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28

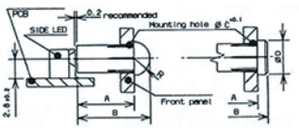
Optoelectronics, Indicators, Lamps & Displays

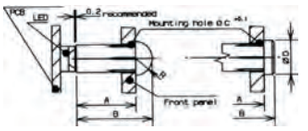
Farnell Page 870 Date: 21-08-06 time: 16:51

Light Pipes

Light Guides - In-line

MENTOR





- Versatile light guides for in-line transmission of light
- For press-fit into Front Panel
- Available in two versions:-
- Spherical version - similar display effect to that of an LED
- Planar version (flat chamfered end) - provides enhanced display characteristics
- Provides ESD protection (approx 12.5 kV)
- For use with Side or Top LEDs

A	B	C	D	Mftrs. List No.
Spherical				
7	8,5	2,8	3,2	1282.1.
Planer				
7	8,5	2,8	3,2	1282.2.

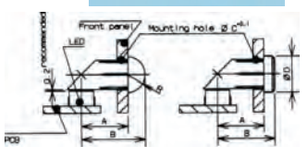
248985

Order Multiple=10

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
1282.1.	**432-7767●**	1.61	1.39	1.32	1.22	– –
1282.2.	**432-7779●**	1.61	1.39	1.32	1.22	– –

Light Guides - 45°

MENTOR



- Versatile light guides for 45° transmission of light
- For press-fit into Front Panel
- Spherical version - similar display effect to that of an LED
- Planar version (flat chamfered end) - provides enhanced display characteristics
- Provides ESD protection (see table)
- For use with Side or Top LEDs

A (mm)	B (mm)	C (mm)	D(mm)	Approx ESD Resistance	Mftrs. List No.
Spherical					
5.7	7.2	2.8	3.2	11.2 kV	1282.3.
6.5	8.9	4.2	5	12 kV	1293.3.
Planer					
5.7	8.5	2.8	3.2	11.2 kV	1282.4.
6.5	8	4.2	5	12 kV	1293.4.

248990

Order Multiple=10

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
1282.3.	**432-7780●**	1.13	0.98	0.91	0.85	– –
1293.3.	**432-7792●**	1.14	0.99	0.93	0.88	– –
1282.4.	**432-7809●**	1.13	0.98	0.91	0.85	– –
1293.4.	**432-7810●**	1.13	0.98	0.91	0.85	– –

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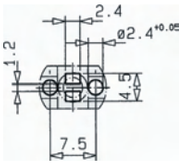
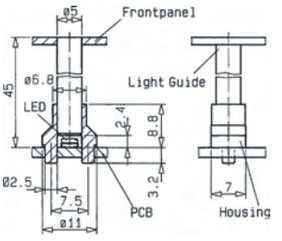
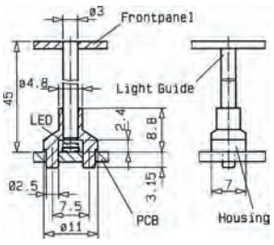
The very latest NEW products

Upright Light Guides - 3mm

MENTOR







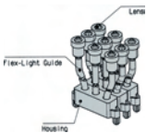
- Upright light guides for SMD LEDs
- Light guide is removable from the PCB support for ease of production
- Supports are positioned on PCB by two insert pins

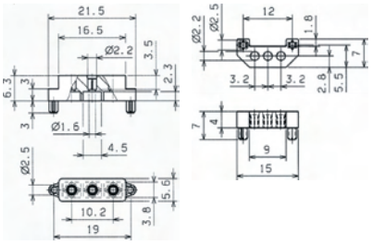
248996

Dia.	Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
3mm	1216.1003.	**432-7822●**	2.39	2.11	1.98	1.82	– –
5mm	1216.1005.	**324-5172●**	1.58	1.48	1.35	1.12	– –

Stackable Light Guide System

MENTOR





- Stackable triple light guides for SMD LEDs
- Supports and light guides available separately
- Supports are positioned on PCB by two insert pins
- Light guides 1mm black fibre coated, (total diameter: 2.2mm), available in 100, 200 or 300mm lengths
- Lens not supplied

Mftrs. List No.	Description
Mounting Supports	
1304.1001	In-line Support
1304.1002	Angled Support
1mm fibre-coated light guide	
1304.1003	100mm
1304.1004	200mm
1304.1005	300mm

249003

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
Mounting Supports						
1304.1001	**432-7846**	0.91	0.79	0.72	0.67	– –
1304.1002	**432-7858**	0.91	0.79	0.72	0.67	– –
Light Guides						
1304.1003	**432-7860**	0.58	0.49	0.46	0.43	– –
1304.1004	**432-7871**	1.13	0.98	0.91	0.85	– –
1304.1005	**432-7883**	1.61	1.42	1.32	1.22	– –

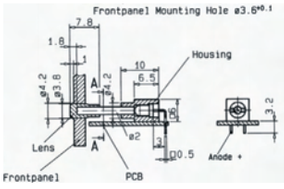
Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

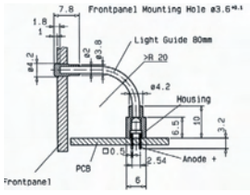
C = CYAN M = Magenta Y = Yellow B = Black/SING

LED with flexible light guide

MENTOR

- Housing incorporates THT LED in either red, green, or yellow
- Light guide is flexible, Ø 2mm, 80mm length
- Push-fit lens for front panel





Mftrs. List No.	Fwd Voltage typ	Fwd Voltage max	Fwd Current Max mA	Luminous Intensity Lv(mcd) @10mA min	Luminous Intensity Lv(mcd) @10mA max	Peak Fwd Current A	Rev. Voltage V
1316.2001.	2.0	2.6	40	10	32	0.5	5
1316.7001	2.0	2.6	40	10	32	0.5	5
1316.8001.	2.0	2.6	40	16	50	0.5	5

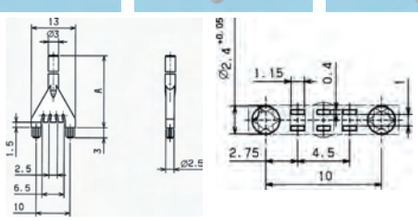
Mftrs. List No.	LED Type	Colour	Wavelength (nm)	Lens Colour	Dispersion Angle
1316.2001.	A63	red	635	red/clear	40°
1316.7001	A64	yellow	586	yellow/clear	40°
1316.8001.	A65	green	565	green/clear	40°

249006

Colour	Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
Red	1316.2001.	**432-7895**	6.39	5.61	5.26	4.86	– –
Yellow	1316.7001	**432-7901**	6.39	5.61	5.26	4.86	– –
Green	1316.8001.	**432-7913**	6.45	5.67	5.37	4.96	– –

Tri-chromatic upright light guides for SMD LEDs

MENTOR



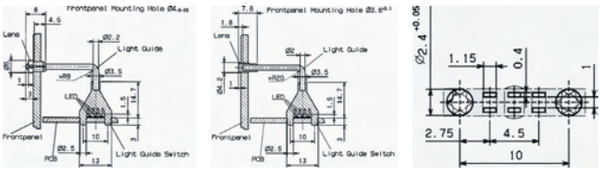
- Designed for use with three **Type 0805 CHIPLEDS** or smaller
- Provide mono, bi, or tri-chromatic displays, or blends of all three colours
- Positioned on PCB by two insert pins
- Available in 15mm, 30mm, or 45mm lengths

249010

Length (A)	Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
15mm	1294.1001	**432-7925**	2.14	1.89	1.76	1.63	– –
30mm	1294.1002.	**432-7937**●	2.33	2.05	1.92	1.77	– –
45mm	1294.1003	**432-7949**	2.52	2.20	2.05	1.91	– –

Tri-chromatic flexible upright light guides for SMD LEDs

MENTOR



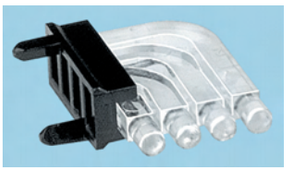
- Designed for use with three **Type 0805 CHIPLEDS** or smaller
- Provide mono, bi, or tri-chromatic displays, or blends of all three colours
- Light guide 150mm long, 2mm diameter, available as either 2000μm fibres or black coated 1000μm fibres
- Positioned on PCB by two insert pins

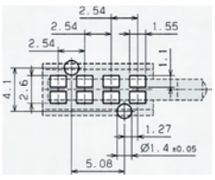
249013

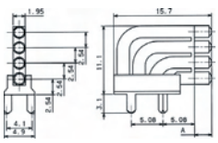
Length	Fibre	Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
150mm	1000µm	1294.1.	**432-7950**●	3.65	3.21	3.02	2.79	– –
150mm	2000µm	1294.2.	**432-7962**●	3.97	3.50	3.28	3.02	– –

Miniature Quadruple Light Guide for SMD LEDs

MENTOR







- Designed for use with **Type 0805 CHIPLEDS** or smaller
- Can be strip-mounted in a grid of 5.8mm
- Fitted with a diaphragm to avoid blooming and to allow colour blending
- Positioned on PCB by two insert pins

249027

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
1296.1004.	**432-7974**●	3.78	3.31	3.12	2.88	– –

Light Pipes

Positioning LEDs away from the front panel helps to reduce EMC. Light Pipes are manufactured from hi-efficiency polycarbonate, and provide designers with a simple, low cost method of transferring light from SMD LEDs to the front panel with minimal loss of light intensity. This gives various options for positioning the light and offers a number of combinations of either single or multiple light pipes giving vertical, right angled or flexible light output.

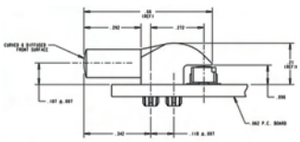
333461

Optical Light Pipes - Single Element

Right angle - Clear

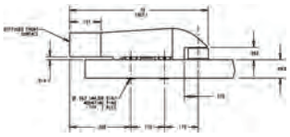
Dialight

788-1533 H=5.5, W=3.5, D=16.5mm
Face Dia=3.57mm



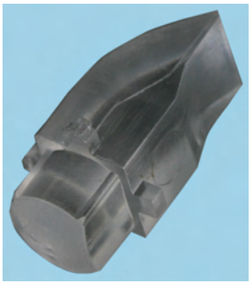
788-1533

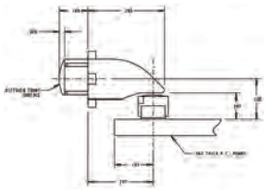
788-1541 H=3.8, W=3.3, D=17.5mm
Face = 3.6mm^2



788-1541

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available





788-1550

788-1550 H=5.8, W=5.4, D=10.2mm
Face Dia=3mm

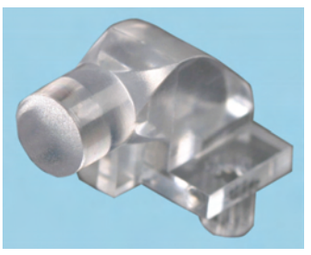
- High transmissive polycarbonate material
- ESD protection (Circuit isolated from front panel)
- Wide viewing angle
- Press fit to PCB (788-1533 & 788-1541)
- Press fit to front panel (788-1550)
- 35% oxygen index
- Operating/storage temperature range -30°C to +100°C

361041

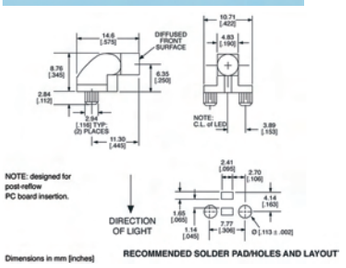
Mftrs List No.	Order Code	Price Each 1+	10+	50+	100+	+
515-1049F	113-8255●	0.59	0.55	0.52	0.49	– –
515-1105F	113-8256●	0.59	0.55	0.52	0.49	– –
515-1096F	113-8257●	3.29	2.99	2.80	2.64	– –

Optical Light Pipe

5mm round



This device has a large and bright 5mm diameter light emitting surface. It is designed to replace 5mm right angle through-hole devices. The light pipe is secured to the PCB by 2 press-fit pins located on either side of the light pipe element.



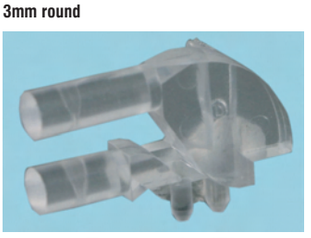
- High transmissive polycarbonate material
- UL94V-0 compliant
- ESD protection (Circuit isolated from front panel)
- Wide viewing angle
- Press fit to PCB
- 35% oxygen index
- Operating/storage temperature range -30°C to +100°C

361038

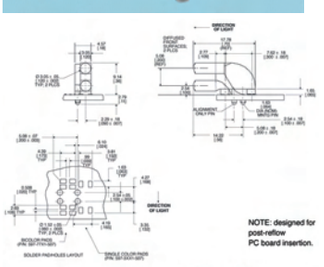
Mftrs List No.	Order Code	Price Each 1+	10+	50+	100+	+
515-1011F	113-8252●	0.59	0.55	0.52	0.49	– –

Optical Light Pipe - Bi-Level

3mm round



This device has 2 x 3mm diameter elements placed 2.54mm (0.1") from the surface of the PCB and 5.08mm (0.2") apart. The recommended minium mounting pitch between elements is 5.08mm (0.2")

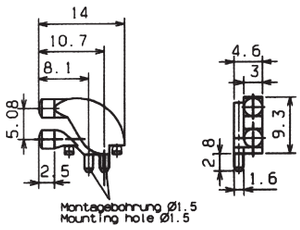


- High transmissive polycarbonate material
- UL94V-0 compliant
- ESD protection (Circuit isolated from front panel)
- Wide viewing angle
- Press fit to PCB
- 35% oxygen index
- Operating/storage temperature range -30°C to +100°C

361037

Mftrs List No.	Order Code	Price Each 1+	10+	50+	100+	+
515-1094F	113-8251●	0.59	0.55	0.52	0.49	– –

Light Pipes - Dual, Curved 90°



Dual vertical-stacked, 90° ∅ 3mm,
PCB mounted by 2 fluted pins.
Temperature range = -40°C to +85°C

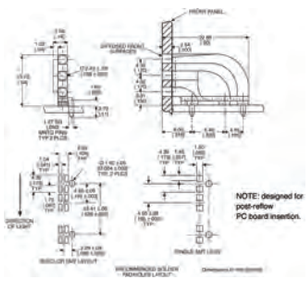
333465

Mftrs List No.	Order Code	Price Each 1+	+	+	+	+
1280.1010.	324-5111●	1.20	– –	– –	– –	– –

Optical Light Pipe - Tri-High

3mm square

This device has 3 x 2.5mm diameter elements placed 4.32mm (0.17") apart. They can be placed in arrays with a 5mm (0.2") pitch and can utilize either single or multi-colour LED's

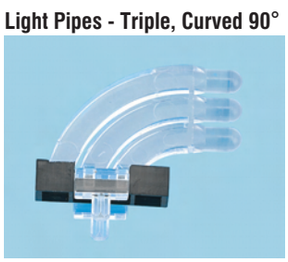


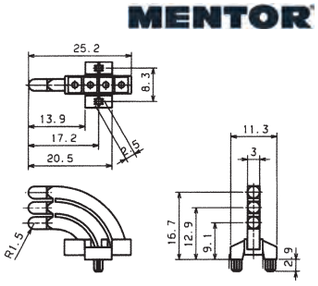
- High transmissive polycarbonate material
- UL94V-0 compliant
- ESD protection (Circuit isolated from front panel)
- Wide viewing angle
- Press fit to PCB
- 35% oxygen index
- Operating/storage temperature range -30°C to +100°C

361036

Mftrs List No.	Order Code	Price Each 1+	10+	50+	100+	+
515-1064F	113-8249●	1.01	0.94	0.88	0.81	– –

Light Pipes - Triple, Curved 90°





Triple vertical-stacked, 90° ∅ 3mm,
PCB mounted by 2 fluted pins.
Temperature range = -40°C to +85°C

333467

Mftrs List No.	Order Code	Price Each 1+	25+	100+	250+	+
1276.1003.	324-5123●	1.98	1.80	1.64	1.35	– –

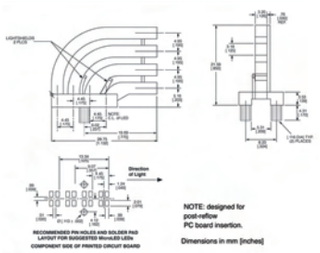
Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

Optical Light Pipe - Quad High

3mm square

Dialight

The 4 vertical elements are spaced 5.16mm (0.203") from the PCB surface and then 4.95mm (0.195") between each other. The device is held in place on the PCB by two 2.95mm (0.116") press fit pins, 8.2mm (0.324") apart on the bottom of the Light Pipe.



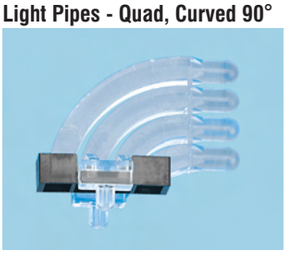
- High transmissive polycarbonate material
- UL94V-0 compliant
- ESD protection (Circuit isolated from front panel)
- Wide viewing angle
- Press fit to PCB
- 35% oxygen index
- Operating/storage temperature range -30°C to +100°C

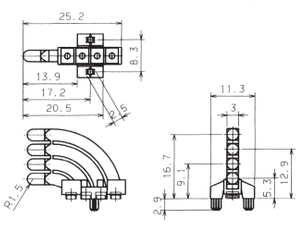
361035

Mftrs List No.	Order Code	Price Each 1+	10+	50+	100+	+
515-1023F	**113-8247●**	1.46	1.33	1.24	1.17	– –

Light Pipes - Quad, Curved 90°

MENTOR





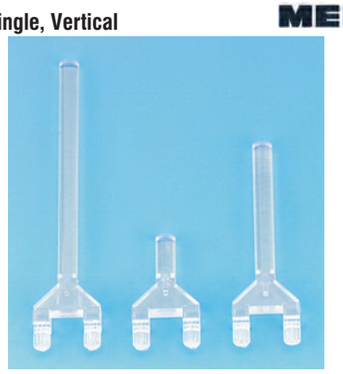
Quad vertical-stacked, 90° ∅ 3mm, PCB mounted by 2 fluted pins.
Temperature range = -40°C to +85°C

OPT703A/B/C

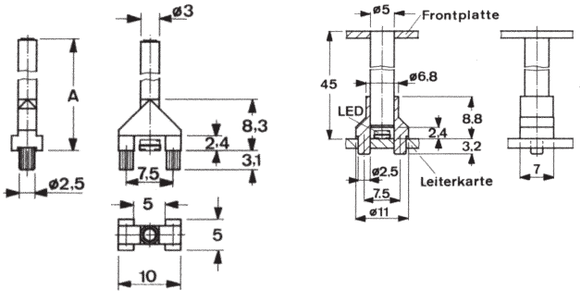
Mftrs List No.	Order Code	Price Each 1+	25+	100+	250+	+
1276.1004.	**324-5135●**	1.95	1.76	1.61	1.35	– –

Light Pipes - Single, Vertical

MENTOR



A = 15mm 1275.1001, 30mm 1275.1002, 45mm 1275.1003



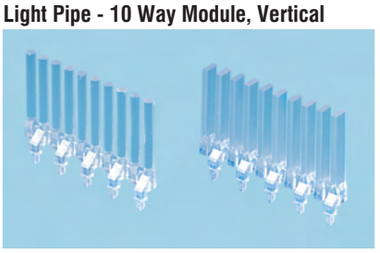
Single straight vertical-stacked, ∅ 3 & 5mm, PCB mounted by 2 fluted pins.
Available in 15mm, 30mm and 45 mm lengths.
Temperature range = -40°C to +85°C

333471

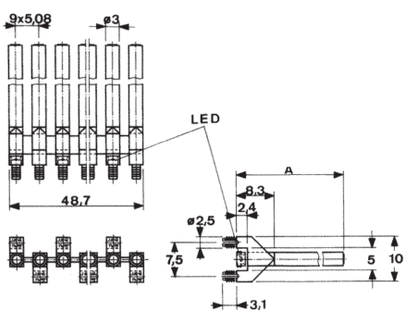
Length	Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
3mm Diameter							
15mm	1275.1001.	**324-5147●**	0.43	0.41	0.38	0.37	– –
30mm	1275.1002.	**324-5159●**	0.43	0.41	0.38	0.37	– –
45mm	1275.1003.	**324-5160●**	0.43	0.41	0.38	0.37	– –
5mm Diameter							
45mm	1216.1005.	**324-5172●**	1.58	1.48	1.35	1.12	– –

Light Pipe - 10 Way Module, Vertical

MENTOR



10 way light pipe module straight vertical-stacked, available in ∅ 3mm & 2.0 x 5.0mm rectangular format with lengths of 15mm, 30mm and 45mm. PCB mounted by 10 fluted pins.
Temperature range = -40°C to +85°C



A = 15mm 127.1210/ 1274.1210,

30 mm 1272.1220/ 1274.1220,

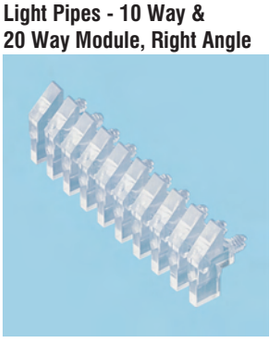
45mm 1272.1230/ 1274.1230

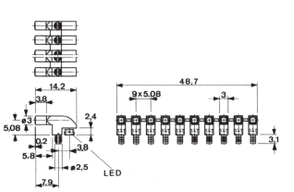
333472

Length	Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
3mm Diameter							
15mm	1272.1010.	**324-5184●**	1.07	0.98	0.91	0.78	– –
30mm	1272.1020.	**324-5196●**	1.48	1.35	1.26	1.02	– –
45mm	1272.1030.	**324-5202●**	1.48	1.35	1.26	1.02	– –
2mm x 5mm Rectangular							
15mm	1274.1010.	**324-5214●**	1.20	1.10	1.01	0.84	– –
30mm	1274.1020	**324-5226**	1.20	1.10	1.01	0.84	– –
45mm	1274.1030	**324-5238**	1.20	1.10	1.01	0.84	– –

Light Pipes - 10 Way & 20 Way Module, Right Angle

MENTOR



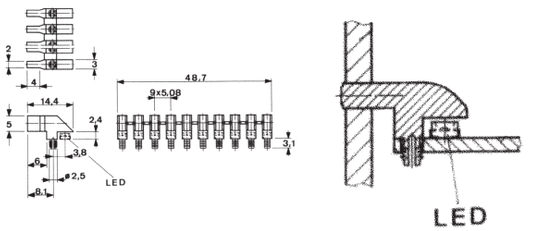


● Compliant
◄ Non-compliant
++ Limited stock - RoHS replacement available

RoHS

C = CYAN M = Magenta Y = Yellow B = Black/SING

Farnell Page 874 Date: 21-08-06 time: 16:53



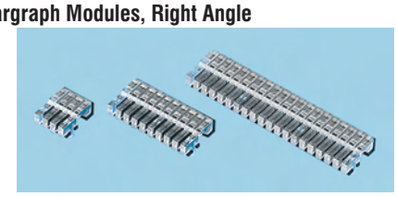
90° light pipe arrays for use with SMD LEDs. The 20 way units are a dual tier format and the 10 way units are single tier. The 20 way dual tier is available in 3mm ∅ round section while the 10 way single tier modules are available in 3mm ∅ and 2mm x 5mm rectangular. PCB mounted by 10 fluted pins.
Temperature range = -40°C to +85°C

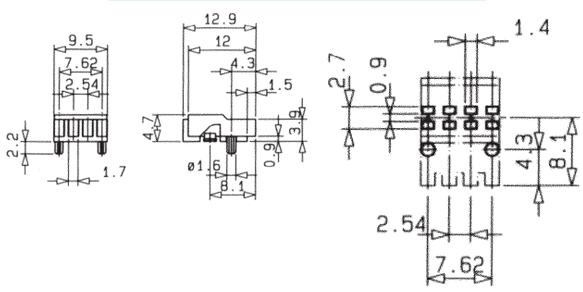
333473

Mftrs List No.	Order Code	Price Each 1+	25+	100+	250+	+
10 Way Single Tier 2mm x 5mm Rectangular						
1273.1010.	**324-5240●**	1.32	1.17	1.07	0.93	– –
10 way Single Tier 3mm Diameter						
1271.1010.	**324-5251●**	1.42	1.29	1.20	0.98	– –
20 way Single Tier 3mm Diameter						
1270.1010.	**324-5263●**	3.62	3.34	3.12	2.60	– –

Light Pipes - 4 Way, 10 Way & 20 Way Bargraph Modules, Right Angle

MENTOR





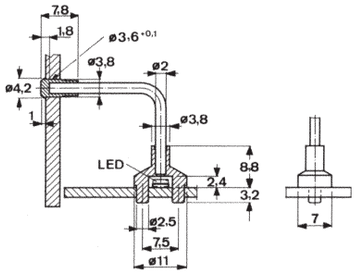
Low profile right angle light pipe bargraph for use with SMD LEDs. They are available in 4, 10 and 20 ways with 1.7 x 3.9 rectangular viewing areas. The arrays are PCB mounted by fluted pins.
Temperature range: -40°C to +85°C

333474

Mftrs List No.	Order Code	Price Each 1+	25+	100+	250+	+
4 Way						
1278.1004.	**324-5275●**	1.58	– –	– –	– –	– –
10 Way						
1278.1010	**324-5287**	1.86	– –	– –	– –	– –
20 Way						
1278.1020	**324-5299**	1.61	1.54	1.45	1.23	– –

Light Pipes - Flexible

MENTOR



Flexible 2mm ∅ light pipe kit for use with SMD LEDs. 2mm ∅ flexible section may be cold formed to min 9mm radius. PCB mounted by fluted pins. Available in 80mm and 150mm lengths with 3mm ∅ viewing area. (Note - 150mm version has an internal 1mm core with a black sheath).

333475

Mftrs List No.	Order Code	Price Each 1+	25+	100+	250+	+
80mm Light Pipe						
1216.1002.	**324-5305●**	2.45	2.29	2.18	1.91	– –
150mm Light Pipe						
1216.1001.	**324-5317●**	3.53	3.18	2.96	2.56	– –

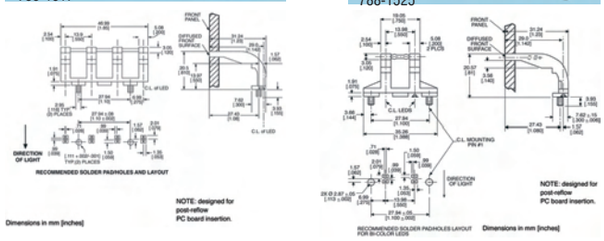
Optical Light Pipe Arrays

3 x 5mm rectangular - RJ45 jack

Dialight

788-1517

788-1525



- High transmissive polycarbonate material
- UL94V-0 compliant
- ESD protection (Circuit isolated from front panel)
- Wide viewing angle
- Press fit to PCB
- 35% oxygen index
- Operating/storage temperature range -30°C to +100°C

The design of these devices enables indicators to be positioned above corresponding RJ45 jack or other components. They are secured to the PCB by two press fit pins located under the base of the light pipes.

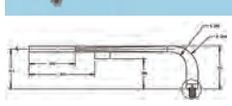
361039

Mftrs List No.	Order Code	Price Each 1+	10+	50+	100+	+
515-1022F	**113-8253●**	3.09	2.86	2.60	2.54	– –
515-1070F	**113-8254●**	2.18	1.99	1.86	1.73	– –

Optical Light Pipe - Twin Vertical

2 x 1.3mm round

Dialight



Designed to carry SMD light source information over a Small Form-factor Pluggable (SFP) cage assembly to the front panel. The device is secured to the PCB by means of two press fit pins located under the base of the light pipe assembly.

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

C = CYAN M = Magenta Y = Yellow B = Black/SING

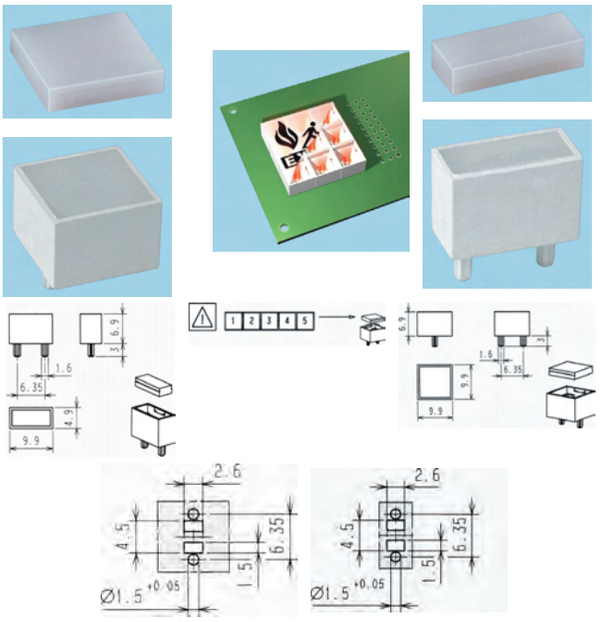
- High transmissive polycarbonate material
- ESD protection (Circuit isolated from front panel)
- Wide viewing angle
- Press fit to PCB
- 35% oxygen index
- Operating/storage temperature range -30°C to +100°C

361040

Mftrs List No.	Order Code	Price Each 1+	10+	50+	100+	+
515-1118F	113-8258●	1.76	1.59	1.50	1.40	– –

Surface Symbol Illumination System

MENTOR



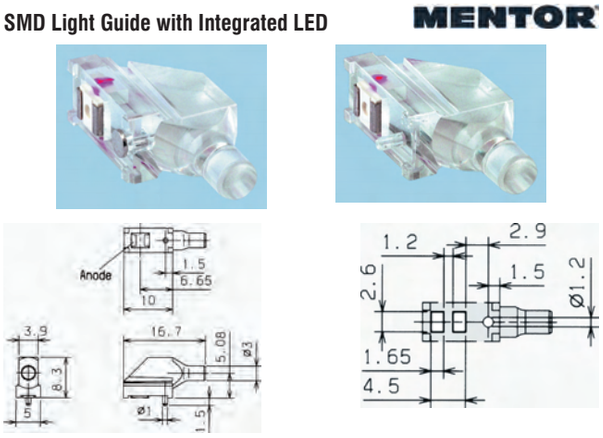
- Square and rectangular versions
- 2 x Rectangular units = 1 square unit
- Available complete, or as separate housings / diffuser covers
- Can be grouped together and covered with one large printed diffuser panel - see example photo
- Provide surface and background illumination
- Provide excellent surface radiation with low height
- Positioned via fixing pins

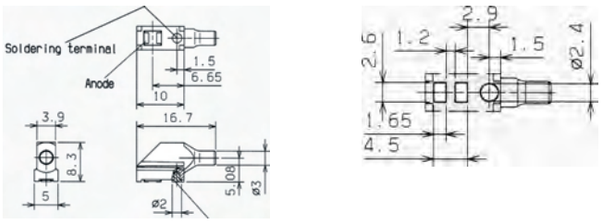
249051

Description	Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
Square							
Complete	2366.1.	SMD 432-8000	2.46	2.14	2.02	1.86	– –
Housing Only	2366.0001	SMD 432-8012	1.20	1.01	0.94	0.88	– –
Diffuser Cover	2366.0002	SMD 432-8024	1.07	0.91	0.85	0.79	– –
Rectangular							
Complete	2366.1001	SMD 432-8036	2.33	2.05	1.92	1.77	– –
Housing Only	2366.0003	SMD 432-8048	1.07	0.91	0.85	0.79	– –
Diffuser Cover	2366.0004	SMD 432-8050	0.94	0.79	0.76	0.70	– –

SMD Light Guide with Integrated LED

MENTOR





- 3mm diameter display, planar, horizontally radiating
- Available with solder support surface or fixing pin
- ESD to front ≥12kV

Mftrs. List No.	LED Type	Colour	Wavelength (nm)	Lens Colour	Dispersion Angle
1283.1201	L1	super red	635	clear	±120°
1283.1801	L3	green	565	clear	±120°
1283.1203.	L1	super red	635	clear	±120°
1283.1703.	L2	yellow	586	clear	±120°
1283.1803	L3	green	565	clear	±120°

Mftrs. List No.	Fwd Voltage typ	max	Fwd Current Max mA	Luminous Intensity Lv(mcd) @10mA min	typ	max	Rev. Voltage V
1283.1201	2.0	2.6	30	4	-	12	5
1283.1801	2.0	2.6	30	4	-	12	5
1283.1203.	2.0	2.6	30	4	-	12	5
1283.1703.	2.0	2.6	30	4	-	12	5
1283.1803	2.0	2.6	30	4	-	12	5

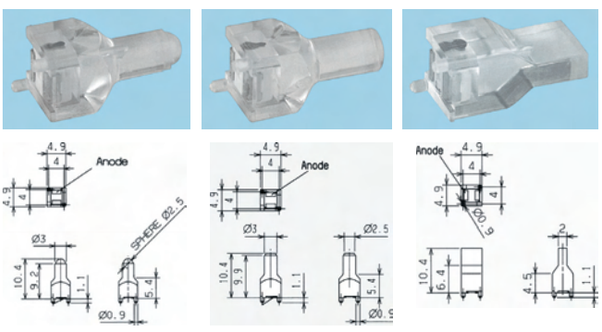
249082

Order Multiple=5 LED Colour	Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
With Solder Support Surface							
Super Red	1283.1201	432-8061	6.52	5.83	5.39	4.95	– –
Green	1283.1801	432-8085	6.52	5.83	5.39	4.95	– –
With Fixing Pin							
Super Red	1283.1203.	432-8097	5.92	5.29	4.91	4.47	– –
Yellow	1283.1703.	432-8103	5.92	5.29	4.91	4.47	– –
Green	1283.1803	432-8115	5.92	5.29	4.91	4.47	– –

SMD Light Guide with Integrated LED

MENTOR

3mm Diameter Planar or Spherical, 2mm x 5mm Rectagular Planar



- Vertically Radiating
- ESD to front ≥10kV

Mftrs. List No.	LED Type	Colour	Wavelength (nm)	Lens Colour	Dispersion Angle
1286.1201	L1	super red	635	clear	±120°
1286.1701	L2	yellow	586	clear	±120°
1286.1801	L3	green	565	clear	±120°
1286.2201	L1	super red	635	clear	±120°
1286.2701	L2	yellow	586	clear	±120°
1286.2801.	L3	green	565	clear	±120°
1287.1701	L2	yellow	586	clear	±120°
1287.1801	L3	green	565	clear	±120°

Mftrs. List No.	Fwd Voltage typ	max	Fwd Current Max mA	Luminous Intensity Lv(mcd) @ 10mA min	typ	max	Rev. Voltage V
1286.1201	2.0	2.6	30	4	-	12	5
1286.1701	2.0	2.6	30	4	-	12	5
1286.1801	2.0	2.6	30	4	-	12	5
1286.2201	2.0	2.6	30	4	-	12	5
1286.2701	2.0	2.6	30	4	-	12	5
1286.2801.	2.0	2.6	30	4	-	12	5
1287.1701	2.0	2.6	30	4	-	12	5
1287.1801	2.0	2.6	30	4	-	12	5

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

249086

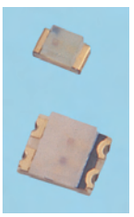
LED Colour	Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
∅ 3mm Spherical							
Super Red	1286.1201	**432-8188**	6.74	6.05	5.61	5.13	– –
Yellow	1286.1701	**432-8190**	6.74	6.05	5.61	5.13	– –
Green	1286.1801	**432-8206**	6.74	6.05	5.61	5.13	– –
∅ 3mm Planar							
Super Red	1286.2201	**432-8218**	6.74	6.05	5.61	5.13	– –
Yellow	1286.2701	**432-8220**	6.74	6.05	5.61	5.13	– –
Green	1286.2801.	**432-8231**	6.74	6.05	5.61	5.13	– –
2mm x 5mm Rectangular							
Yellow	1287.1701	**432-8255**	6.74	6.05	5.61	5.13	– –
Green	1287.1801	**432-8267**	6.74	6.05	5.61	5.13	– –

Surface Mount Light Emitting Diodes (LEDs)

Surface Mount – 'Flip Chip'

Top, Right Angle and Reverse Mounting

AVAGO TECHNOLOGIES



Dimensions (mm)
C170 - W=2.0, D=1.25, H=1.1
C155 - W=3.2, D=2.7, H=1.1
C660, S660 - W=3.0, D=1.0, H=2.0
C110 - W=3.2, D=1.0, H=1.5
C265 - W=3.4, D=1.25, H=1.1
S690 - W=1.6, D=0.8, H=0.7
S670 - W=2.0, D=1.25, H=1.1

Supplied on 8mm tape.

Peak Inverse Voltage (PIV)=5

Colour	View Angle	Typ Lum Intensity @ 20mA (mcd)	I_F (mA) (max)	Peak Wavelength	Mftrs. List No.	Order Code
Tinted, Diffused Lens - Top Mount						
HE Red	170°	10	20	630nm	HSMS-C170	579-0839
HE Red	170°	17	25	660nm	HSMH-C170	579-0840
Green	170°	15	20	570nm	HSMG-C170	579-0852
Orange	170°	8	20	605nm	HSMD-C170	579-0864
Yellow	170°	8	20	589nm	HSMY-C170	579-0876
Untinted, Non-diffused Lens - Right Angle Mount						
Amber	130°	95	25	595nm	HSMA-C110.	855-4455
Red	130°	95	25	637nm	HSMC-C110.	855-4498
Orange	130°	8.0	25	605nm	HSMD-C110.	855-4536
Red	130°	10.0	30	630nm	HSMH-C110.	855-4625
Orange	130°	95	25	609nm	HSML-C110.	855-4668
Green	130°	150	20	520nm	HSMQ-C110.	855-4692
Blue	130°	60	20	469nm	HSMR-C110.	855-4722
Untinted, Diffused Lens - Right Angle Mount						
Red	155°	16	25	650nm	HSMH-C660	947-994
HE Red	130°	11	25	630nm	HSMS-C110	322-9567
Red	155°	50	30	630nm	HSMC-S660	322-9555
Amber	155°	65	30	592nm	HSMA-S660	322-9543
Orange	155°	65	30	609nm	HSMD-S660	322-9592
Yellow	130°	9	25	589nm	HSMY-C110	322-9579
Green	155°	9	30	566nm	HSMG-C660	948-093
Green	130°	16	25	570nm	HSMG-C110	322-9580
Untinted, Diffused Lens - Reverse Mount						
HE Red	170°	17	25	660nm	HSMH-C265	579-0890
Green	170°	15	25	570nm	HSMG-C265	579-0906
Untinted, Diffused Lens - Top Mount						
Red	165°	50	30	630nm	HSMC-S670	322-5150
Red	165°	50	30	630nm	HSMC-S690	322-9531
Red	170°	90	25	637nm	HSMC-C170.	855-4501
Red	170°	90	25	637nm	HSMC-C190.	855-4510
Red	170°	90	25	637nm	HSMC-C191.	855-4528
Amber	165°	65	30	592nm	HSMA-S670	322-5136
Amber	165°	65	30	592nm	HSMA-S690	322-5148
Amber	170°	90	25	595nm	HSMA-C170.	855-4463
Amber	170°	90	25	595nm	HSMA-C190.	855-4471
Amber	170°	90	25	595nm	HSMA-C191.	855-4480
Orange	165°	65	30	609nm	HSMD-S670	322-9518
Orange	165°	65	30	609nm	HSMD-S690	322-9520
Orange	170°	8.0	25	605nm	HSMD-C150.	855-4544
Orange	170°	8.0	20	605nm	HSMD-C190.	855-4552
Green	170°	15	25	570nm	HSMG-C150.	855-4595
Green	170°	15	20	570nm	HSMG-C190.	855-4609
Green	170°	15	20	570nm	HSMG-C191.	855-4617
Red	170°	10.0	30	630nm	HSMH-C150.	855-4633
Red	170°	10.0	25	630nm	HSMH-C190.	855-4641
Red	170°	10.0	25	630nm	HSMH-C191.	855-4650
Orange	170°	90	25	609nm	HSML-C170.	855-4676
Orange	170°	90	25	609nm	HSML-C191.	855-4684
Green	140°	145	20	520nm	HSMQ-C150.	855-4706
Green	140°	145	20	520nm	HSMQ-C170.	855-4714
Blue	140°	55	20	469nm	HSMR-C150.	855-4730
Blue	140°	55	20	469nm	HSMR-C170.	855-4749
Red	170°	10.0	25	630nm	HSMS-C150.	855-4757
Red	170°	10.0	20	630nm	HSMS-C190.	855-4765
Yellow	170°	8	25	570nm	HSMY-C150.	855-4773
Yellow	170°	8	20	570nm	HSMY-C190.	855-4781
Yellow	170°	8	20	570nm	HSMY-C191.	855-4790

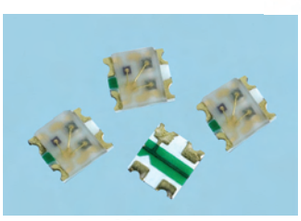
206291

Colour	Order Code	Price Each 5+	10+	100+	500+	+
Right Angle Mount						
Red	SMD **947-994**	0.53	0.49	0.46	0.32	– –
HE Red	SMD **322-9567**	0.50	0.30	0.19	0.16	– –
Red	SMD **322-9555**	1.34	0.84	0.60	0.50	– –
Red	SMD **855-4625**	0.33	0.27	0.23	0.20	– –
Red	SMD **855-4498**	0.78	0.65	0.53	0.46	– –
Amber	SMD **322-9543**	1.34	0.84	0.60	0.50	– –
Amber	SMD **855-4455**	0.78	0.65	0.53	0.46	– –
Orange	SMD **322-9592**	1.34	0.84	0.60	0.50	– –
Orange	SMD **855-4536**	0.33	0.27	0.23	0.20	– –
Orange	SMD **855-4668**	0.78	0.65	0.53	0.46	– –
Yellow	SMD **322-9579**	0.68	0.39	0.25	0.19	– –
Green	SMD **948-093**	1.00	0.59	0.40	0.31	– –
Green	SMD **322-9580**	0.42	0.38	0.34	0.25	– –
Green	SMD **855-4692**	4.17	3.48	2.86	2.51	– –
Blue	SMD **322-5124**	1.28	0.99	0.84	0.82	– –
Blue	SMD **855-4722**	4.17	3.48	2.86	2.51	– –
Top Mount						
HE Red	SMD **579-0839**	0.36	0.26	0.23	0.21	– –
HE Red	SMD **579-0840**	0.36	0.26	0.23	0.21	– –
HE Red	SMD **855-4757**	0.24	0.20	0.17	0.14	– –
HE Red	SMD **855-4765**	0.20	0.16	0.14	0.12	– –
Green	SMD **579-0852**	0.36	0.26	0.23	0.21	– –
Orange	SMD **579-0864**	0.36	0.26	0.23	0.21	– –
Yellow	SMD **579-0876**	0.36	0.26	0.23	0.21	– –
Yellow	SMD **855-4773**	0.24	0.20	0.17	0.14	– –
Yellow	SMD **855-4781**	0.20	0.16	0.14	0.12	– –
Yellow	SMD **855-4790**	0.26	0.22	0.18	0.16	– –
Green	SMD **855-4595**	0.24	0.20	0.17	0.14	– –
Green	SMD **855-4609**	0.20	0.16	0.14	0.12	– –
Green	SMD **855-4617**	0.26	0.22	0.18	0.16	– –
Green	SMD **855-4706**	3.84	3.21	2.64	2.31	– –
Green	SMD **855-4714**	4.17	3.48	2.86	2.51	– –
Blue	SMD **322-5100**	1.28	0.99	0.84	0.82	– –
Blue	SMD **322-5112**	1.28	0.99	0.84	0.82	– –
Blue	SMD **855-4730**	3.84	3.21	2.64	2.31	– –
Blue	SMD **855-4749**	4.17	3.48	2.86	2.51	– –
Red	SMD **322-5150**	1.27	0.79	0.56	0.48	– –
Red	SMD **322-9531**	1.27	0.79	0.56	0.48	– –
Red	SMD **855-4501**	0.51	0.43	0.35	0.31	– –
Red	SMD **855-4510**	0.58	0.48	0.40	0.35	– –
Red	SMD **855-4528**	0.51	0.43	0.35	0.31	– –
Red	SMD **855-4633**	0.24	0.20	0.17	0.14	– –
Red	SMD **855-4641**	0.20	0.16	0.14	0.12	– –
Red	SMD **855-4650**	0.26	0.22	0.18	0.16	– –
Amber	SMD **322-5136**	1.27	0.79	0.56	0.48	– –
Amber	SMD **322-5148**	1.27	0.79	0.56	0.48	– –
Amber	SMD **855-4463**	0.58	0.48	0.40	0.35	– –
Amber	SMD **855-4471**	0.58	0.48	0.40	0.35	– –
Amber	SMD **855-4480**	0.51	0.43	0.35	0.31	– –
Orange	SMD **322-9518**	1.30	0.81	0.56	0.49	– –
Orange	SMD **322-9520**	1.30	0.81	0.56	0.49	– –
Orange	SMD **855-4544**	0.24	0.20	0.17	0.14	– –
Orange	SMD **855-4552**	0.20	0.16	0.14	0.12	– –
Orange	SMD **855-4676**	0.58	0.48	0.40	0.35	– –
Orange	SMD **855-4684**	0.51	0.43	0.35	0.31	– –
Reverse Mount						
HE Red	SMD **579-0890**	0.42	0.39	0.37	0.30	– –
Green	SMD **579-0906**	0.42	0.39	0.37	0.30	– –

Surface Mount - Bi-colour

Diffused Optics

AVAGO TECHNOLOGIES



3.2 x 2.7mm

1.6 x 0.8mm

Colour	View Angle	Lum. Intensity (mcd) @ 20mA min.	Typ.	Peak Wavelength (nm)	Reverse Voltage (V)	Forward Voltage Typ. (V)	Max. (V)
Diffused Lens - 3.2 x 7mm footprint							
Yellow	170°	2.5	8.0	589	5	2.1	2.6
Orange	170°	2.5	8.0	605	5	2.2	2.6
HE Red	170°	2.5	10	630	5	2.1	2.6
Green	170°	4.0	15	570	5	2.2	2.6
Diffused Lens - 1.6 x 0.8mm footprint							
HE Red	120°	2.5	10	630	5	2.1	2.6
Green	120°	4.0	15	570	5	2.2	2.6

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

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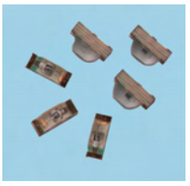
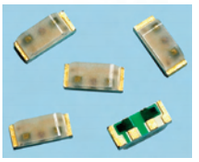
Colour	Mftrs. List No.	Order Code	Price Each 5+	25+	100+	250+	+
3.2 x 2.7mm footprint							
Green/Yellow	HSMF-C156.	SMD 855-4560●	0.45	0.37	0.31	0.27	– –
Green/Orange	HSMF-C157.	SMD 855-4579●	0.45	0.37	0.31	0.27	– –
HE Red and Green	HSMF-C155	SMD 579-0888●	0.42	0.39	0.37	0.30	– –
1.6 x 0.8mm footprint							
Green/HE Red	HSMF-C165.	SMD 855-4587●	0.53	0.45	0.37	0.32	– –

Surface Mount - ChipLED's

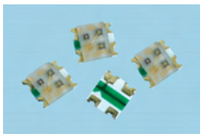
Top and Side Emitting



C120 (0603) Package



C113 and C115 Packages



C114 Package

- Small footprint packages
- High reliability LED package
- High optical efficiency
- Super wide viewing angles
- Compatible with both IR and TTW soldering process

NEW

Package Style	Colour	Lum. Intensity (mcd) @ 20mA min.	Typ.	Peak Wavelength (nm)	Forward Voltage Typ. (V)	Max. (V)	Order Code (V)
C120 (0603) Package - H = 1.0, W = 1.6, D = 0.6mm							
C120 Right Angle	Amber	25	90	595	1.9	2.4	105-8355
C120 Right Angle	Red	25	90	637	1.9	2.4	105-8357
C120 Right Angle	Orange	2.5	8	605	2.2	2.6	105-8358
C120 Right Angle	Green	18	52	570	2.1	2.6	105-8360
C120 Right Angle	Green	4	15	572	2.2	2.6	105-8364
C120 Right Angle	Red	4	15	660	1.8	2.6	105-8365
C120 Right Angle	Orange	25	90	609	1.9	2.4	105-8367
C120 Right Angle	Blue	18	55	469	3.4	3.9	105-8369
C120 Right Angle	HE Red	2.5	10	630	2.1	2.6	105-8372
C120 Right Angle	White	45	160		3.6	3.9	105-8374
Low Profile (C191) Package - H = 0.4, W = 1.6, D = 0.8mm							
C191 Top	Orange	2.5	8	605	2.2	2.6	105-8359
C191 Top	Blue	18	55	469	3.4	3.9	105-8371
C191 Top	HE Red	2.5	10	630	2.1	2.6	105-8373
C191 Top	White	71.5	200		3.6	3.9	105-8375
Tri - Colour (C113, C114 and C115) - Common Anode							
C113	Red	28.5	80	626	1.9	2.4	105-8361
H = 1.0, W = 2.5, D = 1.0mm	Green	18	50	572	2.0	2.6	
	Blue	28.5	60	470	3.4	3.9	
C114	Red	28.5	85	626	1.9	2.4	105-8362
H = 0.35, W = 1.6, D = 1.5mm	Green	45	180	525	3.4	3.9	
	Blue	28.5	70	470	3.4	3.9	
C115	Red	28.5	80	626	1.9	2.4	105-8363
H = 1.0, W = 2.5, D = 1.0mm	Green	71.5	170	525	3.4	3.9	
	Blue	28.5	60	470	3.4	3.9	

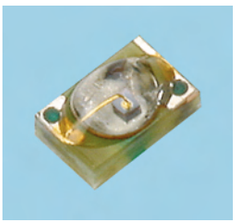
Mftrs. List No. to Order Code	Mftrs. List No. to Order Code	Mftrs. List No. to Order Code
HSMA-C120=105-8355	HSMF-C114=105-8362	HSMR-C191=105-8371
HSMC-C120=105-8357	HSMF-C115=105-8363	HSMS-C120=105-8372
HSMD-C120=105-8358	HSMG-C120=105-8364	HSMS-C191=105-8373
HSMD-C191=105-8359	HSMH-C120=105-8365	HSMW-C120=105-8374
HSME-C120=105-8360	HSML-C120=105-8367	HSMW-C191=105-8375
HSMF-C113=105-8361	HSMR-C120=105-8369	

422865

Colour	Order Code	Price Each 5+	25+	100+	250+	+
Single - Colour						
Amber	SMD 105-8355●	0.59	0.46	0.38	0.34	– –
Red	SMD 105-8357●	0.59	0.46	0.38	0.34	– –
Orange	SMD 105-8358●	0.35	0.28	0.23	0.20	– –
Orange	SMD 105-8359●	0.24	0.18	0.15	0.14	– –
Green	SMD 105-8360●	0.59	0.46	0.38	0.34	– –
Green	SMD 105-8364●	0.35	0.28	0.23	0.20	– –
Red	SMD 105-8365●	0.35	0.28	0.23	0.20	– –
Orange	SMD 105-8367●	0.35	0.28	0.23	0.20	– –
Blue	SMD 105-8369●	1.53	1.20	0.99	0.90	– –
Blue	SMD 105-8371●	3.84	2.97	2.43	2.19	– –
HE Red	SMD 105-8372●	0.35	0.28	0.23	0.20	– –
HE Red	SMD 105-8373●	0.24	0.18	0.15	0.14	– –
Tri - Colour						
Red, Green and Blue	SMD 105-8361●	2.01	1.56	1.29	1.17	– –
Red, Green and Blue	SMD 105-8362●	3.24	2.52	2.07	1.86	– –
Red, Green and Blue	SMD 105-8363●	3.48	2.70	2.22	2.01	– –
White						
White	SMD 105-8374●	3.84	2.97	2.43	2.19	– –
White	SMD 105-8375●	3.84	2.97	2.43	2.19	– –

Surface Mount - 'Godzilla' Oval Lens

40° x 100°, High Performance



L = 2.0, W = 1.25, D =120

Colour	View Angle	Typ. Lum. Intensity (mcd) @ 20mA min.	max.	Peak Wavelength (nm)	Mftrs. List No.	Order Code
40° x 100° - Untinted Clear Oval Lens						
Red	40° x 100°	96	160	590	HSMC-C540-F0001	362-5369
Blue	40° x 100°	26	55	470	HSMN-C540-A0001	362-5370
Green	40° x 100°	57	230	525	HSMM-C540-D0001	362-5382

228775

Colour	Order Code	Price Each 5+	10+	100+	500+	+
Oval 40° x 100° Untinted Clear Lens						
Red	SMD 362-5369●	0.50	0.39	0.33	0.32	– –
Blue	SMD 362-5370●	2.55	1.99	1.68	1.63	– –
Green	SMD 362-5382●	2.52	1.97	1.66	1.61	– –

Surface Mount — 0805 Chip LEDs

L = 1.25, W = 2, H = 1.12

Colour	View angle	Luminous Intensity (mcd) min. @ 20mA	Luminous Intensity (mcd) typ. @ 20mA	I_f (mA) max	PIV max	Mftrs. List No.	Order Code
Untinted Clear Lens							
Red	140°	4	15	30	5V	QTLP630C-2...	359-9668
Yellow	140°	5	15	20	5V	QTLP630C-3...	359-9670
Green	140°	7	20	30	5V	QTLP630C-4...	359-9681
Red	140°	10	20	30	5V	QTLP630C-7...	359-9693
Red	140°	4	15	30	5V	QTLP630C-2	102-1302
Yellow	140°	5	15	20	5V	QTLP630C-3	102-1303
Green	140°	7	20	30	5V	QTLP630C-4	102-1304
Red	140°	10	20	30	5V	QTLP630C-7	102-1305
Superbright, Untinted Clear Lens							
Orange	140°	20	40	30	5V	QTLP630C-E...	359-9700
Red	140°	15	30	30	5V	QTLP630C-R...	359-9711
Yellow	140°	25	50	20	5V	QTLP630C-Y...	359-9723
Orange	140°	20	40	30	5V	QTLP630C-E	102-1306
Red	140°	15	30	30	5V	QTLP630C-R	102-1307
Yellow	140°	25	50	20	5V	QTLP630C-Y	102-1309

228639

Colours	Order Code	Price Each 5+	25+	100+	250+	+
Untinted Diffused Lens						
Red	SMD 359-9668‡	0.41	0.38	0.34	0.21	– –
Yellow	SMD 359-9670‡	0.29	0.27	0.24	0.17	– –
Green	SMD 359-9681‡	0.41	0.38	0.34	0.21	– –
Red	SMD 359-9693‡	0.43	0.40	0.35	0.26	– –
Red	SMD 102-1302●	0.41	0.38	0.34	0.21	– –
Yellow	SMD 102-1303●	0.29	0.27	0.24	0.17	– –
Green	SMD 102-1304●	0.41	0.38	0.34	0.21	– –
Red	SMD 102-1305●	0.43	0.40	0.35	0.26	– –
Superbright, Untinted Clear Lens						
Orange	SMD 359-9700‡	0.51	0.45	0.38	0.33	– –
Red	SMD 359-9711‡	1.01	0.85	0.76	0.57	– –
Yellow	SMD 359-9723‡	0.51	0.45	0.39	0.29	– –
Orange	SMD 102-1306●	0.51	0.45	0.38	0.33	– –
Red	SMD 102-1307●	1.01	0.85	0.76	0.57	– –
Yellow	SMD 102-1309●	0.51	0.45	0.39	0.29	– –

Product Watch
obsolescence notification

- FREE to all account holders
- Notification of obsolete, end of line and end of stock items
- Replacement or upgrade recommendations

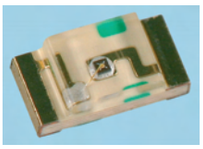
Advanced warning of obsolete components

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

Surface Mount - 1206

Water Clear Lens

Kingbright



Standard lens
H = 1.1, W = 3.6, D = 1.6mm

Dome lens
H = 1.8, W = 3.6, D = 1.6mm

Viewing angle (Standard 1206)	120°	Reverse current	10μA
Viewing angle (Dome lens 1206)	50°	DC Forward current	30mA
Viewing angle (Dome lens 1206 - Blue and Super Bright Green)	40°	Storage temperature	-40 to 85°C
Reverse voltage	5V	Operating temperature	-40 to 80°C

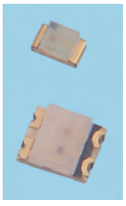
Colour	Material	Wavelength Typical (nm)	Intensity (mcd) @ 20mA Min.	Typ.	Forward Volts. Typ.	Order Code
Standard 1206 package						
Blue	GaN	430	2	8	4.0	852-9957
Blue	InGaN	470	30	45		852-9965
Green	InGaN	525	50	90	4.0	852-9973
Green	InGaAlP	574	20	50	2.1	852-9981
Yellow	InGaAlP	590	40	80	2.0	852-9990
Orange	InGaAlP	610	40	200	2.0	853-0009
Red	InGaAlP	640	70	180	1.9	853-0017
Red	GaAsP/GaP	627	5	12	2.0	853-0025
Green	GaP	565	3	12	2.2	853-0033
Yellow	GaAsP/GaP	590	2	8	2.1	853-0041
Dome lens 1206 package						
Blue	GaN	468	280	600	3.5	853-0050
Green	InGaAlP	574	110	350	2.1	853-0068
Super Bright Green	GaP	565	5	20	2.2	853-0076
Yellow	InGaAlP	590	100	300	2.0	853-0084
Orange	InGaAlP	610	400	1200	2.0	853-0092
Red	InGaAlP	640	300	600	1.9	853-0103
Ultra Red	InGaAlP	640	200	500	1.95	853-0114
Ultra Green	InGaAlP	574	70	200	2.1	853-0130
Ultra Yellow	InGaAlP	590	80	250	2.0	853-0149
Ultra Orange	InGaAlP	610	300	700	2.1	853-0157

381953/405974

Mftrs. List No.	Order Code	Price Each 10+	50+	100+	250+	+
Standard 1206 package						
KP-3216MBC	SMD 852-9957	1.76	1.50	1.24	1.04	– –
KP-3216PBC	SMD 852-9965	2.73	2.28	1.95	1.69	– –
KP-3216VGC	SMD 852-9973	3.03	2.54	2.18	1.86	– –
KP-3216MGC	SMD 852-9981	1.04	0.88	0.72	0.58	– –
KP-3216SYC	SMD 852-9990	0.53	0.44	0.36	0.32	– –
KP-3216SEC	SMD 853-0009	0.53	0.44	0.36	0.32	– –
KP-3216SURC	SMD 853-0017	0.53	0.44	0.36	0.32	– –
KP-3216EC	SMD 853-0025	0.30	0.24	0.19	0.17	– –
KP-3216SGC	SMD 853-0033	0.34	0.27	0.23	0.20	– –
KP-3216YC	SMD 853-0041	0.30	0.24	0.19	0.17	– –
Dome lens 1206 package						
KPTD-3216QBC-D	SMD 853-0050	1.82	1.53	1.27	1.07	– –
KPTD-3216MGC	SMD 853-0068	1.04	0.88	0.72	0.58	– –
KPTD-3216SGC	SMD 853-0076	0.38	0.31	0.25	0.21	– –
KPTD-3216SYC	SMD 853-0084	0.57	0.48	0.39	0.35	– –
KPTD-3216SEC	SMD 853-0092	0.57	0.48	0.39	0.35	– –
KPTD-3216SURC	SMD 853-0106	0.57	0.48	0.39	0.35	– –
KPTD-3216SURCK	SMD 853-0114	0.43	0.34	0.29	0.26	– –
KPTD-3216CGCK	SMD 853-0130	0.57	0.48	0.40	0.36	– –
KPTD-3216SYCK	SMD 853-0149	0.43	0.34	0.29	0.26	– –
KPTD-3216SECK	SMD 853-0157	0.43	0.34	0.29	0.26	– –

Surface Mount — 1206 Chip LED

FAIRCHILD SEMICONDUCTOR



L=3.2, W=1.6, D=1.1

Colour	View angle	Luminous Intensity (mcd) min. @ 20mA	Luminous Intensity (mcd) typ. @ 20mA	If (mA) max	PIV max	Mftrs. List No.	Order Code
Untinted Clear Lens							
Red	140°	3.6	6	30	5V	QTLP650C-2	102-1311
Yellow	140°	3.6	6	30	5V	QTLP650C-3	102-1313
Green	140°	6	10	30	5V	QTLP650C-4	102-1315
Red	140	9	15	30	5V	QTLP650C-7	102-1316
Untinted Diffused Lens							
Red	160°	2.4	4	30	5	QTLP650D-2	102-1323
Yellow	160°	2.4	4	20	5	QTLP650D-3	102-1324
Green	160°	4	6.5	30	5	QTLP650D-4	102-1325
Bicolour, Untinted Clear Lens							
Red and Yellow	140°	2.5/	4/	30/	5	QTLP650C-23	102-1312
Green and Yellow	140°	6.5/4	6.5/6.5	20/30	5	QTLP650C-34	102-1314
Bicolour, Untinted Clear Lens							
Red and Green	140°	9/4	15/6.5	30/30	5	QTLP650C-74	102-1317
Superbright, Untinted Clear Lens							
Blue	140°	20	30	30	5	QTLP650C-B	102-1318
Orange	140°	15	30	30	5	QTLP650C-E	102-1319
Red	140°	15	30	30	5	QTLP650C-R	102-1320
Yellow	140°	15	35	20	5	QTLP650C-Y	102-1322

228642

Colours	Order Code	Price Each 5+	25+	100+	250+	+
Untinted Clear Lens						
Red	SMD 102-1311	0.39	0.35	0.30	0.19	– –
Yellow	SMD 102-1313	0.34	0.30	0.27	0.20	– –
Green	SMD 102-1315	0.35	0.31	0.27	0.19	– –
Red	SMD 102-1316	0.33	0.29	0.26	0.21	– –
Untinted Diffused Lens						
Red	SMD 102-1323	0.33	0.29	0.26	0.19	– –
Yellow	SMD 102-1324	0.32	0.28	0.25	0.19	– –
Green	SMD 102-1325	0.30	0.27	0.24	0.19	– –
Bicolour, Untinted Diffused Lens						
Red and Yellow	SMD 102-1312	0.59	0.52	0.46	0.43	– –
Green and Yellow	SMD 102-1314	0.59	0.53	0.46	0.37	– –
Red and Green	102-1317	0.88	0.78	0.68	0.56	– –
		1+	**25+**	**100+**	**250+**	**+**
Superbright, Untinted Clear Lens						
Blue	SMD 102-1318	7.36	6.31	5.14	3.68	– –
		5+	**25+**	**100+**	**250+**	**+**
Orange	SMD 102-1319	1.10	0.98	0.82	0.62	– –
Red	SMD 102-1320	1.01	0.85	0.76	0.56	– –
Yellow	SMD 102-1322	0.88	0.85	0.68	0.49	– –

Surface Mount - Chip LEDs

Case Style 0805

OSRAM

L=2.0, W=1.25, D=0.8

Colour	View Angle	Lum. Intensity (mcd) typ. @ 20mA	I_F (mA) (max)	Mftrs. List No.	Order Code
Untinted Clear Lens					
Red	160°	55	25	LSR976-Z	121-2729
Orange	160°	55	25	LOR976-Z	121-2731
Yellow	160°	55	25	LYR976-Z	121-2732

206544

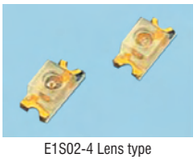
Colour	Order Code	Price Each 5+	25+	100+	250+	+
Red	SMD 121-2729	0.75	0.68	0.60	0.34	– –
Orange	SMD 121-2731	0.49	0.42	0.39	0.36	– –
Yellow	SMD 121-2732	0.49	0.42	0.39	0.36	– –

E1S02 / E1S03 Series

Surface Mount

TOYODA GOSEI CO.,LTD

E1S02-3 flat type



E1S02-4 Lens type

E1S03 0603 type

The E1S02 Series of high intensity surface mount LEDs exhibit the leading optical features associated with Toyoda Gosei, and are available with or without an incorporated lens, allowing the designer increased control over the light output.
The E1S03 range of LEDs are housed in an industry standard 0603 package, and emit a high level of intensity for such a small unit. Typical applications include backlighting, architectural effect lighting and status indication.

Mftrs. List No.	Colour	Dominant Wavelength Max (nm)	Viewing Angle	Luminous Intensity Typ (mcd)	Vf (V) Typ.	If (mA) Max.	Order Code
E1S02-3B0A7-02.	Blue	475	120°	56	3.4	30	423-7912
E1S02-3G0A7-02.	Green	530	120°	161	3.3	30	423-7924
E1S02-4B0A7-02.	Blue	475	20°	161	3.4	30	423-7936
E1S02-4G0A7-02.	Green	530	20°	475	3.3	30	423-7948
E1S03-AB1A7-02.	Blue	480	160°	44	3.4	20	423-8000
E1S03-AG1A7-02.	Green	540	160°	148	3.3	20	423-8011
E1S02-3B0A7-02	Blue	475	120°	56	3.4	30	105-7097

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

E1S02-3G0A7-02	Green	530	120°	161	3.3	30	105-7098
E1S02-4B0A7-02	Blue	475	20°	161	3.4	30	105-7099
E1S02-4G0A7-02	Green	530	20°	475	3.3	30	105-7100
E1S03-AB1A7-02	Blue	480	160°	44	3.4	20	105-7101
E1S03-AG1A7-02	Green	540	160°	148	3.3	20	105-7102

	Length (mm)	Width (mm)	Height (mm)
E1S02 Series	3	1.4	1.3
E1S03 Series	1.6	0.8	0.8

249862

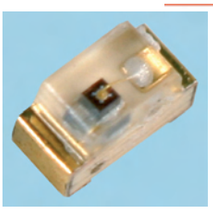
Mftrs. List No.	Order Code	Price Each 1+	10+	25+	100+	+
E1S02-3B0A7-02.	SMD 423-7912‡	5.01	4.88	4.82	4.63	– –
E1S02-3G0A7-02.	SMD 423-7924‡	4.00	3.94	3.87	3.78	– –
E1S02-4B0A7-02.	SMD 423-7936‡	5.01	4.88	4.82	4.63	– –
E1S02-4G0A7-02.	SMD 423-7948‡	5.01	4.88	4.82	4.63	– –
E1S03-AB1A7-02.	SMD 423-8000‡	4.79	4.76	4.57	4.38	– –
E1S03-AG1A7-02.	SMD 423-8011‡	4.79	4.76	4.57	4.38	– –
E1S02-3B0A7-02	SMD 105-7097●	5.01	4.88	4.82	4.63	– –
E1S02-3G0A7-02	SMD 105-7098●	4.00	3.94	3.87	3.78	– –
E1S02-4B0A7-02	SMD 105-7099●	5.01	4.88	4.82	4.63	– –
E1S02-4G0A7-02	SMD 105-7100●	5.01	4.88	4.82	4.63	– –
E1S03-AB1A7-02	SMD 105-7101●	4.79	4.76	4.57	4.38	– –
E1S03-AG1A7-02	SMD 105-7102●	4.79	4.76	4.57	4.38	– –

Surface Mount - 0603

Water Clear Lens

Kingbright®

SMD



H = 1.1, W = 1.6, D = 0.8mm

Viewing angle	120°	DC Forward current	30mA
Reverse voltage	5V	Storage temperature	-40 to 85°C
Reverse current	10μA	Operating temperature	-40 to 85°C

Colour	Material	Wavelength Typical (nm)	Intensity (mcd) @ 20mA Min.	Typ.	Forward Volts. Typ.	Order Code
Blue	GaN	430	2	8	4.0	852-9795
Blue	InGaN	468	18	45	3.65	852-9809
Green	InGaN	525	80	120	4.0	852-9817
Green	InGaAlP	574	20	50	2.1	852-9825
Green	GaP	565	3	10	2.2	852-9833
Yellow	InGaAlP	590	40	80	2.0	852-9841
Orange	InGaAlP	610	80	200	2.0	852-9850
Red	InGaAlP	640	70	150	1.9	852-9868

381935/405975

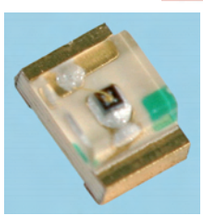
Mftrs. List No.	Order Code	Price Each 10+	50+	100+	250+	+
KP-1608MBC	SMD 852-9795●	1.76	1.50	1.24	1.04	– –
KP-1608PBC	SMD 852-9809●	1.86	1.56	1.30	1.11	– –
KP-1608VGC	SMD 852-9817●	3.03	2.38	2.08	1.76	– –
KP-1608MGC	SMD 852-9825●	1.04	0.88	0.72	0.58	– –
KP-1608SGC	SMD 852-9833●	0.30	0.27	0.21	0.17	– –
KP-1608SYC	SMD 852-9841●	0.47	0.41	0.34	0.30	– –
KP-1608SEC	SMD 852-9850●	0.47	0.41	0.34	0.30	– –
KP-1608SURC	SMD 852-9868●	0.47	0.41	0.34	0.30	– –

Surface Mount - 0805

Water Clear Lens

Kingbright®

SMD



H = 1.1, W = 2.0, D = 1.25mm

Viewing angle	120°	Reverse current	10μA	Storage temperature	-30 to 85°C
Reverse voltage	5V	DC Forward current	30mA	Operating temperature	-20 to 80°C

Colour	Material	Wavelength Typical (nm)	Intensity (mcd) @ 20mA Min.	Typ.	Forward Volts. Typ.	Order Code
Blue	GaN	430	2	8	4.0	852-9876
Blue	InGaN	468	30	45	3.5	852-9884
Green	GaP	525	50	100	3.5	852-9892
Green	InGaAlP	574	20	50	2.1	852-9906
Yellow	InGaAlP	588	40	60	2.0	852-9914
Orange	InGaAlP	610	70	200	2.0	852-9922
Red	InGaAlP	640	60	150	2.0	852-9930
Red	GaAsP/GaP	625	5	12.5	2.0	852-9949

381949/405976

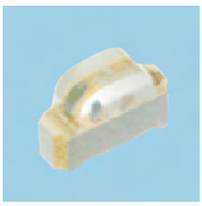
Mftrs. List No.	Order Code	Price Each 10+	50+	100+	250+	+
KP-2012MBC	SMD 852-9876●	1.76	1.50	1.24	1.04	– –
KP-2012PBC	SMD 852-9884●	2.73	2.28	1.95	1.69	– –
KP-2012VGC	SMD 852-9892●	2.96	2.47	2.12	1.82	– –
KP-2012MGC	SMD 852-9906●	1.04	0.88	0.72	0.58	– –
KP-2012SYC	SMD 852-9914●	0.47	0.41	0.34	0.30	– –
KP-2012SEC	SMD 852-9922●	0.47	0.41	0.34	0.30	– –
KP-2012SURC	SMD 852-9930●	0.47	0.41	0.34	0.30	– –
KP-2012EC	SMD 852-9949●	0.30	0.24	0.19	0.17	– –

Surface Mount - Bi-colour and Tri-colour

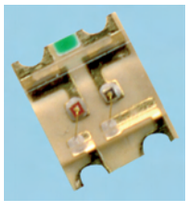
Water Clear Lens

Kingbright®

SMD



Bi-colour - Sideview
H = 2.0, W = 3.0, D = 1.0mm



Bi-colour - Topview
H = 1.1, W = 3.0, D = 2.5mm

Tri-colour - 4 pin PLCC4
H = 1.8, W = 5.0, D = 6.0mm

Viewing angle - Bi-colour	120°
Viewing angle - Tri-colour	120°
Reverse voltage (All)	5V
Reverse current (All)	10μA
Operating temperature	-40 to 85°C

Colour	Material	Wavelength Typical (nm)	Intensity (mcd) @ 20mA Min.	Typ.	Forward Volts. Typ.	Order Code
Bi-colour - Sideview						
Red	GaAsP/GaP	627	4	12	2.0	853-0165
Green	GaP	565	2.6	12	2.2	
Bi-colour - Topview						
Red	GaAsP/GaP	627	4	12	2.0	853-0173
Green	GaP	565	4	12	2.2	
Tri-colour - 6 Pin DIL						
Red	InGaAlP	630	650	1000	2.0	853-0181
Green	InGaN	520	180	350	4.0	
Blue	InGaN	465	110	250	3.7	
Tri-colour - 6 Pin						
Red	InGaAlP	630	650	1000	2.0	853-0190
Green	InGaN	520	180	350	4.0	
Blue	InGaN	465	110	250	3.7	
Tri-colour - 4 Pin PLCC4						
Red	InGaAlP	627	12	30	2.0	853-0203
Green	InGaN	565	12	30	2.2	
Blue	GaN	430	5	20	4.0	

381963

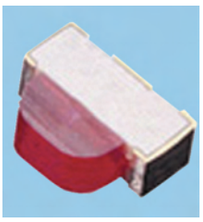
Mftrs. List No.	Order Code	Price Each 10+	50+	100+	250+	+
Bi-colour - Sideview						
KPBA-3010ESGC-F01	SMD 853-0165●	0.64	0.51	0.44	0.39	– –
Bi-colour - Topview						
KPB-3025ESGC-F01	SMD 853-0173●	0.61	0.51	0.42	0.37	– –
Tri-colour - 6 Pin DIL						
KAF-5060PBESEEVGC	853-0181●	11.07	9.41	7.71	6.44	– –
Tri-colour - 6 Pin						
KAAF-5060PBESEEVGC	SMD 853-0190●	11.07	9.41	7.71	6.44	– –
Tri-colour - 4 Pin PLCC4						
KAA-3528EMBSGC	SMD 853-0203●	3.09	2.64	2.18	1.79	– –

Surface Mount - Sideview

Water Clear Lens

Kingbright®

SMD



H = 2.0, W = 3.0, D = 1.0mm

Viewing angle	120°	DC Forward current (Green)	25mA
Reverse voltage	5V	Storage temperature	-40 to 85°C
Reverse current	10μA	Operating temperature	-40 to 85°C
DC Forward current (Red and Yellow)	30mA		

● Compliant
◄ Non-compliant
‡ Limited stock - RoHS replacement available

RoHS

C = CYAN M = Magenta Y = Yellow B = Black/SING

Colour	Material	Wavelength Typical (nm)	Intensity (mcd) @ 20mA Min.	Typ.	Forward Volts. Typ.	Order Code
Red	GaAsP/GaP	627	5	12	2.0	853-0327
Green	GaP	565	3	12	2.2	853-0335
Yellow	GaAsP/GaP	590	3	5	2.1	853-0343

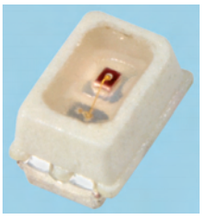
381959

Mftrs. List No.	Order Code	Price Each 10+	50+	100+	250+	+
KPA-3010EC	SMD 853-0327	0.30	0.24	0.19	0.16	– –
KPA-3010SGC	SMD 853-0335	0.30	0.24	0.19	0.16	– –
KPA-3010YC	SMD 853-0343	0.30	0.24	0.19	0.16	– –

SMD MiniLED

2.3 x 1.3 x 1.4mm Package

VISHAY



H = 1.3, W = 2.3, D = 1.4mm

The MiniLED Series has been designed in a small white SMT package. This very small package is ideally suited for small scale, high-power products that are expected to work reliably in harsh environments such as automotive and industrial applications.

Features:
- High Brightness
- Low power consumption
- Low Profile
- Non-diffused lens ideally suited to light pipes
- Compatible with IR reflow soldering

Applications:
- Backlighting in automotive dashboards and switches
- Indicator and backlighting in telephones and fax
- Audio, video and battery driven equipment
- Flat backlight for LCD's, switches and symbols

Parameter	
DC Forward Current (mA)	30mA
Half Angle	60°
Operating Temp. Range	-40 to 100°C
Storage Temp. Range	-40 to 100°C
LED Junction Temp.	110°C
Solder Temperature	260°C (for 5 seconds)

Colour	Vf (V)	Vr (V)	Peak Wavelength λ_p	Luminous Flux (mcd)	Power Dissipation (mW)	Order Code	Mftrs. List No.
Red	3.0	6	640	7.5	95	831-1471	TLMS2100-GS08.
Soft orange	3.0	6	605	7.5	95	831-1382	TLMO2100-GS08.
Yellow	3.0	6	585	7.5	95	831-1544	TLMY2100-GS08.
Green	3.0	6	565	10	95	831-1331	TLMG2100-GS08.
Pure green	3.0	6	555	2.2	95	831-1439	TLMP2100-GS08.
Red	2.6	5	643	80	80	831-1340	TLMK2300-GS08.
Orange	2.6	5	610	120	80	831-1323	TLMF2300-GS08.
Yellow	2.6	5	590	120	80	831-1293	TLME2300-GS08.

380978

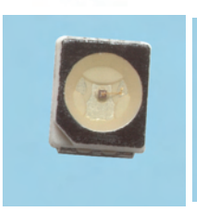
Colour	Order Code	Price Each 5+	25+	100+	250+	+
120° Viewing Angle						
Red	SMD 831-1471	0.33	0.29	0.24	0.20	– –
Soft orange	SMD 831-1382	0.33	0.29	0.24	0.20	– –
Yellow	SMD 831-1544	0.33	0.29	0.24	0.20	– –
Green	SMD 831-1331	0.33	0.29	0.24	0.20	– –
Pure green	SMD 831-1439	0.46	0.37	0.30	0.20	– –
Red	SMD 831-1340	0.43	0.38	0.32	0.26	– –
Orange	SMD 831-1323	0.43	0.38	0.32	0.26	– –
Yellow	SMD 831-1293	0.43	0.38	0.32	0.26	– –

Surface Mount

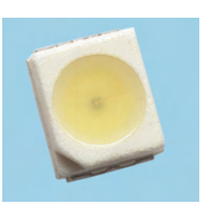
PLCC-2 Package

AVAGO TECHNOLOGIES

White Face



Black Face



White

- Industry standard 1.9 x 2.8 x 3.2mm package
- High reliability LED package
- Super wide 120° viewing angle
- Compatible with both IR and TTW soldering process
- Black Face version to minimize reflection to improve contrast
- White version has built in reflector to increase light intensity

NEW

Colour	Lum. Intensity (mcd) @ 20mA min.	Typ.	Peak Wavelength (nm)	Forward Voltage Typ. (V)	Max. (V)	Order Code (V)
White Face						
Amber			592	1.9	2.4	105-8378
Amber			592	1.9	2.4	105-8379
Amber			592	1.9	2.4	105-8380
Red	40		635	1.9	2.4	105-8384
Red	100	140	635	1.9	2.4	105-8385
Red	160	220	635	1.9	2.4	105-8386
Orange	10	15	600	2.2	2.6	105-8389
Green			566	1.9	2.4	105-8390
Green			566	1.9	2.4	105-8391
Green	10		558	2.2	2.6	105-8392
Red	25	50	645	1.9	2.6	105-8394
Red/Orange	125		621	1.9	2.4	105-8395
Red/Orange	160	200	621	1.9	2.4	105-8396
Orange	160	220	609	1.9	2.4	105-8397
Blue			468	3.4	4.05	105-8401
HE Red	4	15	635	2.2	2.6	105-8404
Amber			594	1.9	2.6	105-8405
Red/Orange	250	350	623	2.2	2.6	105-8408
Yellow	10	12	583	2.2	2.6	105-8412
Red	250	350	639	2.2	2.6	105-8413
White						
White	250	1000		3.4	4.05	105-8409
White	100	395		3.4	4.05	105-8410
Black Face						
Amber			592	1.9	2.4	105-8382
Amber			592	1.9	2.4	105-8383
Red	63	100	635	1.9	2.4	105-8387
Red	160	220	635	1.9	2.4	105-8388
Green			523	3.4	4.05	105-8398
Green			523	3.4	4.05	105-8399
Blue			468	3.4	4.05	105-8402
Blue			468	3.4	4.05	105-8403
Amber			594	1.9	2.6	105-8406
Amber			594	1.9	2.6	105-8407
Red	250	350	639	2.2	2.6	105-8414

422852

Colour	Mftrs. List No.	Order Code	Price Each 5+	25+	100+	250+	+
White Face							
Amber	HSMA-A100-Q00J1	SMD 105-8378	0.26	0.20	0.16	0.15	– –
Amber	HSMA-A100-R0PJ1	SMD 105-8379	0.32	0.25	0.21	0.19	– –
Amber	HSMA-A101-S00J1	SMD 105-8380	0.45	0.35	0.29	0.26	– –
Red	HSMC-A100-P30J1	SMD 105-8384	0.26	0.20	0.16	0.15	– –
Red	HSMC-A100-R00J1	SMD 105-8385	0.32	0.25	0.21	0.19	– –
Red	HSMC-A101-S00J1	SMD 105-8386	0.38	0.30	0.24	0.22	– –
Orange	HSMD-A100-L00J1	SMD 105-8389	0.26	0.20	0.16	0.15	– –
Green	HSME-A100-L01J1	SMD 105-8390	0.51	0.40	0.33	0.29	– –
Green	HSME-A100-M02J1	SMD 105-8391	0.45	0.35	0.29	0.26	– –
Green	HSMG-A100-K42J2	SMD 105-8392	0.19	0.15	0.12	0.11	– –
Red	HSMH-A100-N00J1	SMD 105-8394	0.26	0.20	0.16	0.15	– –
Red/Orange	HSMJ-A101-R80J1	SMD 105-8395	0.38	0.30	0.24	0.22	– –
Red/Orange	HSMJ-A101-S00J1	SMD 105-8396	0.38	0.30	0.24	0.22	– –
Orange	HSML-A101-S00J1	SMD 105-8397	0.38	0.30	0.24	0.22	– –
Blue	HSMN-A100-R00J1	SMD 105-8401	1.59	1.27	1.04	0.94	– –
HE Red	HSMS-A100-L00J1	SMD 105-8404	0.19	0.15	0.12	0.11	– –
Amber	HSMU-A100-S00J1	SMD 105-8405	0.70	0.55	0.45	0.40	– –
Red/Orange	HSMV-A100-T00J1	SMD 105-8408	0.70	0.55	0.45	0.40	– –
White	HSMW-A100-T50J1	SMD 105-8409	1.59	1.27	1.04	0.94	– –
White	HSMW-A101-R50J1	SMD 105-8410	1.17	0.91	0.73	0.66	– –
Yellow	HSMY-A100-L00J1	SMD 105-8412	0.26	0.20	0.16	0.15	– –
Red	HSMZ-A100-T00J1	SMD 105-8413	0.70	0.55	0.45	0.40	– –
Black Face							
Amber	HSMA-A160-Q00J1	SMD 105-8382	0.32	0.25	0.21	0.19	– –
Amber	HSMA-A161-S00J1	SMD 105-8383	0.38	0.30	0.24	0.22	– –
Red	HSMC-A160-Q00J1	SMD 105-8387	0.32	0.25	0.21	0.19	– –
Red	HSMC-A161-S00J1	SMD 105-8388	0.38	0.30	0.24	0.22	– –
Green	HSMM-A160-S00J1	SMD 105-8398	1.79	1.40	1.14	1.04	– –
Green	HSMM-A161-R00J1	SMD 105-8399	1.24	0.94	0.77	0.70	– –
Blue	HSMN-A160-P00J1	SMD 105-8402	1.50	1.17	0.94	0.85	– –
Blue	HSMN-A161-N00J1	SMD 105-8403	0.98	0.75	0.61	0.55	– –
Amber	HSMU-A160-R00J1	SMD 105-8406	0.70	0.55	0.45	0.40	– –
Amber	HSMU-A160-T00J1	SMD 105-8407	0.85	0.64	0.53	0.48	– –
Red	HSMZ-A160-T00J1	SMD 105-8414	0.76	0.60	0.49	0.44	– –

Surface Mount - PLCC - 2

Water Clear Lens

Kingbright®

H = 1.9, W = 3.5, D = 2.8mm

Viewing angle	120°	Reverse current	10μA	Storage temperature	-40 to 85°C
Reverse voltage	5V	DC Forward current	30mA	Operating temperature	-40 to 85°C

Colour	Material	Wavelength Typical (nm)	Intensity (mcd) @ 20mA Min.	Typ.	Forward Volts. Typ.	Order Code
Red	GaAsP/GaP	627	8	20	2.0	853-0211
Green	GaP	565	7	20	2.2	853-0220
Yellow	GaAsP/GaP	590	4	15	2.1	853-0238
Blue	GaN	430	5	15	4.0	853-0246
White	GaN		18	60	3.8	853-0254
Yellow	InGaAlP	590	40	120	2.0	853-0262

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Colour	Material	Wavelength Typical (nm)	Intensity (mcd) @ 20mA Min.	Typ.	Forward Volts. Typ.	Order Code
Orange	InGaAlP	610	200	350	2.0	853-0270
Red	InGaAlP	640	80	250	1.9	853-0289
Green	InGaAlP	574	80	150	2.1	853-0297
Blue	GaN	464	110	200	3.5	853-0300
White	GaN		110	300	3.5	853-0319

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Mftrs. List No.	Order Code	Price Each 10+	50+	100+	250+	+
KA-3528EC	SMD 853-0211●	0.43	0.34	0.28	0.23	– –
KA-3528SGC	SMD 853-0220●	0.43	0.34	0.28	0.23	– –
KA-3528YC	SMD 853-0238●	0.43	0.34	0.28	0.23	– –
KA-3528MBC	SMD 853-0246●	2.12	1.73	1.43	1.24	– –
KA-3528MWC	SMD 853-0254●	2.41	2.05	1.66	1.40	– –
KA-3528SYC	SMD 853-0262●	0.61	0.51	0.41	0.34	– –
KA-3528SEC	SMD 853-0270●	0.61	0.51	0.40	0.34	– –
KA-3528SURC	SMD 853-0289●	0.61	0.51	0.40	0.34	– –
KA-3528MGC	SMD 853-0297●	1.14	0.98	0.75	0.64	– –
KA-3528QBC-D	SMD 853-0300●	2.05	1.76	1.40	1.24	– –
KA-3528QWC-D	SMD 853-0319●	2.34	1.92	1.59	1.37	– –

Surface Mount - PLCC-2 High brightness

AVAGO TECHNOLOGIES

A range of high brightness, high reliability SMT LEDS in the industry standard PLCC-2 package.
The Agilent range features SMT package enhancements over conventional PLCC-2 devices with availabilty in a broad range of colours and dice technologies including AlIGaP, InGaN and TS AlInGaP.

Colour	View Angle	Lum Intensity (mcd) @ I_F=10mA min.	typ.	I_F (mA) (max)	PIV (max)	Mftrs. List No.	Order Code
Untinted Clear Lens							
Red	120°	4	15	30	5	HSMS-A100-J00J1	413-4321
Red	120°	10	50	30	5	HSMH-A100-L00J1	413-4333
Red	120°	63	100	30	5	HSMC-A100-Q00J1	413-4345
Red	120°	100	400	30	5	HSMZ-A100-R00J1	413-4357
Red/Orange	120°	63	200	30	5	HSMJ-A100-Q00J1	413-4369
Red/Orange	120°	100	350	30	5	HSMV-A100-R00J1	413-4370
Orange	120°	4	15	30	5	HSMD-A100-J00J1	413-4382
Orange	120°	63	160	30	5	HSML-A100-Q00J1	413-4394
Amber	120°	100	270	30	5	HSMU-A100-R00J1	413-4400
Amber	120°	4	15	30	5	HSMY-A100-J00J1	413-4412
Yellow	120°	4	18	30	5	HSMG-A100-J02J1	413-4424
Emerald Green	120°	2.5	8	30	5	HSMG-A100-H01J1	413-4436
Green	120°	160	280	30	5	HSMM-A100-S00J1	413-4448
Green	120°	100	200	30	5	HSMM-A101-R00J1	413-4450
Cyan	120°	160	280	30	5	HSMK-A100-S00J1	413-4461
Cyan	120°	100	170	30	5	HSMK-A101-R00J1	413-4473
Blue	120°	4	15	30	5	HSMB-A100-J00J1	413-4485
Blue	120°	40	70	30	5	HSMN-A100-P00J1	413-4497
Blue	120°	25	50	30	5	HSMN-A101-N00J1	413-4503

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Colour	Order Code	Price Each 5+	10+	100+	500+	+
Untinted Clear Lens						
Red	SMD 413-4321●	0.44	0.25	0.16	0.13	– –
Red	SMD 413-4333●	0.45	0.27	0.17	0.14	– –
Red	SMD 413-4345●	0.48	0.29	0.18	0.15	– –
Red	SMD 413-4357●	1.05	0.64	0.44	0.38	– –
Red/Orange	SMD 413-4369●	0.50	0.30	0.19	0.16	– –
Red/Orange	SMD 413-4370●	0.97	0.59	0.41	0.35	– –
Orange	SMD 413-4382●	0.43	0.26	0.16	0.14	– –
Orange	SMD 413-4394●	0.48	0.29	0.18	0.15	– –
Amber	SMD 413-4400●	0.97	0.59	0.41	0.35	– –
Amber	SMD 413-4412●	0.44	0.25	0.16	0.13	– –
Yellow	SMD 413-4424●	0.41	0.24	0.16	0.12	– –
Emerald Green	SMD 413-4436●	0.50	0.30	0.19	0.16	– –
Green	SMD 413-4448●	2.46	1.55	1.10	0.93	– –
Green	SMD 413-4450●	2.14	1.35	0.95	0.81	– –
Cyan	SMD 413-4461●	2.36	1.57	1.18	1.04	– –
Cyan	SMD 413-4473●	2.20	1.38	0.98	0.83	– –
Blue	SMD 413-4485●	1.30	0.81	0.56	0.49	– –
Blue	SMD 413-4497●	2.01	1.26	0.90	0.76	– –
Blue	SMD 413-4503●	1.44	0.97	0.69	0.53	– –

Surface Mount - PLCC-2, Standard and Superbright

FAIRCHILD SEMICONDUCTOR™

SMD

L=3.2, W=2.8, H=1.9

Colour	View Angle	Lum Intensity (mcd) @ I_F=10mA min.	typ.	I_F (mA) (max)	PIV (max)	Mftrs. List No.	Order Code
Untinted Clear Lens							
Red	120°	6	10	30	5	QTLP670C-2...	359-9917
Yellow	120°	6	10	20	5	QTLP670C-3...	359-9942
Green	120°	15	25	30	5	QTLP670C-4...	359-9954
Red	120°	25	40	30	5	QTLP670C-7...	359-9978
Red	120°	6	10	30	5	QTLP670C-2	102-1327
Yellow	120°	6	10	20	5	QTLP670C-3	102-1330
Green	120°	15	25	30	5	QTLP670C-4	102-1331
Red	120°	25	40	30	5	QTLP670C-7	102-1332
Superbright, Untinted Clear Lens							
Red	120°	40	70	30	5	QTLP670C-R	102-1337
Yellow	120°	40	70	30	5	QTLP670C-Y	102-1339
Orange	120°	40	70	30	5	QTLP670C-E	102-1336
Blue	120°	20	30	30	5	QTLP670C-B	102-1335
White	120°	20	30	30	5	QTLP670CI-W	102-1338

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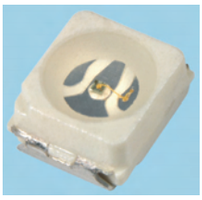
Colour	Order Code	Price Each 5+	25+	100+	250+	+
Untinted Clear Lens						
Red	SMD 359-9917‡	0.38	0.36	0.32	0.21	– –
Yellow	SMD 359-9942‡	0.35	0.31	0.27	0.21	– –
Green	SMD 359-9954‡	0.35	0.31	0.27	0.20	– –
Red	SMD 359-9978‡	0.41	0.38	0.34	0.25	– –
Red	SMD 102-1327●	0.35	0.31	0.27	0.20	– –
Yellow	SMD 102-1330●	0.35	0.31	0.27	0.21	– –
Green	SMD 102-1331●	0.35	0.31	0.27	0.20	– –
Red	SMD 102-1332●	0.41	0.38	0.34	0.25	– –
Superbright, Untinted Clear Lens						
Red	SMD 102-1337●	0.60	0.54	0.45	0.34	– –
Yellow	SMD 102-1339●	0.66	0.58	0.49	0.38	– –
Orange	SMD 102-1336●	0.66	0.58	0.49	0.38	– –
Blue	SMD 102-1335●	5.17	4.38	3.56	2.24	– –
White	SMD 102-1338●	5.17	4.38	3.53	2.24	– –

SMD LED's - Low Current

VISHAY

PLCC-2 Package

SMD



H = 1.65, W = 3.5, D = 2.8mm

The LED package is specifically designed for low current applications. It consists of a lead frame, which is embedded, in a white thermoplast. The reflector inside the package is filled with clear epoxy.

Features:
- High Brightness
- EIA and ICE standard package
- Low Profile
- Non-diffused lens ideally suited to light pipes
- Compatible with infared, vapour phase and wave soldering processes

Applications:
- Backlighting in automotive dashboards and switches
- Indicator and backlighting in telephones and fax machines
- Audio, video and battery driven equipment
- Flat backlight for LCD's, switches and symbols

Parameter	
DC Forward Current (mA)	7mA
Power Dissipation (mW)	20mW
Operating Temp. Range	-40 to 100°C
Storage Temp. Range	-55 to 100°C
LED Junction Temp.	100°C
Solder Temperature	260°C (for 5 seconds)

Colour	Vf (V)	Vr (V)	Peak Wavelength λ_p	Luminous Flux (mcd)	Angle of Half Intensity	Order Code	Mftrs. List No.
Yellow	2.9	6	585	2.5	60°	831-1242	TLMA3100-GS08.
Green	2.4	6	565	1.6	60°	831-1285	TLMC3100-GS08.
Green	2.4	6	565	1.6	60°	121-3159	TLMC3100-GS08
Red	2.9	6	635	2.5	60°	831-1510	TLMT3100-GS08.
Red	2.2	6	635	20	60°	831-1480	TLMS3000-GS08.
Red	2.2	6	635	20	60°	121-3161	TLMS3000-GS08
Orange	2.2	6	610	50	60°	831-1390	TLMO3000-GS08.
Orange	2.2	6	610	50	60°	121-3160	TLMO3000-GS08
Yellow	2.2	6	585	50	60°	831-1552	TLMY3000-GS08.

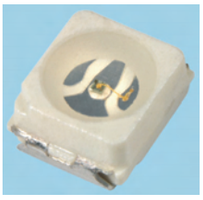
380944

Colour	Order Code	Price Each 5+	25+	100+	250+	+
120° Viewing Angle						
Yellow	SMD 831-1242	0.34	0.31	0.26	0.21	– –
Green	SMD 831-1285	0.31	0.28	0.23	0.19	– –
Green	SMD 121-3159●	0.46	0.34	0.27	0.20	– –
Red	SMD 831-1510	0.46	0.34	0.27	0.20	– –
Red	SMD 831-1480	0.31	0.28	0.23	0.19	– –
Red	SMD 121-3161●	0.39	0.30	0.23	0.17	– –
Orange	SMD 831-1390	0.31	0.28	0.23	0.19	– –
Orange	SMD 121-3160●	0.42	0.34	0.27	0.20	– –
Yellow	SMD 831-1552	0.35	0.27	0.21	0.16	– –

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

SMD LED's High Efficiency

PLCC-2 Package



These devices have been designed to meet the increasing demand for high efficiency LED's. The package consists of a lead frame, which is embedded, in a white thermoplast. The reflector inside the package is filled with clear epoxy.

H = 1.65, W = 3.5, D = 2.8mm

Features:
- High Brightness
- EIA and ICE standard package
- Low Profile
- Non-diffused lens ideally suited to light pipes
- Compatible with infared, vapour phase and wave soldering processes

Applications:
- Backlighting in automotive dashboards and switches
- Indicator and backlighting in telephones and fax
- Audio, video and battery driven equipment
- Flat backlight for LCD's, switches and symbols

Order Codes	831-1250	831-1404, 831-1498
Parameter		
DC Forward Current (mA)	20mA	30mA
Half Angle	60°	
Operating Temp. Range	-40 to 100°C	
Storage Temp. Range	-40 to 100°C	
LED Junction Temp.	110°C	
Solder Temperature	260°C (for 5 seconds)	

Colour	Vf (V)	Vr (V)	Peak Wavelength λ_d	Luminous Flux (mcd)	Power Dissipation (mW)	Order Code	Mftrs. List No.
Blue	4.5	5	428	8.0	100	831-1250	TLMB3100-GS08.
Orange	2.8	6	605	8.0	100	831-1404	TLMO3100-GS08.
Pure green	2.8	6	555	4	100	831-1447	TLMP3100-GS08.

380968

Colour	Order Code	Price Each 5+	25+	100+	250+	+
120° Viewing Angle						
Blue	SMD 831-1250	1.09	0.98	0.81	0.66	– –
Orange	SMD 831-1404	0.31	0.28	0.23	0.19	– –
Pure green	SMD 831-1447	0.31	0.28	0.23	0.19	– –

SMD LED's - High Intensity

PLCC-2 Package

The LED package consists of a lead frame, which is embedded, in a white thermoplast. The reflector inside the package is filled with clear epoxy.

H = 1.65, W = 3.5, D = 2.8mm

Features:
- High Brightness
- EIA and ICE standard package
- Low Profile
- Non-diffused lens ideally suited to light pipes
- Compatible with infared, vapour phase and wave soldering processes

Applications:
- Backlighting in automotive dashboards and switches
- Indicator and backlighting in telephones and fax machines
- Audio, video and battery driven equipment
- Flat backlight for LCD's, switches and symbols

Parameter	
DC Forward Current (mA)	20mA
Half Angle	60°
Operating Temp. Range	-40 to 100°C
Storage Temp. Range	-40 to 100°C
LED Junction Temp.	110°C
Solder Temperature	260°C (for 5 seconds)

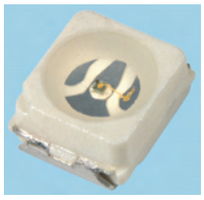
Colour	Vf (V)	Vr (V)	Peak Wavelength λ_d	Luminous Flux (mcd)	Power Dissipation (mW)	Order Code	Mftrs. List No.
Blue	4.2	5	464	40	84	831-1269	TLMB3140-GS08.
Blue/Green	4.2	5	502	130	84	831-1277	TLMBG3100-GS08.
White	4.2	5		140	85	831-1536	TLMW3100-GS08.
White	4.2	5		140	85	121-3162	TLMW3100-GS08
True green	4.2	5	522	180	84	831-1528	TLMTG3100-GS08.
Yellow	2.6	5	590	50	80	831-1307	TLME3100-GS08.
Red	2.6	5	630	18	80	831-1358	TLMK3100-GS08.

380947

Colour	Order Code	Price Each 5+	25+	100+	250+	+
120° Viewing Angle						
Blue	SMD 831-1269	2.89	2.58	2.15	1.74	– –
Blue/Green	SMD 831-1277	1.80	1.60	1.34	1.08	– –
White	SMD 831-1536	1.84	1.64	1.37	1.10	– –
White	SMD 121-3162	2.51	1.92	1.53	1.11	– –
True green	SMD 831-1528	1.80	1.60	1.34	1.08	– –
Yellow	SMD 831-1307	0.39	0.35	0.29	0.23	– –
Red	SMD 831-1358	0.41	0.36	0.30	0.24	– –

SMD LED's Power

PLCC-2 Package



The LED package is designed to incorporate larger chips than the standard PLCC-2 device and is therefore capable of withstanding a 50mA drive current. The package consists of a lead frame, which is embedded, in a white thermoplast. The reflector inside this package is filled with clear epoxy.

H = 1.65, W = 3.5, D = 2.8mm

Features:
- High Brightness
- Suitable for all soldering methods according to CECC
- Low Profile
- ESD class 2

Applications:
- Traffic signals and signs
- Interior and exterior lighting
- Dot matrix panels, signs and displays
- Dashboard illumination

Parameter	
DC Forward Current (mA)	50mA
Half Angle	60°
Operating Temp. Range	-40 to 100°C
Storage Temp. Range	-40 to 100°C
LED Junction Temp.	125°C
Solder Temperature	260°C (for 5 seconds)

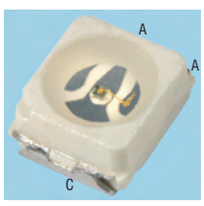
Colour	Vf (V)	Vr (V)	Peak Wavelength λ_d	Luminous Flux (mcd)	Power Dissipation (mW)	Order Code	Mftrs. List No.
Red	2.55	5	624	500	130	831-1374	TLMK3300-GS18.
Red	2.55	5	641	300	130	831-1501	TLMS3300-GS08.
Soft orange	2.55	5	611	500	130	831-1420	TLMO3300-GS08.
Pure green	2.6	5	565	50	130	831-1463	TLMPG3300-GS18.
Yellow/Green	2.6	5	576	130	130	831-1595	TLMYG3300-GS08.

380987

Colour	Order Code	Price Each 5+	25+	100+	250+	+
120° Viewing Angle						
Red	SMD 831-1374	0.53	0.42	0.33	0.23	– –
Red	SMD 831-1501	0.47	0.42	0.35	0.28	– –
Soft orange	SMD 831-1420	0.47	0.42	0.35	0.28	– –
Pure green	SMD 831-1463	0.47	0.42	0.35	0.28	– –
Yellow/Green	SMD 831-1595	0.47	0.42	0.35	0.28	– –

SMD LED's Bicolour

PLCC-2 Package



These devices have been designed to meet the increasing demand for SMD Bicolour LED's. The package consists of a lead frame, which is embedded, in a white thermoplast. The reflector inside the package is filled with clear epoxy. This device consists of a red and yellow chip.

H = 1.65, W = 3.5, D = 2.8mm

Features:
- High Brightness
- EIA and ICE standard package
- Low Profile
- Non-diffused lens ideally suited to light pipes
- Compatible with infared, vapour phase and wave soldering processes

Applications:
- Backlighting in automotive dashboards and switches
- Indicator and backlighting in telephones and fax machines
- Audio, video and battery driven equipment
- Flat backlight for LCD's, switches and symbols

Parameter		Parameter	
DC Forward Current (mA)	30mA	Storage Temp. Range	-55 to 100°C
Half Angle	60°	LED Junction Temp.	110°C
Operating Temp. Range	-40 to 100°C	Solder Temperature	260°C (for 5 seconds)

Colour	Vf (V) R/Y	Vr (V) R/Y	Peak Wavelength R/Y	Luminous Flux (mcd) R/Y	Power Dissipation (mW)	Mftrs. List No.
Red and Yellow	1.9/2.0	6	643/590	125/200	100	TLMEK3100-GS18.

380971

Colours	Order Code	Price Each 5+	25+	100+	250+	+
120° Viewing Angle						
Red and Yellow	SMD 831-1315	0.55	0.49	0.41	0.33	– –

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Prices are in Singapore Dollars and exclusive of GST. Due to the volatile nature of certain products, prices are subject to change without notice.

Surface Mount - SMT- TOPLED®

OSRAM

Case Style PLCC-2

Colour	View Angle	Lum. Intensity (mcd) typ.	I_F (mA) (max)	Mftrs. List No.	Order Code
Untinted Clear Lens					
HE Red	120°	18 @ 10mA	30mA	LST670-J2L1-1	515-607
Yellow	120°	18 @ 10mA	30mA	LYT676-R1S2-26-Z	121-2751
Ultra Bright-Untinted Clear Lens					
Hyper Red	120°	28 @ 10mA	30mA	LHT674-L2N1-1-Z	121-2752
Hyper Bright-Untinted Clear Lens					
Super Red	120°	180 @ 20mA	30mA	LST676-Q1R2-1-1-Z	121-2753
Yellow	120°	280 @ 20mA	20mA	LYT676-R1S2-26.	881-648
Bicolour-Untinted Clear Lens					
Red and Green	120°	12@ 10mA	30mA	LSGT670	250-867

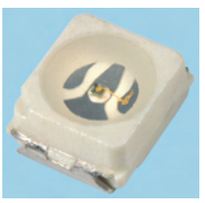
221674

Colour	Order Code	Price Each 5+	25+	100+	250+	+
HE Red	SMD 515-607	0.71	0.60	0.56	0.47	– –
Yellow	SMD 121-2751●	0.69	0.58	0.55	0.45	– –
Hyper Red	SMD 121-2752●	0.86	0.73	0.69	0.57	– –
Super Red	SMD 121-2753●	0.43	0.42	0.37	0.30	– –
Yellow	SMD 881-648	0.80	0.68	0.64	0.53	– –
Bicolour						
Red and Green	SMD 250-867	1.22	1.04	0.97	0.80	– –

SMD LED's High Heat Dissipation

VISHAY

PLCC-3 Package



H = 1.65, W = 3.5, D = 2.8mm

The LED package is an advanced development in terms of heat dissipation. The lead frame profile of the PLCC-3 SMD package is optimized to reduce thermal resistance. This allows higher drive current and doubles the light output compared to the high intensity SMD LED in PLCC-2 package.

Features:
- High Brightness
- EIA and ICE standard package
- Low Profile
- Non-diffused lens ideally suited to light pipes
- Compatible with infared, vapour phase and wave soldering processes

Applications:
- Backlighting in automotive dashboards and switches
- Indicator and backlighting in telephones and fax
- Audio, video and battery driven equipment
- Flat backlight for LCD's, switches and symbols

Parameter		Parameter	
DC Forward Current (mA)	70mA	Storage Temp. Range	-40 to 100°C
Half Angle	60°	LED Junction Temp.	110°C
Operating Temp. Range	-40 to 100°C	Solder Temperature	260°C (for 5 seconds)

Colour	Vf (V)	Vr (V)	Peak Wavelength λ_d	Luminous Flux (mcd)	Power Dissipation (mW)	Order Code	Mftrs. List No.
Red	2.55	2.55	624	500	180	831-1366	TLMK3200-GS18.
Red	2.55	2.55	641	300	180	831-1498	TLMS3200-GS18.
Soft orange	2.55	2.55	611	500	180	831-1412	TLMO3200-GS18.
Yellow	2.55	2.55	590	450	180	831-1560	TLMY3200-GS18.
Pure green	2.6	2.6	565	50	180	831-1455	TLMPG3200-GS18.
Yellow-Green	2.6	2.6	567	130	180	831-1587	TLMYG3200-GS18.

380966

Colour	Order Code	Price Each 5+	25+	100+	250+	+
120° Viewing Angle						
Red	SMD 831-1366●	0.51	0.45	0.38	0.31	– –
Red	SMD 831-1498●	0.51	0.45	0.38	0.31	– –
Soft orange	SMD 831-1412●	0.55	0.49	0.41	0.33	– –
Yellow	SMD 831-1560●	0.55	0.49	0.41	0.33	– –
Pure green	SMD 831-1455●	0.55	0.49	0.41	0.33	– –
Yellow-Green	SMD 831-1587●	0.51	0.45	0.38	0.31	– –

RoHS Directive

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Surface Mount - Envisium

AVAGO TECHNOLOGIES

Power PLCC-4

H = 1.9, W = 3.2, D = 2.8mm

NEW

- Industry standard PLCC-4 (Plastic Leaded Chip Carrier)
- High reliability LED package
- Mid-Power intensity brightness with optimum flux performance
- TS AlInGaP dice technologies
- Available in Red, Red Orange and Amber colours
- High optical efficiency
- Wide operating temperature of -40°C to 100°C
- Wide viewing angle of 120°
- Compatible with both IR and TTW soldering process

Applications
- Interior automotive
- Instrument panel backlighting
- Central console backlighting
- Navigation and audio system
- Push button backlighting
- Exterior automotive
- Turn signals
- Side repeaters
- Rear combination lamp
- Puddle light
- Electronic signs and signals
- Channel lettering
- Contour lighting
- Indoor variable message sign
- Office automation, home appliances, industrial equipment
- Front panel backlighting
- Push button backlighting
- Display backlighting

Envisium is a class of mid-Power LEDs from Agilent and Lumileds utilising the very best solid-state lighting technologies from these two industry leaders.
The Envisium Power PLCC-4 SMT package may be driven at a higher current and is capable of dissipating the heat more efficiently compared to a conventional PLCC-2 SMT package.
These LEDs produce higher light output with better flux performance than conventional PLCC-4 SMT LEDs.
The performance characteristics of these new mid-power LEDs make them uniquely suitable for use in harsh conditions such as in automotive applications, and in electronics signs and signals.

Colour	View Angle	Typ. Lum. Intensity (mcd) @ 50mA min.	max.	Peak Wavelength (nm)	Mftrs. List No.	Order Code
40° x 100° - Untinted Clear Oval Lens						
Amber	120°			594	ASMC-PAB9-TV005	980-6946
Red/Orange	120°			594	ASMC-PHB9-TW005	980-6954
Red/Orange	120°	630	1000	594	ASMC-PRB9-TV005	980-6962

413014

Colour	Order Code	Price Each 5+	25+	100+	250+	+
Amber	SMD 980-6946●	0.98	0.75	0.59	0.49	– –
Red/Orange	SMD 980-6954●	0.98	0.75	0.59	0.49	– –
Red/Orange	SMD 980-6962●	0.98	0.75	0.59	0.49	– –

Surface Mount

PLCC-4 Package

AVAGO TECHNOLOGIES

NEW

- Industry standard 1.9 x 2.8 x 3.2mm package
- High reliability LED package
- High optical efficiency
- High current capacity
- Super wide 120° viewing angle
- Compatible with both IR and TTW soldering process
- White version has built in reflector to increase light intensity

Colour	Lum. Intensity (mcd) @ 20mA min.	Typ.	Peak Wavelength (nm)	Forward Voltage Typ. (V)	Max. (V)	Order Code (V)
Amber			592	2.2	2.5	105-8415
Amber			592	2.2	2.5	105-8416
Red	160	400	635	2.2	2.5	105-8417
Red	250	800	635	2.2	2.5	105-8418
Green	40	130	568	2.2	2.5	105-8419
Red	250	800	621	2.2	2.5	105-8429
Cyan	310	1000	502	3.8	4.6	105-8430
Orange	400	1260	609	2.2	2.5	105-8431
Green	310	1000	518	3.8	4.6	105-8432
Green	160	500	518	3.8	4.6	105-8433
Blue	80	250	468	3.8	4.6	105-8434

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

Colour	Lum. Intensity (mcd) @ 20mA min.	Typ.	Peak Wavelength (nm)	Forward Voltage Typ. (V)	Max. (V)	Order Code (V)
Blue	50	130	468	3.8	4.6	105-8436
Amber			592	2.8	3.4	105-8437
Red	500	1600	639	2.8	3.4	105-8439
White						
White	400	700		3.8	4.6	105-8438

422854

Colour	Mftrs. List No.	Order Code	Price Each 5+	25+	100+	250+	+
Amber	HSMA-A400-T35M1	SMD 105-8415	0.32	0.25	0.21	0.19	– –
Amber	HSMA-A401-U20M1	SMD 105-8416	0.38	0.30	0.24	0.22	– –
Red	HSMC-A400-S30M1	SMD 105-8417	0.32	0.25	0.21	0.19	– –
Red	HSMC-A401-T40M1	SMD 105-8418	0.38	0.30	0.24	0.22	– –
Green	HSME-A401-P4PM1	SMD 105-8419	0.64	0.50	0.41	0.37	– –
Red	HSMJ-A401-T40M1	SMD 105-8429	0.38	0.30	0.24	0.22	– –
Cyan	HSMK-A400-T80M2	SMD 105-8430	1.73	1.37	1.11	1.01	– –
Orange	HSML-A401-U40M1	SMD 105-8431	0.38	0.30	0.24	0.22	– –
Green	HSMM-A400-T8YM2	SMD 105-8432	1.79	1.40	1.14	1.04	– –
Green	HSMM-A401-S4YM2	SMD 105-8433	1.53	1.20	0.98	0.88	– –
Blue	HSMN-A400-Q8QM2	SMD 105-8434	1.53	1.20	0.98	0.88	– –
Blue	HSMN-A401-P7QM2	SMD 105-8436	1.11	0.85	0.69	0.62	– –
Amber	HSMU-A400-U85M1	SMD 105-8437	0.70	0.55	0.45	0.40	– –
White	HSMW-A400-U00M2	SMD 105-8438	1.73	1.37	1.11	1.01	– –
Red	HSMZ-A400-U80M1	SMD 105-8439	0.64	0.50	0.41	0.37	– –

Surface Mount

PLCC - 4 with Domed Lens

AVAGO TECHNOLOGIES

H = 3.87, W = 2.8, D = 3.2mm

- Industry standard PLCC-4 package
- High reliability LED package
- High optical efficiency
- Narrow 30° viewing angle
- Compatible with both IR and TTW soldering process

NEW

These Power PLCC-4 SMT LED's with lens are high performance devices targeted mainly at the automotive and electronic signs and signal markers. The top mount single-chip packages with focused radiation offer high brightness in the beam direction. This design coupled with careful selection of component materials allow the product to perform with higher reliability across a large temperature range of -40°C to 100°C.

Colour	Lum. Intensity (mcd) @ 50mA min.	Typ.	Peak Wavelength (nm)	Forward Voltage Typ. (V)	Max. (V)	Order Code (V)
Amber	1400	3000	592	2.2	2.5	110-8948
Amber	2240	4700	592	2.2	2.5	110-8949
Amber	2850	5000	592	2.2	2.5	110-8950
Red	1125	2300	635	2.2	2.5	110-8951
Red	2240	4000	635	2.2	2.5	110-8952
Red/Orange	1125	2300	621	2.2	2.5	110-8953
Red/Orange	2240	4500	621	2.2	2.5	110-8954
Red/Orange	3500	6000	623	2.8	3.4	110-8960
Orange	2240	4500	609	2.2	2.5	110-8956
Green	1400	2400	518	3.9	4.6	110-8957
Blue	450	950	468	3.9	4.6	110-8958
Blue	285	360	468	3.9	4.6	110-8959

Mftrs. List No. to Order Code	Mftrs. List No. to Order Code	Mftrs. List No. to Order Code
HSMA-A430-W90M1=110-8948	HSMC-A431-X90M1=110-8952	HSMM-A430-W90M2=110-8957
HSMA-A431-X90M1=110-8949	HSMJ-A430-W50M1=110-8953	HSMN-A430-U50M2=110-8958
HSMA-A431-Y00M1=110-8950	HSMJ-A431-X90M1=110-8954	HSMN-A431-T50M2=110-8959
HSMC-A430-W50M1=110-8951	HSML-A431-X90M1=110-8956	HSMV-A430-Y90M1=110-8960

422897

Colour	Order Code	Price Each 5+	25+	100+	250+	+
Single - Colour						
Amber	SMD 110-8948	0.78	0.57	0.48	0.42	– –
Amber	SMD 110-8949	0.88	0.63	0.53	0.46	– –
Amber	SMD 110-8950	0.98	0.68	0.58	0.51	– –
Red	SMD 110-8951	0.88	0.63	0.53	0.46	– –
Red	SMD 110-8952	0.98	0.68	0.58	0.51	– –
Red/Orange	SMD 110-8953	0.88	0.63	0.53	0.46	– –
Red/Orange	SMD 110-8954	0.98	0.68	0.58	0.51	– –
Orange	SMD 110-8956	0.88	0.63	0.53	0.46	– –
Green	SMD 110-8957	2.38	1.69	1.43	1.24	– –
Blue	SMD 110-8958	1.86	1.33	1.11	0.98	– –
Blue	SMD 110-8959	1.33	0.94	0.78	0.68	– –
Red/Orange	SMD 110-8960	1.59	1.14	0.94	0.85	– –

Surface Mount - 2 and 3 Colour

PLCC-4 Package

SMD AVAGO TECHNOLOGIES

- Industry standard 1.9 x 2.8 x 3.2mm package
- High reliability LED package
- High optical efficiency
- Super wide 120° viewing angle
- Compatible with both IR and TTW soldering process

NEW

Colour	Lum. Intensity (mcd) @ 20mA min.	Typ.	Peak Wavelength (nm)	Forward Voltage Typ. (V)	Max. (V)	Order Code (V)
Bi - Colour						
Red	8	16	626	2.2	2.6	105-8420
Green/Yellow	10	20	569	2.2	2.6	
Red	8	16	626	2.2	2.6	105-8421
Yellow	6.3	12	585	2.2	2.6	
Red	8	16	626	2.2	2.6	105-8422
Green/Emerald	4	8	569	2.2	2.6	
Orange	8	16	602	2.2	2.6	105-8424
Green/Yellow	10	20	569	2.2	2.6	
Orange	8	16	602	2.2	2.6	105-8425
Green/Emerald	4	8	560	2.2	2.6	
Yellow	8	16	560	2.2	2.6	105-8426
Green/Yellow	10	20	569	2.2	2.6	
Tri - Colour						
Red	8	13	626	2.2	2.6	105-8427
Green	12.5	20	525	2.2	2.6	
Blue	8	10	462	3.4	4.05	
Red	25	80	525	2.2	2.6	105-8428
Green	25	160	525	3.4	4.05	
Blue	25	40	462	3.4	4.05	

Mftrs. List No.		Mftrs. List No.	
	HSMF-A201-A00J1=105-8420		HSMF-A205-A00J1=105-8425
	HSMF-A202-A00J1=105-8421		HSMF-A206-A00J1=105-8426
	HSMF-A203-A00J1=105-8422		HSMF-A301-A00J1=105-8427
	HSMF-A204-A00J1=105-8424		HSMF-A341-A00J1=105-8428

422858

Colour	Order Code	Price Each 5+	25+	100+	250+	+
Bi - Colour						
Red and Green	SMD 105-8420	0.76	0.60	0.49	0.44	– –
Red and Yellow	SMD 105-8421	0.76	0.60	0.49	0.44	– –
Red and Green	SMD 105-8422	0.76	0.60	0.49	0.44	– –
Orange and Green	SMD 105-8424	0.76	0.60	0.49	0.44	– –
Orange and Green	SMD 105-8425	0.91	0.70	0.57	0.51	– –
Yellow and Green	SMD 105-8426	0.76	0.60	0.49	0.44	– –
Tri - Colour						
Red, Green and Blue	SMD 105-8427	1.99	1.56	1.27	1.14	– –
Red, Green and Blue	SMD 105-8428	4.59	3.58	2.93	2.64	– –

SMT - SIDELED®

OSRAM

H=3.8, W=4.2, D=3.8

Colour	View Angle	Lum. Intensity (mcd) typ. @ 10mA	I_F (mA) max	Mftrs. List No.	Order Code
Hyper Bright - Untinted Clear Lens					
Super Red	120°	180 @ 20mA	30	LSA676-P2R1-1	881-739
Yellow	120°	224 @ 20mA	20	LYA676-Q2S1-26	881-740

206298

Colour	Order Code	Price Each 5+	25+	100+	250+	+
Hyper Bright						
Super Red	SMD 881-739	0.85	0.72	0.68	0.56	– –
Yellow	SMD 881-740	0.90	0.77	0.72	0.59	– –

Surface Mount -TLxx1008 Series

TOSHIBA

L = 1.6, W = 0.8, H = 0.6

Colour	View Angle	Typ Lum Intensity @ 20mA (mcd) Min.	Typ.	Peak Wave Length	Forward Voltage Typ.	PIV	Mftrs. List No.	Order Code
Untinted Diffused Lens								
Red	110°	15.3	55	636nm	2	4	TLSU1008	324-6486
Orange	110°	27.2	78	612nm	2	4	TLOU1008	324-6498
Yellow	110°	8.5	24	590nm	2.1	4	TLYU1008	324-6504
Green	110°	8.5	29	574nm	2.4	4	TLGU1008	324-6516
Pure green	110°	1.53	6	562nm	2.3	4	TLPGU1008	324-6528

206672

Colour	Mftrs. List No.	Order Code	Price Each 5+	100+	250+	500+	+
Red	TLSU1008	SMD 324-6486 ▲	0.66	0.61	0.54	0.34	– –
Orange	TLOU1008	SMD 324-6498 ▲	0.68	0.63	0.56	0.35	– –
Yellow	TLYU1008	SMD 324-6504 ▲	0.66	0.61	0.54	0.34	– –
Green	TLGU1008	SMD 324-6516 ▲	0.70	0.66	0.58	0.29	– –
Pure green	TLPGU1008	SMD 324-6528 ▲	0.64	0.62	0.57	0.39	– –

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Surface Mount -TLxx1102 Series

TOSHIBA

SMD

L = 3.2, W = 2.8, H = 3.4

Colour	View Angle	Typ Lum Intensity (mcd) @ 20mA Min.	Typ.	Peak Wave length	Forward Voltage Typ.	PIV	Mftrs. List No.	Order Code
Untinted Diffused Lens								
Red	60°	85	200	636nm	2	4	TLSU1102	324-6309
Orange	60°	85	200	612nm	2	4	TLOU1102	324-6310
Yellow	60°	47.6	130	590nm	2.1	4	TLYU1102	324-6322
Green	60°	47.6	130	574nm	2.3	4	TLGU1102	324-6334
Pure green	60°	8.5	30	562nm	2.3	4	TLPGU1102	324-6346

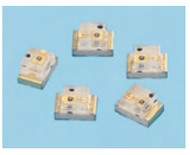
206670

Colour	Mftrs. List No.	Order Code	Price Each 5+	100+	250+	500+	+
Red	TLSU1102	SMD 324-6309▲	0.86	0.78	0.66	0.44	– –
Orange	TLOU1102	SMD 324-6310▲	0.90	0.82	0.69	0.46	– –
Yellow	TLYU1102	SMD 324-6322▲	0.90	0.82	0.69	0.46	– –
Green	TLGU1102	SMD 324-6334▲	0.97	0.88	0.74	0.50	– –
Pure green	TLPGU1102	SMD 324-6346▲	0.91	0.82	0.69	0.48	– –

Surface Mount -TLxx1002 Series

TOSHIBA

SMD



L = 2.0, W = 1.25, H = 1.1

Colour	View Angle	Typ Lum Intensity (mcd) @ 20mA Min.	Typ.	Peak Wave length	Forward Voltage Typ.	PIV	Mftrs. List No.	Order Code
Untinted Clear Lens								
Red	125°	15.3	45	644nm	2.4	4	TLRE1002	324-6401
Red	125°	8.5	30	636nm	2.4	4	TLSU1002	324-6413
Orange	125°	27.2	60	612nm	2.4	4	TLOE1002	324-6425
Orange	125°	15.3	40	612nm	2.4	4	TLOU1002	324-6437
Yellow	125°	27.2	60	590nm	2.5	4	TLYE1002	324-6449
Yellow	125°	8.5	30	590nm	2.5	4	TLYU1002	324-6450
Green	125°	8.5	27	574nm	2.8	4	TLGU1002A	324-6462
Pure green	125°	1.53	6	562nm	2.8	4	TLPGU1002	324-6474

206669

Colour	List No.	Order Code	Price Each 5+	100+	250+	500+	+
Red	TLRE1002	SMD 324-6401▲	0.78	0.71	0.64	0.47	– –
Red	TLSU1002	SMD 324-6413▲	0.49	0.44	0.39	0.26	– –
Orange	TLOE1002	SMD 324-6425▲	0.91	– –	– –	– –	– –
Orange	TLOU1002	SMD 324-6437▲	0.64	0.62	0.52	0.39	– –
Yellow	TLYE1002	SMD 324-6449▲	0.82	0.76	0.69	0.50	– –
Yellow	TLYU1002	SMD 324-6450▲	0.72	0.68	0.56	0.35	– –
Green	TLGU1002A	SMD 324-6462▲	0.70	0.66	0.58	0.29	– –
Pure green	TLPGU1002	SMD 324-6474▲	0.64	0.62	0.57	0.39	– –

Surface Mount -TLxx1100 Series

TOSHIBA

SMD

L = 3.2, W =2.8, H = 1.9

Colour	View Angle	Typ Lum Intensity (mcd) @ 20mA Min.	Typ.	Peak Wave length	Forward Voltage Typ.	PIV	Mftrs. List No.	Order Code
Untinted Clear Lens								
Red	120°	27.2	80	636nm	2	4	TLSU1100	324-6358
Orange	120°	47.6	100	612nm	2	4	TLOU1100	324-6360
Yellow	120°	15.3	50	590nm	2.1	4	TLYU1100	324-6371
Green	120°	15.3	45	574nm	2.3	4	TLGU1100	324-6383
Pure green	120°	4.76	12	562nm	2.3	4	TLPGU1100	324-6395

206668

Colour	Mftrs. List No.	Order Code	Price Each 5+	100+	250+	500+	+
Red	TLSU1100	SMD 324-6358▲	0.70	0.66	0.58	0.40	– –
Orange	TLOU1100	SMD 324-6360▲	0.64	0.62	0.57	0.42	– –
Yellow	TLYU1100	SMD 324-6371▲	0.72	0.68	0.60	0.41	– –
Green	TLGU1100	SMD 324-6383▲	0.81	0.71	0.64	0.44	– –
Pure green	TLPGU1100	SMD 324-6395▲	0.75	0.64	0.59	0.45	– –

Surface Mount - Indicator Lamps

Kingbright®

H = 1.5, W = 3.0, D = 2.2
Leads = 0.5 x 0.15
Overall width across leads = 4.5

SMD

Supplied on tape in multiples of 5 (reel=1500 pcs.)

Colour	View Angle	Lum. Intensity (mcd) @ I_F = 20mA Min.	Max.	F_F (mA) (max.)	PIV (max.)	Order Code
Water Clear Lens						
Ultra red	90°	70	300	30	5	620-920
Yellow	90°	8	40	30	5	620-932
Ultra green	90°	8	40	25	5	620-944

206385

Colour	Order Code	Price Each 5+	25+	50+	100+	+
Ultra red	SMD 620-920●	0.63	0.58	0.51	0.22	– –
Yellow	SMD 620-932●	0.72	0.54	0.48	0.22	– –
Ultra green	SMD 620-944●	0.51	0.46	0.41	0.23	– –

Surface Mount – SOT-23

Kingbright®

Supplied on 8mm width tape in multiples of 5 (reel=2K pcs).
Note: Correct polarity MUST be observed.

SMD

Overall dimensions (max):
H=1.05, W=2.4 (1.3 body only), L=3.0

Colour	View Angle	Typ Lum Intensity (mcd) @ 20mA Min.	Typ.	I_F (mA) (max.)	PIV (max.)	Mftrs. List No.	Order Code
Tinted Diffused Lens							
HE Red	140°	8	32	30	5	KM-23ID.	387-9951
Standard red	140°	50	90	30	5	KM-23SRD.	387-9987
Standard green	140°	8	32	25	5	KM-23SGD.	387-9963
Yellow	140°	5	12.5	30	5	KM-23YD.	387-9975
White Diffused Lens - Bi Colour							
Red and Green	140°	8/8	32/32	30/25	5	KM-23ESGW.	387-9999

231922

Colour	Order Code	Price Each 5+	100+	250+	500+	+
Tinted Diffused Lens						
HE Red	SMD 387-9951●	1.24	1.07	0.94	0.60	– –
Standard red	SMD 387-9987●	1.37	1.17	1.04	0.68	– –
Standard green	SMD 387-9963●	1.37	1.17	1.02	0.47	– –
Yellow	SMD 387-9975●	1.27	1.14	0.98	0.63	– –
White Diffused Lens - Bi Colour						
Red and Green	SMD 387-9999●	1.53	1.35	1.14	0.66	– –

Surface Mount - Subminiature

AVAGO TECHNOLOGIES

H=2.9 (overall), W=2.2, D=2.2
Leads=0.51 x 0.20,
Overall width across leads = 3.8 Overall width across leads=3.8

Cathode lead identified by colour stripe.
Supplied on 12mm tape (reel=1500 pcs).

Colour	View Angle	Typ Lum Intensity (mcd)	I_F (mA) (max.)	PIV (max.)	Mftrs. List No.	Order Code
Tinted Diffused Lens						
AlGaAs Red	90°	1 @ 10mA	50	3	HLMP-6000-E0011..	425-394
AlGaAs Red	90°	1 @ 10mA	50	3	HLMP-6000-E0011	100-3354
HE Red	90°	3 @ 10mA	30	5	HLMP-6300-F0011..	425-400
HE Red	90°	3 @ 10mA	30	5	HLMP-6300-F0011	100-3357
Yellow	90°	3 @ 10mA	20	5	HLMP-6400-F0011..	425-412
Yellow	90°	3 @ 10mA	20	5	HLMP-6400-F0011	100-3358
Green	90°	3 @ 10mA	30	5	HLMP-6500-F0011..	425-424
Green	90°	3 @ 10mA	30	5	HLMP-6500-F0011	100-3359
Amber	28°	500 @ 20mA	50	5	HLMA-QL00..	885-885
Amber	28°	500 @ 20mA	50	5	HLMA-QL00	100-3388

206276

Colour	Order Code	Price Each 5+	10+	100+	500+	+
AlGaAs Red	SMD 425-394●‡	1.13	0.69	0.48	0.41	– –
AlGaAs Red	SMD 100-3354●	2.37	1.38	0.95	0.75	– –
HE Red	SMD 425-400●‡	0.97	0.59	0.41	0.35	– –
HE Red	SMD 100-3357●	1.91	1.12	0.77	0.61	– –
Yellow	SMD 425-412●‡	0.97	0.59	0.41	0.35	– –
Yellow	SMD 100-3358●	1.91	1.12	0.77	0.61	– –
Green	SMD 425-424●‡	0.97	0.59	0.41	0.35	– –
Green	SMD 100-3359●	1.91	1.12	0.77	0.61	– –
Amber	SMD 885-885▲‡	0.68	0.41	0.35	0.33	– –
Amber	SMD 100-3388●	1.17	0.77	0.67	0.57	– –

RoHS ● Compliant ▲ Non-compliant ‡ Limited stock - RoHS replacement available

C = CYAN M = Magenta Y = Yellow B = Black/SING

Subminiature

AVAGO TECHNOLOGIES

W=2.2, D= 2.2

Leads: L=11.4, 0.5 x 0.2
Cathode identified by metallic strip on body.
H=2.90 (domed, overall), 2.15 (flat top, overall),

Colour	View Angle	Typ Lum Intensity (mcd)	I_F (mA) (max.)	PIV (max.)	Mftrs. List No.	Order Code
Tinted Diffused Lens						
Red	90°	1 @ 10mA	50	3	HLMP-6000-E0011..	425-394
Red	90°	1.2 @ 10mA	50	3	HLMP-6000..	322-027
Red	90°	1.2 @ 10mA	50	3	HLMP-6000	100-3184
Deep red	35°	160 @ 20mA	30	5	HLMP-Q102..◆	549-526
Deep red	35°	160 @ 20mA	30	5	HLMP-Q102◆	100-3370
HE Red	90°	3 @ 10mA	30	5	HLMP-6300..	322-052
HE Red	90°	3 @ 10mA	30	5	HLMP-6300	100-3186
Yellow	90°	3 @ 10mA	20	5	HLMP-6400..	322-064
Yellow	90°	3 @ 10mA	20	5	HLMP-6400	100-3187
Green	90°	3 @ 10mA	30	5	HLMP-6500..	322-076
Green	90°	3 @ 10mA	30	5	HLMP-6500	100-3188
Untinted Non-Diffused						
Deep red	15°	530 @ 20mA	30	5	HLMP-Q106..◆	549-538
Deep red	15°	530 @ 20mA	30	5	HLMP-Q106◆	100-3371
Red	90°	2.0 @ 10mA	5.0	5	HLMP-6620-F0031◆	857-6530
Green	90°	40 @ 10 mA	13.0	5	HLMP-6505-L0011◆	857-6513
Red	90°	2.0 @ 10 mA	5.0	5	HLMP-6620-F0010◆	857-6521
Low Current - Tinted Diffused Lens						
Red	90°	1.8 @ 1mA	20	5	HLMP-Q150..	322-106
Red	90°	1.8 @ 1mA	20	5	HLMP-Q150	100-3189
Red	90°	0.8 @ 2mA	7	5	HLMP-7000..	322-118
Red	90°	0.8 @ 2mA	7	5	HLMP-7000	100-3190
Green	90°	0.6 @ 2mA	30	5	HLMP-7040..	481-830
Green	90°	0.6 @ 2mA	30	5	HLMP-7040	100-3360
Resistored, 5 Volt - Untinted Diffused						
HE Red	90°	2 @ 5V	5	5	HLMP-6620..	885-836
HE Red	90°	2 @ 5V	5	5	HLMP-6620	100-3386
Yellow	90°	2 @ 5V	5	5	HLMP-6720..	885-850
Yellow	90°	2 @ 5V	5	5	HLMP-6720	100-3387

◆ High Brightness

206702

Colour	Order Code	Price Each 5+	10+	100+	500+	+
Red	SMD 425-394●‡	1.13	0.69	0.48	0.41	– –
Red	322-027▲‡	0.68	0.45	0.39	0.33	– –
Red	100-3184●	1.10	0.73	0.63	0.54	– –
Deep red	549-526▲‡	0.85	0.51	0.44	0.42	– –
Deep red	100-3370●	1.30	1.13	0.98	0.84	– –
Red	NEW 857-6521	1.95	1.79	1.59	1.50	– –
Red	NEW 857-6530	1.40	1.30	1.14	1.07	– –
Green	NEW 857-6513	0.72	0.64	0.59	0.56	– –
HE Red	322-052▲‡	0.53	0.37	0.32	0.28	– –
HE Red	100-3186●	0.85	0.54	0.47	0.40	– –
Yellow	322-064▲‡	0.53	0.37	0.32	0.28	– –
Yellow	100-3187●	0.85	0.54	0.47	0.40	– –
Green	322-076▲‡	0.53	0.37	0.32	0.28	– –
Green	100-3188●	0.85	0.54	0.47	0.40	– –
Deep red	549-538▲‡	0.85	0.56	0.49	0.42	– –
Deep red	100-3371●	1.31	0.86	0.74	0.64	– –
Red	322-106▲‡	0.64	0.44	0.38	0.36	– –
Red	100-3189●	0.96	0.63	0.55	0.47	– –
Red	322-118▲‡	0.68	0.45	0.39	0.33	– –
Red	100-3190●	1.51	1.00	0.86	0.74	– –
Green	481-830▲‡	0.59	0.41	0.35	0.33	– –
Green	100-3360●	1.51	1.00	0.86	0.74	– –
HE Red	885-836▲‡	1.08	0.73	0.62	0.54	– –
HE Red	100-3386●	1.89	1.28	1.08	0.96	– –
Yellow	885-850▲‡	1.08	0.73	0.62	0.54	– –
Yellow	100-3387●	1.51	1.31	1.12	0.97	– –

Power LED's

1 Watt surface Mount LEDs

X-Lamp Series

forge EUROPA

H=4, W=7, D=9mm

Features include:
- High power LED emitter
- Wide range of colours including white
- Integrated Lambertian pattern lens
- Suitable for infrared reflow
- Class II ESD rating

Applications include:
- Reading lamps
- Backlighting
- Automotive lighting
- Signalling
- Advertising signs
- Architectural lighting

Mftrs. List No.	Colour	Wavelength Dominant (min)	(max)	Luminous flux (nm) (lm)	Foward voltage (Vf)	Viewing angle (Deg.)
FEL-SM1WBWC	Blue				4	100
FEL-SM1WCWC	Cyan				4	100
FEL-SM1WGWC	Green				4	100
FEL-SM1WYWC	Yellow				3	100
FEL-SM1WRWC	Red				3	100
FEL-SM1WWWC	White				4	100

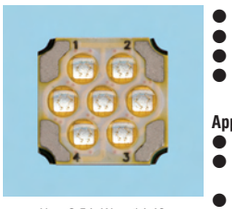
383807

Mftrs. List No.	Order Code	Price Each 1+	10+	25+	50+	+
FEL-SM1WBWC	SMD 873-9021●	28.58	25.39	23.31	21.22	– –
FEL-SM1WCWC	SMD 873-9030●	31.44	27.96	25.62	23.31	– –
FEL-SM1WGWC	SMD 873-9048●	31.44	27.96	25.62	23.31	– –
FEL-SM1WYWC	SMD 873-9056●	21.22	18.88	17.32	15.72	– –
FEL-SM1WRWC	SMD 873-9064●	21.22	18.88	17.32	15.72	– –
FEL-SM1WWWC	SMD 873-9072●	28.58	25.39	23.31	21.22	– –

Light Engine

lamina Bright Lights. Bright Ideas.™

BL - 2000 Series LED Arrays



H = 2.54, W = 14.48, D = 14.48mm

- Thermally matched LED/substrate
- Extended long life
- High Power light source
- Available in Red, Amber, Green, Blue, White and RGB

Applications:
- Solid state illumination
- Architectural detail lighting (uplighters and down-lighters)
- Cove Lighting
- Advertising signs
- Reading lamps
- LED replacement lamps
- Bollards, Security and Garden lighting
- Traffic signalling, Beacons and Rail Crossing

A range of compact high power LED "Light Engines" manufactured by mounting 7 high intensity LED die onto a thermally matched substrate. The base material comprises of a specifically developed multilayer Low Temperature Co-Fired Ceramic on metal (LTCC-M) material. The process of matching the thermal expansion rates of the LED die to the base material allows for extremely reliable performance, whist the heat transfer properties of the base material allow the LED emitters to maintain a safe operating temperature even when the die are mounted in close proximity.

Colour	View Angle	Lum. Intensity Typ. (lm)	Wavelength Typ. (nm)	Max. (nm)	Test Current (I_f) (A)	Voltage Typ. (V_f) (V)	Power @ 25°C junction temp. (W)	Order Code	Mftrs. List No.
Red	125°		618	623	2.1	6.7	13.6	859-2713	BL-21A0-0121
Amber	125°		589	594	2.1	6.7	13.7	859-2721	BL-21E0-0131
Red	125°	59		635	0.63	2.4	1.51	859-2730	BL-22F0-0132
Green	125°	31		540	0.63	3.6	2.27		
Blue	125°	4.2		475	0.21	3.6	0.76		
Blue	125°		470	475	0.42	10.7	4.5	859-2748	BL-22B1-0140
Green	125°			535	0.42	10.2	4.3	859-2756	BL-22C1-0141
White	125°		5500★	10000	0.42	11.3	4.7	859-2764	BL-22D0-0130
White	125°		4300★	5500	0.21	24	5	859-2772	BL-22D1-0244

★ = Colour Temperature

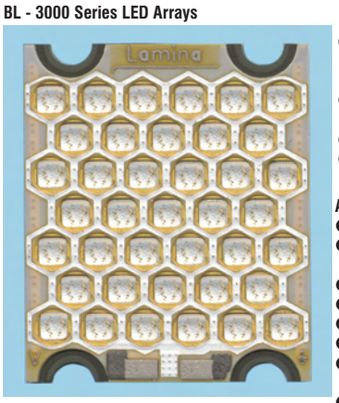
383079/405977

Colour	Order Code	Price Each 1+	10+	50+	+	+
Red	859-2713●	38.84	32.61	29.07	– –	– –
Amber	859-2721●	38.84	32.61	29.07	– –	– –
Red/Green/Blue	859-2730●	39.46	33.13	29.53	– –	– –
Blue	859-2748●	22.79	19.67	17.38	– –	– –
Green	859-2756●	25.46	21.97	19.42	– –	– –
White	859-2764●	34.48	28.94	25.81	– –	– –
White	859-2772●	40.35	33.88	30.20	– –	– –

Light Engine

lamina Bright Lights. Bright Ideas.™

BL - 3000 Series LED Arrays



H = 2.29, W = 26.67, D = 31.75mm

- Thermally matched LED/substrate
- Extended long life
- High Power light source
- Available in Red, Amber, Green, Blue, White and RGB

Applications:
- Solid state illumination
- Architectural detail lighting (uplighters and downlighters)
- Cove Lighting
- Advertising signs
- Reading lamps
- LED replacement lamps
- Bollards, Security and Garden lighting
- Traffic signalling, Beacons and Rail Crossing

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

A range of compact high power LED "Light Engines" manufactured by mounting 39 high intensity LED die onto a thermally matched substrate. The base material comprises of a specifically developed multilayer Low Temperature Co-Fired Ceramic on metal (LTCC-M) material. The process of matching the thermal expansion rates of the LED die to the base material allows for extremely reliable performance, whist the heat transfer properties of the base material allow the LED emitters to maintain a safe operating temperature even when the die are mounted in close proximity.

Colour	View Angle	Lum. Intensity Intensity Typ. (lm)	Wavelength Typ. (nm)	Wavelength Max. (nm)	Test Current (I_f) (A)	Voltage Typ. (V_f) (V)	Power @ 25°C junction temp. (W)	Order Code	Mftrs. List No.
Red	125°			623	15.6	6.69	104.33	859-2780	BL-31A0-0122
Amber	125°			594	15.6	6.69	104.33	859-2799	BL-31E0-0134
Red	125°	218		629	1.17	4.8	5.6	859-2802	BL-33F0-0142
Green	125°	114		535	1.17	7.2	8.4		
Blue	125°	47		475	1.17	7.2	8.4		
Blue	125°			475	2.35	10.5	24.57	859-2810	BL-32B1-0143
Green	125°			535	2.34	10	23.4	859-2829	BL-32C1-0144
White	125°		5500★	10000	2.3	11.3	26	859-2837	BL-32D0-0133
White	125°		4300★	5500	1.17	24	28	859-2845	BL-32D1-0245

★ = Colour Temperature

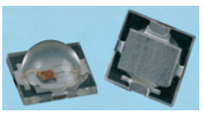
383130

Colour	Order Code	Price Each 1+	5+	10+	+	+
Red	859-2780●	164.43	150.60	145.22	– –	– –
Amber	859-2799●	164.43	150.60	145.22	– –	– –
Red/Green/Blue	859-2802●	121.72	111.48	107.50	– –	– –
Blue	859-2810●	103.70	92.39	89.09	– –	– –
Green	859-2829●	127.50	116.78	112.61	– –	– –
White	859-2837●	139.83	128.07	123.49	– –	– –
White	859-2845●	156.73	143.55	138.42	– –	– –

DORADO Series - Surface Mount

COTCO

7 x 7mm, QFN Type



H = 3.7, W = 7.0, D = 7.0mm

- Water clear compound encapsulated
- High luminous flux output
- Exposed pad design for efficient heat transfer
- Designed for high current operation
- Reflow solderable

SMD

Colour	Red and Amber	Blue and Green	White
Viewing angle - Blue and Green	100°	140°	70°
Reverse voltage	5V	5V	5V
Reverse current	10µA	10µA	10µA
DC Forward current	150mA	300mA	300mA
Storage temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C
Operating temperature	-20 to 80°C	-20 to 80°C	-20 to 80°C

Colour	Material	Wavelength Typical (nm)	Intensity (lm) Min.	Intensity (lm) Typ.	Forward Volts. Typ.	Order Code
Red	AlGaInP	624			2.2	853-0351
Amber	AlGaInP	594			2.2	853-0360
Blue	InGaN	470			3.6	853-0378
Green	InGaN	527			3.6	853-0386
White	InGaN				3.5	853-0394

381960

Mftrs. List No.	Order Code	Price Each 1+	10+	25+	50+	+
LD-701AHR1-A0	SMD 853-0351●	7.13	6.05	4.95	4.10	– –
LD-701AYL1-A0	SMD 853-0360●	7.13	6.05	4.95	4.10	– –
LD-700ABL1-D0	SMD 853-0378●	15.07	13.67	10.29	9.50	– –
LD-700APG1-D0	SMD 853-0386●	18.13	16.44	12.30	11.39	– –
LD-700AWN1-70	SMD 853-0394●	21.12	19.14	14.35	13.28	– –

Luxeon - Power Light Source

LUMILEDS™ LIGHT FROM SILICON VALLEY

Luxeon™ is a revolutionary, energy efficient and ultra compact new light source, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting.
The Luxeon range features one or more power light sources mounted onto an aluminium-core printed circuit board, allowing for ease of assembly, optimum cooling and accurate light centre positioning. The discrete emitters are also available separately as are the optics.
The range includes 1 watt and 5 watt power emitters.

Features:

- Highest Flux per LED family in the world
- Very long operating life (up to 10,000 hours)
- Available in White, Green, Blue, Royal Blue, Cyan, Red, Red-Orange and Amber
- Lambertian, Batwing, Side Emitting or Collimated Distribution Pattern
- More Energy Efficient than Incandescent and most Halogen lamps
- Low voltage DC operated
- Cool beam, safe to the touch
- Instant light (<100ns)
- Fully Dimmable
- No UV
- Superior ESD protection

Typical Applications:

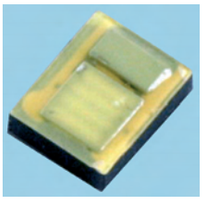
- Reading Lamps (car, bus, aircraft)
- Portable (flashlight, bicycle)
- Decorative
- Advertising Signs
- Architectural Detail Lighting (uplighters and downlighters)
- Cove Lighting
- Automotive Lighting (Stop-tail-turn)
- Edge-lit signs (Exit, point of sale)
- Medical Applications
- Power Signaling / Airfield / Taxiway Lighting
- Edge-Lit Signs (Exit, Point Of Sale)
- Bollards, Security and Garden Lighting
- Traffic Signaling, Beacons and Rail Crossing
- LCD Backlights / Light Guides
- Fibre Optic Alternative

248825

Luxeon™ Flash

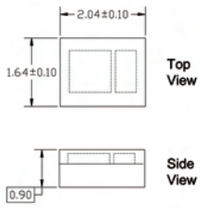
LUMILEDS™ LIGHT FROM SILICON VALLEY

Power Light Source



H = 0.9, W = 2.04, D = 1.64mm

- High Flash Luminance from a single LED
- Compact SMD package
- "Flash" or "Torch" modes of operation
- Smallest power LED available
- 63 Lumen output @ 2.0 A
- LED junction temp. (Absolute Max.) 150°C



Luxeon™ Flash is an ultra compact small form factor light source specifically designed and tested for use as a camera flash in space constrained, portable digital imaging applications or for use as a flashlight lamp. The Luxeon™ Flash device is based on proven Luxeon™ technology and provides the highest level of light output available for a solid state light source.
Featuring a 1.0mm profile this surface mount device has a 2.0mm x 1.6mm footprint and provides a useful life of 100,000 flashes at 1 amp, or 168 hours of DC (flashlight/torch mode) at 350mA.

Electrical Characteristics @ 1000mA, T_j = 25°C

Current	V_{Min}	V_{Typ}	V_{Max}
1000mA	3.2V	3.8V	4.8V

NB - Higher currents (up to 2000mA) are possible through proper thermal management

Colour Temperature (White) for Flash & Totch Modes

Min	Typ	Max	Viewing Angle
5000K	7000K	10000K	120°

Typical Flux Output vs. Drive Current

Current	Flux (Lumens)
100mA	7 LM
200mA	12 LM
300mA	18 LM
350mA	20 LM
500mA	26 LM
700mA	34 LM
1000mA	43 LM
1500mA	53 LM
2000mA	63 LM

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LUXEON™ Flash Emitter Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
	LXCL-PWF1	879-9873●	13.38	12.21	11.10

Luxeon® LED Emitters

LUMILEDS™ LIGHT FROM SILICON VALLEY

Luxeon Version

Batwing

H = 4.8, Dia. = 8mm
Side Emitting

H = 6.09, Dia. = 9mm
Lambertian
H = 5.86, Dia. = 8mm

- Long operating life - up to 100k hours
- More energy efficient than incandescent and most halogen lamps
- Low voltage DC operation
- Cool beam, safe to touch
- Instant light, less than 100 ns
- Fully dimmable
- No UV
- Superior ESD protection

NEW

LUXEON® is a revolutionary, energy efficient and ultra compact light source, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting.

Colour	Lum. Intensity (lm) min.	Lum. Intensity (lm) Typ.	Wavelength Typical (nm)	Forward Voltage Typ. (V)	Forward Voltage Max. (V)	Order Code (V)
Batwing						
Green			530	3.42	3.99	110-6541
Cyan			505	3.42	3.99	110-6543
Blue			470	3.42	3.99	110-6544
Red			625	2.85	3.27	110-6546
Amber			590	2.85	3.27	110-6547

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

Colour	Lum. Intensity (lm) min.	Lum. Intensity (lm) Typ.	Wavelength Typical (nm)	Forward Voltage Typ. (V)	Forward Voltage Max. (V)	Order Code (V)
Batwing						
Warm White			3300K	3.42	3.99	110-6628
White			5500K	3.42	3.99	110-6643
Amber			590	2.95	3.99	110-9085
Red			625	2.95	3.51	110-9087
Red/Orange			617	2.95	3.51	110-9088
Royal Blue	145mW	220mW	455	3.42	3.99	110-9089
Lambertian						
White			5500K	3.42	3.99	110-6548
Green			530	3.42	3.99	110-6549
Cyan			505	3.42	3.99	110-6550
Blue			470	3.42	3.99	110-6551
Royal Blue	145mW	220mW	455	3.42	3.99	110-6552
Red			627	2.95	3.51	110-6553
Red - Orange			617	2.95	3.51	110-6554
Amber			590	2.95	3.51	110-6555
Side Emitting						
Amber			590	2.95	3.51	110-9090
Blue			470	3.42	3.99	110-9092
Cyan			505	3.42	3.99	110-9093
Green			530	3.42	3.99	110-9094
Red			627	2.95	3.51	110-9095
Red - Orange			617	2.95	3.51	110-9096
Royal Blue	145mW	220mW	455	3.42	3.99	110-9097
White			5500K	3.42	3.99	110-9098

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Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
Batwing Beam Pattern					
Green	LXHL-BM01	SMD 110-6541	7.19	6.64	6.15
Cyan	LXHL-BE01	SMD 110-6543	7.19	6.64	6.15
Blue	LXHL-BB01	SMD 110-6544	7.19	6.64	6.15
Red	LXHL-BD01	SMD 110-6546	3.87	3.58	3.32
Amber	LXHL-BL01	SMD 110-6547	3.87	3.58	3.32
Warm White	LXHL-BW03	SMD 110-6628	8.95	8.27	7.68
White	LXHL-BW02	SMD 110-6643	8.95	8.27	7.68
Amber	LXHL-BL03	SMD 110-9085	5.86	5.40	5.01
Red	LXHL-BD03	SMD 110-9087	5.86	5.40	5.01
Red/Orange	LXHL-BH03	SMD 110-9088	5.86	5.40	5.01
Royal Blue	LXHL-BR02	SMD 110-9089	7.19	6.64	6.15
Lambertian Beam Pattern					
White	LXHL-PW01	SMD 110-6548	8.95	8.27	7.77
Green	LXHL-PM01	SMD 110-6549	7.19	6.64	6.15
Cyan	LXHL-PE01	SMD 110-6550	7.19	6.64	6.15
Blue	LXHL-PB01	SMD 110-6551	7.19	6.64	6.15
Royal Blue	LXHL-PR03	SMD 110-6552	7.19	6.64	6.15
Red	LXHL-PD01	SMD 110-6553	5.86	5.40	5.01
Red - Orange	LXHL-PH01	SMD 110-6554	5.86	5.40	5.01
Amber	LXHL-PL01	SMD 110-6555	5.86	5.40	5.01
Side Emitting Beam Pattern					
Amber	LXHL-DL01	SMD 110-9090	5.86	5.40	5.01
Blue	LXHL-DB01	SMD 110-9092	7.19	6.64	6.15
Cyan	LXHL-DE01	SMD 110-9093	7.19	6.64	6.15
Green	LXHL-DM01	SMD 110-9094	7.19	6.64	6.15
Red	LXHL-DD01	SMD 110-9095	5.86	5.40	5.01
Red - Orange	LXHL-DH01	SMD 110-9096	5.86	5.40	5.01
Royal Blue	LXHL-DR01	SMD 110-9097	7.19	6.64	6.15
White	LXHL-DW01	SMD 110-9098	8.95	8.27	7.68

Luxeon™ 1W Star (Mounted) Emitters

LUMILEDS™ LIGHT FROM SILICON VALLEY

Luxeon Star

Luxeon Star (With Connector)

Luxeon Star (With Optic)

NEW

A range of modules incorporate the Luxeon™ emitters on a preformed heatsinking PCB base. This makes the devices easier to use, the assemblies feature suitable mounting points and electrical connections.
The range includes the "batwing", "lambertian" and "side" emitting variants together with a version carrying a collimating optic lens.

Parameter	White/Green/Cyan/Blue/Royal Blue	Red/Amber/Red-Orange
DC Forward Current (mA)		385
Peak Pulsed Forward Current	500	550
Reverse Voltage (V)	>	>5
LED Junction Temp (°C)	120	120
Storage & Operating Temp (°C):		
Luxeon Star:	-40 to 120	-40 to 120
Luxeon Star (with Optic):	-40 to 75	-40 to 75

Colour	Vf (V)	Luminous Flux (lm)	Beam Pattern	Wavelength	Viewing Angle	Mftrs. List No.	Order Code
Luxeon Star							
White	3.99		Aile de chauve-souris	5500K	110°	LXHL-BW02	110-6643
Warm white	3.99		Batwing	3300K	110°	LXHL-MWGC	110-6627
Green	3.99		Aile de chauve-souris	530nm	110°	LXHL-MM1C	110-6556
Cyan	3.99		Aile de chauve-souris	505nm	110°	LXHL-ME1C	110-6558
Blue	3.99		Aile de chauve-souris	470nm	110°	LXHL-MB1C	110-6559
Royal Blue	3.99	100	Aile de chauve-souris	455nm	110°	LXHL-MRRC	110-6560
Red	3.27		Aile de chauve-souris	625nm	110°	LXHL-MD1C	110-6561
Luxeon Star							
Red	3.51		Aile de chauve-souris	645nm	110°	LXHL-MDAC	110-9152
Red/Orange	3.51		Aile de chauve-souris	620.5nm	110°	LXHL-MHAC	110-9153
Amber	3.27		Aile de chauve-souris	590nm	110°	LXHL-ML1C	110-6562
Amber	3.51		Aile de chauve-souris	597nm	110°	LXHL-MLAC	110-9150
White	3.99		Lambert	5500K	140°	LXHL-MW1D	110-6563
Green	3.99		Lambert	530nm	140°	LXHL-MM1D	110-6564
Cyan	3.99		Lambert	505nm	140°	LXHL-ME1D	110-6565
Blue	3.99		Lambert	470nm	140°	LXHL-MB1D	110-6566
Royal Blue	3.99	220mW	Lambert	455nm	140°	LXHL-MRRD	110-9154
Red	3.51		Lambert	625nm	110°	LXHL-MD1D	110-6567
Red - Orange	3.51		Lambert	617nm	110°	LXHL-MH1D	110-6568
Amber	3.51		Lambert	590nm	110°	LXHL-ML1D	110-6571
White	3.99		Emission latérale	5500K	75° - 85°	LXHL-FW1C	110-6587
Green	3.99		Emission latérale	530nm	75° - 85°	LXHL-FM1C	110-6588
Cyan	3.99		Emission latérale	505nm	75° - 85°	LXHL-FE1C	110-6589
Blue	3.99		Emission latérale	470nm	75° - 85°	LXHL-FB1C	110-6590
Royal Blue	3.99	90	Emission latérale	455nm	75° - 85°	LXHL-FR1C	110-6591
Red	3.51		Emission latérale	590nm	75° - 85°	LXHL-FD1C	110-6592
Red/Orange	3.51		Emission latérale	617nm	75° - 85°	LXHL-FH1C	110-9155
Amber	3.51		Emission latérale	590nm	75° - 85°	LXHL-FL1C	110-6593
Luxeon Star/C (with Connector)							
White	3.99		Aile de chauve-souris	5500K	110°	LXHL-MWEA	110-6645
Green	3.99		Aile de chauve-souris	530nm	110°	LXHL-MM1A	110-6572
Cyan	3.99		Aile de chauve-souris	505nm	110°	LXHL-ME1A	110-6573
Blue	3.99		Aile de chauve-souris	470nm	110°	LXHL-MB1A	110-6574
Royal Blue	3.99	100	Aile de chauve-souris	455nm	110°	LXHL-MRRA	110-6575
Red	3.27		Aile de chauve-souris	625nm	110°	LXHL-MD1A	110-6576
Amber	3.27		Aile de chauve-souris	590nm	110°	LXHL-ML1A	110-6577
White	3.99		Lambert	5500K	140°	LXHL-MW1B	110-6578
Green	3.99		Lambert	530nm	140°	LXHL-MM1B	110-6579
Cyan	3.99		Lambert	505nm	140°	LXHL-ME1B	110-6580
Blue	3.99		Lambert	470nm	140°	LXHL-MB1B	110-6581
Royal Blue	3.99	100	Lambert	455nm	140°	LXHL-MRRB	110-6583
Red	3.51		Lambert	625nm	110°	LXHL-MD1B	110-6584
Red/Orange	3.51		Lambert	617nm	140°	LXHL-MH1B	110-9156
Amber	3.51		Lambert	590nm	110°	LXHL-ML1B	110-6585
Luxeon Star/O (with Optic)							
White	3.99		Aile de chauve-souris	5500K	110°	LXHL-NWE8	110-6646
Warm white	3.99		Aile de chauve-souris	3300K	110°	LXHL-NWG8	110-9160
Green	3.99		Aile de chauve-souris	530nm	110°	LXHL-NM98	110-6595
Cyan	3.99		Aile de chauve-souris	505nm	110°	LXHL-NE98	110-6596
Blue	3.99		Aile de chauve-souris	470nm	110°	LXHL-NB98	110-6597
Royal Blue	3.99	100	Aile de chauve-souris	455nm	110°	LXHL-NRR8	110-6599
Red	3.27		Aile de chauve-souris	625nm	110°	LXHL-ND98	110-6601
Amber	3.27		Aile de chauve-souris	590nm	110°	LXHL-NL98	110-6602
Red/Orange	3.51		Lambert	617nm	140°	LXHL-NH94	110-9159
Amber	3.51		Lambert	590nm	140°	LXHL-NL94	110-9158

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Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
Luxeon Star					
Warm white	LXHL-MWGC	SMD 110-6627	10.81	9.99	9.28
Green	LXHL-MM1C	SMD 110-6556	9.05	8.37	7.75
Cyan	LXHL-ME1C	SMD 110-6558	9.05	8.37	7.75
Blue	LXHL-MB1C	SMD 110-6559	9.05	8.37	7.75
Royal Blue	LXHL-MRRC	SMD 110-6560	9.05	8.37	7.75
Red	LXHL-MD1C	SMD 110-6561	5.76	5.31	4.93
Red	LXHL-MDAC	SMD 110-9152	7.71	7.13	6.61
Red/Orange	LXHL-MHAC	SMD 110-9153	7.71	7.13	6.61
Amber	LXHL-ML1C	SMD 110-6562	5.76	5.31	4.92
Amber	LXHL-MLAC	SMD 110-9150	7.71	7.13	6.61
White	LXHL-MW1D	SMD 110-6563	10.81	9.99	9.28
Green	LXHL-MM1D	SMD 110-6564	9.05	8.37	7.75
Cyan	LXHL-ME1D	SMD 110-6565	9.05	8.37	7.75
Blue	LXHL-MB1D	SMD 110-6566	9.05	8.37	7.75
Royal Blue	LXHL-MRRD	SMD 110-9154	9.05	8.37	7.75
Red	LXHL-MD1D	SMD 110-6567	7.71	7.13	6.61
Red - Orange	LXHL-MH1D	SMD 110-6568	7.71	7.13	6.61
Amber	LXHL-ML1D	SMD 110-6571	7.71	7.13	6.61
White	LXHL-FW1C	SMD 110-6587	10.81	9.99	9.28
Green	LXHL-FM1C	SMD 110-6588	9.05	8.37	7.75
Cyan	LXHL-FE1C	SMD 110-6589	9.05	8.37	7.75
Blue	LXHL-FB1C	SMD 110-6590	9.05	8.37	7.75
Royal Blue	LXHL-FR1C	SMD 110-6591	9.05	8.37	7.75
Red	LXHL-FD1C	SMD 110-6592	7.71	7.13	6.61
Red/Orange	LXHL-FH1C	SMD 110-9155	7.71	7.13	6.61
Amber	LXHL-FL1C	SMD 110-6593	7.71	7.13	6.61
Luxeon Star/C (with Connector)					
White	LXHL-MWEA	SMD 110-6645	14.43	13.00	11.81
Green	LXHL-MM1A	SMD 110-6572	12.15	11.14	10.03
Cyan	LXHL-ME1A	SMD 110-6573	12.15	11.14	10.03
Blue	LXHL-MB1A	SMD 110-6574	12.15	11.14	10.03
Royal Blue	LXHL-MRRA	SMD 110-6575	12.15	11.14	10.03
Red	LXHL-MD1A	SMD 110-6576	7.73	7.09	6.38
Amber	LXHL-ML1A	SMD 110-6577	7.73	7.09	6.38
White	LXHL-MW1B	SMD 110-6578	14.53	13.32	12.00
Green	LXHL-MM1B	SMD 110-6579	12.15	11.14	10.03
Cyan	LXHL-ME1B	SMD 110-6580	12.15	11.14	10.03
Blue	LXHL-MB1B	SMD 110-6581	12.15	11.14	10.03
Royal Blue	LXHL-MRRB	SMD 110-6583	12.15	11.14	10.03
Red	LXHL-MD1B	SMD 110-6584	10.35	9.49	8.55
Red/Orange	LXHL-MH1B	SMD 110-9156	7.71	7.13	6.61
Amber	LXHL-ML1B	SMD 110-6585	10.35	9.49	8.55

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

C = CYAN M = Magenta Y = Yellow B = Black/SING

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
Luxeon Star/O (with Optic)					
White	LXHL-NWE8	SMD 110-6646	18.57	16.71	15.21
Warm white	LXHL-NWG8	SMD 110-9160	13.93	12.86	11.95
Green	LXHL-NM98	SMD 110-6595	16.32	14.97	13.49
Cyan	LXHL-NE98	SMD 110-6596	16.32	14.97	13.49
Blue	LXHL-NB98	SMD 110-6597	16.32	14.97	13.49
Royal Blue	LXHL-NRR8	SMD 110-6599	16.32	14.97	13.49
Red	LXHL-ND98	SMD 110-6601	11.90	10.91	9.83
Amber	LXHL-NL98	SMD 110-6602	11.90	10.91	9.83
Red/Orange	LXHL-NH94	SMD 110-9159	10.81	9.99	9.28
Amber	LXHL-NL94	SMD 110-9158	10.81	9.99	9.28

Luxeon® LED Emitters

LUMILEDS™ LIGHT FROM SILICON VALLEY

Luxeon III Version

H = 6.09, Dia. = 9mm
Lambertian
H = 5.86, Dia. = 8mm

Side Emitting

NEW

- Long operating life - up to 100k hours
- More energy efficient than incandescent and most halogen lamps
- Low voltage DC operation
- Cool beam, safe to touch
- Instant light, less than 100 ns
- Fully dimmable
- No UV
- Superior ESD protection

LUXEON® III is a revolutionary, energy efficient and ultra compact light source, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting. LUXEON® III is rated for up to 1400mA operation, delivering increased lumens per package.

Colour	Lum. Intensity (lm) min.	Typ.	Wavelength Typical (nm)	Forward Voltage Typ. (V)	Max. (V)	Order Code (V)
Lambertian						
White				3.7	4.47	110-6629
Green			530	3.7	4.47	110-6630
Cyan			505	3.7	4.47	110-6631
Blue			470	3.7	4.47	110-6632
Royal Blue	275mW	340mW	455	3.7	4.47	110-6633
Amber			590	2.95	3.51	110-9117
Red			627	2.95	3.51	110-9118
Red/Orange			617	3.7	4.47	110-9119
Side Emitting						
White			5500K	3.7	4.47	110-6634
Green			530	3.7	4.47	110-6649
Blue			470	3.7	4.47	110-6651
Amber			590	2.95	3.51	110-9120
Red			627	2.95	3.51	110-9122
Red/Orange			617	2.95	3.51	110-9123

423138

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
Lambertian Beam Pattern					
White	LXHL-PW09	SMD 110-6629	10.29	9.50	8.82
Green	LXHL-PM09	SMD 110-6630	8.56	7.88	7.32
Cyan	LXHL-PE09	SMD 110-6631	8.56	7.88	7.32
Blue	LXHL-PB09	SMD 110-6632	8.56	7.88	7.32
Royal Blue	LXHL-PR09	SMD 110-6633	8.56	7.88	7.32
Amber	LXHL-PL09	SMD 110-9117	12.08	11.13	10.35
Red	LXHL-PD09	SMD 110-9118	12.08	11.13	10.35
Red/Orange	LXHL-PH09	SMD 110-9119	12.08	11.13	10.35
Side Emitting Beam Pattern					
White	LXHL-DW09	SMD 110-6634	10.29	9.50	8.82
Green	LXHL-DM09	SMD 110-6649	8.56	7.88	7.32
Blue	LXHL-DB09	SMD 110-6651	8.56	7.88	7.32
Amber	LXHL-DL09	SMD 110-9120	12.08	11.13	10.35
Red	LXHL-DD09	SMD 110-9122	12.08	11.13	10.35
Red/Orange	LXHL-DH09	SMD 110-9123	12.08	11.13	10.35

Luxeon™ III Star

LUMILEDS™ LIGHT FROM SILICON VALLEY

Light Source

Lambertian

Side Emitting

NEW

- Long operating life - up to 100k hours
- Energy efficient
- Low voltage DC operation
- Cool beam, safe to touch
- Instant light, less than 100 ns
- Fully dimmable
- No UV
- Superior ESD protection

Luxeon Star hexagonal modules can be connected and powered in a close packed hexagonal configuration for tight spacing and increased light output per unit area. Available in white, green, cyan, blue, royal blue, red, red-orange, and amber.

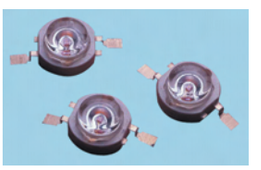
Colour	Lum. Intensity (lm) min.	Typ.	Wavelength Typical (nm)	Forward Voltage Typ. (V)	Max. (V)	Order Code (V)
Lambertian Beam Pattern						
White			5500K	3.7	4.47	110-6635
Green			530	3.7	4.47	110-6637
Cyan			505	3.7	4.47	110-6638
Blue			470	3.7	4.47	110-6639
Royal Blue	275mW	340mW	455	3.7	4.47	110-6640
Red			627	2.95	3.51	110-9125
Red/Orange			617	2.95	3.51	110-9126
Amber			590	2.95	3.51	110-9124
Side Emitting Beam Pattern						
White			5500K	3.7	3.90	110-6641
Green			530	3.7	4.47	110-6642
Blue			470	3.7	4.47	110-6647
Red			627	2.95	3.51	110-9128
Red/Orange			617	2.95	3.51	110-9129
Amber			590	2.95	3.51	110-9127

423166

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
Lambertian Beam Pattern					
White	LXHL-LW3C	SMD 110-6635	12.14	11.23	10.42
Green	LXHL-LM3C	SMD 110-6637	10.42	9.60	8.92
Cyan	LXHL-LE3C	SMD 110-6638	10.42	9.60	8.92
Blue	LXHL-LB3C	SMD 110-6639	10.42	9.60	8.92
Royal Blue	LXHL-LR3C	SMD 110-6640	10.42	9.60	8.92
Red	LXHL-LD3C	SMD 110-9125	13.93	12.86	11.95
Red/Orange	LXHL-LH3C	SMD 110-9126	13.93	12.86	11.95
Amber	LXHL-LL3C	SMD 110-9124	13.93	12.86	11.95
Side Emitting Beam Pattern					
White	LXHL-FW3C	SMD 110-6641	31.54	28.81	26.11
Green	LXHL-FM3C	SMD 110-6642	33.56	30.66	27.80
Blue	LXHL-FB3C	SMD 110-6647	33.56	30.66	27.80
Red	LXHL-FD3C	SMD 110-9128	13.93	12.86	11.95
Red/Orange	LXHL-FH3C	SMD 110-9129	13.93	12.86	11.95
Amber	LXHL-FL3C	SMD 110-9127	13.93	12.86	11.95

Luxeon™ 5W Emitters

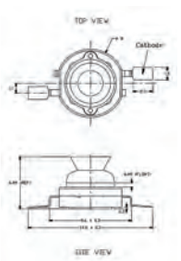
LUMILEDS™ LIGHT FROM SILICON VALLEY

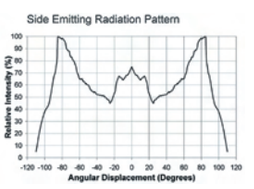


A range of high intensity 5 watt LED power light sources available in "lambertian" or "side" light emission patterns.

Note that the discrete unmounted devices must be attached to a suitable heatsinking PCB if operated at the full rated current, this is to maintain the junction temperature below the maximum permitted per device.
Blue and Royal Blue devices are IEC825 class 2 for eye safety.

Side Emitting





Colour	Vf (V)	Luminous Flux (lm)	Radiation Pattern	Dominant Wavelength λD	Viewing Angle		
White	8.31			5500K	75°	LXHL-DW03	110-6609
Green	8.31			530nm	75°	LXHL-DM02	110-6610
Cyan	8.31			505nm	75°	LXHL-DE02	110-6611
Blue	8.31			470nm	75°	LXHL-DB02	110-6613
Royal Blue	8.31	450mW/cm²		455nm	75°	LXHL-DR02	110-6614
White	8.31			5500K	120°	LXHL-PW03	110-6604
Green	8.31				150°	LXHL-PM02	110-6605
Cyan	8.31				150°	LXHL-PE02	110-6606
Blue	8.31				150°	LXHL-PB02	110-6607
Royal Blue	8.31	500mW/cm²		455nm	150°	LXHL-PR02	110-6608

Parameter	White/Green/Cyan/Blue/Royal Blue
DC Forward Current (mA)	
Peak Pulsed Forward Current	1000
Reverse Voltage (V)	>
LED Junction Temp (°C)	120
Storage Temp (°C)	to

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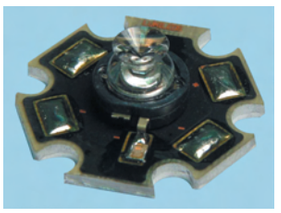
Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
White	LXHL-DW03	SMD 110-6609	55.25	50.68	45.63
Green	LXHL-DM02	SMD 110-6610	45.90	42.10	37.91
Cyan	LXHL-DE02	SMD 110-6611	45.90	42.10	37.91

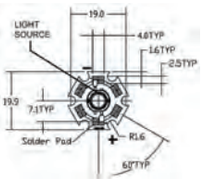
RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
Blue	LXHL-DB02	SMD 110-6613	34.21	31.57	29.30
Royal Blue	LXHL-DR02	SMD 110-6614	45.90	42.10	37.91
White	LXHL-PW03	SMD 110-6604	55.25	50.68	45.63
Green	LXHL-PM02	SMD 110-6605	45.88	42.09	37.91
Cyan	LXHL-PE02	SMD 110-6606	45.90	42.10	37.91
Blue	LXHL-PB02	SMD 110-6607	45.88	42.09	37.91
Royal Blue	LXHL-PR02	SMD 110-6608	45.90	42.10	37.91

Luxeon™ 5 watt Star (Mounted) Emitters

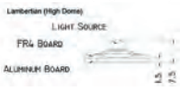
LUMILEDS™ LIGHT FROM SILICON VALLEY



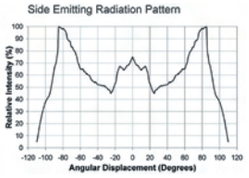


Side Emitting

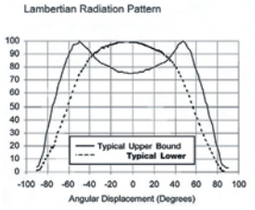
Lambertian (High Dome)



Side Emitting Radiation Pattern



Lambertian Radiation Pattern



A range of Luxeon™ 5 watt discrete emitters and modules which incorporate the emitters on a preformed heatsinking PCB base. The range includes the "lambertian" and "side" emitting variants. This range of devices represent the highest flux per LED currently available, with a flux density twenty times the lm/mm² of standard through hole LEDs.

Parameter	White/Green/Cyan/Blue/Royal Blue
DC Forward Current (mA)	700
Peak Pulsed Forward Current	1000
Reverse Voltage (V)	>5
LED Junction Temp (°C)	120
Storage Temp (°C)	-40 to 120

Colour	Vf (V)	Luminous Flux (lm)	Radiation Pattern	Dominant Wavelength λD	Viewing Angle		
White	8.31		Lambertian	5500K	120°	LXHL-LW6C	110-6615
Green	8.31		Lambertian	530nm	150°	LXHL-LM5C	110-6616
Cyan	8.31		Lambertian	505nm	150°	LXHL-LE5C	110-6617
Blue	8.31		Lambertian		150°	LXHL-LB5C	110-6618
Royal Blue	8.31	500mW/cm²	Lambertian	455nm	150°	LXHL-LR5C	110-6619
White	8.31		Side Emitting	5500K	75°	LXHL-FW6C	110-6620
Green	8.31		Side Emitting	530nm	75°	LXHL-FM5C	110-6621
Cyan	8.31		Side Emitting	505nm	75°	LXHL-FE5C	110-6622
Blue	8.31		Side Emitting	470nm	75°	LXHL-FB5C	110-6623
Royal Blue	8.31	450mW/cm²	Side Emitting	455nm	75°	LXHL-FR5C	110-6626

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Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
White	LXHL-LW6C	SMD 110-6615	57.55	52.78	47.52
Green	LXHL-LM5C	SMD 110-6616	48.20	44.20	39.81
Cyan	LXHL-LE5C	SMD 110-6617	48.20	44.20	39.81
Blue	LXHL-LB5C	SMD 110-6618	48.20	44.20	39.81
Royal Blue	LXHL-LR5C	SMD 110-6619	48.20	44.20	39.81
White	LXHL-FW6C	SMD 110-6620	57.55	52.77	47.54
Green	LXHL-FM5C	SMD 110-6621	48.20	44.20	39.82
Cyan	LXHL-FE5C	SMD 110-6622	48.20	44.20	39.82
Blue	LXHL-FB5C	SMD 110-6623	48.20	44.20	39.82
Royal Blue	LXHL-FR5C	SMD 110-6626	48.20	44.20	39.82

Luxeon™ Collimator

LUMILEDS™ LIGHT FROM SILICON VALLEY

H = 11.2, Dia. = 19.7mm

Typical Applications

NEW

- Reading lights (car, bus, aircraft)
- Portable (flashlight, bicycle)
- Mini-accent, decorative, fibre optics alternative
- Under shelf, task lighting
- Indoor and outdoor commercial and residential architectural lighting

The driving force in the quality of an Optic is it's efficiency, the entrance to the light guide (Optic) is where light can be lost so alignment is very important. The entrance to the NX05 is designed to be the exact size of 1 Luxeon Chip. The NX05 is suggested for all Luxeons with a single chip light source.

This includes Luxeon I (all colours) and Luxeon III (Green, Blue, White, Cyan, Royal Blue). It is not recommended for use with Luxeon V and Luxeon III (Red, Amber, Red Orange) as these are Multi Chip devices.
The optical design of the collimator uses the total internal reflection mechanism to collimate the light source into a 10° beam.

418539

Mftrs. List No.	Order Code	Price Each 1+	10+	50+
LXHL-NX05	110-6603	3.12	2.86	2.67

Luxeon® LED Emitters

LUMILEDS™ LIGHT FROM SILICON VALLEY

Luxeon V and Luxeon V Portable

Lambertian
H = 5.86, Dia. = 8mm

Side Emitting
H = 6.09, Dia. = 9mm

NEW

- Extreme luminous density, 20 times the lm/mm² of through hole LED
- Long operating life - up to 100k hours
- More energy efficient than incandescent and most halogen lamps
- Low voltage DC operation
- Cool beam, safe to touch
- Instant light, less than 100 ns
- Fully dimmable
- No UV
- Superior ESD protection

LUXEON® V is a revolutionary, energy efficient and ultra compact light source, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting. LUXEON® V offers extreme luminous density, up to 50 times that of alternative solid-state light sources creating new opportunities for solid-state lighting to displace conventional lighting technologies.
LUXEON® V Portable is designed for portable lighting products such as flashlights, "miner" head-mounted lights, emergency lighting and other battery-operated devices. This device offers ruggedness, low power consumption and lifetimes greater than 50 times that of flashlight sources.

Colour	Lum. Intensity (lm) min.	Typ.	Wavelength Typical (nm)	Forward Voltage Typ. (V)	Max. (V)	Order Code (V)
Lambertian						
White			5500K	3.7	4.47	110-6629
Green			530	3.7	4.47	110-6630
Cyan			505	3.7	4.47	110-6631
Blue			470	3.7	4.47	110-6632
Royal Blue	275mW	340mW	455	3.7	4.47	110-6633
Amber			590	2.95	3.51	110-9117
Red			627	2.95	3.51	110-9118
Red/Orange			617	3.7	4.47	110-9119
Side Emitting						
White			5500K	3.7	4.47	110-6634
Green			530	3.7	4.47	110-6649
Blue			470	3.7	4.47	110-6651
Amber			590	2.95	3.51	110-9120
Red			627	2.95	3.51	110-9122
Red/Orange			617	2.95	3.51	110-9123
Luxeon V Portable Emitter						
Lambert - White			5500K	6.84	8.31	110-6604
Emission latérale - White			5500K	6.84	8.31	110-6609

423143

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
Lambertian Beam Pattern					
White	LXHL-PW09	SMD 110-6629	10.29	9.50	8.82
Green	LXHL-PM09	SMD 110-6630	8.56	7.88	7.32
Cyan	LXHL-PE09	SMD 110-6631	8.56	7.88	7.32
Blue	LXHL-PB09	SMD 110-6632	8.56	7.88	7.32
Royal Blue	LXHL-PR09	SMD 110-6633	8.56	7.88	7.32
Amber	LXHL-PL09	SMD 110-9117	12.08	11.13	10.35
Red	LXHL-PD09	SMD 110-9118	12.08	11.13	10.35
Red/Orange	LXHL-PH09	SMD 110-9119	12.08	11.13	10.35
Side Emitting Beam Pattern					
White	LXHL-DW09	SMD 110-6634	10.29	9.50	8.82
Green	LXHL-DM09	SMD 110-6649	8.56	7.88	7.32
Blue	LXHL-DB09	SMD 110-6651	8.56	7.88	7.32
Amber	LXHL-DL09	SMD 110-9120	12.08	11.13	10.35
Red	LXHL-DD09	SMD 110-9122	12.08	11.13	10.35
Red/Orange	LXHL-DH09	SMD 110-9123	12.08	11.13	10.35
Luxeon V Portable Emitter - White					
Lambert	LXHL-PW03	SMD 110-6604	55.25	50.68	45.63
Emission latérale	LXHL-DW03	SMD 110-6609	55.25	50.68	45.63

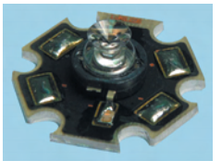
Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Luxeon™ V Star

LUMILEDS™ LIGHT FROM SILICON VALLEY

Light Source

Lambertian



Side Emitting

NEW

- Long operating life - up to 100k hours
- Energy efficient
- Low voltage DC operation
- Cool beam, safe to touch
- Instant light, less than 100 ns
- Fully dimmable
- No UV
- Superior ESD protection

LUXEON® V is a revolutionary, energy efficient and ultra compact light source, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting. LUXEON® V offers extreme luminous density, up to 50 times that of alternative solid-state light sources creating new opportunities for solid-state lighting to displace conventional lighting technologies. These hexagonal modules can be connected and powered in a close packed hexagonal configuration for tight spacing and increased light output per unit area.

LUXEON® V Portable is designed for portable lighting products such as flashlights, "miner" head-mounted lights, emergency lighting and other battery-operated devices. This device offers ruggedness, low power consumption and lifetimes greater than 50 times that of flashlight sources - over 500 hours compared to the typical 20 hour life of an incandescent bulb.

Colour	Lum. Intensity (lm) min.	Lum. Intensity (lm) Typ.	Wavelength Typical (nm)	Forward Voltage Typ. (V)	Forward Voltage Max. (V)	Order Code (V)
Lambertian Beam Pattern						
Green			530	6.84	8.31	110-6616
Cyan			505	6.84	8.31	110-6617
Blue			470	6.84	8.31	110-6618
Royal Blue	275mW	700mW	455	6.84	8.31	110-6619
Side Emitting Beam Pattern						
Green			530	6.84	8.31	110-6621
Cyan			505	6.84	8.31	110-6622
Blue			470	6.84	8.31	110-6623
Royal Blue	275mW	630mW	455	6.84	8.31	110-6626
LUXEON® V Portable						
White - Lambertian			5500K	6.84	8.31	110-6615
White - Side Emitting			5500K	6.84	8.31	110-6620

423175

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
Lambertian Beam Pattern					
Green	LXHL-LM5C	SMD 110-6616 ●	48.20	44.20	39.81
Cyan	LXHL-LE5C	SMD 110-6617 ●	48.20	44.20	39.81
Blue	LXHL-LB5C	SMD 110-6618 ●	48.20	44.20	39.81
Royal Blue	LXHL-LR5C	SMD 110-6619 ●	48.20	44.20	39.81
Side Emitting Beam Pattern					
Green	LXHL-FM5C	SMD 110-6621 ●	48.20	44.20	39.82
Cyan	LXHL-FE5C	SMD 110-6622 ●	48.20	44.20	39.82
Blue	LXHL-FB5C	SMD 110-6623 ●	48.20	44.20	39.82
Royal Blue	LXHL-FR5C	SMD 110-6626 ●	48.20	44.20	39.82
LUXEON® V Portable - White					
Lambertian	LXHL-LW6C	SMD 110-6615 ●	57.55	52.78	47.52
Side Emitting	LXHL-FW6C	SMD 110-6620 ●	57.55	52.77	47.54

Luxeon™ Dental Blue

LUMILEDS™ LIGHT FROM SILICON VALLEY

Emitter

Star

NEW

- Low voltage DC operated
- Cool beam, safe to touch
- Instant light (<100ns)
- Fully dimmable
- No UV
- Radiometric power levels and peak wavelength specifications matched to the response curves of many dental resins.
- Extreme radiometric power results in short curing times, <10 seconds for the Luxeon devices and on the order of 5 seconds for the Luxeon V devices.
- Low voltage DC operation allows for handheld cordless curing wand designs.
- Directed light from the source of the desired wavelength eliminates the need for inefficient colour filters.
- Long life eliminates the need for maintenance and repair operations.

Luxeon Dental Solutions include both Luxeon and Luxeon V alternatives, offering two high power-curing options. Luxeon Dental is available in both emitter and star configurations, providing flexibility in curing system design.

Luxeon Dental products are selected from the peak wavelength range most effective for short curing times, and are produced to elevated minimum power levels to deliver the powerful short wavelength blue power required to reduce curing times while enabling handheld curing wands. This revolutionary product line is specifically tailored to the dental curing industry to provide the source most effective for this application.

Order Code	Product Type	Wavelength Typical	Voltage V_f Typical	Viewing Angle	Radiometric Power (Typ.)	Beam Pattern
110-9086	Emitter	460nm	3.42V	110°	140mW	Aile de chauve-souris
110-9151	Star	460nm	3.42V	110°	140mW	Aile de chauve-souris
110-9161	Emitter	460nm	6.84V	150°	600mW	Lambertian
110-9162	Star	460nm	6.84V	150°	600mW	Lambertian

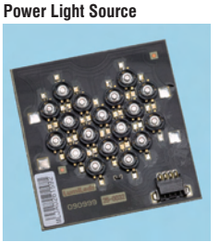
422991

Mftrs. List No.	Order Code	Price Each 1+	10+	50+
LXHL-BRD1	SMD 110-9086 ●	28.74	26.53	24.61
LXHL-MRD1	SMD 110-9151 ●	30.43	28.09	26.07
LXHL-PRD5	SMD 110-9161 ●	86.19	79.55	73.86
LXHL-LRD5	SMD 110-9162 ●	87.88	81.11	75.32

Luxeon™ LED Flood

LUMILEDS™ LIGHT FROM SILICON VALLEY

Power Light Source



- Long operating life - up to 100k hours
- More energy efficient than incandescent and most halogen lamps
- Low voltage DC operation
- Cool beam, safe to touch
- Instant light, less than 100 ns
- Fully dimmable
- No UV
- Superior ESD protection

NEW

These multi LED modules provide an energy efficient and compact light source, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting.

The LED's are mounted on an aluminium core printed circuit board allowing ease of assembly, optimum cooling and accurate light centre positioning.

Colour	Lum. Intensity (lm) min.	Lum. Intensity (lm) Typ.	Wavelength Typical (nm)	Forward Voltage Typ. (V)	Forward Voltage Max. (V)	Order Code (V)
Flood 12 LED						
Amber			590	17	20	110-9099
Blue			470	21	24	110-9100
Cyan			505	21	24	110-9101
Green			530	21	24	110-9102
Red			625	17	20	110-9103
White			5500K	21	24	110-9104
Amber			590	18	21	110-9105
Red			627	18	21	110-9106
Flood 18 LED						
Amber			590	17	20	110-9107
Blue			470	21	24	110-9109
Cyan			505	21	24	110-9111
Green			530	21	24	110-9112
Red			625	17	20	110-9113
White			5500K	21	24	110-9114
Amber			590	18	21	110-9115
Red			627	18	21	110-9116

423022

Colour	Mftrs. List No.	Order Code	Price Each 1+	5+	10+
Flood - 12 LED's					
Amber	LXHL-MLCA	SMD 110-9099 ●	134.30	123.98	115.13
Blue	LXHL-MBCA	SMD 110-9100 ●	179.06	165.29	153.51
Cyan	LXHL-MECA	SMD 110-9101 ●	179.06	165.29	153.51
Green	LXHL-MMCA	SMD 110-9102 ●	179.06	165.29	153.51
Red	LXHL-MDCA	SMD 110-9103 ●	134.30	123.98	115.13
White	LXHL-MWCE	SMD 110-9104 ●	179.06	165.29	153.51
Amber	LXHL-MLCB	SMD 110-9105 ●	179.06	165.29	153.51
Red	LXHL-MDCB	SMD 110-9106 ●	179.06	165.29	153.51
Flood - 18 LED's					
Amber	LXHL-MLJA	SMD 110-9107 ●	201.45	185.96	172.68
Blue	LXHL-MBJA	SMD 110-9109 ●	268.60	247.93	230.23
Cyan	LXHL-MEJA	SMD 110-9111 ●	268.60	247.93	230.23
Green	LXHL-MMJA	SMD 110-9112 ●	268.60	247.93	230.23
Red	LXHL-MDJA	SMD 110-9113 ●	201.45	185.96	172.68
White	LXHL-MWJE	SMD 110-9114 ●	268.60	247.93	230.23
Amber	LXHL-MLJB	SMD 110-9115 ●	268.60	247.93	230.23
Red	LXHL-MDJB	SMD 110-9116 ●	268.60	247.93	230.23

Product Watch obsolescence notification

- FREE to all account holders
- Notification of obsolete, end of line and end of stock items
- Replacement or upgrade recommendations

Advanced warning of obsolete components

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

C = CYAN M = Magenta Y = Yellow B = Black/SING

Farnell Page 892 Date: 21-08-06 time: 17:11

Lenses for LUXEON™ LED's FHS Series

FRAEN

489-4376

489-4420

489-4431

The FHS series offers a complete range of lenses specially designed for the LUXEON™ LED from Lumileds.™
Both Batwing and Lambertion radiation patterns are supported.
The high collection efficiency reaches 85% of the total flux emitted from the LED.
Lenses are available assembled with the universal lens holder. The holder assures the proper placement relationship between the lens and the LED.

- High efficiency
- 4 different beam widths available
- Available with or without lens holder
- Patent Pending

Typical beam divergence with Batwing LED

Beam Type	Amber, Red	Blue, Cyan, Green	White
Narrow Beam	6°	8°	10°
Medium Beam	25°	28°	30°
Wide Beam	40°	42°	45°
Elliptical Beam	10° x 22°	12° x 25°	15° x 30°

Typical beam divergence with Lambertian LED

Beam Type	Amber, Orange, Red	Blue, Cyan, Green	White
Narrow Beam	8°	10°	10°
Medium Beam	25°	28°	30°
Wide Beam	40°	42°	45°
Elliptical Beam	12° x 24°	14° x 25°	15° x 30°

336153.343600

Lens Type	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
Without Holder					
Batwing					
Narrow Beam	FHS-HNB1-LB01-0	**489-4340**	10.32	9.54	9.24
Medium Beam	FHS-HMB1-LB01-0	**489-4388**	10.32	9.54	9.24
Wide Beam	FHS-HWB1-LB01-0	**489-4420**●	11.43	10.38	10.03
Elliptical Beam	FHS-HEB1-LB01-0.	**489-4467**●	11.43	10.38	10.03
Lambertian					
Narrow Beam	FHS-HNB1-LL01-0	**489-4364**●	12.60	11.46	11.03
Medium Beam	FHS-HMB1-LL01-0	**489-4406**●	12.60	11.46	11.03
Wide Beam	FHS-HWB1-LL01-0	**489-4443**●	12.60	11.46	11.03
Elliptical Beam	FHS-HEB1-LL01-0	**489-4480**	12.60	11.46	11.03
With Holder					
Batwing					
Narrow Beam	FHS-HNB1-LB01-H.	**489-4352**●	14.78	13.44	12.95
Medium Beam	FHS-HMB1-LB01-H	**489-4390**●	14.78	13.44	12.95
Wide Beam	FHS-HWB1-LB01-H.	**489-4431**●	14.78	13.44	12.95
Elliptical Beam	FHS-HEB1-LB01-H	**489-4479**●	14.78	13.44	12.95
Lambertian					
Narrow Beam	FHS-HNB1-LL01-H.	**489-4376**●	14.78	13.44	12.95
Medium Beam	FHS-HMB1-LL01-H.	**489-4418**●	14.78	13.44	12.95
Wide Beam	FHS-HWB1-LL01-H.	**489-4455**●	14.78	13.44	12.95
Elliptical Beam	FHS-HEB1-LL01-H.	**489-4492**●	14.78	13.44	12.95

Product Watch obsolescence notification

- FREE to all account holders
- Notification of obsolete, end of line and end of stock items
- Replacement or upgrade recommendations

Advanced warning of obsolete components

Luxeon™ LED Light Module

LUMILEDS™ LIGHT FROM SILICON VALLEY

Power Light Source

Features
- Long operating life - up to 100k hours
- Collimating optics providing tight beams
- Low voltage DC operation
- Cool beam, safe to touch
- Instant light, less than 100 ns
- Fully dimmable
- No UV
- Superior ESD protection

NEW

Applications
- Decorative lighting
- Architectural detail lighting
- Uplighters, downlighters & orientation lighting
- Entertainment lighting
- Bollards

These multi LED modules provide an energy efficient and compact light source, combining the lifetime and reliability advantages of Light Emitting Diodes with the brightness of conventional lighting.
The LED's are mounted on an aluminium core printed circuit board allowing ease of assembly, optimum cooling and accurate light centre positioning.

Colour	Lum. Intensity (lm) min.	Typ.	Wavelength Typical (nm)	Forward Voltage Typ. (V)	Max. (V)	Order Code (V)
Ring, 6 LED						
Amber			590	9	11	110-9143
Blue			470	12	10	110-9144
Cyan		600	505	10	12	110-9146
Green			530	12	10	110-9147
Red			627	9	11	110-9148
White	70	125		10	12	110-9149
Ring, 12 LED						
Amber			590	18	21	110-9137
Blue			470	24	21	110-9138
Cyan			505	21	24	110-9139
Green			530	21	24	110-9140
Red	310	450	627	18	21	110-9141
White	140	250		21	24	110-9142
Line, 12 LED						
Amber			590	18	21	110-9130
Blue			470	24	21	110-9131
Cyan			505	24	21	110-9132
Green			530	24	21	110-9134
Red			627	18	21	110-9135
White				21	24	110-9136

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Colour	Mftrs. List No.	Order Code	Price Each 1+	5+	10+
Configuration	Ring, 6 LED's				
Amber	LXHL-NL93	**110-9143**●	137.10	126.55	117.51
Blue	LXHL-NB97	**110-9144**●	137.10	126.55	117.51
Cyan	LXHL-NE97	**110-9146**●	137.10	126.55	117.51
Green	LXHL-NM97	**110-9147**●	137.10	126.55	117.51
Red	LXHL-ND93	**110-9148**●	137.10	126.55	117.51
White	LXHL-NWE7	**110-9149**●	137.10	126.55	117.51
Configuration	Ring, 12 LED's				
Amber	LXHL-NL92	**110-9137**●	268.86	248.16	230.45
Blue	LXHL-NB96	**110-9138**●	268.86	248.16	230.45
Cyan	LXHL-NE96	**110-9139**●	268.86	248.16	230.45
Green	LXHL-NM96	**110-9140**●	268.86	248.16	230.45
Red	LXHL-ND92	**110-9141**●	268.86	248.16	230.45
White	LXHL-NWE6	**110-9142**●	268.86	248.16	230.45
Configuration	Line, 12 LED's				
Amber	LXHL-NL95	**110-9130**●	219.78	202.85	188.37
Blue	LXHL-NB99	**110-9131**●	219.78	202.85	188.37
Cyan	LXHL-NE99	**110-9132**●	219.78	202.85	188.37
Green	LXHL-NM99	**110-9134**●	219.78	202.85	188.37
Red	LXHL-ND95	**110-9135**●	219.78	202.85	188.37
White	LXHL-NWE9	**110-9136**●	219.78	202.85	188.37

Drivers for Luxeon™ LED's 1, 3 and 5 Watts Stardrive

8 LED, 16 LED, 8 LED Dim.

- Luxeon™ compliant
- Sealed against moisture
- 90% efficient
- Thermal and short circuit protected
- Constant current
- Operational life in excess of 50,000 Hrs.

Stardrive Series modules are designed to drive Lumileds® Luxeon™ Leds from a 24 volt power source. Intended of applications where low voltage, quality, reliability, efficiency and service life are critical factors.
1 Watt modules are available for driving 8 Led's in series, at a maximum of 350 mA, and a module which is capable of driving 16 Led's in series/parallel at a maximum of 700 mA. Both

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

C = CYAN M = Magenta Y = Yellow B = Black/SING

modules are available with Dimming via:- 0 - 10Vdc, 4 - 20mA or Potentiometer Control.
3 Watt modules are available for driving 6 Led's in series, at a maximum of 1A, (Depending on individual Forward voltage Drop). Including Full Power and Dimming via:- 0 - 10Vdc, 4 - 20mA or Potentiometer Control.
5 Watt modules are available for driving 3 Led's in series, at a maximum of 700mA, (Depending on individual Forward voltage Drop). Including Full Power and Dimming via:- 0 - 10Vdc, 4 - 20mA or Potentiometer Control.

Input voltage range	24V ac, 12 to 36V dc
Input current	1A 1 & 3 Watt, 1A5 Watt
Output current - 1 Watt, 8 LED	300mA
Output current - 1 Watt, 16 LED	300mA
Output current - 3 Watt, 6 LED	300mA
Output current - 5 Watt, 3 LED	700mA
Current Accuracy	±2%
Current set	-7% to extend LED life

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Output	Mftrs. List No.	Order Code	Price Each 1+	5+	10+
1 Watt, 8 LED					
1A	101-080	**121-0808**	42.25	38.99	37.66
Dimming					
0 - 10V	101-081	**121-0809**	75.09	69.30	66.96
0 - 20mA	8STARDIMIMA	**492-0028**	73.04	67.41	63.86
Pot.	8STARDIMPOT	**492-0030**	73.04	67.41	63.86
1 Watt, 16 LED					
1A	101-160	**121-0810**	52.37	48.34	46.71
Dimming					
0 - 10V	16STARDIMVDC	**492-0053**	83.95	77.47	73.37
0 - 20mA	16STARDIMIMA	**492-0065**	83.95	77.47	73.37
Pot.	101-163	**121-9901●**	83.95	77.47	73.37
3 Watt, 6 LED					
1A	102-300	**121-0811**	57.19	52.76	51.01
Dimming					
0 - 10V	3WSTARDIMVDC	**492-0090**	81.90	75.89	– –
0 - 20mA	3WSTARDIMIMA	**492-0107**	88.54	81.73	77.44
Pot.	3WSTARDIMPOT	**492-0119**	88.54	81.73	77.44
5 Watt, 3 LED					
700mA	120-500	**121-0812**	58.72	54.23	52.41
Dimming					
0 - 10V	5WSTARDIMVDC	**492-0132**	90.13	83.20	78.80
0 - 20mA	5WSTARDIMIMA	**492-0144**	90.13	83.20	78.80
Pot.	102-503	**121-0813**	92.64	85.54	82.61

Electronic Drivers for LED's

PHILIPS

i - Xitanium™ Series

Constant Current

Constant Voltage

Dimming

- Provide appropriate dc current level to LED's
- AC input 230V ±10%
- Long life (50,000 hours)
- Energy efficient - Switch mode power supply design
- Class 2 electrical insulation
- Short circuit protected
- Meet approbation requirements (CE, ENEC)

A range of drivers specifically designed for use with Lumiled® LED's. The use of these constant current/voltage drivers enhances the long life and optimum performance of high intensity LED's when used for applications such as lighting and illumination. Designed with switch-mode PSU technology the drivers are lightweight, compact and efficient.

Input voltage range	207 to 253V ac	Total Harmonic Distortion	20% maximum
Input frequency	50Hz	Power factor	0.9 minimum
Efficiency	80% typical	Operating temperature	-40 to 60°C

Driver Order Code	**489-4297**	**489-4303**	**489-4315**	**489-4339**	**489-4327**
Power consumption (W)	1.1 to 15	6.8 to 21.5	2.9 to 31.9	4.4 to 51	2.9 to 31.9
Power output (W)	0.9 to 12	5.5 to 17.2	2.3 to 25.5	3.5 to 40.8	2.3 to 25.5
Output voltage (V dc)	2.6 to 32.8	7.8 to 24.6	24V ± 1.2	24V ± 1.2	24V ±1.2
Output current (A dc)	350mA ±17	700mA ±35	0.1 to 1.05	0.15 to 1.7	0.1 to 1.05

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Output	Mftrs. List No.	Order Code	Price Each 1+	5+	10+
Constant Current Output					
350mA / 12W	913700534408.	**489-4297**	67.64	56.38	48.82
700mA / 12W	913700518806.	**489-4303**	67.64	56.38	52.08
Constant Voltage Output					
24V / 25W	9137 005 34505.	**489-4315**	107.09	79.49	76.49
24V / 40W	9137 0050 34506	**489-4339**	124.02	103.35	88.70
Dimming					
24V / 2.3 - 25.5W	913700181903M.	**489-4327**	174.73	145.60	124.83

Flat Top Light Emitting Diodes (LEDs)

3mm, Flat Top

Kingbright

L=6.0, Dia.=4.0
Lead pitch=2.54, Leads=25.5 x 0.5sq
Cathode identified by shorter lead

Colour	View Angle	Lum. Intensity (mcd) @ I_F10mA min.	typ.	I_F (mA) (max.)	PIV (max.)	Order Code
Tinted Diffused Lens						
Red	100°	0.5	3.2	25	5	621-249
HE Red	100°	3.2	12.5	30	5	621-250
Green	100°	1.3	8	25	5	621-262
Yellow	100°	1.3	8	30	5	621-274
Orange	100°	3.2	12.5	30	5	621-286

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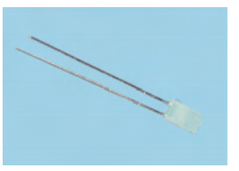
Colour	Order Code	Price Each 5+	50+	100+	500+	+
Red	**621-249▲**	0.28	0.22	0.16	0.11	– –
HE Red	**621-250▲**	0.35	0.35	0.33	0.27	– –
Green	**621-262▲**	0.31	0.29	0.22	0.13	– –
Yellow	**621-274▲**	0.32	0.30	0.24	0.21	– –
Orange	**621-286▲**	0.41	0.39	0.33	0.21	– –

4mm, Flat Top

Kingbright



L=6.0, Dia.=4.0
Lead pitch=2.54, Leads=25.5 x 0.50sq

Cathode identified by shorter lead.

Colour	View Angle	Typ. Lum. Intensity (mcd)	I_F (mA) (max)	PIV (max.)	Order Code
Tinted Diffused Lens					
HE Red	100°	8 @ 10mA	30	5	515-693
Yellow	100°	8 @ 10mA	30	5	515-700
Green	100°	8 @ 10mA	25	5	515-711

206226

Colour	Order Code	Price Each 5+	100+	1K+	5K+
HE Red	**515-693▲**	0.46	0.40	0.32	0.18
Yellow	**515-700▲**	0.46	0.40	0.32	0.18
Green	**515-711▲**	0.35	0.27	0.22	0.16

5mm - Flat Top

High Intensity - InGaN

Agilent Technologies
Authorized Distributor

View Angle	Luminous Intensity @ 20mA Min. (mcd)	Max. (mcd)	Forward Voltage Typical	Maximum	I_F (max)	PIV (max)	Standoff	Mftrs. List No.	Order Code
90°	240	680	3.6V	4.0V	30mA	5V	No	HLMP-FW00-JM000..	857-7331
85°	400	1150	3.2V	4.0V	30mA	5V	No	HLMP-FW66-LP000..	857-7340
85°	520	880	3.2V	4.0V	30mA	5V	No	HLMP-FW66-MN000	807-6820
85°	400	1150	3.2V	4.0V	30mA	5V	Yes	HLMP-FW67-LP000	807-6844
85°	520	880	3.2V	4.0V	30mA	5V	Yes	HLMP-FW67-MN000	807-6868

382870

Colour	Order Code	Price Each 5+	100+	250+	500+	+
White	**857-7331**	1.50	1.37	1.24	1.14	– –
White	**857-7340**	1.59	1.46	1.30	1.20	– –
White	**807-6820●**	1.73	1.56	1.40	1.30	– –
White	**807-6844●**	1.63	1.50	1.33	1.24	– –
White	**807-6868●**	1.73	1.56	1.40	1.30	– –

Superflux LEDs

QuadriLED 4-pin Square LEDs

High Performance - Flat and Domed Lens versions

forge EUROPA

Features:
- 7.6mm square body with flat or lensed options
- Flat lens QuadriLED has 115°C viewing angle in both planes
- Available in white, red, yellow, green, blue, RGB and bi-colour with1-3 die variants
- Device construction is ideally suited to high current op-

● Compliant
◄ Non-compliant
++ Limited stock - RoHS replacement available

RoHS

eration
- Manufactured with copper leadframes for enhanced thermal conductivity
- Ultra wide angle option ideal for backlighting and switch top illumination

QuadriLED 4-pin square rugged package construction makes these devices ideally suited to arduous environmental conditions. The two lens options add to the diversity of potential applications including displays, backlighting and illumination.

Mftrs. List No.	Colour	Wavelength Dom. (nm)	Lum Intensity (mcd)	@ If (mA)	No. of die	Viewing angle (Deg.)
Flat						
FNL-P115B11TWCCI	Blue	624	540	50	1	115
FCL-PH115Y1512WCCI	Yellow	589	540	50	1	115
FCL-PH115G16WCCI	Green	527	480	35	1	115
FCL-PH115G11WCCI	Green	505	480	35	1	115
FCL-PH115B17WCCI	Blue	470	220	35	1	115
FCL-PH115W15WCCI	White	0.31/0.32	375	35	1	115
FCL-P115R078G03WCCI	Red and Green	624/525	140/140	50/35	2	115
FCL-P115Y109B12WCCI	Yellow and Blue	585/470	180/100	50/35	2	115
FNL-P115R078TWCCI	Red	624	1030	45	3	115
FNL-P115Y048TWCCI	Yellow	589	1030	45	3	115
FNL-P115G16TWCCI	Green	527	1100	30	3	115
FNL-P115G11TWCCI	Green	505	840	30	3	115
FCL-PH115R2112WCCI	Red	624	540	50	3	115
FSL-P115W12TWCCI	White	0.31/0.32	1080	30	3	115
FCL-P115R078G03B12WCCI	Red, Green and Blue	624/525/470	140/140/140	50/35/35	3	115
Small Domed lens						
FCL-PH65R2112WCCI	Red	624	1980	50	1	65
FCL-PH65Y1512WCCI	Yellow	589	1980	50	1	65
FCL-PH65G16WCCI	Green	527	1800	35	1	65
FCL-PH65G11WCCI	Green	505	1800	35	1	65
FCL-PH65B17WCCI	Blue	470	850	35	1	65
FCL-PH65W15WCCI	White	0.31/0.32	1350	35	1	65
Large Domed lens						
FCL-P5DR078G03WCCI	Red/Green	624/525	400/400	50/35	2	115
FCL-P5DY109B12WCCI	Yellow and Blue	585/470	500/620	50/35	1/2	115
FNL-P5DR078TWCCI	Red/Yellow	624/589	3800	45	3	115
FNL-P5DY048TWCCI	Yellow	527	3800	45	3	115
FNL-P5DG16TWCCI	Green	527	4100	30	3	115
FNL-P5DG11TWCCI	Green	505	3100	30	3	115
FNL-P5DB11TWCCI	Blue	460	1600	30	3	115
FSL-P5DW12TWCCI	White	0.31/0.32	4000	30	3	115
FCL-P5DR078G03B12WCCI	Red, Green and Blue	624/525/470	400/400/260	50/35/35	3	115

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Mftrs. List No.	Order Code	Price Each 1+	10+	25+	50+
Flat					
FNL-P115B11TWCCI	**873-8742●**	8.10	7.19	6.61	6.02
FCL-PH115Y1512WCCI	**873-8840●**	1.24	1.11	1.01	0.94
FCL-PH115G16WCCI	**873-8858●**	2.28	2.05	1.86	1.69
FCL-PH115G11WCCI	**873-8866●**	2.28	2.05	1.86	1.69
FCL-PH115B17WCCI	**873-8874●**	3.68	3.26	2.99	2.73
FCL-PH115W15WCCI	**873-8939●**	3.91	3.48	3.19	2.93
FCL-P115R078G03WCCI	**873-8785●**	3.42	3.06	2.80	2.57
FCL-P115Y109B12WCCI	**873-8807●**	3.42	3.06	2.80	2.57
FNL-P115R078TWCCI	**873-8688●**	1.79	1.59	1.46	1.33
FNL-P115Y048TWCCI	**873-8700●**	1.79	1.59	1.46	1.33
FNL-P115G16TWCCI	**873-8726●**	8.10	7.19	6.61	6.02
FNL-P115G11TWCCI	**873-8823●**	8.10	7.19	6.61	6.02
FCL-PH115R2112WCCI	**873-8831●**	1.24	1.11	1.01	0.94
FSL-P115W12TWCCI	**873-8769●**	8.10	7.19	6.61	6.02
FCL-P115R078G03B12WCCI	**873-8661●**	6.15	5.47	4.98	4.56
Small Domed lens					
FCL-PH65R2112WCCI	**873-8882●**	1.24	1.11	1.01	0.94
FCL-PH65Y1512WCCI	**873-8890●**	1.24	1.11	1.01	0.94
FCL-PH65G16WCCI	**873-8904●**	2.28	2.05	1.86	1.69
FCL-PH65G11WCCI	**873-8912●**	2.28	2.05	1.86	1.69
FCL-PH65B17WCCI	**873-8920●**	2.28	2.05	1.86	1.69
FCL-PH65W15WCCI	**873-8947●**	3.91	3.48	3.19	2.93
Large Domed lens					
FCL-P5DR078G03WCCI	**873-8777●**	3.42	3.06	2.80	2.57
FCL-P5DY109B12WCCI	**873-8793●**	3.42	3.06	2.80	2.57
FNL-P5DR078TWCCI	**873-8670●**	1.79	1.59	1.46	1.33
FNL-P5DY048TWCCI	**873-8696●**	1.79	1.59	1.46	1.33
FNL-P5DG16TWCCI	**873-8718●**	8.10	7.19	6.61	6.02
FNL-P5DG11TWCCI	**873-8815●**	8.10	7.19	6.61	6.02
FNL-P5DB11TWCCI	**873-8734●**	8.10	7.19	6.61	6.02
FSL-P5DW12TWCCI	**873-8750●**	8.10	7.19	6.61	6.02
FCL-P5DR078G03B12WCCI	**873-8653●**	6.15	5.47	4.98	4.56

Telux™ White LEDs

VISHAY

7.62mm Square, High Temperature Package

H = 2.85, W = 7.62, D = 7.62mm

The TELUX™ series is a clear, non-diffused LED for high-end applications where supreme luminous flux is required.
It is designed in an industry standard 7.62mm square package utilizing highly developed InGaN technologies.
The 4-pin Through Hole Technology design allows highly efficient heat dissipation.

Features:
- High Luminance
- High Power Dissipation
- High Operating Temperature
- High ESD withstand voltage

Applications:
- Exterior Lighting
- Automotive Lighting
- Traffic Signs and Signals
- Replacement Incandescent lamps

Parameter	
DC Forward Current (mA)	50mA
Power Dissipation (mW)	255mW
Operating Temp. Range	-40 to 110°C
Storage Temp. Range	-55 to 110°C
LED Junction Temp.	100°C
Solder Temperature	260°C (for 5 seconds)

Colour	Vf (V)	Vr (V)	Colour Temperature (K)	Luminous Flux (lm)	Angle of Half Intensity	Order Code	Mftrs. List No.
White	5.2	5	5500		30°	831-1137	TLWW8600.
White	5.2	5	5500		30°	831-1161	TLWW9600.
White	5.2	5	5500		45°	831-1153	TLWW8900.
White	5.2	5	5500		45°	831-1170	TLWW9900.

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Colour	Order Code	Price Each 5+	25+	100+	250+	+
60° Viewing Angle						
White	**831-1137●**	2.57	2.29	1.91	1.54	– –
White	**831-1161●**	2.72	2.42	2.02	1.63	– –
90° Viewing Angle						
White	**831-1153●**	2.57	2.29	1.91	1.54	– –
White	**831-1170●**	2.72	2.42	2.02	1.63	– –

Telux™ LEDs 0.3 to 2.1 Lumen

VISHAY

7.62mm Square, High Temperature Package

H = 2.85, W = 7.62, D = 7.62mm

The TELUX™ series is a clear, non-diffused LED for high-end applications where supreme luminous flux is required.
It is designed in an industry standard 7.62mm square package utilizing highly developed (AS) AlInGaP and InGaN technologies.
The 4-pin Through Hole Technology design allows highly efficient heat dissipation.

Features:
- High Luminance
- High Power Dissipation
- High Operating Temperature
- High ESD withstand voltage

Applications:
- Exterior Lighting
- Automotive Lighting
- Traffic Signs and Signals
- Replacement Incandescent lamps

Parameter	Red/Yellow/Orange	Green/Blue/White
DC Forward Current (mA)	70mA	50mA
Power Dissipation (mW)	187mW	230mW
Operating Temp. Range	-40 to 110°C	
Storage Temp. Range	-55 to 110°C	
LED Junction Temp.	100°C	
Solder Temperature	260°C (for 5 seconds)	

Colour	Vf (V)	Vr (V)	Dominant Wavelength λD	Luminous Flux (lm)	Angle of Half Intensity	Technology	Order Code	Mftrs. List No.
Red	2.67	10	618nm		30°	(1)	831-0947	TLWR7600.
Yellow	2.67	10	592nm		30°	(1)	831-1196	TLWY7600.
Soft orange	2.67	10	605nm		30°	(1)	831-0920	TLWO7600.
True green	4.7	5	523nm		30°	(2)	831-1072	TLWTG7600.
Blue/Green	4.7	5	503nm		30°	(2)	831-0890	TLWBG7600.
Blue	4.7	5	470nm		30°	(2)	831-0866	TLWB7600.
White	5.1	5	5500K*		30°	(3)	831-1110	TLWW7600.
Red	2.67	10	618nm		45°	(1)	831-0955	TLWR7900.
Soft orange	2.67	10	592nm		45°	(1)	831-0939	TLWO7900.
Yellow	2.67	10	605nm		45°	(1)	831-1200	TLWY7900.
True green	4.7	5	523nm		45°	(2)	831-1080	TLWTG7900.
Blue/Green	2.67	5	505nm		45°	(2)	831-0904	TLWBG7900.
Blue	4.7	5	470nm		45°	(2)	831-0874	TLWB7900.
White	5.1	5	5500K*		45°	(3)	831-1129	TLWW7900.

* Colour Temperature

Technology: (1) = AlInGaP on GaAs, (2) = InGaN on SiC, (3) = InGaN/YAG on SiC

380909

Colour	Order Code	Price Each 5+	25+	100+	250+	+
60° Viewing Angle						
Red	**831-0947●**	0.73	0.65	0.55	0.44	– –
Yellow	**831-1196●**	0.73	0.65	0.55	0.44	– –
Soft orange	**831-0920●**	0.81	0.72	0.60	0.48	– –
True green	**831-1072●**	2.71	2.41	2.02	1.63	– –
Blue/Green	**831-0890●**	2.99	2.31	1.82	1.30	– –
Blue	**831-0866●**	2.06	1.83	1.53	1.23	– –
White	**831-1110●**	2.42	2.16	1.80	1.45	– –
90° Viewing Angle						
Red	**831-0955●**	0.73	0.65	0.55	0.44	– –
Soft orange	**831-0939●**	0.81	0.72	0.60	0.48	– –
Yellow	**831-1200●**	0.73	0.65	0.55	0.44	– –
True green	**831-1080●**	2.71	2.41	2.02	1.63	– –
Blue/Green	**831-0904●**	1.91	1.70	1.42	1.15	– –
Blue	**831-0874●**	2.06	1.83	1.53	1.23	– –
White	**831-1129●**	2.42	2.16	1.80	1.45	– –

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Telux™ LEDs 0.7 to 3.0 Lumen

VISHAY

7.62mm Square, High Temperature Package

H = 2.85, W = 7.62, D = 7.62mm

The TELUX™ series is a clear, non-diffused LED for high-end applications where supreme luminous flux is required.
It is designed in an industry standard 7.62mm square package utilizing highly developed (AS) AlInGaP and InGaN technologies.
The 4-pin Through Hole Technology design allows highly efficient heat dissipation.

Features:
- High Luminance
- High Power Dissipation
- High Operating Temperature
- High ESD withstand voltage

Applications:
- Exterior Lighting
- Automotive Lighting
- Traffic Signs and Signals
- Replacement Incandescent lamps

Parameter	Red/Yellow/Orange	Green/Blue/White
DC Forward Current (mA)	70mA	50mA
Power Dissipation (mW)	187mW	230mW
Operating Temp. Range	-40 to 110°C	
Storage Temp. Range	-55 to 110°C	
LED Junction Temp.	100°C	
Solder Temperature	260°C (for 5 seconds)	

Colour	Vf (V)	Vr (V)	Dominant Wavelength λD	Luminous Flux (lm)	Angle of Half Intensity	Technology	Order Code	Mftrs. List No.
Red	2.67	10	615nm		30°	(1)	831-0963	TLWR8600.
Yellow	2.67	10	590nm		30°	(1)	831-1218	TLWY8600.
Soft orange	2.67	10	605nm		30°	(2)	831-0920	TLWO7600.
True green	5.0	10	523nm		30°	(2)	831-1099	TLWTG8600.
Blue/Green	4.7	5	503nm		30°	(2)	831-0890	TLWBG7600.
Blue	5.0	5	505nm		30°	(2)	831-0882	TLWB8600.
Red	2.7	10	615nm		45°	(1)	831-0971	TLWR8900.
Yellow	2.7	10	590nm		45°	(1)	831-1226	TLWY8900.
True green	5.0	5	523nm		45°	(2)	831-1102	TLWTG8900.
Blue/Green	5.0	5	505nm		45°	(2)	831-0912	TLWBG8900.

Technology: (1) = AlInGaP on GaAs, (2) = InGaN on SiC

380859

Colour	Order Code	Price Each 5+	25+	100+	250+	+
60° Viewing Angle						
Red	831-0963●	0.81	0.72	0.60	0.48	– –
Yellow	831-1218●	0.81	0.72	0.60	0.48	– –
True green	831-1099●	2.71	2.41	2.02	1.63	– –
Blue/Green	831-0890●	2.99	2.31	1.82	1.30	– –
Blue	831-0882●	2.06	1.83	1.53	1.23	– –
90° Viewing Angle						
Red	831-0971●	0.81	0.72	0.60	0.48	– –
Yellow	831-1226●	0.81	0.72	0.60	0.48	– –
True green	831-1102●	2.71	2.41	2.02	1.63	– –
Blue/Green	831-0912●	2.20	1.96	1.64	1.32	– –

Telux™ Red LEDs 3.2 to 5.0 Lumen

VISHAY

7.62mm Square, High Temperature Package

H = 2.85, W = 7.62, D = 7.62mm

The TELUX™ series is a clear, non-diffused LED for high-end applications where supreme luminous flux is required.
It is designed in an industry standard 7.62mm square package utilizing highly developed AlInGaP OMA technologies.
The 4-pin Through Hole Technology design allows highly efficient heat dissipation.

Features:
- High Luminance
- High Power Dissipation
- High Operating Temperature
- High ESD withstand voltage

Applications:
- Exterior Lighting
- Automotive Lighting
- Traffic Signs and Signals
- Replacement Incandescent lamps

Order Codes: 8311005, 8311013, 8311021, 8311048, 8311056, 8311064, 8310998, 8311030, 8310980

Parameter		
DC Forward Current (mA)	70mA	70mA
Power Dissipation (mW)	187mW	187mW
Operating Temp. Range	-40 to 110°C	
Storage Temp. Range	-55 to 110°C	
LED Junction Temp.	125°C	
Solder Temperature	260°C (for 5 seconds)	

Colour	Vf (V)	Vr (V)	Dominant Wavelength λD	Luminous Flux (lm)	Angle of Half Intensity	Order Code	Mftrs. List No.
Red	2.7	10	615nm		30°	831-1005	TLWR9620.
Red	2.7	10	615nm		30°	831-1013	TLWR9621.
Red	2.7	10	615nm		30°	831-1021	TLWR9622.
Red	2.7	10	615nm		30°	831-0998	TLWR9600.
Red	2.7	10	615nm		45°	831-1048	TLWR9920.
Red	2.7	10	615nm		45°	831-1056	TLWR9921.
Red	2.7	10	615nm		45°	831-1064	TLWR9922.
Red	2.7	10	615nm		45°	831-1030	TLWR9900.
Red	2.7	10	615nm		55°	831-0980	TLWR9000.

380923/405982

Colour	Order Code	Price Each 5+	25+	100+	250+	+
60° Viewing Angle						
Red	831-1005●	1.03	0.92	0.77	0.62	– –
Red	831-1013●	1.10	0.98	0.82	0.66	– –
Red	831-1021●	1.10	0.98	0.82	0.66	– –
Red	831-0998●	1.03	0.92	0.77	0.62	– –
90° Viewing Angle						
Red	831-1048●	0.95	0.85	0.71	0.57	– –
Red	831-1056●	1.03	0.92	0.77	0.62	– –
Red	831-1064●	1.10	0.98	0.82	0.66	– –
Red	831-1030●	1.03	0.92	0.77	0.62	– –
110° Viewing Angle						
Red	831-0980●	0.95	0.85	0.71	0.57	– –

SuperFlux LEDs

Lumiled

Dimensions: 2.5mm(H) x 7.62mm(W) x 7.62mm(D)

This revolutionary package design allows the lighting designer to reduce the number of LEDs required and provide a more uniform and unique illuminated appearance than with other LED solutions. This is possible through the efficient optical package design and high-current capabilities.Tha low profile package can be easily coupled with reflectors or lenses to efficiently distribute light and provide the desired lit appearance.The product range employs the brightest red, red-orange, amber, blue, cyan and green materials available.

Applications:
- Automotive Lighting
- Electronic Signs and Signalling
- Speciality Lighting

Features:
- High Luminance
- Low Power Consumption
- Low Profile

Parameter	Blue/Cyan/Green	Red/Red-Orange/Amber
DC Forward Current (mA)	50	70
Power Dissipation (mW)	233	221
Reverse Voltage (V)	0.55	10
Operating Temp. Range (°C)	-40 to +100	
Storage Temp. Range (°C)	-55 to +100	
LED Junction Temp.	125°C	
Solder Temperature	260°C*	

* For 5 Seconds

Colour	Vf (V)	Vr (V)	Dominant Wavelength λD	Luminous Flux (lm)	Viewing Angle	Capacitance (pF)	Thermal Resistance (°C/W)	Speed of Response (ns)
Red	2.5	20	640nm	0.6	70°	40	125	20
Red/Orange	2.5	20	626nm	0.6	70°	40	125	20
Amber	2.6	20	596nm	0.6	70°	40	125	20
Blue	3.8	0.65	460nm	0.9	90°	1900	130	20
Cyan	3.8	0.65	503nm	0.9	90°	1900	130	20
Green	3.9	0.65	520nm	0.9	90°	1900	130	20

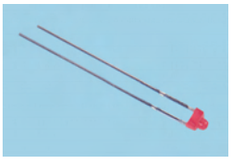
248834

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+
Red	HPWT-MD00-00000	121-9889●	1.07	1.01	0.88
Red/Orange	HPWT-MH00-00000	121-9890●	1.07	1.01	0.88
Amber	HPWT-ML00-00000	121-9891●	0.82	0.76	0.69
Blue	HPWN-MB00-00000	121-9887●	3.21	2.93	2.65
Cyan	HPWN-MC00-00000	432-6040	3.21	2.93	2.65
Green	HPWN-MG00-00000	121-9888●	3.21	2.93	2.65

1.8mm Light Emitting Diodes (LEDs)

1.8mm, Standard and Super Bright

Kingbright



L=3.1, Dia=1.8
Lead pitch=2.54, Leads=0.4sq
Cathode identified by shorter lead

Colour	View Angle	Lum Intensity (mcd) @ I_F=10mA min	(max)	I_F (mA) max	PIV max	Order Code
Tinted Diffused Lens						
Red	70°	0.5	3.2	25	5	636-940
Green	70°	2	20	25	5	636-952
Yellow	70°	2	20	30	5	636-964
Orange	70°	12.5	32	30	5	636-976
Untinted Clear Lens						
Super-bright red	30°	100*	500*	30	5	636-990

*I_F = 20mA

206338

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

Farnell Page 896 Date: 21-08-06 time: 17:14

Colour	Order Code	Price Each 5+	50+	100+	500+	+
Red	**636-940▲**	0.39	0.32	0.27	0.20	– –
Green	**636-952▲**	0.62	0.33	0.30	0.23	– –
Yellow	**636-964▲**	0.62	0.33	0.30	0.23	– –
Orange	**636-976▲**	0.57	0.31	0.28	0.22	– –
Super-bright red	**636-990▲**	0.52	0.47	0.40	0.27	– –

3mm Light Emitting Diodes (LEDs)

3mm/T1 – With Integral Resistor

VISHAY

L=4.5, Dia=2.9, Lead pitch=2.54, Leads=23 x 0.5sq
Cathode identified by shorter lead

Colour	View Angle	Lum. Intensity (mcd) min.	typ.	I_F (mA) (max.)	PIV (max.)	Mftrs. List No.	Order Code
Tinted Diffused Lens							
HE Red	60°	1.6	4 @ 12V	12	6	TLRH4420CU	104-5511
Green	60°	1.6	4 @ 5V	15	6	TLRG4450CU	104-5512
Green	60°	1.6	4 @ 12V	12	6	TLRG4420CU	104-5513
Yellow	60°	1.6	4 @ 5V	15	6	TLRY4450CU	104-5514
Yellow	60°	1.6	4 @ 12V	12	6	TLRY4420CU	104-5515

206431

Colour	Order Code	Price Each 5+	25+	100+	250+	+
5V						
Yellow	**104-5514●**	0.78	0.70	0.58	0.47	– –
Green	**104-5512●**	0.68	0.61	0.51	0.41	– –
12V						
HE Red	**104-5511●**	0.68	0.61	0.51	0.41	– –
Yellow	**104-5515●**	0.68	0.61	0.51	0.41	– –
Green	**104-5513●**	0.68	0.61	0.51	0.41	– –

3mm/T1, Standard and with Resistor

AVAGO TECHNOLOGIES

L=4.7, Dia=3.18
Lead pitch=2.54,
Leads=24 x 0.45sq

Cathode identified by shorter lead

Colour	View Angle	Typ Lum. Intensity (mcd)	I_F (mA) (max.)	PIV (max.)	Mftrs. List No.	Order Code
Tinted Diffused Lens						
HE Red	60°	5.5 @ 10mA	25	5	HLMP-1301	100-3196
Yellow	60°	6 @ 10mA	20	5	HLMP-1401	100-3198
Yellow	60°	2.2 @ 10 mA	20	5	HLMP-1620-C00A1	857-6432
Green	60°	5 @ 20mA	25	5	HLMP-1503	100-3199
Green	60°	1.6 @ 10 mA	20	5	HLMP-1640-B00A1	857-6440
With Resistor, 5V - Tinted Diffused Lens						
HE Red	60°	8 @ 5V	15	5	HLMP-1600	100-3390
Green	60°	8 @ 5V	15	5	HLMP-1640	100-3391
With Resistor, 12V - Tinted Diffused Lens						
HE Red	60°	8 @ 12V	20	5	HLMP-1601	100-3393

221738

Colour	Order Code	Price Each 5+	10+	100+	500+	+
HE Red	**100-3196●**	0.48	0.30	0.24	0.21	– –
Yellow	**100-3198●**	0.40	0.25	0.20	0.18	– –
Yellow	**857-6432**	0.98	0.91	0.81	0.75	– –
Green	**100-3199●**	0.40	0.25	0.20	0.18	– –
Green	**857-6440**	0.98	0.91	0.81	0.75	– –
With Resistor						
HE Red 5Vdc	**100-3390●**	0.96	0.63	0.55	0.47	– –
Green 5Vdc	**100-3391●**	0.96	0.63	0.55	0.47	– –
HE Red 12Vdc	**100-3393●**	0.96	0.63	0.55	0.47	– –

3mm/T1, Standard - With Integral Resistor

SLI

L=4.6, Dia.=3.0
Lead pitch=2.54, Leads=27 0.5sq
Cathode identified by shorter lead.
LEDs with tinted diffused lens.

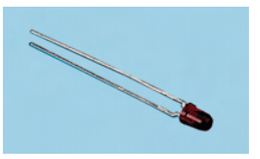
Colour	View Angle	Max. Lum. Intensity (mcd) @ I_F	(mA)	Wavelength	Mftrs. List No.	Order Code
Super Red	60°	50	10	625	VL-934ID-5V	595-305
Super Red	60°	50	10	625	VL-934ID-12V	595-317
Green	60°	32	10	565	VL-934GD-5V	595-329
Green	60°	32	10	565	VL-934GD-12V	595-330
Yellow	60°	32	10	590	VL-934YD-5V	595-342
Yellow	60°	32	10	590	VL-934YD-12V	595-354
Green	60°	60	10	565	VL-934SGD-5V	595-366
Green	60°	60	10	565	VL-934SGD-12V	595-378
Hyper Red	60°	300	10	660	VL-934SRD-5V	595-380
Hyper Red	60°	300	10	660	VL-934SRD-12V	595-391

206312

Colour	Voltage	Code	Price Each 5+	25+	100+	250+	+
Super Red	5V	**595-305**	0.94	0.88	0.76	0.49	– –
Super Red	12V	**595-317**	0.94	0.88	0.76	0.49	– –
Green	5V	**595-329**	0.94	0.88	0.62	0.40	– –
Green	12V	**595-330**	0.94	0.88	0.76	0.40	– –
Yellow	5V	**595-342**	0.94	0.88	0.62	0.40	– –
Yellow	12V	**595-354**	0.94	0.69	0.62	0.40	– –
Green	5V	**595-366**	1.07	0.98	0.82	0.40	– –
Green	12V	**595-378**	1.07	0.69	0.62	0.40	– –
Hyper Red	5V	**595-380**	1.68	1.42	1.04	0.65	– –
Hyper Red	12V	**595-391**	1.68	1.42	1.04	0.65	– –

3mm/T1 Standard

OSRAM



Lead pitch=2.54
Leads=0.5 sq x 26.5
Cathode identified by shorter lead

Colour	View Angle	Lum Intensity (mcd) typ.	I_F (mA) (max)	Mftrs. List No.	Order Code
Tinted Diffused Lens					
HE Red	70°	28 @ 10mA	40	LS3360	881-752
Yellow	70°	28 @ 10mA	40	LY3360-KN	121-9689
Green	70°	28 @ 10mA	40	LG3360KN.	881-776

206464

Colour	Order Code	Price Each 5+	25+	100+	250+	+
HE Red	**881-752**	0.43	0.38	0.36	0.30	– –
Yellow	**121-9689●**	0.36	0.29	0.29	0.26	– –
Green	**881-776▲**	0.51	0.44	0.41	0.34	– –

3mm/T1, Standard
Tinted Diffused Lens

VISHAY

VCH: L=5.08, Dia=3.05
Lead pitch=1.4, Leads=25 x 0.36sq
Cathode identified by flat on body and longer lead

VISH: L=4.5, Dia=3.0
Lead pitch=2.54, Leads=23 x 0.5sq
Cathode identified by shorter lead

Colour	Wavelength Peak (nm)	Viewing Angle	Typ Lum. Intensity (mcd)	I_F (mA) (max)	PIV (max)	Mftr.	Mftrs. List No.	Order Code
Red	660	60°	3 @ 20mA	50	5	VISH	TLUR4400	104-5372
Red	660	90°	1 @ 20mA	50	5	SLI	CMD5075C	113-9552
Red	660	60°	3 @ 20mA	50	5	VISH	TLUR4400	104-5372
Red	650	32°	200 @ 20mA	50	6	VISH	TLDR4900	104-5472
Red	635	90°	5 @ 20mA	35	5	SLI	CMD5774C	113-9553
HE Red	635	32°	13 @ 10mA	30	6	VISH	TLHR4900	104-5468
HE Red	635	44°	15 @ 10mA	30	6	VISH	TLHR4205	104-5464
HE Red	635	44°	8 @ 10mA	30	6	VISH	TLHR4200	104-5463
HE Red	635	50°	2 @ 2mA	7	6	VISH	TLLR4401	104-5504
HE Red	635	60°	10 @ 10mA	30	6	VISH	TLHR4405	104-5457
HE Red	635	60°	5 @ 10mA	30	6	VISH	TLHR4401	104-5456
HE Red	635	60°	4 @	12	6	VISH	TLRH4420CU	104-5511
HE Red	635	120°	6 @ 10mA	30	6	VISH	TLHR4605	104-5458
Orange	605	60°	4 @ 10mA	30	6	VISH	TLHO4400	104-5462
Yellow	585	44°	20 @ 10mA	30	6	VISH	TLHY4205	104-5467
Yellow	585	50°	2 @ 2mA	7	6	VISH	TLLY4401	104-5506
Yellow	585	60°	10 @ 10mA	30	6	VISH	TLHY4405	104-5461
Yellow	585	60°	4 @	15	6	VISH	TLRY4450CU	104-5514
Yellow	585	60°	4 @	12	6	VISH	TLRY4420CU	104-5515
Yellow	585	90°	4 @ 20mA	35	5	SLI	CMD5374C	113-9556
Green	565	50°	2 @ 2mA	7	6	VISH	TLLG4401	104-5505
Green	565	60°	12 @ 10mA	30	6	VISH	TLHG4405	104-5459
Green	565	60°	4 @	12	6	VISH	TLRG4420CU	104-5513
Green	565	60°	4 @	15	6	VISH	TLRG4450CU	104-5512
Green	565	90°	3 @ 20mA	35	5	SLI	CMD5474C	113-9544
Green	565	120°	5 @ 10mA	30	6	VISH	TLHG4605	104-5460
HE Green	565	44°	20 @ 10mA	30	6	VISH	TLHG4205	104-5466

221739

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

C = CYAN M = Magenta Y = Yellow B = Black/SING

Colour	Order Code	Price Each 5+	25+	100+
Red	**104-5372●**	0.23	0.20	0.17
Red	**104-5472●**	0.52	0.46	0.38
Red	**113-9552●**	0.90	0.52	0.35
Red	**113-9553●**	1.24	0.88	0.58
HE Red	**104-5456●**	0.26	0.23	0.19
HE Red	**104-5457●**	0.26	0.23	0.19
HE Red	**104-5458●**	0.26	0.23	0.19
HE Red	**104-5463●**	0.26	0.23	0.19
HE Red	**104-5464●**	0.26	0.23	0.19
HE Red	**104-5468●**	0.26	0.23	0.19
HE Red	**104-5504●**	0.31	0.28	0.23
HE Red	**104-5511●**	0.68	0.61	0.51
Orange	**104-5462●**	0.35	0.31	0.26
Yellow	**104-5461●**	0.29	0.26	0.22
Yellow	**104-5467●**	0.29	0.26	0.22
Yellow	**104-5506●**	0.31	0.28	0.23
Yellow	**104-5514●**	0.78	0.70	0.58
Yellow	**104-5515●**	0.68	0.61	0.51
Yellow	**113-9556●**	1.24	0.76	0.58
Green	**113-9544●**	1.24	0.88	0.58
Green	**104-5459●**	0.31	0.27	0.23
Green	**104-5460●**	0.31	0.27	0.23
Green	**104-5505●**	0.31	0.28	0.23
Green	**104-5512●**	0.68	0.61	0.51
Green	**104-5513●**	0.68	0.61	0.51
HE Green	**104-5466●**	0.31	0.27	0.23

3mm/T1, Standard

LED TECHNOLOGY

L=5.08, Dia=3.1
Lead pitch=2.29, Leads=12.7 x 0.5sq
Recommended lead holes=0.8 dia

Cathode identified by 'flat' on body, except bright red — anode.

Colour	View Angle	Typ Lum. Intensity (mcd)	I_F (mA) (max.)	PIV (max.)	Peak Wavelength	Mftrs. List No.	Order Code
Tinted Diffused Lens							
Red	74°	2.6 @ 20mA	25	5	700nm	L05R3000F1.	472-281
Green	100°	6.3 @ 20mA	25	5	567nm	L02R3000F1.	178-304
Yellow	100°	6 @ 20mA	25	5	585nm	L03R3000F1.	178-305
HE Red	100°	6.5 @ 20mA	25	5	635nm	L4RR3000F1.	178-306
Orange	100°	6.5 @ 20mA	25	5	610nm	L08R3000F1.	178-307
Ultra red	100°	22 @ 20mA	25	4	660nm	L07R3000F1.	178-308

221668

Colour	Order Code	Price Each 5+	100+	1K+	5K+	+
Red	**472-281**	0.56	0.37	0.28	0.17	– –
Green	**178-304**	0.69	0.54	0.40	0.23	– –
Yellow	**178-305**	0.85	0.72	0.60	0.26	– –
HE Red	**178-306**	0.66	0.48	0.36	0.20	– –
Orange	**178-307**	0.71	0.56	0.46	0.23	– –
Ultra red	**178-308**	1.95	1.71	– –	– –	– –

3mm/T1 Standard and High Intensity

VISHAY

L=4.5, Dia=2.9, Lead pitch=2.54, Leads=23x0.5sq
Cathode identified by shorter lead

Colour	View Angle	Lum Intensity (mcd) @ If=10mA min	typ.	If (mA) max	PIV max	Mftrs. List No.	Order Code
Tinted Diffused Lens							
HE Red	60°	2.5	5	30	6	TLHR4401	104-5456
HE Red	60°	6.3	10	30	6	TLHR4405	104-5457
HE Red	120°	2.5	6	30	6	TLHR4605	104-5458
Green	60°	6.3	12	30	6	TLHG4405	104-5459
Green	120°	2.5	5	30	6	TLHG4605	104-5460
Yellow	60°	6.3	10	30	6	TLHY4405	104-5461
Orange	60°	1.6	4	30	6	TLHO4400	104-5462
Tinted Clear Lens							
HE Red	44°	4	8	30	6	TLHR4200	104-5463
HE Red	44°	10	15	30	6	TLHR4205	104-5464
HE Green	44°	16	20	30	6	TLHG4205	104-5466
Yellow	44°	10	20	30	6	TLHY4205	104-5467
Untinted Clear Lens							
HE Red	32°	6.3	13	30	6	TLHR4900	104-5468
Green	32°	16	37	30	6	TLHG4900	104-5469
Yellow	32°	10	26	30	6	TLHY4900	104-5470
Tinted Diffused Lens-High Intensity							
Red	60°	25*	45*	50	6	TLDR4400	104-5471
Untinted Clear Lens-High Intensity							
Red	32°	63*	200*	50	6	TLDR4900	104-5472

*I_F = 20mA

206432

Colour	Order Code	Price Each 5+	25+	100+	250+	+
HE Red	**104-5456●**	0.26	0.23	0.19	0.16	– –
HE Red	**104-5457●**	0.26	0.23	0.19	0.16	– –
HE Red	**104-5458●**	0.26	0.23	0.19	0.16	– –
Green	**104-5459●**	0.31	0.27	0.23	0.18	– –
Green	**104-5460●**	0.31	0.27	0.23	0.18	– –
Yellow	**104-5461●**	0.29	0.26	0.22	0.17	– –
Orange	**104-5462●**	0.35	0.31	0.26	0.21	– –
HE Red	**104-5463●**	0.26	0.23	0.19	0.16	– –
HE Red	**104-5464●**	0.26	0.23	0.19	0.16	– –
HE Green	**104-5466●**	0.31	0.27	0.23	0.18	– –
Yellow	**104-5467●**	0.29	0.26	0.22	0.17	– –
HE Red	**104-5468●**	0.26	0.23	0.19	0.16	– –
Green	**104-5469●**	0.29	0.26	0.22	0.18	– –
Yellow	**104-5470●**	0.29	0.26	0.22	0.17	– –
Red	**104-5471●**	0.51	0.45	0.38	0.31	– –
Red	**104-5472●**	0.52	0.46	0.38	0.31	– –

3mm/T1, High & Ultrahigh Bright

TOSHIBA

Lead pitch=2.54,
Leads=24.0 x 0.45 sq.
Cathode identified by flat on body and shorter lead

1 2 3

Colour	View Angle	Lum. Intensity (mcd) @ I_F=20mA min.	max.	I_F (mA) (max)	PIV max.	Outline	Mftrs. List No.	Order Code
High Bright - Untinted Clear Lens - InGaAlp								
Red	70°	47.6	230	30	4	1	TLRE262A	623-787
Orange	120°	15.3	73.6	30	4	3	TLOE260 ALM	623-805
Yellow	120°	15.3	73.6	30	4	3	TLYE260A(KL)	623-830
Ultra Highbright - Untinted Clear Lens - InGaAlp								
Red	70°	85	414	50	4	1	TLRH262	623-866
Yellow	70°	153	736	50	4	1	TLYH262(PQ)	623-880

206417

Colour	Order Code	Price Each 5+	50+	100+	1K+	+
High Bright						
Red	**623-787**	1.93	1.48	1.04	0.46	– –
Orange	**623-805**	1.56	1.20	0.94	0.60	– –
Yellow	**623-830**	1.99	1.63	1.43	0.47	– –
Ultrahigh Bright		**1+**	**50+**	**100+**	**1K+**	**+**
Red	**623-866**	3.51	2.61	2.02	0.73	– –
Yellow	**623-880**	1.86	1.58	1.32	0.79	– –

3mm/T1, Standard and Ultra Bright

Kingbright

L=4.6, Dia=2.9
Lead pitch=2.54, Leads=27 x 0.5sq
Cathode identified by shorter lead

Colour	View Angle	Lum. Intensity (mcd) @ I_F = 20mA min.	typ.	I_F (mA) (max)	PIV max.	Order Code
Tinted Diffused Lens						
Red	60°	8	50	30	5	335-0861
Orange	60°	8	50	30	5	329-9478
Green	60°	5	32	25	5	329-9480
Untinted Clear Lens						
Green	50°	100	300	25	5	637-129
Red	50°	360	500	30	5	637-130
Red	50°	1200	1400	30	5	637-142

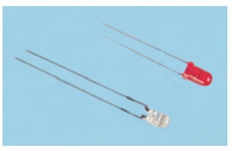
RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

206334

Colour	Order Code	5+	100+	1K+	2K5+	+
		Price Each				
Red	335-0861▲	0.24	0.21	0.17	0.09	– –
Orange	329-9478▲	0.22	0.19	0.16	0.09	– –
Green	329-9480▲	0.24	0.21	0.17	0.09	– –
		5+	100+	1K+	5K+	
Green	637-129▲	0.34	0.29	0.25	0.13	
Red	637-130▲	0.39	0.23	0.18	0.13	
Red	637-142▲	0.47	0.43	0.39	0.28	

3mm/T1, Ultra Bright/High Intensity

AVAGO TECHNOLOGIES



HLMP-Nxxx Series:
L=5.35, Dia=3.10
Lead pitch=2.54,
Leads=23 x 0.65 x 0.40

HLMP Series:
L=4.7, Dia=3.18
Lead pitch=2.54,
Leads=24 x 0.45sq

ESBR3431: L=5.5, Dia=3.0
Lead pitch=2.5, Leads=14 x 0.45sq
Cathode identified by shorter lead.

Colour	View Angle	Typ. Lum Intensity (mcd)	I_F (mA) (max)	PIV (max)	Mftr.	Mftrs. List No.	Order Code
Untinted Clear Lens							
Red	45°	65 @ 20mA	20	5	AV	HLMP-K105	100-3200
Red	45°	30 @	90	5	AGI	HLMP-1321	857-6386
HE Red	45°	45 @ 20mA	25	5	AV	HLMP-1340	100-3201
Yellow	45°	45 @ 20mA	20	5	AV	HLMP-1440	100-3202
Orange	60°	5.5 @ 10mA	30	5	AGI	HLMP-K401..	885-952
Orange	60°	5.5 @ 10mA	30	5	AGI	HLMP-K401	100-3389
Green	45°	45 @ 20mA	25	5	AV	HLMP-1540	100-3204
Tinted Diffused Lens							
Red	60°	45 @ 20mA	20	5	AV	HLMP-K101	100-3205
Red	55°	2.3 @ 10 mA	90	5	AGI	HLMP-1350..	857-6394
Yellow	60°	3.6 @ 10 mA	60	5	AGI	HLMP-1401-D00A1	857-6408
Green	60°	4.2 @ 10 mA	90	5	AGI	HLMP-1503-D0000	857-6416
Green	55°	2.3 @ 10 mA	90	5	AGI	HLMP-1550	857-6424
Narrow Angle Tinted Clear Lens							
Green	45°	12 @ 20mA	25		AV	HLMP-1521◆	100-3375
Untinted Clear Lens - SunPower Series AlInGaP							
Red	60°	180	30	626nm	AV	HLMP-NG07	100-3134
Amber	60°	220	30	590nm	AV	HLMP-NL06	100-3135

◆ High Intensity

221740

Colour	Order Code	5+	10+	100+	500+	+
		Price Each				
Red	100-3200●	0.68	0.43	0.36		
Red	857-6386	0.26	0.23	0.21		
HE Red	100-3201●	0.53	0.33	0.28		
Yellow	100-3202●	0.53	0.33	0.28		
Green	100-3204●	0.53	0.33	0.28		
Red	100-3205●	0.64	0.41	0.35		
Red	857-6394	0.65	0.59	0.53		
Yellow	857-6408	0.68	0.62	0.55		
Green	857-6416	0.29	0.27	0.24		
Green	857-6424	0.52	0.47	0.42		
Green	595-500▲‡	0.38	0.25	0.20		
Green	100-3375●	0.48	0.30	0.24		
		5+	10+	100+	500+	+
Red	100-3134●	0.61	0.38	0.32	0.28	– –
Amber	100-3135●	0.61	0.38	0.32	0.28	– –
Orange	885-952▲‡	0.35	0.22	0.18	0.18	– –
Orange	100-3389●	0.40	0.25	0.20	0.18	– –

3mm/T1 Hyper Bright

OSRAM

L=4.6, Dia=2.9, Lead pitch=2.54,
Leads=0.5sq x 26.5
Cathode identified by shorter lead

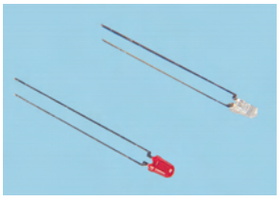
Colour	View Angle	Lum Intensity (mcd) typ.	I_F (mA) (max)	Mftrs. List No.	Order Code
Untinted Clear Lens					
Super Red	40°	280 @ 20mA	30	LS3336RU	881-788
Yellow	40°	450 @ 20mA	20	LY3336SV.	881-790
Tinted Diffused Lens					
Super Red	70°	180 @ 20mA	30	LS3366PS.	881-806
Yellow	70°	180 @ 20mA	20	LY3366QT.	881-818

206466

Colour	Order Code	5+	25+	100+	250+	+
		Price Each				
Super Red	121-2754●	0.79	0.67	0.63	0.52	– –
Super Red	121-2756●	0.78	0.72	0.62	0.49	– –
Yellow	121-2755●	0.86	0.73	0.69	0.57	– –
Yellow	121-2757●	0.86	0.73	0.69	0.57	– –

3mm/T1, Low Current

AVAGO TECHNOLOGIES



L=4.7, Dia=3.18
Lead pitch=2.54, Leads=24 x 0.45sq
Cathode identified by shorter lead.

Colour	View Angle	Typ Lum Intensity (mcd)	I_F (mA) (max)	PIV (max)	Mftrs. List No.	Order Code
Tinted Diffused Lens						
Red	60°	2 @ 1mA	20	5	HLMP-K150	100-3206
Red	50°	1.8 @ 2mA	7	5	HLMP-1700	100-3207
Yellow	50°	1.6 @ 2mA	7	5	HLMP-1719	100-3208
Green	50°	1.6 @ 2mA	7	5	HLMP-1790	100-3209
Untinted Clear Lens						
Red	45nm	3 @ 1mA	20	5	HLMP-K155	100-3210

221741

Colour	Order Code	5+	10+	100+	500+
		Price Each			
Red	100-3206●	0.64	0.41	0.35	0.30
Red	100-3207●	0.43	0.27	0.24	0.20
Yellow	100-3208●	0.43	0.27	0.24	0.20
Green	100-3209●	0.43	0.27	0.24	0.20
Red	100-3210●	0.76	0.50	0.43	0.37

3mm/T1, Low Current

Kingbright

Colour	View Angle	Lum Intensity (mcd) @ I_F=2mA min.	typ.	I_F (mA) (max)	PIV max.	Order Code
Tinted Diffused Lens						
HE Red	60°	0.8	5	2	5	637-040
Green	60°	0.8	3.2	2	5	637-051
Yellow	60°	0.8	3.2	2	5	637-063
Ultra red	60°	0.8	20	2	5	637-075

206336

Colour	Order Code	5+	100+	1K+	5K+
		Price Each			
HE Red	637-040▲	0.30	0.21	0.13	0.09
Green	637-051▲	0.30	0.21	0.13	0.09
Yellow	637-063▲	0.29	0.20	0.13	0.09
Ultra red	637-075▲	0.43	0.34	0.17	0.12

Bicolour, 3mm/T1

Kingbright

L=4.6= Dia.=2.8, Lead pitch=2.54,
Leads=27
Shorter lead indicates Red cathode
(Green cathode on Green/Yellow)

Colour	View Angle	min	Typ Lum Intensity @ 20mA (mcd)	I_F (mA) (max)	PIV	Order Code
Untinted Diffused Lens						
HE Red and Green	60°	8/8	40/40	30/30	5	637-180
HE Red and Yellow	60°	8/5	40/20	30/30	5	637-191
Green and Yellow	60°	8/5	40/20	30/30	5	637-208

206332

Colour	Order Code	1+	50+	100+	1K+	+
		Price Each				
HE Red and Green	637-180▲	1.23	1.11	0.66	0.21	– –
HE Red and Yellow	637-191▲	0.91	0.88	0.51	0.29	– –
Green and Yellow	637-208▲	1.23	1.11	0.66	0.21	– –

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

Bicolour, 3mm/T1

LED TECHNOLOGY

L=5.1, Dia=3.1L
Lead pitch=2.54, Leads=22x0.5sq.

Green cathode identified by flat on body and shorter lead.

Bicolour LEDs have two diodes connected in inverse parallel. AC operation gives a third intermediate colour, e.g. red+green gives orange.

Colour	View Angle	Typ Lum Intensity @ 20mA (mcd)	I_F (mA) (max)	Mftrs. List No.	Order Code
Untinted Diffused Lens					
HE Red and Green	100°	4.5/4.2 @ 20mA	25	L24R3000K2P2.	178-315
Green and Yellow	100°	4/4.2 @ 20mA	25	L23R3000K2P2.	178-317

206708

Colour	Order Code	Price Each 1+	50+	100+	1K+
HE Red and Green	**178-315**	3.69	2.43	2.10	1.26
Green and Yellow	**178-317**	3.69	2.43	2.10	1.26

Tricolour, 3mm/T1

Kingbright

Two colour LEDs connected common cathode. Both diodes connected gives third intermediate colour.

L=4.6, Dia=2.8
Lead spacing=2.54 (in-line)
Lead length A1=20.4 K=24.5 A2=22.4

Colours	View Angle	Lum Intensity min	(mcd) @ 20mA typ	I_F (mA) (max)	PIV	Order Code
Untinted Diffused Lens						
HE Red and Green	60°	20/20	50/50	30/25	5	114-2520
HE Red and Yellow	60°	20/20	50/50	30/30	5	114-2521
Green and Yellow	60°	20/20	50/50	25/30	5	114-2522
Untinted Clear Lens						
Ultra Red and Green	60°	100/50	700/100	25/25	5	114-2518

221690

Colour	Order Code	Price Each 1+	50+	100+	1K+	+
HE Red and Green	**114-2520**●	1.26	0.93	0.72	0.22	– –
HE Red and Yellow	**114-2521**●	1.47	1.17	1.08	0.48	– –
Green and Yellow	**114-2522**●	1.47	1.17	1.08	0.48	– –
Ultra Red and Green	**114-2518**●	1.11	0.94	0.75	0.56	– –

3mm & 5mm White, Blue & Green LEDs

White, 3mm/T1 and 5mm/T1¾

MARL

3mm - L=5.4 (body), Dia=3.1, Lead pitch=2.54, Leads=16.5 x 0.5sq
5mm - L=7.6 (body), Dia=5.0, Lead pitch=2.54, Leads=16.5 x 0.5sq
Cathode identified by flat on body and shorter lead

Colour	View Angle	Typ Lum Intensity @ 20mA (mcd)	I_F (mA) (max)	Vf (typ)	PIV Max	Order Code
Untinted Diffused Lens						
White 5mm	70°	420	30	3.6	5	105-7069
Untinted Clear Lens						
White 3mm	25°	2800	30	3.6	5	105-7134
White 3mm	60°	1270	30	3.6	5	105-7123
White 5mm	20°	5600	30	3.6	5	105-7135
White 5mm	50°	1560	30	3.6	5	105-7132

206476

	Order Code	Price Each 1+	10+	25+	50+	+
3mm T1	**105-7123**●	7.32	6.84	6.51	6.25	– –
5mm T1 3/4	**105-7132**●	6.80	6.44	6.15	5.92	– –
5mm T1 3/4	**105-7069**●	7.32	6.84	6.51	6.25	– –
3mm T1	**105-7134**●	7.32	6.84	6.48	6.25	– –
3mm T1	**105-7123**●	7.32	6.84	6.51	6.25	– –
5mm T1 3/4	**105-7135**●	7.32	6.84	6.51	6.25	– –
5mm T1 3/4	**105-7132**●	6.80	6.44	6.15	5.92	– –

White, 3mm/T1 & 5mm/T1¾

Kingbright

3mm, L=4.6, Dia=2.9, Leads=27 (min.) x 0.5sq
5mm, L=8.6, Dia=5.0, Leads=27 (min.) x 0.5sq.
Cathode identified by short lead and flat on body.
All LEDs have stand/offs.

Colour	View Angle	Lum Intensity @ I_F = 20mA min	typ.	I_F (mA) (max)	V_F typ.	max.	PIV (max.)	Order Code
3mm - Untinted Clear Lens								
White	35°	200	600	30	3.8	4.5	5	352-6847
White	40°	50	300	30	3.8	4.5	5	352-6859
5mm - Untinted Clear Lens								
White	20°	500	850	30	3.5	4.0	5	352-6860
White	30°	80	200	30	3.8	4.5	5	352-6872
5mm - Tinted Diffused Lens								
White	30°	300	450	30	3.5	4.0	5	352-6884

227200

Colour	Order Code	Price Each 1+	25+	100+	250+	+
3mm/T1 - Untinted Clear Lens						
White	**352-6847**	2.05	1.82	1.66	1.40	– –
White	**352-6859**	1.56	1.33	1.24	1.04	– –
5mm/T1¾ - Untinted Clear Lens						
White	**352-6860**▲	2.25	1.99	1.79	1.53	– –
White	**352-6872**▲	1.85	1.53	1.44	1.08	– –
5mm/T1¾ - Tinted Diffused Lens						
White	**352-6884**▲	3.84	3.27	2.85	2.13	– –

Very High Intensity LED - White

TOYODA GOSEI CO.,LTD

3, 4 and 5mm

A range of Very High Intensity white LED's suitable for a wide range of applications including illumination, backlighting and indication. Available in 3 sizes and a selection of viewing angles and luminous intensities.

● High performance, low cost ● ESD Protected

DC Forward Current	30mA	Power Dissipation	120mW
Pulsed Forward Current	100mA	Operating Temperature	-30 to 85°C
Reverse Current	100mA	Storage Temperature	-40 to 100°C

Size	View Angle	Luminous Intensity@20mA typ.	Mftrs. List No.	Code Code
5mm	15°	5000	E1L51-AW0C2-01	105-7113
5mm	30°	2100	E1L53-AW0C2-01	105-7115
5mm	50°	1600	E1L55-AW0C2-01	105-7116
3mm	35°	1300	E1L33-AW0A2-03	105-7117
3mm	45°	1000	E1L35-AW0A2-03	105-7118
4mm	90°	620	E1L49-AW0C2-01.	505-9033
4mm	90°	620	E1L49-AW0C2-01	973-8150

339964.343566

Order Code	Price Each 1+	10+	25+	100+	+
105-7113●	4.52	3.97	3.68	3.58	– –
105-7115●	4.20	3.71	3.45	3.39	– –
105-7116●	4.52	3.97	3.68	3.58	– –
105-7117●	4.52	3.97	3.68	3.58	– –
105-7118●	4.52	3.97	3.68	3.58	– –
505-9033‡	4.52	3.97	3.68	3.58	– –
973-8150●	4.52	3.97	3.68	3.58	– –

Blue, 3mm/T1 and 5mm/T1¾

forge EUROPA

3mm/T1 - Length = 5.3, Dia = 3.0, Lead pitch = 2.54, Lead length = 16, Lead size = 0.5sq. Cathode identified by flat on body and shorter lead

5mm - Length = 8.6, Dia = 5.0, Lead pitch = 2.54, Lead length = 25.4, Lead size = 0.5sq. Cathode identified by flat on body and shorter lead

This range of blue LED lamps are also suitable for use with, and complement, the two ranges of optically matched seven segment LED displays, **SEE PAGE 926** and dot matrix LED displays **SEE PAGE 0000.**

● Compliant
◄ Non-compliant
‡ Limited stock - RoHS replacement available

RoHS

Colour/ Peak Wave-Length	Viewing Angle	Typ. Lum. Intensity @ 20mA (mcd) (465nm = 10mA)	V_F Typ. @ I_F	I_f max. (mA)	PIV	Mftrs. List No.	Order Code
3mm/T1, Blue Diffused Lens							
Blue, nm	60°	180	3.5	25	5	FNL-U300B07CDSL.	366-4442
Blue, nm	60°	34	3.3	15	5	FNL-U300B05CDSL.	366-4454
Blue, nm	60°	70	3.5	25	5	FNL-U300B06CDSL.	366-4466
Blue, nm	60°	24	3.7	25	5	FNL-U300B01CDSL.	366-4478
3mm/T1, Water Clear Lens							
Blue, nm	35°	910	3.5	25	5	FNL-U300B07WCSL.	366-4480
Blue, nm	35°	170	3.3	15	5	FNL-U300B05WCSL.	366-4491
Blue, nm	35°	360	3.5	25	5	FNL-U300B06WCSL.	366-4508
Blue, nm	35°	120	3.7	25	5	FNL-U300B01WCSL.	366-4510
5mm/T1¾, Blue Diffused Lens							
Blue, nm	60°	350	3.5	25	5	FNL-U500B07CDSL.	366-4521
Blue, nm	60°	45	3.3	15	5	FNL-U500B05CDSL.	366-4533
Blue, nm	60°	150	3.5	25	5	FNL-U500B06CDSL.	366-4545
Blue, nm	60°	31	3.7	25	5	FNL-U500B01CDSL.	366-4557
5mm/T1¾, Water Clear Lens							
Blue, nm	25°	2280	3.5	25	5	FNL-U501B07WCSL.	366-4569
Blue, nm	25°	340	3.3	15	5	FNL-U501B05WCSL.	366-4570
Blue, nm	25°	830	3.5	25	5	FNL-U501B06WCSL.	366-4582
Blue, nm	25°	240	3.7	25	5	FNL-U501B01WCSL.	366-4594
5mm/T1¾, Water Clear Lens							
Blue, nm	15°	3490	3.5	25	5	FNL-U500B07WCSL..	366-4600
Blue, nm	15°	450	3.3	15	5	FNL-U500B05WCSL.	366-4612
Blue, nm	15°	1470	3.5	25	5	FNL-U500B06WCSL.	366-4624
Blue, nm	15°	315	3.7	25	5	FNL-U500B01WCSL.	366-4636

229384

Colour, Peak Wavelength	Order Code	Price Each 1+	25+	100+	250+	+
3mm/T1 - 60° Viewing Angle						
Blue, nm	**366-4442**	2.28	1.99	1.79	1.46	– –
Blue, nm	**366-4454**	1.73	1.50	1.37	1.14	– –
Blue, nm	**366-4466**	2.28	1.99	1.79	1.46	– –
Blue, nm	**366-4478**	1.53	1.33	1.20	0.98	– –
3mm/T1 - 35° Viewing Angle						
Blue, nm	**366-4480**	2.28	1.99	1.79	1.46	– –
Blue, nm	**366-4491**	1.73	1.50	1.37	1.14	– –
Blue, nm	**366-4510**	1.53	1.33	1.20	0.98	– –
5mm/T1¾ - 60° Viewing Angle						
Blue, nm	**366-4521**	2.28	1.99	1.79	1.46	– –
Blue, nm	**366-4533**	1.73	1.50	1.37	1.14	– –
Blue, nm	**366-4545**	2.28	1.99	1.79	1.64	– –
Blue, nm	**366-4557**	1.53	1.33	1.20	0.98	– –
5mm/T1¾ - 25° Viewing Angle						
Blue, nm	**366-4569**	2.28	1.99	1.79	1.69	– –
Blue, nm	**366-4570**	1.73	1.50	1.37	1.14	– –
Blue, nm	**366-4582**	2.28	1.99	1.79	1.64	– –
Blue, nm	**366-4594**	1.53	1.33	1.20	0.98	– –
5mm/T1¾ - 15° Viewing Angle						
Blue, nm	**366-4600**	2.28	1.99	1.79	1.46	– –
Blue, nm	**366-4612**	1.73	1.50	1.37	1.14	– –
Blue, nm	**366-4624**	2.28	1.99	1.79	1.46	– –
Blue, nm	**366-4636**	1.53	1.33	1.20	0.98	– –

Blue, 3mm/T1 and 5mm/T1¾

Kingbright

Lead pitch=2.54, Leads=25.5 x 0.5sq.
Cathode identified by flat on body and shorter lead

Colour	View Angle	Typ. Lum. Intensity (mcd) min	typ.	I_F (mA) (max.)	V_F (V) (typ.)	PIV (max.)	Peak Wavelength	Order Code
3mm/T1 Tinted diffused Lens								
Blue	60°	12.5	40	30	4.5	5	430nm	233-481
3mm/T1 Untinted Clear Lens								
Blue	20°	400	550	30	3.5	5.0	468nm	352-6896
Blue	20°	20	90	30	4.5	5	430nm	233-493
5mm/T1¾ Untinted Clear Lens								
Blue	16°	500	1000	30	3.5	5	468nm	352-6902
Blue	16°	40	150	30	4.5	5	430nm	233-511
Blue	16°	300	450	30	3.5	5.0	468nm	352-6914

206268

Type	Order Code	Price Each 1+	25+	100+	250+	+
3mm Diffused	**233-481**	1.82	1.73	1.33	1.01	– –
3mm Clear	**352-6896▲**	1.89	1.66	1.50	1.27	– –
3mm Clear	**233-493**	1.82	1.73	1.33	1.01	– –
5mm Clear	**352-6902▲**	1.89	1.66	1.50	1.27	– –
5mm Clear	**233-511▲**	1.82	1.73	1.33	1.01	– –
5mm Tinted Clear	**352-6914▲**	1.89	1.66	1.50	1.27	– –

Ultra-High Bright Blue and Green 3mm/T1¾ and 5mm/T1¾

MARL

5mm/T1¾
Dia.=5.0
L=8.6
L=7.6 (884-698)

3mm/T1
Dia.=3.1
L=4.6 (942-443)
L=5.0 (942-480)

Lead pitch=2.54
Leads=25.5 x 0.5sq. (0.45sq 1000047)
Cathode identified by shorter lead, the green and blue LEDs have stand-offs

Colour	View Angle	Typ Lum Intensity @ 20mA (mcd)	I_F (mA) (max)	V_F(V) (typ)	PIV (max)	Peak Wavelength	Order Code
3mm/T1 Untinted Clear Lens							
Red	50°	1300	30	1.85	5V	660nm	942-443
Yellow	10°	1530 - 7360	50	2.1	4V	590nm	942-546
Green	15°	6800	30	3.5	5V	525nm	942-467
Blue	15°	2000	30	3.6	5V	470nm	942-479
Blue	45°	600	30	3.6	5V	470nm	942-480
Red	50°	1300	30		5V	660nm	105-7124
Yellow	10°	4445	50		4V	590nm	105-7131
Green	15°	6800	30		5V	525nm	105-7126
Blue	15°	2000	30	3.6	5V	470nm	105-7127
Blue	45°	600	30	3.6	5V	470nm	105-7128
5mm/T1¾Untinted Clear Lens							
Red	30°	2800	30	1.85	5V	660nm	942-492
Yellow	8°	2720-12880	50	2.1	4V	590nm	942-455
Green	15°	3000	30	3.5	5V	525nm	884-698
Blue	15°	3000	30	3.6	5V	470nm	884-923
Blue	45°	700	30	3.6	5V	470nm	884-947
Red	30°	2250	30		5V	660nm	105-7129
Yellow	8°	4560	50		4V	590nm	105-7125
Green	15°	10000	30	3.5	5V	525nm	105-7119
Blue	15°	3000	30	3.6	5V	470nm	105-7120
Blue	45°	700	30	3.6	5V	470nm	105-7122

CAUTION - THESE DEVICES ARE STATIC SENSITIVE

206363

Colour	Order Code	Price Each 1+	10+	25+	50+	+
3mm/T1						
Red	**942-443‡**	1.76	1.54	1.32	0.85	– –
Yellow	**942-546‡**	3.81	3.40	3.06	2.74	– –
Green	**942-467‡**	4.33	4.33	– –	– –	– –
Blue	**942-479‡**	6.58	6.12	5.92	5.73	– –
Blue	**942-480‡**	6.58	6.12	5.92	5.73	– –
Red	**105-7124●**	1.76	1.54	1.32	0.85	– –
Yellow	**105-7131●**	3.81	3.40	3.06	2.74	– –
Green	**105-7126●**	4.33	4.33	– –	– –	– –
Blue	**105-7127●**	6.58	6.12	5.92	5.73	– –
Blue	**105-7128●**	6.58	6.12	5.92	5.73	– –
5mm/T1¾						
Red	**942-492‡**	1.76	1.54	1.07	0.72	– –
Yellow	**942-455‡**	3.81	3.40	3.06	2.17	– –
Green	**884-698‡**	6.58	6.12	5.92	5.73	– –
Blue	**884-923‡**	6.58	6.12	5.92	5.73	– –
Blue	**884-947‡**	6.58	6.12	5.92	5.73	– –
Red	**105-7129●**	1.76	1.54	1.07	0.72	– –
Yellow	**105-7125●**	3.81	3.40	3.06	2.17	– –
Green	**105-7119●**	6.58	6.12	5.92	5.73	– –
Blue	**105-7120●**	6.58	6.12	5.92	5.73	– –
Blue	**105-7122●**	6.58	6.12	5.92	5.73	– –

Blue, 3mm/T1 & 5mm/T¾

AVAGO TECHNOLOGIES

5mm - L=8.71, Dia.=5.0, Leads=22.89 x 0.5sq.
Lead Pitch=2.54

3mm - L=4.7, Dia.=3.18, Leads=23 x 0.45sq.
Lead Pitch=2.54

Colour	View Angle	Typ Lum Intensity @ 20mA (mcd) min.	Typ.	Peak Wave length	Forward Voltage Typ.	PIV	Mftrs. List No.	Order Code
3mm/T1 Untinted Clear Lens								
Blue	40°	25	45	426nm	4 - 5	5	HLMP-KB45-A0000..	325-4616
Blue	40°	25	45	426nm	4 - 5	5	HLMP-KB45-A0000	100-3308
5mm/T1 Untinted Clear Lens								
Blue	25°	40	100	426nm	4 - 5	5	HLMP-DB25-B0000..	325-4628
Blue	25°	40	100	426nm	4 - 5	5	HLMP-DB25-B0000	100-3309

206676

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
3mm/T1 Untinted Clear Lens							
Blue	HLMP-KB45-A0000..	**325-4616▲‡**	1.96	1.17	0.83	0.70	– –
Blue	HLMP-KB45-A0000	**100-3308●**	1.75	1.00	0.71	0.54	– –
5mm/T1¾ Untinted Clear Lens							
Blue	HLMP-DB25-B0000..	**325-4628▲‡**	1.96	1.17	0.83	0.70	– –
Blue	HLMP-DB25-B0000	**100-3309●**	1.75	1.00	0.71	0.54	– –

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

3mm Blue, Green, Blue-Green

TOYODA GOSEI CO.,LTD

E1L31

E1L33/35

This series consists of blue, green and bluish-green LEDs with 20 and 40 degree viewing angles, featuring high performance with low cost. The smaller package lends itself to use in high quality home appliances, measurement and control equipment and communication applications, where space can be at a premium but visual impact cannot be compromised

	Length (mm)	Diameter (mm)	Lead length (mm)
E1L31 Series	8.65	3	25.4
E1L33 Series	8.65	3.1	24.5
E1L35 Series	8.65	3	24.5

Mftrs. List No.	Colour	Dominant Wavelength Min (nm)	Max (nm)	Viewing Angle	Luminous Intensity Min (mcd)	Typ (mcd)	Vf (V) Typ.	If (mA) Max.	Order Code
E1L31-3B0A2	Blue	465	475	20°	500	1300	3.4	30	423-7821
E1L31-AG0A2.	Green	520	540	20°	1500	4200	3.4	30	423-7833
E1L31-AC1A2	Blue/Green	495	510	20°	850	1900	3.3	30	423-7845
E1L33-3B0A2-02.	Blue	465	475	40°	235	470	3.4	30	423-7857
E1L33-3G0A2-02.	Green	520	530	40°	1110	2525	3.3	30	423-7869
E1L35-3B0A2-02.	Blue	465	475	40°	235	470	3.4	30	423-7870
E1L35-3G0A2-02.	Green	520	530	40°	1555	2035	3.3	30	423-7882
E1L33-3B0A2-02	Blue	465	475	40°	235	470	3.4	30	105-7090
E1L33-3G0A2-02	Green	520	530	40°	1110	2525	3.3	30	105-7092
E1L35-3B0A2-02	Blue	465	475	40°	235	470	3.4	30	105-7093
E1L35-3G0A2-02	Green	520	530	40°	1555	2035	3.3	30	105-7094

249860

Mftrs. List No.	Order Code	Price Each 1+	+	+	+	+
E1L31-3B0A2	**423-7821**	3.50	– –	– –	– –	– –
E1L31-AG0A2.	**423-7833**	3.50	– –	– –	– –	– –
E1L31-AC1A2	**423-7845**	3.50	– –	– –	– –	– –
E1L33-3B0A2-02.	**423-7857‡**	3.50	– –	– –	– –	– –
E1L33-3G0A2-02.	**423-7869‡**	3.50	– –	– –	– –	– –
E1L35-3B0A2-02.	**423-7870‡**	3.50	– –	– –	– –	– –
E1L35-3G0A2-02.	**423-7882‡**	3.50	– –	– –	– –	– –
E1L33-3B0A2-02	**105-7090●**	3.50	– –	– –	– –	– –
E1L33-3G0A2-02	**105-7092●**	3.50	– –	– –	– –	– –
E1L35-3B0A2-02	**105-7093●**	3.50	– –	– –	– –	– –
E1L35-3G0A2-02	**105-7094●**	3.50	– –	– –	– –	– –

5mm Blue, Green & Blue-Green

TOYODA GOSEI CO.,LTD

Cathode identified by short lead and flat on body (except E1L51-3BOA & GOA, cathode identified by short lead only).

E1L51-3B & G: L=8.65, Dia=5, Leads=26 (nominal) x 0.6sq
E1L53-3B & G: L=8.65, Dia=5, Leads=26 (nominal) x 0.6sq
E1L51-YC: L=9.1, Dia=5.1, Leads=19 (nominal) x 0.5sq
E1L52-YC: L=6.9, Dia=5, Leads=19 (nominal) x 0.5sq
E1L53-YC: L=6.9, Dia=5, Leads=24 (nominal) x 0.5sq

All LEDs have stand-offs.

Colour	View Angle	Lum Intensity @ I_F = 20mA typ	(max)	I_F(ma) (max)	V_F typ	PIV max	Peak Wavelength min	max	Mftrs. List No.	Order Code
Untinted Clear Lens										
Blue	15°	1800	4860	30	3.4	5	465	475	E1L51-3B0A2-02	105-7071
Blue	15°	1800	3240	30	3.4	5	465	475	E1L55-3B0A2-02	105-7095
Blue	30°	1200	2700	30	3.4	5	465	475	E1L53-3B0A2-02	105-7072
Green	15°	6700	22500	30	3.3	5	520	530	E1L51-3G0A2-02	105-7073
Blue/Green	23°	1790	2680	30	3.2	5	498	513	E1L52-YC1A2-03	105-7076
Green	30°	5000	9500	30	3.3	5	520	530	E1L53-3G0A2-02	105-7074
Blue/Green	6°	3200	3860	30	3.2	5	498	513	E1L51-YC1A2-03	105-7075
Green	15°	1800	3240	30	3.4	5	465	475	E1L55-3G0A2-02	105-7096
Blue/Green	20°	1195	2680	30	3.2	5	493	498	E1L53-YC1A2-03	105-7105

CAUTION - THESE DEVICES ARE STATIC SENSITIVE

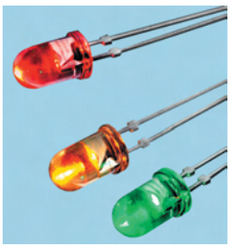
221731

Colour	Order Code	Price Each 1+	25+	100+	250+	+
Blue	**105-7071●**	4.38	4.25	4.00	3.56	– –
Blue	**105-7095●**	4.54	4.25	4.00	3.43	– –
Blue	**105-7072●**	4.38	4.25	4.00	3.43	– –
Green	**105-7073●**	4.38	4.25	4.00	3.43	– –
Blue/Green	**105-7076●**	4.38	4.25	4.00	3.56	– –
Green	**105-7074●**	4.38	4.25	4.00	3.43	– –
Blue/Green	**105-7075●**	4.38	4.25	4.00	3.56	– –
Green	**105-7096●**	4.54	4.25	4.00	3.43	– –
Blue/Green	**105-7105●**	5.70	5.13	4.66	3.43	– –

5mm/T1¾ - Ultrabright

Untinted - Non-Diffused

VISHAY



- High performance - high output
- Ideal for solid state illumination

L=8.7, Dia=5.0,
Lead Pitch=2.54,
Leads=27.2 x 0.5sq
Cathode identified by shorter lead, leads have stand-offs

Colour	View Angle	Lum Intensity (mcd) min	typ	I_F (mA) (max)	PIV max.	Mftrs. List No.	Order Code
Untinted Non-Diffused Lens							
White	±9°	1000	4000 @ 30mA	30mA	5V	TLCW5100.	491-2408
Blue	±9°	575	1500 @ 30mA	30mA	5V	TLCB5100.	491-2410
Red	±9°	4300	11000 @ 50mA	50mA	5V	TLCR5100.	491-2433
Green	±9°	1800	5000 @ 30mA	30mA	5V	TLCTG5100.	491-2457
Yellow	±9°	3200	7500 @ 50mA	50mA	5V	TLCY5100.	491-2470
Blue	±4°	750	2500 @ 30mA	30mA	5V	TLCB5800.	491-2421
Red	±4°	750	2500 @ 30mA	30mA	5V	TLHK5800.	315-2790
Red	±4°	7500	20000 @ 50mA	50mA	5V	TLCR5800.	491-2445
Green	±4°	2400	7000 @ 30mA	30mA	5V	TLCTG5800.	491-2469
Yellow	±4°	5750	14000 @ 50mA	50mA	5V	TLCY5800.	491-2482
Red	±4°	5750	2500 @ 30mA	30mA	5V	TLHK5800	104-5419

337284.343588

Colour	Angle of Half Intensity	Order Code	Price Each 5+	25+	100+	250+	+
White	9°	**491-2408●**	2.35	2.09	1.75	1.41	– –
Blue	9°	**491-2410●**	1.95	1.74	1.45	1.17	– –
Red	9°	**491-2433●**	0.67	0.59	0.49	0.40	– –
Green	9°	**491-2457●**	2.35	2.09	1.75	1.41	– –
Yellow	9°	**491-2470●**	0.67	0.59	0.49	0.40	– –
Blue	4°	**491-2421●**	1.95	1.74	1.45	1.17	– –
Red	4°	**315-2790▲‡**	0.35	0.31	0.26	0.21	– –
Red	4°	**491-2445●**	0.67	0.59	0.49	0.40	– –
Green	4°	**491-2469●**	2.35	2.09	1.75	1.41	– –
Yellow	4°	**491-2482●**	0.67	0.59	0.49	0.40	– –
Red	4°	**104-5419●**	0.35	0.31	0.26	0.21	– –

Agilent Technologies Light Emitting Diodes (LEDs)

4 & 5mm - InGaN Extra Bright

Round and Oval

Agilent Technologies
Authorized Distributor

Reverse Voltage = 5V for all items

Colour	View Angle	Luminous Intensity @ 20mA Min (mcd)	Max (mcd)	I_F (mA) (max)	Standoff	Mftrs. List No.	Order Code
5mm - Untinted Non-diffused Lens							
Blue	15°	2500		30mA	Yes	HLMP-CB12-TW000	857-6653
Blue	15°	2500		30mA	No	HLMP-CB11-TW000	879-2771
Blue	23°	1900		30mA	No	HLMP-CB26-SV000	857-6700
Blue	23°	1900		30mA	Yes	HLMP-CB27-SV000	857-6726
Blue	30°	1150	3200	30mA	No	HLMP-CB36-QT000	857-6777
Blue	30°	1150	3200	30mA	Yes	HLMP-CB37-RU000	879-2780
Cyan	15°	7200	21000	30mA	No	HLMP-CE11-X1000	857-6807
Cyan	15°	7200	21000	30mA	Yes	HLMP-CE12-X1000	857-6815
Cyan	23°	5500	16000	30mA	No	HLMP-CE26-WZ000	857-6840
Cyan	23°	5500	16000	30mA	Yes	HLMP-CE27-WZ000	857-6858
Cyan	30°	5500	16000	30mA	No	HLMP-CE36-WZ000	857-6912
Cyan	30°	5500	16000	30mA	Yes	HLMP-CE37-WZ000	857-6920
Green	15°	9300	27000	30mA	No	HLMP-CM11-Y2000	857-6947
Green	15°	9300	27000	30mA	No	HLMP-CM11-Z1C00	879-2798
Green	15°	9300	27000	30mA	Yes	HLMP-CM12-Y2000	857-6955
Green	23°	7200	21000	30mA	No	HLMP-CM26-X1000	857-6998
Green	23°	9300	16000	30mA	No	HLMP-CM26-YZC00	857-7005
Green	23°	9300	16000	30mA	Yes	HLMP-CM27-X1000	879-2801
Green	30°	7200		30mA	No	HLMP-CM36-X1000	857-7072
Green	30°	7200		30mA	Yes	HLMP-CM37-X1000	857-7099
White	15°	5500	16000	30mA	No	HLMP-CW11-WZ000	857-7102
White	15°	7200	12000	30mA	No	HLMP-CW11-XY000	807-6418
White	15°	7200	12000	30mA	Yes	HLMP-CW12-WZ000	807-6431
White	23°	3200	9300	30mA	No	HLMP-CW26-UX000	857-7129
White	23°	3200	9300	30mA	Yes	HLMP-CW27-UX000	807-6510
White	23°	4200	7200	30mA	Yes	HLMP-CW27-VW000	807-6546
White	30°	2500	7200	30mA	No	HLMP-CW36-TW000	857-7137
White	30°	3200	5500	30mA	No	HLMP-CW36-UV000	807-6583
White	30°	2500	7200	30mA	Yes	HLMP-CW37-TW000	807-6601
White	30°	3200	5500	30mA	Yes	HLMP-CW37-UV000	807-6625

RoHS ● Compliant ▲ Non-compliant ‡ Limited stock - RoHS replacement available

C = CYAN M = Magenta Y = Yellow B = Black/SING

5mm - Untinted Non-diffused Lens							
White	50°	880	2500	30mA	No	HLMP-CW46-PS000	857-7145
White	50°	1150	1900	30mA	No	HLMP-CW46-QR000	807-6662
White	50°	1150	1900	30mA	No	HLMP-CW46-QRB00	879-2810
White	50°	880	2500	30mA	Yes	HLMP-CW47-PS000	807-6686
White	50°	1150	1900	30mA	Yes	HLMP-CW47-QR000	807-6704
White	50°	1150	1900	30mA	Yes	HLMP-CW47-QRB00	879-2828
White	70°	680	1900	30mA	No	HLMP-CW76-NR000	857-7161
White	70°	880	1500	30mA	No	HLMP-CW76-PQ000	807-6741
White	70°	680	1900	30mA	Yes	HLMP-CW77-NR000	807-6765
5mm Oval - Tinted Non-diffused Lens							
Blue	40 x 100°	400	1150	30mA	Yes	HLMP-HB57-LP000	857-7382
Green	40 x 100°	1900	5500	30mA	Yes	HLMP-HM57-SV000	857-7412
4mm Oval - Tinted Non-diffused Lens							
Blue	50 x 100°	400	1150	30mA	Yes	HLMP-LB17-LP000	879-2836
Green	50 x 100°	1900	5500	30mA	Yes	HLMP-LM17-SV000	879-2844

382896

Order Code	Price Each 1+	10+	100+	500+	+
5mm - Untinted Non-diffused Lens					
879-2771●	2.62	1.58	1.17	0.96	– –
857-6653●	2.62	1.58	1.17	0.96	– –
857-6700●	2.62	1.58	1.17	0.96	– –
857-6726●	2.62	1.58	1.17	0.96	– –
857-6777●	2.62	1.58	1.17	0.96	– –
879-2780●	2.62	1.58	1.17	0.96	– –
857-6807●	2.62	1.58	1.17	0.96	– –
857-6815●	2.62	1.58	1.17	0.96	– –
857-6840●	2.62	1.58	1.17	0.96	– –
857-6858●	2.62	1.58	1.17	0.96	– –
857-6912●	2.62	1.58	1.17	0.96	– –
857-6920●	2.62	1.58	1.17	0.96	– –
857-6947●	2.62	1.58	1.17	0.96	– –
879-2798●	2.80	1.69	1.24	1.02	– –
857-6955●	2.62	1.58	1.17	0.96	– –
857-6998●	2.62	1.58	1.17	0.96	– –
857-7005●	2.80	1.69	1.24	1.02	– –
879-2801●	2.62	1.58	1.17	0.96	– –
857-7072●	2.62	1.58	1.17	0.96	– –
857-7099●	2.62	1.58	1.17	0.96	– –
857-7102●	2.97	1.80	1.32	1.09	– –
807-6418●	3.15	1.90	1.40	1.15	– –
807-6431●	2.97	1.80	1.32	1.09	– –
857-7129●	2.97	1.80	1.32	1.09	– –
807-6510●	2.97	1.80	1.32	1.09	– –
807-6546●	3.15	1.90	1.40	1.15	– –
857-7137●	2.97	1.80	1.32	1.09	– –
807-6583●	3.15	1.90	1.40	1.15	– –
807-6601●	2.97	1.80	1.32	1.09	– –
807-6625●	3.15	1.90	1.40	1.15	– –
857-7145●	2.97	1.80	1.32	1.09	– –
807-6662●	3.15	1.90	1.40	1.15	– –
879-2810●	3.23	1.95	1.44	1.18	– –
807-6686●	2.97	1.80	1.32	1.09	– –
807-6704●	3.15	1.90	1.40	1.15	– –
879-2828●	3.23	1.95	1.44	1.18	– –
857-7161●	2.97	1.80	1.32	1.09	– –
807-6741●	3.15	1.90	1.40	1.15	– –
807-6765●	2.97	1.80	1.32	1.09	– –
5mm Oval - Tinted Non-diffused Lens					
857-7382●	2.71	1.64	1.21	0.99	– –
857-7412●	2.71	1.64	1.21	0.99	– –
4mm Oval - Tinted Non-diffused Lens					
879-2836●	2.62	1.58	1.17	0.96	– –
879-2844●	2.62	1.58	1.17	0.96	– –

5mm/T1¾ - Superbright InGAN

Untinted - Non-Diffused

L=8.7, Dia=5.0, Lead Pitch=2.54, Leads=27.2 x 0.5sq
Cathode identified by shorter lead.

- High luminous output
- Max V_f = 4V
- Standoff or non-standoff leads
- Superior resistance to moisture
- New InGAN flip chip die technology with protective diode
- ESD Class 3

These Super Bright Precision Optical Performance LED lamps are based on "flip chip" InGAN material, which is the brightest and most efficient technology for LED's in the blue, green and white region of the spectrum.
The high maximum LED junction temperature limit of +130°C enables high temperature operation in bright sunlight conditions.
Applications include Traffic Signals, Commercial outdoor advertising, Front panel backlighting and Front panel indicators

Colour	Lum Intensity (cd) min	I_f (mA) (max)	PIV max.	Mftrs. List No.	Order Code
White	7.2	30mA	5V	HLMP-CW15-TW000..	492-2906
White	7.2	30mA	5V	HLMP-CW15-TW000	100-3361
White	7.2	30mA	5V	HLMP-CW16-TW000..	492-2918
White	7.2	30mA	5V	HLMP-CW16-TW000	100-3362
White	5.5	30mA	5V	HLMP-CW24-SV000..	492-2920
White	7.2	30mA	5V	HLMP-CW24-SV000	100-3363
White	2.5	30mA	5V	HLMP-CW30-PS000..	492-2931
White	7.2	30mA	5V	HLMP-CW30-PS000	100-3364
White	2.5	30mA	5V	HLMP-CW31-PS000..	492-2943
White	7.2	30mA	5V	HLMP-CW31-PS000	100-3365
Blue	3.5	30mA	0.6V	HLMP-CB18-TW000	492-2955
Blue	3.5	30mA	0.6V	HLMP-CB19-TW000	492-2967
Blue	2.4	30mA	0.6V	HLMP-CB28-RU000	492-2979
Blue	2.4	30mA	0.6V	HLMP-CB29-RU000	492-2980
Blue	1.5	30mA	0.6V	HLMP-CB38-QT000	492-2992
Blue	1.5	30mA	0.6V	HLMP-CB39-QT000	492-3005
Blue	2.5	30mA	0.6V	HLMP-CB18-UVA00	857-6696
Blue	1.5	30mA	0.6V	HLMP-CB28-STD00	857-6734
Cyan	2.5	30mA	0.6V	HLMP-CE38-TW000	857-6939
Green	12.0	30mA	0.6V	HLMP-CM18-X1000	492-3017
Green	12.0	30mA	0.6V	HLMP-CM19-X1000	492-3029
Green	9.3	30mA	0.6V	HLMP-CM28-WZ000	492-3030
Green	9.3	30mA	0.6V	HLMP-CM29-WZ000	492-3042
Green	5.0	30mA	0.6V	HLMP-CM38-UX000	492-3054
Green	5.0	30mA	0.6V	HLMP-CM39-UX000	492-3066

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Viewing Angle (Typical)	Standoff	Order Code	Price Each 1+	10+	100+	500+
High Intensity - WHITE						
15°	No	**492-2906▲‡**	2.60	1.57	1.16	0.95
15°	No	**100-3361●**	2.88	1.74	1.28	1.05
15°	Yes	**492-2918▲‡**	2.60	1.57	1.16	0.95
15°	Yes	**100-3362●**	2.88	1.74	1.28	1.05
23°	Yes	**492-2920▲‡**	2.60	1.57	1.16	0.95
23°	Yes	**100-3363●**	2.88	1.74	1.28	1.05
30°	No	**492-2931▲‡**	2.60	1.57	1.16	0.95
30°	No	**100-3364●**	2.88	1.74	1.28	1.05
30°	Yes	**492-2943▲‡**	2.60	1.57	1.16	0.95
30°	Yes	**100-3365●**	2.88	1.74	1.28	1.05
Super Bright Precision - BLUE						
15°	No	**492-2955▲**	3.17	2.00	1.50	1.33
15°	Yes	**492-2967▲**	3.17	2.00	1.50	1.33
23°	No	**492-2979▲**	3.17	2.00	1.50	1.33
23°	Yes	**492-2980▲**	3.17	2.00	1.50	1.33
30°	No	**492-2992▲**	3.17	2.00	1.50	1.33
30°	Yes	**492-3005▲**	3.17	2.00	1.50	1.33
15°	No	**857-6696**	2.05	1.92	1.66	1.56
23°	No	**857-6734**	2.28	2.12	1.86	1.73
Super Bright Precision - CYAN						
30°	No	**857-6939**	1.69	1.53	1.37	1.27
Super Bright Precision - GREEN						
15°	No	**492-3017▲**	3.17	2.00	1.50	1.33
15°	Yes	**492-3029▲**	3.17	2.00	1.50	1.33
23°	No	**492-3030▲**	3.17	2.00	1.50	1.33
23°	Yes	**492-3042▲**	3.17	2.00	1.50	1.33
30°	No	**492-3054▲**	3.17	2.00	1.50	1.33
30°	Yes	**492-3066▲**	3.17	2.00	1.50	1.33

Electronic Signs and Signals is a fast moving and expanding market where Customers are requiring narrower colour and intensity selections. In order to meet these needs Agilent have created a new numbering system to enable a more effective selection of their LED's for this large and varied market.

Here are some examples of the Applications that these LED's may be used in:

Variable Message Systems including lane signs, urban message signals, fixed and portable message signs.

Traffic Signals including traffic lights, railway crossing signals, pedestrian signals.

Traffic Signs including blink/barricade lamps, beacons, lane arrows, lane indicators/markers, toll signs, pictograms, speed limit signs, parking signs.

Commercial signs including advertising signs, entertainment signs, general information/ health and safety signs, passenger information signs, full colour video panels, stadium signs.

The Agilent Ultra High Bright LED's used in this market area are the Precision Optical Performance (POP) light emitting diodes. The AlInGap and InGaN LED's provide superior light output for excellent readability in sunlight and are extremely reliable. The lamps have untinted, non-diffused lenses and offer well defined spatial radiation patterns. They have advanced optical grade epoxy offering superior high temperature and high moisture resistance performance in outdoor signal and sign applications.

206589

5mm LED's Precision Optical Performance (POP)

Including High Brightness White, Blue and Green

I_F max.=30mA - P.I.V.=5V

Dia=5.0, L=8.71, Leads=22.89x0.5sq
Lead Pitch=2.54
Cathode identified by flat on body and shorter lead

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

- Designed for the Electronic Signs & Signalling market
- Superior performance in outdoor environments
- Viewing angles match Traffic Sign Management requirements
- Well defined spatial radiation patterns
- Red, Green and Blue radiation patterns matched for full colour signs (Oval LED's)
- High luminous output including White
- Colours meet automotive and pedestrian signal specifications

Colour	View Angle	Typ Lum Intensity @ 20mA min.	max	Peak Wavelength (nm)	Stand-offs	Mftrs. List No.	Order Code
Red Untinted Clear Lens							
Red	6°	4700	18400	626	No	HLMP-EG08-WZ000	100-3319
Red	6°	4700	18400	626	No	HLMP-EG10-WZ000	100-3321
Red	15°	2170	8300	630	Yes	HLMP-ED16-TW000	100-3153
Red	15°	2170	8300	630	Yes	HLMP-ED18-TW000	100-3175
Red	23°	2170	8300	630	No	HLMP-ED25-TW000	100-3324
Red	23°	2170	8300	630	Yes	HLMP-ED27-TW000	100-3325
Red	23°	765	2900	626	No	HLMP-EG24-PS000	100-3151
Red	23°	765	2900	626	Yes	HLMP-EG26-PS000	100-3172
Red	30°	1650	6300	626	No	HLMP-ED31-SV000	100-3322
Red	30°	1650	6300	626	Yes	HLMP-ED33-SV000	100-3323
Red	30°	590	2200	626	No	HLMP-EG30-NR000	100-3152
Red	30°	590	2200	626	Yes	HLMP-EG32-NR000	100-3174
Red	15°	3200		639	No	HLMP-ED18-UX000..	857-7170
Red	23°	1900		639	No	HLMP-ED25-SV000	857-7188
Red	23°	1900		639	Yes	HLMP-ED27-SV000	857-7196
Red	30°	1500		639	No	HLMP-ED31-RU000	857-7200
Red	30°	1900		639	No	HLMP-ED31-SV0DD..	857-7218
Red	8°	9300		635	No	HLMP-EG08-Y2000..	857-7226
Red	15°	880		635	No	HLMP-EG15-PS000..	857-7234
Red	30°	520		635	No	HLMP-EG30-MQ000	857-7242
Red-Orange Untinted Clear Lens							
Red/Orange	6°	4700	18400	615	No	HLMP-EH08-Y2000.	100-3326
Red/Orange	6°	4700	18400	615	Yes	HLMP-EH10-WZ000	100-3327
Red/Orange	15°	2750	10700	615	No	HLMP-EH16-UX000	100-3154
Red/Orange	15°	2750	10700	615	Yes	HLMP-EH18-UX000	100-3176
Red/Orange	23°	1650	6300	615	No	HLMP-EH25-SV000	100-3155
Red/Orange	30°	1650	6300	615	No	HLMP-EH31-SV000	100-3328
Red/Orange	30°	1650	6300	615	Yes	HLMP-EH33-SV000	100-3329
Red - Orange	15°	3200		623	No	HLMP-EH16-TW000	857-7250
Red - Orange	23°	2500		623	No	HLMP-EH25-TW000	857-7269
Red - Orange	30°	1500		623	Yes	HLMP-EH33-RU000	857-7277
Amber Untinted Clear Lens							
Amber	6°	3600	13800	590	No	HLMP-EL08-VY000	100-3142
Amber	6°	1650	6300	590	Yes	HLMP-EL10-VY000	100-3165
Amber	15°	2750	10700	592	No	HLMP-EL16-UX000	100-3146
Amber	15°	2750	10700	592	Yes	HLMP-EL18-UX000	100-3169
Amber	15°	1650	6300	590	No	HLMP-EL15-SV000	100-3143
Amber	15°	1650	6300	590	Yes	HLMP-EL17-SV000	100-3166
Amber	23°	1650	6300	592	No	HLMP-EL25-SV000	100-3147
Amber	23°	1650	6300	592	Yes	HLMP-EL27-SV000	100-3170
Amber	23°	765	2900	590	No	HLMP-EL24-PS000	100-3144
Amber	23°	765	2900	590	Yes	HLMP-EL26-PS000	100-3167
Amber	30°	1650	6300	592	No	HLMP-EL31-SV000	100-3330
Amber	30°	1650	6300	592	Yes	HLMP-EL33-SV000	100-3332
Amber	30°	1000	3700	592	No	HLMP-EL31-QT000	100-3149
Amber	30°	1000	3700	592	Yes	HLMP-EL33-QT000	100-3171
Amber	30°	765	2900	590	No	HLMP-EL30-PS000	100-3145
Amber	30°	765	2900	590	Yes	HLMP-EL32-PS000	100-3168
Amber	15°	4200		592	No	HLMP-EL16-VY000..	857-7285
Amber	23°	1900		592	Yes	HLMP-EL25-SUK00	857-7293
Amber	23°	2500		592	Yes	HLMP-EL25-TWS00	857-7307
Amber	23°	2500		592	Yes	HLMP-EL27-TW000	857-7315
Amber	30°	1900		592	No	HLMP-EL31-SVK00..	857-7323
White Untinted Clear Lens							
White	15°	1500			Yes	HLMP-CW16-R0000..	857-7110
White	23°	1900	5500*		No	HLMP-CW23-SV000	403-6748
White	50°	880	2500*		No	HLMP-CW46-PS000	857-7145
White	70°	680	1900*		No	HLMP-CW76-NR000	857-7161
Blue Untinted Clear Lens							
Blue	15°	765	1575*	470	No	HLMP-CB15-P0000	100-3156
Blue	30°	270	560*	470	No	HLMP-CB30-K0000	100-3157
Blue	30°	270	560*	470	Yes	HLMP-CB31-M0000	100-3177
Blue	30°	520		472	No	HLMP-CB30-M0000..	857-6742
Blue	30°	680	1150	468	No	HLMP-CB30-NPC00	857-6750
Blue	30°	680	1900	464	No	HLMP-CB30-NRG00..	857-6769
Blue	30°	1150	3200	464	No	HLMP-CB36-QT000	857-6777
Blue	30°	1500	2500	460	No	HLMP-CB36-RSA00	857-6785
Blue	30°	1150	1900	460	Yes	HLMP-CB38-QRA00	857-6793
Blue	15°	2500		516	No	HLMP-CB11-TW0DD	857-6637
Blue	15°	3200		516	No	HLMP-CB11-UVA00	857-6645
Blue	15°	2500		516	Yes	HLMP-CB12-TW000	857-6653
Blue	23°	1900		516	No	HLMP-CB26-SV000	857-6700
Blue	23°	2500		516	No	HLMP-CB26-TUD00	857-6718
Blue	23°	1900		516	Yes	HLMP-CB27-SV000	857-6726
Blue	30°	1150	3200	464	No	HLMP-CB36-QT000	857-6777
Blue	30°	1500	2500	460	No	HLMP-CB36-RSA00	857-6785
Blue	15°	1500	2500	468	No	HLMP-CB15-QT000	857-6661
Blue	15°	1500		470	No	HLMP-CB15-R0000..	857-6670
Blue	15°	1150	3200	470	No	HLMP-CB15-RSC00..	857-6688
Blue	15°	2.5		466	No	HLMP-CB18-UVA00	857-6696
Blue	23°	1.5		466	No	HLMP-CB28-STD00	857-6734
Blue	30°	1150	1900	460	No	HLMP-CB38-QRA00	857-6793
Cyan Untinted Clear Lens							
Cyan	15°	7200	21000*	501	No	HLMP-CE11-X1000	857-6807
Cyan	15°	7200	21000*	501	Yes	HLMP-CE12-X1000	857-6815
Cyan	23°	5500	16000*	501	No	HLMP-CE26-WZ000	857-6840
Cyan	23°	5500	16000*	501	Yes	HLMP-CE27-WZ000	857-6858
Cyan	30°	5500	16000*	501	No	HLMP-CE36-WZ000	857-6912
Cyan	30°	5500	16000*	501	Yes	HLMP-CE37-WZ000	857-6920
Cyan	23°	2500	4200*	500	No	HLMP-CE23-UXC00	857-6823
Cyan	23°	2500	5500*	502	No	HLMP-CE23-UXQ00.	857-6831
Cyan	30°	1150	3200*	502	No	HLMP-CE30-QTC00	857-6866
Cyan	30°	1150	3200*	502	No	HLMP-CE30-QTQ00	857-6874
Cyan	30°	1500	2500*	500	No	HLMP-CE30-SVC00	857-6882
Cyan Untinted Clear Lens							
Cyan	30°	1500	2500*	498	No	HLMP-CE30-SVQ00	857-6890
Cyan	30°	1500	4200*	502	No	HLMP-CE30-RUQ00	857-6904
Cyan	30°	2.5	3.9*	495	No	HLMP-CE38-TW000	857-6939
Green Untinted Clear Lens							
Green	15°	1650	4700*	524	No	HLMP-CM15-S0000	100-3158
Green	15°	1650	4700*	524	Yes	HLMP-CM16	100-3178
Green	30°	765	1750*	524	No	HLMP-CM30-M0000	100-3159
Green	30°	765	1750*	524	Yes	HLMP-CM31-M00DD..	302-7752
Green	30°	765	1750*	524	Yes	HLMP-CM31-M00DD	100-3179
Green	15°	9300	27000*	516	No	HLMP-CM11-Y2000	857-6947
Green	15°	9300	27000*	516	Yes	HLMP-CM12-Y2000	857-6955
Green	15°	1650	4700*	524	No	HLMP-CM15-VY000..	857-6963
Green	15°	1650	4700*	524	No	HLMP-CM15-W0000	857-6971
Green	15°	1650	4700*	524	No	HLMP-CM15-WXB00	857-6980
Green	30°	765	1750*	524	No	HLMP-CM30-RSB00	857-7013
Green	30°	765	1750*	524	No	HLMP-CM30-S0000..	857-7021
Green	30°	765	1750*	524	No	HLMP-CM30-TUB00	857-7030
Green	30°	765	1750*	524	No	HLMP-CM30-TW000	857-7048
Green	30°	765	1750*	524	No	HLMP-CM30-TWA00	857-7056
Green	30°	765	1750*	524	No	HLMP-CM30-UVA00	857-7064
4mm, Oval 60° x 120° Tinted Clear Lens							
Red	60° x 120°	345	1330	630	Yes	HLMP-RD11-LP000	100-3333
Amber	60° x 120°	345	1330	592	Yes	HLMP-RL11-LP000	100-3334
Blue	60° x 120°	155	–	475	Yes	HLMP-RB11-H0000	100-3335
Green	60° x 120°	155	–	526	Yes	HLMP-RM11-H0000	100-3336
Oval 70° x 35° Untinted Clear Lens							
Red	70° x 35°	345	600	630	No	HLMP-BD06-P0000	100-3183
Red	70° x 35°	345	600	630	Yes	HLMP-BD16-P0000	100-3164
Amber	70° x 35°	345	500	592	No	HLMP-BL06-N0000	100-3182
Amber	70° x 35°		680	592	Yes	HLMP-BL16-N0000	100-3163
Green	70° x 35°	590	1300	526	No	HLMP-BM01-L0000	100-3180
Green	70° x 35°	590	1300	526	Yes	HLMP-BM11-Q0000	100-3160
Blue	70° x 35°	205	400	472	No	HLMP-BB01-J0B00	100-3181
Blue	70° x 35°	205	400	472	Yes	HLMP-BB11	100-3162
Oval 120° x 60° Tinted Clear Lens							
Amber	120° x 60°	155	600	592	Yes	HLMP-SL11-H0000	301-5350
Amber	70° x 35°	345	500	592	Yes	HLMP-BL06-N0000..	302-7831

* Typical values

206587

Colour	Colour	Order Code	Price Each 5+	10+	100+	500+	+
Red Untinted Clear Lens							
Red	HLMP-EG08-WZ000	**100-3319●**	1.54	0.85	0.59	0.46	– –
Red	HLMP-EG10-WZ000	**100-3321●**	1.30	0.72	0.50	0.39	– –
Red	HLMP-ED16-TW000	**100-3153●**	1.91	1.08	0.75	0.60	– –
Red	HLMP-ED18-TW000	**100-3175●**	1.91	1.08	0.75	0.60	– –
Red	HLMP-ED25-TW000	**100-3324●**	2.08	1.18	0.84	0.65	– –
Red	HLMP-ED27-TW000	**100-3325●**	2.08	1.18	0.84	0.65	– –
Red	HLMP-EG24-PS000	**100-3151●**	1.33	0.75	0.50	0.39	– –
Red	HLMP-EG26-PS000	**100-3172●**	1.33	0.75	0.50	0.39	– –
Red	HLMP-ED31-SV000	**100-3322●**	2.03	1.14	0.80	0.63	– –
Red	HLMP-ED33-SV000	**100-3323●**	2.03	1.14	0.80	0.63	– –
Red	HLMP-EG30-NR000	**100-3152●**	1.54	0.85	0.59	0.46	– –
Red	HLMP-EG32-NR000	**100-3174●**	1.57	0.88	0.59	0.46	– –
Red	HLMP-ED18-UX000..	**857-7170**	0.91	0.85	0.72	0.68	– –
Red	HLMP-ED25-SV000	**857-7188**	0.85	0.78	0.68	0.64	– –
Red	HLMP-ED27-SV000	**857-7196**	0.85	0.78	0.68	0.64	– –
Red	HLMP-ED31-RU000	**857-7200**	0.75	0.72	0.62	0.57	– –
Red	HLMP-ED31-SV0DD..	**857-7218**	0.85	0.78	0.68	0.64	– –
Red	HLMP-EG08-Y2000..	**857-7226**	0.72	0.64	0.57	0.53	– –
Red	HLMP-EG15-PS000..	**857-7234**	0.47	0.43	0.38	0.36	– –
Red	HLMP-EG30-MQ000	**857-7242**	0.56	0.51	0.46	0.43	– –
Red-Orange Untinted Clear Lens							
Red/Orange	HLMP-EH08-Y2000.	**100-3326●**	1.90	1.06	0.73	0.57	– –
Red/Orange	HLMP-EH10-WZ000	**100-3327●**	1.54	0.85	0.59	0.46	– –
Red/Orange	HLMP-EH16-UX000	**100-3154●**	2.08	1.18	0.84	0.65	– –
Red/Orange	HLMP-EH18-UX000	**100-3176●**	2.08	1.18	0.84	0.65	– –
Red/Orange	HLMP-EH25-SV000	**100-3155●**	2.25	1.25	0.86	0.68	– –
Red/Orange	HLMP-EH31-SV000	**100-3328●**	2.08	1.18	0.84	0.65	– –
Red/Orange	HLMP-EH33-SV000	**100-3329●**	2.08	1.18	0.84	0.65	– –
Red - Orange	HLMP-EH16-TW000	**857-7250**	0.85	0.78	0.68	0.64	– –
Red - Orange	HLMP-EH25-TW000	**857-7269**	0.91	0.85	0.72	0.68	– –
Red - Orange	HLMP-EH33-RU000	**857-7277**	0.91	0.85	0.72	0.68	– –
Amber Untinted Clear Lens							
Amber	HLMP-EL08-VY000	**100-3142●**	1.30	0.72	0.50	0.39	– –
Amber	HLMP-EL10-VY000	**100-3165●**	1.33	0.75	0.50	0.39	– –
Amber	HLMP-EL16-UX000	**100-3146●**	2.14	1.21	0.84	0.67	– –
Amber	HLMP-EL18-UX000	**100-3169●**	2.14	1.21	0.84	0.67	– –
Amber	HLMP-EL15-SV000	**100-3143●**	1.53	0.87	0.62	0.48	– –
Amber	HLMP-EL17-SV000	**100-3166●**	1.53	0.87	0.62	0.48	– –
Amber	HLMP-EL25-SV000	**100-3147●**	2.03	1.14	0.80	0.63	– –
Amber	HLMP-EL27-SV000	**100-3170●**	2.03	1.14	0.80	0.63	– –
Amber	HLMP-EL24-PS000	**100-3144●**	1.54	0.85	0.59	0.46	– –
Amber	HLMP-EL26-PS000	**100-3167●**	1.54	0.85	0.59	0.46	– –
Amber	HLMP-EL31-SV000	**100-3330●**	2.03	1.14	0.80	0.63	– –
Amber	HLMP-EL33-SV000	**100-3332●**	2.03	1.14	0.80	0.63	– –
Amber	HLMP-EL31-QT000	**100-3149●**	1.97	1.12	0.80	0.61	– –
Amber	HLMP-EL33-QT000	**100-3171●**	1.97	1.12	0.80	0.61	– –
Amber	HLMP-EL30-PS000	**100-3145●**	1.66	0.92	0.63	0.50	– –
Amber	HLMP-EL32-PS000	**100-3168●**	1.66	0.92	0.63	0.50	– –
Amber	HLMP-EL16-VY000..	**857-7285**	0.85	0.78	0.68	0.64	– –
Amber	HLMP-EL25-SUK00	**857-7293**	0.91	0.85	0.72	0.68	– –
Amber	HLMP-EL25-TWS00	**857-7307**	0.75	0.72	0.62	0.57	– –
Amber	HLMP-EL27-TW000	**857-7315**	0.85	0.78	0.68	0.64	– –
Amber	HLMP-EL31-SVK00..	**857-7323**	0.91	0.85	0.72	0.68	– –
White Untinted Clear Lens							
White	HLMP-CW16-R0000..	**857-7110**	1.40	1.30	1.17	1.07	– –
White	HLMP-CW23-SV000	**403-6748**	1.50	1.37	1.24	1.14	– –
White	HLMP-CW46-PS000	**857-7145●**	2.97	1.80	1.32	1.09	– –
White	HLMP-CW76-NR000	**857-7161●**	2.97	1.80	1.32	1.09	– –

● Compliant
▲ Non-compliant
‡ Limited stock - RoHS replacement available

RoHS

			Price Each				
Amber Untinted Clear Lens		**Order Code**	**5+**	**10+**	**100+**	**500+**	
White	HLMP-CW70-LP000..	**857-7153**	1.50	1.37	1.24	1.14	– –
Blue Untinted Clear Lens							
Blue	HLMP-CB15-P0000	**100-3156●**	2.34	1.41	1.06	0.86	– –
Blue	HLMP-CB30-K0000	**100-3157●**	2.25	1.36	1.02	0.82	– –
Blue	HLMP-CB31-M0000	**100-3177●**	2.34	1.41	1.06	0.86	– –
Blue	HLMP-CB30-M0000..	**857-6742**	1.27	1.17	1.04	0.98	– –
Blue	HLMP-CB30-NPC00	**857-6750**	1.37	1.24	1.14	1.04	– –
Blue	HLMP-CB30-NRG00..	**857-6769**	1.27	1.17	1.04	0.98	– –
Blue	HLMP-CB36-QT000	**857-6777●**	2.62	1.58	1.17	0.96	– –
Blue	HLMP-CB36-RSA00	**857-6785**	1.50	1.37	1.24	1.14	– –
Blue	HLMP-CB38-QRA00	**857-6793**	2.25	2.05	1.82	1.69	– –
Blue	HLMP-CB11-TW0DD	**857-6637**	1.27	1.17	1.04	0.98	– –
Blue	HLMP-CB11-UVA00	**857-6645**	1.50	1.37	1.24	1.14	– –
Blue	HLMP-CB12-TW000	**857-6653●**	2.62	1.58	1.17	0.96	– –
Blue	HLMP-CB26-SV000	**857-6700●**	2.62	1.58	1.17	0.96	– –
Blue	HLMP-CB26-TUD00	**857-6718**	1.50	1.37	1.24	1.14	– –
Blue	HLMP-CB27-SV000	**857-6726●**	2.62	1.58	1.17	0.96	– –
Blue	HLMP-CB36-QT000	**857-6777●**	2.62	1.58	1.17	0.96	– –
Blue	HLMP-CB36-RSA00	**857-6785**	1.50	1.37	1.24	1.14	– –
Blue	HLMP-CB15-QT000	**857-6661**	1.14	1.04	0.94	0.88	– –
Blue	HLMP-CB15-R0000..	**857-6670**	1.30	1.20	1.07	1.01	– –
Blue	HLMP-CB15-RSC00..	**857-6688**	1.40	1.30	1.17	1.07	– –
Blue	HLMP-CB18-UVA00	**857-6696**	2.05	1.92	1.66	1.56	– –
Blue	HLMP-CB28-STD00	**857-6734**	2.28	2.12	1.86	1.73	– –
Blue	HLMP-CB38-QRA00	**857-6793**	2.25	2.05	1.82	1.69	– –
Cyan Untinted Clear Lens							
			1+	**10+**	**100+**	**500+**	**+**
Cyan	HLMP-CE11-X1000	**857-6807●**	2.62	1.58	1.17	0.96	– –
Cyan	HLMP-CE12-X1000	**857-6815●**	2.62	1.58	1.17	0.96	– –
Cyan	HLMP-CE26-WZ000	**857-6840●**	2.62	1.58	1.17	0.96	– –
Cyan	HLMP-CE27-WZ000	**857-6858●**	2.62	1.58	1.17	0.96	– –
Cyan	HLMP-CE36-WZ000	**857-6912●**	2.62	1.58	1.17	0.96	– –
Cyan	HLMP-CE37-WZ000	**857-6920●**	2.62	1.58	1.17	0.96	– –
Cyan	HLMP-CE23-UXC00	**857-6823**	1.73	1.59	1.43	1.33	– –
Cyan	HLMP-CE23-UXQ00.	**857-6831**	1.69	1.53	1.37	1.27	– –
Cyan	HLMP-CE30-QTC00	**857-6866**	1.69	1.53	1.37	1.27	– –
Cyan	HLMP-CE30-QTQ00	**857-6874**	1.69	1.53	1.37	1.27	– –
Cyan	HLMP-CE30-SVC00	**857-6882**	1.56	1.43	1.30	1.20	– –
Cyan	HLMP-CE30-SVQ00	**857-6890**	1.73	1.59	1.43	1.33	– –
Cyan	HLMP-CE30-RUQ00	**857-6904**	1.73	1.59	1.43	1.33	– –
Cyan	HLMP-CE38-TW000	**857-6939**	1.69	1.53	1.37	1.27	– –
Green Untinted Clear Lens							
Order Multiple=1			**5+**	**10+**	**100+**	**500+**	**+**
Green	HLMP-CM16	**100-3178●**	2.69	1.65	1.25	1.02	– –
Green	HLMP-CM30-M0000	**100-3159●**	2.60	1.58	1.16	0.96	– –
Green	HLMP-CM31-M00DD	**100-3179●**	2.60	1.58	1.16	0.96	– –
Green	HLMP-CM11-Y2000	**857-6947●**	2.62	1.58	1.17	0.96	– –
Green	HLMP-CM12-Y2000	**857-6955●**	2.62	1.58	1.17	0.96	– –
Green	HLMP-CM15-VY000..	**857-6963**	1.59	1.46	1.30	1.20	– –
Green	HLMP-CM15-W0000	**857-6971**	1.69	1.53	1.37	1.27	– –
Green	HLMP-CM15-WXB00	**857-6980**	1.56	1.43	1.30	1.20	– –
Green	HLMP-CM30-RSB00	**857-7013**	1.59	1.46	1.30	1.20	– –
Green	HLMP-CM30-S0000..	**857-7021**	1.56	1.43	1.27	1.17	– –
Green	HLMP-CM30-TUB00	**857-7030**	1.73	1.59	1.43	1.33	– –
Green	HLMP-CM30-TW000	**857-7048**	1.43	1.33	1.17	1.12	– –
Green	HLMP-CM30-TWA00	**857-7056**	1.69	1.53	1.37	1.27	– –
Green	HLMP-CM30-UVA00	**857-7064**	1.73	1.59	1.43	1.33	– –
4mm Oval 60° x 120° Tinted Clear Lens							
Red	HLMP-RD11-LP000	**100-3333●**	2.03	1.14	0.80	0.63	– –
Amber	HLMP-RL11-LP000	**100-3334●**	2.03	1.14	0.80	0.63	– –
Blue	HLMP-RB11-H0000	**100-3335●**	6.66	4.02	2.96	2.44	– –
Green	HLMP-RM11-H0000	**100-3336●**	4.05	2.45	1.80	1.48	– –
Oval 70° x 35° Untinted Clear Lens							
Red	HLMP-BD06-P0000	**100-3183●**	1.66	0.92	0.63	0.50	– –
Red	HLMP-BD16-P0000	**100-3164●**	1.66	0.92	0.63	0.50	– –
Amber	HLMP-BL06-N0000	**100-3182●**	0.96	0.63	0.55	0.47	– –
Amber	HLMP-BL16-N0000	**100-3163●**	1.66	0.92	0.63	0.50	– –
			5+	**10+**	**100+**	**500+**	**+**
Green	HLMP-BM01-L0000..	**302-7818▲‡**	2.60	1.57	1.16	0.95	– –
Green	HLMP-BM01-L0000	**100-3180●**	3.60	2.18	1.60	1.32	– –
Green	HLMP-BM11-Q0000	**100-3160●**	3.76	2.35	1.77	1.45	– –
Blue	HLMP-BB01-J0B00	**100-3181●**	3.87	2.34	1.72	1.42	– –
Blue	HLMP-BB11	**100-3162●**	3.35	2.06	1.56	1.27	– –
Oval 120° x 60° Tinted Clear Lens							
Amber	HLMP-SL11-H0000	**301-5350▲**	1.13	0.65	0.45	0.35	– –
Amber	HLMP-BL06-N0000..	**302-7831▲‡**	0.74	0.49	0.42	0.36	– –

4, 5mm and Oval Ultra Bright

AVAGO TECHNOLOGIES

Dia=5.0, L=8.71, Leads=23 x 0.5sq
Lead Pitch=2.54
Cathode identified by flat on body and shorter lead
Peak inverse voltage=5V
LEDs that have stand-offs are indicated with*

Colour	View Angle	Typ. Lum Intensity @ 20mA (mcd)	I_F (mA) (max)	Peak Wavelength	Mftrs. List No.	Order Code
4mm Oval Package - Untinted Non-diffused Lens						
Blue	40° x 100°	310	100	467nm	HLMP-LB11-FJ000	857-7420
Blue	40° x 100°	520	100	467nm	HLMP-LB11-HL000..	857-7439
Green	40° x 100°	880	100	520nm	HLMP-LM11-LP000	857-7447
Green	40° x 100°	1900	100	520nm	HLMP-LM11-NR000	857-7455
Green	60° x 120°	520	100	524nm	HLMP-RM11-M0000	857-7463
5mm Oval Package - Untinted Non-diffused Lens						
Blue	40° x 100°	360	100	470nm	HLMP-HB55-FJ000	857-7358
Blue	40° x 100°	880	100	470nm	HLMP-HB57-KN0ZZ	857-7366
5mm Oval Package - Untinted Non-diffused Lens						
Blue	40° x 100°	680	100	470nm	HLMP-HB57-LMCZZ	857-7374
Blue	40° x 100°	1150	100	470nm	HLMP-HB57-LP000	857-7382
Green	40° x 100°	2500	100	521nm	HLMP-HM57-RSCZZ.	857-7390
Green	40° x 100°	4200	100	521nm	HLMP-HM57-RU0ZZ	857-7404
Green	40° x 100°	5500	100	521nm	HLMP-HM57-SV000	857-7412
Blue	30° x 70°	240	100	472nm	HLMP-AB01-J0000	857-6548
Red	30° x 70°	880	100	630nm	HLMP-AD06-P0000..	857-6556
Amber	30° x 70°	680	100	592nm	HLMP-AL06-N0000	857-6564
Green	30° x 70°	1150	100	526nm	HLMP-AM01-Q0000	857-6572
Blue	30° x 70°	310	100	472nm	HLMP-BB11-K0000	857-6580
Green	30° x 70°	400	100	526nm	HLMP-BM11-L0000..	857-6599
5mm Oval Package - Tinted Clear Lens						
Red	35° x 70°	400	30	626nm	HLMP-BG01-MN000	100-3132
Amber	35° x 70°	300	30	590nm	HLMP-BL01-NR000	100-3133
5mm Tinted - Diffused Lens						
Red DH AlGaAS	65°	70	30	637nm	HLMP-D101	100-3228
5mm Untinted Non-diffused Lens						
Red DH AS AlGaAS	24°	240	20	637nm	HLMP-D105	100-3223
HE Red DH AS AlGaAS	24°	125	25	626nm	HLMP-3750	100-3224
Yellow DH AlGaAS	24°	140	20	585nm	HLMP-3850	100-3225
Green DH AlGaAS	24°	120	25	569nm	HLMP-3950	100-3226
5mm Tinted Non-diffused Lens						
Red	15°	600	30	645nm	HLMP-C115	100-3414
HE Red	15°	300	30	635nm	HLMP-C215	100-3415
HE Red	25°	170	30	635nm	HLMP-C223	100-3416
Yellow	15°	300	20	583nm	HLMP-C315	100-3423
Yellow	25°	170	20	583nm	HLMP-C323	100-3417
Orange	15°	300	30	600nm	HLMP-C415	100-3424
Orange	25°	170	30	600nm	HLMP-C423	100-3419
Green	15°	300	30	568nm	HLMP-C515	100-3420
Green	25°	170	30	568nm	HLMP-C523	100-3421

221733

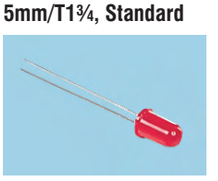
		Price Each				
Colour	**Order Code**	**5+**	**100+**	**250+**	**500+**	**+**
4mm						
Blue	**857-7420**	1.24	1.14	1.01	0.94	– –
Blue	**857-7439**	1.27	1.17	1.04	0.98	– –
Green	**857-7447**	1.50	1.37	1.24	1.14	– –
Green	**857-7455**	1.59	1.46	1.30	1.20	– –
Green	**857-7463**	1.92	1.73	1.56	1.44	– –
Blue	**857-7358**	1.11	1.04	0.91	0.85	– –
Blue	**857-7366**	1.46	1.33	1.20	1.11	– –
Blue	**857-7374**	1.56	1.43	1.27	1.17	– –
Blue	**857-7382●**	2.71	1.64	1.21	0.99	– –
Green	**857-7390**	1.56	1.43	1.27	1.17	– –
Green	**857-7404**	1.46	1.33	1.20	1.11	– –
Green	**857-7412●**	2.71	1.64	1.21	0.99	– –
Blue	**857-6548**	1.89	1.69	1.53	1.43	– –
Red	**857-6556**	0.61	0.56	0.50	0.46	– –
Amber	**857-6564**	0.61	0.56	0.50	0.46	– –
Green	**857-6572**	2.15	1.95	1.76	1.63	– –
Blue	**857-6580**	1.95	1.79	1.59	1.50	– –
Green	**857-6599**	1.92	1.76	1.56	1.46	– –
5mm						
Red	**100-3132●**	0.96	0.63	0.55	0.47	– –
Amber	**100-3133●**	0.96	0.63	0.55	0.47	– –
Red DH AS AlGaAS	**100-3414●**	0.89	0.59	0.51	0.44	– –
Red DH AlGaAS*	**100-3223●**	0.53	0.33	0.28	0.25	– –
Red DH AlGaAS	**100-3228●**	0.68	0.43	0.36	0.32	– –
HE Red	**100-3415●**	0.76	0.50	0.43	0.37	– –
HE Red	**100-3416●**	0.76	0.50	0.43	0.37	– –
HE Red*	**100-3224●**	0.96	0.63	0.55	0.47	– –
Yellow	**100-3423●**	0.76	0.50	0.43	0.37	– –
Yellow	**100-3417●**	0.76	0.50	0.43	0.37	– –
Yellow*	**100-3225●**	0.96	0.63	0.55	0.47	– –
Orange	**100-3424●**	0.96	0.63	0.55	0.47	– –
Orange	**100-3419●**	0.76	0.50	0.43	0.37	– –
Green	**100-3420●**	0.76	0.50	0.43	0.37	– –
Green	**100-3421●**	0.76	0.50	0.43	0.37	– –
Green*	**100-3226●**	0.96	0.63	0.55	0.47	– –

*LEDs **with** stand-offs

5mm Light Emitting Diodes (LEDs)

5mm/T1¾, Standard

AVAGO TECHNOLOGIES



L=9.19, Dia.=5.08
Lead pitch=2.54, Leads=25 x 0.64sq
Cathode identified by flat on body and shorter lead.
LEDs have no stand-offs, except 322-763 and 322-775

Colour	View Angle	Typ Lum Intensity (mcd)	I_F (mA) (max)	PIV (max)	Mftrs. List No.	Order Code
Wide Angle Tinted Diffused Lens						
HE Red	60°	5.4 @ 10mA	25	5	HLMP-3301	100-3211
HE Red	60°	12 @ 10mA	25	5	HLMP-3762	100-3376
Orange	60°	7 @ 10mA	25	5	HLMP-D401	100-3212
Yellow	60°	8 @ 10mA	20	5	HLMP-3401	100-3213

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

	View	Typ Lum	I_F (mA)	PIV	Mftrs.	Order
Wide Angle Tinted Diffused Lens						
Green	60°	5.2 @ 10mA	30	5	HLMP-3507	100-3214
Narrow Angle Tinted Clear Lens						
HE Red	35°	60 @ 10mA	20	5	HLMP-3316	100-3216
Yellow	35°	50 @ 10mA	20	5	HLMP-3416	100-3217
Green	24°	70 @ 20mA	30	5	HLMP-3519	100-3218

FOR SUITABLE MOUNTING CLIP AND RING SEE ORDER CODE 110-5125

221720

		Price Each				
Colour	Order Code	5+	10+	100+	500+	+
HE Red	322-635▲‡	0.40	0.25	0.20	0.18	– –
HE Red	100-3211●	0.48	0.30	0.24	0.21	– –
HE Red	595-524▲‡	0.67	0.45	0.39	0.33	– –
HE Red	100-3376●	0.89	0.59	0.51	0.44	– –
Red	NEW 857-6459	0.29	0.26	0.23	0.22	– –
Orange	322-659▲‡	0.39	0.25	0.20	0.18	– –
Orange	100-3212●	0.48	0.30	0.24	0.21	– –
Yellow	322-672▲‡	0.35	0.22	0.18	0.18	– –
Yellow	100-3213●	0.40	0.25	0.20	0.18	– –
Yellow	NEW 857-6491	0.61	0.56	0.50	0.46	– –
Green	322-696▲‡	0.35	0.22	0.18	0.18	– –
Green	100-3214●	0.40	0.25	0.20	0.18	– –
Green	NEW 655-1403	0.56	0.51	0.46	0.43	– –
HE Red	322-714▲‡	0.39	0.25	0.20	0.18	– –
HE Red	100-3216●	0.48	0.30	0.24	0.21	– –
Yellow	322-726▲‡	0.35	0.25	0.20	0.18	– –
Yellow	100-3217●	0.48	0.30	0.24	0.21	– –
Green	322-740▲‡	0.39	0.25	0.20	0.18	– –
Green	100-3218●	0.48	0.30	0.24	0.21	– –

5mm/T1¾, Standard

SLI/ VISHAY

VCH: L=8.64, Dia=5.08
Lead pitch=2.54, Leads=25 x 0.51sq.
Cathode identified by flat on body, Cathode is shorter lead on CMD64530, longer lead on others.

VISHAY: L=8.6, Dia=5.1
Lead pitch=2.54, Leads=25 x 0.63sq.
Cathode identified by flat on body and shorter lead, LED has stand-offs.

Colour	View Angle	Typ Lum Intensity (mcd)	I_F (mA) (max)	PIV (max)	Mftr	Mftrs. List No.	Order Code
Tinted Diffused Lens							
Red	60°	1.6 @ 20mA	20	5	VISH	TLUR5400	104-5373
Red	80°	1.6 @ 20mA	100	5	SLI	CMD5053	113-9561
Red	150°	0.6 @ 20mA	100	5	SLI	CMD5055	113-9562
Red	65°	6 @ 20mA	35	5	SLI	CMD5753	113-9564
Yellow	65°	6 @ 20mA	35	5	SLI	CMD5353	113-9566
Green	65°	6 @ 20mA	35	5	SLI	CMD64530	113-9559
Tinted Clear Lens							
Red	28°	40 @ 20mA	35	5	SLI	CMD5752	113-9565
Yellow	28°	45 @ 20mA	35	5	SLI	CMD5352	113-9567
Green	35°	25 @ 20mA	35	5	SLI	CMD64520	113-9560

FOR SUITABLE MOUNTING CLIP AND RING SEE ORDER CODE 110-5125

221725

		Price Each			
Colour	Order Code	5+	25+	100+	
Red	104-5373●	0.23	0.20	0.17	
Red	113-9561●	0.82	0.61	0.35	
Red	113-9562●	1.16	0.82	0.50	
Red	113-9564●	1.32	0.98	0.82	
Yellow	113-9566●	1.32	0.98	0.54	
Green	113-9559●	1.32	0.98	0.54	
Tinted Clear Lens		5+	100+	250+	500+	+
Red	113-9565●	1.24	1.17	0.98	0.60	– –
Yellow	113-9567●	1.24	1.17	0.98	0.60	– –
Green	113-9560●	1.23	1.17	0.98	0.48	– –

5mm/T1¾, Standard

LED TECHNOLOGY

L=8.7, Dia=5.0
Lead pitch=2.54, Leads=17.8 x 0.64sq
Recommended lead holes=0.8 dia
Cathode identified by 'flat' on body, except bright red - anode.
LEDs have stand-offs.

Colour	View Angle	Typ Lum Intensity (mcd)	I_F (mA) (max)	PIV (max)	Peak Wavelength	Mftrs. List No.	Order Code
Tinted Diffused Lens							
Green	68°	3.7 @ 10mA	30	5	567nm	L02R5000E1.	178-310
Yellow	68°	3.1 @ 10mA	30	5	585nm	L03R5000E1.	178-311
HE Red	68°	4.3 @ 10mA	30	5	635nm	L4RR5000E1.	178-312
Orange	68°	4.3 @ 10mA	30	5	635nm	L08R5000E1.	178-313
Ultra Bright Red	68°	32 @ 10mA	25	3	660nm	L07R5000E1.	178-314

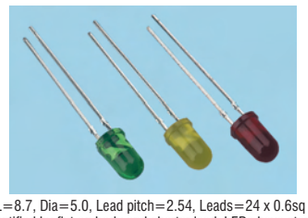
FOR SUITABLE MOUNTING CLIP AND RING SEE ORDER CODE 558-412

221667

		Price Each					
Colour	Order Code	10+	100+	1K+	5K+	+	+
Green	178-310	0.79	0.60	0.46	0.26	– –	– –
Yellow	178-311	0.98	0.66	0.52	0.34	– –	– –
HE Red	178-312	0.47	0.42	0.35	0.32	– –	– –
Orange	178-313	0.85	0.62	0.36	0.26	– –	– –
Ultra Bright Red	178-314	2.13	1.70	0.85	0.72	– –	– –

5mm/T1¾ Standard and High Intensity

VISHAY



L=8.7, Dia=5.0, Lead pitch=2.54, Leads=24 x 0.6sq
Cathode identified by flat on body and shorter lead. LEDs have stand-offs.

Colour	View Angle	Lum Intensity (mcd) @ I_F=10mA min	typ	I_F (mA) (max)	PIV max.	Mftrs. List No.	Order Code
Tinted Diffused Lens							
HE Red	60°	1.6	3.5	30	6	TLHR5400	104-5473
HE Red	60°	4	7	30	6	TLHR5401	104-5474
HE Red	60°	6.3	10	30	6	TLHR5405	104-5475
Green	60°	6.3	15	30	6	TLHG5405	104-5476
Yellow	60°	6.3	10	30	6	TLHY5405	104-5478
Tinted Clear Lens							
HE Red	28°	10	20	30	6	TLHR5200	104-5479
HE Red	28°	16	30	30	6	TLHR5201	104-5480
HE Red	28°	25	40	30	6	TLHR5205	104-5481
Green	28°	40	50	30	6	TLHG5205	104-5482
Untinted Clear Lens							
Green	8°	400*	700*	30	6	TLHG5800	104-5483
Yellow	8°	100*	250*	30	6	TLHY5800	104-5484
Blue	4°	130*	380*	20	5	TLHB5800	104-5418
Tinted Diffused Lens-High Intensity							
Red	60°	35*	70*	50	6	TLDR5400	104-5485
Untinted Clear Lens-High Intensity							
Red	8°	1000*	2500*	50	6	TLDR5800	104-5486
Yellow	8°	1000*	3500*	30	5	TLHE5800	104-5487
Orange	8°	1000*	3500*	30	5	TLHF5800	104-5488

* If = 20mA

206433

		Price Each				
Colour	Order Code	5+	25+	100+	250+	+
Tinted Diffused Lens						
HE Red	104-5473●	0.26	0.23	0.19	0.16	– –
HE Red	104-5474●	0.26	0.23	0.19	0.16	– –
HE Red	104-5475●	0.26	0.23	0.19	0.16	– –
Green	104-5476●	0.31	0.27	0.23	0.18	– –
Yellow	104-5478●	0.29	0.26	0.22	0.17	– –
Tinted Clear Lens						
HE Red	104-5479●	0.26	0.23	0.19	0.16	– –
HE Red	104-5480●	0.26	0.23	0.19	0.16	– –
HE Red	104-5481●	0.26	0.23	0.19	0.16	– –
Green	104-5482●	0.31	0.27	0.23	0.18	– –
Untinted Clear Lens						
Green	104-5483●	0.31	0.27	0.23	0.18	– –
Yellow	104-5484●	0.29	0.26	0.22	0.17	– –
Blue	104-5418●	0.47	0.42	0.35	0.28	– –
Tinted Diffused Lens-High Intensity						
Red	104-5485●	0.48	0.43	0.36	0.29	– –
Untinted Clear Lens-High Intensity						
Red	104-5486●	0.48	0.43	0.36	0.29	– –
Yellow	104-5487●	0.39	0.35	0.29	0.23	– –
Orange	104-5488●	0.35	0.31	0.26	0.21	– –

5mm/T¾, Standard & Hyper Bright

OSRAM

L=8.6, Dia=5.0
Lead pitch=2.54, Leads=0.5 sq x 26,
Cathode identified by flat on body and shorter lead

Colour	View Angle	Lum Intensity (mcd) typ.	I_F (mA) (max)	Mftrs. List No.	Order Code
Tinted Diffused Lens					
HE Red	70°	18 @ 10mA	40	LS5360-JM	121-9687
Green	70°	11 @ 10mA	40	LG5360-HL	121-9684

206449

		Price Each				
Colour	Order Code	5+	25+	100+	250+	+
HE Red	121-9687●	0.39	0.36	0.29	0.23	– –
Green	SMD 121-9684●	0.39	0.36	0.29	0.23	– –

● Compliant
◄ Non-compliant
‡ Limited stock - RoHS replacement available

RoHS

C = CYAN M = Magenta Y = Yellow B = Black/SING

White - High Intensity

TOYODA GOSEI CO.,LTD

5mm - With Standoff

Power Dissipation	120mW
DC Forward Current	30mA
Reverse Current	100mA
Operating Temperature	-30 to 85°C

NEW

Cathode identified by short lead

H = 8.65 (body), L = 25.5mm (cathode lead)

Mftrs. List No.	Colour	Viewing Angle	Luminous Intensity Typ (mcd)	Vf (V) Typ.	If (mA) Max.	Order Code
E1L51-AW0C2-01	White	15°	5000	3.4	100	105-7113
E1L53-AW0C2-01	White	30°	2100	3.4	100	105-7115
E1L33-AW0A2-03	White	35°	1300	3.4	100	105-7117
E1L35-AW0A2-03	White	45°	1000	3.4	100	105-7118
E1L55-AW0C2-01	White	50°	1600	3.4	100	105-7116

419076

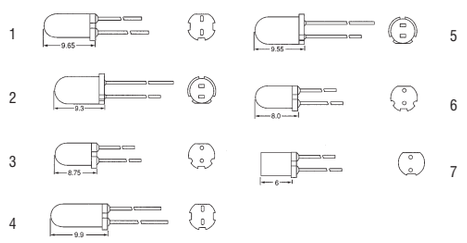
Mftrs. List No.	Order Code	Price Each 1+	10+	25+	100+	+
E1L51-AW0C2-01	**105-7113●**	4.52	3.97	3.68	3.58	– –
E1L53-AW0C2-01	**105-7115●**	4.20	3.71	3.45	3.39	– –
E1L55-AW0C2-01	**105-7116●**	4.52	3.97	3.68	3.58	– –
E1L33-AW0A2-03	**105-7117●**	4.52	3.97	3.68	3.58	– –
E1L35-AW0A2-03	**105-7118●**	4.52	3.97	3.68	3.58	– –

5mm/T1¾, High & Ultrahigh Bright

TOSHIBA

Lead pitch 2.54, leads 21.0 x 0.5sq.

Cathode identified by flat on body and shorter lead.



Colour	View Angle	Lum Intensity (mcd) @ I_F = 20mA min	max	I_F (mA) max.	PIV Max.	Outline	Mftrs. List No.	Order Code
High Bright - Untinted Clear Lens - InGaAlP								
Yellow	22°	850	4140	30	4	2	TLYE157AP	623-600
Ultrahigh Bright- Untitnted Clear Lens - InGaAlP								
Red	30°	272	700*	50	4	3	TLSE156P	325-5530
Red	30°	500	900*	50	4	3	TLRMH156P	325-5487
Red	30°	272	1288	50	4	3	TLRE156AP	325-5499
Red	30°	476	2300	50	4	3	TLSH156P	325-5529
Red	30°	476	2300	50	4	3	TLSH16T(F)	114-1085
Red	30°	272	1288	50	4	3	TLRH156P	623-623
Red	30°	272	1288	50	4	3	TLRH156P(F)	114-1083
Red	22°	700	2240*	50	4	2	TLRMH157P	325-5475
Red	22°	476	2300	50	4	2	TLRE157AP	325-5505
Red	22°	476	1400*	50	4	2	TLSE157P	325-5542
Red	22°	1530	7360	50	4	2	TLSH157P	623-660
Red	22°	1530	7360	50	4	2	TLSH157P(TU,F)	114-1086
Red	20°	153	450*	50	4	3	TLSU156P	325-5554
Red	20°	153	450*	50	4	3	TLSU156P(F)	114-1091
Red	15°	1400	4200*	50	4	8	TLRMH151P	325-5463
Red	8°	1530	7360	50	4	1	TLRE180AP	325-5517
Red	8°	2720	7000	50	4	1	TLRE20TP(F)	114-1082
Red	8°	1530	7360	50	4	1	TLRH180P	325-5451
Red	8°	1530	7360	50	4	1	TLRH180P(F)	114-1084
Red	8°	850	1800*	50	4	1	TLSU180P	325-5566
Red	8°	2720	12880	50	4	1	TLSH180P	623-672
Red	8°	2720	12880	50	4	1	TLSH180P(UV,F)	114-1087
Orange	22°	1530	7360	50	4	2	TLOH157P	623-696
Orange	22°	1530	7360	50	4	2	TLOH157P(TU,F)	114-1076
Orange	8°	2720	12880	50	4	1	TLOH180P	623-702
Orange	8°	2720	12880	50	4	1	TLOH180P(F)	114-1078
Yellow	30°	476	2300	50	4	3	TLYH156P	623-714
Yellow	30°	476	2300	50	4	3	TLYH156P(F)	114-1092
Yellow	22°	850	4140	50	4	2	TLYH157P	623-726
Yellow	22°	850	4140	50	4	2	TLYH157P(F)	114-1093
Yellow	20°	153	570*	50	4	3	TLYU156P	325-5580
Yellow	8°	1530	7360	50	4	1	TLYE180AP.	325-5578
Yellow	8°	2720	12880	50	4	1	TLYH180P	623-738
Yellow	8°	2720	12880	50	4	1	TLYH180P(UV,F)	114-1094
Yellow	6°	850	2600*	50	4	1	TLYU180P	325-5591
Green	20°	--	1400*	50	4	5	TLGE159P	325-5608
Green	20°	--	1400*	50	4	5	TLGE159P(F)	114-1074
Green	7°	--	4500*	50	4	4	TLGE183P	325-5610
Ultrahigh Bright- Untitnted Clear Lens - InGaAlP								
Green	7°	--	4500*	50	4	4	TLGE183P(F)	114-1075
Pure green	30°	47.6	230	50	4	6	TLPGE158P	333-0370
Pure green	30°	85	200	50	4	6	TLPGE18TP(F)	114-1079
Pure green	20°	--	400*	50	4	5	TLPGE159P	325-5621
Pure green	20°	--	400*	50	4	5	TLPGE159P(F)	114-1080
Pure green	7°	--	1200*	50	4	4	TLPGE183P	322-5288
Pure green	7°	--	1200*	50	4	4	TLPGE183P(F)	114-1081
Ultrahigh Bright - Tinted Clear Lens - InGaAlP								
Red	30°	153	300*	50	4	2	TLSU113P	325-5633
Yellow	30°	153	430*	50	4	2	TLYU113P	325-5645
Ultrahigh Bright - Tinted Diffused Lens - InGaAlP								
Red	40°	47.6	100*	50	4	2	TLSU114P	325-5657
Red	40°	47.6	100*	50	4	2	TLSU114P(F)	114-1088
Yellow	40°	47.6	140*	50	4	2	TLYU114P	325-5669

* = Typical Value

Peak emission wavelength (typ.) TLRE=644nm, TLOE=612nm, TLYE=590nm, TLRH=644nm, TLSH=623nm, TLOH=612nm, TLYH=590nm, TLPGA=562nm, TLGE=574nm, TLPGE=562nm, TLRMH=636nm, TLSU=636nm, TLSE=623nm, TLYU=590nm

206415

Colour	Order Code	Price Each 1+	50+	100+	1K+	+
High Bright						
Yellow	**623-600**	1.64	1.26	1.11	– –	– –
Ultrahigh Bright - Untinted Clear Lens - InGaAlP						
Red	**325-5530**	0.94	0.85	0.76	0.65	– –
Red	**325-5487**	0.94	0.85	0.76	0.73	– –
Red	**325-5499**	0.66	0.61	0.54	0.44	– –
Red	**325-5529**	0.97	0.88	0.80	– –	– –
Red	**114-1085●**	0.97	0.88	0.80	– –	– –
Red	**623-623**	1.90	1.54	1.29	0.76	– –
Red	**114-1083●**	1.90	1.54	1.29	0.76	– –
Red	**325-5475**	0.88	0.79	– –	– –	– –
Red	**325-5505**	0.94	0.85	0.76	0.60	– –
Red	**325-5542**	0.94	0.85	0.76	0.63	– –
Red	**623-660**	1.90	1.54	1.29	0.76	– –
Red	**114-1086●**	1.90	1.54	1.29	0.76	– –
Red	**325-5554**	0.41	0.37	0.30	0.29	– –
Red	**114-1091●**	0.41	0.37	0.30	0.29	– –
Red	**325-5463**	0.94	0.88	0.79	– –	– –
Red	**325-5517**	0.97	0.88	0.78	0.62	– –
Red	**114-1082●**	0.97	0.88	0.78	0.62	– –
Red	**325-5451**	0.81	– –	– –	– –	– –
Red	**114-1084●**	0.81	– –	– –	– –	– –
Red	**325-5566**	0.41	0.37	0.30	0.29	– –
Red	**623-672**	1.59	1.30	1.14	0.88	– –
Red	**114-1087●**	1.59	1.30	1.14	0.88	– –
Orange	**623-696**	1.96	1.59	1.33	0.79	– –
Orange	**114-1076●**	1.96	1.59	1.33	0.79	– –
Orange	**623-702**	1.90	1.54	1.29	0.80	– –
Orange	**114-1078●**	1.90	1.54	1.29	0.80	– –
Yellow	**623-714**	1.90	1.54	1.29	0.82	– –
Yellow	**114-1092●**	1.90	1.54	1.29	0.82	– –
Yellow	**623-726**	1.86	1.53	1.33	1.04	– –
Yellow	**114-1093●**	1.86	1.53	1.33	1.04	– –
Yellow	**325-5580**	0.38	0.35	0.33	0.30	– –
Yellow	**325-5578**	0.94	0.85	0.76	0.60	– –
Yellow	**114-1094●**	1.90	1.54	1.29	0.76	– –
Yellow	**623-738**	1.90	1.54	1.29	0.76	– –
Yellow	**325-5591**	0.41	0.37	0.30	0.29	– –
Green	**325-5608**	0.97	0.88	0.78	0.70	– –
Green	**114-1074●**	0.97	0.88	0.78	0.70	– –
Green	**325-5610**	0.97	0.88	0.78	0.66	– –
Green	**114-1075●**	0.97	0.88	0.78	0.66	– –
Pure green	**333-0370**	2.88	2.39	2.17	1.54	– –
Pure green	**114-1079●**	2.88	2.39	2.17	1.54	– –
Pure green	**325-5621**	0.97	0.88	0.78	0.71	– –
Pure green	**114-1080●**	0.97	0.88	0.78	0.71	– –
Pure green	**322-5288**	2.21	1.82	1.73	1.27	– –
Pure green	**114-1081●**	2.21	1.82	1.73	1.27	– –
Ultrahigh Bright - Tinted Clear Lens - InGaAlP						
Red	**325-5633**	0.54	0.48	0.43	0.29	– –
Yellow	**325-5645**	0.41	0.37	0.30	0.29	– –
Ultrahigh Bright - Tinted Diffused Lens - InGaAlP						
Red	**325-5657**	0.41	0.37	0.30	0.29	– –
Red	**114-1088●**	0.41	0.37	0.30	0.29	– –
Yellow	**325-5669**	0.41	0.37	0.30	0.29	– –

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5mm/T1¾, Ultra Bright

Kingbright

L=8.6, Dia.=5; Lead pitch=2.54,
Leads=27 x 0.5sq
Cathode identified by shorter lead
Ligitek
L=9.0, Dia=4.9; Lead pitch=2.54, Leads=25.0 x 0.5sq
Cathode identified by short lead and flat on body

Colour	View Angle	Lum. Intensity (mcd) @ I_F=10mA min.	typ.	I_F (mA) (max.)	PIV (max.)	Order Code
Untinted Clear Lens						
Green	30°	100	300	25	5	637-154
Ultra red	30°	500	1000	30	5	637-166
Ultra red	30°	2000	3500	30	5	637-178
Yellow	32°	37.6	55	60	5	857-6483
Green	24°	170	300	90	5	857-6505
Tinted Diffused Lens						
Yellow	60°	100	500	30	5	328-3811

*=Typ. Luminous Intensity. **=Max. forward voltage

206333

Colour	Order Code	Price Each 5+	100+	1K+	5K+
Green	**637-154▲**	0.34	0.29	0.25	0.13
Ultra red	**637-166▲**	0.44	0.34	0.18	0.12
Ultra red	**637-178▲**	0.47	0.43	0.39	0.33
Yellow	**857-6483**	0.51	0.46	0.41	0.38
Green	**857-6505**	0.72	0.64	0.57	0.53
		5+	**50+**	**100+**	**500+**
Yellow	**328-3811▲**	0.75	0.63	0.53	0.36

5mm/T1¾, Low Current

Kingbright

L=8.6, Dia=5.9,Lead
pitch=2.54, Leads=27 x 0.5sq

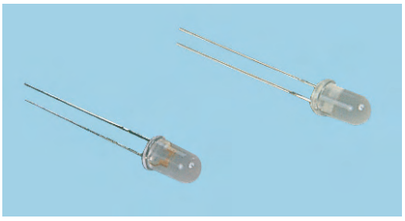
Colour	View Angle	Lum. Intensity (mcd) @ I_F=2mA min.	typ.	I_F (mA) max	PIV max	Order Code
Tinted Diffused Lens						
HE Red	60°	0.8	5	7	5	637-087
Green	60°	0.8	3.2	7	5	637-099
Yellow	60°	0.8	3.2	7	5	637-105
Ultra red	60°	8	20	30	5	637-117

206335

Colour	Order Code	Price Each 5+	100+	1K+	5K+
HE Red	**637-087▲**	0.30	0.21	0.13	0.09
Green	**637-099▲**	0.30	0.27	0.17	0.09
Yellow	**637-105▲**	0.27	0.19	0.12	0.09
Ultra red	**637-117▲**	0.40	0.32	0.16	0.12

Bicolour, 5mm/T1

LED TECHNOLOGY



178-318, 178-319, 178-320, L=8.9, Dia=5.08
Lead pitch=2.54, Leads=22 x 0.5sq

TLMP5491 L=8.65, Dia=5.0
Lead pitch=2.54, Leads=25 x 0.5sq. LED has stand-offs.
Green cathode identified by flat on body and shorter lead (HE Red cathode on HE Red/Yellow).

Bicolour LEDs have two diodes connected in inverse parallel. AC operation gives a third intermediate colour, e.g. red + green gives orange.

Colour	View Angle	Typ Lum. Intensity (mcd)	I_F (mA) (max.)	Mftrs. List No.	Order Code
Untinted Diffused Lens					
HE Red and Green	90°	5/4.8 @ 20mA	25	L24R5005K2P2.	178-318
HE Red and Yellow	90°	5/4.5 @ 20mA	25	L34R5005K2P2.	178-319
Green and Yellow	90°	4.8/4.5 @ 20mA	25	L23R5005K2P2.	178-320

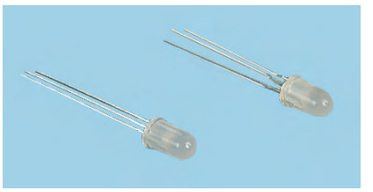
FOR SUITABLE MOUNTING CLIP SEE ORDER CODE 233-547

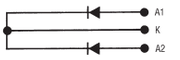
221743

Colour	Order Code	Price Each 1+	50+	100+	1K+
HE Red and Green	**178-318**	3.33	2.94	2.31	1.77
HE Red and Yellow	**178-319**	3.33	2.94	2.31	1.26
Green and Yellow	**178-320**	3.05	2.67	2.01	1.24

Tricolour, 5mm/T1¾

AVAGO TECHNOLOGIES VISHAY





178-296
L=8.6, Dia=5.0
Leads on 2.54 PCD
with stand-offs
Leads L=24 x 0.5sq

HLMP4000
L=8.6, Dia=5.0
Leads spacing 1.27
(leads in line), no stand-offs
Leads L=25 x 0.51sq

178-296
A1=Green (longest lead)
A2=Orange/Red (shortest lead)
HLMP4000
A2=Red (short lead)
K=Common cathode (centre lead)

Two colour LEDs connected common cathode. Both diodes connected gives third intermediate colour.

Colours	View Angle	Typ Lum. Intensity (mcd)	I_F (mA) (max.)	Mftr.	Mftrs. List No.	Order Code
Ultra Bright - Untinted Clear Lens						
Orange-Red and Green	60°	6 @ 20mA	30mA	VISH	TLUV5300.	178-296
HE Red and Green	65°	5/8 @ 10mA	30mA	AGI	HLMP-4000	100-3244
Orange-Red and Green	60°	/ @ 20mA		AGI	TLUV5300	104-5375

FOR SUITABLE MOUNTING CLIP AND RING FOR HLMP4000 SEE ORDER CODE 233-547

221744

Order Code	Price Each 5+	25+	100+	250+
178-296▲‡	0.77	0.68	0.57	0.46
100-3244●	1.58	0.89	0.62	0.49
104-5375●	0.77	0.68	0.57	0.46

Tricolour, 5mm/T1¾

Kingbright

L=8.6, Dia=5, Lead spacing=2.54 (in-line)
Lead length A1=20.5 K=24.5
A2=22.5

Order Code	Mftrs. List No.	Anode (A) Pin No. 1	Cathode Pin No. 2	Anode (B) Pin No. 3
637-282	L-59EGC.	Red	Common	Green
116-8662	L-59EYC	Red	Common	Yellow
637-300	L-59GYC.	Green	Common	Yellow
637-312	L-59SRSGC.	Red	Common	Green

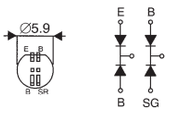
Colour	View Angle	Lum Intensity (mcd) @ 20mA min	typ	I_F (mA) max	PIV	Order Code
Untinted Clear Lens						
HE Red and Green	24°	100/50	300/200	30/25	5	637-282
HE Red and Yellow	24°	100/30	300/80	30/30	5	116-8662
Green and Yellow	24°	50/30	200/80	25/30	5	637-300
Ultra Red and Ultra Green	24°	300/80	700/200	30/25	5	637-312

206339

Colour	Order Code	Price Each 1+	50+	100+	500+	+
HE Red and Green	**637-282▲**	0.85	0.63	0.50	0.30	– –
HE Red and Yellow	**116-8662●**	1.23	1.14	1.02	0.87	– –
Green and Yellow	**637-300▲**	0.57	0.46	0.42	0.21	– –
Ultra Red and Ultra Green	**637-312▲**	0.78	0.56	0.50	0.30	– –

5mm/T1¾, Full Colour RGB

Kingbright



L=8.6, Dia.=5.0, Lead pitch=2.54,
Leads=21.5 x 0.5sq, Centre pin anode.

Colour	View Angle	Lum. Intensity (mcd) @ I_F=20mA min.	typ.	I_F (mA) (max.)	PIV (max.)	Order Code
Water Clear Lens						
HE Red	15°	90	200	30	5	116-8572
Green		50	150	25	5	
Blue		12.5	40	30	5	
Blue		12.5	40	30	5	
White Diffused Lens						
HE Red	30°	20	90	30	5	116-8585
Green		10	70	25	5	
Blue		3.2	12.5	30	5	
Blue		3.2	12.5	30	5	

● Compliant
◄ Non-compliant
‡ Limited stock - RoHS replacement available

RoHS

C = CYAN M = Magenta Y = Yellow B = Black/SING

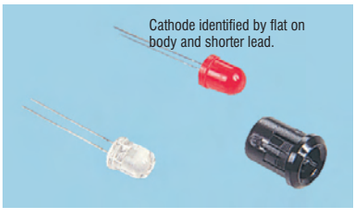
206386

	Order Code	Price Each 1+	25+	50+	100+	+
Water clear	116-8572●	15.69	12.69	8.40	5.31	– –
White diffused	116-8585●	15.82	12.47	8.01	5.18	– –

8mm & 10mm Light Emitting Diodes (LEDs)

8mm, Standard and Ultrabright

Kingbright



L=11, Dia=8.0 , Lead pitch=2.54, Leads=25.5 x 0.5 sq
Black plastic mounting clip: Bezel dia=14
Back of panel dia=12, Depth=13.5

Colour	View Angle	Typ. Lum. Intensity (mcd)	I_F (mA) (max)	PIV (max.)	Peak Wavelength	Order Code
Tinted Diffused Lens						
HE Red	50°	150 @ 20mA	30	5	625nm	179-020
Green	50°	70 @ 20mA	30	5	565nm	179-021
Yellow	50°	70 @ 20mA	30	5	590nm	179-022
Ultra Bright-Tinted Diffused Lens						
Red	60°	200 @ 20mA	30	5	660nm	179-023
Red	60°	350 @ 20mA	30	5	660nm	179-024
Red	60°	550 @ 20mA	30	5	660nm	253-637
Ultra Bright-Untinted Clear Lens						
Red	40°	1000 @ 20mA	30	5	660nm	179-025
Red	40°	3000 @ 20mA	30	5	660nm	253-649

206249

Colour	Order Code	Price Each 5+	50+	100+	250+
HE Red	179-020▲	0.56	0.51	0.44	0.32
Green	179-021▲	0.56	0.51	0.44	0.32
Yellow	179-022▲	0.56	0.51	0.44	0.32
Red	179-023▲	1.04	0.72	0.53	0.23
Red	179-024▲	0.38	0.33	0.29	0.21
Red	253-637▲	2.02	1.79	1.43	1.17
Red	179-025▲	0.81	0.60	0.41	0.22
Red	253-649▲	2.38	2.18	1.63	1.37
Mounting clip	179-037	0.48	0.41	0.28	0.19

Flashing, 8mm and 10mm

Kingbright

Standard and Ultrabright

Lead pitch=2.54,
Leads=25.5 x 0.5sq
Cathode identified by shorter lead.

Note: Internally current controlled. Unsuitable for use with a voltage dropping series resistor.

Black plastic mounting clips	8mm LED clip	10mm LED clip	Black plastic mounting clips	8mm LED clip	10mm LED clip
Bezel dia.	14	16	Back of panel depth	13.5	15
Back of panel dia.	12	14			

Flash rate	1.5 - 2.5Hz	Forward current I_F	38 - 56mA (typ)
Forward voltage V_F	min 3.5V, max 12V	Reverse voltage V_R	0.5V

Type	Colour	View Angle	Typ Lum Intensity (mcd)	Peak Wavelength	Order Code
8mm Tinted Diffused Lens					
Standard	HE Red	60°	100 @ 9V	625nm	116-8544
Ultrabright	Red	60°	400 @ 9V	660nm	116-8545
8mm Untinted Clear Lens					
Ultrabright	Red	40°	1000 @ 9V	660nm	116-8559
10mm Tinted Diffused Lens					
Standard	HE Red	60°	100 @ 9V	625nm	116-8548
Ultrabright	Red	60°	400 @ 9V	660nm	116-8554
10mm Untinted Clear Lens					
Ultrabright	Red	40°	1000 @ 9V	660nm	116-8568

206252

Colour	Order Code	Price Each 1+	50+	100+	250+
8mm					
HE Red	116-8544●	1.26	1.20	1.14	1.08
Red	116-8545●	1.68	1.11	0.93	0.74
Red	116-8559●	1.47	1.11	0.75	0.74
10mm					
HE Red	116-8548●	2.22	1.98	1.62	1.08
Red	116-8554●	1.68	1.11	0.93	0.74
Red	116-8568●	1.68	1.11	0.93	0.74
Mounting Clips		5+	50+	100+	250+
8mm	179-037	0.48	0.41	0.28	0.19
10mm	179-038	0.55	0.44	0.35	0.22

10mm, Standard and Ultrabright

Kingbright

L=13.5, Dia=10.0
Lead pitch=2.54, Leads=25.5 x 0.5sq
Black plastic mounting clip:
Bezel dia=16
Back of panel dia=14, Depth=15
Cathode identified by shorter lead.

Colour	Peak Wavelength	View Angle	Typ. Lum. Intensity (mcd)	I_F (mA) (max)	PIV (max)	Order Code
Tinted Diffused Lens						
HE Red	625nm	60°	150 @ 20mA	30	5	116-8543
Green	565nm	60°	70 @ 20mA	30	5	114-2462
Yellow	590nm	60°	70 @ 20mA	30	5	114-2474
Ultra Bright - Tinted Diffused Lens						
Red	660nm	60°	200 @ 20mA	30	5	114-2464
Red	660nm	60°	350 @ 20mA	30	5	114-2465
Red	660nm	60°	550 @ 20mA	30	5	114-2467
Ultra Bright - Untinted Clear Lens						
Red	660nm	40°	1000 @ 20mA	30	5	114-2466
Red	660nm	40°	3000 @ 20mA	30	5	114-2469

206250

Colour	Order Code	Price Each 5+	50+	100+	250+
HE Red	116-8543●	0.56	0.51	0.44	0.32
HE Red	116-8543●	0.56	0.51	0.44	0.32
Red	114-2464●	1.05	0.93	0.78	0.38
Red	114-2465●	0.68	0.63	0.48	0.28
Red	114-2467●	2.02	1.79	1.43	1.17
Red	114-2466●	0.56	0.54	0.48	0.29
Red	114-2469●	2.25	2.12	1.56	1.33
Green	114-2462●	0.56	0.51	0.44	0.32
Yellow	114-2474●	0.56	0.51	0.44	0.32
Mounting Clip	179-038	0.55	0.44	0.35	0.22

10mm, Ultrahigh Bright

TOSHIBA

L=15.1, Dia=10.0
Lead pitch=2.54,
Leads=21.0 0.5sq
Cathode identified by flat on body and shorter lead

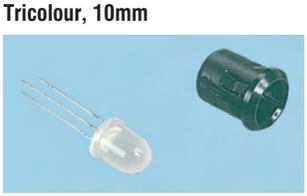
Colour	View Angle	Lum. Intensity (med) @ I_F 20mA min	max	I_F (mA) max	PIV max	Order Code
Untinted Clear Lens - InGaALP						
Red	4°	4760	23000	50	4	623-441 / 120-1935
Orange	4°	8500	41400	50	4	623-453 / 114-1066
Yellow	4°	8500	41400	50	4	114-1067 / 114-1067

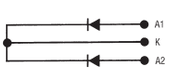
206404

Colour	Order Code	Price Each 1+	25+	50+	100+	+
Red	623-441	5.92	4.82	3.50	2.35	– –
Red	120-1935●	5.92	4.82	3.50	2.35	– –
Orange	623-453	6.46	4.82	3.69	2.63	– –
Orange	114-1066●	6.46	4.82	3.69	2.63	– –
Yellow	623-465	12.56	10.44	7.95	4.90	– –
Yellow	114-1067●	12.56	10.44	7.95	4.90	– –

Tricolour, 10mm

Kingbright





L=13.5, Dia=9.8
Lead spacing= 2.54 (leads in line)
Leads=24.5 x 0.5sq

Black plastic mounting clip:
Bezel dia=16
Back of panel dia=14, Depth=15

K= Common cathode centre lead)
A2=Red (kinked lead)

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Colour	View Angle	Lum. Intensity (mcd) @ 20mA Min.	typ.	I_F (mA) (max)	PIV (max)	Peak Wavelength	Order Code
Untinted Diffused Lens							
HE Red and Green	50°	30/20	90/60	30/25	5	625/565nm	179-032
Untinted Clear Lens							
HE Red and Yellow	50°	30/20	90/60	30/30	5	625/625nm	637-324
Green and Yellow	50°	20/20	60/60	25/30	5	590/590nm	637-336
Ultra Red and Green	50°	100/40	300/70	30/25	5	660/660nm	637-348

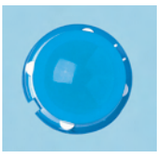
206251

Colour	Order Code	Price Each 5+	50+	100+	250+
HE Red and Green	**179-032▲**	1.41	1.20	0.93	0.69
HE Red and Yellow	**637-324▲**	1.76	1.44	1.32	0.69
Green and Yellow	**637-336▲**	1.68	1.56	1.47	0.69
Ultra Red and Green	**637-348▲**	1.30	1.27	1.24	0.78
Mounting clip	**179-038**	0.55	0.44	0.35	0.22

20mm Light Emitting Diodes (LEDs)

20mm Blue LED

Kingbright



For the first time here is a large diameter blue LED which offers excellent visibility in ambient daylight with viewing distances up to 11 metres. It has a wide viewing angle and low power consumption.

H=13.70, Lens Dia. 20.0, Bezel Dia. 23.0
Pin Spacing=2.54, Row spacing=15.20, Lead L=5.70

Colour	Typ Lum. Intensity (mcd)/LED @ 10mA min.	max.	I_F (max)	V_F (typ)	Peak Wavelength	PIV (max)	Mftrs. List No.	Order Code
Blue	12.5	50	30	3.3 - 4.0	470nm	5	DLC/6MBD.	428-2735

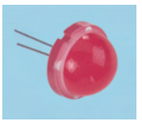
Viewing angle = 120°

206649

Colour	Order Code	Price Each 1+	10+	25+	50+	+
Blue	**428-2735**	15.06	14.36	13.23	11.86	– –

20mm, Standard

Kingbright



L=13.5, Dia=20
Lead spacing=2.54,
Leads=27 x 0.6sq
Cathode identified by shorter lead

Colour	Peak Wavelength	View Angle	Lum Intensity (mcd) min.	typ.	@ I_F (mA)	I_F (mA) (max)	PIV (max)	Order Code
Tinted Diffused Lens								
Ultra red	660	120°	50	80	20	30	5	114-2477
HE Red	625	120°	4	13	10	25	5	114-2476
Yellow	590	120°	2.5	80	10	30	5	114-2478
Green	565	120°	8	8.3	10	25	5	114-2475

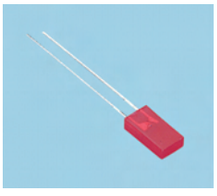
206346

Colour	Order Code	Price Each 1+	25+	100+	+
HE Red	**114-2476●**	1.56	1.37	1.16	– –
Green	**114-2475●**	1.56	1.37	1.16	– –
Ultra red	**114-2477●**	1.53	1.39	– –	– –
Yellow	**114-2478●**	1.56	1.37	1.16	– –

Square, Rectangular & Side Viewing LEDs

Rectangular, 2.0mm x 5.0mm

FAIRCHILD SEMICONDUCTOR™



H=5, W=2, H=7.5
Lead pitch=2.54,
Leads=25.4
Cathode identified by flat on body and shorter lead

Colour	Lum Intensity (mcd) @ I_F=10mA min.	View Angle	Lum Intensity (mcd) @ I_F=10mA min.	typ.	I_F (mA) (max)	PIV (max)	Mftrs. List No.	Order Code
Tinted Diffused Lens								
Red	635	100°	1	4	30	5	MV57123	102-1273
Yellow	585	100°	1	4	20	5	MV53123	102-1268
Green	562	100°	1	4	30	5	MV54123	102-1271

228638

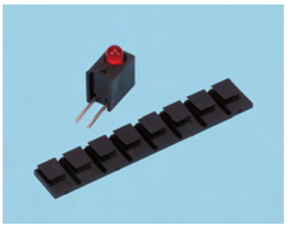
Colour	Order Code	Price Each 5+	10+	100+	250+	+
Tinted Diffused Lens						
Red	**102-1273●**	0.65	0.51	0.36	0.24	– –
Yellow	**102-1268●**	0.40	0.35	0.26	0.19	– –
Green	**102-1271●**	0.65	0.51	0.36	0.24	– –

PCB Mounting LEDs

3mm/T1

MARL

Standard and Low Current



Viewed from front, pins downward, anode is left pin.
A 8 way tie bar is available separately enabling the LEDs to be accurately mounted as arrays.

3mm – H=8.3 (body), W=4.6, D=6.3 (body)
Lead pitch=2.54, Leads=5.0 x 0.5sq.

Colour	View Angle	Lum. Intensity (mcd) @ I_F = 20mA (typ)	I_F (max)	V^F(typ)	PIV (max)	Mftrs. List No.	Order Code
Red	30°	35	20	2.2	5	113-305-04	973-9190
Yellow	30°	20	20	2.2	5	113-311-04	973-9203
Green	30°	20	20	2.2	5	113-314-04	973-9211
Low Current							
Red	30°	3.5*	2	1.9	5	113-305-01	973-9220
Yellow	30°	2*	2	1.9	5	113-311-01	973-9238
Green	30°	2*	2	1.9	5	113-314-01	973-9246

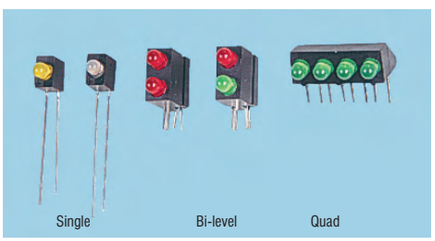
206532

Colour	Order Code	Price Each 5+	25+	100+	250+	+
Red	**973-9190●**	0.79	0.76	0.69	0.52	– –
Yellow	**973-9203●**	0.79	0.76	0.69	0.52	– –
Green	**973-9211●**	0.79	0.76	0.69	0.52	– –
Low Current						
Red	**973-9220●**	0.94	0.80	0.74	0.52	– –
Yellow	**973-9238●**	0.94	0.80	0.74	0.52	– –
Green	**973-9246●**	0.94	0.80	0.74	0.52	– –
		5+	**100+**	**250+**		
Tie Bar	**973-6956●**	0.83	0.72	0.66		

3mm/T1

MARL

Single, Bi-colour, Bi-level and Quad



Single	Bi-level	Quad
H=6.2, W=4.0, D (body)=5.2	H=10.16, W=5.08,	H=6.7, W=17.6, D (body)=9.3
Lead pitch=2.54	D (body)=10	Lead pitch=2.54
Leads=21 x 0.5sq.	Lead pitch=2.54 x 2.54	LED pitch=4.4
	Leads=3.75 x 0.5sq.	Leads=5.0 x 0.5sq.

Viewed from front, pins downward, anode is left hand pin on single (red bi-colour) and quad types, right hand pin on bi-level types.

Colour	View Angle	Typ Lum Intensity (mcd)	Mftrs. List No.	Order Code
Single				
Red	30°	35 @ 20mA	103-305-04.	264-362
Yellow	30°	35 @ 20mA	103-311-04.	264-374
Green	30°	20 @ 20mA	103-314-04.	264-386
Single Bi - colour				
Red over Green	50°	25 / 25 @ 20mA	103-330-04.	264-398
Bi - Level				
Red over Red	30°	35 @ 20mA	122-305-04.	264-404
Green over Green	30°	20 @ 20mA	122-314-04.	264-428
Red over Green	30°	35 / 20 @ 20mA	122-000-04-52.	264-430
Quad				
Red x 4	30°	35 @ 20mA	107-305-04.	264-441
Green x 4	30°	20 @ 20mA	107-314-04.	264-453

IF (max) = 25mA (all types). PIV = 3.0V (max) (all types).

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

Colour	Order Code	5+	50+	100+	500+
		Price Each			
Red	264-362‡	1.47	1.29	1.07	0.85
Yellow	264-374‡	1.47	1.29	1.07	0.85
Green	264-386‡	1.47	1.29	1.07	0.85
		1+	50+	100+	500+
Red over Green	264-398‡	4.35	3.65	2.96	2.37
Red over Red	264-404‡	2.14	1.92	1.61	1.48
Green over Green	264-428‡	2.14	1.92	1.61	1.48
Red over Green	264-430‡	3.87	3.15	2.65	1.64
Red x 4	264-441‡	4.73	4.20	3.43	3.15
Green x 4	264-453‡	4.73	4.20	3.43	3.15

Colour	View Angle	Typ Lum Intensity (mcd)	Mftrs. List No.	Order Code
Single				
Red	30°	35 @ 20mA	103-305-04	973-7286
Yellow	30°	35 @ 20mA	103-311-04	973-7294
Green	30°	20 @ 20mA	103-314-04	973-7308
Single Bi - colour				
Red over Green	50°	25 / 25 @ 20mA	103-330-04	973-7316
Bi - Level				
Red over Red	30°	35 @ 20mA	122-305-04	973-7324
Green over Green	30°	20 @ 20mA	122-314-04	973-7332
Red over Green	30°	35 / 20 @ 20mA	122-000-04-52	973-7340
Quad				
Red x 4	30°	35 @ 20mA	107-305-04	973-7359
Green x 4	30°	20 @ 20mA	107-314-04	973-7367

IF (max) = 25mA (all types). PIV = 3.0V (max) (all types).

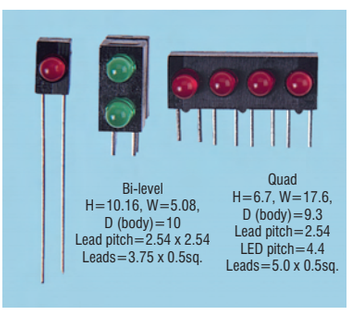
206272

Colour	Order Code	5+	50+	100+	500+
		Price Each			
Red	973-7286●	1.47	1.29	1.07	0.85
Yellow	973-7294●	1.47	1.29	1.07	0.85
Green	973-7308●	1.47	1.29	1.07	0.85
		1+	50+	100+	500+
Red over Green	973-7316●	4.35	3.65	2.96	2.37
Red over Red	973-7324●	2.14	1.92	1.61	1.48
Green over Green	973-7332●	2.14	1.92	1.61	1.48
Red over Green	973-7340●	3.87	3.15	2.65	1.64
Red x 4	973-7359●	4.73	4.20	3.43	3.15
Green x 4	973-7367●	4.73	4.20	3.43	3.15

3mm/T1 Low Current

MARL

Single, Bi-level and Quad



Single
H=6.2, W=4.0,
D (body)=5.2
Lead pitch=2.54
Leads=21 x 0.5sq.

Bi-level
H=10.16, W=5.08,
D (body)=10
Lead pitch=2.54 x 2.54
Leads=3.75 x 0.5sq.

Quad
H=6.7, W=17.6,
D (body)=9.3
Lead pitch=2.54
LED pitch=4.4
Leads=5.0 x 0.5sq.

Colour	View Angle	Typ. Lum. Intensity (mcd)	I_F (mA) (max.)	Mftrs. List No.	Order Code
Single					
Red	30°	1.5	2	103-305-01	973-8223
Yellow	30°	1.5	2	103-311-01	973-8231
Green	30°	2	2	103-314-01	973-8240
Bi-Level					
Red	30°	1.5	2	122-305-01	973-8258
Yellow	30°	1.5	2	122-311-01	973-8266
Green	30°	2	2	122-314-01	973-8274
Quad					
Red4	30°	1.5	2	107-305-01	973-8282
Green4	30°	2	2	107-314-01	973-8290
Red/Green/Red/Green	30°	1.5 / 2	2 / 2	107-000-01-50	973-8304

221692

Colour	Order Code	1+	25+	100+	250+	+
		Price Each				
Single						
Red	973-8223●	1.54	1.29	1.10	0.72	– –
Yellow	973-8231●	1.54	1.29	1.10	0.79	– –
Green	973-8240●	1.54	1.29	1.10	0.72	– –
Bi-Level						
Red	973-8258●	3.28	2.78	2.43	1.49	– –
Yellow	973-8266●	3.62	2.96	2.27	1.49	– –
Green	973-8274●	3.28	2.78	2.43	1.67	– –
Quad						
Red x 4	973-8282●	7.43	6.02	5.29	2.33	– –
Green x 4	973-8290●	7.56	5.17	4.63	2.33	– –
Red/Green/Red/Green	973-8304●	6.68	5.67	5.10	3.49	– –

3mm/T1 5 Volt

MARL

Single

H = 6.2, W = 4.0, D (body) = 5.2
Lead pitch = 2.54, Leads = 21 x 0.5sq.

Colour	View Angle	Typ Lum Intensity	I_F (mA) (max.)	Mftrs. List No.	Order Code
Red	60°	8mCd	10	103-381-20	973-8347
Green	60°	8mCd	10	103-383-20	973-8355

221694

Colour	Order Code	1+	25+	100+	250+	+
		Price Each				
Single						
Red	973-8347●	2.02	1.61	1.32	1.05	– –
Green	973-8355●	2.02	1.61	1.32	0.76	– –

5mm/T1¾

AVAGO TECHNOLOGIES

Standard

H = 6.2, W = 6.2, D (body) = 9.0
Lead pitch = 2.54, Lead length = 3.7
Leads - 0.45sq (HLMP3301/3401/3507)
0.64sq 9HLMP3001/3105/3600/3680)
Cathode is right hand pin (viewed from front, pins downward)

Colour	View Angle	Typ Lum Intensity (mcd)	I_F (mA) (max.)	PIV (max.)	Mftrs. List No.	Order Code
Tinted Diffused Lens						
HE Red	60°	7 @ 10mA	25	5	HLMP-3301-F00B2	100-3372
Yellow	60°	8 @ 10mA	20	5	HLMP-3401-E00B2	100-3373
Green	60°	5.2 @ 10mA	25	5	HLMP-3507-D00B2	100-3374

206696

Colour	Order Code	5+	10+	100+	500+	10+
		Price Each				
HE Red	100-3372●	0.89	0.59	0.51	0.44	0.59
Yellow	100-3373●	0.89	0.59	0.51	0.44	0.59
Green	100-3374●	0.89	0.59	0.51	0.44	0.59

5mm/T1¾

AVAGO TECHNOLOGIES

Low Current

H=6.2, W=6.2, D=9.0 (body)
Lead Pitch=2.54, Leads=4.1 x 0.45sq.

Flat on body denotes cathode

Colour	View Angle	Typ. Lum. Intensity (mcd)	I_F (mA) (max)	PIV max	Mftrs. List No.	Order Code
Tinted Diffused Lens						
Red	50°	2 @ 2mA	7	5	HLMP-4700-C00B2	100-3377
Yellow	50°	1.8 @ 2mA	7	5	HLMP-4719-A00B2	100-3378
Green	50°	1.8 @ 2mA	7	5	HLMP-4740-A00B2	100-3381

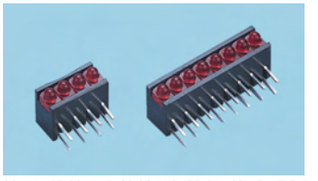
206403

Colour	Order Code	5+	10+	100+	500+	10+
		Price Each				
Red	100-3377●	0.91	0.62	0.52	0.46	0.62
Yellow	100-3378●	0.91	0.62	0.52	0.46	0.62
Green	100-3381●	0.91	0.62	0.52	0.46	0.91

2mm

MENTOR

4, 8 & 10 LED Arrays



H=5.08, W=10.16, (x 4) 20.32 (x 8) 25.4 (x 10), D=7.5 (body)
Lead pitch=2.54, Row spacing=2.54, Leads=3.3 x 0.5sq
Rear pins are anode.

Colour	View Angle	Lum Intensity (mcd) @ I_F 10mA min	(max)	1_F(mA) max	PIV (max)	Mftrs. List No.	Order Code
Red x 4	20°	1	3.2	50	6	RTZ2041R	121-5806
Red x 8	20°	1	3.2	50	6	RTZ2081R	121-5807
Red x 10	20°	1	3.2	50	6	RTZ2101R	121-5808

206395

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

Colour	Order Code	1+	10+	25+	50+	+
		Price Each				
Red x 4	121-5806	8.98	8.22	7.34	6.32	– –
Red x 8	121-5807	14.49	13.23	11.91	8.88	– –
		1+	25+	50+	100+	+
Red x 10	121-5808	19.94	17.92	14.46	10.18	– –

LED Accessories

3mm, 5mm LED Spacers and Holders

multicomp

Square 2 Pin, 5mm x 5mm | Round 2 Pin, 5mm | Round 2 Pin, 3mm | Round 3 Pin, 5mm | Right Angle 2 Pin, 3mm

206584

Mftrs. List No.	Height (mm)	O/A Dia	Order Code	25+	100+	500+	1K+
				Price Each			
Square 2 Pin LED Holder - 5mm × 5mm							
LEDX-3	3	—	955-5013●	0.20	0.15	0.14	0.09
LEDX-4	4	—	955-5021●	0.19	0.14	0.14	0.09
LEDX-5	5	—	955-5030●	0.19	0.14	0.14	0.09
LEDX-6	6	—	955-5048●	0.19	– –	– –	– –
LEDX-7	7	—	955-5056●	0.19	0.14	0.14	0.06
LEDX-8	8	—	955-5064●	0.19	– –	– –	– –
LEDX-9	9	—	955-5072●	0.20	0.19	0.14	0.09
LEDX-10	10	—	955-5080●	0.19	– –	– –	– –
LEDX-11	11	—	955-5099●	0.19	0.17	0.14	0.09
LEDX-12	12	—	955-5102●	0.23	0.19	0.16	0.11
Round 2 Pin LED Holder - 5mm							
LED-2A	2	5	955-5110●	0.15	0.13	0.11	0.06
LED-3A	3	5	955-5137●	0.15	0.13	0.11	0.06
LED-4.5A	4.5	5	955-5145●	0.15	0.13	0.11	0.06
LED-6.5A	6.5	5	955-5153●	0.15	0.13	0.11	0.06
LED-10	10	5	955-5161●	0.15	0.13	0.11	0.06
LED-13	13	5	955-5170●	0.19	0.14	0.14	0.09
LED-16	16	5	955-5188●	0.19	0.14	0.14	0.09
LED-17	17	5.6	955-5196●	0.19	0.14	0.14	0.09
LED-20	20.2	5	955-5200●	0.19	0.14	0.14	0.09
LED-22	22	5.1	955-5218●	0.19	0.17	0.14	0.09
LED-23	23	5.1	955-5226●	0.19	0.17	0.14	0.09
Round 2 Pin LED Holder - 3mm							
LED3-3	3	4.2	955-5234●	0.15	0.13	0.11	0.06
LED3-4	4	4.2	955-5242●	0.15	0.13	0.11	0.06
LED3-5	5	4.2	955-5250●	0.16	0.13	0.11	0.06
LED3-6	6.1	4.2	955-5269●	0.15	0.13	0.11	0.06
LED3-10	10	4.2	955-5277●	0.15	0.13	0.11	0.06
LED3-13	13	4.2	955-5285●	0.19	0.14	0.14	0.09
LED3-16	16	4.2	955-5293●	0.19	0.14	0.14	0.09
LED3-17	17	4.2	955-5307●	0.19	0.14	0.14	0.09
LED3-20	20	4.2	955-5315●	0.19	0.14	0.14	0.09
LED3-22	22	4.2	955-5323●	0.19	0.14	0.14	0.09
LED3-23	23	4.2	955-5331●	0.19	0.14	0.14	0.09
Round 3 Pin LED Holder - 5mm							
LED-5SX3	6	7.4	955-5340●	0.16	0.13	0.11	0.06
LED-5X3	6.5	7.4	955-5358●	0.16	0.13	0.11	0.06
LED-5KX3	7.7	7.4	955-5366●	0.16	0.13	0.11	0.06
LED-7X3	8	7.4	955-5374●	0.16	0.13	0.11	0.06
LED-8X3	9	7.4	955-5382●	0.15	0.13	0.11	0.06
LED-8MX3	9.5	7.4	955-5390●	0.15	0.13	0.11	0.06
LED-10X3	11.5	7.4	955-5404●	0.19	0.14	0.14	0.09
LED-16X3	16.1	7.1	955-5412●	0.19	0.14	0.14	0.09
Right Angle LED Holder							
	H x W x D						
LED 2F	6 x 6.1 x 7.8		955-5420●	0.19	0.17	0.14	0.09

5mm/T1¾ and 3mm/T1 LED Holders

Arcolectric

Standard 3mm/T1
L=11.0, Bezel dia.=7.6
Mounting hole dia.=6.3
Max. panel thickness=6.3

Standard 5mm/T1¾
L=14.5, Bezel dia.=9.5
Mounting hole dia=8.0
Max. panel thickness=5.5

Deep reflector 5mm/T1¾
L=17.1, Bezel dia.=10.0
Mounting hole dia.=8.0
Max. panel thickness=7.0

Panel mounting LED holders for 2 lead 5mm/T1¾ and 3mm/T1¾ LEDs. The brass bodies have a polished chrome or black anodised finish. The LED is held in place by a screw-in nylon base 5mm/T1¾ or push fit base 3mm/T1 type.

The deep reflector types are fully recessed with a parabolic shroud which focuses the light output to give a strong directional signal.

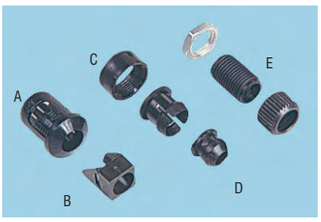
The sealed versions give protection to **IP66** featuring positive sealing of both LED/body and body/panel interfaces.

Mftrs. List No. A104800AAB =145-470 A10500A =232-336
A104800AAC =254-976 A104700CHROME =491-706
A105000 =232-312 A104700BLACK =491-718
A10480A =232-324

206185

Type	Order Code	1+	100+	250+	500+	+
		Price Each				
5mm/T1¾, Non Sealed						
Standard	145-470●	3.62	3.21	2.61	1.20	– –
Standard, Black	254-976●	4.50	3.84	3.02	1.23	– –
Deep Reflector	232-312●	3.66	3.21	2.61	1.45	– –
5mm/T1¾, Sealed						
Standard	232-324●	7.91	6.68	5.13	2.23	– –
Deep Reflector	232-336●	6.36	5.45	4.53	– –	– –
5 Per Pack				Price Per Pack		
3mm/T1, Non-Sealed		1+	20+	50+	100+	+
Standard	491-706●	21.11	17.64	14.27	6.23	– –
Standard, Black	491-718●	21.30	17.64	14.52	6.87	– –

Assemblies, Clips, Rings, Housing



A: 233-523: Prominent Bezel dia=9.5,
Back of panel D=10, Dia=8
233-535: Recessed Bezel dia=9.5,
Back of panel D=12, Dia=8

B: 233-584 / 1175568:
9.0x6.35x6.35

C: C: 233-547 (for HP 5mm/T1¾ LED)
Clip O/D=8.00,
Ring H=4.19, O/D=9.30
Mounting hole dia=6.35,
Panel thickness=3.17 max
558-412
Clip O/D=7.8
Ring H=4.2, O/D=9.2,
Mounting hole dia.=6.3,
Panel thickness=2.7 max.

D: 233-572:
Clip O/D=5.9,
Mounting holde dia.=4.75,
Panel thickness=1.70 max.

E: 323-524
Barrel: L=9.53 x ¼" - 40 UNS-2A
Bezel: L=3.96, Dia=7.92
Mounting hole dia=6.35,
Panel thickness=4.75 max

Panel Mounting Hardware
323-524 consists of a black plastic barrel assembly (with two holes spaced 2.54mm for 5mm/T1¾ LED leads), brass bezel (coloured black) and nut. The black plastic clips and rings provide front panel mounting for 5mm/T1¾ LED's. The one-piece clips provide prominent and recessed bezels for 5mm/T1¾ LEDs and prominent bezels for 3mm/T1 LEDs.

Right Angle Housing
Black plastic right angle housing suitable for HP and other 5mm/T1¾ high dome LEDs.

Mftrs. List No.HLMP-5029 =233-584 / 117-5568HLMP-0103=857-6378
CM4999-003=110-5126

Colour	Order Code	1+	25+	50+	100+	+
		Price Each				
5mm/T1¾ Barrel Assembly						
With black bezel	110-5126●	8.41	7.43	6.52	3.72	– –
5mm/T1¾ Clip and Ring						
T - 1¾ Black Plastic	857-6378●	0.37	0.34	0.31		

206710

Colour	Pk Qty	Order Code	1+	10+	100+
			Price Per Pack		
Clips and Rings					
5mm/T1_3/4	50	110-5125●	15.07	11.59	9.01
5mm/T1_3/4	50	120-8906●	19.50	15.85	13.41
3mm/T1 & 5mm/T1¾ One-piece Clips					
3mm/T1	50	120-8877●	14.65	12.08	7.32
5mm/T1_3/4	25	110-5123●	13.43	10.11	7.78
5mm/T1_3/4	25	110-5124●	13.43	10.11	7.78
5mm/T1¾ Right Angle Housing					
	25	117-5568●	14.09	11.46	– –

Combined Lens/Mounts

	H overall	H above panel	Dia.
5mm/T1¾ standard	10.92	5.59	7.11
5mm/T1¾ low profile	10.92	1.78	7.11
3mm/T1 standard	7.37	3.81	4.83

A combined lens and mount for standard 5mm/T1¾ and 3mm/T1 LEDs, provides increased apparent brightness, wider viewing angle and added protection. Snap in lens/mount from front, and whilst holding this in position insert the LED from the back. The low profile lens/mounts are supplied with a spacer, required for panels less than 4.8mm thick.

Size	Mounting Hole Dia	Max Panel Thickness	Order Code
5mm/T1_3/4	6.35 ± 00.5	1.6 – 3.2	117-5492 to 117-5497
5mm/T1_3/4	6.35 ± 00.5	0.8 – 6.35	117-5500 to 117-5504
3mm/T1	4.34 ± 00.5	0.8 – 1.6	117-5498,117-5499

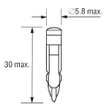
RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

206184

Colour	Order Code	Price Each 5+	25+	100+	500+	+
5mm/T1¾ Standard						
Red	**117-5492**	0.79	0.61	0.47	0.32	– –
Amber	**117-5494**	0.79	0.61	0.47	0.32	– –
	117-5495	0.79	0.61	0.47	0.32	– –
Yellow	**117-5496**	0.79	0.61	0.47	0.32	– –
Clear	**117-5497**	0.79	0.61	0.47	0.32	– –
5mm/T1¾ Low Profile						
Red	**117-5500**	0.79	0.66	0.51	0.41	– –
Amber	**117-5501**	0.79	0.66	0.51	0.41	– –
	117-5502	0.79	0.66	0.51	0.41	– –
Yellow	**117-5503**	0.79	0.66	0.51	0.41	– –
Clear	**117-5504**	0.79	0.66	0.51	0.41	– –
3mm/T1 Standard						
Red	**117-5498**	0.79	0.66	0.47	0.29	– –
Clear	**117-5499**	0.76	0.58	0.44	0.29	– –

Multi-Chip LEDs

Telephone Slide, T5.5 with Integral Resistor

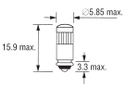


Design features and specifications are identical to Midget Groove.

206354

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+	100+	+
12V dc Red	15051250	**113-9590●**	10.27	8.32	6.27	5.91	– –
12V dc Green	15051251.	**654-450**	10.27	8.32	7.72	6.00	– –
12V dc Yellow	15051252.	**654-462**	10.27	8.32	7.72	5.91	– –
24V dc Red	15051350	**113-9592●**	10.17	8.44	8.13	5.91	– –
24V dc Green	15051351	**113-9591●**	10.27	8.32	6.27	5.91	– –
24V dc Yellow	15051352	**110-5144●**	10.27	8.32	6.27	5.91	– –

Midget Groove, T1¾ with Integral Resistor



Centre contact anode (+)

Supply Voltage	12V	24V	28V
Luminous intensity (typ)			
Yellow	36mCd	63mCd	63mCd
Green	90mCd	90mCd	90mCd
Yellow	63mCd	63mCd	63mCd
Forward Current	14mA	14mA	14mA

Wavelength(nm): Yellow 635, Green 567, Yellow 585. No of LED chips:6
Viewing angle: 140°, operating temp. range -25°C to +60°C

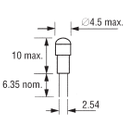
206351

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+	100+	+
12V dc Red	15121250	**110-5134●**	8.28	7.75	7.31	5.49	– –
12V dc Yellow	15121252	**110-5135●**	8.28	7.75	6.33	5.49	– –
12V dc Green	15121251	**113-9581●**	8.28	7.75	6.33	5.49	– –
24V dc Red	15121350	**110-5136●**	8.28	7.75	6.33	5.49	– –
24V dc Yellow	15121352	**110-5138●**	8.28	7.75	7.31	5.49	– –
24V dc Green	15121351	**110-5137●**	8.28	7.75	7.31	5.49	– –
28V dc Red	15121450	**110-5141●**	8.28	7.75	6.33	5.49	– –
28V dc Yellow	15121452	**110-5143●**	8.28	7.75	6.33	5.49	– –
28V dc Green	15121451	**110-5142●**	8.28	7.75	6.33	5.49	– –

Bi-Pin, T1 (4.2mm Head) with Integral Resistor

Polarity indicated by (+)

These devices are fully potted to minimise the possibility of arcing within the narrow space housing the lead wires and resistor.



Supply Voltage	12V	24V	28V
Luminous intensity (typ)			
Red	26mCd	19mCd	19mCd
Green	59mCd	44mCd	44mCd
Yellow	43mCd	32mCd	32mCd
Forward Current	16mA	12mA	12mA

Wavelength(nm): Red 635, Green 567, Yellow 585 No of LED chips 4
Viewing angle to half intensity 140° Operating temp. range-25°C to +60°C

206352

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+	100+	+
12V dc Red	15010250	**113-9594●**	11.25	9.92	7.59	6.98	– –
12V dc Green	15010251	**113-9593●**	11.25	9.92	7.59	6.98	– –
12V dc Yellow	15010252	**113-9595●**	11.25	9.92	7.59	6.98	– –
24V dc Red	15010350	**113-9600●**	11.25	9.92	8.69	6.98	– –
24V dc Green	15010351	**113-9598●**	11.25	9.92	7.59	6.98	– –
24V dc Yellow	15010352	**113-9601●**	11.25	9.92	7.59	6.98	– –
28V dc Red	15010450	**113-9608●**	11.25	9.92	7.59	6.98	– –
28V dc Green	15010451	**113-9607●**	11.25	9.92	7.59	6.98	– –
28V dc Yellow	15010452	**113-9609●**	11.25	9.92	7.59	6.97	– –

MES (E10)

Design features and specifications are identical to corresponding types in MBC/MCC (BA9s) range (see below).

CE approved.

206282

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+	+
12V ac/dc Red	18330250	**466-402**	13.23	12.03	10.46	– –
12V ac/dc Green	18330251.	**466-414**	13.23	12.03	10.46	– –
24V ac/dc Red	18330350	**110-5133●**	13.23	12.03	11.56	– –
24V ac/dc Green	18330351	**466-440**	13.23	12.03	10.46	– –
24V ac/dcYellow	18330352.	**466-451**	13.23	11.02	10.46	– –
		Order Code	**Price Each 5+**	**10+**	**25+**	**+**
Removal Tool		**301-1586**	0.41	0.36	0.32	– –

MBC/MCC (BA9s)

Colour identified by coloured band on low voltage types and by plastic shroud over the metal body on 130V/230V ac types.

Length = 25.0 max.

If the 130V ac or 230V ac types are to be used in applications where there is a possibility of an overload by extremely high noise levels or surge, the device must be protected by fitting a 500mA quick blow fuse in series.

Note: 130V ac types are not suitable for use from 240V ac supplies by using a dropper resistor.

Supply Voltage (nom)	**6V ac/dc**	**12V ac/dc**	**24V ac/dc**
Supply Voltage Tolerance	+10% max	+10% max	+10% max
Luminous intensity (typ. ac)*			
HE Red	110mcd	110mcd	110mcd
Green	95mcd	170mcd	170mcd
Yellow	95mcd	120mcd	120mcd
Operating Current			
HE Red	35mA ac	38mA ac/25mA dc	19mA ac/15mA dc
Green	38mA ac	38mA ac/25mA dc	19mA ac/15mA dc
Yellow	27mA ac	38mA ac/25mA dc	19mA ac/15mA dc

Note: Luminous intensity for dc operation is typically 7% less than for ac

110V ac and 230V ac

Supply voltage 110/130V ac, 230V ac Power rating 490mW
Luminous intensity(typ) Red= 90mcd, Green=130mcd, Yellow=95mcd

Wavelength(nm) Red=635 (12V,24V), Red=660 (6V, 110V, 230V), Green=565, Yellow=585
Viewing angle to half intensity 140° Operating Temp range -20°C to + 50°C
No of LED chips 8

206281

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	50+	100+
6V ac/dc Red	18310113	**113-9578●**	21.86	19.34	15.40	12.56
6V ac/dc Green	18310111	**113-9577●**	21.86	19.34	16.98	12.09
6V ac/dc Yellow	18310112	**464-685**	21.86	19.34	15.40	12.09
12V ac/dc Red	18310250	**110-5128●**	13.73	11.21	10.46	– –
12V ac/dc Green	18310251	**110-5129●**	13.73	12.54	10.46	– –
12V ac/dc Yellow	18310252	**464-715**	13.73	11.21	10.46	– –
24V ac/dc Red	18310350	**110-5130●**	13.73	12.54	11.40	10.46
24V ac/dc Green	18310351	**110-5131●**	13.73	12.54	11.40	10.46
24V ac/dc Yellow	18310352	**110-5132●**	13.73	12.54	11.40	10.46
130V ac Red	18401153	**113-9572●**	18.72	– –	– –	– –
130V ac Green	18401151	**113-9571●**	27.44	– –	– –	– –
130V ac Yellow	18401152	**113-9573●**	27.44	– –	– –	– –
230V ac Red	18411153	**113-9576●**	45.86	42.24	32.41	28.36
230V ac Green	18411151	**113-9574●**	27.44	– –	– –	– –
230V ac Yellow	18411152.	**466-360**	27.44	– –	– –	– –
			5+	**10+**	**25+**	**+**
Removal Tool		**301-1586**	0.41	0.36	0.32	– –

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Multi-Chip LED, Bulb Replacements

15mm Bayonet (BA15s) Polarized

Dia. - Body = 14.99mm,
Lens = 24.89mm
Length O/A = 38.74mm

- Use 90% less energy than incandescent
- Long life - up to 100K hours
- No heat generated
- Resistant to shock and vibration
- AlInGap and InGaN technology

Mftrs. List No.	Colour	Voltage (Vdc)	Current (mA)	Intensity (mcd)
5864601103	Red	14	30	17325
5864601105	Red	28	30	17325
5864602103	Green	14	20	21000
5864602105	Green	28	20	21000
5864603103	Yellow	14	30	17325
5864603105	Yellow	28	30	17325
5864606103	White	14	20	23800
5864606105	White	28	20	23800

361079

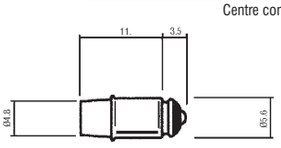
Mftrs List No.	Order Code	Price Each 1+	10+	50+	100+	+
5864601103	**788-1622**	30.37	27.54	25.75	23.70	– –
5864601105	**788-1630**	30.37	27.54	25.75	23.70	– –
5864602103	**788-1649**	50.58	45.90	42.90	39.45	– –
5864602105	**788-1657**	50.58	45.90	42.90	39.45	– –
5864603103	**788-1665**	30.37	27.54	25.75	23.70	– –
5864603105	**788-1673**	30.37	27.54	25.75	23.70	– –
5864606103	**788-1681**	50.58	45.90	42.90	39.45	– –
5864606105	**788-1690**	50.58	45.90	42.90	39.45	– –

White Single-Chip Based LEDs

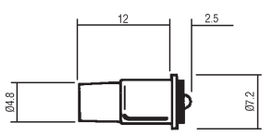
Single Chip White LED Bulb Replacements

3000 mcd typical brightness

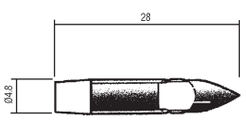
Centre contact anode (+)



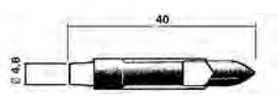
Midget Groove - 205 series



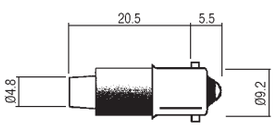
Midget Flange - 206 series



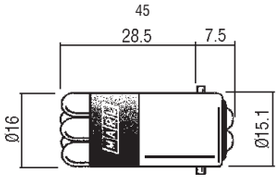
Telephone Slide T5.5 - 209 series



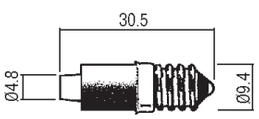
Telephone Slide T6.8 - 208 series



BA9s - 215 series



BA 15d - 225 series



MES - 211 series

The single chip bulb replacements have a Mean Time Between Failure (MTBF) in excess of 100,000 hours offering major benefits including reduced power, low heat generation, increased reliability and less maintenance. The single light source is compatible with all coloured lens options. The BA15ds are made up of a cluster of 6 5mm LEDs and the Sub-Midget Flange LEDs are fully potted.

Operating Voltages		12V dc	24V dc	28V dc	48V dc
Operating current					
Midget groove	205 Series	20mA dc	20mA dc	17mA dc	10mA dc
Midget Flange	206 Series	20mA dc	20mA dc	17mA dc	10mA dc
Telephone Slide T5.5	209 Series	20mA dc	20mA dc	— —	10mA dc
Telephone Slide T6.8	208 Series	20mA dc	17mA dc	17mA dc	12mA dc
BA9s	215 Series	17mA dc	17mA dc	17mA dc	12mA dc
BA15d	225 Series	— —	20mA dc	17mA dc	— —
MES	211 Series	20mA dc	20mA dc	— —	10mA dc

Luminous intensity (typ): 3000mcd, note 225 series=3000mcd per LED (6 LED per cluster) and 202 series = 2000mcd
Operating temp. range: -40°C to +80°C Viewing angle to half intensity: 120° except 225 series=30°

206521

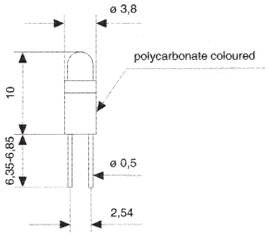
Voltage	Mftrs. List No.	Order Code	Price Each 1+	10+	25+	50+	+
Midget Groove							
12V dc	205-997-21-38	**973-7006●**	17.80	16.38	15.79	– –	– –
24V dc	205-997-22-38	**973-7014●**	17.80	16.38	15.79	– –	– –
28V dc	205-997-23-38	**973-7022●**	17.80	16.38	15.79	– –	– –
48V dc	205-997-24-38	**973-7030●**	18.55	18.30	17.91	– –	– –
Midget Flange							
12V dc	206-997-21-38	**973-7049●**	15.79	– –	– –	– –	– –
24V dc	206-997-22-38	**973-7057●**	15.79	– –	– –	– –	– –
28V dc	206-997-23-38	**973-7065●**	15.86	– –	– –	– –	– –
Telephone Slide T5.5							
12V dc	209-997-21-38	**973-7073●**	16.92	– –	– –	– –	– –
24V dc	209-997-22-38	**973-7081●**	16.66	16.38	16.33	– –	– –
Telephone Slide T6.8							
24V dc	208-997-22-38	**973-7090●**	17.83	17.58	– –	– –	– –
28V dc	208-997-23-38	**973-7103●**	17.91	– –	– –	– –	– –
48V dc	208-997-24-38	**973-7111●**	19.69	17.91	– –	– –	– –
BA9s							
12V dc	215-997-21-38	**973-7120●**	18.52	17.20	16.28	– –	– –
24V dc	215-997-22-38	**973-7138●**	18.52	17.20	16.28	– –	– –
28V dc	215-997-23-38	**973-7146●**	18.52	17.91	– –	– –	– –
48V dc	215-997-24-38	**973-7154●**	20.85	17.45	16.54	16.28	– –
BA 15d							
24V dc	225-997-22	**973-7197●**	104.13	– –	– –	– –	– –
28V dc	225-997-23	**973-7200●**	98.03	92.11	89.71	– –	– –
MES							
12V dc	211-997-21-38	**973-7162●**	18.18	17.92	17.32	16.28	– –
24V dc	211-997-22-38	**973-7170●**	18.18	17.92	17.32	16.28	– –
48V dc	211-997-24-38	**973-7189●**	20.85	17.45	16.54	16.28	– –

Single-Chip LED Bulb Replacements

Bi-Pin, T1

12V, 24V & 28V ac/dc with Half Wave Rectification

Polarity indicated by (+)



Supply Voltage ac/dc	12V	24V	28V	Yellow	240mCd	200mCd	200mCd
Luminous intensity (typ)				White Clear Lens	600mCd	500mCd	500mCd
Standard red	280mCd	330mCd	230mCd	White Diffused Lens	300mCd	250mCd	250mCd
Standard green	780mCd	650mCd	650mCd	Forward Current - ac/dc	6/mA12	7/mA14	5/mA10

Wavelength (nm) Standard red, 630 Standard green, 525 Yellow, 587 White N/A

Operating temperature range: -20°C to +60°C

231904

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	25+	50+	+
12V ac/dc Standard red	15015250.	**387-4643**	8.28	7.53	6.87	5.67	– –
12V ac/dc Standard green	15015251.	**387-4655**	11.15	10.14	9.26	7.86	– –
12V ac/dc White Clear Lens	1501525W3.	**387-4680**	11.15	10.14	9.26	7.86	– –
12V ac/dc White Diffused Lens	1501525W3D.	**387-4692**	11.15	10.14	9.26	7.86	– –
24V ac/dc Standard red	15015350.	**387-4709**	8.28	7.53	6.87	5.67	– –

● Compliant
◄ Non-compliant
++ Limited stock - RoHS replacement available

RoHS

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	25+	50+	+
24V ac/dc Standard green	15015351.	**387-4710**	11.15	10.14	9.26	7.86	– –
24V ac/dc Yellow	15015352.	**387-4722**	8.28	7.53	6.87	5.67	– –
24V ac/dc White Clear Lens	1501535W3.	**387-4746**	11.15	10.14	9.26	7.86	– –
24V ac/dc White Diffused Lens	1501535W3D.	**387-4758**	11.15	10.14	9.26	8.00	– –
28V ac/dc Standard red	15015450	**387-4760**	8.28	7.53	6.87	5.67	– –
28V ac/dc White Clear Lens	1501545W3.	**387-4801**	11.15	10.14	9.26	7.86	– –
28V ac/dc White Diffused Lens	1501545W3D.	**387-4813**	11.15	10.14	9.26	7.86	– –

Solo LED - Filament Replacement Lamps

BA7, BA9s and T6.8

MARL

NEW

- Single product multi-voltage operation
- BA9s and BA7 and T6.8 direct replacement
- Five high intensity colours
- Full internal encapsulation
- 8-48 Vac/dc - Bi-polar
- MTBF 100,000 hours
- Flat or domed top LED options

The Solo LED lamp offers a total solution to LED filament replacements. Intelligent circuitry allows operation with either AC or DC supply voltages of 8 to 48 volts, allowing optimum brightness levels to be achieved. This offers the additional advantage of reduced inventory/stock costs by eliminating the need to stock differing voltage options and stock profiles normally associated with instrumentation and equipment.

These LED's are sunlight readable and shock/vibration resistant.

Please note this product will illuminate below 8V ac/dc but will not stabilise at 10mA until the 8 volt threshold has been reached.

Absolute maximum input voltage 50V ac/dc
Operating temperature -20°C to +50°C

Colour	View Angle	Typ. Lum. Intensity (mcd) @ 20 mA	Peak Wavelength (nm)	Face
Red	120°	2750	660	Flat
Yellow	120°	4500	590	Flat
Green	120°	6000	525	Flat
Blue	120°	2000	470	Flat
White	120°	3000	—	Flat

383406

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	25+	50+
BA7 Series - Flat Top						
Red	253-501-64	**872-5519▲**	30.14	24.54	20.47	17.58
Yellow	253-521-64	**872-5535▲**	30.14	24.54	20.47	17.58
Green	253-532-64	**872-5551▲**	36.81	30.08	25.06	21.48
Blue	253-930-64	**872-5578▲**	40.17	32.78	27.28	23.44
White	253-997-64	**872-5594▲**	40.17	32.78	27.28	23.44
BA7 Series - Domed Top						
Red	253-501-64-38	**872-5527▲**	30.14	24.54	20.47	17.58
Yellow	253-521-64-38	**872-5543▲**	30.14	24.54	20.47	17.58
Green	253-532-64-38	**872-5560▲**	36.81	30.08	25.06	21.48
Blue	253-930-64-38	**872-5586▲**	40.17	32.78	27.28	23.44
White	253-997-64-38	**872-5608▲**	40.17	32.78	27.28	23.44
BA9 Series - Flat Top						
Red	255-501-64	**872-5616▲**	30.14	24.54	20.47	17.58
Yellow	255-521-64	**872-5624▲**	30.14	24.54	20.47	17.58
Green	255-532-64	**872-5632▲**	36.81	30.08	25.06	21.48
Blue	255-930-64	**872-5640▲**	40.17	32.78	27.28	23.44
White	255-997-64	**872-5659▲**	40.17	32.78	27.28	23.44
BA9 Series - Domed Top						
Red	255-501-64-38.	**365-5386‡**	18.11	15.37	13.48	10.25
Yellow	255-521-64-38.	**365-5398‡**	18.11	15.37	13.48	10.25
Green	255-532-64-38.	**365-5404‡**	31.09	26.40	23.12	17.58
Blue	255-930-64-38.	**365-5416‡**	29.58	26.40	23.12	17.01
White	255-997-64-38.	**365-5428‡**	34.78	29.58	25.89	19.68
T6.8 Series - Flat Top						
Red	258-501-64	**872-5667▲**	30.14	24.54	20.47	17.58
Yellow	258-521-64	**872-5683▲**	30.14	24.54	20.47	17.58
Green	258-532-64	**872-5705▲**	36.81	30.08	25.06	21.48
Blue	258-930-64	**872-5721▲**	40.17	32.78	27.28	23.44
White	258-997-64	**872-5756▲**	40.17	32.78	27.28	23.44
T6.8 Series - Domed Top						
Red	258-501-64-38	**872-5675▲**	30.14	24.54	20.47	17.58
Yellow	258-521-64-38	**872-5691▲**	30.14	24.54	20.47	17.58
Green	258-532-64-38	**872-5713▲**	36.81	30.08	25.06	21.48
Blue	258-930-64-38	**872-5730▲**	40.17	32.78	27.28	23.44
White	258-997-64-38	**872-5764▲**	40.17	32.78	27.28	23.44

Single-Chip LED, Bulb Replacements

T3¼ Miniature, Screw (E10) and Bayonet (BA9s)

Dialight

E10

BA9s

- Large plastic lens cases
- Tinted lens to identify colour
- Use up to 90% less energy than incandescent
- Long life - up to 100K hours
- No heat generated
- Resistant to shock and vibration
- AlInGaP and InGaN technology

Mftrs. List No.	Colour	Wavelength Peak (nm)	Nominal Voltage	Forward Current (mA)	Intensity (mcd)
5862701203	Red	630	12V dc	15	1050
5862701205	Red	630	24V dc	7.5	525
5862702203	Green	525	12V dc	15	1650
5862702205	Green	525	24V dc	7.5	825
5862703203	Amber	592	12V dc	15	1275
5862703205	Amber	592	24V dc	7.5	637
5862705203	Blue	470	12V dc	15	487
5862705205	Blue	470	24V dc	7.5	243
5862706203	White		12V dc	15	825
5862706205	White		24V dc	7.5	412
5862701220	Red	630	6 - 36V ac/dc	10	1000
5862702220	Green	525	6 - 36V ac/dc	10	1500
5862703220	Amber	592	6 - 36V ac/dc	10	550
5862705220	Blue	470	6 - 36V ac/dc	10	200
5862706220	White		6 - 36V ac/dc	10	650
5862401203	Red	630	12V dc	15	1050
5862401205	Red	630	24V dc	15	1050
5862402203	Green	525	12V dc	15	1650
5862402205	Green	525	24V dc	15	1650
5862403203	Amber	592	12V dc	15	1275
5862403205	Amber	592	24V dc	15	1275
5862405203	Blue	470	12V dc	15	487
5862405205	Blue	470	24V dc	15	487
5862406203	White		12V dc	15	825
5862406205	White		24V dc	15	825
5862401220	Red	630	6 - 36V ac/dc	10	1000
5862402220	Green	525	6 - 36V ac/dc	10	1500
5862403220	Amber	592	6 - 36V ac/dc	10	550
5862405220	Blue	470	6 - 36V ac/dc	10	200
5862406220	White		6 - 36V ac/dc	10	650

361080

Mftrs List No.	Order Code	Price Each 1+	10+	50+	100+	+
Miniature Screw - E10						
5862701203	**788-1703**	13.15	11.95	11.16	10.29	– –
5862701205	**788-1711**	13.15	11.95	11.16	10.29	– –
5862702203	**788-1738**	15.07	13.67	12.79	11.78	– –
5862702205	**788-1746**	15.07	13.67	12.79	11.78	– –
5862703203	**788-1754**	13.15	11.95	11.16	10.29	– –
5862703205	**788-1762**	13.15	11.95	11.16	10.29	– –
5862705203	**788-1770**	15.07	13.67	12.79	11.78	– –
5862705205	**788-1789**	15.07	13.67	12.79	11.78	– –
5862706203	**788-1797**	15.07	13.67	12.79	11.78	– –
5862706205	**788-1800**	15.07	13.67	12.79	11.78	– –
5862701220	**788-1819**	16.50	14.97	14.00	12.89	– –
5862702220	**788-1827**	18.36	16.67	15.59	14.32	– –
5862703220	**788-1835**	16.50	14.97	14.00	12.89	– –
5862705220	**788-1843**	18.36	16.67	15.59	14.32	– –
5862706220	**788-1851**	18.36	16.67	15.59	14.32	– –
Miniature Bayonet - BA9s						
5862401203	**788-1860**	13.15	11.95	11.16	10.29	– –
5862401205	**788-1878**	13.15	11.95	11.16	10.29	– –
5862402203	**788-1886**	15.07	13.67	12.79	11.78	– –
5862402205	**788-1894**	15.07	13.67	12.79	11.78	– –
5862403203	**788-1908**	13.15	11.95	11.16	10.29	– –
5862403205	**788-1916**	13.15	11.95	11.16	10.29	– –
5862405203	**788-1924**	15.07	13.67	12.79	11.78	– –
5862405205	**788-1932**	15.07	13.67	12.79	11.78	– –

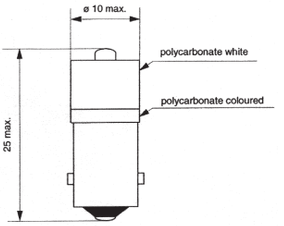
Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Mftrs List No.	Order Code	Price Each 1+	10+	50+	100+	+
Miniature Bayonet - BA9s						
5862406203	**788-1940**	15.07	13.67	12.79	11.78	– –
5862406205	**788-1967**	15.07	13.67	12.79	11.78	– –
5862401220	**788-1975**	16.50	14.97	14.00	12.89	– –
5862402220	**788-1983**	18.36	16.67	15.59	14.32	– –
5862403220	**788-1991**	16.50	14.97	14.00	12.89	– –
5862405220	**788-2009**	18.36	16.67	15.59	14.32	– –
5862406220	**788-2017**	18.39	16.67	15.59	14.32	– –

MBC/MCC (BA9s)

12V, 24V, 28V, 48V, 60V ac/dc with Full Bridge Rectification & 130V, 230V ac

Colour identified by coloured band on low voltage types and by plastic shroud over the metal body on 130V/230V ac types.
Length = 25.0 max.



Note: 130V ac types are not suitable for use with a 240V ac supplies using a dropper resistor.

Supply Voltage ac/dc	24V	28V	48V
Luminous intensity (typ)			
Red	350mCd	350mCd	190mCd
Green	1000mCd	1000mCd	530mCd
Yellow	300mCd	300mCd	160mCd
Blue	400mCd		
White Clear Lens	750mCd	750mCd	400mCd
White Diffused Lens	750mCd	750mCd	200mCd
Forward Current - ac/dc	15mA	15mA	7mA

Supply Voltage ac/dc	130V	230V
Luminous intensity (typ)		
Red	120mCd	70mCd
Green	330mCd	200mCd
Yellow	100mCd	
White Clear Lens	250mCd	150mCd
White Diffused Lens		75mCd
Forward Current - ac	5mA	3mA

Wavelength (nm) Red, 630 Green, 525 Yellow, 587 Blue, 470 White N/A

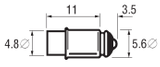
Operating temperature range: -20°C to +60°C

231906

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	25+	50+
24V ac/dc Red	18602350	**110-5161●**	8.51	7.75	7.09	6.43
24V ac/dc Green	18602351	**110-5162●**	12.54	11.40	10.40	9.45
24V ac/dc Yellow	18602352	**110-5163●**	8.51	7.75	7.09	6.43
24V ac/dc Blue	18602357	**110-5165●**	12.54	11.40	10.40	9.45
24V ac/dc White	1860235W3	**110-5166●**	12.54	11.40	10.40	9.45
24V ac/dc White Diffused Lens	1860235W3D	**110-5167●**	12.54	11.40	10.40	9.45
28V ac/dc Red	18602450	**110-5168●**	8.51	7.75	7.09	6.43
28V ac/dc Green	18602451	**110-5169●**	12.54	11.40	10.40	9.45
28V ac/dc Yellow	18602452	**110-5170●**	8.51	7.75	7.09	6.43
28V ac/dc White Clear Lens	1860245W3	**110-5171●**	12.54	11.40	10.40	9.45
28V ac/dc White Diffused Lens	1860245W3D	**110-5172●**	12.54	11.40	10.40	9.45
48V ac/dc Red	18602650	**110-5173●**	8.51	7.75	7.09	6.43
48V ac/dc Green	18602651	**110-5174●**	12.54	11.40	10.40	9.45
48V ac/dc Yellow	18602652	**110-5175●**	8.51	7.75	7.09	6.43
48V ac/dc White Clear Lens	1860265W3	**113-9568●**	12.54	11.40	10.40	9.45
48V ac/dc White Diffused Lens	1860265W3D	**110-5177●**	12.54	11.40	10.40	9.45
130V ac Red	18606130	**110-5178●**	8.51	7.75	7.09	6.43
130V ac Green	18606131	**110-5179●**	12.69	11.56	10.55	9.58
130V ac Yellow	18606132	**110-5180●**	8.51	7.75	7.09	6.43
130V ac White Clear Lens	1860613W3	**110-5181●**	12.69	11.56	10.55	9.58
230V ac Red	18606230	**110-5182●**	8.51	7.75	7.09	6.43
230V ac Green	18606231	**110-5183●**	12.69	11.56	10.55	9.58
230V ac/dc White Clear Lens	1860623W3	**110-5184●**	12.69	11.56	10.55	9.58
230V ac White Diffused Lens	1860623W3D	**110-5185●**	12.69	11.56	10.55	9.58

Midget Groove - Sunlight Readable

These single chip, true sunlight readable LEDs incorporate an ultra-high bright LED which has been flat topped to provide wide angled switch illumination.



Centre contact anode (+), Colour by coloured band

Mean time between failure (MTBF) = 100,000 hours

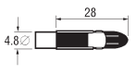
Supply Voltage	24V	24V	28V	Wavelength (nm)
Luminous intensity (typ)				
Red	4500mCd	2750mCd	2750mCd	590
Green	6000mCd	6000mCd	6000mCd	525
Yellow	4500mCd	4500mCd	4500mCd	590
Blue	2000mCd	2000mCd	2000mCd	450
Forward Current	20mA	20mA	20mA	

Viewing angle 85° Operating temperature range -20°to+50°C

206440

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	25+	100+	+
28Vdc Red	205-501-21-38	**973-8509●**	12.00	9.32	8.57	8.16	– –
28Vdc Green	205-532-21-38	**973-8517●**	21.11	20.44	18.33	15.78	– –
28Vdc Yellow	205-521-21-38	**973-8525●**	12.25	10.65	8.38	8.16	– –
28Vdc Blue	205-930-21-38	**973-8533●**	21.11	20.44	18.33	15.78	– –
28Vdc Red	205-501-22-38	**973-8541●**	12.00	9.80	8.32	8.16	– –
28Vdc Green	205-532-22-38	**973-8550●**	21.11	20.44	18.33	15.78	– –
28Vdc Yellow	205-521-22-38	**973-8568●**	12.25	10.65	8.38	8.16	– –
28Vdc Blue	205-930-22-38	**973-8576●**	20.92	18.87	17.17	15.26	– –
28Vdc Red	205-501-23-38	**973-8584●**	10.49	8.79	8.16	– –	– –
28Vdc Green	205-532-23-38	**973-8592●**	22.43	– –	– –	– –	– –
28Vdc Yellow	205-521-23-38	**973-8606●**	12.25	10.65	8.38	8.16	– –

Telephone Slide, T5.5 – Sunlight Readable



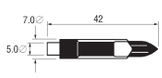
Polarity indicated by (+), Colour identified by coloured dot.

Design features and specification are identical to Midget Groove range (see above).

206443

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	25+	100+	+
12Vdc Red	209-501-21-38	**973-8770●**	10.49	8.79	8.67	– –	– –
12Vdc Green	209-532-21-38	**973-8789●**	22.62	20.73	17.14	14.49	– –
12Vdc Yellow	209-521-21-38	**973-8797●**	10.49	8.79	8.67	– –	– –
24Vdc Red	209-501-22-38	**973-8800●**	10.49	8.79	8.65	– –	– –
24Vdc Green	209-532-22-38	**973-8819●**	22.62	20.73	17.14	14.49	– –
24Vdc Yellow	209-521-22-38	**973-8827●**	10.49	8.79	8.67	– –	– –
28Vdc Red	209-501-23-38	**973-8835●**	10.49	8.67	– –	– –	– –
28Vdc Yellow	209-521-23-38	**973-8843●**	10.49	8.67	– –	– –	– –

Telephone Slide, T6.8 - Sunlight Readable



Polarity indicated by (+), Colour identified by coloured dot.

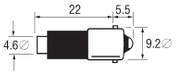
Design features and specifications are identical to Midget Groove range (see above).

206444

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	25+	100+	+
12Vdc Red	208-501-21-38	**973-8851●**	13.10	10.71	9.10	8.93	– –
12Vdc Green	208-532-21-38	**973-8860●**	19.94	19.94	18.02	15.84	– –
12Vdc Yellow	208-521-21-38	**973-8878●**	13.10	10.71	9.10	8.93	– –
24Vdc Red	208-501-22-38	**973-8886●**	13.10	10.71	9.10	8.93	– –
24Vdc Green	208-532-22-38	**973-8894●**	19.94	– –	– –	– –	– –
24Vdc Yellow	208-521-22-38	**973-8916●**	13.10	10.71	9.10	8.93	– –
28Vdc Yellow	208-521-23-38	**973-8924●**	17.67	– –	– –	– –	– –

Bayonet Cap, BA9 – Sunlight Readable

Design Features and specifications are identified to Midget Groove range (see above)



Centre contact anode (+), Colour identified by coloured band

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

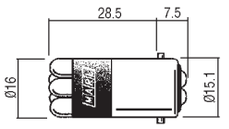
C = CYAN M = Magenta Y = Yellow B = Black/SING

206442

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	25+	100+	+
12Vdc Red	215-501-21-38	**973-8681●**	10.49	8.79	8.37	– –	– –
12Vdc Green	215-532-21-38	**973-8690●**	21.11	17.64	16.10	15.71	– –
12Vdc Yellow	215-521-21-38	**973-8703●**	12.76	10.65	9.51	8.21	– –
12Vdc Blue	215-930-21-38	**973-8711●**	21.11	17.64	16.10	14.43	– –
24Vdc Red	215-501-22-38	**973-8720●**	10.49	8.79	8.42	– –	– –
24Vdc Green	215-532-22-38	**973-8738●**	21.11	17.64	16.10	14.43	– –
24Vdc Yellow	215-521-22-38	**973-8746●**	12.76	10.65	9.51	8.39	– –
24Vdc Blue	215-930-22-38	**973-8754●**	22.62	20.73	17.14	15.80	– –
28Vdc Green	215-532-23-38	**973-8762●**	21.11	17.64	16.10	15.71	– –

BA 15d, - 2 pin Base

MARL



Bi-polar. Colour identified by a dot on side of body.

This range of bulb replacement LEDs are made up of a cluster of 6, 5mm LEDs. Please note that the intensities given are for a single 5mm LED.

Supply Voltage	24V
Luminous Intensity/LED (typ.)	
Red	3000mCd
Green	6000mCd
Blue	2000mCd
Blue	2000mCd
Forward Current (typ.)	25mA
Wavelength (nm)	Red=660,Green=525,Yellow=470,Blue=470
Viewing angle to half intensity	30°
Operating temp. range	-40°C to +80°C

206526

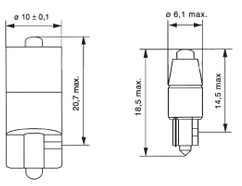
Colour	Mftrs. List No.	Order Code	Price Each 1+	5+	10+	25+	+
Red	225-501-22	**973-6964●**	41.83	38.78	35.19	29.69	– –
Green	225-532-22	**973-6972●**	78.84	76.89	74.66	72.07	– –
Yellow	225-521-22	**973-6980●**	41.01	36.79	34.56	29.69	– –
Blue	225-930-22	**973-6999●**	77.65	– –	– –	– –	– –

Wedge Base - 5mm, 10mm

CML INNOVATIVE TECHNOLOGIES

6V ac/dc, 12V ac/dc, 24V ac/dc, 28V ac/dc

10mm 5mm



10mm 5mm

Supply Voltage:	6V ac/dc, 12V ac/dc, 24V ac/dc, 28V ac/dc
Operating Current:	5mm, 12mA 10mm, 14mA
Maximum reverse voltage:	80V
Operating Temperature:	-20°C to +60°C

Typical Luminous Intensity (mcd) @ operating voltage

Colour	5mm Wedge Base	10mm Wedge Base
Red	280	330
Green	780	910
Yellow	240	280
Blue	300	350
White	600	700

206572

5mm Wedge Base	Order Code	Price Each 1+	10+	25+	100+	+
6V ac/dc Red	**313-5408**	11.96	10.58	9.51	6.74	– –
6V ac/dc Green	**313-5391**	16.12	14.27	12.82	9.07	– –
6V ac/dc Yellow	**313-5410**	11.96	10.58	9.51	6.74	– –
6V ac/dc Blue	**313-5380**	16.12	14.27	12.82	9.07	– –
6V ac/dc White	**313-5421**	16.12	14.27	12.82	9.07	– –
12V ac/dc Red	**301-6183**	10.71	9.17	8.41	6.74	– –
12V ac/dc Green	**301-6195**	14.42	13.32	12.16	9.07	– –
12V ac/dc Yellow	**301-6201**	10.71	9.17	8.41	6.74	– –
12V ac/dc Blue	**301-6213**	14.42	13.32	12.16	9.07	– –
12V ac/dc White	**301-6225**	14.42	13.32	12.16	9.07	– –
24V ac/dc Red	**301-6237**	8.41	8.19	7.88	6.74	– –
24V ac/dc Green	**113-9612●**	11.50	11.02	10.46	9.07	– –
24V ac/dc Yellow	**301-6250**	10.71	9.95	9.07	6.74	– –
24V ac/dc Blue	**301-6262**	14.42	13.32	12.16	9.07	– –
24V ac/dc White	**113-9613●**	11.34	11.21	10.71	9.07	– –
28V ac/dc Red	**313-5457**	8.41	8.19	7.88	6.74	– –
28V ac/dc Green	**313-5445**	11.34	11.21	10.71	9.07	– –
28V ac/dc Yellow	**313-5469**	11.96	10.58	9.51	6.74	– –
28V ac/dc Blue	**313-5433**	16.12	14.27	12.82	9.07	– –
28V ac/dc White	**113-9614●**	11.34	11.21	10.71	9.07	– –

5mm Wedge Base	Order Code	Price Each 1+	10+	25+	100+	+
10mm Wedge Base						
6V ac/dc Red	**313-5500**	11.96	10.58	9.51	6.74	– –
6V ac/dc Green	**313-5494**	16.12	14.27	12.82	9.07	– –
6V ac/dc Yellow	**313-5512**	11.96	10.58	9.51	6.74	– –
6V ac/dc Blue	**313-5482**	16.12	14.27	12.82	9.07	– –
6V ac/dc White	**313-5524**	16.12	14.27	12.82	9.07	– –
12V ac/dc Red	**301-6286**	10.71	9.17	8.41	6.74	– –
12V ac/dc Green	**301-6298**	14.42	13.32	12.16	9.07	– –
12V ac/dc Yellow	**301-6304**	10.71	9.17	8.41	6.74	– –
12V ac/dc Blue	**301-6316**	14.42	13.32	12.16	9.07	– –
12V ac/dc White	**113-9611●**	14.42	13.32	12.16	9.07	– –
24V ac/dc Red	**301-6330**	10.71	9.95	9.07	6.74	– –
24V ac/dc Green	**301-6341**	14.42	13.32	12.16	9.07	– –
24V ac/dc Yellow	**301-6353**	10.71	9.95	9.07	6.74	– –
24V ac/dc Blue	**301-6365**	14.42	13.32	12.16	9.07	– –
24V ac/dc White	**110-5186●**	14.43	12.35	11.28	9.07	– –
28V ac/dc Red	**313-5550**	11.96	10.58	9.51	6.74	– –
28V ac/dc Green	**313-5548**	16.12	14.27	12.82	9.07	– –
28V ac/dc Yellow	**313-5561**	11.96	10.58	9.51	6.74	– –
28V ac/dc Blue	**313-5536**	16.12	14.27	12.82	9.07	– –
28V ac/dc White	**110-5187●**	16.12	14.27	12.82	9.07	– –

LED Indicators, 3mm Lens Diameter

3mm with Integral Resistor

Arcolectric

Snap-in LED indicators with suitable series resistor built into one lead. Approved to **UL, CSA, OVE, DEMKO** specifications. Termination 200mm 16/0.2 flexible leads.

L=41 (excl. flexible leads)
Lens=4.8 x 7.5 dia., Bezel dia.=9.8
Panel cut-out=8.0 dia.
Panel thickness=0.8-1.6
Red lead indicates anode (+ve)

Operating Voltages	12–14V dc, 12–14V dc.	Operating temperature:	85°C max.

	Typ. Lum. Intensity (mcd).	I_F@ Nom. V.	V_R max.
Red	1	20mA	5V
Green	1	20mA	5V
Amber	4	20mA	5V

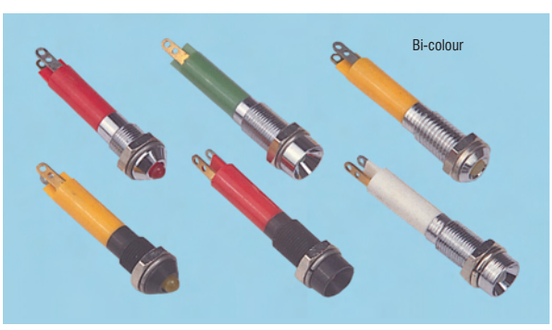
221670

Colour	Order Code	Price Each 1+	25+	100+	250+	+
12/14V dc						
Red	**942-8976●**	10.14	9.67	4.28	3.42	– –
Green	**942-8984●**	10.15	9.67	8.76	4.00	– –
24/28V dc						
Red	**942-8992●**	10.14	9.67	8.76	3.42	– –
Green	**942-9000●**	10.15	9.67	8.76	4.00	– –
Amber	**942-9018●**	10.14	9.67	4.28	3.42	– –

3mm with Integral Resistor

CML INNOVATIVE TECHNOLOGIES

Single and Bi-Colour



Prominent:	Recessed:	Flat-top:
Total L behind bezel=28.9	Total L behind bezel=30.4	Total L behind bezel=32.4

All types: Bezel dia.=7, thread=M6x0.75, mounting hole dia.=6, tab connections=2x0.5, tinned tab indicates cathode (-), common cathode or bi-colour.

A range of panel mounting LED indicators with integral resistor to permit direct connection to 12V or 24V dc supplies. The 3mm LEDs are fitted in high quality satin chrome or black chrome plated brass housings, fitted with fixing nut and washer. Connection is by faston/solder tab terminals. **CE** approved.

	I_F @ V_s	Wavelength Peak	Luminous Intensity @ V_s	Order Code
Satin Chrome - Prominant , 12V				
HE Red	30mA	660nm	23.5mCd	113-9486
Yellow	30mA	590nm	41mCd	113-9488
Green	30mA	565nm	48mCd	110-5203
Satin Chrome - Prominant , 24V				
HE Red	18mA	660nm	15mCd	110-5208
Yellow	18mA	590nm	24.5mCd	113-9501

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Satin Chrome - Prominant , 24V				
Green	18mA	565nm	28.5mCd	113-9497
Blue	18mA	475nm	1.8mCd	113-9494
HE Red and Green	—	—	9 / 11mCd	110-5200
Satin Chrome - Recessed, 12V				
HE Red	30mA	660nm	22mCd	110-5212
Green	30mA	565nm	50mCd	110-5213
Blue	30mA	475nm	mCd2.5	110-5214
HE Red and Green	—	—	9 / 11mCd	110-5200
Satin Chrome - Recessed, 24V				
HE Red	18mA	660nm	14.5mCd	110-5217
Green	18mA	565nm	31mCd	110-5219
Blue	18mA	475nm	1.8mCd	110-5222
HE Red and Green	—	—	13 / 20mCd	110-5202
Satin Chrome - Flat-top, 12V				
HE Red	30mA	660nm	10mCd	110-5194
Yellow	30mA	590nm	16.4mCd	110-5196
Green	30mA	565nm	17.5mCd	110-5195
Satin Chrome - Flat-top, 24V				
HE Red	18mA	660nm	6.5mCd	110-5197
Yellow	18mA	590nm	9.4mCd	110-5199
Green	18mA	565nm	10mCd	110-5198
Black Chrome - Prominant, 12V				
HE Red	30mA	660nm	23.5mCd	110-5204
Green	30mA	565nm	48mCd	110-5205
Blue	30mA	475nm	2.5mCd	110-5207
Black Chrome - Prominant, 24V				
HE Red	18mA	660nm	15mCd	110-5209
Yellow	18mA	590nm	24.5mCd	110-5211
Green	18mA	565nm	28.5mCd	110-5210
Black Chrome - Recessed, 12V				
HE Red	30mA	660nm	22mCd	110-5215
Green	30mA	565nm	50mCd	110-5216
Blue	30mA	475nm	2.5mCd	113-9481
Black Chrome - Recessed, 24V				
HE Red	18mA	660nm	14.5mCd	110-5223
Yellow	18mA	590nm	25mCd	113-9503
Green	18mA	565nm	31mCd	110-5224
Blue	18mA	475nm	1.8mCd	110-5225

206315

		Price Each				
	Order Code	1+	25+	100+	250+	+
Satin Chrome - Prominent						
12VHE Red	113-9486●	6.77	6.24	4.47	4.18	– –
12V Yellow	113-9488●	6.77	5.51	4.47	4.19	– –
12V Green	110-5203●	6.77	4.69	4.47	4.19	– –
24V HE Red	110-5208●	6.77	6.24	5.51	4.19	– –
24V Yellow	113-9501●	6.77	6.24	5.51	4.19	– –
24V Green	113-9497●	6.77	6.24	5.51	4.19	– –
24V Blue	113-9494●	11.25	10.71	10.17	9.53	– –
24V HE Red and Green	110-5200●	8.22	6.11	5.89	5.77	– –
Satin Chrome - Recessed						
12V HE Red	110-5212●	6.77	6.24	4.47	4.19	– –
12V Green	110-5213●	6.77	4.66	4.47	4.19	– –
12V Blue	110-5214●	11.25	10.71	10.17	9.53	– –
12V HE Red and Green	110-5201●	8.22	7.62	7.18	6.14	– –
24V HE Red	110-5217●	6.77	6.24	5.51	4.19	– –
24V Green	110-5219●	6.77	6.24	4.47	4.19	– –
24V Blue	110-5222●	11.25	10.71	10.17	9.53	– –
24V HE Red and Green	110-5202●	8.22	7.62	5.89	5.77	– –
Satin Chrome - Flat-Top						
12V HE Red	110-5194●	8.13	6.68	6.11	4.88	– –
12V Green	110-5195●	8.13	7.59	6.11	4.88	– –
12V Yellow	110-5196●	8.13	6.68	6.11	4.88	– –
24V HE Red	110-5197●	9.86	9.04	6.11	4.88	– –
24V Green	110-5198●	9.86	6.68	6.11	4.88	– –
24V Yellow	110-5199●	9.86	6.68	6.11	4.88	– –
Black Chrome - Prominent						
12V HE Red	110-5204●	7.31	6.71	4.95	4.65	– –
12V Green	110-5205●	7.31	6.71	4.95	4.65	– –
12V Blue	110-5207●	11.78	11.34	10.84	10.14	– –
24V HE Red	110-5209●	7.31	6.71	4.95	4.65	– –
24V Green	110-5210●	7.31	6.71	4.95	4.65	– –
24V Yellow	110-5211●	9.17	8.13	5.80	4.65	– –
Black Chrome - Recessed						
12V HE Red	110-5215●	7.31	5.17	4.95	4.65	– –
12V Green	110-5216●	7.31	5.17	4.95	4.65	– –
12V Blue	113-9481●	11.27	11.25	10.96	9.53	– –
24V HE Red	110-5223●	7.31	6.71	4.95	4.65	– –
24V Green	110-5224●	7.31	6.71	5.89	4.65	– –
24V Yellow	113-9503●	7.31	6.71	5.89	4.65	– –
24V Blue	110-5225●	11.78	11.34	10.84	9.81	– –

3mm

multicomp

A range of panel mounting LED indicators in high qualiy bright chrome or black chrome plated brass housings. Fitted with fixing nut and washer. **CE** approved.

Bezel=4 x 7 dia (Prominent),
3 x 7 dia (Recessed),
Total L behind bezel=11.5 (Prominent)
13.0 (Recessed),
Mounting hole dia.=6,
Shorter lead Cathode

Style	Colour	Typ. Lum. Intensity(mcd) @I_F=20mA	V_F (typ.) (V)	I_F (max) mA
Prominent	HE Red	17.5	2-2.6	45
Recessed	HE Red	15	2-2.6	45
Prominent	Green	27	2-2.6	45
Recessed	Green	34	2-2.6	45
Prominent	Yellow	32	2-2.6	45
Recessed	Yellow	28	2-2.6	45
Prominent	Pure Orange	17.5	2-2.6	30
Recessed	Pure Orange	15	2-2.6	30
Prominent	Blue	5	3.8-4.4	50
Recessed	Blue	6	3.8-4.4	50

206468

		Price Each				
Colour	Order Code	1+	25+	100+	250+	+
Bright Chrome - Prominent						
HE Red	110-5226●	3.12	2.85	2.43	1.58	– –
Green	110-5227●	3.12	2.85	2.43	1.71	– –
Yellow	110-5228●	3.12	2.85	2.43	1.58	– –
Pure Orange	113-9519●	2.43	2.22	1.92	1.58	– –
Blue	113-9518●	7.06	– –	– –	– –	– –
Bright Chrome - Recessed						
HE Red	110-5229●	3.12	2.85	2.43	1.71	– –
Green	110-5230●	3.12	2.85	2.43	1.58	– –
Yellow	110-5232●	3.12	2.85	2.43	1.58	– –
Pure Orange	110-5233●	2.43	2.22	1.92	1.58	– –
Blue	110-5234●	5.82	5.37	5.01	4.19	– –
Black Chrome - Prominent						
HE Red	110-5235●	3.54	3.15	2.73	1.77	– –
Green	110-5236●	3.54	3.15	2.73	1.77	– –
Yellow	110-5237●	3.54	3.15	2.73	1.77	– –
Pure Orange	110-5238●	2.43	2.31	2.10	1.77	– –
Blue	110-5239●	6.18	5.70	5.10	4.42	– –
Black Chrome - Recessed						
HE Red	110-5240●	3.54	3.15	2.73	1.77	– –
Green	110-5241●	3.54	3.15	2.73	1.77	– –
Yellow	110-5242●	3.54	3.15	2.10	1.77	– –
Pure Orange	110-5244●	2.43	2.31	2.10	1.77	– –

LED Indicators, 4mm Lens Diameter

4mm

BULGIN

Recessed type Prominent type

Panel mounting 4mm LEDs housed in a choice of black anodised aluminium or bright chromium plated brass bezels. The bezels of the chrome finished types are polished to form high quality reflectors. The indicators are available with either recessed or prominent LEDs.

Body length=14, Bezel dia=7.6, Mounting hole dia=6.2
Thread=M6 x 0.75, Short lead is cathode

Operating temperature -25°C to +80°C
Maximum power dissipation 70mW
Viewing angle 120°

Colour	I_F max.	V_F typ.	V_R max.	Typ. Lum. Intensity (mcd)
Red	25mA	1.9V	3V	1.5 @ 5mA
Green	25mA	2.1V	3V	3.5 @ 20mA
Amber	25mA	2.1V	3V	5 @ 20mA

206579

		Price Each			
Colour	Order Code	1+	25+	100+	250+
Prominent - Bright Chrome					
Red	170-160●	3.93	3.53	2.74	2.55
Green	170-161●	4.10	3.72	2.90	2.68
Amber	170-162●	4.10	3.72	2.90	2.68
Recessed - Bright Chrome					
Red	170-163●	3.93	3.53	2.74	2.55
Green	170-164●	4.10	3.72	2.90	2.68
Amber	170-165●	4.10	3.72	2.90	2.68
Prominent - Black anodised aluminium					
Red	170-585●	5.14	4.47	3.40	2.68
Green	170-586●	5.14	4.47	3.40	2.68
Amber	170-587●	5.14	4.47	3.40	2.68
Recessed - Black anodised aluminium					
Red	170-588●	4.10	3.72	2.90	2.68
Green	170-589●	4.10	3.72	2.90	2.68
Amber	170-590●	4.10	3.72	2.90	2.68

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

4mm with Integral Resistor

The 4mm LED is housed in a bright chrome plated brass housing and has a protective lens. Connection is via solder tags.

Body length=32, Bezel dia=8.4, Mounting hole dia=7.2
Thread=M7 x 0.75, Colour marker indicates anode (+ve)

Operating temperature -25°C to +80°C

Colour	Nominal Operating Voltages	Typ. Lum. Intensity	I_F @ Nom. V.	V_R max.
Red	6, 12 and 24V dc	0.8mCd	10mA	3V
Green	6, 12 and 24V dc	1mCd	15mA	3V
Amber	6V dc	2mCd	15mA	3V

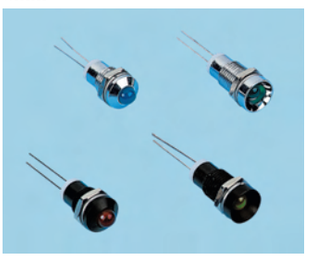
206596

Colour	Order Code	Price Each 1+	50+	100+
5/6V dc				
Red	**121-8540●**	15.39	5.64	5.29
Green	**121-8543●**	15.39	9.51	7.69
12V dc				
Red	**121-8544●**	15.39	9.51	5.29
Green	**121-8545●**	15.39	9.51	7.06
24V dc				
Red	**121-8546●**	16.12	10.65	7.69
Green	**121-8547●**	16.12	5.64	5.29
Amber	**121-8548●**	16.12	10.65	5.29

LED Indicators, 5mm Lens Diameter

5mm

multicomp



A range of panel mounting LED indicators in high quality bright chrome or black chrome plated brass housings. Fitted with fixing nut and washer. **CE** approved.

Bezel=5.0 x 9.5 dia (Prominent), 3.0 x 9.5 (Recessed) Total L behind bezel=12.0 (Prominent), 15.0 (Recessed) Mounting hole dia=8.0, Shorter lead cathode

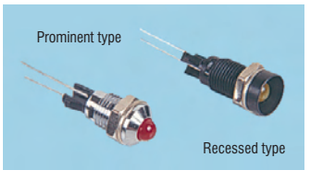
Style	Colour	Type. Lum. Intensity (mcd) @I_F=20mA	V_F (typ.) V	I_F (max) mA
Dome-top	HE Red	20	2-2.6	45
Recessed	HE Red	27	2-2.6	45
Dome-top	Green	25	2-2.6	45
Recessed	Green	30	2-2.6	45
Dome-top	Yellow	25	2-2.6	45
Recessed	Yellow	27	2-2.6	45
Dome-top	Pure Orange	20	2-2.6	30
Recessed	Pure Orange	27	2-2.6	30
Dome-top	Blue	6	3.8-4.4	50
Recessed	Blue	7	3.8-4.4	50

206469

Colour	Order Code	Price Each 1+	25+	100+	250+	+
Bright Chrome - Prominent						
HE Red	**110-5245●**	3.68	3.15	2.64	1.86	– –
Green	**110-5246●**	3.69	3.15	1.92	1.67	– –
Yellow	**110-5247●**	3.63	3.18	2.01	1.67	– –
Pure Orange	**110-5248●**	2.34	2.16	2.01	1.67	– –
Blue	**110-5249●**	5.94	5.52	5.10	4.28	– –
Bright Chrome - Recessed						
HE Red	**110-5250●**	3.63	3.18	2.01	1.67	– –
Green	**113-9520●**	3.63	3.18	2.01	1.67	– –
Yellow	**110-5251●**	3.63	3.18	2.01	1.67	– –
Pure Orange	**110-5252●**	2.34	2.16	2.01	1.67	– –
Blue	**110-5253●**	5.94	5.52	5.10	4.28	– –
Black Chrome - Prominent						
HE Red	**110-5254●**	3.87	3.42	2.10	1.77	– –
Green	**110-5256●**	3.87	3.42	2.10	1.77	– –
Yellow	**110-5257●**	3.87	3.42	2.10	1.79	– –
Pure Orange	**113-9523●**	2.43	2.28	2.10	1.77	– –
Blue	**110-5258●**	6.30	5.82	5.43	4.51	– –
Black Chrome - Recessed						
HE Red	**110-5259●**	3.87	3.42	2.94	1.77	– –
Green	**110-5260●**	3.87	3.42	2.94	1.77	– –
Yellow	**110-5261●**	3.87	3.42	2.94	1.77	– –
Pure Orange	**113-9524●**	2.43	2.28	2.10	1.77	– –
Blue	**110-5262●**	6.30	5.82	5.43	4.51	– –

5mm

MENTOR



Panel mounting LEDs in bright or black chrome plated brass bezels. The LED is detachable from its housing. The indicators are available with either recessed or prominent LEDs.

Body length (overall)= 22.3 (prominent), 23.3 (recessed)
Bezel dia=9.5 Mounting hole dia=8.2
Thread=M8 x 0.75 Short lead is cathode

Operating temperature -25°C to +100°C Viewing angle 120°
Maximum power dissipation 100mW

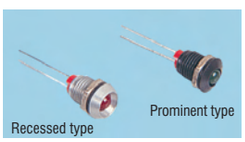
	I_F max.	V_F typ.	V_R max.	Typ. Lum. Intensity (mcd)
Red	50mA	1.6V	5V	6 @ 10mA
Green	30mA	2.4V	5V	9 @ 10mA
Yellow	30mA	2.4V	5V	9 @ 10mA

206590

Colour	Order Code	Price Each 1+	50+	100+
Prominent - Bright Chrome				
Red	**121-5783**	8.81	6.68	4.98
Green	**121-5788**	8.82	6.69	4.98
Yellow	**121-5786**	8.82	6.69	4.98
Recessed - Bright Chrome				
Red	**121-5777**	8.81	6.68	4.98
Yellow	**121-5779**	8.82	6.69	4.98
Prominent - Black Chrome				
Red	**121-5785**	8.11	5.98	4.71
Green	**121-5789**	8.11	5.98	4.71
Yellow	**121-5787**	8.11	5.98	4.71
Recessed - Black Chrome				
Red	**121-5778**	7.54	5.74	4.33
Green	**121-5782**	8.11	5.98	3.22
Yellow	**121-5780**	8.11	3.42	3.22

5mm, Sealed

BULGIN



Body length=14.2, Bezel dia=10.3
Mounting hole
dia=8.0 Thread=0.312" x 32 TPI
Max panel thickness=5.6
Long lead is cathode

Waterproofed to **IP66**. The aluminium threaded bodies are either clear or black anodised, and are available with either prominent or recessed LEDs.

Operating temperature -40°C to +100°C Maximum power dissipation 105mW

	I_F max.	V_F typ.	V_R max.	Typ. Lum. Intensity (mcd)
Red	35mA	2V	5V	6 @ 20mA
Green	35mA	2.2V	5V	6 @ 20mA
Yellow	35mA	2.1V	5V	6 @ 20mA

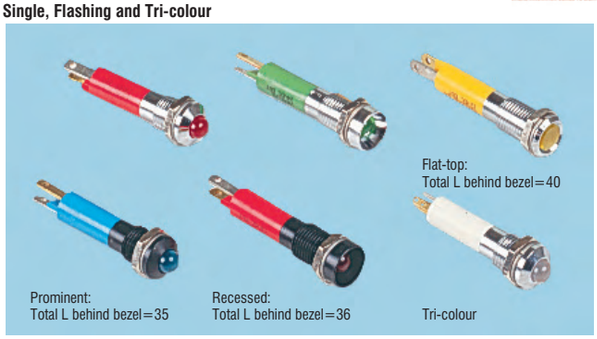
206245

Colour	Order Code	Price Each 1+	25+	100+	250+	+
Red	**178-171●**	14.62	12.69	11.50	9.58	– –
Green	**178-172●**	14.62	12.69	11.50	9.58	– –
Yellow	**178-173●**	14.62	12.69	11.50	9.58	– –
Red	**178-174●**	14.62	12.69	11.50	9.58	– –
Green	**178-175●**	14.62	12.69	11.50	9.58	– –
Yellow	**178-176●**	14.62	12.66	11.50	9.58	– –
Red	**178-177●**	14.62	12.66	11.50	9.58	– –
Green	**178-178●**	14.62	12.66	11.50	9.58	– –
Yellow	**178-179●**	14.62	12.66	11.50	9.58	– –
Red	**178-180●**	14.62	12.66	11.50	9.58	– –
Green	**178-181●**	14.62	12.66	11.50	9.58	– –
Yellow	**178-182●**	14.62	12.66	11.50	9.58	– –

5mm with Integral Resistor

CML

Single, Flashing and Tri-colour



Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

All types: Bezel dia.=9.5, Thread=M8 x 0.75, Mounting hole dia.=8.
Tab connections=2.8 x 0.8 (except tri-colour tabs=2 x 0.5).
Tinned tab indicates cathode (–), common cathode on tri/colour.

A range of panel mounting LED indicators with integral resistor to permit direct connection to 12V or 24V dc supplies. The 5mm LEDs are fitted in high quality bright chrome or black chrome plated brass housings, fitted with fixing nut and washer. Connection is by faston/solder tab terminals.

Available in dome-top, recessed and flat-top LED styles. The tri-colour indicators have HE red and green LEDs, both LEDs connected gives yellow. **CE** approved.

Typ. Luminous Intensity at Operating Current	Red	HE Red	Green	Yellow	Blue
Prominent 12V	—	30mCd	40mCd	38mCd	12mCd
Prominent 24V	—	22mCd	27mCd	27mCd	10mCd
Recessed 12V	—	38mCd	50mCd	40mCd	12mCd
Recessed 24V	—	30mCd	35mCd	30mCd	10mCd
Flat-top 12V	—	14.5mCd	13.5mCd	12.5mCd	—
Flat-top 24V	1.2mCd	11mCd	10mCd	9mCd	—
Flashing	—	12.5mCd	—	—	—
Tri-colour Prominent/Recessed	Red 10mcd + Green 20mcd				
Tri-colour Flat-top	Red 2.5mcd + Green 2.5mcd				

206328

Colour	Order Code	Price Each 1+	25+	100+	250+
Bright Chrome - Flat-Top					
12V HE Red	110-5264●	10.49	9.39	7.94	4.98
12V Yellow	113-9487●	10.49	9.39	7.94	4.98
12V Green	113-9482●	10.49	9.39	6.17	4.98
24V Red	110-5265●	10.49	6.74	6.17	4.98
24V HE Red	110-5268●	10.49	9.39	6.17	4.98
24V Yellow	113-9500●	10.49	9.39	6.17	4.98
24V Green	110-5266●	10.49	9.39	7.94	4.98
12V HE Red, Green and Yellow	110-5269●	8.82	8.35	7.69	6.51
24V HE Red, Green and Yellow	113-9499●	17.73	14.99	9.95	8.37
Bright Chrome - Dome-Top					
12V HE Red	110-5270●	7.21	6.46	4.03	4.00
12V Yellow	110-5272●	7.21	4.41	4.03	4.00
12V Green	110-5271●	7.21	4.41	4.03	4.00
12V Blue	113-9479●	11.25	11.02	10.71	9.53
24V HE Red	110-5273●	7.21	6.46	4.03	4.00
24V Yellow	110-5275●	7.21	6.46	4.03	4.00
24V Green	110-5274●	7.21	6.46	4.03	4.00
24V Blue	110-5276●	12.51	11.02	10.71	9.53
12V HE Red, Green and Yellow	110-5278●	11.56	10.71	8.00	6.74
24V HE Red, Green and Yellow	110-5281●	10.84	9.86	6.74	– –
Black Chrome - Dome-Top					
12V HE Red	110-5290●	7.69	6.90	4.57	4.51
12V Yellow	110-5293●	7.69	4.98	4.57	4.51
12V Green	110-5291●	7.69	6.90	4.57	4.51
12V Blue	110-5294●	12.54	11.97	11.81	10.46
24V HE Red	110-5295●	7.69	6.90	4.57	4.51
24V Yellow	110-5297●	7.69	6.90	4.57	4.51
24V Green	110-5296●	7.69	6.90	4.57	4.51
24V Blue	110-5298●	12.54	11.97	11.81	10.46
12V HE Red, Green and Yellow	110-5312●	12.10	9.54	8.82	7.44
24V HE Red, Green and Yellow	110-5311●	11.56	7.75	7.44	– –
Bright Chrome - Recessed					
12V HE Red	110-5282●	7.21	5.15	– –	– –
12V Yellow	110-5284●	7.21	4.41	4.03	4.00
12V Green	110-5283●	7.21	6.46	5.51	4.00
12V Blue	110-5285●	10.62	– –	– –	– –
24V HE Red	110-5286●	7.21	6.46	4.03	4.00
24V Yellow	110-5288●	7.21	4.41	4.03	4.00
24V Green	110-5287●	7.21	6.46	4.03	4.00
24V Blue	110-5289●	10.62	– –	– –	– –
12V HE Red, Green and Yellow	110-5307●	9.45	8.66	8.00	6.74
24V HE Red, Green and Yellow	110-5308●	10.84	7.02	6.74	– –
Black Chrome - Recessed					
12V HE Red	110-5299●	7.69	6.90	4.57	4.51
12V Yellow	110-5301●	7.69	6.90	4.57	4.51
12V Green	110-5300●	7.69	6.90	4.57	4.51
12V Blue	110-5302●	12.35	11.97	11.81	10.46
24V Red	110-5315●	8.22	5.61	5.39	– –
24V HE Red	110-5303●	8.14	– –	– –	– –
24V Yellow	110-5305●	7.69	4.98	4.57	4.51
24V Green	110-5304●	7.69	4.98	4.57	4.51
24V Blue	110-5306●	12.35	11.97	11.81	10.46
12V HE Red, Green and Yellow	110-5314●	10.46	9.54	8.82	7.44
24V HE Red, Green and Yellow	110-5313●	11.56	7.75	7.44	– –
Bright Chrome - Dome-Top - Flashing					
24V Red	110-5277●	8.22	7.47	5.39	– –
Black Chrome - Dome-Top - Flashing					
24V Red	110-5316●	9.36	6.39	6.14	– –
Black Chrome - Recessed - Flashing					
24V Red	113-9533●	9.36	6.39	6.14	– –

5mm with Integral Resistor

12V ac and 24V ac

A range of panel mounting indicators with integral resistor to permit direct connection to 12V ac and 24V ac supplies. They are fitted in a high quality satin chrome or black chrome brass housing, fitted with fixing nut and washer. Connection is by faston/solder tab terminals. **CE** approved.

Prominent: Total L behind bezel=44, Recessed: Total L behind bezel=46,
All types: Bezel dia=9.5, thread=M8 x 0.75, mounting hole dia=8, tab connections=2.8 x 0.8

Operating voltage (±10%) 1	2V ac, 24V ac	Operating temperature range	-55°Cto +70°C
Operating current (max.)	20mA	Life Expectancy	60000 hours min

Typical luminous intensity (mcd) at operating current:

	HE Red	Green	Yellow
Prominent 12Vac	23	30	28.5
Prominent 24Vac	16.5	20	20
Recessed 12Vac	28.5	37.5	30
Recessed 24Vac	22.5	26.5	22.5

206470

Colour	Order Code	Price Each 1+	25+	100+	250+	+
Bright Chrome - Prominent						
12V ac HE Red	113-9522●	6.87	6.46	4.69	4.42	– –
12V ac Green	110-5324●	6.87	6.46	4.69	4.42	– –
24V ac HE Red	110-5325●	6.87	6.46	6.02	4.42	– –
24V ac Green	110-5326●	6.87	6.46	6.02	4.42	– –
24V ac Yellow	110-5327●	6.87	4.95	4.73	4.42	– –
Bright Chrome - Recessed						
12V ac HE Red	110-5330●	6.87	4.95	4.73	4.42	– –
12V ac Green	110-5331●	6.87	4.95	4.73	4.42	– –
24V ac HE Red	110-5332●	6.87	6.46	4.73	4.42	– –
24V ac Green	110-5333●	6.87	6.46	4.73	4.42	– –
24V ac Yellow	110-5335●	4.42	– –	– –	– –	– –
Black Chrome - Prominent						
24V ac HE Red	110-5328●	7.15	5.13	4.91	4.59	– –
24V ac Green	110-5329●	7.15	5.13	4.91	4.59	– –
Black Chrome - Recessed						
12V ac Green	110-5336●	7.15	5.13	4.91	4.59	– –
24V ac HE Red	110-5337●	7.15	6.71	6.27	4.59	– –
24V ac Green	110-5338●	7.15	6.71	4.91	4.59	– –
24V ac Yellow	110-5339●	7.15	5.13	4.91	4.59	– –

5mm, Sunlight Readable with Integral Resistor, IP67 Rated

24V dc

A range of Sunlight
Readable panel-mounting indicators with integral resistor to permit direct connection to 24V dc supplies. The 5mm LED's are fitted in high quality prominent or recessed, bright chrome or black chrome brass housings, fitted with fixing nut and washer. Connection is by faston/solder tab terminals.

Total L behind bezel=38, Bezel dia.=9.5, Thread=M8 x 0.75, Mounting hole dia.=8, Tab Connections=2.8 x 0.8

Operating voltage:	24V dc	Reverse Voltage (max.)	80V
Operating Temperature:	-20°Cto +50°C	Operating current:	17mADC / 9mA AC

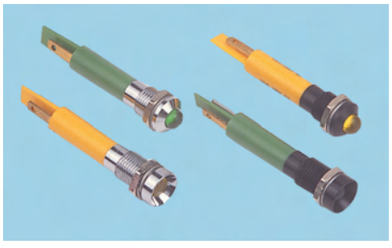
Typical luminous intensity (cd/m²)	Mega Red	Mega Green	Mega Yellow	Mega Blue	White
	1200	1300	1100	600	1000

206578

Colour	Order Code	Price Each 1+	10+	25+	50+	+
Bright Chrome - Prominent						
Red	110-5353●	11.69	10.49	9.42	7.81	– –
Green	110-5355●	26.02	23.37	20.98	17.32	– –
Yellow	110-5354●	15.78	14.18	12.66	11.81	– –
Blue	113-9506●	24.76	22.55	20.16	17.42	– –
White	113-9511●	23.50	21.33	19.37	15.34	– –
Bright Chrome - Recessed						
Red	110-5356●	12.03	10.84	9.70	8.51	– –
Green	110-5357●	26.55	23.31	20.07	16.07	– –
Yellow	301-1744	15.78	14.18	12.69	11.78	– –
White	110-5359●	21.99	19.75	17.70	15.78	– –
Black Chrome - Prominent						
Red	110-5361●	12.28	11.12	9.95	6.98	– –
Green	110-5362●	26.43	23.72	21.26	16.07	– –
Black Chrome - Recessed						
Red	110-5363●	13.17	12.60	11.02	8.06	– –
Yellow	110-5364●	16.85	15.12	13.55	12.03	– –

5mm with Integral Resistor

110V ac and 240V ac



Prominent: Total L behind bezel=44
Recessed: Total L behind bezel = 46

All types: Bezel dia.=9.5, thread=M8 x 0.75, mounting hole dia.=8, Tab connections=2.8 x 0.8

A range of panel mounting indicators with integral resistor to permit direct connection to 110V ac and 240V ac supplies. The 5mm LEDs are fitted in high quality satin chrome or black chrome brass housings, fitted with fixing nut and washer. Connection is by faston/solder tab terminals. **CE** approved.

RoHS ● Compliant ◄ Non-compliant ++ Limited stock - RoHS replacement available

Operating voltage: 110V nom., 135V max. 110V nom., 135V max. Operating temperature range -55°C to +60°C

Operating current (nom.)6mA(110V)6mA(230) Life Expectancy 60000 hours min.

Typ. luminous intensity at operating current		Red	Green	Yellow
Prominent/Recessed	110V	36mcd	10mCd	15mCd
Prominent/Recessed	230V	22mcd	10mCd	15mCd

206313

Colour	Order Code	Price Each 1+	25+	50+	100+	+
Satin Chrome - Prominent						
110V Red	**110-5320**	15.84	10.17	9.70	9.07	– –
110V Green	**110-5321**	15.84	10.17	9.70	9.07	– –
110V Yellow	**110-5323**	15.84	10.17	9.70	9.07	– –
230V Red	**113-9490**	15.84	15.06	9.70	9.07	– –
230V Green	**113-9489**	15.84	10.17	9.70	9.07	– –
Satin Chrome - Recessed						
110V Red	**113-9477**	15.84	10.17	9.70	9.07	– –
110V Green	**110-5370**	15.84	10.17	9.70	9.07	– –
110V Yellow	**110-5372**	15.84	10.17	9.70	9.07	– –
230V Red	**110-5373**	15.84	10.17	9.70	9.07	– –
230V Green	**110-5374**	15.84	10.17	9.70	9.07	– –
230V Yellow	**110-5375**	15.84	15.06	9.70	9.02	– –
Black Chrome - Prominent						
110V Red	**110-5365**	16.88	10.84	10.36	9.67	– –
110V Green	**110-5366**	16.88	16.07	10.36	9.67	– –
110V Yellow	**570-084**	16.88	10.84	10.36	9.67	– –
230V Red	**110-5367**	16.88	10.84	10.36	9.67	– –
230V Green	**110-5368**	16.88	16.07	10.36	9.67	– –
230V Yellow	**110-5369**	16.88	10.84	10.36	9.67	– –
Black Chrome - Recessed						
110VRed	**570-187**	16.88	10.84	10.36	9.67	– –
110V Green	**110-5376**	16.88	10.84	10.36	9.67	– –
110V Yellow	**110-5377**	16.88	10.84	10.36	9.67	– –
230V Red	**110-5378**	16.88	10.84	10.36	9.67	– –
230V Green	**110-5379**	16.88	10.84	10.36	9.67	– –
230V Yellow	**110-5380**	16.88	10.84	10.36	9.67	– –

LED Indicators, 7mm Lens Diameter

7mm, Sunlight Readable - IP66 Rated

MARL

12V & 24V dc

- 8.1mm mounting dia. panel indicator
- Sealed to **IP66**
- Sunlight readability
- Nickel plated Brass housing
- MTBF 90,000 hours
- Designed for push on spade connectors

L=33.0 (overall), Length behind bezel=29.3, Mounting hole dia.=8.1, Bezel dia.=11.5

Operating Voltage: 12V dc, 24V dc Operating Current: 20mA

Colour	Luminous Intensity @ 20mA	Wavelength
Red	2750mcd	660nm
Green	6000mcd	525nm
Yellow	4500mcd	595nm
White	3000mcd	–

Viewing angle: 120° Operating Temperature: - 20°C to +60°C

206571

Colour	Mftrs. List No.	Order Code	Price Each 1+	25+	50+	100+	+
12V dc Red	508-501-21	**973-7448**	24.32	22.30	21.20	– –	– –
12V dc Green	508-532-21	**973-7464**	27.97	25.67	24.57	23.25	– –
12V dc Yellow	508-521-21	**973-7456**	24.32	22.30	21.20	– –	– –
12V dc White	508-997-21	**973-7472**	27.97	25.67	24.57	24.23	– –
24V dc Red	508-501-22	**973-7480**	24.32	22.30	21.20	– –	– –
24V dc Green	508-532-22	**973-7502**	27.97	25.67	24.57	23.25	– –
24V dc Yellow	508-521-22	**973-7499**	24.32	22.30	21.20	– –	– –
24V dc White	508-997-22	**973-7510**	27.97	25.67	24.57	24.53	– –

7mm, IP67 Rated - Sunlight Readable

MARL

With Integral Resistor - 12V dc, 24V dc and 28V dc

A range of sunlight readable, high performance, panel mounting LED indicators. Sealed to **IP67** rating. Black anodised housing fitted with fixing nut and washer. Connection is via faston/solder tab terminals.

L=33.0 (overall), Length behind bezel=29.3,
Mounting Hole dia=8.1,
Tab connections=2.8 x 0.8, Polarity indicated on tab terminals

Operating Voltages	12V	24V	28V	Wavelength (nm)
Typ. Luminous Intensity				
Red	2750 mcd	2750 mcd	2750 mcd	660
Green	6000 mcd	6000 mcd	6000 mcd	525
Yellow	4500 mcd	4500 mcd	4500 mcd	590
Blue	2000 mcd	2000 mcd	2000 mcd	450
Reverse voltage protection		1000Vdc	Operating temp. range	-20°C to +60°C
Operating Current	20mA		Viewing angle	140°C

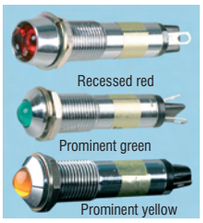
206437

Colour	Mftrs. List No.	Order Code	Price Each 1+	5+	10+	25+	+
12V dc Red	677-501-21-R	**973-8398**	28.63	27.34	24.44	24.37	– –
12V dc Green	677-532-21-G	**973-8401**	35.01	– –	– –	– –	– –
12V dc Yellow	677-521-21-Y	**973-8410**	26.51	26.27	24.76	24.37	– –
12V dc Blue	677-930-21-B	**973-8428**	34.89	34.86	33.40	33.14	– –
24V dc Red	677-501-22-R	**973-8436**	25.99	24.79	24.37	– –	– –
24V dc Green	677-532-22-G	**973-8444**	35.69	– –	– –	– –	– –
24V dc Yellow	677-521-22-Y	**973-8452**	25.99	24.79	24.37	– –	– –
24V dc Blue	677-930-22-B	**973-8460**	35.42	– –	– –	– –	– –
28V dc Red	677-501-23-R	**973-8479**	28.63	27.34	24.44	24.37	– –
28V dc Green	677-532-23-G	**973-8487**	33.77	33.74	33.14	31.31	– –
28V dc Yellow	677-521-23-Y	**973-8495**	28.63	27.34	24.44	24.37	– –

Panel Mount Indicators

Dialight

7mm Mounting Hole



Colour	Luminous Intensity I_V (mcd)	If (mA) max	Operating V_f (V)	Mftrs List No.	Order Code
Prominent LED					
Red	8.0	15	6	6071112120	788-2262
Green	8.0	15	6	6071212120	788-2270
Yellow	2.2	15	6	6071312120	788-2289
Red	8.0	15	12	6071112130	788-2297
Green	8.0	15	12	6071212130	788-2300
Yellow	2.2	15	12	6071312130	788-2319
Recessed LED					
Red	8.0	15	6	6072112120	788-2327
Green	8.0	15	6	6072212120	788-2335
Yellow	2.2	15	6	6072312120	788-2343
Red	8.0	15	12	6072112130	788-2351
Green	8.0	15	12	6072212130	788-2360
Yellow	2.2	15	12	6072312130	788-2378

Dimensions	Prominent	Recessed
Depth: Lamp to panel / Body	4.07mm / 23.10mm	3.81mm / 23.88mm
Diameter - Lens	4.07mm	7.37mm
Diameter - Bezel	8.13mm	8.38mm
Diameter - Mounting hole	7mm	7mm
Panel thickness (Max)	7mm	7mm
Material - Housing	Chrome plated Brass	Chrome plated Brass
Temperature - Operating	-25°C to +85°C	
Expected life	100,000 hours	

361100

Colour	Voltage (V dc)	Order Code	Price Each 1+	10+	50+	100+	+
Prominent LED							
Red	6	**788-2262**	6.25	5.66	5.31	4.88	– –
Green	6	**788-2270**	6.58	5.99	5.60	5.14	– –
Yellow	6	**788-2289**	6.58	5.99	5.60	5.14	– –
Red	12	**788-2297**	6.25	5.66	5.31	4.88	– –
Green	12	**788-2300**	6.58	5.99	5.60	5.14	– –
Yellow	12	**788-2319**	6.58	5.99	5.60	5.14	– –
Recessed LED							
Red	6	**788-2327**	6.25	5.66	5.31	4.88	– –
Green	6	**788-2335**	6.58	5.99	5.60	5.14	– –
Yellow	6	**788-2343**	6.58	5.99	5.60	5.14	– –
Red	12	**788-2351**	6.25	5.66	5.31	4.88	– –
Green	12	**788-2360**	6.58	5.99	5.60	5.14	– –
Yellow	12	**788-2378**	6.58	5.99	5.60	5.14	– –

LED Indicators, 8mm Lens Diameter

8mm

MENTOR

Panel mounting 8mm LEDs housed in a choice of bright or black chrome plated brass bezels. The bezels of the bright chrome types are polished to form high quality reflectors.

Body length (overall)=19.5, Bezel dia=14
Mounting hole dia.=12.3, Thread=M12 x 0.75
Short lead is cathode

Operating Temperature -40°C to +85°C

	I_F max.	V_F typ.	V_R max.	Typ. Lum. Intensity (mcd)
Red	20mA	2V	3V	25 @ 20mA
Green	20mA	2.1V	3V	14 @ 25mA
Yellow	20mA	2.1V	3V	35 @ 25mA

206265

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

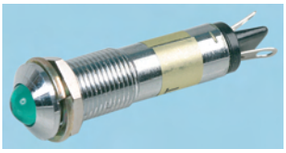
Colour	Order Code	Price Each 1+	50+	100+
Bright Chrome				
Red	**121-5791**	13.21	10.46	5.50
Green	**121-5794**	13.56	10.81	5.62
Yellow	**121-5793**	13.12	10.81	5.62
Black Chrome				
Red	**121-5792**	13.66	10.96	5.65
Green	**121-5795**	13.86	11.60	5.71
Yellow	**232-300**	14.45	12.10	5.95

LED Indicators, 10mm Lens Diameter

Panel Mount Indicators

9mm Mounting Hole

Dialight



Prominent green

Recessed yellow

Dimensions	Prominent	Recessed
Depth: Lamp to panel / Body	5.08mm / 30.99mm	5.08mm / 32mm
Diameter - Lens	6.10mm	8.89mm
Diameter - Bezel	10.92mm	10.92mm
Diameter - Mounting hole	9.3mm	9.3mm
Panel thickness (Max)	7.5mm	7.5mm
Material - Housing	Chrome plated Brass or Black finished Brass	
Current	15mA	
Luminous Intensity (typ.)	Red = 60, Green = 110, Yellow = 90mCd	
Temperature - Operating	-25°C to +85°C	
Expected life	100,000 hours	

Order Code	Mftrs. List No.	Order Code	Mftrs. List No.
788-2386	6091112120	788-2564	6091122120
788-2394	6091212120	788-2572	6091222120
788-2408	6091312120	788-2580	6091322120
788-2416	6091112130	788-2599	6091122130
788-2424	6091212130	788-2602	6091222130
788-2432	6091312130	788-2610	6091322130
788-2440	6092112120	788-2629	6092122120
788-2459	6092212120	788-2637	6092222120
788-2467	6092312120	788-2645	6092322120
788-2475	6092112130	788-2653	6092122130
788-2483	6092212130	788-2661	6092222130
788-2491	6092312130	788-2670	6092322130
788-2505	6091112140	788-2688	6091122140
788-2513	6091212140	788-2696	6091222140
788-2521	6091312140	788-2700	6091322140
788-2530	6092112140	788-2718	6092122140
788-2548	6092212140	788-2726	6092222140
788-2556	6092312140	788-2734	6092322140

361115

Colour	Voltage (V dc)	Order Code	Price Each 1+	10+	50+	100+	+
Chrome Plated Brass Housing							
Prominent LED							
Red	6	**788-2386**	5.89	5.34	4.98	4.59	– –
Green	6	**788-2394**	5.89	5.34	4.98	4.59	– –
Yellow	6	**788-2408**	5.89	5.34	4.98	4.59	– –
Red	12	**788-2416**	5.89	5.34	4.98	4.59	– –
Green	12	**788-2424**	5.89	5.34	4.98	4.59	– –
Yellow	12	**788-2432**	5.89	5.34	4.98	4.59	– –
Red	24	**788-2505**	5.89	5.34	4.98	4.59	– –
Green	24	**788-2513**	5.89	5.34	4.98	4.59	– –
Yellow	24	**788-2521**	5.89	5.34	4.98	4.59	– –
Recessed LED							
Red	6	**788-2440**	5.89	5.34	4.98	4.59	– –
Green	6	**788-2459**	5.89	5.34	4.98	4.59	– –
Yellow	6	**788-2467**	5.89	5.34	4.98	4.59	– –
Red	12	**788-2475**	5.89	5.34	4.98	4.59	– –
Green	12	**788-2483**	5.89	5.34	4.98	4.59	– –
Yellow	12	**788-2491**	5.89	5.34	4.98	4.59	– –
Red	24	**788-2530**	5.89	5.34	4.98	4.59	– –
Green	24	**788-2548**	5.89	5.34	4.98	4.59	– –
Yellow	24	**788-2556**	5.89	5.34	4.98	4.59	– –
Black Coated Brass Housing							
Prominent LED							
Red	6	**788-2564**	6.38	5.79	5.40	4.98	– –
Green	6	**788-2572**	6.38	5.79	5.40	4.98	– –
Yellow	6	**788-2580**	6.38	5.79	5.40	4.98	– –
Red	12	**788-2599**	6.38	5.79	5.40	4.98	– –
Green	12	**788-2602**	6.38	5.79	5.40	4.98	– –
Yellow	12	**788-2610**	6.38	5.79	5.40	4.98	– –
Red	24	**788-2688**	6.38	5.79	5.40	4.98	– –
Green	24	**788-2696**	6.38	5.79	5.40	4.98	– –
Yellow	24	**788-2700**	6.38	5.79	5.40	4.98	– –
Recessed LED							
Red	6	**788-2629**	6.38	5.79	5.40	4.98	– –
Green	6	**788-2637**	6.38	5.79	5.40	4.98	– –
Yellow	6	**788-2645**	6.38	5.79	5.40	4.98	– –
Red	12	**788-2653**	6.38	5.79	5.40	4.98	– –
Green	12	**788-2661**	6.38	5.79	5.40	4.98	– –
Yellow	12	**788-2670**	6.38	5.79	5.40	4.98	– –
Red	24	**788-2718**	6.38	5.79	5.40	4.98	– –
Green	24	**788-2726**	6.38	5.79	5.40	4.98	– –
Yellow	24	**788-2734**	6.38	5.79	5.40	4.98	– –

12V dc, 24V dc, Sunlight Readable

Stainless Steel Housing

MARL

- Unique design
- Robust stainless steel housing for operating in harsh environments
- Low profile lens style
- Sealed to **IP67**
- Sunlight visible
- Full internal encapsulation

Mounting hole dia.=13.0, Overall L=38
Total L behind bezel=35,
Bezel dia.= 17, Tab connections 2.8 x 0.5

Operating Voltage: 12V dc @ 20mA, 24V dc @ 20mA, 230V ac 3mA

Colour	Luminous intensity @ operating voltage	Wavelength
Red	2750mCd	660nm
Green	6000mCd	525nm
Yellow	4500mCd	590nm

221727

Colour	Order Code	Price Each 1+	5+	10+	15+	+
12V dc						
Red	**973-7952●**	38.65	33.23	31.56	28.32	– –
Green	**973-7960●**	44.48	38.24	36.29	32.28	– –
Yellow	**973-7979●**	39.31	33.80	32.07	30.56	– –
24V dc						
Red	**973-7987●**	38.65	33.23	31.56	28.32	– –
Green	**973-7995●**	44.48	38.24	36.29	32.28	– –
Yellow	**973-8002●**	39.31	33.80	32.07	30.56	– –
230V ac						
Red	**973-8029●**	39.53	33.99	32.26	29.92	– –

Large Area

With or Without Resistor

vch INTERNATIONAL

Body length=31.5
Bezel dia=15.7
Mounting hole dia=12.7
Flying lead length=150.0

Large high brightness, push-fit panel mounting LEDs in bright chrome nylon housing with an attractive chrome bezel and coloured lens. Built in reflector giving a wide viewing angle of 140°. These LEDs are available either with or without a current limiting resistor. Connection is via 0.187" push-on/solder lug terminals or by flying leads.

Without Resistor	Typ. Lum. Intensity	V_F typ.	@	I_F	V_R max.	Mftrs. List No.	Order Code
●Green	5mCd	2.2V		30mA	5V	6340-005-505G	110-5436
◆Green	5mCd	2.2V		30mA	5V	6340-305-505G	113-9534
●Amber	10mCd	2.2V		30mA	5V	6340-001-505A	113-9532

With Resistor		Typ. Lum. Intensity	@	Operating Current	V_R max.	Mftrs. List No.	Order Code
●Red	5V dc	13mCd		30mA	5V	6342-002-505R	113-9528
●Red	28V dc	7mCd		17mA	5V	6346-002-505R	110-5439
●Green	28V dc	3mCd		17mA	5V	6346-005-505G	110-5440
●Amber	28V dc	5mCd		17mA	5V	6346-001-505A	110-5441

●Tab terminals ◆Flying leads

221719

Colour	Voltage	Order Code	Price Each 1+	50+	100+
Green	—	**110-5436●**	6.68	5.20	4.95
Green	—	**113-9534●**	6.98	5.10	4.73
Amber	—	**113-9532●**	7.40	5.54	5.01
Red	5V dc	**113-9528●**	7.40	5.54	4.95
Amber	5V dc	**113-9527●**	7.40	5.54	4.95
Red	28V dc	**110-5439●**	10.52	8.03	6.62
Green	28V dc	**110-5440●**	10.52	8.03	6.62
Amber	28V dc	**110-5441●**	10.52	8.03	6.62
			5+	**50+**	**100+**
Mounting Clip		**110-5438●**	0.56	0.39	0.34

RoHS ● Compliant ◀ Non-compliant ‡ Limited stock - RoHS replacement available

12V dc, 24V dc and 230V ac

MARL

Mounting hole dia.=12.7, Overall L=38.5
Total L behind bezel=26.5, Bezel dia.=17,
Max. panel thickness=8,
Tab Connections=2.8 x 0.5

- Bright nickel plated brass housing
- Robust termination tags accept push-on connectors
- Sealed to IP67
- Full internal encapsulation

This range of LED Indicators is the nickel plated brass bodied versions of the above black anodised type from Marl. They have the same benefits and features.

Operating current: 12V dc 20mA, 24V dc 20mA, 240V ac 3mA
Operating temperature range:-40°C to +85°C

Typical Luminous intensity I_0 (mcd)	Red	Super Red	Green	Yellow
12V dc	40	200		
24V dc	40	200	40	40
230V ac	5	15	3	5

221723

Colour	Order Code	Price Each 1+	10+	25+
12V dc				
Red	**973-7790**	27.34	25.33	23.66
Super Red	**973-7804**	27.34	25.33	23.66
24V dc				
Red	**973-7812**	27.34	25.33	23.66
Super Red	**973-7820**	27.34	25.33	23.66
Green	**973-7839**	27.34	25.33	23.66
Yellow	**973-7847**	27.34	25.33	23.66
240V ac				
Red	**973-7855**	28.60	26.46	25.83
Super Red	**973-7863**	28.60	26.46	25.83
Green	**973-7871**	28.60	26.46	25.83
Yellow	**973-7880**	28.60	26.46	25.83

10mm Wire Ended

CML

2.5V dc

L behind bezel=19, Bezel dia.=16,
Thread=M14 x 1, Mounting hole dia.=14.5

A range of panel mounted, wire ended indicators. They are fitted in high quality bright chrome or black chrome brass housings, fitted with fixing nut and washer. **CE approved**.

Operating Voltage 2.5V dc
Operating temperature -55°C to +70°C
Operating current (max.) 30mA
Typical luminous intensity @ 20mA HE Red 65mcd, Green 20mcd, Yellow 23mcd

206348

Colour	Order Code	Price Each 1+	25+	100+	250+	+
Bright Chrome						
HE Red	**110-5458**	7.65	6.51	5.37	4.39	– –
Green	**110-5459**	7.65	6.51	5.37	4.39	– –
Yellow	**110-5460**	7.65	6.51	5.37	4.39	– –
Black Chrome						
HE Red	**110-5461**	7.97	7.00	5.70	4.72	– –
Green	**113-9535**	10.02	7.40	5.98	3.95	– –
Yellow	**110-5463**	7.97	7.00	5.70	4.72	– –

10mm with Integral Resistor

CML

12V dc to 24V dc and 110Vac to 240Vac – Single, Flashing and Tri-colour

Total L behind bezel=42, Bezel dia.=16,
Thread=M14 x 1
Mounting hole dia.=14.5
Tab connections=2.8 x 0.8

A range of panel mounting LED indicators with integral resistor to permit direct connection to 12V and 24V dc supplies. The 10mm LEDs are fitted in high quality bright chrome or black chrome brass housings, fitted with fixing nut and washer. Connection is by faston/solder tab terminals. The tri-colour indicators have HE red and green LEDs, both LEDs connected gives yellow. **CE** approved.

Operating Voltage 12V dc, 24V dc ±10%
Operating current (max.) 30mA (12V), 22mA (24V)
Reverse voltage (max.) 5V
Operating temperature range -25°C to +70°C

Typical Luminous Intensity @ I_F=20mA	HE Red	Green	Yellow
12V	90mcd	30mcd	35mcd
24V	70mcd	22mcd	25mcd

206283

Colour	Order Code	Price Each 1+	25+	50+	100+	+
Bright Chrome						
(V),Colour						
12 DC, HE Red, Green and Yellow	**110-5447**	15.37	11.12	10.69	– –	– –
12 DC, HE Red	**110-5451**	11.18	10.36	7.12	7.02	– –
12 DC, HE Red, Green and Yellow	**110-5456**	15.78	13.95	10.93	– –	– –
12 DC, HE Red	**113-9485**	10.77	10.02	9.01	6.79	– –
12 DC, Green	**110-5452**	10.65	7.75	7.12	7.02	– –
12 DC, Green	**113-9483**	10.27	7.47	6.87	6.79	– –
12 DC, Yellow	**110-5453**	10.65	7.75	7.12	7.02	– –
12 DC, Yellow	**110-5442**	10.27	7.47	6.87	6.79	– –
24 DC, Red	**110-5446**	14.24	10.46	10.04	– –	– –
24 DC, HE Red, Green and Yellow	**110-5457**	15.78	13.95	10.93	– –	– –
24 DC, HE Red, Green and Yellow	**110-5448**	15.37	13.48	12.41	11.63	– –
24 DC, Yellow	**110-5445**	10.27	7.47	6.87	6.79	– –
24 DC, Green	**110-5444**	10.27	9.48	6.87	6.79	– –
110 AC, Red	**110-5475**	18.05	13.58	12.51	12.32	– –
110 AC, Yellow	**110-5476**	19.62	14.62	13.45	13.25	– –
110 AC, Blue (neon)	**113-9180**	14.62	13.04	12.57	12.32	– –
230 AC, Red	**110-5477**	18.05	13.58	12.51	12.32	– –
Black Chrome						
24 DC, Red	**110-5455**	14.74	10.80	10.37	– –	– –
24 DC, HE Red	**113-9498**	11.18	10.36	7.12	7.02	– –
24 DC, HE Red, Green and Yellow	**110-5457**	15.78	13.95	10.93	– –	– –
24 DC, Yellow	**110-5454**	10.65	7.75	7.12	7.02	– –
24 DC, Green	**113-9495**	10.65	9.86	7.12	7.02	– –

10mm, High Contrast with Integral Resistor, IP67 Rated

CML

24V dc

Total L behind bezel=41, Bezel dia.=16,
Thread=M14 x 1, Mounting hole dia.=14.5,
Tab Connections=2.8 x 0.8

A range of LED panel-mounting indicators with integral resistor to permit direct connection to 24V dc supplies. They incorporate a white diffused 10mm LED to give a high 'on/off' contrast and are fitted in high quality prominent, bright chrome or black chrome brass housings, fitted with fixing nut and washer. Connection is by faston/solder tab terminals.

Operating Voltage: 24V dc
Operating Temperature: -20°C to +50°C
Reverse voltage (max.) 80V
Operating current: 17mA

Typical Luminous Intensity (mcd)	HE Red	Green	Yellow
	60	40	40

206576

Colour	Order Code	Price Each 1+	10+	25+	50+	+
Matt Chrome (Brushed Satin) - Prominent						
24Vdc HE Red	**110-5468**	11.53	10.65	9.76	7.25	– –
24Vdc Green	**110-5469**	11.53	9.86	9.04	7.25	– –
24Vdc Yellow	**110-5470**	11.53	10.65	9.76	7.25	– –
Black Chrome - Prominent						
24Vdc HE Red	**110-5471**	11.53	9.86	9.04	7.25	– –
24Vdc Green	**110-5472**	11.53	10.65	9.76	7.25	– –
24Vdc Yellow	**110-5473**	11.53	10.65	9.76	7.25	– –

10mm, with Lamp Test Facility and Integral Resistor, IP67 Rated

CML

24V ac/dc Matt Chrome (Brushed Satin) Finish

Total L behind bezel=41, Bezel dia.=16,
Thread=M14 x 1, Mounting hole dia.=14.5,
Tab Connections=2.8 x 0.8

A range of LED panel mounting indicators with a lamp test facility suitable for both ac and dc operation. Integral resistors permit direct connection to the stated supply. The LED's are fitted in a high quality Matt Chrome (Brushed Satin) housing, giving protection to IP67 rating, fitted with 'O' ring, fixing nut and washer. Connection is by faston/solder tab terminals.

	Red	Green	Yellow	Blue	White
Typical luminous intensity (mcd):	80	60	60	350	650
Forward Current:	17mA	17mA	17mA	17mA	17mA
Reverse Voltage (max.):	80V	Operating Temperature: -20°C to +50°C			

206574

Colour	Order Code	Price Each 1+	10+	25+	50+	+
Matt Chrome (Brush satin)						
24Vac/dc HE Red	**110-5464**	11.79	10.93	9.99	7.44	– –
24Vac/dc Green	**110-5465**	11.79	10.93	9.99	7.44	– –
24Vac/dc Yellow	**110-5466**	11.79	10.93	9.99	7.44	– –
24Vac/dc Blue	**110-5467**	25.91	23.91	21.86	16.59	– –
230Vac	**110-5477**	18.05	13.58	12.51	12.32	– –
24Vac/dc White	**113-9569**	25.91	23.91	21.86	16.28	– –

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

C = CYAN M = Magenta Y = Yellow B = Black/SING

10mm, Sunlight Readable - IP67 Rated

12V & 24V dc, 110V & 240V ac

- 12.7mm mounting dia. panel indicator
- Sealed to **IP67**
- Sunlight readability
- Nickel plated Brass housing
- MTBF 90,000 hours
- Designed for push on spade connectors

L=33.0 (overall), Length behind bezel=26.5, Mounting hole dia.=12.7, Bezel dia.=17

Operating Voltage: 12Vdc @ 20Ma, 24Vdc @ 20mA, 110Vac @ 9mA, 240Vac @ 4mA

Colour	Luminous Intensity @ 20mA	Wavelength
Red	3500mcd	660nm
Green	6000mcd	525nm
Yellow	6200mcd	595nm
White	3000mcd	—

Viewing angle: 120° Operating Temperature: -20°C to +60°C

206567

Colour	Mftrs. List No.	Order Code	Price Each 1+	5+	10+	25+	+
12V dc Red	512-501-21	**973-7529**	43.28	39.22	31.78	24.57	– –
12V dc Green	512-532-21	**973-7545**	45.99	37.49	33.77	26.52	– –
12V dc Yellow	512-521-21	**973-7537**	43.28	39.22	31.78	24.57	– –
12V dc White	512-997-21	**973-7553**	43.72	35.66	33.11	27.40	– –
24V dc Red	512-501-22	**973-7561**	33.39	30.40	27.09	24.57	– –
24V dc Green	512-532-22	**973-7588**	40.01	37.49	34.40	26.18	– –
24V dc Yellow	512-521-22	**973-7570**	33.39	30.40	27.09	24.57	– –
24V dc White	512-997-22	**973-7596**	43.72	39.19	35.41	28.45	– –
110V ac Red	512-501-75	**973-7600**	27.59	27.06	– –	– –	– –
110V ac Green	512-532-75	**973-7626**	31.75	29.52	27.66	26.39	– –
110V ac Yellow	512-521-75	**973-7618**	47.66	38.87	35.03	27.06	– –
240V ac Red	512-501-76	**973-7634**	47.66	38.87	35.03	27.06	– –
240V ac Green	512-532-76	**973-7650**	39.82	35.72	32.26	26.39	– –
240V ac Yellow	512-521-76	**973-7642**	34.62	32.16	30.30	27.06	– –
240V ac White	512-997-76	**973-7669**	42.43	40.57	37.58	27.68	– –

10mm with Integral Resistor

110V ac and 240V ac

Total L behind bezel=67, Bezel dia.=16,
Thread=M14 x 1
Mounting hole dia.=14.5.
Tab connections=2.8 x 0.8

A range of panel mounting indicators with integral resistor to permit direct connection to 110V ac and 240V ac supplies. The 10mm LEDs are fitted in high quality bright chrome or black chrome brass housings, fitted with fixing nut and washer. A matching blue indicator is available using a fluorescent (neon) tube. Connection is by faston/solder tab terminals. **CE** approved.

Note: 110V ac types are not suitable for use on 240V ac supply by using a dropper resistor.

Operating Voltage: 110V nom, 135V max. 230V nom, 250V max. Operating current (nom.) 6mA (110V), 3mA (230V) Operating temperature range -25°C to +60°C

Typical Luminous Intensity	Red	Green	Yellow	Blue
110V	47mcd	34mcd	27mcd	7.5mcd
230V	18mcd	11mcd	8mcd	7.5mcd

Life expectancy LED 60,000 hours min.
Fluorescent 25,000 hours min.

206284

Colour	Order Code	Price Each 1+	25+	50+	100+	+
Bright Chrome						
110V Red	**110-5475**	18.05	13.58	12.51	12.32	– –
110V Green	**113-9476**	19.62	14.62	13.45	13.25	– –
110V Yellow	**110-5476**	19.62	14.62	13.45	13.25	– –
110V Blue (neon)	**461-489**	14.62	13.04	12.57	12.32	– –
240V Red	**110-5477**	18.05	13.58	12.51	12.32	– –
240V Green	**110-5478**	19.62	14.62	13.45	13.25	– –
240V Yellow	**113-9492**	19.62	14.62	13.45	13.25	– –
Black Chrome						
110V Red	**110-5480**	18.52	14.11	12.98	12.79	– –
110V Green	**110-5481**	19.97	15.12	13.92	13.72	– –
240V Red	**110-5482**	18.52	14.11	12.98	12.79	– –
240V Green	**110-5483**	19.97	15.12	13.92	13.72	– –
240V Yellow	**113-9493**	19.97	15.12	13.92	13.72	– –
240V Blue (neon)	**110-5484**	14.99	13.55	13.01	12.79	– –

LED Indicators, 16mm Lens Diameter

16mm with Integral Resistor, IP67

12V dc, 24V dc, 12V ac, 24V ac, 130V ac & 230V ac

Total L behind bezel=58, Bezel dia.=22,
Thread=M22 x 1.5
Mounting hole dia.=22,
Tab connections=2.8 x 0.8

A range of panel mounting indicators with integral resistor to permit direct connections to the stated voltages. They are fitted in a high quality bright chrome or black chrome brass housings, giving protection to **IP67**, fitted with 'O' ring, fixing nut and washer. Connection is by faston/solder tab terminals. There are two negative terminals provided for ease of wiring to a number of indicators. **CE** approved.

Note the spare terminal should be insulated if not being used. 110V ac types are not suitable for use on 240V ac supply by using a dropper resistor.

Operating voltage: 12Vdc - 38mA,24Vdc - 19mA,24Vac - 20mA, 130Vac -6mA,230Vac - 4mA

Operating temp. range: -25°C to + 60°C Life expectancy: 60000h

Typ. Luminous Intensity:	Red	Green	Yellow
12/24V dc	160	120	350
12/24V dc	265	120	350
130/230Vac	28	20	48

206505

Colour Bright Chrome	Order Code	Price Each 1+	10+	25+	50+	+
12V dc Red	**110-5502**	26.04	25.36	23.94	18.96	– –
12V dc Green	**110-5503**	26.04	25.36	23.94	18.96	– –
12V dc Yellow	**110-5505**	26.04	25.36	23.94	18.96	– –
24V acRed	**110-5506**	26.86	26.18	24.70	19.56	– –
24V acGreen	**110-5507**	26.86	26.18	24.70	19.56	– –
24V dc Red	**110-5508**	26.04	25.36	23.94	18.96	– –
24V dc Green	**113-9536**	26.04	25.36	23.94	18.96	– –
24V dc Yellow	**110-5509**	26.04	25.36	23.94	18.96	– –
130V ac Red	**110-5510**	29.32	28.54	26.96	21.33	– –
130V ac Yellow	**110-5511**	29.32	28.54	26.96	21.33	– –
230V ac Red	**110-5512**	29.32	28.54	26.96	21.33	– –
230V ac Green	**110-5513**	29.32	28.54	26.96	21.33	– –
230V ac Yellow	**110-5514**	29.32	28.54	26.96	21.33	– –
Black Chrome						
130V ac Yellow	**110-5515**	29.81	29.01	27.40	21.70	– –
230V ac Red	**110-5517**	29.81	29.01	27.40	21.70	– –
230V ac Green	**110-5518**	29.81	29.01	27.40	21.70	– –

Vandal Resistant

12.1mm Dia. panel cutout

- Rugged stainless steel body
- Low profile front panel projection
- Wide viewing angle
- Front panel sealed to IP67
- Rear of panel fixing
- Colour coded insulators
- Solder tag/2.8mm terminals
- Panel thickness 3 to 14mm

NEW

L=41.2mm (overall), D=5mm (lens),
D=15mm(bezel)

LED (ratings @ 20mA)

Red	Yellow	Green	Blue
2000mCd	100mCd	400mCd	1575mCd

Operating temperature -40 to 80°C
Operating current (typical) 20mA

413924

Colour	Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+
12V operating						
Red	DX0505/RD/12	**963-0201**	19.04	17.02	15.95	15.07
Yellow	DX0505/YL/12	**963-0210**	19.04	17.02	15.95	15.07
Green	DX0505/GN/12	**963-0228**	19.04	17.02	15.95	15.07
Blue	DX0505/BL/12	**963-0236**	19.04	17.02	15.95	15.07
24V operating						
Red	DX0505/RD/24	**963-0244**	19.04	17.02	15.95	15.07
Yellow	DX0505/YL/24	**963-0252**	19.04	17.02	15.95	15.07
Green	DX0505/GN/24	**963-0260**	19.04	17.02	15.95	15.07
Blue	DX0505/BL/24	**963-0279**	19.04	17.02	15.95	15.07

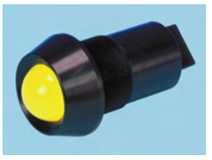
RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

LED Indicators, 20mm Lens Diameter

20mm - IP67 Rated

24V dc

MARL



This range of large diameter LED indicators have 20mm tinted diffused LEDs in a black anodised aluminium housing and sealed to **IP67** rating. They are supplied with sealing rings, fixing nut, washer and screw terminations.

Overall L=67, Total L behind bezel=49,
Bezel dia.=34.5, Mounting hole dia.=25.4

Operating current: 24V dc 20mA

Maximum reverse voltage: 1000V
Operating temperature range: -30°C to +40°C
Viewing angle: 180°

Typical Lum.Intensity I_V@ I_{OPR} (cdm^2)	Ultra Red	Red	Green	Yellow
24V dc	365	180	155	160
Wave Length (nm)	660	635	565	585

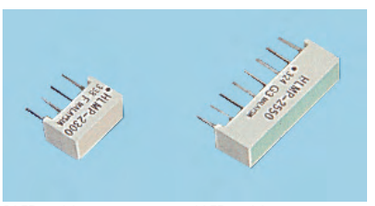
206519

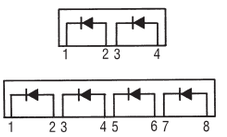
Colour	Mftrs. List No.	Order Code	Price Each 1+	3+	5+	+	+
24V dc							
Ultra red	671-289-22	**973-7219●**	100.80	93.05	89.27	– –	– –
Red	671-290-22	**973-7227●**	87.95	84.24	– –	– –	– –
Green	671-292-22	**973-7235●**	87.95	84.24	– –	– –	– –
Yellow	671-291-22	**973-7243●**	87.95	84.24	– –	– –	– –

LED Bar Modules

5mm Height

AVAGO TECHNOLOGIES





Single-in-line leads, pitch=2.54.
Leads=0.51 x 0.58

2 LED module
H=4.95, W=10.16, D=6.22
Light area=3.81 x 8.89

4 LED module
H=4.95, W=20.32, D=6.22
Light area=3.81 x 19.05

Black plastic mounting clips:

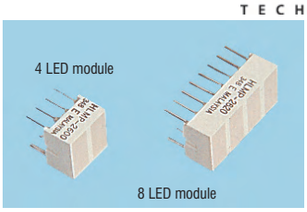
Outline	Colour	Typ Intensity (all LEDs on) mcd	I_F (mA) (max) each LED	PIV (max)	Mftrs. List No.	Order Code
	Red	7.5 @ 3mA	15	5	HLCP-A100	100-3245
	Red	15 @ 20mA	15	5	HLCP-B100	100-3246
	HE Red	23 @ 20mA	30	6	HLMP-2300	100-3247
	HE Red	45 @ 20mA	30	6	HLMP-2350	100-3248
	Yellow	20 @ 20mA	25	6	HLMP-2400	100-3249
	Yellow	38 @ 20mA	25	6	HLMP-2450	100-3250
	Green	25 @ 20mA	30	6	HLMP-2500	100-3251
	Green	50 @ 20mA	30	6	HLMP-2550	100-3253

206190

Colour	Order Code	Price Each 1+	10+	100+	500+	+
Red	**100-3245●**	4.89	3.01	2.27	1.86	– –
Red	**100-3246●**	7.96	5.14	4.08	3.34	– –
HE Red	**100-3247●**	4.06	2.50	1.89	1.54	– –
HE Red	**100-3248●**	6.34	4.09	3.25	2.66	– –
Yellow	**100-3249●**	4.06	2.50	1.89	1.54	– –
Yellow	**100-3250●**	6.41	4.14	3.29	2.69	– –
Green	**100-3251●**	4.06	2.50	1.89	1.54	– –
Green	**100-3253●**	6.41	4.14	3.29	2.69	– –
		5+	**100+**	**+**		
2 LED Clip	**117-5574●**	0.63	0.46	– –		
4 LED Clip	**117-5575●**	0.63	0.46	– –		

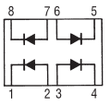
10mm Height

AVAGO TECHNOLOGIES

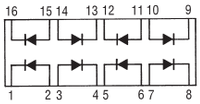


4 LED module
H=10.16, W=10.16, D=6.22
Light area (single area type)=8.89 x 8.89

8 LED module
H=10.16, W=20.32, D=6.22
Light area (single area type)=8.89 x 19.05



Lead spacing=2.54
Row spacing=7.62
Leads=0.51x0.58



Bicolour light bars have 4 HE Red LEDs connected as shown, and Green LEDs across each in inverse parallel. Reverse voltage=6V max.

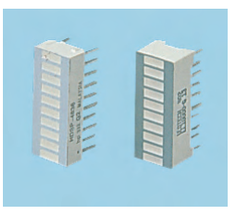
Outline	Colour	Typ Luminous Intensity/seg.(mcd) mcd	I_F (mA) (max) each LED	Mftrs. List No.	Order Code
	Red	7.5 @ 3mA	15	HLCP-D100	100-3254
	Red	7.5 @ 3mA	15	HLCP-E100	100-3255
	Red	15 @ 3mA	15	HLCP-C100	100-3256
	Red	30 @ 3mA	15	HLCP-H100	100-3257
	HE Red	45 @ 20mA	30	HLMP-2655	100-3258
	HE Red	80 @ 20mA	30	HLMP-2685	100-3259
	Yellow	38 @ 20mA	25	HLMP-2755	100-3260
	Yellow	70 @ 20mA	25	HLMP-2785	100-3261
	Green	25 @ 20mA	30	HLMP-2820	100-3262
	Green	50 @ 20mA	30	HLMP-2855	100-3263
	Green	100 @ 20mA	30	HLMP-2885	100-3265
	Bi Colour HE Red/Green	45/45 @ 20mA	30	HLMP-2965	100-3266

206191

Colour	Order Code	Price Each 1+	10+	100+	500+	+
Red	**100-3254●**	9.43	6.09	4.84	3.96	– –
Red	**100-3255●**	13.05	8.61	6.89	5.68	– –
Red	**100-3256●**	7.88	5.09	4.05	3.31	– –
Red	**100-3257●**	11.75	7.75	6.20	5.11	– –
HE Red	**100-3258●**	6.85	4.44	3.37	2.75	– –
HE Red	**100-3259●**	9.82	6.48	5.19	4.27	– –
Yellow	**100-3260●**	6.85	4.44	3.37	2.75	– –
Yellow	**100-3261●**	9.82	6.48	5.19	4.27	– –
Green	**100-3262●**	11.47	7.57	6.06	4.99	– –
Green	**100-3263●**	6.85	4.44	3.37	2.75	– –
Green	**100-3265●**	9.82	6.48	5.19	4.27	– –
Bi-colour	**100-3266●**	14.22	9.38	7.51	6.18	– –

LED Arrays

10 Segment Bar Graph



End stackable 10 segment bar graph displays with separate anodes and cathodes for each light segment. The HDSP series features interlock mechanism to aid end-to-end alignment.

	H	W	D	Segments
HDSP series	10.16	25.4	6.1	1.52 x 5.08
HLCP-J100	10.16	25.4	6.1	1.52 x 5.08
MV series	10.2	25.3	8	1.78 x 5.08

Lead pitch=2.54 Row spacing=7.62

Colour	Typ. inten./Seg.	V_F max.	I_F (mA) (max)	Mftrs.	Mftrs. List No.	Order Code
Red	1mCd @ 10mA	2.2	15	AGI	HLCP-J100	100-3267
HE Red	3.5mCd @ 10mA	2.5	30	AGI	HDSP-4830	100-3268
HE Red	2mCd @ 10mA	3	25	AGI	LL10000HR	120-8882
Yellow	1.9mCd @ 10mA	2.5	20	AGI	HDSP-4840	100-3269
Green	1.9mCd @ 10mA	3	25	AGI	LL10000G	120-8884
Multicolour	◆	◆	◆	AGI	HDSP-4850	100-3270
Multicolour	◆	◆	◆	AGI	HDSP-4832	100-3271
Red/Yellow/Green	1.9mCd @ 1mA	2.5	30	AGI	HDSP-4836	100-3272

◆ Multi colour displays have HE Red. Yellow and Green elements identcal to those of HDSP4830/40/50 in the following arrangements

Segments	a	b	c	d	e	f	g	h	i	j
HDSP4832	R	R	R	Y	Y	Y	Y	G	G	G
HDSP4836	R	R	Y	Y	G	G	Y	Y	R	R

pin 1 = Anode a. pin 2 = Anode b, etc pin 11 = Cathode j. pin 12 = Cathode i, etc

206193

Colour	Order Code	Price Each 1+	10+	100+
Red	**100-3267●**	14.60	10.20	8.17
HE Red	**100-3268●**	11.64	8.14	6.52
HE Red	**120-8882●**	8.01	7.49	7.32
Yellow	**100-3269●**	11.64	8.14	6.52
Green	**120-8884●**	8.14	7.49	7.32
Multicolour	**100-3270●**	11.64	8.14	6.52
Multicolour	**100-3271●**	13.27	9.39	7.62
Red/Yellow/Green	**100-3272●**	13.27	9.39	7.62

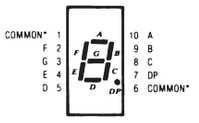
Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Agilent Technologies LED Displays

7.6mm (0.3") - Compact Package

AVAGO TECHNOLOGIES

H=12.7, W=7.62, D=6.09



*Internally connected
Pin spacing=2.54
Row spacing=5.08

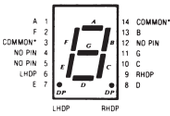
Colour	CA/CC	Format	Typ Luminous Intensity/segment mcd @	I_F(mA)	Typ V_F @	(mA)	V_R	Mftrs. List No.	Order Code
HE Red	Anode	8.	4.4	20	2.8	60	3	HDSP-7501	100-3273
HE Red	Cathode	8.	4.4	20	2.8	60	3	HDSP-7503	100-3274
Green	Anode	8.	1.3	10	2.1	10	3	HDSP-7801	100-3275
Green	Cathode	8.	1.3	10	2.1	10	3	HDSP-7803	100-3277
Sunlight Viewable, AlGaAs									
Red	Anode	8.	14	20	1.8	20	3	HDSP-A151	100-3139
Red	Cathode	8.	14	20	1.8	20	3	HDSP-A153	100-3140
High Intensity/Low Current AlGaAs Peak I_F 45mA/seg									
Red	Anode	8.	0.6	1	1.6	1	3	HDSP-A101	100-3278
Red	Cathode	8.	3.6	5	1.6	1	3	HDSP-A103	100-3279
Low Current Capable of high current drive for multipexing. Peak I_F 45mA/seg									
HE Red	Anode	8.	0.27	2	1.6	2	3	HDSP-7511	100-3280
HE Red	Cathode	8.	0.27	2	1.6	2	3	HDSP-7513	100-3281

206248

Format	CA/CC	Order Code	Price Each 1+	10+	100+	500+	+
HE Red							
8.	Anode	**100-3273●**	2.93	2.66	2.06		
8.	Cathode	**100-3274●**	2.93	2.66	2.06		
Green							
8.	Anode	**100-3275●**	2.93	2.66	2.06		
8.	Cathode	**100-3277●**	2.93	2.66	2.06		
AlGaAs Red							
8.	Anode	**100-3139●**	3.42	3.20	2.48		
8.	Cathode	**100-3140●**	3.42	3.20	2.48		
AlGaAs Red - High Intensity/Low Current			Price Each 1+	10+	100+	500+	+
8.	Anode	**100-3278●**	3.42	3.20	2.48	1.84	– –
8.	Cathode	**100-3279●**	3.68	3.34	2.59	1.92	– –
HE Red - Low Current							
8.	Anode	**100-3280●**	2.93	2.66	2.06	1.53	– –
8.	Cathode	**100-3281●**	2.93	2.66	2.06	1.53	– –

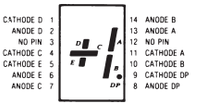
10.9mm (0.43")

AVAGO TECHNOLOGIES



NOTE: PIN 6=NC FOR RHDP TYPES
PIN 9=NC FOR LHDP TYPES

*Internally Connected



H=19.05, W=12.7, D=6.35
Pin spacing=2.54
Row spacing=7.62

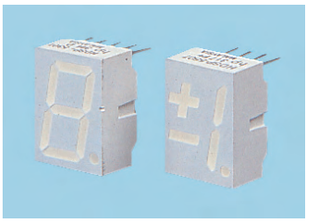
Colour	CA/CC	Format	Typ Luminous Intensity/segment mcd @		Typ V_F @	(mA)	V_R	Mftrs. List No.	Order Code
HE Red	Anode	.8	4.4	20	2.8	60	3	5082-7650	117-5577
HE Red	Anode	8.	4.4	20	2.8	60	3	5082-7651	117-5582
HE Red	Anode	8.	4.4	20	2.8	60	3	5082-7653	117-5583
HE Red	Universal	+1.	4.4	20	2.8	60	3	5082-7656	117-5584
Green	Cathode	8.	1.3	10	2.1	10	3	HDSP-4603	100-3283
Low Current/High Intensity AlGas. Peak I_F 45mA/seg									
Red	Anode	8.	0.65	1	1.6	1	3	HDSP-E101	100-3284
Red	Cathode	8.	3.9	1	1.6	5	3	HDSP-E103	100-3285
Sunlight Viewable, ALGaAs									
Red	Cathode	.8	15	20	1.8	20	3	HDSP-E153	264-301

206269

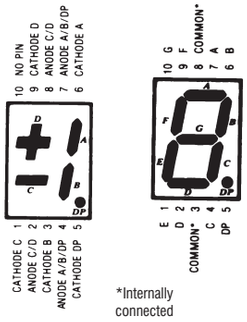
Format	CA/CC	Order Code	Price Each 1+	10+	100+	500+	+
Red							
HE Red							
.8	Anode	**117-5577●**	8.18	5.39	4.32	3.55	– –
8.	Anode	**117-5582●**	8.18	5.39	4.32	3.55	– –
8.	Anode	**117-5583●**	8.18	5.39	4.32	3.55	– –
+1.	Universal	**117-5584●**	8.18	5.39	4.32	3.55	– –
Green							
8.	Cathode	**100-3283●**	7.90	5.21	4.17	3.44	– –
AlGaAs Red - High Intensity/Low Current							
8.	Anode	**100-3284●**	9.82	6.48	5.19	4.27	– –
8.	Cathode	**100-3285●**	9.82	6.48	5.19	4.27	– –
Sunlight Viewable, ALGaAs Red							
.8	Cathode	**264-301▲**	7.69	5.30	4.32	3.85	– –

14.2mm (0.56")

AVAGO TECHNOLOGIES



H=17.02, W=12.57, D=8.0
Pin spacing=2.54
Row spacing=15.24



*Internally connected

Colour	CA/CC	Format	Typ Luminous Intensity/segment mcd @	I_F (mA)	Typ V_F	mA	V_R	Mftrs. List No.	Order Code
HE Red	Anode	8.	2.8	20	2.1	20	3	HDSP-5501	100-3293
HE Red	Cathode	8.	2.8	20	2.1	20	3	HDSP-5503	100-3294
HE Red	Anode	±1	2.8	20	2.1	20	3	HDSP-5507	100-3295
Green	Anode	8.	1.5	10	2.1	10	3	HDSP-5601	100-3296
Green	Cathode	8.	1.5	10	2.1	10	3	HDSP-5603	100-3297
Sunlight Viewable, AlGaAs									
Red	Anode	8.	16	20	1.8	20	3	HDSP-H151	100-3141
High Intensity/Low Current, AlGaAs. Peak 1F 45mA/Seg									
Red	Anode	8.	{ 0.7	1 }	1.6	1	3	HDSP-H101	100-3298
Red	Cathode	8.	{	}	1.6	1	3	HDSP-H103	100-3299
Low Current. Capable of high current drive for multiplexing Peak 1F45mA/seg									
HE Red	Anode	8.	0.37	2	1.6	2	3	HDSP-5551	100-3300
HE Red	Cathode	8.	0.37	2	1.6	2	3	HDSP-5553	100-3301

206289

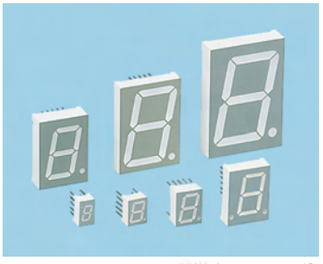
Format	CA/CC	Order Code	Price Each 1+	10+	100+	500+	+
HE Red							
8.	Anode	**100-3293●**	2.35	2.13	1.65	1.22	– –
8.	Cathode	**100-3294●**	2.35	2.13	1.65	1.22	– –
±1	Anode	**100-3295●**	2.97	2.81	2.18	1.61	– –
Green							
8.	Anode	**100-3296●**	2.35	2.13	1.65	1.22	– –
8.	Cathode	**100-3297●**	2.35	2.13	1.65	1.22	– –
Sunlight Viewable AlGaAs							
8.	Anode	**100-3141●**	2.74	2.57	1.99	1.47	– –
High Intensity/ Low Current, AlGaAs							
8.	Anode	**100-3298●**	2.74	2.57	1.99	1.47	– –
8.	Cathode	**100-3299●**	2.83	2.57	1.99	1.47	– –
Low Current Red							
8.	Anode	**100-3300●**	2.35	2.13	1.65	1.22	– –
8.	Cathode	**100-3301●**	2.35	2.13	1.65	1.22	– –

Blue LED Displays - 7 Segment & Dot Matrix

Blue LED Displays

7.6mm, 10mm, 14.2mm & 20.3mm

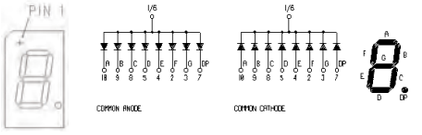
forge EUROPA



- Two optically matched ranges of seven segment and dot matrix LED displays together with a complimentary range of LED lamps **see below**
- Two performance options, HE Blue and Blue
- Choice of two wavelengths, HE Blue 465nm and Blue 428nm
- Distinctive blue colour ideal for a host of applications including audio, instrumentation and corporate signage

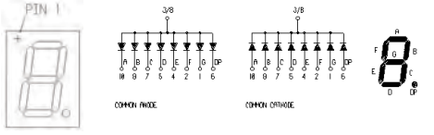
7.6mm (0.3")

H = 12.7, W = 7.6, Pin spacing = 2.54, Column spacing = 5.08



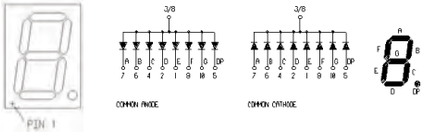
10mm (0.39")

H = 12.9, W = 9.7, Pin spacing = 2.54, Column spacing = 7.62



14.2mm (0.56")

H = 17.1, W = 12.4, Pin spacing = 2.54, Row spacing = 15.24



● Compliant
◄ Non-compliant
‡ Limited stock - RoHS replacement available

RoHS

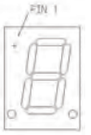
Optoelectronics, Indicators, Lamps & Displays

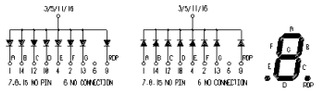
28

Farnell Page 926 Date: 21-08-06 time: 17:49

20.3mm (0.8")

H = 27.7, W = 20.0,
Pin spacing = 2.54, Column spacing = 15.24





Colour	CA/CC	Typ. Luminous Intesity/Segment (mcd) HE Blue @ 10mA Blue @ 20mA	V_F typ.	Mftrs. List No.	Order Code
7.6mm					
HE Blue	Cathode	8	3.3	FN1-0311B0500GW.	366-4648
HE Blue	Anode	8	3.3	FN1-0312B0500GW.	366-4650
Blue	Cathode	3	3.7	FN1-0311B0100GW.	366-4661
Blue	Anode	3	3.7	FN1-0312B0100GW.	366-4673
10.0mm					
HE Blue	Cathode	10	3.3	FN1-0391B050JGW.	366-4685
HE Blue	Anode	10	3.3	FN1-0392B050JGW.	366-4697
Blue	Cathode	4	3.7	FN1-0391B010JGW.	366-4703
Blue	Anode	4	3.7	FN1-0392B010JGW.	366-4715
14.2mm					
HE Blue	Cathode	14	3.3	FN1-0561B050SGW.	366-4727
HE Blue	Anode	14	3.3	FN1-0562B050SGW.	366-4739
Blue	Cathode	5	3.7	FN1-0561B010SGW.	366-4740
Blue	Anode	5	3.7	FN1-0562B010SGW.	366-4752
20.3mm					
HE Blue	Cathode	18	3.3	FN1-0801B0500GW.	366-4764
HE Blue	Anode	18	3.3	FN1-0802B0500GW.	366-4776
Blue	Cathode	6	3.7	FN1-0801B0100GW.	366-4788
Blue	Anode	6	3.7	FN1-0802B0100GW.	366-4790

229071

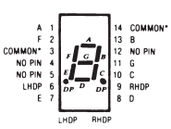
Colour	CA/CC	Order Code	Price Each 1+	10+	25+	50+	+
7.6mm							
HE Blue	Cathode	**366-4648**	11.49	10.55	9.60	7.76	– –
HE Blue	Cathode	**120-0600●**	11.49	10.55	9.60	7.76	– –
HE Blue	Anode	**366-4650**	11.49	10.55	9.60	8.94	– –
HE Blue	Anode	**120-0601●**	11.49	10.55	9.60	8.94	– –
Blue	Cathode	**366-4661**	10.09	9.49	– –	– –	– –
Blue	Cathode	**120-0602●**	10.09	9.49	– –	– –	– –
Blue	Anode	**366-4673**	10.09	9.24	8.43	6.62	– –
Blue	Anode	**120-0617●**	10.94	10.03	9.95	– –	– –
10.0mm							
HE Blue	Cathode	**366-4685**	11.49	10.55	9.60	7.56	– –
HE Blue	Cathode	**120-0605●**	11.49	10.55	9.60	7.56	– –
HE Blue	Anode	**366-4697**	11.49	10.55	9.60	7.56	– –
HE Blue	Anode	**120-0606●**	11.49	10.55	9.60	7.56	– –
Blue	Cathode	**366-4703**	10.09	9.28	8.43	6.62	– –
Blue	Cathode	**120-0607●**	10.09	9.28	8.43	6.62	– –
Blue	Anode	**366-4715**	10.09	9.28	8.43	7.50	– –
Blue	Anode	**120-0608●**	10.09	9.28	8.43	7.50	– –
14.2mm							
HE Blue	Cathode	**366-4727**	11.52	10.55	9.63	7.90	– –
HE Blue	Cathode	**120-0609●**	11.52	10.55	9.63	7.90	– –
HE Blue	Anode	**366-4739**	11.52	10.55	9.63	7.82	– –
HE Blue	Anode	**120-0610●**	11.52	10.55	9.63	7.82	– –
Blue	Cathode	**366-4740**	10.12	9.28	8.46	6.86	– –
Blue	Cathode	**120-0611●**	10.12	9.28	8.46	6.86	– –
Blue	Anode	**366-4752**	10.12	9.53	– –	– –	– –
Blue	Anode	**120-0612●**	10.12	9.53	– –	– –	– –
20.3mm							
HE Blue	Cathode	**366-4764**	12.11	– –	– –	– –	– –
HE Blue	Cathode	**120-0613●**	12.08	– –	– –	– –	– –
HE Blue	Anode	**366-4776**	12.11	– –	– –	– –	– –
HE Blue	Anode	**120-0614●**	12.08	– –	– –	– –	– –
Blue	Cathode	**366-4788**	10.94	10.03	9.15	7.18	– –
Blue	Cathode	**120-0615●**	10.94	10.03	9.15	7.18	– –
Blue	Anode	**366-4790**	10.94	10.03	9.95	– –	– –
Blue	Anode	**120-0617●**	10.94	10.03	9.95	– –	– –

LED Displays

7.6mm (0.3")

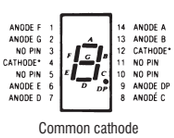
QT

H=19.3, W=10.16, D=5.08
Pin spacing=2.54
Row spacing=7.62



NOTE: PIN 6 = NC FOR RHDP TYPES
PIN 9 = NC FOR LHDP TYPES

Common anode



Common cathode

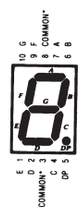
Colour	CA/CC	Format	Typ. Lum. Inten./seg. @ I_F=10mA mcd	Max. V_F	@ I_F mA	V_R	Mftrs. List No.	Order Code
Red	Anode	.8	0.35	2	20	5	MAN72A	102-1077
Red	Anode	8.	0.35	2	20	5	MAN71A	102-1078
Red	Cathode	8.	0.35	2	20	5	MAN74A	102-1079
HE Red	Anode	.8	1.9	2.5	20	5	MAN3920A	102-1080
HE Red	Cathode	8.	1.9	2.5	20	5	MAN3940A	102-1081
Green	Anode	.8	3.2	3	20	5	MAN3420A	102-1082
Green	Cathode	8.	3.2	3	20	5	MAN3440A	102-1083
Red	Anode	.8	0.35	2	20	5	MAN72A..	232-555
Red	Anode	8.	0.35	2	20	5	MAN71A..	232-567
Red	Cathode	8.	0.35	2	20	5	MAN74A..	232-579
HE Red	Anode	.8	1.9	2.5	20	5	MAN3920A...	232-592
HE Red	Cathode	8.	1.9	2.5	20	5	MAN3940A..	232-609
Green	Anode	.8	3.2	3	20	5	MAN3420A...	232-610
Green	Cathode	8.	3.2	3	20	5	MAN3440A...	232-622

206260

Format	CA/CC	Mftrs. List No.	Order Code	Price Each 1+	10+	100+
Red						
.8	Anode	MAN72A	**102-1077●**	3.16	2.78	2.52
8.	Anode	MAN71A	**102-1078●**	3.16	2.78	2.52
8.	Cathode	MAN74A	**102-1079●**	3.16	2.78	2.52
HE Red						
.8	Anode	MAN3920A	**102-1080●**	1.60	1.34	1.20
8.	Cathode	MAN3940A	**102-1081●**	2.85	2.48	2.26
Green						
.8	Anode	MAN3420A	**102-1082●**	1.64	1.41	1.26
8.	Cathode	MAN3440A	**102-1083●**	1.64	1.41	1.26
Red						
.8	Anode	MAN72A..	**232-555‡**	3.16	2.78	2.52
8.	Anode	MAN71A..	**232-567‡**	3.16	2.78	2.52
8.	Cathode	MAN74A..	**232-579‡**	3.16	2.78	2.52
HE Red						
.8	Anode	MAN3920A...	**232-592‡**	5.76	4.23	1.65
8.	Cathode	MAN3940A..	**232-609‡**	2.85	2.48	2.26
Green						
.8	Anode	MAN3420A...	**232-610‡**	3.00	2.88	1.62
8.	Cathode	MAN3440A...	**232-622‡**	1.64	1.37	1.22

12.7mm (0.5")

LED TECHNOLOGY



H=19.0, W=12.7, D=8.0
Pin spacing=2.54
Row spacing=15.24

*Internally connected

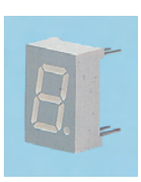
Colour	CA/CC	Format	Typ Luminous Intensity/Segment mcd @	I_F (mA)	Typ. V_F @ 20mA	V_R	Mftrs. List No.	Order Code
Red	Anode	8.	2.2	20	2.1	5	D50C05GW111	120-8886
Red	Cathode	8.	2.2	20	2.1	5	D50C05GW111	120-8886
HE Red	Anode	8.	5.5	20	2.1	5	D50A04GW111.	177-998
HE Red	Cathode	8.	5.5	20	2.1	5	D50C04GW111.	177-999

206280

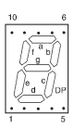
Format	CA/CC	Order Code	Price Each 1+	10+	25+	100+	+
Red							
8.	Anode	**120-8886●**	6.87	5.63	4.00	2.60	– –
8.	Cathode	**120-8886●**	6.87	5.63	4.00	2.60	– –
HE Red							
8.	Anode	**177-998**	10.45	8.57	7.12	3.39	– –
8.	Cathode	**177-999**	9.76	6.35	5.14	3.39	– –

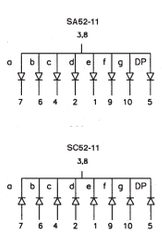
13.2mm (0.52")

Kingbright



H=17.55, W=12.40,
D=7.00
Pin spacing=2.54
Row spacing=15.24





Colour	CA/CC	Format	Lum Intensity/Seg. @ I_F=10mA min (mcd)	max	Typ. V_F @ 20mA	V_R	Order Code
HE Red	Anode	8.	2.2	20	2	5	116-8589
HE Red	Cathode	8.	2.2	20	2	5	114-2435
Ultra red	Anode	8.	5.6	20	1.85	5	116-8597
Ultra red	Cathode	8.	5.6	20	1.85	5	116-8602
Yellow	Anode	8.	2.2	20	2.1	5	116-8608
Green	Anode	8.	2.2	20	2.2	5	116-8611
Green	Cathode	8.	2.2	20	2.2	5	116-8615

206378

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

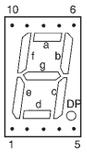
C = CYAN M = Magenta Y = Yellow B = Black/SING

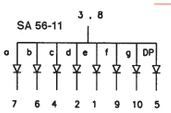
Format	CA/CC	Order Code	Price Each 1+	25+	100+	500+	+
HE Red							
8.	Anode	**116-8589**●	1.29	1.14	1.02	0.90	– –
8.	Cathode	**114-2435**●	1.29	1.14	1.02	– –	– –
Ultra Red							
8.	Anode	**116-8597**●	1.32	1.11	1.05	1.03	– –
8.	Cathode	**116-8602**●	1.26	1.11	1.05	0.98	– –
Yellow							
8.	Anode	**116-8608**●	1.14	1.02	0.96	0.95	– –
Green							
8.	Anode	**116-8611**●	1.26	1.08	0.99	0.82	– –
8.	Cathode	**116-8615**●	1.11	0.99	0.93	0.83	– –

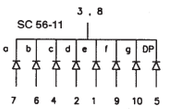
14.2mm (0.56")

Kingbright

H=19.05, W=12.50, D=8.0
Pin spacing=2.54
Row spacing=15.24







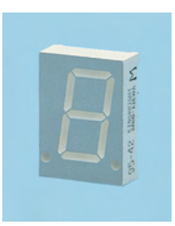
Colour	CA/CC	Format	Lum Intensity/Seg. @ I_F=10mA min (mcd)	max	Typ. V_F @ 20mA	V_R	Order Code
HE Red	Anode	8.	2.2	5.6	2	5	114-2440
HE Red	Cathode	8.	2.2	5.6	2	5	114-2441
Ultra red	Cathode	8.	5.6	21	1.85	5	114-2442
Yellow	Anode	8.	2.2	5.6	2.1	5	114-2443
Yellow	Cathode	8.	2.2	5.6	2.1	5	114-2444
Green	Anode	8.	2.2	5.6	2.2	5	114-2438
Green	Cathode	8.	2.2	5.6	2.2	5	114-2439

206398

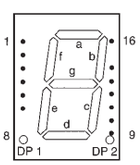
Format	CA/CC	Order Code	Price Each 1+	50+	100+	500+	+
HE Red							
8.	Anode	**114-2440**●	1.26	1.17	1.02	0.80	– –
8.	Cathode	**114-2441**●	1.26	1.17	1.02	0.80	– –
Ultra Red							
8.	Cathode	**114-2442**●	1.27	1.14	1.11	0.88	– –
Yellow							
8.	Anode	**114-2443**●	1.17	1.04	1.04	0.80	– –
8.	Cathode	**114-2444**●	1.17	1.04	1.04	0.79	– –
Green							
8.	Anode	**114-2438**●	1.14	1.01	0.94	0.75	– –
8.	Cathode	**114-2439**●	1.14	1.01	0.94	0.75	– –

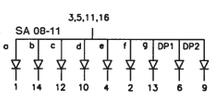
20.3mm (0.8")

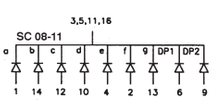
Kingbright



H=27.7, W=20.0, D=8.4
Pin spacing=2.54
Row spacing=15.24







Colour	CA/CC	Format	Lum Intensity/Seg. @ I_F=10mA min (mcd)	max	Typ. V_F @ 20mA	V_R	Order Code
HE Red	Anode	8.	2.2	9	2	5	114-2448
HE Red	Cathode	8.	2.2	9	2	5	114-2449
Ultra red	Anode	8.	9	21	1.85	5	114-2450
Ultra red	Cathode	8.	9	21	1.85	5	114-2451
Yellow	Cathode	8.	1.4	3.6	2.1	5	114-2452
Green	Anode	8.	1.4	3.6	2.2	5	114-2445
Green	Cathode	8.	1.4	3.6	2.2	5	114-2447

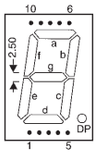
206375

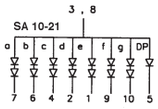
Format	CA/CC	Order Code	Price Each 1+	50+	100+	500+	+
HE Red							
8.	Anode	**114-2448**●	1.37	1.20	1.11	1.05	– –
8.	Cathode	**114-2449**●	1.53	1.30	1.20	1.09	– –
8.	Anode	**114-2450**●	1.66	1.43	1.30	1.17	– –
8.	Cathode	**114-2451**●	1.66	1.43	1.30	1.19	– –
8.	Cathode	**114-2452**●	1.53	1.30	1.20	1.12	– –
Green							
8.	Anode	**114-2445**●	1.46	1.27	1.17	1.05	– –
8.	Cathode	**114-2447**●	1.46	1.27	1.17	1.01	– –

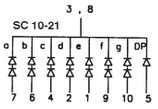
25.4mm (1.0")

Kingbright

H=34.0, W=24.0, D=10.5
Pin spacing=2.54
Row spacing=30.4







Colour	CA/CC	Format	Lum Intensity/Seg. @ I_F = 10mA (mcd) min	max	Typ. V_F @ 20mA	V_R	Order Code
HE Red	Anode	8.	5.6	14	2	5	116-8620
HE Red	Cathode	8.	5.6	14	2	5	116-8622
Ultra red	Anode	8.	14	31	1.85	5	116-8623
Ultra red	Cathode	8.	14	31	1.85	5	116-8625
Green	Anode	8.	3.6	9	2.2	5	116-8626

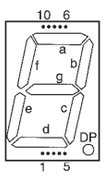
206382

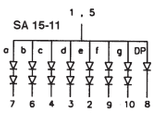
Format	CA/CC	Order Code	Price Each 1+	25+	100+	250+	+
HE Red							
8.	Anode	**116-8620**●	2.31	1.92	1.82	1.79	– –
8.	Cathode	**116-8622**●	2.31	1.92	1.82	1.76	– –
Ultra Red							
8.	Anode	**116-8623**●	2.51	2.05	1.98	– –	– –
8.	Cathode	**116-8625**●	2.51	2.05	1.95	1.87	– –
Ultra Green							
8.	Anode	**116-8626**●	2.47	2.02	1.89	1.65	– –

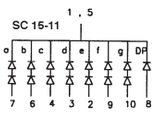
38.1mm (1.5")

Kingbright

H=47.0, W=33.15, D=12.5
Pin spacing=2.54
Row spacing=40.64







Colour	CA/CC	Format	Lum Intensity/Seg. @ I_F = 10mA (mcd) min	max	Typ. V_F @ 20mA	V_R	Order Code
HE Red	Anode	8.	3.6	21	2	5	116-8627
HE Red	Cathode	8.	3.6	21	2	5	116-8628
Ultra red	Anode	8.	14	31	1.85	5	116-8631
Ultra red	Cathode	8.	14	31	1.85	5	116-8632
Green	Anode	8.	3.6	9	2.2	5	116-8633

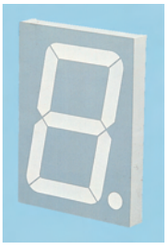
206379

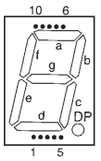
Format	CA/CC	Order Code	Price Each 1+	25+	100+	250+	+
HE Red							
8.	Anode	**116-8627**●	2.99	2.31	2.23	– –	– –
8.	Cathode	**116-8628**●	2.99	2.42	– –	– –	– –
Ultra Red							
8.	Anode	**116-8631**●	3.65	2.90	2.82	– –	– –
8.	Cathode	**116-8632**●	3.65	2.90	2.80	2.79	– –
Ultra Green							
8.	Anode	**116-8633**●	3.78	3.11	– –	– –	– –

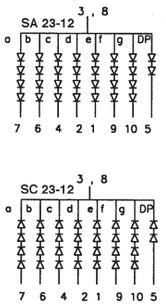
RoHS ● Compliant ◀ Non-compliant ‡ Limited stock - RoHS replacement available

56.9mm (2.24")

Kingbright







H=70.0, W=48.0, D=12.0
Pin spacing=2.54
Row spacing=60.1

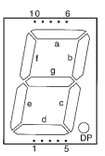
Colour	CA/CC	Format	Lum Intensity/Seg. @ I_F = 10mA (mcd) min	max	Typ. V_F @ 20mA	V_R	Order Code
HE Red	Anode	8.	5.6	14	2	5	116-8637
HE Red	Cathode	8.	5.6	14	2	5	116-8638
Ultra red	Anode	8.	14	31	1.85	5	116-8639
Ultra red	Cathode	8.	14	31	1.85	5	116-8641
Green	Anode	8.	9	21	2.2	5	116-8643

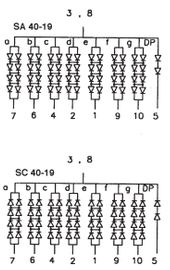
206381

Format	CA/CC	Order Code	Price Each 1+	10+	25+	+	+
HE Red							
8.	Anode	**116-8637●**	6.84	5.22	– –	– –	– –
8.	Cathode	**116-8638●**	6.84	5.14	5.12	– –	– –
Ultra Red							
8.	Anode	**116-8639●**	7.39	5.61	– –	– –	– –
8.	Cathode	**116-8641●**	7.39	6.71	– –	– –	– –
Ultra Green							
8.	Anode	**116-8643●**	7.32	5.83	– –	– –	– –

100mm (4.0")

Kingbright





H=122, W=90, D=15
Pin spacing=5.08
Row spacing=107.0

Colour	CA/CC	Format	Lum Intensity/Seg @ I_F=10mA (mcd) min	max	Typ V_F @ 20mA	V_R	Order Code
HE Red	Anode	8.	5.6	14	2	5	116-8645
HE Red	Cathode	8.	5.6	14	2	5	116-8646
Ultra red	Anode	8.	14	31	1.85	5	116-8647
Ultra red	Cathode	8.	14	31	1.85	5	116-8648
Yellow	Anode	8.	3.6	9	2.1	5	116-8649
Ultra green	Anode	8.	14	31	2.2	5	116-8650

206384

Format	CA/CC	Order Code	Price Each 1+	10+	+	+	+
HE Red							
8.	Anode	**116-8645●**	19.46	15.25	– –	– –	– –
8.	Cathode	**116-8646●**	19.46	15.96	– –	– –	– –
Ultra Red							
8.	Anode	**116-8647●**	20.64	15.63	– –	– –	– –
8.	Cathode	**116-8648●**	20.64	15.60	– –	– –	– –
Yellow							
8.	Anode	**116-8649●**	21.78	17.85	– –	– –	– –
Ultra Green							
8.	Anode	**116-8650●**	18.39	16.93	– –	– –	– –

LED Displays with Serial Driver

4 Digit LED Displays with Serial Driver — OPTO IMAGES

- A series of 4 digit, 7 segments displays with direct drive serial input
- 'N' versions have right hand decimal point, 'CL' versions have colons for clock applications
- Driver has serial input format featuring serial data, clock and chip enable
- Single 5 to 9 volt supply
- Serial bus signals interface is HCMOS compatible

- Data is sent as 36 bits of segment data: logic 1 driving segment on
- Standard numeric plus a variety of special characters may be generated
- Both variants have 2 spare outputs - may be used for driving external annunciator LEDs
- LED current is programmed via on board resistor (user alterable) to 15mA/seg.

Display Size	Luminous Intensity/Seg. (mcd) – Min./Typ 0.3"/8mm	0.56"/14mm	0.8"/20mm	1.0"/25mm	1.5"/38mm
HE Red	0.6/1.8	0.9/2.4	1/2.55	1.4/3.6	1.4/3.6

206507

Colour	Mftrs. List No.	Order Code	Price Each 1+	5+	10+	25+	+
0.3"/8mm							
HE Red	B08M04N-R	**121-0819**	35.35	29.85	29.26	24.45	– –
0.56/14mm							
HE Red	B14M04N-R	**121-0820**	35.90	31.12	29.98	29.39	– –
0.8"/20mm							
HE Red	B20M04N-R	**948-597**	38.55	32.31	30.51	30.50	– –
1.0"/25mm							
HE Red	B25M04N-R	**948-652**	49.50	41.85	39.54	39.15	– –
HE Red	B25M04CL-R	**948-688**	49.50	41.85	39.54	39.15	– –

Alphanumeric LED Displays

50mm (2.0")

Kingbright

Dot Matrix

H=53.30, W=38.5, D=8.45
Pin spacing=2.54, Row spacing=38.1

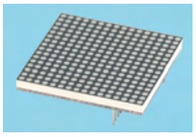
Colour	Column Anode/Cathode	Lum Intensity/Seg @ I_F = 10mA(mcd) min	max	Typ.V_F @ I_f=20mA	V_R (max)	Order Code
HE Red	Anode	3.6	9	2	5	116-8664
Ultra red	Anode	9	31	1.85	5	116-8663
Bi-Colour						
HE Red/Green	Cathode	3600/2200	9000/5600	2/2.2	5	114-2453

206436

Colour	Column Anode/Cathode	Order Code	Price Each 1+	25+	+	+
HE Red	Anode	**116-8664●**	4.43	3.52	– –	– –
Ultra red	Anode	**116-8663●**	5.76	4.75	– –	– –
Bi-Colour						
HE Red/Green	Cathode	**114-2453●**	8.97	7.31	– –	– –

16 x 16 Dot Matrix LED Display — MICRON

1.6" High, 4mm Profile



- 256 LED die
- 1.8mm diameter dots
- 2.5mm dot pitch
- Black face surface colour

Mftrs. List No.	Row	Chip Material	Peak Wavelength	Forward voltage @ 20mA Typ.	Max.	Luminous Intensity @ 10mA Min.	Typ.
M16PSGBW1-11.	Cathode	GaP	572nm	2.1V	2.4V	4mcd	7mcd
M16OSGBW1-21.	Anode	GaP	572nm	2.1V	2.4V	4mcd	7mcd
M16P07BW1-11.	Cathode	GaAlAs	660nm	1.7V	2.2V	7mcd	12mcd
M16O07BW1-21.	Anode	GaAlAs	660nm	1.7V	2.2V	7mcd	12mcd
M16P04BW1-11	Cathode	GaAsP	630nm	2.1V	2.4V	2mcd	3mcd
M16O04BW1-21	Anode	GaAsP	630nm	2.1V	2.4V	2mcd	3mcd

337923

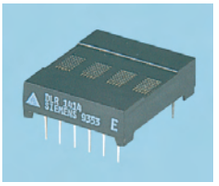
Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	25+	100+
Green	M16PSGBW1-11.	**501-4621**	38.80	32.35	30.43	28.29
Green	M16OSGBW1-21.	**501-4633**	38.80	32.35	30.43	28.29
Red	M16P07BW1-11.	**501-4645**	42.97	35.81	33.72	31.31
Red	M16O07BW1-21.	**501-4657**	38.80	32.32	30.69	– –
Orange	M16P04BW1-11	**501-4669**	41.47	34.57	32.55	30.21
Orange	M16O04BW1-21	**501-4670**	41.47	34.57	32.55	30.21

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

3.66mm, 4.57mm and 5.03mm – 4 Characters, Intelligent

Dot Matrix

OSRAM



H	W	D	Pin Spacing	Row Spacing	Mftrs. List No.
20.3	17.8	6.1	2.54	15.24	DLR1414., DLG1414.
20.3	25.4	6.6	2.54	15.24	DLR2416.
10.16	19.91	5.08	2.54	7.62	SLR2016, SLG2016.

Driven by integral CMOS IC with built-in memory, character generator, multiplex and LED drive circuitry. Solid epoxy construction ensures excellent optical and aesthetic qualities.

		DLR1414 DLG1414	DLR2416	SLR2016 SLG2016
Character height		3.66mm	5.03mm	4.57mm
Character spacing		4.45mm	6.35mm	5.00mm
Supply voltage (typ.)		5.0V	5.0V	5.0V
Access time @ 25°C		110ns	110ns	110ns
Typ. lum. intensity/LED	Red	50µcd	60µcd	50µcd
	Green	70µcd	--	75µcd
I_{CC} typ @ 25°C (4 charcter 20 dots/char)		80mA	110mA	80mA

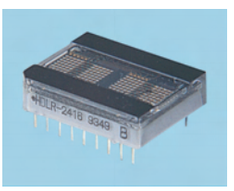
206261

Colour	Mftrs. List No.	Order Code	Price Each 1+	25+	100+	+	+
Red	DLR1414	**121-2733**●	42.12	35.80	27.47	– –	– –
Green	DLG1414	**121-2735**●	42.64	36.25	27.81	– –	– –
Red	DLR2416	**121-2736**●	55.70	47.35	36.33	– –	– –
Red	SLR2016	**481-464**	57.19	50.13	38.46	– –	– –
Green	SLG2016	**121-2750**●	59.58	51.63	39.62	– –	– –

5.08mm – 4 Character, Intelligent

Dot Matrix

AVAGO TECHNOLOGIES



Four character 5x7 dot matrix displays driven by integral CMOS IC, and pin compatible with HPDL2416 display. Built in RAM, ASCII decoder and LED drive circuitry. Additional features over HPDL2416 include an expanded 128 ASCII character set, internal 8-level dimming control and external dimming capability, and individual digit blanking. Choice of two colours.

H=20.07, W=25.15, D=6.60
Characters: H=5.08, W=3.43, Spacing=6.35
Pin spacing=2.54, Row spacing=15.24

Supply voltage (typ)	5.0V
Data set up time	50ns
Data hold time	40ns
Typ. luminous intensity/character (19 dots ON)	HE Red 3.5 mcd, Green 5.6 mcd.
I_{CC} typ @ 25°C (4 characters x 20 dots/char)	125mA (red), 110mA (others)

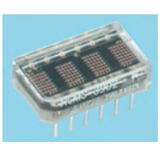
206230

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
HE Red	HDLO-2416	**117-5586**●	49.30	37.13	30.65	27.15	– –
Green	HDLG-2416	**117-5587**●	49.30	37.13	30.65	27.15	– –

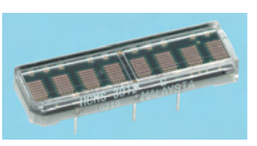
AlphaNumeric Displays

3.3V High Performance CMOS

AVAGO TECHNOLOGIES



4 Character Display



8 Character Display

- Interface directly with microprocessors
- 0.15" and .020" character height in either 4 or 8 character configuration
- Rugged X and Y stackable package
- Serial input
- Brightness control
- Wave solderable
- 3.3V operating voltage

This family of display modules feature a dot matrix display driven by an on board CMOS IC. The serial IC interface allows higher character count information to be displayed with a minimum of data lines. The 5 x 7 pixel format allows the display of upper case, lower case, Katakana and custom user defined characters.

Optical Characteristics - 0.03 mcd	**Luminous Intensity per LED** Minimum	Typical	**Wavelength** Typical	Dominant
Red	0.03 mcd	0.128 mcd	641nm	628nm
Orange	0.03 mcd	0.128 mcd	592nm	588nm
Optical Characteristics - 0.52 mcd				
Red	0.52 mcd	2.3 mcd	635nm	624nm
Green	0.52 mcd	1.0 mcd	574nm	572nm

Recommended operating conditions	**Min.**	**Max.**
Operating Temperature (°C)	-40	85
Storage Temperature (°C)	-55	100
Logic Supply Voltage (V)	3.1	5.5
LED Supply Voltage (V)	3.1	5.5
Power Dissipation (W)	0.766 (4 Character)	1.532 (8 Character)

Order Code:	Mftrs. List No.	Order Code:	Mftrs. List No.
492-3108	HCMS-3902	492-3182	HCMS-3906
492-3110	HCMS-3912	492-3194	HCMS-3916
492-3121	HCMS-3962	492-3200	HCMS-3966
492-3133	HCMS-3972	492-3212	HCMS-3976
492-3145	HCMS-3904	492-3224	HCMS-3907
492-3157	HCMS-3914	492-3236	HCMS-3917
492-3169	HCMS-3964	492-3248	HCMS-3967
492-3170	HCMS-3974	492-3250	HCMS-3977

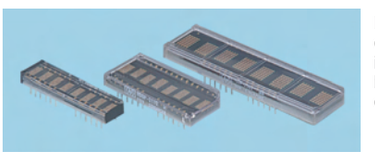
337876

Character Configuration	Colour	Order Code	Price Each 1+	10+	100+	500+	+
Intensity = 0.03 mcd (Min.)							
4 x 0.15"	Red	**492-3108**	45.71	34.90	29.96	26.09	– –
8 x 0.15"	Red	**492-3110**	65.75	52.47	45.06	39.23	– –
4 x 0.2"	Red	**492-3121**	47.04	35.91	30.84	26.85	– –
8 x 0.2"	Red	**492-3133**	68.48	53.64	46.93	40.87	– –
4 x 0.15"	Orange	**492-3145**	45.71	34.90	29.96	26.09	– –
8 x 0.15"	Orange	**492-3157**	65.75	52.47	45.06	39.23	– –
4 x 0.2"	Orange	**492-3169**	47.04	35.91	30.84	26.85	– –
8 x 0.2"	Orange	**492-3170**	68.48	53.64	46.93	40.87	– –
Intensity = 0.52 mcd (Min.)							
4 x 0.15"	Red	**492-3182**●	49.48	37.78	32.44	28.24	– –
8 x 0.15"	Red	**492-3194**	71.80	56.23	49.21	42.85	– –
4 x 0.2"	Red	**492-3200**	50.74	38.74	33.26	28.96	– –
8 x 0.2"	Red	**492-3212**	74.21	58.12	50.85	44.28	– –
4 x 0.15"	Green	**492-3224**●	49.48	37.78	32.44	28.24	– –
8 x 0.15"	Green	**492-3236**●	71.80	56.23	49.21	42.85	– –
4 x 0.2"	Green	**492-3248**	50.74	38.74	33.26	28.96	– –
8 x 0.2"	Green	**492-3250**	74.21	58.12	50.85	44.28	– –

4.57mm, 4.81mm and 6.96mm –

8 Character Dot Matrix

AVAGO TECHNOLOGIES



Designed for standard microprocessor interface techniques. Built-in LED drive circuitry. Programmable features include multi-level dimming and blanking.

Series	H	W	D	Package	Spacing Pin	Row
5mm	19.6	42.6	5.3	28 pin DIP	2.54	15.24
7mm	19.4	70.9	6.6	28 pin DIP	2.54	15.24
5mm Compact	11.4	42.9	5.3	30 pin DIP	2.54	7.62
5mm Compact - Serial Input	11.4	42.9	5.3	26 pin DIP	2.54	7.62

Character height (typ.) 4.81mm (5mm), 6.96mm (7mm), 4.57mm (5mm Compact)
Character spacing 5.26mm, (5mm), 8.84mm (7mm), 5.36mm (5mm Compact)
Supply voltage (typ.) 5.0V
Typ. Lum. intensity/character (all HDSP Series)
HE Red, Green 7.5 mcd (character average)
AlGaAs Red 25.0 mcd (character average)
Typ. Lum. intensity/LED (HCMS Series)
AlGaAs red 0.230 mcd (character average)
Green 0.114 mcd (character average)
I_{CC} typ @ 25°C (All HDSP Series)
HE Red, Green 300mA (8 characters 20 dots/char.)
AlGaAs Red 330mA (8 characters 20 dots/char.)
Peak pixel current (typ. @ 25°C) (HCMS Series)
HE Red, Green 14.0mA (all pixels ON)
AlGaAs Red 15.4mA (all pixels ON)

206238

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
5mm							
HE Red	HDSP-2112	**117-5588**●	78.70	61.64	53.93	46.96	– –
Green	HDSP-2113	**117-5589**●	78.70	61.64	53.93	46.96	– –
7mm							
HE Red	HDSP-2502	**117-5570**●	97.65	79.64	69.68	60.68	– –
Green	HDSP-2503	**117-5571**●	93.12	72.93	63.82	55.57	– –
5mm Compact							
Red	HDSP-2534	**117-5572**●	100.21	78.48	68.67	59.80	– –
Green	HDSP-2533	**117-5573**●	81.54	63.87	55.88	48.66	– –
5mm Compact - Serial Input							
Green (574nm)	HCMS-2903	**114-5047**●	57.26	45.80	41.63	36.94	– –
Red (637nm)	HCMS-2905	**114-5048**●	66.83	53.45	48.60	43.10	– –
Green (574nm)	HCMS-2913	**114-5049**●	91.24	72.98	66.34	58.85	– –
Red (637nm)	HCMS-2915	**114-5050**●	104.91	83.91	76.30	67.67	– –
Green (574nm)	HCMS-2973	**114-5043**●	79.86	64.72	56.63	49.31	– –
Red(637nm)	HCMS-2975	**114-5045**●	81.42	63.77	55.80	48.58	– –

RoHS ● Compliant ▲ Non-compliant ‡ Limited stock - RoHS replacement available

Agilent Technologies LED Colour Tiles

Rich Colour – 8 x 8 Dot Matrix Displays

47.8mm (1.88") Package

AVAGO TECHNOLOGIES

H=47.8, W=47.8, D=9.0

- 8 x 8 dot matrix RGB colour LED tiles
- Each dot has RGB colours
- 256,000 colours available
- Ideal for indoor large screen video wall applications
- Full colour moving message displays easy to implement
- X – Y stackable
- Viewable to 30 metres
- Available as common anode or common cathode
- Industry standard pin/out – 36.0mm (1.4") DIP leads on 2.54mm (0.1") centres
- A black background offers a high contrast

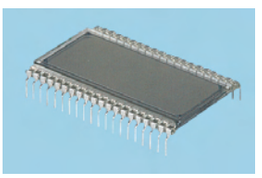
OPT730

Type	Mftrs. List No.	Order Code	Price Each 1+	10+	100+
Common Anode	HDSP-R881	**348-4178**	165.78	142.80	124.95
Common Cathode	HDSP-R883	**348-4180**	165.78	142.80	124.95

Liquid Crystal Displays

Reflective & Transflective

VARITRONIX



7-segment field effective liquid crystal displays available as Reflective or Transflective. Visible in direct sunlight as well as in low light applications. They are supplied with fixed pin DIL connections with 0.1" centres, they insert directly into a PCB or socket strips. Black segments on grey background. The Transflective LCDs have similar characteristics to the Reflective LCDs except they may be backlit.

Digits	Character Height	Overall Dim.	Row Space	Mftrs. List No.	Order Code
Reflective					
3.5	8.9	51.5 x 22	24.5	VI301-DPRC	118-3158
3.5	12.7	50.8 x 30.5	33	VI302-DPRC	118-3159
3.5	12.7	50.8 x 30.5	33	VI303-DPRC	118-3160
3.5	17.8	70 x 38.1	40.6	VI315-DPRC	118-3161
3.5	25.4	93.85 x 45.72	48.2	VI320-DPRC	118-3162
4	8.9	51.5 x 22	24.5	VI401-DPRC	118-3164
4	12.7	50.8 x 30.5	33	VI402-DPRC	118-3165
4	17.8	70 x 38.1	40.6	VI415-DPRC	118-3166
4	25.4	93.85 x 45.72	48.2	VI421-DPRC	118-3167
4.5	8.9	51.5 x 22	24.5	VI514-DPRC	118-3168
4.5	10.2	50.5 x 30.5	33	VI502-DPRC	118-3169
4.5	15.2	70 x 38.1	40.6	VI510-DPRC	118-3170
6	12.7	70 x 30	32.5	VI602-DPRC	118-3171
6	17.8	93.85 x 38.1	40.6	VI607-DPRC	118-3172
8	12.7	93.85 x 30.5	33	VI804-DPRC	118-3173
6	12.7	69.8 x 30.48	33	VI602-DP-FC-S	118-3185
Transflective					
3.5	12.7	50.8 x 30.5	33	VI303-DP-FC-S-LV	118-3144
3.5	12.7	50.8 x 30.5	33	VI302-DP-FC-S-LV	118-3145
4	12.7	50.8 x 30.5	33	VI402-DP-FC-S-LV	118-3146
4	17.8	69.85 x 38.1	40.6	VI415-DP-FC-S-LV	118-3147

Operating voltage: Min. 3V, typ. 5V, max.6Vrms
Supply current: Typ. 5µA/digit
Operating frequency: 32Hz
Operating temperature: -10°C to +60°C

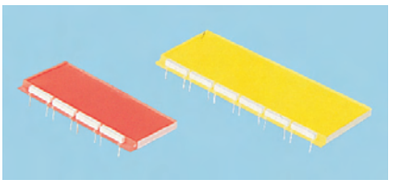
206208

No. of digits	Character Height	Order Code	Price Each 1+	10+	25+	100+	+
Reflective							
3.5	8.9	**118-3158●**	22.80	19.83	15.42	8.37	– –
3.5	12.7	**118-3159●**	15.18	13.20	12.30	9.57	– –
3.5	12.7	**118-3160●**	14.70	12.84	12.57	8.88	– –
3.5	17.8	**118-3161●**	48.21	33.39	26.28	17.76	– –
3.5	25.4	**118-3162●**	71.40	58.80	38.58	31.53	– –
4	8.9	**118-3164●**	22.80	17.07	13.68	8.37	– –
4	12.7	**118-3165●**	14.10	12.90	11.67	8.88	– –
4	17.8	**118-3166●**	24.60	21.60	20.85	17.76	– –
4	25.4	**118-3167●**	48.30	37.50	31.53	– –	– –
4.5	8.9	**118-3168●**	21.27	15.90	12.69	8.37	– –
4.5	10.2	**118-3169●**	16.95	14.85	13.50	8.88	– –
4.5	15.2	**118-3170●**	71.40	38.49	35.73	31.53	– –
6	12.7	**118-3171●**	24.03	21.00	19.71	15.76	– –
6	17.8	**118-3172●**	61.65	46.95	38.70	25.62	– –
8	12.7	**118-3173●**	59.37	47.91	39.39	24.64	– –
6	12.7	**118-3185●**	24.15	20.97	18.54	16.37	– –
Transflective							
3.5	12.7	**118-3144●**	21.93	18.36	16.35	9.21	– –
3.5	12.7	**118-3145●**	15.18	13.20	12.60	9.21	– –
4	12.7	**118-3146●**	14.19	12.45	11.43	10.00	– –
4	17.8	**118-3147●**	24.60	21.51	19.50	18.23	– –

LED Backlight Panels

LED Backlight Panels

LED TECHNOLOGY



Order Codes	Overall Area	Active Area
120-8878	47.5 x 17.0	47.5 x 14.5
120-8879	48.7 x 23.3	48.7 x 20.8
120-8880	48.7 x 23.3	48.7 x 20.8
120-8881	67.0 x 28.5	67.0 x 26.0

Thickness=3.0, all tolerances=±0.3

A range of LED backlight panels designed for use with 3½ and 4 digit standard transflective numeric LCDs. The coloured acrylic panels are edge-lit. The LED pins are on a 2.54mm pitch for connection to a simple drive circuit on the user's PCB. The system will operate from a dc supply of 5V or higher with low current consumption. Supplied with full instructions.

Overall Dim.	No. of LEDs	Suitable Transflective LCD: Character No. of Digits	Height	Order Codes	Order Codes: Green	Superbright Red
47.5 x 17.0	4	4	8.9	233-651	120-8878	—
48.7 x 23.3	4	3.5 3.5LOBAT	8.9 12.7 12.7	120-8878 120-8879 120-8880	120-8879	120-8880
67.0 x 28.5	6	4	17.8	120-8881	120-8881	—

206270

Character Height	Colour	Order Code	Price Each 1+	10+	25+	100+
8.9	Green	**120-8878●**	19.86	10.29	9.60	8.53
12.7	Green	**120-8879●**	21.48	13.28	12.01	10.58
12.7	Red	**120-8880●**	25.39	14.09	12.53	12.18
17.8	Green	**120-8881●**	31.25	17.51	15.56	13.77

Alphanumeric LCD Modules

VARITRONIX / POWERTIP

Reflective Modules

Standard and Large Character

A range of easily readable intelligent alphanumeric dot matrix LCD modules.

The modules have all control refresh and display functions executed by a dedicated controller/character generator chip on board. All the displays can be interfaced to a 4 or 8 bit bus.

'Supertwist (STN)' These displays have blue/black active pixels on yellow background.

- Standard: +5V dc power supply only 'Supertwist': +5V dc and -5V dc power supply or single +5V dc power supply
- Operating temperature: Standard TN 0°C to 50°C 'Supertwist' 0°C to 50°C 'X-Technology' (Hitachi) 0°C to 40°C

Format Char.x Lines	Module Size W x H x D	Display Area W x H	Character Size W x H	Mftr.	Mftrs. List No.	Order Code
TN (+5V dc only)						
8 x 1	84 x 44 x 13	61 x 15.8	6.45 x 9.4	VAR	MDL81809-LV	118-3125
16 x 1	80 x 36 x 13	65.5 x 13.8	3.07 x 6.56	TRID	TRIMODS1531	118-3127
16 x 2	84 x 44 x 10	61 x 15.8	2.96 x 5.56	TRID	TRIMODS1535	118-3128
16 x 4	87 x 60 x 10	61.7 x 25.2	2.95 x 4.75	TRID	TRIMODS1539	118-3129
20 x 2	115 x 40 x 10	83 x 18.6	3.25 x 5.63	TRID	TRIMODS1543	118-3130
20 x 4	98 x 60 x 10	76 x 25.2	3.01 x 4.83	TRID	TRIMODS1546	118-3131
20 x 4	98 x 60 x 10	76 x 25.2	3.01 x 4.83	TRID	TRIMODS1546	118-3131
40 x 2	182 x 33 x 11	154 x 15.8	3.15 x 4.85	TRID	TRIMODS1554NONB/L-TN	118-3155
STN (+5V dc only)						
16 x 1	122 x 33 x 11	99 x 13	4.84 x 9.22◆	VAR	MDLS16168-LV	118-3148
16 x 1	80 x 36 x 10	64.5 x 13.8	3.07 x 6.56	TRID	TRIMODS1533	118-3132
16 x 2	122 x 44 x 11	61 x 23	4.84 x 9.22◆	VAR	MDLS16268C-LV	118-3149
16 x 2	84 x 44 x 10	61 x 15.8	2.96 x 5.56	TRID	TRIMODS1537	118-3133
16 x 2	85 x 36 x 9.3	63.5 x 15.8	3.15 x 4.45◆	VAR	MDLS162D65-LV	118-3174
20 x 2	115 x 40 x 10	83 x 18.6	3.25 x 5.63	TRIS	TRIMODS1544	118-3134
20 x 2	116 x 37 x 11	83 x 18.6	3.2 x 4.85	VAR	MDLS20265-LV	118-3176
20 x 4	98 x 60 x 12	76 x 25.2	2.9 x 4.75◆	VAR	MDLS20464-LV	118-3141
24 x 2	118 x 36 x 10	93.5 x 15.8	3.2 x 4.5	VAR	MDLS24265-LV	118-3177
40 x 2	182 x 33 x 11	93.5 x 15.8	3.15 x 4.85	TRID	TRIMODS1554NONB/L-STN	118-3156
40 x 4	196 x 56 x 11	154.4 x 27.6	3.14 x 5.5	VAR	MDLS40466-LV	118-3135

◆ = Large Character Displays

206233

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Format	Order Code	Price Each 1+	5+	10+	25+	+
TN (+5V Supply Only)						
8 x 1	**118-3125**●	55.02	46.89	43.62	36.27	– –
16 x 1	**118-3127**●	26.61	20.16	17.43	11.39	– –
16 x 2	**118-3128**●	32.40	28.59	25.41	13.90	– –
16 x 4	**118-3129**●	55.26	48.12	41.46	26.51	– –
20 x 2	**118-3130**●	42.15	37.01	32.94	29.62	– –
20 x 4	**118-3131**●	56.96	51.27	45.41	41.01	– –
40 x 2	**118-3155**●	61.68	57.00	53.49	40.69	– –
STN (+5V Supply only)						
16 x 1	**118-3148**●	46.89	43.35	40.68	30.92	– –
16 x 1	**118-3132**●	34.17	27.24	22.71	14.16	– –
16 x 2	**118-3149**●	68.39	63.18	59.28	45.10	– –
16 x 2	**118-3133**●	42.75	35.40	28.32	18.09	– –
16 x 2	**118-3174**●	66.11	55.23	53.10	39.76	– –
20 x 2	**118-3134**●	59.79	53.40	39.69	25.11	– –
20 x 2	**118-3176**●	68.01	65.82	61.50	36.27	– –
24 x 2	**118-3177**●	66.30	55.50	48.00	39.76	– –
20 x 4	**118-3141**●	91.89	81.87	67.86	54.87	– –
24 x 2	**118-3177**●	66.30	55.50	48.00	39.76	– –
40 x 2	**118-3156**●	64.62	61.92	60.24	53.48	– –
40 x 2	**118-3178**●	113.82	102.42	93.12	56.68	– –
40 x 4	**118-3135**●	142.83	124.92	109.60	– –	– –

3 Volt, Alphanumeric LCD Modules — VARITRONIX

Reflective and Transflective with LED Backlighting

This DOT Matrix Character module range, operates from a SINGLE 3V supply and offers STN displays with wide viewing angle and contrast ratio. Interface is via the industry standard parallel format, with a temperature range of 0°C to 50°C.

All displays have built in controller.

	Format Char. Lines	Module Size W x H x D	Display Area W x H	Character Size W x H	Mftrs. List No.	Order Code
	16 x 1	80 x 36 x 11	64.5 x 13.8	3.15 x 6.3	MDLS161663V	118-3191
	16 x 2	84 x 44 x 10	61.0 x 13.8	2.95 x 5.55	MDLS162653V	118-3192
●	16 x 2	84 x 44 x 12.3	61.0 x 13.8	2.95 x 5.55	MDLS16265LED043V	118-3193

● Displays with LED backlighting

206400

Format	Order Code	Price Each 1+	5+	10+	25+
16 x 1	**118-3191**●	53.85	48.87	40.74	30.27
16 x 2	**118-3192**●	62.90	57.06	51.90	38.31
16 x 2	**118-3193**●	66.27	62.31	58.74	50.61

Modules with LED Backlighting — VARITRONIX / POWERTIP

Transflective intelligent LCD modules with built-in green LED backlighting, no inverter circuit is required. They interface directly to 8-bit and 4-bit microprocessors. The modules are equivalent to the standard reflective modules, with compatible display area and mounting. All types have 5 x 7 character font.

Supply: Single +5V dc only — Operating temperature: VAR, TRID & BAT 0°C to +50°C; Operating temperature: PTIP -20°C to +70°C

Format	Module Size W x H x D	Display Area W x H	Character Size W x H	Mftrs. Mftr.List No.	Order Code
16 x 1	122 x 33 x 14.4	99 x 13	4.84 x 9.22◆	VARMDLS16168-STET-LED04	118-3153
16 x 2	84 x 44 x 14	61 x 15.8	2.96 x 5.56	PTIPPC1602LRS-FSO-B	414-6177
16 x 2	84 x 44 x 10	61 x 15.8	2.96 x 5.56	TRIDTRIMODS1538STNLEDTFV.	118-3136
16 x 2	85 x 36 x 9.3	63.5 x 15.8	3.15 x 5.75	VARMDLS162D65-LV-LED04.	118-3181
16 x 2	122 x 44 x 14.4	99 x 23	4.84 x 9.22◆	VARMDLS16268-C-LV-LED04.	118-3154
16 x 4	87 x 60 x 13	61.8 x 25.2	2.95 x 4.75	VARMDLS16465-LV-LED04.	118-3137
20 x 2	115 x 40 x 10	83 x 18.6	3.25 x 5.63	TRIDTRIMODS1545	118-3139
20 x 2	116 x 37 x 11	83 x 18.6	3.2 x 4.85	VARMDLS20265-LV-LED04	118-3182
20 x 4	98 x 60 x 14.8	76 x 25.2	2.9 x 76	VARMDLS20464-LV-LED04	118-3142
24 x 2	118 x 36 x 10	93.5 x 15.8	3.2 x 4.5	VARMDLS24265SP-LV-LED04.	118-3183
40 x 2	192 x 36 x 14	154 x 15.3	3.2 x 4.85	TRIDTRIMODS1554B/LSTN	301-3157 / 118-3157
40 x 2	182 x 33.5 x 11	154 x 15.8	3.15 x 4.85	VARMDLS40266-LV-LED04	118-3184
40 x 4	196 x 56 x 11	154.4 x 27.6	3.14 x 5.5	VARMDLS40466-LV-LED04	118-3143
NTN (+5V Supply only)					
20 x 4	98.8 x x 10.6	70.4 x 20.8	2.95 x 4.75	DENLMR4434BG4C20SNY	114-4451

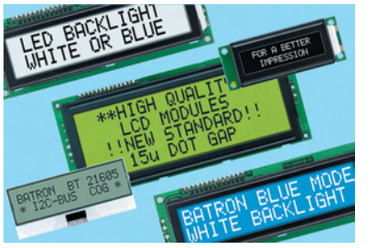
■ = Modules supplied with film connectors and cables ◆ = Large character displays

206229

Format	Order Code	Price Each 1+	5+	10+	25+	+
STN (+5V Supply only)						
16 x 1	**118-3153**●	60.96	55.14	49.44	40.22	– –
16 x 2	**414-6177**	46.80	41.76	33.39	26.52	– –
16 x 2	**118-3136**●	51.00	44.91	36.54	21.86	– –
16 x 2	**118-3181**●	114.44	97.47	79.35	52.53	– –
16 x 2	**118-3154**●	67.32	59.52	57.36	55.71	– –
16 x 4	**118-3137**●	105.66	90.15	76.17	64.87	– –
20 x 2	**118-3139**●	97.62	79.71	65.61	37.80	– –
20 x 2	**118-3182**●	138.92	118.32	99.18	68.70	– –
20 x 4	**118-3142**●	186.66	164.04	147.00	115.53	– –
24 x 2	**118-3183**●	108.51	98.79	81.60	74.40	– –
40 x 2	**118-3157**●	74.76	71.58	69.66	61.85	– –
40 x 2	**491-883**	194.77	163.98	135.12	110.10	– –
40 x 2	**118-3184**●	194.77	163.98	135.12	110.10	– –
40 x 4	**118-3143**●	266.68	190.74	173.55	141.83	– –
NTN (+5V Supply only)						
20 x 4	**114-4451**●	222.69	198.36	174.63	158.98	– –

Alphanumeric LCD Modules — Batron

HQ Series



The HQ series of STN and FSTN alphanumeric LCD modules give an enhanced image with high contrast and wide viewing angle. This is achieved by implementing a 15 micron gap between pixels to give much denser characters.
These modules offer an attractive display with low power requirements and ease of interface. Efficient LED backlights include high intensity white or green LEDs.

- High definition pixels
- Industry standard sizes
- 4 bit or 8 bit parallel interface on most modules
- Reflective black/yellow
- Transflective black / green or black / white versions
- Transmissive white/blue versions
- 16 x 2 version with I²C interface

Mftrs. List No:	Order Code	Mftrs. List No:	Order Code
BTHQ21603V-SRE WC	944-8675	BTHQ22008VSS-STF-LED04	944-8799
BTHQ21605VSS-SRE	944-8683	BTHQ42003AV-STF-06-LED WC	944-8802
BTHQ21608VSS-SRE	944-8691	BTHQ42005VSS-STF-LED04	944-8810
BTHQ22005VSS-SRE	944-8705	BTHQ42008VSS-06-STF-LED04	944-8829
BTHQ22008VSS-SRE	944-8713	BTHQ21605AVB-YETF-LED04-I2C	★944-8837
BTHQ42003AV-SRE WC	944-8721	BTHQ21603V-SMN-LED WHITE WC	944-8845
BTHQ42005VSS-SRE	944-8730	BTHQ21605VSS-SMN-LED WHITE	944-8853
BTHQ42008VSS-SRE	944-8748	BTHQ22005VSS-SMN-LED WHITE	944-8861
BTHQ21603V-STF-LV-LED YG WC	944-8756	BTHQ22008VSS-SMN-LED WHITE	944-8870
BTHQ21605VSS-06-STF-LED01	944-8764	BTHQ42005VSS-SMN-LED WHITE	944-8888
BTHQ21608VSS-STF-LED	944-8772	BTHQ42008VSS-SMN-LED WHITE	944-8896
BTHQ22005VSS-STF-LED04	944-8780		

Format	Module Size (mm) W	H	D	Display Area W x H (mm)	Character Size W x H (mm)	Connector	Order Code
Reflective (Not backlit) - Black characters on a yellow/green background (STN)							
16 x 2	53	20	8	36 x 10	3.15 x 1.85	B, 1 x 16	944-8675
16 x 2	84	44	10	61 x 15.8	5.55 x 2.95	B, 1 x 16	944-8683
16 x 2	122	43	15	99 x 23	9.22 x 4.84	T, 1 x 14	944-8691
20 x 2	116	37	14	83 x 18.6	5.55 x 3.2	L, 2 x 8	944-8705
20 x 2	146	43	14	123 x 23	9.21 x 4.84	T, 1 x 14	944-8713
20 x 4	65	28	8.5	46 x 18.4	3.15 x 1.85	B, 1 x 16	944-8721
20 x 4	98	60	14	76 x 25.2	4.69 x 2.9	T, 1 x 16	944-8730
20 x 4	146	62.5	14	123 x 42.5	9.22 x 4.84	T, 1 x 14	944-8748
Transflective - Black characters on a yellow/green background (STN)							
16 x 2	53	20	8	36 x 10	3.15 x 1.85	B, 1 x 16	944-8756
16 x 2	84	44	14	61 x 15.8	5.55 x 2.95	B, 1 x 16	944-8764
16 x 2	84	44	14	61 x 15.8	5.55 x 2.95	T, 1 x 14	★944-8837
16 x 2	122	43	15	99 x 23	9.22 x 4.84	T, 1 x 14	944-8772
20 x 2	116	37	14	83 x 18.6	5.55 x 3.2	L, 2 x 8	944-8780
20 x 2	146	43	14	123 x 23	9.21 x 4.84	T, 1 x 14	944-8799
20 x 4	65	28	8.5	46 x 18.4	3.15 x 1.85	B, 1 x 16	944-8802
20 x 4	98	60	14	76 x 25.2	4.69 x 2.9	T, 1 x 16	944-8810
20 x 4	146	62.5	14	123 x 42.5	9.22 x 4.84	T, 1 x 14	944-8829
Transflective - Black characters on a white background (STN)							
16 x 2	53	20	8	36 x 10	3.15 x 1.85	B, 1 x 16	944-8900
16 x 2	84	44	10	61 x 15.8	5.55 x 2.95	B, 1 x 16	944-8918
16 x 2	122	43	15	99 x 23	9.22 x 4.84	T, 1 x 14	944-8926
20 x 2	116	37	14	83 x 18.6	5.55 x 3.2	L, 2 x 8	944-8934
20 x 2	146	43	14	123 x 23	9.21 x 4.84	T, 1 x 14	944-8942
20 x 4	65	28.4	8.5	46 x 18.4	3.15 x 1.85	B, 1 x 16	944-8950
20 x 4	98	60	14	76 x 25.2	4.69 x 2.9	T, 1 x 16	944-8969
20 x 4	146	62.5	14	123 x 42.5	9.22 x 4.84	T, 1 x 14	944-8977

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

Format	Module Size (mm) W	H	D	Display Area W x H (mm)	Character Size W x H (mm)	Connector	Mftrs. List No.	Background Colour	Order Code
Transmissive - White characters on a blue background (FSTN)									
16 x 2	53	20	8	36 x 10	3.15 x 1.85	B, 1 x 16			944-8845
16 x 2	84	44	10	61 x 15.8	5.55 x 2.95	B, 1 x 16			944-8853
20 x 2	116	37	14	83 x 18.6	5.55 x 3.2	L, 2 x 8			944-8861
20 x 2	146	43	14	123 x 23	9.21 x 4.84	T, 1 x 14			944-8870
20 x 4	98	60	14	76 x 25.2	4.69 x 2.9	T, 1 x 16			944-8888
20 x 4	146	62.5	14	123 x 42.5	9.22 x 4.84	T, 1 x 14			944-8896

Connector details:
B = Bottom, L = Left, T = Top. No. of rows x No. of pins (e.g. 1 x 20 = 1 row x 20 pins)

★ - I²C Interface

338280

Format	Order Code	Price Each 1+	5+	10+	25+	+
Black characters on a yellow/green background (STN) Not backlight						
16 x 2	**944-8675●**	32.88	29.91	27.41	25.29	– –
16 x 2	**944-8683●**	32.22	29.30	26.85	24.80	– –
16 x 2	**944-8691●**	51.66	49.06	– –	– –	– –
20 x 2	**944-8705●**	44.59	40.56	37.14	34.31	– –
20 x 2	**944-8713●**	85.28	77.53	71.09	65.62	– –
20 x 4	**944-8721●**	69.33	63.05	57.78	53.35	– –
20 x 4	**944-8730●**	70.31	63.93	58.59	54.10	– –
20 x 4	**944-8748●**	181.95	165.42	151.65	139.97	– –
Black characters on a yellow/green background (STN)						
16 x 2	**944-8756●**	40.04	36.42	33.36	30.82	– –
16 x 2	**944-8764●**	44.27	40.26	36.91	34.08	– –
16 x 2	**★944-8837●**	52.41	47.65	43.68	40.33	– –
16 x 2	**944-8772●**	86.58	78.74	72.16	66.63	– –
20 x 2	**944-8780●**	60.87	55.33	50.75	46.84	– –
20 x 2	**944-8799●**	104.49	95.01	87.07	80.40	– –
20 x 4	**944-8802●**	90.16	81.99	75.16	69.36	– –
20 x 4	**944-8810●**	84.63	76.95	70.54	65.10	– –
20 x 4	**944-8829●**	216.46	196.80	180.39	166.53	– –
Black characters on a white background (STN)						
16 x 2	**944-8900●**	50.78	46.19	42.32	39.06	– –
16 x 2	**944-8918●**	51.43	46.77	42.87	39.58	– –
16 x 2	**944-8926●**	96.02	87.30	80.04	73.89	– –
20 x 2	**944-8934●**	81.70	74.28	68.09	62.85	– –
20 x 2	**944-8942●**	121.74	110.67	101.46	93.65	– –
20 x 4	**944-8950●**	94.30	85.77	80.17	74.63	– –
20 x 4	**944-8969●**	106.76	97.06	88.99	82.16	– –
20 x 4	**944-8977●**	258.77	235.27	215.64	199.08	– –
White characters on a blue background (FSTN)						
16 x 2	**944-8845●**	51.43	46.77	42.87	39.58	– –
16 x 2	**944-8853●**	52.08	47.36	43.42	40.07	– –
20 x 2	**944-8861●**	74.90	68.13	63.70	59.29	– –
20 x 2	**944-8870●**	123.04	111.87	102.53	94.66	– –
20 x 4	**944-8888●**	108.07	98.27	90.07	83.13	– –
20 x 4	**944-8896●**	262.35	238.53	218.64	201.81	– –

Alphanumeric LCD Modules

Everbouquet

TN and STN

- Temperature range 0 - 50°C
- Standard 5v power supply
- Hi intensity white or Green backlight LEDs
- Minimum backlight intensity 6cd/m²
- Low power requirements
- High contrast

A TN and a range of STN LCD modules available in reflective black on grey or yellow/green (non illuminated), transflective black on yellow / green and also a very high contrast transmissive white on black or white on blue 'negative' modes.
These modules are compatible with industry standard sizes and feature standard parallel 4 bit or 8 bit interfaces. Suitable for indoor or outdoor viewing.

Format	Module Size (mm) W	H	D	Display Area W x H (mm)	Character Size W x H (mm)	Connector	Mftrs. List No.	Background Colour	Order Code
Reflective - Black characters on a grey background (TN)									
16 x 2	69.5	77.4	2.7	61 x 15.1	2.95 x 5.55	T, 1 x 14	MCG1602B-TGR	Grey	944-9566
Reflective - Black characters on a grey or Yellow/Green background (STN)									
16 x 2	85	30	10	21 x 9	5.56 x 2.96	L, 2 x 7	MC1602D-SYR	Yell/Grn	944-8624
16 x 2	85	32.6	10	64.5 x 16	5.56 x 2.96	L, 2 x 7	MC1602M-SYR	Yell/Grn	944-8632
16 x 2	59	29.3	4	52 x 15	4.67 x 2.54	T, 1 x 15	MC1602X-SYR	Yell/Grn	944-8640
16 x 4	72	48	10	61.8 x 25.2	4.76 x 2.95	T, 1 x 16	MC1604C-SYR	Yell/Grn	944-8659
20 x 4	59	29.3	5	21 x 9	2.6 x 1.845	T, 1 x 17	MC2004F-SYR	Yell/Grn	944-8667
Transflective - Black characters on a Yellow/Green background (STN)									
16 x 2	85	30	15	21 x 9	5.56 x 2.96	L, 1 x 7	MC1602D-SYL	Yell/Grn	944-8985
16 x 2	85	32.6	15	64.5 x 16	5.56 x 2.96	L, 1 x 7	MC1602M-SYL	Yell/Grn	944-8993
16 x 2	59	29.3	5	52 x 15	4.67 x 2.54	T, 1 x 15	MC1602X-SYL	Yell/Grn	944-9000
16 x 4	72	48	15	61.8 x 25.2	4.76 x 2.95	T, 1 x 16	MC1604C-SYL	Yell/Grn	944-9019
Transmissive - White characters on a black background (STN)									
16 x 1	80	36	10	64.5 x 16	6.56 x 3.07	T, 1 x 16	MC16011A8-FBLW	Black	944-9167
16 x 1	122	33	15	99 x 13	8.06 x 4.85	B, 1 x 16	MC1601H-FBLW	Black	944-9175
16 x 2	80	36	10	64.5 x 16	5.56 x 2.96	T, 1 x 16	MC1602C8-FBLW	Black	944-9183
16 x 2	84	44	10	64.5 x 16	5.56 x 2.96	B, 1 x 16	MC16021E8-FBLW	Black	944-9191
16 x 2	85	36	10	64.5 x 16	5.56 x 2.96	L, 2 x 7	MC1602F7-FBLW	Black	944-9205
Transmissive - White characters on a black background (STN)									
16 x 2	122	44	10	99 x 24	8.06 x 4.85	B, 1 x 16	MC1602J-FBLW	Black	944-9213
16 x 4	87	60	15	61.8 x 25.2	4.76 x 2.95	T, 1 x 16	MC1604B-FBLW	Black	944-9221
16 x 4	77	51	10	61.8 x 25.2	5.55 x 2.95	B, 1 x 16	MC1604D9-FBLW	Black	944-9230
20 x 2	116	37	14	84 x 19	4.85 x 3.2	L, 2 x 8	MC2002DA-FBLW	Black	944-9248
20 x 2	190	54	15	149 x 31	12.75 x 6	L, 2 x 8	MC2002E-FBLW	Black	944-9256
24 x 2	118	36	15	96 x 18.8	5.55 x 3.2	L, 2 x 8	MC24021A9-FBLW	Black	944-9264
20 x 4	96	60	15	76 x 25.2	4.75 x 2.95	T, 1 x 16	MC2004E-FBLW	Black	944-9272
40 x 2	182	33.5	10	154 x 15.3	5.55 x 3.2	L, 2 x 7	MC4002A7-FBLW	Black	944-9280
40 x 4	190	54	15	149 x 31	4.89 x 2.78	L, 2 x 8	MC4004A-FBLW	Black	944-9299
Transmissive - White characters on a blue background (STN)									
16 x 1	80	36	10	21 x 9	64.5 x 3.07	T, 1 x 16	MC16011A8-SBLW	Blue	944-9027
16 x 1	122	33	15	99 x 13	8.06 x 4.85	B, 1 x 16	MC1601H-SBLW	Blue	944-9035
16 x 2	80	36	10	64.5 x 16	5.56 x 2.96	T, 1 x 16	MC1602C8-SBLW	Blue	944-9043
16 x 2	84	44	10	64.5 x 16	5.56 x 2.96	B, 1 x 16	MC16021E8-SBLW	Blue	944-9051
16 x 2	85	36	10	64.5 x 16	5.56 x 2.96	L, 2 x 7	MC1602F7-SBLW	Blue	944-9060
16 x 2	122	44	10	99 x 24	8.06 x 4.85	B, 1 x 16	MC1602J-SBLW	Blue	944-9078
16 x 4	87	60	15	61.8 x 25.2	4.76 x 2.95	T, 1 x 16	MC1604B-SBLW	Blue	944-9086
16 x 4	77	51	10	61.8 x 25.2	5.55 x 2.95	B, 1 x 16	MC1604D9-SBLW	Blue	944-9094
20 x 2	116	37	14	84 x 19	4.85 x 3.2	L, 2 x 8	MC2002DA-SBLW	Blue	944-9108
20 x 2	190	54	15	149 x 31	12.75 x 6	L, 2 x 8	MC2002E-SBLW	Blue	944-9116
24 x 2	118	36	15	96 x 18.8	5.55 x 3.2	L, 2 x 8	MC24021A9-SBLW	Blue	944-9124
20 x 4	98	60	15	76 x 25.2	4.75 x 2.95	T, 1 x 16	MC2004E-SBLW	Blue	944-9132
40 x 2	182	33.5	10	154 x 15.3	5.55 x 3.2	L, 2 x 7	MC4002A7-SBLW	Blue	944-9140
40 x 4	190	54	15	149 x 31	4.89 x 2.78	L, 2 x 8	MC4004A-SBLW	Blue	944-9159

Connector details:
B = Bottom, L = Left, T = Top. No. of rows x No. of pins (e.g. 1 x 20 = 1 row x 20 pins)

338271

Format	Order Code	Price Each 1+	5+	10+	25+	+
Black characters on a grey background (TN)						
16 x 2	**944-9566●**	22.92	20.83	19.11	17.64	– –
Black characters on a grey background (STN)						
16 x 2	**944-8624●**	28.51	25.94	23.76	21.94	– –
16 x 2	**944-8632●**	29.56	26.89	24.64	22.75	– –
16 x 2	**944-8640●**	31.90	29.00	26.59	24.54	– –
16 x 4	**944-8659●**	43.10	39.19	35.94	33.17	– –
20 x 4	**944-8667●**	61.13	55.60	50.94	47.03	– –
Black characters on a Yellow/Green background (STN)						
16 x 2	**944-8985●**	35.41	32.22	29.52	27.24	– –
16 x 2	**944-8993●**	39.26	35.71	32.71	30.21	– –
x	**949-000**	15.09	12.47	11.47	9.23	– –
16 x 4	**944-9019●**	51.04	46.42	42.54	39.29	– –
White characters on a black background (STN)						
16 x 1	**944-9167●**	64.77	58.92	54.00	49.83	– –
16 x 1	**944-9175●**	74.86	68.06	62.40	57.61	– –
16 x 2	**944-9183●**	68.36	62.17	56.96	52.60	– –
16 x 2	**944-9191●**	70.96	64.51	59.14	54.59	– –
16 x 2	**944-9205●**	62.04	56.38	51.69	47.72	– –
16 x 2	**944-9213●**	101.56	92.34	84.63	78.12	– –
16 x 4	**944-9221●**	94.66	86.06	78.90	72.85	– –
16 x 4	**944-9230●**	95.66	86.97	79.71	73.60	– –
20 x 2	**944-9248●**	85.93	78.12	71.61	66.11	– –
20 x 2	**944-9256●**	141.49	128.61	117.93	108.85	– –
24 x 2	**944-9264●**	83.82	76.23	69.85	64.48	– –
20 x 4	**944-9272●**	129.55	117.80	107.97	99.67	– –
40 x 2	**944-9280●**	127.79	116.20	106.50	98.30	– –
40 x 4	**944-9299●**	165.91	150.80	138.24	127.60	– –
White characters on a blue background (STN)						
16 x 1	**944-9027●**	59.31	53.94	49.44	45.64	– –
16 x 1	**944-9035●**	67.44	61.32	56.21	51.88	– –
16 x 2	**944-9043●**	63.02	57.29	52.54	48.50	– –
16 x 2	**944-9051●**	65.10	59.21	54.26	50.09	– –
16 x 2	**944-9060●**	64.32	58.49	53.61	49.48	– –
16 x 2	**944-9078●**	96.61	87.85	80.53	74.34	– –
16 x 4	**944-9086●**	94.26	85.70	78.58	72.52	– –
16 x 4	**944-9094●**	92.83	84.40	77.37	71.41	– –
20 x 2	**944-9108●**	79.10	71.94	65.91	60.87	– –
20 x 2	**944-9116●**	132.35	120.30	110.28	101.78	– –
24 x 2	**944-9124●**	80.43	73.14	67.02	61.88	– –
20 x 4	**944-9132●**	122.65	111.52	102.21	94.36	– –
40 x 2	**944-9140●**	120.89	109.92	100.74	93.00	– –
40 x 4	**944-9159●**	156.83	142.57	130.69	120.63	– –

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Large Character Displays with Serial Input

DENSITRON

Transflective with LED Backlight

Three large character displays for easy reading and use in terminal applications.

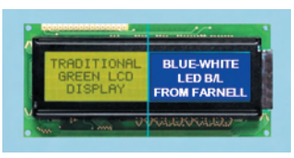
Both the 2 x 20 and 4 x 40 formats have on-board RS232 serial ports allowing easy interconnection to any serial port. In addition a local keyboard of up to 240 keys can be attached directly to the display and fed back via the serial port to the host.

Format	Module Size	Display Area	Character Size	Mftrs. List No.	Order Code
20 x 2	180 x 40 x 18.3	142.8 x 20.64	6.00 x 9.66	LSR4305BG2C20SNG	114-4456
40 x 4	280 x 88 x 17.3	239.2 x 63.65	10.36 x 14.51	LSR4790BG4C40SNG	114-4457

206631

Format	Mftrs. List No.	Order Code	Price Each 1+	3+	+	+	+
2 x 20 with serial driver	LSR4305BG2C20SNG	**114-4456**●	183.60	181.44	– –	– –	– –
4 x 40 with serial driver	LSR4790BG4C40SNG	**114-4457**●	625.80	– –	– –	– –	– –

Blue Alphanumeric LCD Modules with LED Backlight



Photograph to show difference between standard LCD and the Blue-White LCD

A range of Alphanumeric LCD displays with high contrast white characters on a dark blue background, ideal for adding a high technology appearance to products already using standard STN green/ black form factor displays.

The displays utilise the latest white LED technology for the backlight whilst maintaining compatibility with the standard HD44780 driver format.
All displays have a built in controller (HD44780 or equivalent)

Format Char. Lines	Module Size W x H x D	Display Area W x H	Character Size W x H	Mftrs. List No.	Order Code
16 x 1	122 x 33 x 10	99 x 13	4.84 x 9.66	ASI-G-161BS-LJ-EWS/W	412-7304
16 x 2	84 x 44 x 10	64.5 x 16	2.96 x 4.86	ASI-G-162FS-GF-EWS/W.	412-7316
16 x 2	122 x 44 x 15	99 x 24	4.84 x 8.06	ASI-G-162AS-LJ-EWS/W.	412-7328
20 x 2	116 x 37 x 9	84 x 19	3.2 x 4.85	ASI-G-202AS-FE-EWS/W.	412-7330
20 x 4	98 x 60 x 15	76 x 25.2	2.95 x 4.15	ASI-G-204AAS-LL-FWS/W.	439-8129
24 x 2	118 x 36 x 9	96 x 18.8	3.2 x 4.85	ASI-G-242AS-GE-EWS/W.	412-7341
40 x 2	182 x 35.5 x 10	154 x 15.3	3.2 x 4.85	ASI-G-402AS-GF-EWS/W.	412-7353
40 x 4	190 x 54 x 15	149 x 31	2.78 x 4.27	ASI-G-404AS-LJ-EWS/W.	412-7365

240569

Format	Order Code	Price Each 1+	5+	10+	25+	+
16 x 1	**412-7304**	75.36	69.84	64.02	56.15	– –
16 x 2	**412-7316**▲	73.26	67.20	61.08	49.26	– –
16 x 2	**412-7328**▲	106.20	96.57	88.50	81.49	– –
20 x 2	**412-7330**▲	114.39	101.70	91.50	70.21	– –
20 x 4	**439-8129**▲	158.19	143.81	131.83	125.55	– –
24 x 2	**412-7341**▲	112.77	101.52	92.25	77.88	– –
40 x 2	**412-7353**▲	151.44	136.32	123.93	104.88	– –
40 x 4	**412-7365**▲	278.40	247.47	222.69	185.58	– –

LCD Message Contollers

LCD Message Controller

H=50, W=82, D=14
(Display, Ribbon Cable and Connector are available separately).

The **LCD Message Controller** is an interface between an RS232 input and an LCD display. It has been pre-assembled and tested. Commands sent via the RS232 interface are decoded into ASCII characters to be displayed and control codes for selecting line, position, clear display etc.

It is a ready made interface module to drive standard LCD modules from 8 x 1 to 20 x 4. The module is not designed to be used with the 4 x 40 displays.

May be used in conjunction with any standard LCD alphanumeric module using the Hitachi HD44780 controller.

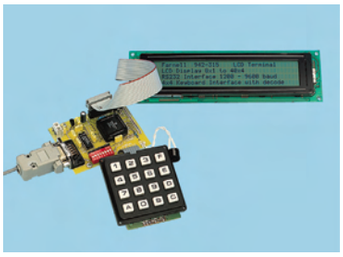
LCDMC2

This is an enhancement of the popular LCD Message Controller. The additional features of the board are: Higher Baud rate selection in 1200, 2400, 4800 and 9600. Capability of handling 40 x 4 modules. Additional control codes and VFD drive capability.

206393

LCD Message Controller	Order Code	Price Each 1+	5+
Single	**654-632**	95.85	71.14
LCDMC2	**139-890**	91.74	77.65

LCD Terminal



Overall size = 87mm x 60mm x 17mm, 2 x 3mm mounting holes

Note: **The LCD display and lead, battery, D connector and lead are available separately**

- Interfaces with standard alphanumeric displays from 1x8 to 4x40 with SIL or DIL connection
- RS232 baud rates of 1200, 2400, 4800 and 9600 selectable
- Buffering of incoming characters
- 4x4 keypad interface with RS232 transmit of keypress
- Audible feedback (with external speaker) for BELL character and keypress
- Onboard 5V regulator
- Board available with pre-programmed PIC.

LCD Terminal (With Pre-Programmed PIC)

The LCD Terminal is an enhancement of the popular LCD Message Controller, **see order code 654-632**, with additional features some of which are shown above.

206486

LCD Terminal (With PIC)	Order Code	Price Each 1+	5+
Single	**942-315**	122.04	106.95

Graphic LCD Modules

Monochrome

VARITRONIX / BATRON / POWERTIP

100 x 32 Pixels, 160 x 32 Pixels, 128 x 64 Pixels, 192 x 64 Pixels, 240 x 64 Pixels, 240 x 128 Pixels, 320 x 240 Pixels

- STN / FSTN technologies with flat, space saving profiles
- Blue/black on yellow/green background, LED and CCFL backlighting available
- T6963/KS0108/SED1520 controllers to display text, graphics or both
- Versions with touchscreens
- Ultrathin models

Features	Flex Film Connector	Pixel Format	Module Size W x H x D	Display Area W x H	Pixel Size W x H	Mftr.	Order Code
●		100 x 32	75 x 54 x 13.5	60 x 26.5	0.38 x 0.45	VAR	546-847
●KS,FSTN	20 way	128 x 64	55.2 x 39 x 6	45.2 x 27	0.39 x 0.55	PTIP	413-5052
■		128 x 64	78 x 70 x 10	62 x 44	0.39 x 0.55	VAR	546-859
■●		128 x 64	78 x 70 x 13	62 x 44	0.39 x 0.55	VAR	118-3189
■		128 x 128	96 x 106 x 12	73 x 86	0.5 x 0.5	VAR	301-3315
■●		128 x 128	96 x 106 x 14.5	73 x 86	0.5 x 0.5	VAR	301-3327
●		192 x 64	100 x 60 x 13	84 x 31	0.36 x 0.36	VAR	546-872
■		240 x 64	180 x 65 x 12	132 x 39	0.48 x 0.48	VAR	654-073
■●		240 x 64	180 x 65 x 14.5	132 x 39	0.48 x 0.48	VAR	118-3195
■●		240 x 128	144 x 104 x 12.5	114 x 64	0.40 x 0.40	VAR	654-103
●T/S,FSTN	16 way	240 x 320	92 x 71.7 x 9.3	59 x 76.78	0.22 x 0.22	PTIP	413-5106
●T/S,FSTN		240 x 320	148 x 120.2 x 20.3	92.14 x 120.1	0.33 x 0.33	PTIP	413-5118

● Displays with LED backlighting
◆ Supplied with film connectors and cables
SED SED1520 controller
T/S Touch Screen
■ Displays with built-in T6963 controller
▲ Displays with CCFL Backlighting
U/T Ultra Thin display

206296

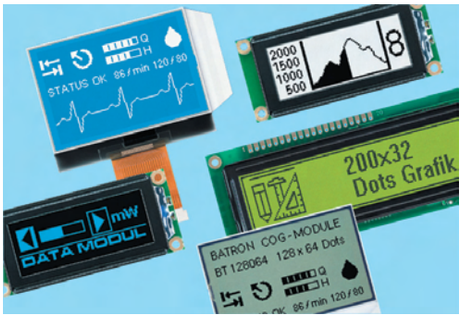
Mftrs. List No.	Order Code	Price Each 1+	5+	10+	25+	+
MGLS10032A-LV2-LED03.	**546-847**	121.44	112.11	111.83	– –	– –
MGLS10032A-LV2-LED03	**118-3186**●	121.44	112.11	111.83	– –	– –
JXG12864LRF-NRA-B.	**413-5052**	113.70	99.48	79.56	66.33	– –
MGLS12864T.	**546-859**	125.55	104.58	96.35	– –	– –
MGLS12864T	**118-3188**●	125.55	104.58	96.35	– –	– –
MGLS12864T-LV2-LED03	**118-3189**●	142.23	119.40	109.14	– –	– –
MGLS128128T-STD2.	**301-3315**	193.27	175.44	164.46	161.54	– –
MGLS128128T-STD2	**118-3150**●	193.27	175.44	164.46	161.54	– –

RoHS ● Compliant ◀ Non-compliant ‡ Limited stock - RoHS replacement available

Mftrs. List No.	Order Code	Price Each 1+	5+	10+	25+	+
MGLS128128T-LV2-LED04.	**301-3327**	227.73	192.72	192.23	– –	– –
MGLS128128T-LV2-LED04	**118-3152●**	227.73	192.72	192.23	– –	– –
MGLS19264-LED03.	**546-872**	206.04	190.14	189.72	– –	– –
MGLS19264-LED03	**118-3190●**	206.04	190.14	189.72	– –	– –
MGLS2406G-STD2.	**654-073**	185.13	165.54	151.02	144.06	– –
MGLS2406G-STD2	**118-3194●**	185.13	165.54	151.02	144.06	– –
MGLS24064-STD2-LED03	**118-3195●**	211.26	162.51	162.10	– –	– –
MGLS240128T-STD2-LED3.	**654-103**	263.79	239.82	202.41	– –	– –
MGLS240128T-STD2-LED3	**118-3196●**	263.79	239.82	202.41	– –	– –
JXG320240LRF-HNN-H-A1.	**413-5106**	238.88	214.99	199.37	186.48	– –
JXG320240WRF-DE4-HY4	**413-5118**	574.02	516.63	469.65	397.41	– –

Graphic LCD Modules — Batron

HQ Series



The HQ series of STN graphic LCD modules give an enhanced graphic image with high contrast and wide viewing angle. This is achieved by implementing a 15 micron gap between pixels to give a much denser image.
Available in reflective, transflective and transmissive variants these modules offer an attractive display with low power requirements and ease of interface.
LED backlit versions include high intensity white or green LEDs.

Applications include:
- Instrumentation
- POS equipment
- Metering
- Consumer Electronics
- Graphical User Interfaces (GUI)
- Medical

Mftrs. List Nos:	Order Code
BTHQ100032V-SRE WC	944-9302
BTHQ128064AVC-COG-SRE	944-9337
BTHQ128064AVD-COG-SRE	944-9370
BTHQ100032V-STF-LED YG WC	944-9310
BTHQ128064AVC-COG-STF-LED02 GREEN	944-9345
BTHQ128064AVD-COG-STF-LED02 GREEN	944-9388
BTHQ240064AVB-COG-YETF-LED02 GREEN	944-9418
BTHQ100032V-FSTF-LED WHITE WC	944-9329
BTHQ128064AVC-COG-FSTF-LED05 WHITE	944-9353
BTHQ128064AVD-COG-FSTF-LED05 WHITE	944-9396
BTHQ240064AVB-COG-FETF-LED05 WHITE	944-9426
BTHQ128064AVC-COG-SMN-LED05 WHITE	944-9361
BTHQ128064AVD-COG-SMN-LED05 WHITE	944-9400
BTHQ240064AVB-COG-EMN-06-LED WHITE	944-9434

Format	Module Size W	H	D	Display Area W x H	Controller	Connector	Order Code
Reflective - Black characters on a yellow/green background							
100 x 32	65	28.4	8	46 x 46	SED 1520	B, 1 x 17	944-9302
128 x 64	64	52	5	60 x 60	UC 1606	B, 1 x 22	944-9337
128 x 64	54.6	42.2	1.8	50.6 x 50.6	S1D 10605D04B	T, 1 x 28	944-9370
Transflective - Black characters on a green background							
100 x 32	65	28.4	8	46 x 46	SED 1520	T, 1 x 17	944-9310
128 x 64	64	52	5	60 x 60	UC 1606	B, 1 x 22	944-9345
128 x 64	54.6	42.2	1.8	50.6 x 50.6	S1D 10605D04B	T, 1 x 28	944-9388
240 x 64	120	44.8	5	102.4 x 102.4	S1D 10605D04B	T, 1 x 22	944-9418
Transflective - Black characters on a white background							
100 x 32	65	28.4	8	46 x 46	SED 1520	T, 1 x 18	944-9329
128 x 64	64	52	5	60 x 60	UC 1606	B, 1 x 22	944-9353
128 x 64	54.6	42.2	1.8	50.6 x 50.6	S1D 10605D04B	T, 1 x 28	944-9396
240 x 64	120	44.8	5	102.4 x 102.4	S1D 10605D04B	T, 1 x 22	944-9426
Transmissive - White characters on a blue background							
128 x 64	64	52	5	60 x 60	UC 1606	B, 1 x 22	944-9361
128 x 64	54.6	42.2	1.8	50.6 x 50.6	S1D 10605D04B	T, 1 x 28	944-9400
240 x 64	120	44.8	5	102.4 x 102.4	S1D 10605D04B	T, 1 x 22	944-9434

Connector details:
B = Bottom, L = Left, T = Top. No. of rows x No. of pins (e.g. 1 x 20 = 1 row x 20 pins)

338281

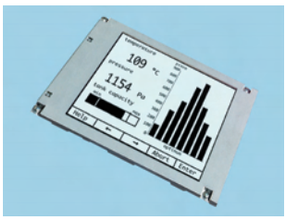
Format (connection)	Order Code	Price Each 1+	5+	10+	25+	+
Black Characters on a yellow/green background						
100 x 32 (A)	**944-9302●**	75.74	68.88	63.15	59.99	– –
128 x 64 (B)	**944-9337●**	106.11	96.48	88.44	81.64	– –
128 x 64 (C)	**944-9370●**	40.95	37.20	34.11	31.51	– –
Black Characters on a green background						
100 x 32 (A)	**944-9310●**	88.15	80.14	73.47	67.80	– –
128 x 64 (B)	**944-9345●**	114.58	104.16	95.53	88.18	– –
128 x 64 (C)	**944-9388●**	48.96	44.53	40.82	37.66	– –
240 x 64 (C)	**944-9418●**	221.54	201.39	184.59	170.40	– –

Format (connection)	Order Code	Price Each 1+	5+	10+	25+	+
Black Characters on a white background						
100 x 32 (A)	**944-9329●**	105.79	96.19	88.18	81.38	– –
128 x 64 (B)	**944-9353●**	117.65	– –	– –	– –	– –
128 x 64 (C)	**944-9396●**	72.00	65.46	59.99	55.40	– –
240 x 64 (C)	**944-9426●**	238.69	216.98	198.91	183.61	– –
White Characters on a blue background						
128 x 64 (B)	**944-9361●**	166.33	151.23	138.63	127.95	– –
128 x 64 (C)	**944-9400●**	69.07	62.82	57.55	53.15	– –
240 x 64 (C)	**944-9434●**	266.13	241.94	221.76	204.71	– –

Connection:
(A) With Connector, (B) Universal Interface, (C) FPC Cable

STN Monochrome Graphic Displays — HITACHI

250 x 128 (5.1") & 320 x 240 (4.7") - Transmissive, CFL Backlight



- LMG74xx has a built-in T6963C controller
- Black on White Film STN
- High contrast ratio 20:1
- Starter Kits and Inverters are also available
- Matched Inverter also available separately

Suitable Starter Kits & Inverters

- Each Starter Kit contains:
  - A comprehensive instruction leaflet with Module and Inverter details, handling precautions, suggestions for driver chip and connector suppliers
  - The matched Inverter
  - Input connector for the module
  - Input connector for the Inverter with flying leads

Display Type	Order Code	Starter Kit	Order Code	Matched Inverter	Order Code
LMG7420PLFC-X (G)	390-1713	START74XX.	390-1853	INVC191	390-1981
LMG7520RPFC	390-1725	START7520.	390-1865	INVC473	390-2006

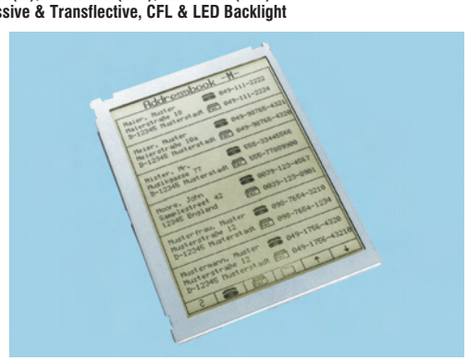
	Module Size W	H	D	Display Area W	H	Pixel Size W	H	Mftrs. List No.
240 x 128								
159.4	101	11		123	68	0.47	0.47	LMG7420PLFC-X (G)
320 x 240								
129.6	92.6	7.5		100	75.5	0.285	0.285	LMG7520RPFC

233685

Mftrs. List No.	Order Code	Price Each 1+	+	+
Display Resolution				
240 x 128				
LMG7420PLFC-X (G)	**390-1713**	252.87	– –	– –
320 x 240				
LMG7520RPFC	**390-1725**	200.93	– –	– –
Starter Kits				
START74XX.	**390-1853**	154.71	– –	– –
START7520.	**390-1865**	154.71	– –	– –
Inverters				
INVC191	**390-1981**	66.26	– –	– –
INVC473	**390-2006**	46.92	– –	– –

SP10xx & SP14xx STN Monochrome Graphic Displays — HITACHI

240 x 160 (4"), 240 x 320 (3.8"), 320 x 240 (5.7") - Transmissive & Transflective, CFL & LED Backlight



- Starter Kits and Inverters are also available
- Each Starter Kit contains:
  - A comprehensive instruction leaflet with Module and Inverter details, handling precautions, suggestions for driver chip and connector suppliers

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

- The matched Inverter
- Input connector for the module
- Input connector for the Inverter with flying leads

● Matched Inverter also available separately

Suitable Starter Kits & Inverters

Display Type	Order Code	Starter Kit	Order Code	Matched Inverter	Order Code
SP10Q002-T	390-1737	STARTSP10Q002	390-1877	INVC473	390-2006
SP10Q003-T.	390-1749	STARTSP10Q005-T	390-1889	Not Required	
SP10Q005-T.	390-1750	STARTSP10Q005-T	390-1889	Not Required	
SP14Q002-A1.	390-1762	STARTSP14Q002.	390-1907	INVC196 (5V)	390-2020 or
				INVC132 (12V).	390-2031
SP14Q002-T.	390-1774	STARTSP14Q002.	390-1907	INVC196 (5V)	390-2020 or
				INVC132 (12V).	390-2031
SP14Q002-C2A.	390-1786	STARTSP14Q002.	390-1907	INVC196 (5V)	390-2020 or
				INVC132 (12V).	390-2031

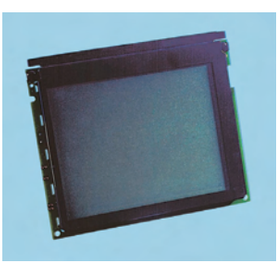
Screen Size	Backlight Type	Module Size W	H	D	Display Area W	H	Pixel Size W	H	Mftrs. List No.
240 x 160 - FSTN, Black on White Transflective									
4"	CFL	120	80	7.0	88.1	60	0.335	0.335	SP10Q002-T
240 x 320 - FSTN, Black on White Transflective. Low Power, Resistive Touchscreen									
3.8"	LED	70.1	92.1	9.0	60.6	79.8	0.225	0.225	SP10Q003-T.
240 x 320 - FSTN, Black on White Transflective. Low Power.									
3.8"	LED	70.1	92.1	7.9	60.6	79.8	0.225	0.225	SP10Q005-T.
320 x 240 - FSTN, Black on White Transmissive. High Brightness									
5.7"	CFL	167	109	10.0	120	89	0.345	0.345	SP14Q002-A1.
320 x 240 - FSTN, Black on White Transflective. Low Power, Sunlight Readable.									
5.7"	CFL	167	109	10.0	120	89	0.345	0.345	SP14Q002-T.
320 x 240 - FSTN, Black on White Transflective. High Brightness, Resistive Touchscreen									
5.7"	CFL	167	109	11.4	120	89	0.345	0.345	SP14Q002-C2A.

233700

Mftrs. List No.	Order Code	Price Each 1+	+	+
Display Resolution				
240 x 160				
SP10Q002-T	**390-1737**	167.35	– –	– –
240 x 320				
SP10Q003-T.	**390-1749**	227.20	– –	– –
SP10Q005-T.	**390-1750**	190.93	– –	– –
320 x 240				
SP14Q002-A1.	**390-1762**	193.84	– –	– –
SP14Q002-T.	**390-1774**	218.83	– –	– –
SP14Q002-C2A.	**390-1786**	289.51	– –	– –
Starter Kits				
STARTSP10Q005-T	**390-1889**	71.56	– –	– –
STARTSP14Q002.	**390-1907**	77.33	– –	– –
Inverters				
INVC473	**390-2006**	46.92	– –	– –
INVC196 (5V)	**390-2020**	37.06	– –	– –
INVC132 (12V).	**390-2031**	59.52	– –	– –

5" ¼VGA LCDs with Built In Controller — DENSITRON

LED, CCFL Backlight



- Either LED or CCFL backlight options
- 8-bit parallel input
- On-board memory mapped graphic control
- Suitable for any 6800 or 8080 environment
- CCFL backlight Inverter available
- FSTN technology

A choice of 2.5" ¼VGA LCDs (320 x 240 pixels) with on-board controllers for simple hardware and software integration.

Format	Backlight	Module Size W x H x D	Display Area W x H	Pixel Size W x H	Mftrs. List No.
320 x 240	LED	148 x 120 x 23.1	115.17 x 86.37	0.33 x 0.33	LMR4755BG240G320WCF
320 x 240	CCFL	148 x 131.7 x 23.1	115.17 x 86.37	0.33 x 0.33	LMR6755B240G320WCF
Inverter		44 x 14 x 21			INV-12

206632

Format	Mftrs. List No.	Order Code	Price Each 1+	3+	5+
320 x 240 LED	LMR4755BG240G320WCF	**114-4453●**	479.65	– –	– –
320 x 240 CCFL	LMR6755B240G320WCF	**114-4454●**	469.98	450.45	– –
Inverter	INV-12	**118-0975●**	33.57	31.14	28.86

Monochrome, 10.4" VGA — HITACHI

640 x 480 pixels

- Film black and white transmissive
- Single edge CFL backlight
- High contrast ratio 18:1
- Ideal for displaying animated graphics without ghosting or after image
- STN colour, film black or white

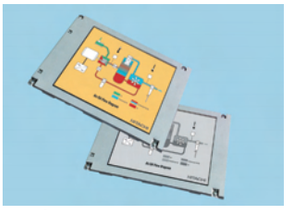
Module Size W	H	D	Display Area W	H	Pixel Size W	H
264	183	8.5	215.2	162.4	0.33	0.33

OPT423

Mftrs. List No.	Order Code	Price Each 1+	+	+
LMG7550XUFC.	**657-608**	716.10	– –	– –

STN Colour Graphic Displays — HITACHI

320 x 240 (5.7"), Transmissive, CFL Backlight. With or Without Touchscreen



- High contrast ratio of 40:1
- High Brightness of 150cd/m^2
- 3.3V only supply
- Starter Kits and Inverters available
- Matched Inverter available separately

Each Starter Kit contains:

- A comprehensive instruction leaflet with Module and Inverter details
- Handling precautions
- Suggestions for driver chip and connector suppliers
- The matched Inverter
- Input connector for the module
- Input connector for the Inverter with flying leads

Suitable Starter Kits & Inverters

Display Type	Order Code	Starter Kit	Order Code	Matched Inverter	Order Code
SX14Q001.	390-1804	STARTSX14Q001.	390-1944	INVC196 (5V)	390-2020 or
				INVC132 (12V).	390-2031
SX14Q001-ZZA.	390-1816	STARTSX14Q001ZZA	390-1956	INVC196	390-2043

Screen Size	Backlight Type	Module Size W	H	D	Display Area W	H	Pixel Size W	H	Mftrs. List No.
320 x 240 - Mechanically Compatible with SP14Qxxx Range									
5.7"	CFL	167	109	10.0	115.18	86.38	0.34	0.70	SX14Q001.
320 x 240 - Mechanically Compatible with SP14Qxxx Range. With Resistive Touchscreen									
5.7"	CFL	167	109	11.6	115.18	86.38	0.34	0.70	SX14Q001-ZZA.

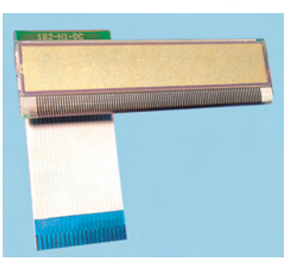
233711

Mftrs. List No.	Order Code	Price Each 1+	+	+
Display Resolution				
320 x 240				
SX14Q001.	**390-1804**	370.51	– –	– –
SX14Q001-ZZA.	**390-1816**	442.22	– –	– –
Starter Kits				
STARTSX14Q001.	**390-1944**	182.84	– –	
Inverters				
INVC196 (5V)	**390-2020**	37.06	– –	– –
INVC132 (12V).	**390-2031**	59.52	– –	– –

LCD Min-Modules

2 x 16 & 2 x 20 Character, 33 x 100 & 64 x 100 Graphic Displays — DENSITRON

Monochrome Transflective with LED Backlight



- 2 x 16 and 2 x 20 offer 5V only input
- On-board character generator
- 33 x 100, 64 x 100 offer on-board graphic controller with memory
- Serial or parallel input
- All displays feature low-profile LED backlighting
- Simple 1.0mm pitch flexible cable interconnection

These modules use STN (Supertwisted Nematic) technology and have a space saving of up to 50% when compared to similar resolution panels, this range of "mini-modules" offers the ultimate in miniature high-resolution display technology.

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

Farnell Page 936 Date: 21-08-06 time: 17:58

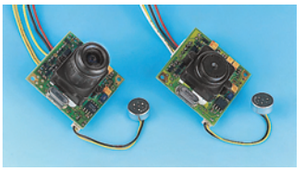
Format	Module Size	Display Area	Character Size	Pixel Size	Mftrs. List No.
2 x 16	65 x 19.5 x 7.8	54.7 x 9.0	2.95 x 4.35	0.60 x 0.55	LMR4047BG2C16HNG/5V
2 x 20	80 x 21.5 x 7.8	68.5 x 10.7	2.95 x 5.15	0.60 x 0.65	LMR4052BG2C20HNG/5V
33 x 100	75 x 35 x 8.6	59.96 x 21.74	—	0.60 x 0.66	LMR4900BG33G100SNY
64 x 100	53 x 79 x 7.9	52.95 x 40.27	—	0.54 x 0.51	LMR4068BG64G100SNY/B

206630

Format	Mftrs. List No.	Order Code	Price Each 1+	3+	5+	10+	+
2 x 16	LMR4047BG2C16HNG/5V	**114-4459**●	36.12	34.26	31.95	27.11	– –
2 x 20	LMR4052BG2C20HNG/5V	**114-4460**●	45.54	42.93	39.45	35.34	– –
33 x 100	LMR4900BG33G100SNY	**114-4462**●	77.52	74.10	71.31	70.36	– –
64 x 100	LMR4068BG64G100SNY/B	**114-4463**●	109.93	– –	– –	– –	– –

CCD PCB Cameras

CCD Monochrome PCB Camera



- Compact Design
- Good sensitivity
- Audio output, microphone attached
- Low voltage operation
- Suitable for use with Video Input Graphic LCD Kits

H=32, W=32, D=30 (249-622)

Image sensor	⅓" CCD 512(H) x 582(V) pixels	Video output	1 Vp-p (75 ohm)
Horizontal resolution	380TVL	Audio output	700mV line level
Lens	Integral 3.8mm lens or Pinhole lens	Power supply	10V - 12.6VDC
Iris	Electronic		
Sensitivity	<0.5 lux Integral lens, <3.0 lux Pinhole lens		

OPT602

Lens	Order Code	Price Each 1+	+	+
Integral	**249-622**	127.88	– –	– –
Pinhole	**249-634**	127.88	– –	– –

Vacuum Flourescent Displays

LCD Compatible 5 x 7 Dot Character Modules

Parallel Interface with 5mm and 9mm character heights.
These 5x7 dot matrix VF displays are designed to be interchangeable with most LCD modules without the need for a re-design. This allows the user to upgrade their equipment to give a high quality, bright visible display with a wide operating temperature.

- Selectable 4/8bit M68/i80 Interface
- ASCII + extended character fonts
- Single 5Vdc supply
- 4-level brightness control
- U series Operating Temp -20 to +70C
- Software power-down function
- W series Operating Temp -40 to +85C

Format	Character Height	Module Size H	W	D	Display Area H x W	Power Supply	Interface	Order Code
2 x 16	5	36	80	12	11.5x51	5V@230mA	Parallel	121-6659
2 x 16	9	44	122	20	82.7x19	5V dc@350mA	Parallel	121-6662
2 x 20	5	36	115	15	11.5x71	5V@130mA	Parallel	913-2775
2 x 20	9	43	146	19	18.8x103	5V dc@400mA	Parallel	913-2783
4 x 20	5	60	98	17	20.9x71	5V@300mA	Parallel	121-6668
2 x 40	5	33	182	17	11.5x139	5V@300mA	Parallel	913-2791

206483

Mftrs. List No.	Order Code	Price Each 1+	3+	10+	25+
CU16025ECPB-W6J	**121-6659**●	104.82	81.24	– –	– –
CU16029ECPB-W1J	**121-6662**●	139.08	115.92	107.79	– –
CU20025ECPB-W1J.	**913-2775**▲	116.01	100.90	89.25	82.87
CU20029ECPB-W1J.	**913-2783**▲	170.72	148.46	131.37	121.96
CU20045SCPB-W5J	**121-6668**●	175.26	159.30	135.83	– –
CU40025SCPB-W6J.	**913-2791**▲	221.80	192.86	170.63	158.42

Standard 5 x 7 Dot Matrix Modules

Async Serial/Parallel Interface plus Bold Character Format
The modules include micro-controller ICs with refresh RAM, Character Generator and Interface Logic. The High-Speed 8-bit parallel Interface is 5V CMOS compatible suitable for connection to a host CPU bus. The asynchronous serial Interface accepts baud rates up to 19200 with or without parity. Font tables may be either hardware or software selected.

- High Speed Parallel/Serial Int
- Operating Temperature -10 to +65C
- ASCII, Katakana & extended character fonts
- User definable fonts

Power and Serial data connection is through a 3-way connector, mating half supplied. Parallel data connections use standard IDC connectors, see table for details.

KS-Series Interface connector is 26-way IDC **(208-826)**
T-series Interface connector is 16-way IDC **(208-802)** except for 40x6 module which is 34-way **(208-838)**

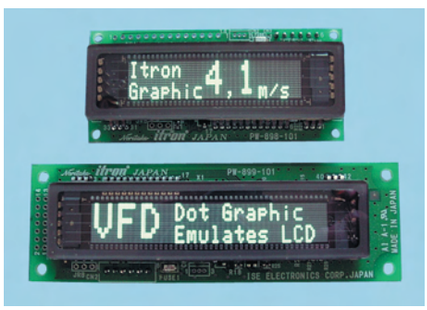
Format	Character Height	Module Size H	W	D	Display Area H x W	Power Supply	Interface	Order Code
1 x 20	8.8	34	164	26.5	9x120	5V@360mA	P/S	121-6669
2 x 20	4.7	40	124	24.5	15x78	5V@280mA	P/S	121-6664
2 x 20	9.0	47	205	31.5	24x162	5V@700mA	P/S	481-646
4 x 20	5.0	64	150	25.5	26x90	5V@500mA	P/S	121-6667
2 x 40	5.1	43	240	26.5	16x188	5V@800mA	P/S	121-6672

Interface Code: P/S = Parallel or Serial, Bi/P = Bi-directional Parallel

228225

Mftrs. List No.	Order Code	Price Each 1+	3+	10+	25+
CU209SCPB-T20A	**121-6669**●	267.75	248.28	216.23	– –
CU20025SCPB-T20A	**121-6664**●	267.48	226.65	207.30	– –
CU20029SCPB-T20A.	**481-646**▲	338.07	288.21	– –	– –
CU20045SCPB-T31A	**121-6667**●	463.09	402.71	356.26	330.77
CU40026-TW200A	**121-6672**●	402.77	350.24	309.84	287.71
RS-232 Adapter	**121-6693**●	24.48	24.25	24.02	17.51

Dot Graphic LCD Compatible Modules



Parallel/Serial Interface with 2 Character Font Sizes
This range of modules can display large and small ASCII characters using the commands found in existing character modules plus extended graphics control. The modules operate from a 5Vdc power supply, and are capable of operating from -40 to +85°C in humid applications.
Graphics formats are 112 x 16, 140 x 16, 140 x 32 and 280 x 16.

Format	Character Height	Module Size H	W	D	Display Area H x W	Power Supply	Interface	Order Code
2 x 16	5	36	80	20	11.5x52.5	5V dc@260mA	Parallel	412-8783
2 x 20	5	37	116	20	69.9x11.5	5V dc@290mA	Parallel	412-8795
4 x 20	5	60	98	16	69.9x21.6	5V dc@450mA	Parallel	412-8801
2 x 40	5	33.5	182	8.6	137.05x11.0	5V dc@400mA	Parallel & Serial	913-2767

240229

Mftrs. List No.	Order Code	Price Each 1+	3+	10+	25+
GU112X16G-7806..	**412-8783**	108.60	90.51	84.17	– –
GU140X16G-7806..	**412-8795**	112.38	93.66	87.09	– –
GU140X32F-7806..	**412-8801**	150.48	125.40	116.62	– –
GU280X16G-7806. NEW	**913-2767**▲	228.50	198.72	175.80	163.24

Dot Graphic Modules - 0.5mm pixel

Asynchronous Serial Interface

These VF display modules use a patented transformerless power supply unit. The serial interface is fully duplex and accepts various baud rates up to 38400Bd.
The modules have numerous customer options available including special fonts, application specific commands and key scanning.

NEW

- High brightness Dot Graphic Display
- Single 5V dc supply
- SPI & RS232 serial interface
- 3 ASCII fonts (5 x 5, 5 x 7 & 10 x 14)
- 8 user I/O pins

Format Characters x Lines	Module Size H	W	D	Display Area H	W	Power Supply	Interface	Order Code
128 x 18	30	126	8.6	30	83.05	5.0V dc@300mA	SPI/RS232	913-2732
126 x 32	38	126	8.4	38	83.05	5.0V dc@400mA	SPI/RS232	913-2716
126 x 64	72	129	12.9	72	83.05	5.0V dc@750mA	SPI/RS232	913-2724

403254

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

C = CYAN M = Magenta Y = Yellow B = Black/SING

Mftrs. List No.	Order Code	Price Each 1+	3+	10+	25+
GU128X18F-K612A4.	913-2732▲	195.79	170.27	150.61	139.87
GU126X32F-K612A4.	913-2716▲	214.41	186.48	164.96	153.18
GU126X64F-K612A4.	913-2724▲	270.43	235.17	208.06	193.18

Message Sign Dot Graphic Modules

Noritake itron

RS232 Asynchronous Serial Interface

The modules include a large dot graphic VFD, VF drivers and microcontroller with refresh RAM, character generation, interface logic and patented transformerless DC/DC converter. The RS232 serial interface accepts 9600 or 19200 baud rates with optional parity bit. The modules feature a low profile design with numerous custom options available including special fonts and commands. Modules can be connected to a multi-drop address system. The communication settings and address can be set using the three buttons on the rear of the module.

Format	Module Size H	W	D	Display Area H x W	Power Supply	Interface	Order Code
8 x 96	30	215	15	12.6x153	12V dc@250mA	RS232	412-8886
8 x 128	46	370	17	25.35x307	12V dc@500mA	RS232	412-8898

240260

Mftrs. List No.	Order Code	Price Each 1+	5+	10+	+
GU96X8M-K612C5..	412-8886	122.10	101.76	94.63	– –
GU128X8T-K612C5..	412-8898	332.28	276.90	257.52	– –

Cold Cathode Flourescent Tubes (CCFL)

Straight — SLI

2.6mm Diameter

A cold cathode fluorescent tube with a matching inverter. Among other things this small diameter tube is for the backlighting of LCD displays but it may be used for other applications as well.

Type	Dia (mm) ±2mm	Glass Length ±1.0mm	Lamp current ±10%	Lamp Voltage rms norm.	Brightness cd/M² ±15%	Life (hours)	Mftrs. List No.	Order Code
Straight	2.6	205	5.0mA	500V	38000	25000	HMBSM26205	113-9179
		21 x 90 x 120	.0mA				HIU742AK	113-9181

	Input voltage min.	typ.	max.	Input Current typ.	max.	Frequency min.	typ.	max.	Output Current min.	typ.	max.	Order Code
Inverter	9.0V	9.5V	10.0V	480mA	560mA	35kHz	43kHz	51kHz	3.5mA	4.5mA	5.5mA	113-9181

206648

Style	Diameter	Order Code	Price Each 1+	5+	10+	25+
Straight	2.6	113-9179●	29.92	25.01	23.28	18.90
Inverter	—	113-9181●	67.68	– –	– –	– –

EL (Electro-Luminescent) Wire

Electro Luminescent Wire — PACEL

1m, 2m, 6m, 12m

The colours shown are in the non-illuminated state therefore the colours will vary from those illustrated.

Brightness: Typically 100Cd/m² @ 12V dc. 22mA/m 2KHz

For the first time Linear Electro Luminescent Lighting is available. This unique lighting product is extremely flexible as the Electroluminescent material is manufactured in the form of a wire with a 2mm diameter. It is available in 1m, 2m, 6m and 12m lengths with various colour options. Each length of Wire comes complete with fitting instructions.

N.B. This product should be used in conjunction with the EL Wire Inverters that have been impedance matched to give optimum performance. A 12V dc input to each inverter will drive the matched length of EL Wire to the brightness shown below.

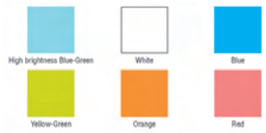
206542

Colour	Order Code	Price Each 1+	5+	10+	25+	+
1 Metre Lengths of EL Wire						
Red	142-165●	29.17	24.70	22.93	19.30	– –
Orange	142-177●	29.17	24.70	22.93	19.30	– –
Green	142-190●	29.17	24.70	22.93	19.30	– –
Blue	142-207●	29.17	24.70	22.93	19.30	– –
Yellow	142-219●	29.17	24.70	22.93	19.30	– –
2 Metre Lengths of EL Wire						
Red	142-220●	50.59	47.79	45.14	39.06	– –
Green	142-256●	50.59	47.79	45.14	39.06	– –
Blue	142-268●	50.59	47.79	45.14	39.06	– –
6 Metre Lengths of EL Wire		1+	3+	6+	+	+
Red	142-281●	99.32	96.55	95.33	– –	– –
Blue	142-323●	99.32	96.55	95.33	– –	– –
12 Metre Lengths of EL Wire		1+	+	+	+	+
Blue	142-384●	179.03	– –	– –	– –	– –
Matched Inverters		1+	5+	10+	+	+
1M Matched	118-0987●	60.21	56.94	53.79	– –	– –
2M Matched	118-0989●	60.21	56.94	53.79	– –	– –
6M Matched	118-0991●	60.21	56.94	53.79	– –	– –
12M Matched	118-0992●	60.21	56.94	53.79	– –	– –

EL (Electro-Luminescent) Sheet Kits

Electro Luminescent Sheet kits — PACEL

50 x 60, 130 x 120, A5 (210 x 148.5), A4 (210 x 297), A3 (434 x 311)



N.B. The colours shown are before the ac voltage is applied therefore the colours will vary from those illustrated.

The Pacel EL Sheet Kit has a sheet of Electro Luminescent sheet together with copper contacts, conductive adhesive tape, insulating tape and instructions. When an ac voltage is applied, using an inverter, available seperately, the electro luminescent material emits light. The sheets are ultra-thin, very flexible, lightweight and vibration/impact resistant. They may be cut into any desired shape providing each shape has a terminal strip on one of the sides. The number of contact sets supplied with each size sheet are:

Sheet size:	50 x 60	130 x 120	A5	A4	A3
No.of Contact Sets:	1	4	6	10	20

Additional contact sets are also available.

Brightness: Typically 70-100Cd/m2 when driven at 115V, 400-600Hz

206545

Colour	Order Code	Price Each 1+	5+	10+	25+	+
50 x 60						
High Brightness						
Blue-Green	141-896●	24.41	22.49	21.17	19.25	– –
White	141-902●	24.41	22.49	21.17	19.30	– –
Blue	141-914●	24.41	22.49	21.17	19.07	– –
Yellow-Green	141-926●	24.41	22.49	21.17	19.20	– –
Orange	141-938●	24.41	22.49	21.17	19.30	– –
Red	141-940●	24.41	22.49	21.17	19.30	– –
130 x 120						
High Brightness						
Blue-Green	141-951●	58.53	58.12	– –	– –	– –
White	141-963●	58.53	58.08	– –	– –	– –
Blue	141-975●	58.53	58.12	– –	– –	– –
Yellow-Green	141-987●	58.53	57.43	– –	– –	– –
Orange	141-999●	58.53	53.39	51.00	50.45	– –
Red	142-001●	58.53	58.12	– –	– –	– –
A5 (210 x 148.5)		1+	3+	6+	9+	+
High Brightness						
Blue-Green	142-037●	74.94	70.81	69.52	– –	– –
White	142-049●	74.94	70.81	69.52	– –	– –
Blue	142-050●	74.94	70.81	68.41	– –	– –
Yellow-Green	142-062●	74.94	70.81	69.10	– –	– –
Orange	142-074●	74.94	70.81	66.72	57.89	– –
Red	142-086●	74.94	70.81	69.52	– –	– –
A4 (210 x 297)						
High Brightness						
Blue-Green	142-098●	119.32	– –	– –	– –	– –
White	142-104●	119.32	– –	– –	– –	– –
Blue	142-116●	119.27	– –	– –	– –	– –
Orange	142-130●	113.27	98.34	95.56	– –	– –
Red	142-141●	119.18	– –	– –	– –	– –
A3 (311 x 434)						
White	393-4640●	200.94	192.98	– –	– –	– –
Green	393-4652●	200.94	192.98	– –	– –	– –
Blue	393-4664●	200.94	192.98	– –	– –	– –

Contact Sets for EL Sheets		Price Per Pack 1+	+	+
Spare Con Sets(10)	142-153●	16.23	– –	– –

Optoelectronics, Indicators, Lamps & Displays

28

● Compliant ▲ Non-compliant ‡ Limited stock - RoHS replacement available

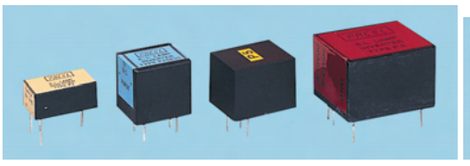
RoHS

C = CYAN M = Magenta Y = Yellow B = Black/SING

Farnell Page 938 Date: 21-08-06 time: 18:00

EL Inverters

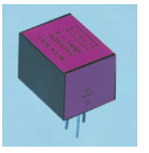
EL Inverters — PACEL



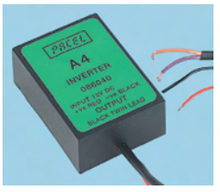
595-299
118-0999
H=8, W=23.5,
D=14.0

549-113
572-731
1180996
1180998
H=18.5, W=21.5,
D=19.0

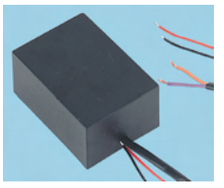
549-125
H=18.2, W=24,
D=16.8



142-440
118-0993
H=17.5, W=25,
D=19



393-4627
118-0994
H = 27
W = 70
D = 50



393-4639
118-0995
H = 27
W = 70
D = 50

A range of fully encapsulated dc to ac inverters for driving various sizes of electroluminescent (EL) backlit LCDs and EL sheets (available separately). The correct inverter may be chosen by calculating the area of EL to be lit. The P2 and P4 are open circuit and short circuit protected.

The P4 is available with 5V or 12V dc inputs and is a high current design giving higher brightness levels than the P5. The P5EHP is a high power version of the P5E.
The 086040 has a 12V dc input and will power sheets up to A4 size, the 086040 has a 12V dc input and can power sheets up to A3 size. Do not operate the larger inverters without a load connected.

DC Input Voltage V	AC Output Voltage (r.m.s.) V	Output @ Frequency KHz	Max. EL Area cm^2	Mftrs. List No.	Order Code
2-5	50-70	0.9-1.5	30	P2-R	118-0999
2-5	300	0.4-2.0	100	P4SE05-R	118-0996
11-14	300	0.4-2.0	100	P4SE12-R	118-0998
2-5	70-170	0.3-0.89	100	P5E-R	118-0997
2-5	80-190	0.8-3.5	100	P5EHP-R	118-0993
4-10	60-150	0.2-0.4	400	P6-R	121-0694
12 V max.	115 Vac max.	0.4-0.5	1247	086030-R	118-0995

206327

Mftrs. List No.	Order Code	Price Each 1+	5+	10+	+	+
P2-R	**118-0999**	64.23	56.73	48.21	– –	– –
P4SE05-R	**118-0996**	71.61	64.29	48.45	– –	– –
P4SE12-R	**118-0998**	71.61	64.29	60.99	– –	– –
P5E-R	**118-0997**	58.62	52.41	47.97	– –	– –
P5EHP-R	**118-0993**	62.97	38.34	35.58	– –	– –
P6-R	**121-0694**	115.85	107.61	92.70	– –	– –
086040-R	**118-0994**	134.61	119.31	100.95	– –	– –
P2-R	**118-0999**	64.23	56.73	48.21	– –	– –

Display Filters

Anti-Glare

Thickness 1.0mm (105 x 35),
1.5mm (250 x 105), 1.5mm (220 x 130)

High quality acrylic filters for display applications. One surface has a cast-in low glare finish. It is available in neutral (grey), red, light red and green.

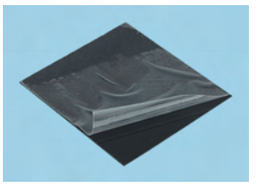
The 1mm thick material can be easily cut down by scoring with a sharp knife, then breaking. The 1.5mm thick material is ideally cut with a high speed tungsten carbide tipped bandsaw.

206498

105 x 35mm	Order Code	Price Each 1+	10+	25+	100+
Neutral	**177-145**	22.88	17.85	13.64	9.79
Light Red	**177-146**	22.66	17.85	13.64	7.90
220 x 130mm					
Red	**178-183**	50.79	43.71	23.64	– –
Light Red	**178-184**	49.36	33.51	24.93	– –
Green	**178-185**	40.90	27.48	20.48	– –
Neutral	**178-186**	40.50	36.12	20.28	– –

Infra-Red Filters

Infra-Red Filters



Infrared broad band acrylic filter material for use in conjunction with IR emitters in security applications etc. The filters transmit infrared light at wavelengths greater than 750nm and are virtually opaque to visible light. Transmittance is up to a maximum of approximately 90% from 750nm to 2000nm.

One surface has a cast-in low glare finish. The material gives excellent resistance to many common chemicals and solvents. It can be easily cut down by scoring with a sharp knife, then breaking.

H		Thickness	Order Code
100	305	1	177-143
305	305	1	177-144

206520

Size	Order Code	Price Each 1+	5+	10+	15+	+
100mm x 305mm	**177-143**	59.18	50.06	40.46	27.60	– –
305mm x 305mm	**177-144**	121.90	105.14	90.46	81.46	– –

Agilent Technologies Optocouplers

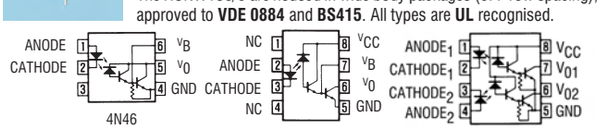
Darlington Output – Single and Dual, Low Current 100 KBd Data-Rate

AVAGO TECHNOLOGIES

Split darlington output types (all except 4N46) provide low saturation.

The HCNW138 is for use in TTL applications. The HCNW139, HCPL4701 and HCPL4731 are for CMOS, LSTTL and other low power applications.

The HCNW138/9 are housed in wide body packages (0.4" row spacing), approved to **VDE 0884** and **BS415**. All types are **UL** recognised.



Voltage V_{OL} 0.1V typ. Withstand test voltage HCNW 138/9

Channels	Current Transfer Ratio (min.) @ I_F	V_{CC} max.	Mftrs. List No.	Order Code
Single	500% @ 1.6mA	18V	HCNW139-300E	108-5024
Single	250% @ 10mA	7V	4N46-300E	108-5021
Single	300% @ 1.6mA	7V	6N138-300E	108-5022
Single	500% @ 0.5mA	18V	6N139-300E	108-5023
Single	600% @ 0.5mA	18V	HCPL-4731-300E	108-5029
Dual	300% @ 1.6mA	7V	HCPL-2730-300E	108-5026
Dual	500% @ 0.5mA	18V	HCPL-2731-300E	108-5027
Dual	600% @ 0.5mA	18V	HCPL-4701-300E	108-5028
Single	300% @ 1.6mA	7V	4N46-000E	999-4815
Single	300% @ 1.6mA	7V	6N138-000E	999-4823
Single	400% @ 0.5mA	18V	6N139-000E	999-4831
Single	300% @ 1.6mA	7V	HCPL-2730-000E	999-4840
Dual	400% @ 0.5mA	18V	HCPL-2731-000E	999-4858
Dual	600% @ 0.5mA	18V	HCPL-4701-000E	999-5137
Dual	600% @ 0.5mA	18V	HCPL-4731-000E	999-5145

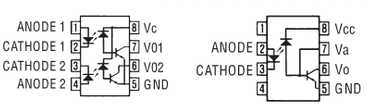
206206

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
HCNW139-300E	SMD **108-5024**	5.63	3.94	3.58	3.19	– –
4N46-300E	SMD **108-5021**	4.69	3.29	2.99	2.64	– –
6N138-300E	SMD **108-5022**	2.83	1.99	1.82	1.59	– –
6N139-300E	SMD **108-5023**	2.83	1.99	1.82	1.59	– –
HCPL-2730-300E	SMD **108-5026**	7.32	5.14	4.65	4.13	– –
HCPL-2731-300E	SMD **108-5027**	7.71	5.40	4.92	4.36	– –
HCPL-4731-300E	SMD **108-5029**	11.65	8.14	7.42	6.58	– –
HCPL-4701-300E	SMD **108-5028**	5.18	3.65	3.29	2.93	– –
4N46-000E	**999-4815**	4.50	3.44	2.79	2.19	– –
6N138-000E	**999-4823**	3.27	2.61	2.05	1.42	– –
6N139-000E	**999-4831**	3.27	2.61	2.05	1.42	– –
HCPL-2730-000E	**999-4840**	6.45	5.07	4.04	3.37	– –
HCPL-2731-000E	**999-4858**	6.77	5.32	4.24	3.53	– –
HCPL-4701-000E	**999-5137**	4.97	3.81	3.08	2.42	– –
HCPL-4731-000E	**999-5145**	10.18	8.01	6.37	5.31	– –

Transistor Output

Single and Dual, High Speed 1MBd Data-Rate

AVAGO TECHNOLOGIES



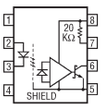
Single*

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

C = CYAN M = Magenta Y = Yellow B = Black/SING

All types are **UL** recognised.

The HCNW135 is for use in TTL/CMOS, TTL/LSTTL or wide bandwidth analogue applications. The HCNW136 and SFH6136 are designed for high speed TTL/TTL applications.



HCNW4506/ HCPL4506

6N Series
HCPL Series
Standard width body, 0.3" row spacing

Dual
HCNW135/6, HCPL4506 and HCNW4502/3/6
Wide body, 0.4" row spacing

Note:
*HCNW4502/3, HCPL4502/3, and HCPL4504 are similar to 6N136, but have pin 7 unconnected, giving improved ESD protection.

Typical data rate (NRZ) 1Mbit/s
Output voltage V_O 15V max
Supply voltage V_{CC} 15V max

Common mode transient immunity:
HCPL-4503-000E/6HCPL-4503-000E/6 15000V/µs
HCPL-4534-000Eand 30000V/µs@ V_{CM} =1500V
Other types 10001000V/µs

Channels	Isolation Test Voltage ac rms	Curr. Trsfr. Ratio @ I_F = 16mA min.	Switching Time (µ) typ. t_{PHL}	t_{PLH}	Mftrs. List No.	Order Code
Single	5000	19%	0.2	0.35	HCNW-136-000E**	999-4742
Single	2500	19%	0.2	0.5	HCPL-4504-300E**	108-4998
Single	5000	44%*	0.4	0.55	HCNW4506-300E**	108-4993
Single	3750	44%*	0.4	0.55	HCPL-4506-300E**	108-5002
Single	2500	7%	0.2	1.3	6N135-000E	999-4750
Single	2500	7%	0.2	1.3	6N135-300E	108-4985
Single	2500	19%	0.2	0.6	6N136-000E	999-4769
Single	2500	19%	0.2	0.6	6N136-300E	108-4986
Single	2500	15%	0.2	0.6	HCNW136-000E	108-4988
Single	2500	15%	0.2	0.6	HCNW136-300E	108-4989
Single	2500	19%	0.2	0.6	HCPL-4502-000E	999-4777
Single	2500	15%	0.2	0.6	HCNW4502-300E	108-4990
Single	2500	19%	0.2	0.8	HCPL-4502-300E	108-4996
Single	2500	15%	0.2	0.6	HCPL-4503-000E	999-4785
Single	2500	15%	0.2	0.6	HCNW4503-000E	108-4991
Single	2500	25%	0.2	0.6	HCNW4503-300E	108-4992
Single	5000	19%	0.2	0.6	HCNW-4503-000E**	999-5218
Single	2500	19%	0.2	0.8	HCPL-4503-300E**	108-4997
Dual	2500	15%	0.2	0.6	HCPL-4534-000E	912-9979
Dual	2500	7%	0.2	1.3	HCPL-2530-000E	999-4793
Dual	2500	7%	0.2	1.3	HCPL-2530-300E	108-4994
Dual	2500	19%	0.2	0.6	HCPL-2531-300E	108-4995
Dual	2500	19%	0.2	0.6	HCPL-2531-000E	999-4807

* I_F = 10mA, **= Wide body packages, **VDE 0884, BS415** approved

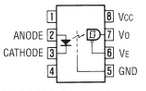
206202

Mftrs. List No.	Order Code	1+	10+	Price Each 100+	500+	+
HCNW-136-000E	999-4742●	4.64	3.55	2.88	2.26	– –
HCPL-4504-300E	SMD 108-4998●	5.01	3.48	3.19	2.83	– –
HCNW4506-300E	SMD 108-4993●	7.16	5.01	4.56	4.04	– –
HCPL-4506-300E	SMD 108-5002●	5.01	3.48	3.19	2.83	– –
6N135-000E	999-4750●	3.27	2.61	2.05	1.42	– –
6N135-300E	SMD 108-4985●	2.73	1.92	1.73	1.53	– –
6N136-000E	999-4769●	3.27	2.61	2.05	1.42	– –
6N136-300E	SMD 108-4986●	2.73	1.92	1.73	1.53	– –
HCNW136-000E	108-4988●	4.95	3.45	3.12	2.80	– –
HCNW136-300E	SMD 108-4989●	5.05	3.55	3.22	2.86	– –
HCPL-4502-000E	999-4777●	3.41	2.72	2.14	1.48	– –
HCNW4502-300E	SMD 108-4990●	5.05	3.55	3.22	2.86	– –
HCPL-4502-300E	SMD 108-4996●	2.80	1.95	1.76	1.56	– –
HCPL-4503-000E	999-4785●	3.79	2.90	2.35	1.85	– –
HCNW4503-000E	108-4991●	6.31	4.43	4.04	3.58	– –
HCNW4503-300E	SMD 108-4992●	6.44	4.52	4.10	3.65	– –
HCNW-4503-000E	999-5218●	4.86	3.81	3.09	2.43	– –
HCPL-4503-300E	SMD 108-4997●	3.81	2.67	2.41	2.15	– –
HCPL-4534-000E	912-9979●	6.99	5.49	4.37	3.64	– –
HCPL-2530-000E	999-4793●	5.86	4.49	3.63	2.86	– –
HCPL-2530-300E	SMD 108-4994●	5.76	4.04	3.68	3.26	– –
HCPL-2531-300E	SMD 108-4995●	6.02	4.20	3.84	3.39	– –
HCPL-2531-000E	999-4807●	6.16	4.71	3.82	3.00	– –

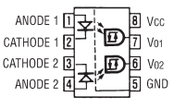
Schmitt Trigger Output – Low Current, High Speed 5MBd Data-Rate

AVAGO TECHNOLOGIES

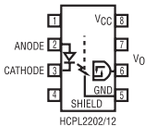
UL recognised



HCP2200/01/11/19
HCNW2201/11 (Wide)
(Body versions)



HCPL2231
HCPL2232



HCPL2202/12

Supply voltage 4.5–20V

Note: HCPL2201/11 and HCNW2201/11 have pin 6 unconnected (no voltage enable). The HCNW201/11 are housed in wide body packages approved to **VDE 0884** and **BS415**.

Low input current, logic gates with Schmitt trigger output. Compatible with CMOS, LSTTL and TTL logic.

Channels	CMR (Vµs) (min.)	Output (ns) t_r	t_f	$i_{F(ON)}$	Mftrs. List No.	Order Code
Single	1000	55	15	1.6	HCPL-2200-300E	108-5035
Single	1000	30	7	10	HCPL-2201-300E	108-5036
Single	1000	30	7	10	HCPL-2202-300E	108-5038
Single	1000	30	7	10	HCNW2201-000E	108-5031
Single	10000	30	7	10	HCNW2201-300E	108-5032
Single	2500	55	15	1.6	HCPL-2219-300E	108-5040
Single	10000*	30	7	10	HCPL-2212-300E	108-5039
Single	1000*	30	7	10	HCNW2211-000E	108-5033
Single	10000*	30	7	10	HCNW2211-300E	108-5034
Dual	5000*	30	7	1.8	HCPL-2232	232-932

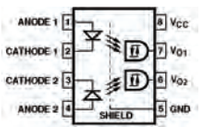
* Minimum CMR of 10kV/µs with V^{CM} = 1000V can be achieved with input current, I^F of 5mA

206228

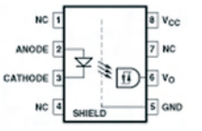
Mftrs. List No.	Order Code	1+	10+	Price Each 100+	500+	+
Single Channel						
HCPL-2200-000E	999-4920●	6.24	4.90	3.90	3.25	– –
HCPL-2200-300E	SMD 108-5035●	6.77	4.75	4.30	3.81	– –
HCPL-2201-000E	999-4939●	6.24	4.90	3.90	3.25	– –
HCPL-2201-300E	SMD 108-5036●	6.77	4.75	4.30	3.81	– –
HCPL-2202-000E	999-5234●	6.13	4.82	3.84	3.20	– –
HCPL-2202-300E	SMD 108-5038●	6.64	4.65	4.23	3.74	– –
HCNW-2201-000E	999-5242●	7.08	5.57	4.43	3.69	– –
HCNW2201-000E	108-5031●	8.43	5.89	5.37	4.75	– –
HCNW2201-300E	SMD 108-5032●	8.53	5.99	5.44	4.82	– –
HCPL-2219-000E	999-5250●	7.84	6.16	4.91	4.09	– –
HCPL-2219-300E	SMD 108-5040●	8.59	6.02	5.47	4.85	– –
HCPL-2211-000E	999-4947●	6.88	5.41	4.30	3.59	– –
HCPL-2212	942-030▲	5.37	4.22	3.36	2.80	– –
HCPL-2212-300E	SMD 108-5039●	7.29	5.08	4.62	4.10	– –
HCNW-2211-000E	999-5269●	7.64	6.01	4.78	3.98	– –
HCNW2211-000E	108-5033●	9.05	6.35	5.76	5.11	– –
HCNW2211-300E	SMD 108-5034●	9.11	6.38	5.79	5.14	– –
Dual Channel						
HCPL-2231-000E	999-4955●	16.36	12.87	10.25	8.54	– –
HCPL-2232	232-932▲	16.06	12.63	10.05	8.38	– –

Optocoupler - Schmitt Trigger Output High Speed 5MBd

AVAGO TECHNOLOGIES



HCPL-2212



HCPL-2232

High CMR optically coupled gates with Schmitt trigger output.
Compatible with CMOS, LSTTL and TTL logic.
CSA & **VDE** Approved, **BSI** Certified and **UL** Recognised

NEW

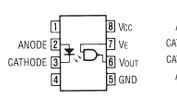
Channels	CMR (Vµs) (min.)	Isolation Test Voltage V rms	Output (ns) t_r	t_f	$i_{F(ON)}$	Supply Voltage	Order Code
Single	5000	2500	30	7	1.6	4.5 to 20V	912-9987
Double	5000	2500	30	7	1.8	4.5 to 20V	912-9812

403179

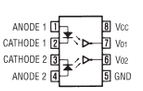
Mftrs. List No.	Order Code	1+	10+	Price Each 100+	500+	+
Single Channel						
HCPL-2212-000E	912-9987●	6.02	4.74	3.77	3.14	– –
Dual Channel						
HCPL-2232-000E	912-9812●	14.74	11.59	9.23	7.69	– –

Logic Gate Output– Single and Dual, High Speed 40MBd and 40MBd Data-Rate

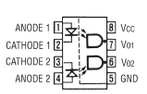
AVAGO TECHNOLOGIES



6N137/HCPL2601/2611
HCNW137/2601/2611

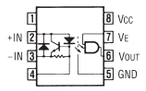


HCPL2630/
2631/4661

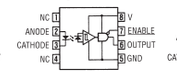


HCPL2430

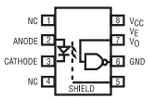
All **UL** recognised,
HCPL7601/11, HCNW137/2601/2611 are **VDE 0884** approved
HCNW137/2601/2611 are wide body versions



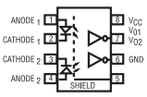
HCPL2602/2612



HCPL2400/2411



HCPL261A/261N



HCPL263A/263N

Withstand test voltage=2500Vrms (HCPL7601/11=3750V rms)
(HCNW137/2601/2611=5000V rms)

Channels	CMR (Vµs) (min.)	@ (VCM)	Input On-Current (mA)	Output Enable	Prop. Delay (ns) typ. t_{PHL} (ON)	t_{PLH}	Mftrs. List No.
10MBd Data-Rate (Typical), LSTTL/TTL Compatible							
Single	N/A	N/A	5	Yes	50	48	6N137-000E
Single	N/A	N/A	5	Yes	50	48	6N137-300E
Single	N/A	N/A	5	Yes	50	48	HCNW137-300E
Single	5000	50	5	Yes	50	48	HCPL-2601-000E
Single	5000	50	5	Yes	50	48	HCNW2601-300E
Single	5000	50	5	Yes	50	48	HCPL-2601-300E
Single	10000	1000	5	Yes	50	48	HCPL-2611-000E
Single	10000	1000	5	Yes	50	48	HCNW2611-000E
Single	5	1000	5	Yes	50	48	HCPL-2611-300E

● Compliant
▲ Non-compliant
† Limited stock - RoHS replacement available

RoHS

C = CYAN M = Magenta Y = Yellow B = Black/SING

Channels	CMR (Vμs) (min.)	@ (VCM)	Input On-Current (mA)	Output Enable	Prop. Delay (ns) typ. t_{PHL} (ON)	t_{PLH}	Mftrs. List No.
10MBd Data-Rate (Typical), LSTTL/TTL Compatible							
Single	10000	1000	5	Yes	50	48	HCNW-2611-000E
Dual	N/A	N/A	5	Yes	50	48	HCPL-2630-000E
Dual	N/A	N/A	5	Yes	50	48	HCPL-2630-300E
Dual	5000	50	5	Yes	50	48	HCPL-2631-000E
Dual	10000	1000	5	No	50	48	HCPL-4661-000E
10MBd Data-Rate (Typical), HCMOS/LSTTL/TTL Compatible							
Single	1000	50	3	Yes	53	52	HCPL-261A-000E
Single	1000	50	3	Yes	12	42	HCPL-261A-300E
Single	1000*	1000	3	Yes	53	52	HCPL-261N-000E
Dual	1000	50	3	No	53	52	HCPL-263A-000E
Dual	1000	50	3	No	12	42	HCPL-263A-300E
Dual	1000*	1000	3	No	53	52	HCPL-263N-000E
10MBd Data-Rate (Typical), CMOS/TTL Compatible- Low current input							
Single	1000	50	2	No	57	55	HCPL-7601-000E
Single	1000	50	3	No	12	42	HCPL-263A-300E
Single	10000	1000	2	No	57	55	HCPL-7611-000E
Single	15	1000	2	No	57	55	HCPL-7611-300E
10MBd Data-Rate (Typical), High CMR Line Receiver							
Single	1000	50	5	Yes	50	48	HCPL-2602-000E
Single	1000	50	5	Yes	50	48	HCPL-2602-300E
Single	3500	300	5	Yes	50	48	HCPL-2612-000E
Single	3500	300	5	Yes	50	48	HCPL-2612-300E
40MBd Data-Rate (Typical), HCMOS/LSTTL/TTL Compatible							
Single	1000	50	4	3 State	33	30	HCPL-2400-000E
Single	1000	300	4	Output	33	30	HCPL-2411-000E
Dual	10	50	5		10	20	HCPL-2430-300E

* 15kV/μs with Vcm = 1kV can be acheived using HP application circuit

206203

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
10MBd, LSTTL/TTL						
Single						
6N137-000E	999-4866	3.62	2.89	2.27	1.58	– –
6N137-300E	SMD 108-5003	3.09	2.18	1.99	1.76	– –
HCNW137-300E	SMD 108-5004	5.05	3.55	3.22	2.86	– –
HCPL-2601-000E	999-4882	4.20	3.22	2.61	2.05	– –
HCNW2601-300E	SMD 108-5005	5.24	3.68	3.35	2.96	– –
HCPL-2601-300E	SMD 108-5008	4.17	2.93	2.67	2.34	– –
HCPL-2611-000E	999-5153	5.06	3.98	3.17	2.64	– –
HCNW2611-000E	108-5006	6.09	4.26	3.87	3.42	– –
HCPL-2611-300E	SMD 108-5010	5.18	3.65	3.29	2.93	– –
HCNW-2611-000E	999-5293	5.31	4.18	3.33	2.77	– –
Dual						
HCPL-2630-000E	999-4904	6.13	4.82	3.84	3.20	– –
HCPL-2630-300E	SMD 108-5014	6.77	4.75	4.30	3.81	– –
HCPL-2631-000E	999-4912	6.77	5.32	4.24	3.53	– –
HCPL-4661-000E	999-5307	9.81	7.71	6.14	5.12	– –
10MBd, HCMOS/LSTTL/TTL						
HCPL-261A-000E	999-5315	4.62	3.53	2.86	2.25	– –
HCPL-261A-300E	SMD 108-5012	4.88	3.42	3.09	2.73	– –
HCPL-261N-000E	999-5323	4.58	3.61	2.87	2.39	– –
Dual						
HCPL-263A-000E	999-5331	9.86	7.76	6.17	5.14	– –
HCPL-263A-300E	SMD 108-5015	11.33	7.94	7.19	6.38	– –
HCPL-263N-000E	999-5340	10.18	8.01	6.37	5.31	– –
10MBd, High CNMR Line Receiver						
Single						
HCPL-7601-000E	999-5358	6.18	4.86	3.87	3.23	– –
HCPL-7601-300E	SMD 108-5016	6.44	4.52	4.10	3.65	– –
HCPL-7611-000E	999-5366	6.61	5.20	4.14	3.45	– –
HCPL-7611-300E	SMD 108-5017	7.03	4.92	4.46	3.97	– –
10MBd, HCMOS/LSTTL - Low Current Input						
Single						
HCPL-2602-000E	999-4890	12.74	10.02	7.98	6.65	– –
HCPL-2602-300E	SMD 108-5009	13.48	9.44	8.56	7.62	– –
HCPL-2612-000E	999-5374	13.70	10.77	8.58	7.15	– –
HCPL-2612-300E	SMD 108-5011	15.56	10.90	9.90	8.79	– –
40MBd, HCMOS/LSTTL/STTL/TTL						
Single						
HCPL-2400-000E	999-4874	9.49	7.46	5.94	4.95	– –
HCPL-2411-000E	999-5420	10.61	8.34	6.64	5.53	– –
Dual						
HCPL-2430-300E	SMD 108-5007	22.39	15.69	14.26	12.63	– –

Optocoupler - High Speed

High CMR

AVAGO TECHNOLOGIES

SMD - H = 3.65, W = 9.8, D = 6.35mm

DIL - H = 3.56, W = 9.65, D = 6.35mm

UL Recognised 3750 V_{RMS} for 1 minute, **CSA** and **IEC/EN/DIN EN 60747-5-2** Approved

Guaranteed Temperature Range	Input Current (mA)	Common Mode Rejection (KV/μs)	Voltage Supply (Vdc)	Number of Channels	Speed	Package	Mftrs. List No.
TTL Compatible							
-40 to 85°C	5mA	5	4.5 to 5.5	1	10MegaBaud	DIL	HCNW137-000E
-40 to 85°C	5mA	5	4.5 to 5.5	1	10MegaBaud	DIL	HCNW2601-000E
-40 to 85°C	5mA	5	4.5 to 5.5	1	10MegaBaud	DIL	HCPL-0601-500E
-40 to 85°C	5mA	5	4.5 to 5.5	2	10MegaBaud	SMD	HCPL-2631-300E
-40 to 85°C	5mA	10	4.5 to 5.5	2	10MegaBaud	DIL	HCPL-4661-020E
-40 to 85°C	5mA	10	4.5 to 5.5	2	10MegaBaud	SMD	HCPL-4661-300E
0 to 70°C	25mA	15	15 to 30	1	1MegaBaud	DIL	HCPL-4504-000E
0 to 70°C	25mA	15	15 to 30	2	1MegaBaud	SMD	HCPL-4534-300E
0 to 70°C	50mA	15	15 to 30	1	1MegaBaud	DIL	HCNW4502-000E
0 to 70°C	15mA	15	15 to 30	1	1MegaBaud	DIL	HCPL-2502-000E
0 to 70°C	15mA	1	15 to 30	1	1MegaBaud	DIL	HCPL-2502-300E
0 to 70°C	50mA	10	15 to 30	1	1MegaBaud	DIL	HCPL-0453-500E
-40 to 100°C	10mA	10	4.5 to 5.5	1	15MegaBaud	SMD	HCPL-0708-000E
-40 to 100°C	10mA	10	4.5 to 5.5	2	15MegaBaud	SMD	HCPL-0738-000E
Low Power Consumption - <1 mW, High CTR - 3500%							
0 to 70°C, ac & dc	40μA	10	1.6 to 18	1	100KiloBaud	DIL	HCPL-070A-000E
Low Input Current							
-40 to 85°C	0.5mA	400	4.75 to 5.25	2	8MegaBaud	DIL	HCPL-2300-560E
High CMR Logic Gate							
-40 to 85°C	1.8mA	10	4.5 to 20	1	5MegaBaud	SMD	HCPL-2211-300E
-40 to 85°C	1.8mA	10	4.5 to 20	2	5MegaBaud	SMD	HCPL-2231-300E
-40 to 85°C	1.8mA	1	4.5 to 20	2	5MegaBaud	SMD	HCPL-2232-300E
-40 to 70°C	4mA	10	4.75 to 5.25	1	40MegaBaud	SMD	HCPL-2400-300E

382834

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
HCNW137-000E	854-9745	3.78	3.45	2.90	2.83	– –
HCNW2601-000E	854-9753	3.97	3.61	3.06	2.96	– –
HCPL-0601-500E	SMD 854-9788	3.78	3.45	2.90	2.83	– –
HCPL-2631-300E	SMD 854-9907	5.86	5.34	4.49	4.36	– –
HCPL-4661-020E	854-9982	8.37	7.65	6.44	6.25	– –
HCPL-4661-300E	SMD 854-9990	8.37	7.65	6.44	6.25	– –
HCPL-4504-000E	854-9966	3.87	3.55	2.96	2.90	– –
HCPL-4534-300E	SMD 854-9974	6.51	5.92	5.01	4.88	– –
HCNW4502-000E	854-9761	3.84	3.52	2.93	2.86	– –
HCPL-2502-000E	854-9893	3.32	3.03	2.57	2.47	– –
HCPL-2502-300E	SMD 108-5063	3.22	2.25	2.05	1.82	– –
HCPL-0453-500E	SMD 854-9770	3.55	3.22	2.73	2.64	– –
HCPL-0708-000E	SMD 854-9818	7.81	7.13	6.02	5.83	– –
HCPL-0738-000E	SMD 854-9834	17.02	15.53	13.09	12.69	– –
HCPL-070A-000E	SMD 854-9826	4.23	3.87	3.26	3.16	– –
HCPL-2300-560E	854-9877	8.37	7.65	6.44	6.25	– –
HCPL-2211-300E	SMD 854-9842	5.96	5.44	4.59	4.43	– –
HCPL-2231-300E	SMD 854-9850	13.87	12.63	10.68	10.35	– –
HCPL-2232-300E	SMD 854-9869	14.94	13.61	11.49	11.13	– –
HCPL-2400-300E	SMD 854-9885	8.14	7.45	6.28	6.09	– –

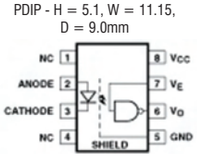
Optocoupler - Transistor Output

High Speed

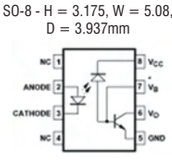
AVAGO TECHNOLOGIES

PDIP - H = 5.1, W = 11.15, D = 9.0mm

SO-8 - H = 3.175, W = 5.08, D = 3.937mm



8549796 & 8549800



8549761 & 8549770

UL Recognised, **CSA** and **IEC/EN/DIN EN 60747-5-2** Approved

Guaranteed Temperature Range	Current Transfer Ratio - min (%)	Common Mode Rejection (KV/μs)	Speed	Package Style	Mftrs. List No.
Single Channel - TTL Compatible					
0 to 70°C	19%	15	1Mbps	PDIP	HCNW4502-000E
0 to 70°C	19%	10	1Mbps	SO-8	HCPL-0453-500E
Single Channel - LSTTL/TTL Compatible					
-40 to 85°C (ac & dc)		10	10MegaBaud	SO-8	HCPL-0611-500E
Single Channel - HCMOS/LSTTL/TTL Compatible					
-40 to 85°C (ac & dc)		15	10MegaBaud	SO-8	HCPL-061N-000E

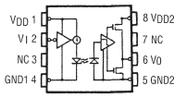
382762

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
HCNW4502-000E	854-9761	3.84	3.52	2.93	2.86	– –
HCPL-0453-500E	SMD 854-9770	3.55	3.22	2.73	2.64	– –
HCPL-0611-500E	SMD 854-9796	4.56	4.17	3.52	3.42	– –
HCPL-061N-000E	SMD 854-9800	4.30	3.91	3.29	3.19	– –

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

High Speed CMOS

AVAGO TECHNOLOGIES



The HCPL-77xx optocouplers utilise the latest CMOS IC technology to achieve outstanding performance with very low power consumption. They require only two bypass capacitors for complete CMOS capability. A CMOS logic input signal controls the LED driver IC which supplies current to the IC.

UL1577 and **VDE0884** approved.

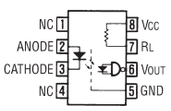
Data Rate (NRZ) Mbd max.	Common Mode Transient Immunity	Withstand Test Voltage Vac/1 min	Minimum Pulse Width	Mftrs. List No.
25	10kV/µs	2500	80ns	HCPL-7710
25	10kV/µs	2500	40ns	HCPL-7720
25	10kV/µs	2500	40ns	HCPL-7721
25	20kV/µs	2500	80ns	HCPL-7710-300E
25	10kV/µs	1181	40ns	HCPL-7720-300E
25	10kV/µs	1181	40ns	HCPL-7721-300E

206267

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
HCPL-7710	**143-170**▲	8.36	6.57	5.23	4.36	– –
HCPL-7720	**143-236**▲	9.68	7.61	6.06	5.05	– –
HCPL-7721	**143-248**▲	11.00	8.65	6.89	5.74	– –
HCPL-7710-300E SMD	**108-5041**●	10.64	7.45	6.77	5.99	– –
HCPL-7720-300E SMD	**108-5042**●	12.34	8.63	7.84	6.97	– –
HCPL-7721-300E SMD	**108-5043**●	14.03	9.83	8.95	7.94	– –

Logic Gate Output– Low Current High Speed

AVAGO TECHNOLOGIES



HCPL2300

Low input current high speed optocoupler. Compatible with CMOS, LSTTL and TTL logic. Schottky clamped open collector output.

UL recognised

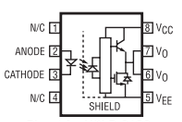
Threshold current	0.5mA	Current transfer ratio	16000% min.
Typ data rate	5Mbit/s	Withstand test voltage	3000V dc

206205

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
HCPL-2300-000E	**912-9855**●	9.03	7.10	5.65	4.71	– –
HCPL-2300-300E SMD	**108-5020**●	11.13	7.78	7.10	6.28	– –

IGBT Gate Drive

AVAGO TECHNOLOGIES



Pinout for HCLP-3120

- 1.0V maximum low level output voltage eliminates the need for negative gate drive
- Undervoltage lock-out protection (UVLO) with hysteresis
- Wide operating V_{cc} range: 15 to 30 volts
- Industrial temperature range: -40°C to 100°C
- **UL** recognised

Peak Output Current (min.)	CMR (V/µs) (min.)	V_{CM}	Supply Current (max.)	Prop. Delay (µs) t_{PLH}	t_{PHL}	Package	Mftrs. List No.	Order Code
A2	15000	1500	5	0.1	0.1	DIP8	HCPL-3120-000E	999-5439
A2	15000	1500	5	0.5	0.5	DIP8	HCNW-3120-000E	999-5056
A0.5	15000	1500	5	0.1	0.1	DIP8	HCPL-3150-000E	999-5447
A2	15000	1500	5	0.5	0.5	DIP8	HCPL-J312-000E	999-5048
A0.4	10000	1000	3	0.7	0.7	DIP8	HCPL-0314-000E	999-5064
A0.4	15000	1500	3	0.7	0.7	DIP8	HCPL-J314-000E	999-5080
A0.4	10000	1000	3	0.7	0.7	DIP8	HCPL-3140-000E	999-5072
A0.5	10	1000	12	0.2	0.3	SMD-DIP-8 (Gull wing)	HCPL-3140-300E	108-5047

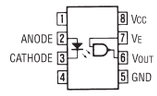
206485

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
HCPL-3120-000E	**999-5439**●	6.10	4.67	3.78	2.97	– –
HCNW-3120-000E	**999-5056**●	6.99	5.57	– –	– –	– –
HCPL-3150-000E	**999-5447**●	5.49	4.32	3.44	2.86	– –
HCPL-J312-000E	**999-5048**●	6.34	4.99	3.97	3.31	– –
HCPL-0314-000E SMD	**999-5064**●	4.32	3.31	2.68	2.11	– –
HCPL-J314-000E	**999-5080**●	4.62	3.53	2.86	2.25	– –
HCPL-3140-000E	**999-5072**●	4.20	3.22	2.61	2.05	– –
HCPL-3140-300E SMD	**108-5047**●	4.36	3.06	2.77	2.47	– –

Optocoupler - Logic Gate Output

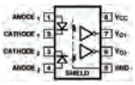
10MBd and 40MBd Data-Rate

AVAGO TECHNOLOGIES

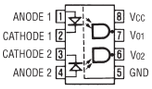


HCNW-2611

HCPL-261N



HCPL-263N



HCPL-2430

NEW

CSA and **IEC/EN/DIN EN 60747-5-2** Approved, **UL** Recognised

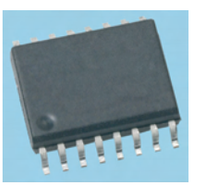
Channels	CMR (Vµs) (min.)	@ (VCM)	Input On-Current (mA)	Output Enable	Prop. Delay (ns) typ. t_{PHL} (ON)	t_{PLH}	Mftrs. List No.
10MBd Data-Rate (Typical), LSTTL/TTL Compatible							
Single	10000	1000	5	Yes	50	48	HCNW2611-300E
10MBd Data-Rate (Typical), HCMOS/LSTTL/TTL Compatible							
Single	1000*	1000	3	Yes	53	52	HCPL-261N-300E
Dual	1000*	1000	3	No	53	52	HCPL-263N-300E
40MBd Data-Rate (Typical), HCMOS/LSTTL/TTL Compatible							
Dual	1000	50	4		33	30	HCPL-2430-000E

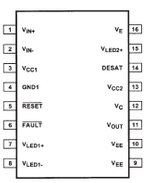
403184

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
10MBd, LSTTL/TTL						
Single						
HCNW2611-300E SMD	**913-0020**●	5.04	3.96	3.15	2.63	– –
10MBd, HCMOS/LSTTL/TTL						
HCPL-261N-300E SMD	**913-0039**●	4.27	3.36	2.67	2.23	– –
Dual						
HCPL-263N-300E SMD	**913-0047**●	9.47	7.45	5.93	4.94	– –
40MBd, HCMOS/LSTTL/STTL/TTL						
Dual						
HCPL-2430-000E	**912-9847**●	18.10	14.24	11.23	9.44	– –

2.0Amp Gate Drive Optocoupler with Integrated (V_{CE}) Desaturation and Fault Status Feedback

AVAGO TECHNOLOGIES





HCPL-316J

The HCPL-316J is a highly integrated power control device that incorporates all the necessary components for a complete, isolated IGBT gate drive circuit with fault protection and feedback into one SO-16 package. TTL input logic levels allows direct interface with a microcontroller, and an optically isolated power output stage drives IGBTs with power ratings of up to 150A and 1200V.

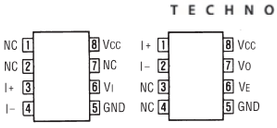
- Drive IGBTs up to I_C=150A, V_{CE}=1200V
- Optically isolated, FAULT status feedback
- CMOS/TTL compatible
- 500ns maximum switching speeds
- 'Soft' IGBT turn-off
- Integrated fail-safe IGBT protection
- User configurable: Inverting, Non-inverting, Auto-shutdown
- Wide operating V_{CC} range; 15 to 30 volts
- -40°C to +100°C operating temperature range
- 15kV/µs minimum common mode rejection (CMR) @ V_{CM}=1500V

206653

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
HCPL-316J-000E	**999-4726**●	15.72	12.37	9.84	8.20	– –

20mA Current Loop

AVAGO TECHNOLOGIES



HCPL4100 HCPL4200

UL recognised.

HCPL4100: Optically coupled 20mA current loop transmitter. Optocoupler to operate as transmitter in 20mA current loop system. Internal shielding.

Supply voltage	4.5 to 20V	Data rate @ 400m line length	20K Baud
Common mode transient immunity	10KV/µs typ.	Output V_0	27V max.
		Withstand test voltage	3KV dc

● Compliant
◄ Non-compliant
++ Limited stock - RoHS replacement available

RoHS

C = CYAN M = Magenta Y = Yellow B = Black/SING

HCPL4200: Optically coupled 20mA current loop receiver. Optocoupler to operate as receiver in 20mA current loop system. Internal shielding.

Supply voltage	4.5 to 20V	Data rate @ 1400m line length	20K Baud
Common mode transient immunity	10KV/µs typ.	Input hysteresis current	0.8mA typ
		Withstand test voltage	3KV dc

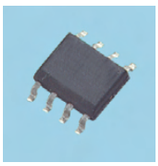
206207

	Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
Transmitter	HCPL-4100-000E	912-9820●	12.35	9.71	7.73	6.44	– –
Transmitter	HCPL-4100-300E	SMD 108-5030●	15.23	10.68	9.70	8.59	– –
Receiver	HCPL-4200-000E	912-9839●	12.42	9.77	7.78	6.48	– –
Receiver	HCPL-4200-300E	SMD 854-9958●	11.39	10.38	8.79	8.50	– –

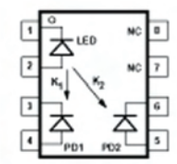
Optocoupler - Analog

High Linearity and 20mA Current Loop

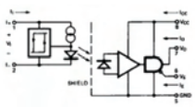
DIL - H = 5.1, W = 11.3, D = 9.0mm



SMD - H = 4, W = 11.5, D = 9mm



Analog Couplers



Current Loop Receiver

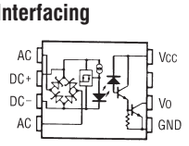
UL Recognised and **CSA** Approved

Operating Temperature Range	Transfer Gain - min (%)	Common Mode Rejection (KV/µs)	Bandwidth	Package Style	Mftrs. List No.
Single Channel - THT Analog Optocoupler					
-55 to 100°C	15%		1.5MHz	DIL	HCNR200-000E
-55 to 100°C	5%		1.5MHz	DIL	HCNR201-000E
Single Channel - Surface Mount Optocoupler					
-55 to 100°C	15%		1.5MHz	SMD	HCNR200-300E
-55 to 100°C	5%		1.5MHz	SMD	HCNR201-300E
Single Channel - 20mA Current Loop Receiver					
-40 to 85°C		1000V/µs	20KiloBaud @ 1400 meters line length	SMD	HCPL-4200-300E

382781

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
HCNR200-000E	854-9702●	5.83	5.31	4.46	4.33	– –
HCNR200-300E	SMD 854-9710●	5.92	5.40	4.52	4.39	– –
HCNR201-000E	854-9729●	7.71	7.03	5.92	5.76	– –
HCNR201-300E	SMD 854-9737●	7.78	7.06	5.96	5.79	– –
HCPL-4200-300E	SMD 854-9958●	11.39	10.38	8.79	8.50	– –

AC/DC to Logic Interfacing



UL recognised

Optocouplers for voltage and current threshold detection, 5 – 240V ac/dc voltage sensing. **HCPL3760** is an upgraded version of HCPL3700, having low input current.

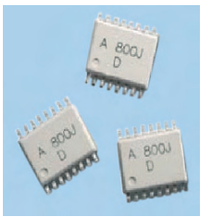
Input threshold current (typ.):		Output Current (max.)	30mA
HCPL3700	2.5mA (on), 1.3mA (off)	Withstand test voltage	3000V dc
HCPL3760	1.2mA (on), 0.6mA (off)	Typ. data rate	4KHz

206204

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
HCPL-3700-000E	912-9863●	7.52	5.92	4.71	3.92	– –
HCPL-3760-000E	912-9871●	10.38	8.16	6.50	5.41	– –
HCPL-3700-300E	SMD 108-5018●	9.05	6.35	5.76	5.11	– –
HCPL-3760-300E	SMD 108-5019●	12.79	8.95	8.14	7.23	– –

Powerline Data Access Arrangement IC

Optically coupled



The HCPL-800J is a galvanically isolated Powerline Data Access Arrangement IC.
It provides the key features of isolation, Tx line driver and Tx amplifier as required in a powerline modem application.
Used together with a simple LC coupling circuit, the HCPL-800J offers a higly integrated, cost effective Analogue Front End (AFE) solution. Optical coupling technology provides very high isolation mode rejection, facilitating excellent EMI and EMC performance.

Application robustness is enhanced by the inherent properties of opto-isolation devices, to effectively block the transfer of damaging surge transients. Excellent transmitter performance is achieved with the use of a high efficiency, low distortion line driver stage. Transmitter robustness is further enhanced with integrated load detection and over-temperature protection functions.
The HCPL-800J is designed to work with various transceiver ICs and significantly simplify the implementation of a powerline modem.

- -60 dB overall Tx distortion
- 25 nV/SqHz typical input referred noise.
- Load detection function
- Under-Voltage detection
- Over-Temperature shutdown
- Highly efficient Tx line driver
- Built-in Rx Amplifier
- Operating temperature -40°C to +85°C

Applications

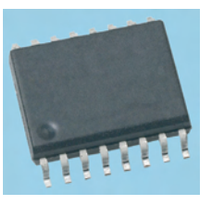
- Automatic Meter Reading (AMR)
- Powerline Modem
- Home Automation / Control
- Security and Surveillance
- General Purpose Isolated Transceiver
- Internet Appliances

346977

Mftrs. List No.	Order Code	Price Each 1+	10+	50+
HCPL-800J	SMD 330-5478▲‡	9.90	8.46	7.26
HCPL-800J-000E	SMD 999-4963●	9.90	8.46	7.26

Optically Isolated Amplifier

Short Circuit and Overload Protected



H = 3.5, W = 10.312, D = 7.493mm

NEW

This isolation amplifier is designed for current sensing in electronic motor drives. In a typical implementation, motor currents flow through an external resistor and the resulting analogue voltage drop is sensed by the device. A larger analogue output voltage is created on the other side of the HCPL-788J's optical barrier. The output voltage is proportional to the motor drive current and can be connected directly to a single supply A to D converter. Since the common mode voltage swings several hundred volts in tens of nanoseconds in modern electronic motor drives, the device was designed to ignore very high common mode transient slew rates.

- Output voltage directly compatible with A/D converters
- Fast short circuit detection (3 µs)
- Transient fault protection
- 1µs / °C offset change against temperature
- 25 kV / µs isolation transient immunity
- Operating temperature -40°C to +85°C
- **CSA**, **IEC/EN/DIN EN 60747-5-2** Approved, **UL** Recognised

414766

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
HCPL-788J	SMD 312-9378▲‡	14.05	12.66	11.18	9.32	– –
HCPL-788J-000E	SMD 999-4734●	14.05	12.66	11.18	9.32	– –

Surface Mount, SOIC-8

High Speed

Surface mount optocouplers in SOIC-8 package, compatible with standard surface mount processes. The electrical parameters are identical to the standard product. UL recognised.

Overall dimensions: H=5.8, W=5.08, D=3.2

Type **Single Channel**	Standard DIP Equivalent	Mftrs. List No.
Darlington output, low input current, high CTR	6N138	HCPL-0700-000E
Darlington output, low input current, high CTR	6N139	HCPL-0701-000E
Transistor	6N135	HCPL-0500-000E
Transistor	6N136	HCPL-0501-000E
Transistor, high CMR	HCPL-4504	HCPL-0454-000E
Transistor, high CMR	HCPL-4503	HCPL-0453-000E
Logic Gate, high CMR, logic gate	6N137	HCPL-0600-000E
Logic Gate, high CMR, logic gate	HCPL-2601	HCPL-0601-000E
Logic Gate, high CMR, logic gate	HCPL-2611	HCPL-0611-000E
Logic Gate CMOS	HCPL - 7710	HCPL-0710-000E
Logic Gate CMOS	HCPL - 7220	HCPL-0720-000E
Logic Gate CMOS	HCPL - 7220	HCPL-063A-000E
High speed CMOS	HCPL - 7721	HCPL-0721-000E
Logic Gate, high CMR, HCMOS compatible, logic gate	HCPL-261A	HCPL-061A-000E
Very High CMR,IPM and gate drive interface	HCPL-4506	HCPL-0466-000E

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Type **Single Channel**	Standard DIP Equivalent	Mftrs. List No.
Logic Gate, logic gate	HCPL-2201	HCPL-0201-000E
Very High CMR, logic gate	HCPL-2211	HCPL-0211-000E
Type		
Dual Channel		
Darlington output, low input current, high CTR	HCPL-4731	HCPL-073A-000E
Transistor	HCPL-2530	HCPL-0530-000E
Transistor	HCPL-2531	HCPL-0531-000E
Transistor	HCPL-4534	HCPL-0534-000E
Logic Gate, high CMR, logic gate	HCPL-2630	HCPL-0630-000E
Logic Gate, high CMR, logic gate	HCPL-2631	HCPL-0631-000E
High speed, high CMR, logic gate	HCPL-4661	HCPL-0661-000E
Logic Gate, high CMR, HCMOS compatible, logic gate	HCPL-263A	HCPL-063A-000E
High speed, high CMR, HCMOS compatible, logic gate	HCPL-263N	HCPL-063N-000E
Transistor, high CMR, HCMOS compatible, logic gate	HCPL-263N	HCPL-0501-000E
Low input current, high Darlington	HCPL-2730	HCPL-0730-000E
Low input current, high Darlington	HCPL-2731	HCPL-0731-000E

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Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
HCPL-0700-000E	SMD 999-5196●	3.73	2.86	2.31	1.82	– –
HCPL-0701-000E	SMD 999-5200●	3.97	3.04	2.46	1.93	– –
HCPL-0500-000E	SMD 999-5226●	3.38	2.58	2.09	1.64	– –
HCPL-0454-000E	SMD 999-5285●	6.10	4.67	3.78	2.97	– –
HCPL-0453-000E	SMD 999-4670●	4.20	3.35	2.72	2.13	– –
HCPL-0600-000E	SMD 999-4696●	4.44	3.40	2.75	2.16	– –
HCPL0601	SMD 999-5102●	4.68	3.58	2.90	2.28	– –
HCPL-0611-000E	SMD 999-5382●	5.22	4.11	3.27	2.73	– –
HCPL-0710-000E	SMD 934-6880●	15.01	13.15	11.95	10.74	– –
HCPL-0720-000E	SMD 934-6899●	17.22	15.14	13.70	12.34	– –
HCPL-063A-000E	SMD 999-5412●	10.66	8.38	6.67	5.56	– –
HCPL-0721-000E	SMD 912-9804●	10.31	8.11	6.46	5.38	– –
HCPL-061A-000E	SMD 999-5390●	4.71	3.73	2.97	2.48	– –
HCPL-0466-000E	SMD 913-0012●	5.38	4.23	3.37	2.81	– –
HCPL-0201-000E	SMD 999-5404●	6.50	5.11	4.07	3.39	– –
HCPL-0211-000E	SMD 912-9995●	6.04	4.75	3.78	3.15	– –
Dual Channel						
HCPL-073A-000E	SMD 913-0004●	9.37	7.37	5.87	4.89	– –
HCPL-0530-000E	SMD 999-5161●	8.10	6.37	5.07	4.23	– –
HCPL-0531-000E	SMD 999-5170●	8.48	6.67	5.31	4.42	– –
HCPL-0534-000E	SMD 999-5188●	11.35	8.93	7.11	5.92	– –
HCPL-0630-000E	SMD 999-5099●	8.53	6.88	5.47	4.56	– –
HCPL-0631-000E	SMD 999-5110●	10.29	8.09	6.44	5.37	– –
HCPL-0661-000E	SMD 913-0055●	7.54	5.93	4.72	3.93	– –
HCPL-063A-000E	SMD 999-5412●	10.66	8.38	6.67	5.56	– –
HCPL-0501-000E	SMD 999-4688●	3.97	3.04	2.46	1.93	– –
HCPL-0730-000E	SMD 999-5277●	8.48	6.67	5.31	4.42	– –
HCPL-0731-000E	SMD 999-5129●	9.43	7.42	5.91	4.92	– –

Agilent Technologies 3.3 Volt Optocouplers

3.3 Volt Digital Optocouplers

Single and Dual Channels, DIP and SO8 Packages

AVAGO TECHNOLOGIES

- The worlds first 3.3 volt optocouplers
- Excellent performance in isolation, CMR drive current and propogation delay
- Data rates of 100KBd to 15MBd
- JEDEC specification for 3.3V LVTTL/LVCMOS logic
- CMR up to 25kv/µs
- Safety approvals **VDE, CSA (pending)** and **UL** Recognised

5 Volt Equivalents	3.3 Volt Versions	Description	Channels	Package	Order Code
Single Channel - DIP Versions					
6N135 6N136	HCPL-250L	1MBd TTL isolator - High input drive.	Single	DIP	365-5519
6N137 HCPL-2601	HCPL-260L	15MBd logic gate isolator - High speed, high CMR.	Single	DIP	365-5520
6N138 6N139	HCPL-270L	High gain 0.5mA isolator - Low Input I_f	Single	DIP	365-5532
6N135 6N136	HCPL-250L-000E	1MBd TTL isolator - High input drive.	Single	DIP	912-9880
6N137 HCPL-2601	HCPL-260L-000E	15MBd logic gate isolator - High speed, high CMR.	Single	DIP	999-4971
6N138 6N139	HCPL-270L-000E	High gain 0.5mA isolator - Low Input I_f	Single	DIP	999-4980
Single Channel - SO8 Versions					
HCPL-0500 HCPL-0501	HCPL-050L	1MBd TTL isolator - High input drive.	Single	SO8	365-5544
HCPL-0600 HCPL-0601	HCPL-060L	15MBd logic gate isolator - High speed, high CMR.	Single	SO8	365-5556
HCPL-0700 HCPL-0701	HCPL-070L	High gain 0.5mA isolator - Low Input I_f	Single	SO8	365-5568
HCPL-0500 HCPL-0501	HCPL-050L-000E	1MBd TTL isolator - High input drive.	Single	SO8	999-4998
HCPL-0600 HCPL-0601	HCPL-060L-000E	15MBd logic gate isolator - High speed, high CMR.	Single	SO8	912-9898
HCPL-0700 HCPL-0701	HCPL-070L-000E	High gain 0.5mA isolator - Low Input I_f	Single	SO8	999-5005
Daul Channel - DIP Versions					
HCPL-2530 HCPL-2531	HCPL-253L	1MBd TTL isolator - High input drive.	Dual	DIP	365-5570
HCPL-2630 HCPL-2631	HCPL-263L	15MBd logic gate isolator - High speed, high CMR.	Dual	DIP	365-5581
HCPL-2730 HCPL-2731	HCPL-273L	High gain 0.5mA isolator - Low Input I_f	Dual	DIP	365-5593
HCPL-2530 HCPL-2531	HCPL-253L-000E	1MBd TTL isolator - High input drive.	Dual	DIP	999-5013
HCPL-2630 HCPL-2631	HCPL-263L-000E	15MBd logic gate isolator - High speed, high CMR.	Dual	DIP	999-5021
HCPL-2730 HCPL-2731	HCPL-273L-000E	High gain 0.5mA isolator - Low Input I_f	Dual	DIP	999-5030
Dual Channel - SO8 Versions					
HCPL-0530 HCPL-0531	HCPL-053L	1MBd TTL isolator - High input drive.	Dual	SO8	365-5600
HCPL-0630 HCPL-0631	HCPL-063L	15MBd logic gate isolator - High speed, high CMR.	Dual	SO8	365-5611
HCPL-0730 HCPL-0731	HCPL-073L	High gain 0.5mA isolator - Low Input I_f	Dual	SO8	365-5623
HCPL-0530 HCPL-0531	HCPL-053L-000E	1MBd TTL isolator - High input drive.	Dual	SO8	912-9901
HCPL-0630 HCPL-0631	HCPL-063L-000E	15MBd logic gate isolator - High speed, high CMR.	Dual	SO8	912-9910
HCPL-0730 HCPL-0731	HCPL-073L-000E	High gain 0.5mA isolator - Low Input I_f	Dual	SO8	912-9928

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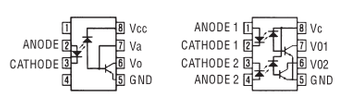
Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
Single Channel - DIP Version						
HCPL-250L	365-5519▲	2.45	2.04	1.63	1.22	– –
HCPL-260L	365-5520▲‡	3.66	2.92	2.41	2.05	– –
HCPL-260L-300E	SMD 108-5052●	4.17	2.93	2.67	2.34	– –
HCPL-270L	365-5532▲‡	2.55	2.13	1.70	1.28	– –
HCPL-250L-000E	912-9880●	3.36	2.68	2.10	1.46	– –
HCPL-260L-000E	999-4971●	4.32	3.31	2.68	2.11	– –
HCPL-270L-000E	999-4980●	3.62	2.89	2.27	1.58	– –
Single Channel - SO8 Version						
HCPL-050L	SMD SMD 365-5544▲‡	3.03	2.32	1.88	1.48	– –
HCPL-060L	SMD SMD 365-5556▲	3.93	3.29	2.67	2.09	– –
HCPL-070L	SMD SMD 365-5568▲‡	3.18	2.54	2.06	1.62	– –
HCPL-050L-000E	SMD 999-4998●	4.20	3.22	2.61	2.05	– –
HCPL-060L-000E	SMD 912-9898●	4.78	3.66	2.96	2.33	– –
HCPL-070L-000E	SMD 999-5005●	4.20	3.22	2.61	2.05	– –
Dual Channel - DIP Version						
HCPL-253L	365-5570▲‡	4.40	3.46	2.75	2.30	– –
HCPL-263L	365-5581▲‡	7.04	5.54	4.41	3.67	– –
HCPL-263L-300E	SMD 108-5053●	7.84	5.50	4.98	4.43	– –
HCPL-273L	365-5593▲‡	5.06	3.98	3.17	2.64	– –
HCPL-253L-000E	999-5013●	6.29	4.95	3.94	3.28	– –
HCPL-263L-000E	999-5021●	7.41	5.83	4.64	3.87	– –
HCPL-273L-000E	999-5030●	7.14	5.62	4.47	3.73	– –
Dual Channel - SO8 Version						
HCPL-053L	SMD SMD 365-5600▲	6.69	5.26	4.19	3.49	– –
HCPL-063L	SMD 365-5611▲	8.76	7.20	5.84	5.26	– –
HCPL-073L	SMD SMD 365-5623▲	7.04	5.54	4.41	3.67	– –
HCPL-053L-000E	SMD 912-9901●	7.97	6.27	4.99	4.16	– –
HCPL-063L-000E	SMD 912-9910●	9.99	7.86	6.25	5.21	– –
HCPL-073L-000E	SMD 912-9928●	8.95	7.04	5.61	4.67	– –

Optocouplers

Transistor Output

High Speed, 1Mb/s Data Rate

FAIRCHILD SEMICONDUCTOR™



All parts are **UL** recognised

Isolation Voltage (pk()	Current Transfer Ratio Ratio @ (min.) @ I_F = 1.6mA	I_{cc} (max.)	Switching Time (µ) typ. t_{PHL}	t_{PLH}	Mftrs. List No.
Single Channel - Transistor Output					
2500	7%	200	0.45	0.5	6N135..
2500	19%	200	0.45	0.3	6N136..
2500	12%	200	0.45	0.3	HCPL-2503...
2500	19%	200	0.45	0.3	HCPL-4502...
2500	7	200	0.45	0.5	6N135
2500	19	200	0.45	0.3	6N136
2500	12	200	0.45	0.3	HCPL-2503
2500	19	200	0.45	0.3	HCPL-4502
Dual Channel - Transistor Output					
2500	7%	400	0.45	0.5	HCPL-2530..
2500	19%	400	0.45	0.3	HCPL-2531..
2500	7%	400	0.45	0.5	HCPL-2530
2500	19%	400	0.45	0.3	HCPL-2531

● Compliant
▲ Non-compliant
‡ Limited stock - RoHS replacement available

RoHS

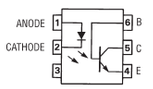
Farnell Page 944 Date: 21-08-06 time: 18:08

229119

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	250+	+
Single Channel - Transistor Output						
6N135..	**364-1740‡**	1.55	1.23	0.99	0.67	– –
6N136..	**359-8202‡**	1.55	1.23	0.99	0.67	– –
HCPL-2503...	**359-8949‡**	2.72	2.16	1.70	– –	– –
6N135	**102-1342●**	1.55	1.27	1.02	0.69	– –
6N136	**102-1195●**	1.55	1.27	1.02	0.69	– –
HCPL-2503	**102-1244●**	2.72	2.16	1.70	– –	– –
Dual Channel - Transistor Output						
HCPL-2530..	**359-8962‡**	3.64	2.78	2.05	1.77	– –
HCPL-2531..	**359-8986‡**	3.85	2.94	2.17	1.87	– –
HCPL-4502...	**364-1752‡**	2.47	2.31	2.02	– –	– –
HCPL-2530	**102-1246●**	3.64	2.87	2.11	1.82	– –
HCPL-2531	**102-1247●**	3.85	3.03	2.23	1.93	– –
HCPL-4502	**102-1343●**	2.47	2.31	2.02	– –	– –

Transistor Output

FAIRCHILD SEMICONDUCTOR™



Transistor

ac Input

All parts are **UL** recognised. Items ending in either 'V-M' or '.300' are also **VDE** approved.

Isolation Voltage (pk)	Curr. Trsfr. Ratio @ I_F = 10ma min	Breakdown Voltage (min) $V_{(BR)}$ CEO	Switching Time (µs) typ. t_r	t_f	
Transistor Output					
2500	20%	30	3	3	4N25..
7500	20%	30	2.8	4.5	4N25-M...
5300	20%	30	2.5	2.6	4N25.3S
1500	20%	30	3	3	4N26..
7500	20%	30	2.8	4.5	4N26-M...
5300	20%	30	2.5	2.6	4N26.300...
5300	10%	30	2.5	2.6	4N27..
5300	20%	30	2.5	2.6	4N27.300...
500	10%	30	3	3	4N28..
5300	10%	30	2.5	2.6	4N28.300...
5300	100%	30	5	5	4N35..
7500	100%	30	7.5	5.7	4N35-M...
5300	100%	30	5	5	4N35.300...
5300	100%	30	5	5	4N35V-M...
2500	100%	30	5	5	4N36..
7500	100%	30	7.5	5.7	4N36-M...
1500	100%	30	5	5	4N37..
7500	100%	30	7.5	5.7	4N37-M...
5300	100%	30	5	5	4N37.300...
5300	100%	30	5	5	4N37V-M...
4400	40 - 160%	30	3	3	CNX35...
5300	40%	70	2	11	CNY17-1..
7500	40%	70	1.6	2.3	CNY17-1-M...
5000	40%	70	2	2	CNY17-1.300...
7500	63%	70	1.6	2.3	CNY17-2-M...
5000	63%	70	2	2	CNY17-2.300...
5300	100%	70	3	14	CNY17-3..
7500	100%	70	1.6	2.3	CNY17-3-M...
5000	100%	70	2	2	CNY17-3.300...
5300	100%	70	3	14	CNY17-3V-M...
5000	160%	30	2	2	CNY17-4.300...
7500	50%	30	2.8	4.5	H11A1-M...
7500	50%	30	2	2	H11A1.300...
3500	20%	30	5	5	MCT2..
2500	150%	30	5	5	MCT210..
7500	100%	30	6	5.5	MCT2201.300...
2500	20%	30	3	3	4N25
7500	20%	30	2.8	4.5	4N25-M
1500	20%	30	3	3	4N26
7500	20%	30	2.8	4.5	4N26-M
5300	20%	30	2.5	2.6	4N26.300
5300	10%	30	2.5	2.6	4N27
5300	20%	30	2.5	2.6	4N27.300
500	10%	30	3	3	4N28
5300	10%	30	2.5	2.6	4N28.300
5300	100%	30	5	5	4N35
7500	100%	30	7.5	5.7	4N35-M
5300	100%	30	5	5	4N35.300
5300	100%	30	5	5	4N35V-M
2500	100%	30	5	5	4N36
7500	100%	30	7.5	5.7	4N36-M
1500	100%	30	5	5	4N37
7500	100%	30	7.5	5.7	4N37-M
5300	100%	30	5	5	4N37.300
5300	100%	30	5	5	4N37V-M
4400	40%	30	3	3	CNX35U
5300	40%	70	2	11	CNY17-1
7500	40%	70	1.6	2.3	CNY17-1-M
5000	40%	70	2	2	CNY17-1.300
7500	63%	70	1.6	2.3	CNY17-2-M
5000	63%	70	2	2	CNY17-2.300
5300	100%	70	3	14	CNY17-3
7500	100%	70	1.6	2.3	CNY17-3-M
5000	100%	70	2	2	CNY17-3.300
5300	100%	70	3	14	CNY17-3V-M
5000	160%	30	2	2	CNY17-4.300
7500	50%	30	2.8	4.5	H11A1-M
7500	50%	30	2	2	H11A1.300
3500	20%	30	5	5	MCT2
2500	150%	30	5	5	MCT210
7500	100%	30	6	5.5	MCT2201.300

Isolation Voltage (pk)	Curr. Trsfr. Ratio @ I_F = 10ma min	Breakdown Voltage (min) $V_{(BR)}$ CEO	Switching Time (µs) typ. t_r	t_f	
High Voltage Transistor Output					
5300	20%	300	5	5	H11D1..
5300	20%	300	5	5	H11D1.300...
5300	20%	80	5	5	4N38..
5300	20%	80	5	5	4N38.300...
5300	20%	300	5	5	H11D1
5300	20%	300	5	5	H11D1.300
5300	20%	80	5	5	4N38
5300	20%	80	5	5	4N38.300
AC Input, Transistor Output					
2500	20%	30	2	2	H11AA1..
2500	20%	30	2	2	H11AA1
CMOS Compatable Input,Transistor Output (CTR @ I_F = 1mA)					
5656	300%	30	5	5	H11AG1..
5656	300%	30	5	5	H11AG1
10mm Lead Bend Versions					
5300	20%	30	2.5	2.6	4N26T-M...
5300	40%	70	2	11	CNY17-1TV-M...
5300	63%	70	3	14	CNY17-2.300W...
5300	63%	70	3	14	CNY17-2TV-M...
5300	100%	70	3	14	CNY17-3.300W...
5300	100%	70	3	14	CNY17-3TV-M...
5300	20%	30	2.5	2.6	4N26T-M
5300	40%	70	2	11	CNY17-1TV-M
5300	63%	70	3	14	CNY17-2.300W
5300	63%	70	3	14	CNY17-2TV-M
5300	100%	70	3	14	CNY17-3.300W
5300	100%	70	3	14	CNY17-3TV-M

228767

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	250+	+
Transistor Output						
4N25..	SMD **326-021‡**	0.95	0.76	0.57	0.40	– –
4N25-M...	SMD **885-381‡**	0.68	0.63	0.53	0.50	– –
4N25.3S	SMD **359-7453**	0.81	0.63	0.47	0.32	– –
4N26..	SMD **326-033‡**	1.09	0.84	0.63	0.40	– –
4N26-M...	SMD **885-393‡**	0.65	0.54	0.49	– –	– –
4N26.300...	**359-7507‡**	0.81	0.76	0.57	0.40	– –
4N27..	SMD **359-7568‡**	1.04	0.83	0.62	0.44	– –
4N27.300...	SMD **364-1685‡**	0.95	0.76	0.57	0.40	– –
4N28..	SMD **326-045‡**	1.09	0.84	0.63	0.40	– –
4N28.300...	SMD **359-7623‡**	0.81	0.76	0.57	0.40	– –
4N35..	SMD **326-057‡**	1.09	0.84	0.63	0.40	– –
4N35-M...	SMD **885-423‡**	0.95	0.76	0.57	0.40	– –
4N35.300...	SMD **359-7878‡**	0.81	0.76	0.57	0.40	– –
4N35V-M...	SMD **359-7945‡**	0.88	0.76	0.63	– –	– –
4N36..	**326-069‡**	1.09	0.84	0.63	0.40	– –
4N36-M...	SMD **885-435‡**	0.68	0.56	0.51	0.37	– –
4N37..	**326-070‡**	1.09	0.76	0.57	0.40	– –
4N37-M...	**885-447‡**	0.95	0.76	0.57	0.40	– –
4N37.300...	SMD **359-8019‡**	0.81	0.76	0.57	0.40	– –
4N37V-M...	SMD **359-8070‡**	0.81	0.76	0.57	0.40	– –
CNX35...	**326-460‡**	1.04	0.88	0.81	– –	– –
CNY17-1..	SMD **359-8251‡**	0.93	0.76	0.57	0.38	– –
CNY17-1-M...	**885-460‡**	0.90	0.65	0.49	– –	– –
CNY17-1.300...	SMD **326-094‡**	1.06	0.76	0.57	0.38	– –
CNY17-2-M...	**885-472‡**	0.95	0.68	0.51	0.34	– –
CNY17-2.300...	SMD **326-112‡**	0.92	0.69	0.52	0.38	– –
CNY17-3..	**359-8380‡**	0.93	0.76	0.57	0.38	– –
CNY17-3-M...	SMD **885-484‡**	2.65	2.27	1.92	0.63	– –
CNY17-3.300...	SMD **326-136‡**	0.92	0.69	0.52	0.38	– –
CNY17-3V-M...	SMD **359-8457‡**	0.90	0.68	0.51	0.34	– –
CNY17-4.300...	SMD **254-770‡**	1.06	0.76	0.57	0.38	– –
H11A1-M...	**885-496‡**	0.96	0.84	0.63	0.40	– –
H11A1.300...	**326-197‡**	1.02	0.84	0.63	0.40	– –
MCT2..	**425-291‡**	0.99	0.71	0.53	0.36	– –
MCT210..	**326-264‡**	1.74	1.26	0.94	0.63	– –
MCT2201.300...	**326-288‡**	1.02	0.77	0.57	0.42	– –
4N25	**102-1090●**	1.13	0.86	0.65	0.41	– –
4N25-M	**102-1349●**	0.68	0.63	0.53	0.50	– –
4N26	**102-1091●**	1.09	0.86	0.65	0.41	– –
4N26-M	**102-1350●**	0.65	0.54	0.49	– –	– –
4N26.300	**102-1154●**	0.96	0.86	0.65	0.41	– –
4N27	**102-1158●**	1.04	0.83	0.62	0.44	– –
4N27.300	**102-1340●**	1.13	0.86	0.65	0.41	– –
4N28	**102-1092●**	1.09	0.86	0.65	0.41	– –
4N28.300	**102-1161●**	0.96	0.86	0.65	0.41	– –
4N35	**102-1093●**	1.09	0.86	0.65	0.41	– –
4N35-M	**102-1351●**	1.13	0.86	0.65	0.41	– –
4N35.300	**102-1173●**	0.96	0.86	0.65	0.41	– –
4N35V-M	**102-1180●**	0.88	0.76	0.63	– –	– –
4N36	**102-1094●**	1.09	0.86	0.65	0.41	– –
4N36-M	**102-1352●**	0.68	0.56	0.51	0.37	– –
4N37	**102-1095●**	1.09	0.86	0.65	0.41	– –
4N37-M	**102-1353●**	1.13	0.86	0.65	0.41	– –
4N37.300	**102-1182●**	0.96	0.86	0.65	0.41	– –
4N37V-M	**102-1185●**	0.96	0.86	0.65	0.41	– –
CNX35U	**102-1113●**	1.04	0.88	0.81	– –	– –
CNY17-1	**102-1201●**	1.03	0.78	0.59	0.39	– –
CNY17-1-M	**102-1354●**	0.95	0.70	0.52	0.35	– –
CNY17-1.300	**102-1097●**	1.06	0.78	0.59	0.39	– –
CNY17-2-M	**102-1355●**	0.95	0.70	0.52	0.35	– –
CNY17-2.300	**102-1098●**	1.09	0.78	0.59	0.39	– –

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

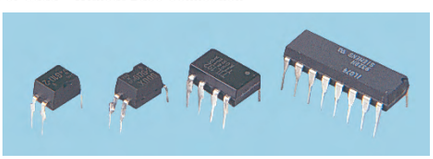
C = CYAN M = Magenta Y = Yellow B = Black/SING

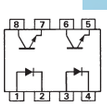
Mftrs. List No.	Order Code	Price Each 1+	10+	100+	250+	+
Transistor Output						
CNY17-3	102-1210●	1.03	0.78	0.59	0.39	– –
CNY17-3-M	102-1356●	2.65	2.27	1.92	0.63	– –
CNY17-3.300	102-1099●	1.09	0.78	0.59	0.39	– –
CNY17-3V-M	SMD 102-1218●	0.90	0.70	0.52	0.35	– –
CNY17-4.300	102-1085●	1.06	0.78	0.59	0.39	– –
H11A1-M	102-1358●	1.13	0.86	0.65	0.41	– –
H11A1.300	102-1100●	1.13	0.86	0.65	0.41	– –
MCT2	102-1346●	0.99	0.73	0.55	0.37	– –
MCT210	102-1101●	1.74	1.29	0.97	0.65	– –
MCT2201.300	102-1103●	1.21	0.87	0.65	0.44	– –
High Voltage Transistor Output						
H11D1..	326-306‡	1.65	1.24	0.93	0.69	– –
H11D1.300...	SMD 359-8720‡	1.45	1.16	0.93	0.63	– –
4N38..	SMD 359-8081‡	1.54	1.22	0.91	0.67	– –
4N38.300...	359-8093‡	1.54	1.22	0.91	0.67	– –
H11D1	102-1104●	2.00	1.43	1.07	0.72	– –
H11D1.300	102-1224●	1.45	1.19	0.96	0.65	– –
4N38	102-1188●	1.83	1.38	1.04	0.69	– –
4N38.300	102-1189●	1.83	1.38	1.04	0.69	– –
AC Input, Transistor Output						
H11AA1..	461-003‡	1.27	0.91	0.68	0.46	– –
H11AA1	102-1347●	1.27	0.94	0.70	0.47	– –
CMOS Compatable Input, Transistor Output						
H11AG1..	326-343‡	1.94	1.39	1.04	0.69	– –
H11AG1	102-1105●	1.94	1.40	1.05	0.71	– –
10mm Lead Bend Versions						
4N26T-M...	359-7556‡	0.87	0.79	0.59	– –	– –
CNY17-1TV-M...	359-8317‡	0.90	0.68	0.51	0.34	– –
CNY17-2.300W...	359-8330‡	0.91	0.73	0.57	0.38	– –
CNY17-2TV-M...	359-8378‡	0.90	0.68	0.51	0.34	– –
CNY17-3.300W...	359-8391‡	0.91	0.73	0.57	0.38	– –
CNY17-3TV-M...	359-8445‡	0.90	0.68	0.51	0.34	– –
4N26T-M	102-1157●	0.87	0.79	0.59	– –	– –
CNY17-1TV-M	102-1204●	0.90	0.70	0.52	0.35	– –
CNY17-2.300W	102-1206●	1.03	0.78	0.59	0.39	– –
CNY17-2TV-M	102-1209●	0.90	0.70	0.52	0.35	– –
CNY17-3.300W	102-1211●	1.03	0.78	0.59	0.39	– –
CNY17-3TV-M	102-1216●	0.90	0.70	0.52	0.35	– –

Transistor Output

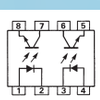
VISHAY TOSHIBA

Single, Dual or Quad - Without Base Connection

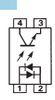




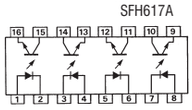
SFH615A-2/
SFH618A-4
SFH617A



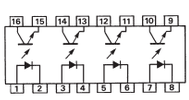
ILD74/CNY74-2H



SFH620A-2
SFH628A-3



ILQ74/CNY74-4H



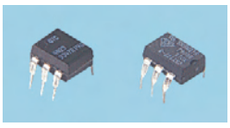
TLP521-4(A,F)

Channels	Isolation Voltage (pk.)	Curr. Trsfr. Ratio (min) @ I_F	Breakdown $V_{(BR)}$ CEO min	Mftr.	Mftrs. List No.
Transistor Output					
Single	5300 rms	63% @ 5mA	70V	VISHAY	SFH610A-2
Dual	2500 rms	20% @ 5mA	55V	TOSHIBA	TLP521-2(A.F)
Quad	5000 rms	50% @ 5mA	55V	TOSHIBA	TLP620-4(F)
Quad	2500 rms	20% @ 5mA	55V	TOSHIBA	TLP521-4(A.F)
Quad	5000 rms	100% @ 5mA	55V	TOSHIBA	TLP621-4(F)
Single	2500 rms	50% @ 5mA	55V	TOSHIBA	TLP521-1(A,F,T)
Single	5000 rms	50% @ 5mA	55V	TOSHIBA	TLP621(F,T)
Single	5300 rms	63% @ 5mA	70V	VISHAY	SFH615A-2
Single	5300 rms	63% @ 5mA	70V	VISHAY	SFH617A-2X006
Single	5300 rms	160% @ 5mA	55V	VISHAY	SFH618A-4
Dual	5000 rms	50% @ 5mA	70V	VISHAY	CNY74-2H
Dual	5300 rms	12.5% @ 5mA	20V	VISHAY	ILD74
Quad	5000 rms	50% @ 5mA	70V	VISHAY	CNY74-4H
Quad	5300 rms	12.5% @ 5mA	20V	VISHAY	ILQ74
AC Input,Transistor Output					
Single	5300	63% @ 10mA	70V	VISHAY	SFH620A-2
Single	5300	100% @ 1mA	55V	VISHAY	SFH628A-3

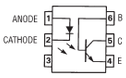
206200

Mftrs. List No.	Mftr.	Order Code	Price Each 1+	25+	100+	250+
Transistor Output						
SFH610A-2	VISHAY	104-5381●	1.13	1.01	0.84	0.68
TLP521-2(A.F)	TOSHIBA	114-1124●	3.31	1.63	1.49	1.16
TLP620-4(F)	TOSHIBA	114-1125●	5.63	4.69	4.25	3.97
TLP521-4(A.F)	TOSHIBA	114-1126●	3.73	3.12	2.58	– –
TLP621-4(F)	TOSHIBA	114-1127●	6.49	5.92	4.85	2.96
TLP521-1(A,F,T)	TOSHIBA	114-1130●	0.76	0.63	0.60	0.54
TLP621(F,T)	TOSHIBA	114-1133●	0.98	0.79	0.69	0.61
SFH615A-2	VISHAY	104-5382●	0.97	0.86	0.72	0.58
SFH617A-2X006	VISHAY	104-5383●	1.09	0.97	0.81	0.65
SFH618A-4	VISHAY	104-5394●	1.31	1.16	0.97	0.78
CNY74-2H	VISHAY	104-5431●	1.45	1.29	1.08	0.87
ILD74	VISHAY	104-5423●	2.32	2.06	1.73	1.39
CNY74-4H	VISHAY	104-5432●	2.90	2.58	2.16	1.74
ILQ74	VISHAY	104-5424●	4.18	3.72	3.12	2.51
AC Input, Transistor Output						
SFH620A-2	VISHAY	104-5384●	1.39	1.24	1.04	0.84
SFH628A-3	VISHAY	104-5443●	1.59	1.47	1.23	0.99

Transistor Output



Standard 0.3" row spacing 0.4" row spacing



Transistor

ac Input

Note: CNY17F-3 and CNY17F-3 OPT16 have pin 6 unconnected, giving high base-noise immunity.

All CNY17 Series (QT and Infineon), CNW Series, H11A1Z and MCT2201Z are approved to **VDE0884**.

Infineon CNY17 Series and CNW Series are approved to **IEC65**, **IEC950**, **BS6301**, **BSEN60065**, **BSEN60950**, **EN41003**.

All types except 232-658 are **UL** recognised. QT types are approved to **CSA**.

■ 0.4" row spacing

Isolation Voltage (pk)	Curr. Trsfr. Ratio @ I_F =10mA (min)	Breakdown $V_{(BR)}$ CEO min	Swithcing Time (µs) typ. t_r	t_f	Mftr.	Mftrs. List No.
Transistor Output						
2500 rms	100% -	30	3	3	TOSHIBA	4N35(SHORT,F)▲
3750 rms	40% - 80%	32	7	6.7	VISHAY	CNY17-1
3750 rms	63% - 125%	32	7	6.7	VISHAY	CNY17-2
3750 rms	100% - 200%	32	7	6.7	VISHAY	CNY17-3
5300 rms	100% - 200%	70	2	2	VISHAY	CNY17F-3X001
5300 rms	100% - 200%	70	2	2	VISHAY	CNY17F-3X016
3750 rms	63% - 125%	90	2.5	2.7	VISHAY	CNY75A
3750 rms	100% - 200%	90	3	3.7	VISHAY	CNY75B
3750 rms	160% - 320%	90	4.2	4.7	VISHAY	CNY75C
3750 rms	40% - 80%	32	7	6.7	VISHAY	TCDT1101
3750 rms	40% - 80%	32	7	6.7	VISHAY	TCDT1101G▲
3750 rms	63% - 125%	32	7	6.7	VISHAY	TCDT1102
3750 rms	63% - 125%	32	7	6.7	VISHAY	TCDT1102G▲
3750 rms	100% -	70	15	15	VISHAY●	TCDT1110
3750 rms	100% -	70	15	15	VISHAY●	TCDT1110G▲
3750 rms	40% -	90	3	3.7	VISHAY	TCDT1120
3750 rms	40% -	90	3	3.7	VISHAY	TCDT1120G▲
3750 rms	63% - 125%	90	3	3.7	VISHAY	TCDT1122G▲
3750 rms	160% - 320%	90	4	4.7	VISHAY	TCDT1124
High Voltage Transistor Output						
5300 dc	63% - 125%	300	2.5	5.5	VISHAY	SFH640-2
AC Input Transistor Output						
5000 rms	50%	55	2	3	TOSHIBA	TLP630(F)
CMOS Compatible Input, Transistor Output (CTR @ I_F=1mA)						
5656 dc	*300%@ V_{CE}=5V	30	-	-	FCH	H11AG1
5656 dc	*160%@ V_{CE}=5V		-	-	VISHAY	SFH608-4

▲ The 'G' suffix denotes a row spacing of 10.16mm (spacing on others=9.0mm)
● t_{off} t_{on} time
* = I_F @ 1mA

206195

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
4N35(SHORT,F)	120-1939●	1.08	0.98	0.82	0.52	– –
CNY17-1	104-5399●	0.95	0.85	0.71	0.57	– –
CNY17-2	104-5400●	0.95	0.85	0.71	0.57	– –
CNY17-3	104-5401●	0.95	0.85	0.71	0.57	– –
CNY17F-3X001	104-5391●	1.25	1.11	0.93	0.75	– –
CNY17F-3X016	104-5392●	1.37	1.22	1.02	0.82	– –
CNY75A	104-5402●	0.75	0.67	0.56	0.45	– –
CNY75B	104-5403●	0.75	0.67	0.56	0.45	– –
CNY75C	104-5405●	0.75	0.67	0.56	0.45	– –
TCDT1101	104-5406●	0.79	0.71	0.60	0.48	– –
TCDT1101G	104-5407●	0.79	0.71	0.60	0.48	– –
TCDT1102	104-5408●	0.79	0.71	0.60	0.48	– –
TCDT1102G	104-5409●	0.79	0.71	0.60	0.48	– –
TCDT1110	104-5410●	0.80	0.71	0.60	0.48	– –
TCDT1110G	104-5411●	0.80	0.71	0.60	0.48	– –

RoHS ● Compliant ▲ Non-compliant ‡ Limited stock - RoHS replacement available

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
TCDT1120	104-5412●	0.80	0.71	0.60	0.48	– –
TCDT1120G	104-5413●	0.80	0.71	0.60	0.48	– –
TCDT1122G	104-5414●	0.80	0.71	0.60	0.48	– –
TCDT1124	104-5415●	0.80	0.71	0.60	0.48	– –
High Voltage Transistor Output						
SFH640-2	104-5396●	2.49	2.22	1.86	1.49	– –
AC Input, Transistor Output						
TLP630(F)	114-1134●	3.07	2.84	2.30	1.54	– –
CMOS Compatible Input, Transistor Output						
H11AG1	102-1105●	1.94	1.40	1.05	0.71	– –
SFH608-4	104-5393●	1.83	1.63	1.36	1.10	– –

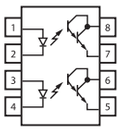
Isolation Voltage (pk)	CTR Min. (%)	Max. (%)	Breakdown $V_{(BR)}CEO$ (min)	Turn ON Time Typ. (µs)	Package Style	Mftrs. List No.
5300	100	200	100	2	6 Pin DIP	CNY17F3

423754

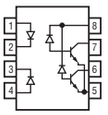
Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
No Base Connection						
CNY17F3	NEW 108-6678●	0.94	0.72	0.52	0.33	– –

Single and Dual, Transistor Output and Logic Output, High Speed

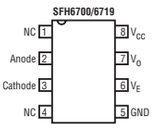
VISHAY



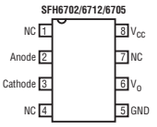
Pin out (a)



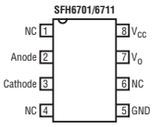
Pin out (b)



Pin out (c)



Pin out (d)



Pin out (e)

Isolation ac Test Voltage (V_{rms})	Curr. Trsfr. Ratio min (%)	@ I_F (mA)	Switching Time (µs) t_{PHL}	typ. t_{PLH}	Mftrs. List No.	Order Code
Transistor Output - High Speed						
5300	19	16	0.5	0.3	SFH6136	104-5422
2500	—	—	115	125	SFH6701	104-5389
2500	—	—	115	125	SFH6712	104-5390

Channels	Pin Out	CMR (min.) (V/us)	@ (VCM)	Input On-Current (mA)	Prop. Delay (ns) typ. t_{PHL}	t_{PLH}	Mftrs. List No.	Order Code
Logic Output - High Speed - 5Mbit/sec								
Single	e	1000	50	5	115	125	SFH6701	104-5389
Single	d	2500	400	5	115	125	SFH6712	104-5390
Single	d			25	0.5	0.3	SFH6136	104-5422

206551

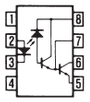
Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
Transistor Output						
SFH6136	104-5422●	3.05	2.71	2.27	1.83	– –
Logic Output						
SFH6701	104-5389●	7.11	6.34	5.28	4.27	– –
SFH6712	104-5390●	7.62	6.79	5.66	4.57	– –

Darlington Output

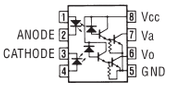
Low Input Current, High Gain

FAIRCHILD SEMICONDUCTOR

All parts are **UL** recognised



6N138
6N139



HCPL-2730
HCPL-2731

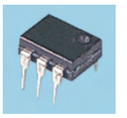
Voltage V_{OL} 0.4V
Withstand test voltage 2500V ac

Channels	Current Transfer Ratio (min.) @ I_F = 1.6mA	V_{cc} max.	Mftrs. List No.	Order Code
Dual	300%	30	6N138	102-1344
Dual	500%	30	6N139	102-1341
Dual	300%	30	HCPL-2730	102-1257
Dual	500%	30	HCPL-2731	102-1258

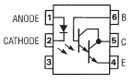
229064

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	250+	+
Single						
6N138	102-1344●	1.59	1.27	1.02	0.69	– –
6N139	102-1341●	1.59	1.27	1.02	0.69	– –
Dual						
HCPL-2730	102-1257●	3.49	2.75	2.03	1.75	– –
HCPL-2731	102-1258●	3.85	3.03	2.23	1.93	– –

Darlington Output



Darlington



High Voltage Darlington

Note: TIL188-1 is similar to TIL187-1 but has pin 6 unconnected, giving high base-noise immunity.

QT types are approved to **CSA**.

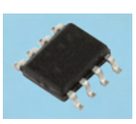
Isolation Voltage (pk) (*dc)	Curr. Trsfr. Ratio @ I_F = 10mA (min)	Breakdown $V_{(BR)}$ CEO min	Switching Time (µs) typ. t_r	t_f	Mftr.	Mftrs. List No.
Darlington Output						
5300	100%	30	5	40	FCH	4N29
5300	100%	30	5	40	FCH	4N30
5300	50%	30	5	40	FCH	4N31
2500	500%	30	5	100	FCH	4N32
2500	500%	30	5	100	QT	4N33-FCH
2500	500%	25	125	100	FCH	H11B1
4400	600%	30	5	30	FCH	CNX48
5300	500%	30	5	100	FCH	4N32.300
5300	500%	30	5	100	FCH	4N33.300
1500	500%	30	0.06	5	QT	4N33-M
High Voltage Darlington Output						
3535	1000%	100	5	100	FCH	H11G1
3535	1000%	80	5	100	FCH	H11G2
3535	1000%	55	5	100	FCH	H11G3

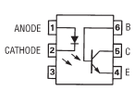
206197

Mftrs. List No.	Order Code	Price Each 5+	10+	100+	250+	+
Darlington Output						
4N29	102-1162●	1.00	0.90	0.68	0.43	– –
4N30	102-1165●	0.93	0.86	0.65	0.41	– –
4N31	102-1166●	0.96	0.86	0.65	0.41	– –
		1+	**10+**	**100+**	**250+**	
4N32	102-1106●	1.13	0.86	0.65	0.41	
		1+	**25+**	**100+**	**1K+**	
4N33-FCH	102-1107●	1.26	– –	– –	– –	
CNX48	102-1115●	2.73	2.70	1.92	1.14	
4N33-M	102-1145●	1.32	1.20	0.91	0.61	
4N32.300	102-1167●	0.96	0.86	0.65	0.41	– –
4N33.300	102-1170●	0.96	0.86	0.65	0.41	– –
		1+	**10+**	**100+**	**250+**	
H11B1	102-1108●	1.20	0.89	0.67	0.45	
High Voltage Darlington Output		**1+**	**10+**	**100+**	**250+**	**+**
H11G1	102-1109●	1.68	1.24	0.93	0.62	– –
H11G2	102-1110●	1.80	1.29	0.97	0.65	– –
H11G3	102-1111●	1.63	1.21	0.91	0.61	– –

Transistor Output

FAIRCHILD SEMICONDUCTOR





Optocouplers with high efficiency and very low degradation AlGaAs infra-red emitter coupled to high speed phototransistor. MCT5200/1 have guaranteed minimum values for $CTR_{CE(SAT)}$ and CTR_{CB} over 0°C-70°C. MCT5210/1 have high values of $CTR_{CE(SAT)}$ with low LED input current.MOCD207R2M and MCT6 are dual channel optocouplers.

Isolation Voltage (pk)	$CTR_{CE\ (typ.)}$ @ I_F	$CTR_{CE\ (SAT)}$ (min) @ I_F	Breakdown $V_{(BR)}CEO$ (min)	Mftrs. List No.
2500	150% @ 10mA	100% @ 10mA	70V	MOCD207R2M
3500	200% @ 10mA	75% @ 10mA	30V	MCT5200...
3500	300% @ 5mA	120% @ 5mA	30V	MCT5201...
3500	400% @ 3mA	60% @ 3mA	30V	MCT5210...
3500	110% @ 1mA	75% @ 1mA	30V	MCT5211..
3500	200% @ 10mA	75% @ 10mA	30V	MCT5200
3500	300% @ 5mA	120% @ 5mA	30V	MCT5201
3500	400% @ 3mA	60% @ 3mA	30V	MCT5210
3500	110% @ 1mA	75% @ 1mA	30V	MCT5211
5300	20 % min @ 60mA	—	85V	MCT6

206237

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

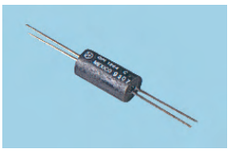
Mftrs. List No.	Order Code	Price Each 1+	10+	100+
MCT5200	102-1116●	1.87	1.38	1.04
MCT5201	102-1117●	1.49	1.22	0.98
MCT5210	102-1118●	1.49	1.22	0.98
MCT5211	102-1119●	1.58	1.30	1.04
MCT6	108-6679●	1.46	1.11	0.81
MOCD207R2M	SMD 108-6672●	1.76	1.33	1.11

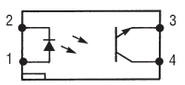
Isolation Voltage (pk)	CTR Min. (%)	CTR Max (%)	Breakdown $V_{(BR)}CEO$ (min)	Package Style	Mftrs. List No.
2500	100	200	70V	SOIC-8	MOCD207R2M
5300	20	-	85V	8 Pin DIP	MCT6

423751

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
Dual Channel						
MOCD207R2M	NEW SMD 108-6672●	1.76	1.33	1.11	0.85	– –
MCT6	108-6679●	1.46	1.11	0.81	0.53	– –

Transistor Output – 10kV Isolation





◆ OPI Series, L=14.0, Dia=6.6 Pin spacing=2.54

◆ **Note:** OPI110A and OPI110C have detector connections reversed, i.e. pin 4 is emitter.

OPI1264D is **ATEX (BAS01ATEX1278U)** approved.

Isolation Voltage (pk)	Curr. Trsfr. Ratio (min.) @ I_F	Breakdown $V_{(BR)}$	Mftr.	Mftrs. List No.
10000Vdc	25% @ 10mA	30V	OPTEK	OPI1264A
10000Vdc	100% @ 10mA	30V	OPTEK	OPI1264C
10000Vdc	100% @ 1mA	30V	Bedford	OPI1264D
10000Vdc	25% @ 10mA	30V	OPTEK	OPI110A
10000Vdc	100% @ 10mA	30V	OPTEK	OPI110C

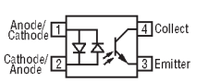
206199

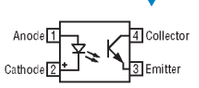
Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+
OPI1264A	326-630●	11.63	10.11	8.82	4.66
OPI1264C	232-520●	13.10	10.84	9.29	6.39
OPI1264D	121-0712●	12.95	10.94	9.67	6.22
OPI110A	232-531●	6.52	5.48	4.66	4.14
OPI110C	232-543●	6.99	5.92	5.04	4.42

Surface Mount, DIL 4

VISHAY

SFH6286-2/SFH6206-2





SFH6165-2

Surface mount lead form versions of the most popular 4 pin optocouplers. The design of the lead bend ensures that the creepage and clearance of ≥8mm is not comprised. Approved to **IEC65, IEC950, BS6401, BSEN60065, BSEN60950, EN41003. UL** recognised.

SMD

Isolation Voltage (pk) (AC RMS)	Curr. Trsfr Ratio % (min-max)	Breakdown $V_{(BR)}$ CEO min	Mftrs. List No.	Order Code
Transistor Output				
5300	63 - 125 @ I_F=10mA	70	SFH6156-2T	104-5527
AC Input, Transistor Output				
5300	100 - 320 @ I_F=1mA	55	SFH6286-2T	104-5528
5300	63 - 125 @ I_F=10mA	70	SFH6206-2T	104-5529

206450

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
Transistor Output						
SFH6156-2T	SMD 104-5527●	1.13	1.01	0.84	0.68	– –
AC Input, Transistor Output						
SFH6286-2T	SMD 104-5528●	1.92	1.71	1.43	1.15	– –
SFH6206-2T	SMD 104-5529●	1.65	1.47	1.23	0.99	– –

Bi-lateral Analogue FET Output

FAIRCHILD SEMICONDUCTOR

Optocouplers with symmetrical bi-lateral photo-detector output, designed for distortion free control of low level AC and DC analogue signals.

UL recognised.

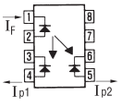
Isolation Voltage (pk)	Breakdown Voltage (max.)	On-State Resistance (max)	Turn-on/Turn-off @ I_F=16mA (max)	Off Resistance (min)	Mftrs. List No.	Order Code
2500	30	200Ω	15μs	300MΩ	H11F1	102-1120
1500	15	470Ω	15μs	300MΩ	H11F3	102-1121

206210

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	250+	+
H11F1	102-1120●	4.35	3.43	2.53	2.18	– –
H11F3	102-1121●	3.85	3.03	2.23	1.93	– –

Linear - IL300

VISHAY



$K_1 = I_{P1}/I_F$ $K_2 = I_{P2}/I_F$
$K_3 = K_2/K_1$

- Couples ac and dc signals
- 0.01% servo linearity
- Wide bandwidth, >200kHz
- High gain stability, ±0.005%/°C
- Withstand test voltage 7500V ac (pk) (1 sec)

A unique optocoupler using two separate isolated photodiodes with matched characteristics, one of which is used as a feedback element. The combination of the linear photodiodes and the feedback concept enables construction of simple but accurate linear isolating circuits. Applications include switch mode power supply feedback and isolation of process control transducers. Approved to **IEC65, IEC950, BS6301, BSEN60065, BSEN60950, EN41003**.

IL300 has transfer gain (K3) of between 0.56 (min.) and 1.65 (max.).

IL300F offers a narrower selection band for K3 of between 0.95 (min.) and 1.056 (max.).

206258

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+
IL300	104-5385●	6.17	5.50	4.58	3.70
IL300-F	104-5395●	29.75	26.52	22.10	17.85

High Speed Logic Gate Output

FAIRCHILD SEMICONDUCTOR

10Mb Data Rate

CMR (Vμs) (min.)	@ (VCM)	Input On-Current (mA)	Output Enable	Prop. Delay (ns) typ. t_{PHL}	t_{PLH}	Package	Mftrs. List No.
Single Output							
50kV/μs	1000	20	No	60	60	SO8	FOD0708
50kV/μs	50	50	Yes	75	90	DIP-8	FOD260L
kV/μs10	1000	50	Yes	20	20	SO8	HCPL0611
10000V/μs	—	5	Yes	45	45	DIL6	6N137
10000V/μs	400	5	Yes	45	45	DIL6	HCPL-2611
5000V/μs	50	5	Yes	45	45	DIL6	HCPL-2601
5000V/μs	50	50	Yes	20	20	SO8	HCPL0600
Dual Output							
50kV/μs	1000	20	Yes	60	60	SO8	FOD0738
10000V/μs	—	5	Yes	45	45	DIL6	HCPL-2630
5000V/μs	50	5	Yes	45	45	DIL6	HCPL-2631

228640

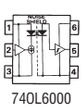
Mftrs. List No.	Order Code	Price Each 1+	10+	100+	250+	+
Single						
6N137	102-1197●	2.26	1.86	1.46	1.01	– –
FOD260L	122-8310●	3.48	2.44	2.12	1.99	– –
FOD0708	SMD 120-8102●	6.57	4.59	3.54	3.39	– –
HCPL-2601	102-1249●	2.62	2.15	1.69	1.17	– –
HCPL-2611	102-1251●	2.54	2.00	1.48	1.27	– –
HCPL0611	SMD 122-8311●	5.37	3.78	3.26	3.03	– –
HCPL0600	SMD 108-6675●	5.05	3.81	3.16	2.34	– –
Dual						
HCPL-2630	102-1252●	4.55	3.58	2.64	2.28	– –
HCPL-2631	102-1255●	4.40	3.47	2.65	2.33	– –
FOD0738	SMD 120-8103●	12.90	9.00	7.05	6.63	– –

Logic to Logic

FAIRCHILD SEMICONDUCTOR

– High Speed

UL recognised



74OL6000

74OL6001

74OL6010

74OL6011

Pins: 1=V_{CC1} (Input V_{CC}), 2=V_{IN} (Data In), 3=GND_1 (Input GND), 4=GND_0 (Output GND), 5=V_0 (Data Out), 6=V_{CC0} (Output V_{CC}).

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

C = CYAN M = Magenta Y = Yellow B = Black/SING

'Optologic'® optocouplers provide logic to logic interfacing. The range covers LSTTL to TTL and LSTTL to CMOS interfacing, each being available as a buffer or inverter. Contains input IC for 5V supply, high speed, high output amplifier and internal noise shield. Supports data communication up to 15MBd.

Input Supply V_{CC1}	5V	Common mode transient immunity	±15kV/µs
Output Supply V_{CC0}	5V (740L6000/1) 4.5 – 15V (740L6010/1)	Power dissipation	350mW
		Propagation delay t_{PHL}	60ns typ.
Withstand test voltage	2500V rms		

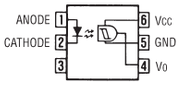
Logic Compatibility Input	Output	Logic Function	Output Configuration	Mftrs. List No.	Order Code
LSTTL	TTL	Buffer	Totem pole	740L6000	102-1122
LSTTL	TTL	Inverter	Totem pole	740L6001	102-1123
LSTTL	CMOS	Buffer	Open collector	740L6010	102-1124
LSTTL	CMOS	Inverter	Open collector	740L6011	102-1125

206236

Order Code	Price Each 1+	10+	100+	250+	+
102-1122●	6.01	4.74	3.62	3.18	– –
102-1123●	6.01	4.74	3.62	3.18	– –
102-1124●	6.01	4.74	3.62	3.18	– –
102-1125●	6.01	4.74	3.62	3.18	– –

Schmitt Trigger Output

FAIRCHILD SEMICONDUCTOR™



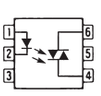
All parts are **UL** recognised, H11L1V-M, H11L2V-M, H11L3V-M, H11N1V-M, H11N2V-M, H11N3V-M are **VDE** approved.

Isolation Voltage (pk) V_{rms}	Typ. Data Rate	Turn-on Current (max)	V_{CC} (max.)	Mftrs.	Mftrs. List No.	Order Code
7500V	1Mbps	1.6mA	16V	FCH	H11L1-M	102-1359
5300V	1Mbps	1.6mA	16V	FCH	H11L1V-M	102-1228
7500V	1Mbps	1.6mA	16V	FCH	H11L1M	102-1127
5300V	1Mbps	10mA	16V	FCH	H11L2-M	102-1231
5300V	1Mbps	10mA	16V	FCH	H11L2V-M	102-1232
5300V	1Mbps	5mA	16V	FCH	H11L3-M	102-1233
5300V	1Mbps	5mA	16V	FCH	H11L3V-M	102-1235
5656V	5Mbps	3.2mA	16V	FCH	H11N1	102-1128
5300V	5Mbps	3.2mA	3.2V	FCH	H11N1-M	102-1236
5300V	5Mbps	3.2mA	16V	FCH	H11N1V-M	102-1238
5300V	5Mbps	5mA	16V	FCH	H11N2-M	102-1239
5300V	5Mbps	5mA	16V	FCH	H11N2V-M	102-1240
5300V	5Mbps	1mA	16V	FCH	H11N3-M	102-1241

206209

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	250+	+
H11L1-M	**102-1359●**	1.85	1.52	1.19	0.83	– –
H11L1V-M	**102-1228●**	1.85	1.52	1.19	0.83	– –
H11L1M	**102-1127●**	1.83	1.52	1.19	0.83	– –
H11L2-M	**102-1231●**	2.17	1.86	1.51	0.91	– –
H11L2V-M	**102-1232●**	1.68	1.38	1.08	0.75	– –
H11L3-M	**102-1233●**	1.76	1.44	1.13	0.79	– –
H11L3V-M	**102-1235●**	2.02	1.73	1.43	0.78	– –
H11N1	**102-1128●**	7.84	6.18	4.72	4.15	– –
H11N1-M	**102-1236●**	6.15	4.89	3.74	3.29	– –
H11N1V-M	**102-1238●**	7.58	6.43	5.10	2.93	– –
H11N2-M	**102-1239●**	6.06	4.64	3.54	3.11	– –
H11N2V-M	**102-1240●**	7.14	5.95	4.73	2.68	– –
H11N3-M	**102-1241●**	5.08	4.00	3.06	2.69	– –

Triac Driver



MOC30XX, TLP30XX & K30XXX are **UL** recognised.

Optocouplers with light activated silicon bi-lateral switch detectors, designed for applications requiring isolated triac triggering.

◆=Zero voltage crossing triac drivers to give reduced EMI and line noise, and improved static dv/dt.

Isolation Voltage (pk)	I_F Trigger (max.)	Blocking Voltage (min)	RMS Fwrd. Current @ 25°C (max.)	Mftr	Mftrs. List No.
3750V	15mA	250V	100mA	VISHAY	K3010P
3750V	15mA	250V	100mA	VISHAY	K3011P
3750V	15mA	250V	100mA	VISHAY	K3012P
3750V	15mA	400V	100mA	VISHAY	K3020P
3750V	15mA	400V	100mA	VISHAY	K3021P
3750V	15mA	400V	100mA	VISHAY	K3022P
3750V	15mA	400V	100mA	VISHAY	K3023P
5300V	2.0mA	600V	300mA	FAIRCHILD	IL410
6000V	10mA	400V	100mA	TOSHIBA	TLP3022(S,F)
6000V	5mA	400V	100mA	TOSHIBA	TLP3043(S,C,F)
6000V	10mA	600V	100mA	TOSHIBA	TLP3052(S,F)
6000V	10mA	600V	100mA	TOSHIBA	◆TLP3062(S,C,F)
6000V	5mA	600V	100mA	TOSHIBA	◆TLP3063(S,C,F)
7500V	10mA	250V	100mA	FAIRCHILD	MOC3011-M
7500V	5mA	250V	100mA	FAIRCHILD	MOC3012-M
7500V	15mA	400V	100mA	FAIRCHILD	MOC3021-M
7500V	10mA	400V	100mA	FAIRCHILD	MOC3022-M
7500V	5mA	400V	100mA	FAIRCHILD	MOC3023-M
7500V	10mA	400V	100mA	FAIRCHILD	◆MOC3042-M
7500V	5mA	400V	100mA	FAIRCHILD	◆MOC3043-M
7500V	15mA	600V	100mA	FAIRCHILD	◆MOC3061-M
7500V ac		600V	60mA	FAIRCHILD	MOC3063M
7500V ac		600V	60mA	FAIRCHILD	◆MOC3062M
7500V ac		400V	60mA	FAIRCHILD	◆MOC3041M
7500V ac		600V	60mA	FAIRCHILD	◆MOC3052M

206212

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
TLP3022(S,F)	**114-1135●**	1.93	1.84	1.45	1.32	– –
TLP3043(S,C,F)	**114-1136●**	1.96	1.59	1.33	1.16	– –
TLP3052(S,F)	**114-1137●**	3.31	2.79	2.11	1.92	– –
TLP3062(S,C,F)	**120-1934●**	2.05	2.02	1.51	1.35	– –
TLP3063(S,C,F)	**114-1138●**	2.19	2.05	1.73	1.35	– –
MOC3011-M	**102-1363●**	1.80	1.29	0.97	0.65	– –
MOC3012-M	**102-1364●**	1.88	1.35	1.01	0.68	– –
MOC3021-M	**102-1365●**	1.75	1.29	0.97	0.65	– –
MOC3022-M	**102-1366●**	1.88	1.35	1.01	0.68	– –
MOC3023-M	**102-1367●**	1.88	1.35	1.01	0.68	– –
MOC3042-M	**102-1368●**	1.79	1.43	1.12	0.78	– –
MOC3043-M	**102-1371●**	1.79	1.43	1.12	0.78	– –
MOC3061-M	**102-1372●**	1.92	1.57	1.24	0.86	– –
IL410	**104-5434●**	6.64	5.92	4.93	3.98	– –
K3010P	**104-5435●**	1.30	1.16	0.97	0.78	– –
K3011P	**104-5436●**	1.30	1.16	0.97	0.78	– –
K3012P	**104-5437●**	1.30	1.16	0.97	0.78	– –
K3020P	**104-5438●**	1.30	1.16	0.97	0.78	– –
K3021P	**104-5439●**	1.30	1.16	0.97	0.78	– –
K3022P	**104-5440●**	1.30	1.16	0.97	0.78	– –
K3023P	**104-5442●**	1.30	1.16	0.97	0.78	– –

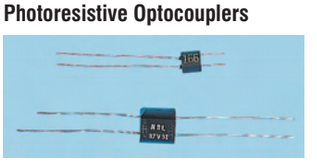
Isolation Voltage (V)	I_f Trigger (mA)	Continuous Forward Current (mA)	OFF State Terminal Voltage (V)	Package Style	Mftrs. List No.
7500	5	60	600	8 Pin DIL	MOC3063M
7500	10	60	600	6 Pin DIL	MOC3062M
7500	15	60	400	6 Pin DIL	MOC3041M
7500	10	60	600	6 Pin DIL	MOC3052M

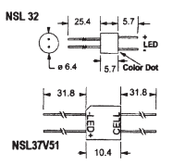
423752

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
Triac Driver						
MOC3063M	NEW **108-6673●**	1.63	1.37	1.11	0.70	– –
MOC3062M	NEW **108-6676●**	1.50	1.27	1.01	0.65	– –
MOC3041M	NEW **108-6677●**	1.56	1.27	1.04	0.65	– –
MOC3052M	NEW **108-6680●**	1.56	1.30	1.04	0.65	– –

Photoresistive Optocouplers

SILONEX





Photoresistor optocouplers are ideal for audio applications, Soft switching, potentiometer replacement, compressors, expanders, limiters, etc. The resistive output of this type of device has very low distortion characteristics.

Mftrs. List No.	LED I_f (mA)	R_{on} MAX (Ω)	R_{dark} Min (Ω)	Order Code
NSL 32.	20	500	K	316-8773
NSL 37V51	40	2000	M	316-8785
NSL-32SR3	25	60		369-2218

206638

Mftrs. List No.	Order Code	Price Each 1+	25+	100+
NSL 32.	**316-8773▲**	3.57	3.02	2.74
NSL 37V51	**316-8785**	8.02	6.81	6.03
NSL-32SR3	**369-2218▲**	5.51	4.66	4.62

Surface Mount Optocouplers - Transistor, Darlington, SCR

FAIRCHILD SEMICONDUCTOR™

Schmitt Trigger & High Speed Logic Gate Outputs

Surface mount optocouplers in 6 pin and 8 pin packages. Items ending with F-M or FR2V-M are low profile packages. They are all compatible with standard surface mount processes.

SMD

The electrical parameters are identical to the standard DIL versions.

All parts are **UL** recognised. Items ending in either 'V-M' or '300' are also **VDE** approved.

Mftrs List No. for Surface Mount Version	Order Code for Surface Mount Version	Mftrs List No. for Surface Mount Version	Order Code for Surface Mount Version
Transistor Output		**Transistor Output**	
4N25.300	102-1149	4N26.300	102-1154
4N25.S	102-1150	4N26.S	102-1155
4N25S-M	102-1152	4N26SR2-M	102-1156
4N25SR2V-M	102-1153	4N27.3S	102-1159

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

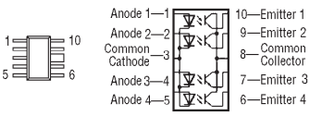
Mftrs List No. for Surface Mount Version	Order Code for Surface Mount Version	Mftrs List No. for Surface Mount Version	Order Code for Surface Mount Version
Transistor Output		**Transistor Output**	
4N27.S	102-1160	**Darlington Output**	
4N35.3S	102-1174	4N29.S	102-1164
4N35.S	102-1176	4N32.3S	102-1168
4N35F-M	102-1177	4N32.S	102-1169
4N35FR2V-M	102-1178	4N33.3S	102-1171
4N35S-M	102-1179	4N33.S	102-1172
4N36S-M	102-1181	6N139.S	102-1200
4N37.S	102-1183	HCPL-2731S	102-1259
4N37SR2V-M	102-1184	**SCR Output**	
4N38.S	102-1190	4N40.3S	102-1194
6N136.S	102-1196	H11C6.S	102-1223
CNY17-1.3S	102-1202	**Schmitt Trigger Output**	
CNY17-1.S	102-1203	H11L1S-M	102-1226
CNY17-2.3S	102-1207	H11L1SR2V-M	102-1227
CNY17-2FR2V-M	102-1208	H11L3SR2V-M	102-1234
CNY17-3.3S	102-1212	H11N1SR2V-M	102-1237
CNY17-3FR2V-M	102-1213	H11N3SR2V-M	102-1243
CNY17-3S-M	102-1214	**High Speed Logic Gate Output**	
CNY17-3SR2V-M	102-1215	6N137.S	102-1198
CNY17-4.3S	102-1219	HCPL-2601.S	102-1250
H11D1.S	102-1225	HCPL-2630.S	102-1253
HCPL-2531.S	102-1248	HCPL-2631.S	102-1256

228765

Mftrs. List No.	Order Code	Price Each 5+	25+	100+	250+	+
Transistor Output						
4N25.300	102-1149●	0.91	0.79	0.66	0.47	– –
4N25.S	102-1150●	0.85	0.69	0.58	0.38	– –
4N25S-M	102-1152●	0.88	0.76	0.63	0.40	– –
4N25SR2V-M	102-1153●	0.92	0.69	0.52	0.35	– –
4N26.300	102-1154●	0.96	0.86	0.65	0.41	– –
4N26.S	102-1155●	0.85	0.69	0.58	0.38	– –
4N26SR2-M	102-1156●	0.92	0.69	0.52	0.35	– –
4N27.3S	102-1159●	0.85	0.69	0.58	0.38	– –
4N27.S	102-1160●	0.85	0.69	0.58	0.38	– –
4N35.3S	102-1174●	0.85	0.69	0.58	0.38	– –
4N35.S	102-1176●	0.88	0.72	0.60	0.38	– –
4N35F-M	102-1177●	0.91	0.76	0.66	0.39	– –
4N35FR2V-M	SMD 102-1178●	0.94	0.82	0.66	0.39	– –
4N35S-M	102-1179●	0.96	0.86	0.65	0.41	– –
4N36S-M	102-1181●	0.96	0.86	0.65	0.41	– –
4N37.S	102-1183●	0.85	0.69	0.58	0.38	– –
4N37SR2V-M	102-1184●	0.76	0.66	0.55	0.34	– –
4N38.S	102-1190●	1.58	1.39	1.13	0.69	– –
6N136.S	102-1196●	2.46	2.11	1.73	1.19	– –
CNY17-1.3S	SMD 102-1202●	1.03	0.78	0.59	0.39	– –
CNY17-1.S	102-1203●	0.96	0.77	0.65	0.41	– –
CNY17-2.3S	102-1207●	1.03	0.78	0.59	0.39	– –
CNY17-2FR2V-M	SMD 102-1208●	0.91	0.82	0.66	0.41	– –
CNY17-3.3S	102-1212●	1.03	0.78	0.59	0.39	– –
CNY17-3FR2V-M	102-1213●	0.91	0.82	0.66	0.41	– –
CNY17-3S-M	102-1214●	1.01	0.85	0.72	0.43	– –
CNY17-3SR2V-M	102-1215●	0.90	0.70	0.52	0.35	– –
CNY17-4.3S	102-1219●	1.03	0.78	0.59	0.39	– –
H11D1.S	102-1225●	1.95	1.67	1.42	0.82	– –
HCPL-2531.S	102-1248●	6.14	5.32	4.38	2.58	– –
Darlington Output						
4N29.S	102-1164●	0.96	0.86	0.65	0.41	– –
4N32.3S	102-1168●	0.85	0.69	0.58	0.38	– –
4N32.S	102-1169●	0.85	0.69	0.58	0.38	– –
4N33.3S	102-1171●	0.96	0.86	0.65	0.41	– –
4N33.S	102-1172●	0.96	0.86	0.65	0.41	– –
6N139.S	SMD 102-1200●	1.55	1.27	1.02	0.69	– –
HCPL-2731S	102-1259●	6.14	5.32	4.38	2.68	– –
SCR Output						
4N40.3S	102-1194●	2.09	1.71	1.35	0.94	– –
H11C6.S	102-1223●	2.10	1.72	1.35	0.94	– –
Schmitt Trigger Output						
H11L1S-M	102-1226●	1.85	1.52	1.19	0.83	– –
H11L1SR2V-M	102-1227●	1.89	1.55	1.22	0.85	– –
H11L3SR2V-M	102-1234●	2.51	2.08	1.67	0.94	– –
H11N1SR2V-M	102-1237●	6.41	5.47	4.36	2.60	– –
H11N3SR2V-M	102-1243●	6.52	5.45	4.35	2.46	– –
High Speed Logic Gate Output						
6N137.S	SMD 102-1198●	3.21	2.68	2.17	1.29	– –
HCPL-2601.S	SMD 102-1250●	2.62	2.15	1.69	1.17	– –
HCPL-2630.S	SMD 102-1253●	4.55	3.58	2.64	2.28	– –
HCPL-2631.S	102-1256●	8.25	6.87	5.61	3.34	– –

Surface Mount, Quad Channel —

VISHAY



SMD

A quad channel optocoupler in an industry standard SOT223 package which results in a remarkable optocoupler channel to PCB area ratio (5.7mm² per channel). Pin count is reduced by the use of common anode inputs and common collector outputs.

Isolation Voltage	Curr Trsfr Ration % (min-max.)	Breakdown $V_{(BR)}$ CEO (min)	Mftrs.List No.	Order Code
2500	160 - 320 @ I_F=1mA	70	SFH6943-4T	104-5530

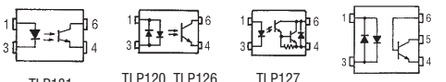
206462

Order Code	Price Each 1+	25+	100+	250+	+
SMD 104-5530●	9.83	8.76	7.30	5.90	– –

Mini Flat — Surface Mount

TOSHIBA

Transistor Output, Darlington Transistor Outout



TLP181
1 Anode
3 Cathode
4 Emitter
6 Collector

TLP120, TLP126
1 Anode, Cathode
3 Cathode, Anode
4 Emitter
6 Collector

TLP127
1 Anode
3 Cathode
4 Emitter
6 Collector

TLP130
1 Anode, Cathode
3 Cathode, Anode
4 Emitter
5 Collector
6 Base

SMD

Isolation Voltage (pk) (AC $_{RMS}$)	Curr. Trsfr Ratio (min.) @ I_F	Breakdown $V_{(BR)}$ CEO min	Mftrs. List No.	Order Code
Transistor Output				
3750	100% @ 5mA	80V	TLP181(F,T)	114-1129
Transistor Output, AC Input				
V	100% @ ±1mA	80V	TLP126(F)	114-1128
V	100% @ ±5mA	80V	TLP180(F,T)	120-1936
Darlington Transistor Output				
2500	1000% @ 1mA	300V	TLP127(U,F)	120-1937

206416

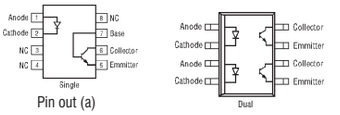
Order Code	Price Each 1+	25+	100+	250+	+
114-1129●	0.97	0.91	0.84	0.71	– –
114-1128●	2.05	1.73	1.67	1.48	– –
120-1936●	2.30	2.14	1.92	1.20	– –
120-1937●	1.93	1.64	1.54	1.35	– –

Surface Mount

FAIRCHILD SEMICONDUCTOR™

VISHAY

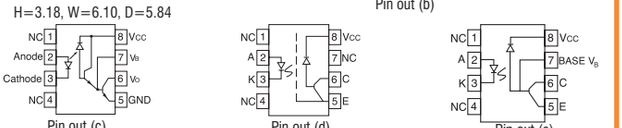
SMD



Pin out (a)

Pin out (b)

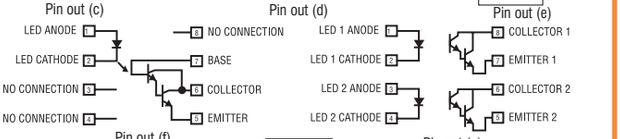
H=3.18, W=6.10, D=5.84



Pin out (c)

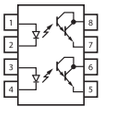
Pin out (d)

Pin out (e)



Pin out (f)

Pin out (g)



Pin out (h)

Channels	Pin Out	Isolation ac Test Voltage (V_{rms})	Curr. Trsfr. Ratio min (%)	@ I_F (mA)	Switching Time (µs) t_{on}	typ. t_{off}	Mftr	Mftrs. List No.
High CTR								
Single	a	3000	63	10	3	2.8	FAIRCHILD	MOC206-M
Single	a	3000	20	10	7.5	5.7	FAIRCHILD	MOC211-M
Dual	b	3000	100	1	7.5	5.7	FAIRCHILD	MOCD217-M
Single	a	2500	63	10	3	3	VISHAY	IL206AT
Single	a	2500	100	10	3	3	VISHAY	IL213AT
Single	c	2500	500	1.6	4	4	VISHAY	SFH6319T
Single	-	5000	100-200	10	3.5	5	VISHAY	SFH6186-3T
Single		2500	-		3	3	VISHAY	IL206AT
Single		2500	-		3	3	VISHAY	IL213AT
Single		2500	-		5	4	VISHAY	ILD206T
Single		2500	-		5	4	VISHAY	ILD213T
Single		5000	100-200	10	3.5	5	VISHAY	SFH6186-3T
Single		2500	-		0.25	0.5	VISHAY	SFH6316T
Single		2500	-		4	4	VISHAY	SFH6319T
Single		2500	-		0.5	0.5	VISHAY	SFH6343T
Dual	b	3000	100	10	3	2.8	FAIRCHILD	MOCD207-M
Dual	b	2500	63	10	5	4	VISHAY	ILD206T
Dual	b	2500	100	10	5	4	VISHAY	ILD213T
Dual	b	3000	63	10	3	2.8	FAIRCHILD	MOC206-M
Dual	b	3000	20	10	7.5	5.7	FAIRCHILD	MOC211-M

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

Channels	Pin Out	Isolation ac Test Voltage (V_{rms})	Curr. Trsfr. Ratio min (%)	Ratio @ I_F (mA)	Switching Time (µs) t_{on}	Switching Time (µs) typ. t_{off}	Mftr	Mftrs. List No.
High Speed								
		3000	100	10	3	2.8	FAIRCHILD	MOCD207-M
		2500	100	10	1.6	2.2	FAIRCHILD	MOCD207R2M
Single	e	2500	19	16	0.25	0.5	VISHAY	SFH6316T
Single	d	2500	15	16	0.5	0.5	VISHAY	SFH6343T
Darlington Output								
Single	f	3000	500	1	3.5	95	FAIRCHILD	MOC223-M
Dual	g	3000	500	1	3.5	95	FAIRCHILD	MOCD223-M
Dual	g	3000	500	1	3.5	95	FAIRCHILD	MOC223-M
Dual	h	3000	500	1	3.5	95	FAIRCHILD	MOCD223-M

206299

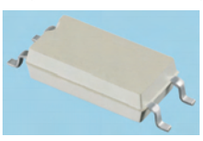
Mftrs. List No.	Order Code	Price Each 1+	10+	100+	250+	+
MOC206-M	SMD 102-1360	1.27	0.94	0.70	0.47	– –
MOC211-M	SMD 102-1361	1.43	0.75	0.75	0.51	– –
		1+	**25+**	**100+**		
IL206AT	SMD 104-5448	1.29	1.15	0.96		
IL213AT	SMD 104-5449	1.39	1.24	1.04		
		1+	**10+**	**100+**	**250+**	**+**
MOCD207-M	SMD 102-1373	1.93	1.58	1.24	0.86	– –
MOCD207R2M	SMD 108-6672	1.76	1.33	1.11	0.85	– –
MOCD217-M	SMD 102-1374	2.01	1.65	1.29	0.90	– –
		1+	**25+**	**100+**		
ILD206T	SMD 104-5450	2.79	2.48	2.08		
ILD213T	SMD 104-5451	2.79	2.48	2.08		
SFH6186-3T	SMD 104-5433	1.57	1.40	1.17		
SFH6316T	SMD 104-5452	3.48	3.10	2.60		
SFH6319T	SMD 104-5454	3.83	3.41	2.86		
SFH6343T	SMD 104-5455	3.92	3.49	2.92		
		1+	**10+**	**100+**	**250+**	**+**
MOC223-M	SMD 102-1362	1.87	1.38	1.04	0.69	– –
MOCD223-M	SMD 102-1375	1.93	1.58	1.24	0.86	– –

Phototransistor Output, AC Input

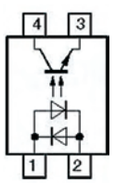
Long Mini-Flat SOP4L Package

VISHAY

SMD



H = 2, W = 7.5, D = 3.8mm



The optocoupler consists of a darlington phototransistor optically coupled to a gallium arsenide infrared emitting diode in a SO6L package.
The elements are mounted on one leadframe, provide a fixed distance between input and output for highest safety requirements

- Low profile
- Extra low coupling capacitance - typicaly 0.2pF
- High common mode rejection
- Creepage distance > 8mm
- Reinforced isolation provides circuit protection against electric shock (Safety Class II)
- **BSI, CSA** & **DIN** Approvals, **UL** Recognised

Current Transfer Ratio (CTR)	(V_f) Max.	Isolation test voltage (RMS)	Total power dissipated	Operating/Storage temperature	Collector emitter voltage (V_{CEO})	Collector current (I_C)
80 to 800%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA

380767

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
TCLT1600.	SMD 831-0840	1.33	1.19	0.99	0.80	– –

Input Type	Isolation Voltage (pk)	CTR Min. (%)	Breakdown $V_{(BR)}CEO$ (min)	Package Style	Mftrs. List No.
AC input	5300	100	30V	6 Pin DIL	H11AA4

423756

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
AC input						
H11AA4	NEW 108-6684	1.40	1.04	0.78	0.50	– –

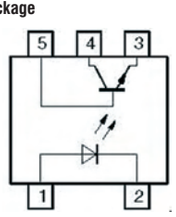
Phototransistor Output

Long Mini-Flat SOP5L Half Pitch Package

VISHAY

SMD

H = 2, W = 7.5, D = 3.8mm



The TCLT11 Series consists of a phototransistor optically coupled to a gallium arsenide infrared emitting diode in a 5-lead SOP5L package.
The elements are mounted on one leadframe, provide a fixed distance between input and output for highest safety requirements

- Low profile 5 lead package
- Isolation Test Voltage 5000 V_{RMS}
- Extra low coupling capacitance - 0.3pF @1 MHz
- Connected base
- DC input with transistor output
- **BSI, CSA, DIN** & **FIMKO** Approvals, **UL** Recognised

Current Transfer Ratio (CTR)	(V_f) Max.	Isolation test voltage (RMS)	Total power dissipated	Operating/Storage temperature	Collector emitter voltage (V_{CEO})	Collector current (I_C)	Order Code
50 to 600%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0769
63 to 125%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0777
100 to 200%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0785
50 to 150%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0793
100 to 300%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0807
80 to 160%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0815
130 to 260%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0823
200 to 400%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0831

380766

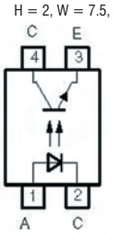
Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
TCLT1100.	SMD 831-0769	1.13	1.01	0.84	0.68	– –
TCLT1102.	SMD 831-0777	1.01	0.81	0.63	0.45	– –
TCLT1103.	SMD 831-0785	1.13	1.01	0.84	0.68	– –
TCLT1105.	SMD 831-0793	1.13	1.01	0.84	0.68	– –
TCLT1106.	SMD 831-0807	1.13	1.01	0.84	0.68	– –
TCLT1107.	SMD 831-0815	1.01	0.81	0.63	0.45	– –
TCLT1108.	SMD 831-0823	1.01	0.81	0.63	0.45	– –
TCLT1109.	SMD 831-0831	1.33	1.19	0.99	0.80	– –

Phototransistor Output

Long Mini-Flat SOP4L Package

VISHAY

H = 2, W = 7.5, D = 3.8mm



The TCLT10 Series consists of a phototransistor optically coupled to a gallium arsenide infrared emitting diode in a 4-lead SOP4L package.
The elements are mounted on one leadframe, provide a fixed distance between input and output for highest safety requirements

SMD

- Low profile 4 lead package
- High Isolation 5000 V_{RMS}
- Extra low coupling capacitance - 0.3pF @1 MHz
- DC input with transistor output
- **BSI, CSA, DIN** & **FIMKO (SETI)** Approvals, **UL** Recognised

Current Transfer Ratio (CTR)	(V_f) Max.	Isolation test voltage (RMS)	Total power dissipated	Operating/Storage temperature	Collector emitter voltage (V_{CEO})	Collector current (I_C)	Order Code
50 to 600%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0688
63 to 125%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0696
100 to 200%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0700
50 to 150%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0718
100 to 300%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0726
80 to 160%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0734
130 to 260%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0742
200 to 400%	1.6V	5000V ac	250mW	-40 to 100°C	70V	50mA	831-0750

380765

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
TCLT1000.	SMD 831-0688	1.05	0.94	0.79	0.63	– –
TCLT1002.	SMD 831-0696	1.05	0.94	0.79	0.63	– –
TCLT1003.	SMD 831-0700	1.05	0.94	0.79	0.63	– –
TCLT1005.	SMD 831-0718	1.05	0.94	0.79	0.63	– –
TCLT1006.	SMD 831-0726	1.05	0.94	0.79	0.63	– –
TCLT1007.	SMD 831-0734	1.05	0.94	0.79	0.63	– –
TCLT1008.	SMD 831-0742	1.05	0.94	0.79	0.63	– –
TCLT1009.	SMD 831-0750	1.13	1.01	0.84	0.68	– –

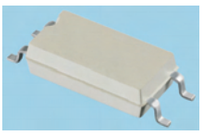
Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Photodarlington Output

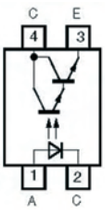
Long Mini-Flat SOP4L Package

VISHAY

SMD



H = 2, W = 7.5, D = 3.8mm



The optocoupler consists of a darlington phototransistor optically coupled to a gallium arsenide infrared emitting diode in a SO6L package.
The elements are mounted on one leadframe, provide a fixed distance between input and output for highest safety requirements

- Low profile
- Extra low coupling capacitance - typicaly 0.2pF
- High common mode rejection
- Creepage distance > 8mm
- Reinforced isolation provides circuit protection against electric shock (Safety Class II)
- **BSI, CSA** & **DIN** Approvals, **UL** Recognised

Current Transfer Ratio (CTR)	(V_f) Max.	Isolation test voltage (RMS)	Total power dissipated	Operating/Storage temperature	Collector emitter voltage (V_{CEO})	Collector current (I_C)
600 to 800%	1.6V	5000V	250mW	-40 to 100°C	35V	80mA

377690

Mftrs. List No.	Order Code	1+	25+	Price Each 100+	250+	+
TCLD1000.	SMD 831-0670	1.11	0.99	0.83	0.67	– –

Optically Isolated Error Amplifier

NEW

FAIRCHILD SEMICONDUCTOR™

Transistor Output

These optically isolated error amplifiers consist of a precision programmable shunt reference and an optocoupler. These devices are primarily intended for use as the error amplifier/reference voltage/optocoupler function in isolated ac to dc power supplies and dc/dc converters. The use of these components in power supply designs can significantly reduce the component count and save space in tightly packaged designs. The tight tolerance reference eliminates the need for adjustments in most applications.

BSI, **CSA** and **VDE** approved, **UL** Recognised

Reference Voltage (V)	Isolation Voltage (V rms)	CTR - Min. (%)	CTR - max. (%)	Package Style	Mftrs. List No.
Tolerance 0.5%					
2.5	2500	100	200	8 Pin SOP	F0D2742A
2.5	2500	100	200	8 Pin SOP	F0D2742AR1
2.5	2500	100	200	8 Pin SOP	F0D2742AR1V
2.5	5000	100	200	8 Pin DIL	F0D2741A
2.5	5000	100	200	8 Pin DIL	F0D2741AS
2.5	5000	100	200	8 Pin SMD	F0D2741ASD
2.5	5000	100	200	8 Pin DIL	F0D2741ASV
2.5	5000	100	200	8 Pin DIL	F0D2741AT
2.5	5000	100	200	8 Pin DIL	F0D2741ATV
2.5	5000	100	200	8 Pin DIL	F0D2741AV
2.5	5000	100	200	8 Pin DIL	F0D2741BS
2.5	5000	50	100	8 Pin DIL	F0D2743A
2.5	5000	50	100	8 Pin DIL	F0D2743AS
2.5	5000	50	100	8 Pin SMD	F0D2743ASD
2.5	5000	50	100	8 Pin DIL	F0D2743ASV
2.5	5000	50	100	8 Pin DIL	F0D2743AT
2.5	5000	50	100	8 Pin DIL	F0D2743ATV
2.5	5000	50	100	8 Pin DIL	F0D2743AV
Tolerance 1%					
1.24	2500	100	200	8-Pin SOP	F0D2712
1.24	2500	100	200	8-Pin SOP	F0D2712R1
1.24	2500	100	200	8-Pin SOP	F0D2712R1V
2.5	2500	100	200	8 Pin SOP	F0D2742B
2.5	2500	100	200	8 Pin SOP	F0D2742BR1
2.5	2500	100	200	8 Pin SOP	F0D2742BR1V
2.5	5000	100	200	8 Pin DIL	F0D2741B
2.5	5000	100	200	8 Pin SMD	F0D2741BSD
2.5	5000	100	200	8 Pin DIL	F0D2741BSV
2.5	5000	100	200	8 Pin DIL	F0D2741BT
2.5	5000	100	200	8 Pin DIL	F0D2741BTV
2.5	5000	100	200	8 Pin DIL	F0D2741BV
2.5	5000	50	100	8 Pin DIL	F0D2743B
2.5	5000	50	100	8 Pin DIL	F0D2743BS
2.5	5000	50	100	8 Pin SMD	F0D2743BSD
2.5	5000	50	100	8 Pin DIL	F0D2743BSV
2.5	5000	50	100	8 Pin DIL	F0D2743BT
2.5	5000	50	100	8 Pin DIL	F0D2743BTV
2.5	5000	50	100	8 Pin DIL	F0D2743BV
Tolerance 2%					
2.5	2500	100	200	8 Pin SOP	F0D2742C
2.5	2500	100	200	8 Pin SOP	F0D2742CR1
2.5	2500	100	200	8 Pin SOP	F0D2742CR1V
2.5	5000	100	200	8 Pin DIL	F0D2741C
2.5	5000	100	200	8 Pin DIL	F0D2741CS
2.5	5000	100	200	8 Pin SMD	F0D2741CSD
2.5	5000	100	200	8 Pin DIL	F0D2741CSV
2.5	5000	100	200	8 Pin DIL	F0D2741CT
2.5	5000	100	200	8 Pin DIL	F0D2741CTV
2.5	5000	100	200	8 Pin DIL	F0D2741CV
2.5	5000	50	100	8 Pin DIL	F0D2743C
2.5	5000	50	100	8 Pin DIL	F0D2743CS
Tolerance 2%					
2.5	5000	50	100	8 Pin SMD	F0D2743CSD
2.5	5000	50	100	8 Pin DIL	F0D2743CSV
2.5	5000	50	100	8 Pin DIL	F0D2743CT
2.5	5000	50	100	8 Pin DIL	F0D2743CTV
2.5	5000	50	100	8 Pin DIL	F0D2743CV

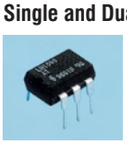
423723

Mftrs. List No.	Order Code	1+	25+	Price Each 100+	250+	+
Tolerance 0.5%						
F0D2742A	SMD 122-0045	1.79	1.33	1.14	0.85	– –
F0D2742AR1	SMD 108-6663	1.95	1.46	1.24	0.91	– –
F0D2742AR1V	SMD 122-0046	1.92	1.46	1.24	0.91	– –
F0D2741A	108-6656	1.95	1.46	1.24	0.91	– –
F0D2741AS	122-0028	1.92	1.46	1.24	0.91	– –
F0D2741ASD	SMD 108-6657	1.79	1.37	1.14	0.85	– –
F0D2741ASV	122-0029	1.73	1.30	1.11	0.81	– –
F0D2741AT	122-0030	1.73	1.30	1.11	0.81	– –
F0D2741ATV	122-0031	1.92	1.46	1.24	0.91	– –
F0D2741AV	122-0033	1.92	1.46	1.24	0.91	– –
F0D2741BS	122-0034	1.73	1.30	1.11	0.81	– –
F0D2743A	108-6666	1.73	1.30	1.11	0.81	– –
F0D2743AS	122-0051	1.73	1.30	1.11	0.81	– –
F0D2743ASD	SMD 108-6667	1.79	1.37	1.14	0.85	– –
F0D2743ASV	122-0052	1.73	1.30	1.11	0.81	– –
F0D2743AT	122-0053	1.73	1.30	1.11	0.81	– –
F0D2743ATV	122-0054	1.73	1.30	1.11	0.81	– –
F0D2743AV	122-0055	1.73	1.30	1.11	0.81	– –
Tolerance 1%						
F0D2712	SMD 122-0026	1.73	1.30	1.11	0.81	– –
F0D2712R1	SMD 108-6655	1.95	1.46	1.24	0.91	– –
F0D2712R1V	SMD 122-0027	2.12	1.59	1.37	1.01	– –
F0D2742B	SMD 122-0047	1.66	1.24	1.07	0.78	– –
F0D2742BR1	SMD 108-6664	1.79	1.37	1.14	0.85	– –
F0D2742BR1V	SMD 122-0048	1.79	1.33	1.14	0.85	– –
F0D2741B	108-6658	1.73	1.30	1.11	0.81	– –
F0D2741BSD	SMD 108-6659	1.73	1.30	1.11	0.81	– –
F0D2741BSV	122-0035	1.73	1.30	1.11	0.81	– –
F0D2741BT	122-0036	1.73	1.30	1.11	0.81	– –
F0D2741BTV	122-0037	1.73	1.30	1.11	0.81	– –
F0D2741BV	122-0038	1.73	1.30	1.11	0.81	– –
F0D2743B	108-6668	1.66	1.27	1.04	0.78	– –
F0D2743BS	122-0057	1.66	1.24	1.07	0.78	– –
F0D2743BSD	SMD 108-6669	1.73	1.30	1.11	0.81	– –
F0D2743BSV	122-0058	1.66	1.24	1.07	0.78	– –
F0D2743BT	122-0059	1.66	1.24	1.07	0.78	– –
F0D2743BTV	122-0060	1.66	1.24	1.07	0.78	– –
F0D2743BV	122-0061	1.66	1.24	1.07	0.78	– –
Tolerance 2%						
F0D2742C	SMD 122-0049	1.53	1.14	0.98	0.72	– –
F0D2742CR1	SMD 108-6665	1.66	1.27	1.04	0.78	– –
F0D2742CR1V	SMD 122-0050	1.66	1.24	1.07	0.78	– –
F0D2741C	108-6660	1.66	1.27	1.04	0.78	– –
F0D2741CS	122-0039	1.66	1.24	1.07	0.78	– –
F0D2741CSD	SMD 108-6661	1.66	1.27	1.04	0.78	– –
F0D2741CSV	122-0040	1.66	1.24	1.07	0.78	– –
F0D2741CT	122-0041	1.59	1.20	1.01	0.75	– –
F0D2741CTV	122-0042	1.59	1.20	1.01	0.75	– –
F0D2741CV	122-0043	1.59	1.20	1.01	0.75	– –
F0D2743C	108-6670	1.66	1.27	1.04	0.78	– –
F0D2743CS	122-0062	1.66	1.24	1.07	0.78	– –
F0D2743CSD	SMD 108-6671	1.66	1.27	1.04	0.78	– –
F0D2743CSV	122-0063	1.66	1.24	1.07	0.78	– –
F0D2743CT	122-0064	1.59	1.20	1.01	0.75	– –
F0D2743CTV	122-0065	1.59	1.20	1.01	0.75	– –
F0D2743CV	122-0066	1.59	1.20	1.01	0.75	– –

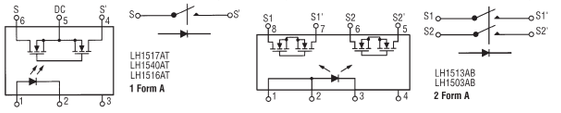
Solid State Relays

Single and Dual, Form A

VISHAY



- Bounce free switching
- No arcing or noise
- No mounting restrictions
- Extremely high reliability
- Immune to shock
- Immune to environmental hazards such as dirt and humidity



A range of optocouplers with high voltage MOSFET outputs that duplicate the function of electromechanical relays. These Solid State Relays incorporate current limiting which will clamp the load current at a predetermined value preventing damage to the device from transients and load short circuits. The devices are capable of switching currents from nanoamps to hundreds of milliamps, making then ideal for a wide variety of switching applications.

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

C = CYAN M = Magenta Y = Yellow B = Black/SING

Type	Max Load Current (mA) AC/DC	DC	Max Load Voltage (V)	Isolation Test Voltage (AC_{RMS})	Switching Time t_r, t_f (ms)	Mftrs. List No.
Single Form A (NO)	120	250	350	5300	2	LH1540AT
Dual Form A (NO)	140	–	200	3750	2.5	LH1513AB
Dual Form A (NO)	110	–	350	3750	2.5	LH1503AB

206452

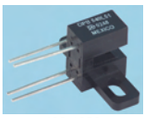
Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
LH1540AT	**104-5531●**	4.92	4.39	3.67	2.95	– –
LH1513AB	**104-5533●**	13.37	11.91	9.96	8.02	– –
LH1503AB	**104-5534●**	13.37	11.91	9.96	8.02	– –

Slotted Opto Switches

Transistor/Darlington Output

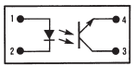
Top View

489-1016

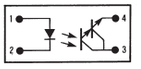


489-1028

Top View



Transistor



Darlington

Note: 491-354 has emitter connections reversed.

H	W	D	Gap width	Pin spacing	Order Code
11	12	6.35	3.1	7.2 x 2.5	102-1129, 102-1130, 102-1131
5.2	5	4	2	3.75 x 2.54	491-354
9.52	10.16	5.58	5.08	8.26 x 2.67	491-330
16.2	17.7	6	8	13.8 x 2.5	117-3621
19.7	14	5	5	11.2 x 1.25	117-3623
16.1	31.75	6.35	16.76	2.54 x 1.25	489-1016
10.55	23.75	12.95	3.18	8.13 x 2.54	489-1028

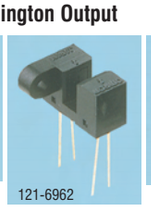
IC mA @ I_F mA		Breakdown $V_{(BR)}$ CEO min	Switching Time (µs) typ. t_{on}µs	t_{off}µs	VCE $_{(SAT)}$	Mftr.	Mftrs. List No.
Transisitor Output							
1	20	30	8	50	0.4	FCH	H22A1
1	20	55	8	50	0.4	FCH	H22A4
0.25	10	30	50	50	0.4	Kodenshi	SG-211
1	5	30	40	20	0.4	OPTEK	OPB620
20	50	30	4	4	0.4	OMRON	EE-SX1070
20	50	30	4	4	0.4	OMRON	EE-SX1042
50	20	30			0.4	OPTEK	OPB815L
50	20	30			0.4	OPTEK	OPB840L51
Darlington Output							
7.5	10	30	45	250	1	FCH	H22B1

206214

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+
SG-211	**491-354●**	5.83	5.29	4.28	3.35
OPB620	**491-330●**	7.25	6.68	5.54	3.49
EE-SX1070	**117-3621●**	5.23	5.01	4.79	3.30
EE-SX1042	**117-3623●**	5.98	5.86	– –	– –
OPB815L	**489-1016●**	9.05	8.59	7.91	7.58
OPB840L51	**489-1028●**	9.05	8.59	7.91	7.58
H22A1	**102-1129●**	2.00	1.37	1.08	0.90
H22A4	**102-1130●**	2.25	1.59	1.25	1.04
H22B1	**102-1131●**	2.03	1.43	1.13	0.94

Transistor/Darlington Output

121-6963

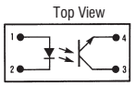


121-6962

117-3627

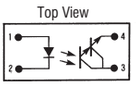
118-2342-with leads
183-8386-with pins
176-9388-with pins

Top View



◆Transistor

Top View



Darlington

Illustration 121-6963 also represents the following:
102-1132, 139-828, 120-1176, 120-1178, 102-1133, 117-3624 & 117-3626

◆**Note:** HOA1873-11 has detector connections reversed, i.e. pin 4 is collector.
Chamfer indicates emitter (diode) on H21 series. Pin 1 identified on OPB866-T55.

	H	W	D	Gap width	Pin spacing	Fixing Centres
H21A1, H21B1	10.8	24.7	6.35	3.1	7.2 x 2.5	19
OPB815W-Z*	14.1	31.75	6.35	9.53	13 x 2.5	25.4
HOA1877-002*	12.7	31.75	7.62	9.52	17.78 x 2.5	25.4
OPB365T55	10.8	24.7	6.35	2.9	5.6 x 2.5	19
HOA1873-11	10.8	25.4	6.35	2.54	7.62 x 2.54	19
HOA0865-T55	10.8	24.7	6.35	3.1	5.6 x 2.5	19
EE-SX129	8.0	13	6	3	9.2 x 1.94	—
EE-SG3	18	25.4	6.35	3.6	7.6 x 2.54	19
EE-SG3-B	15.9	25.4	6.2	3.6	7.6 x 2.54	19
EE-SV3	18.2	15.1	6.2	3.4	7.6 x 2.54	12.7
EE-SM3B	10	25	6.2	3	6.5 x 2.54	19
HOA1877-003	12.7	31.75	7.62	9.52	17.78 x 2.54	25.4
H21A1	10.8	24.7	6.35	3.1	7.2 x 2.54	19
H21B1	10.8	24.7	6.35	3.1	7.2 x 2.54	19

* = Flying Lead Termination, Length = 610mm min.

IC mA	I_F @ mA	t_{on} µs typ.	t_{off} µs typ.	VCE $_{(SAT)}$ max.	Mftr.	Mftrs. List No.	Order Code
NPN Transistor Output							
1	20	8	50	0.4	FCH	H21A1	102-1132
20	50	4	4	0.4	OMRON	EE-SX1070	117-3621
20	50	4	4	0.4	OMRON	EE-SX1042	117-3623
20	50	4	4	0.4	OMRON	EE-SV3	117-3627
NPN Transistor Output - Deep Gap							
1	20	—	—	0.4	OPTEK	OPB815W-Z	118-2342
0.5	50	—	—	0.4	HONEYWELL	HOA1877-002	176-9388
NPN Transistor Output							
14**	20	—	—	0.4	OPTEK	OPB365T55	139-828
0.3	20	10	12	0.4	HWL	HOA1873-11	120-1176
0.5	10	5	5	0.4	HWL	HOA0865-T55	120-1178
20	50	4	4	—	OMRON	EE-SX129	121-6962
20	50	4	4	0.4	OMRON	EE-SG3	117-3624
20	50	4	4	0.4	OMRON	EE-SG3-B	117-3626
20	50	4	4	0.4	OMRON	EE-SV3	117-3627
Darlington Output							
1	20	8	50	0.4	FCH	H22A1	102-1129
1	20	8	50	0.4	FCH	H22A4	102-1130
7.5	10	45	250	1	FCH	H22B1	102-1131
20	15	180	60	0.9	OMRON	EE-SM3B	121-6963
1.5	50	15	15	1.1	HONEYWELL	HOA1877-003	183-8386
1.5	10	45	250	1.1	FCH	H21B1	102-1133

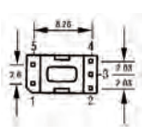
** I_C = Maximum Rating

206213

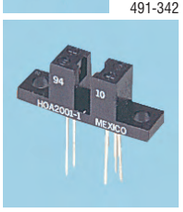
Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+
H21A1	**102-1132●**	2.25	1.59	1.25	1.04
EE-SX1070	**117-3621●**	5.23	5.01	4.79	3.30
EE-SX1042	**117-3623●**	5.98	5.86	– –	– –
EE-SV3	**117-3627●**	13.23	11.91	10.71	7.81
OPB815W-Z	**118-2342●**	21.29	14.11	10.33	7.30
HOA1877-002	**176-9388●**	20.96	18.42	16.63	15.07
OPB365T55	**139-828●**	8.76	7.65	6.80	4.05
HOA1873-11	**120-1176●**	6.29	5.95	5.70	– –
HOA0865-T55	**120-1178●**	6.29	5.95	5.70	– –
EE-SX129	**121-6962●**	9.07	6.55	6.11	5.25
EE-SG3	**117-3624●**	10.73	10.43	9.95	9.39
EE-SG3-B	**117-3626●**	10.87	7.02	– –	– –
EE-SV3	**117-3627●**	13.23	11.91	10.71	7.81
H22A1	**102-1129●**	2.00	1.37	1.08	0.90
H22A4	**102-1130●**	2.25	1.59	1.25	1.04
H22B1	**102-1131●**	2.03	1.43	1.13	0.94
EE-SM3B	**121-6963●**	9.76	8.06	7.65	6.79
HOA1877-003	**183-8386●**	23.14	20.34	18.42	16.76
H21B1	**102-1133●**	2.45	1.73	1.36	1.14

Schmitt Trigger Output

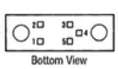
491-342



Bottom View
1 Anode
2 Gnd
3 Output
4 V_{CC}
5 Cathode



102-1134,
120-1179



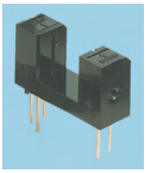
Bottom View

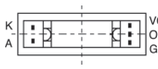
Bottom View
1 Anode
2 Cathode
3 V_{CC}
4 VO
5 GND

113-6079
(610mm flying leads)

Red	Anode
Black	Cathode
Green	Ground
White	V_{CC}
Blue	V_{out}

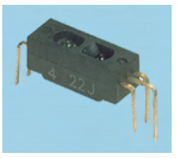
Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

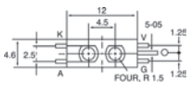




Bottom View
A Anode
K Cathode
V V_{cc}
O Output
G GND

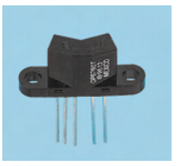
117-3622





Top View
A Anode
K Cathode
V V_{cc}
O Output
G GND

117-3631



Top View (Pin 1 Left)
1 Cathode
2 Anode
3 GND
4 Output
5 V_{CC}

139-841

121-7280
White Collector
Blue Output
Green Emitter
Red Anode
Black Cathode

121-7281
White VCC
Blue Output
Green Ground
Red Anode
Black Cathode

	H	W	D	Gap width	Fixing Centres	Pin spacing
Transmissive Sensing						
HAO2001	10	24.6	6.35	3.05	19.05	7.6 x 2.5 x 1.27
HOA6990-T51	11.5	24.89	6.6	3.05	19.18	Flying leads
OPB625	9.52	10.16	5.58	5.08	—	8.26 x 2.6 x 2.3
EE-SX4070	18.3	17.7	6	8	—	13.8 x 2.5 x 1.25
OPB916B	16.51	30.73	6.48	5.08	24.38	Flying leads
OPB917B	25.65	30.73	6.48	5.08	24.38	Flying leads
H21LO1	10.6	24.5	6.35	3	24.38	Flying leads
Reflective Sensing						
EE-SY410	8.8	17.2 (overall)	4.6	—	—	17 x 2.5 x 1.25
OPB760T	10.8	25.1	6.4	—	19.1	—

H21LOI - Emitter: V_F max. 1.6V @ 20mA. V_R max 6V.
Detector: Schmitt trigger. Power dissipation 150mW @ 25°C. Operating voltage 4V to 15V. Turn-on threshold current I_F (on) 20mA typ. for V_{CC}=5V, RL=270=t_r, t_f=100ns typ. (Mftr. Fairchild)
HOA2001 - Emitter: V_F max. 1.5V @ 20mA. V_R max 3V.
Detector: Includes amplifier, voltage regulator, Schmitt trigger and output stage for direct interfacing to TTL/LSTTL/CMOS. Power dissipation 250mW @ 25°C. Operating voltage 4.5V to 16V. Max. O/P sink current 40mA when light beam interrupted. Supply current 5mA typ. t_r 60ns typ. t_f 15ns typ. (Mftr. Honeywell).
HOA6990-T51 - Emitter: V_F max. 1.5V 20mA. V_R max. 3V.
Detector: Includes amplifier, voltage regulator, Schmitt trigger and totem pole output stage for direct TTL interfacing. Output is low when exitation is zero. Operating voltage 4.5V to 7.0V. Max. supply current 15mA, t_r t_f 70ns typ. (Mftr. Honeywell).
OPB625 - Emitter: V_F max. 1.6V @ 10mA. V_R max. 3V.
Detector: Includes linear amplifier, Schmitt trigger and output stage 10K pull up, buffered for TTL/LSTTL interfacing. Max o/p sink current 16mA. Supply current 5mA typ t_r t_f 30ns typ. (Mftr. Optek).
EE-SX4070 - Emitter: V_F max. 1.5V @ 20mA. V_R max. 4V.
Detector: Includes amplifier, voltage regulator, Schmitt trigger and output stage for direct interfacing to TTL/LSTTL/CMOS. Power dissipation 250mW @ 25°C. Operating voltage 4.5V to 16V. Consumption current 3.2mA typ. for V_{CC}=16V. Propagation delay - 3µs (H ➡ L), 20µs (L ➡ H). (Mftr. Omron).
EE-SY410 - Emitter: V_F max. 1.5V @ 20mA. V_R max. 4V.
Detector: Includes pre-amplifier circuit with temperature-compensating circuit, voltage regulator, Schmitt trigger and output stage for direct interfacing to TTL/LSTTL/CMOS. Power dissipation 250mW @ 25°C. Operating voltage 4.5V to 16V. Response delay time - 3µs (H ➡ L), 20µs (L ➡ H). (Mftr. Omron).
OPB760T - Emitter: V_F max. 1.8V @ 40mA. V_R max 3V.
Detector: Includes built-in hysteresis amplifier, Photologic™ output, TTL Totem Pole Buffered output. Total device power dissipation 300mW @ 25°C, diode forward current 40mA, (Mftrs. Optek)
OPB916B - V_F max. 1.8V @ 20mA. I_R max 100µA.
Light ON - Output HIGH, Photologic™ Buffered output with 10kR pull-up resistor. Input power dissipation 100mW, Output power dissipation 90mW (Mftrs. Optek)
OPB917B - V_F max. 1.8V @ 20mA. I_R max 100µA.
Light ON - Output HIGH, Photologic™ Buffered output with 10kR pull-up resistor. Input power dissipation 100mW, Output power dissipation 90mW (Mftrs. Optek)

206215

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	1K+
Transmissive Sensing					
HOA2001	**120-1179**●	14.68	13.92	13.20	– –
HOA6990-T51	**113-6079**●	14.97	14.21	13.61	13.29
OPB625	**491-342**●	9.89	8.38	7.53	4.42
EE-SX4070	**117-3622**●	6.02	5.76	5.51	3.67
Transmissive Sensing					
OPB916B	**121-7280**●	15.69	14.84	13.93	13.38
OPB917B	**121-7281**●	16.08	14.91	14.03	13.74
H21LO1	**102-1134**●	6.49	4.88	2.87	1.80
Reflective Sensing					
EE-SY410	**117-3631**●	12.12	11.75	11.25	10.58
OPB760T	**139-841**●	17.67	10.30	9.70	8.28

Tab Mounted Transmissive Switch — SILONEX

with cable harness

- Single channel configuration
- Cable harness for remote termination
- Tab mounting on package side
- 3.8mm slot width

Single emitter/sensor transmissive optical sensor with phototransistor output. Cable fitted for remote termination

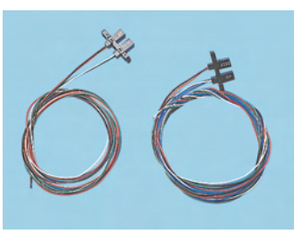
Input - LED V_fV typ	I_{max} mA max	Output Phototransistor I_{ceo} nA max	BV_{ceo} V min	BV_{eco} V min	Coupled V_{ce} (sat)-V max	I_c (on) µA min
1.2	50	100	30	5	0.4	1.5

206639

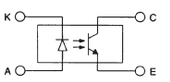
Mftrs. List No.	Order Code	Price Each 1+	25+	100+
STS-88-057	**121-9004**●	7.91	6.80	5.98

Side Fixing Flanges — OMRON

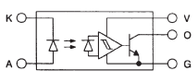
3.4mm Slots, Photo-Transistor & Photo-Logic Outputs



Internal Circuit



Internal Circuit



H=11.4, W=25, D=6

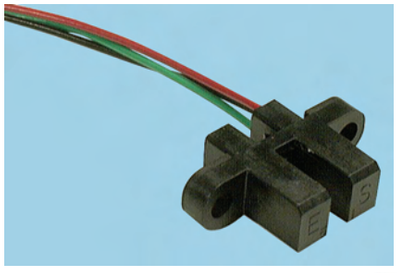
- Standard type slotted sensor with 3.4mm slot
- Photo-Transistor (E-SX1088-W1) or Photo-Logic (EE-SX4088-W1)
- Both types pre-wired with 610mm wires

EE-SX1088-W1 I_c=20mA @ I_F=50mA, t_r& t_f=4µs typ. V_{CE}(sat) = 0.4V max
EE-SX4088-W1 I_{cc}=10mA max. V_{cc}=4.5V - 16V, t_{PLH}=3µs typ. t_{PHL}20µs typ. f=3 kHz min.

206643

Mftrs. List No.	Order Code	Price Each 1+	10+	25+	50+	+
EE-SX1088-W1	**117-3617**●	16.15	14.40	13.70	10.71	– –
EE-SX4088-W1	**117-3618**●	16.22	14.77	14.08	11.02	– –

SR16C-J6 Digital Vane Sensor — Honeywell



NEW

- Compact, robust package
- Mechanically interchangeable with standard optical style sensors
- Operated by a 'Ferrous Vane' interrupter for pulse counting or position sensing
- Current sinking (open collector) output
- 3.8V dc to 30V dc power supply
- Medium level magnetic switching to reduce stray field interference
- Internally sealed packages for moderate environment applications
- No mechanical contacts; eliminates product wear
- Non-contact position sensing

RoHS ● Compliant ◀ Non-compliant ‡ Limited stock - RoHS replacement available

C = CYAN M = Magenta Y = Yellow B = Black/SING

Package Style	Dual Tower Wire Exit
Supply Voltage	3.8 to 30V dc
Output Type	Sink
Termination Type	26 Guage 7 Strand Lead Wire
Operating Temperature	-20 to 85°C
Output Voltage	0.4V dc
Vibration	10g/10Hz to 500Hz
Humidity	95% RH/40°C 100 h
Vane and Geartooth	Low Carbon Steel, High Permeability,
Target Material	Low Residual Induction
Output Current (Max.)	40mA
Supply Current (Max. @ 25°C)	10mA
Vane Thickness	1.14mm
Minimum Tooth Depth	6.35mm

419622

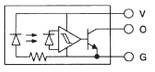
Mftrs. List No.	Order Code	Price Each 1+	5+	10+	25+	+
SR16C-J6	108-2266●	13.70	12.63	10.94	9.07	– –

Screw Mounting

OMRON

5mm Slot, Photo-Logic Outputs

Internal Circuit



H=21, W=44.5 (inc. connector), D=11

- Photo-Logic output
- 5mm slot
- Easy screw mounting (no cut-out)
- Connection uses OMRON connector EE-1005 complete with 1 metre of cable (available separately)

EE-SX4009-P1: I_{cc}=30mA max. V_{cc}=5V (V_{cc}max. = 10V) V_{OL}0.3V max. V_{OH}= (V_{cc}0.9) V min. f=3kHz min.

206645

Mftrs. List No.	Order Code	Price Each 1+	10+	25+	50+	+
EE-SX4009-P1	117-3619●	12.18	11.02	10.58	8.32	– –
EE-1005	117-2756●	6.69	6.03	5.64	3.90	– –

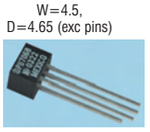
Reflective Opto Switches

Miniature/Standard

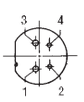
120-1180
H=6.22,
W=4.5,
D=4.65 (exc pins)

Bottom View
Pin spacing 2.54 2.29
Collector identification
dy dot

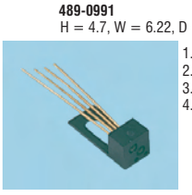
120-1174



489-0991
H = 4.7, W = 6.22, D = 4.6



1 Cathode
2 Anode
3 Collector
4 Emitter



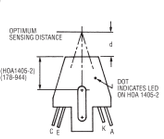
1. Cathode
2. Anode
3. Collector
4. Emitter

H=6.35, Dia.=6.35,
D=15.88
491-573, 491-585

Red Anode
Black Cathode
White Collector
Green Emitter

H=6.35, W=6.35, D=15.88, Lead length=305
113-6080

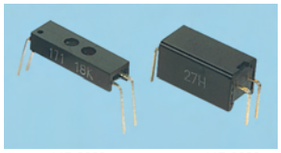
H=23, W=17, D=5
Fixing slot=8.5 3.1



178-944, 120-1181, 176-9741

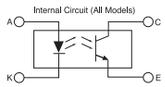
Red Anode
Black Cathode
Orange Collector
Black Emitter

H=24, W=15.4,
D=2.79,
Lead length=610
120-1182



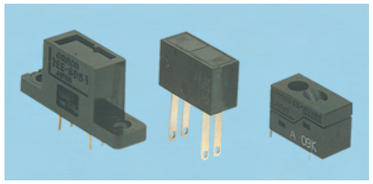
117-3629
H=8.5, W=15 (overall),
D=4.2

117-3630
H=8.4, W=15.2 (overall),
D=6.2



A Anode
K Cathode
C Collector
E Emitter

121-6966 and 117-3628 have PCB terminals.
121-6965 and 121-6967 have soldering terminals



121-6966
H=15.9, W=25.4, D=6.35
121-6965
H=18, W=25.4, D=6.35

121-6967
H=17.7, W=13, D=5.7
(overall)
117-3628
H=15.6, W=13, D=5.7
(overall)

117-3632
H=11, W=14.1
(overall),
D=6

139-830
H=4.5, W=6.1, D=4.40
1 Collector
2 Emitter
3 Anode
4 Cathode
Pin 1 identified by flat on body

118-2345
H = 12.45, W = 12.7, D = 12.07

118-2344
H = 15.49, W = 18.03, D = 5.33
Orange Anode
Green Cathode
White Collector
Blue Emitter

Reflective object sensors in miniature and standard packages, all with transistor outputs.

I_c mA	@ I_F	Output Transistor V_{DE}(max)	P_D(max)	Optimum sensing distance	Mftr	Mftrs. List No.	Order Code
Miniature							
0.7	20mA	30V	100mW	1.2	HWL	HOA1397-2	120-1180
0.16	30mA	30V	75mW	5.08	HWL	HOA2498-2	491-573
0.16	30mA	30V	75mW	5.08	HWL	HOA1180-2	113-6080
2	30mA	15V	75mW	5.08	HWL	HOA2498-3	491-585
4	20mA	30V	100mW	2.79	OPTEK	OPB608B*	139-830
20	50mA	30V	100mW	3.5	OMRON	EE-SY171	117-3629
20	50mA	30V	100mW	4.4	OMRON	EE-SY113	117-3630
25	50mA	30V	75mW	1.27	OPTEK	OPB706B	489-0991
Standard							
0.025	40mA	30V	75mW	5.08	HWL	HOA1406-1	120-1182
0.2	40mA	30V	60mW	3.81	OPTEK	OPB704	178-944
0.8	50mA	30V	75mW	5	HWL	HOA1404-002	176-9741
0.8	30mA	30V	70mW	5	HWL	HOA1405-2	120-1181
1.0	50mA	30V	70mW	3.8	HWL	HOA0709-001	120-1174
20	50mA	30V	100mW	5	OMRON	EE-SB5	121-6965
20	50mA	30V	100mW	5	OMRON	EE-SB5-B	121-6966
20	50mA	30V	100mW	5	OMRON	EE-SF5	121-6967
20	50mA	30V	100mW	4	OMRON	EE-SY169A	117-3632
20	50mA	30V	100mW	5	OMRON	EE-SF5-B	117-3628
50	50mA	35V	300mW	12.7	OPTEK	OPB715-Z	118-2345
200	40mA	30V	100mW	3.81	OPTEK	OPB704W-Z	118-2344

* The OPB608B has enhanced low current roll off to improve the contrast ratio and immunity to background irradiance

206216

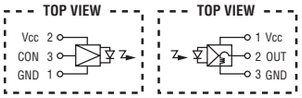
Mftrs. List No.	Order Code	Price Each 1+	25+	100+	1K+
Miniature					
OPB608B	139-830●	8.19	6.77	4.41	2.84
HOA1397-2	120-1180●	11.02	10.65	10.17	9.95
HOA2498-2	491-573●	11.99	11.37	10.87	10.65
HOA2498-3	491-585●	11.85	11.47	10.99	10.71
HOA1180-2	113-6080●	29.42	27.94	26.71	26.11
EE-SY171	117-3629●	14.43	9.32	8.47	6.80
EE-SY113	117-3630●	10.33	8.35	8.15	– –
OPB706B	489-0991●	10.87	– –	– –	– –
Standard					
OPB704	178-944●	14.97	13.10	11.06	7.65
HOA1404-002	176-9741●	22.43	19.69	17.80	16.18
HOA1405-2	120-1181●	13.57	11.39	9.96	8.85
HOA1406-1	120-1182●	41.00	39.69	37.96	37.11
EE-SB5	121-6965●	19.64	– –	– –	– –
OPB704W-Z	118-2344●	12.92	12.04	10.71	10.29
EE-SB5-B	121-6966●	17.20	13.17	12.44	10.65
EE-SF5	121-6967●	13.26	10.11	9.54	8.18
EE-SF5-B	117-3628●	13.99	11.59	10.99	9.39
EE-SY169A	117-3632●	21.39	19.81	18.68	18.04
OPB715-Z	118-2345●	23.73	22.52	20.73	18.75
HOA0709-001	120-1174●	9.60	8.43	7.65	6.93

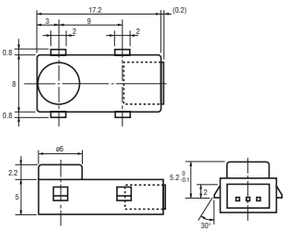
Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

Separated Opto Switches

Matched Pair

KODENSHI





- Internally modulated infra-red LED and a matching photodetector mounted insepa-rate compact housings with lenses
- May be used up to 100cm separation
- Electrical connection is made by integral connector
- Logic output detector will drive TTL cir-cuits directly
- Integral light filtering and modulation pro-vide immunity to ambient light
- May be used for sensing applications where wide separation is required at an economic cost
- May also be used in reflective mode with a very long range
- 3 way cable assembly for emitter and detector available, lead length - 30cm

Detecting Distance: 100cm minimum @ Vcc 5V
Power Dissipation: 100mW maximum
Switching speeds: 0.5mS
Operating temperature range: -10°C to +60°C

343629/206515

Mftrs. List No.	Order Code	Price Each 1+	5+	10+	25+	+
PIE310/PID310D	**118-2343**●	44.37	39.56	35.88	24.44	– –
Cable assembly	**121-5660**●	5.43	5.13	4.53	3.76	– –

Ultra Violet Emitters

UV LEDs, 3mm and 5mm

A selected range of low cost Ultra Violet (UV) LEDs in 3mm and 5 mm package styles.
The range includes various wavelength, power and half angle variants.
The UV LED is of particular use for compound analy-sis whereby a product may fluoresce when exposed to UV light. The wavelength of light emitted from the subject may be then monitored and processed.

CAUTION: Invisible UV Radiation, precautions must be taken when operating. During operation the UV LEDs radiate intense UV light. Do not look directly into the UV light, as this can be harmful to the eyes even for very brief periods of time.

Size	Luminous Intensity (mcd)	Output Power mW	Half Intensity Angle	Peak Wavelength	Forward Voltage @ 10mA	Forward current I_{FM}	Mftrs List No.
3	1200	—	20°	400nm	3.2V	30	HUVL400-320B
5	2200	1.8	10°	400nm	3.2V	30	HUVL400-510
5	2200	1.8	10°	400nm	3.2V	30	HUVL400-510B
5	2200	1.8	20°	400nm	3.2V	30	HUVL400-520B
5	1700	1.8	30°	400nm	3.2V	30	HUVL400-530B
5	—	1.5	10°	370nm	3.2V	30	HUVL370-510

240946

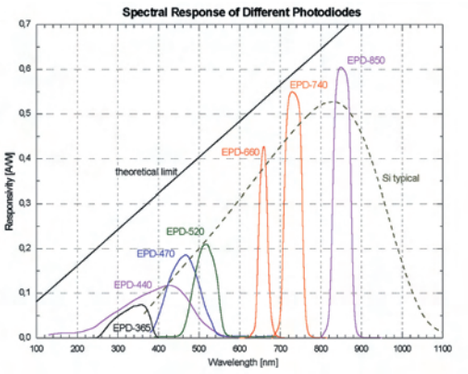
Mftrs List No.	Order Code	Price Each 1+	3+	5+	10+	+
HUVL400-510	**120-0310**●	8.63	7.81	6.93	5.80	– –
HUVL400-510B	**120-0311**●	9.07	8.19	7.25	6.02	– –
HUVL400-520B	**120-0312**●	9.07	8.19	7.25	6.02	– –
HUVL400-530B	**120-0313**●	9.07	8.19	7.25	6.02	– –
HUVL370-510	**120-0332**●	17.96	16.25	14.49	12.06	– –

Emitters and Detectors

Wavelength Selective and UV Photodiodes

T0-46 Case

5mm Plastic Case



Spectral Response chart for Photodiodes

- Highly Wavelength Selective
- Addition Filters not required
- High signal to Noise Ratio
- Higher Responsivity than Traditional Sili-con Photodiodes
- Rise / Fall times ~ 100ns
- Dark Currents <0.1nA
- Operating Temperature (TO can) -40 to +125°C

A range of highly wavelength selective photodiodes using patented technology which offers a responsivity of 0.5 A/W, this can be acheived without any additional filters. Unwanted signals from ambient light may be neglected because of the excellent selectivity of the devices.The following chart shows the spectral responsivity for the range of photodiodes. The range covers wavelengths from Infrared up into the UV region.

Typ Resp. at λ_p	Spectral Range (min)	Spectral Range (max)	Active Area	Dark Current $V_{R=.01V}$	Case Style	Wavelength Peak Sensitivity λ_p	Mftrs. List No.
0.07Sλ	245nm	400nm	1.96mm²	0.002nA	TO-46	365nm	EPD-365-0/1.4
0.12Sλ	190nm	570nm	1.2mm²	0.020nA	TO-46	440nm	EPD-440-0/1.45
0.12Sλ	430nm	510nm	0.13mm²	0.05nA	5mm plastic lens	440nm	EPD-470-5/0.5
0.14Sλ	490nm	560nm	0.13mm²	0.05nA	5mm plastic lens	525nm	EPD-520-5/0.5
0.12Sλ	620nm	700nm	0.13mm²	0.2nA	5mm plastic lens	660nm	EPD-660-5/0.5
.5Sλ	700nm	780nm	0.13mm²	0.2nA	5mm plastic lens	740nm	EPD-740-5/0.5

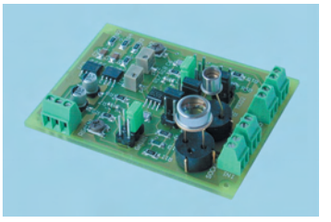
Mftrs. List No.

EPD-365-0/1.4 = 120-0314 EPD-470-5/0.5(RoHs) = 120-0327 EPD-660-5/0.5 = 120-0329
EPD-440-0/1.45 = 120-0315 EPD-520-5/0.5 = 120-0328 EPD-740-5/0.5(RoHs) = 120-0330

241019

Peak Wavelength	Order Code	Price Each 1+	3+	5+	10+	+
365	**120-0314**●	89.73	82.83	78.72	– –	– –
440	**120-0315**●	89.73	82.83	78.72	– –	– –
440	**120-0327**●	13.86	11.58	10.89	10.14	– –
525	**120-0328**●	13.86	11.58	10.89	10.14	– –
660	**120-0329**●	22.32	18.60	17.49	16.32	– –
740	**120-0330**●	22.32	18.60	17.49	16.32	– –

Photodiode 2-channel Amplifier Board



- Ideal for Photodiode Evaluation
- Two channels with Adjustable Gain
- Photodiodes Plug into Board or Con-nect to Screw Terminals
- On-Board Voltage Regulators

Note: the board is supplied without photo-diodes

In most applications using photodiodes only very small photocurrents are generated. These currents normally range from a microampere down to picoampere and they cannot be measured by a usual multimeter, the multifunctional amplifier board provides this function by converting the minute photocurrents to voltages using transimpedance ampifiers.
The board has two independant channels, each with adjustable gain with links to select voltage or transimpedance amplifier type and also to cascade the amplifiers into a single two-stage amplifier.
Current gain is provided in the range 10^5 V/A....10^7 and voltage gain from 2 to 1000 V/V in single stage configuration. Higher gains up to 10^{10} V/A may be achieved in two-stage configuration.
The circuit is ideally operated with a dual power supply of ±9V to ±24V. For lower performance measurements a single supply of 24V to 36V may be used.The photodiodes plug directly into sockets or are externally connected via screw terminals. The output voltages are available on screw terminals.

241020

Description	Order Code	Price Each 1+
Photodiode Amplifier Board	**120-9955**	206.53

● Compliant
◄ Non-compliant
+ Limited stock - RoHS replacement available
RoHS

C = CYAN M = Magenta Y = Yellow B = Black/SING

Infra-Red – 875nm

Surface Mount and 5mm/T1¾

AVAGO TECHNOLOGIES

5mm/T1/¾
L=8.7 (body)
Lead pitch - 2.54, leads = 22.5 x 0.5sq
Cathode identified by shorter lead

Subminiature Surface Mount:
H=2.16 (Flat top), 2.92 (Domed)
W=2.04, D=2.21
Overall width across leads (gull wing) = 3.81
Lead spacing (through hole) = 2.54, lead length=10.42
Cathode identified by stripe on body

Light Output @ 50mA	Half Angle	Peak Wavelength	Switching t_r, t_f(µs)	Mftrs. List No.	Package	Order Code
Emitters - 5mm/T1¾						
38mW/Sr	30°	875nm	0.4, 0.4	HSDL-4220	5mm/T1¾	100-3402
75mW/Sr	17°	875nm	0.4, 0.4	HSDL-4230	5mm/T1¾	100-3413
Emitters - Flat Top Lens, Subminiature Surface Mount						
30mW/Sr	110°	875nm	0.4, 0.4	HSDL-4400-011	Gull Wing	100-3403
30mW/Sr	110°	875nm	0.4, 0.4	HSDL-4400-1L1	Through Hole	100-3404
Emitters - Domed Lens, Subminiature Surface Mount						
17mW/Sr	24°	875nm	0.4, 0.4	HSDL-4420-011	Gull Wing	100-3405
17mW/Sr	24°	875nm	0.4, 0.4	HSDL-4420-1L1	Through hole	100-3406

Sensitivity λ@ 875nm	Half Angle	Peak Response	Response t_r, t_f(µs)	Mftrs. List No.	Package	Order Code
Detectors - Flat Top Lens, Subminature Surface Mount						
0.5A/W @875nm	110°	875nm	0.75, 0.75	HSDL-5400-011	Gull Wing	100-3407
0.5A/W @875nm	110°	875nm	0.75, 0.75	HSDL-5400-1L1	Through Hole	100-3408
Detectors - Domed Lens, Subminature Surface Mount						
0.5A/W @875nm	28°	875nm	0.75, 0.75	HSDL-5420-011	Gull Wing	100-3411
0.5A/W @875nm	28°	875nm	0.75, 0.75	HSDL-5420-1L1	Through Hole	100-3412

The HSDL-5400 series has an optical filter to reduce the effects of ambient light

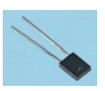
206480

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
Emitters - 5mm/T1¾						
HSDL-4220	100-3402●	2.19	1.87	1.47	1.02	– –
HSDL-4230	100-3413●	2.32	1.98	1.56	1.08	– –
		1+	10+	100+	500+	+
Emitters - Flat Top Lens, Subminiature Surface Mount						
HSDL-4400-011	SMD 100-3403●	1.76	1.50	1.18	0.82	– –
HSDL-4400-1L1	SMD 100-3404●	1.68	1.43	1.12	0.78	– –
Emitters - Domed Lens, Subminiature Surface Mount						
HSDL-4420-011	SMD 100-3405●	1.76	1.50	1.18	0.82	– –
HSDL-4420-1L1	SMD 100-3406●	1.96	1.67	1.31	0.91	– –
Detectors - Flat Top Lens, Subminiature Surface Mount						
HSDL-5400-011	SMD 100-3407●	1.29	1.06	0.74	0.62	– –
HSDL-5400-1L1	SMD 100-3408●	1.46	1.19	0.84	0.70	– –
Detectors - Domed Lens, Subminiature Surface Mount						
HSDL-5420-011	SMD 100-3411●	1.29	1.06	0.74	0.62	– –
HSDL-5420-1L1	SMD 100-3412●	1.45	1.19	0.83	0.69	– –

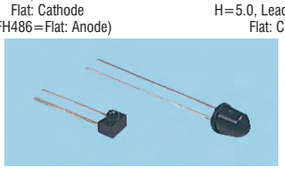
Infra-Red Emitters - Plastic Package

5mm/T1¾
Lead pitch=2.54
Flat: Cathode
(SFH486=Flat: Anode)

5mm/T1¾
SFH485F-1: Flat top
H=5.0, Lead pitch=2.54
Flat: Cathode

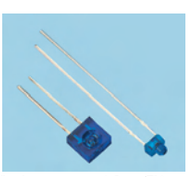


Side Viewing
SEP8506-3:
5.7 x 4.5 x 2.3
Lead pitch=2.54



Side viewing
SEP8736-3
3.3 4.57 4.29
Lead pitch=2.54

TO-18
Lead pitch 2.54
tab: cathode



Side Viewing
CQX48B
5.0 5.0 2.65
Lead pitch=2.54

1.8mm/T¾
CQY37N
L=2.9, Lead pitch=2.54
Flat: Cathode

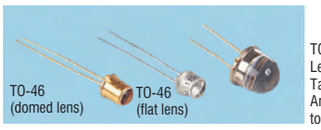
OPE5... Series, Cathode = Short Lead, Anode = 24mm (Min)

Light Output mW @ 1_F (mA)	Half Angle	Peak Wavelength	Switching tr,tf (µs)	Mftr.	Mftrs. List No.
5mm/T1¾					
38W/sr@100	30°	875nm	0.4	AV	HSDL-4220
80W/sr@100	10°	940nm	25	KNON	OPE5594A
50W/sr@100	22°	850nm	25	KNON	OPE5685
90W/sr@100	10°	880nm	25	KNON	OPE5587
15mW/sr@100	50°	950nm	1	OSRAM	LD271
>40mW/sr@100	34°	950nm	0.5	OSRAM	SFH415-U
80–160mW/sr@100	16°	880nm	0.6, 0.5	OSRAM	SFH484-2
3.15–6.3mW/sr@100	80°	880nm	0.6, 0.5	OSRAM	SFH485P.
60mW/Sr @ 100	22°	880nm	0.6, 0.5	OSRAM	SFH486.
30-50mW/sr @ 100	12°	875nm	0.6	VISH	TSHA5201.
25-40mW/sr @ 100	12°	875nm	0.6	VISH	TSHA5200.
15mW/Sr @ 100	35°	950nm	0.4, 0.45	VISH	TSUS5202.
11W/sr@100	50°	950nm	0.4	VISH	TSUS5400.
30-50mW/sr @ 100	12°	875nm	0.6	VISH	TSHA5201
25-40mW/sr @ 100	12°	nm	0.6, 0.6	VISH	TSHA5200
15W/sr@100	15°	950nm	0.4	VISH	TSUS5202
11mW/Sr	22	950	0.4	VISH	TSUS5400
3mm/T1					
16-30mW/sr @ 100	20°	875nm	0.6	VISH	TSHA4401.
7-18mW/sr @ 100	16°	950nm	0.8	VISH	TSUS4300.
16-30mW/sr @ 100	25°	940nm	0.8	VISH	TSAL4400.
0.5mW/Sr @ 20	16°	940nm	0.6, 0.35	OPTEK	OP165D
2–4mW/cm² @100	15°	800nm	0.6	HWL	SEP8705-3
16-30mW/Sr @ 100	20°	875nm	0.6, 0.6	VISH	TSHA4401
7-18mW/sr @ 100	16°	950nm	0.8, 0.8	VISH	TSUS4300
16–30mW/cm² @100	25°	nm	0.8	VISH	TSAL4400
1.8mm/T¾					
2.2-5mW/sr @ 50	12°	950nm	0.4, 0.45	VISH	CQY37N.
2.2-5mW/sr @ 50	12°	950nm	0.4, 0.45	VISH	CQY37N
TO-18 Narrow angle					
4.8mW @ 100	25°	890nm	0.5, 0.25	OPTEK	OP298B
TO-18 Wide Angle					
26mW/ @ 100	60°	890nm	0.5, 0.25	OPTEK	OP293B
Side Viewing					
0.4–1.2mW/cm²	40°	890nm	0.5, 0.25	OPTEK	OP240B
–mW/cm² @ 100	50°	935nm	0.6	HWL	SEP85063
1.7mW (min) @20	10°	880nm	0.7	HWL	SEP8736-3.

206221

Order Multiple=5 Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
5mm/T1¾						
HSDL-4220	100-3402●	2.19	1.87	1.47	1.02	– –
OPE5594A	489-0929●	1.79	1.50	1.20	1.14	– –
OPE5685	489-0930●	1.14	1.01	0.78	0.68	– –
OPE5587	489-0942●	1.24	1.11	0.85	0.75	– –
LD271	121-2748●	1.27	1.08	1.02	0.84	– –
SFH415-U	121-2749●	0.78	0.66	0.62	0.51	– –
SFH484-2	121-2737●	1.98	1.68	1.58	1.31	– –
SFH485P	121-2738●	1.70	1.45	1.36	1.12	– –
SFH486	121-2759●	1.32	1.16	1.09	0.90	– –
TSHA5201	104-5516●	0.76	0.70	0.58	0.47	– –
TSHA5200	104-5522●	0.72	0.64	0.54	0.43	– –
TSUS5202	104-5377●	0.38	0.34	0.28	0.23	– –
TSUS5400	104-5378●	0.38	0.34	0.28	0.23	– –
3mm/T1		5+	25+	100+	250+	+
OP165D	178-945●	4.82	4.00	3.46	1.36	– –
SEP8705-3	120-1203●	2.95	2.77	2.68	2.55	– –
TSHA4401	104-5517●	0.78	0.70	0.58	0.47	– –
TSUS4300	104-5518●	0.45	0.40	0.34	0.27	– –
TSAL4400	104-5420●	0.34	0.31	0.26	0.21	– –
1.8mm/T1¾		5+	25+	100+	250+	+
CQY37N	104-5521●	0.68	0.61	0.51	0.41	– –
TO-18 Narrow Angle		1+	25+	100+	500+	+
OP298B	491-305●	2.58	1.89	1.80	1.77	– –
TO-18 Wide Angle						
OP293B	491-299●	2.93	1.32	– –	– –	– –
Side Viewing		5+	25+	100+	500+	+
OP240B	316-7537●	2.64	2.11	1.83	1.39	– –
		1+	25+	100+	500+	+
SEP85063	120-1204●	2.89	2.68	2.61	2.43	– –
SEP8736-3	120-1209●	2.89	2.68	2.61	2.43	– –

Infra-Red Emitters - Sealed Metal Package



TO-46
Lead pitch=2.54,
Tag: Cathode
Anode connected to case.

Light Output mW @ 1_F (mA)	Half Angle	Peak Wavelength	Switching tr,tf (ns)	Mftr.	Mftrs. List No.
TO-46 Narrow Angle (Domed Lens)					
5@100	18°	935nm	1	OPTEK	OP133
7.0@100	20°	880nm	0.6	HONEYWELL	SE5470-3
9	20	880	1.5	QT	F5D2
3.5@100	15°	940nm	1	QT	LED55B
5.4@100	15°	940nm	1	QT	LED55C
TO-46 Wide Angle (Flat Lens)					
12@100	80°	880nm	1.5	QT	F5E1

◆ Power emitted about the mechanica axis of the package into 6.35mm dia. aperture placed 36.3mm from top of flange.

221666

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Mftrs. List No.	Order Code	Price Each 1+	25+	50+	100+
TO-46 Narrow Angle					
OP133	**316-7549●**	6.65	5.98	5.17	3.56
SE5470-3	**327-359●**	8.70	8.35	8.03	7.65
F5D2	**102-1135●**	6.33	5.55	3.88	2.88
LED55B	**102-1136●**	6.14	5.14	3.60	2.67
LED55C	**102-1137●**	6.26	5.24	3.67	2.72
TO-46 Wide Angle					
F5E1	**102-1139●**	6.66	5.75	4.02	2.98

Infra-Red Emitter - Panel Mounting

CQW13 infra-red emitter in bright plated housing with mirror reflector and optical system, giving high radiation intensity (720mW/Sr typ.) and greatly increased transmission distance. Designed for pulse operation (1.5A max).

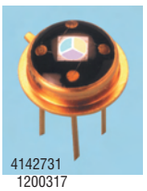
Body L=18, Bezel dia.=13, Thread=M8#0.75, Short Lead: Cathode

Half Angle	20°typ.	Switching Time	1.0µs
Peak Response	950nm	Temperature Range	-25°Cto +100°C

206222

Mftrs. List No.	Order Code	Price Each 1+	25+	100+
RTM5070	**121-5798●**	18.69	14.79	12.29

MCS3 Colour Sensors — JEN-COLOUR



4142731
1200317

4142720
1200316

4142743
1200319

4142755
1200321

4142780

- Rapid Colour Recognition
- 3 x On-chip Integrated PIN Photodiodes
- Leaded and SMD Package Versions
- Dielectric Filters for the three colour ranges: Red, Green and Blue
- TO5 versions with/without IR-Blocking
- SMD version

Applications:
- Quality Control
- Production Monitoring
- Control of Manufacturing
- Detection of Colour Marks

The **MCS3** colour sensors are made up of 3 x Si-PIN photo diodes integrated onto a single chip. They are constructed as segments of a ring with the diameter of 2,0 mm. The design uses Si-PIN photo diodes which allow signal frequencies up to MHz-range. In order to achieve low cross talk between the photodiodes, the individual sectors are separated from each other by additional structures. Each of the photodiodes are sensitised with a dielectric spectral filter for a specific colour range from the primary colours red, green and blue. The individual outputs are then accessable for processing.
The range is further enhanced by variants with infrared filtering which give considerable attenuation to wavelengths above 725nm.
The **MCSi** colour sensors feature a hexagonal matrix of 3 x 19 Si-PIN photodiodes on one substrate, each photodiode having an individual filter above it. These devices average the colour signal from the whole sensing area and makes the unit less sensitive to images which are not central onto the array.
A development board is available for the evaluation and testing of the sensors for colour recognition. Specific adapter boards allow the TO-5 and SOP8 packages to be utilised. Four white light LEDs illuminate a test surface under an incident angle of 45°(approx.). At a distance of 20 mm along the surface, diffused reflected light is detected and digitised by the MCS colour sensor.
Communication between a PC computer and the MCS-EB1 development board is via an RS232 interface. Through this interface the sensor data may be read and parameters for the sensors set up. The PC software allows manual gain selection for the current-voltage converter. In addition to the 10-bit ADC output values obtained for the various RGB photocurrents, the normalised colour portions and mixed colours are represented on an animated screen in real-time.
To complement the sensors a dedicated four channel SMD transimpedance amplifier is available in a SOP16 package.

Rev. Voltage (typ)	Dark Current (nA)	Rise / Fall Time (µ)	Crosstalk %	Lead Cap. (pF) V_R=5V	Noise Equ. Pwr. W/√Hz	Package Style	Mftrs List No.
5V	0.1	<1	0.5%	50	$<10^{-13}$	SO-8	MCS3AS
5V	0.1	<1	0.5%	50	$<10^{-13}$	TO-5	MCS3AT
9V	0.1	<1	0.5%	50	$<10^{-13}$	TO-5	MCS3BT
5V	0.1	<1	0.5%	<100	$<10^{-13}$	TO-5	MCSIAT
Field of	λ_B	400 - 510nm					
Spectral	λ_G	490 - 610nm					
Sensitivity	λ_R	590 - 750nm					

Mftrs. List Nos: MCS3AS = 120-0316 MCS3BT = 120-0319 MCS-EB1 = 120-0322
MCS3AT(RoHs) = 120-0317 MCSIAT(RoHs) = 120-0321

241023

Description	Order Code	Price Each 1+	3+	5+
Colour Sensor SOP8	SMD **120-0316●**	78.24	72.21	68.63
Colour Sensor TO-5	**120-0317●**	91.05	84.68	– –
Colour Sensor TO-5 with I/R filter	**120-0319●**	118.41	110.11	– –
Colour Sensor Array TO-5	**120-0321●**	113.76	105.79	– –
Colour Sensor Array TO-5 Four Channel Photodiode Preamp	SMD **414-2779**	21.69	20.22	19.76

PIN Photodiode Detector - Plastic Package — EG & G VACTEC

H=6.0, W=8.0, D=1.8
Cathode indentified by dot on body

- Blue enhanced silicon PIN photodiode
- Excellent for monitoring ambient visible light
- Industry standard in street light control and security lighting markets
- Includes filter which removes sensitivity to unwanted infra-red
- For applications involving visible light
- Active area: 5.16mm²
- Spectral range: 330-720 nm

206513

Mftrs. List No.	Order Code	Price Each 1+	25+	50+	100+	+
VTB8440BH	**118-2340●**	5.97	5.85	5.49	5.49	– –

Photodiode Detectors - High output with filter options — SILONEX

- Standard, IR and BG spectral response
- High output for package size
- Active area: 9.8mm² & 2.0mm²

Housed in epoxy coated ceramic packages, these devices feature high photocurrent output for the package size. Available in standard spectral response, I_R filtered (for daylight rejection applications) and BG filtered (for daylight sensing applications). With two active areas available these devices are an excellent balance of performance and economy.

	Short circuit current typ. @ 25mW/cm²	Breakdown voltage V @ 1_R100µA	Spectral Peak (nm)	T_rT_f	Order Code
SLD-70 BG2A	55µA	50	550(1)	4/6	121-9006
SLD-70 C2A	700µA	50	930(2)	4/6	121-9007

(1)Low $I_R$response,, (2) Standard photodiode response

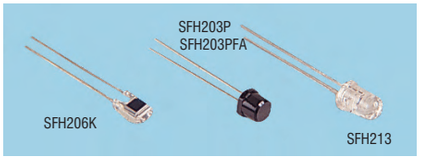
221721

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+
SLD-70 BG2A	**121-9006●**	7.53	6.36	5.67	4.96
SLD-70 C2A	**121-9007●**	4.32	3.63	3.21	2.88

Photodiode Detectors - Plastic Package

BPW34: H=4.3, W=4.7, D=2.8
BPW34B, BPW34FA: H=4.0, W=4.5, D=2.2
Lead pitch=5.1, Ident=Cathode

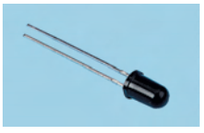
BPW41N (side viewing)
H=6.8, W=5.0, D=4.0
Lead pitch=2.5, Ident=Cathode



SFH206K (side viewing) H=6.8, Dia=5.0 Lead pitch=2.54 Chamfer=Cathode

SFH203P, SFH203PFA
5mm/T1¾ flat top, H=4.2
Lead pitch=2.54 Flat=Cathode

SFH213
5mm/T1¾ Lead pitch=2.54
Flat=Cathode



SFH203-FA,
SFH213-FA
5mm/T7¾
Lead pitch=2.54
Flat Cathode

Optoelectronics, Indicators, Lamps & Displays

28

● Compliant
◄ Non-compliant
‡ Limited stock - RoHS replacement available

RoHS

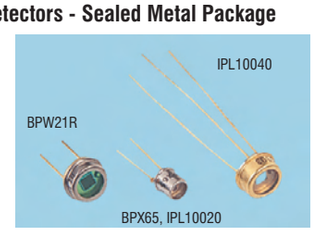
Sensitivity @ λ=850nm	Active Area	Half Angle	Peak Response	Response t_r,t_f(µs)	Mftr.	Mftrs. List No.
0.62A/W @ 850nm	7.5mm²	60°	900nm	0.05	VISH	BPW34
75nA/lx @ 850nm	7.45mm²	60°	850nm	25	OSRAM	●BPW34-B
0.59A/W @ 850nm	7mm²	60°	950nm	0.4	OSRAM	◆BPW34-FA
0.62A/W @ 850nm	7mm²	60°	850nm	0.001	OSRAM	BPW34S
0.59A/W @ 850nm	7mm²	60°	950nm	0.002	OSRAM	◆BPW34FS
0.6A/W @ 850nm	7.5mm²	65°	940nm	0.05	VISH	◆BPW41N
0.62A/W @ 850nm	1mm²	20°	850nm	0.005	OSRAM	SFH213
0.59A/W @ 850nm	1mm²	20°	900nm	0.005	OSRAM	◆SFH213-FA
0.62A/W @ 850nm	7mm²	70°	nm	0.35	OSRAM	SFH206K
0.62A/W @ 850nm	1mm²	60°	850nm	0.002	OSRAM	SFH203P
0.59A/W @ 850nm	1mm²	60°	900nm	0.002	OSRAM	◆SFH203PFA
.59A/W @ 850nm	1mm²	20°	900nm	0.002	OSRAM	◆SFH203-FA

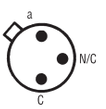
◆with IR filters (filters out daylight). ●Blue enhanced response-sensitivity at λ = 400nm.

206259

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
BPW34	**104-5425●**	1.80	1.60	1.34	1.08	– –
BPW34-B	**121-2739●**	12.63	10.73	10.10	8.33	– –
BPW34-FA	**121-2740●**	2.16	1.89	1.78	1.47	– –
BPW34S	**121-2745●**	2.25	1.95	1.76	1.56	– –
BPW34FS	**121-2747●**	1.95	1.76	1.69	1.40	– –
BPW41N	**104-5426●**	1.84	1.64	1.37	1.10	– –
SFH213	**121-2761●**	1.59	1.40	1.17	0.98	– –
SFH213-FA	**121-2763●**	1.59	1.40	1.17	0.98	– –
SFH206K	**121-2741●**	2.78	2.36	2.22	1.83	– –
SFH203P	**121-9691●**	1.56	1.46	1.37	1.27	– –
SFH203PFA	**121-2742●**	2.47	2.10	1.98	1.63	– –
SFH203-FA	**121-2743●**	1.74	1.54	1.45	1.20	– –

Photodiode Detectors - Sealed Metal Package





IPL10040

BPX65, IPL10020 (T0-18 flat lens) Lead pitch=2.5 Tag: Anode

BPW21R (T039) H=3.0, Dia=8.0 Lead pitch=5.0 Tag: Anode

IPL10040 (TO-5 flat lens) H=3.9, Dia=8.25

Sensitivity (typ.)	Active Area	Half Angle	Peak Response	Response t_r t_f (µs)	Mftr.	Mftrs. List No.	Order Code
0.55A/W	1mm²	74°	850nm	0.0035	CENT.	BPX65.	327-451
0.5A/W	0.66mm²	50°	900nm	0.004	IPL	IPL10020BW.	121-2464
0.5A/W	5.5mm²	100°	900nm	0.01	IPL	IPL10040DW.	121-2465
7nA/lux	7.5mm²	100°	560nm	3.5	IPL ■	BPW21R	104-5427

■ with colour correction filter (visible radiation)

206217

Order Code	Price Each 1+	25+	100+	250+	+
327-451●	18.30	17.97	16.53	11.81	– –
121-2464●	15.66	8.40	– –	– –	– –
121-2465●	21.90	14.28	– –	– –	– –
104-5427●	21.40	19.05	15.94	12.84	– –

Silicon Avalanche Photodiode (APD) - Hermetically Sealed Metal Package

EG & G

H=3.89, Dia.= 5.41,
Lead Pitch=1.27,
Lead Length=12.7 x 0.46 dia.
Centre pin Cathode

- Offers internal photoelectric gain
- Used to detect extremely low light levels - 400 - 1150nm region
- Provides greater detection sensitivity than a PIN photodiode, the latters sensitivity is limited by pre-amplifier noise
- 0.5mm active diameter
- Fast response time - 0.5ns typically
- Wide operating temperature: -40°C to +70°C

206516

Mftrs. List No.	Order Code	Price Each 1+	+	+	+	+
C30902EH	**118-2339●**	322.79	– –	– –	– –	– –

Photodiode Detectors - Sealed Metal Package

CENTRONIC

OSD1-5T (TO18): H=5.1, Dia.=4.7, Lead pitch=2.54, Tag: Anode

OSD5-5T, OSD15-5T (TO5): H=3.1, Dia.=8.1, Lead pitch=5.1, Tag: Anode

Silicon photodetectors for low light level and high signal to noise ratio applications.

H=5.1, Dia.=4,7
Lead pitch=3.0 Tag: Anode

H=3.67, Dia.=4,68

High sensitivity chip suitable for fibre applications and encoder designs

Responsivity (typ.)	Active Area	Dark Current (max.)	NEP W/Hz½	Cap. (V_r=12V) pF (max.)	Shunt Res. MΩ (min.)	Risetime ns (Typ.)	Mftrs. List No.
0.21A/W	1mm²	1nA	$2.5x10^{-14}$	7	250	7	OSD1-5T.
0.21A/W	5mm²	2nA	$3.3x10^{-14}$	35	100	9	OSD5-5T.
0.21A/W	15mm²	5nA	$5.5x10^{-14}$	80	50	12	OSD15-5T.
0.55A/W	1mm²	5nA	$3.3x10^{-14}$	3.5	—	8	BPX65RT.
0.35A/W	0.55mm²	10nA	$6.8x10^{-14}$	8	—	1	AEPX65.

*V_F = 5V, **V_F = 20V

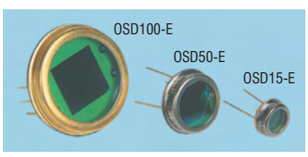
206318

Mftrs. List No.	Order Code	Price Each 1+	5+	10+	25+	+
OSD1-5T.	**548-716●**	20.19	16.41	15.62	– –	– –
OSD5-5T.	**548-728●**	24.81	23.22	22.09	– –	– –
BPX65RT.	**548-789●**	13.56	11.55	10.35	8.91	– –
AEPX65.	**548-777●**	40.29	26.55	25.25	– –	– –
		1+	**10+**	**25+**	**50+**	
OSD15-5T.	**548-730●**	39.69	36.93	34.44	27.30	

Photodiode Detectors - Sealed Metal Package

CENTRONIC

Eye Response Detectors



- Silicon photodetectors with colour correcting filters
- Spectral response approximating that of the human eye
- Ideal for photometric applications

Responsivity nA Lux^{-1} (typ.)	Active Area	Dark Current (max.)	NEP W/Hz½	Cap. (V_r=12V) pF (max.)	Shunt Res. MΩ (min.)	Risetime ns (Typ.)	Mftrs. List No.
22	15mm²	10mA	$5.2x10^{-14}$	80	5	12	OSD15-E.
30	50mm²	40mA	$9.3x10^{-14}$	270	1.5	26	OSD50-E.
60	100mm²	100mA	$1.2x10^{-13}$	520	1	45	OSD100-E.

206310

Mftrs. List No.	Order Code	Price Each 1+	5+	10+	25+	+
OSD15-E.	**548-741●**	55.62	47.22	43.05	37.11	– –
OSD50-E.	**548-753●**	132.63	113.09	– –	– –	– –
OSD100-E.	**548-765●**	293.67	250.36	– –	– –	– –

Proximity Sensor

Miniature Surface Mount

AVAGO TECHNOLOGIES

NEW

H = 2.7, W = 6.9, D = 2.35mm

- Excellent optical isolation resulting in near zero optical cross-talk
- High efficiency emitter and high sensitivity photodiode for high signal-to-noise ratio
- Detects objects from near zero to 60mm
- Low dark current
- Guaranteed temperature performance

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

The HSDL-9100 is an analog-output reflective sensor with an integrated high efficiency infrared emitter and photodiode housed in a small form SMD package. The small size makes it ideal for space-constrained mobile applications such as mobile phones and PDAs. It provides a long detection range (60mm) and offers programmability for easy design into a variety of portable devices. This innovative Proximity Sensor performs reliably within the temperature range of -25°C to 85°C.

Recommended operating conditions	Min.	Max.
Operating Temperature (°C)	-40	85
Forward Voltage (V) - Emitter	1.5 (Typ.)	1.65
Reverse Voltage (V) - Emitter	5	
Peak Wavelength (nm)	940 (Typ.)	
Dark Current (nA) - Detector	2	10
Forward Voltage (V) - Detector		1.3
Reverse Voltage (V) - Detector		35

417936

Mftrs. List No.	Order Code	Price Each 1+	10+	25+	100+
HSDL-9100-021	961-3846●	2.67	2.44	2.25	2.08

Photodiode with Integral Amplifier

Visible and Infra-Red

H=4.6, W=4.6, D=2.5. Lead pitch=2.0

Optical sensors combining photodiode and transimpedance amplifier on a single monolithic IC. Output voltage is directly proportional to light intensity. Excellent noise immunity and low power consumption.

TSL25X have a wide spectral response and are housed in clear package. TSL26X Series have integral filter to cut out visible light and are housed in black IR-transmissive package. Choice of sensitivities allow easy matching to different light levels.

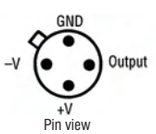
Supply voltage	3V to 9V dc (5V nom.)	Dark Voltage	10mV (max.)
Supply current	900µA (typ.)	Output Voltage	

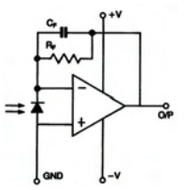
Responsivity (mV/mW/cm²)	Spectral Response (nm) Peak	>30% peak	Response t_r, t_f (µs)	Mftrs. List No.
80	800	340 to 950	360	TSL250
45	800	340 to 950	90	TSL251R
23	910	850 to 1030	90	TSL261R
2.8	910	850 to 1030	7	TSL262R

OPT245

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+
TSL250R	489-1053	9.34	5.60	4.78	4.46

Photodiode with Integral Amplifier IPL





Hybrid photodetector consisting of photodiode and amplifier with feedback circuit providing an output voltage proportional to the incident light level (increasing with increasing light level). Operates from single or dual supply.

dc supply voltage	+4V to +36V or ±2V to ±18V	Peak Spectral response	900nm
Active area	1.75mm²	Frequency response (-3dB)	65kHz

Lens	Output Voltage at Peak Responsivity	Half Angle	Mftrs. List No.
Flat	860mV/µW/cm²	86°	IPL10530DAW
Domed	860mV/µW/cm²	27°	IPL10530DAL

206234

Mftrs. List No.	Order Code	Price Each 1+	10+	25+	100+	+
IPL10530DAW	121-2466●	65.58	58.38	53.52	– –	– –
IPL10530DAL	121-2459●	49.31	45.57	43.45	41.50	– –

Hybrid Emitters and Detector IPL

The emitter units include a monitoring photodiode and amplifier, the output of which can be used to servo the emitter for constant output. Alternatively, an emitter can be used in conjunction with the detector unit, which is a photodiode and amplifier matched to the emitter. The two outputs can then be fed into a difference amplifier for various differential monitoring applications including smoke monitors and meters, particle monitoring and various water analysers.

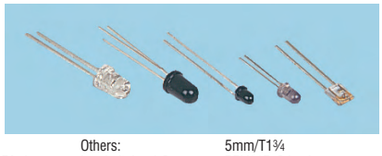
Emitter Units		Detector Units	
dc supply voltage	±2V to ±18V	dc supply voltage	±2V to ±18V +14V to +36V
Wavelength (pk)	Green: 565nm IR: 880nm	Peak Spectral response	900nm
LED beam angle(-3dB)	10°	Freq. response (-3dB)	35kHz
Detector freq. response (-3dB)		Half angle	27°

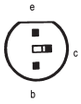
206273

	Order Code	Price Each 1+	10+	25+
Emitter, Green	121-2460	77.55	73.77	68.54
Emitter, IR	121-2462●	77.05	– –	– –
Detector	121-2463●	72.81	65.55	60.39

Phototransistor Detectors -

Plastic Package



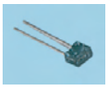


3mm/T1
BPW85B, SFH309-FA-4:
Lead pitch=2.54
Short lead: Collector

Others:
Lead pitch=1.3
Flat: Collector

5mm/T1¾
BPV11F: 3 lead,
pins on 2.54 PCD

Side Viewing
SDP8406-3
5.7 x 4.5 x 2.3
Lead pitch=2.54



Side Viewing
SDP8436-3
3.3 x 4.57 x 4.29
Lead pitch=2.54

1.8mm/T¾
BPW17N
L=2.9, Lead
pitch=2.54
Flat: Collector

Sensitivity (mA)/(mW/cm²) min	Half Angle	Peak Response	Response t_r t_f (µs)	Mftr.		Mftrs. List No.
5mm/T1¾						
3.0-10.0 @ 1mW/cm²	15°	950nm	3.8	VISH		BPV11
9.0 (typ) @ 1mW/cm²	30°	900nm	3.3	VISH	◆	BPV11F
3mm/T1						
1.0-2.0 @ 0.5mW/cm²	32°	900nm	10	OSRAM	◆	SFH309FA-4
1.5-4.0 @ 1mW/cm²	50°	830nm	1.5	VISH		BPW85
3.0-8.0 @ 1mW/cm²	25°	950nm	1.5	VISH		BPW85C
0.8-3.2 @ 1mW/cm²	30°	950nm	1.5	VISH		TEFT4300
4.0 (min) @ 20mW/cm²	16°	840nm	5	OPTEK		OP505D
12.0-24.0 @ 5mW/cm²	40°	880nm	12	HWL		SDP84053
1.8mm/T¾						
0.5-1.0 @ 1mW/cm²	12°	950nm	3.7	VISH		BPW17N
Side Viewing						
3.4-6.5 @ 1mW/cm²	50°	935nm	8	HWL		SDP8406-3
7.0-17.5 @ 1mW/cm²	18°	880nm	10	HWL		SDP8436-3
2.0-4.0 @ 1mW/cm²	37°	920nm	6	VISH		TEKT5400-ASZ

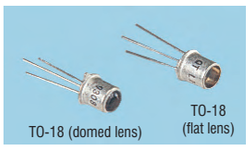
◆ with IR filter (filters out daylight)

206219

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
5mm/T1¾						
BPV11F	104-5379●	2.64	2.35	1.97	1.59	– –
BPV11	104-5525●	2.64	2.35	1.97	1.59	– –
3mm/T1						
SFH309FA-4	121-2744●	1.46	1.30	1.07	0.85	– –
OP505D	178-946●	3.18	2.73	2.37	1.19	– –
SDP84053	120-1205●	2.31	2.19	2.04	1.89	– –
BPW85	104-5380●	1.67	1.49	1.24	1.00	– –
BPW85C	104-5524●	1.78	1.59	1.33	1.07	– –
TEFT4300	104-5526●	1.67	1.49	1.24	1.00	– –
1.8mm/T¾						
BPW17N	104-5523●	2.13	1.90	1.59	1.28	– –
Side Viewing						
SDP8406-3	120-1206●	1.83	1.74	1.65	1.56	– –
SDP8436-3	120-1210●	2.64	2.46	2.34	2.25	– –
TEKT5400-ASZ	104-5447●	1.40	1.25	1.04	0.84	– –

Phototransistor Detectors -

Sealed Metal Package



Pins on 2.54 PCD

Sensitivity IC (mA) / (mW/cm²)	Half Angle	Peak Response	Response t_r t_f (µs)	Mftr.	Mftrs. List No.
Narrow Angle (Domed Lens)					
7-22mA @ 5mW/cm²	15°	850nm	7	OPTEK	OP804SL
8mA @ 5mW/cm²	18°	880nm	6	HWL	SD5443-3
12mA @ 10mW/cm²	15°	850nm	75	QT◆	L14F1
7-22mA @ 5mW/cm²	15°	850nm	5	QT	L14G1
8mA @ 5mW/cm²	15°	850nm	5	QT	L14G3
Wide Angle (Flat Lens)					
1.0mA @ 10mW/cm²	58°	840nm	5	QT	L14C1

◆ Photo Darlington

● Compliant
◄ Non-compliant
++ Limited stock - RoHS replacement available

RoHS

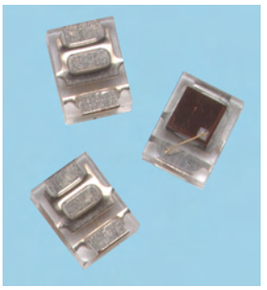
206218

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	1K+
OP804SL	316-7513●	7.83	7.02	6.39	4.08
SD5443-3	327-578●	4.44	4.20	3.99	3.78
L14F1	102-1141●	3.43	2.70	1.99	1.72
L14G1	102-1142●	3.22	2.53	1.87	1.61
L14G3	102-1143●	3.28	2.59	1.91	1.65
L14C1	102-1348●	3.35	2.64	1.95	1.68

Ambient Light Photo Diode

Miniature Surface Mount

AVAGO TECHNOLOGIES



H = 0.6, W = 2.0, D = 1.5mm

NEW

The HSDL-9001 is an analog-output ambient light photo diode in a miniature Quad-Flat surface mount package. The device may be used in applications where ambient light is required or in applications that use daylight and artificial light exposed devices. The device has a spectral response that peaks at the same wavelength as the human eye, 550nm, which ensures that the sensor provides a high performance solution to ambient light detection. Mobile phones and PDAs that draw heavy current from display backlighting benefit from incorporating the device in their designs to significantly reduce the power consumption.

- Close responsivity to the human eye
- Miniature QFN surface mount package
- Infinite ambient detection threshold control
- Guaranteed temperature performance
- V_{CC} supply 2.7 to 3.6V

Recommended operating conditions	Min.	Max.
Operating Temperature (°C)	-40	85
Supply Voltage (V)	2.7	3.6
Light Current (nA)	125 (Typ.)	
Dark Current (nA)		5
Peak Wavelength Sensitivity (nm)	550 (Typ.)	
Switching Time (ms)		2

417935

Mftrs. List No.	Order Code	Price Each 1+	10+	25+	100+
HSDL-9001	SMD 961-3820●	1.27	1.14	1.04	0.98

Ambient Light Photo Sensor

Miniature Surface Mount

AVAGO TECHNOLOGIES

H = 0.8, W = 2, D = 1.25mm

NEW

- Close responsivity to the human eye
- Good output linearity across wide illumination range
- Low sensitivity variation across various light sources
- Guaranteed temperature performance
- V_{CC} supply 2.4 to 5.5V

The APDS-9002 is an analogue-output ambient light photo sensor in a miniature chipLED surface mount package. It consists of a spectrally suited phototransistor, which peaks in the human luminosity curve. Hence, it provides an excellent responsivity that is close to the response of human eye.

The APDS-9002 is ideal for applications in which the measurement of ambient light is used to control display backlighting. Mobile appliances such as mobile phones and PDAs that draw heavy current from display backlighting will benefit from incorporating this photo sensor in the design by reducing power consumption significantly.

Recommended operating conditions	Min.	Max.
Operating Temperature (°C)	-40	85
Supply Voltage (V)	2.4	5.5
Photo Current (µA) - V_{CC}=3V, Lux=10	10	33
Photo Current (µA) - V_{CC}=3V, Lux=100	136	410
Dark Current (nA)	50 (Typ.)	160
Rise time (ms)	0.95 (Typ.)	2
Fall time (ms)	0.95 (Typ.)	2

417937

Mftrs. List No.	Order Code	Price Each 1+	10+	25+	100+
APDS-9002-021	SMD 961-3854●	1.07	0.98	0.91	0.85

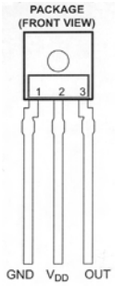
Light to Voltage Optical Sensors

TAOS

Infrared or Visible light Responsivity

H = 4.6, W = 4.6, D = 1.64mm
Lead length = 14.75mm

- Contains photodiode, operational amplifier and feedback components
- High irradiance responsivity
- Low dark(offset) voltage
- Low supply current



These devices are light-to-voltage optical sensors, each combining a photodiode and a transimpedance amplifier (feedback resistor = 16MΩ, 8 MΩ and 2.8MΩ respectively) on a single monolithic IC. Output voltage is directly proportional to the light intensity (irradiance) on the photodiode. They are supplied in a 3 lead plastic sidelooker package with integral lens. The TSL260 series of infrared devices also contain an integral visible light cutoff filter

Supply voltage (Recommended)	2.7 to 5.5V
Supply voltage (Absolute max.)	6V
Offset (dark) voltage	10mV
Supply current	1.1mA
Operating temperature (Recommended)	0 to 70°C
Operating temperature (Absolute max.)	-25 to 85°C

Irradiance Responsivity	Sensitivity (typ.)	Active Area	Peak Response	Output pulse Rise/Fall Time	Mftrs. List No.	Order Code
TSL250 Series						
137mV	14.6µW/cm²	1mm²	635nm	260µs	TSL250R	118-2346
137mV	38.5µW/cm²	0.5mm²	635nm	70µs	TSL251R	118-2347
137mV	196µW/cm²	0.26mm²	635nm	7µs	TSL252R	118-2348
TSL260 Series						
111mV	18µW/cm²	1.0mm²	940nm	260µs	TSL260R	118-2349
111mV	46µW/cm²	0.5mm²	940nm	70µs	TSL261R	118-2350
111mV	220µW/cm²	0.26mm²	940nm	7µs	TSL262R	118-2351

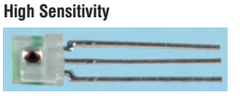
336918

Order Code	Price Each 1+	25+	100+	250+	+
118-2346●	9.34	5.60	4.78	4.46	– –
118-2347●	9.34	5.60	4.78	4.46	– –
118-2348●	9.34	5.60	4.78	4.46	– –
118-2349●	9.34	5.60	4.78	4.46	– –
118-2350●	9.34	5.60	4.78	4.46	– –
118-2351●	9.34	5.60	4.78	4.46	– –

Light to Voltage Optical Sensors

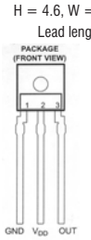
TAOS

High Sensitivity



H = 4.6, W = 4.6, D = 1.64mm
Lead length = 14.75mm

- Converts light intensity to output voltage
- Integral colour filter
- High sensitivity
- Low noise (200 µV rmsTyp. to 1 kHz)
- Rail to rail output
- High power supply rejection (35dB at 1 kHz)



These devices are high sensitivity low noise light to voltage optical converters that incorporate onboard colour filters. The devices combine a photodiode and a transimpedance amplifier on a single monolithic CMOS integrated circuit with a colour filter over the photodiode. Output voltage is directly proportional to light intensity (irradiance) on the photodiode. Each device has a transimpedance gain of 320 MΩ with improved offset voltage stability and low power consumption and is supplied in a clear plastic sidelooker package with integral lens.

Supply voltage (Recommended)	4.5 to 5.5V	Output pulse rise time (typ)	160µs
Supply voltage (Absolute max.)	6V	Output pulse fall time (typ)	150µs
Offset (dark) voltage	15mV	Operating temperature (Recommended)	0 to 70°C
Supply current	1.9 to 3.5mA	Operating temperature (Absolute max.)	-25 to 85°C
Output current	±10mA		

Responsivity Irradiance V/(µW/cm²)	Illuminance V/Lx	Peak Response	Onboard Filter colour	Mftrs. List No.	Order Code
1.67	1.11	635nm	Red	TSLR257-LF	121-7277
1.00	0.17	565nm	Green	TSLG257-LF	121-7278
1.11	1.48	470nm	Blue	TSLB257-LF	121-7279

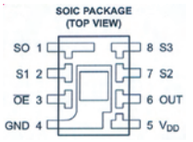
337187.343633

Order Code	Price Each 1+	5+	25+	100+	+
121-7277●	7.26	6.61	5.66	5.27	– –
121-7278●	7.26	6.61	5.66	5.27	– –
121-7279●	7.26	6.61	5.66	5.27	– –

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Colour Light to Frequency Converter — TAOS

Programmable



- High resolution conversion of light intensity to frequency
- Programmable colour and full scale output frequency
- Communicates directly with a microcontroller
- Nonlinearity error typically 0.2% at 50 kHz
- Stable 200 ppm/°C temperature coefficient
- Power down mode

The **TSC230** device combines configurable silicon photodiodes and a current to frequency converter on a single monolithic CMOS integrated circuit. The output is a square wave (50% duty cycle) with frequency directly proportional to light intensity. The full scale output frequency can be scaled by one of three preset values via two control input pins. Digital inputs and outputs allow direct interface to a microcontroller or other logic circuitry. Output enable places the output in the high impedance state for multiple unit sharing of a microcontroller input line. The converter contains an 8 x 8 array of photodiodes with 16 parallel connected photodiodes each for red, green, blue or unfiltered colour sensing. The colour to be converted to a frequency is pin selectable. Photodiodes are 120µm x 120µm in size and are on 144µm centres.

Supply voltage (Recommended) V_{DD}	2.7 to 5.5V
Supply voltage (Absolute max.)	6V
Supply current	2 to 3mA
Digital output voltage range	-0.3 to +6 V
Digital output current	±10 mA
SMBus operating frequency	10 to 100 kHz
SMBus input high voltage	2.1 V
SMBus input low voltage	0.8 V
Operating Temperature (Absolute max.)	-25 to 85°C
Operating Temperature (Recommended)	0 to 70°C

337171.343634

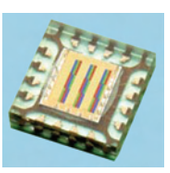
Mftrs. List No.	Order Code	Price Each 1+	5+	25+	100+
TCS230	SMD 489-1211●	13.87	12.63	10.81	10.09

Colour Sensor

Light to Voltage Converter

AVAGO TECHNOLOGIES

NEW



This sensor combines a photodiode array and three trans-impedance amplifiers in a single monolithic CMOS IC solution. With Red (R), Green (G) and Blue (B) colour filters coated over the photodiode array, the sensor converts R, G, and B light to analogue voltage outputs, denoted by VR_{OUT}, VG_{OUT} and VB_{OUT} respectively. The sensor is packaged in a small surface mount QFN-16 package.

H = 1.0, W = 5, D = 5mm

The sensor is ideal open-loop colour identification and closed-loop colour point control. It is designed for low luminance applications including colour detection, environment lighting, industrial process etc.

Recommended operating conditions	Min.	Max.
Supply Voltage (V)	4.5	5.5
Output Voltage Swing (V)		4.8
Supply Current (mA)	2.5 (Typ.)	
Dark Voltage (mV)		15
Rise time (ms)	5 (Typ.)	
Fall time (ms)	5 (Typ.)	
Operating Temperature (°C)	-40	85

418550

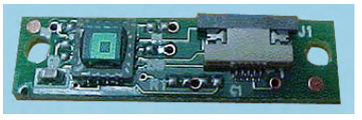
Mftrs. List No.	Order Code	Price Each 5+	25+	100+	250+	+
HDJD-S722-QR999	SMD 105-8376●	41.44	32.22	26.37	23.76	– –

Colour Sense Module

Internal Voltage Regulator

AVAGO TECHNOLOGIES

NEW



H = 3, W = 27.6, D = 7mm

This sensor combines a 12 x 12 photodiode array and three trans-impedance amplifiers in a single monolithic CMOS IC solution. With Red ®, Green (G) and Blue (B) colour filters coated over the photodiode array, the sensor converts R G B light to analogue voltage outputs, denoted by VR_{OUT}, VG_{OUT} and VB_{OUT} respectively. The sensor is driven by a single 5V supply and incorporates an internal 5V to 3.3V voltage regulator. The spectral sensitivity response of the sensor is optimized for RGB-LED backlight applications. The sensor has good detection ability in light output chromaticity drift, when used with closed loop feedback controller, manages to bring the backlight system to realize good du V performance.

Potential applications include white point control in emissive display, environmental lighting and colour control in industrial process.

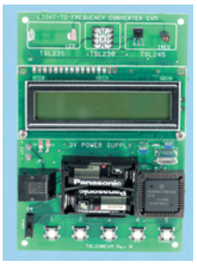
Recommended operating conditions	Min.	Max.	Recommended operating conditions	Min.	Max.
Supply Voltage (V)	4.5	5.5	Rise time (ms)	15 (Typ.)	
Output Voltage Swing (V)		3.0	Fall time (ms)	15 (Typ.)	
Supply Current (mA)	3 (Typ.)		Operating Temperature (°C)	-20	85
Dark Voltage (mV)		15			

418540

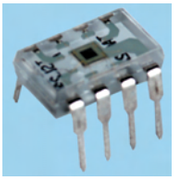
Mftrs. List No.	Order Code	Price Each 5+	25+	100+	250+	+
HDJD-S831-QT333	105-8377●	72.52	56.41	46.16	41.60	– –

Light to Frequency Converter - Programmable — TAOS

Ultraviolet to Visible Light Range



Evaluation Module



- High resolution conversion of light to frequency
- No external components required
- Programmable sensitivity and full-scale output frequency
- Communicates directly with a microcontroller

The **TSL230R** light-to-frequency converter combines a configurable silicon photodiode and a current to frequency converter on a single monolithic CMOS integrated circuit.

The device has an absolute output frequency tolerance of ±20%. It has been temperature compensated for the ultraviolet-to-visible light range of 320nm to 700nm and responds over the light range of 320nm to 1050nm.

The output can be either a pulse train or a square wave (50% duty cycle) with frequency directly proportional to light intensity.

Device sensitivity is selectable in three ranges, providing two decades of adjustment. The full-scale output frequency can be scaled by one of four preset values.

All inputs and outputs are fully TTL compatible. An output enable is provided that places the output in a high impedance state for multi unit sharing of a microcontroller input line.

The **TSL230R Evaluation Module** illustrates the use of the TSL230R device in ambient, transmissive and reflective light measurement applications. The output of the sensor can be measured on the LCD display (stand-alone mode) or interfaced to a PC (slave mode) via the on board RS-232 serial port.

The Evaluation Module includes Windows® 9x based software (on 3.5" floppy disk), cable and batteries.

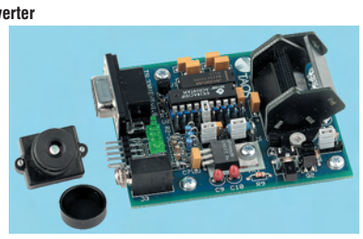
Supply voltage (Recommended)	2.7 to 5.5V	High level output voltage	4.5V
Supply voltage (Absolute max.)	6V	Low level output voltage	0.25V
Full scale frequency	1.1MHz	High level input current	5µA
Supply current	2mA	Low level input current	5µA
High level input voltage	2V	Operating Temperature	-25 to 70°C
Low level input voltage	0.8V		

336920

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+
TSL230-LF	118-2355●	14.75	13.64	12.56	12.27
TSL230EVM	489-1144	348.75			
LTFEVM	120-5796●	348.75			

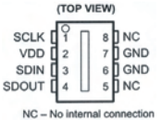
Linear Sensor Array — TAOS

102 x 1 with Analog to Digital Converter



Evaluation Module

- 102 x 1 sensor element organization
- 300 dots per inch pixel pitch
- High sensitivity
- On chip 8-bit analogue to digital conversion
- High speed serial interface
- 1 MHz pixel rate



The **TSL3301** device is a high sensitivity 300 dpi, linear optical sensor array with integrated 8 bit analogue to digital converters. The array consists of 102 pixels, each measuring 85 µm (H) by 77 µm (W) and spaced on 85 µm centres. Associated with each pixel is a charge integrator/amplifier and sample hold circuit. All pixels have concurrent integration periods and sampling times. The array is split into three 34 pixel zones, with each zone having programmable gain and offset levels. Data communication is accomplished through a three wire serial interface.

The **TSL3301 Evaluation Module** allows evaluation of the TSL3301 Linear Optical Sensor

RoHS ● Compliant ◄ Non-compliant ++ Limited stock - RoHS replacement available

C = CYAN M = Magenta Y = Yellow B = Black/SING

Array in a variety of configurations. The module can demonstrate optical edge detection, measurement, document scanning, image functions and provides full control of the internal registers and integration time. The module incorporates a TSL3301 device and comes complete with EE/Flash - may be reprogrammed by user (programmer not included).
The TSL3301 Evaluation Module includes Windows® based host software (and documentation) on CDROM, SELFOC lens array and camera lens.

Supply voltage (Recommended) V_{DD}	3 to 5.5V	High level input voltage	2V to V_{DD}
Supply voltage (Absolute max.)	6V	Low level input voltage	0.8V
Supply current (Typ) - A/D active	11mA	Low level input current	5µA
		Operating Temperature (Absolute max.)	-25 to 85°C
Clock frequency (max.)	10MHz	Operating Temperature (Recommended)	0 to 70°C

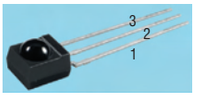
336922

Mftrs. List No.	Order Code	Price Each 1+	5+	25+	100+
TSL3301-LF	118-2356	24.09	21.94	18.75	17.54
TSL3301EVM.	489-1181	393.39			

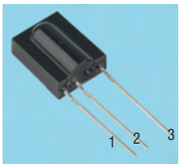
Infrared Receiver Modules

For Remote Control Systems

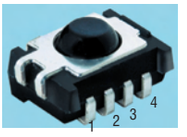
VISHAY



A1 - Pin 2 = V_s, Pin 3 = GND
A2 - Pin 3 = V_s, Pin 2 = GND
A1 & **A2** Pin 1 = OUT



B Pin 1 = GND, Pin 2 = V_s, Pin 3 = OUT



C1 Pin 1 = GND, Pin 2 = NC, Pin 3 = OUT, Pin 4 = V_s
C2 Pin 1 = GND, Pin 2 = GND, Pin 3 = V_s, Pin 4 = OUT

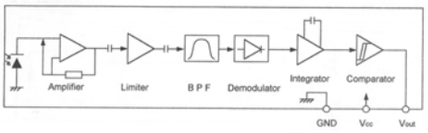
- Photo detector and preamplifier in one package
- Internal filter for PCM frequency
- Improved shielding against electrical field disturbance
- TTL and CMOS compatible
- Output active low

Supply Voltage	Current (Max)	Length (burst)	Burst Data Gap (between bursts)	Bursts (Rx/sec)	Carrier Frequency	Case Style	Mftrs List No.
High Data Rate PCM (20 kbps)							
2.7 to 5.5	5mA	22µs	26µs		455kHz	A2	TSOP7000.
2.7 to 5.5	5mA	22µs	26µs		455kHz	C1	TSOP5700TR.
Short Burst and High Data Rate (4000 bps)							
4.5 to 5.5	5mA	6 cycles/burst	10 cycles	2200 bursts/sec	36kHz	A2	TSOP4136.
4.5 to 5.5	5mA	6 cycles/burst	10 cycles	2200 bursts/sec	38kHz	A2	TSOP4138.
4.5 to 5.5	5mA	6 cycles/burst	10 cycles	2200 bursts/sec	33kHz	B	TSOP1133.
4.5 to 5.5	5mA	6 cycles/burst	10 cycles	2200 bursts/sec	36kHz	B	TSOP1136.
4.5 to 5.5	5mA	6 cycles/burst	10 cycles	2200 bursts/sec	38kHz	B	TSOP1138.
Standard, supporting all major transmission codes							
2.7 to 5.5	3mA	10 cycles/burst	14 cycles	800 bursts/sec	36kHz	A1	TSOP32236.
2.7 to 5.5	3mA	10 cycles/burst	14 cycles	800 bursts/sec	38kHz	A1	TSOP32238.
2.7 to 5.5	3mA	10 cycles/burst	14 cycles	800 bursts/sec	36kHz	A2	TSOP34836.
2.7 to 5.5	3mA	10 cycles/burst	14 cycles	800 bursts/sec	38kHz	A2	TSOP34838.
2.7 to 5.5	3mA	10 cycles/burst	14 cycles	800 bursts/sec	36kHz	C2	TSOP36236TR.
2.7 to 5.5	3mA	10 cycles/burst	14 cycles	800 bursts/sec	38kHz	C2	TSOP36238TR.
4.5 to 5.5	5mA	10 cycles/burst	14 cycles	800 bursts/sec	36kHz	A1	TSOP2236.
4.5 to 5.5	5mA	10 cycles/burst	14 cycles	800 bursts/sec	38kHz	A1	TSOP2238.
4.5 to 5.5	5mA	10 cycles/burst	14 cycles	400 bursts/sec	36kHz	A1	TSOP2436.
4.5 to 5.5	5mA	10 cycles/burst	14 cycles	400 bursts/sec	38kHz	A1	TSOP2438.
4.5 to 5.5	5mA	10 cycles/burst	14 cycles	800 bursts/sec	36kHz	A2	TSOP4836.
4.5 to 5.5	5mA	10 cycles/burst	14 cycles	800 bursts/sec	38kHz	A2	TSOP4838.
4.5 to 5.5	5mA	10 cycles/burst	14 cycles	800 bursts/sec	36kHz	B	TSOP1236.
4.5 to 5.5	5mA	10 cycles/burst	14 cycles	800 bursts/sec	38kHz	B	TSOP1238.
4.5 to 5.5	5mA	10 cycles/burst	14 cycles	800 bursts/sec	36kHz	C2	TSOP6236TR.
4.5 to 5.5	5mA	10 cycles/burst	14 cycles	800 bursts/sec	38kHz	C2	TSOP6238TR.

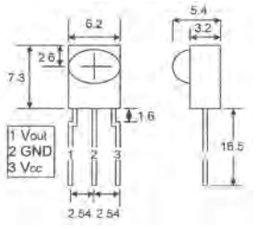
337505

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
TSOP7000.	491-3231	8.10	7.21	6.03	4.86	– –
TSOP5700TR.	SMD 491-3206	6.26	5.57	4.66	3.75	– –
TSOP4136.	491-3164	2.71	2.42	2.02	1.63	– –
TSOP4138.	491-3176	2.71	2.42	2.02	1.63	– –
TSOP1133.	491-3012	2.71	2.42	2.02	1.63	– –
TSOP1136.	491-3024	2.71	2.42	2.02	1.63	– –
TSOP1138.	491-3036	2.71	2.42	2.02	1.63	– –
TSOP32236.	491-3103	2.54	2.29	1.92	1.55	– –
TSOP32238.	491-3115	2.54	2.29	1.92	1.55	– –
TSOP34836.	491-3127	2.71	2.42	2.02	1.63	– –
TSOP34838.	491-3139	2.71	2.42	2.02	1.63	– –
TSOP36236TR.	SMD 491-3140	3.59	3.19	2.67	2.15	– –
TSOP36238TR.	SMD 491-3152	3.59	3.19	2.67	2.15	– –
TSOP2236.	491-3061	2.58	2.29	1.92	1.55	– –
TSOP2238.	491-3073	2.58	2.29	1.92	1.55	– –
TSOP2436.	491-3085	2.58	2.29	1.92	1.55	– –
TSOP2438.	491-3097	2.58	2.29	1.92	1.55	– –
TSOP4836.	491-3188	2.58	2.29	1.92	1.55	– –
TSOP4838.	491-3190	2.58	2.29	1.92	1.55	– –
TSOP1236.	491-3048	2.58	2.29	1.92	1.55	– –
TSOP1238.	491-3050	2.58	2.29	1.92	1.55	– –
TSOP6236TR.	SMD 491-3218	3.59	3.19	2.67	2.15	– –
TSOP6238TR.	SMD 491-3220	3.59	3.19	2.67	2.15	– –

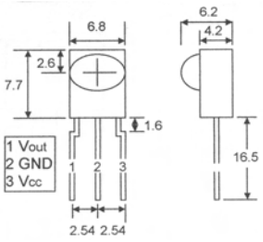
Infrared Remote Control Receivers



HIM602 / 702 Schematic



HIM602



HIM702

- Wide Reception Angle
- Long Reception Distance
- Good EMI Protection
- Low power Consumption

Applications Include:
- Audio / Video Control
- Multimedia
- Games
- Remote Control Lighting
- Automotive Alarm Control

A range of infrared remote control receivers featuring an integral I/R photodiode, amplifer, limiter, bandpass filter and demodulator.
These devices can receive a 38kHz carrier transmission signal from an infrared remote controller and output a demodulated logic pulse stream, this data may then be forward directly to a microcontroller for decoding.
The devices are available with a vertical or horizontal mounting configuration and also low power options. The design has built-in lens and integral EMI metal shield.

V_{CC} (min)	V_{CC} (max)	Supply Current (mA)	Reception Distance (typ)	Peak Wavelength	BPF Centre Freq.	Mftrs List No.	Order Code
4.5	5.5	3	16m	940nm	38kHz	HIM602V.	414-2822
4.5	5.5	3	16m	940nm	38kHz	HIM602H	120-0323
2.4	5.5	0.6	15m	940nm	38kHz	HIM702VM	120-0324
2.4	5.5	0.6	15m	940nm	38kHz	HIM702HM.	414-2858

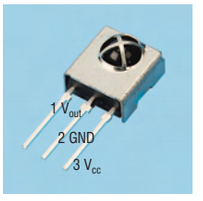
Mftrs. List Nos: HIM602V. = 414-2822 HIM702VM = 120-0324
HIM602H = 120-0323 HIM702HM. = 414-2858

241026

Description		Order Code	Price Each 1+	5+	10+	25+
Vertical Receiver	HIM602V.	414-2822	5.49	4.89	4.47	3.60
Horizontal Receiver	HIM602H	120-0323	5.49	4.89	4.47	3.60
Low Pwr Vert. Receiver	HIM702VM	120-0324	6.03	5.37	4.92	3.96
Low Pwr Horiz. Receiver	HIM702HM.	414-2858	6.03	5.37	4.92	3.96

Remote Control Receiver

KODENSHI



H=8.9 (to tab)
W=7.4
D=4.8

This monolithic infra-red remote control receiver replaces PIC12043S, it is an enhanced version and has improved electromagnetic interference resistance.

The device consists of a photodiode, preamplifier and signal processor. It operates at a tuned frequency of 37.9KHz and can be used with a standard infra-red emitter to produce a remote control with a typical range of 10 to 20 metres.

The device has a metal shield to prevent electromagnetic interference and is suitable for many industrial and domestic applications, e.g. lighting, air conditioning, machinery, doors etc.

Supply Voltage	4.5V - 5.5V dc	Output	active low
Supply Current	5mA max.	Half Angle	45°
Peak Response	940nm		

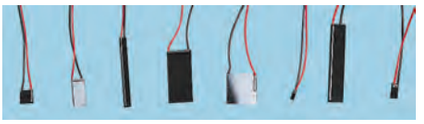
206514

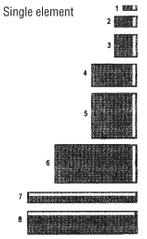
Mftrs. List No.	Order Code	Price Each 1+	10+	25+	50+	+
PIC26043SM	139-877	15.36	14.25	13.32	7.59	– –

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Planar Photodiodes

Solderable Planar Photodiodes — SILONEX





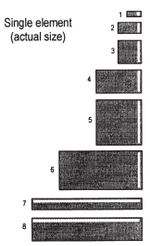
This range of photodiodes is suitable for a large variety of sensing applications. The large active areas can be used to accurately sense object position such as a paper edge, or as a large target for laser or long-range applications. Devices are supplied with a protective coating and 130mm flying leads.

Mftrs. List No.	Short circuit current (typ) @ 25mW/cm²	Open Circuit Voltage (typ)	Dark Current VR=5V (max) µA	Fig.	Chip size
SLSD-71N1.	0.5mA	0.4	1.7	2	2.5 x 5.1mm
SLSD-71N2.	1.2mA	0.4	3.3	3	5.1 x 5.1mm
SLSD-71N3.	2.1mA	0.4	1.7	4	5.1 x 10.2mm
SLSD-71N4.	2.3mA	0.4	5	7	2.5 x 25.4mm
SLSD-71N5.	4mA	0.4	3.3	5	10.2 x 10.2mm
SLSD-71N6.	6mA	0.4	3.3	8	5.1 x 25.4mm
SLSD-71N7.	8mA	0.4	5	6	9 x 19.3mm
SLSD-71N8.	0.17mA	0.4	1.7	1	1.3 x 3.4mm

206642

Mftrs. List No.	Order Code	Price Each 1+	25+	100+
SLSD-71N1.	**316-8207**	10.38	8.67	7.74
SLSD-71N2.	**316-8219**	11.91	10.02	8.91
SLSD-71N3.	**316-8220**	21.42	18.03	16.08
SLSD-71N4.	**316-8232**	21.84	18.33	16.29
SLSD-71N5.	**316-8244**	41.82	35.01	31.20
SLSD-71N6.	**316-8256**	46.62	39.09	34.80
SLSD-71N7.	**316-8268**	72.33	60.63	53.94
SLSD-71N8.	**316-8270**	7.95	6.57	5.70

Solderable Planar Photodiodes - Chip Only — SILONEX



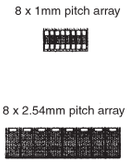
This range of photodiodes is suitable for a large variety of sensing applications. The large active areas can be used to accurately sense object position such as a paper edge, or as a large target for laser or long-range applications. Devices are supplied as a chip for the user to connect to. Arrays, duals and many other sensing configurations are possible.

Mftrs. List No.	Short circuit current (typ) @ 25mW/cm²	Open Circuit Voltage (typ)	Dark Current VR=5V (max) µA	Fig.	Chip size
SLCD-61N1	0.5mA	0.4	1.7	2	2.5 x 5.1mm
SLCD-61N2	1.2mA	0.4	3.3	3	5.1 x 5.1mm
SLCD-61N3	2.1mA	0.4	1.7	4	5.1 x 10.2mm
SLCD-61N4	2.3mA	0.4	5	7	2.5 x 25.4mm
SLCD-61N5	4mA	0.4	3.3	5	10.2 x 10.2mm
SLCD-61N8	0.17mA	0.4	1.7	1	1.3 x 3.4mm

206640

Mftrs. List No.	Order Code	Price Each 1+	25+	100+
SLCD-61N1	**121-8986●**	2.97	2.52	2.25
SLCD-61N2	**121-8987●**	5.01	4.26	3.78
SLCD-61N3	**121-8988●**	13.32	11.16	9.87
SLCD-61N4	**121-8989●**	14.79	12.42	11.01
SLCD-61N5	**121-8990●**	32.64	27.36	24.42
SLCD-61N8	**121-8991●**	5.40	4.59	4.05

Solderable Planar Photodiode Arrays — SILONEX



Photodiode arrays are ideal for position sensing applications, this type of array offers the smallest scale package for the usable active area. The solderable contacts allow chip termination without a wire-bonding machine.

Mftrs. List No.	Short circuit current (typ) @ 25mW/cm²	Open Circuit Voltage (typ)	Dark Current VR=1V (max) µA	
SLDA-61S1008	80µA	0.4	3	9.36mm²
SLDA-61S2508	450µA	0.4	3	76.76mm²

206641

Mftrs. List No.	Order Code	Price Each 1+	25+	100+
SLDA-61S1008	**121-9001●**	17.25	14.43	12.84
SLDA-61S2508	**121-9002●**	34.68	29.10	25.89

IrDA Compliant Products

Infrared Transceiver and Remote Control Modules — AVAGO TECHNOLOGIES

IrDA® Data Compliant

- Fully compliant to IrDA specifications
- Guaranteed temperature performance
- Low power consumption
- Small module size
- IEC 825 Class 1 eye safety

Small form factor InfraRed (IR) transceiver modules that provide interface between logic and IR signals for through air, serial, half duplex IR data links. The IR transceiver modules can be shut down completely to achieve very low power consumption. In the shut down mode the PIN diode will be inactive thus producing very little photocurrent even under very bright ambient light.

IrDA defined Operating Modes

Bit Rate	From	To
Standard InfraRed (SIR)	9600 bps	115.2 kbps
Medium InfraRed (MIR)	576 kbps	1152 kbps
Fast InfraRed (FIR)	4 Mbps	

Supply Voltage	Receiver Data Rate Min.	Max	IrDA Range	Dimensions H x W x D (mm)	IrDA Specification	Mftrs List No.
2.7 to 5.5	2.4kbps	115.2kbps	>1.5m	2.7 x 9.1 x 3.65	1.3	HSDL-3000#007
2.7 to 5.5	9.6kbps	115.2kbps	up to 50cm	2.7 x 9.1 x 3.65	1.4	HSDL-3002-007◆
2.4 to 3.6	9.6kbps	115.2kbps	up to 50cm	2.7 x 8.0 x 2.95	1.4 (SIR)	HSDL-3003-021◆
2.7 to 3.6	2.4kbps	115.2kbps	up to 30cm	2.5 x 8.0 x 3.0	1.2 (low power)	HSDL-3201#021
2.7 to 3.6	9.6kbps	4Mbps	>1.5m	4.0 x 12.2 x 4.9	1.1	HSDL-3602-007
2.7 to 5.25	9.6kbps	4Mbps	>1.5m	3.9 x 9.8 x 4.65	1.4 (FIR)	HSDL-3603-007

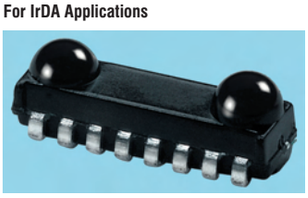
◆ marked devices have independent IrDA and remote control functions.
Order code 492-3273 has a remote control range up to 6m and 492-3285 up to 8m.

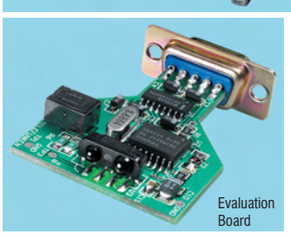
337884/343623

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	500+	+
HSDL-3000#007	SMD **117-5591●**	10.49	8.78	6.87	5.94	– –
HSDL-3002-007	SMD **100-3366●**	11.67	9.76	7.65	6.61	– –
HSDL-3003-021	SMD **100-3368●**	12.82	10.72	8.40	7.26	– –
HSDL-3201#021	SMD **117-5593●**	10.75	8.99	7.05	6.09	– –
HSDL-3602-007	SMD **117-5594●**	11.62	9.72	7.61	6.58	– –
HSDL-3603-007	SMD **100-3369●**	11.62	9.72	7.61	6.58	– –

Infrared Transceiver and Remote Control Modules — VISHAY

For IrDA Applications





- Low profile package
- Reduced power consumption
- Directly interface with wide variety of I/O devices
- Compliant with IrDA defined operating modes
- Operating temperature -25 to 85°C
- Evaluation Board available for SIR "4000" Series

IrDA defined Operating Modes

Bit Rate	From	To
Standard InfraRed (SIR)	9600 bps	115.2 kbps
Medium InfraRed (MIR)	576 kbps	1152 kbps
Fast InfraRed (FIR)	4 Mbps	

Voltage	Supply Current (Rx)	Current (Tx)	IrDA Range	Remote Control Range	Dimensions H x W x D (mm)	Operating Mode	Mftrs List No.
2.7 to 5.5	2mA	10mA	1.0m	-	2.74 x 7.98 x 3.33	FIR	TFBS6614.
2.7 to 5.5	<3mA	10mA	1.0m	up to 22m	4 x 9.7 x 4.7	FIR	TFDU6102-TR3.◆
2.4 to 5.5	<3mA	10mA	1.0m	up to 22m	2.5 x 8.5 x 2.9	FIR	TFDU4300-TR3◆
2.7 to 5.5	<3mA	10mA	1.0m	up to 22m	2.5 x 8.5 x 2.9	FIR	TFDU5307-TT3

◆ marked devices have independent IrDA and remote control functions

337495

Mftrs. List No.	Order Code	Price Each 1+	10+	50+	100+	+
TFBS6614.	SMD **491-2986●**	15.43	13.74	11.47	9.26	– –
TFDU6102-TR3.	SMD **491-2998●**	14.38	12.80	10.69	8.63	– –
TFDU4300-TR3	SMD **104-5444●**	10.41	9.27	7.74	6.24	– –
TFDU5307-TT3	SMD **104-5445●**	12.58	11.20	9.36	7.55	– –
Evaluation Board IRA41004232.	**491-3000●**	167.21	154.35	143.69	– –	– –

● Compliant
◄ Non-compliant
‡ Limited stock - RoHS replacement available

RoHS

C = CYAN M = Magenta Y = Yellow B = Black/SING

Serial Infra-Red IrDA Compliant Transceiver

SIR, 115.2 Kbit/s, 2.7 to 5.5V Operation

VISHAY

Pin Description - TFDUxxxx
1. IRED Anode
2. IRED Cathode
3. Transmit Data Input
4. Received Data Output
5. No Connection
6. Supply Voltage/Shutdown
7. Sensitivity Control
8. Ground

Side View = 13.0 x 5.95 x 5.3
BabyFace = 9.7 x 4.7 x 4.0

- Compliant to IrDA 1.2: up to 115.2kbit/s
- 2.7 to 5.5V wide operating voltage range
- Low power consumption: 1.3mA supply current
- Power sleep mode through V_{cc}/SD pin: 5nA sleep current
- Long range: up to 3.0m at 115.2 kbit/s
- Directly interfaces with various Super I/O and controller devices and Vishay Telefunken's TOIM3000 & TOIM3232 I/Os
- Built-in EMI protection - no external shielding necessary
- Few external components required
- Backward compatible to all Vishay Telefunken SIR infrared transceivers

V_{CC} V	$I_{IRED\ (DC)}$ mA	$I_{IRED\ (RP)}$ mA	V_{TXD} V	V_{RXD} V
2.7 - 5.5	100	500	-0.5 to V_{CC1} +0.5	-0.5to V_{CC} +0.5

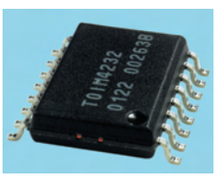
206662

Mftrs. List No.	Order Code	Price Each 1+	10+	50+	100+	+
Universal Viewing						
TFDU4100-TR3	**104-5417●**	9.57	8.52	7.12	5.74	– –

Encoder/Decoder for IrDA Applications

SO16 Integrated Interface Circuit

VISHAY



- Pulse shaping function
- Directly interfaces to Vishay TFD... SIR tranceiver to RS232 port
- Programmable baud clock generator - 13 baud rates
- 3/16 bit pulse duration or 1.627µs pulse selectable
- 2.7 to 3.6V operating voltage, 5V tolerant inputs
- Low operating current

The Endec provides proper pulse shaping for Standard Infra Red (SIR) IrDA® transceivers. For transmission the device shortens the RS232 output signal to IrDA compatible electrical pulses to drive the infrared transmitter. In the receive mode the device stretches the received infrared pulses to the proper bit width depending on the operating bit rate. The IrDA bit rate varies from 2.4 kbs to 115.2 kbs. The Endec is programmable to operate from 1200 bs to 115.2 kbs by the communication software via the RS232 port.

337290

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	250+	+
TOIM4232-TR1	SMD **104-5446●**	11.96	11.25	10.24	9.67	– –

Pyro Detector Modules

Pyro Detector Modules — Seiko

MS-331

MS-311

MS-400

A Selected range of small Passive Infrared (PIR) modules that combine a pyroelectric infrared detector, sensor circuitry and a lens.
The MS-3xx series have a range of 5 metres, each module has it's own timer and output time can be freely adjusted. They have a choice of two operating modes: one-shot and retriggerable. the output is via an open collector transistor.
The MS-400 sensor is a miniature PIR module without timer, it is designed for mounting directly onto a PCB. This module has a height of only 15.9mm but has a range of 2.5 metres.
Applications include:

- Automatic Light Switches
- Safety Systems
- Intruder Alarms

Max range	Lens Diameter / width	Depth	Supply voltage (min)	Supply voltage (max)	Detection spread angle	Mftrs. List No.	Order Code
5m	23∅	24	2.6	5.5	40°	MS331	120-9947
2.5m	14.3∅	15.9	4.5	5.5	54°	MS401	120-9948

241022

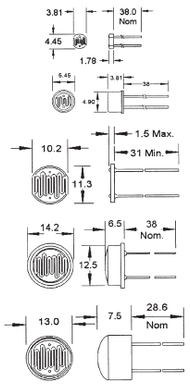
Mftrs. List No.	Order Code	Price Each 1+	5+	10+
MS331	**120-9947**	52.80	48.37	44.69
MS401	**120-9948**	29.95	27.44	25.36

Light Dependent Resistors

SILONEX

Packaged in either hermetically sealed cans, plastic case or coated in moisture resistant epoxy, light dependant resistors are ideal for daylight sensing and switching applications. They can also be used in position sensing applications. Two active areas are available: TO-8 and TO-18.

316-8335
316-8347
316-8359
316-8360
327-700



Mftrs. List No.	R (Ω) Typ.	R dark (Ω) Min.	Spectral Peak (nm)	V	Order Code
NSL 19M51.	5kR @ 100 lux	20kR(1)	550	100	316-8335
NSL 06S53.	5kR @ 100 lux	20kR(1)	550	100	316-8347
NSL 4962.	17kR @ 1 ftc	1MR(2)	515	320	316-8359
NSL 4960.	17kR @ 1 ftc	1MR(2)	515	320	316-8360
NORP12.	0.4kR @ 100 ftc	1.0MR	515	320	327-700

(1) after 10 seconds, (2) after 5 seconds
ftc = footcandle

206625

Mftrs. List No.	Order Code	Price Each 1+	25+	100+	1K+
NSL 19M51.	**316-8335▲**	1.40	1.23	– –	– –
NSL 06S53.	**316-8347▲**	4.54	3.81	3.34	2.98
NSL 4962.	**316-8359▲**	2.08	1.76	1.51	1.40
NSL 4960.	**316-8360▲**	5.98	5.01	4.35	3.95
NORP12.	**327-700▲**	4.85	4.19	4.16	– –

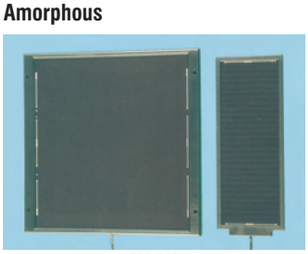
Solar Panels

Beco Solar

The characteristics of BP Solar panels are based on measurements made at Standard Test Conditions (STC) which are - illumination of 1kW/m^2 at spectral distribution of AM 1.5 and a cell temperature of 25°C.

221695

Amorphous — Beco Solar



653-949

Framed Amorphous Module
- Aluminium frame
- BA-5, 5.2 watt module
- 3m (BA-5) cable fitted

Unframed Solar Plate
- SA-0640, 0.3 watt plate
- Fitted with 150mm leads
- Suitable for 6V battery charging

Solarex amorphous silicon modules are manufactured using automated processes similar to those used for semiconductor manufacturing. These processes result in a monolithic module of solar-grade glass precision layered with conductive and semiconductive films. These films are laser-scribed into individual solar cells using a patented method which produces superior voltage characteristics and overall performance at low light levels.

Mftrs. List No.	Dimensions L	W	D	Nom. Volts	Amps @ pp	Volts @ pp
SA-0640	152	55	2	6	0.04	7.5
BA-5	340	320	30	18	0.36	25

206356

Mftrs. List No.	Order Code	Price Each
SA-0640	**653-937**	30.45
BA-5	**653-950**	168.55

Polycrystalline — BP Solar

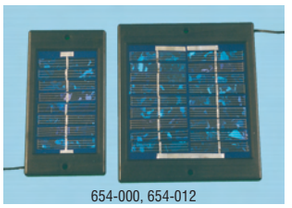
The cells in BP Solar polycrystalline modules are manufactured from 0.2mm thick slices of a boron doped silicon crystal block. This P-type material is sprayed on one face with phosphoric acid, passed through a diffusion oven to form an N-type layer and then given an anti-reflective coating. After the addition of conductive layers the resulting cells are connected in series and laminated between tempered glass and ethylene vinyl acetate (EVA) with a Tedlar™ backsheet. The laminates are then fitted into bronze-anodised aluminium frames. Alternatively, glass-less, 'Lite' modules are available where the laminate is backed with a stainless steel sheet for strength and durability.

221696

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

Low Power Modules

BP Solar



654-000, 654-012

- MSX-005F, 0.5 watt module
- MSX-01F, 1.2 watt module
- Impact resistant Lexan™ frame
- 750mm cable fitted
- Stable output and long life

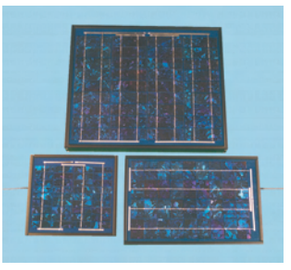
Mftrs. List No.	L	W	D	Nom. Volts	Amps @ pp	Volts @ pp
MSX-005F	147	79	10	3	0.15	3.7
MSX-01F	161	139	10	6	0.15	8.4

221697

Mftrs. List No.	Order Code	Price Each
MSX-005F	**654-000**	47.70
MSX-01F	**654-012**	72.81

Medium Power Modules

BP Solar



- SX-5, 4.5 watt module
- SX-10, 10 watt module
- SX-20U, 20 watt module
- SX-30U, 30 watt module
- BP-350U, 50 watt module
- 4 metre cable fitted to SX-5 & SX-10
- Large junction box on SX-20, SX-30 & BP-350U
- SX-20 can be configured to 6V or 12V
- Clear-anodised aluminium frame
- Tempered glass/EVA laminate construction

654-024, 654-036, 654-048

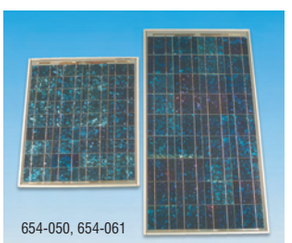
Mftrs. List No.	L	W	D	Nom. Volts	Amps @ pp	Volts @ pp
SX-5M	269	249	23	12	0.27	16.5
SX-10M	420	269	23	12	0.58	17.1
SX-20U	423	502	50	12	1.17	17.1
SX-30U	591	500	50	12	1.86	17.2
BP-350U	937	500	50	12	3.08	17.2

221698

Mftrs. List No.	Order Code	Price Each
SX-5M	**654-024**	285.31
SX-10M	**654-036**	334.59
SX-20U	**654-048**	576.00
SX-30U	**654-050**	747.93
BP-350U	**654-061**	925.31

Value Line Modules3

SOLAREX



654-050, 654-061

- VLX-32, 32 watt module
- VLX-53, 53 watt module
- Large junction box
- Can be configured to 6V or 12V
- Clear-anodised aluminium frame
- Tempered glass/EVA laminate construction

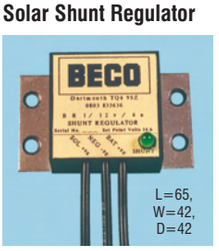
Mftrs. List No.	L	W	D	Nom. Volts	Amps @ pp	Volts @ pp
SX-30U	591	500	50	12	1.86	17.2
BP-350U	937	500	50	12	3.08	17.2

OPT334

Mftrs. List No.	Order Code	Price Each
SX-30U	**654-050**	747.93
BP-350U	**654-061**	925.31

Solar Shunt Regulator

Beco Solar



L=65, W=42, D=42

- 12 Volt, 6 amp solid state shunt regulator
- Temperature compensated
- Fully encapsulated
- LED status indication
- Blocking diode included

The BECO Solar Shunt Regulator is designed to limit the voltage to which a lead acid battery can be driven when on charge from a photovoltaic (solar) module or array. The unit is set to regulate at 14.6 volts and operation is indicated by an LED. Suitable for use with any 12 volt (nominal) module(s) up to a maximum of 6 amps.

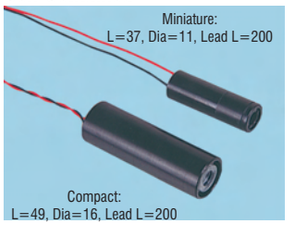
206361

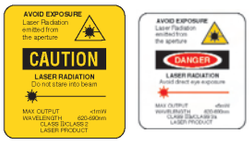
Mftrs. List No.	Order Code	Price Each
BR1/12/6	**653-925**	120.21

Laser Diode Modules

Self-Contained

IMATRONIC





Connections
Red=Supply +ve, Black=Supply -ve

A range of self-contained continuous wave visible laser diode modules. Applications include alignment, bar code readers, robotic control, target designation, positioning and security detection.

- Choice of output wavelengths: 633nm and 670nm
- Output power options: Class 2 (1mW), Class 3a (3, 5mW)
- Choice of housings: 11mm or 16mm
- User adjustable focusing (tool supplied)
- Integral drive circuitry
- Output power stabilisation
- Reverse polarity protection
- LED emission indicator

Wavelengths: 633nm*, 670nm
Beam size at aperture (mm): Miniature - 4 x 2, Compact - 5 dia. (Class 2) 5 x 2 (Class 3a)
Focusing range (mm): Miniature - 35-∞, Compact - 150-∞ (Class 2) 20-∞ (Class 3a)
*Approximately nine times brighter than comparable 670nm versions.

Operating voltage: 4V to 6V DC

Operating temperature: -10°C to +40°C Storage temperature: -20°C to +65°C
Operational life: MTTF in excess of 10,000 hours at its operating temperature range

WARNING: These devices are laser diode modules and conform to BS (EN) 60825 emission criteria. Do not look directly into the laser beam. Eye protection should be worn as blink response is not sufficient to protect the human eye.
<1mW visible - class II, 3mW & 5mW visible - class IIIa.

206264

Module Type	Order Code	Price Each 1+	3+	+
Miniature, 0.9mW, 670nm	**121-6290**●	247.50	227.85	– –
Miniature,.9mW, 633nm	**121-6294**●	421.47	304.11	– –
Miniature,3mW, 670nm	**121-6291**●	274.35	– –	– –
Miniature,5mW, 633nm	**121-6313**●	629.65	527.31	– –
Compact,0.9W, 670nm	**121-6292**●	259.88	181.35	– –
Compact,0.9mW, 633nm	**121-6295**●	383.10	209.25	– –
Compact,3mW, 670nm	**121-6293**●	426.01	– –	– –

Laser Generator

IMATRONIC

SlimFit Module

- Power output to European and U.S. legislation
- Rugged construction
- Very small, SlimFit profile
- User adjustable lens focus
- Low voltage dc operation
- Reverse polarity protected

The modules are self contained OEM laser diode modules. The extremely compact design includes automatic power control circuits and adjustable focus optics. The laser has the highest visibility of any red laser diodes and can be seen in most daylight conditions.The modules have a rugged design and very small size (7mm diameter). Good thermal connection of the laser diode to the module housing results in long laser life.The modules are supplied with an aspheric lens. The output beam is elliptical and offers a small output beam diameter and focussed spot size.

Specifications	121-6298	121-6299
Optical		
Output Power (±20 %)	5mW	1mW
Wavelength	635nm	650nm
Focus Range	500 to mm	500 to mm
Beam Size (at aperture)	3 x 1 mm	3 x 1 mm
Beam Size (at nearest focus)	<50µm	<50µm
Electrical/Mechanical		
Supply Voltage (red lead)	3 to 6V	3 to 6V
Supply Voltage (black lead)	0	0
Operating Current	60mA	35mA
Length	30mm	30mm
Diameter	7mm	7mm
Supply Lead Length	200mm	200mm

RoHS ● Compliant ◄ Non-compliant ++ Limited stock - RoHS replacement available

C = CYAN M = Magenta Y = Yellow B = Black/SING

Farnell Page 966 Date: 21-08-06 time: 18:25

Environmental		
Operating Temperature	-10 to 50°C	-10 to 60°C
Storage Temperature	-40 to 85°C	-40 to 85°C
Operating Humidity	90%rh	90%rh
MTTF at 25°C	>20,000Hrs.	>60,000Hrs.

338555

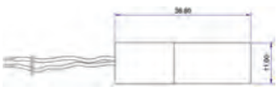
Wavelength	Mftrs List No.	Order Code	Price Each 1+	3+	5+
635nm	1450-06	**121-6298**●	289.70	244.12	209.26
650nm	1450-07	**121-6299**●	224.60	189.90	162.75

WARNING: These devices are laser diode modules and conform to BS (EN) 60825 emission criteria. Do **NOT** look directly into the laser beam. Eye protection should be worn as blink response is not sufficient to protect the human eye.
<1mW visible - class 2, 3mW & 5mW visible - class 3R.

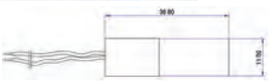
Laser Line Generator — IMATRONIC

Crossed Line, Miniature

- Compliant with European and U.S. Legislation
- Rugged Construction
- Small size, only 11mm Diameter
- User Adjustable Focussing Lens
- Low Voltage DC Operation
- Reverse Polarity Protection



Cross Line Module



Laser Line Module

The CrossLite Miniature line laser is a self-contained OEM laser diode module emitting a crossed line pattern. It is of high visibility and can be seen in most lighting conditions. It is generally used where alignment by eye is required but is also suitable for use with camera systems.
The angle between the cross may be adjusted to any value between 0° and 90°. This can be used to produce accurate cross line references even when the laser is not mounted at exactly 90° to the surface.
It is designed for industrial applications and offers superior ruggedness and miniature size (11mm diameter). Internal connection of the laser diode to the module housing ensures good heatsinking and long laser life.

Specifications	121-6309
Optical	
Output Power (±20 %)	3mW
Laser Classification	3R
Wavelength	635nm
Focus Range	50mm to ∞
Beam Size (at aperture)	4 x 2mm
Line Width (at nearest focus)	<100µm
Electrical/Mechanical	
Supply Voltage (red lead)	6 to 3V
Supply Voltage (black lead)	0V
Operating Current	50mA
Length	37mm
Diameter	11mm
Supply Lead Length	200mm
Environmental	
Operating Temperature	-10 to 40°C
Storage Temperature	-40 to 80°C
Operating Humidity	90%rh
MTTF at 25°C	>20,000Hrs.

338590

Description	Mftrs List No.	Order Code	Price Each 1+	3+	5+
Laser Line	LLM115G/635/3	**121-6309**●	680.30	569.62	488.25

WARNING: These devices are laser diode modules and conform to BS (EN) 60825 emission criteria. Do **NOT** look directly into the laser beam. Eye protection should be worn as blink response is not sufficient to protect the human eye.
<1mW visible - class 2, 3mW & 5mW visible - class 3R.

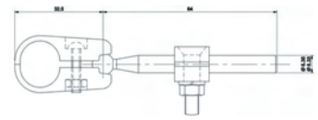
Product Watch obsolescence notification

- FREE to all account holders
- Notification of obsolete, end of line and end of stock items
- Replacement or upgrade recommendations

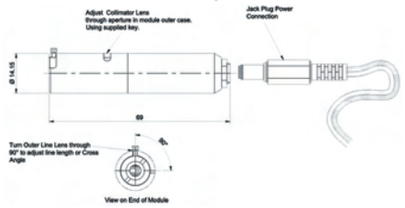
Advanced warning of obsolete components

Laser Generator — LASERLYTE

Variable Line Length Modules



Mounting Kit



Variable Line Module

- Variable focus
- Variable line length
- Variable cross intersection angle
- Bright 5mW output power
- Complete with Universal Mounting kit

Alignment Applications:
- Screen-printing
- Saw and blade guidance
- Positioning of garments for pressing or heat sealing of motifs etc.
- Pattern matching for material inspection
- Edge alignment of material on floatation tables

A range of lasers with integrated optics, these devices can project either a dot, a line, or a cross with variable intersection angle. These lasers are ideal for alignment on production lines whereby a product has to be placed in a precise position to be worked upon, examples such as drilling, cutting or screen-printing. The laser cross generator features a variable intersection angle so that any target errors due to non-perpendicular mounting of the laser may be counteracted to achieve true 90° intersecting lines.
The Mounting Kit holds the laser module in a clamp which rotates on a 60mm ball headed rod. A second clamp allows the rod to slide to different positions and to be fixed to any surface using the screws provided.
121-6304 Cross Lines with Rotating Axis - Rotating lines which can be adjusted to intersect at any angle, from any angle of mounting.
121-6305 Variable Length Line - Double the length of the line by adjusting the fan angle to spread light from 30° to 80°
121-6306 Dot with Variable Intensity - Focus the dot to a precise spot at any distance and vary the intensity.

Specifications	121-6304	121-6305	121-6306
Optical			
Output Power (±20 %)	5mW	51 to mW	51 to mW
Wavelength	635nm	650nm	650nm
Electrical/Mechanical			
Connector Cable Length	1.5m	1.5m	1.5m
Length	67mm	67mm	67mm
Diameter	14mm	14mm	14mm

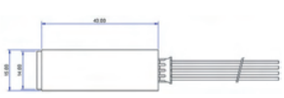
338587

Wavelength	Mftrs List No.	Order Code	Price Each 1+	3+	5+
635nm	V3RXL	**121-6304**●	878.85	732.38	627.76
650nm	V5VLL	**121-6305**●	651.00	542.51	465.01
650nm	V5DVI	**121-6306**●	683.55	569.62	488.25

WARNING: These devices are laser diode modules and conform to BS (EN) 60825 emission criteria. Do **NOT** look directly into the laser beam. Eye protection should be worn as blink response is not sufficient to protect the human eye.
<1mW visible - class 2, 3mW & 5mW visible - class 3R.

Laser Generator — IMATRONIC

Axially Aligned



Axially Aligned Laser Generator

- Stable output power
- True ON/OFF pulsed control
- Linear amplitude or time modulation
- Zero offset input
- Wide temperature range
- Low power consumption
- Excellent power supply rejection
- Electrically isolated outer case

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

C = CYAN M = Magenta Y = Yellow B = Black/SING

The modules have been designed to almost eliminate axial alignment errors in a versatile controllable package. Acculase diode lasers are precision controllable laser light sources available in both infrared and visible wavelengths. This design fully integrates advanced circuits and optical components into a single piece, cylindrical housing to which the beam has been accurately centred aligned and collimated.A single input allows the light intensity to be set using a simple resistor or voltage source. The output can be modulated rapidly with any arbitrary waveform.The output power can be optimized for any system configuration. One laser can suit variations in ambient lighting and reflectance.

Specifications	**121-6303**
Optical	
Output Power (±20 %)	3mW
Laser Classification	3R
Wavelength	635nm
Beam Size (at aperture)	3 x 1mm
Beam Divergence	0.05 x 0.1 mrad
Electrical/Mechanical	
Supply Voltage - red lead	3 to 6V
Supply Voltage - black lead	0
Control Voltage Range	0 - 1V
Max. Control Frequency	300Hz
Operating Current	40mA
Length	48mm
Diameter	15mm
Supply Lead Length	2m
Environmental	
Operating Temperature	-10 to 40°C
Storage Temperature	-20 to 70°C
Operating Humidity	90%rh non-condensing

338585

Wavelength	Mftrs List No.	**Order Code**	Price Each 1+	3+	5+
635nm	1420-05	**121-6303●**	647.74	542.51	465.01

WARNING: These devices are laser diode modules and conform to BS (EN) 60825 emission criteria. Do **NOT** look directly into the laser beam. Eye protection should be worn as blink response is not sufficient to protect the human eye.
<1mW visible - class 2, 3mW & 5mW visible - class 3R.

OEM Laser Diode Modules

414-2809

414-2792

Connections
Red=Supply +ve,
Black=Supply -ve
Pink=TTL modulation input

- Low Cost
- Miniature Design
- Automatic Power Control
- 3.0Vdc Operating
- Adjustable or Fixed Focus Options (650nm)
- Red or High visibility Green Options

A range of laser diode modules designed for OEM applications with the lowest cost, miniature size and beam focussing requirements.
These modules are ideal for a wide range of low power laser applications, such as general sighting, levelling and positioning.
The red laser modules are available with either a fixed or adjustable focus, the wavelength being in the red region at 650nm.
The green 532nm diode pumped solid state modules use a laser diode pumped Nd:YVO_4 crystal coupled with KTP as a frequency doubler to generate green light. These modules produce a high visibility beam which appears up to ten times brighter than a red laser for the same 1mW power output. Additional heat sinking may be required for continuous operation. A pulsed green laser module is available with modulation up to 1 kHz and a power output from 1.5 to 2.99mW.

Colour	Module size (mm) Dia.	Length	Focus	Supply volts (min)	(max)	Wave-length (nm)	Beam Dia. (mm)	Supply current (mA)	Output power max (mW)	Max Modulation	Mftrs. List No.
Red	10.5	17	Fixed	2.7	6	650	5.8	45	1	—	PLP6501FR
Red	10.5	17	Adj.	2.7	6	650	5.8	45	1	—	PLP6501AR
Green	12	56.5	Fixed	—	3	532	1	350	0.99	—	GMP532-1F3-C
Green	12	56.5	Fixed	—	3	532	1	350	2.99	1kHz	GMP532-3F3-P

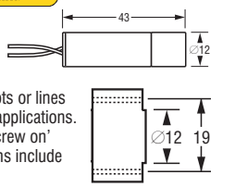
WARNING: These devices are laser diode modules and conform to BS (EN) 60825 emission criteria. Do not look directly into the laser beam. Eye protection should be worn as blink response is not sufficient to protect the human eye.
<1mW visible - class II, 3mW & 5mW visible - class IIIa.

241021

Description	Mftrs List No.	**Order Code**	Price Each 1+	3+	5+
1mW Laser, 650nm Fixed focus	PLP6501FR	**120-9950**	58.30	54.42	52.34
1mW Laser, 650nm Adj. focus	PLP6501AR	**120-9951**	58.30	54.42	52.34
1mW Laser, 532nm Fixed focus	GMP532-1F3-C	**120-9949**	858.34	836.05	804.70
2.99mW Laser, 532nm Fixed focus	GMP532-3F3-P	**120-9953**	858.34	836.05	804.70

Self-Contained

MELLES GRIOT



This range of high quality, user focusable diode lasers with integral drive electronics offers reliability at an affordable price. The 635nm modules emit very bright spots or lines and are particularly suited to high ambient light level applications. Options include an easy to install flanged housing, and 'screw on' line generating optics for use with any module. Applications include alignment, positioning, security and machine vision.

Wavelengths	635nm, 670nm, 780nm
Output owers	<1mW, (Class2), 3mW, 5mW (Class 3a) with exception of 780nm and 635nm
12mW modules (class 3b)	
Housings:	12mm cylindrical or flanged x 43mm
Beam size (Nom.)	2mm x 4mm
Beam Divergence	<0.5 mrad
Pointing Stability	<0.5 mrad/deg C
Supply Voltage	3 to 6V dc
Current Drain (typ.)	<70mA
Output Power Stabilisation	<5%
	Reverse Polarity protected
Operating Temperature	-10°C to +40°C (except 670nm 3mW -10°C to +60°C)

WARNING: These devices are laser diode modules and conform to BS (EN) 60825 emission criteria. Do not look directly into the laser beam. Eye protection should be worn as blink response is not sufficient to protect the human eye.
<1mW visible - class II, 3mW & 5mW visible - class IIIa, 12mW - class 111b.

206539

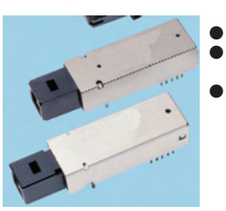
Module Type	Housing	**Order Code**	Price Each 1+	5+	10+
635nm, 1mW	Cylindrical	**121-8965●**	340.20	274.35	– –
635nm, 1mW	Flanged	**121-8966●**	365.40	297.60	– –
635nm, 3mW	Cylindrical	**121-8968●**	384.30	311.55	– –
670nm, 3mW	Cylindrical	**121-8969●**	252.00	204.60	– –
780nm, 3mW	Cylindrical	**121-8970●**	264.60	222.93	213.90
Line Generator	12° Fan	**121-8971●**	154.35	125.55	– –

Fibre Optics - Transceiver Modules & Chip Sets

Multimode Fibre Transceiver

2 x 5 DIP, with MT - RJ Interface

AVAGO TECHNOLOGIES



- Single 3.3V supply
- Wave solder & Aqueous Wash Compatible
- Receiver output squelch function enabled

NEW

This family of multimode fibre optic transceivers provide products suitable for FDDI, SONET OC - 3 physical layers for ATM and other services. The transceivers are supplied in industry standard 2 x 5 DIL style packages with an MT - RJ fibre connector.
The ATM versions are fully compliant with the ATM Forum UNI SONET OC-3 specifications. The FDDI fast ethernet tranceivers are fully compliant with the optical performance requirements of the FDDI PMD and the FDDI LCF-PMD standards. They are also fully compliant with the optical performance requirements of the ATM 100 Mb/s physical layer and of the 100 Base-FX version of IEEE 802.3u.

Supply Voltage (V)	Data Rate	Nominal Wavelength (nm)	Model Type	Operating Temp. (°C)	Shield	Mftrs Mftrs List No.
3.3		1300	FDDI	0 to 70	None	AFBR-5903Z
3.3		1300	FDDI	0 to 70	Extended	AFBR-5903EZ
3.3		1300	FDDI	-40 to 85	None	AFBR-5903AZ
3.3		1300	SONET OC-3	0 to 70	None	AFBR-5905Z
3.3		1300	SONET OC-3	0 to 70	Extended	AFBR-5905EZ
3.3		1300	SONET OC-3	-40 to 85	None	AFBR-5905AZ

RoHS ● Compliant ▲ Non-compliant ‡ Limited stock - RoHS replacement available

407195

Mftrs. List No.	Order Code	Price Each 1+	10+	25+
AFBR-5903Z	**945-0114**	101.85	81.51	67.93
AFBR-5903AZ	**945-0122**	124.67	99.70	83.10
AFBR-5903EZ	**945-0130**	111.74	89.41	74.51
AFBR-5905Z	**945-0149**	101.85	81.51	67.93
AFBR-5905EZ	**945-0157**	111.74	89.41	74.51
AFBR-5905AZ	**945-0165**	124.67	99.70	83.10

Single Mode Transceiver

1 x 9 SIP, SC Duplex

Standard - H=10.35, W=25.4, D=39.12mm

Mezzanine - H=9.8, W=25.4, D=39.6mm

- 1300nm products for 2000m backbone links
- Interchangeable with LED multi-sourced 1 x 9 transceivers
- Wave solder and aqueous wash process compatibility
- Designed for Fibre backbone and closest to the desktop links

NEW

This range of SC fibre transceivers provide a range of products for FDDI, 100 Mb/s ATM and Fast Ethernet or SONET OC-3/SDH STM-1 implementations. Both types are supplied in the industry standard 1 x 9 SIP duplex connector interface package.
The FDDI products are compliant with PMD standard, which is ISO/IEC 9314-3: 1990 and ANSI X3.166 - 1990.
The SONET OC-3 products are fully compliant with ATM forum UNI SONET OC-3 multimode fibre physical layer specification.

Supply Voltage (V)	Height	Model Type	Operating Temp. (°C)	Shield	Mftrs Mftrs List No.
5.0	Standard	FDDI	0 to 70	None	AFBR-5103Z
5.0	Standard	FDDI	-40 to 85	None	AFBR-5103AZ
5.0	Mezzanine	FDDI	0 to 70	None	AFBR-5103PZ
5.0	Mezzanine	FDDI	0 to 70	Extended	AFBR-5103PEZ
3.3 or 5.0	Standard	FDDI	0 to 70	None	AFBR-5803Z
3.3 or 5.0	Standard	FDDI	-10 to 85	None	AFBR-5803AZ
5.0	Mezzanine	SONET OC-3	0 to 70	None	AFBR-5205Z
5.0	Mezzanine	SONET OC-3	-40 to 85	None	AFBR-5205AZ
5.0	Standard	SONET OC-3	0 to 70	None	AFBR-5205PZ
5.0	Standard	SONET OC-3	0 to 70	Extended	AFBR-5205PEZ
3.3 or 5.0	Standard	SONET OC-3	0 to 70	None	AFBR-5805Z
3.3 or 5.0	Standard	SONET OC-3	-40 to 85	None	AFBR-5805AZ

407196

Mftrs. List No.	Order Code	Price Each 1+	10+	25+
AFBR-5103Z	**944-9892**	81.64	65.33	54.46
AFBR-5103AZ	**944-9914**	98.85	79.10	65.91
AFBR-5103PZ	**944-9930**	98.85	79.10	65.91
AFBR-5103PEZ	**944-9949**	98.85	79.10	65.91
AFBR-5205Z	**944-9965**	81.64	65.33	54.46
AFBR-5205AZ	**944-9973**	81.64	65.33	54.46
AFBR-5205PZ	**944-9990**	98.85	79.10	65.91
AFBR-5205PEZ	**945-0009**	98.85	79.10	65.91
AFBR-5803Z	**945-0025**	81.64	65.33	54.46
AFBR-5803AZ	**945-0041**	98.85	79.10	65.91
AFBR-5805Z	**945-0076**	81.64	65.33	54.46
AFBR-5805AZ	**945-0084**	98.85	79.10	65.91

Single Mode Transceiver

1 x 9 SIP, ST Duplex

- 1300nm products for 2000m backbone links
- Interchangeable with LED multi-sourced 1 x 9 transceivers
- Wave solder and aqueous wash process compatibility
- Designed for Fibre backbone and closest to the desktop links

NEW

H=12, W=25.4,D(O/A)=42, D(Body)24.8 mm

This range of ST fibre transceivers provide a range of products for FDDI, 100 Mb/s ATM and Fast Ethernet or SONET OC-3/SDH STM-1 implementations. Both types are supplied in the industry standard 1 x 9 SIP duplex connector interface package.
The FDDI products are compliant with PMD standard, which is ISO/IEC 9314-3: 1990 and ANSI X3.166 - 1990.
The SONET OC-3 products are fully compliant with ATM forum UNI SONET OC-3 multimode fibre physical layer specification.

Supply Voltage (V)	Model Type	Operating Temp. (°C)	Mftrs Mftrs List No.	Supply Voltage (V)	Model Type	Operating Temp. (°C)	Mftrs Mftrs List No.
5.0	FDDI	0 to 70	AFBR-5103TZ	5.0	SONET OC-3	0 to 70	AFBR-5205TZ
5.0	FDDI	-40 to 85	AFBR-5103ATZ	5.0	SONET OC-3	-40 to 85	AFBR-5205ATZ
3.3 or 5.0	FDDI	0 to 70	AFBR-5803TZ	3.3 or 5.0	SONET OC-3	0 to 70	AFBR-5805TZ
3.3 or 5.0	FDDI	-10 to 85	AFBR-5803ATZ	3.3 or 5.0	SONET OC-3	-40 to 85	AFBR-5805ATZ

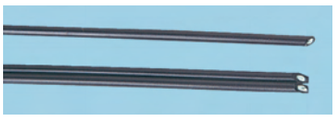
407197

Mftrs. List No.	Order Code	Price Each 1+	10+	25+
AFBR-5103ATZ	**944-9922**	98.85	79.10	65.91
AFBR-5103TZ	**944-9957**	81.64	65.33	54.46
AFBR-5205ATZ	**944-9981**	98.85	79.10	65.91
AFBR-5205TZ	**945-0017**	81.64	65.33	54.46
AFBR-5803ATZ	**945-0050**	98.85	79.10	65.91
AFBR-5803TZ	**945-0068**	81.64	65.33	54.46
AFBR-5805ATZ	**945-0092**	98.85	79.10	65.91
AFBR-5805TZ	**945-0106**	81.64	65.33	54.46

Fibre Optics - Plastic Systems

Polymer Fibre Optic Cable

FIBRE DATA



Single: Dia=1.0 core, 2.2 overall
Twin: 2 x single cable, welded in figure 8 format.

Acrylic optical cable sheathed with special fluorine containing polymer. Being inexpensive it is ideal for the design and development of short distance transmission links and for the demonstration of fibre optic systems.

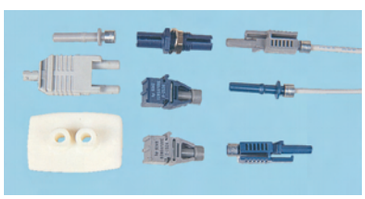
The cable is matched for visible red light in the region of 400 - 700nm.
The cable has a minimum bend radius of 50mm and may be cut with a hot blade.

Attenuation	150dB/km @ 600nm	Single	FDPF 4001 EH
Operating temperature	-30°C to +80°C	Twin	FDPF 4002 EH

206489

20m Coils	Order Code	Price Each 1+	5+	10+
Single	**120-8838**	80.92	71.58	65.13
Twin	**120-8837**	141.46	84.89	81.15
100m Coils		**1+**	**2+**	**5+**
Single	**120-8842**	280.39	251.94	239.67
Twin	**120-8843**	548.96	506.77	480.01

'Versatile Link' Evaluation Kit



The 'Versatile Link' fibre optic kit contains HFBR1524 transmitter, HFBR2524 receiver, 5 metres of cable connected to HFBR4511 and HFBR4513 connectors, spare connectors, adaptor, polishing kit and literature.

Guaranteed link length	12m @ 5MBd	Receiver supply voltage	+5
Transmitter drive current	60mA		

206500

Mftrs. List No.	Order Code	Price Each
HFBR-0501..	**327-750**	52.28

'Versatile Link' Modules —

Plastic 1mm fibre

HFBR4501, HFBR4503, HFBR4506

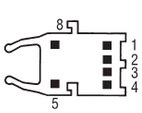
Modules
H=7.7, W=10.2, D=19.6.
Pin spacing=2.5. Row spacing=7.6.

Body colour coding:
Transmitters Grey, Receivers Blue.

Connectors
Simplex: L=25.4, O/D (plug)=3.8.
Simplex latching:
L=33.0, W=8.9, H=8.9, O/D (plug)=3.8
Duplex: L=38.1, H=5.8
O/D (plugs)=3.8, spaced 10.2
Bulkhead feedthrough: L=30, Mtng hole=7.9 dia.

CONNECTIONS: Transmitters:
1–Anode, 2–Cathode, 3, 4, 5, 8–N.C.
Receivers: (excl. HFBR2523)
1–Vo, 2–Gnd, 3–Vcc, 4–RL, 5, 8–N.C.
HFBR2523 Receiver:
1–Vo, 2–Gnd, 4–Vcc, 3,5,8–N.C.

PIN VIEW



Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

The 'Versatile Link' fibre optic system represents a package improvement over the 'Snap-in' modules detailed below, and are compatible with 'Snap-in' connectors. The 'Versatile Link' system features smaller package size, and includes latching connectors. The module housings interlock for use with two-way 'duplex' connector.

Link performance is guaranteed over ambient temperature range 0°C to 70°C. The receivers have logic compatible output levels and have high noise immunity.

The connectors are for terminating 1mm plastic optical cable. A suitable crimp tool is available.

Transmitter Drive Current 60mA Receiver Supply Voltage +5V

Guaranteed link length for transmitter/receiver pairs:
HFBR-1521/2521 12m @ 5MBd
HFBR-1522/2522 24m @ 1MBd
HFBR1523/2523 8m @ 40kBd (for low current $I_{FPK(T+R)}$ = 6mA)
60m @ 40kBd (for extended distance $I_{FPK(T)}$ = 60mA
HFBR-1524/2524 5m @ 1MBd

The polishing kit consists of a polishing fixture (which can be used to polish fibres in a 'duplex' connector or two 'simplex' connectors simultaneously), 600 grit abrasive paper and 3µm lapping film.

Mftrs. List No. 249-476=HFBR-4597 (Hewlett Packard), 264-982=HTX-LWL (Weidmuller Klippon)

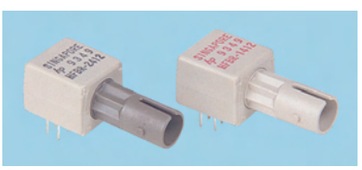
206501

	Mftrs. List No.	Order Code	Price Each 1+	10+	100+
Transmitters	HFBR-1521Z	**117-3128●**	24.76	21.94	15.00
Transmitters	HFBR-1522Z	**117-3129●**	24.76	21.94	15.00
Transmitters	HFBR-1523Z	**117-3126●**	25.54	22.01	15.47
Transmitters	HFBR-1524Z	**117-3130●**	24.76	21.94	15.00
Transmitters	HFBR-2521Z	**117-3131●**	24.76	21.94	15.00
Transmitters	HFBR-2522Z	**117-3132●**	24.76	21.94	15.00
Transmitters	HFBR-2523Z	**117-3127●**	25.97	22.38	15.73
Transmitters	HFBR-2524Z	**117-3134●**	24.76	21.94	15.00
Connectors					
Simplex (grey)	HFBR-4501Z	**117-3135●**	2.27	1.92	1.32
Simplex (blue)	HFBR-4511Z	**117-3136●**	2.27	1.92	1.32
Simplex, latching (grey)	HFBR-4503Z	**117-3137●**	1.99	1.68	1.15
Simplex, latching (blue)	HFBR-4513Z	**117-3138●**	1.99	1.68	1.15
Duplex (white)	HFBR-4506Z	**117-3139●**	3.91	3.30	2.26
Bulkhead Feedthrough (grey)	HFBR-4505Z	**117-3140●**	3.41	2.88	1.98
Bulkhead Feedthrough (blue)	HFBR-4515Z	**117-3141●**	3.41	2.88	1.98
Polishing Kit	HFBR-4593Z	**117-3142●**	13.43	11.35	7.78
Crimp Tool	HFBR4597	**249-476**	580.11	– –	– –

Fibre Optics - Glass Systems

High Speed ST® Modules

AVAGO TECHNOLOGIES



ST Port Bottom View

Body: H=10.2, W=12.7, D=12.7
Pin/row spacing=2.5
Port colour coding:
Transmitter Light Grey
Receiver Dark Grey

Connections:
HFBR1412/4: Pins 2, 6, 7 – Anode, 3 – Cathode
HFRR2412: Pins 3, 7 – Common, 2 – Vcc, 6 Data
HFBR2414: Pins 3, 7 – Common, 2 – Signal, 6 – Vcc
Other pins – no connection

Miniature bayonet coupled transmitter and receiver modules for high performance links up to 4Km, and data rates up to 30 MBd. Auto-insertable and wave-solderable.

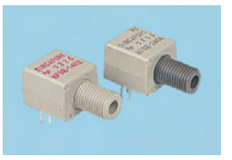
Transmitter			HFBR-1412	HFBR-1412	HFBR14-14	HFBR14-14
Coupled Optical Power (dBm)			-6.5	-12.0	-12.0	-16.5
Cable Size (µm)			200 PCS	100/140	62.5/125	50/125
Receiver		**Sensitivity (dBm)**				
HFBR2412	Logic IC	-24.5	5MBd/3.5Km	5MBd/4.1Km	5MBd/4.7Km	5MBd/3.2Km
HFBR2412	PIN	-36	5MBd/5.6Km	5MBd/7.3Km	5MBd/8.6Km	5MBd/7.0Km
HFBR2412	PIN	-33	30MBd/600m	30MBd/3.0Km	30MBd/4.0Km	5MBd/4.0Km

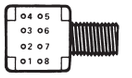
206495

	Mftrs. List No.	Order Code	Price Each 1+	10+	100+
Standard transmitter	HFBR-1412Z	**117-3153●**	48.47	41.78	28.80
High power transmitter	HFBR-1414Z	**117-3164●**	48.47	41.78	28.80
5MBd TTL receiver	HFBR-2412Z	**117-3168●**	48.47	41.78	28.80
25MHz analogue receiver	HFBR-2414Z	**117-3171●**	48.47	41.78	28.80
125MHz analogue receiver	HFBR-2416Z	**117-3150●**	48.47	41.78	28.80

High Speed SMA Modules — (Glass Fibre)

AVAGO TECHNOLOGIES





Bottom View

SMA Port

Thread: ¼"-36 UNS, L=9.5
Body: H=9.5, W=12.7, D=12.7
Pin/row spacing=2.5

Connections:
HFBR1402/4: Pins 2, 6 and 7 – Anode, 3 – Cathode.
HFBR2402/4/6: Pin 2 – Data, 3, 7 – Common, 6 – Vcc (5V)
Other pins – no connection.

Port Colour Coding: Transmitters – Light Grey. Receivers – Dark Grey.

Miniature transmitter and receiver modules in a dual-in-line package of high strength heat resistant plastic. Auto insertable.

The modules have SMA port and interface directly with SMA connectors.

Suitables cables:
100/140µm, 50/125µm, 62.5/125µm, 85/125µm glass fibre, 200µm PCS.

Peak optical power:
HFBR1402: 11.5dBm typ from 1m 100/140µm cable.
HFBR1404: 17.5dBm typ from 1m 50/125µm cable.

Data rate: HFBR2402: DC to 5 MBd (TTL CMOS compatible output).
HFBR2404: 40MBd max, 25MHz analogue output.
HFBR2406 175Mbd, 125MHz analogue output

Receiver supply voltage +5V Operating temperature -40°C to +85°C

Link performance of transmitter/receiver pairs:
HFBR1402/2402, 1300m @ 5MBd
HFBR1402/2404, 1500m @ 40MBd
2100m @ 10MBd
HFBR1404/2402, 1500m @ 5MBd
HFBR1404/2404, 2000m @ 40MBd
3000m @ 10MBd

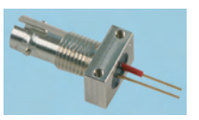
206494

Colour	Mftrs. List No.	Order Code	Price Each 1+	10+	100+
Standard transmitter	HFBR-1402Z	**117-3143●**	48.47	41.78	28.80
High power transmitter	HFBR-1404Z	**117-3144●**	48.47	41.78	28.80
5MBd TTL receiver	HFBR-2402Z	**117-3146●**	45.72	34.03	– –
25MHz analogue receiver	HFBR-2404Z	**117-3147●**	48.47	41.78	28.80
125MHz SMA fibre receiver	HFBR-2406Z	**117-3149●**	48.47	41.78	28.80

ST Emitters

Honeywell

Low Cost VCSEL



Body overall, H=9.7, W=12.7, L=31.7, Lead Length=10mm. 2 holes drilled and tapped, 2.56 UNC-2B, Fixing centres=9.5mm

Body overall, H=9.7, W=12.7, L=31.7, Lead Length=10mm. 2 holes drilled and tapped, 2.56 UNC-2B, Fixing centres=9.5mm

- High speed low cost VCSEL
- Industry standard ST-LP fibre connector
- Designed for drive currents between 5 and 15mA
- Optimised for low temperature dependence

These fibre optic LAN components are high performance Vertical Cavity Surface Emitting Laser (VCSEL) high speed communications devices. The devices produce a circularly symmetric, narrow divergence beam. They are designed to be used with inexpensive silicon or gallium arsenide detectors, but are able to perform as well with some indium gallium arsenide detectors.

Order Code 7538901 - A high radiance 850nm VCSEL packaged in a TO-46 header with a metal can assembled in a ST-LP connector.
Order Code 7538910 - A high radiance 850nm VCSEL packaged in a ST PCB mounting housing.

Absolute max. ratings:

Operating temperature	0 to 70°C
Forward current	15mA
Reverse voltage	5V @ 10µA

Electro optical characteristics

1201186	**Min.**	**Typ.**	**Max.**
Coupled power	200µW	400µW	
Rise/fall time		400ps/400ps	
Threshold current	1.5mA	3.5mA	
Peak wavelength	820nm	850nm	850nm
7538910			
Optical output power	200µW	500µW	1000µW
Rise/fall time		100ps/300ps	
Threshold current		3.6mA	6mA
Peak operating current current (Adjustable to establish operating power)		12mA	20mA
Peak wavelength	830nm	850nm	860nm

345967

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	+
HFE3637-001/XBA	**120-1186●**	75.84	64.19	59.60	– –
HFE4083-322/XBA	**753-8910●**	120.70	102.11	94.81	– –

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

C = CYAN M = Magenta Y = Yellow B = Black/SING

Fibre Optic Detector

Honeywell

TTL Output

The HFD3023-500 series is a direct coupled optical receiver designed for short distance 850nm fibre optic systems. The receiver contains a monolithic IC with an integral photodiode and amplification circuit, and an open collector Schottky output. The output allows it to be directly interfaced with standard TTI (Transistor-Transistor Logic) circuits.

Storage Temperature	-55 to 125°C (-67 to 257°F)
Case Operating Temperature	-40 to 85°C (-40 to 185°F)
Lead Solder Temp.	260°C, 10s
Supply Voltage	6V

NEW

Description	Mftrs. List No.	Order Code
5Mb Direct Coupled Receiver	HFD3023-500	108-2182
SMA Single Hole 5Mb Direct Coupled Receiver	HFD3023-500-AAA	108-2183
SMA PCB Mount 5Mb Direct Coupled Reciever	HFD3023-500-ABA	108-2184
SMA 4 Hole 5Mb Direct Coupled Receiver	HFD3023-500-BAA	108-2185
ST PCB Mount 5Mb Direct Coupled Receiver	HFD3023-500-BBA	108-2186

419438

Mftrs. List No.	Order Code	Price Each 1+	5+	10+	25+
HFD3023-500	**108-2182●**	43.36	35.19	31.44	31.34
HFD3023-500-AAA	**108-2183●**	81.54	65.39	58.96	– –
HFD3023-500-ABA	**108-2184●**	81.54	65.39	58.96	– –
HFD3023-500-BAA	**108-2185●**	81.54	65.39	58.96	– –
HFD3023-500-BBA	**108-2186●**	81.54	65.39	58.96	– –

PIN Diode reciever

Honeywell

ST PCB Mounting

Body overall, H=9.7, W=12.7, L=31.7, Lead Length=10mm. 2 holes drilled and tapped, 2.56 UNC-2B, Fixing centres=9.5mm

The HFD3065-002/XBA PIN Photodiode is designed for use in high speed fibre optic receivers. It has a large area detector, providing efficient response to 50 - 100 µm diameter fibres at wavelengths of 750 to 950 nanometers. The case is electrically isolated from the anode and cathode terminals to enhance the EMI/RFI shielding thus increasing the sensitivity and speed characteristics.
Works with emitters, HFE4080-321/XBA - Order Code 655089 or HFE4083-322/XBA - Order Code 7538910.

- Low capacitance
- High speed
- High responsivity
- Electrically isolated case

Absolute max. ratings:

Reverse voltage	50V
Forward voltage	1.5V

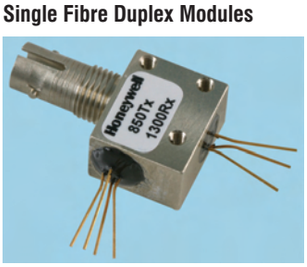
Electro optical characteristics	Min.	Typ.	Max.
Flux responsivity	0.52	0.55	
Active area		1.0mm²	
Dark current		1.0nA	5 nA
Response time (10-90% & 90-10%)		3.5 ns	
Capacitance		2.0pF VR=0,3.5pF VR=20V	

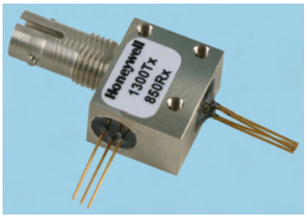
345949

Mftrs. List No.	Order Code	Price Each 1+	10+	100+	+
HFD3065-002/XBA	**120-1185●**	68.94	58.33	54.16	– –

Single Fibre Duplex Modules

Honeywell





A pair of dual wavelength fibre duplex modules that allow full duplex communication over a single fibre link. They may also be used where a dual fibre solution is neither possible nor economical. Alternatively, one duplex module may be used to double the capacity of an existing system.
Each duplex module consists of one on-axis port and one off axis port. These devices are coupled to the single fibre via integral lenses and a 3 dB wavelength differentiating mirror within the duplex module body. In this configuration the two duplex modules can communicate simultaneously and independently of each other.

- Full duplex over single fibre
- DC to 160 MHz link bandwidth
- Link budgets of 2 km (1.24 miles) or greater
- 40 dB isolation
- Low profile ST housing

The two devices listed are in the following configurations:

HOD4090 - 111/BBA (Order Code 7538871)
850 nm VCSEL laser V_{rev} Laser=10V (typ) Threshold current=3.6mA (typ) V_{FWD}=1.8V (typ)
1300 nm PIN diode V_{rev}=50V Dark current=2.0nA (typ) Capacitance=1.5 pF (typ)

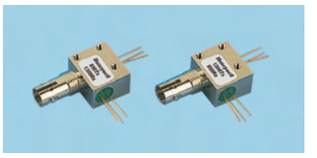
HOD4090 - 111/BBA (Order Code 7538871)
1300 nm laser V_{rev} Photo Diode=10V I_{FWD} - Photo Diode=1mA V_{FWD}=1.2V (typ)
850 nm PIN diode V_{rev}=50V Dark current=0.05nA (typ) Capacitance=1.5 pF (typ)

345953

Mftrs. List No.	Order Code	Price Each 1+	10+	+	+
HOD4090-111/BBA	**753-8871●**	390.60	330.51	– –	– –
HOD2236-111/BBA	**753-8880●**	428.33	362.41	– –	– –

Single Fibre Duplex Modules

Honeywell



- Full Duplex communication over a single multimode fibre
- Doubles the number of comm. channels over an installed fibre-optic infrastructure
- Standard ST optical port and PCB connector height
- Supplied in pairs with an emitter and detector in each ST package configured as below:
  HOD4013-132/BBA - 850nm LED with 1300nm PIN diode,
  HOD3021-212/BBA - 1300nm LED with 850nm PIN diode
- Optical cross-talk immunity: <-40dDm
- Wide operating temperature range: -40°C to +85°C
- Commercial variation of proven military design
- Link lengths in excess of 5km using standard glass fibres

206560

	Order Code	Price Each 1+	+	+	+
Fibre Duplexer	**120-1175●**	592.88	– –	– –	– –

VCSEL, ST Emitter

Honeywell

Vertical Cavity Surface Emitting Laser

The HFE4080-321 is a high performance 850 nm VCSEL (Vertical Cavity Surface Emitting Laser) mounted in an industry standard ST housing. Data rates from DC to greater than 2GB/s dependent on component application. The VCSEL has a low current consumption (5-15mA) which makes design and interfacing to logic gates easier. Specifically designed to connect to 50/125 or 62.5/125 micron multimode fibre.

Body overall, H=21.5, W=12.7, D=9.5, Lead Length=10, 2 holes drilled and tapped 2.56 UNC, Fixing centres=9.5

Absolute max. ratings:

Case operating temperature range 0°C to -70°C		Reverse voltage 5V @ 10µA
Continuous forward current (heat sinked)	15mA	

Electro optical characteristics	Min.	Typ.	Max.
Output power I_f=10mA	0.8mW	1.5mW	
Threshold current I_{TH}		3.5mA	6mA
Forward voltage I_f=10mA		1.75V	2.1V
Peak wavelength I_f=10mA DC	820nm	850nm	860nm
Spectral bandwidth		0.5nm	
Rise and fall times T_r, T_f (prebias above threshold)		100ps	400ps
Analogue bandwidth I_f=10mA DC		6GHz	

Caution: The VCSEL is a laser and should be treated as a potential eye hazard if handled incorrectly

206409

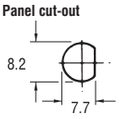
Mftrs. List No.	Order Code	Price Each 1+	5+	10+	25+	+
HFE4080-321-XBA	**120-1183●**	137.76	130.86	123.96	117.09	– –

Fibre Optics - Universal System

SMA Emitters and Detectors

FIBRE DATA

Panel cut-out



Single hole type

Panel, Rear Fitting
Body overall L=20.6
Nut=11 A/F

PCB
Body overall L=16.3, W=12.7
2 holes drilled
and tapped 2.56 UNC

PCB type recommended panel hole size=2.3 dia. 2 holes on 9.5 fixing centres. Lead length=21

Connections: Emitters: Red sleeve – Anode. Detectors: Black sleeve – Anode

Universal 9mm FSMA emitters and detectors are suitable for use with both 1mm polymer fibre and 200/250µm glass fibre cables. This enables low cost polymer cable to be used over shorter distances with the same emitters and detectors as used with 200/250µm cable over longer distances.

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

The PIN diode photodetectors have 1mm square active area permitting collection of light with high efficiency for all fibres up to 1000µm (1mm) core size, and can be used for frequencies up to and in excess of 100MHz. The spectral range of sensitivity is 400 to 1100nm.

The emitters and detectors are both available in a choice of mounting styles with SMA connection. All have full epoxy primary encapsulation.

206491

Mounting	Order Code	Price Each 1+	10+	25+
Emitters				
Panel, rear fitting	**120-8870●**	48.21	34.67	33.75
PCB	**120-8872●**	48.21	34.67	33.75
Detectors				
Panel, rear fitting	**120-8873●**	38.80	27.93	27.28
PCB	**120-8874●**	38.80	27.93	27.28

Fibre Optic Terminated Optical Leads

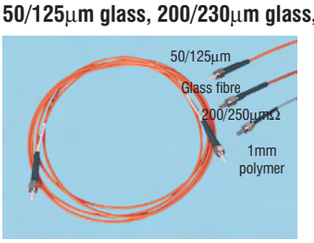
Fibre Optic Cable Assemblies

- Factory tested and certified
- ST, SC, MTRJ & LC versions
- Insertion loss <0.35dB
- LSZH cable sheath as standard
- Individually packed

231787

Connector Combinations and Cable Length	Mftrs. List No.	Order Code	Price Each 1+	5+
ST - ST Duplex, Zipcord Cable				
ST - ST, 1M	FPC-22010-00	**121-9593●**	50.82	45.06
ST - ST, 3M	FPC-22030-00	**121-9594●**	57.75	51.21
ST - ST, 5M	FPC-22050-00	**121-9596●**	64.68	57.33
SC - SC Duplex, Zipcord Cable				
SC - SC, 1M	FPC-44010-00	**121-9597●**	78.75	69.81
SC - SC, 2M	FPC-44020-00	**121-9598●**	82.59	73.20
SC - SC, 5M	FPC-44050-00	**121-9599●**	93.93	83.25
2 x ST - 2 x SC Duplex, Zipcord Cable				
2 x ST - 2 x SC, 1M	FPC-24010-00	**121-9600●**	66.54	58.98
ST - MTRJ Duplex, Zipcord Cable				
ST - MTRJ Female, 2M	FPC-28020-00	**121-9602●**	79.20	– –
ST - ST Duplex, Zipcord Cable				
ST - ST, 1M	FPC-22010-10	**121-9603●**	51.42	45.60
ST - ST, 2M	FPC-22020-10	**121-9604●**	55.44	49.14
ST - ST, 3M	FPC-22030-10	**121-9605●**	59.61	52.83
ST - ST, 5M	FPC-22050-10	**121-9606●**	67.65	59.97
SC - SC Duplex, Zipcord Cable				
SC - SC, 1m	FPC-44010-10	**121-9607●**	79.41	70.38
SC - SC, 2m	FPC-44020-10	**121-9608●**	83.70	74.19
SC - SC, 3m	FPC-44030-10	**121-9609●**	87.99	78.00
SC - SC, 5m	FPC-44050-10	**121-9610●**	96.69	85.71
2 x ST - 2 x SC Duplex, Zipcord Cable				
2 x ST - 2 x SC, 2m	FPC-24020-10	**121-9611●**	71.49	63.36
2 x ST - 2 x SC, 3m	FPC-24030-10	**121-9612●**	75.78	67.17

50/125µm glass, 200/230µm glass, 1mm polymer — FIBRE DATA



A range of fibre optical leads, terminated with 9mm FSMA connectors compatible with FSMA transmitters and receivers.

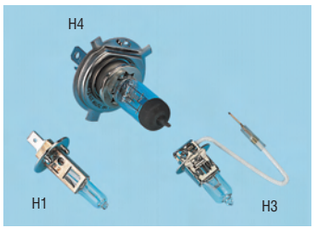
Type	Core Dia.	Cladding Dia.	Cladding Dia.
50/125µm glass	0.050	0.125	2.5
200/230µm glass	0.200	0.250	3.2
1mm polymer	1.0	—	2.2

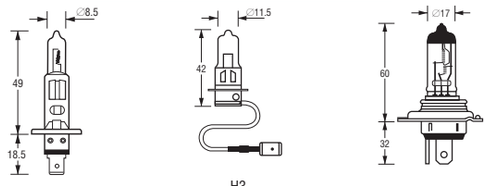
206490

Length	Order Code	Price Each 1+	5+	10+	25+
50/125µm Glass Fibre					
2m	**120-8865●**	170.40	152.01	124.96	103.54
5m	**120-8866●**	180.23	120.30	114.54	109.56
10m	**120-8863●**	196.60	131.24	124.93	119.49
20m	**120-8864●**	237.62	158.62	151.00	144.46
200/230µm Glass Fibre					
2m	**120-8907●**	124.08	97.65	92.96	88.93
5m	**120-8908●**	144.13	113.93	108.46	103.77
10m	**120-8909●**	176.55	139.48	132.80	127.01
1mm Polymer					
1m	**120-8867●**	68.13	61.16	40.30	34.89
2m	**120-8868●**	74.86	67.28	61.55	47.16
5m	**120-8869●**	84.53	75.91	69.59	53.32

Automotive Lamps & Lighting

Stop/Fog and Headlight Lamps — LUX



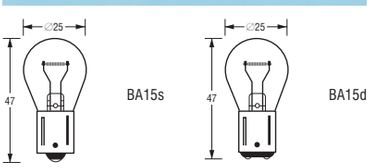


Voltage	Wattage	Description	BS Ref	Style	Order Code
12V	55W	H1 Tungsten/Halogen	BS448	H1	113-9209
12V	55W	H1 Xenon	BS448X	H1	113-9212
24V	70W	H1 Tungsten/Halogen	BS466	H1	113-9211
12V	55W	H3 Tungsten/Halogen	BS453	H3	113-9213
24V	70W	H3 Tungsten/Halogen	BS460	H3	113-9214
12V	60W/55W	H4 Tungsten/Halogen	BS472	H4	113-9215
12V	60W/55W	H4 Xenon	BS472X	H4	113-9218
24V	75W/70W	H4 Tungsten/Halogen p43t	BS475	H4	113-9217

206546

Order Code	Price Each 1+	10+	25+	50+	+
113-9209●	4.92	4.18	– –	– –	– –
113-9212●	23.94	20.43	18.96	15.81	– –
113-9211●	8.79	7.35	6.84	6.05	– –
113-9213●	4.35	3.72	– –	– –	– –
113-9214●	6.75	5.77	– –	– –	– –
113-9215●	6.60	5.63	– –	– –	– –
113-9218●	26.98	– –	– –	– –	– –
113-9217●	14.01	11.64	10.86	9.58	– –

Stop/Tail Flashers — LUX

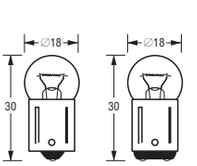


Voltage	Wattage	Description	Style	Order Code
12V	21W	SCC BA15s	BA15s	113-9269
24V	21W	SCC BA15s	BA15s	113-9271
12V	21W	SBC BA15d	BA15d	113-9263

206533

BS Ref.	Order Code	Price Each 1+	10+	25+	50+	+
BS382	**113-9269●**	0.56	0.48	0.47	– –	– –
BS241	**113-9271●**	0.93	0.78	0.66	0.60	– –
BS335	**113-9263●**	0.93	0.78	0.75	0.60	– –

Side, Tail Indicators — LUX



BA15s SCC BA15d SBC

● Compliant
◄ Non-compliant
‡ Limited stock - RoHS replacement available

RoHS

C = CYAN M = Magenta Y = Yellow B = Black/SING

Farnell Page 972 Date: 21-08-06 time: 18:29

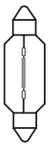
Wattage	Voltage	Description	Style	Order Code
5W	12V	SCC BA15s	BA15s	113-9270
5W	12V	SBC BA15d	BA15d	113-9264
5W	24V	SCC BA15s	BA15s	113-9272
5W	24V	SCC BA15s (Heavy Duty)	BA15s	113-9273
5W	24V	SBC BA15d	BA15d	113-9266
5W	24V	SBC BA15d (Heavy Duty)	BA15d	113-9267
10W	12V	SCC BA15s	BA15s	113-9268

206535

BS Ref.	Order Code	Price Each 1+	10+	25+	50+	+
BS207	**113-9270●**	0.63	0.58	0.52	0.42	– –
BS245	**113-9268●**	0.63	0.57	0.54	0.51	– –
BS149	**113-9272●**	0.72	0.66	0.56	0.47	– –
BS248	**113-9273●**	1.56	1.47	1.35	1.02	– –
BS209	**113-9264●**	0.72	0.66	0.59	0.47	– –
BS150	**113-9266●**	0.63	0.57	0.54	0.51	– –
247BS247	**113-9267●**	1.57	1.41	1.35	1.02	– –

Festoon and Wedge Base Lamps for Side, Tail, Licence Plate and Interior Illumination

LUX



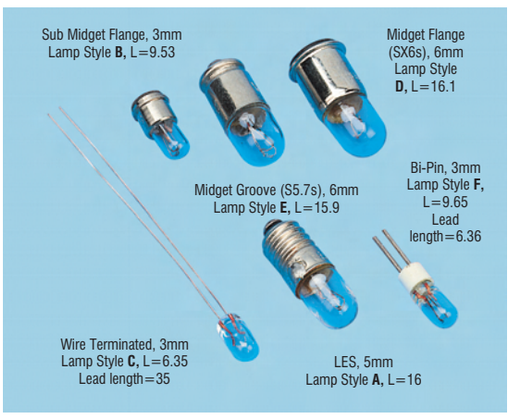
Voltage	Wattage	Description	Style	Order Code
12V	5W	11x38mm Festoon	Festoon	113-9192
12V	10W	11x38mm Festoon	Festoon	113-9191
24V	5W	11x38mm Festoon	Festoon	113-9193

206536

BS Ref.	Order Code	Price Each 1+	10+	25+	50+	+
BS239	**113-9192●**	0.78	0.66	0.59	0.51	– –
BS272	**113-9191●**	0.90	0.72	0.69	0.58	– –
BS242	**113-9193●**	0.69	0.57	0.56	– –	– –

NATO Numbered Filament Lamps

NATO Numbered Filament Lamps



MBC/MCC (BA9s), 10mm, Lamp Style G, L=28

MBC/MCC (BA9s), 11mm, Lamp Style H, L=24

MES (E10), 10mm, Lamp Style I, L=28

MES (E10), 11mm, Lamp Style J, L=28

Nato Number	Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Lamp Style	Order Code
9951903	14	0.05	0.7	3	1000	A	113-9220
9951906	24	0.04	0.96	3	10000	A	113-9221
9953258	28	0.04	1.12	4.5	4000	A	113-9222
9959184	28	0.024	0.672	1.6	4000	B	113-9275
9954534	28	0.024	0.672	1.9	4000	C	113-9474
9951189	5	0.06	0.3	0.6	40000	C	113-9475
9952907	12	0.06	0.72	1.9	16000	C	113-9471
9959118	28	0.04	1.12	4.5	4000	D	113-9276
9959182	28	0.04	1.12	4	10000	D	113-9278
6590286	28	0.04	1.12	3.8	10000	E	113-9262
9952193	28	0.024	0.672	1.9	4000	F	113-9190
9951294	6.5	0.3	2	12	4000	G	113-9189
995473999547399954739	12	0.183	2.2	11	3000	GGG	113-9182
5411318	24	0.05	1.3	1.3	5000	G	113-9184
9951233	24	0.12	2.9	12	3000	G	113-9187
9951234	24	0.117	2.8	11	3000	H	113-9185
9951922	6.5	0.3	2	12	4000	I	113-9231
9959233	24	0.05	1.2	4	5000	I	113-9225
9951232	24	0.12	2.9	12	3000	I	113-9227
9951183	6.5	0.3	2	12	4000	J	113-9229
9953247	12	0.183	2.2	11	4000	J	113-9224
9951297	24	0.117	2.8	11	3000	J	113-9226

206581

Voltage	Nominal Lumens	Order Code	Price Each 5+	50+	100+	250+	+
14V	3	**113-9220●**	0.90	0.81	0.75	0.60	– –
24V	3	**113-9221●**	0.90	0.81	0.75	0.60	– –
28V	4.5	**113-9222●**	0.90	0.81	0.75	0.60	– –
28V	1.6	**113-9275●**	1.77	1.62	1.44	1.16	– –
28V	1.9	**113-9474●**	1.59	1.50	1.35	1.07	– –
5V	0.6	**113-9475●**	0.75	0.69	0.63	0.47	– –
12V	1.9	**113-9471●**	0.75	0.69	0.63	0.47	– –
28V	4.5	**113-9276●**	0.81	0.78	0.69	0.56	– –
28V	4	**113-9278●**	0.81	0.78	0.69	0.56	– –
28V	3.8	**113-9262●**	1.02	0.87	0.81	0.65	– –
28V	1.9	**113-9190●**	2.43	2.28	2.07	1.63	– –
6.5V	12	**113-9189●**	0.81	0.78	0.69	0.47	– –
12V	11	**113-9182●**	0.81	0.78	0.69	0.47	– –
24V	1.3	**113-9184●**	0.81	0.78	0.69	0.47	– –
24V	12	**113-9187●**	0.81	0.78	0.69	0.47	– –
24V	11	**113-9185●**	0.81	0.78	0.69	0.47	– –
6.5V	12	**113-9231●**	0.81	0.78	0.69	0.47	– –
24V	4	**113-9225●**	0.81	0.78	0.69	0.47	– –
24V	12	**113-9227●**	0.81	0.78	0.69	0.47	– –
6.5V	12	**113-9229●**	0.81	0.78	0.69	0.49	– –
12V	11	**113-9224●**	0.81	0.78	0.69	0.47	– –
24V	11	**113-9226●**	0.81	0.78	0.69	0.47	– –

Torch Bulbs

Xenon, Krypton, Halogen and Vacuum Versions

P13.5s, L=32 | BA9s, L=33 | E10, L=32, B L=24

Voltage (V)	Current (A)	Nominal Lumens	Nominal Life (Hrs)	Lamp Type	Lamp Style	Mftrs List No.	Order Code
2.5	0.83	23	25	Halogen	A	1340100H	110-5532
5.2	0.85	90	25	Halogen	A	1340300H	110-5533
2.4	0.3	6	4	Near/Far	B	13000100	110-5546
2.2	0.25	4	10	Test Bulb	B	13100503	110-5547
12	10 (Watt)	200	240	Halogen	C	4330000H	110-5534
12	20 (Watt)	200	240	Halogen	C	00000433	110-5535
2.4	0.85	12	10	Xenon	D	1321090X	110-5542
2.4	0.5	10	10	Xenon	D	1321080K	113-9259
3.6	0.3	10	30	Krypton	D	1321120K	110-5543
4.75	0.5	32	20	Krypton	D	1321155K	110-5544
4.8	0.7	58	15	Krypton	D	1321156K	313-4477
5.4	0.54	38	15	Krypton	D	1321160K	110-5545
2.8	0.85	35	10	Halogen	D	1325100H	110-5536
4	0.85	60	25	Halogen	D	1325200H	110-5537
5.2	0.85	85	25	Halogen	D	1325300H	110-5538
6	1	100	100	Halogen	D	1325600H	110-5539
6.5	0.7	90	20	Halogen	D	1325700H	110-5540
2.5	0.3	6	10	Vacuum	D	13211100	110-5548
3.6	0.5	17	30	Vacuum	D	13211303	110-5549
3.8	0.3	13	10	Vacuum	D	13211400	110-5550
4.75	0.5	25	15	Vacuum	D	13211550	110-5551
5.85	0.5	39	15	Vacuum	D	13211700	110-5552

206609

Voltage	Nominal Lumens	Order Code	Price Each 1+	10+	25+	100+	+
2.5	23	**110-5532●**	7.80	7.35	5.94	3.72	– –
5.2	90	**110-5533●**	9.24	8.40	7.20	3.95	– –
2.4	6	**110-5546●**	1.26	1.17	0.96	0.60	– –
2.2	4	**110-5547●**	1.68	1.32	0.99	0.60	– –
12	200	**110-5534●**	13.60	10.26	8.19	4.88	– –
12	200	**110-5535●**	17.07	12.90	10.29	6.14	– –
2.4	12	**110-5542●**	2.43	1.95	1.86	1.16	– –
2.4	10	**113-9259●**	0.75	0.66	0.63	0.51	– –
3.6	10	**110-5543●**	1.37	0.99	0.81	0.51	– –
4.75	32	**110-5544●**	1.37	0.99	0.78	0.47	– –
4.8	58	**313-4477**	1.37	0.99	0.78	0.47	– –

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products, prices are subject to change without notice.

C = CYAN M = Magenta Y = Yellow B = Black/SING

Voltage	Nominal Lumens	Order Code	Price Each 1+	10+	25+	100+	+
5.4	38	**110-5545●**	1.33	0.99	0.78	0.47	– –
2.8	35	**110-5536●**	10.45	7.71	5.94	3.72	– –
4	60	**110-5537●**	10.98	8.34	6.60	3.95	– –
5.2	85	**110-5538●**	10.98	8.34	6.60	3.95	– –
6	100	**110-5539●**	11.45	8.46	6.51	4.09	– –
6.5	90	**110-5540●**	12.29	9.33	7.41	4.42	– –
2.5	6	**110-5548●**	0.60	0.54	0.49	0.28	– –
3.6	17	**110-5549●**	0.57	0.54	0.42	0.28	– –
3.8	13	**110-5550●**	0.87	0.63	0.52	0.33	– –
4.75	25	**110-5551●**	0.57	0.54	0.42	0.28	– –
5.85	39	**110-5552●**	0.87	0.63	0.52	0.30	– –

Filament Lamps

MES (E10) 10mm, T3¼ — SLI

L=28.0◆
L=30.0

Voltage (V)	Current (A)	Output (W)	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
6.5	0.3	1.95	12	4000	W503-5	113-9437
12	0.183	2.2	11	3000	W1309-5	113-9428
12	0.25	3	12.5	4000	W577-5	113-9427
24	0.05	1.2	3.8	5000	W592-5	113-9431
24	0.12	2.8	10.7	3000	W599-5	113-9433
24	0.07	1.96	4.5	25000	W1122-5	113-9432
48	0.1	4.8	41.5	1000	CM1823-1	113-9436◆
130	0.02	2.6	3	3000	W1159-5	113-9430
	0.02	2.6	3	3000	W1159	254-150

207608

Voltage	Nominal Lumens	Order Code	Price Each 5+	100+	500+
6.5	12	**113-9437●**	1.11	0.84	0.70
12	11	**113-9428●**	1.14	0.77	– –
12	12.5	**113-9427●**	1.35	0.99	0.87
24	3.8	**113-9431●**	1.26	1.20	0.96
24	10.7	**113-9433●**	1.41	1.05	0.87
24	4.5	**113-9432●**	1.17	0.90	0.61
48	41.5	**113-9436●**	2.25	0.84	0.81
60	10.5	**113-9438●**	2.28	1.65	1.40
130	3	**113-9430●**	3.36	2.17	– –

MES (E10) 11mm, G3½ — SLI

L=24.0

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
2.5	0.2	0.5	3.8	10	G627-5	113-9200
2.5	0.25	0.63	5.6	30	G628-5	113-9201
3.5	0.15	0.525	1.5	5000	G191-5	113-9205
3.5	0.3	1	6	1000	G647	328-303
6	0.06	0.36	1	10000	G198-5	113-9208
6.5	0.15	0.975	6	3000	G473-5	113-9206
6.5	0.3	1.95	12	4000	G501-5	113-9207
12	0.1	1.2	5	5000	G573-5	113-9197
12	0.18	2.2	9.4	3000	G987-5	113-9199
24	0.05	1.2	3.8	3000	G592-5	113-9202
24	0.12	2.8	10.7	3000	G650-5	113-9203

207610

Voltage	Nominal Lumens	Order Code	Price Each 5+	100+	1K+
2.5	3.8	**113-9200●**	0.99	0.72	0.67
2.5	5.6	**113-9201●**	1.20	0.90	0.84
3.5	1.5	**113-9205●**	1.68	0.78	0.69
3.5	6	**328-303**	1.07	0.78	0.72
6	1	**113-9208●**	0.99	0.72	0.67
6.5	6	**113-9206●**	0.99	0.72	0.67
6.5	12	**113-9207●**	1.00	0.72	0.67
12	5	**113-9197●**	1.08	0.84	0.74
12	9.4	**113-9199●**	1.08	0.84	0.74
24	3.8	**113-9202●**	2.15	1.50	0.90
24	10.7	**113-9203●**	1.23	0.90	0.87

MBC/MCC (BA9s) 9mm T2 ⅞, 10mm — multicomp

T2⅞ L=23 T3¼
L=30

● Low cost replacement filament lamps

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Order Code
9mm T2 ⅞					
24	0.05	1.2	3.1	10000	315-9152
24	0.83	2	6.3	5000	315-9164
30	0.07	2	6.3	5000	315-9176
36	0.55	2	5	4000	315-9188
10mm T3 ¼					
12	0.17	2	9.4	3000	315-9190
24	0.05	1.2	3.8	5000	315-9206
24	0.07	2	6.3	10000	315-9218
24	0.08	2	6.3	7000	315-9220
24	0.12	3	10.7	5000	315-9231
28	0.04	1.1	4.3	3000	315-9243
30	0.07	2	6.3	5000	315-9255
130	0.02	3.2	4.5	3000	315-9267

206599

Voltage	Nominal Lumens	Order Code	Price Each 10+	50+	100+	500+
9mm T2 ⅞						
24	3.1	**315-9152**	1.30	1.11	0.93	0.75
24	6.3	**315-9164**	1.30	1.11	0.93	0.75
30	6.3	**315-9176**	1.30	1.11	0.93	0.75
36	5	**315-9188**	1.30	1.11	0.96	0.75
10mm T3 ¼						
12	9.4	**315-9190**	1.44	1.26	1.14	0.90
24	3.8	**315-9206**	1.48	1.38	1.17	0.93
24	6.3	**315-9218**	1.48	1.38	1.17	0.93
24	6.3	**315-9220**	1.48	1.38	1.17	0.93
24	10.7	**315-9231**	1.48	1.38	1.17	0.93
28	4.3	**315-9243**	1.48	1.38	1.17	0.93
30	6.3	**315-9255**	1.48	1.38	1.17	0.93
130	4.5	**315-9267**	3.24	2.88	2.52	2.04

MBC/MCC (BA9s) 10mm, T3¼ — SLI

L=28.0
◆L=30.0

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
5	0.09	0.45	3.1	750	W440-1	113-9417
6	0.2	1.2	3.8	15000	W1212-5	113-9426
6.3	0.15	0.945	4.1	20000	CM755-5	113-9418◆
6.3	0.15	0.945	6.5	3000	CM47-5	113-9419◆
6.3	0.25	1.575	11.3	3000	CM44-5	113-9420◆
6.5	0.15	0.97	6	3000	W476-1	113-9422
6.5	0.3	1.95	12	4000	W504-1	113-9424
12	0.17	2	9.4	3000	W643-5	113-9397
14	0.08	1.12	3.9	15000	756-5	113-9399◆
24	0.05	1.2	3.8	5000	W568-5	113-9401
24	0.07	2	6.3	10000	W1152-1	113-9402
24	0.083	2	6.3	10000	W1201-5	113-9404
24	0.12	2.88	12	3000	W600-5	113-9403
28	0.04	1.1	4.3	3000	CM1819-5	113-9405
28	0.07	1.96	12.6	1000	1829-5	113-9407◆
28	0.08	2.24	7.8	7500	CM757-5	113-9408◆
28	0.1	2.8	20	1000	CM1820-5	113-9409◆
28	0.17	4.76	38	1000	CM1864-5	113-9412
28	0.17	4.76	44	500	CM313-5	113-9410◆
30	0.07	2	6.3	5000	W1204-5	113-9413
48	0.02	0.96	1.9	1000	W1166-5	113-9414
48	0.04	1.92	6.3	5000	W1206-1	113-9415
50	0.05	2.5	9	5000	W608-5	113-9416
60	0.033	2	5	3000	W1207-5	113-9425
130	0.02	3.2	4.5	3000	W1121T	113-9398

207609

Voltage	Nominal Lumens	Order Code	Price Each 5+	100+	500+
5	3.1	**113-9417●**	1.68	0.93	0.81
6	3.8	**113-9426●**	0.81	0.75	0.63
6.3	4.1	**113-9418●**	1.68	1.20	0.78
6.3	6.5	**113-9419●**	1.49	1.08	0.78
6.3	11.3	**113-9420●**	1.49	1.08	0.78
6.5	6	**113-9422●**	1.23	0.90	0.74
6.5	12	**113-9424●**	1.23	0.90	0.74
12	9.4	**113-9397●**	1.20	0.90	0.81
14	3.9	**113-9399●**	1.64	1.11	0.84
24	3.8	**113-9401●**	1.35	1.05	0.92
24	6.3	**113-9402●**	1.34	1.08	0.61
24	6.3	**113-9404●**	1.34	1.05	0.96
24	12	**113-9403●**	1.35	1.05	0.92
28	4.3	**113-9405●**	1.34	1.05	0.96
28	12.6	**113-9407●**	1.26	1.02	0.92
28	7.8	**113-9408●**	1.29	1.05	0.89
28	20	**113-9409●**	2.08	1.50	1.35
28	38	**113-9412●**	1.32	1.02	0.92
28	44	**113-9410●**	2.31	1.41	0.96
30	6.3	**113-9413●**	1.35	1.05	0.61
48	1.9	**113-9414●**	1.56	1.47	– –
48	6.3	**113-9415●**	2.06	1.65	1.02
50	9	**113-9416●**	2.16	1.68	1.47
60	5	**113-9425●**	3.03	2.13	1.02
130	4.5	**113-9398●**	7.77	5.61	4.21

MBC/MCC (BA9s) 9mm, T2⅞ — SLI

L=24.0

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
6	0.333	2	6.3	15000	1164	113-9396
12	0.167	2	6.3	10000	1135	113-9389
24	0.05	1.2	3.1	10000	1127	113-9390
24	0.83	2	6.3	5000	1137	113-9391
36	0.55	2	5	4000	1130	113-9394
48	0.042	2	6.3	5000	1138	113-9395
30	0.07	2	6.3	5000	1129	113-9392

RoHS ● Compliant ◀ Non-compliant ‡ Limited stock - RoHS replacement available

C = CYAN M = Magenta Y = Yellow B = Black/SING

207642

Voltage	Nominal Lumens	Order Code	Price Each 5+	100+	1K+
6	6.3	**113-9396●**	1.08	0.90	0.81
12	6.3	**113-9389**	1.24	– –	– –
24	3.1	**113-9390**	1.14	0.96	– –
24	6.3	**113-9391**	1.08	0.96	– –
36	5	**113-9394**	1.08	0.96	0.96
48	6.3	**113-9395**	1.47	1.38	– –
30	6.3	**113-9392**	1.14	1.05	0.96

Bayonet (BA7s) 7mm, T2

SLI

L=20.7

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
12	0.17	2	7.5*	1000*	281	113-9376
24	0.04	1	3*	7000*	285	113-9377
24	0.125	3	10*	3000*	283	113-9378

* min @ 13.5595421

206319

Voltage	Nominal Lumens	Order Code	Price Each 5+	100+	1K+
12	7.5	**113-9376●**	2.55	1.77	0.99
24	3*	**113-9377●**	2.55	1.14	1.11
24	10	**113-9378●**	1.47	1.29	1.20

Sub-Midget Flange (SX4s) 3mm/T1

multicomp

L=14.0 max.

● Low cost replacement filament lamps

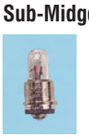
Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Order Code
5	0.06	0.3	0.6	25000	315-9280
12	0.06	0.7	1.9	16000	315-9292
28	0.03	0.7	1.5	4000	315-9309

206598

Voltage	Nominal Lumens	Order Code	Price Each 10+	50+	100+	500+
5	0.6	**315-9280**	3.43	3.09	2.58	2.10
12	1.9	**315-9292**	3.68	3.24	2.82	2.25
28	1.5	**315-9309**	3.37	2.91	2.55	1.98

Sub-Midget Flange (SX4s) 3mm, T1

SLI and CML



L=9.5

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
5	0.06	0.3	0.6	25000	MCFPSF-001	315-9280
12	0.06	0.7	1.9	16000	MCFPSF-002	315-9292
28	0.03	0.7	1.5	4000	MCFPSF-003.	315-9309
28	0.03	0.7	1.5	4000	6839-002	113-9292

220833

Voltage	Nominal Lumens	Order Code	Price Each 10+	50+	100+
5	0.6	**315-9280**	3.43	3.09	2.58
12	1.9	**315-9292**	3.68	3.24	2.82
28	1.5	**315-9309**	3.37	2.91	2.55
28	1.5	**113-9292●**	3.36	2.70	1.68

Midget Flange (SX6s, S6/8) 6mm T1¾

multicomp

Low cost replacement filament lamps

L=16mm

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Order Code
6	0.2	1.2	7.9	1000	315-8895
12	0.1	1.2	5	5000	315-8901
12	0.09	12	4.4	5000	315-8913
14	0.08	14	3.8	15000	315-8925
28	0.04	28	4.3	4000	315-8937
28	0.04	28	3.8	10000	315-8950
28	0.04	28	2.5	20000	315-8962

206603

Voltage	Nominal Lumens	Order Code	Price Each 10+	50+	100+	500+
6	7.9	**315-8895**	2.05	1.83	1.50	1.23
12	5	**315-8901**	2.05	1.83	1.50	1.23
12	4.4	**315-8913**	2.05	1.83	1.50	1.23
14	3.8	**315-8925**	2.16	1.89	1.44	1.05
28	4.3	**315-8937**	1.83	1.59	1.38	1.05
28	3.8	**315-8950**	2.24	1.92	1.62	1.29
28	2.5	**315-8962**	2.16	1.89	1.44	1.17

Midget Flange (SX6s, S6/8) 6mm, T1¾

SLI

L=16.1

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
6	0.1	0.6	2.5	5000	723	113-9355
6	0.2	1.2	7.5	1000	328	113-9358
6	0.2	1.2	7.9	1000	724.	113-9357
12	0.04	0.48	1.5	10000	394	113-9339
12	0.09	1.12	4.4	5000	725	113-9340
14	0.04	0.6	2	5000	733	113-9341
14	0.08	1.12	3.77	15000	382	113-9342
14	0.08	1.12	6.28	1000	330	113-9343
28	0.024	0.672	1.7	4000	1116	113-9346
28	0.04	1.12	4.5	4000	727	113-9350
28	0.04	1.12	4.3	4000	327	113-9349
28	0.04	1.12	4.02	10000	736	113-9351
28	0.04	1.12	3.8	10000	387	113-9348
28	0.04	1.12	2.5	20000	385	113-9347
28	0.08	2.24	10.05	2000	729	113-9352
48	0.025	1.2	4	2500	730	113-9353
60	0.02	1.2	2.2	3000	777	113-9354

207653

Voltage	Nominal Lumens	Order Code	Price Each 1+	100+	1K+
6	2.5	**113-9355●**	1.77	1.26	1.04
6	7.5	**113-9358●**	1.89	1.41	1.06
6	7.9	**113-9357●**	2.62	1.86	1.59
12	1.5	**113-9339●**	2.74	1.92	1.20
12	4.4	**113-9340●**	1.59	1.17	1.04
14	2	**113-9341●**	2.62	1.86	1.11
14	3.77	**113-9342●**	2.78	1.92	1.20
14	6.28	**113-9343●**	1.77	1.26	1.10
28	1.7	**113-9346●**	1.86	1.41	1.11
28	4.5	**113-9350●**	1.83	1.35	1.09
28	4.3	**113-9349●**	2.51	1.74	0.63
28	4.02	**113-9351●**	1.87	1.44	1.20
28	3.8	**113-9348●**	2.89	2.04	0.66
28	2.5	**113-9347●**	2.01	1.44	1.10
28	10.05	**113-9352●**	2.78	1.92	1.29
48	4	**113-9353●**	3.21	2.31	1.87
60	2.2	**113-9354●**	3.21	2.31	1.87

Midget Groove (S5.7s) 6mm T1 ¾

multicomp

L=15.9

● Low cost replacement filament lamps

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Order Code
6.3	0.2	1.26	5	20000	315-8974
14	0.08	1.12	6.3	750	315-8986
14	0.08	1.12	3.8	15000	315-8998
28	0.04	1.12	4.3	4000	315-9000
28	0.04	1.12	3.8	10000	315-9012
48	0.025	1.2	4.3	5000	315-9024
60	0.02	1.2	2.1	3000	315-9036

206602

Voltage	Nominal Lumens	Order Code	Price Each 10+	50+	100+	500+
6.3	5	**315-8974**	1.91	1.62	1.41	1.14
14	6.3	**315-8986**	1.99	1.68	1.44	1.17
14	3.8	**315-8998**	1.99	1.77	1.53	1.26
28	4.3	**315-9000**	1.99	1.77	1.53	1.26
28	3.8	**315-9012**	2.09	1.89	1.56	1.29
48	4.3	**315-9024**	2.91	2.55	2.16	1.74
60	2.1	**315-9036**	3.37	2.88	2.40	2.01

Midget Groove (S5.7s) 6mm T1¾

SLI

Lens End L=16.5

Standard L=15.9

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
Lens End						
2.5	0.35	0.88	3.10	10000	253	113-9361
Standard						
6.3	0.2	1.26	5	20000	379	113-9366
14	0.08	1.12	6.3	750	336	113-9359
6.3	0.2	1.26	5	20000	379	113-9366
28	0.04	1.12	4.3	4000	334	113-9362
28	0.04	1.12	3.8	10000	388	113-9363
36	0.03	1.08	3.52	5000	788	113-9364
48	0.025	1.2	4.3	5000	790	113-9365
60	0.02	1.2	2.1	3000	799	113-9367

227414

Voltage	Nominal Lumens	Order Code	Price Each 1+	100+	1K+
Lens End					
2.5	3.10	**113-9361●**	11.01	7.74	4.62
Standard					
6.3	5	**113-9366●**	1.92	1.03	– –
14	6.3	**113-9359●**	1.83	1.53	1.09
14	3.8	**113-9360●**	1.89	1.56	1.44
28	4.3	**113-9362●**	2.04	1.44	1.09
28	3.8	**113-9363●**	1.95	1.80	1.62
36	3.52	**113-9364●**	2.49	1.74	1.29
48	4.3	**113-9365●**	3.06	2.16	1.58
60	2.1	**113-9367●**	3.12	2.70	1.89

Prices are in Singapore Dollars and exclusive of GST.
Due to the volatile nature of certain products,
prices are subject to change without notice.

Wire ended T1, T1½

3mm T1, 5mm T1½

multicomp

● Low cost replacement filament lamps

T1 L=6.35, T1½ L=13.2
Lead Length=25.0 min.

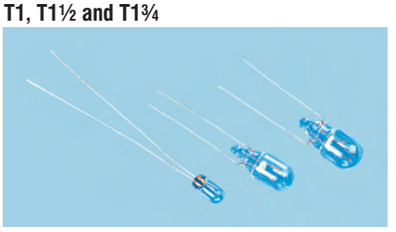
Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Order Code
3mm T1					
5	0.06	0.3	0.4	25000	315-9310
5	0.06	0.3	0.6	20000	315-9322
5	0.12	0.56	1.5	20000	315-9334
12	0.06	0.72	1.9	5000	315-9346
28	0.03	0.67	1.9	1000	315-9358
5mm T1½					
24	0.04	0.96	2.8	10000	315-9360
28	0.04	1.12	4.3	4000	315-9371

206595

Voltage	Lumens	Order Code	Price Each 10+	50+	100+	500+
3mm T1						
5	0.4	**315-9310**	1.17	1.14	0.93	0.90
5	0.6	**315-9322**	1.30	1.11	0.99	0.81
5	1.5	**315-9334**	1.14	1.11	0.87	0.81
12	1.9	**315-9346**	1.55	1.41	1.20	0.96
28	1.9	**315-9358**	1.02	0.90	0.75	0.59
5mm T1½						
24	2.8	**315-9360**	1.30	1.11	0.99	0.78
28	4.3	**315-9371**	1.30	1.11	0.99	0.81

Wire Ended T1, T1½ and T1¾

SLI



3mm, T1 L=6.35 Lead length=35.0 nom
5mm, T1½ L=13.5 Lead length=19.0 nom
6mm, T1¾ L=13.5 Lead length=19.0 nom

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
3mm, T1						
5	0.06	0.3	0.4	25000	680	113-9296
5	0.06	0.3	0.6	20000	683-004	113-9297
5	0.115	0.56	1.5	20000	715-004	113-9298
12	0.06	0.72	1.9	5000	7219-004	113-9294
28	0.024	0.67	1.9	1000	6838-004	113-9295
5mm, T1½						
6	0.06	0.36	1	10000	673BS	113-9312
14	0.04	0.56	2	5000	690BS	113-9308
14	0.05	0.7	3	1000	682BS	113-9309
24	0.05	0.96	2.8	10000	687BS	113-9310
28	0.04	1.12	4.5	4000	688BS	113-9311
6mm, T1¾						
14	0.08	1.12	3.8	15000	2182	113-9369
28	0.04	1.12	3.8	10000	2187	113-9371

207616

Voltage	Nominal Lumens	Order Code	Price Each 5+	100+	1K+
3mm, T1					
5	0.4	**113-9296●**	1.96	1.38	0.81
5	0.6	**113-9297●**	1.32	0.96	0.77
5	1.5	**113-9298●**	1.13	0.87	0.78
12	1.9	**113-9294●**	1.46	1.07	1.01
28	1.9	**113-9295●**	2.61	1.92	1.55
5mm, T1½					
6	1	**113-9312●**	0.99	0.72	0.57
14	2	**113-9308●**	1.60	1.11	0.69
14	3	**113-9309●**	1.07	0.78	0.72
24	2.8	**113-9310●**	2.00	1.38	0.81
28	4.5	**113-9311●**	1.32	0.96	0.78
6mm, T1¾					
14	3.8	**113-9369●**	1.23	1.14	0.81
28	3.8	**113-9371●**	1.23	1.14	0.81

Wedge Base 5mm, T1½

SLI

L=18.0

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
6	0.17	1	3.8	5000	1105LF	113-9327
12	0.166	2	7.5	1000	924-002LF	113-9322
12	0.1	1.2	7.2	1000	286-20L-LF	113-9315
12	0.03	0.36	0.7	3000	1107-002-LF	113-9314
12	0.08	1	3	5000	1108LF	113-9321
24	0.03	0.72	1.25	5000	1110LF	113-9323
24	0.04	0.96	3	10000	1111LF	113-9324
24	0.05	1.2*	6.3*	1000	508LF	113-9325
28	0.04	1.12	3.8	10000	1199LF	113-9326

* @ 28V

207647

Voltage	Nominal Lumens	Order Code	Price Each 10+	100+	500+
6	3.8	**113-9327●**	1.37	0.93	0.63
12	7.5	**113-9322●**	1.40	0.96	0.63
12	7.2	**113-9315●**	0.93	0.66	0.47
12	0.7	**113-9314●**	0.93	0.66	0.59
12	3	**113-9321●**	0.84	0.66	0.60
24	1.25	**113-9323●**	1.37	0.90	0.84
24	3	**113-9324●**	1.03	0.75	0.72
24	6.3	**113-9325●**	1.33	0.96	0.78
28	3.8	**113-9326●**	1.28	0.93	0.87

Wedge Base 6mm, T1¾

SLI

L=20.3

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
6.3	0.2	1.26	5	20000	CM86LF	113-9375
14	0.08	1.12	3.8	15000	CM73LF	113-9372
14	0.09	1.26	6.3	1500	CM37LF	113-9373
28	0.04	1.12	3.8	10000	CM85LF	113-9374

207605

Voltage	Nominal Lumens	Order Code	Price Each 10+	100+	500+
6.3	5	**113-9375●**	1.26	0.90	0.73
14	3.8	**113-9372●**	1.08	0.84	0.73
14	6.3	**113-9373●**	1.71	0.81	0.78
28	3.8	**113-9374●**	1.32	0.99	0.86

Wedge Base 10mm, T3¼

SLI

L=26.8 Nom. (L=20.7 for 526-976 and 526-988)

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
6.3	0.15	0.95	4.3	7500	159LF	113-9450
6.3	0.25	1.575	8.2	10000	259LF	113-9452
12	0.166	2	13*	1000*	509LF	113-9442
12	0.1	1.2	5	5000	1112LF	113-9439
12	0.18	2.16	12.6	3000	510LF	113-9440
12	0.22	2.64	22.6	1000	512LF	113-9441
12	0.22*	3*	22*	1000*	504LF	113-9443
12	0.37*	5*	50*	1000*	501	110-5555
14	0.19	2.66	12.5	4000	550207LF	113-9444
24	0.08	1.92	8	5000	513LF	113-9445
24	0.13	3	22**	1000**	505LF	113-9446
24	0.21	5	50**	1000**	507LF	113-9448
28	0.06	1.68	7.8	5000	656-002LF	113-9449

* @ 13.5V ** @28V

207607

Voltage	Nominal Lumens	Order Code	Price Each 5+	100+	500+	1K+	+
6.3	4.3	**113-9450●**	0.96	0.35	0.32	0.28	– –
6.3	8.2	**113-9452●**	0.53	0.41	0.38	0.28	– –
12	13*	**113-9442●**	1.53	0.99	0.66	– –	– –
12	5	**113-9439●**	1.02	0.81	0.69	0.51	– –
12	12.6	**113-9440●**	1.02	0.87	0.45	0.28	– –
12	22.6	**113-9441●**	1.02	0.99	0.69	– –	– –
12	22	**113-9443●**	1.02	0.66	0.63	– –	– –
12	50*	**110-5555●**	1.02	0.99	0.99	– –	– –
14	12.5*	**113-9444●**	0.96	0.69	0.66	0.28	– –
24	8	**113-9445●**	1.26	0.90	0.78	0.28	– –
24	22	**113-9446●**	1.17	1.14	0.75	– –	– –
24	50	**113-9448●**	1.17	1.08	0.75	– –	– –
28	7.8	**113-9449●**	0.99	0.78	0.69	0.28	– –

Telephone Slide (DIN 49 838B) T5.5

SLI

L=30

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
12	0.1	1.2	3.8	5000	12T55M100	113-9457
24	0.05	1.2	3.4	5000	24T55M50	113-9458
30	0.04	1.2	3.6	5000	30T55M40	113-9461
36	0.02	0.72	1.35	5000	36T55M20	113-9462
48	0.025	1.2	2.6	5000	48T55M25	113-9463
60	0.02	1.2	2.1	5000	60T55M20	113-9464

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

207612

Voltage	Nominal Lumens	Order Code	Price Each 5+	50+	100+	1K+
12	3.8	**113-9457**	1.56	1.36	– –	– –
24	3.4	**113-9458**	1.50	1.46	– –	– –
30	3.6	**113-9461**	2.01	1.74	1.50	1.47
36	1.35	**113-9462**	3.78	3.72	2.88	1.74
48	2.6	**113-9463**	2.01	1.74	1.74	– –
60	2.1	**113-9464**	2.34	1.91	– –	– –

Telephone Slide (American) 7mm, T2

SLI

L=22.2

L=27.1

Voltage (V)	Current (A)	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
22mm Length					
12	0.04	1.1	15000	12ESB	113-9383
24	0.04	1.5	8000	24ESB	113-9384
28	0.04	3.1	6000	28ESB	113-9387
27mm Length					
24	0.073	10.7	10000	24PSB	113-9385
28	0.04	2.1	5000	28PSB	113-9388
120	0.025	4.5	5000	120PSB	113-9382

207652

Voltage	Nominal Lumens	Order Code	Price Each 1+	100+	1K+
22mm Length					
12	1.1	**113-9383**	5.30	1.62	1.50
24	1.5	**113-9384**	5.77	2.67	1.59
28	3.1	**113-9387**	5.77	2.67	1.59
27mm Length					
24	10.7	**113-9385**	4.77	2.67	1.59
28	2.1	**113-9388**	4.77	1.74	1.59
120	4.5	**113-9382**	4.62	3.00	1.83

Telephone Slide (DIN49601) T6.8

L=46.5

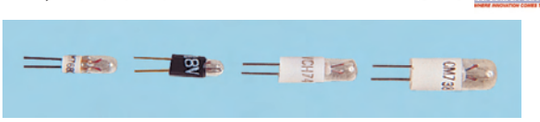
Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
24	0.05	1.2	3.5	5000	03632500	113-9466
28	0.04	1.12	4.5	5000	03633200	113-9467
30	0.04	1.2	3.8	5000	03633700	113-9469
60	0.02	1.2	2.2	5000	03636000	113-9470

207645

Voltage	Nominal Lumens	Order Code	Price Each 1+	100+	1K+
24	3.5	**113-9466●**	2.24	2.05	1.37
28	4.5	**113-9467●**	2.49	2.14	1.40
30	3.8	**113-9469●**	2.49	2.14	1.40
60	2.2	**113-9470●**	2.61	2.27	1.61

Bi-Pin T1, T1¼ and T1¾

SLI &



3mm, T1	3mm, T1	4mm, T1¼	6mm, T1¾
L=9.65	L=9.65	L=14.0	L=15.8
Lead length=6.85	Lead length=6.4	Lead length=6.85	Lead length=6.85
Lead spacing=1.27	Lead spacing=2.54	Lead spacing=2.54	Lead spacing=3.17

Voltage (V)	Current (A)	Watts	Nominal Lumens	Nominal Life (Hrs)	Mftrs. List No.	Order Code
3mm, T1 (1.27 lead spacing)						
5	0.06	0.3	0.38	40000	7680	113-9286
28	0.024	0.672	1.9	40000	7839-004	113-9283
3mm, T1 (2.54 lead spacing)						
5	0.06	0.3	1.9	5000	8-2401	113-9287
6	0.115	0.69	1.9	25000	01143800	113-9288
12	0.06	0.72	1.9	10000	01144800	113-9279
12	0.06	0.72	1.9	16000	8-2417	113-9280
18	0.026	0.47	1.9	5000	01145200	113-9281
24	0.024	0.58	1.9	5000	01145600	113-9282
28	0.024	0.67	1.9	4000	8-2402	113-9285
28	0.024	0.67	1.9	5000	01146000	113-9284
4mm, T1¼						
6	0.06	0.36	1.6	3000	7309	113-9331
12	0.03	0.36	0.7	3000	747BP	113-9328
24	0.035	0.84	1.9	7500	1091BP	113-9329
4mm, T1¼						
28	0.04	1.12	4	1000	7632	113-9330
6mm, T1¾						
6.3	0.2	1.26	5	20000	7381	113-9338
14	0.08	1.12	3.8	15000	7382	113-9333
28	0.04	1.12	3.8	10000	7387	113-9336
28	0.04	1.12	2.5	20000	7374	113-9335
28	0.04	1.12	4.3	4000	7327	113-9337

Mftr. VCH except 3mm, T1 (2.54 lead spacing) types EBT.

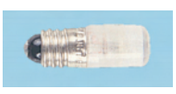
207620

Voltage	Nominal Lumens	Order Code	Price Each 1+	100+	500+
3mm, T1 (1.27 lead spacing)					
5	0.38	**113-9286●**	2.14	– –	– –
28	1.9	**113-9283●**	2.71	– –	– –
3mm, T1 (2.54 lead spacing)					
5	1.9	**113-9287●**	2.50	2.04	1.74
6	1.9	**113-9288●**	3.86	2.87	1.92
12	1.9	**113-9279●**	3.34	2.71	1.98
12	1.9	**113-9280●**	2.64	2.01	1.27
18	1.9	**113-9281●**	4.10	3.59	2.02
24	1.9	**113-9282●**	4.22	3.72	2.61
28	1.9	**113-9285●**	2.46	2.07	1.27
28	1.9	**113-9284●**	3.86	3.31	2.80
4mm, T1¼					
6	1.6	**113-9331●**	2.01	1.44	1.38
12	0.7	**113-9328●**	2.37	1.74	1.35
24	1.9	**113-9329●**	2.25	1.68	1.57
28	4	**113-9330●**	2.25	1.68	1.59
6mm, T1¾					
6.3	5	**113-9338●**	2.19	2.04	1.33
14	3.8	**113-9333●**	2.01	1.77	1.28
28	3.8	**113-9336●**	3.02	2.16	1.41
28	2.5	**113-9335●**	2.70	1.89	1.35
28	4.3	**113-9337●**	1.57	1.53	1.41

Neon Lamps

MES (E10) T3¼

SLI



10mm/T3¼
L=30

With Series Resistor Colour	Voltage	Mftrs.List No.	Order Code	With Series Resistor Green(fluorescent)	250-250V	8GR220	113-9239
Amber - Red	250-250V	8UHR220	113-9238				

207618

With Series Resistor			Price Each 1+	100+	1K+
Amber - Red	V	**113-9238●**	2.01	1.59	1.47
Green	250V	**113-9239●**	2.61	2.01	1.89

MBC/MCC (BA9s) 10mm, T3¼

multicomp

L=28.0

Neon lamps with integral resistor. These capped neons have a white body with a clear lens.

Colour	Voltage	Mftrs.List No.	Order Code
Amber - Red	100-120V	MC09321150	113-9235
Amber - Red	220-250V	MC09322250	113-9236
Green	220-250V	MC09322750	113-9237

206453

Order Code	Price Each 5+	100+	500+	1K+	+
113-9235●	1.68	1.20	1.08	0.93	– –
113-9236●	1.68	1.20	1.08	0.93	– –
113-9237●	2.52	1.80	1.65	1.44	– –

Wire Ended T1¼ and T2

SLI

4mm/T1¼ 6mm/T2

Amber-Red wire-ended neon lamps without series resistor.

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Due to the volatile nature of certain products,
prices are subject to change without notice.

Brightness	Body Length	Lead Length	Current Range mA	Maximum Strike Voltage ac	Maximum Strike Voltage dc	Recommended Series Resistor 110V ac	Recommended Series Resistor 240V ac	Mftrs. List No.
4mm, T1 ¼								
Standard	10	25	0.22 - 0.27	65	90	220K 1/4W	750K 1/4W	2ML
High	10	25	0.5 - 0.7	95	135	Not suitable	220K 1/4W	1MH
6mm, T2								
Standard	16	30	0.35 - 0.55	65	90	100K 1/4W	330K 1/4W	16/30SB
Standard	16	50	0.35 - 0.55	65	90	100K 1/4W	330K 1/4W	16/50SB
High	12.5	25	0.85 - 1.2	95	135	56K 1/4W	180K 1/4W	12.5/25HB
High	16	30	1.8 - 2.5	95	35	33K 1/4W	100K 1/4W	16/30HB
High	16	50	1.8 - 2.5	95	135	33K 1/4W	100K 1/4W	16/50HB

207617

Brightness	Mftrs. List No.	Order Code	Price Each 5+	100+	1K+
4mm, T1 ¼					
Standard	2ML	**113-9240**●	0.51	0.39	0.34
High	1MH	**113-9243**●	0.51	0.39	0.34
6mm, T2					
Standard	16/30SB	**113-9247**●	0.39	0.36	0.33
Standard	16/50SB	**113-9248**●	0.63	0.47	0.39
High	12.5/25HB	**113-9249**●	0.56	0.44	0.39
High	16/30HB	**113-9250**●	0.63	0.51	0.32
High	16/50HB	**113-9251**●	0.63	0.47	0.42

Nut Fixing

Arcolectric

Moulded nylon body. Polycarbonate lens with chrome bezel. An appropriate resistor is incorporated in the body moulding. Approved to **CSA, VDE, OVE, KEMA, SEMKO, DEMKO, NEMKO, SEV** specifications, **UL** Recognised.

L=40.0 (body+lens), Lens=8 x 14 dia
Panel cut-out=12.7 dia , Panel thickness=12 max

Mftrs. List No. L017700/colour/voltage

207635

Colour **200 – 250V ac**	Order Code	Price Each 1+	100+	250+	500+	+
Red	**140-277**●	16.02	11.25	8.04	3.98	– –
Green	**140-276**●	15.21	10.62	7.35	4.25	– –
Amber	**140-275**●	16.02	11.25	8.04	3.98	– –
110 – 130V ac						
Red	**151-751**●	16.19	13.02	9.42	4.44	– –
Green	**151-752**●	15.21	10.62	7.35	4.25	– –
Amber	**151-753**●	16.02	11.25	8.04	3.98	– –

Panel Lampholders

LES (E5/8) or Midget Flange (SX6s, S6/8)

Arcolectric

Flat Lens

Threaded nylon body for screwed nut fixing. Polycarbonate transparent lens with removable chrome finish bezel. Supplied with special adaptor which allows for the fitting of either 6mm/T1¾" S6/8 caps midget flange or LES E5/8 bulbs.

L=30.5 (overall), Lens=9.5x14 dia
Panel cut-out=12.7 dia , Panel thickness=9.6 max

Note: The lens bezel is electrically connected to the case of the lamp.
Not suitable for use above 50V.

Mftrs. List No. T0063A0/colour.

207623

Lens Colour	Order Code	Price Each 1+	50+	100+	250+	+
Red	**140-291**●	4.75	4.49	4.01	2.95	– –
Green	**140-290**●	4.78	4.53	4.01	2.95	– –
Amber	**140-287**●	4.75	4.49	3.18	2.95	– –
Blue	**140-288**●	4.75	4.49	4.01	2.95	– –
Clear	**140-289**●	4.75	4.49	3.18	2.95	– –

MES (E10)

Arcolectric

Flat Lens

A lamp holder with plastic body and polished chrome bezel.

Termination 6.35 tabs.

Note: Not suitable for use above 50V.

Mftrs. List No. C1090FE/colour.

L=51.0 (overall), Lens=12 x 17 dia
Panel cut-out=19.0 dia, Panel thickness=6.3 max

207625

Lens Colour	Order Code	Price Each 1+	50+	100+	250+	+
Red	**140-259**●	13.29	11.46	10.82	3.16	– –
Green	**140-258**●	13.29	11.46	9.34	3.16	– –
Amber	**140-255**●	13.29	11.46	3.98	3.16	– –

MES (E10)

Arcolectric

Domed Lens

A lampholder with plastic body and polished chrome bezel

Termination 6.35 tabs.

Note: Not suitable for use above 50V.

Mftrs. List No. C1090VE/colour.

L=54.8 (overall), Lens=16 x 17 dia
Panel cut-out=19.0 dia, Panel thickness=6.3 max

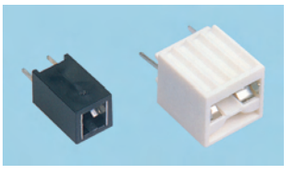
207626

Lens Colour	Order Code	Price Each 1+	50+	100+	250+	+
Red	**140-254**●	11.81	10.40	8.86	3.16	– –
Green	**140-253**●	11.81	10.40	8.86	3.16	– –
Amber	**140-250**●	11.81	10.40	3.98	3.16	– –

PCB Lampholders

Wedge Base T1½ and T3¼

SLI/VCH



Tin plated spring bronze contacts directly soldered onto PCB. T1½ and T3¼ also suitable for panel and lug mounting respectively.

T1½: H=7.4, W=7.4
L=17.2 overall.

T3¼: H=12, W=12,
L=17.9 overall.

	Material	Mftrs. List No.	Order Code
T1½, 5mm	Polycarbonate	LH3	110-5558
T3¼, 10mm	Malcrolon	LH12	110-5557

221680

	Order Code	Price Each 5+	100+	500+
T1½	**110-5557**●	1.85	0.77	0.62
T3¼	**110-5558**●	1.38	1.09	0.64

Filament Indicators

Miniature, Nut Fixing

BOSS INDUSTRIAL MOULDINGS

Polycarbonate lens and body incorporating a nickle plated brass bezel. ¼ UNF threaded body with nut and washer supplied.

L=30.0 (overall),
Lens=5.0 x 6.7 dia,
Panel cut-out=6.4 dia,
Panel thickness=0.5=3.5

Termination 135mm flexible leads,
Voltage identified by lead colour:

Maximum working temperature 70°C
White=6V, Yellow=14V, Green=28V

APPROVED TO **BS EN60-335-1, BS EN60-065, BS EN61010-1** and **BS EN60950**

221706

Colour **6V**	Order Code	Price Each 1+	50+	100+	250+	+
Red	**745-327**●	3.34	2.77	2.59	– –	– –
Green	**745-339**●	3.34	2.77	2.59	– –	– –
Amber	**745-340**●	3.75	2.77	2.59	– –	– –
14V						
Red	**881-510**●	3.65	2.84	2.61	– –	– –
Green	**881-521**●	3.65	2.84	2.64	– –	– –
Amber	**881-533**●	3.65	2.88	– –	– –	– –
Opal	**365-4795**●	4.17	3.06	2.70	2.51	– –
28V						
Red	**881-545**●	3.97	3.46	3.06	2.69	– –
Green	**881-557**●	3.97	3.46	2.93	2.69	– –
Amber	**881-569**●	3.97	3.43	2.93	2.69	– –
Opal	**365-4801**●	4.47	3.75	3.21	2.56	– –

RoHS ● Compliant ◄ Non-compliant ‡ Limited stock - RoHS replacement available

Miniature, Nut Fixing

Arcolectric

A low voltage filament lamp with 200mm PVC leads and a chrome finished brass body.
L=14.5 (body=lens)
Lens=4 x 7 dia.
Panel cut-out=6.3 dia.
Panel thickness=6.3 max.

Mftrs List No. L104100FAL/colour/voltage

220834

Lens Colour	Order Code	Price Each 1+	100+	250+	500+	+
6 Volts						
Red	**147-401●**	11.52	4.35	4.05	3.53	– –
12-14 Volts						
Red	**147-401●**	11.52	4.35	4.05	3.53	– –
Green	**147-404●**	11.52	4.35	4.05	3.53	– –
Clear	**147-403●**	11.52	4.35	4.05	3.53	– –
24-28 Volts						
Red	**149-878●**	11.91	4.35	4.05	3.53	– –
Green	**149-879●**	12.60	4.35	4.05	3.53	– –
Amber	**149-880●**	12.60	4.35	4.05	3.53	– –
Clear	**149-881●**	12.60	4.35	4.05	3.53	– –

Neon Indicators

Miniature, Snap-In Fixing

Arcolectric

Miniature snap-in neon indicator with suitable resistor built into one lead. Approved to **CSA, OVE, DEMKO** specifications and **UL** Recognised.

Termination 200mm 16/0.2 flexible leads.

L=41 (excl. flexible leads), Lens=4.8 x 7.5 dia
Bezel dia=9.8, Panel cut-out=8.0 dia
Panel thickness=0.8-1.6

Mftrs. List No. L295100N/colour/voltage

220836

Colour **200-250V ac**	Order Code	Price Each 1+	100+	250+	500+
Red	**151-764●**	7.86	5.22	3.54	2.63
Green	**151-765●**	8.76	5.40	3.63	2.70
Amber	**151-766●**	7.86	5.22	3.54	2.63
100-130V ac					
Red	**657-414●**	3.63	3.15	2.73	2.63
Green	**657-426●**	4.05	3.51	3.09	2.81
Amber	**657-438●**	3.63	3.15	2.73	2.42

Miniature, Nut Fixing

Arcolectric

Miniature panel mounting neon indicator with suitable resistor built into one lead.

Termination 200mm PVC flexible leads.

L=14.5 (body+lens), Lens=4 x 8 dia
Panel cut-out=6.35 dia., Panel thickness=6.35 max

Mftrs. List No. L104100N / colour / voltage

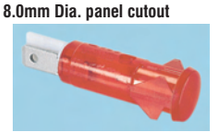
220835

Colour **200-250V ac**	Order Code	Price Each 1+	100+	250+	500+	+
Red	**140-000●**	11.02	9.24	7.11	3.45	– –
Green	**147-422●**	10.92	9.24	7.11	3.44	– –
Amber	**140-001●**	10.92	9.24	6.12	3.16	– –
Clear	**140-002●**	10.92	7.92	6.12	3.16	– –
100-130V ac						
Red	**140-003●**	11.02	9.24	7.11	3.45	– –
Green	**147-423●**	10.92	9.24	6.12	3.44	– –
Amber	**140-004●**	10.92	7.92	6.12	3.16	– –
Clear	**140-005●**	10.92	7.92	6.12	3.16	– –

Snap-In Fixing

Arcolectric

8.0mm Dia. panel cutout



L=39mm (overall), D=9.5mm (lens)

- Snap-in neon indicator for panels 0.8 to 3.5mm thick
- Integral resistor for direct 220/240V ac operation
- Approved to **CSA** and **VDE**, **UL** Recognised.
- Connection via 4.8 x 8.0mm fast-on terminals

Mftrs. List Nos:	Order Codes:
H0568BYNAA	826-4767
H0568BYNAB	826-4775
H0568BYNAC	826-4783

NEW

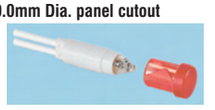
377465/405987

Colour	Order Code	Price Each 1+	50+	100+	250+	+
200 – 250V ac						
Red	**826-4767●**	2.18	1.66	1.33	1.14	– –
Amber	**826-4775●**	2.18	1.66	1.33	1.14	– –
Green	**826-4783●**	2.57	2.02	1.56	1.33	– –

Snap-In Fixing

Arcolectric

9.0mm Dia. panel cutout



L = 34mm (overall), D = 10mm (lens)

- Snap-in neon indicator for panels 0.8 to 3.5mm thick
- Integral resistor for direct 220/240V ac operation
- **VDE** and **CSA** Approved, **UL** Recognised.
- Connection via 200mm heat resistant PVC leads

NEW

Mftrs. List Nos:	Order Codes:
L0569AWNAE	826-4791
L0569AWNAF	826-4805
L0569AWNAG	826-4813

377467/405989

Colour	Order Code	Price Each 1+	50+	100+	250+	+
200 – 250V ac						
Red	**826-4791●**	2.47	1.89	1.50	1.27	– –
Amber	**826-4805●**	2.47	1.89	1.50	1.27	– –
Green	**826-4813●**	2.83	2.21	1.76	1.46	– –

Nut Fixing

Arcolectric

L=57.8 (overall), Lens=3.0 x 13.2 dia.
Panel cut-out=10.0 dia
Panel thickness=12 max

Low profile neon indicators with nylon body and polycarbonate lens with chrome bezel and fixing nut. An appropriate resistor is incorporated in the body moulding. Approved to **CSA, VDE, OVE, KEMA, SEMKO, DEMKO, NEMKO** and **SEV** specifications, **UL** Recognised.

Termination 6.3mm tabs.

Mftrs. List No. C027500 / colour / voltage + Bezel

207651

Colour	Order Code	Price Each 1+	50+	100+	250+	+
200 – 250V ac						
Red	**254-915●**	5.88	5.16	4.65	3.84	– –
Green	**254-927●**	6.40	5.64	5.10	4.20	– –
Amber	**254-939●**	5.88	5.16	4.65	3.84	– –
110 – 130V ac						
Red	**254-940●**	5.88	5.16	4.65	3.84	– –
Green	**254-952●**	6.40	5.64	5.10	4.20	– –
Amber	**254-964●**	5.88	5.16	4.65	3.84	– –

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