

# Semiconductor Hardware & Thermal Management

## Latest Products from...

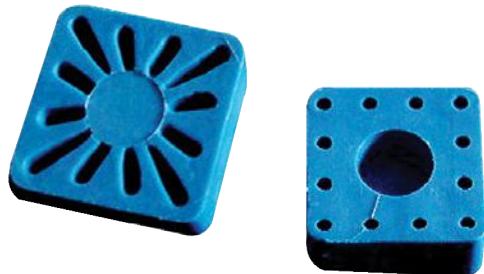
### IC Sockets Wire Wrap



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### Transistor Pads

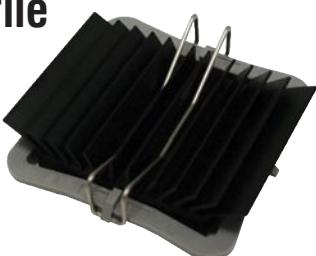
fischer elektronik



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### Heatsinks Maxi Grip Low Profile

QATS  
Innovations in Thermal Management™



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### IC Test Clips

3M



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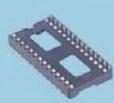
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## IC Sockets - Dual-In-Line

## Dual wipe DIP Sockets



- Low profile
- Dual wiping contact
- Stack end to end or side to side for high board density
- Large target area with tapered lead-in ramps for easy dip insertion
- Phosphor Bronze Contact
- Insulator: P.B.T 30% G.F. polyester, UL recognised
- Plating: Tin-plated over nickel
- High quality turned pin options

Contact rating	1A
Contact resistance	20mΩ max.
Insulation resistance	5000MΩ @ 500VDC
Dielectric withstand voltage	1000 VAC (1Min)
Capacitance	0.5pF max.
Dielectric withstand voltage	1,000 Volts RMS
Operating temperature	-45°C to +105°C
Engaging Force	340 Grams per contact max.
Separating force	20 Grams per contact max.
Durability	50 cycles

249136.342475

No. of Ways	Tube Quantity	Order Code	Price Each				
			1+	10+	25+	100+	+
0.3" (7.62mm) Row Spacing	—	428-5608	0.131	0.086	0.049	0.045	—
			1+	50+	500+	1K+	—
0.6" (15.24mm) Row Spacing	40	428-5669	0.200	0.135	0.094	0.088	—
0.3" (7.62mm) Row Spacing (Sold in Tubes)	6	424-2142	1.860	1.540	1.200	0.880	0.540
	8	118-2585●	3.450	2.130	1.920	1.730	1.560
	14	118-2586●	3.240	2.080	1.910	1.710	1.080
	16	118-2587●	3.200	2.200	2.030	1.140	1.070
	18	118-2588●	3.070	2.060	1.920	1.130	1.040
	20	118-2589●	3.130	2.040	1.890	1.160	1.070
	24	110-3836●	8.090	7.440	7.140	6.730	—
	28	118-2590●	2.650	1.760	1.750	1.710	1.070
0.6" (15.24mm) Row Spacing (Sold in Tubes)	28	118-2591●	2.650	1.760	1.730	1.650	1.070
	32	118-2595●	2.680	1.750	1.720	1.710	1.080
	40	118-2593●	2.460	1.640	1.620	1.600	1.120
0.6" (15.24mm) Row Spacing (Sold in Tubes)	24	110-3838●	5.770	5.300	5.090	4.800	—

## DIPLOMATE™ Dual Wipe DIP Sockets

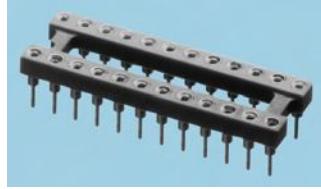


- Open frame construction
- Inhibits solder wicking and flux contamination
- Tin plated phosphor bronze contacts
- Stackable end-to-end or side-by-side
- Suitable for auto-insertion
- Body height above PCB 4.45mm
- UL recognised

211532

No. of Ways	Mfrs List No.	Order Code	Price Each					
			5+	100+	500+	1K+	+	
0.3" (7.62mm) Row Spacing	8	1-390261-2	110-1345●	0.109	0.099	0.092	0.088	—
	14	1-390261-3	110-1346●	0.099	0.090	0.083	0.081	—
	16	1-390261-4	110-1347●	0.125	0.115	0.108	0.103	—
	18	1-390261-5	110-1348●	0.128	0.114	0.107	0.104	—
	20	1-390261-6	110-1349●	0.142	0.128	0.119	0.114	—
0.6" (15.24mm) Row Spacing	24	1-390262-1	110-1350●	0.102	0.094	0.090	0.084	—
	28	1-390262-2	110-1351●	0.123	0.112	0.106	0.102	—
	40	1-390262-5	110-1352●	0.170	0.154	0.145	0.140	—

## Sockets, Open Frame Collet Solder Pin Tails



Pitch, lead = 2.54mm

## Features:

- Open Frame allows Efficient Utilization of Board Space with Optimized Cooling
- Choose from Several Pin Styles
- Compatible with Automatic Insertion Equipment
- Side-to-Side and End-to-End Stackable



## Specifications:

- Body Material is black UL 94V-0 glass-filled 4/6 Nylon
- Pin Body is Brass Alloy 360 1/2-hard per UNS C36000 ASTM B16-00
- Pin Body Plating 10μ [0.25μm] min. Gold per MIL-G-45204 or 200μ [5.08μm] min. 93/7 Tin/Lead per ASTM B545 or 200μ [5.08μm] min. Tin per ASTM B545 Type 1 over 100μ [2.54μm] min. Nickel per SAE AMS-QQ-N-290
- 4-fingered Collet Contact is Beryllium-Copper Alloy per UNS C17200 ASTM B194-01
- Contact Plating 200μ [5.08μm] min. 93/7 Tin/Lead per ASTM B545 or 200μ [5.08μm] min. Tin per ASTM B545 Type 1 or 10μ [0.25μm] Gold per MIL-G-45204 over 50μ min. [1.27μm] Nickel per SAE AMS-QQ-N-290
- Available Plating = Heavy Gold 30μ [0.76μm]

RoHS Compliant  
Non-compliant

08447 11 11 11

Fax: 08447 11 11 12

749

- Contact Current Rating = 3 amps
- Operating Temperature = 221°F [105°C] Tin and Tin/Lead plating = 257°F [125°C] Gold plating
- Insertion Force = 180 grams/pin
- Withdrawal Force = 90 grams/pin
- Normal Force = 140 grams/pin
- Midget Pin Insertion Force = 370 grams/pin
- Midget Pin Withdrawal Force = 150 grams/pin
- Midget Pin Normal Force = 240 grams/pin, based on a 0.018 [0.46] dia. test lead
- Accepts Lead Lengths from 0.100 [2.54] min. and 0.015-0.025 [0.38-0.64] in dia.
- Accepts Midget Pin Lead Lengths from 0.080 [2.03] and up to 0.022 [0.56] dia.

## Mounting Considerations:

- Suggested PCB Hole Size for Solder Pin Tail and Extra Long Pin = 0.030 ± 0.002 [0.76 ± 0.05] dia.
- Suggested PCB Hole Size for Midget Pin = 0.040 ± 0.002 [1.02 ± 0.05] dia.

527584

Mfrs. List No.	No. of Ways	Pitch, row mm	Order Code	1+	25+	100+
08-3518-10	8	7.62	167-4784●	0.55	0.50	0.29
14-3518-10	14	7.62	167-4785●	0.73	0.67	0.38
16-3518-10	16	7.62	167-4786●	0.83	0.77	0.45
18-3518-10	18	7.62	167-4787●	1.03	0.95	0.56
20-3518-10	20	7.62	167-4788●	0.93	0.85	0.49
24-3518-10	24	7.62	167-4789●	1.16	1.08	0.63
22-4518-10	22	10.16	167-4790●	1.38	1.12	0.87
24-4518-10	24	10.16	167-4792●	1.56	1.27	1.00
24-6518-10	24	15.24	167-4793●	1.15	1.04	0.65
28-6518-10	28	15.24	167-4794●	1.38	1.23	0.78
32-6518-10	32	15.24	167-4795●	1.56	1.42	0.89
40-6518-10	40	15.24	167-4796●	1.83	1.65	1.03
48-6518-10	48	15.24	167-4797●	2.37	2.13	1.33
50-9518-10	50	22.86	167-4798●	3.12	2.54	1.99
64-9518-10	64	22.86	167-4799●	3.99	3.25	2.54

## Premium Quality, Turned Pin DIP Sockets



## 800 Series, Thick 30μ Gold Plated Contacts



The 800 Series socket combines precision four-fingered inner contacts with an open ladder insulator to produce the ultimate high-reliability socket.

H (above PCB)=4.75, W=10.16 (0.3" row spacing), 12.7 (0.4" row spacing), 17.78 (0.6" row spacing), L=1.27 (x No. ways)  
PCB clearance=4.32 min.

- Low insertion force, precision 4-finger inner contacts
- High quality turned pin contacts
- "X" and "Y" stackable. Open ladder for cooling, cleaning and inspection
- Accepts IC leads: Rectangular - 0.23mm x 0.38mm to 0.28mm x 0.51mm Round - 0.41mm to 0.53mm 2.67mm min. length
- Thermoplastic polyester body, UL recognised

Contact rating	3A	Insulator	Thermoplastic polyester
Contact resistance	10mΩ	Shell	Brass, Tin / Lead plated
Insulation resistance	5000 x 10 <sup>6</sup> MΩ	Contact	Beryllium Copper, Gold plated
Insertion force	134g typ.	Operating temp.	-55°C to +125°C
Mfrs. List No.	8xx-AG11D where xx = No. of ways.		

241546

No. of Ways	Order Code	1+	60+	240+	480+	960+
0.3" (7.62mm) Row Spacing	8	107-7303●	0.66	0.53	0.45	0.37
	14	107-7295●	1.11	0.89	0.75	0.59
	16	107-7298●	1.34	1.07	0.90	0.71
	18	107-7299●	1.57	1.27	1.05	0.91
	20	107-7300●	1.64	1.48	1.34	1.20
	24	107-7301●	1.93	1.55	1.29	1.02
0.4" (10.16mm) Row Spacing	22	107-7304●	1.89	1.50	1.24	1.06
0.6" (22.86mm) Row Spacing	24	107-7305●	2.02	1.62	1.36	1.08
	28	107-7306●	2.21	1.99	1.80	1.61
	32	107-7307●	2.50	2.01	1.67	1.44
	40	107-7308●	3.36	2.68	2.23	1.92
	48	107-7309●	4.15	3.33	2.76	2.37

## Low Profile – Turned Pin Contacts



- Available individually, or in convenience tubes
- High precision, four-fingered inner contacts
- X and Y stackable
- Open frame design for cooling, cleaning and easy inspection
- Non-wicking, closed base
- Supplied in 630mm tubes
- Beryllium copper inner contact, 10μ gold-on-nickel or tin plated
- Thermoplastic polyester body, UL recognised

Contact rating	3A	Capacitance	1pF
Contact resistance	10mΩ	Dielectric withstand voltage	1kV rms
Insulation resistance	5000 x 10 <sup>6</sup> MΩ	Operating temperature	-55°C to +105°C
Mfrs. List No.	8XX-AG11DESL (gold plated), 8XX-AG12DES (tin plated) except 824-AG31DESL = 107-7328. XX = No. of ways.		



## IC Sockets - Dual-In-Line - continued

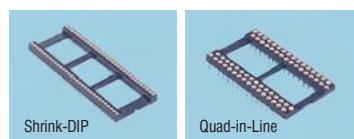
## Low Profile – Turned Pin Contacts - continued

211506

No. of Ways	No. of Contact Ways	Tube Material	Qty.	Order Code	1+	4+	Price Per Tube 8+	20+	40+
<b>7.62mm (0.3") Row Spacing - Tubed Quantities</b>									
8	Gold	60	107-7345●	9.47	8.91	8.57	8.16	7.76	
14	Gold	34	107-7312●	8.62	8.09	7.75	7.42	7.07	
14	Tin	34	107-7313●	12.40	11.41	10.50	9.66	8.96	
16	Gold	30	107-7316●	8.38	7.89	7.56	7.22	6.89	
16	Tin	30	107-7317●	12.63	11.62	10.69	9.82	9.12	
18	Gold	26	107-7319●	7.25	6.81	6.53	6.25	5.97	
18	Tin	26	107-7320●	13.65	12.55	11.55	10.63	9.85	
20	Gold	24	107-7322●	9.65	9.06	8.70	8.34	7.95	
24	Gold	20	107-7326●	8.57	8.06	7.76	7.42	7.06	
<b>10.16mm (0.4") Row Spacing - Tubed Quantities</b>									
22	Gold	22	107-7323●	12.93	12.14	11.67	11.15	10.62	
<b>15.24mm (0.6") Row Spacing - Tubed Quantities</b>									
24	Gold	20	107-7329●	8.45	7.94	7.65	7.29	6.96	
28	Gold	17	107-7331●	8.63	8.11	7.76	7.44	7.09	
28	Tin	17	107-7332●	11.22	10.36	9.62	8.98	8.42	
32	Gold	15	107-7334●	8.54	8.01	7.69	7.36	7.02	
32	Tin	15	107-7335●	12.57	11.57	10.64	9.79	9.07	
40	Gold	12	107-7337●	8.53	8.01	7.69	7.36	7.02	
40	Tin	12	107-7339●	12.57	11.57	10.64	9.79	9.07	
48	Gold	10	107-7342●	7.63	7.17	6.89	6.58	6.25	

No. of Ways	Tube Quantity	Order Code	Price Per Tube				
			1+	5+	10+	25+	50+
<b>0.3" (7.62mm) Row Spacing</b>							
6	69	102-3052●	21.08	17.47	15.11	11.90	11.00
8	52	102-3053●	24.68	19.93	16.65	13.38	12.08
14	29	102-3054●	22.15	17.90	14.98	12.03	10.87
16	25	102-3055●	21.38	17.28	14.43	11.62	10.50
18	22	102-3057●	17.04	14.12	12.24	9.60	8.88
20	20	102-3058●	23.06	19.13	16.61	13.01	12.04
22	18	102-3059●	8.93	7.21	6.03	4.86	4.38
24	17	102-3065●	17.61	14.58	12.66	9.93	9.17
28	14	102-3066●	13.02	10.72	9.27	7.66	7.10
<b>0.4" (10.16mm) Row Spacing</b>							
22	18	102-3064●	9.53	7.88	6.84	5.36	4.97
<b>0.6" (15.24mm) Row Spacing</b>							
24	17	102-3060●	16.35	13.54	11.75	9.22	8.51
28	14	102-3061●	19.51	16.18	14.00	11.02	10.37
32	12	102-3062●	14.38	12.11	10.87	7.88	7.73
40	10	102-3063●	21.25	17.64	15.30	11.97	11.12

### Low Profile, Thick Gold Plated Turned Pin Contacts



- Auto-insertable
- High reliability
- Long life, ≥1000 insertions
- Four leaf beryllium copper spring contacts to **CDA172**
- Tin-lead plated brass pins
- Glass filled polyester body to **UL94V-0**

Temperature range -55°C to +180°C Insulation resistance >10<sup>12</sup>Ω  
Contact resistance <10mΩ Body height 3.6mm, 4.2mm (366-5781)  
Mfrs. List No. D73064-01 = 102-3067, D8864-01 = 102-3069

211565

No. of Ways	Order Code	1+	10+	50+	100+	250+	Price Each
<b>0.75" (19.05mm) Quad-in-Line</b>							
64	102-3067●	5.91	4.50	3.59	3.09	2.78	
64	102-3069●	9.93	7.90	6.39	4.87	4.61	

### Extended Sockets – Turned Pin Contacts



- Bridges components to save pcb space
- 5mm min. clearance from pcb
- Facilitates test hook connection to IC pins
- Beryllium copper brass contacts, tin shell and gold clip
- 1000 insertions min.
- Glass filled polyester body, **UL94V-0** rated

Pin spacing	0.1" (2.54mm)	Row spacing	0.6" (15.24mm)	411947
				Price Each
24 Way	102-3071●	3.24	2.36	1.89
28 Way	102-3072●	3.88	2.79	2.24
40 Way	102-3073●	5.67	4.08	3.26

### Socket, Wire Wrap Edge-Grip



#### Features:

- Dual beam, edge-grip contacts provide high retention with positive wiping action.
- Removable cover provides lower profile.
- Side-to-side stackable.

#### Mounting Considerations:

- Suggested PCB hole size=.046±.002 [1.17 ± .05] dia.

Pitch, lead = 2.54mm  
Pitch, row = 7.62 / 15.24mm (28Way and above)

#### Specifications:

- Body is black UL 94V-0 Glass-filled 4/6 Nylon.
- Dual beam contact is Grade A Phosphor Bronze Alloy, 1/2 hard.
- Contact plating: (all over 50μ [1.27μm] Nickel per SAE-AMS-QQ-N-290)  
    Tin = 200μ [5.08μm] min Matte Tin per ASTM B545-97.  
    Gold = 10μ [0.25μm] min. Gold per MIL-G-45204.
- Contact current rating=1.5 Amp.
- Contact resistance=20 mOhms initial.
- Insulation resistance=100 MOhms @ 500 VDC per MIL-STD-1344, method 3003.1.
- Dielectric withstanding voltage=1000 VAC.
- Operating temperature  
    =-67°F to 221°F [-55°C to 105°C] Tin  
    =-67°F to 257°F [-55°C to 125°C] Gold
- Solderability: MIL-STD-202, method 208 less heat aging.

527495

Mfrs. List No.	No. of Ways	Order Code	1+	25+	100+	250+	Price Each
C8108-04	8	167-4758●	1.27	1.07	1.03	0.91	
C8114-04	14	167-4759●	1.80	1.51	1.46	1.29	
C8116-04	16	167-4760●	1.98	1.67	1.61	1.33	
C8120-04	20	167-4761●	2.51	2.13	2.06	1.81	
C8128-04	28	167-4762●	3.63	3.07	2.96	2.61	
C8140-04	40	167-4763●	5.21	4.41	4.25	3.74	
C9108-00	8	167-4764●	1.49	1.26	1.21	1.06	
C9114-00	14	167-4765●	2.44	2.06	1.99	1.76	
C9116-00	16	167-4767●	2.81	2.37	2.29	2.01	
C9140-00	28	167-4768●	4.83	4.09	3.95	3.46	
C9128-00	40	167-4769●	6.68	5.64	5.45	4.49	

### Low Profile Wire Wrap – Turned Pin Contacts



- Suitable for 3 level wire wrap applications
- Same specification as D28 series (above)
- Four leaf beryllium copper spring contacts, thick gold plated
- Tin-lead plated brass pins
- Glass reinforced polyester body, **UL** recognised

Mfrs. List No. D08xx-01, where xx=No of ways, except D0924-42=102-3045

211574

No. of Ways	Order Code	1+	100+	250+	500+	1K+	Price Each
<b>0.3" (7.62mm) Row Spacing</b>							
6	102-3036●	0.400	0.340	0.250	0.210	0.199	
8	102-3037●	0.640	0.540	0.500	0.470	0.420	
14	102-3038●	1.070	0.960	0.880	0.790	0.710	
16	102-3039●	1.040	0.900	0.850	0.750	0.680	
18	102-3040●	1.250	1.070	1.000	0.890	0.820	
20	102-3041●	1.380	1.220	1.120	1.000	0.920	
24	102-3045●	1.760	1.510	1.360	1.130	1.110	
<b>0.6" (15.24mm) Row Spacing</b>							
28	102-3042●	2.040	1.790	1.660	1.460	1.360	
40	102-3043●	2.700	2.360	2.230	1.980	1.800	

### Turned Pin with Decoupling Capacitor



- In-built 0.1 μF chip capacitor from Vcc to Gnd
- Greater suppression than leaded capacitor equivalents
- Low profile
- 4-leaf beryllium copper spring contacts, gold plated
- Tin plated pins
- Glass epoxy laminate body, **UL** recognised

Temperature range -65°C to +125°C Pin spacing 0.1" (2.54mm)  
Insulation resistance 5 × 10<sup>9</sup>Ω Contact resistance 3.5mΩ  
Dielectric withstand voltage 2100V min. Body height 4.45mm

211588

Row Spacing	Order Code	1+	25+	100+	500+	Price Each
7.62	14 Way	121-7108●	0.98	0.91	0.89	0.71
7.62	16 Way	121-7109●	1.07	0.99	0.95	0.79
7.62	20 Way	121-7110●	1.26	1.18	1.14	0.92
7.62	24 Way	121-7111●	1.68	1.46	1.36	1.13
15.24	28 Way	121-7113●	1.63	1.51	1.47	1.24
15.24	40 Way	121-7115●	2.17	2.03	1.97	1.70

Contact resistance 1A  
Contact resistance <10mΩ  
Dielectric strength 1kV ac min.  
Insulation resistance Mechanical life  
Temperature range 10000 MΩ min.  
100 cycles min.  
-55°C to +125°C

Mfrs. List No. D26XX-01 where XX=no. of ways

211529

Order Code	1+	100+	250+	500+	1K+	Price Each
<b>0.3" (7.62mm) Row Spacing</b>						
8 Way	102-3046●	0.85	0.57	0.44	0.40	0.38
14 Way	102-3047●	1.37	0.92	0.75	0.62	0.59
16 Way	102-3048●	1.65	1.10	0.90	0.76	0.73
18 Way	102-3049●	1.54	1.03	0.85	0.69	0.68
<b>0.6" (15.24mm) Row Spacing</b>						
28 Way	102-3050●	2.90	1.97	1.62	1.33	1.31
40 Way	102-3051●	4.16	2.81	2.33	1.90	1.88

**IC Sockets - Dual-In-Line - continued****Socket, Zero Insertion Force**

Pitch, lead = 2.54mm Pitch, row = 15.24mm

**ARIES**  
Electronics (Europe)


**Features:**

- A choice of 24, 28, or 40 pin count devices can be inserted without bending or otherwise damaging the legs, since no force is required to either insert or remove the component from the socket.
- Contacts are normally open and are closed by a unique cam action controlled by dual lever arms.
- The last 15° of movement of the cam provides a wiping action to the contacts on the legs of the device to remove any residue, ensuring a gas-tight seal.
- Tapered entry guides help guide the device legs into the mating position with the contacts.

**Specifications:**

- Body, handle, and cam are Black UL 94V-0 Glass-filled 4/6 Nylon.
- Pins are Beryllium Copper 170 or 172, 1/2 hard.
- Pin plating: 200μ" [5.08μm] min. Matte Tin per ASTM-B545-97 over 50μ" [1.27μm] min. Nickel per SAE-AMS-QQ-N-290.
- Contact current rating=1 Amp.
- Operating temperature: 221°F [105°C] Tin
- Minimum Retention Force (when closed)=15 grams/lead, based on a .008 [.20] thick test lead.
- Accepts most lead widths with lengths from .075 to .250 [1.91 to 6.35].

**Mounting Considerations:**

- Suggested PCB hole size=.035 ± .002 [.89 ± .05] dia.

527533

**Features:**

- Aries Universal Test Socket accepts devices on .300 to .600 [7.62 to 15.24] centers
- All pin count sockets go into PCB with either .300 or .600 [7.62 to 15.24] centers
- Swing quick-release handle down to open contacts and insert device. Release and handle automatically returns as contacts close onto device leads
- Socket handle can be mounted on either the right or left side
- Sockets can be soldered into PCBs or plugged into any socket

**Specifications:**

- Socket Body: black UL 94V-0 Glass-filled Polyphenylene Sulfide (PPS)
- Handle: Stainless Steel
- Handle Knob: Brass Alloy 360, 1/2-hard
- Contacts: Beryllium Copper 172 per QQ-C-533 or Spinodal
- Spinodal Contact Plating: -16 = 50μ [1.27μm] min. Nickel Boron
- Contact Current Rating: 1 Amp
- Insulation Resistance: 1000 MΩhs min.
- Dielectric Withstanding Voltage: 1000 VAC
- Life Cycle: 25,000 to 50,000 cycles

527488

Mfrs. List No.	No. of Ways	Order Code	1+	25+	100+	Price Each
24-6574-10	24	167-4712●		7.23	6.07	4.91
28-6574-10	28	167-4713●		8.24	6.92	5.60
32-6574-10	32	167-4714●		9.29	7.79	6.31
40-6574-10	40	167-4715●		10.99	9.22	7.47
48-6574-10	48	167-4716●		12.89	10.82	8.76

**Universal Zero Insertion Force Test Socket**
**ARIES**  
Electronics (Europe)

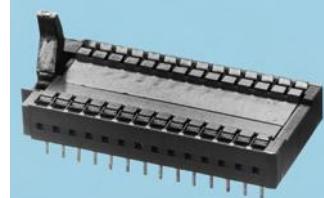

Range of ZIF sockets which will accept DIL devices with 0.3" (7.62mm) to 0.6" (15.24mm) row spacing, with a pin width of 0.38mm to 1.14mm. Sockets are lever locking, ON in DOWN position. Body is of polyphenylene sulphide. 113-6788 is for SO-IC packages

Pin spacing	0.1" (2.54mm)	Contact rating	1A
IC row spacing	0.3" (7.62mm) to 0.6" (15.24mm)	Breakdown voltage (min)	1000V ac
PCB row spacing	0.6" (15.24mm)	Insulation resistance	1000MΩ
Contact material	Beryllium Copper, tin plated	Life (min)	25000 cycles

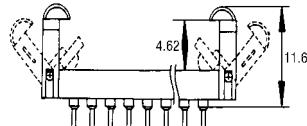
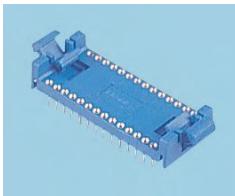
454697

Mfrs. List No.	Order Code	1+	10+	25+	100+	Price Each
24 Way 24-6554-10	116-9109●	7.03	5.25	4.88	4.49	
24 Way 24-6554-11	<b>NEW</b> 167-4706●	6.92	6.05	5.88	—	
28 Way 28-6554-10	116-9110●	7.59	5.99	5.57	4.91	
28 Way 28-6554-11	<b>NEW</b> 167-4707●	7.50	6.56	6.38	—	
32 Way 32-6554-10	113-6782●	8.48	6.69	6.22	5.48	
32 Way 32-6554-11	<b>NEW</b> 167-4708●	8.32	7.28	7.08	—	
40 Way 40-6554-10	116-9111●	10.11	7.98	7.42	6.55	
40 Way 40-6554-11	<b>NEW</b> 167-4709●	9.94	8.68	8.44	—	
44 Way 44-547-11	113-6788●	138.22	124.41	115.36	—	
48 Way 48-6554-10	113-6791●	12.57	9.36	8.71	7.68	
48 Way 48-6554-11	<b>NEW</b> 167-4710●	11.61	10.15	9.86	—	

**Socket, LO-PRO®file Zero Insertion Force**
**ARIES**  
Electronics (Europe)

Pitch, lead = 2.54mm Pitch, row = 15.24mm

**Lock/Eject – Turned Pin Contacts**
**ARIES**  
Electronics (Europe)


Socket for DIL IC packages designed for fast in-field board maintenance. The latch acts as a locking device to prevent disconnection and is ideal for high vibration environments. When used as an ejector, the latch removes the DIL package without damage. Glass filled thermoplastic body UL recognised. Turned pin contacts are beryllium copper, gold plated. Solder tail terminations are tin plated brass.

Temperature range -55°C to +105°C

Pin spacing 0.1" (2.54mm)  
Row spacing 0.6" (15.24mm)

Mfrs. List No. xx-C182-10, where xx=No. of ways

425215

No. of Ways	Order Code	1+	25+	100+	250+	Price Each
14	<b>NEW</b> 167-4724●	2.31	1.84	1.30	1.28	
16	<b>NEW</b> 167-4725●	2.49	1.98	1.41	1.39	
28	116-9115●	4.08	3.00	2.32	2.23	
32	113-6579●	6.20	4.22	2.86	2.69	
40	116-9116●	6.40	5.36	3.63	3.42	

**Socket, Quick-Release Test**
**ARIES**  
Electronics (Europe)




Pitch, lead = 2.54mm

Pitch, row = 15.24mm

**Features:**

- A choice of 24, 28, or 40 pin count devices can be inserted without bending or otherwise damaging the legs, since no force is required to either insert or remove the component from the socket.
- A metal cam provides strong, smooth action as it moves to a positive stop, compressing the double-sided contacts, ensuring a gas-tight seal.
- Test point openings provided to reach all pins.

**Specifications:**

- Plastic body is Black UL 94V-0 glass-filled 4/6 Nylon.
- Contacts are Beryllium Copper Alloy 172, spring tempered.
- Contact plating: 200μ" [5.08μm] min. Matte Tin per ASTM-B545-97 over 50μ" [1.27μm] min. Nickel per SAE-AMS-QQ-N-290.
- Operating temperature -67°F to 221°F [-55°C to 105°C].
- Contact current rating=2 Amps.
- Contact resistance=10 mΩhs max.
- Breakdown voltage=1000 VAC min.
- Average Retention Force (when closed)=110 grams/lead, based on .010 [.25] diameter test lead.

**Mounting Considerations:**

- Suggested PCB hole size=.035 ± .002 ± .89 ± .05 dia.

527527

Mfrs. List No.	No. of Ways	Order Code	1+	25+	100+	250+
24-526-10	24	167-4770●	5.27	4.79	4.08	3.36
28-526-10	28	167-4771●	5.79	5.27	4.48	3.68
40-526-10	40	167-4772●	5.99	5.44	4.62	3.81

**Zero Insertion Force Test Socket**

- For test and burn-in
- Lever actuated
- Beryllium copper contacts, nickel-boron plated
- UL recognised



211459

Mfrs. List No.	Order Code	1+	30+	50+	100+
<b>Standard 0.3" (7.62mm) Row Spacing</b>					
14 Way	214-3339-00-0602	121-3194●	11.04	9.49	8.54
16 Way	216-3340-00-0602J	989-7330●	7.93	7.72	7.50
18 Way	218-3341-00-0602J	989-7461●	12.72	11.24	10.76
20 Way	220-3342-00-0602J	989-7445●	13.01	12.10	11.58
<b>Standard 0.6" (15.24mm) Row Spacing</b>					
24 Way	224-1275-00-0602J	989-7348●	15.24	14.82	14.42
28 Way	228-1277-00-0602J	989-7356●	17.37	15.63	14.02
32 Way	232-1285-00-0602J	989-7402●	21.10	20.50	18.45
40 Way	240-1280-00-0602J	989-7364●	23.24	21.51	18.86
48 Way	248-1282-00-0602J	989-7488●	24.45	22.75	21.76
<b>Universal 0.3"-0.6" (7.62mm-15.24mm) Row Spacing</b>					
24 Way	224-1286-00-0602J	989-7470●	18.33	16.83	16.39
28 Way	228-1371-00-0602J	989-7372●	20.65	19.00	18.17
32 Way	232-1287-00-0602J	989-7380●	22.37	21.75	19.54
40 Way	240-1288-00-0602J	989-7399●	17.27	16.79	16.36
<b>Shrink DIP, 0.4"-0.8" (10.16mm-20.70mm) Row Spacing</b>					
64 Way	264-1300-00-0602J	989-7496●	30.91	23.73	20.62

**Surface Mount DIL Sockets**

- High precision
- Amenable pins, allows for easy pad alignment on the PCB.
- 2.54mm pin spacing
- Tin plated contacts with gold plated contact spring



Mfrs. List No.	Height (mm)	Width (mm)	Depth (mm)
DIL 16 SMD M	5.9	10.1	20.1
DIL 20 SMD M	5.9	10.1	25.2
DIL 24 03 SMD M	5.9	10.1	30.3
DIL 28 SMD M	5.9	17.6	35.4

496971

Mfrs. List No.	Order Code	1+	10+	25+	50+
DIL 16 SMD M	131-9817●	1.11	0.94	0.80	0.70
DIL 20 SMD M	131-9818●	1.32	1.09	0.93	0.82
DIL 24 03 SMD M	131-9819●	1.60	1.34	1.14	1.00
DIL 28 SMD M	131-9820●	1.87	1.56	1.34	1.16

Overall W	Body D	Order Code	1+	10+	50+	100+
8 Way	6.0	3.9	989-7615●	16.33	15.03	12.85
8 Way	6.4	4.4	989-7631●	16.48	12.67	10.85
16 Way	10.2	7.6	989-7585●	17.89	16.73	15.58
16 Way	6.4	4.4	989-7640●	20.67	15.90	13.62
20 Way	10.4	7.55	989-7658●	20.49	20.07	19.06
28 Way	10.47	7.55	989-7593●	21.10	20.41	17.69



211490

**IC Sockets - Small Outline****Test Sockets**

- High quality TSSOP ZIF Socket
- Press to lock Mechanism



Mfrs. List No.	Order Code	1+	10+	25+	50+
DIL 16 SMD M	131-9817●	1.11	0.94	0.80	0.70
DIL 20 SMD M	131-9818●	1.32	1.09	0.93	0.82
DIL 24 03 SMD M	131-9819●	1.60	1.34	1.14	1.00
DIL 28 SMD M	131-9820●	1.87	1.56	1.34	1.16

493875

Length	Width	Mfrs. List No.	Order Code	1+	5+	10+	25+	50+	+
14.63	14.7	676-3200111	109-5897●	36.40	30.34	25.68	23.98	—	—

211497

**SOIC ZIF Sockets**

- Suitable for gull wing style devices
- Top or front actuated sprung flip lid
- Lid actuation suitable for manual or automated use
- Compact size
- Side by side stackable
- Tweezer slot aids component placement/removal
- 80gms force per lead
- UL recognised

Contact rating 1A  
 Insulation resistance >10<sup>12</sup>Ω @ 500V dc  
 Withstand voltage 1000 Vrms  
 Contacts Beryllium Copper  
 Insulator Glass filled polyethersulfone  
 Operating temperature -55°C to +150°C

211544



Mfrs. List No.	Order Code	1+	5+	10+	25+
8 Way	208-7391-55-1902	989-7500●	20.42	16.68	16.55
20 Way	220-7201-55-1902	989-7518●	28.42	23.40	23.11
24 Way	224-7397-55-1902	989-7526●	27.73	25.37	24.28
28 Way	228-7396-55-1902	989-7534●	28.20	25.80	24.68

**SOP, Zero Insertion Force**

A subsidiary of PCD Inc.

Contacts Body	Beryllium Copper recognised	IC	Overall W	Body D	Order Code	1+	10+	50+	100+
8 Way	6.0	3.9	989-7615●	16.33	15.03	12.85	9.69		
8 Way	6.4	4.4	989-7631●	16.48	12.67	10.85	9.69		
16 Way	10.2	7.6	989-7585●	17.89	16.73	15.58	13.93		
16 Way	6.4	4.4	989-7640●	20.67	15.90	13.62	12.03		
20 Way	10.4	7.55	989-7658●	20.49	20.07	19.06	17.88		
28 Way	10.47	7.55	989-7593●	21.10	20.41	17.69	15.39		

WELLS-CTI

A subsidiary of PCD Inc.

H	W	D	Order Code	1+	5+	25+
8 Way	13.6	18.8	9.0	989-7666●	16.92	13.02
20 Way	13.6	22.0	14.2	989-7623●	27.62	21.25

425356

IC	Overall W	Body D	Order Code	1+	10+	25+	50+
48 Way	18.0	40	109-5884●	26.99	22.50	19.03	17.78
56 Way	20.0	40	109-5885●	30.22	25.20	21.33	19.91

**IC Sockets - Single-In-Line****Strip-Line Headers with Coined Contacts**

Electronics (Europe)



Pitch, lead = 2.54mm

**Features:**

- Aries Strip-Line headers are available with either fork or post style coined contacts.
- "Break" feature allows header to be cut to the number of positions desired.
- Side-to-side and end-to-end stackable.

**Specifications:**

- Body material is black UL 94-V0 Glass-filled 4/6 Nylon.
- Coined contacts are Brass, 1/2 hard
- Contact plating:
- 200μm min. Matte Tin plating per ASTM B545-97 over 50μm min Nickel per QQ-N-290.
- Contact current rating = 2 Amps.

**IC Sockets - Single-In-Line - continued****Strip-Line Headers with Coined Contacts - continued**

- Operating temperature=221°F [105°C] Tin
- Fork contact accepts up to .025 [.64] diameter leads.

**Mounting Considerations:**

- Suggested PCB hole size=.035±.002 [.89 ± .05] dia.

527534

Mfrs. List No.	No. of Ways	Order Code	1+	25+	100+
25-0600-10	25	167-4775●	1.62	1.42	1.19

**Mini-Link™ Miniature Jumpers**

Pitch, lead = 2.54mm

**Features:**

- Mini-Link™ miniature jumpers are useful for jumpering .025 [.63] square pins on .100 [2.54] centers.
- Used to jumper from row-to-row or from pin-to-pin.
- Their miniature size makes it possible to stack one on top of the other.
- A convenient test probe slot is provided as well.
- With a handle, used for ease of inserting or extracting.

**Specifications:**

- Body material is black UL 94V-0 Glass-filled 4/6 Nylon.
- Contacts are Beryllium Copper Alloy 174, spring tempered, per ASTM B768.
- Standard contact plating is 20μ [.51μm] Gold per MIL-G-45204 over 50μ [1.27μm] min. Nickel per SAE-AMS-QQ-N-290.
- Current rating=3 Amps.
- Operating temperature= -67°F to 257°F [-55°C to 125°C]
- Insertion Force=210 ± 40 grams/pin.
- Withdrawal Force=180 ± 40 grams/pin.
- Minimum insertion depth=.075 [1.91].

527579

Mfrs. List No.	No. of Ways	Order Code	1+	25+	100+	250+
ML-100	2	167-4800●	0.300	0.270	0.200	0.193

**Sockets, Pin-Line Collet Solder Tail Pins**

Pitch, lead = 2.54mm

**Features:**

- Rows of socket strips may be mounted on any centers and are end-to-end or side-by-side stackable for .100 [2.54] grid or matrix patterns.
- Available with solder tail or wire wrap pins.
- "Break" feature allows strips to be cut to the number of positions desired.

**Specifications:**

- Body material is black UL 94V-0 Glass-filled 4/6 Nylon.
- Pin body is Brass Alloy 360 1/2 hard per UNS C36000 ASTMB16-00.
- Pin body plating is either 10μ [.25μm] min. Gold per MIL-G-45204 or 200μ [5.08μm] min. 93/7 Tin/Lead per ASTM B545 or 200μ [5.08μm] min. Tin per ASTM B545 Type 1 over 100μ [2.54μm] min. Nickel per SAE-AMS-QQ-N-290.
- 4-fingered collet contact is Beryllium Copper Alloy per UNS C17200 ASTM-B194-01.
- Contact current rating=3 Amps.
- Insertion Force=180 grams/pin; Withdrawal Force=90 grams/pin; Normal Force=140 grams/pin; based on a .018 [.46] dia. test lead.
- Operating temperature=221°F [105°C] Tin & Tin/Lead plating =257°F [125°C] Gold plating.
- Insertion Force=180 grams/pin; Withdrawal Force=90 grams/pin; Normal Force=140 grams/pin; based on a .018 [.46] dia. test lead.
- Accepts leads .015-.025 [.38-.64] in diameter.

**Mounting Considerations:**

- Suggested PCB hole size=.030 ± .002 [.76 ± .05] dia.

527538

Mfrs. List No.	No. of Ways	Order Code	1+	25+	100+
25-0513-10	25	167-4776●	1.69	1.49	1.20

**Sockets, Single Row Collet Solder Tail Pins**

Pitch, lead = 2.54mm

**Features:**

- Aries collet sockets are available in single or dual rows.
- Cuttable to the number of pins desired to fit the application.
- Side-to-side and end-to-end stackable.

**Specifications:**

- Body material is black UL 94V-0 Glass-filled 4/6 Nylon.
- Pin body is Brass Alloy 360 1/2 hard per UNS C36000 ASTM-B16-00.
- Pin body plating is either 10μ [.25μm] min. Gold per MIL-G-45204 or 200μ [5.08μm] min. 93/7 Tin/Lead per ASTM B545 or 200μ [5.08μm] min. Tin per ASTM B545 Type 1 over 100μ [2.54μm] min. Nickel per SAE-AMS-QQ-N-290.
- 4-fingered collet contact is Beryllium Copper Alloy per UNS C17200 ASTM-B194-01.
- Contact plating is either 200μ [5.08μm] min. 93/7 Tin/Lead per ASTM B545 or 200μ [5.08μm] min. Tin per ASTM B545 Type 1 or 10μ [.25μm] Gold per MIL-G-45204 over 50μ min. [1.27μm] Nickel per SAE-AMSQQ-N-290. Heavy 30μ [.76μm] Gold Plating also available.
- Contact current rating=3 Amps.
- Insertion Force=180 grams/pin; Withdrawal Force=90 grams/pin; Normal Force=140 grams/pin; based on a .018 [.46] dia. test lead.
- Operating temperature
  - =221°F [105°C] Tin & Tin/Lead plating
  - =257°F [125°C] Gold plating.
- Insertion Force=180 grams/pin; Withdrawal Force=90 grams/pin; Normal Force=140 grams/pin; based on a .018 [.46] dia. test lead.
- Accepts leads .015-.025 [.38-.64] in diameter.
- Accepts lead lengths from .100 [2.54] min.

**Mounting Considerations:**

- Suggested PCB hole size=.030 ± .002 [.76 ± .05] dia.

527573

Mfrs. List No.	No. of Ways	Order Code	1+	25+	100+
40-0518-10	40	167-4779●	1.67	1.41	1.32

**SIL Socket Terminal Strips**

500 Series, 4-Fingered Contacts

H (above pcb)=4.57, W=2.54  
L=2.54 x (No. of ways)

- Snap-off to required length
- Non-wicking, closed base
- Two-piece tapered entry, closed entry inner contact and outer sleeve
- Accepts IC or component leads 0.41-0.53mm dia., 2.67mm min. length
- Uses: microprocessor sockets, hybrid IC sockets, QIL sockets, component sockets and test points
- Stamped pin contacts
- Thermoplastic polyester body, UL recognised

Contact rating	1A	Insulator	Thermoplastic polyester
Contact resistance	10mΩ	Shell	Brass, Tin / Lead plated
Insulation resistance	5000 x 10 <sup>12</sup> MΩ	Contact	Beryllium Copper, 10μ Gold plated
Insertion force	179g typ.	Operating temp.	-55°C to +125°C
Dielectric withstand voltage	1000V rms		

Mfrs. List No. 510-AG91Dxx-ESL where xx = No. of ways

241541

No. of Ways	Order Code	5+	50+	Price Each	100+	250+	1K+
0.1" (2.54mm) Pitch 5	121-8868●	0.37	0.35	0.32	0.29	0.26	

**Turned Pin, 0.1" (2.54mm) Pin Spacing**

Body H=4.2, W=2.54

- Turned pin contacts
- Cut to desired length
- Beryllium copper, gold-plated contacts

- Tin-lead plated brass pins
- UL recognised

211471

No. of Ways	Order Code	1+	100+	500+	1K+	2K5+
20	102-3034●	0.84	0.62	0.53	0.49	0.47
32	102-3035●	1.15	0.86	0.79	0.75	0.71
<b>Wire-Wrap</b>						
20	102-3031●	1.71	1.52	1.46	1.30	1.27
32	102-3033●	2.75	2.38	2.19	2.01	1.89

**Sockets, Pin-Line Collet Wire Wrap Pins**

Pitch, lead = 2.54mm

**ARIES**  
Electronics (Europe)


**Features:**

- Rows of socket strips may be mounted on any centers and are end-to-end or side-by-side stackable for .100 [2.54] grid or matrix patterns.
- Available with wire wrap or solder tail pins.
- "Break" feature allows strips to be cut to the number of positions desired.

**Specifications:**

- Body material is Black UL 94-V0 Glass-filled 4/6 Nylon.
- Pin body is Brass Alloy 360 1/2 hard per UNS C36000 ASTM-B16-00.
- Pin body plating is either 10 $\mu$  [.25 $\mu$ m] min. Gold per MIL-G-45204 or 200 $\mu$  [5.08 $\mu$ m] min. 93/7 Tin/Lead per ASTM B545 or 200 $\mu$  [5.08 $\mu$ m] min. Tin per ASTM B545 Type 1 over 100 $\mu$  [2.54 $\mu$ m] min. Nickel per SAE-AMS-QQ-N-290.
- 4-fingered collet contact is Beryllium Copper Alloy per UNS C17200 ASTM-B194-01.
- Contact plating is 30 $\mu$  [.76 $\mu$ m] min. Gold per MIL-G-45204 over 50 $\mu$  min. [1.27 $\mu$ m] Nickel per SAE-AMS-QQ-N-290.
- Contact current rating=3 Amps.
- Operating Temp:  
-67°F to 221°F [-55°C to 105°C] Tin  
-67°F to 257°F [-55°C to 125°C] Gold
- Insertion Force=180 grams/pin; Withdrawal Force=90 grams/pin; Normal Force=140 grams/pin; based on a 0.18 [4.6] dia. test lead.
- Accepts leads .015-.025 [.38-.64] in dia., .110-.162 [2.79-4.11] long.

**Mounting Considerations:**

- Suggested PCB hole size=.045 ± .002 [1.14 ± .05] dia.

52751

Mfrs. List No.	No. of Ways	Order Code	1+	25+	100+	Price Each
25-0503-30	25	167-4777●	6.42	5.64	4.35	

**Wire Wrap Socket, 0.1" (2.54mm)  
Pin Spacing**


- Turned pin socket contacts
- May be cut to desired length
- 4 leaf beryllium copper contacts, gold plated
- Tin-lead plated brass shell
- UL recognised

Mfrs. List No. D01-995-20-01=170-716,  
D01-995-32-01=170-717

Body H=4.9, W=2.54, Lead L=12.9

211480

No. of Ways	Order Code	1+	100+	500+	1K+	Price Each
20	102-3031●	1.71	1.52	1.46	1.30	
32	102-3033●	2.75	2.38	2.19	2.01	

**Zero Insertion Force Test Socket – ZIP Strip™**


- For use with SIL packages
- 2 or more will accommodate non-standard leaded packages
- Glass filled polysulfone, **UL94V-0** rated bodies
- Beryllium copper contacts, gold plated
- 0.1" (2.54mm) pin spacing
- 1A contact rating
- 1kV rms breakdown voltage
- -55°C to +150°C operating temperature

211452

Mfrs. List No.	No. of Ways	Order Code	1+	5+	10+	25+	Price Each
210-2599-00-0602	10 way	989-7410●	18.85	17.72	16.96	16.20	
232-2601-00-0602	32 way	989-7437●	32.50	30.54	29.24	27.95	

**10 Way In-Line ZIP Strip Socket**


- Lever actuated zero insertion force mechanism
- Socket contact point of 2.2 mm (0.085") below top surface of socket
- Accepts pins upto 0.6 mm square (0.025")
- Ganging bar included to enable mass actuation

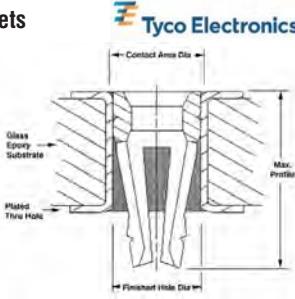
- Can be used in sets of 2 or more to create a socket for non-standard leaded packages
- Colour: green

Pin spacing  
Contact material  
Insulation Material:  
Contact rating  
Breakdown voltage (min)  
Insulation resistance  
Operating temp

0.1" (2.54mm)  
Beryllium Copper  
Glass filled polysulfone  
1 Amp  
1000 V rms @ sea level  
Greater than: 1 x 10<sup>9</sup> Ω @ 500 Vdc  
-55°C to 150 °C

423301

Mfrs. List No.	Order Code	1+	5+	10+	25+	Price Each
232-2601-00-0602	989-7437●	32.50	30.54	29.24	27.95	--

**IC Sockets - Ultra-Low Profile****Holtite™ Press-fit, Zero Profile Sockets**


The solderless zero-profile Holtite™ socket contact is designed to be press-fitted into the plated-through hole of a pcb, allowing the plated-through hole to become the component socket. The outer conical shape of the Holtite™ socket contact sizes the plated-through hole when pressed into place. The precision-machined geometry displaces the plated material without damaging the hole, or affecting the normal mechanical and electrical contact performance.

- Beryllium copper contacts, gold plated
- Maximum heat dissipation
- Solderless, gas-tight, press-fit insertion
- Supplied on MYLAR carrier strip
- Lowest socket profile
- Reliable, precision-machined, tapered-entry, four finger contact

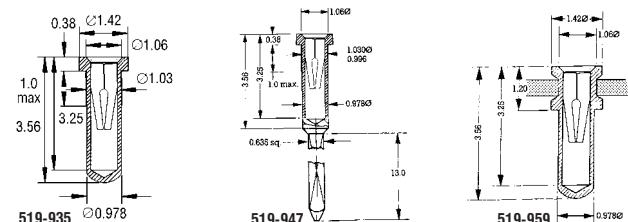
Current rating	3A max.	Operating temperature	-55°C to +125°C (Gold)
Contact resistance	9mΩ max.		-55°C to +125°C (Tin/Lead)
Insertion force	102g	Material:	Beryllium Copper
Extraction force	100g	Plating:	Gold

L mm	Dia. mm	Min. pcb thickness, mm	PCB hole dia., mm	Mfrs. List No.	Order Code
<b>Gold Plated</b>					
2.39	1.12	0.75	1.04	8134-HC-5P2	416-8367
3.45	1.59	0.75	1.47	8134-HC-6P2	416-8380
3.45	1.59	0.75	1.47	8134-HC-8P2	416-8409

241543

Order Multiple=5 Mfrs. List No.	Order Code	5+	250+	Price Each	1K+	2K+	10K+
<b>Gold Plated</b>							
8134-HC-5P2	416-8367●	0.117	0.086	0.069	0.065	0.063	
8134-HC-6P2	416-8380●	0.350	0.310	0.270	0.230	0.185	
8134-HC-8P2	416-8409●	0.197	0.175	0.154	0.133	0.111	

3

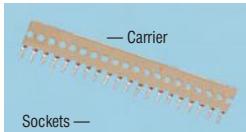
**Ultra Low Profile Sockets**


Subminiature, high reliability sockets designed to allow IC devices to be mounted on to PC boards giving virtually zero above board profile, with the added advantage of allowing tracks to be taken between the sockets, spaced on 2.54mm centres. The sockets can also function as through-board connections.

The socket is a press-fit into a 1mm hole and has a closed body design to eliminate solder wicking. The outer shell of the socket has a tinned finish, while the inner spring contacts are gold finished. The sockets are available either loose or in strips mounted on 2.54mm centres. The sockets are also available with three level wire wrap tails. The strips may be cut as desired and the plastic carrier may be easily removed after soldering.

211497

Order Multiple=10 Mfrs. List No.	Order Code	10+	100+	1K+
Standard, loose	H315ZF01	519-935●	0.450	0.440
Wire wrap, loose	H317ZF01	519-947●	0.400	0.280
Socket strip	D01F6020001	519-959●	0.131	0.116

**IC Sockets - Ultra-Low Profile - continued****Ultra Low Profile Sockets on SIL Carrier**

- Carrier backed for auto-insertion
- Socket specification as per 519-935 **above**
- 2.54mm (0.1") carrier centres
- Mfrs. List No. D01-990xx01, where xx=No. of ways

Carrier H=13, L=2.54 x No. of ways

211502

No. of Ways	Order Code	1+	25+	100+	500+
10 way	177-847●	1.67	1.22	1.00	0.88

**IC Sockets - Pin Grid Array (PGA)****CMBF Series**

Heatsink cooler designed for BGA chipsets. Complete with Fan and fixings.



Includes assembly containing:

Fan (with 3-pin connector):

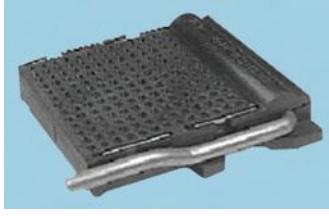
Clip:

Heatsink + screws:

Thermal tape:

483988

Mfrs. List No.	L, W (mm)	H (mm)	Order Code	1+	5+	25+
CMBF0135352901-00	35x35	29	137-3241●	13.27	11.94	11.34
CMBF014042901-00	40x40	29	137-3242●	13.61	12.25	11.63
CMBF014222901-00	42.5x42.5	29	137-3243●	10.19	9.17	8.71

**Socket, PGA**

Pitch, lead = 2.54mm

**Features:**

- A strong, metal cam activates the normally closed contacts, preventing dependency on plastic for contact force.
- The handle can be provided on right or left hand side.
- Consult factory for special handle requirements.

**Specifications:**

- Socket body is black UL 94V-0 Polyphenylene Sulfide (PPS).
- Contacts are either Beryllium-Copper Alloy 174, 1/2 hard or Spinodal Alloy.
- Plating for Spinodal Alloy contact only: 6: 50μ [1.27μm] min. Nickel Boron.
- Handle is Stainless Steel.
- Contact current rating: 1 amp
- Operating temperatures: -85°F to 257°F [-65°C to 125°C] Gold plating, -85°F to 392°F [-65°C to 200°C] Nickel plated Spinodal.
- Accepts leads 0.014-0.026 [0.36-0.66] in diameter, 0.120-0.290 [3.05-7.37] long.

**Mounting Considerations:**

- Suggested PCB hole size: 0.032 ± 0.002 [0.81 ± 0.05] dia.
- Plugs into standard PGA sockets.

527492

Mfrs. List No.	No. of Ways	Order Code	Price Each
169-PR13001-12	169	167-4748●	31.99
225-PR15001-12	225	167-4749●	35.53
289-PR17001-12	289	167-4750●	41.50
361-PR19001-12	361	167-4751●	48.28
441-PR21001-12	441	167-4752●	55.84

**Zero Insertion Force PGA Socket Kits**

Contacts

Order Code	989-7542	989-7550	989-7577
Mfrs. List No.	200-6311-9UN-1900	200-6313-9UN-1900	200-6321-9UN-1900

424894

Order Multiple=1	Grid Size	Order Code	1+	30+	50+
11x11	989-7542●	17.56	17.10	16.66	
13x13	989-7550●	26.31	21.81	18.31	
21x21	989-7577●	70.55	49.97	43.33	

Order Multiple=10	Contacts for PGA ZIF sockets	Order Code	10+	200+	1K+
		989-7607●	0.67	0.62	0.53

**IC Sockets - PLCC/LCC****PLCC Sockets**

- Through-hole or surface mount options
- Phosphor bronze contacts, tin/lead plated
- Thermoplastic body **UL** recognised
- In-built location pegs
- Supplied in tube multiples

H (above pcb) = 7.95 (through hole), 4.47 (SMD)

Mfrs. List No. D830xxC-06 and D830xxB-06 (SMD only) where xx = No. of ways.

221198

Tube Qty.	Order Code	Price Per Tube				
		1+	10+	50+	100+	250+
32 way	29	741-243	5.23	—	—	—
44 way	25	741-255	14.66	11.75	10.98	10.27
			1+	10+	50+	100+
44 way	25	SMD 102-2621●	22.54	18.60	18.23	16.49
	16	SMD 102-2624●	21.64	18.62	16.60	15.21

**PLCC Sockets, Through-Hole Mounting**

H (above pcb) = 8.25

- Level 11 connectors
- Accept J-Leaded PLCCs to JEDEC MS-016 and MS-018
- 8.25mm body height
- Top loaded contacts - eliminates solder bridging
- Closed base construction
- UL** recognised

Operating temperature -55°C to + 170°C  
Housing High temperature PCT polyester

Contacts Phosphor bronze, Tin plated

211526

No. of Ways	Mfrs. List No.	Order Code	1+	50+	100+	500+
28	1-822473-2	110-1354●	0.49	0.45	0.42	0.39
32	1-822473-3	110-1355●	0.75	0.67	0.62	0.60
44	1-822473-4	110-1356●	0.81	0.73	0.68	0.62
52	1-822473-5	110-1357●	0.89	0.81	0.77	0.70
68	1-822473-6	110-1358●	1.15	1.06	1.00	0.90

Order Multiple=1	Extraction Tool	Order Code	1+	25+	100+
	822154-1	162-632	3.56	2.54	2.30

**PLCC Sockets, Through-Hole Mounting**Industry standard sockets for JEDEC A/B PLCCs, incorporating internal standoffs for precision chip positioning, bottom standoffs for simpler flux residue removal, and 2.54mm grid solder tails. **UL** recognised.

H (above pcb)=7.7

Current rating	1A	Contacts	Phosphor Bronze
Contact resistance	30mΩ max.	Insulator	Polyphenylene Sulphide
No. of ways	W/D	Mfrs List No.	No. of ways
28	18.3	8428-11B1-RK-TP	52
32	17.9/21.25	8432-11B1-RK-TP	68
44	23.45	8444-11B1-RK-TP	84

241540

No. of Ways	Order Code	1+	10+	50+	100+	500+
28	118-3026●	0.87	0.67	0.56	0.48	0.37
32	118-3027●	0.80	0.64	0.51	0.40	0.38
44	118-3029●	0.96	0.78	0.61	0.49	0.48
52	118-3030●	1.20	0.93	0.72	0.62	0.51
68	118-3031●	1.31	1.03	0.80	0.65	0.64
84	118-3032●	1.53	1.20	0.93	0.77	0.69

Production sockets for JEDEC 'A' PLCCs
Through-hole terminations on 1.0" (2.54mm) grid
Internal standoffs for precision placement
Phosphor bronze contacts, tin/lead on nickel plated
Glass filled polyphenylene sulphide body, <b>UL</b> recognised

Contact resistance 15mΩ typ.  
Operating temperature -55°C to + 105°C

Mfrs. List No. PCS-Oxx-A-1, where xx=No. of ways

222187



No. of Ways	H (Above PCB)	W	D	Order Code	1+	100+	500+
20	9.14	14.98	14.98	107-7350●	0.80	0.70	0.51
32	8.38	20.07	17.52	107-7353●	1.82	1.52	1.19
44	9.14	22.6	22.6	107-7354●	2.22	1.87	1.46

**PLCC Sockets**

H (above pcb)=5.08

No. of ways	WD	Mfrs List No.
20	15.24	8420-21B1-RK-TP
28	17.78	8428-21B1-RK-TP
32	17.78 / 20.32	8432-21B1-RK-TP
44	22.86	8444-21B1-RK-TP
52	25.4	8452-21B1-RK-TP
68	30.48	8468-21B1-RK-TP
84	35.56	8484-21B1-RK-TP

Current rating 1A Contacts Phosphor Bronze

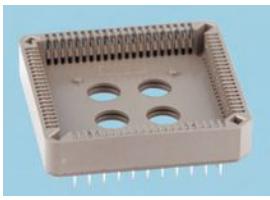
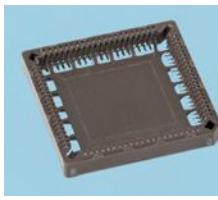
Contact resistance &lt;30mΩ Isolator Polyphenylene Sulphide

Low cost, production grade sockets for JEDEC A/B packages. Very low profile, top extraction style with internal standoffs and inspection windows. Compatible with all SMT soldering processes. **UL** recognised

457038



No. of Ways	Order Code	1+	10+	50+	100+	500+
20	SMD-118-3018●	0.67	0.61	0.48	0.39	0.34
28	SMD-118-3019●	0.82	0.63	0.49	0.41	0.36
32	SMD-118-3020●	0.79	0.63	0.49	0.39	0.37
44	SMD-118-3021●	0.93	0.73	0.57	0.48	0.44
52	SMD-118-3022●	1.02	0.81	0.63	0.52	0.51
68	SMD-118-3024●	1.25	1.00	0.77	0.63	0.62
84	SMD-118-3025●	1.55	1.18	0.92	0.79	0.64

**PLCC Sockets**

- Through-hole or surface mount options
- Through-hole version has copper alloy contacts, tin plated
- SMD version has phosphor-bronze contacts, tin-lead plating
- Polyphenylene sulphide body, **UL** recognised
- Supplied both individually and in tube multiples

**Through Hole**

No. of Ways	Order Code	1+	10+	50+	250+
20	110-3870●	0.131	0.125	0.109	0.093
28	110-3871●	0.340	0.330	0.280	0.220
32	110-3872●	0.530	0.430	0.400	0.390
44	110-3873●	0.580	0.450	0.420	0.400
52	110-3874●	0.210	0.158	0.144	0.140
68	110-3875●	0.640	0.520	0.460	0.440
84	110-3876●	0.700	0.550	0.520	0.470

337914.342477

**Tubes**

Through Hole		Price Per Tube				
No. of Ways	Tube Quantity	Order Code	1+	50+	100+	500+
44	25	110-3860●	15.72	14.42	13.31	12.35
68	19	110-3862●	21.42	19.65	18.12	16.83
84	15	110-3863●	12.61	11.55	10.67	9.91

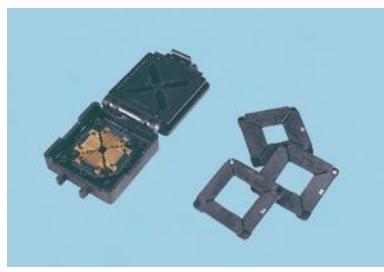
Surface Mount		Price Per Tube				
No. of Ways	Tube Quantity	Order Code	1+	50+	100+	500+
32	28	SMD-110-3864●	10.00	9.01	8.18	7.50
44	25	SMD-110-3865●	17.45	15.70	14.25	13.08

337914.342477

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**Universal PLCC ZIF Socket**

- Supplied with 7 inserts for 20, 28, 32, 44, 52, 68, and 84 way packages
- Pin down PLCC orientation
- Lid closure ensures positive pin contact
- Suitable for direct pcb or PGA socket mounting
- UL recognised

H (above PCB)=34.0, W=76.2, D=80.8 (closed), 183.4 (open)

211465

Mfrs. List No.	Order Code	1+	5+	10+
84-537-21-7	113-6790●	424.36	367.77	317.27

**IC Sockets - QTFP****ZIF TQFP Sockets**

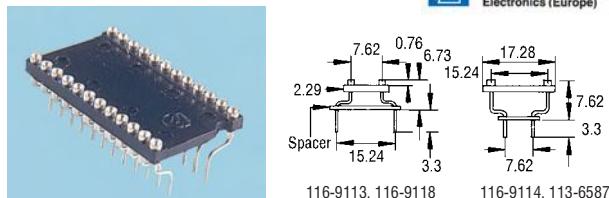
H (above pcb)=15.42

- Zero insertion force for autoload, 10,000 mech operations max
- 2 mm lead form
- Contact rating: 1A
- Insulation breakdown: 1000VAC RMS for 1 min.
- With normal or scrubbing contacts (1095890)
- Socket Body: PEI, PPS, or equivalent
- Contact plating: Gold over Nickle
- Contact Resistance: 30 mΩ
- Burn-in applications up to 150°C
- Small overall size

Size I.C. L x W (mm)	No. of Ways	Socket W/L mm	Mfrs. List No.
10 x 10	44	29.3	7010-044-6-08
10 x 10	64	29.3	7014-064-6-08
14 x 14	64	33.3	7014-064-6-08
14 x 14	80	33.3	7014-080-6-08

428749

Mfrs. List No.	Order Code	1+	5+	10+
7010-064-6-08	133-7654●	64.52	53.78	45.51
7014-064-6-08	133-7656●	64.38	53.64	45.42
7014-080-6-08	133-7655●	76.18	63.47	53.74
7010-044-6-08	133-7653●	48.63	40.52	34.31

**IC Sockets - Adaptors****0.3" (7.62mm) DIL to 0.6" (15.24mm) DIL**

116-9113, 116-9118

116-9114, 113-6587

No. of Ways	Mfrs List No.	Order Code	1+	25+	100+
0.3" (7.62mm) to 0.6" (15.24mm) Row Spacing, Enlarger	24	1106396-24	116-9113●	6.51	4.21
	28	1106396-28	116-9118●	7.11	4.60
0.6" (15.24mm) to 0.3" (7.62mm) Row Spacing, Reducer	24	1107254-24	116-9114●	6.51	4.21
	28	1107254-28	113-6587●	7.11	4.60

211436

**0.3" (7.62mm) DIL to SOIC**

- Accepts 0.3" (7.62mm) row spacing DIP packages
- Low profile, 6.65mm max
- Small footprint - no bigger than a standard DIP socket
- Glass filled thermoplastic polyester body
- Gold plated, beryllium copper contacts
- Contact rating 3A
- UL recognised

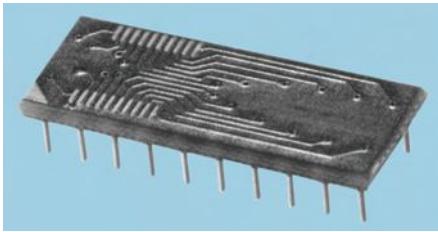


## IC Sockets - Adaptors - continued

## 0.3" (7.62mm) DIL to SOIC - continued

No. of Ways	Mfrs List No.	Order Code	1+	50+	Price Each
14	14-354000-11-RC	113-6582●	12.96	11.95	11.51
16	16-354000-11-RC	113-6583●	13.38	12.35	11.88
20	20-354000-11-RC	113-6584●	14.69	13.55	13.05
24	24-354000-11-RC	NEW 167-4726●	16.31	12.65	11.83
28	28-354000-11-RC	113-6585●	17.60	16.24	15.65

## Adaptor, SSOP/DIP



Pitch, lead = 2.54mm

**ARIES**  
Electronics (Europe)
**New**

Pitch, row = 7.62mm

## Features:

- RoHS/WEEE Compliant
- Allows the use of .65mm pitch surface mount ICs in thru-hole designs.
- Ideal for prototyping and testing/evaluating SSOP ICs.
- Adapter can be cut to smaller sizes by end user.
- Consult factory for panelized form or for mounting of consigned ICs.

## Specifications:

- Adapter body is .062 [1.58] thick FR406 or IS410 per IPC4101A/26 with 1 ounce minimum Copper traces both sides.
- Pad are finished with ENIG (Immersion Gold over Electroless Nickel)
- Pins are Brass Alloy 360 1/2 hard per UNS C36000 ASTM-B16-00.
- Pin plating is 10μ Min. Gold per MIL-G-45204 over 100μ Min. Nickel per SAE-AMS-QQ-N-290.
- Current rating=1 Amp.
- Operating temperature=221°F [105°C].

3

## Mounting Considerations:

- Suggested PCB hole size=.028 ± .003 [.71 ± .08] dia.
- Will plug into standard IC sockets.

211542

## DIMM Memory Sockets

**Tyco Electronics**


Pitch Lead mm	Pitch Row mm	Module Orientation	Height Profile	Contact Material	Mfrs List No.
SDRAM	6.2	Right Angle	Low	Gold	390114-1
	6.2	Right Angle	High	Gold	390112-1
	6.2	Right Angle	High	Gold	390322-1
	8.8	Right Angle	Ultra High	Gold	390110-1
DRAM	1.27	1.9	Vertical	Standard	5390168-1
	1.27	1.9	Right Angle	Low	1-5390171-6
	1.27	1.6	25 Degrees	Low	5390170-6
200 Pin DDR1	0.6	6.2	Right Angle	Standard	Gold over Nickel
	0.6	6.2	Right Angle	Standard	Gold over Nickel
	0.6	6.2	Right Angle	Standard	Gold over Nickel
200 Pin DDR2	0.6	6.2	Right Angle	Standard	Gold over Nickel
	1	1.9	Vertical	Standard	—

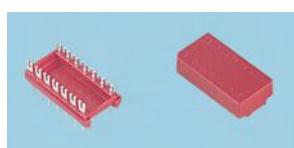
419725

Mfrs. List No.	Order Code	1+	10+	25+	50+	100+	Price Each
390113-1	109-5863●	3.45	3.20	3.07	2.95	2.83	
390112-1	109-5865●	3.86	3.59	3.44	3.30	3.16	
390322-1	109-5866●	3.45	3.20	3.07	2.95	2.83	
390110-1	109-5867●	2.59	2.41	2.31	2.21	2.12	
5390168-1	109-5871●	3.69	3.44	3.28	3.14	3.00	
5390170-6	109-5874●	3.69	3.44	3.28	3.14	3.00	
1473005-1	109-5876●	4.73	4.40	4.22	4.04	3.87	
1473005-4	109-5877●	4.73	4.40	4.22	4.04	3.87	
1473006-1	109-5878●	4.22	3.93	3.76	3.61	3.46	
1473006-4	109-5879●	4.22	3.93	3.76	3.61	3.46	
1775802-1	132-6665●	4.45	3.93	3.76	3.55	3.53	

419725

## Component DIL Headers

## 8 Way to 40 Way Headers and Covers

**ARIES**  
Electronics (Europe)


- For use with matching DIL socket
- Versatile board-to-board connector
- Components may be soldered across the pins
- Numbered pin positions
- Matching snap-fit covers
- UL recognised

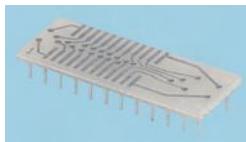
Pin spacing	0.1" (2.54mm)	Row spacing	0.3" (7.62mm)	6, 8, 14, 16, 18, 20 pin
Height above pcb	6.0		0.6" (15.24mm)	24, 28 pin
With cover	6.9 (7.4 for 24, 28 pin)			

Mfrs. List No. Headers xx-600-10, Covers xx-650-10, where xx=No of ways

211517

No. of Ways	Order Code	1+	100+	500+	Price Each
<b>DIL Headers</b>					
8 way	116-9106●	0.990	0.740	0.680	
8 way	116-9106●	0.990	0.740	0.680	
14 way	116-9107●	1.350	1.040	0.800	
14 way	116-9107●	1.350	1.040	0.800	
16 way	116-9108●	1.510	1.160	1.080	
16 way	116-9108●	1.510	1.160	1.080	
20 way	113-6775●	1.700	1.340	1.040	
24 way	113-6776●	2.080	1.640	1.270	
28 way	113-6777●	2.580	1.930	1.730	
<b>Covers</b>					
8 way	117-2776●	0.510	0.440	0.360	
8 way	117-2776●	0.510	0.440	0.360	
14 way	117-2778●	0.300	0.210	0.155	
14 way	NEW 167-4718●	0.490	0.380	0.300	
14 way	NEW 167-4719●	0.490	0.380	0.300	
14 way	NEW 167-4720●	0.490	0.380	0.300	
16 way	117-2779●	0.320	0.230	0.183	
16 way	NEW 167-4721●	0.490	0.380	0.300	
16 way	NEW 167-4722●	0.520	0.410	0.320	
16 way	NEW 167-4723●	0.520	0.410	0.320	
24 way	113-6780●	0.410	0.290	0.240	

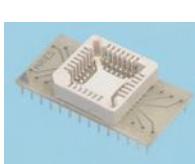
## SOIC to 0.3" (7.62mm) DIL

**ARIES**  
Electronics (Europe)


- Converts to standard 0.3" (7.62mm) row spacing DIL configuration
- Wide solder pads, min. row spacing 0.15" (3.81mm)
- Suitable for SOJ packages
- Tin/nickel plated phosphor bronze pins

211481

## PLCC to 0.6" (15.24mm) DIL

**ARIES**  
Electronics (Europe)


- Converts to standard DIL pin outs, 0.1" (2.54mm) pitch, 0.6" (15.24mm) row spacing
- Nickel plated phosphor-bronze pins
- UL recognised

211482

No. of Ways	Mfrs List No.	Order Code	1+	5+	20+	50+	Price Each
28	28-653000-11-RC	116-9121●	38.93	31.94	29.90	23.57	
32	32-653000-11-RC	116-9124●	39.33	31.79	28.53	22.31	
44	44-653000-11-RC	116-9122●	55.82	44.66	38.34	32.52	

**£ €** 40,000 PRICES REDUCED

Prices are in £ sterling &amp; exclusive of VAT

## 14 Way to 40 Way, Turned Pin

**HARWIN**

Slotted DIL headers with precision turned contacts, for use in either board-to-board interconnection or for mounting small discrete components. May be used with corresponding DIL socket. Body is black glass filled polyester, UL recognised, contacts are brass with tin on nickel finish. Pin spacing 0.1" (2.54mm). Operating temperature range -55°C to +150°C.

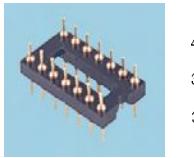
H (above PCB)=6.14

Mfrs. List No. D62xx-01, where xx=No of ways

211528

No. of Ways	Order Code	1+	100+	Price Each 250+	500+	1K+
<b>0.3" (7.62mm) Row Spacing</b>						
14	176-361●	1.41	1.24	1.21	1.16	1.13
16	176-362●	2.10	1.94	1.91	1.88	1.81
20	176-363●	2.33	2.15	2.12	2.07	2.02
<b>0.6" (15.24mm) Row Spacing</b>						
24	176-364●	2.06	1.91	1.85	1.82	1.79
40	176-366●	4.36	4.04	3.94	3.86	3.77

## DIL Through Headers – Turned Pin

**HARWIN**

DIL through headers with precision machined brass pins, for use as either through-connect headers or as miniature connectors in conjunction with DIL sockets. Body is black glass filled polyester, UL recognised, contacts have tin/lead finish.

Mfrs. List No. D92xx-01 (tin/lead), D92xx-05 (gold), where xx = No of ways

211538

No. of Ways	Contacts	Order Code	1+	25+	100+	500+
<b>0.3" (7.62mm) Row Spacing</b>						
14	Tin / Lead	177-852●	1.90	1.42	1.20	0.98
16	Tin / Lead	177-854●	2.26	1.69	1.44	1.13

## IC Installation and Extraction Tools

## Lead Alignment Hand Tool

**ARIES**  
Electronics (Europe)

- Straightens bent pins
- Aligns 0.3" (7.62mm) and 0.6" (15.24mm) row spacing IC pins
- Accepts DIL ICs up to 48 pin (63.5mm length)
- Simple squeeze-to-operate
- Static safe

Mfrs. List No. T516AS

211547

## DIP Extractor Tool

**ARIES**  
Electronics (Europe)

## Features:

- An extremely handy, economical tool for removing ICs from DIP sockets.
- Reduces the risk of pin damage associated with stubborn IC removal.

527493

Mfrs. List No.	Order Code	1+	Price Each 25+
T-90	167-4753	2.94	2.75

## DIL Extraction Tool



A simple robust IC extraction tool manufactured from stainless steel with a soft plastic cover for increased grip. Suitable for use on DIL packages from 6 to 28 leads.

W=25, L=10

211438

Order Code	1+	Price Each 10+	25+
109-152	5.67	4.81	4.18

## DIL IC Inserters and Extractors

## TERMINAL



- Durable, high quality metal construction
- Static safe
- Precision lifting/lowering mechanism prevents IC pin damage
- Extractor requires:  
1mm min. clearance underneath the IC  
3mm min. clearance between adjacent ICs

Mfrs. List No. TW2100-14=877-463  
TW2000-40=877-451  
TW2000-16=877-475  
TW2100-24/6=877-505  
TW2000-24=877-440  
TW2100-40=877-517

211516

No. of Ways	IC Row Spacing	Order Code	1+	Price Each 5+	25+
<b>Inserters</b>					
14	0.3"	877-463	27.36	25.72	24.34
24/28	0.6"	877-505	33.59	31.59	29.90
40	0.6"	877-517	28.65	26.94	25.50
<b>Extractors</b>					
14 to 20	0.3"	877-426	31.05	29.17	27.60
24/28	0.6"	877-440	39.49	36.21	33.01
40/48	0.6"	877-451	35.57	32.60	29.73

## PLCC Extraction Tool



- Simple and safe 'squeeze to remove' operation
- Universal size - fits all PLCC packages

222189

Order Code	1+	Price Each 10+	25+
150-4085	13.27	11.89	11.05

## IC Test Clips

**3M**

## DIL IC Test Clip/Extractor



- Unique design provides accurate, reliable contact
- Non-shorting, positive spring clamping
- Narrow nose for greater dexterity in densely populated boards
- Exposed contacts allow probing at IC legs
- Alloy 770 contacts
- Nylon body

Mfrs. List No. 923690-xx, where xx=No. of ways, except 178-274=923689-24

211548

No. of Ways	Order Code	1+	Price Each 10+	25+
<b>0.3" (7.62mm) Row Spacing</b>				
8 way	178-270●	8.98	8.26	7.64
14 way	178-271●	8.20	7.97	7.55
16 way	178-272●	9.67	8.74	8.10
20 way	178-273●	12.02	11.76	11.17
24 way	178-274●	15.55	15.12	14.35
<b>0.6" (15.24mm) Row Spacing</b>				
24 way	178-275●	27.03	22.56	20.05
28 way	178-276●	31.55	26.31	23.40
40 way	178-277●	21.75	21.13	20.06

**FREE technical support**  
Our trained engineers are here to help!

**08447 11 11 22****techsales@farnell.co.uk****Live technical chat at**  
**www.farnell.co.uk**

**IC Test Clips - continued****SOIC, PLCC and PQFP Test Leads**

211468

Description	Order Code	Price Each	1+	10+	100+
Test - Test Black	518-025●	3.05	2.40	2.08	
Test - Test Red	101-1430●	2.22	1.97	1.78	
0.64mm Socket - 4mm Stackable Red	121-2467●	5.10	4.01	3.44	
0.64mm Socket - 4mm Stackable Red	121-2467●	5.10	4.01	3.44	
0.64mm Socket - 4mm Stackable Black	121-2468●	5.10	4.01	3.44	
0.64mm Socket - 4mm Stackable Black	121-2468●	5.10	4.01	3.44	

**SOIC Small-Outline IC**

These test clips are for the easy and convenient testing of surface mounted small-outline IC's (SOIC's). Strong helical springs and insulating contact combs ensure contact integrity during testing. Probes or single row female connectors will connect to the 0.025" (0.63mm) square, gold plated contacts on 0.1" (2.54mm) centres.

Mfrs. List No. 178-278/279/280 923650-xx, 178-282/283  
923660-xx, where xx=No. of ways

IC pin spacing 0.05" (1.27mm)

211463

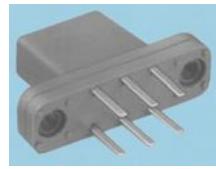
No. of Ways	Order Code	1+	Price Each	5+	10+
<b>Narrow Bodied 0.15" (3.81mm)</b>					
8 way	178-278●	8.90	8.65	8.21	
14 way	178-279●	10.33	10.07	9.81	
16 way	178-280●	9.33	9.11	8.87	
<b>Wide Bodied 0.3" (7.62mm)</b>					
20 way	178-282●	10.90	10.60	10.06	
24 way	178-283●	11.24	10.92	10.37	

**Transistor/Diode Sockets and Fixing Hardware****Transistor Sockets**

- High quality, turned pin
- Through-hole mounting
- Gold plated brass contacts (<4mΩ)
- Gold plated Beryllium CU spring
- Insulation resistance: >10<sup>18</sup> Ohm
- Material (isolation body): Teflon
- Maximum working voltage: 100V
- Maximum current: 5A
- Operating temp range: -200°C to 260°C
- All Sockets 7.3mm height above PCB

496993

Mfrs. List No.	Compatibility	Order Code	1+	Price Each	25+	100+
TF 183	TO-18 3-pin	146-6132●	1.61	1.45	1.37	
TF 510	TO-5 10-pin	146-6130●	3.11	2.80	2.64	
TF 53	TO-5 3-pin	146-6126●	1.70	1.53	1.45	
TF 54	TO-5 4-pin	146-6127●	1.92	1.72	1.63	
TF 56	TO-5 6-pin	146-6128●	2.45	2.20	2.07	
TF 58	TO-5 8-pin	146-6129●	2.73	2.46	2.33	

**Transistor Test Socket**

This Power In-line socket must be mounted to board with screws and accepts a wide range of in-line devices up to 3 lead, including TO-3 and TO-66. The socket has 2 entry ports which accept devices with 0.75" to 0.2" between leads.

- Glass filled Polyphenylene-Sulfide
- Contacts: 0.76μm Gold over 1.27μm Nickel
- TO-3 and TO-66 compatible
- 3-contact, accommodates: 0.2" to 0.75 distance between outer leads"
- 1 Ampere current rating
- 55°C to +150°C temperature range
- UL recognised

427729

Order Code	Price Each			
	1+	10+	25+	50+
109-5896●	20.24	18.63	18.34	17.33

**Transistor and IC Sockets**

177-129



TO-3 Socket - 131-9821

- Polyester thermoplastic
- Gold flash contacts
- TO-18, TO-5/39 sockets fit 0.1" (2.54mm) grid
- TO-99 socket fits 0.3" (7.62mm) square pattern
- 55°C to +150°C temperature range
- UL recognised

211550

Order Multiple=5	Order Code	Price Each				
		5+	100+	250+	500+	1K+
3 Pin TO-18	177-128●	0.30	0.28	0.27	0.26	0.25
3 Pin TO-5, TO-39	177-129●	0.34	0.31	0.30	0.29	0.28
Order Multiple=1		1+	100+	250+	500+	1K+
8 Pin TO-99	177-130●	0.87	0.80	0.79	0.77	0.74
3 Pin TO-3	131-9821●	1.02	0.85	0.74	0.64	0.57

**Transistor Pads**

519-960 H=3.43 Dia=6.35 519-972 H=3.81 Dia=7.11 519-984 H=3.18 Dia=6.35 520-007 H=3.68 Dia=9.37

211551

Order Multiple=100	Order Code	Price Each			
		100+	1K+	2K5+	10K+
519-960●		0.016	0.014	0.012	0.011
519-972●		0.013	0.012	0.010	0.009
519-984●		0.013	0.012	0.010	0.009
520-007●		0.016	0.014	0.012	0.011

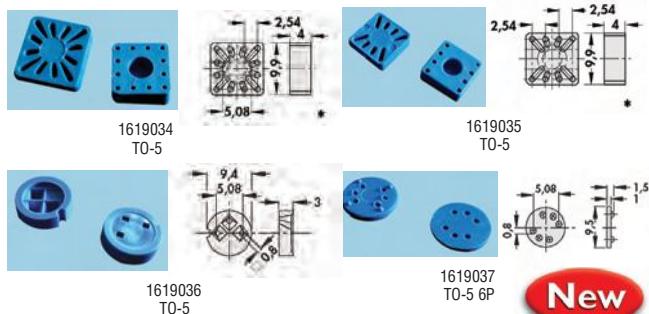
**TO-99 IC Mounting Pads**

H=1.65, Dia.=9.53

211552

Order Multiple=100	Order Code	Price Each			
		100+	2K5+	10K+	100K+
TO-99 low profile pad	520-019●	0.023	0.019	0.011	0.009

## Transistor Pads



Material  
Heat resistance  
Flammability

Polyamide, GF reinforced  
145 °C  
UL 94 V-0 (at thickness ≥ 3 mm), UL 94 V-1

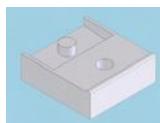
New

517344

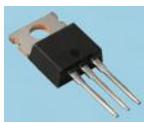
Mfrs.		Order Code	10+	250+	1K+	10K+	Price Each
US 512-4		161-9034●	0.124	0.089	0.070	0.062	
US 58-4		161-9035●	0.124	0.089	0.070	0.062	
MS 53-3		161-9036●	0.033	0.023	0.018	0.015	
MS 56-15		161-9037●	0.048	0.035	0.028	0.024	

## Transistor Covers

Richco®



HTRTC-xx Series



IEC TO-220 Range

- Material: Flame retardant P.B.T (RMS-110)

Package Compatability Dimensions (mm)  
TO-220 Length 15.4 Width 10.2 Depth 3.7

High Temperature  
TO-220 16 10.7 5.4

- Colour White

Mfrs. List No. IEC-T0-220-18

Order Code 132-5997

467693

Mfrs.	Compatability	Order Code	25+	100+	500+	Price Each
HTRTC-1	TO-220	132-5990●	2.23	2.00	1.80	
IEC-T0-220-18	TO-220	132-5997●	2.50	2.26	2.03	

## TO-3 Mounting Accessories

multicomp

170-022  
(1kV breakdown)

170-031

211553

- Order Multiple=1

Heat Transfer Pad	Order Code	1+	25+	100+	1K+	Price Each
Order Multiple=5	170-022●	0.890	0.670	0.500	0.460	
		5+	100+	250+	1K+	

Plastic Covers	Snap-on	Order Code	0.184	0.147	0.105	0.094	Price Each
		170-031●					

## Transistor Fixing Kits

multicomp



520-159 M3 Thread

520-160 M3 Thread

211555

- Order Multiple=10

Type	Order Code	10+	250+	1K+	10K+	Price Each
TO-3 / TO-66	520-159●	0.153	0.132	0.120	0.108	
TO-220 / TO-126 / SOT-93	520-160●	0.083	0.075	0.061	0.060	

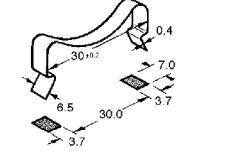
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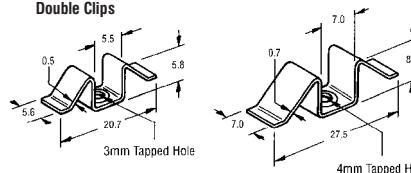
## Spring Mounting Clips

Laird TECHNOLOGIES®

## Single Clips



## Double Clips



A convenient and reliable method of mounting plastic power devices, applying an even pressure across the body. Produces excellent heat transfer characteristics.

Available as single or double clips. The double clip requires one screw, and is suitable for any panel or pad thickness. Zinc plated, clear passivated finish. Isolation voltage 1kV.

Packages	Max. Panel Thickness (mm)	Max. Pad Thickness (mm)	Max. Force (kg)	Mfrs. List No.	Order Code
1 x TO-220	2.0	0.2	3.0	TSC704	557-729
1 x TO-3P, TO-218, TO-247	2.0	0.5	3.5	TSC903	557-730
2 x TO-220	—	—	—	TSC607-ZP	520-111
2 x TO-3P, TO-218, TO-247	—	—	—	TSC506-ZP	520-135

211444

Order Multiple=10	Package	Order Code	10+	100+	250+	1K+	Price Each
Single Clips	TO-220	557-729●	0.124	0.081	0.058	0.045	
	TO-3P, TO-218, TO-247	557-730●	0.099	0.075	0.056	0.036	
Double Clips	TO-220	520-111●	0.320	0.240	0.210	0.144	
	TO-3P, TO-218, TO-247	520-135●	0.410	0.340	0.240	0.177	

multicomp

## Transistor Insulating Bushes



- For use with screw mounted transistors
- Isolates transistors from heatsinks
- Popular TO-220 and TO-3 sizes
- Nylon construction
- Suitable for use with Sil-Pad and other thermal pads
- Sold in packs of 10

222200

Pack Quantity =10	Size	Order Code	1+	25+	100+	1K+	Price Per Pack
	TO-220	936-649●	0.90	0.69	0.52	0.40	
	TO-3	936-637●	0.90	0.69	0.52	0.40	

ARIES®  
electronics (Europe)

## Crystal Oscillator Sockets and Hardware

## Oscillator Sockets



Pitch, row = 7.62mm

## Features:

- This four pin socket (in 14 & 8 position frames) accept standard oscillator packages.
- Designed to be end-to-end or side-to-side stackable.
- Machine insertable.

New

- Specifications:
- Body material is black UL 94V-0 Glass-filled 4/6 Nylon.
  - Pin body is Brass Alloy 360 1/2 hard per UNS C36000 ASTM-B16-00.
  - Pin body plating is 200μ [1.27μm] min. 93/7 Tin/Lead per ASTM B545 or 200μ [5.08μm] min Tin per ASTM B 545 Type 1 over 100μ [2.54μm] min. Nickel per SAE-AMS-QQ-N-290.
  - 4-fingered collet contact is Beryllium Copper Alloy per UNS C17200 ASTM-B194-01.
  - Contact plating is 10μ [25μm] min. Gold per MIL-G-45204 over 50μ [1.27μm] min. Nickel per SAE-AMS-QQ-N-290.
  - Contact current rating=3 Amps.
  - Operating temperature=-221°F [105°C].
  - Insertion Force=180 grams/pin; Withdrawal Force=90 grams/pin; Normal Force=140 grams/pin; based on a .018 [.46] diameter test lead.
  - Accepts leads .015-.025 [.38-.64] in diameter, .100-.146 [2.54-3.71] in length.

## Mounting Considerations:

- Suggested PCB hole size=.030 ± .002 [.76 ± .05] dia.

Farnell

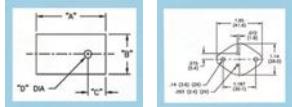


- All kits offer 1kV isolation, except 520-202 (2kV)
  - 520-172/520-251** use 4.37mm high bushes, shank length 3.2mm
  - 520-184** uses 6.35mm high bushes, shank length 5.2mm
  - The kits with silicone impregnated washer eliminate the need for heatsink compound
  - It is recommended that heatsink compound should be used with Mica washer kits - See above
- ◊ Suitable for TO-218 devices with rounded tab (e.g. some bipolar transistors).  
 ◆ Suitable for TO-247/TO-3P devices with rectangular tab (e.g. power MOSFET's).

211557

Order Multiple=10		Price Each			
Type	Order Code	10+	250+	1K+	10K+
<b>Kits with Mica Washer</b>					
MK3301	520-172●	0.111	0.096	0.081	0.071
TO-3 (6.35mm Bush)	520-184●	0.160	0.110	0.095	0.083
TO-3 (2kV isolation)	520-202●	0.196	0.160	0.105	0.094
TO-220	520-214●	0.114	0.110	0.083	0.058
TO-126	520-226●	0.138	0.089	0.071	0.058
◊ SOT-93 (TO-3P, TO-218)	520-238●	0.149	0.098	0.083	0.070
<b>Kits with Silicone Impregnated Washer</b>					
TO-3 (4.37mm Bush)	520-251●	0.390	0.320	0.290	0.250
TO-126	522-624●	0.160	0.137	0.105	0.094
TO-220 Fit	522-636●	0.118	0.104	0.079	0.069
◊ SOT-93 (TO-3P, TO-218)	522-648●	0.290	0.250	0.164	0.123
◆ TO-3P, TO-218	522-650●	0.280	0.210	0.177	0.136

## Transistor Insulators



- Material: Nylon flame retardant, UL 94V-2 (RMS-01)
- Snap action

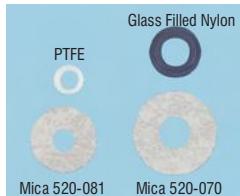
To-218 or To-220

To-3

467689

Mfrs.	Compatibility	Order Code	25+	100+	500+	Price Each
List No.						
TO-3-05	TO-3	132-5987●	10.21	9.19	8.27	
TO-218-70	TO-218	132-5988●	4.68	4.21	3.79	
TO-220-68	TO-220	132-5989●	5.11	4.60	4.15	

## Stud Device Insulating Kits



211554

Order Multiple=10		Price Each			
Type	Order Code	10+	250+	1K+	10K+
<b>Insulating Kits</b>					
DO-4 (10-32)	520-070●	0.198	0.159	0.114	0.088
DO-5 (1/4-28)	520-081●	0.138	0.086	0.059	0.058

## Thermally Conductive Material



Sil-Pad 400®



- Suitable for clip mounted TO-220 packages (664-194), or screw mounted TO-220 and TO-3P packages
- Clean, grease-free and flexible
- 0.45°C/W thermal resistance
- Electrically isolating to 3.5kV (min)
- Silicon rubber/fibre-glass
- 60°C to +180°C operating temperature
- 0.18mm thickness

 Mfrs. List No. 3223-07FR-43 =664-194 SP400-0.007-00-54 =878-3608  
 3223-07FR-104NH=664-224 SP400-0.007-00-1212=878-3616

Package	Order Code	10+	500+	1K+	Price Each
TO-220	664-194	0.200	0.184	0.162	
TO-3P	664-224	0.280	0.250	0.230	
<b>Order Multiple=1</b>					
300mm x 300mm sheet	878-3616	19.150	15.270	12.490	
<b>Pack Quantity=10</b>					
Package		1+	5+	25+	Price Per Pack
TO-220 (pre-cut hole)	878-3608	2.420	1.890	1.610	

## Transistor Insulating Bushes

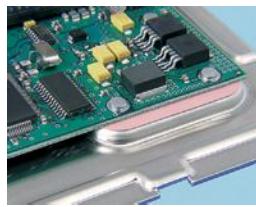
222196

Size	Order Code	1+	25+	100+	1K+	Price Per Pack
TO-220	936-649●	0.90	0.69	0.52	0.40	
TO-3	936-637●	0.90	0.69	0.52	0.40	

Over 480,000 products online



## Sil-Pad SP900S



- Thermal impedance: 0.61°C-in²/W (@5 psi)
- Low mounting pressure
- Suitable for clip mounted TO-220 packages (878-3551) or screw mounted TO-220 and TO-3P power packages
- Smooth and highly compliant surface
- Electrically isolating

Thermal Conductivity W/m-K	Dielectric Breakdown Voltage kV-ac	Dielectric Constant	Volume Resistivity Ω-m
1.6	5.5	6	0.2mm 10 <sup>10</sup>

Pack Quantity=10	Order Code	1+	10+	25+	Price Per Pack
Package					
TO-220	878-3551	1.31	1.21	1.12	
TO-220 (pre-cut hole)	878-3560	1.31	1.21	1.12	
TO-3P	878-3578●	1.91	1.53	1.31	

## Transistor Insulating Bushes

387133

Pack Quantity=10	Order Code	1+	25+	100+	1K+	Price Per Pack
Size						
TO-220	936-649●	0.90	0.69	0.52	0.40	
TO-3	936-637●	0.90	0.69	0.52	0.40	

## Medium Grade Thermally Conductive Material



Sil-Pad K6®



- Thermal impedance: 0.49°C-in²/W (@50 psi)
- Tough dielectric barrier against cut-through
- Electrically isolating to 6kV (min).
- Medium performance Kapton®-based film
- 0.15mm thickness

Sil-Pad K-6 is a medium performance film-based thermally conductive insulator. The film is coated with a silicone elastomer to deliver high performance and provides a continuous, physically tough, dielectric barrier against 'cut-through' and resultant assembly failures.

 Mfrs. List No. K6-54 =664-250  
 K6-104 =681-090  
 SIL-PAD K6 300MMX300MM SHEET =681-106

222195

Order Multiple=10	Order Code	10+	100+	1K+	Price Each
Package					
TO-220	664-250	0.35	0.28	0.26	
<b>Order Multiple=1</b>					
TO-3P (Pre-cut hole)	681-090	0.44	0.32	0.31	
<b>300mm x 300mm sheet</b>					
	681-106	45.31	43.07	39.48	

## Transistor Insulating Bushes

Size	Order Code	1+	25+	100+	1K+	Price Per Pack
TO-220	936-649●	0.90	0.69	0.52	0.40	
TO-3	936-637●	0.90	0.69	0.52	0.40	

Order Multiple=5	Order Code	5+	100+	1K+	Price Each
Package					
TO-220	936-741	0.48	0.33	0.26	
<b>TO-3P</b>					
	936-753	0.74	0.51	0.42	
<b>Order Multiple=1</b>					
300mm x 300mm sheet	936-765	95.23	82.69	73.85	

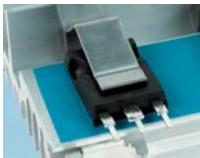
## Transistor Insulating Bushes

Size	Order Code	1+	25+	100+	1K+	Price Per Pack
TO-220	936-649●	0.90	0.69	0.52	0.40	
TO-3	936-637●	0.90	0.69	0.52	0.40	



## Thermal Interface Materials - continued

## Sil-Pad A1500

**BERGQVIST**

- Thermal impedance:  $0.42^{\circ}\text{C}\cdot\text{in}^2/\text{W}$  (@50 psi)
- Solvent-free process
- Elastomeric compound coated on both sides

Bergquist Sil-Pad A1500 is a silicone-based thermally conductive and electrically insulating material. It consists of a cured silicone elastomeric compound coated on both sides of a fiberglass reinforcement layer.

Thermal Conductivity W/m-K	Dielectric Breakdown Voltage kV-ac	Dielectric Constant	Dielectric Constant	Volume Resistivity $\Omega\cdot\text{m}$
2	6000	7	0.2mm	$10^{11}$

387150

100mm x 100mm sheet	Order Code	1+	Price Each	5+	10+
	878-3667	16.78	13.37	10.93	

High Performance, High Reliability Insulator **BERGQVIST**  
Sil-Pad 2000®

- Ultimate performance and reliability
- $0.2^{\circ}\text{C}/\text{W}$  thermal resistance
- Electrically isolating to 4kV (min).
- Clean, grease-free and flexible
- $-60^{\circ}\text{C}$  to  $+200^{\circ}\text{C}$  operating temperature
- Boron nitride loaded silicon elastomer
- Pre-cut for transistors, or uncut sheet
- 0.38mm thickness

Sil-Pad 2000 is a high performance thermally conductive insulator designed for demanding military / aerospace and commercial applications. Sil-Pad 2000 complies with MIL-M-38527/8A, MIL-M-38527C and MIL-I-49456.

Mfrs. List No. 2015-54 = 681-118 2015-104 = 681-120 SP2000 SHBHT = 681-131

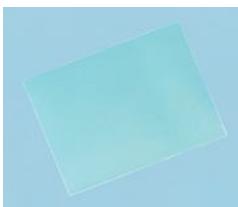
3

Order Multiple=5	Package	Order Code	5+	Price Each	100+	1K+
TO-220		681-118	0.64	0.52	0.44	
TO-3P		681-120	1.02	0.85	0.72	
Order Multiple=1			1+		5+	10+
150mm x 150mm sheet		681-131	64.20	61.01	55.93	

## Transistor Insulating Bushes

222194

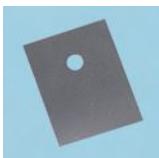
Pack Quantity=10	Size	Order Code	1+	Price Per Pack	25+	100+	1K+
TO-220		936-649●	0.90	0.69	0.52	0.40	
TO-3		936-637●	0.90	0.69	0.52	0.40	

Phase Change Material  
Hi-Flow® 300 and 625**BERGQVIST**

- Handles like a Sil-Pad at room temperature, flows as grease at  $+65^{\circ}\text{C}$  (pressure dependent)
- Convenient alternative to grease/mica washer
- Thixotropic - retains its shape
- Hi-Flow 625 and 300 are electrically insulative:
- Breakdown voltage: Hi-Flow 625 = 4kV, Hi-Flow 300 = 5kV

211531

100mm x 100mm sheet	Order Code	1+	Price Each	5+	10+
Hi-Flow 300	878-3683	8.78	7.01	5.74	
Hi-Flow 625 (adhesive backed)	168-828	6.49	5.26	4.23	

Grease Replacement Thermal Interface  
Q-Pad 3®**BERGQVIST**

- Graphite loaded polymer elastomer
- Electrically conductive - non-insulating
- Clean, grease-free and easy to assemble
- $1.3^{\circ}\text{C}/\text{W}$  thermal resistance
- Pre-cut for transistors, or uncut sheet
- 0.13mm thickness

Bergquist Q-Pad 3 eliminates problems associated with thermal grease such as contamination of electronic assemblies and reflow solder baths. Q-Pad 3 may be installed prior to soldering and cleaning, without worry. When clamped between two surfaces, the elastomer conforms to surface textures thereby creating an air free interface between heat generating components and heat sinks.

211474

Order Multiple=10	Type	Mfrs. List No.	Order Code	10+	100+	500+
TO-220		Q3AC-35	557-780	0.096	0.090	0.085
Order Multiple=1				1+	5+	10+
300mm x 300mm sheet (adhesive backed)			681-465	20.630	20.110	19.110

## Thermally Conductive, Pressure Sensitive Adhesive Tape

**BERGQVIST**

## Bond-Ply 100



- Thermal impedance:  $0.86^{\circ}\text{C}\cdot\text{in}^2/\text{W}$  (@ 100 psi)
- High bond strength to a variety of surfaces
- Double-sided pressure sensitive adhesive tape
- High performance, thermally conductive acrylic adhesive
- Can be used instead of heat cure adhesive, screw mounting or clip mounting

## Typical applications:

- Mount heat sink onto BGA graphic processor or drive processor
- Mount heat spreader onto power converter PCB or onto motor control PCB

Thermal Conductivity W/m-K	Dielectric Breakdown Voltage V-ac	Tensile Strength (psi) / (MPa)	Thickness	Volume Resistivity $\Omega\cdot\text{m}$
0.8	3000	6	0.127mm	$10^{11}$

387159/405607

150mm x 150mm sheet	Order Code	1+	5+	10+
300mm x 300mm sheet	878-3705	10.11	8.07	6.61
Supplied in Packs of 10	878-3713	34.54	27.55	22.52
25mm x 25mm sheet	Order Code	1+	10+	25+
	878-3721	3.43	2.74	2.24

387159/405607

## Gap Pad™ Conformable Air Gap Fillers

**BERGQVIST**

Gap Pad provides an effective thermal interface between heat sinks and electronic devices where uneven surface topography, air gaps and rough surface textures are present.

- Eliminates air gaps to reduce thermal resistance
- Highly conformable to reduce interfacial resistance
- Low-stress vibration dampening
- Compatible with automated dispensing equipment
- Available in different grades, of various thicknesses

## VO: Standard applications

## VO Soft: Low stress applications, fragile components

## VO Ultra-Soft: Highly-conformable, gel-like modulus

2000-S40: High thermal performance, highly-conformable, glass reinforced

2500-S80: High thermal performance, highly-conformable, non-reinforced, inherently tacky

3000-S30: Ultra-high thermal performance, highly-conformable, glass reinforced

Material	Thermal Conductivity W/m-K	Dielectric Breakdown Voltage kV-ac	Dielectric Constant	Volume Resistivity $\Omega\cdot\text{m}$	Adhesive Backed?
Gap Pad VO	0.8	6	5.5	$1\times 10^{11}$	y
Gap Pad VO Soft	0.8	6	5.5	$1\times 10^{11}$	n
Gap Pad VOUS	1	6	5.5	$1\times 10^{11}$	n
Gap Pad 2000 S40	2.0	2.5	6.0	$4.2 \times 10^{11}$	n
Gap Pad 2500 S80	2.7	6	6.8	$1\times 10^{11}$	n
Gap Pad 3000 S30	3.0	2.5	6.0	$8.5^{10}$	n

211495

100mm x 100mm Sheet Thickness	Order Code	1+	5+	10+
Gap Pad VO				
1.5mm	681-143	16.97	15.80	14.74
2mm	936-728	19.95	19.06	18.32
3.2mm	681-155	29.06	27.64	25.33
4mm	936-730	36.80	34.32	30.27
Gap Pad VO Ultra-Soft				
1.5mm	168-830	16.88	16.06	14.63
3.2mm	168-841	31.45	27.28	24.37
Gap Pad VO Ultra-Soft				
1.0mm	878-3411	15.05	14.67	13.11
2mm	878-3438	19.97	19.44	17.39
3.175mm	878-3446	33.78	32.89	29.43
5mm	878-3454	48.30	47.04	42.08
Gap Pad 2000 S40				
1.0mm	878-3462	17.24	16.29	15.47
2.0mm	878-3470	24.24	22.89	21.73
3.175mm	878-3489	32.56	30.71	29.20

100mm x 100mm Sheet		Price Each		
Thickness	Order Code	1+	5+	10+
<b>Gap Pad 2500 S80</b>				
1mm	878-3497	21.11	19.94	18.93
3.175mm	878-3519	22.71	21.44	20.37
<b>Gap Pad 3000 S30</b>				
1mm	878-3527	35.37	33.39	31.73
2mm	878-3535	47.18	44.54	42.34
3.175mm	878-3543	58.63	55.36	52.58

**Transistor Insulating Tubes**

Laird  
TECHNOLOGIES



TO-220 L=25, Dia.=10  
TO-218/247/3P L=30, Dia.=13

A simple and safe method of isolating power devices. The transistor is inserted into the flexible tube, which is then clipped on to a suitable heatsink. Electrical isolation is greatly improved compared to traditional screw mounting techniques. **UL** recognised.

Thickness	0.6 max.	Thermal conductivity	0.7 Wm <sup>-1</sup> K <sup>-1</sup>
Breakdown voltage	8000V	Elongation	115%
Thermal resistance	0.92°C/W	Temperature range	-55°C to +180°C

FOR SUITABLE TRANSISTOR CLIPS SEE ORDER CODES 557-729 & 557-730

222192

Order Multiple=10		Price Each			
Package	Mfrs. List No.	Order Code	10+	250+	1K+
TO-220	THER-T-SMALL	547-566●	0.167	0.140	0.128
TO-218/TO-247					
TO-3P	THER-T-LARGE	547-578●	0.220	0.199	0.174
					0.121

**Kool-Pad® Thermally Conductive Sheet**

Laird  
TECHNOLOGIES

- Cut-to-shape 300mm x 300mm sheets
- Silicon rubber/fibre glass, **UL** recognised
- 60°C to +180°C operating temperature

Mfrs. List No. K177-NA-30X30 =121-9143 K200-NA-30X30 =121-9148

211558

R <sub>th</sub> °C/W	V <sub>isolation</sub> KV	Thick- ness mm	Order Code	1+	5+	25+	100+
0.45	3.5	0.18	121-9143●	13.36	9.98	7.97	6.37
0.28	1	0.2	121-9148●	9.44	8.49	7.63	6.87

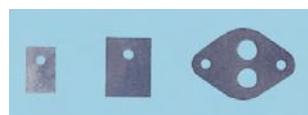
**Self-Adhesive Kool-Pad™,  
Thermally Conductive Sheet**

Laird  
TECHNOLOGIES

- Eliminates mechanical clamping to heatsinks
- Cut-to-shape 300mm x 300mm sheets
- Heat curable, adhesive coated on both sides
- 0.49°C/W thermal resistance (TO-3)
- Electrically conductive aluminium foil base
- 20°C to +155°C operating temperature
- Thickness 0.14mm
- UL** recognised

211473

		Price Each			
Mfrs. List No.	Order Code	1+	5+	25+	100+
KA150-2AC-30X30	121-9151●	13.39	13.12	12.84	11.43

**Conductive Thermal Pads**

Laird  
TECHNOLOGIES

- Dry alternative to grease
- Zemrex CM20' material
- Electrically conductive**
- Resistant to most solvents
- Non-contaminating to solder baths

Thermal resistance (TO-3)		Operating temperature	to +
Thermal conductivity	cal/cm sec °C	Volume resistivity	10 <sup>-3</sup> Ωcm
Mfrs. List No.	CM20-NA-314	= 121-9149	CM20-NA-403 = 121-9150

211556

Order Multiple=50	Type	Order Code	50+	Price Each
Order Multiple=10			250+	5K+
TO-220	121-9149●	0.028	0.022	0.018
TO-3P	121-9150●	0.053	0.044	0.039

**Thermally conductive adhesive**

fischer elektronik



- Thermally conductive, electrically non-conductive adhesive
- Two part epoxy resin adhesive, metaloxide filled
- Fully replaces mechanical fastenings
- Excellent function and application characteristics
- Thermal conductivity 0.822 W/mK
- Adhesive epoxy

449570

Mfrs. List No.	Order Code	1+	5+	10+	100+
WLK 5	5g 121-1723●	8.70	7.82	7.04	6.33
WLK 30	30g 121-1724●	24.60	22.13	19.94	17.95

**Graphite thermally conductive paste  
with high thermal conductivity**

fischer elektronik



- Thermally and electrically conductive
- Graphite filler, silicone-free, organic admixtures, biologically degradable matrix based on, for example, oil
- Pasty consistency
- Density at least 0.7g/cm<sup>3</sup>
- Thermal conductivity 10.5 W/mK
- Resistivity at least 10MOhm/cm
- Flash point for oil DIN 51755, 321°C
- Temperature range of from -40°C to 400°C
- Water-soluble

452835

Mfrs. List No.	Order Code	1+	10+	50+	100+
WLPG 02	2 ml 131-5295●	5.57	4.65	3.98	3.48
WLPG 05	5 ml 131-5296●	10.75	9.77	8.96	8.27

**Heat Pipes****Heat Pipes**

- Copper heat pipes, pure water filled for operation between +5 degC and 110°C
- Various wick structures offered, Screen mesh, Grooved, Sintered and composite (G+S)
- Low thermal resistance for transportation of heat from hot source to exchanger. Heat pipe can be incorporate into a block and fix a finned structure (or heat sink) to allow effective heat removal.
- Thermal resistance of pipe taken at 70°C working temperature (adiabatic), under horizontal orientation, evaporator section 15mm, and condensation section 60mm

497112

Length (mm)	Thickness (mm)	R <sub>th</sub> (K/W)	Mfrs. List No.	Order Code	1+	25+	100+
100	5	0.02-0.04	00C93390101	137-3301●	6.00	5.40	4.87
150	6	0.02-0.03	00C93400101	137-3302●	6.53	5.89	5.30
150	4	0.65-0.90	00C93410101	137-3303●	6.85	6.17	5.56
200	6	0.35-0.60	00C93420101	137-3305●	6.99	6.29	5.66
100	5	0.03-0.06	00C93430101	137-3306●	6.53	5.89	5.30
150	6	0.02-0.03	00C93440101	137-3307●	6.85	6.17	5.56
150	8	0.003-0.05	00C93450101	137-3308●	6.99	6.29	5.66
200	6	0.003-0.08	00C93460101	137-3309●	9.25	8.32	7.49
150	8	0.003-0.015	00C93470101	137-3310●	9.25	8.32	7.49
300	8	0.002-0.007	00C93480101	137-3311●	9.25	8.32	7.49

**Heatsinks - IC/Microprocessor**

To calculate the size of heatsink you need for a device ( Thermal Resistance in °C/W), the following equation may be used:

$$R_{SA} = (T_J - T_A)/P_d - (R_{jc} + R_{cs})$$

Where:

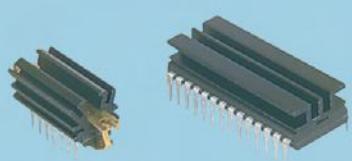
R<sub>jc</sub> = Thermal resistance of the junction (°C/W)

R<sub>cs</sub> = Thermal resistance of the case (°C/W)

P<sub>d</sub> = Maximum power dissipated by the device (°C/W)

T<sub>J</sub> = Maximum temperature of the junction (at full P<sub>d</sub>) (°C/W)

T<sub>A</sub> = Maximum ambient temperature (°C)

**Heatsinks - IC/Microprocessor - continued****Dual-in-Line**

**AAVID THERMALLOY**  
ONE COOL IDEA AFTER ANOTHER

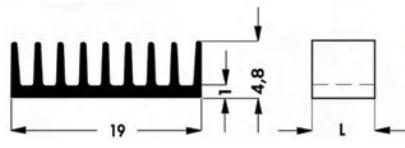
**170-755 H=7.3, W=10.5, L=31.5  
(inc. clip)**  
**175-010 H=4.8, W=13.5, L=30.5**  
**175-012 H=4.8, W=13.5, L=50.8**

Mfrs. List No. DIP1490 = 170-755 DIP1495 = 175-010 DIP1497 = 175-012

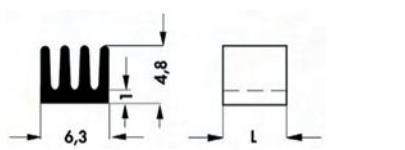
211559

**Order Multiple=5**

Thermal Resistance	IC Pin count	Order Code	5+	Price Each
			100+	250+
<b>0.3° (7.62mm) IC Row Spacing</b>		<b>170-755●</b>	1.04	0.80
31°C/W 14/16			0.76	
<b>0.6° (15.24mm) IC Row Spacing</b>		<b>175-010●</b>	0.50	0.41
25°C/W 24			0.39	
20°C/W 40		<b>175-012●</b>	0.67	0.56
			0.53	

**Heatsinks for DIL packages**

ICK...B



ICK 14/16 L

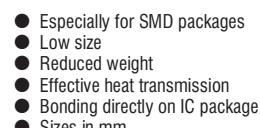
Typ	Pin count	Length (mm)	R <sub>W</sub> (K/W)
ICK 14/16 B	14/16	6.3	50
ICK 24 B	24	33.0	13
ICK 40 B	40	51.0	8.5
ICK 14/16 L	14/16	19.0	46

330607

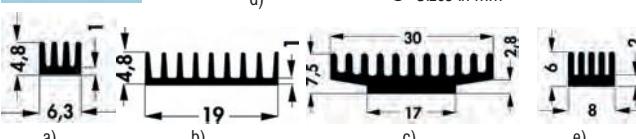
Typ	Order Code	1+	100+	1K+	5K+
ICK 14/16 B	462-0896●	0.270	0.240	0.210	0.187
ICK 24 B	462-0914●	0.410	0.370	0.340	0.310
ICK 40 B	462-0926●	0.540	0.480	0.440	0.400
ICK 14/16 L	462-0902●	0.280	0.250	0.220	0.192

**Heatsinks for SMD packages**

**fischer elektronik**



- Especially for SMD packages
- Low size
- Reduced weight
- Effective heat transmission
- Bonding directly on IC package
- Sizes in mm



Order Code	Typ	Case Style	Length (mm)	R <sub>W</sub> (K/W)
430-2163	ICK SMD A 5 SA	a	4.8	123
430-2175	ICK SMD A 8 SA	a	4.8	87
430-2187	ICK SMD A 10 SA	a	4.8	75
430-2199	ICK SMD A 13 SA	a	4.8	63
430-2205	ICK SMD A 17 SA	a	4.8	51
430-2217	ICK SMD A 22 SA	a	4.8	34
430-2242	ICK SMD B 10 SA	b	4.8	35
430-2254	ICK SMD B 13 SA	b	4.8	29
430-2266	ICK SMD B 19 SA	b	4.8	22
430-2278	ICK SMD C 7 SA	c	7.5	33
430-2280	ICK SMD C 10 SA	c	7.5	26
430-2291	ICK SMD C 17 SA	c	7.5	17
430-6557	ICK SMD E 15 SA	d	8	27
430-2310	ICK SMD E 22 SA	d	8	21
430-2321	ICK SMD E 29 SA	d	8	18
430-2333	ICK SMD F 8 SA	e	6	74
430-2345	ICK SMD F 10 SA	e	6	71
430-2357	ICK SMD F 17 SA	e	6	42
430-2369	ICK SMD F 19 SA	e	6	37
430-2370	ICK SMD F 21 SA	e	6	33
430-2382	ICK SMD F 26 SA	e	6	26

246703

Typ	Order Code	Price Each			
		1+	10+	25+	100+
ICK SMD A 5 SA	430-2163●	0.220	0.168	0.148	--
ICK SMD A 8 SA	430-2175●	0.220	0.168	0.148	--
ICK SMD A 10 SA	430-2187●	0.390	0.290	0.240	0.169
ICK SMD A 13 SA	430-2199●	0.240	0.187	0.154	--
ICK SMD A 17 SA	430-2217●	0.220	0.178	0.147	--
ICK SMD A 22 SA	430-2217●	0.260	0.210	0.177	--
ICK SMD B 10 SA	430-2242●	0.400	0.320	0.270	--
ICK SMD B 13 SA	430-2254●	0.440	0.350	0.290	--
ICK SMD B 19 SA	430-2266●	0.480	0.410	0.330	--
ICK SMD C 7 SA	430-2278●	0.690	0.580	0.450	--
ICK SMD C 10 SA	430-2280●	0.690	0.590	0.460	--
ICK SMD C 17 SA	430-2291●	0.740	0.620	0.480	--
ICK SMD E 15 SA	430-6557●	1.710	1.430	1.110	--
ICK SMD E 22 SA	430-2310●	1.580	1.370	1.220	--
ICK SMD E 29 SA	430-2321●	1.610	1.390	1.100	--
ICK SMD F 8 SA	430-2333●	0.370	0.320	0.260	--
ICK SMD F 10 SA	430-2345●	0.430	0.370	0.320	--
ICK SMD F 17 SA	430-2357●	0.540	0.450	0.370	--
ICK SMD F 19 SA	430-2369●	0.550	0.460	0.360	--
ICK SMD F 21 SA	430-2370●	0.610	0.520	0.400	--
ICK SMD F 26 SA	430-2382●	0.640	0.550	0.420	--

**Chip Carrier**

**AAVID THERMALLOY**  
ONE COOL IDEA AFTER ANOTHER



JEDEC A&D 68 and 132 Pin Leadless Chip Carriers and 68 pin Leaded Quad Packages (Bond On) **9.3 C/W** Matt black paint finish

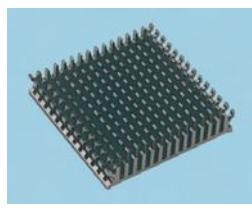
Mfrs. List No. CP68 = 175-006

211560

Order Code	1+	25+	100+	1K+
175-006●	6.79	5.60	4.86	3.39

**Pin Grid Array, 17 x 17**

**marston**  
SPECIALISTS



Suitable for pin grid array packages on 17 x 17 matrix (45mm square), for example Intel i486 50MHz microprocessor. Flat pin design for maximum efficiency, utilises air flow from any direction. Fitted with heat conductive adhesive tape for easy attachment.

Thermal resistance 8.0°C/W (natural convection)  
2.5°C/W (air velocity 122m per minute)

211445

Mfrs. List No.	Order Code	1+	20+	100+
CP51035/3	265-615●	10.03	8.75	7.69

**BGA Heatsinks**

**CCI**  
CERAMIC



- PGA Heatsink
- Material: AL-6063
- Finish: Anodised
- Double sided adhesive provides simple and effective attachment
- Thermal Resistances specified at different airflow rates
- Typically used with DSP, FPGAs and other electronic packages.

Aluminium BGA and compact crosscut heatsinking for a variety of applications requiring extension of surface area for cooling.

497100

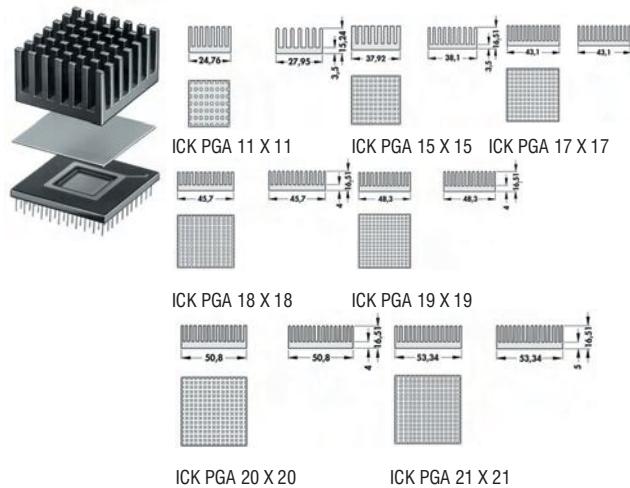
IC Size, sq (mm <sup>2</sup> )	R <sub>thJA</sub> @ 0.3 m/s	R <sub>thJA</sub> @ 1 m/s	Mfrs. List No.	Order Code	1+	25+	100+
25	9.6	5.3	00C845401A	137-3299●	0.94	0.84	0.76
28	9.51	5.29	CC108	137-3295●	0.94	0.84	0.76
30	9.96	5.87	CC109	137-3296●	0.91	0.82	0.74
38	9.12	4.65	CC110	137-3297●	1.05	0.94	0.84
40	9.38	5.14	CC111	137-3300●	1.15	1.04	0.93
45	7.93	3.57	CC102	137-3294●	1.74	1.56	1.41

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## Heatsinks for PGA



Sizes of heatsinks (mm) can be seen in technical diagram. Sizes of thermally conductive foil WLFT family are in price table (mm).

311907

Mfr.List.No	Order Code	$R_{th}$ (K/W)	Price Each			
			1+	100+	250+	500+
ICK PGA 11 X 11	462-0940●	11	1.43	1.21	1.07	0.94
ICK PGA 15 X 15	462-0951●	9.2	1.83	1.59	1.38	1.19
ICK PGA 17 X 17	462-0963●	8.6	2.51	2.16	1.87	1.63
ICK PGA 18 X 18	462-0975●	8.2	2.43	2.08	1.81	1.58
ICK PGA 19 X 19	462-0938●	8.8	2.48	2.13	1.85	1.61
ICK PGA 20 X 20	462-0987●	7.5	2.87	2.48	2.15	1.89
ICK PGA 21 X 21	462-0999●	7.1	2.70	2.33	2.04	1.76

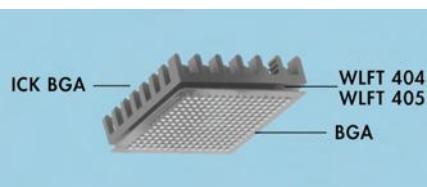
Fitting thermally conductive foil:

Mfr.List.No	Order Code	Price Each			
		1+	100+	250+	500+
WLFT 404 14X14	121-1706●	0.39	0.34	0.29	0.26
WLFT 404 23X23	121-1707●	0.97	0.80	0.68	0.60
WLFT 404 24.5 X 27.7	469-5525●	1.30	1.21	1.12	1.03
WLFT 404 27X27	121-1708●	2.15	1.79	1.53	1.35
WLFT 404 35X35	121-1709●	2.72	2.26	1.94	1.69
WLFT 404 37 X 38	469-5537●	1.81	1.75	1.65	1.58
WLFT 404 43 X 43	469-5549●	2.11	1.96	1.81	1.67
WLFT 404 46 X 46	469-5550●	2.26	2.10	1.94	1.79
WLFT 404 48 X 48	469-5562●	2.27	2.26	2.25	1.93
WLFT 404 50 X 50	469-5574●	2.57	2.40	2.22	2.05
WLFT 404 53 X 53	469-5586●	2.77	2.64	2.49	2.37

Alternative thermally conductive glue:

Mfr.List.No	Description	Thermal conductivity	Order Code	Price Each	
				1+	5+
WLK 5	5g Binder / 0.5g Accelerator	0.822W/m.K	121-1723●	8.70	7.82
WLK 30	30g Binder / 3g Accelerator	0.836W/m.K	121-1724●	24.60	22.13

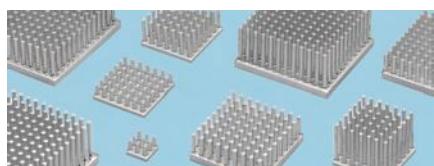
## BGA Heatsinks



Typ	Height (mm)	Width (mm)	Depth (mm)	K/W	Price Each			
					1+	5+	10+	100+
ICK BGA 14X14	6	14	14	30	2.02	1.68	1.45	1.28
ICK BGA 23X23	6	23	23	23	2.24	1.86	1.60	1.42
ICK BGA 27X27	6	27	27	20	2.24	1.86	1.60	1.42
ICK BGA 35X35	6	35	35	17	2.24	1.86	1.60	1.42

452244

## Pin Heatsinks



Typ	Height (mm)	Width (mm)	Depth (mm)	K/W
ICK S 25 X 25 X 6.5	6.5	25	25	5.4
ICK S 32 X 32 X 20	20	32	32	3.4
ICK S 36 X 36 X 10	10	36	36	4.4
ICK S 45 X 45 X 20	20	45	45	3.2

452252

Typ	Order Code	1+	5+	10+	100+
ICK S 25 X 25 X 6.5	121-1712●	4.16	3.45	2.98	2.62
ICK S 32 X 32 X 20	121-1713●	5.20	4.32	3.72	3.27
ICK S 36 X 36 X 10	121-1714●	5.47	4.54	3.91	3.44
ICK S 45 X 45 X 20	121-1715●	5.20	4.32	3.72	3.27

452252

## PLCC Heatsinks



Mfrs. part no	Height (mm)	Width (mm)	Depth (mm)	K/W
ICK PLCC 28	11.8	11.8	8	25
ICK CC 64	17	30	7.5	17
ICK R	12	25	25	19

ICK PLCC 28

452245

Mfrs. part no	Order Code	1+	10+	100+	250+
ICK PLCC 28	430-2400●	0.61	0.54	0.41	--
ICK CC 64	430-2412●	1.21	1.03	0.81	--
ICK R	122-2501●	2.58	2.15	1.83	1.62

483988

## CMBF Series



Heatsink cooler designed for BGA chipsets. Complete with Fan and fixings.

- Includes assembly containing:
- Fan (with 3-pin connector):
- Clip:
- Heatsink + screws:
- Thermal tape:

Mfrs. List No.	L, W (mm)	H (mm)	Order Code	1+	5+	25+
CMBFO135352901-00	35x35	29	137-3241●	13.27	11.94	11.34
CMBFO140402901-00	40x40	29	137-3242●	13.61	12.25	11.63
CMBFO142422901-00	42.5x42.5	29	137-3243●	10.19	9.17	8.71

477635

## Actively Cooled Chipset Fans



BGA Chip Set Compatible



- Heatsink and fan combinations
- Extruded heatsink design
- Fin material is Al 6063
- Available in a wide range of thermal resistances
- Black anodised finish
- 5V fan

Mfrs. List No.	Chipset (mm)	$R_{th}$ (°C/W)	Order Code	1+	5+	10+	25+
CEBF0127271803-00	27x27	3.62	137-3235●	13.02	11.71	11.13	--
CEBF0135351602-00	35x35	2.32	137-3236●	10.81	9.72	9.23	--
CEBF0140401605-00	40x40	1.95	137-3238●	11.17	10.04	9.55	--
CEBF0142421601-00	42.5x42.5	1.5	137-3239●	6.98	6.28	5.96	--
CEBF0145451601-00	45x45	1.3	137-3240●	6.98	6.28	5.96	--

481091

Mfrs. List No.	Chipset (mm)	$R_{th}$ K/W @ 0.5m/s	@ 2.5m/s	Order Code	1+	25+
MBH19002-12P/2.6	19x19	12	7.9	137-3254●	2.95	2.66
MBH19002-25P/2.6	19x19	25	3.9	137-3255●	3.10	2.79
MBH27002-12P/2.6	27x27	12	6.0	137-3256●	3.69	2.91
MBH27002-25P/2.6	27x27	25	3.3	137-3257●	3.69	2.91
MBH29002-12P/2.6	29x29	12	5.2	137-3258●	3.54	3.19
MBH29002-33P/2.6	29x29	33	2.9	137-3259●	3.82	3.44
MBH33002-12P/2.6	31x31	12	5.3	137-3260●	3.54	3.19



**Heatsinks - IC/Microprocessor - continued****MBH Series - Pin Fin - continued**

Mfrs. List No.	Chipset (mm)	R <sub>m</sub> , KW Height @ 0.5m/s @ 2.5m/s	Order Code	Price Each 1+ 25+
MBH33002-33P/2.6	31x31	33 2.6 1.1	137-3261●	3.82 3.44
MBH35002-12P/2.6	35x35	35 3.5 1.1	NEW 160-1016●	3.54 3.22
MBH35002-12P/2.6	35x35	35 3.5 1.1	NEW 160-1017●	3.69 3.36
MBH375002-12P/2.6	37.5x37.5	12 4.3 1.7	137-3263●	3.54 3.19
MBH375002-33P/2.6	37.5x37.5	33 2.1 0.9	137-3264●	3.82 3.44
MBH42.5002-12P/2.6	42.5x42.5	12 3.4 1.2	137-3265●	4.74 3.79
MBH42.5002-25P/2.6	42.5x42.5	25 1.9 0.73	137-3266●	4.89 3.80

**Heatsink, Maxigrip STD**

New

Thermal resistance °C/W	Height mm	Width mm	Depth mm	Mfrs. List No.
13.9	7.5	17	17	ATS-50170B-C2-R0
12.9	7.5	19	19	ATS-50190B-C2-R0
8.8	7.5	21	21	ATS-50210B-C2-R0
8.3	7.5	23	23	ATS-50230B-C2-R0
6.1	7.5	25	25	ATS-50250B-C2-R0
5.8	7.5	27	27	ATS-50270B-C2-R0
5.6	7.5	29	29	ATS-50290B-C2-R0
5.4	7.5	30	30	ATS-50300B-C2-R0
5.3	7.5	31	31	ATS-50310B-C2-R0
4.2	7.5	32.5	32.5	ATS-50325B-C2-R0
4.2	7.5	33	33	ATS-50330B-C2-R0
3.4	7.5	35	35	ATS-50350B-C2-R0
3.3	7.5	37.5	37.5	ATS-50375B-C2-R0
3.2	7.5	40	40	ATS-50400B-C2-R0
3	7.5	42.5	42.5	ATS-50425B-C2-R0
2.6	7.5	45	45	ATS-50450B-C2-R0
9	12.5	17	17	ATS-50170G-C2-R0
8.4	12.5	19	19	ATS-50190G-C2-R0
5.7	12.5	21	21	ATS-50210G-C2-R0
5.4	12.5	23	23	ATS-50230G-C2-R0
4	12.5	25	25	ATS-50250G-C2-R0
3.8	12.5	27	27	ATS-50270G-C2-R0
3.7	12.5	29	29	ATS-50290G-C2-R0
3.6	12.5	30	30	ATS-50300G-C2-R0
3.5	12.5	31	31	ATS-50310G-C2-R0
2.8	12.5	32.5	32.5	ATS-50325G-C2-R0
2.7	12.5	33	33	ATS-50330G-C2-R0
2.2	12.5	35	35	ATS-50350G-C2-R0
2.1	12.5	37.5	37.5	ATS-50375G-C2-R0
2	12.5	40	40	ATS-50400G-C2-R0
2	12.5	42.5	42.5	ATS-50425G-C2-R0
1.6	12.5	45	45	ATS-50450G-C2-R0
6.8	17.5	17	17	ATS-50170P-C2-R0
6.4	17.5	19	19	ATS-50190P-C2-R0
4.3	17.5	21	21	ATS-50210P-C2-R0
4.1	17.5	23	23	ATS-50230P-C2-R0
3	17.5	25	25	ATS-50250P-C2-R0
2.9	17.5	27	27	ATS-50270P-C2-R0
2.8	17.5	29	29	ATS-50290P-C2-R0
2.7	17.5	30	30	ATS-50300P-C2-R0
2.7	17.5	31	31	ATS-50310P-C2-R0
2.1	17.5	32.5	32.5	ATS-50325P-C2-R0
2.1	17.5	33	33	ATS-50330P-C2-R0
1.7	17.5	35	35	ATS-50350P-C2-R0
1.6	17.5	37.5	37.5	ATS-50375P-C2-R0
1.6	17.5	40	40	ATS-50400P-C2-R0
1.5	17.5	42.5	42.5	ATS-50425P-C2-R0
1.3	17.5	45	45	ATS-50450P-C2-R0

527307

Mfrs. List No.	Thermal resistance °C/W	Order Code	Price Each 1+ 10+ 50+ 100+
ATS-50170B-C2-R0	13.9	166-9012●	7.73 6.74 6.39 5.98
ATS-50190B-C2-R0	12.9	166-9014●	7.77 6.78 6.43 6.02
ATS-50210B-C2-R0	8.8	166-9015●	7.83 6.84 6.48 6.06
ATS-50230B-C2-R0	8.3	166-9016●	7.88 6.88 6.52 6.10
ATS-50250B-C2-R0	6.1	166-9017●	7.94 6.93 6.57 6.15
ATS-50270B-C2-R0	5.8	166-9018●	7.99 6.97 6.61 6.18
ATS-50290B-C2-R0	5.6	166-9019●	8.05 7.02 6.66 6.23
ATS-50300B-C2-R0	5.4	166-9020●	8.11 7.08 6.71 6.28
ATS-50310B-C2-R0	5.3	166-9021●	8.15 7.12 6.75 6.31
ATS-50325B-C2-R0	4.2	166-9022●	8.21 7.17 6.80 6.36
ATS-50330B-C2-R0	4.2	166-9024●	8.24 7.19 6.82 6.38
ATS-50350B-C2-R0	3.4	166-9025●	8.27 7.22 6.85 6.41
ATS-50375B-C2-R0	3.3	166-9026●	8.33 7.27 6.90 6.45
ATS-50400B-C2-R0	3.2	166-9027●	8.39 7.32 6.95 6.50
ATS-50425B-C2-R0	3	166-9028●	8.45 7.38 7.00 6.54
ATS-50450B-C2-R0	2.6	166-9029●	8.51 7.43 7.04 6.59
ATS-50170G-C2-R0	9	166-9030●	8.15 7.12 6.75 6.31
ATS-50190G-C2-R0	8.4	166-9031●	8.21 7.17 6.80 6.36
ATS-50210G-C2-R0	5.7	166-9032●	8.27 7.22 6.85 6.41
ATS-50230G-C2-R0	5.4	166-9033●	8.33 7.27 6.90 6.45
ATS-50250G-C2-R0	4	166-9034●	8.39 7.32 6.95 6.50
ATS-50270G-C2-R0	3.8	166-9036●	8.45 7.38 7.00 6.54
ATS-50290G-C2-R0	3.7	166-9037●	8.51 7.43 7.04 6.59
ATS-50300G-C2-R0	3.6	166-9038●	8.57 7.48 7.09 6.64

527336

Mfrs. List No.	Thermal resistance °C/W	Order Code	Price Each 1+ 10+ 50+ 100+
ATS-50310G-C2-R0	3.5	166-9039●	8.63 7.53 7.14 6.68
ATS-50325G-C2-R0	2.8	166-9040●	8.70 7.59 7.20 6.74
ATS-50330G-C2-R0	2.7	166-9042●	8.73 7.62 7.22 6.76
ATS-50350G-C2-R0	2.2	166-9043●	8.76 7.65 7.25 6.78
ATS-50375G-C2-R0	2.1	166-9044●	8.82 7.70 7.30 6.83
ATS-50400G-C2-R0	2	166-9045●	8.88 7.75 7.35 6.88
ATS-50425G-C2-R0	2	166-9046●	8.95 7.81 7.41 6.93
ATS-50450G-C2-R0	1.6	166-9048●	9.01 7.86 7.46 6.98
ATS-50170P-C2-R0	6.8	166-9049●	8.64 7.54 7.15 6.69
ATS-50190P-C2-R0	6.4	166-9050●	8.71 7.61 7.21 6.75
ATS-50210P-C2-R0	4.3	166-9051●	8.77 7.66 7.26 6.79
ATS-50230P-C2-R0	4.1	166-9052●	8.83 7.71 7.31 6.84
ATS-50250P-C2-R0	3	166-9053●	8.90 7.77 7.37 6.89
ATS-50270P-C2-R0	2.9	166-9054●	8.96 7.82 7.42 6.94
ATS-50290P-C2-R0	2.8	166-9055●	9.04 7.89 7.48 7.00
ATS-50300P-C2-R0	2.7	166-9056●	9.10 7.94 7.53 7.04
ATS-50310P-C2-R0	2.7	166-9057●	9.17 8.00 7.59 7.10
ATS-50325P-C2-R0	2.1	166-9058●	9.23 8.05 7.64 7.14
ATS-50330P-C2-R0	2.1	166-9061●	9.26 8.08 7.67 7.17
ATS-50350P-C2-R0	1.7	166-9062●	9.30 8.11 7.69 7.20
ATS-50375P-C2-R0	1.6	166-9063●	9.37 8.18 7.75 7.25
ATS-50400P-C2-R0	1.6	166-9064●	9.44 8.24 7.81 7.31
ATS-50425P-C2-R0	1.5	166-9065●	9.50 8.29 7.86 7.35
ATS-50450P-C2-R0	1.3	166-9066●	9.57 8.35 7.92 7.41

**Heatsink, Maxigrip Low Profile**

New

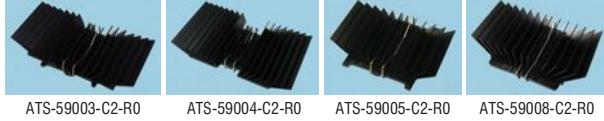
Mfrs. List No.	Thermal resistance °C/W	Order Code	Price Each 1+ 10+ 50+ 100+
ATS-51170D-C2-R0	12.6	166-9068●	7.87 6.87 6.51 6.09
ATS-51190D-C2-R0	11.6	166-9069●	7.95 6.94 6.58 6.16
ATS-51210D-C2-R0	8	166-9071●	8.04 7.01 6.65 6.22
ATS-51230D-C2-R0	7.5	166-9074●	8.12 7.09 6.72 6.29
ATS-51250D-C2-R0	5.5	166-9075●	8.20 7.16 6.79 6.35
ATS-51270D-C2-R0	5.3	166-9076●	8.30 7.24 6.87 6.42
ATS-51290D-C2-R0	5	166-9077●	8.38 7.31 6.94 6.49
ATS-51300D-C2-R0	2.6	166-9081●	8.44 7.37 6.99 6.53
ATS-51310D-C2-R0	4.8	166-9082●	8.49 7.41 7.02 6.57
ATS-51325D-C2-R0	3.8	166-9085●	8.55 7.46 7.07 6.62
ATS-51330D-C2-R0	3.8	166-9086●	8.57 7.48 7.09 6.64
ATS-51350D-C2-R0	3.1	166-9087●	8.60 7.50 7.11 6.65



Mfrs. List No.	Thermal resistance °C/W	Order Code	1+	10+	50+	100+
ATS-51375D-C2-R0	3	166-9088●	8.65	7.55	7.16	6.70
ATS-51400D-C2-R0	2.8	166-9089●	8.71	7.61	7.21	6.75
ATS-51425D-C2-R0	2.7	166-9090●	8.76	7.65	7.25	6.78
ATS-51450D-C2-R0	2.3	166-9091●	8.82	7.70	7.30	6.83
ATS-51170K-C2-R0	8.5	166-9092●	8.32	7.26	6.89	6.44
ATS-51190K-C2-R0	7.9	166-9093●	8.40	7.34	6.96	6.51
ATS-51210K-C2-R0	5.4	166-9094●	8.50	7.42	7.03	6.58
ATS-51230K-C2-R0	5.1	166-9095●	8.60	7.50	7.11	6.65
ATS-51250K-C2-R0	3.8	166-9097●	8.69	7.58	7.19	6.73
ATS-51270K-C2-R0	3.6	166-9098●	8.79	7.67	7.27	6.80
ATS-51290K-C2-R0	3.4	166-9099●	8.88	7.75	7.35	6.88
ATS-51300K-C2-R0	3.4	166-9100●	8.94	7.80	7.40	6.92
ATS-51310K-C2-R0	3.3	166-9101●	8.99	7.84	7.44	6.96
ATS-51325K-C2-R0	2.6	166-9103●	9.05	7.90	7.49	7.00
ATS-51330K-C2-R0	2.6	166-9104●	9.08	7.93	7.52	7.03
ATS-51350K-C2-R0	2.1	166-9105●	9.11	7.95	7.54	7.05
ATS-51375K-C2-R0	2	166-9106●	9.17	8.00	7.59	7.10
ATS-51400K-C2-R0	1.9	166-9107●	9.23	8.05	7.64	7.14
ATS-51425K-C2-R0	1.8	166-9108●	9.30	8.11	7.69	7.20
ATS-51450K-C2-R0	1.5	166-9109●	9.36	8.17	7.74	7.24
ATS-51170R-C2-R0	6.5	166-9110●	8.82	7.70	7.30	6.83
ATS-51190R-C2-R0	6.1	166-9111●	8.92	7.78	7.38	6.90
ATS-51210R-C2-R0	4.2	166-9112●	9.01	7.86	7.46	6.98
ATS-51230R-C2-R0	4	166-9113●	9.12	7.96	7.55	7.06
ATS-51250R-C2-R0	2.9	166-9115●	9.21	8.04	7.63	7.13
ATS-51270R-C2-R0	2.8	166-9116●	9.32	8.14	7.71	7.22
ATS-51290R-C2-R0	2.7	166-9117●	9.43	8.23	7.80	7.30
ATS-51300R-C2-R0	2.6	166-9118●	9.49	8.28	7.85	7.35
ATS-51310R-C2-R0	2.6	166-9119●	9.55	8.33	7.90	7.39
ATS-51325R-C2-R0	2	166-9120●	9.62	8.39	7.96	7.45
ATS-51330R-C2-R0	2	166-9121●	9.64	8.42	7.98	7.47
ATS-51350R-C2-R0	1.6	166-9122●	9.68	8.45	8.01	7.49
ATS-51375R-C2-R0	1.6	166-9123●	9.74	8.50	8.06	7.54
ATS-51400R-C2-R0	1.5	166-9124●	9.81	8.56	8.12	7.59
ATS-51425R-C2-R0	1.5	166-9125●	9.88	8.62	8.18	7.65
ATS-51450R-C2-R0	1.2	166-9127●	9.94	8.68	8.23	7.70

**Heatsink, Maxigrip Flip-Chip IC**
**ATS** ADVANCED THERMAL SOLUTIONS EUROPE, B.V.  
Innovations in Thermal Management®

ATS-59000-C2-R0 ATS-59001-C2-R0 ATS-59002-C2-R0

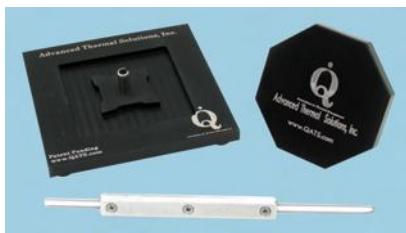


Mfrs. List No.	Thermal resistance °C/W	Height mm	Width mm	Depth mm	Mfrs. List No.
ATS-59000-C2-R0	4.2	9	21	45	ATS-59000-C2-R0
	3	11	28	45	ATS-59001-C2-R0
	3.8	13	25	32	ATS-59002-C2-R0
	3.8	13	25	50	ATS-59003-C2-R0
	1.9	12	32	55	ATS-59004-C2-R0
	3.8	10	29	37	ATS-59005-C2-R0
	3.8	11	29	37	ATS-59006-C2-R0
	1.6	16.75	35	46	ATS-59007-C2-R0
	1.6	16.75	35	46	ATS-59008-C2-R0
	1.8	13	62	52	ATS-59009-C2-R0
	1.8	13	62	52	ATS-59010-C1-R0

527336

Mfrs. List No.	Thermal resistance °C/W	Order Code	1+	10+	50+	100+
ATS-59000-C2-R0	4.2	166-9133●	18.80	16.41	15.56	14.55
ATS-59001-C2-R0	3	166-9134●	19.79	17.27	16.37	15.32
ATS-59002-C2-R0	3.8	166-9135●	18.50	16.15	15.31	14.32
ATS-59003-C2-R0	3.8	166-9136●	13.19	11.51	10.92	10.21
ATS-59004-C2-R0	1.9	166-9137●	13.31	11.62	11.01	10.30
ATS-59005-C2-R0	3.8	166-9139●	14.35	12.52	11.87	11.11
ATS-59006-C2-R0	3.8	166-9141●	14.43	12.59	11.94	11.17
ATS-59007-C2-R0	1.6	166-9142●	11.58	10.11	9.59	8.97
ATS-59008-C2-R0	1.6	166-9143●	11.61	10.13	9.61	8.99
ATS-59009-C2-R0	1.8	166-9144●	14.35	12.52	11.87	11.11
ATS-59010-C1-R0	1.8	166-9145●	14.67	12.80	12.14	11.35

527336

**Maxigrip Tool**
**ATS** ADVANCED THERMAL SOLUTIONS EUROPE, B.V.  
Innovations in Thermal Management®

527336

Mfrs. List No.	mm	Order Code	1+	10+	50+	100+
MGT190	19	166-9150●	60.80	53.06	50.32	47.07
MGT210	21	166-9152●	60.80	53.06	50.32	47.07
MGT230	23	166-9153●	60.80	53.06	50.32	47.07
MGT250	25	166-9154●	60.80	53.06	50.32	47.07
MGT270	27	166-9155●	60.80	53.06	50.32	47.07
MGT290	29	166-9156●	60.80	53.06	50.32	47.07
MGT300	30	166-9157●	60.80	53.06	50.32	47.07
MGT310	31	166-9158●	60.80	53.06	50.32	47.07
MGT325	32.5	166-9159●	60.80	53.06	50.32	47.07
MGT330	33	166-9160●	60.80	53.06	50.32	47.07
MGT350	35	166-9161●	60.80	53.06	50.32	47.07
MGT375	37.5	166-9162●	60.80	53.06	50.32	47.07
MGT400	40	166-9164●	60.80	53.06	50.32	47.07
MGT425	42.5	166-9166●	60.80	53.06	50.32	47.07
MGT450	45	166-9167●	60.80	53.06	50.32	47.07

**LGA Heatsink, with Fan**

ATS-57000-C1-R0



ATS-57001-C1-R0



ATS-57002-C1-R0



ATS-57003-C1-R0



3

**Heatsinks - Pressed**

To calculate the size of heatsink you need for a device ( Thermal Resistance in °C/W), the following equation may be used:

$$R_{SA} = (T_J - T_A)/P_d - (R_{jc} + R_{cs})$$

Where:

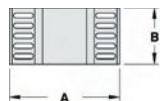
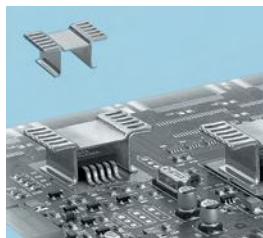
 $R_{jc}$  = Thermal resistance of the junction (°C/W) $R_{cs}$  = Thermal resistance of the case (°C/W) $P_d$  = Maximum power dissipated by the device (°C/W) $T_J$  = Maximum temperature of the junction (at full  $P_d$ ) (°C/W) $T_A$  = Maximum ambient temperature (°C)**TO-5/TO-18/TO-39**

Mfrs. List No. 5C-20 = 170-065, 5F = 170-066, 5F2 = 170-754

211561

Order Multiple=5	$R_{th}$ °C/W	Order Code	5+	25+	100+	1K+
TO-5/TO-39	62.2	170-754●	0.550	0.370	0.310	0.210
	45.2	170-066●	0.280	0.230	0.196	0.183
Order Multiple=1			1+	25+	100+	1K+
	30	170-065●	3.600	2.740	2.290	1.470

£ € 40,000 PRICES REDUCED

**Heatsinks - Pressed - continued****Heatsinks for D PAK and others**

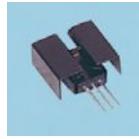
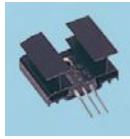
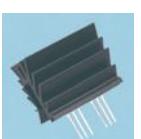
- Material: Copper
- Direct assembly on the board by solderable surface
- applicable for SMD cases like D PAK (TO252), D2 PAK (TO 263), D3 PAK (TO268), SO-8, SO-14, SO-16, Power SO-10 SOT 23 etc.
- Sizes in mm

Order Code	Typ	R <sub>w</sub>	A	B	C	D	E	F
430-2424	FK 244 13 D PAK	25	23	13	14.8	10	8	10
430-2436	FK 244 13 D2 PAK	22.8	26	13	17.8	13	8	10
430-2448	FK 244 13 D3 PAK	19.5	31	13	22.8	18	8	10
431-4001	FK 244 08 D PAK	31.5	23	8	14.8	10	8	10
431-4049	FK 244 08 D2 PAK	29.3	26	8	17.8	13	8	10
431-4050	FK 244 08 D3 PAK	26	31	8	22.8	18	8	10

246705

Typ	Order Code	1+	10+	25+	100+
FK 244 13 D PAK	430-2424●	0.78	0.66	0.52	--
FK 244 13 D2 PAK	430-2436●	0.78	0.66	0.52	--
FK 244 13 D3 PAK	430-2448●	0.80	0.69	0.54	--
FK 244 08 D PAK	431-4001●	0.55	0.46	0.43	0.38
FK 244 08 D2 PAK	431-4049●	0.55	0.46	0.43	0.38
FK 244 08 D3 PAK	431-4050●	0.57	0.51	0.44	0.39

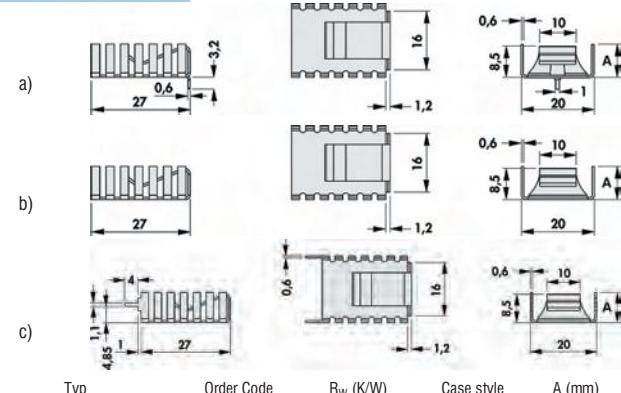
246705

**TO-126/TO-220 Clip-on**170-498  
H=10, W=21.8, D=19170-758  
H=12.5, W=25, D=20Solderable tabs 1.7 x 0.5  
151-305  
H=9, W=19, D=10Solderable tinned nickel  
coating tabs 1.7 x 0.7  
121-3451  
H=11, W=22, D=19178-701  
H=11, W=22, D=19Solderable tabs 1.70.5  
121-3476  
H=12.7, W=12.7, D=19.5121-3432/121-3434  
Solderable tabs 1.3 dia on  
fixing centres  
21 (121-3432), 36 (121-  
3434)  
H=20, W=21, D=28  
H=20, W=36, D=28179-954  
H=8.1, W=19.7,  
D=13.2265-196  
H=8.1, W=19.7, D=20  
523-392  
H=27, W=16, D=35Solderable tabs 1.3 dia on  
fixing centres 35  
PF752 = 178-701  
HF35 = 121-3434  
PF720 = 265-196 HS Marston 82SN-00200-U-220 = 170-758  
PF730 = 179-954 PPC0350BP = 523-392  
HF20 = 121-3432  
211562

R <sub>th</sub> °C/W	Convection °C/W	Order Code	5+	25+	100+	1K+
<b>TO-126</b>						
34		179-954●	0.590	0.430	0.320	0.199
<b>TO-220</b>						
28		265-196●	0.270	0.200	0.160	0.130
25		121-3476●	0.330	0.230	0.210	0.200
23.5		151-305●	1.060	0.880	0.730	0.480
23.3		170-498●	0.750	0.600	0.540	0.370
14		178-701●	0.390	0.340	0.310	0.280
21		170-758●	0.590	0.530	0.470	0.340
20		121-3451●	0.640	0.490	0.480	0.460
<b>Order Multiple=1</b>						
13		121-3432●	1.880	1.430	1.150	0.760
11		121-3434●	2.120	1.730	1.380	0.910
8		523-392●	2.280	1.740	1.480	1.080

**Heatsinks Clip-On****fischer elektronik**

- Universal heatsink for case styles TO-218, TO-220, TO-247, SIP Multiwatt and similar
- Easy assembly
- Sizes in mm



Typ	Order Code	R <sub>w</sub> (K/W)	Case style	A (mm)
FK 245 MI 247 O	430-2450	20.2	a	9
FK 245 MI 247 H	430-2461	20.5	b	9
FK 245 MI 247 V	430-2473	19.7	c	9
FK 243 MI 247 O	430-2485	18.7	a	13
FK 243 MI 247 H	430-2497	19	b	13
FK 243 MI 247 V	430-2503	18.4	c	13

247178

Typ	Order Code	1+	10+	25+	100+
FK 245 MI 247 O	430-2450●	0.96	0.83	0.66	--
FK 245 MI 247 H	430-2461●	1.03	0.88	0.67	--
FK 245 MI 247 V	430-2473●	1.03	0.88	0.67	--
FK 243 MI 247 O	430-2485●	0.73	0.63	0.49	--
FK 243 MI 247 H	430-2497●	1.06	0.90	0.71	--
FK 243 MI 247 V	430-2503●	1.03	0.89	0.69	--

**HEAT SINKS****TO-220/TO-3P Clip-on or Screw Fixing**595-846  
H=13.0, W=30.0, D=30.0595-871  
H=10.0, W=44.0, D=36.9595-883  
H=10.0, W=44.0, D=17.8595-810 H=25.0, W=42.2, D=38.0  
595-834 H=22.0, W=28.0, D=38.0  
H=13.0, W=30.0, D=30.2 (Body)  
Solder tabs pitch 24.1 and length 5.0

Devices may be fixed with screw or clip. 595-858 has solder tabs.  
595-810 can have two devices mounted per heatsink.

211488

Order Multiple=1	R <sub>th</sub> °C/W	Order Code	1+	25+	100+	500+	1K+
20		595-883●	1.120	0.800	0.600	0.450	0.400
17		595-858●	1.320	1.100	0.970	0.940	0.870
14		595-846●	1.520	1.190	1.060	1.020	0.940
12		595-871●	1.080	0.820	0.710	0.580	0.480
9.9		595-834●	1.070	0.940	0.870	0.820	0.780
7.1		595-810●	0.780	0.580	0.470	0.370	0.340
<b>Order Multiple=10</b>			10+	100+	1K+		
<b>Clip</b>		595-895●	0.191	0.123	0.092		

**TO-220 Clip-on**595-779  
H=19.0, W=22.0,  
D=19.0595-780  
H=11.0, W=22.0,  
D=19.0595-895  
CLIP04 = 595-895

Devices may be fixed either by screw or with clip.

Mfrs. List No. LS205 = 595-780 LS185 = 595-779 CLIP04 = 595-895

Prices are in £ sterling &amp; exclusive of VAT

Order Multiple=1						
R <sub>th</sub> °C/W	Order Code	1+	25+	100+	500+	1K+
30	595-780●	1.070	0.810	0.720	0.690	0.630
21	595-779●	0.900	0.630	0.490	0.380	0.350
Order Multiple=10		10+	100+	1K+		
Clip	595-895●	0.191	0.123	0.092		

211487

**TO-126/TO-220/TO-218 Screw Fixing**

707-351  
H=13, W=42, D=38  
707-363  
H=19, W=42, D=38



1213460\*  
H = 12.7, W = 30, D = 45  
\* = solder terminals

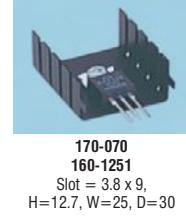


707-557  
H = 11, W = 22, D = 19

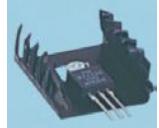
Mfrs. List No. TV100 = 707-351 TV265G = 121-3460  
TV101 = 707-363 TV102 = 707-557

211504

Price Each						
Package	°C/W	Order Code	1+	25+	100+	1K+
TO-126	29.9	707-557●	0.90	0.57	0.43	0.27
TO-220 / TO-218	13	121-3460●	1.58	1.01	0.83	0.56
TO-220	9	707-351●	1.38	0.83	0.70	0.47
TO-220	7.7	707-363●	1.38	0.83	0.70	0.47

**TO-220/TO-126/TO-218 Screw Fixing**

170-070  
160-1251  
Slot = 3.8 x 9,  
H=12.7, W=25, D=30



170-071  
H=12.7, W=30, D=30.2  
179-936  
H=12.7, W=30, D=45.0  
Slot = 3.8 x 9.9



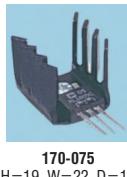
170-072  
H=19, W=22, D=19  
170-073  
H=11, W=22, D=19  
Hole dia = 4



179-934  
H=12.7, W=30, D=30.2  
Slot = 3.8 x 9.9



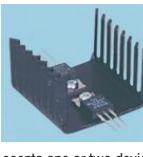
170-074  
H=22, W=28, D=38  
Hole dia = 4



170-075  
H=19, W=22, D=19  
170-076  
H=13, W=22, D=19  
Hole dia = 4



177-009  
H=10.2, W=31.7, D=17.8  
Hole dia = 3.7



179-935  
Accepts one or two devices  
H=25, W=42, D=38.0  
2 holes dia = 4



177-010  
H=10.2, W=44.4, D=17.8,  
Hole dia = 3.7



May be mounted flat or free-standing vertically  
179-938  
H=9.4, W=28, D=19  
Hole dia = 3.8



May be mounted vertically by two No 6  
self tapping screws as shown  
(not supplied)  
175-009  
H=16, W=60, D=32

Mfrs. List No. TV46 = 170-076 TV1505 = 170-071  
TV4 = 170-075 TV1500 = 179-934  
TV58 = 170-073 TV65 = 179-936  
TV5 = 170-072 TV96 = 177-009  
TV35 = 179-935 TV97 = 177-010  
1.25GY-50 = 175-009 TV40 = 170-074  
220SA = 179-938 523002B00000G = 160-1251

224008

Order Multiple=5		Price Each				
R <sub>th</sub> °C/W	Order Code	1+	25+	100+	500+	1K+
TO-126	27	170-076●	0.80	0.60	0.47	0.31
	21	170-075●	0.60	0.59	0.55	0.47
Order Multiple=1		1+	25+	100+	500+	1K+
TO-220	30	170-073●	0.87	0.66	0.52	0.32
	20	177-009●	1.02	0.79	0.60	0.43
	21	170-072●	0.58	0.46	0.42	0.28
	19	NEW 160-1251●	0.56	0.46	0.35	0.27
	13	179-935●	1.42	1.08	0.83	0.54
	6.8	175-009●	1.79	1.76	1.65	1.50
TO-220/TO126	21	179-938●	0.90	0.56	0.48	0.34
	17	170-071●	0.87	0.62	0.49	0.31
	14.2	179-934●	0.87	0.62	0.49	0.32
TO-220/202	13	179-936●	0.93	0.78	0.67	0.46
TO-220/218	20	177-010●	1.12	0.79	0.60	0.43
	9.9	170-074●	0.71	0.66	0.58	0.52

**TO-220/TO-218**

- Tinned nickel coating or black anodised with integral solderable tabs

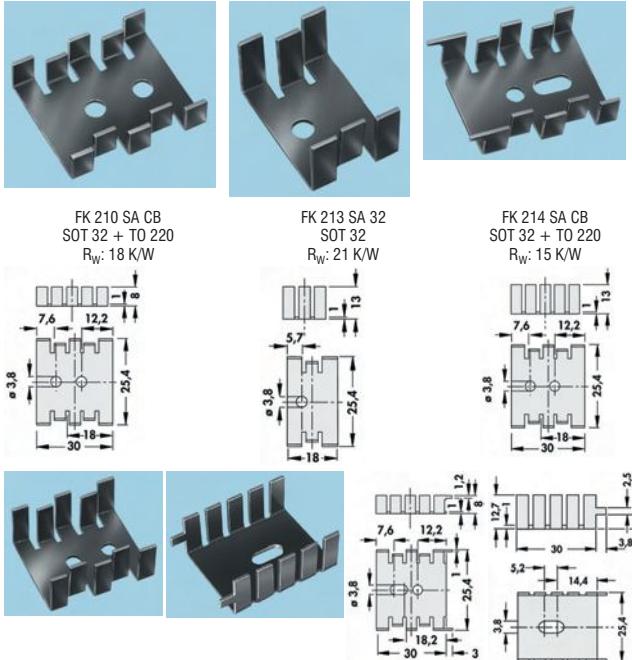
H = 41.2 (overall), W = 51, D = 19, Hole dia = 3.1

211441

Price Each						
Finish	Order Code	1+	25+	100+	500+	1K+
Tinned Nickel	232-956●	0.89	0.77	0.67	0.64	
Black anodised	681-507●	2.97	2.32	2.04	1.35	

**fischer elektronik**

3

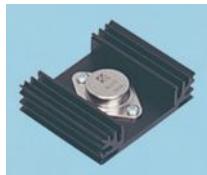
**Heatsinks for Transistors in Plastic Cases**

Typ	Best.-Nr.	1+	100+	250+	500+
FK 210 SA-CB	462-1220●	0.52	0.38	0.29	0.24
FK 213 SA-32	462-1244●	0.48	0.34	0.29	0.24
FK 214 SA-CB	462-1256●	0.53	0.39	0.34	0.28
FK 212 SA-CB	462-1232●	0.52	0.38	0.29	0.24
FK 222 MI 220	462-1281●	0.64	0.52	0.43	0.37
FK 216 SA-CB	462-1268●	0.53	0.39	0.34	0.28
FK 218 SA-32	462-1270●	0.44	0.37	0.33	0.28
FK 224 MI 220-1	462-1128●	0.54	0.46	0.40	0.34
FK 224 SA 220-1	462-1116●	0.45	0.39	0.34	0.30

330612

## Heatsinks - Pressed - continued

TO-3

170-087: H=16, W=60, D=89  
232-660: H=20, W=65, D=50

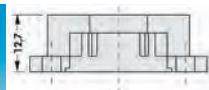
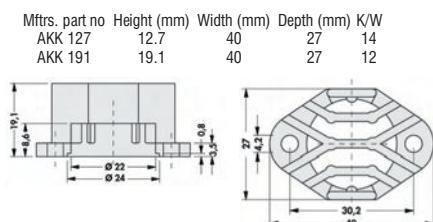
170-077: H=25, W=42, D=38

399-9348  
H=32.8 x 46.48 sq177-013  
H=25, W=40.8, D=26.9  
Fixing centres=30.15, Ø 4.1595-743  
H=43.0, W=41.2, D=45.0Mfrs. List No. Aavid Thermalloy: 437911=170-077, 002193=399-9348,  
436628=170-087, 437691=177-013,  
ABL: 510AB 0500MB(TO3)=232-660, LS50=595-743

211569

$R_{th}$ °C/W		Price Each			
	Order Code	1+	25+	100+	1K+
7.3	177-013●	3.28	3.14	2.64	2.39
7.1	170-077●	0.82	0.75	0.56	0.53
5.5	399-9348●	2.21	2.16	1.41	1.10
4	595-743●	1.69	1.30	1.02	0.63
3.4	170-087●	5.16	3.98	3.17	2.17
3.3	232-660●	3.00	2.29	2.12	2.02

## Heatsinks for TO-3

Material: Aluminium  
Surface: black coatedMfrs. part no Height (mm) Width (mm) Depth (mm) K/W  
AKK 127 12.7 40 27 14  
AKK 191 19.1 40 27 12

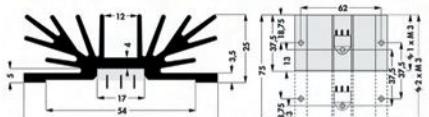
330596

Mfrs. part no  
AKK 127  
AKK 191

	Order Code	1+	100+	250+	500+
AKK 127	462-1360●	1.59	1.34	1.26	1.15
AKK 191	462-1372●	1.61	1.37	1.28	1.19

## Heatsinks, TO-220

fischer elektronik

Mfrs. part no  
SK 64/37.5 SA1XM3  
SK 64/75 SA 2 XM 3

Height (mm) Width (mm) Depth (mm) K/W

25 37.5 70 4.1

25 75 70 2.7

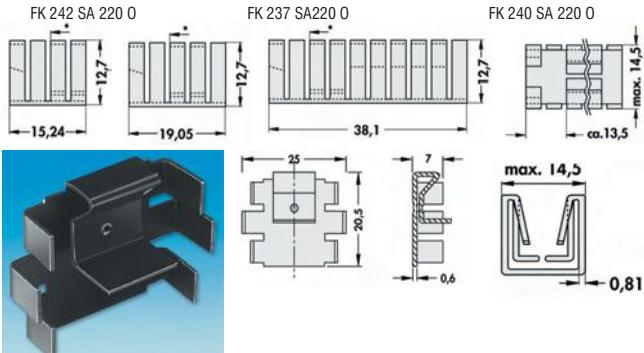
330597

Mfrs. part no  
SK 64/37.5 SA1XM3  
SK 64/75 SA 2 XM 3

	Order Code	1+	100+	250+	500+
SK 64/37.5 SA1XM3	462-1530●	2.59	2.28	2.00	1.79
SK 64/75 SA 2 XM 3	462-1542●	3.79	3.37	3.01	2.64

## Clip on Heatsinks for TO 220

fischer elektronik



FK 220 SA 220

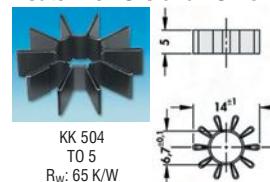
Typ	Height (mm)	Width (mm)	Depth (mm)	K/W
FK 220 SA 220	7	20.5	25	25
FK 237 SA 220 V	13	13	18	21
FK 237 SA220 H	17	15	20	21
FK 237 SA 220 O	12.7	14.5	19.05	21
FK 240 SA 220 O	12.7	14.5	38.1	16
FK 240 SA 220 V	17	15	39	16
FK 242 SA 220 O	12.7	14.5	15.24	26
FK 242 SA 220 H	13	15	16	26
FK 242 SA 220 V	13	15	16	26

- small version with improved thermal resistance
- various versions, with or without soldering lug
- uses less PCB space than other heatsinks
- easy assembly

330608

Mfrs. part number		Order Code	1+	10+	100+	250+
FK 220 SA 220	vertical mount	462-1104●	0.35	0.30	0.26	0.22
FK 237 SA 220 V	horizontal mount	122-2496●	0.96	0.80	0.68	0.58
FK 237 SA220 H	without soldering lug	122-2497●	1.03	0.85	0.72	0.64
FK 237 SA 220 O	without soldering lug	462-1141●	0.55	0.46	0.41	0.36
FK 240 SA 220 O	without soldering lug	462-1207●	0.99	0.85	0.72	0.65
FK 240 SA 220 V	vertical mount	122-2502●	2.76	2.31	1.97	1.72
FK 242 SA 220 O	without soldering lug	462-1177●	0.47	0.41	0.37	0.33
FK 242 SA 220 H	horizontal mount	122-2499●	1.10	0.91	0.78	0.68
FK 242 SA 220 V	vertical mount	122-2498●	0.87	0.72	0.62	0.55

## Heatsinks TO-5 and TO-18

KK 510  
TO 5  
R<sub>w</sub>: 38 K/WKK 184  
TO 18  
R<sub>w</sub>: 65 K/W

330111

Mfrs. List No	Order Code	1+	10+	100+	250+
KK 184	131-9815●	0.62	0.52	0.44	0.39
KK 510	131-9816●	2.09	1.74	1.49	1.31
KK 504	122-2495●	0.42	0.36	0.30	0.26

## Clip for Transistor Heatsinks

fischer elektronik



- For TO-218, TO-220, TO-3, TO-247 and TO-248.
- Stainless steel (0.8mm thick)
- External dimensions in mm (HxWxD): 18x10x10

457044

Mfrs. List No.	Order Code	1+	50+	100+	500+
THFU 2	134-4123	0.131	0.110	0.090	0.083

## Heatsinks - Extruded

To calculate the size of heatsink you need for a device (Thermal Resistance in °C/W), the following equation may be used:  
 $R_{SA} = (T_J - T_A)/P_d - (R_{jc} + R_{cs})$ 

Where:

 $R_{jc}$  = Thermal resistance of the junction (°C/W) $R_{cs}$  = Thermal resistance of the case (°C/W) $P_d$  = Maximum power dissipated by the device (°C/W) $T_J$  = Maximum temperature of the junction (at full  $P_d$ ) (°C/W) $T_A$  = Maximum ambient temperature (°C)

Over 480,000 products online



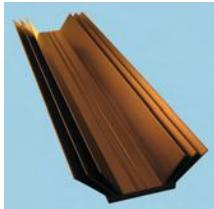
**Heatsink, Star**
**ATS** SOLUTIONS  
EUROPE, B.V.  
Innovations in Thermal Management


**New**
**Features & Benefits:**

- Designed for high-performance convection cooling of high heat flux LEDs
- Base includes inner and outer threads for attachment of lens mounts, brackets and other hardware
- Each Star series heat sink is made from lightweight, anodized aluminum for maximum thermal performance

523965

Mfrs. List No.	Order Code	1+	10+	50+	100+	Price Each
<b>25mm</b>						
ATSEU-077C-C1-R0	165-0393●	8.28	7.85	7.35	6.98	
ATSEU-077C-C2-R0	165-0394●	9.32	8.84	8.27	7.86	
ATSEU-077C-C3-R0	165-0395●	9.04	8.57	8.02	7.62	
ATSEU-077C-C4-R0	165-0396●	10.08	9.56	8.94	8.49	
<b>45mm</b>						
ATSEU-077D-C1-R0	165-0398●	8.61	8.17	7.64	7.26	
ATSEU-077D-C2-R0	165-0399●	9.65	9.15	8.56	8.13	
ATSEU-077D-C3-R0	165-0400●	9.37	8.89	8.31	7.89	
ATSEU-077D-C4-R0	165-0401●	10.41	9.87	9.24	8.78	
<b>50mm</b>						
ATSEU-077B-C1-R0	165-0389●	8.68	8.23	7.70	7.32	
ATSEU-077B-C2-R0	165-0390●	9.71	9.21	8.62	8.19	
ATSEU-077B-C3-R0	165-0391●	9.44	8.96	8.38	7.96	
ATSEU-077B-C4-R0	165-0392●	10.48	9.94	9.30	8.84	
<b>75mm</b>						
ATSEU-077A2-C1-R1	165-0338●	9.01	8.54	7.99	7.80	
ATSEU-077A2-C2-R0	165-0386●	10.05	9.53	8.91	8.46	
ATSEU-077A-C3-R0	165-0387●	9.78	9.27	8.67	8.24	
ATSEU-077A-C4-R0	165-0388●	10.82	10.26	9.59	9.11	

**Heatsink, Maxiflow**
**ATS** SOLUTIONS  
EUROPE, B.V.  
Innovations in Thermal Management


**New**

Thermal resistance °C/W	Height mm	Width mm	Depth mm	Mfrs. List No.
0.5	26	45	330	ATS-58000-C1-R0
0.5	26	87	305	ATS-58001-C1-R0
—	26	87	305	ATS-58002-C1-R0
0.4	26	87	305	ATS-58003-C2-R0

527328

Mfrs. List No.	Thermal resistance °C/W	Order Code	1+	10+	50+	100+	Price Each
ATS-58000-C1-R0	0.5	166-9146●	25.00	21.82	20.69	19.35	
ATS-58001-C1-R0	0.5	166-9147●	23.81	20.78	19.70	18.43	
ATS-58002-C1-R0	—	166-9148●	21.43	18.70	17.73	16.59	
ATS-58003-C2-R0	0.4	166-9149●	23.81	20.78	19.70	18.43	

**TO-220/TO-218 Screw Fixing**
**AAVID**  
THERMALLOY

ONE COOL IDEA AFTER ANOTHER

- Includes solder pins

211503

Order Multiple=1 R <sub>th</sub> °C/W	Order Code	1+	25+	100+	1K+	Price Each
3.1	121-3471●	3.00	2.21	1.64	1.16	
3.6	121-3470●	2.62	1.94	1.44	1.01	
3.9	121-3469●	2.13	1.63	1.24	0.88	
12.9	121-3468●	1.74	1.08	0.77	0.50	
16.7	121-3467●	0.96	0.80	0.60	0.48	

**40,000 PRICES REDUCED**
**RoHS** Compliant  
Non-compliant
**TO-220, Screw Fixing**
**Wakefield**  
Engineering

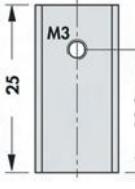
- High thermal efficiency
- Space-saving, vertical mounting
- Wave solderable pins on 25.4mm centres
- Black anodised

H*	W	D	Mfrs List No.
25.4	34.9	12.7	637-10ABPE
38.1	34.9	12.7	637-15ABPE
50.8	34.9	12.7	637-20ABPE
50.8	41.9	25.4	647-10-ABPE

\*denotes height above pcb

211539

R <sub>th</sub> °C/W	Order Code	1+	10+	25+	50+	Price Each
2.1	121-9494●	2.13	1.58	1.41	1.17	
4.5	121-9491●	1.43	1.04	0.94	0.80	
4	121-9493●	1.81	1.33	1.18	1.02	
5	121-9495●	2.00	1.25	0.84	0.72	

**Heatsinks for TO-220 Transistors**
**fischer** elektronik


330603

**TO-220/TO-218 Screw Fixing**
**AAVID**  
THERMALLOY

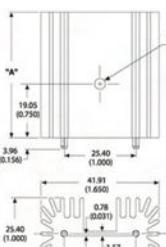
- Includes solder pins

H	W	D	Mfrs. List No.	Order Code
38.1	41.91	25.4	6298BG	121-3469
50.8	41.91	25.4	6299BG	121-3470
63.5	41.91	25.4	6300BG	121-3471

211501

R <sub>th</sub> °C/W	Order Code	1+	25+	100+	1K+	Price Each
3.9	121-3469●	2.13	1.63	1.24	0.88	
3.6	121-3470●	2.62	1.94	1.44	1.01	
3.1	121-3471●	3.00	2.21	1.64	1.16	

457973

**TO-220/TO-218/TO-247/Multiwatt Compatible Drilled, Black Anodised**

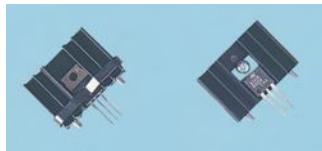
- Radial fins
- Quality Extruded design
- PCB Pins for secure mounting

High power extruded heat sink with large radial fins and straight pins

**REACH - SVHCs**

Products containing **Substances of Very High Concern** under REACH can now be easily identified online. Look for this logo to access supporting safety datasheets at [www.farnell.co.uk](http://www.farnell.co.uk)

**Farnell**
**08447 11 11 11****Fax: 08447 11 11 12**

**Heatsinks - Extruded - continued****TO-220/TO-218/TO-202**

	<b>SW Series</b>	H	W	D
121-3435/121-3459/121-3461/121-3462	523.525			
121-3437/121-3438/121-3441/121-3453	523.525			
121-3439/121-3442	12.534.550			
121-3457/121-3458	12.534.563			
<b>BW Series</b>				
121-3446	25.4	35	38	
121-3447	25.4	35	38	
121-3449/121-3450	25.4	35	30	
<b>Solderable tabs 2.6 dia on 25.4 fixing centres</b>				
Mfrs. List No.	SW25-2 = 121-3435	SW38-2 = 121-3437	SW50-2 = 121-3439	
BW38-2G = 121-3446	SW63-2 = 121-3457	BW50-2G = 121-3447		
SW25-6 = 121-3459	SW38-6 = 121-3444	SW50-4 = 121-3442		
SW25-4 = 121-3436	SW38-4 = 121-3438	BW50-4G = 121-3450		
BW38-4G = 121-3449	SW63-4 = 121-3458	6801 = 177-008		

211566

**Price Each**

R <sub>th</sub> °C/W	Order Code	1+	25+	100+	1K+
<b>Clip Mounted, TO-220 / TO-218</b>					
13	121-3435●	0.780	0.660	0.580	0.430
10	121-3437●	1.000	0.770	0.700	0.480
8.6	121-3439●	0.970	0.780	0.710	0.500
7.2	121-3446●	1.790	1.500	1.270	0.880
6.8	121-3457●	0.680	0.550	0.500	0.350
5.8	121-3447●	1.630	1.320	1.100	0.760
<b>Screw Mounted, TO-202</b>					
13	121-3459●	0.940	0.780	0.690	0.460
10	121-3444●	1.120	0.890	0.750	0.530
<b>Screw Mounted, TO-220 / TO-218</b>					
13	121-3436●	0.880	0.860	0.740	0.620
10	121-3438●	0.960	0.940	0.830	0.790
8.6	121-3442●	1.020	1.000	0.890	0.790
7.2	121-3449●	1.770	1.430	1.210	0.810
6.8	121-3458●	1.100	1.070	1.000	0.920
5.8	121-3450●	1.980	1.670	1.440	0.970
<b>Clips</b>					
SW series	121-3445●	0.127	0.093	0.083	0.070
BW Series	177-008●	0.280	0.240	0.180	0.091

**Multiple TO-220/TO-202**

## Screw or Clip Fixing



Incorporating tin plated roll pins for additional support and/or earthing points. Clips supplied separately.

H	W	D	R <sub>th</sub> °C/W	Mfrs.	List No.	Order code
25.4	34.92	12.8	14	60988G		121-3463
38.1	34.92	12.8	11	60998G		121-3464
50.8	34.92	12.8	9	61008G		121-3466

211499

Order Multiple=1	Order Code	1+	25+	100+	1K+	Price Each
<b>Heatsinks</b>						
	121-3463●	1.520	1.130	0.960	0.530	
	121-3464●	1.740	1.220	0.970	0.590	
	121-3466●	1.940	1.400	1.070	0.690	
<b>Order Multiple=5</b>		5+	25+	100+	1K+	
<b>Clip</b>	707-442●	0.290	0.220	0.160	0.091	

**Multiple TO-220/TO-218, Clip Fitting**

Style	Package	Mfrs.	List No.	Order code
Slim	TO-220	4525		121-3455
265-202	5.0°C/W H=45, W=50, D=30			
265-214	3.7°C/W H=45, W=75, D=30			
265-226	2.9°C/W H=45, W=100, D=30			

265-202 5.0°C/W H=45, W=50, D=30  
265-214 3.7°C/W H=45, W=75, D=30  
265-226 2.9°C/W H=45, W=100, D=30

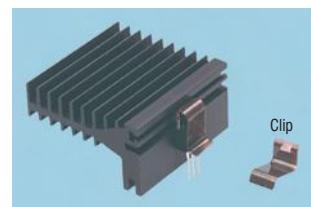
The heatsinks feature a clip retaining slot and are for use with retaining clips for quick and easy fitting. Standard clips have stabilising legs to allow assembly prior to device fitment. Device can be removed and replaced without clip removal. Slim clips are without stabilising legs, allowing devices to be placed closer together.

**Fitting:** Assemble clip to the retaining rail by thumb pressure applied to the top/front of the clip, this will snap it firmly into place. Clips can be removed and re-used by gripping the clip immediately adjacent to the rail using long nosed pliers or similar and twisting in an upward direction.

Mfrs. List No. KM50-1=265-202 KM75-1=265-214 KM100-1=265-226

211446

R <sub>th</sub> , °C/W	Order Code	1+	10+	Price Each	25+	100+
<b>Heatsinks</b>						
5	265-202●	2.760	2.630	2.080	1.460	
3.7	265-214●	2.860	2.320	2.030	1.480	
2.9	265-226●	3.320	3.190	2.640	1.860	
		10+	50+	100+	500+	
<b>Standard Clip</b>						
<b>Slim Clip</b>						
TO-220	121-3455●	0.260	0.175	0.109	0.070	

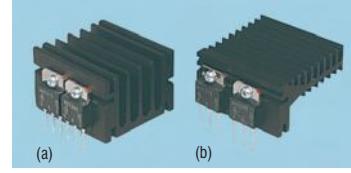
**Multiple TO-220/TO-218, Clip Fitting**

A simple, reliable and convenient alternative to screw attachment. The heatsinks also include slots to allow the option of screw connections.

Mfrs. List No. PPN0500B = 526-873 PPN0750B = 526-885 PPN1000B = 526-897

211484

Order Multiple=1	R <sub>th</sub> °C/W	Order Code	1+	10+	25+	100+	Price Each
	5	526-873●	2.830	2.370	2.270	1.930	
	3.7	526-885●	4.920	3.780	3.260	2.380	
	4.5	526-897●	4.850	3.550	3.440	3.280	
<b>Order Multiple=10</b>							
	Clip	526-903●	10+	100+	1K+		
			0.156	0.121	0.098		

**Multiple TO-220/TO-218**

- (a) 177-011 H=33, W=46, D=50
- 177-012 H=33, W=46, D=100
- 523-173 H=33, W=46, D=150
- (b) 253-911 H=28, W=50, D=50
- 253-923 H=28, W=50, D=75
- 253-935 H=28, W=50, D=100

- Serrated slot for TO-220/TO-218 screw fixing.
- Accepts M3 or No. 6 self tapping screw sizes

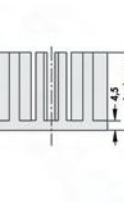
211567

R <sub>th</sub> °C/W	Order Code	1+	10+	25+	100+	500+	Price Each
5	253-911●	3.28	2.47	2.25	1.67	1.40	
4.9	177-011●	4.18	3.33	2.90	2.22	1.96	
3.7	253-923●	4.22	3.22	2.84	2.13	1.85	
3.4	177-012●	6.83	5.44	4.79	3.58	3.21	
3.25	523-173●	10.34	7.92	6.86	4.95	4.38	
3.1	253-935●	5.10	3.93	3.45	2.56	2.25	

Typ	Length (mm)	Order Code	1+	100+	250+	500+	Price Each
SK 125/50 SA	50	462-1323●	1.44	1.25	1.07	0.93	
SK 125/84 SA	84	462-1335●	2.06	1.78	1.55	1.34	

**TO-3, Omni-directional**

R <sub>th</sub> @ 7.5W °C/W	Order Code	1+	25+	50+	100+	Price Each
6.7	335-4234●	5.13	3.77	3.36	2.81	
4.5	335-4090●	6.50	5.42	4.67	4.06	

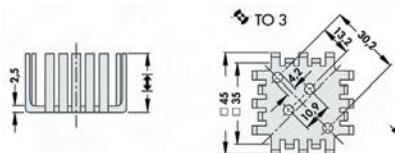
**TO-3 Heatsinks**

Prices are in £ sterling &amp; exclusive of VAT





FK 201 SA3



Typ  
FK 318 SA-3  
FK 201SA-3

Case style  
TO 3  
TO 3

Height (mm)  
31,8  
25,4

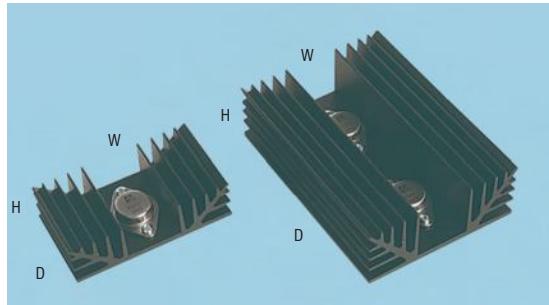
R<sub>W</sub> (K/W)  
4.8  
6

Material: Aluminium  
Surface finish: black coated

330610

Price Each				
Typ	Order Code	1+	100+	1K+
FK 318 SA-3	462-1384●	1.82	1.63	1.46
FK 201 SA-3	462-1359●	0.69	0.62	0.56

## TO-3



253-698

H=25, W=88, D=50

253-704

H=25, W=88, D=75

253-716

H=35, W=88, D=75

253-728

H=35, W=88, D=100

253-730

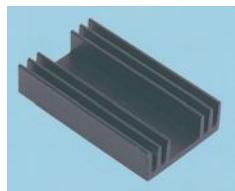
H=35, W=88, D=125

Mfrs List No. 515AB0500MB (TO-3)=253-698,  
520AB0750MB (TO-3)=253-716,  
520AB1250MB (TO-3X2)=253-730.

211442

R <sub>th</sub> °C/W	Holes Drilled	Order Code	1+	10+	30+	100+
2.5	1 x TO-3	253-698●	3.90	3.07	2.90	2.80
1.9	1 x TO-3	253-704●	6.66	4.92	4.40	3.21
1.65	1 x TO-3	253-716●	5.18	4.25	4.06	3.88
1.4	1 x TO-3	253-728●	9.50	7.02	6.32	4.59
1.2	2 x TO-3	253-730●	11.03	8.18	7.31	5.31

## Undrilled

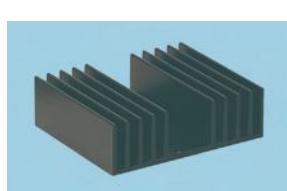


Mfrs.  
List No.  
232-968 11 29.5 50 MQ50-1  
232-970 11 29.5 75 MQ75-1  
232-981 11 29.5 100 MQ100-1

211440

R <sub>th</sub> °C/W	Order Code	1+	25+	100+	250+
7.2	232-968●	1.28	1.03	0.90	0.64
5.8	232-970●	1.44	1.19	1.00	0.72
5.1	232-981●	1.64	1.32	1.14	0.80

## Undrilled



Mfrs.  
List No.  
150-014 14 93 100 325AB1000B  
150-015 14 93 150 325AB1500B  
150-016 37 120 100 345AB1000B  
150-017 37 120 150 345AB1500B  
150-018 37 120 200 345AB2000B  
523-185 50 125 100 350AB1000B  
150-019 50 125 150 350AB1500B  
523-197 50 125 200 350AB2000B  
150-020 50 125 250 350AB2500B

211573

R <sub>th</sub> °C/W	Order Code	Price Each			
		1+	10+	30+	100+
2.9	150-014●	6.87	5.66	4.92	3.50
2.2	150-015●	9.32	7.77	6.76	4.65
1	150-016●	9.48	7.37	7.15	6.85
0.9	150-017●	17.09	14.14	12.39	8.78
0.85	150-018●	19.94	16.70	15.23	11.49
0.67	523-185●	19.14	14.70	12.65	9.16
0.5	150-019●	18.53	16.30	15.64	15.01
0.42	523-197●	27.52	22.54	21.34	16.51
0.36	150-020●	37.72	32.81	28.87	23.66

## Undrilled, 05DN Series



Order Code Length Mfrs. List No.  
414-189 50 05DN-00500-A-200  
414-219 100 05DN-01000-A-100  
414-220 100 05DN-01000-A-200  
414-232 150 05DN-01500-A-100  
414-244 150 05DN-01500-A-200  
414-256 300 05DN-03000-A-100

211575

R <sub>th</sub> °C/W	Order Code	1+	10+	30+	100+
<b>Matt Black Anodised Finish</b>					
4.5	414-189●	3.93	3.06	2.69	1.80
2.9	414-220●	6.75	5.23	4.48	3.43
2.3	414-244●	9.34	7.20	6.28	4.23
<b>Plain Non-Anodised Finish</b>					
3.2	414-219●	4.94	3.76	3.34	2.21
2.6	414-232●	6.48	5.03	4.33	2.91
1.75	414-256●	12.67	9.44	8.01	5.46

## 10DN Series, Plain Finish

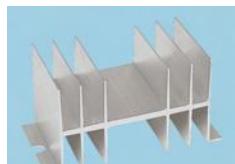


Mfrs. List No. Length Order Code Hole Pattern  
10DN-00750-A-1SX 75 414-281 None  
10DN-01000-B-1SX 100 414-311 1 x T0-3  
10DN-01000-C-1SX 100 414-323 2 x T0-3

211576

R <sub>th</sub> °C/W	Order Code	1+	10+	30+	100+
2.72	414-281●	6.00	4.59	4.03	2.74
2.3	414-311●	9.17	7.09	6.18	4.19
2.3	414-323●	8.99	6.96	6.04	4.10

## 11DN Series



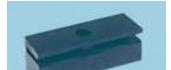
Order Code Length Hole Mounting Notches Mfrs. List No.  
414-359 50 None Yes 11DN-00500-A-1SX  
253-900 75 None Yes 11DN-00750-A-7SX\*\*  
414-384 100 None No 11DN-01000-A-100  
414-396 100 None Yes 11DN-01000-A-1SX  
414-438 100 None Yes 11DN-01000-A-2SX\*  
414-451 150 None Yes 11DN-01500-A-1SX  
414-463 150 2 x T0-3 Yes 11DN-01500-C-1SX  
414-487 150 None Yes 11DN-01500-A-2SX\*

\*Anodised finish is matt black. \*\*Anodised finish is gold.

211577

R <sub>th</sub> °C/W	Finish	Order Code	1+	10+	30+	100+
2.75	Plain	414-359●	5.18	4.04	3.41	2.34
2.2	Anodised	253-900●	7.83	6.09	5.14	3.51
1.97	Plain	414-384●	6.95	5.39	4.59	3.08
1.97	Plain	414-396●	8.13	6.30	5.30	3.60
1.78	Anodised	414-438●	7.31	6.59	6.07	4.75
1.58	Plain	414-451●	9.99	7.73	6.55	4.44
1.58	Plain	414-463●	11.69	9.22	7.62	5.15
1.42	Anodised	414-487●	14.97	11.37	9.25	6.37

## 'Transiblock' Insulating Spacer



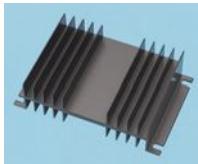
The nylon transiblock insulating spacer is used to insulate the entire heat sink from the chassis.  
Suitable for use with HS Marston 10DN and 11DN heat sinks.  
H=8.7, W=25.4, D=8.7, 4BA clearance hole

211578

Order Multiple=10 Mfrs List No	Order Code	10+	100+	1K+
9680	117-4692●	0.36	0.30	0.27

Over 480,000 products online



**Heatsinks - Extruded - continued****Double Surface**

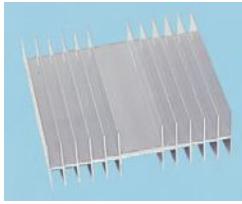
- Pre-drilled for TO-3, or undrilled
- Very low thermal resistance
- Low height
- Black anodised

Wakefield  
Engineering

Order Code	H	W	D	Mfrs. List No.
335-4209	31.8	120.7	76.2	403-K.
335-4155	66.7	120.7	140.2	423-K.

227479

R <sub>th</sub> @50W °C/W	Mfrs. List No.	Order Code	1+	10+	25+	50+	Price Each
Undrilled 1.68	403-K.	335-4209●	8.11	5.93	5.26	4.44	
0.95	423-K.	335-4155●	17.27	12.65	11.22	9.47	

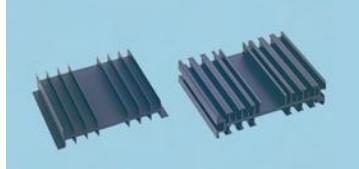
**Undrilled 30DN, 40DN, 50DN Series**

Overall H	W	L	Mfrs. List No.	Order Code
31.4	108	150	30DN-01500-A-100	414-530
58.7	108	150	40DN-01500-A-100	414-578
58.7	163.5	150	50DN-01500-A-100	414-608
58.7	163.5	300	50DN-03000-A-100	414-621

- Plain Finish

211581

R <sub>th</sub> °C/W	Order Code	1+	10+	30+	100+	Price Each
2	414-530●	7.94	6.17	5.15	3.52	
1.1	414-578●	14.88	11.55	9.73	6.53	
0.77	414-608●	25.44	18.65	18.09	17.05	
0.6	414-621●	39.55	31.25	27.97	20.10	

**Undrilled**

marston  
electronics

**170-090** H=26.7, W=123.8, D=100   **148-117** H=32, W=130, D=100

Mfrs. List No. 44DN01000A200=148-117, 10DN01000A200=170-090

211570

R <sub>th</sub> °C/W	Order Code	1+	10+	25+	100+	Price Each
2	170-090●	5.48	4.91	4.57	3.90	
1.2	148-117●	15.16	11.87	10.33	6.93	

**Undrilled**

marston  
electronics

**170-761** H=15.9, W=63.5, D=50  
**170-089** H=15.9, W=63.5, D=100  
**170-762** H=15.9, W=63.5, D=150  
**170-763** H=25.9, W=104.8, D=50  
**170-764** H=25.9, W=104.8, D=100  
**170-765** H=25.9, W=104.8, D=150

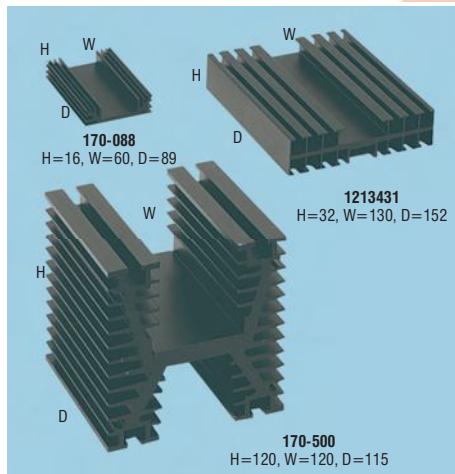
Mfrs. List No. 02HN01000A200=170-089, 02HN00500A200=170-761  
07WN01000A200=170-764, 07WN00500A200=170-763  
07WN01500A200=170-765

211572

R <sub>th</sub> °C/W	Order Code	1+	10+	25+	100+	Price Each
5.7	170-761●	3.28	2.54	2.20	1.46	
3.9	170-089●	3.85	3.53	3.34	2.66	
3	170-762●	7.47	5.80	4.98	3.39	
2.8	170-763●	5.87	4.50	3.95	2.68	
1.8	170-764●	9.99	7.79	6.88	4.59	
1.5	170-765●	14.74	11.59	10.05	6.76	

**Undrilled**

AAVID  
THERMALLOY  
ONE COOL IDEA AFTER ANOTHER



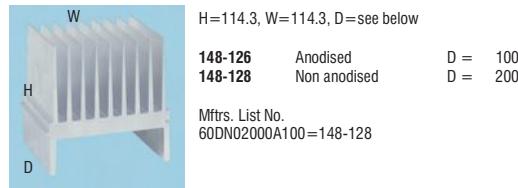
Mfrs. List No. 3.5Y1 = 170-088, 6W-1 = 121-3431, NV115-1 = 170-500

211571

R <sub>th</sub> °C/W	Order Code	1+	10+	25+	100+	Price Each
3.4	170-088●	3.25	2.59	2.28	1.78	
1.1	121-3431●	8.34	7.84	7.20	6.84	
0.5	170-500●	21.32	17.52	16.67	15.84	

**Undrilled**

marston  
electronics



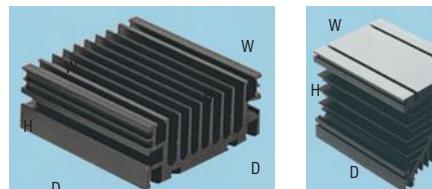
H=114.3, W=114.3, D=see below

**148-126** Anodised      **148-128** Non anodised  
D = 100                    D = 200

Mfrs. List No.  
60DN02000A100=148-128

211579

R <sub>th</sub> °C/W	Order Code	1+	10+	25+	100+	Price Each
0.75	148-126●	23.33	21.80	20.28	19.13	
0.55	148-128●	59.57	51.71	43.21	34.16	

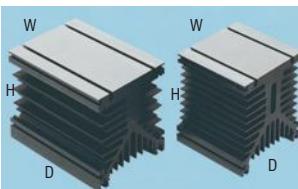
**Undrilled with Tee-Slots**

**175-647**  
H=41, W=96, D=100

**175-648**  
H=41, W=96, D=150

**523-380**  
H=41, W=96, D=200

Slot spacing=47.6 & 80



**170-753\*** H=135, W=125, D=180

Slot spacing=80

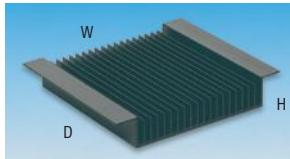
\* Plain finish top surface, machined flat for power devices.  
\*\* Top surface machined flat before black anodising

Mfrs. List No.  
Aavid Thermalloy DB120-20=179-955,  
ABL

150AB1000MB=175-647

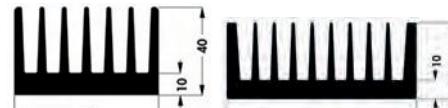
211580

R <sub>th</sub> °C/W	Order Code	1+	10+	25+	100+	1K+	Price Each
1.3	175-647●	10.88	9.21	8.82	7.04	6.29	
1.1	175-648●	17.40	13.92	12.42	9.19	8.45	
0.87	523-380●	20.54	16.82	15.93	12.34	10.90	
0.41	179-955●	34.59	30.46	23.63	21.85	18.74	
0.33	170-753●	37.52	33.82	30.78	28.25	26.10	
0.32	179-956●	64.18	56.97	51.17	48.59	43.41	

**Comb Section**
**ABL HEAT SINKS**

Order Code	H	W	D	Mfrs. List No.
253-613	46	240	150	193AB1500B
253-625	46	240	250	193AB2500B

21143

**fischer elektronik**
**Heatsinks, extruded**

SK 100

SK 92

SK 58

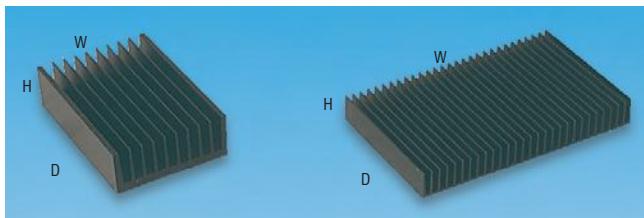
SK 85

SK 47

Typ Length (mm)  $R_{th}$  (K/W)

SK 100/50 SA	50	2.5
SK 100/75 SA	75	1.9
SK 100/100 SA	100	1.5
SK 92/50 SA	40	1.9
SK 92/75 SA	40	1.6
SK 92/100 SA	40	1.4
SK 92/150 SA	40	1.2
SK 85/50 SA	50	1.4
SK 85/75 SA	75	1.2
SK 85/100 SA	100	0.9
SK 85/150 SA	150	0.7
SK 58/50 SA	50	1.7
SK 58/100 SA	100	1.25
SK 58/150 SA	150	1.1
SK 47/75 SA	75	0.85
SK 47/100 SA	100	0.7
SK 47/150 SA	150	0.5

311908

**Comb Section**
**ms marston**

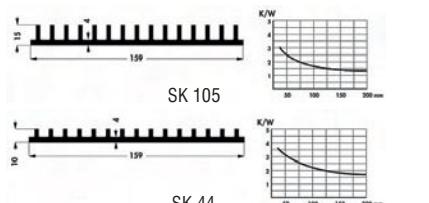
$R_{th}$ °C/W	H	W	D	Mfrs. List No.	Order Code
1.7	30	80	100	47DN-01000-A-200	738-906*
1.5	40	100	100	43DN-01000-A-200	738-890
1.2	40	100	150	43DN-01500-A-200	151-283
1	25	200	125	150CN-01250-A-200	148-124
1	40	100	250	43DN-02500-A-200	150-013
0.9	40	123	150	94DN-01500-A-200	526-769
0.7	40	123	200	94DN-02000-A-200	526-770
0.65	25	200	200	150CN-02000-A-200	254-204
0.6	40	123	250	94DN-02500-A-200	526-782
0.6	40	160	150	938SP-01500-A-200	526-794
0.54	40	200	100	97CN-01000-A-200	148-122
0.53	40	160	200	938SP-02000-A-200	526-800
0.42	40	300	100	96CN-01000-A-200	148-119
0.4	40	200	150	97CN-01500-A-200	148-123
0.36	40	300	150	96CN-01500-A-200	148-120
0.34	40	200	200	97CN-02000-A-200	168-683
0.33	40	200	250	97CN-02500-A-200	170-769
0.31	40	300	200	96CN-02000-A-200	168-695
0.29	40	300	250	96CN-02500-A-200	148-121
0.28	40	300	300	96CN-03000-A-200	168-701

\*Includes 2 x 3.75 dia extruded holes, 70.5 slot spacing, along the base

211582

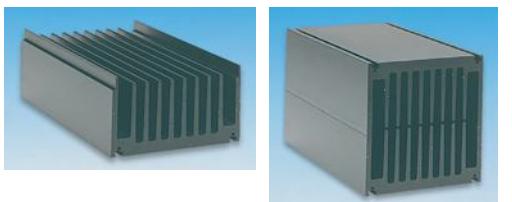
$R_{th}$ °C/W	Order Code	Price Each
1.7	738-906*	12.50
1.5	738-890*	21.41
1.2	151-283*	24.52
1	148-124*	23.30
1	150-013*	42.10
0.9	526-769*	24.80
0.7	526-770*	23.88
0.65	254-204*	30.59
0.6	526-782*	29.73
0.6	526-794*	23.86
0.54	148-122*	30.29
0.53	526-800*	30.86
0.42	148-119*	39.31
0.4	148-123*	43.60
0.36	148-120*	56.16
0.34	168-683*	48.07
0.33	170-769*	39.74
0.31	168-695*	67.79
0.29	148-121*	73.11
0.28	168-701*	97.38

211582

**Heatsinks for prototyping boards**
**fischer elektronik**


330601

Typ	Length (mm)	Order Code	Price Each
SK 105/100 SA	100	462-1440*	4.81
SK 105/150 SA	150	462-1475*	6.31
SK 44/100 SA	100	462-1426*	5.43
SK 44/150 SA	150	462-1438*	6.50

**Heatsinks - Extruded - continued****Comb Section Assembly**

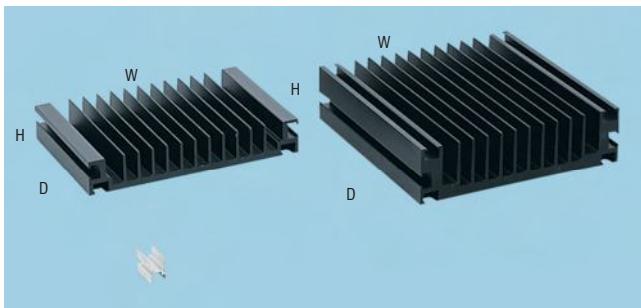
Fin-to-Fin Assembly

Two sections may be assembled fin-to-fin, providing a highly efficient force cooled assembly.

Order Code	H	W	D	Mfrs. List No.
526-812	64.5	119	200	173AB2000B
526-915	64.5	119	300	173AB3000B

211485

R <sub>th</sub> °C/W	Order Code	1+	10+	25+
0.63	526-812●	36.68	29.29	25.03
0.48	526-915●	51.93	41.48	35.42

**Comb Section 'Comb-Lok'**

151-284 H=25, W=150, D=100

- Matt black anodised
- Incorporate T-slots

- Suitable for M4 cage nuts and M6 bolt heads

211583

**Order Multiple=1**

R <sub>th</sub> °C/W	Order Code	1+	10+	30+	100+
1.7	151-284●	17.330	14.320	12.240	8.300
0.65	151-291●	26.530	24.950	24.460	23.080
0.3	151-293●	75.860	65.350	55.120	44.750
<b>Order Multiple=50</b>		<b>50+</b>	<b>250+</b>	<b>1K2+</b>	<b>2K5+</b>
M4 Caged Nuts	522-697●	0.161	0.117	0.096	0.076

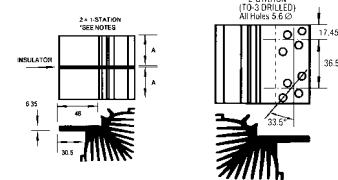
**Force Cooled Assemblies**

Illustration shows complete assembly:  
2 x 1 station module kits  
1 x 2 station component kit  
1 x 119mm axial flow fan - (available separately)

Total Assembly  
H=128, W=171 (incl platforms)  
D (1 station)=41, D (2 station)=78  
D (3 station)=114, D (4 station)=151  
D (6 station)=224  
Fixing centres (to fan)=105 x 105 x 4 dia.

- Compact high thermal performance
- Electrically isolated extensions
- Force cooled or natural convection
- TO-3 pre-drilled, or undrilled
- **Module Kit** comprises 4 aluminium extensions
- **Component Kit** contains necessary hardware gaskets, end plates and instructions
- Complete assembly comprises one or more **module kits** and corresponding **component kit**

Typical dissipation  
Typical thermal resistance for station No 1  
(station nearest fan) per extrusion

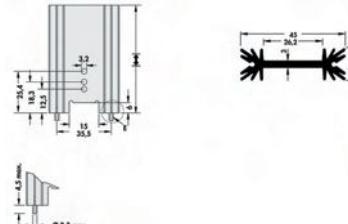
1 station - 200W, 6 station - 800W  
1.16°C/W @ 10 cu ft/min  
1.02°C/W @ 15 cu ft/min

Mfrs. List No. FC-Mx=148-449 to 148-451,  
FC-Cx=148-452 to 148-455,

FC-Mx-AC=151-302  
where x=No of stations

211584

Order Code	1+	Price Each	
		10+	30+
<b>Module Kits (TO-3 drilled)</b>			
151-303●	79.23	67.97	59.96
<b>Module Kits (Undrilled)</b>			
148-449●	26.44	24.88	22.72
148-450●	41.87	36.02	31.62
148-451●	71.37	61.24	54.02
<b>Component Kits</b>			
148-453●	36.32	30.45	27.41
148-455●	36.28	31.16	27.46

**Heatsinks, extruded****PCB mounting**

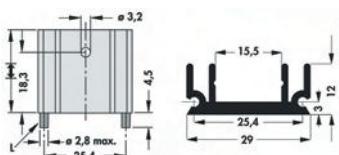
Man. part no  
SK 409/25,4 STS  
SK 409/38,1 STS  
SK 409/50,8 STS

Transistor Package  
TO 220, TO 3 P  
TO 220, TO 3 P  
TO 220, TO 3 P

Thermal Resistance  
8,2 K/W  
7,0 K/W  
6,2 K/W

330598

Man. part no	Order Code	1+	100+	250+	500+
SK 409/25,4 STS	462-1293●	1.21	1.04	0.93	0.79
SK 409/38,1 STS	462-1300●	1.23	1.05	0.91	0.80
SK 409/50,8 STS	462-1311●	1.42	1.18	1.04	0.93

**Heatsinks with soldering lugs****Extruded heatsinks**

Man. part number  
SK 145/25 STS-220  
SK 145/37,5 STS-220

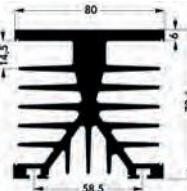
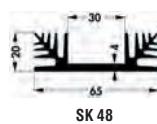
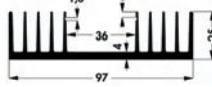
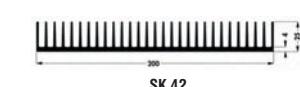
For TO 218, TO 220, TO 247 and TO 248

Height (mm)  
25  
37,5

R<sub>th</sub> (K/W)  
13,5  
12

330605

Man. part no	Order Code	1+	100+	250+	500+
SK 145/25 STS-220	462-1402●	1.00	0.85	0.72	0.65
SK 145/37,5 STS-220	462-1414●	1.11	0.95	0.81	0.71

**Heatsinks, extruded**

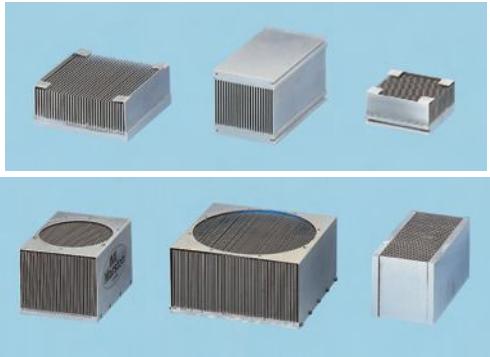
Man. part no	Length	K/W	Man. part no	Length	K/W	Man. part no	Length	K/W
SK 42/50 SA	50	1.5	SK 42/150 SA	150	0.75	SK 56/150 SA	150	0.34
SK 42/75 SA	75	1.2	SK 48/50 SA-3	50	2.8	SK 56/200 SA	200	0.3
SK 42/100 SA	100	0.9	SK 56/100 SA	100	0.4	SK 61/100 SA	100	0.8



Man. part no	Length	K/W	Man. part no	Length	K/W	Man. part no	Length	K/W
SK 4/50 SA	50	2.4	SK 81/50 SA	50	3	SK 81/100 SA	100	2.1
SK 4/75 SA	75	1.9	SK 81/75 SA	75	2.5	SK 89/150 SA	150	0.7
SK 4/100 SA	100	1.5						

335466

Man. part no	Order Code	1+	100+	250+	500+
SK 42/50 SA	462-1943●	4.26	3.70	3.22	2.80
SK 42/75 SA	462-1955●	6.19	5.41	4.69	4.07
SK 42/100 SA	462-1980●	7.88	6.83	5.96	5.17
SK 42/150 SA	462-1992●	12.05	10.48	9.11	7.94
SK 48/50 SA-3	462-1347●	1.98	1.76	1.52	1.36
SK 56/100 SA	121-1720●	19.71	16.37	--	--
SK 56/150 SA	121-1721●	30.24	25.10	--	--
SK 56/200 SA	121-1722●	36.87	33.19	--	--
SK 61/100 SA	462-2030●	11.47	9.97	8.67	7.55
SK 04/50 SA	462-1505●	2.07	1.81	1.56	1.36
SK 04/75 SA	462-1517●	2.80	2.44	2.13	1.83
SK 04/100 SA	462-1529●	3.84	3.36	2.92	2.53
SK 81/50 SA	121-1718●	2.80	2.33	2.00	1.76
SK 81/75 SA	121-1716●	4.07	3.38	2.92	2.57
SK 81/100 SA	121-1719●	4.69	3.89	3.35	2.95
SK 89/150 SA	462-1499●	13.35	11.58	10.10	8.78



- Ultra-Low thermal resistance
- Low weight
- Space efficient design
- Low volume
- Fans are available separately

## Heatsinks, Extruded

### PCB Mounting - Transistor Screw mounting



- For TO-220, SOT-32 and TO-3 screw mounting
- With soldering lug
- Black anodized

Mfrs. part no	Height (mm)	Width (mm)	Depth (mm)	K/W
SK 129 25.4 STS	25	42	25.4	7.8
SK 129 38.1 STS	25	42	38.1	6.5
SK 129 50.8 STS	25	42	50.8	5.3
SK 129 63.5 STS	25	42	63.5	4.5

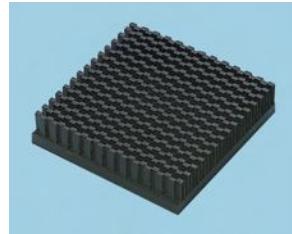
496941

Mfrs. part no  
SK 129 25.4 STS

Mfrs. part no	Order Code	1+	10+	25+	50+
SK 129 25.4 STS	131-9810●	1.99	1.67	1.42	1.25
SK 129 38.1 STS	131-9811●	2.20	1.83	1.58	1.38
SK 129 50.8 STS	131-9813●	2.49	2.09	1.78	1.57
SK 129 63.5 STS	131-9812●	2.68	2.24	1.92	1.68

## Heatsinks - Multi-Fin

### High Performance, Multi-Fin



- Highly efficient corrugated design
- Low profile
- For use with miniature d.c. fans, available separately
- Self adhesive fan gasket included
- Skimmed flat rear surface
- Black anodised finish
- Recommended device attachment by self-adhesive thermally conductive sheet

- Suitable for other cooling applications e.g. microprocessors
- Ideal for use with DuraTEC™ Thermoelectric Modules,

Order Code	H	W	L	Fan Size	Fan Order Code	Mfrs. List No.
936-881	15.5	30	30	25		CP464-030-030-04-S-2
936-893	15.5	45	45	40		CP464-045-045-04-S-2
936-900	15.5	60	60	60	960-0302	CP464-060-060-04-S-2
936-911	15.5	80	80	80	960-0981	CP464-080-080-04-S-2
936-923	15.5	100	100	80	960-0981	CP464-100-100-04-S-2

222203

R<sub>th</sub> Forced Convection °C/W

Order Code	1+	25+	100+	250+
936-881●	18.31	14.59	12.33	9.48
936-893●	19.15	15.95	13.99	10.82
936-900●	20.13	16.86	16.50	13.20
936-911●	24.04	23.17	20.89	16.87
936-923●	26.44	23.87	22.99	18.77

222203

R<sub>th</sub> Forced Convection °C/W

Order Code	1+	25+	100+	250+
936-881●	18.31	14.59	12.33	9.48
936-893●	19.15	15.95	13.99	10.82
936-900●	20.13	16.86	16.50	13.20
936-911●	24.04	23.17	20.89	16.87
936-923●	26.44	23.87	22.99	18.77

222203

## FREE technical support

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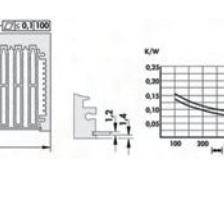
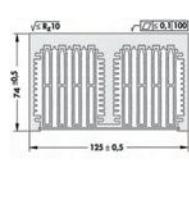
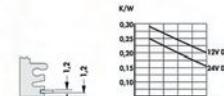
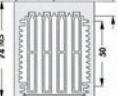
08447 11 11 22



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## Hollow-fin cooling aggregates



Technical data (fans):  
 Manufacturer:  
 Size (mm):  
 Voltage:  
 Power dissipation:  
 Flow rate max:

12V DC  
 Papst  
 74x63x100  
 24V  
 3.6W  
 40m³/h

24V DC  
 Papst  
 74x63x100  
 24V  
 3.4W  
 46m³/h

## Heatsinks - Multi-Fin - continued

### Hollow-fin cooling aggregates - continued

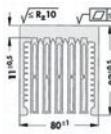
Temperature range	-20 to + 65°C	-20 to + 65°C
Noise level	40dBAA	44dBAA
Rotation frequency	5300 min <sup>-1</sup>	6400 min <sup>-1</sup>
Weight	0.636g	1.25g
Failure rate	L <sub>10</sub> >70.000 h (40°C)	L <sub>10</sub> >70.000 h (40°C)

328376

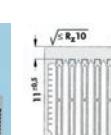
Typ	Order Code	1+	10+	+
LA 6/100 12V	122-2505●	41.24	38.11	--
LA 6/100 24V	122-2506●	40.84	37.72	--
LA 6/150 12V	122-2507●	45.23	41.66	--
LA 6/150 24V	122-2508●	44.73	41.27	--
LA 7/100 12V	122-2518●	62.16	--	--
LA 7/100 24V	122-2519●	63.31	--	--
LA 7/150 12V	122-2524●	70.69	--	--
LA 7/150 24V	122-2525●	75.52	--	--

328376

### Hollow-fin cooling aggregates



LA 9

**fischer elektronik**


LA 10

- less flow loss through good geometry
- very good thermal efficiency

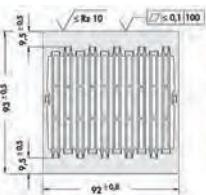
- compact assembly with axial fans

328377

Typ	Order Code	1+	10+	+
LA 9/100 230V	122-2512●	61.54	56.77	--
LA 9/100 24V	122-2511●	54.91	50.61	--
LA 9/150 230V	122-2516●	58.16	--	--
LA 9/150 24V	122-2513●	52.81	--	--
LA 9/200 230V	122-2520●	63.94	--	--
LA 9/200 24V	122-2517●	58.59	--	--
LA 10/150 24V	122-2530●	103.42	--	--

328377

### Hollow-fin cooling aggregates

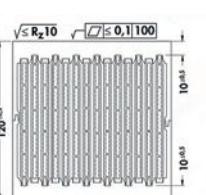


LA 17

**fischer elektronik**

- Technical data (fans):  
Manufacturer: Papst  
Size (mm): 121 x 123 x 150  
Voltage: 24V DC  
Power dissipation: 11W  
Flow rate max: 237m<sup>3</sup>/h  
Temperature range: -30 to + 55°C  
Noise level: 59dBA  
Rotation frequency: 4400 min<sup>-1</sup>  
Weight: 390g  
Failure rate: L<sub>10</sub>>70.000 h (40°C)

- 230V AC  
Papst  
121 x 123 x 150  
230V AC  
19W  
160m<sup>3</sup>/h  
-40 to + 85°C  
47dBA  
2650 min<sup>-1</sup>  
550 g  
L<sub>10</sub>>37.500 h (40°C)



LA 21

### Technical data (fans):

24V DC	230V AC
Manufacturer: Papst	Papst
Size (mm): 93 x 94 x 150	93 x 94 x 200
Voltage: 24V DC	230V AC
Power dissipation: 2.4W	12W
Flow rate max: 80m <sup>3</sup> /h	75m <sup>3</sup> /h
Temperature range: -20 to + 75°C	-40 to + 75°C
Noise level: 37dBA	37dBA
Rotation frequency: 3000 min <sup>-1</sup>	2700 min <sup>-1</sup>
Weight: 190 g	420 g
Failure rate: L <sub>10</sub> >70.000 h (40°C)	L <sub>10</sub> >52.500 h (40°C)

- less flow loss through good geometry

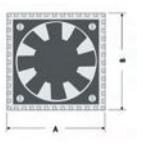
- compact assembly with axial fans

328378

Typ	Order Code	1+	+	+
LA 17/150 230V	122-2526●	74.34	--	--
LA 17/150 24V	122-2527●	92.87	--	--
LA 17/200 230V	122-2529●	95.99	--	--
LA 17/200 24V	122-2532●	108.14	--	--
LA 21/150 24V	122-2514●	56.17	--	--
LA 21/200 230V	122-2523●	65.52	--	--
LA 21/200 24V	122-2522●	65.52	--	--

328378

### Cooler fan, universal


**fischer elektronik**


Mfrs. List No.	Dimensions (mm)	Type of fixing	R <sub>w</sub> at 85°C
A	B	C	
LA ICK 17 X17 W 12V	43.10	43.10	20.00
LA ICK 17 X17 W 5V	43.10	43.10	20.00

330602

Mfrs. List No.	Order Code	1+	10+	+	+
LA ICK 17 X17 W 12V	122-2503●	21.12	19.19	--	--
LA ICK 17 X17 W 5V	122-2504●	19.05	17.32	--	--

330602

## Thermoelectric Modules

### Cooler, Peltier Standard up to 90°C

**SPC multicomp**


- PE series, max operating temperature for short term 110°C, recommended max 90°C for long lifetime
- Good reliability in ON-OFF power cycling mode
- Recommended operating current 0.7 Imax for long life

Power Rating (W)	Current DC Max (A)	Voltage Input Max (V)	Depth mm	Length/Height mm	Mfrs. List No.
8.8	3.9	3.8	3.6	15	MCPE-031-10-13
7.5	3.2	3.8	3.8	15	MCPE-031-10-15
19.1	3.9	8.8	3.6	20	MCPE-071-10-13
19.6	2	15.7	4.8	30	MCPE-127-10-25
17	3.2	8.8	3.8	20	MCPE-071-10-15
32.7	6	8.8	3.9	30	MCPE-071-14-16
38.1	3.9	15.7	3.6	30	MCPE-127-10-13
71.8	3.9	29.8	3.6	40	MCPE-241-10-13
112.7	6	29.8	3.9	55	MCPE-241-14-15

521880

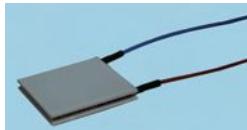
Mfrs. List No.	Order Code	1+	10+	25+	50+
MCPE-031-10-13	163-9746●	13.00	11.37	10.11	9.10
MCPE-031-10-15	163-9747●	13.40	11.73	10.42	9.38
MCPE-071-10-13	163-9748●	15.60	13.65	12.13	10.91
MCPE-071-10-15	163-9749●	15.80	13.82	12.28	11.06
MCPE-071-14-16	163-9750●	18.19	15.91	14.15	12.73
MCPE-127-10-13	163-9751●	18.39	16.10	14.30	12.87
MCPE-127-10-25	163-9752●	20.14	17.63	15.67	14.10
MCPE-241-10-13	163-9753●	38.09	33.33	29.62	26.66
MCPE-241-14-15	163-9755●	52.37	45.83	40.73	36.66

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[Live technical chat at  
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**Cooler, Peltier Standard up to 150°C**

- PF series, for up to 150°C and high efficiency
- Max temperature for short time 200°C, recommended operation up to 150°C for long life.
- High power cycling applications in ON/OFF mode
- Recommended operation current not higher than the 0.7 I<sub>max</sub> for long life
- E modules are epoxy sealed for moisture protection

Power Rating (W)	Current DC Max (A)	Voltage Input Max (V)	Depth mm	Length/Height mm	Mfrs. List No.
4.5	2	3.8	4.8	15	MCPF-031-10-25
19	8.5	3.8	3.8	20	MCPF-031-14-11
37.6	3.9	15.7	4.8	40	MCPF-127-14-25-E
44	8.5	8.8	3.8	30	MCPF-071-14-11
54	4.4	20	3.9	40	MCPF-161-12-16-E
57.9	6	15.7	3.9	40	MCPF-127-14-16-E
61.6	5	20	3.7	40	MCPF-161-12-14-E
79	8.5	15.7	3.8	40	MCPF-127-14-11-E
83	6.7	20	3.3	40	MCPF-161-12-10-E
85.7	6	24.4	—	—	MCPF-199-14-15-E
116.3	8.5	24.4	—	—	MCPF-199-14-11-E

521881



New

**Cooler, Peltier High Power Density**

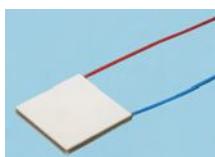
- HPE series for up to 90°C for long life, high capacity from small surface and long life in power cycling with change of polarity
- With operation close to 0.5 I<sub>max</sub> extremely high COP (coefficient of performance) can be achieved
- Epoxy sealed for moisture protection

Power Rating (W)	Current DC Max (A)	Voltage Input Max (V)	Depth mm	Length/Height mm	Mfrs. List No.
30	6	8.8	3.1	20	MCHPE-071-10-08-E
55	6	15.7	3.1	30	MCHPE-127-10-08-E
88	9	15.8	3.6	30	MCHPE-128-10-05-E
120	6	35.9	3.4	40	MCHPE-288-10-08-E
121	8.5	24.6	3.8	40	MCHPE-200-14-11-E
150	15.4	15.7	3.8	30	MCHPE-127-14-06-E
196	9	35.9	3.1	40	MCHPE-288-10-05-E
222	15.4	24.6	3.7	40	MCHPE-200-14-06-E
340	15.4	35.8	3.9	50	MCHPE-288-14-06-E

521879



New

**Cooler, Peltier Single Stage**

- PE1 and TE1 modules have specification of -40 to +100°C operation, and are silicone sealed for moisture protection

Power Rating (W)	Current DC Max (A)	Voltage Input Max (V)	Depth mm	Length/Height mm	Mfrs. List No.
10.3	8.5	2.1	3.4	15	MCPE1-01708NC-S
18.8	8.5	3.8	3.4	20	MCPE1-03108NC-S
29.7	6	8.8	3.1	20	MCPE1-07106NC-S
31.1	6	8.8	3.95	30	MCPE1-07107AC-S
35.2	3.9	15.7	3.65	30	MCPE1-12704AC-S
43.1	8.5	8.8	3.45	30	MCPE1-07108AC-S
53.1	6	15.7	3.15	30	MCPE1-12706AC-S
55.6	6	15.7	3.95	40	MCPE1-12707AC-S
77.1	8.5	15.7	3.45	40	MCPE1-12708AC-S
110	12	15.4	3.7	40	MCTE1-12712L-S
130	15	15.4	3.5	50	MCTE1-12715L-S
118	8.5	24.1	3.5	40	MCTE1-19908L-S
200	13	24.1	3.5	50	MCTE1-19913L-S

521874



New

Mfrs. List No.	Order Code	Price Each			
		1+	10+	25+	50+
MCPE1-12708AC-S	163-9718●	17.81	15.59	13.85	12.46
MCPE1-07108AC-S	163-9719●	16.06	14.06	12.49	11.24
MCPE1-03108NC-S	163-9720●	10.81	9.47	8.41	7.57
MCPE1-01708NC-S	163-9721●	17.81	15.59	13.85	12.46
MCPE1-12707AC-S	163-9722●	17.81	15.59	13.85	12.46
MCPE1-07107AC-S	163-9723●	16.06	14.06	12.49	11.24
MCPE1-12706AC-S	163-9724●	17.81	15.59	13.85	12.46
MCPE1-07106NC-S	163-9725●	16.06	14.06	12.49	11.24
MCPE1-12704AC-S	163-9726●	20.72	18.14	16.12	14.50
MCTE1-12712L-S	163-9727●	17.81	15.59	13.85	12.46
MCTE1-12715L-S	163-9728●	17.81	15.59	13.85	12.46
MCTE1-19908L-S	163-9731●	24.62	21.55	19.16	17.24
MCTE1-19913L-S	163-9732●	24.62	21.55	19.16	17.24

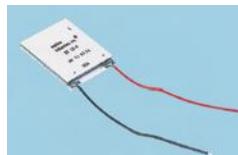
**Cooler, Peltier Two Stage**

- PK2 and PE2 modules are high performance double stage modules, silicone sealed for moisture protection, for applications where high cooling capacity is needed at high operation temperature
- Recommended operation temperature up to 90°C for long life.
- Recommended operating current 0.7 I<sub>max</sub> for long life

Power Rating (W)	Current DC Max (A)	Voltage Input Max (V)	Depth mm	Length/Height mm	Mfrs. List No.
8.7	2.8	15.7	—	—	MCPK2-15828NC-S
51.6	8.5	16.1	7.05	40	MCPK2-19808AC-S
44.7	9.6	15.9	7	40	MCPE2-177-19-14-L2

521877

Mfrs. List No.	Order Code	Price Each			
		1+	10+	25+	50+
MCPK2-15828NC-S	163-9733●	37.63	32.93	29.26	26.34
MCPK2-19808AC-S	163-9734●	37.63	32.93	29.26	26.34
MCPE2-177-19-14-L2	163-9735●	76.68	67.10	59.64	53.67

**DuraTEC, High Power Heat Pumps**

- Single stage, Peltier-Effect coolers
- Reliable solid state design
- Sealed against condensation/moisture
- dc powered
- Vibration and noise free
- Small, lightweight package
- Precision temperature control to <0.05°C
- Maintenance free

- Polarity dependent heating/cooling
- 100mm leads

Heat Pump Capacity W	$\Delta T_{max}$ °C	I <sub>max</sub> A	V <sub>max</sub> V	H	W	D	Mfrs. List No.
6	68	2.5	3.6	4.04	16	20.5	RC3-2.5-01LS
9	68	3.7	3.6	3.43	16	20.5	RC3-4-01LS
17	68	7.4	3.6	3.63	20	24.5	RC3-8-01LS
20	68	3.7	8.2	3.43	23.5	28	RC6-4-01LS
30	68	5.6	8.2	4.01	30	34	RC6-6-01LS
39	68	7.4	8.2	3.63	30	34	RC6-8-01LS
23	68	2.5	14.7	4.04	30	34	RC12-2.5-01LS
36	68	3.7	14.6	3.43	30	34	RC12-4-01LS
54	68	5.6	14.6	4.01	40	44	RC12-6-01LS
71	68	7.4	14.7	3.63	40	44	RC12-8-01LS
71	68	7.4	14.7	3.63	40	44	RC12-8-01LS

222001

Mfrs. List No.	Order Code	1+	10+	25+
RC3-2.5-01LS	115-6591●	27.15	24.29	21.86
RC3-4-01LS	115-6592●	26.20	23.45	21.10
RC3-8-01LS	115-6593●	29.19	25.46	22.08
RC6-4-01LS	115-6594●	29.86	26.06	22.58
RC6-6-01LS	115-6588●	32.83	30.61	26.32
RC6-8-01LS	115-6595●	39.77	34.70	30.08
RC12-2.5-01LS	115-6596●	33.56	29.25	25.38
RC12-4-01LS	115-6598●	32.96	28.75	24.93
RC12-6-01LS	115-6599●	34.65	32.29	27.76
RC12-8-01LS	115-6590●	39.46	36.78	31.62

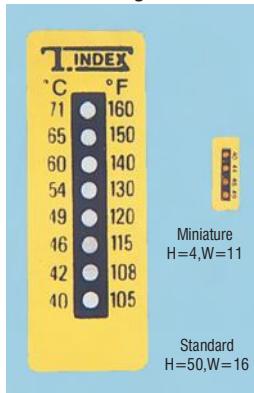
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## Temperature Indicators

## Non Reversing Labels



## THERMINDEX

- Self-adhesive
- Non-reversing-records peak temperatures
- Water and oil resistant
- 'Miniature' range has 4 sensing areas
- 'Standard' range has 8 sensing areas
- <1s response time
- ±1°C accuracy (<100°C), ±1% (>100°C)

Mfrs. List No. SERIES 4M=522-892 to 522-934  
SERIES 8=522-958 to 552-995

°C temperature markings

Miniature	Order code
40	44
54	60
77	82
99	104
121	127
143	132
149	138
154	140
160	143
166	171
177	182
188	193
199	204
204	210
216	224
232	241
249	249
254	254
260	260

Standard	Order code
40.6	43.3
77	82
121	127
166	171
210	216
46	88
99	93
132	132
182	182
232	232
49	138
143	143
149	149
154	154
160	160
177	177
241	241
54.4	193
188	193
249	249
60	199
249	254
65.5	260
71	260
110	260
116	260
116	260
160	260
204	260
260	260

211587

10 Strips Per Pack	Order Code	Price Per Pack
<b>Temperature Range</b>		
<b>Miniature</b>		
40°C to 49°C	522-892	8.56
54°C to 71°C	522-909	8.56
77°C to 93°C	522-910	8.56
99°C to 116°C	522-922	8.56
121°C to 138°C	522-934	8.56
<b>Standard</b>		
40.6°C to 71°C	522-958	8.73
77°C to 116°C	522-960	9.00
121°C to 160°C	522-971	8.73
166°C to 204°C	522-983	8.76
210°C to 260°C	522-995	6.63
		7.39
		6.74
		6.74
		6.74
		6.74
		6.74
		6.85
		7.04
		6.85
		6.87
		5.20

## Reversible Strips

## THERMINDEX

10 Strips Per Pack	Order Code	Price Per Pack
<b>Temperature Range</b>		
<b>Miniature</b>		
0°C to 30°C	523-010	9.60
30°C to 60°C	523-021	9.60
60°C to 90°C	523-033	7.28
		7.98
		6.92
		7.98
		6.92
		6.06
		5.25

- Self-adhesive
- Thermochromic liquid crystal
- 7 sensing areas, at 5°C intervals
- Correct temperature is indicated in green
- <1s response time, ±1°C accuracy

227492

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