



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



Table of Contents

General Information

How to Use This Standard Part Catalog..... 2
 Index by Part Number..... 3
 Index by Device and Thermal Resistance..... 4-5
 Index by Style and Thermal Resistance..... 6-8
 How to Select a Heat Sink..... 9-10
 How to Read a Thermal Graph..... 11

Board Mounted Heat Sinks

Heat Sinks for IC Packages
 BGA..... 12-19
 DIP..... 21-23

Surface Mount Discrete Semiconductor Packages
 D-PAK..... 24-25
 SO..... 24
 SMT Footprints..... 26

Thru-Hole Discrete Semiconductor Packages
 TO-220..... 27-50
 TO-220 and TO-262..... 51-53
 TO-220, TO-218, and TO-247..... 53-58
 TO-220 and TO-202..... 59
 TO-220, TO-218, TO-247, and Multiwatt..... 60-61
 TO-218..... 62
 TO-202..... 63-64
 TO-126..... 65
 SIP..... 66-67
 TO-92..... 68
 TO-3..... 69-73
 TO-66..... 74
 TO-5..... 75-76
 Axial Lead Devices..... 77
 Bridge Rectifiers..... 77

Options

Table of Contents..... 78-79
 How to Decipher an Aavid 12 Digit Part Number..... 80
 How to Decipher a "Thermalloy" Origin Part Number..... 81
 Index A, B, C = Aavid Standard Parts w/Options..... 82-84
 Index D = "Thermalloy" Origin Parts w/Options..... 85

Interface Materials

In-Sil™, Kondux™, Grafoil® Pads..... 86
 Hi-Flow®, Alignment Pads..... 87
 Double Sided Tape Options (Factory Applied)..... 88

Labor Saving Heat Sink to Board and Semiconductor Mounts

Wave-On™ Mounts, Semiconductor Mounts, Shur-Lock™ Tabs, Solderable Tabs, Solderable Pins..... 89-94
 Solderable Nuts, Clinch Nuts, Solderable Studs, Device Mounting Studs..... 94-96

Clips

Kool-Klips™..... 97
 Thermal Clips..... 98

Accessories

Mounting Kits..... 99
 Insulating Shoulder Washers..... 100
 Insulators—ThermalFilm™ and ThermalFilm™ MT..... 101-102
 Insulators—Mica and Thermasil™ III..... 103
 Insulating Washers/Aluminum Oxide..... 104
 Insulating Stanchion Pads..... 105
 Insulating Covers..... 106
 Mounting Pads..... 107-109
 Finishes..... 110
 Card Ejectors & Guides..... 111
 Thermal Greases and Epoxies..... 112-115

How to Use This Catalog

Base part number

Semiconductor device

Style description for heat sink

Icons indicate that a mounting kit, grease or epoxy can be used with the heat sink

TO-220 Heat Sinks

7022

Channel style heat sink with folded back fins

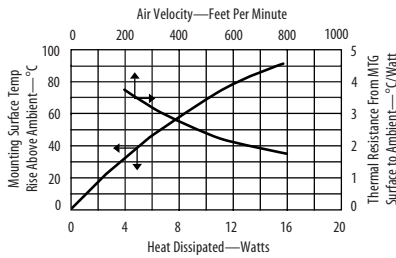
Grease & Epoxy page 112

Mounting Kits page 99

Semiconductor devices have been included in photos to assist in determining mounting position.

Thermal graphs show natural and forced convection based on black anodize finish. For information on how to use a thermal graph, please refer to page 11.

Mechanical drawing dimensions as shown are mm (inches)

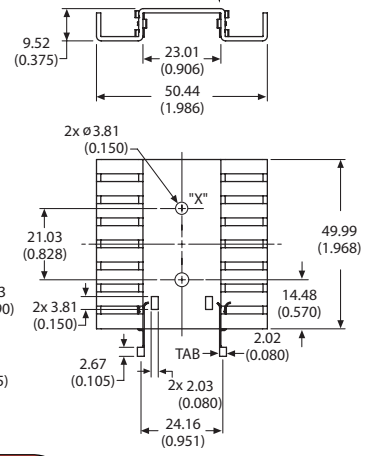


Detailed description illustrates the heat sink's differentiating features.

Channel style heat sink with folded back fins for increased cooling surface area. Available with tin plated solderable tabs for easy attachment to the printed circuit card.

Ordering information will specify the base heat sink with available accessories.

Material and finish information is shown for each part



Material: 1.27 (0.050) Thick Aluminum
 Finish: See Table

ORDERING INFORMATION

Part Number	Description	Finish	Dia of PCB Plated Thru Hole for Tabs
7022BG	Channel heat sink with folded back fins	Black anodize	
7022PBG	Channel heat sink with folded back fins	Pre-black anodize*	
7022B-MTG	With solderable tabs	Black anodize	2.90 (0.114)
7022PB-MTG	With solderable tabs	Pre-black anodize*	2.90 (0.114)

* Edges cut during the manufacturing process will be unfinished. See page XX for more information

POPULAR OPTIONS: 7022B- G
 Base part no. A RoHS Compliant

Aavid has a large selection of popular options to enhance your heat sink selection. This section will indicate the most popular options available.

Position	Code	Description	Location	Details
A	TC11-MT	Insulated device mounting clip for TO-220 and solderable tabs	Hole X	Page

For additional options see page xx

Detailed indexes are available to select additional options.

Index by Part Number

Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page	Part Number	Page
10-5597-02G	14	374424B00032G	17	530101B00150G	54	574102B00000G	45	581002B02500G	61	7022PB-MTG	29
10-5597-22G	14	374424B00035G	16	530102B00100G	54	574102B03300G	45	581101B02500G	61	7023BG	67
10-5597-33G	14	374424B60023G	12	530102B00150G	54	574204B00000G	63	581102B02500G	61	7023B-MTG	28
10-5607-04G	14	374524B00032G	17	530161B00162G	54	574204B03300G	63	581201B02500G	61	7025BG	27
10-5607-05G	14	374524B00035G	16	530162B00162G	54	574402B00000G	45	581202B02500G	61	7025B-MTG	27
10-5634-01G	12	374524B60023G	12	530401B00100G	55	574402B03200G	45	584000B00000G	67	7038BG	67
10-6326-27G	14	374624B00032G	17	530401B00150G	55	574502B00000G	45	584000B03500G	67	709203B00400G	19
10-6326-28G	14	374624B00035G	16	530402B00100G	55	574502B03300G	45	5900PBG	32	7106DG	24
10-6327-01G	14	374624B60024G	12	530402B00150G	55	574602B00000G	45	590102B03600G	34	7106D/TRG	24
10-BRD1-01G	12	374724B00032G	17	530510B00000G	66	574602B03300G	45	590302B03600G	34	7109DG	25
10-BRD1-03G	12	374724B00035G	16	530510U00000G	66	574802B00000G	43	591202B00000G	51	7109D/TRG	25
10-BRD1-04G	12	374724B60024G	12	530613B00000G	40	574802B03300G	43	591202B03100G	51	7128DG	36
10-BRD1-05G	12	374824B00032G	17	530614B00000G	40	574902B00000G	45	591202B04000G	51	7130DG	62
10-BRD1-07G	12	374824B00035G	16	530714B00000G	40	574902B03300G	45	591302B00000G	51	7136DG	35
10-BRD2-01G	12	374824B60024G	12	530801B05100G	54	575002B00000G	33	591302B02800G	51	7137DG	42
10-CLS1-01G	12	374924B00032G	17	530801B05150G	54	575002D00000G	33	591302B04000G	51	7139DG	35
10-CLS2-01G	12	374924B00035G	16	530802B05100G	54	575102B00000G	46	592201B03400G	62	7140DG	42
10-L4LB-03G	14	375024B60024G	12	530802B05150G	54	575200B00000G	68	592502B03400G	49	7141DG	38
10-L4LB-05G	14	375024B00032G	17	530861B05162G	54	575300B00000G	68	592502U03400G	49	7142DG	36
10-L4LB-11G	14	375024B00035G	16	530862B05162G	54	575400B00000G	68	592902B03400G	33	7148DG	67
10-THMA-01G	12	375024B60024G	12	531002B02500G	59	575603B00000G	70	593002B03400G	33	7173DG	39
10-TNT2-01G	14	375124B00032G	17	531002V02500G	59	575703B00000G	70	593101B03600G	62	7178DG	35
2317B-EP11-BGS1G	18	375124B00035G	16	531102B02500G	59	575803B00000G	70	593202B03500G	48	799403B01500G	19
2319B-TACHG	17	375124B60024G	12	531102V02500G	59	575903B00000G	70	5FG	75	92FG	68
2321B-TACHG	17	375224B00032G	17	531202B02500G	59	576012B00000G	40	6000DG	77	BW38-2G	58
2327B-CP50G	16	375324B00035G	16	531202V02500G	59	576014B00000G	40	6000UG	77	BW38-4G	58
2327B-TACHG	16	375424B00034G	16	531302B02500G	59	576103B00000G	73	6021BG	30	BW50-2G	58
2332B-TACHG	17	500103B00000G	72	531302V02500G	59	576203B00000G	73	6021PBG	30	BW50-4G	58
2338B-TACHG	17	500203B00000G	72	532602B02500G	50	576303B00000G	73	6022BG	47	BW63-2G	58
2342B-TACHG	17	500303B00000G	72	532702B02500G	50	576403B00000G	73	6022PBG	47	BW63-4G	58
2518B-EP11-BGS2G	18	500403B00000G	72	532802B02500G	50	576602B00000G	33	6025DG	48	ML26AAG	50
2519B-EP11-BGS5G	18	501000B00000G	20	533001B02551G	55	576602D00000G	33	6032DG	47	PF432G	52
2520B-EP04-BGS5G	18	501000J00000G	20	533002B02551G	55	576802B00000G	52	6038BG	36	PF433G	52
2522B-EP04-BGS5G	18	501100B00000G	23	533101B02551G	55	576802B03100G	52	6043PBG	43	PF434G	52
320105B00000G	76	501200B00000G	23	533102B02551G	55	576802B04000G	52	6046PBG	64	PF435G	52
320205B00000G	76	501303B00000G	70	533201B02551G	55	576802V00000G	52	6047PBG	64	PF436G	52
323005B00000G	76	501403B00000G	70	533202B02551G	55	576802V03100G	52	6049PBG	43	PF523G	73
325705B00000G	76	501503B00000G	70	533301B02551G	55	576802V04000G	52	6094PBG	43	PF526G	73
326005B00000G	76	501603B00000G	70	533302B02551G	55	576802U00000G	52	6109PBG	35	PF527G	73
335114B00032G	19	501706B00000G	74	533401B02552G	57	576802U03100G	52	6110PBG	35	PF720G	44
335211B00000G	19	501806B00000G	74	533402B02552G	57	576802U04000G	52	615633B00250G	19	PF723G	44
335211B00032G	19	501906B00000G	74	533421B02552G	57	576904B00000G	64	6201PBG	75	PF730G	65
335214B00000G	19	502006B00000G	74	533422B02552G	57	577002B00000G	34	6202PBG	75	PF732G	65
335214B00032G	19	504102B00000G	38	533501B02552G	57	577002B04000G	34	6203PBG	75	PF750G	44
335214B00034G	19	504222B00000G	38	533502B02552G	57	577102B00000G	34	6221PBG	30	PF752G	44
335224B00032G	17	505103B00000G	72	533521B02552G	57	577102B04000G	34	6222BG	77	PF758G	44
335224B00034G	16	505303B00000G	72	533522B02552G	57	577202B00000G	34	6223BG	77	SW25-2G	56
335314B00000G	19	505403B00000G	72	533601B02552G	57	577202B04000G	34	6224BG	77	SW25-4G	56
335314B00032G	19	506003B00000G	69	533602B02552G	57	577304B00000G	64	6225B-MTG	47	SW25-6G	59
335314B00035G	19	506304B00000G	63	533621B02552G	57	577404B00000G	64	6230DG	30	SW38-2G	56
335324B00032G	16	506902B00000G	41	533622B02552G	57	577500B00000G	65	6232B-MTG	48	SW38-4G	56
335714B00000G	19	507002B00000G	41	533701B02552G	57	577500U00000G	65	6232PB-MTG	48	SW38-6G	59
335714B00032G	19	507102B00000G	41	533702B02552G	57	577922B00000G	40	6236BG	39	SW50-2G	56
335724B00032G	17	507222B00000G	41	533721B02552G	57	578105B00000G	75	6236PBG	39	SW50-4G	56
335814B00000G	19	507302B00000G	38	533722B02552G	57	578205B00000G	75	6237BG	42	SW63-2G	56
335814B00032G	19	507302J00000G	38	533802B02554G	50	578305B00000G	75	6237PBG	42	SW63-4G	56
335824B00032G	17	508500B00000G	23	533902B02554G	50	578405B00000G	75	6238BG	37	TV1500G	32
335824B00034G	16	508600B00000G	23	534002B02554G	50	578505B00000G	75	6238B-MTG	37	TV1505G	32
336314B00000G	19	508700B00000G	23	534202B02853G	37	578622B03200G	40	6239B-MTG	37	TV265G	32
336624B00032G	17	513001B02500G	58	534202B03453G	37	579003B00000G	71	6284BG	23	TV35G	31
364424B00032G	17	513002B02500G	58	542502B00000G	49	579103B00000G	69	6374BG	61	TV4G	65
364424B00034G	16	513101B02500G	58	542502D00000G	49	579103V00000G	69	6380BG	60	TV40G	39
371824B00032G	17	513102B02500G	58	551002B00000G	29	579206B00000G	74	6381BG	60	TV46G	31
371824B00034G	16	513201B02500G	58	560200B00000G	20	579206V00000G	74	6382BG	60	TV47G	31
372024B00032G	17	513202B02500G	58	560200W00000G	20	579302B00000G	46	6396BG	60	TV58G	31
372024B00034G	16	513301B02500G	58	563002B00000G	33	579402B00000G	46	6396B-P2G	60	TV96G	53
372924M02000G	14	513302B02500G	58	563002D00000G	33	579604B00000G	63	6398BG	60	TV97G	53
373024B00032G	17	519703B00000G	71	566010B00000G	66	579604B03300G	63	6398B-P2G	60	YB32-4G	61
373024B00034G	16	519803B00000G	71	566010B03100G	66	579704B00000G	63	6399BG	60		
373224M00032G	17	519903B00000G	71	566010B03400G	66	579704B03300G	63	6399B-P2G	60		
373324M00032G	17	520103B00000G	71	566902B00000G	53	579802B00000G	43	6400BG	60		
374024B00032G	17	520327B00000G	69	566902B03100G	53	579802B03300G	43	6400B-P2G	60		
374024B00035G	16	520328B00000G	69	566902B04000G	53	579902B00000G	43	6400B-U01100G	19		
374024B60023G	12	520329B00000G	69	569003B00000G	71	579902B03300G	43	7019BG	27		
374124B00032G	17	529701B02500G	56	569022B00000G	42	580100B00000G	20	7019B-MTG	27		
374124B00035G	16	529702B02500G	56	573100D00000G	24	580100W00000G	20	7019PBG	27		
374124B60023G	12	529801B02500G	56	573100D00010G	24	580200B00000G	20	7020BG	27		
374224B00032G	17	529802B02500G	56	573300D00000G	24	580200W00000G	20	7020B-MTG	27		
374224B00035G	16	529901B02500G	56	573300D00010G	24	580300B00000G	21	7021BG	28		
374224B60023G	12	529902B02500G	56	573400D00000G	25	580400B00000G	22	7021B-MTG	28		
374324B00032G	17	530001B02500G	56	573400D00010G	25	580500B00000G	22	7022BG	29		
374324B00035G	16	574004B00000G	56	574004B00000G	63	580600B00000G	21	7022B-MTG	29		
374324B60023G	12	530101B00100G	54	574004U00000G	63	581001B02500G	61	7022PBG	29		

INDEX

Index by Device Cooled and Thermal Resistance

Part Number θ_n Board Mounting Page

AXIAL LEAD



6000UG	15.0	V	77
6000DG	15.0	V	77

BRIDGE RECTIFIERS



6222BG	9.4	V	77
6223BG	9.4	V	77
6224BG	9.4	V	77

DIPS



501200B00000G	68.0	H	23
501100B00000G	67.0	H	23
501000J00000G	60.0	H	20
501000B00000G	60.0	H	20
580300B00000G	39.0	H	21
580400B00000G	39.0	H	22
508500B00000G	34.0	H	23
508600B00000G	32.0	H	23
580100B00000G	30.0	H	20
580100W00000G	30.0	H	20
508700B00000G	27.2	H	23
6284BG	25.0	H	23
560200B00000G	20.0	H	20
560200W00000G	20.0	H	20
580200B00000G	20.0	H	20
580200W00000G	20.0	H	20
580500B00000G	20.0	H	22
580600B00000G	20.0	H	21

IC PACKAGES, BGA, PGA, QFP, LCC

Bi Directional Air Flow	H	19
Solder Anchor	H	12
Push Pin	H	14
Clip Attachment	H	18
Tape Attachment	H	16

MULTIWATT



YB32-4G	8.4	V	61
6380BG	6.8	V	60
6381BG	5.8	V	60
6396BG	5.6	V	60
6396B-P2G	5.6	V	60
6374BG	5.0	V	61
6398BG	4.4	V	60
6398B-P2G	4.4	V	60
6382BG	4.2	V	60
6399BG	3.3	V	60
6399B-P2G	3.3	V	60
6400BG	2.7	V	60
6400B-P2G	2.7	V	60

SIPS



530510U00000G	20.6	V	66
530510B00000G	20.6	V	66
7038BG	16.0	V	67
7148DG	16.0	V	67
566010B00000G	11.5	H-V	66
566010B03400G	11.5	V	66
566010B03100G	11.5	H	66
584000B00000G	10.0	V	67
584000B03500G	10.0	V	67
6380BG	6.8	V	60
6381BG	5.8	V	60
6382BG	4.2	V	60

SMT



D-PAK TO-252			
573100D00010G	25.0	H	24
573100D00000G	25.0	H	24

Part Number θ_n Board Mounting Page

D²PAK TO-263

573300D00010G	16.0	H	24
573300D00000G	16.0	H	24
7109D/TRG	9.0	H	25
7109DG	9.0	H	25

D²PAK TO-263 SO-10

7106D/TRG	14.0	H	24
7106DG	14.0	H	24

D²PAK TO-268

573400D00010G	11.0	H	25
573400D00000G	11.0	H	25

TO-3



575603B00000G	15.6	H	70
575703B00000G	13.4	H	70
579103B00000G	12.5	H	69
579103V00000G	12.5	H	69
501303B00000G	12.0	H	70
519803B00000G	11.4	H	71
575803B00000G	11.0	H	70
PF523G	10.1	H	73
501403B00000G	10.0	H	70
505103B00000G	10.0	H	72
575903B00000G	9.8	H	70
PF526G	8.9	H	73

KEY

H = Horizontal mount

V = Vertical mount

H-V = Either horizontal or vertical depending on device leads

θ_n = Natural convection thermal resistance based on a 75°C heat sink temperature rise

501503B00000G	8.4	H	70
501603B00000G	7.8	H	70
505303B00000G	7.8	H	72
PF527G	7.4	H	73
500103B00000G	7.2	H	72
576103B00000G	7.2	H	73
506003B00000G	7.0	H	69
500203B00000G	6.2	H	72
576203B00000G	6.2	H	73
579003B00000G	6.0	H	71
505403B00000G	6.0	H	72
576303B00000G	6.0	H	73
500303B00000G	5.8	H	72
569003B00000G	5.5	H	71
520103B00000G	5.4	H	71
576403B00000G	5.1	H	73
500403B00000G	5.0	H	72
519703B00000G	4.8	H	71
520329B00000G	4.7	H	69
520328B00000G	4.7	H	69
520327B00000G	4.7	H	69
519903B00000G	4.2	H	71

TO-5



320105B00000G	63.0	V	76
320205B00000G	63.0	V	76
325705B00000G	60.0	V	76
326005B00000G	57.0	V	76
323005B00000G	56.0	V	76
6201PBG	54.0	V	75
5FG	45.2	V	75
6202PBG	43.0	V	75
578105B00000G	40.0	V	75
578205B00000G	38.0	V	75
6203PBG	38.0	V	75
578305B00000G	35.0	V	75
578405B00000G	31.0	V	75
578505B00000G	28.0	V	75

Part Number θ_n Board Mounting Page

TO-66



579206B00000G	22.0	H	74
579206V00000G	22.0	H	74
501706B00000G	12.0	H	74
501806B00000G	9.6	H	74
501906B00000G	8.0	H	74
502006B00000G	8.0	H	74

TO-92



575200B00000G	60.0	V	68
575300B00000G	50.0	V	68
575400B00000G	40.0	V	68
92FG	36.1	V	68

TO-126



PF730G	35.8	H-V	65
PF732G	35.8	H-V	65
577500B00000G	26.0	V	65
577500U00000G	26.0	V	65
TV4G	21.6	H	65

TO-202



576904B00000G	32.0	H-V	64
574004B00000G	28.0	V	63
574004U00000G	28.0	V	63
577304B00000G	27.2	H-V	64
6046PBG	25.0	V	64
6047PBG	25.0	V	64
579604B00000G	24.0	V	63
579604B03300G	24.0	V	63
579704B00000G	24.0	V	63
579704B03300G	24.0	V	63
577404B00000G	24.0	H-V	64
574204B00000G	16.8	V	63
574204B03300G	16.8	V	63
506304B00000G	14.4	H-V	63
531002B02500G	13.4	V	59
531002V02500G	13.4	V	59
SW25-6G	13.0	V	59
531102B02500G	10.4	V	59
531102V02500G	10.4	V	59
SW38-6G	10.0	V	59
531302B02500G	8.0	V	59
531302V02500G	8.0	V	59
531202V02500G	7.5	V	59
531202B02500G	7.5	V	59

TO-218



TV96G	24.0	H	53
7130DG	23.1	V	62
TV97G	20.0	H	53
581001B02500G	19.6	V	61
581101B02500G	16.8	V	61
581201B02500G	12.8	V	61
513001B02500G	13.4	V	58
533001B02551G	13.0	V	55
SW25-2G	11.4	V	56
SW25-4G	11.4	V	56

Part Number θ_n Board Mounting Page

533101B02551G	11.0	V	55
513101B02500G	11.0	V	58
SW38-2G	10.2	V	56
SW38-4G	10.2	V	56
533201B02551G	9.0	V	55
513201B02500G	9.0	V	58
SW50-2G	8.8	V	56
SW50-4G	8.8	V	56
593101B03600G	8.6	V	62
YB32-4G	8.4	V	61
513301B02500G	8.0	V	58
533301B02551G	8.0	V	55
530001B02500G	8.0	V	56
BW63-4G	7.4	V	58
BW38-2G	7.2	V	58
BW38-4G	7.2	V	58
SW63-2G	7.0	V	56
SW63-4G	7.0	V	56
6380BG	6.8	V	60
592201B03400G	6.8	V	62
530101B00100G	6.3	V	54
530101B00150G	6.3	V	54
530801B05100G	6.3	V	54
530801B05150G	6.3	V	54
530401B00100G	6.3	V	55
530401B00150G	6.3	V	55
6381BG	5.8	V	60
BW50-2G	5.8	V	58
BW50-4G	5.8	V	58
533701B02552G	5.7	V	57
533721B02552G	5.7	V	57
6396BG	5.6	V	60
6396B-P2G	5.6	V	60
529701B02500G	5.5	V	56
6374BG	5.0	V	61
533401B02552G	5.0	V	57
533421B02552G	5.0	V	57
529801B02500G	5.0	V	56
BW63-2G	4.7	V	58
529901B02500G	4.5	V	56
533501B02552G	4.5	V	57
533521B02552G	4.5	V	57
530161B00162G	4.4	V	54
530861B05162G	4.4	V	54
6398BG	4.4	V	60
6398B-P2G	4.4	V	60
6382BG	4.2	V	60
533601B02552G	3.8	V	57
533621B02552G	3.8	V	57
6399BG	3.3	V	60
6399B-P2G	3.3	V	

Index by Device Cooled, Heat Sink Style, and Thermal Resistance

Part Number θ_n Board Mounting Page

AXIAL LEAD

6000UG	15.0	V	77
6000DG	15.0	V	77

BRIDGE RECTIFIERS

6222BG	9.4	V	77
6223BG	9.4	V	77
6224BG	9.4	V	77

DIPS

Extruded Heat Sinks			
501200B00000G	68.0	H	23
501100B00000G	67.0	H	23
508700B00000G	27.2	H	23
6284BG	25.0	H	23
580500B00000G	20.0	H	22
580600B00000G	20.0	H	21

Slide On Heat Sinks			
501000J00000G	60.0	H	20
501000B00000G	60.0	H	20
580300B00000G	39.0	H	21
580400B00000G	39.0	H	22
508500B00000G	34.0	H	23
508600B00000G	32.0	H	23
580100B00000G	30.0	H	20
580100W00000G	30.0	H	20
560200B00000G	20.0	H	20
560200W00000G	20.0	H	20
580200B00000G	20.0	H	20
580200W00000G	20.0	H	20

IC PACKAGES, BGA, PGA, QFP, LCC

Bi Directional Air Flow	H	19
Solder Anchor	H	12
Push Pin	H	14
Clip Attachment	H	18
Tape Attachment	H	16

MULTI-WATT

Extruded Heat Sinks			
YB32-4G	8.4	V	61
6380BG	6.8	V	60
6381BG	5.8	V	60
6396BG	5.6	V	60
6396B-P2G	5.6	V	60
6374BG	5.0	V	61
6398BG	4.4	V	60
6398B-P2G	4.4	V	60
6382BG	4.2	V	60
6399BG	3.3	V	60
6399B-P2G	3.3	V	60
6400BG	2.7	V	60
6400B-P2G	2.7	V	60

SIPS

Channel Style Heat Sinks			
530510U00000G	20.6	V	66
530510B00000G	20.6	V	66
Clip On Style Heat Sinks			
584000B00000G	10.0	V	67
584000B03500G	10.0	V	67
Extruded Heat Sinks			
6380BG	6.8	V	60
6381BG	5.8	V	60
6382BG	4.2	V	60
Plug In Style Heat Sinks			
566010B00000G	11.5	H-V	66
566010B03400G	11.5	V	66
566010B03100G	11.5	H	66
Slide On Style Heat Sinks			
7038BG	16.0	V	67
7148DG	16.0	V	67

Part Number θ_n Board Mounting Page

SMT

D-Pak TO-252			
573100D00010G	15.0	H	24
573100D00000G	15.0	H	24
D² Pak TO-263			
573300D00010G	18.0	H	24
573300D00000G	18.0	H	24
7109D/TRG	11.0	H	25
7109DG	11.0	H	25
D² Pak TO-263 SO10 (MO-184)			
7106D/TRG	15.0	H	24
7106DG	15.0	H	24
D² Pak TO-268			
573400D00010G	14.0	H	25
573400D00000G	14.0	H	25

TO-3

Diamond Shaped Basket Heat Sinks			
575603B00000G	15.6	H	70
575703B00000G	13.4	H	70
501303B00000G	12.0	H	70

KEY

- H = Horizontal mount
- V = Vertical mount
- H-V = Either horizontal or vertical depending on device leads
- θ_n = Natural convection thermal resistance based on a 75°C heat sink temperature rise

575803B00000G	11.0	H	70
PF523G	10.1	H	73
501403B00000G	10.0	H	70
575903B00000G	9.8	H	70
PF526G	8.9	H	73
501503B00000G	8.4	H	70
501603B00000G	7.8	H	70
PF527G	7.4	H	73

Hat Section Heat Sink			
506003B00000G	7.0	H	69
Space Saving Collar Heat Sinks			
579103B00000G	12.5	H	69
579103V00000G	12.5	H	69

Square Basket Heat Sinks			
519803B00000G	11.4	H	71
505103B00000G	10.0	H	72
505303B00000G	7.8	H	72
500103B00000G	7.2	H	72
576103B00000G	7.2	H	73
500203B00000G	6.2	H	72
576203B00000G	6.2	H	73
579003B00000G	6.0	H	71
505403B00000G	6.0	H	72
576303B00000G	6.0	H	73
500303B00000G	5.8	H	72
569003B00000G	5.5	H	71
520103B00000G	5.4	H	71
576403B00000G	5.1	H	73
500403B00000G	5.0	H	72
519703B00000G	4.8	H	71
519903B00000G	4.2	H	71

Two Piece Heat Sinks			
520329B00000G	4.7	H	69
520328B00000G	4.7	H	69
520327B00000G	4.7	H	69

Part Number θ_n Board Mounting Page

TO-5

Extruded Collar Heat Sinks			
320105B00000G	63.0	V	76
320205B00000G	63.0	V	76
325705B00000G	60.0	V	76
326005B00000G	57.0	V	76
323005B00000G	56.0	V	76

Low Cost Push On Heat Sink			
5FG	45.2	V	75

Snap On Cooler Heat Sinks			
578105B00000G	40.0	V	75
578205B00000G	38.0	V	75
578305B00000G	35.0	V	75
578405B00000G	31.0	V	75
578505B00000G	28.0	V	75

Space Saving Collar Heat Sinks			
6201PBG	54.0	V	75
6202PBG	43.0	V	75
6203PBG	38.0	V	75

TO-66

Diamond Shaped Basket Heat Sinks			
501706B00000G	12.0	H	74
501806B00000G	9.6	H	74
501906B00000G	8.0	H	74
502006B00000G	8.0	H	74
Space Saving Collar Heat Sinks			
579206B00000G	22.0	H	74
579206V00000G	22.0	H	74

TO-92

Clip On Style Heat Sink			
92FG	36.1	V	68
Slip On Style Heat Sinks			
575200B00000G	60.0	V	68
575300B00000G	50.0	V	68
575400B00000G	40.0	V	68

TO-126

Channel Style Heat Sink			
TV4G	21.6	H	65
Slip On Style Heat Sinks			
PF730G	35.8	H-V	65
PF732G	35.8	H-V	65
577500B00000G	26.0	V	65
577500U00000G	26.0	V	65

TO-202

Channel Style Heat Sinks			
576904B00000G	32.0	H-V	64
577304B00000G	27.2	H-V	64
577404B00000G	24.0	H-V	64

Compact Slide On Heat Sinks			
6046PBG	25.0	V	64
6047PBG	25.0	V	64

Extruded Heat Sinks			
531002B02500G	13.4	V	59
531002V02500G	13.4	V	59
SW25-6G	13.0	V	59
531102B02500G	10.4	V	59
531102V02500G	10.4	V	59
SW38-6G	10.0	V	59
531302B02500G	8.0	V	59
531302V02500G	8.0	V	59
531202V02500G	7.5	V	59
531202B02500G	7.5	V	59

Low Cost Slide On Heat Sinks			
574004B00000G	28.0	V	63
574004U00000G	28.0	V	63

Index by Device Cooled, Heat Sink Style, and Thermal Resistance

Part Number θ_{th} Board Mounting Page

TO-202 CONTINUED

Low Cost Slide On Cooler Heat Sinks

579604B00000G	24.0	V	63
579604B03300G	24.0	V	63
579704B00000G	24.0	V	63
579704B03300G	24.0	V	63
574204B00000G	16.8	V	63
574204B03300G	16.8	V	63

Low Profile Hat Section Heat Sink

506304B00000G	14.4	H-V	63
---------------	------	-----	----

Space Saving Staggered Heat Sink

6034DG	8.3	V	64
--------	-----	---	----

TO-218

Channel Style Heat Sink

593101B03600G	8.6	V	62
---------------	-----	---	----

Dual Extruded Heat Sinks

533721B02552G	5.7	V	57
533421B02552G	5.0	V	57
533521B02552G	4.5	V	57
533621B02552G	3.8	V	57

Dual High Rise Style Heat Sinks

530161B00162G	4.4	V	54
530861B05162G	4.4	V	54

Extruded Heat Sinks

581001B02500G	19.6	V	61
581101B02500G	16.8	V	61
513001B02500G	13.4	V	58
533001B02551G	13.0	V	55
581201B02500G	12.8	V	61
SW25-2G	11.4	V	56
SW25-4G	11.4	V	56
533101B02551G	11.0	V	55
513101B02500G	11.0	V	58
SW38-2G	10.2	V	56
SW38-4G	10.2	V	56
533201B02551G	9.0	V	55
513201B02500G	9.0	V	58
SW50-2G	8.8	V	56
SW50-4G	8.8	V	56
YB32-4G	8.4	V	61
533301B02551G	8.0	V	55
530001B02500G	8.0	V	56
513301B02500G	8.0	V	58
BW63-4G	7.4	V	58
BW38-2G	7.2	V	58
BW38-4G	7.2	V	58
SW63-2G	7.0	V	56
SW63-4G	7.0	V	56
6380BG	6.8	V	60
BW50-2G	5.8	V	58
BW50-4G	5.8	V	58
6381BG	5.8	V	60
533701B02552G	5.7	V	57
6396BG	5.6	V	60
6396B-P2G	5.6	V	60
529701B02500G	5.5	V	56
533401B02552G	5.0	V	57
529801B02500G	5.0	V	56
BW63-2G	4.7	V	58
529901B02500G	4.5	V	56
533501B02552G	4.5	V	57
6398BG	4.4	V	60
6398B-P2G	4.4	V	60
6382BG	4.2	V	60
533601B02552G	3.8	V	57
6399BG	3.3	V	60
6399B-P2G	3.3	V	60
6400BG	2.7	V	60
6400B-P2G	2.7	V	60
6374BG	5.0	V	61

Part Number θ_{th} Board Mounting Page

Hat Section Heat Sinks

TV96G	24.0	H	53
TV97G	20.0	H-V	53

High Rise Style Heat Sinks

530101B00100G	6.3	V	54
530101B00150G	6.3	V	54
530801B05100G	6.3	V	54
530801B05150G	6.3	V	54
530401B00100G	6.3	V	55
530401B00150G	6.3	V	55

Plug In Style Heat Sink

592201B03400G	6.8	V	62
---------------	-----	---	----

Slide On Heat Sink

7130DG	23.1	V	62
--------	------	---	----

TO-220

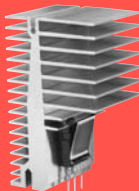
Channel Style Heat Sinks

7178DG	35.7	V	35
577002B04000G	32.0	V	35
577002B00000G	32.0	H-V	35
TV58G	29.9	H-V	31
7139DG	28.3	H	35

NEED HIGHER PERFORMANCE?

Aavid Thermalloy also offers the Max Clip System™ for discrete power semiconductors featuring simple assembly and high reliability.

www.aavidthermalloy.com/products/maxclip



TV46G	27.1	H-V	31
TV47G	27.1	H-V	31
577102B00000G	25.9	H-V	35
577102B04000G	25.9	V	35
7173DG	25.8	V	39
6236BG	25.0	V	39
6236PBG	25.0	V	39
577202B00000G	24.4	H-V	35
577202B04000G	24.4	V	35
507302B00000G	24.0	H-V	39
507302J00000G	24.0	H-V	39
576014B00000G	23.2	H-V	41
6110PBG	21.0	H-V	35
576012B00000G	20.8	H-V	41
7142DG	20.3	H	36
7141DG	20.3	V	38
530714B00000G	20.3	H-V	41
7136DG	19.7	V	35
7128DG	19.2	V	36
6038BG	18.0	V	36
592902B03400G	17.9	V	33
6109PBG	17.0	H-V	35
TV1505G	17.0	V	32
530614B00000G	16.7	H-V	41
530613B00000G	16.7	H-V	41
576602B00000G	16.6	V	34
576602D00000G	16.6	V	34
504102B00000G	15.6	H-V	39
TV1500G	14.2	V	32
575002B00000G	13.6	V	34
575002D00000G	13.6	V	34
6238BG	13.6	H-V	37
6238B-MTG	13.6	V	37
6239B-MTG	13.6	V	37
593002B03400G	13.4	V	33

Part Number θ_{th} Board Mounting Page

534202B02853G	13.4	V	38
534202B03453G	13.4	V	38
577922B00000G	13.2	V	41
578622B03200G	13.2	V	41
563002B00000G	13.0	V	34
563002D00000G	13.0	V	34
TV265G	13.0	V	32
5900PBG	13.0	V	32
6021BG	12.5	V	30
6021PBG	12.5	V	30
6221PBG	12.5	V	30
6230DG	12.5	V	30
551002B00000G	12.4	H	30
590302B03600G	11.2	V	34
7019BG	11.0	V	27
7019PBG	11.0	V	27
7019B-MTG	11.0	V	27
590102B03600G	10.0	V	34
TV40G	9.9	H	39
7020BG	8.7	V	27
7020B-MTG	8.7	V	27
TV35G	7.2	H	31
7025BG	6.8	V	27
7025B-MTG	6.8	V	27
7021BG	6.8	V	28
7021B-MTG	6.8	V	28
7022BG	6.5	V	29
7022PBG	6.5	V	29
7022B-MTG	6.5	V	29
7022PB-MTG	6.5	V	29
504222B00000G	6.4	H	39
7023BG	4.4	V	28
7023B-MTG	4.4	V	28

Clip On Style Heat Sinks

6094PBG	40.5	H	43
6049PBG	34.1	V	43
579802B00000G	26.4	V	44
579802B03300G	26.4	V	44
579902B00000G	26.4	V	44
579902B03300G	26.4	V	44
6043PBG	23.0	V	43
574802B00000G	20.4	H-V	44
574802B03300G	20.4	V	44

Dual Extruded Heat Sinks

6380BG	6.8	V	60
6381BG	5.8	V	60
533722B02552G	5.7	V	57
533422B02552G	5.0	V	57
6374BG	5.0	V	61
6382BG	4.2	V	60
533622B02552G	3.8	V	57
533522B02552G	2.7	V	57

Dual High Rise Style Heat Sinks

530162B00162G	4.4	V	54
530862B05162G	4.4	V	54

Extruded Heat Sinks

ML26AAG	17.9	H	50
581002B02500G	17.4	V	61
581102B02500G	16.8	V	61
513002B02500G	13.4	V	58
531002B02500G	13.4	V	59
531002V02500G	13.4	V	59
533802B02554G	13.0	V	50
533002B02551G	13.0	V	55
SW25-6G	13.0	V	59
581202B02500G	12.8	V	61
SW25-2G	11.4	V	56
SW25-4G	11.4	V	56
533902B02554G	11.0	V	50
533102B02551G	11.0	V	55
513102B02500G	11.0	V	58
531102B02500G	10.4	V	59
531102V02500G	10.4	V	59

Index by Device Cooled, Heat Sink Style, and Thermal Resistance

Part Number θ_n Board Mounting Page

TO-220 CONTINUED

SW38-2G	10.2	V	56
SW38-4G	10.2	V	56
SW38-6G	10.0	V	59
534002B02554G	9.0	V	50
533202B02551G	9.0	V	55
513202B02500G	9.0	V	58
SW50-2G	8.8	V	56
SW50-4G	8.8	V	56
YB32-4G	8.4	V	61
533302B02551G	8.0	V	55
530002B02500G	2.6	V	56
513302B02500G	8.0	V	58
531302B02500G	8.0	V	59
531302V02500G	8.0	V	59
531202V02500G	7.5	V	59
531202B02500G	7.5	V	59
BW38-2G	7.2	V	58
BW38-4G	7.2	V	58
SW63-2G	7.0	V	56
SW63-4G	7.0	V	56
BW50-2G	5.8	V	58
BW50-4G	5.8	V	58
533702B02552G	5.7	V	57
6396BG	5.6	V	60
6396B-P2G	5.6	V	60
532602B02500G	5.5	V	50
529702B02500G	5.5	V	56
533402B02552G	5.0	V	57
532702B02500G	4.8	V	50
BW63-2G	4.7	V	58
BW63-4G	4.7	V	58
529902B02500G	4.5	V	56
533502B02552G	4.5	V	57
6398BG	4.4	V	60
6398B-P2G	4.4	V	60
532802B02500G	4.2	V	50
533602B02552G	3.8	V	57
529802B02500G	3.7	V	56
6399BG	3.3	V	60
6399B-P2G	3.3	V	60
6400BG	2.7	V	60
6400B-P2G	2.7	V	60

Hat Section Heat Sinks

6237BG	25.0	H	42
6237PBG	25.0	H	42
TV96G	24.0	H	53
7137DG	20.8	V	42
7140DG	20.8	H	42
506902B00000G	20.0	V	42
TV97G	20.0	H-V	53
507002B00000G	15.6	H-V	42
507102B00000G	15.6	H-V	42
507222B00000G	9.6	H	42

High Rise Style Heat Sinks

530102B00100G	6.3	V	54
530102B00150G	6.3	V	54
530802B05100G	6.3	V	54
530802B05150G	6.3	V	54
530402B00100G	6.3	V	55
530402B00150G	6.3	V	55

Plug In Style Heat Sinks

576802B00000G	27.3	V	52
576802V00000G	32.6	V	52
576802U00000G	32.6	V	52
576802B03100G	27.3	H	52
576802V03100G	32.6	H	52
576802U03100G	32.6	H	52
576802B04000G	27.3	V	52
576802V04000G	32.6	V	52
576802U04000G	32.6	V	52
591202B00000G	26.8	H-V	51
591202B03100G	26.8	H	51
591202B04000G	26.8	V	51
591302B00000G	26.8	H-V	51
591302B02800G	26.8	V	51

Part Number θ_n Board Mounting Page

591302B04000G	26.8	H	51
PF432G	20.3	V	52
PF433G	20.3	V	52
PF434G	20.3	H	52
PF435G	20.3	V	52
PF436G	20.3	H	52
566902B00000G	18.8	H-V	53
566902B03100G	18.8	H	53
566902B04000G	18.8	V	53

Slide On Heat Sinks

PF730G	35.8	V	65
PF732G	35.8	V	65
PF720G	28.9	V	44
PF723G	28.9	V	44
PF752G	23.7	V	44
574402B00000G	23.2	H-V	45
574402B03200G	23.2	H	45
574102B00000G	23.2	H-V	45
574102B03300G	23.2	V	45
574602B00000G	21.6	H-V	45
574602B03300G	21.6	V	45
574502B00000G	21.2	H-V	45
574502B03300G	21.2	V	45
PF750G	20.3	V	44
PF758G	17.3	V	44
574902B00000G	16.0	H-V	45
574902B03300G	16.0	V	45

KEY

H = Horizontal mount

V = Vertical mount

H-V = Either horizontal or vertical depending on device leads

θ_n = Natural convection thermal resistance based on a 75°C heat sink temperature rise

Snap Down Style Heat Sinks

575102B00000G	16.8	H-V	46
579302B00000G	16.8	V	46
579402B00000G	16.8	V	46

Space Saving Heat Sinks

542502B00000G	24.0	H	49
542502D00000G	24.0	H	49
592502B03400G	22.0	V	49
592502U03400G	22.0	V	49
6025DG	17.9	V	48
6022PBG	16.7	V	47
6022BG	16.7	V	47
6225B-MTG	15.0	V	47
593202B03500G	10.4	V	48
6232B-MTG	10.0	V	48
6232PB-MTG	10.0	V	48
6032DG	8.3	V	47

Square Basket Heat Sink

569022B00000G	5.5	H	42
---------------	-----	---	----

TO-247

Dual Extruded Heat Sinks

533721B02552G	5.7	V	57
533421B02552G	5.0	V	57
533521B02552G	4.5	V	57
533621B02552G	3.8	V	57

Dual High Rise Style Heat Sinks

530161B00162G	4.4	V	54
530861B05162G	4.4	V	54

Extruded Heat Sinks

513001B02500G	13.4	V	58
533001B02551G	13.0	V	55
SW25-2G	11.4	V	56
SW25-4G	11.4	V	56

Part Number θ_n Board Mounting Page

533101B02551G	11.0	V	55
513101B02500G	11.0	V	58
SW38-2G	10.2	V	56
SW38-4G	10.2	V	56
533201B02551G	9.0	V	55
513201B02500G	9.0	V	58
SW50-2G	8.8	V	56
SW50-4G	8.8	V	56
YB32-4G	8.4	V	61
533301B02551G	8.0	V	55
530001B02500G	8.0	V	56
513301B02500G	8.0	V	58
BW38-2G	7.2	V	58
BW38-4G	7.2	V	58
SW63-2G	7.0	V	56
SW63-4G	7.0	V	56
6380BG	6.8	V	60
BW50-2G	5.8	V	58
BW50-4G	5.8	V	58
6381BG	5.8	V	60
533701B02552G	5.7	V	57
6396BG	5.6	V	60
6396B-P2G	5.6	V	60
529701B02500G	5.5	V	56
533401B02552G	5.0	V	57
6374BG	5.0	V	61
529801B02500G	5.0	V	56
BW63-2G	4.7	V	58
BW63-4G	4.7	V	58
529901B02500G	4.5	V	56
533501B02552G	4.5	V	57
6398BG	4.4	V	60
6398B-P2G	4.4	V	60
6382BG	4.2	V	60
533601B02552G	3.8	V	57
6399BG	3.3	V	60
6399B-P2G	3.3	V	60
6400BG	2.7	V	60
6400B-P2G	2.7	V	60

Hat Section Heat Sinks

TV96G	24.0	H	53
TV97G	20.0	H-V	53

High Rise Style Heat Sinks

530101B00100G	6.3	V	54
530101B00150G	6.3	V	54
530801B05100G	6.3	V	54
530801B05150G	6.3	V	54
530401B00100G	6.3	V	55
530401B00150G	6.3	V	55

TO-262

Plug In Style Heat Sinks

576802B00000G	27.3	H-V	52
576802V00000G	32.6	H-V	52
576802U00000G	32.6	H-V	52
576802B03100G	27.3	H	52
576802V03100G	32.6	H	52
576802U03100G	32.6	H	52
576802B04000G	27.3	V	52
576802V04000G	32.6	V	52
576802U04000G	32.6	V	52
591202B00000G	26.8	H-V	51
591202B03100G	26.8	H	51
591202B04000G	26.8	V	51
591302B00000G	26.8	H-V	51
591302B02800G	26.8	V	51
591302B04000G	26.8	H	51
566902B00000G	18.8	H-V	53
566902B03100G	18.8	H	53
566902B04000G	18.8	V	53
PF432G	20.3	V	52
PF433G	20.3	V	52
PF434G	20.3	H	52
PF435G	20.3	V	52
PF436G	20.3	H	52

How to select a heat sink

The basic equation for heat transfer or power dissipation may be stated as follows:

$$P_D = \frac{\Delta T}{\Sigma R_{\theta}}$$

Where:

P_D = the power dissipated by the semiconductor device in watts.

ΔT = the temperature difference of driving potential which causes the flow of heat.

ΣR_{θ} = the sum of the thermal resistances of the heat flow path across which ΔT exists.

The above relationship may be stated in the following forms:

$$P_D = \frac{T_J - T_A}{R_{\theta JC} + R_{\theta CS} + R_{\theta SA}} \quad P_D = \frac{T_C - T_A}{R_{\theta CS} + R_{\theta SA}} \quad P_D = \frac{T_S - T_A}{R_{\theta SA}}$$

Where:

T_J = the junction temperature in °C (maximum is usually stated by the manufacturer of the semiconductor device).

T_C = case temperature of the semiconductor device in °C.

T_S = temperature of the heat sink mounting surface in thermal contact with the semiconductor device in °C.

T_A = ambient air temperature in °C.

$R_{\theta JC}$ = thermal resistance from junction to case of the semiconductor device in °C per watt (usually stated by manufacturer of semiconductor device).

$R_{\theta CS}$ = thermal resistance through the interface between the semiconductor device and the surface on which it is mounted in °C per watt.

$R_{\theta SA}$ = thermal resistance from mounting surface to ambient or thermal resistance of heat sink in °C per watt.

The above equations are generally used to determine the required thermal resistance of the heat sink ($R_{\theta SA}$), since the heat dissipation, maximum junction and/or case temperature, and ambient temperature are known or set.

Figure 1 indicates the location of the various heat flow paths, temperatures and thermal resistances.

The common practice is to represent the system with a network of resistances in series as shown in Figure 2.

FIGURE 1

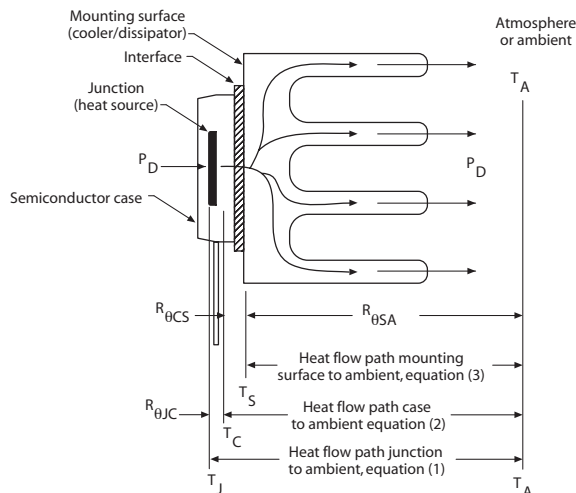
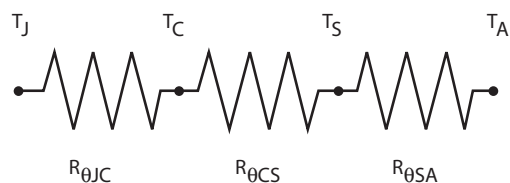


FIGURE 2



How To Select a Heat Sink

Example A

Find a space saving heat sink to keep a TO-220 device below the maximum 150°C junction temperature in natural convection. Device will be screw mounted with an electrically conductive interface.

Given:

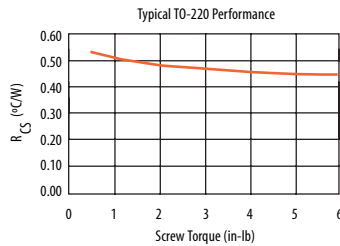
$$P_D = 6 \text{ watts}$$

$$R_{\theta JC} = 3^\circ\text{C/W (from semiconductor manufacturer)}$$

$$T_J \text{ max} = 150^\circ\text{C (from semiconductor manufacturer)}$$

$$T_A \text{ max} = 65^\circ\text{C}$$

A Kondux™ pad is a good choice for electrically conductive applications. Thermal resistance for Kondux™ can be determined from the following graph.



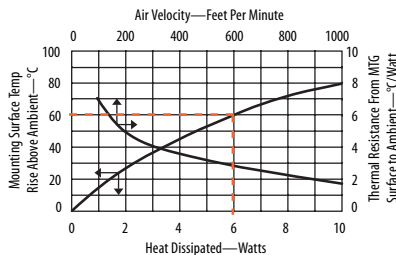
At 2 in-lb of torque the thermal resistance is approximately $R_{\theta CS} = 0.5^\circ\text{C/W}$

Using equation 1, solve for $R_{\theta SA}$

$$R_{\theta SA} = \frac{150 - 65}{6} - (3 + 0.5) = 10.7^\circ\text{C/W}$$

The Index by Heat Sink Style on page 8 lists space saving heat sinks. Several models are in the 10 °C/W range. Choose the one that best fits the application and verify thermal resistance from graph.

Part number 593202B03500G shows a 60 °C temperature rise at 6 watts.



$$R_{\theta SA} = \frac{60}{6} = 10.0^\circ\text{C/W}$$

Which meets the above requirement in natural convection.

Example B

Find a heat sink to keep a TO-220 device below the maximum 150 °C junction temperature in forced convection at 400 ft/min. Device must be electrically insulated and mounted with a labor saving clip.

Given:

$$P_D = 12 \text{ watts}$$

$$R_{\theta JC} = 2.5^\circ\text{C/W (from semiconductor manufacturer)}$$

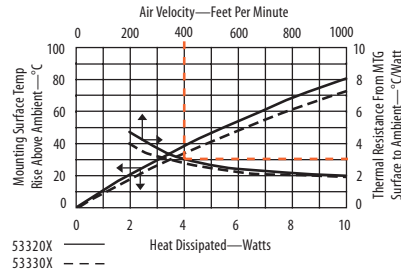
$$T_J \text{ max} = 140^\circ\text{C (from semiconductor manufacturer)}$$

$$T_A \text{ max} = 50^\circ\text{C}$$

A Hi-Flow® pad works great with clip mounting and provides the necessary electrical insulation. Thermal resistance for Hi-Flow® at low pressure is 1.15°C/W (from page 87). Using equation 1, solve for $R_{\theta SA}$

$$R_{\theta SA} = \frac{140 - 50}{12} - (2.5 + 1.15) = 3.85^\circ\text{C/W}$$

Many styles are available. If board space is a concern, 533202B02551G (pg 55) meets the requirements.



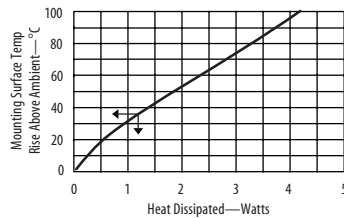
According to the above graph, an airflow of 400 ft/min results in a thermal resistance of 3°C/W. This is less than the required thermal resistance of 3.85°C/W and is therefore acceptable under these airflow conditions.

If height is a concern, 533702B02552G would meet the requirements and is only 1.0" tall

Hi-Flow® is a trademark of the Bergquist Company

The performance graphs you will see in this catalog (see graph 579802) are actually a composite of two separate graphs which have been combined to save space. The small arrows on each curve indicate to which axis the curve corresponds. Thermal graphs are published assuming the device to be cooled is properly mounted and the heat sink is in its recommended mounting position.

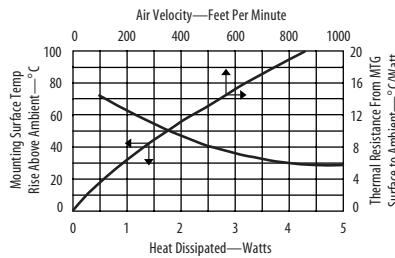
GRAPH A



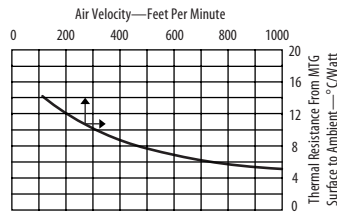
GRAPH A is used to show heat sink performance when used in a natural convection environment (i.e. without forced air). This graph starts in the lower left hand corner with the horizontal axis representing the heat dissipation (watts) and the vertical left hand axis representing the rise in heat sink mounting surface temperature above ambient (°C). By knowing the power to be dissipated, the temperature rise of the mounting surface can be predicted. Thermal resistance in natural convection is determined by dividing this temperature rise by the power input (°C/W).

EXAMPLE A: Aavid Thermalloy part number 579802 is to be used to dissipate 3 watts of power in natural convection. Because we are dealing with natural convection, we refer to graph "A". Knowing that 3 watts are to be dissipated, follow the grid line to the curve and find that at 3 watts there is a temperature rise of 75°C. To get the thermal resistance, divide the temperature rise by the power dissipated, which yields 25°C/W.

579802



GRAPH B



GRAPH B is used to show heat sink performance when used in a forced convection environment (i.e. with forced air flow through the heat sink). This graph has its origin in the top right hand corner with the horizontal axis representing air velocity over the heat sink LFM* and the vertical axis representing the thermal resistance of the heat sink (°C/W). Air velocity is calculated by dividing the output volumetric flow rate of the fan by the cross-sectional area of the outflow air passage.

$$\text{Velocity (LFM)}^* = \frac{\text{Volume (CFM)}^{**}}{\text{area (ft}^2\text{)}}$$

EXAMPLE B: For the same application we add a fan which blows air over the heat sink at a velocity of 400 LFM. The addition of a fan indicates the use of forced convection and therefore we refer to graph "B". This resistance of 9.50°C/W is then multiplied by the power to be dissipated, 3 watts. This yields a temperature rise of 28.5°C.

CONVERTING VOLUME TO VELOCITY

Although most fans are normally rated and compared at their free air delivery at zero back pressure, this is rarely the case in most applications. For accuracy, the volume of output must be derated 60%–80% for the anticipation of back pressure.

EXAMPLE: The output air volume of a fan is given as 80 CFM. The output area is 6 inches by 6 inches or 36 in² or 25 ft². To find velocity:

$$\text{Velocity (LFM)} = \frac{\text{Volume (CFM)}}{\text{area (ft}^2\text{)}}$$

$$\text{Velocity} = \frac{80}{0.25} = 320$$

Velocity is 320 LFM, which at 80%, derates to 256 LFM.

DESIGN ASSISTANCE

Aavid Thermalloy can assist in the design of heat sinks for both forced and natural convection applications. Contact us for help with your next thermal challenge. For more information, visit our web site at: www.aavidthermalloy.com

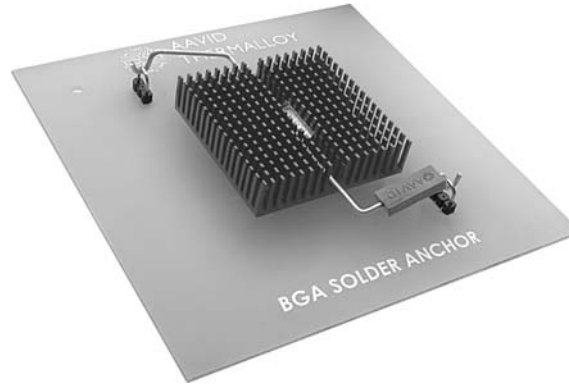
* Linear feet per minute

** Cubic feet per minute

Solder anchor attachment

Aavid's unique Solder anchor attachment method uses two or four small Solder anchors attached to the circuit card and a wire spring clip to securely fasten the heat sink to the device. This method is rugged, compact and allows for easy removal in case of rework.

All products include a phase change pad suitable for most IC package styles to optimize thermal performance. Models are available with a single or dual spring clips for additional thermal interface pressure. Solder anchors are ordered separately.

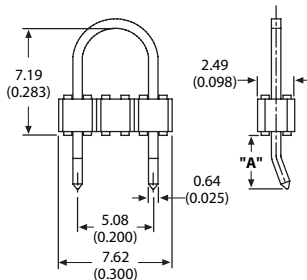


ORDERING INFORMATION

IC Pkg Size (mm)	IC Pkg Style	Part Number	"W" (mm)	"L" (mm)	"H" (mm)	"A" (mm)	Øn ¹	Øt ²	Finish	Fig. ⁴	PCB Fig. ⁴	#Anchors ³
23 x 23	All	374024B60023G	23.00	23.00	10.00	49.70	40.00	11.69	Black anodize	1	A	2
23 x 23	All	374124B60023G	23.00	23.00	18.00	49.70	23.40	7.39	Black anodize	1	A	2
23 x 23	All	374224B60023G	23.00	23.00	25.00	49.70	19.70	6.37	Black anodize	1	A	2
27 x 27	All	374324B60023G	27.00	27.00	10.00	49.70	30.60	9.35	Black anodize	1	A	2
27 x 27	All	374424B60023G	27.00	27.00	18.00	49.70	20.30	6.46	Black anodize	1	A	2
27 x 27	All	374524B60023G	27.00	27.00	25.00	49.70	16.50	5.47	Black anodize	1	A	2
35 x 35	Flip chip	10-5634-01G	31.00	34.90	23.00		11.50	4.20	Black anodize	2	C	2
35 x 35	Flip chip	10-THMA-01G	31.00	34.90	35.00		10.70	3.95	Black anodize	2	C	2
35 x 35	All	374624B60024G	35.00	35.00	10.00	62.30	23.40	7.55	Black anodize	1	B	2
35 x 35	All	374724B60024G	35.00	35.00	18.00	62.30	15.30	5.15	Black anodize	1	B	2
35 x 35	All	374824B60024G	35.00	35.00	25.00	62.30	12.00	4.27	Black anodize	1	B	2
37.5 x 37.5	Flip chip	10-BRD2-01G	35.70	37.30	23.00		11.50	4.20	Clear anodize	2	B	2
37.5 x 37.5	Flip chip	10-BRD1-01G	37.50	37.50	23.00		10.10	3.83	Black anodize	2	B	2
37.5 x 37.5	Flip chip	10-BRD1-03G	37.50	37.50	23.00		10.10	3.83	Black anodize	3	D	4
37.5 x 37.5	Flip chip	10-BRD1-04G	37.50	37.50	23.00		10.10	3.83	Black anodize	2	B	2
37.5 x 37.5	Flip chip	10-BRD1-05G	37.50	37.50	23.00		10.10	3.83	Clear anodize	3	D	4
37.5 x 37.5	Flip chip	10-BRD1-07G	37.50	37.50	23.00		10.10	3.83	Clear anodize	2	B	2
40 x 40	All	374924B60024G	40.00	40.00	10.00	62.30	20.30	6.46	Black anodize	1	B	2
40 x 40	All	375024B60024G	40.00	40.00	18.00	62.30	12.20	4.34	Black anodize	1	B	2
42 x 40	All	375124B60024G	40.00	40.00	25.00	62.30	10.30	3.83	Black anodize	1	B	2
42.5 x 42.5	Flip chip	10-CLS1-01G	42.30	42.30	23.00		8.80	3.51	Black anodize	2	E	2
42.5 x 42.5	Flip chip	10-CLS2-01G	42.30	42.30	35.00		8.30	3.44	Black anodize	2	E	2

SOLDER ANCHOR

Part Number	PCB Thickness (mm)	"A" Dim (mm)
125700D00000G	1.60	3.61
125800D00000G	2.54-2.79	4.70



1. Natural convection thermal resistance based on a 75° C heat sink temperature rise.
2. Force convection thermal resistance based on an entering 1.0 m/s (200LFM) airflow.
3. Solder anchors are sold separately refer to drawing above.
4. Solder anchor mechanical drawings and board mounting drawings see page 13.

Solder anchor heat sinks mechanical drawings

FIGURE 1

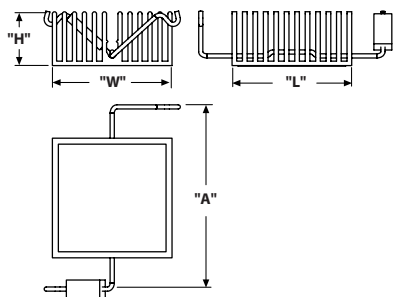


FIGURE 2

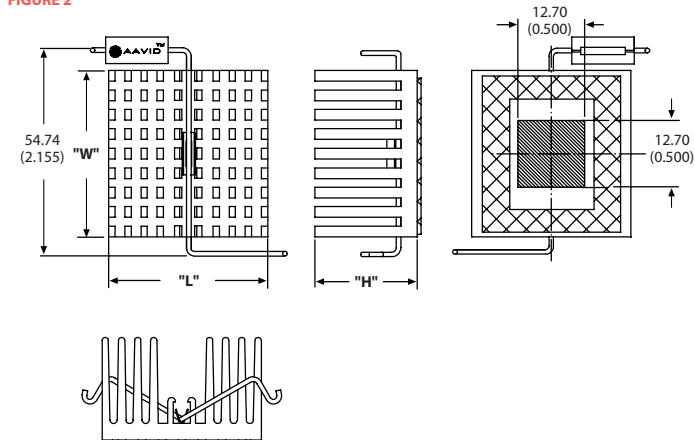
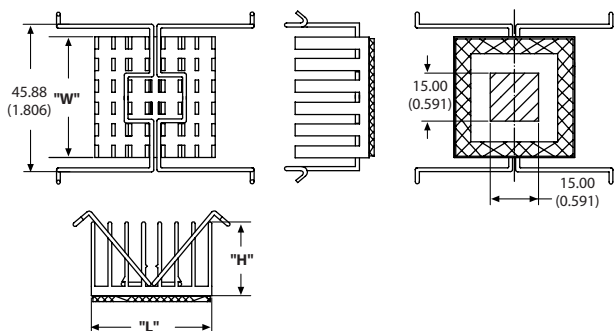


FIGURE 3



Board mounting pattern information for solder anchor heat sinks

FIGURE A

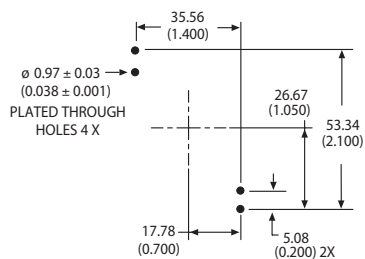


FIGURE B

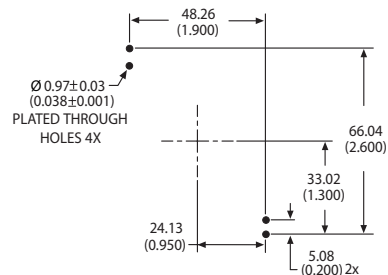


FIGURE C

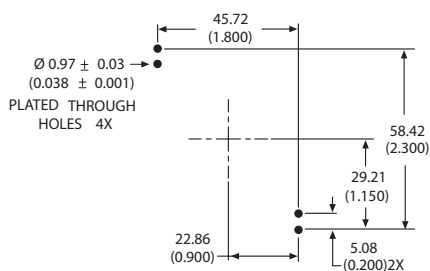


FIGURE D

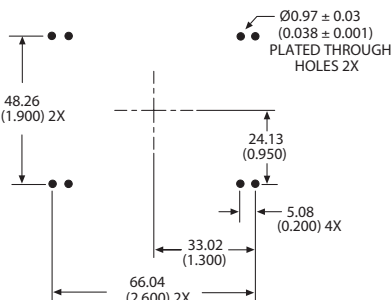
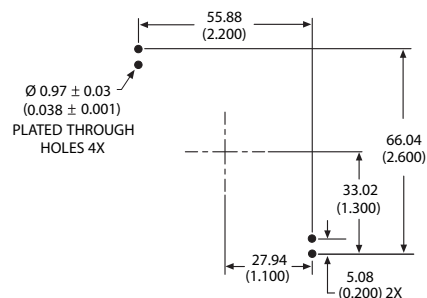


FIGURE E



Push pin attachment

Push pin heat sinks require two 3.10mm holes in the circuit card to quickly attach the heat sink over the device. The one piece design makes assembly a snap. Pressure is maintained by the tension of the push pin coil springs to ensure even pressure across the device. Push pins provide a greater margin of reliability in applications where gravity or vibration may cause tapes or adhesives to fail. The addition of a phase change pad optimizes thermal performance.



ORDERING INFORMATION

IC Pkg. Size (mm)	Part Number	"W" (mm)	"L" (mm)	"H" (mm)	"S" (mm)	"T" (mm)	θ_{n^2}	θ_{f^3}	Finish	Fig.	PCB Fig. ¹	Pin Style	Pad
28 x 28	10-6326-27G	28.00	28.00	6.00	46.60	6.50	44.10	13.13	Black anodize	1	A	Plastic	Yes
28 x 28	10-6326-28G	28.00	28.00	6.00	46.60	6.50	44.10	13.13	Black anodize	1	A	Brass	Yes
28 x 28	10-6327-01G	28.50	28.50	10.00	46.60	7.00	30.60	9.26	Black anodize	2	A	Plastic	No
35 x 35	10-TNT2-01G	36.10	48.00	11.60		6.50	18.80	6.13	Black anodize	3	D	Plastic	No
37.5 x 37.5	10-5597-02G	37.40	37.40	6.00	59.00	6.50	33.30	9.91	Green anodize	5	B	Plastic	No
37.5 x 37.5	10-5597-22G	37.40	37.40	6.00	59.00	6.50	33.30	9.91	Gold anodize	5	B	Plastic	Yes
37.5 x 37.5	10-5597-33G	37.40	37.40	6.00	59.00	6.50	33.30	9.91	Gold anodize	5	B	Brass	Yes
37.5 x 37.5	10-5607-04G	37.40	37.40	10.00	59.00	7.00	22.10	6.99	Black anodize	5	B	Plastic	Yes
37.5 x 37.5	10-5607-05G	37.40	37.40	10.00	59.00	7.00	22.10	6.99	Black anodize	5	B	Brass	Yes
37.5 x 37.5	372924M02000G	37.40	37.40	6.00	59.00	6.50	32.60	9.91	Green anodize	5	B	Plastic	No
45 x 45	10-L4LB-03G	45.20	41.40	11.89	58.80	8.00	16.70	5.60	Black anodize	4	C	Plastic	Yes
45 x 45	10-L4LB-05G	45.20	41.40	11.89	58.80	8.00	16.70	5.60	Black anodize	4	C	Brass	Yes
45 x 45	10-L4LB-11G	45.20	41.40	11.70	58.80	8.00	14.20	4.91	Black anodize	4	C	Plastic	No

1. Push pin mechanical drawings and board mounting drawings see page 15
2. Natural convection thermal resistance based on a 75° C heat sink temperature rise.
3. Forced convection thermal resistance based on an entering 1.0 m/s (200LFM) airflow.

Mechanical drawings

FIGURE 1

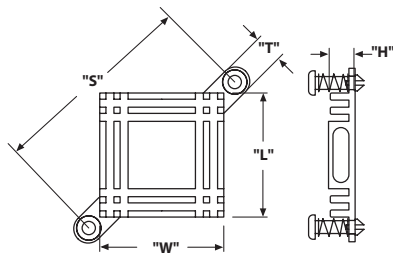


FIGURE 2

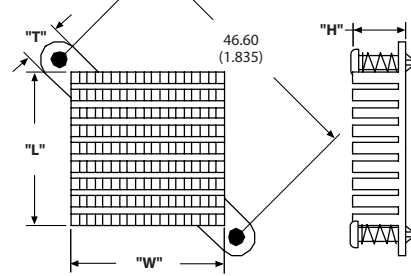


FIGURE 3

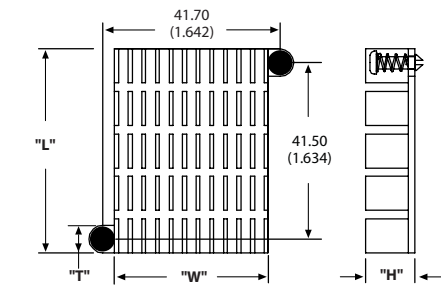


FIGURE 4

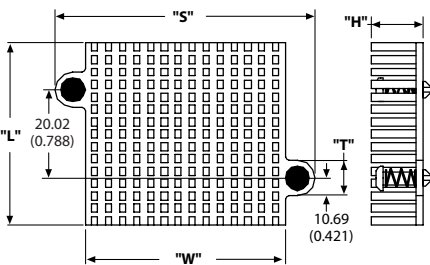
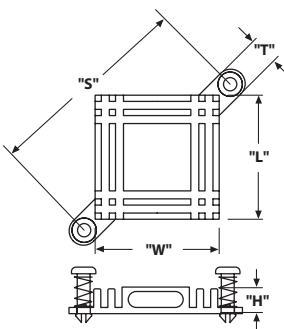


FIGURE 5



Board mounting pattern information

FIGURE A

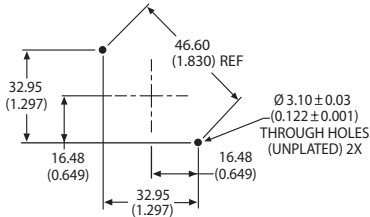


FIGURE B

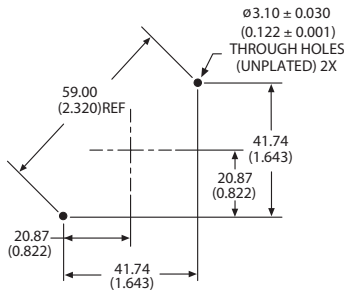


FIGURE C

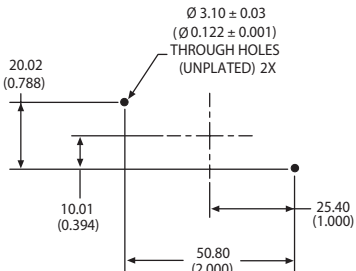
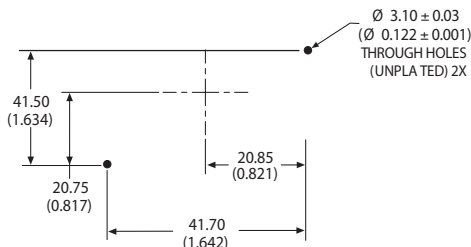
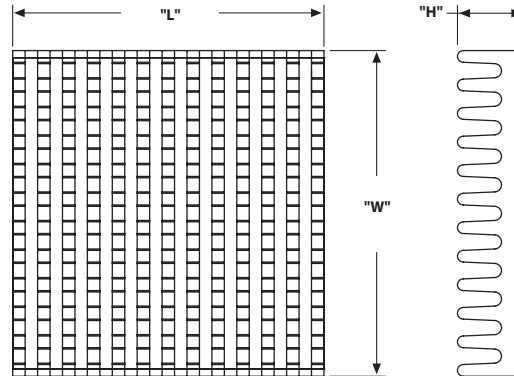
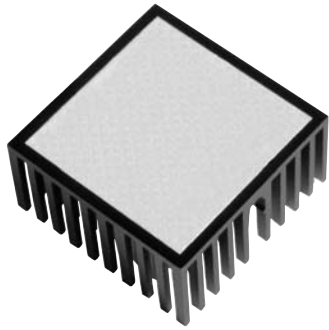


FIGURE D



Heat sinks for plastic BGA packages



Pressure sensitive, thermally conductive adhesive tape easily and reliably bonds a heat sink to an integrated circuit package. Tapes provide high thermal conductivity and exceptional bonding properties. Adhesives are formulated for plastic and metal/ceramic packages.

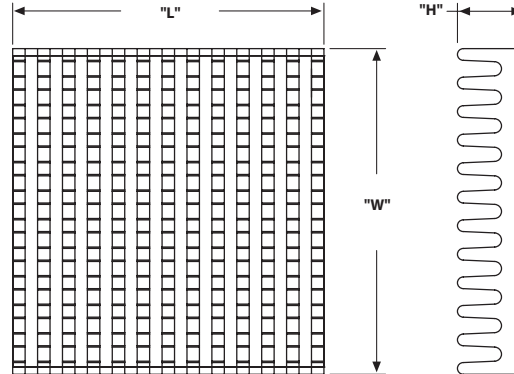
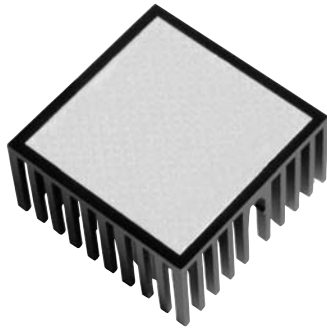
Material: Aluminum

ORDERING INFORMATION

IC Pkg. Size (mm)	IC Pkg. Style	Part Number	"W" (mm)	"L" (mm)	"H" (mm)	θ_{n^2}	θ_{f^3}	Finish	Tape code ¹
10 x 10	Plastic	375324B00035G	10.20	10.20	10.20	71.40	21.20	Black anodize	35
15 x 15	Plastic	375424B00034G	15.20	15.20	6.40	62.50	17.60	Black anodize	34
23 x 23	Plastic	374024B00035G	23.00	23.00	10.00	40.00	11.69	Black anodize	35
23 x 23	Plastic	374124B00035G	23.00	23.00	18.00	23.40	7.39	Black anodize	35
23 x 23	Plastic	374224B00035G	23.00	23.00	25.00	19.70	6.370	Black anodize	35
25 x 25	Plastic	335224B00034G	25.00	25.00	9.90	34.00	10.39	Black anodize	34
27 x 27	Plastic	374324B00035G	27.00	27.00	10.00	30.60	9.35	Black anodize	35
27 x 27	Plastic	374424B00035G	27.00	27.00	18.00	20.30	6.46	Black anodize	35
27 x 27	Plastic	374524B00035G	27.00	27.00	25.00	16.50	5.47	Black anodize	35
28 x 28	Plastic	373024B00034G	27.90	27.90	8.90	33.30	10.00	Black anodize	34
28 x 28	Plastic	2327B-CP50G	27.90	28.10	15.20	23.40	7.43	Black anodize	34
31 x 31	Plastic	335824B00034G	30.00	30.00	9.40	29.40	9.11	Black anodize	34
35 x 35	Plastic	371824B00034G	35.00	35.00	7.00	31.90	9.67	Black anodize	34
35 x 35	Plastic	374624B00035G	35.00	35.00	10.00	23.40	7.55	Black anodize	35
35 x 35	Plastic	374724B00035G	35.00	35.00	18.00	15.30	5.15	Black anodize	35
35 x 35	Plastic	374824B00035G	35.00	35.00	25.00	12.00	4.27	Black anodize	35
35 x 35	Plastic	372024B00034G	35.00	35.00	27.90	11.90	4.28	Black anodize	34
40 x 40	Plastic	374924B00035G	40.00	40.00	10.00	20.30	6.46	Black anodize	35
40 x 40	Plastic	364424B00034G	40.10	40.00	11.40	18.40	6.02	Black anodize	34
40 x 40	Plastic	375024B00035G	40.00	40.00	18.00	12.20	4.34	Black anodize	35
40 x 40	Plastic	375124B00035G	40.00	40.00	25.00	10.30	3.83	Black anodize	35

1. For tape specifications see page 88
2. Natural convection thermal resistance based on a 75° C heat sink temperature rise.
3. Forced convection thermal resistance based on an entering 1.0 m/s (200LFM) airflow.

Heat sinks for metal/ceramic BGA packages



Material: Aluminum

ORDERING INFORMATION

IC Pkg. Size (mm)	IC Pkg. Style	Part Number	"W" (mm)	"L" (mm)	"H" (mm)	θ_{n^2}	θ_{f^2}	Finish	Tape Code ¹
10 x 10	Metal / Ceramic	375224B00032G	10.20	11.10	10.20	71.40	21.20	Black anodize	32
23 x 23	Metal / Ceramic	374024B00032G	23.00	23.00	10.00	40.00	11.69	Black anodize	32
23 x 23	Metal / Ceramic	374124B00032G	23.00	23.00	18.00	23.40	7.39	Black anodize	32
23 x 23	Metal / Ceramic	374224B00032G	23.00	23.00	25.00	19.70	6.370	Black anodize	32
25 x 25	Metal / Ceramic	335224B00032G	25.00	25.00	9.90	34.00	10.39	Black anodize	32
27 x 27	Metal / Ceramic	335324B00032G	26.90	26.90	11.40	27.70	8.71	Black anodize	32
27 x 27	Metal / Ceramic	374324B00032G	27.00	27.00	10.00	30.60	9.35	Black anodize	32
27 x 27	Metal / Ceramic	374424B00032G	27.00	27.00	18.00	20.30	6.46	Black anodize	32
27 x 27	Metal / Ceramic	374524B00032G	27.00	27.00	25.00	16.50	5.47	Black anodize	32
28 x 28	Metal / Ceramic	373024B00032G	27.90	27.90	8.89	33.30	10.00	Black anodize	32
28 x 28	Metal / Ceramic	373224M00032G	28.00	28.00	6.00	44.10	13.13	Green anodize	32
28 x 28	Metal / Ceramic	2327B-TACHG	27.90	28.10	15.20	23.40	7.43	Black anodize	32
31 x 31	Metal / Ceramic	335724B00032G	30.10	30.10	6.60	35.70	10.84	Black anodize	32
31 x 31	Metal / Ceramic	335824B00032G	30.00	30.00	9.40	29.40	9.11	Black anodize	32
32.5 x 32.5	Metal / Ceramic	2338B-TACHG	33.00	31.40	12.50	23.10	7.23	Black anodize	32
35 x 35	Metal / Ceramic	371824B00032G	35.00	35.00	7.00	31.90	9.67	Black anodize	32
35 x 35	Metal / Ceramic	374624B00032G	35.00	35.00	10.00	23.40	7.55	Black anodize	32
35 x 35	Metal / Ceramic	374724B00032G	35.00	35.00	18.00	15.30	5.15	Black anodize	32
35 x 35	Metal / Ceramic	374824B00032G	35.00	35.00	25.00	12.00	4.27	Black anodize	32
35 x 35	Metal / Ceramic	372024B00032G	35.00	35.00	27.90	11.90	4.28	Black anodize	32
37.5 x 37.5	Metal / Ceramic	373324M00032G	37.40	37.40	6.00	32.60	9.91	Green anodize	32
37.5 x 37.5	Metal / Ceramic	2319B-TACHG	38.10	38.10	10.16	12.50	3.50	Black anodize	32
37.5 x 37.5	Metal / Ceramic	336624B00032G	38.10	38.10	16.00	15.30	5.15	Black anodize	32
40 x 40	Metal / Ceramic	374924B00032G	40.00	40.00	10.00	20.30	6.46	Black anodize	32
40 x 40	Metal / Ceramic	364424B00032G	40.10	40.00	11.40	18.40	6.02	Black anodize	32
40 x 40	Metal / Ceramic	375024B00032G	40.00	40.00	18.00	12.20	4.34	Black anodize	32
40 x 40	Metal / Ceramic	375124B00032G	40.00	40.00	25.00	10.30	3.83	Black anodize	32
42.5 x 42.5	Metal / Ceramic	2321B-TACHG	43.20	41.30	8.90	22.10	6.93	Black anodize	32
42.5 x 42.5	Metal / Ceramic	2332B-TACHG	43.20	41.30	16.50	12.90	4.53	Black anodize	32
45 x 45	Metal / Ceramic	2342B-TACHG	45.70	44.60	7.00	23.10	7.26	Black anodize	32
50 +	Metal / Ceramic	3334B-TACHG	50.50	50.20	16.50	6.0	3.3	Black anodize	32

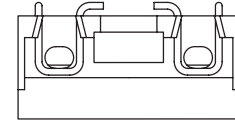
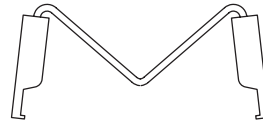
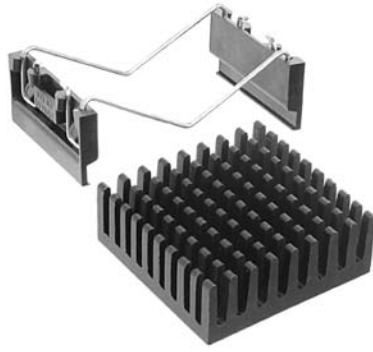
1. For tape specifications see page 88

2. Natural convection thermal resistance based on a 75° C heat sink temperature rise.

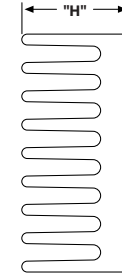
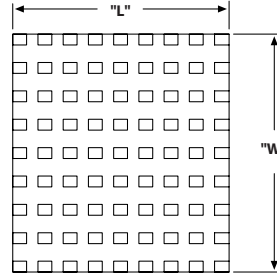
3. Forced convection thermal resistance based on an entering 1.0 m/s (200LFM) airflow.

BGA-Clip Attachment

Clip attachment



Aavid's BGS Clip heat sinks provide a mechanical attachment alternative to tape applications where it is desirable to attach the heat sink directly to the device. The unique clip uses spring pressure to ensure even contact across the device while the end plates firmly engage the edge of the package, locking the heat sink in place. Each heat sink uses pre-applied thermal grease for optimum thermal performance.

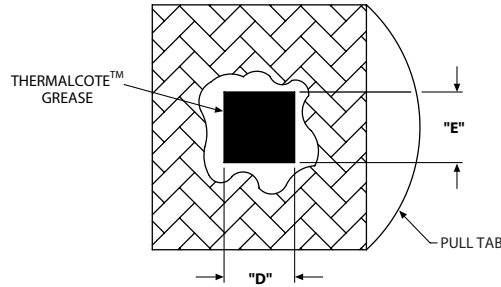


Material: Aluminum
Finish: Black Anodize

ORDERING INFORMATION

IC Pkg. Size (mm)	Part Number	"W" (mm)	"L" (mm)	"H" (mm)	IC Pkg. Style	θ_{n1}	θ_{f2}	Interface	Clip
27 x 27	2317B-EP11-BGS1G	26.14	20.47	15.24	All	32.60	9.94	EP11	BGS1
35 x 35	2518B-EP11-BGS2G	30.50	28.10	15.60	All	22.70	7.05	EP11	BGS2
42.5 x 42.5	2519B-EP11-BGS5G	34.50	31.40	15.60	All	19.70	6.30	EP11	BGS5
42.5 x 42.5	2520B-EP04-BGS5G	38.10	38.00	15.60	All	15.60	5.17	EP04	BGS5
42.5 x 42.5	2522B-EP04-BGS5G	38.10	38.00	10.16	All	22.10	6.94	EP04	BGS5

1. Natural convection thermal resistance based on a 75° C heat sink temperature rise.
2. Forced convection thermal resistance based on an entering 1.0 m/s (200LFM) airflow.

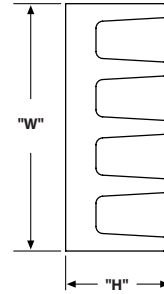


TAPE TYPE AND INTERFACE MATERIAL INFORMATION

Material	Description	Adhesive	Thermal Resistance	Color	Carrier	"D" Dim	"E" Dim
EP11	Thermalcote™ grease with release liner	None	0.18	White	None	13.34 (0.525)	13.34 (0.525)
EP04	Thermalcote™ grease with release liner	None	0.03	White	None	31.75 (1.250)	31.75 (1.250)

For more information on Thermalcote™ see page 113.

Bi Directional



Designed for applications with airflow traveling in a single direction, these heat sinks are suitable for a variety of standard square IC packages. Models are available with pre-applied thermal tape for easy attachment to the IC. Epoxy attach models are also available.

Material: Aluminum

ORDERING INFORMATION

IC Pkg Size	IC Pkg Style	Part Number	"W" (mm)	"L" (mm)	"H" (mm)	θn ¹	θf ²	Finish	Attachment	Tape Code ³
10 X 10	All	615653B00250G	6.00	6.00	5.00	142.58	76.26	Black anodize	Epoxy ¹	N/A
10 X 10	All	709203B00400G	10.00	10.00	10.00	55.98	29.94	Black anodize	Epoxy ¹	N/A
24 X 24	Metal	335114B00032G	24.00	24.00	24.00	13.60	7.27	Black anodize	Tape	32
25 X 25	Metal	335214B00032G	25.00	25.00	10.00	10.00	5.35	Black anodize	Tape	32
25 X 25	Metal	335211B00032G	25.00	25.00	10.00	10.00	5.35	Black anodize	Tape	32
25 X 25	All	335214B00000G	25.00	25.00	10.00	10.00	5.35	Black anodize	Epoxy ¹	N/A
25 X 25	All	335211B00000G	25.00	25.00	10.00	10.00	5.35	Black anodize	Epoxy ¹	N/A
25 X 25	Plastic	335214B00034G	25.00	25.00	10.00	10.00	5.35	Black anodize	Tape	34
27 X 27	Plastic	335314B00035G	27.00	27.00	11.00	10.00	5.35	Black anodize	Tape	35
27 X 27	Metal	335314B00032G	27.00	27.00	11.00	10.00	5.35	Black anodize	Tape	32
27 X 27	All	335314B00000G	27.00	27.00	11.00	10.00	5.35	Black anodize	Epoxy ¹	N/A
28 X 28	All	700353U01100G	28.00	28.00	9.00	18.49	9.89	Unfinished	Epoxy ¹	N/A
30 X 30	All	335814B00000G	30.00	30.00	9.00	10.50	5.61	Black anodize	Epoxy ¹	N/A
30 X 30	All	335714B00000G	30.00	30.00	7.00	15.20	8.13	Black anodize	Epoxy ¹	N/A
30 X 30	Metal	335814B00032G	30.00	30.00	9.00	9.20	4.92	Black anodize	Tape	32
30 X 30	Metal	335714B00032G	30.00	30.00	7.00	15.20	8.13	Black anodize	Tape	32
37.5 X 37.5	All	799403B01500G	38.00	38.00	10.00	12.21	6.53	Black anodize	Epoxy ¹	N/A
37.5 X 37.5	All	336314B00000G	36.00	36.00	17.00	11.00	5.88	Black anodize	Epoxy ¹	N/A

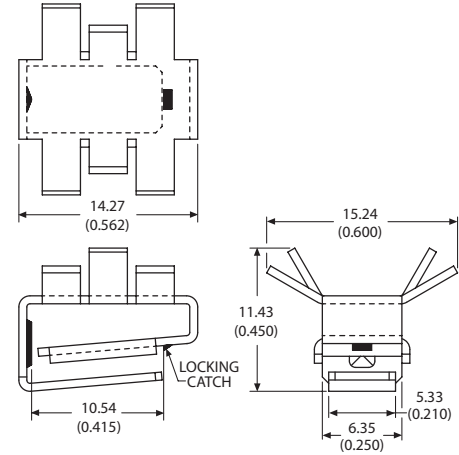
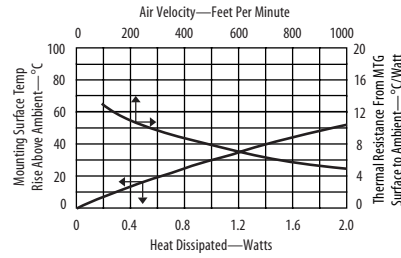
1. Epoxy ordered separately for information on Epoxy see page 114,115.
2. For tape specifications see page 88.
3. Natural convection thermal resistance based on a 75°C heat sink temperature rise.
4. Forced convection thermal resistance based on an entering 1.0 m/s (200LFM) airflow.



5801 Slide on heat sink with staggered fins



Slide on heat sink with staggered fins attaches to 8 pin DIP packages quickly and easily. The heat sink features double spring action and locking catch to firmly attach the device creating a thermal conduction path on both the top and bottom surfaces. Available in two finishes.

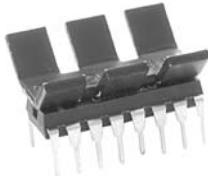


Material: 0.63 (0.025) Thick Aluminum
Finish: See Table

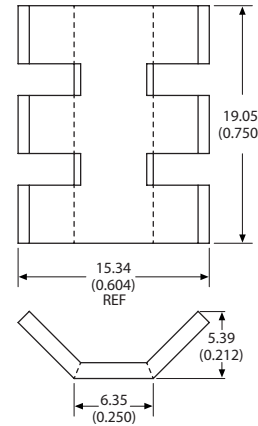
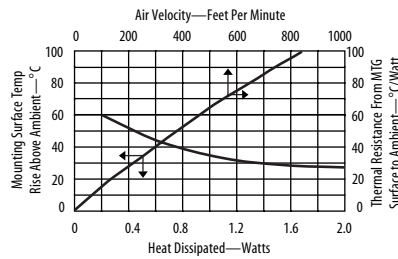
ORDERING INFORMATION

Part Number	Finish
580100B00000G	Black anodize
580100W00000G	Black anodize with black paint on bottom side

5010 Angle fin heat sink



Angle fin heat sink is a simple low cost solution for cooling DIP devices. Suitable for 14 and 16 pin packages and available in two finish options. Easily attaches using thermal epoxy.



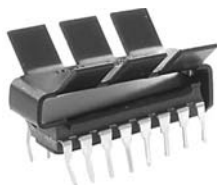
Material: 1.27 (0.050) Thick Aluminum
Finish: See Table

ORDERING INFORMATION

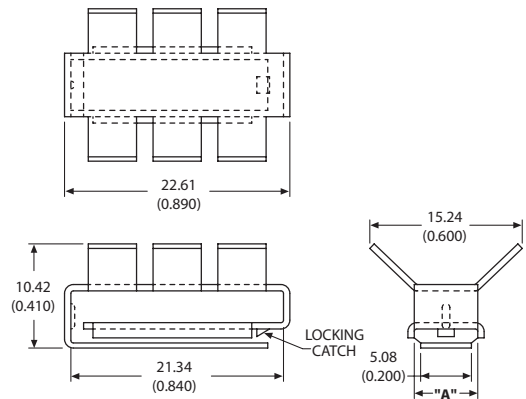
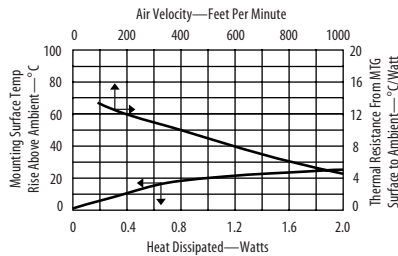
Part Number	Finish
501000J00000G	Pre black anodize*
501000B00000G	Black anodize

* Edges cut during the manufacturing process will be unfinished. See page 110 for more information.

5602, 5802 Slide on heat sink with angled fins



Slide on heat sink with angled fins attaches to 14 and 16 pin DIP packages quickly and easily. The heat sink features double spring action and locking catch to firmly attach the device creating a thermal conduction path on both the top and bottom surfaces. Available in two finishes.



Material: 0.63 (0.025) Thick Aluminum
Finish: See Table

ORDERING INFORMATION

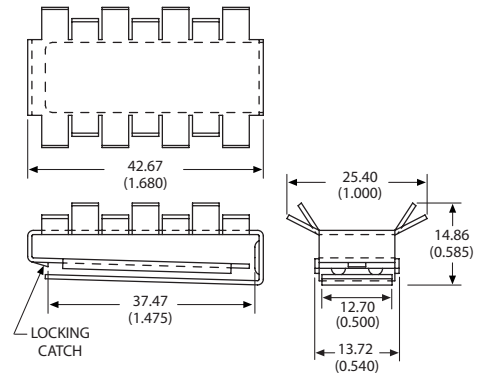
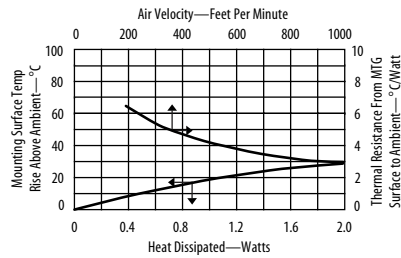
Part Number	Device Pkg Style	Finish	"A" Dim
560200B00000G	Ceramic	Black anodize	7.87 (0.310)
560200W00000G	Ceramic	Black anodize with black paint on bottom side	7.87 (0.310)
580200B00000G	Plastic	Black anodize	6.35 (0.250)
580200W00000G	Plastic	Black anodize with black paint on bottom side	6.35 (0.250)



5806 Slide on heat sink with staggered fins



Slide on heat sink with staggered fins attaches to 28 pin DIP packages quickly and easily. The heat sink features double spring action and locking catch to firmly attach the device creating a thermal conduction path on both the top and bottom surfaces.

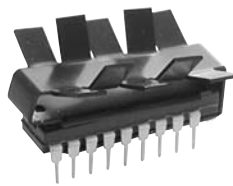


Material: 0.81 (0.032) Thick Aluminum
Finish: Black Anodize

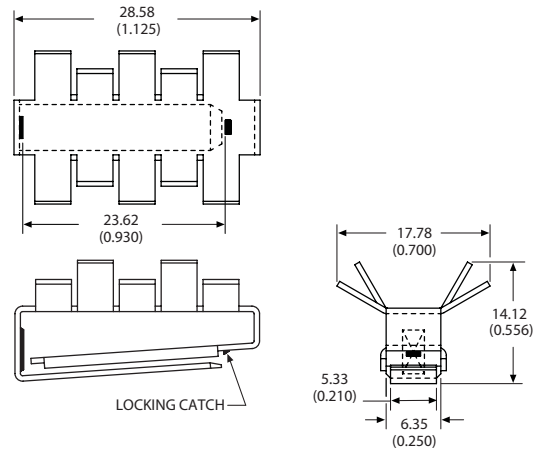
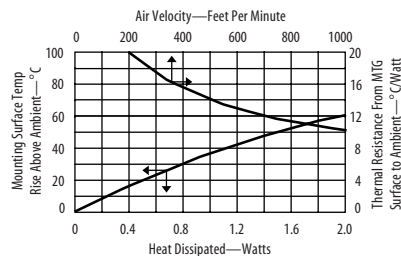
ORDERING INFORMATION

Part Number	Description
580600B00000G	Slide on heat sink with staggered fins

5803 Slide on heat sink with staggered fins



Slide on heat sink with staggered fins attaches to 18 pin DIP packages quickly and easily. The heat sink features double spring action and locking catch to firmly attach the device creating a thermal conduction path on both the top and bottom surfaces.



Material: 0.63 (0.025) Thick Aluminum
Finish: Black Anodize

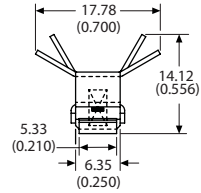
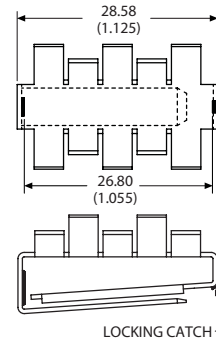
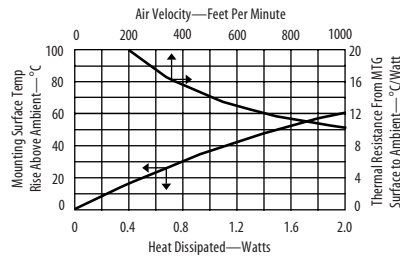
ORDERING INFORMATION

Part Number	Description
580300B00000G	Slide on heat sink with staggered fins

5804 Slide on heat sink with staggered fins



Slide on heat sink with staggered fins attaches to 20 pin DIP packages quickly and easily. The heat sink features double spring action and locking catch to firmly attach the device creating a thermal conduction path on both the top and bottom surfaces.

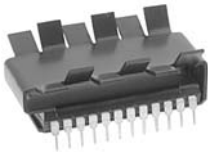


Material: 0.63 (0.025) Thick Aluminum
Finish: Black Anodize

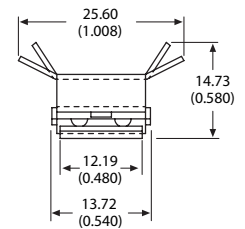
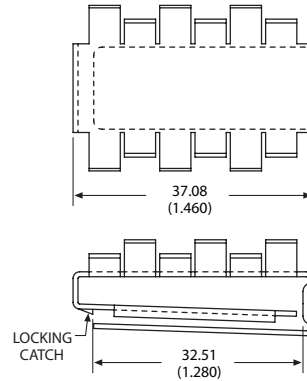
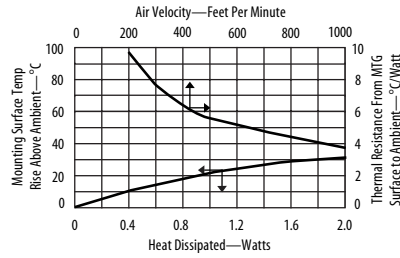
ORDERING INFORMATION

Part Number	Description
580400B00000G	Slide on heat sink with staggered fins

5805 Slide on heat sink with staggered fins



Slide on heat sink with staggered fins attaches to 24 pin DIP packages quickly and easily. The heat sink features double spring action and locking catch to firmly attach the device creating a thermal conduction path on both the top and bottom surfaces.



Material: 0.81 (0.032) Thick Aluminum
Finish: Black Anodize

ORDERING INFORMATION

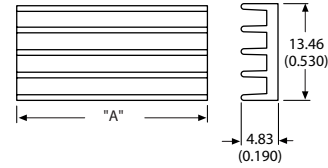
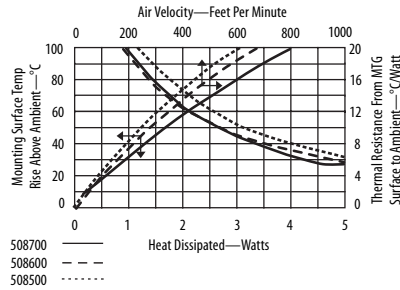
Part Number	Description
580500B00000G	Slide on heat sink with staggered fins

5085, 5086, 5087

Extruded epoxy attach on heat sink with straight fins



Extruded epoxy attach on heat sink with straight fins attaches to 24, 28, and 40 pin DIP packages quickly and easily. May be added before or after final board assembly. No additional board space is required.



Material: Aluminum
Finish: Black Anodize

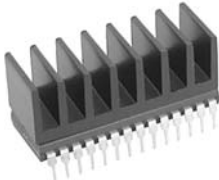
ORDERING INFORMATION

Part Number	DIP Package	"A" Dim
508500B00000G	24 pin	31.75 (1.250)
508600B00000G	28 pin	36.83 (1.450)
508700B00000G	40 pin	50.80 (2.000)

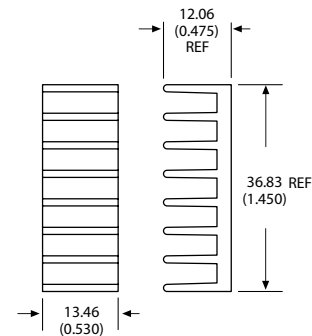
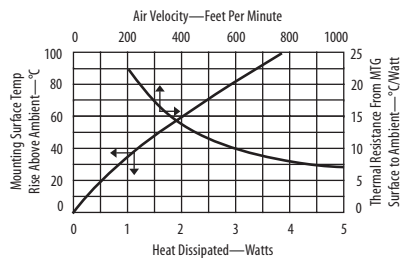
For epoxy information see pages 114-115.

6284

Extruded epoxy attach heat sink



Extruded epoxy attach heat sink which requires no additional board space is suitable for narrow DIP packages. May be added before or after final board assembly. No additional board space is required. Attaches to 28 pin DIP.



Material: Aluminum
Finish: Black Anodize

ORDERING INFORMATION

Part Number	Description
6284BG	Extruded epoxy attach heat sink for 28 pin DIP

For epoxy information see pages 114-115.

5011, 5012

Extruded epoxy attach heat sink with straight fins

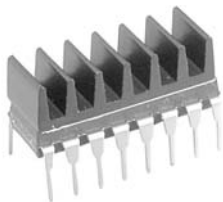


FIGURE A

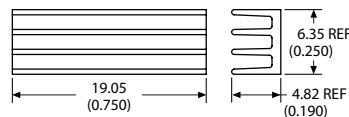
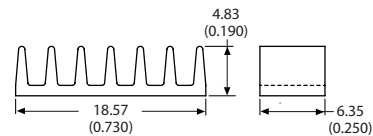


FIGURE B



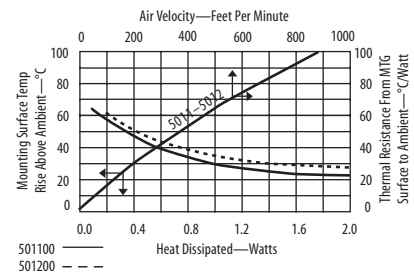
Material: Aluminum
Finish: Black Anodize

Extruded epoxy attach heat sink with straight fins attaches to 14 and 16 pin DIP packages quickly and easily. May be added before or after final board assembly. No additional board space is required. Available in two fin directions.

ORDERING INFORMATION

Part Number	Description	Figure
501100B00000G	Extruded epoxy attach heat sink with straight fins	A
501200B00000G	Extruded epoxy attach heat sink with straight fins	B

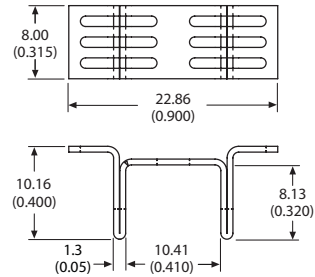
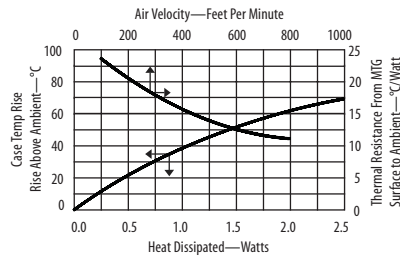
For epoxy information see pages 114-115.



5731 Surface mount heat sink for D-PAK (TO-252) package semiconductors



Surface mount heat sink for D-PAK (TO-252) package semiconductors remove the heat indirectly without contacting the device like traditional through hole heat sinks. The device and the heat sink are soldered directly to a modified drain pad creating a thermal transfer path from package tab to the heat sink.



Material: 0.63 (0.025) Thick Copper
Finish: Tin Plated

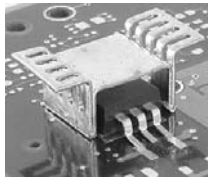
Refer to Figure A and B on page 26 for board footprint information

ORDERING INFORMATION

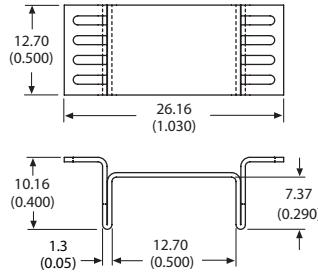
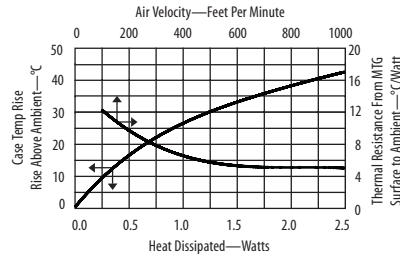
Part Number	Packaging
573100D00010G	13" Reel, 250 per reel
573100D00000G	Bulk, 500 per bag

See page 25 for tape and reel information

5733 Surface mount heat sink for D² PAK (TO-263) package semiconductors



Surface mount heat sink for D² PAK (TO-263) package semiconductors remove the heat indirectly without contacting the device like traditional through hole heat sinks. The device and the heat sink are soldered directly to a modified drain pad creating a thermal transfer path from package tab to the heat sink.



Material: 0.63 (0.025) Thick Copper
Finish: Tin Plated

Refer to Figure A and B on page 26 for board footprint information

ORDERING INFORMATION

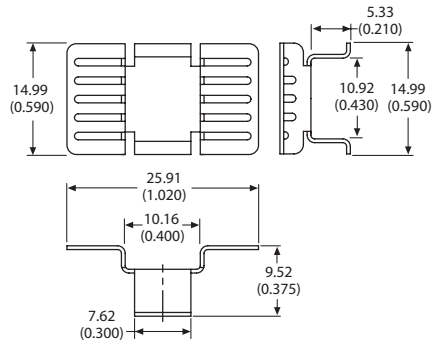
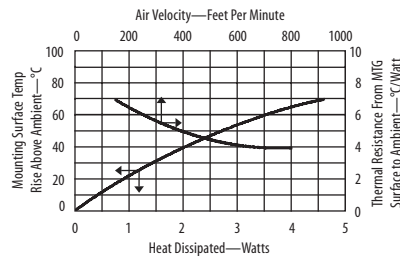
Part Number	Packaging
573300D00010G	13" Reel, 250 per reel
573300D00000G	Bulk, 500 per bag

See page 25 for tape and reel information

7106 Surface mount heat sink for D² PAK (TO-263), power SO-10 (MO-184) and SO-10 package semiconductors



Surface mount heat sink for D² PAK (TO-263), power SO-10 (MO-184) and SO-10 package semiconductors remove the heat indirectly without contacting the device like traditional through hole heat sinks. The device and the heat sink are soldered directly to a modified drain pad creating a thermal transfer path from package tab to the heat sink.



Material: 0.63 (0.025) Thick Copper
Finish: Tin Plated

Refer to Figure C on page 26 for board footprint information

ORDERING INFORMATION

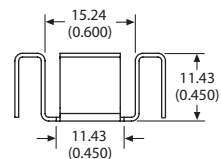
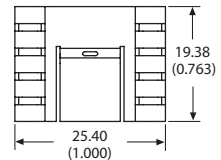
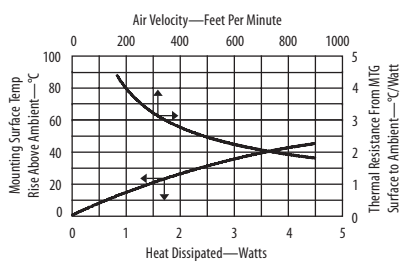
Part Number	Packaging
7106D/TRG	13" Reel, 200 per reel
7106DG	Bulk, 500 per bag

See page 25 for tape and reel information

7109 Surface mount heat sink for D² PAK (TO-263) package semiconductors



Surface mount heat sink for D² PAK (TO-263) package semiconductors remove the heat indirectly without contacting the device like traditional through hole heat sinks. The device and the heat sink are soldered directly to a modified drain pad creating a thermal transfer path from package tab to the heat sink.



Refer to Figure D on page 26 for board footprint information

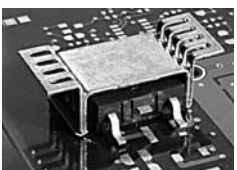
Material: 0.63 (0.025) Thick Copper
Finish: Tin Plated

ORDERING INFORMATION

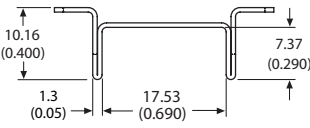
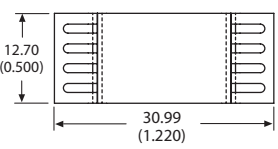
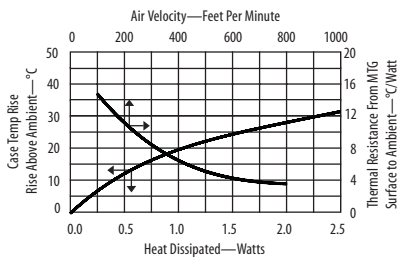
Part Number	Packaging
7109D/TRG	13" Reel, 125 per reel
7109DG	Bulk, 500 per bag

See below for tape and reel information

5734 Surface mount heat sink for D³ PAK (TO-268) package semiconductors



Surface mount heat sink for D³ PAK (TO-268) package semiconductors remove the heat indirectly without contacting the device like traditional through hole heat sinks. The device and the heat sink are soldered directly to a modified drain pad creating a thermal transfer path from package tab to the heat sink.



Refer to Figure A and B on page 26 for board footprint information

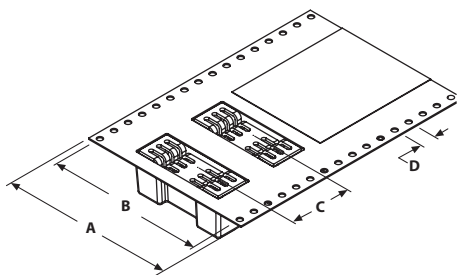
Material: 0.63 (0.025) Thick Copper
Finish: Tin Plated

ORDERING INFORMATION

Part Number	Packaging
573400D00010G	13" Reel, 250 per reel
573400D00000G	Bulk, 500 per bag

See below for tape and reel information

Tape and Reel information



ORDERING INFORMATION

Part Number	"A" Dim	"B" Dim	"C" Dim	"D" Dim
7106D/TRG	44.00 (1.730)	40.40 (1.590)	24.00 (0.940)	4.06 (0.160)
7109D/TRG	44.00 (1.730)	40.40 (1.590)	36.00 (1.420)	4.06 (0.160)
573100D00010G	44.00 (1.730)	40.40 (1.590)	16.00 (0.630)	4.06 (0.160)
573300D00010G	44.00 (1.730)	40.40 (1.590)	24.00 (0.940)	4.06 (0.160)
573400D00010G	44.00 (1.730)	40.40 (1.590)	24.00 (0.940)	4.06 (0.160)