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# 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

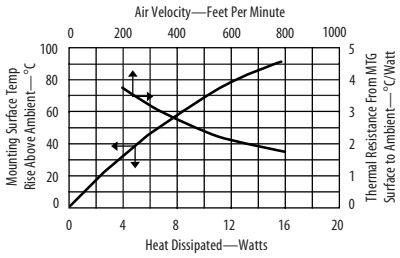
**7022** Channel style heat sink with folded back fins

Grease & Epoxy page112

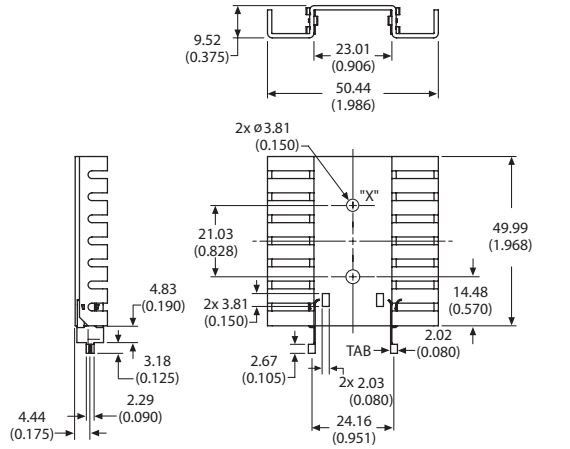
Mounting Kits page 99

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.

Material and finish information is shown for each part

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

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

### 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

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

### POPULAR OPTIONS: 7022B-____G

Base part no. A RoHS Compliant

| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | TC11-MT | Insulated device mounting clip for T0-220 and solderable tabs | Hole X | Page |

For additional options see page xx

Detailed indexes are available to select additional options.



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| 6399BG | 3.3 | V | 60 |
| 6399B-P2G | 3.3 | V | 60 |
| 6400BG | 2.7 | V | 60 |
| 6400B-P2G | 2.7 | V | 60 |

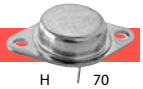
## SIPS

| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| 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

| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| **D-PAK TO-252** | | | |
| 573100D00010G | 25.0 | H | 24 |
| 573100D00000G | 25.0 | H | 24 |
| **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 |
| **D³PAK TO-268** | | | |
| 573400D00010G | 11.0 | H | 25 |
| 573400D00000G | 11.0 | H | 25 |

## TO-3



| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| 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

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

| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| 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

| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| 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 |

## TO-66

| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| 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 |

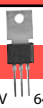
## TO-92

| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| 575200B00000G | 60.0 | V | 68 |
| 575300B00000G | 50.0 | V | 68 |
| 575400B00000G | 40.0 | V | 68 |
| 92FG | 36.1 | V | 68 |

## TO-126

| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| 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



| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| 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

| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| 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 |
| 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 | 60 |
| 6400BG | 2.7 | V | 60 |
| 6400B-P2G | 2.7 | V | 60 |

## TO-220

| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| 6094PBG | 40.5 | H | 43 |
| PF730G | 35.8 | V | 65 |
| PF732G | 35.8 | V | 65 |
| 7178DG | 35.7 | V | 35 |
| 6049PBG | 34.1 | V | 43 |
| 576802V00000G | 32.6 | V | 52 |
| 576802U00000G | 32.6 | V | 52 |
| 576802V03100G | 32.6 | H | 52 |
| 576802U03100G | 32.6 | H | 52 |
| 576802V04000G | 32.6 | V | 52 |
| 576802U04000G | 32.6 | V | 52 |
| 577002B00000G | 32.0 | H–V | 34 |
| 577002B04000G | 32.0 | V | 34 |
| TV58G | 29.9 | H–V | 31 |
| PF720G | 28.9 | V | 44 |
| PF723G | 28.9 | V | 44 |
| 7139DG | 28.3 | H | 35 |
| 576802B00000G | 27.3 | V | 52 |
| 576802B03100G | 27.3 | H | 52 |
| 576802B04000G | 27.3 | V | 52 |
| TV46G | 27.1 | H–V | 31 |
| TV47G | 27.1 | H–V | 31 |
| 591202B00000G | 26.8 | H–V | 51 |
| 591202B03100G | 26.8 | H | 51 |



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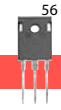
| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| 591202B04000G | 26.8 | V | 51 |
| 591302B00000G | 26.8 | H–V | 51 |
| 591302B02800G | 26.8 | V | 51 |
| 591302B04000G | 26.8 | H | 51 |
| 579802B00000G | 26.4 | V | 43 |
| 579802B03300G | 26.4 | V | 43 |
| 579902B00000G | 26.4 | V | 43 |
| 579902B03300G | 26.4 | V | 43 |
| 577102B00000G | 25.9 | H–V | 34 |
| 577102B04000G | 25.9 | V | 34 |
| 7173DG | 25.8 | V | 39 |
| 6236BG | 25.0 | V | 39 |
| 6236PBG | 25.0 | V | 39 |
| 6237BG | 25.0 | H | 42 |
| 6237PBG | 25.0 | H | 42 |
| 577202B00000G | 24.4 | H–V | 34 |
| 577202B04000G | 24.4 | V | 34 |
| 507302B00000G | 24.0 | H–V | 38 |
| 507302J00000G | 24.0 | H–V | 38 |
| 542502B00000G | 24.0 | H | 49 |
| 542502D00000G | 24.0 | H | 49 |
| TV96G | 24.0 | H | 53 |
| PF752G | 23.7 | V | 44 |
| 576014B00000G | 23.2 | H–V | 40 |
| 574402B00000G | 23.2 | H–V | 45 |
| 574402B03200G | 23.2 | H | 45 |
| 574102B00000G | 23.2 | H–V | 45 |
| 574102B03300G | 23.2 | V | 45 |
| 6043PBG | 23.0 | V | 43 |
| 592502B03400G | 22.0 | V | 49 |
| 592502U03400G | 22.0 | V | 49 |
| 574602B00000G | 21.6 | H–V | 45 |
| 574602B03300G | 21.6 | V | 45 |
| 574502B00000G | 21.2 | H–V | 45 |
| 574502B03300G | 21.2 | V | 45 |
| 6110PBG | 21.0 | H–V | 35 |
| 576012B00000G | 20.8 | H–V | 40 |
| 7137DG | 20.8 | V | 42 |
| 7140DG | 20.8 | H | 42 |
| 574802B00000G | 20.4 | H–V | 43 |
| 574802B03300G | 20.4 | V | 43 |
| PF750G | 20.3 | V | 44 |
| 7142DG | 20.3 | H | 36 |
| 7141DG | 20.3 | V | 38 |
| 530714B00000G | 20.3 | H–V | 40 |
| 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 |
| 506902B00000G | 20.0 | V | 41 |
| TV97G | 20.0 | H–V | 53 |
| 7136DG | 19.7 | V | 35 |
| 7128DG | 19.2 | V | 36 |
| 566902B00000G | 18.8 | H-V | 53 |
| 566902B03100G | 18.8 | H | 53 |
| 566902B04000G | 18.8 | V | 53 |
| 6038BG | 18.0 | V | 36 |
| 592902B03400G | 17.9 | V | 33 |
| 6025DG | 17.9 | V | 48 |
| 6025B-TTG | 17.9 | V | 48 |
| ML26AAG | 17.9 | H | 50 |
| 581002B02500G | 17.4 | V | 61 |
| PF758G | 17.3 | V | 44 |
| TV1505G | 17.0 | V | 32 |
| 6109PBG | 17.0 | H–V | 35 |
| 575102B00000G | 16.8 | H–V | 46 |
| 579302B00000G | 16.8 | V | 46 |
| 579402B00000G | 16.8 | V | 46 |
| 581102B02500G | 16.8 | V | 61 |
| 530614B00000G | 16.7 | H–V | 40 |
| 530613B00000G | 16.7 | H–V | 40 |
| 6022PBG | 16.7 | V | 47 |
| 6022BG | 16.7 | V | 47 |
| 576602B00000G | 16.6 | V | 33 |
| 576602D00000G | 16.6 | V | 33 |
| 574902B00000G | 16.0 | H–V | 45 |
| 574902B03300G | 16.0 | V | 45 |
| 504102B00000G | 15.6 | H–V | 38 |
| 507002B00000G | 15.6 | H–V | 41 |
| 507102B00000G | 15.6 | H–V | 41 |
| 6225B-MTG | 15.0 | V | 47 |
| TV1500G | 14.2 | V | 32 |
| 575002B00000G | 13.6 | V | 33 |
| 575002D00000G | 13.6 | V | 33 |
| 6238BG | 13.6 | H–V | 37 |
| 6238B-MTG | 13.6 | V | 37 |
| 6239B-MTG | 13.6 | V | 37 |
| 593002B03400G | 13.4 | V | 33 |
| 534202B02853G | 13.4 | V | 37 |
| 534202B03453G | 13.4 | V | 37 |
| 513002B02500G | 13.4 | V | 58 |
| 531002B02500G | 13.4 | V | 59 |
| 531002V02500G | 13.4 | V | 59 |
| 577922B00000G | 13.2 | V | 40 |
| 578622B03200G | 13.2 | V | 40 |
| TV265G | 13.0 | V | 32 |
| 5900PBG | 13.0 | V | 32 |
| 563002B00000G | 13.0 | V | 33 |
| 563002D00000G | 13.0 | V | 33 |
| 533802B02554G | 13.0 | V | 50 |
| 533002B02551G | 13.0 | V | 55 |
| SW25-6G | 13.0 | V | 59 |
| 581202B02500G | 12.8 | V | 61 |
| 6021BG | 12.5 | V | 30 |
| 6021PBG | 12.5 | V | 30 |
| 6221PBG | 12.5 | V | 30 |
| 6230DG | 12.5 | V | 30 |
| 551002B00000G | 12.4 | H | 29 |
| SW25-2G | 11.4 | V | 56 |
| SW25-4G | 11.4 | V | 56 |
| 590302B03600G | 11.2 | V | 34 |
| 7019BG | 11.0 | V | 27 |
| 7019PBG | 11.0 | V | 27 |
| 7019B-MTG | 11.0 | V | 27 |
| 533902B02554G | 11.0 | V | 50 |
| 513102B02500G | 11.0 | V | 58 |
| 533102B02551G | 11.0 | V | 55 |
| 593202B03500G | 10.4 | V | 48 |
| 531102B02500G | 10.4 | V | 59 |
| 531102V02500G | 10.4 | V | 59 |
| SW38-2G | 10.2 | V | 56 |
| SW38-4G | 10.2 | V | 56 |
| 590102B03600G | 10.0 | V | 34 |
| 6232B-MTG | 10.0 | V | 48 |
| 6232PB-MTG | 10.0 | V | 48 |
| SW38-6G | 10.0 | V | 59 |
| TV40G | 9.9 | H | 39 |
| 507222B00000G | 9.6 | H | 41 |
| 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 |
| 7020BG | 8.7 | V | 27 |
| 7020B-MTG | 8.7 | V | 27 |
| YB32-4G | 8.4 | V | 61 |
| 6032DG | 8.3 | V | 47 |
| 533302B02551G | 8.0 | V | 55 |
| 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 |
| TV35G | 7.2 | H | 31 |
| BW38-2G | 7.2 | V | 58 |
| BW38-4G | 7.2 | V | 58 |
| SW63-2G | 7.0 | V | 56 |
| SW63-4G | 7.0 | V | 56 |
| 7025BG | 6.8 | V | 27 |
| 7025B-MTG | 6.8 | V | 27 |
| 7021BG | 6.8 | V | 28 |
| 7021B-MTG | 6.8 | V | 28 |
| 6380BG | 6.8 | V | 60 |
| 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 | 38 |
| 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 |
| 6381BG | 5.8 | V | 60 |
| BW50-2G | 5.8 | V | 58 |
| BW50-4G | 5.8 | V | 58 |
| 533702B02552G | 5.7 | V | 57 |
| 533722B02552G | 5.7 | V | 57 |
| 6396BG | 5.6 | V | 60 |
| 6396B-P2G | 5.6 | V | 60 |
| 569022B00000G | 5.5 | H | 42 |
| 532602B02500G | 5.5 | V | 50 |
| 529702B02500G | 5.5 | V | 56 |
| 6374BG | 5.0 | V | 61 |
| 533402B02552G | 5.0 | V | 57 |
| 533422B02552G | 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 |
| 7023BG | 4.4 | V | 28 |
| 7023B-MTG | 4.4 | V | 28 |
| 530162B00162G | 4.4 | V | 54 |
| 530862B05162G | 4.4 | V | 54 |
| 6398BG | 4.4 | V | 60 |
| 6398B-P2G | 4.4 | V | 60 |
| 532802B02500G | 4.2 | V | 50 |
| 6382BG | 4.2 | V | 60 |
| 533602B02552G | 3.8 | V | 57 |
| 533622B02552G | 5.0 | V | 57 |
| 6399BG | 5.0 | V | 60 |
| 529802B02500G | 3.7 | V | 56 |
| 6399B-P2G | 3.3 | V | 60 |
| 6400BG | 2.7 | V | 60 |
| 6400B-P2G | 2.7 | V | 60 |
| 533302B02552G | 2.7 | V | 57 |
| 530002B02500G | 2.6 | V | 56 |

**TO-247**



| Part Number | θn | Board Mounting | Page |
|---|---|---|---|
| TV96G | 24.0 | H | 53 |
| TV97G | 20.0 | H–V | 53 |
| 513001B02500G | 13.4 | V | 58 |
| 533001B02551G | 13.0 | V | 55 |
| 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 |
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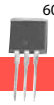

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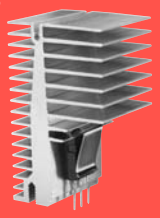

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**KEY**

H = Horizontal mount

V = Vertical mount

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

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




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| 530001B02500G | 8.0 | V | 56 |
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| 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 |


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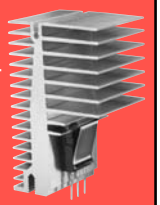

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# Index by Device Cooled, Heat Sink Style, and Thermal Resistance




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| SW38-2G | 10.2 | V | 56 |
| SW38-4G | 10.2 | V | 56 |
| SW38-6G | 10.0 | V | 59 |
| 534002B02554G | 9.0 | V | 50 |
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| 533302B02551G | 8.0 | V | 55 |
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| 531202V02500G | 7.5 | V | 59 |
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| 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 |
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| 6396BG | 5.6 | V | 60 |
| 6396B-P2G | 5.6 | V | 60 |
| 532602B02500G | 5.5 | V | 50 |
| 529702B02500G | 5.5 | V | 56 |
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| 532702B02500G | 4.8 | V | 50 |
| BW63-2G | 4.7 | V | 58 |
| BW63-4G | 4.7 | V | 58 |
| 529902B02500G | 4.5 | V | 56 |
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| 6398BG | 4.4 | V | 60 |
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| TV96G | 24.0 | H | 53 |
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| 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 |
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| 591302B04000G | 26.8 | H | 51 |
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| PF433G | 20.3 | V | 52 |
| PF434G | 20.3 | H | 52 |
| PF435G | 20.3 | V | 52 |
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| 566902B00000G | 18.8 | H-V | 53 |
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| 574102B00000G | 23.2 | H–V | 45 |
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| 574502B00000G | 21.2 | H-V | 45 |
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| 579302B00000G | 16.8 | V | 46 |
| 579402B00000G | 16.8 | V | 46 |
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| 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 |
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| 533721B02552G | 5.7 | V | 57 |
| 533421B02552G | 5.0 | V | 57 |
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| 533621B02552G | 3.8 | V | 57 |
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| 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 |
| 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 |


**KEY**

H = Horizontal mount

V = Vertical mount

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

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



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## 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.

$\Delta T$ = the temperature difference of driving potential which causes the flow of heat.

$\Sigma R_\theta$ = the sum of the thermal resistances of the heat flow path across which $\Delta T$ exists.

The above relationship may be stated in the following forms:

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

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**

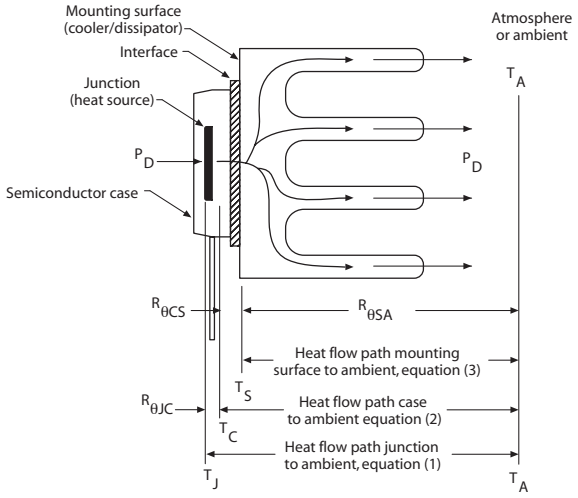
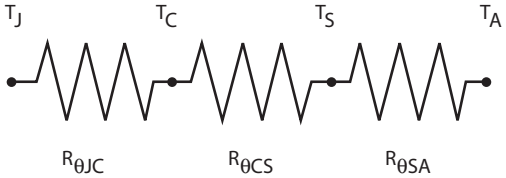



**FIGURE 2**



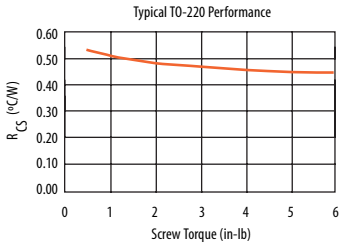
# How To Select a Heat Sink

## 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 watts
$R_{\theta JC}$ = 3°C/W (from semiconductor manufacturer)
$T_J$ max = 150°C (from semiconductor manufacturer)
$T_A$ max = 65°C

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



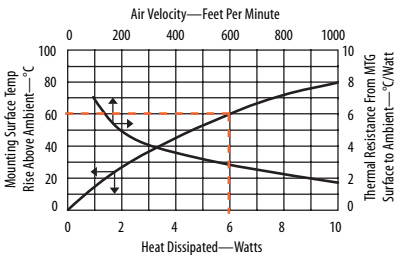

At 2 in-lb of torque the thermal resistance is approximately $R_{\theta CS}$ = 0.5°C/W

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

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

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.




$$R_{\theta SA} = \frac{60}{6} = 10.0°C/W$$

Which meets the above requirement in natural convection.

## Example B

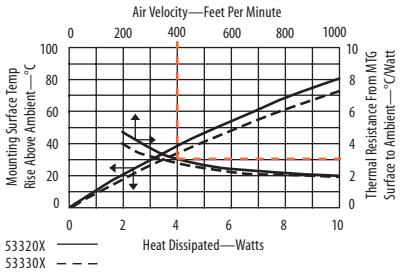
Find a heat sink to keep a TO-220 device below the maximum 150 °C junction temperature in forced convection at 400 ft/min. Device must be electrically insulated and mounted with a labor saving clip.

Given:
$P_D$ = 12 watts
$R_{\theta JC}$ = 2.5°C/W (from semiconductor manufacturer)
$T_J$ max = 140°C (from semiconductor manufacturer)
$T_A$ max = 50°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 $R_{\theta SA}$

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

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



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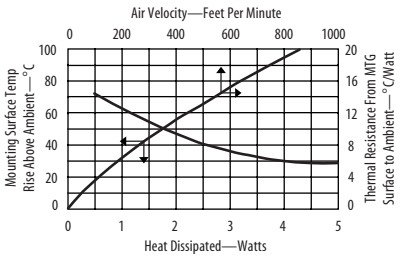
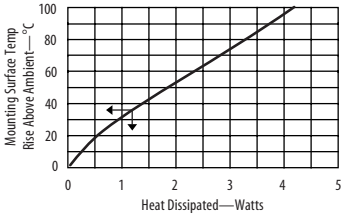
The performance graphs you will see in this catalog (see graph 579802) are actually a composite of two separate graphs which have been combined to save space. The small arrows on each curve indicate to which axis the curve corresponds. Thermal graphs are published assuming the device to be cooled is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

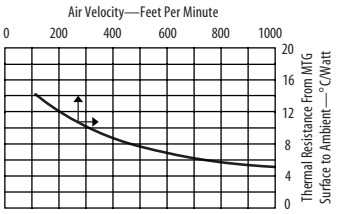
579802




GRAPH A




GRAPH B




**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.

**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 in$^2$ or 25 ft$^2$. 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**

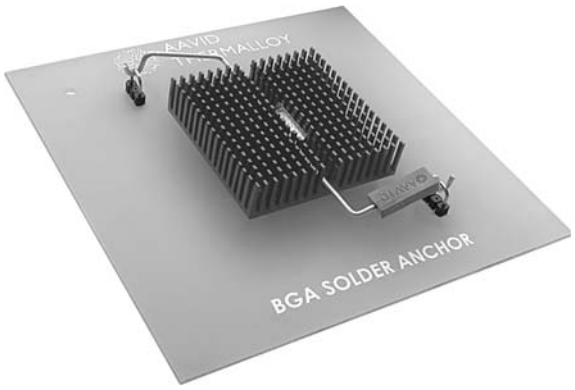
* Linear feet per minute

** Cubic feet per minute

# BGA–Solder Anchor

## 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.

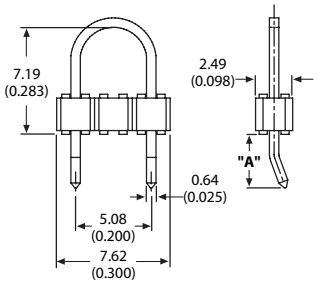



### ORDERING INFORMATION

| IC Pkg Size (mm) | IC Pkg Style | Part Number | "W" (mm) | "L" (mm) | "H" (mm) | "A" (mm) | θn[1] | θf[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.



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## Solder anchor heat sinks mechanical drawings

FIGURE 1

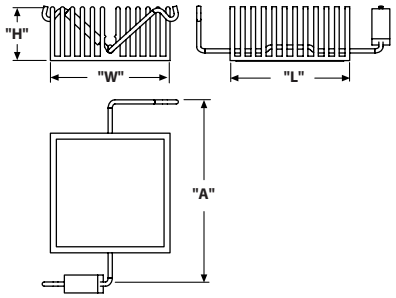



FIGURE 2

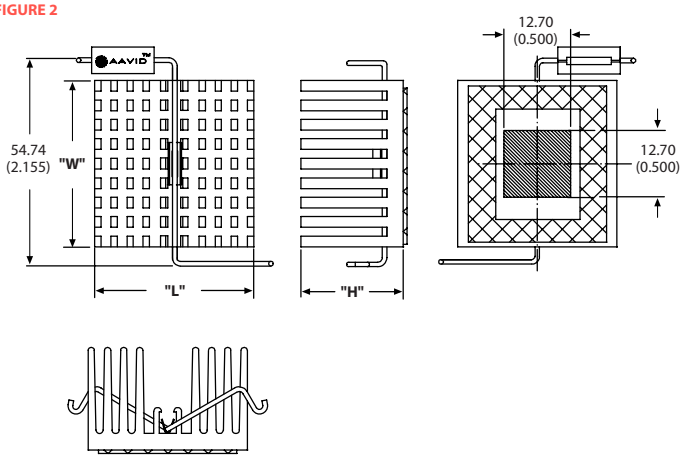
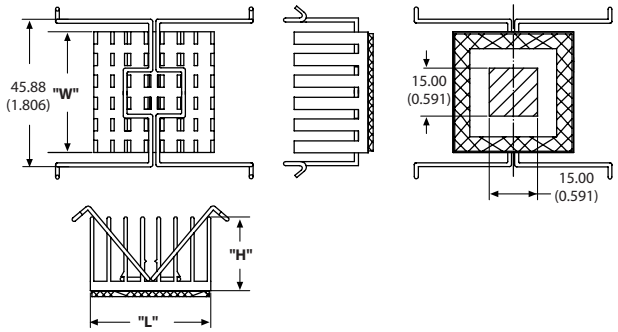



FIGURE 3




## Board mounting pattern information for solder anchor heat sinks

FIGURE A

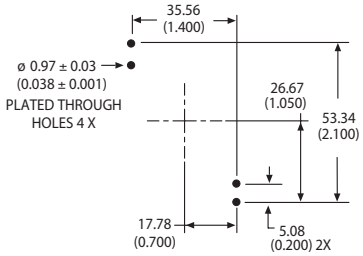



FIGURE B

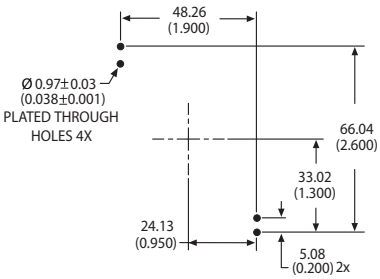



FIGURE C

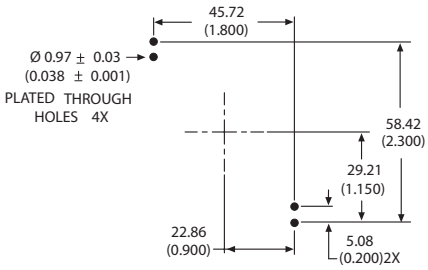



FIGURE D

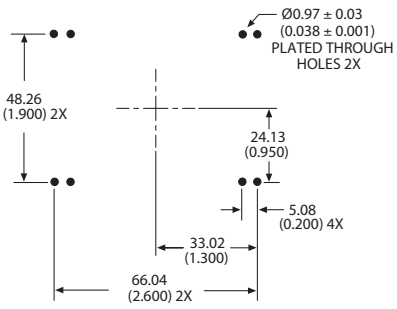
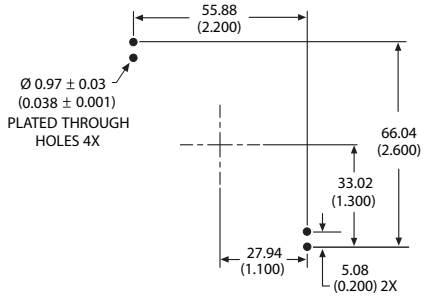


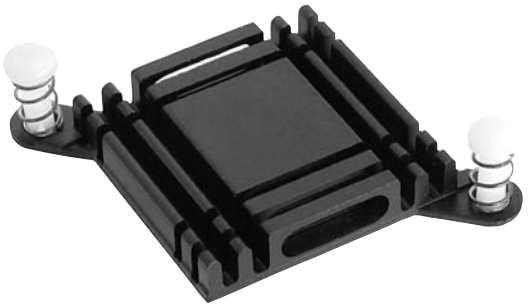

FIGURE E



# BGA–Push Pin Attachment

## 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) | θn[2] | θf[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.



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## Mechanical drawings

FIGURE 1

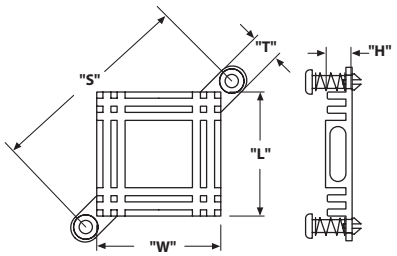



FIGURE 2

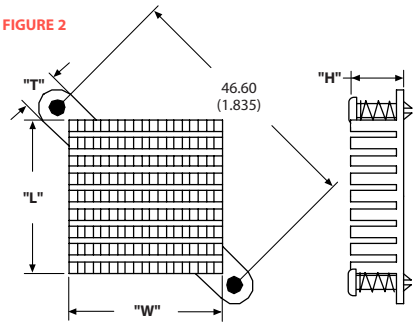



FIGURE 3

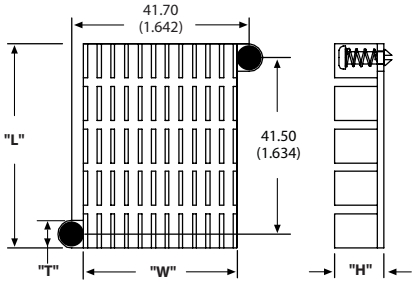



FIGURE 4

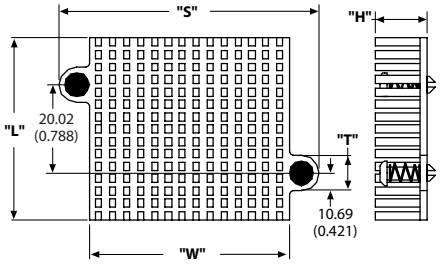
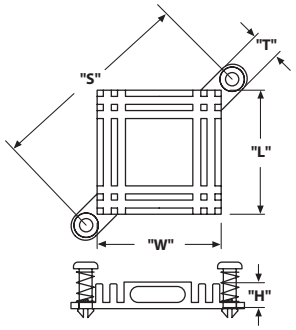



FIGURE 5




## Board mounting pattern information

FIGURE A

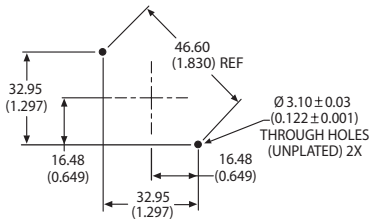



FIGURE B

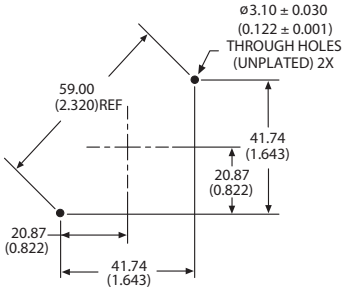



FIGURE C

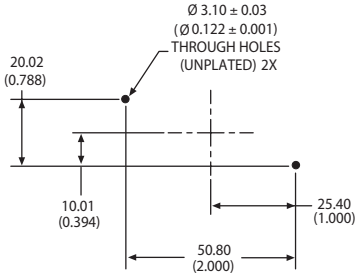
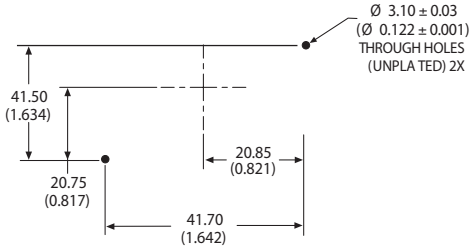
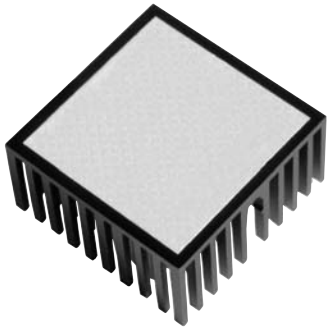


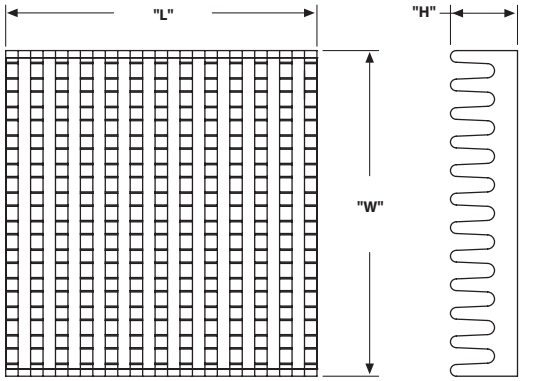

FIGURE D



# BGA–Tape Attachment

## Heat sinks for plastic BGA packages






Material: Aluminum

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.

### ORDERING INFORMATION

| IC Pkg. Size (mm) | IC Pkg. Style | Part Number | "W" (mm) | "L" (mm) | "H" (mm) | θn[2] | θf[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.



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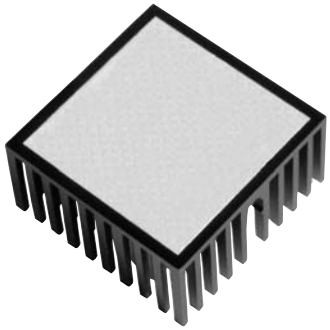
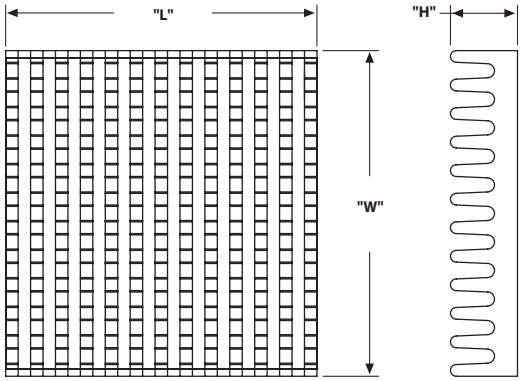
## Heat sinks for metal/ceramic BGA packages






Material: Aluminum

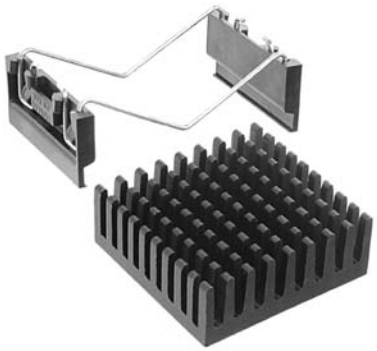
### ORDERING INFORMATION

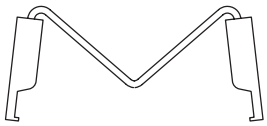
| IC Pkg. Size (mm) | IC Pkg. Style | Part Number | "W" (mm) | "L" (mm) | "H" (mm) | θn [2] | θf [3] | Finish | Tape Code [1] |
|---|---|---|---|---|---|---|---|---|---|
| 10 x 10 | Metal / Ceramic | 375224B00032G | 10.20 | 11.10 | 10.20 | 71.40 | 21.20 | Black anodize | 32 |
| 23 x 23 | Metal / Ceramic | 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 |

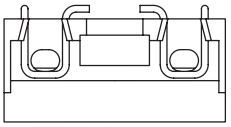
1. For tape specifications see page 88
2. Natural convection thermal resistance based on a 75° C heat sink temperature rise.
3. Forced convection thermal resistance based on an entering 1.0 m/s (200LFM) airflow.

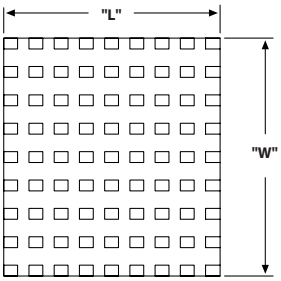
# BGA–Clip Attachment

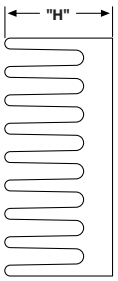
## Clip attachment









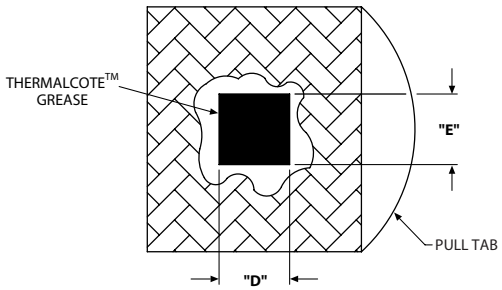

Aavid's BGS Clip heat sinks provide a mechanical attachment alternative to tape applications where it is desirable to attach the heat sink directly to the device. The unique clip uses spring pressure to ensure even contact across the device while the end plates firmly engage the edge of the package, 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 | θn[1] | θf[2] | 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.



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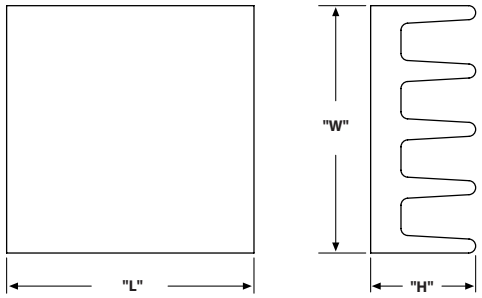
## Bi Directional




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

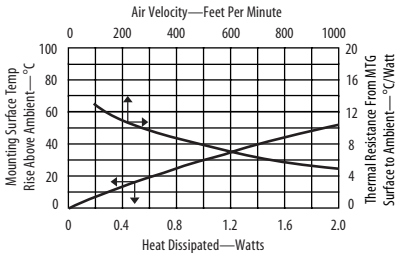
| IC Pkg Size | IC Pkg Style | Part Number | "W" (mm) | "L" (mm) | "H" (mm) | θn[3] | θf[4] | Finish | Attachment | Tape Code [2] |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 X 10 | All | 615653B00250G | 6.00 | 6.00 | 5.00 | 142.58 | 76.26 | Black anodize | Epoxy[1] | N/A |
| 10 X 10 | All | 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 |

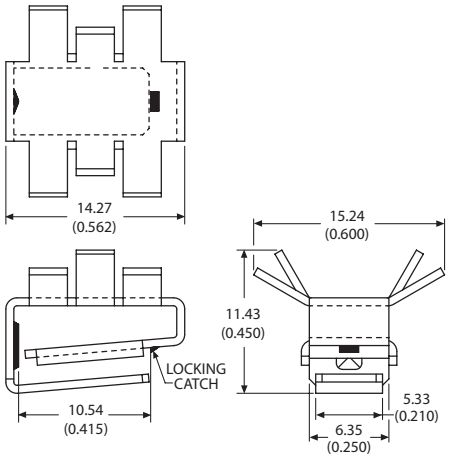
1. Epoxy ordered separately for information on Epoxy see page 114,115.
2. For tape specifications see page 88.
3. Natural convection thermal resistance based on a 75°C heat sink temperature rise.
4. Forced convection thermal resistance based on an entering 1.0 m/s (200LFM) airflow.

# DIPS

## 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

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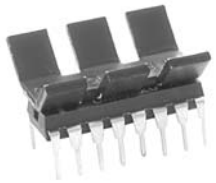
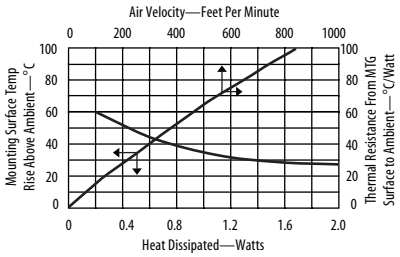
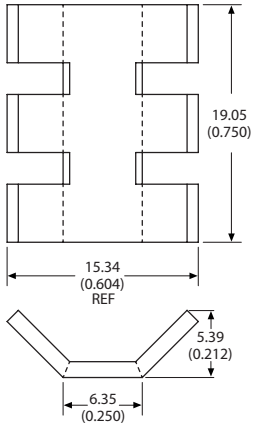


**Angle fin heat sink** is a simple low cost solution for cooling DIP devices. Suitable for 14 and 16 pin packages and available in two finish options. Easily attaches using thermal epoxy.



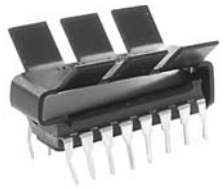

Material: 1.27 (0.050) Thick Aluminum
Finish: See Table

### ORDERING INFORMATION

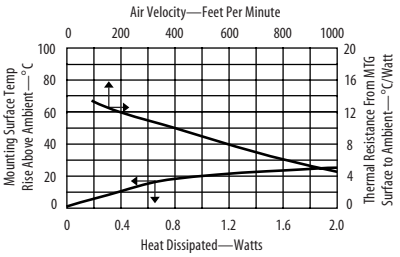
| Part Number | Finish |
|---|---|
| 501000J00000G | Pre black anodize* |
| 501000B00000G | Black anodize |

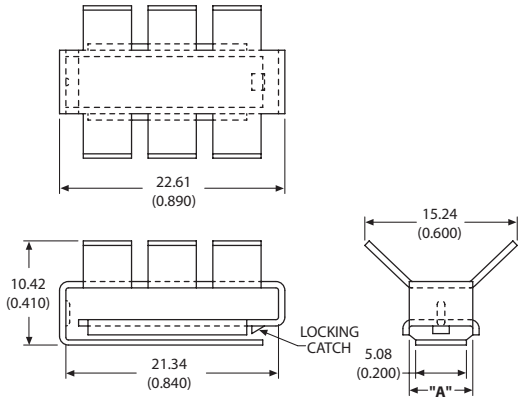
* Edges cut during the manufacturing process will be unfinished.
See page 110 for more information.

## 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) |



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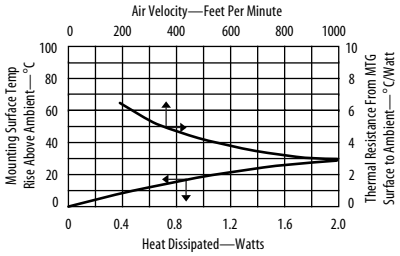
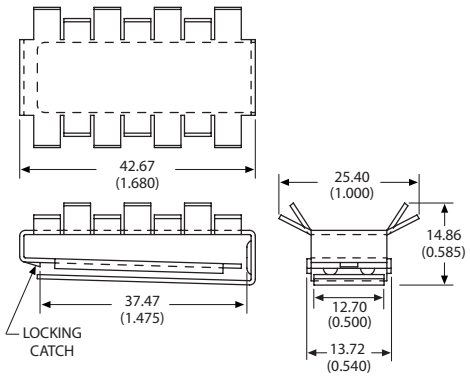
## 5806 Slide on heat sink with staggered fins

**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.



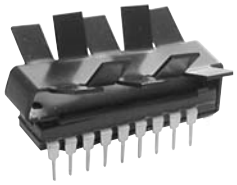




### ORDERING INFORMATION

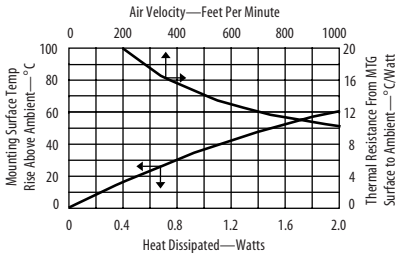
| Part Number | Description |
|---|---|
| 580600B00000G | Slide on heat sink with staggered fins |

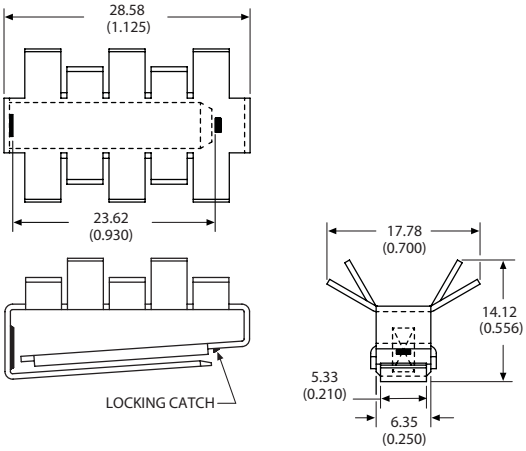
Material: 0.81 (0.032) Thick Aluminum
Finish: Black Anodize

## 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.



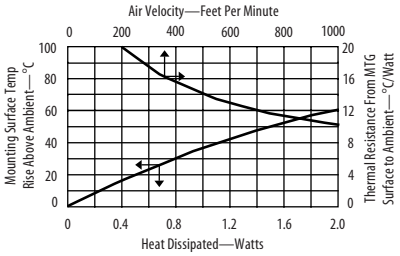



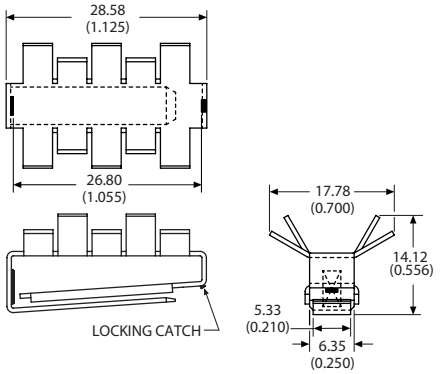

### ORDERING INFORMATION

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

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

## 5804 Slide on heat sink with staggered fins



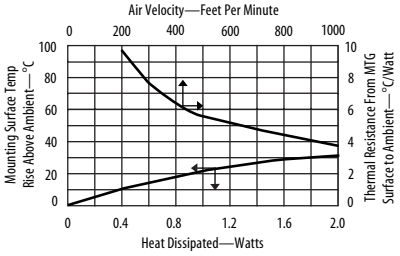

**Slide on heat sink with staggered fins** attaches to 20 pin DIP packages quickly and easily. The heat sink features double spring action and locking catch to firmly attach the device creating a thermal conduction path on both the top and bottom surfaces.

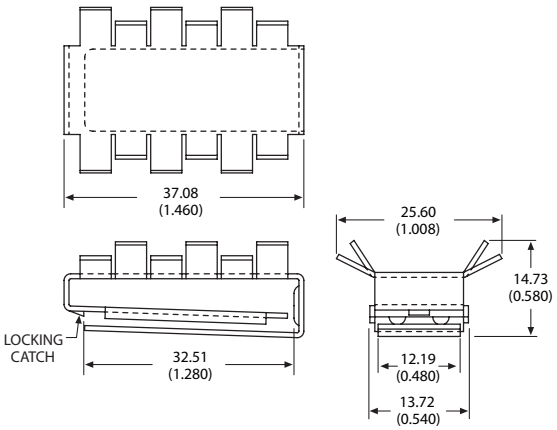
Material: 0.63 (0.025) Thick Aluminum
Finish: Black Anodize

### 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 |



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## 5085, 5086, 5087 Extruded epoxy attach on heat sink with straight fins

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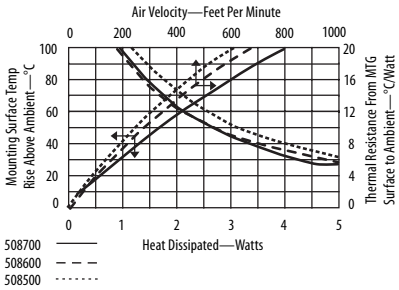
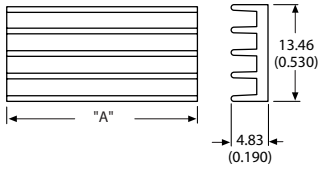
**Extruded epoxy attach on heat sink** with straight fins attaches to 24, 28, and 40 pin DIP packages quickly and easily. May be added before or after final board assembly. No additional board space is required.




Material: Aluminum
Finish: Black Anodize

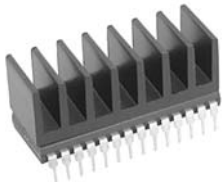
### ORDERING INFORMATION

| 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) |

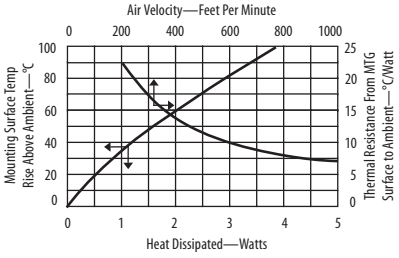
For epoxy information see pages 114-115.

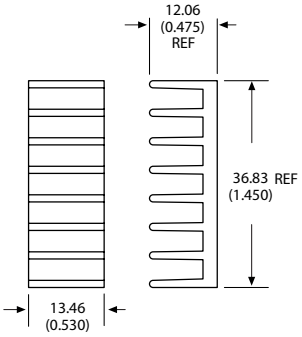
## 6284 Extruded epoxy attach heat sink

Grease & Epoxy page112



**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

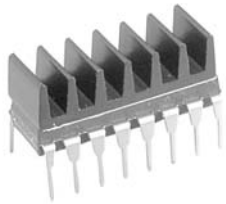
### ORDERING INFORMATION

| 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

Grease & Epoxy page112



**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.

FIGURE A

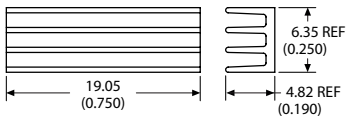
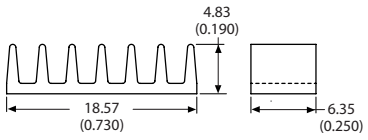
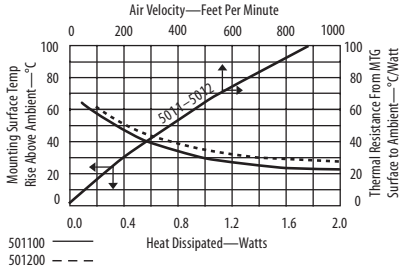



FIGURE B




Material: Aluminum
Finish: Black Anodize

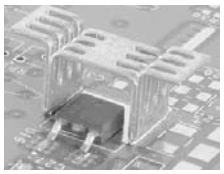



### ORDERING INFORMATION

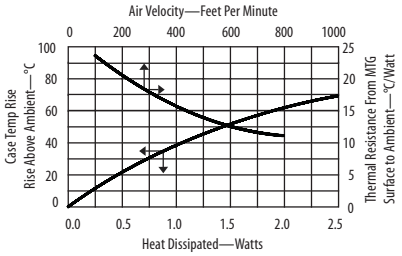
| Part Number | Description | Figure |
|---|---|---|
| 501100B00000G | Extruded epoxy attach heat sink with straight fins | A |
| 501200B00000G | Extruded epoxy attach heat sink with straight fins | B |

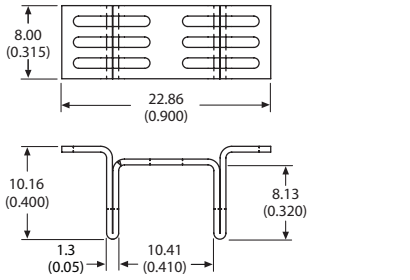
For epoxy information see pages 114-115.

## 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

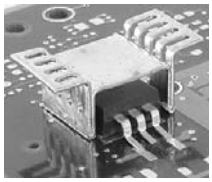
Refer to Figure A and B on page 26 for board footprint information

### ORDERING INFORMATION

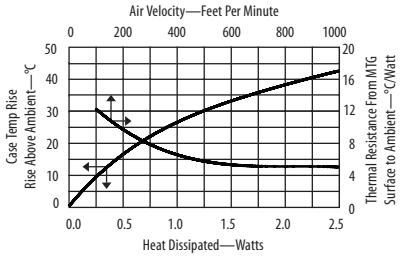
| Part Number | Packaging |
|---|---|
| 573100D00010G | 13" Reel, 250 per reel |
| 573100D00000G | Bulk, 500 per bag |

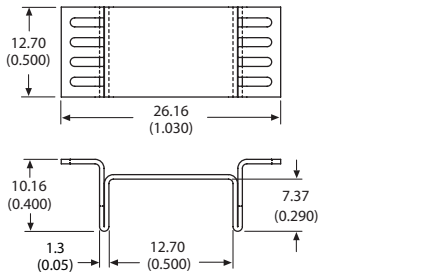
See page 25 for tape and reel information

## 5733 Surface mount heat sink for D²PAK (TO-263) package semiconductors



**Surface mount heat sink for D²PAK (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

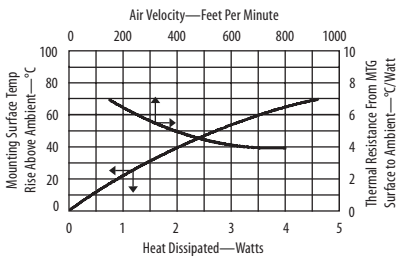
### ORDERING INFORMATION

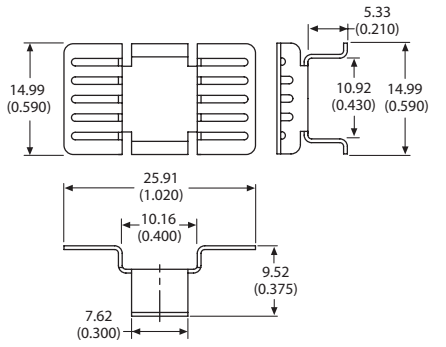
| Part Number | Packaging |
|---|---|
| 573300D00010G | 13" Reel, 250 per reel |
| 573300D00000G | Bulk, 500 per bag |

See page 25 for tape and reel information

## 7106 Surface mount heat sink for D²PAK (TO-263), power SO-10 (MO-184) and SO-10 package semiconductors

**Surface mount heat sink for D²PAK (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



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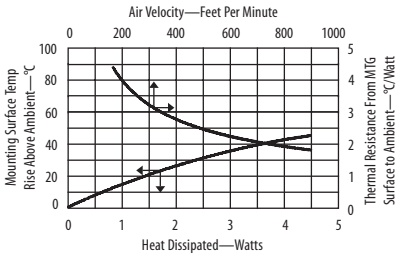
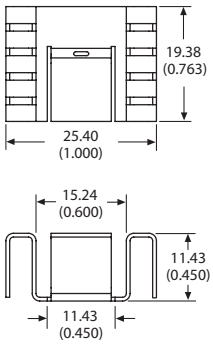
## 7109 Surface mount heat sink for D²PAK (TO-263) package semiconductors

**Surface mount heat sink for D²PAK (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

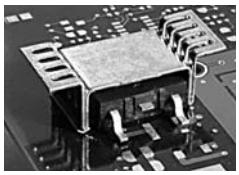
Material: 0.63 (0.025) Thick Copper
Finish: Tin Plated

### ORDERING INFORMATION

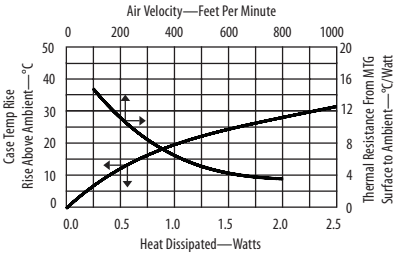
| Part Number | Packaging |
|---|---|
| 7109D/TRG | 13" Reel, 125 per reel |
| 7109DG | Bulk, 500 per bag |

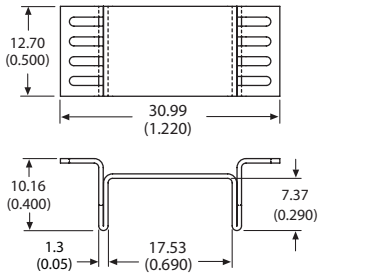
See below for tape and reel information

## 5734 Surface mount heat sink for D³PAK (TO-268) package semiconductors



**Surface mount heat sink for D³PAK (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

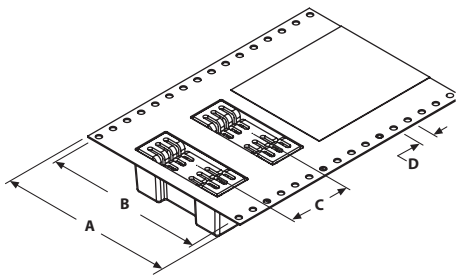
Material: 0.63 (0.025) Thick Copper
Finish: Tin Plated

### 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

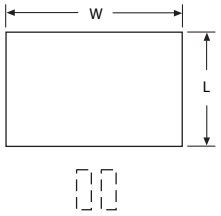
| Part Number | "A" Dim | "B" Dim | "C" Dim | "D" Dim |
|---|---|---|---|---|
| 7106D/TRG | 44.00 (1.730) | 40.40 (1.590) | 24.00 (0.940) | 4.06 (0.160) |
| 7109D/TRG | 44.00 (1.730) | 40.40 (1.590) | 36.00 (1.420) | 4.06 (0.160) |
| 573100D00010G | 44.00 (1.730) | 40.40 (1.590) | 16.00 (0.630) | 4.06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

# SMT Footprints

## FIGURE A

Recommended copper heat speader drain pad footprint

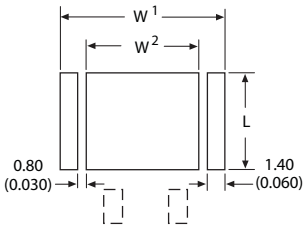
Note: The thickness of the drain pad is variable depending on the amount of heat generated by the SMT device, design limitations and process.




| Part Number | "L" | "W" |
|---|---|---|
| 573100 | 9.53 (0.375) | 13.97 (0.550) |
| 573300 | 14.22 (0.560) | 16.26 (0.640) |
| 573400 | 14.22 (0.560) | 21.08 (0.830) |

## FIGURE B

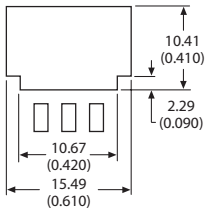
Recommended heat sink solder mask opening



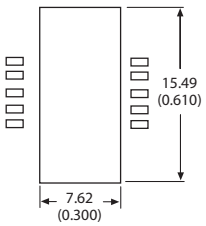

| Part Number | "L" | "W1" | "W2" |
|---|---|---|---|
| 573100 | 9.02 (0.355) | 13.46 (0.530) | 8.89 (0.350) |
| 573300 | 13.72 (0.540) | 15.75 (0.620) | 11.18 (0.440) |
| 573400 | 13.72 (0.540) | 20.57 (0.810) | 16.00 (0.630) |

## FIGURE C

Recommended copper pad size
for heat sink and device mounting footprint



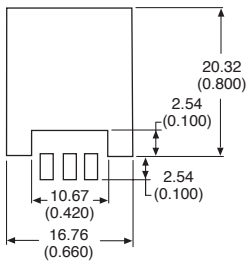

For D Pak (TO-263)




For MO-184 and SO-10

## FIGURE D

Recommended copper pad size
for heat sink and device mounting footprint



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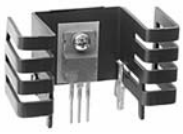
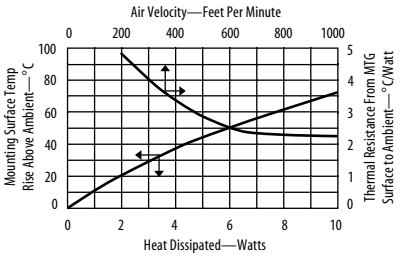
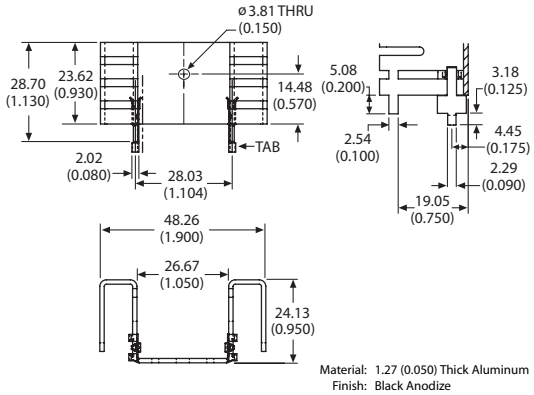
## 7025 Channel style heat sink with folded back fins

Grease & Epoxy page112 | Mounting Kits page 99



**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

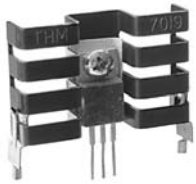
| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 7025BG | Channel heat sink with no solderable tabs | |
| 7025B-MTG | With solderable mounting tabs | 2.90 ( 0.114) |

Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

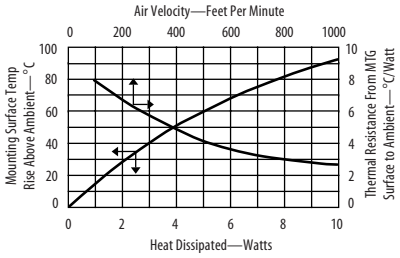
For additional options see page 85

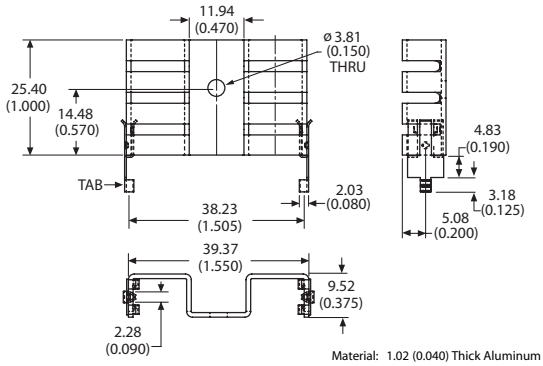
## 7019 Narrow channel style heat sink with folded back fins

Grease & Epoxy page112 | Mounting Kits page 99



**Narrow 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

| Part Number | Description | Finish | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 7019BG | Channel heat sink with no solderable tabs | Black anodize | |
| 7019PBG | Channel heat sink with no solderable tabs | Pre black anodize* | |
| 7019B-MTG | With solderable tabs | Black anodize | 2.90 ( 0.114) |

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

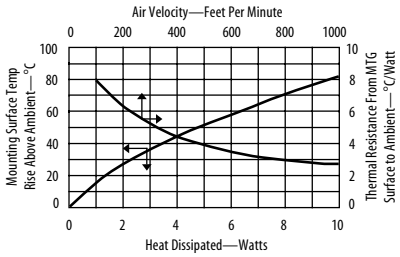
Material: 1.02 (0.040) Thick Aluminum
Finish: See Table

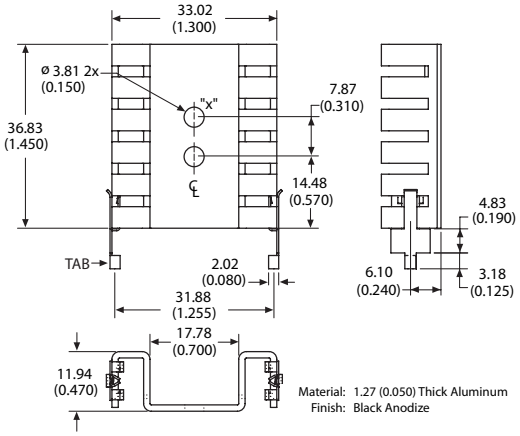
For additional options see page 85

## 7020 Narrow channel style heat sink with folded back fins

Grease & Epoxy page112 | Mounting Kits page 99

**Narrow 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

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 7020BG | Narrow channel heat sink with no solderable tabs | |
| 7020B-MTG | With solderable tabs | 2.90 (0.114) |

Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### POPULAR OPTIONS: 7020B-____G

Base part no. — A

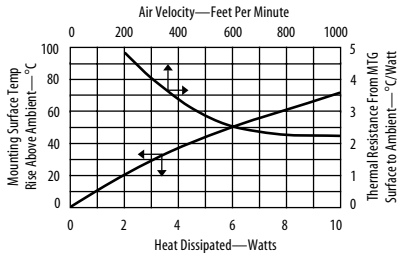
| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | TC10-MT | Insulating device mounting clip and solderable tabs | Hole X | Page 93, 98 |

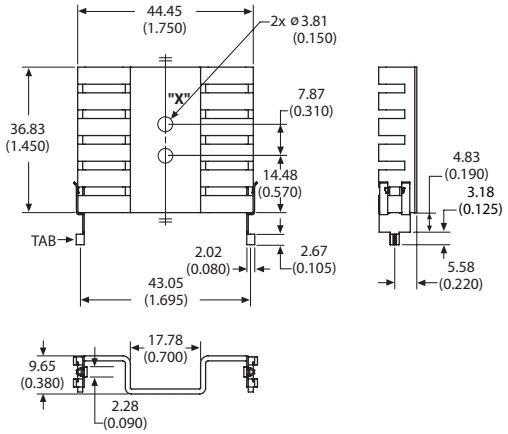
For additional options see page 85

# TO-220 Heat Sinks

## 7021 Channel style heat sink with folded back fins

Grease & Epoxy page112 | Mounting Kits page 99




**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.

Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 7021BG | Channel heat sink with no solderable tabs | |
| 7021B-MTG | With solderable tabs | 2.90 ( 0.114) |

### POPULAR OPTIONS: 7021B-____G

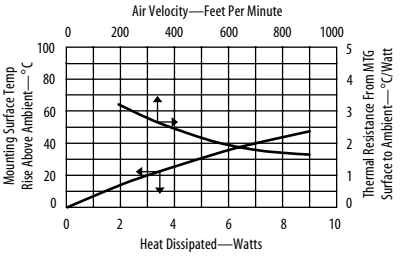
Base part no. A

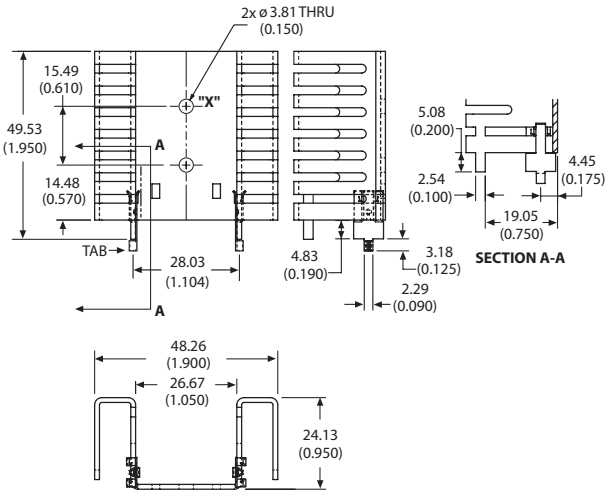
| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | TC10-MT | Locking device mounting clip and solderable tabs | Hole X | Page 93, 98 |
| A | MT5 | Bifurcated tabs with 0.205 stand off | | Page 93 |
| A | MT6 | Bifurcated tabs with 0.115 stand off | | Page 93 |
| A | TC10-MT5 | Locking device mounting clip and bifurcated tabs | Hole X | Page 93, 98 |

For additional options see page 85

## 7023 Channel style heat sink with folded back fins

Grease & Epoxy page112 | Mounting Kits page 99




**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.

Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 7023BG | Channel heat sink with no solderable tabs | |
| 7023B-MTG | With solderable tabs | 2.90 ( 0.114) |

### POPULAR OPTIONS: 7023B-____G

Base part no. A

| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | TC6-MT | Locking device mounting clip and solderable tabs | Hole X | Page 93, 98 |
| A | TC7-MT | Insulating device mounting clip and solderable tabs | Hole X | Page93, 98 |

For additional options see page 85



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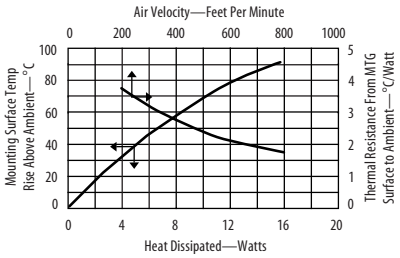
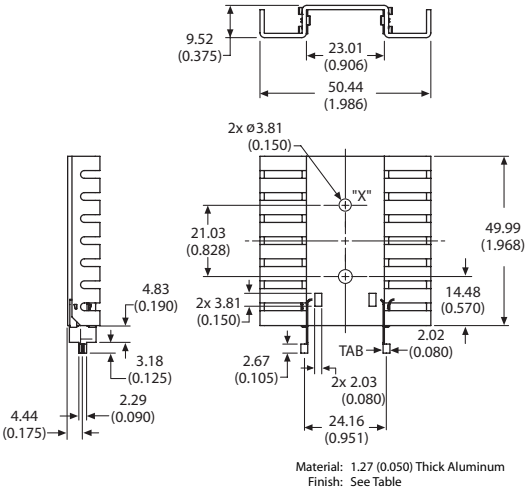
## 7022 Channel style heat sink with folded back fins

Grease & Epoxy page112

Mounting Kits page 99




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

**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

| Part Number | Description | Finish | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 7022BG | Channel heat sink with no solderable tabs | Black anodize | |
| 7022PBG | Channel heat sink with no solderable tabs | 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 110 for more information

### POPULAR OPTIONS: 7022B-____G

Base part no. — A

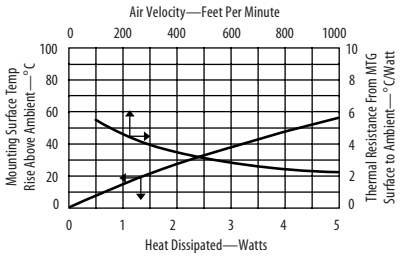
| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | TC11-MT | Insulated device mounting clip for T0-220 and solderable tabs | Hole X | Page 93, 98 |

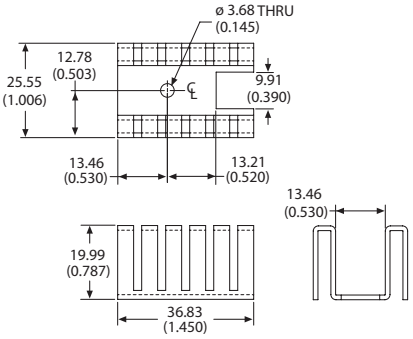
For additional options see page 85

## 5510 High performance channel style heat sink with folded back fins

Grease & Epoxy page112

Mounting Kits page 99




Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

**High performance channel style heat sink with folded back fins** for greater cooling capacity in a minimum of space when mounted horizontally. Folded back fin design maximizes surface area without increasing the vertical space required by the heat sink.

### ORDERING INFORMATION

| Part Number | Description |
|---|---|
| 551002B00000G | High performance channel style heat sink with folded back fins |

### POPULAR OPTIONS: 551002B0 00 00G

Base part no. — A

| Position | Code | Description | Details |
|---|---|---|---|
| A | 01 | 6-32 Wave On threaded insert<br>0.100 stand off | Page 89 |

For additional options see page 82

# TO-220 Heat Sinks

## 6021, 6221 Channel style heat sink with straight fins

Grease & Epoxy page112 | Mounting Kits page 99

FIGURE A

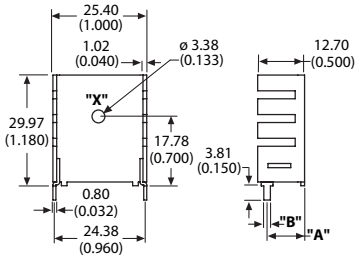
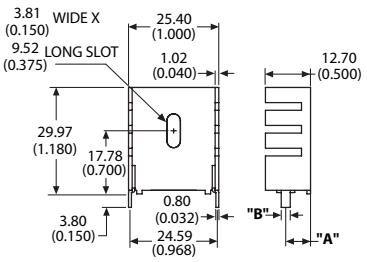
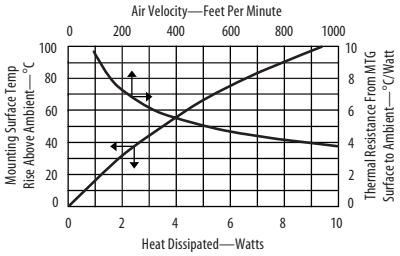



FIGURE B




**Channel style heat sink with straight fins** features integrated solderable tabs for easy mounting to the printed circuit card. Available with a single device mounting hole or slotted hole to accomodate varying device lead lengths.

Material: 1.02 (0.040) Thick Aluminum
Finish: See Table




### ORDERING INFORMATION

| Part Number | Description | Finish | Figure | Dia of PCB Plated Thru Hole for Tabs | "A" Dim | "B" Dim |
|---|---|---|---|---|---|---|
| 6021BG | Channel heat sink with straight fins and integrated tabs | Black anodize | A | 2.21 (0.087) | 10.16 (0.400) | 1.78 (0.070) |
| 6021PBG | Channel heat sink with straight fins and integrated tabs | Pre-black anodize* | A | 2.21 (0.087) | 10.16 (0.400) | 1.78 (0.070) |
| 6221PBG | With slotted device mounting hole | Pre-black anodize* | B | 3.18 (0.125) | 6.99 (0.275) | 2.54 (0.100) |

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

### POPULAR OPTIONS:

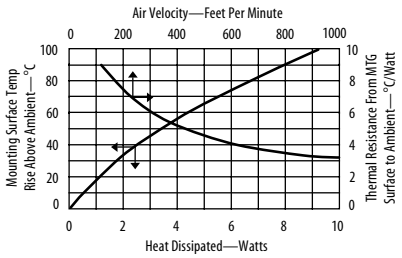
6021- ____ - ____ G
*Available on the 6021 only* Base part no. A B

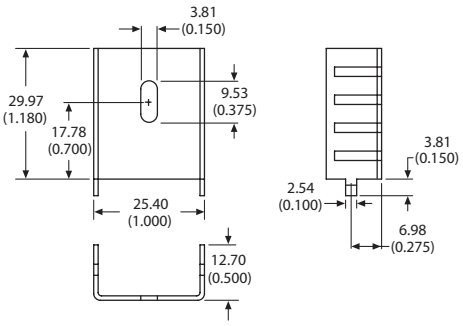
| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | B | Black anodize | | |
| A | PB | Pre-black anodize* | | |
| B | SF1 | 4-40 UNC-2A device mounting stud | Hole X | Page 96 |

For additional options for part 6021 see page 85

## 6230 Copper channel style heat sink with straight fins

Grease & Epoxy page112 | Mounting Kits page 99




**Copper channel style heat sink with straight fins** features integrated tabs which can be twisted to attach the heat sink to the board prior to wave solder.

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

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 6230DG | Channel heat sink with straight fins and integrated tabs | 3.00 (0.118) |



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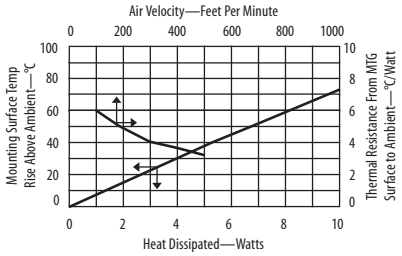
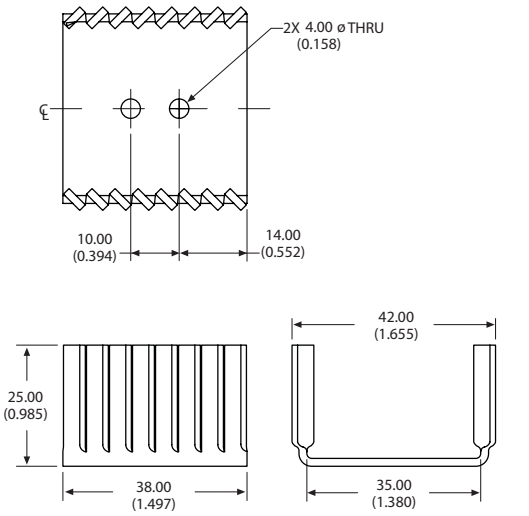
## TV35 Narrow channel style heat sink features twisted fins

Grease & Epoxy page112

Mounting Kits page 99




**Narrow channel style heat sink** features twisted fins for increased air turbulence and better cooling. Mounts horizontally to accommodate two TO-220 devices.

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

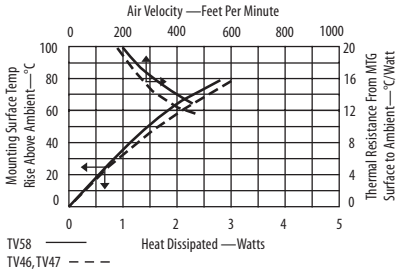
### ORDERING INFORMATION

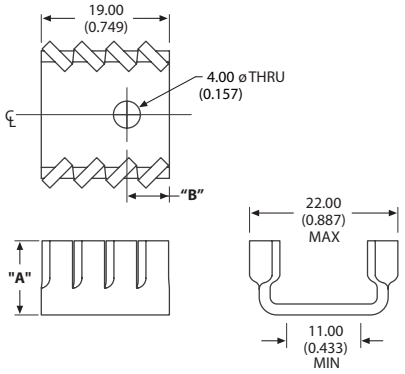
| Part Number | Description |
|---|---|
| TV35G | Channel style heat sink with twisted fins |

## TV46, TV47, TV58 Narrow channel style heat sink features twisted fins

Grease & Epoxy page112

Mounting Kits page 99




**Narrow channel style heat sink** features twisted fins for increased air turbulence and better cooling. Can be mounted vertically or horizontally.

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

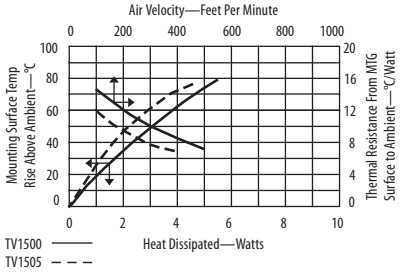
### ORDERING INFORMATION

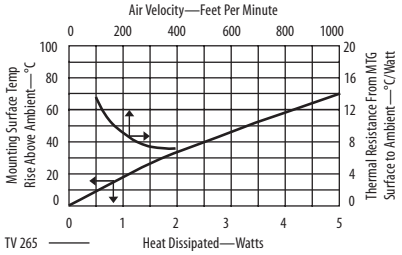
| Part Number | "A" Dim | "B" Dim |
|---|---|---|
| TV46G | 13.00 (0.512) | 9.50 (0.374) |
| TV47G | 13.00 (0.512) | 6.30 (0.248) |
| TV58G | 11.00 (0.433) | 6.30 (0.248) |

# TO-220 Heat Sinks

## TV265, TV1500, TV1505 Channel style heat sink features twisted fins

Grease & Epoxy page 112
Mounting Kits page 99




**Channel style heat sink features twisted fins** for increased air turbulence and better cooling. Can be mounted vertically or horizontally. Models are available with integrated twist tabs or mounting solderable tabs.

FIGURE A

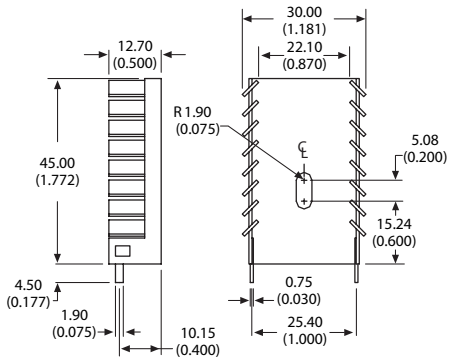
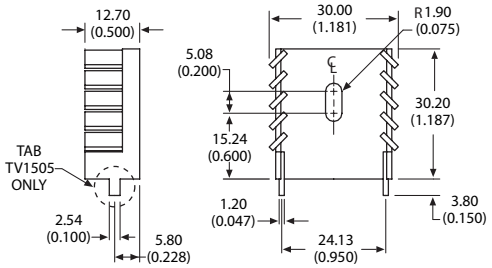



FIGURE B



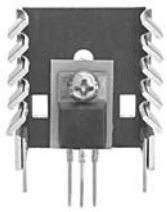

Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

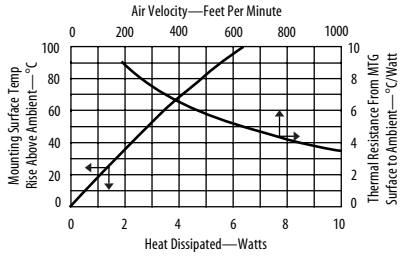
### ORDERING INFORMATION

| Part Number | Description | Figure | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| TV265G | Channel style heat sink with twisted fins and solderable tabs | A | 2.39 (0.094) |
| TV1500G | Channel style heat sink with twisted fins | B | |
| TV1505G | With integrated twist tabs | B | 3.30 (0.130) |

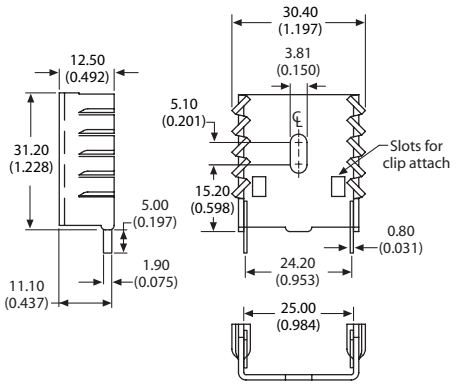
## 5900 Channel style heat sink features solderable tabs and twisted fins

Grease & Epoxy page 112
Mounting Kits page 99






**Channel style heat sink features solderable tabs and twisted fins** for increased air turbulence for better cooling. For ease of assembly use with clip 7701 (sold separately) to attach device. See page 97 for clip information.




Material: 1.19 (0.047) Thick Aluminum
Finish: Pre Black Anodize*

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 5900PBG | Channel style heat sink with twisted fins and solderable tabs | 2.40 (0.094) |

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



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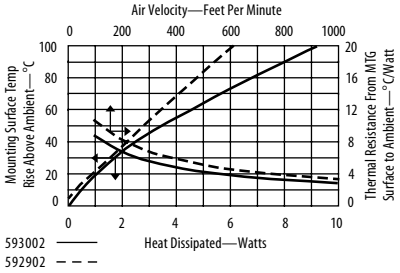
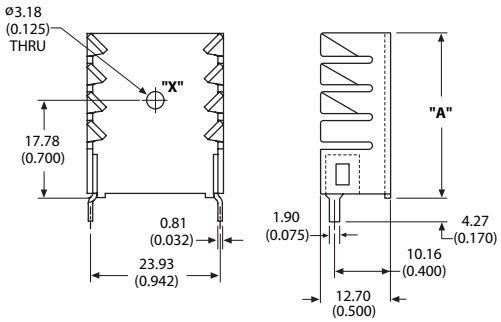
## 5929, 5930 Channel style heat sink featuring twisted fins

Grease & Epoxy page112 | Mounting Kits page 99

**Channel style heat sink features twisted fins** for increased air turbulence for better cooling. Two heights are available and include wave solderable tin plated tabs for easy attachment to the PC board.




Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | "A" Dim | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 592902B03400G | 24.89 (0.980) | 2.36 (0.093) |
| 593002B03400G | 29.97 (1.180) | 2.36 (0.093) |

### POPULAR OPTIONS: 59 _-_ 02B034 00G

Base part no. — A

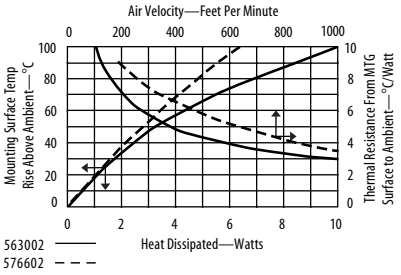
| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | 05 | 4-40 male semiconductor mount 0.380 LG | Hole X | Page 90 |

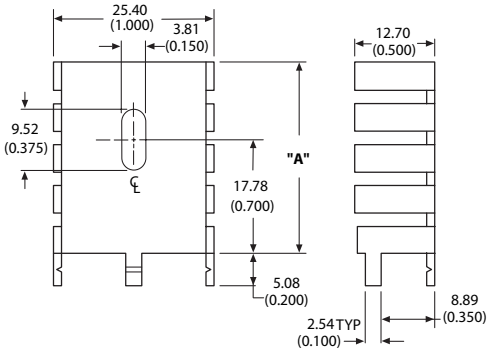
For additional options see page 82

## 5630, 5766 Channel style heat sink featuring three integrated tabs

Grease & Epoxy page112 | Mounting Kits page 99

**Channel style heat sink features three integrated tabs** for greater stability and slotted mounting hole to accommodate a variety of device lead lengths. Available in two heights. Mounting tabs are designed for either soldering (tin finish) or twisted.



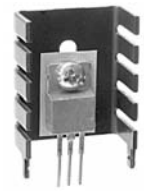

Material: 1.27 (0.050) Thick Aluminum
Finish: See Table

### ORDERING INFORMATION

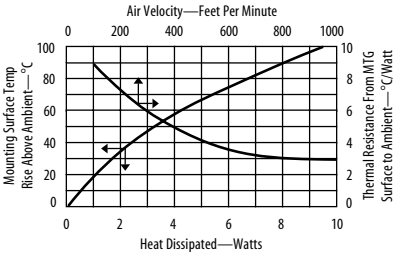
| Part Number | "A" Dim | Finish | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 563002B00000G | 29.97 (1.180) | Black anodize | 3.10 (0.122) |
| 563002D00000G | 29.97 (1.180) | Tin plated | 3.10 (0.122) |
| 576602B00000G | 24.13 (0.950) | Black anodize | 3.10 (0.122) |
| 576602D00000G | 24.13 (0.950) | Tin plated | 3.10 (0.122) |

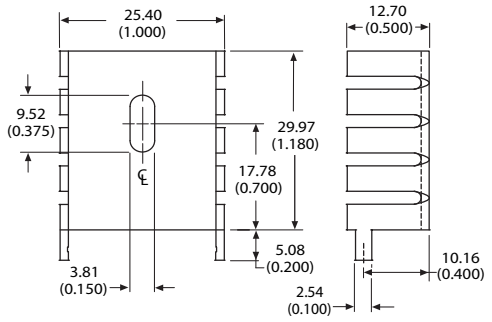
## 5750 Channel style heat sink with two integrated tabs

Grease & Epoxy page112 | Mounting Kits page 99



**Channel style heat sink features two integrated tabs** and slotted mounting hole to accommodate a variety of device lead lengths. Mounting tabs are designed for either soldering (tin finish) or twisted.




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

### ORDERING INFORMATION

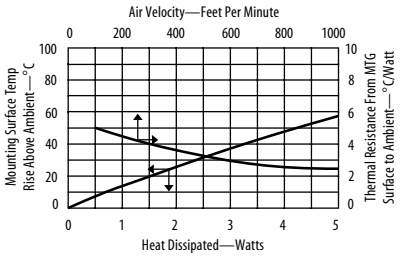
| Part Number | Finish | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 575002B00000G | Black anodize | 3.10 (0.122) |
| 575002D00000G | Tin plated | 3.10 (0.122) |

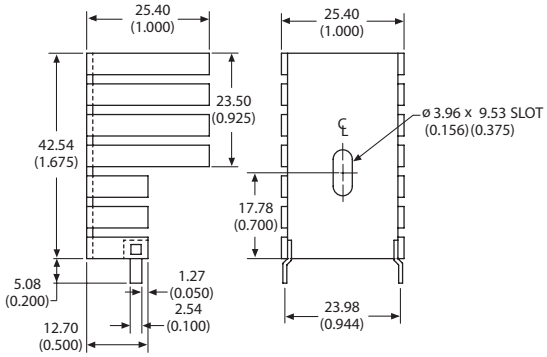
# TO-220 Heat Sinks

## 5901 Channel style heat sink featuring recessed lower fins

Grease & Epoxy page 112 | Mounting Kits page 99

**Channel style heat sink features recessed lower fins** to allow closer component spacing and longer upper fins for maximum cooling. Includes two solderable tabs for easy attachment to the PC card.




Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

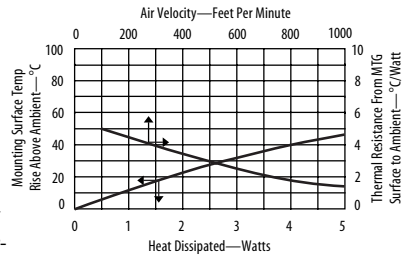
| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 590102B03600G | High performance heat sink with recessed lower fins | 2.92 (0.115) |

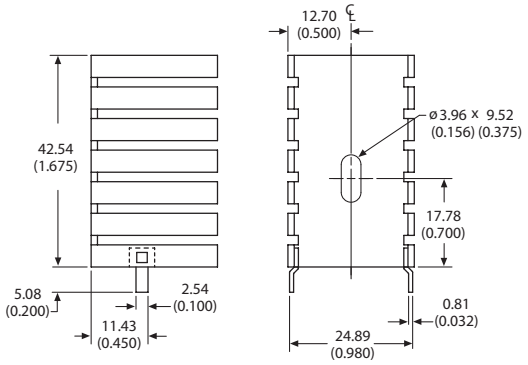
For additional options see page 82

## 5903 Channel style heat sink featuring slotted mounting hole

Grease & Epoxy page 112 | Mounting Kits page 99

**Channel style heat sink features slotted mounting hole** to accommodate a variety of devices and lead lengths. Includes two solderable tabs for easy attachment to the PC card.




Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

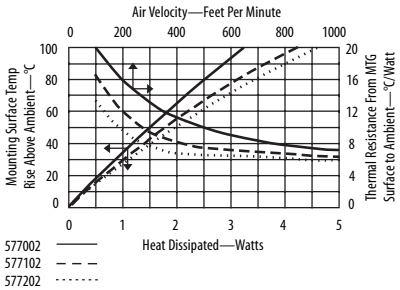
| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 590302B03600G | High performance heat sink with solderable tabs | 2.92 (0.115) |

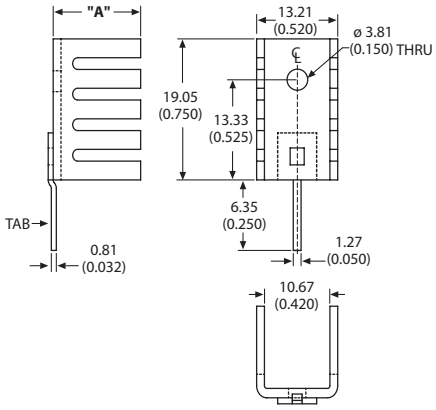
For additional options see page 82

## 5770, 5771, 5772 Slim low cost channel style heat sink

Grease & Epoxy page 112 | Mounting Kits page 99

**Slim low cost channel style heat sink** is ideal where space and cost are limited. Available in 3 fin heights with or without solderable mounting tab.




Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | "A" Dim | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 577002B00000G | Slim, low cost channel style heat sink with no solderable tabs | 6.35 (0.250) | |
| 577002B04000G | With solderable tab | 6.35 (0.250) | 1.73 (0.068) |
| 577102B00000G | Slim, low cost channel style heat sink with no solderable tabs | 9.52 (0.375) | |
| 577102B04000G | With solderable tab | 9.52 (0.375) | 1.73 (0.068) |
| 577202B00000G | Slim, low cost channel style heat sink with no solderable tabs | 12.70 (0.500) | |
| 577202B04000G | With solderable tab | 12.70 (0.500) | 1.73 (0.068) |

### POPULAR OPTIONS: 577_|_02B 0 4000G

Base part no. A

| Position | Code | Description | Details |
|---|---|---|---|
| A | 3 | In-Sil-8™ pad | Page 86 |

For additional options see page 82



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## 6109, 6110 Low cost channel style heat sink featuring integrated alignment tabs

Grease & Epoxy page112

Mounting Kits page 99

**Low cost channel style heat sink features integrated alignment tabs** to prevent the device from rotating while applying torque to the mounting hardware. Available in two lengths with a pre-black anodized finish.

FIGURE A

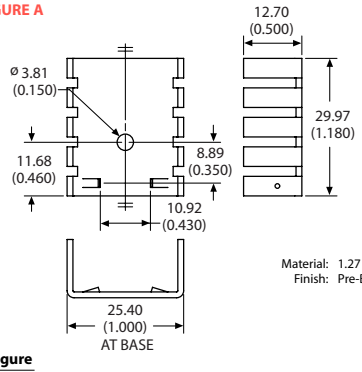
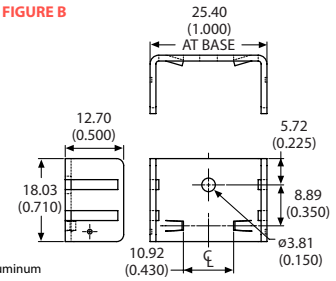



FIGURE B




Material: 1.27 (0.050) Thick Aluminum
Finish: Pre-Black Anodize*

### ORDERING INFORMATION

| Part Number | Description | Figure |
|---|---|---|
| 6109PBG | Low cost channel heat sink with device locating tabs | A |
| 6110PBG | Low cost channel heat sink with device locating tabs | B |

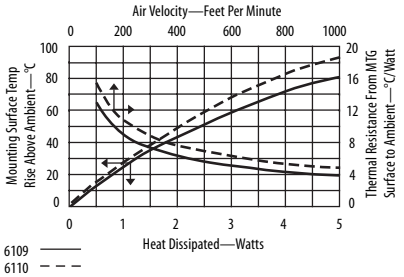
* Edges cut during the manufacturing process will be unfinished.
See page 110 for more information

### POPULAR OPTIONS: 61__PB - ___ G

Base part no. A

| Position | Code | Description | Details |
|---|---|---|---|
| A | MT | Solderable mounting tabs | Page 93 |

For additional options see page 85

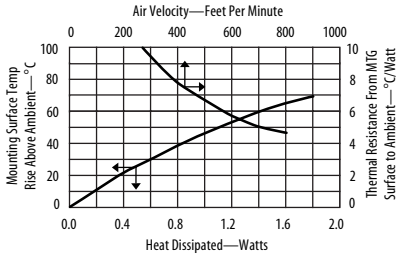


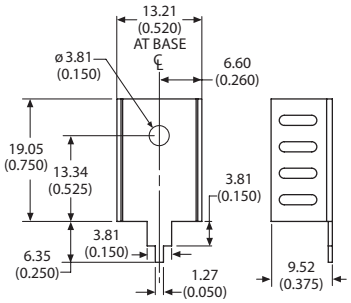

## 7178 Copper narrow channel style heat sink with a single integrated tab

Grease & Epoxy page112

Mounting Kits page 99

**Copper narrow channel style heat sink includes a single integrated tab** to allow easy attachment to the PC board. Tin plated finish ensures easy solderability.




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

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 7178DG | Narrow channel copper heat sink | 2.54 (0.100) |

## 7136, 7139 Copper channel style slide on heat sink featuring integrated mounting clip

**Copper channel style slide on heat sink features integrated mounting clip** for easy no hardware attachment to the device. Also includes solderable mounting tabs for easy attachment to the PC board.

FIGURE A

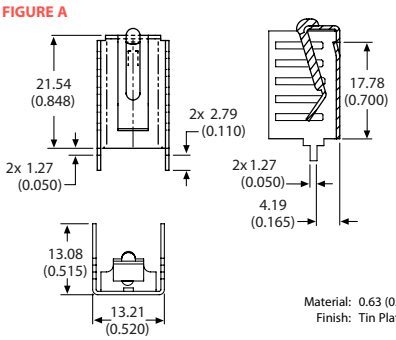
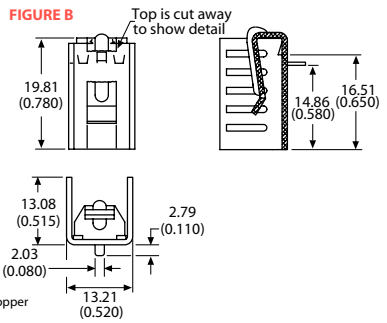


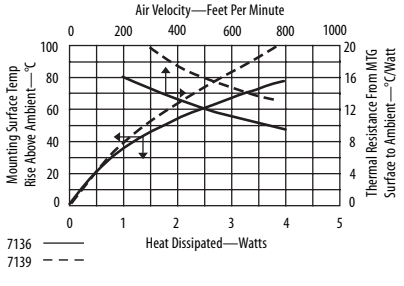

FIGURE B




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

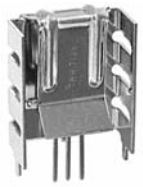
### ORDERING INFORMATION

| Part Number | Description | Figure | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 7136DG | Vertical mount | A | 2.54 (0.100) |
| 7139DG | Horizontal mount | B | 2.54 (0.100) |

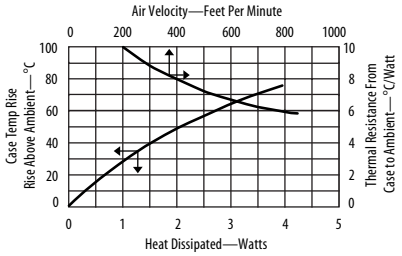


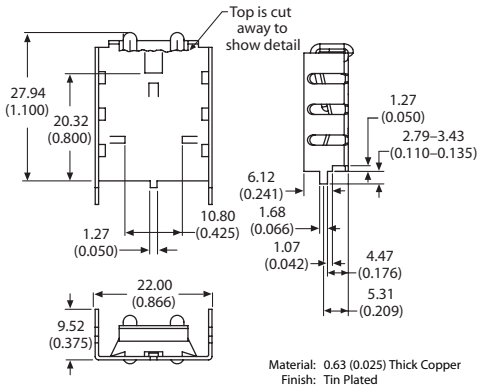
# TO-220 Heat Sinks

## 7128 Copper channel style heat sink with integrated clip



**Copper channel style heat sink with integrated clip and locking tab** for secure attachment to the device. Narrow profile uses less board space. Includes tin plated solderable tabs for easy attachment to the printed circuit card.



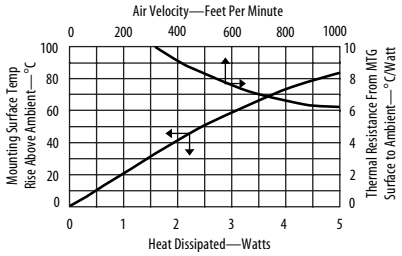

Material: 0.63 (0.025) Thick Copper
Finish: Tin Plated

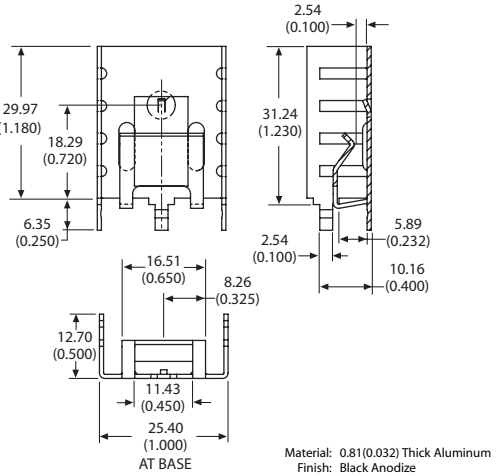
### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 7128DG | Slide on channel heat sink with integrated clip and locking tabs | 2.92 (0.115) |

## 6038 Channel style heat sink with integrated clip

**Channel style heat sink with integrated clip and locking tab** for secure attachment to the device. Tabs can be bent for mounting.



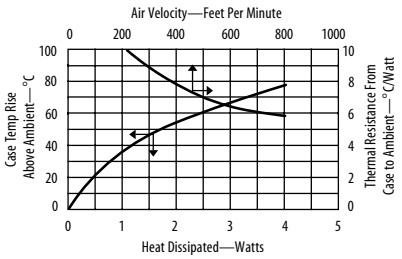

Material: 0.81(0.032) Thick Aluminum
Finish: Black Anodize

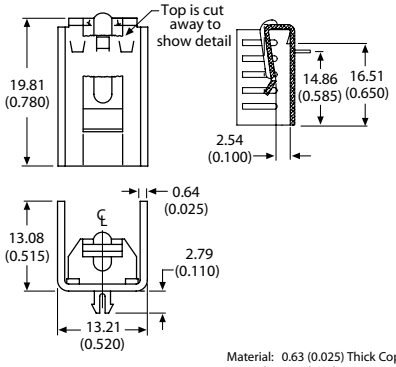
### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 6038BG | Slide on channel heat sink with integrated clip and locking tabs | 3.81 (0.150) |

## 7142 Narrow channel style heat sink with integrated clip

**Narrow channel style heat sink with integrated clip and locking tab** for secure attachment to the device. Device can be mounted horizontally using a single center tab that can be soldered directly to the PC board.




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

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 7142DG | Slide on narrow channel heat sink with integrated clip and locking tabs | 3.18 (0.125) |



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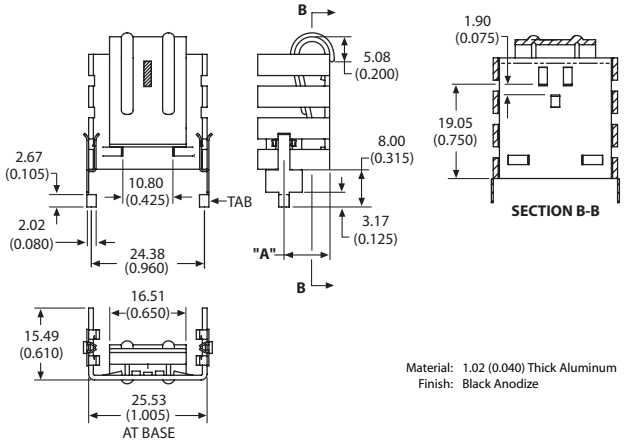
## 6238, 6239 Channel style heat sink with integrated clip

**Channel style heat sink with integrated clip** features strong spring tension and device locking tab to attach device securely to the heat sink. Available with solderable tabs for vertical mount or without tabs for mounting horizontally.

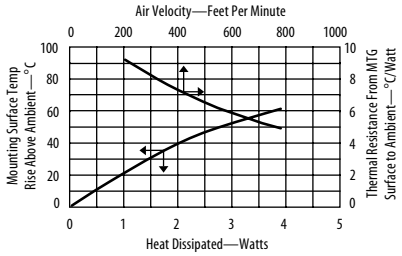



Material: 1.02 (0.040) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | "A" Dim | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 6238BG | Channel heat sink with integral clip, no solderable tab | | |
| 6238B-MTG | With solderable mounting tabs | 10.16 (0.400) | 2.90 (0.114) |
| 6239B-MTG | With solderable mounting tabs | 6.99 (0.275) | 2.90 (0.114) |

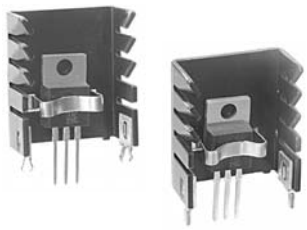
For additional options see page 85



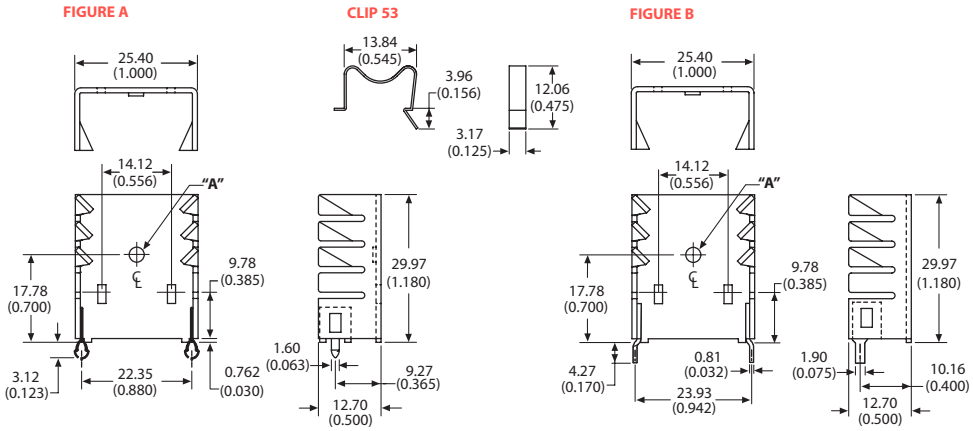

## 5342 Channel style heat sink with convenient clip

Grease & Epoxy page112

Mounting Kits page 99



**Channel style heat sink features a dittin to locate the device and a convenient clip** to eliminate the need for mounting hardware. The twisted fins increase cooling efficiency. Available in two solderable mounting tab styles. Can be ordered without the ditton if electrical isolation is required or for mounting tabless packages.

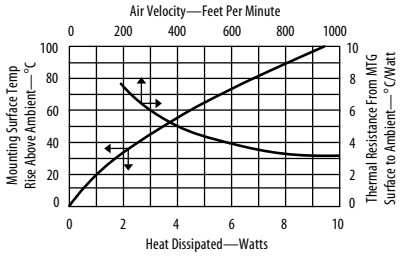



Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Figure | "A" Dim | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|---|
| 534202B02853G | With Shur-Lock™ tabs and clip | A | Dia 3.05(0.120) x 0.64(0.025) High Dittin | 2.39 (0.094) |
| 534202B03453G | With solderable mounting tabs and clip | B | Dia 3.05(0.120) x 0.64(0.025) High Dittin | 2.39 (0.094) |
| 534265B02853G | With Shur-Lock™ tabs and clip | A | No Dittin | 2.39 (0.094) |
| 534265B03453G | With solderable mounting tabs and clip | B | No Dittin | 2.39 (0.094) |

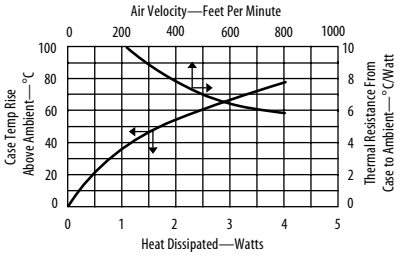
For additional options see page 82

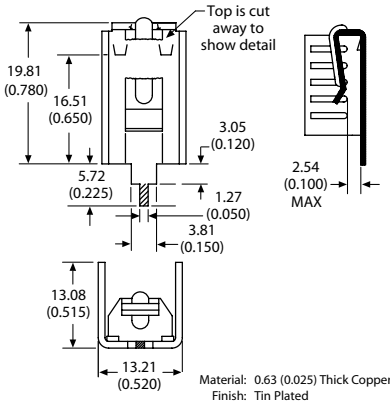


# TO-220 Heat Sinks

## 7141 Copper narrow channel style heat sink with integrated clip

**Copper narrow channel style heat sink with integrated clip and locking tab** for secure attachment to the device. Single center tab can be soldered directly to the PC board.




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

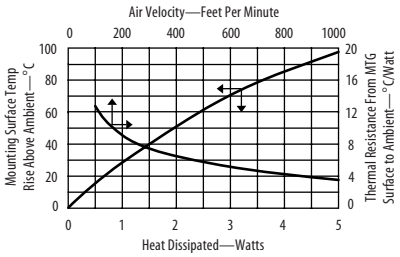
### ORDERING INFORMATION

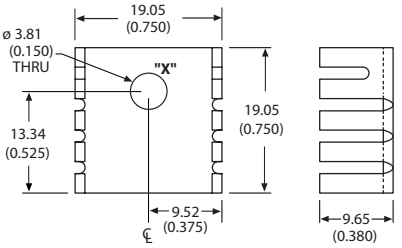
| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 7141DG | Narrow channel heat sink with integrated clip | 2.77 (0.109) |

## 5073 Economy, narrow base, low profile channel style heat sink

Grease & Epoxy page112
Mounting Kits page 99

**Economy, narrow base, low profile channel style heat sink** is perfect for use on printed circuit boards with 0.500 inch centering. When mounted horizontally, the total height of the heat sink is just 0.380.




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

### ORDERING INFORMATION

| Part Number | Finish |
|---|---|
| 507302B00000G | Black anodize |
| 507302J00000G | Pre-black anodize* |

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

### POPULAR OPTIONS: 507302 _ 000 00G

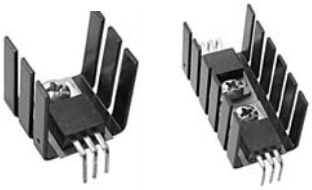
Base part no. — A

| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | 09 | Stud 4–40 x 0.350 LG | Hole X | Page 96 |

For additional options see page 82

## 5041, 5042 Economy, narrow base, low profile channel style heat sink

Grease & Epoxy page112
Mounting Kits page 99



**Economy, narrow base, low profile channel style heat sink** is perfect for use on printed circuit boards with tight component spacing. Models are available for single and dual device mounting.

FIGURE A

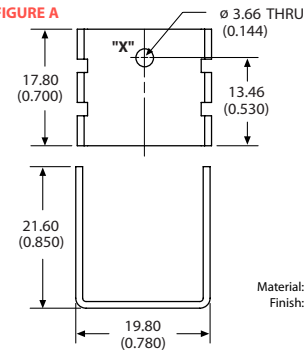
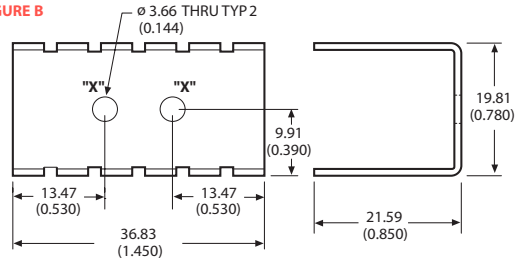
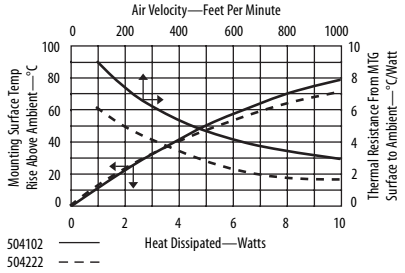



FIGURE B




Material: 1.02 (0.040) Thick Aluminum
Finish: Black Anodize




### ORDERING INFORMATION

| Part Number | Description | Figure |
|---|---|---|
| 504102B00000G | Economy, narrow base channel style heat sink | A |
| 504222B00000G | For dual devices | B |

### POPULAR OPTIONS: 504_ _2B00000G

Base part no. — A

| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | 01 | 6-32 Wave On threaded insert 0.100 stand off | Hole X | Page 89 |

For additional options see page 82



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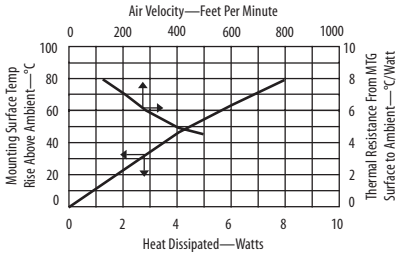
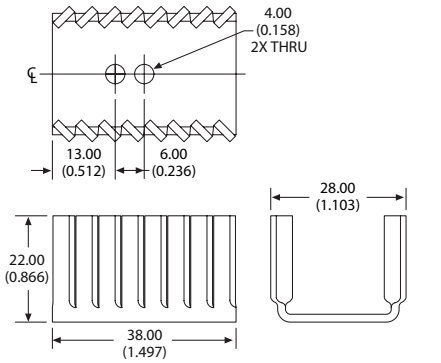
## TV40 Narrow channel style heat sink features twisted fins

Grease & Epoxy page112

Mounting Kits page 99




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

**Narrow channel style heat sink features twisted fins** for increased air turbulence and better cooling. Mounts horizontally to accommodate two TO-220 devices.

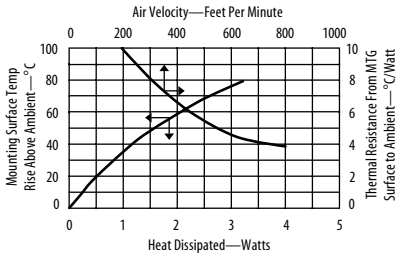
### ORDERING INFORMATION

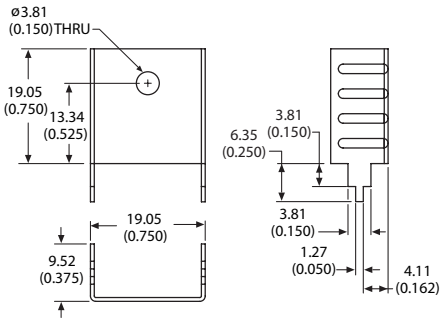
| Part Number | Description |
|---|---|
| TV40G | Narrow channel style heat sink with twisted fins |

## 7173 Copper channel style heat sink featuring two integrated tabs

Grease & Epoxy page112

Mounting Kits page 99



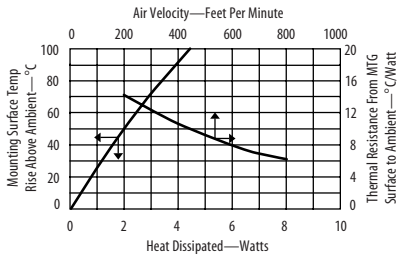

Material: 0.63 (0.025) Thick Copper
Finish: Tin Plated

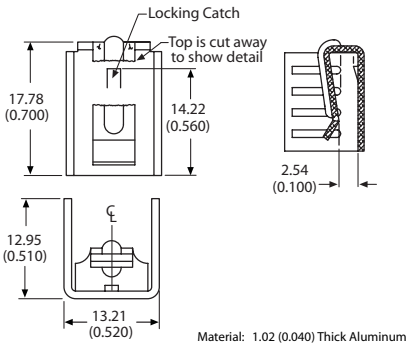
**Copper channel style heat sink features two integrated tabs.** The heat sink is tin plated and can be soldered to the PC board.

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 7173DG | Copper channel style heat sink | 2.54 (0.100) |

## 6236 Channel style heat sink featuring an integrated device retaining clip




Material: 1.02 (0.040) Thick Aluminum
Finish: See Table

**Channel style heat sink features an integrated device retaining clip** that eliminates the need for attachment hardware. Available in two finish options.

### ORDERING INFORMATION

| Part Number | Finish |
|---|---|
| 6236BG | Black anodize |
| 6236PBG | Pre-black anodize* |

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

# TO-220 Heat Sinks

## 5306, 5307, 5760 Channel style heat sink with wide mounting surface

Grease & Epoxy page 112 | Mounting Kits page 99

**Lightweight, low cost channel style heat sink** with wide mounting surface and selection of lengths to accept a variety of packages. Models accomodate one or two devices.

FIGURE A

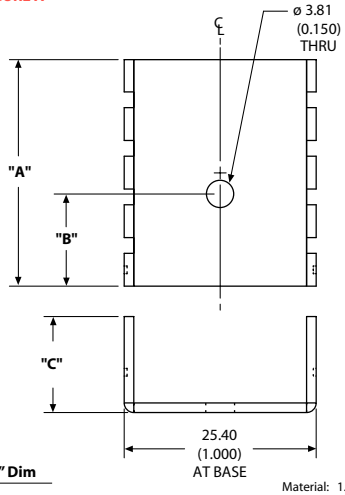
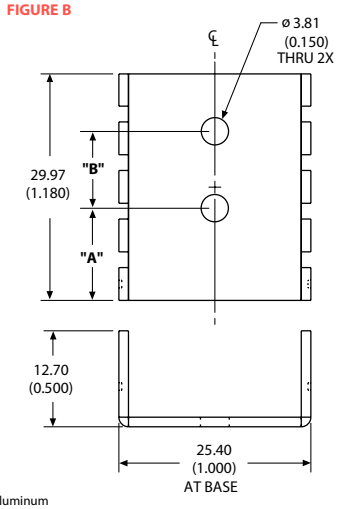



FIGURE B

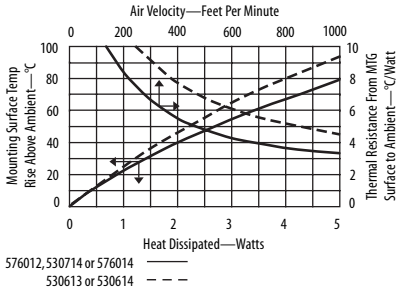



Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Figure | "A" Dim | "B" Dim | "C" Dim |
|---|---|---|---|---|
| 530613B00000G | B | 12.19 (0.480) | 10.16 (0.400) | |
| 530614B00000G | A | 29.97 (1.180) | 11.68 (0.460) | 12.70 (0.500) |
| 530714B00000G | A | 18.03 (0.710) | 12.32 (0.485) | 12.70 (0.500) |
| 576012B00000G | A | 22.86 (0.900) | 11.43 (0.450) | 9.65 (0.380) |
| 576014B00000G | A | 22.86 (0.900) | 8.13 (0.320) | 9.65 (0.380) |

For additional options see page 82




## 5779, 5786 Twin channel style heat sink

Grease & Epoxy page 112 | Mounting Kits page 99

**Twin channel style heat sink** vertically mounts two TO-220 devices to a single heat sink. Center fins increase cooling capacity. Available with integrated twist tabs or staked on solder tabs for easy attachment to the PC board.

FIGURE A

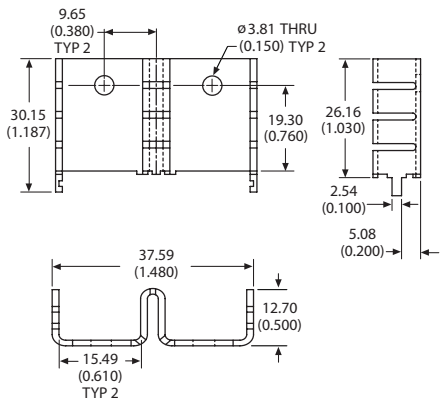
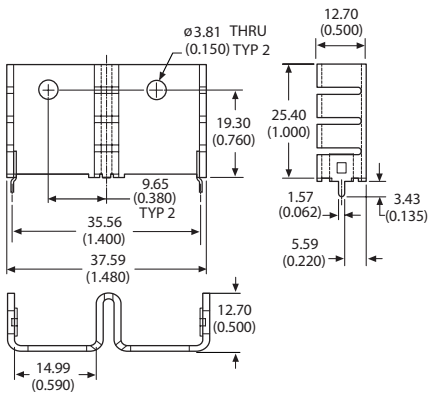



FIGURE B

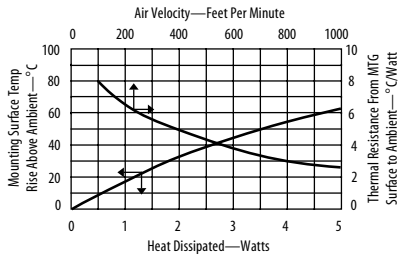



Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Figure | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 577922B00000G | Twin channel style heat sink with integrated tabs | A | 3.10 (0.122) |
| 578622B03200G | With staked on solderable tabs | B | 1.91 (0.075) |

For additional options see page 82



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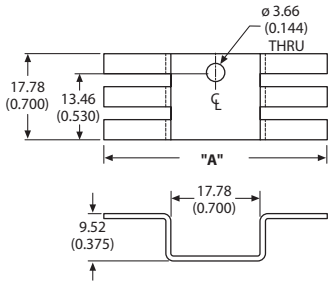
## 5069, 5070, 5071, 5072 Hat section style heat sink

Grease & Epoxy page 112

Mounting Kits page 99

**Hat section style heat sinks** are low profile and perfect for use on printed circuit cards with 0.500 inch centering between boards. For higher power applications the 5071 hat can be added to the 5070 or 5072 for double sided cooling of a TO-220 device.

FIGURE A




Material: 1.02 (0.040) Thick Aluminum
Finish: Black Anodize

FIGURE B

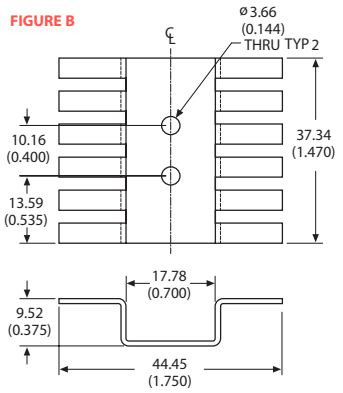
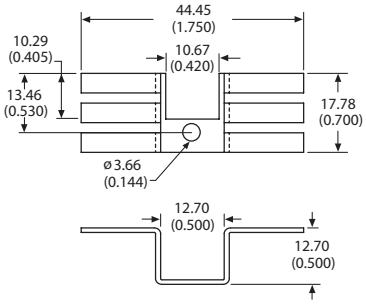



FIGURE C




### ORDERING INFORMATION

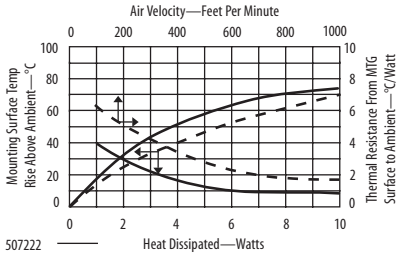
| Part Number | Description | Figure | "A" Dim |
|---|---|---|---|
| 506902B00000G | Hat section heat sink | A | 31.75 (1.250) |
| 507002B00000G | Wide hat section heat sink | A | 44.45 (1.750) |
| 507102B00000G | Hat section heat sink with cut out | C | |
| 507222B00000G | Dual device hat section heat sink | B | |

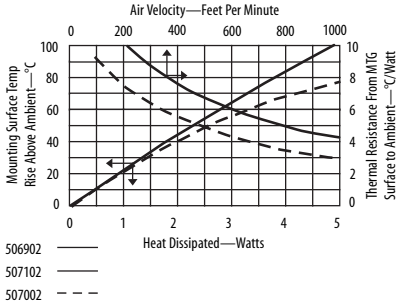
### POPULAR OPTIONS:

50_ _ _2B 0 0000G
Base part no. A

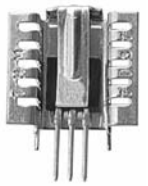
| Position | Code | Description | Details |
|---|---|---|---|
| A | 1 | Kon Dux™ pad | Page 86 |

For additional options see page 82



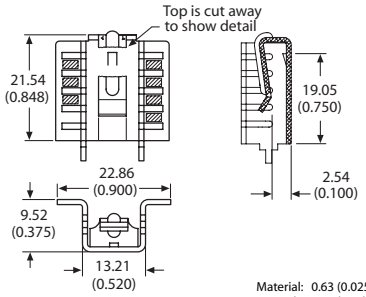




## 7137, 7140 Copper, hat section, slide on heat sink



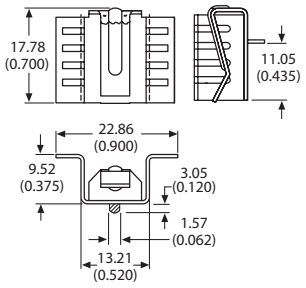
**Copper, hat section, slide on heat sink features integrated mounting clip** for easy no hardware attachment to the device. Also included are solderable mounting tabs for easy attachment to the PC card.

FIGURE A



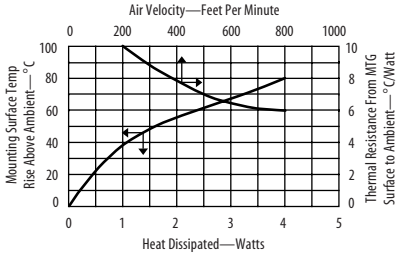

Material: 0.63 (0.025) Thick Copper
Finish: Tin Plated

FIGURE B



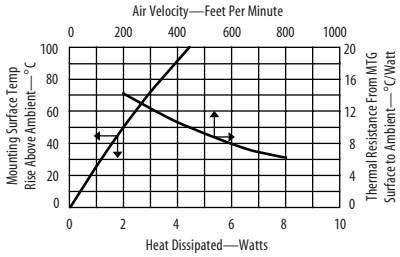

### ORDERING INFORMATION

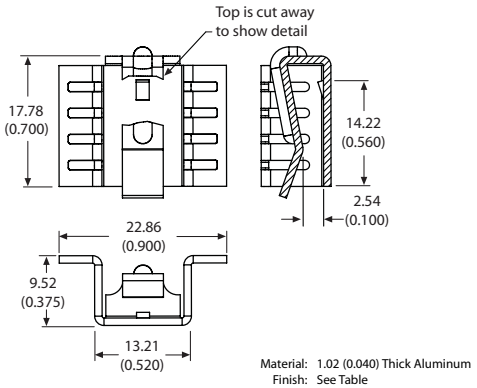
| Part Number | Description | Figure | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 7137DG | Vertical mount | A | 2.54 (0.100) |
| 7140DG | Horizontal mount | B | 2.54 (0.100) |



# TO-220 Heat Sinks

## 6237 Hat section style heat sink featuring an integrated clip




Material: 1.02 (0.040) Thick Aluminum
Finish: See Table

**Hat section style heat sink features an integrated clip** for secure attachment to the device without added hardware. Available in two finishes.

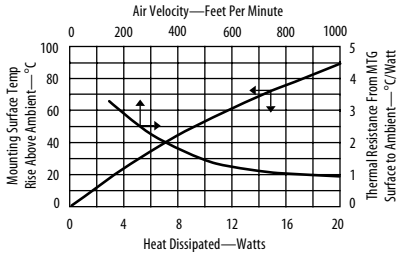
### ORDERING INFORMATION

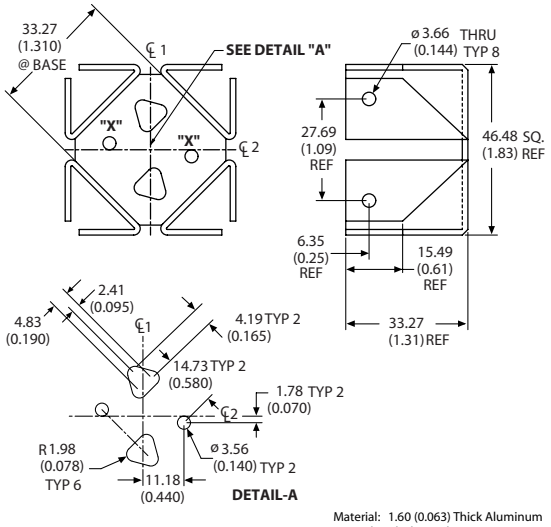
| Part Number | Finish |
|---|---|
| 6237BG | Black anodize |
| 6237PBG | Pre-black anodize* |

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

## 5690 High power, square basket heat sink with folded back fins

Grease & Epoxy page 112
Mounting Kits page 99




Material: 1.60 (0.063) Thick Aluminum
Finish: Black Anodize

**High power, square basket heat sink** accommodates two TO-220 devices. Features folded back fins for increased surface area for maximum cooling.

### ORDERING INFORMATION

| Part Number | Description |
|---|---|
| 569022B00000G | High power, square basket, folded back fin heat sink |

### POPULAR OPTIONS: 569022B0 00 00G

Base part no. A

| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | 01 | 6–32 Wave On threaded insert, 0.100 stand off 0.062 Bd | Hole X | Page 89 |

For additional options see page 82



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## 5748, 5798, 5799 Clip on style heat sink featuring an integrated clip

**Clip on style heat sink features an integrated clip** to retain the device meaning no mounting hardware is required. Models have fins on both sides, left or right side and are available with solderable tabs for easy attachment to the PC board.

FIGURE A

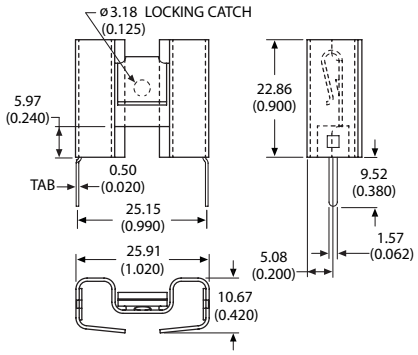
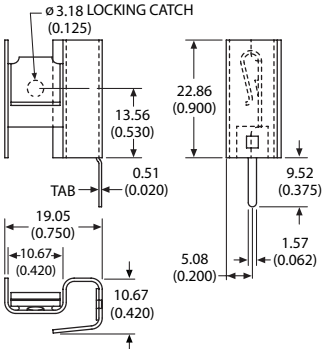



FIGURE B



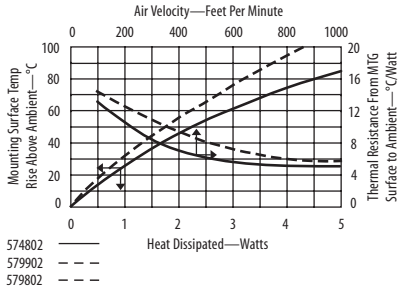

Material: 0.63 (0.025) Thick Aluminum
Finish: Black Anodize

Note: Fins on left or right. Right hand side model shown

### ORDERING INFORMATION

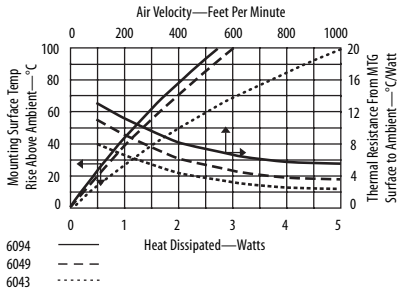
| Part Number | Description | Figure | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 574802B00000G | Clip on heat sink, left & right side fins, no solderable tabs | A | |
| 574802B03300G | Left & right side fins with solderable tabs | A | 1.91 (0.075) |
| 579802B00000G | Left side fin, no solderable tabs | B | |
| 579802B03300G | Left side fin with solderable tab | B | 1.91 (0.075) |
| 579902B00000G | Right side fin, no solderable tabs | B | |
| 579902B03300G | Right side fin with solderable tab | B | 1.91 (0.075) |

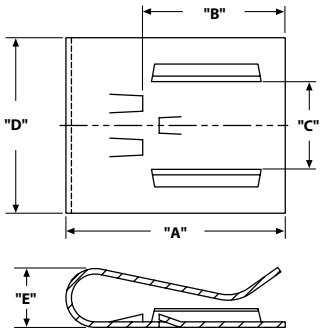
For additional options see page 82




## 6043, 6049, 6094 Low cost, clip on style heat sink featuring a locking tab

**Low cost, clip on style heat sink features a locking tab** to prevent the device from dislodging from the heat sink. Also includes slide runners to ensure proper device alignment. Available in a pre-black anodize finish.




Material: 0.63 (0.025) Thick Aluminum
Finish: Pre-Black Anodize*

### ORDERING INFORMATION

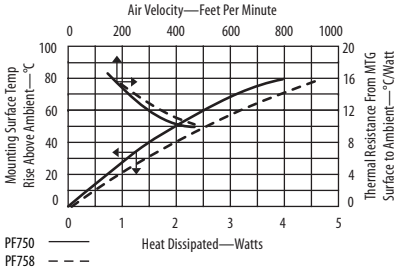
| Part Number | "A" Dim | "B" Dim | "C" Dim | "D" Dim | "E" Dim |
|---|---|---|---|---|---|
| 6043PBG | 25.40 (1.000) | 16.51 (0.650) | 10.16 (0.400) | 20.32 (0.800) | 6.81 (0.268) |
| 6049PBG | 25.40 (1.000) | 16.51 (0.650) | 10.16 (0.400) | 13.97 (0.550) | 6.81 (0.268) |
| 6094PBG | 19.71 (0.776) | 14.73 (0.580) | 10.92 (0.430) | 20.32 (0.800) | 6.45 (0.254) |

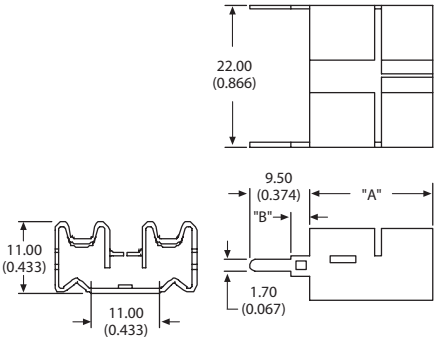
*Edges cut during the manufacturing process will be unfinished.
See page 110 for more information

# TO-220 Heat Sinks

## PF750, PF758 Slip on heat sink featuring integrated tabs

**Slip on heat sink** is tin plated and has integrated tabs for soldering to the PC board. Locating features provide simple device alignment and spring action holds the device for good thermal contact.



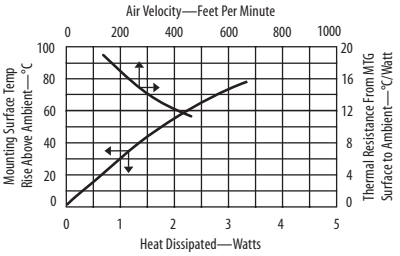

### ORDERING INFORMATION

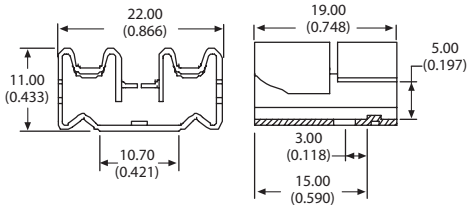
| Part Number | Description | "A" Dim | "B" Dim |
|---|---|---|---|
| PF750G | Slip on heat sink with tabs | 19.00(0.748) | 3.00(0.118) |
| PF758G | Slip on heat sink with tabs | 24.00(0.945) | 5.20(0.205) |

Material: 0.71 (0.028) Thick Aluminum
Finish: Tin Plate

## PF752 Slip on heat sink

**Slip on heat sink** has locating features for simple device alignment. Spring action holds the device for good thermal contact.



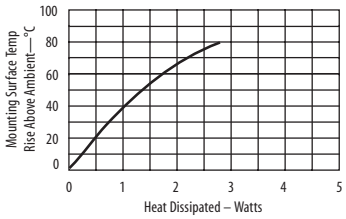

Material: 0.71 (0.028) Thick Aluminum
Finish: Black Anodize

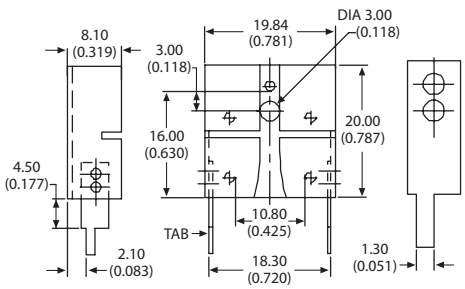
### ORDERING INFORMATION

| Part Number | Description |
|---|---|
| PF752G | Slip on heat sink |

## PF720, PF723 Slip on heat sink

**Slip on heat sink** has locating features for simple device alignment. Spring action holds the device for good thermal contact. Available with or without solderable mounting tabs




Material: 0.71 (0.028) Thick Aluminum
Finish: Pre-Black Paint*

### ORDERING INFORMATION

| Part Number | Description |
|---|---|
| PF720G | Slip on heat sink, no solderable tabs |
| PF723G | With solderable tabs |

* Edges cut during manufacturing process will be unfinished



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## 5744, 5745, 5746, 5749 Low cost, labor saving, slide on heat sink featuring spring action

**Low cost, labor saving, slide on heat sink features spring action** to firmly hold the device tab to the heat sink providing maximum metal to metal contact and good thermal conduction. Available with solderable tabs for horizontal or vertical mounting to the PC board.

FIGURE A

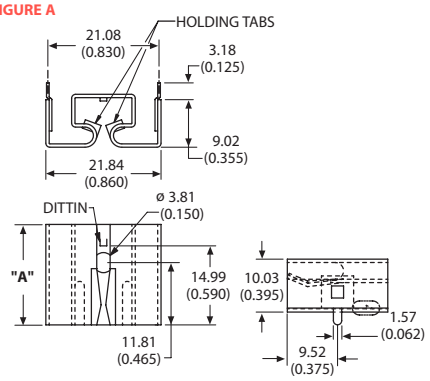
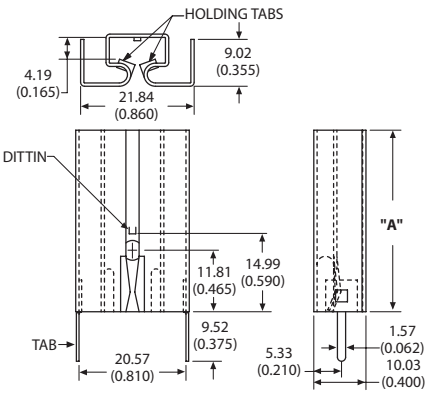



FIGURE B

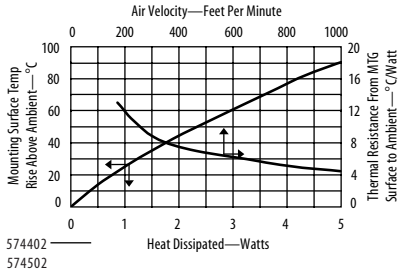


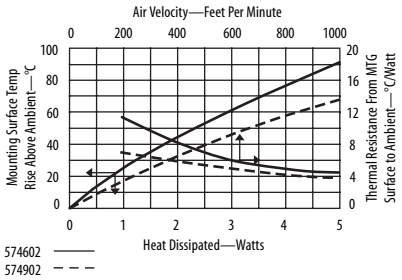

Material: 0.63 (0.025) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Figure | "A" Dim | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|---|
| 574402B00000G | Low cost slide on heat sink, no solderable tabs | A | 19.05 (0.750) | |
| 574402B03200G | With solderable tabs for horizontal mounting | A | 19.05 (0.750) | 1.91 (0.075) |
| 574502B00000G | Low cost slide on heat sink, no solderable tabs | B | 19.05 (0.750) | |
| 574502B03300G | With solderable tabs for vertical mounting | B | 19.05 (0.750) | 1.91 (0.075) |
| 574602B00000G | Low cost slide on heat sink , no solderable tabs | B | 17.53 (0.690) | |
| 574602B03300G | With solderable tabs for vertical mounting | B | 17.53 (0.690) | 1.91 (0.075) |
| 574902B00000G | Low cost slide on heat sink , no solderable tabs | B | 35.05 (1.380) | |
| 574902B03300G | With solderable tabs for vertical mounting | B | 35.05 (1.380) | 1.91 (0.075) |

For additional options see page 82

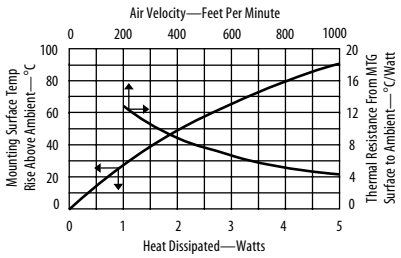


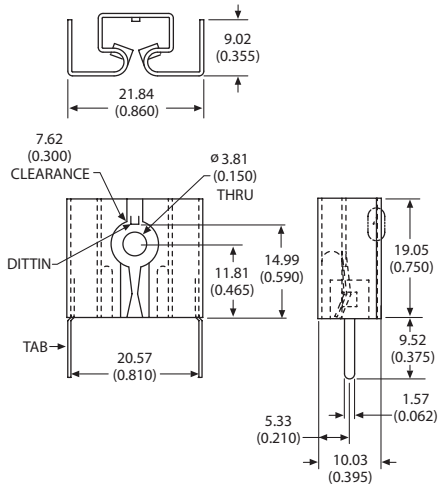




## 5741 Low cost, labor saving, slide on heat sink featuring spring action

Mounting Kits page 99

**Low cost, labor saving, slide on heat sink features spring action** to firmly hold the device tab to the heat sink providing maximum metal to metal contact and good thermal conduction. Includes a clearance hole in the top side to allow the use of optional hardware to attach device and heat sink to circuit board or other surface. Also available with solderable tabs for vertical mounting to the PC board.




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

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 574102B00000G | Low cost slide on heat sink, no solderable tabs | |
| 574102B03300G | With solderable tabs | 1.91 (0.075) |

### POPULAR OPTIONS: 574102B0 00 00G

Base part no. A

| Position | Code | Description | Details |
|---|---|---|---|
| A | 37 | Solderable tab with step to limit insertion depth | Page 92 |

For additional options see page 82

# TO-220 Heat Sinks

## 5751, 5793, 5794 Snap down style heat sink featuring two side fins

**Snap down style heat sink features two side fins that act as springs** to hold the semiconductor firmly to the heat sink. Models include an integrated clip and device locking catch for more robust applications. Available for both standard and bevel edged TO-220 packages.

**FIGURE A**

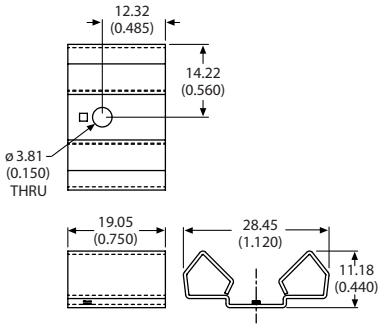
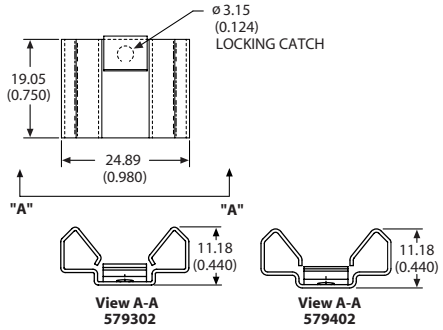



**FIGURE B**

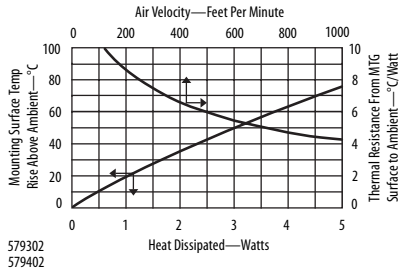


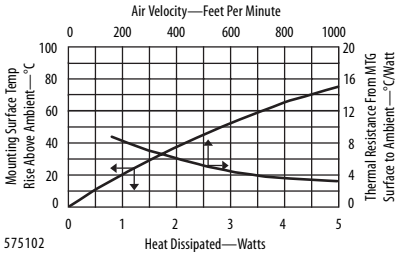

Material: 0.63 (0.025) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Figure |
|---|---|---|
| 575102B00000G | Snap down heat sink | A |
| 579302B00000G | With integrated clip and locking catch | B |
| 579402B00000G | With integrated clip and locking catch for TO-220 with beveled edge | B |

For additional options see page 82



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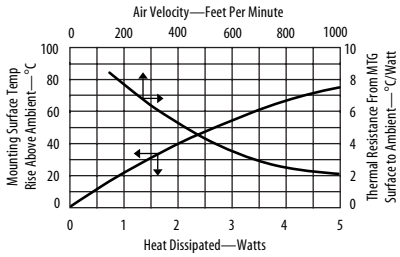
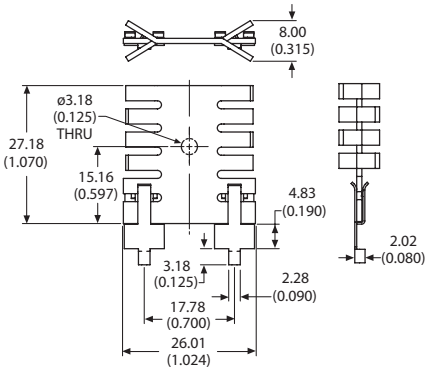
## 6225 Space saving staggered fin heat sink

Grease & Epoxy page 112

Mounting Kits page 99

**Space saving staggered fin heat sink for vertical mounting** TO-220 devices. Features solderable mounting tabs for easy attachment to the PC board.




### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 6225B-MTG | Space saving staggered fin heat sink | 2.90 (0.114) |

For additional options see page 85

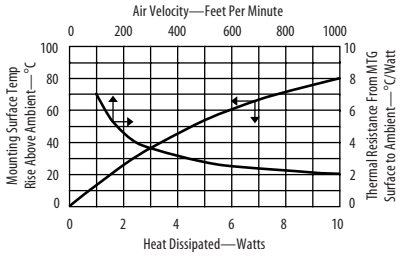
Material: 1.02 (0.040) Thick Aluminum
Finish: Black Anodize

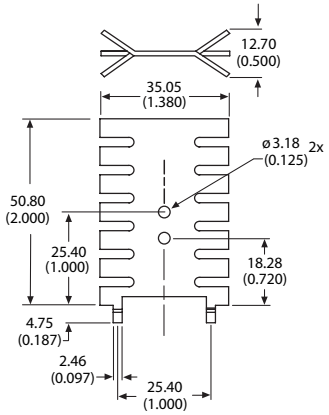
## 6032 Copper, space saving staggered fin heat sink

Grease & Epoxy page 112

Mounting Kits page 99

**Copper, space saving staggered fin heat sink for vertical mounting** TO-220 devices. Features solderable mounting tabs for easy attachment to the PC board.




### ORDERING INFORMATION

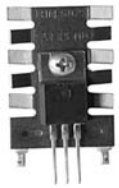
| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 6032DG | Copper space saving staggered fin heat sink | 3.10 (0.122) |

Material: 1.27 (0.050) Thick Copper
Finish: Tin Plated

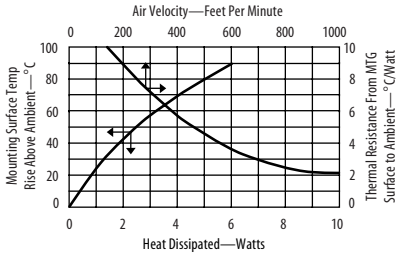
## 6022 Space saving staggered fin heat sink

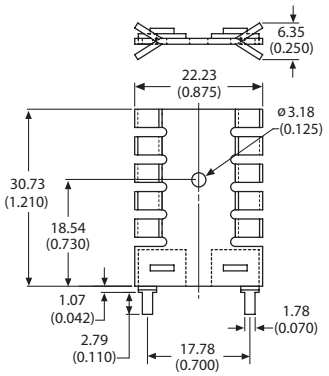
Grease & Epoxy page 112

Mounting Kits page 99



**Space saving staggered fin heat sink for vertical mounting** TO-220 devices. Features staked on solderable mounting tabs for easy attachment to the PC board.




### ORDERING INFORMATION

| Part Number | Finish | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 6022PBG | Pre-black anodize* | 2.36 (0.093) |
| 6022BG | Black anodize | 2.36 (0.093) |

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

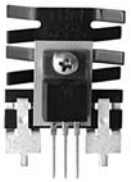
For additional options see page 85

Material: 1.02 (0.040) Thick Aluminum
Finish: See Table

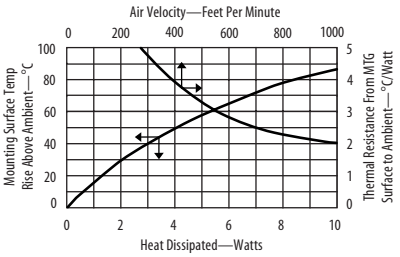
# TO-220 Heat Sinks

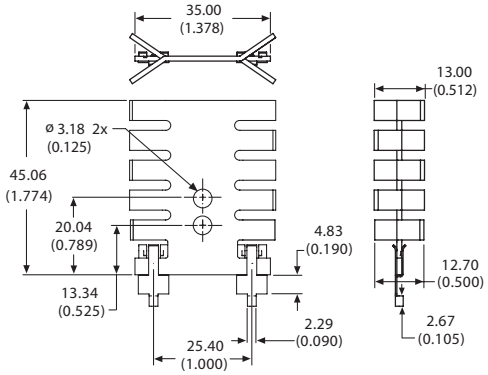
## 6232 Space saving staggered fin heat sink

Grease & Epoxy page112 | Mounting Kits page 99



**Space saving staggered fin heat sink** for vertical mounting TO-220 devices. Features solderable mounting tabs with triangular base for easy attachment to the PC board.




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

### ORDERING INFORMATION

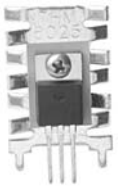
| Part Number | Finish | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 6232B-MTG | Black anodize | 3.10 (0.122) |
| 6232PB-MTG | Pre-black anodize* | 3.10 (0.122) |

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

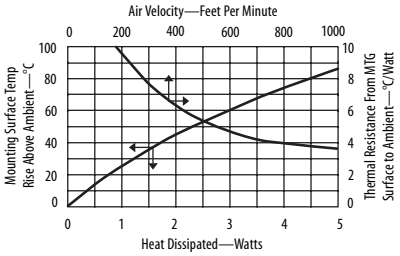
For additional options see page 85

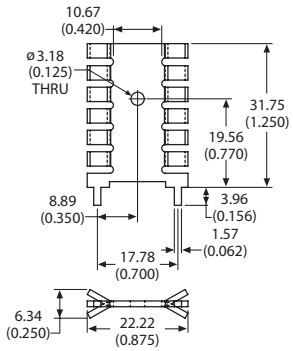
## 6025 Copper, space saving staggered fin heat sink

Grease & Epoxy page112 | Mounting Kits page 99



**Copper, space saving staggered fin heat sink** for vertical mounting TO-220 devices. Features integrated solderable mounting tabs for easy attachment to the PC board.




Material: 1.27 (0.050) Thick Copper
Finish: Tin Plated

### ORDERING INFORMATION

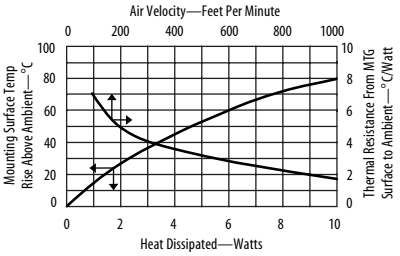
| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 6025DG | Copper, space saving staggered fin heat sink with solderable tabs | 2.54 (0.100) |

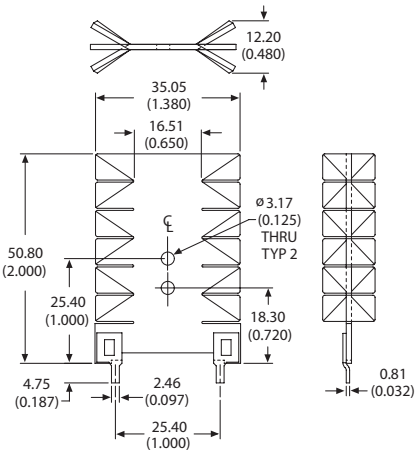
For additional options see page 85

## 5932 Space saving twisted fin heat sink

Grease & Epoxy page112 | Mounting Kits page 99

**Space saving twisted fin heat sink** for vertical mounting TO-220 devices. Features solderable mounting tabs for easy attachment to the PC board.




Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 593202B03500G | Space saving twisted fin heat sink with solderable tabs | 2.84 (0.112) |

### POPULAR OPTIONS: 593202B0 00 00G

Base part no. — A

| Position | Code | Description | Details |
|---|---|---|---|
| A | 34 | Solderable tab for 0.094 plated thru hole | Page 92 |

For additional options see page 82



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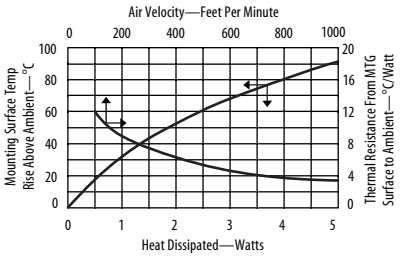
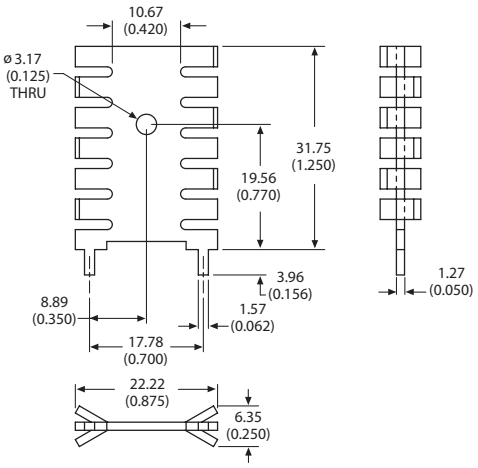
## 5425 Space saving staggered fin heat sink

Grease & Epoxy page 112

Mounting Kits page 99

**Space saving staggered fin heat sink for vertical mounting** TO-220 devices. Features integrated solderable mounting tabs that can be twisted for attachment to the PC board. Heat sink is also available with tin plating for soldering directly to the PC board.




### ORDERING INFORMATION

| Part Number | Finish | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 542502B00000G | Black anodize | 2.39 (0.094) |
| 542502D00000G | Tin plated | 2.39 (0.094) |

For additional options see page 82

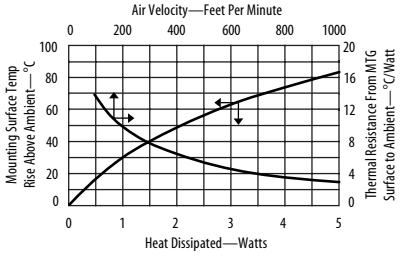
Material: 1.27 (0.050) Thick Aluminum
Finish: See Table

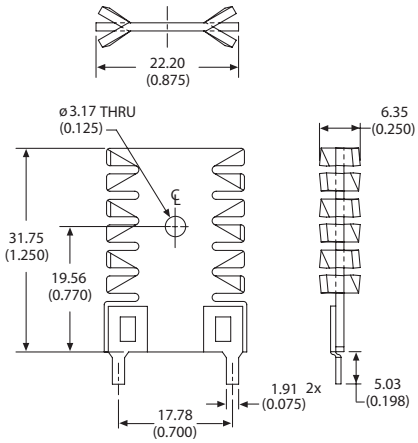
## 5925 Space saving twisted fin heat sink

Grease & Epoxy page 112

Mounting Kits page 99

**Space savings twisted fin heat sink for vertical mounting** TO-220 devices. Features staked on solderable mounting tabs for easy attachment to the PC board.




### ORDERING INFORMATION

| Part Number | Finish | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 592502B03400G | Black anodize | 2.39 (0.094) |
| 592502U03400G | Unfinished | 2.39 (0.094) |

For additional options see page 82

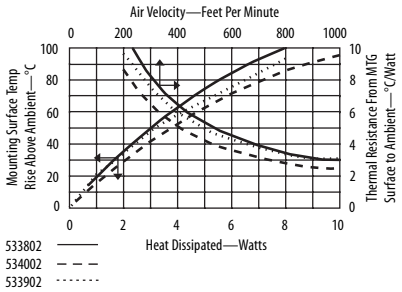
Material: 1.27 (0.050) Thick Aluminum
Finish: See Table

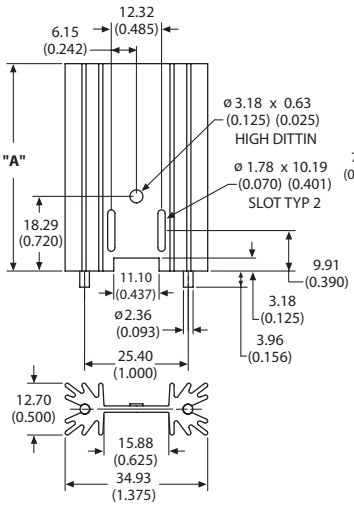
# TO-220 Heat Sinks

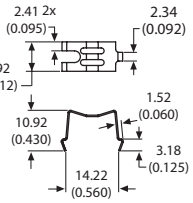
## 5338, 5339, 5340 Extruded heat sink with radial fins

Grease & Epoxy page112

**Extruded heat sink with radial fins and channel clip attach feature** make device attachment easy. Includes clip and two solderable mounting pins which permit vertical mounting and eliminate stress on device leads. Available in three heights for TO-220 devices.




**CLIP 54**

### ORDERING INFORMATION

| Part Number | "A" Dim | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|
| 533802B02554G | 25.40 (1.000) | 2.67 (0.105) |
| 533902B02554G | 38.10 (1.500) | 2.67 (0.105) |
| 534002B02554G | 50.80 (2.000) | 2.67 (0.105) |

Material: Aluminum
Finish: Black Anodize

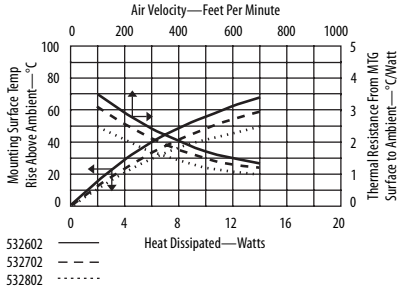
For additional options see page 83

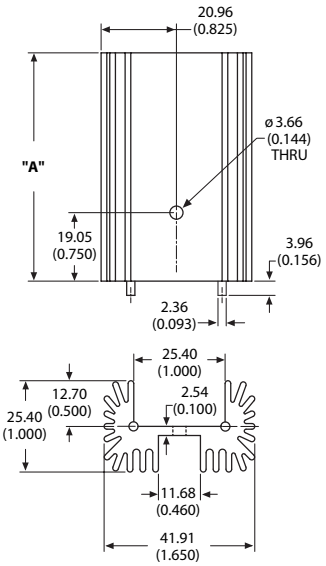
## 5326, 5327, 5328 High power extruded heat sink with large radial fins

Grease & Epoxy page112

Mounting Kits page 99

**High power extruded heat sink with large radial fins** and increased fin count for additional cooling capacity. Solderable pins allow vertical mounting without stress on the device leads. Available in three heights for TO-220 devices.




### ORDERING INFORMATION

| Part Number | "A" Dim | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|
| 532602B02500G | 38.10 (1.500) | 2.67 (0.105) |
| 532702B02500G | 50.80 (2.000) | 2.67 (0.105) |
| 532802B02500G | 63.50 (2.500) | 2.67 (0.105) |

Material: Aluminum
Finish: Black Anodize

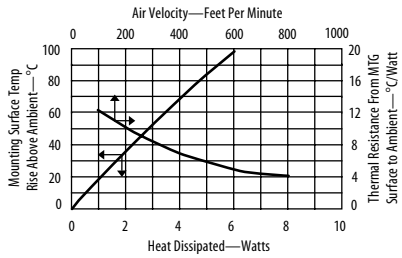
For additional options see page 83

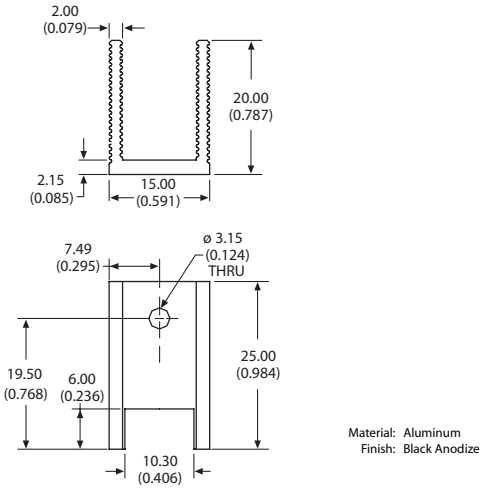
## ML26AA Extruded channel style heat sink featuring serrated fins

Grease & Epoxy page112

Mounting Kits page 99

**Extruded channel style heat sink features serrated fins** for increased cooling capacity. The base of the heat sink is notched to clear the device leads when mounted horizontally on the printed circuit card. Narrow channel accommodates a TO-220 device.




### ORDERING INFORMATION

| Part Number | Description |
|---|---|
| ML26AAG | Extruded channel style heat sink |

Material: Aluminum
Finish: Black Anodize



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## 5912 Plug in style heat sink featuring four spring action clips

**Plug in style heat sink features four spring action clips** to firmly hold the device to the heat sink ensuring maximum metal to metal thermal contact. Available with solderable mounting tabs for both horizontal and vertical mounting to the PC board.

FIGURE A

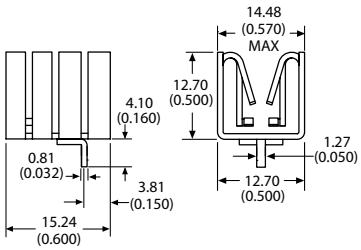
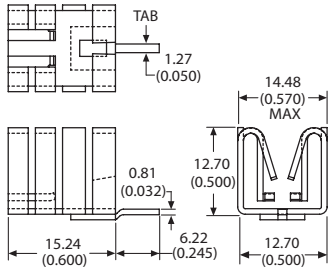



FIGURE B

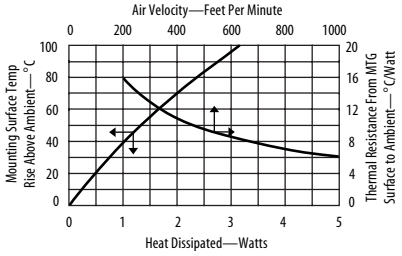



Material: 0.81 (0.032) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Figure | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 591202B00000G | Plug in style heat sink, no mounting tab | A | |
| 591202B03100G | With horizontal mounting tab | A | 1.73 (0.068) |
| 591202B04000G | With vertical mounting tab | B | 1.75 (0.069) |

For additional options see page 84




## 5913 Plug in style heat sink featuring four spring action clips

**Plug in style heat sink features four spring action clips** to firmly hold the device to the heat sink ensuring maximum metal to metal thermal contact. Includes 2 integrated standoffs to steady the heat sink during wave soldering. Available with solderable mounting tabs for vertical mounting to the PC board.

FIGURE A

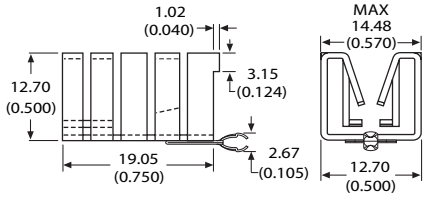
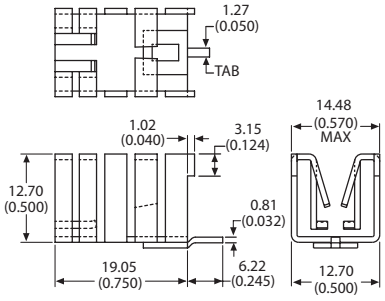



FIGURE B

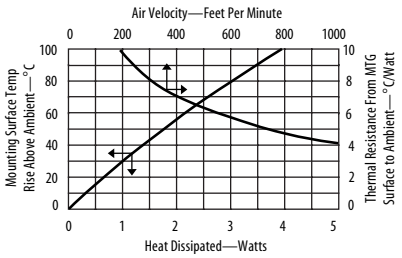



Material: 0.81 (0.032) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Figure | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 591302B00000G | Plug in style heat sink with integrated standoffs, no mounting tab | B | |
| 591302B02800G | With Shur-Lock™ tab for vertical mounting | A | 1.73 (0.068) |
| 591302B04000G | With tab for vertical mounting | B | 1.75 (0.069) |

For additional options see page 84



# TO-220 & TO-262 Heat Sinks

## 5768 Plug in style heat sink featuring four spring action clips

**Plug in style heat sink features four spring action clips** to firmly hold the device to the heat sink ensuring maximum metal to metal thermal contact. Available with solderable mounting tabs for both horizontal and vertical mounting to the PC board.

FIGURE A

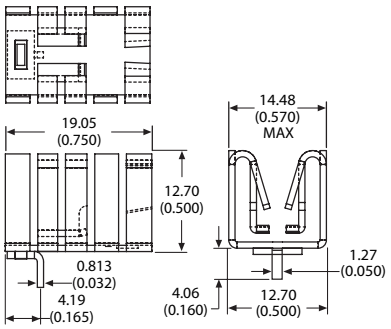
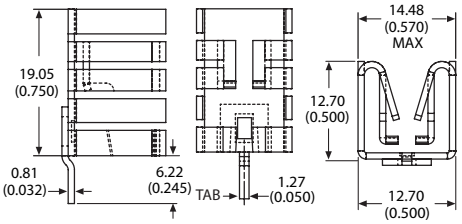



FIGURE B

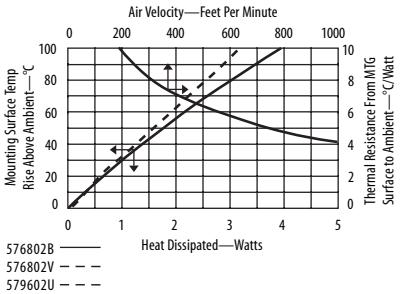



Material: 0.81 (0.032) Thick Aluminum
Finish: See Table

### ORDERING INFORMATION

| Part Number | Description | Figure | Finish | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|---|
| 576802B00000G | Slim plug in heat sink, no mounting tab | A | Black anodize | |
| 576802V00000G | Slim plug in heat sink, no mounting tab | A | AavSHIELD[3] | |
| 576802U00000G | Slim plug in heat sink, no mounting tab | A | Unfinished | |
| 576802B03100G | With single tab for horizontal mounting | A | Black anodize | 1.73 (0.068) |
| 576802V03100G | With single tab for horizontal mounting | A | AavSHIELD[3] | 1.73 (0.068) |
| 576802U03100G | With single tab for horizontal mounting | A | Unfinished | 1.73 (0.068) |
| 576802B04000G | With single tab for vertical mounting | B | Black anodize | 1.75 (0.069) |
| 576802V04000G | With single tab for vertical mounting | B | AavSHIELD[3] | 1.75 (0.069) |
| 576802U04000G | With single tab for vertical mounting | B | Unfinished | 1.75 (0.069) |

For additional options see page 84




## PF432, PF433, PF434, PF435, PF436 Plug in style heat sink features pre-blackened finish

**Plug in style heat sink features pre-blackened finish** and two spring action clips to firmly hold the device to the heat sink ensuring maximum metal to metal thermal contact. Available with solderable mounting tabs for both horizontal and vertical mounting to the PC board.

FIGURE A

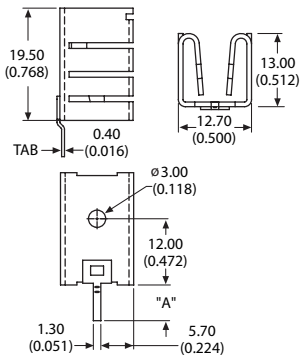



FIGURE B

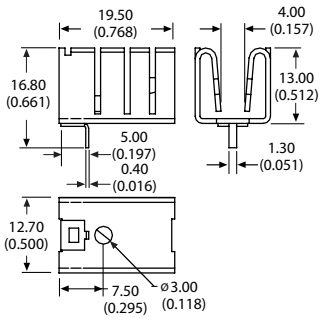
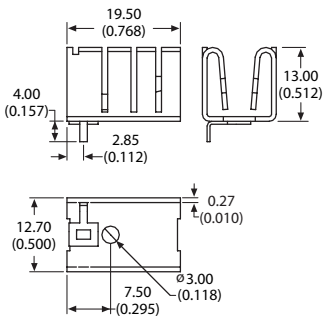



FIGURE C

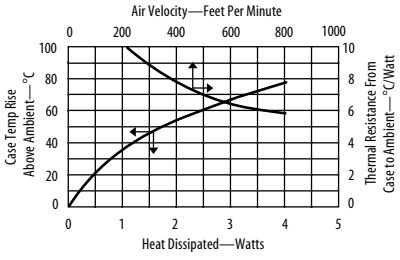



Material: 0.71 (0.028) Thick Aluminum
Finish: Pre-Black Anodize*

### ORDERING INFORMATION

| Part Number | Description | Figure | Dim "A" | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|---|
| PF432G | Plug in style heat sink with solderable tab, vertical mount | A | 6.20 (0.244) | 1.60 (0.063) |
| PF433G | With vertical mount no tab | A | | |
| PF434G | With solderable tab, horizontal mount | B | | 1.60 (0.063) |
| PF435G | With solderable tab, vertical mount | A | 9.50 (0.374) | 1.60 (0.063) |
| PF436G | With solderable tab offset from center, horizontal mount | C | | 1.60 (0.063) |

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



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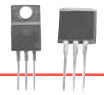




## 5669 Plug in style heat sink with folded back fins

**Plug in style heat sink with folded back fins** for extra cooling capacity. Features four spring action clips to firmly hold the device to the heat sink ensuring maximum metal to metal thermal contact. Available with or without solderable mounting tabs for both horizontal and vertical mounting to the PC board.

FIGURE A

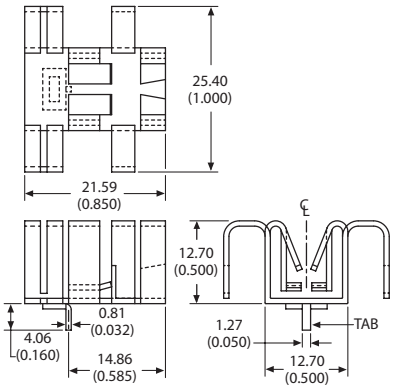
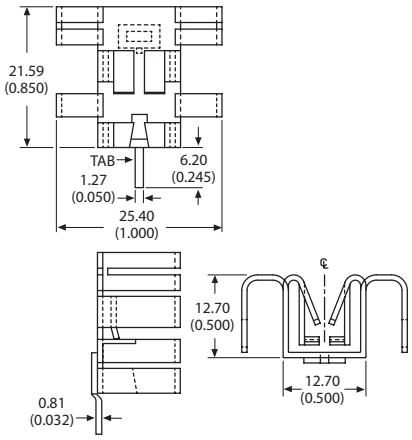



FIGURE B

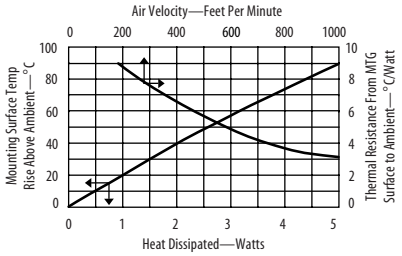



Material: 0.81 (0.032) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Figure | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 566902B00000G | Plug in style heat sink with no mounting tab | A | |
| 566902B03100G | With horizontal mounting tab | A | 1.73 (0.068) |
| 566902B04000G | With vertical mounting tab | B | 1.75 (0.069) |

For additional options see page 82

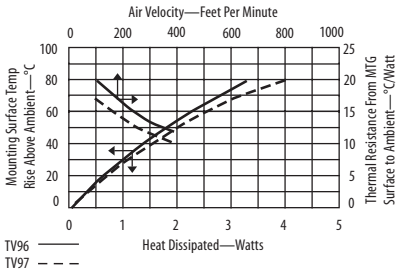


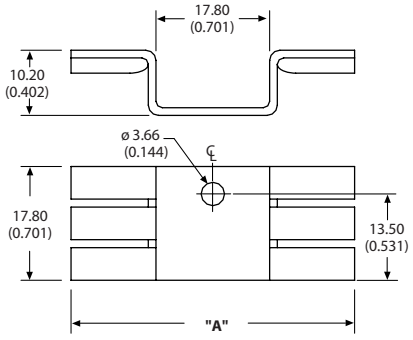

# TO-220 & TO-218 & TO-247 Heat Sinks

## TV96, TV97 Hat section heat sink with twisted fins

Grease & Epoxy page112

Mounting Kits page 99



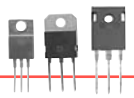

Material: 0.99 (0.039) Thick Aluminum
Finish: Black Anodize

**Hat section heat sink with twisted fins** is low profile and perfect for use on circuit cards with 0.500 spacing. The twisted fins increase air turbulence for better thermal performance.

### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| TV96G | 31.70 (1.248) |
| TV97G | 44.40 (1.748) |

# TO-220 & TO-218 & TO-247 Heat Sinks



## 5301 High rise style heat sink features twisted fins and Wave-On™ solderable mounts

Grease & Epoxy page112 | Mounting Kits page 99

**High rise style heat sink features twisted fins and Wave-On™ solderable mounts** for easy attachment to the PC card. Models include thru holes on one side to attach devices using standard hardware and dittins with special slots on the other for easy device attachment using a convenient spring clip. Dual models use two dittins and clips to locate and attach devices.

BASE PART

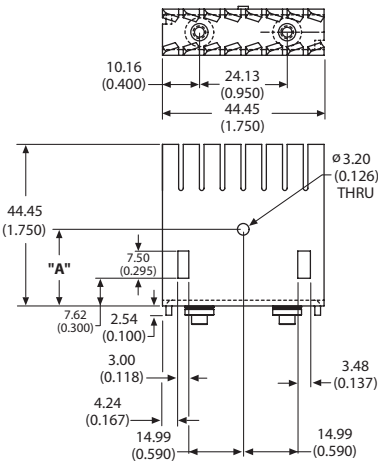



FIGURE A

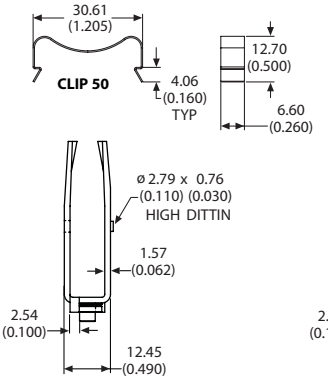
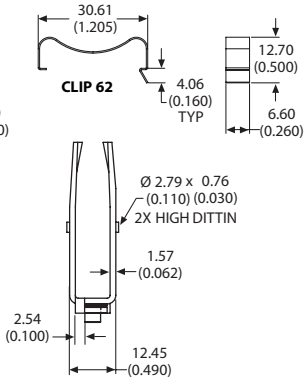



FIGURE B

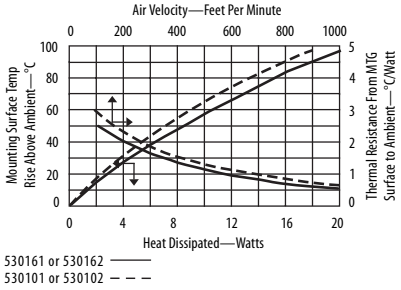



Material: 1.60 (0.063) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Device | Figure | "A" Dim | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|---|---|
| 530101B00100G | Heat sink twisted fin | TO-218, TO-247 | | 21.08 (0.830) | 4.75 (0.187) |
| 530101B00150G | With device clip #50 | TO-218, TO-247 | A | 21.08 (0.830) | 4.75 (0.187) |
| 530102B00100G | Heat sink twisted fin | TO-220 | | 18.29 (0.720) | 4.75 (0.187) |
| 530102B00150G | With device clip #50 | TO-220 | A | 18.29 (0.720) | 4.75 (0.187) |
| 530161B00162G | With two device clips #62 | Dual TO-218, TO-247 | B | 21.08 (0.830) | 4.75 (0.187) |
| 530162B00162G | With two device clips #62 | Dual TO-220 | B | 18.29 (0.720) | 4.75 (0.187) |

For additional options see page 82




## 5308 High rise style heat sink features twisted fins and solderable tabs

Grease & Epoxy page112 | Mounting Kits page 99

**High rise style heat sink features twisted fins and solderable tabs** for easy attachment to the PC card. Models include thru holes on one side to attach devices using standard hardware and dittins with special slots on the other for easy device attachment using a convenient spring clip. Dual models use two dittins and clips to locate and attach devices.

BASE PART

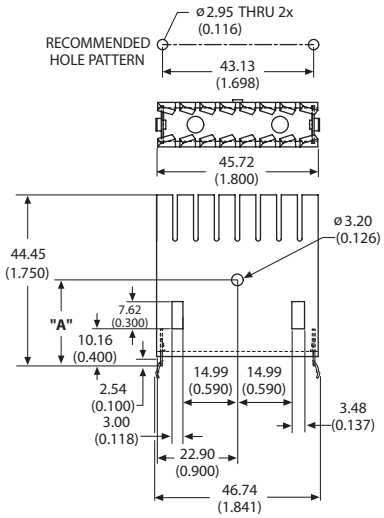



FIGURE A

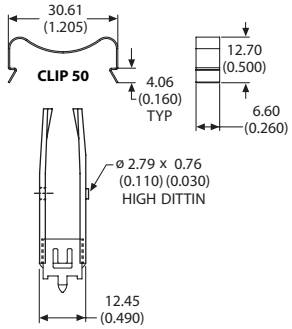
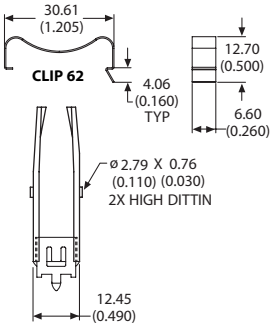



FIGURE B

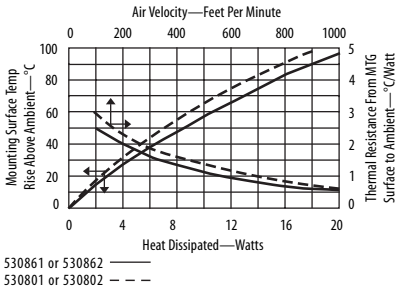



Material: 1.60 (0.063) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Device | Figure | "A" Dim | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|---|---|
| 530801B05100G | Heat sink twisted fin and solderable tabs | TO-218, TO-247 | | 21.08 (0.830) | 2.95 (0.116) |
| 530801B05150G | With device clip #50 | TO-218, TO-247 | A | 21.08 (0.830) | 2.95 (0.116) |
| 530802B05100G | Heat sink twisted fin and solderable tabs | TO-220 | | 18.29 (0.720) | 2.95 (0.116) |
| 530802B05150G | With device clip #50 | TO-220 | A | 18.29 (0.720) | 2.95 (0.116) |
| 530861B05162G | With two device clips #62 | Dual TO-218, TO-247 | B | 21.08 (0.830) | 2.95 (0.116) |
| 530862B05162G | With two device clips #62 | Dual TO-220 | B | 18.29 (0.720) | 2.95 (0.116) |

For additional options see page 82



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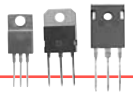


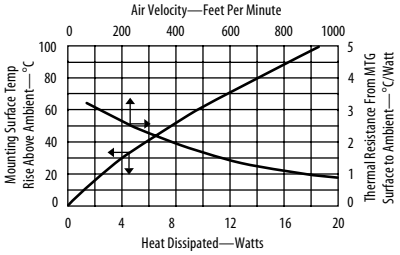


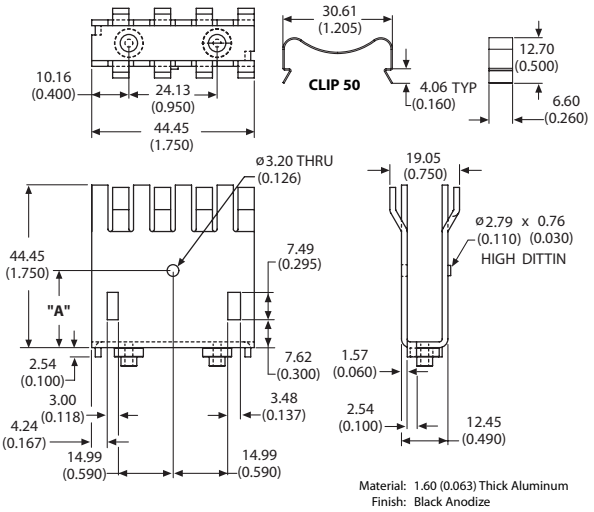
## 5304 High rise style heat sink features staggered fins and Wave-On™ solderable mounts

Grease & Epoxy page112

Mounting Kits page 99

**High rise style heat sink features staggered fins and Wave-On™ solderable mounts** for easy attachment to the PC card. Models include thru holes on one side to attach devices using standard hardware and dittins with special slots on the other for easy device attachment using a convenient spring clip.




Material: 1.60 (0.063) Thick Aluminum
Finish: Black Anodize

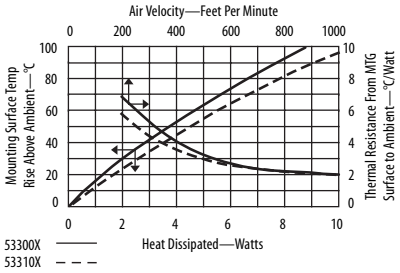
### ORDERING INFORMATION

| Part Number | Description | Device | "A" Dim | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|---|
| 530401B00100G | High rise style heat sink staggered fins | TO-218, TO-247 | 21.08 (0.830) | 4.75 (0.187) |
| 530401B00150G | With device clip #50 | TO-218, TO-247 | 21.08 (0.830) | 4.75 (0.187) |
| 530402B00100G | High rise style heat sink staggered fins | TO-220 | 18.29 (0.720) | 4.75 (0.187) |
| 530402B00150G | With device clip #50 | TO-220 | 18.29 (0.720) | 4.75 (0.187) |

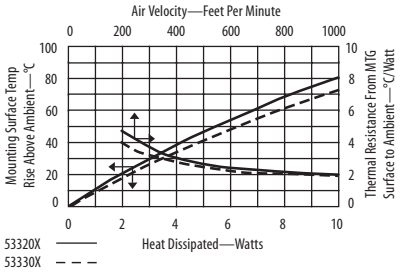
For additional options see page 82

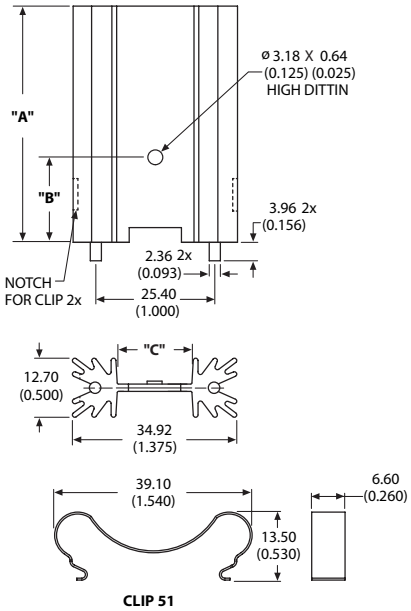
## 5330, 5331, 5332, 5333 Extruded heat sink with radial fins

Grease & Epoxy page112




**Extruded heat sink with radial fins and clip attach feature** makes device attachment easy. Includes two solderable mounting pins which permit vertical mounting and eliminate stress on device leads. Available in four heights for TO-220, TO-218 and TO-247 devices.



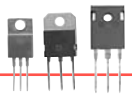

Material: Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Device | "A" Dim | "B" Dim | "C" Dim | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|---|---|---|
| 533001B02551G | TO-218, TO-247 | 25.40 (1.000) | 21.59 (0.850) | 17.02 (0.670) | 2.67 (0.105) |
| 533002B02551G | TO-220 | 25.40 (1.000) | 18.29 (0.720) | 15.88 (0.625) | 2.67 (0.105) |
| 533101B02551G | TO-218, TO-247 | 38.10 (1.500) | 21.59 (0.850) | 17.02 (0.670) | 2.67 (0.105) |
| 533102B02551G | TO-220 | 38.10 (1.500) | 18.29 (0.720) | 15.88 (0.625) | 2.67 (0.105) |
| 533201B02551G | TO-218, TO-247 | 50.80 (2.000) | 21.59 (0.850) | 17.02 (0.670) | 2.67 (0.105) |
| 533202B02551G | TO-220 | 50.80 (2.000) | 18.29 (0.720) | 15.88 (0.625) | 2.67 (0.105) |
| 533301B02551G | TO-218, TO-247 | 63.50 (2.500) | 21.59 (0.850) | 17.02 (0.670) | 2.67 (0.105) |
| 533302B02551G | TO-220 | 63.50 (2.500) | 18.29 (0.720) | 15.88 (0.625) | 2.67 (0.105) |

For additional options see page 83

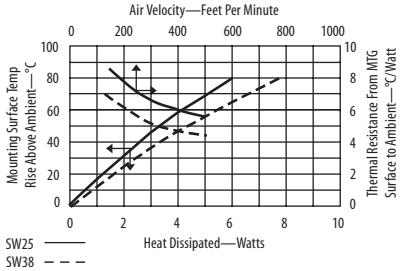
# TO-220 & TO-218 & TO-247 Heat Sinks

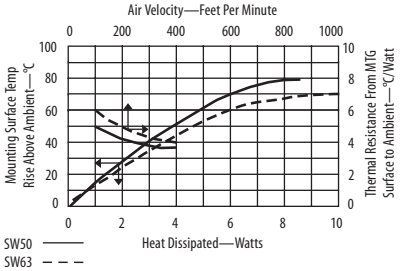


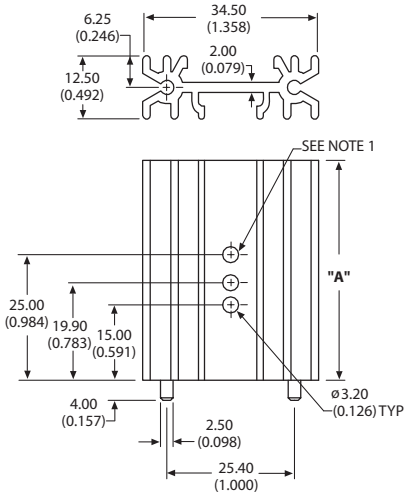
## SW25, SW38, SW50, SW63 — Extruded heat sink with unequal channel widths

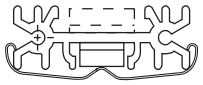
Grease & Epoxy page 112 | Mounting Kits page 99

**Extruded heat sink with unequal channel widths front and back** can accommodate a TO-220, TO-218, or TO-247 devices. Includes two solderable mounting pins which permit vertical mounting and eliminate stress on device leads. Available in three heights. Version without hole uses clip 5901 (sold separately) to attach device. See page 97 for clip information.



NOTE 1: This hole not present in SW25 model

Material: Aluminum
Finish: Black Anodize

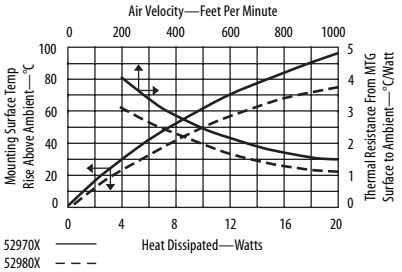
### ORDERING INFORMATION

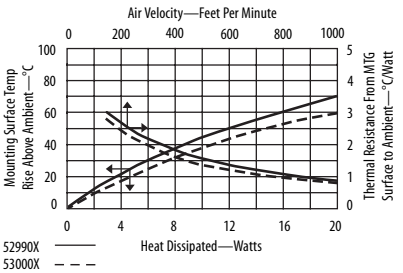
| Part Number | Description | "A" Dim | Holes | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|---|---|
| SW25-2G | Extruded heat sink with unequal channel widths front and back | 25.00 (0.984) | No | 3.00 (0.118) |
| SW25-4G | With device mounting holes | 25.00 (0.984) | Yes | 3.00 (0.118) |
| SW38-2G | Extruded heat sink with unequal channel widths front and back | 38.00 (1.496) | No | 3.00 (0.118) |
| SW38-4G | With device mounting holes | 38.00 (1.496) | Yes | 3.00 (0.118) |
| SW50-2G | Extruded heat sink with unequal channel widths front and back | 50.00 (1.968) | No | 3.00 (0.118) |
| SW50-4G | With device mounting holes | 50.00 (1.968) | Yes | 3.00 (0.118) |
| SW63-2G | Extruded heat sink with unequal channel widths front and back | 63.00 (2.480) | No | 3.00 (0.118) |
| SW63-4G | With device mounting holes | 63.00 (2.480) | Yes | 3.00 (0.118) |

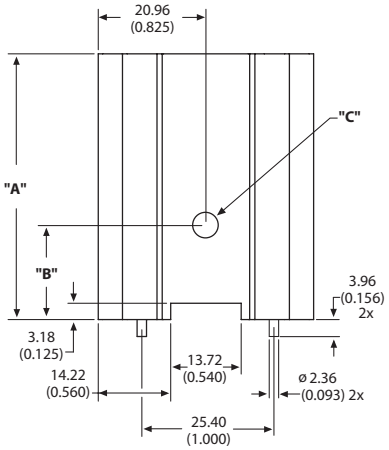
## 5297, 5298, 5299, 5300 — Extruded heat sink with large radial fins

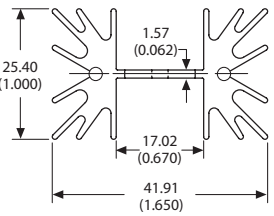
Grease & Epoxy page 112 | Mounting Kits page 99

**Extruded heat sink with large radial fins** features equal channel widths on both sides for single or dual device mounting. Includes two solderable mounting pins which permit vertical mounting and eliminate stress on device leads. Available in four heights for TO-220, TO-218, and TO-247 devices.




Material: Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Device | "A" Dim | "B" Dim | "C" Dim | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|---|---|---|
| 529701B02500G | TO-218, TO-247 | 25.40 (1.000) | 21.59 (0.850) | 3.66 (0.144) | 2.67 (0.105) |
| 529702B02500G | TO-220 | 25.40 (1.000) | 18.29 (0.720) | 3.17 (0.125) | 2.67 (0.105) |
| 529801B02500G | TO-218, TO-247 | 38.10 (1.500) | 21.59 (0.850) | 3.66 (0.144) | 2.67 (0.105) |
| 529802B02500G | TO-220 | 38.10 (1.500) | 18.29 (0.720) | 3.17 (0.125) | 2.67 (0.105) |
| 529901B02500G | TO-218, TO-247 | 50.80 (2.000) | 21.59 (0.850) | 3.66 (0.144) | 2.67 (0.105) |
| 529902B02500G | TO-220 | 50.80 (2.000) | 18.29 (0.720) | 3.17 (0.125) | 2.67 (0.105) |
| 530001B02500G | TO-218, TO-247 | 63.50 (2.500) | 21.59 (0.850) | 3.66 (0.144) | 2.67 (0.105) |
| 530002B02500G | TO-220 | 63.50 (2.500) | 18.29 (0.720) | 3.17 (0.125) | 2.67 (0.105) |

For additional options see page 83



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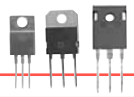
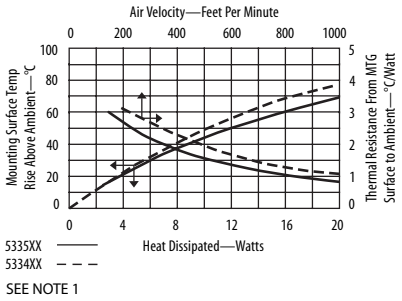




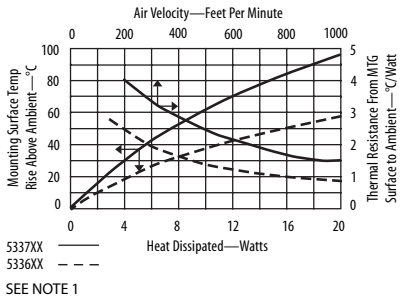
## 5334, 5335, 5336, 5337 Extruded heat sink with large radial fins

Grease & Epoxy page112

**Extruded heat sink with large radial fins and channel clip attach feature** makes device attachment easy. Includes clip and two solderable mounting pins which permit vertical mounting and eliminate stress on device leads. Available in four heights for TO-220, TO-218, and TO-247 devices.

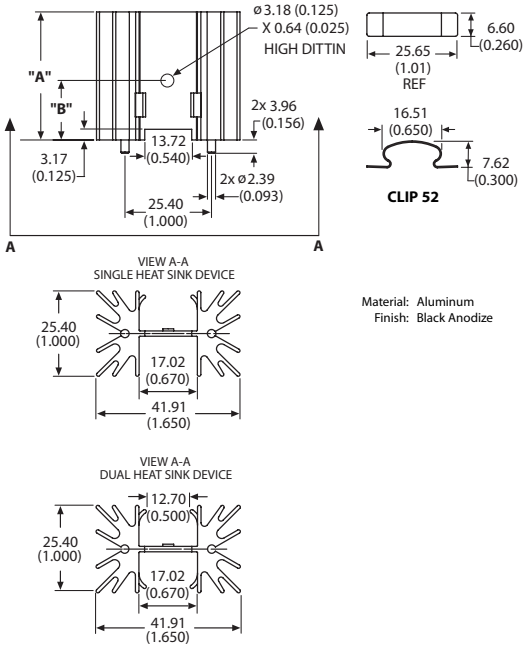



SEE NOTE 1




SEE NOTE 1

NOTE 1: Graph depicts single device models. Dual device models exhibit a 15% performance increase.



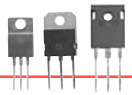

Material: Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Device | Description | "A" Dim | "B" Dim | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|---|---|---|
| 533401B02552G | TO-218, TO-247 | Extruded heat sink with radial fins and device clip #52 | 38.10 (1.500) | 21.59 (0.850) | 2.67 (0.105) |
| 533402B02552G | TO-220 | Extruded heat sink with radial fins and device clip #52 | 38.10 (1.500) | 18.29 (0.720) | 2.67 (0.105) |
| 533421B02552G | Dual TO-218, TO-247 | With 2 device clips #52 | 38.10 (1.500) | 21.59 (0.850) | 2.67 (0.105) |
| 533422B02552G | Dual TO-220 | With 2 device clips #52 | 38.10 (1.500) | 18.29 (0.720) | 2.67 (0.105) |
| 533501B02552G | TO-218, TO-247 | Extruded heat sink with radial fins and device clip #52 | 50.80 (2.000) | 21.59 (0.850) | 2.67 (0.105) |
| 533502B02552G | TO-220 | Extruded heat sink with radial fins and device clip #52 | 50.80 (2.000) | 18.29 (0.720) | 2.67 (0.105) |
| 533521B02552G | Dual TO-218, TO-247 | With 2 device clips #52 | 50.80 (2.000) | 21.59 (0.850) | 2.67 (0.105) |
| 533522B02552G | Dual TO-220 | With 2 device clips #52 | 50.80 (2.000) | 18.29 (0.720) | 2.67 (0.105) |
| 533601B02552G | TO-218, TO-247 | Extruded heat sink with radial fins and device clip #52 | 63.50 (2.500) | 21.59 (0.850) | 2.67 (0.105) |
| 533602B02552G | TO-220 | Extruded heat sink with radial fins and device clip #52 | 63.50 (2.500) | 18.29 (0.720) | 2.67 (0.105) |
| 533621B02552G | Dual TO-218, TO-247 | With 2 device clips #52 | 63.50 (2.500) | 21.59 (0.850) | 2.67 (0.105) |
| 533622B02552G | Dual TO-220 | With 2 device clips #52 | 63.50 (2.500) | 18.29 (0.720) | 2.67 (0.105) |
| 533701B02552G | TO-218, TO-247 | Extruded heat sink with radial fins and device clip #52 | 25.40 (1.000) | 21.59 (0.850) | 2.67 (0.105) |
| 533702B02552G | TO-220 | Extruded heat sink with radial fins and device clip #52 | 25.40 (1.000) | 18.29 (0.720) | 2.67 (0.105) |
| 533721B02552G | Dual TO-218, TO-247 | With 2 device clips #52 | 25.40 (1.000) | 21.59 (0.850) | 2.67 (0.105) |
| 533722B02552G | Dual TO-220 | With 2 device clips #52 | 25.40 (1.000) | 18.29 (0.720) | 2.67 (0.105) |

For additional options see page 83

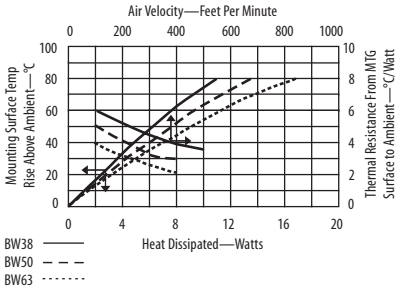
# TO-220 & TO-218 & TO-247 Heat Sinks

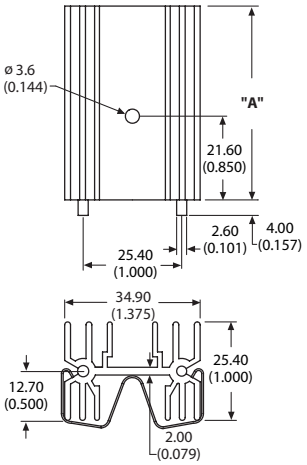


## BW38, BW50, BW63 Wide extruded heat sink with unequal channel

Grease & Epoxy page112 | Mounting Kits page 99

**Wide extruded heat sink with unequal channel widths** on front and back can accommodate a TO-220, TO-218, or TO-247 device. Includes two solderable mounting pins which permit vertical mounting and eliminate stress on device leads. Available in three heights. Versions without hole use clip 6801 (sold separately) to attach device. See page 97 for clip information.




Material: Aluminum
Finish: Black Anodize

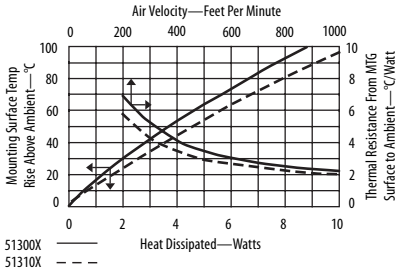
### ORDERING INFORMATION

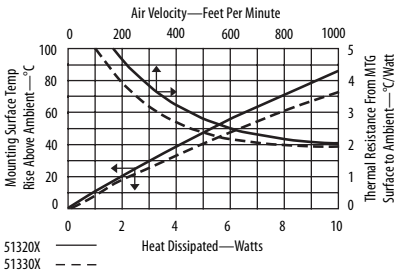
| Part Number | Description | "A" Dim | Holes | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|---|---|
| BW38-2G | Extruded heat sink with unequal channel widths front and back | 38.00 (1.496) | No | 3.00 (0.118) |
| BW38-4G | With device mounting hole | 38.00 (1.496) | Yes | 3.00 (0.118) |
| BW50-2G | Extruded heat sink with unequal channel widths front and back | 50.00 (1.968) | No | 3.00 (0.118) |
| BW50-4G | With device mounting hole | 50.00 (1.968) | Yes | 3.00 (0.118) |
| BW63-2G | Extruded heat sink with unequal channel widths front and back | 63.00 (2.480) | No | 3.00 (0.118) |
| BW63-4G | With device mounting hole | 63.00 (2.480) | Yes | 3.00 (0.118) |

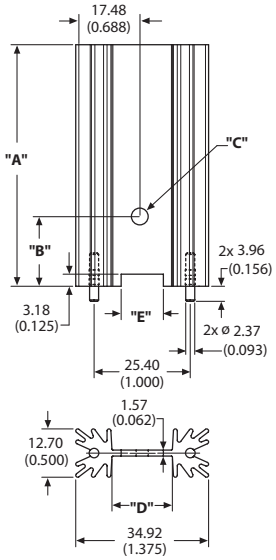
## 5130, 5131, 5132, 5133 Extruded heat sink with radial fins

Grease & Epoxy page112 | Mounting Kits page 99

**Extruded heat sink with radial fins feature equal channel widths** on both sides for single or dual device mounting. Includes two solderable mounting pins which permit vertical mounting and eliminate stress on device leads. Available in four heights for TO-220,TO-218, and TO-247 devices.




Material: Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Device | "A" Dim | "B" Dim | "C" Dim | "D" Dim | "E" Dim | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|---|---|---|---|---|
| 513001B02500G | TO-218, TO-247 | 25.40 (1.000) | 21.59 (0.850) | 3.66 (0.144) | 17.02 (0.670) | 13.72 (0.540) | 2.67 (0.105) |
| 513002B02500G | TO-220 | 25.40 (1.000) | 18.29 (0.720) | 3.17 (0.125) | 15.88 (0.625) | 11.10 (0.437) | 2.67 (0.105) |
| 513101B02500G | TO-218, TO-247 | 38.10 (1.500) | 21.59 (0.850) | 3.66 (0.144) | 17.02 (0.670) | 13.72 (0.540) | 2.67 (0.105) |
| 513102B02500G | TO-220 | 38.10 (1.500) | 18.29 (0.720) | 3.17 (0.125) | 15.88 (0.625) | 11.10 (0.437) | 2.67 (0.105) |
| 513201B02500G | TO-218, TO-247 | 50.80 (2.000) | 21.59 (0.850) | 3.66 (0.144) | 17.02 (0.670) | 13.72 (0.540) | 2.67 (0.105) |
| 513202B02500G | TO-220 | 50.80 (2.000) | 18.29 (0.720) | 3.17 (0.125) | 15.88 (0.625) | 11.10 (0.437) | 2.67 (0.105) |
| 513301B02500G | TO-218, TO-247 | 63.50 (2.500) | 21.59 (0.850) | 3.66 (0.144) | 17.02 (0.670) | 13.72 (0.540) | 2.67 (0.105) |
| 513302B02500G | TO-220 | 63.50 (2.500) | 18.29 (0.720) | 3.17 (0.125) | 15.88 (0.625) | 11.10 (0.437) | 2.67 (0.105) |

For additional options see page 83



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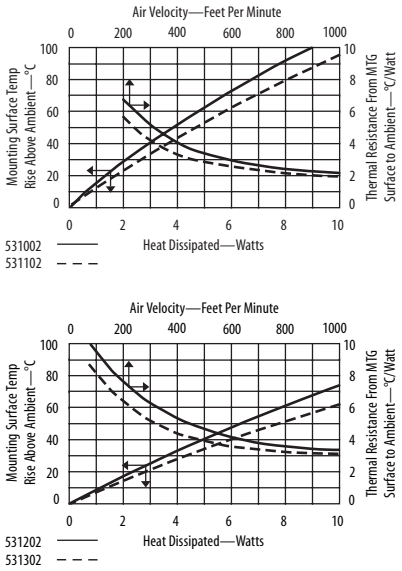
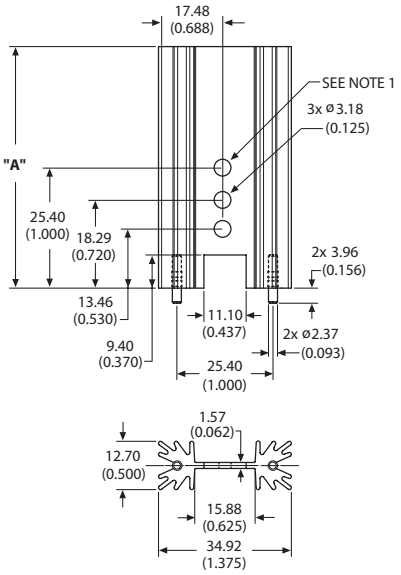
## 5310, 5311, 5312, 5313 Extruded heat sink with radial fins & notched base

Grease & Epoxy page 112

Mounting Kits page 99

**Extruded heat sink with radial fins and notched base** features equal channel widths on both sides and mounting holes to accomodate TO-220 and TO-202 devices. Includes two solderable mounting pins which permit vertical mounting and eliminate stress on device leads. Available in four heights.




NOTE 1: This hole not present in 5310 series

Material: Aluminum
Finish: See Table

### ORDERING INFORMATION

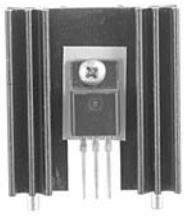
| Part Number | "A" Dim | Finish | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|---|
| 531002B02500G | 25.40 (1.000) | Black anodize | 2.67 (0.105) |
| 531002V02500G | 25.40 (1.000) | AavSHIELD$^3$ | 2.67 (0.105) |
| 531102B02500G | 38.10 (1.500) | Black anodize | 2.67 (0.105) |
| 531102V02500G | 38.10 (1.500) | AavSHIELD$^3$ | 2.67 (0.105) |
| 531202B02500G | 50.80 (2.000) | Black anodize | 2.67 (0.105) |
| 531202V02500G | 50.80 (2.000) | AavSHIELD$^3$ | 2.67 (0.105) |
| 531302B02500G | 63.50 (2.500) | Black anodize | 2.67 (0.105) |
| 531302V02500G | 63.50 (2.500) | AavSHIELD$^3$ | 2.67 (0.105) |

For additional options see page 83

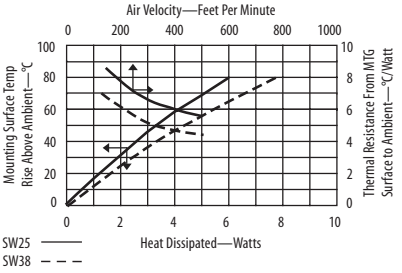
## SW25-6, SW38-6 Extruded heat sink with unequal channel widths

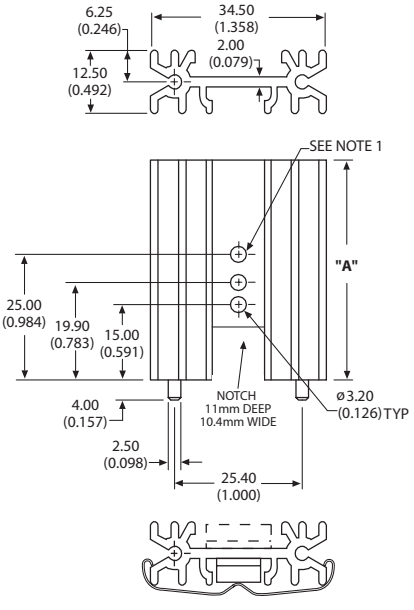
Grease & Epoxy page 112

Mounting Kits page 99



**Extruded heat sink with unequal channel widths front and back** can accommodate a TO-220 or TO-202 device. Includes two solderable mounting pins which permit vertical mounting and eliminate stress on device leads. Clip 5901 (sold separately) can be used to attach device. See page 97 for clip information.



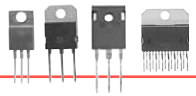

NOTE 1: This hole not present in SW25 series

Material: Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | "A" Dim | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|---|
| SW25-6G | Extruded heat sink with unequal channel widths front and back | 25.00 (0.984) | 3.00 (0.118) |
| SW38-6G | Extruded heat sink with unequal channel widths front and back. | 38.00 (1.496) | 3.00 (0.118) |

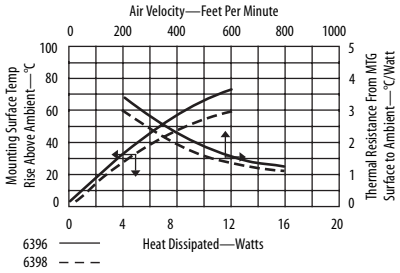
# TO-220 & TO-218 & TO-247 & Multiwatt Heat Sinks

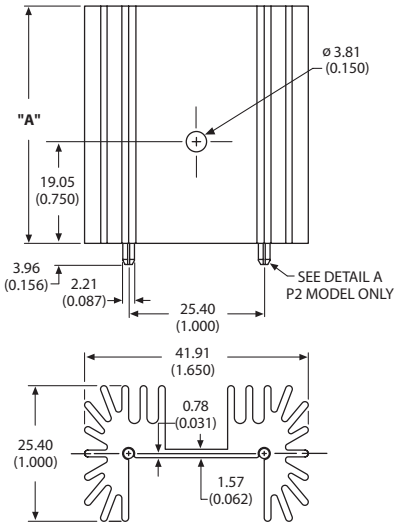


## 6396, 6398, 6399, 6400 High power extruded heat sink with large radial fins

Grease & Epoxy page112 | Mounting Kits page 99

**High power extruded heat sink with large radial fins and solderable shoulder pins** allows vertical mounting without stress on the device leads. Available with shoulder pins to provide fixed clearance between the bottom of the heat sink and the board. Available in four heights for TO-220, TO-218, TO-247and multiwatt devices.




### ORDERING INFORMATION

| Part Number | Description | "A" Dim | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|---|
| 6396BG | Extruded heat sink with large radial fins and straight pins | 25.40 (1.000) | 2.89 (0.114) |
| 6396B-P2G | With solderable shoulder pins | 25.40 (1.000) | 3.10 (0.122) |
| 6398BG | Extruded heat sink with large radial fins and straight pins | 38.10 (1.500) | 2.89 (0.114) |
| 6398B-P2G | With solderable shoulder pins | 38.10 (1.500) | 3.10 (0.122) |
| 6399BG | Extruded heat sink with large radial fins and straight pins | 50.80 (2.000) | 2.89 (0.114) |
| 6399B-P2G | With solderable shoulder pins | 50.80 (2.000) | 3.10 (0.122) |
| 6400BG | Extruded heat sink with large radial fins and straight pins | 63.50 (2.500) | 2.89 (0.114) |
| 6400B-P2G | With solderable shoulder pins | 63.50 (2.500) | 3.10 (0.122) |

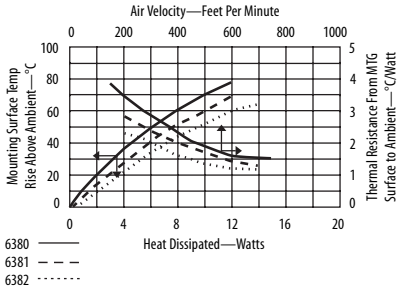
For additional options see page 85

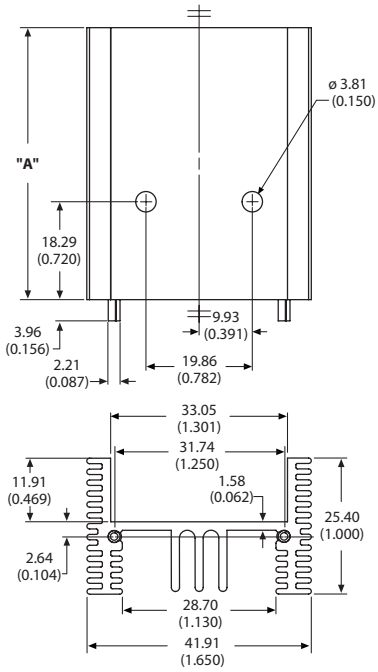
Material: Aluminum
Finish: Black Anodize

## 6380, 6381, 6382 High power extruded heat sink

Grease & Epoxy page112 | Mounting Kits page 99

**High power extruded heat sink** for SIP packages. Solderable pins allow vertical mounting without stress on the device leads. Available in three heights. Can also be used for dual TO-220, TO-218, TO-247 and multiwatt devices.




### ORDERING INFORMATION

| Part Number | Description | "A" Dim | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|---|
| 6380BG | Extruded heat sink with solderable pins | 25.40 (1.000) | 2.89 (0.114) |
| 6381BG | Extruded heat sink with solderable pins | 38.10 (1.500) | 2.89 (0.114) |
| 6382BG | Extruded heat sink with solderable pins | 50.80 (2.000) | 2.89 (0.114) |

For additional options see page 85

Material: Aluminum
Finish: Black Anodize



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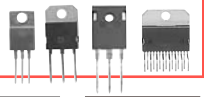
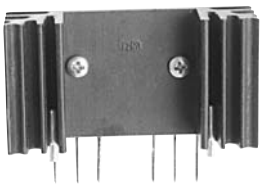


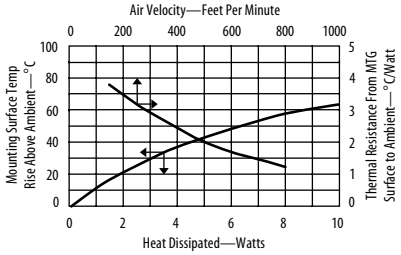


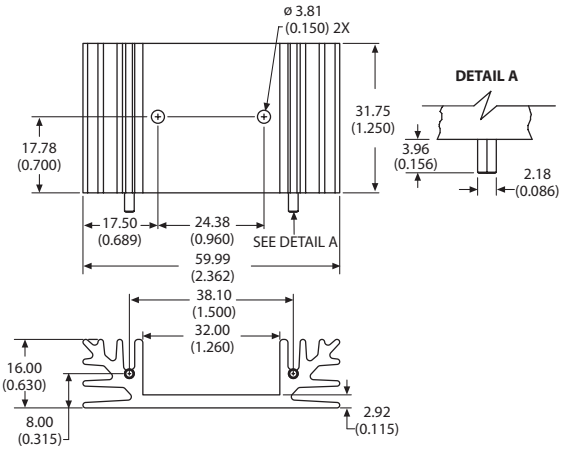
## 6374 Extruded heat sink for SIP packages

Grease & Epoxy page 112 | Mounting Kits page 99



**Extruded heat sink** for SIP packages. Solderable pins allow vertical mounting without stress on the device leads. Can also be used for dual TO-220, TO-218, TO-247, and multiwatt devices.




### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|
| 6374BG | Extruded heat sink with solderable pins | 2.89 (0.114) |

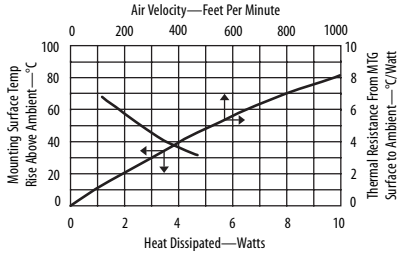
For additional options see page 85

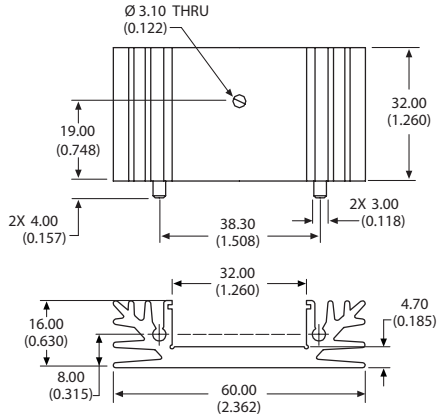
Material: Aluminum
Finish: Black Anodize

## YB32-4 High power flat back extruded channel style heat sink

Grease & Epoxy page 112 | Mounting Kits page 99

**High power flat back extruded channel style heat sink** features a wide channel to accommodate several devices. Includes two solderable pins to allow vertical mounting without stress on the device leads. Can be used with TO-220, TO-218, TO-247, and multiwatt devices.




### ORDERING INFORMATION

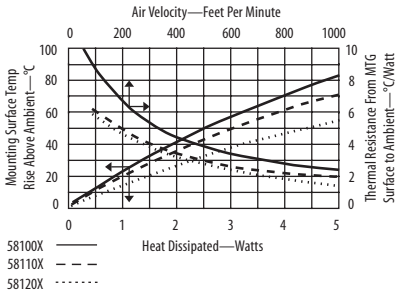
| Part Number | Description | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|
| YB32-4G | High power flat back extruded heat sink | 3.48 (0.137) |

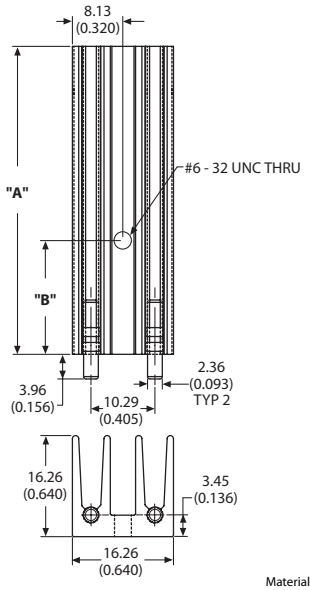
Material: Aluminum
Finish: Black Anodize

## 5810, 5811, 5812 Flat back extruded heat sink featuring solderable pins

Grease & Epoxy page 112 | Mounting Kits page 99

**Flat back extruded heat sink features solderable pins** which allow vertical mounting without stess on the device leads. Available in three heights for TO-220 and TO-218 devices.




### ORDERING INFORMATION

| Part Number | Device | "A" Dim | "B" Dim | Dia of PCB Plated Thru Hole for Pins |
|---|---|---|---|---|
| 581001B02500G | TO-218 | 25.40 (1.000) | 21.59 (0.850) | 2.67 (0.105) |
| 581002B02500G | TO-220 | 25.40 (1.000) | 18.29 (0.720) | 2.67 (0.105) |
| 581101B02500G | TO-218 | 38.10 (1.500) | 21.59 (0.850) | 2.67 (0.105) |
| 581102B02500G | TO-220 | 38.10 (1.500) | 18.29 (0.720) | 2.67 (0.105) |
| 581201B02500G | TO-218 | 50.80 (2.000) | 21.59 (0.850) | 2.67 (0.105) |
| 581202B02500G | TO-220 | 50.80 (2.000) | 18.29 (0.720) | 2.67 (0.105) |

For additional options see page 83

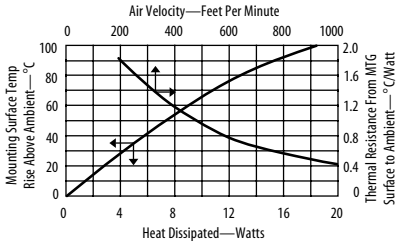
Material: Aluminum
Finish: Black Anodize

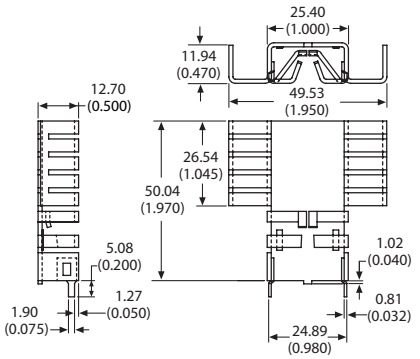
# TO-218 Heat Sinks

## 5922 Plug in style heat sink

Mounting Kits page 99

**Plug in style heat sink requires no hardware** to attach to the device. The four spring action clips apply even pressure eliminating gaps between the heat sink and device which rob thermal performance.




Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 592201B03400G | High power plug in heat sink with folded back fins and solderable mounting tabs | 2.39 (0.094) |

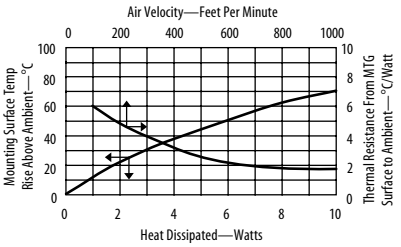
For additional options see page 82

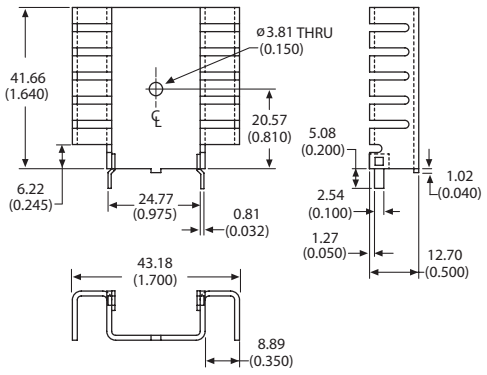
## 5931 Channel style heat sink with folded back fins

Grease & Epoxy page112

Mounting Kits page 99

**Channel style heat sink with folded back fins** for extra cooling capacity. The heat sink features solderable tabs for easy attachment to the PC board.




Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 593101B03600G | Channel style heat sink with folded back fins and solderable tabs | 2.92 (0.115) |

### POPULAR OPTIONS: 593101B 0 0000G

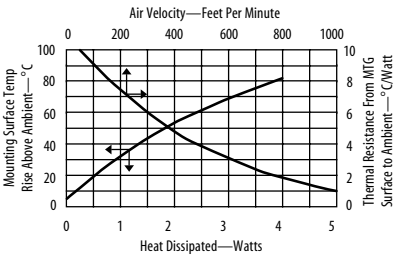
Base part no. — A

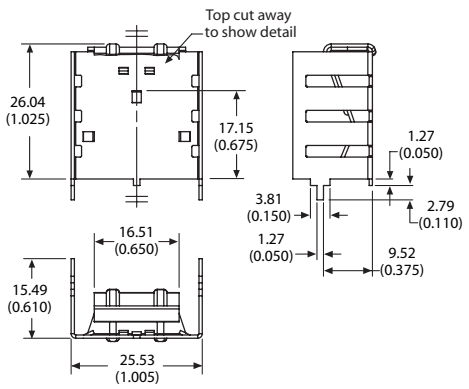
| Position | Code | Description | Details |
|---|---|---|---|
| A | 1 | Kon-Dux™ pad | Page 86 |
| A | 3 | In-Sil-8™ pad | Page 86 |

For additional options see page 82

## 7130 Copper slide on heat sink

**Copper slide on heat sink requires no hardware** to attach the device. In addition, the copper heat sink is tin/lead plated to allow easy soldering to the PC board.




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

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 7130DG | Slide on, channel style heat sink with integrated tabs | 2.54 (0.100) |



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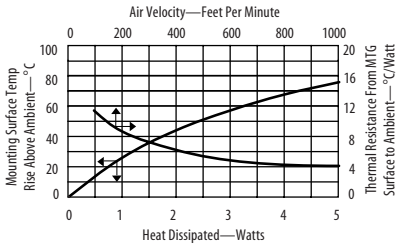
Taiwan Tel: +886(2) 2698-9888 email: sales@aavid.com.tw

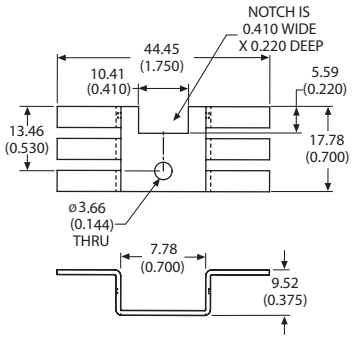
## 5063 Low profile hat section heat sink

Grease & Epoxy page 112

Mounting Kits page 99

**Low profile hat section heat sink** has a total height of 0.375 making it perfect for mounting to printed circuit boards with 0.500 centering between boards.




Material: 1.02 (0.040) Thick Aluminum
Finish: Black Anodize

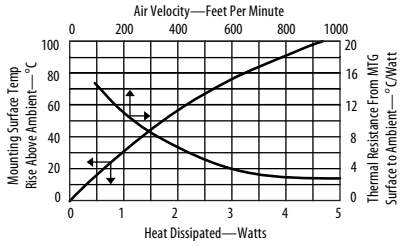
### ORDERING INFORMATION

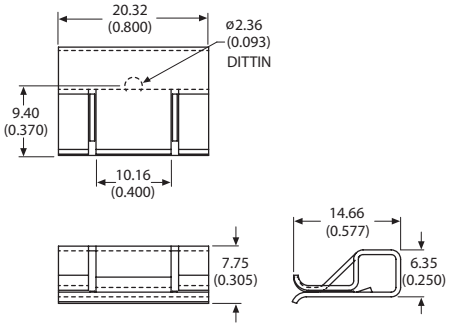
| Part Number | Description |
|---|---|
| 506304B00000G | Hat section heat sink |

For additional options see page 84

## 5740 Low cost slide on heat sink

**Low cost slide on heat sink** provides positive retention with an integral locking tab. The spring tension ensures excellent thermal contact for maximum performance. Requires no hardware to mount.



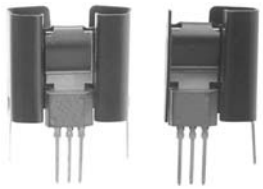




Material: 0.63 (0.025) Thick Aluminum
Finish: See Table

### ORDERING INFORMATION

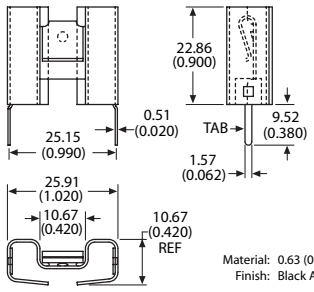
| Part Number | Finish |
|---|---|
| 574004B00000G | Black anodize |
| 574004U00000G | Unfinished |

## 5742, 5796, 5797 Low cost slide on cooler heat sink



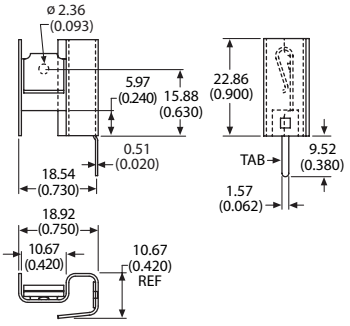
**Low cost slide on cooler heat sink** is easy to assemble to the device and requires no mounting hardware. Models have fins on both sides, or the left or right. Available with or without staked on solderable tab for easy board mounting.

FIGURE A




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

FIGURE B

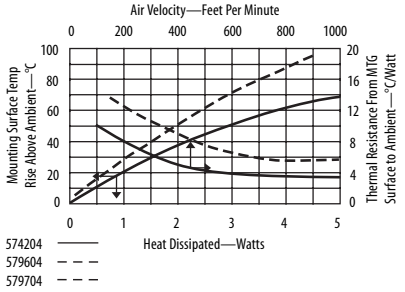



Note: Fins on Left or Right. Right hand fin model shown.

### ORDERING INFORMATION

| Part Number | Description | Figure | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 574204B00000G | Low cost slide on cooler, no solderable tabs | A | |
| 574204B03300G | With solderable tabs | A | 1.910 (0.075) |
| 579604B00000G | With left side fin only, no solderable tabs | B | |
| 579604B03300G | With left side fin only and solderable tabs | B | 1.910 (0.075) |
| 579704B00000G | With right side fin only, no solderable tabs | B | |
| 579704B03300G | With right side fin only and solderable tabs | B | 1.910 (0.075) |

For additional options see page 84

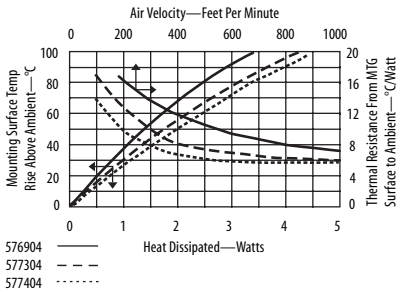


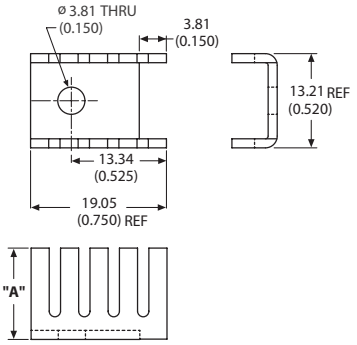
# TO-202 Heat Sinks

## 5769, 5773, 5774 Slim low profile channel style heat sink

Grease & Epoxy page112 | Mounting Kits page 99

**Slim low profile channel style heat sink** is notched to accommodate the TO-202 center tab packages. Available in 3 heights.




Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

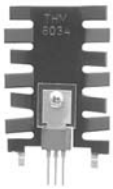
### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| 576904B00000G | 6.35 (0.250) |
| 577304B00000G | 9.53 (0.375) |
| 577404B00000G | 12.70 (0.500) |

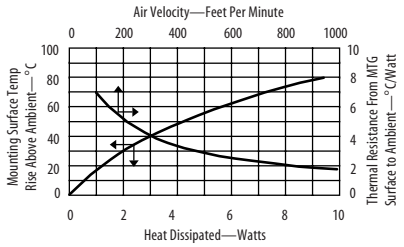
For additional options see page 84

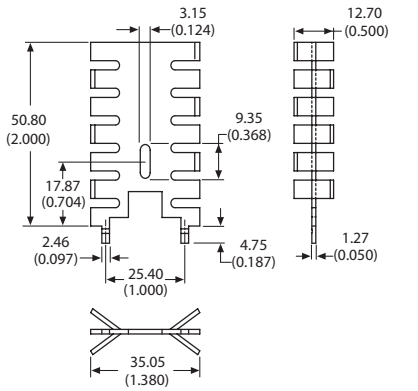
## 6034 Space saving staggered fin heat sink

Grease & Epoxy page112 | Mounting Kits page 99



**Space saving heat sink** features staggered fins for increased cooling efficiency. This verticle mount heat sink features integrated matte tin plated tabs to solder directly to the PC board.




Material: 1.27 (0.050) Thick Copper
Finish: Tin Plated

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 6034DG | Space saving staggered fin heat sink with integrated tin plated tabs | 3.10 (0.122) |

## 6046, 6047 Compact slide on heat sink

**Compact slide on heat sink** makes assembly easy. The 6046 features a positive device catch to lock the heat sink to the device.

FIGURE A

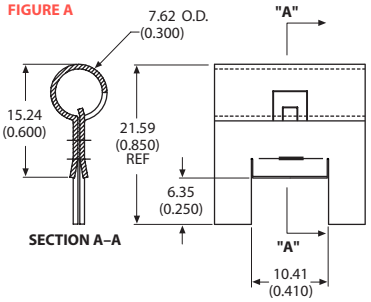
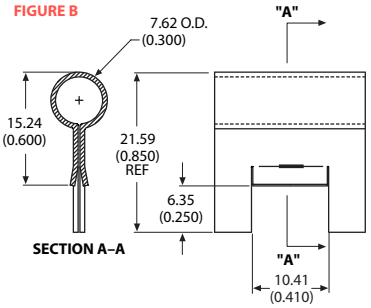



FIGURE B

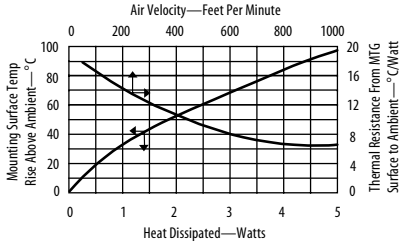



Material: 0.63 (0.025) Thick Aluminum
Finish: Pre-Black Anodize*

### ORDERING INFORMATION

| Part Number | Description | Figure |
|---|---|---|
| 6046PBG | With device catch | A |
| 6047PBG | Compact slide on heat sink | B |

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



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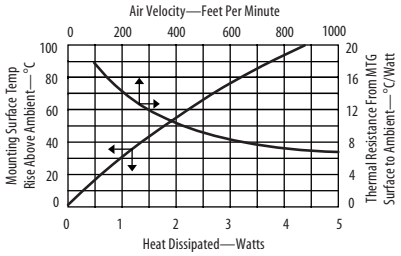
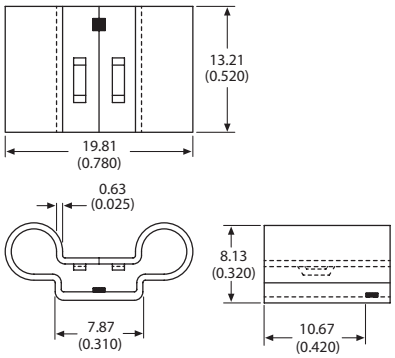
## 5775 Slip on heat sink

**Slip on heat sink** requires no hardware to attach to the device. Spring pressure ensures excellent retention. May be assembled before or after the device is attached to the board.




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

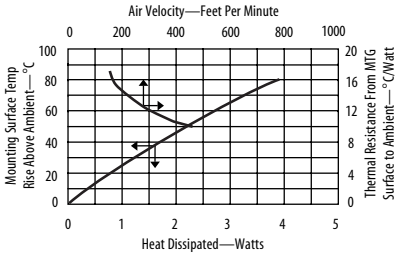
### ORDERING INFORMATION

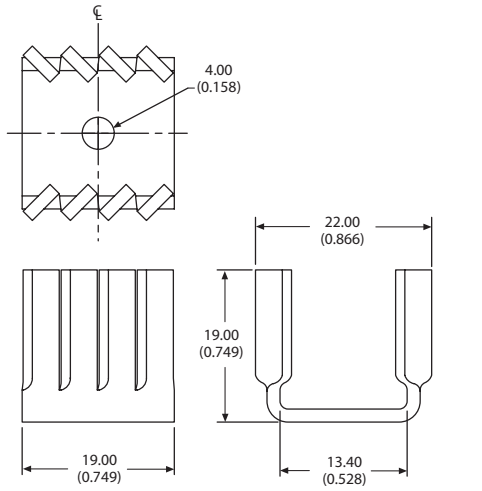
| Part Number | Finish |
|---|---|
| 577500B00000G | Black anodize |
| 577500U00000G | Unfinished |

## TV4 Narrow channel style heat sink featuring twisted fins

Grease & Epoxy page112
Mounting Kits page 99

**Narrow channel style heat sink features twisted fins** for increased air turbulance for better cooling. Can be mounted horizontally or vertically.




Material: 1.63 (0.064) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description |
|---|---|
| TV4G | Narrow channel style heat sink with twisted fins |

## PF730, PF732 Slip on heat sink

**Slip on heat sink** has locating features for simple device alignment. Spring action holds the device for good thermal contact. The tabbed version is made from tin plated copper and the no tab version is lightweight aluminum.

FIGURE A

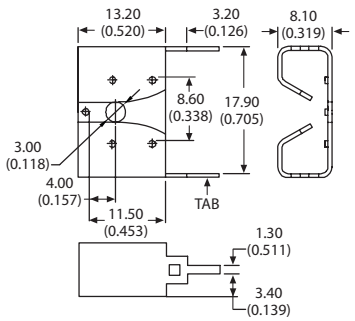
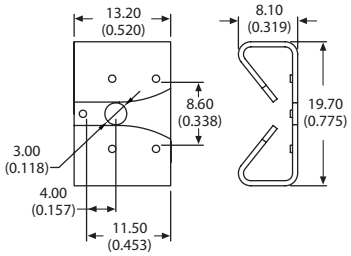
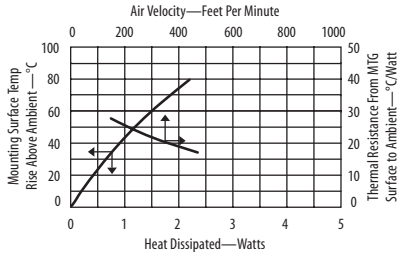



FIGURE B



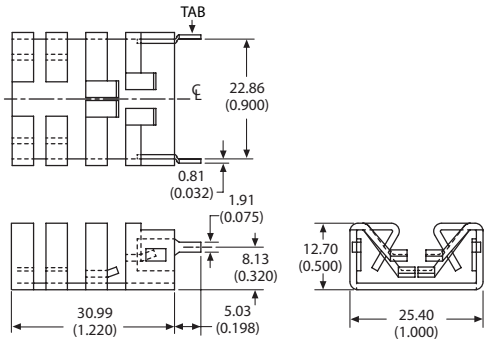

### ORDERING INFORMATION

| Part Number | Description | Material | Finish | Figure |
|---|---|---|---|---|
| PF730G | Slip on heat sink | Aluminum | Black anodize | B |
| PF732G | With solderable tabs | Copper | Tin plated | A |

## 5660 Plug in style heat sink

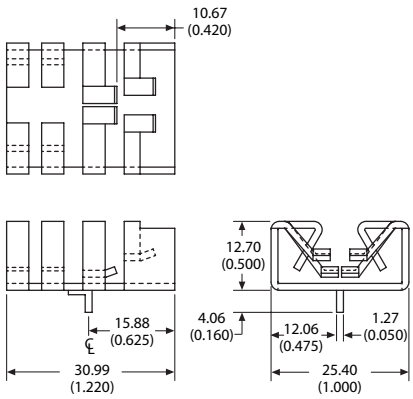
**Plug in style heat sink** features four spring action clips to firmly hold the device to the heat sink ensuring maximum metal to metal contact. Available with or without solderable tabs for horizontal or vertical mounting to the PC board.

FIGURE A




Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

FIGURE B




### ORDERING INFORMATION

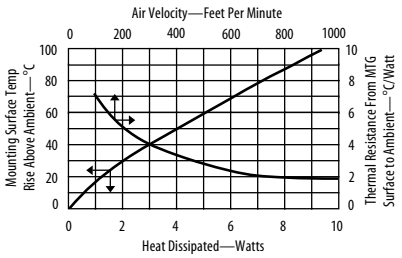
| Part Number | Description | Figure | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 566010B00000G | Plug in style heat sink, no solderable tabs | B | |
| 566010B03100G | With solderable tab for horizontal mounting | B | 1.73 (0.068) |
| 566010B03400G | With solderable tabs for vertical mounting | A | 2.39 (0.094) |

### POPULAR OPTIONS:

566010B0 00 00G
Base part no. A

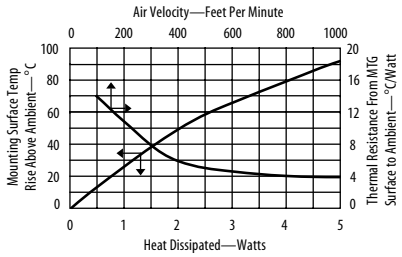
| Position | Code | Description | Details |
|---|---|---|---|
| A | 28 | Solderable Shur-Lock™ Tab for vertical mounting | Page 91 |

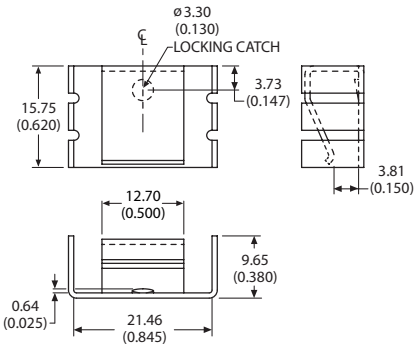
For additional options see page 84




## 5305 Channel style heat sink with integrated clip

**Channel style heat sink with integrated clip** features strong spring tension and device locking catch to attach device securely to the heat sink. Available in two finishes.




Material: 0.81 (0.032) Thick Aluminum
Finish: See Table

### ORDERING INFORMATION

| Part Number | Finish |
|---|---|
| 530510U00000G | Unfinished |
| 530510B00000G | Black anodize |



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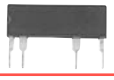
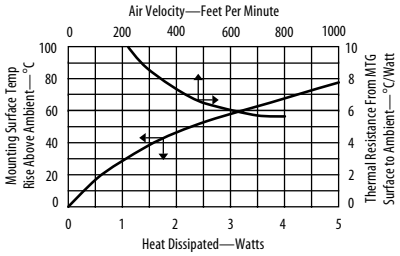
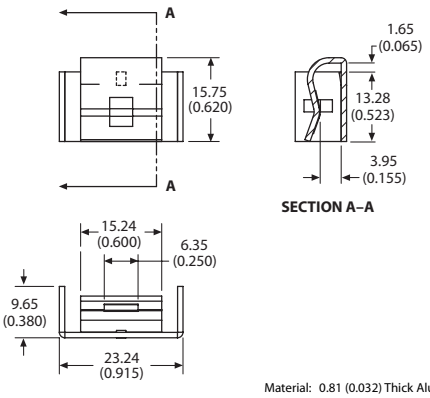




## 7038 Channel style slide on heat sink featuring an integrated clip and device retaining tab



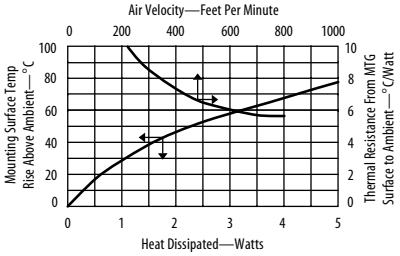

**Channel style slide on heat sink** features an integrated clip and device retaining tab to hold the heat sink to the device. Small footprint consumes less board space.

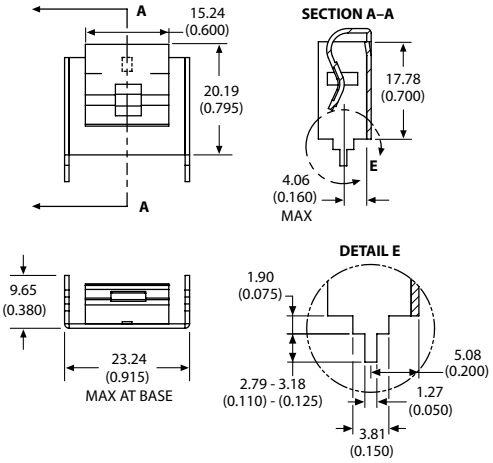
Material: 0.81 (0.032) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description |
|---|---|
| 7038BG | Channel style slide on heat sink |

## 7148 Copper channel style slide on heat sink featuring an integrated clip and solderable tabs



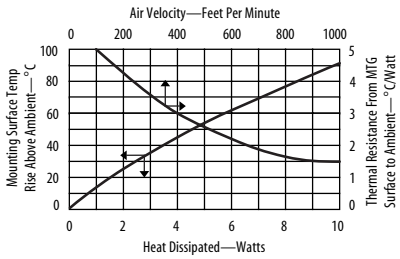

**Copper channel style slide on heat sink** features an integrated clip and solderable tabs. Includes a device retaining tab to securely hold the heat sink to the device. Small footprint consumes less board space.

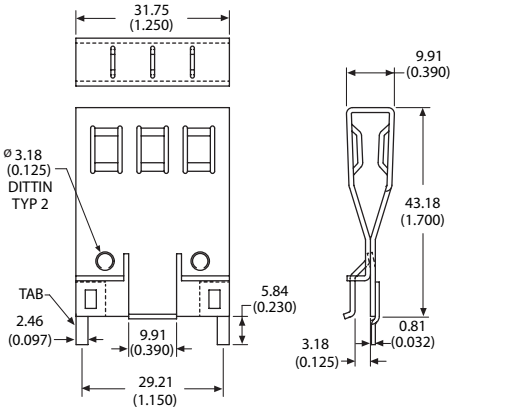
Material: 0.81 (0.032) Thick Copper
Finish: Tin Plated

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 7148DG | Slide on heat sink with integrated clip | 2.54 (0.100) |

## 5840 Clip on heat sink featuring louvers




**Clip on heat sink features louvers** to provide excellent cooling in natural or forced air convection. Spring action provides strong clamping force to securely hold the heat sink to the device. Available with or without solderable tabs.

Material: 1.02 (0.040) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

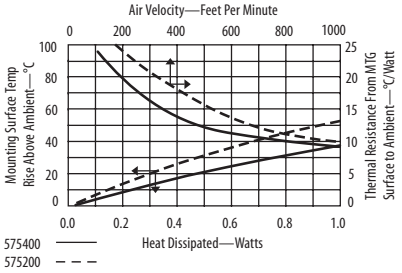
| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 584000B00000G | Clip on heat sink. no solderable tabs | |
| 584000B03500G | With solderable tabs for vertical mounting | 2.84 (0.112) |

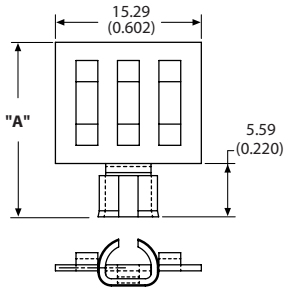
For additional options see page 84

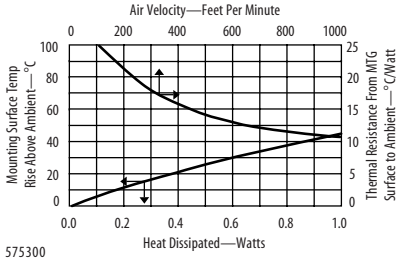
# TO-92 Heat Sinks

## 5752, 5753, 5754 Low cost slip on heat sink

**Low cost slip on heat sink** features an expandable collar that tightly grips the device meaning no extra mounting hardware is required. Three heights to choose from.



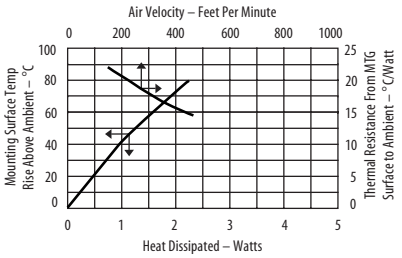

Material: 0.63 (0.025) Thick Aluminum
Finish: Black Anodize

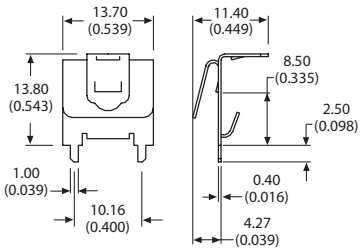
### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| 575200B00000G | 18.29 (0.720) |
| 575300B00000G | 24.64 (0.970) |
| 575400B00000G | 30.99 (1.220) |

## 92F Low cost brass clip on heat sink

**Low cost brass clip on heat sink** requires no hardware to attach to the device. Includes integrated tabs that can be soldered or twisted to attach the heat sink to the board reducing stress on the device leads.




Material: 0.38 (0.015) Thick Brass
Finish: Unfinished

### ORDERING INFORMATION

| Part Number | Description | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|
| 92FG | Brass clip on heat sink | 1.73 (0.068) |



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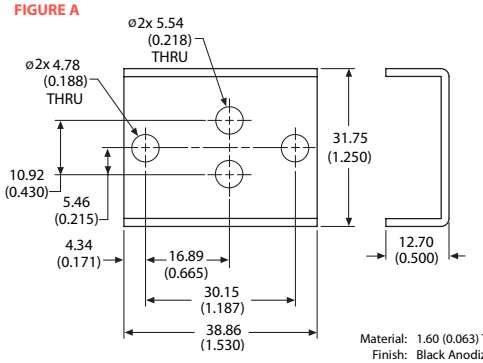
## 5203 Two piece heat sink

Grease & Epoxy page112

Mounting Kits page 99

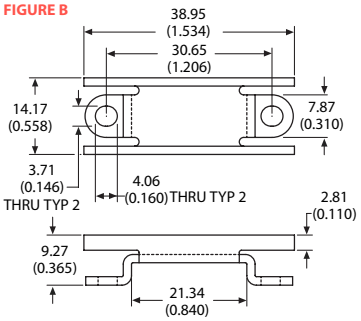
**Two piece heat sink** adds extra cooling in the same amount of board space as other solutions. Base and top can be ordered separately.

FIGURE A




Material: 1.60 (0.063) Thick Aluminum
Finish: Black Anodize

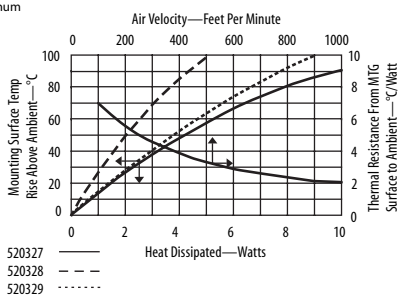
FIGURE B




### ORDERING INFORMATION

| Part Number | Description | Figure |
|---|---|---|
| 520327B00000G | Two piece heat sink assembly, base and top | |
| 520328B00000G | Top only | B |
| 520329B00000G | Base only | A |

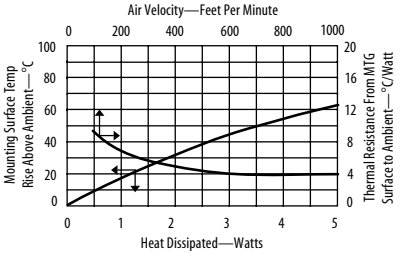
For additional options see page 84

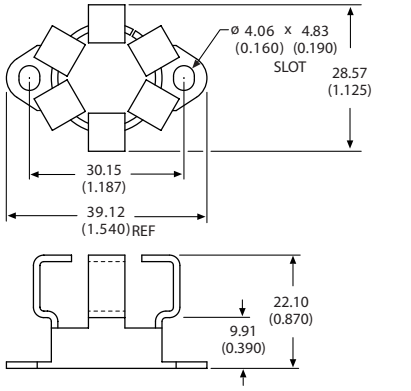



## 5791 Space saving expandable collar heat sink

Mounting Kits page 99

**Space saving expandable collar heat sink** has the same footprint as the device being cooled meaning no extra board space is required to fit the heat sink. The expandable collar tightly grips the device meaning no extra hardware is required. May also be used with any diamond or square basket heat sink to form a two piece heat sink for additional cooling. Available in conductive AavSHIELD[3] or black anodize finish.




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

### ORDERING INFORMATION

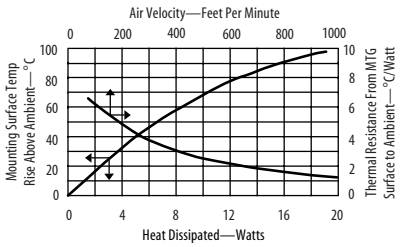
| Part Number | Finish |
|---|---|
| 579103B00000G | Black anodize |
| 579103V00000G | AavSHIELD[3] |

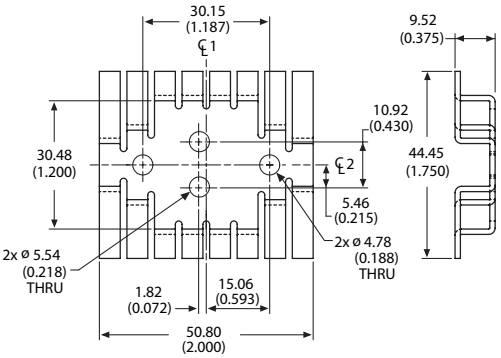
## 5060 Low profile hat section heat sink

Grease & Epoxy page112

Mounting Kits page 99

**Low profile hat section heat sink** is ideal for applications where low component heights are required such as card cages with PCBs mounted on 0.500 centers.




Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description |
|---|---|
| 506003B00000G | Low profile hat section heat sink |

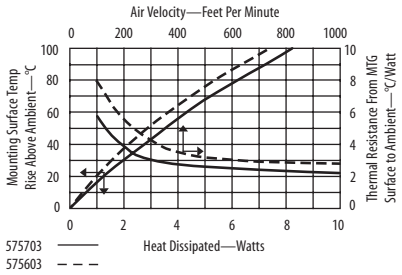
For additional options see page 84

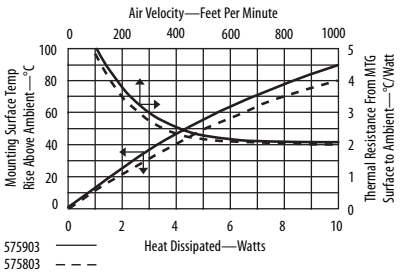
# TO-3 Heat Sinks

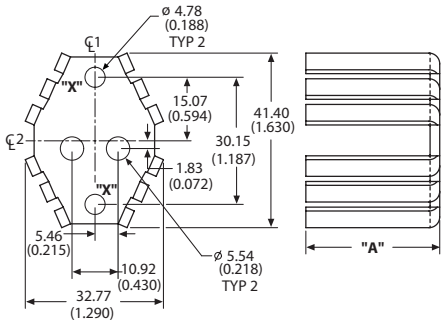
## 5756, 5757, 5758, 5759 Space saver diamond shaped basket heat sink

Grease & Epoxy page 112 | Mounting Kits page 99

**Space saver diamond shaped basket heat sink** featuring a narrow base with slanted fins to increase air turbulence in natural and forced convection applications. Made from heavy gauge material. Four heights to choose from.




Material: 2.29 (0.090) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| 575603B00000G | 12.70 (0.500) |
| 575703B00000G | 19.05 (0.750) |
| 575803B00000G | 25.40 (1.000) |
| 575903B00000G | 31.75 (1.250) |

### POPULAR OPTIONS: 575_03B 0 00 00G

Base part no. A B

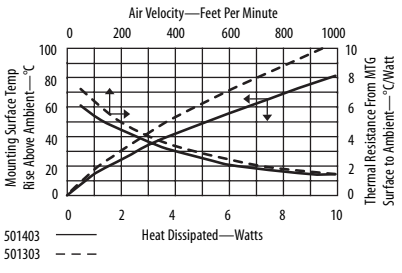
| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | 1 | Kon-Dux™ pad | | Page 86 |
| A | 3 | In-Sil-8™ pad | | Page 86 |
| B | 01 | 6-23 Wave-On™ threaded insert 0.100 stand off | Hole X | Page 89 |

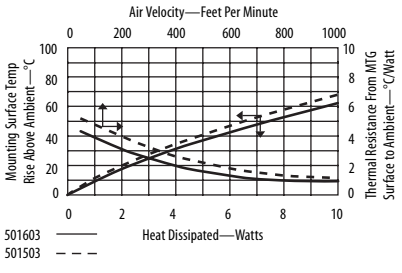
For additional options see page 84

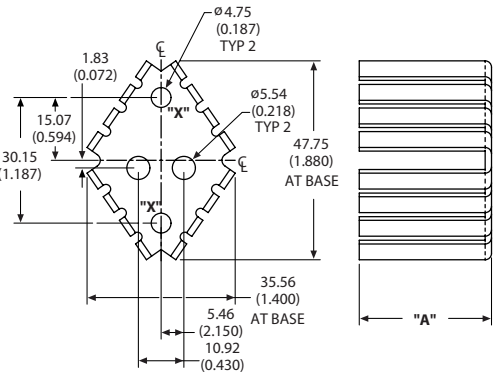
## 5013, 5014, 5015, 5016 Low cost diamond shaped basket heat sink

Grease & Epoxy page 112 | Mounting Kits page 99

**Low cost diamond shaped basket heat sink** with straight fins. High fin count enhances efficiency. Four heights to choose from.




Material: 1.60 (0.063) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| 501303B00000G | 12.70 (0.500) |
| 501403B00000G | 19.05 (0.750) |
| 501503B00000G | 25.40 (1.000) |
| 501603B00000G | 31.75 (1.250) |

### POPULAR OPTIONS: 501_03B 0 00 00G

Base part no. A B C

| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | 1 | Kon-Dux™ pad | | Page 86 |
| B | 01 | 6-23 Wave-On™ threaded insert 0.100 stand off | Hole X | Page 89 |
| C | 08 | 6-32 x 0.350 Solderable stud | Hole X | Page 96 |

For additional options see page 84



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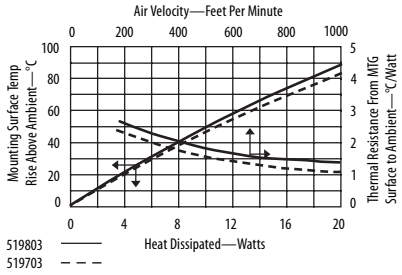
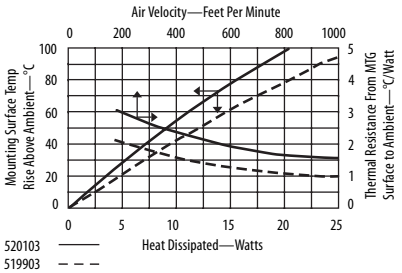
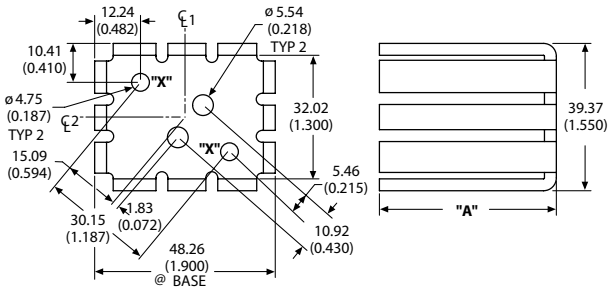
## 5197, 5198, 5199, 5201 Heavy gauge square basket heat sink

Grease & Epoxy page112 | Mounting Kits page 99

**Heavy gauge square basket heat sink** provides excellent performance by using 1/8 thick aluminum to maximize efficiency. Available in 4 heights.




Material: 3.17 (0.125) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| 519703B00000G | 38.10 (1.500) |
| 519803B00000G | 44.45 (1.750) |
| 519903B00000G | 50.80 (2.000) |
| 520103B00000G | 31.12 (1.225) |

### POPULAR OPTIONS: 5_ _ _03B 0 00 00G

Base part no. A B

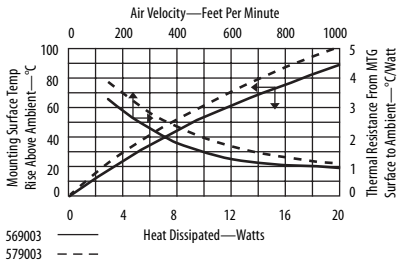
| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | 1 | Kon-Dux™ pad | | Page 86 |
| B | 01 | 6-32 Wave-On™ theaded insert 0.100 stand off | Hole X | Page 89 |

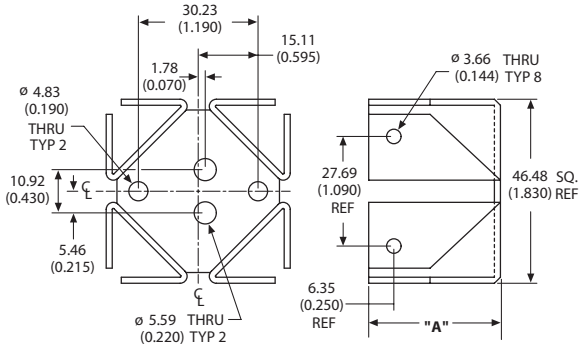
For additional options see page 84

## 5690, 5790 Square basket heat sink features folded back fins

Grease & Epoxy page112 | Mounting Kits page 99

**Square basket heat sink** features folded back fins to increase surface area and power dissipation. Two heights are available.




Material: 1.60 (0.063) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| 569003B00000G | 33.27 (1.310) |
| 579003B00000G | 25.40 (1.000) |

### POPULAR OPTIONS: 5_9003B 0 0000G

Base part no. A

| Position | Code | Description | Details |
|---|---|---|---|
| A | 1 | Kon-Dux™ pad | Page 86 |
| A | 3 | In-Sil-8™ pad | Page 86 |

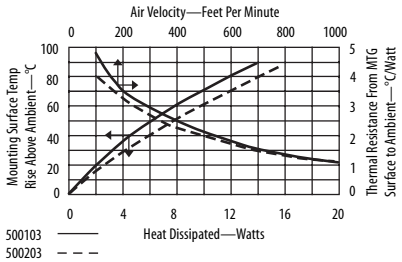
For additional options see page 84

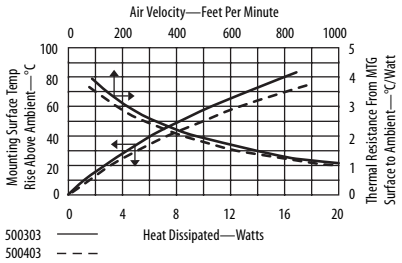
# TO-3 Heat Sinks

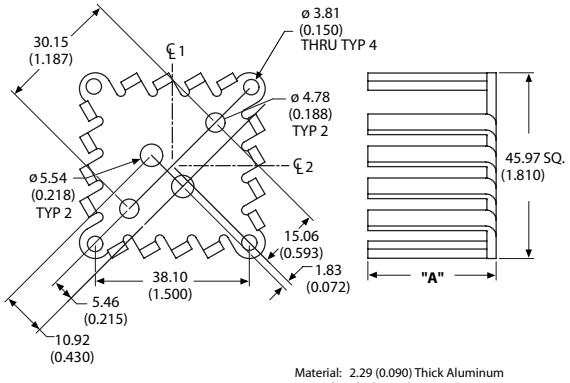
## 5001, 5002, 5003, 5004 Square basket heat sink featuring slanted fins

Grease & Epoxy page112 | Mounting Kits page 99

**Square basket heat sink featuring a slanted fin** design for increased air turbulence and four integrated mounting holes. Four heights to choose from.




Material: 2.29 (0.090) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| 500103B00000G | 12.70 (0.500) |
| 500203B00000G | 19.05 (0.750) |
| 500303B00000G | 25.40 (1.000) |
| 500403B00000G | 31.75 (1.250) |

### POPULAR OPTIONS: 500_03B 0 0000G

Base part no. A

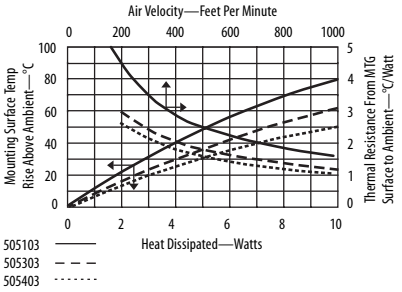
| Position | Code | Description | Details |
|---|---|---|---|
| A | 1 | Kon-Dux™ pad | Page 86 |
| A | 3 | In-Sil-8™ pad | Page 86 |

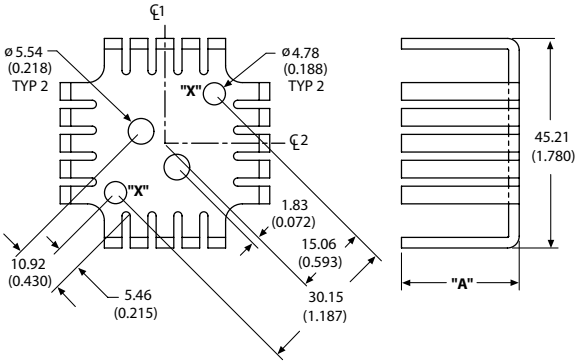
For additional options see page 84

## 5051, 5053, 5054 Square basket heat sink featuring straight fins

Grease & Epoxy page112 | Mounting Kits page 99

**Square basket heat sink features straight fins** and 0.090 thick aluminum for increased cooling capacity. Three heights to choose from.




Material: 2.29 (0.090) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| 505103B00000G | 12.70 (0.500) |
| 505303B00000G | 25.40 (1.000) |
| 505403B00000G | 31.75 (1.250) |

### POPULAR OPTIONS: 505_03B0 00 00G

Base part no. A

| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | 01 | 6-23 Wave-On™ threaded insert 0.100 stand off | Hole X | Page 89 |

For additional options see page 84



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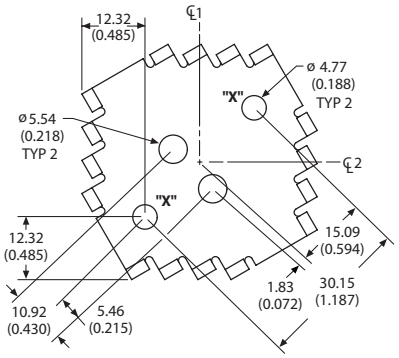
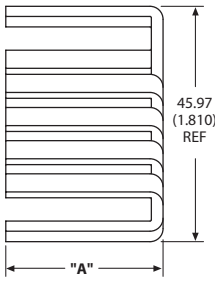
## 5761, 5762, 5763, 5764 Square basket heat sink featuring slanted vane fins

Grease & Epoxy page 112
Mounting Kits page 99

**Square basket heat sink features slanted vane fins** for efficient heat dissipation. Air movement from any direction is diverted into the center of the heat sink to create turbulence and improve heat transfer. Four heights to choose from.

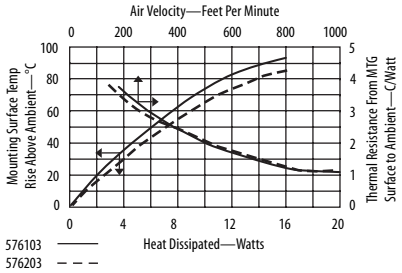


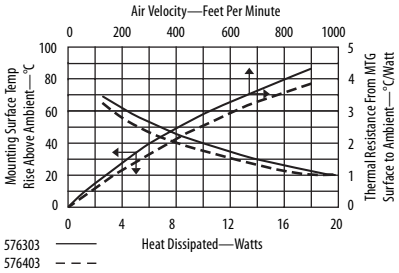




Material: 2.29 (0.090) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| 576103B00000G | 12.70 (0.500) |
| 576203B00000G | 19.05 (0.750) |
| 576303B00000G | 25.40 (1.000) |
| 576403B00000G | 31.75 (1.250) |




### POPULAR OPTIONS: 576 _ 03B 0 00 00G

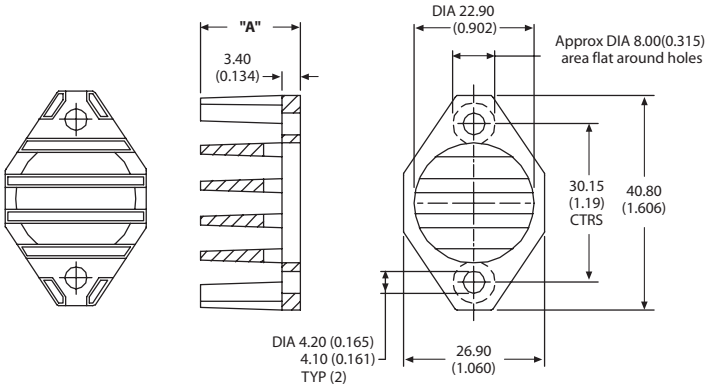
Base part no. A B

| Position | Code | Description | Location | Details |
|---|---|---|---|---|
| A | 1 | Kon-Dux™ pad | | Page 86 |
| B | 01 | 6-32 Wave-On™ theaded insert 0.100 stand off | Hole X | Page 89 |

For additional options see page 84

## PF523, PF526, PF527 Diamond shaped heat sink

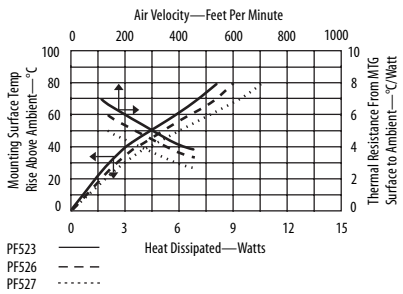
**Diamond shaped heat sink** is the same profile as the device which saves space on the board. This rugged design is made from cast aluminum and is available in three different heights.




Material: Cast Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| PF523G | 12.50 (0.492) |
| PF526G | 19.00 (0.748) |
| PF527G | 25.00 (0.984) |

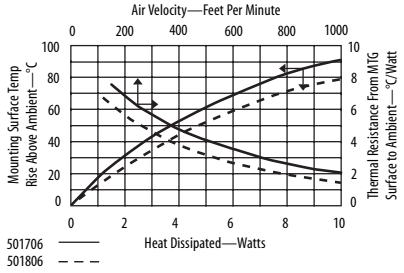


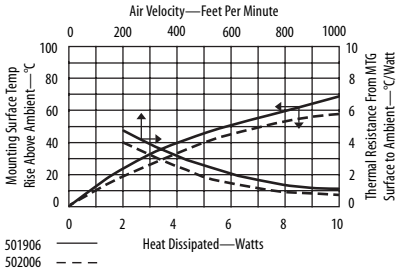
# TO-66 Heat Sinks

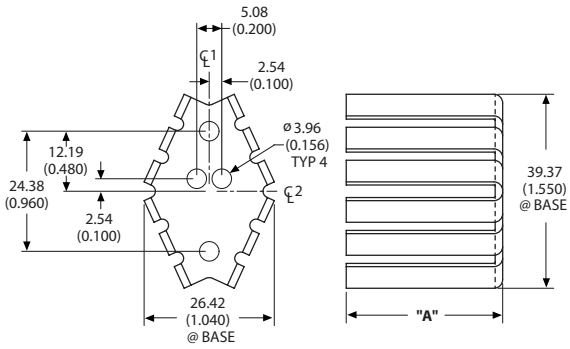
## 5017, 5018, 5019, 5020 Low cost diamond shaped basket heat sink

Grease & Epoxy page 112
Mounting Kits page 99

**Low cost diamond shaped basket heat sink** with straight fins. High fin count enhances efficiency. Four heights to choose from.




Material: 1.60 (0.063) Thick Aluminum
Finish: Black Anodize

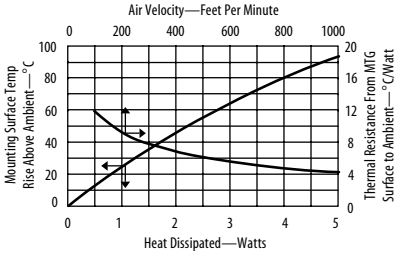
### ORDERING INFORMATION

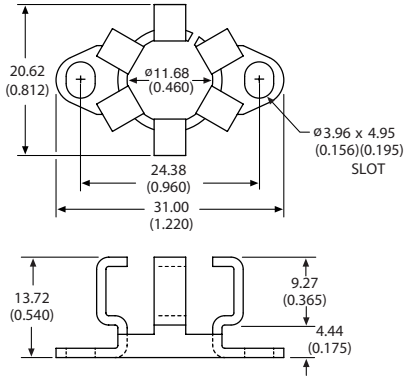
| Part Number | "A" Dim |
|---|---|
| 501706B00000G | 12.70 (0.500) |
| 501806B00000G | 19.05 (0.750) |
| 501906B00000G | 25.40 (1.000) |
| 502006B00000G | 31.75 (1.250) |

## 5792 Space saving expandable collar heat sink

Mounting Kits page 99

**Space saving expandable collar heat sink** has the same footprint as the device being cooled meaning no extra board space is required to fit the heat sink. The expandable collar tightly grips the device.




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

### ORDERING INFORMATION

| Part Number | Finish |
|---|---|
| 579206B00000G | Black anodize |
| 579206V00000G | AavSHIELD[3] |



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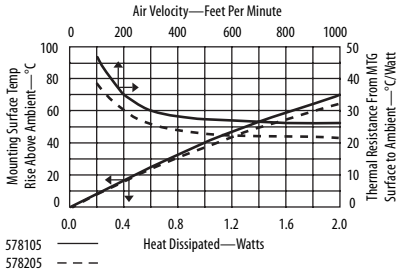
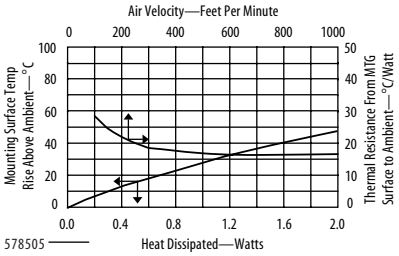
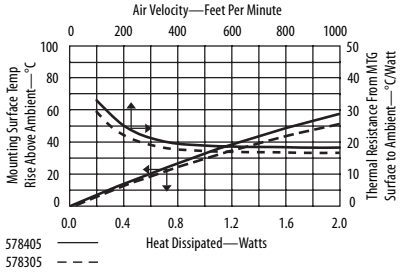
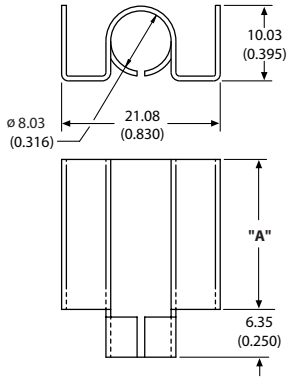
## 5781, 5782, 5783, 5784, 5785 Snap on cooler heat sink

**Snap on cooler** features easy no tools installation. Folded back fins provide maximum surface area while preserving valuable board space.



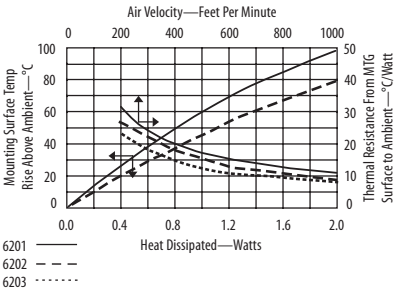

### ORDERING INFORMATION

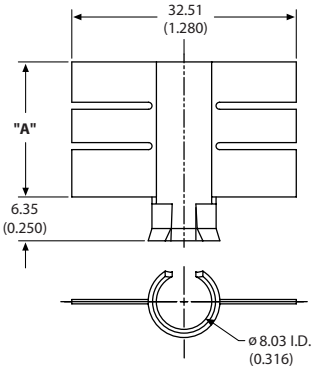
| Part Number | "A" Dim |
|---|---|
| 578105B00000G | 3.96 (0.156) |
| 578205B00000G | 6.35 (0.250) |
| 578305B00000G | 12.70 (0.500) |
| 578405B00000G | 19.05 (0.750) |
| 578505B00000G | 25.40 (1.000) |

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

## 6201, 6202, 6203 Space saving expandable heat sink

**Space saving expandable heat sink** features a collar that tightly grips the device meaning no extra hardware is required. Heat sinks are constructed of pre-black anodize material to lower cost.




### ORDERING INFORMATION

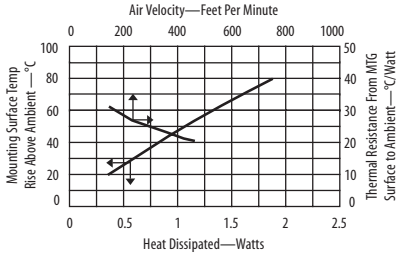
| Part Number | "A" Dim | # Fins |
|---|---|---|
| 6201PBG | 6.35 (0.250) | 1 |
| 6202PBG | 12.70 (0.500) | 2 |
| 6203PBG | 19.56 (0.770) | 3 |

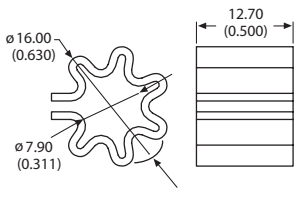
* Edges cut during the manufacturing process will be unfinished.
See page 110 more more information

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

## 5F Low cost push on heat sink

**Low cost push on heat sink** uses spring pressure to firmly grip the device case creating a good thermal interface.




### ORDERING INFORMATION

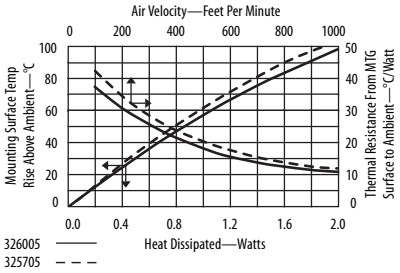
| Part Number | Description |
|---|---|
| 5FG | Low cost push on heat sink |

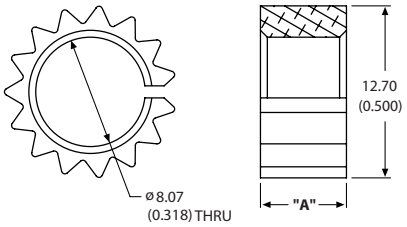
Material: Aluminum
Finish: Black Anodize

# TO-5 Heat Sinks

## 3257, 3260 Extruded collar style heat sink with radial fins

**Extruded collar style heat sink with radial fins.** The split collar design provides a press fit between the transistor and the heat sink creating an excellent thermal conduction path. Available in two heights.



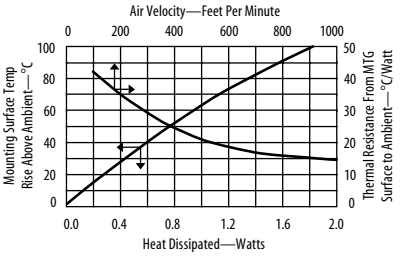

Material: Aluminum
Finish: Black Anodize

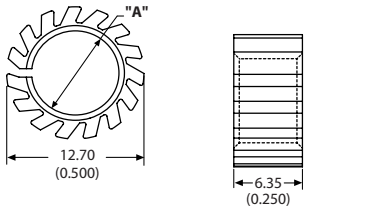
### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| 325705B00000G | 6.35 (0.250) |
| 326005B00000G | 9.53 (0.375) |

## 3201, 3202 Extruded collar style heat sink with swept back fins

**Extruded collar style heat sink with swept back fins** for increased surface area in a small volume. The split collar design provides a press fit between the transistor and the heat sink creating an excellent thermal conduction path. Available in two inside diameters.



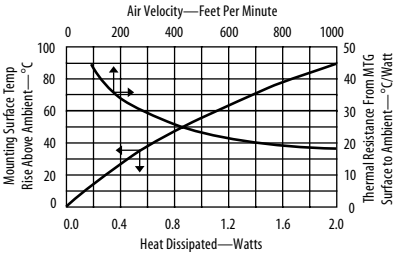

Material: Aluminum
Finish: Black Anodize

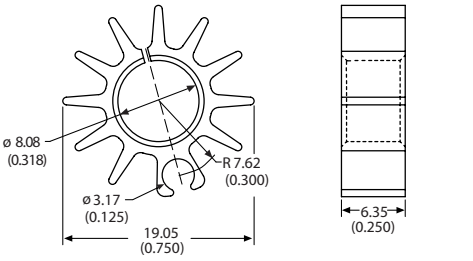
### ORDERING INFORMATION

| Part Number | "A" Dim |
|---|---|
| 320105B00000G | 8.07 (0.318) |
| 320205B00000G | 7.75 (0.305) |

## 3230 Extruded collar style heat sink with mounting hole

**Extruded collar style heat sink with mounting hole** for hardware attachment to the circuit card. The heat sink includes a mount boss that will accept a 4-40 screw for secure mounting in high vibration environments. The split collar design provides a press fit between the transistor and the heat sink creating an excellent thermal conduction path.




Material: Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

| Part Number | Description |
|---|---|
| 323005B00000G | Extruded collar style heat sink with mounting boss |



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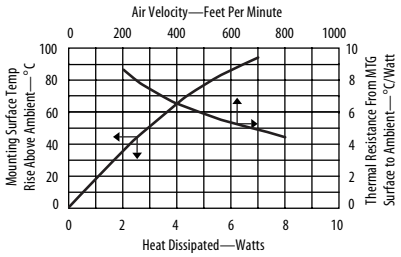
## 6000 Copper heat sink for axial lead devices



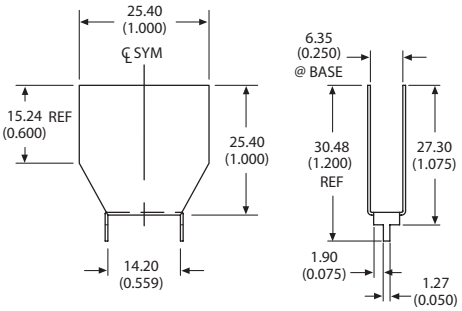
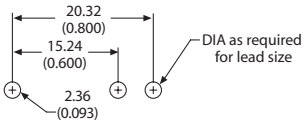




**FIGURE A**




**Copper heat sink for axial lead device** requires no extra board space to mount. One lead of the heat sink is soldered to the device while the other solders to the PC board. Available in two finishes.

Material: 0.53 (0.021) Thick Copper
Finish: See Table

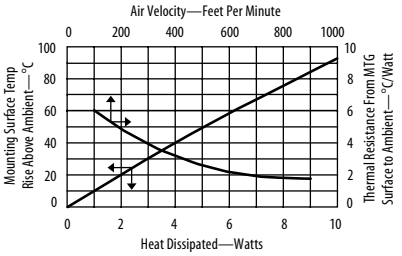
### ORDERING INFORMATION

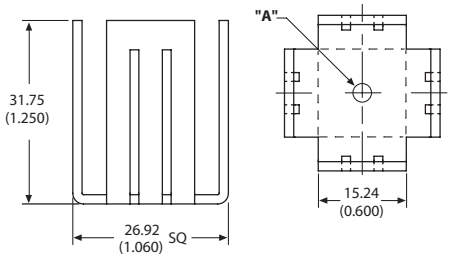
| Part Number | Description | Finish | Dia of PCB Plated Thru Hole for Tabs |
|---|---|---|---|
| 6000UG | Heat sink for axial lead device | Unfinished | See figure A |
| 6000DG | Heat sink for axial lead device | Tin plated* | See figure A |

* See page 110 for more information

# Bridge Rectifiers

## 6222, 6223, 6224 Square basket style heat sink for bridge rectifiers




**Square basket style heat sink** for bridge rectifiers uses no additional board space. Available with three different mounting hole diameters.

Material: 1.27 (0.050) Thick Aluminum
Finish: Black Anodize

### ORDERING INFORMATION

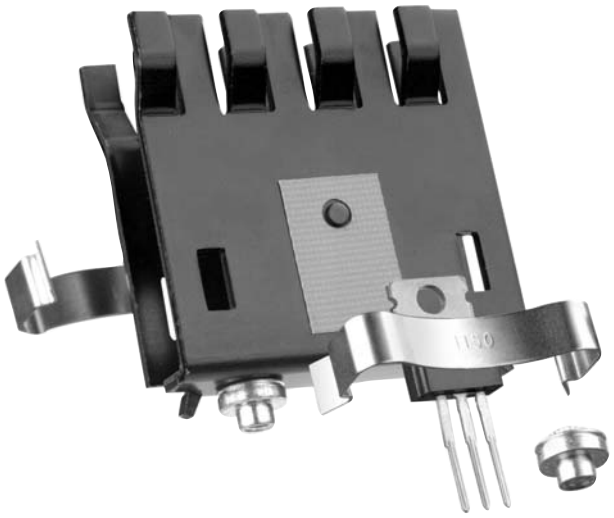
| Part Number | "A" Dim |
|---|---|
| 6222BG | 3.61 (0.142) Dia Thru |
| 6223BG | 4.14 (0.163) Dia Thru |
| 6224BG | 4.77 (0.188) Dia Thru |

Thermal solutions go beyond the heat dissipator itself. Aavid Thermalloy offers a total solution package, which includes a number of options and accessory items described in this section of the catalog.

A total thermal solution includes an efficient thermal interface and means of mechanical attachment. Aavid Thermalloy has a full-line of interface materials that can be pre-applied or supplied as an accessory item. Mechanical assembly options include attachment of semiconductors to heat sinks, heat sinks to printed circuit boards, and heat sinks to sockets of CPUs.

Aavid Thermalloy offers the most complete line of value added options of any supplier in the industry. Our full line of accessories includes mounting kits, shoulder washers, insulators, mounting pads, and various grease products and epoxies, which are sold separately, and can be used with a variety of Aavid heat sinks.

This section will provide the most complete solution to your thermal requirement.



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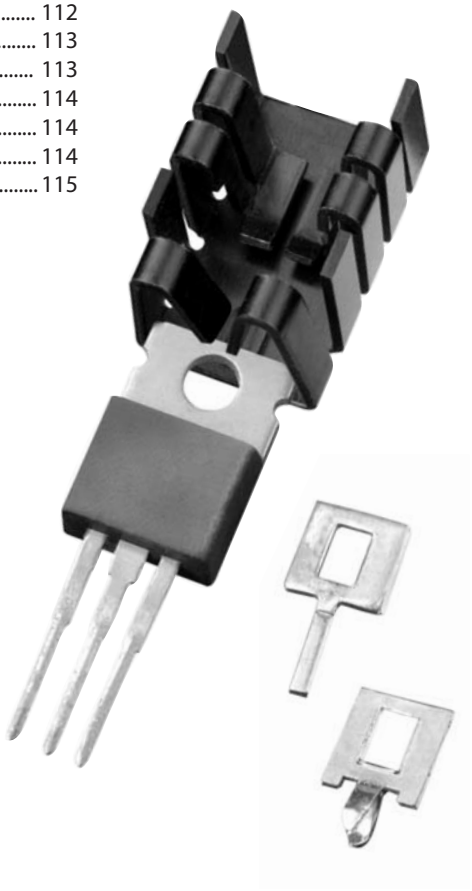

## How to decipher an Aavid standard 12 digit part number

Aavid Thermalloy's standard product line in most cases consists of a 12-digit part number sequence. In most standard offerings, Digits 1 through 4, define the model basic part number. Digits 5 and 6 designate the package style that a particular heat sink is designed to cool. The 7th digit determines the finish, and the 8th identifies the interface material, if one can be used for that particular style heat sink. The 9th and 10th digits define the PC board mounting method, and the 11th and 12th digits define the method of attachment of the package to the heat sink. For digits 8,9,10,11 and 12, the absence of any of those options is always designated by a zero in those positions. Important NOTE: The 12 digit part number sequence is a general format. Due to the different variations and styles of heat sinks, we have included an Option Index on pages 82–84 to show available options and accessories for the products covered in this catalog.

Standard board level:

| 5748 | 02 | B | 0 | 37 | 00 | G |
|---|---|---|---|---|---|---|
| A | B | C | D | E | F | G |

**A** = Base Part Number
**B** = Package Style
**C** = Finish
**D** = Interface Material
**E** = PC Board Mounting
**F** = Package Mounting
**G** = RoHS Compliant

**To order most Aavid Thermalloy heat sinks, you must use a 12 digit part number using the following options:**

## Digits 5-6: *Package style*

| CODE | DEVICE |
|---|---|
| 00 | Blank |
| 01 | TO-218 |
| 02 | TO-220, TO-216, TO-217 |
| 03 | TO-3 |
| 04 | TO-202 |
| 05 | TO-5, TO-39 |
| 06 | TO-66 |
| 08 | TO-247 |
| 10 | Multiwatt/SIP |
| 21 | Dual TO-218 |
| 22 | Dual TO-220 |

## Digit 7: *Finish*

| CODE | DESCRIPTION |
|---|---|
| B | Black Anodize |
| D | Solderable 100% Tin Finish |
| J | Pre-Black Anodize |
| M | Green Anodize |
| U | Unfinished |
| V | AavSHIELD[3] |
| W | Black Anodize w/Black Paint |

For additional information see page 110

## Digit 8: *Interface material*

| CODE | DESCRIPTION |
|---|---|
| 0 | None |
| 1 | One Kon-Dux™ Pad |
| 2 | Two Kon-Dux™ Pads |
| 3 | One In-Sil-8™ Pad |
| 4 | Two In-Sil-8™ Pad |
| 7 | One Hi-Flow® Pad |
| 8 | Two Hi-Flow® Pads |

For additional information see pages 86 and 87

## Digits 9-10: *PC Board mounting*

**Solderable Wave-On™ mounts**

| CODE | STAND-OFF | THREAD |
|---|---|---|
| 01 | 0.100″ | #6-32 |
| 02 | 0.100″ | #4-40 |
| 03 | 0.045″ | #4-40 |
| 04* | 0.100″ | #6-32 |
| 05 | 0.045″ | #6-32 |
| 07 | 0.100″ | 3.5mm |
| 09 | 0.200″ | #6-32 |
| 13 | 0.129″ | #6-32 |

* 0.090 PCB (others 0.062″)
For additional information see page 89

**Solderable pins for board mounted extrusions**

| CODE | DESCRIPTION |
|---|---|
| 21 | Solid Pin with Stand Off Shoulder 0.050″ |
| 25 | Solid Solderable Pin |

For additional information see page 94

**Solderable nut**

| CODE | DESCRIPTION | LENGTH |
|---|---|---|
| 13 | SNE-2 6-32 UNC-2B | 0.305″ |
| 14 | SNE-1 4-40 UNC-2B | 0.305″ |

For additional information see page 94

**Solderable staked on **tabs**

| CODE | DESCRIPTION | |
|---|---|---|
| 28 | Shur-Lock™ Tab | (0.130 for 0.062″ PC Boards) |
| 31 | Centered Horizontal | (0.050 W x 0.130 L) |
| 32 | Centered Horizontal | (0.050 W x 0.130 L) |
| 33 | Centered Vertical | (0.062 W x 0.340 L) |
| 34 | Vertical Pair L & R | (0.075 W x 0.170 L) |
| 35 | Vertical Pair L & R | (0.097 W x 0.200 L) |
| 36 | Centered Vertical | (0.100 W x 0.150 L) |
| 37 | Centered Step | (0.062 W x 0.250 L with 0.125 wide step) |
| 39 | Centered Vertical | (0.050 W x 0.375 L) |
| 40 | Centered Vertical | (0.050 W x 0.245 L) |
| 43 | Centered Step | (0.050 W x 0.375 L) |
| 48 | Centered Vertical | (0.062 W x 0.280 L) |
| 53 | MT Tab Vertical Pair | (0.090 W x 0.125 L) |
| 54 | MT2 Tab Vertical Pair | (0.090 W x 0.125 L) |
| 55 | MT3 Tab Vertical Pair | (0.090 W x 0.125 L) |
| 56 | Bifurcated Tab Vertical Pair | (0.110 W x 0.125 with 0.190 step) |
| 57 | Bifurcated Tab Vertical Pair | (0.110 W x 0.125 with 0.100 step) |

For additional information see pages 91–93

** For additional tab options, please contact Application Engineering at (603) 224-9988

## Digits 11-12: *Package mounting*

**Semiconductor mounts**

| CODE | DESCRIPTION | LENGTH |
|---|---|---|
| 01 | #6-32 Female | |
| 02 | #4-40 Female | |
| 03 | M-3 Female | |
| 04 | #6-32 Male | 0.380″ |
| 05 | #4-40 Male | 0.380″ |

For additional information see page 90

**Standard clips**

Kool-Klips™
Sold separately

| CODE | PART# |
|---|---|
| 50 | 115000 |
| 51 | 115100 |
| 52 | 115200 |
| 53 | 115300 |
| 54 | 115400 |
| 62 | 116200 |

For additional information see page 97

**Thermal clips**

Factory applied to heat sink

| CODE | PART# |
|---|---|
| 32 | TC-1 |
| 33 | TC-10 |
| 34 | TC-11 |
| 35 | TC-12 |

For additional information see page 98

**Studs**

| CODE | DESCRIPTION | LENGTH |
|---|---|---|
| 06 | SE-2 Stud #6-32 | 0.485" |
| 07 | SM-3 M-3 Male | 0.350″ |
| 08 | SE-1 Stud #6-32 | 0.350" |
| 09 | SE-3 Stud #4-40 | 0.350" |
| 11 | SF-1 M3 x 0.5 | 0.302" |
| 14 | SE-4 Stud #6-32 | 0.350" |
| 17 | SM-1M-3 Male | 0.350" |

For additional information see page 96

**Clinch nuts**

| CODE | DESCRIPTION |
|---|---|
| 12 | CNE-42 4-40 Clinch nut |
| 13 | CNM-1 M3 X 0.5 Clinch nut |

For additional information see page 95



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## How to decipher a Thermalloy origin part number?

Aavid Thermalloy features a variety of Thermalloy origin standard products that consist of a different part number sequence than the standard Aavid 12 digit part numbering system. In most cases, digits 1 through 4, designate the basic model number of the heat sink. Digits 5-6, designate the finish of the heat sink. Digits 6-13 can designate any number of different options that come with a specific model number. (Please refer to Option Index D on page 85 to see Aavid Thermalloy's offerings per base number.)

**To order most Thermalloy origin heat sinks you must use the basic part numbering system below:**

Standard board level: **6021** ___ – ___ - ___ **G**

**A** **B** **C** **D** **E**

**A** = Model Number
**B** = Finish
**C** = Productivity Enhancement (if applicable)
**D** = Second Productivity Enhancement (if applicable)
**E** = RoHS Compliant Suffix

**Popular finishes***
**(followed after base number in location B above)**
B=Black Anodize
PB= Pre-Black Anodized
D=Tin Plated
U=Clean, No Finish
V=AavSHIELD[3]

*For additional information see page 110

**Popular productivity enhancing options:**
**Digits (Figure C-D above)**
P_= Solderable Roll Pins (see page 94)
TC_ _ = Thermal Clip (see page 98)
CNE_ _ = Clinch Nuts (see page 95)
CNM_= Clinch Nuts Metric (see page 95)
MT= Mounting Tabs (see page 93)
8223-CL03,8241-CL11 = Alignment Pad (see page 87)
SE-_= Solderable Studs (see page 96)
SF_= Mounting Studs (see page 96)
G_= Grafoil® Pad (see page 86)
SNM_= Solderable Nuts Metric (see page 94)
SNE= Solderable Nuts (see page 94)
BGS_= BGS Clip (page 18)

Note: For a wide range of part number specific options, please see our Aavid Option Index D on page 85

# Option Index A

Available option codes for Aavid 12 digit part numbers. For additional information on option codes see "How to decipher an Aavid 12 digit part number" on page 80. To find the appropriate Option Index for a selected part number please refer to the main product section in the front of the catalog or "How to use this catalog" on page 2.

## Ordering Codes

| Base part | Finishes (page 110) | Solderable tabs (page 91–93) | Clips (page 97) | Wave-On™ mounts (page 89) | Kondux™ pads (page 86) | In-Sil-8™ pads (page 86) | Hi-Flow® pads (page 87) | Semiconductor mnts (page 90) | Studs (page 96) |
|---|---|---|---|---|---|---|---|---|---|
| 504102 | B U | 53 54 55 56 57 | | 01 02 03 05 | 1 | 3 | | | |
| 504222 | B U | | | 01 02 03 05 | 2 | 4 | | 01 02 03 05 | 07 08 |
| 506902 | B U | | | 01 02 03 05 | 1 | 3 | | | |
| 507002 | B U J | 53 54 55 56 57 | | 01 02 03 05 | 1 | 3 | | 01 02 03 05 | 07 08 |
| 507102 | B U J | | | | | | | | |
| 507222 | B U J V | 53 54 55 56 57 | | 01 02 03 05 | 1 2 | 3 4 | | 01 02 03 05 | 07 08 |
| 507302 | B U J V | 33 36 39 40 | | 01 02 03 05 | 1 | 3 | | 01 02 03 05 | 07 08 |
| 530101 | B U V | | 50 | 01 04 05 07 | 1 2 | 3 | 7 | | |
| 530102 | B U | | 50 | 01 04 05 07 | 1 2 | 3 | 7 | | |
| 530161 | B U | | 62 | 01 04 05 07 | 1 2 | 3 | | | |
| 530162 | B U | | 62 | 01 04 05 07 | 1 2 | 3 | | | |
| 530401 | B U | | 50 | 01 04 05 07 | 1 2 | 3 | 7 | | |
| 530402 | B U | | 50 | 01 04 05 07 | 1 2 | 3 | 7 | | |
| 530613 | B U J V | 53 54 55 56 57 | | | 1 | 3 | | | |
| 530614 | B U J | 53 54 55 56 57 | | | 1 | 3 | | | |
| 530714 | B U V | 53 54 55 56 57 | | | 1 | 3 | | | |
| 530801 | B U | | 50 | 01 04 05 07 | 1 2 | 3 | 7 | | |
| 530802 | B U | | 50 | 01 04 05 07 | 1 2 | 3 | 7 | | |
| 530861 | B U | | 62 | 01 04 05 07 | 1 2 | | | | |
| 530862 | B U | | 62 | 01 04 05 07 | 1 2 | | | | |
| 534202 | B U | 28 34 35 | 53 | | 1 | | | | |
| 534265 | B U | 28 34 35 | 53 | | | 3 | 7 | | |
| 542502 | B U J D | | | 05 | 1 | 3 | | 01 02 03 05 | 07 08 |
| 551002 | B U | | | 01 02 03 05 | 1 | 3 | | 01 02 03 05 | 07 08 |
| 563002 | B U J D | | | | | 3 | | | |
| 569022 | B U | | | 01 02 03 05 | | | | 01 02 03 05 | 07 08 |
| 574102 | B U | 32 33 37 | | | | | | | |
| 574402 | B U | 32 33 37 | | | | | | | |
| 574502 | B U V | 32 33 37 48 | | | | | | | |
| 574602 | B U | 32 33 37 43 | | | | | | | |
| 574802 | B U | 33 37 | | | | | | | |
| 574902 | B U | 28 33 37 43 | | | | | | | |
| 575002 | B U D | | | | | | | | |
| 575102 | B U V | | | | 1 | 3 | | | |
| 576012 | B U V | | | | 1 | 3 | | | |
| 576014 | B U V | | | | 1 | 3 | | | |
| 576602 | B U D | | | | | 3 | | | |
| 577002 | B U V | 28 33 36 39 40 | | 01 02 03 05 | 1 | 3 | | 01 02 03 05 | 07 08 |
| 577102 | B U V | 28 33 36 39 40 | | 01 02 03 05 | 1 | 3 | | 01 02 03 05 | 07 08 |
| 577202 | B U J V | 33 36 38 39 40 | | 01 02 03 05 | 1 | 3 | | 01 02 03 05 | 07 08 |
| 577922 | B U V | | | | 2 | 4 | | | |
| 578622 | B U V | 28 32 34 35 | | | 2 | 4 | | 01 02 03 05 | 07 08 |
| 579302 | B U | | | | | | | | |
| 579402 | B U | | | | | | | | |
| 579802 | B U | 33 | | | | | | | |
| 579902 | B U | 33 | | | 1 | | | 05 | |
| 590102 | B U | 36 | | 02 | 1 | | | | |
| 590302 | B U | 36 37 | | | 1 | 3 | | | |
| 592201 | B U | 34 | | | | | | | |
| 592502 | B U | 28 34 35 | | 01 02 03 05 | 1 | 3 | | 01 02 03 05 | 07 08 |
| 592902 | B U | 28 34 | | | 1 | 3 | | 01 02 03 05 | 07 08 |
| 593002 | B U V | 28 34 35 | | | 1 | 3 | | 01 02 03 05 | 07 08 |
| 593101 | B U | 36 | | | 1 | 3 | | 01 | |
| 593202 | B U V | 28 34 35 | | 01 02 03 05 | 1 | 3 | | 01 02 03 05 | 07 08 |



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Available Option codes for Aavid 12 digit part numbers. For additional information on option codes see "How to decipher an Aavid 12 digit part number" on page 80. To find the appropriate Option Index for a selected part number please refer to the main product section in the front of the catalog or "How to use this catalog" on page 2.

## Ordering Codes

| Base part | Finishes (page 110) | Clips (page 97–98) | Kondux™ pads (page 86) | In-Sil-8™ pads (page 86) | Hi-Flow® pads (page 87) | Semiconductor mounts (page 90) | Solderable pins (page 94) | Studs (page 96) | Clinch nuts (page 95) |
|---|---|---|---|---|---|---|---|---|---|
| 513001 | B U | | 1 2 | 3 4 | | 01 03 | 21 25 | | |
| 513002 | B U | | 1 2 | 3 4 | | | 21 25 | | |
| 513101 | B U | | 1 2 | 3 4 | | | 21 25 | | |
| 513102 | B U | | 1 2 | 3 4 | | 01 02 03 | 21 25 | | |
| 513201 | B U | | 1 2 | 3 4 | | 01 05 | 21 25 | | |
| 513202 | B U V | | 1 2 | 3 4 | | 01 02 03 | 21 25 | | |
| 513301 | B U | | 1 2 | 3 4 | | 02 | 21 25 | | |
| 513302 | B U V | | 1 2 | 3 4 | | 01 02 | 21 25 | | |
| 529701 | B | | 1 2 | 3 4 | | | 21 25 | | |
| 529702 | B | | 1 2 | 3 4 | | | 21 25 | | |
| 529801 | B | | 1 2 | 3 4 | | 01 02 | 21 25 | 11 | 12 |
| 529802 | B | | 1 2 | 3 4 | | 01 02 | 21 25 | 11 | 12 |
| 529901 | B | 33 34 | 1 2 | 3 4 | | 01 02 05 | 21 25 | 11 | 13 |
| 529902 | B | 33 34 | 1 2 | 3 4 | | 01 02 05 | 21 25 | | |
| 530001 | B U | 33 | 1 | 3 | | 01 | 21 25 | | |
| 530002 | B U | | 1 | 3 | | 02 | 21 25 | | |
| 531002 | B U V | | 1 | 3 | | | 21 25 | | |
| 531102 | B U V | | 1 | 3 | | 02 03 | 21 25 | | |
| 531202 | B U V | | 1 | 3 | | 01 02 | 21 25 | | |
| 531302 | B U V | | 1 | 3 | | 02 | 21 25 | | |
| 532602 | B | | 1 | 3 | | 01 02 | 21 25 | | |
| 532702 | B | | 1 | 3 | | 01 | 21 25 | | |
| 532802 | B | | 1 | 3 | | 02 | 21 25 | | |
| 533001 | B U | 51 | 1 | 3 | 7 | | 21 25 | | |
| 533002 | B U | 51 | 1 | 3 | 7 | | 21 25 | | |
| 533101 | B U | 51 | 1 | 3 | 7 | | 21 25 | | |
| 533102 | B U | 51 | 1 | 3 | 7 | | 21 25 | | |
| 533201 | B U | 51 | 1 | 3 | 7 | | 21 25 | | |
| 533202 | B U | 51 | 1 | 3 | 7 | | 21 25 | | |
| 533301 | B U | 51 | 1 | 3 | 7 | | 21 25 | | |
| 533302 | B U | 51 | 1 | 3 | 7 | | 21 25 | | |
| 533401 | B | 52 | 1 | | | | 21 25 | | |
| 533402 | B | 52 | 1 | 3 | | | 21 25 | | |
| 533421 | B | 52 | 1 2 | 3 | | | 21 25 | | |
| 533422 | B | 52 | 1 2 | 3 | | | 21 25 | | |
| 533501 | B | 52 | 1 | 3 | | | 21 25 | | |
| 533502 | B | 52 | 1 | 3 | | | 21 25 | | |
| 533521 | B | 52 | 1 2 | | | | 21 25 | | |
| 533522 | B | 52 | 1 2 | 3 | | | 21 25 | | |
| 533601 | B | 52 | 1 | 3 | | | 21 25 | | |
| 533602 | B | 52 | 1 | 3 | | | 21 25 | | |
| 533621 | B | 52 | 1 2 | 3 | | | 21 25 | | |
| 533622 | B | 52 | 1 2 | 3 | | | 21 25 | | |
| 533701 | B | 52 | 1 | | | | 21 25 | | |
| 533702 | B | 52 | 1 | 3 | | | 21 25 | | |
| 533721 | B | 52 | 1 2 | 3 | | | 21 25 | | |
| 533722 | B | 52 | 1 2 | | | | 21 25 | | |
| 533802 | B U | 54 | 1 2 | 3 | 7 | | 21 25 | | |
| 533902 | B U | 54 | 1 2 | 3 | 7 | | 21 25 | | |
| 534002 | B U | 54 | 1 2 | 3 | 7 | | 21 25 | | |
| 581001 | B U | | 1 | 3 | | | 21 25 | | |
| 581002 | B U V | | 1 | 3 | | | 21 25 | | |
| 581101 | B U | | 1 | 3 | | | 21 25 | | |
| 581102 | B U | | 1 | 3 | | | 21 25 | | |
| 581201 | B U | | 1 | 3 | | | 21 25 | | |
| 581202 | B U | | 1 | 3 | | | 21 25 | | |

# Option Index C

Available option codes for Aavid 12 digit part numbers. For additional information on option codes see "How to decipher an Aavid 12 digit part number" on page 80. To find the appropriate Option Index for a selected part number please refer to the main product section in the front of the catalog or "How to use this catalog" on page 2.

## Ordering Codes

| Base part | Finishes (page 110) | Wave-On™ mounts (page 89) | Kondux™ pads (page 86) | In-Sil-8™ pads (page 86) | Semiconductor mounts (page 90) | Solderable tabs (page 91–93) | Solderable nuts (page 94) | Solderable studs (page 96) |
|---|---|---|---|---|---|---|---|---|
| 500103 | B U | 01 02 04 05 07 | 1 | 3 | | | | 06 08 09 |
| 500203 | B U | 01 02 04 05 09 | 1 | 3 | | | | 06 08 09 |
| 500303 | B U | 01 02 03 04 05 | 1 | 3 | | | | 06 08 09 |
| 500403 | B U | 01 02 03 04 05 | 1 | 3 | | | | 06 08 09 |
| 501303 | B U | 01 03 04 05 07 | 1 | 3 | | | 13 | 06 07 08 09 |
| 501403 | B U | 01 02 03 05 07 | 1 | 3 | | | 13 | 06 08 17 |
| 501503 | B U V | 01 03 05 07 09 | 1 | 3 | 04 | | 13 | 06 08 17 |
| 501603 | B U V | 01 02 04 05 07 | 1 | 3 | | | 13 14 | 08 17 |
| 505103 | B U | 01 02 03 04 05 | 1 | 3 | | | | |
| 505303 | B U | 01 02 03 04 05 | 1 | 3 | | | | |
| 505403 | B U | 01 02 03 04 05 | 1 | 3 | | | | |
| 506003 | B U | | | | | | 13 14 | |
| 506304 | B U | 01 | | | | 53 | 14 | |
| 519703 | B U | 01 03 04 05 07 | 1 | 3 | | | | |
| 519803 | B U | 01 03 04 05 07 | 1 | 3 | | | | |
| 519903 | B U V | 01 03 04 05 09 | 1 | 3 | | | | |
| 520103 | B U V | 01 04 05 07 09 | 1 | 3 | | | | |
| 520328 | B U V | | | | | | | |
| 520329 | B U V | | | | | | | 08 |
| 566010 | B U | | | | | 28 31 34 37 | | |
| 566902 | B U | | | | | 31 37 39 40 | | |
| 569003 | B U V | 01 02 04 05 | 1 | 3 | | | | 06 08 17 |
| 574204 | B U | | | | | 32 33 | | |
| 575603 | B U V | 01 03 04 05 | 1 | 3 | | | | |
| 575703 | B U | 01 03 04 05 | 1 | 3 | | | | |
| 575803 | B U | 01 04 05 07 09 | 1 | 3 | | | | |
| 575903 | B U | 01 03 04 05 07 | 1 | 3 | | | | |
| 576103 | B U V | 01 02 03 04 05 | 1 | 3 | | | | |
| 576203 | B U V | 01 02 03 04 05 | 1 | 3 | | | | |
| 576303 | B U | 01 02 04 05 | 1 | 3 | | | | |
| 576403 | B U V | 01 02 04 05 | 1 | 3 | | | | |
| 576802 | B U V | | | | | 31 32 33 37 39 40 | | |
| 576904 | B U | 01 02 03 05 | | | | | | |
| 577304 | B U | 01 02 03 05 | | | 01 | | | |
| 577404 | B U V | 01 02 03 05 | | | 05 | | | 09 11 |
| 579003 | B U | 05 | | | | | | |
| 579604 | B U | | | | | 32 33 | | |
| 579704 | B U | | | | | 32 33 | | |
| 584000 | B U | | | | | 33 35 | | |
| 591202 | B U | | | | | 31 33 37 38 39 40 | | |
| 591302 | B U | | | | | 28 40 | | |



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Available option codes for Thermalloy origin part numbers. For additional information on option codes see "How to decipher a Thermalloy Origin part number" on page 81. To find the appropriate Option Index for a selected part number, refer to the main product section in the front of the catalog or "How to use this catalog" on page 2.

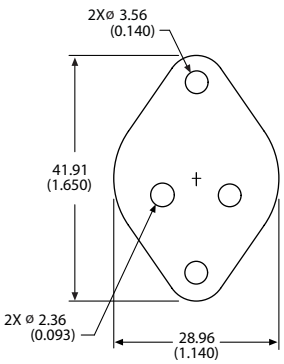
## Ordering Codes

| Base part | Finishes (page 110) | Mounting tabs (page 93) | Clips (page 98) | Solderable studs & pins (page 94–96) | Device mtg. studs (page 96) | Clinch nuts (page 95) | Solderable nuts (page 94) | Alignment pads (page 87) | Grafoil® pads (page 86) |
|---|---|---|---|---|---|---|---|---|---|
| 6021 | B U PB | | | | SF1 | CNM1 | | | G5 |
| 6022 | B U PB | | | | SF1 SF2 | CNM1 | | | |
| 6025 | PB D | | TC-10 | | SF1 SF3 | CNE42 | | | G5 |
| 6109 | B U PB | MT MT5 | TC-1 | SE3 SE1 | SF1 | CNE42 | | | G5 |
| 6110 | B U PB | MT | | SE1 SM3 | | CNE42 | | | |
| 6225 | B U PB | MT | TC-10 | | SF1 | | | | G5 |
| 6230 | B U PB D | | | | | | | | |
| 6232 | B U PB | MT MT3 MT5 | TC-1 | | SF1 | | | | G5 |
| 6238 | B U PB | MT MT5 MT6 | | | | | | | G5 |
| 6239 | B U | MT | | | | | | | |
| 6374 | B | | | P2 | | | | | |
| 6380 | B | | | P2 | | CNE42 | | | |
| 6396 | B | | | P2 P3 | | CNM1 CNM2 | | | |
| 6398 | B | | TC-6 | P2 | | CNE42 CNE43 | | | G7 |
| 6399 | B | | TC-6 | P2 | | CNM2 | | | G7 |
| 6400 | B | | | P2 | | | | | |
| 7019 | B U PB | MT MT6 | | SE3 | SF1 | | SNM1 | | |
| 7020 | B U | MT MT2 MT5 MT6 | TC-10 TC-11 TC-12 | SE3 | | CNM1 CNE42 | | 8223-CL03 | G5 G4 |
| 7021 | B U | MT MT5 MT6 | TC-10 TC-11 TC-12 | | | CNE42 | | 8223-CL03 | G5 |
| 7022 | B U PB | MT MT5 | TC-1 TC-11 TC-12 | SE3 | SF1 | | | 8241-CL11 8223-CL03 | |
| 7023 | B U | MT MT5 | TC-1 TC-6 TC-7 TC-12 | | | | SNE2 | | G4 |
| 7025 | B U | MT MT3 MT6 | TC-12 | SE3 | | | | 8223-CL03 | |

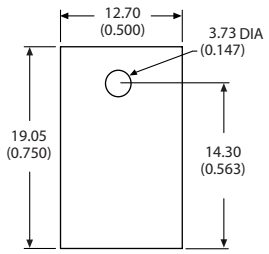
## In-Sil-8™

These silicone based pads provide both thermal conductivity and electrical isolation. In-Sil-8™ pads have a fiberglass carrier that withstands the rigors of assembly, harsh environments and aging under continuous use. In-Sil-8™ pads install faster than traditional mica and grease and will not contaminate solder baths. Screw mounting is recommended to achieve the best thermal performance.

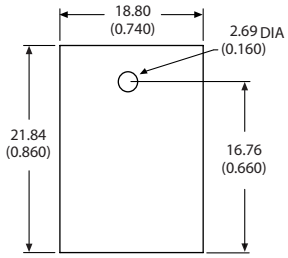
TO-3




TO-220




TO-218




### ORDERING INFORMATION

*example 12 digit part* **507222B_0000G**

**Ordering code**

The shape and hole pattern of the heat sink will determine the shape and hole pattern of the pad. If you are ordering a heat sink which mounts to a semiconductor on both sides, the ordering code for two pads should be used. To order additional In-Sil™ pads separate, or factory applied variations please contact an Aavid sales rep for inquiries.

| Ordering code | Description |
|---|---|
| 0 | No pads |
| 3 | One In-Sil-8™ pad |
| 4 | Two In-Sil-8™ pads |

### MATERIAL PROPERTIES

| | |
|---|---|
| **Color** | Grey |
| **Thickness** | 0.18 (0.007) |
| **Breakdown voltage** | 3500 |
| **Dielectric constant** | 5.5 |

| | TO-3 | TO-220 | TO-218 |
|---|---|---|---|
| Thermal resistance (approx.) | 0.33 | 1.25 | 0.77 |
| Screw size | 6-32 | 4-40 | 4-40 |
| Torque in–lbs | 6–8 | 4–6 | 4–6 |

## KonDux™ / Grafoil® Conducta-Pad**

Kondux™ interface pads are a cost effective alternative to thermally conductive grease compounds. Kondux™ pads are electrically conductive and ideal for use with small, discrete semiconductors. Aavid pre-applies Kondux™ to your heatsink to enhance heat conductance from the semiconductor case and speed your manufacturing process.

Figure A

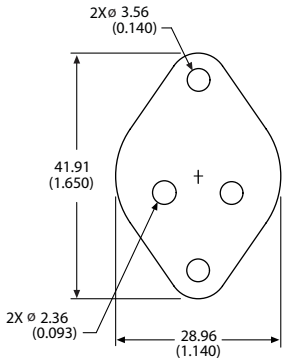
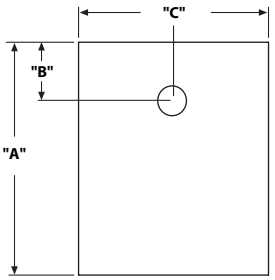



Figure B




### ORDERING INFORMATION

*example 12 digit part* **575703B_0000G**

**Ordering code**

The shape and hole pattern of the heat sink will determine the shape and hole pattern of the pad. If you are ordering a heat sink which mounts to a semiconductor on both sides, the ordering code for two pads should be used.

| Ordering code | Device | Figure | "A" Dim | "B" Dim | "C" Dim |
|---|---|---|---|---|---|
| 1 or 2* | TO-3 | A | | | |
| 1 or 2* | TO-218 | B | 19.05 (0.750) | 4.57 (0.180) | 15.24 (0.600) |
| 1 or 2* | TO-220 | B | 15.88 (0.625) | 2.68 (0.105) | 10.67 (0.420) |

*Factory applied only
One KonDux™ pad

*example*
*Thermalloy origin part* **6109B - __ G**
A B C

**A** = Model number
**B** = Grafoil® pad
**C** = RoHS compliant

| Suffix | Device | Figure | "A" Dim | "B" Dim | "C" Dim |
|---|---|---|---|---|---|
| G1 | TO-3 | A | | | |
| G4 | TO-218 | B | 19.30 (0.760) | 4.83 (0.190) | 15.75 (0.620) |
| G5 | TO-220 | B | 16.51 (0.650) | 3.43 (0.135) | 10.67 (0.420) |
| G7 | Multiwatt | B | 17.53 (0.690) | 2.92 (0.115) | 20.07 (0.790) |

### MATERIAL PROPERTIES

| | |
|---|---|
| **Color** | Black (metallic) |
| **Thickness** | 0.13 (0.005) |
| **Thermal resistance** | See Graph pg 10 |
| **Electrical resistivity** | 15 x $10^{-4}$ Ohms |
| **Compression strength: for 10% reduction in thickness** | 580 psi |
| **Tensile strength** | 650 psi |
| **Ultimate compression strength** | 12500 psi |
| **Service temperature** | -240°C to +300°C |
| **Liner** | None |

** The Grafoil® name was originally marketed by Thermalloy and is the same material as Kondux™
Grafoil® is a registered trademark of the Union Carbide Company



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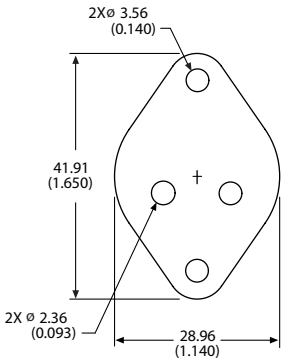
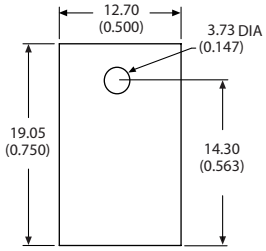
## Hi-Flow® *

Aavid Thermalloy has added a phase change pad to its line-up. These pads provide low thermal resistance and electrical isolation for low pressure spring mount applications. Above the phase change temperature the material flows to fill in surface irregularities and maximize the heat conduction path.

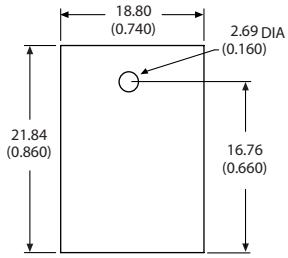
TO-3




TO-220




TO-218




### ORDERING INFORMATION

*example 12 digit part* **530101B ┬ 5150G**

**Ordering code**

The shape and hole pattern of the heat sink will determine the shape and hole pattern of the pad. If you are ordering a heat sink which mounts to a semiconductor on both sides, the ordering code for two pads should be used. To order additional Hi-Flow® pads separate, or factory applied variations please contact an Aavid sales rep for inquiries.

| Ordering code | Description |
|---|---|
| 0 | No pads |
| 7 | One Hi-Flow® pad |
| 8 | Two Hi-Flow® pads |

### MATERIAL PROPERTIES

| | |
|---|---|
| **Reinforcement carrier** | Polymide |
| **Thickness** | 0.127 (0.005) |
| **Continuous use temp (°C)** | 150 |
| **Phase change temp(°C)** | 55 |
| **Dielectric breakdown voltage (Vac)** | 5000 |
| **Dielectric constant (1000 Hz)** | 4.5 |
| **Volume resistivity (Ohm-meter)** | 1012 |

**Thermal impedance vs. pressure**

| Pressure | 10 | 25 | 50 | 200 |
|---|---|---|---|---|
| TO-220 Thermal performance (°C/W) | 1.15 | 1.14 | 1.12 | 1.1 |

* Hi-Flow® is a registered trademark of the Bergquist Company

## Alignment Pads

Solderable alignment pads are an innovative way to attach the heat sink to your transistor that could cut your assembly time by more than half. Alignment pads provide cost effective solderability, while providing numerous additional benefits. Alignment pads are factory applied and can be bought separately as well. Please refer to accessory Index D on page 85.

### ORDERING INFORMATION

*example*

*Thermalloy origin part* **7022B–8223–CL03 G**

**A** **B** **C**

| Suffix | Device | Figure |
|---|---|---|
| 8223-CL03G | TO-220 | B |
| 8241-CL11G | TO-218 | A |

**A** = Model number
**B** = Alignment pad
**C** = RoHS compliant

Figure A

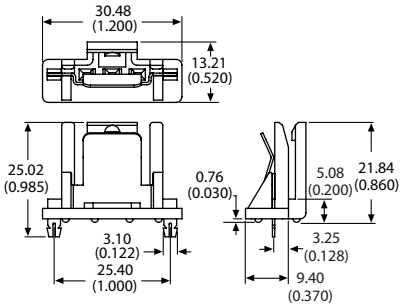
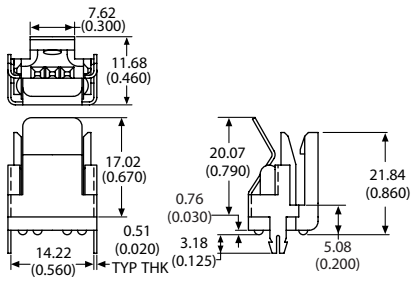
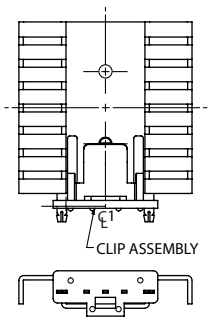



Figure B

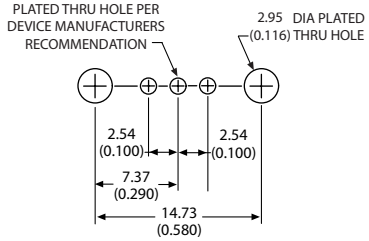



**Typical installation**

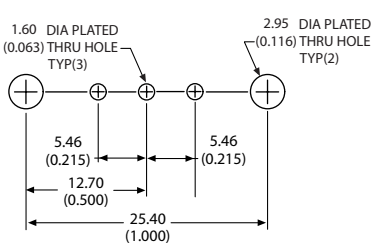
*Shown with part number 8241-CL11*




*Recommended hole pattern for 8223-CL03G*




*Recommended hole pattern for 8241-CL11G*



# Interface Material / Double Sided Tape

Double-sided thermal tapes adhere the heat sink to the device and offer good thermal characteristics. They are easy to apply, require no curing time, can be electrically conductive or isolating, and need no mechanical support to provide thermal or physical contact between the device and the heat sink. Aavid can apply one side to a heat sink.

## ORDERING INFORMATION

*example 12 digit part* **375224B000 _ _G**

**Ordering code**

| Ordering code | Tape option |
|---|---|
| 31 | T414 |
| 32 | T405R |
| 33 | T412 |
| 34 | T410R |
| 35 | T411 |

## T414 for ceramic or metal packages

Uses a 0.001 inch (0.03 mm) Kapton MT™ filled polymide film coated on both sides with high-bond strength, pressure-sensitive acrylic adhesive that is loaded with aluminum oxide particles. This provides both good thermal performance and excellent electrical isolation.

| | |
|---|---|
| **Color** | Beige |
| **Electrical function** | Insulating |
| **Thickness** | 0.127 mm (0.005) |
| **Carrier** | Kapton MT™ |
| **Thermal impedance** | 0.60 °C-in²/w |
| **Thermal conductivity** | 0.37 w/m-k |
| **Breakdown voltage** | 5000 VAC |
| **Volume resistivity** | 5 x $10^{15}$ Ohm-cm |
| **Lap shear adhesion** | 125 (0.862) psi |
| **Die shear adhesion** | |
| **Aluminum 25°C** | 150 psi |
| **Aluminum 150°C** | 15 psi |
| **Creep adhesion** | |
| **25°C @ 12psi** | >50 days |
| **150°C @ 12psi** | >10 days |

## T405R for ceramic or metal packages

Uses a 0.002 inch (0.05 mm) aluminum foil core coated on both sides with high-bond strength, pressure-sensitive acrylic adhesive that is loaded with aluminum oxide particles. The aluminum foil provides added thermal conductivity for applications where electrical isolation is not required. The combination of filter, expanded metal and embossed surface enhances both tape conformability and thermal performance.

| | |
|---|---|
| **Color** | White |
| **Electrical function** | Conductive |
| **Thickness** | 0.006 (0.015) |
| **Carrier** | Aluminum |
| **Thermal impedance** | 0.54 °C-in²/w |
| **Thermal conductivity** | 0.50 w/m-k |
| **Breakdown voltage** | N/A |
| **Volume resistivity** | 3 x 10-2 Ohm-cm |
| **UL flammability** | 94V-0 |
| **Rating** | U.L.94 |
| **Lap shear adhesion** | 134 psi |
| **Die shear adhesion** | |
| **Aluminum 25°C** | 125 psi |
| **Aluminum 150°C** | 55 psi |
| **Alum.oxide 25°C** | 145 psi |
| **Alum.oxide 150°C** | 60 psi |
| **Creep adhesion** | |
| **25°C @ 12 psi** | >50 days |
| **150°C @ 12 psi** | >50 days |

## T412 for ceramic or metal packages

Uses an expanded foil carrier coated on both sides with high-bond strength, pressure sensitive acrylic that is loaded with titanium diboride particles. The combination of filter, expanded metal and embossed surface enhances both tape conformability and thermal performance.

| | |
|---|---|
| **Color** | Grey |
| **Electrical function** | Conductive |
| **Thickness** | 0.009 (0.23 ) |
| **Carrier** | Expanded aluminum |
| **Thermal impedance** | 0.25 °C-in²/w |
| **Thermal conductivity** | 1.40 w/m-k |
| **Breakdown voltage** | N/A |
| **Volume resistivity** | N/A |
| **UL flammability** | N/A |
| **Lap shear adhesion** | 70 psi |
| **Die shear adhesion** | |
| **Aluminum 25°C** | 135 psi |
| **Aluminum 150°C** | 25 psi |
| **Alum.oxide 25°C** | 125 psi |
| **Alum.oxide 150°C** | 40 psi |
| **Creep adhesion** | |
| **25°C @ 12 psi** | >50 days |
| **150°C @ 12 psi** | >10 days |

Note: Double Sided Tapes are factory applied only.

## T410R / T411 for plastic packages

**T410R thermally conductive tape** consists of a high bond strength, pressure sensitive acrylic adhesive loaded with aluminum oxide and coated onto a 0.002 inch (0.05mm) aluminum foil carrier. The other side of the foil carrier has a silicone pressure sensitive adhesive which provides excellent adhesion to silicone-contaminated plastics and other low energy surfaces.

**T411 thermally conductive tape** consists of a high bond strength, pressure sensitive adhesive with an aluminum mesh carrier layer. The mesh carrier allows the tape to conform to curved surfaces of plastic molded IC packages, providing a high adhesive strength attachment for heat sinks. The high performance silicone PSA allows adhesion to silicone-contaminated plastics and other low energy surfaces.

| **Typical properties** | T410R | T411 |
|---|---|---|
| **Construction** | Acrylic | Silicone |
| **Adhesive (to heat sink side)** | | |
| **Color** | White | Clear (silver) |
| **Carrier** | Aluminum foil | Aluminum mesh |
| **Adhesive (onto component side)** | Silicone | Silicone |
| **Color (to component side)** | Clear (Silver) | Clear (Silver) |
| **Thickness, mm (inch)** | 0.18 (0.007) | 0.28 (0.011) |
| **Thermal impedance @<1 psi °C-cm²/w (°C-in²/w)** | 7.1 (1.1) | 6.5 (1.0) |
| **Operating temperature range, °C** | -50 to + 150 | -50 to + 150 |
| **Lap shear adhesion, psi (MPa)** | 60 (0.414) | 14 (0.094) |
| **Die shear adhesion, psi (MPa) steel/FR4** | | |
| **25°C** | 170 (1.172) | 80 (0.552) |
| **125 °C** | 40 (0.276) | 20 (0.138) |



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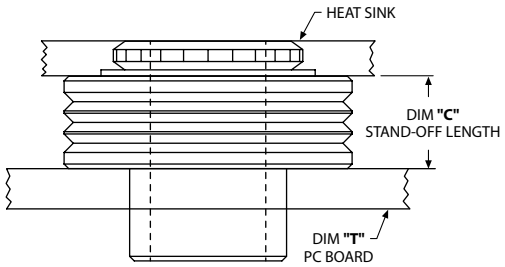
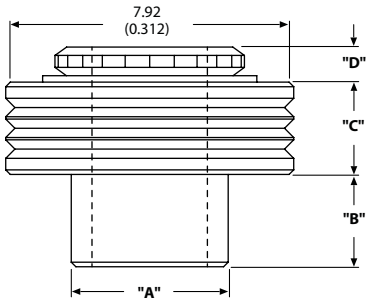
## Wave-On™ Mounts

Solderable mounts can be factory installed to practically every board-mountable heat sink and flat sided extrusion. The female threaded through holes permit pre-assembly to the semiconductor via machine screws , allowing the heat sink/semiconductor package to be treated as one unit when fitted in PC board through holes for wave soldering.

### Typical Wave-On™ mount installation




### FEATURES

**Saves production time and cost**

- Cuts production steps by half
- Factory installation eliminates steps
- Permits soldering in one step
- All the benefits of female threaded mount
- Automated fastening
- Excellent solderability

**Better thermal performance**

- Built in stand-off adds air space between PCB and heat sink for improved air flow and easier cleaning
- No lockwashers, nuts or separate mounts with various thread lengths

### ORDERING INFORMATION

*example part* **574802B0 _ _ 00G**

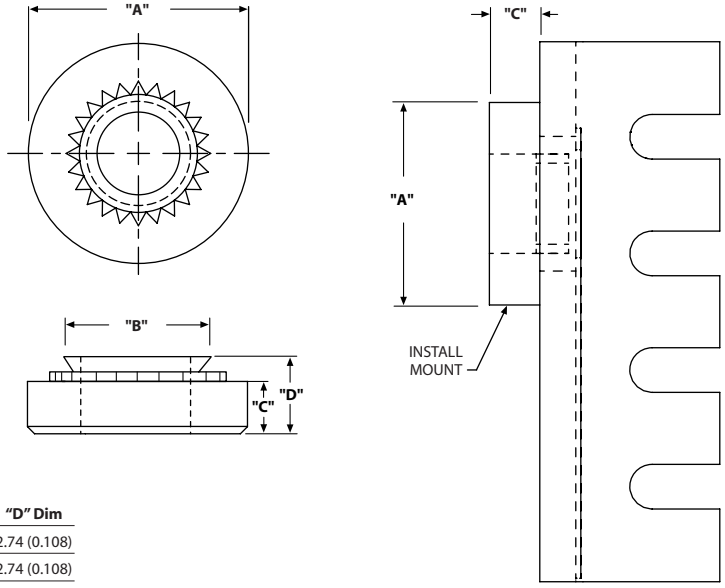
**Ordering code**

| Ordering code | Model | "A" Dim | "B" Dim | "C" Dim | "D" Dim | Threaded thru holes |
|---|---|---|---|---|---|---|
| 01 | E | 4.32 (0.170) | 2.54 (0.100) | 2.54 (0.100) | 0.96 (0.038) | #6-32 |
| 02 | EA | 3.43 (0.135) | 2.54 (0.100) | 2.54 (0.100) | 0.96 (0.038) | #4-40 |
| 03 | EG | 3.43 (0.135) | 2.54 (0.100) | 1.14 (0.045) | 0.96 (0.038) | #4-40 |
| 04 | EH | 4.32 (0.170) | 3.43 (0.135) | 2.54 (0.100) | 0.96 (0.038) | #6-32 |
| 05 | EK | 4.32 (0.170) | 2.54 (0.100) | 1.14 (0.045) | 0.96 (0.038) | #6-32 |
| 07 | EM | 4.32 (0.170) | 2.54 (0.100) | 2.54 (0.100) | 0.96 (0.038) | 3.5MM |
| 09 | ER | 4.32 (0.170) | 2.54 (0.100) | 5.08 (0.200) | 0.96 (0.038) | #6-32 |

| Model | Dia of PCB plated thru hole | PCB thickness "T" |
|---|---|---|
| EA, EG | 3.68 (0.145) | 1.57 (0.062) |
| E, EK, EM, ER | 4.75 (0.187) | 1.57 (0.062) |
| EH | 4.75 (0.187) | 2.29 (0.090) |

## Female Semiconductor Mounts

- Fastens semiconductor to heat sink fast and efficiently
- Up to 10 times faster than fastening with standard nuts and bolts
- Used with most JEDEC case sizes, factory installed




### ORDERING INFORMATION

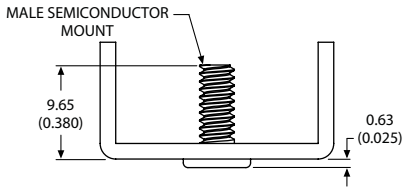
*example 12 digit part* **542502B000 _ _G**

**Ordering code**

| Ordering code | Thread | "A" Dim | "B" Dim | "C" Dim | "D" Dim |
|---|---|---|---|---|---|
| 01 | #6-32 | 7.11 (0.280) | 4.75 (0.187) | 1.78 (0.070) | 2.74 (0.108) |
| 02 | #4-40 | 6.35 (0.250) | 4.19 (0.165) | 1.78 (0.070) | 2.74 (0.108) |
| 03 | 3.00 (0.118) | 6.35 (0.250) | 4.22 (0.166) | 1.50 (0.059) | 2.47 (0.097) |

## Male Semiconductor Mounts

- Captive male studs for semiconductor attachments
- Used with most JEDEC case sizes, factory installed




### ORDERING INFORMATION

*example 12 digit part* **507302B000 _ _G**

**Ordering code**

| Ordering code | Thread |
|---|---|
| 04 | #6-32 |
| 05 | #4-40 |



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## Shur-Lock™ Tabs

**Aavid's Shur-Lock™ self locking stand-off tab** (U.S. Patent #5,437,561) positively secures any heat sink to the printed circuit board. This Shur-Lock™ tab exhibits many unique design features.

The rounded and bifurcated tip of the Shur-Lock™ solderable tab has been designed to easily snap into any 0.093" diameter hole. Once through the hole, the tab provides a positive resistance to backing or falling out of the hole. In addition, the spring action between the tab and the plated through hole prevents leaning or lift-off of the heat sink prior to or during the soldering process. The tip extension of the Shur-Lock™ tab has been designed to protrude less than 0.060" beyond the back of a standard 0.0625" PC board, which is below the normal lead trimming allowance for assembled PCBs.

Shur-Lock's™ stand-off design facilitates the cleaning of assembled PCBs and permits electrical traces to be routed under the heat sink. The wide base supports of the tab further improve the stability of the heat sink assembly.

### ORDERING INFORMATION

*example 12 digit part* **574802B0 _ _ 00G**

**Ordering code**

### PRODUCT INFORMATION

| | |
|---|---|
| **Material** | Spring steel |
| **Finish** | Tin plating over a copper flash |
| **Pull-out force*** | 70 lbs/tab minimum |
| **Recommended** | |
| **PCB hole diameter** | 0.092" – 0.096" |
| **PCB thickness** | 0.065" – 0.068" |

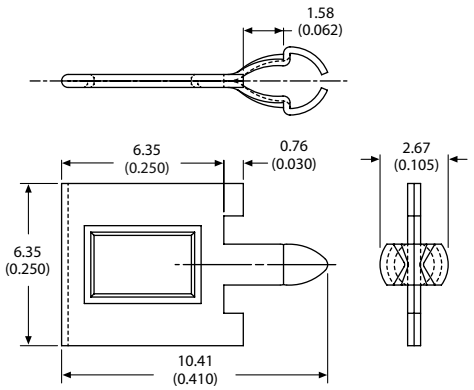
Variations of the above specifications are possible. Contact Aavid Thermalloy for additional details for use with thicker PCB sizes, such as 0.093" or other hole diameters.
*Vertical force applied to the sink-tab joint.

### FEATURES

- Positive PCB engagement
- Integrated PCB stand-off
- Quick "snap-in" assembly design
- Reduces installed assembly cost
- Designed for rugged shock and vibration environments
- Can be installed on a variety of stamped and extruded board level heat sinks

Factory applied only

### Tab ordering code 28




## Solderable Staked on Tabs

Aavid solderable tabs stake onto heat sinks for solder mounting into the PC board. The tabs are available in a variety of lengths, widths and thicknesses.

Tabs are factory applied for both vertical and horizontal mountings including: step tabs, which keep the heat sink elevated above the board, and tabs with a triangular base for extra stability.

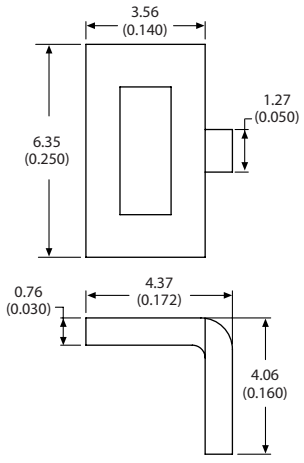
Many of Aavid's tabs are customized. Below are examples of standard tabs. Please consult Aavid's customer service department for information about other tab options.

### ORDERING INFORMATION

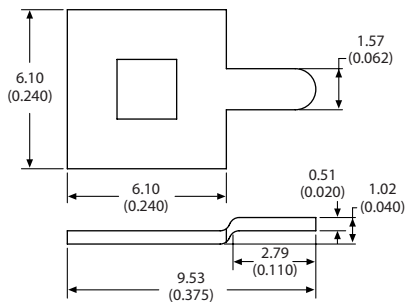
*example 12 digit part* **574802B0 _ _ 00G**

**Ordering code**

### Tab ordering code 31

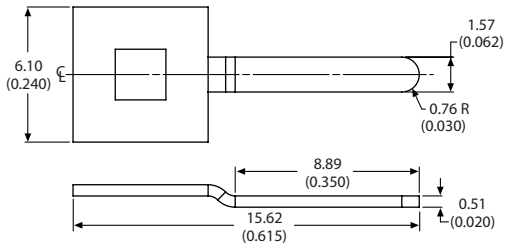



### Tab ordering code 32

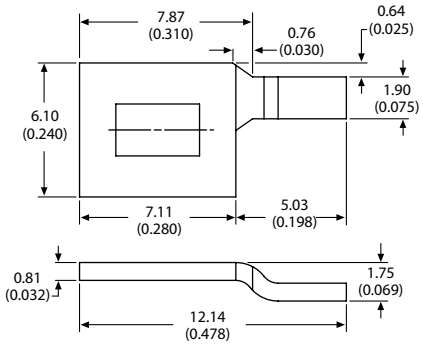


# Tabs

## Tab ordering code 33

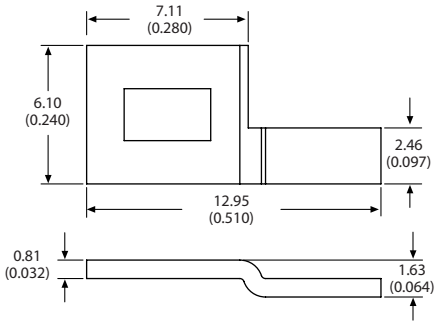



## Tab ordering code 34

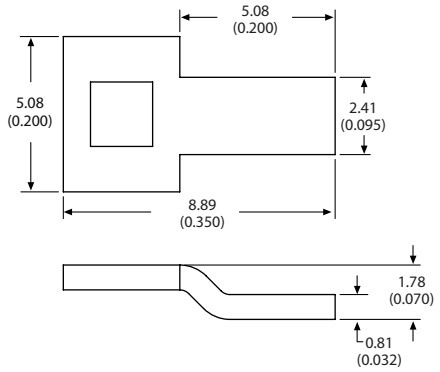



Note: The drawing above shows the right hand of a matched pair which are supplied mounted to the heat sink.

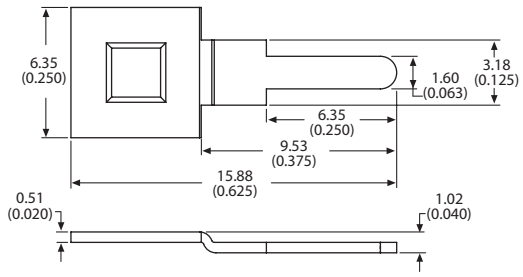
## Tab ordering code 35



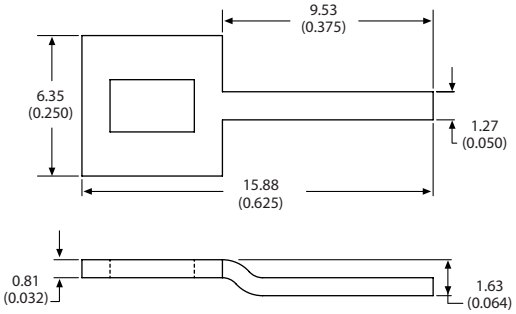

## Tab ordering code 36




## Tab ordering code 37




## Tab ordering code 39



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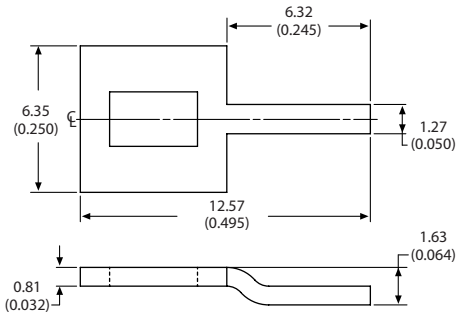
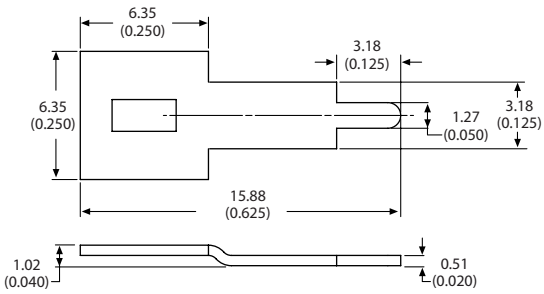
## Tab ordering code 40




## Tab ordering code 43




## Solderable Mounting Tabs

Heat sinks ordered with solderable mounting tabs have tin-plated spring steel tabs permanently locked onto the heat sink to provide wave solderability. The solderable tabs are mounted on the heat sink after anodizing, thus eliminating any special coating or handling. The result is a wave solderable heat sink with black anodized performance.

FIGURE A

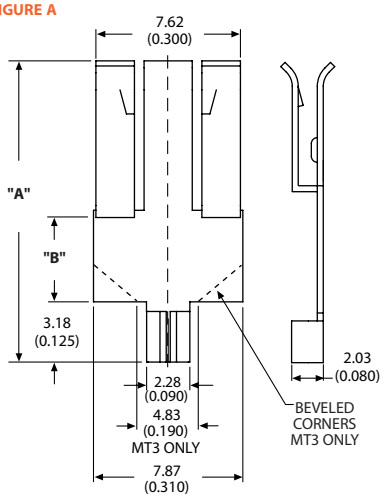
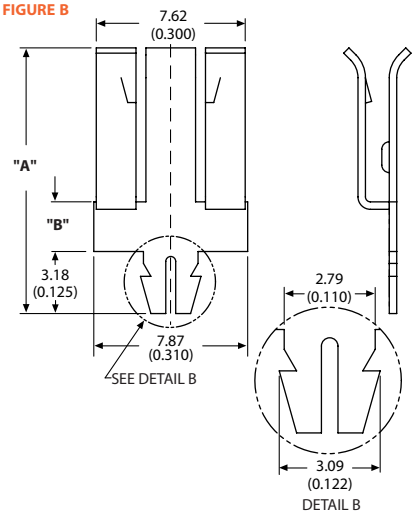



FIGURE B



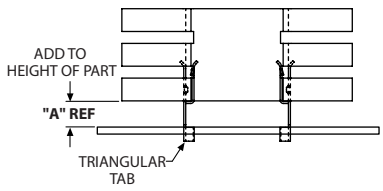

### ORDERING INFORMATION

*example 12 digit part* **574802B0 _ _ 00G**
**Ordering code**

*example Thermalloy origin part* **6070B– ___ G**
**A** **B** **C**

**A** = Model number
**B** = Mounting tab suffix
**C** = RoHS compliant

**Typical Installation**




| Suffix | Ordering code | Stand-off height | Features | "A" Dim | "B" Dim | Figure | Recommended PCB plated thru hole: |
|---|---|---|---|---|---|---|---|
| MT | 53 | 5.21 (0.205) | Solderable mounting tab | 15.88 (0.625) | 4.83 (0.190) | A | 2.90 ± 0.10 (0.114 ± 0.004) |
| MT2 | 54 | 8.51 (0.335) | Solderable mounting tab | 19.18 (0.755) | 8.13 (0.320) | A | 2.90 ± 0.10 (0.114 ± 0.004) |
| MT3 | 55 | 5.21 (0.205) | 50 degree beveled corners on stand-off portion reducing board footprint from 7.87 (0.310) to 4.83 (0.190) width. Only tab with this feature. | 15.88 (0.625) | 4.83 (0.190) | A | 2.90 ± 0.10 (0.114 ± 0.004) |
| MT5 | 56 | 5.21 (0.205) | Bifurcated tabs in lieu of triangular shape | 15.88 (0.625) | 4.83 (0.190) | B | 2.95 ± 0.05 (0.116 ± 0.002) |
| MT6 | 57 | 2.92 (0.115) | Bifurcated tabs in lieu of triangular shape | 13.59 (0.535) | 2.54 (0.100) | B | 2.95 ± 0.05 (0.116 ± 0.002) |

Notes: Mounting tabs have unique locking features built into their design. Aavid Thermalloy adds to standard and custom heat sinks. For this reason, the tabs are factory applied, and cannot be sold separately. Please see page 85 for additional tab options.

# Solderable Pins / Solderable Nuts

## Solderable Pins

Vertically mounted, extruded heat sinks are converted to wave solderable with the addition of solderable roll pins. Roll pins are available with stand-off shoulders in different heights for easier cleaning after wave soldering.

FIGURE A

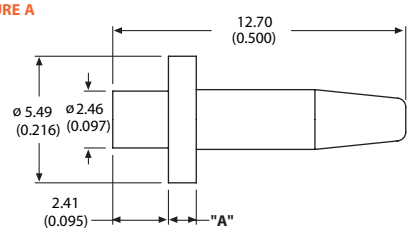
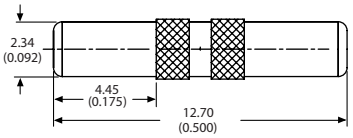
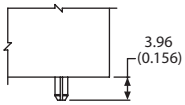


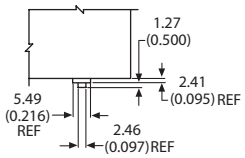

FIGURE B



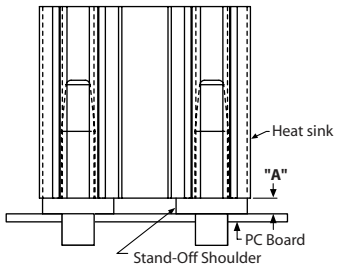

Pin 25




Pin P2-P3




Typical installation P2-P3




### ORDERING INFORMATION

*example 12 digit part* **529902B0 _ _ 00G**
Ordering code

*example Thermalloy origin part* **6396B– _ _ G**
A B C

**A** = Model number
**B** = Solid pin suffix
**C** = RoHS compliant

| Suffix | Ordering code | Description | "A" Dim | Figure |
|---|---|---|---|---|
| P2 | 21 | Solid pin w/stand-off shoulder 0.050" | 0.050 | A |
| P3 | N/A | Solid pin w/stand-off shoulder 0.125" | 0.125 | A |
| N/A | 25 | Solid solderable pin | | B |

## Solderable Nuts

Solderable nuts are permanently swaged into the heat sink for quick pre-assembly with the transistor. Screws are used to mount to the heat sink and are installed from the top. Solderable nuts feature a closed end that prevents solder from wicking into threads and trapping contaminants or flux. Heat sink and transistor are then handled as a single component and dropped into plated-thru holes in the PC board for wave soldering. (Solderable nuts require slightly larger printed circuit board hole sizes)

### FEATURES

- Pre-mounted to heat sink at factory
- Ease of pre-assembly in production
- Mechanical and electrical integrity
- Wave solderability

### ORDERING INFORMATION

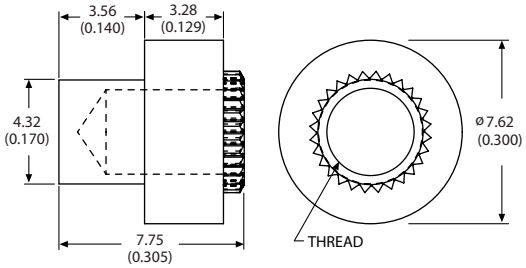
*example 12 digit part* **506003B0 _ _ 00G**
Ordering code

*example Thermalloy origin part* **7019B– _ _ _ _ G**
A B C

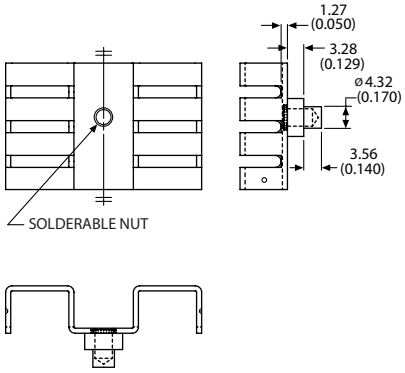
**A** = Model number
**B** = Solderable nut suffix
**C** = RoHS compliant

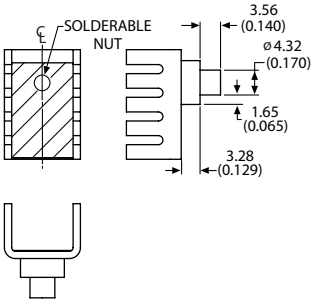
| Suffix | Ordering code | Dia of PCB thru hole | Thread |
|---|---|---|---|
| SNM-1 | N/A | 4.95 (0.195) | M3X0.5 |
| SNE-1 | 14 | 4.95 (0.195) | 4-40 UNC-2B |
| SNE-2 | 13 | 4.95 (0.195) | 6-32 UNC-2B |

Note: If a part number requires 2 solderable nuts, simply add a "/2" after the solderable nut character suffix on Thermalloy origin parts.




Mechanical drawings showing heat sinks with solderable nuts



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## Clinch Nuts

Clinch nuts are threaded nuts that allow quick assembly of the transistor to the heat sink. A single screw mounts the transistor to the heat sink, reducing your hardware requirements. Clinch nuts are permanently pressed into the heat sink, and come in a variety of English and Metric threads–CNE designates an English thread, and CNM designates a Metric thread.

FIGURE A

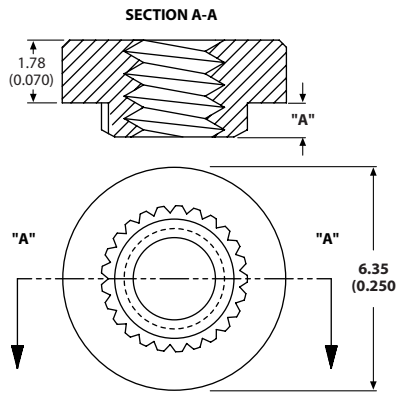
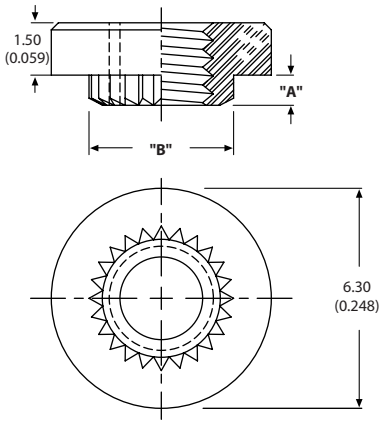



FIGURE B




### ORDERING INFORMATION

*example 12 digit part* **529801B000 _ _ G**

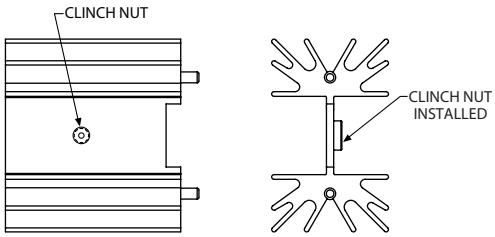
**Ordering code**

*example Thermalloy origin part* **7019B– _____ G**

**A** = Model number
**B** = Clinch nut suffix
**C** = RoHS compliant

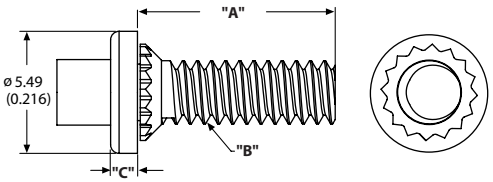
| Suffix | Ordering code | Thread | "A" Dim | "B" Dim | Figure |
|---|---|---|---|---|---|
| CNE42 | 12 | 4-40 UNC-2B | 0.96 (0.038) | | A |
| CNE43 | N/A | 4-40 UNC-2B | 1.37 (0.054) | | A |
| CNM1 | 13 | M3 X 0.5 | 0.76 (0.030) | 4.06 (0.160) | B |
| CNM2 | N/A | M3 X 0.5 | 0.96 (0.038) | 4.22 (0.166) | B |

Mechanical drawing showing heat sink with clinch nut



## Solderable Studs

Threaded solderable studs are permanently swaged in place for quick pre-assembly with the transistor. The device is placed over the stud (s) followed by the lock washer and nut. This entire component is then dropped into plated-thru holes in the printed circuit board for wave soldering. The end of the stud is tin-plated for excellent solderability and extends only 0.040" below a 0.062" PC board to clear lead trimming saws.




### ORDERING INFORMATION

*example 12 digit part* **501303B000 _ _ G**
**Ordering code**

*example Thermalloy origin part* **7022B– _ _ G**
**A** **B** **C**

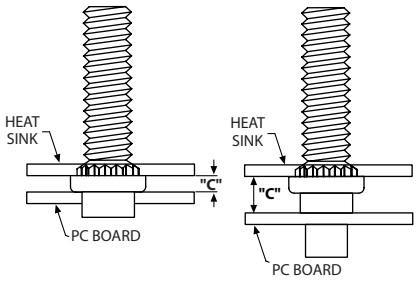
**A** = Model number
**B** = Stud suffix
**C** = RoHS compliant

| Suffix | Ordering code | Dia of PCB thru hole | "A" Dim | "B" Dim | "C" Dim | Figure |
|---|---|---|---|---|---|---|
| SE-1 | 08 | 3.68 (0.145) | 8.89 (0.350) | 6-32 | 1.13-1.26 (0.045-0.050) | A |
| SE-2 | 06 | 3.68 (0.145) | 12.32 (0.485) | 6-32 | 1.14-1.27 (0.045-0.050) | A |
| SE-3 | 09 | 3.68 (0.145) | 8.89 (0.350) | 4-40 | 1.14-1.26 (0.045-0.050) | A |
| SE-4 | 14 | 3.68 (0.145) | 8.89 (0.350) | 6-32 | 3.05 (0.120) | B |
| SM-1 | 17 | 3.68 (0.145) | 8.89 (0.350) | M3 x 0.5 | 3.05 (0.120) | B |
| SM-3 | 07 | 3.68 (0.145) | 8.89 (0.350) | M3 x 0.5 | 1.13-1.26 (0.045-0.050) | A |

Note: Factory installed only

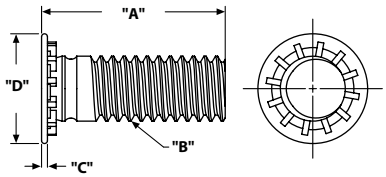
**Typical installation**

**FIGURE A** **FIGURE B**




## Device Mounting Studs

Device mounting studs for "Thermalloy-origin" items are available as options on certain vertical and board mount heat sinks as a labor-saving aid for mounting semiconductors. This optional feature speeds production assembly time and reduces hardware requirements.




### ORDERING INFORMATION

*example 12 digit part* **529801B000 _ _ G**
**Ordering code**

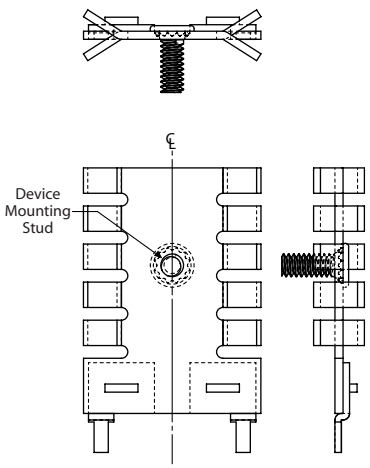
*example Thermalloy origin part* **7019B– _ _ G**
**A** **B** **C**

**A** = Model number
**B** = Stud suffix
**C** = RoHS compliant

| Suffix | Ordering code | "A" Dim | "B" Dim | "C" Dim | "D" Dim |
|---|---|---|---|---|---|
| SF1 | 11 | 7.92 (0.312) | 4-40 UNC-2A | 0.25 (0.010) | 4.75 (0.187) |
| SF2 | N/A | 8.00 (0.315) | M3 x 0.5 | 0.25 (0.010) | 4.60 (0.181) |
| SF3 | N/A | 7.92 (0.312) | 6-32 UNC-2A | 0.25 (0.010) | 5.23 (0.206) |

Note: Factory installed only

**Mechanical drawing showing heat sink with device mounting studs**



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## Aavid Kool-Klips™

These one piece stainless steel clips eliminate the need for screws, lock washers and nuts in the assembly process, therefore reducing assembly time and cost. These can be bought separately, or found in the 11th or 12th position when deciphering an Aavid Standard product. Please reference Indexes to see which clips are popular with which product offering.

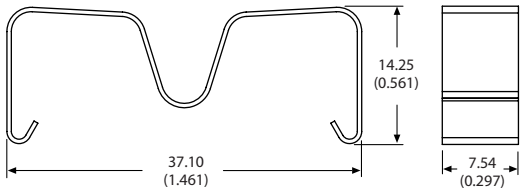
### ORDERING INFORMATION

To order clips seperately use part number below.
To order a clip as an option use ordering code.

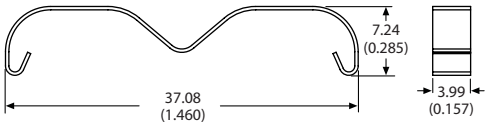
*example 12 digit part* **530101B000 _ _ G**
**Ordering code**

| Part number | Transistor case style | Ordering code |
|---|---|---|
| 115000F00000G | TO-220, TO-218 | 50 |
| 115100F00000G | TO-220, TO-218 | 51 |
| 115200F00000G | TO-220, TO-218 | 52 |
| 115300F00000G | TO-220, TO-218 | 53 |
| 115400F00000G | TO-220 | 54 |
| 116200F00000G | TO-220, TO-218 | 62 |
| 5901G | TO-220, TO-218, TO-247 | Sold separately only |
| 6801G | TO-220, TO-218, TO-247 | Sold separately only |
| 7701G | TO-220 | Sold separately only |

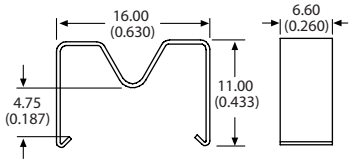
### 6801G



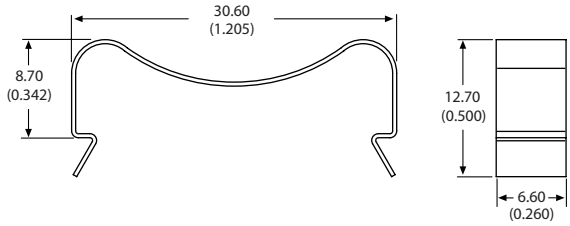

### 5901G



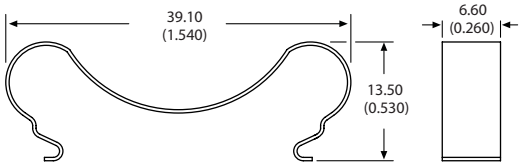

### 7701G



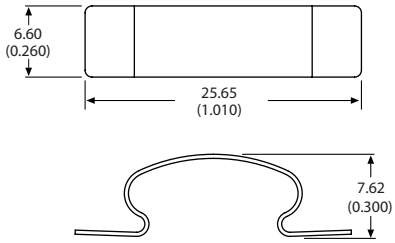

### 115000F00000G Code 50



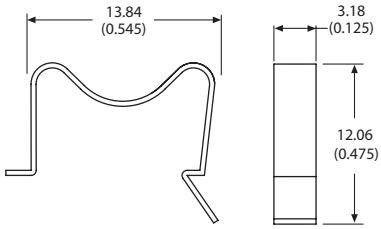

### 115100F00000G Code 51



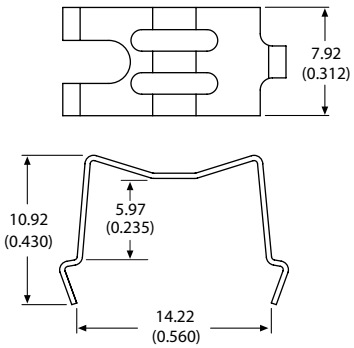

### 115200F00000G Code 52



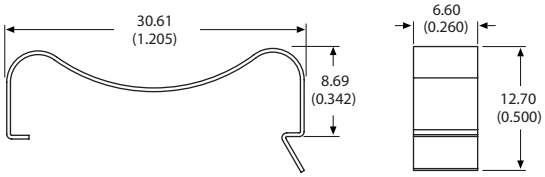

### 115300F00000G Code 53




### 115400F00000G Code 54




### 116200F00000G Code 62



## Thermal Clips

**Factory-Installed ONLY thermal clips**, available on many standard heat sinks (shown below) eliminate the use of screws and nuts in assembling the heat sink and transistor. Plastic case transistors slip into place for easy assembly. Thermal clips are available in a variety of configurations. Locking clips have an internal tab to lock the transistor permanently in place.

### ORDERING INFORMATION

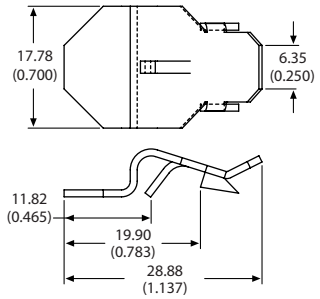
*example 12 digit part* **530600B000 __ G**
**Ordering code**

*example Thermalloy origin part* **7023B– ___ G**
**A** **B** **C**

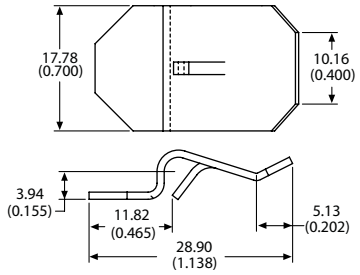
**A** = Model number
**B** = Clip suffix
**C** = RoHS compliant

| Suffix | Ordering code | Transistor case style | Clip/Cover features |
|---|---|---|---|
| TC1 | 32 | TO-220 | Locking |
| TC6 | 36 | TO-218, TO-220, Multiwatt | Locking |
| TC7 | N/A | TO-218, TO-220, Multiwatt | Insulated |
| TC10 | 33 | TO-220, TO-218 | Locking |
| TC11 | 34 | TO-220 | Insulated |
| TC12 | 35 | TO-218, TO-220 | Locking |

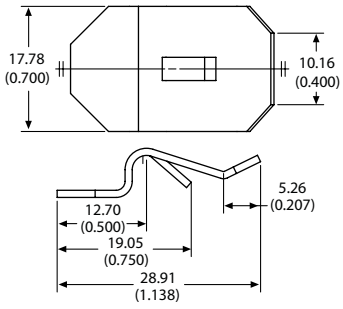
## TC-1 Code 32



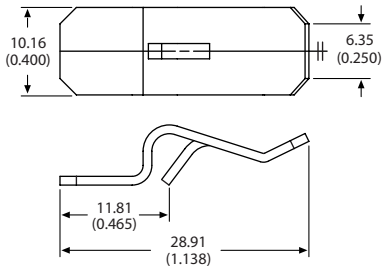

## TC-6 Code 36



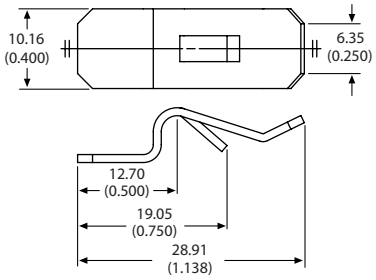

## TC-7 Code N/A



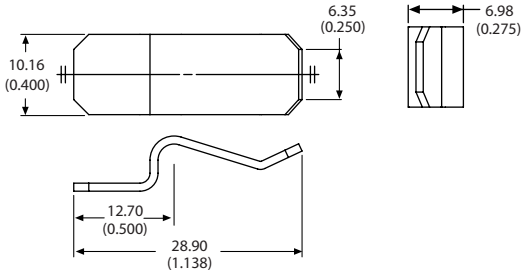

## TC-10 Code 33




## TC-11 Code 34




## TC-12 Code 35



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## Mounting Kits

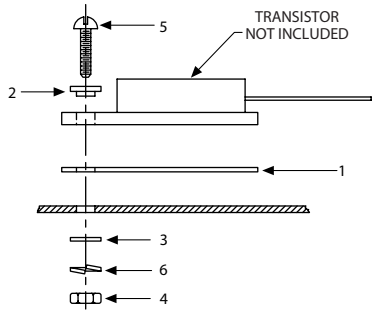
### FEATURES

- Pre-packaged in heat-sealed plastic bags for use on assembly line.
- Stock mounting hardware using one number for better control and identification.
- Three different insulating materials available:
  Low cost Thermalfilm™
  High temperature Mica
  High performance Thermalsil™ III
- Other insulator materials available for special order include: hard anodized aluminum and aluminum oxide.
- Individually packaged for convenient stocking and handling of mounting hardware. Kits contain all hardware necessary to electrically isolate the transistor from the heat sink.

## TO-220 Mounting kit part number 4880

### ORDERING INFORMATION

| Part number | Description |
|---|---|
| 4880G | Kit with Thermalfilm™ |
| 4880MG | Kit with Mica Insulator |
| 4880SG | Kit with Thermalsil™ III |




### EACH KIT INCLUDES:

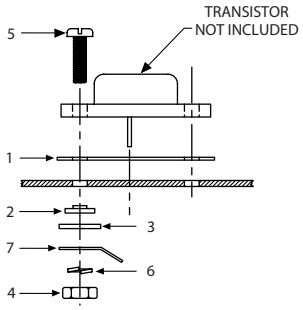
| Part number | Item | Qty | Description |
|---|---|---|---|
| | 1 | 1 | Insulator |
| 43-77-9 | | | Thermalfilm™ (see page 101) |
| (56-77-9) | | | Mica (see page 103) |
| (53-77-9) | | | Thermalsil™ III (see page 103) |
| 7721-7PPS | 2 | 1 | Shoulder washer |
| MS15795-804 | 3 | 1 | Flat washer #4<br>No. 4-40 UNC-2B |
| MS35649-244 | 4 | 1 | Hex nut<br>No. 4-40 UNC-2A X |
| MS51957-17 | 5 | 1 | 1/2 Long phillips pan head screw |
| MS35338-135 | 6 | 1 | Lock washer, No. 4 |

Note: Smooth side of flat washer should be placed against insulator when using the kit.

## TO-3 Mounting kit part number 4804

### ORDERING INFORMATION

| Part number | Description |
|---|---|
| 4804G | Kit with Thermalfilm™ |
| 4804MG | Kit with Mica Insulator |
| 4804SG | Kit with Thermalsil™ III |




### EACH KIT INCLUDES:

| Part number | Item | Qty | Description |
|---|---|---|---|
| | 1 | 1 | Insulator |
| 43-03-2 | | | Thermalfilm™ (see page 101) |
| (56-03-2) | | | Mica (see page 103) |
| (53-03-2) | | | Thermalsil™ III (see page 103) |
| 7721-5PPS | 2 | 2 | Shoulder washer |
| MS15795-805 | 3 | 2 | Flat washer #6 |
| MS35649-264 | 4 | 2 | No. 6-32 UNC-2B<br>Hex nut |
| MS 51957-30 | 5 | 2 | No. 6-32 UNC-2A X<br>1/2 Long phillips pan head screw |
| MS35338-136 | 6 | 2 | Lock washer, No. 6 |
| 322-156 | 7 | 1 | Solder lug |

Note: Smooth side of flat washer should be placed against insulator when using the kit.

# Insulating Shoulder Washers

## FEATURES

- Available in nylon or polyphenylene sulfide
- Chemically inert [no known solvents under 200°C (392°F)]
- Maximum recommended service temperature of 260°C (500°F)
- Recommended torque is 0.565Nm to 0.678Nm (5 to 6 inch-pounds) on all shoulder washers except –7, which has recommended torque of 0.452Nm (4 inch-pounds)

## Polyphenylene Sulfide PPS Shoulder Washers

FIGURE A

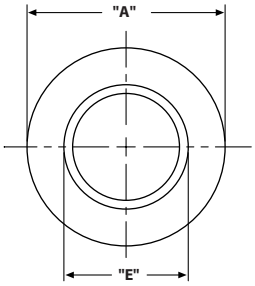
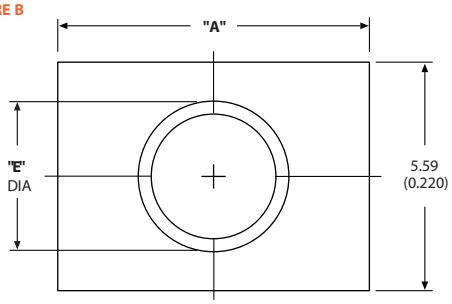
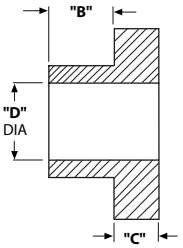



FIGURE B



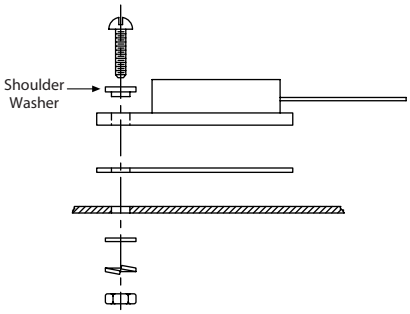

Note: This figure is common to figures A and B

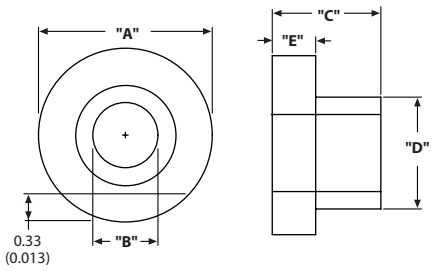
| Part number | "A" Dim | "B" Dim | "C" Dim | "D" Dim | "E" Dim | Screw size | Figure |
|---|---|---|---|---|---|---|---|
| 7721-1PPSG | 7.11 (0.280) | 3.18 (0.125) | 1.07 (0.042) | 2.84 (0.112) | 3.81 (0.150) | 4 | A |
| 7721-2PPSG | 7.11 (0.280) | 4.70 (0.185) | 1.07 (0.042) | 2.84 (0.112) | 3.81 (0.150) | 4 | A |
| 7721-3PPSG | 7.11 (0.280) | 3.18 (0.125) | 1.07 (0.042) | 2.84 (0.112) | 3.56 (0.140) | 4 | A |
| 7721-5PPSG | 7.92 (0.312) | 0.79 (0.031) | 1.19 (0.047) | 3.66 (0.144) | 4.50 (0.177) | 6 | A |
| 7721-6PPSG | 7.11 (0.280) | 0.79 (0.031) | 1.19 (0.047) | 3.00 (0.118) | 3.68 (0.145) | 4 | A |
| 7721-7PPSG* | 5.46 (0.215) | 0.81 (0.032) | 1.02 (0.040) | 2.95 (0.116) | 3.43 (0.135) | 4 | A |
| 7721-10PPSG | 7.62 (0.300) | 2.41 (0.095) | 1.40 (0.055) | 2.97 (0.117) | 3.56 (0.140) | 4** | B |

Note: A single gate extension, not to exceed 0.64 (0.025) in length, is allowable on the outside of all shoulder washers.

* Design allows insertion in the tab of a TO-220.
** Also for M3 screw.

## Nylon Shoulder Washers




Material is nylon type 6

| Part number | "A" Dim | "B" Dim | "C" Dim | "D" Dim | "E" Dim |
|---|---|---|---|---|---|
| 7721-11NG | 7.80/8.05 (0.307/0.317) | 2.87/3.00 (0.113/0.118) | 3.56/3.81 (0.140/0.150) | 3.76/3.89 (0.148/0.153) | 1.09/1.35 (0.043/0.053) |
| 7721-13NG | 5.89/6.05 (0.232/0.238) | 2.87/3.00 (0.113/0.118) | N/A | 3.43/3.56 (0.135/0.140) | 1.19/1.40 (0.047/0.055) |
| 7721-15NG | 5.59/6.10 (0.220/0.240) | 2.90/2.95 (0.114/0.116) | 1.73/1.91 (0.068/0.075) | 3.43/3.58 (0.135/0.140) | 0.51/0.64 (0.020/0.025) |



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## Thermalfilm™ Polyimide Plastic Films

Thermalfilm™ and Thermalfilm™ MT are low cost polymide plastic insulating films designed to be an improved replacement for mica. These insulators have a distinctive amber color and can be easily recognized and assembled on a production line.

Thermalfilm™ MT, made from high performance Kapton™ MT material, provides thermal conductivity nearly 2-5 times greater than standard Thermalfilm™. Both insulators have an extremely high resistance to flow or thin out under high compressive stresses, particularly at elevated temperatures. Excellent physical, mechanical and electrical properties remain nearly constant over a wide range of temperatures and frequencies. They are radiation resistant, have no melting points, and have no known organic solvents. The polymide plastic film is UL listed as a component in UL's publication "Component – Plastic Material" dated September 18, 1969. The UL card number is E39505R, Guide QMFZ2 filed by E. I. du Pont de Nemours & Co., Inc. Thermalfilm™ is rated 94-V/0.

### ORDERING INFORMATION

For standard pre-cut sizes of Thermalfilm™ and Thermafilm™ MT see page 102.

**ELECTRICAL – TYPICAL VALUE @ 25° C**

| PROPERTY | THERMALFILM™ | THERMALFILM™ MT | TEST METHOD |
|---|---|---|---|
| Dielectric strength | 0.03mm (1-mil) | 177.2 x $10^3$ volts/mm | ASTM D149-64 |
| | 240 x $10^3$ volts/mm | (4500 volts/mm) | |
| | (6,100 volts/mil) | | |
| Dielectric constant | 3.5 | 4.3 | ASTM D150-64T |
| Dissipation factor | 0.002 | 0.002 | ASTM D150-64T |
| Volume resistivity | $10^{17}$ ohm-cm | $10^{17}$ ohm-cm | ASTM D257-61 |
| Surface resistivity | $10^{16}$ ohms | $10^{16}$ ohms | ASTM D257-61 |
| Corona start voltage 0.025mm (1-mil) | 465 volts | 465 volts | ASTM D1868-61T |
| Insulation resistance | 100.000 megohm mfds. | 100.000 megohm mfds. | Based on 0.05 mfd wound |
| | | | capacitor using 0.25 mm |
| | | | (1-mil) Film |
| | **PHYSICAL** | | |
| Material thickness | 0.05mm (0.002") | 0.05mm (0.002") | |
| Ultimate tensile strength (MD) | 1.72 x $10^8$ Pa (25,000 psi) | 103 MPa (1500 psi) | ASTM D882-64T |
| Bursting strength test (Mullen) | 3.10 x $10^5$ Pa (45 psi) | 0.31 MPa (45 psi) | ASTM 0774-63 |
| Tear strength – initial | 27,559 gm/mm (700 gm/mil) | 35,433 gm/mm (900 gm/mil) | ASTM D1004-61 |
| Density | 1.42 gm/$cm^3$ (88.7 lb/$ft^3$) | 1.78 gm/$cm^3$ (111.1 lb/$ft^3$) | ASTM D1505-63T |
| Folding endurance (MIT) | >10,000 cycles | >10,000 cycles | ASTM D2176-63T |
| | **THERMAL** | | |
| Melting point | NONE | NONE | |
| Zero strength temperature | 815°C (1499°F) | 815°C (1499°F) | Hot Bar (Du Pont test) |
| Cut through temperature | 435°C (815°F) | 435°C (815°F) | Weighted probe on heated film |
| | 525°C (977°F) | 525°C (977°F) | (Du Pont test) |
| Service temperature | -260°C to 240°C | -260°C to 240°C | |
| | (-436°F to 464°F) | (-436°F to 464°F) | |
| Thermal conductivity | 0.156W/m °C | 0.379 W/m °C | Model TC-1000 twin heatmeter |
| | (0.09 BTU/hr-ft-°F) | (0.219 BTU/hr-ft-°F) | Comparative tester |
| Flammability | V-0, UL "E" card E39505 | V-0, UL "E" card E39505 | UL 94 |

Notes: One mil equals 0.001 inch

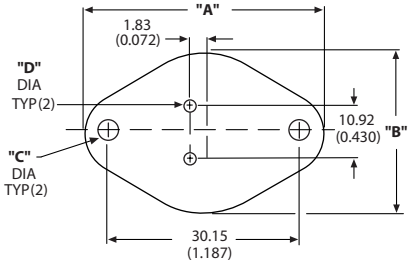
Dimensional tolerances are ± 0.38mm (0.015"), hole diameters are ± 0.25mm (0.010") and angularity is ± 1 1/2° unless otherwise specified.

## Thermalfilm™ for TO-3

### ORDERING INFORMATION

| Part number | "A" Dim | "B" Dim | "C" Dim | "D" Dim |
|---|---|---|---|---|
| 43-03-2G | 42.04 (1.655) | 27.00 (1.063) | 3.96 (0.156) | 1.57 (0.062) |
| 43-03-4G | 39.70 (1.563) | 26.67 (1.050) | 3.56 (0.140) | 1.57 (0.062) |

Thermalfilm™ information on page 101
Dimensional tolerances are ± 0.38mm (0.015), hole diameters are ± 0.25mm (0.010) and angularity is ± 1 1/2° unless otherwise specified.




## Thermalfilm™ for TO-5 and TO-18

### ORDERING INFORMATION

| Part number | Device | Figure | "A" Dim | "B" Dim | "C" Dim |
|---|---|---|---|---|---|
| 43-05-1G | TO-5 | A | 9.91 (0.390) | 5.08 (0.200) | 0.91 (0.036) |
| 43-05-2G | TO-5 | B | 9.91 (0.390) | 5.08 (0.200) | 0.91 (0.036) |
| 43-18-1G | TO-18 | A | 6.35 (0.250) | 2.54 (0.100) | 0.91 (0.036) |

Thermalfilm™ information on page 101
Dimensional tolerances are ± 0.38mm (0.015), hole diameters are ± 0.25mm (0.010) and angularity is ± 1 1/2° unless otherwise specified.

FIGURE A

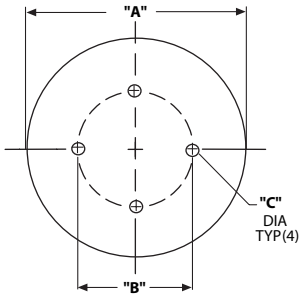
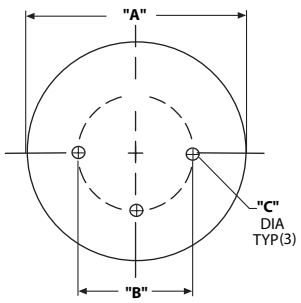



FIGURE B



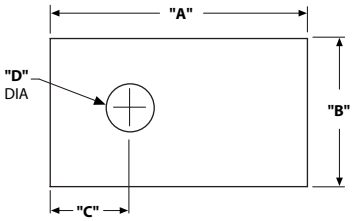

## Thermalfilm™ for TO-220, TO-126, Case 77, Case 199, Case 90, TO-218 and TO-3P

### ORDERING INFORMATION

| Part number | Device | "A" Dim | "B" Dim | "C" Dim | "D" Dim |
|---|---|---|---|---|---|
| 43-77-1G | TO-126, Case 77 | 11.10 (0.437) | 7.92 (0.312) | 3.56 (0.140) | 2.36 (0.093) |
| 43-77-2G | Case 90, Case 199 | 17.45 (0.687) | 14.27 (0.562) | 5.54 (0.218) | 3.18 (0.125) |
| 43-77-8G | Case 90, Case 199 | 18.92 (0.745) | 13.84 (0.545) | 5.38 (0.212) | 3.81 (0.150) |
| 43-77-9G | TO-220 | 18.42 (0.725) | 13.21 (0.520) | 4.32 (0.170) | 2.92 (0.115) |
| 46-77-9G* | TO-220 | 18.42 (0.725) | 13.21 (0.520) | 4.32 (0.170) | 2.92 (0.115) |
| 43-77-20G | TO-220, TO-218, TO-3P | 23.24 (0.915) | 18.80 (0.740) | 6.98 (0.275) | 3.66 (0.144) |

* Thermalfilm™ MT part numbers begin with "46"

Thermalfilm™ information on page 101
Dimensional tolerances are ± 0.38mm (0.015), hole diameters are ± 0.25mm (0.010) and angularity is ± 1 1/2° unless otherwise specified.



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## Mica and Thermalsil™ III

Thermalsil™ III provides excellent thermal conductivity and electrical resistance. It is used as an electrically-isolating interface material composed of silicone elastomer binder with a thermally conductive filler. It is reinforced with glass cloth to resist tearing and cut-through due to burrs on transistors or heat sinks.

Thermalsil™ III eliminates the need for grease application and conforms to mounting surfaces under clamping pressure for optimum heat conduction. The finely woven glass cloth provides the thinnest possible matrix for enhanced thermal resistance. Thermalsil™ III is available in any configuration with adhesive backing.

Mica insulators provide high maximum operating temperatures (550˚C) and excellent electrical properties.

FIGURE A

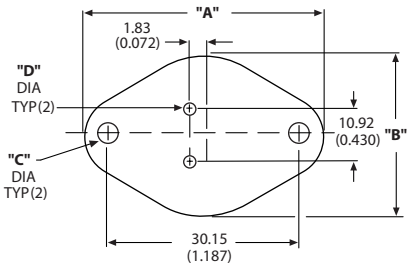
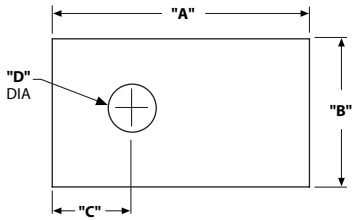



FIGURE B




### ORDERING INFORMATION

| Part number | Description | Device | "A" Dim | "B" Dim | "C" Dim | "D" Dim | Figure |
|---|---|---|---|---|---|---|---|
| 56-77-9G | Mica | TO-220 | 18.42 (0.725) | 13.21 (0.520) | 4.32 (0.170) | 2.92 (0.115) | B |
| 56-03-2G | Mica | TO-3 | 42.04 (1.655) | 27.00 (1.063) | 3.96 (0.156) | 1.57 (0.062) | A |
| 53-77-9G | Thermalsil™ III | TO-220 | 18.42 (0.725) | 13.21 (0.520) | 4.32 (0.170) | 2.92 (0.115) | B |
| 53-03-2G | Thermalsil™ III | TO-3 | 42.04 (1.655) | 27.00 (1.063) | 3.96 (0.156) | 1.57 (0.062) | A |

### TYPICAL PROPERTIES FOR MICA INSULATORS

| Property | |
|---|---|
| | **Electrical** |
| **Dielectric strength**<br>**0.025 mm to 0.076 mm thick in air (1 to 3 mils thick in air)** | 172 X $10^3$ volts/mm (4500 volts/mil) |
| **Dielectric constant** | 6.5 to 8.7 |
| **Dissipation factor** | 0.0001-0.0004 @ $10^6$ Hz |
| **Volume resistivity** | $10^{15}$ ohm-cm |
| | **Physical** |
| **Modules of elasticity in tension** | 172 X $10^3$ Mpa (25 X $10^6$) psi |
| **Tensile strength** | 310 Mpa (45,000 psi) |
| **Hardness mohs, shore** | 3.0, 115 |
| **Compressive strength** | 2.21 X $10^8$ Pa (32,000 psi) |
| **Specific gravity** | 2.9 |
| | **Thermal** |
| **Thermal conductivity** | 0.528 W/(m ˚C ) (0.30 Btu/hr-ft ˚F) |
| **Coefficient of thermal expansion** | 3.24 X $10^{-5}$ ˚C (1.8 X $10^{-5}$ ˚F) |
| **Specific heat** | 0.084 KJ/Kg ˚C (0.02 Btu/Lb ˚F) |
| **Melting point** | 1275˚C (2327 ˚F) |
| **Max. operating temperature** | 550 ˚C (1022 ºF) |

### TYPICAL PROPERTIES FOR THERMALSIL™ III

| Property | Typical value 25°C | Test method |
|---|---|---|
| | **Electrical** | |
| **Dielectric constant** | 2.5@50 Hz<br>2.5@$10^3$ Hz<br>2.5@$10^6$ Hz | ASTM D-150 |
| **Dielectric breakdown voltage** | 26.3 x $10^3$ volts/mm (667 volts/mil) | ASTM D-149 |
| **Volume resistivity** | 5.7 x $10^{15}$ ohm-cm | ASTM D-257 |
| **Dielectric dissipation factor** | 0.008@50 Hz<br>0.004 @$10^3$ Hz<br>0.004 @$10^6$ Hz | ASTM D-150 |
| | **Physical** | |
| **Thickness** | 0.15mm<br>(0.006 inch) | |
| **Color** | Gray-Green | |
| **Tensile strength** | 6.1 x $10^7$ Pa (8786 psi) | |
| **Hardness, shore A** | 87 | |
| **Elongation** | 2% or less | |
| | **Thermal** | |
| **Thermal conductivity** | 0.92 W/(m ˚C ) (0.532 Btu/hr. ft ˚F) | |
| **Flame resistance** | UL 94V-0 | UL card #E-58126 (S) |
| **Service temperature** | -60°C to 180°C<br>(-76°F to 356°F) | |

## Aluminum Oxide

Aluminum oxide has unique thermal conductivity qualities and features low loss factors at high frequencies. It has high compressive strength, high volume resistivity, low thermal expansion and resists radiation.

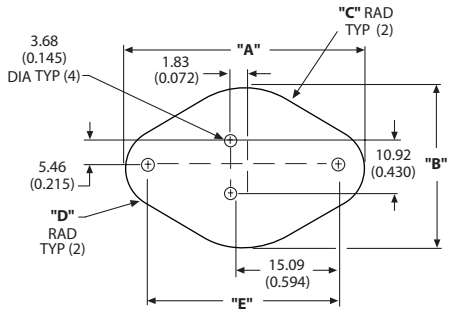
Aluminum oxide insulating washers have a dielectric strength of approximately 21.7 x $10^3$ volts/mm for .76mm material (550 volts/mil for 0.030 inch material) and 16.9 x $10^3$ volts/mm for 1.57mm material (430 volts/mil for 0.062 inch material). The thermal conductivity of aluminum oxide is 15.06W/(m°C) at 75°C.

| PROPERTY | CHEMICAL – TYPICAL VALUE | TEST METHOD |
|---|---|---|
| $A1_20_3$ | 94% nominal | Spectrographic analysis (100%-% by wt. of total metallic impurity) |
| Dielectric constant 25°C (77°F) | **ELECTRICAL** | |
| | 8.9 (1MHz) | ASTM D150-70 |
| | 8.9 (10GHz) | ASTM D2520-70 |
| Dissipation factor 25°C (77°F) | 0.0001 (MHz) | ASTM D150-70 |
| | 0.0010 (10GHz) | ASTM D2520-70 |
| Electrical resistivity 25°C (77°F) | >$10^{14}$ ohm-cm | ASTM D1829-66 |
| Dielectric strength (AC) | 8.66 x $10^3$ volts/mm (6.35mm thick) | ASTM D116-69 |
| | [220 volts/mil (0.250" thick)] | |
| | 16.73 x $10^3$ volts/mm (1.27mm thick) | |
| | [425 volts/mil (0.050" thick)] | |
| | 28.35 x $10^3$ volts/mm (0.25mm thick) | |
| | [720 volts/mil (0.010" thick)] | |
| | **PHYSICAL** | |
| Density | 3.62 g/cm$^3$ (226 lb/ft$^3$) | ASTM C20-70 |
| Hardness | 78 (Rockwell 45 N) | ASTM E18-67 |
| | **MECHANICAL** | |
| Flexural strength 25°C (77°F) | 3.17 x $10^8$ Pa (minimum) [46.00 psi (minimum)] | ACMA Test #2 |
| | 3.52 x $10^8$ Pa (typical) [51,000 psi (typical)] | |
| Modules of elasticity | 2.83 x $10^{11}$ Pa (41 x $10^6$ psi) | ASTM C623-69T |
| Poisson's ratio | 0.21 | ASTM C623-69T |
| Tensile strength 25°C (77°F) | 1.93 x $10^8$ Pa (28,000 psi) | ACMA Test #4 |
| Compressive strength 25°C (77°F) | 2.10 x $10^9$ Pa (305,000 psi) | ASTM C528-63T |
| | **THERMAL** | |
| Coefficient of thermal expansion | 7.9 x $10^6$/°C (4.4 x $10^6$/°F) | ASTM C372-56 |
| Thermal conductivity | 18.01 W/(m°C) @ 25°C | ASTM C408-58 |
| | 14.24 W/(m°C) @ 100°C | |
| | 79.56 W/(m°C) @ 400°C | |
| Specific heat (100°C) | 8.79 x $10^4$ KJ/kg°C [2.1 x $10^4$ Btu/lb °F] | ASTM C351-61 |
| Melting point | >3600°C (6512°F) | |
| Maximum temperature for continuous use | 1700°C (3100°F) | |

## Aluminum Oxide for TO-3

### ORDERING INFORMATION

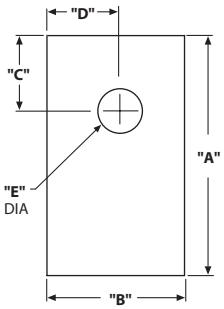
| Part number | Thickness | "A" Dim | "B" Dim | "C" Dim | "D" Dim | "E" Dim |
|---|---|---|---|---|---|---|
| 4103G* | 1.91 (0.075) | 39.70 (1.563) | 26.67 (1.050) | 13.34 (0.525) | 4.75 (0.187) | 30.40 (1.197) |
| 4104G* | 1.78 (0.070) | 44.45 (1.750) | 31.75 (1.250) | 15.88 (0.625) | 7.16 (0.282) | 30.15 (1.187) |




## Aluminum Oxide Ceramic for TO-220

### ORDERING INFORMATION

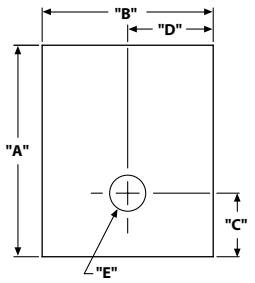
| Part number | Thickness | "A" Dim | "B" Dim | "C" Dim | "D" Dim | "E" Dim |
|---|---|---|---|---|---|---|
| 4169G* | 1.57 (0.062) | 19.30 (0.760) | 13.97 (0.550) | 4.78 (0.188) | 6.98 (0.275) | 3.68 (0.145) |
| 4170G** | 1.78 (0.070) | 19.30 (0.760) | 13.97 (0.550) | 4.78 (0.188) | 6.98 (0.275) | 3.68 (0.145) |
| 4171G** | 1.78 (0.070) | 16.51 (0.650) | 12.70 (0.500) | 4.32 (0.170) | 6.35 (0.250) | 3.81 (0.150) |
| 4177G** | 1.78 (0.070) | 17.45 (0.687) | 14.27 (0.562) | 5.54 (0.218) | 7.14 (0.281) | 3.18 (0.125) |




## Aluminum Oxide Ceramic for TO-218, TO-247, and TO-3P

### ORDERING INFORMATION

| Part number | Thickness | "A" Dim | "B" Dim | "C" Dim | "D" Dim | "E" Dim |
|---|---|---|---|---|---|---|
| 4180G* | 1.78 (0.070) | 23.24 (0.915) | 18.80 (0.740) | 6.98 (0.275) | 9.40 (0.370) | 3.96 (0.156) |



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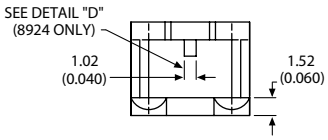
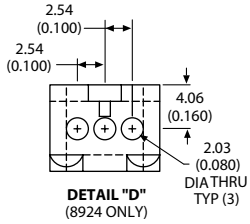
## 8923-1, 8923-2, 8924 Stanchion Pads

### FEATURES

- Reduces stress on leads during wave solder and post-soldering operations
- Provides stable mount to resist shock and vibration damage to leads
- 8923-1, 8923-2, and 8924 fit the TO-220

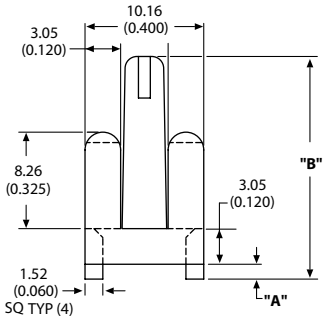


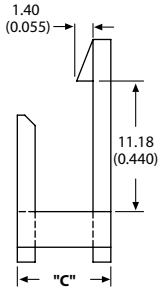




### ORDERING INFORMATION

| Part number | "A" Dim | "B" Dim | "C" Dim |
|---|---|---|---|
| 8923-1G | 2.54 (0.100) | 20.32 (0.800) | 8.00 (0.315) |
| 8923-2G | 1.27 (0.050) | 19.05 (0.750) | 8.00 (0.315) |
| 8924G | 1.27 (0.050) | 19.05 (0.750) | 7.87 (0.310) |

Note: Tolerances ± 0.25 (0.010) unless otherwise specified.
Material is nylon 6/6 rated 94 V-O



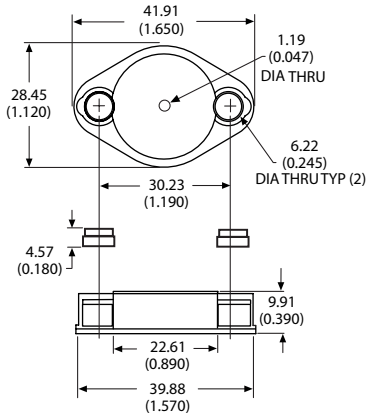
## TO-3 Insulating Covers

Insulating covers are designed to provide protection from accidental shock during field service or repair.

Pan head screws not provided–MS 51957-30 or equivalent recommended–secure the cover to the TO-3. At the typical mounting screw torque of 0.68–0.90 Nm (6-8 inch pounds), the TO-3 cover material cold-flows around the screw head to securely fasten the cover.

Included are No.6 split washers as inserts to provide electrical connection of mounting screws to the TO-3 collector and an insulating snap-in cover for the screw heads. A test probe hole is provided in the top of the cover.

The 8903VB is made from thermoplastic polyester that meets the requirements of UL Bulletin 94 V-O. In addition to its excellent flammability rating, thermoplastic polyester offers resistance to most chemical environments, heat deflection temperature to 215.6°C (420°F) and UL continuous use temperature of 130°C (266°F).

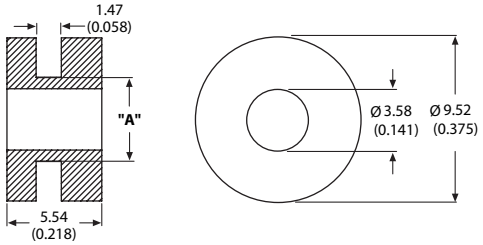



### ORDERING INFORMATION

| Part number | Material | Color | Flammability standards |
|---|---|---|---|
| 8903NWG | Nylon | White | Self-extinguishing UL 94 V-2 |
| 8903VBG | Thermoplastic polyester | Black | Self-extinguishing UL 94 V-0 UL 492 Type 1 |

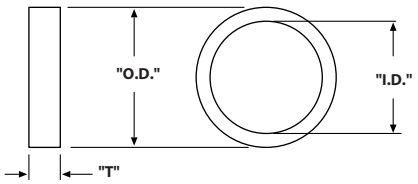
## Teflon-filled Acetal Insulators for TO-3

| Part number | Fits notch | "A" Dim |
|---|---|---|
| 103G | 4.83 (0.190) | 4.90 (0.193) |
| 109G | 6.35 (0.250) | 6.35 (0.250) |




## Teflon-filled Acetal Bushings for TO-3

| Part number | "I.D." | "O.D." | "T" |
|---|---|---|---|
| 110G | 5.03/5.21(0.198/0.205) | 6.81/6.98 (0.268/0.275) | 1.57/1.40 (0.062/0.055) |
| 113G | 6.43/6.60 (0.253/0.260) | 7.82/8.00 (0.308/0.315) | 1.57/1.40 (0.062/0.055) |



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## FEATURES

- Prevent heat damage during soldering
- Facilitate board clean-up
- Prevent solder bridges
- Assure uniform device height

## PRODUCT INFORMATION

| Suffix | Base material | MAXIMUM OPERATING TEMPERATURE Continuous | Deflection | Color |
|---|---|---|---|---|
| NG | Nylon base resin per ASTM STD D4066-82-PA111 | 121.0°C 250°F | 243.3°C 470°F | Natural |
| DAPG* | Diallyl Phthalate per MIL-M-14G type SDG | 204.4°C 400°F | 282.2°C 540°F | Black only |

* All "DAP" mounting pads meet UL 94 V-0

Note: Please specify material for each mounting pad: "N" = nylon; "DAP" = Diallyl Phtalate.
Example: 7717-3NG, 7717-86DAPG

## Index of Semiconductor Lead Conversion Pads

### ORDERING INFORMATION

| Part number | Converts lead spacing from | To | # of Leads | Outside dia | Thickness |
|---|---|---|---|---|---|
| | | For epoxy transistors | | | |
| 7717-130G | 0.05 In-Line | TO-92 & TO-15 | 3 | 5.84 (0.230) | 1.02 (0.040) |
| | | For TO-18 | | | |
| 7717-247G | TO-18 | TO-5 | 3 | 7.11 (0.280) | 3.81 (0.170) |
| 7717-26G | TO-18 | TO-5 | 3 | 8.71 (0.343) | 3.05 (0.120) |
| 7717-44G | TO-18 | TO-5 | 4 | 7.75 (0.305) | 3.18 (0.125) |

See pages 108 and 109 for mechanical drawings

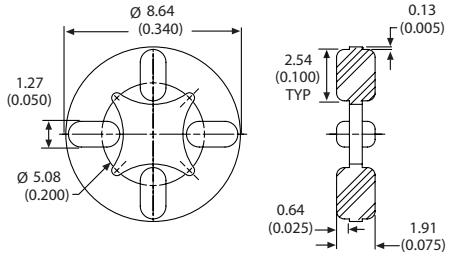
## Index of Semiconductor Mounting Pads

### ORDERING INFORMATION

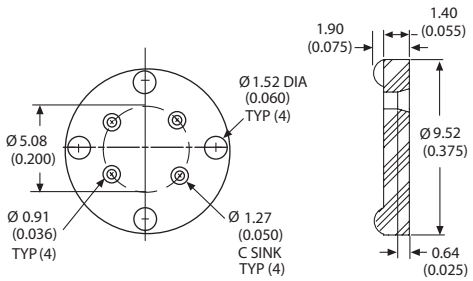
| Part number | Leads | Outside dia | Thickness |
|---|---|---|---|
| | | For TO-5 | |
| 7717-86G | 3 | 8.71 (0.343) | 1.91 (0.075) |
| 7717-178G | 3 | 8.89 (0.350) | 0 .53 (0.021) |
| 7717-79G | 3 | 9.02 (0.355) | 0.97 (0.038) |
| 7717-3G | 3–4 | 8.64 (0.340) | 1.91 (0.075) |
| 7717-15G | 4 | 8.89 (0.350) | 0.51 (0.020) |
| 7717-5G | 4 | 8.89 (0.350) | 3.18 (0.125) |
| 7717-4G | 4 | 9.53 (0.375) | 1.91 (0.075) |
| | | For TO-18 | |
| 7717-16G | 4 | 5.08 (0.200) | 0.51 (0.020) |
| 7717-18G | 4 | 5.08 (0.200) | 2.54 (0.100) |
| 7717-108G | 4 | 5.16 (0.203) | 1.78 (0.070) |
| 7717-89G | 4 | 6.35 (0.250) | 2.03 (0.080) |
| 7717-7G | 4 | 6.35 (0.250) | 3.18 (0.125) |
| | | For integrated circuits | |
| 7717-122G | 8 | 9.27 (0.365) | 1.78 (0.070) |
| 7717-8G | 8 | 9.53 (0.375) | 1.91 (0.075) |
| 7717-156G | 14 | 19.05 x 11.43 (0.750 x 0.450) | 1.27 (0.050) |
| | | Misc. mounting pads | |
| 7717-175G | Crystal Can Relay | 10.16/20.32 (0.400 x 0.800) | 1.27 (0.050) |

See pages 108 and 109 for mechanical drawings

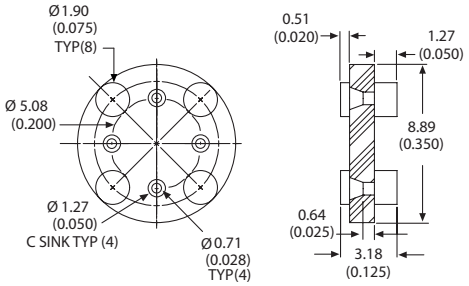
## 7717-3G



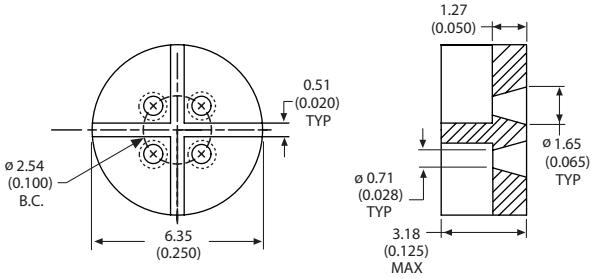

## 7717-4G



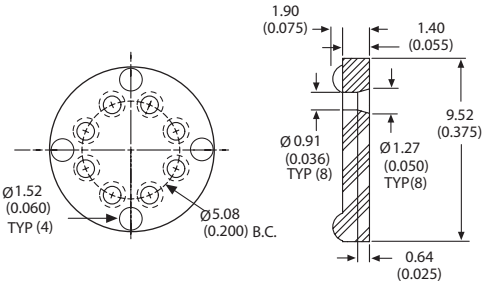

## 7717-5G



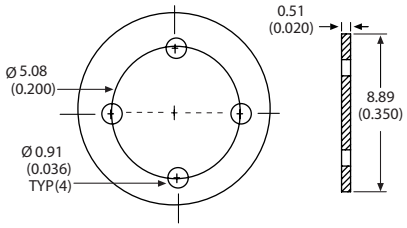

## 7717-7G



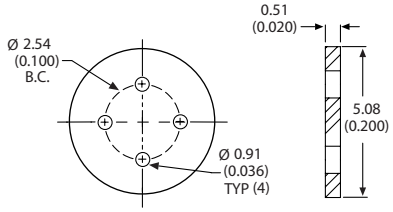

## 7717-8G



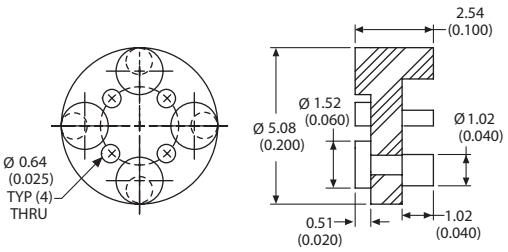

## 7717-15G



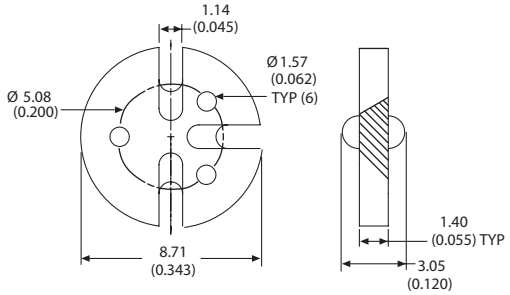

## 7717-16G



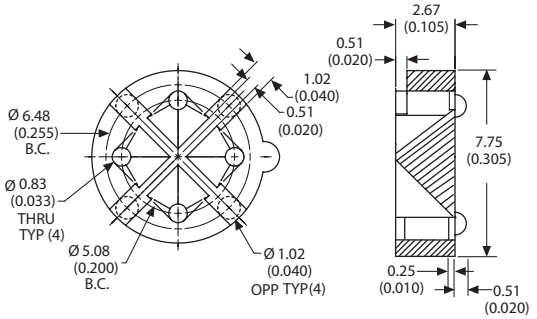

## 7717-18G




## 7717-26G Lead Conversion




## 7717-44G Lead Conversion



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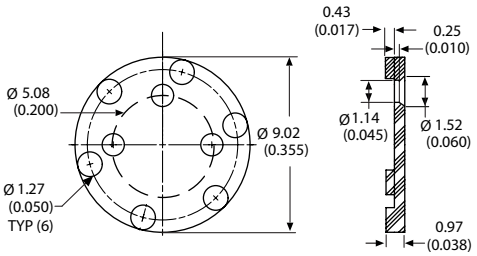
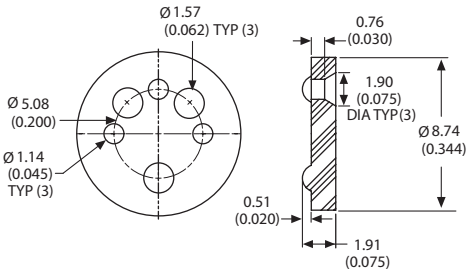
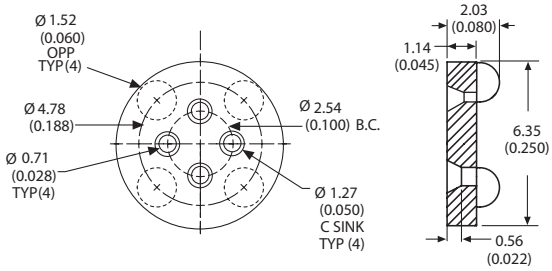
## 7717-79G



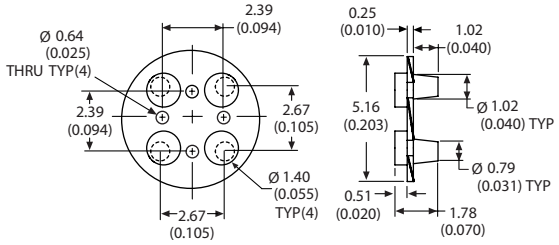

## 7717-86G



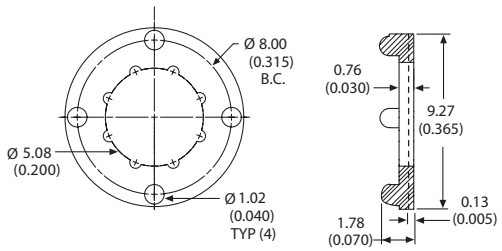

## 7717-89G



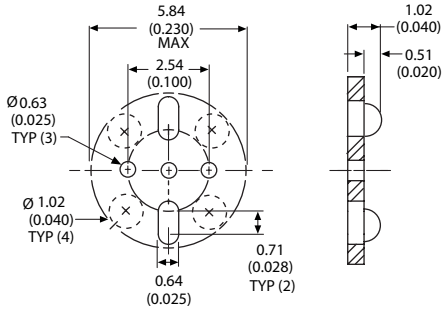

## 7717-108G



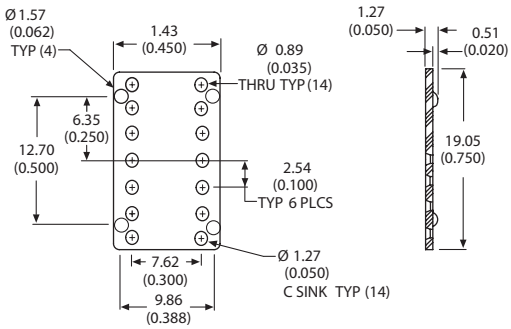

## 7717-122G



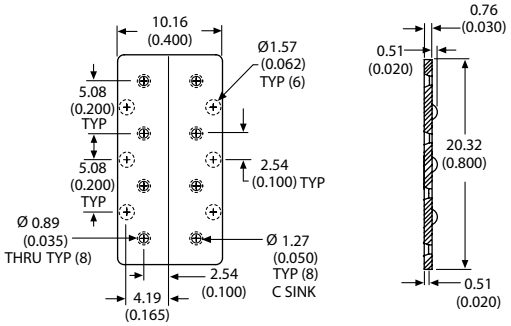

## 7717-130G Epoxy Transistors



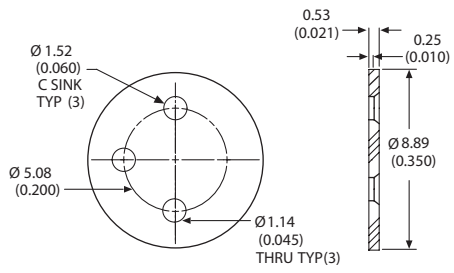

## 7717-156G



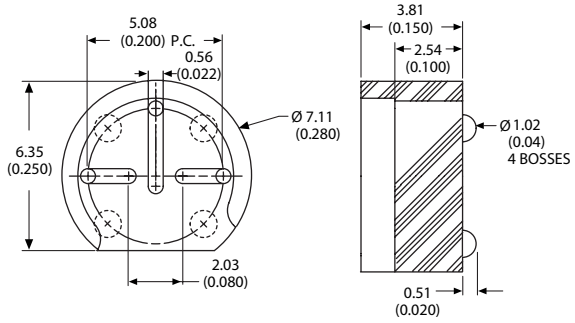

## 7717-175G




## 7717-178G




## 7717-247G Lead Conversion



| Finish | Aavid Code | Thermalloy Suffix | Description |
|---|---|---|---|
| Black Anodize | B | B | Recommended for increased thermal performance.<br>Anodize is electrically isolating and does not provide electrical insulation. |
| AavSHIELD$^3$ | V | V | For corrosion protection or painting only.<br>Color variation may be expected with this finish.<br>Chromate is electrically conductive.<br>Does not provide electrical insulation. |
| Tin Plating | D | D | Allows heat sink to be soldered to the PC Board. |
| Pre-Black Anodized | J | PB | Edges cut during the manufacturing process will be unfinished. |
| Green Anodize | M | | Alternative finish to Black anodize.<br>Recommended for increased thermal performance.<br>Electrically isolating but does not provide electrical insulation. |
| Unfinished | U | U | Clean, no finish. |
| Black Anodize w/Black Paint | W | | Paint on mounting surface prevents metal from contacting the circuit thus avoiding shorts. |

## ORDERING INFORMATION

**Aavid Thermalloy code –** Finish option must be noted by one of the above letters in the 7th position.
Aavid's standard finish is black anodize (B) unless otherwise noted.

*example 12 digit part* **530122B00000G**
A B C

**A** = Base part
**B** = Finish code
**C** = RoHS compliant

**Thermalloy origin suffix –** The suffixes should be added after the model number to indicate the desired finish.

*example*
*Thermalloy origin part* **6396BG**
A B C

**A** = Model number
**B** = Finish suffix
**C** = RoHS compliant

Note : All thermal graphs reflect black anodize finish.



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## Snap-On Ejectors / Pullers

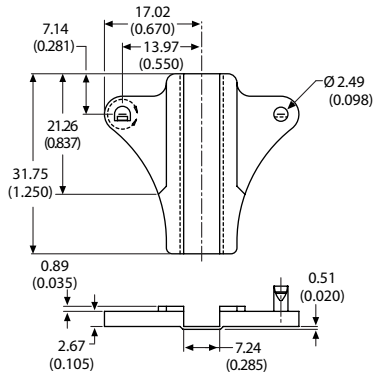
### FEATURES

- Saves time – no roll pin required
- Excellent for retrofit applications
- Material is nylon per ASTM D4066-82PA162F11
- Cost no more than conventional ejector/puller
- Rated at 222.5N (50 lbs.) / ejector force per pair
- One piece – no assembly required
- May be heat stamped

### ORDERING INFORMATION

| Part number |
|---|
| 5021NG |

5021NG Ejector




## Standard Ejectors / Pullers

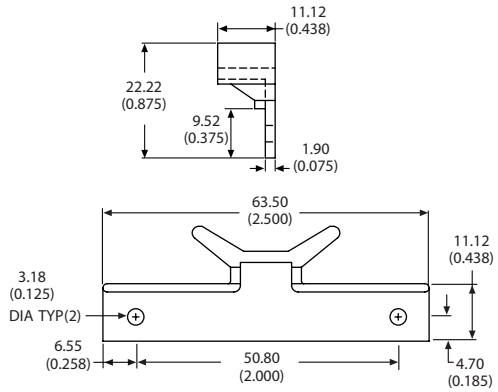
### FEATURES

- Lever action releases card from its connector safely and quickly
- Cards, their components and connectors are less frequently damaged when extracting PC boards
- No special extraction tools are needed for board removal
- Material is nylon per ASTM D4066-82 PA120B4413F24, UL 94 V-O rated (natural color)
- Roll pins are provided (NAS 561-P3-4)

### ORDERING INFORMATION

| Part number | Figure |
|---|---|
| 5005-09NG | A |
| 5005-08NG | B |
| 5005-25NG | C |

FIGURE A 5005-09NG PULLER *




*No roll pins provided

FIGURE B 5005-08NG SLIM FACE/ FLAT

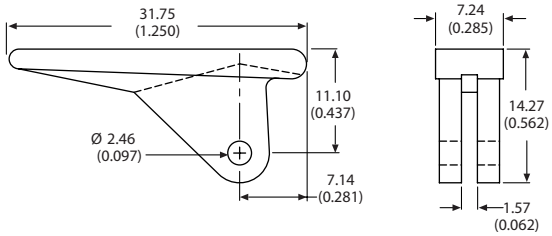
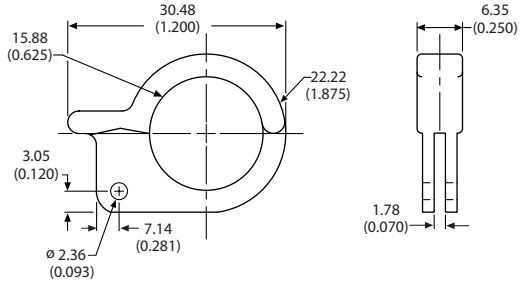



FIGURE C 5005-25NG COMBINATION EJECTOR/PULLER



## Sil-Free™

Sil-Free™ 1020 is a metal-oxide-filled, silicone-free synthetic grease specially formulated to enhance heat transfer across the interface between the semiconductor case and the heat sink without the migration or contamination associated with silicone-based products.

Dry interface case-to-sink thermal resistance is typically reduced 50% to 75% with proper application of Sil-Free™ 1020.

This virtually "no-bleed", high-performance compound will not dry out, harden, melt, or run, even after long-term continuous exposure to temperatures up to 200°C. Even in a vacuum atmosphere (10-5 Torr, 24 hours@100°C), Sil-Free™ 1020 exhibits virtually "no bleed" or evaporation.

### ORDERING INFORMATION

| Part number | Package | Size |
|---|---|---|
| 101700F00000G | Syringe | 43 grams (1.5 oz) |
| 101800F00000G | Tube | 57 grams (2.0 oz) |
| 101900F00000G | Jar | 57 grams (2.0 oz) |
| 102000F00000G | Tube | 143 grams (5.0 oz) |
| 102100F00000G | Jar | 457 grams (16.0 oz) |

### PRODUCT INFORMATION

| | |
|---|---|
| **Color** | White |
| **Thermal conductivity** | 0.79 W/(m-°C) |
| **Operating temperature range** | -40°C to +200°C |
| **Volume** | $10^{12}$ Ohm-cm 2.3 ± 0.5 |
| **Weight** | 47.5 grams |
| **Dielectric strength** | 225 volts/mil |
| **Consistency** | Paste |
| **Bleed** | 0.09 max<br>% after 24hr @ 200°C |
| **Specific gravity** | 2.8 ± 0.2 |
| **Shelf life** | Indefinite (unopened)* |

* It is recommended that the containers be turned over every 6 months to minimize settling for ease of mixing

## Ther-O-Link™

Ther-O-Link™ is a silicone-based thermal compound that cost effectively enhances the heat transfer between a semiconductor case and a heat sink. Easy to apply, Ther-O-Link™ substantially reduces dry interface thermal resistance, while providing long life under a variety of conditions.

### ORDERING INFORMATION

| Part number | Package | Size |
|---|---|---|
| 100000F00000G | Ampule | 1 gram (0.03 oz) |
| 100100F00000G | Syringe | 35.7 grams (1.25 oz) |
| 100200F00000G | Tube | 57 grams (2.0 oz) |
| 100500F00000G | Tube | 143 grams (5.0 oz) |
| 100800F00000G | Tube | 228.6 grams (8.0 oz) |
| 101600F00000G | Can | 0.45 kg (1 lb) |
| 108000F00000G | Can | 2.27 kg (5 lb) |
| 132000F00000G | Can | 9.07 kg (20 lb) |

### PRODUCT INFORMATION

| | |
|---|---|
| **Color** | White |
| **Thermal conductivity** | 0.73 W/(m-°C) |
| **Operating temperature range** | -40°C to +200°C |
| **Volume resistivity** | 1.0 x $10^{15}$ Ohm-cm |
| **Dielectric strength** | 250 volts/mil |
| **Consistency** | Paste |
| **Bleed** | 0.6 max |
| **Specific gravity** | 2.8 |
| **Shelf life** | Indefinite (unopened)* |

* It is recommended that the containers be turned over every 6 months to minimize settling for ease of mixing

## Ultrastick™

Aavid's Ultrastick™ is a unique phase-change thermal interface material that surpasses grease in thermal performance and long-term stability. This solid, silicone-free, paraffin-based thermal compound changes phase at 60°C, with a concurrent volumetric expansion that fills gaps between the mating surfaces. Ultrastick™ comes in a convenient applicator bar, allowing for neat, fast application to both heat sink and component surfaces. One cost-effective application leaves a thin, film-like deposit, providing excellent heat transfer and low interface thermal resistance.

### ORDERING INFORMATION

| Part number | Package | Size |
|---|---|---|
| 100300F00000G | Bar | 47.5 grams (0.16 oz) |

### PRODUCT INFORMATION

| | |
|---|---|
| **Temperature range** | -40°C to +200°C |
| **Volume resistivity** | 1.0 X $1.0^{15}$ Ohm-cm |
| **Dielectric strength** | 250 volts/mil |
| **Consistency** | Paste |
| **Bleed** | 0.6 max |
| **Specific gravity** | 0.28 |
| **Color** | Opaque White |
| **Thermal resistance** | 0.03°C/W per square inch @ 20 psi<br>0.02°C/W per square inch @ 100 psi |
| **Shelf life** | Indefinite* |

* Recommended max. storage temperature: 40°C (105°F)



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## Thermalcote™

Thermalcote™ is a superior thermal joint compound of thermally loaded silicone based grease for use with all heat sinks. It improves the transfer of thermal energy across the metal to metal interfaces between the transistor or rectifier case and the heat sink. Thermalcote™ conducts heat approximately 15 times better than air and more than 4 times better than unloaded silicone grease. It is non-toxic, extremely stable, and neither cakes or runs from -40° to 204°C (-40°F to 399°F).

### ORDERING INFORMATION

| Part number | Net weight |
|---|---|
| 249G | 28 grams (1 oz) tube |
| 250G | 57 grams (2 oz) tube |
| 251G | 0.45 kg (1 lb) can |
| 252G | 2.27kg (5 lb) can |
| 253G | 4.54 kg(10 lb) can |

### PRODUCT INFORMATION

| | |
|---|---|
| **Color** | Opaque white |
| **Operating temperature range** | -40°C to 204°C (-40°F to 399°F) |
| **Thermal conductivity** | 0.765W/(m °C )(.226 Btu/hr ft °F) |
| **Dielectric strength** | 11.8 x $10^3$ volts/mm (300 volts/mil) 1.27 mm gap (0.050" gap) |
| **Cleaning solvent** | Mineral spirits or turpentine |
| **Specific gravity** | 1.6 |
| **Evaporation 24 hours@200°C (392°F), wt%** | 1 |
| **Shelf life** | Indefinite (unopened)* |

* It is recommended that the containers be turned over every 6 months to minimize settling for ease of mixing

## Thermalcote™ II

Thermalcote™ II was developed as the sensible alternative to silicone-based thermal greases. Thermalcote™ II employs a highly conductive synthetic base fluid that enables the finished product to exhibit the same thermal characteristics as the silicone-based products.

Thermalcote™ II contains no silicone. The high lubricity of the base oil permits efficient application to both semiconductor case or heat sink, and it will effectively fill the microscopic air gaps on the metal-to-metal mating surfaces. It is non-toxic, extremely stable, and neither cakes or runs from -40° to 200°C (-40°F to 392°F).

### ORDERING INFORMATION

| Part number | Net weight |
|---|---|
| 349G | 28 grams (1 oz) tube |
| 350G | 57 grams (2 oz) jar |
| 351G | 0.45 kg (1 lb) can |

### PRODUCT INFORMATION

| | |
|---|---|
| **Color** | Blue |
| **Operating temperature range** | -40°C to 200°C (-40°F to 392°F) |
| **Thermal conductivity** | 0.699W/(M °C) (0.204 Btu/hr ft °F) |
| **Dielectric strength** | 7.9 x $10^3$volts/mm (200volts/mil) 1.27 mm gap (0.050" gap) |
| **Cleaning solvent** | Mineral spirits or turpentine |
| **Specific gravity** | 2.93@60°F (15.6°C) |
| **Evaporation, 24 hours@200°C (392°F), wt%** | 0.6 max |
| **Shelf life** | Indefinite (unopened)* |

* It is recommended that the containers be turned over every 6 months to minimize settling for ease of mixing

## Ther-O-Bond™ Adhesive

### ORDERING INFORMATION

| Part number | Description | Package/Kit | Size |
|---|---|---|---|
| 159900F00000G | Ther-O-Bond™ 1500 | Resin and hardener | 0.946 liter (1 qt) |
| 161000F00000G | Ther-O-Bond™ 1600 | 2-Part plastic kit | 10gm (0.35 oz) |
| 164000F00000G | Ther-O-Bond™ 1600 | 2-Part plastic kit | 40gm (1.40 oz) |
| 200000F00000G | Ther-O-Bond™ 2000 | Adhesive syringe<br>Activator bottle | 25ml<br>13ml |

## Ther-O-Bond™ 1500

Ther-O-Bond™ 1500 is a versatile epoxy casting system developed for high performance, production potting and encapsulating applications where low shrinkage and rapid air evacuation are required. This formulation has a very low surface tension and a flowable viscosity, which affords excellent air release. Ther-O-Bond™ 1500 adhers to rigid plastics and laminates, metals and ceramics, has a low coefficient of thermal expansion and is readily machined and shaped with ordinary shop tools. The fully cured epoxy system is an excellent electrical insulator which provides good resistance to electrolysis, leakage and corrosion room water, weather, gases and chemical compounds.

### HANDLING CHARACTERISTICS

| | |
|---|---|
| **Mix ratio by weight, resin to hardener:** | 100 to 15 |
| **Mixed viscosity @ 25°C, cps:** | 1000 - 1500 |
| **Work-life @ 25°C** | 45 Minutes |
| **Gel time @ 25°C** | 3-6 Hours |
| **Cure schedule @ 25°C** | 8 Hours |
| **Cure schedule @ 65°C** | 1 Hour |
| **Cure schedule @ 100°C** | 0.5 Hour |

### PHYSICAL PROPERTIES

| | |
|---|---|
| **Color** | Black |
| **Specific gravity** | 1.5 |
| **Operating temp, °C** | -60 to 155 |
| **Heat distortion temp, °C** | 100 |
| **Hardness, shore D:** | 88 |
| **Thermal conductivity W/(m°C)** | 1.26 |
| **Compressive strength, psi** | 14,000 |
| **Dissipation factor,** | 0.01 |
| **Self extinguishing:** | yes |
| **C.T.E. (ppm/°C)** | 25 |
| **Tensile strength (@25°C)** | 9200 psi |
| **Dielectric** | 800 |
| **Shelf life** | 18 months* |

* Stated shelf life is from date of manufacture. To allow for inventory cycle, product shipped from Aavid will have less than 18 months remaining shelf life. Aavid guarantees a minimum of 3 months remaining shelf life. Please adjust order quantity so all product will be consumed within 3 months of date of shipment.

## Ther-O-Bond™ 1600

For smaller applications, Ther-O-Bond™ 1600 produces a stable, durable, high-impact bond, with good heat transfer characteristics. It is a thixotropic (smooth paste) thermally conductive epoxy system used for staking thermistors, diodes, resistors, integrated circuits and other heat sensitive components to printed circuit boards. This two-part adhesive develops strong, durable, high impact bonds at room temperature, which improve heat transfer while maintaining electrical insulation. Ther-O-bond™ 1600 bonds readily to itself, to metals, silica, steatie, alumina, sapphire and other ceramics, glass, plastics and many other materials because its coefficient of thermal expansion provides a good match for those materials over a fairly wide temperature range.

### HANDLING CHARACTERISTICS

| | |
|---|---|
| **Mix ratio by weight, resin to hardener:** | 100 to 5 |
| **Mixed viscosity @ 25°C, cps:** | 33,000 |
| **Work-life @ 25°C** | 45 Minutes |
| **Gel time @ 25°C** | 3-6 Hours |
| **Cure schedule @ 25°C** | 8 Hours |
| **Cure schedule @ 65°C** | 1 Hour |
| **Cure schedule @ 100°C** | 0.5 Hour |

### PHYSICAL PROPERTIES

| | |
|---|---|
| **Color** | Blue |
| **Specific gravity:** | 2.30 |
| **Operating temp, °C** | -70 to 115 |
| **Hardness, shore D:** | 90 |
| **Izod impact, F1 Lbs/Inch of notch** | 0.49 |
| **Thermal conductivity W/(m-°C)** | 0.85 |
| **C.T.E. (ppm/°C)** | 25 |
| **Tensile strength (@25°C)** | 9200 psi |
| **Tensile lap shear, psi** | 2900 |
| **Dielectric strength (volts/mil)** | 410 |
| **Dielectric constant (1 KHz @ 25°C)** | 5.9 |
| **Dissipation factor, KH@ 25°C** | 5.9 |
| **Shelf life** | 18 months* |

## Ther-O-Bond™ 2000

Ther-O-Bond™ 2000 acrylic adhesive cures rapidly at room temperature, while providing a repairable, thermally conductive bond.

### PRODUCT INFORMATION

| | |
|---|---|
| **Color** | White |
| **Thermal conductivity W/(m-°C)** | 0.48 |
| **C.T.E. (ppm/°C)** | 25 |
| **Tensile strength (@25°C)** | 2360 psi |
| **Dielectric strength (volts/mil)** | 220 |
| **Shelf life** | 18 months* |

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## Thermalbond™

Thermalbond™ is a thermally conductive, high strength epoxy adhesive. It provides exceptional adhesion to copper, aluminum, steel, glass, ceramics, and most plastics. Thermalbond™ also has a coefficient of thermal expansion compatible with aluminum, copper, and brass, making it particularly well suited for thermally bonding semiconductors and other components to chassis or heat sinks.

### ORDERING INFORMATION

| Part number | Net weight |
|---|---|
| 4949G | 0.8 oz (25 gram kit) |
| 4950G | 1.7 oz (50 gram kit) |
| 4951G | 3.5 oz (100 gram kit) |
| 4952G | 7.0 oz (200 gram kit) |
| 4953G | 4 lbs (1814 grams) |

### MIXING INSTRUCTIONS

Mix resin thoroughly before removing material. Add 7.1 parts of RT-7 hardener to 100 parts of resin by weight, or 17 parts of RT-7 hardener to 100 parts of resin by volume. Adhesive will set up in:

24 hrs at 25°C (77°F)
2 hrs. at 65°C (149°F)
1 hr. at 100°C (212°F)
30min. at 130°C (266°F)

Note: For maximum electrical and physical properties, a post cure is neccessary. Post cure at room temperature for 4 days or for 4 hours at 93°C (200°F).

### HANDLING CHARACTERISTICS

Typical electrical and physical properties at room temperature with RT-7 hardener

| | |
|---|---|
| **Color** | Green |
| **Specific gravity** | 2.35 |
| **Working viscosity** | 25,000 cps |
| **Thermal conductivity** | 1.34W/(m °C) (0.77 Btu/hr •ft• °F) |
| **Thermal resistivity** | 29.4°C in/watt |
| **Tensile strength** | 6.34 x $10^7$ Pa (9,2000 psi) |
| **Compressive strength** | 1.44 x $10^8$ Pa (20,9000 psi) |
| **Bond shear strength aluminum to aluminum, 25.4mm (1") overlap @ 25°C, (77°F)** | 3.17 x $10^7$ Pa (4,6000 psi) |
| **Thermal coefficient of expansion** | 24 x $10^{-6}$/°C (1.32 x $10^{-6}$/°F) |
| **Water absorption, % after 10 days@ 25°C (77°F)** | 0.20 |
| **Hardness, Shore D** | 86 |
| **Volume resistivity** | 1.0 x $10^{16}$ |
| **Dielectric strength** | 59.1 x $10^3$ volts/mm (1500 volts/mil) |
| **Dielectric constant@25°C (77°F) 100KHz** | 6.1 |
| **Dielectric factor@25°C (77°F) 100KHz** | 0.020 |
| **Operating temperatures** | -65°C to 155°C (-85°F to 311°F) |
| **Linear shrinkage** | 0.002 in/in |
| **Shelf life** | 12 months* |
| **Pot life@25°C (77°F)** | 2-3 hours |
| **Suggested stripping agent** | Miller-Stephenson MS 111 |
| **Cleaning solvent** | Acetone |

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# The Total Integrated Solution for Cooling Electronics®

AAVID THERMALLOY

APPLIED THERMAL TECHNOLOGIES, LLC

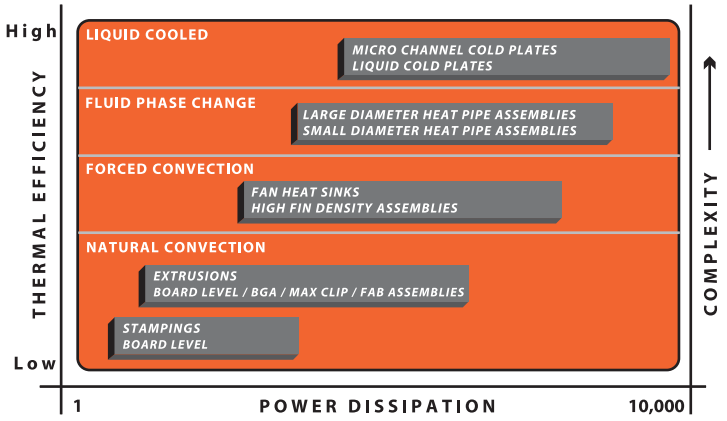
Aavid Thermalloy has the expertise to design and manufacture cooling solutions spanning the entire range of thermal efficiency and mechanical complexity. The board level products displayed in this catalog represent only a fraction of our capabilities. Most applications require custom solutions, which is why so many leading electronics companies partner with Aavid Thermalloy.

For demanding applications Aavid Thermalloy can design and validate custom innovative solutions utilizing the most advanced engineering resources saving you precious development time. Our manufacturing facilities, located in strategic markets around the globe, deliver cost effective products providing you a competitive advantage. From concept to production, Aavid Thermalloy can enable your design anywhere in the world.

Experts at solving cooling challenges ranging from networking, telecom and consumer electronics, to power and biomedical devices. Our clients include Cisco, Nortel, HP, Apple, Sun, Bio-Rad, Mitsubishi and other industry leading companies worldwide. Utilizing the latest CFD/FEA and experimental techniques we can:

- Perform conjugate analyses with conduction, convection and radiation
- Optimize venting and fan placement
- Increase power density
- Reduce noise, cost and size.
- Increase MTBF

Dedicated thermal engineers characterize your system and provide the most advanced and effective cooling solutions, saving thousands in engineering resources, thermal modeling software, and test hardware.




There are 4 cooling mechanisms that Aavid Thermalloy and Applied Thermal Technologies take pride in having expertise in: natural convection, forced convection, fluid phase change and liquid cooling. The above graph is a starting point to determine which technology can be used for your system configuration.

For more information regarding any of these cooling mechanisms, please contact Aavid Thermalloy at:

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Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

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С нами вы становитесь еще успешнее!

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