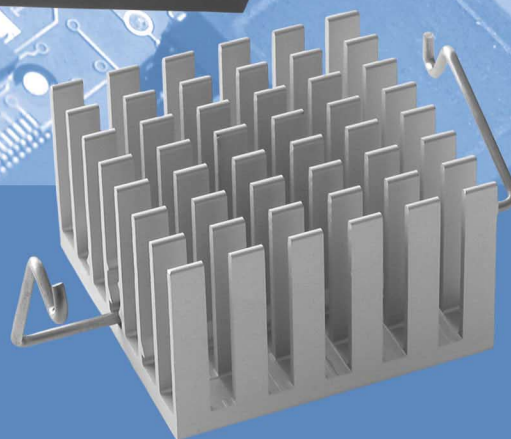
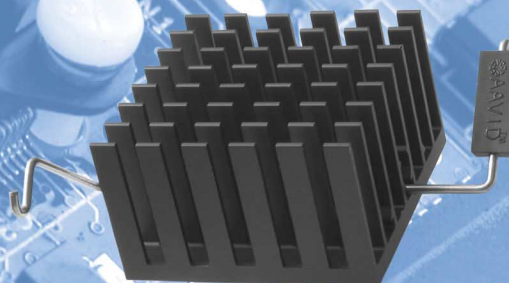
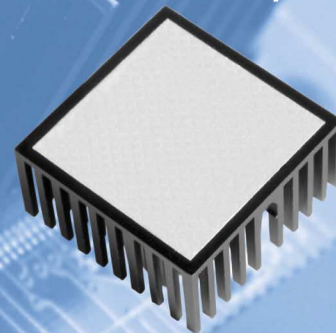
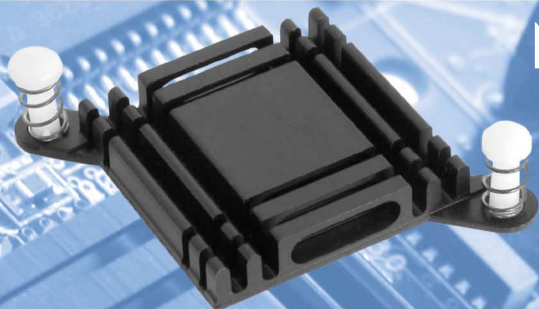




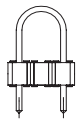
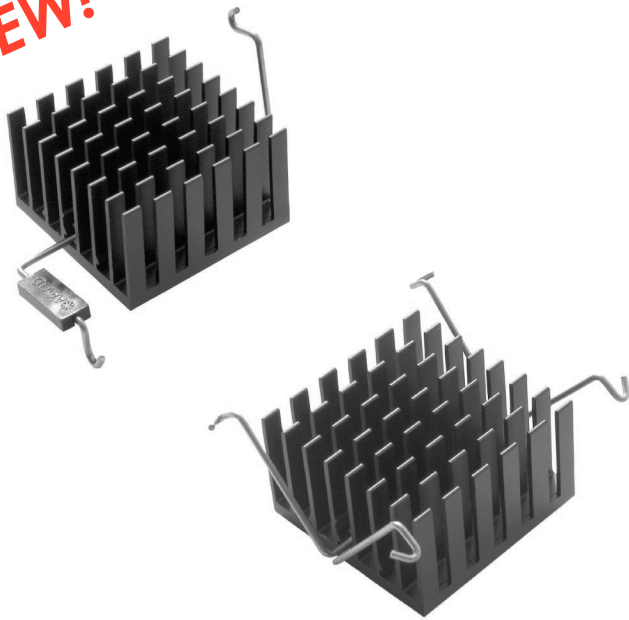
## New Cooling Solutions for Ball Grid Arrays



## The Industry's Most Comprehensive Selection of BGA Heat Sinks

Aavid Thermalloy offers the broadest line of innovative BGA heat sinks – including standard, off-the-shelf solutions to support all of your most demanding applications. Cost effective and highly functional, our BGA heat sinks range in size from 10mm x 10mm to 45mm x 45mm, and accommodate heights from 6mm to 35mm. All come in the flat base and light weight you require, and deliver proven, long-term reliability.

**NEW!**



Solder Anchor Sold Separately  
**Part # D057**  
 Solder anchors must be soldered to PCB  
 prior to attaching the heat sink clip  
 Consult P.C. Board Hole Pattern for number required

| Part Number         | Width       | Length      | Height      | *θn         | *θf         | *Finish  |          |
|---------------------|-------------|-------------|-------------|-------------|-------------|----------|----------|
| 374024B60023        | 23.0        | 23.0        | 10.0        | 40.0        | 11.69       | B        | A        |
| 374124B60023        | 23.0        | 23.0        | 18.0        | 23.4        | 7.39        | B        | A        |
| <b>374224B60023</b> | <b>23.0</b> | <b>23.0</b> | <b>25.0</b> | <b>19.7</b> | <b>6.37</b> | <b>B</b> | <b>A</b> |
| 374324B60023        | 27.0        | 27.0        | 10.0        | 30.6        | 9.35        | B        | A        |
| 374424B60023        | 27.0        | 27.0        | 18.0        | 20.3        | 6.46        | B        | A        |
| <b>374524B60023</b> | <b>27.0</b> | <b>27.0</b> | <b>25.0</b> | <b>16.5</b> | <b>5.47</b> | <b>B</b> | <b>A</b> |
| 10-5634-01**        | 31.0        | 34.9        | 23.0        | 11.5        | 4.20        | B        | I        |
| 10-THMA-01**        | 31.0        | 34.9        | 35.0        | 10.7        | 3.95        | B        | I        |
| 374624B60024        | 35.0        | 35.0        | 10.0        | 23.4        | 7.55        | B        | B        |
| <b>374724B60024</b> | <b>35.0</b> | <b>35.0</b> | <b>18.0</b> | <b>15.3</b> | <b>5.15</b> | <b>B</b> | <b>B</b> |
| <b>374824B60024</b> | <b>35.0</b> | <b>35.0</b> | <b>25.0</b> | <b>12.0</b> | <b>4.27</b> | <b>B</b> | <b>B</b> |
| 10-BRD2-01**        | 35.7        | 37.3        | 23.0        | 11.5        | 4.20        | N        | B        |
| 10-BRD1-01**        | 37.5        | 37.5        | 23.0        | 10.1        | 3.83        | B        | B        |
| 10-BRD1-03**        | 37.5        | 37.5        | 23.0        | 10.1        | 3.83        | B        | G        |
| 10-BRD1-04**        | 37.5        | 37.5        | 23.0        | 10.1        | 3.83        | B        | B        |
| 10-BRD1-05**        | 37.5        | 37.5        | 23.0        | 10.1        | 3.83        | N        | G        |
| 10-BRD1-07**        | 37.5        | 37.5        | 23.0        | 10.1        | 3.83        | N        | B        |
| <b>374924B60024</b> | <b>40.0</b> | <b>40.0</b> | <b>10.0</b> | <b>20.3</b> | <b>6.46</b> | <b>B</b> | <b>B</b> |
| <b>375024B60024</b> | <b>40.0</b> | <b>40.0</b> | <b>18.0</b> | <b>12.2</b> | <b>4.34</b> | <b>B</b> | <b>B</b> |
| <b>375124B60024</b> | <b>40.0</b> | <b>40.0</b> | <b>25.0</b> | <b>10.3</b> | <b>3.83</b> | <b>B</b> | <b>B</b> |
| 10-CLS1-01**        | 42.3        | 42.3        | 23.0        | 8.8         | 3.51        | B        | H        |
| 10-CLS2-01**        | 42.3        | 42.3        | 35.0        | 8.3         | 3.44        | B        | H        |

\* See bottom of page 4 for information on how to use this table  
 Refer to page 4 for PCB hole patterns

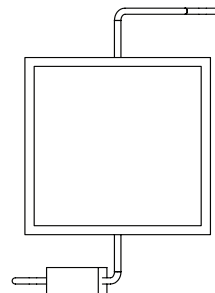
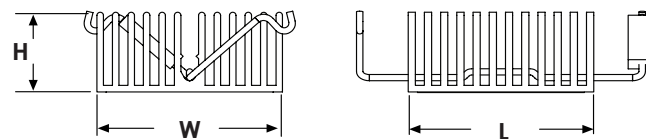
\*\* Heat Sinks for Flip Chip includes foam pad around perimeter.  
 This stabilizes the part so heat sink doesn't move.

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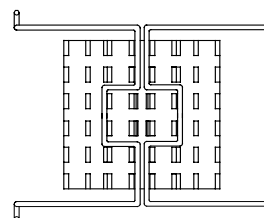
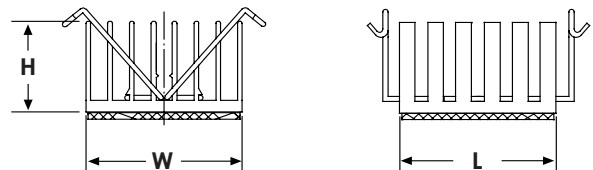
## FEATURES AND BENEFITS

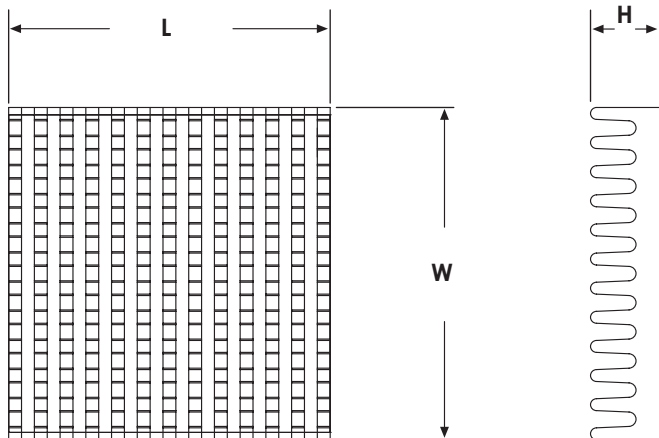
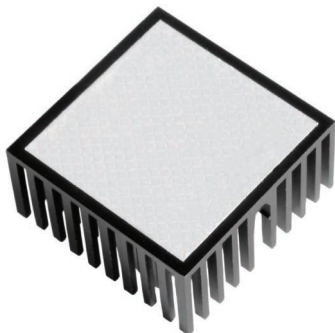
- New unique wire clip design allows for complete reworkability after assembly without damage to the BGA package or PC Board
- Configurations are available for a wide range of BGA package sizes
- Minimal PC Board real estate is required for mounting
- Solder Anchors provide the most rugged mounting in the industry
- Each Heat Sink utilizes a phase change pad as the interface for optimal thermal performance.

Drawing represents those heat sinks requiring 2 solder anchors



Drawing represents heat sink part numbers  
 10-BRD1-03 and 10-BRD1-05 that require 4 solder anchors





## FEATURES AND BENEFITS

- Configurations are available for a wide range of BGA package sizes
- Tape mounted versions eliminate the need for mounting holes in the PC Board
- These Heat Sinks can be used with either plastic or metal/ceramic BGA Packages
- These Heat Sinks are compatible with Ther-a-grip tapes

| Part Number         | Width       | Length      | Height      | * $\theta_n$ | * $\theta_f$ | Surface        |          |
|---------------------|-------------|-------------|-------------|--------------|--------------|----------------|----------|
| 375324B00035        | 10.2        | 10.2        | 10.2        | 71.4         | 21.20        | Plastic        | B        |
| 375224B00032        | 10.2        | 11.1        | 10.2        | 71.4         | 21.20        | Metal          | B        |
| 375424B00034        | 15.2        | 15.2        | 6.4         | 62.5         | 17.60        | Plastic        | B        |
| 374024B00032        | 23.0        | 23.0        | 10.0        | 40.0         | 11.69        | Metal          | B        |
| <b>374024B00035</b> | <b>23.0</b> | <b>23.0</b> | <b>10.0</b> | <b>40.0</b>  | <b>11.69</b> | <b>Plastic</b> | <b>B</b> |
| 374124B00032        | 23.0        | 23.0        | 18.0        | 23.4         | 7.39         | Metal          | B        |
| <b>374124B00035</b> | <b>23.0</b> | <b>23.0</b> | <b>18.0</b> | <b>23.4</b>  | <b>7.39</b>  | <b>Plastic</b> | <b>B</b> |
| 374224B00032        | 23.0        | 23.0        | 25.0        | 19.7         | 6.37         | Metal          | B        |
| 374224B00035        | 23.0        | 23.0        | 25.0        | 19.7         | 6.37         | Plastic        | B        |
| 335224B00032        | 25.0        | 25.0        | 9.9         | 34.0         | 10.39        | Metal          | B        |
| 335224B00034        | 25.0        | 25.0        | 9.9         | 34.0         | 10.39        | Plastic        | B        |
| 335324B00032        | 26.9        | 26.9        | 11.4        | 27.7         | 8.71         | Metal          | B        |
| 374324B00032        | 27.0        | 27.0        | 10.0        | 30.6         | 9.35         | Metal          | B        |
| <b>374324B00035</b> | <b>27.0</b> | <b>27.0</b> | <b>10.0</b> | <b>30.6</b>  | <b>9.35</b>  | <b>Plastic</b> | <b>B</b> |
| 374424B00032        | 27.0        | 27.0        | 18.0        | 20.3         | 6.46         | Metal          | B        |
| <b>374424B00035</b> | <b>27.0</b> | <b>27.0</b> | <b>18.0</b> | <b>20.3</b>  | <b>6.46</b>  | <b>Plastic</b> | <b>B</b> |
| 374524B00032        | 27.0        | 27.0        | 25.0        | 16.5         | 5.47         | Metal          | B        |
| 374524B00035        | 27.0        | 27.0        | 25.0        | 16.5         | 5.47         | Plastic        | B        |
| 373024B00032        | 27.9        | 27.9        | 8.9         | 33.3         | 10.00        | Metal          | B        |
| 373024B00034        | 27.9        | 27.9        | 8.9         | 33.3         | 10.00        | Plastic        | B        |
| 373224M00032        | 28.0        | 28.0        | 6.0         | 44.1         | 13.13        | Metal          | M        |
| 2327B-CP50          | 27.9        | 28.1        | 15.2        | 23.4         | 7.43         | Plastic        | B        |
| 2327B-TACH          | 27.9        | 28.1        | 15.2        | 23.4         | 7.43         | Metal          | B        |
| 335724B00032        | 30.1        | 30.1        | 6.6         | 35.7         | 10.84        | Metal          | B        |
| 335824B00032        | 30.0        | 30.0        | 9.4         | 29.4         | 9.11         | Metal          | B        |

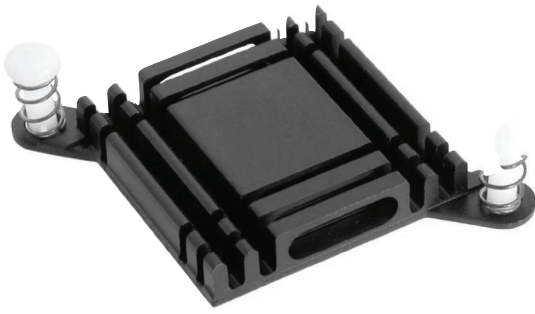
| Part Number         | Width       | Length      | Height      | * $\theta_n$ | * $\theta_f$ | Surface        | *Finish  |
|---------------------|-------------|-------------|-------------|--------------|--------------|----------------|----------|
| <b>335824B00034</b> | <b>30.0</b> | <b>30.0</b> | <b>9.4</b>  | <b>29.4</b>  | <b>9.11</b>  | <b>Plastic</b> | <b>B</b> |
| 2338B-TACH          | 33.0        | 31.4        | 12.5        | 23.1         | 7.23         | Metal          | B        |
| <b>371824B00032</b> | <b>35.0</b> | <b>35.0</b> | <b>7.0</b>  | <b>31.9</b>  | <b>9.67</b>  | <b>Metal</b>   | <b>B</b> |
| <b>371824B00034</b> | <b>35.0</b> | <b>35.0</b> | <b>7.0</b>  | <b>31.9</b>  | <b>9.67</b>  | <b>Plastic</b> | <b>B</b> |
| <b>374624B00032</b> | <b>35.0</b> | <b>35.0</b> | <b>10.0</b> | <b>23.4</b>  | <b>7.55</b>  | <b>Metal</b>   | <b>B</b> |
| <b>374624B00035</b> | <b>35.0</b> | <b>35.0</b> | <b>10.0</b> | <b>23.4</b>  | <b>7.55</b>  | <b>Plastic</b> | <b>B</b> |
| <b>374724B00032</b> | <b>35.0</b> | <b>35.0</b> | <b>18.0</b> | <b>15.3</b>  | <b>5.15</b>  | <b>Metal</b>   | <b>B</b> |
| <b>374724B00035</b> | <b>35.0</b> | <b>35.0</b> | <b>18.0</b> | <b>15.3</b>  | <b>5.15</b>  | <b>Plastic</b> | <b>B</b> |
| 374824B00032        | 35.0        | 35.0        | 25.0        | 12.0         | 4.27         | Metal          | B        |
| 374824B00035        | 35.0        | 35.0        | 25.0        | 12.0         | 4.27         | Plastic        | B        |
| 372024B00032        | 35.0        | 35.0        | 27.9        | 11.9         | 4.28         | Metal          | B        |
| 372024B00034        | 35.0        | 35.0        | 27.9        | 11.9         | 4.28         | Plastic        | B        |
| <b>373324M00032</b> | <b>37.4</b> | <b>37.4</b> | <b>6.0</b>  | <b>32.6</b>  | <b>9.91</b>  | <b>Metal</b>   | <b>M</b> |
| <b>374924B00032</b> | <b>40.0</b> | <b>40.0</b> | <b>10.0</b> | <b>20.3</b>  | <b>6.46</b>  | <b>Metal</b>   | <b>B</b> |
| 374924B00035        | 40.0        | 40.0        | 10.0        | 20.3         | 6.46         | Plastic        | B        |
| <b>364424B00032</b> | <b>40.1</b> | <b>40.0</b> | <b>11.4</b> | <b>18.4</b>  | <b>6.02</b>  | <b>Metal</b>   | <b>B</b> |
| 364424B00034        | 40.1        | 40.0        | 11.4        | 18.4         | 6.02         | Plastic        | B        |
| <b>375024B00032</b> | <b>40.0</b> | <b>40.0</b> | <b>18.0</b> | <b>12.2</b>  | <b>4.34</b>  | <b>Metal</b>   | <b>B</b> |
| 375024B00035        | 40.0        | 40.0        | 18.0        | 12.2         | 4.34         | Plastic        | B        |
| 375124B00032        | 40.0        | 40.0        | 25.0        | 10.3         | 3.83         | Metal          | B        |
| 375124B00035        | 40.0        | 40.0        | 25.0        | 10.3         | 3.83         | Plastic        | B        |
| 2321B-TACH          | 43.2        | 41.3        | 8.9         | 22.1         | 6.93         | Metal          | B        |
| 2332B-TACH          | 43.2        | 41.3        | 16.5        | 12.9         | 4.53         | Metal          | B        |
| 2342B-TACH          | 45.7        | 44.6        | 7.0         | 23.1         | 7.26         | Metal          | B        |

\* See bottom of page 4 for information on how to use this table

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## PUSH PIN ATTACHMENT METHOD

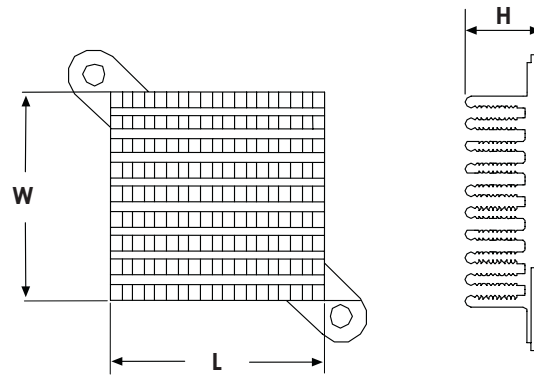


| Part Number         | Width       | Length      | Height      | *θn         | *θf         | *Finish  | *Fig.    |
|---------------------|-------------|-------------|-------------|-------------|-------------|----------|----------|
| 10-6326-27          | 28.0        | 28.0        | 6.0         | 44.1        | 13.13       | B        | C        |
| 10-6326-28          | 28.0        | 28.0        | 6.0         | 44.1        | 13.13       | B        | C        |
| <b>10-6327-01</b>   | <b>28.5</b> | <b>28.5</b> | <b>10.0</b> | <b>30.6</b> | <b>9.26</b> | <b>B</b> | <b>C</b> |
| 10-TNT2-01          | 36.1        | 48.0        | 11.6        | 18.8        | 6.13        | B        | F        |
| 10-5597-02          | 37.4        | 37.4        | 6.0         | 33.3        | 9.91        | M        | D        |
| 10-5597-22          | 37.4        | 37.4        | 6.0         | 33.3        | 9.91        | M        | D        |
| 10-5597-33          | 37.4        | 37.4        | 6.0         | 33.3        | 9.91        | M        | D        |
| 10-5607-04          | 37.4        | 37.4        | 10.0        | 22.1        | 6.99        | B        | D        |
| 10-5607-05          | 37.4        | 37.4        | 10.0        | 22.1        | 6.99        | B        | D        |
| <b>372924M02000</b> | <b>37.4</b> | <b>37.4</b> | <b>6.0</b>  | <b>32.6</b> | <b>9.91</b> | <b>M</b> | <b>D</b> |
| 10-L4LB-03          | 41.4        | 45.2        | 11.7        | 16.7        | 5.60        | B        | E        |
| 10-L4LB-05          | 41.4        | 45.2        | 11.7        | 16.7        | 5.60        | B        | E        |
| <b>10-L4LB-11</b>   | <b>41.4</b> | <b>45.2</b> | <b>11.7</b> | <b>14.2</b> | <b>4.91</b> | <b>B</b> | <b>E</b> |

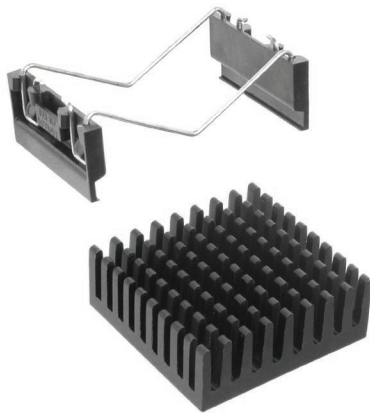
\* See bottom of page 4 for information on how to use this table  
Refer to page 4 for PCB hole Patterns

## FEATURES AND BENEFITS

- Configurations are available for a wide range of BGA Package sizes
- All Heat Sinks utilize industry standard hole patterns
- Plastic push pins are standard. Consult Aavid Thermalloy for versions available with brass push pins for more rugged applications
- Each Heat Sink utilizes a Phase Change Pad as the interface for Optimal Thermal Performance
- Minimal diameter holes are necessary for mounting to PC Board



## CLIP ATTACHMENT METHOD

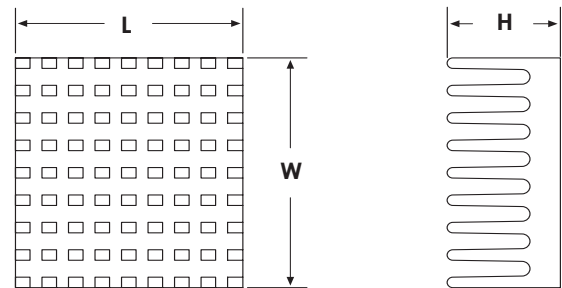


| Part Number            | Width       | Length      | Height      | *θn         | *θf         | *Finish  |
|------------------------|-------------|-------------|-------------|-------------|-------------|----------|
| 2317B-EP11-BGS1        | 26.1        | 20.5        | 15.2        | 32.6        | 9.94        | B        |
| 2518B-EP11-BGS2        | 30.5        | 28.1        | 15.6        | 22.7        | 7.05        | B        |
| <b>2519B-EP11-BGS5</b> | <b>34.5</b> | <b>31.4</b> | <b>15.6</b> | <b>19.7</b> | <b>6.30</b> | <b>B</b> |
| <b>2522B-EP04-BGS5</b> | <b>38.1</b> | <b>38.0</b> | <b>10.2</b> | <b>22.1</b> | <b>6.94</b> | <b>B</b> |
| 2520B-EP04-BGS5        | 38.1        | 38.0        | 15.6        | 15.6        | 5.17        | B        |

\* See bottom of page 4 for information on how to use this table

## FEATURES AND BENEFITS

- A unique clip eliminates the need for mounting holes in the PC Board
- Each Heat Sink utilizes a Phase Change Pad as the interface for optimal thermal performance
- The clips unique design eliminates the need for thermal tape attachment
- The Clips are available in industry standard sizes to fit a wide variety of BGA package sizes



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# PCB HOLE PATTERNS

FIGURE A

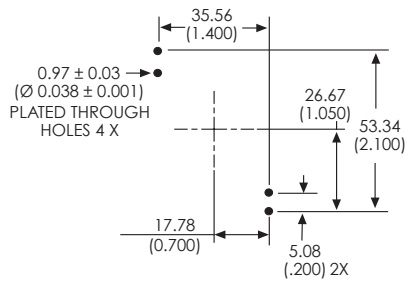


FIGURE B

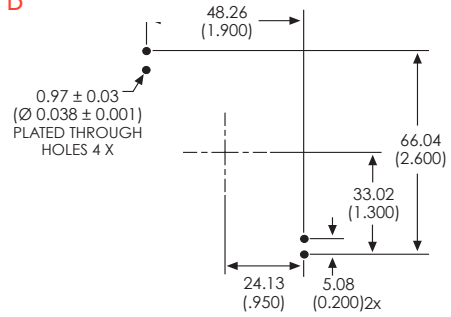


FIGURE C

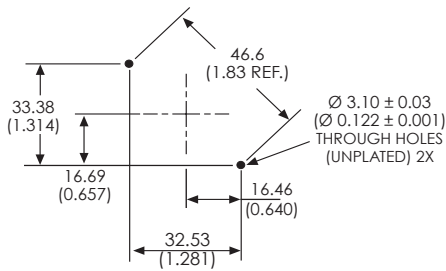


FIGURE D

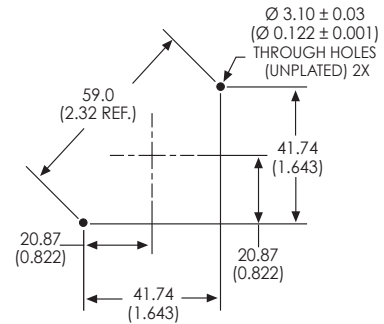


FIGURE E

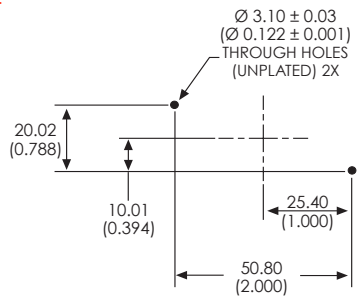


FIGURE F

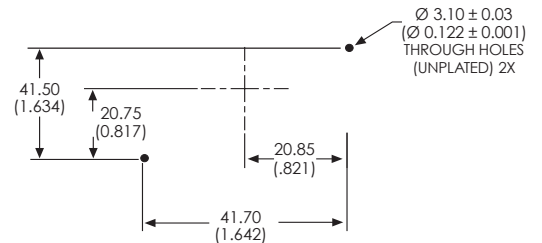


FIGURE G

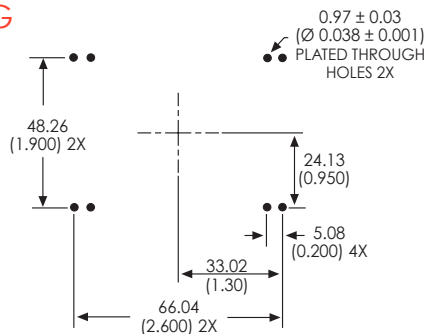


FIGURE H

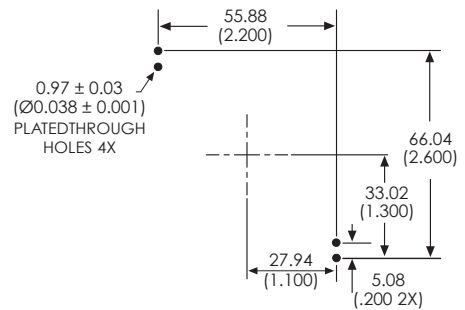
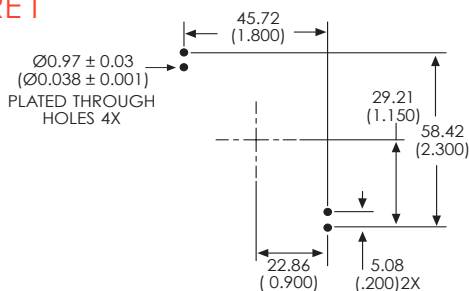


FIGURE I



## TABLE GUIDE

Dimensions are in mm

$\theta_n$  = Natural convection thermal resistance based on a 75°C heat sink temperature rise

$\theta_f$  = Forced convection thermal resistance based on an entering 1.0 m/s (200 lfm) airflow

Finish: B = Black Anodize, M = Green Anodize, N = Clear Anodize



# AAVID THERMALLOY

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80 Commercial Street  
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TEL: (603) 224-9988 FAX: (603) 223-1790

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Direct +86 (21) 6401-6692

Email [amall@ameya360.com](mailto:amall@ameya360.com)

QQ 800077892

Skype [ameyasales1](#) [ameyasales2](#)

➤ Customer Service :

Email [service@ameya360.com](mailto:service@ameya360.com)

➤ Partnership :

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