

## 900 Series

Wakefield-Vette's 900 Series Heat Sinks for Chipset can match up to devices from Intel, Broadcom, Xilinx, TI, Motorola, ATI, AMD, Nvidia, Vishay, Powerex, Infineon, Microsemi, and many more.

These heat sinks are designed for air flow applications in the Telecom, Data Center, Networking, Cloud Computing, and many more Industries.

**Material:** AL 6063

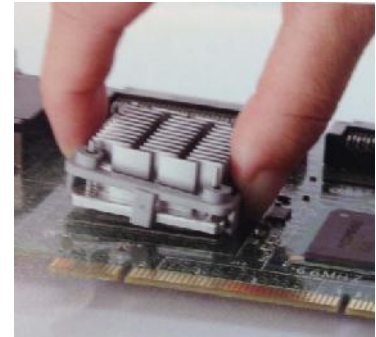
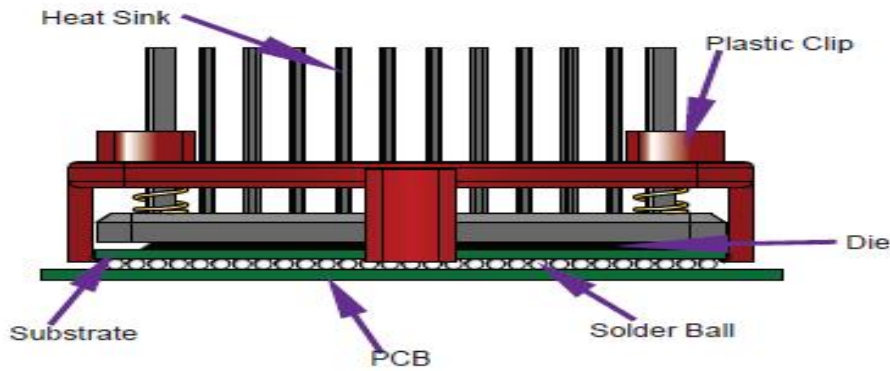
**Finish:** Black Anodize



| SERIES | Height | CHIP SIZE | FORCED CONVECTION  |          |           | SERIES | HEIGHT   | CHIP SIZE | FORCED CONVECTION |                    |          |          |
|--------|--------|-----------|--------------------|----------|-----------|--------|----------|-----------|-------------------|--------------------|----------|----------|
|        |        |           | NATURAL CONVECTION | 200 LFM  | 400 LFM   |        |          |           | 600 LFM           | NATURAL CONVECTION | 200 LFM  | 400 LFM  |
| 901    | 12     | 19mm      | 14.77 C/W          | 6.63 C/W | 5.09 C/W  | 906    | 12       | 31mm      | 12.02 C/W         | 3.37 C/W           | 2.25 C/W | 1.87 C/W |
|        | 15     | 19mm      | 14 C/W             | 6.12 C/W | 4.63 C/W  |        | 15       | 31mm      | 11.43 C/W         | 3.13 C/W           | 2.02 C/W | 1.66 C/W |
|        | 18     | 19mm      | 13.23 C/W          | 5.67 C/W | 4.17 C/W  |        | 18       | 31mm      | 10.85 C/W         | 2.85 C/W           | 1.79 C/W | 1.45 C/W |
|        | 21     | 19mm      | 12.46 C/W          | 5.28 C/W | 3.87 C/W  |        | 21       | 31mm      | 10.27 C/W         | 2.63 C/W           | 1.63 C/W | 1.31 C/W |
|        | 23     | 19mm      | 11.98 C/W          | 4.89 C/W | 3.58 C/W  |        | 23       | 31mm      | 9.88 C/W          | 2.44 C/W           | 1.5 C/W  | 1.19 C/W |
|        | 28     | 19mm      | 11.5 C/W           | 4.38 C/W | 3.26 C/W  |        | 28       | 31mm      | 8.93 C/W          | 2.21 C/W           | 1.36 C/W | 1.05 C/W |
| 902    | 33     | 19mm      | 9.57 C/W           | 4.04 C/W | 2.98 C/W  | 33     | 31mm     | 7.98 C/W  | 2.02 C/W          | 1.19 C/W           | .93 C/W  |          |
|        | 12     | 21mm      | 14.31 C/W          | 5.81 C/W | 3.86 C/W  | 907    | 12       | 33mm      | 11.56 C/W         | 3.23 C/W           | 2.09 C/W | 1.73 C/W |
|        | 15     | 21mm      | 13.57 C/W          | 5.3 C/W  | 3.5 C/W   |        | 15       | 33mm      | 11 C/W            | 2.97 C/W           | 1.88 C/W | 1.54 C/W |
|        | 18     | 21mm      | 12.83 C/W          | 4.95 C/W | 3.35 C/W  |        | 18       | 33mm      | 10.45 C/W         | 2.69 C/W           | 1.7 C/W  | 1.37 C/W |
|        | 21     | 21mm      | 12.09 C/W          | 4.61 C/W | 3.111 C/W |        | 21       | 33mm      | 9.9 C/W           | 2.5 C/W            | 1.52 C/W | 1.22 C/W |
|        | 23     | 21mm      | 11.63 C/W          | 4.32 C/W | 2.91 C/W  |        | 23       | 33mm      | 9.54 C/W          | 2.3 C/W            | 1.37 C/W | 1.08 C/W |
| 28     | 21mm   | 10.47 C/W | 3.89 C/W           | 2.61 C/W | 28        |        | 33mm     | 8.62 C/W  | 2.08 C/W          | 1.23 C/W           | .98 C/W  |          |
| 903    | 33     | 21mm      | 9.3 C/W            | 3.57 C/W | 2.37 C/W  | 33     | 33mm     | 7.71 C/W  | 1.89 C/W          | 1.08 C/W           | .86 C/W  |          |
|        | 12     | 23mm      | 13.85 C/W          | 4.75 C/W | 3.31 C/W  | 908    | 12       | 35mm      | 11.1 C/W          | 3.07 C/W           | 2.07 C/W | 1.64 C/W |
|        | 15     | 23mm      | 13.14 C/W          | 4.38 C/W | 3.05 C/W  |        | 15       | 35mm      | 10.58 C/W         | 2.79 C/W           | 1.87 C/W | 1.46 C/W |
|        | 18     | 23mm      | 12.44 C/W          | 4.07 C/W | 2.81 C/W  |        | 18       | 35mm      | 10.06 C/W         | 2.54 C/W           | 1.69 C/W | 1.27 C/W |
|        | 21     | 23mm      | 11.73 C/W          | 3.84 C/W | 2.57 C/W  |        | 21       | 35mm      | 9.53 C/W          | 2.35 C/W           | 1.52 C/W | 1.15 C/W |
|        | 23     | 23mm      | 11.28 C/W          | 3.59 C/W | 2.4 C/W   |        | 23       | 35mm      | 8.75 C/W          | 2.13 C/W           | 1.35 C/W | 1.01 C/W |
| 28     | 23mm   | 10.16 C/W | 3.22 C/W           | 2.17 C/W | 28        |        | 35mm     | 7.93 C/W  | 1.94 C/W          | 1.19 C/W           | .86 C/W  |          |
| 904    | 33     | 23mm      | 9.04 C/W           | 2.93 C/W | 1.95 C/W  | 33     | 35mm     | 7.11 C/W  | 1.69 C/W          | 1.02 C/W           | .72 C/W  |          |
|        | 12     | 27mm      | 12.93 C/W          | 4.34 C/W | 3 C/W     | 909    | 12       | 37.5mm    | 10.52 C/W         | 3.11 C/W           | 2.01 C/W | 1.61 C/W |
|        | 15     | 27mm      | 12.29 C/W          | 4.05 C/W | 2.76 C/W  |        | 15       | 37.5mm    | 10.04 C/W         | 2.82 C/W           | 1.79 C/W | 1.41 C/W |
|        | 18     | 27mm      | 11.64 C/W          | 3.73 C/W | 2.5 C/W   |        | 18       | 37.5mm    | 9.56 C/W          | 2.59 C/W           | 1.59 C/W | 1.22 C/W |
|        | 21     | 27mm      | 11 C/W             | 3.43 C/W | 2.31 C/W  |        | 21       | 37.5mm    | 9.08 C/W          | 2.38 C/W           | 1.41 C/W | 1.06 C/W |
|        | 23     | 27mm      | 10.58 C/W          | 3.21 C/W | 2.11 C/W  |        | 23       | 37.5mm    | 8.75 C/W          | 2.15 C/W           | 1.24 C/W | .94 C/W  |
| 28     | 27mm   | 9.54 C/W  | 2.89 C/W           | 1.84 C/W | 28        |        | 37.5mm   | 7.93 C/W  | 1.88 C/W          | 1.08 C/W           | .8 C/W   |          |
| 905    | 33     | 27mm      | 8.51 C/W           | 2.62 C/W | 1.66 C/W  | 33     | 37.5mm   | 7.11 C/W  | 1.64 C/W          | .93 C/W            | .68 C/W  |          |
|        | 12     | 29mm      | 12.47 C/W          | 4.09 C/W | 2.74 C/W  | 910    | 12       | 40mm      | 9.95 C/W          | 3.09 C/W           | 1.93 C/W | 1.56 C/W |
|        | 15     | 29mm      | 11.86 C/W          | 3.81 C/W | 2.52 C/W  |        | 15       | 40mm      | 9.51 C/W          | 2.77 C/W           | 1.73 C/W | 1.37 C/W |
|        | 18     | 29mm      | 11.25 C/W          | 3.56 C/W | 2.31 C/W  |        | 18       | 40mm      | 9.06 C/W          | 2.74 C/W           | 1.52 C/W | 1.17 C/W |
|        | 21     | 29mm      | 10.63 C/W          | 3.3 C/W  | 2.12 C/W  |        | 21       | 40mm      | 8.62 C/W          | 2.22 C/W           | 1.35 C/W | .99 C/W  |
|        | 23     | 29mm      | 10.23 C/W          | 3.06 C/W | 1.91 C/W  |        | 23       | 40mm      | 8.3 C/W           | 2.01 C/W           | 1.19 C/W | .87 C/W  |
| 28     | 29mm   | 9.24 C/W  | 2.72 C/W           | 1.69 C/W | 28        |        | 40mm     | 7.55 C/W  | 1.8 C/W           | 1.04 C/W           | .75 C/W  |          |
| 33     | 29mm   | 8.24 C/W  | 2.47 C/W           | 1.49 C/W | 33        | 40mm   | 6.78 C/W | 1.61 C/W  | .88 C/W           | .64 C/W            |          |          |

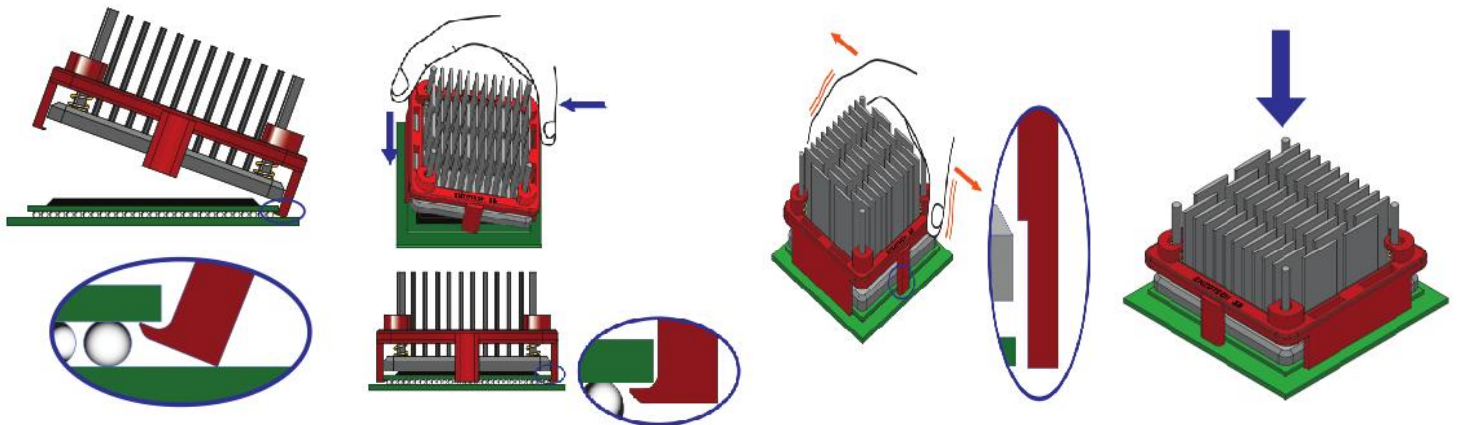
| Series | Chip Size | Construction      | Height    | Chip Height | Finish      | Interface |
|--------|-----------|-------------------|-----------|-------------|-------------|-----------|
| 901-   | 19-       | 1-                | 12-       | 1-          | B-          | 1         |
| XXX    | XX        | X                 | XX        | X           | X           | X         |
| 901    | 19        | 1= Elliptical Fin | 12 = 11.6 | 1 = .9-2.1  | B = BLK ANO | 0 = None  |
| 902    | 21        | 2= Pin Fin        | 15 = 14.6 | 2 = 2.2-3.4 |             | 1 = T725  |
| 903    | 23        |                   | 18 = 17.6 |             |             |           |
| 904    | 27        |                   | 21 = 20.6 |             |             |           |
| 905    | 29        |                   | 23 = 22.6 |             |             |           |
| 906    | 31        |                   | 28 = 27.6 |             |             |           |
| 907    | 33        |                   | 33 = 32.6 |             |             |           |
| 908    | 35        |                   |           |             |             |           |
| 909    | 37.5      |                   |           |             |             |           |
| 910    | 40        |                   |           |             |             |           |

Thermal Cooling Solutions from Smart to Finish



Wakefield-Vette's heat sink assembles onto chip set using the space that is between the PCB and the substrate of the solder balls. The solder balls provide a minimal gap of .5mm to .7mm. Attachment feature is below a .4mm thickness. The clipping system will not interfere or damage chip. Contact area is the edge of chip.

### ASSEMBLY INSTRUCTION:



**Step 1:** Hook the clip under one side of the BGA chip set.

**Step 2:** Rotate assembly down until opposite side clip engages substrate edge of BGA chip set.

**Step 3:** Make sure the solder rods are clearing from edges of BGA chip set.

**Step 4:** Press firmly down to make sure clips fully engage edges of chip set. Heat Sink should not move around easily.

### Random Vibration Test

Frequency : 5 Hz to 500 Hz  
 Acceleration : 3.13 grms  
 P.S.D : 0.01 g<sup>2</sup>/HZ (5 Hz)  
 0.02 g<sup>2</sup>/HZ (20 Hz to 500 Hz)  
 Test Axis : X, Y, Z axis  
 Test Time : 10 mins (Each axis)  
 Total Test Time : 30 mins

### SHOCK TEST SPECIFICATION :

Wave Form : Half sine wave  
 Acceleration : 50 g  
 Duration Time : 11 ms  
 No. of Shock : Each axis 3 times  
 Shock Direction : ±X, ±Y, ±Z axis  
 Reliability & Communication  
 Testing Instruments