



Surface Mountable Heat Sinks

Smart Heatsinks (SHS) offers the patented, low cost surface mounted heat sinks to meet the challenging in compact circuit design, cooling and small space. The new heat sinks comprise an extruded heat sink body and solderable feet named “Rollers” which are mated mechanically to the heat sink body by forging to reduce the interface thermal resistance between the feet and heat dissipation body. These types of heat sinks are suitable for SMT power semiconductor devices in D-PAK(T-252), D² PAK(T-263), D³ PAK(T-268) and SO-10 packages with either natural or forced convection cooling.

Their unique design removes heat indirectly through conduction without making contact with the SMT device like traditional through hole solutions. The semiconductor’s conventional copper drain pad is modified to extend beyond the edges of the semiconductor package providing space to mount the heat sink. The device and heat sink are soldered directly to the modified drain pad (0.65mm or 0.025” thick) creating a thermal transfer path from the package tab to the surface mount heat sink. Unlike any others, our heat sinks have 5 times surface areas as that of those on market, and have either black or silver body colors.

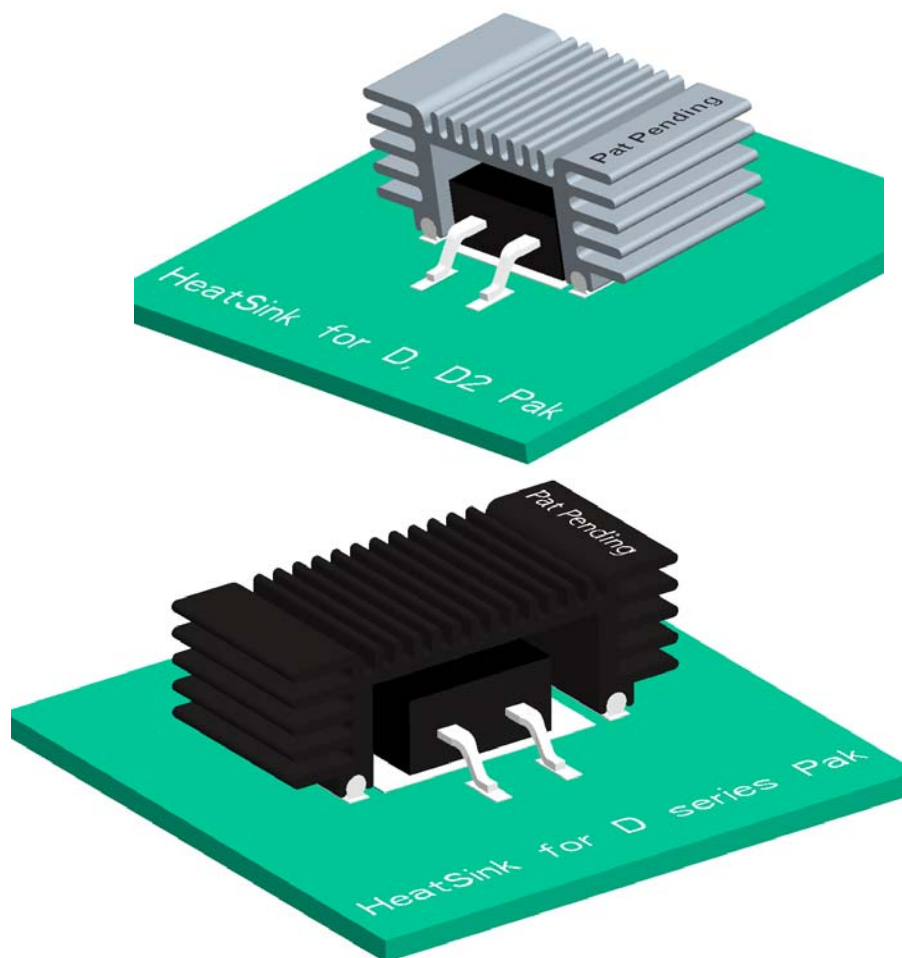


Fig. 1 Smart Heatsinks Surface Mounting Heat Sinks (Patent Pending)



Features and Benefits

- **Minimum assembly cost and labor**
Assembly can be picked & placed to eliminate manual stuffing.
- **Compatibility**
Compatible with both tin-lead and lead-free (Sn/Ag/Cu) solders
- **Maximum Thermal Transfer**
Unique design maximizes the surface areas, increases thermal transfer rate with convection cooling. Black anodized heat sink body maximizes the radiation cooling.
- **Simplicity**
No attachment holes required in the printed circuit board
- **Design Flexibility**
Wing configuration allows lower profile components placed to maximize PCB area usage.

Materials:

Heat Sink: Extruded: Aluminum Alloy 6063-T5 per ASTN B221 or equivalents

Sold Feet: Copper Rod or Wire

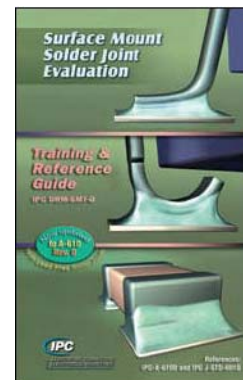
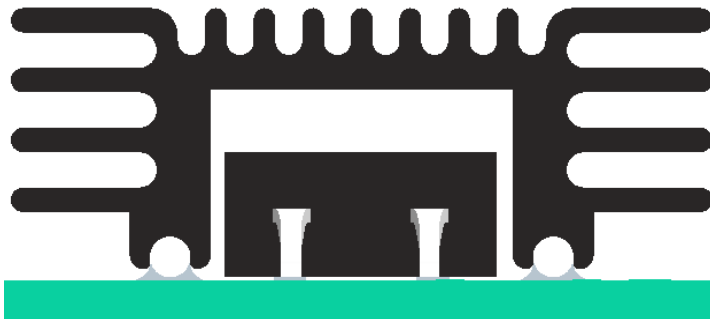
Finish:

Heat Sink: Degreased or Black Anodize per Mil-8625, Type II, Class 2

Sold Feet: 100% Tin Plated per Mil-10727C, Type I

Compliance:

RoSH . IPC-1720A and IPC-S-816



**Solder Joints Complained with IPC – 1720A and IPC – S – 816
For Surface Mounting Components**



Products Applications and Specifications

<p>P/N: SHS-D3-101() for D³-Pak (T-268)</p>	<p>Thermal Performance</p>																								
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Analysis Data for SHS- D3-101 Heat Sink with D³ Power Resistor					
Power Dissipations (W)	2.0	4.0	6.0	8.0	10.0
Air Velocity (Feet per Minute)	200	400	600	800	1000
Mounting Surface Temp (°C)	48.7	54.7	59.2	63.2	67.1
Case Temp (°C)	50.1	57.7	63.6	69.2	74.6
Mounting Surf Temp Rise above Ambient (°C)	23.7	29.7	34.2	38.2	42.1
Case Temp Rise above Ambient (°C)	25.1	32.7	38.6	44.2	49.6
Thermal res. Frm. MTG Surf to Ambient (°C/W)	11.85	7.43	5.70	4.78	4.21
<i>Ambient temperature 25 °C, D³ Package, drain pad .65mm (.026") thick copper, tin plated</i>					



<p>P/N: SHS-D2- 101-() for D²-Pak (T-263)</p>	<p style="text-align: center;">Thermal Performance</p> <table border="1" style="display: none;"> <caption>Thermal Performance Data</caption> <thead> <tr> <th>Heat Dissipated (W)</th> <th>Air Velocity (FPM)</th> <th>Case Temp Rise Above Ambient (°C)</th> <th>Thermal Resistance From MTG Surface to Ambient (°C/W)</th> </tr> </thead> <tbody> <tr><td>2.0</td><td>200</td><td>29.7</td><td>14.2</td></tr> <tr><td>4.0</td><td>400</td><td>39.0</td><td>9.08</td></tr> <tr><td>6.0</td><td>600</td><td>46.3</td><td>7.02</td></tr> <tr><td>8.0</td><td>800</td><td>52.8</td><td>5.89</td></tr> <tr><td>10.0</td><td>1000</td><td>58.9</td><td>5.18</td></tr> </tbody> </table>	Heat Dissipated (W)	Air Velocity (FPM)	Case Temp Rise Above Ambient (°C)	Thermal Resistance From MTG Surface to Ambient (°C/W)	2.0	200	29.7	14.2	4.0	400	39.0	9.08	6.0	600	46.3	7.02	8.0	800	52.8	5.89	10.0	1000	58.9	5.18
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Analysis Data for SHS-D2-101 Heat Sink with D² Power Resistor					
Power Dissipations (W)	2.0	4.0	6.0	8.0	10.0
Air Velocity (Feet per Minute)	200	400	600	800	1000
Mounting Surface Temp (°C)	53.4	61.3	67.1	72.1	76.8
Case Temp (°C)	54.7	64.0	71.3	77.8	83.9
Mounting Surf Temp Rise above Ambient (°C)	28.4	36.3	42.1	47.1	51.8
Case Temp Rise above Ambient (°C)	29.7	39.0	46.3	52.8	58.9
Thermal res frm MTG Surf to Ambient (°C/W)	14.2	9.08	7.02	5.89	5.18
<i>Ambient temperature 25 °C, D² Package, drain pad .65mm (.026”) thick copper, tin plated</i>					

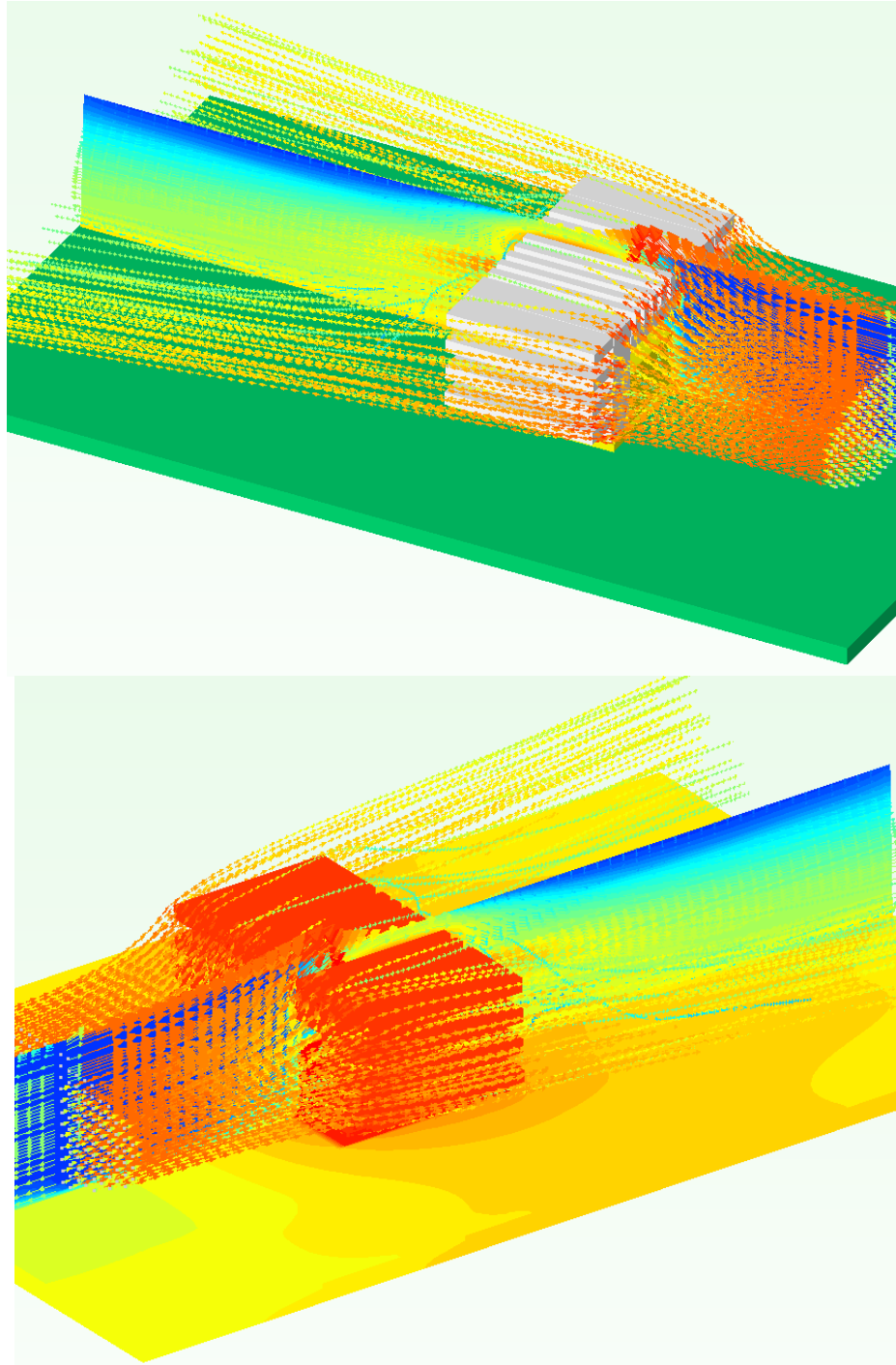


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Analysis Data for SHS-D2-101 Heat Sink with D Power Resistor					
Power Dissipations (W)	2.0	4.0	6.0	8.0	10.0
Air Velocity (Feet per Minute)	200	400	600	800	1000
Mounting Surface Temp (°C)	53.2	61.1	66.7	71.6	76.2
Case Temp (°C)	54.3	63.5	70.5	76.8	82.7
Mounting Surf Temp Rise above Ambient (°C)	28.4	36.3	42.1	47.1	51.8
Case Temp Rise above Ambient (°C)	29.7	39.0	46.3	52.8	58.9
Thermal res frm MTG Surf to Ambient (°C/W)	14.2	9.08	7.02	5.89	5.18
<i>Ambient temperature 25 °C, D Package, drain pad .65mm (.026”) thick copper, tin plated</i>					



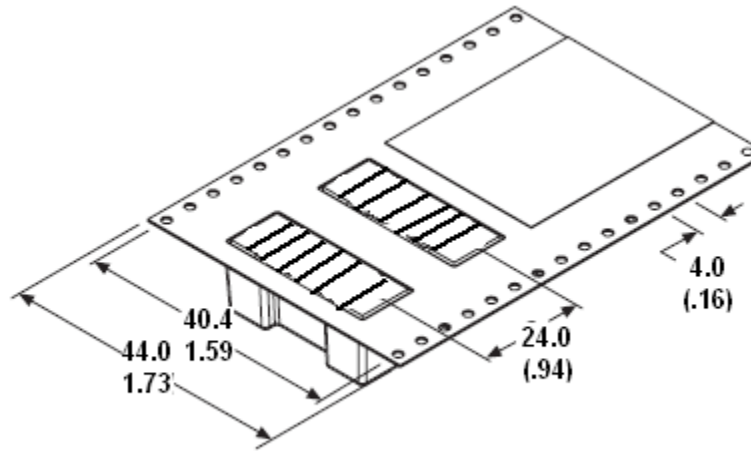
Thermal Analyses and CFD Simulations





Packaging Information

Tape and Reel



Box Packaging

Small Box (SB) – 100 pcs per Box

Medium Box (MB) – 500 pcs per Box

Large Box (LB) – 1000 pcs per Box

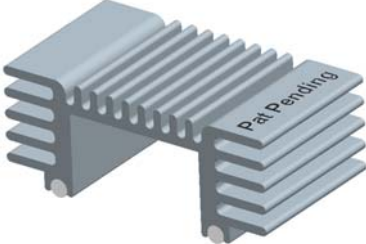



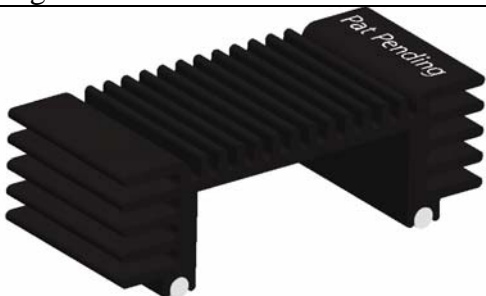

(For 5000+ pcs per order, there will be huge discount, please contact our sales Dept.)

Ordering Information

Part Number	Descriptions	Packaging
SHS-D2-101-SB	SMT Heat sink for D & D2, no finish	Bulk 100 per box
SHS-D2-101-B-SB	SMT Heat sink for D & D2, black anodized finish	Bulk 100 per box
SHS-D2-101-MB	SMT Heat sink for D & D2, no finish	Bulk 500 per box
SHS-D2-101-B-MB	SMT Heat sink for D & D2, black anodized finish	Bulk 500 per box
SHS-D2-101-LB	SMT Heat sink for D & D2, no finish	Bulk 1000 per box
SHS-D2-101-B-LB	SMT Heat sink for D & D2, black anodized finish	Bulk 1000 per box
SHS-D2-101-TR	SMT Heat sink for D & D2, no finish	13" Reel 250/reel
SHS-D2-101-B-TR	SMT Heat sink for D & D2, black anodized finish	13" Reel 250/reel
SHS-D3-101-SB	SMT Heat sink for D3, no finish	Bulk 100 per box
SHS-D3-101-B-SB	SMT Heat sink for D3, black anodized finish	Bulk 100 per box
SHS-D3-101-MB	SMT Heat sink for D3, no finish	Bulk 500 per box
SHS-D3-101-B-MB	SMT Heat sink for D3, black anodized finish	Bulk 500 per box
SHS-D3-101-LB	SMT Heat sink for D3, no finish	Bulk 1000 per box
SHS-D3-101-B-LB	SMT Heat sink for D3, black anodized finish	Bulk 1000 per box
SHS-D3-101-TR	SMT Heat sink for D3, no finish	13" Reel 250/reel
SHS-D3-101-B-TR	SMT Heat sink for D3, black anodized finish	13" Reel 250/reel



Heat Sink Comparisons

Smart Heatsinks	Comparison	Aavid, Wakefield & others
 <p>D Pak Heat Sink</p>	Vs.	 <p>D Pak Heat Sink</p>
Surface Areas	5 times	Surface Areas
Thermal Performance	Up to 500%	Thermal Performance
Radiation Improvement	Up to 130%	Radiation Improvement
Cost	~	Cost
Footprint	>	Footprint
Height	=	Height
 <p>D² Pak Heat Sink</p>	Vs.	 <p>D² Pak Heat Sink</p>
Surface Areas	3 times	Surface Areas
Thermal Performance	Up to 300%	Thermal Performance
Cost	<	Cost
Footprint	=	Footprint
Height	=	Height
 <p>D³ Pak Heat Sink</p>	Vs.	 <p>D³ Pak Heat Sink</p>
Surface Areas	3 times	Surface Areas
Radiation Improvement	Up to 130%	Radiation Improvement
Thermal Performance	Up to 350%	Thermal Performance
Cost	~	Cost
Footprint	=	Footprint
Height	=	Height