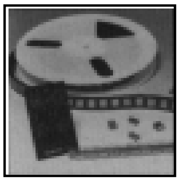
BOARD LEVEL POWER SEMICONDUCTOR HEAT SINKS



PATENT 361317

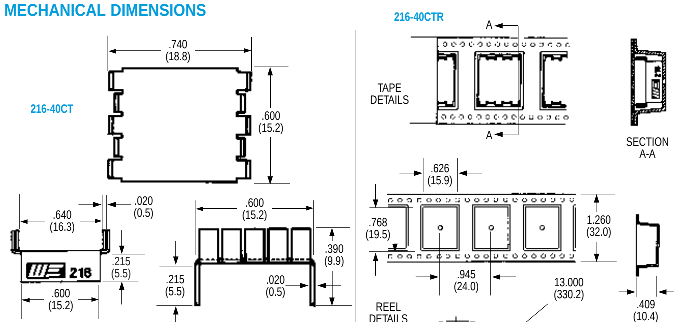
216 SERIES *Surface Mount Heat Sinks*

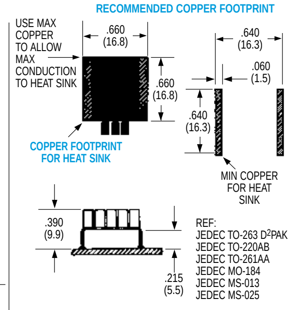
D²PAK, TO-220, SOL-20

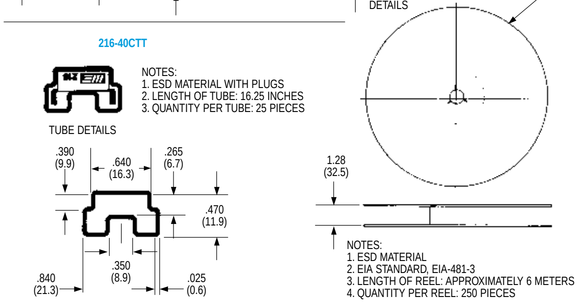
Standard P/N	Height Above PC Board	Footprint Dimensions	Package Format	Package Quantity	Thermal Performance at Typical Load Natural Convection	Forced Convection
216-40CT	.390 in. (9.9)	.600 in. (15.2) x .740 in. (18.8)	Bulk	1	55°C @ 1W	16.0°C/W @ 200 LFM
216-40CTT	.390 in. (9.9)	.600 in. (15.2) x .740 in. (18.8)	Tube	25	55°C @ 1W	16.0°C/W @ 200 LFM
216-40CTR	.390 in. (9.9)	.600 in. (15.2) x .740 in. (18.8)	Tape & Reel	250	55°C @ 1W	16.0°C/W @ 200 LFM

Increase the power dissipation level of D²PAK, TO-220, SOL-20 and other surface mount power components while maintaining the benefits of high-speed, automated pick and place assembly technology. The patented 216 Series heat sink is mounted astride the component and solder reflowed to the PCB using standard board assembly equipment (Fuji, Philips, etc.) and processes. This creates a very low thermal resistance path from the component tab to the heat sink and in turn to the ambient air which lowers junction temperatures for reliable operation. Available in bulk, tube or tape & reel packaging which meet EIA Standards and ESD protection requirements. Material: Copper, tin-lead plated.

MECHANICAL DIMENSIONS



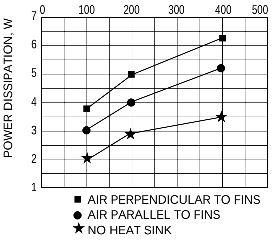




NOTES:
1. ESD MATERIAL WITH PLUGS
2. LENGTH OF TUBE: 16.25 INCHES
3. QUANTITY PER TUBE: 25 PIECES

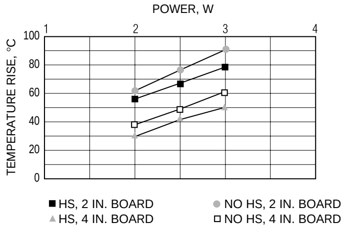
NOTES:
1. ESD MATERIAL
2. EIA STANDARD, EIA-481-3
3. LENGTH OF REEL: APPROXIMATELY 6 METERS
4. QUANTITY PER REEL: 250 PIECES

6 LAYER BOARD, D²PAK
125°C LEAD, 40°C AMBIENT

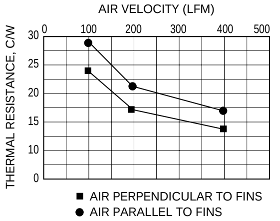


THERMAL PERFORMANCE DATA

NATURAL CONVECTION
6 LAYER BOARD, D²PAK
125°C LEAD, 40°C AMBIENT



6 LAYER BOARD, D²PAK



Dimensions: in. (mm)

PATENT PENDING

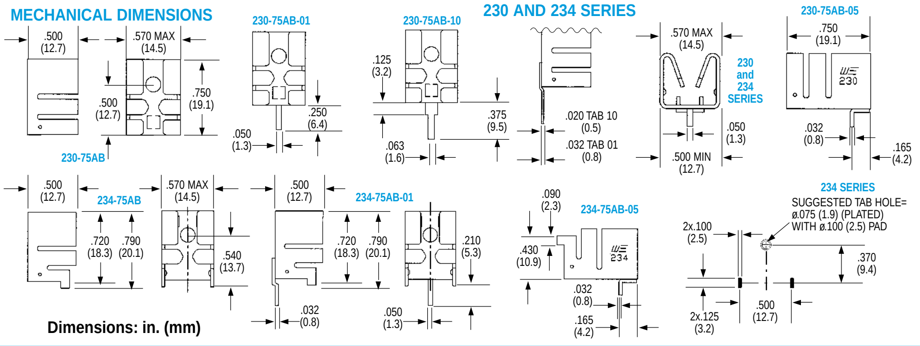
230 and 234 SERIES *Compact, Wavesolderable Low-Profile Self-Locking Heat Sinks*

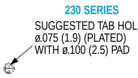
TO-220

Standard P/N	Height Above PC Board	Footprint Dimensions	Mounting Configuration	Solderable Tab Option	Mounting Style	Thermal Performance at Typical Load Natural Convection	Forced Convection
230-75AB	.750 in. (19.1)	.570 in. (14.5) x .500 in. (12.7)	Vert./Horiz.	No Tab	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM
230-75AB-01	.750 in. (19.1)	.570 in. (14.5) x .500 in. (12.7)	Vertical	01	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM
230-75AB-05	.500 in. (12.7)	.750 in. (19.1) x .570 in. (14.5)	Horizontal	05	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM
230-75AB-10	.875 in. (22.2)	.570 in. (14.5) x .500 in. (12.7)	Vertical	10	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM
234-75AB	.790 in. (20.0)	.570 in. (14.5) x .500 in. (12.7)	Vert./Horiz.	No Tab	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM
234-75AB-01	.790 in. (20.0)	.570 in. (14.5) x .500 in. (12.7)	Vertical	01	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM
234-75AB-05	.500 in. (12.7)	.790 in. (20.0) x .570 in. (14.5)	Horizontal	05	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM

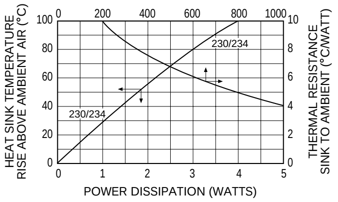
Compact, slim, labor-saving heat sinks with integral self locking features for TO-220 semiconductors. Their unique design (patent pending) ensures uniform force applied to the component for effective and maximum thermal contact in horizontal or vertical mounting positions while eliminating the need for fastening hardware. A mounting hole is available for hardware mounting when desired. The 230 and 234 Series can be used interchangeably. The 234 Series has standoffs on the base of the heat sink. Specify solderable tab options by the addition of suffix 01, 05, or 10 to the standard part number (i.e. 230-75AB-01). Material: Aluminum, black anodized.

MECHANICAL DIMENSIONS





NATURAL AND FORCED
CONVECTION CHARACTERISTICS



Dimensions: in. (mm)

BOARD LEVEL POWER SEMICONDUCTOR HEAT SINKS

233 and 236 SERIES *Self-Locking Wavesolderable Heat Sinks*

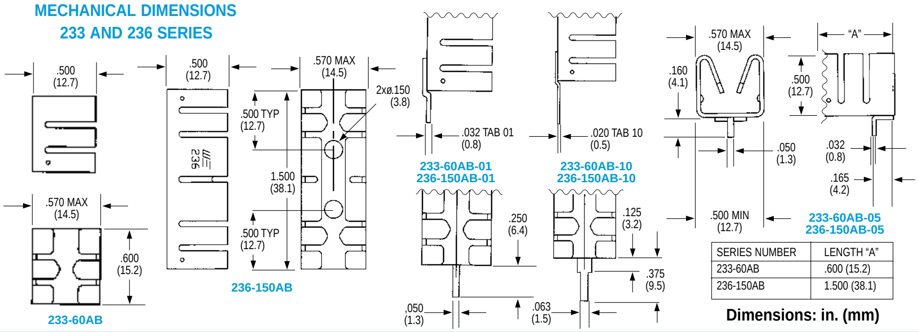
TO-220

PATENT PENDING

Standard P/N	Height Above PC Board	Footprint Dimensions	Mounting Configuration	Solderable Tab Option	Mounting Style	Thermal Performance at Typical Load Natural Convection	Forced Convection
233-60AB	.600 in. (15.2)	.570 in. (14.5) x .500 in. (12.7)	Vert./Horiz.	No Tab	Clip/Mtg Hole	58°C @ 2W	11°C/W @ 400 LFM
233-60AB-01	.600 in. (15.2)	.570 in. (14.5) x .500 in. (12.7)	Vertical	01	Clip/Mtg Hole	58°C @ 2W	11°C/W @ 400 LFM
233-60AB-05	.500 in. (12.7)	.600 in. (15.2) x .570 in. (14.5)	Horizontal	05	Clip/Mtg Hole	58°C @ 2W	11°C/W @ 400 LFM
233-60AB-10	.725 in. (18.4)	.570 in. (14.5) x .500 in. (12.7)	Vertical	10	Clip/Mtg Hole	58°C @ 2W	11°C/W @ 400 LFM
236-150AB	1.500 in. (38.1)	.570 in. (14.5) x .500 in. (12.7)	Vert./Horiz.	No Tab	Clip/Mtg Hole	40°C @ 2W	4.8°C/W @ 400 LFM
236-150AB-01	1.500 in. (38.1)	.570 in. (14.5) x .500 in. (12.7)	Vertical	01	Clip/Mtg Hole	40°C @ 2W	4.8°C/W @ 400 LFM
236-150AB-05	.500 in. (12.7)	1.500 in. (38.1) x .570 in. (14.5)	Horizontal	05	Clip/Mtg Hole	40°C @ 2W	4.8°C/W @ 400 LFM
236-150AB-10	1.625 in. (41.3)	.570 in. (14.5) x .500 in. (12.7)	Vertical	10	Clip/Mtg Hole	40°C @ 2W	4.8°C/W @ 400 LFM

Compact labor-saving heat sinks with integral self-locking features ensure uniform force applied to the component for maximum thermal contact. No installation tools required. Specify solderable tab options by the addition of suffix 01, 05, or 10 to the standard part number (i.e. 233-60AB-01). Material: Aluminum, black anodized.

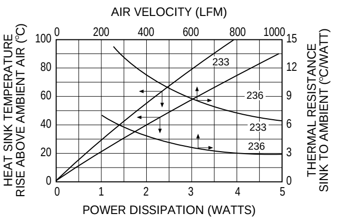
MECHANICAL DIMENSIONS 233 AND 236 SERIES



SERIES NUMBER	LENGTH "A"
233-60AB	.600 (15.2)
236-150AB	1.500 (38.1)

Dimensions: in. (mm)

NATURAL AND FORCED CONVECTION CHARACTERISTICS



SUGGESTED TAB HOLE = Ø.075 (1.9) (PLATED) WITH Ø.100 (2.5) PAD

275 and 231 SERIES *Compact, Stress-Free Labor-Saving Locking-Tab Heat Sinks*

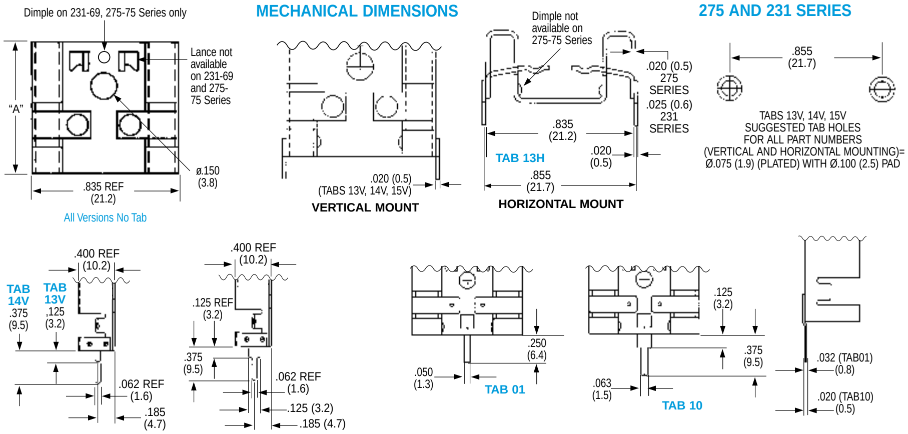
TO-220

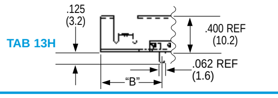
PATENT 5381041

Standard P/N Ref[1]	Height Above PC Board[2]	Footprint Dimensions	Mounting Configuration	Solderable Tab Option[1]	Mounting Style	Thermal Performance at Typical Load Natural Convection	Forced Convection
275-75AB	.750 in. (19.1)	.835 in. (21.2) x .400 in. (10.2)	Vert./Horiz.	No Tab	Clip/Mtg Hole	44°C @ 2W	7.9°C/W @ 400 LFM
275-75AB-01	.750 in. (19.1)	.835 in. (21.2) x .400 in. (10.2)	Vertical	01	Clip/Mtg Hole	44°C @ 2W	7.9°C/W @ 400 LFM
275-75AB-10	.875 in. (22.2)	.835 in. (21.2) x .400 in. (10.2)	Vertical	10	Clip/Mtg Hole	44°C @ 2W	7.9°C/W @ 400 LFM
231-69PAB	.690 in. (17.5)	.835 in. (21.2) x .400 in. (10.2)	Vert./Horiz.	No Tab	Clip/Mtg Hole	45°C @ 2W	8°C/W @ 400 LFM
231-69PAB-13H	.400 in. (10.2)	.690 in. (17.5) x .835 in. (21.2)	Horizontal	13H	Clip/Mtg Hole	45°C @ 2W	8°C/W @ 400 LFM
231-69PAB-XXX	.690 in. (17.5)	.835 in. (21.2) x .400 in. (10.2)	Vertical	13V,14V,15V	Clip/Mtg Hole	45°C @ 2W	8°C/W @ 400 LFM
231-75PAB	.750 in. (19.1)	.835 in. (21.2) x .400 in. (10.2)	Vert./Horiz.	No Tab	Clip/Mtg Hole	43°C @ 2W	7.9°C/W @ 400 LFM
231-75PAB-13H	.400 in. (10.2)	.750 in. (19.1) x .835 in. (21.2)	Horizontal	13H	Clip/Mtg Hole	43°C @ 2W	7.9°C/W @ 400 LFM
231-75PAB-XXX	.750 in. (19.1)	.835 in. (21.2) x .400 in. (10.2)	Vertical	13V,14V,15V	Clip/Mtg Hole	43°C @ 2W	7.9°C/W @ 400 LFM
231-137PAB	1.375 in. (34.9)	.835 in. (21.2) x .400 in. (10.2)	Vert./Horiz.	No Tab	Clip/Mtg Hole	32°C @ 2W	5.9°C/W @ 400 LFM
231-137PAB-13H	.400 in. (10.2)	1.375 in. (34.9) x .835 in. (21.2)	Horizontal	13H	Clip/Mtg Hole	32°C @ 2W	5.9°C/W @ 400 LFM
231-137PAB-XXX	1.375 in. (34.9)	.835 in. (21.2) x .400 in. (10.2)	Vertical	13V,14V,15V	Clip/Mtg Hole	32°C @ 2W	5.9°C/W @ 400 LFM

Unique stress-free labor-saving locking-tab design ensures reliable device-to-heat-sink surface contact while providing rapid component installation and removal without tools (See also 235 Series). **Note**[1]**:** Specify solderable tab options by the addition of suffix 01, 10, 13H, 13V, 14V or 15V to the standard part number (i.e. 231-75PAB-14V). **Note**[2]**:** Add .125 in. (3.2) for TAB 15V. Material: Aluminum, pre-anodized black.

MECHANICAL DIMENSIONS 275 AND 231 SERIES



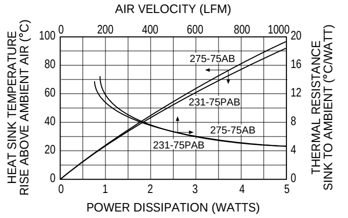


SERIES NO.	DIM "A"	DIM "B"
231-69PAB	.690 (17.5)	.345 (8.8)
231-75PAB	.750 (19.1)	.375 (9.5)
275-75AB	.750 (19.1)	——
231-137PAB	1.375 (34.9)	.688 (17.5)

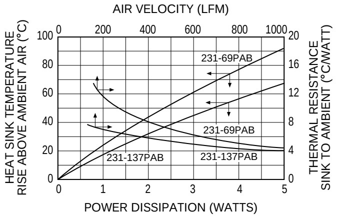
TABS 01 AND 10 SUGGESTED TAB HOLE= ø.075 (1.9) (PLATED) WITH ø.100 (2.5) (PAD)

Dimensions: in. (mm)

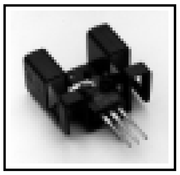
NATURAL AND FORCED CONVECTION CHARACTERISTICS



NATURAL AND FORCED CONVECTION CHARACTERISTICS



BOARD LEVEL POWER SEMICONDUCTOR HEAT SINKS



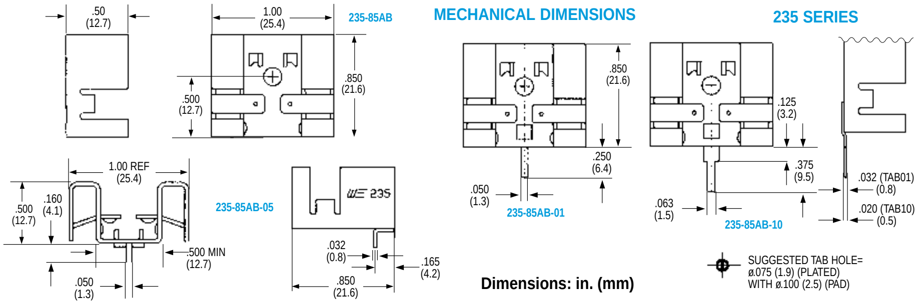
PATENT 5381041

235 SERIES *Compact, Stress-Free Labor-Saving Locking-Tab Heat Sinks*

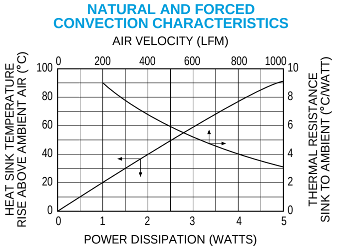
TO-220

Standard P/N	Height Above PC Board	Footprint Dimensions	Mounting Configuration	Solderable Tab Option	Mounting Style	Thermal Performance at Typical Load Natural Convection	Forced Convection
235-85AB	.850 in. (21.6)	1.000 in. (25.4) x .500 in. (12.7)	Vert./Horiz.	No Tab	Clip/Mtg Hole	40°C @ 2W	6.8°C/W @ 400 LFM
235-85AB-01	.850 in. (21.6)	1.000 in. (25.4) x .500 in. (12.7)	Vertical	01	Clip/Mtg Hole	40°C @ 2W	6.8°C/W @ 400 LFM
235-85AB-05	.500 in. (12.7)	.850 in. (21.6) x 1.000 in. (25.4)	Horizontal	05	Clip/Mtg Hole	40°C @ 2W	6.8°C/W @ 400 LFM
235-85AB-10	.975 in. (24.8)	1.000 in. (25.4) x .500 in. (12.7)	Vertical	10	Clip/Mtg Hole	40°C @ 2W	6.8°C/W @ 400 LFM

Unique stress-free labor-saving locking-tab design ensures reliable device-to-heat-sink surface contact for TO-220 components. The 235 Series maximizes surface area providing more effective cooling of components mounted either horizontally or vertically. Components insert quickly and easily without the use of installation tools by depressing heat sink sides, reducing process time and assembly costs. A mounting hole is available for hardware mounting when desired. Models are available with or without solderable tab options. Specify solderable tab options by the addition of suffix 01, 05, or 10 to the standard part number (i.e. 235-85AB-01). Material: Aluminum, black anodized.



NATURAL AND FORCED CONVECTION CHARACTERISTICS

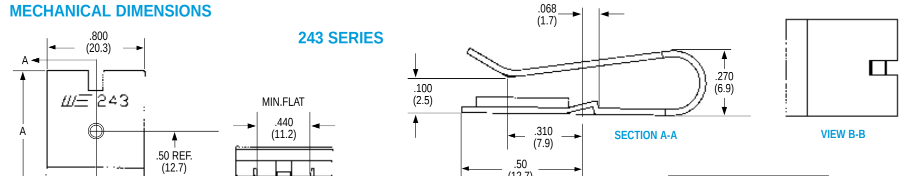


243 SERIES *Labor-Saving Clip-On Heat Sinks*

TO-220

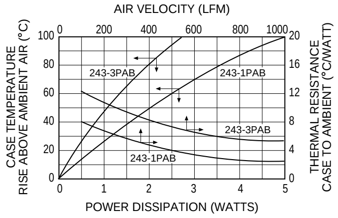
Standard P/N	Height Above PC Board	Footprint Dimensions	Mounting Configuration	Solderable Tab Option	Mounting Style	Thermal Performance at Typical Load Natural Convection	Forced Convection
243-1PAB	1.000 in. (25.4)	.800 in. (20.3) x .270 in. (6.9)	Vert./Horiz.	No Tab	Clip	50°C@ 2W	4.5°C/W @ 400 LFM
243-3PAB	.800 in. (20.3)	.800 in. (20.3) x .270 in. (6.9)	Vert./Horiz.	No Tab	Clip	78°C@ 2W	8.2°C/W @ 400 LFM

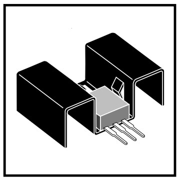
Rapid component alignment and installation of TO-220 components is achieved with the 243 Series Clip-On design while ensuring reliable device-to-heat-sink surface contact for maximum thermal efficiency. Components insert quickly and easily without the use of installation tools, reducing process time and assembly costs. Material: Aluminum, pre-anodized black.



PART NUMBER	DIM A
243-1PAB	1.000 (25.4)
243-3PAB	.800 (20.3)

NATURAL AND FORCED CONVECTION CHARACTERISTICS





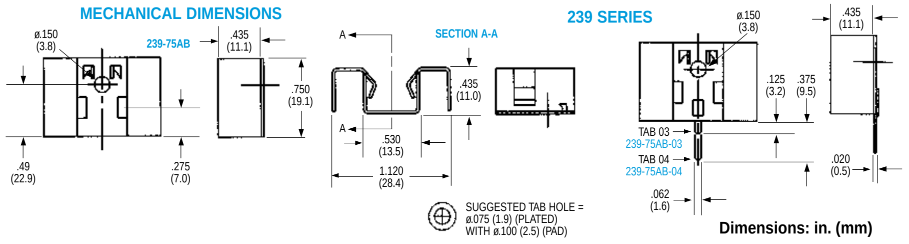
PATENT PENDING

239 SERIES *Snap-Down Self-Locking Heat Sinks*

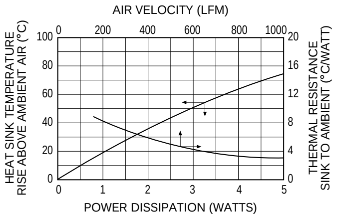
TO-220

Standard P/N	Height Above PC Board	Footprint Dimensions	Mounting Configuration	Solderable Tab Option	Mounting Style	Thermal Performance at Typical Load Natural Convection	Forced Convection
239-75AB	.750 in. (19.1)	1.120 in. (28.4) x .435 in. (11.0)	Vert./Horiz.	No Tab	Clip/Mtg Hole	38°C @ 2W	6°C/W @ 400 LFM
239-75AB-03	.750 in. (19.1)	1.120 in. (28.4) x .435 in. (11.0)	Vertical	03	Clip/Mtg Hole	38°C @ 2W	6°C/W @ 400 LFM
239-75AB-04	.750 in. (19.1)	1.120 in. (28.4) x .435 in. (11.0)	Vertical	04	Clip/Mtg Hole	38°C @ 2W	6°C/W @ 400 LFM

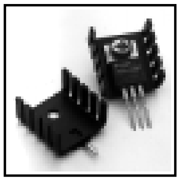
Snap-down heat sinks for TO-220 devices mounted either vertically or horizontally. Integral self-locking-fin features eliminate the need for installation tools or other hardware typically required for installation or removal of components. A hole is available for hardware mounting when desired. Unique fin design aligns the component and securely retains it when "Snapped" into the heat sink for reliable component operation. Specify solderable tab options by the addition of suffix 03 or 04 to the standard part number (i.e. 239-75AB-03). Material: Aluminum, black anodized.



NATURAL AND FORCED CONVECTION CHARACTERISTICS



BOARD LEVEL POWER SEMICONDUCTOR HEAT SINKS



273 SERIES *Low-Cost, Low-Height Wavesolderable Heat Sinks*

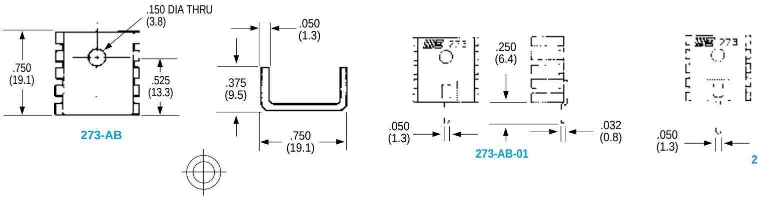
TO-218, TO-220

Standard P/N	Height Above PC Board	Footprint Dimensions	Mounting Configuration	Solderable Tab Option	Mounting Style	Thermal Performance at Typical Load Natural Convection	Forced Convection
273-AB	.375 in. (9.5)	.750 in. (19.1) x .750 (19.1)	Vertical/Horizontal	No Tab	Mtg Hole	49°C @ 2W	7.2°C/W @ 400 LFM
273-AB-01	.375 in. (9.5)	.750 in. (19.1) x .750 (19.1)	Vertical	01	Mtg Hole	49°C @ 2W	7.2°C/W @ 400 LFM
273-AB-02	.375 in. (9.5)	.750 in. (19.1) x .750 (19.1)	Vertical	02	Mtg Hole	49°C @ 2W	7.2°C/W @ 400 LFM

This low-cost, low-profile wavesolderable heat sink occupies minimum space and is ideal for use with many low-power semiconductors in a variety of applications. The heat sink can be mounted vertically or horizontally on printed circuit boards. Specify solderable tab options by the addition of suffix 01 or 02 to the standard part number (i.e. 273-AB-01). Material: Aluminum, black anodized.

MECHANICAL DIMENSIONS

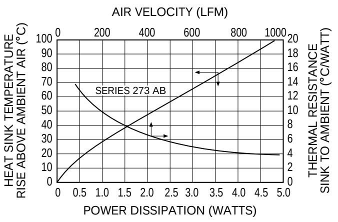
273 SERIES



Note:
1. Suggested Tab Hole = ø.075 (1.9) (Plated) with ø.100 (2.5) pad

Dimensions: in. (mm)

NATURAL AND FORCED CONVECTION CHARACTERISTICS



274 SERIES *Low-Cost, Low-Height Wavesolderable Heat Sinks*

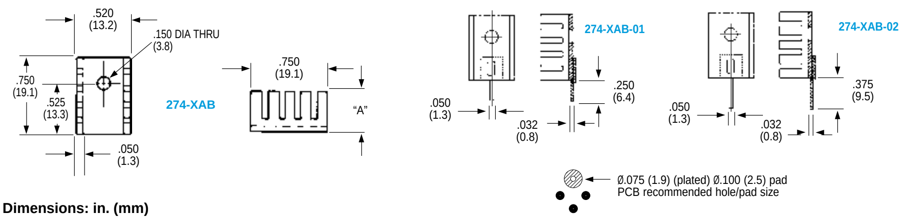
TO-220

Standard P/N	Height Above PC Board "A"	Footprint Dimensions	Mounting Configuration	Solderable Tab Option	Mounting Style	Thermal Performance at Typical Load Natural Convection	Forced Convection
274-1AB	.375 in. (9.5)	.520 in. (13.2) x .750 in. (19.1)	Vertical/Horizontal	No Tab	Mtg Hole	56°C @ 2W	8.0°C/W @ 400 LFM
274-1AB-01	.375 in. (9.5)	.520 in. (13.2) x .750 in. (19.1)	Vertical	01	Mtg Hole	56°C @ 2W	8.0°C/W @ 400 LFM
274-1AB-02	.375 in. (9.5)	.520 in. (13.2) x .750 in. (19.1)	Vertical	02	Mtg Hole	56°C @ 2W	8.0°C/W @ 400 LFM
274-2AB	.500 in. (12.7)	.520 in. (13.2) x .750 in. (19.1)	Vertical/Horizontal	No Tab	Mtg Hole	50°C @ 2W	7.0°C/W @ 400 LFM
274-2AB-01	.500 in. (12.7)	.520 in. (13.2) x .750 in. (19.1)	Vertical	01	Mtg Hole	50°C @ 2W	7.0°C/W @ 400 LFM
274-2AB-02	.500 in. (12.7)	.520 in. (13.2) x .750 in. (19.1)	Vertical	02	Mtg Hole	50°C @ 2W	7.0°C/W @ 400 LFM
274-3AB	.250 in. (6.4)	.520 in. (13.2) x .750 in. (19.1)	Vertical/Horizontal	No Tab	Mtg Hole	62°C @ 2W	9.0°C/W @ 400 LFM
274-3AB-01	.250 in. (6.4)	.520 in. (13.2) x .750 in. (19.1)	Vertical	01	Mtg Hole	62°C @ 2W	9.0°C/W @ 400 LFM
274-3AB-02	.250 in. (6.4)	.520 in. (13.2) x .750 in. (19.1)	Vertical	02	Mtg Hole	62°C @ 2W	9.0°C/W @ 400 LFM

Similar to the 273 Series, the 274 Series has a narrower footprint width for use on densely populated circuit boards. Use these types when space is at a premium and low cost is needed. Specify solderable tab options by the addition of suffix 01 or 02 to the standard part number (i.e. 274-1AB-01). Material: Aluminum, black anodized.

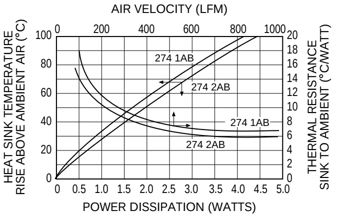
MECHANICAL DIMENSIONS

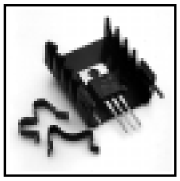
274 SERIES



Dimensions: in. (mm)

NATURAL AND FORCED CONVECTION CHARACTERISTICS





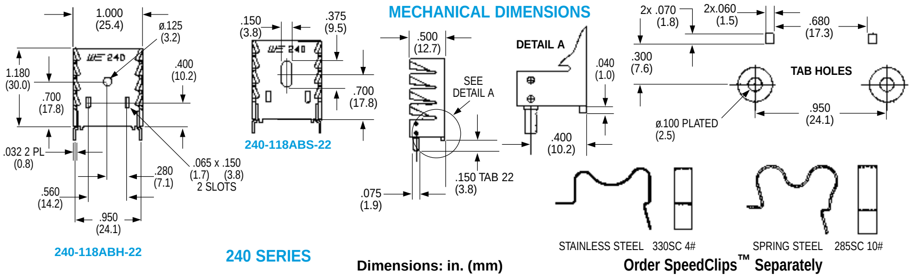
240 SERIES *Labor-Saving Twisted Fin Heat Sinks*

TO-220

Standard P/N	Height Above PC Board	Footprint Dimensions	Mounting Configuration	Solderable Tab Option	Mounting Style	Thermal Performance at Typical Load Natural Convection	Forced Convection
240-118ABH-22	1.180 in. (30.0)	1.000 in. (25.4) x .500 in. (12.7)	Vertical	22	Clip/Mtg Hole	55°C @ 4W	5.3°C/W @ 400 LFM
240-118ABS-22	1.180 in. (30.0)	1.000 in. (25.4) x .500 in. (12.7)	Vertical	22	Clip/Mtg Slot	55°C @ 4W	5.3°C/W @ 400 LFM

Twisted fin design for efficient cooling of vertically mounted TO-220 devices occupies minimum board space. Heat sinks are available with a mounting hole or mounting slot and optional labor-saving clip attachments. **Order SpeedClips™ 285SC or 330SC separately** for rapid component installation, lowering manufacturing costs . Standard solderable tab option is specified by the addition of suffix 22 to the standard part number (i.e. 240-118ABH-22 or 240-118ABS-22). Material: Aluminum, black anodized.

MECHANICAL DIMENSIONS

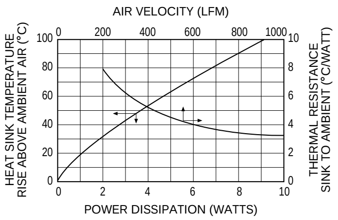


240 SERIES

Dimensions: in. (mm)

Order SpeedClips™ Separately

NATURAL AND FORCED CONVECTION CHARACTERISTICS



BOARD LEVEL POWER SEMICONDUCTOR HEAT SINKS

242 SERIES *Low-Height, Low-Profile Twisted Fin Heat Sinks*

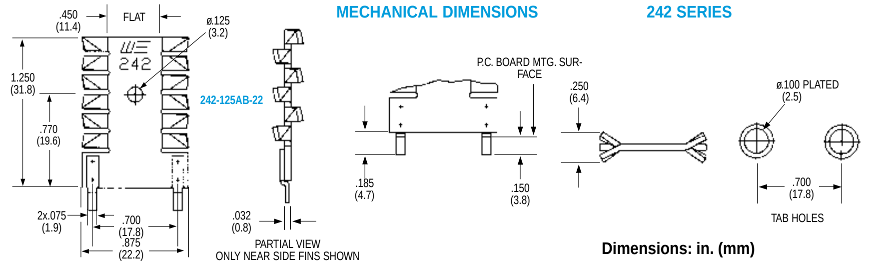
TO-220

Standard P/N	Height Above PC Board	Footprint Dimensions	Mounting Configuration	Solderable Tab Option	Mounting Style	Thermal Performance at Typical Load	
						Natural Convection	Forced Convection
242-125AB-22	1.285 in. (32.6)	.875 in. (22.2) x .250 in. (6.4)	Vertical	22	Mtg Hole	48°C @ 2W	6.2°C/W @ 400 LFM

Efficient, low-profile twisted fin heat sinks for vertical mounting of TO-220 devices. Its slim design minimizes PC board space occupied and the alternating twisted fins increase air turbulence for improved cooling. Standard models include wavesolderable tinned tabs for direct PC board mounting. Specify part number 242-125AB-22. Material: Aluminum, black anodized.

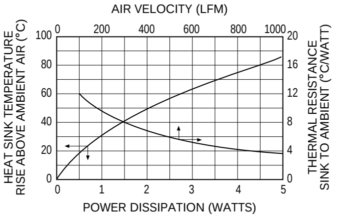
MECHANICAL DIMENSIONS

242 SERIES



Dimensions: in. (mm)

NATURAL AND FORCED
CONVECTION CHARACTERISTICS



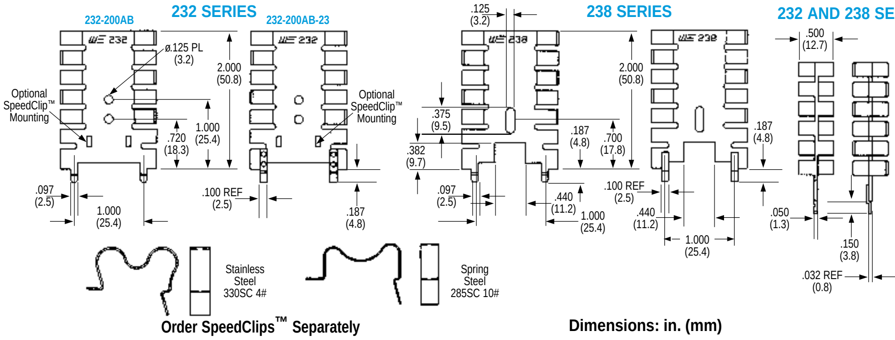
232 and 238 SERIES *Staggered Fin Heat Sinks for Vertical Mounting*

TO-202, TO-220

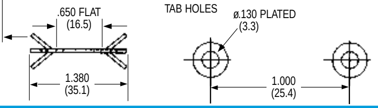
Standard P/N	Height Above PC Board	Footprint Dimensions	Mounting Configuration	Tab Options Type	Mounting Style	Thermal Performance at Typical Load	
						Natural Convection	Forced Convection
232-200AB	2.000 in. (50.8)	1.380 in. (35.1) x .500 in. (12.7)	Vertical	2, Twisted	Clip/Mtg Hole	48°C @ 4W	3.3°C/W @ 400 LFM
232-200AB-23	2.000 in. (50.8)	1.380 in. (35.1) x .500 in. (12.7)	Vertical	2, Solderable	Clip/Mtg Hole	48°C @ 4W	3.3°C/W @ 400 LFM
238-200AB	2.000 in. (50.8)	1.380 in. (35.1) x .500 in. (12.7)	Vertical	2, Twisted	Mtg Slot	48°C @ 4W	3.3°C/W @ 400 LFM
238-200AB-23	2.000 in. (50.8)	1.380 in. (35.1) x .500 in. (12.7)	Vertical	2, Solderable	Mtg Slot	48°C @ 4W	3.3°C/W @ 400 LFM

Staggered fin design for efficient cooling of TO-202 (Series 238) and TO-220 (Series 232) semiconductor devices. Models mount vertically and are available with two solderable tabs (232-200AB-23 or 238-200AB-23) or two twisted tabs (232-200AB or 238-200AB). **Order SpeedClips™ 285SC or 330SC separately** (232 Series only) for rapid component installation, lowering manufacturing costs. Material: Aluminum, black anodized.

MECHANICAL DIMENSIONS

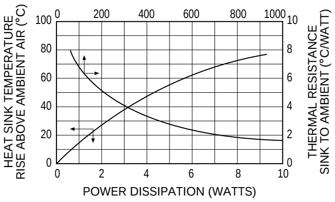


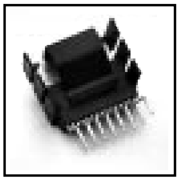
Order SpeedClips™ Separately



Dimensions: in. (mm)

NATURAL AND FORCED
CONVECTION CHARACTERISTICS





251 SERIES *Slim-Profile Heat Sinks With Integral Clips*

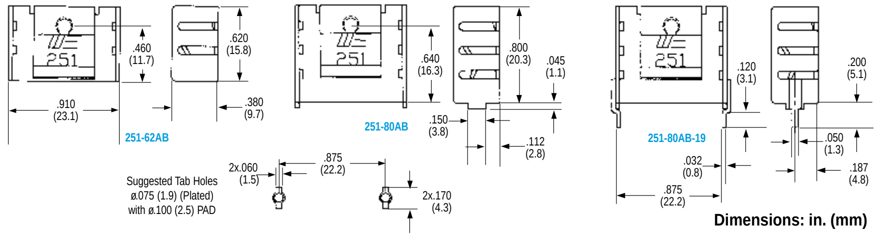
15 Lead Multiwatt

Standard P/N	Height Above PC Board	Footprint Dimensions	Mounting Configuration	Solderable Tab Option	Mounting Style	Thermal Performance at Typical Load	
						Natural Convection	Forced Convection
251-62AB	.620 in. (15.7)	.910 in. (23.1) x .380 in. (9.7)	Vertical/Horizontal	No Tab	Clip	66°C @ 3W	6.6°C/W @ 400 LFM
251-80AB	.845 in. (21.5)	.910 in. (23.1) x .380 in. (9.7)	Vertical/Horizontal	No Tab	Clip	64°C @ 3W	6.4°C/W @ 400 LFM
251-80AB-19	.875 in. (22.2)	.910 in. (23.1) x .380 in. (9.7)	Vertical	19	Clip	64°C @ 3W	6.4°C/W @ 400 LFM

Lightweight, slim-profile heat sinks with integral self-locking clips occupy minimum board real estate and reduce assembly costs. Their small footprint is ideal for a variety of low-power multiwatt component applications. Models are available in heights of .620 in. (15.7) and .845 in. (21.5). Specify solderable tab option for the 251-80AB (only) by the addition of suffix 19 to the standard part number (i.e. 251-80AB-19). Material: Aluminum, black anodized.

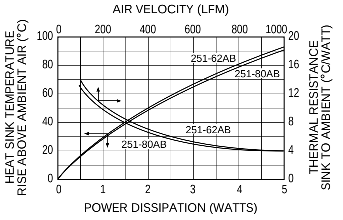
MECHANICAL DIMENSIONS

251 SERIES

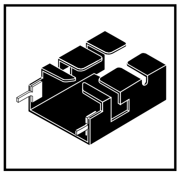


Dimensions: in. (mm)

NATURAL AND FORCED
CONVECTION CHARACTERISTICS



BOARD LEVEL POWER SEMICONDUCTOR HEAT SINKS



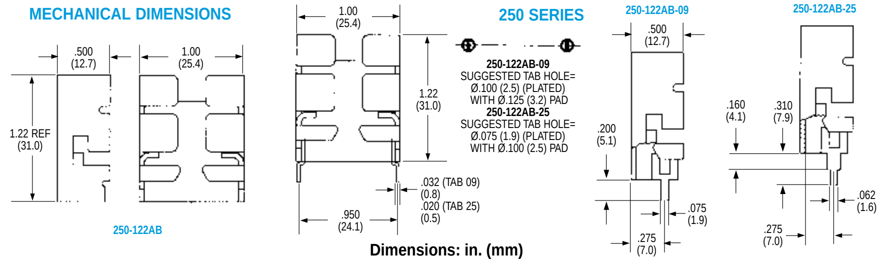
250 SERIES *High-Performance Slim Profile Heat Sinks With Integral Clips*

Multiwatt

Standard P/N	Height Above PC Board	Footprint Dimensions	Mounting Configuration	Solderable Tab Option	Mounting Style	Thermal Performance at Typical Load Natural Convection	Forced Convection
250-122AB	1.220 in. (31.0)	1.000 in. (25.4) x .500 in. (12.7)	Vert./Horiz.	No Tab	Clip	50°C @ 4W	3.7°C/W @ 400 LFM
250-122AB-09	1.220 in. (31.0)	1.000 in. (25.4) x .500 in. (12.7)	Vertical	09	Clip	50°C @ 4W	3.7°C/W @ 400 LFM
250-122AB-25	1.380 in. (35.1)	1.000 in. (25.4) x .500 in. (12.7)	Vertical	25	Clip	50°C @ 4W	3.7°C/W @ 400 LFM

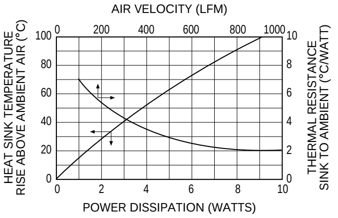
Slim profile heat sinks with integral self-locking clips occupy minimum board real estate and reduce assembly costs. Their integral locking features eliminate mounting hardware typically needed for component installation and removal yet provide rapid and secure device-to-heat-sink surface contact and retention. The 250 Series is ideal for a variety of high-power dissipation Multiwatt component applications. Specify solderable tab options by the addition of suffix 09 or 25 to the standard part number (i.e. 250-122AB-09 or 250-122AB-25). Material: Aluminum, black anodized.

MECHANICAL DIMENSIONS



Dimensions: in. (mm)

NATURAL AND FORCED CONVECTION CHARACTERISTICS



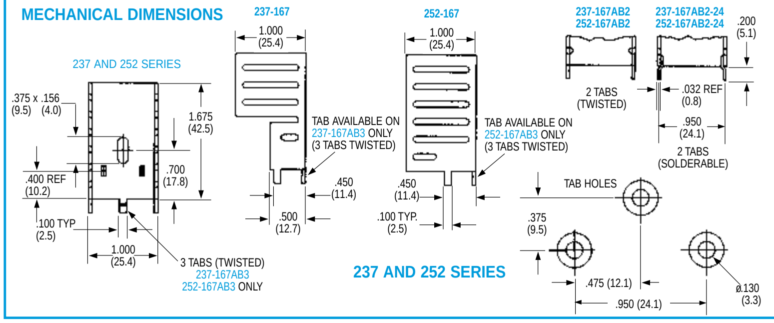
237 and 252 SERIES *High-Performance, High-Power Vertical Mount Heat Sinks*

TO-220

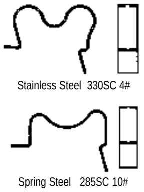
Standard P/N	Height Above PC Board	Footprint Dimensions	Mounting Configuration	Tab Options Type	Mounting Style	Thermal Performance at Typical Load Natural Convection	Forced Convection
237-167AB2	1.675 in. (42.5)	1.000 in. (25.4) x 1.000 in. (25.4)	Vertical	2, Twisted	Clip/Mtg Slot	46°C @ 4W	4.5°C/W @ 200 LFM
237-167AB3	1.675 in. (42.5)	1.000 in. (25.4) x 1.000 in. (25.4)	Vertical	3, Twisted	Clip/Mtg Slot	46°C @ 4W	4.5°C/W @ 200 LFM
237-167AB2-24	1.675 in. (42.5)	1.000 in. (25.4) x 1.000 in. (25.4)	Vertical	2, Solderable	Clip/Mtg Slot	46°C @ 4W	4.5°C/W @ 200 LFM
252-167AB2	1.675 in. (42.5)	1.000 in. (25.4) x 1.000 in. (25.4)	Vertical	2, Twisted	Clip/Mtg Slot	40°C @ 4W	4.5°C/W @ 200 LFM
252-167AB3	1.675 in. (42.5)	1.000 in. (25.4) x 1.000 in. (25.4)	Vertical	3, Twisted	Clip/Mtg Slot	40°C @ 4W	4.5°C/W @ 200 LFM
252-167AB2-24	1.675 in. (42.5)	1.000 in. (25.4) x 1.000 in. (25.4)	Vertical	2, Solderable	Clip/Mtg Slot	40°C @ 4W	4.5°C/W @ 200 LFM

High-performance heat sinks for TO-220 devices mounted vertically. Three bottom fins of the 237 series are recessed to allow closer component mounting. Models are available with two twist and three twist mount tabs or two solderable tabs. Specify solderable tab options by the addition of suffix 24 to the standard part number (i.e. 237-167AB-24 or 252-167AB-24). **Order SpeedClips™ 285SC or 330SC separately** for rapid component installation, lowering manufacturing costs. Material: Aluminum, black anodized.

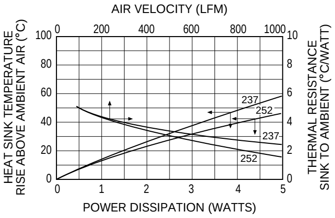
MECHANICAL DIMENSIONS



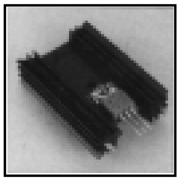
Order SpeedClips™ Separately



NATURAL AND FORCED CONVECTION CHARACTERISTICS



Dimensions: in. (mm)



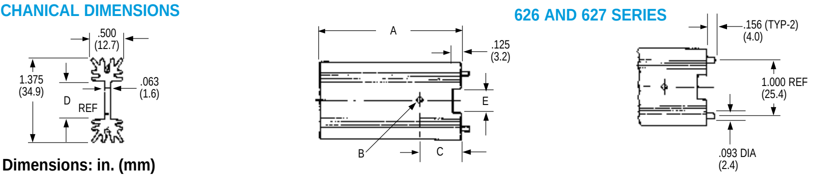
626 and 627 SERIES *High-Efficiency Heat Sinks for Vertical Board Mounting*

TO-218, TO-220

Standard P/N	Standard P/N	Height Above PC Board "A"	Maximum Footprint	Thermal Performance at Typical Load Natural Convection	Forced Convection
626-10ABP	627-10ABP	1.000 in. (25.4)	1.375 in. (34.9) x .500 in. (12.7)	76°C @ 6W	5.8°C/W @ 200 LFM
626-15ABP	627-15ABP	1.500 in. (38.1)	1.375 in. (34.9) x .500 in. (12.7)	65°C @ 6W	5.5°C/W @ 200 LFM
626-20ABP	627-20ABP	2.000 in. (50.8)	1.375 in. (34.9) x .500 in. (12.7)	55°C @ 6W	4.7°C/W @ 200 LFM
626-25ABP	627-25ABP	2.500 in. (63.5)	1.375 in. (34.9) x .500 in. (12.7)	48°C @ 6W	4.2°C/W @ 200 LFM

Wave-solderable pins on 1 in. (25.4) centers for vertical mounting. Maximum semiconductor package width is .660 in. (16.8). Models have .125 in. (3.2) "Notch" for PC board traces below the heat sink base and a mounting hole positioned for either TO-218 or TO-220 components. Thermal accessory products including thermal compounds, adhesives, interface materials, and others are available.

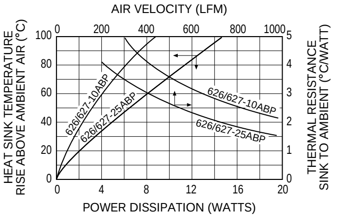
MECHANICAL DIMENSIONS



Dimensions: in. (mm)

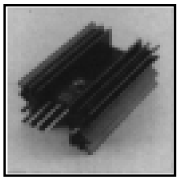
Series	Type Device	Hole Diameter "B"	Hole Height "C"	Webb Width "D"	Notch Width "E"	Extrusion Profile
626	TO-218	.144 (3.7)	.850 (21.6)	.660 (16.8)	.540 (13.7)	8420
627	TO-220	.128 (3.3)	.720 (18.3)	.625 (15.9)	.437 (11.1)	5183

NATURAL AND FORCED CONVECTION CHARACTERISTICS



Refer to **Full Line Catalog** for additional
Board-Level Heat Sinks and
Thermal Accessory Products

BOARD LEVEL POWER SEMICONDUCTOR HEAT SINKS



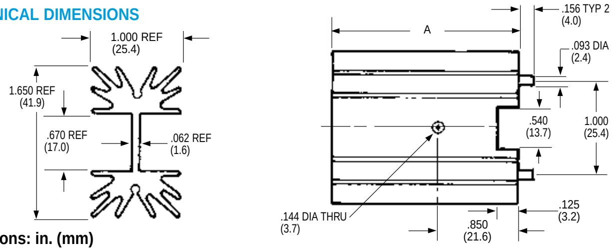
657 SERIES High-Performance Notched Heat Sinks for Vertical Board Mounting

TO-220, TO-247, TO-218

Standard P/N	Height Above PC Board "A"	Maximum Footprint	Thermal Performance at Typical Load: Natural Convection	Thermal Performance at Typical Load: Forced Convection
657-10ABPN	1.000 in. (25.4)	1.650 in. (41.9) x 1.000 in. (25.4)	41°C @ 6W	3.7°C/W @ 200 LFM
657-15ABPN	1.500 in. (38.1)	1.650 in. (41.9) x 1.000 in. (25.4)	38°C @ 6W	3.3°C/W @ 200 LFM
657-20ABPN	2.000 in. (50.8)	1.650 in. (41.9) x 1.000 in. (25.4)	32°C @ 6W	2.9°C/W @ 200 LFM
657-25ABPN	2.500 in. (63.5)	1.650 in. (41.9) x 1.000 in. (25.4)	25°C @ 6W	2.7°C/W @ 200 LFM

Wave-solderable pins for secure PC board mounting for large plastic package power semiconductor packages and "Notch" for PC board traces below the heat sink base. Maximum heat sink thermal performance is achieved with the 657 Series. Accessory Products available include thermal interface materials and compounds to provide electrical isolation or reduced interface resistance. Material: aluminum, black anodized.

MECHANICAL DIMENSIONS

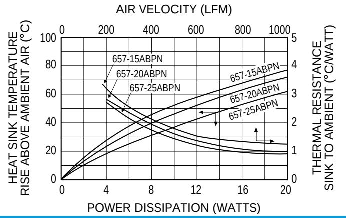


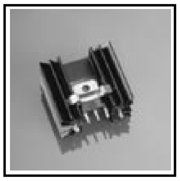
Dimensions: in. (mm)

657 SERIES

657 SERIES
(EXTRUSION PROFILE 6533)

NATURAL AND FORCED CONVECTION CHARACTERISTICS





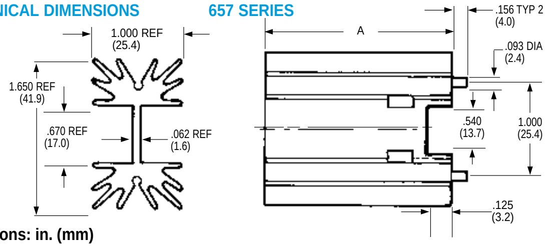
657 SERIES High-Performance Heat Sinks with SpeedClips™ for Vertical Board Mounting

TO-220, TO-247, TO-218

Standard P/N	Height Above PC Board "A"	Maximum Footprint	Thermal Performance at Typical Load: Natural Convection	Thermal Performance at Typical Load: Forced Convection
657-10ABPSC	1.000 in. (25.4)	1.650 in. (41.9) x 1.000 in. (25.4)	41°C @ 6W	3.7°C/W @ 200 LFM
657-15ABPSC	1.500 in. (38.1)	1.650 in. (41.9) x 1.000 in. (25.4)	38°C @ 6W	3.3°C/W @ 200 LFM
657-20ABPSC	2.000 in. (50.8)	1.650 in. (41.9) x 1.000 in. (25.4)	32°C @ 6W	2.9°C/W @ 200 LFM
657-25ABPSC	2.500 in. (63.5)	1.650 in. (41.9) x 1.000 in. (25.4)	25°C @ 6W	2.7°C/W @ 200 LFM

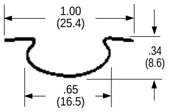
Wave-solderable pins for secure PC board mounting for large plastic package power semiconductor packages and "Notch" for PC board traces. Quickly assemble components to heat sink with Wakefield SpeedClips™ (included). Maximum heat sink thermal performance is achieved with the 657 Series. Accessory Products available include thermal interface materials and compounds to provide electrical isolation or reduced interface resistance. Material: aluminum, black anodized.

MECHANICAL DIMENSIONS **657 SERIES**



Dimensions: in. (mm)

SPEEDCLIP™ INCLUDED IN ORDER



Width of Clip:
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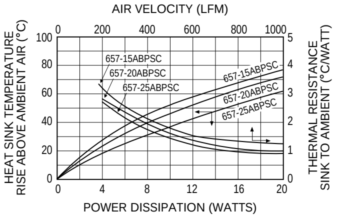
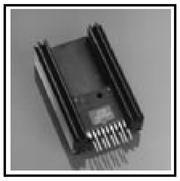
657 SERIES
(EXTRUSION PROFILE 6533)

NATURAL AND FORCED CONVECTION CHARACTERISTICS



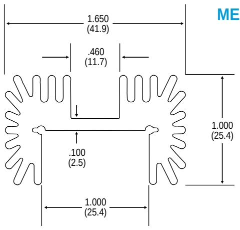


677 SERIES High-Performance High-Power Heat Sinks for Vertical Board Mounting

*TO-218, TO-220, TO-247
15-LEAD MULTIWATT*

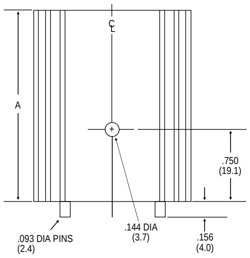
Standard P/N	Height Above PC Board "A"	Maximum Footprint	Thermal Performance at Typical Load: Natural Convection	Thermal Performance at Typical Load: Forced Convection
677-10ABP	1.000 in. (25.4)	1.650 in. (41.9) x 1.000 in. (25.4)	52°C @ 6W	3.1°C/W @ 200 LFM
677-15ABP	1.500 in. (38.1)	1.650 in. (41.9) x 1.000 in. (25.4)	46°C @ 6W	2.8°C/W @ 200 LFM
677-20ABP	2.000 in. (50.8)	1.650 in. (41.9) x 1.000 in. (25.4)	40°C @ 6W	2.5°C/W @ 200 LFM
677-20ABP	2.500 in. (63.5)	1.650 in. (41.9) x 1.000 in. (25.4)	35°C @ 6W	2.2°C/W @ 200 LFM

Maximum heat sink thermal performance for high-power board-level power semiconductors. Wave-solderable pins on 1.000 in. (25.4) centers are provided for vertical mounting on printed circuit boards. Accessory Products available include thermal interface materials, thermal compounds, and other accessory products. Material: aluminum, black anodized.



MECHANICAL DIMENSIONS

677 SERIES
(EXTRUSION PROFILE 8719)



Dimensions: in. (mm)

677 SERIES

NATURAL AND FORCED CONVECTION CHARACTERISTICS