

217 SERIES Surface Mount Heat Sinks

D²PAK, TO-220, SOT-223, SOL-20

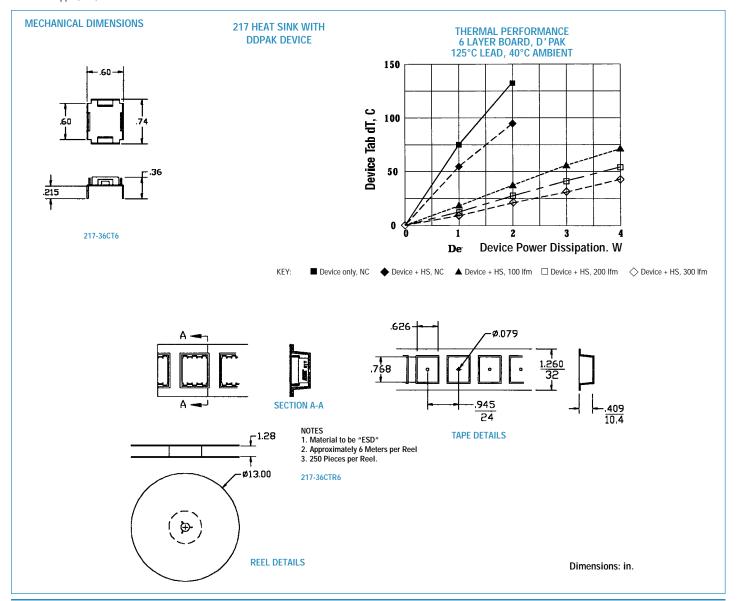
Compatible with surface mount technology (SMT) automated production techniques for ease of assembly and a variety of soldering methods, these heat sinks allow greater packaging densities and reduction in PC-board area, increasing the power dissipation of surface mount devices (SMDs) while maintaining and improving manufacturers' component thermal specifications.

FEATURES AND BENEFITS:

- No interface material is needed
- Copper with tin-lead plating for improved solderability and assembly
 Both the component and the heat sink are installed on the PC-board utilizing
 standard SMT assembly equipment for "Tape & Reel" and "Tube" formats
 EIA standards and ESD protection are specified
 Can be used with water soluble or no clean SMT solder creams or other pastes

	Height Above	Footprint	Thermal Performance at Typical Load					
Standard P/N	PC Board in. (mm)	Dimensions in. (mm)	Package Format	Package Quantity	Natural Convection	Forced Convection)		
217-36CT6 A	.390 (9.9)	.600 (15.2) x .740 (18.8)	Bulk	1	55°C @ 1W	16.0°C/W @ 200 LFM		
217-36CTT6	.390 (9.9)	.600 (15.2) x .740 (18.8)	Tube	20	55°C @ 1W	16.0°C/W @ 200 LFM		
217-36CTR6▲	.390 (9.9)	.600 (15.2) x .740 (18.8)	Tape & Reel	250	55°C @ 1W	16.0°C/W @ 200 LFM		

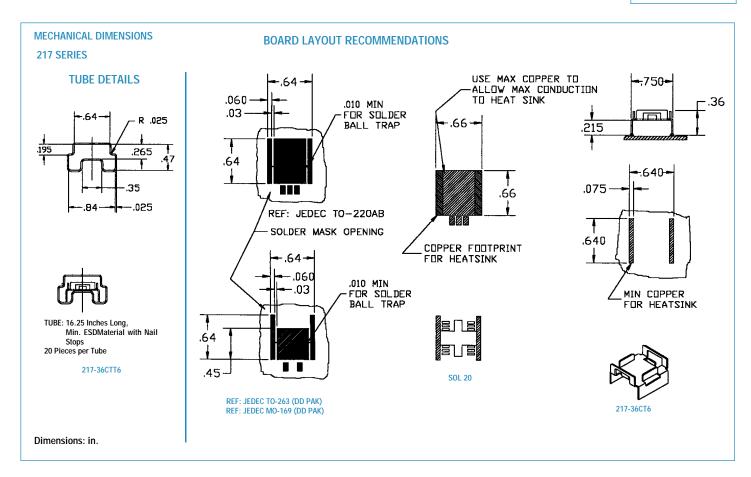
Material: Copper, Tin, Lead Plated

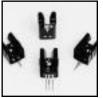




217 SERIES Surface Mount Heat Sinks

D²PAK, TO-220, SOL-20



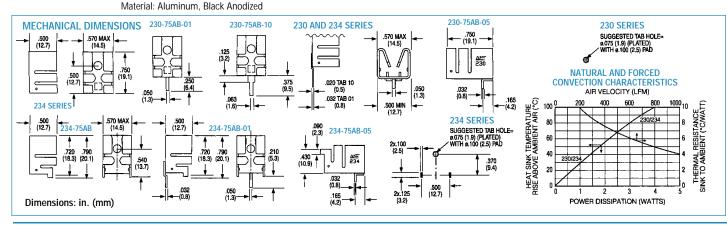


PATENT PENDING

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

TO-220

Standard P/N	Height Above PC Board in. (mm)	Footprint Dimensions in. (mm)	Mounting Configuation	Solderable Tab Option	Mounting Style	Thermal Performation Natural Convection	mance at Typical Load Forced Convection)
230-75AB 🛕	.750 (19.1)	.570 (14.5) x .500 (12.7)	Vert./Horiz.	No Tab	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM
	` ,	, , , ,			. 3		
230-75AB-01	.750 (19.1)	.570 (14.5) x .500 (12.7)	Vertical	01	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM
230-75AB-05	.500 (12.7)	.750 (19.1) x .570 (14.5)	Horizontal	05	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM
230-75AB-10	.875 (22.2)	.570 (14.5) x .500 (12.7)	Vertical	10	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM
234-75AB	.790 (20.0)	.570 (14.5) x .500 (12.7)	Vert./Horiz	No Tab	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM
234-75AB-01	.790 (20.0)	.570 (14.5) x .500 (12.7)	Vertical	01	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM
234-75AB-05	.500 (12.7)	.790 (20.0) x .570 (14.5)	Horizontal	05	Clip/Mtg Hole	57°C @ 2W	7.5°C/W @ 400 LFM







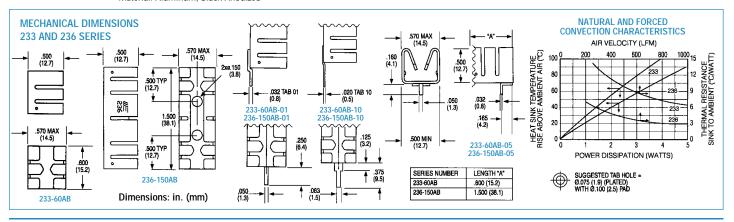
PATENT PENDING

233 AND 236 SERIES Self-Locking Wavesolderable Heat Sinks

TO-220

	Height Above	Footprint				Thermal Perfo	ormance at Typical Load
Standard P/N	PC Board in. (mm)	Dimensions in. (mm)	Mounting Configuration	Solderable Tab Options	Mounting Style	Natural Convection	Forced Convection
233-60AB 🔺	.600 (15.2)	.570 (14.5) x .500 (12.7)	Vert./Horiz.	No Tab	Clip/Mtg Hole	58°C @ 2W	11.0°C/W @ 400 LFM
233-60AB-01	.600 (15.2)	.570 (14.5) x .500 (12.7)	Vertical	01	Clip/Mtg Hole	58°C @ 2W	11.0°C/W @ 400 LFM
233-60AB-05	.500 (12.7)	.600 (15.2) x .570 (14.5)	Horizontal	05	Clip/Mtg Hole	58°C @ 2W	11.0°C/W @ 400 LFM
233-60AB-10 A	.725 (18.4)	.570 (14.5) x .500 (12.7)	Vertical	10	Clip/Mtg Hole	58°C @ 2W	11.0°C/W @ 400 LFM
236-150AB	1.500 (38.1)	.570 (14.5) x .500 (12.7)	Vert./Horiz	No Tab	Clip/Mtg Hole	58°C @ 2W	4.80°C/W @ 400 LFM
236-150AB-01	1.500 (38.1)	.570 (14.5) x .500 (12.7)	Vertical	01	Clip/Mtg Hole	58°C @ 2W	4.80°C/W @ 400 LFM
236-150AB-05 A	.500 (12.7)	1.500 (38.1) x .570 (14.5)	Horizontal	05	Clip/Mtg Hole	58°C @ 2W	4.80°C/W @ 400 LFM
236-150AB-10	1.625 (41.3)	.570 (14.5) x .570 (12.7)	Vetrical	10	Clip/Mtg Hole	58°C @ 2W	4.80°C/W @ 400 LFM

Material: Aluminum, Black Anodized





PATENT 5381041

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

TO-220

	Height Al	oove	Footprint			7	Thermal Perform	ance at Typical Load
Standard P/N		PC Board in. (mm)	Dimensions in. (mm)	Mounting Configuration	Solderable Tab Options	Mounting Style	Natural Convection	Forced Convection
275-75AB		.750 (19.1)	.835 (21.2) x .400 (12.7)	Vert./Horiz.	No Tab	Clip/Mtg Hole	44 C @ 2W	7.9°C/W @ 400 LFM
275-75AB-01		.750 (19.1)	.835 (21.2) x .400 (12.7)	Vertical	01	Clip/Mtg Hole	44°C @ 2W	7.9°C/W @ 400 LFM
275-75AB-10		.875 (12.7)	.835 (21.2) x .400 (14.5)	Vertical	10	Clip/Mtg Hole	44°C @ 2W	7.9°C/W @ 400 LFM
231-69PAB		.690 (18.4)	.835 (21.2) x .400 (12.7)	Vert./Horiz.	No Tab	Clip/Mtg Hole	45°C @ 2W	8°C/W @ 400 LFM
231-69PAB-13H		.400 (38.1)	.690 (17.5) x .835 (12.7)	Horizontal	13H	Clip/Mtg Hole	45°C @ 2W	8°C/W @ 400 LFM
231-69PAB-XXX		.690 (38.1)	.835 (21.2) x .400 (12.7)	Vertical	13V, 14V, 15V	Clip/Mtg Hole	45°C @ 2W	8°C/W @ 400 LFM
231-75PAB		.750 (12.7)	.835 (21.2) x .400 (14.5)	Vert./Horiz.	No Tab	Clip/Mtg Hole	43°C @ 2W	7.9°C/W @ 400 LFM
231-75PAB-13H		.400 (41.3)	.750 (19.1) x .835 (12.7)	Horizontal	13H	Clip/Mtg Hole	43°C @ 2W	7.9°C/W @ 400 LFM
(14V A) 231-75P	PAB-XXX	.750 (34.9)	.835 (21.2) x .400 (12.7)	Vertical	13V, 14V, 15V	Clip/Mtg Hole	43°C @ 2W	7.9°C/W @ 400 LFM
231-137PAB		1.375 (10.2)	.835 (21.2 x .400 (12.7)	Vert./Horiz.	No Tab	Clip/Mtg Hole	32°C @ 2W	5.9°C/W @ 400 LFM
231-137PAB-13H	l	.400 (10.2)	1.375 (34.9) x .835 (12.7)	Horizontal	13H	Clip/Mtg Hole	32°C @ 2W	5.9°C/W @ 400 LFM
(15VA) 231-137F	PAB-XXX	1.375 (10.2)	.835 (21.2) x .400 (12.7)	Vertical	13V, 14V, 15V	Clip/Mtg Hole	32°C @ 2W	5.9°C/W @ 400 LFM

Material: Aluminum, Pre-anodized Black (PAB), Anodized Black (AB) 275 AND 231 SERIES NATURAL AND FORCED **MECHANICAL** CONVECTION CHARACTERISTICS
AIR VELOCITY (LFM) **DIMENSIONS** 띠 HEAT SINK TEMPERATURE RISE ABOVE AMBIENT AIR (°C) ◍ TAB 13H .020 (0.5) (TABS 13V, 14V, 15V) All versions No Tab HORIZONTAL MOUNT POWER DISSIPATION (WATTS) NATURAL AND FORCED CONVECTION CHARACTERISTICS
AIR VELOCITY (LFM) .032 (TAB01) ----(0.8) .375 (9.5) HEAT SINK TEMPERATURE RISE ABOVE AMBIENT AIR (°C) .020 (TAB10) -----(0.5) -.125 (3.2) SERIES NO. DIM "A" DIM "B" 231-69PAB .690 (17.5) .345 (8.8) 231-75PAB .750 (19.1) .375 (9.5) 275-75AB 231-137PAE 1.375 (34.9) .688 (17.5) Dimensions: in. (mm) POWER DISSIPATION (WATTS)





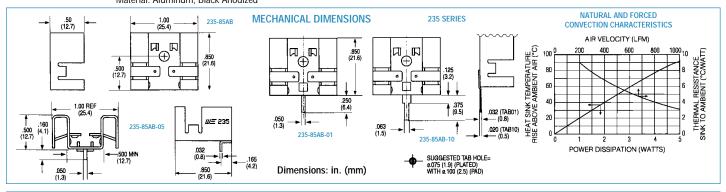
235 SERIES Compact, Stress-Free Labor-Saving Locking-Tab Heat Sinks

TO-220

	Height Above	Footprint				Thermal Perf	ormance at Typical Load
Standard P/N	PC Board in. (mm)	Dimensions in. (mm)	Mounting Configuration	Solderable Tab Options	Mounting Style	Natural Convection	Forced Convection
235-85AB 🔺	.850 (21.6)	1.000 (25.4) x .500 (12.7)	Vert./Horiz.	No Tab	Clip/Mtg Hole	40°C @ 2W	6.8°C/W @ 400 LFM
235-85AB-01	.850 (21.6)	1.000 (25.4) x .500 (12.7)	Vertical	01	Clip/Mtg Hole	40°C @ 2W	6.8°C/W @ 400 LFM
235-85AB-05	.500 (12.7)	.850 (21.6) x1.000 (25.4)	Horizontal	05	Clip/Mtg Hole	40°C @ 2W	6.8°C/W @ 400 LFM
235-85AB-10	.975 (24.8)	1.000 (25.4) x .500 (12.7)	Vertical	10	Clip/Mtg Hole	40°C @ 2W	6.8°C/W @ 400 LFM

PATENT 5381041 235-85AB-10 .975 (24.8) 1.00

Material: Aluminum, Black Anodized



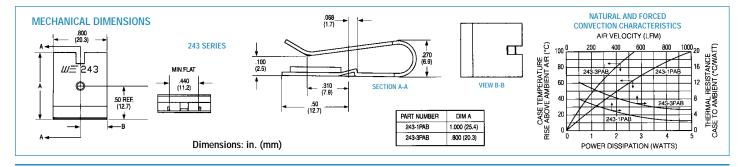


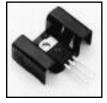
243 SERIES Labor-Saving Clip-On Heat Sinks

TO-220

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

Material: Aluminum, Pre-anodized Black





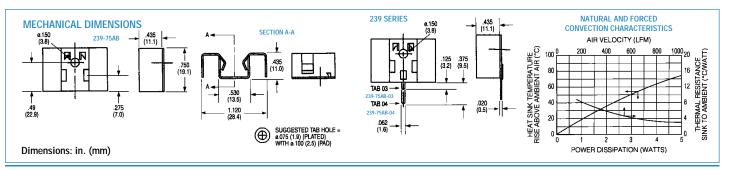
239 SERIES Snap-Down Self-Locking Heat Sinks

TO-220

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

PATENT PENDING

Material: Aluminum, Black Anodized





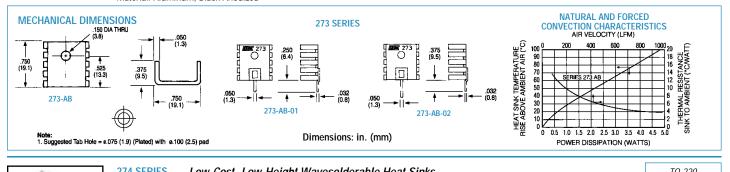


273 SERIES Low-Cost, Low-Height Wavesolderable Heat Sinks

TO-218, TO-220

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

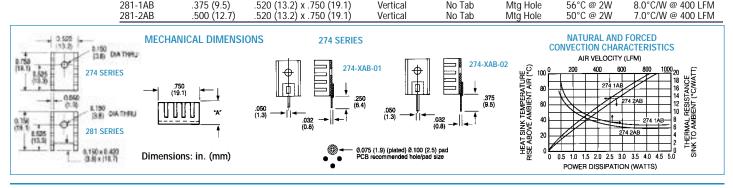
Material: Aluminum, Black Anodized





Material: Aluminum, Black Anodized

274 SERIES	Low-Cost,	Low-Height Wavesolde	rable Heat Sin	ks			TO-220
Standard P/N	Height Above PC Board in. (mm)	Footprint Dimensions in. (mm)	Mounting Configuration	Solderable Tab Options	Mounting Style	Thermal Perfo Natural Convection	ormance at Typical Load Forced Convection
274-1AB 🔺	.375 (9.5)	.520 (13.2) x .750 (19.1)	Vert./Horiz.	No Tab	Mtg Hole	56°C @ 2W	8.0°C/W @ 400 LFM
274-1AB-01 🔺	.375 (9.5)	.520 (13.2) x .750 (19.1)	Vertical	01	Mtg Hole	56°C @ 2W	8.0°C/W @ 400 LFM
274-1AB-02	.375 (9.5)	.520 (13.2) x .750 (19.1)	Vertical	02	Mtg Hole	56°C @ 2W	8.0°C/W @ 400 LFM
274-2AB 🔺	.500 (12.7)	.520 (13.2) x .750 (19.1)	Vert./Horiz.	No Tab	Mtg Hole	50°C @ 2W	7.0°C/W @ 400 LFM
274-2AB-01	.500 (12.7)	.520 (13.2) x .750 (19.1)	Vertical	01	Mtg Hole	50°C @ 2W	7.0°C/W @ 400 LFM
274-2AB-02	.500 (12.7)	.520 (13.2) x .750 (19.1)	Vertical	02	Mtg Hole	50°C @ 2W	7.0°C/W @ 400 LFM
274-3AB 🔺	.250 (6.4)	.520 (13.2) x .750 (19.1)	Vert./Horiz.	No Tab	Mtg Hole	62°C @ 2W	9.0°C/W @ 400 LFM
274-3AB-01	.250 (6.4)	.520 (13.2) x .750 (19.1)	Vertical	01	Mtg Hole	62°C @ 2W	9.0°C/W @ 400 LFM
274-3AB-02	.250 (6.4)	.520 (13.2) x .750 (19.1)	Vertical	02	Mtg Hole	62°C @ 2W	9.0°C/W @ 400 LFM
281-1AB	.375 (9.5)	.520 (13.2) x .750 (19.1)	Vertical	No Tab	Mtg Hole	56°C @ 2W	8.0°C/W @ 400 LFM
281-2AB	.500 (12.7)	.520 (13.2) x .750 (19.1)	Vertical	No Tab	Mtg Hole	50°C @ 2W	7.0°C/W @ 400 LFM





240 SERIES Labor-Saving Twisted Fin Heat Sinks

TO-220

	Height Above	Footprint				Thermal Perfe	ormance at Typical Load
Standard P/N	PC Board in. (mm)	Dimensions in. (mm)	Mounting Configuration	Solderable Tab Options	Mounting Style	Natural Convection	Forced Convection
240-118ABH-22	1.180 (30.0)	1.000 (25.4) x .500 (12.7)	Vertical	22	Clip/Mtg Hole	55°C @ 4W	5.3° C/W @ 400 LFM
240-118ABS-22	1.180 (30.0)	1.000 (25.4) x .500 (12.7)	Vertical	22	Clip/Mtg Slot	55°C @ 4W	5.3° C/W @ 400 LFM
Material: Alumini	um, Black Anodize	ed					

MECHANICAL DIMENSIONS 240 SERIES NATURAL AND FORCED CONVECTION CHARACTERISTICS AIR VELOCITY (LFM) .300 (7.6) HEAT SINK TEMPERATURE RISE ABOVE AMBIENT AIR (°C) .700 (17.8) ø.100 PLATED (2.5) .400 (10.2) 240-118ABS-22 POWER DISSIPATION (WATTS) STAINLESS STEEL 330SC 44 SPRING STEEL 285SC 10# 240-118ABH-22 Dimensions: in. (mm) Order SpeedClips[™] Separately





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

TO-220

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

242-125AB-22 MECHANICAL DIMENSIONS

242 SERIES

NATURAL AND FORCED CONVECTION CHARACTERISTICS

AIR PLAT (13.6)

(3.1.9)

P.C. BOARD MTG. SURFACE

(3.1.9)

P.C. BOARD MTG. SURFACE

(3.2)

P.C. BOARD MTG. SURFACE

(3.2)

P.C. BOARD MTG. SURFACE

(3.3.9)

P.C. BOARD MTG. SURFACE

(3.4.7)

(3.4.7)

P.C. BOARD MTG. SURFACE

(3.5.1)

P.C. BOARD MTG. SURFACE

(3.6.4)

P.C. BOARD MTG. SURFACE

(3.7.70

(3.8.4)

P.C. BOARD MTG. SURFACE

(3.9.1)

P.C. BOARD MTG. SURFACE

(3.1.9)

P.C

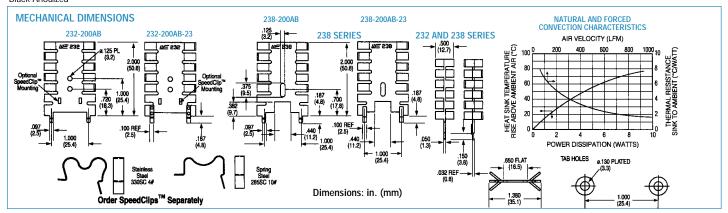


Material: Aluminum, Black Anodized

232 AND 238 SERIES Staggered Fin Heat Sinks for Vertical Mounting

TO-202, TO-220

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



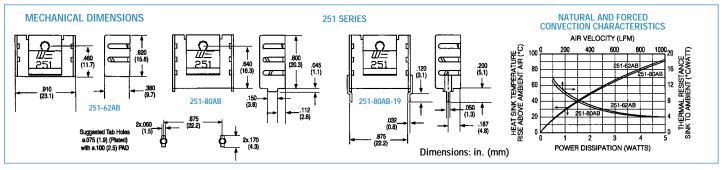


251 SERIES Slim-Profile Heat Sinks With Integral Clips

15 Lead Multiwatt

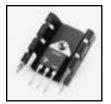
Standard P/N	Height Above PC Board in. (mm)	Footprint Dimensions in. (mm)	Mounting Configuration	Solderable Tab Options	Mounting Style	Thermal Perfo Natural Convection	ormance at Typical Load Forced Convection
251-62AB	.620 (15.7)	.910 (23.1) x .380 (9.7)	Vert./Horiz.	No Tab	Clip	66°C @ 3W	66°C/W @ 400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

Material: Aluminum, Black Anodized





BOARD LEVEL HEAT SINKS FOR TO-220, TO-218 AND MULTIWATT™ COMPONENTS

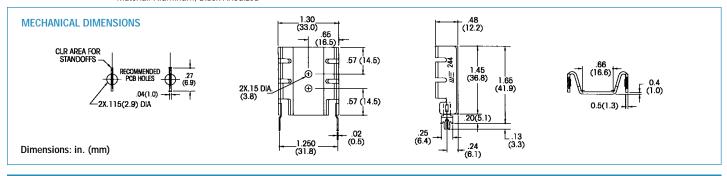


244 SERIES Low Height, Slim Profile Wavesolderable Folded Fin Heat Sinks

MULTIWATT

	Height Above	Footprint	Thermal Performance at Typical Load					
Standard P/N	PC Board in. (mm)	Dimensions in. (mm)	Mounting Configuration	Solderable Tab Options	Natural Convection	Forced Convection	Weight lbs. (grams)	
244-145AB	1.450 (36.8)	1.300 (33.0) x 480 (12.1)	Vert/Horiz,	No Tab	44°C @ 4W	4.4°C/W @ 400 LFM	.0160 (7.25)	
244-145AB-50	1.650 (41.9)	1.300 (33.0) x 480 (12.1)	Vertical	50	44°C @ 4W	4.4°C/W @ 400 LFM	.0170 (7.20)	

Material: Aluminum, Black Anodized



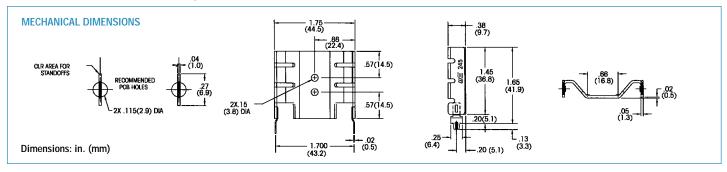


245 SERIES Low Height, Slim Profile Wavesolderable Folded Fin Heat Sinks

MULTIWATT

	Height Above	Footprint			Thermal Perfo	rmance at Typical Load	
Standard P/N	PČ Board in. (mm)	Dimensions in. (mm)	Mounting Configuration	Solderable Tab Options	Natural Convection	Forced Convection	Weight lbs. (grams)
245-145AB	1.450 (36.8)	1.750 (44.5) x .380 (9.7)	Ver.t/Horiz.	No Tab	38°C @ 4W	3.2°C/W @ 400 LFM	.0160 (7.25)
245-145AB-50	1.650 (41.9)	1.750 (44.5) x .380 (9.7)	Vertical	50	38°C @ 4W	3.2°C/W @ 400 LFM	.0170 (7.20)

Material: Aluminum, Black Anodized



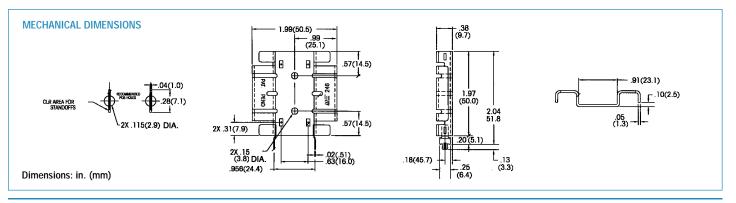


246 SERIES Medium Height, Slim Profile Wavesolderable Folded Fin Heat Sinks

MULTIWATT

	Height Above	Footprint	Thermal Performance at Typical Load				
Standard P/N	PC Board in. (mm)	Dimensions in. (mm)	Mounting Configuration	Solderable Tab Options	Natural Convection	Forced Convection	Weight lbs. (grams)
246-197AB	1.968 (50.0)	1.986 (50.4) x 3.75 (9.5)	Vert./Horiz.	No Tab	35°C @ 4W	2.8°C/W @ 400 LFM	.0240 (10.90)
246-197AB-50	2.168 (55.1)	1.986 (50.4) x 3.75 (9.5)	Vertical	50	35°C @ 4W	2.8°C/W @ 400 LFM	.0250 (11.40)

Order SpeedClip™ 285SC or 330SC separately. (See 248 Series section). Material: Aluminum, Black Anodized





BOARD LEVEL HEAT SINKS FOR TO-220, TO-218 AND MULTIWATT™ COMPONENTS

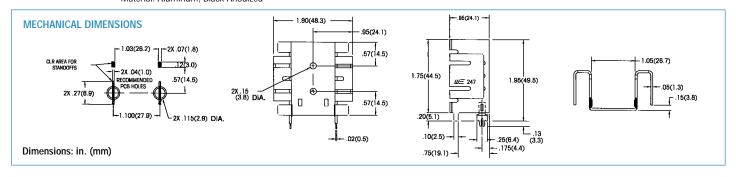


247 SERIES Medium Height, Deep Profile Wavesolderable Folded Fin Heat Sinks

MULTIWATT

	Height Above	<i>y</i>				rmance at Typical Load	
Standard P/N	PC Board in. (mm)	Dimensions in. (mm)	Mounting Configuration	Solderable Tab Options	Natural Convection	Forced Convection	Weight lbs. (grams)
247-195AB	1.950 (49.5)	1.900 (48.3) x .950 (24.1)	Vert./Horiz.	No Tab	25°C@ 4W	2.4°C/W @ 400 LFM	.0330 (15.10)
247-195AB-50	1.950 (49.5)	1.900 (48.3) x .950 (24.1)	Vertical	50	25°C@ 4W	2.4°C/W @ 400 LFM	.0340 (15.60)

Order SpeedClip™ 285SC or 330SC separately. (See 248 Series section). Material: Aluminum, Black Anodized

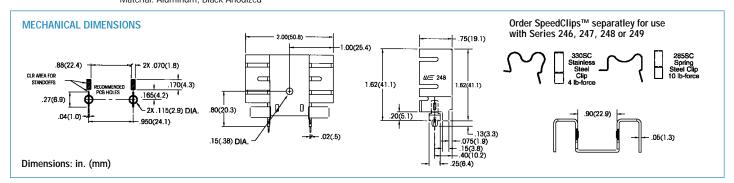


248 SERIES Low Height, Medium Profile Wavesolderable Folded Fin Heat Sinks

MULTIWATT

	Height Above	Height Above Footprint Thermal Performan				rmance at Typical Load	
Standard	PC Board	Dimensions	Mounting	Solderable	Natural	Forced	Weight
P/N	in. (mm)	in. (mm)	Configuration	Tab Options	Convection	Convection	lbs. (grams)
248-162AB	1.620 (41.1)	2.000 (50.8) x .750 (19.1)	Vert/Horiz.	No Tab	35°C @ 4w	2.5°C/W @ 400 LFM	.026 (11.60)
248-162AB-50	1.620 (41.1)	2.000 (50.8) x .750 (19.1)	Vertical	50	35°C @ 4w	2.5°C/W @ 400 LFM	.027 (12.20)

Order SpeedClip™ 285SC or 330SC separately.
Material: Aluminum, Black Anodized



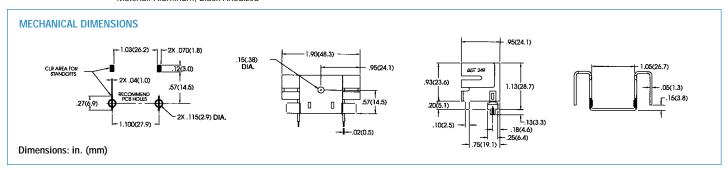
▲ Normally stocked

249 SERIES Medium Height, Deep Profile Wavesolderable Folded Fin Heat Sinks

MULTIWATT

	Height Above	Footprint	Thermal Performance at Typical Load				
Standard P/N	PC Board in. (mm)	Dimensions in. (mm)	Mounting Configuration	Solderable Tab Options	Natural Convection	Forced Convection	Weight lbs. (grams)
249-113AB	1.130 (28.7)	1.900 (48.3) x .950 (24.1)	Vert./Horiz,	No Tab	35°C@ 4W	3.29°C/W @ 400 LFM	.020 (8.90)
249-113AB-50	1.130 (28.7)	1.900 (48.3) x .950 (24.1)	Vertical	50	35°C@ 4W	3.29°C/W @ 400 LFM	.021 (9.40)

Order SpeedClip™ 285SC or 330SC separately. (See 248 Series section). Material: Aluminum, Black Anodized







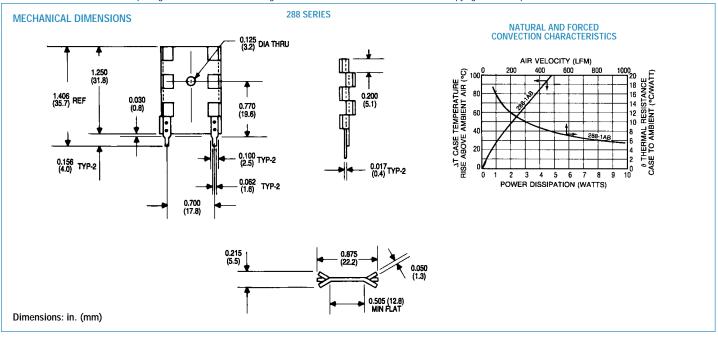
288 SERIES Compact Wave-Solderable Low-Cost Heat Sinks

TO-220, TO-202

	Height Above	Maximum	Thermal Perfor	mance at Typical Load	
Standard P/N	PČ Board in. (mm)	Footprint in. (mm)	Natural Convection	Forced Convection	Weight lbs. (grams)
288-1AB ▲	1.250 (31.8)	0.875 (22.2) x 0.215 (5.5)	85°C @ 4W	12°C/W @ 200 LFM	0.0057 (2.59)

Mounting tabs are pre-tinned to ensure excellent wave-solder bond and good electrical connections for vertical mounting of TO-220 and TO-202 semiconductor packages. These heat sinks are designed for use where minimum PC

board space is available. The 288-1AB is a stamped aluminum heat sink, black anodized, designed for applications requiring good heat dissipation from a heat sink occupying minimum space, available at minimum cost.





271 SERIES Top-Mount Booster Heat Sinks for Use with 270/272/280 Series

Horizontal

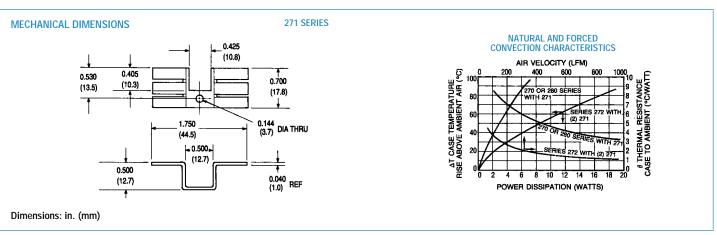
TO-220

	Height Above	Mounting Footprint	Thermal Performa		
Standard P/N	Semiconductor Case in. (mm)	Dimensions in. (mm)	Natural Convection	Forced Convection	Weight lbs. (grams)
271-AB ▲	0.500 (12.7)	1.750 (44.5) x 0.700 (17.8)	62°C @ 4W (NOTE A) 31 °C @ 4W (NOTE B)	5.1° C/W @ 400 LFM 1.8° C/W 400 LFM (NOTE B)	0.0052 (2.36)

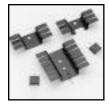
Material: Aluminum, Black Anodized

This top-hat style booster heat sink can be added to any of the 270, 272, or 280 Series for improved performance.

NOTE A: Thermal resistance with one 271-AB. NOTE B: Thermal resistance (total) as shown with (2) 271-AB types added to (1) 272-AB type.







270/272/280 SERIES Small Footprint Low-Cost Heat Sinks

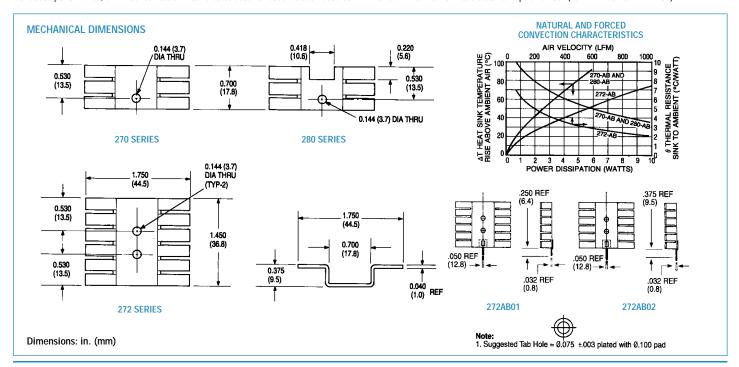
TO-220, TO-202

	Height Above	Horizontal Mounting					
Standard P/N	PČ Board in. (mm)	Maximum Footing in. (mm)	Solderable Tab Options	Natural Convection	Forced Convection	Weight lbs. (grams)	
270-AB 🔺	0.375 (9.4)	1.750 (44.5) x 0.700 (17.8)	_	70°C @ 4W	6.0° C/W @ 400 LFM	0.0052 (2.36)	
272-AB 🔺	0.375 (9.4)	1.750 (44.5) x 1.450 (36.8)	01,02	42°C @ 4W	3.6° C/W @ 400 LFM	0.0105 (5.72)	
280-AB	0.375 (9.4)	1.750 (44.5) x 0.700 (17.8)		70°C @ 4W	6.0°C/W @ 400 LFM	0.0048 (2.18)	

Material: Aluminum, Black Anodized

These exceptionally low-cost heat sinks can be mounted horizontally under a TO-220 or TO-202 case style with a maximum height of only 0.375 in. (9.4). For added performance, a 271 Series heat sink can also be used for double-sided heat dissi-

pation. The 270-AB and 280-AB accept one power semiconductor; the 272-AB is designed for two power semiconductors. Specify solderable tab options for the 272 Series by the addition of suffix "01" or "02" to the standard part number (i.e. 272-AB01 or 272-AB02).





289 AND 290 SERIES Low-Cost Single or Dual Package Heat Sinks

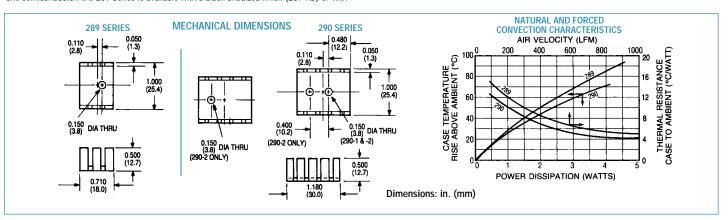
TO-218, TO-202, TO-220

Height Above		Horizontal Mounting	Thermal Perform		
Standard P/N	PC Board in. (mm)	Maximum Footing in. (mm)	Natural Convection	Forced Convection	Weight lbs. (grams)
289-AB 🔺	0.500 (12.7)	1.000 (25.4) x 0.710 (18.1)	50°C @ 2W	44° C/W @ 400 LFM	0.0055 (2.49)
289-AP	0.500 (12.7)	1.000 (25.4) x 0.710 (18.1)	50°C@2W	44° C/W @ 400 LFM	0.0055 (2.49)
290-1AB 🔺	0.500 (12.7)	1.000 (25.4) x 1.180 (30.0)	44°C @ 2W	35° C/W @ 400 LFM	0.0082 (3.72)
290-2AB 🔺	0.500 (12.7)	1.000 (25.4) x 1.180 (30.0)	44°C @ 2W	35° C/W @ 400 LFM	0.0081 (3.67)

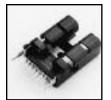
Material: Aluminum, Black Anodized

Low in cost and compact in overall dimensions, one 289 Series heat sink can accommodate one semiconductor; the 289 Series is available with a black anodized finish (289-AB) or with

no finish (289-AP). Two semiconductors can be mounted to the 290-2AB style.



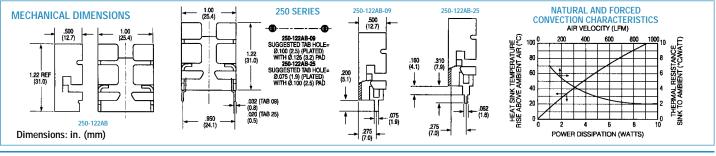




250 SERIES High-Performance Slim Profile Heat Sinks With Integral Clips

Multiwatt

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



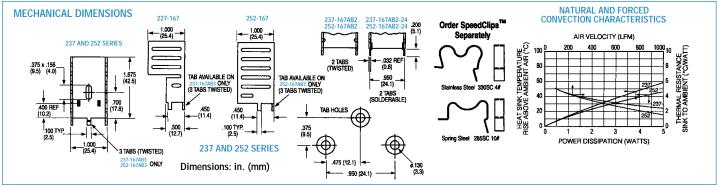


237 AND 252 SERIES High-Performance, High-Power Vertical Mount Heat Sinks

TO-220

	Height Above	Footprint				Thermal Perfori	mance at Typical Load
Standard P/N	PC Board in. (mm)	Dimensions in. (mm)	Mounting Configuration	Solderable Tab Options	Mounting Style	Natural Convection	Forced Convection
237-167AB2	1.675 (42.5)	1.000 (25-4) x 1.000 (25.4)	Vertical	2, Twisted	Clip/Mtg Slot	46°C @ 4W	4.5° C/W @ 200 LFM
237-167AB3	1.675 (42.5)	1.000 (25.4) x 1.000 (25.4)	Vertical	Twisted	Clip/Mtg Slot	46°C@4W	4.5° C/W @ 200 LFM
237-167AB2-24	1.675 (42.5)	1.000 (25.4) x 1.000 (25.4)	Vertical	2, Solderable	Clip/Mtg Slot	46°C @ 4W	4.5° C/W @ 200 LFM
252-167AB2	1.675 (42.5)	1.000 (25.4) x 1.000 (25.4)	Vertical	Twisted	Clip/Mtg Slot	40°C @ 4W	4.5° C/W @ 200 LFM
252-167AB3	1.675 (42.5)	1.000 (25.4) x 1.000 (25.4)	Vertical	Twisted	Clip/Mtg Slot	40°C@4W	4.5° C/W @ 200 LFM
252-167AB2-24	1.675 (42.5)	1.000 (25.4) x 1.000 (25.4)	Vertical	Solderable	Clip/Mtg Slot	40°C @ 4W	4.5° C/W @ 200 LFM

Order SpeedClips™ 285SC or 330SC separately for rapid component installation, lowering manufacturing costs. Material: Aluminum, Black Anodized





291 SERIES Labor-Saving Clip-on Heat Sinks

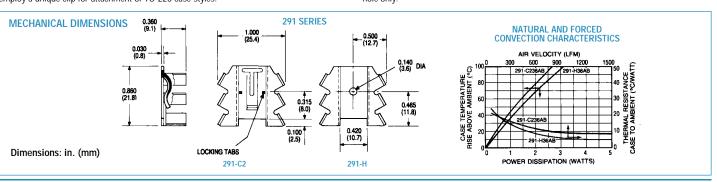
TO-220

	Height Above	Mounting Footprint		Thermal Perforn	nance at Typical Load	
Standard P/N	PC Board in. (mm)	Dimensions in. (mm)	Mounting Style	Natural Convection	Forced Convection	Weight lbs. (grams)
291-C236AB	0.860 (21.)9	1.100 (27.0) x 0.360 (9.1)	TO-220 (Clip)	80°C @ 2W	24°C/W @ 600 LFM	0.0026 (1.18)
291-H36AB ▲	0.860 (21.9)	1.100 (27.0) x 0.360 (9.1)	TO-220 (Mtg. Hole)	68°C @ 2W	16°C/W @ 600 LFM	0.0026 (1.18))

Material: Aluminum, Black Anodized

Designed for mounting horizontally or vertically on a circuit board, 291 Series heat sinks employ a unique clip for attachment of TO-220 case styles.

One type is available with a locking clip and one with a 0.140 in. (3.6) diameter mounting hole only.





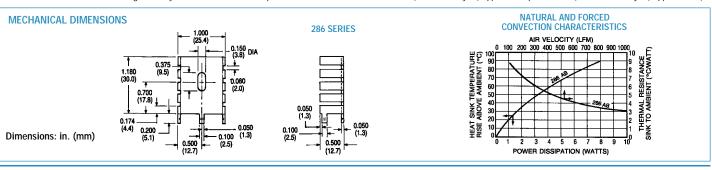


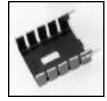
286 SERIES Aluminum and Copper Low-Cost Wave-Solderable Heat Sinks

TO-220

Height Above			Thermal Performance at Typical Load			
Standard	PC Board	Maximum Footprint		Natural	Forced	Weight
P/N	in. (mm)	in. (mm)	Material	Convection	Convection	lbs. (grams)
286-AB 🔺	1.190 (30.2)	1.000 (25.4) x 0.500 (12.7)	Aluminum, Anodized	58°C @ 4W	7.4°CW @ 200 LFM	0.0085 (3.86)
286-CBT ▲	1.190 (30.2)	1.000 (25.4) x 0.500 (12.7)	Copper, Black	58°C @ 4W	7.4° CW @ 200 LFM	0.0250 (11.34)
286-CT	1.190 (30.2)	1.000 (25.4) x 0.500 (12.7)	Copper, Tinned	58°C @ 4W	7.4° CW @ 200 LFM	0.0250 (11.34)

Efficient heat removal at low cost can be achieved by inserting the 286 Series directly into predrilled circuit boards; scored mounting tabs may be bent after insertion to provide added stability. The 286 Series can be wavesoldered directly to the board. Material: 286-AB style (aluminum, black anodized), 286-CBT style (copper, black paint tin tabs), and 286-CT style (copper, tinned).





287 SERIES Wave-Solderable Low-Cost Heat Sinks

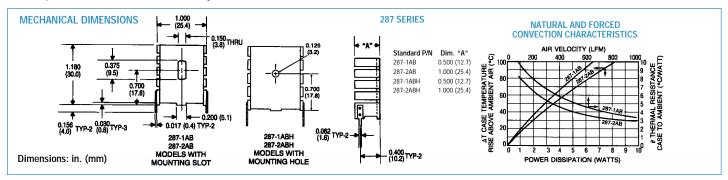
TO-220

		Height Above	Maximum	Thermal Performa	ance at Typical Load	
Standa	ard P/N	PC Board	Footprint "A"	Natural	Forced	Weight
Mounting Slot	Mounting Hole	in. (mm)	in. (mm)	Convection	Convection	lbs. (grams)
287-1AB ▲	287-1ABH ▲	1.180 (30.0)	1.000 (25.4) x 0.500 (12.7)	65°C @ 4W	7.8°CW @ 200 LFM	0.0090 (4.08)
287-2AB 🔺	287-2ABH	1.180 (30.0)	1.000 (25.4) x 1.000 (25.4)	55°10 @ 4W	6.4°CW @ 200 LFM	0.0140 (6.35)

Material: Aluminum, Black Anodized

Mount these cost-effective TO-220 heat sinks vertically into pre-drilled printed circuit boards. Soldered, pre-tinned tabs can be wavesoldered directly to the board. A 0.375 in. $(9.5\ \text{mm})$

mounting slot allows for correct positioning of TO-220 and similar semiconductor packages.



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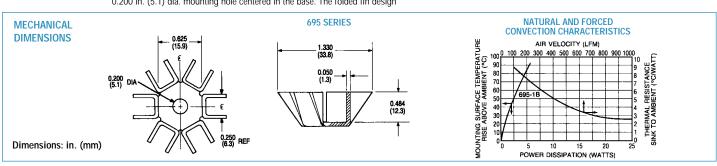
695 SERIES Space-Saving Heat Sinks for Small Stud-Mounted Diodes

STUD-MOUNT

Maximum			Thermal Perform		
Standard P/N	Width in. (mm)	Height in. (mm)	Natural Convection	Forced Convection	Weight lbs. (grams)
695-1B ▲	1.330 (33.8)	0.530 (13.7)	72°C @ 4.0W	5.2°C/W @ 400 LFM	0.0030 (1.36)

Mount and effectively heat sink small stud-mounted diodes with the 695 Series space-saving heat sink type. Each unit is black anodized aluminum with an 0.200 in. (5.1) dia. mounting hole centered in the base. The folded fin design

provides good heat dissipation for use where height is limited above the printed circuit board or base plate.

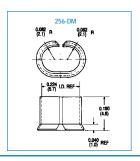






256 SERIES Thermal Retainers

Standard P/N	Height (Less Mounting Tab) in. (mm)	Material	Weight Ibs. (grams)
256-DM ▲	0.190 (4.0)	Beryllium Copper	0.0005 (0.23)



TO-92

260 SERIES Cup Clips for TO-5 Case Style Semiconductors

TO-5

Characteristics	TO-5
Thermal Resistance – Epoxy Insulated Thermal Resistance – Beryllium Oxide Insulated	14° C/W 16° C/W
Breakdown Voltage – Epoxy Type (VAC), 60 Hz Breakdown Voltage – Beryllium Type (VAC), 60 Hz	500 1000
Recommended Operating Voltage, AC or DC Clean Conditions: % Hipot Rating Dusty Conditions: % Hipot Rating Dirty Conditions: % Hipot Rating	50 30 10 to 20
Temperature Range — Continuous (C°)	-73/+149

Model	Depth of Tapped Base
260-4T5E 260-4TH5E 260-4TH5B	0.093 (2.36) 0.125 (3.18) 0.125 (3.18)

Base Style: H = hex
Semiconductor
Case Style: 5 = TO-5
Insulation E = epoxy
Type: B = beryllium



TO-5 CASE STY	TO-5 CASE STYLE CUP CLIPS — ORDERING GUIDE					
Standard P/N	Insulation Type	Outline Dimension L x W x I.D. in. (mm)	Weight lbs. (grams)	Case Style		
260-4T5E ▲	Epoxy Insulated	0.370 (9.4) x 0.380 (9.7) dia. x 0.290 (7.4)	0.0024 (1.09)	TO-5		
260-4TH5E ▲	Epoxy Insulatad	0.400 (10.2) x 0.370 (9.4) hex. x 0.290 (7.4)	0.0031 (1.41)	TO-5		
260-6SH5E ▲	Epoxy Insulated	0.557 (14.1) x 0.370 (9.4) hex. x 0.290 (7.4)	0.0037 (1.68)	TO-5		
260-10SH5E	Epoxy Insulated	0.557 (14.1) x 0.370 (9.4) hex. x 0.290 (7.4)	0.0042 (1.91)	TO-5		
260-4TH5B ▲	Beryllium Oxide Insulated	0.445 (11.3) x 0.370 (9.4) hex. x 0.290 (7.4)	0.0042 (1.91)	TO-5		
260-6SH5B ▲	Beryllium Oxide Insulated	0.607 (15.4) x 0.370 (9.4) hex. x 0.290 (7.4)	0.0039 (1.77)	TO-5		
260-10SH5B	Beryllium Oxide Insulated	0.607 (15.4) x 0.370 (9.4) hex. x 0.290 (7.4)	0.0043 (1.95)	TO-5		

Materials and Finish: Cups - beryllium copper, black ebonol "C"; Bases - brass, black ebonol "C"; Ceramic Spacers - beryllium oxide

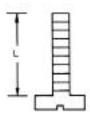
Base Mounting Configurations = T0-5

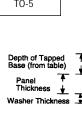
Plain Type — Epoxy bonded, or used with #4 pan head screws.

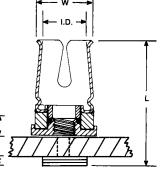
Tapped Base — #4-40 UNC screw (not supplied) fits tapped hole. Care should be taken not to use too long a screw, which could short against the semiconductor case. For correct screw lengths:

Correct Screw Length (L) = Depth of Base + Panel Thickness + Washer Thickness

Stud Mounting Base. #6-32 UNC or #10-32 UNF studs. Nuts and washers not supplied. Stud hole must be slightly countersunk to ensure flat mounting.



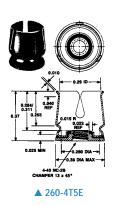


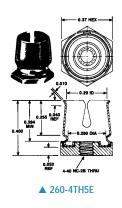


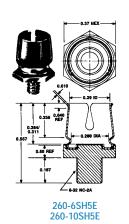
To determine the correct mounting screw lengths, add dimensions as follows:

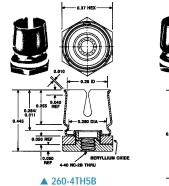
Correct Screw Length (L) = Depth of Base + Panel Thickness + Washer Thickness

Epoxy Insulated For TO-5

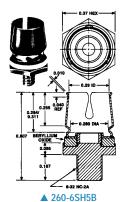








Beryllium Oxide Insulated For TO-5



260-10SH5B

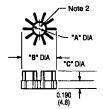


200 SERIES High-Efficiency Heat Sinks for Small Metal Can Power Semiconductors

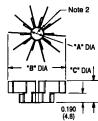












Single-Level Star 201, 202, 204, 205, 211 Series

Dual-Level Star 203,207,213 Series

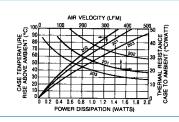
Dual-Level Sunburst 209, 215 Series

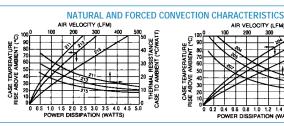
Applicable Available Semiconductor Heat Sink Heat Sink **Heat Sink** Natural Standard P/N Case Diameter Inside Dia. Outside Dia. Height Convection Forced Power & Finish Min/Max "B" Case Rise Convection Semiconductor in. (mm) in. (mm) in. (mm) Above Ambient CA@200 LFM) Case Types Types in. (mm) 0.161 (4.1)/0.240 (6.1) 0.187 (4.8) 65°C @ 1W 31°C/W TO-18, TO-24, TO-28, ▲ 201CB, 201AB 0.150 (3.8) 0.640 (16.2) 202CB 0.161 (4.1)/0.240 (6.1) 0.150 (3.8) 0.490 (12.5) 0.187 (4.8) 73°C @ 1W 43°C/W TO-40, TO-44 203CB 0.161 (4.1)/0.240 (6.1) 0.150 (3.8) 0.640 (16.2) 0.375 (9.5) 53°C @ 1W 23°C/W 204CB ▲, 204SB 0.275 (7.0)/0.370 (9.4) 0.255 (6.5) 0.550 (4.8) 0.187 (4.8) 68°C @ 1W 35°C/W TO-5, TO-9, TO-11, 59°C @ 1W 205CB ▲, 205SB 205AB, 205AP 0.275 (7.0)/0.370 (9.4) 0.255 (6.5) 0.720 (18.3) 0.187 (4.8) 0.187 (4.8) 28°C/W TO-12, TO-26, TO-29, 0.275 (7.0)/0.370 (9.4) 0.255 (6.5) 68°C @ 1W 28°C/W TO-33, TO-43, TO-45 0.720 (18.3) 46°C @ 1W 207CB ▲, 207SB ▲ 0.275 (7.0)/0.370 (9.4) 20°C/W 0.255 (6,5) 0.720 (18.3) 0.375 (9.5) 207AB 🛕, 207AP 0.275 (7.0)/0.370 (9.4) 0.255 (6.5) 0.720 (18.3) 0.375 (9.5) 53°C @ 1W 20°C/W 209CB, 209SB 30°C @ 1W 13°C/W 0.275 (7.0)/0.370 (9.4) 0.255 (6.5) 1.280 (32.5) 0.437 (11.1) 0.830 (21.1) 0.830 (21.1) 211CB 0.440 (11.2)/0.544 (13.8) 0.420 (10.7) 0.187 (4.8) 50°C @ 1W 24°C/W TO-8 TO-38 0.440 (11.2)/0.544 (13.8) 0.375 (9.5) 44°C @ 1W 19°C/W 213CB, 213SB 0.420 (10.7) 0.440 (11.2)/0.544 (13.8) 0.375 (9.5) 51°C @ 1W 19°C/W 213AB, 213AP 0.830 (21.1) 0.420 (10.7) 15°C/W 215CB, 215AB 0.440 (11.2)/0.544 (13.8) 0.437 (11.1) 28°C @ 1W 0.420 (10.7) 1.400 (35.6) 0.440 (11.2)/0.544 (13.8)

	, ,		
Materials and Finishes Available for 200 Series:			
CB	Beryllium cop-		
	per; black ebonol		
	"C" Finish		
SB	Silver-bearing		
	copper; black		
	ebonol "C"		
AB	Aluminum, black		
	anodized		
AΡ	Aluminum, no		
	finish applied		

DIODES

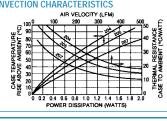
TO-92





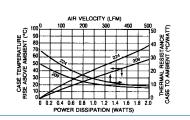
1.400 (35.6)

0.437 (11.1)



15°C/W

32°C @ 1W



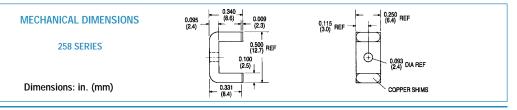
215AP

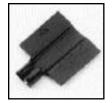
258 SERIES Thermal Links for Fused Glass Diodes

0.420 (10.7)

Weight Standard **Dimensions** Material P/N Finish lbs. (grams) 258 🔺 0.500 (12.7) x 0.250 (6.4) x 0.340 (8.6) DeltaCoate™ 151 on all surfaces 0.0018 (0.82) Aluminum except solder pads and base

The thermal resistance from diode leads to chassis or heat sink is 12°C/watt, when unit is mounted with TYPF 120 Joint Compound. If a 10°C/watt chassis or sink to ambient impedance is available, the thermal resistance from the diode leads to ambient is reduced from about 150°C/watt to 22°C/watt



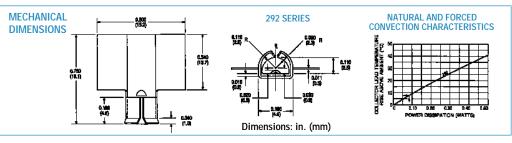


292 SERIES Heat Sink for Single TO-92

Weight

Height Above Overall Thermal Performance Standard PC Board Fin Width **Finish** P/N in. (mm) in. (mm) **Natural Convection** lbs. (grams) 292-AB 🔺 0.750 (19.1) 0.600 (15.3) 0.225° C/W @ 0.250 W Black Anodized 0.00049 (0.22)

Power semiconductors packaged in a TO-92 style plastic case can be cooled effectively at little additional cost with the addition of the 292-AB heat sink. The 292-AB is effective over the typical power range of such devices. Material: Aluminum, Black Anodized.







634 SERIES Slim Profile Unidirectional Fin Vertical Mount Heat Sink

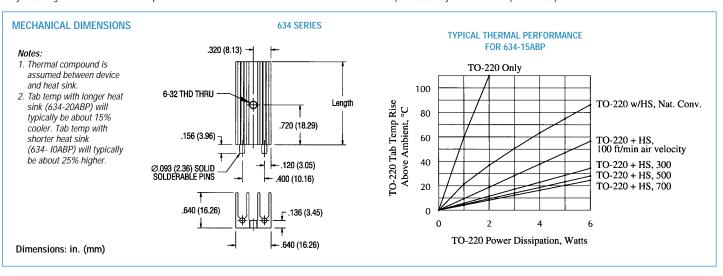
TO-220 and TO-218

Standard P/N		Height Above PC Board	Footprint Dimensions	Weight
Plain Pin	Without Pin	in. (mm)	in. (mm)	lbs. (grams)
634-10ABP ▲	634-10AB	1.000 (25.4)	0.640 (16.26) x 0.640 (16.26)	0.016 (7.48)
634-15ABP	634-15AB	1.500 (38.1)	0.640 (16.26) x 0.640 (16.26)	0.025 (11.21)
634-20ABP ▲	634-20AB	2.000 (50.8)	0.640 (16.26) x 0.640 (16.26)	0.033 (14.95)

Material: Aluminum, Black Anodized

These slim profile unidirectional fin heat sinks offer users two assembly alternatives for vertically mounting TO-220 and TO-218 components. Models are available with or without wave-

solderable pins on 0.40 in. (10.2) centers, making them ideal for a variety of applications where quick assembly is needed and space is at a premium.





637 SERIES High-Efficiency Heat Sinks For Vertical Board Mounting

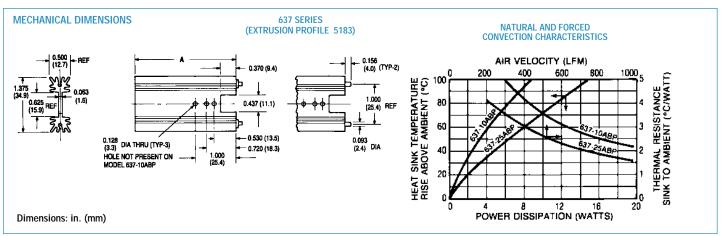
TO-220

	Height Above		Thermal Perforn	nance at Typical Load	
Standard	PC Board "A"	Maximum Footprint	Natural	Forced	Weight
P/N	in. (mm)	in. (mm)	Convection	Convection	lbs. (grams)
637-10ABP ▲	1.000 (25.4)	1.375 (34.9) x 0.500 (12.7)	76°C @ 6W	5.8° C/W @ 200 LFM	0.023 (10.43)
637-15ABP ▲	1.500 (38.1)	1.375 (34.9) x 0.500 (12.7)	65°C @ 6w	5.5° C/W @ 200 LFM	0.035 (15.88)
637-20ABP ▲	2.000 (50.8)	1.375 (34.9) x 0.500 (12.7)	55°C @ 6W	4.7° C/W @ 200 LFM	0.050 (22.68)
637-25ABP ▲	2.500 (63.5)	1.375 (34.9) x 0.500 (12.7)	48°C @ 6W	4.2° C/W @ 200 LFM	0.062 (28.12)

Material: Aluminum, Black Anodized

Wave-solderable pins on 1 in. centers for vertical mounting on printed circuit boards. Maximum semiconductor package width 0.625 in. (15.9). Use this heat sink where weight

and board space occupied must be minimized. Refer to the Accessory products section for thermal interface materials, thermal compounds, and other accessories products.







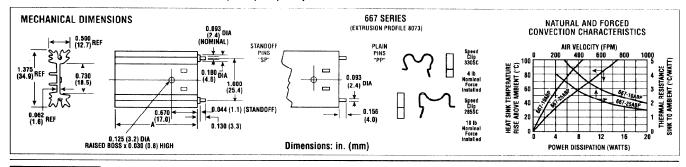
667 SERIES Labor-Saving SpeedClip™ Heat Sinks for Vertical Board Mounting

TO-220

		Height Above	Maximum	Thermal Perfo	rmance at Typical Load	
Standa Standoff Pin	ard P/N Plain Pin	PC Board "A" in. (mm)	Footprint in. (mm)	Natural Convection	Forced Convection	Weight lbs (grams)
667-10ABSP ▲	667-10ABPP ▲	1.000 (25.4)	1.375 (34.9) x 0.500 (12.7)	76°C @ 6W	5.8°C/W @ 200 LFM	0.0240 (11.0)
667-15ABSP	667-15ABPP ▲	1.500 (38.1)	1.375 (34.9) x 0.500 (12.7)	66°C @ 6W	5.5°C/W @ 200 LFM	0.0340 (15.6)
667-20ABSP	667-20ABPP	2.000 (50.8)	1.375 (34.9) x 0.500 (12.7)	58°C @ 6W	4.7°C/W @ 200 LFM	0.0460 (21.0)
667-25ABSP	667-25ABPP	2.500 (63.5)	1.375 (34.9) x 0.500 (12.7)	48°C @ 6W	4.2°C/W @ 200 LFM	0.0580 (26.2)

Wave-solderable pins. Material: Aluminum, Black Anodized

Excellent performance, choice of wave-solderable plain pins (PP-Type) or wave-solderable hex-shaped standoff pins (SP-Type), and reduced assembly cost. Note: Order 330 SC or 285 SC SpeedClip™ separately.



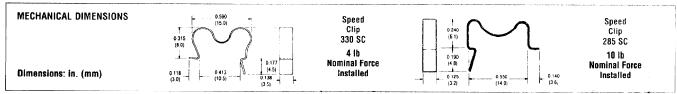


285 AND 330 SERIES 285 SC and 330 SC SpeedClips™ for 667 Series Heat Sinks

Standard P/N	Nominal Installed Loading Force	For Use With Series	Material	Weight lbs. (grams)
285 SC	10 lbs	232, 237, 240, 252, 667	Carbon Steel	0.00053 (0.24)
330 SC	4 lbs	232, 237, 240, 252, 667	Stainless Steel	0.00074 (0.34)

SpeedClips™ employ a locking safety tab for mounting. Must be ordered separately for these heat sink series. Use these SpeedClips™ with our 237, 240, 252, and 667 Series heat sinks

for the lowest production assembly time and cost. Order one SpeedClip™ for each 667 Series heat sink purchased.





647 SERIES High-Performance Heat Sinks for Vertical Board Mounting

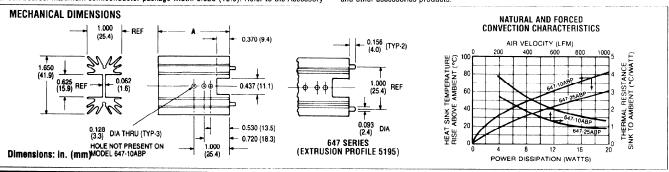
Hatabi Abassa

TO-220

Board "A"	Maximum Footprint	Natural	Forced	Mainht
in. (mm)	in. (mm)	Convection	Convection	Weight Ibs. (grams)
.000 (25.4)	1.650 (41.9) x 1.000 (25.4)	42°C @ 6W	3.8° C/W @ 200 LFM	0.055 (24.95)
.500 (38.1)	1.650 (41.9) x 1.000 (25.4)	37°C @ 6w	3.5° C/W @ 200 LFM	0.075 (34.02)
.750 (44.5)	1.650 (41.9) x 1.000 (25.4)	34°C @ 6W	3.3° C/W @ 200 LFM	0.090 (40.82)
.000 (50.8)	1.650 (41.9) x 1.000 (25.4)	31°C @ 6W	3.1° C/W @ 200 LFM	0.104 (47.17)
.500 (63.5)	1.650 (41.9) x 1.000 (25.4)	25°C @ 6W	2.8° C/W @ 200 LFM	0.125 (56.70)
	.000 (25.4) .500 (38.1) .750 (44.5) .000 (50.8) .500 (63.5)	.000 (25.4)	.000 (25.4)	.000 (25.4)

Wave-solderable pins on 1 in. centers for vertical mounting of larger devices on printed circuit boards. Maximum semiconductor package width: 0.625 (15.9). Refer to the Accessory

Products section for thermal interface materials, 126 Series silicone-free thermal compounds, and other accessories products.





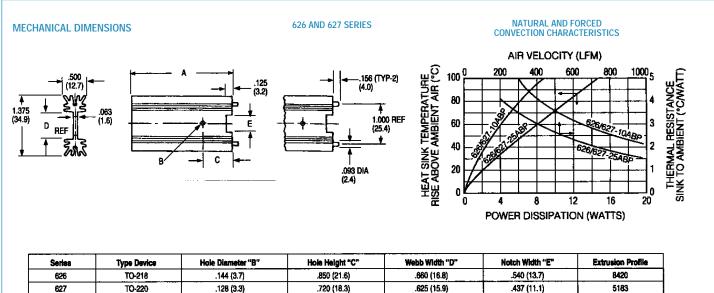


626 AND 627 SERIES High-Efficiency Heat Sinks for Vertical Board Mounting

TO-218, TO-220

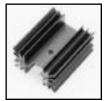
Standard P/N	Standard P/N	Height Above PC Board "A" in. (mm)	Maximum Footprint in. (mm)	Thermal Perfor Natural Convection	rmance at Typical Load Forced Convection
626-10ABP	627-10ABP	1.000 (25.4)	1.375 (34.9) x .500 (12.7)	76°C @ 6W	5.8°C/W @ 200 LFM
626-15ABP	627-15ABP	1.500 (38.1)	1.375 (34.9) x .500 (12.7)	65°C @ 6W	5.5°C/W @ 200 LFM
626-20ABP	627-20ABP	2.000 (50.8)	1.375 (34.9) x .500 (12.7)	55°C @ 6W	4.7°C/W @ 200 LFM
626-25ABP	627-25ABP	2.500 (63-5)	1.375 (34.9) x .500 (12.7)	48°C @ 6W	4.2°C/M @ 200 LFM

Wave-solderable pins. Material: Aluminum, Black Anodized



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

Dimensions: in. (mm)



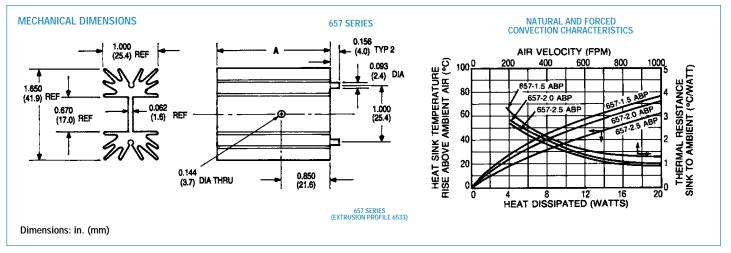
High-Performance Heat Sinks for Vertical Board Mounting 657 SERIES

TO-220, TO-247, TO-218

	Height Above	Maximum	Thermal Perform	iance at Typical Load	
Standard	PC Board "A"	Footprint	Natural	Forced	Weight
P/N	in. (mm)	in. (mm)	Convection	Convection	lbs (grams)
657-10ABP 🔺	1.000 (25.4)	1.650 (41.9) x 1.000 (25.4)	41°C @ 6W	3.7°C/W @ 200 LFM	0.0515 (23.36)
657-15ABP 🔺	1.500 (38.1)	1.650 (41.9) x 1.000 (25.4)	38°C @ 6W	3.3°C/W @ 200 LFM	0.0760 (34.60)
657-20ABP 🔺	2.000 (50.8)	1.650 (41.9) x 1.000 (25.4)	32°C @ 6W	2.9°C/W @ 200 LFM	0.1030 (47.00)
657-25ABP ▲	2.500 (63.5)	1.650 (41.9) x 1.000 (25.4)	25°C @ 6W	2.7°C/W @ 200 LFM	0.1250 (57.00)

Wave-solderable pins. Material: Aluminum, Black Anodized

11-1-b4 Ab ----





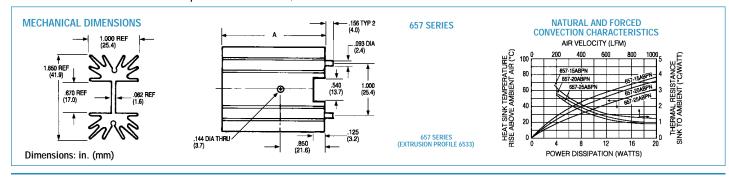


657 SERIES High-Performance Notched Heat Sinks for Vertical Board Mounting

TO-220, TO-247, TO-218

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

Wave-solderable pins. Material: Aluminum, Black Anodized



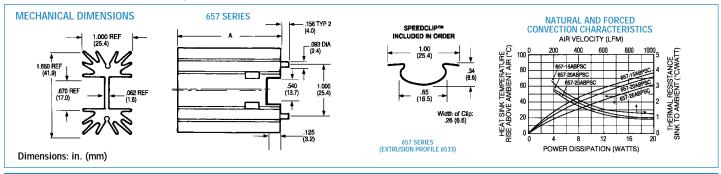


657 SERIES High-Performance Heat Sinks with SpeedClips™ for Vertical Board Mounting

TO-220, TO-247, TO-218

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

Wave-solderable pins. Material: Aluminum, Black Anodized



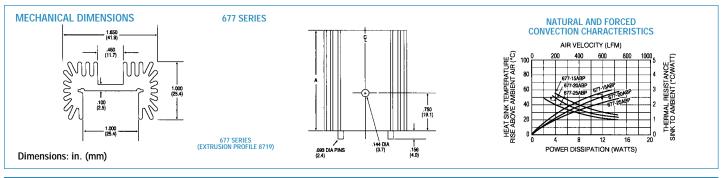


677 SERIES High-Performance, High-Power Heat Sinks for Vertical Board Mounting

TO-218, TO-220, TO-247 15-LEAD Multiwatt

	Height Above	Maximum	Thermal Perform	nance at Typical Load
Standard P/N	PC Board "A" in. (mm)	Footprint in. (mm)	Natural Convection	Forced Convection
677-10ABP	1.000 (25.4)	1.650 (41.9) x 1.000 (25.4)	52°C @ 6W	3.1°C/W @ 200 LFM
677-15ABP	1.500 (38.1)	1.650 (41.9) x 1.000 (25.4)	46°C @ 6W	2.8°C/W @ 200 LFM
677-20ABP	2.000 (50.8)	1.650 (41.9) x 1.000 (25.4)	40°C @ 6W	2.5°C/W @ 200 LFM
677-25ABP	2.500 (63.5)	1.650 (41.9) x 1.000 (25.4)	35°C @ 6W	2.2°C/W @ 200 LFM

Wave-solderable pins. Material: Aluminum, Black Anodized







690 SERIES Highest Efficiency/Lowest Unit Cost Heat Sinks

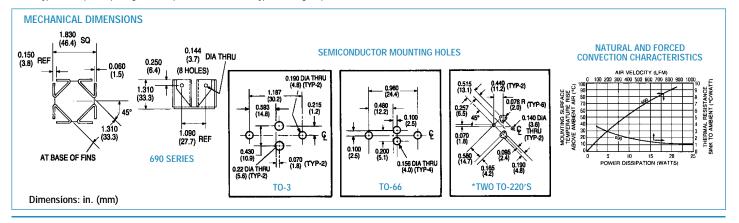
TO-3, TO-66, TO-220

	Height Above		Thermal Perform	nance at Typical Load	Semiconductor	
Standard P/N	PC Board in. (mm)	Outline Dimensions in. (mm)	Natural Convection	Forced Convection	Mounting Hole Pattern	Weight lbs. (grams)
690-3B ▲	1.310 (33.3)	1.860 (47.2)-sq	44°C @ 7.5W	2.0° C/W @ 400 LFM	(1) TO-3	0.0700 (31.75)
690-66B	1.310 (33.3)	1.860 (47.2)-sq	44°C @ 7.5W	2.0° C/W @ 400 LFM	(1) TO-66	0.0700 (31.75)
690-220B	1.310 (33.3)	1.860 (47.2)-sq	44°C @ 7.5W	2.0° C/W @ 400 LFM	(2) TO-220	0.0700 (31.75)

Material: Aluminum, Black Anodized

These low-cost heat sinks provide the most power dissipation at the lowest unit cost and are available in three standard types to mount and cool one TO-3 or TO-66 metal power semiconductor type or two plastic package TO-220 power semiconductor types. For higher power

semiconductors, the 690 Series can dissipate up to 20 watts while maintaining a mounting surface temperature rise above ambient air temperature of no more than 91°C.





680 SERIES Maximum Efficiency Omnidirectional Heat Sinks

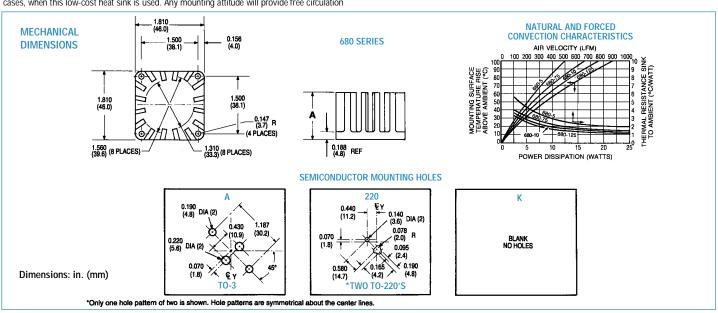
TO-3, TO-220

	Height Above	Horizontal Mounting		nance at Typical Load	Semiconductor	
Standard P/N	PC Board "A" in. (mm)	Footprint Dimensions in. (mm)	Natural Convection	Forced Convection	Mounting Hole Pattern	Weight lbs. (grams)
680-5A ▲	0.500 (12.7)	1.810 (46.0)-sq	70°C @ 7.5W	3.0° C/W @ 400 LFM	(1) TO-3	0.0700 (31.75)
680-75A ▲	0.750 (19.1)	1.810 (46.0)-sq	58°C @ 7.5W	2.4° C/W @ 400 LFM	(1) TO-3	0.0900 (40.82)
680-10A 🔺	1.000 (25.4)	1.810 (46.0)-sq	52°C @ 7.5W	2.0° C/W @ 400 LFM	(1) TO-3	0.0980 (44.45)
680-125A 🔺	1.250 (31.8)	1.810 (46.0)-sq	45°C @ 7.5W	1.5° C/W @ 400 LFM	(1) TO-3	0.1100 (49.90)
680-5220	0.500 (12.7)	1.810 (46.0)-sq	70°C @ 7.5W	3.0° C/W @ 400 LFM	(2) TO-220	0.0700 (31.75)
680-75220	0.750 (19.1)	1.810 (46.0)-sq	58°C @ 7.5W	2.4° C/W @ 400 LFM	(2) TO-220	0.0900 (40.82)
680-10220	1.000 (25.4)	1.810 (46.0)-sq	52°C @ 7.5W	2.0° C/W @ 400 LFM	(2) TO-220	0.0980 (44.45)
680-125220 🔺	1.250 (31.8)	1.810 (46.0)-sq	45°C @ 7.5W	1.5° C/W @ 400 LFM	(2) TO-220	0.1100 (49.90)

Material: Aluminum, Black Anodized

Achieve optimum natural convection cooling per unit volume occupied above the printed circuit board for TO-3 (one semiconductor package per heat sink) or for two TO-220 style cases, when this low-cost heat sink is used. Any mounting attitude will provide free circulation

of air in natural convection applications. These 680 Series heat sinks can also be specified without any semiconductor mounting hole pattern by specifying suffix "K" (Example: 680-5K).







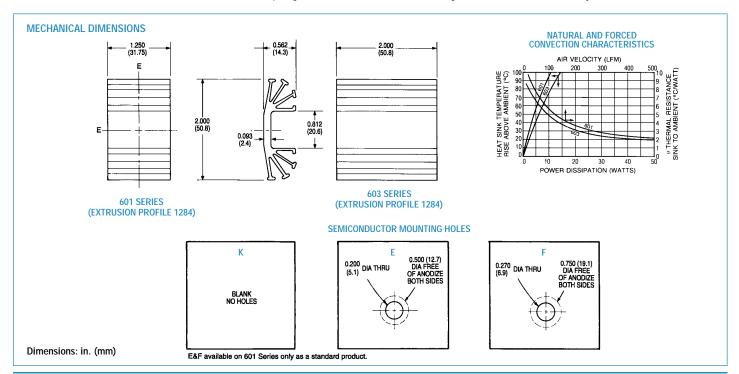
601 AND 603 SERIES Low-Height Heat Sinks

DO-4/DO-5 Diodes

	Footprint		Mounting	Thermal Perform	Thermal Performance at Typical Load	
Standard P/N	Dimensions in. (mm)	Height in. (mm)	Hole Dia. in. (mm)	Natural Convection	Forced Convection	Weight lbs. (grams)
601E	2.000 (50.8) x 1.250 (31.8)	0.562 (14.3)	0.200 (5.1)	52°C @ 5.0W	4.5° C/W @ 175 LFM	0.0500 (22.68)
601F	2.000 (50.8) x 1.250 (31.8)	0.562 (14.3)	0.270 (6.9)	52°C @ 5.0W	4.5° C/W @ 175 LFM	0.0500 (22.68)
601K	2.000 (50.8) x 1.250 (31.8)	0.562 (14.3)	None	52°C @ 5.0W	4.5° C/W @ 175 LFM	0.0500 (22.68)
603K	2.000 (50.8) x 2.000 (50.8)	0.562 (14.3)	None	41°C @ 5.0W	4.0° C/W @ 175 LFM	0.0810 (36.74)

Material: Aluminum Alloy, Black Anodized

Use these low-height heat sinks on printed circuit board applications for TO-66 power semiconductors and DO-4 and DO-5 diodes, where close board-to-board spacing and efficient heat dissipation are required. The 601 and 603 Series may also be attached to enclosure panels or brackets using isolation hardware where necessary.





635 SERIES Space-Saving Low-Cost Heat Sinks

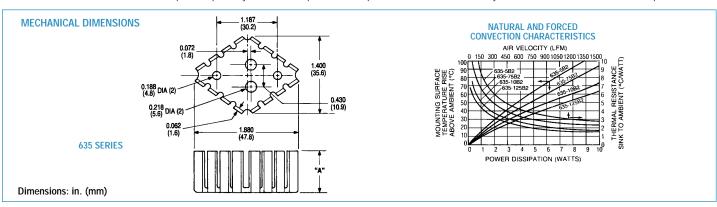
TO-3

	Height Above	Outline	Thermal Perform	mance at Typical Load	Semiconductor	
Standard P/N	PC Board "A" in. (mm)	Dimensions in. (mm)	Natural Convection	Forced Convection	Mounting Hole Pattern	Weight lbs. (grams)
635-5B2	0.500 (12.7)	1.900 (48.3) x 1.420 (36.0)	90°C @ 8.0W	6.0° C/W @ 300 LFM	TO-3	0.0200 (9.07)
635-75B2	0.750 (19.1)	1.900 (48.3) x 1.420 (36.0)	77°C @ 8.0W	4.8° C/W @ 300 LFM	TO-3	0.0220 (9.98)
635-10B2	1.000 (25.4)	1.900 (48.3) x 1.420 (36.0)	61°C @ 8.0W	3.6° C/W @ 300 LFM	TO-3	0.024 (10.89)
635-125B2	1.250 (31.8)	1.900 (48.3) x 1.420 (36.0)	53°C @ 8.0W	3.1°C/W @ 300 LFM	T0-3	0.028 (12.70)

Material: Aluminum Alloy, Black Anodized

Use this low-cost TO-3 heat sink style for multiple TO-3 applications on a single printed circuit board, where two or more TO-3s must be placed in proximity and minimum space is

available for heat sinking. Four different heights are available, all with TO-3 mounting hole pattern in the base. Consult factory for TO-66, TO-220, and multilead IC hole patterns.



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Wakefield Thermal:

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