



PENGUIN™ COOLERS: HEAT SINKS FOR MICROPROCESSORS, ASICs AND BGAs



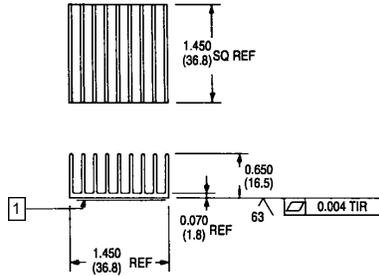
659 SERIES Unidirectional Fin Heat Sink for AMD Am386®, PowerPC™ 601

14 x 14, 38, 40 mm CQFP

Standard P/N	Base Dimensions in. (mm)	Height in. (mm)	Heat Sink Finish	Weight lbs. (grams)
659-65AB ▲	1.45 (36.8) sq	0.650 (16.5)	Black Anodized	0.050 (22.68)

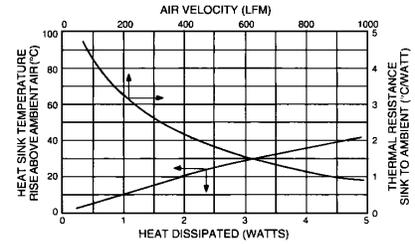
Notes: 1. Optional factory preapplied pressure-sensitive adhesive. Pages 74–76.

MECHANICAL DIMENSIONS



Dimensions: in. (mm)

NATURAL AND FORCED CONVECTION CHARACTERISTICS



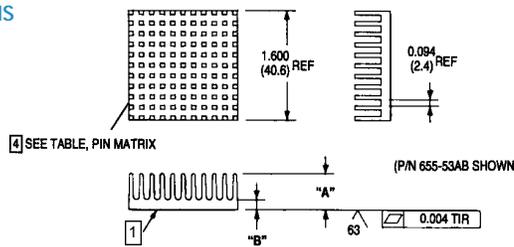
655 SERIES Pin Fin Heat Sinks for PowerPC™ 601, PowerPC™ 603

17 x 17 PGA, 32 mm CQFP
40 mm CQFP

Standard P/N	Base Dimensions in. (mm)	Dimension "A" in. (mm)	Dimension "B" in. (mm)	Heat Sink Finish	Weight lbs. (grams)
655-26AB ▲	1.600 (40.6) sq	0.260 (6.6)	0.125 (3.2)	Black Anodized	0.038 (17.01)
655-53AB ▲	1.600 (40.6) sq	0.525 (13.3)	0.145 (3.7)	Black Anodized	0.050 (22.68)

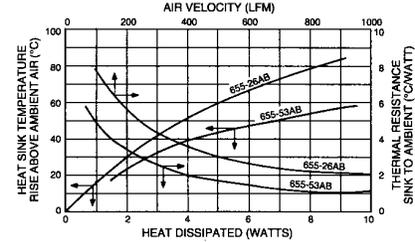
Notes: 1. Optional factory preapplied pressure-sensitive adhesive. Pages 74–76.

MECHANICAL DIMENSIONS



Dimensions: in. (mm)

NATURAL AND FORCED CONVECTION CHARACTERISTICS



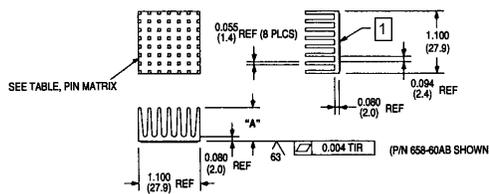
658 SERIES Omnidirectional Pin Fin Heat Sinks for IntelDX4™, AMD Am29240™, PowerPC™ 603

POWERQUAD2™, 28-38 mm CQFP/MQUAD™

Standard P/N	Base Dimensions in. (mm)	Dimension "A" in. (mm)	Heat Sink Finish	Weight lbs. (grams)
658-25AB ▲	1.100 (27.9) sq	0.250 (6.4)	Black Anodized	0.013 (5.67)
658-35AB ▲	1.100 (27.9) sq	0.350 (8.9)	Black Anodized	0.015 (6.70)
658-45AB ▲	1.100 (27.9) sq	0.450 (8.9)	Black Anodized	0.019 (8.50)
658-60AB ▲	1.100 (27.9) sq	0.600 (8.9)	Black Anodized	0.031 (14.17)

Notes: 1. Optional factory preapplied pressure-sensitive adhesive. Pages 74–76.

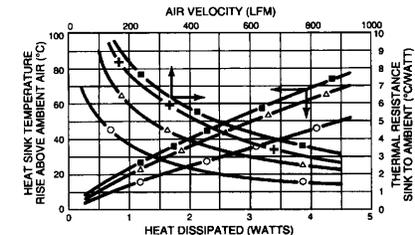
MECHANICAL DIMENSIONS



Dimensions: in. (mm)

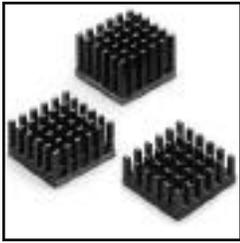
KEY: ■ 658-25AB + 658-35AB ▲ 658-45AB ○ 658-60AB

NATURAL AND FORCED CONVECTION CHARACTERISTICS





PENGUIN™ COOLERS: HEAT SINKS FOR MICROPROCESSORS, ASICs AND BGAs



624 SERIES Omnidirectional Pin Fin Heat Sink for 21mm BGAs

Standard P/N	Base Dimensions in. Sq.	Fin Height "A" in. (mm)	Typical Applications	Adhesive Options	Weight lbs. (grams)
624-25AB	.827 (21)	.250 (6.4)	21mm BGA	Pages 74-76	.009 (4.09)
624-35AB	.827 (21)	.350 (8.9)	21mm BGA	Pages 74-76	.011 (4.99)
624-45AB	.827 (21)	.450 (11.4)	21mm BGA	Pages 74-76	.015 (6.81)
624-60AB	.827 (21)	.600 (15.2)	21mm BGA	Pages 74-76	.026 (11.80)

Material: Aluminum, Black Anodized

The 624 Series is an omnidirectional pin fin heat sink for both natural and forced-convection applications.

Applications include network routers and switches, high-resolution printers, digital cameras, consumer video games, digital video disks (DVD) and global positioning systems (GPS).

PRODUCT FEATURES

- Available in four standard heights, .25 inch, .35 inch, .45 inch, and .60 inch.
- Available with pressure sensitive adhesives for quick and easy mounting. Pages 74-76.

MECHANICAL DIMENSIONS

624 THERMAL PERFORMANCE

PRODUCT DESIGNATION

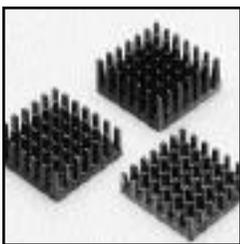
624-60-AB-T4

SERIES NUMBER: 624
HEIGHT DESIGNATOR OR DIM "A": 60
35 - 0.350" (8.9mm) NOMINAL
45 - 0.450" (11.4mm) NOMINAL
60 - 0.600" (15.2mm) NOMINAL

INTERFACE MATERIAL: BLANK - NO INTERFACE
T3 - ADHESIVE RESISTOR CHARACTERISTICS
T4 - CHARACTERISTICS

MATERIAL & FINISH: BLACK ANODIZED PER MIL-A-8625 C

Dimensions: in.



625 SERIES Omnidirectional Pin Fin Heat Sink for 25mm BGAs

Standard P/N	Base Dimensions in. Sq.	Fin Height "A" in. (mm)	Typical Applications	Adhesive Options	Weight lbs. (grams)
625-25AB ▲	.984 (25)	0.250 (6.4)	25 mm BGA	Pages 74-76	.012 (5.45)
625-35AB ▲	.984 (25)	0.350 (8.9)	25 mm BGA	Pages 74-76	.014 (6.36)
625-45AB ▲	.984 (25)	0.450 (11.4)	25 mm BGA	Pages 74-76	.018 (8.17)
625-60AB ▲	.984 (25)	0.650 (15.2)	25 mm BGA	Pages 74-76	.030 (13.62)

Material: Aluminum, Black Anodized

The 625 Series is an omnidirectional pin fin heat sink for both natural and forced-convection applications.

Applications include network routers and switches, high-resolution printers, digital cameras, consumer video games, digital video disks (DVD) and global positioning systems (GPS).

PRODUCT FEATURES

- Available in four standard heights, .25 inch, .35 inch, .45 inch, and .60 inch.
- Available with pressure sensitive adhesives for quick and easy mounting. Pages 74-76.

MECHANICAL DIMENSIONS

625 THERMAL PERFORMANCE

PRODUCT DESIGNATION

625-60-AB-T4

SERIES NUMBER: 625
HEIGHT DESIGNATOR OR DIM "A": 60
35 - 0.350" (8.9mm) NOMINAL
45 - 0.450" (11.4mm) NOMINAL
60 - 0.600" (15.2mm) NOMINAL

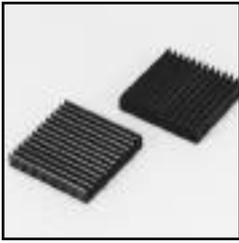
INTERFACE MATERIAL: BLANK - NO INTERFACE
T3 - ADHESIVE RESISTOR CHARACTERISTICS
T4 - CHARACTERISTICS

MATERIAL & FINISH: BLACK ANODIZED PER MIL-A-8625 C

Dimensions: in.



PENGUIN™ COOLERS: HEAT SINKS FOR MICROPROCESSORS, ASICs AND BGAs



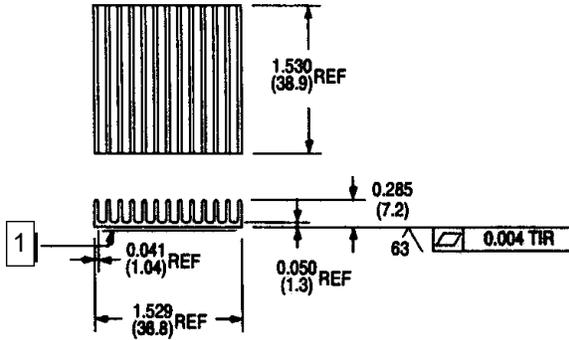
660 SERIES Unidirectional Fin Heat Sink for PowerPC™ 603

32 mm, 40 mm C4QFP

Standard P/N	Base Dimensions in. (mm)	Height in. (mm)	Heat Sink Finish	Weight lbs. (grams)
660-29AB ▲	1.529 (38.8) x 1.530 (38.9)	0.285 (7.2)	Black Anodized	0.031 (14.17)

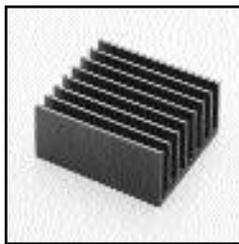
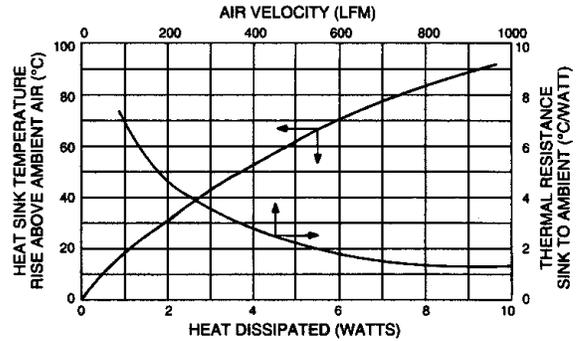
Notes: 1. Optional factory preapplied pressure-sensitive adhesive. Pages 74-76.

MECHANICAL DIMENSIONS



Dimensions: in. (mm)

NATURAL AND FORCED CONVECTION CHARACTERISTICS



642 SERIES Unidirectional Fin Heat Sink for BGAs

BGA

Standard P/N	Base Dimensions in. Sq.	Fin Height "A" in. (mm)	Typical Applications	Adhesive Options	Weight lbs. (grams)
642-25AB ▲	1.378 (35)	.250 (6.6)	35 mm BGA	Pages 74-76	.022 (9.99)
642-35AB ▲	1.378 (35)	.350 (8.9)	35 mm BGA	Pages 74-76	.027 (12.26)
642-45AB ▲	1.378 (35)	.450 (11.4)	35 mm BGA	Pages 74-76	.031 (14.07)
642-60AB ▲	1.378 (35)	.600 (15.2)	35 mm BGA	Pages 74-76	.039 (17.71)

Material: Aluminum, Black Anodized

The 642 Series is an unidirectional pin fin heat sink for both natural and forced-convection applications.

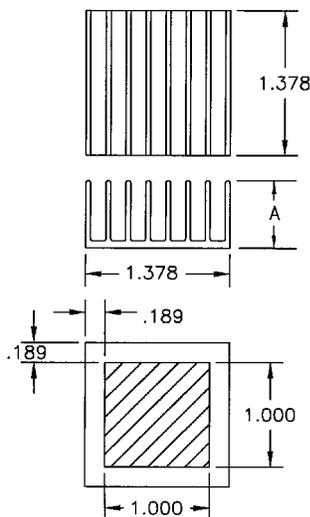
Applications include network routers and switches, high-resolution printers, digital cameras, consumer video games, digital video disks (DVD) and global positioning systems (GPS).

PRODUCT FEATURES

- Available in four standard heights, .25 inch, .35 inch, .45 inch, and .60 inch.
- Available with pressure sensitive adhesives for quick and easy mounting. Pages 74-76.
- Use T4 when attaching to a plastic device surface and T2 for all other surfaces.

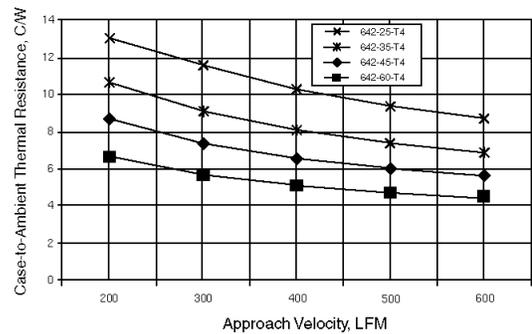
MECHANICAL DIMENSIONS

642 SERIES



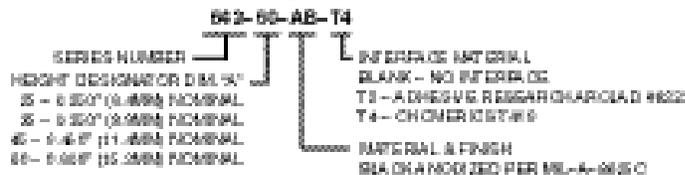
Dimensions: in. (mm)

642 THERMAL PERFORMANCE



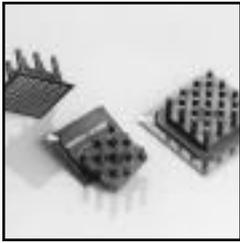
Performance shown is with T4 thermal adhesive applied.

PRODUCT DESIGNATION





DELTEM™ COMPOSITE HEAT SINKS FOR PQFPs, CQFPs, AND BGAs

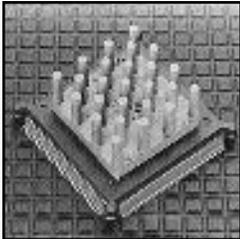


Deltem™ D10650-40 Pin Fin Heat Sink for 100-Lead PQFPs, 169 BGA

84, 100 PQFP, 169 BGA

Standard P/N	Base Dimensions in. (mm)	Height in. (mm)	Weight lbs. (grams)
D10650-40 ▲	0.650 (16.5) sq	0.400 (10.2)	0.013 (5.67)

Notes: Available with pressure sensitive adhesives for quick and easy mounting. Pages 74–76.

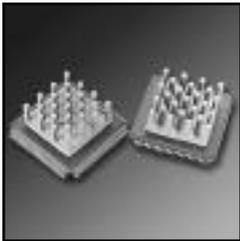


Deltem™ D10850-40 Pin Fin Heat Sink for Intel i960KA™, Cyrix Cx486SLC, ASICs

128-208 PQFP, 313 BGA

Standard P/N	Base Dimensions in. (mm)	Height in. (mm)	Weight lbs. (grams)
D10850-40 ▲	0.850 (21.6) sq	0.400 (10.2)	0.019 (8.50)

Notes: Available with pressure sensitive adhesives for quick and easy mounting. Pages 74–76.



Deltem™ II D20850-40 Pin Fin Heat Sink for ASICs, Intel i960KA™, Intel 486DX2

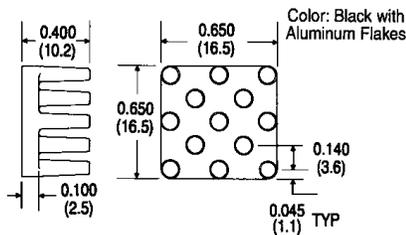
168-208 PQFP, PowerQuad™ 2 PBGA, CBGA

Standard P/N	Base Dimensions in. (mm)	Height in. (mm)	Weight lbs. (grams)
D20850-40 ▲	0.850 (21.6) sq	0.400 (10.2)	0.019 (8.5)

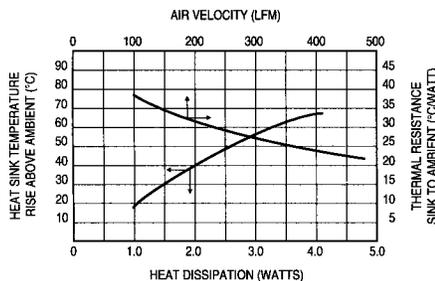
Notes: Available with pressure sensitive adhesives for quick and easy mounting. Pages 74–76.

MECHANICAL DIMENSIONS

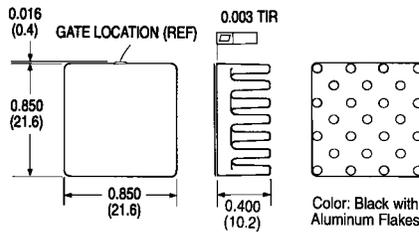
DELTEM™ D10650-40 PIN FIN HEAT SINK



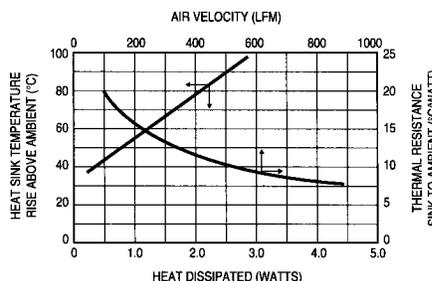
NATURAL AND FORCED CONVECTION CHARACTERISTICS



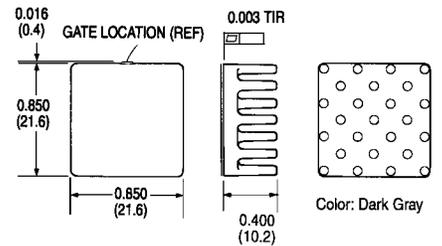
DELTEM™ D10850-40 PIN FIN HEAT SINK



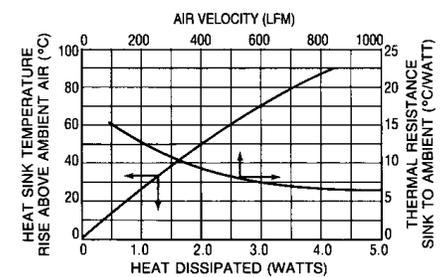
NATURAL AND FORCED CONVECTION CHARACTERISTICS



DELTEM™ II D20850-40 PIN FIN HEAT SINK



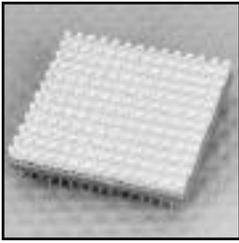
NATURAL AND FORCED CONVECTION CHARACTERISTICS



Dimensions: in. (mm)



PENGUIN™ COOLERS: HEAT SINKS FOR MICROPROCESSORS AND ASICs



662 SERIES Pin Fin Heat Sink for Limited Height Applications for Intel 80486DX, AMD Am29030

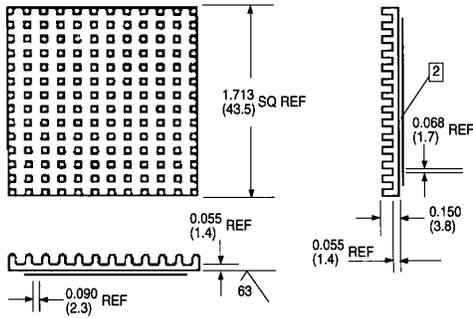
17 x 17 PGA

Standard P/N	Base Dimensions in. (mm)	Height in. (mm)	Heat Sink Finish	Weight lbs. (grams)
662-15AG	1.713 (43.5) sq	0.150 (3.8)	Gold Iridite	0.019 (8.50)

Notes: 1. Optional factory preapplied pressure-sensitive adhesive. Pages 74-76.

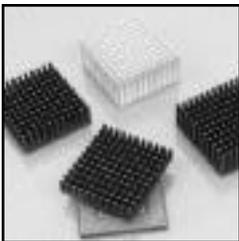
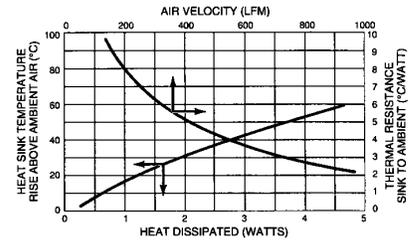
MECHANICAL DIMENSIONS

12 x 14 PINS



Dimensions: in. (mm)

NATURAL AND FORCED CONVECTION CHARACTERISTICS



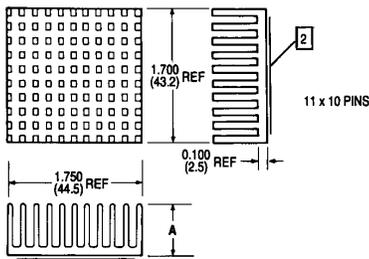
628 SERIES Pin Fin Heat Sinks for IntelDX4™, Intel 80486DX2™, and Am486™DX2, Am486™DX4

17 x 17 PGA

Standard P/N	Base Dimensions in. (mm)	Dimensions "A" in. (mm)	Heat Sink Finish	Weight lbs. (grams)
628-20AB	1.750 (44.5) x 1.700 (43.2)	0.200 (5.1)	Black Anodized	0.031 (14.17)
628-25AB	1.750 (44.5) x 1.700 (43.2)	0.250 (6.4)	Black Anodized	0.038 (17.01)
628-35AB	1.750 (44.5) x 1.700 (43.2)	0.350 (8.9)	Black Anodized	0.044 (19.84)
628-40AB ▲	1.750 (44.5) x 1.700 (43.2)	0.400 (10.2)	Black Anodized	0.050 (22.68)
628-65AB ▲	1.750 (44.5) x 1.700 (43.2)	0.650 (16.5)	Black Anodized	0.056 (25.51)

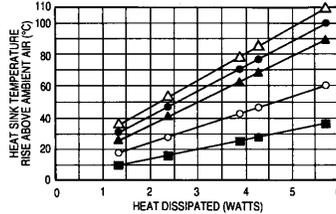
Notes: 1. Optional factory preapplied pressure-sensitive adhesive. Pages 74-76.

MECHANICAL DIMENSIONS

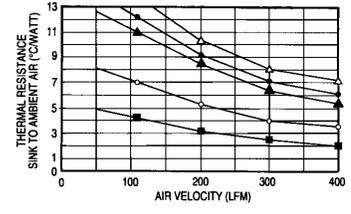


Dimensions: in. (mm)

NATURAL CONVECTION CHARACTERISTICS



FORCED CONVECTION CHARACTERISTICS



KEY: △ 628-20AB ● 628-25AB ▲ 628-35AB ○ 628-40AB ■ 628-65AB



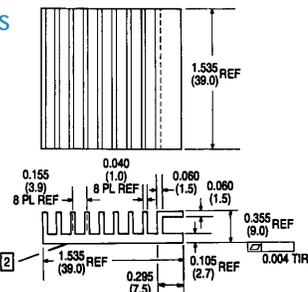
663 SERIES Unidirectional Fin Heat Sink for Intel 80486DX/DX2™

17 x 17 PGA

Standard P/N	Base Dimensions in. (mm)	Dimensions "A" in. (mm)	Heat Sink Finish	Weight lbs. (grams)
663-35AB	1.535 (39.0) sq	0.355 (9.0)	Black Anodized	0.031 (14.17)

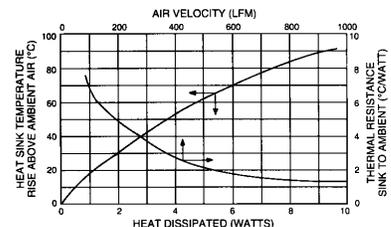
Notes: 1. Optional factory preapplied pressure-sensitive adhesive. Pages 74-76.

MECHANICAL DIMENSIONS



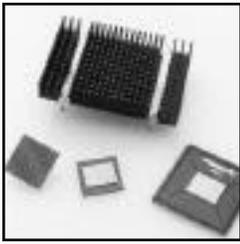
Dimensions: in. (mm)

NATURAL AND FORCED CONVECTION CHARACTERISTICS





PENGUIN™ COOLERS: HEAT SINKS FOR MICROPROCESSORS AND ASICs



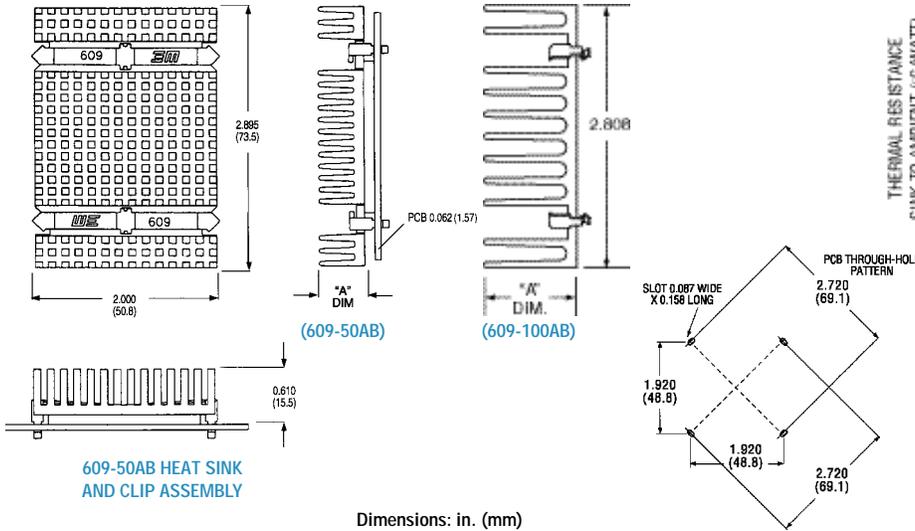
609 SERIES Pin Fin Heat Sink/Clip Assembly for PowerPC™ 601, 604 (304 C4QFP, 255 CBGA)

40mm C4QFP
21mm CBGA

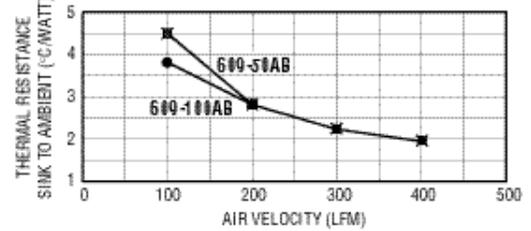
Standard P/N	Base Dimensions in. (mm)	Dimensions "A" in. (mm)	Heat Sink Finish	Weight lbs. (grams)
609-50AB	2.895 (73.5) x 2.000 (50.8)	0.500 (12.7)	Black Anodized	0.094 (42.5)
609-100AB	2.808 (71.32) x 1.700 (43.7)	1.00 (25.4)	Black Anodized	0.130 (59.0)

Notes: 1. Optional factory preapplied thermal interface material. Pages 74-76.

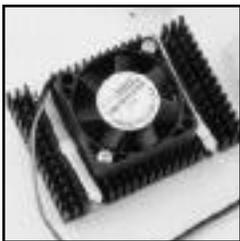
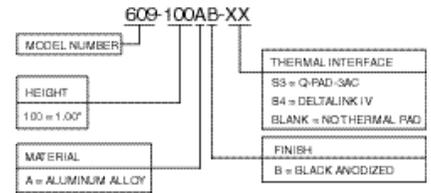
MECHANICAL DIMENSIONS



FORCED CONVECTION THERMAL PERFORMANCE DATA (FLOW PARALLEL TO EXTRUSION DIRECTION)



PRODUCT DESIGNATION



619 SERIES Fan Heat Sink for BGA and PowerPC™ Packages

BGA/Power PC

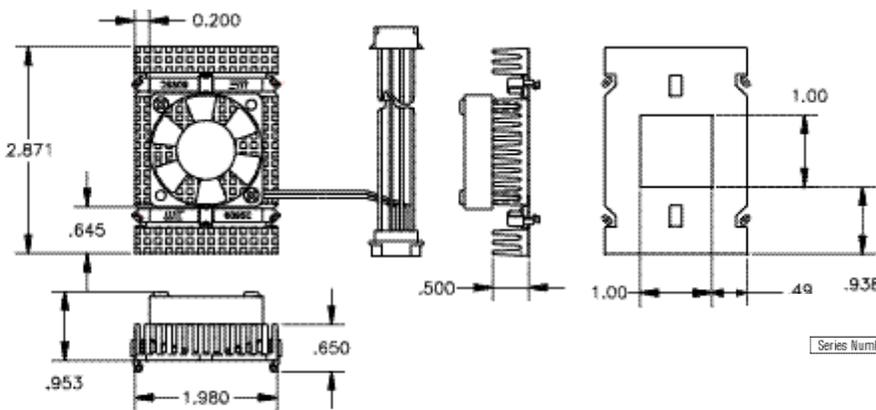
Standard P/N	Base Dimensions in. (mm)	Height in. (mm)	Heat Sink Finish	Thermal Performance	Weight lbs. (grams)
61995AB124D1	2.871 (72.92) x 1.98 (50.29)	0.953 (24.21)	Black Anodized	1.2 ± 0.1° C/W	.150 (68.10)
61995AB054D1	2.871 (72.92) x 1.98 (50.29)	0.953 (24.21)	Black Anodized	1.2 ± 0.1° C/W	.150 (68.10)

Notes: 1. Optional factory preapplied thermal interface material. Pages 74-76.

FEATURES AND BENEFITS:

- Captivated clips for ease of assembly
- Low acoustic noise
- Impingement air flow
- Accommodates BGA packages up to 45 mm in size

MECHANICAL DIMENSIONS



PRODUCT DESIGNATION

