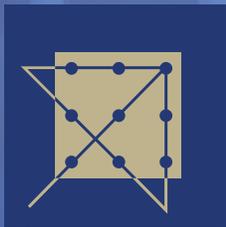


HEATSINK PRODUCT LISTING & SPECIFICATIONS



radian

RADIAN THERMAL PRODUCTS, INC.

2026 - 27
HEATSINK
CATALOGUE

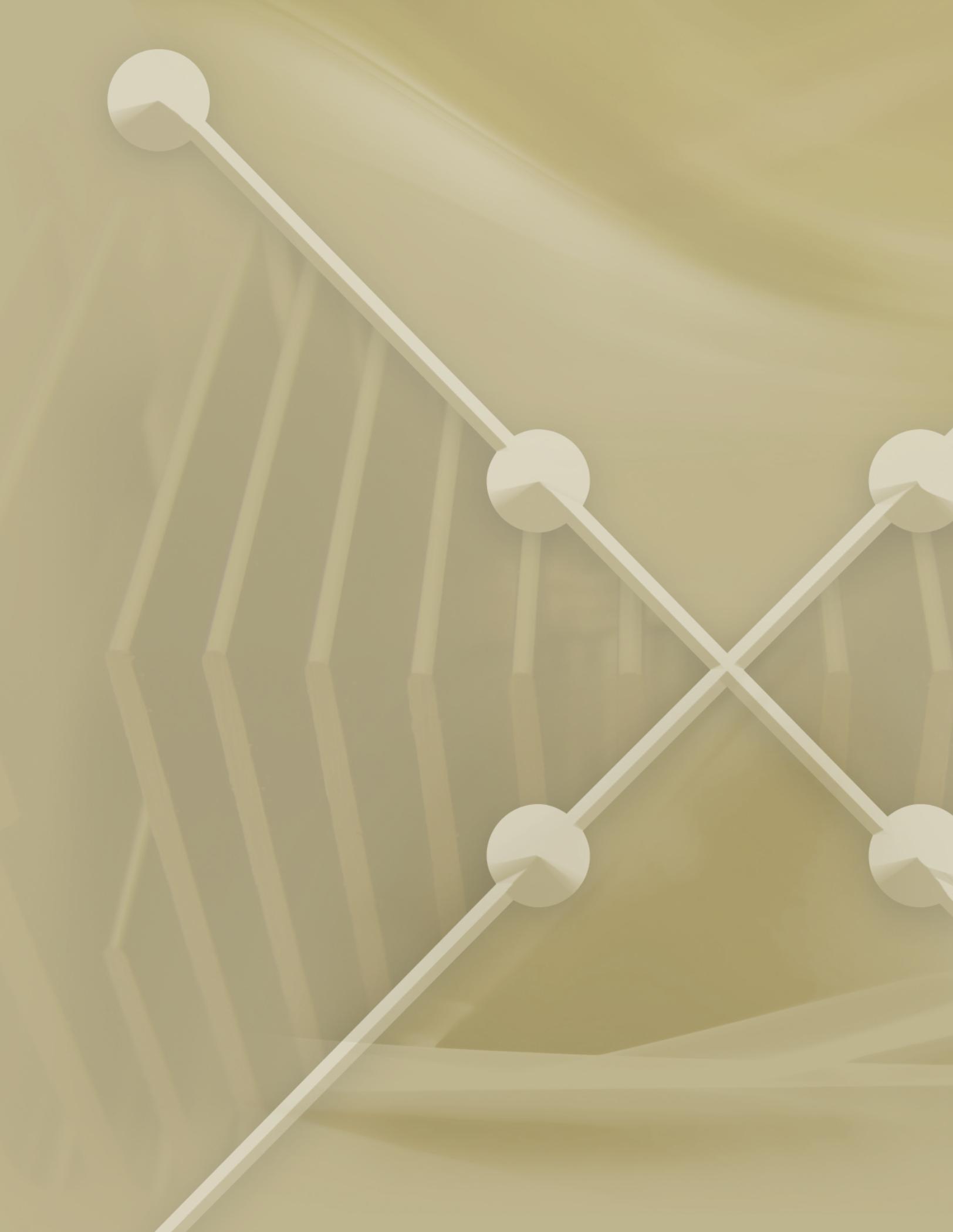


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NOTE:

Radian Heatsinks reserves the right to make changes to the standard products without notice.

RADIAN

THERMAL PRODUCTS, INC.

INTRODUCTION

Radian Heatsinks is a global company headquartered in the heart of the Silicon Valley, California, with manufacturing operations in Asia. We specialize in the design and manufacturing of a wide range of thermal solutions, including heatsinks, heat pipes, vapor chambers and other custom products.

We are a leading heatsink manufacturer and supplier that prides itself on delivering high-quality heatsinks for various industries. Our expertise and experience in designing and manufacturing custom heatsinks allow us to provide the best solutions for effectively managing the cooling of electronic devices.

Radian Thermal inc. has been assessed by NSF-ISR and is in conformance to the ISO 9001:2015 standard. All products supplied by Radian Heatsinks are RoHS-5 or RoHS-6 compliant, as defined by EU Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, unless otherwise requested.

COMPLEMENTARY ENGINEERING SERVICES

- ☑ Optimized heatsink design and thermal analysis
- ☑ Thermal simulations using CFD (Computational Fluid Dynamics)
- ☑ A complete thermal engineering lab offering board level testing for temperature and air flow
- ☑ Radian provides CNC machining capabilities for rapid production across low to medium volumes, extending beyond heatsinks. Our services encompass vertical, 5th axis milling, lathing, assembly, and industry-standard plating. With automated palatalized robots enabling lights-out unmanned machining, our machine shop maximizes efficiency.
- ☑ Radian holds state-of-the-art inspection equipment to uphold stringent quality standards.

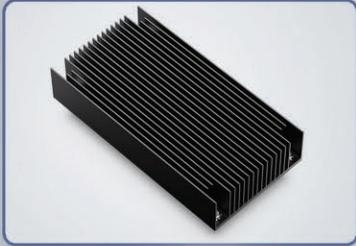
RADIAN

THERMAL PRODUCTS, INC.

COMPANY HISTORY

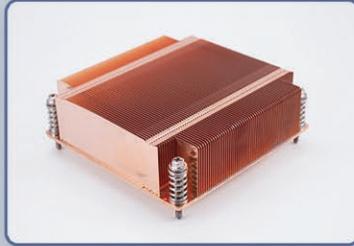
- 1974** Intricast Company formed (incorporated in 1977)
Custom components for electronics using investment casting
- 1990** Company acquires and moves into 35,000 sq. ft. facility
- 1993** Establish elliptical heatsink line
- 1995** Launch separate heatsink division
‣ *Casted, Machined, and Extruded heatsinks*
‣ *Increased manufacturing capabilities (Forged, Skiving, and Stamped Heatsinks)*
- 2000** Establish Intricast Asia subsidiary in Taiwan
New "Rapid Prototyping" capability for castings (US)
- 2001** Re-launched Heatsink Division as Radian Heatsinks
- 2002** Certified ISO 9001:2000
- 2003** Launched online store for short lead time low quantity requirements
- 2005** Introduced heat pipes
- 2006** Increased engineering support
Developed a team of sales representatives throughout North America
- 2007** Expanded to Europe and Asia
‣ *New sales representatives throughout Europe*
‣ *New attachment clip options introduced*
‣ *New active heatsinks launched*
- 2008** Introduced various attachment options:
‣ *Brass Push Pins*
‣ *Captive Screws*
‣ *Introduced new line of low profile heatsinks*
- 2010** Introduced vapor chamber technology
- 2012** Radian Heatsinks and Intricast merge to form Radian Thermal Products, Inc.
- 2018** Radian Thermal Products, Inc. opens facility for Vapor Chamber line
- 2020** Revamps Santa Clara, CA machine shop
- 2022** Opens new manufacturing facility in Vietnam and China
- 2023** Introduces Trinity Robots (automated palletized system) to 5th-Axis CNCs for lights out 24/7 machining
- 2024** Introduced thin vapor vhamber technology and liquid cold plate
- 2025** Acquisition of Matsuura 5-axis and Google AI robotics for Santa-Clara
Radian Vietnam achieves ISO 9001:2015 certification.
New vapor chamber production & soldering line in Vietnam

CAPABILITIES & CUSTOM DESIGNS



EXTRUDED HEATSINKS

- ☑ High aspect ratio thin fin extrusions
- ☑ Aluminum Alloy 6063
- ☑ Available in both standard and custom



STAMPED FIN HEATSINKS

- ☑ Stamped Fin heatsinks available in both AL and CU
- ☑ Often combined with heat pipes and vapor chambers



FORGED HEATSINKS

- ☑ Extremely high aspect ratios (up to 35:1)
- ☑ Forged heatsink in both copper & aluminum
- ☑ Available in both standard and custom



VAPOR CHAMBERS

- ☑ Used in conjunction with stamped fins
- ☑ Better spreading efficiency than copper or heat pipe based heatsinks
- ☑ High efficiency wick structure design
- ☑ Lightweight heatsinks



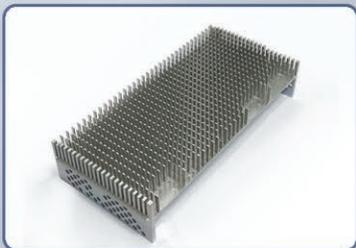
HEAT PIPES

- ☑ Base embedded heat pipes (Soldered or Epoxied)
- ☑ Integrated with Stamped Fins (Soldered or Pressed)
- ☑ Available in various sizes & configurations



SKIVED HEATSINKS

- ☑ Thin Fin Copper Skiving with fins as thin as 0.008"
- ☑ CU1100 pure copper with high thermal conductivity (400W/mK)
- ☑ No NRE required for most parts
- ☑ Also available in aluminum



RAPID PROTOTYPE & MACHINING

- ☑ Quick turn from our local foundry
- ☑ Made from a 3D model
- ☑ No hard tooling required
- ☑ Aluminum or copper



LOW PROFILE (PCIe) HEATSINKS

- ☑ Standard OTS parts design for PCIe requirements
- ☑ Aluminum or Copper
- ☑ Push-pin or thermal tape mounting



CAST HEATSINKS

- ☑ Die-casting in special AL alloy with high thermal conductivity (160 W/mK)
- ☑ High aspect ratio pin fins (Up to 10:1)
- ☑ Investment casting also available



ATTACHMENT METHODS

- ☑ Clips
- ☑ Push-pins
- ☑ Tape
- ☑ Captive screws
- ☑ Wire & Anchor



CUSTOM CLIP-ON

- ☑ Offer custom extended fins with clip attachment



WITH CUSTOM COLORS

- ☑ Offer custom anodize colors

STANDARD CLIP-ON HEATSINK SELECTOR

by BGA size

						15	Thermal Resistance Theta_SA (C/W)		
Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM	
ELLIPTICAL	INM15001-11W/2.3	AL	24	11.3	2.8	8.51	6.64	5.84	
	INM15001-14W/2.3	AL	24	14.3	3.4	8.17	6.36	5.58	
	INM15001-17W/2.3	AL	24	17.3	3.9	7.81	6.06	5.28	
	INM15001-20W/2.3	AL	24	20.3	4.4	7.48	5.75	5.05	
	NM15001-22W/2.3	AL	24	22.3	4.9	7.18	5.48	4.82	

						16	Thermal Resistance Theta_SA (C/W)		
Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM	
ELLIPTICAL	INM16001-11W/2.3	AL	24	11.3	3.1	8.01	6.34	5.74	
	INM16001-14W/2.3	AL	24	14.3	3.7	7.52	6.06	5.28	
	INM16001-17W/2.3	AL	24	17.3	4.2	7.07	5.81	5.04	
	INM16001-20W/2.3	AL	24	20.3	4.7	6.71	5.53	4.72	
	INM16001-22W/2.3	AL	24	22.3	5.1	5.91	4.92	4.52	

						17	Thermal Resistance Theta_SA (C/W)		
Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM	
ELLIPTICAL	INM17001-11W/1.7	AL	24	10.7	3.4	7.0	6.0	5.6	
	INM17001-14W/1.7	AL	24	13.7	3.9	6.4	5.5	5.1	
	INM17001-17W/1.7	AL	24	16.7	4.4	5.8	4.8	4.5	
	INM17001-20W/1.7	AL	24	19.7	4.9	5.2	4.3	3.8	
	INM17001-22W/1.7	AL	24	21.7	5.2	4.9	4.1	3.7	
	INM17001-27W/1.7	AL	24	26.7	6.1	4.6	3.8	3.4	
	INM17001-32W/1.7	AL	24	31.7	7.0	4.3	3.6	3.2	

STANDARD CLIP-ON HEATSINK SELECTOR

by BGA size

19

Thermal Resistance
Theta_SA (C/W)

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
PLATE FIN	INL19001-6/1.7	AL	20	6.3	4.6	5.5	4.6	4.1
	INL19001-10/1.7	AL	20	9.5	5.7	4.9	3.9	3.5
	INL19001-13/1.7	AL	20	12.7	6.8	4.1	3.4	3.1
ELLIPTICAL	INM19001-15W/2.6	AL	24	14.6	6.2	7.2	5.3	4.5
	INM19001-18W/2.6	AL	24	17.6	6.8	6.7	4.8	3.9
	INM19001-21W/2.6	AL	24	20.6	7.4	5.5	4.0	3.3
	INM19001-23W/2.6	AL	24	22.6	7.8	4.7	3.5	2.9
	INM19001-28W/2.6	AL	24	27.6	8.8	4.3	3.1	2.6
	INM19001-33W/2.6	AL	24	2.6	9.8	3.9	2.9	2.4
ROUND PIN	INM19002-12P/2.6	AL	26	11.6	4.0	7.7	5.5	4.5
	INM19002-12PCU/2.6	CU	28	11.6	10.0	6.4	4.8	4.0
	INM19002-15P/2.6	AL	26	14.6	4.8	7.5	5.0	4.4
	INM19002-15PCU/2.6	CU	28	14.6	13.0	6.0	4.3	3.5
	INM19002-20P/2.6	AL	26	19.6	5.7	5.1	3.7	3.0
	INM19002-20PCU/2.6	CU	28	19.6	15.0	4.2	3.1	2.6
	INM19002-25P/2.6	AL	26	24.6	6.9	4.7	3.4	2.7
INM19002-25PCU/2.6	CU	28	24.6	15.0	3.9	2.9	2.4	

21

Thermal Resistance
Theta_SA (C/W)

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
PLATE FIN	INL21001-6/1.7	AL	20	6.3	5.3	5.4	4.3	3.8
	INL21001-10/1.7	AL	20	9.5	6.7	4.7	3.7	3.2
	HS1800EB	AL	18	12.7	8.5	6.7	4.3	3.4
	INL21001-13/1.7	AL	20	12.7	8.0	3.9	3.3	2.8
ELLIPTICAL	INM21001-15W/2.6	AL	24	14.6	7.2	6.6	4.8	4.0
	INM21001-18W/2.6	AL	24	17.6	7.8	5.4	4.0	3.3
	INM21001-21W/2.6	AL	24	20.6	8.4	4.7	3.5	2.7
	INM21001-23W/2.6	AL	24	22.6	8.8	4.3	3.2	2.7
	INM21001-28W/2.6	AL	24	27.6	9.8	3.8	2.9	2.5
	INM21001-33W/2.6	AL	24	32.6	10.8	3.2	2.5	2.1

STANDARD CLIP-ON HEATSINK SELECTOR

by BGA size

23

Thermal Resistance
Theta_SA (C/W)

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
PLATE FIN	INL23001-6/1.7	AL	20	6.3	6.2	5.3	4.1	3.6
	INL23001-10/1.7	AL	20	9.5	7.7	4.5	3.5	3.0
	HS1801EB	AL	18	12.7	8.5	5.8	3.6	2.8
	INL23001-13/1.7	AL	20	12.7	9.2	3.7	3.0	2.6
ELLIPTICAL	INM23001-15W/2.6	AL	24	14.6	8.7	5.4	3.9	3.2
	INM23001-18W/2.6	AL	24	17.6	9.4	4.4	3.2	2.6
	INM23001-21W/2.6	AL	24	20.6	10.0	3.8	2.8	2.3
	INM23001-23W/2.6	AL	24	22.6	10.5	3.5	2.5	2.1
	INM23001-28W/2.6	AL	24	27.6	11.6	3.1	2.3	2.0
	INM23001-33W/2.6	AL	24	32.6	12.7	2.7	2.0	1.8
FANSINK	FI23	AL	34	20	33.0		3.5	
	FJ23	AL	34	20	33.0		3.5	

25

Thermal Resistance
Theta_SA (C/W)

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
PLATE FIN	INL25001-6/1.7	AL	20	6.3	7.3	4.7	3.6	3.2
	INL25001-10/1.7	AL	20	9.5	9.1	4.1	3.1	2.6
	HS1802EB	AL	18	12.7	8.5	4.9	3.0	2.4
	INL25001-13/1.7	AL	20	12.7	11.0	3.4	2.5	2.1
ELLIPTICAL	INM25001-15W/2.6	AL	24	14.6	9.7	4.6	3.3	2.6
	INM25001-18W/2.6	AL	24	17.6	10.4	3.8	2.7	2.2
	INM25001-21W/2.6	AL	24	20.6	11.1	3.3	2.4	1.9
	INM25001-23W/2.6	AL	24	22.6	11.6	3.0	2.2	1.8
	INM25001-28W/2.6	AL	24	27.6	12.7	2.7	2.0	1.7
	INM25001-33W/2.6	AL	24	32.6	13.9	2.4	1.8	1.5
FANSINK	FI25	AL	33	20	35.0		3.1	
	FJ25	AL	33	20	35.0		3.1	

STANDARD CLIP-ON HEATSINK SELECTOR

by BGA size

27

Thermal Resistance
Theta_SA (C/W)

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
PLATE FIN	INL27001-6/1.7	AL	20	6.3	8.1	4.6	3.5	3.0
	INL27001-10/1.7	AL	20	9.5	10.0	3.8	2.6	2.2
	HS1803EB	AL	18	12.7	11.3	4.5	2.7	2.1
	INL27001-13/1.7	AL	20	12.7	12.2	3.1	2.1	1.8
	INH27001-15/2.6	AL	22	14.6	4.9	4.2	2.6	2.1
	INH27001-18/2.6	AL	22	17.6	5.4	3.5	2.2	1.8
	INH27001-23/2.6	AL	22	22.9	6.1	2.7	1.7	1.4
ELLIPTICAL	INM27001-15W/2.6	AL	24	14.6	11.0	4.5	3.2	2.7
	INM27001-18W/2.6	AL	24	17.6	11.8	3.7	2.6	2.2
	INM27001-21W/2.6	AL	24	20.6	12.6	3.1	2.3	1.9
	INM27001-23W/2.6	AL	24	22.6	13.1	2.9	2.1	1.8
	INM27001-28W/2.6	AL	24	27.6	14.5	2.7	2.0	1.7
	INM27001-33W/2.6	AL	24	32.6	15.8	2.3	1.8	1.5
ROUND PIN	INM27002-12P/2.6	AL	26	11.6	7.6	5.3	3.8	3.1
	INM27002-12PCU/2.6	CU	28	11.6	25.0	4.6	3.3	2.7
	INM27002-15P/2.6	AL	26	14.6	8.5	4.4	3.2	2.6
	INM27002-15PCU/2.6	CU	28	14.6	25.0	4.0	2.9	2.4
	INM27002-20P/2.6	AL	26	19.6	10.0	3.1	2.2	1.9
	INM27002-20PCU/2.6	CU	28	19.6	28.0	2.8	2.1	1.7
	INM27002-25P/2.6	AL	26	24.6	11.5	2.8	2.0	1.7
	INM27002-25PCU/2.6	CU	28	24.6	28.0	2.6	1.9	1.6
FANSINK	FI27	AL	33	21.0			2.5	
	FJ27	AL	33	21.0			2.5	

STANDARD CLIP-ON HEATSINK SELECTOR

by BGA size

29

Thermal Resistance
Theta_SA (C/W)

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
PLATE FIN	INL29001-6/1.7	AL	20	6.3	9.4	4.5	3.4	2.7
	INL29001-10/1.7	AL	20	9.5	11.9	3.7	2.5	2.1
	HS1804EB	AL	18	12.7	14.1	3.8	2.2	1.7
	INL29001-13/1.7	AL	20	12.7	14.4	3.0	2.0	1.7
ELLIPTICAL	INM29001-15W/2.6	AL	24	14.6	12.5	4.4	3.1	2.5
	INM29001-18W/2.6	AL	24	17.6	13.3	3.9	2.8	2.3
	INM29001-21W/2.6	AL	24	20.3	14.1	3.3	2.3	1.9
	INM29001-23W/2.6	AL	24	22.6	14.6	2.8	2.0	1.7
	INM29001-28W/2.6	AL	24	27.6	16.0	2.5	1.8	1.5
	INM29001-33W/2.6	AL	24	32.6	17.3	2.3	1.7	1.4
ROUND PIN	INM29002-12P/2.6	AL	26	11.6	9.3	3.9	2.6	2.1
	INM29002-12PCU/2.6	CU	28	11.6	25.0	4.0	2.8	2.3
	INM29002-15P/2.6	AL	26	14.6	10.4	3.7	2.5	2.0
	INM29002-15PCU/2.6	CU	28	14.6	25.0	3.6	2.4	2.0
	INM29002-20P/2.6	AL	26	19.6	11.7	2.6	1.8	1.5
	INM29002-20PCU/2.6	CU	28	19.6	28.0	2.4	1.8	1.5
	INM29002-25P/2.6	AL	26	24.6	13.5	2.5	1.8	1.4
	INM29002-25PCU/2.6	CU	28	24.6	30.0	2.2	1.6	1.4
FANSINK	FI29	AL	33	21	37.0		2.3	
	FJ29	CU	33	21	37.0		2.3	

STANDARD CLIP-ON HEATSINK SELECTOR

by BGA size

31

Thermal Resistance
Theta_SA (C/W)

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
PLATE FIN	INL31001-6/1.7	AL	20	6.3	10.4	4.3	3.2	2.6
	INL31001-10/1.7	AL	20	9.5	13.1	3.3	2.2	1.8
	HS1805EB	AL	18	12.7	14.1	3.5	2.1	1.6
	INL31001-13/1.7	AL	20	12.7	15.7	2.8	1.9	1.5
ELLIPTICAL	INM31001-15W/2.6	AL	24	14.6	15.3	3.3	2.3	1.8
	INM31001-18W/2.6	AL	24	17.6	16.7	2.7	1.9	1.5
	INM31001-21W/2.6	AL	24	20.6	8.0	2.3	1.7	1.4
	INM31001-23W/2.6	AL	24	22.6	18.9	2.1	1.5	1.3
	INM31001-28W/2.6	AL	24	27.6	21.1	1.9	1.4	1.2
	INM31001-33W/2.6	AL	24	32.6	23.4	1.7	1.2	1.0
FANSINK	FI31	AL	33	22	40.0		2.1	
	FJ31	AL	33	22	40.0		2.1	

STANDARD CLIP-ON HEATSINK SELECTOR

by BGA size

33

**Thermal Resistance
Theta_SA (C/W)**

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
PLATE FIN	INL33001-6/1.7	AL	20	6.3	11.9	4.3	3.1	2.6
	INL33001-10/1.7	AL	20	9.5	15.2	2.9	2.1	1.6
	INL33001-13/1.7	AL	20	12.7	18.5	2.3	1.5	1.3
	INH33001-15/2.6	AL	22	14.6	8.2	3.1	1.9	1.5
	INH33001-18/2.6	AL	22	17.6	9.0	2.6	1.6	1.3
	INH33001-23/2.6	AL	22	22.9	10.3	2.0	1.3	1.0
ELLIPTICAL	INM33001-15W/2.6	AL	24	14.6	17.8	3.4	2.2	1.7
	INM33001-18W/2.6	AL	24	17.6	19.2	2.9	1.9	1.4
	INM33001-21W/2.6	AL	24	20.6	20.5	2.4	1.5	1.1
	INM33001-23W/2.6	AL	24	22.6	21.4	1.9	1.3	0.9
	INM33001-28W/2.6	AL	24	27.6	23.6	1.7	1.1	0.8
	INM33001-33W/2.6	AL	24	32.6	25.9	1.5	1.0	0.7
ROUND PIN	INM33002-12P/2.6	AL	26	11.6	11.0	3.8	2.7	2.2
	INM33002-12PCU/2.6	CU	28	11.6	45.0	3.0	2.0	1.5
	INM33002-15P/2.6	AL	26	14.6	12.3	3.2	2.2	1.8
	INM33002-15PCU/2.6	CU	28	14.6	50.0	2.7	1.7	1.2
	INM33002-20P/2.6	AL	26	19.6	13.8	2.3	1.6	1.3
	INM33002-20PCU/2.6	CU	28	19.6	55.0	1.8	1.1	0.9
	INM33002-25P/2.6	AL	26	24.6	16.5	1.9	1.4	1.2
	INM33002-25PCU/2.6	CU	28	24.6	60.0	1.6	1.0	0.8
FANSINK	FI33	AL	33	22	42.0		2.0	
	FJ33	AL	33	22	42.0		2.0	

STANDARD CLIP-ON HEATSINK SELECTOR

by BGA size

35

**Thermal Resistance
Theta_SA (C/W)**

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
PLATE FIN	INL35001-6/1.7	AL	20	6.3	12.8	4.2	3.1	2.5
	INL35001-10/1.7	AL	20	9.5	16.1	2.6	1.8	1.4
	INL35001-13/1.7	AL	20	12.7	19.5	2.0	1.4	1.2
	HS1807EB	AL	18	12.7	19.8	2.9	1.7	1.3
	INH35001-15/2.6	AL	22	14.6	8.2	2.9	1.7	1.3
	INH35001-18/2.6	AL	22	17.6	9.0	2.4	1.4	1.1
	INH35001-23/2.6	AL	22	22.9	10.3	1.9	1.2	0.9
ELLIPTICAL	INM35001-15W/2.6	AL	24	14.6	20.9	2.9	2.1	1.7
	INM35001-18W/2.6	AL	24	17.6	22.6	2.4	1.7	1.4
	INM35001-21W/2.6	AL	24	20.6	23.7	2.1	1.5	1.2
	INM35001-23W/2.6	AL	24	22.6	26.4	1.9	1.3	1.1
	INM35001-28W/2.6	AL	24	27.6	29.2	1.7	1.2	1.0
	INM35001-33W/2.6	AL	24	32.6	30.9	1.5	1.0	0.8
ROUND PIN	INM35002-12P/2.6	AL	26	11.6	13.4	3.4	2.5	1.9
	INM35002-12PCU/2.6	CU	28	11.6	45.0	3.0	2.1	1.7
	INM35002-15P/2.6	AL	26	14.6	15.1	2.9	2.0	1.7
	INM35002-15PCU/2.6	CU	28	14.6	55.0	2.6	1.8	1.5
	INM35002-20P/2.6	AL	26	19.6	17.9	2.0	1.5	1.2
	INM35002-20PCU/2.6	CU	28	19.6	58.0	1.8	1.3	1.0
	INM35002-25P/2.6	AL	26	24.6	20.7	1.8	1.3	1.0
	INM35002-25PCU/2.6	CU	28	24.6	63.0	1.7	1.2	0.9
FANSINK	FA35	AL	35	22.7			1.9	
	FB35	AL	35	19.2			1.9	
	FI35	AL	33	22.0			1.9	
	FJ35	AL	33	22.0			1.9	

STANDARD CLIP-ON HEATSINK SELECTOR

by BGA size

37.5

**Thermal Resistance
Theta_SA (C/W)**

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	Thermal Resistance		
						200 LFM	400 LFM	600 LFM
PLATE FIN	INL37.5001-6/1.7	AL	20	6.3	14.9	3.8	2.7	2.2
	INL37.5001-10/1.7	AL	20	9.5	19.3	2.4	1.7	1.3
	HS1808EB	AL	18	12.7	22.6	2.6	1.5	1.2
	INL37.5001-13/1.7	AL	20	12.7	23.4	2.0	1.3	1.1
ELLIPTICAL	INM37.5001-15W/2.6	AL	24	14.6	22.2	2.7	1.9	1.6
	INM37.5001-18W/2.6	AL	24	17.6	24.1	2.2	1.6	1.3
	INM37.5001-21W/2.6	AL	24	20.6	26.1	1.9	1.4	1.2
	INM37.5001-23W/2.6	AL	24	22.6	27.4	1.7	1.3	1.1
	INM37.5001-28W/2.6	AL	24	27.6	30.6	1.5	1.2	0.9
	INM37.5001-33W/2.6	AL	24	32.6	33.9	1.3	1.0	0.8
ROUND PIN	INM37.5002-12P/2.6	AL	26	11.6	15.7	3.4	2.3	1.8
	INM37.5002-12PCU/2.6	CU	28	11.6	86.0	2.8	2.0	1.7
	INM37.5004-12P/2.6	AL	32	11.6	16.1	3.4	2.4	1.9
	INM37.5004-12PCU/2.6	CU	32	11.6	55.0	2.9	1.8	1.4
	INM37.5002-15P/2.6	AL	26	14.6	17.8	2.7	1.9	1.6
	INM37.5002-15PCU/2.6	CU	28	14.6	89.0	2.4	1.8	1.5
	INM37.5004-15P/2.6	AL	32	14.6	17.6	2.9	2.0	1.6
	INM37.5004-15PCU/2.6	CU	32	14.6	62.0	2.3	1.4	1.1
	INM37.5002-20P/2.6	AL	26	19.6	21.3	1.8	1.4	1.2
	INM37.5002-20PCU/2.6	CU	28	19.6	93.0	1.8	1.2	1.0
	INM37.5004-20P/2.6	AL	33	19.6	20.0	2.0	1.4	1.2
	INM37.5004-20PCU/2.6	CU	33	20.6	76.0	1.7	1.0	0.8
	INM37.5004-23P/2.6	AL	33	22.6	22.7	1.7	1.25	1.0
	INM37.5002-25P/2.6	AL	26	24.6	24.8	1.6	1.2	1.0
	INM37.5002-25PCU/2.6	CU	28	24.6	100.0	1.6	1.1	0.9
	INM37.5004-25P/2.6	AL	32	24.6	22.7	1.7	1.3	1.0
INM37.5004-25PCU/2.6	CU	32	24.6	80.0	1.5	0.9	0.7	
FI37.5	AL	33	22.0	43.0		1.8		
FJ37.5	AL	33	22.0	43.0		1.8		

STANDARD CLIP-ON HEATSINK SELECTOR

by BGA size

40

Thermal Resistance
Theta_SA (C/W)

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
PLATE FIN	INL40001-6/1.7	AL	20	6.3	18.1	3.7	2.5	2.0
	INL40001-10/1.7	AL	20	9.5	23.7	2.6	1.6	1.3
	HS1809EB	AL	18	12.7	22.6	2.4	1.4	1.0
	INL40001-13/1.7	AL	20	12.7	29.3	2.0	1.2	1.0
	INH40001-15/2.6	AL	22	14.6	10.3	2.5	1.5	1.1
	INH40001-18/2.6	AL	22	17.6	11.3	2.1	1.3	1.0
	INH40001-23/2.6	AL	22	22.9	13.0	1.7	1.0	0.8
ELLIPTICAL	INM40001-15W/2.6	AL	24	14.6	25.2	2.4	1.6	1.3
	INM40001-18W/2.6	AL	24	17.6	27.4	1.9	1.4	1.1
	INM40001-21W/2.6	AL	24	20.6	29.6	1.7	1.2	0.9
	INM40001-23W/2.6	AL	24	22.6	31.1	1.5	1.1	0.8
	INM40001-28W/2.6	AL	24	27.6	24.7	1.3	1.0	0.8
	INM40001-33W/2.6	AL	24	32.6	38.4	1.2	0.8	0.7
ROUND PIN	INM40002-12P/2.6	AL	26	11.6	17.8	2.8	1.9	1.5
	INM40002-12PCU/2.6	CU	28	11.6	79.0	2.4	1.6	1.3
	INM40002-15P/2.6	AL	26	14.6	20.0	2.4	1.6	1.3
	INM40002-15PCU/2.6	CU	28	14.6	86.0	2.1	1.4	1.2
	INM40002-20P/2.6	AL	26	19.6	24.0	1.7	1.2	0.9
	INM40002-20PCU/2.6	CU	28	19.6	89.0	1.5	1.0	0.8
	INM40002-25P/2.6	AL	26	24.6	28.0	1.4	1.0	0.8
	INM40002-25PCU/2.6	CU	28	24.6	104.0	1.4	0.9	0.7
FANSINK	FA40	AL	35	22.8	40.0		1.5	
	FB40	AL	35	22.8	40.0		1.5	

STANDARD CLIP-ON HEATSINK SELECTOR

by BGA size

42.5

**Thermal Resistance
Theta_SA (C/W)**

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
PLATE FIN	INL42.5001-6/1.7	AL	20	6.3	20.0	3.5	2.3	1.8
	INL42.5001-10/1.7	AL	20	9.5	26.1	2.5	1.6	1.2
	HS1810EB	AL	18	12.7	25.5	2.2	1.3	0.9
	INL42.5001-13/1.7	AL	20	12.7	32.2	1.9	1.1	1.0
ELLIPTICAL	INM42.5001-15W/2.6	AL	24	14.6	27.8	2.1	1.4	1.2
	INM42.5001-18W/2.6	AL	24	17.6	30.2	1.7	1.2	0.9
	INM42.5001-21W/2.6	AL	24	20.6	32.6	1.5	1.0	0.8
	INM42.5001-23W/2.6	AL	24	22.6	34.2	1.4	0.9	0.7
	INM42.5001-28W/2.6	AL	24	27.6	38.2	1.2	0.8	0.7
	INM42.5001-33W/2.6	AL	24	32.6	42.2	1.0	0.7	0.6
ROUND PIN	INM42.5002-12P/2.6	AL	26	11.6	20.6	2.5	1.7	1.3
	INM42.5002-12PCU/2.6	CU	28	11.6	107.0	2.1	1.5	1.2
	INM42.5002-15P/2.6	AL	26	14.6	23.0	2.1	1.4	1.1
	INM42.5002-15PCU/2.6	CU	28	14.6	121.0	1.9	1.2	1.0
	INM42.5002-20P/2.6	AL	26	19.6	28.0	1.5	1.0	0.8
	INM42.5002-20PCU/2.6	CU	28	19.6	125.0	1.3	0.9	0.8
	INM42.5002-25P/2.6	AL	26	24.6	33.0	1.3	0.8	0.7
INM42.5002-25PCU/2.6	CU	28	24.6	128.0	1.2	0.8	0.7	
FANSINK	FA42.5	AL	35	23.3	44.0		1.4	
	FB42.5	AL	35	23.3	44.0		1.4	
	FI42.5	AL	33	23.2	49.0		1.4	
	FJ42.5	AL	33	23.2	49.0		1.4	

STANDARD CLIP-ON HEATSINK SELECTOR

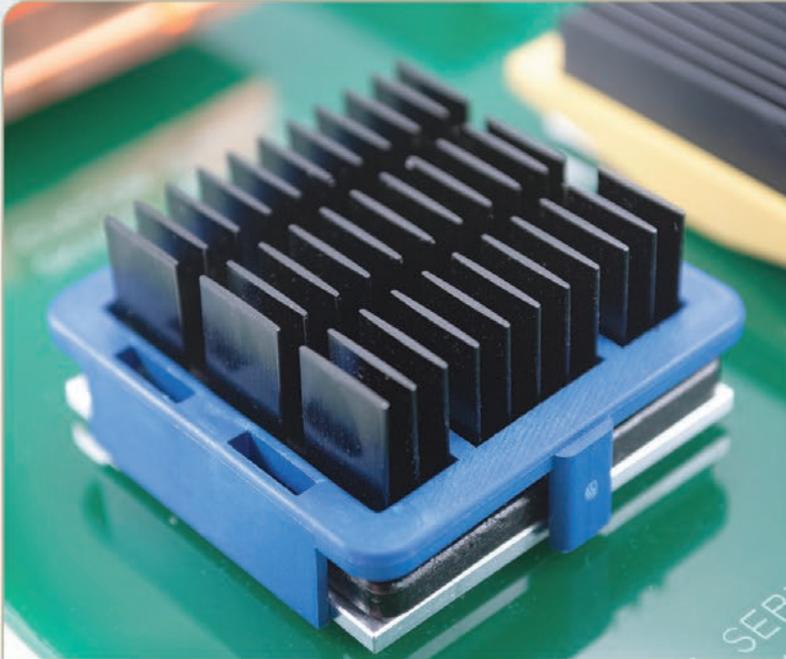
by BGA size

45

**Thermal Resistance
Theta_SA (C/W)**

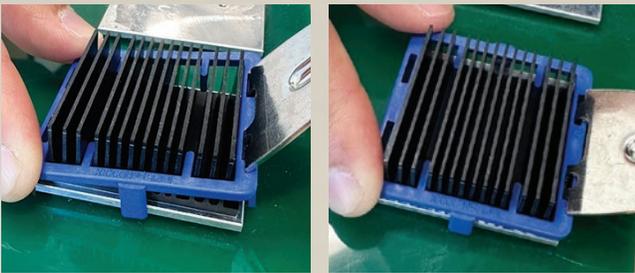
Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
PLATE FIN	INL45001-6/1.7	AL	20	6.3	22.6	3.2	2.1	1.5
	INL45001-10/1.7	AL	20	9.5	29.8	2.4	1.5	1.2
	HS1811EB	AL	18	12.7	31.1	2.1	1.2	0.9
	INL45001-13/1.7	AL	20	12.7	36.9	1.8	1.1	0.9
ELLIPTICAL	INM45001-15W/2.6	AL	24	14.6	31.2	1.9	1.3	1.1
	INM45001-18W/2.6	AL	24	17.6	34.0	1.6	1.1	0.8
	INM45001-21W/2.6	AL	24	20.6	36.7	1.4	0.9	0.7
	INM45001-23W/2.6	AL	24	22.6	38.6	1.2	0.8	0.7
	INM45001-28W/2.6	AL	24	27.6	43.2	1.1	0.7	0.6
	INM45001-33W/2.6	AL	24	32.6	47.8	0.9	0.7	0.5
FANSINK	FA45	AL	35	23.3	48.0		1.2	
	FB45	AL	35	23.3	48.0		1.2	

EZ-SNAP™ CLIP MOUNTING GUIDE



Mount & remove BGA heatsinks quickly & easily with Radian's versatile **EZ Touch Clip Tool**
Part #: HS8132

MOUNTING

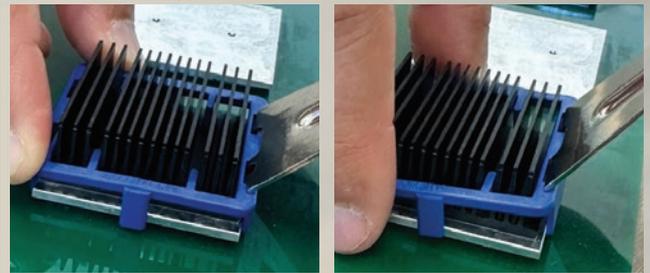


1. Center EZ-Snap™ clip alongside BGA
2. Tilt EZ-Snap™ and slip one lip under edge of BGA
3. Push down on far side of heatsink
4. Use EZ Touch clip tool to slide remaining lip under BGA and snap down to secure clip onto chip

NOTE:

Remove protective sheet from thermal pad before installing EZ-Snap™ clip & heatsink.

REMOVAL



1. Slip Radian's clip tool or other thinly edged instrument into the pry holes on EZ-Snap™ Clip
2. Slightly tilt tool to dislodge clip
3. Remove loosened EZ-Snap™ clip and heatsink

NOTE:

Be careful not to break heatsink pins when tilting tool.

HS1800 series

Removable Heatsinks for BGA Chipsets Aluminum Plate Fin BGA Heatsinks

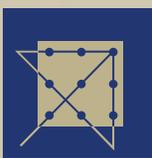


The HS1800 Series of aluminum plate fin BGA heatsinks are high efficiency cooling products which are ideal for linear air flow environments.

These devices mount with EZ-Snap™ mounting clips and / or thermal tape to provide optimum cooling for various package sizes and airflow. These off-the-shelf, high efficiency solutions are easy to install and require no special board modifications or complex assemblies.

FEATURES :

- ☑ High efficiency aluminum plate fin design provides low pressure-drop characteristics
- ☑ Constructed of extruded aluminum AL6063 for optimum heat transfer
- ☑ Ideal for linear air flow environments
- ☑ Designed specifically for BGAs and other surface mount packages
- ☑ Optional EZ-Snap™ mounting clip is constructed of UL94-V0 rated nylon
- ☑ Use Clip Tool HS8132 to attach or remove heatsink assembly directly to BGA Chip
- ☑ Finished with black anodize plating
- ☑ Selected clip & thermal pad options are preassembled at the factory

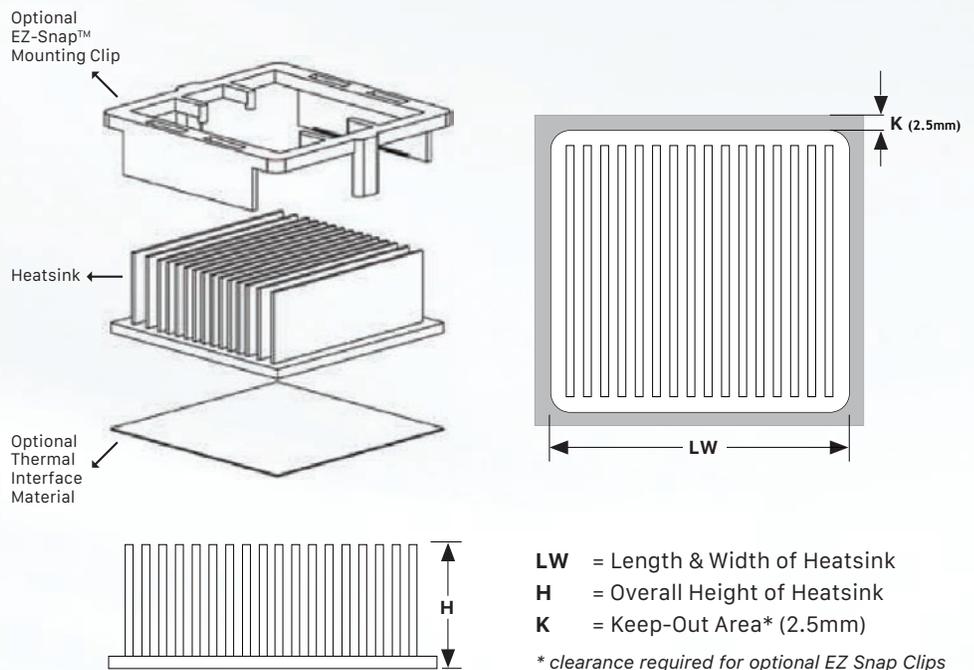


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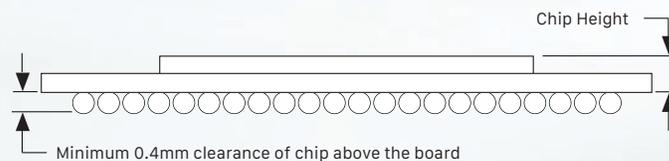
See next page for "LW" & "H" dimensional values



EZ-Snap™ Mounting Clip

CLIPS DIRECTLY TO BGA CHIP WITH HS8132 CLIP TOOL

See next page for fitting chip heights. Consult factory for unique chip height requirements



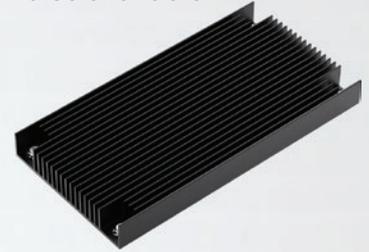
Note 1: Chip height measurements exclude ball dimensions (0.4mm)

Note 2: Chip must have 0.4mm clearance above the board for clip to adhere properly. Clips for 0.3mm clearance are also available, please contact Radian sales for more details.

Note 3: Maintain keep-out clearance of 2.5mm around chip for clip to adhere properly



CUSTOM OPTIONS also available



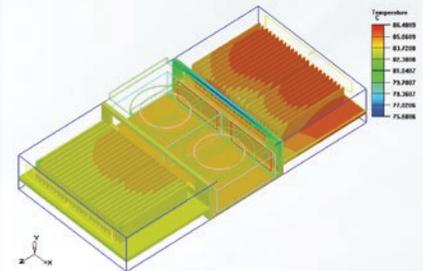
EXTRUDED HEATSINKS

- High aspect ratio thin fin extrusions
- Aluminum alloy 6063
- Available in both standard and custom



CASTED HEATSINKS

- Die-casting in special AL alloy with high thermal conductivity (160 W/mK)
- High aspect ratio pin fins (Up to 10:1)
- Investment casting also available



COMPLIMENTARY THERMAL ANALYSIS

Contact Radian Heatsinks for more details



INSTALLATION TOOL HS8132

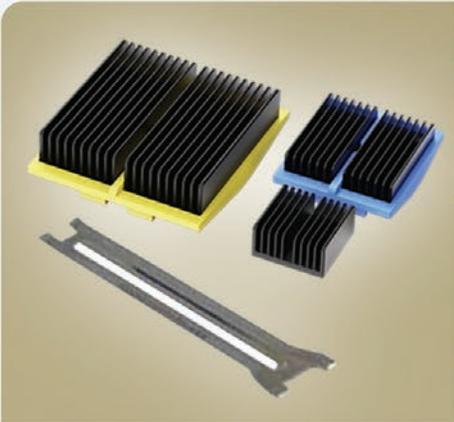
See page 17 for details

BGA Size	Heatsink Part No.	Optional Tape / Pad ⁽²⁾		Optional Mounting Clip			Thermal Resistance Theta_SA (C/W)			
		Part No.	Interface Material	Part No.(3)	Fits Chip Height (mm)	Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
Part Number⁽¹⁾										
21	HS1800EB	P0728 or P0728	3M8815 or 3M8815	K21	1.5 - 2.1*	12.7	8.5	6.7	4.3	3.4
23	HS1801E	P1728 or P1705	3M8815 or T710	K22	2.5 - 3.1*	12.7	8.5	5.8	3.6	2.8
25	HS1802EB	P1328 or P1705	3M8815 or T710	K23	1.5 - 2.1*	12.7	8.5	4.9	3.0	2.4
27	HS1803EB	P1828 or P1805	3M8815 or T710	K24	1.5 - 2.1*	12.7	11.3	4.5	2.7	2.1
29	HS1804EB	P4928 or P4905	3M8815 or T710	K43	2.4 - 3.0*	12.7	14.1	3.8	2.2	1.7
31	HS1805EB	P4728 or P4705	3M8815 or T710	K38	1.5 - 2.1*	12.7	14.1	3.5	2.1	1.6
32.5	HS1806EB	P1228 or P1205	3M8815 or T710	K34	4.9 - 5.5*	12.7	17.0	3.3	1.9	1.5
35	HS1807EB	P3828 or P380	3M8815 or T710	K25 K51 K52 K29 K35 K53	1.5 - 2.1* 1.7 - 2.3* 2.5 - 3.1* 3.4 - 4.0* 3.2 - 3.8* 4.1 - 4.7*	12.7	19.8	2.9	1.7	1.3
37.5	HS1808EB	P1528 or P1505	3M8815 or T710	K26 K45	1.5 - 2.1* 2.9 - 3.5*	12.7	22.6	2.6	1.5	1.2
40	HS1809EB	P4028 or P4005	3M8815 or T710	K27 K54 K55 K30 K36 K56	1.4 - 2.0* 1.7 - 2.3* 2.5 - 3.1* 3.4 - 4.0* 3.2 - 3.8* 4.1 - 4.7*	12.7	22.6	2.4	1.4	1.0
42.5	HS1810EB	P1528 or P4005	3M8815 or T71	K40 K41 K31	0.8 - 1.4* 1.4 - 2.0* 2.7 - 3.33*	12.7	25.5	2.2	1.3	0.9
45	HS1811EB	P1628 or P1205	3M8815 or T710	K28	1.5 - 2.1*	12.7	31.1	2.1	1.2	0.9

NOTES:

1. Example Part Numbers:
 HS1807EBP3805K35 35 x 12.7mm Heatsink with optional K35 mounting clip for 3.2-3.8mm chip heights & T710 Thermally Conductive
 HS1800EBK21 21 x 12.7mm Heatsink with optional K21 mounting clip for 1.5-2.1mm chip heights
 HS1803EB 27 x 12.7mm Heatsink only
 HS1801EBP0728 23 x 12.7mm Heatsink with 3M8815 a thermally conductive adhesive tape
2. Optional thermal interface materials are defined as follows:
 T710 - Thermally conductive phase change pad for use with mounting clip (Chomerics Part # T710)
 3M8815 - Thermally conductive adhesive tape
3. Mounting clips are constructed of UL94-VO rated nylon material.
4. Thermal data provided are for reference only. Actual cooling performance may vary by application.
5. Contact Radian to discuss unique heatsink, clip and interface requirements.
6. Specifications are subject to change without notice.

* Contact Radian for mounting clips to fit chip heights not displayed above.

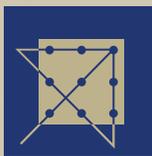


The INL Series of aluminum plate fin BGA heatsinks are low profile, high efficiency cooling products which are ideal for linear air flow environments.

These devices mount with EZ-Snap™ mounting clips to provide optimum cooling for various package sizes and airflow. These off-the-shelf, high efficiency solutions are easy to install and require no special board modifications or complex assemblies.

FEATURES :

- ☑ Low profile high density heatsink
- ☑ High efficiency aluminum plate fin design provides low pressure-drop characteristics
- ☑ Constructed of extruded aluminum AL6063 for optimum heat transfer
- ☑ Ideal for linear air flow environments
- ☑ Designed specifically for BGAs and other surface mount packages
- ☑ Optional EZ-Snap™ mounting clip is constructed of UL94-V0 rated nylon
- ☑ Use clip tool HS8132 to attach or remove heatsink assembly directly to BGA chip
- ☑ Finished with black anodize plating
- ☑ Selected clip & thermal pad options are preassembled at the factory

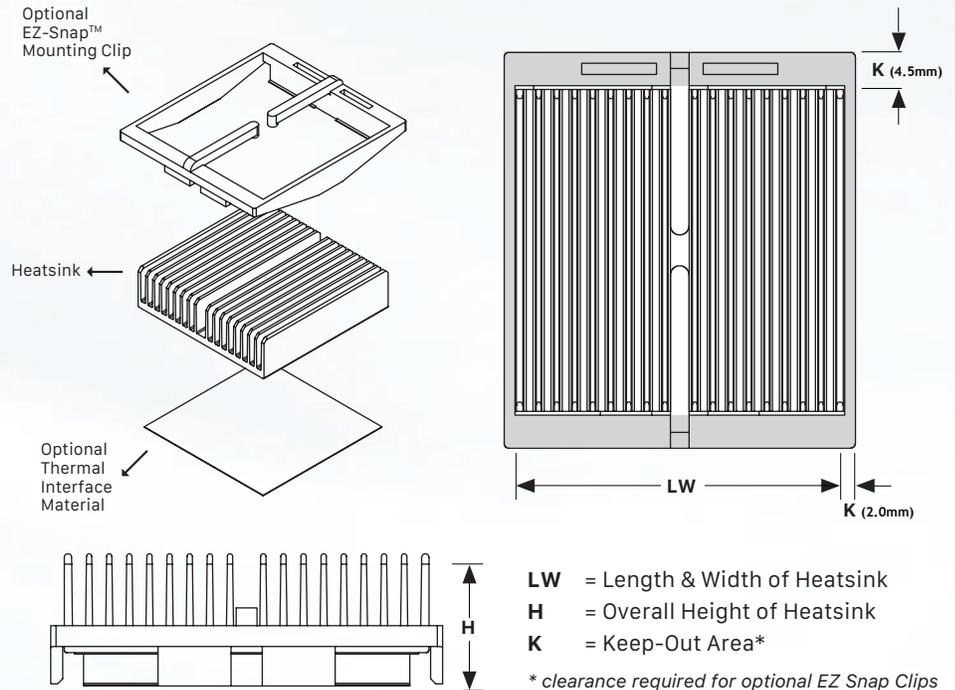


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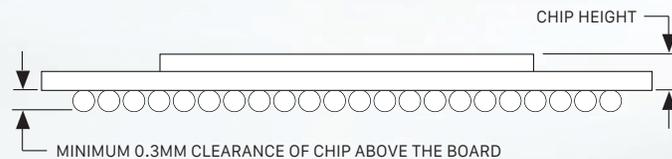
See next page for "LW" & "H" dimensional values



EZ-Snap™ Mounting Clip

CLIPS DIRECTLY TO BGA CHIP WITH HS8132 CLIP TOOL

See next page for fitting chip heights. Consult factory for unique chip height requirements



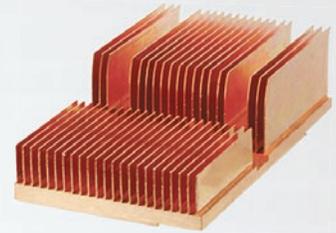
Note 1: Chip height measurements exclude ball dimensions (0.3mm)

Note 2: Chip must have 0.3mm clearance above the board for clip to adhere properly

Note 3: Maintain keep-out clearance of 2mm Length side and 4.5mm Width side around chip for clip to adhere properly



CUSTOM OPTIONS also available



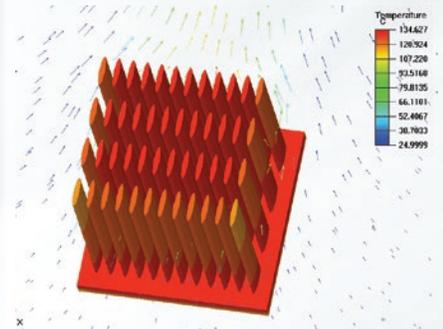
SKIVED HEATSINKS

- Thin Fin Copper Skiving with fins as thin as 0.008"
- CU1100 pure copper with high thermal conductivity (400W/mK)
- No NRE required for most parts



FORGED HEATSINKS

- Extremely high aspect ratios (Up to 35:1)
- Forged heatsink in both copper and aluminum
- Available in both standard and custom



COMPLIMENTARY THERMAL ANALYSIS

Contact Radian Heatsinks for more details



INSTALLATION TOOL HS8132

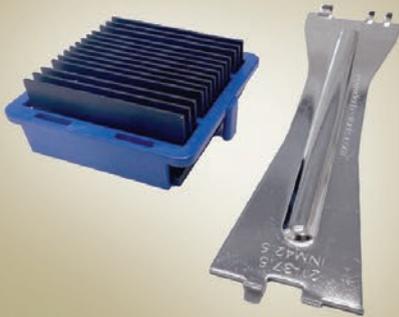
See page 17 for details

BGA Size	Part Number ⁽¹⁾			Optional Thermal Tap/Pad Part # ⁽²⁾	Heatsink Height (mm)	Weight (g)	Thermal Resistance Theta_SA (C/W)		
	Heatsink Part No.	Optional Mounting Clip					200 LFM	400 LFM	600 LFM
		Part No.	Fits Chip Heights (mm)						
19	INL19001-6/1.7	O	0.9 - 1.4*	+T725	6.3	4.6	5.5	4.6	4.1
	INL19001-10/1.7	BU	1.5 - 2.0*	or	9.5	5.7	4.9	3.9	3.5
	INL19001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	6.8	4.1	3.4	3.1
21	INL21001-6/1.7	O	0.9 - 1.4*	+T725	6.3	5.3	5.4	4.3	3.8
	INL21001-10/1.7	BU	1.5 - 2.0*	or	9.5	6.7	4.7	3.7	3.2
	INL21001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	8.0	3.9	3.3	2.8
23	INL23001-6/1.7	O	0.9 - 1.4*	+T725	6.3	6.2	5.3	4.1	3.6
	INL23001-10/1.7	BU	1.5 - 2.0*	or	9.5	7.7	4.5	3.5	3.0
	INL23001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	9.2	3.7	3.0	2.6
24	INL24001-6/1.7	O	0.9 - 1.4*	+T725	6.3	6.4	5.0	3.9	3.3
	INL24001-10/1.7	BU	1.5 - 2.0*	or	9.5	8.0	4.3	3.3	2.7
	INL24001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	9.5	3.6	2.6	2.3
25	INL25001-6/1.7	O	0.9 - 1.4*	+T725	6.3	7.3	4.7	3.6	3.2
	INL25001-10/1.7	BU	1.5 - 2.0*	or	9.5	9.1	4.1	3.1	2.6
	INL25001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	11.0	3.4	2.5	2.1
27	INL27001-6/1.7	O	0.9 - 1.4*	+T725	6.3	8.1	4.6	3.5	3.0
	INL27001-10/1.7	BU	1.5 - 2.0*	or	9.5	10.0	3.8	2.6	2.2
	INL27001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	12.2	3.1	2.1	1.8
29	INL29001-6/1.7	O	0.9 - 1.4*	+T725	6.3	9.4	4.5	3.4	2.7
	INL29001-10/1.7	BU	1.5 - 2.0*	or	9.5	11.9	3.7	2.5	2.1
	INL29001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	14.4	3.0	2.0	1.7
31	INL31001-6/1.7	O	0.9 - 1.4*	+T725	6.3	10.4	4.3	3.2	2.6
	INL31001-10/1.7	BU	1.5 - 2.0*	or	9.5	13.1	3.3	2.2	1.8
	INL31001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	15.7	2.8	1.9	1.5
33	INL33001-6/1.7	O	0.9 - 1.4*	+T725	6.3	11.9	4.3	3.1	2.6
	INL33001-10/1.7	BU	1.5 - 2.0*	or	9.5	15.2	2.9	2.1	1.6
	INL33001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	18.5	2.3	1.5	1.3
35	INL35001-6/1.7	O	0.9 - 1.4*	+T725	6.3	12.8	4.2	3.1	2.5
	INL35001-10/1.7	BU	1.5 - 2.0*	or	9.5	16.1	2.6	1.8	1.4
	INL35001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	19.5	2.0	1.4	1.2
37.5	INL37.5001-6/1.7	O	0.9 - 1.4*	+T725	6.3	14.9	3.8	2.7	2.2
	INL37.5001-10/1.7	BU	1.5 - 2.0*	or	9.5	19.3	2.4	1.7	1.3
	INL37.5001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	23.4	2.0	1.3	1.1
40	INL40001-6/1.7	O	0.9 - 1.4*	+T725	6.3	18.1	3.7	2.5	2.0
	INL40001-10/1.7	BU	1.5 - 2.0*	or	9.5	23.7	2.6	1.6	1.3
	INL40001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	29.3	2.0	1.2	1.0
42.5	INL42.5001-6/1.7	O	0.9 - 1.4*	+T725	6.3	20.0	3.5	2.3	1.8
	INL42.5001-10/1.7	BU	1.5 - 2.0*	or	9.5	26.1	2.5	1.6	1.2
	INL42.5001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	32.2	1.9	1.1	1.0
45	INL45001-6/1.7	O	0.9 - 1.4*	+T725	6.3	22.6	3.2	2.1	1.5
	INL45001-10/1.7	BU	1.5 - 2.0*	or	9.5	29.8	2.4	1.5	1.2
	INL45001-13/1.7	Y	2.1 - 2.6*	+3M8815	12.7	36.69	1.8	1.1	0.9

NOTES:

1. Example Part Numbers:
 INL27001-6/1.7 27mm x 6.3mm Heatsink only
 INL35001-10/1.7BU 35mm x 9.5mm Heatsink with "BU" (blue) mounting clip (1.5-2.0mm chip height)
 INL27001-13/1.7BU+T725 27mm x 12.7mm Heatsink with "BU" (blue) mounting clip (1.5-2.0mm chip height) and T725 thermal pad
2. Optional thermal interface materials are defined as follows:
 T725 - Thermally conductive phase change pad for use with mounting clip (Chomerics Part # T725)
3. Mounting clips are constructed of UL94-VO rated nylon material
4. Thermal data provided are for reference only. Actual cooling performance may vary by application.
5. Contact Radian to discuss unique heatsink, clip and interface requirements.
6. Specifications are subject to change without notice.

* Contact Radian for mounting clips to fit chip heights not displayed above.

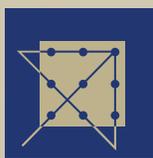


The INH Series of aluminum plate fin BGA heatsinks are high efficiency cooling products which are ideal for linear air flow environments.

These devices mount with EZ-Snap™ mounting clips to provide optimum cooling for various package sizes and airflow. These off-the-shelf, high efficiency solutions are easy to install and require no special board modifications or complex assemblies.

FEATURES :

- ☑ High efficiency aluminum plate fin design provides low pressure-drop characteristics
- ☑ Constructed of extruded aluminum AL6063 for optimum heat transfer
- ☑ Ideal for linear air flow environments
- ☑ Designed specifically for BGAs and other surface mount packages
- ☑ Optional EZ-Snap™ mounting clip is constructed of UL94-V0 rated nylon
- ☑ Use clip tool HS8132 to attach or remove heatsink assembly directly to BGA chip
- ☑ Finished with black anodize plating
- ☑ Selected clip & thermal pad options are preassembled at the factory

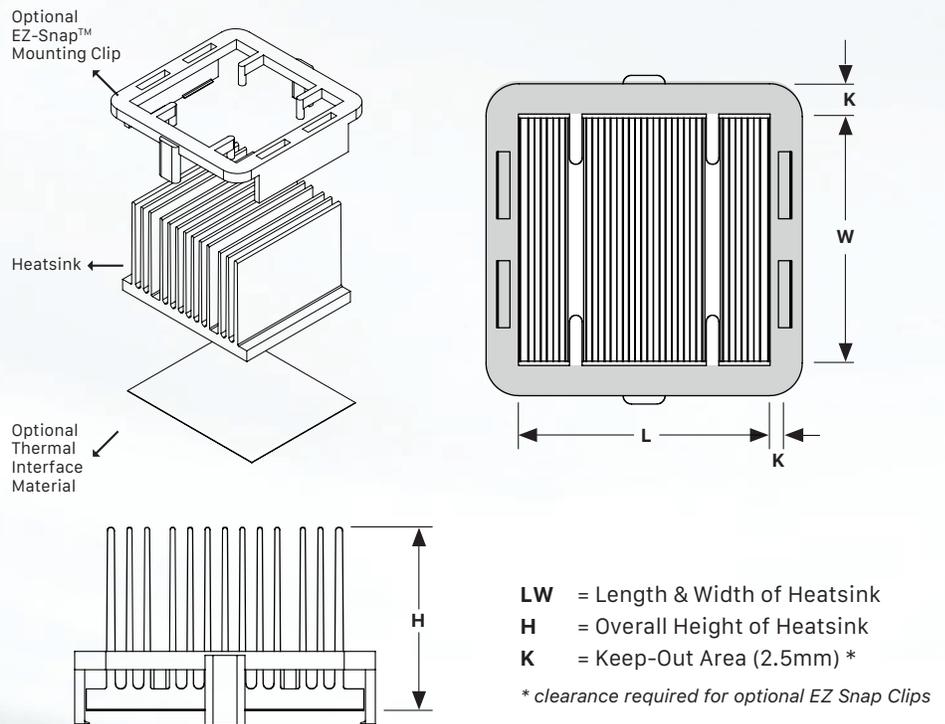


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BUY ONLINE

MECHANICAL OUTLINE DRAWING

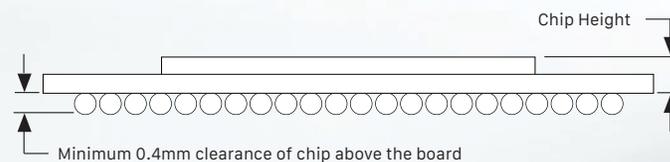
See next page for "LW" & "H" dimensional values



EZ-Snap™ Mounting Clip

CLIPS DIRECTLY TO BGA CHIP WITH HS8132 CLIP TOOL

See next page for fitting chip heights. Consult factory for unique chip height requirements



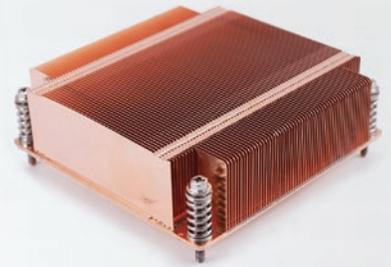
Note 1: Chip height measurements exclude ball dimensions (0.4mm)

Note 2: Chip must have 0.4mm clearance above the board for clip to adhere properly

Note 3: Maintain keep-out clearance of 2.5mm around chip for clip to adhere properly



CUSTOM OPTIONS
also available



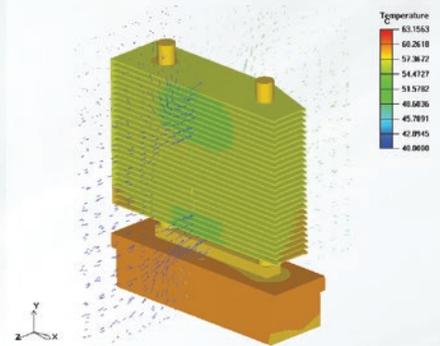
STAMPED FIN HEATSINKS

- Stamped Fin heatsinks available in both AL and CU
- Often combined with heat pipes



HEAT PIPES

- Base embedded heat pipe (Soldered or Epoxied)
- Integrated with Stamped Fins (Soldered or Pressed)
- Available in various sizes and configurations



COMPLIMENTARY THERMAL ANALYSIS

Contact Radian Heatsinks for more details



INSTALLATION TOOL HS8132

See page 17 for details

BGA Size	Heatsink Part No.	Optional Mounting Clip		Optional Thermal Tap/Pad Part # ⁽²⁾	Heatsink Height (mm)	Width (g)	Length	Weight	Thermal Resistance Theta_SA (C/W)		
		Part No.	Fits Chip Heights (mm)						200 LFM	400 LFM	600 LFM
Part Number⁽¹⁾											
27	INH27001-15/2.6	O or BU	0.6 - 1.2* or 1.4 - 2.0*	+T710	14.6	26.9	22.1	4.9	4.2	2.6	2.1
	INH27001-18/2.6	K32	2.3 - 2.9* or 3.0 - 3.6*	or	17.6	26.9	22.1	5.4	3.5	2.2	1.8
	INH27001-23/2.6	Y		+3M8815	22.9	26.9	22.1	6.1	2.7	1.7	1.4
33	INH33001-15/2.6	O or BU	0.6 - 1.2* or 1.4 - 2.0*	+T710	14.6	32.3	27.2	8.2	3.1	1.9	1.5
	INH33001-18/2.6	K32	2.3 - 2.9* or 3.0 - 3.6*	or	17.6	32.3	27.2	9.0	2.6	1.6	1.3
	INH33001-23/2.6	Y		+3M8815	22.9	32.3	27.2	10.3	2.1	1.3	1.0
35	INH35001-15/2.6	O or BU	0.6 - 1.2* or 1.4 - 2.0*	+T710	14.6	34.8	29.0	8.2	2.9	1.7	1.3
	INH35001-18/2.6	K32	2.3 - 2.9* or 3.0 - 3.6*	or	17.6	34.8	29.0	9.0	2.1	1.4	1.1
	INH35001-23/2.6	Y		+3M8815	22.9	34.8	29.0	10.3	1.9	1.2	0.9
40	INH40001-15/2.6	O or BU	0.6 - 1.2* or 1.4 - 2.0*	+T710	14.6	39.1	34.5	10.3	2.5	1.5	1.1
	INH40001-18/2.6	K32	2.3 - 2.9* or 3.0 - 3.6*	or	17.6	39.1	34.5	11.3	2.1	1.3	1.0
	INH40001-23/2.6	Y		+3M8815	22.9	39.1	34.5	13.0	1.7	1.0	0.8

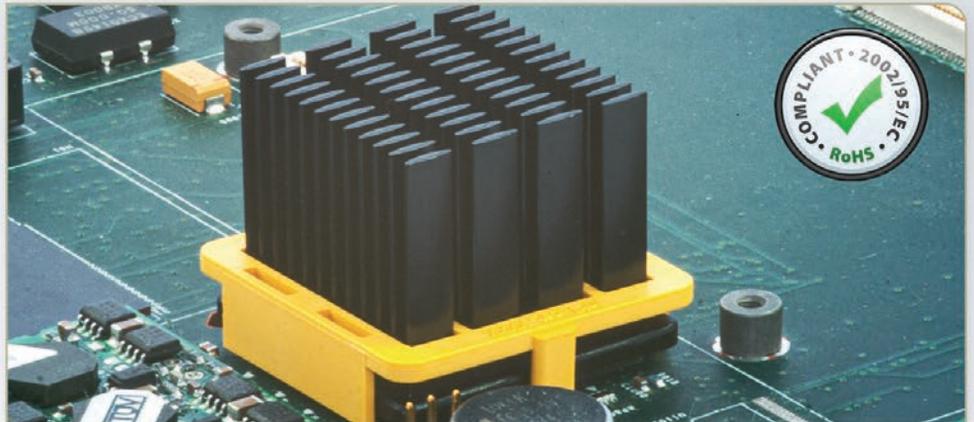
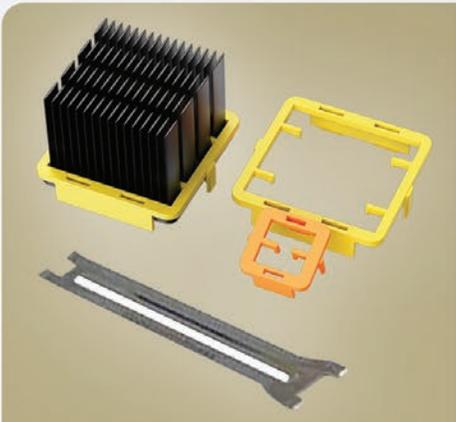
NOTES:

1. Example Part Numbers:
 INH35001-15/2.6 35mm x 14.6mm Heatsink only
 INH35001-15/2.6BU 35mm x 14.6mm Heatsink with "BU" (blue) mounting clip (1.4-2.0mm chip height)
 INH35001-15/2.6O+T710 35mm x 14.6mm Heatsink with "O" mounting clip (0.6-1.2mm chip height) and T710 thermal pad
2. Optional thermal interface materials are defined as follows:
 T710 - Thermally conductive phase change pad for use with mounting clip (Chomerics Part # T710)
3. Mounting clips are constructed of UL94-VO rated nylon material.
4. Thermal data provided are for reference only. Actual cooling performance may vary by application.
5. Contact Radian to discuss unique heatsink, clip and interface requirements.
6. Specifications are subject to change without notice.

* Contact Radian for mounting clips to fit chip heights not displayed above.

INM-W series

Removable Heatsinks for BGA Chipsets Elliptical Fin Aluminum BGA Heatsink

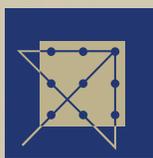


The INM-W Series of elliptical fin aluminum BGA Heatsinks are high efficiency cooling products which are ideal for linear air flow environments.

These devices mount with EZ-Snap™ mounting clips and / or thermal tape to provide optimum cooling for various package sizes and airflow. These off-the-shelf, high efficiency solutions are easy to install and require no special board modifications or complex assemblies.

FEATURES :

- ☑ High efficiency aluminum elliptical fin design provides low pressure-drop characteristics
- ☑ Constructed of forged aluminum AL6063 for optimum heat transfer
- ☑ Ideal for linear air flow environments
- ☑ Designed specifically for BGAs and other surface mount packages
- ☑ Optional EZ-Snap™ mounting clip is constructed of UL94-V0 rated nylon
- ☑ Use clip tool HS8132 to attach or remove heatsink assembly directly to BGA chip
- ☑ Finished with black anodize plating
- ☑ Selected clip & thermal pad options are pre-assembled at the factory

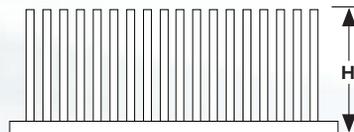
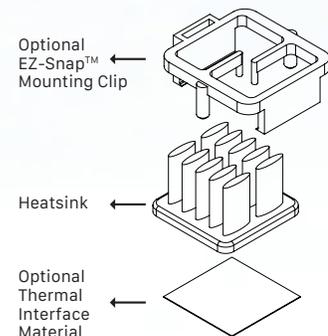
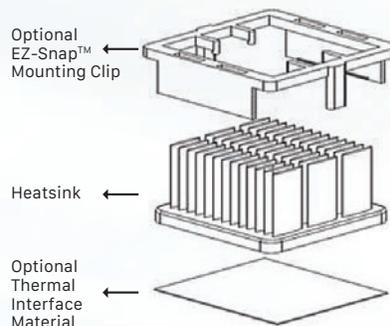
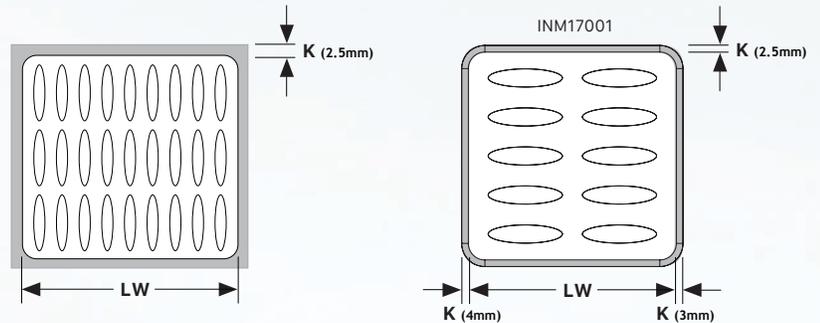


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BUY ONLINE

MECHANICAL OUTLINE DRAWING

See next page for "LW" & "H" dimensional values



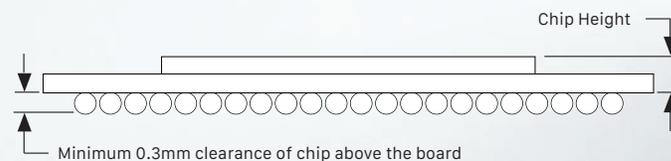
LW = Length & Width of Heatsink
H = Overall Height of Heatsink
K = Keep-Out Area *

* clearance required for optional EZ Snap Clip

EZ-Snap™ Mounting Clip

CLIPS DIRECTLY TO BGA CHIP WITH HS8132 CLIP TOOL

See next page for fitting chip heights. Consult factory for unique chip height requirements



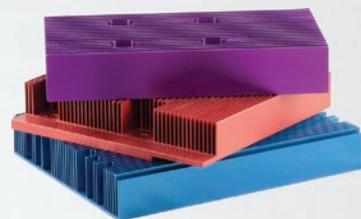
Note 1: Chip height measurements exclude ball dimensions (0.3mm)

Note 2: Chip must have 0.3mm clearance above the board for clip to adhere properly

Note 3: Maintain keep-out clearance of 2.5mm around chip for clip to adhere properly

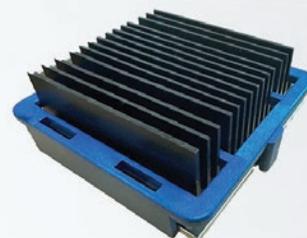


CUSTOM OPTIONS
also available



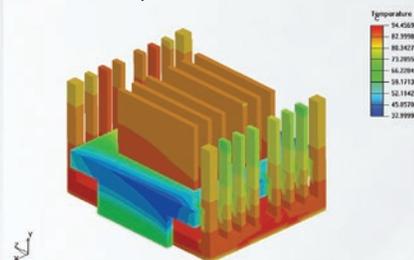
WITH CUSTOM COLORS

Offer custom anodize colors



CUSTOM CLIP-ON

Offer custom extended fins with clip attachment



COMPLIMENTARY THERMAL ANALYSIS

Contact Radian Heatsinks for more details



INSTALLATION TOOL HS8132

See page 17 for details

* Contact Radian for mounting clips to fit chip heights not displayed above.

BGA Size	Part Number ⁽¹⁾				Heatsink Height (mm)	Weight (oz.)	Thermal Resistance Theta_SA (C/W)			
	Heatsink Part No.	Optional Mounting Clip		Optional Thermal Tap/Pad Part # ⁽²⁾			100 LFM	200 LFM	400 LFM	600 LFM
		Part No.	Fits Chip Heights (mm)							
17	INM17001-11W/1.7	O			10.7	3.4	7.8	7.0	6.0	5.6
	INM17001-14W/1.7				13.7	3.9	7.2	6.4	5.5	5.1
	INM17001-17W/1.7	or	0.9 - 1.4	+3M8815	16.7	4.4	6.5	5.8	4.8	4.5
	INM17001-20W/1.7	B	1.5 - 2.0	or	19.7	4.9	5.9	5.2	4.3	3.8
	INM17001-22W/1.7	or		+T710	21.7	5.2	5.6	4.9	4.1	3.7
	INM17001-27W/1.7	or	2.1 - 2.6*		26.7	6.1	5.3	4.6	3.8	3.4
INM17001-32W/1.7	Y			31.7	7.0	4.9	4.3	3.6	3.2	
19	INM19001-15W/2.6	O			14.6	6.2	10.2	7.2	5.3	4.5
	INM19001-18W/2.6		0.6 - 1.2		17.6	6.8	9.6	6.7	4.8	3.9
	INM19001-21W/2.6	B	1.4 - 2.0	+3M8815	20.6	7.4	7.9	5.5	4.0	3.3
	INM19001-23W/2.6	or		or	22.6	7.8	6.7	4.7	3.5	2.9
	INM19001-28W/2.6	or	3.0 - 3.6*	+T710	27.6	8.8	6.0	4.3	3.1	2.6
	INM19001-33W/2.6	Y			32.6	9.8	5.5	3.9	2.9	2.4
21	INM21001-15W/2.6	O			14.6	7.2	9.5	6.6	4.8	4.0
	INM21001-18W/2.6		0.6 - 1.2		17.6	7.8	7.8	5.4	4.0	3.3
	INM21001-21W/2.6	B	1.4 - 2.0	+3M8815	20.6	8.4	6.6	4.7	3.5	2.7
	INM21001-23W/2.6	or		or	22.6	8.8	6.0	4.3	3.2	2.7
	INM21001-28W/2.6	or	3.0 - 3.6*	+T710	27.6	9.8	5.5	3.8	2.9	2.5
	INM21001-33W/2.6	Y			32.6	10.8	4.5	3.2	2.5	2.1
23	INM23001-12W/2.6	O			11.6	8.0	9.6	6.0	3.9	3.1
	INM23001-15W/2.6		0.6 - 1.2		14.6	8.7	7.8	5.4	3.9	3.2
	INM23001-18W/2.6	B	1.4 - 2.0	+3M8815	17.6	9.4	6.4	4.4	3.2	2.6
	INM23001-21W/2.6	or		or	20.6	10.0	5.5	3.8	2.8	2.3
	INM23001-23W/2.6	or	3.0 - 3.6*	+T710	22.6	10.5	5.0	3.5	2.5	2.1
	INM23001-28W/2.6	or			27.6	11.6	4.4	3.1	2.3	2.0
INM23001-33W/2.6	Y			32.6	12.7	3.8	2.7	2.0	1.8	
25	INM25001-15W/2.6	O			14.6	9.7	6.9	4.6	3.3	2.6
	INM25001-18W/2.6		0.6 - 1.2		17.6	10.4	5.6	3.8	2.7	2.2
	INM25001-21W/2.6	B	1.4 - 2.0	+3M8815	20.6	11.1	4.8	3.3	2.4	1.9
	INM25001-23W/2.6	or		or	22.6	11.6	4.4	3.0	2.2	1.8
	INM25001-28W/2.6	or	3.0 - 3.6*	+T710	27.6	12.7	3.9	2.7	2.0	1.7
	INM25001-33W/2.6	Y			32.6	13.9	3.3	2.4	1.8	1.5
27	INM27001-15W/2.6	O			14.6	11.0	6.7	4.5	3.2	2.7
	INM27001-18W/2.6		0.6 - 1.2		17.6	11.8	5.5	3.7	2.6	2.2
	INM27001-21W/2.6	B	1.4 - 2.0	+3M8815	20.6	12.6	4.7	3.1	2.3	1.9
	INM27001-23W/2.6	or		or	22.6	11.6	4.4	3.0	2.2	1.8
	INM27001-28W/2.6	or	3.0 - 3.6*	+T710	27.6	14.5	3.8	2.7	2.0	1.7
	INM27001-33W/2.6	or			32.6	15.8	3.3	2.3	1.8	1.5
29	INM29001-15W/2.6	O			14.6	12.5	6.8	4.4	3.1	2.5
	INM29001-18W/2.6		0.6 - 1.2		17.6	13.3	5.9	3.9	2.8	2.3
	INM29001-21W/2.6	B	1.4 - 2.0	+3M8815	20.6	14.1	4.9	3.3	2.3	1.9
	INM29001-23W/2.6	or		or	22.6	14.6	4.2	2.8	2.0	1.7
	INM29001-28W/2.6	or	3.0 - 3.6*	+T710	27.6	16.0	3.8	2.5	1.8	1.5
	INM29001-33W/2.6	or			32.6	17.3	3.4	2.3	1.7	1.4
31	INM31001-15W/2.6	O			14.6	15.3	5.2	3.3	2.3	1.8
	INM31001-18W/2.6		0.6 - 1.2		17.6	16.7	4.3	2.7	1.9	1.5
	INM31001-21W/2.6	B	1.4 - 2.0	+3M8815	20.6	18.0	3.6	2.3	1.7	1.4
	INM31001-23W/2.6	or		or	22.6	18.9	3.3	2.1	1.5	1.3
	INM31001-28W/2.6	or	3.0 - 3.6*	+T710	27.6	21.1	2.9	1.9	1.4	1.2
	INM31001-33W/2.6	or			32.6	23.4	2.5	1.7	1.2	1.0
33	INM33001-15W/2.6	O			14.6	17.8	5.5	3.4	2.2	1.7
	INM33001-18W/2.6		0.6 - 1.2		17.6	19.2	4.8	2.9	1.9	1.4
	INM33001-21W/2.6	B	1.4 - 2.0	+3M8815	20.6	20.5	3.9	2.4	1.5	1.1
	INM33001-23W/2.6	or		or	22.6	21.4	3.3	1.9	1.3	0.9
	INM33001-28W/2.6	or	3.0 - 3.6*	+T710	27.6	23.6	2.9	1.7	1.1	0.8
	INM33001-33W/2.6	or			32.6	25.9	2.5	1.5	1.0	0.7
35	INM35001-15W/2.6	O			14.6	20.9	4.5	2.9	2.1	1.7
	INM35001-18W/2.6		0.6 - 1.2		17.6	22.6	3.7	2.4	1.7	1.4
	INM35001-21W/2.6	B	1.4 - 2.0	+3M8815	20.6	23.7	3.2	2.1	1.5	1.2
	INM35001-23W/2.6	or		or	22.6	26.4	2.9	1.9	1.3	1.1
	INM35001-28W/2.6	or	3.0 - 3.6*	+T710	27.6	29.2	2.5	1.7	1.2	1.0
	INM35001-33W/2.6	or			32.6	30.9	2.2	1.5	1.0	0.8
37.5	INM37.5001-15W/2.6	O			14.6	22.2	4.2	2.7	1.9	1.6
	INM37.5001-18W/2.6		0.6 - 1.2		17.6	24.1	3.4	2.2	1.6	1.3
	INM37.5001-21W/2.6	B	1.4 - 2.0	+3M8815	20.6	26.1	2.9	1.9	1.4	1.2
	INM37.5001-23W/2.6	or		or	22.6	27.4	2.7	1.7	1.3	1.1
	INM37.5001-28W/2.6	or	3.0 - 3.6*	+T710	27.6	30.6	2.3	1.5	1.2	0.9
	INM37.5001-33W/2.6	or			32.6	33.9	2.0	1.3	1.0	0.8
40	INM40001-15W/2.6	O			14.6	25.2	3.7	2.4	1.6	1.3
	INM40001-18W/2.6		0.6 - 1.2		17.6	27.4	3.0	1.9	1.4	1.1
	INM40001-21W/2.6	B	1.4 - 2.0	+3M8815	20.6	29.6	2.5	1.7	1.2	0.9
	INM40001-23W/2.6	or		or	22.6	31.1	2.3	1.5	1.1	0.8
	INM40001-28W/2.6	or	3.0 - 3.6*	+T710	27.6	34.7	2.0	1.3	1.0	0.8
	INM40001-33W/2.6	or			32.6	38.4	1.7	1.2	0.8	0.7
42.5	INM42.5001-15W/2.6	O			14.6	27.8	3.4	2.1	1.4	1.2
	INM42.5001-18W/2.6		0.6 - 1.2		17.6	30.2	2.8	1.7	1.2	0.9
	INM42.5001-21W/2.6	B	1.4 - 2.0	+3M8815	20.6	32.6	2.4	1.5	1.0	0.8
	INM42.5001-23W/2.6	or		or	22.6	34.2	2.1	1.4	0.9	0.7
	INM42.5001-28W/2.6	or	3.0 - 3.6*	+T710	27.6	38.2	1.8	1.2	0.8	0.7
	INM42.5001-33W/2.6	or			32.6	42.2	1.6	1.0	0.7	0.6
45	INM45001-15W/2.6	O			14.6	31.2	3.1	1.9	1.3	1.1
	INM45001-18W/2.6		0.6 - 1.2		17.6	34.0	2.5	1.6	1.1	0.8
	INM45001-21W/2.6	B	1.4 - 2.0	+3M8815	20.6	36.7	2.1	1.4	0.9	0.7
	INM45001-23W/2.6	or		or	22.6	38.6	1.9	1.2	0.8	0.7
	INM45001-28W/2.6	or	3.0 - 3.6*	+T710	27.6	43.2	1.7	1.1	0.7	0.6
	INM45001-33W/2.6	or			32.6	47.8	1.4	0.9	0.7	0.5

NOTES:

- Example Part Numbers:
 INM27001-15W/2.6 27 x 14.6mm Heatsink Only
 INM35001-18W/2.6O 35 x 17.6mm Heatsink with "O"(orange) mounting clip (0.6-1.2mm chip height)
 INM40001-15W/2.6+T411 40 x 14.6mm Heatsink with T411 Thermal Tape for Plastic Packages
 INM42.5001-28W/2.6BU+T710 42.5 x 27.6mm Heatsink with "BU"(blue) mounting clip for 1.4-2.0mm chip heights and T710 thermal pad
- Optional Thermal Interface Materials are defined as follows:
 T411 - Thermally conductive tape ideal for plastic packages (Chomerics Part # T411)
 T412 - Thermally conductive tape ideal for metal or ceramic packages (Chomerics Part # T412)
 T710 - Thermally conductive phase change pad for use with mounting clip (Chomerics Part # T710)
- Mounting Clips are constructed of UL94-VO rated nylon material and come in 3 colors, O = Orange, BU = Blue and Y = Yellow
- Thermal data provided is for reference only. Actual cooling performance may vary by application
- Contact Radian to discuss unique heatsink, clip and interface requirements.
- Specifications are subject to change without notice

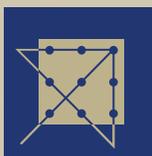


The INM-P Series of aluminum round pin BGA heatsinks are high efficiency cooling products which are ideal for omni-directional air flow.

These devices mount with EZ-Snap™ mounting clips and / or thermal tape to provide optimum cooling for various package sizes and airflow. These off-the-shelf, high efficiency solutions are easy to install and require no special board modifications or complex assemblies.

FEATURES :

- ☑ High efficiency aluminum round pin design provides low pressure-drop characteristics
- ☑ Constructed of forged aluminum AL6063 for optimum heat transfer
- ☑ Ideal for omni-directional air flow
- ☑ Designed specifically for BGAs and other surface mount packages
- ☑ Optional EZ-Snap™ mounting clip is constructed of UL94-V0 rated nylon
- ☑ Use clip tool HS8132 to attach or remove heatsink assembly directly to BGA chip
- ☑ Finished with black anodize plating
- ☑ Selected clip & thermal pad options are pre-assembled at the factory

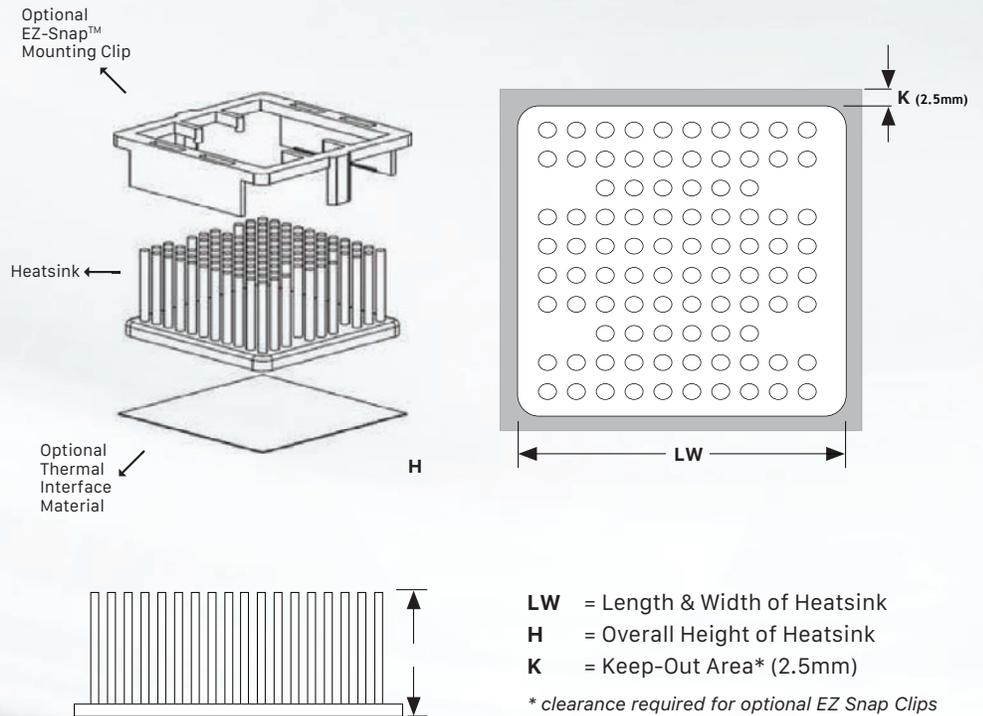


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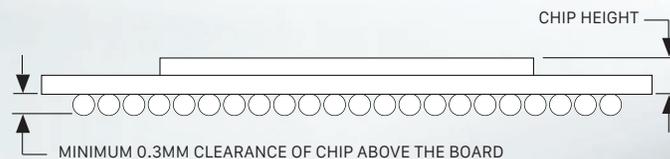
See next page for "LW" & "H" dimensional values



EZ-Snap™ Mounting Clip

CLIPS DIRECTLY TO BGA CHIP WITH HS8132 CLIP TOOL

See next page for fitting chip heights. Consult factory for unique chip height requirements



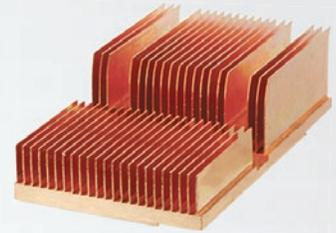
Note 1: Chip height measurements exclude ball dimensions (0.3mm)

Note 2: Chip must have 0.3mm clearance above the board for clip to adhere properly

Note 3: Maintain keep-out clearance of 2.5mm around chip for clip to adhere properly



CUSTOM OPTIONS also available



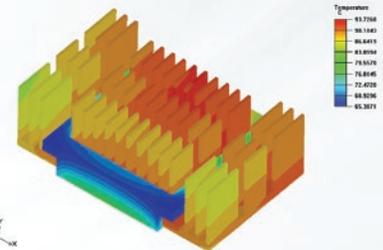
SKIVED HEATSINKS

- Thin Fin Copper Skiving with fins as thin as 0.008"
- CU1100 pure copper with high thermal conductivity (400W/mK)
- No NRE required for most parts



FORGED HEATSINKS

- Extremely high aspect ratios (Up to 35:1)
- Forged heatsink in both copper and aluminum
- Available in both standard and custom



COMPLIMENTARY THERMAL ANALYSIS

Contact Radian Heatsinks for more details



INSTALLATION TOOL HS8132

See page 17 for details

BGA Size	Part Number ⁽¹⁾				Heatsink Height (mm)	Weight (g)	Thermal Resistance Theta_SA (C/W)			
	Heatsink Part No.	Optional Mounting Clip		Optional Thermal Tap/Pad Part # ⁽²⁾			100 LFM	200 LFM	400 LFM	600 LFM
		Part No.	Fits Chip Heights (mm)							
19	INM19002-12P/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	4.0	11.0	7.7	5.5	4.5
	INM19002-15P/2.6	or B	1.4 - 2.0*		14.6	4.8	10.5	7.5	5.0	4.4
	INM19002-20P/2.6	or Y	3.0 - 3.6*		19.6	5.7	7.5	5.1	3.7	3.0
	INM19002-25P/2.6				24.6	6.9	6.7	4.7	3.4	2.7
27	INM27002-12P/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	7.6	7.9	5.3	3.8	3.1
	INM27002-15P/2.6	or B	1.4 - 2.0*		14.6	8.5	6.6	4.4	3.2	2.6
	INM27002-20P/2.6	or K32	2.3 - 2.9*		19.6	10.0	4.6	3.1	2.2	1.9
	INM27002-25P/2.6	or Y	3.0 - 3.6*		24.6	11.5	3.9	2.8	2.0	1.7
29	INM29002-12P/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	9.3	6.1	3.9	2.7	2.2
	INM29002-15P/2.6	or B	1.4 - 2.0*		14.6	10.4	5.7	3.7	2.5	2.0
	INM29002-20P/2.6	or Y	3.0 - 3.6*		19.6	11.7	4.1	2.6	1.8	1.5
	INM29002-25P/2.6				24.6	13.5	3.9	2.5	1.8	1.4
33	INM33002-12P/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	11.0	5.9	3.8	2.6	2.1
	INM33002-15P/2.6	or B	1.4 - 2.0*		14.6	12.3	4.9	3.2	2.2	1.8
	INM33002-20P/2.6	or K33	2.3 - 2.9*		19.6	13.8	3.5	2.3	1.6	1.3
	INM33002-25P/2.6	or Y	3.0 - 3.6*		24.6	16.5	2.9	1.9	1.4	1.2
35	INM35002-12P/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	13.4	5.3	3.4	2.5	1.9
	INM35002-15P/2.6	or B	1.4 - 2.0*		14.6	15.1	4.4	2.9	2.0	1.7
	INM35002-20P/2.6	or K29	2.3 - 2.9*		19.6	17.9	3.2	2.0	1.5	1.2
	INM35002-25P/2.6	or Y	3.0 - 3.6*		24.6	20.7	2.6	1.8	1.3	1.0
37.5	INM37.5002-12P/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	15.7	5.0	3.4	2.3	1.8
	INM37.5002-15P/2.6	or B	1.4 - 2.0*		14.6	17.8	4.1	2.7	1.9	1.6
	INM37.5002-20P/2.6	or Y	3.0 - 3.6*		19.6	21.3	3.0	1.8	1.4	1.2
	INM37.5002-25P/2.6				24.6	24.8	2.4	1.6	1.2	1.0
40	INM40002-12P/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	17.8	4.3	2.8	1.9	1.5
	INM40002-15P/2.6	or B	1.4 - 2.0*		14.6	20.0	3.6	2.4	1.6	1.3
	INM40002-20P/2.6	or K30	2.3 - 2.9*		19.6	24.0	2.5	1.7	1.2	0.9
	INM40002-25P/2.6	or Y	3.0 - 3.6*		24.6	28.0	2.1	1.4	1.0	0.8
42.5	INM42.5002-12P/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	20.6	4.0	2.5	1.7	1.3
	INM42.5002-15P/2.6	or B	1.4 - 2.0*		14.6	23.0	3.3	2.1	1.4	1.1
	INM42.5002-20P/2.6	or Y	3.0 - 3.6*		19.6	28.0	2.4	1.5	1.0	0.8
	INM42.5002-25P/2.6				24.6	33.0	1.9	1.3	0.8	0.7

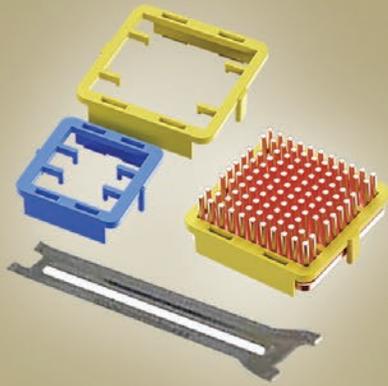
NOTES:

- Example Part Numbers:
 INM27002-15P/2.6 27 x 14.6mm Heatsink only
 INM35002-20P/2.6O 35 x 19.6mm Heatsink with "O" (orange) mounting clip (0.6-1.2mm chip height)
 INM40002-15P/2.6+3M8815 40 x 14.6mm Heatsink with 3M8815 thermal tape
 INM42.5002-25P/2.6BU+T710 42.5 x 24.6mm Heatsink with "BU" (blue) mounting clip for 1.4-2.0mm chip heights and T710 thermal pad
- Optional thermal interface materials are defined as follows:
 T710 - Thermally conductive phase change pad for use with mounting clip (Chomerics Part # T710)
 3M8815 - Thermally conductive adhesive tape
- Mounting clips are constructed of UL94-VO rated nylon material.
- Thermal data provided are for reference only. Actual cooling performance may vary by application.
- Contact Radian to discuss unique heatsink, clip and interface requirements.
- Specifications are subject to change without notice.

* Contact Radian for mounting clips to fit chip heights not displayed above.

INM-PCU series

Removable Heatsinks for BGA Chipsets Round Pin Copper BGA Heatsink



The INM-PCU Series of copper round pin BGA heatsinks are high efficiency cooling products which are ideal for omni-directional air flow.

These devices mount with EZ-Snap™ mounting clips and / or thermal tape to provide optimum cooling for various package sizes and airflow. These off-the-shelf, high efficiency solutions are easy to install and require no special board modifications or complex assemblies.

FEATURES :

- ☑ High efficiency copper round pin design provides low pressure-drop characteristics
- ☑ Constructed of forged CU1100 oxygen-free copper for optimum heat transfer
- ☑ Ideal for omni-directional air flow
- ☑ Designed specifically for BGAs and other surface mount packages
- ☑ Optional EZ-Snap™ mounting clip is constructed of UL94-V0 rated nylon
- ☑ Use clip tool HS8132 to attach or remove heatsink assembly directly to BGA chip
- ☑ Finished with clear anti-oxidation finish
- ☑ Selected clip & thermal pad options are pre-assembled at the factory

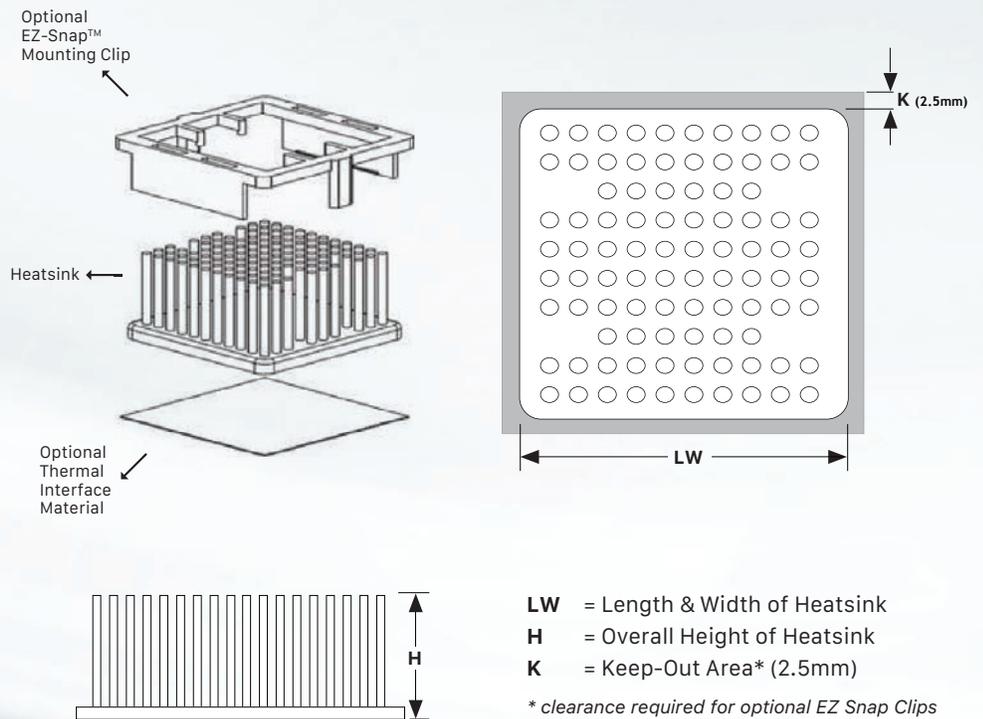


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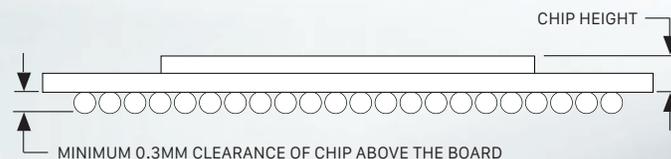
See next page for "LW" & "H" dimensional values



EZ-Snap™ Mounting Clip

CLIPS DIRECTLY TO BGA CHIP WITH HS8132 CLIP TOOL

See next page for fitting chip heights. Consult factory for unique chip height requirements



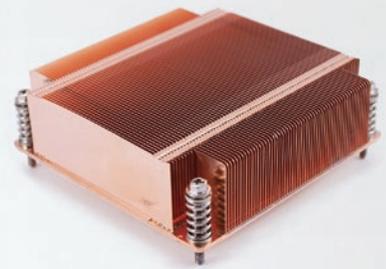
Note 1: Chip height measurements exclude ball dimensions (0.3mm)

Note 2: Chip must have 0.3mm clearance above the board for clip to adhere properly

Note 3: Maintain keep-out clearance of 2.5mm around chip for clip to adhere properly



CUSTOM OPTIONS
also available



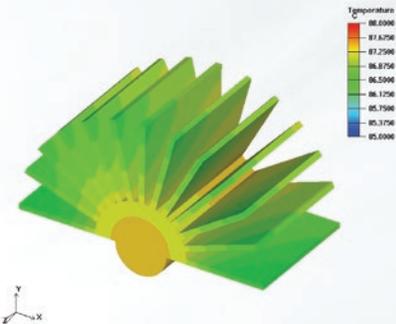
STAMPED FIN HEATSINKS

- Stamped Fin heatsinks available in both AL and CU
- Often combined with heat pipes



HEAT PIPES

- Base embedded heat pipe (Soldered or Epoxied)
- Integrated with Stamped Fins (Soldered or Pressed)
- Available in various sizes and configurations



COMPLIMENTARY THERMAL ANALYSIS

Contact Radian Heatsinks for more details



INSTALLATION TOOL HS8132

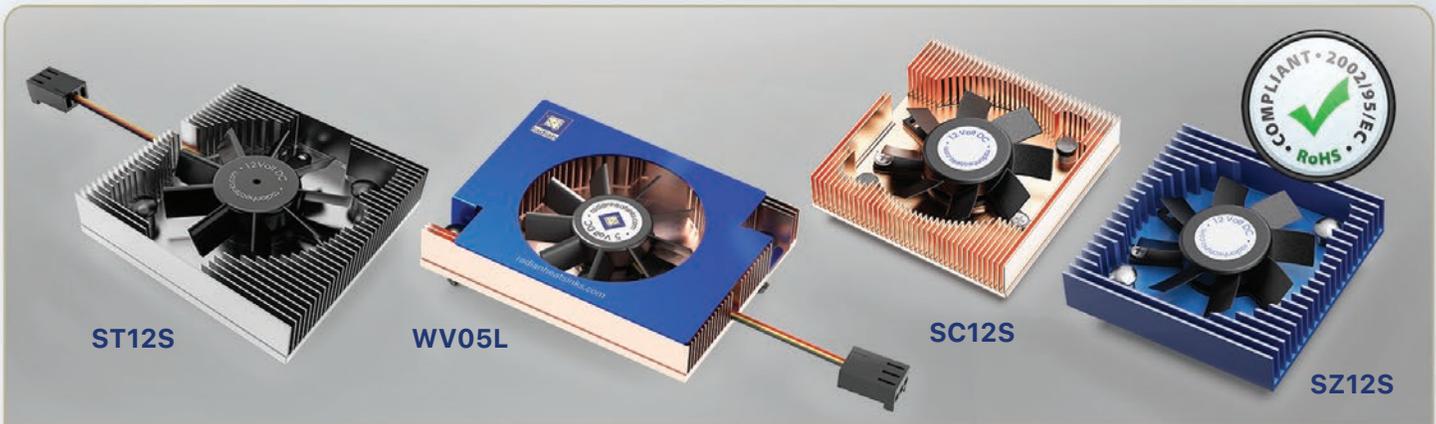
See page 17 for details

BGA Size	Heatsink Part No.	Part Number ⁽¹⁾		Optional Thermal Tap/Pad Part # ⁽²⁾	Heatsink Height (mm)	Weight (g)	Thermal Resistance Theta_SA (C/W)			
		Optional Mounting Clip					100 LFM	200 LFM	400 LFM	600 LFM
		Part No.	Fits Chip Heights (mm)							
19	INM19002-12PCU/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	10	9.0	6.4	4.8	4.0
	INM19002-15PCU/2.6	or B	or 1.4 - 2.0*		14.6	13	8.6	6.0	4.3	3.5
	INM19002-20PCU/2.6	or Y	or 3.0 - 3.6*		19.6	15	6.0	4.2	3.1	2.6
	INM19002-25PCU/2.6				24.6	15	5.5	3.9	2.9	2.4
27	INM27002-12PCU/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	25	6.8	4.6	3.3	2.7
	INM27002-15PCU/2.6	or B	or 1.4 - 2.0*		14.6	25	6.0	4.0	2.9	2.4
	INM27002-20PCU/2.6	K32	or 2.3 - 2.9*		19.6	28	4.2	2.8	2.1	1.7
	INM27002-25PCU/2.6	or Y	or 3.0 - 3.6*		24.6	28	3.8	2.6	1.9	1.6
29	INM29002-12PCU/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	25	6.1	4.0	2.8	2.3
	INM29002-15PCU/2.6	or B	or 1.4 - 2.0*		14.6	25	5.4	3.6	2.4	2.0
	INM29002-20PCU/2.6	or Y	or 3.0 - 3.6*		19.6	28	3.8	2.4	1.8	1.5
	INM29002-25PCU/2.6				24.6	30	3.4	2.2	1.6	1.4
33	INM33002-12PCU/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	45	5.0	3.0	2.0	1.5
	INM33002-15PCU/2.6	or B	or 1.4 - 2.0*		14.6	50	4.4	2.7	1.7	1.2
	INM33002-20PCU/2.6	K33	or 2.3 - 2.9*		19.6	55	2.9	1.8	1.1	0.9
	INM33002-25PCU/2.6	or Y	or 3.0 - 3.6*		24.6	60	2.7	1.6	1.0	0.8
35	INM35002-12PCU/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	45	4.6	3.0	2.1	1.7
	INM35002-15PCU/2.6	or B	or 1.4 - 2.0*		14.6	55	4.0	2.6	1.8	1.5
	INM35002-20PCU/2.6	K29	or 2.3 - 2.9*		19.6	58	2.8	1.8	1.3	1.0
	INM35002-25PCU/2.6	or Y	or 3.0 - 3.6*		24.6	63	2.6	1.7	1.2	0.9
37.5	INM37.5002-12PCU/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	86	4.3	2.8	2.0	1.7
	INM37.5002-15PCU/2.6	or B	or 1.4 - 2.0*		14.6	89	3.8	2.4	1.8	1.5
	INM37.5002-20PCU/2.6	or Y	or 3.0 - 3.6*		19.6	93	2.7	1.8	1.2	1.0
	INM37.5002-25PCU/2.6				24.6	100	2.4	1.6	1.0	0.9
40	INM40002-12PCU/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	79	3.7	2.4	1.6	1.3
	INM40002-15PCU/2.6	or B	or 1.4 - 2.0*		14.6	86	3.4	2.1	1.4	1.2
	INM40002-20PCU/2.6	K30	or 2.3 - 2.9*		19.6	89	2.3	1.5	1.0	0.8
	INM40002-25PCU/2.6	or Y	or 3.0 - 3.6*		24.6	104	2.1	1.4	0.9	0.7
42.5	INM42.5002-12P/2.6	O	0.6 - 1.2*	+3M8815 or +T710	11.6	107	3.5	2.1	1.5	1.2
	INM42.5002-15PCU/2.6	or B	or 1.4 - 2.0*		14.6	121	3.0	1.9	1.2	1.0
	INM42.5002-20PCU/2.6	or Y	or 3.0 - 3.6*		19.6	125	2.1	1.3	0.9	0.8
	INM42.5002-25PCU/2.6				24.6	128	1.9	1.2	0.8	0.7

NOTES:

1. Example Part Numbers:
 INM27002-15PCU/2.6 27 x 14.6mm Heatsink only
 INM35002-20PCU/2.6O 35 x 19.6mm Heatsink with "O" (orange) mounting clip (0.6-1.2mm chip height)
 INM40002-15PCU/2.6+3M8815 40 x 14.6mm Heatsink with 3M8815 thermal tape
 INM42.5002-25PCU/2.6BU+T710 42.5 x 24.6mm Heatsink with "BU" (blue) mounting clip for 1.4-2.0mm chip heights and T710 thermal pad
2. Optional thermal interface materials are defined as follows:
 T710 - Thermally conductive phase change pad for use with mounting clip (Chomerics Part # T710)
 3M8815 - Thermally conductive adhesive tape
3. Mounting clips are constructed of UL94-VO rated nylon material.
4. Thermal data provided are for reference only. Actual cooling performance may vary by application.
5. Contact Radian to discuss unique heatsink, clip and interface requirements.
6. Specifications are subject to change without notice.

* Contact Radian for mounting clips to fit chip heights not displayed above.



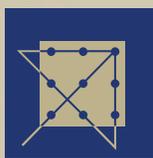
A PCIe Fansink is specifically designed for a PCI Express (Peripheral Component Interconnect Express) card, which is a high-speed serial computer expansion bus standard. Format specifications are maintained and developed by the PCI-SIG (PCI Special Interest Group), a group of more than 900 companies that also maintain the conventional PCI specifications.

As a PCIe card has a height restriction of 14.48mm this means that fin height is fairly limited for the PCIe heatsink, especially when considering that a typical BGA chip height is around 3mm including solder balls.

FEATURES :

- ☑ Designed for PCIe heatsink height requirements
- ☑ DC fan for improved heat dissipation
- ☑ Aluminum or Copper
- ☑ Constructed of extrusion or skiving
- ☑ Push-pin or thermal tape mounting
- ☑ Finish: Anodization (aluminum) or Anti-oxidation (Copper)

Part Number	Voltage	Thermal Pad	LxW (mm)	Heatsink Height	R-Theta (C/W)
WV05L	5	Tmate 2905c	50x65	11	1.1
WV05S	5	Tmate 2905c	50x50	10.5	1.28
WV12L	12	Tmate 2905c	50x65	11	1.1
WV12S	12	Tmate 2905c	50x50	10.5	1.28
ST05L	5	Tmate 2905c	50x65	11	1.48
ST05S	5	Tmate 2905c	50x50	10.5	1.65
ST12L	12	Tmate 2905c	50x65	11	1.48
ST12S	12	Tmate 2905c	50x50	10.5	1.65
SZ05L	5	Tmate 2905c	50x63.37	10.5	1.85
SZ05S	5	Tmate 2905c	50x50	10.5	2.2
SZ12L	12	Tmate 2905c	50x63.37	10.5	1.85
SZ12S	12	Tmate 2905c	50x50	10.5	2.2
SC05L	5	Tmate 2905c	50x63.37	10.5	1.4
SC05S	5	Tmate 2905c	50x50	10.5	1.6
SC12L	12	Tmate 2905c	50x63.37	10.5	1.4
SC12S	12	Tmate 2905c	50x50	10.5	1.6



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Small Round Pin

Round Pin Aluminum BGA Heatsink



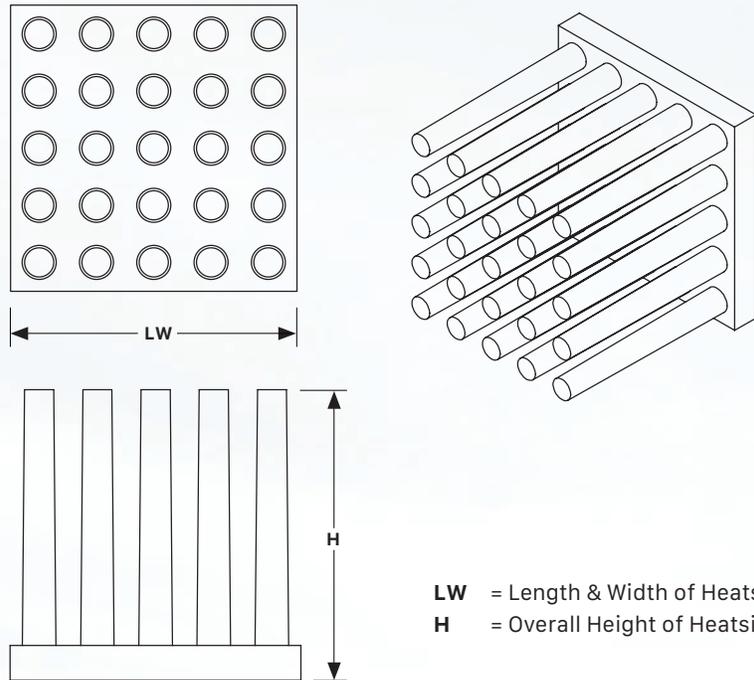
The miniature series of aluminum heatsinks are high efficiency cooling products which are ideal for omni-directional airflow.

These devices may be packaged with optional thermal tape to facilitate installation of the heatsinks.

FEATURES :

- ☑ High efficiency cooling solution for numerous surface mount devices, including hot IC packages, flip chips, BGA packages, peripheral memory/RAM, and more
- ☑ Round pin design provides extremely low thermal resistances per given volume and facilitates omni-directional air flow to maximize heat dissipation
- ☑ Ideally suited for devices dissipating heavy heat loads or applications with space, height and/or weight constraints
- ☑ Standard product includes anodized aluminum heatsink
- ☑ Interface material and thermally conductive, double-sided adhesive tape are available for metal, plastic and ceramic packages

MECHANICAL OUTLINE DRAWING



LW = Length & Width of Heatsink
H = Overall Height of Heatsink



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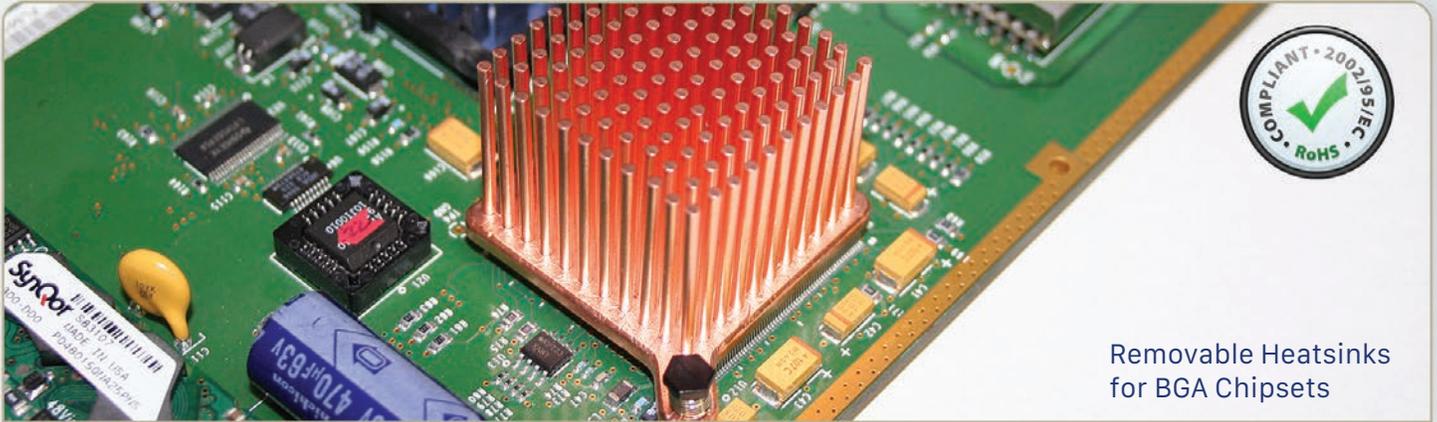
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BGA Size	Part Number			Thermal Resistance Theta _{SA} (C/W)			
	Heatsink Part Number	Optimal Thermal Pad	Heatsink (Height mm)	100 LFM	200 LFM	400 LFM	600 LFM
12.7	CS2005V00	Contact Radian	12.7	18.0	11.0	7.0	5.6
	CS2006V00	Contact Radian	7.6	29.0	18.0	11.5	9.2
	CS2058V00	Contact Radian	5.8	58.0	34.6	21.4	16.4
17.8	CS2042V00	Contact Radian	12.7	11.9	7.1	4.4	3.4
25.4	CS2050V00	Contact Radian	19.1	6.7	4.7	3.6	3.2
	CS2051V00	Contact Radian	12.7	15.1	9.8	6.5	5.3

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37.5004 series

Round Pin BGA Heatsink



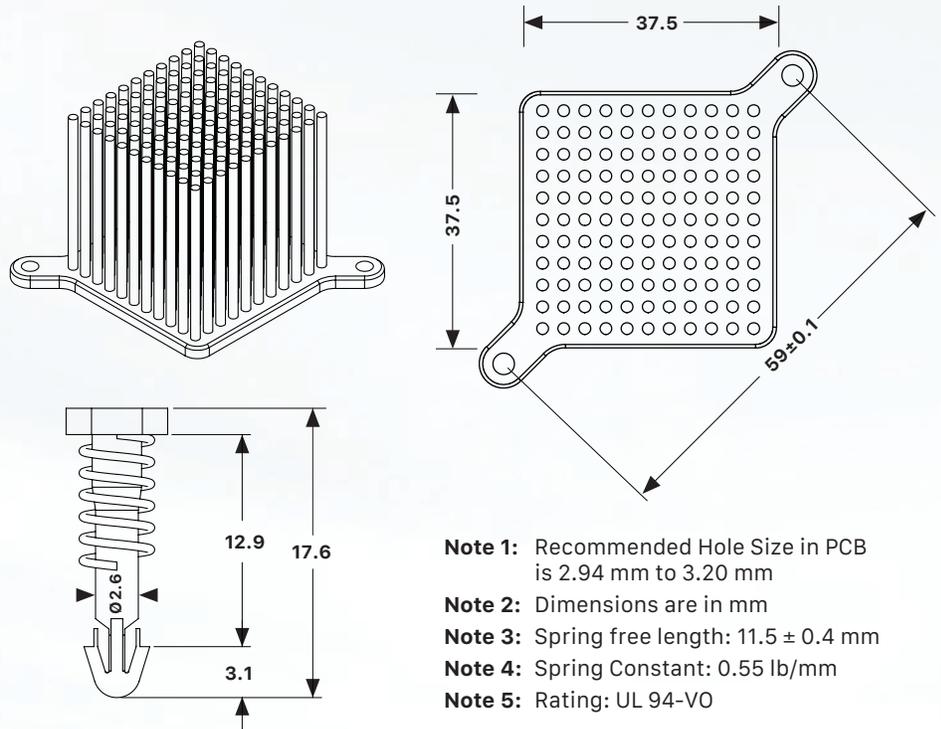
Removable Heatsinks for BGA Chipsets

The 37.5004 Series of aluminum or copper round pin BGA heatsinks are high efficiency cooling products which are ideal for omni-directional air flow.

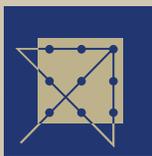
FEATURES :

- ☑ High efficiency aluminum or copper round pin design provides low pressure-drop characteristics
- ☑ Constructed of aluminum AL6063 or forged CU1100 oxygen-free copper for optimum heat transfer
- ☑ Ideal for omni-directional air flow
- ☑ Designed specifically for BGAs and other surface mount packages
- ☑ Finished with black anodize plating or with a clear anti-oxidation finish
- ☑ Spring loaded push pins for optimum heat transfer

MECHANICAL OUTLINE DRAWING



- Note 1:** Recommended Hole Size in PCB is 2.94 mm to 3.20 mm
- Note 2:** Dimensions are in mm
- Note 3:** Spring free length: 11.5 ± 0.4 mm
- Note 4:** Spring Constant: 0.55 lb/mm
- Note 5:** Rating: UL 94-V0

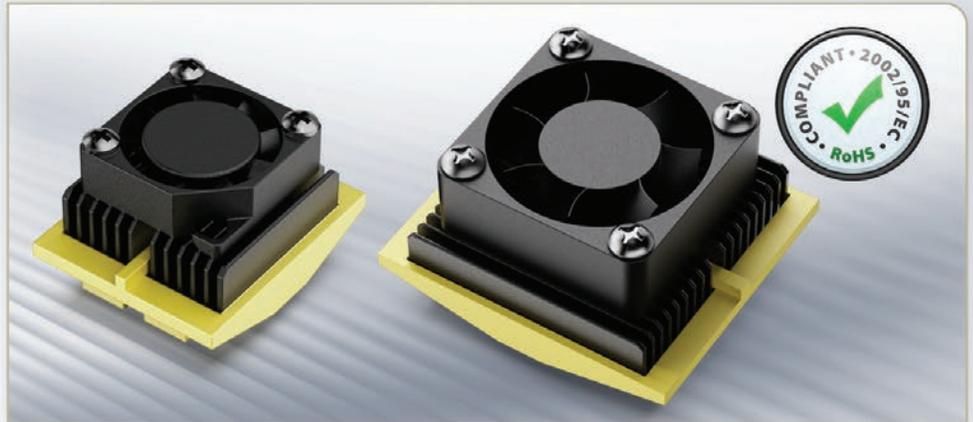


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Part Number					Thermal Resistance Theta _{SA} (C/W)			
BGA Size	Heatsink Part Number	Standard Push Pin	Optimal Thermal Pad Part#	Heatsink Height (mm)	Weight (g)	200 LFM	400 LFM	600 LFM
37.5	INM37.5004-12P/2.6	+K01	+T710 or +3m8815	11.6	16.1	3.4	2.4	1.9
	INM37.5004-15P/2.6			14.6	17.6	2.9	2.0	1.6
	INM37.5004-20P/2.6			19.6	20.0	2.0	1.4	1.2
	INM37.5004-23P/2.6			22.6	22.7	1.7	1.25	1.0
	INM37.5004-25P/2.6			24.6	23.3	1.4	1.1	0.8
	INM37.5004-12PCU/2.6*			11.6	55.0	2.9	1.8	1.4
	INM37.5004-15PCU/2.6*			14.6	62.0	2.3	1.4	1.1
	INM37.5004-20PCU/2.6*			20.6	76.0	1.7	1.0	0.8
	INM37.5004-25PCU/2.6*			24.6	80.0	1.3	0.8	0.7

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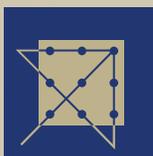


The F-Series of aluminum cross cut fin BGA heatsinks with fans are high efficiency cooling products designed for BGA chipsets.

These devices mount with EZ-Snap™ mounting clips to provide optimum cooling for various package sizes. These off-the-shelf, high efficiency solutions are easy to install and require no special board modifications or complex assemblies.

FEATURES :

- ☑ High efficiency aluminum plate fin design provides low pressure-drop characteristics
- ☑ Constructed of extruded aluminum AL6063 for optimum heat transfer
- ☑ DC Fan for improved heat dissipation
- ☑ Designed specifically for BGAs and other surface mount packages
- ☑ EZ-Snap™ Mounting Clip is constructed of UL94-V0 Rated Nylon
- ☑ Use Clip Tool HS8132 to attach (or remove) heatsink directly to BGA Chip
- ☑ Heatsinks are finished with black anodize plating
- ☑ Clip & thermal pad options are pre-assembled at the factory

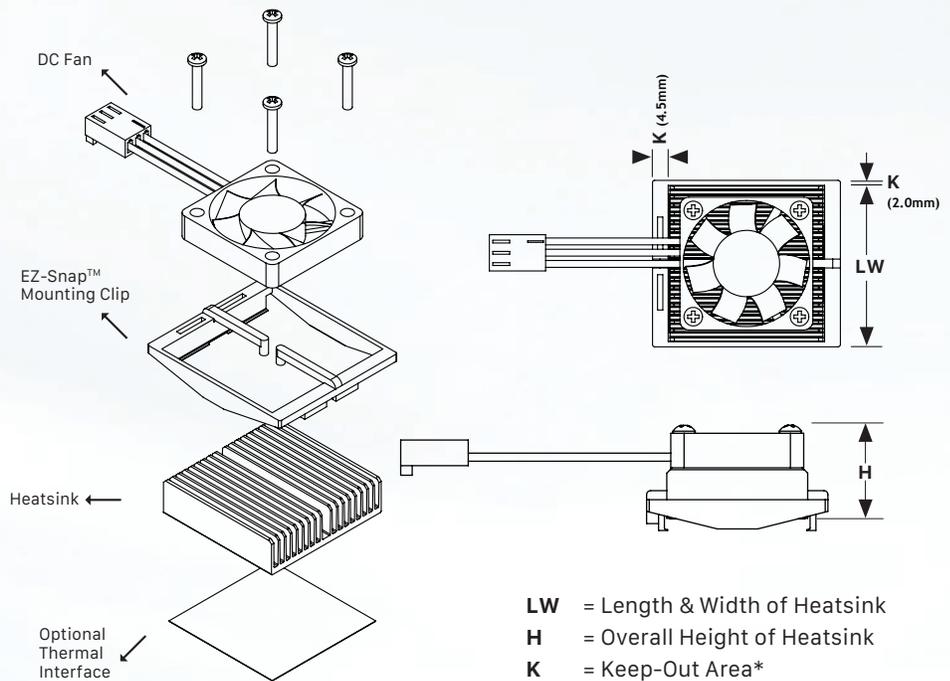


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MECHANICAL OUTLINE DRAWING

See next page for "LW" & "H" dimensional values

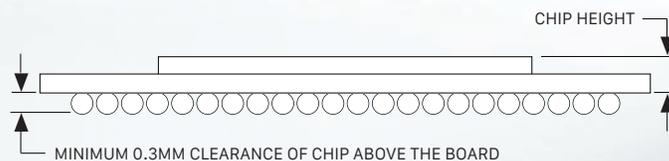


* clearance required for optional EZ Snap Clips

EZ-Snap™ Mounting Clip

CLIPS DIRECTLY TO BGA CHIP WITH HS8132 CLIP TOOL

See next page for fitting chip heights. Consult factory for unique chip height requirements



Note 1: Chip height measurements exclude ball dimensions (0.3mm)

Note 2: Chip must have 0.3mm clearance above the board for clip to adhere properly

Note 3: Maintain keep-out clearance of 2mm Length side and 4.5mm Width side around chip for clip to adhere properly



CUSTOM OPTIONS
also available



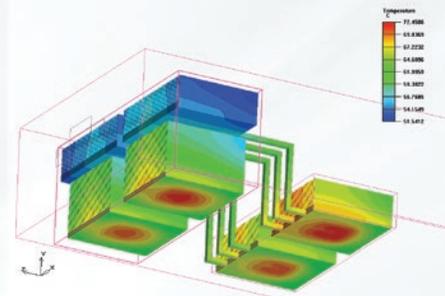
VAPOR CHAMBERS

- Used in conjunction with stamped fins
- Better spreading efficiency than copper or heat pipe based heatsinks
- High efficiency wick structure design
- Lightweight heatsinks



RAPID PROTOTYPE

- Quick turn from our local foundry
- Made from a 3D model



COMPLIMENTARY THERMAL ANALYSIS

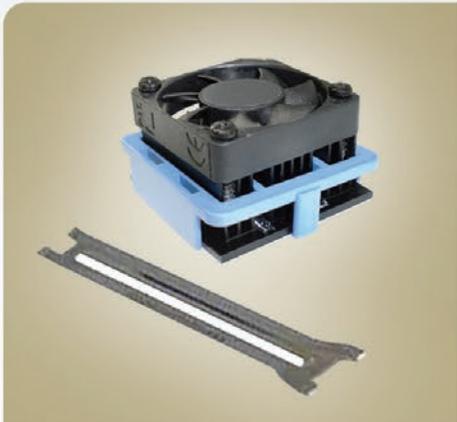
Contact Radian Heatsinks for more details



INSTALLATION TOOL HS8132

See page 17 for details

BGA Size	Part Number ⁽¹⁾				Optional Thermal Tap/Pad Part #	Heatsink Height (mm)	R-theta	Weight (g)	Resistance (C/W)
	Fansink		Optional Mounting Clip						
	Fansink Part #	Voltage Input	Optional Mounting Clip	Fits Chip Height (mm)					
23	FI23	12V	O or B	0.9 - 1.4	T725	17.4	2.1 °C/W	33	3.5
	FJ23	5V	or Y	1.5 - 2.0 2.1 - 2.6	or 3M8815				
25	FI25	12V	O or B	0.9 - 1.4	T725	17.4	2.1 °C/W	35	3.1
	FJ25	5V	or Y	1.5 - 2.0 2.1 - 2.6	or 3M8815				
27	FI27	12V	O or B	0.9 - 1.4	T725	21.0	2.5 °C/W	36	2.5
	FJ27	5V	or Y	1.5 - 2.0 2.1 - 2.6	or 3M8815				
29	FI29	12V	O or B	0.9 - 1.4	T725	21.0	2.1 °C/W	37	2.5
	FJ29	5V	or Y	1.5 - 2.0 2.1 - 2.6	or 3M8815				
31	FI31	12V	O or B	0.9 - 1.4	T725	22.0	2.1 °C/W	40	2.1
	FJ31	5V	or Y	1.5 - 2.0 2.1 - 2.6	or 3M8815				
33	FI33	12V	O or B	0.9 - 1.4	T725	22.0	2.1 °C/W	42	2.0
	FJ33	5V	or Y	1.5 - 2.0 2.1 - 2.6	or 3M8815				
37.5	FI37.5	12V	O or B	0.9 - 1.4	T725	22	1.3 °C/W	43	1.8
	FJ37.5	5V	or Y	1.5 - 2.0 2.1 - 2.6	or 3M8815				
42.5	FI42.5	12V	O or B	0.9 - 1.4	T725	25.2	1.4 °C/W	45	1.3
	FJ42.5	5V	or Y	1.5 - 2.0 2.1 - 2.6	or 3M8815				



The F-Series of aluminum plate fin BGA heatsinks with fans are high efficiency cooling products designed for BGA chipsets.

These devices mount with EZ-Snap™ mounting clips to provide optimum cooling for various package sizes. These off-the-shelf, high efficiency solutions are easy to install and require no special board modifications or complex assemblies.

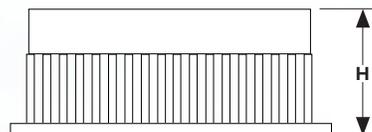
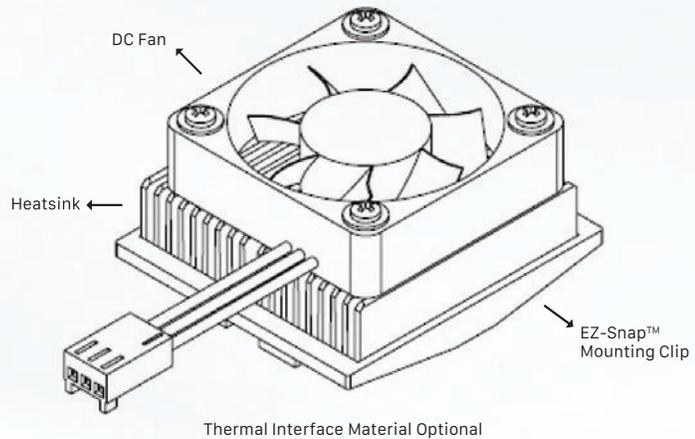
FEATURES :

- ☑ Constructed of extruded aluminum AL6063 for optimum heat transfer
- ☑ DC Fan for improved heat dissipation
- ☑ Designed specifically for BGAs and other surface mount packages
- ☑ EZ-Snap™ Mounting Clip is constructed of UL94-V0 Rated Nylon
- ☑ Use Clip Tool HS8132 to attach (or remove) heatsink directly to BGA Chip
- ☑ Finished with black anodize plating
- ☑ Clip & thermal pad options are pre-assembled at the factory



MECHANICAL OUTLINE DRAWING

See next page for "LW" & "H" dimensional values



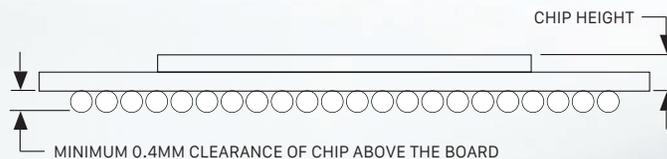
LW = Length & Width of Heatsink
H = Overall Height of Heatsink
K = Keep-Out Area*

* clearance required for optional EZ Snap Clips

EZ-Snap™ Mounting Clip

CLIPS DIRECTLY TO BGA CHIP WITH HS8132 CLIP TOOL

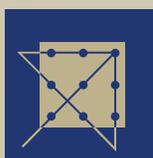
See next page for fitting chip heights. Consult factory for unique chip height requirements



Note 1: Chip height measurements exclude ball dimensions (0.4mm)

Note 2: Chip must have 0.4mm clearance above the board for clip to adhere properly

Note 3: Maintain keep-out clearance of 2.5mm around chip for clip to adhere properly

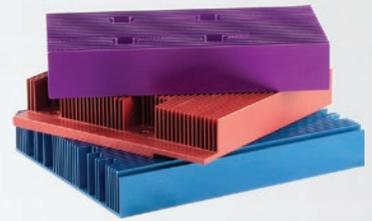


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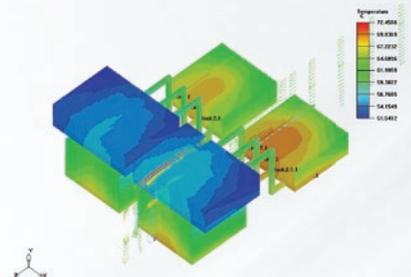
WITH CUSTOM COLORS

Offer custom anodize colors



CUSTOM CLIP-ON

Offer custom extended fins with clip attachment



COMPLIMENTARY THERMAL ANALYSIS

Contact Radian Heatsinks for more details



INSTALLATION TOOL HS8132

See page 17 for details

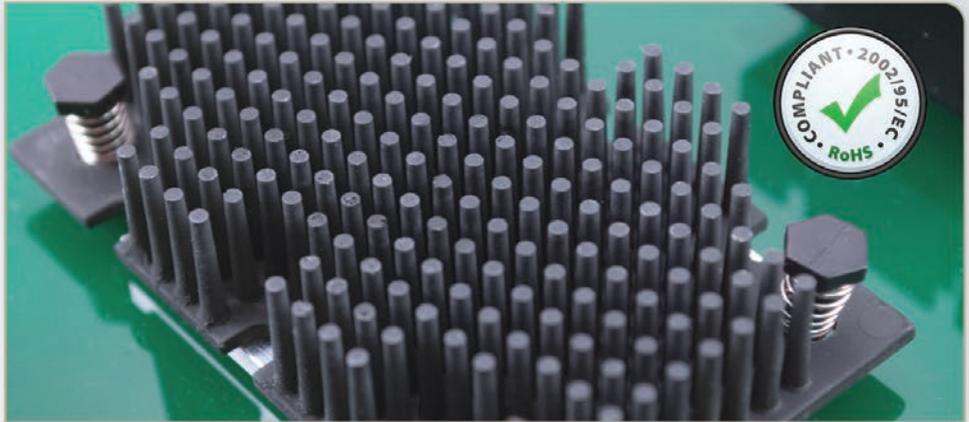
* Contact Radian for mounting clips to fit chip heights not displayed above.

BGA Size	Part Number ⁽¹⁾		Optional Mounting Clip		Optional Thermal Tap/Pad Part #	Heatsink Height (mm)	Thermal Resistance Theta_SA	Fan Spec	Harness Spec
	Fansink		Optional Mounting Clip	Fits Chip Height (mm)					
	Fansink Part #	Voltage Input							
35	FA35	12V	+K25B or +K51B or +K52B or +K35B	1.5 - 2.1 1.7 - 2.3 2.5 - 3.1 3.2 - 3.8	+3M8815 or +T710	22.7	1.7 °C/W	Airflow: 4.1 CFM Noise: 27.9 dBA Speed: 9,000 RPM Power: 1.4 Watts	Length: 300mm (+/-20) Connector: Molex 22-01-3037 (Matching Connector 22-23-2031) Pin 1: Ground (Black) Pin 2: + Voltage Input (Red) Pin 3: Tachometer (Blue or White)
	FB35	5V	+K29B or +K53B	3.4 - 4.0 4.1 - 4.7					
40	FA40	12V	+K27B or +K36B or +K54B or +K55B	1.5 - 2.1 1.7 - 2.3 2.5 - 3.1 3.2 - 3.8	+3M8815 or +T710	22.8	1.3 °C/W	Airflow: 6.0 CFM Noise: 30.0 dBA Speed: 8,000 RPM Power: 1.56 Watts	Length: 300mm (+/-20) Connector: Molex 22-01-3037 Pin 1: Ground (Black) Pin 2: + Voltage Input (Red) Pin 3: Tachometer (White)
	FB40	5V	+K30B or +K56B	3.4 - 4.0 4.1 - 4.7					
42.5	FA42.5	12V	+K40B or +K41B or +K31B	0.8 - 1.4 1.4 - 2.0 2.7 - 3.3	+3M8815 or +T710	23.3	1.2 °C/W	Airflow: 5.7 CFM Noise: 20.0 dBA Speed: 4,800 RPM Power: 1.0 Watts	Length: 300mm (+/-20) Connector: Molex 22-01-3037 Pin 1: Ground (Black) Pin 2: + Voltage Input (Red) Pin 3: Tachometer (Blue)
	FB42.5	5V							
45	FA45	12V			+3M8815 or +T710	22.7	1.7 °C/W	Airflow: 5.7 CFM Noise: 20.0 dBA Speed: 4,800 RPM Power: 1.0 Watts	Length: 300mm (+/-20) Connector: Molex 22-01-3037 Pin 1: Ground (Black) Pin 2: + Voltage Input (Red) Pin 3: Tachometer (Blue)
	FB45	5V	+K28B	1.5 - 2.1					

NOTES:

1. Add suffix "+T725" to designate thermally conductive phase change pad (Chomerics Part # T725)
2. Mounting clips are constructed of UL94-VO rated nylon material and black in color
3. Thermal data provided is for reference only. Actual cooling performance may vary by application
4. Specifications are subject to change without notice.

* Contact Radian to discuss unique heatsink, clip and interface requirements.

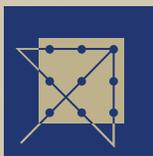


The DC/DC Series of aluminum heatsinks are high efficiency cooling products which are designed to meet the thermal requirements of today's DC/DC converter products.

These devices may be packaged with optional hard-ware mounting kits and thermal interface pads to facilitate installation of the heatsinks directly to the DC/DC converters.

FEATURES :

- ☑ High efficiency round pin or plate fin design provide low pressure-drop characteristics
- ☑ Constructed of aluminum AL6063 or 356.0 for optimum heat transfer
- ☑ Round pin designs are ideal for omnidirectional airflow environments
- ☑ Plate fin designs are ideal for linear air flow environments
- ☑ Designed specifically for DC/DC Converters and other baseplate packages
- ☑ Finished with black anodize plating
- ☑ Selected hardware mounting kit and thermal interface pad options are pre-packaged at the factory

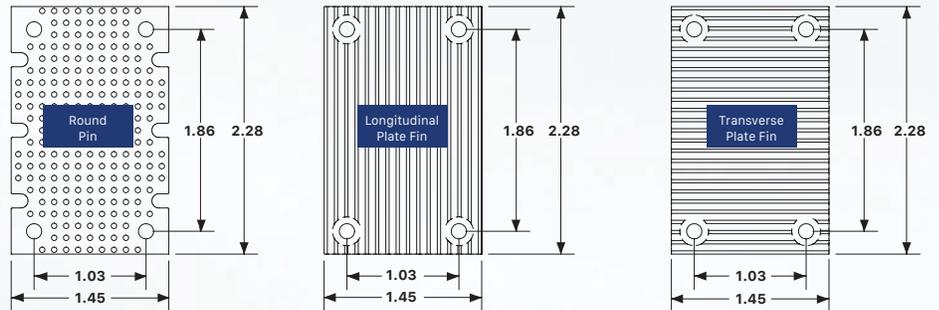


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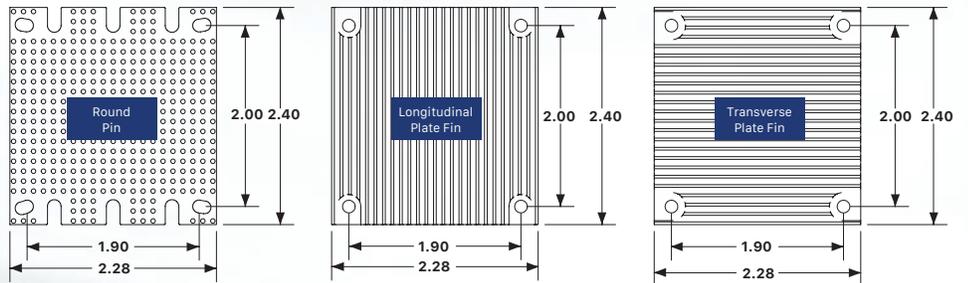
1/4 Brick Outline Drawings

See next page for height dimensions, Pin/Fin style and thermal resistance ratings



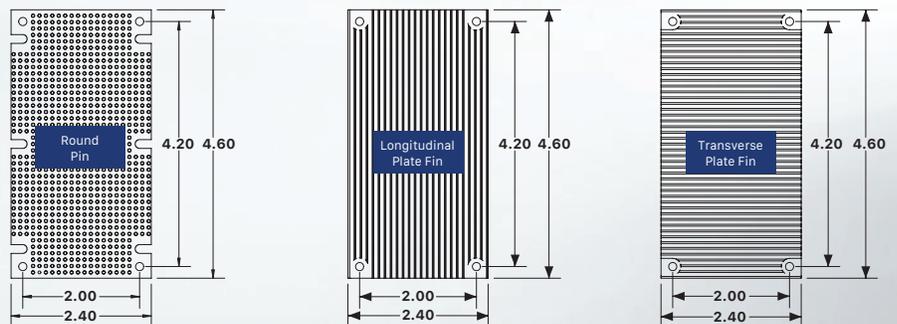
1/2 Brick Outline Drawings

See next page for height dimensions, Pin/Fin style and thermal resistance ratings



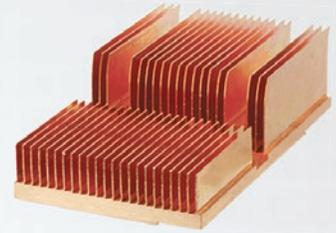
Full Brick Outline Drawings

See next page for height dimensions, Pin/Fin style and thermal resistance ratings





CUSTOM OPTIONS also available



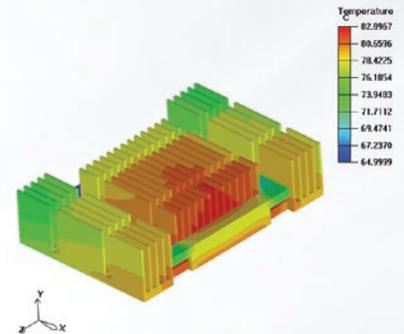
SKIVED HEATSINKS

- Thin Fin Copper Skiving with fins as thin as 0.008"
- CU1100 pure copper with high thermal conductivity (400W/mK)
- No NRE required for most parts



FORGED HEATSINKS

- Extremely high aspect ratios (Up to 35:1)
- Forged heatsink in both copper and aluminum
- Available in both standard and custom



COMPLIMENTARY THERMAL ANALYSIS

Contact Radian Heatsinks for more details



INSTALLATION TOOL HS8132

See page 17 for details

Brick Package	Pin / Fin Style	Optional Mounting Clip		Thermal Pad	Mounting Hardware	Thermal Resistance Theta_SA (C/W)		
		Heatsink Height _(in)	Heatsink			200 LFM	400 LFM	600 LFM
Quarter Brick	Round Pin	0.23	HS2065DB	P7314	4 pieces of M3 x 4mm screws with lock washer or K04 4 pieces of M3 x 5mm screws with lock washer or K04 4 pieces of M3 x 6mm screws with lock washer	3.9	2.5	2.0
		0.45	HS2066DB			2.3	1.5	1.2
		0.70	HS2075DB			1.5	1.0	0.8
		0.90	HS2159DB			1.4	1.0	0.8
	Plate Fin Longitudinal	0.23	HS1567EB	P0114		4.1	2.4	1.8
		0.45	HS1568EB			2.1	1.3	0.9
		0.70	HS1569EB			1.4	0.8	0.6
		0.90	HS1570EB			1.2	0.7	0.5
	Plate Fin Transverse	0.23	HS1571EB	P0114		3.0	1.8	1.3
		0.45	HS1572EB			1.5	0.9	0.7
		0.70	HS1573EB			1.0	0.6	0.5
		0.90	HS1574EB			0.8	0.5	0.4
Half Brick	Round Pin	0.23	HS2067DB	P7414	3.1	2.0	1.5	
		0.45	HS2069DB		1.8	1.1	0.9	
		0.70	HS2074DB		1.4	0.9	0.7	
		0.90	HS2158DB		1.4	1.0	0.8	
	Plate Fin Longitudinal	0.23	HS1575EB	P0314	2.6	1.6	1.2	
		0.45	HS1576EB		1.4	0.8	0.6	
		0.70	HS1577EB		0.9	0.5	0.4	
		0.90	HS1578EB		0.7	0.4	0.3	
	Plate Fin Transverse	0.23	HS1579EB	P0314	2.5	1.5	1.1	
		0.45	HS1580EB		1.3	0.8	0.6	
		0.70	HS1581EB		0.9	0.5	0.4	
		0.90	HS1582EB		0.7	0.4	0.3	
Full Brick	Round Pin	0.23	HS2070DB	P7514	1.6	1.0	0.8	
		0.45	HS2071DB		1.0	0.6	0.5	
		0.70	HS2073DB		0.7	0.5	0.4	
		0.90	HS2160DB		0.6	0.4	0.3	
	Plate Fin Longitudinal	0.23	HS1591EB	P0514	2.1	1.3	0.9	
		0.45	HS1592EB		1.2	0.7	0.5	
		0.70	HS1593EB		0.8	0.5	0.3	
		0.90	HS1594EB		0.7	0.4	0.3	
	Plate Fin Transverse	0.23	HS1595EB	P0514	1.3	0.8	0.6	
		0.70	HS1597EB		0.5	0.3	0.2	
		0.90	HS1598EB		0.4	0.2	0.2	

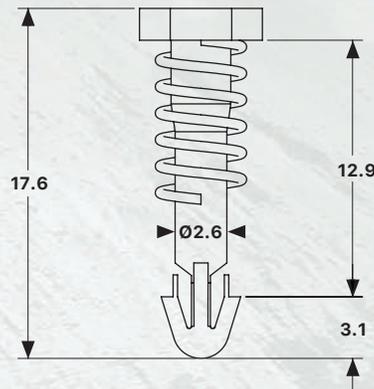
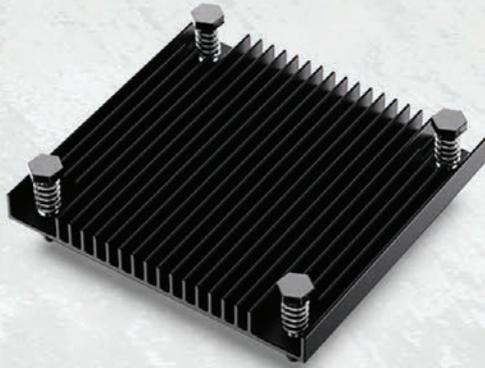
NOTES:

1. Example Part Numbers:
 HS1567EB 1/4 Brick Heatsink (0.23" High), plate fin (longitudinal)
 HS2071DBP3514 Full Brick Heatsink (0.45" High), round pin with thermal interface pad
 HS1581EBP0314K04 1/2 Brick Heatsink (0.70 High), plate fin (transverse) with thermal interface pad and 4 pieces of M3 x 4mm screws & lock washers
 HS1598EBK05 Full brick heatsink (0.90" High), plate fin (transverse) with 4 pieces of M3 x 5mm screws & lock washers
2. Optional thermal pad is thermally conductive Laird T-Mate 2905c
3. Thermal data provided are for reference only. Actual cooling performance may vary by application.
4. Specifications are subject to change without notice.

* Contact Radian for mounting clips to fit chip heights not displayed above.

Push-Pin

Aluminum Heatsink



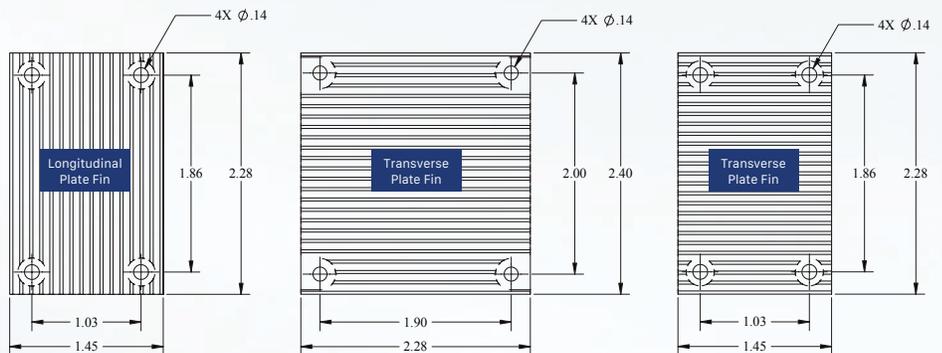
Spring free length: 11.5 ± 0.4mm
 Spring Constant: 0.55 lb/mm
 Rating: UL 94-V0

The Push-Pin Series of aluminum heatsinks are high efficiency cooling products which are ideal for linear airflow environments.

FEATURES :

- ☑ High efficiency plate fin design provide low pressure-drop characteristics
- ☑ Constructed of aluminum AL6063 for optimum heat transfer
- ☑ Plate fin designs are ideal for linear air flow environments
- ☑ Finished with black anodize plating
- ☑ Selected hardware mounting kit and thermal interface pad options are pre-assembled at the factory

MECHANICAL OUTLINE DRAWING



* Recommended PCB Hole Size is 3mm (0.118)

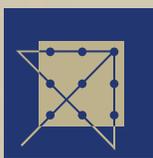
Heatsink Width (in)	Heatsink Length (in)	Heatsink Height (in)	Part Number			Thermal Resistance Theta _{SA} (C/W)		
			Part Number	Pad Size & Type	Optional Push Pin	200 LFM	400 LFM	600 LFM
1.45	2.28	0.23	HS1567EB	P3805*		4.1	2.4	1.8
1.45	2.28	0.45	HS1568EB	P3805*	K01	2.2	1.3	1.0
1.45	2.28	0.70	HS1569EB	P3805*	Push-Pins	1.4	0.9	0.7
1.45	2.28	0.90	HS1570EB	P3805*		1.2	0.7	0.5
2.28	1.45	0.23	HS1571EB	P3805*		3.2	2.0	1.6
2.28	1.45	0.45	HS1572EB	P3805*	K01	1.7	1.1	0.9
2.28	1.45	0.70	HS1573EB	P3805*	Push-Pins	1.1	0.8	0.6
2.28	1.45	0.90	HS1574EB	P3805*		0.9	0.6	0.5
2.40	2.28	0.23	HS1579EB	P6705**		2.7	1.7	1.3
2.40	2.28	0.45	HS1580EB	P6705**	K01	1.5	1.0	0.8
2.40	2.28	0.70	HS1581EB	P6705**	Push-Pins	1.0	0.6	0.5
2.40	2.28	0.90	HS1582EB	P6705**		0.8	0.5	0.4

* P3805 is 1.375x1.375" (35x35mm) Chomerics T710 pad

** P6705 is 1.60x1.60 (40.6x40.6mm) Chomerics T710 pad

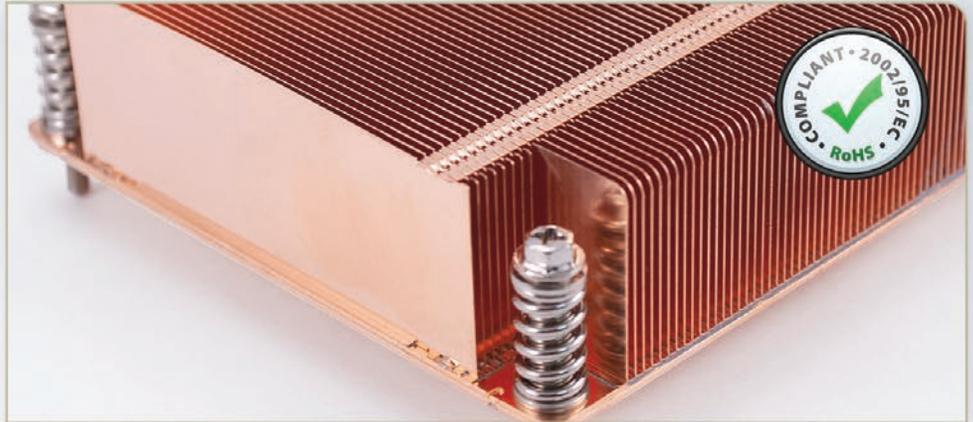
NOTES:

1. Example Part Numbers:
 HS1567EB 1.45" x 2.28" Heatsink (0.23" High), plate fin (longitudinal)
 HS1567EBP3805K01 1.45" x 2.28" Heatsink (0.23" High), plate fin (longitudinal) with thermal interface pad T710 and 4 push-pins K01
2. Thermal data provided are for reference only. Actual cooling performance may vary by application.
3. Specifications are subject to change without notice.



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BUY ONLINE

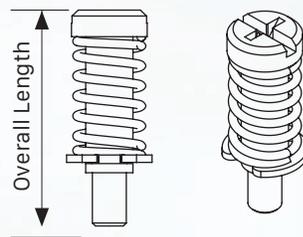


Heavy duty Captive Screws provide a secure method for attaching heatsinks to board. Ideal for large aluminum or copper heatsinks

FEATURES :

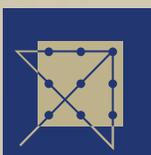
- ☑ Screw and spring held captive to the heatsink
- ☑ Multiple thread sizes available
- ☑ Made from stainless steel, RoHS compliant
- ☑ Spring loaded to evenly distribute force
- ☑ Multiple spring sizes available
- ☑ Resistance to high temperature and thermal cycling

MECHANICAL OUTLINE DRAWING



- Note 1:** Recommended keep out area on PCB: 0.300" diameter
- Note 2:** Back plate or standard hex nut shall be used on opposite side of PCB
- Note 3:** Phillips head or flat head screw driver can be used

Part Number	Thread Size	Combined Thickness Heatsink + Chip	Force (lb)	Spring Constant (lb/in)	Overall Length (in)
HS8089SP001CL001	#4-40	0.098" (2.5mm)	1.3	21.1	0.73
		0.118" (3.0mm)	1.7		
		0.138" (3.5mm)	2.1		
		0.157" (4.0mm)	2.5		
		0.177" (4.5mm)	3.0		
		0.197" (5.0mm)	3.4		
		0.217" (5.5mm)	3.8		
		0.236" (6.0mm)	4.2		
HS8089SP002CL001	#4-40	0.098" (2.5mm)	3.1	29.5	0.73
		0.118" (3.0mm)	3.7		
		0.138" (3.5mm)	4.3		
		0.157" (4.0mm)	4.9		
		0.177" (4.5mm)	5.4		
		0.197" (5.0mm)	6.0		
		0.217" (5.5mm)	6.6		
		HS8091SP003CL001	#4-40		
0.394" (10.0mm)	2.5				
0.433" (11.0mm)	3.2				
0.472" (12.0mm)	3.9				
0.512" (13.0mm)	4.6				
0.551" (14.0mm)	5.3				
HS8091SP004CL001	#4-40	0.276" (7.0mm)	2.9	20.8	1.27
		0.315" (8.0mm)	3.7		
		0.354" (9.0mm)	4.5		
		0.394" (10.0mm)	5.3		
		0.433" (11.0mm)	6.1		
		0.472" (12.0mm)	7.0		
		0.512" (13.0mm)	7.8		
		0.551" (14.0mm)	8.6		
HS8121SP001CL001	M2.5	0.098" (2.5mm)	1.3	21.1	0.73
		0.118" (3.0mm)	1.7		
		0.138" (3.5mm)	2.1		
		0.157" (4.0mm)	2.5		
		0.177" (4.5mm)	3.0		
		0.197" (5.0mm)	3.4		
		0.217" (5.5mm)	3.8		
		0.236" (6.0mm)	4.2		
HS8125SP002CL001	M3.0	0.098" (2.5mm)	3.1	29.5	0.73
		0.118" (3.0mm)	3.7		
		0.138" (3.5mm)	4.3		
		0.157" (4.0mm)	4.9		
		0.177" (4.5mm)	5.4		
		0.197" (5.0mm)	6.0		
		0.217" (5.5mm)	6.6		

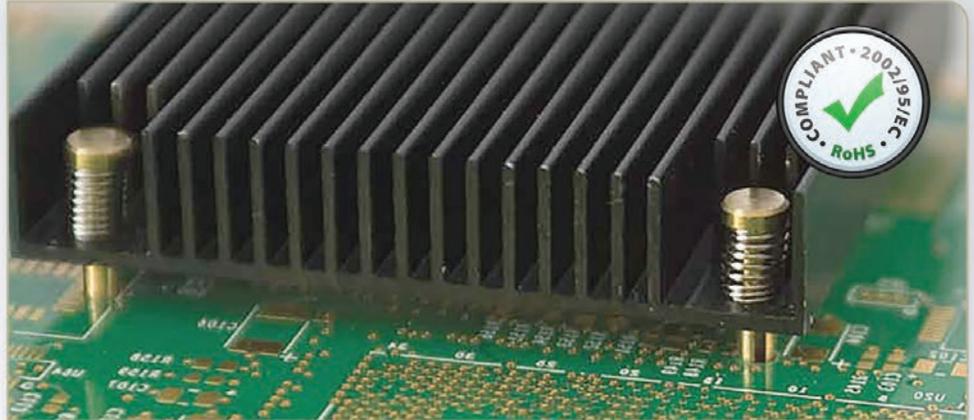


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BUY ONLINE

Brass Push Pins

Attachments for Electronic Modules

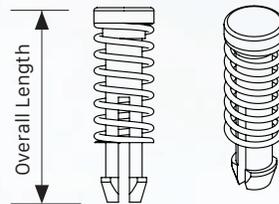


The brass push pins provide a secure attachment method for our heatsinks to your board with some board modifications.

FEATURES :

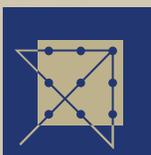
- ☑ Fits various PCB hole size
- ☑ Constant and reliable pressure is maintained by the springs to ensure proper contact.
- ☑ Convenient and secure mounting
- ☑ Customer can choose between multiple push pin heights/ spring combinations to achieve desired pressure.
- ☑ Made of RoHS compliant lead-free brass
- ☑ Resistance to high temperature and thermal cycling

MECHANICAL OUTLINE DRAWING



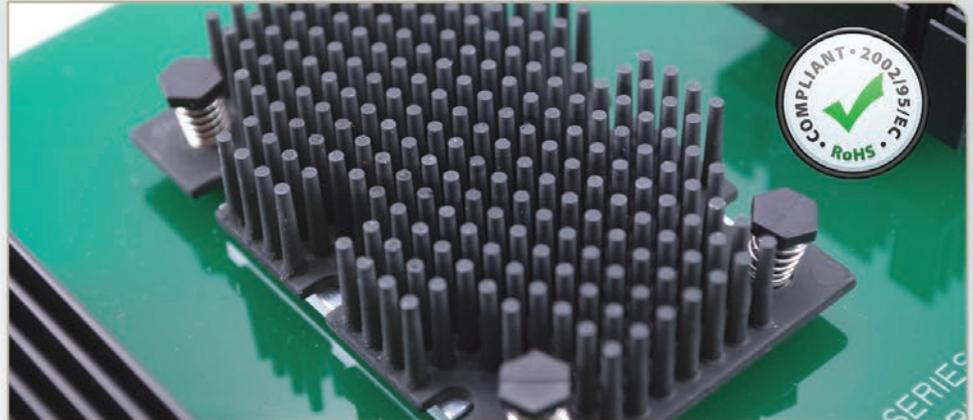
Note 1: Recommended keep out area on PCB: 0.20" diameter

Part Number	Combined Heatsink + Chip + PCB	Force (lb)	Spring Constant (lb/in)	Extension on Back Side of PCB (in)	Suggested Hole on (in)	Overall Length (in)
HS8111SP010	0.12" (3mm)	1.7	9	0.08	0.105	0.43
	0.16" (4mm)	2.1				
	0.18" (4.5mm)	2.3				
HS8112SP010	0.12" (3mm)	1.7	9	0.08	0.125	0.43
	0.16" (4mm)	2.1				
	0.18" (4.5mm)	2.3				
HS8116SP005	0.16" (4mm)	2.1	8.6	0.075	0.118	0.565
	0.20" (5mm)	2.5				
	0.24" (6mm)	2.8				
HS8116SP008	0.16" (4mm)	4.9	18.6	0.075	0.118	0.565
	0.20" (5mm)	5.6				
	0.24" (6mm)	6.4				
HS8103SP005	0.16" (4mm)	2.1	8.6	0.085	0.118	0.585
	0.20" (5mm)	2.5				
	0.24" (6mm)	2.8				
HS8103SP007	0.16" (4mm)	4.5	17.9	0.085	0.118	0.585
	0.20" (5mm)	5.2				
HS8103SP008	0.16" (4mm)	4.9	18.6	0.085	0.118	0.585
	0.20" (5mm)	5.6				
	0.24" (6mm)	6.4				
HS8130SP005	0.16" (4mm)	1.6	8.6	0.08	0.125	0.63
	0.20" (5mm)	2.0				
	0.24" (6mm)	2.3				
HS8097SP005	0.16" (4mm)	1.3	8.6	0.085	0.118	0.685
	0.20" (5mm)	1.6				
	0.24" (6mm)	2.0				
HS8097SP007	0.16" (4mm)	2.7	17.9	0.085	0.118	0.685
	0.20" (5mm)	3.4				
	0.24" (6mm)	4.1				
HS8097SP008	0.16" (4mm)	3.0	18.6	0.085	0.118	0.685
	0.20" (5mm)	3.8				
	0.24" (6mm)	4.5				
HS8133SP010	0.35" (9mm)	1.3	9	0.08	0.125	0.71
	0.39" (10mm)	1.7				
	0.43" (11mm)	2.1				
HS8131SP010	0.43" (11mm)	1.0	9	0.08	0.125	0.826
	0.47" (12mm)	1.4				
	0.51" (13mm)	1.7				
HS8093SP013	0.16" (4mm)	2.2	6.3	0.085	0.118	0.83
	0.20" (5mm)	2.4				
	0.24" (6mm)	2.7				
	0.28" (7mm)	2.9				
	0.31" (8mm)	3.2				



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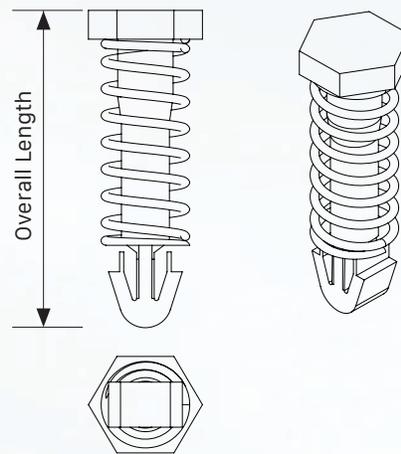


The plastic push pins provide a secure attachment method for our heatsinks to your board.

FEATURES :

- ☑ Fits various PCB hole size
- ☑ Constant and reliable pressure is maintained by the springs to ensure proper contact
- ☑ Convenient and secure mounting
- ☑ Customer can choose between multiple push pin heights/ spring combinations to achieve desired pressure.
- ☑ Made of RoHS compliant nylon brass
- ☑ Resistance to high temperature and thermal cycling

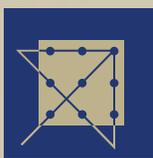
MECHANICAL OUTLINE DRAWING



Note 1

Recommended keep out area on PCB: 0.20" diameter

Part Number	Combined Thickness Heatsink + Chip + PCB	Force (lb)	Spring Constant (lb/in)	Extension on Back Side of PCB (in)	Suggested Hole on PCB (in)	Overall Height (in)	Flammability (UL-94)
HS8064	0.20" (5mm)	1.2	13.3	0.110	0.118	0.657	V2
	0.24" (6mm)						
	0.28" (7mm)						
	0.31" (8mm)						
HS8078	0.24" (6mm)	1.1	10	0.098	0.110	0.519	V0
	0.28" (7mm)	1.5					
HS8082	0.39" (10mm)	1.2	10	0.122	0.118	0.693	V2
	0.43" (11mm)	1.6					
HS8083	0.35" (9mm)	1.1	10	0.110	0.118	0.657	V2
	0.39" (10mm)	1.5					
HS8129	0.16" (4mm)	1.4	13.9	0.122	0.118	0.693	V0
	0.20" (5mm)	2.0					
	0.24" (6mm)	2.5					
	0.28" (7mm)	3.1					
	0.31" (8mm)	3.6					
HS8136	0.157" (4mm)	0.9	21.1	0.106	0.118	0.520	V0
	0.177" (4.5mm)	1.3					
	0.197" (5mm)	1.7					
	0.217" (5.5mm)	2.1					

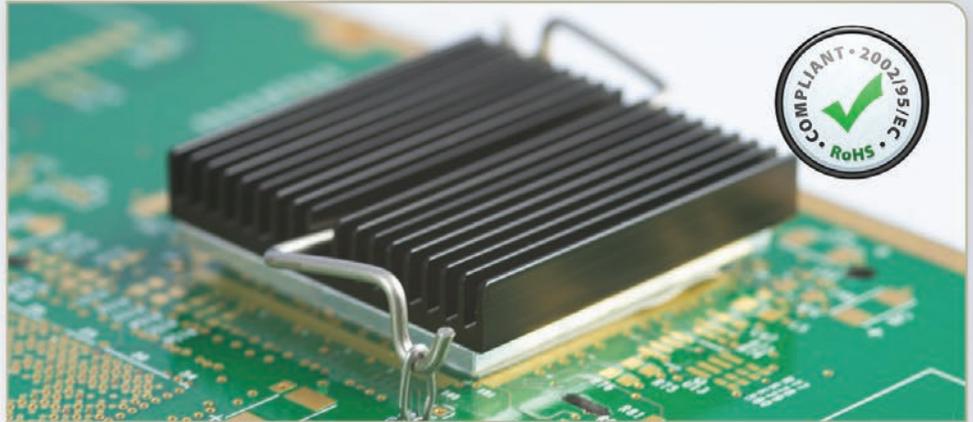
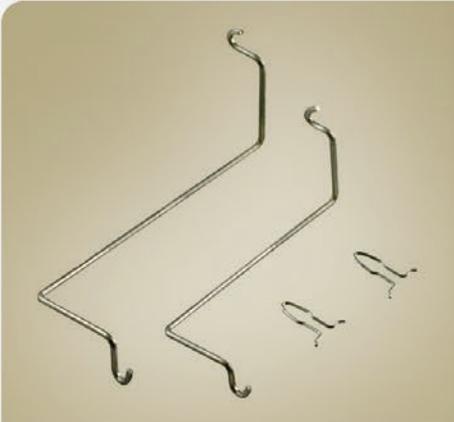


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BUY ONLINE

Wire Clips

Attachments for Electronic Modules And Solder Less Anchors



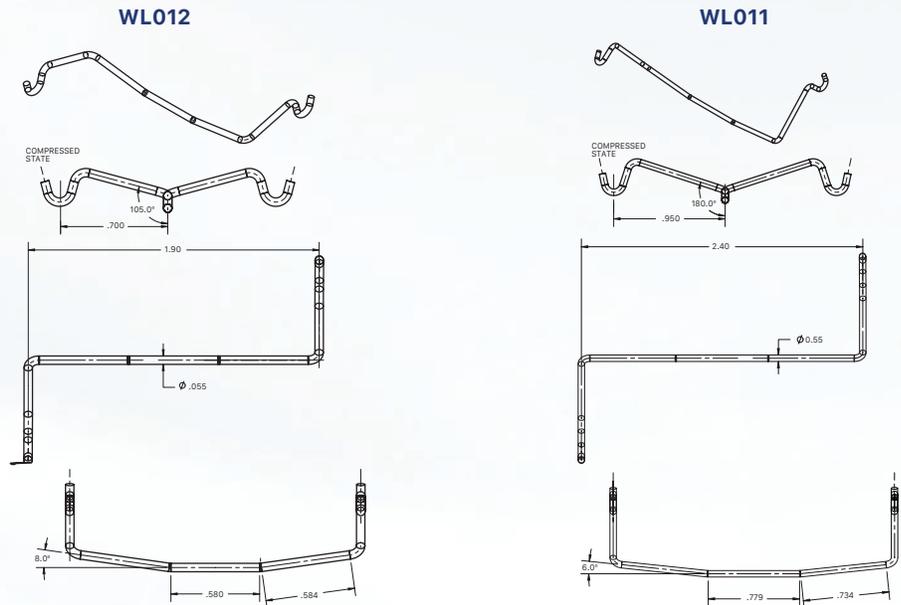
Our wire clips and solder less anchors provide a secure attachment method for our heatsinks to your board with some board modifications.

FEATURES :

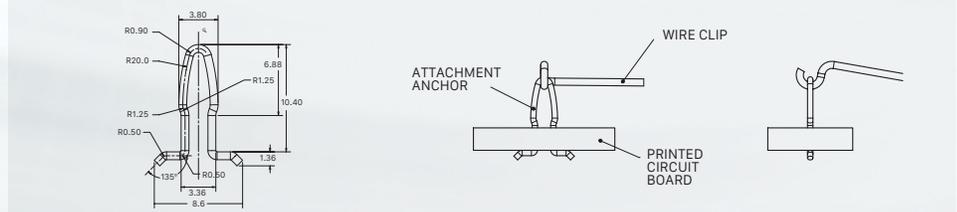
- ☑ Wire clips and solder less anchors provide rugged heatsink attachment
- ☑ Solder less anchors are inserted in the PCB without a need for a special tool into a 1mm x 3mm oval hole
- ☑ Anchors can be used for a range of PCB thicknesses from 0.059" to 0.123"
- ☑ Customer can choose between two wire clip sizes that can be used for heatsinks ranging from 23mm to 45mm depending on the board layout
- ☑ Mounting method offers ease of rework
- ☑ Made from RoHS compliant stainless steel

MECHANICAL OUTLINE DRAWING

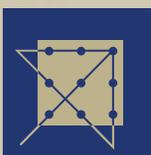
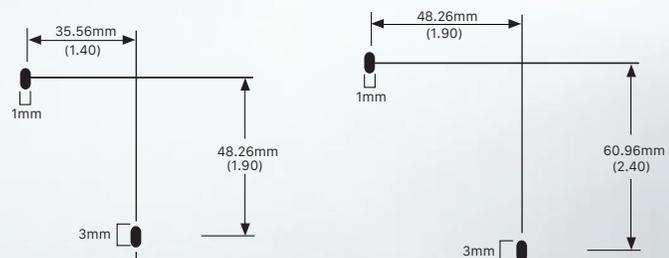
(2 Anchors included per Assembly)



INSTALLATION ON PRINTED CIRCUIT BOARD



Recommended PCB Hole Pattern



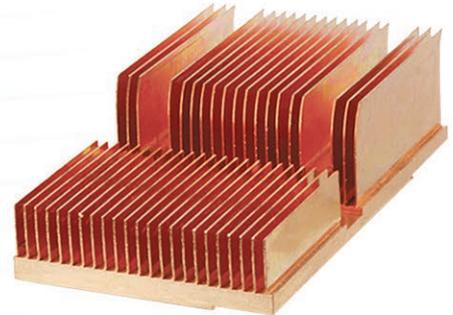
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BUY ONLINE

MANUFACTURING PROCESSES

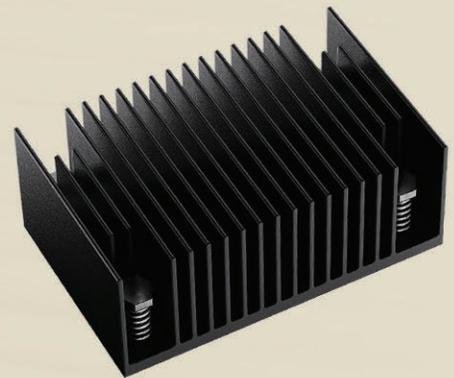
SKIVING

- ☑ Ultra thin fins (as thin as .008") high aspect ratio provides greater surface area for maximum heat dissipation
- ☑ Optimum cooling performance in high airflow applications
- ☑ Fins and base made from single block material (no additional interface resistance)
- ☑ No NRE for custom designs
- ☑ Copper or aluminum



EXTRUSIONS

- ☑ Suitable for high volume production with low NRE
- ☑ High thermal conductivity aluminum alloy A6063
- ☑ Most cost effective when post machining is not required
- ☑ Thin fin extrusion technology offers optimal heatsink performance



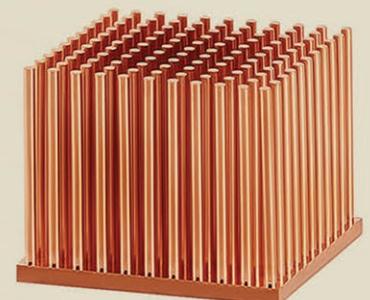
CASTINGS

- ☑ Special high thermal conductivity cast aluminum alloy
- ☑ Ideal for round pin and elliptical fins
- ☑ Very cost effective for heatsinks with complex geometries
- ☑ Die-Casting most suitable for high volume applications
- ☑ Investment casting available for low volume
- ☑ RPT process available to cast prototypes in the same alloy without hard tooling



FORGING

- ☑ Fins can be round, elliptical, straight or any combination on the same part
- ☑ Aspect ratio up to 35:1 is feasible
- ☑ Heatsink of the same footprint with optional heights require only one set of forging die
- ☑ Heatsinks can be made from AL 6063 or CU11000 alloys
- ☑ No draft angles required on fins



MANUFACTURING PROCESSES

MACHINING

- ☑ Precision machining for complex parts
- ☑ Design flexibility; capable of machining detailed features
- ☑ Machined heatsinks made from Copper 1100° or Aluminum 6061
- ☑ No NRE charges
- ☑ Quick turn prototyping



HEAT PIPES

Heat pipes are sealed copper tubes that transfer heat rapidly away from the source.

- ☑ High thermal conductivity enables heat pipes to transfer and dissipate heat to a more convenient location
- ☑ Embedded heat pipes drastically improves the spreading of heat
- ☑ Available in various shapes and sizes. They can be flat or round, and can be formed to fit most contours
- ☑ Also available with stamped fins



VAPOR CHAMBERS

Vapor chambers are sealed copper plates that rapidly disperse heat away from the source.

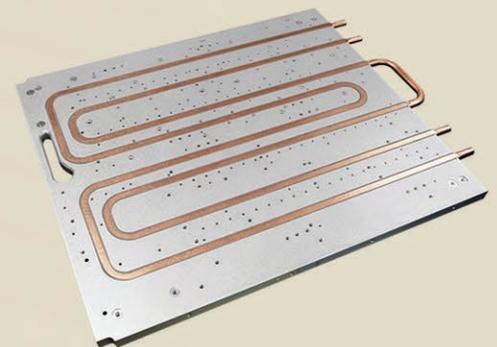
- ☑ Best heat spreading option at the base of a heatsink
- ☑ More effective when heatsink v/s source ratio is higher
- ☑ Light weight alternative to copper heatsinks
- ☑ Internal support structure to prevent buckling of chamber walls
- ☑ Compatible with stamped fins
- ☑ Typically used for the most challenging applications

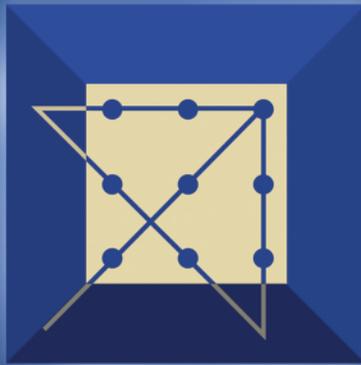


LIQUID COOLING

Liquid Cooling is a method of heat removal from components and can transfer heat more effectively than air cooling.

- ☑ Efficient heat dissipation and quiet Operation
- ☑ Overclocking Potential
- ☑ Space efficiency and modularity
- ☑ Temperature Monitoring and customizable
- ☑ Reduced Dust Accumulation





radian
heatsinks

RADIAN THERMAL PRODUCTS, INC.

No.145, Kewang 2nd Rd
Longtan Dist., Taoyuan County
32556 Taiwan, R.O.C
+886-3-4071668

2160 Walsh Avenue
Santa Clara, CA
95050 USA
+1 (408) 988-6200

FA3 / FB6 Factory, Fuji Precision Cluster
Yen Phong Industrial Park
Yen Phong Commune
Bac Ninh Province, Vietnam

sales@radianheatsinks.com | radianheatsinks.com