

radian

h e a t s i n k s

An Intricast Company

ISSUE 105

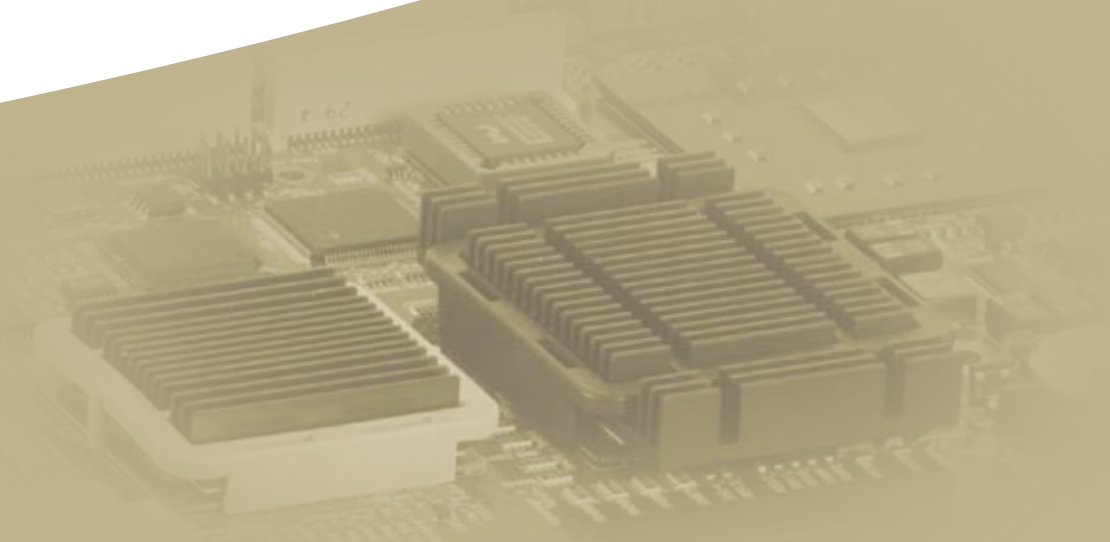


Table of Contents

Introduction and Company History.....	3
Capabilities and Custom Designs.....	4
Selector Guide by BGA Size.....	5-16
EZ-Snap™ Clip Mounting Guide.....	17
HS1800 Series.....	18
INL Series.....	20
INH Series.....	22
INC Series.....	24
INM-W Series.....	26
HS2000-60 Series.....	28
HS2000-80 Series.....	30
INM-P Series.....	32
INM-PCU Series.....	34
Small Round Pin.....	36
INM37.5004 Series.....	37
FI & FJ Series.....	38-39
F Series.....	40
DCDC Series.....	42
Push-Pin Heatsink Series.....	44
XFP Products.....	45
Captive Screws.....	46
Brass Push Pins.....	47
Plastic Push Pins.....	48
Wire Clips.....	49
Skiving, Extrusions, Castings and Forging.....	50
Machining, Heat Pipes and Vapor Chambers.....	51

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.

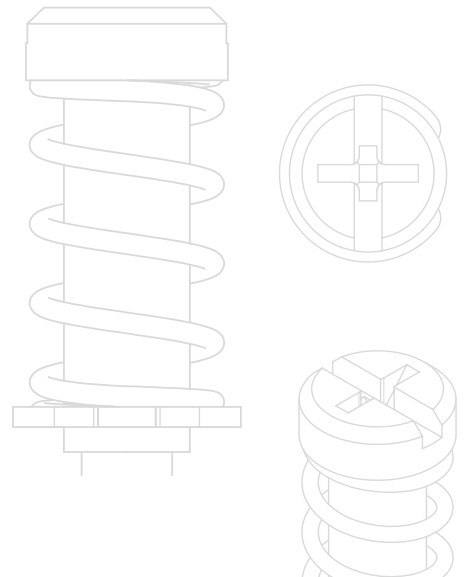
Complimentary Engineering Services

- 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

Company History

- 1974 Intracast Company formed (incorporated in 1977) Custom components for electronics using investment casting
- 1990 Moved to company owned 35,000 sq. ft. building
- 1993 Established elliptical heatsink line
- 1995 Launched separate heatsink division
 - Casted, Machined, and Extruded heatsinks
 - Increased manufacturing capabilities
 - Forged, Skiving, and Stamped Heatsinks
- 2000 Established Intracast 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

Note 1: Recommended Hole Size in PCB is 2.94 mm to 3.20 mm
Note 2: Dimensions are in mm



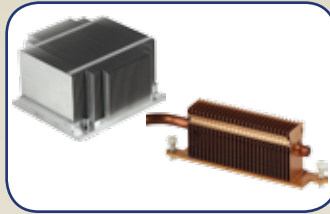
Note: Radian Heatsinks reserves the right to make changes to standard products without notice.

Capabilities and 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



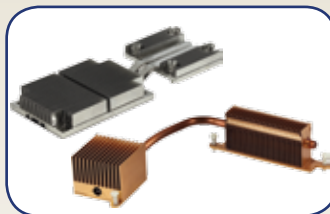
WITH CUSTOM COLORS

- Offer custom anodize colors



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



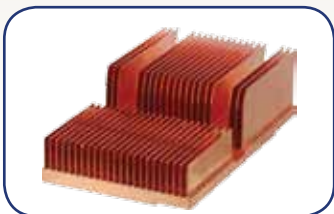
HEAT PIPES

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



CUSTOM CLIP-ON

- Offer custom extended fins with clip attachment



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



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



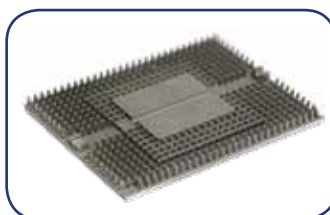
MACHINING

- Prototype runs
- Special shapes
- Aluminum or copper



FORGED HEATSINKS

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



RAPID PROTOTYPE

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



ATTACHMENT METHODS

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

STANDARD CLIP-ON HEATSINK SELECTOR BY BGA SIZE

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	26	10.7	3.4	7.0	6.0	5.6
	INM17001-14W/1.7	AL	26	13.7	3.9	6.4	5.5	5.1
	INM17001-17W/1.7	AL	26	16.7	4.4	5.8	4.8	4.5
	INM17001-20W/1.7	AL	26	19.7	4.9	5.2	4.3	3.8
	INM17001-22W/1.7	AL	26	21.7	5.2	4.9	4.1	3.7
	INM17001-27W/1.7	AL	26	26.7	6.1	4.6	3.8	3.4
	INM17001-32W/1.7	AL	26	31.7	7.0	4.3	3.6	3.2

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
	INC19001-8/1.5	AL	24	8.4	3.2	14.0	9.7	8.1
	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	26	14.6	6.2	7.2	5.3	4.5
	INM19001-18W/2.6	AL	26	17.6	6.8	6.7	4.8	3.9
	INM19001-21W/2.6	AL	26	20.6	7.4	5.5	4.0	3.3
	INM19001-23W/2.6	AL	26	22.6	7.8	4.7	3.5	2.9
	INM19001-28W/2.6	AL	26	27.6	8.8	4.3	3.1	2.6
	INM19001-33W/2.6	AL	26	32.6	9.8	3.9	2.9	2.4
ROUND PIN	INM19002-12P/2.6	AL	32	11.6	4.0	7.7	5.5	4.5
	INM19002-12PCU/2.6	CU	34	11.6	10.0	6.4	4.8	4.0
	INM19002-15P/2.6	AL	32	14.6	4.8	7.5	5.0	4.4
	INM19002-15PCU/2.6	CU	34	14.6	13.0	6.0	4.3	3.5
	INM19002-20P/2.6	AL	32	19.6	5.7	5.1	3.7	3.0
	INM19002-20PCU/2.6	CU	34	19.6	15.0	4.2	3.1	2.6
	INM19002-25P/2.6	AL	32	24.6	6.9	4.7	3.4	2.7
	INM19002-25PCU/2.6	CU	34	24.6	15.0	3.9	2.9	2.4

STANDARD CLIP-ON HEATSINK SELECTOR BY BGA SIZE

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	26	14.6	7.2	6.6	4.8	4.0
	INM21001-18W/2.6	AL	26	17.6	7.8	5.4	4.0	3.3
	INM21001-21W/2.6	AL	26	20.6	8.4	4.7	3.5	2.7
	INM21001-23W/2.6	AL	26	22.6	8.8	4.3	3.2	2.7
	INM21001-28W/2.6	AL	26	27.6	9.8	3.8	2.9	2.5
	INM21001-33W/2.6	AL	26	32.6	10.8	3.2	2.5	2.1
ROUND PIN	HS2133DB	AL	28	7.1	5.6	14.8	9.6	7.9
	HS2087DB	AL	30	7.6	5.6	13.2	9.1	7.5
	HS2101DB	AL	28	12.2	5.6	8.6	5.9	4.8
	HS2088DB	AL	30	12.7	8.5	8.3	5.7	4.7

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	26	14.6	8.7	5.4	3.9	3.2
	INM23001-18W/2.6	AL	26	17.6	9.4	4.4	3.2	2.6
	INM23001-21W/2.6	AL	26	20.6	10.0	3.8	2.8	2.3
	INM23001-23W/2.6	AL	26	22.6	10.5	3.5	2.5	2.1
	INM23001-28W/2.6	AL	26	27.6	11.6	3.1	2.3	2.0
	INM23001-33W/2.6	AL	26	32.6	12.7	2.7	2.0	1.8
ROUND PIN	HS2134DB	AL	28	7.1	5.6	11.6	7.9	6.5
	HS2099DB	AL	30	7.6	5.6	11.0	7.5	6.2
	HS2135DB	AL	28	12.2	8.5	7.4	5.1	4.3
	HS2100DB	AL	30	12.7	8.5	7.2	4.9	4.1

STANDARD CLIP-ON HEATSINK SELECTOR BY BGA SIZE

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	26	14.6	9.7	4.6	3.3	2.6
	INM25001-18W/2.6	AL	26	17.6	10.4	3.8	2.7	2.2
	INM25001-21W/2.6	AL	26	20.6	11.1	3.3	2.4	1.9
	INM25001-23W/2.6	AL	26	22.6	11.6	3.0	2.2	1.8
	INM25001-28W/2.6	AL	26	27.6	12.7	2.7	2.0	1.7
	INM25001-33W/2.6	AL	26	32.6	13.9	2.4	1.8	1.5
ROUND PIN	HS2124DB	AL	28	7.1	8.5	10.7	7.2	5.8
	HS2077DB	AL	30	7.6	8.5	10.3	6.9	5.7
	HS2102DB	AL	28	12.2	8.5	6.7	4.5	3.7
	HS2078DB	AL	30	12.7	8.5	6.5	4.4	3.6

STANDARD CLIP-ON HEATSINK SELECTOR BY BGA SIZE

27

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	Thermal Resistance Theta _{SA} (C/W)		
						200 LFM	400 LFM	600 LFM
PLATE FIN	INL27001-6/1.7	AL	20	6.3	8.1	4.6	3.5	3.0
	INC27001-7/1.5	AL	24	7.1	6.5	9.2	5.8	4.6
	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	26	14.6	11.0	4.5	3.2	2.7
	INM27001-18W/2.6	AL	26	17.6	11.8	3.7	2.6	2.2
	INM27001-21W/2.6	AL	26	20.6	12.6	3.1	2.3	1.9
	INM27001-23W/2.6	AL	26	22.6	13.1	2.9	2.1	1.8
	INM27001-28W/2.6	AL	26	27.6	14.5	2.7	2.0	1.7
	INM27001-33W/2.6	AL	26	32.6	15.8	2.3	1.8	1.5
ROUND PIN	HS2136DB	AL	28	7.1	8.5	9.6	6.4	5.2
	HS2085DB	AL	30	7.6	8.5	9.2	6.2	5.0
	INM27002-12P/2.6	AL	32	11.6	7.6	5.3	3.8	3.1
	INM27002-12PCU/2.6	CU	34	11.6	25.0	4.6	3.3	2.7
	HS2137DB	AL	28	12.2	8.5	6.0	4.1	3.5
	HS2086DB	AL	30	12.7	8.5	5.9	4.0	3.4
	INM27002-15P/2.6	AL	32	14.6	8.5	4.4	3.2	2.6
	INM27002-15PCU/2.6	CU	34	14.6	25.0	4.0	2.9	2.4
	INM27002-20P/2.6	AL	32	19.6	10.0	3.1	2.2	1.9
	INM27002-20PCU/2.6	CU	34	19.6	28.0	2.8	2.1	1.7
	INM27002-25P/2.6	AL	32	24.6	11.5	2.8	2.0	1.7
	INM27002-25PCU/2.6	CU	34	24.6	28.0	2.6	1.9	1.6
FANSINK	FI27	AL	38	16.0				
	FJ27	AL	38	16.0				

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	26	14.6	12.5	4.4	3.1	2.5
	INM29001-18W/2.6	AL	26	17.6	13.3	3.9	2.8	2.3
	INM29001-21W/2.6	AL	26	20.3	14.1	3.3	2.3	1.9
	INM29001-23W/2.6	AL	26	22.6	14.6	2.8	2.0	1.7
	INM29001-28W/2.6	AL	26	27.6	16.0	2.5	1.8	1.5
	INM29001-33W/2.6	AL	26	32.6	17.3	2.3	1.7	1.4
ROUND PIN	INM29002-12P/2.6	AL	32	11.6	9.3	3.9	2.6	2.1
	INM29002-12PCU/2.6	CU	34	11.6	25.0	4.0	2.8	2.3
	INM29002-15P/2.6	AL	32	14.6	10.4	3.7	2.5	2.0
	INM29002-15PCU/2.6	CU	34	14.6	25.0	3.6	2.4	2.0
	INM29002-20P/2.6	AL	32	19.6	11.7	2.6	1.8	1.5
	INM29002-20PCU/2.6	CU	34	19.6	28.0	2.4	1.8	1.5
	INM29002-25P/2.6	AL	32	24.6	13.5	2.5	1.8	1.4
	INM29002-25PCU/2.6	CU	34	24.6	30.0	2.2	1.6	1.4

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
	INC31001-7/1.5	AL	24	7.1	9.0	6.3	3.8	2.8
	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	26	14.6	15.3	3.3	2.3	1.8
	INM31001-18W/2.6	AL	26	17.6	16.7	2.7	1.9	1.5
	INM31001-21W/2.6	AL	26	20.6	18.0	2.3	1.7	1.4
	INM31001-23W/2.6	AL	26	22.6	18.9	2.1	1.5	1.3
	INM31001-28W/2.6	AL	26	27.6	21.1	1.9	1.4	1.2
	INM31001-33W/2.6	AL	26	32.6	23.4	1.7	1.2	1.0

32.5

						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	HS1806EB	AL	18	12.7	17.0	3.3	1.9	1.5
ROUND PIN	HS2144DB	AL	28	7.1	11.3	7.0	4.6	3.7
	HS2142DB	AL	30	7.6	11.3	6.6	4.4	3.5
	HS2145DB	AL	28	12.2	14.1	4.5	3.0	2.5
	HS2143DB	AL	30	12.7	14.1	4.4	2.9	2.4

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	26	14.6	17.8	3.4	2.2	1.7
	INM33001-18W/2.6	AL	26	17.6	19.2	2.9	1.9	1.4
	INM33001-21W/2.6	AL	26	20.6	20.5	2.4	1.5	1.1
	INM33001-23W/2.6	AL	26	22.6	21.4	1.9	1.3	0.9
	INM33001-28W/2.6	AL	26	27.6	23.6	1.7	1.1	0.8
	INM33001-33W/2.6	AL	26	32.6	25.9	1.5	1.0	0.7
ROUND PIN	INM33002-12P/2.6	AL	32	11.6	11.0	3.8	2.7	2.2
	INM33002-12PCU/2.6	CU	34	11.6	45.0	3.0	2.0	1.5
	INM33002-15P/2.6	AL	32	14.6	12.3	3.2	2.2	1.8
	INM33002-15PCU/2.6	CU	34	14.6	50.0	2.7	1.7	1.2
	INM33002-20P/2.6	AL	32	19.6	13.8	2.3	1.6	1.3
	INM33002-20PCU/2.6	CU	34	19.6	55.0	1.8	1.1	0.9
	INM33002-25P/2.6	AL	32	24.6	16.5	1.9	1.4	1.2
	INM33002-25PCU/2.6	CU	34	24.6	60.0	1.6	1.0	0.8

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
	INC35001-7/1.5	AL	24	7.1	11.2	5.9	3.6	2.7
	INL35001-10/1.7	AL	20	9.5	16.1	2.6	1.8	1.4
	INC350A1-12/1.8	AL	24	12.0	20.1	2.1	1.3	1.1
	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	26	14.6	20.9	2.9	2.1
INM35001-18W/2.6		AL	26	17.6	22.6	2.4	1.7	1.4
INM35001-21W/2.6		AL	26	20.6	23.7	2.1	1.5	1.2
INM35001-23W/2.6		AL	26	22.6	26.4	1.9	1.3	1.1
INM35001-28W/2.6		AL	26	27.6	29.2	1.7	1.2	1.0
INM35001-33W/2.6		AL	26	32.6	30.9	1.5	1.0	0.8
ROUND PIN	HS2132DB	AL	28	7.1	11.3	6.4	4.8	3.3
	HS2089DB	AL	30	7.6	11.3	6.1	4.0	3.2
	INM35002-12P/2.6	AL	32	11.6	13.4	3.4	2.5	1.9
	INM35002-12PCU/2.6	CU	34	11.6	45.0	3.0	2.1	1.7
	HS2103DB	AL	28	12.2	14.1	3.9	2.6	2.1
	HS2090DB	AL	30	12.7	17.0	3.7	2.4	1.9
	INM35002-15P/2.6	AL	32	14.6	15.1	2.9	2.0	1.7
	INM35002-15PCU/2.6	CU	34	14.6	55.0	2.6	1.8	1.5
	INM35002-20P/2.6	AL	32	19.6	17.9	2.0	1.5	1.2
	INM35002-20PCU/2.6	CU	34	19.6	58.0	1.8	1.3	1.0
	INM35002-25P/2.6	AL	32	24.6	20.7	1.8	1.3	1.0
	INM35002-25PCU/2.6	CU	34	24.6	63.0	1.7	1.2	0.9
	FANSINK	FA35	AL	40	22.7			
FB35		AL	40	19.2				
FJ35		AL	38	16.0				

STANDARD CLIP-ON HEATSINK SELECTOR BY BGA SIZE

37.5

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	Thermal Resistance Theta_SA (C/W)		
						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	26	14.6	22.2	2.7	1.9	1.6
	INM37.5001-18W/2.6	AL	26	17.6	24.1	2.2	1.6	1.3
	INM37.5001-21W/2.6	AL	26	20.6	26.1	1.9	1.4	1.2
	INM37.5001-23W/2.6	AL	26	22.6	27.4	1.7	1.3	1.1
	INM37.5001-28W/2.6	AL	26	27.6	30.6	1.5	1.2	0.9
	INM37.5001-33W/2.6	AL	26	32.6	33.9	1.3	1.0	0.8
ROUND PIN	HS2138DB	AL	28	7.1	11.3	5.9	3.8	3.0
	HS2091DB	AL	30	7.6	11.3	5.6	3.6	2.9
	INM37.5002-12P/2.6	AL	32	11.6	15.7	3.4	2.3	1.8
	INM37.5002-12PCU/2.6	CU	34	11.6	86.0	2.8	2.0	1.7
	INM37.5004-12P/2.6	AL	37	11.6	16.1	3.4	2.4	1.9
	INM37.5004-12PCU/2.6	CU	37	11.6	55.0	2.9	1.8	1.4
	HS2139DB	AL	28	12.2	14.1	4.0	2.6	2.1
	HS2092DB	AL	30	12.7	14.1	3.8	2.5	2.0
	INM37.5002-15P/2.6	AL	32	14.6	17.8	2.7	1.9	1.6
	INM37.5002-15PCU/2.6	CU	34	14.6	89.0	2.4	1.8	1.5
	INM37.5004-15P/2.6	AL	37	14.6	17.6	2.9	2.0	1.6
	INM37.5004-15PCU/2.6	CU	37	14.6	62.0	2.3	1.4	1.1
	INM37.5002-20P/2.6	AL	32	19.6	21.3	1.8	1.4	1.2
	INM37.5002-20PCU/2.6	CU	34	19.6	93.0	1.8	1.2	1.0
	INM37.5004-20P/2.6	AL	37	19.6	20.0	2.0	1.4	1.2
	INM37.5004-20PCU/2.6	CU	37	20.6	76.0	1.7	1.0	0.8
	INM37.5004-23P/2.6	AL	37	22.6	22.7	1.7	1.25	1.0
	INM37.5002-25P/2.6	AL	32	24.6	24.8	1.6	1.2	1.0
	INM37.5002-25PCU/2.6	CU	34	24.6	100.0	1.6	1.1	0.9
	INM37.5004-25P/2.6	AL	37	24.6	22.7	1.7	1.3	1.0
INM37.5004-25PCU/2.6	CU	37	24.6	80.0	1.5	0.9	0.7	

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
	INC40001-7/1.5	AL	24	7.1	14.8	4.1	2.5	2.0
	INC40001-8/2.0	AL	24	8.1	20.6	3.1	1.9	1.5
	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	26	14.6	25.2	2.4	1.6
INM40001-18W/2.6		AL	26	17.6	27.4	1.9	1.4	1.1
INM40001-21W/2.6		AL	26	20.6	29.6	1.7	1.2	0.9
INM40001-23W/2.6		AL	26	22.6	31.1	1.5	1.1	0.8
INM40001-28W/2.6		AL	26	27.6	24.7	1.3	1.0	0.8
INM40001-33W/2.6		AL	26	32.6	38.4	1.2	0.8	0.7
ROUND PIN	HS2140DB	AL	28	7.1	11.3	5.7	3.5	2.8
	HS2081DB	AL	30	7.6	14.1	5.1	3.3	2.7
	INM40002-12P/2.6	AL	32	11.6	17.8	2.8	1.9	1.5
	INM40002-12PCU/2.6	CU	32	11.6	79.0	2.4	1.6	1.3
	HS2141DB	AL	28	12.2	17.0	3.4	2.2	1.8
	HS2080DB	AL	30	12.7	19.8	3.3	2.1	1.7
	INM40002-15P/2.6	AL	32	14.6	20.0	2.4	1.6	1.3
	INM40002-15PCU/2.6	CU	34	14.6	86.0	2.1	1.4	1.2
	INM40002-20P/2.6	AL	32	19.6	24.0	1.7	1.2	0.9
	INM40002-20PCU/2.6	CU	34	19.6	89.0	1.5	1.0	0.8
	INM40002-25P/2.6	AL	32	24.6	28.0	1.4	1.0	0.8
	INM40002-25PCU/2.6	CU	34	24.6	104.0	1.4	0.9	0.7
	FANSINK	FA40	AL	40	22.8			
FB40		AL	40	22.8				

STANDARD CLIP-ON HEATSINK SELECTOR BY BGA SIZE

42.5

Style	Heatsink PN	Material	Data Sheet Page#	Height (mm)	Weight (g)	Thermal Resistance Theta _{SA} (C/W)		
						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	26	14.6	27.8	2.1	1.4	1.2
	INM42.5001-18W/2.6	AL	26	17.6	30.2	1.7	1.2	0.9
	INM42.5001-21W/2.6	AL	26	20.6	32.6	1.5	1.0	0.8
	INM42.5001-23W/2.6	AL	26	22.6	34.2	1.4	0.9	0.7
	INM42.5001-28W/2.6	AL	26	27.6	38.2	1.2	0.8	0.7
	INM42.5001-33W/2.6	AL	26	32.6	42.2	1.0	0.7	0.6
ROUND PIN	HS2167DB	AL	28	7.1	17.0	4.9	3.7	2.5
	HS2166DB	AL	30	7.6	17.0	4.7	3.0	2.4
	INM42.5002-12P/2.6	AL	32	11.6	20.6	2.5	1.7	1.3
	INM42.5002-12PCU/2.6	CU	34	11.6	107.0	2.1	1.5	1.2
	HS2169DB	AL	28	12.2	19.8	3.2	2.1	1.7
	HS2168DB	AL	30	12.7	19.8	3.1	2.0	1.8
	INM42.5002-15P/2.6	AL	32	14.6	23.0	2.1	1.4	1.1
	INM42.5002-15PCU/2.6	CU	34	14.6	121.0	1.9	1.2	1.0
	INM42.5002-20P/2.6	AL	32	19.6	28.0	1.5	1.0	0.8
	INM42.5002-20PCU/2.6	CU	34	19.6	125.0	1.3	0.9	0.8
	INM42.5002-25P/2.6	AL	32	24.6	33.0	1.3	0.8	0.7
	INM42.5002-25PCU/2.6	CU	34	24.6	128.0	1.2	0.8	0.7
FANSINK	FA42.5	AL	40	23.3				
	FB42.5	AL	40	23.3				
	FI42.5	AL	38	23.2				
	FJ42.5	AL	38	23.2				

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	28	14.6	31.2	1.9	1.3	1.1
	INM45001-18W/2.6	AL	28	17.6	34.0	1.6	1.1	0.8
	INM45001-21W/2.6	AL	28	20.6	36.7	1.4	0.9	0.7
	INM45001-23W/2.6	AL	28	22.6	38.6	1.2	0.8	0.7
	INM45001-28W/2.6	AL	28	27.6	43.2	1.1	0.7	0.6
	INM45001-33W/2.6	AL	28	32.6	47.8	0.9	0.7	0.5
ROUND PIN	HS2129DB	AL	28	7.1	19.8	4.4	2.8	2.2
	HS2093DB	AL	30	7.6	19.8	4.2	2.7	2.1
	HS2125DB	AL	28	12.2	22.6	2.9	1.9	1.5
	HS2094DB	AL	30	12.7	25.5	2.8	1.8	1.5
FANSINK	FA45	AL	40	23.2				
	FB45	AL	40	23.2				

EZ-Snap™ Clip Mounting Guide



MOUNTING



1. Center EZ-Snap™ clip alongside BGA



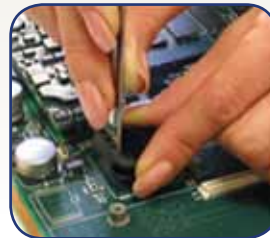
3. Push down on far side of heatsink

2. Tilt EZ-Snap™ and slip one lip under edge of BGA

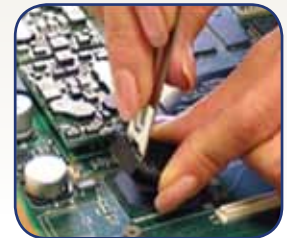
4. Use EZ Touch clip tool to slide remaining lip under BGA and snap down to secure clip onto chip

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 pre-assembled at the factory

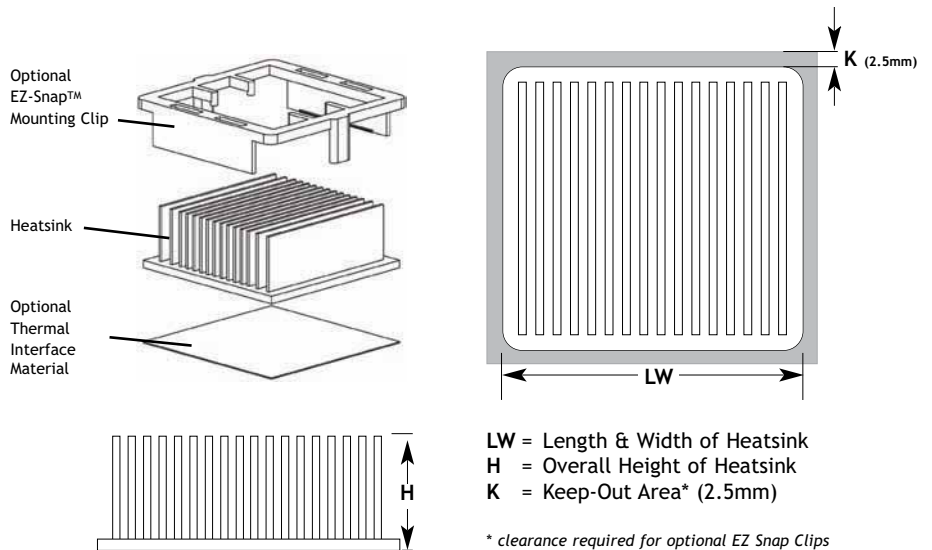


Radian Heatsinks
A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

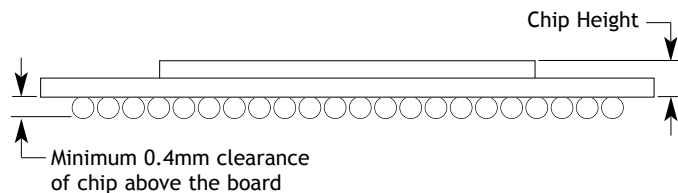
Mechanical Outline Drawing

(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. 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

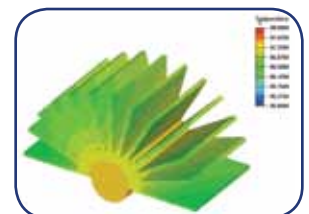
- High aspect ratio thin fin extrusions
- Aluminum alloy 6063
- Available in both standard and custom



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	Part Number ⁽¹⁾					Height (mm)	Weight (g)	Thermal Resistance Theta_SA (C/W)		
	Heatsink Part Number	Optional Tape/Pad ⁽²⁾		Optional Mounting Clip				200 LFM	400 LFM	600 LFM
		Part Number	Interface Material	Part Number ⁽³⁾	Fits Chip Height (mm)					
21	HS1800EB	P0728 or P0705	3M8815 -or- T710	K21	1.5 - 2.1*	12.7	8.5	6.7	4.3	3.4
23	HS1801EB	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 P1305	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 P3805	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	P2028 or P2005	3M8815 or T710	K40 K41 K31	0.8 - 1.4* 1.4 - 2.0* 2.7 - 3.3*	12.7	25.5	2.2	1.3	0.9
45	HS1811EB	P1628 or P1605	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-V0 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.

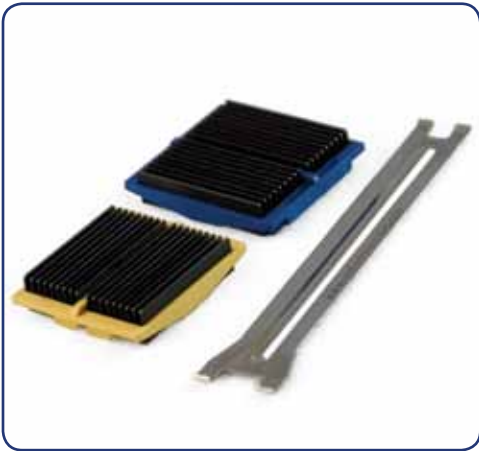
6) Specifications are subject to change without notice.

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



INL Series

Removable Heatsinks for BGA Chipsets Aluminum Plate Fin BGA Heatsink



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:

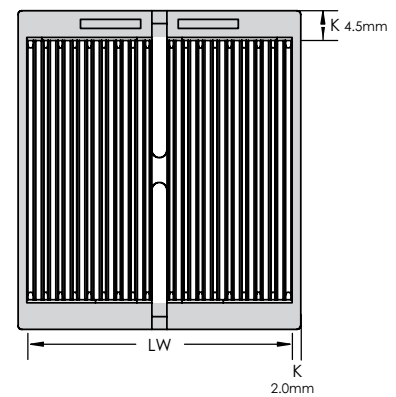
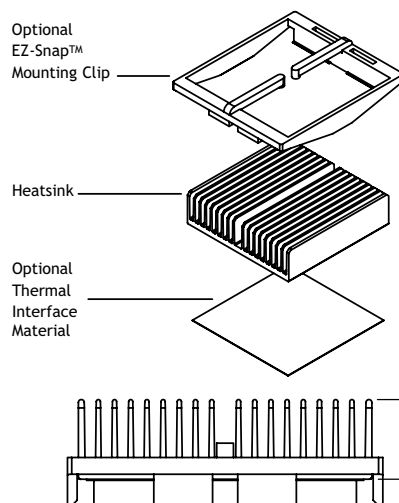
- Low profile high density heatsink
- High efficiency aluminum plate fin design provides low pressure-drop characteristics
- Constructed of extruded aluminum AL6063 for optimum heat transfer
- Ideal for linear air flow environments
- Designed specifically for BGAs and other surface mount packages
- Optional 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 pre-assembled at the factory



Radian Heatsinks
A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

Mechanical Outline Drawing (See next page for "LW" & "H" dimensional values)

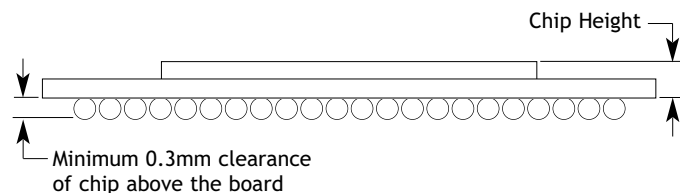


LW = Length & Width of Heatsink
H = Overall Height of Heatsink
K = Keep-Out Area*

* 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 (0.3mm)
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

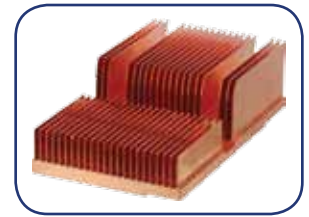
BGA Size	Part Number ⁽¹⁾			Optional Thermal Tap/Pad Part # ⁽²⁾	Heatsink Height (mm)	Weight (g)	Thermal Resistance Theta_SA (C/W)		
	Heatsink Part Number	Optional Mounting Clip					200 LFM	400 LFM	600 LFM
		Part Number ⁽³⁾	Fits Chip Heights (mm)						
19	INL19001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	4.6	5.5	4.6	4.1
	INL19001-10/1.7	BU	1.5 - 2.0*		9.5	5.7	4.9	3.9	3.5
	INL19001-13/1.7	Y	2.1 - 2.6*		12.7	6.8	4.1	3.4	3.1
21	INL21001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	5.3	5.4	4.3	3.8
	INL21001-10/1.7	BU	1.5 - 2.0*		9.5	6.7	4.7	3.7	3.2
	INL21001-13/1.7	Y	2.1 - 2.6*		12.7	8.0	3.9	3.3	2.8
23	INL23001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	6.2	5.3	4.1	3.6
	INL23001-10/1.7	BU	1.5 - 2.0*		9.5	7.7	4.5	3.5	3.0
	INL23001-13/1.7	Y	2.1 - 2.6*		12.7	9.2	3.7	3.0	2.6
24	INL24001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	6.4	5.0	3.9	3.3
	INL24001-10/1.7	BU	1.5 - 2.0*		9.5	8.0	4.3	3.3	2.7
	INL24001-13/1.7	Y	2.1 - 2.6*		12.7	9.5	3.6	2.6	2.3
25	INL25001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	7.3	4.7	3.6	3.2
	INL25001-10/1.7	BU	1.5 - 2.0*		9.5	9.1	4.1	3.1	2.6
	INL25001-13/1.7	Y	2.1 - 2.6*		12.7	11.0	3.4	2.5	2.1
27	INL27001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	8.1	4.6	3.5	3.0
	INL27001-10/1.7	BU	1.5 - 2.0*		9.5	10.0	3.8	2.6	2.2
	INL27001-13/1.7	Y	2.1 - 2.6*		12.7	12.2	3.1	2.1	1.8
29	INL29001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	9.4	4.5	3.4	2.7
	INL29001-10/1.7	BU	1.5 - 2.0*		9.5	11.9	3.7	2.5	2.1
	INL29001-13/1.7	Y	2.1 - 2.6*		12.7	14.4	3.0	2.0	1.7
31	INL31001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	10.4	4.3	3.2	2.6
	INL31001-10/1.7	BU	1.5 - 2.0*		9.5	13.1	3.3	2.2	1.8
	INL31001-13/1.7	Y	2.1 - 2.6*		12.7	15.7	2.8	1.9	1.5
33	INL33001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	11.9	4.3	3.1	2.6
	INL33001-10/1.7	BU	1.5 - 2.0*		9.5	15.2	2.9	2.1	1.6
	INL33001-13/1.7	Y	2.1 - 2.6*		12.7	18.5	2.3	1.5	1.3
35	INL35001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	12.8	4.2	3.1	2.5
	INL35001-10/1.7	BU	1.5 - 2.0*		9.5	16.1	2.6	1.8	1.4
	INL35001-13/1.7	Y	2.1 - 2.6*		12.7	19.5	2.0	1.4	1.2
37.5	INL37.5001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	14.9	3.8	2.7	2.2
	INL37.5001-10/1.7	BU	1.5 - 2.0*		9.5	19.3	2.4	1.7	1.3
	INL37.5001-13/1.7	Y	2.1 - 2.6*		12.7	23.4	2.0	1.3	1.1
40	INL40001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	18.1	3.7	2.5	2.0
	INL40001-10/1.7	BU	1.5 - 2.0*		9.5	23.7	2.6	1.6	1.3
	INL40001-13/1.7	Y	2.1 - 2.6*		12.7	29.3	2.0	1.2	1.0
42.5	INL42.5001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	20.0	3.5	2.3	1.8
	INL42.5001-10/1.7	BU	1.5 - 2.0*		9.5	26.1	2.5	1.6	1.2
	INL42.5001-13/1.7	Y	2.1 - 2.6*		12.7	32.2	1.9	1.1	1.0
45	INL45001-6/1.7	O	0.9 - 1.4*	+T725 or +3M8815	6.3	22.6	3.2	2.1	1.5
	INL45001-10/1.7	BU	1.5 - 2.0*		9.5	29.8	2.4	1.5	1.2
	INL45001-13/1.7	Y	2.1 - 2.6*		12.7	36.9	1.8	1.1	0.9

NOTES:

- 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
- Optional thermal interface materials are defined as follows:
 T725 - Thermally conductive phase change pad for use with mounting clip (Chomerics Part # T725)
- Mounting clips are constructed of UL94-V0 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.

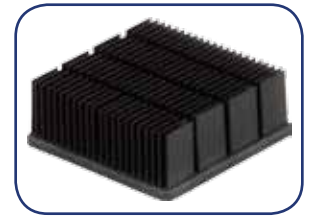
*Contact Radian for mounting clips to fit chip heights not displayed above.

Custom Options Also Available



SKIVED HEATSINKS

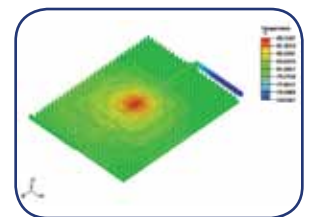
- Thin Fin Copper Skiving with fins as thin as 0.008"
- CU1100 pure copper with high thermal conductivity (400W/mK)
- No NRE required for most parts



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

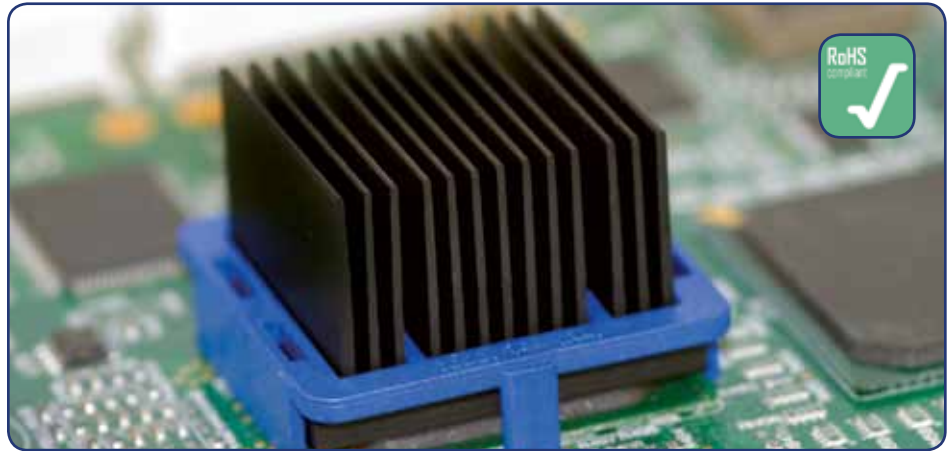
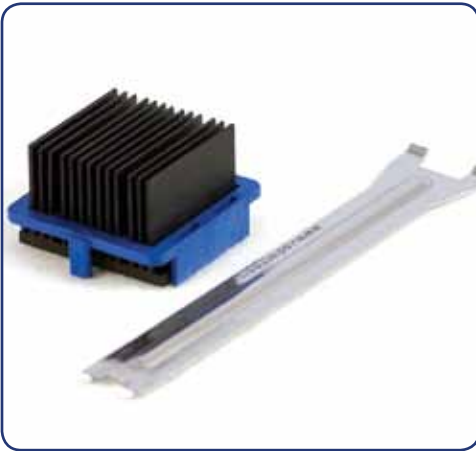


See Page 17 For Details

INH Series

Removable Heatsinks for BGA Chipsets

Aluminum Plate Fin BGA Heatsink



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:

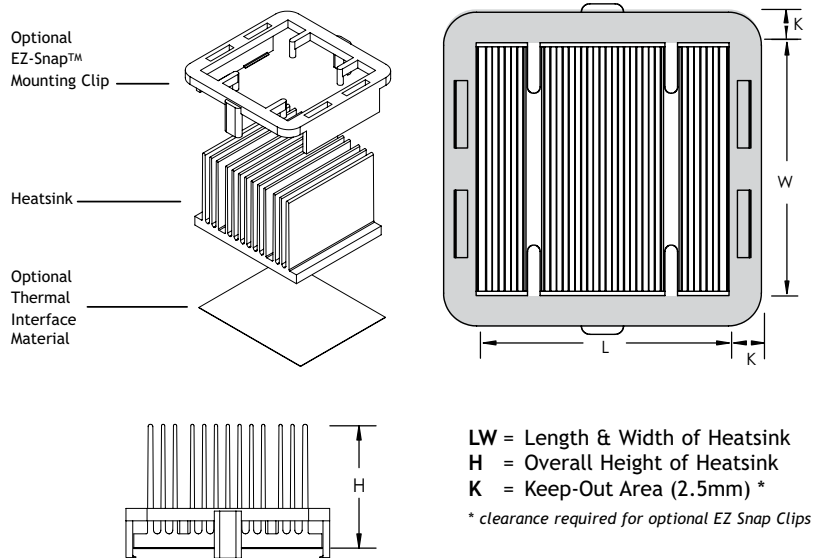
- High efficiency aluminum plate fin design provides low pressure-drop characteristics
- Constructed of extruded aluminum AL6063 for optimum heat transfer
- Ideal for linear air flow environments
- Designed specifically for BGAs and other surface mount packages
- Optional EZ-Snap™ mounting clip is constructed 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 pre-assembled at the factory



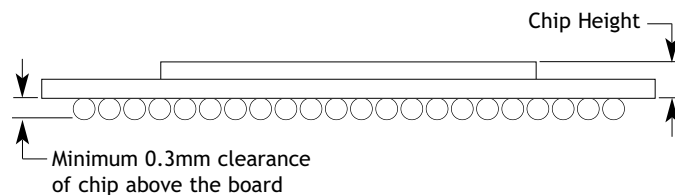
Radian Heatsinks
A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

Mechanical Outline Drawing (See next page for "LW" & "H" dimensional values)

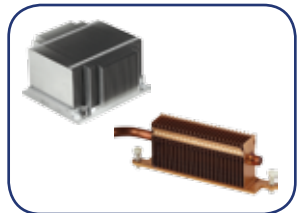


EZ-Snap™ Mounting Clip CLIPS DIRECTLY TO BGA CHIP WITH HS8132 CLIP TOOL See next page for fitting chip heights. Consult factory for unique chip height requirements



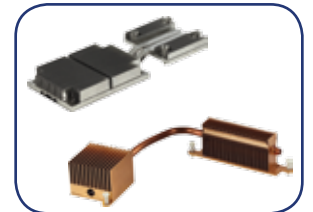
- Note 1: Chip height measurements exclude ball dimensions (0.4mm)
Note 2: Chip must have 0.4mm clearance above the board for clip to adhere properly
Note 3: Maintain keep-out clearance of 2.5mm around chip for clip to adhere properly

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 pipes (Soldered or Epoxied)
- Integrated with Stamped Fins (Soldered or Pressed)
- Available in various sizes and configurations

BGA Size	Part Number ⁽¹⁾			Optional Thermal Tap/Pad Part # ⁽²⁾	Heatsink Height (mm)	Width (mm)	Length (mm)	Weight (g)	Thermal Resistance Theta_SA (C/W)		
	Heatsink Part Number	Optional Mounting Clip							200 LFM	400 LFM	600 LFM
		Part Number ⁽³⁾	Fits Chip Heights (mm)								
27	INH27001-15/2.6	O or BU or K32 or Y	0.6 - 1.2*	+T710 or +3M8815	14.6	26.9	22.1	4.9	4.2	2.6	2.1
	INH27001-18/2.6		1.4 - 2.0*		17.6	26.9	22.1	5.4	3.5	2.2	1.8
	INH27001-23/2.6		2.3 - 2.9* or 3.0 - 3.6*		22.9	26.9	22.1	6.1	2.7	1.7	1.4
33	INH33001-15/2.6	O or BU or K33 or Y	0.6 - 1.2*	+T710 or +3M8815	14.6	32.3	27.2	8.2	3.1	1.9	1.5
	INH33001-18/2.6		1.4 - 2.0*		17.6	32.3	27.2	9.0	2.6	1.6	1.3
	INH33001-23/2.6		2.3 - 2.9* or 3.0 - 3.6*		22.9	32.3	27.2	10.3	2.0	1.3	1.0
35	INH35001-15/2.6	O or BU or K29 or Y	0.6 - 1.2*	+T710 or +3M8815	14.6	34.8	29.0	8.2	2.9	1.7	1.3
	INH35001-18/2.6		1.4 - 2.0*		17.6	34.8	29.0	9.0	2.4	1.4	1.1
	INH35001-23/2.6		2.3 - 2.9* or 3.0 - 3.6*		22.9	34.8	29.0	10.3	1.9	1.2	0.9
40	INH40001-15/2.6	O or BU or K30 or Y	0.6 - 1.2*	+T710 or +3M8815	14.6	39.1	34.5	10.3	2.5	1.5	1.1
	INH40001-18/2.6		1.4 - 2.0*		17.6	39.1	34.5	11.3	2.1	1.3	1.0
	INH40001-23/2.6		2.3 - 2.9* or 3.0 - 3.6*		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)
INH35001-15/2.60+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.

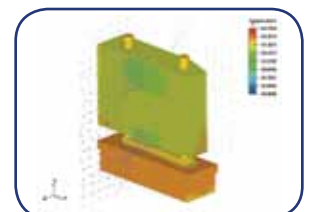
5) Contact Radian to discuss unique heatsink, clip and interface requirements.

6) Specifications are subject to change without notice.

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



Complimentary Thermal Analysis



Contact Radian Heatsinks for more details

Installation Tool HS8132



See Page 17
For Details

INC Series

Removable Heatsinks for BGA Chipsets Aluminum Plate Fin BGA Heatsink

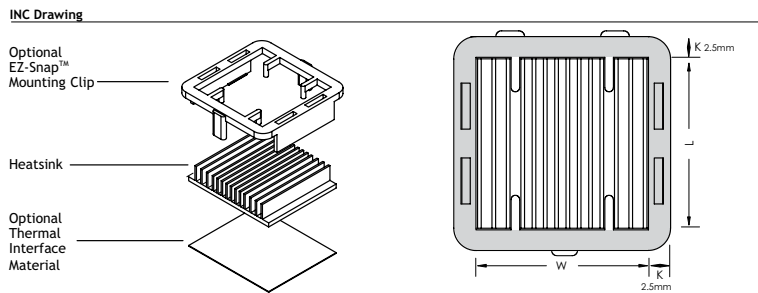


These devices mount with EZ-Snap™ mounting clips to provide optimum cooling for various package sizes and airflow. These off-the-shelf, high efficiency solutions are easy to install and require no special board modifications or complex assemblies.

FEATURES:

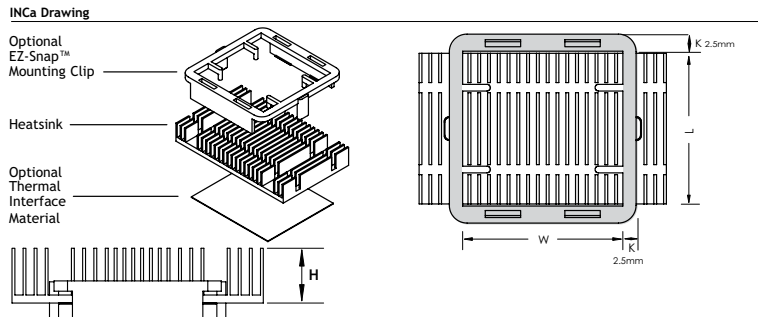
- Low profile high density heatsink
- High efficiency aluminum plate fin design provides low pressure-drop characteristics
- Constructed of extruded aluminum AL6063 for optimum heat transfer
- Ideal for linear air flow environments
- Designed specifically for BGAs and other surface mount packages
- Optional 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 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*

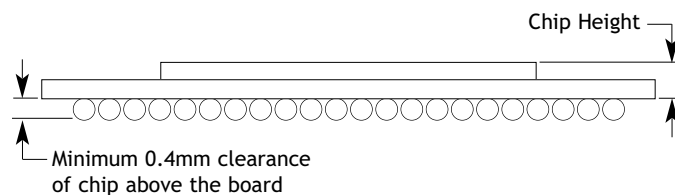
* clearance required for optional EZ Snap Clips



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



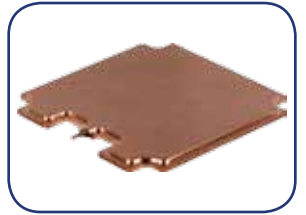
- Note 1: Chip height measurements exclude ball dimensions (0.4mm)
 Note 2: Chip must have 0.4mm clearance above the board for clip to adhere properly
 Note 3: Maintain keep-out clearance of 2mm Length side and 4.5mm width side around chip for clip to adhere properly



Radian Heatsinks
A division of Intracast Co., Inc.

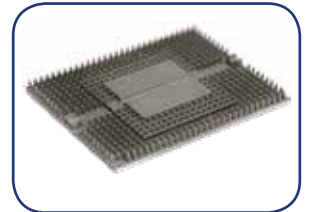
BUY ON-LINE AT:
www.radianheatsinks.com

Custom Options Also Available



VAPOR CHAMBERS

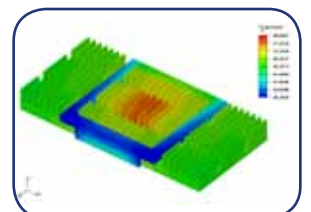
- Used in conjunction with stamped fins
- Better spreading efficiency than copper or heat pipe based heatsinks
- High efficiency wick structure design
- Lightweight heatsinks



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 # ⁽²⁾	Heatsink Height (mm)	Width (mm)	Length (mm)	Weight (g)	Thermal Resistance Theta_SA (C/W)		
	Heatsink Part Number	Optional Mounting Clip							200 LFM	400 LFM	600 LFM
		Part Number ⁽³⁾	Fits Chip Heights (mm)								
19	INC19001-8/1.5	O or BU or Y	1.7 - 2.3* or 2.5 - 3.1* or 4.1 - 4.7*	+Li98	8.4	18.5	13.2	3.2	14.0	9.7	8.1
27	INC27001-7/1.5	O or BU or Y	1.7 - 2.3* or 2.5 - 3.1* or 4.1 - 4.7*	+Li98	7.1	26.8	21.6	6.5	9.2	5.8	4.6
31	INC31001-7/1.5	O or BU or Y	1.7 - 2.3* or 2.5 - 3.1* or 4.1 - 4.7*	+Li98	7.1	30.5	26.9	9.0	6.3	3.8	2.8
35	INC35001-7/1.5	K25 or K51 or K52 or K35 or K29 or K53	1.5 - 2.1* or 1.7 - 2.3* or 2.5 - 3.1* or 3.2 - 3.8* or 3.4 - 4.1* or 4.1 - 4.7*	+Li98	7.1	34.9	29.5	11.2	5.9	3.6	2.7
35a	INC350A1-12/1.8	K25 or K35	1.2 - 1.8* or 2.9 - 3.5*	+Li98	12	55.9	29.5	20.1	2.1	1.3	1.1
40	INC40001-7/1.5	K27 or K54 or K55 or K36 or K30 or K56	1.4 - 2.0* or 1.7 - 2.3* or 2.5 - 3.1* or 3.2 - 3.8* or 3.4 - 4.1* or 4.1 - 4.7*	+Li98	7.1	40	34.7	14.8	4.1	2.5	2.0
40a	INC400A1-8/2.0	K27 or K54 or K55 or K36 or K30 or K56	0.9 - 1.5* or 1.2 - 1.8* or 2.0 - 2.6* or 2.7 - 3.3* or 2.9 - 3.5* or 3.6 - 4.2*	+Li98	8.1	55.9	34.0	20.6	3.1	1.9	1.5

NOTES:

1) Example Part Numbers:

INC27001-7/1.5 27mm x 7.1mm Heatsink only
 INC31001-7/1.5BU 31mm x 7.1mm Heatsink with "BU" (blue) mounting clip (2.5-3.1mm chip height)
 INC40001-7/1.5K55+Li98 40mm x 7.1mm Heatsink with K55 mounting clip (2.5-3.1mm chip height) and Li98 thermal pad

2) Optional thermal interface materials are defined as follows:

Li98 - Thermally conductive adhesive tape

3) Mounting clips are constructed of UL94-V0 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:

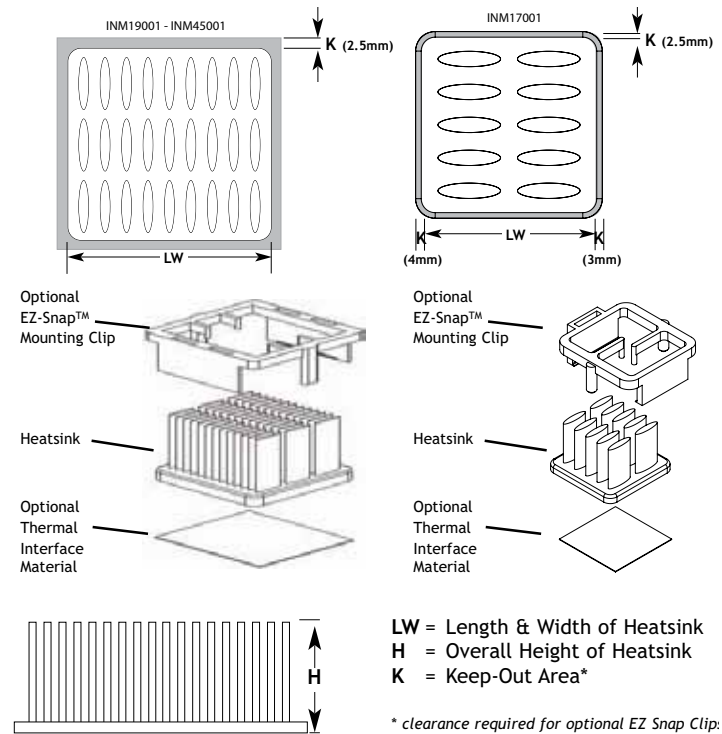
- High efficiency aluminum elliptical fin design provides low pressure-drop characteristics
- Constructed of forged aluminum AL6063 for optimum heat transfer
- Ideal for linear air flow environments
- Designed specifically for BGAs and other surface mount packages
- Optional EZ-Snap™ mounting clip is 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



Radian Heatsinks
A division of Intracast Co., Inc.

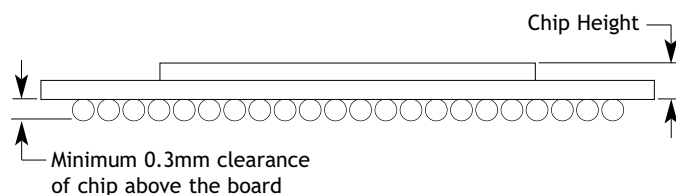
BUY ON-LINE AT:
www.radianheatsinks.com

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 (0.3mm)
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

BGA Size	Part Number ⁽¹⁾			Optional Thermal Tap/Pad Part # ⁽²⁾	Heatsink Height (mm)	Weight (oz.)	Thermal Resistance Theta_SA (C/W)			
	Heatsink Part Number	Optional Mounting Clip					100 LFM	200 LFM	400 LFM	600 LFM
		Part Number ⁽³⁾	Fits Chip Heights (mm)							
17	INM17001-11W/1.7	O or BU or Y	0.9 - 1.4*	+3M8815	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				16.7	4.4	6.5	5.8	4.8	4.5
	INM17001-20W/1.7				19.7	4.9	5.9	5.2	4.3	3.8
	INM17001-22W/1.7				21.7	5.2	5.6	4.9	4.1	3.7
	INM17001-27W/1.7				26.7	6.1	5.3	4.6	3.8	3.4
19	INM19001-15W/2.6	O or BU or Y	0.6 - 1.2*	+3M8815	14.6	6.2	10.2	7.2	5.3	4.5
	INM19001-18W/2.6				17.6	6.8	9.6	6.7	4.8	3.9
	INM19001-21W/2.6				20.6	7.4	7.9	5.5	4.0	3.3
	INM19001-23W/2.6				22.6	7.8	6.7	4.7	3.5	2.9
	INM19001-28W/2.6				27.6	8.8	6.0	4.3	3.1	2.6
	INM19001-33W/2.6				32.6	9.8	5.5	3.9	2.9	2.4
21	INM21001-15W/2.6	O or BU or Y	0.6 - 1.2*	+3M8815	14.6	7.2	9.5	6.6	4.8	4.0
	INM21001-18W/2.6				17.6	7.8	7.8	5.4	4.0	3.3
	INM21001-21W/2.6				20.6	8.4	6.6	4.7	3.5	2.7
	INM21001-23W/2.6				22.6	8.8	6.0	4.3	3.2	2.7
	INM21001-28W/2.6				27.6	9.8	5.5	3.8	2.9	2.5
	INM21001-33W/2.6				32.6	10.8	4.5	3.2	2.5	2.1
23	INM23001-12W/2.6	O or BU or Y	0.6 - 1.2*	+3M8815	11.6	8.0	9.6	6.0	3.93	3.13
	INM23001-15W/2.6				14.6	8.7	7.8	5.4	3.9	3.2
	INM23001-18W/2.6				17.6	9.4	6.4	4.4	3.2	2.6
	INM23001-21W/2.6				20.6	10.0	5.5	3.8	2.8	2.3
	INM23001-23W/2.6				22.6	10.5	5.0	3.5	2.5	2.1
	INM23001-28W/2.6				27.6	11.6	4.4	3.1	2.3	2.0
25	INM25001-15W/2.6	O or BU or Y	0.6 - 1.2*	+3M8815	14.6	9.7	6.9	4.6	3.3	2.6
	INM25001-18W/2.6				17.6	10.4	5.6	3.8	2.7	2.2
	INM25001-21W/2.6				20.6	11.1	4.8	3.3	2.4	1.9
	INM25001-23W/2.6				22.6	11.6	4.4	3.0	2.2	1.8
	INM25001-28W/2.6				27.6	12.7	3.9	2.7	2.0	1.7
	INM25001-33W/2.6				32.6	13.9	3.3	2.4	1.8	1.5
27	INM27001-15W/2.6	O or BU or K32 or Y	0.6 - 1.2*	+3M8815	14.6	11.0	6.7	4.5	3.2	2.7
	INM27001-18W/2.6				17.6	11.8	5.5	3.7	2.6	2.2
	INM27001-21W/2.6				20.6	12.6	4.7	3.1	2.3	1.9
	INM27001-23W/2.6				22.6	13.1	4.2	2.9	2.1	1.8
	INM27001-28W/2.6				27.6	14.5	3.8	2.7	2.0	1.7
	INM27001-33W/2.6				32.6	15.8	3.3	2.3	1.8	1.5
29	INM29001-15W/2.6	O or BU or Y	0.6 - 1.2*	+3M8815	14.6	12.5	6.8	4.4	3.1	2.5
	INM29001-18W/2.6				17.6	13.3	5.9	3.9	2.8	2.3
	INM29001-21W/2.6				20.6	14.1	4.9	3.3	2.3	1.9
	INM29001-23W/2.6				22.6	14.6	4.2	2.8	2.0	1.7
	INM29001-28W/2.6				27.6	16.0	3.8	2.5	1.8	1.5
	INM29001-33W/2.6				32.6	17.3	3.4	2.3	1.7	1.4
31	INM31001-15W/2.6	O or BU or Y	0.6 - 1.2*	+3M8815	14.6	15.3	5.2	3.3	2.3	1.8
	INM31001-18W/2.6				17.6	16.7	4.3	2.7	1.9	1.5
	INM31001-21W/2.6				20.6	18.0	3.6	2.3	1.7	1.4
	INM31001-23W/2.6				22.6	18.9	3.3	2.1	1.5	1.3
	INM31001-28W/2.6				27.6	21.1	2.9	1.9	1.4	1.2
	INM31001-33W/2.6				32.6	23.4	2.5	1.7	1.2	1.0
33	INM33001-15W/2.6	O or BU or K33 or Y	0.6 - 1.2*	+3M8815	14.6	17.8	5.5	3.4	2.2	1.7
	INM33001-18W/2.6				17.6	19.2	4.8	2.9	1.9	1.4
	INM33001-21W/2.6				20.6	20.5	3.9	2.4	1.5	1.1
	INM33001-23W/2.6				22.6	21.4	3.3	1.9	1.3	0.9
	INM33001-28W/2.6				27.6	23.6	2.9	1.7	1.1	0.8
	INM33001-33W/2.6				32.6	25.9	2.5	1.5	1.0	0.7
35	INM35001-15W/2.6	O or BU or K29 or Y	0.6 - 1.2*	+3M8815	14.6	20.9	4.5	2.9	2.1	1.7
	INM35001-18W/2.6				17.6	22.6	3.7	2.4	1.7	1.4
	INM35001-21W/2.6				20.6	23.7	3.2	2.1	1.5	1.2
	INM35001-23W/2.6				22.6	26.4	2.9	1.9	1.3	1.1
	INM35001-28W/2.6				27.6	29.2	2.5	1.7	1.2	1.0
	INM35001-33W/2.6				32.6	30.9	2.2	1.5	1.0	0.8
37.5	INM37.5001-15W/2.6	O or BU or Y	0.6 - 1.2*	+3M8815	14.6	22.2	4.2	2.7	1.9	1.6
	INM37.5001-18W/2.6				17.6	24.1	3.4	2.2	1.6	1.3
	INM37.5001-21W/2.6				20.6	26.1	2.9	1.9	1.4	1.2
	INM37.5001-23W/2.6				22.6	27.4	2.7	1.7	1.3	1.1
	INM37.5001-28W/2.6				27.6	30.6	2.3	1.5	1.2	0.9
	INM37.5001-33W/2.6				32.6	33.9	2.0	1.3	1.0	0.8
40	INM40001-15W/2.6	O or BU or K30 or Y	0.6 - 1.2*	+3M8815	14.6	25.2	3.7	2.4	1.6	1.3
	INM40001-18W/2.6				17.6	27.4	3.0	1.9	1.4	1.1
	INM40001-21W/2.6				20.6	29.6	2.5	1.7	1.2	0.9
	INM40001-23W/2.6				22.6	31.1	2.3	1.5	1.1	0.8
	INM40001-28W/2.6				27.6	34.7	2.0	1.3	1.0	0.8
	INM40001-33W/2.6				32.6	38.4	1.7	1.2	0.8	0.7
42.5	INM42.5001-15W/2.6	O or BU or Y	0.6 - 1.2*	+3M8815	14.6	27.8	3.4	2.1	1.4	1.2
	INM42.5001-18W/2.6				17.6	30.2	2.8	1.7	1.2	0.9
	INM42.5001-21W/2.6				20.6	32.6	2.4	1.5	1.0	0.8
	INM42.5001-23W/2.6				22.6	34.2	2.1	1.4	0.9	0.7
	INM42.5001-28W/2.6				27.6	38.2	1.8	1.2	0.8	0.7
	INM42.5001-33W/2.6				32.6	42.2	1.6	1.0	0.7	0.6
45	INM45001-15W/2.6	O or BU or Y	0.6 - 1.2*	+3M8815	14.6	31.2	3.1	1.9	1.3	1.1
	INM45001-18W/2.6				17.6	34.0	2.5	1.6	1.1	0.8
	INM45001-21W/2.6				20.6	36.7	2.1	1.4	0.9	0.7
	INM45001-23W/2.6				22.6	38.6	1.9	1.2	0.8	0.7
	INM45001-28W/2.6				27.6	43.2	1.7	1.1	0.7	0.6
	INM45001-33W/2.6				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/2.60 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-V0 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

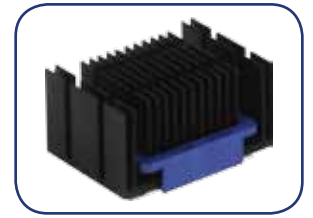
*Contact Radian for mounting clips to fit chip heights not displayed above.



Custom Options Also Available

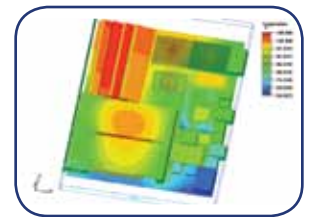


WITH CUSTOM COLORS
 • Offer custom anodize colors



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

HS2000-60 Series

Removable Heatsinks for BGA Chipsets

Round Pin Aluminum BGA Heatsink



The HS2000-60 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:

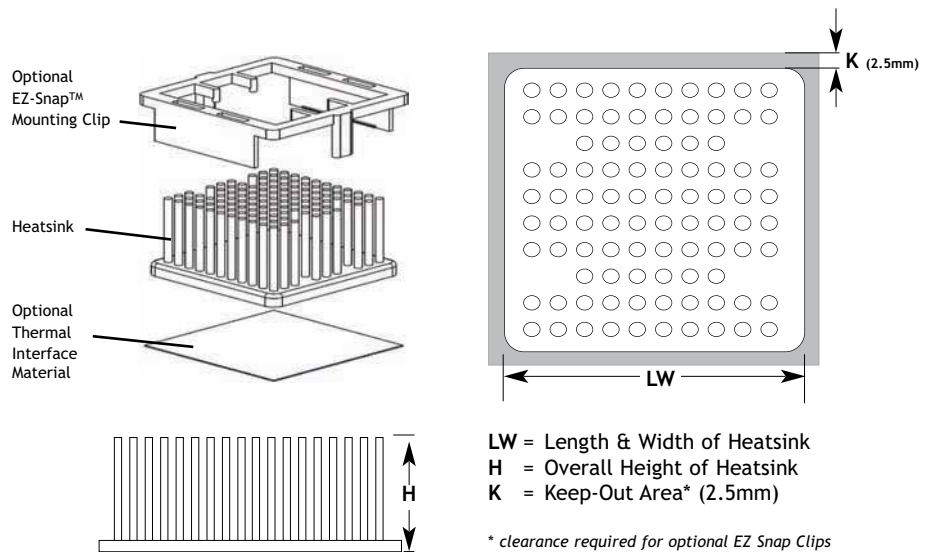
- High efficiency aluminum round pin design provides low pressure-drop characteristics
- Constructed of die-cast aluminum 356.0 for optimum heat transfer
- Ideal for omni-directional air flow
- Designed specifically for BGAs and other surface mount packages
- Optional EZ-Snap™ mounting clip is constructed 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



Radian Heatsinks
A division of Intracast Co., Inc.

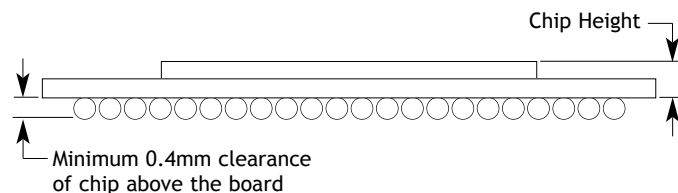
BUY ON-LINE AT:
www.radianheatsinks.com

Mechanical Outline Drawing (See next page for "LW" & "H" dimensional values)



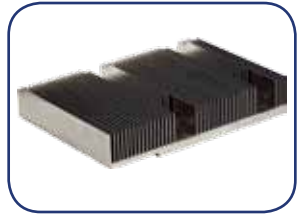
EZ-Snap™ Mounting Clip

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. 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



MACHINING

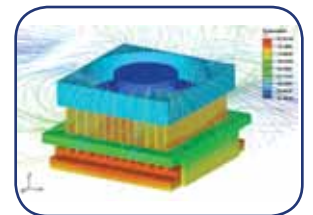
- Prototype Runs
- Special Shapes
- Aluminum or Copper



ATTACHMENT METHODS

- Clips
- Push-pins
- Tape
- Captive Screws
- Wire & Anchor

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 Number	Optional Tape / Pad ⁽²⁾		Optional Mounting Clip				200 LFM	400 LFM	600 LFM
		Part Number	Interface Material	Part Number ⁽³⁾	Fits Chip Height (mm)					
21	HS2133DB	P0728 or P0705	3M8815 or T710	K21	1.5 - 2.1*	7.1	5.6	14.8	9.6	7.9
	HS2101DB					12.2	5.6	8.6	5.9	4.8
23	HS2134DB	P1728 or P1705	3M8815 or T710	K22	2.5 - 3.1*	7.1	5.6	11.6	7.9	6.5
	HS2135DB					12.2	8.5	7.4	5.1	4.3
25	HS2124DB	P1328 or P1305	3M8815 or T710	K23	1.5 - 2.1*	7.1	8.5	10.7	7.2	5.8
	HS2102DB					12.2	8.5	6.7	4.5	3.7
27	HS2136DB	P1828 or P1805	3M8815 or T710	K24	1.5 - 2.1*	7.1	8.5	9.6	6.4	5.2
	HS2137DB					12.2	8.5	6.0	4.1	3.5
32.5	HS2144DB	P1228 or P1205	3M8815 or T710	no clip for HS2144DB	4.9 - 5.5*	7.1	11.3	7.0	4.6	3.7
	HS2145DB			K34		12.2	14.1	4.5	3.0	2.5
35	HS2132DB	P3828 or P3805	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*	7.1	11.3	6.4	4.8	3.3
	HS2103DB					12.2	14.1	3.9	2.6	2.1
37.5	HS2138DB	P1528 or P1505	3M8815 or T710	K26	1.5 - 2.1*	7.1	11.3	5.9	3.8	3.0
	HS2139DB					K45	12.2	14.1	4.0	2.6
40	HS2140DB	P4028 or P4005	3M8815 or T710	K27 K54 K55 K36 K30 K56	1.4 - 2.0* 1.7 - 2.3* 2.5 - 3.1* 3.2 - 3.8* 3.4 - 4.0* 4.1 - 4.7*	7.1	11.3	5.7	3.5	2.8
	HS2141DB					12.2	17.0	3.4	2.2	1.8
42.5	HS2167DB	P2028 or P2005	3M8815 or T710	K40 K41 K31	0.8 - 1.4* 1.4 - 2.0* 2.7 - 3.3*	7.1	17.0	4.9	3.7	2.5
	HS2169DB					12.2	19.8	3.2	2.1	1.7
45	HS2129DB	P1628 or P1605	3M8815 or T710	K28	1.5 - 2.1*	7.1	19.8	4.4	2.8	2.2
	HS2125DB					12.2	22.6	2.9	1.9	1.5

NOTES:

1) Example Part Numbers:

HS2169DBP2005K31	42.5 x 12.19mm Heatsink with optional K31 mounting clip for 2.7-3.3mm chip heights & T710 thermal pad
HS2103DBK35	35 x 12.19mm Heatsink with optional K35 mounting clip for 3.2-3.8mm chip heights
HS2133DBP0728	21 x 7.11mm Heatsink with optional 3M8815 a thermal adhesive tape
HS2125DB	45 x 12.19mm Heatsink only

2) Optional thermal pad 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-V0 rated nylon material.

4) Thermal data provided is 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.



HS2000-80 Series

Removable Heatsinks for BGA Chipsets Round Pin Aluminum BGA Heatsink



The HS2000-80 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:

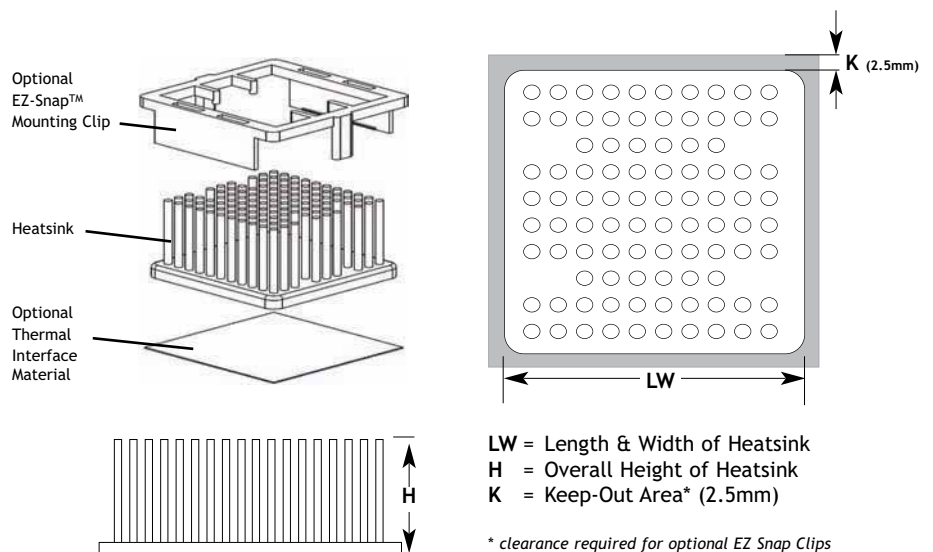
- High efficiency aluminum round pin design provides low pressure-drop characteristics
- Constructed of die-cast aluminum 356.0 for optimum heat transfer
- Ideal for omni-directional air flow
- Designed specifically for BGAs and other surface mount packages
- Optional EZ-Snap™ mounting clip is constructed 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



Radian Heatsinks
A division of Intracast Co., Inc.

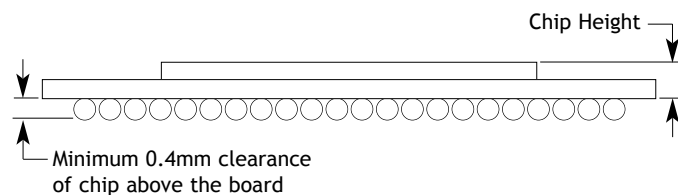
BUY ON-LINE AT:
www.radianheatsinks.com

Mechanical Outline Drawing (See next page for "LW" & "H" dimensional values)



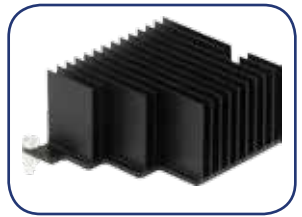
EZ-Snap™ Mounting Clip

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. 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

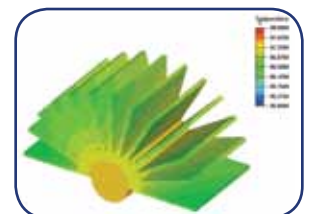
- High aspect ratio thin fin extrusions
- Aluminum Alloy 6063
- Available in both standard and custom



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	Part Number ⁽¹⁾					Heatsink Height (mm)	Weight (g)	Thermal Resistance Theta_SA (C/W)		
	Heatsink Part Number	Optional Tape / Pad ⁽²⁾		Optional Mounting Clip				200 LFM	400 LFM	600 LFM
		Part Number	Interface Material	Part Number ⁽³⁾	Fits Chip Height (mm)					
21	HS2087DB	P0728 or P0705	3M8815 or T710	K21	1.0 - 1.6*	7.6	5.6	13.2	9.1	7.5
	HS2088DB					12.7	8.5	8.3	5.7	4.7
23	HS2099DB	P1728 or P1705	3M8815 or T710	K22	2.0 - 2.6*	7.6	5.6	11.0	7.5	6.2
	HS2100DB					12.7	8.5	7.2	4.9	4.1
25	HS2077DB	P1328 or P1305	3M8815 or T710	K23	1.0 - 1.6*	7.6	8.5	10.3	6.9	5.7
	HS2078DB					12.7	8.5	6.5	4.4	3.6
27	HS2085DB	P1828 or P1805	3M8815 or T710	K24	1.0 - 1.6*	7.6	8.5	9.2	6.2	5.0
	HS2086DB					12.7	8.5	5.9	4.0	3.4
32.5	HS2142DB	P1228 or P1205	3M8815 or T710	no clip for HS2142DB	4.4 - 5.0*	7.6	11.3	6.6	4.4	3.5
	HS2143DB			K34		12.7	14.1	4.4	2.9	2.4
35	HS2089DB	P3828 or P3805	3M8815 or T710	K25 K51 K52 K35 K29 K53	1.0 - 1.6* 1.2 - 1.8* 2.0 - 2.6* 2.7 - 3.3* 2.9 - 3.5* 3.6 - 4.2*	7.6	11.3	6.1	4.0	3.2
	HS2090DB					12.7	17.0	3.7	2.4	1.9
37.5	HS2091DB	P1528 or P1505	3M8815 or T710	K26	1.0 - 1.6*	7.6	11.3	5.6	3.6	2.9
	HS2092DB			K45	2.4 - 3.0*	12.7	14.1	3.8	2.5	2.0
40	HS2081DB	P4028 or P4005	3M8815 or T710	K27 K54 K55 K36 K30 K56	0.9 - 1.5* 1.2 - 1.8* 2.0 - 2.6* 2.7 - 3.3* 2.9 - 3.5* 3.6 - 4.2*	7.6	14.1	5.1	3.3	2.7
	HS2080DB					12.7	19.8	3.3	2.1	1.7
42.5	HS2166DB	P2028 or P2005	3M8815 or T710	K40 K41 K31	0.3 - 0.9* 0.9 - 1.5* 2.2 - 2.8*	7.6	17.0	4.7	3.0	2.4
	HS2168DB					12.7	19.8	3.1	2.0	1.8
45	HS2093DB	P1628 or P1605	3M8815 or T710	K28	1.0 - 1.6*	7.6	19.8	4.2	2.7	2.1
	HS2094DB					12.7	25.5	2.8	1.8	1.5

NOTES:

1) Example Part Numbers:

HS2166DBP2005K31 42.5 x 7.62mm Heatsink with optional K31 mounting clip for 2.2-2.8mm chip heights & T710 thermal pad
 HS2090DBK35 35 x 12.70mm Heatsink with optional K35 mounting clip for 2.7-3.3mm chip heights
 HS2088DBP0728 21 x 12.70mm Heatsink with optional 3M8815 a thermal adhesive tape
 HS2094DB 45 x 12.70mm Heatsink only

2) Optional thermal pad 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-V0 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-P Series

Removable Heatsinks for BGA Chipsets Round Pin Aluminum BGA Heatsink



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:

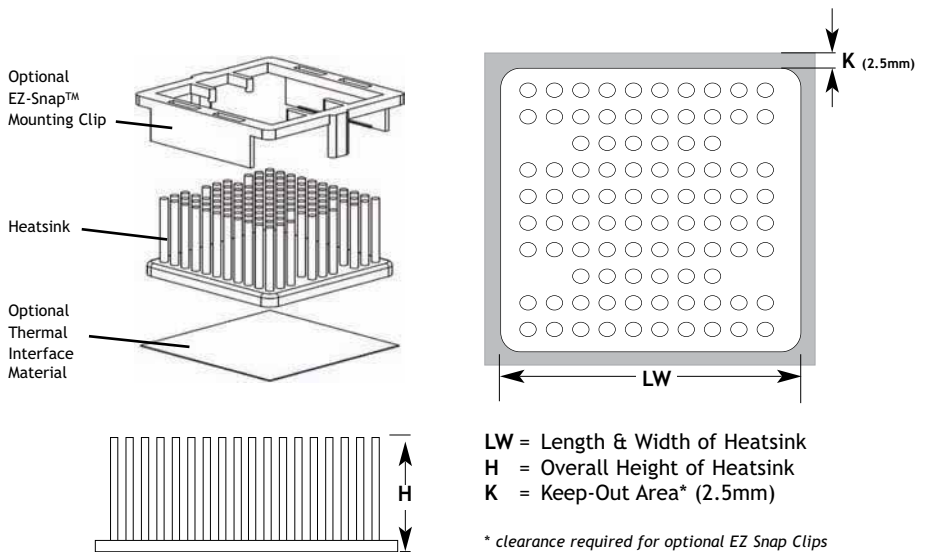
- High efficiency aluminum round pin design provides low pressure-drop characteristics
- Constructed of forged aluminum AL6063 for optimum heat transfer
- Ideal for omni-directional air flow
- Designed specifically for BGAs and other surface mount packages
- Optional EZ-Snap™ mounting clip is constructed 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



Radian Heatsinks
A division of Intracast Co., Inc.

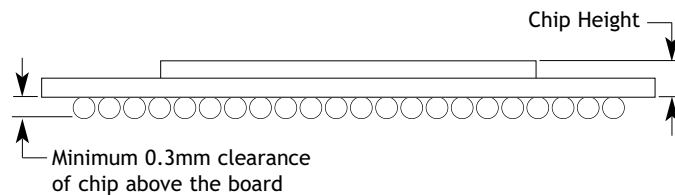
BUY ON-LINE AT:
www.radianheatsinks.com

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 (0.3mm)
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

BGA Size	Part Number ⁽¹⁾				Heatsink Height (mm)	Weight (g)	Thermal Resistance Theta _{SA} (C/W)			
	Heatsink Part Number	Optional Mounting Clip		Optional Thermal Tape/Pad Part # ⁽²⁾			100 LFM	200 LFM	400 LFM	600 LFM
		Part Number ⁽³⁾	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 BU	or 1.4 - 2.0*		14.6	4.8	10.5	7.5	5.0	4.4
	INM19002-20P/2.6	or Y	or 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 BU	or 1.4 - 2.0*		14.6	8.5	6.6	4.4	3.2	2.6
	INM27002-20P/2.6	or K32	or 2.3 - 2.9*		19.6	10.0	4.6	3.1	2.2	1.9
	INM27002-25P/2.6	or Y	or 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 BU	or 1.4 - 2.0*		14.6	10.4	5.7	3.7	2.5	2.0
	INM29002-20P/2.6	or Y	or 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 BU	or 1.4 - 2.0*		14.6	12.3	4.9	3.2	2.2	1.8
	INM33002-20P/2.6	or K33	or 2.3 - 2.9*		19.6	13.8	3.5	2.3	1.6	1.3
	INM33002-25P/2.6	or Y	or 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 BU	or 1.4 - 2.0*		14.6	15.1	4.4	2.9	2.0	1.7
	INM35002-20P/2.6	or K29	or 2.3 - 2.9*		19.6	17.9	3.2	2.0	1.5	1.2
	INM35002-25P/2.6	or Y	or 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 BU	or 1.4 - 2.0*		14.6	17.8	4.1	2.7	1.9	1.6
	INM37.5002-20P/2.6	or Y	or 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 BU	or 1.4 - 2.0*		14.6	20.0	3.6	2.4	1.6	1.3
	INM40002-20P/2.6	or K30	or 2.3 - 2.9*		19.6	24.0	2.5	1.7	1.2	0.9
	INM40002-25P/2.6	or Y	or 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 BU	or 1.4 - 2.0*		14.6	23.0	3.3	2.1	1.4	1.1
	INM42.5002-20P/2.6	or Y	or 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:

1) Example Part Numbers:

- INM27002-15P/2.6 27 x 14.6mm Heatsink only
- INM35002-20P/2.60 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

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-V0 rated nylon material.

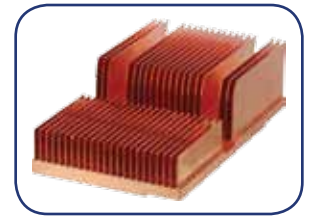
4) Thermal data provided are for reference only. Actual cooling performance may vary by application.

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

6) Specifications are subject to change without notice.

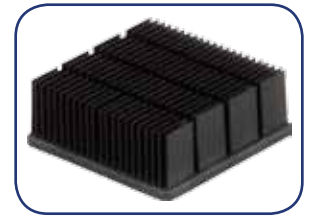
*Contact Radian for mounting clips to fit chip heights not displayed above.

Custom Options Also Available



SKIVED HEATSINKS

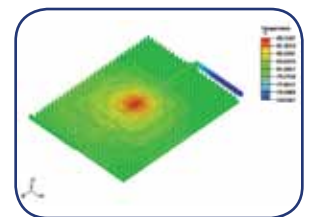
- Thin Fin Copper Skiving with fins as thin as 0.008"
- CU1100 pure copper with High Thermal Conductivity (400W/mK)
- No NRE required for most parts



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

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

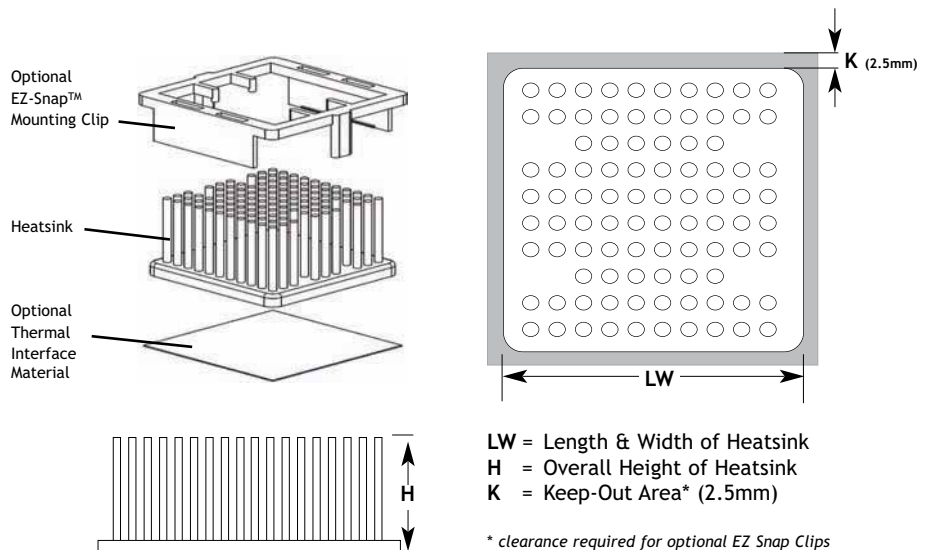


Radian Heatsinks
A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

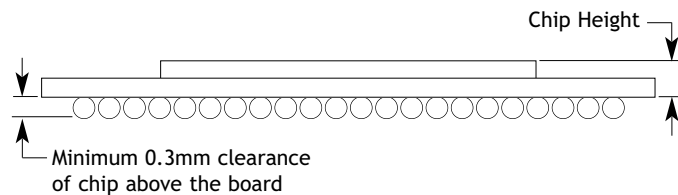
Mechanical Outline Drawing

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



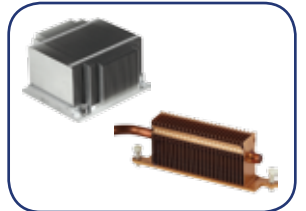
EZ-Snap™ Mounting Clip

CLIPS DIRECTLY TO BGA CHIP WITH HS8132 CLIP TOOL
See next page for fitting chip heights. Consult factory for unique chip height requirements



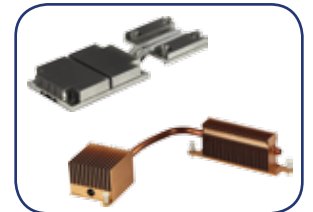
- Note 1: Chip height measurements exclude ball dimensions (0.3mm)
Note 2: Chip must have 0.3mm clearance above the board for clip to adhere properly
Note 3: Maintain keep-out clearance of 2.5mm around chip for clip to adhere properly

Custom Options Also Available



STAMPED FIN HEATSINKS

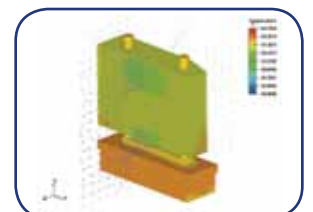
- Stamped fin heatsinks available in both AL and CU
- Often combined with heat pipes



HEAT PIPES

- Base embedded heat pipes (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	Part Number ⁽¹⁾				Heatsink Height (mm)	Weight (g)	Thermal Resistance Theta_SA (C/W)			
	Heatsink Part Number	Optional Mounting Clip		Optional Thermal Tape/Pad Part # ⁽²⁾			100 LFM	200 LFM	400 LFM	600 LFM
		Part Number ⁽³⁾	Fits Chip Heights (mm)							
19	INM19002-12PCU/2.6	O	0.6 - 1.2*	+3M8815	11.6	10	9.0	6.4	4.8	4.0
	INM19002-15PCU/2.6	or BU	or 1.4 - 2.0*	or	14.6	13	8.6	6.0	4.3	3.5
	INM19002-20PCU/2.6	or Y	or 3.0 - 3.6*	+T710	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	11.6	25	6.8	4.6	3.3	2.7
	INM27002-15PCU/2.6	or BU	or 1.4 - 2.0*	or	14.6	25	6.0	4.0	2.9	2.4
	INM27002-20PCU/2.6	or K32	or 2.3 - 2.9*	+T710	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	11.6	25	6.1	4.0	2.8	2.3
	INM29002-15PCU/2.6	or BU	or 1.4 - 2.0*	or	14.6	25	5.4	3.6	2.4	2.0
	INM29002-20PCU/2.6	or Y	or 3.0 - 3.6*	+T710	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	11.6	45	5.0	3.0	2.0	1.5
	INM33002-15PCU/2.6	or BU	or 1.4 - 2.0*	or	14.6	50	4.4	2.7	1.7	1.2
	INM33002-20PCU/2.6	or K33	or 2.3 - 2.9*	+T710	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	11.6	45	4.6	3.0	2.1	1.7
	INM35002-15PCU/2.6	or BU	or 1.4 - 2.0*	or	14.6	55	4.0	2.6	1.8	1.5
	INM35002-20PCU/2.6	or K29	or 2.3 - 2.9*	+T710	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	11.6	86	4.3	2.8	2.0	1.7
	INM37.5002-15PCU/2.6	or BU	or 1.4 - 2.0*	or	14.6	89	3.8	2.4	1.8	1.5
	INM37.5002-20PCU/2.6	or Y	or 3.0 - 3.6*	+T710	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	11.6	79	3.7	2.4	1.6	1.3
	INM40002-15PCU/2.6	or BU	or 1.4 - 2.0*	or	14.6	86	3.4	2.1	1.4	1.2
	INM40002-20PCU/2.6	or K30	or 2.3 - 2.9*	+T710	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	INM42.5002-12PCU/2.6	O	0.6 - 1.2*	+3M8815	11.6	107	3.5	2.1	1.5	1.2
	INM42.5002-15PCU/2.6	or BU	or 1.4 - 2.0*	or	14.6	121	3.0	1.9	1.2	1.0
	INM42.5002-20PCU/2.6	or Y	or 3.0 - 3.6*	+T710	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/2.60	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.



Small Round Pin

Round Pin Aluminum BGA Heatsink



CS2050V00



CS2042V00



CS2005V00/CS2006V00

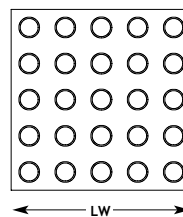
The miniature series of aluminum heatsinks are high efficiency cooling products which are ideal for omni-directional airflow.

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

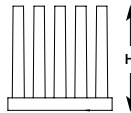
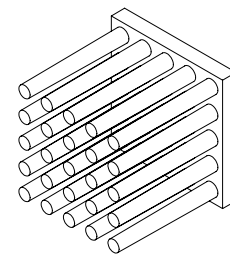
FEATURES:

- 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

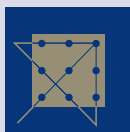


LW



H

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



Radian Heatsinks
A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

BGA Size	Part Number		Heatsink Height (mm)	Thermal Resistance Theta_SA (C/W)			
	Heatsink Part Number	Optional Thermal Pad		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

37.5004 Series

Round Pin BGA Heatsink



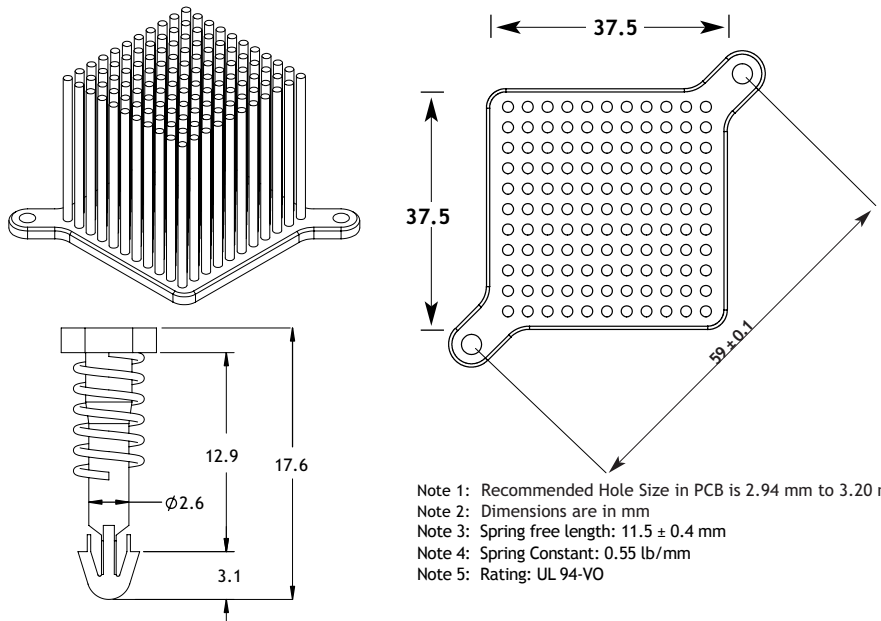
Removable Heatsinks for BGA Chipsets

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-VO



Radian Heatsinks
A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

BGA Size	Part Number		Optional Thermal Pad Part #	Heat Sink Height (mm)	Weight (g)	Thermal Resistance Theta _{SA} (C/W)		
	Heatsink Part Number	Standard Push Pin				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

* PCU are made from forged C11000 Oxygen-Free Copper



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:

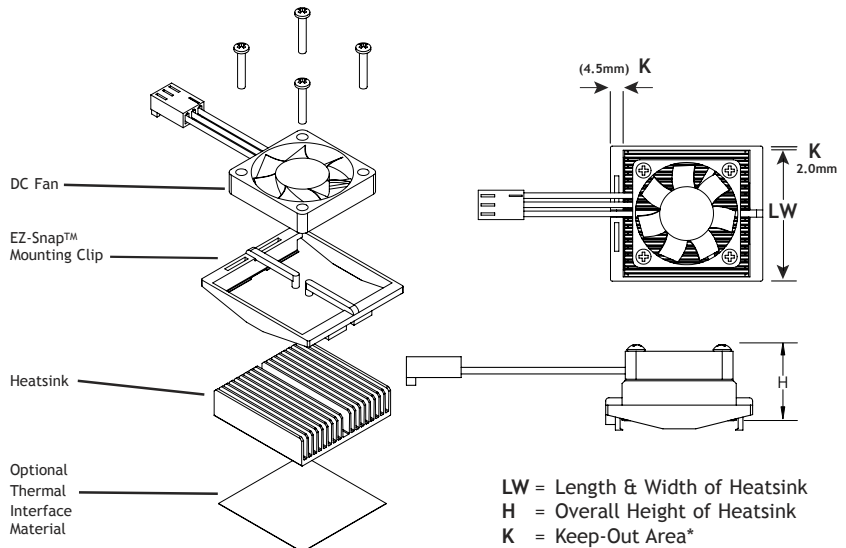
- High efficiency aluminum plate fin design provides low pressure-drop characteristics
- Constructed of extruded aluminum AL6063 for optimum heat transfer
- DC Fan for improved heat dissipation
- Designed specifically for BGAs and other surface mount packages
- EZ-Snap™ Mounting Clip is constructed of 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



Radian Heatsinks
A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

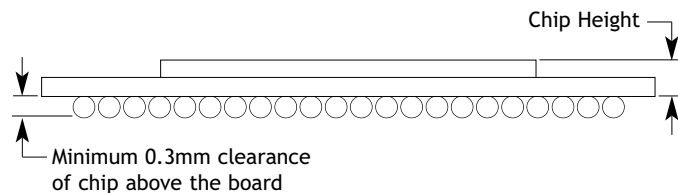
Mechanical Outline Drawing (See next page for "LW" & "H" dimensional values)



* clearance required for EZ Snap Clips

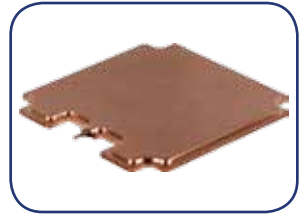
EZ-Snap™ Mounting Clip

CLIPS DIRECTLY TO BGA CHIP WITH HS8132 CLIP TOOL
See next page for fitting chip heights. Consult factory for unique chip height requirements



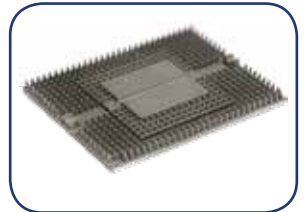
- Note 1: Chip height measurements exclude ball dimensions (0.3mm)
Note 2: Chip must have 0.3mm clearance above the board for clip to adhere properly
Note 3: Maintain keep-out clearance of 2mm Length side and 4.5mm Width side around chip for clip to adhere properly

Custom Options Also Available



VAPOR CHAMBERS

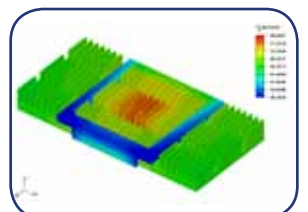
- Used in conjunction with stamped fins
- Better spreading efficiency than copper or heat pipe based heatsinks
- High efficiency wick structure design
- Lightweight heatsinks



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	Fan Spec	Harness Spec
	Fansink		Optional Mounting Clip						
	Fansink Part #	Voltage Input	Optional Mounting Clip	Fits Chip Heights (mm)					
27	FI27	12V	0 or BU	0.9 - 1.4 1.5 - 2.0	T725 or 3M8815	16.0	2.1 °C/W	Airflow: 2.4 CFM Noise: 26.0 dBA Speed: 12,000 RPM Power: 0.65/0.75 Watts	Length: 140mm (+/-10) Connector: Molex 22-01-3027 Pin 1: Ground (Black) Pin 2: + Voltage Input (Red)
	FJ27	5V	Y	2.1 - 2.6					
35	FJ35	5V	0 or BU or Y	0.9 - 1.4 1.5 - 2.0 2.1 - 2.6	T725 or 3M8815	16.0	1.7 °C/W	Airflow: 3.3 CFM Noise: 27.9 dBA Speed: 9,000 RPM Power: 0.30/0.30 Watts	Length: 300mm (+/-20) Connector: Molex 22-01-3037 Pin 1: Ground (Black) Pin 2: + Voltage Input (Red) Pin 3: Tachometer (White)
			0 or BU or Y	0.9 - 1.4 1.5 - 2.0 2.1 - 2.6					
			0 or BU or Y	0.9 - 1.4 1.5 - 2.0 2.1 - 2.6					
42.5	FI42.5	12V	0 or BU or Y	0.9 - 1.4 1.5 - 2.0 2.1 - 2.6	T725 or 3M8815	23.2	1.3 °C/W	Airflow: 5.7 CFM Noise: 20.0 dBA Speed: 4,800 RPM Power: 0.96/0.57 Watts	Length: 300mm (+/-20) Connector: Molex 22-01-3037 Pin 1: Ground (Black) Pin 2: + Voltage Input (Red) Pin 3: Tachometer (White)
	FJ42.5	5V	Y	2.1 - 2.6					

NOTES:

- 1) Add suffix "+T725" to designate thermally conductive phase change pad (Chomerics Part # T725).
- 2) Mounting clips are constructed of UL94-V0 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.

F Series

Removable Heatsinks for BGA Chipsets Active BGA Heatsink



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:

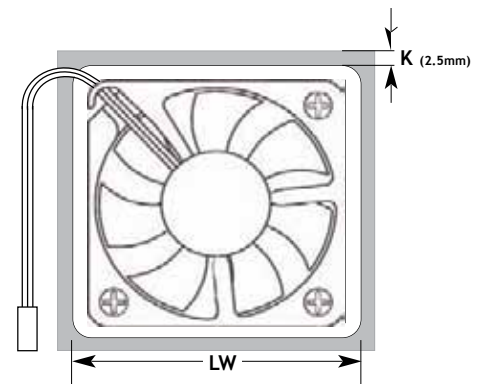
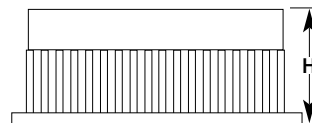
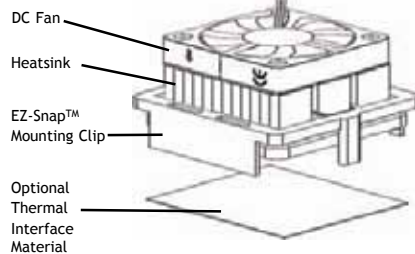
- Constructed of extruded aluminum AL6063 for optimum heat transfer
- DC Fan for improved heat dissipation
- Designed specifically for BGAs and other surface mount packages
- EZ-Snap™ mounting clip is constructed of UL94-V0 rated nylon
- Use clip tool HS8132 to attach (or remove) heatsink directly to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



Radian Heatsinks
A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

Mechanical Outline Drawing (See next page for "LW" & "H" dimensional values)



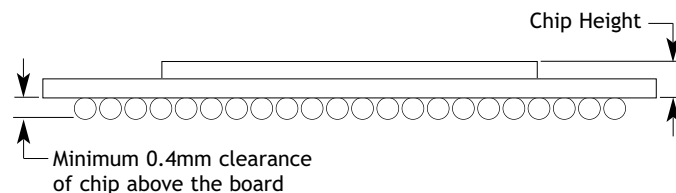
LW = Length & Width of Heatsink
H = Overall Height of Heatsink
K = Keep-Out Area* (2.5mm)

* clearance required for 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

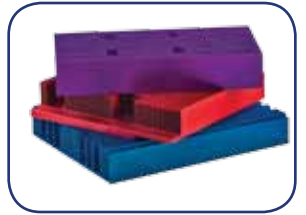


Note 1: Chip height measurements exclude ball dimensions (0.4mm)

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

Custom Options Also Available

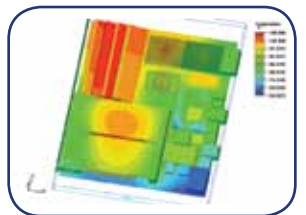


WITH CUSTOM COLORS
• Offer custom anodize colors



CUSTOM CLIP-ON
• Offer custom extended fins with clip attachment

Complimentary Thermal Analysis



Contact Radian Heatsinks for more details

Installation Tool HS8132



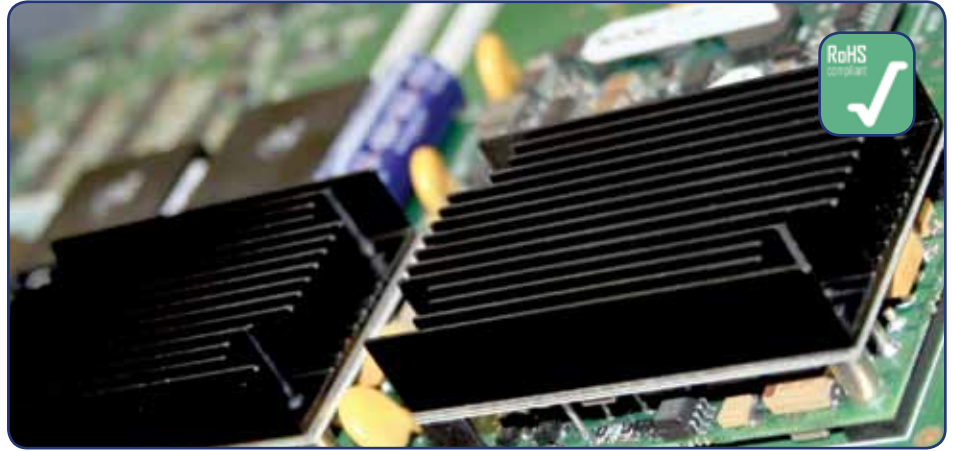
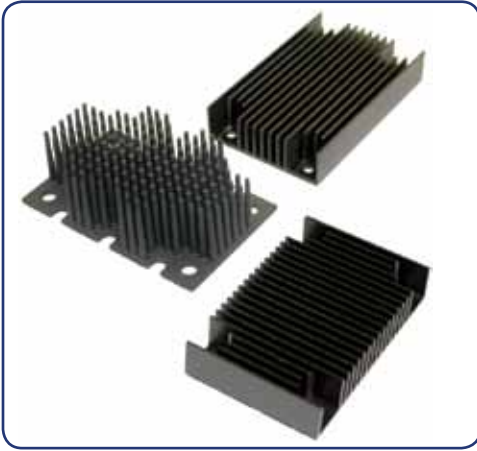
BGA Size	Part Number ⁽¹⁾				Optional Thermal Tap/Pad Part #	Heatsink Height (mm)	Thermal Resistance Theta_SA	Fan Spec	Harness Spec
	Fansink		Optional Mounting Clip						
	Fansink Part #	Voltage Input	Optional Mounting Clip	Fits Chip Heights (mm)					
35	FA35	12V	+K25B or +K51B or +K52B	1.5 - 2.1 1.7 - 2.3 2.5 - 3.1	+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					
40	FA40	12V			+K27B or +K36B or +K54B	1.3 - 2.1 3.2 - 3.8 1.7 - 2.3	+3M8815 or +T710	22.8	1.3 °C/W
			FB40	5V	+K55B or +K30B or +K56B	2.5 - 3.1 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
			45	FA45	12V	+K28B			
FB45	5V						+3M8815 or +T710	23.2	1.2 °C/W

NOTES:

- 1) Add suffix "+T710" to designate thermally conductive phase change pad (Chomerics Part # T710).
- 2) Mounting clips are constructed of UL94-V0 rated nylon material.
- 3) Thermal data provided are for reference only. Actual cooling performance may vary by application.
- 4) Specifications are subject to change without notice.
- 5) 27mm size available, contact Radian for specifications

* 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:

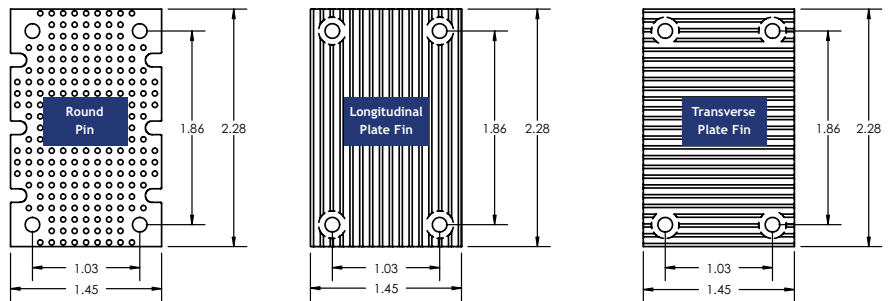
- High efficiency round pin or plate fin design provide low pressure-drop characteristics
- Constructed of aluminum AL6063 or 356.0 for optimum heat transfer
- Round pin designs are ideal for omni-directional airflow environments
- Plate fin designs are ideal for linear air flow environments
- Designed 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



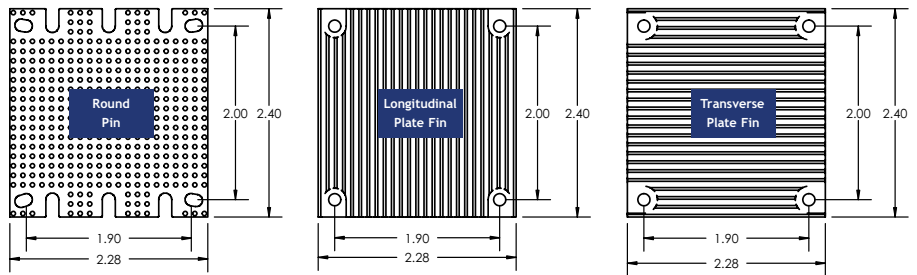
Radian Heatsinks
A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

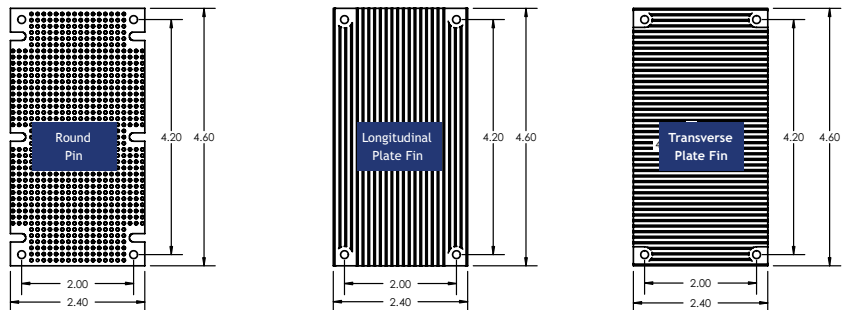
1/4 Brick Outline Drawings: See next page for height dimensions, Pin/Fin style and thermal resistance ratings



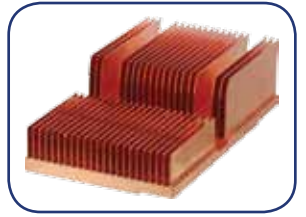
1/2 Brick Outline Drawings: See next page for height dimensions, Pin/Fin style and thermal resistance ratings



Full Brick Outline Drawings: See next page for height dimensions, Pin/Fin style and thermal resistance ratings

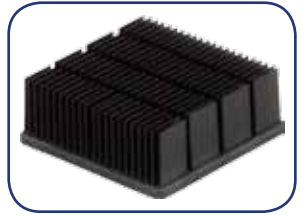


Custom Options Also Available



SKIVED HEATSINKS

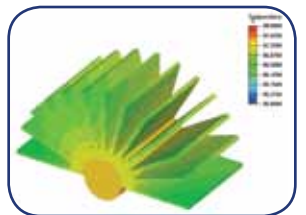
- Thin Fin Copper Skiving with fins as thin as 0.008"
- CU1100 pure copper with high thermal conductivity (400W/mK)
- No NRE required for most parts



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	Heatsink Height (In)	Part Number ⁽¹⁾			Thermal Resistance Theta_SA (C/W)				
			Heatsink	Thermal Pad	Mounting Hardware	200 LFM	400 LFM	600 LFM		
Quarter Brick	Round Pin	0.23	HS2065DB	P7314	K04 4 pieces of M3 x 4mm 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		or	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	K05 4 pieces of M3 x 5mm screws with lock washer	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		or	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		K06 4 pieces of M3 x 6mm screws with lock washer	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	or		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			K08 4 pieces of M3 x 8mm screws with lock washer	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

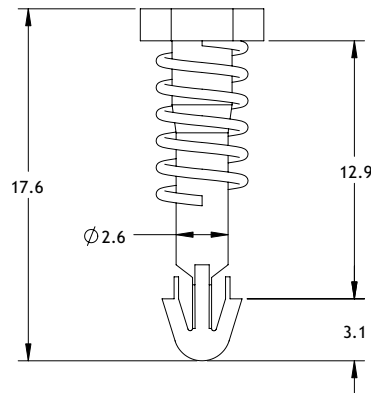
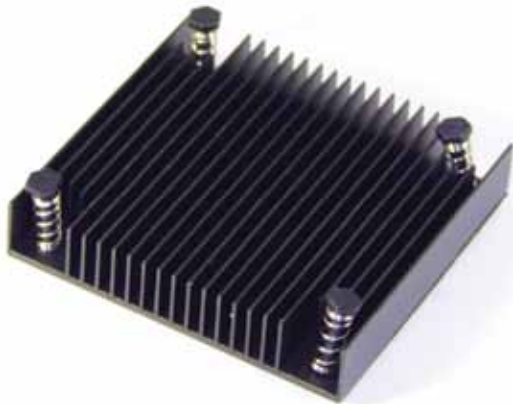
3) Thermal data provided are for reference only. Actual cooling performance may vary by application.

4) Specifications are subject to change without notice.



Push-Pin

Aluminum Heatsink

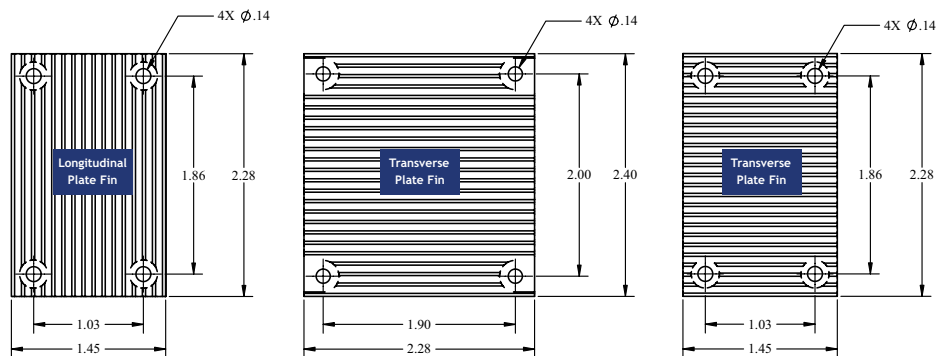


Spring free length: 11.5 ± 0.4mm
 Spring Constant: 0.55 lb/mm
 Rating: UL 94-V0

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



* 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*	K01 Push-Pins	4.1	2.4	1.8
1.45	2.28	0.45	HS1568EB	P3805*		2.2	1.3	1.0
1.45	2.28	0.70	HS1569EB	P3805*		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*	K01 Push-Pins	3.2	2.0	1.6
2.28	1.45	0.45	HS1572EB	P3805*		1.7	1.1	0.9
2.28	1.45	0.70	HS1573EB	P3805*		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**	K01 Push-Pins	2.7	1.7	1.3
2.40	2.28	0.45	HS1580EB	P6705**		1.5	1.0	0.8
2.40	2.28	0.70	HS1581EB	P6705**		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:

- 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
- Thermal data provided are for reference only. Actual cooling performance may vary by application.
- Specifications are subject to change without notice.



Radian Heatsinks
 A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

NEW Product:

Standard XFP Heatsink with Clip

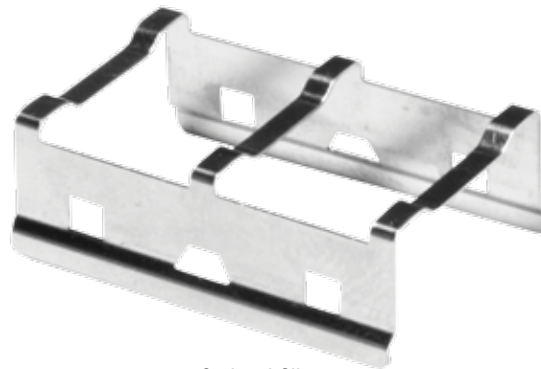


This low profile XFP heatsink is designed specifically for applications with height constraints. Optimal performance is achieved by extending the heatsink at the back of the XFP cage. The optional clip fits most XFP cages and is available as an assembly or as a separate item.

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 XFPs
- Optional mounting clip
- Finished with black anodize plating

Part Number		Heatsink Width (mm)	Heatsink Length (mm)	Heatsink Height (mm)	Thermal Resistance Theta _{SA} (C/W)		
Heatsink Only	Optional Clip				200 LFM	400 LFM	600 LFM
FX002	FX003	81	22	7.4	4.3	3.2	2.7



Optional Clip
Part #: FX003

NOTES:

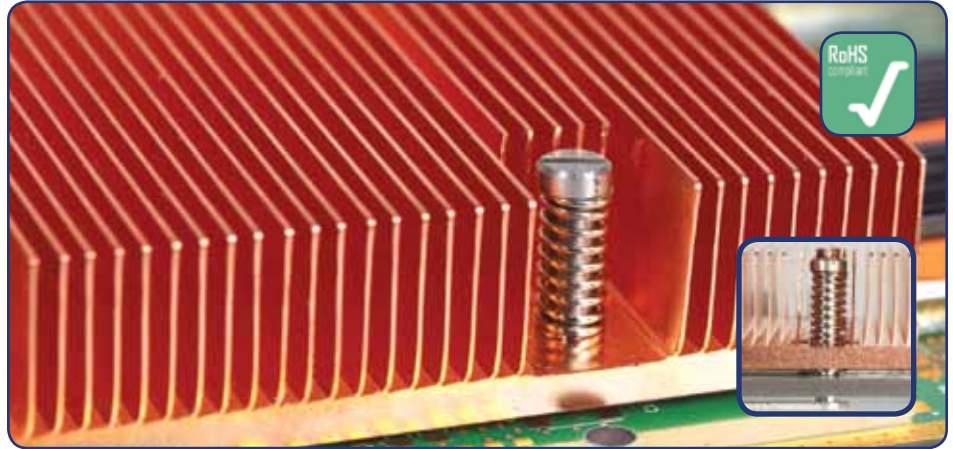
- 1) Low profile standard XFP heatsink is compliant with XFP MSA
- 2) Also available as a kit heatsink and clip under part number FX004



Radian Heatsinks
A division of Intricast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

Captive Screws



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

FEATURES:

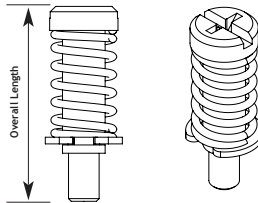
- Screw and spring held captive to the heatsink
- Multiple thread sizes available
- Made from stainless steel, RoHS compliant
- Spring loaded to evenly distribute force
- Multiple spring sizes available
- Resistance to high temperature and thermal cycling



Radian Heatsinks
A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

Attachments for Electronic Modules Mechanical Outline Drawing

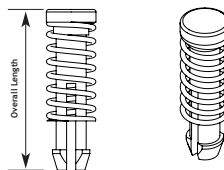
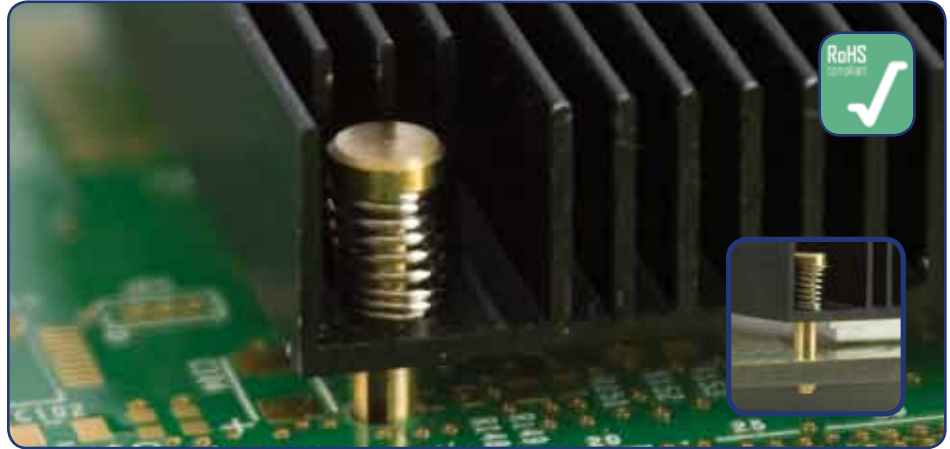


- Note 1: Recommended keep out area on PCB: 0.300" diameter
 Note 2: Back plate or standard hex nut shall be used on opposite side of PCB
 Note 3: Phillips head or flat head screw driver can be used

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		
		0.256" (6.5mm)	4.6		
		0.298" (7.5mm)	5.4		
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		
		0.354" (9.0mm)	1.8		
		0.394" (10.0mm)	2.5		
		0.433" (11.0mm)	3.2		
HS8091SP003CL001	#4-40	0.472" (12.0mm)	3.9	17.8	1.27
		0.512" (13.0mm)	4.6		
		0.551" (14.0mm)	5.3		
		0.276" (7.0mm)	2.9		
		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		
HS8091SP004CL001	#4-40	0.551" (14.0mm)	8.6	20.8	1.27
		0.098" (2.5mm)	1.3		
		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		
		0.256" (6.5mm)	4.6		
HS8121SP001CL001	M2.5	0.098" (2.5mm)	3.1	21.1	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		
		0.298" (7.5mm)	5.4		
		0.338" (8.5mm)	6.1		
		0.378" (9.5mm)	6.8		
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		

Brass Push Pins

Attachments for Electronic Modules



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

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



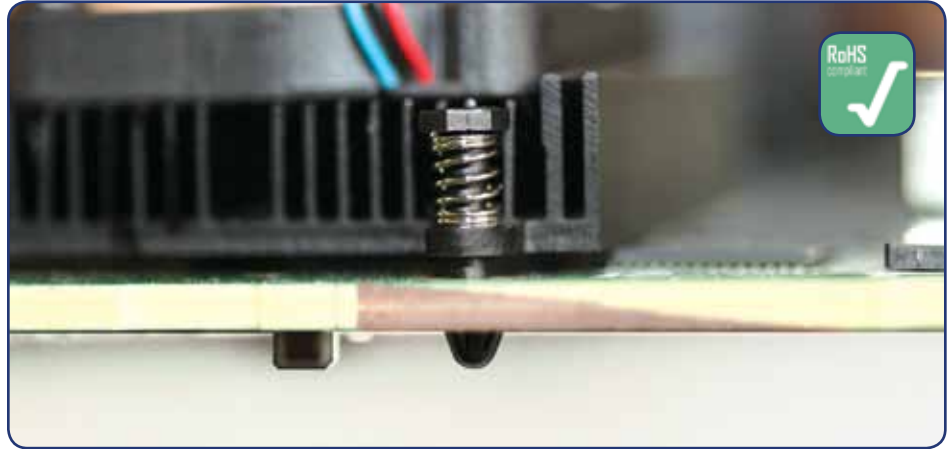
Radian Heatsinks
A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

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 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				
	0.16" (4mm)	4.9				
HS8103SP008	0.20" (5mm)	5.6	18.6	0.085	0.118	0.585
	0.24" (6mm)	6.4				
	0.28" (7mm)	7.1				
HS8130SP005	0.16" (4mm)	1.6	8.6	0.08	0.125	0.63
	0.20" (5mm)	2.0				
	0.24" (6mm)	2.3				
	0.28" (7mm)	2.6				
	0.31" (8mm)	3.0				
HS8097SP005	0.16" (4mm)	1.3	8.6	0.085	0.118	0.685
	0.20" (5mm)	1.6				
	0.24" (6mm)	2.0				
	0.28" (7mm)	2.3				
	0.31" (8mm)	2.6				
HS8097SP007	0.16" (4mm)	2.7	17.9	0.085	0.118	0.685
	0.20" (5mm)	3.4				
	0.24" (6mm)	4.1				
	0.28" (7mm)	4.8				
	0.16" (4mm)	3.0				
HS8097SP008	0.20" (5mm)	3.8	18.6	0.085	0.118	0.685
	0.24" (6mm)	4.5				
	0.28" (7mm)	5.2				
	0.31" (8mm)	6.0				
	0.35" (9mm)	6.7				
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				
	0.55" (14mm)	2.1				
	0.16" (4mm)	2.2				
HS8093SP013	0.20" (5mm)	2.4	6.3	0.085	0.118	0.83
	0.24" (6mm)	2.7				
	0.28" (7mm)	2.9				
	0.31" (8mm)	3.2				

Plastic Push Pins

Attachments for Electronic Modules

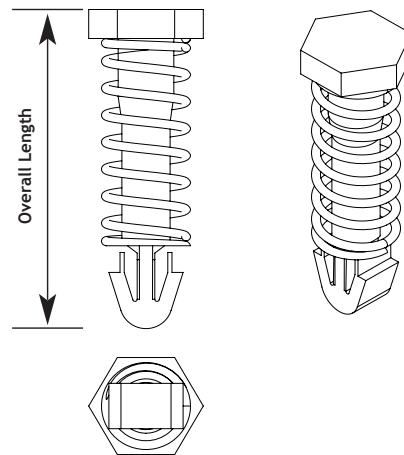


The plastic push pins provide a secure attachment method for our heatsinks to your board.

FEATURES:

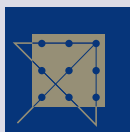
- Fits various PCB hole size
- Constant and reliable pressure is maintained by the springs to ensure proper contact
- Convenient and secure mounting
- Customer can choose between multiple push pin heights/ spring combinations to achieve desired pressure.
- Made of RoHS compliant nylon brass
- Resistance 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)	1.7					
	0.28" (7mm)	2.3					
	0.31" (8mm)	2.8					
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	0.35" (9mm)	4.2	21.1	0.106	0.118	0.520	V0
	0.157" (4mm)	0.9					
	0.177" (4.5mm)	1.3					
	0.197" (5mm)	1.7					
	0.217" (5.5mm)	2.1					

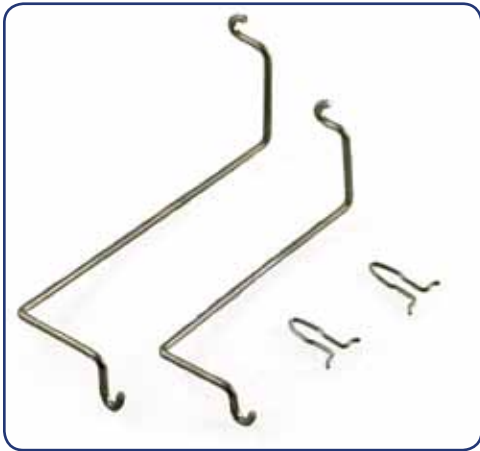


Radian Heatsinks
A division of Intracast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

Wire Clips

Attachments for Electronic Modules And Solder Less Anchors

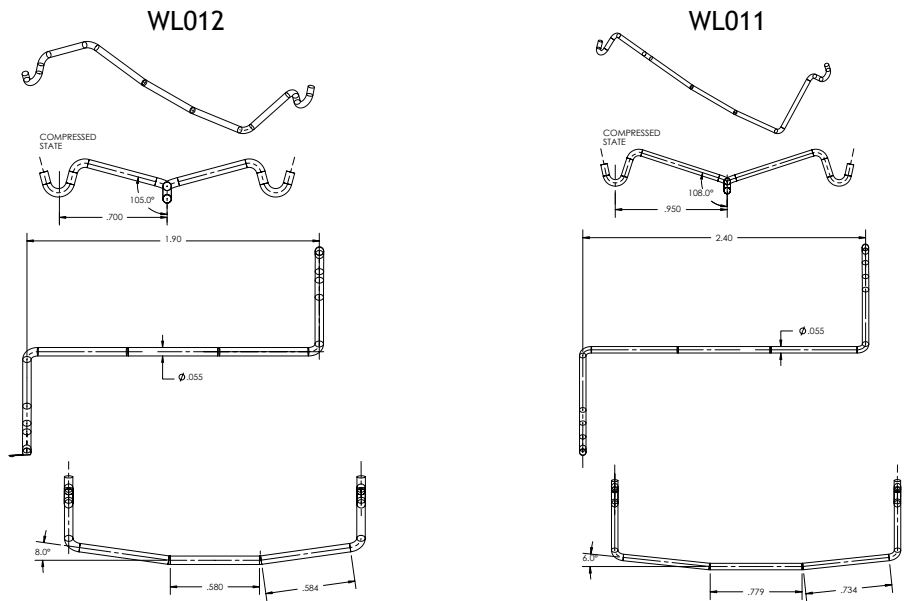


Our wire clips and solder less anchors provide a secure attachment method for our heatsinks to your board with some board modifications.

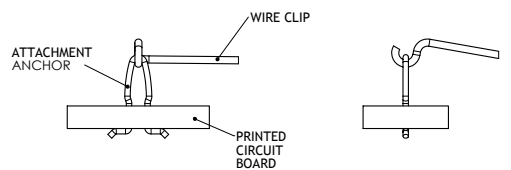
FEATURES:

- 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

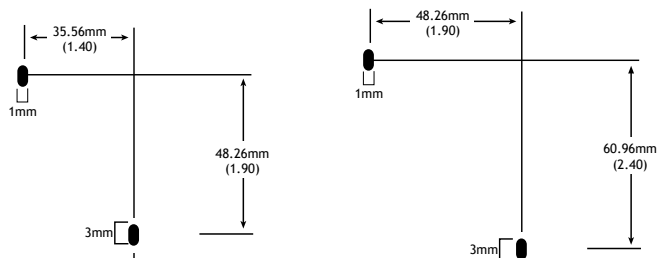
Mechanical Outline Drawing (2 Anchors included per Assembly)



INSTALLATION ON PRINTED CIRCUIT BOARD



Recommended PCB Hole Pattern



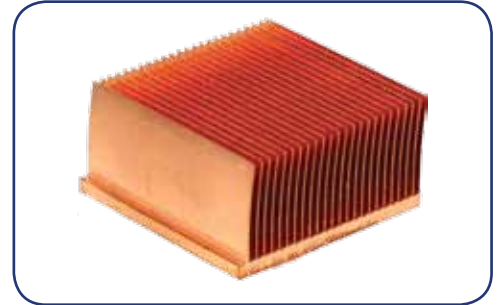
Radian Heatsinks
A division of Intricast Co., Inc.

BUY ON-LINE AT:
www.radianheatsinks.com

Manufacturing Processes

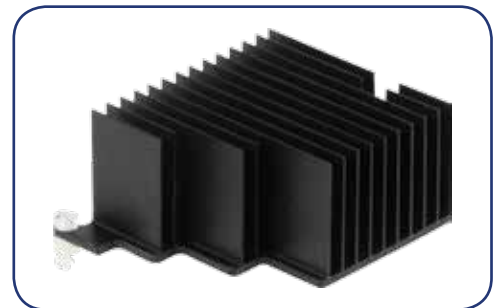
SKIVING

- 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

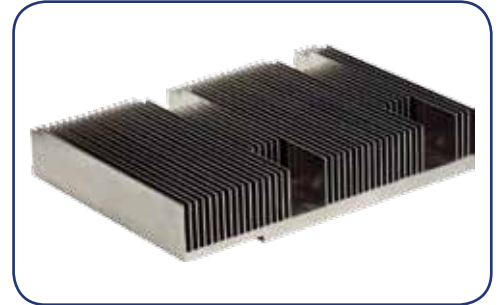
- Fins can be round, elliptical, straight or any combination on the same part
- Aspect ratio up to 35:1 is feasible
- Heatsink of the same footprint with optional heights require only one set of forging die
- Heatsinks can be made from AL 6063 or CU11000 alloys
- No draft angles required on fins



Manufacturing Processes

MACHINING

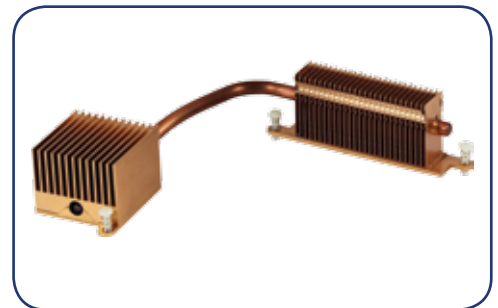
- Precision machining for complex parts
- Design flexibility; capable of machining detailed features
- Machined heatsinks made from Copper 1100° or Aluminum 6061
- No NRE charges
- Quick turn prototyping



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





radian
h e a t s i n k s
An Intricast Company

Radian Heatsinks

2160 Walsh Ave., Santa Clara, CA 95050

Tel: 800.689.2802 or 408.988.6200 • Fax: 408.988.0683

www.radianheatsinks.com