C&H TECHNOLOGY

Thermal Management
Semiconductor Clamps
Power Assemblies







SPECIALISTS IN POWER ELECTRONIC COMPONENTS AND ASSEMBLIES

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HIGH POWER SEMICONDUCTORS

Modules, Stud-Types, and Puk (disc) packages available in a wide range of electrical ratings.



- IGBT
- Thyristor / SCR
- Rectifier / Diode
- MOSFETs



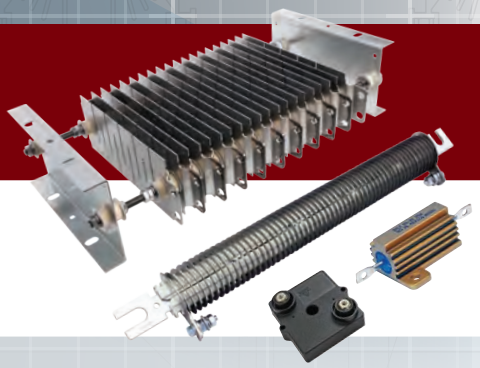
POWER CAPACITORS

High power capacitors for a wide variety of industrial applications.

- Aluminum Electrolytic
- Film
- Heavy Current Power
- Energy Storage

POWER RESISTORS

High power ratings, large resistance range, excellent stability, also available in Heat Sink mountable packages.



- Wirewound
- Thick Film
- Grid Resistors
- Custom Configurations Available



SEMICONDUCTOR CLAMPS

Complete line of Box Clamps and Bar Clamps for Hockey Puk Type Disc Semiconductors, precalibrated to simplify the manufacturing process on the assembly line.

- 5kN – 95kN Precalibrated Forces
- Precision Clamps Available
- Custom Configurations Available

THERMAL MANAGEMENT

High performance cooling solutions for a variety of high power applications.



- Extruded Heat Sinks
- Bonded Fin Heat Sinks
- Liquid Chill Plates
- Liquid Chill Blocks
- Custom Configurations Available

ABOUT US

This page is dedicated to the History of C&H and our core competency. C&H Technology, Inc. has celebrated 40 years of specializing in Power Electronic Components. Over the years we have added thousands of products and have become a global leader specializing in: Rectifiers (Diodes), Thyristors (SCRs), Bridge Rectifiers, IGBTs, MOSFETs, Power Assemblies, Heat Sinks, Bar Clamps, Box Clamps, Resistors, Capacitors, Thermistors, and Current Sensors.

We are proud to have earned your trust for quality products, reliability and service. C&H is committed to maintaining our excellence through the latest technology, engineering solutions, extensive inventory and world class customer service.

C&H Technology offers a wide selection of Rectifier Assemblies using Diodes, Thyristors (SCRs) and IGBTs. Choose from a large selection of standard rectifier circuits and configurations. Custom assemblies tailored to specific customer requirements are also available with different Bus Bar options. C&H Technology offers a Configuration Tool to help build the correct assembly part number based on your specific application and parameters. Many industry standard heat sinks are in stock to enable quick turnaround. C&H Technology also offers Snubber Circuits, SCR Firing Circuits, MOV Protection, Thermal Switches, and Isolation mounting feet that can be added to any of our Assemblies.

C&H Technology specializes in Extruded Aluminum Heat Sinks, Bonded Fin Heat Sinks, Liquid Cooled Chill Blocks & Friction Stir-Welded Heat Sinks for power electronic semiconductors and assemblies. We offer a full range of heat sinks for cooling your power electronic application from 10 watts to 10,000 watts. With our extensive inventory, we can accommodate any size order from prototypes to large production runs.

C&H Technology, Inc. is committed to satisfying our customer's needs by supplying products and services with a high level of reliability, maintainability, and functionality with on-time and competitive pricing. We will meet the needs and surpass the expectations of our customers by providing Excellence, Value, and Quality.

QAS INTERNATIONAL
ISO 9001:2015
REGISTERED COMPANY
Certificate No. US2116

Introduction

THERMAL MANAGEMENT

- Extruded heat sinks are available in many different profiles offering both natural and forced air convection. Additional machining options include drilling and tapping of holes, flycutting for surface flatness, and plating finishes.
- Bonded Fin heat sinks are designed for natural and forced air convection. C&H offers both standard and fully customized solutions with optional hole patterns, mounting feet, fans with shrouds, and plating finishes.
- Liquid Chill Plates include traditional copper press-in tubes from our standard offering of 1 to 6 pass models, and all aluminum Friction Stir-Welded plates with a patented internal fin structure.
- Liquid Chill Blocks include Cast Copper and Furnace Brazed Copper Chill blocks for hockey puk devices ranging from 30mm to 75mm in diameter.

SEMICONDUCTOR CLAMPS

- C&H Semiconductor bar clamps use three technologies to ensure accurate clamping force - Belleville Washers, Pre-Calibrated Deflection Bar, and Precision Bar styles to meet all application requirements.
- Box Clamps for single sided cooling are available for hockey puks up to 80mm in diameter.

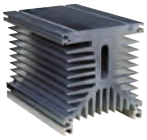
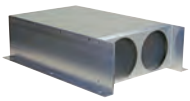
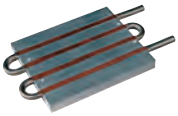
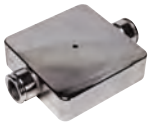
POWER ASSEMBLIES

- Standard Assemblies featured use either module or hockey puk devices on various thermal solutions.
- Available in both air and liquid-cooled models. Standard Assemblies include 1-phase and 3-phase configurations for Diode Bridge, SCR Bridge, and AC Switch circuits.
- Dimensioned 3D models of each standard assembly are depicted on pages 66 - 103.
- Custom solutions are available in all categories.

Note: What is shown in this catalog is a limited representation of the capability of C&H Technology. **Custom solutions are available in all categories.**

The information presented in this book is believed to be accurate and reliable. However, C&H Technology, Inc. can assume no responsibility for its use, nor any infringements of patents, or other rights of third parties which may result from its use. No patent liability shall be incurred for the use of the circuits, devices, or assemblies described herein. We reserve the right to change specifications and data without notice.

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HEAT SINK INTRODUCTION

C&H Technology offers a variety of thermal solutions including extruded heat sinks, bonded fin heat sinks, and an assortment of liquid cooling options. Our experience shows an effective approach takes thermal management into consideration early in the design phase. C&H Technology engineers are on standby to assist and help choose a heat sink for your system or application.

Extruded Aluminum Heat Sinks are available in an assortment of shapes for Small Discrete components, Stud-Type, Power Modules, and Hockey Puk devices. We offer a wide selection of extruded heat sinks designed for both natural convection as well as forced air cooling.

- Custom extrusion dies available upon request.
- Wide selection of industry standard shapes as well as custom shapes.

Our Bonded Fin Heat Sinks are tailored for power electronic semiconductors and assemblies. The benefit of this technology offers high fin density and very low thermal resistance.

- Wide selection of industry standard shapes as well as custom configurations.
- Custom bonded fin copper heat sinks with up to 3x the cooling of aluminum.
- High performance impingement bonded fins with extremely low cost per watt.

Liquid Chill Plates using Embedded Copper Tubing and high-performance Friction Stir-Welding options are available.

- Standard Aluminum Chill Plates with Embedded Copper Tubing available in one, two, four or six pass configurations.
- Friction Stir-Welded custom and standard configurations available.
- Available with drilled and tapped holes for the mounting of semiconductors and brackets.

STANDARD SPECIFICATIONS:

Heat Sink Extrusions:

Aluminum 6063-T5
Aluminum 6063-T6
Aluminum C57B-T5

Bonded Fin Heat Sinks:

Base Plates: Aluminum 6063-T5 or 6061-T5
Fins: Aluminum 1100-H14, 3003 or 6061

Standard Tolerances:

Flatness: 0.001 in/in
Roughness: #63 or better
Saw Cut: ± 0.020
Cut to Width: ± 0.010 in

Place Values:

X	± .1
.X	± .05
.XX	± .01
.XXX	± .005

Finishes:

Natural Finish
Clear Alodine 5200 – RoHS Compliant
Clear Anodized – MIL-A-8625, Type II
Black Anodized – MIL-A-8265, Type II
Gold Iridite – MIL-C-5441, Type III
Clear Chromate – MIL-C-5441
Type II Trivalent Chromate –
RoHS Compliant
MIL-DTL-5541F

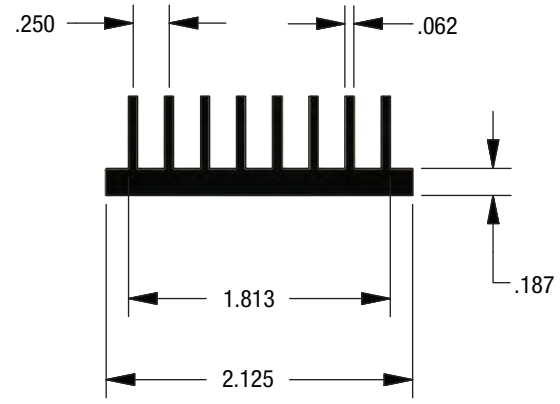
Thermal Management

Extruded Heat Sinks

Model	Perimeter (in²/in)	Width (in.)	Height (in.)	Weight (lbs/ft)	Thermal Resistance (°C/W/3in.)	Device Type	Assembly Profile	Page Number
CHEH0011	105.000	9.81	2.830	12.81	0.710	Puk	Profile G	12
CHEH0012	98.070	6.96	2.670	9.50	0.700	Module	---	12
CHEH0017	85.140	7.00	3.130	7.84	0.800	Puk	Profile F	10
CHEH0023	71.250	4.75	4.500	4.33	1.000	Stud	---	10
CHEH0031	118.250	9.25	6.750	9.60	0.400	Stud	---	13
CHEH0032	48.100	4.75	2.625	2.50	1.500	Stud	---	8
CHEH0051	108.400	9.80	2.830	11.10	0.700	Puk	---	13
CHEH0055	72.000	4.48	2.270	4.32	1.050	Module	---	10
CHEH0057	158.710	6.80	3.035	10.05	0.480	Module	---	14
CHEH0073	91.690	4.96	5.380	9.11	0.820	Module	---	11
CHEH0077	185.000	6.38	3.420	8.86	0.085*	Module	---	14
CHEH0078	137.000	12.58	3.250	23.75	0.550	Puk	Profile H	13
CHEH0090	61.850	5.99	1.107	3.51	1.220	Module	---	9
CHEH0091	167.130	6.46	2.145	7.29	0.094*	Module	---	14
CHEH0130	93.390	3.59	2.110	4.00	0.810	Module	---	11
CHEH0148	107.550	9.43	1.420	6.17	0.700	Module	---	12
CHEH0155	43.650	5.14	1.312	3.35	1.400	Module	---	7
CHEH0332	12.620	2.13	0.687	0.78	4.400	Discrete	---	6
CHEH0711	31.080	4.75	1.250	1.42	1.900	Stud	---	6
CHEH0746	78.580	9.88	1.312	6.22	0.900	Module	---	10
CHEH0811	54.810	8.24	1.050	4.79	1.000	Module	---	8
CHEH0871	39.340	4.50	1.400	2.37	1.500	Module	---	7
CHEH0930	27.720	3.25	1.000	1.42	1.800	Module	---	6
CHEH1246	41.460	4.47	1.812	3.94	1.300	Module	---	7
CHEH13450	49.570	5.00	2.250	4.30	1.400	Puk	Profile D	8
CHEH1484	55.500	4.25	4.300	3.01	1.000	Stud	---	8
CHEH1806	36.060	4.13	1.310	2.71	1.500	Module	---	6
CHEH1822	37.890	4.13	1.750	2.92	1.400	Module	---	7
CHEH1842	56.870	6.75	1.631	4.32	1.000	Module	---	9
CHEH1912	51.268	4.20	2.465	5.78	1.100	Module	---	8
CHEH1916	59.340	8.68	1.470	4.50	1.000	Module	---	9
CHEH3040	22.560	3.93	0.590	1.41	2.300	Module	---	6
CHEH3286	87.390	6.05	1.650	5.84	0.800	Module	---	11
CHEH3399	80.450	7.89	1.080	4.33	0.900	Module	---	10
CHEH3415	131.020	8.00	1.630	6.15	0.800	Module	---	13
CHEH3490	38.970	5.39	1.050	2.98	1.500	Module	---	7
CHEH3515	24.470	2.12	1.015	1.43	2.700	Discrete	---	6
CHEH3589	50.636	3.01	1.015	1.39	2.300	Module	---	8
CHEH3598	94.249	5.93	1.220	4.15	0.900	Module	---	11
CHEH3603	85.901	9.88	2.930	7.86	1.300	Module	---	11
CHEH3647	38.490	2.40	1.650	1.56	1.300	Discrete	---	7
CHEH3648	58.770	5.00	1.650	3.30	1.000	Module	---	9
CHEH3671	215.115	10.00	2.920	13.25	0.350	Module	---	14
CHEH3702	141.970	17.00	1.332	11.04	0.490	Module	---	13
CHEH3728	118.070	6.65	3.170	6.40	1.060	Module	---	13
CHEH3896	78.378	7.20	2.480	5.45	0.970	Module	---	10
CHEH3969	55.940	6.25	2.000	3.44	1.400	Stud	---	9
CHEH3973	97.846	9.75	2.280	7.55	0.770	Module	---	11
CHEH3975	102.191	12.75	1.350	9.10	1.000	Module	---	12
CHEH4025	101.500	10.16	1.876	6.60	0.670	Module	---	12
CHEHK1750-12	N/A	5.06	2.060	N/A	0.190*	Stud	---	14
CHEHK18	100.400	4.92	5.310	11.80	0.700	Module	Profile A	12
CHEHK7	58.200	5.13	2.000	6.40	1.200	Puk	Profile E	9

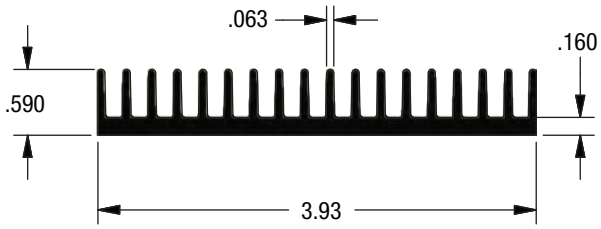
* Thermal Performances based on forced airflow of 500 LFM in units of °C/W/6in.

CHEH0332



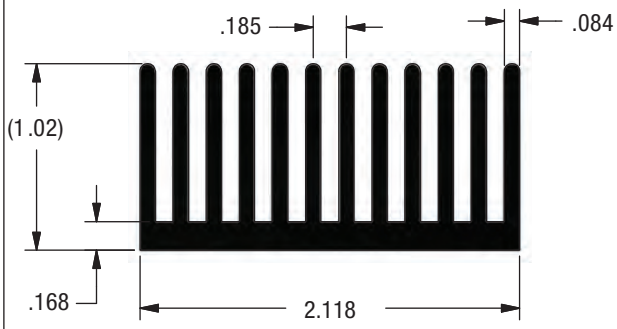
Per. 12.620 IN²/IN Wt. 0.78 LB/FT Θsa 4.400 ˚C/W/3”

CHEH3040



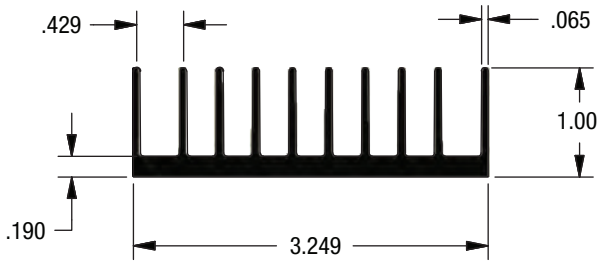
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CHEH3515



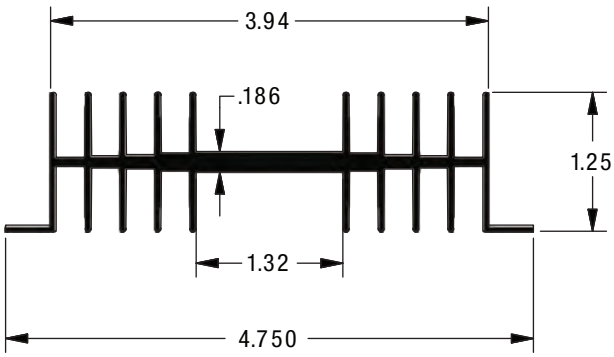
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CHEH0930



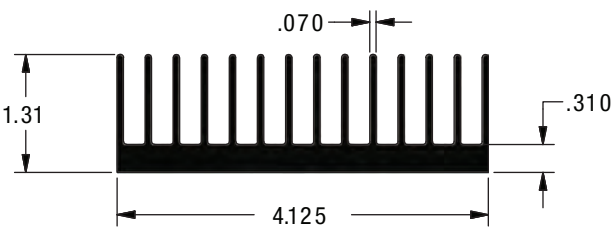
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CHEH0711



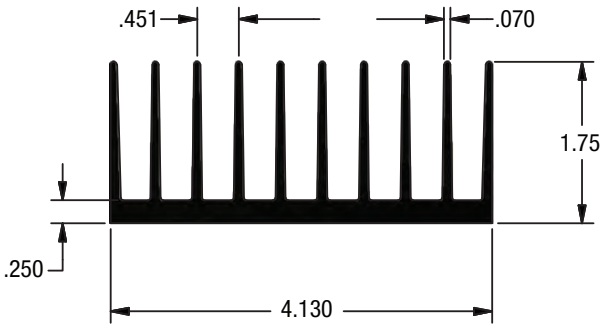
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CHEH1806



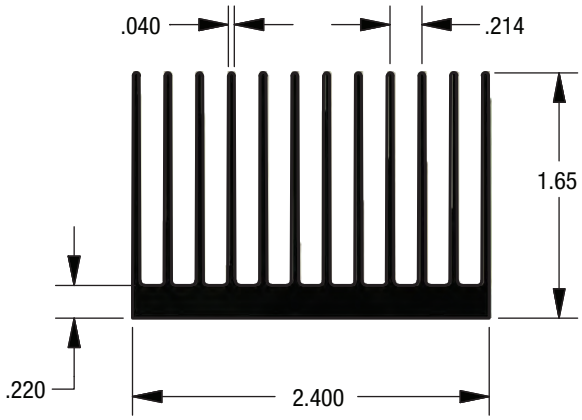
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CHEH1822



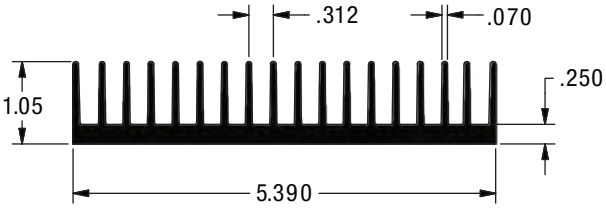
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CHEH3647



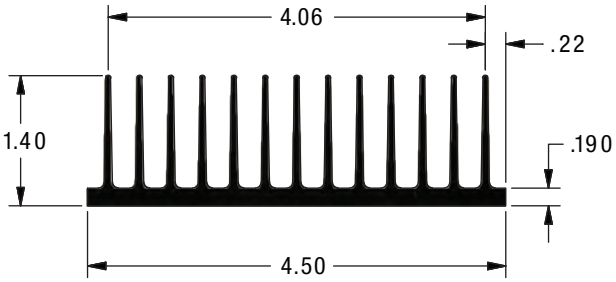
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CHEH3490



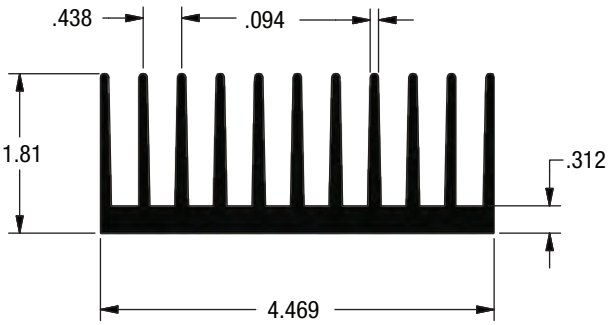
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CHEH0871



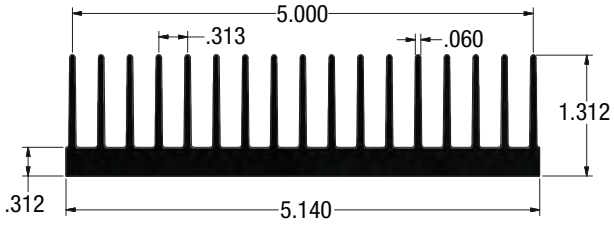
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CHEH1246



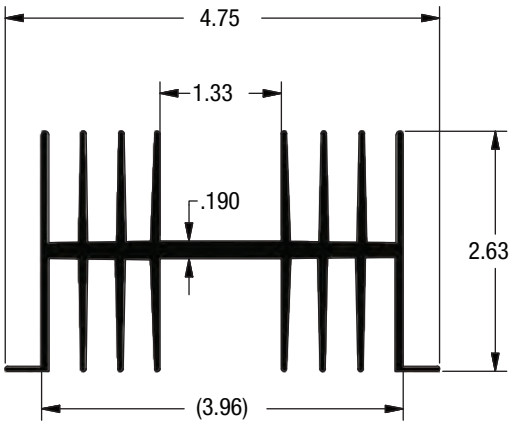
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CHEH0155



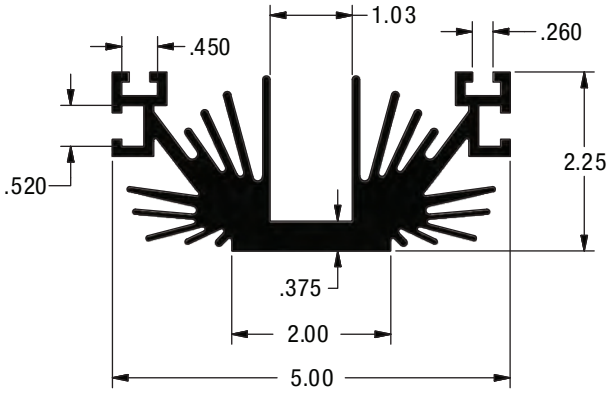
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CHEH0032



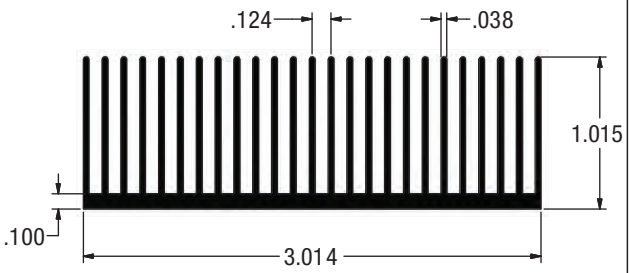
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CHEH13450



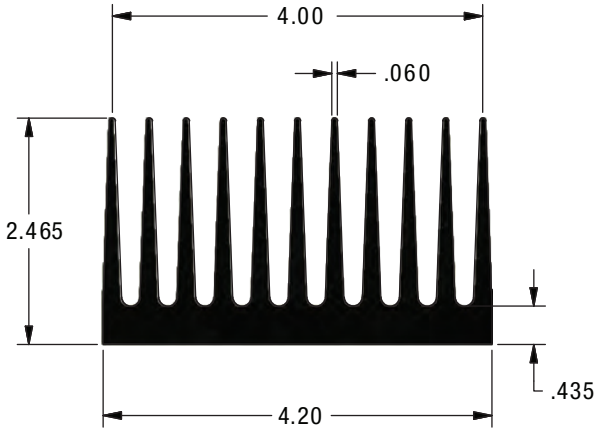
Per. 49.570 IN²/IN Wt. 4.30 LB/FT Θsa 1.400 ˚C/W/3”

CHEH3589



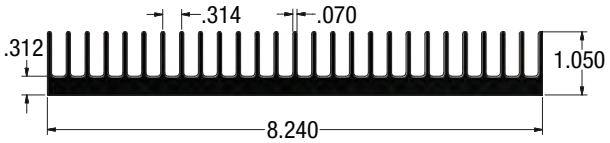
Per. 50.636 IN²/IN Wt. 1.39 LB/FT Θsa 2.300 ˚C/W/3”

CHEH1912



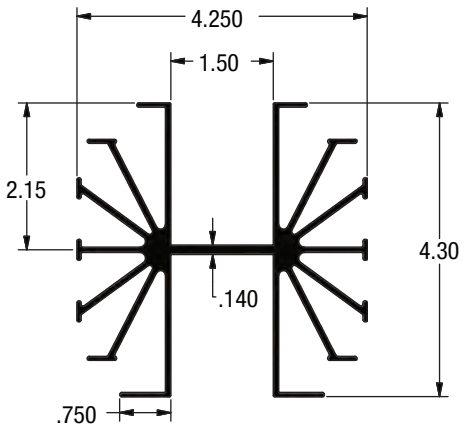
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CHEH0811



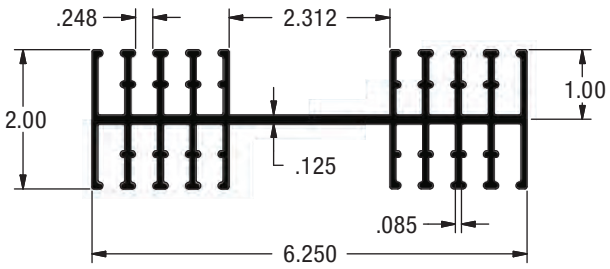
Per. 54.810 IN²/IN Wt. 4.79 LB/FT Θsa 1.000 ˚C/W/3”

CHEH1484



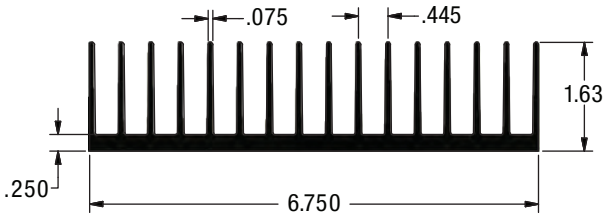
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CHEH3969



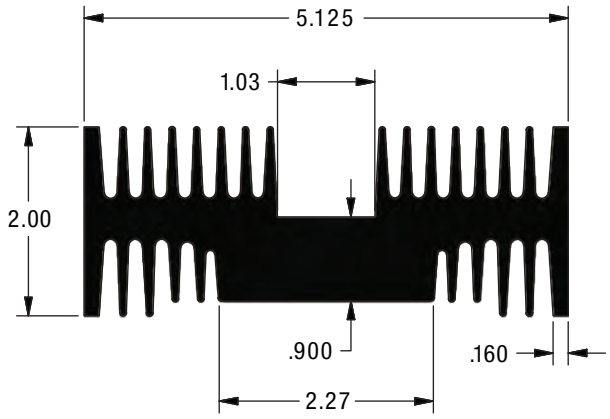
Per. 55.940 IN²/IN Wt. 3.44 LB/FT Θsa 1.400 ˚C/W/3”

CHEH1842



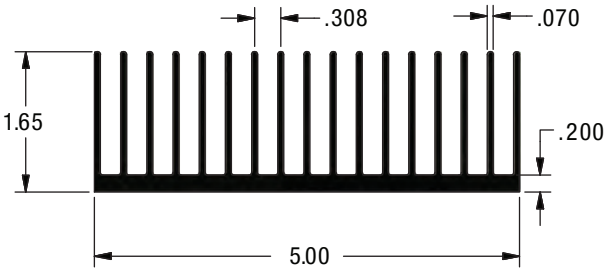
Per. 56.870 IN²/IN Wt. 4.32 LB/FT Θsa 1.000 ˚C/W/3”

CHEHK7



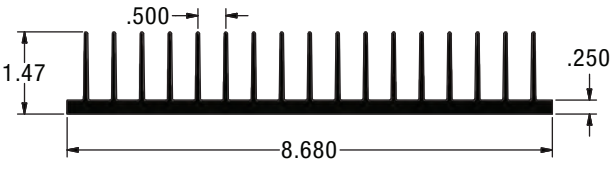
Per. 58.200 IN²/IN Wt. 6.40 LB/FT Θsa 1.200 ˚C/W/3”

CHEH3648



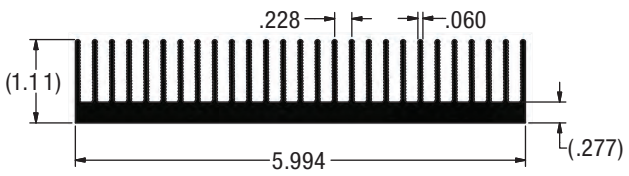
Per. 58.770 IN²/IN Wt. 3.30 LB/FT Θsa 1.000 ˚C/W/3”

CHEH1916



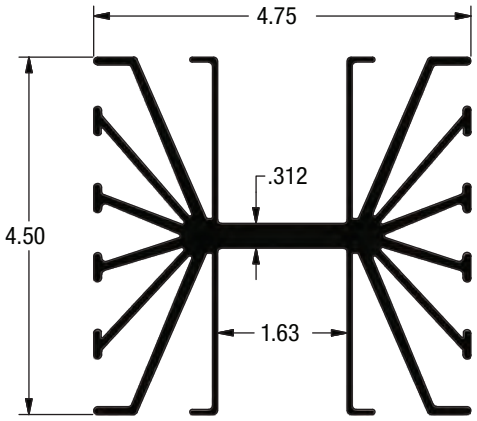
Per. 59.340 IN²/IN Wt. 4.50 LB/FT Θsa 1.000 ˚C/W/3”

CHEH0090



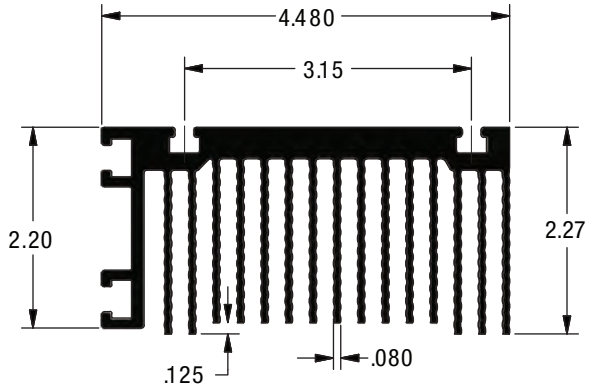
Per. 61.850 IN²/IN Wt. 3.51 LB/FT Θsa 1.220 ˚C/W/3”

CHEH0023



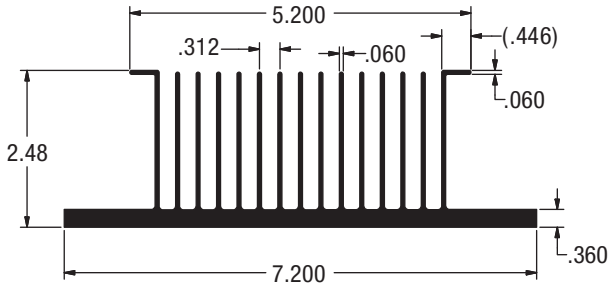
Per. 71.250 IN²/IN Wt. 4.33 LB/FT Θsa 1.000 ˚C/W/3”

CHEH0055



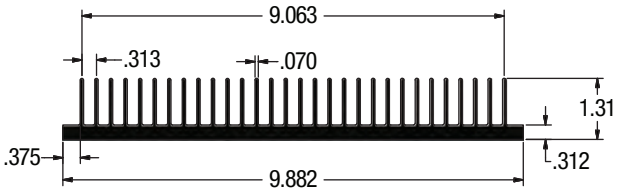
Per. 72.000 IN²/IN Wt. 4.32 LB/FT Θsa 1.050 ˚C/W/3”

CHEH3896



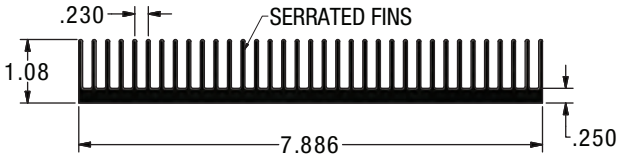
Per. 78.378 IN²/IN Wt. 5.45 LB/FT Θsa 0.970 ˚C/W/3”

CHEH0746



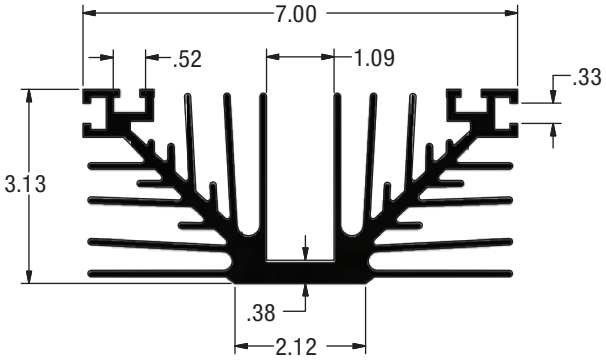
Per. 78.580 IN²/IN Wt. 6.22 LB/FT Θsa 0.900 ˚C/W/3”

CHEH3399



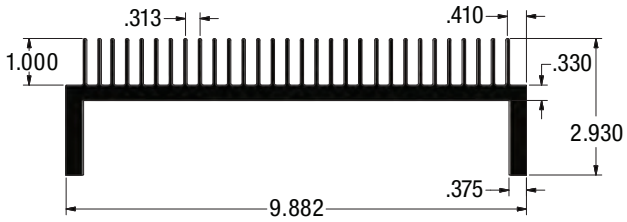
Per. 80.450 IN²/IN Wt. 4.33 LB/FT Θsa 0.900 ˚C/W/3”

CHEH0017



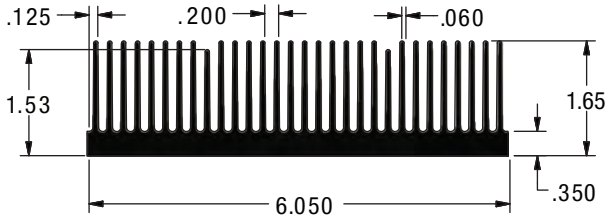
Per. 85.140 IN²/IN Wt. 7.84 LB/FT Θsa 0.800 ˚C/W/3”

CHEH3603



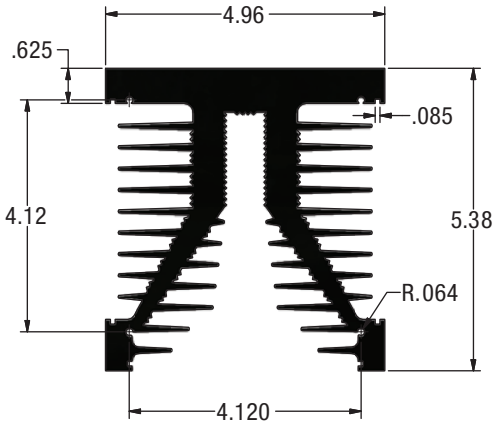
Per. 85.901 IN²/IN Wt. 7.86 LB/FT Θsa 1.300 °C/W/3”

CHEH3286



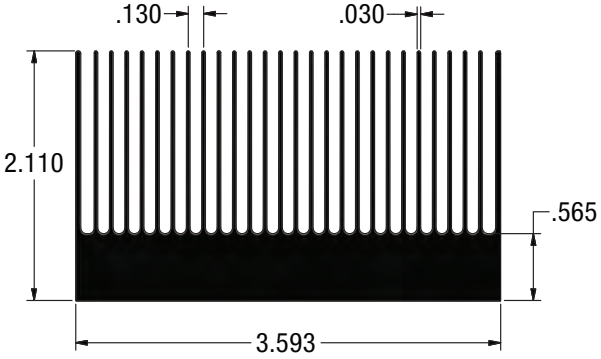
Per. 87.390 IN²/IN Wt. 5.84 LB/FT Θsa 0.800 °C/W/3”

CHEH0073



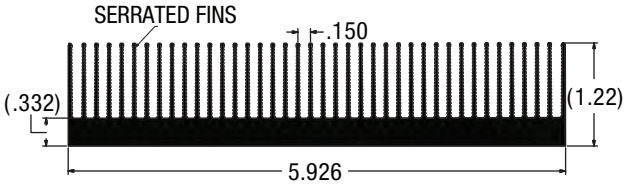
Per. 91.690 IN²/IN Wt. 9.11 LB/FT Θsa 0.820 °C/W/3”

CHEH0130



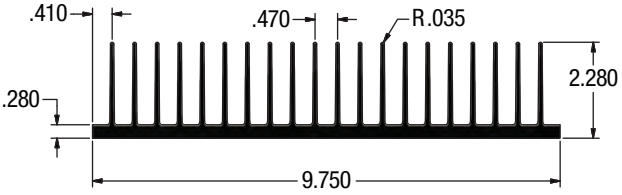
Per. 93.390 IN²/IN Wt. 4.00 LB/FT Θsa 0.810 °C/W/3”

CHEH3598



Per. 94.249 IN²/IN Wt. 4.15 LB/FT Θsa 0.900 °C/W/3”

CHEH3973



Per. 97.846 IN²/IN Wt. 7.55 LB/FT Θsa 0.770 °C/W/3”