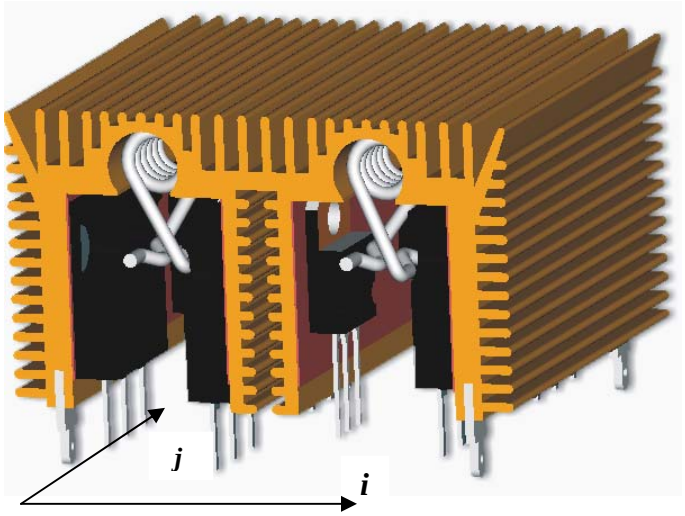
Matrix Clip System™ Heat Sink

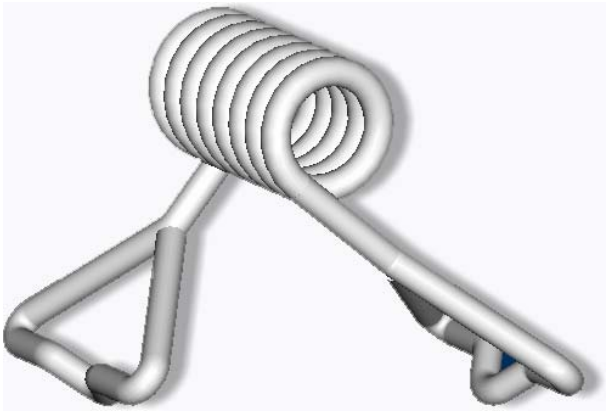


Matrix Clip System Heat Sink w/Power Devices

Design Realization, Inc. offers the patented, high performance, low cost and compact heat sink with matrix clip system. The unitary constructed heat sink can be universally mounted on printed circuit or wiring board to meet the circuit design needs without the requirement to change the air-flow direction. The new heat sink comprises of a base frame with extruded (or brazed or bonded) fins, solderable feet and torsion spring clips. The heat sink's capacity of holding power devices can be increased transversally & longitudinally. The matrix [i, j] with i spring clips along X axis and j along Y axis makes it very easy for designers to configure electronic packaging. ***All-in-One*** solution makes designers be no longer troubled with how to attach devices onto heat sink and how to mount the heat sink assembly onto PCB. Therefore, the time-to-market can be shortened. This heat sink provides easiest assembly, largest surface areas and smallest space occupation. Our ***bonded-fin heat sink*** is developed with military & aerospace grade and performance (fin density up to 20 fins/in.), but sold with commercial price. It is the ideal type of heat sink for high power density and small size (1U or 2U) electronic packaging with forced convention cooling.

Our patented ***pre-distortion coil spring clip*** and ***offset coil spring clip*** provide the uniform pressure on electronic devices or components, highest reliability and repeatability, shock and vibration resistance, minimum air drag and lighter weight. Two spring clips are 100% exchangeable but provide different foot-print for customer's preferences.

Pre-distortion Spring Clip



Offset Spring Clip

The thermal profile of the heat sink and the stress profile of the clip are analyzed with FEA software tool to make the sure the designs are robust.

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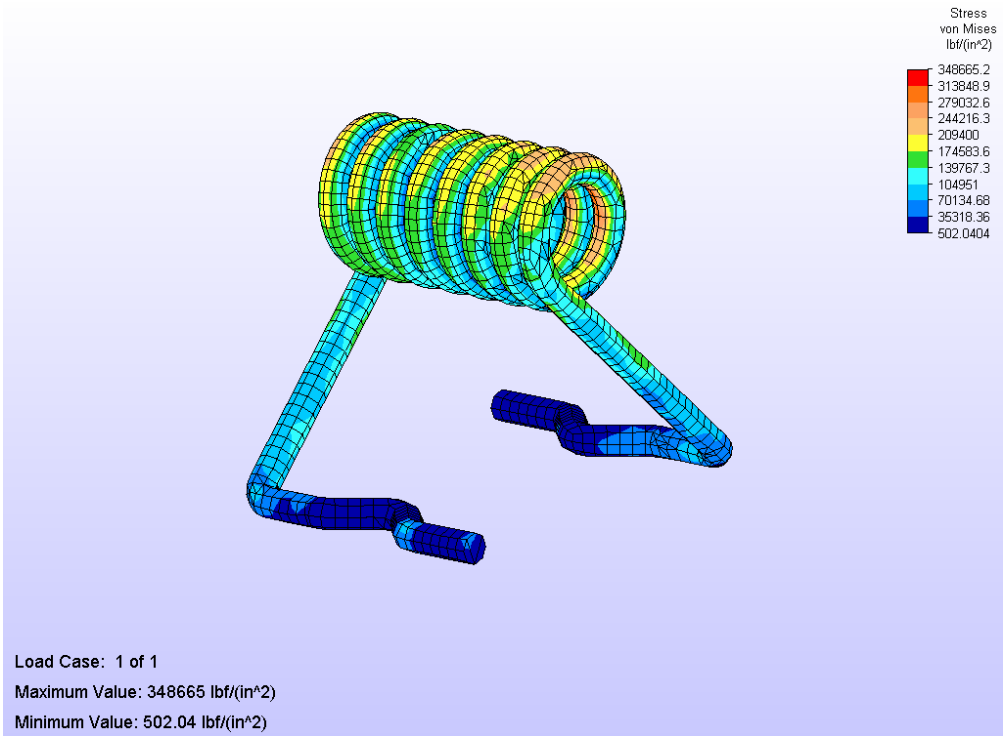
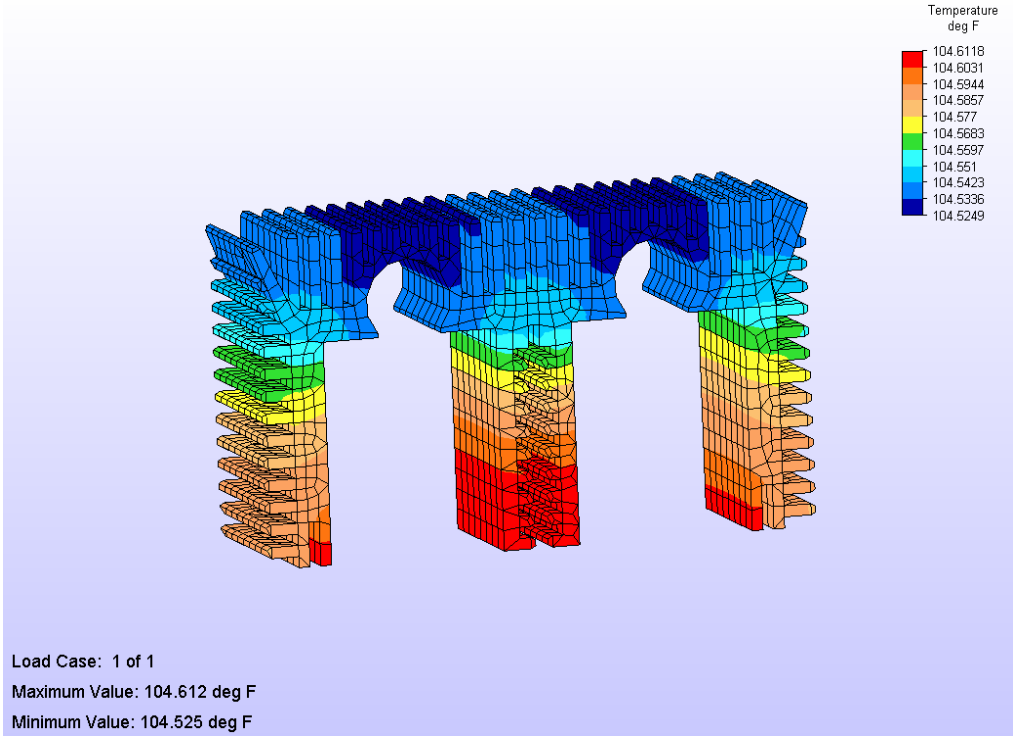


Coil Spring Clip Stress Analysis



Matrix Clip System Heat Sink™ Thermal Analysis

Features and Benefits

- **Minimum assembly cost and labor**
  Spring clips make the mounting holes and fasteners obsolete in assembly.
- **Maximum Repeatability**
  Spring force easy removal and replacement of components
- **Maximum Thermal Transfer**
  Maximum surface area per unit volume, efficient cooling fins and consistent mounting force reduces thermal resistance.
- **Maximum Resistance to Shock & Vibration**
  Spring coil can store and absorb energy. Light weight and resilient spring clip locks electronic component in place to provide maximum resistance to shock and vibration. Pieced solder feet create maximum solder strength.
- **Maximum Reliability**
  Resilient spring action locks electronic component in place. Fewer parts in assembly and no fasteners and washers required. Prevent short circuit by eliminating metal particles generated from hardware or thread tapping.
- **Design Flexibility**
  Provide the maximum flexibility for dynamic device locations and changes, various mounting options, and customizing dimensions to meet the design needs without costly tooling alteration. "***Configure-to-Fit***" gives designers total freedom to configure heat sink needed for their packaging.

Material:

Heat Sink: Aluminum Alloy 6063-T5 or equivalent

Fins: Aluminum Alloy 6063-T5 or equivalent. Copper Alloy C110 or equivalent.

Spring Clip: Music Wire, Per ASTM A228.

Foot: Cold-rolled Steel, Per ASTM A-366, commercial quality, or equivalents.

Insulator (Optional): Sil-Pad 900-S, K6 800-S and K10, or equivalent.

Finish:

Heat Sink: Clear or Yellow Chromate Per Mil-5541-C, or Black Anodize per Mil-8625, Type II, Class 2, or Unfinished

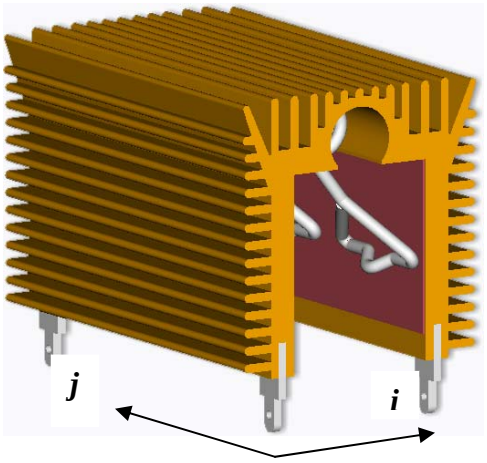
Copper Fin: Bright Tin Plated per Mil-10727 Or unfinished

Spring Clip: Bright Nickel Plated per QQ-N-290-A, Class 1, Grade G.

Foot: Bright Tin Plated per Mil-10727, Over copper strike.

Products Applications and Specifications

100 Series Matrix Clip System™ Heat Sink

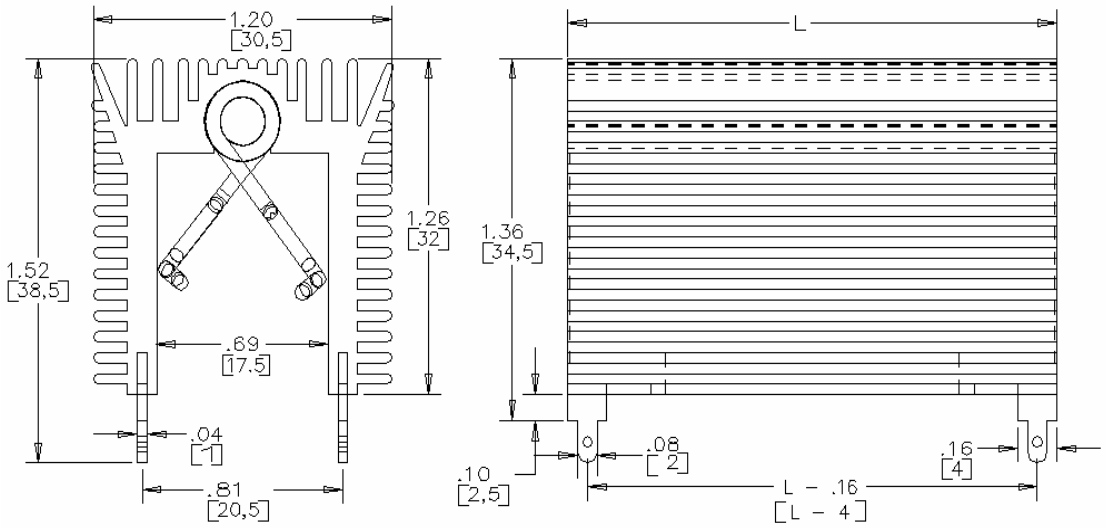


P/N: 102- EA – O - 2.40-YC - I

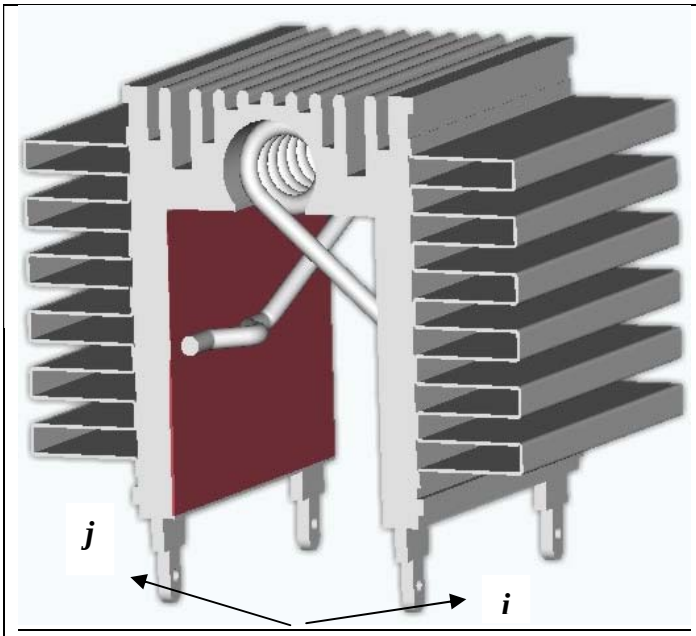
Surface Area (bonded fin) in^2/in (mm^2/mm)	Weight oz/in (g/mm)	Clip Force lb (kg)
18 (460)	.65 (.96)	12.3 (5.9)
Applications	Cooling	Mounting
TO-247, TO-3P TO-220, TO-264 Etc.	Forced or Natural Convection	Thought Hole

NOTE: Customers can specify their own Height and Width of 100 Series M.C. S. Heat Sink.

Mechanical Dimensions in. [mm]



Patent Pending

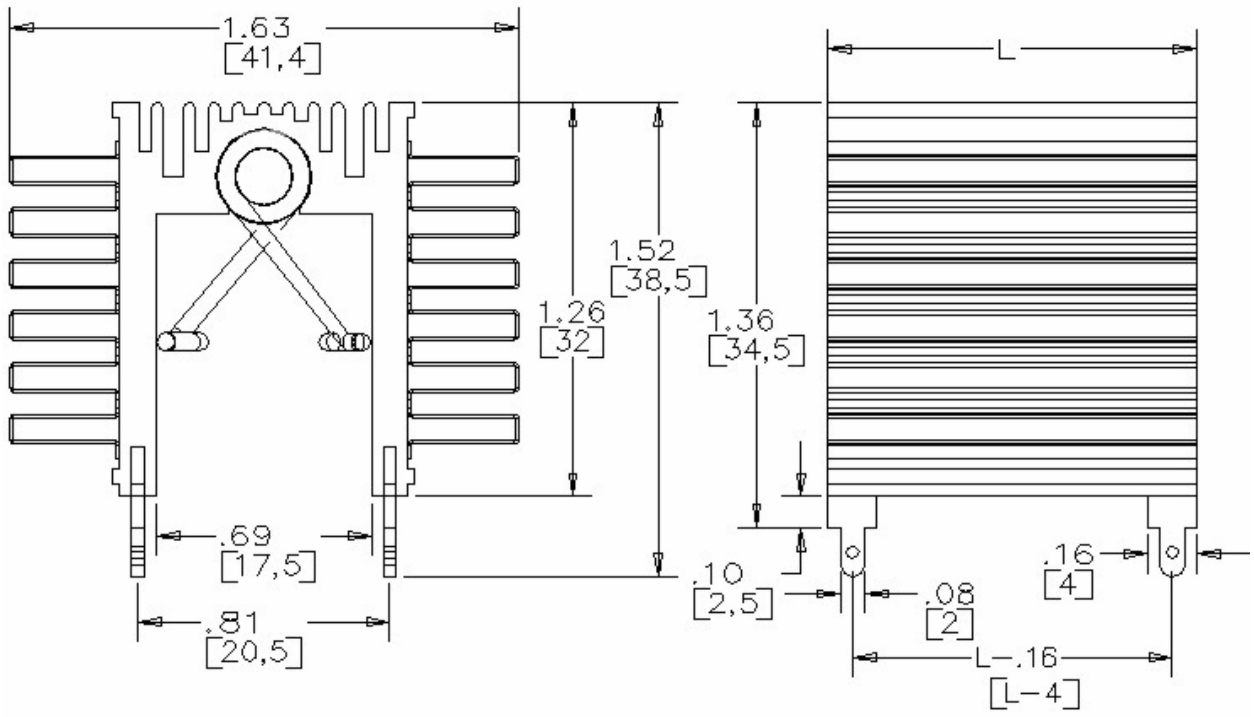


P/N: 102- BA – O - 2.40- N - I

Surface Area (bonded fin) in^2/in (mm^2/mm)	Weight oz/in (g/mm)	Clip Force lb (kg)
27(677)	.65 (.96)	12.3 (5.9)
Applications	Cooling	Mounting
TO-247, TO-3P TO-220, TO-264 Etc.	Forced or Natural Convection	Thought Hole

NOTE: Customers can specify their own Height and Width of 100 Series M.C. S. Heat Sink.

Mechanical Dimensions in. [mm]



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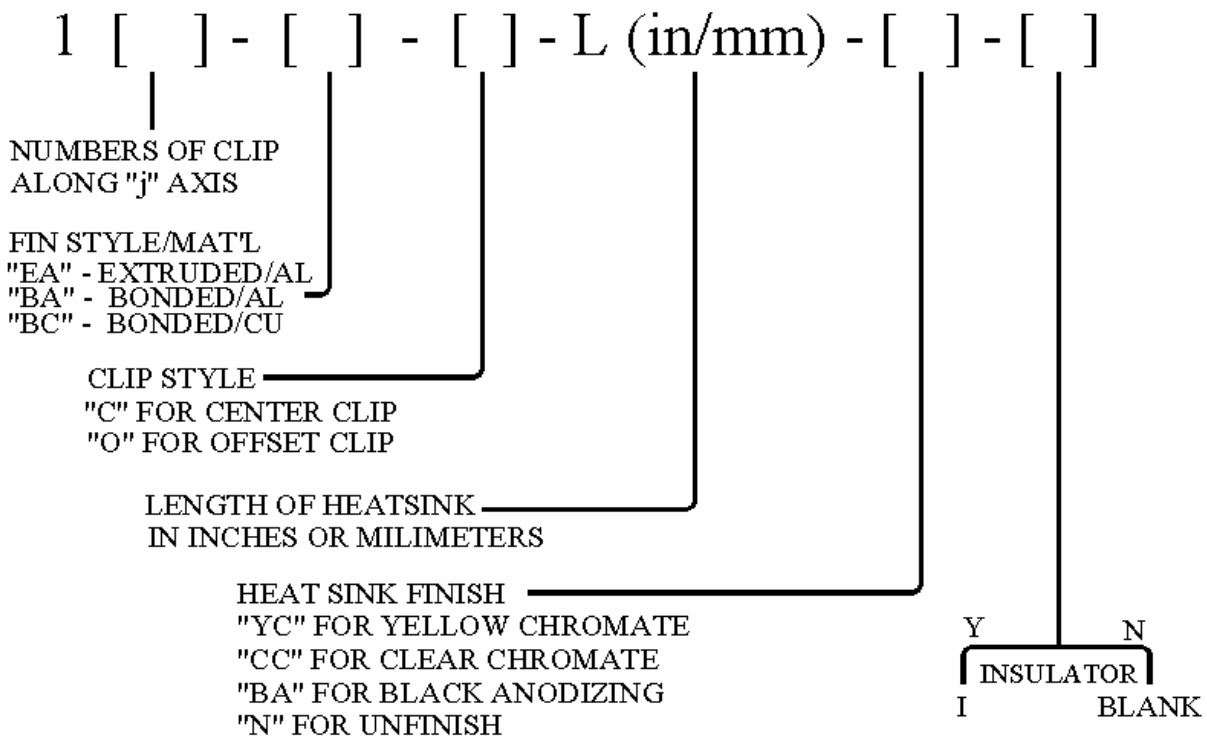
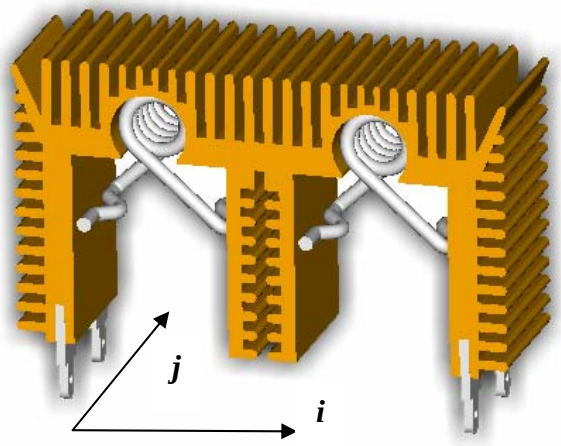
100 Series Matrix Clip System Part Number Specifications



NOTE: Insulator size is 0.91 (23.1) x L-.16 (4.0).

200 Series Matrix Clip System™ Heat Sink

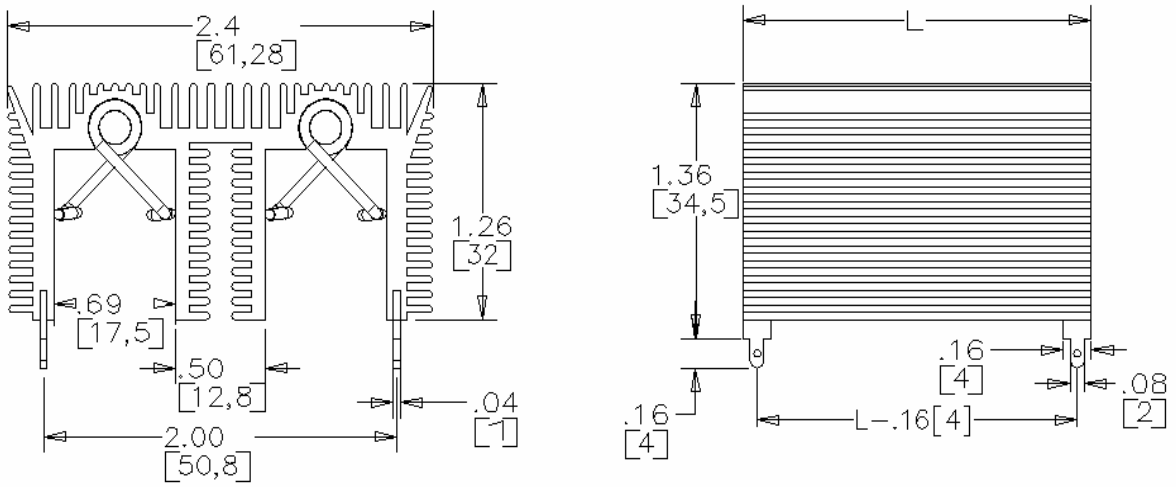


P/N: 201 - EA - C- 1.20 –YC

Surface Area (extruded/bonded fin) $in^2/in(mm^2/mm)$	Weight oz/in(g/mm)	Clip force lb (kg)
30 (771)/57(1443)	1.01 (1.5)	13 (5.9)
Applications	Cooling	Mounting
TO-247, TO-3P TO-220, TO-264 Etc.	Forced or free convective	Thought Hole

NOTE: Customers can specify their own Height and Width of 200 Series M.C.S. Heat Sink.

Mechanical Dimensions in. [mm]



Patent Pending

200 Series Matrix Clip System Part Number Specifications

2 [ ] - [ ] - [ ] - L (in/mm) - [ ] - [ ]

NUMBERS OF CLIP ALONG "j" AXIS

FIN STYLE/MAT'L
"EA" - EXTRUDED/AL
"BA" - BONDED/AL
"BC" - BONDED/CU

CLIP STYLE
"C" FOR CENTER CLIP
"O" FOR OFFSET CLIP

LENGTH OF HEATSINK IN INCHES OR MILIMETERS

HEAT SINK FINISH
"YC" FOR YELLOW CHROMATE
"CC" FOR CLEAR CHROMATE
"BA" FOR BLACK ANODIZING
"N" FOR UNFINISH

Y N
INSULATOR
I BLANK

NOTE: Insulator size is 0.91 (23.1) x L-.16 (4.0).

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"***Configure-to-Fit***" makes it possible for our customers to configure their own Matrix Clip System™ Heat Sink to fit their PWB/PCB layouts and meet their design and thermal requirement without worrying about how to mount the heat sink onto PCB/PWB and how to clip the electronic devices onto heat sink. The configured heat sink will fit your design needs while fitting our matrix clip system. The following numbering system will help you to specify your Matrix Clip System™ Heat Sink part number:

"*Configure-to-Fit*" Part Number Specifications

[ ] - [ ] - [ ]- [ ] -[ ] x [ ] x [ ] (in/mm) - [ ] - [ ]

NUMBERS OF CLIP ALONG "i" & "j" AXIS

FIN STYLE/MATERIAL
"EA" - EXTRUDED/AL
"BA" - BONDED/AL
"BC" - BONDED/CU

CLIP STYLE
"C" FOR CENTER CLIP
"O" FOR OFFSET CLIP

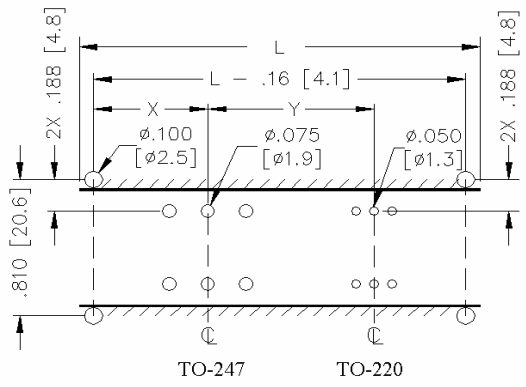
HEATSINK Width x Height x Lenght IN INCHES OR MILIMETERS
SPECIFY AS W1/W2-H1/H2 IF USE STEPPED FINS. W1, H1 UPPER WIDTH AND HEIGTH, W2, H2 LOWER WIDTH AND EHIGHT

HEAT SINK FINISH
"YC" FOR YELLOW CHROMATE
"CC" FOR CLEAR CHROMATE
"BA" FOR BLACK ANODIZING
"N" FOR UNFINISH

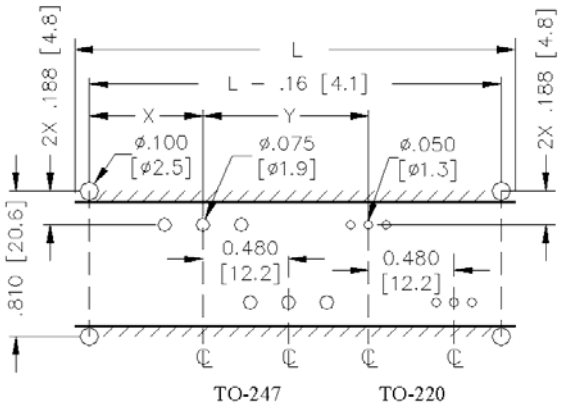
Y N
INSULATOR
I BLANK

NOTES: Insulator size is 0.91 (23.1) x L - .16 (4.0)

Recommended Foot Print for all Matrix Clip System™ Heat Sink

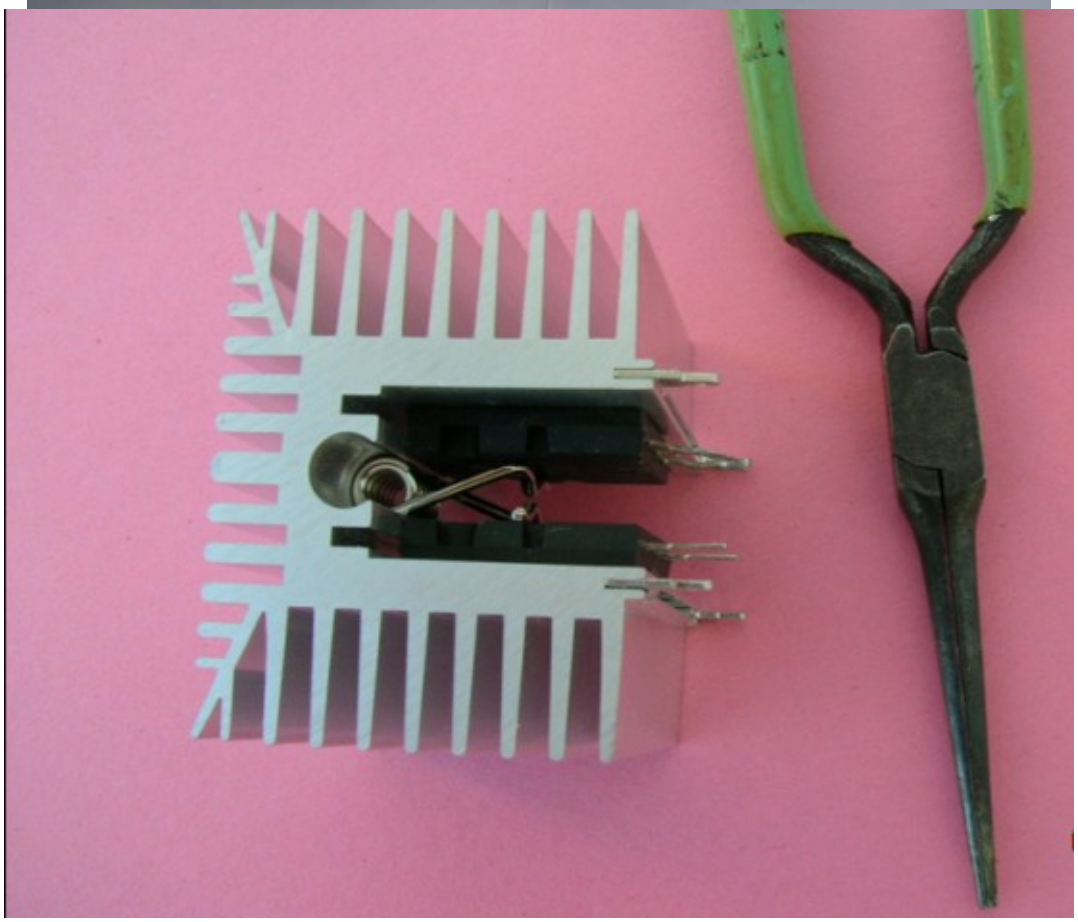


NOTES:
UNIT: INCH [MM]
X, Y DIMs ARE USER DEFINED



NOTES:
UNIT: INCH [MM]
X, Y DIMs ARE USER DEFINED

Use Center Clip & up to .010" thick insulators. Tolerance: +/- .010



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