

## HIGH FIN DENSITY HEAT SINKS FOR POWER MODULES, IGBTs, RELAYS



### 510, 511 & 512 SERIES

| Standard Catalog P/N <sup>(5)</sup> | Milled Base <sup>(1)</sup> | Nonmilled Base <sup>(2)</sup> | Base Width<br>in. (mm) | Length<br>in. (mm) | Height                                                 |                                                           | Thermal Resistance <sup>(5)</sup><br>( $\theta_{sa}$ ) at Typical Load  |                                                                                 |
|-------------------------------------|----------------------------|-------------------------------|------------------------|--------------------|--------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------------------|
|                                     |                            |                               |                        |                    | Milled Base <sup>(1)</sup><br>("M Series")<br>in. (mm) | Nonmilled Base <sup>(2)</sup><br>("U" Series)<br>in. (mm) | Natural<br>Convection <sup>(3)</sup><br>( $^{\circ}\text{C}/\text{W}$ ) | Forced<br>Convection <sup>(4)</sup><br>( $^{\circ}\text{C}/\text{W}$ @ 100 CFM) |
| 510-3M                              | 510-3U                     | 510-3U                        | 7.380 (187.452)        | 3.000 (76.2)       | 3.106 (78.9)                                           | 3.136 (79.7)                                              | 0.56                                                                    | 0.088                                                                           |
| 510-6M                              | 510-6U                     | 510-6U                        | 7.380 (187.452)        | 6.000 (152.4)      | 3.106 (78.9)                                           | 3.136 (79.7)                                              | 0.38                                                                    | 0.070                                                                           |
| 510-9M                              | 510-9U                     | 510-9U                        | 7.380 (187.452)        | 9.000 (228.6)      | 3.106 (78.9)                                           | 3.136 (79.7)                                              | 0.29                                                                    | 0.066                                                                           |
| 510-12M                             | 510-12U                    | 510-12U                       | 7.380 (187.452)        | 12.000 (304.8)     | 3.106 (78.9)                                           | 3.136 (79.7)                                              | 0.24                                                                    | 0.062                                                                           |
| 510-14M                             | 510-14U                    | 510-14U                       | 7.380 (187.452)        | 14.000 (355.6)     | 3.106 (78.9)                                           | 3.136 (79.7)                                              | 0.21                                                                    | 0.059                                                                           |
| 511-3M                              | 511-3U                     | 511-3U                        | 5.210 (132.33)         | 3.000 (76.2)       | 2.350 (59.7)                                           | 2.410 (61.2)                                              | 0.90                                                                    | 0.120                                                                           |
| 511-6M                              | 511-6U                     | 511-6U                        | 5.210 (132.33)         | 6.000 (152.4)      | 2.350 (59.7)                                           | 2.410 (61.2)                                              | 0.65                                                                    | 0.068                                                                           |
| 511-9M                              | 511-9U                     | 511-9U                        | 5.210 (132.33)         | 9.000 (228.6)      | 2.350 (59.7)                                           | 2.410 (61.2)                                              | 0.56                                                                    | 0.060                                                                           |
| 511-12M                             | 511-12U                    | 511-12U                       | 5.210 (132.33)         | 12.000 (304.8)     | 2.350 (59.7)                                           | 2.410 (61.2)                                              | 0.45                                                                    | 0.045                                                                           |
| 512-3M                              | 512-3U                     | 512-3U                        | 7.200 (182.88)         | 3.000 (76.2)       | 2.350 (59.7)                                           | 2.410 (61.2)                                              | 0.90                                                                    | 0.120                                                                           |
| 512-6M                              | 512-6U                     | 512-6U                        | 7.200 (182.88)         | 6.000 (152.4)      | 2.350 (59.7)                                           | 2.410 (61.2)                                              | 0.65                                                                    | 0.068                                                                           |
| 512-9M                              | 512-9U                     | 512-9U                        | 7.200 (182.88)         | 9.000 (228.6)      | 2.350 (59.7)                                           | 2.410 (61.2)                                              | 0.56                                                                    | 0.060                                                                           |
| 512-12M                             | 512-12U                    | 512-12U                       | 7.200 (182.88)         | 12.000 (304.8)     | 2.350 (59.7)                                           | 2.410 (61.2)                                              | 0.45                                                                    | 0.045                                                                           |

**Notes:**

1. Precision-milled base for maximum heat transfer performance (flatness 0.002 in./in.)

2. Nonmilled base flatness: 0.006 in./in.

3. Natural convection heat dissipation for distributed heat sources at 50°C rise.

4. Forced convection heat dissipation for distributed heat sources at 100 cubic feet per minute, shrouded condition.

5. Standard models are provided without finish.

### MECHANICAL DIMENSIONS

#### 510 SERIES

#### 510 Series (Extrusion Profile 5113)

| Series | A           | B            | Flatness                   |
|--------|-------------|--------------|----------------------------|
| 510-U  | 0.216 (5.5) | 3.136 (79.7) | 0.006 in./in. (0.15 mm/mm) |
| 510-M  | 0.165 (4.2) | 3.106 (78.9) | 0.002 in./in. (0.05 mm/mm) |

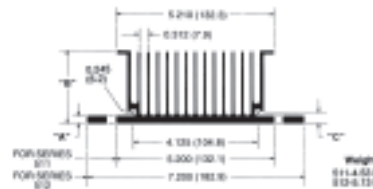
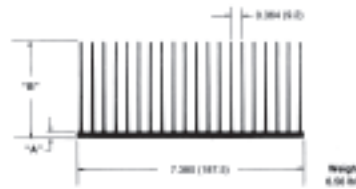
#### 511 AND 512 SERIES

#### 511 Series (Extrusion Profile 6438-1)

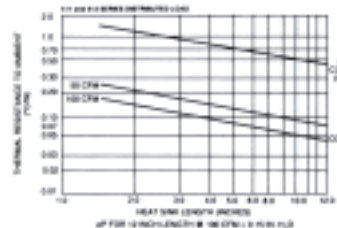
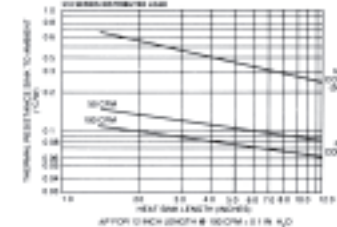
#### 512 Series (Extrusion Profile 6438-2)

| Series      | A           | B            | C           | Flatness                   |
|-------------|-------------|--------------|-------------|----------------------------|
| 511-U 512-U | 0.250 (6.4) | 2.410 (61.2) | 0.372 (9.4) | 0.006 in./in. (0.15 mm/mm) |
| 511-M 512-M | 0.220 (5.6) | 2.350 (59.7) | 0.342 (8.7) | 0.002 in./in. (0.05 mm/mm) |

Dimensions: in. (mm)



### NATURAL AND FORCED CONVECTION CHARACTERISTICS

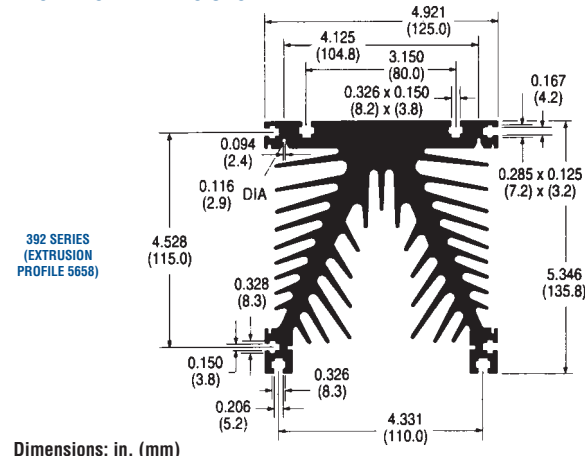


### 392 SERIES

### High Performance Heat Sinks for Power Modules, IGBTs and Solid State Relays

| Standard P/N, Finish |                 | Length<br>in. (mm) | Thermal Resistance at Typical Load                                         |                                                                           | Weight<br>lbs. (grams) |
|----------------------|-----------------|--------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------|
| Black<br>Anodized    | Gold<br>Iridite |                    | Natural<br>Convection ( $\theta_{sa}$ )<br>( $^{\circ}\text{C}/\text{W}$ ) | Forced<br>Convection ( $\theta_{sa}$ )<br>( $^{\circ}\text{C}/\text{W}$ ) |                        |
| 392-120AB            | 392-120AG       | 4.725 (120.0)      | 0.50                                                                       | 0.16 @ 100 CFM                                                            | 4.452 (2019.43)        |
| 392-180AB            | 392-180AG       | 7.087 (180.0)      | 0.43                                                                       | 0.11 @ 100 CFM                                                            | 6.636 (3010.09)        |
| 392-300AB            | 392-300AG       | 11.811 (300.0)     | 0.33                                                                       | 0.08 @ 100 CFM                                                            | 10.420 (4726.51)       |

### MECHANICAL DIMENSIONS



### NATURAL AND FORCED CONVECTION CHARACTERISTICS

