



## Features

- EB welded metal strip
- Very high power
- Excellent long term stability
- Low resistance, low TCR
- Low thermal EMF
- RoHS compliant\* and halogen free\*\*
- AEC-Q200 compliant

## Applications

- Current sensing
- Voltage division
- Battery management systems
- Power modules
- Frequency converters
- Industrial

# Model CSS2H-2512 Series Current Sense Resistor

### Electrical Characteristics

| Characteristic  | Model CSS2H-2512 Series                            |                    |
|---|--|--------------------|
| Resistance Range /<br>Power Rating @70 °C <sup>1</sup> /<br>Power Rating @130 °C <sup>1</sup> | CSS2H-2512C-000 <sup>3</sup>                       | < 0.1 mΩ / 100 A   |
|   | CSS2H-2512R-L300x                                  | 0.3 mΩ / 6 W / 3 W |
|   | CSS2H-2512R-L500x                                  | 0.5 mΩ / 6 W / 3 W |
|   | CSS2H-2512R-1L00x                                  | 1.0 mΩ / 5 W / 3 W |
|   | CSS2H-2512K-1L80x                                  | 1.8 mΩ / 5 W / 3 W |
|   | CSS2H-2512K-2L00x                                  | 2.0 mΩ / 5 W / 3 W |
|   | CSS2H-2512K-2L30x                                  | 2.3 mΩ / 5 W / 3 W |
|   | CSS2H-2512K-3L00x                                  | 3.0 mΩ / 4 W / 2 W |
|   | CSS2H-2512K-3L50x                                  | 3.5 mΩ / 4 W / 2 W |
|   | CSS2H-2512K-4L00x <sup>4</sup>                     | 4.0 mΩ / 3 W / 2 W |
| CSS2H-2512K-5L00x <sup>4</sup>  | 5.0 mΩ / 2.5 W / 1.5 W                             |                    |
| Operating Temperature Range   | -55 to +170 °C                                     |                    |
| TCR - Resistive Alloy <sup>2</sup>  | ±50 PPM/°C (20~60 °C)                              |                    |
| Temperature Coefficient<br>including<br>Copper Terminals                                      | CSS2H-2512R-L300x                                  | ±150 PPM/°C        |
|   | CSS2H-2512R-L500x                                  | ±100 PPM/°C        |
|   | CSS2H-2512R-1L00x                                  | ±75 PPM/°C         |
|   | CSS2H-2512K-1L80x                                  | ±75 PPM/°C         |
|   | CSS2H-2512K-2L00x                                  | ±75 PPM/°C         |
|   | CSS2H-2512K-2L30x                                  | ±75 PPM/°C         |
|   | CSS2H-2512K-3L00x                                  | ±75 PPM/°C         |
|   | CSS2H-2512K-3L50x                                  | ±75 PPM/°C         |
|   | CSS2H-2512K-4L00x <sup>4</sup>                     | ±75 PPM/°C         |
|   | CSS2H-2512K-5L00x <sup>4</sup>                     | ±75 PPM/°C         |
| Inductance  | Material type R: < 2 nH<br>Material type K: < 5 nH |                    |
| Resistance Tolerance  | ±1 %, ±5 %   |                    |

<sup>1</sup> Terminal temperature <sup>2</sup> For full TCR range, refer to TCR curve

<sup>3</sup> Tinned copper <sup>4</sup> CSS2H-2512K-4L00F and -5L00F are available upon request - contact factory

### Environmental Characteristics

| Characteristic               | Test Condition  | ΔR Max.            |
|------------------------------|---|--------------------|
| Thermal Shock                | -55 to +150 °C / 2000 Cycles                          | 0.50 %             |
| Short Time Overload          | 5 Times Rated Power<br>for 5 Second Duration          | 0.50 %             |
| Resistance to Soldering Heat | +260 °C / 10 Seconds                                  | 0.50 %             |
| High Temperature Exposure    | +170 °C / 2000 Hours                                  | 1.00 %             |
| Low Temperature Storage      | -65 °C / 24 Hours                                     | 0.10 %             |
| Biased Humidity Test         | +85 °C, 85 %R.H., 1000 Hours                          | 0.50 %             |
| Moisture Resistance          | 10 Days with Cold Shock, No Load                      | 0.20 %             |
| Mechanical Shock             | 100 g, 6 ms half sine                                 | 0.20 %             |
| Vibration, High Frequency    | 20 g, 10-2000 Hz                                      | 0.20 %             |
| Load Life                    | 2000 Hours, Max. Load,<br>Terminal Temperature 130 °C | 1.00 %             |
| Solderability                | J-STD-002   | 95 % Coverage Min. |
| ESD                          | AEC-Q200-002, 25 kV                                   | 0.25 %             |
| Board Flex                   | 60 Sec. Min. Holding Time                             | 0.25 %             |
| Moisture Sensitivity Level   |   | Level 1            |

### Additional Information

Click these links for more information:



### How to Order

**CSS 2H - 2512 R - L500 J**

Model \_\_\_\_\_

No. of Terminals & Style \_\_\_\_\_

Size \_\_\_\_\_

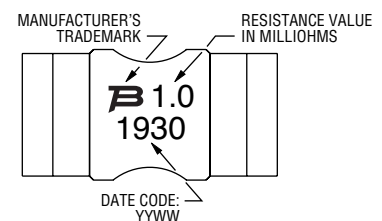
Material Type \_\_\_\_\_  
(See Part Number Table)

Resistance Code (milliohms) \_\_\_\_\_  
"L" represents decimal point  
(examples: L500 = .500 milliohms;  
1L00 = 1.00 milliohms)

Resistance Tolerance \_\_\_\_\_  
F = ±1 %  
J = ±5 %

Packaging size \_\_\_\_\_  
Blank = Standard 13" reel  
E = Mini 7" reel

### Typical Part Marking



**WARNING Cancer and Reproductive Harm**  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

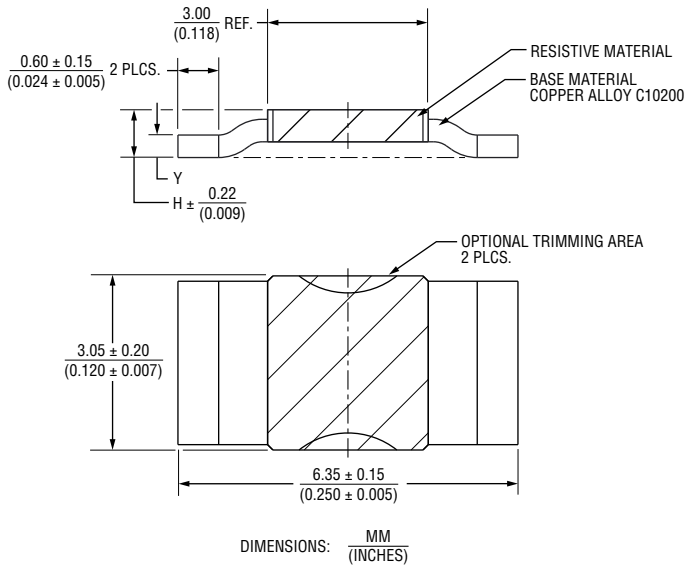
\* RoHS Directive 2015/863, Mar 31, 2015 and Annex.  
\*\* Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

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# Model CSS2H-2512 Series Current Sense Resistor

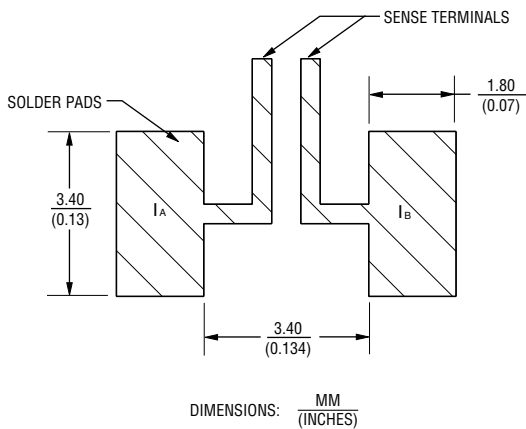
**BOURNS®**

## Product Dimensions

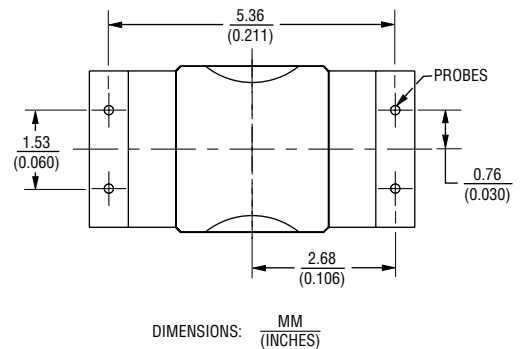


| Part Number                            | Dimension H max.       | Dimension Y max.       | Alloy  |
|--|------------------------|------------------------|--------|
| CSS2H-2512C-000                        | $\frac{0.78}{(0.031)}$ | $\frac{0.43}{(0.017)}$ | Cu/Tin |
| CSS2H-2512R-L300x                      | $\frac{1.65}{(0.065)}$ | $\frac{1.20}{(0.047)}$ | Cu-Mn  |
| CSS2H-2512R-L500x                      | $\frac{1.21}{(0.048)}$ | $\frac{0.86}{(0.034)}$ | Cu-Mn  |
| CSS2H-2512R-1L00x                      | $\frac{0.78}{(0.031)}$ | $\frac{0.43}{(0.017)}$ | Cu-Mn  |
| CSS2H-2512K-1L80x                      | $\frac{1.21}{(0.048)}$ | $\frac{0.73}{(0.029)}$ | Fe-Cr  |
| CSS2H-2512K-2L00x<br>CSS2H-2512K-2L30x | $\frac{1.09}{(0.043)}$ | $\frac{0.73}{(0.029)}$ | Fe-Cr  |
| CSS2H-2512K-3L00x<br>CSS2H-2512K-3L50x | $\frac{0.81}{(0.032)}$ | $\frac{0.45}{(0.018)}$ | Fe-Cr  |
| CSS2H-2512K-4L00x                      | $\frac{0.73}{(0.029)}$ | $\frac{0.43}{(0.017)}$ | Fe-Cr  |
| CSS2H-2512K-5L00x                      | $\frac{0.65}{(0.026)}$ | $\frac{0.43}{(0.017)}$ | Fe-Cr  |

## Recommended Pad Layout



## Recommended Measurements



## Electrical Schematic



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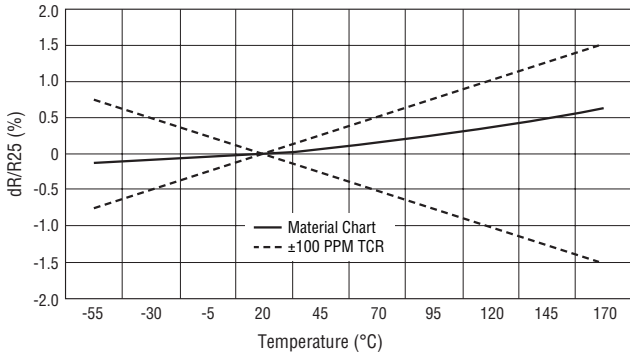
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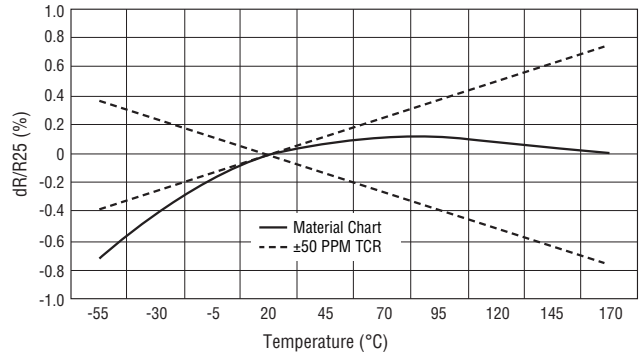


## TCR Curves

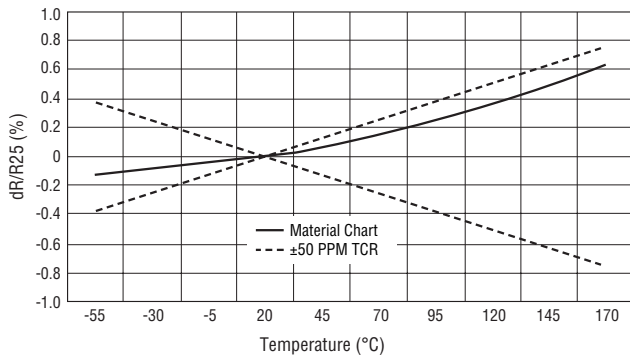
K-Type Resistive Material



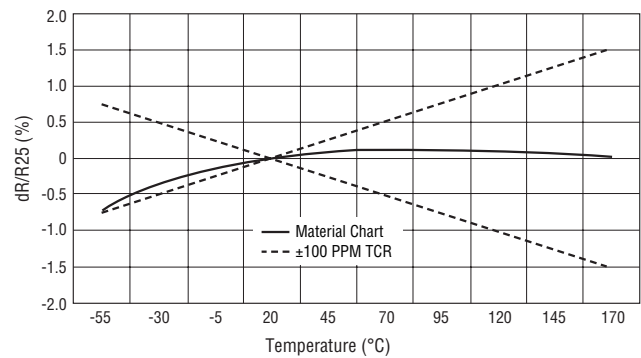
R-Type Resistive Material



K-Type Resistive Material

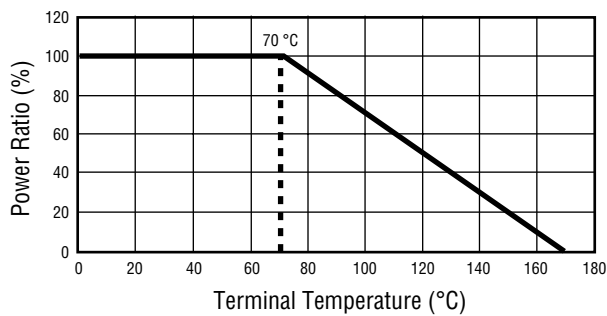


R-Type Resistive Material

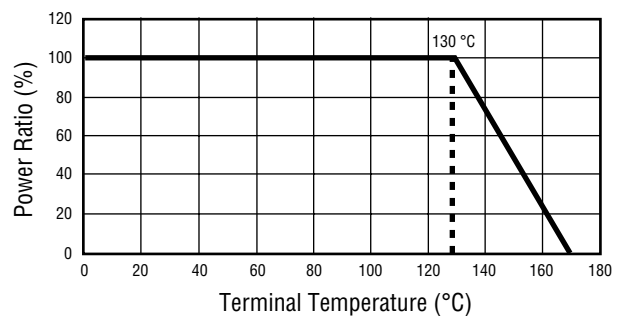


## Power Derating Curves

@70 °C



@130 °C



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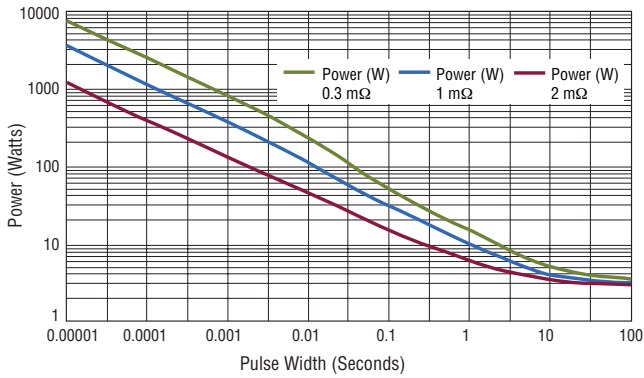
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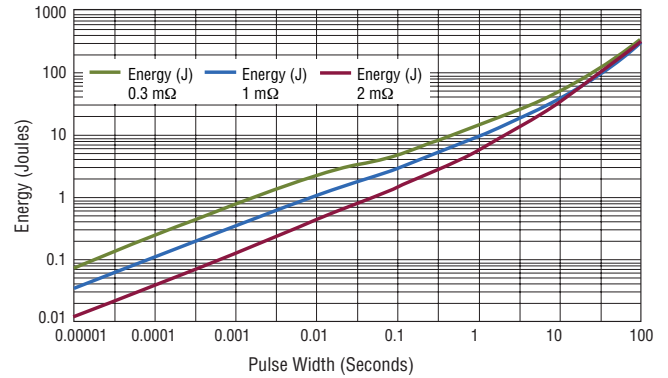
# Model CSS2H-2512 Series Current Sense Resistor



## Maximum Pulse Power



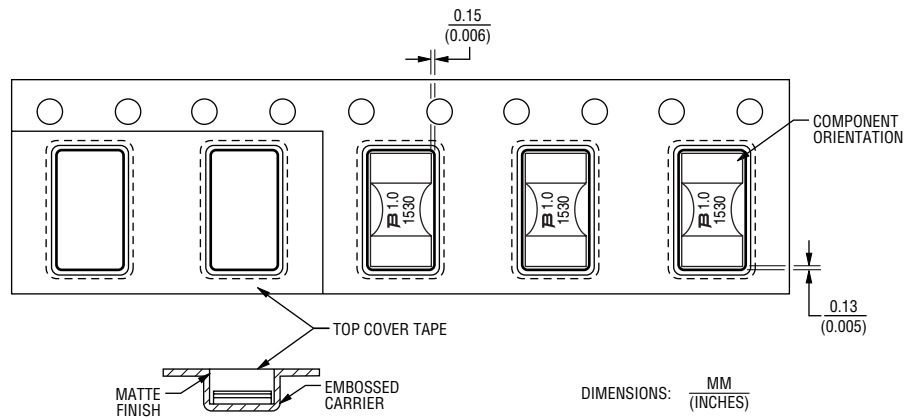
## Maximum Pulse Energy



## Packaging Specifications

Components packaged per EIA-481.

- Standard Reel Size: 13 inches
- Tape Width: 12 mm
- Quantity: 3,000 pcs. per reel
  
- Mini-Reel Size: 7 inches
- Tape Width: 12 mm
- Quantity: 1000 pcs. per reel



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