



Features

- EB welded metal strip
- High power up to 5 W
- Excellent long term stability
- Four terminals for high accuracy
- RoHS compliant* and halogen free**
- AEC-Q200 compliant

Applications

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

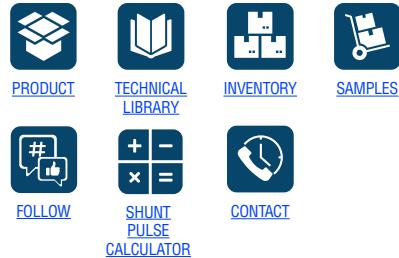
Model CSS4C-1216 Current Sense Resistor

Specifications

| Characteristic | Model CSS4C- | | |
|-----------------------|--------------|--------------|------------|
| | 1216T-L300 | 1216T-L500 | 1216C-1L00 |
| Power Rating @ 100 °C | 5 W | 5 W | 3 W |
| Resistance Range | 0.3 mΩ | 0.5 mΩ | 1 mΩ |
| TCR (20~60 °C) | ±100 PPM/°C | ±50 PPM/°C | ±50 PPM/°C |
| Tolerance | ±1 % / ±5 % | | |
| Inductance | | <2 nH | |
| Max. Working Voltage | | V = √(P x R) | |

Additional Information

Click these links for more information:



Environmental Characteristics

Operating Temperature

..... -65 °C to +170 °C

Storage Conditions

Temperature +5 °C to +35 °C

Humidity 40 % to 75 %

Moisture Sensitivity Level 1

Performance Characteristics

| Test | Conditions | Test Condition | |
|------------------------------|--------------------------------------------|--------------------------------------------------|--------------------|
| | | Reference | Limit |
| Short Time Overload | 5X rated power for 5 sec. | IEC 60115-1 4.13 | ΔR < ±0.5 % |
| Low Temperature Storage | -65 °C for 24 hrs. | IEC 60115-1-4.23.4 JIS-C5201-4.23.4 | ΔR < ±1 % |
| High Temperature Exposure | 1000 hours @ +170 °C | AEC-Q200-REV E-Test 3 MIL-STD202 Method 108 | ΔR < ±1 % |
| Temperature Cycling | 1000 cycles (-55 °C to +150 °C) | AEC-Q200-REV E-Test 4 JESD22 Method JA-104 | ΔR < ±0.5 % |
| Bias Humidity | + 85 °C, 85 % RH, 10 % bias, 1000 hours | AEC-Q200-REV E-Test 7 MIL-STD-202 Method 103 | ΔR < ±0.5 % |
| Mechanical Shock | 100 g for 6 ms, half sine shock pulse | AEC-Q200-REV E-Test 13 MIL-STD-202 Method 213 | ΔR < ±0.2 % |
| Vibration | 5 g's for 20 min, 10-2 kHz 12 cycles | AEC-Q200-REV E-Test 14 MIL-STD-202 Method 204 | ΔR < ±0.2 % |
| Operational Life | 1000 hours at rated power at +125 °C | AEC-Q200-REV E-Test 8 MIL-STD-202 Method 108 | ΔR < ±1 % |
| Resistance to Soldering Heat | +260 ±5 °C, 10 ±1 second dwell | AEC-Q200-REV E-Test 15 MIL-STD-202 Method 210 | ΔR < ±0.5 % |
| Solderability | 235 ±3 °C dipping time: 3 ±0.5 seconds | AEC-Q200-REV E-Test 18 J-STD-002 | >95 % tin coverage |



CALIFORNIA WARNING: Can expose you to lead, a carcinogen and reproductive toxicant.

See 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.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

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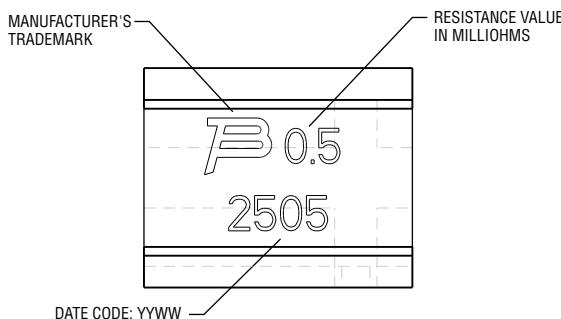
BOURNS®

How To Order

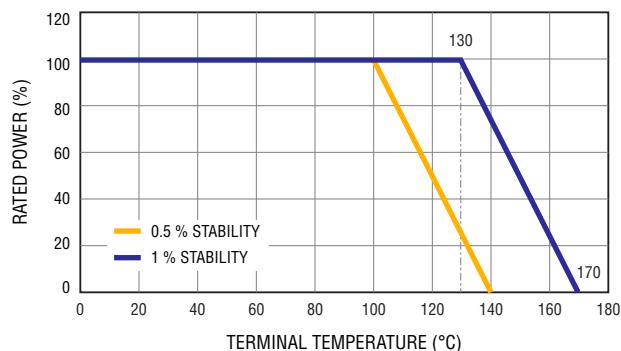
CSS 4C - 1216 T - L500 F

Model _____
 CSS = Current Sense Shunt
 Number of Terminals and Style _____
 4C = 4 terminals
 Package Size _____
 1216 = 1216 in. (3038 mm)
 Material _____
 T = Copper Manganese Tin Alloy
 C = Copper Manganese Alloy
 Resistance Value _____
 "L" represents decimal point in $\text{m}\Omega$
 (example: L500 = 0.0005 Ω , 1L00 = 0.001 Ω)
 Resistance Tolerance _____
 F = $\pm 1\%$
 J = $\pm 5\%$
 Packaging Type _____
 (blank) = 3,000 pcs. / 13-inch reel

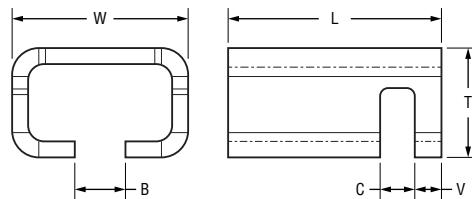
Typical Part Marking



Derating Curve



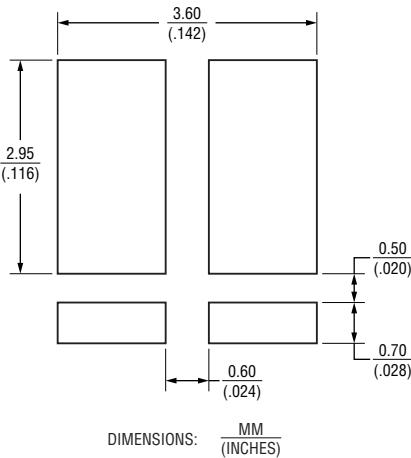
Product Dimensions



| Dim. | Model CSS4C- | | |
|------|---------------------------------------|----------------------------------------|------------|
| | 1216T-L300 | 1216T-L500 | 1216C-1L00 |
| L | | 3.80 ± 0.20 (.150 \pm .008) | |
| W | | 3.10 ± 0.20 (.122 \pm .008) | |
| T | $2.0 +0/-0.35$ (.079 $+0/-0.014$) | $1.90 +0/-0.35$ (.075 $+0/-0.014$) | |
| B | | 0.85 ± 0.20 (.033 \pm .008) | |
| V | | 0.50 ± 0.10 (.020 \pm .004) | |
| C | | 0.60 ± 0.15 (.024 \pm .006) | |

DIMENSIONS: $\frac{\text{MM}}{(\text{INCHES})}$

Recommended Layout



DIMENSIONS: $\frac{\text{MM}}{(\text{INCHES})}$

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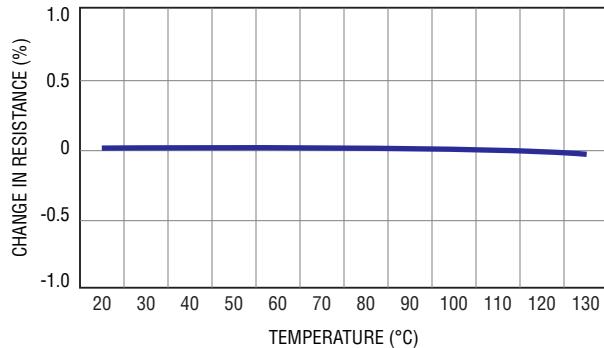
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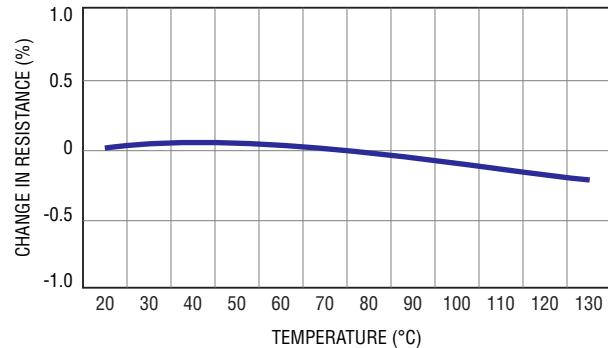
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TCR Curve

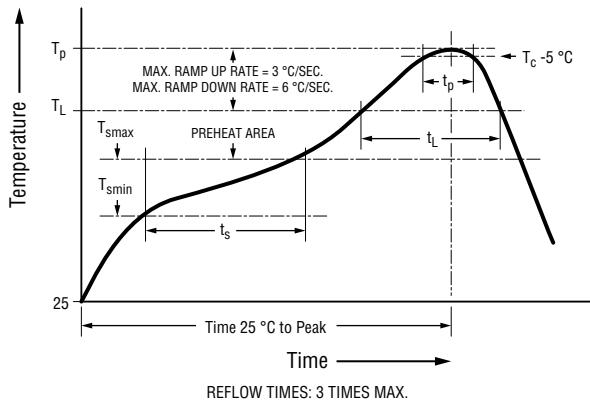
COPPER MANGANESE TIN ALLOY



COPPER MANGANESE ALLOY



Soldering Profile



| Profile Feature | Pb Free Assembly |
|--------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Preheat | 150 °C 200 °C 60-120 seconds |
| - Temperature Min. (T_{smin}) - Temperature Max. (T_{smax}) - Time (t_s) from T_{smin} to T_{smax} | |
| Ramp-up Rate (T_L to T_p) | 3 °C/second max. |
| Liquidous temperature (T_L) Time (t_L) maintained above T_L | 217 °C 60-150 seconds |
| Peak package body temperature (T_p) | 260 °C |
| Time (t_p) at $T_c - 5$ °C (T_p should be equal to or less than T_c) | 30 seconds* |
| Ramp-Down Rate (T_p to T_L) | 6 °C/second max. |
| Time 25 °C to Peak Temperature | 8 minutes max. |

*Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum

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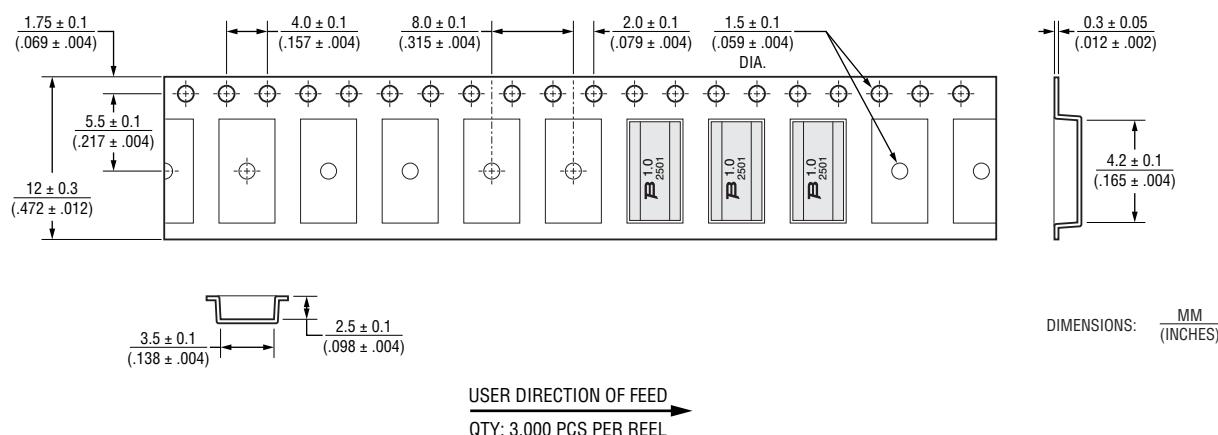
Packaging Specifications

Components packaged on plastic tape & reel per DIN EN 60286-3.

Standard Reel Size: 13 inches

Tape Width: 12 mm

Quantity: 3,000 pcs. per reel



BOURNS®

Americas: Tel: +1 951-781-5500 • Email: americanus@bourns.com

Mexico: Tel: +52-614-478-0400 • Email: mexicus@bourns.com

Asia: Tel: +886 2-2562-4117 • Email: asiacus@bourns.com

EMEA: Tel: +36 88 885 877 • Email: euocus@bourns.com

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