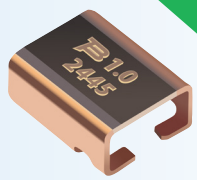
BOURNS®

AUTOMOTIVE GRADE

CSS4C-1216 SERIES

Current Sense Resistor



*RoHS COMPLIANT / **HALOGEN FREE & AEC-Q200 COMPLIANT

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
- Battery management systems
- Power modules
- Frequency converters
- Industrial

Sustainability

- Energy-saving low-power design
- High efficiency, low power loss
- Small size reduces material use

Product Overview

The CSS4C-1216 Series features an EB welded metal strip design that delivers excellent long-term stability, low inductance (< 2 nH), and high accuracy using a four-terminal Kelvin configuration. With power ratings up to 5 W, resistance values from 0.2 mΩ to 3 mΩ, and TCR as low as ±50 ppm/°C, this series enables improved efficiency and precise current measurement while maintaining AEC-Q200 compliance and robust performance in demanding automotive and industrial environments. It provides increased flexibility for designers in high-current applications such as battery management systems, power modules, and industrial electronics.

Electrical Characteristics

Characteristic	Model CSS4C-	Value
Resistance Range / Power Rating @ 100 °C	1216T-L200	0.2 mΩ / 5 W
	1216T-L300	0.3 mΩ / 5 W
	1216T-L400	0.4 mΩ / 5 W
	1216T-L500	0.5 mΩ / 5 W
	1216C-L750	0.75 mΩ / 4 W
	1216C-1L00	1.0 mΩ / 3 W
	1216A/N-2L00	2.0 mΩ / 2 W
	1216A-3L00	3.0 mΩ / 2 W
TCR (20~60 °C)	1216T-L200	±150 PPM/°C
	1216T-L300	±100 PPM/°C
	1216T-L400	±100 PPM/°C
	1216T-L500	±50 PPM/°C
	1216C-L750	±50 PPM/°C
	1216C-1L00	±50 PPM/°C
	1216A/N-2L00	±50 PPM/°C
	1216A-3L00	±50 PPM/°C
Tolerance	±1 % / ±3 % / ±5 %	
Inductance	< 2 nH	
Maximum Working Voltage	V = √(P x R)	

Environmental Characteristics

Specification	Value
Operating Temperature	-65 °C to +170 °C
Storage Conditions Temperature Humidity	 +5 °C ~ +35 °C 40 % ~ 75 %
Moisture Sensitivity Level	1

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
A = FeCrAl Alloy
N = NiCr Alloy

Resistance Value
"L" represents decimal point in mΩ
(example: L500 = 0.0005 Ω, 1L00 = 0.001 Ω)

Resistance Tolerance
F = ±1 %
H = ±3 %
J = ±5 %

Packaging Type
(blank) = 3,000 pcs. / 13-inch reel

Contact Information

www.bourns.com	Phone	Email
Asia-Pacific	+886-2 2562-4117	asiacus@bourns.com
Europe	+36 88 885 877	eurocus@bourns.com
Mexico	+52 614 478 0400	mexicus@bourns.com
The Americas	+1-951 781-5500	americus@bourns.com

* 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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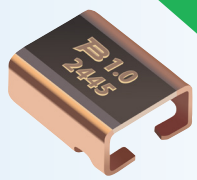
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Current Sense Resistor

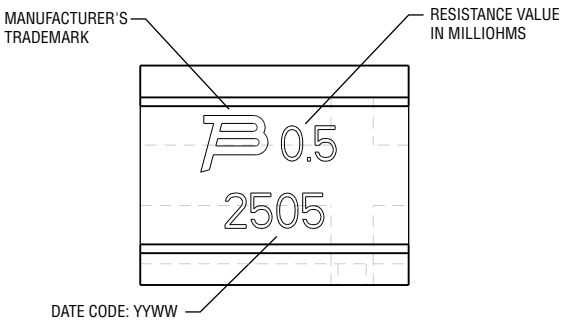


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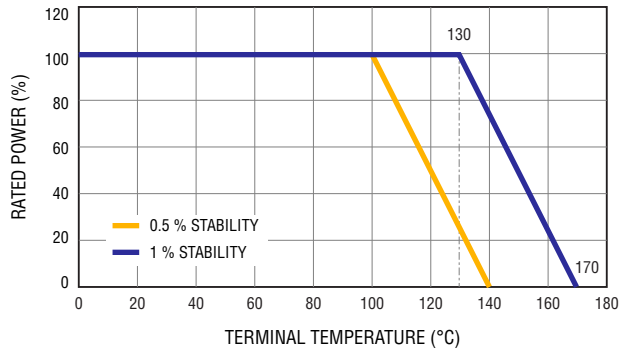
Performance Characteristics

Test	Conditions	Test Condition Reference	Limit
High Temperature Exposure	1000 hrs. @ T=170 °C Unpowered	AEC-Q200-REV E-Test 3 MIL-STD202 Method 108	ΔR < ±1 %
Temperature Cycling	-55 °C to 150 °C, 1000 Cycles, 30 minutes at each extreme	AEC-Q200-REV E-Test 4 JESD22 Method JA-104	ΔR < ±0.5 %
Biased Humidity	+85 °C & 85 % RH with 10 % operating power, 1000 hours	AEC-Q200-REV E-Test 7 MIL-STD-202 Method 103	ΔR < ±0.5 %
Operational Life	1000 hours at rated power at +125 °C	AEC-Q200-REV E-Test 8 MIL-STD-202 Method 108	ΔR < ±1 %
External Visual	Visual inspection	MIL-STD-883 Method 2009	Visual
Physical Dimension	Dimensional inspection as per SBCL specifications	JESD22 Method JB-100	Shall confirm within tolerance limits
Resistance to Solvents	Clean with aqueous chemical	MIL-STD-202 Method 215	Marking shall be legible
Mechanical Shock	100 g for 6 ms, Half sine shock pulse	AEC-Q200-REV E-Test 13 MIL-STD-202 Method 204	ΔR < ±0.2 %
Vibration	5 g for 20 minutes, 12 cycles each of 3 orientations. 10-2000 Hz	AEC-Q200-REV E-Test 14 MIL-STD-202 Method 108	ΔR < ±0.2 %
Resistance to Soldering Heat	Solder temperature: 260 °C, Time: 10 seconds ±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 % Coverage @ 10x Magnification
Electrical Characterization	Resistance as defined	User spec.	Shall confirm within tolerance limits
Short Time Overload	5x Rated power for 5 seconds	IEC 60115-1 4.13	ΔR < ±0.5 %
Low Temperature Storage	-65 °C for 24 hours	IEC 60115-1-4.23.4 JIS-C5201-4.23.4	ΔR < ±0.1 %

Typical Part Marking



Power Derating Curve



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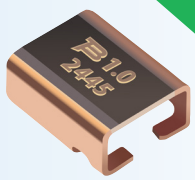
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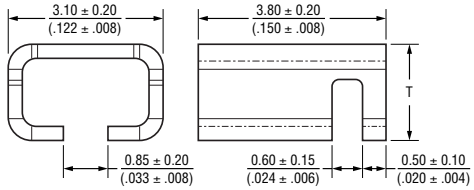
CSS4C-1216 SERIES

Current Sense Resistor



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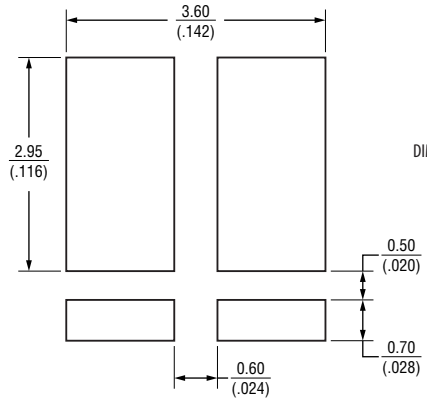
Product Dimensions



DIMENSIONS: MM / (INCHES)

Model CSS4C-	Dimensions (Max.) T	Alloy
1216T-L200	2.40 ± 0.35 (.094 ± .014)	Copper Manganese Tin
1216T-L300	2.00 ± 0.35 (.079 ± .014)	
1216T-L400	1.90 ± 0.35 (.075 ± .014)	
1216T-L500		
1216C-L750		Copper Manganese Alloy
1216C-1L00	1.70 ± 0.35 (.067 ± .014)	
1216A-2L00	1.90 ± 0.35 (.075 ± .014)	FeCrAl Alloy
1216N-2L00		NiCr Alloy
1216A-3L00	1.70 ± 0.35 (.067 ± .014)	FeCrAl Alloy

Recommended Layout



DIMENSIONS: MM / (INCHES)

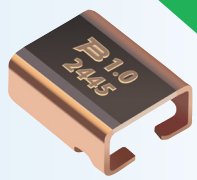
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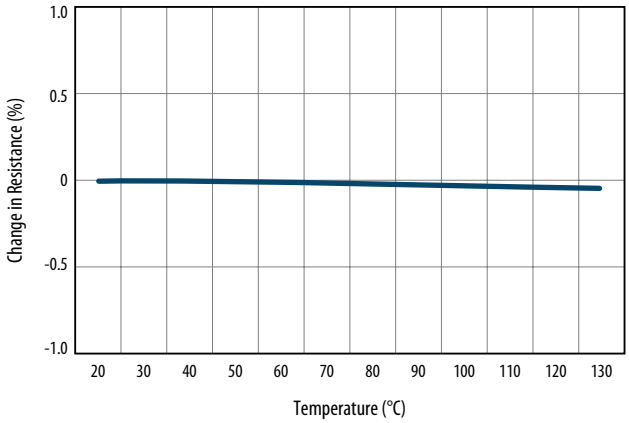
Current Sense Resistor



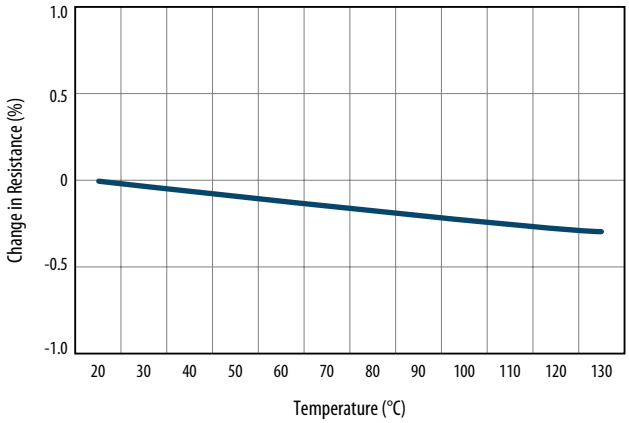
*RoHS COMPLIANT / **HALOGEN FREE & AEC-Q200 COMPLIANT

TCR Curves

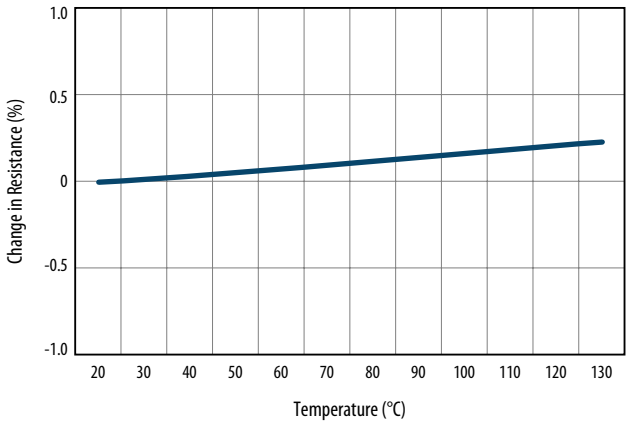
Typical Resistance Drift – Resistance Alloy -T



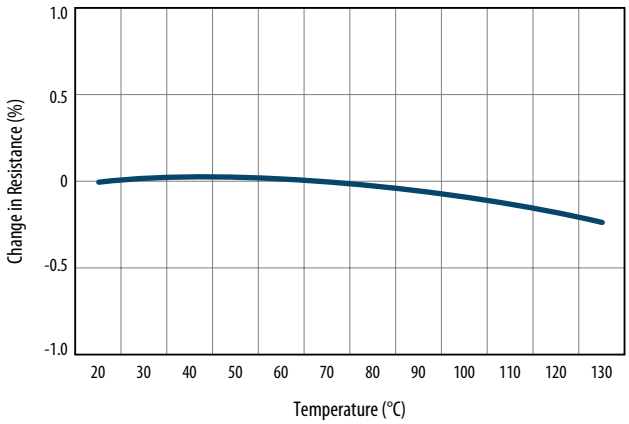
Typical Resistance Drift – Resistance Alloy -A



Typical Resistance Drift – Resistance Alloy -N



Typical Resistance Drift – Resistance Alloy -C



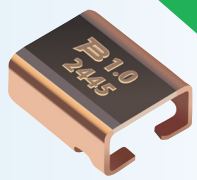
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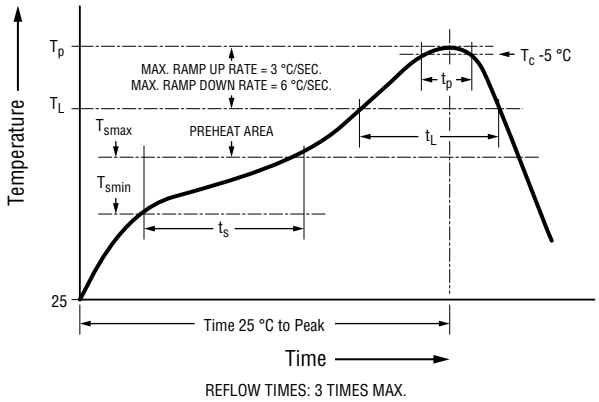
CSS4C-1216 SERIES

Current Sense Resistor



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Soldering Profile



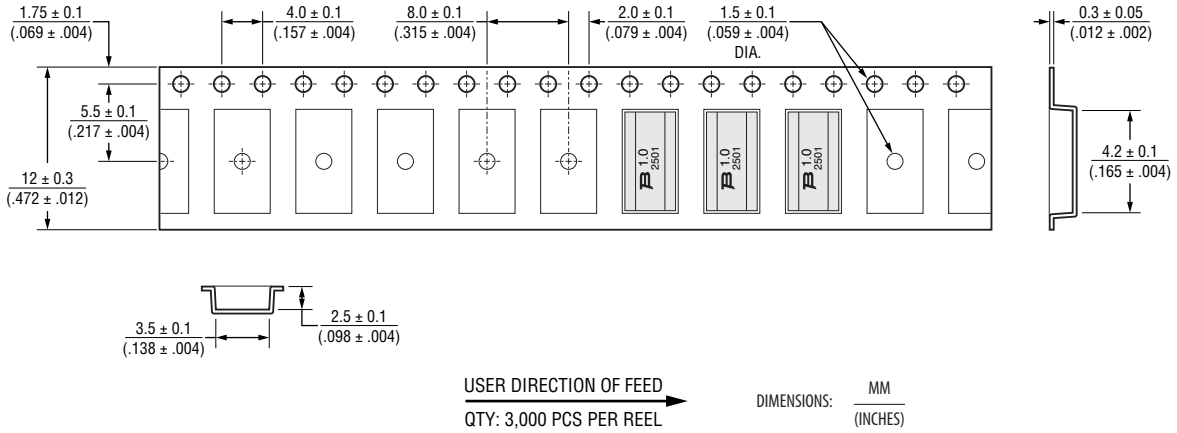
REFLOW TIMES: 3 TIMES MAX.

Profile Feature	Pb Free Assembly
Preheat - Temperature Min. (T_{smin}) - Temperature Max. (T_{smax}) - Time (t_s) from T_{smin} to T_{smax}	 150 °C 200 °C 60-120 seconds
Ramp-up Rate (T_L to T_p)	3 °C/second max.
Liquidus 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.

Packaging Dimensions

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



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