Features:

- 1, 3 and 5 watts
- ±1%, ±2% or ±5% tolerance
- Best available TCR = 20ppm/ºC
- Low inductance versions available for high frequency applications
- All welded construction
- Flameproof
- Non-inductive (10 nH max)
- Solderable copper leads (60/40)
- High current handling to 70 amps
- RoHS compliant / lead-free

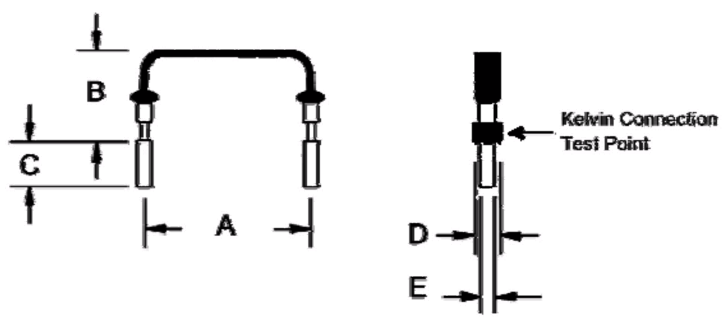
Applications:

- Current sensing
- Feedback
- Low inductance
- Surge and pulse

Electrical Specifications			
Type / Code	Power Rating (Watts) at 85ºC	Ohmic Range (Ω) and Tolerance (1)	
		1%	2%, 5%
BR1	1 W	0.005 - 0.1	0.005 - 0.1
BR3	3 W	0.005 - 0.1	0.005 - 0.1
BR5	5 W	0.005 - 0.05	0.005 - 0.05

(1) Contact factory for resistance values below 0.005Ω

Please refer to the High Power Resistor Application Note (page 3) for more information on designing and implementing high power resistor types.



Mechanical Specifications						
Type / Code	A	B	C	D	E	Unit
BR1	0.45 + 0.04/-0.02 11.43 + 1.02/-0.508	0.2 ± 0.1 5.08 ± 2.54	0.125 ± 0.03 3.18 ± 0.762	0.065 + 0.01/-0.005 1.65 + 0.254/-0.127	0.04 ± 0.002 1.02 ± 0.051	inches mm
BR3	0.6 + 0.04/-0.02 15.3 + 1.02/-0.508	0.6 Typ - 1 Max 15.3 Typ - 25.4 Max	0.125 ± 0.03 3.18 ± 0.762	0.065 + 0.01/-0.005 1.65 + 0.254/-0.127	0.04 ± 0.002 1.02 ± 0.051	inches mm
BR5	0.8 + 0.04/-0.02 20.32 + 1.02/-0.508	0.6 Typ - 1 Max 15.3 Typ - 25.4 Max	0.125 ± 0.03 3.18 ± 0.762	0.065 + 0.01/-0.005 1.65 + 0.254/-0.127	0.04 ± 0.002 1.02 ± 0.051	inches mm

Performance Characteristics

Test	Test Results
Moisture Resistance	± 1%
Load Life @ 25ºC - 1,000 hrs.	± 1%
Short Time Overload	± 0.5%
Temperature Cycle @ -40ºC & +125ºC (1,000 cyc)	± 1%

How to Order

1	2	3	4	5	6	7	8	9
B	R	1	F	B	1	0	L	0

Product Series	
BR	Current Sense

Size	Power
1	1W
3	3W
5	5W

Tolerance	
Code	Tol
F	1%
G	2%
J	5%

Packaging			
Code	Description	Size	Quantity
B	bulk	all sizes	1,000

Resistance Value
Four characters with "L" used as multiplier of 10^{-3} for any value under 0.1 ohm.
0.1 ohm = R100 0.05 ohm = 50L0 0.005 ohm - 5L00

Legacy Part Number (before January 3, 2011):

SEI Type	Code	Nominal Resistance	Tolerance	Packaging
BR	**1**	**0.01**	**1%**	**B**

Type	Description
BR	Current Sense

Code	Wattage
1	1 W
3	3 W
5	5 W

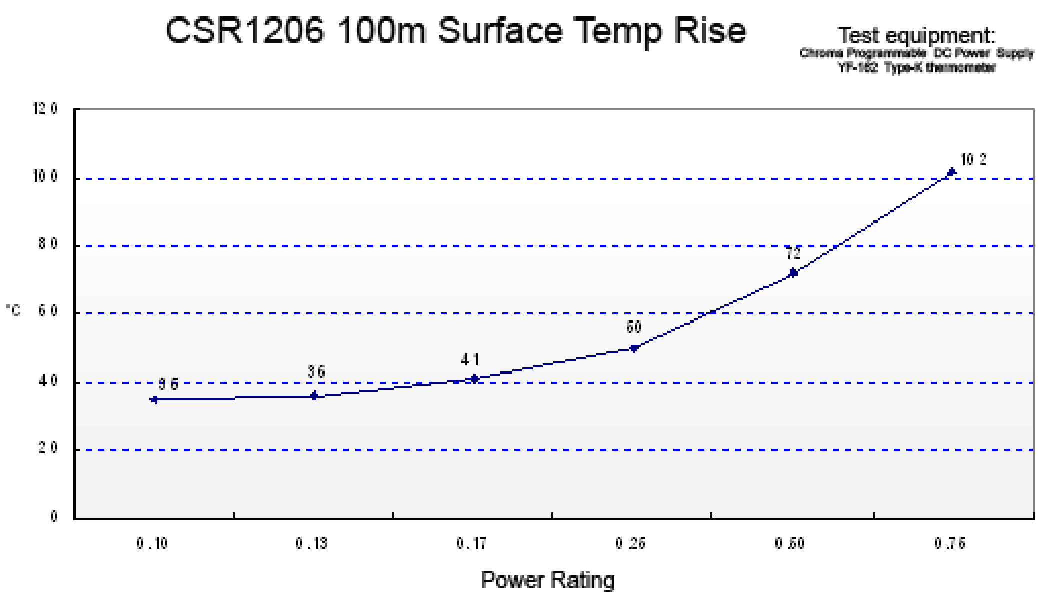
Tolerance
1%
2%
5%

Code	Description	Pkg Qty
B	bulk	1,000

High Power Chip Resistors and Thermal Management

Stackpole has developed several surface mount resistor series in addition to our current sense resistors, which have had higher power ratings than standard resistor chips. This has caused some uncertainty and even confusion by users as to how to reliably use these resistors at the higher power ratings in their designs.

The data sheets for the RHC, RMCP, RNCP, CSR, CSRN, CSRF, CSS, and CSSH state that the rated power assumes an ambient temperature of no more than 100 degrees C for the CSS / CSSH series and 70 degrees C for all other high power resistor series. In addition, IPC and UL best practices dictate that the combined temperature on any resistor due to power dissipated and ambient air shall be no more than 105C. At first glance this wouldn't seem too difficult, however the graph below shows typical heat rise for the CSR ½ 100 milliohm at full rated power. The heat rise for the RMCP and RNCP would be similar. The RHC with its unique materials, design, and processes would have less heat rise and therefore would be easier to implement for any given customer.



The 102 degrees C heat rise shown here would indicate there will be additional thermal reduction techniques needed to keep this part under 105C total hot spot temperature if this part is to be used at 0.75 watts of power. However, this same part at the usual power rating for this size would have a heat rise of around 72 degrees C. This additional heat rise may be dealt with using wider conductor traces, larger solder pads and land patterns under the solder mask, heavier copper in the conductors, vias through PCB, air movement, and heat sinks, among many other techniques. Because of the variety of methods customers can use to lower the effective heat rise of the circuit, resistor manufacturers simply specify power ratings with the limitations on ambient air temperature and total hot spot temperatures and leave the details of how to best accomplish this to the design engineers. Design guidelines for products in various market segments can vary widely so it would be unnecessarily constraining for a resistor manufacturer to recommend the use of any of these methods over another.

Note: The final resistance value can be affected by the board layout and assembly process, especially the size of the mounting pads and the amount of solder used. This is especially notable for resistance values ≤ 50 mΩ. This should be taken into account when designing.