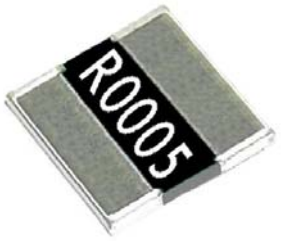
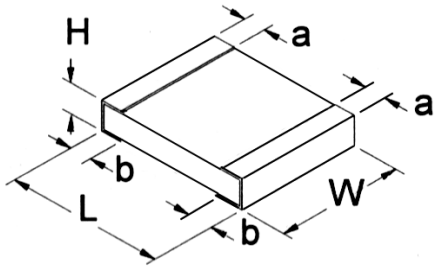
Features:

- High power metal alloy current sense resistor
- Very low inductance (0.5nH to 5nH)
- High temperature performance up to 225°C; for operation up to 275ºC, contact factory
- Excellent frequency response
- Low thermal EMF (<1µV/C)
- Proprietary processing technique produces extremely low resistance values
- RoHS compliant / lead-free



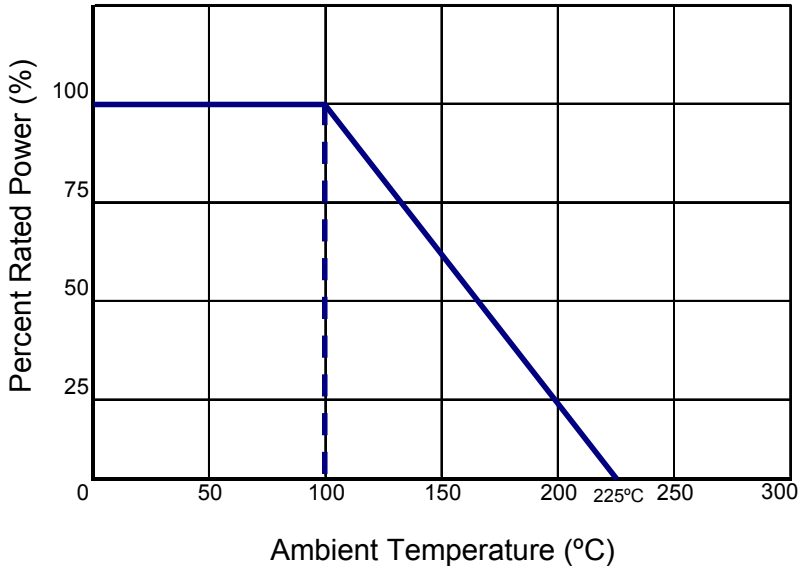
Electrical Specifications							
Type / Code	Package Type	Power Rating (Watts) @ 100ºC	Max. Rating Current	Max. Overload Current	Resistance Temperature Coefficient	Ohmic Range (Ω) and Tolerance	
						0.5%	1%, 5%
CSS1206	1206	1W	31.62A	63.25A	±50 ppm/ºC ±25 ppm/ºC ±15 ppm/ºC	- 0.007 - 0.015 0.0151 - 0.050	0.001 - 0.004 0.0041 - 0.0150 0.0151 - 0.050
CSS2010	2010	1W	31.62A	63.25A	±50 ppm/ºC ±25 ppm/ºC ±15 ppm/ºC	- 0.003 - 0.0069 0.007 - 0.1	0.001 - 0.003 0.0031 - 0.0069 0.007 - 0.1
CSS2512	2512	2W	63.25A	141.42A	±50 ppm/ºC ±25 ppm/ºC ±15 ppm/ºC	- - 0.007 - 0.075	0.0005 - 0.003 0.0031 - 0.0069 0.007 - 0.075
CSSH2512	2512	3W	77.46A	134.16A	±50 ppm/ºC ±25 ppm/ºC	 0.007 - 0.01	0.0005 - 0.002 0.0021 - 0.01
CSS2725	2725	4W	126.49A	252.95A	±50 ppm/ºC ±25 ppm/ºC	- -	0.00025 - 0.0009 0.001 - 0.003
CSS2728	2728	3W	27.39A	47.43A	±25 ppm/ºC ±15 ppm/ºC	0.004 - 0.007 0.0071 - 0.1	0.004 - 0.007 0.0071 - 0.1
CSSH2728	2728	4W	31.62A	63.25A	±25 ppm/ºC ±15 ppm/ºC	0.004 - 0.007 0.008 - 0.05	0.004 - 0.007 0.008 - 0.05

Please refer to the High Power Resistor Application Note (page 4) for more information on designing and implementing high power resistor types.



Mechanical Specifications						
Type / Code	L Body Length	W Body Width	H Body Height	a Top Termination	b Bottom Termination	Unit
CSS1206	3.200 ± 0.254	1.600 ± 0.254	0.645 ± 0.254	0.508 ± 0.254	0.508 ± 0.254	mm
CSS2010 (≤3mΩ)	5.080 ± 0.254	2.540 ± 0.254	0.787 ± 0.254	1.295 ± 0.254	1.295 ± 0.254	mm
CSS2010 (>3mΩ)	5.080 ± 0.254	2.540 ± 0.254	0.645 ± 0.254	0.787 ± 0.254	0.787 ± 0.254	mm
CSS2512 (≤4mΩ)	6.250 ± 0.254	3.300 ± 0.254	0.787 ± 0.254	1.880 ± 0.254	1.880 ± 0.254	mm
CSS2512 (≥5mΩ)	6.250 ± 0.254	3.300 ± 0.254	0.645 ± 0.254	1.120 ± 0.254	1.120 ± 0.254	mm
CSSH2512 (0.5mΩ)	6.250 ± 0.254	3.300 ± 0.254	0.787 ± 0.254	1.880 ± 0.254	1.880 ± 0.254	mm
CSSH2512 (0.6 - 2.9mΩ)	6.250 ± 0.254	3.300 ± 0.254	0.787 ± 0.254	1.180 ± 0.254	1.180 ± 0.254	mm
CSSH2512 (3 - 4mΩ)	6.250 ± 0.254	3.300 ± 0.254	0.787 ± 0.254	1.676 ± 0.254	1.676 ± 0.254	mm
CSSH2512 (4.1 - 10mΩ)	6.250 ± 0.254	3.300 ± 0.254	0.787 ± 0.254	1.180 ± 0.254	1.180 ± 0.254	mm
CSS2725 (0.25 - 0.50mΩ)	6.800 ± 0.254	6.700 ± 0.254	0.991 ± 0.254	2.160 ± 0.254	2.160 ± 0.254	mm
CSS2725 (1mΩ)	6.800 ± 0.254	6.700 ± 0.254	1.092 ± 0.254	2.160 ± 0.254	2.160 ± 0.254	mm
CSS2725 (1.5mΩ)	6.800 ± 0.254	6.700 ± 0.254	0.991 ± 0.254	2.160 ± 0.254	2.160 ± 0.254	mm
CSS2725 (2mΩ)	6.800 ± 0.254	6.700 ± 0.254	0.889 ± 0.254	1.800 ± 0.254	1.800 ± 0.254	mm
CSS2725 (2.5mΩ)	6.800 ± 0.254	6.700 ± 0.254	0.889 ± 0.254	1.650 ± 0.254	1.650 ± 0.254	mm
CSS2725 (3mΩ)	6.800 ± 0.254	6.700 ± 0.254	0.889 ± 0.254	1.300 ± 0.254	1.300 ± 0.254	mm
CSS2728	6.706 ± 0.254	7.188 ± 0.254	0.991 ± 0.254	1.143 ± 0.254	1.143 ± 0.254	mm
CSSH2728	6.706 ± 0.254	7.188 ± 0.254	0.991 ± 0.254	1.143 ± 0.254	1.143 ± 0.254	mm

Power Derating Curve:



Performance Characteristics

Test	Test Method	Test Specification	Typical
Load Life	MIL-STD-502F-Method 108A RCWV at 70°C; 1.5hrs ON; 0.5hrs OFF Total 1024 ± 24hrs	± 1%	≤ 0.75%
Resistance to Soldering Heat	MIL-STD-202F-Method 210E 260 ± 5°C for 10 ± 1sec	± 1%	≤ 0.75%
Solderability	MIL-STD-202F-Method 208H 245 ± 5°C for 2 ± 0.5sec	minimum 95% coverage	> 95%
Thermal Shock	MIL-STD-202F-Method 107G -55°C to 150°C, 100 cycles	± 1%	≤ 0.75%
Short Time Overload	JIS-C-5201-1 4.13 3 - 5x rated power for 5 sec	± 1%	≤ 0.75%
Temperature Cycling	JIS-C-5201-1 4.19 -55°C: 30 min. 25°C: 2 to 3 min. 155°C: 30min. 25°C: 2 to 3 min.	± 1%	≤ 0.75%
Moisture Resistance	MIL- STD-202F-Method 106G	± 1%	≤ 0.75%
Insulation Resistance	MIL-STD-202F-Method 302 Apply 100Vdc for 1 minute	1MΩ minimum	≥ 1MΩ
Leach Resistance	-	90 seconds minimum	≥ 90 seconds

Operating Temperature Range: -55°C to +225°C. For operation at higher temperatures, contact factory.

How to Order

1	2	3	4	5	6	7	8	9	10	11	12	13
C	S	S	2	7	2	5	F	T	3	L	0	0

Product Series	
CSS	Metal Alloy
CSSH	High Power

Size	Power
1206	1W
2010	1W
2512	2W
(H)2512	3W
2725	4W
2728	3W
(H)2728	4W

Tolerance	
Code	Tol
D	0.5%
F	1%
J	5%

Packaging			
Code	Description	Size	Quantity
T	7" reel - plastic tape	CSS1206	4,000
		CSS2010, CSS2512 CSSH2512	2,000
		CSS2725, CSS2728 CSSH2728	1,000

Resistance Value
Four characters with "L" used as multiplier of 10^{-3} for any value under 0.1 ohm.
0.00025 ohm = L250 0.0009 ohm = L900 0.003 ohm = 3L00

Legacy Part Number (before January 3, 2011):

SEI Type	Code	Nominal Resistance	Tolerance	Packaging
CSS	2725	0.003	1%	R

Type	Description
CSS	Metal Alloy
CSSH	High Power

Code	Wattage	Size
1206	1W	1206
2010	1W	2010
2512	2W	2512
(H) 2512	3W	2512
2725	4W	2725
2728	3W	2728
(H) 2728	4W	2728

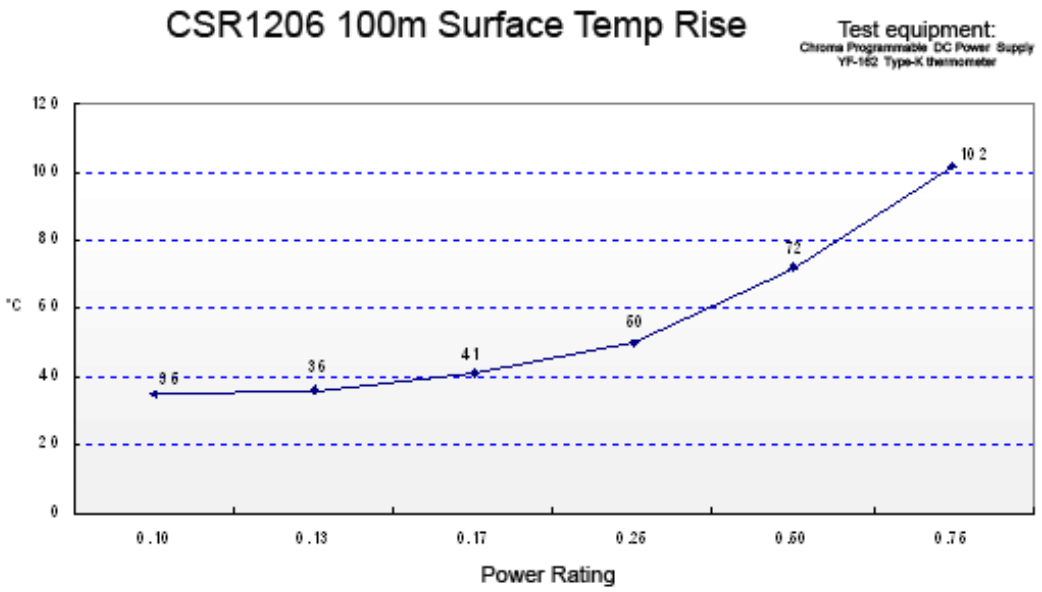
Tolerance
0.5%
1%
5%

SEI Types	Quantity		Description
	Standard	Code	
CSS1206	4,000	R	7" reel plastic tape
CSS2010	2,000		
CSS2512			
CSSH2512			
CSS2725	1,000		
CSS2728			
CSSH2728			

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.