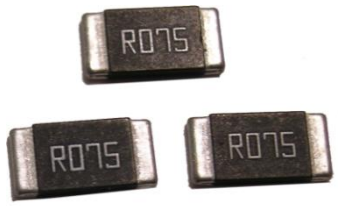
Features:

- High power metal alloy current sense resistor
- Molded package for superior heat dissipation
- Typical inductance < 5nH
- Ideal for power supplies and motor drives
- Package size 2512 is qualified to AEC-Q200
- 100% RoHS compliant and lead free without exemption
- Halogen free
- REACH compliant

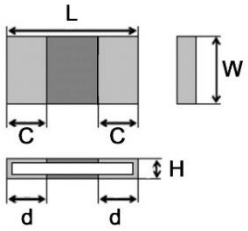


Electrical Specifications

Type/Code	Power Rating (W)	Maximum Working Voltage (V)	Maximum Current (A)	TCR (ppm/ºC)	Ohmic Range (Ω) and Tolerance
					1%, 5%
CSM0603	0.33	$(P*R)^{1/2}$	5.6	± 70	0.01
CSM2512	3	$(P*R)^{1/2}$	54.8	± 50	0.001 - 0.1

P = Rated Power (W)
R = Resistance Value (Ω)

Mechanical Specifications



Type/Code	L	W	C	H	d	Unit
CSM0603	0.063 ± 0.004 1.60 ± 0.10	0.031 ± 0.004 0.80 ± 0.10	0.008 ± 0.004 0.20 ± 0.10	0.012 ± 0.004 0.30 ± 0.10	0.012 ± 0.004 0.30 ± 0.10	inches mm
CSM2512 (0.001 Ω - 0.004 Ω)	0.252 ± 0.008 6.40 ± 0.20	0.126 ± 0.008 3.20 ± 0.20	0.079 ± 0.008 2.00 ± 0.20	0.028 ± 0.008 0.70 ± 0.20	0.079 ± 0.008 2.00 ± 0.20	inches mm
CSM2512 (> 0.004 Ω - 0.1 Ω)	0.252 ± 0.008 6.40 ± 0.20	0.126 ± 0.008 3.20 ± 0.20	0.035 ± 0.008 0.90 ± 0.20	0.028 ± 0.008 0.70 ± 0.20	0.035 ± 0.008 0.90 ± 0.20	inches mm

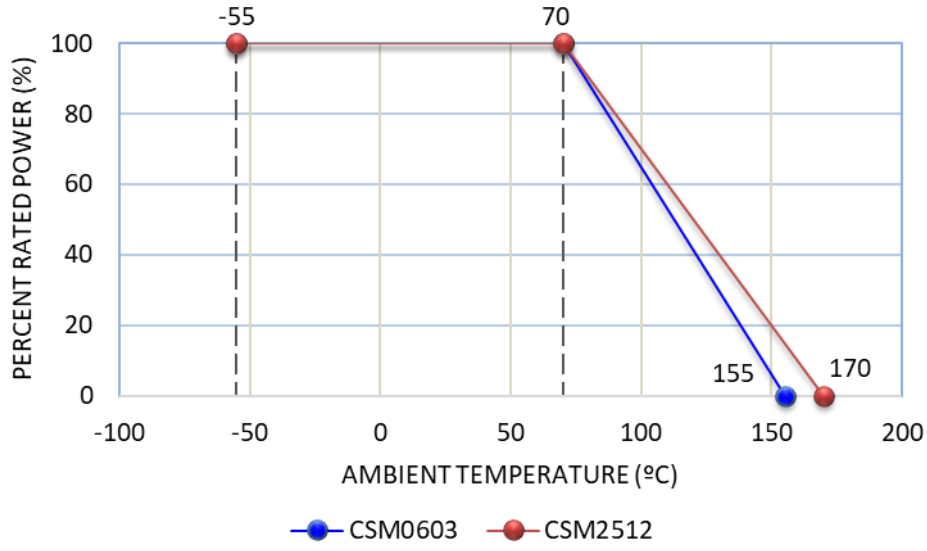
Performance Characteristics

Test Item	Test Specification	Test Condition
Temperature Coefficient of Resistance	CSM2512 ± 50 ppm/ºC CSM0603 ± 70 ppm/ºC	+25ºC ~ +125ºC
Load Life	± 1%	1000 hours at rated power, 70ºC, 1.5 hours ON, 0.5 hours OFF
Short Time Overload	± 0.5%	5 X rated power for 5 seconds (for 0.04 - 0.1 Ω > rated power x 2.5 for 5 seconds)
Moisture No Load	± 0.5%	85ºC, 85% R.H., 1000 hours
Temperature Cycling	< ± 0.5%	1000 cycles (-55°C to 125°C) Measurement at 24 hours after test conclusion JESD22 Method JA-104
Resistance to Soldering Heat	± 0.5%	260 ± 5ºC for 20 ± 1 seconds
Solderability	At least 95% of surface area of electrode must be covered with new solder	245 ± 5ºC for 2 ± 0.5 seconds

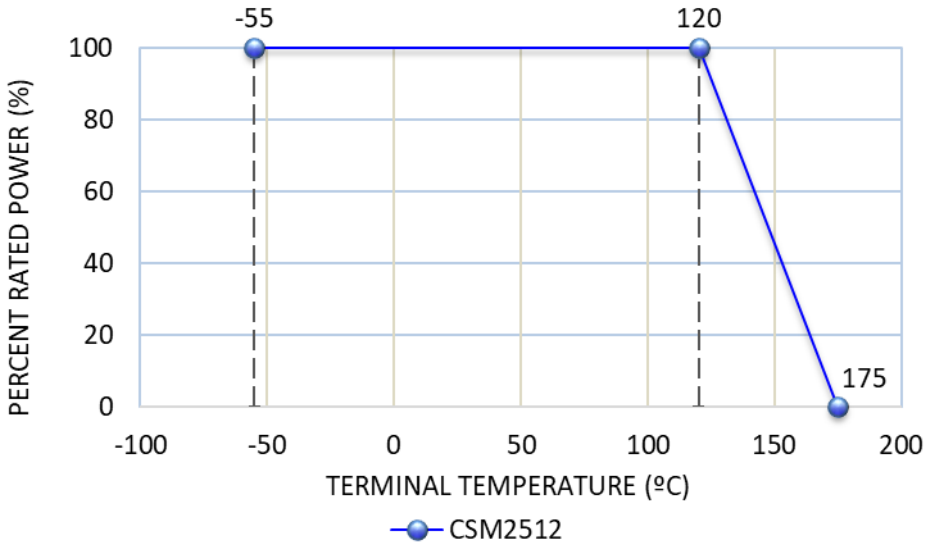
Performance Characteristics (cont.)		
Test Item	Test Specification	Test Condition
High Temperature Exposure	± 0.5%	170ºC for 1000 hours
Low Temperature Storage	± 0.5%	-55ºC for 1000 hours
Substrate Bending	± 1%	Bending width 2 mm
Insulation Resistance	> 100MΩ	100VDC for 1 minute

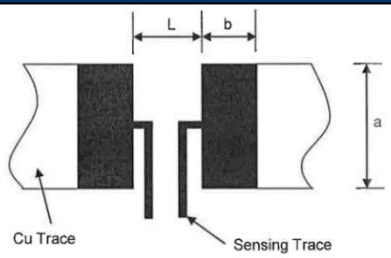
Storage Conditions: Temperature 5°C ~ 35°C; R.H. 40% ~ 75%
Operating temperature range for CSM0603 is -55°C to +155°C and for CSM2512 is -55°C to +170°C

Power Derating Curve:



Terminal Temperature:



Recommended Pad Layout


Type/Code	a	b	L	Unit
CSM0603	0.039 1.00	0.028 0.70	0.035 0.90	inches mm
CSM2512 (≤ 0.004 Ω)	0.157 4.00	0.122 3.10	0.051 1.30	inches mm
CSM2512 (> 0.004 Ω)	0.157 4.00	0.083 2.10	0.161 4.10	inches mm

Recommended Solder Profile

This information is intended as a reference for solder profiles for Stackpole resistive components. These profiles should be compatible with most soldering processes. These are only recommendations. Actual numbers will depend on board density, geometry, packages used, etc., especially those cells labeled with "*".

100% Matte Tin / RoHS Compliant Terminations

Soldering iron recommended temperatures: 330°C to 350°C with minimum duration.
Maximum number of reflow cycles: 3.

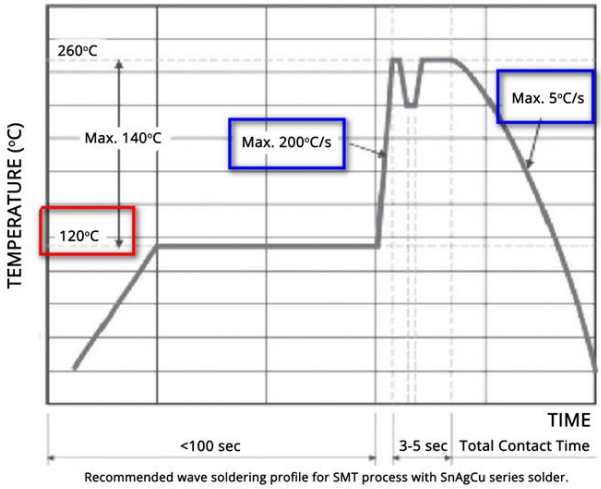
Wave Soldering			
Description	Maximum	Recommended	Minimum
Preheat Time	80 seconds	70 seconds	60 seconds
Temperature Diff.	140°C	120°C	100°C
Solder Temp.	260°C	250°C	240°C
Dwell Time at Max.	10 seconds	5 seconds	*
Ramp DN (°C/sec)	N/A	N/A	N/A

Temperature Diff. = Defference between final preheat stage and soldering stage.

Convection IR Reflow			
Description	Maximum	Recommended	Minimum
Ramp Up (°C/sec)	3°C/sec	2°C/sec	*
Dwell Time > 217°C	150 seconds	90 seconds	60 seconds
Solder Temp.	260°C	245°C	*
Dwell Time at Max.	30 seconds	15 seconds	10 seconds
Ramp DN (°C/sec)	6°C/sec	3°C/sec	*

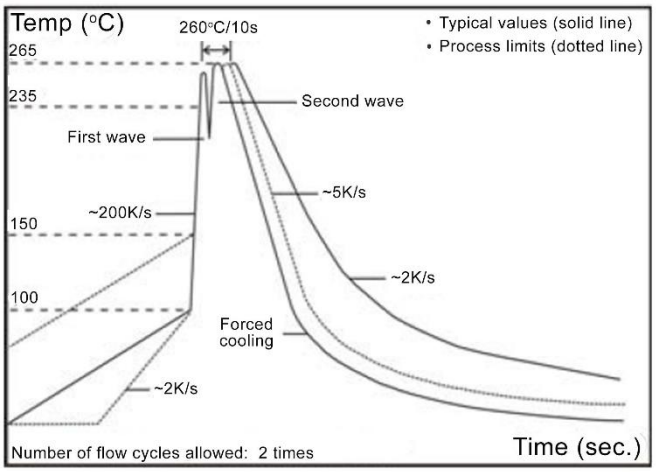
Wave Soldering Profile

CSM0603



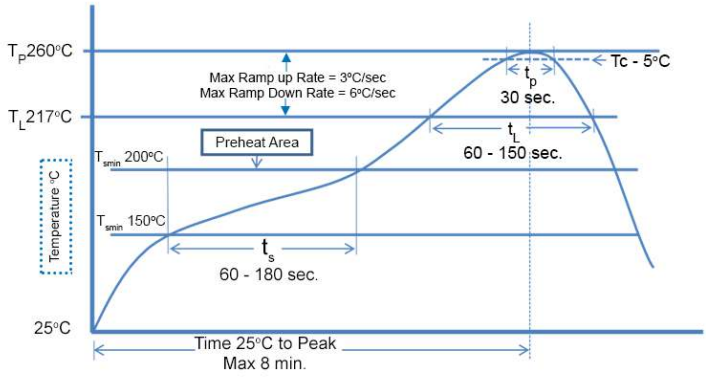
Recommended wave soldering profile for SMT process with SnAgCu series solder.

CSM2512

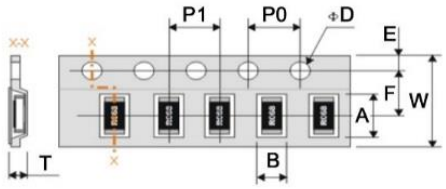


Wave Soldering (Flow Soldering)

Recommended Lead Free Resistor Reflow Profile

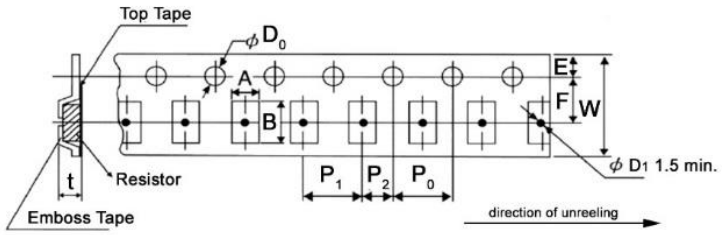


Taping Specifications – CSM0603



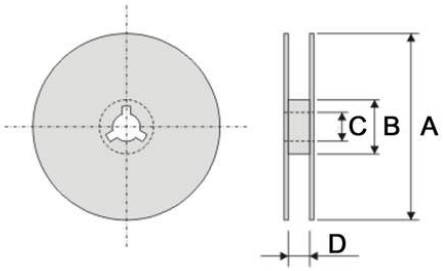
Type/Code	A	B	W	F	E	Unit
CSM0603	0.075 ± 0.008 1.90 ± 0.20	0.045 ± 0.006 1.15 ± 0.15	0.315 ± 0.008 8.00 ± 0.20	0.138 ± 0.002 3.50 ± 0.05	0.069 ± 0.004 1.75 ± 0.10	inches mm
	P1	P0	ØD	T	Unit	
	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.059 +0.004/-0 1.50 +0.10/-0	0.031 max. 0.80 max.	inches mm	

Taping Specifications – CSM2512



Type/Code	A	B	W	F	E	Unit
CSM2512	0.142 ± 0.008 3.60 ± 0.20	0.272 ± 0.008 6.90 ± 0.20	0.472 ± 0.008 12.00 ± 0.20	0.217 ± 0.002 5.50 ± 0.05	0.069 ± 0.004 1.75 ± 0.10	inches mm
	P1	P2	P0	D0	t	Unit
	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.157 ± 0.002 4.00 ± 0.05	0.059 +0.004 / -0 1.5 +0.10 / -0	0.047 ± 0.006 1.20 ± 0.15	inches mm

Packaging Specifications



Type/Code	A	B	C	D	Unit
CSM0603	7.087 ± 0.059 180.00 ± 1.50	2.362 ± 0.039 60.00 ± 1.00	0.512 ± 0.008 13.00 ± 0.20	0.354 + 0.039 9.00 + 1.00	inches mm
CSM2512	7.087 ± 0.059 180.00 ± 1.50	2.362 ± 0.039 60.00 ± 1.00	0.512 ± 0.039 13.00 ± 1.00	0.512 + 0.039 13.00 + 1.00	inches mm

RoHS Compliance

Stackpole Electronics has joined the worldwide effort to reduce the amount of lead in electronic components and to meet the various regulatory requirements now prevalent, such as the European Union's directive regarding "Restrictions on Hazardous Substances" (RoHS 3). As part of this ongoing program, we periodically update this document with the status regarding the availability of our compliant components. All our standard part numbers are compliant to EU Directive 2011/65/EU of the European Parliament as amended by Directive (EU) 2015/863/EU as regards the list of restricted substances.

RoHS Compliance Status

Standard Product Series	Description	Package / Termination Type	Standard Series RoHS Compliant	Lead-Free Termination Composition	Lead-Free Mfg. Effective Date (Std Product Series)	Lead-Free Effective Date Code (YY/WW)
CSM	Molded Metal Plate Sensing Resistor	SMD	YES	100% Matte Sn over Ni	Always	Always

"Conflict Metals" Commitment

We at Stackpole Electronics, Inc. are joined with our industry in opposing the use of metals mined in the "conflict region" of the eastern Democratic Republic of the Congo (DRC) in our products. Recognizing that the supply chain for metals used in the electronics industry is very complex, we work closely with our own suppliers to verify to the extent possible that the materials and products we supply do not contain metals sourced from this conflict region. As such, we are in compliance with the requirements of Dodd-Frank Act regarding Conflict Minerals.

Compliance to "REACH"

We certify that all passive components supplied by Stackpole Electronics, Inc. are SVHC (Substances of Very High Concern) free and compliant with the requirements of EU Directive 1907/2006/EC, "The Registration, Evaluation, Authorization and Restriction of Chemicals", otherwise referred to as REACH. Contact us for complete list of REACH Substance Candidate List.

Environmental Policy

It is the policy of Stackpole Electronics, Inc. (SEI) to protect the environment in all localities in which we operate. We continually strive to improve our effect on the environment. We observe all applicable laws and regulations regarding the protection of our environment and all requests related to the environment to which we have agreed. We are committed to the prevention of all forms of pollution.

How to Order

C	S	M	2	5	1	2	F	T	1	0	L	0

Product Series	
Code	Description
CSM	Molded Metal Plate Sensing Resistor

Size	
Code	W
0603	0.33
2512	3

Tolerance	
Code	Tol
F	1%
J	5%

Packaging			
Code	Description	Size	Quantity
T	Paper Tape	0603	5000
	Emboss	2512	4000

Resistance Value
Four characters with the multiplier used as the decimal holder.
"L" used as multiplier of 10^{-3} for any value under 0.1 ohm
0.001 = 1L00 0.01 = 10L0 0.1 ohm = R100