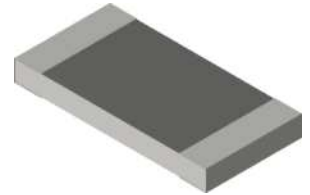


Features:

- Molded package for superior heat dissipation
- Typical inductance < 5nH
- RoHS compliant, REACH compliant, lead free, and halogen free
- Package size 2512 is AEC-Q200 compliant



Electrical Specifications			
Type/Code	Power Rating (W)	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance
			1%, 5%
CSM0603	0.33	± 70	0.01
CSM2512	3	± 50	0.001 - 0.1

Max. Working Voltage = $(P \cdot R)^{1/2}$

P = Rated Power (W)

R = Resistance Value (Ω)

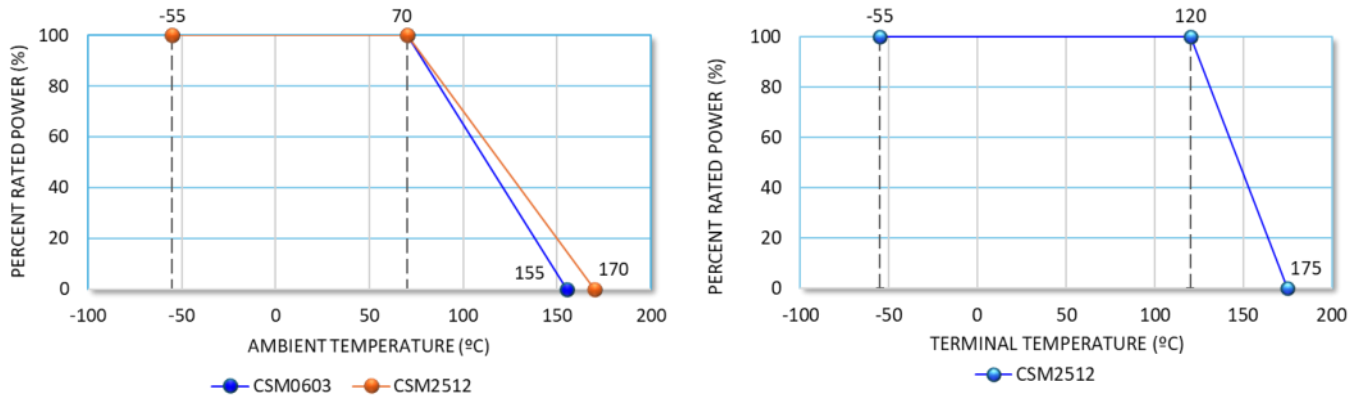
Mechanical Specifications					
Type/Code	L	W	H	d	Unit
CSM0603	0.063 ± 0.004 1.60 ± 0.10	0.031 ± 0.004 0.80 ± 0.10	0.012 ± 0.004 0.30 ± 0.10	0.012 ± 0.004 0.30 ± 0.10	inches mm
CSM2512 (0.001 Ω - 0.004 Ω)	0.252 ± 0.008 6.40 ± 0.20	0.126 ± 0.008 3.20 ± 0.20	0.035 ± 0.008 0.90 ± 0.20	0.079 ± 0.008 2.00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

Performance Characteristics		
Test Item	Test Specification	Test Condition
Temperature Coefficient of Resistance	CSM2512 ± 50 ppm/°C CSM0603 ± 70 ppm/°C	+25 ~ +125°C
Load Life	ΔR ± 1%	1000 hours at rated power, 70°C, 1.5 hours ON, 0.5 hours OFF
Short Time Overload	ΔR ± 0.5%	5 X rated power for 5 seconds
Moisture No Load	ΔR ± 0.5%	85°C, 85% R.H., 1000 hours
Temperature Cycling	ΔR < ± 0.5%	1000 cycles (-55 to 125°C) Measurement at 24 hours after test conclusion JESD22 Method JA-104
Resistance to Soldering Heat	ΔR ± 0.5%	260 ± 5°C for 20 ± 1 seconds
Solderability	At least 95% of surface area of electrode must be covered with new solder	245 ± 5°C for 2 ± 0.5 seconds
High Temperature Exposure	ΔR ± 0.5%	170°C for 1000 hours
Low Temperature Storage	ΔR ± 0.5%	-55°C for 1000 hours
Substrate Bending	ΔR ± 1%	Bending width 2 mm
Insulation Resistance	ΔR > 100MΩ	100 VDC for 1 minute

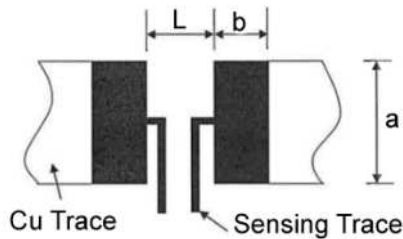
Recommended storage conditions: Temperature 5 ~ 35°C; R.H. 40% ~ 75%

Operating temperature range for CSM0603 is -55 to +155°C and for CSM2512 is -55 to +170°C

Power Derating Curve:



Recommended Solder Pad



Type/Code	a	b	L	Unit
CSM0603	0.039 1.00	0.028 0.70	0.035 0.90	inches mm
CSM2512 ($\leq 0.004 \Omega$)	0.157 4.00	0.122 3.10	0.051 1.30	inches mm
CSM2512 ($> 0.004 \Omega$)	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

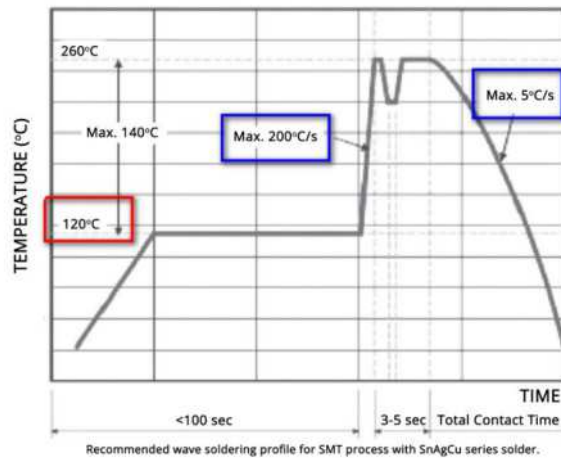
Temperature Diff. = Difference between final preheat stage and soldering stage.

Convection IR Reflow

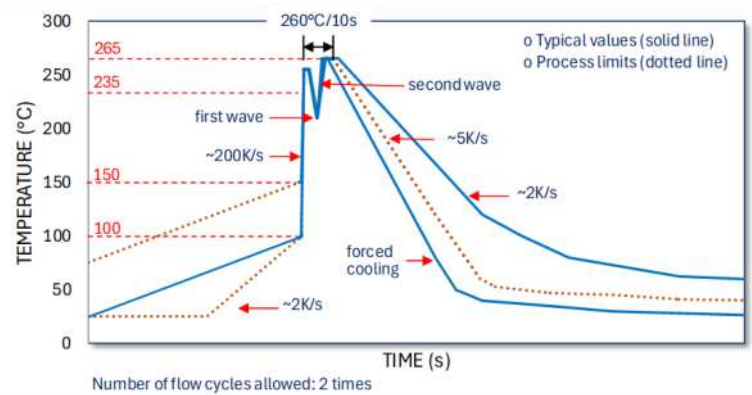
Description	Maximum	Recommended	Minimum
Ramp Up (°C/sec)	3°C/sec	2°C/sec	*
Dwell Time > 217°C	150 seconds	90 seconds	60 seconds
Solder Temp.	260°C	245°C	*
Dwell Time at Max.	30 seconds	15 seconds	10 seconds
Ramp DN (°C/sec)	6°C/sec	3°C/sec	*

Wave Soldering Profile

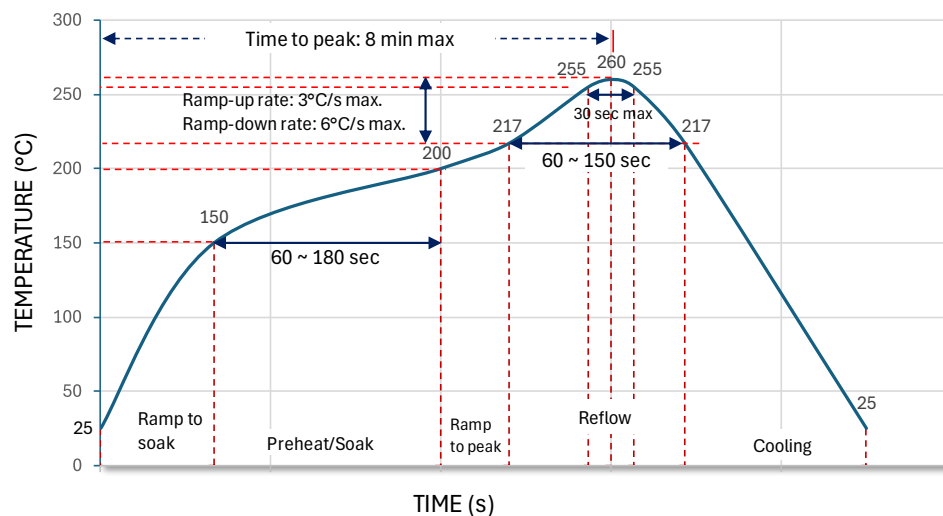
CSM0603



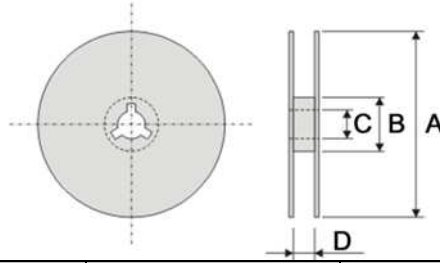
CSM2512



Recommended Resistor Reflow Profile

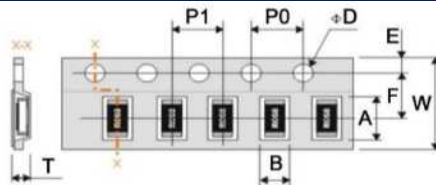


Reel Specifications



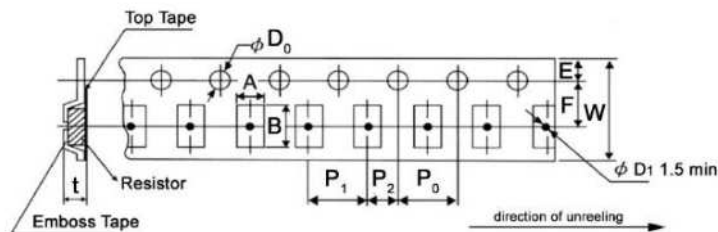
Type/Code	A	B	C	D	Unit
CSM0603	7.087 ± 0.059 180.00 ± 1.50	2.362 ± 0.039 60.00 ± 1.00	0.512 ± 0.008 13.00 ± 0.20	0.354 ± 0.039 9.00 ± 1.00	inches mm
CSM2512	7.087 ± 0.059 180.00 ± 1.50	2.362 ± 0.039 60.00 ± 1.00	0.512 ± 0.039 13.00 ± 1.00	0.512 ± 0.039 13.00 ± 1.00	inches mm

Taping Specifications - Paper Tape



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 - Plastic Tape



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 1.50 +0.10 / -0	0.047 ± 0.006 1.20 ± 0.15	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 Alloy Current 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		Size		Tolerance		Packaging				Resistance Value		
Code		Code	W	Code	Tol	Code	Description	Size	Quantity	Four characters with the multiplier used as the decimal holder.		
CSM		0603	0.33	F	1%	T	7" Reel Paper Tape	0603	5000	"L" used as multiplier of 10 ⁻³ for any value under 0.1 ohm		
		2512	3	J	5%		7" Reel Plastic Tape	2512	4000	0.001 = 1L00		
										0.01 = 10L0		
										0.1 ohm = R100		