

Features:

- High power current sense resistor
- TCR of ± 50 ppm/ $^{\circ}\text{C}$
- Resistances down to $0.2\text{m}\Omega$
- Non-standard resistance values available
- RoHS compliant, REACH compliant, lead free, and halogen free
- CSNL2512 is AEC-Q200 compliant

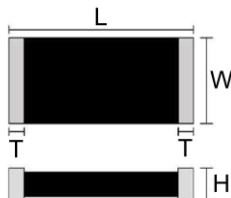


Electrical Specifications

Type/Code	Power Rating (W)	TCR (ppm/ $^{\circ}\text{C}$)	Ohmic Range (Ω) and Tolerance
			1%, 5%
CSNL1206	1 @ 80°C	± 50	0.001 - 0.05
CSNL2010	1.5 @ 80°C	± 100 ± 50	0.0005 0.001 - 0.1
CSNL2512	3 @ 70°C	± 150 ± 100 ± 50	0.0002 0.0003 0.0005 - 0.2

Note: Not all values in the range may be available. Contact Stackpole.

Mechanical Specifications



Type/Code	Resistance Range (Ω)	L Body Length	W Body Width	H Body Height	T Bottom Termination	Unit
CSNL1206	0.001 - 0.05	0.126 ± 0.010 3.20 ± 0.25	0.063 ± 0.010 1.60 ± 0.25	0.025 ± 0.010 0.65 ± 0.25	0.020 ± 0.010 0.51 ± 0.25	inches mm
CSNL2010	≤ 0.003	0.200 ± 0.010 5.08 ± 0.25	0.100 ± 0.010 2.54 ± 0.25	0.031 ± 0.010 0.79 ± 0.25	0.051 ± 0.010 1.30 ± 0.25	inches mm
	0.004	0.200 ± 0.010 5.08 ± 0.25	0.100 ± 0.010 2.54 ± 0.25	0.025 ± 0.010 0.65 ± 0.25	0.031 ± 0.010 0.79 ± 0.25	inches mm
CSNL2512	0.0002	0.250 ± 0.010 6.35 ± 0.25	0.122 ± 0.010 3.10 ± 0.25	0.056 ± 0.010 1.42 ± 0.25	0.094 ± 0.010 2.40 ± 0.25	inches mm
	0.0003	0.250 ± 0.010 6.35 ± 0.25	0.122 ± 0.010 3.10 ± 0.25	0.049 ± 0.010 1.25 ± 0.25	0.100 ± 0.010 2.55 ± 0.25	inches mm
	0.0005	0.250 ± 0.010 6.35 ± 0.25	0.125 ± 0.010 3.18 ± 0.25	0.049 ± 0.008 1.25 ± 0.20	0.073 ± 0.015 1.85 ± 0.38	inches mm
	0.00075	0.250 ± 0.010 6.35 ± 0.25	0.125 ± 0.010 3.18 ± 0.25	0.030 ± 0.008 0.75 ± 0.20	0.061 ± 0.015 1.55 ± 0.38	inches mm
	0.001	0.250 ± 0.010 6.35 ± 0.25	0.125 ± 0.010 3.18 ± 0.25	0.026 ± 0.008 0.65 ± 0.20	0.061 ± 0.015 1.55 ± 0.38	inches mm

Mechanical Specifications (cont.)

Type/Code	Resistance Range (Ω)	L Body Length	W Body Width	H Body Height	T Bottom Termination	Unit
CSNL2512	0.0015	0.250 $\pm$ 0.010 6.35 $\pm$ 0.25	0.125 $\pm$ 0.010 3.18 $\pm$ 0.25	0.018 $\pm$ 0.008 0.45 $\pm$ 0.20	0.061 $\pm$ 0.015 1.55 $\pm$ 0.38	inches mm
	0.002	0.250 $\pm$ 0.010 6.35 $\pm$ 0.25	0.125 $\pm$ 0.010 3.18 $\pm$ 0.25	0.014 $\pm$ 0.008 0.35 $\pm$ 0.20	0.061 $\pm$ 0.015 1.55 $\pm$ 0.38	inches mm
	0.0025	0.250 $\pm$ 0.010 6.35 $\pm$ 0.25	0.125 $\pm$ 0.010 3.18 $\pm$ 0.25	0.026 $\pm$ 0.008 0.65 $\pm$ 0.20	0.055 $\pm$ 0.015 1.40 $\pm$ 0.38	inches mm
	0.003	0.250 $\pm$ 0.010 6.35 $\pm$ 0.25	0.125 $\pm$ 0.010 3.18 $\pm$ 0.25	0.022 $\pm$ 0.008 0.55 $\pm$ 0.20	0.055 $\pm$ 0.015 1.40 $\pm$ 0.38	inches mm
	0.004	0.250 $\pm$ 0.010 6.35 $\pm$ 0.25	0.125 $\pm$ 0.010 3.18 $\pm$ 0.25	0.018 $\pm$ 0.008 0.45 $\pm$ 0.20	0.055 $\pm$ 0.015 1.40 $\pm$ 0.38	inches mm
	0.005	0.250 $\pm$ 0.010 6.35 $\pm$ 0.25	0.125 $\pm$ 0.010 3.18 $\pm$ 0.25	0.014 $\pm$ 0.008 0.35 $\pm$ 0.20	0.055 $\pm$ 0.015 1.40 $\pm$ 0.38	inches mm
	0.006	0.250 $\pm$ 0.010 6.35 $\pm$ 0.25	0.125 $\pm$ 0.010 3.18 $\pm$ 0.25	0.013 $\pm$ 0.008 0.32 $\pm$ 0.20	0.055 $\pm$ 0.015 1.40 $\pm$ 0.38	inches mm
	0.007	0.250 $\pm$ 0.010 6.35 $\pm$ 0.25	0.125 $\pm$ 0.010 3.18 $\pm$ 0.25	0.011 $\pm$ 0.008 0.27 $\pm$ 0.20	0.055 $\pm$ 0.015 1.40 $\pm$ 0.38	inches mm
	0.01	0.250 $\pm$ 0.010 6.35 $\pm$ 0.25	0.125 $\pm$ 0.010 3.18 $\pm$ 0.25	0.010 $\pm$ 0.008 0.25 $\pm$ 0.20	0.055 $\pm$ 0.015 1.40 $\pm$ 0.38	inches mm
	0.012 - 0.2	0.252 $\pm$ 0.010 6.40 $\pm$ 0.25	0.126 $\pm$ 0.010 3.20 $\pm$ 0.25	0.028 $\pm$ 0.008 0.70 $\pm$ 0.20	0.035 $\pm$ 0.012 0.90 $\pm$ 0.30	inches mm

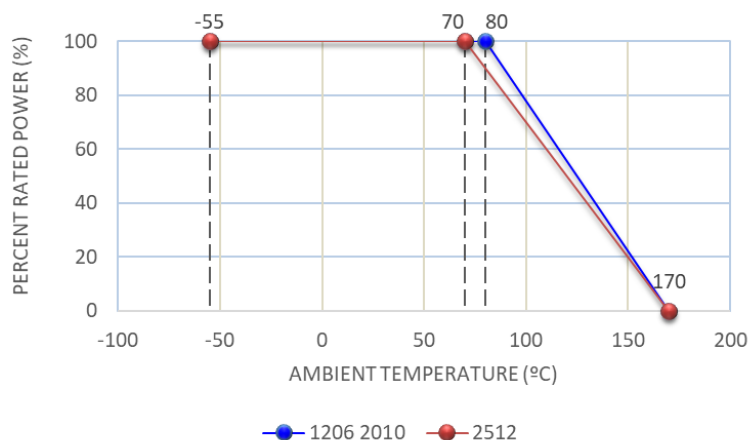
Performance Characteristics

Test	Test Method	Test Specification	Typical
Load Life	MIL-STD-502F-Method 108A RCWV at 70°C; 1.5 hour ON; 0.5 hour OFF Total 1024 $\pm$ 24 hours	$\pm$ 1%	$\leq$ 0.5%
Resistance to Soldering Heat	MIL-STD-202F-Method 210E 260 $\pm$ 5°C for 10 $\pm$ 1 seconds	$\pm$ 0.5%	$\leq$ 0.25%
Solderability	MIL-STD-202F-Method 208H 245 $\pm$ 5°C for 2 $\pm$ 0.5 seconds	minimum 95% coverage	> 95%
Thermal Shock	MIL-STD-202F-Method 107G -55 to 150°C, 100 cycles	$\pm$ 0.5%	$\leq$ 0.5%
Short Time Overload	JIS-C-5202-5.5 5x rated power for 5 seconds	All except CSNL2512-3W: $\pm$ 0.5% CSNL2512-3W: $\pm$ 1%	$\leq$ 0.5%
Temperature Cycling	JIS-C-5202-7.4 -55°C: 30 minutes 25°C: 2 to 3 minutes 155°C: 30 minutes 25°C: 2 to 3 minutes	$\pm$ 0.5%	$\leq$ 0.5%
Moisture Resistance	MIL-STD-202F-Method 106G	$\pm$ 0.5%	$\leq$ 0.5%
Insulation Resistance	MIL-STD-202F-Method 302 Apply 100 Vdc for 1 minute	1M Ω minimum	$\geq$ 1M Ω
Leach Resistance	-	90 seconds minimum	$\geq$ 90 seconds

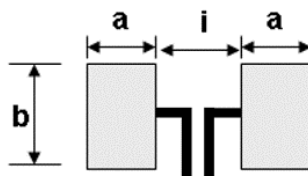
Operating temperature range is -55 to +170°C

Recommended storage temperature is 25 $\pm$ 5°C. Humidity: 60 $\pm$ 20%

Power Derating Curve:



Recommended Pad Layout

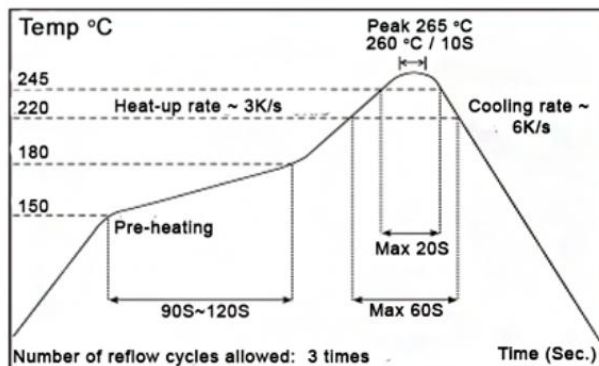


Type/Code	Resistance Range (Ω)	a	b	i	Unit
CSNL1206	0.001 - 0.05	0.063 1.60	0.086 2.18	0.039 1.00	inches mm
CSNL2010	≤ 0.003	0.114 2.89	0.115 2.92	0.048 1.22	inches mm
	0.004	0.090 2.29	0.115 2.92	0.095 2.41	inches mm
CSNL2512	0.0002	0.110 2.80	0.140 3.55	0.079 2.00	inches mm
	0.0003	0.110 2.80	0.140 3.55	0.079 2.00	inches mm
	0.0005	0.123 3.13	0.134 3.40	0.020 0.52	inches mm
	0.00075	0.115 2.93	0.134 3.40	0.037 0.94	inches mm
	0.001	0.094 2.38	0.134 3.40	0.080 2.04	inches mm
	0.0015	0.074 1.88	0.134 3.40	0.120 3.04	inches mm
	0.002	0.064 1.63	0.134 3.40	0.139 3.54	inches mm
	0.0025, 0.003	0.064 1.63	0.134 3.40	0.139 3.54	inches mm

Recommended Pad Layout (cont.)

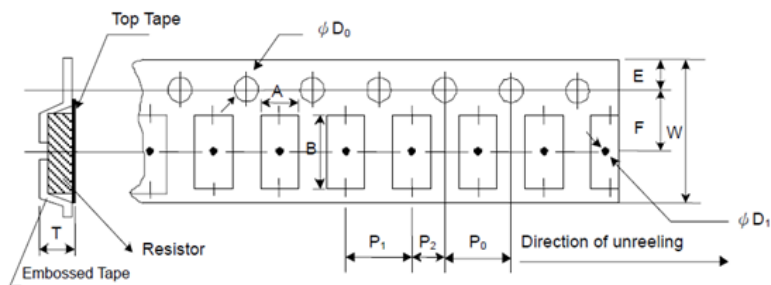
Type/Code	Resistance Range (Ω)	a	b	i	Unit
CSNL2512	0.004	0.104 2.63	0.134 3.40	0.061 1.54	inches mm
	0.005, 0.006	0.094 2.38	0.134 3.40	0.080 2.04	inches mm
	0.007	0.074 1.88	0.134 3.40	0.120 3.04	inches mm
	0.01	0.064 1.63	0.134 3.40	0.139 3.54	inches mm
	0.012 - 0.2	0.079 2.00	0.138 3.50	0.157 4.00	inches mm

Recommended Resistor Reflow Profile



Time of IR reflow soldering at maximum temperature point 260°C: 10 seconds.

Taping Specifications - Plastic Tape



Type/Code	Ohmic Value (Ω)	Quantity	A	B	W	F	E	P0	Unit
CSNL1206	0.001 - 0.05	4000	0.072 ± 0.004 1.83 ± 0.10	0.137 ± 0.004 3.48 ± 0.10	0.315 ± 0.006 8.00 ± 0.15	0.138 ± 0.004 3.50 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	inches mm
CSNL2010	0.0005 - 0.01	2000	0.114 ± 0.004 2.90 ± 0.10	0.215 ± 0.004 5.45 ± 0.10	0.472 ± 0.006 12.00 ± 0.15	0.217 ± 0.004 5.50 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	inches mm
CSNL2512	0.0002, 0.0003	2000	0.138 ± 0.004 3.50 ± 0.10	0.266 ± 0.004 6.75 ± 0.10	0.472 ± 0.012 12.00 ± 0.30	0.217 ± 0.004 5.50 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	inches mm
	0.0005 - 0.01	2000	0.134 ± 0.004 3.40 ± 0.10	0.266 ± 0.004 6.75 ± 0.10	0.472 ± 0.004 12.00 ± 0.10	0.217 ± 0.002 5.50 ± 0.05	0.069 ± 0.004 1.75 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	inches mm
	0.012 - 0.2	4000	0.138 ± 0.004 3.50 ± 0.10	0.264 ± 0.004 6.70 ± 0.10	0.472 ± 0.012 12.00 ± 0.30	0.217 ± 0.002 5.50 ± 0.05	0.069 ± 0.004 1.75 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	inches mm

Type/Code	Ohmic Value (Ω)	T	P1	P2	$\varnothing D0$	$\varnothing D1$	Unit
CSNL1206	0.001 - 0.05	0.043 ± 0.004 1.10 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.004 2.00 ± 0.10	0.059 ± 0.004 1.50 ± 0.10	- -	inches mm
CSNL2010	0.0005 - 0.01	0.052 ± 0.004 1.33 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.004 2.00 ± 0.10	0.059 ± 0.004 1.50 ± 0.10	- -	inches mm
CSNL2512	0.0002, 0.0003	0.057 ± 0.008 1.45 ± 0.20	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.004 2.00 ± 0.10	$0.059 \pm 0.004/-0$ $1.50 \pm 0.10/-0$	0.061 ± 0.004 1.55 ± 0.10	inches mm
	0.0005, 0.00075	0.057 ± 0.008 1.45 ± 0.20	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.06 ± 0.002 1.55 ± 0.05	0.06 min. 1.40 min.	inches mm
	0.001 - 0.01	0.032 ± 0.004 0.81 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.061 ± 0.010 1.55 ± 0.25	0.055 min. 1.40 min.	inches mm
	0.012 - 0.2	0.047 ± 0.000 1.20 ± 0.00	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	$0.059 \pm 0.004/-0$ $1.50 \pm 0.10/-0$	$0.059 \pm 0.01/-0$ $1.50 \pm 0.25/-0$	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)
CSNL	Metal Alloy Current Sensing Chip Resistor	SMD	YES	100% Matte Sn over Ni	May-04	04/18

"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	N	L	2	5	1	2	F	T	1	L	0	0
Product Series		Size		Tolerance		Packaging				Resistance Value			
Code		Code		Code	Tol	Code	Description	Size	Quantity	Four characters with the multiplier used as the decimal holder. "L" used as multiplier of 10^{-3} for any value under 0.1 ohm. 0.0005 ohm = L500 0.001 ohm = 1L00 0.01 ohm = 10L0 0.1 ohm = R100			
CSNL		1206		F	1%	T	7" Reel Plastic Tape	1206	4000				
		2010		J	5%			2010	2000				
		2512						2512 (0.0002Ω - 0.01Ω)					
								2512 (0.012Ω - 0.2Ω)	4000				