

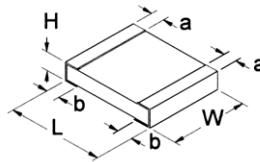
**Features:**

- Metal element current sensing resistor
- High power current sense resistor
- TCR of  $\pm 50$  ppm/ $^{\circ}$ C
- Resistances down to 0.0005 (1/2m $\Omega$ )
- Current handling up to 63 amps
- Non-standard resistance values available
- 100% RoHS compliant and lead free without exemption
- Halogen free
- REACH compliant
- For CSNL2512 with power rating of 3W, see [SEI-CSNL2512-3W](#)



Electrical Specifications				
Type/Code	Power Rating (W)	Dielectric Withstanding Voltage (V)	TCR (ppm/ $^{\circ}$ C)	Ohmic Range ( $\Omega$ ) and Tolerance 1%, 5%
CSNL1206	1 @ 80 $^{\circ}$ C	200	$\pm 50$	0.001 - 0.05
CSNL2010	1.5 @ 80 $^{\circ}$ C		$\pm 100$	0.0005
CSNL2512	2 @ 70 $^{\circ}$ C		$\pm 50$	0.001 - 0.1
			$\pm 50$	0.0005 - 0.01

**Mechanical Specifications**



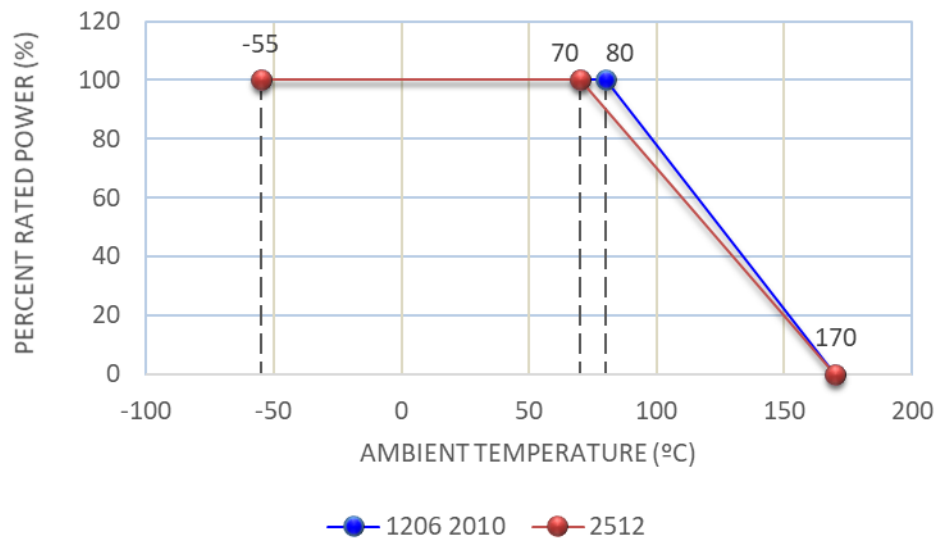
Type/Code	Resistance Range ( $\Omega$ )	H Body Height	a Top Termination	b Bottom	L Body Length	W Body Width	Unit
CSNL1206	0.001 - 0.05	0.025 $\pm$ 0.010	0.020 $\pm$ 0.010	0.020 $\pm$ 0.010	0.126 $\pm$ 0.010	0.063 $\pm$ 0.010	inches
		0.65 $\pm$ 0.25	0.51 $\pm$ 0.25	0.51 $\pm$ 0.25	3.20 $\pm$ 0.25	1.60 $\pm$ 0.25	mm
CSNL2010	$\leq$ 0.003	0.031 $\pm$ 0.010	0.051 $\pm$ 0.010	0.051 $\pm$ 0.010	0.200 $\pm$ 0.010	0.100 $\pm$ 0.010	inches
	$\geq$ 0.0031	0.79 $\pm$ 0.25	1.30 $\pm$ 0.25	1.30 $\pm$ 0.25	5.08 $\pm$ 0.25	2.54 $\pm$ 0.25	mm
CSNL2512	0.0005	0.025 $\pm$ 0.010	0.031 $\pm$ 0.010	0.031 $\pm$ 0.010	0.200 $\pm$ 0.010	0.100 $\pm$ 0.010	inches
	0.00075	0.049 $\pm$ 0.008	0.051 $\pm$ 0.015	0.051 $\pm$ 0.015	0.250 $\pm$ 0.010	0.125 $\pm$ 0.010	inches
		1.25 $\pm$ 0.20	1.30 $\pm$ 0.38	1.30 $\pm$ 0.38	6.35 $\pm$ 0.25	3.18 $\pm$ 0.25	mm
	0.001	0.030 $\pm$ 0.008	0.051 $\pm$ 0.015	0.051 $\pm$ 0.015	0.250 $\pm$ 0.010	0.125 $\pm$ 0.010	inches
		0.75 $\pm$ 0.20	1.30 $\pm$ 0.38	1.30 $\pm$ 0.38	6.35 $\pm$ 0.25	3.18 $\pm$ 0.25	mm
	0.0015	0.026 $\pm$ 0.008	0.051 $\pm$ 0.015	0.051 $\pm$ 0.015	0.250 $\pm$ 0.010	0.125 $\pm$ 0.010	inches
		0.65 $\pm$ 0.20	1.30 $\pm$ 0.38	1.30 $\pm$ 0.38	6.35 $\pm$ 0.25	3.18 $\pm$ 0.25	mm
	0.002	0.018 $\pm$ 0.008	0.051 $\pm$ 0.015	0.051 $\pm$ 0.015	0.250 $\pm$ 0.010	0.125 $\pm$ 0.010	inches
		0.45 $\pm$ 0.20	1.30 $\pm$ 0.38	1.30 $\pm$ 0.38	6.35 $\pm$ 0.25	3.18 $\pm$ 0.25	mm
	0.0025	0.014 $\pm$ 0.008	0.051 $\pm$ 0.015	0.051 $\pm$ 0.015	0.250 $\pm$ 0.010	0.125 $\pm$ 0.010	inches
		0.35 $\pm$ 0.20	1.30 $\pm$ 0.38	1.30 $\pm$ 0.38	6.35 $\pm$ 0.25	3.18 $\pm$ 0.25	mm
	0.0025	0.026 $\pm$ 0.008	0.051 $\pm$ 0.015	0.051 $\pm$ 0.015	0.250 $\pm$ 0.010	0.125 $\pm$ 0.010	inches
0.65 $\pm$ 0.20		1.30 $\pm$ 0.38	1.30 $\pm$ 0.38	6.35 $\pm$ 0.25	3.18 $\pm$ 0.25	mm	
0.003	0.022 $\pm$ 0.008	0.051 $\pm$ 0.015	0.051 $\pm$ 0.015	0.250 $\pm$ 0.010	0.125 $\pm$ 0.010	inches	
	0.55 $\pm$ 0.20	1.30 $\pm$ 0.38	1.30 $\pm$ 0.38	6.35 $\pm$ 0.25	3.18 $\pm$ 0.25	mm	
0.004	0.018 $\pm$ 0.008	0.051 $\pm$ 0.015	0.051 $\pm$ 0.015	0.250 $\pm$ 0.010	0.125 $\pm$ 0.010	inches	
	0.45 $\pm$ 0.20	1.30 $\pm$ 0.38	1.30 $\pm$ 0.38	6.35 $\pm$ 0.25	3.18 $\pm$ 0.25	mm	
0.005	0.014 $\pm$ 0.008	0.051 $\pm$ 0.015	0.051 $\pm$ 0.015	0.250 $\pm$ 0.010	0.125 $\pm$ 0.010	inches	
	0.35 $\pm$ 0.20	1.30 $\pm$ 0.38	1.30 $\pm$ 0.38	6.35 $\pm$ 0.25	3.18 $\pm$ 0.25	mm	
0.006	0.013 $\pm$ 0.008	0.051 $\pm$ 0.015	0.051 $\pm$ 0.015	0.250 $\pm$ 0.010	0.125 $\pm$ 0.010	inches	
	0.32 $\pm$ 0.20	1.30 $\pm$ 0.38	1.30 $\pm$ 0.38	6.35 $\pm$ 0.25	3.18 $\pm$ 0.25	mm	
0.0065	0.012 $\pm$ 0.008	0.051 $\pm$ 0.015	0.051 $\pm$ 0.015	0.250 $\pm$ 0.010	0.125 $\pm$ 0.010	inches	
	0.30 $\pm$ 0.20	1.30 $\pm$ 0.38	1.30 $\pm$ 0.38	6.35 $\pm$ 0.25	3.18 $\pm$ 0.25	mm	

Mechanical Specifications (cont.)							
Type/Code	Resistance Range (Ω)	H Body Height	a Top Termination	b Bottom	L Body Length	W Body Width	Unit
CSNL2512	0.007	0.011 ± 0.008 0.27 ± 0.20	0.051 ± 0.015 1.30 ± 0.38	0.051 ± 0.015 1.30 ± 0.38	0.250 ± 0.010 6.35 ± 0.25	0.125 ± 0.010 3.18 ± 0.25	inches mm
	0.01	0.010 ± 0.008 0.25 ± 0.20	0.051 ± 0.015 1.30 ± 0.38	0.051 ± 0.015 1.30 ± 0.38	0.250 ± 0.010 6.35 ± 0.25	0.125 ± 0.010 3.18 ± 0.25	inches mm

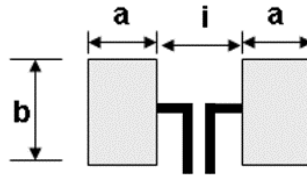
Performance Characteristics			
Test	Test Method	Test Specification	Typical
Load Life	MIL-STD-502F-Method 108A RCWV at 70°C; 1.5 hour ON; 0.5 hour OFF Total 1024 ± 24 hours	± 1%	≤ 0.5%
Resistance to Soldering Heat	MIL-STD-202F-Method 210E 260 ± 5°C for 10 ± 1 seconds	± 0.5%	≤ 0.25%
Solderability	MIL-STD-202F-Method 208H 245 ± 5°C for 2 ± 0.5 seconds	minimum 95% coverage	> 95%
Thermal Shock	MIL-STD-202F-Method 107G -55°C to 150°C, 100 cycles	± 0.5%	≤ 0.5%
Short Time Overload	JIS-C-5202-5.5 5x rated power for 5 seconds	± 0.5%	≤ 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	± 0.5%	≤ 0.5%
Moisture Resistance	MIL-STD-202F-Method 106G	± 0.5%	≤ 0.5%
Insulation Resistance	MIL-STD-202F-Method 302 Apply 100 Vdc for 1 minute	1M Ω minimum	≥ 1M Ω
Leach Resistance	-	90 seconds minimum	≥ 90 seconds

Operating temperature range is -55°C to +170°C

Power Derating Curve:



**Recommended Pad Layout**



Type/Code	Resistance Range ( $\Omega$ )	a	b	i	Unit
CSNL1206	0.001 - 0.05	0.063	0.086	0.039	inches
		1.60	2.18	1.00	mm
CSNL2010	$\leq 0.003$	0.114	0.115	0.048	inches
	$\geq 0.0031$	2.89	2.92	1.22	mm
CSNL2512	0.0005	0.090	0.115	0.095	inches
		2.29	2.92	2.41	mm
	0.0005	0.123	0.134	0.020	inches
		3.13	3.40	0.52	mm
	0.00075	0.115	0.134	0.037	inches
		2.93	3.40	0.94	mm
	0.001	0.094	0.134	0.080	inches
		2.38	3.40	2.04	mm
	0.0015	0.074	0.134	0.120	inches
		1.88	3.40	3.04	mm
0.002 - 0.0035	0.064	0.134	0.139	inches	
	1.63	3.40	3.54	mm	
0.004 - 0.0045	0.104	0.134	0.061	inches	
	2.63	3.40	1.54	mm	
0.005 - 0.006	0.094	0.134	0.080	inches	
	2.38	3.40	2.04	mm	
0.0065 - 0.007	0.074	0.134	0.120	inches	
	1.88	3.40	3.04	mm	
0.008 - 0.01	0.064	0.134	0.139	inches	
	1.63	3.40	3.54	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**

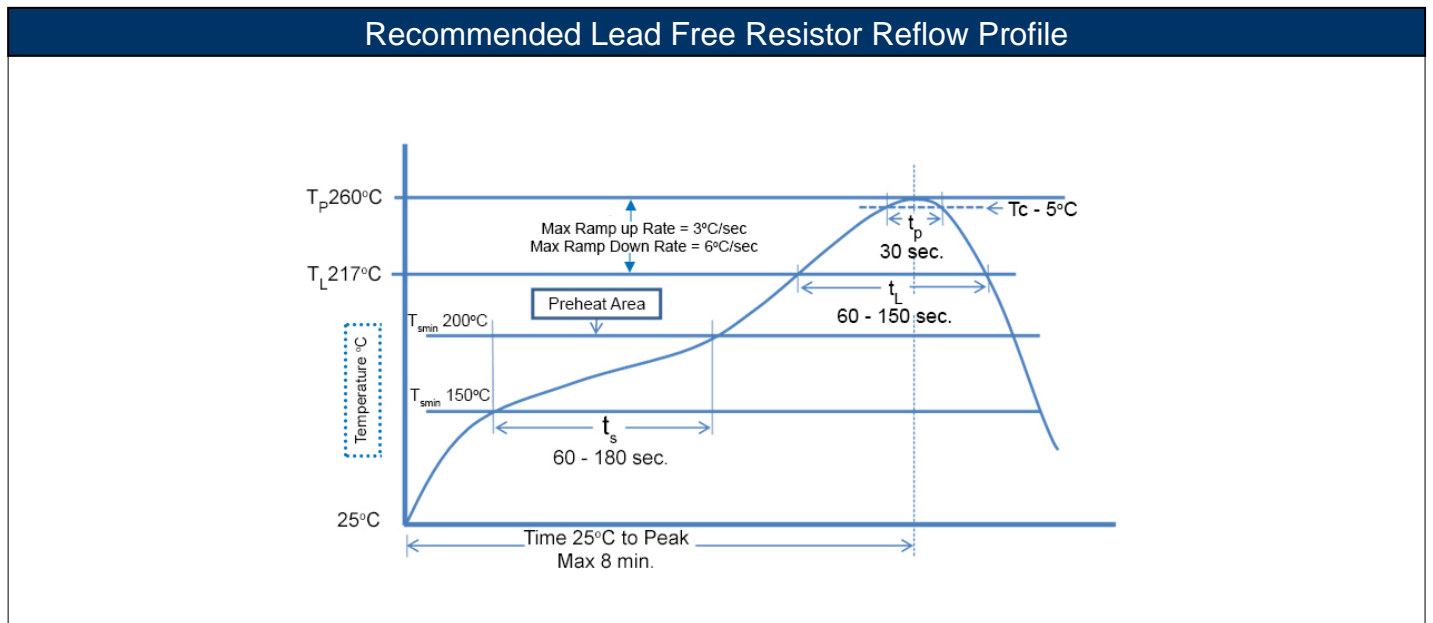
Soldering iron recommended temperatures: 330°C to 350°C with minimum duration.  
Maximum number of reflow cycles: 3.

**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	*



### Taping Specifications – Embossed 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	0.137 ± 0.004	0.315 ± 0.006	0.138 ± 0.004	0.069 ± 0.004	0.157 ± 0.004	inches
			1.83 ± 0.10	3.48 ± 0.10	8.00 ± 0.15	3.50 ± 0.10	1.75 ± 0.10	4.00 ± 0.10	mm
CSNL2010	0.0005 - 0.01	2000	0.114 ± 0.004	0.215 ± 0.004	0.472 ± 0.006	0.217 ± 0.004	0.069 ± 0.004	0.157 ± 0.004	inches
			2.90 ± 0.10	5.45 ± 0.10	12.00 ± 0.15	5.50 ± 0.10	1.75 ± 0.10	4.00 ± 0.10	mm
CSNL2512	0.0005 - 0.00075	2000	0.134 ± 0.004	0.266 ± 0.004	0.472 ± 0.004	0.217 ± 0.002	0.069 ± 0.004	0.157 ± 0.004	inches
			3.40 ± 0.10	6.75 ± 0.10	12.00 ± 0.10	5.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	mm
CSNL2512	0.001 - 0.01	2000	0.134 ± 0.004	0.266 ± 0.004	0.472 ± 0.004	0.217 ± 0.002	0.069 ± 0.004	0.157 ± 0.004	inches
			3.40 ± 0.10	6.75 ± 0.10	12.00 ± 0.10	5.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	mm

Taping Specifications – Embossed Plastic Tape (cont.)								
Type / Code	Ohmic Value (Ω)	Quantity	T	P1	P2	ØD0	ØD1	Unit
CSNL1206	0.001 - 0.05	4000	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	2000	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	0.0005 - 0.00075	2000	0.057 ± 0.008 1.45 ± 0.20	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.061 ± 0.002 1.55 ± 0.05	0.055 min. 1.40 min.	inches mm
CSNL2512	0.001 - 0.01	2000	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 ± 0.002 1.55 ± 0.05	0.055 min. 1.40 min.	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 Plate Current Sensing Surface Mount 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 1 2 0 6 F T 1 0 L 0**

Product Series		Size		Tolerance		Packaging				Resistance Value
Code	Description	Code	W	Code	Tol	Code	Description	Size	Quantity	
CSNL	Metal Plate	1206	1	F	1%	T	7" Reel - Plastic Tape	1206	4000	Four characters with the multiplier used as the decimal holder. "L" used as multiplier of $10^{-3}$ for any value under 0.1 ohm.
		2010	1.5	J	5%			2010, 2512	2000	0.0005 ohm = L500 0.001 ohm = 1L00 0.01 ohm = 10L0 0.1 ohm = R100
		2512	2							