

Features:

- Low resistance and low TCR
- Excellent long term stability
- RoHS compliant, REACH compliant, lead free, and halogen free
- AEC-Q200 compliant



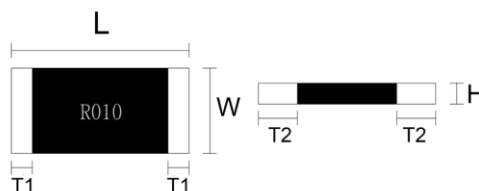
Electrical Specifications

Type/Code	Maximum Power Rating (W)	Rated Terminal Temperature	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance
				1% and 5%
CSSU2512	5	105°C	± 50	0.001, 0.002, 0.003
		85°C	± 50	0.004, 0.005, 0.006, 0.01

$$V = \sqrt{P \cdot R}$$

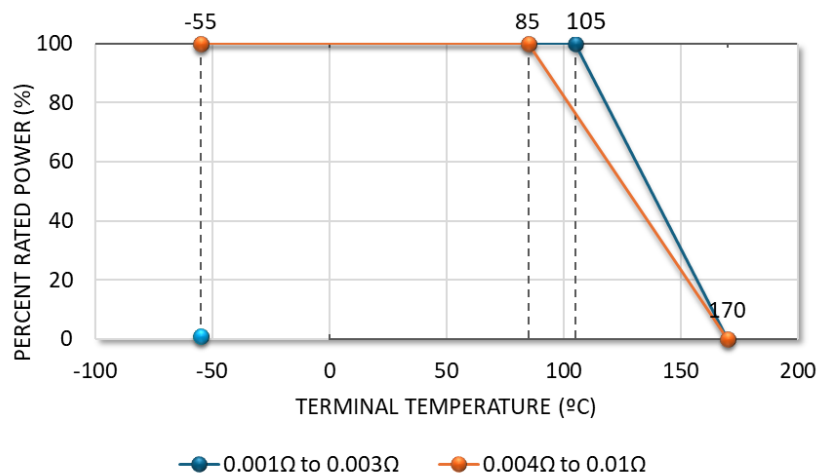
Other values may be available.

Mechanical Specifications



Type/Code	Maximum Power Rating (W)	Resistance Range (Ω)	L	W	H	T1	T2	Unit
CSSU2512	5	0.001	0.250 ± 0.010 6.35 ± 0.25	0.120 ± 0.010 3.05 ± 0.25	0.030 ± 0.010 0.75 ± 0.25	0.045 ± 0.010 1.15 ± 0.25	0.087 ± 0.010 2.20 ± 0.25	inches mm
		0.002 to 0.005	0.250 ± 0.010 6.35 ± 0.25	0.120 ± 0.010 3.05 ± 0.25	0.030 ± 0.010 0.75 ± 0.25	0.045 ± 0.010 1.15 ± 0.25	0.045 ± 0.010 1.15 ± 0.25	inches mm
		0.006, 0.01	0.250 ± 0.010 6.35 ± 0.25	0.120 ± 0.010 3.05 ± 0.25	0.023 ± 0.010 0.58 ± 0.25	0.045 ± 0.010 1.15 ± 0.25	0.043 ± 0.010 1.10 ± 0.25	inches mm

Power Derating Curve:

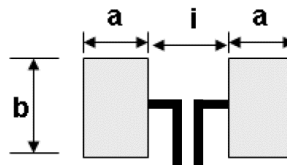


Performance Characteristics

Test	Test Method	Test Specification	Test Condition
Temperature Coefficient of Resistance (TCR)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	Per specification (refer to Electrical Specification table)	At 25°C/+150°C, 25°C is the reference temperature
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	$\Delta R/R1 \leq \pm 1\%$	The number of rated power is 4 times rated power for 5 seconds
High Temperature Exposure	JIS-C-5201-1 4.25 IEC 60068-2-2	$\Delta R/R1 \leq \pm 1\%$	At 155°C for 1000 hours
		$\Delta R/R1 \leq \pm 2\%$	At 170°C for 1000 hours
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	$\Delta R/R1 \leq \pm 0.5\%$	260 \pm 5°C for 10 seconds
Temperature Cycling	JESD22 Method JA-104	$\Delta R/R1 \leq \pm 1\%$	1000 cycles (-55 to +155°C) Measurement at 24 \pm 4 hours after test conclusion. 30 minutes maximum dwell time at each temperature extreme.
Biased Humidity	MIL-STD-202 Method 103	$\Delta R/R1 \leq \pm 1\%$	1000 hours; 85°C / 85% RH, 10% of operating power. Measurement at 24 \pm 4 hours after test conclusion.
Endurance of Rated Terminal Part Temperature	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	$\Delta R/R1 \leq \pm 1\%$	105 \pm 2°C (0.001, 0.002, and 0.003 Ω) 85 \pm 2°C (0.004, 0.005, and 0.01 Ω) at rated power for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"
Solderability	JIS-C-5201-1 4.17 IEC-60115-1 4.17	> 95% coverage	245 \pm 5°C for 3 seconds
Dielectric Withstanding Voltage	JIS-C5201-1 4.7	No short or burned on the appearance	Applied 500 VAC for 1 minute
Core Body Strength	JIS-C-5201-1 4.15	No breakage	Central part pressurizing force: 5 N, 10 seconds
Terminal Strength (SMD)	AEC-Q200-006	No breakage	Pressurizing force: 17.7 N for 60 seconds
Bending Strength	JIS-C-5201-1 4.33 IEC-60115-1 4.33	$\Delta R/R1 \leq \pm 0.5\%$ No breakage	Bending once 2 mm for 10 seconds
Moisture Resistance	MIL-STD-202 Method 106	$\Delta R/R1 \leq \pm 0.5\%$	T=24 hours / Cycle, 10 cycles Steps 7a & 7b not required. Unpowered.

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

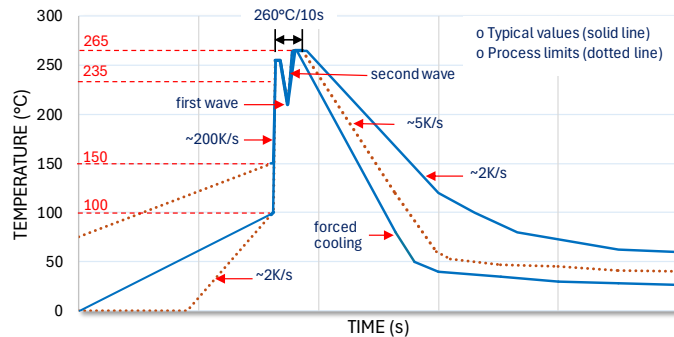
Recommended Pad Layout



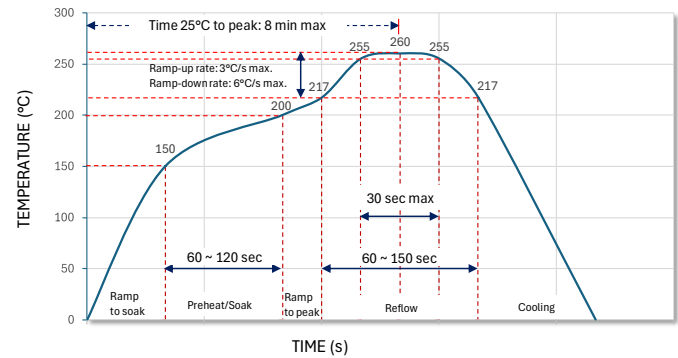
Type/Code	Maximum Power Rating (W)	Resistance Range (Ω)	a	b	i	Unit
CSSU2512	5	0.001	0.127 3.23	0.145 3.68	0.051 1.30	inches mm
		0.002-0.01	0.102 2.60	0.145 3.68	0.100 2.55	inches mm

Recommended Resistor Reflow Profile

Wave Solder Temperature Condition

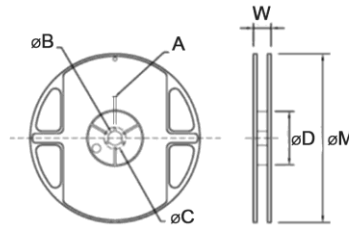


Solder Reflow Temperature Condition



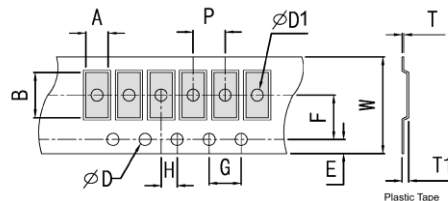
Soldering iron: temperature $350 \pm 10^\circ\text{C}$. Dwell time shall be less than 3 seconds.

Reel Specifications



Type/Code	Tape Width	A	B	C	D	W	M	Unit
CSSU	7" Reel - 12 mm	0.098 ± 0.020 2.50 ± 0.50	0.531 ± 0.020 13.50 ± 0.50	0.697 ± 0.020 17.70 ± 0.50	2.362 ± 0.020 60.00 ± 0.50	0.638 ± 0.020 16.20 ± 0.50	7.008 ± 0.039 178.00 ± 1.00	inches mm

Packaging Specifications - Plastic Tape

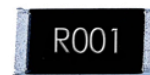


Type/Code	Resistance Range (Ω)	W	P	E	F	D	D1	Unit
CSSU	0.001 to 0.005	0.472 ± 0.012 12.00 ± 0.30	0.157 ± 0.004 4.00 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.217 ± 0.004 5.50 ± 0.10	$0.059 +0.004/-0$ $1.50 +0.1/-0$	0.061 ± 0.004 1.55 ± 0.10	inches mm
	0.006, 0.01	0.472 ± 0.012 12.00 ± 0.30	0.157 ± 0.004 4.00 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.217 ± 0.004 5.50 ± 0.10	$0.059 +0.004/-0$ $1.50 +0.1/-0$	0.061 ± 0.004 1.55 ± 0.10	inches mm
	Resistance Range (Ω)	G	H	A	B	T1	T	Unit
	0.001 to 0.005	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.004 2.00 ± 0.10	0.138 ± 0.004 3.50 ± 0.10	0.266 ± 0.004 6.75 ± 0.10	0.043 ± 0.004 1.10 ± 0.10	0.008 ± 0.002 0.20 ± 0.05	inches mm
	0.006, 0.01	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.004 2.00 ± 0.10	0.138 ± 0.004 3.50 ± 0.10	0.266 ± 0.004 6.75 ± 0.10	0.035 ± 0.004 0.90 ± 0.10	0.008 ± 0.002 0.20 ± 0.05	inches mm

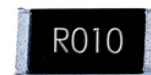
Marking Instructions

The nominal resistance is marked on the surface of the overcoating with the use of **four character markings**.

"R" will be used as the decimal holder.



0.001Ω



0.01Ω

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)
CSSU	High Power 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	S	U	2	5	1	2	F	T	1	L	0	0
Product Series		Size		Tolerance		Packaging				Resistance Value			
Code		Size		Code		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.			
CSSU		2512		F	1%	T	7" Reel - Plastic Tape	2512	4000				
				J	5%					0.001 ohm = 1L00 0.002 ohm = 2L00 0.003 ohm = 3L00 0.004 ohm = 4L00 0.005 ohm = 5L00 0.006 ohm = 6L00 0.01 ohm = 10L0			