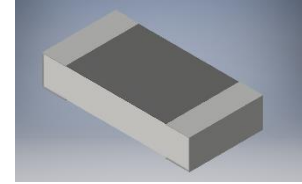


**Features:**

- 0201 to 2512 (standard terminations) and 0508 to 1225 (wide terminations) available
- Low resistance, TCR and inductance
- Excellent long-term stability
- High precision current sensing
- High power capability
- “-UP” High power version
- Non-standard resistance values available
- RoHS compliant, REACH compliant, lead free, and halogen free
- AEC-Q200 compliant (all sizes except 0201)
- [For anti-sulfur CSRT, see CSRT-AS Series – Anti-sulfur Metal Film Low Resistance Chip Resistor](#)



**Applications:**

- Consumer electronics
- Computer
- Telecom
- Measuring instrument
- Industrial / Power supply
- Battery management system

Electrical Specifications				
Type/Code	Power Rating (W) @ 70°C	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance	
			0.5%	1%, 2%, 5%
CSRT0201	0.2	± 100	0.05 - 0.091	
		± 50	0.1 - 10	
CSRT0402	0.25	± 100	0.05 - 0.091	
		± 50	0.1 - 10	
CSRT0603	0.4	± 100	0.05 - 0.091	
		± 50	0.1 - 10	
CSRT0805	0.5	± 150	0.039 - 0.047	
		± 100	0.05 - 0.091	
		± 50	0.1 - 10	
CSRT1206	0.5	± 200	-	0.01 - 0.036
		± 150	0.039 - 0.047	
	1	± 100	0.05 - 0.091	
		± 50	0.1 - 10	
CSRT1210	1	± 150	0.039 - 0.047	
		± 100	0.05 - 0.091	
		± 50	0.1 - 10	
CSRT2010	1.5	± 50	0.1 - 10	
CSRT2512	3	± 50	0.1 - 10	

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

P = Rated Power (W)

R = Resistance Value (Ω)

**Electrical Specifications – High Power**

Type/Code	Power Rating (W) @ 70°C	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance	
			0.5%, 1%, 2%, 5%	
CSRT2512 -UP	3.5	± 50	0.05 - 50	

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

P = Rated Power (W)

R = Resistance Value (Ω)

**Electrical Specifications – Wide Termination**

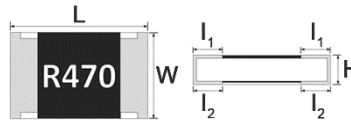
Type/Code	Power Rating (W) @ 70°C	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance	
			0.5%	1%, 2%, 5%
CSRT0508	1	± 100	0.1 - 2	0.01 - 2
CSRT0612	1			
CSRT1020	2			
CSRT1225	3			

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

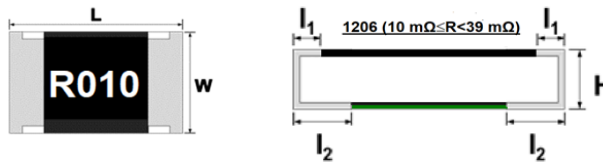
P = Rated Power (W)

R = Resistance Value (Ω)

**Mechanical Specifications**

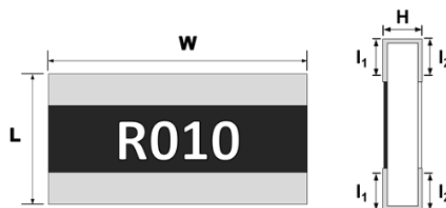


Type/Code	L Body Length	W Body Width	H Body Height	l <sub>1</sub> Top Termination	l <sub>2</sub> Bottom Termination	Unit
CSRT0201	0.024 ± 0.001 0.60 ± 0.03	0.012 ± 0.001 0.30 ± 0.03	0.010 ± 0.002 0.26 ± 0.05	0.006 ± 0.002 0.15 ± 0.05	0.006 ± 0.002 0.15 ± 0.05	inches mm
CSRT0402	0.039 ± 0.004 1.00 ± 0.10	0.020 ± 0.002 0.50 ± 0.05	0.014 ± 0.002 0.35 ± 0.05	0.008 ± 0.004 0.20 ± 0.10	0.010 ± 0.004 0.25 ± 0.10	inches mm
CSRT0603	0.063 ± 0.004 1.60 ± 0.10	0.031 ± 0.004 0.80 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	0.010 ± 0.006 0.25 ± 0.15	0.012 ± 0.006 0.30 ± 0.15	inches mm
CSRT0805	0.079 ± 0.004 2.00 ± 0.10	0.049 ± 0.004 1.25 ± 0.10	0.022 ± 0.004 0.55 ± 0.10	0.014 ± 0.008 0.35 ± 0.20	0.016 ± 0.008 0.40 ± 0.20	inches mm
CSRT1206 (0.039 Ω - 10 Ω)	0.122 ± 0.004 3.10 ± 0.10	0.063 ± 0.004 1.60 ± 0.10	0.022 ± 0.004 0.55 ± 0.10	0.016 ± 0.008 0.40 ± 0.20	0.018 ± 0.008 0.45 ± 0.20	inches mm
CSRT1210	0.122 ± 0.004 3.10 ± 0.10	0.098 ± 0.006 2.50 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.020 ± 0.008 0.50 ± 0.20	0.020 ± 0.008 0.50 ± 0.20	inches mm
CSRT2010	0.197 ± 0.008 5.00 ± 0.20	0.098 ± 0.006 2.50 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.024 ± 0.010 0.60 ± 0.25	0.024 ± 0.010 0.60 ± 0.25	inches mm
CSRT2512 (-UP)	0.248 ± 0.008 6.30 ± 0.20	0.126 ± 0.008 3.20 ± 0.20	0.028 ± 0.006 0.70 ± 0.15	0.026 ± 0.010 0.65 ± 0.25	0.026 ± 0.010 0.65 ± 0.25	inches mm



Type/Code	L Body Length	W Body Width	H Body Height	l <sub>1</sub> Top Termination	l <sub>2</sub> Bottom Termination	Unit
CSRT1206 (0.01 Ω - 0.038 Ω)	0.130 ± 0.008 3.30 ± 0.20	0.067 ± 0.008 1.70 ± 0.20	0.026 ± 0.008 0.65 ± 0.20	0.008 ± 0.006 0.20 ± 0.15	0.027 ± 0.008 0.68 ± 0.20	inches mm

**Mechanical Specifications – Wide Termination**



Type/Code	L Body Length	W Body Width	H Body Height	l <sub>1</sub> Top Termination	l <sub>2</sub> Bottom Termination	Unit
CSRT0508	0.049 ± 0.004	0.079 ± 0.004	0.022 ± 0.006	0.010 ± 0.006	0.014 ± 0.006	inches
	1.25 ± 0.10	2.00 ± 0.10	0.55 ± 0.15	0.25 ± 0.15	0.35 ± 0.15	mm
CSRT0612	0.063 ± 0.006	0.126 ± 0.008	0.022 ± 0.006	0.012 ± 0.008	0.020 ± 0.008	inches
	1.60 ± 0.15	3.20 ± 0.20	0.55 ± 0.15	0.30 ± 0.20	0.50 ± 0.20	mm
CSRT1020	0.098 ± 0.006	0.197 ± 0.006	0.022 ± 0.006	0.016 ± 0.008	0.020 ± 0.008	inches
	2.50 ± 0.15	5.00 ± 0.15	0.55 ± 0.15	0.40 ± 0.20	0.50 ± 0.20	mm
CSRT1225	0.126 ± 0.008	0.248 ± 0.008	0.022 ± 0.006	0.024 ± 0.010	0.031 ± 0.010	inches
	3.20 ± 0.20	6.30 ± 0.20	0.55 ± 0.15	0.60 ± 0.25	0.80 ± 0.25	mm

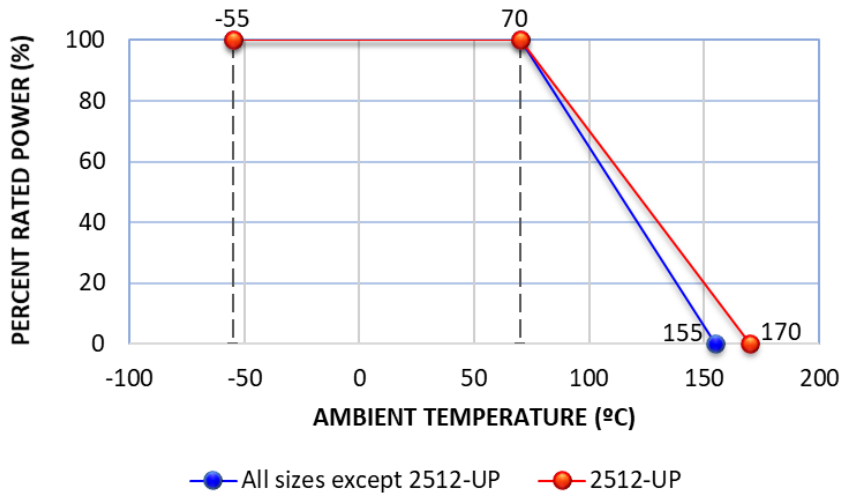
**Performance Characteristics**

Test Item	Test Method	Test Condition	Test Limits
Temperature Coefficient of Resistance (TCR)	JIS C-5201-1 4.8 IEC-60115-1 4.8	TCR +125°C, 25°C is the reference temperature	Refer to Electrical Specifications table
Short Time Overload	JIS C-5201-1 4.13 IEC-60115-1 4.13	Standard Power: 6.25 times rated power whichever is less for 5 seconds High Power and wide terminal type: 5 times rated power whichever is less for 5 seconds	± (1% + 0.001Ω)
Insulation Resistance	JIS C-5201-1 4.8 IEC-60115-1 4.8	100 VDC for 1 minute	≥ 10GΩ
Dielectric Withstanding Voltage	JIS C-5201-1 4.7	0805, 0508, 0612 and above applied 500 VAC, 1 minute 0201, 0402, 0603 applied 300 VAC, 1 minute	No short or burned on the appearance
Core Body Strength	JIS C-5201-1 4.15	Central part pressurizing force: 10 N, 10 seconds	No breakage.
Solderability	JIS C-5201-1 4.17 IEC-60115-1 4.17	245°C ± 5°C for 3 ± 0.5 seconds	>95% coverage - no visual damage
Resistance to Soldering Heat	JIS C-5201-1 4.18 IEC-60115-1 4.18	260°C ± 5°C for 10 seconds	± (1% + 0.001Ω) No visual damage
Leaching	JIS C5201-1 4.18 IEC-60068-2-58 8.2.1	260°C ± 5°C for 30 seconds	>95% coverage - no visual damage
Rapid Change of Temperature	JIS C-5201-1 4.19 IEC-60115-1 4.19	-55°C to +155°C, 300 cycles	± (1% + 0.001Ω) No visual damage
Damp Heat with Load	JIS C-5201-1 4.24 IEC-60115-1 4.24	40°C ± 2°C, 90 ~ 95% R.H., rated power or max. working current whichever is less for 1000 hours with 1.5 hours "ON" and 0.5 hours "OFF"	± (1% + 0.001Ω)
Biased Humidity	MIL-STD-202 Method 103	1000 hours; 85°C/85% RH, 10% of operating power. Measurement at 24 ± 4 hours after test conclusion.	± (0.5% + 0.05Ω)
Load Life (Endurance)	JIS C-5201-1 4.25 IEC-60115-1 4.25.1	70°C ± 2°C, rated power or max. working current whichever is less for 1000 hours with 1.5 hours "ON" and 0.5 hours "OFF"	± (1% + 0.001Ω)
High Temperature Exposure	JIS C-5201-1 4.25 IEC 60068-2-2	At +155°C ± 5°C for 1000 + 48/- 0 hours all sizes, except 2512-UP At +170°C ± 5°C for 1000 + 48/- 0 hours for 2512-UP	± (1% + 0.001Ω)
Resistance to Solvent	JIS C-5201-1 clause 4.29	The tested resistor be immersed into isopropyl alcohol of 20°C ~ 25°C for 60 seconds. Then the resistor is left in room for 48 hours	± (1% + 0.001Ω) No visual damage
Terminal Strength	JIS C-5201-1 4.32 AEC Q200-006	Pressurizing force for 10 seconds. 0201, 0402, 0603: 8 N; 0805, 0612 and above: 17.7N	No breakage

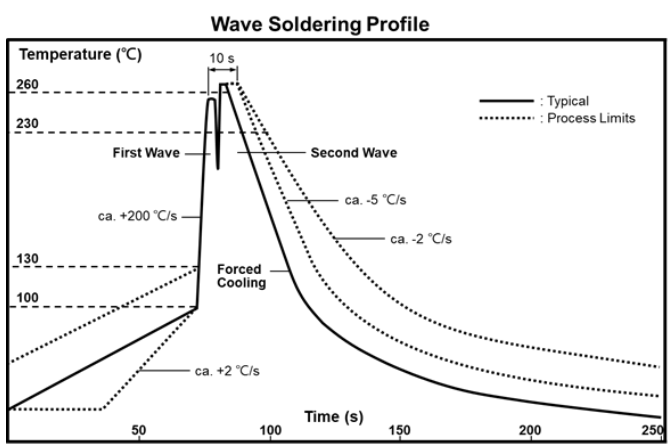
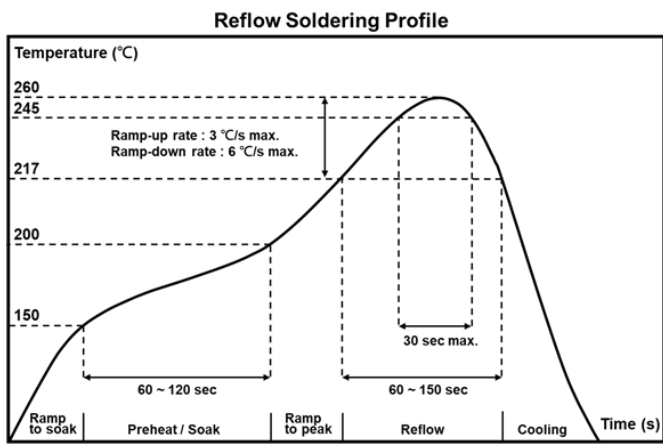
Performance Characteristics (cont.)			
Test Item	Test Method	Test Condition	Test Limits
Bending Strength	JIS C-5201-1 4.33 IEC-60115-1 4.33	Bending once for 5 seconds. D: 0201, 0402, 0603, 0805 = 5 mm 1206, 1210, 0508, 0612 = 3 mm 2010, 2512, 1020, 1225 = 2 mm	± (1% + 0.001Ω) No visual damage

Operating temperature range is -55°C to +155°C for all sizes except 2512-UP  
Operating temperature range for 2512-UP is -55°C to +170°C

**Power Derating Curve:**

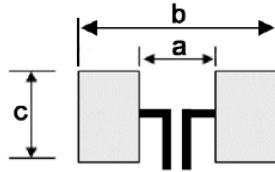


**Soldering Profiles**



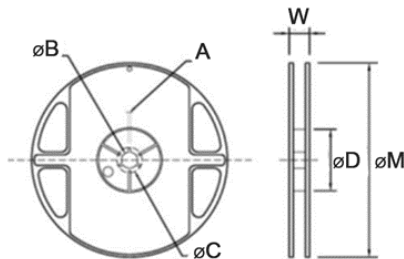
Rework temperature (hot air equipment): 350°C, 3 ~ 5 seconds  
Recommended reflow methods:  
IR, vapor phase oven, hot air oven  
If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

**Recommended Pad Layout**



Type/Code	a	b	c	Unit
CSRT0201	0.010	0.033	0.014	inches
	0.25	0.85	0.35	mm
CSRT0402	0.020	0.063	0.028	inches
	0.50	1.60	0.70	mm
CSRT0603	0.031	0.094	0.039	inches
	0.80	2.40	1.00	mm
CSRT0805	0.051	0.114	0.057	inches
	1.30	2.90	1.45	mm
CSRT1206 (0.01 Ω - 0.038 Ω)	0.047	0.189	0.072	inches
	1.20	4.80	1.84	mm
CSRT1206 (0.039 Ω - 10 Ω)	0.087	0.165	0.071	inches
	2.20	4.20	1.80	mm
CSRT1210	0.079	0.173	0.106	inches
	2.00	4.40	2.70	mm
CSRT2010	0.150	0.260	0.106	inches
	3.80	6.60	2.70	mm
CSRT2512 (-UP)	0.193	0.319	0.134	inches
	4.90	8.10	3.40	mm
CSRT0508	0.016	0.071	0.079	inches
	0.40	1.80	2.00	mm
CSRT0612	0.020	0.102	0.126	inches
	0.50	2.60	3.20	mm
CSRT1020	0.039	0.159	0.217	inches
	1.00	4.05	5.50	mm
CSRT1225	0.047	0.205	0.276	inches
	1.20	5.20	7.00	mm

**Reel Specifications**



Type/Code	A	B	C	D	W	M	Unit
CSRT0201	0.079 ± 0.020 2.00 ± 0.50	0.531 ± 0.039 13.50 ± 1.00	0.827 ± 0.039 21.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	0.453 ± 0.079 11.50 ± 2.00	7.008 ± 0.079 178.00 ± 2.00	inches mm
CSRT0402							
CSRT0603							
CSRT0805							

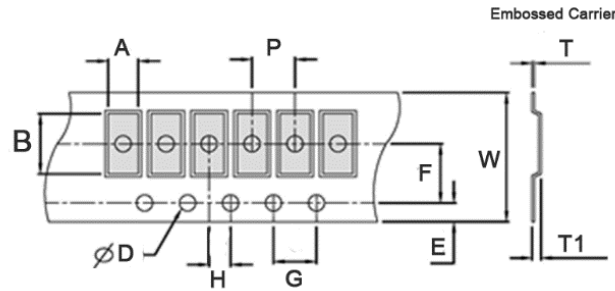
Reel Specifications (cont.)							
Type/Code	A	B	C	D	W	M	Unit
CSRT1206	0.079 ± 0.020 2.00 ± 0.50	0.531 ± 0.039 13.50 ± 1.00	0.827 ± 0.039 21.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	0.453 ± 0.079	7.008 ± 0.079 178.00 ± 2.00	inches
CSRT1210					11.50 ± 2.00		mm
CSRT2010					0.453 ± 0.079		inches
					11.50 ± 2.00		mm
CSRT2512 (-UP)					0.630 ± 0.079		inches
					16.00 ± 2.00		mm
CSRT0508					0.630 ± 0.079		inches
					11.50 ± 2.00		mm
CSRT0612					0.453 ± 0.079		inches
	11.50 ± 2.00	mm					
CSRT1020	0.630 ± 0.079	inches					
	16.00 ± 2.00	mm					
CSRT1225	0.630 ± 0.079	inches					
	16.00 ± 2.00	mm					

Packaging Specifications - Paper Tape						
Type/Code	A	B	W	E	F	Unit
CSRT0201	0.018 ± 0.004 0.45 ± 0.10	0.030 ± 0.004 0.75 ± 0.10	0.315 ± 0.008 8.00 ± 0.20	0.069 ± 0.004 1.75 ± 0.10	0.138 ± 0.002 3.50 ± 0.05	inches
CSRT0402	0.028 ± 0.004 0.70 ± 0.10	0.047 ± 0.004 1.20 ± 0.10				mm
CSRT0603	0.041 ± 0.008 1.05 ± 0.20	0.071 ± 0.008 1.80 ± 0.20				inches
CSRT0805	0.061 ± 0.008 1.55 ± 0.20	0.091 ± 0.008 2.30 ± 0.20				mm
CSRT1206	0.075 ± 0.008 1.90 ± 0.20	0.120 ± 0.008 3.05 ± 0.20				inches
CSRT1210	0.112 ± 0.008 2.85 ± 0.20	0.120 ± 0.008 3.05 ± 0.20				mm
CSRT0508	0.059 ± 0.006 1.50 ± 0.15	0.089 ± 0.006 2.25 ± 0.15				inches
CSRT0612	0.112 ± 0.008 2.85 ± 0.20	0.120 ± 0.008 3.05 ± 0.20				mm

**Packaging Specifications - Paper Tape (cont.)**

Type/Code	G	H	T	P	D	Unit
CSRT0201	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.014 ± 0.004	0.079 ± 0.004	0.059 +0.004/-0 1.50 +0.10/-0	inches
CSRT0402			0.35 ± 0.10	2.00 ± 0.10		inches
CSRT0603			0.018 ± 0.004	0.079 ± 0.004		inches
CSRT0805			0.45 ± 0.10	2.00 ± 0.10		inches
			0.024 ± 0.004	0.157 ± 0.004		inches
CSRT1206			0.60 ± 0.10	4.00 ± 0.10		inches
			0.030 ± 0.004	0.157 ± 0.004		inches
CSRT1210			0.75 ± 0.10	4.00 ± 0.10		inches
			0.030 ± 0.004	0.157 ± 0.004		inches
CSRT0508	0.75 ± 0.10	4.00 ± 0.10	inches			
	0.030 ± 0.004	0.157 ± 0.004	inches			
CSRT0612	0.75 ± 0.10	4.00 ± 0.10	inches			
	0.030 ± 0.004	0.157 ± 0.004	inches			

**Packaging Specifications - Embossed Tape**



Type/Code	A	B	W	E	F	G	Unit
CSRT2010	0.110 ± 0.008 2.80 ± 0.20	0.220 ± 0.008 5.60 ± 0.20	0.472 ± 0.004 12.00 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.217 ± 0.002 5.50 ± 0.05	0.157 ± 0.004 4.00 ± 0.10	inches
CSRT2512 (-UP)	0.134 ± 0.008 3.40 ± 0.20	0.264 ± 0.008 6.70 ± 0.20					inches
CSRT1020	0.110 ± 0.008 2.80 ± 0.20	0.220 ± 0.008 5.60 ± 0.20					inches
CSRT1225	0.134 ± 0.008 3.40 ± 0.20	0.264 ± 0.008 6.70 ± 0.20					inches
Type/Code	H	T	T1	P	D	D1	Unit
CSRT2010	0.079 ± 0.002 2.00 ± 0.05	0.009 ± 0.004 0.23 ± 0.10	0.033 ± 0.006 0.85 ± 0.15	0.157 ± 0.004 4.00 ± 0.10	0.059 +0.004/-0 1.50 +0.10/-0	0.059 ± 0.004 1.50 ± 0.10	inches
CSRT2512 (-UP)							inches
CSRT1020							inches
CSRT1225							inches



**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)
CSRT	Thin Film 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. 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**

<b>C</b>	<b>S</b>	<b>R</b>	<b>T</b>	<b>2</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>F</b>	<b>T</b>	<b>1</b>	<b>R</b>	<b>0</b>	<b>0</b>	<b>-</b>	<b>U</b>	<b>P</b>
----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------

Product Series		Size		Tolerance		Packaging				Resistance Value		Special	
Code	Description	Code	W	Code	Tol	Code	Description	Size	Quantity	Four characters with the multiplier used as the decimal holder. "L" used as multiplier of 10 <sup>-3</sup> for any value under 0.1 ohm.		Code	Description
CSRT	Thin Film Current Sensing	0201	0.2	D	0.5%	T	Paper Tape	0201, 0402	10000	0.01 ohm = 10L0		blank	Standard
		0402	0.25	F	1%				0603, 0805, 1206	5000	0.098 ohm = 98L0		-UP
		0603	0.4	G	2%		Embossed	1210, 0508, 0612		10 ohm = 10R0			
		0805	0.5	J	5%				2010, 2512	4000			
		1206	0.5					1020, 1225					
			1										
		1210	1										
		2010	1.5										
		2512	3										
		2512 (-UP)	3.5										
		0508	1										
		0612	1										
		1020	2										
		1225	3										