Stackpole Electronics, Inc.

Resistive Product Solutions

Features:

- 0201 to 1225 sizes available
- Power ratings to 3W
- Non-standard resistance values available
- E24 values standard; E96 and other values may be available upon request
- 0815, 2010 and 2512 sizes available with narrow terminations (CSRN)
- 100% RoHS compliant and lead free without exemption and halogen free
- REACH compliant



		Electrical Speci	fications - CSR	
Type/Code	Power Rating (W) @ 70°C	Dielectric Withstanding	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance
		Voltage (V)	± 1000	1% 2%, 5% 0.1 - 0.13
0000004	0.05	000		
CSR0201	0.05	200	± 600	0.15 - 0.5
			± 300	0.51 - 1
CSR0402	0.125	200	± 200 ⁽¹⁾	0.05 - 1
CSR0603	0.125	200	± 300 ⁽³⁾	0.02 - 0.3
00110000	0.125	200	± 200 ⁽²⁾	0.33 - 1
CSR0805	0.25	200	± 200 ⁽³⁾	0.02 - 1
CSR1206	0.5	200	± 100 ⁽²⁾	0.01 - 1
		200	± 600	0.01 - 0.02
			± 400	0.022 - 0.051
CSR1210	0.5		± 300	0.056 - 0.091
			± 200	0.1 - 1
CSR2010	1	200	± 200 ⁽³⁾	0.01 - 1
CSR2512	2	200	± 200 ⁽³⁾	0.01 - 1
			± 300	- 0.001 - 0.004
CSR0830	2	200	± 200	0.005 - 0.01
			± 150	0.011 - 0.33
			± 300	0.003 - 0.004
0004005		000	± 200	0.005 - 0.02
CSR1225	3	200	± 150	0.022 - 0.03
			± 100	0.033 - 7.5

⁽¹⁾ Contact Stackpole for TCR below 500 $\text{m}\Omega$

⁽³⁾ Contact Stackpole for TCR below 100 m Ω

Electrical Specifications – CSRN (Narrow Termination)						
Type/Code	Type/Code Power Rating (W) @ 70°C	Dielectric Withstanding	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance		
		Voltage (V)		1%, 2%, 5%		
CSRN2010	1	200	± 200	0.01 - 1		
CSRN0815	4	200	± 300	0.01 - 0.018		
CSKINUOIS	I I	200	± 150	0.02 - 0.47		
CSRN2512 ^(*)	2	200	± 200	0.01 - 1		

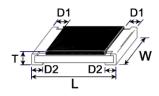
^(*) AEC-Q200 Qualified

⁽²⁾ Contact Stackpole for TCR below 150 m Ω

Electrical Specifications – CSR-HP						
Type/Code	Power Rating (W)	Dielectric Withstanding	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance		
	@ 70°C	Voltage (V)		1%, 2%, 5%		
		200	± 400	0.051 - 0.1		
CSR0603HP	0.2		± 300	0.11 - 0.5		
			± 200	0.51 - 1		
			± 600	0.01 - 0.02		
CSR1210HP	0.75	200	± 400	0.022 - 0.05		
CSR 12 10HP	0.75	200	± 300	0.051 - 0.091		
			± 200	0.1 - 1		

Please refer to the High-Power Resistor Application Note (page 8) for more information on designing and implementing high power resistor types.

Mechanical Specifications - CSR



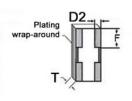
Type/Code	Weight (g) (1000 pieces)	L Body Length	W Body Width	T Body Height	D1 Top Termination	D2 Bottom Termination	Unit
CSR0201	0.18	0.024 ± 0.001 0.60 ± 0.03	0.012 ± 0.001 0.30 ± 0.03	0.009 ± 0.002 0.23 ± 0.05	0.005 ± 0.002 0.12 ± 0.05	0.006 ± 0.002 0.15 ± 0.05	inches mm
CSR0402	0.7	0.039 ± 0.002 1.00 ± 0.05	0.020 ± 0.002 0.50 ± 0.05	0.013 ± 0.004 0.32 ± 0.10	0.010 ± 0.004 0.25 ± 0.10	0.008 ± 0.004 0.20 ± 0.10	inches mm
CSR0603	1.99	0.063 ± 0.004 1.60 ± 0.10	0.031 ± 0.004 0.80 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	0.012 ± 0.008 0.30 ± 0.20	0.012 ± 0.008 0.30 ± 0.20	inches mm
CSR0805	5.3	0.079 ± 0.006 2.00 ± 0.15	0.049 ± 0.006 1.25 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.012 ± 0.008 0.30 ± 0.20	0.016 ± 0.010 0.40 ± 0.25	inches mm
CSR1206	8.82	0.120 ± 0.006 3.05 ± 0.15	0.061 ± 0.006 1.55 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.020 ± 0.012 0.50 ± 0.30	0.016 ± 0.010 0.40 ± 0.25	inches mm
CSR1210	15.5	0.122 ± 0.004 3.10 ± 0.10	0.102 ± 0.006 2.60 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.020 ± 0.012 0.50 ± 0.30	0.020 ± 0.010 0.50 ± 0.25	inches mm
CSR2010	27.03	0.197 ± 0.008 5.00 ± 0.20	0.100 ± 0.008 2.54 ± 0.20	0.020 ± 0.006 0.50 ± 0.15	0.068 ± 0.006 1.72 ± 0.15	0.067 ± 0.006 1.70 ± 0.15	inches mm
CSR2512	53.08	0.252 ± 0.008 6.40 ± 0.20	0.126 ± 0.008 3.20 ± 0.20	0.020 ± 0.006 0.50 ± 0.15	0.024 ± 0.012 0.60 ± 0.30	0.079 ± 0.010 2.00 ± 0.25	inches mm
CSR0830	35.71	0.079 ± 0.008 2.00 ± 0.20	0.295 ± 0.012 7.50 ± 0.30	0.024 ± 0.004 0.60 ± 0.10	0.016 ± 0.008 0.40 ± 0.20	0.016 ± 0.008 0.40 ± 0.20	inches mm

	Mechanical Specifications – CSRN (Narrow Termination)								
Type/Code	Weight (g) (1000 pieces)	L Body Length	W Body Width	T Body Height	D1 Top Termination	D2 Bottom Termination	Unit		
CSRN0815	19.96	0.079 ± 0.008 2.00 ± 0.20	0.148 ± 0.008 3.75 ± 0.20	0.024 ± 0.004 0.60 ± 0.10	0.016 ± 0.008 0.40 ± 0.20	0.016 ± 0.008 0.40 ± 0.20	inches mm		
CSRN2010	27.03	0.197 ± 0.008 5.00 ± 0.20	0.096 ± 0.006 2.45 ± 0.15	0.024 ± 0.006 0.60 ± 0.15	0.024 ± 0.012 0.60 ± 0.30	0.020 ± 0.010 0.50 ± 0.25	inches mm		
CSRN2512	53.08	0.250 ± 0.008 6.35 ± 0.20	0.124 ± 0.006 3.15 ± 0.15	0.024 ± 0.004 0.60 ± 0.10	0.024 ± 0.012 0.60 ± 0.30	0.022 ± 0.010 0.55 ± 0.25	inches mm		

Stackpole Electronics, Inc. Resistive Product Solutions

Mechanical Specifications - CSR1225





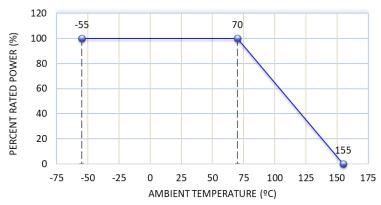
Type/Code	Weight (g) (1000 pieces)	L	W	Т	D1	D2	F	Unit
CSR1225	64.88	0.126 ± 0.006 3.20 ± 0.15	0.254 ± 0.006 6.45 ± 0.15	0.035 ± 0.006 0.90 ± 0.15	0.024 ± 0.012 0.60 ± 0.30	0.031 ± 0.010 0.80 ± 0.25	0.090 ± 0.005 2.29 ± 0.13	inches mm

	Performance Characteristics							
Test	Test Method	Test Specification	Typical	Test Condition				
High Temperature Exposure	MIL-STD-202 Method 108	1% Tol: (± 1% + 0.05Ω) 2%, 5% Tol: (± 1.5% + 0.1Ω)	≤ 0.5%	1000 hours at T = 155°C. Unpowered. Measurement at 24 ± 4 hours after test conclusion.				
Short Time	JIS-C-5201-1 4.13	$\pm (0.5\% + 0.05\Omega)$	≤ 0.25%					
Overload	IEC 60115-1 4.13	\pm (1% + 0.05Ω) For high power rating	≤ 0.5%	RCV (rated current) * 2.5 for 5 seconds.				
Temperature Cycling	JESD22 Method JA-104	1% Tol: (± 0.5% + 0.05Ω) 2%, 5% Tol: (± 1.5% + 0.1Ω)	≤ 0.5%	1000 Cycles (-55°C to +125°C) Measurement at 24 ± 4 hours after test conclusion. 30 minuntes maximum dwell time at each temperature extreme. 1 minute maximum transition time.				
Biased Humidity	MIL-STD-202 Method 103	1% Tol: (± 1% + 0.1Ω) 2%, 5% Tol: (± 2% + 0.1Ω)	≤ 0.5%	1000 hours 85°C / 85% RH. Note: Specified conditions: 10% of operating power. Measurement at 24 ± 4 hours after test conclusion.				
Operational Life	MIL-STD-202 Method 108	1% Tol: (± 1% + 0.1Ω) 2%, 5% Tol: (±2% + 0.1Ω)	≤ 0.5%	Condition D Steady State TA = 125°C at rated power. Measurement at 24 ± 4 hours after test conclusion.				
External Visual	MIL-STD 883 Method 2009	-	Pass	Electrical test not required. Inspect device construction, marking and workmanship.				
Physical Dimensions	JESD22 Method JB-100	-	Pass	Verify physical dimensions to the applicable device detail specification. Note: User(s) and supplier specification, electrical test not required.				
Resistance to Solvents	MIL-STD 202 Method 215	Marking unsmeared	Pass	Note: Aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents.				
Mechanical Shock	MIL-STD 202 Method 213	1% Tol: (± 0.25% + 0.05Ω) 2%, 5% Tol: (± 1% + 0.05Ω)	≤ 0.5%	Figure 1 of Method 213. Condition C.				
Vibration	MIL-STD 202 Method 204	1% Tol: (± 0.5% + 0.05Ω) 2%, 5% Tol: (±1% + 0.05Ω)	≤ 0.5%	5g's for 20 minuntes, 12 cycles each of 3 orientations. Note: Use 8" X 5" PCB 0.031" thick 7 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10 - 2000Hz.				
Resistance to Soldering Heat	MIL-STD 202 Method 210	1% Tol: (± 0.5% +0.05Ω) 2%, 5% Tol: (± 1% + 0.05Ω)	≤ 0.5%	Condition B no pre-heat of samples. Note: Single wave solder - Procedure 2 for SMD.				
ESD	AEC-Q200-002		Pass	With the electrometer in direct contact with the discharge tip, verify the voltage setting at levels of \pm 500V, \pm 1kV, \pm 2kV, \pm 4kV, \pm 8kV. The electrometer reading shall be within \pm 10% for voltages from 500V to \leq 8kV.				
Solderability	J-STD-002	> 95% Coverage		Electrical test not required. Magnification 50 times. Conditions: SMD: a) Method B, 4 hours @ 155°C dry heat @ 235°C. b) Method B @ 215°C category 3. c) Method D category 3 at 260°C.				

Performance Characteristics (cont.)							
Test	Test Method	Test Specification	Typical	Test Condition			
Electrical Characterization	User Spec		Pass	Parametrically test per lot and sample size requirements, summary to show Min, Max, Mean and Standard Deviation at room as well as Min and Max operating temperatures.			
Flammability	UL-94	No ignition of tissue or scorching of pine board.	Pass	V - 0 or V - 1 are acceptable. Electrical test not required.			
Board Flex	AEC-Q200-005	1% Tol: (± 1% + 0.05Ω) 2%, 5% Tol: (± 1% + 0.05Ω)	≤ 0.5%	60 second minimum holding time.			
Terminal Strength (SMD)	AEC-Q200-006	No breakage	Pass				
Flame Retardance	AEC-Q200-001	No flame	Pass				
Voltage Proof	JIS-C-5201-1 4.7 IEC-60115-1 4.7	No breakdown or flashover	Pass	1.42 times Max. Operating Voltage for 1 minute. 0201: 50V; 0402: 100V; 0603: 150V; 0805: 300V 1206, 1210, 2010, 2512, 0830, 1225, 0815: 400V			

Operating temperature range is -55°C to +155°C

Power Derating Curve:



Recommended Pad Layouts - CSR

Type/Code	a	b	С	Unit
CSR0201	0.010	0.012	0.016 ± 0.008	inches
C5R0201	0.25	0.30	0.40 ± 0.20	mm
CSR0402	0.020	0.020	0.024 ± 0.008	inches
C3R0402	0.50	0.50	0.60 ± 0.20	mm
CSR0603	0.031	0.039	0.035 ± 0.008	inches
C3R0003	0.80	1.00	0.90 ± 0.20	mm
CSR0805	0.039	0.039	0.053 ± 0.008	inches
C3R0603	1.00	1.00	1.35 ± 0.20	mm
CSR1206	0.079	0.045	0.067 ± 0.008	inches
C3R1206	2.00	1.15	1.70 ± 0.20	mm
CSR1210	0.079	0.045	0.098 ± 0.008	inches
U3K1210	2.00	1 15	2.50 ± 0.20	mm

1.15

2.00

mm

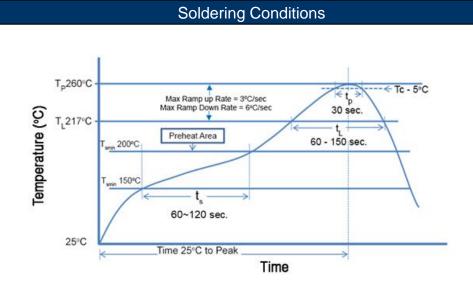
 2.50 ± 0.20

Stackpole Electronics, Inc. Resistive Product Solutions

Thick Film Current Sensing Resistor

	Recommended Pad Layouts – CSR (cont.)						
Type/Code	а	b	С	Unit			
CSR0830	0.039	0.071	0.299 ± 0.008	inches			
C3K0830	1.00	1.80	7.60 ± 0.20	mm			
CSR2010	0.055	0.094	0.110 ± 0.008	inches			
C3R2010	1.40	2.40	2.80 ± 0.20	mm			
CSR2512	0.039	0.140	0.126 ± 0.008	inches			
C3R2512	1.00	3.55	3.20 ± 0.20	mm			
CSR1225	0.047	0.079	0.276 ± 0.008	inches			
CSK1223	1.20	2.00	7.00 ± 0.20	mm			

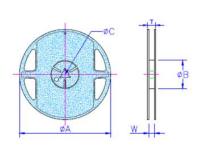
Recommended Pad Layouts - CSRN						
Type/Code	a	b	С	Unit		
CSRN0815	0.039	0.071	0.154 ± 0.008	inches		
CSKN0813	1.00	1.80	3.90 ± 0.20	mm		
CSRN2010	0.142	0.055	0.098 ± 0.008	inches		
CSRN2010	3.60	1.40	2.50 ± 0.20	mm		
CSRN2512	0.193	0.063	0.126 ± 0.008	inches		
CSRN2512	4.90	1.60	3.20 ± 0.20	mm		



Profile Feature	Pb-Free Assembly	
Preheat		
Min. Temperature (Tsmin)	150°C	
Max. Temperture (Tsmax)	200°C	
Prehating time (ts) from (Tsmin to Tsmax)	60-120 seconds	
Ramp-up Rate (T _L to T _P)	3°C/second max.	
Liquidous Temperature (T _L)	217°C	
Time (t _L) maintained above T _L	60-150 seconds	
Min. Peak Temperature (Tp min)	235°C	
Max. Peak Temperature (Tp max)	260°C	
Time (tp) within 5°C of the specified classification temperature (Tc)	30 seconds max.	
Ramp-down rate (T _P to T _L)	6°C/second max.	
Time 25°C to peak temperature	8 minutes max.	

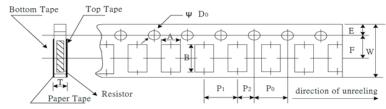
Thick Film Current Sensing Resistor

Reel Specifications



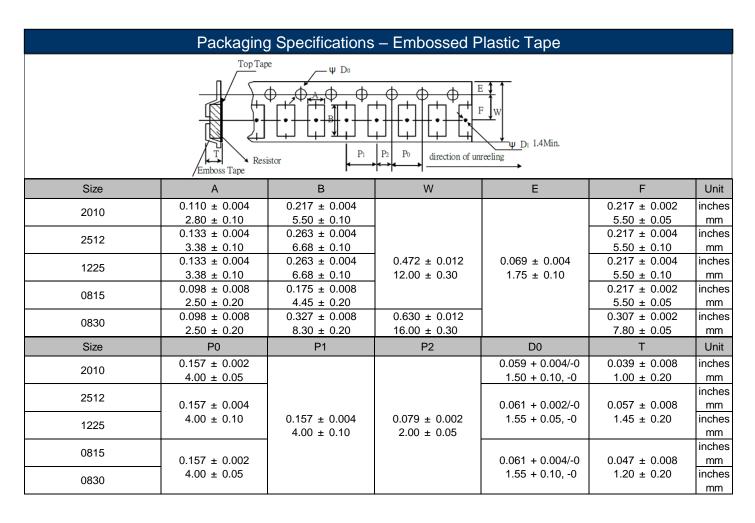
Size	A	В	С	W	Т	Unit
0201						inches
0201						mm
0402						inches
						mm
0603				0.074	0.450 0.000	inches
		2.362 ± 0.039 60.00 ± 1.00	0.531 ± 0.028 13.50 ± 0.70	0.374 ± 0.004 9.50 ± 0.10	0.453 ± 0.039 11.50 ± 1.00	mm
0805						inches
	-					mm
1206	7.008 ± 0.039 178.00 ± 1.00					inches mm
						inches
1210						mm
						inches
2010						mm
0540						inches
2512				0.531 ± 0.039	0.610 ± 0.039	mm
1225				13.50 ± 1.00	15.50 ± 1.00	inches
1220						mm
0815						inches
0010						mm
0830				0.689 ± 0.039	0.768 ± 0.039	inches
0000				17.50 ± 1.00	19.50 ± 1.00	mm

Packaging Specifications - Paper Tape



Size	А	В	W	E	F	Unit
0201	0.015 ± 0.002	0.027 ± 0.002	0.315 ± 0.004	0.069 ± 0.002		inches
0201	0.38 ± 0.05	0.68 ± 0.05	8.00 ± 0.10	1.75 ± 0.05		mm
0402	0.026 ± 0.004	0.045 ± 0.004				inches
0402	0.65 ± 0.10	1.15 ± 0.10				mm
0603	0.043 ± 0.004	0.075 ± 0.004				inches
0003	1.10 ± 0.10	1.90 ± 0.10				mm
0805	0.063 ± 0.004	0.094 ± 0.008	0.315 ± 0.008	0.069 ± 0.004	0.138 ± 0.002	inches
0803	1.60 ± 0.10	2.40 ± 0.20	8.00 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	mm
1206	0.075 ± 0.004	0.138 ± 0.008				inches
1200	1.90 ± 0.10	3.50 ± 0.20				mm
1210	0.114 ± 0.004	0.138 ± 0.008				inches
	2.90 ± 0.10	3.50 ± 0.20				mm

Packaging Specifications – Paper Tape (cont.)								
Size	P0	P1	P2	D0	Т	Unit		
0201		0.079 ± 0.002	0.079 ± 0.004 2.00 ± 0.10		0.017 ± 0.008 0.42 ± 0.20	inches mm		
0402	0.157 ± 0.004 4.00 ± 0.10	2.00 ± 0.05	2.00 2 0.10		0.018 ± 0.004 0.45 ± 0.10	inches		
0603		0.157 ± 0.002 4.00 ± 0.05	0.079 ± 0.002 2.00 ± 0.05	0.059 + 0.004/-0 1.50 + 0.10/-0	0.028 ± 0.004 0.70 ± 0.10	inches		
0805					0.70 ± 0.10	inches		
1206			2.00 2 0.00	1.00 1 0.107 0	0.033 ± 0.004 0.85 ± 0.10	inches		
1210						inches mm		



Resistive Product Solutions

High Power Chip Resistors and Thermal Management

Stackpole has developed several surface mount resistor series in addition to our current sense resistors, which have had higher power ratings than standard resistor chips. This has caused some uncertainty and even confusion by users as to how to reliably use these resistors at the higher power ratings in their designs.

The data sheets for the RHC, RMCP, RNCP, CSR, CSRN, CSRF, CSS, and CSSH state that the rated power assumes an ambient temperature of no more than 100°C for the CSS / CSSH series and 70°C for all other high power resistor series. In addition, IPC and UL best practices dictate that the combined temperature on any resistor due to power dissipated and ambient air shall be no more than 105°C. At first glance this wouldn't seem too difficult, however the graph below shows typical heat rise for the CSR1206 100 milliohms at full rated power. The heat rise for the RMCP and RNCP would be similar. The RHC with its unique materials, design, and processes would have less heat rise and therefore would be easier to implement for any given customer.

120 102 100 TEMPERATURE (ºC) 72 80 50 60 41 36 36 40 20 0 0.1 0.13 0.17 0.26 0.6 0.76 POWER RATING (W)

CSR1206 100mΩ Surface Temperature Rise

The 102°C heat rise shown here would indicate there will be additional thermal reduction techniques needed to keep this part under 105°C total hot spot temperature if this part is to be used at 0.75 watts of power. However, this same part at the usual power rating for this size would have a heat rise of around 72°C. This additional heat rise may be dealt with using wider conductor traces, larger solder pads and land patterns under the solder mask, heavier copper in the conductors, via through PCB, air movement, and heat sinks, among many other techniques. Because of the variety of methods customers can use to lower the effective heat rise of the circuit, resistor manufacturers simply specify power ratings with the limitations on ambient air temperature and total hot spot temperatures and leave the details of how to best accomplish this to the design engineers. Design guidelines for products in various market segments can vary widely so it would be unnecessarily constraining for a resistor manufacturer to recommend the use of any of these methods over another.

Note: The final resistance value can be affected by the board layout and assembly process, especially the size of the mounting pads and the amount of solder used. This is especially notable for resistance values $\leq 50~\text{m}\Omega$. This should be taken into account when designing.

Stackpole Electronics, Inc.

Resistive Product Solution:

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)		
CSR	Thick Film Current Sensing Surface Mount Chip Resistor	SMD	YES	100% Matte Sn over Ni	May-04	04/18		
CSRN	Thick Film Current Sensing Surface Mount Chip Resistor, Narrow	SMD	YES	100% Matte Sn over Ni	May-04	04/18		

"Conflict Metals" Commitment

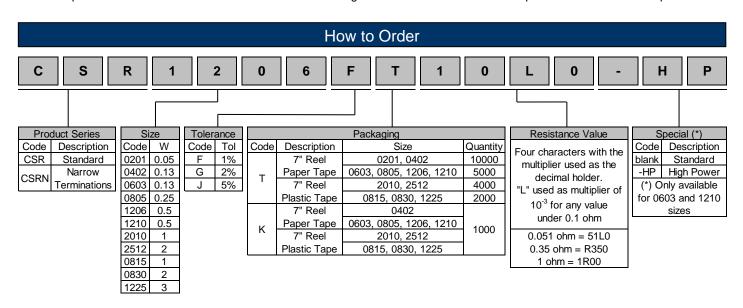
We at Stackpole Electronics, Inc. are joined with our industry in opposing the use of metals mined in the "conflict region" of the eastern Democratic Republic of the Congo (DRC) in our products. Recognizing that the supply chain for metals used in the electronics industry is very complex, we work closely 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.



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

SEI Stackpole:

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CSR0805FKR200 CSRN2010FKR500 CSR1206FKR200 CSRN2512FK68L0 CSRN2512FTR100
CSRN2010FKR250 CSR1206FK50L0 CSRN2010FKR200 CSRN2512FK20L0 CSRN2512FKR330 CSR1206FK25L0
 CSR1206FK15L0 CSRN2010FKR100 CSR1206FK12L0 CSR1206FK30L0 CSR1206FKR300 CSR1206FK10L0
CSR1206FK20L0 CSR0805FKR100 CSR0603FK20L0 CSRN2010FKR400 CSRN2512FKR250 CSR0603FKR150
CSRN2512FTR500 CSRN2512FKR750 CSR1206FKR250 CSR1206FK1R00 CSRN2512FKR680
CSRN2512FKR100 CSRN2512FKR470 CSR1206FKR100 CSR0805FKR250 CSRN2512FK30L0 CSRN2512FK40L0
 CSRN2512JT10L0 CSRN2010FK25L0 CSRN2010FK60L0 CSR1206FTR130 CSRN2512FKR150
CSRN2512FK25L0 CSR0805FK20L0 CSR1206FT1R00 CSR0805FKR500 CSRN2512FKR200 CSR0805FK1R00
CSR0603FKR500 CSR1206FTR500 CSRN2512FKR300 CSRN2512FKR400 CSRN2010FK50L0 CSR1206FKR500
CSR0805FK25L0 CSR0603FKR200 CSR1206FK75L0 CSRN2512FK10L0 CSRN2512FTR250 CSRN2010FK40L0
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