

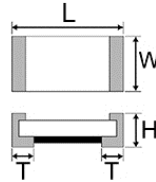
**Features:**

- High power rating
- Wide resistance range
- Other resistance values may be available
- RoHS compliant, REACH compliant, lead free, and halogen free
- All sizes, except 0612, 0805-HP and 2010, are AEC-Q200 compliant

Electrical Specifications				
Type/Code	Power Rating (W)	TCR (ppm/°C)	Ohmic Range ( $\Omega$ ) and Tolerance	
			1%	5%
CSRF0402	0.125	$\pm 300$	0.003 - 0.007	
		$\pm 200$	0.008 - 0.02	
CSRF0402-HP	0.25	$\pm 400$	0.0025	
		$\pm 300$	0.003 - 0.004	
		$\pm 200$	0.005 - 0.007	
		$\pm 100$	0.008 - 0.02	
CSRF0603	0.25	$\pm 100$	0.002 - 0.004	
		$\pm 150$	0.005 - 0.009	
		$\pm 75$	0.01 - 0.03	
CSRF0603-HP	0.5	$\pm 100$	0.002 - 0.009	
		$\pm 75$	0.01 - 0.03	
CSRF0805	0.5	$\pm 100$	0.003 - 0.01	
		$\pm 50$	0.011 - 0.03	
CSRF0805-HP	1	$\pm 100$	0.005 - 0.01	
		$\pm 50$	0.011 - 0.03	
CSRF0508	1	$\pm 100$	0.005 - 0.009	
		$\pm 50$	0.01 - 0.062	
CSRF1206	1	$\pm 100$	0.003 - 0.01	
		$\pm 50$	0.011 - 0.05	
CSRF0612	1.5	$\pm 100$	0.002 - 0.004	
		$\pm 75$	0.005 - 0.03	
CSRF2010 <sup>(1)</sup>	1	$\pm 200$	0.002	
		$\pm 100$	0.003 - 0.009	
		$\pm 50$	0.01 - 0.1	
CSRF2512	2	$\pm 100$	0.002 - 0.009	
		$\pm 50$	0.01 - 0.56	
CSRF1225	3	$\pm 100$	0.001 - 0.009	-
		$\pm 50$	0.01 - 0.1	-

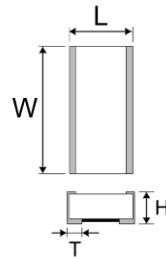
(1) For 2010 size, MOQ of 20 K pieces per value is required.

### Mechanical Specifications



Type/Code	L Body Length	W Body Width	H Body Height	T Bottom Termination	Unit
CSRF0402 0.003Ω - 0.007Ω	0.039 ± 0.004 1.00 ± 0.10	0.022 ± 0.004 0.55 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	0.014 ± 0.004 0.35 ± 0.10	inches mm
CSRF0402 0.008Ω - 0.02Ω	0.039 ± 0.004 1.00 ± 0.10	0.022 ± 0.004 0.55 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	0.010 ± 0.004 0.25 ± 0.10	inches mm
CSRF0402-HP 0.0025Ω	0.039 ± 0.004 1.00 ± 0.10	0.022 ± 0.004 0.55 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	inches mm
CSRF0402-HP 0.003Ω - 0.004Ω	0.039 ± 0.004 1.00 ± 0.10	0.022 ± 0.004 0.55 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	inches mm
CSRF0402-HP 0.005Ω - 0.007Ω	0.039 ± 0.004 1.00 ± 0.10	0.022 ± 0.004 0.55 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	0.014 ± 0.004 0.35 ± 0.10	inches mm
CSRF0402-HP 0.008Ω - 0.02Ω	0.039 ± 0.004 1.00 ± 0.10	0.022 ± 0.004 0.55 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	0.010 ± 0.004 0.25 ± 0.10	inches mm
CSRF0603 (standard and -HP) 0.002Ω - 0.004Ω	0.063 ± 0.004 1.60 ± 0.10	0.031 ± 0.004 0.80 ± 0.10	0.022 ± 0.006 0.55 ± 0.15	0.022 ± 0.008 0.55 ± 0.20	inches mm
CSRF0603 (standard and -HP) 0.005Ω - 0.03Ω	0.063 ± 0.004 1.60 ± 0.10	0.031 ± 0.004 0.80 ± 0.10	0.022 ± 0.006 0.55 ± 0.15	0.012 ± 0.008 0.30 ± 0.20	inches mm
CSRF0805 CSRF0805-HP	0.083 ± 0.008 2.10 ± 0.20	0.051 ± 0.006 1.30 ± 0.15	0.028 ± 0.006 0.70 ± 0.15	0.018 ± 0.008 0.45 ± 0.20	inches mm
CSRF1206	0.122 ± 0.008 3.10 ± 0.20	0.061 ± 0.008 1.55 ± 0.20	0.031 ± 0.006 0.80 ± 0.15	0.022 ± 0.008 0.55 ± 0.20	inches mm
CSRF2010 0.002Ω	0.197 ± 0.008 5.00 ± 0.20	0.098 ± 0.008 2.50 ± 0.20	0.030 ± 0.008 0.75 ± 0.20	0.071 ± 0.012 1.80 ± 0.30	inches mm
CSRF2010 0.003Ω	0.197 ± 0.008 5.00 ± 0.20	0.098 ± 0.008 2.50 ± 0.20	0.030 ± 0.008 0.75 ± 0.20	0.063 ± 0.012 1.60 ± 0.30	inches mm
CSRF2010 0.004Ω - 0.005Ω	0.197 ± 0.008 5.00 ± 0.20	0.098 ± 0.008 2.50 ± 0.20	0.030 ± 0.008 0.75 ± 0.20	0.051 ± 0.012 1.30 ± 0.30	inches mm
CSRF2010 > 0.005Ω	0.197 ± 0.008 5.00 ± 0.20	0.098 ± 0.008 2.50 ± 0.20	0.030 ± 0.008 0.75 ± 0.20	0.031 ± 0.012 0.80 ± 0.30	inches mm
CSRF2512	0.252 ± 0.012 6.40 ± 0.30	0.126 ± 0.012 3.20 ± 0.30	0.030 ± 0.012 0.75 ± 0.30	0.055 ± 0.022 1.40 ± 0.55	inches mm

**Mechanical Specifications**



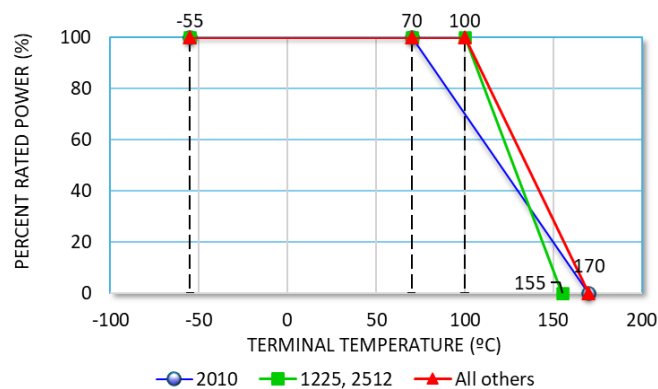
Type/Code	L Body Length	W Body Width	H Body Height	T Bottom Termination	Unit
CSRF0508	0.047 ± 0.010	0.079 ± 0.010	0.026 ± 0.008	0.017 ± 0.008	inches
	1.20 ± 0.25	2.00 ± 0.25	0.65 ± 0.20	0.43 ± 0.20	mm
CSRF0612	0.063 ± 0.008	0.126 ± 0.008	0.024 ± 0.008	0.012 ± 0.008	inches
	1.60 ± 0.20	3.20 ± 0.20	0.60 ± 0.20	0.30 ± 0.20	mm
CSRF1225	0.126 ± 0.012	0.252 ± 0.012	0.026 ± 0.008	0.024 ± 0.008	inches
	3.20 ± 0.30	6.40 ± 0.30	0.65 ± 0.20	0.60 ± 0.20	mm

**Performance Characteristics**

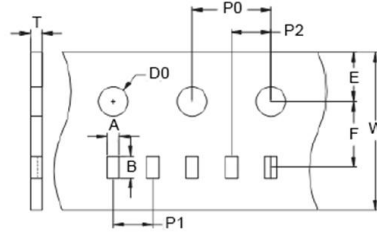
Test	Test Method	Test Specification	Typical	Test Condition
Load Life	MIL-STD-202F-Method 108A	$\Delta R \pm 1\%$ 1225: $\Delta R \pm(2\% + 0.5 \text{ m}\Omega)$	$\Delta R \leq 0.5\%$	RCWV at 70°C; 1.5 hours "ON"; 0.5 hour "OFF" Total 1000 ±24 hours
Resistance to Soldering Heat	MIL-STD-202F-Method 210E	$\Delta R \pm 1\%$	$\Delta R \leq 0.3\%$	260 ± 5°C for 10 ± 1 seconds
Solderability	MIL-STD-202F-Method 208H	minimum 95% coverage	> 95%	245 ± 5°C for 2 ± 0.5 seconds
Thermal Shock	MIL-STD-202F-Method 107G	$\Delta R \pm 1\%$	$\Delta R \leq 0.3\%$	-55 to +150°C, 100 cycles
Short Time Overload <sup>(*)</sup>	JIS-C-5202-5.5	$\Delta R \pm(1\% + 0.5 \text{ m}\Omega)$	$\Delta R \leq 0.3\%$	Sizes 0805-HP, 0508,1225, and 2512: 2.5 X rated power for 5 seconds All other sizes: 5 X rated power for 5 seconds
High Temperature Exposure	JIS-C-5201-1, Clause 4.23.2 IEC60068-2-2	$\Delta R \pm 1\%$ 1225: $\Delta R \pm(1\% + 0.5 \text{ m}\Omega)$	$\Delta R \leq 0.2\%$	125°C, 1000 hours 1225: 155°C, 1000 hours
Moisture Resistance	MIL-STD-202F-Method 106G	$\Delta R \pm 1\%$	$\Delta R \leq 0.5\%$	
Insulation Resistance	MIL-STD-202F-Method 302	$\Delta R$ 1 M $\Omega$ minimum	$\Delta R \geq 1 \text{ M}\Omega$	Apply 100 VDC for 1 minute

(\*) Sufficient copper size and weight required to maintain component temperature below 100°C  
Recommended storage temperature: 5 ~ 35°C. humidity: 40 ~ 75%  
Operating temperature range: 1225 and 2512 = -55 to +155°C; all other sizes = -55 to +170°C

**Power Derating Curve:**

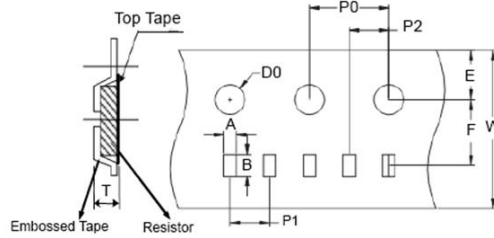


**Taping Specifications - Paper Tape**



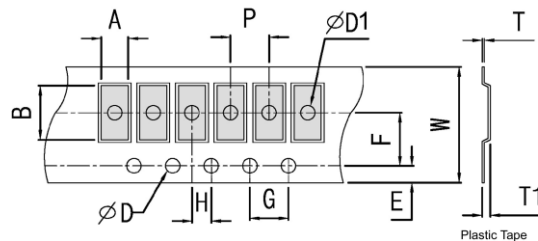
Type/Code	A	B	E	F	W	Unit
CSRF0402	0.028 ± 0.002 0.70 ± 0.05	0.047 ± 0.002 1.20 ± 0.05	0.069 ± 0.004 1.75 ± 0.10	0.138 ± 0.002 3.50 ± 0.05	0.315 ± 0.008 8.00 ± 0.20	Inches mm
CSRF0603	0.043 ± 0.004 1.10 ± 0.10	0.075 ± 0.004 1.90 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.138 ± 0.002 3.50 ± 0.05	0.315 ± 0.008 8.00 ± 0.20	Inches mm
CSRF0805	0.063 ± 0.004 1.60 ± 0.10	0.094 ± 0.004 2.40 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.138 ± 0.002 3.50 ± 0.05	0.315 ± 0.008 8.00 ± 0.20	Inches mm
CSRF0508	0.066 ± 0.008 1.68 ± 0.20	0.094 ± 0.008 2.38 ± 0.20	0.069 ± 0.004 1.75 ± 0.10	0.138 ± 0.004 3.50 ± 0.10	0.315 ± 0.012 8.00 ± 0.30	Inches mm
CSRF1206	0.079 ± 0.004 2.00 ± 0.10	0.142 ± 0.004 3.60 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.138 ± 0.002 3.50 ± 0.05	0.315 ± 0.008 8.00 ± 0.20	Inches mm
CSRF0612	0.079 ± 0.004 2.00 ± 0.10	0.142 ± 0.004 3.60 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.138 ± 0.002 3.50 ± 0.05	0.315 ± 0.008 8.00 ± 0.20	Inches mm
Type/Code	P0	P1	P2	D0	T	Unit
CSRF0402	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.004 2.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.061 ± 0.002 1.55 ± 0.05	0.024 ± 0.004 0.60 ± 0.10	Inches mm
CSRF0603	0.157 ± 0.004 4.00 ± 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	0.028 ± 0.004 0.70 ± 0.10	Inches mm
CSRF0805	0.157 ± 0.004 4.00 ± 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	0.038 ± 0.004 0.97 ± 0.10	Inches mm
CSRF0508	0.157 ± 0.004 4.00 ± 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	0.034 ± 0.008 0.87 ± 0.20	Inches mm
CSRF1206	0.157 ± 0.004 4.00 ± 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	0.038 ± 0.004 0.97 ± 0.10	Inches mm
CSRF0612	0.157 ± 0.004 4.00 ± 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	0.038 ± 0.004 0.97 ± 0.10	Inches mm

**Taping Specifications - Plastic Tape**



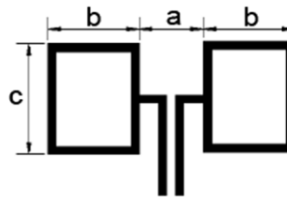
Type/Code	A	B	E	F	W	Unit
CSRF2010	0.110 ± 0.006	0.217 ± 0.006	0.069 ± 0.004	0.217 ± 0.002	0.472 ± 0.012	Inches
	2.80 ± 0.15	5.50 ± 0.15	1.75 ± 0.10	5.50 ± 0.05	12.00 ± 0.30	mm
CSRF2512	0.134 ± 0.008	0.266 ± 0.008	0.069 ± 0.004	0.217 ± 0.004	0.472 ± 0.012	Inches
	3.40 ± 0.20	6.75 ± 0.20	1.75 ± 0.10	5.50 ± 0.10	12.00 ± 0.30	mm
Type/Code	P0	P1	P2	D0	T	Unit
CSRF2010	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.059 ± 0.004	0.033 ± 0.008	Inches
	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 ± 0.10	0.84 ± 0.20	mm
CSRF2512	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.059 ± 0.004	0.039 ± 0.008	Inches
	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	1.50 ± 0.10	1.00 ± 0.20	mm

**Taping Specifications - Plastic Tape**



Type/Code	W	P	E	F	D	G	Unit
CSRF1225	0.472 ± 0.012	0.016 ± 0.004	0.069 ± 0.004	0.217 ± 0.004	0.059 +0.004/-0	0.157 ± 0.004	Inches
	12.00 ± 0.30	0.40 ± 0.10	1.75 ± 0.10	5.50 ± 0.10	1.50 +0.1/-0	4.00 ± 0.10	mm
	H	A	B	T1	T	Unit	
CSRF1225	0.079 ± 0.004	0.134 ± 0.008	0.266 ± 0.008	0.039 ± 0.008	0.010 ± 0.004	Inches	
	2.00 ± 0.10	3.40 ± 0.20	6.75 ± 0.20	1.00 ± 0.20	0.25 ± 0.10	mm	

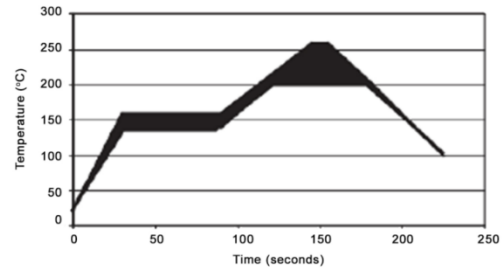
### Recommended Solder Pad



Size	Ohmic Range ( $\Omega$ )	a	b	c	Unit
CSRF0402	0.003 - 0.007	0.012 0.30	0.024 0.60	0.024 0.60	inches mm
	0.008 - 0.02	0.020 0.50	0.020 0.50	0.024 0.60	inches mm
CSRF0402-HP	All	0.008 0.20	0.031 0.80	0.024 0.60	inches mm
CSRF0603	0.002 - 0.004	0.014 0.35	0.043 1.10	0.039 1.00	inches mm
	0.005 - 0.009	0.024 0.60	0.035 0.90	0.039 1.00	inches mm
	0.01 - 0.03	0.035 0.90	0.028 0.70	0.039 1.00	inches mm
CSRF0603-HP	0.005 - 0.009	0.024 0.60	0.035 0.90	0.039 1.00	inches mm
CSRF0603-HP	0.01 - 0.03	0.035 0.90	0.028 0.70	0.039 1.00	inches mm
CSRF0805	All	0.047 1.20	0.047 1.20	0.055 1.40	inches mm
CSRF0805-HP	All	0.047 1.20	0.047 1.20	0.055 1.40	inches mm
CSRF0508	All	0.024 0.60	0.043 1.10	0.091 2.30	inches mm
CSRF1206	All	0.087 2.20	0.051 1.30	0.071 1.80	inches mm
CSRF0612	All	0.024 0.60	0.051 1.30	0.142 3.60	inches mm
CSRF2010	0.002	0.039 1.00	0.104 2.65	0.114 2.90	inches mm
	0.003 - 0.009	0.063 1.60	0.093 2.35	0.114 2.90	inches mm
	0.01 - 0.1	0.106 2.70	0.071 1.80	0.114 2.90	inches mm
CSRF2512	0.002 - 0.003	0.063 1.60	0.152 3.85	0.141 3.57	inches mm
CSRF2512	0.004 - 0.56	0.122 3.10	0.122 3.10	0.141 3.57	inches mm
CSRF1225	0.001 - 0.1	0.093 2.35	0.285 7.25	0.055 1.40	inches mm

**Soldering Recommendations:**

- Peak reflow temperatures and durations:
  - IR Reflow Peak = 260°C max for 10 seconds
  - Wave Solder = 260°C max for 10 seconds
- Compatible with lead and lead-free solder reflow process
- Recommended IR Reflow Profile:



**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)
CSRF	Foil on Ceramic Current Sensing Surface Mount Chip Resistor	SMD	YES	100% Matte Sn over Ni	Jul-04	04/27

**“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 R F 0 4 0 2 F T 8 L 0 0 - H P

Product Series
Code
CSRF

Size	
Code	W
0402	0.125
0402-HP	0.25
0603	0.25
0603-HP	0.5
0805	0.5
0805-HP	1
0508	1
1206	1
0612	1.5
2010	1
2512	2
1225	3

Tolerance	
Code	Tol
F	1%
J	5%

Packaging			
Code	Description	Size	Quantity
T	7" Reel Paper Tape	0402	10000
		0603, 0805 0612, 1206 0508	5000
	7" Reel Plastic Tape	2010, 1225 2512	4000

Resistance Value
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..
0.005 ohm = 5L00
0.01 ohm = 10L0
0.1 ohm = R100

Special	
Code	Description
blank	Standard
-HP	High Power