

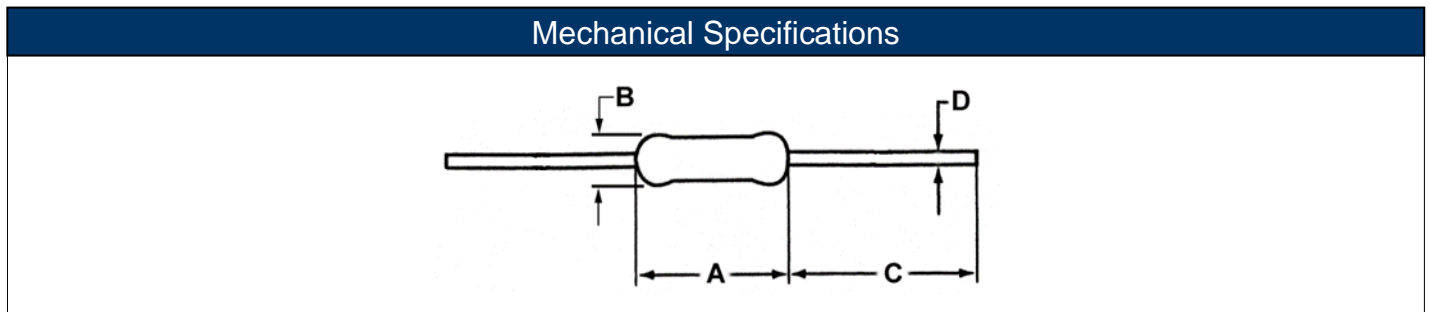
**Features:**

- Lower-cost alternative to carbon comps and wirewounds
- Coating meets UL 94V-0
- Meets solvent test of Mil Standard 202, Method 215
- Cut and formed product is available on select sizes; contact factory for details
- Higher or lower resistance values may be possible; contact factory
- Flameproof
- RoHS compliant, lead free and halogen free



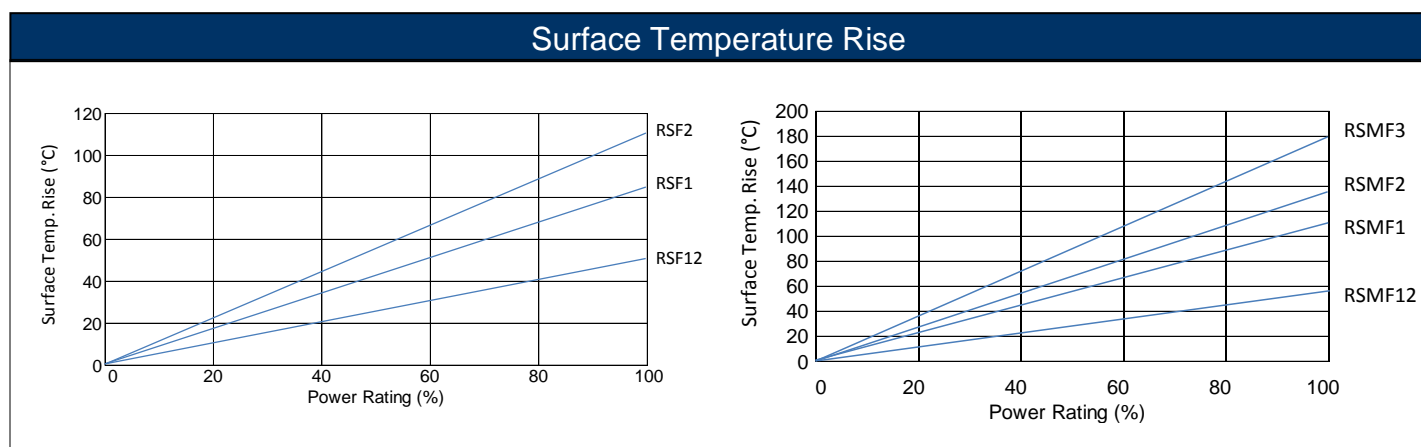
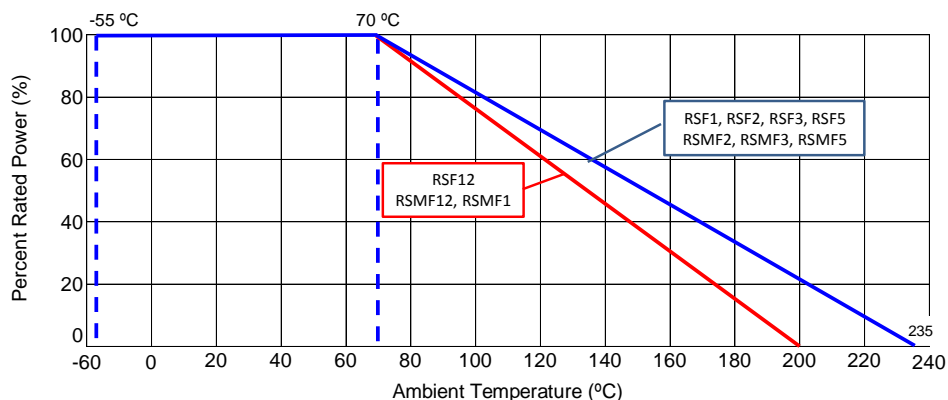
Electrical Specifications								
Type / Code	Power Rating (W) @ 70 °C	Maximum Working Voltage (1)	Maximum Overload Voltage	Dielectric Withstanding Voltage	TCR	Ohmic Range (Ω) and Tolerance		
						1%	2%	5%
RSF12	0.5	250	400	350	± 200 ppm/°C	0.1 - 150 K	0.1 - 75 K	0.1 - 1 M
RSF1	1	350	600	600	± 200 ppm/°C	0.1 - 100 K		0.1 - 1 M
RSF2	2	350	600	600	± 200 ppm/°C	0.1 - 120 K		
RSF3	3	800	1000	750	± 200 ppm/°C	0.1 - 470 K	0.1 - 560 K	0.1 - 1 M
RSF5	5	1000	1000	750	± 200 ppm/°C	0.1 - 470 K	0.1 - 560 K	0.1 - 1 M
RSMF12	0.5	250	400	350	± 200 ppm/°C	0.1 - 46.4 K	0.1 - 47 K	0.1 - 470 K
RSMF1	1	350	600	500	± 200 ppm/°C	0.1 - 75 K		0.1 - 470 K
RSMF2	2	350	600	500	± 200 ppm/°C	0.1 - 100 K		0.1 - 470 K
RSMF3	3	500	800	600	± 200 ppm/°C	0.1 - 118 K	0.1 - 120 K	0.1 - 470 K
RSMF5	5	1000	1000	750	± 200 ppm/°C	0.1 - 470 K	0.1 - 560 K	0.1 - 1 M

(1) Lesser of  $\sqrt{P \cdot R}$  or maximum working voltage



Type / Code	A Body Length	B Body Diameter	C Lead Length (Bulk)	D Lead Diameter	Lead-Tape Specification	Unit
RSF12	0.35 ± 0.04	0.13 ± 0.03	1.10 ± 0.12	0.03 ± 0.003	0.250	inches
	9.00 ± 1.00	3.20 ± 0.80	28.00 ± 3.00	0.70 ± 0.08	6.35	mm
RSF1	0.43 ± 0.06	0.18 ± 0.04	1.10 ± 0.20	0.03 ± 0.002	0.250	inches
	11.00 ± 1.50	4.50 ± 1.00	28.00 ± 5.00	0.80 ± 0.05	6.35	mm
RSF2	0.59 ± 0.06	0.22 ± 0.04	1.18 ± 0.20	0.03 ± 0.004	0.250	inches
	15.00 ± 1.50	5.50 ± 1.00	30.00 ± 5.00	0.75 ± 0.10	6.35	mm
RSF3	0.69 ± 0.04	0.24 ± 0.02	1.38 ± 0.12	0.03 ± 0.002	0.250	inches
	17.50 ± 1.00	6.00 ± 0.50	35.00 ± 3.00	0.80 ± 0.05	6.35	mm
RSF5	0.96 ± 0.04	0.31 ± 0.02	1.38 ± 0.12	0.03 ± 0.002	0.250	inches
	24.50 ± 1.00	8.00 ± 0.50	35.00 ± 3.00	0.80 ± 0.05	6.35	mm
RSMF12	0.24 ± 0.03	0.09 ± 0.01	1.10 ± 0.12	0.02 ± 0.003	0.250	inches
	6.00 ± 0.80	2.30 ± 0.30	28.00 ± 3.00	0.55 ± 0.07	6.35	mm
RSMF1	0.35 ± 0.04	0.13 ± 0.03	1.10 ± 0.12	0.03 ± 0.003	0.250	inches
	9.00 ± 1.00	3.20 ± 0.80	28.00 ± 3.00	0.70 ± 0.08	6.35	mm
RSMF2	0.43 ± 0.06	0.18 ± 0.04	1.18 ± 0.20	0.03 ± 0.002	0.250	inches
	11.00 ± 1.50	4.50 ± 1.00	30.00 ± 5.00	0.80 ± 0.05	6.35	mm
RSMF3	0.59 ± 0.06	0.22 ± 0.04	1.18 ± 0.20	0.03 ± 0.004	0.250	inches
	15.00 ± 1.50	5.50 ± 1.00	30.00 ± 5.00	0.75 ± 0.10	6.35	mm
RSMF5	0.69 ± 0.04	0.24 ± 0.02	1.38 ± 0.08	0.03 ± 0.002	0.250	inches
	17.50 ± 1.00	6.00 ± 0.50	35.00 ± 2.00	0.80 ± 0.05	6.35	mm

**Power Derating Curve:**



**Performance Characteristics**

Test	Test Method	Test Specification	Typical Results
Insulation Resistance	JIS C5201-1, IEC60115-1, 4.6	≥ 1 G Ω	≥ 1 G Ω
Voltage Proof	JIS C5201-1, IEC60115-1, 4.7	≤ ± (0.5% + 0.05 Ω)    No mechanical damage.	< ± 0.25%
Short Time Overload	JIS C5201-1, IEC60115-1, 4.13	≤ ± (0.75% + 0.05 Ω)	< ± 0.1%
Resistance to Solder Heat	JIS C5201-1, IEC60115-1, 4.18	≤ ± (2.0% + 0.05 Ω)	< ± 1.0%
Endurance at 70 °C	JIS C5201-1, IEC60115-1, 4.25.1	≤ ± (5.0% + 0.05 Ω)	< ± 2.0%
Robustness of Terminations	JIS C5201-1, IEC60115-1, 4.16	≤ ± (1.0% + 0.05 Ω)	< ± 0.10%
Damp Heat (Steady state)	JIS C5201-1, IEC60115-1, 4.24	≤ ± (5% + 0.05 Ω)	< ± 1.5%
Rapid Change of Temperature	JIS C5201-1, IEC60115-1, 4.19	≤ ± (1% + 0.05 Ω)	< ± 0.2%
Resistance to Solvents	JIS C5201-1, IEC60115-1, 4.29	No damage to component or removal of marking.	Pass
Intermittent Overload	JIS C5201-1, IEC60115-1, 4.39	≤ ± (2% + 0.05 Ω)	< ± 0.3%
Accidental Overload (Flame resistance)	JIS C5201-1, IEC60115-1, 4.26	No flaming of gauze.	Pass

Operating Temperature Range: -55 °C to +200 °C (RSF12, RSMF12, RSMF1)  
-55 °C to +235 °C (All others)

**Repetitive Pulse Information:**

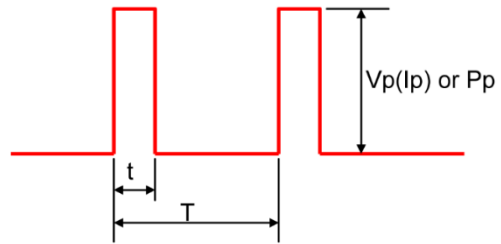
If repetitive pulses are applied to resistors, pulse wave form must be less than “pulse limiting voltage”, “pulse limiting current” or “pulse limiting wattage” calculated by the formula below.

$$V_p = K \sqrt{P \times R \times T / t}$$

$$I_p = K \sqrt{P / R \times T / t}$$

$$P_p = K^2 \times P \times T / t$$

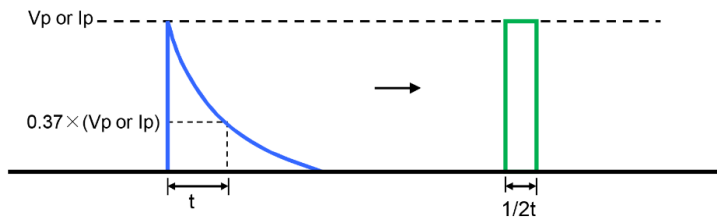
Where:  $V_p$ : Pulse limiting voltage (V)  
 $I_p$ : Pulse limiting current (A)  
 $P_p$ : Pulse limiting wattage (W)  
 $P$ : Power rating (W)  
 $R$ : Nominal resistance (ohm)  
 $T$ : Repetitive period (sec)  
 $t$ : Pulse duration (sec)  
 $K$ : Coefficient: 0.8  
 $[V_r$ : Rated Voltage (V),  $I_r$ : Rated Current (A)]



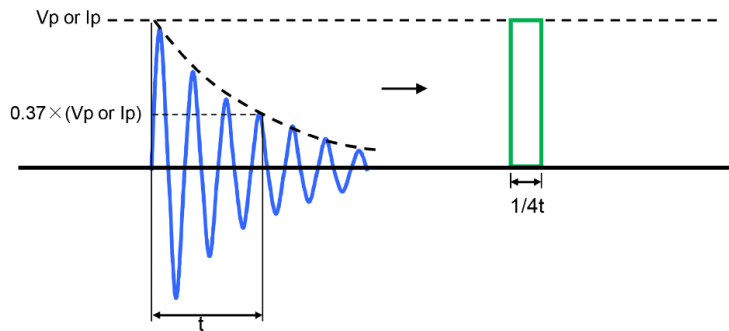
- Note 1: If  $T > 10 \rightarrow T = 10$  (sec),  $T / t > 1000 \rightarrow T / t = 1000$
- Note 2: If  $T > 10$  and  $T / t > 1000$ , "Pulse Limiting power (Single pulse) is applied"
- Note 3: If  $V_p < V_r$  ( $I_p < I_r$  or  $P_p < P$ ),  $V_r$  ( $I_r, P$ ) is  $V_p$  ( $I_p, P_p$ )
- Note 4: Pulse limiting voltage (current, wattage) is applied at less than rated ambient temperature. If ambient temperature is more than the rated temperature (70 °C), decrease power rating according to "Power Derating Curve"
- Note 5: Assure sufficient margin for use period and conditions for "pulse limiting voltage"
- Note 6: If the pulse waveform is not square wave, judge after transform the waveform into square wave according to the "Waveform Transformation to Square Wave".

**Waveform Transformation to Square Wave**

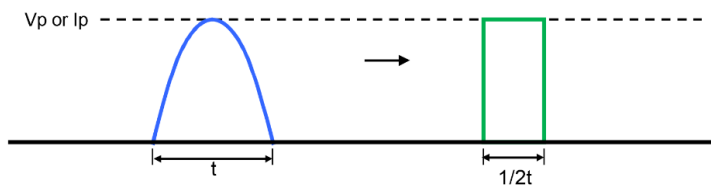
1. Discharge curve wave with time constant "t" → Square wave



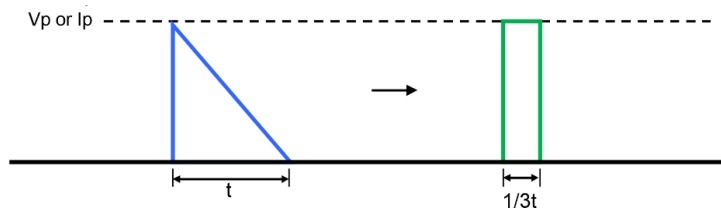
2. Damping oscillation wave with time constant of envelope "t" → Square wave



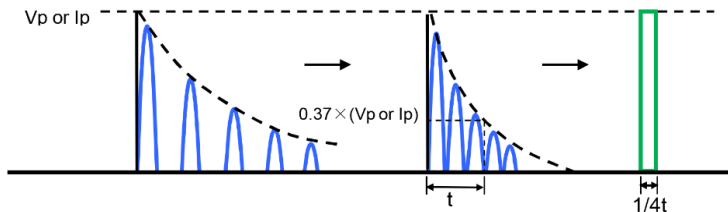
3. Half-wave rectification wave → Square wave



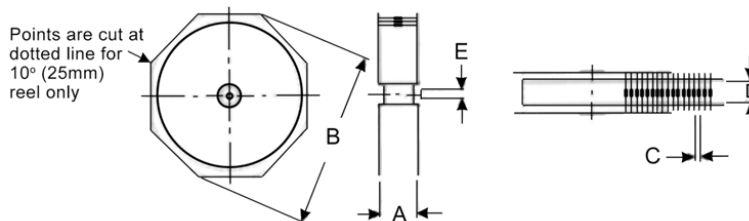
4. Triangular wave → Square wave



5. Special wave → Square wave



**Packaging Specifications**



Reeled in accordance with EIA-296-F

Type / Code	A max <sup>(1)</sup>	B max	C	D <sup>(2)</sup>	Tape	Unit
RSF12	2.736 69.50	13.504 343.00	0.197 ± 0.020 5.00 ± 0.50	2.063 ± 0.079 52.40 ± 2.00	0.250 6.35	inches mm
RSF1	2.815 71.50	13.504 343.00	0.197 ± 0.020 5.00 ± 0.50	2.063 ± 0.079 52.40 ± 2.00	0.250 6.35	inches mm
RSF2	3.524 89.50	13.504 343.00	0.394 ± 0.020 10.00 ± 0.50	2.500 ± 0.079 63.50 ± 2.00	0.250 6.35	inches mm
RSF3	3.740 95.00	12.008 305.00	0.394 ± 0.020 10.00 ± 0.50	2.874 ± 0.079 73.00 ± 2.00	0.250 6.35	inches mm
RSF5	4.331 110.00	12.008 305.00	0.394 ± 0.020 10.00 ± 0.50	3.465 ± 0.079 88.00 ± 2.00	0.250 6.35	inches mm
Type / Code	A max <sup>(1)</sup>	B max	C	D <sup>(2)</sup>	Tape	Unit
RSM12	2.618 66.50	13.504 343.00	0.197 ± 0.020 5.00 ± 0.50	2.063 ± 0.079 52.40 ± 2.00	0.250 6.35	inches mm
RSM1	2.736 69.50	13.504 343.00	0.197 ± 0.020 5.00 ± 0.50	2.063 ± 0.079 52.40 ± 2.00	0.250 6.35	inches mm
RSM2	2.815 71.50	13.504 343.00	0.197 ± 0.020 5.00 ± 0.50	2.063 ± 0.079 52.40 ± 2.00	0.250 6.35	inches mm
RSM3	3.524 89.50	13.504 343.00	0.394 ± 0.020 10.00 ± 0.50	2.500 ± 0.079 63.50 ± 2.00	0.250 6.35	inches mm
RSM5	3.740 95.00	12.008 305.00	0.394 ± 0.020 10.00 ± 0.50	2.874 ± 0.079 73.00 ± 2.00	0.250 6.35	inches mm

Dimension "E": This is a non-critical dimension that does not have a tolerance in the standard.

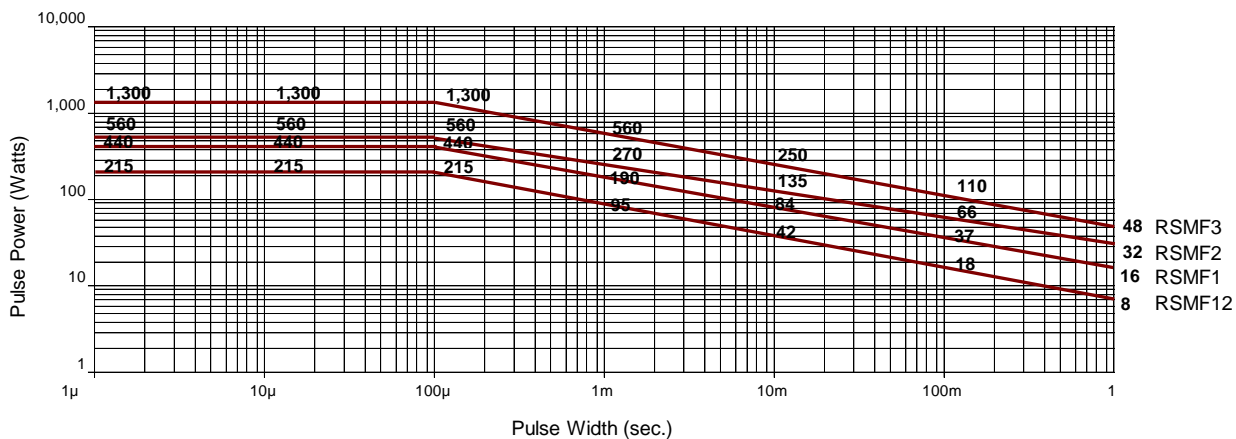
Range of diameters is from 0.547 inches (13.90 mm) to 1.500 inches (38.10 mm).

(1) Reference value only. The "A" dimension shall be governed by the overall length of the taped component.

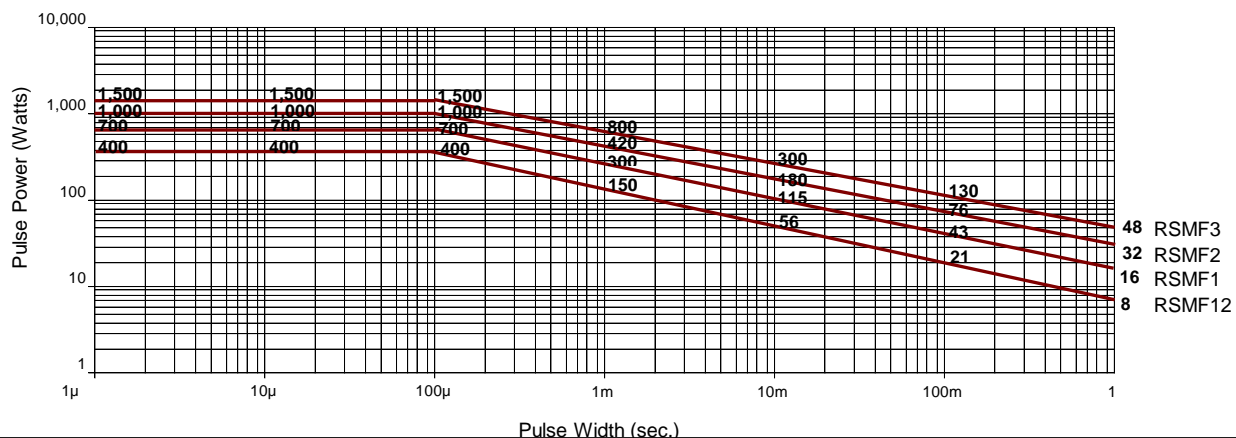
The distance between flanges shall be 0.059 inches (1.50 mm) to 0.315 (8.00 mm) greater than the overall component.

(2) The given dimension "D" expresses the standard width spacing. A 26 mm narrow spacing is available as option "N" packaging code.

**Pulse Limiting Power (one pulse) / RSMF Series  $\leq 5\Omega$**



**Pulse Limiting Power (one pulse) / RSMF Series  $\geq 5\Omega$**



**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)
RSF	General Purpose Metal Oxide Leaded Resistor	Axial	YES	99.3/0.7 Sn/Cu 100% Matte Sn	Apr-05 (Japan) Jan-04 (Taiwan, China)	05/14 04/01
RSMF	Mini-Metal Oxide Leaded Resistor	Axial	YES	99.3/0.7 Sn/Cu 100% Matte Sn	Apr-05 (Japan) Jan-04 (Taiwan, China)	05/14 04/01

**“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**

1 2 3 4 5 6 7 8 9 10 11

R S F 1 2 J T R 4 7 0

Product Series		Power		Tolerance			Packaging				Resistance Value
Code	Description	Size	Power Rating	Code	Tol	Value	Code	Description	Size	Quantity	
RSF	Metal Oxide	12	0.5 W	F	1%	E96	T	Tape and Reel	RSMF12, PRSM12	5000	Four characters with the multiplier used as the decimal holder.  0.22 ohm = R220 33.2 ohm = 33R2 10.2 Kohm = 10K2 1 Mohm = 1M00
RSMF	Mini	1	1 W	G	2%	E24			RSF12, RSF1	2500	
PRSF <sup>(1)</sup>	Panasert	2	2 W	J	5%				PRSF1, PRSM2	2000	
PRSM <sup>(1)</sup>	Panasert Mini	3	3 W						RSF2, RSMF3	1000	
		5	5 W						RSF3, RSMF5	1000	
							T	Tape and Reel	RSF5	500	
							A	Ammo	RSMF12	5000	
									RSF12; RSMF1, PRSM12	2000	
									RSF1, RSF2, RSMF2, PRSF1, PRSM2, RSMF3	1000	
								RSF3, RSF5, RSMF5	500		
							B	Bulk	All Sizes	1000	

(1) For packaging information, see [Radial Leaded Packaging Specifications](#)