SPR / SPRM Series

Discharge Path Resistor

Stackpole Electronics, Inc.

Resistive Product Solutions

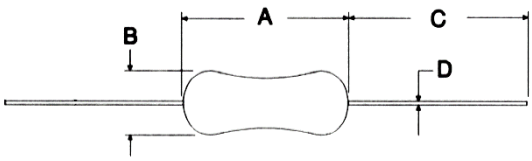
Features:

- Excellent anti-surge characteristics
- Stable characteristics through the resistance range
- Applications include power supplies, CRT's and anti-surge circuits
- Good alternative to carbon composition resistors
- Cut and formed product is available on select sizes; contact Stackpole for details
- 100% RoHS compliant and lead free without exemption
- Halogen free
- REACH compliant

Electrical Specifications

Type/Code	Power Rating (W) @ 70ºC	Maximum Working Voltage	Maximum Overload Voltage (V)	Surge Withstanding Voltage (KV)	Ohmic Range (Ω) and Tolerance
					5%
SPRM12	0.5	$E=\sqrt{P*R}$	2500	10	1M - 12M
SPR1	1		5000		

Mechanical Specifications



Type/Code	A Body Length	B Body Diameter	C Lead Length (Bulk)	D Lead Diameter	Unit
SPRM12	0.354 ± 0.039	0.118 ± 0.020	1.102 ± 0.079	0.028 ± 0.002	inches
	9.00 ± 1.00	3.00 ± 0.50	28.00 ± 2.00	0.70 ± 0.05	mm
SPR1	0.591 ± 0.039	0.197 ± 0.020	1.378 ± 0.118	0.031 ± 0.002	inches
	15.00 ± 1.00	5.00 ± 0.50	35.00 ± 3.00	0.80 ± 0.05	mm

Performance Characteristics (JIS C 5201-1)

Test	Test Results
Moisture Resistance	± 5%
Temperature Cycling	± 1%
Load Life	± 5%
Resistance to Soldering Heat	± 1%
Short Time Overload	± 2%
Discharge	± 10%

Operating Temperature Range: -55ºC to +155ºC

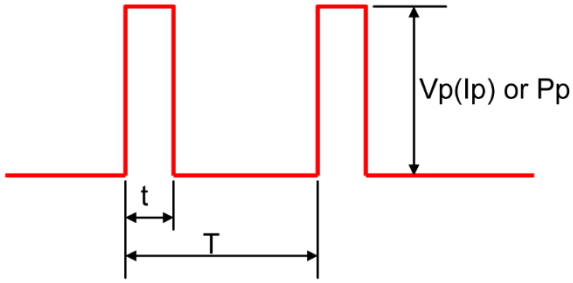
Repetitive Pulse Information:

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.

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

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

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

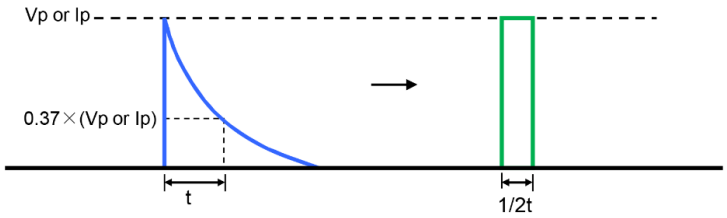


Where: Vp: Pulse limiting voltage (V)
Ip: Pulse limiting current (A)
Pp: Pulse limiting wattage (W)
P: Power rating (W)
R: Nominal resistance (ohm)
T: Repetitive period (sec)
t: Pulse duration (sec)
K: Coefficient: 1
[Vr: Rated Voltage (V), Ir: Rated Current (A)]

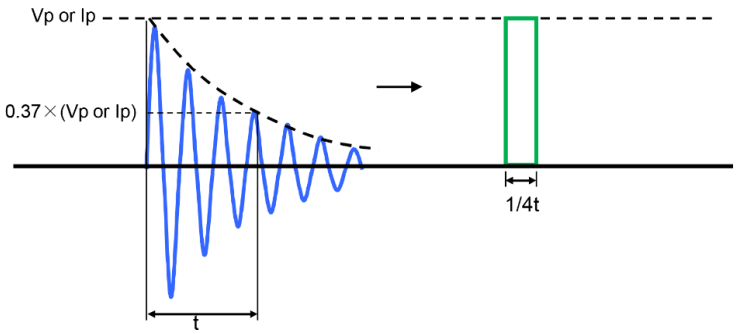
Note 1: If T > 10 → T = 10 (sec), T / t > 1000 → T / t = 1000
Note 2: If T > 10 and T / t > 1000, “Pulse Limiting power (Single pulse) is applied
Note 3: If Vp < Vr (Ip < Ir or Pp < P), Vr (Ir, P) is Vp (Ip, Pp)
Note 4: Pulse limiting voltage (current, wattage) is applied at less than rated ambient temperature. 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

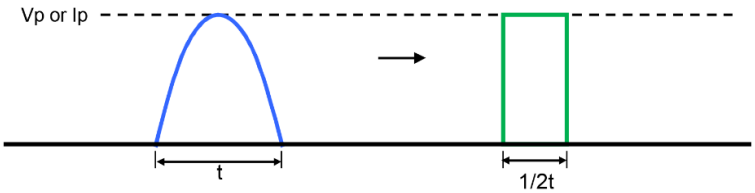
1. Discharge curve wave with time constant “t” → Square wave



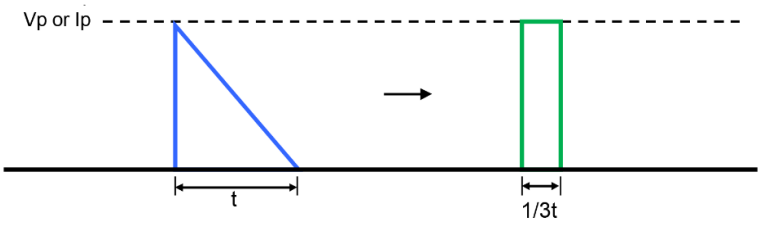
2. Damping oscillation wave with time constant of envelope “t” → Square wave



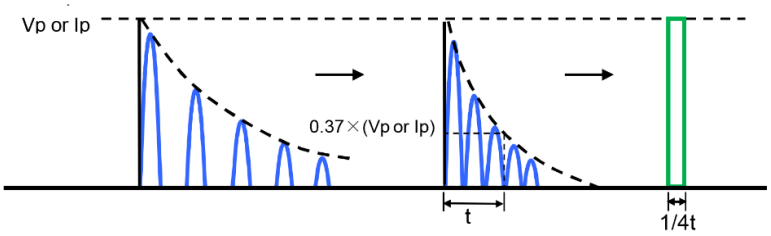
3. Half-wave rectification wave → Square wave



4. Triangular wave → Square wave

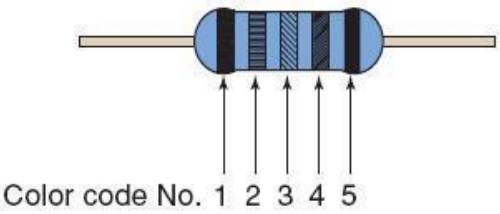


5. Special wave → Square wave



Color Code

Description



1, 1st band significant figure

2, 2nd band significant figure

3, Multiplier

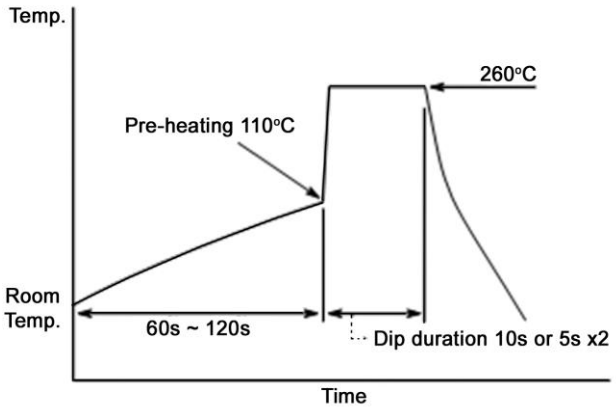
4, Tolerance

5, Color code 5th Color Green(Discharge Resistor)

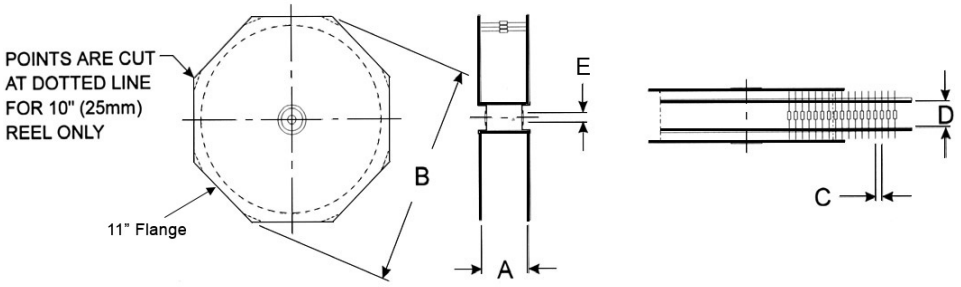
Recommended Soldering Conditions

Flow Soldering:
- Pre-heating: 110°C MAX
- Peak temperature/duration: 260°C within 10 seconds (1st, 2nd wave total)
- Temperature profile (see chart on the right)

Iron Soldering:
- 380°C, 5 seconds, once/terminal



Packaging Specifications



Series	A max(1)	B max	C	D(2)	Tape	Unit
SPRM12	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
SPR1	3.917 99.50	13.504 343.00	0.394 ± 0.020 10.00 ± 0.50	2.063 ± 0.079 52.40 ± 2.00	0.250 6.35	inches mm

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)
SPR	Discharge Path Leaded Resistor	Axial	YES	99.3/0.7 Sn/Cu	Apr-05	05/14

"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

S	P	R	1	J	B	1	0	M	0

Product Series

SPR	Standard
SPRM	Mini

Power

Size	W
12	0.5
1	1

Tolerance

Code	Tol	Value
J	5%	E24

Packaging

Code	Description	Size	Quantity
B	Bulk	SPRM12; SPR1	1000
A	Ammo	SPRM12	2000
		SPR1	500

Resistance Value

Four characters with the multiplier used as the decimal holder.

1 Mohm = 1M00
12 Mohm = 12M0