

Features:

- Excellent pulse withstanding performance
- Broad resistance range
- Higher anti-surge performance compared with RMCF Series
- Standard power RPC, 5% and wider tolerances, are untrimmed
- 1% and wider tolerances are qualified to AEC-Q200
- RoHS compliant and halogen free
- REACH compliant
- Lower values may be available – contact Stackpole



Electrical Specifications							
Type/Code	Power Rating (W) @ 70°C	Maximum Working Voltage (V)	Maximum Overload Voltage (V)	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance		
					0.5%	1%	5%, 10%, 20%
RPC0402	0.2	50	100	±300	-	1 - 20	
				±100	100 - 1M	20.5 - 1M	22 - 1M
RPC0603	0.1	50	100	±200	10 - 294	1 - 294	10 - 270
				±100	300 - 1M		
RPC0805	0.25	150	300	±200	10 - 294	1 - 294	1 - 270
				±100	300 - 20M		
RPC1206	0.33	200	400	±200	10 - 20	1 - 20	
				±100	20.5 - 20M		22 - 20M
RPC1210	0.5	200	400	±200	10 - 20	1 - 20	
				±100	20.5 - 20M		22 - 20M
RPC2010	0.75	400	800	±200	10 - 20	1 - 20	
				±100	20.5 - 20M		22 - 20M
RPC2512	1.5	500	1000	±200	10 - 20	1 - 20	
				±100	20.5 - 20M		22 - 20M

Working Voltage = $\sqrt{P \cdot R}$ or Max. Working Voltage listed above, whichever is lower.

Overload Voltage = $2.5 \cdot \sqrt{P \cdot R}$ or Max. Overload Voltage listed above, whichever is lower.

Electrical Specifications – High Power (HP)							
Type/Code	Power Rating (W) @ 70°C	Maximum Working Voltage (V)	Maximum Overload Voltage (V)	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance		
					0.5%	1%	5%
RPC0603_-HP	0.25	75	150	±200	10 - 294	1 - 294	10 - 270
				±100	300 - 1M		
RPC0805_-HP	0.4	150	300	±200	10 - 294	1 - 294	1 - 270
				±100	300 - 1M		
RPC1206_-HP	0.5	200	400	±200	10 - 20	1 - 20	
				±100	20.5 - 1M		22 - 1M
RPC1210_-HP	0.75	200	400	±200	10 - 20	1 - 20	
				±100	20.5 - 1M		22 - 1M
RPC2010_-HP	1	400	800	±200	10 - 20	1 - 20	
				±100	20.5 - 1M		22 - 1M
RPC2512_-HP ^(*)	2	500	1000	±350	10	1 - 10	
				±100	10.5 - 200K		

(*) Double-sided printed resistor element.

Working Voltage = $\sqrt{P \cdot R}$ or Max. Working Voltage listed above, whichever is lower.

Overload Voltage = $2.5 \cdot \sqrt{P \cdot R}$ or Max. Overload Voltage listed above, whichever is lower.

Electrical Specifications – Ultra High Power (UP)

Type/Code	Power Rating (W) @ 70°C	Maximum Working Voltage (V)	Maximum Overload Voltage (V)	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance		
					0.5%	1%	5%
RPC0805_-UP	0.5	400	600	±200	10 - 294	1 - 294	1 - 270
				±100	300 - 1M		
RPC1206_-UP	0.75	500	1000	±200	10 - 20	1 - 20	
				±100	20.5 - 1M		22 - 1M

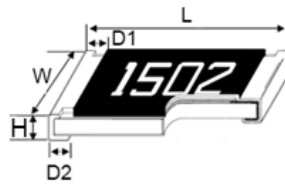
Ultra High Power: double side printed resistor element.
Working Voltage = $\sqrt{P \cdot R}$ or Max. Working Voltage listed above, whichever is lower.
Overload Voltage = $2.5 \cdot \sqrt{P \cdot R}$ or Max. Overload Voltage listed above, whichever is lower.

Electrical Specifications – Ultra High Power Jumper

Type/Code	Jumper Rated Current (A)	Max. Resistance
RPC0805_-UP	6	0.005 max.
RPC1206_-UP	10	

RPC0603-UP zero ohm jumper with 5A current rating also available.
Ultra High Power: double side printed resistor element.

Mechanical Specifications



Type/Code	Weight (g) (1000 pcs)	L Body Length	W Body Width	H Body Height	D1 Top Termination	D2 Bottom Termination	Unit
RPC0402	0.64	0.039 ± 0.002 1.00 ± 0.05	0.020 ± 0.002 0.50 ± 0.05	0.014 ± 0.002 0.35 ± 0.05	0.008 ± 0.004 0.20 ± 0.10	0.008 ± 0.004 0.20 ± 0.10	inches mm
RPC0603 (HP)	2.042	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
RPC0805 (HP)	4.368	0.079 ± 0.004 2.00 ± 0.10	0.049 ± 0.004 1.25 ± 0.10	0.020 ± 0.004 0.50 ± 0.10	0.014 ± 0.008 0.35 ± 0.20	0.016 ± 0.008 0.40 ± 0.20	inches mm
RPC0805_-UP	5.049	0.079 ± 0.004 2.00 ± 0.10	0.049 ± 0.004 1.25 ± 0.10	0.020 ± 0.004 0.50 ± 0.10	0.014 ± 0.008 0.35 ± 0.20	0.016 ± 0.008 0.40 ± 0.20	inches mm
RPC1206 (HP)	8.947	0.122 ± 0.004 3.10 ± 0.10	0.061 ± 0.004 1.55 ± 0.10	0.022 ± 0.004 0.55 ± 0.10	0.020 ± 0.010 0.50 ± 0.25	0.020 ± 0.008 0.50 ± 0.20	inches mm
RPC1206_-UP	9.541	0.122 ± 0.004 3.10 ± 0.10	0.061 ± 0.004 1.55 ± 0.10	0.022 ± 0.004 0.55 ± 0.10	0.020 ± 0.010 0.50 ± 0.25	0.020 ± 0.008 0.50 ± 0.20	inches mm
RPC1210 (HP)	15.959	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 ± 0.010 0.50 ± 0.25	0.020 ± 0.008 0.50 ± 0.20	inches mm
RPC2010 (HP)	24.241	0.197 ± 0.004 5.00 ± 0.10	0.098 ± 0.006 2.50 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.024 ± 0.010 0.60 ± 0.25	0.020 ± 0.008 0.50 ± 0.20	inches mm
RPC2512	39.448	0.250 ± 0.004 6.35 ± 0.10	0.122 ± 0.006 3.10 ± 0.15	0.022 ± 0.004 0.55 ± 0.10	0.024 ± 0.010 0.60 ± 0.25	0.020 ± 0.008 0.50 ± 0.20	inches mm
RPC2512 (HP)	42	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 ± 0.010 0.60 ± 0.25	0.020 ± 0.008 0.50 ± 0.20	inches mm

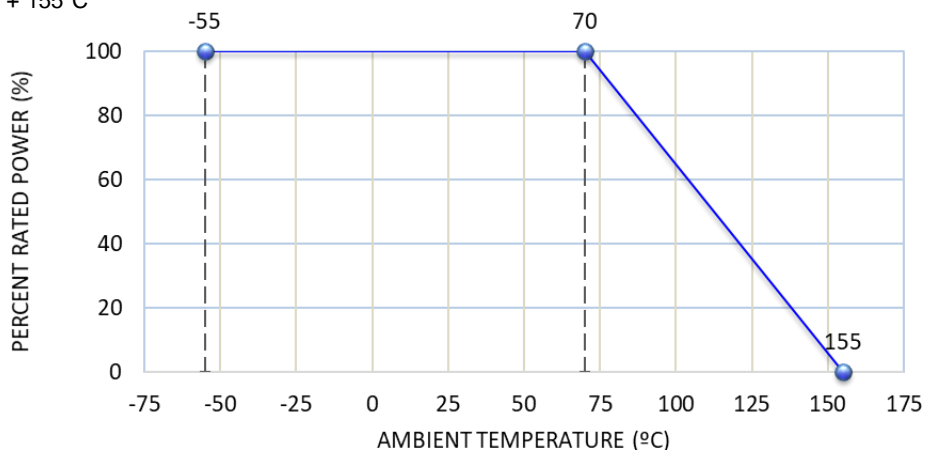
Performance Characteristics			
Item	Test Method	Test Specification	Test Condition
Temperature Coefficient of Resistance (T.C.R.)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	Within the specified tolerance	At 25°C / -55°C and 25°C / + 125°C, 25°C is the reference temperature
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	± (1% + 0.05Ω)	RCWV * 2.5 or max. overload voltage whichever is lower for 5 seconds Jumper: 2*I _{max} for 5 seconds
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	≥ 10G	Max. overload voltage for 1 minute
Endurance Tolerances of 0.5%, 1%	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	± (1% + 0.05Ω)	70°C ± 2°C, RCWV for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"
Endurance Tolerances of 5%, 10%, 20%	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	± (3% + 0.05Ω)	70°C ± 2°C, RCWV for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"
Damp Heat with Load Tolerances of 0.5%, 1%	JIS-C-5201-1 4.24 IEC-60115-1 4.24	± (0.5% + 0.05Ω)	40°C ± 2°C, 90~95% R.H, RCWV for 1000 hour with 1.5 hours "ON" and 0.5 hour "OFF"
Damp Heat with Load Tolerances of 5%, 10%, 20%	JIS-C-5201-1 4.24 IEC-60115-1 4.24	± (3% + 0.05Ω)	40°C ± 2°C, 90~95% R.H, RCWV for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"
Damp Heat with Load Ultra High Power	JIS-C-5201-1 4.24 IEC-60115-1 4.24	± (1% + 0.05Ω)	
Dry Heat Tolerances of 0.5%, 1%	JIS-C-5201-1 4.23 IEC-60115-1 2.23.2	± (0.5% + 0.05Ω)	At +155°C for 1000 hours
Dry Heat Tolerances of 5%, 10%, 20%	JIS-C-5201-1 4.23 IEC-60115-1 2.23.2	± (3% + 0.05Ω)	At +155°C for 1000 hours
Bending Strength	JIS-C-5201-1 4.33 IEC-60115-1 4.33	± (1% + 0.05Ω)	Bending once for 5 seconds 2010, 2512 sizes: 2mm; other sizes: 3mm
Solderability	JIS-C-5201-1 4.17 IEC-60115-1 4.17	95% min. coverage	245°C ± 5°C for 3 seconds
Resistance to Soldering Heat tolerances of 0.5%, 1%	JIS-C-5201-1 4.18 IEC-60115-1 4.18	± (0.5% + 0.05Ω)	260°C ± 5°C for 10 seconds
Resistance to Soldering Heat tolerances of 5%, 10%, 20%	JIS-C-5201-1 4.18 IEC-60115-1 4.18	± (1% + 0.05Ω)	260°C ± 5°C for 10 seconds
Voltage Proof	JIS-C-5201-1 4.7 IEC-60115-1 4.7	No Breakdown or flashover	1.42 times max. operating voltage for 1 minute
Leaching	JIS-C-5201-1 4.18 IEC-60068-2-58-8.2.1	Individual leaching area ≤ 5% Total leaching area ≤ 10%	260°C ± 5°C for 30 seconds
Rapid Change of Temperature tolerances of 0.5%, 1%	JIS-C-5201-1 4.18 IEC-60115-1 4.18	± (0.5% + 0.05Ω)	-55°C to + 150°C , 5 cycles
Rapid Change of Temperature tolerances of 5%, 10%, 20%	JIS-C-5201-1 4.18 IEC-60115-1 4.18	± (1% + 0.05Ω)	-55°C to + 150°C , 5 cycles

RCWV (Rated Continuous Working Voltage)= $\sqrt{P \cdot R}$ or Max. Working Voltage whichever is lower.

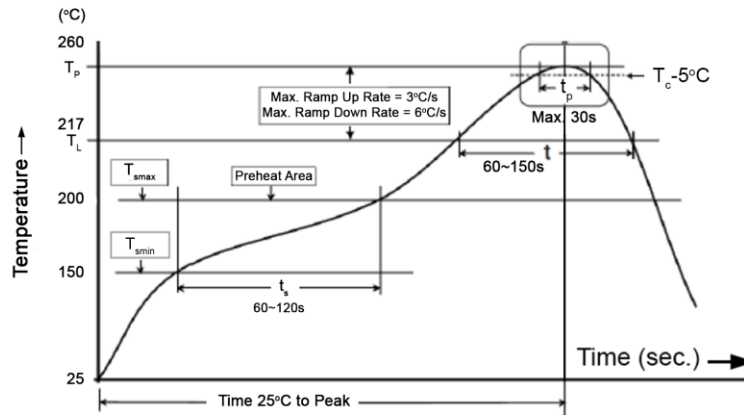
Storage Temperature: 15 ~ 28°C; humidity < 80% R.H.

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

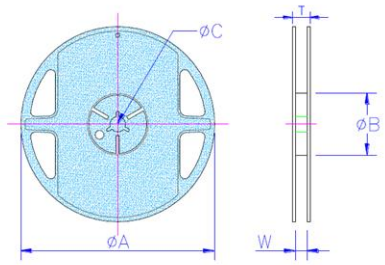
Power Derating Curve:



Soldering Condition:

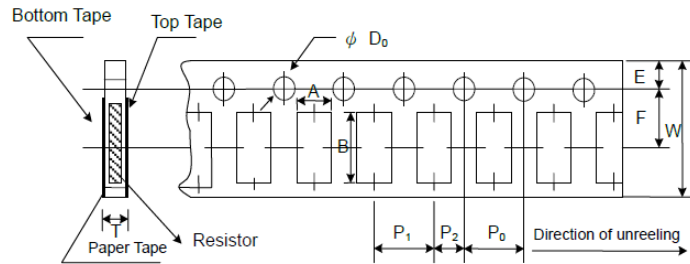


Reel Specifications



Type/Code	Packaging	Tape Width	Reel Diameter	A	B	C	W	T	Unit
RPC0402	Paper	8 mm	7 inches	7.028 ± 0.059	2.362 +0.039 / -0	0.512 ± 0.008	0.354 ± 0.020	0.492 ± 0.020	inches
RPC0603				178.50 ± 1.50	60 +1 / -0	13.00 ± 0.20	9.00 ± 0.50	12.50 ± 0.50	mm
RPC0805				7.028 ± 0.059	2.362 +0.039 / -0	0.512 ± 0.008	0.354 ± 0.020	0.492 ± 0.020	inches
RPC1206				178.50 ± 1.50	60 +1 / -0	13.00 ± 0.20	9.00 ± 0.50	12.50 ± 0.50	mm
RPC1210				7.028 ± 0.059	2.362 +0.039 / -0	0.512 ± 0.008	0.354 ± 0.020	0.492 ± 0.020	inches
				178.50 ± 1.50	60 +1 / -0	13.00 ± 0.20	9.00 ± 0.50	12.50 ± 0.50	mm
RPC2010	Embossed	12 mm	7 inches	7.028 ± 0.059	2.362 +0.039 / -0	0.512 ± 0.020	0.512 ± 0.020	0.610 ± 0.020	inches
RPC2512				178.50 ± 1.50	60 +1 / -0	13.00 ± 0.50	13.00 ± 0.50	15.50 ± 0.50	mm
				7.028 ± 0.059	2.362 +0.039 / -0	0.512 ± 0.020	0.512 ± 0.020	0.610 ± 0.020	inches
				178.50 ± 1.50	60 +1 / -0	13.00 ± 0.50	13.00 ± 0.50	15.50 ± 0.50	mm

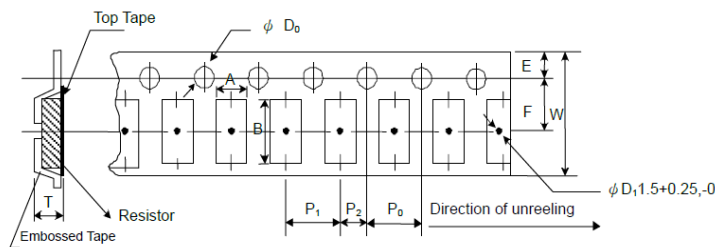
Packaging Specifications - Paper Tape



Type/Code	A	B	W	E	F	Unit
RPC0402	0.026 ± 0.004	0.045 ± 0.004	0.315 ± 0.008	0.069 ± 0.004	0.138 ± 0.002	inches
	0.65 ± 0.10	1.15 ± 0.10	8.00 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	mm
RPC0603	0.043 ± 0.004	0.075 ± 0.004	0.315 ± 0.008	0.069 ± 0.004	0.138 ± 0.002	inches
	1.10 ± 0.10	1.90 ± 0.10	8.00 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	mm
RPC0805	0.063 ± 0.004	0.094 ± 0.008	0.315 ± 0.008	0.069 ± 0.004	0.138 ± 0.002	inches
	1.60 ± 0.10	2.40 ± 0.20	8.00 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	mm
RPC1206	0.075 ± 0.004	0.138 ± 0.008	0.315 ± 0.008	0.069 ± 0.004	0.138 ± 0.002	inches
	1.90 ± 0.10	3.50 ± 0.20	8.00 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	mm
RPC1210	0.114 ± 0.004	0.138 ± 0.008	0.315 ± 0.008	0.069 ± 0.004	0.138 ± 0.002	inches
	2.90 ± 0.10	3.50 ± 0.20	8.00 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	mm

Type/Code	P ₀	P ₁	P ₂	ϕD_0	T	Unit
RPC0402	0.157 ± 0.004	0.079 ± 0.002	0.079 ± 0.002	0.059 ± 0.004	0.018 ± 0.004	inches
	4.00 ± 0.10	2.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	0.45 ± 0.10	mm
RPC0603	0.157 ± 0.004	0.157 ± 0.002	0.079 ± 0.002	0.059 ± 0.004	0.028 ± 0.004	inches
	4.00 ± 0.10	4.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	0.70 ± 0.10	mm
RPC0805	0.157 ± 0.004	0.157 ± 0.002	0.079 ± 0.002	0.059 ± 0.004	0.033 ± 0.004	inches
	4.00 ± 0.10	4.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	0.85 ± 0.10	mm
RPC1206	0.157 ± 0.004	0.157 ± 0.002	0.079 ± 0.002	0.059 ± 0.004	0.033 ± 0.004	inches
	4.00 ± 0.10	4.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	0.85 ± 0.10	mm
RPC1210	0.157 ± 0.004	0.157 ± 0.002	0.079 ± 0.002	0.059 ± 0.004	0.033 ± 0.004	inches
	4.00 ± 0.10	4.00 ± 0.05	2.00 ± 0.05	1.50 ± 0.10	0.85 ± 0.10	mm

Packaging Specifications – Embossed Plastic Tape



Type/Code	A	B	W	E	F	Unit
RPC2010	0.110 ± 0.004	0.217 ± 0.004	0.472 ± 0.012	0.069 ± 0.004	0.217 ± 0.002	inches
	2.80 ± 0.10	5.50 ± 0.10	12.00 ± 0.30	1.75 ± 0.10	5.50 ± 0.05	mm
RPC2512	0.138 ± 0.004	0.264 ± 0.004	0.472 ± 0.012	0.069 ± 0.004	0.217 ± 0.002	inches
	3.50 ± 0.10	6.70 ± 0.10	12.00 ± 0.30	1.75 ± 0.10	5.50 ± 0.05	mm
Type/Code	P ₀	P ₁	P ₂	ϕD_0	T	Unit
RPC2010	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.059 ± 0.004	0.047 - 0.000	inches
	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 ± 0.10	1.20 - 0.00	mm
RPC2512	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.059 ± 0.004	0.047 - 0.000	inches
	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	1.50 ± 0.10	1.20 - 0.00	mm

Marking

- No marking for 0402
- 3-digit marking for 0603 in E24

3-digit marking for 0603 in E24	
Example:	
101	= 100 Ω
102	= 1K Ω

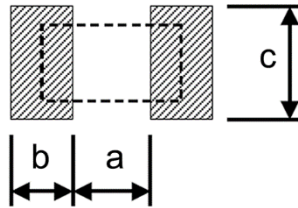
101 1st and 2nd digits are E24 code
3rd digit is the multiplier

E24 Code	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47	51	56	62	68	75	82	91
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- 4-digit marking for 0805-2512

4-digit marking for 0805-2512					
Resistance	100 Ω	2.2K Ω	10K Ω	100K Ω	1M Ω
Marking	1000	2201	1002	1003	1004

Recommended Pad Layout

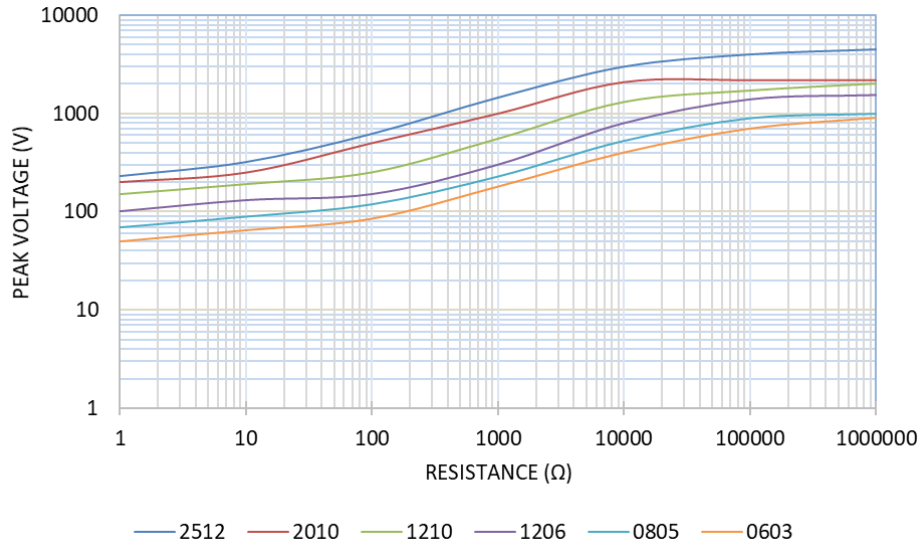


Type/Code	a	b	c	Unit
RPC0402	0.020	0.018	0.024	inches
	0.50	0.45	0.60	mm
RPC0603	0.035	0.024	0.035	inches
	0.90	0.60	0.90	mm
RPC0805	0.047	0.028	0.051	inches
	1.20	0.70	1.30	mm
RPC1206	0.079	0.035	0.063	inches
	2.00	0.90	1.60	mm
RPC1210	0.079	0.035	0.110	inches
	2.00	0.90	2.80	mm
RPC2010	0.150	0.035	0.110	inches
	3.80	0.90	2.80	mm
RPC2512	0.193	0.039	0.134	inches
	4.90	1.00	3.40	mm

Lightning Surge

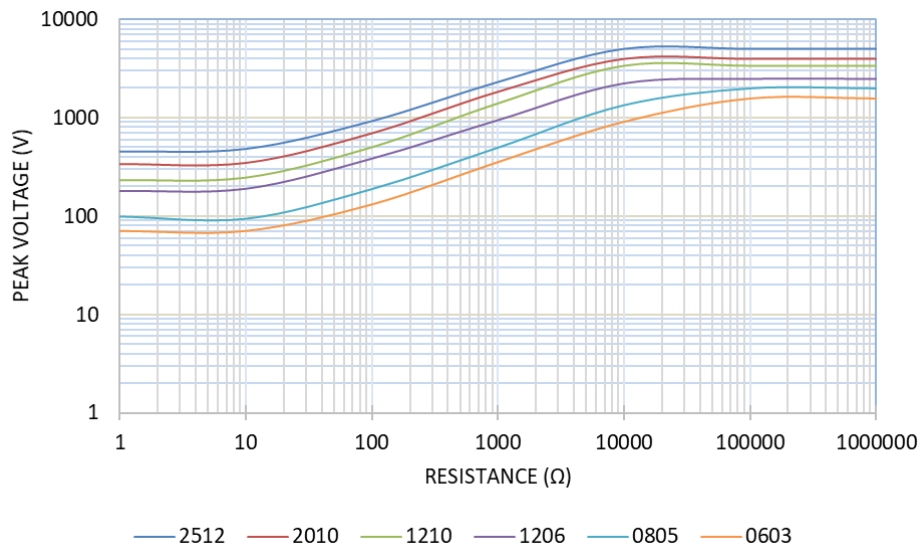
Resistors are tested in accordance with IEC 60115-1 using both 1.2 / 50 us and 10 / 700 pulse shapes. The limit of acceptance is a shift in resistance of less than 1% from the initial value.

1.2/50us Lightning Surge (*)
RPC (Standard Power) tolerances of 0.5% and 1%
RPC-HP (High Power) all tolerances
RPC-UP (Ultra High Power) all tolerances

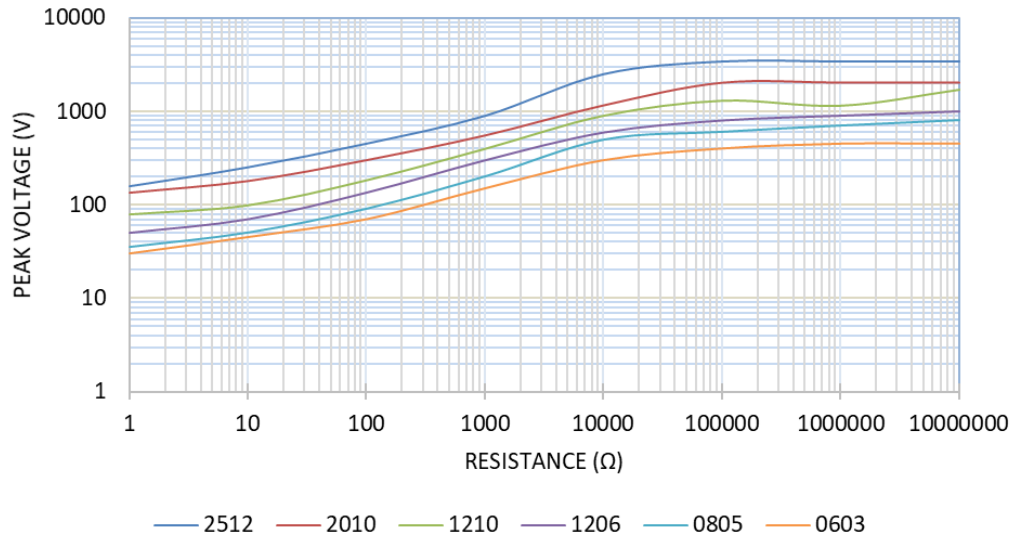


(*) Note: Data provided shows typical performance and is for reference only.

1.2/50us Lightning Surge (*)
RPC (Standard Power)
Tolerances of 5%, 10% and 20%

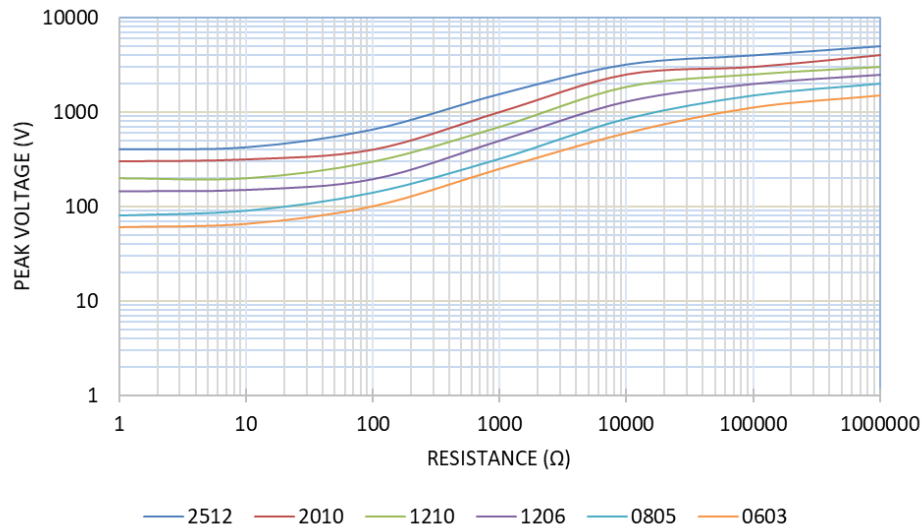


10/700us Lightning Surge (*)
RPC (Standard Power) tolerances of 0.5% and 1%
RPC-HP (High Power) all tolerances
RPC-UP (Ultra High Power) all tolerances



(*) Note: Data provided shows typical performance and is for reference only.

10/700us Lightning Surge (*)
RPC (Standard Power)
Tolerances of 5%, 10% and 20%

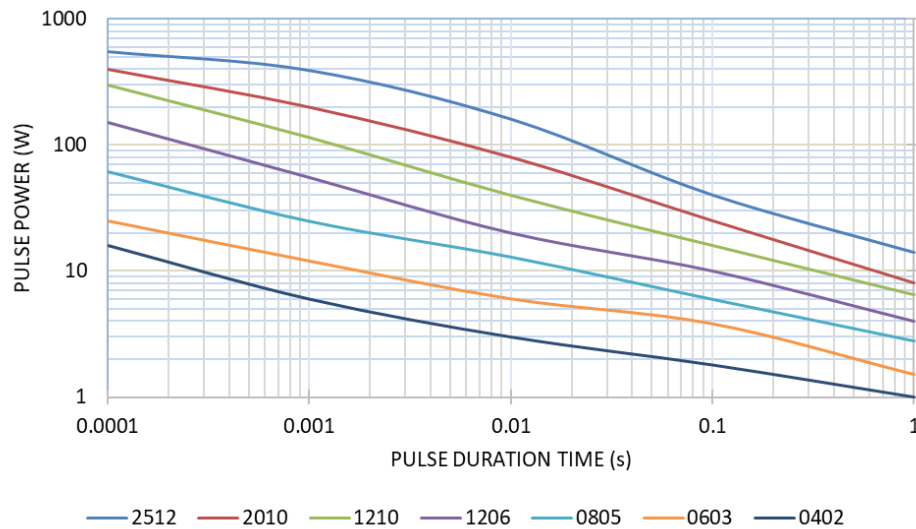


(*) Note: Data provided shows typical performance and is for reference only.

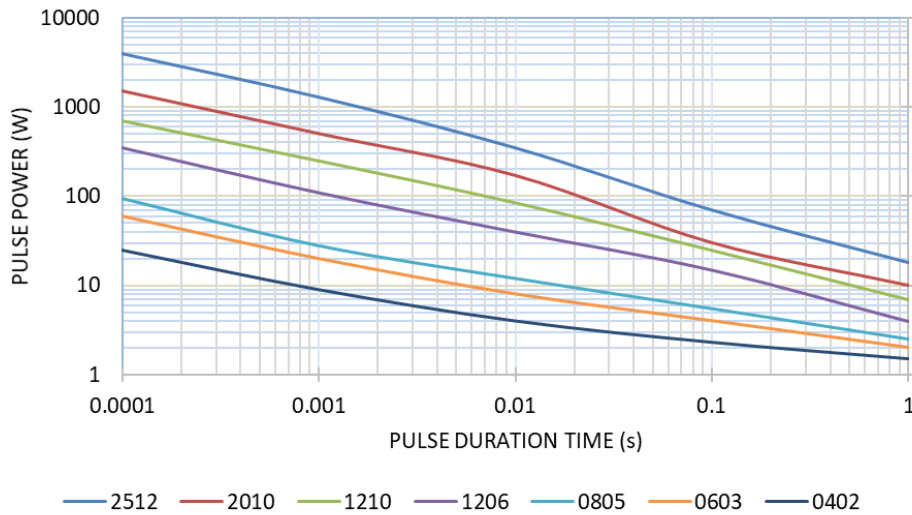
Pulse Withstand Capacity

The single impulse graph is the result of 50 impulses of rectangular shape applied at one-minute intervals. The limit of acceptance was a shift in resistance of less than 1% from the initial value. The power applied was subject to the restrictions of the maximum permissible impulse voltage graph shown.

Single Pulse Power (100 ohms)
RPC (Standard Power) tolerances of 0.5% and 1%
RPC-HP (High Power) all tolerances
RPC-UP (Ultra High Power) all tolerances



Single Pulse Power (100 ohms)
RPC (Standard Power)
Tolerances of 5%, 10% and 20%

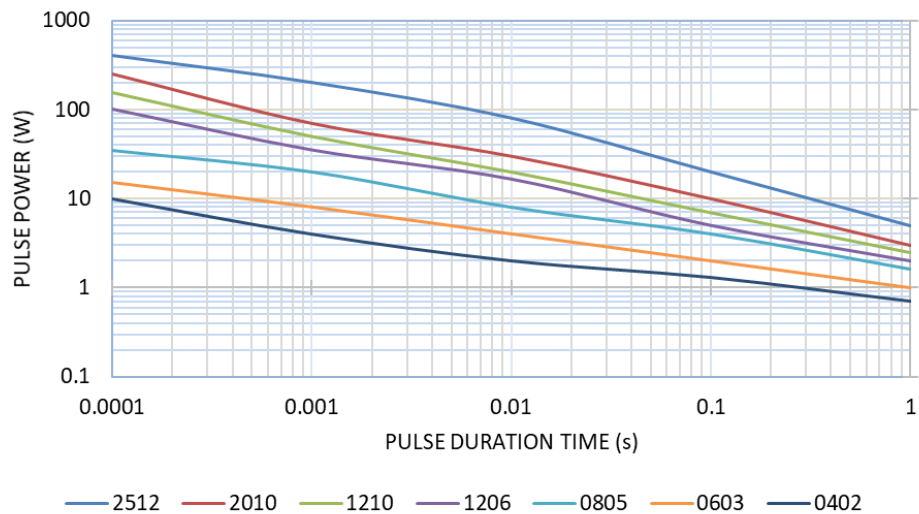


This data is for the 100 Ω resistance value for each size. Pulse power handling is dependent on the resistance value. For resistance values higher or lower than 100 Ω, contact Stackpole for advice on pulse handling characteristics of your particular resistance value of interest.

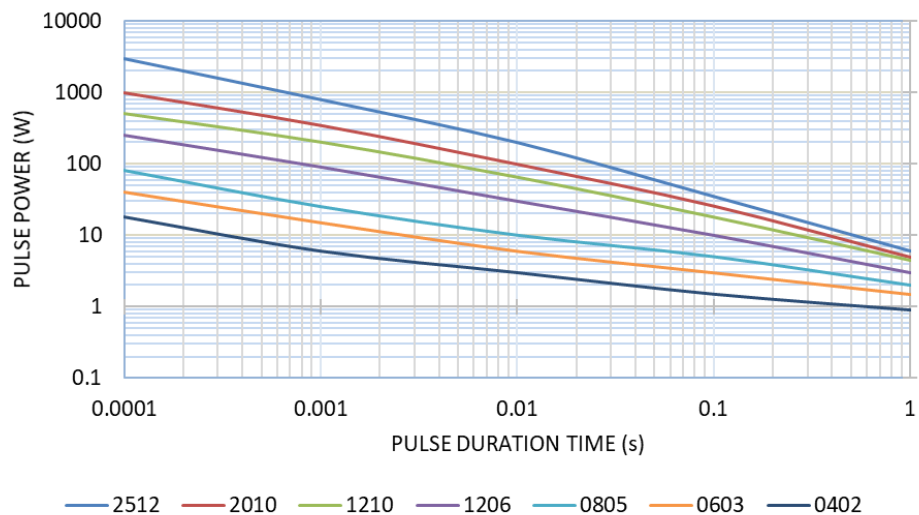
Continuous Pulse

The continuous load graph was obtained by applying repetitive rectangular pulses where the pulse period was adjusted so that the average power dissipated in the resistor was equal to its rated power at 70 °C. Again, the limit of acceptance was a shift in resistance of less than 1% from the initial value.

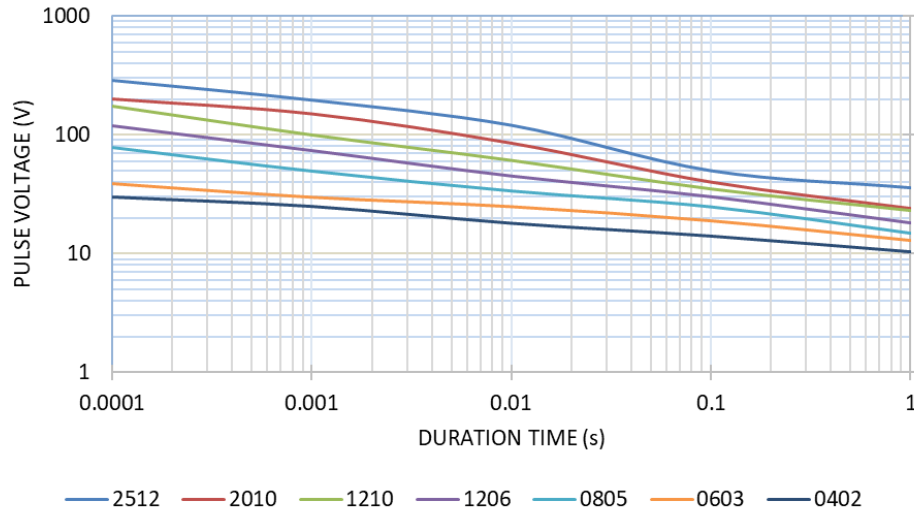
Continuous Pulse Power (100 ohms)
RPC (Standard Power) tolerances of 0.5% and 1%
RPC-HP (High Power) all tolerances
RPC-UP (Ultra High Power) all tolerances



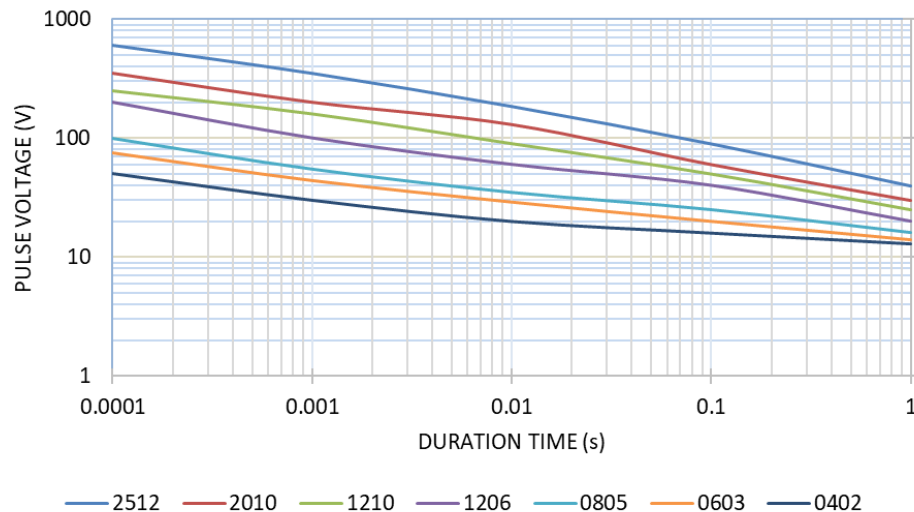
Continuous Pulse Power (100 ohms)
RPC (Standard Power)
Tolerances of 5%, 10% and 20%



Pulse Voltage (100 ohms)
RPC (Standard Power) tolerances of 0.5% and 1%
RPC-HP (High Power) all tolerances
RPC-UP (Ultra High Power) all tolerances



Pulse Voltage (100 ohms)
RPC (Standard Power)
Tolerances of 5%, 10% and 20%



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)
RPC	Pulse Withstanding Thick Film Surface Mount Chip Resistor	SMD	YES RoHS Compliant by means of exemption 7c-I	100% Matte Sn over Ni	Jan-03	03/01

“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

