

RPCQ Series

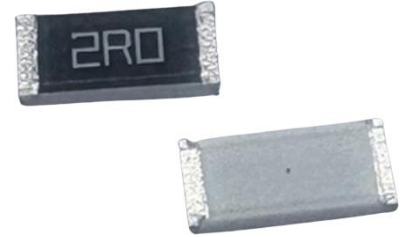
Automotive Grade High Power Pulse Withstanding Chip Resistor

Stackpole Electronics, Inc.

Resistive Product Solutions

Features:

- Extremely high power ratings
- Automotive grade
- Superior anti-surge capability
- Anti-sulfur per ASTM-B-809-95 and ANSI/EIA 977
- RoHS compliant, REACH compliant, and halogen free
- AEC-Q200 qualified



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
					2%, 5%, 10%
RPCQ1206	1	200	400	±400	1 - 9.1
				±100	10 - 1M
RPCQ2512	4	250	500	±400	1 - 9.1
				±150	10 - 1M

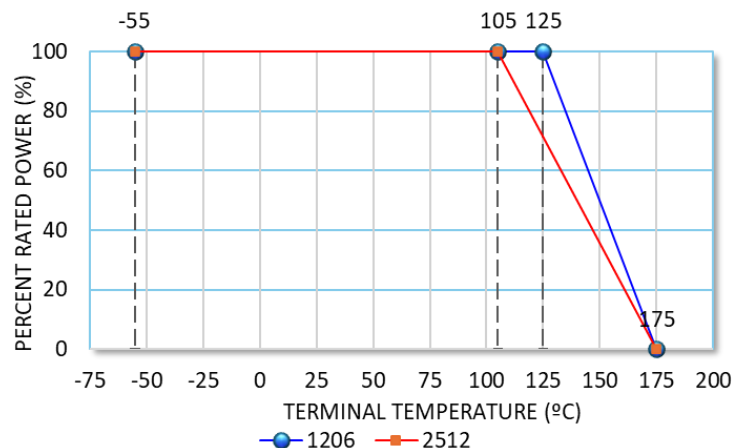
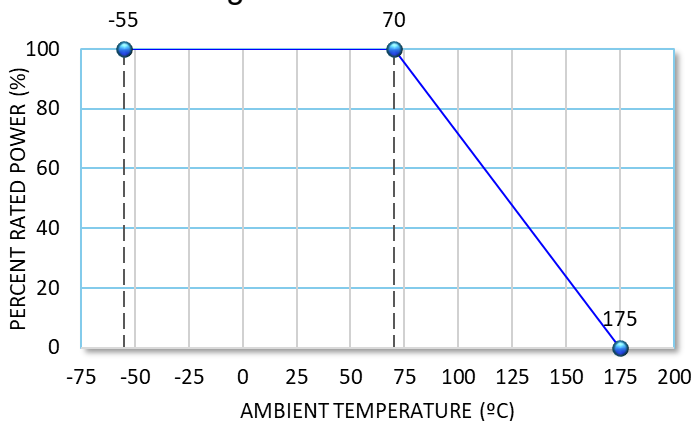
Working Voltage = $\sqrt{P \cdot R}$ or Max. Working Voltage listed above, whichever is lower.

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

Operating temperature range is -55°C to +175°C

Mechanical Specifications						
Type/Code	L Body Length	W Body Width	H Body Height	I1 Top Termination	I2 Bottom Termination	Unit
RPCQ1206	0.120 ± 0.004	0.063 ± 0.004	0.026 ± 0.006	0.016 ± 0.008	0.016 ± 0.008	inches
	3.05 ± 0.10	1.60 ± 0.10	0.65 ± 0.15	0.40 ± 0.20	0.40 ± 0.20	mm
RPCQ2512	0.248 ± 0.008	0.126 ± 0.006	0.030 ± 0.006	0.024 ± 0.008	0.022 ± 0.010	inches
	6.30 ± 0.20	3.20 ± 0.15	0.75 ± 0.15	0.60 ± 0.20	0.55 ± 0.25	mm

Power Derating Curve:



Performance Characteristics

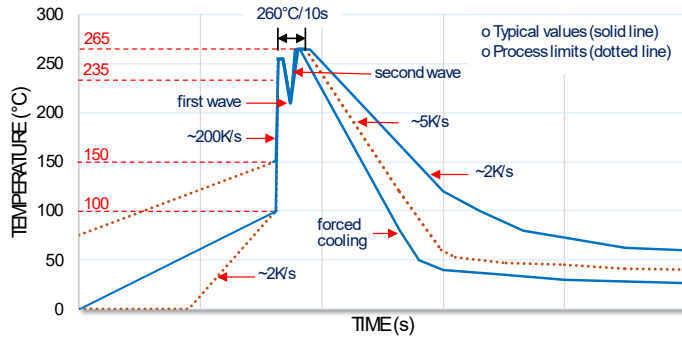
Item	Test Method	Test Specification	Test Condition
Temperature Coefficient of Resistance (T.C.R.)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	As per specification	At 25°C / +155°C, 25°C is the reference temperature
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	$\Delta \pm(2\% + 0.1\Omega)$	High Power: 4 x rated power or max overload voltage whichever is less for 5 seconds
Leaching	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1	Individual leaching area $\leq 5\%$ Total leaching area $\leq 10\%$	260 \pm 5°C for 30 seconds
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	$\Delta \pm(1\% + 0.05\Omega)$	260 \pm 5°C for 10 seconds
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	$\geq 10G\Omega$	Apply 100 VDC for 1 minute
Temperature Cycling	JESD22 Method JA-104	$\Delta \pm(1\% + 0.05\Omega)$	1000 cycles (-55°C to +155°C) Measurement at 24 \pm 4 hours after test conclusion. 30 minutes maximum dwell time at each temperature extreme.
Resistance to Solvent	MIL-STD-202 Method 215	$\Delta \pm(0.5\% + 0.05\Omega)$	Add aqueous wash chemical - OKEM clean or equivalent. Do not use banned solvents.
Biased Humidity	MIL-STD-202 Method 103	$\Delta \pm(3\% + 0.05\Omega)$	1000 hours; 85°C/85% RH, 10% of operating power. Measurement at 24 \pm 4 hours after test conclusion
High Temperature Exposure (Storage)	MIL-STD-202 Method 108	$\Delta \pm(3\% + 0.05\Omega)$	1000 hours at T=175°C. Unpowered. Measurement at 24 \pm 4 hours after test conclusion.
High Temperature Operating Life	MIL-STD-202 Method 108	$\Delta \pm(3\% + 0.05\Omega)$	1000 hours. Power shall be applied to the component intermittently: 90 minutes ON and 30 minutes OFF. Temperature of the chamber: maximum specified operating temperature (TA=70°C) at 1000% rated power without derating. Measurement at 24 \pm 4 hours after test conclusion.
External Visual	MIL-STD-883 Method 2009	-	Electrical test not required. Inspect device construction, marking and workmanship.
Mechanical Shock	MIL-STD-202 Method 103	$\Delta \pm(2\% + 0.05\Omega)$	Wave Form: Tolerance for half sine shock pulse. Peak value is 100 g. Normal duration (D) is 6 (ms)
Vibration	MIL-STD-202 Method 204	$\Delta \pm(2\% + 0.05\Omega)$	5 g for 20 minutes, 12 cycles each of 3 orientations, Note: test from 10 - 2000 Hz
ESD	AEC-Q200-002 or ISO/DIS 10605	$\Delta \pm(3\% + 0.05\Omega)$	Human body model: 2 KV
Solderability	J-STD-002	$\Delta \pm(1\% + 0.05\Omega)$	(1) 4 hours, 155°C, dry heat (2) 245 \pm 5°C, 3 seconds
Terminal Strength (SMD)	AEC-Q200-006	No breakage.	Pressurizing force for 60 seconds: 17.7N
Board Flex	AEC-Q200-005	$\Delta \pm(1\% + 0.05\Omega)$	Bending once for 60 seconds. 1206: 3 mm 2512: 2 mm
Single Pulse High Voltage Overload	IEC-60115	$\Delta \pm(1\% + 0.05\Omega)$	Severity No. 4: $U = 10 \times \sqrt{(P_{70} \times R)}$ or $U = 2 \times U_{MAX}$, whichever is less severe. One pulse per minute, 10 pulses 10/700 μ s.
Sulfur Test	ASTM-B-809-95 EIA-977	$\Delta \pm(2\% + 0.05\Omega)$	105 \pm 2°C, no rating power for 1000 hours

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

Recommended storage temperature is 15 ~ 28°C; humidity < 80% R.H.

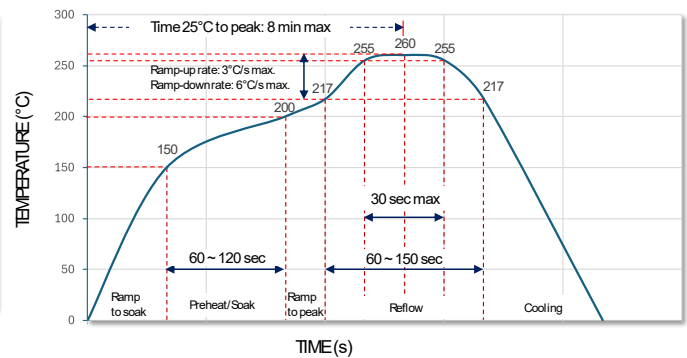
Recommended Soldering Conditions

Wave Solder Temperature Condition



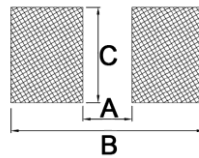
Number of flow cycles allowed: 2 times

Reflow Solder Profile



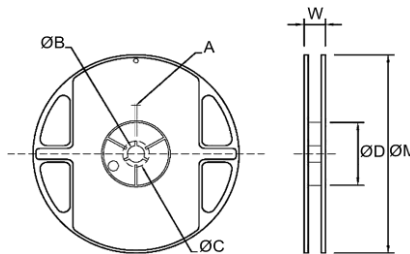
Rework temperature (hot air equipment): 350°C, 3 to 5 seconds.
 Recommended reflow methods: IR, vapor phase oven, hot air oven
 (If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.)

Recommended Land Pattern



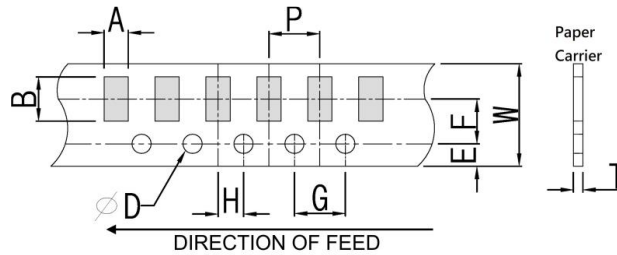
Type/Code	A	B	C	Unit
RPCQ1206	0.087	0.165	0.067	inches
	2.20	4.20	1.70	mm
RPCQ2512	0.193	0.319	0.134	inches
	4.90	8.10	3.40	mm

Reel Specifications



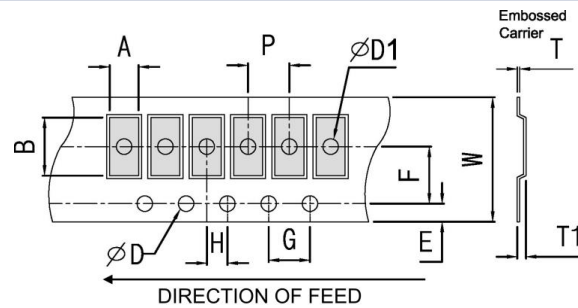
Type/Code	A	B	C	D	W	M	Unit
1206	0.079 ± 0.020	0.531 ± 0.039	0.827 ± 0.039	2.362 ± 0.039	0.453 ± 0.079	7.008 ± 0.079	inches
	2.00 ± 0.50	13.50 ± 1.00	21.00 ± 1.00	60.00 ± 1.00	11.50 ± 2.00	178.00 ± 2.00	mm
2512	0.079 ± 0.020	0.531 ± 0.039	0.827 ± 0.039	2.362 ± 0.039	0.630 ± 0.079	7.008 ± 0.079	inches
	2.00 ± 0.50	13.50 ± 1.00	21.00 ± 1.00	60.00 ± 1.00	16.00 ± 2.00	178.00 ± 2.00	mm

Packaging Specifications - Paper Tape



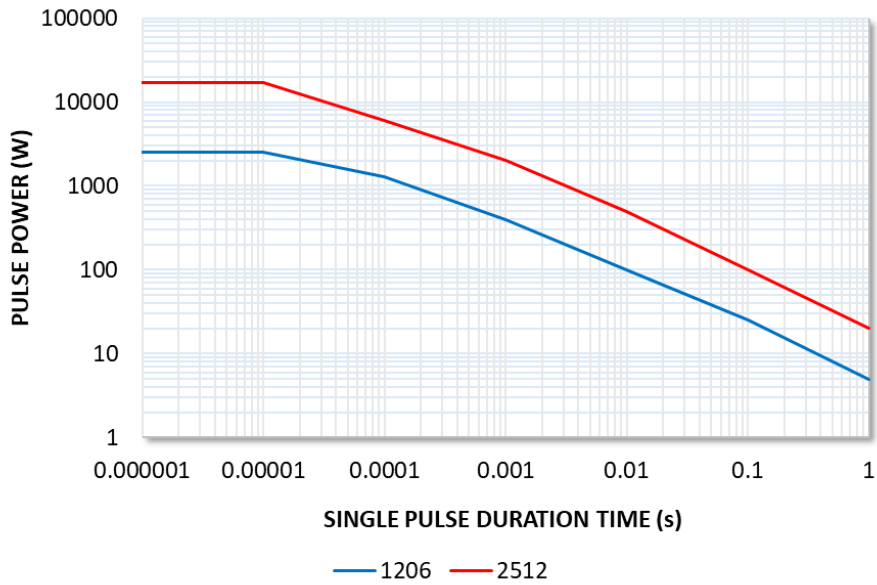
Type/Code	A	B	W	E	F	Unit
RPCQ1206	0.075 ± 0.004 1.90 ± 0.10	0.138 ± 0.008 3.50 ± 0.20	0.315 ± 0.008 8.00 ± 0.20	0.069 ± 0.004 1.75 ± 0.10	0.138 ± 0.002 3.50 ± 0.05	inches mm
Type/Code	G	H	T	ØD	P	Unit
RPCQ1206	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.030 ± 0.004 0.75 ± 0.10	0.059 + 0.004/-0 1.50 + 0.1/-0	0.157 ± 0.004 4.00 ± 0.10	inches mm

Packaging Specifications - Plastic Tape

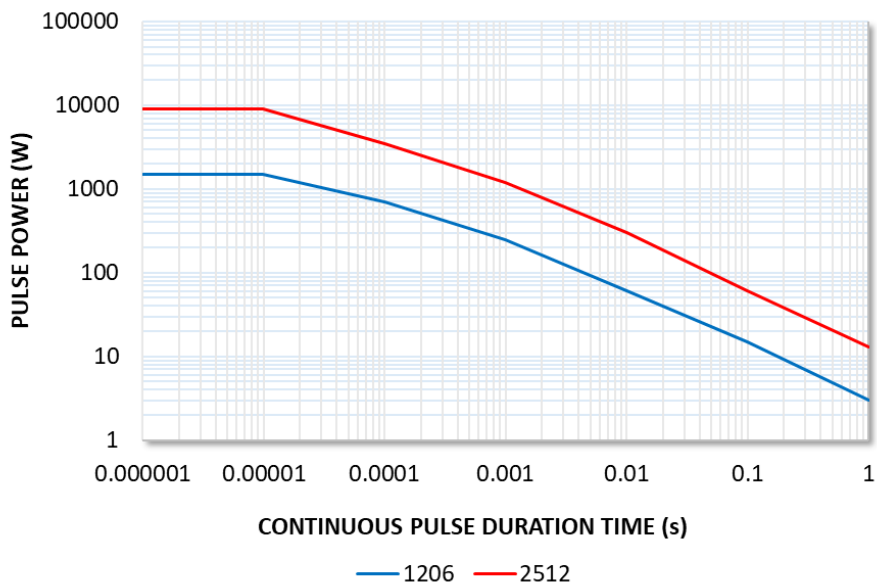


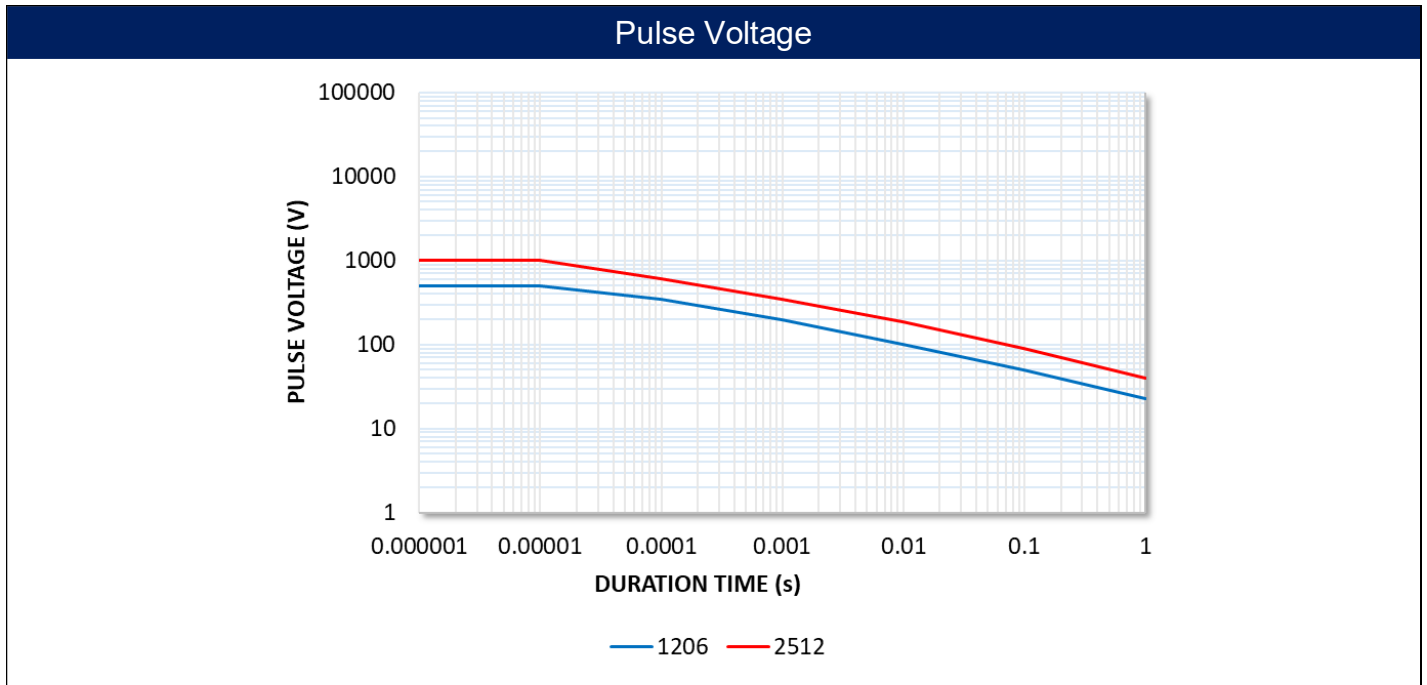
Type/Code	A	B	W	E	F	G	Unit
RPCQ2512	0.134 ± 0.008 3.40 ± 0.20	0.264 ± 0.008 6.70 ± 0.20	0.472 ± 0.004 12.00 ± 0.10	0.069 ± 0.004 1.75 ± 0.10	0.217 ± 0.002 5.50 ± 0.05	0.157 ± 0.004 4.00 ± 0.10	inches mm
Type/Code	H	T	ØD	ØD1	T1	P	Unit
RPCQ2512	0.079 ± 0.002 2.00 ± 0.05	0.009 ± 0.004 0.23 ± 0.10	0.059 + 0.004/-0 1.50 + 0.1/-0	0.059 ± 0.004 1.50 ± 0.10	0.037 ± 0.006 0.95 ± 0.15	0.157 ± 0.004 4.00 ± 0.10	inches mm

Single Pulse Power



Continuous Pulse Power

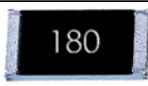




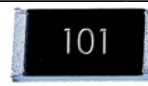
Part Marking Instructions

E24 Values for 2% and 5% tolerance

First and second digits are E24 code; third digit is the multiplier.



180
18Ω



101
100Ω

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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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)
RPCQ	Automotive Grade High Power Pulse Withstanding Chip Resistor	SMD	YES ⁽¹⁾	100% Matte Sn over Ni	Always	Always

Note (1): RoHS compliant by means of exemption 7c-l.

“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.

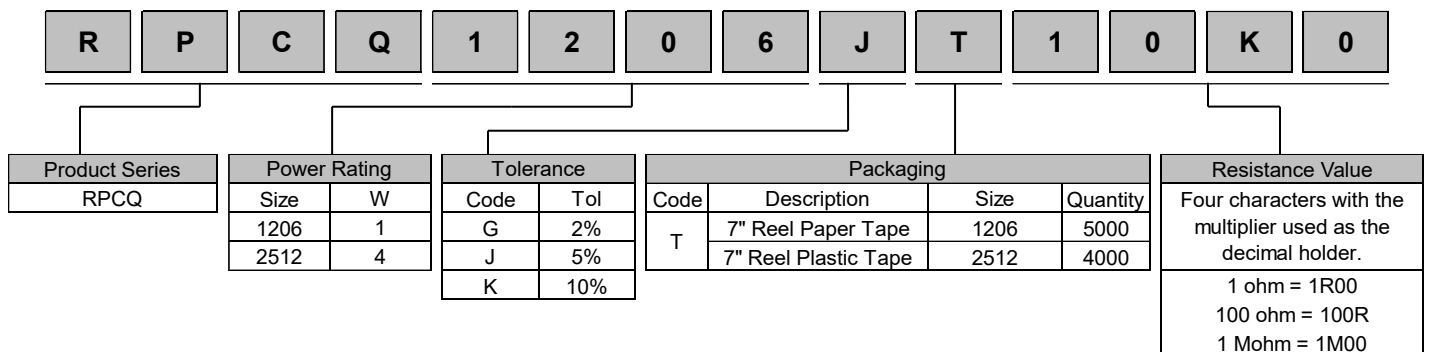
Compliance to “REACH”

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



Mouser Electronics

Authorized Distributor

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[RPCQ2512JT120R](#) [RPCQ1206JT47R0](#) [RPCQ2512JT1K00](#) [RPCQ2512JT82R0](#) [RPCQ2512JT220R](#)
[RPCQ2512JT6R80](#) [RPCQ2512JT2R20](#) [RPCQ2512JT47R0](#) [RPCQ2512JT12R0](#) [RPCQ2512JT100R](#)
[RPCQ2512JT180R](#) [RPCQ1206JT33R0](#) [RPCQ1206JT100R](#) [RPCQ1206JT15R0](#) [RPCQ2512JT330R](#)
[RPCQ1206JT1R00](#) [RPCQ2512JT200R](#) [RPCQ2512JT22R0](#) [RPCQ1206JT3R30](#) [RPCQ2512JT18R0](#)
[RPCQ2512JT68R0](#) [RPCQ1206JT1K00](#) [RPCQ1206JT2R20](#) [RPCQ2512JT1R00](#) [RPCQ2512JT10K0](#)
[RPCQ2512JT33R0](#) [RPCQ2512JT36R0](#) [RPCQ2512JT24R0](#) [RPCQ2512JT10R0](#) [RPCQ2512JT390R](#)
[RPCQ1206JT4R70](#) [RPCQ2512JT510R](#) [RPCQ2512JT3R30](#) [RPCQ2512JT270R](#) [RPCQ2512JT470R](#)
[RPCQ1206JT10R0](#) [RPCQ2512JT680R](#) [RPCQ2512JT4R70](#) [RPCQ2512JT15R0](#) [RPCQ2512JT150R](#)
[RPCQ2512JT820R](#)