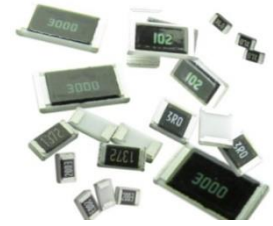


### Features:

- Nickel barrier terminations standard
- High power rating for each case size
- RoHS compliant, REACH compliant, and halogen free

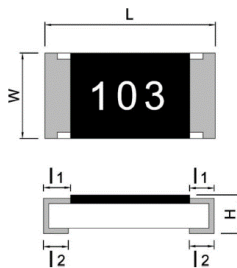


### Electrical Specifications

Type/Code	Power Rating (W) @ 70°C	Max. Working Voltage (V) <sup>(1)</sup>	Max. Overload Voltage (V)	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance <sup>(2)</sup>	
					0.5%	1%, 2%, 5%
RMCP0402-UP	0.2	50	100	± 400	-	1 - 9.76
				± 100	10 - 1M	10 - 10M
RMCP0603-UP	0.33	150	200	± 400	-	1 - 9.76
				± 100	10 - 1M	10 - 10M
RMCP0805-UP	0.5	200	300	± 400	-	1 - 9.76
				± 100	10 - 1M	10 - 10M
RMCP1206-UP	0.75	200	400	± 400	-	1 - 9.76
				± 100	10 - 1M	10 - 10M
RMCP1210-UP	1	200	400	± 400	-	1 - 9.76
				± 100	10 - 1M	10 - 10M
RMCP2010-UP	1.5	200	400	± 400	-	1 - 9.76
				± 150	10 - 1M	10 - 10M
RMCP2512-UP	3	250	500	± 400	-	1 - 9.76
				± 150	10 - 1M	10 - 10M

Notes: (1) Lesser of  $\sqrt{P \cdot R}$  or maximum working voltage  
 (2) Contact Stackpole for non-standard parts

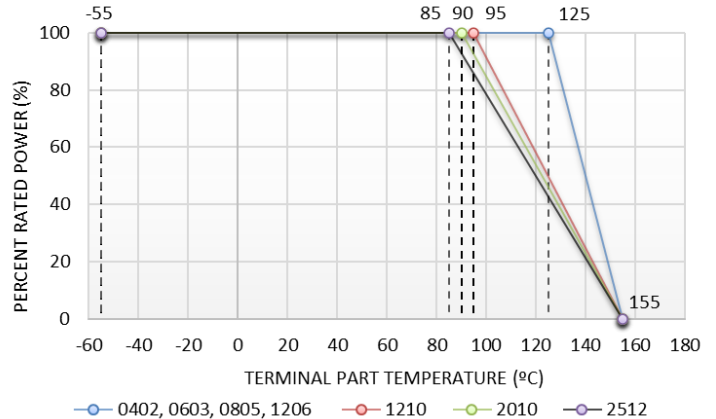
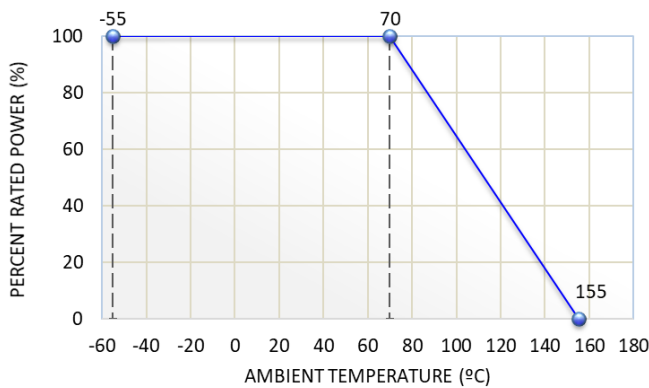
### Mechanical Specifications



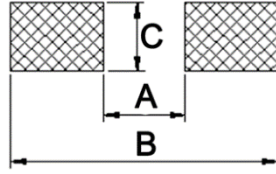
Type/Code	L	W	H	l <sub>1</sub>	l <sub>2</sub>	Unit
RMCP0402-UP	0.039 ± 0.0039	0.020 ± 0.0020	0.012 ± 0.0020	0.006 ± 0.0039	0.008 ± 0.0039	inches
	1.00 ± 0.10	0.50 ± 0.05	0.30 ± 0.05	0.15 ± 0.10	0.20 ± 0.10	mm
RMCP0603-UP	0.063 ± 0.0079	0.031 ± 0.0059	0.016 ± 0.0039	0.012 ± 0.008	0.012 ± 0.004	inches
	1.60 ± 0.20	0.80 ± 0.15	0.40 ± 0.10	0.30 ± 0.20	0.30 ± 0.10	mm
RMCP0805-UP	0.079 ± 0.008	0.049 ± 0.006	0.020 ± 0.006	0.012 ± 0.006	0.016 ± 0.006	inches
	2.00 ± 0.20	1.25 ± 0.15	0.50 ± 0.15	0.30 ± 0.15	0.40 ± 0.15	mm
RMCP1206-UP	0.120 ± 0.004	0.063 ± 0.008	0.022 ± 0.006	0.016 ± 0.008	0.020 ± 0.008	inches
	3.05 ± 0.10	1.60 ± 0.20	0.55 ± 0.15	0.40 ± 0.20	0.50 ± 0.20	mm
RMCP1210-UP	0.120 ± 0.004	0.098 ± 0.008	0.022 ± 0.006	0.020 ± 0.008	0.020 ± 0.008	inches
	3.05 ± 0.10	2.50 ± 0.20	0.55 ± 0.15	0.50 ± 0.20	0.50 ± 0.20	mm
RMCP2010-UP	0.197 ± 0.008	0.098 ± 0.008	0.022 ± 0.004	0.024 ± 0.008	0.024 ± 0.008	inches
	5.00 ± 0.20	2.50 ± 0.20	0.55 ± 0.10	0.60 ± 0.20	0.60 ± 0.20	mm
RMCP2512-UP	0.248 ± 0.008	0.126 ± 0.008	0.027 ± 0.006	0.024 ± 0.008	0.024 ± 0.008	inches
	6.30 ± 0.20	3.20 ± 0.20	0.68 ± 0.15	0.60 ± 0.20	0.60 ± 0.20	mm

Performance Characteristics			
Test	Test Method	Test Conditions	Test Specifications
Temperature coefficient of Resistance (TCR)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	At 25 /-55°C and 25°C/+155°C, 25°C is the reference temperature	As per specification
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	Ultra Power: 5 x Rated Power or Max. Overload Voltage whichever is less for 5 seconds	1% and below: $\pm (1\%+0.05 \Omega)$ 2%, 5%: $\pm (2\%+0.1 \Omega)$
Leaching	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1	260 $\pm$ 5°C for 30 seconds	Individual leaching area $\leq$ 5% Total leaching area $\leq$ 10%
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	260 $\pm$ 5°C for 10 seconds	1% and below: $\pm (0.5\%+0.05 \Omega)$ 2%, 5%: $\pm (1\%+0.05 \Omega)$
Rapid Change of Temperature	JIS-C-5201-1 4.19 IEC-60115-1 4.19	-55°C to +150°C, 5 cycles	1% and below: $\pm (0.5\%+0.05 \Omega)$ 2%, 5%: $\pm (1\%+0.1 \Omega)$
Resistance to Solvent	JIS-C-5201-1 4.29	The tested resistor is immersed into isopropyl alcohol of 20~25°C for 60 seconds, then the resistor is left in the room for 48 hours	1% and below: $\pm (0.5\%+0.05 \Omega)$ 2%, 5%: $\pm (0.5\%+0.05 \Omega)$
Damp Heat with Load	JIS-C-5201-1 4.24 IEC-60115-1 4.24	40 $\pm$ 2°C, 90~95% R.H. RCWV or Max. Working Voltage whichever is less for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"	1% and below: $\pm (1\%+0.05 \Omega)$ 2%, 5%: $\pm (2\%+0.05 \Omega)$ Value < 1 $\Omega$ : $\pm (2\%+0.05 \Omega)$
Load Life (Endurance)	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	70 $\pm$ 2°C, RCWV or Max. Working Voltage whichever is less for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"	1% and below: $\pm (1\%+0.05 \Omega)$ 2%, 5%: $\pm (3\%+0.1 \Omega)$ Value < 1 $\Omega$ : $\pm (3\%+0.1 \Omega)$
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	Apply 100VDC for 1 minute	$\geq$ 10G $\Omega$
Bending Strength	JIS-C-5201-1 4.33 IEC-60115-1 4.33	Bending once for 5 seconds 0402, 0603, 0805 = 5mm 1206, 1210 = 3mm 2010, 2512 = 2mm	1% and below: $\pm (1\%+0.05 \Omega)$ 2%, 5%: $\pm (1\%+0.05 \Omega)$

**Power Derating Curve:**

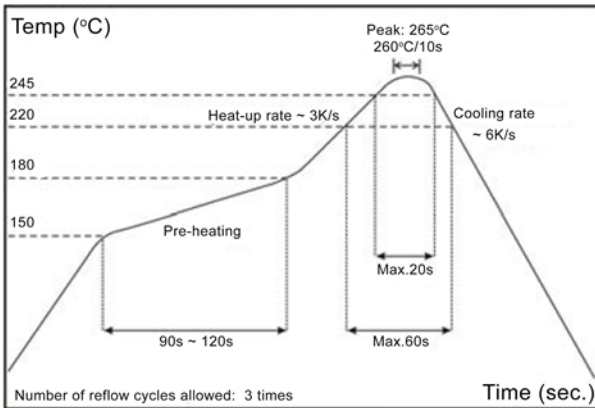


### Recommended Pad Layout

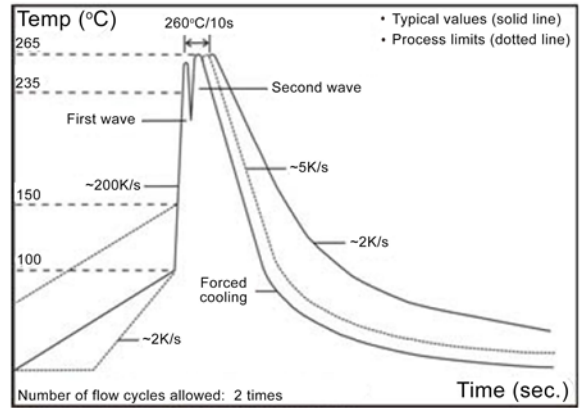


Type/Code	A	B	C	Unit
RMCP0402-UP	0.020	0.063	0.028	inches
	0.50	1.60	0.70	mm
RMCP0603-UP	0.031	0.094	0.039	inches
	0.80	2.40	1.00	mm
RMCP0805-UP	0.051	0.118	0.055	inches
	1.30	3.00	1.40	mm
RMCP1206-UP	0.087	0.165	0.067	inches
	2.20	4.20	1.70	mm
RMCP1210-UP	0.079	0.173	0.110	inches
	2.00	4.40	2.80	mm
RMCP2010-UP	0.138	0.260	0.110	inches
	3.50	6.60	2.80	mm
RMCP2512-UP	0.193	0.319	0.138	inches
	4.90	8.10	3.50	mm

### Recommended Soldering Parameters



IR Reflow Soldering



Wave Soldering (Flow Soldering)

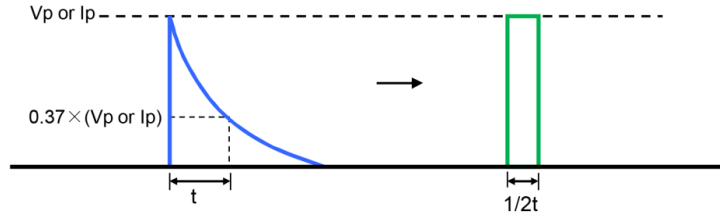
Rework temperature (hot air equipment): 350°C, 3-5 seconds

Recommended reflow methods:

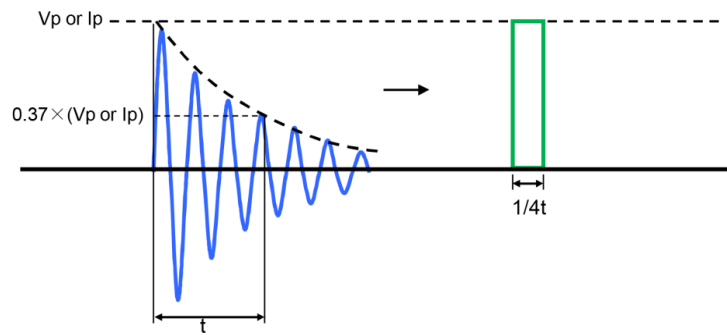
- IR, vapor phase oven, hot air oven.
- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

**Waveform Transformation to Square Wave**

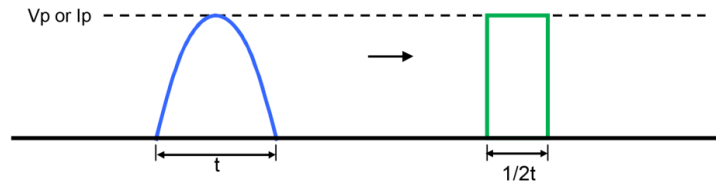
1. Discharge curve wave with time constant "t" → Square wave



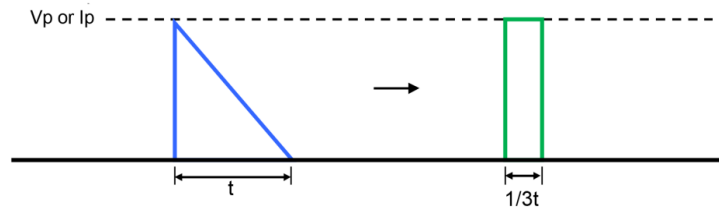
2. Damping oscillation wave with time constant of envelope "t" → Square wave



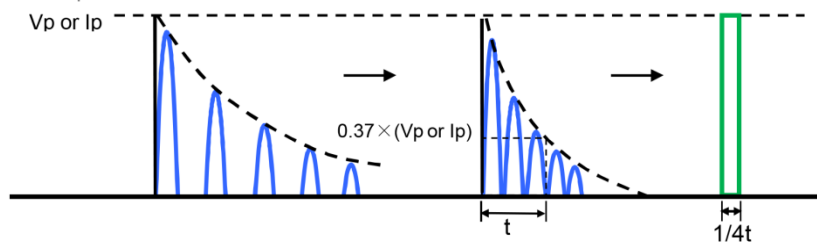
3. Half-wave rectification wave → Square wave



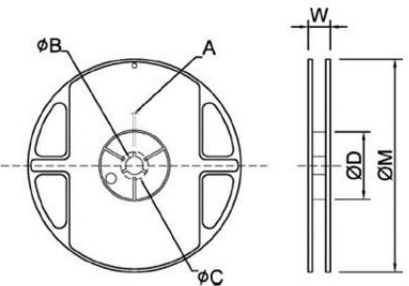
4. Triangular wave → Square wave

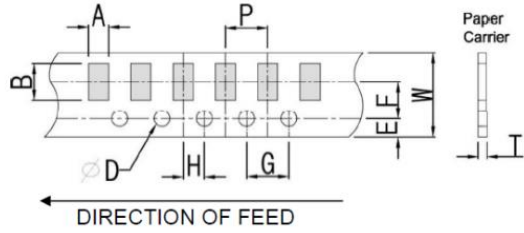


5. Special wave → Square wave

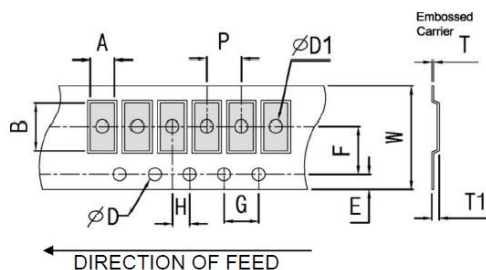


Packaging (EIA Standard RS-481)

Reel Specifications								
								
Size	Size / Quantity	A	B	C	D	W	M	Unit
0402	7" 10K/Reel	0.079 ± 0.020 2.00 ± 0.50	0.531 ± 0.039 13.50 ± 1.00	0.827 ± 0.039 21.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	0.453 ± 0.079	7.008 ± 0.079	Inches
0603, 0805 1206, 1210						11.50 ± 2.00		Inches
						0.630 ± 0.079		mm
2010, 2512	4K/Reel	0.079 ± 0.020 2.00 ± 0.50	0.531 ± 0.039 13.50 ± 1.00	0.827 ± 0.039 21.00 ± 1.00	2.362 ± 0.039 60.00 ± 1.00	16.00 ± 2.00	7.008 ± 0.079	Inches
0603, 0805, 1206	10" 10K/Reel					3.937 ± 0.039		10.000 ± 0.079
		100.00 ± 1.00	11.50 ± 2.00	254.00 ± 2.00	mm			

Packaging Specifications – Paper Tape										
										
Size	A	B	W	E	F	Unit				
0402	0.028 ± 0.004 0.70 ± 0.10	0.047 ± 0.004 1.20 ± 0.10	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				
0603	0.041 ± 0.008	0.071 ± 0.008				Inches				
	1.05 ± 0.20	1.80 ± 0.20				mm				
0805	0.061 ± 0.008 1.55 ± 0.20	0.091 ± 0.008 2.30 ± 0.20				0.030 ± 0.004 0.75 ± 0.10	0.059 +0.004/-0 1.5 +0.10/-0	0.079 ± 0.004 2.00 ± 0.10	Inches	
1206	0.075 ± 0.008 1.90 ± 0.20	0.138 ± 0.008 3.50 ± 0.20							mm	
1210	0.112 ± 0.008 2.85 ± 0.20	0.138 ± 0.008 3.50 ± 0.20	mm							
Size	G	H	T	D	P	Unit				
0402	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.018 ± 0.004	0.059 +0.004/-0 1.5 +0.10/-0	0.079 ± 0.004 2.00 ± 0.10	Inches				
0603			0.45 ± 0.10			Inches				
			0.024 ± 0.004			0.60 ± 0.10	mm			
0805			0.030 ± 0.004 0.75 ± 0.10			0.079 ± 0.002 2.00 ± 0.05	0.030 ± 0.004	0.059 +0.004/-0 1.5 +0.10/-0	0.079 ± 0.004 2.00 ± 0.10	Inches
1206							0.75 ± 0.10			mm
1210			0.030 ± 0.004			0.079 ± 0.002 2.00 ± 0.05	0.75 ± 0.10	0.059 +0.004/-0 1.5 +0.10/-0	0.079 ± 0.004 2.00 ± 0.10	Inches
	0.75 ± 0.10	mm								

**Packaging Specifications – Plastic Tape**



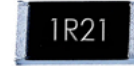
Size	A	B	W	E	F	G	Unit
2010	0.110 ± 0.008 2.80 ± 0.20	0.220 ± 0.008 5.60 ± 0.20	0.472 ± 0.004	0.069 ± 0.004	0.217 ± 0.002	0.157 ± 0.004	inches mm
2512	0.134 ± 0.008 3.40 ± 0.20	0.264 ± 0.008 6.70 ± 0.20	12.00 ± 0.10	1.75 ± 0.10	5.50 ± 0.05	4.00 ± 0.10	inches mm
Size	H	T	D	D1	T1	P	Unit
2010	0.079 ± 0.002 2.00 ± 0.05	0.009 ± 0.004 0.23 ± 0.10	0.059 +0.004/-0 1.5 +0.10/-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
2512							

**Part Marking Instructions**

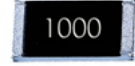
**E96 and E24 Values for 0805-2512 (0.5% and 1% tolerances)**

The nominal resistance is marked on the surface of the overcoating with the use of **four character markings**.

- 1. Values <100Ω will use "R" as the decimal holder.



1.21Ω

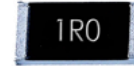


100Ω

**E24 Values (5% tolerance)**

The nominal resistance is marked on the surface of the overcoating with the use of **three character markings**.

- 1. Values between 1Ω and 9.1Ω will use "R" as the decimal holder.



1Ω

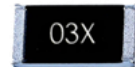


1.2 KΩ

**E96 Values for 0603 size (1% tolerances)**

A two character number is assigned to each standard R-Value (E96) as shown in the chart below. This is followed by one alpha character which is used as a multiplier.

Each letter from "Y" - "F" represents a specific multiplier.



10.5Ω

Alpha Character = Multiplier	
Y = 0.1	C = 1000
X = 1	D = 10000
A = 10	E = 100000
B = 100	F = 1000000

Chip Marking	Value
01B =	10.0 x 100 = 1 KΩ
25C =	17.8 x 1000 = 17.8 KΩ
93D =	90.9 x 10000 = 909 KΩ

**E96**

#	R-Value	#	R-Value	#	R-Value	#	R-Value	#	R-Value	#	R-Value
01	10.0	17	14.7	33	21.5	49	31.6	65	46.4	81	68.1
02	10.2	18	15.0	34	22.1	50	32.4	66	47.5	82	69.8
03	10.5	19	15.4	35	22.6	51	33.2	67	48.7	83	71.5
04	10.7	20	15.8	36	23.2	52	34.0	68	49.9	84	73.2
05	11.0	21	16.2	37	23.7	53	34.8	69	51.1	85	75.0
06	11.3	22	16.5	38	24.3	54	35.7	70	52.3	86	76.8
07	11.5	23	16.9	39	24.9	55	36.5	71	53.6	87	78.7
08	11.8	24	17.4	40	25.5	56	37.4	72	54.9	88	80.6
09	12.1	25	17.8	41	26.1	57	38.3	73	56.2	89	82.5
10	12.4	26	18.2	42	26.7	58	39.2	74	57.6	90	84.5
11	12.7	27	18.7	43	27.4	59	40.2	75	59.0	91	86.6
12	13.0	28	19.1	44	28.0	60	41.2	76	60.4	92	88.7
13	13.3	29	19.6	45	28.7	61	42.2	77	61.9	93	90.9
14	13.7	30	20.0	46	29.4	62	43.2	78	63.4	94	93.1
15	14.0	31	20.5	47	30.1	63	44.2	79	64.9	95	95.3
16	14.3	32	21.0	48	30.9	64	45.3	80	66.5	96	97.6

Note: 0402 sizes are unmarked.

**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)
RMCP	General Purpose High Power Thick Film Chip Resistor	SMD	YES <sup>(1)</sup>	100% Matte Sn over Ni	Always	Always

Note (1): RoHS Compliant by means of exemption 7c-I.

**“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**

