

Features:

- Inner terminations engineered to deter sulfur contamination
- Non-standard resistance values available
- Zero ohm available (max. resistance 0.05Ω)
- “-HP” denotes high power
- RoHS compliant, REACH compliant, and halogen free



Electrical Specifications								
Type/Code	Power Rating (W) @ 70°C	Maximum Working Voltage (V) ⁽¹⁾	Maximum Overload Voltage (V) ⁽²⁾	Maximum Current Jumper (A)	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance		
						0.5%	1%	5%
RMCS0201	0.05	25	50	1	±200	-	1 - 10M	
RMCS0402	0.063	75	150	1	±200	1 - 9.76		
					±100	10 - 1M		
					±200	1.02M - 10M		
RMCS0603	0.1	75	150	1	±200	1 - 9.76		
					±100	10 - 1M		
					±200	1.02M - 10M		
RMCS0805	0.125	150	300	2	±200	1 - 9.76		
					±100	10 - 1M		
					±200	1.02M - 10M		
RMCS1206	0.25	200	400	2	±200	1 - 9.76		
					±100	10 - 1M		
					±200	1.02M - 10M		
RMCS1210	0.33	200	400	2.5	±200	1 - 9.76		
					±100	10 - 1M		
					±200	1.02M - 10M		
RMCS2010	0.75	200	400	3.5	±200	1 - 9.76		
					±100	10 - 1M		
					±200	1.02M - 10M		
RMCS2512	1	250	500	4	±200	1 - 9.76		
					±100	10 - 1M		
					±200	1.02M - 10M		

(1) Lesser of $\sqrt{(P \cdot R)}$ or maximum working voltage, whichever is lower.

(2) $2.5 \cdot \sqrt{(P \cdot R)}$ or Max. Overload Voltage listed above, whichever is lower.

Electrical Specifications - High Power						
Type/Code	Power Rating (W) @ 70°C	Maximum Working Voltage (V) ⁽¹⁾	Maximum Overload Voltage (V) ⁽²⁾	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance	
					0.5% ⁽³⁾	1%, 5%
RMCS0201-HP	0.083	25	50	±200	-	10 - 1M
RMCS0402-HP	0.1	75	150	±200	-	1 - 9.76
				±100	10 - 1M	10 - 1M
RMCS0603-HP	0.25	75	150	±200	-	1 - 9.76
				±100	10 - 1M	10 - 1M
RMCS0805-HP	0.33	150	300	±200	-	1 - 9.76
				±100	10 - 1M	10 - 1M

Electrical Specifications - High Power (cont.)

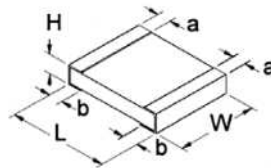
Type/Code	Power Rating (W) @ 70°C	Maximum Working Voltage (V) ⁽¹⁾	Maximum Overload Voltage (V) ⁽²⁾	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance	
					0.5% ⁽³⁾	1%, 5%
RMCS1206-HP	0.5	200	400	±200	-	1 - 9.76
				±100	10 - 1M	10 - 1M
RMCS1210-HP	0.75	200	400	±200	-	1 - 9.76
				±100	10 - 1M	10 - 1M
RMCS2010-HP	1	200	400	±200	-	1 - 9.76
				±100	10 - 1M	10 - 1M
RMCS2512-HP	2	200	400	±400	-	1 - 9.76
				±100	10 - 1M	10 - 10M

(1) Lesser of $\sqrt{P \cdot R}$ or maximum working voltage, whichever is lower.

(2) $2.5 \cdot \sqrt{P \cdot R}$ or Max. Overload Voltage listed above, whichever is lower.

(3) 0.5% tolerance for 0603 and 0805 requires lower power rating. Contact Stackpole for details.

Mechanical Specifications



Type/Code	Typical Unit Wt. (mg)	L Body Length	W Body Width	H Body Height	a Top Termination	b Bottom Termination	Unit
RMCS0201	0.15	0.024 ± 0.001 0.60 ± 0.03	0.012 ± 0.001 0.30 ± 0.03	0.009 ± 0.001 0.23 ± 0.03	0.006 ± 0.002 0.15 ± 0.05	0.006 ± 0.002 0.15 ± 0.05	inches mm
RMCS0402	0.62	0.039 ± 0.006 1.00 ± 0.15	0.020 ± 0.002 0.50 ± 0.05	0.014 ± 0.004 0.35 ± 0.10	0.008 ± 0.006 0.20 ± 0.15	0.010 ± 0.006 0.25 ± 0.15	inches mm
RMCS0603	2.0	0.063 ± 0.008 1.60 ± 0.20	0.031 ± 0.004 0.80 ± 0.10	0.018 ± 0.006 0.45 ± 0.15	0.012 ± 0.008 0.30 ± 0.20	0.012 ± 0.008 0.30 ± 0.20	inches mm
RMCS0805	4.4	0.079 ± 0.008 2.00 ± 0.20	0.049 ± 0.006 1.25 ± 0.15	0.020 ± 0.006 0.50 ± 0.15	0.014 ± 0.008 0.35 ± 0.20	0.016 ± 0.008 0.40 ± 0.20	inches mm
RMCS1206	8.9	0.122 ± 0.006 3.10 ± 0.15	0.061 ± 0.010 1.55 ± 0.25	0.022 ± 0.006 0.55 ± 0.15	0.020 ± 0.012 0.50 ± 0.30	0.020 ± 0.008 0.50 ± 0.20	inches mm
RMCS1210	16.0	0.122 ± 0.006 3.10 ± 0.15	0.102 ± 0.012 2.60 ± 0.30	0.022 ± 0.006 0.55 ± 0.15	0.020 ± 0.010 0.50 ± 0.25	0.020 ± 0.008 0.50 ± 0.20	inches mm
RMCS2010	24.2	0.197 ± 0.008 5.00 ± 0.20	0.098 ± 0.008 2.50 ± 0.20	0.022 ± 0.004 0.55 ± 0.10	0.024 ± 0.010 0.60 ± 0.25	0.020 ± 0.012 0.50 ± 0.30	inches mm
RMCS2512	39.4	0.248 ± 0.008 6.30 ± 0.20	0.124 ± 0.008 3.15 ± 0.20	0.022 ± 0.006 0.55 ± 0.15	0.024 ± 0.010 0.60 ± 0.25	0.022 ± 0.010 0.55 ± 0.25	inches mm
RMCS2512-HP	39.4	0.248 ± 0.008 6.30 ± 0.20	0.126 ± 0.008 3.20 ± 0.20	0.024 ± 0.008 0.60 ± 0.20	0.024 ± 0.012 0.60 ± 0.30	0.024 ± 0.012 0.60 ± 0.30	inches mm

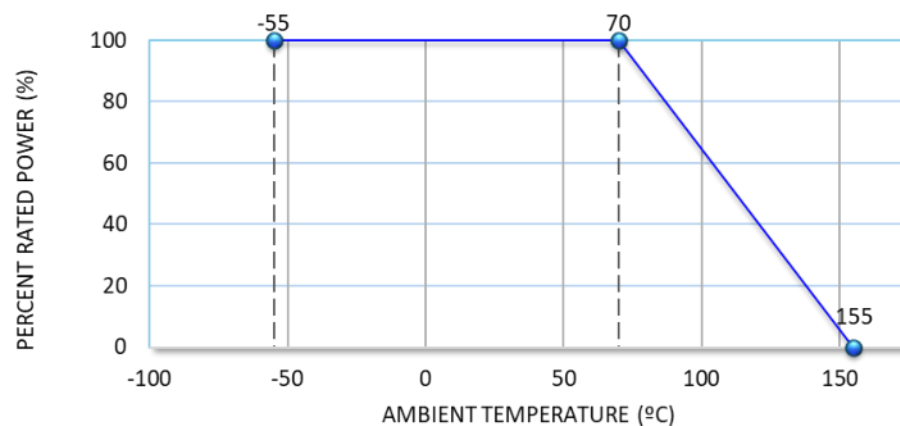
Performance Characteristics					
Test	Test Method	Test Specification			Test Condition
		±1% and below	±5%	Jumper	
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	$\Delta R \pm(1\% + 0.05\Omega)$	$\Delta R \pm(2\% + 0.05\Omega)$	< 50mΩ	RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds, 2 seconds for high power series.
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	$\geq 10G$			Max. Overload Voltage for 1 minute
Endurance	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	$\Delta R \pm(2\% + 0.1\Omega)$	$\Delta R \pm(3\% + 0.1\Omega)$	< 100mΩ	70 ± 2°C, RCWV for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"
Damp Heat with Load	JIS-C-5201-1 4.24 IEC-60115-1 4.24	$\Delta R \pm(2\% + 0.1\Omega)$	$\Delta R \pm(3\% + 0.1\Omega)$	< 100mΩ	40 ± 2°C, 90~95% R.H., RCWV for 1000 hours with 1.5 hours "ON" and 0.5 hour "OFF"
Dry Heat	JIS-C-5201-1 4.23 IEC-60115-1 4.23.2	$\Delta R \pm(1\% + 0.05\Omega)$	$\Delta R \pm(1.5\% + 0.1\Omega)$	< 50mΩ	At +125/+155°C for 1000 hours
Bending Strength	JIS-C-5201-1 4.33 IEC-60115-1 4.33	$\Delta R \pm(1\% + 0.05\Omega)$	$\Delta R \pm(1\% + 0.05\Omega)$	< 50mΩ	Bending once for 5 seconds 2010, 2512 sizes: 2 mm / Other sizes: 3 mm
Solderability	JIS-C-5201-1 4.17 IEC-60115-1 4.17	95% minimum coverage			245 ± 5°C for 3 seconds
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	$\Delta R \pm(0.5\% + 0.05\Omega)$	$\Delta R \pm(1\% + 0.05\Omega)$	< 50mΩ	260 ± 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
Rapid change of Temperature	JIS-C-5201-1 4.19 IEC-60115-1 4.19	$\Delta R \pm(0.5\% + 0.05\Omega)$	$\Delta R \pm(1\% + 0.05\Omega)$	< 50mΩ	-55 to +125°C/+155°C, 5 cycles
Sulfur Test	ASTM-B-809-95	$\Delta R \pm(0.5\% + 0.05\Omega)$	$\Delta R \pm(0.5\% + 0.05\Omega)$	< 50mΩ	H ₂ S, 50 ± 2°C, 91~93% R.H., no power rating for 1000 hours

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

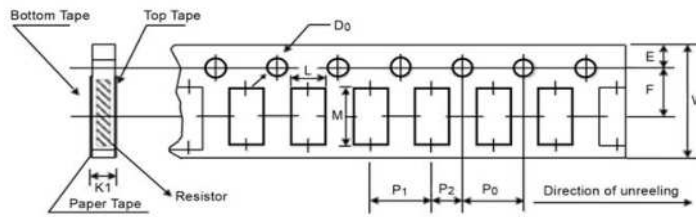
Recommended storage temperature: 15 ~ 28°C. Humidity < 80% R.H.

Operating temperature range is -55 to +155°C

Power Derating Curve:

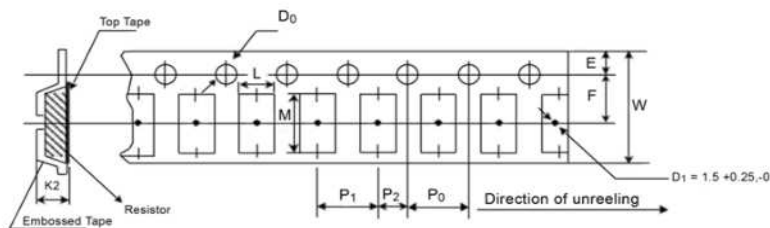


Taping Specifications - Paper Tape



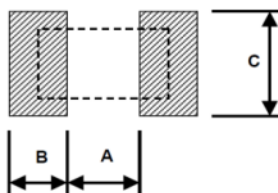
Type/Code	L	M	W	E	F	Unit
RMCS0201	0.015 ± 0.002 0.38 ± 0.05	0.027 ± 0.002 0.68 ± 0.05	0.315 ± 0.008 8.00 ± 0.20	0.069 ± 0.004 1.75 ± 0.10	0.138 ± 0.002 3.50 ± 0.05	inches mm
RMCS0402	0.026 ± 0.006 0.65 ± 0.15	0.045 ± 0.006 1.15 ± 0.15	0.315 ± 0.008 8.00 ± 0.20	0.069 ± 0.004 1.75 ± 0.10	0.138 ± 0.002 3.50 ± 0.05	inches mm
RMCS0603	0.043 ± 0.010 1.10 ± 0.25	0.075 ± 0.010 1.90 ± 0.25	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
RMCS0805	0.063 ± 0.010 1.60 ± 0.25	0.094 ± 0.010 2.40 ± 0.25	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
RMCS1206	0.075 ± 0.008 1.90 ± 0.20	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
RMCS1210	0.110 ± 0.010 2.80 ± 0.25	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	P ₀	P ₁	P ₂	ØD ₀	K1	Unit
RMCS0201	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.004 / -0 1.50 +0.10 / -0	0.017 ± 0.008 0.42 ± 0.20	inches mm
RMCS0402	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.004 / -0 1.50 +0.10 / -0	0.018 ± 0.008 0.45 ± 0.20	inches mm
RMCS0603	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.004 / -0 1.50 +0.10 / -0	0.028 ± 0.008 0.70 ± 0.20	inches mm
RMCS0805	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.004 / -0 1.50 +0.10 / -0	0.033 ± 0.008 0.85 ± 0.20	inches mm
RMCS1206	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.004 / -0 1.50 +0.10 / -0	0.033 ± 0.008 0.85 ± 0.20	inches mm
RMCS1210	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.004 / -0 1.50 +0.10 / -0	0.030 ± 0.008 0.75 ± 0.20	inches mm

Taping Specifications - Plastic Tape



Type/Code	L	M	W	E	F	Unit
RMCS2010	0.110 ± 0.008 2.80 ± 0.20	0.217 ± 0.008 5.50 ± 0.20	0.472 ± 0.012 12.00 ± 0.30	0.069 ± 0.004 1.75 ± 0.10	0.217 ± 0.002 5.50 ± 0.05	inches mm
RMCS2512	0.138 ± 0.008 3.50 ± 0.20	0.264 ± 0.008 6.70 ± 0.20	0.472 ± 0.012 12.00 ± 0.30	0.069 ± 0.004 1.75 ± 0.10	0.217 ± 0.002 5.50 ± 0.05	inches mm
Type/Code	P ₀	P ₁	P ₂	ØD ₀	K2	Unit
RMCS2010	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.004 / -0 1.50 +0.10 / -0	0.047 - 0 1.20 - 0	inches mm
RMCS2512	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.004 4.00 ± 0.10	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.004 / -0 1.50 +0.10 / -0	0.047 - 0 1.20 - 0	inches mm

Recommended Solder Pad



Type/Code	a	b	c	Unit
RMCS0201	0.012 0.30	0.010 0.25	0.012 0.30	inches mm
RMCS0402	0.024 0.60	0.020 0.50	0.028 0.70	inches mm
RMCS0603	0.035 0.90	0.031 0.80	0.039 1.00	inches mm
RMCS0805	0.051 1.30	0.031 0.80	0.055 1.40	inches mm
RMCS1206	0.087 2.20	0.039 1.00	0.067 1.70	inches mm
RMCS1210	0.079 2.00	0.035 0.90	0.110 2.80	inches mm
RMCS2010	0.150 3.80	0.035 0.90	0.110 2.80	inches mm
RMCS2512	0.193 4.90	0.063 1.60	0.138 3.50	inches mm

Recommended Solder Profile

This information is intended as a reference for solder profiles for Stackpole resistive components. These profiles should be compatible with most soldering processes. These are only recommendations. Actual numbers will depend on board density, geometry, packages used, etc., especially those cells labeled with “**”.

100% Matte Tin / RoHS Compliant Terminations

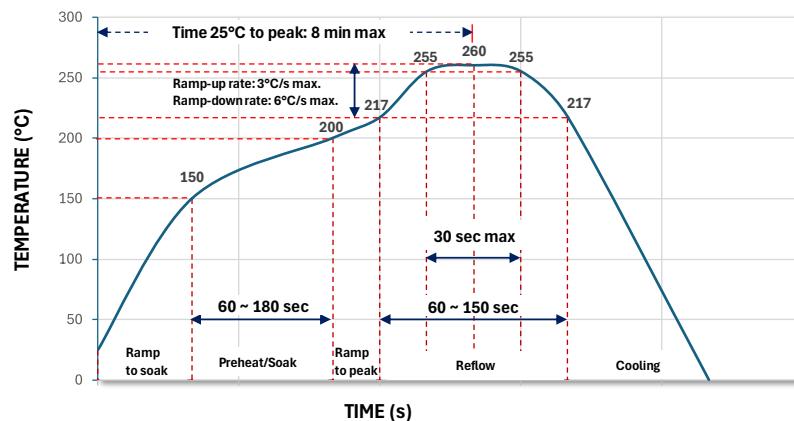
Soldering iron recommended temperatures: 330 to 350°C with minimum duration.
Maximum number of reflow cycles: 3.

Wave Soldering			
Description	Maximum	Recommended	Minimum
Preheat Time	80 seconds	70 seconds	60 seconds
Temperature Diff.	140°C	120°C	100°C
Solder Temp.	260°C	250°C	240°C
Dwell Time at Max.	10 seconds	5 seconds	*
Ramp DN (°C/sec)	N/A	N/A	N/A

Temperature Diff. = Difference between final preheat stage and soldering stage.

Convection IR Reflow			
Description	Maximum	Recommended	Minimum
Ramp Up (°C/sec)	3°C/sec	2°C/sec	*
Dwell Time > 217°C	150 seconds	90 seconds	60 seconds
Solder Temp.	260°C	245°C	*
Dwell Time at Max.	30 seconds	15 seconds	10 seconds
Ramp DN (°C/sec)	6°C/sec	3°C/sec	*

Recommended Resistor Reflow Profile



Part Marking Specifications

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

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

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



1.21Ω



100Ω

E24 Values for 0805-2512 (5% tolerance)

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

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



1Ω



1.2 KΩ

E24 Values for 0603 (5% tolerance)

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

- Values between 1Ω and 9.1Ω will use "R" as the decimal holder.
- Values ≥10Ω will use no decimal holder.



6.8Ω



10Ω

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.

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



10.5Ω

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: 0201, and 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
RMCS	Sulfur Resistant Thick Film Chip Resistor	SMD	YES ⁽¹⁾	100% Matte Sn over Ni

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

R	M	C	S	0	6	0	3	J	T	4	K	7	0	-	H	P
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Product Series	
RMCS	Sulfur Resistant

Size	Power Rating (W)	
	RMCS	-HP
0201	0.05	0.083
0402	0.063	0.1
0603	0.1	0.25
0805	0.125	0.33
1206	0.25	0.5
1210	0.33	0.75
2010	0.75	1
2512	1	2

Tolerance		
Code	Tol	Value
D	0.5%	E96
F	1%	E96, E24
J	5%	E24
Z	Jumper	

Packaging			
Code	Description	Size	Quantity
T	7" Reel Paper Tape	0201, 0402	10000
		0603, 0805	5000
	7" Reel Plastic Tape	2010, 2512	4000

Resistance Value	
Four characters with the multiplier used as the decimal holder.	
1 ohm = 1R00	
100 Kohm = 100K	
1.02 Mohm = 1M02	
Zero ohm jumper = 0R00	

Special	
Code	Description
blank	Standard
-HP	High Power