Features:

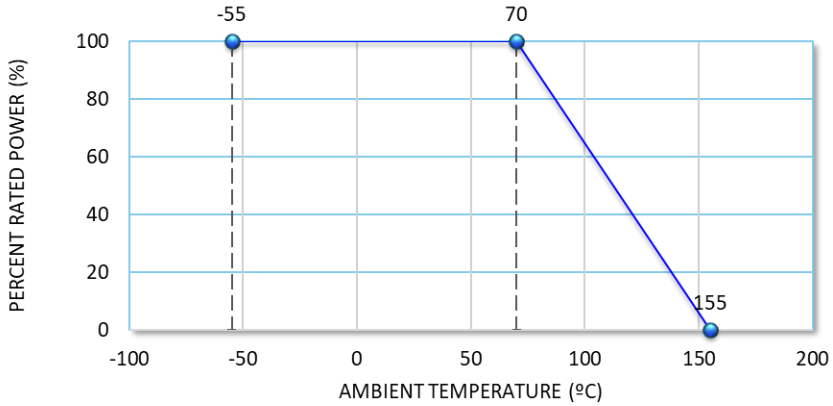
- Reliable multilayer terminals
- Higher component and equipment reliability
- Excellent performance at high voltage
- Special construction to prevent sulfur contamination
- RoHS compliant, REACH compliant, and halogen free
- AEC-Q200 qualified

Electrical Specifications

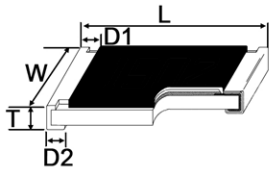
Type/Code	Power Rating (W) @ 70ºC	Maximum Operating Voltage (V) (1)	Maximum Overload Voltage (V) (2)	TCR (ppm/ºC)	Ohmic Range (Ω) and Tolerance	
					1%	5%
RVCA0402	0.063	100	200	± 100	39K - 1M	
				± 200	1.02M - 10M	1.1M - 20M
				± 400	-	22M - 100M
RVCA0603	0.1	200	400	± 100	56K - 1M	
				± 200	1.02M - 10M	1.1M - 20M
				± 400	-	22M - 100M
RVCA0805	0.125	400	800	± 100	100K - 1M	
				± 200	1.02M - 10M	1.1M - 20M
				± 400	-	22M - 100M
RVCA1206	0.25	500	1000	± 100	100K - 1M	
				± 200	1.02M - 10M	1.1M - 20M
				± 400	-	22M - 100M
RVCA2010	0.5	2000	3000	± 100	51K - 1M	
				± 200	1.02M - 10M	1.1M - 20M
				± 400	-	22M - 100M
RVCA2512	1	3000	4000	± 100	30K - 1M	
				± 200	1.02M - 10M	1.1M - 20M
				± 400	-	22M - 100M

(1) Operating Voltage = √(P*R) or max. operating voltage listed above, whichever is lower.
(2) Overload Voltage = 2.5* √(P*R) or max. overload voltage listed above, whichever is lower.
Operating temperature range is -55 to +155°C

Power Derating Curve:



Mechanical Specifications



Type/Code	Typical Unit Weight (mg)	L Body Length	W Body Width	T Body Height	D2 Top Termination	D2 Bottom Termination	Unit
RVCA0402	0.62	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
RVCA0603	2.0	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
RVCA0805	4.4	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
RVCA1206	8.9	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
RVCA2010	24.2	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
RVCA2512	39.4	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

Performance Characteristics

Item	Test Method	Requirement	
		± 1%	± 5%
Temperature Coefficient of Resistance (TCR)	JIS-C-5201-1 4.8; IEC-60115-1 4.8 At 25°C/-55°C and 25°C/+125°C, 25°C is the reference temperature	As specified	
Short Time Overload	JIS-C-5201-1 4.13; IEC-60115-1 4.13 RCWV*2.5 or Max. Overload Voltage, whichever is lower for 5 seconds	± (1% + 0.05Ω)	± (2% + 0.05Ω)
Insulation Resistance	JIS-C-5201-1 4.6; IEC-60115-1 4.6 Max. Overload Voltage for 1 minute	≥ 10 G	
Operational Life	MIL-STD-202 Method 108 Condition D steady State TA=125°C at derated power. Measurement at 24 ± 4 hours after test conclusion.	± (2% + 0.05Ω)	± (3% + 0.1Ω)
Biased Humidity	MIL-STD-202 Method 103 1000 hours 85°C/85% R.H. 10% of operating power (≤ 100 V)	± (2% + 0.05Ω)	± (3% + 0.1Ω)
High Temperature Exposure	MIL-STD-202 Method 108 at +155°C for 1000 hours	± (1% + 0.05Ω)	± (1.5% + 0.1Ω)
Board Flex	AEC-Q200-005 Bending once for 60 seconds 2010, 2512 sizes: 2 mm; Other sizes: 3 mm	± (1% + 0.05Ω)	
Solderability	JIS-C-5201-1 4.17; IEC-60115-1 4.17 245 ± 5°C for 3 seconds	95% min. coverage	
Resistance to Soldering Heat	JIS-C-5201-1 4.18; IEC-60115-1 4.18 260 ± 5°C for 10 seconds	± (0.5% + 0.05Ω)	± (1% + 0.05Ω)
Voltage Proof	JIS-C-5201-1 4.7; IEC-60115-1 4.7 0402: 150 V for 1 minute 0603: 300 V for 1 minute All other sizes: 500 V for 1 minute	No breakdown or flashover	
Leaching	JIS-C-5201-1 4.18; IEC-60068-2-58 8.2.1 260 ± 5°C for 30 seconds	Individual leaching area ≤ 5% Total leaching area ≤ 10%	
Temperature Cycling	JESD22 Method JA-104 -55 to + 125°C, 1000 cycles	± (1% + 0.05Ω)	

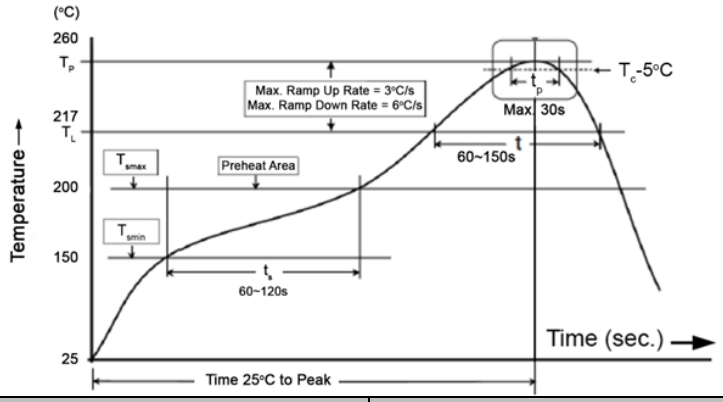
Performance Characteristics (cont.)

Item	Test Method	Requirement	
		± 1%	± 5%
Mechanical Shock	MIL-STD-202 Method 213 Wave form: Tolerance for half sine shock pulse. Peak value is 100 g's. Normal duration (D) is 6.	± (1% + 0.05Ω)	
Vibration	MIL-STD-202 Method 204 5 g's for 20 minutes, 12 cycles each of 3 orientations, 10 - 2000 Hz	± (1% + 0.05Ω)	
ESD	AEC-Q200-002 Human body model 0402/0603: 1 KV All other sizes: 2 KV	± (3% + 0.05Ω)	
Resistance to Solvents	MIL-STD-202 Method 215 Add aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents	No visible damage on appearance and marking.	
Terminal Strength	AEC-Q200-006 Force of 1.8 kg for 60 seconds	No breakage	
Flammability	UL-94 V-0 or V-1 are acceptable. Electrical test not required.	No ignition of the tissue paper or scorching on the pinewood board	
Sulfur Test	EIA-977 (Condition A) 60 ± 2°C, no power rating for 500 hours	ΔR ± 1%	ΔR ± 5%

RCWV (Rated continuous working voltage) = √(P*R) or max. operating voltage, whichever is lower.
Storage temperature is 15~28 °C, Humidity < 80% R.H.
Shelf life is 2 years from production date.

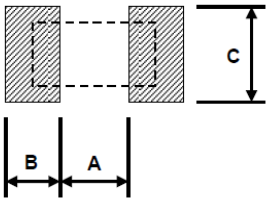
Soldering Conditions

Number of reflow cycles allowed: 3 times.



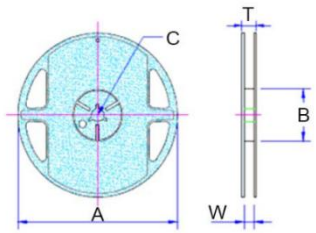
Profile Feature	Pb-Free Assembly
Preheat: Min. temperature (Tsmin) Max. temperature (Tsmax) Preheating time (ts) from (Tsmin to Tsmax)	 150°C 200°C 60-120 seconds
Ramp-up rate (T_L to T_P)	3°C/second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L	217°C 60-150 seconds
Min. Peak temperature (T_P min)	235°C
Max. Peak temperature (T_P max)	260°C
Time (t_P) within 5°C of the specified classification temperature (T_C)	30 seconds max.
Ramp-down rate (T_P to T_L)	6°C/second max.
Time 25°C to peak temperature	8 minutes max.

Recommended Pad Layout



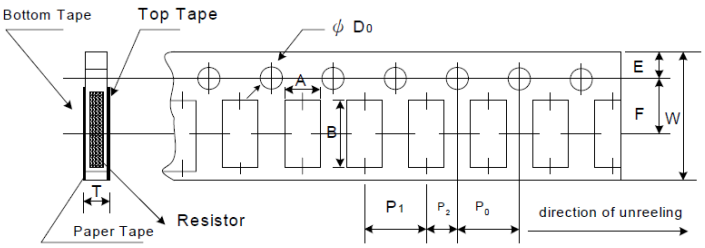
Type/Code	A	B	C	Unit
RVCA0402	0.020 0.50	0.018 0.45	0.024 0.60	inches mm
RVCA0603	0.035 0.90	0.024 0.60	0.035 0.90	inches mm
RVCA0805	0.047 1.20	0.028 0.70	0.051 1.30	inches mm
RVCA1206	0.079 2.00	0.035 0.90	0.063 1.60	inches mm
RVCA2010	0.150 3.80	0.035 0.90	0.110 2.80	inches mm
RVCA2512	0.193 4.90	0.063 1.60	0.138 3.50	inches mm

Reel Specifications



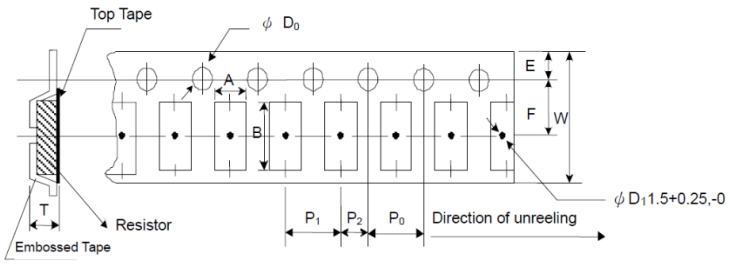
Type/Code	Packaging/Quantity		A	B	C	W	T	Unit
RVCA0402	Paper	10000	7.028 ± 0.059 178.50 ± 1.50	2.362 +0.039/-0 60.00 +1.00/-0	0.512 ± 0.008 13.00 ± 0.20	0.354 ± 0.020 9.00 ± 0.50	0.492 ± 0.020 12.50 ± 0.50	inches mm
RVCA0603, RVCA0805 RVCA1206	Paper	5000	7.028 ± 0.059 178.50 ± 1.50	2.362 +0.039/-0 60.00 +1.00/-0	0.512 ± 0.008 13.00 ± 0.20	0.354 ± 0.020 9.00 ± 0.50	0.492 ± 0.020 12.50 ± 0.50	inches mm
RVCA2010, RVCA2512	Plastic	4000	7.028 ± 0.059 178.50 ± 1.50	2.362 +0.039/-0 60.00 +1.00/-0	0.512 ± 0.020 13.00 ± 0.50	0.512 ± 0.020 13.00 ± 0.50	0.512 ± 0.020 13.00 ± 0.50	inches mm

Packaging Specifications - Paper Tape



Type/Code	A	B	W	E	F	Unit
RVCA0402	0.026 ± 0.004 0.65 ± 0.10	0.045 ± 0.004 1.15 ± 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 mm
RVCA0603	0.043 ± 0.004 1.10 ± 0.10	0.075 ± 0.004 1.90 ± 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 mm
RVCA0805	0.063 ± 0.004 1.60 ± 0.10	0.094 ± 0.008 2.40 ± 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
RVCA1206	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	P0	P1	P2	D0	T	Unit
RVCA0402	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 ± 0.004 0.45 ± 0.10	inches mm
RVCA0603	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.002 4.00 ± 0.05	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.004/-0 1.50 +0.10/-0	0.028 ± 0.004 0.70 ± 0.10	inches mm
RVCA0805	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.002 4.00 ± 0.05	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.004/-0 1.50 +0.10/-0	0.033 ± 0.004 0.85 ± 0.10	inches mm
RVCA1206	0.157 ± 0.004 4.00 ± 0.10	0.157 ± 0.002 4.00 ± 0.05	0.079 ± 0.002 2.00 ± 0.05	0.059 +0.004/-0 1.50 +0.10/-0	0.033 ± 0.004 0.85 ± 0.10	inches mm

Packaging Specifications - Plastic Tape



Type/Code	A	B	W	E	F	Unit
RVCA2010	0.110 ± 0.004 2.80 ± 0.10	0.213 ± 0.008 5.40 ± 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
RVCA2512	0.138 ± 0.004 3.50 ± 0.10	0.264 ± 0.004 6.70 ± 0.10	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

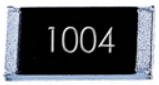
Packaging Specifications - Plastic Tape (cont.)

Type/Code	P0	P1	P2	D0	T	Unit
RVCA2010	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
RVCA2512	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

Part Marking Instructions

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**.



1 MΩ

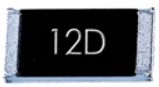
E24 Values 0603-2512 (5% tolerance)

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

11 MΩ

E96 Values for 0603 (1% Marking)

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		Alpha Character = Value
Y = 0.1	C = 1000	01Y = 10.0 x 0.1 = 1Ω
X = 1	D = 10000	01B = 10.0 x 100 = 1KΩ
A = 10	E = 100000	25C = 17.8 x 1000 = 17.8KΩ
B = 100	F = 1000000	01F = 10.0 x 100000 = 10MΩ

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 resistors are not marked.

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)
RVCA	Automotive Grade High Voltage Thick Film Chip Resistor	SMD	YES(1)	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

R	V	C	A	0	6	0	3	F	T	1	0	0	K

Product Series	
Code	Description
RVCA	Automotive Grade High Voltage Thick Film Chip Resistor

Size
Code
0402
0603
0805
1206
2010
2512

Tolerance		
Code	Tol	Value
F	1%	E24, E96
J	5%	E24

Packaging			
Code	Description	Size	Quantity
T	Paper Tape	0402	10000
		0603, 0805, 1206	5000
	Plastic Tape	2010, 2512	4000

Resistance Value
Four characters with the multiplier used as the decimal holder.
100 Kohm = 100K 5.6 Mohm = 5M60 22 Mohm = 22M0