

RVC2010FT9M09 Datasheet

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DiGi Electronics Part Number	RVC2010FT9M09-DG
Manufacturer	Stackpole Electronics Inc
Manufacturer Product Number	RVC2010FT9M09
Description	RES 9.09M OHM 1% 1/2W 2010
Detailed Description	9.09 MOhms ±1% 0.5W, 1/2W Chip Resistor 2010 (5 025 Metric) Thick Film

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Purchase and inquiry

Manufacturer Product Number:

RVC2010FT9M09

Series:

RVC

Resistance:

9.09 MOhms

Power (Watts):

0.5W, 1/2W

Features:

-

Operating Temperature:

-55°C ~ 155°C

Supplier Device Package:

2010

Height - Seated (Max):

0.026" (0.65mm)

Failure Rate:

-

Manufacturer:

Stackpole Electronics Inc

Product Status:

Active

Tolerance:

±1%

Composition:

Thick Film

Temperature Coefficient:

±200ppm/°C

Package / Case:

2010 (5025 Metric)

Size / Dimension:

0.197" L x 0.098" W (5.00mm x 2.50mm)

Number of Terminations:

2

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8533.21.0030

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

RVC Series

High Voltage Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

Features:

- Voltage ratings 2 times or more compared to standard chip resistors
- Values up to 100M Ω
- Lower resistance values may be available - contact Stackpole
- Proportionally higher pulse power capability
- RoHS compliant, REACH compliant, and halogen free
- AEC-Q200 compliant



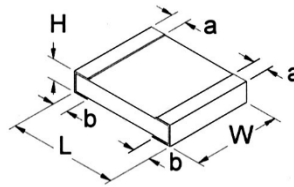
Electrical Specifications

Type/Code	Power Rating (W) @ 70°C	Max Working Voltage (V)	Max Overload Voltage (V)	TCR (ppm/°C)	Ohmic Range (Ω) and Tolerance	
					1%	5%
RVC0402	0.063	100	200	±100 ±200 ±400	39K - 1M	
					1.02M - 10M -	1.1M - 20M 22M - 100M
RVC0603	0.1	200	400	±100 ±200 ±400	56K - 1M	
					1.02M - 10M -	1.1M - 20M 22M - 100M
RVC0805	0.125	400	800	±100 ±200 ±400	100K - 1M	
					1.02M - 10M -	1.1M - 20M 22M - 100M
RVC1206	0.25	500	1000	±100 ±200 ±400	100K - 1M	
					1.02M - 10M -	1.1M - 20M 22M - 100M
RVC2010	0.5	2000	3000	±100 ±200 ±400	51K - 1M	
					1.02M - 20M -	1.1M - 20M 22M - 100M
RVC2512	1	3000	4000	±100 ±200 ±400	30K - 1M	
					1.02M - 20M -	1.1M - 20M 22M - 100M

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

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

Mechanical Specifications



Type/Code	Typical Unit Weight (mg)	L Body Length	W Body Width	H Body Height	a Top Termination	b Bottom Termination	Unit
RVC0402	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
RVC0603	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
RVC0805	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
RVC1206	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

Rev Date: 2/18/2025

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This specification may be changed at any time without prior notice.
Please confirm technical specifications before use.

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RVC Series

High Voltage Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

Mechanical Specifications (cont.)

Type/Code	Typical Unit Weight (mg)	L Body Length	W Body Width	H Body Height	a Top Termination	b Bottom Termination	Unit
RVC2010	24.2	0.197 ± 0.008 5.00 ± 0.20	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
RVC2512	39.4	0.250 ± 0.008 6.35 ± 0.20	0.126 ± 0.006 3.20 ± 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

Test	Test Method	Test Specification		Test Condition
		±1%	±5%	
Temperature Coefficient of Resistance (TCR)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	As specified by Electrical Specification Table		-55 ~ +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)	±(2% + 0.05Ω)	RCWV *2.5 or Max. Overload Voltage whichever is lower for 5 seconds
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	≥ 10G		Max. Overload voltage for 1 minute
Endurance	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	±(2% + 0.1Ω)	±(3% + 0.1Ω)	70 ± 2°C, RCWV for 1000 hours with 1.5 hour "ON" and 0.5 hour "OFF"
Damp Heat with Load	JIS-C-5201-1 4.24 IEC-60115-1 4.24	±(2% + 0.1Ω)	±(3% + 0.1Ω)	40 ± 2°C, 90 ~ 95% R.H., RCWV for 1000 hours with 1.5 hour "ON" and 0.5 hour "OFF"
Dry Heat	JIS-C-5201-1 4.23 IEC-60115-1 4.23.2	±(1% + 0.05Ω)	±(1.5% + 0.1Ω)	at +155°C for 1000 hours
Bending Strength	JIS-C-5201-1 4.33 IEC-60115-1 4.33	±(1% + 0.05Ω)	±(1% + 0.05Ω)	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% min. coverage		245 ± 5°C for 3 seconds
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	±(0.5% + 0.05Ω)	±(1% + 0.05Ω)	260 ± 5°C for 10 seconds
Voltage Proof	JIS-C-5201-1 4.7 IEC-60115-1 4.7	No breakdown or flashover		0402: 150 V for 1 minute 0603: 300 V for 1 minute 0805, 1206, 2010, 2512: 500 V 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 ± 5°C for 30 seconds
Rapid Change of Temperature	JIS-C-5201-1 4.19 IEC-60115-1 4.19	±(0.5% + 0.05Ω)	±(1% + 0.05Ω)	-55 to +155°C, 5 cycles

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

Recommended storage temperature is 25 ± 3°C; humidity < 80% RH

Operating temperature range is -55 to 155°C

Power Derating Curve:

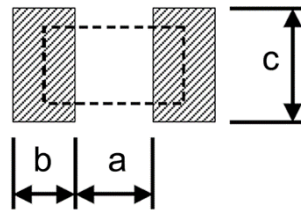


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Recommended Pad Layout



Type/Code	a	b	c	Unit
RVC0402	0.020 0.50	0.018 0.45	0.024 0.60	inches mm
RVC0603	0.035 0.90	0.024 0.60	0.035 0.90	inches mm
RVC0805	0.047 1.20	0.028 0.70	0.051 1.30	inches mm
RVC1206	0.079 2.00	0.035 0.90	0.063 1.60	inches mm
RVC2010	0.150 3.80	0.035 0.90	0.110 2.80	inches mm
RVC2512	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

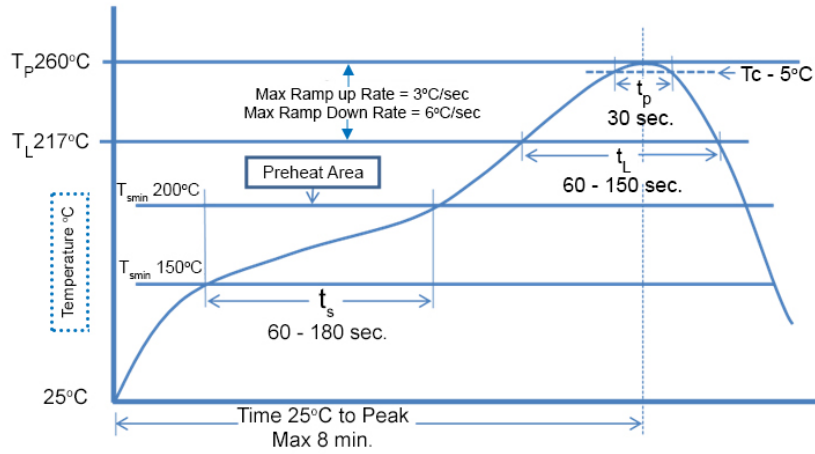
Description	Maximum	Recommended	Minimum
Ramp Up (°C/sec)	3°C/sec	2°C/sec	*
Dwell Time > 217°C	150 seconds	90 seconds	60 seconds
Solder Temp.	260°C	245°C	*
Dwell Time at Max.	30 seconds	15 seconds	10 seconds
Ramp DN (°C/sec)	6°C/sec	3°C/sec	*

RVC Series

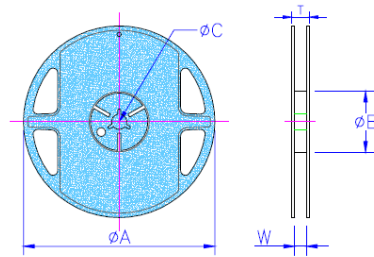
High Voltage Chip Resistor

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Recommended Resistor Reflow Profile

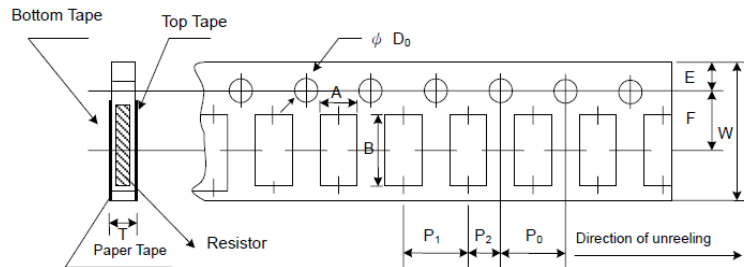


Reel Specifications



Type/Code	Tape Width (mm)	Reel Diameter (inches)	A	B	C	W	T	Unit
RVC0402, RVC0603 RVC0805, RVC1206	8 mm	7"	7.028 ± 0.059 178.50 ± 1.50	2.362 ± 0.039 60.00 ± 1.00	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
RVC2010, RVC2512	12 mm	7"	7.028 ± 0.059 178.50 ± 1.50	2.362 ± 0.039 60.00 ± 1.00	0.512 ± 0.020 13.00 ± 0.50	0.512 ± 0.020 13.00 ± 0.50	0.610 ± 0.020 15.50 ± 0.50	inches mm

Packaging Specifications - Paper Tape



Type/Code	A	B	W	E	F	Unit
RVC0402	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
RVC0603	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
RVC0805	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
RVC1206	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	D	T	Unit
RVC0402	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 1.50 ± 0.10	0.018 ± 0.004 0.45 ± 0.10	inches mm
RVC0603	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 1.50 ± 0.10	0.028 ± 0.004 0.70 ± 0.10	inches mm
RVC0805	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 1.50 ± 0.10	0.031 ± 0.004 0.80 ± 0.10	inches mm
RVC1206	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 1.50 ± 0.10	0.033 ± 0.004 0.85 ± 0.10	inches mm

Packaging Specifications - Plastic Tape



Type/Code	A	B	W	E	F	Unit
RVC2010	0.110 ± 0.004 2.80 ± 0.10	0.217 ± 0.004 5.50 ± 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
RVC2512	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

RVC Series

High Voltage Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

Packaging Specifications - Plastic Tape (cont.)

Type/Code	P0	P1	P2	D	T	Unit
RVC2010	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 1.50 ± 0.10	0.047 1.20	inches mm
RVC2512	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 1.50 ± 0.10	0.047 1.20	inches mm

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**.



E24 Values 0603-2512 (5% tolerance)

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



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 "C" - "F" represents a specific multiplier.



Alpha Character = Multiplier	Chip Marking	Value
C = 1000	73C	56.2x1000 = 56.2KΩ
D = 10000	05D	11.0x10000 = 110KΩ
E = 100000	01E	10.0 x100000 = 1MΩ
F = 1000000	01F	10.0x1000000 = 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

RVC Series

High Voltage Chip Resistor

Stackpole Electronics, Inc.
Resistive Product Solutions

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)
RVC	High Voltage Chip Resistor	SMD	YES(1)	100% Matte Sn over Ni	Jan-03	03/01

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.

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