

# RVF series

## Thick Film High Voltage Chip Resistor

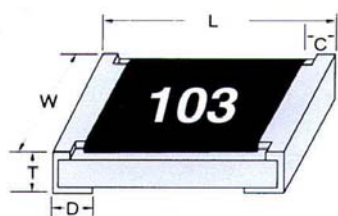
### ◆ Features

- » Special material and design for high working voltage require
- » Compatible with flow and reflow soldering
- » Suitable for lead free soldering
- » Voltage Coefficient Resistance (VCR)  $\leq \pm 300\text{ppm/V}$ .

### ◆ Application

- » Power supply
- » Automotive industry
- » Measurement instrument
- » Back light inverter
- » Medical equipment

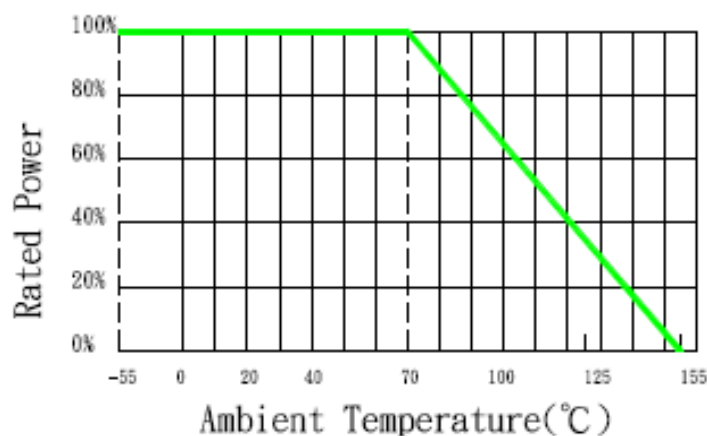
### ◆ Dimensions



Size	L	W	C	D	T
0402	1.00±0.05	0.50±0.05	0.20±0.10	0.20±0.10	0.35±0.05
0603	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
0805	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
1206	3.10±0.10	1.60±0.10	0.50±0.20	0.50±0.20	0.55±0.10
2010	5.00±0.20	2.50±0.20	0.65±0.25	0.60±0.25	0.60±0.10
2512	6.40±0.20	3.20±0.20	0.65±0.25	0.90±0.25	0.60±0.15

Unit: mm

### ◆ Power Derating Curve



## ◆ Rating

### HIGH VOLTAGE POWER CHIP RESISTOR

Type	Power Rating at 70°C	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperature Coefficient (ppm/°C)	Resistance Range	
						Min.	Max.
RVF0402	1/16W	100V	200V	±1%(F)	±100	10Ω	1MΩ
				±1%(F)	±200	1.02MΩ	10MΩ
				±5%(J)	±100	10Ω	1MΩ
				±5%(J)	±200	1.1MΩ	20MΩ
				±5%(J)	±400	22MΩ	100MΩ
RVF0603	1/10W	200V	400V	±1%(F)	±100	10Ω	1MΩ
				±1%(F)	±200	1.02MΩ	10MΩ
				±5%(J)	±200	10Ω	20MΩ
				±5%(J)	±400	22MΩ	100MΩ
RVF0805	1/8W	400V	800V	±1%(F)	±100	10Ω	1MΩ
				±1%(F)	±200	1.02MΩ	10MΩ
				±5%(J)	±200	10Ω	20MΩ
				±5%(J)	±400	22MΩ	100MΩ
RVF1206	1/4W	800V	1600V	±1%(F)	±100	10Ω	1MΩ
				±1%(F)	±200	1.02MΩ	22MΩ
				±5%(J)	±200	10Ω	20MΩ
				±5%(J)	±400	22MΩ	100MΩ
RVF2010	1/2W	2000V	3000V	±1%(F)	±100	10Ω	1MΩ
				±1%(F)	±200	1.02MΩ	22MΩ
				±5%(J)	±200	10Ω	20MΩ
				±5%(J)	±400	22MΩ	100MΩ
RVF2512	1W	3000V	4000V	±1%(F)	±100	10Ω	1MΩ
				±1%(F)	±200	1.02MΩ	22MΩ
				±5%(J)	±200	10Ω	20MΩ
				±5%(J)	±400	22MΩ	100MΩ

## ◆ Part Number

RVF	2010	J	10K
Type	Size	Tolerance	R Value
RVF	0402	F: ± 1%	10Ω = 10R
	0603	J: ± 5%	10KΩ = 10K
	0805		2.2MΩ = 2M2
	1206		
	2010		
	2512		

## ◆ Specification

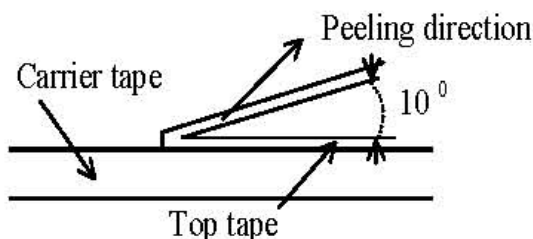
### Specification and Test Method

TEST	SPECIFICATION	TEST METHOD
DC Resistance	F : $\pm 1\%$ ; J : $\pm 5\%$	IEC 60115-1 / JIS C 5201-1 , Clause 4.5 Measure the resistance Value.
Short Time Overload	$\Delta R \leq \pm(1\% + 0.1\Omega)$ No mechanical damage	IEC 60115-1 / JIS C 5201-1, Clause 4.13 2 × Rated voltage or Max. Overload Voltage for 5 sec. measure resistance after 30 minutes
Solderability	Over 95% of termination must be covered with solder	IEC 60115-1/ JIS C5201-1, Clause 4.17 After immersing flux, dip in the $245 \pm 2^\circ\text{C}$ molten solder bath for $3 \pm 0.5$ sec.
Resistance to solder Heat	$\Delta R \leq \pm(1\% + 0.1\Omega)$ No mechanical damage	IEC 60115-1 / JIS C 5201-1 , Clause 4.18 With $260 \pm 5^\circ\text{C}$ for $10 \pm 1$ sec
Load Life Humidity	$\Delta R \leq \pm(5\% + 0.1\Omega)$	IEC 60115-1 / JIS C 5201-1 , Clause 4.24 Maintain the temperature of the resistor at $40 \pm 2^\circ\text{C}$ and 90% ~ 95% R.H. with the rated voltage applied. Cycle ON for 1.5 hours and OFF for 0.5 hour for 1000+48/-0 hours. After 1 ~ 4 hours, measure the resistance value.
Temperature Coefficient of Resistance (TCR)	Refer to the rating table.	IEC 60115-1 / JIS C 5201-1 , Clause 4.8 Test temperature : $25^\circ\text{C}$ (T1) ~ $-55^\circ\text{C}$ (T2) $25^\circ\text{C}$ (T1) ~ $+155^\circ\text{C}$ (T2) $\text{TCR}(\text{ppm}/^\circ\text{C}) = \frac{R_2 - R_1}{R_1} \times \frac{1}{T_2 - T_1} \times 10^6$ T1: $25^\circ\text{C}$ T2: Test temperature R1: Resistance at reference temperature (T1) R2: Resistance at test temperature (T2)
Voltage Coefficient Of resistance (TCR)	$\leq \pm 300 \text{ppm/V}$	JIS C 5202 5.3 Measuring Voltage 10V/100V
Load Life	$\Delta R \leq \pm(5\% + 0.1\Omega)$	IEC 60115-1 / JIS C 5201-1 , Clause 4.25 Permanent resistance change after 1000+48/-0 hours (1.5 hours ON, 0.5hour OFF) at RCWV or Max. Keep the resistor at $70 \pm 2^\circ\text{C}$ ambient.
Temperature Cycle	$\Delta R \leq \pm(1\% + 0.05\Omega)$ No mechanical damage	IEC 60115-1 / JIS C 5201-1 , Clause 4.19 Repeat 5 cycles as follows $-55^\circ\text{C}$ (30min.) $\rightarrow +25^\circ\text{C}$ (2~3min.) $\rightarrow +155^\circ\text{C}$ (30min.) $\rightarrow +25^\circ\text{C}$ (2~3min.)
Insulation Resistance	Between termination and coating must be over 1000MΩ	IEC 60115-1 / JIS C 5201-1 , Clause 4.6 Test voltage : $100 \pm 15\text{V}$
Bending strength	$\Delta R \leq \pm(1\% + 0.05\Omega)$ No mechanical damage	IEC 60115-1 / JIS C 5201-1 , Clause 4.33 Resistance changes after bended on the 90mm PCB. Bend : 3mm for 0603, 0805 2mm for 1206, 2010, 2512

## ◆ Taping Specification

### » Ability

Peel force is 0.2N to 1.0N at peel off speed of 300 mm/minute, and does not have flash and tear under the following test method.



### Minimum bending radius

When carrier tape is bent by min. bending radius(15mm) only one time, no defection of chip and no break of carrier tape.

### Temperature test of top tape

Top tape doesn't peel after 120 hours exposure at 60°C, 90-95%R.H.

### » Taping package condition

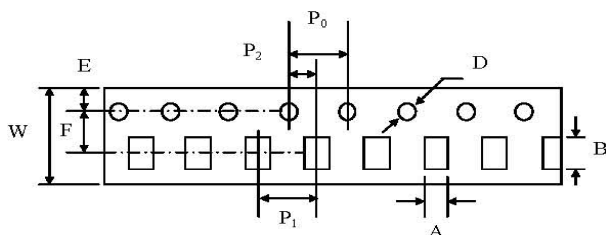
Resistance side is facing up.

Chip resistor is free, not sticking to top tape and bottom tape.

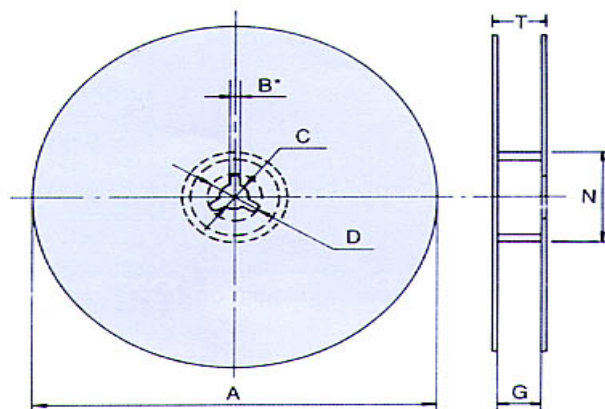
Chip resistor is easy to take out from carrier tape and chip hole have no mechanical damage.

## ◆ Tape and Reel Package

Taping specs are according to EIA RS-481



Accumulated dimensional tolerance  $40 \pm 0.2 \text{ mm}$



**Tape:**

Size	A	B	W	F	E	P1	P2	P0	D
0402	0.65±0.10	1.15±0.10	8.00±0.30	3.50±0.05	1.75±0.10	2.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
0603	1.10±0.20	1.90±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
0805	1.65±0.20	2.40±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
1206	2.00±0.20	3.57±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
2010	2.80±0.20	5.50±0.20	12.00±0.30	5.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
2512	3.50±0.20	6.70±0.20	12.00±0.30	5.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0

Unit: mm

**Reel:**

Size	Packing Q'ty	A	N	C	D	B	G	T
0402	10kpcs/Reel (7")	178.0±1.5	60.0±0.5	13.0±0.5	20(Min.)	2.0±0.5	10.0±1.5	14.9max.
0603 0805 1206	5kpcs/Reel (7")	178.0±2.0	60.0±0.5	13.0±0.5	20(Min.)	2.0±0.5	10.0±1.5	14.9max.
2010 2512	4kpcs/Reel (7")	178.0±2.0	60.0±0.5	13.0±0.5	20(Min.)	2.0±0.5	13.8±1.5	16.7max.

Unit: mm