

RPF series

Thick Film High-Power Lead Free Chip Resistor

◆ Features

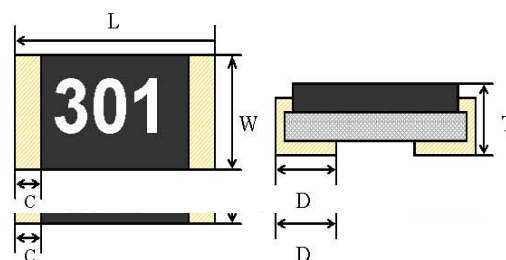
- » High Power rating and compact size
- » High reliability and stability
- » Reduced size of final equipment
- » Lead free product is upon customer requested
- » RoHS compliant & Halogen Free

◆ Application

- » Power supply
- » PDA
- » Digital meter
- » Computer
- » Automotives

◆ Mechanical Dimensions

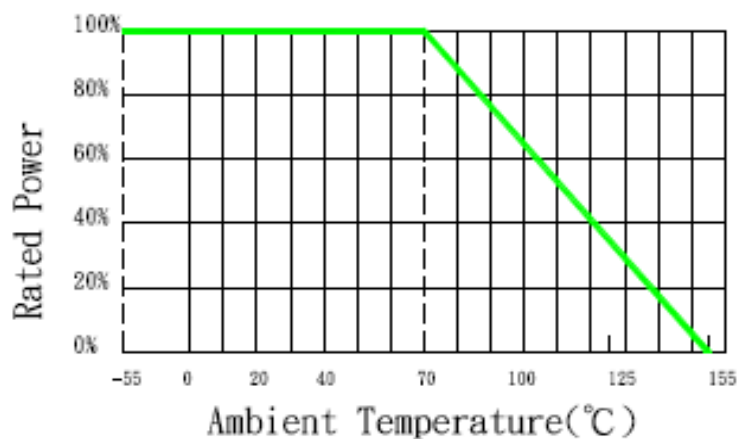
Type	DIMENSIONS				
	L	W	C	D	T
RPF0402	1.00±0.10	0.50±0.05	0.30±0.05	0.20±0.10	0.25±0.10
RPF0603	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
RPF0805	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
RPF1206	3.10±0.10	1.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
RPF1210	3.10±0.10	2.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
RPF2010	5.00±0.20	2.50±0.20	0.65±0.25	0.60±0.25	0.60±0.10
RPF2512	6.30±0.20	3.10±0.20	0.60±0.25	1.80±0.25	0.60±0.15



Unit: mm.

◆ Power Derating Curve

Power Derating Curve by Ambient Temperature Rated Load (%)



◆ Part Number

RPF	2512	J	10K	<input type="checkbox"/>	<input type="checkbox"/>
Type	Size	Tolerance	R Value	Reel Size	Package Quantity
RPF	0402	F: $\pm 1\%$	10K Ω = 10K	Blank = 7" (standard package As below)	10= 10K per reel
	0603	J: $\pm 5\%$	0 Ω = 0R	B= 13"	20= 20K per reel
	0805		2.2M Ω = 2M2	C= 10"	08= 8K per reel
	1206				16= 16K per reel
	1210				
	2010				
	2512				

» Standard Package Q'ty for each size is as following.

TYPE	Standard Package Q'ty
RPF0402	10K per reel
RPF0603	5K per reel
RPF0805	5K per reel
RPF1206	5K per reel
RPF1210	5K per reel
RPF2010	4K per reel
RPF2512	4K per reel

◆ Rating

Standard type

Type	Size	Power Rating At 70°C	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperature Coefficient (ppm/°C)	Resistance Range		Standard Resistance Values
							Min.	Max.	
RPF0402	0402	1/10W	50V	100V	±1% (F)	±100	10Ω	1MΩ	E96/E24
					±5% (J)	±200	1Ω	1MΩ	E24
RPF0603	0603	1/8W	50V	100V	±1% (F)	±100	10Ω	1MΩ	E96/E24
					±1% (F)	±200	1Ω	9.76Ω	E96/E24
					±5% (J)	±200	1Ω	1MΩ	E24
RPF0805	0805	1/4W	150V	300V	±1% (F)	±100	10Ω	1MΩ	E96/E24
					±1% (F)	±200	1Ω	9.76Ω	E96/E24
					±5% (J)	±200	1Ω	1MΩ	E24
RPF1206	1206	1/2W	200V	400V	±1% (F)	±100	10Ω	1MΩ	E96/E24
					±5% (J)	±200	1Ω	9.76Ω	E24
RPF1210	1210	1/2W	200V	400V	±1% (F)	±100	1Ω	1MΩ	E96/E24
					±5% (J)	±200	1Ω	1MΩ	E24
RPF2010	2010	1W	200V	400V	±1% (F)	±100	1Ω	1MΩ	E96/E24
					±5% (J)	±200	1Ω	1MΩ	E24
RPF2512	2512	2W	300V	600V	±1% (F)	±100	1Ω	1MΩ	E96/E24
					±5% (J)	±200	1Ω	1MΩ	E24

Low Resistance

Type	Power Rating at 70°C	Max. RCWV (mV)	Max. Overload Voltage (mV)	Resistance Tolerance (%)	Temperature Coefficient (ppm/°C)	Resistance Range (mΩ)		Standard Resistance Values
						Min.	Max.	
RPF0603	1/8W	477	1066	±1%, ±5%	±150*	510	910	E-24
RPF0805	1/4W	551	1232	±1%, ±5%	±100*	510	910	
RPF1206	1/2W	675	1508	±1%, ±5%	±100	510	910	
RPF1210	1/2W	675	1508			200	910	
RPF2010	1W	954	2133			200	910	
RPF2512	2W	1349	3017			200	910	

◆ 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	J: $\Delta R \leq \pm(2\% + 0.1\Omega)$ F: $\Delta R \leq \pm(1\% + 0.05\Omega)$	5 × Rated power for 5 seconds
Solderability	Over 95% of termination must be covered with solder	IEC 60115-1 / JIS C 5201-1, Clause 4.17 After immersing flux, dip in the $245 \pm 2^\circ\text{C}$ molten solder bath for 3 ± 0.5 sec.
Resistance to solder Heat	J: $\Delta R \leq \pm(1\% + 0.1\Omega)$ F: $\Delta R \leq \pm(0.5\% + 0.05\Omega)$ No mechanical damage	IEC 60115-1 / JIS C 5201-1 , Clause 4.18 With $260 \pm 5^\circ\text{C}$ for 10 ± 1 sec
Load Life Humidity	J: $\Delta R \leq \pm(3\% + 0.1\Omega)$ F: $\Delta R \leq \pm(1\% + 0.05\Omega)$	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)	F: $\pm 100\text{ppm}/^\circ\text{C}$ J: $\pm 200\text{ppm}/^\circ\text{C}$	IEC 60115-1 / JIS C 5201-1 , Clause 4.8 Test temperature : $25^\circ\text{C}(T1) \rightarrow -55^\circ\text{C}(T2)$ $25^\circ\text{C}(T1) \rightarrow +155^\circ\text{C}(T2)$ $\text{TCR (ppm}/^\circ\text{C}) = \frac{R2 - R1}{R1} \times \frac{1}{T2 - T1} \times 10^6$ T1: 25°C T2: Test temperature R1: Resistance at reference temperature (T1) R2: Resistance at test temperature (T2)
Load Life	J : $\Delta R \leq \pm(3\% + 0.1\Omega)$ F : $\Delta R \leq \pm(1\% + 0.05\Omega)$	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	J : $\Delta R \leq \pm(1\% + 0.1\Omega)$ F : $\Delta R \leq \pm(0.5\% + 0.05\Omega)$ No mechanical damage	IEC 60115-1 / JIS C 5201-1 , Clause 4.19 Repeat 5 cycles as follows -55°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 1000M Ω	IEC 60115-1 / JIS C 5201-1 , Clause 4.6 Test voltage : $100 \pm 15\text{V}$
Bending strength	J : $\Delta R \leq \pm(1\% + 0.1\Omega)$ F : $\Delta R \leq \pm(0.5\% + 0.05\Omega)$ No mechanical damage	IEC 60115-1 / JIS C 5201-1 , Clause 4.33 Resistance changes after bended on the 90mm PCB. Bending width : 3mm for 0603, 0805, 2mm for 1206, 1210, 2010, 2512

◆ Specification

RPF < 1Ω Specification and Test Method

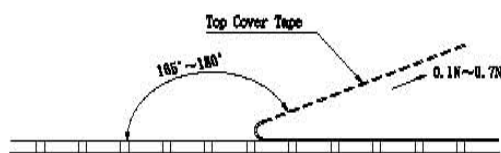
TEST	SPECIFICATION	TEST METHOD
DC Resistance	F : $\pm 1\%$; J : $\pm 5\%$	IEC 60115-1 / JIS C 5201-1 , Clause 4.5 Measure the resistance Value.
Short Time Overload	J: $\Delta R \leq \pm(2\% + 0.5m\Omega)$ F: $\Delta R \leq \pm(1\% + 0.5m\Omega)$	5 × Rated power for 5 seconds
Solderability	Over 95% of termination must be covered with solder	IEC 60115-1 / JIS C 5201-1, Clause 4.17 After immersing flux, dip in the $245 \pm 2^\circ\text{C}$ molten solder bath for 3 ± 0.5 sec.
Resistance to solder Heat	J: $\Delta R \leq \pm(1\% + 0.5m\Omega)$ F: $\Delta R \leq \pm(0.5\% + 0.5m\Omega)$ No mechanical damage	IEC 60115-1 / JIS C 5201-1 , Clause 4.18 With $260 \pm 5^\circ\text{C}$ for 10 ± 1 sec
Load Life Humidity	J: $\Delta R \leq \pm(3\% + 0.5m\Omega)$ F: $\Delta R \leq \pm(1\% + 0.5m\Omega)$	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 information.	IEC 60115-1 / JIS C 5201-1 , Clause 4.8 Test temperature : $25^\circ\text{C}(T1) \rightarrow -55^\circ\text{C}(T2)$ $25^\circ\text{C}(T1) \rightarrow +155^\circ\text{C}(T2)$ $\text{TCR}(\text{ppm}/^\circ\text{C}) = \frac{R2 - R1}{R1} \times \frac{1}{T2 - T1} \times 10^6$ T1: 25°C T2: Test temperature R1: Resistance at reference temperature (T1) R2: Resistance at test temperature (T2)
Load Life	J : $\Delta R \leq \pm(3\% + 0.5m\Omega)$ F : $\Delta R \leq \pm(1\% + 0.5m\Omega)$	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	J : $\Delta R \leq \pm(1\% + 1m\Omega)$ F : $\Delta R \leq \pm(0.5\% + 1m\Omega)$ No mechanical damage	IEC 60115-1 / JIS C 5201-1 , Clause 4.19 Repeat 5 cycles as follows -55°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	J : $\Delta R \leq \pm(1\% + 1m\Omega)$ F : $\Delta R \leq \pm(0.5\% + 1m\Omega)$ No mechanical damage	IEC 60115-1 / JIS C 5201-1 , Clause 4.33 Resistance changes after bended on the 90mm PCB. Bending width : 3mm for 0603 0805, 2mm for 1206, 1210, 2010, 2512

◆ Packing

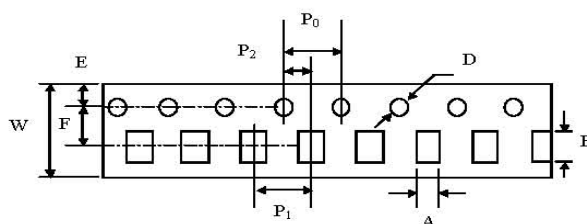
Peel Strength of Top Cover Tape

The peel speed shall be about 300 mm/min

The peel force of top cover tape shall between 0.1 to 0.7N



Tape Packaging Dimensions

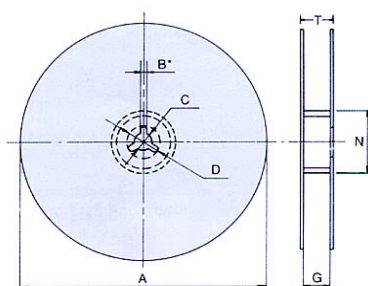


Accumulated dimensional tolerance $40 \pm 0.2 \text{ mm}$

Size	A	B	W	F	E	P1	P2	P0	D
0402	0.70 ± 0.1	1.20 ± 0.1	8.0 ± 0.2	1.75 ± 0.1	3.5 ± 0.05	4.0 ± 0.1	2.0 ± 0.05	0.45 ± 0.1	1.5 ± 0.1
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	$1.50 + 0.10 / -0$
1210	3.00 ± 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 Dimensions



Size	Packing Q'ty	A	N	C	D	B	G	T
0402	10kpcs/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.
0603	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.
0805	10kpcs/Reel (10")	254.0 ± 2.0	100.0 ± 1.0	13.5 ± 0.5	20(Min.)	2.0 ± 0.5	10.0 ± 1.5	14.9max.
1206	20kpcs/Reel (13")	330.0 ± 2.0	100.0 ± 1.0	13.5 ± 0.5	20(Min.)	2.0 ± 0.5	10.0 ± 1.5	14.9max.
2010	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.
2512	8kpcs/Reel (10")	254.0 ± 2.0	100.0 ± 1.0	13.0 ± 0.5	20(Min.)	2.0 ± 0.5	13.8 ± 1.5	20.0max.
	16kpcs/Reel (13")	330.0 ± 2.0	100.0 ± 1.0	13.5 ± 0.5	20(Min.)	2.0 ± 0.5	13.8 ± 1.5	20.0max.

Unit: mm

All product specification and data are subject to change without notice.