

RPF series Thick Film High-Power Lead Free Chip Resistor

◆ Features

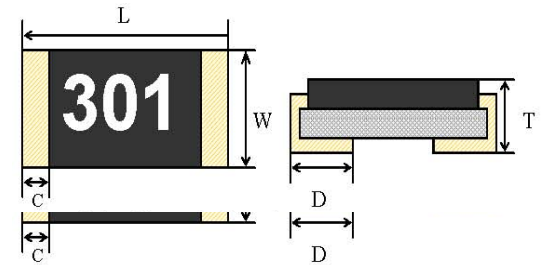
- » High Power rating and compact size
- » High reliability and stability
- » Reduced size of final equipment
- » Lead free product is upon customer requested
- » RoHS compliant & Halogen Free

◆ Application

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

◆ Mechanical Dimensions

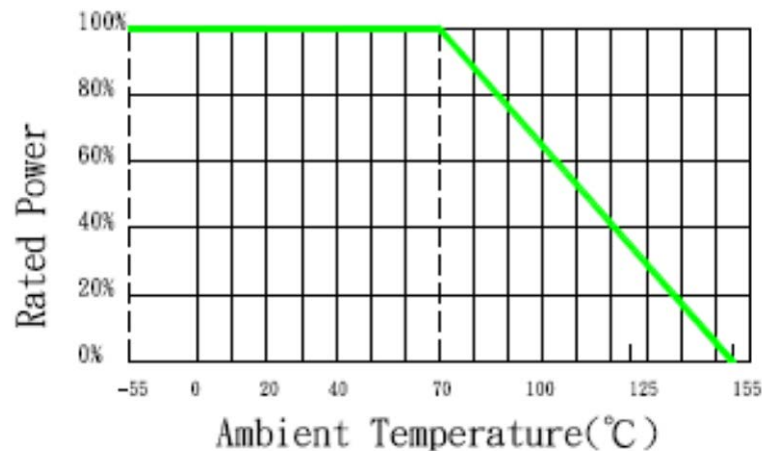
Type	DIMENSIONS				
	L	W	C	D	T
RPF0402	1.00±0.10	0.50±0.05	0.30±0.05	0.20±0.10	0.25±0.10
RPF0603	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
RPF0805	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
RPF1206	3.10±0.10	1.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10
RPF1210	3.10±0.10	2.60±0.10	0.50±0.25	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	□	□□
Type	Size	Tolerance	Rated Power	R Value	Reel Size	Package Quantity
RPF	0402	B: ± 0.1%	Blank=Standard	10KΩ = 10K	Blank = 7"	(standard package As below)
	0603	D: ± 0.5%	E=1/3W	0Ω = 0R	B= 13"	10= 10K per reel
	0805	F: ± 1%	F=1/2W	2.2MΩ = 2M2	C= 10"	20= 20K per reel
	1206	J: ± 5%	G=3/4W			08= 8K per reel
	1210		K=3W			16= 16K per reel
	2010		I=1.5W			
	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	±0.1% (B)	±200	10Ω	1MΩ	E24
					±0.5% (D)				
					±1% (F)	±100	10Ω	1MΩ	E96/E24
RPF0603	0603	1/8W	75V	125V	±0.1% (B)	±100	10Ω	1MΩ	E24
					±0.5% (D)				
		1/8W 1/3W	50V 75V	100V 125V	±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	±0.1% (B)	±100	10Ω	1MΩ	E24
					±0.5% (D)				
		1/4W 1/2W	150V 200V	300V 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	±0.1% (B)	±100	10Ω	1MΩ	E24
					±0.5% (D)				
		1/2W 3/4W	200V 250V	400V 500V	±1% (F)	±100	10Ω	1MΩ	E96/E24
±1% (F)	±200				1Ω	9.76Ω	E96/E24		
±5% (J)	±200	1Ω	1MΩ	E24					
RPF1210	1210	1/2W	200V	400V	±0.1% (B)	±100	10Ω	1MΩ	E24
					±0.5% (D)				
					±1% (F)	±100	10Ω	1MΩ	E96/E24
±5% (J)	±200	1Ω	1MΩ	E24					
RPF2010	2010	1W 1.5W	200V 250V	400V 500V	±0.1% (B)	±100	10Ω	1MΩ	E24
					±0.5% (D)				
					±1% (F)	±100	1Ω	1MΩ	E96/E24
±5% (J)	±200	1Ω	1MΩ	E24					
RPF2512	2512	2W	200V	400V	±0.1% (B)	±100	10Ω	1MΩ	E24
					±0.5% (D)				
		2W 3W	200V 250V	400V 500V	±1% (F)	±100	10Ω	1MΩ	E96/E24
±1% (F)	±100				10Ω	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*	500	910	E-24
RPF0805	1/4W	551	1232	±1%, ±5%	±100*	500	910	
RPF1206	1/2W	675	1508	±1%, ±5%	±100	500	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 : ±1% ; J : ±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 x 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 : $25^{\circ}\text{C}(\text{T1}) \rightarrow -55^{\circ}\text{C}(\text{T2})$ $25^{\circ}\text{C}(\text{T1}) \rightarrow +155^{\circ}\text{C}(\text{T2})$ $\text{TCR}(\text{ppm}/^{\circ}\text{C}) = \frac{R2 - R1}{R1} \times \frac{1}{T2 - T1} \times 10^6$ T1: 25°C T2: Test temperature R1: Resistance at reference temperature (T1) R2: Resistance at test temperature (T2)
Load Life	J : $\Delta R \leq \pm(3\% + 0.1\Omega)$ 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 < 1 Ω 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: $\Delta R \leq \pm(2\% + 0.5\text{m}\Omega)$ F: $\Delta R \leq \pm(1\% + 0.5\text{m}\Omega)$	5 x 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: $\Delta R \leq \pm(1\% + 0.5\text{m}\Omega)$ F: $\Delta R \leq \pm(0.5\% + 0.5\text{m}\Omega)$ 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 1000M Ω	IEC 60115-1 / JIS C 5201-1 , Clause 4.6 Test voltage : $100 \pm 15\text{V}$
Bending strength	J : $\Delta R \leq \pm(1\% + 1m\Omega)$ 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

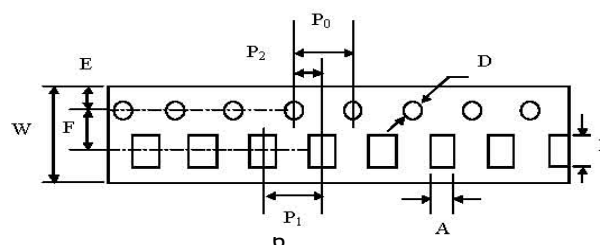
Peel Strength of Top Cover Tape

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

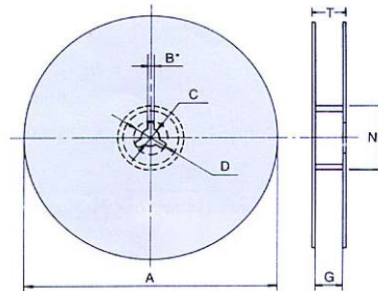


Accumulated dimensional tolerance $40\pm 0.2\text{mm}$

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								
1210	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 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.
	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.