

Anti-Surge Thick Film Chip Resistors

Type: **ERJ PA2, P03, PA3, P06, P08, P14**



Features

- ESD surge characteristics superior to standard metal film resistors
- High reliability
Metal glaze thick film resistive element and three layers of electrodes
- Suitable for both reflow and flow soldering
- High power ... 0.20 W : 0402 inch / 1005 mm size (ERJPA2), 0603 inch / 1608 mm size (ERJP03)
0.25 W : 0603 inch / 1608 mm size (ERJPA3)
0.50 W : 0805 inch / 2012 mm size (ERJP06), 1210 inch / 3225 mm size (ERJP14)
0.66 W : 1206 inch / 3216 mm size (ERJP08)
- Reference Standards... IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B
- AEC-Q200 qualified
- RoHS compliant

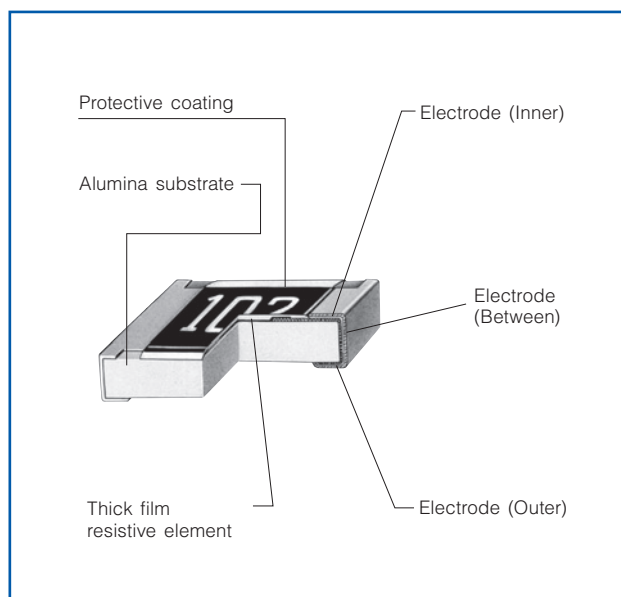
■ **As for Packaging Methods, Land Pattern, Soldering Conditions and Safety Precautions,**
Please see Data Files

Explanation of Part Numbers

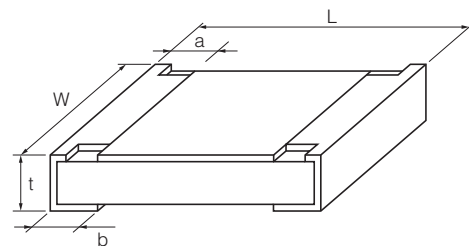
1	2	3	4	5	6	7	8	9	10	11	12
E	R	J	P	0	6	D	1	0	0	2	V

Product Code	Size, Power Rating		Resistance Tolerance		Resistance Value	Packaging Methods			
Thick Film Chip Resistors	Code	Inch	Power R.	Code		Tolerance	Code	Packaging	Part No.
	PA2	0402	0.20 W	D	± 0.5 %	The first two or three digits are significant figures of resistance and the third or 4th one denotes number of zeros following. Three digit type (±5 %), four digit type (±1 %, ±0.5 %) Example: 222→2.2k Ω, 1002→10k Ω	X	Punched Carrier Taping 2 mm pitch, 10,000 pcs.	ERJPA2
	P03	0603	0.20 W	F	± 1 %		V	Punched Carrier Taping 4 mm pitch, 5,000 pcs.	ERJP03 ERJPA3 ERJP06 ERJP08
	PA3	0603	0.25 W	J	± 5 %		U	Embossed Carrier Taping 4 mm pitch, 5,000 pcs.	ERJP14
	P06	0805	0.50 W						
	P08	1206	0.66 W						
	P14	1210	0.50 W						

Construction



Dimensions in mm (not to scale)



Part No.	Dimensions (mm)					Mass (Weight) [g/1000 pcs.]
	L	W	a	b	t	
ERJPA2	1.00 ^{+0.05}	0.50 ^{+0.05}	0.20 ^{+0.15}	0.25 ^{+0.05}	0.35 ^{+0.05}	0.8
ERJP03	1.60 ^{+0.15}	0.80 ^{+0.15} _{-0.05}	0.15 ^{+0.15} _{-0.10}	0.30 ^{+0.15}	0.45 ^{+0.10}	2
ERJPA3	1.60 ^{+0.15}	0.80 ^{+0.15} _{-0.05}	0.15 ^{+0.15} _{-0.10}	0.25 ^{+0.10}	0.45 ^{+0.10}	2
ERJP06	2.00 ^{+0.20}	1.25 ^{+0.10}	0.25 ^{+0.20}	0.40 ^{+0.20}	0.60 ^{+0.10}	4
ERJP08	3.20 ^{+0.05} _{-0.20}	1.60 ^{+0.05} _{-0.15}	0.40 ^{+0.20}	0.50 ^{+0.20}	0.60 ^{+0.10}	10
ERJP14	3.20 ^{+0.20}	2.50 ^{+0.20}	0.35 ^{+0.20}	0.50 ^{+0.20}	0.60 ^{+0.10}	16

Ratings

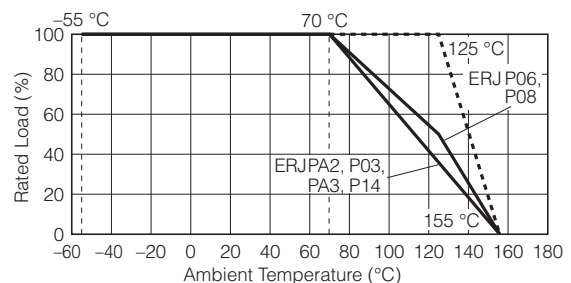
Part No. (inch size)	Power Rating ⁽³⁾ at 70 °C (W)	Limiting Element Voltage ⁽¹⁾ (V)	Maximum Overload Voltage ⁽²⁾ (V)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. ($\times 10^{-6}/^{\circ}\text{C}$)	Category Temperature Range (°C)	AEC-Q200 Grade
ERJPA2 (0402)	0.20	50	100	$\pm 0.5, \pm 1$	10 to 1M (E24, E96)	± 100	-55 to +155	Grade 0
				± 5	10 to 1M (E24)	± 200		
ERJP03 (0603)	0.20	150	200	± 0.5	10 to 1M (E24, E96)	± 150	-55 to +155	Grade 0
				± 1	10 to 1M (E24, E96)	± 200		
				± 5	1 to 1M (E24)	± 200 <small>R < 10 Ω : -150 to +400 10 Ω ≤ R : ±200</small>		
ERJPA3 (0603)	0.25	150	200	$\pm 0.5, \pm 1$	10 to 1M (E24, E96)	± 100	-55 to +155	Grade 0
				± 5	1 to 1.5M (E24)	± 200		
ERJP06 (0805)	0.50	400	600	$\pm 0.5, \pm 1$	10 to 1M (E24, E96)	± 100 <small>R < 33 Ω : ±300 33 Ω ≤ R : ±100</small>	-55 to +155	Grade 0
				± 5	1 to 3.3M (E24)	± 200 <small>R < 10 Ω : -100 to +600 10 Ω ≤ R < 33 Ω : ±300 33 Ω ≤ R : ±200</small>		
ERJP08 (1206)	0.66	500	1000	$\pm 0.5, \pm 1$	10 to 1M (E24, E96)	± 100	-55 to +155	Grade 0
				± 5	1 to 10M (E24)	± 200 <small>R < 10 Ω : -100 to +600 10 Ω ≤ R : ±200</small>		
ERJP14 (1210)	0.50	200	400	$\pm 0.5, \pm 1$	10 to 1M (E24, E96)	± 100	-55 to +155	Grade 0
				± 5	1 to 1M (E24)	± 200 <small>R < 10 Ω : -100 to +600 10 Ω ≤ R : ±200</small>		

- (1) Rated Continuous Working Voltage (RCWV) shall be determined from $\text{RCWV} = \sqrt{\text{Power Rating} \times \text{Resistance Values}}$, or Limiting Element Voltage listed above, whichever less.
 (2) Overload Test Voltage (OTV) shall be determined from $\text{OTV} = \text{Specified Magnification (refer to performance)} \times \text{RCWV}$ or Maximum Overload Voltage listed above, whichever less.
 (3) Use it on the condition that the case temperature is below the upper category temperature.

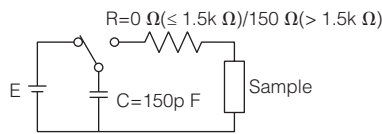
Power Derating Curve

For resistors operated in ambient temperatures above 70 °C, power rating shall be derated in accordance with the figure on the right.

* When the temperature of ERJP14 is 155 °C or less, the derating start temperature can be changed to 125 °C. (See the dotted line)

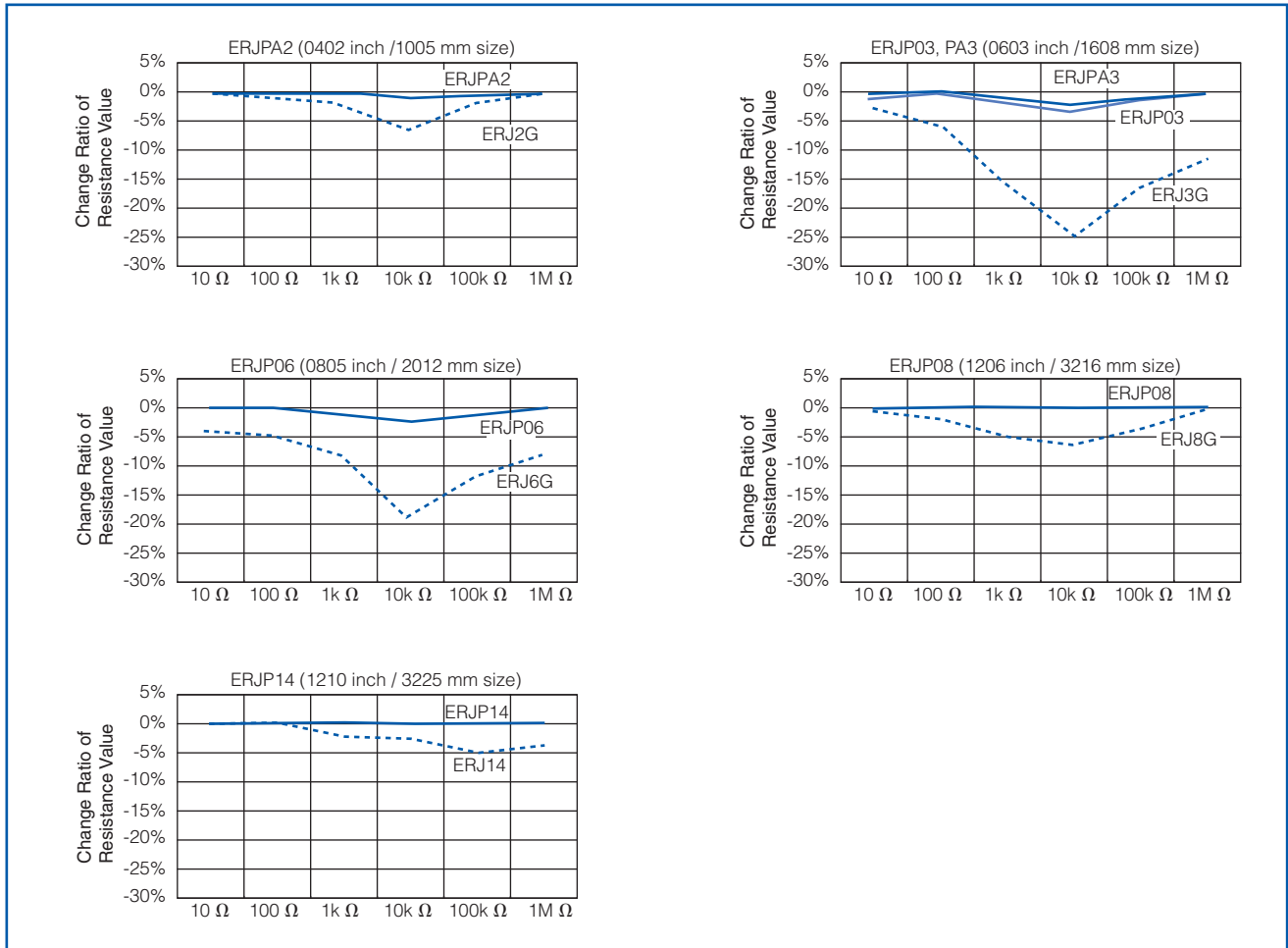


ESD Characteristic



0402 inch size : E=±1k V
 0603, 0805, 1206, 1210 inch size : E=±3k V

— Anti-Surge Thick Film Chip Resistors(ERJP Type)
 - - - Thick Film Chip Resistors(ERJ Type)



Performance

Test Item	Performance Requirements	Test Conditions
Resistance	Within Specified Tolerance	20 °C
T. C. R.	Within Specified T. C. R.	+25 °C/+155 °C (ERJPA2 : +125 °C)
Overload	±2% Only when it is ERJP03 (D), P14 (D) : ±0.5%	ERJP06 : Rated Voltage×1.77, 5 s ERJPA2, ERJPA3, ERJP08 : Rated Voltage×2.0, 5 s ERJP03, ERJP14 : Rated Voltage×2.5, 5 s
Resistance to Soldering Heat	D : ±0.5%, F, J : ±1%	270 °C, 10 s
Rapid Change of Temperature	±1%	-55 °C (30 min.) / +155 °C (30 min.) , 100 cycles
High Temperature Exposure	±1%	+155 °C, 1000 h
Damp Heat, Steady State	±1%	60 °C, 90% to 95%RH, 1000 h
Load Life in Humidity	±3% Only when it is ERJP03 (D), P14 (D) : ±1%	60 °C, 90% to 95%RH, Rated Voltage, 1.5 h ON / 0.5 h OFF cycle, 1000 h
Endurance at 70 °C	±3% Only when it is ERJP03 (D), P14 (D) : ±1%	70 °C, Rated Voltage, 1.5 h ON / 0.5 h OFF cycle, 1000 h