

## 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

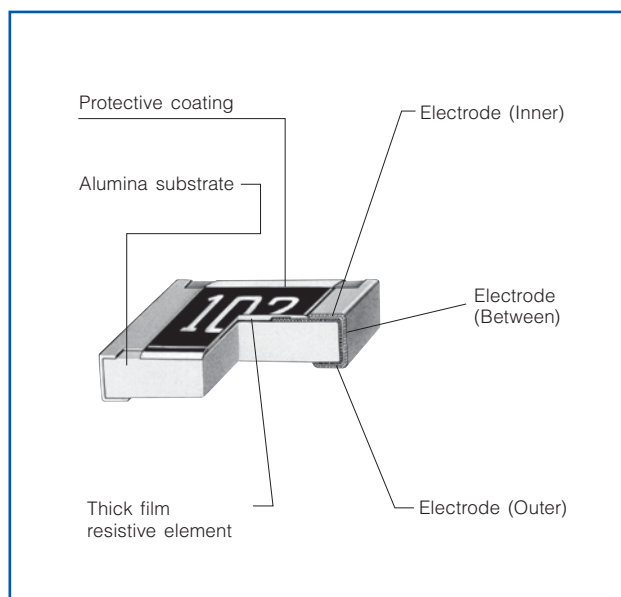
### Explanation of Part Numbers

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

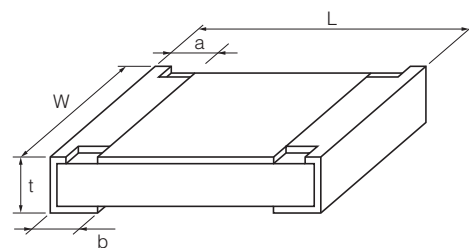
  

Product Code	Size, Power Rating		Resistance Tolerance		Resistance Value	Packaging Methods			
Thick Film Chip Resistors	Code	Inch	Power R.	Code		Tolerance	Code	Packaging	Part No.
	PA2	0402	0.20 W	D	± 0.5 %	The first two or three digits are significant figures of resistance and the third or 4th one denotes 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. (inch size)	Dimensions (mm)					Mass (Weight) [g/1000 pcs.]
	L	W	a	b	t	
ERJPA2 (0402)	1.00 <sup>+0.05</sup>	0.50 <sup>+0.05</sup>	0.20 <sup>+0.15</sup>	0.25 <sup>+0.05</sup>	0.35 <sup>+0.05</sup>	0.8
ERJP03 (0603)	1.60 <sup>+0.15</sup>	0.80 <sup>+0.15</sup> <sub>-0.05</sub>	0.15 <sup>+0.15</sup> <sub>-0.10</sub>	0.30 <sup>+0.15</sup>	0.45 <sup>+0.10</sup>	2
ERJPA3 (0603)	1.60 <sup>+0.15</sup>	0.80 <sup>+0.15</sup> <sub>-0.05</sub>	0.15 <sup>+0.15</sup> <sub>-0.10</sub>	0.25 <sup>+0.10</sup>	0.45 <sup>+0.10</sup>	2
ERJP06 (0805)	2.00 <sup>+0.20</sup>	1.25 <sup>+0.10</sup>	0.25 <sup>+0.20</sup>	0.40 <sup>+0.20</sup>	0.60 <sup>+0.10</sup>	4
ERJP08 (1206)	3.20 <sup>+0.05</sup> <sub>-0.20</sub>	1.60 <sup>+0.05</sup> <sub>-0.15</sub>	0.40 <sup>+0.20</sup>	0.50 <sup>+0.20</sup>	0.60 <sup>+0.10</sup>	10
ERJP14 (1210)	3.20 <sup>+0.20</sup>	2.50 <sup>+0.20</sup>	0.35 <sup>+0.20</sup>	0.50 <sup>+0.20</sup>	0.60 <sup>+0.10</sup>	16

## Ratings

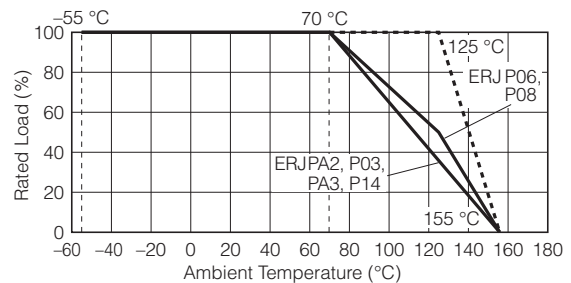
Part No. (inch size)	Power Rating <sup>(3)</sup> at 70 °C (W)	Limiting Element Voltage <sup>(1)</sup> (V)	Maximum Overload Voltage <sup>(2)</sup> (V)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. ( $\times 10^{-6}/^{\circ}\text{C}$ )	Category Temperature Range (°C)
ERJPA2 (0402)	0.20	50	100	$\pm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

- (1) Rated Continuous Working Voltage (RCWW) shall be determined from  $\text{RCWW} = \sqrt{\text{Power Rating} \times \text{Resistance Values}}$ , or Limiting Element Voltage listed above, whichever less.  
 (2) Overload (Short-time Overload) Test Voltage (SOTV) shall be determined from  $\text{SOTV} = 2.5 \times \text{RCWW}$  or max. Overload Voltage listed above whichever less.  
 (3) Use it on the condition that the case temperature is below 155 °C.

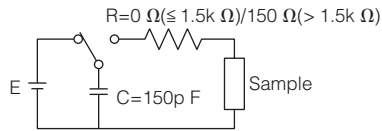
### Power Derating Curve

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)

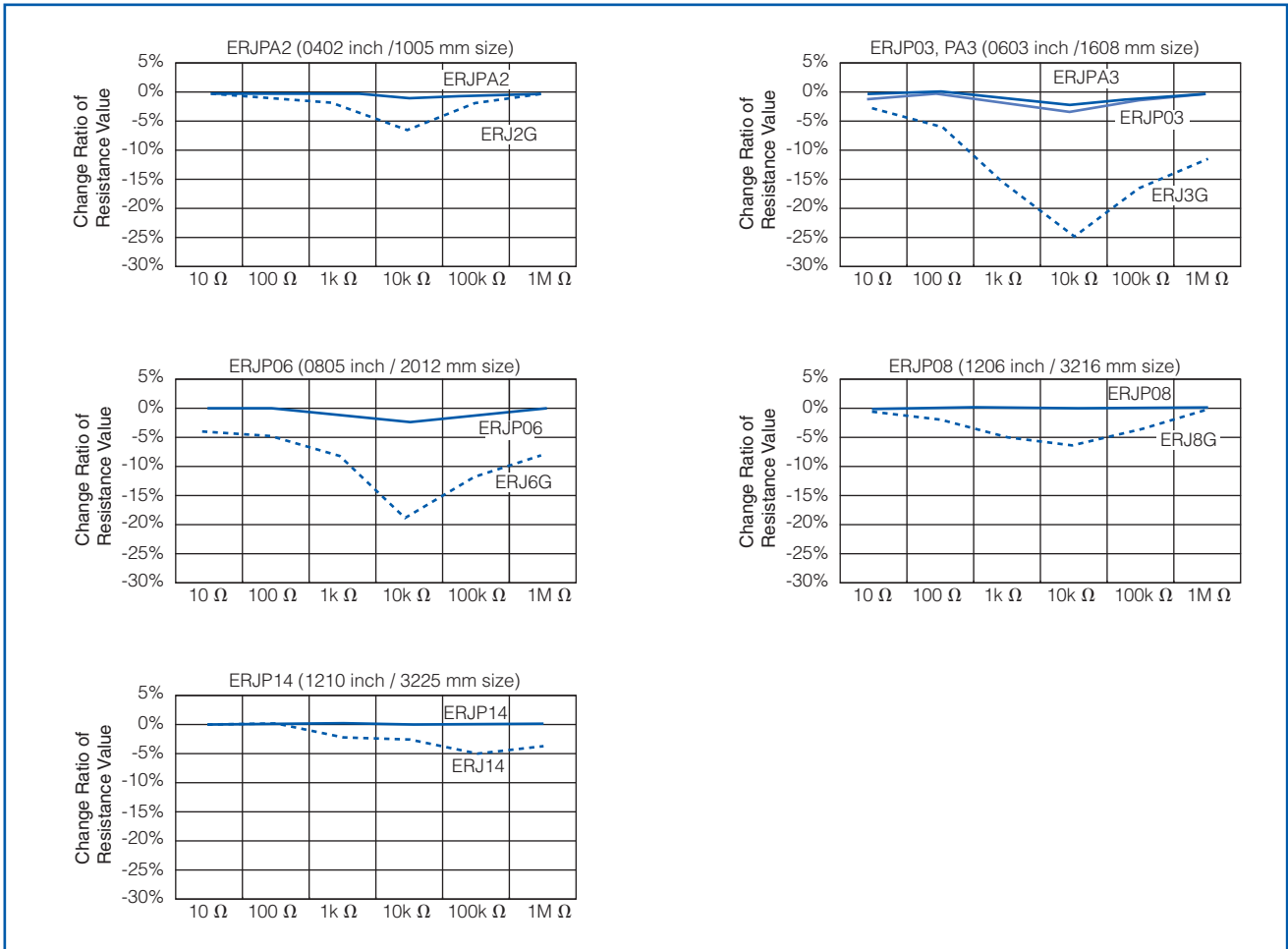


## ESD Characteristic



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)



## Anti-Pulse Thick Film Chip Resistors



Type: **ERJ T06, T08, T14**  
**ERJ T14L**

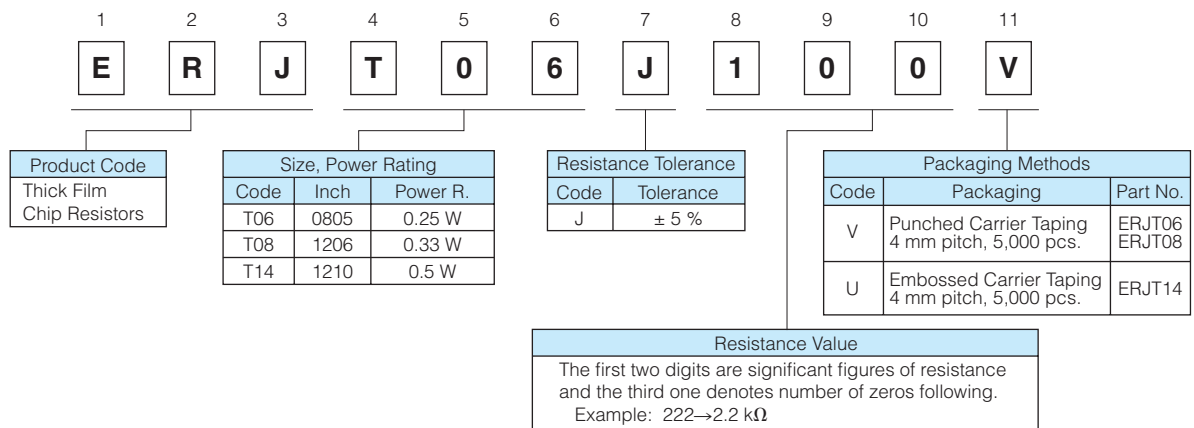
### Features

- Anti-Pulse characteristics  
High pulse characteristics achieved by the optimized trimming specifications (ERJT06, T08, T14)
- Further high pulse characteristics achieved by trimming-less specifications (ERJT14L)
- High reliability  
Metal glaze thick film resistive element and three layers of electrodes
- Suitable for both reflow and flow soldering
- High power ... 0.25W : 0805 inch / 2012 mm size (ERJT06)  
0.33W : 1206 inch / 3216 mm size (ERJT08)  
0.50W : 1210 inch / 3225 mm size (ERJT14, ERJT14L)
- Reference Standards...IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B
- AEC-Q200 qualified
- RoHS compliant

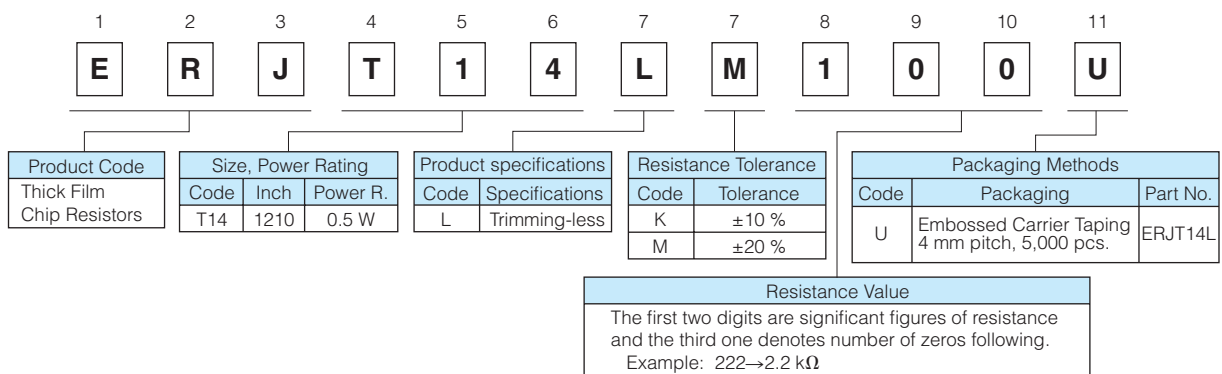
■ **As for Packaging Methods, Land Pattern, Soldering Conditions and Safety Precautions,**  
Please see Data Files

### Explanation of Part Numbers

- ERJT06, T08, T14 Type

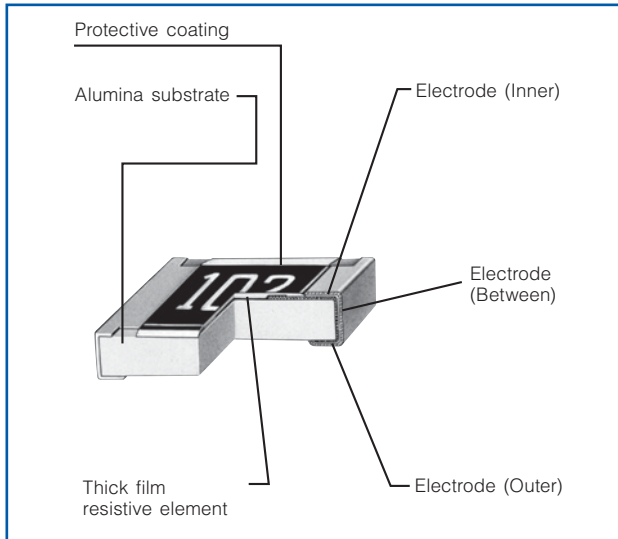


- ERJT14L Type

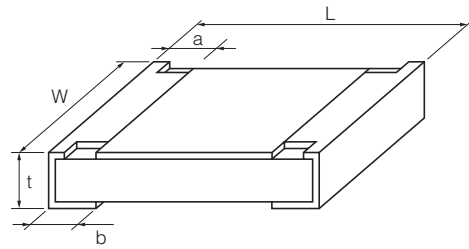


\* Please contact us for 2012 (mm) and 3216 (mm) size trimming-less types.

## Construction



## Dimensions in mm (not to scale)



Part No. (inch size)	Dimensions (mm)					Mass (Weight) [g/1000 pcs.]
	L	W	a	b	t	
ERJT06 (0805)	2.00 <sup>+0.20</sup>	1.25 <sup>+0.10</sup>	0.25 <sup>+0.20</sup>	0.40 <sup>+0.20</sup>	0.60 <sup>+0.10</sup>	4
ERJT08 (1206)	3.20 <sup>+0.05</sup> <sub>-0.20</sub>	1.60 <sup>+0.05</sup> <sub>-0.15</sub>	0.40 <sup>+0.20</sup>	0.50 <sup>+0.20</sup>	0.60 <sup>+0.10</sup>	10
ERJT14 ERJT14L (1210)	3.20 <sup>+0.20</sup>	2.50 <sup>+0.20</sup>	0.35 <sup>+0.20</sup>	0.50 <sup>+0.20</sup>	0.60 <sup>+0.10</sup>	16

## Ratings

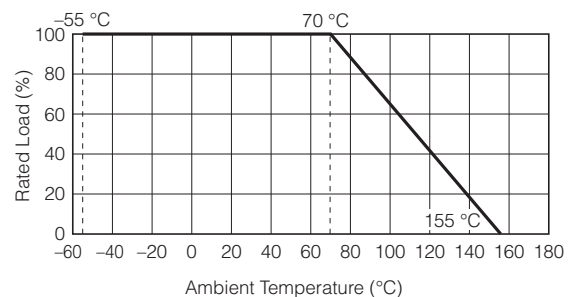
Part No. (inch size)	Power Rating at 70 °C (W)	Limiting Element Voltage <sup>(1)</sup> (V)	Maximum Overload Voltage <sup>(2)</sup> (V)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. (×10 <sup>-6</sup> /°C)	Category Temperature Range (°C)
ERJT06 (0805)	0.25	150	200	±5	1 to 1 M (E24)	Less than 10 Ω : -100 to +600 Less than 33 Ω : ±300 More than 33 Ω : ±200	-55 to +155
ERJT08 (1206)	0.33	200	400	±5	1 to 1 M (E24)	Less than 10 Ω : -100 to +600 More than 10 Ω : ±200	-55 to +155
ERJT14 (1210)	0.50	200	400	±5	1 to 1 M (E24)	Less than 10 Ω : -100 to +600 More than 10 Ω : ±200	-55 to +155
ERJT14L (1210)	0.50	200	400	±10 ±20	1 to 1 M (E12)	Less than 10 Ω : -100 to +600 More than 10 Ω : ±200	-55 to +155

(1) Rated Continuous Working Voltage (RCWV) shall be determined from  $RCWV = \sqrt{\text{Power Rating} \times \text{Resistance Values}}$ , or Limiting Element Voltage listed above, whichever less.

(2) Overload (Short-time Overload) Test Voltage (SOTV) shall be determined from  $SOTV = 2.5 \times RCWV$  or max. Overload Voltage listed above whichever less.

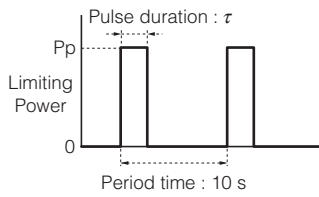
### Power Derating Curve

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



## Limiting Power Curve

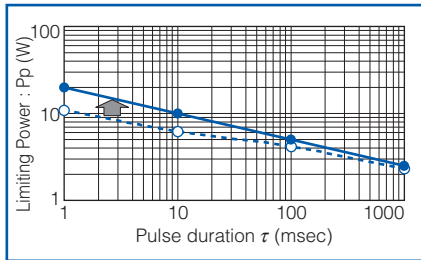
- In rush pulse Characteristic



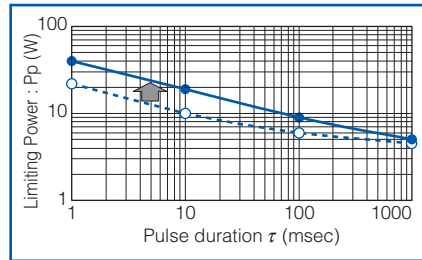
Test cycle : 1000 cycles  
Spec : Resistance value = within  $\pm 5\%$

- ▲ : Anti-Pulse Thick Film Chip Resistors (ERJT14L Type)
- : Anti-Pulse Thick Film Chip Resistors (ERJT Type)
- : Thick Film Chip Resistors (ERJ Type)

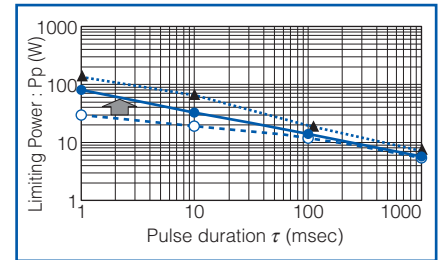
- ERJT06 (0805 inch/2012 mm size)



- ERJT08 (1206 inch/3216 mm size)



- ERJT14,ERJT14L (1210 inch/3225 mm size)



\* Please contact us for 2012 (mm) and 3216 (mm) size trimming-less types.

## Anti-Surge Thick Film Chip Resistors (Double-sided resistive elements structure) 0805

Type: **ERJ P6W**

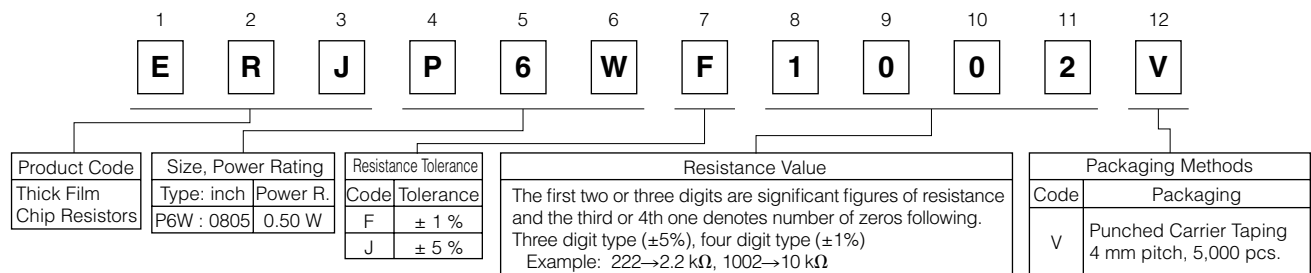
### ■ Features

- 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 ··· 0.50 W : 2012(0805) size(ERJP6W)
- High pulse characteristics ··· 1.5 times higher than 0805 inch size Anti-Surge Thick Film Chip Resistors (ERJP06)
- Reference Standards ··· IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B
- AEC-Q200 qualified
- RoHS compliant

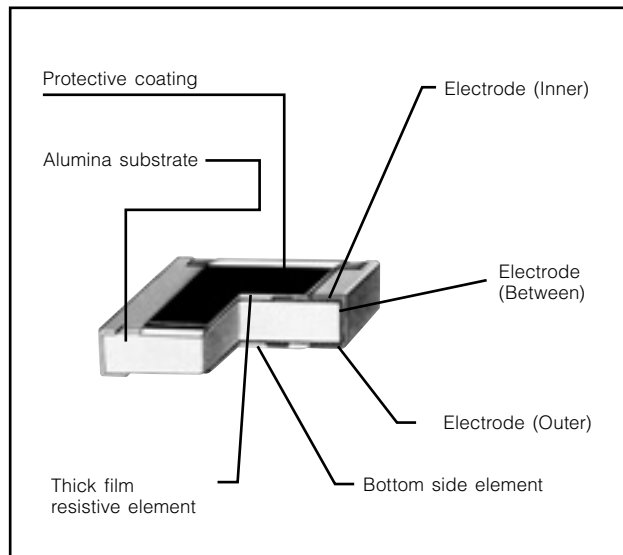
### ■ Packaging Methods, Land Pattern, Soldering Conditions and Safety Precautions

Please see Data Files

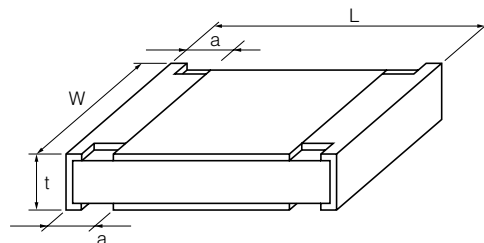
### ■ Explanation of Part Numbers



### ■ Construction



### ■ Dimensions in mm (not to scale)



Type (inch size)	Dimensions (mm)				Mass (Weight) [g/1000 pcs.]
	L	W	a	t	
ERJP6W (0805)	2.00±0.20	1.25±0.20	0.35±0.20	0.65±0.10	6

### ■ Ratings

Type (inch size)	Power Rating <sup>(3)</sup> at 70 °C (W)	Limiting Element Voltage <sup>(1)</sup> (V)	Maximum Overload Voltage <sup>(2)</sup> (V)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. (×10 <sup>-6</sup> /°C)	Category Temperature Range (°C)
ERJP6W (0805)	0.50	150	200	±1	10 to 1 M (E24, E96)	±200	-55 to +155
				±5	1 to 1 M (E24)	R < 10 Ω : -100 to +600 10 Ω ≤ R : ±200	

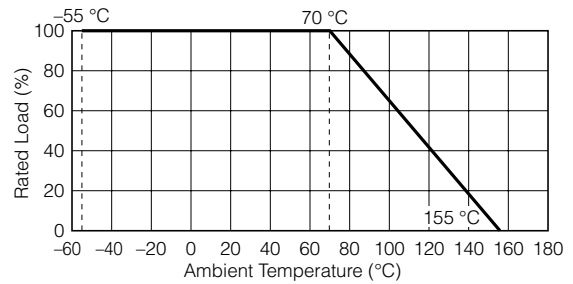
(1) Rated Continuous Working Voltage (RCWV) shall be determined from  $RCWV = \sqrt{\text{Power Rating} \times \text{Resistance Values}}$ , or Limiting Element Voltage listed above, whichever less.

(2) Overload (Short-time Overload) Test Voltage (SOTV) shall be determined from  $SOTV = 2.5 \times \text{Power Rating}$  or max. Overload Voltage listed above whichever less.

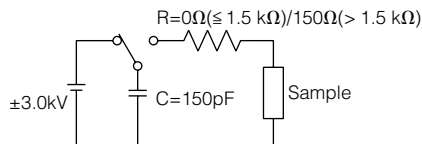
(3) Use it on the condition that the case temperature is below 155 °C.

### Power Derating Curve

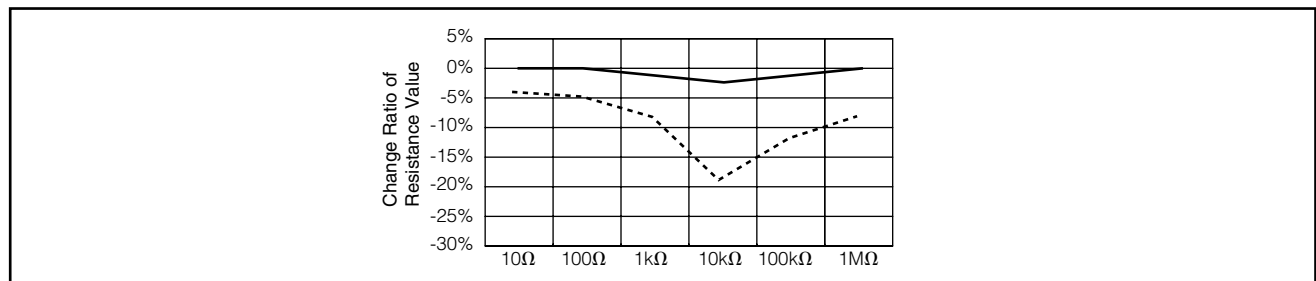
For resistors operated in ambient temperatures above 70 °C, power rating shall be derated in accordance with the figure on the right.



### ■ ESD Characteristic

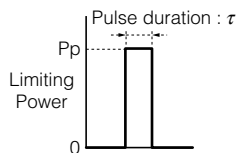


— Anti-Surge Thick Film Chip Resistors (ERJP6W Type)  
 - - - Thick Film Chip Resistors (ERJ6G Type)



### ■ Limiting Power Curve

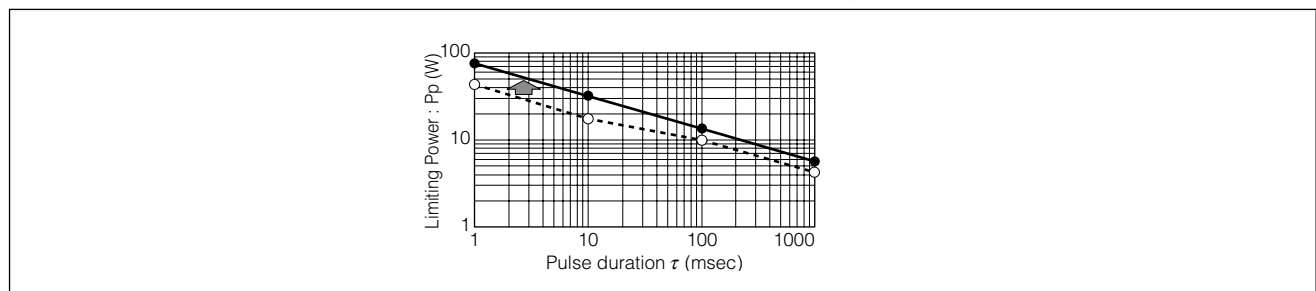
● In rush pulse Characteristic



Test cycle : 1 cycles

Spec : Resistance value = within ±1%

— Anti-Surge Thick Film Chip Resistors (ERJP6W Type)  
 - - - Anti-Surge Thick Film Chip Resistors (ERJP06 Type)





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