

### Anti-Surge Thick Film Chip Resistors 0603, 0805, 1206, 1210

Type: **ERJ P03, 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...
  - 0.2 W : 1608(0603) size
  - 0.25 W : 2012(0805) size
  - 0.33 W : 3216(1206) size
  - 0.5 W : 3225(1210) size
- Reference Standards...IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B

#### ■ Packaging Methods

Please see Pages 40 to 43

#### ■ Recommended Land Pattern

Please see Pages 44 to 45

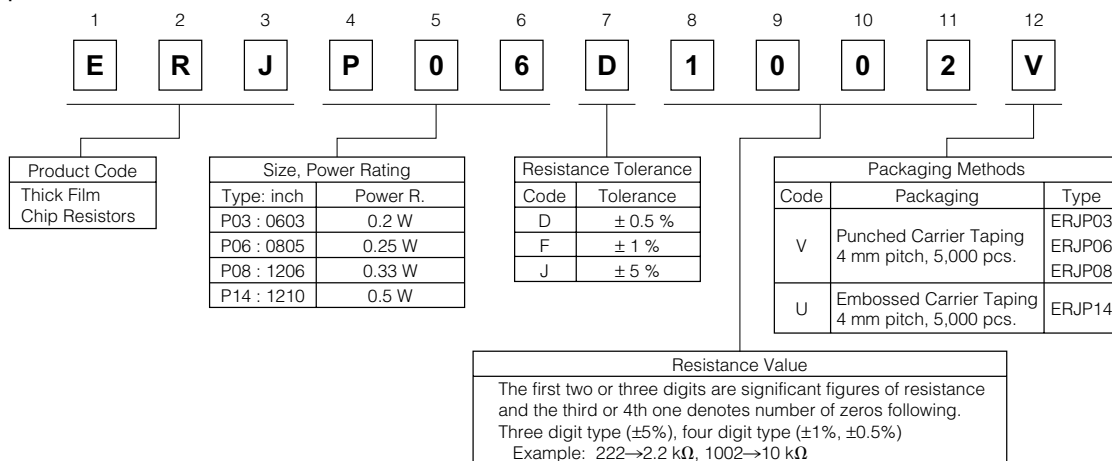
#### ■ Recommended Soldering Conditions

Please see Page 46

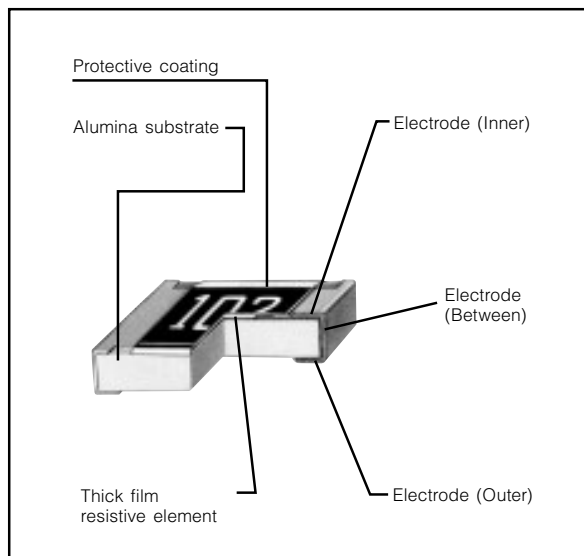
#### ■ Safety Precautions

Please see Page 47

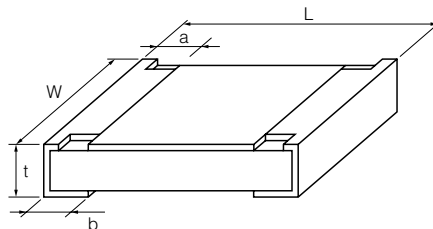
#### ■ Explanation of Part Numbers



#### ■ Construction



#### ■ Dimensions in mm (not to scale)



Type (inch size)	Dimensions (mm)					Mass (Weight) [g/1000 pcs.]
	L	W	a	b	t	
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
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

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Should a safety concern arise regarding this product, please be sure to contact us immediately.

00 Sep. 2010

### ■ Ratings

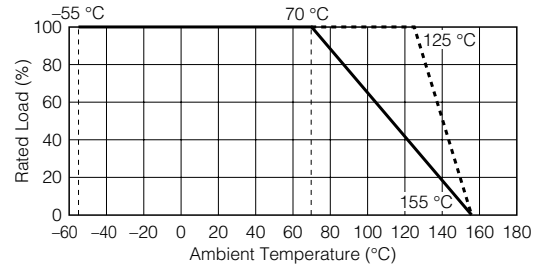
Type (inch size)	Power Rating at 70 °C (W)	Limiting Element Voltage <sup>(1)</sup> (V)	Maximum Overload Voltage <sup>(2)</sup> (V)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. (×10 <sup>-6</sup> /°C)	Category Temperature Range (°C)
ERJP03 (0603)	0.2	150	200	±0.5	10 to 1 M (E24, E96)	±150	-55 to +155
				±1	10 to 1 M (E24, E96)	±200	
				±5	1 to 1 M (E24)	±200 Less than 10 Ω : -150 to +400	
ERJP06 (0805)	0.25	150 (400) <sup>(3)</sup>	200 (600) <sup>(3)</sup>	±0.5, ±1	10 to 1 M (E24, E96)	Less than 33 Ω : ±300 More than 33 Ω : ±100	-55 to +155
				±5	1 to 3.3 M (E24)	Less than 33 Ω : ±300 More than 33 Ω : ±200	
ERJP08 (1206)	0.33	200 (500) <sup>(3)</sup>	400 (1000) <sup>(3)</sup>	±0.5, ±1	10 to 1 M (E24, E96)	±100	-55 to +155
				±5	1 to 10 M (E24)	Less than 10 Ω : -100 to +600 More than 10 Ω : ±200	
ERJP14 (1210)	0.5	200	400	±0.5, ±1	10 to 1 M (E24, E96)	±100	-55 to +155
				±5	1 to 1 M (E24)	Less than 10 Ω : -100 to +600 More than 10 Ω : ±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) Please contact us when resistors with guaranteed high voltage are need.

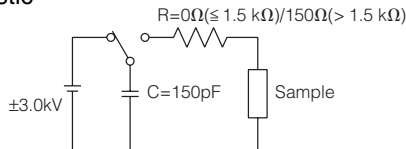
### Power Derating Curve

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

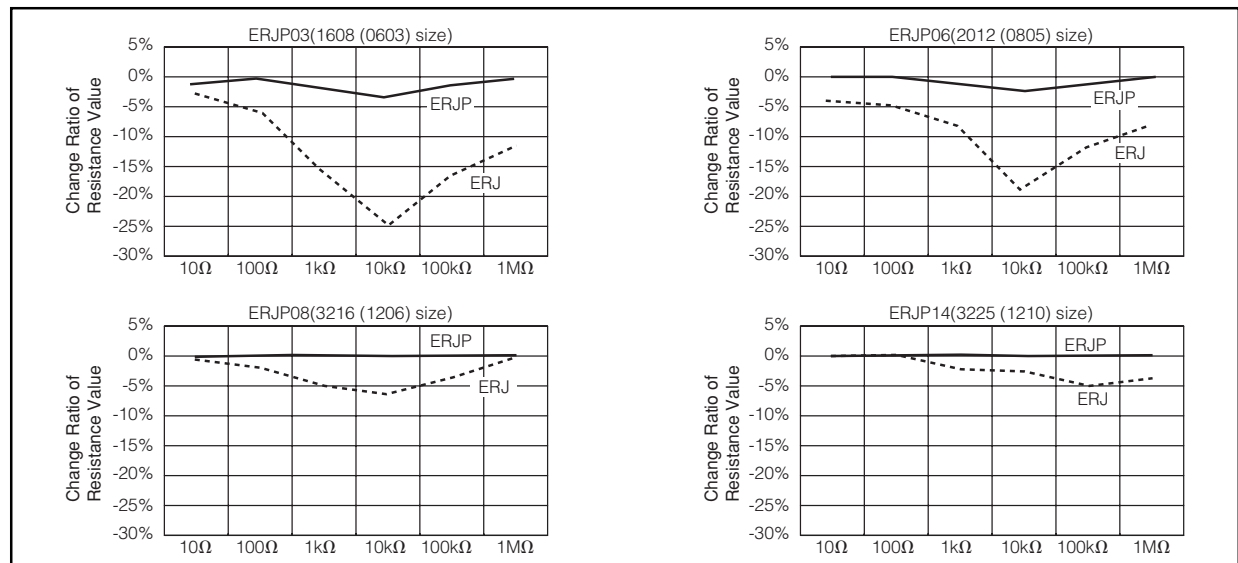
\* When the temperature of ERJP06/08/14 is 155 °C or less, the derating start temperature can be changed to 125 °C. (See the dotted line)



### ■ ESD Characteristic



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



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### Anti-Pulse Thick Film Chip Resistors 0805, 1206, 1210

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



#### ■ Features

- Anti-Pulse characteristics  
High pulse characteristics achieved by the optimized trimming specifications
- High reliability  
Metal glaze thick film resistive element and three layers of electrodes
- Suitable for both reflow and flow soldering
- High power...
  - 0.25 W : 2012(0805) size
  - 0.33 W : 3216(1206) size
  - 0.5 W : 3225(1210) size
- Reference Standards...IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B

#### ■ Packaging Methods

Please see Pages 40 to 43

#### ■ Recommended Land Pattern

Please see Pages 44 to 45

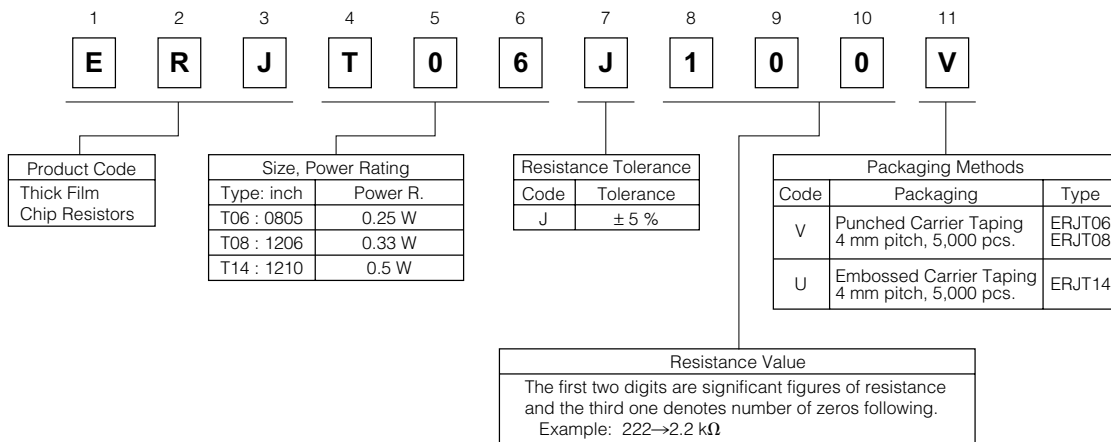
#### ■ Recommended Soldering Conditions

Please see Page 46

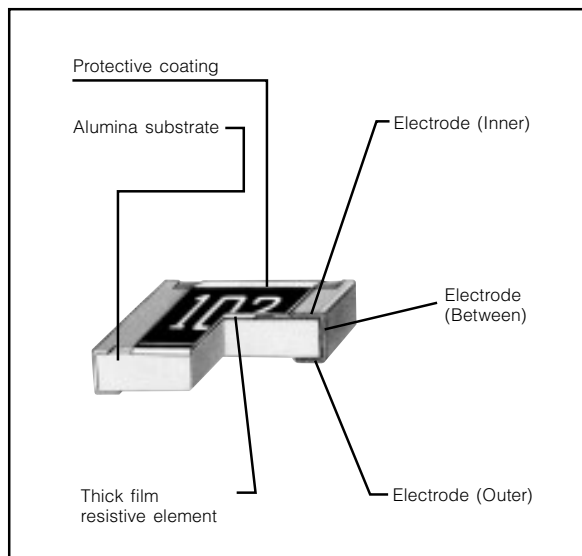
#### ■ Safety Precautions

Please see Page 47

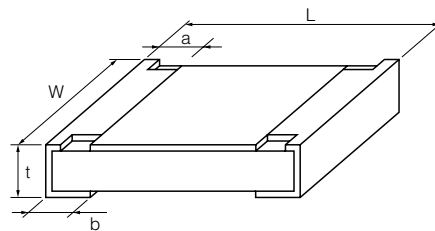
#### ■ Explanation of Part Numbers



#### ■ Construction



#### ■ Dimensions in mm (not to scale)



Type (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 (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

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00 Sep. 2010

### ■ Ratings

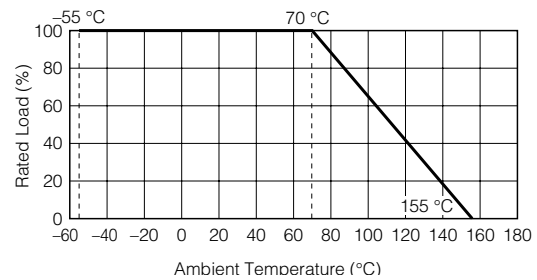
Type (inch size)	Power Rating at 70 °C (W)	Limiting Element Voltage <sup>(1)</sup> (V)	Maximum Overload Voltage <sup>(2)</sup> (V)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. ( $\times 10^{-6}/^{\circ}\text{C}$ )	Category Temperature Range (°C)
ERJT06 (0805)	0.25	150	200	±5	1 to 1 M (E24)	Less 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)	0.5	200	400	±5	1 to 1 M (E24)	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  $\text{RCWV} = \sqrt{\text{Power Rating} \times \text{Resistance Values}}$ , or Limiting Element Voltage listed above, whichever less.

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

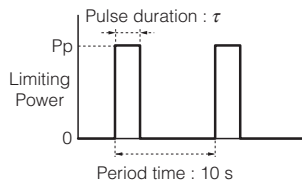
### Power Derating Curve

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

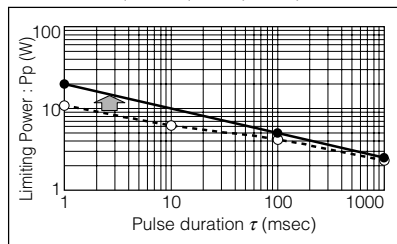
- In rush pulse Characteristic



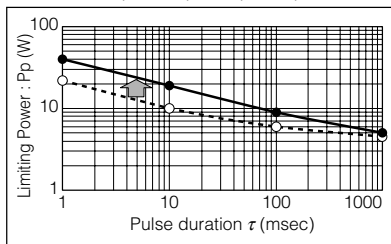
Test cycle : 1000 cycles  
Spec : Resistance value = within ±5%

● : Anti-Pulse Thick Film Chip Resistors (ERJT Type)  
○ : Thick Film Chip Resistors (ERJ Type)

#### ● ERJT06 (2012 (0805) size)



#### ● ERJT08 (3216 (1206) size)



#### ● ERJT14 (3225 (1210) size)

