

### 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

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#### ■ Safety Precautions

Please see Page 47

#### ■ Explanation of Part Numbers



#### ■ Construction



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



| Type<br>(inch size) | Dimensions (mm)                        |  |  |                       |                       | Mass (Weight)<br>[g/1000 pcs.] |
|---------------------|--|--|--|-----------------------|-----------------------|--------------------------------|
|                     | L                                      | W                                      | a                                      | b                     | t                     |                                |
| ERJP03<br>(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<br>(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<br>(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<br>(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                             |

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.  
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<br>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<br>More than 33 Ω : ±100         | -55 to +155                     |
|                  |                           |   |   | ±5                       | 1 to 3.3 M (E24)     | Less than 33 Ω : ±300<br>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<br>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<br>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

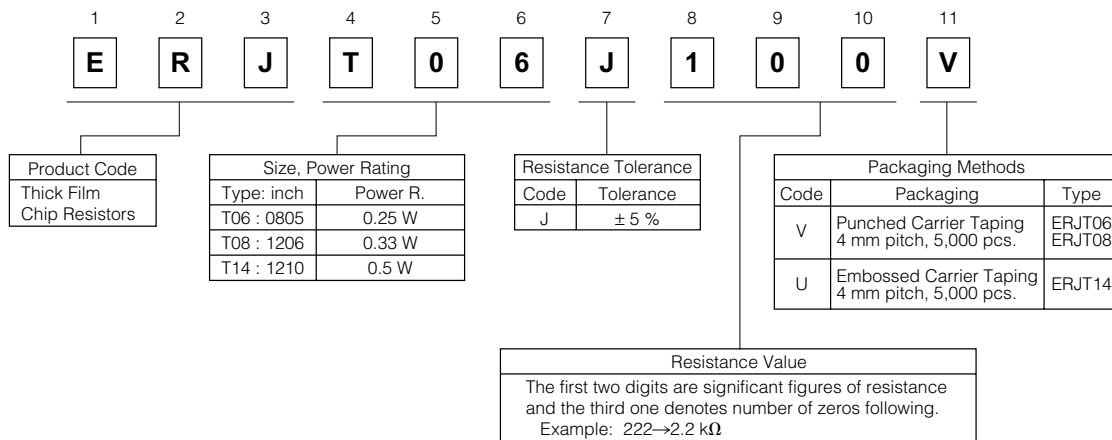
#### ■ Recommended Soldering Conditions

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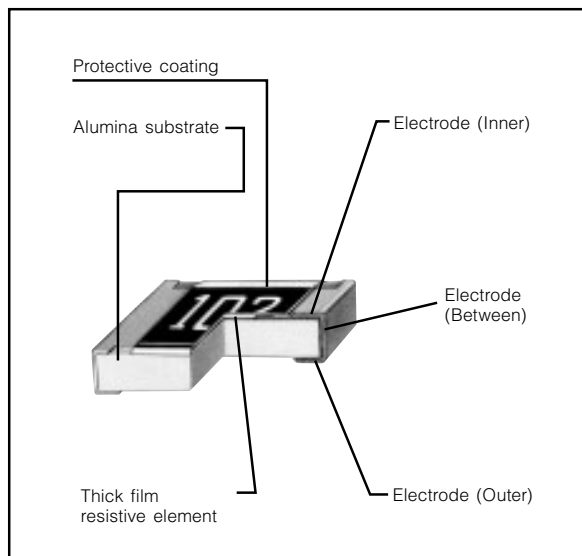
#### ■ Safety Precautions

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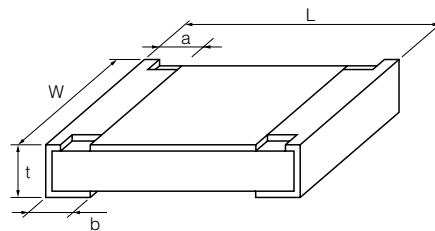
#### ■ Explanation of Part Numbers



#### ■ Construction



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



| Type<br>(inch size) | Dimensions (mm)                        |  |                       |                       |                       | Mass (Weight)<br>[g/1000 pcs.] |
|---------------------|--|--|-----------------------|-----------------------|-----------------------|--------------------------------|
|                     | L                                      | W                                      | a                     | b                     | t                     |                                |
| ERJT06<br>(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<br>(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<br>(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<br>(inch size) | Power Rating<br>at 70 °C<br>(W) | Limiting<br>Element<br>Voltage <sup>(1)</sup><br>(V) | Maximum<br>Overload<br>Voltage <sup>(2)</sup><br>(V) | Resistance<br>Tolerance<br>(%) | Resistance<br>Range<br>(Ω) | T.C.R.<br>(×10 <sup>-6</sup> /°C)   | Category<br>Temperature<br>Range<br>(°C) |
|---------------------|---------------------------------|--|--|--------------------------------|----------------------------|---|--|
| ERJT06<br>(0805)    | 0.25                            | 150  | 200  | ±5                             | 1 to 1 M<br>(E24)          | Less than 10 Ω : -100 to +600<br>Less than 33 Ω : ±300<br>More than 33 Ω : ±200 | -55 to +155                              |
| ERJT08<br>(1206)    | 0.33                            | 200  | 400  | ±5                             | 1 to 1 M<br>(E24)          | Less than 10 Ω : -100 to +600<br>More than 10 Ω : ±200                          | -55 to +155                              |
| ERJT14<br>(1210)    | 0.5                             | 200  | 400  | ±5                             | 1 to 1 M<br>(E24)          | Less than 10 Ω : -100 to +600<br>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  $SOTV = 2.5 \times \text{Power Rating}$  or max. Overload Voltage listed above whichever less.

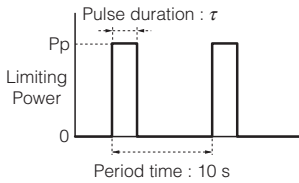
### Power Derating Curve

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)

