

### Anti-Sulfurated Thick Film Chip Resistors

ERJ S : 0402, 0603, 0805, 1206, 1210, 1812, 2010, 2512

ERJ U : 0201, 0402, 0603, 0805, 1206, 1210, 1812, 2010, 2512

Type: **ERJ S02, S03, S06, S08, S14 S12, S1D, S1T (Au-based inner electrode type)**

Type: **ERJ U01, U02, U03, U06, U08, U14, U12, U1D, U1T (Ag-Pd-based inner electrode type)**



#### ■ Features

- High resistance to sulfurization achieved by adopting an Au-based inner electrode (ERJS type) and Ag-Pd-based inner electrode (ERJU type)
- High reliability  
Metal glaze thick film resistive element and three layers of electrodes
- Suitable for both reflow and flow soldering
- Reference Standard: IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B ● RoHS compliant

■ 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

|          |          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 1        | 2        | 3        | 4        | 5        | 6        | 7        | 8        | 9        | 10       | 11       | 12       |
| <b>E</b> | <b>R</b> | <b>J</b> | <b>S</b> | <b>0</b> | <b>6</b> | <b>F</b> | <b>1</b> | <b>0</b> | <b>0</b> | <b>2</b> | <b>V</b> |

**Product Code**  
Thick Film Chip Resistors

| Size, Power Rating |          |                 |          |
|--------------------|----------|-----------------|----------|
| Type: inch         | Power R. | Type: inch      | Power R. |
| U01 : 0201         | 0.05 W   | S14, U14 : 1210 | 0.5 W    |
| S02, U02 : 0402    | 0.1 W    | S12, U12 : 1812 | 0.75 W   |
| S03, U03 : 0603    | 0.1 W    | S1D, U1D : 2010 | 0.75 W   |
| S06, U06 : 0805    | 0.125 W  | S1T, U1T : 2512 | 1 W      |
| S08, U08 : 1206    | 0.025 W  |                 |          |

**Resistance Tolerance**

| Code | Tolerance |
|------|-----------|
| F    | ± 1 %     |
| J    | ± 5 %     |
| 0    | Jumper    |

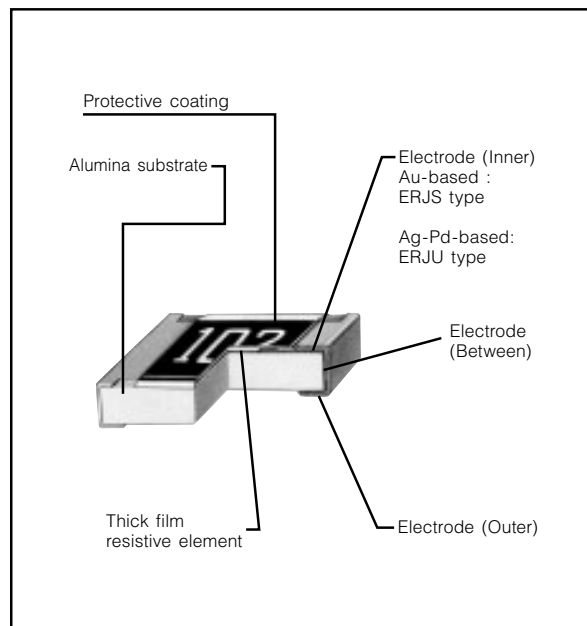
**Resistance Value**

The first two or three digits are significant figures of resistance and the third or 4th one denotes number of zeros following. Jumper is expressed by R00. Three digit type (±5%), four digit type (±1%)  
Example: 222→2.2 kΩ, 1002→10 kΩ

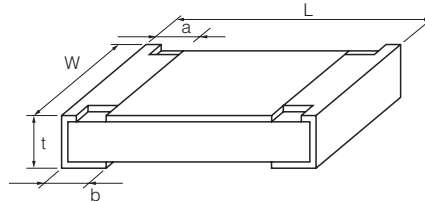
**Packaging Methods**

| Code | Packaging   | Type   |
|------|---|--|
| C    | Pressed Carrier Taping<br>2 mm pitch, 15,000 pcs. | ERJU01   |
| X    | Punched Carrier Taping<br>2 mm pitch, 10,000 pcs. | ERJS02, ERJU02                                     |
| V    | Punched Carrier Taping<br>4 mm pitch, 5,000 pcs.  | ERJS03, ERJU03<br>ERJS06, ERJU06<br>ERJS08, ERJU08 |
| U    | Embossed Carrier Taping<br>4 mm pitch, 5,000 pcs. | ERJS14, ERJU14<br>ERJS12, ERJU12<br>ERJS1D, ERJU1D |
|      | Embossed Carrier Taping<br>4 mm pitch, 4,000 pcs. | ERJS1T, ERJU1T                                     |

#### ■ Construction



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



| Type (inch size) | Dimensions (mm)                                |  |                       |                       |                       | Mass (Weight) [g/1000 pcs.] |
|------------------|--|--|-----------------------|-----------------------|-----------------------|-----------------------------|
|                  | L  | W  | a                     | b                     | t                     |                             |
| ERJU01 (0201)    | 0.60 <sup>+0.03</sup>                          | 0.30 <sup>+0.03</sup>                          | 0.10 <sup>+0.05</sup> | 0.15 <sup>+0.05</sup> | 0.23 <sup>+0.03</sup> | 0.15                        |
| ERJS02<br>ERJU02 | 1.00 <sup>+0.05</sup>                          | 0.50 <sup>+0.05</sup>                          | 0.20 <sup>+0.10</sup> | 0.25 <sup>+0.10</sup> | 0.35 <sup>+0.05</sup> | 0.8                         |
| ERJS03<br>ERJU03 | 1.60 <sup>+0.15</sup>                          | 0.80 <sup>+0.15</sup><br>0.80 <sup>-0.05</sup> | 0.30 <sup>+0.20</sup> | 0.30 <sup>+0.15</sup> | 0.45 <sup>+0.10</sup> | 2                           |
| ERJS06<br>ERJU06 | 2.00 <sup>+0.20</sup>                          | 1.25 <sup>+0.10</sup>                          | 0.40 <sup>+0.20</sup> | 0.40 <sup>+0.20</sup> | 0.60 <sup>+0.10</sup> | 4                           |
| ERJS08<br>ERJU08 | 3.20 <sup>+0.05</sup><br>3.20 <sup>-0.20</sup> | 1.60 <sup>+0.05</sup><br>1.60 <sup>-0.15</sup> | 0.50 <sup>+0.20</sup> | 0.50 <sup>+0.20</sup> | 0.60 <sup>+0.10</sup> | 10                          |
| ERJS14<br>ERJU14 | 3.20 <sup>+0.20</sup>                          | 2.50 <sup>+0.20</sup>                          | 0.50 <sup>+0.20</sup> | 0.50 <sup>+0.20</sup> | 0.60 <sup>+0.10</sup> | 16                          |
| ERJS12<br>ERJU12 | 4.50 <sup>+0.20</sup>                          | 3.20 <sup>+0.20</sup>                          | 0.50 <sup>+0.20</sup> | 0.50 <sup>+0.20</sup> | 0.60 <sup>+0.10</sup> | 27                          |
| ERJS1D<br>ERJU1D | 5.00 <sup>+0.20</sup>                          | 2.50 <sup>+0.20</sup>                          | 0.60 <sup>+0.20</sup> | 0.60 <sup>+0.20</sup> | 0.60 <sup>+0.10</sup> | 27                          |
| ERJS1T<br>ERJU1T | 6.40 <sup>+0.20</sup>                          | 3.20 <sup>+0.20</sup>                          | 0.65 <sup>+0.20</sup> | 0.60 <sup>+0.20</sup> | 0.60 <sup>+0.10</sup> | 45                          |

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### ■ Ratings

<For Resistor>

| 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>( $\times 10^{-6}/^{\circ}\text{C}$ )   | Category<br>Temperature<br>Range<br>(°C) |
|----------------------------|---------------------------------|--|--|--------------------------------|----------------------------|---|--|
| ERJU01<br>(0201)           | 0.05                            | 25   | 50   | ±1                             | 10 to 1 M (E24, E96)       | <10 Ω:<br>-100 to +600<br><br>10 Ω to 1 MΩ:<br>±200(±5%)<br>±100(±1%)*<br><br>*ERJU01,<br>ERJS02,<br>ERJU02 :<br>±200<br><br>1 MΩ<:<br>-400 to +150 | -55 to +125                              |
|                            |                                 |  |  | ±5                             | 1 to 1 M (E24)             |   |  |
| ERJS02<br>ERJU02<br>(0402) | 0.1                             | 50   | 100  | ±1                             | 10 to 1 M (E24, E96)       |   | -55 to +155                              |
|                            |                                 |  |  | ±5                             | 1 to 3.3 M (E24)           |   |  |
| ERJS03<br>ERJU03<br>(0603) | 0.1                             | 75   | 150  | ±1                             | 10 to 1 M (E24, E96)       |   | -55 to +155                              |
|                            |                                 |  |  | ±5                             | 1 to 10 M (E24)            |   |  |
| ERJS06<br>ERJU06<br>(0805) | 0.125                           | 150  | 200  | ±1                             | 10 to 1 M (E24, E96)       |   | -55 to +155                              |
|                            |                                 |  |  | ±5                             | 1 to 10 M (E24)            |   |  |
| ERJS08<br>ERJU08<br>(1206) | 0.25                            | 200  | 400  | ±1                             | 10 to 1 M (E24, E96)       |   | -55 to +155                              |
|                            |                                 |  |  | ±5                             | 1 to 10 M (E24)            |   |  |
| ERJS14<br>ERJU14<br>(1210) | 0.5                             | 200  | 400  | ±1                             | 10 to 1 M (E24, E96)       | -55 to +155   |  |
|                            |                                 |  |  | ±5                             | 1 to 10 M (E24)            |   |  |
| ERJS12<br>ERJU12<br>(1812) | 0.75                            | 200  | 500  | ±1                             | 10 to 1 M (E24, E96)       | -55 to +155   |  |
|                            |                                 |  |  | ±5                             | 1 to 10 M (E24)            |   |  |
| ERJS1D<br>ERJU1D<br>(2010) | 0.75                            | 200  | 500  | ±1                             | 10 to 1 M (E24, E96)       | -55 to +155   |  |
|                            |                                 |  |  | ±5                             | 1 to 10 M (E24)            |   |  |
| ERJS1T<br>ERJU1T<br>(2512) | 1.0                             | 200  | 500  | ±1                             | 10 to 1 M (E24, E96)       | -55 to +155   |  |
|                            |                                 |  |  | ±5                             | 1 to 10 M (E24)            |   |  |

(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.

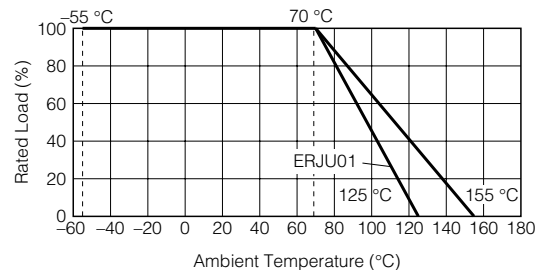
(2) Overload (Short-time Overload) Test Voltage (SOTV) shall be determined from  $\text{SOTV} = 2.5 \times \text{Power Rating}$  or max. Overload Voltage listed above whichever less.

<For Jumper>

| Type<br>(inch size)        | Rated Current<br>(A) | Maximum Overload Current<br>(A) |
|----------------------------|----------------------|---------------------------------|
| ERJU01<br>(0201)           | 0.5                  | 1                               |
| ERJS02<br>ERJU02<br>(0402) | 1                    | 2                               |
| ERJS03<br>ERJU03<br>(0603) |                      |                                 |
| ERJS06<br>ERJU06<br>(0805) | 2                    | 4                               |
| ERJS08<br>ERJU08<br>(1206) |                      |                                 |
| ERJS14<br>ERJU14<br>(1210) |                      |                                 |
| ERJS12<br>ERJU12<br>(1812) |                      |                                 |
| ERJS1D<br>ERJU1D<br>(2012) |                      |                                 |
| ERJS1T<br>ERJU1T<br>(2512) |                      |                                 |

### Power Derating Curve

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



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