

### 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                          |

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.

### ■ 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>(×10 <sup>-6</sup> /°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  $RCWV = \sqrt{\text{Power Rating} \times \text{Resistance Values}}$ , 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.

<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.



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.

01 Mar. 2011