

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 |
| E | R | J | S | 0 | 6 | F | 1 | 0 | 0 | 2 | V |

Product Code
Thick Film Chip Resistors

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

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

| 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 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 | |

■ 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 ^{+0.03} | 0.30 ^{+0.03} | 0.10 ^{+0.05} | 0.15 ^{+0.05} | 0.23 ^{+0.03} | 0.15 |
| ERJS02 ERJU02 | 1.00 ^{+0.05} | 0.50 ^{+0.05} | 0.20 ^{+0.10} | 0.25 ^{+0.10} | 0.35 ^{+0.05} | 0.8 |
| ERJS03 ERJU03 | 1.60 ^{+0.15} | 0.80 ^{+0.15} 0.80 ^{-0.05} | 0.30 ^{+0.20} | 0.30 ^{+0.15} | 0.45 ^{+0.10} | 2 |
| ERJS06 ERJU06 | 2.00 ^{+0.20} | 1.25 ^{+0.10} | 0.40 ^{+0.20} | 0.40 ^{+0.20} | 0.60 ^{+0.10} | 4 |
| ERJS08 ERJU08 | 3.20 ^{+0.05} 3.20 ^{-0.20} | 1.60 ^{+0.05} 1.60 ^{-0.15} | 0.50 ^{+0.20} | 0.50 ^{+0.20} | 0.60 ^{+0.10} | 10 |
| ERJS14 ERJU14 | 3.20 ^{+0.20} | 2.50 ^{+0.20} | 0.50 ^{+0.20} | 0.50 ^{+0.20} | 0.60 ^{+0.10} | 16 |
| ERJS12 ERJU12 | 4.50 ^{+0.20} | 3.20 ^{+0.20} | 0.50 ^{+0.20} | 0.50 ^{+0.20} | 0.60 ^{+0.10} | 27 |
| ERJS1D ERJU1D | 5.00 ^{+0.20} | 2.50 ^{+0.20} | 0.60 ^{+0.20} | 0.60 ^{+0.20} | 0.60 ^{+0.10} | 27 |
| ERJS1T ERJU1T | 6.40 ^{+0.20} | 3.20 ^{+0.20} | 0.65 ^{+0.20} | 0.60 ^{+0.20} | 0.60 ^{+0.10} | 45 |

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■ Ratings

<For Resistor>

| Type (inch size) | Power Rating at 70 °C (W) | Limiting Element Voltage ⁽¹⁾ (V) | Maximum Overload Voltage ⁽²⁾ (V) | Resistance Tolerance (%) | Resistance Range (Ω) | T.C.R. (×10 ⁻⁶ /°C) | Category Temperature Range (°C) |
|----------------------------|---------------------------------|--|--|--------------------------------|----------------------------|---|--|
| ERJU01 (0201) | 0.05 | 25 | 50 | ±1 | 10 to 1 M (E24, E96) | <10 Ω: -100 to +600 10 Ω to 1 MΩ: ±200(±5%) ±100(±1%)* *ERJU01, ERJS02, ERJU02 : ±200 1 MΩ<: -400 to +150 | -55 to +125 |
| | | | | ±5 | 1 to 1 M (E24) | | |
| ERJS02 ERJU02 (0402) | 0.1 | 50 | 100 | ±1 | 10 to 1 M (E24, E96) | | -55 to +155 |
| | | | | ±5 | 1 to 3.3 M (E24) | | |
| ERJS03 ERJU03 (0603) | 0.1 | 75 | 150 | ±1 | 10 to 1 M (E24, E96) | | -55 to +155 |
| | | | | ±5 | 1 to 10 M (E24) | | |
| ERJS06 ERJU06 (0805) | 0.125 | 150 | 200 | ±1 | 10 to 1 M (E24, E96) | | -55 to +155 |
| | | | | ±5 | 1 to 10 M (E24) | | |
| ERJS08 ERJU08 (1206) | 0.25 | 200 | 400 | ±1 | 10 to 1 M (E24, E96) | | -55 to +155 |
| | | | | ±5 | 1 to 10 M (E24) | | |
| ERJS14 ERJU14 (1210) | 0.5 | 200 | 400 | ±1 | 10 to 1 M (E24, E96) | -55 to +155 | |
| | | | | ±5 | 1 to 10 M (E24) | | |
| ERJS12 ERJU12 (1812) | 0.75 | 200 | 500 | ±1 | 10 to 1 M (E24, E96) | -55 to +155 | |
| | | | | ±5 | 1 to 10 M (E24) | | |
| ERJS1D ERJU1D (2010) | 0.75 | 200 | 500 | ±1 | 10 to 1 M (E24, E96) | -55 to +155 | |
| | | | | ±5 | 1 to 10 M (E24) | | |
| ERJS1T ERJU1T (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 (inch size) | Rated Current (A) | Maximum Overload Current (A) |
|----------------------------|----------------------|---------------------------------|
| ERJU01 (0201) | 0.5 | 1 |
| ERJS02 ERJU02 (0402) | 1 | 2 |
| ERJS03 ERJU03 (0603) | | |
| ERJS06 ERJU06 (0805) | 2 | 4 |
| ERJS08 ERJU08 (1206) | | |
| ERJS14 ERJU14 (1210) | | |
| ERJS12 ERJU12 (1812) | | |
| ERJS1D ERJU1D (2012) | | |
| ERJS1T ERJU1T (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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