

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

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Recommended Land Pattern

Please see Pages 44 to 45

Recommended Soldering Conditions

Please see Page 46

Safety Precautions

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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

| 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 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 |

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) | | <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 +155 | | | | |
| | | | | ±5 | 1 to 3.3 M (E24) | | | | | | | |
| ERJS03 ERJU03 (0603) | 0.1 | 75 | 150 | ±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 +155 | | | |
| | | | | ±5 | 1 to 10 M (E24) | | | | | | | |
| ERJS06 ERJU06 (0805) | 0.125 | 150 | 200 | ±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 +155 | | |
| | | | | ±5 | 1 to 10 M (E24) | | | | | | | |
| ERJS08 ERJU08 (1206) | 0.25 | 200 | 400 | ±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 +155 | |
| | | | | ±5 | 1 to 10 M (E24) | | | | | | | |
| ERJS14 ERJU14 (1210) | 0.5 | 200 | 400 | ±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 +155 |
| | | | | ±5 | 1 to 10 M (E24) | | | | | | | |
| ERJS12 ERJU12 (1812) | 0.75 | 200 | 500 | ±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 +155 |
| | | | | ±5 | 1 to 10 M (E24) | | | | | | | |
| ERJS1D ERJU1D (2010) | 0.75 | 200 | 500 | ±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 +155 |
| | | | | ±5 | 1 to 10 M (E24) | | | | | | | |
| ERJS1T ERJU1T (2512) | 1.0 | 200 | 500 | ±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 +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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