# 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 Soldering Conditions Please see Page 46
■Recommended Land Pattern Please see Pages 44 to 45
■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 FilmChip Resistors |

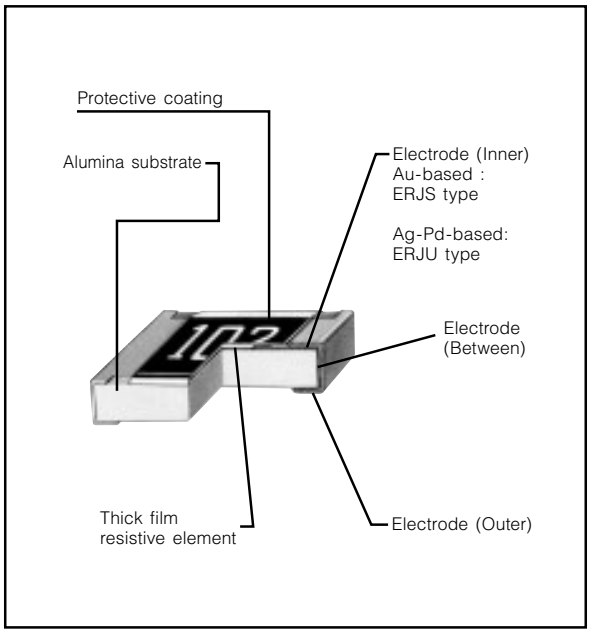
| Size, Power Rating | | | |
|---|---|---|---|
| Type: inch | Power R. | Type: inch | Power R. |
| U01 : 0201 | 0.05 W | S14, U14: 1210 | 0.5 W |
| S02, U02 : 0402 | 0.1 W | S12, U12 : 1812 | 0.75 W |
| S03, U03 : 0603 | 0.1 W | S1D, U1D : 2010 | 0.75 W |
| S06, U06 : 0805 | 0.125 W | S1T, U1T : 2512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

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

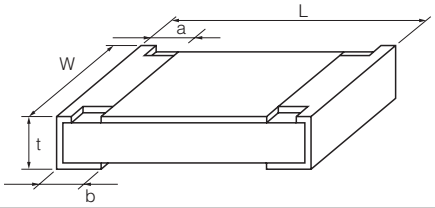
| Resistance Value |
|---|
| The first two or three digits are significant figures of resistance and the third or 4th one denotes number of zeros following. Jumper is expressed by R00. Three digit type (±5%), four digit type (±1%) Example: 222→2.2 kΩ, 1002→10 kΩ |

| 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) | $0.60^{\pm0.03}$ | $0.30^{\pm0.03}$ | $0.10^{\pm0.05}$ | $0.15^{\pm0.05}$ | $0.23^{\pm0.03}$ | 0.15 |
| ERJS02 ERJU02 (0402) | $1.00^{\pm0.05}$ | $0.50^{\pm0.05}$ | $0.20^{\pm0.10}$ | $0.25^{\pm0.10}$ | $0.35^{\pm0.05}$ | 0.8 |
| ERJS03 ERJU03 (0603) | $1.60^{\pm0.15}$ | $0.80^{+0.15}_{-0.05}$ | $0.30^{\pm0.20}$ | $0.30^{\pm0.15}$ | $0.45^{\pm0.10}$ | 2 |
| ERJS06 ERJU06 (0805) | $2.00^{\pm0.20}$ | $1.25^{\pm0.10}$ | $0.40^{\pm0.20}$ | $0.40^{\pm0.20}$ | $0.60^{\pm0.10}$ | 4 |
| ERJS08 ERJU08 (1206) | $3.20^{+0.05}_{-0.20}$ | $1.60^{+0.05}_{-0.15}$ | $0.50^{\pm0.20}$ | $0.50^{\pm0.20}$ | $0.60^{\pm0.10}$ | 10 |
| ERJS14 ERJU14 (1210) | $3.20^{\pm0.20}$ | $2.50^{\pm0.20}$ | $0.50^{\pm0.20}$ | $0.50^{\pm0.20}$ | $0.60^{\pm0.10}$ | 16 |
| ERJS12 ERJU12 (1812) | $4.50^{\pm0.20}$ | $3.20^{\pm0.20}$ | $0.50^{\pm0.20}$ | $0.50^{\pm0.20}$ | $0.60^{\pm0.10}$ | 27 |
| ERJS1D ERJU1D (2010) | $5.00^{\pm0.20}$ | $2.50^{\pm0.20}$ | $0.60^{\pm0.20}$ | $0.60^{\pm0.20}$ | $0.60^{\pm0.10}$ | 27 |
| ERJS1T ERJU1T (2512) | $6.40^{\pm0.20}$ | $3.20^{\pm0.20}$ | $0.65^{\pm0.20}$ | $0.60^{\pm0.20}$ | $0.60^{\pm0.10}$ | 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.



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## ■ Ratings

<For Resistor>

| Type (inch size) | PowerRating 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<br>10 Ω to 1 MΩ: ±200(±5%) ±100(±1%)*<br>*ERJU01, ERJS02, ERJU02 : ±200<br>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.

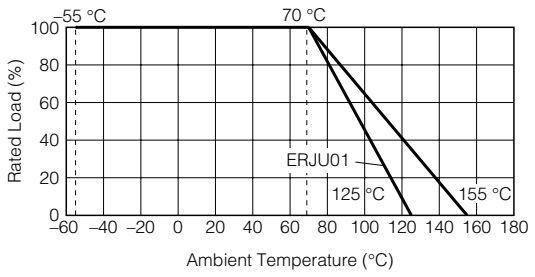
(2) Overload (Short-time Overload) Test Voltage (SOTV) shall be determined from SOTV=2.5 × Power Rating or max. Overload Voltage listed above whichever less.

<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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