

## Anti-Sulfurated Thick Film Chip Resistors



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, U6S, U6Q**  
(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
- Low Resistance type...ERJU6S, U6Q : 0.1  $\Omega$  to 1.0  $\Omega$
- Reference Standard...IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B
- AEC-Q200 qualified (Exemption ERJU01)
- RoHS compliant

■ **As for Packaging Methods, Land Pattern, Soldering Conditions and Safety Precautions,**  
Please see Data Files

### Explanation of Part Numbers

- ERJS0, S1, U0, U1 Type

|   |   |   |   |   |   |   |   |   |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|
| 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 |      |          |            |      |          |
|--------------------|------|----------|------------|------|----------|
| Code               | Inch | Power R. | Code       | Inch | Power R. |
| U01                | 0201 | 0.05 W   | S14<br>U14 | 1210 | 0.5 W    |
| S02<br>U02         | 0402 | 0.1 W    | S12<br>U12 | 1812 | 0.75 W   |
| S03<br>U03         | 0603 | 0.1 W    | S1D<br>U1D | 2010 | 0.75 W   |
| S06<br>U06         | 0805 | 0.125 W  | S1T<br>U1T | 2512 | 1 W      |
| S08<br>U08         | 1206 | 0.25 W   |            |      |          |

| Resistance Tolerance |           |      |           |
|----------------------|-----------|------|-----------|
| Code                 | Tolerance | Code | Tolerance |
| D                    | ± 0.5 %   | J    | ± 5 %     |
| F                    | ± 1 %     | 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.<br>Three digit type (±5%), four digit type (±0.5%, ±1%)<br>Example: 222→2.2 kΩ, 1002→10 kΩ |  |

| Packaging Methods |                                                   |                                                    |
|-------------------|---------------------------------------------------|----------------------------------------------------|
| Code              | Packaging                                         | Part No.                                           |
| 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                                     |

- ERJU6S, U6Q Type

|   |   |   |   |   |   |   |   |   |    |    |
|---|---|---|---|---|---|---|---|---|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| E | R | J | U | 6 | S | J | R | 2 | 0  | V  |

Size, Power Rating

|      |      |          |
|------|------|----------|
| Code | Inch | Power R. |
| U6   | 0805 | 0.25 W   |

Resistance Value

|      |                |
|------|----------------|
| Code | Res. Value     |
| S    | 0.1 Ω to 0.2 Ω |
| Q    | 0.22 Ω to 1 Ω  |

Resistance Tolerance

|      |           |
|------|-----------|
| Code | Tolerance |
| F    | ±1 %      |
| G    | ±2 %      |
| J    | ±5 %      |

Resistance Value

Shown by 3 digits or letters.  
(Example)  
R20 : 0.20 Ω=200 mΩ  
1R0 : 1.00 Ω=1000 mΩ

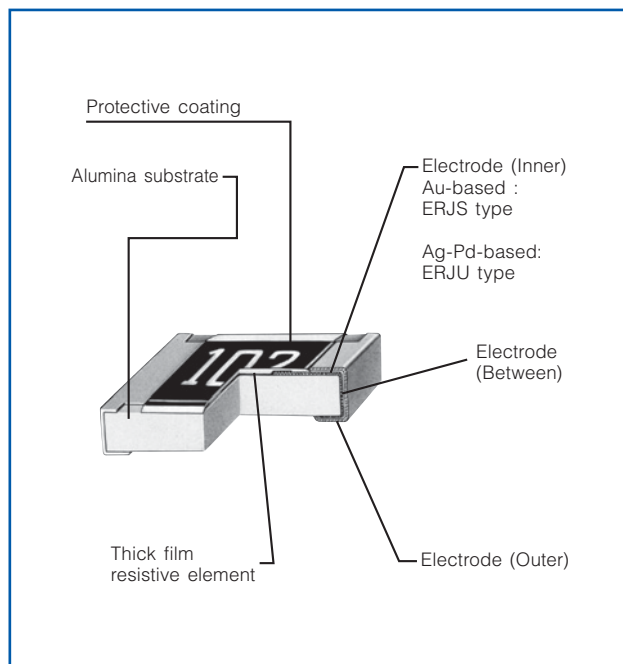
Packaging Methods

|      |                                                  |                  |
|------|--------------------------------------------------|------------------|
| Code | Packaging                                        | Part No.         |
| V    | Punched Carrier Taping<br>4 mm pitch, 5,000 pcs. | ERJU6S<br>ERJU6Q |

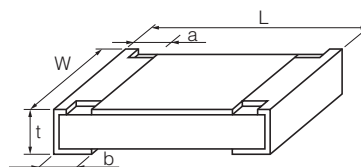
Product Code

Thick Film Chip Resistors

## Construction



## Dimensions in mm (not to scale)



| Part No.<br>(inch size) | Dimensions (mm)       |                       |                       |                       |                       | Mass (Weight)<br>[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 (0402) | 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 (0603) | 1.60 <sup>+0.15</sup> | 0.80 <sup>+0.15</sup> | 0.30 <sup>+0.20</sup> | 0.30 <sup>+0.15</sup> | 0.45 <sup>+0.10</sup> | 2                              |
| ERJS06<br>ERJU06 (0805) | 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                              |
| ERJU6□ (0805)           | 2.00 <sup>+0.20</sup> | 1.25 <sup>+0.10</sup> | 0.45 <sup>+0.20</sup> | 0.45 <sup>+0.20</sup> | 0.55 <sup>+0.10</sup> | 6                              |
| ERJS08<br>ERJU08 (1206) | 3.20 <sup>+0.05</sup> | 1.60 <sup>+0.05</sup> | 0.50 <sup>+0.20</sup> | 0.50 <sup>+0.20</sup> | 0.60 <sup>+0.10</sup> | 10                             |
| ERJS14<br>ERJU14 (1210) | 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 (1812) | 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 (2010) | 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 (2512) | 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                             |

## Ratings

| Part No.<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<br>±5                       | 10 to 1 M (E24, E96)<br>1 to 1 M (E24)   | $<10 \Omega$ :<br>-100 to +600<br><br>$10 \Omega$ to $1 M\Omega$ :<br>±200(±5%)<br>±100(±0.5, ±1%)*<br><br>*ERJU01,<br>ERJS02,<br>ERJU02 :<br>±200<br><br>$1 M\Omega$ <:<br>-400 to +150 | -55 to +125                              |
| ERJS02<br>ERJU02 (0402) | 0.1                             | 50                                                   | 100                                                  | ±0.5, ±1<br>±5                 | 10 to 1 M (E24, E96)<br>1 to 3.3 M (E24) |                                                                                                                                                                                          | -55 to +155                              |
| ERJS03<br>ERJU03 (0603) | 0.1                             | 75                                                   | 150                                                  | ±0.5, ±1<br>±5                 | 10 to 1 M (E24, E96)<br>1 to 10 M (E24)  |                                                                                                                                                                                          | -55 to +155                              |
| ERJS06<br>ERJU06 (0805) | 0.125                           | 150                                                  | 200                                                  | ±0.5, ±1<br>±5                 | 10 to 1 M (E24, E96)<br>1 to 10 M (E24)  |                                                                                                                                                                                          | -55 to +155                              |
| ERJS08<br>ERJU08 (1206) | 0.25                            | 200                                                  | 400                                                  | ±0.5, ±1<br>±5                 | 10 to 1 M (E24, E96)<br>1 to 10 M (E24)  |                                                                                                                                                                                          | -55 to +155                              |
| ERJS14<br>ERJU14 (1210) | 0.5                             | 200                                                  | 400                                                  | ±0.5, ±1<br>±5                 | 10 to 1 M (E24, E96)<br>1 to 10 M (E24)  |                                                                                                                                                                                          | -55 to +155                              |
| ERJS12<br>ERJU12 (1812) | 0.75                            | 200                                                  | 500                                                  | ±0.5, ±1<br>±5                 | 10 to 1 M (E24, E96)<br>1 to 10 M (E24)  |                                                                                                                                                                                          | -55 to +155                              |
| ERJS1D<br>ERJU1D (2010) | 0.75                            | 200                                                  | 500                                                  | ±0.5, ±1<br>±5                 | 10 to 1 M (E24, E96)<br>1 to 10 M (E24)  |                                                                                                                                                                                          | -55 to +155                              |
| ERJS1T<br>ERJU1T (2512) | 1.0                             | 200                                                  | 500                                                  | ±0.5, ±1<br>±5                 | 10 to 1 M (E24, E96)<br>1 to 10 M (E24)  |                                                                                                                                                                                          | -55 to +155                              |

(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  $SOTV = 2.5 \times RCWV$  or max. Overload Voltage listed above whichever less.

## [Low Resistance type]

| Part No.<br>(inch size) | Power Rating<br>at 70 °C<br>(W) | 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) |
|-------------------------|---------------------------------|--------------------------------|----------------------------|-----------------------------------|------------------------------------------|
| ERJU6S (0805)           | 0.25                            | ±1, ±2, ±5                     | 0.1 to 0.2 (E24)           | ±150                              | -55 to +155                              |
| ERJU6Q (0805)           |                                 |                                | 0.22 to 1 (E24)            |                                   |                                          |

[For Jumper]

| Part No.<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.

