

### 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

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#### ■ 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 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 <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 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 ERJU03	1.60 <sup>+0.15</sup>	0.80 <sup>+0.15</sup> 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 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 ERJU08	3.20 <sup>+0.05</sup> 3.20 <sup>-0.20</sup>	1.60 <sup>+0.05</sup> 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 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 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 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 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

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### ■ Ratings

<For Resistor>

Type (inch size)	Power Rating at 70 °C (W)	Limiting Element Voltage <sup>(1)</sup> (V)	Maximum Overload Voltage <sup>(2)</sup> (V)	Resistance Tolerance (%)	Resistance Range (Ω)	T.C.R. (×10 <sup>-6</sup> /°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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