# Thick Film Chip Resistors

Type: **ERJ XG, 1G, 2G, 3G, 6G, 8G, 14, 12, 12Z, 1T**


## Features

- Small size and lightweight
- High reliability
  Metal glaze thick film resistive element and three layers of electrodes
- Compatible with placement machines
  Taping packaging available
- Suitable for both reflow and flow soldering
- Reference Standards
  IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B
- AEC-Q200 qualified (Exemption ERJXG)
- RoHS compliant

## ■ As for Packaging Methods, Land Pattern, Soldering Conditions and Safety Precautions,

Please see Data Files

## Explanation of Part Numbers

- ERJXGN, 1GN, 2GE, 3GE, 6GE, 8GE, 14, 12, 12Z, 1T Type, ±5 %

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| E | R | J | 3 | G | E | Y | J | 1 | 0 | 2 | V |

**Product Code**

| Thick Film Chip Resistors |
|---|

**Size, Power Rating**

| Code | Inch | Power R. |
|---|---|---|
| XGN | 01005 | 0.031 W |
| 1GN | 0201 | 0.05 W |
| 2GE | 0402 | 0.1 W |
| 3GE | 0603 | 0.1 W |
| 6GE | 0805 | 0.125 W |
| 8GE | 1206 | 0.25 W |
| 14 | 1210 | 0.5 W |
| 12 | 1812 | 0.75 W |
| 12Z | 2010 | 0.75 W |
| 1T | 2512 | 1 W |

**Marking**

| Code | Marking |
|---|---|
| Y | Value Marking on black side |
| *Nil | No marking |

**Resistance Tolerance**

| Code | Tolerance |
|---|---|
| J | ±5 % |
| 0 | Jumper |

**Resistance Value**

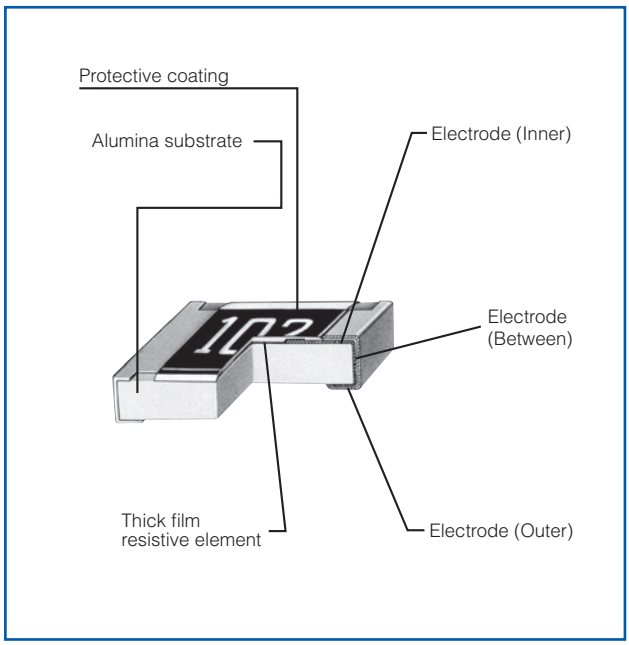
The first two digits are significant figures of resistance and the third one denotes number of zeros following.
Decimal Point is expressed by R as 4.7 = 4R7.
Jumper is expressed by R00.

**Packaging Methods**

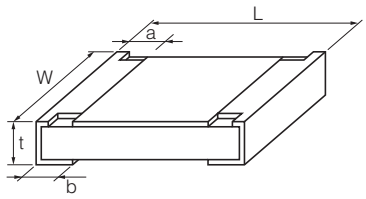
| Code | Packaging | Part No. |
|---|---|---|
| Y | Pressed Carrier Taping W8P2, 20,000 pcs. | ERJXGN |
| U | Embossed Carrier Taping W4P1, 40,000 pcs. | |
| C | Pressed Carrier Taping 2 mm pitch, 15,000 pcs. | ERJ1GN |
| X | Punched Carrier Taping 2 mm pitch, 10,000 pcs. | ERJ2GE |
| Y | Punched Carrier Taping 2 mm pitch, 20,000 pcs. | |
| V | Punched Carrier Taping 4 mm pitch, 5,000 pcs. | ERJ3GE ERJ6GE ERJ8GE |
| U | Embossed Carrier Taping 4 mm pitch, 5,000 pcs. | ERJ14 ERJ12 ERJ12Z |
| | Embossed Carrier Taping 4 mm pitch, 4,000 pcs. | ERJ1T |

✻ When omitted, the rest of the P/N factors shall be moved up respectively.
(Only XGN, 1GN, 2GE type)

## Construction




## Dimensions in mm (not to scale)




| Part No. | Dimensions (mm) | | | | | Mass (Weight) (g/1000 pcs.) |
|---|---|---|---|---|---|---|
| | L | W | a | b | t | |
| ERJXG | $0.40^{\pm0.02}$ | $0.20^{\pm0.02}$ | $0.10^{\pm0.03}$ | $0.10^{\pm0.03}$ | $0.13^{\pm0.02}$ | 0.04 |
| ERJ1G | $0.60^{\pm0.03}$ | $0.30^{\pm0.03}$ | $0.10^{\pm0.05}$ | $0.15^{\pm0.05}$ | $0.23^{\pm0.03}$ | 0.15 |
| ERJ2G | $1.00^{\pm0.05}$ | $0.50^{\pm0.05}$ | $0.20^{\pm0.10}$ | $0.25^{\pm0.05}$ | $0.35^{\pm0.05}$ | 0.8 |
| ERJ3G | $1.60^{\pm0.15}$ | $0.80^{+0.15}_{-0.05}$ | $0.30^{\pm0.20}$ | $0.30^{\pm0.15}$ | $0.45^{\pm0.10}$ | 2 |
| ERJ6G | $2.00^{\pm0.20}$ | $1.25^{\pm0.10}$ | $0.40^{\pm0.20}$ | $0.40^{\pm0.20}$ | $0.60^{\pm0.10}$ | 4 |
| ERJ8G | $3.20^{+0.05}$ | $1.60^{+0.05}$ | $0.50^{\pm0.20}$ | $0.50^{\pm0.20}$ | $0.60^{\pm0.10}$ | 10 |
| ERJ14 | $3.20^{-0.20}_{\pm0.20}$ | $2.50^{-0.15}_{\pm0.20}$ | $0.50^{\pm0.20}$ | $0.50^{\pm0.20}$ | $0.60^{\pm0.10}$ | 16 |
| ERJ12 | $4.50^{\pm0.20}$ | $3.20^{\pm0.20}$ | $0.50^{\pm0.20}$ | $0.50^{\pm0.20}$ | $0.60^{\pm0.10}$ | 27 |
| ERJ12Z | $5.00^{\pm0.20}$ | $2.50^{\pm0.20}$ | $0.60^{\pm0.20}$ | $0.60^{\pm0.20}$ | $0.60^{\pm0.10}$ | 27 |
| ERJ1T | $6.40^{\pm0.20}$ | $3.20^{\pm0.20}$ | $0.65^{\pm0.20}$ | $0.60^{\pm0.20}$ | $0.60^{\pm0.10}$ | 45 |

## Ratings

### [For Resistor]

| Part No. (inch size) | Power Rating (3) at 70 °C (W) | Limiting Element Voltage (1) (V) | Maximum Overload Voltage (2) (V) | Resistance Tolerance (%) | Resistance Range (Ω) | T.C.R. ($\times10^{-6}$/°C) | Category Temperature Range (°C) | AEC-Q200 Grade |
|---|---|---|---|---|---|---|---|---|
| ERJXG (01005) | 0.031 | 15 | 30 | ±5 | 4.7 to 1M (E24) | <10 Ω : −100 to +600<br>10 Ω to 100 Ω : ±300<br>100 Ω< : ±200 | −55 to +125 | – |
| ERJ1G (0201) | 0.05 | 25 | 50 | ±5 | 1 to 10M (E24) | <10 Ω: −100 to +600<br>10 Ω to 1M Ω: ±200<br>1M Ω<: −400 to +150 | −55 to +125 | Grade 1 |
| ERJ2G (0402) | 0.1 | 50 | 100 | ±5 | 1 to 10M (E24) | | −55 to +155 | Grade 0 |
| ERJ3G (0603) | 0.1 | 75 | 150 | ±5 | 1 to 10M (E24) | | −55 to +155 | Grade 0 |
| ERJ6G (0805) | 0.125 | 150 | 200 | ±5 | 1 to 10M (E24) | | −55 to +155 | Grade 0 |
| ERJ8G (1206) | 0.25 | 200 | 400 | ±5 | 1 to 10M (E24) | | −55 to +155 | Grade 0 |
| ERJ14 (1210) | 0.5 | 200 | 400 | ±5 | 1 to 10M (E24) | | −55 to +155 | Grade 0 |
| ERJ12 (1812) | 0.75 | 200 | 500 | ±5 | 1 to 10M (E24) | | −55 to +155 | Grade 0 |
| ERJ12Z (2010) | 0.75 | 200 | 500 | ±5 | 1 to 10M (E24) | | −55 to +155 | Grade 0 |
| ERJ1T (2512) | 1 | 200 | 500 | ±5 | 1 to 1M (E24) | | −55 to +155 | Grade 0 |

(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 Test Voltage (OTV) shall be determined from OTV=Specified Magnification (refer to performance) × RCWV or Maximum Overload Voltage listed above, whichever less.
(3) Use it on the condition that the case temperature is below the upper category temperature.

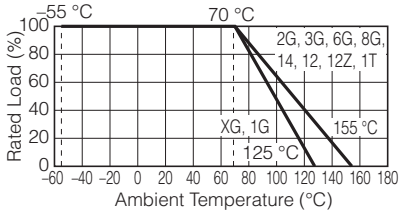
### [For Jumper]

| Part No. (inch size) | Rated Current (A) | Maximum Overload Current (1) (A) |
|---|---|---|
| ERJXG (01005) | 0.5 | 1 |
| ERJ1G (0201) | | |
| ERJ2G (0402) | 1 | 2 |
| ERJ3G (0603) | | |
| ERJ6G (0805) | 2 | 4 |
| ERJ8G (1206) | | |
| ERJ14 (1210) | | |
| ERJ12 (1812) | | |
| ERJ12Z (2010) | | |
| ERJ1T (2512) | | |

(1) Overload test current

### Power Derating Curve

For resistors operated in ambient temperatures above 70 °C, power rating shall be derated in accordance with the figure below.



## Perfomance

| Test Item | Performance Requirements | | Test Conditions |
|---|---|---|---|
| | Resistor type | Jumper type | |
| Resistance | Within Specified Tolerance | 50m Ω or less | 20 °C |
| T. C. R. | Within Specified T. C. R. | 50m Ω or less | +25 °C/+155 °C (ERJXG, ERJ1G : +25 °C/+125 °C) |
| Overload | ±2% | 50m Ω or less | Rated Voltage × 2.5, 5 s<br>Jumper type : Max. Overload Current, 5 s |
| Resistance to Soldering Heat | ±1% | 50m Ω or less | 270 °C, 10 s |
| Rapid Change of Temperature | ±1% | 50m Ω or less | –55 °C (30min.) / +155 °C (ERJXG, ERJ1G : +125 °C) (30min.), 100 cycles |
| High Temperature Exposure | ±1% | 50m Ω or less | +155 °C (ERJXG, ERJ1G : +125 °C) , 1000 h |
| Damp Heat, Steady State | ±1% | 50m Ω or less | 60 °C, 90% to 95 %RH, 1000 h |
| Load Life in Humidity | ±3% | 50m Ω or less | 60 °C, 90% to 95 %RH, Rated Voltage (Jumper type: Rated Current), 1.5 h ON/0.5 h OFF cycle, 1000 h |
| Endurance at 70 °C | ±3% | 50m Ω or less | 70 °C, Rated Voltage(Jumper type: Rated Current), 1.5 h ON/0.5 h OFF cycle, 1000 h |

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