Precision Thick Film Chip Resistors

Type: ERJ XG, 1G
ERJ 1R, 2R, 3R, 6R
ERJ 3E, 6E, 8E, 14, 12, 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
- RoHS compliant

Packaging Methods, Land Pattern, Soldering Conditions and Safety Precautions
Please see Data Files

Explanation of Part Numbers
- ERJ1R, 2R, 3R, 6R Series, ±0.5 % type

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>R</td>
<td>J</td>
<td>3</td>
<td>R</td>
<td>B</td>
<td>D</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>V</td>
</tr>
</tbody>
</table>

Product Code
- Thick Film Chip Resistors
- Type: inch
- Power Rating
  - 1R: 0201, 0.05 W
  - 2R: 0402, 0.063 W
  - 3R: 0603, 0.1 W
  - 6R: 0805, 0.1 W

Size, Power Rating
- Type: inch
- Power Rating
  - 1R: 0201, 0.05 W
  - 2R: 0402, 0.063 W
  - 3R: 0603, 0.1 W
  - 6R: 0805, 0.1 W

T.C.R. Marking
- Code: T.C.R.
  - H: ±50 x 10^-7°C (1R, 2R)
  - B: ±50 x 10^-7°C (3R, 6R)
  - K: ±100 x 10^-7°C (2R)
  - E: ±100 x 10^-7°C (3R, 6R)

Resistance Tolerance
- Code: Tolerance
  - D: ±0.5 %

Packaging Methods
- C: Pressed Carrier Taping 2 mm pitch, 15,000 pcs.
- X: Punched Carrier Taping 2 mm pitch, 10,000 pcs.
- V: Punched Carrier Taping 4 mm pitch, 5,000 pcs.

Resistance Value
- The first three digits are significant figures of resistance and the last one denotes number of zeros following.
- Example: 1002 → 10 kΩ

Low Resistance Tolerance
- ERJXG, 1G, 2R, 3E, 6E, 8E, 14, 12, 1T Series: ±1 %
- ERJ1R, 2R, 3R, 6R Series: ±0.5 %

Reference Standards
- IEC 60115-8, JIS C 5201-8, EIAJ RC-2134B

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.

03 Aug. 2012
Precision Thick Film Chip Resistors

- ERJXG, 1G, 2R, 3E, 6E, 8E, 14, 12, 1T Series, ±1% type

Table:

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Size, Power Rating</th>
<th>Resistance Tolerance</th>
<th>Packaging Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>XGN : 01005</td>
<td>Type : inch</td>
<td>±1 %</td>
<td>ERJXGN</td>
</tr>
<tr>
<td>1GN : 0201</td>
<td>Power R.</td>
<td></td>
<td>ERJ1GN</td>
</tr>
<tr>
<td>2RK : 0402</td>
<td></td>
<td></td>
<td>ERJ2RK</td>
</tr>
<tr>
<td>3EK : 0603</td>
<td></td>
<td></td>
<td>ERJ3EK</td>
</tr>
<tr>
<td>6EN : 0805</td>
<td></td>
<td></td>
<td>ERJ6EN</td>
</tr>
<tr>
<td>8EN : 1206</td>
<td></td>
<td></td>
<td>ERJ8EN</td>
</tr>
<tr>
<td>14N : 1210</td>
<td></td>
<td></td>
<td>ERJ14N</td>
</tr>
<tr>
<td>12N : 1812</td>
<td></td>
<td></td>
<td>ERJ12N</td>
</tr>
<tr>
<td>12S : 2010</td>
<td></td>
<td></td>
<td>ERJ12S</td>
</tr>
<tr>
<td>1TN : 2512</td>
<td></td>
<td></td>
<td>ERJ1TN</td>
</tr>
</tbody>
</table>

Product Code

Thick Film Chip Resistors

Size, Power Rating

Type : inch
XGN : 01005
1GN : 0201
2RK : 0402
3EK : 0603
6EN : 0805
8EN : 1206
14N : 1210
12N : 1812
12S : 2010
1TN : 2512

Power R.
0.031 W
0.05 W
0.1 W
0.1 W
0.125 W
0.25 W
0.5 W
0.75 W
0.75 W
1 W

Resistance Value
The first three digits are significant figures of resistance and the last one denotes number of zeros following.
Decimal point is expressed by “R”.
Example : 1002 → 10 kΩ

Packaging Methods

Code | Packaging Method | Type |
--- | --- | --- |
Y | Pressed Carrier Taping, 2 mm pitch, 20,000 pcs. | ERJXGN |
C | Pressed Carrier Taping, 2 mm pitch, 15,000 pcs. | ERJ1GN |
X | Punched Carrier Taping, 2 mm pitch, 10,000 pcs. | ERJ2RK |
V | Punched Carrier Taping, 4 mm pitch, 5,000 pcs. | ERJ3EK |
ERJ6EN |
ERJ8EN |
U | Embossed Carrier Taping, 4 mm pitch, 4,000 pcs. | ERJ14N |
ERJ12N |
ERJ12S |
ERJ1TN |

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.

Panasonic

03 Aug. 2012
### Ratings 

<table>
<thead>
<tr>
<th>Type (inch size)</th>
<th>Power Rating at 70 °C (W)</th>
<th>Limiting Element Voltage(^{(1)}) (V)</th>
<th>Maximum Overload Voltage(^{(2)}) (V)</th>
<th>Resistance Tolerance (%)</th>
<th>Resistance Range (Ω)</th>
<th>T.C.R. (×10^{-6}/°C)</th>
<th>Category Temperature Range (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERJ1RH (0201)</td>
<td>0.05</td>
<td>15</td>
<td>30</td>
<td>±0.5</td>
<td>1 k to 1 M (E24, E96)</td>
<td>±50</td>
<td>−55 to +125</td>
</tr>
<tr>
<td>ERJ2RH (0402)</td>
<td>0.063</td>
<td>50</td>
<td>100</td>
<td>±0.5</td>
<td>100 to 100 k (E24, E96)</td>
<td>±50</td>
<td>−55 to +125</td>
</tr>
<tr>
<td>ERJ2RK (0402)</td>
<td>0.063</td>
<td>50</td>
<td>100</td>
<td>±0.5</td>
<td>10 to 97.6 k to 1 M (E24, E96)</td>
<td>±100</td>
<td>−55 to +125</td>
</tr>
<tr>
<td>ERJ3RB (0603)</td>
<td>0.1</td>
<td>50</td>
<td>100</td>
<td>±0.5</td>
<td>100 to 100 k (E24, E96)</td>
<td>±50</td>
<td>−55 to +125</td>
</tr>
<tr>
<td>ERJ3RE (0603)</td>
<td>0.1</td>
<td>50</td>
<td>100</td>
<td>±0.5</td>
<td>10 to 97.6 k to 1 M (E24, E96)</td>
<td>±100</td>
<td>−55 to +125</td>
</tr>
<tr>
<td>ERJ6RB (0805)</td>
<td>0.1</td>
<td>150</td>
<td>200</td>
<td>±0.5</td>
<td>100 to 100 k (E24, E96)</td>
<td>±50</td>
<td>−55 to +125</td>
</tr>
<tr>
<td>ERJ6RE (0805)</td>
<td>0.1</td>
<td>150</td>
<td>200</td>
<td>±0.5</td>
<td>10 to 97.6 k to 1 M (E24, E96)</td>
<td>±100</td>
<td>−55 to +125</td>
</tr>
</tbody>
</table>

### Ratings 

<table>
<thead>
<tr>
<th>Type (inch size)</th>
<th>Power Rating at 70 °C (W)</th>
<th>Limiting Element Voltage(^{(1)}) (V)</th>
<th>Maximum Overload Voltage(^{(2)}) (V)</th>
<th>Resistance Tolerance (%)</th>
<th>Resistance Range (Ω)</th>
<th>T.C.R. (×10^{-6}/°C)</th>
<th>Category Temperature Range (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERJXGN (01005)</td>
<td>0.031</td>
<td>15</td>
<td>30</td>
<td>±1</td>
<td>10 to 1 M (E24, E96)</td>
<td>&lt;100 Ω (=) ±300 / 100 Ω (≤) ±200</td>
<td>−55 to +125</td>
</tr>
<tr>
<td>ERJ1GN (0201)</td>
<td>0.05</td>
<td>25</td>
<td>50</td>
<td>±1</td>
<td>10 to 1 M(^{(3)}) (E24, E96)</td>
<td>±200</td>
<td>−55 to +125</td>
</tr>
<tr>
<td>ERJ2RK (0402)</td>
<td>0.1</td>
<td>50</td>
<td>100</td>
<td>±1</td>
<td>10 to 1 M(^{(3)}) (E24, E96)</td>
<td>±100</td>
<td>−55 to +155</td>
</tr>
<tr>
<td>ERJ3EK (0603)</td>
<td>0.1</td>
<td>75</td>
<td>150</td>
<td>±1</td>
<td>10 to 1 M (E24, E96)</td>
<td>±100</td>
<td>−55 to +155</td>
</tr>
<tr>
<td>ERJ6EN (0805)</td>
<td>0.125</td>
<td>150</td>
<td>200</td>
<td>±1</td>
<td>10 to 2.2 M (E24, E96)</td>
<td>±100</td>
<td>−55 to +155</td>
</tr>
<tr>
<td>ERJ8EN (1206)</td>
<td>0.25</td>
<td>200</td>
<td>400</td>
<td>±1</td>
<td>10 to 2.2 M (E24, E96)</td>
<td>±100</td>
<td>−55 to +155</td>
</tr>
<tr>
<td>ERJ14N (1210)</td>
<td>0.5</td>
<td>200</td>
<td>400</td>
<td>±1</td>
<td>10 to 1 M (E24, E96)</td>
<td>±100</td>
<td>−55 to +155</td>
</tr>
<tr>
<td>ERJ12N (1812)</td>
<td>0.75</td>
<td>200</td>
<td>500</td>
<td>±1</td>
<td>10 to 1 M (E24, E96)</td>
<td>±100</td>
<td>−55 to +155</td>
</tr>
<tr>
<td>ERJ12S (2010)</td>
<td>0.75</td>
<td>200</td>
<td>500</td>
<td>±1</td>
<td>10 to 1 M (E24, E96)</td>
<td>±100</td>
<td>−55 to +155</td>
</tr>
<tr>
<td>ERJT1N (2512)</td>
<td>1.0</td>
<td>200</td>
<td>500</td>
<td>±1</td>
<td>10 to 1 M (E24, E96)</td>
<td>±100</td>
<td>−55 to +155</td>
</tr>
</tbody>
</table>

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 \(\text{SOTV} = 2.5 \times \text{Power Rating or max. Overload Voltage listed above whichever less} \times \text{Power Rating}\) or max.
3. Please contact us when you need a type with a resistance of less than 10 Ω.

### Power Derating Curve
For resistors operated in ambient temperatures above 70 °C, power rating shall be derated in accordance with the figure on the right.