

Anti-surge thick film chip resistor

ESR03 (0603 size : 1 / 5W)

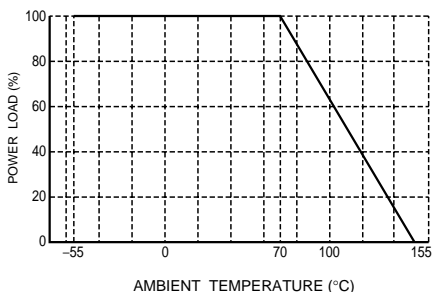
●Features

- 1) Power rating of 1 / 5W (MCR03 1/10W)
- 2) Superior anti surge to MCR series
- 3) Highly reliable chip resistor
Ruthenium oxide dielectric offers superior resistance to the elements.
- 4) ROHM resistors have approved ISO-9001, ISO/TS 16949 certification.
Design and specifications are subject to change without notice. Carefully check the specification sheet before using or ordering it.

●Applications

Automotive, LCD Monitor, projector, power supply, charger, inverter and so on.

●Ratings

| Item | Conditions | Specifications | | |
|--------------------------|--|---|--------------------------|-----|
| Rated power | Power must be derated according to the power derating curve in Figure 1 when ambient temperature exceeds 70°C.  Fig.1 | 0.2W (1/5W) at 70°C | | |
| Rated voltage | The voltage rating is calculated by the following equation. If the value obtained exceeds the limiting element voltage, the voltage rating is equal to the maximum operating voltage. $E = \sqrt{P \times R}$ E: Rated voltage (V) P: Rated power (W) R: Nominal resistance (Ω) | <table border="1"> <tr> <td>Limiting element voltage</td> <td>50V</td> </tr> </table> | Limiting element voltage | 50V |
| Limiting element voltage | 50V | | | |
| Nominal resistance | See Table 1. | | | |
| Operating temperature | | -55°C to +155°C | | |

Resistors

Table 1

| Resistance tolerance | Resistance range (Ω) | Resistance temperature coefficient (ppm/°C) |
|----------------------|----------------------|---|
| D (±0.5%) | 10 ≤ R ≤ 1M (E24) | ±100 |
| F (±1%) | 10 ≤ R ≤ 10M (E24) | ±100 |
| J (±5%) | 10 ≤ R ≤ 10M (E24) | ±200 |

- Before using components in circuits where they will be exposed to transients such as pulse loads (short-duration, high-level loads), be certain to evaluate the component in the mounted state. In addition, the reliability and performance of this component cannot be guaranteed if it is used with a steady state voltage that is greater than its rated voltage.

● Characteristics

| Item | Guaranteed value | Test conditions (JIS C 5201-1) |
|--|--|--|
| | Resistor type | |
| Resistance | J : ±5% F : ±1% D : ±0.5% | JIS C 5201-1 4.5 |
| Variation of resistance with temperature | See Table.1 | JIS C 5201-1 4.8 Measurement : -55 / +25 / +125°C |
| Overload | ± (2.0%+0.1Ω) | JIS C 5201-1 4.13 Rated voltage (current) ×2.5, 2s. Maximum overload voltage : 100V |
| Solderability | A new uniform coating of minimum of 95% of the surface being immersed and no soldering damage. | JIS C 5201-1 4.17 Rosin-Ethanol (25%WT) Soldering condition : 235±5°C Duration of immersion : 2.0±0.5s. |
| Resistance to soldering heat | ± (1.0%+0.05Ω) No remarkable abnormality on the appearance. | JIS C 5201-1 4.18 Soldering condition : 260±5°C Duration of immersion : 10±1s. |
| Rapid change of temperature | ± (1.0%+0.05Ω) | JIS C 5201-1 4.19 Test temp. : -55°C to +125°C 5cyc |
| Damp heat, steady state | ± (3.0%+0.1Ω) | JIS C 5201-1 4.24 40°C, 93%RH Test time : 1,000h to 1,048h |
| Endurance at 70°C | ± (3.0%+0.1Ω) | JIS C 5201-1 4.25.1 Rated voltage (current), 70°C 1.5h : ON – 0.5h : OFF Test time : 1,000h to 1,048h |
| Endurance | ± (3.0%+0.1Ω) | JIS C 5201-1 4.25.3 155°C Test time : 1,000h to 1,048h |
| Resistance to solvent | ± (1.0%+0.05Ω) | JIS C 5201-1 4.29 23±5°C, Immersion cleaning, 5±0.5min. Solvent : 2-propanol |
| Bend strength of the end face plating | ± (1.0%+0.05Ω) Without mechanical damage such as breaks. | JIS C 5201-1 4.33 |
| Static electric characteristics | ± (5.0%+0.05Ω) | EIAJ ED-4701 1300 Test method 304 Voltage : 3kv R : 1.5kΩ C : 100pF Apply cycle : 1 time |

Resistors

●Dimensions (Unit : mm)

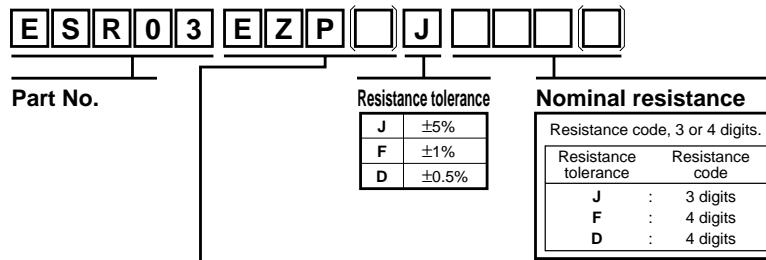
| No. | Material |
|-----|-----------------------------|
| ① | Resistive element |
| ② | Silver thick film electrode |
| ③ | Nickel electrode |
| ④ | Sn electrode |
| ⑤ | Alumina substrate |
| ⑥ | Overcoating |

●Packaging

| Reel | Taping | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|-------------------|----------------|--|---|---|-------------------|--|---|---|---|----------------|----------------|---------------|----------------|----------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|--|---------------|---------------|----------------|----------|
| <p>EIAJ ET-7200B compliant</p> <p>(Unit: mm)</p> <table border="1"> <thead> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> </thead> <tbody> <tr> <td>$\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}$</td> <td>$\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$</td> <td>$9 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$</td> <td>$\phi 13 \pm 0.2$</td> </tr> </tbody> </table> | A | B | C | D | $\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}$ | $\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$ | $9 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ | $\phi 13 \pm 0.2$ | <p>(Unit : mm)</p> <table border="1"> <thead> <tr> <th>W</th> <th>F</th> <th>E</th> <th>A₀</th> <th>B₀</th> </tr> </thead> <tbody> <tr> <td>8.0 ± 0.3</td> <td>3.5 ± 0.05</td> <td>1.75 ± 0.1</td> <td>1.1 ± 0.1</td> <td>1.9 ± 0.1</td> </tr> <tr> <th>D₀</th> <th>P₀</th> <th>P₁</th> <th>P₂</th> <th>T₂</th> </tr> <tr> <td>$\phi 1.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}$</td> <td>$4.0 \pm 0.1$</td> <td>$4.0 \pm 0.1$</td> <td>$2.0 \pm 0.05$</td> <td>Max. 1.1</td> </tr> </tbody> </table> | W | F | E | A ₀ | B ₀ | 8.0 ± 0.3 | 3.5 ± 0.05 | 1.75 ± 0.1 | 1.1 ± 0.1 | 1.9 ± 0.1 | D ₀ | P ₀ | P ₁ | P ₂ | T ₂ | $\phi 1.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}$ | 4.0 ± 0.1 | 4.0 ± 0.1 | 2.0 ± 0.05 | Max. 1.1 |
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| W | F | E | A ₀ | B ₀ | | | | | | | | | | | | | | | | | | | | | | | | | |
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Resistors

●Part No. Explanation



Packaging Specifications Code

| Part No. | Code | Resistance tolerance | | | Packaging specifications | Reel | Basic ordering unit(pcs) |
|--------------|------|----------------------|--------|----------|--------------------------|----------------|--------------------------|
| | | J(±5%) | F(±1%) | D(±0.5%) | | | |
| ESR03 | EZP | ◎ | ◎ | ◎ | Paper tape (4mm Pitch) | φ180mm (7inch) | 5,000 |

Reel (φ180mm) : Compatible with JEITA standard "EIAJ ET-7200B"
 ◎ : Standard product

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