

# Low Ohmic Thick Film Chip Resistors

## MCR03 (1608 size (0603 size) : 1 / 10W)

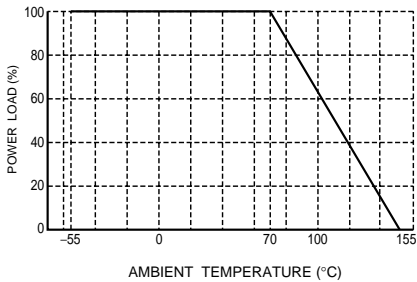
### ●Features

- 1) Power rating of 1 / 10W
- 2) Highly reliable chip resistor  
Ruthenium oxide dielectric offers superior resistance to the elements.
- 3) Electrodes not corroded by soldering  
Thick film makes the electrodes very strong.
- 4) ROHM resistors have approved ISO9001- / ISO/TS16949- certification.

### ●Ratings

Design and specifications are subject to change without notice.

Carefully check the specification sheet before using or ordering it.

| Item                  | Conditions   | Specifications            |
|-----------------------|--|---------------------------|
| Rated power           | <p>Power must be derated according to the power derating curve in Figure 1 when ambient temperature exceeds 70°C.</p>  <p style="text-align: center;">Fig.1</p> | 0.1W (1 / 10W)<br>at 70°C |
| Rated voltage         | <p>The voltage rating is calculated by the following equation.</p> $E = \sqrt{P \times R}$ <p>E: Rated voltage (V)<br/>P: Rated power (W)<br/>R: Nominal resistance (Ω)</p>  |                           |
| Nominal resistance    | See Table 1.   |                           |
| Operating temperature |  | -55°C to + 155°C          |

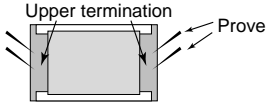
## Resistors

Table 1

| Resistance tolerance | Special specification | Resistance range ( $\Omega$ ) | Resistance temperature coefficient (ppm/ $^{\circ}$ C) |
|----------------------|-----------------------|-------------------------------|--|
| F ( $\pm 1\%$ )      | L                     | 1.0 to 9.1 (E24)              | $\pm 400$  |

- 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                               | F : $\pm 1\%$  | JIS C 5201-1 4.5<br>Load voltage : A<br>Measuring method : measure upper termination by 4 probes.<br> |
| Variation of resistance with temperature | See Table.1  | JIS C 5201-1 4.8<br>Measurement : $+25 / -55 / +25 / +125^{\circ}$ C   |
| Overload                                 | $\pm (2.0\%+0.005\Omega)$  | JIS C 5201-1 4.13<br>Rated voltage (current) $\times 2.5$ , 2s.  |
| Solderability                            | A new uniform coating of minimum of 95% of the surface being immersed and no soldering damage. | JIS C 5201-1 4.17<br>Rosin-Ethanol (25%WT)<br>Soldering condition : $235\pm 5^{\circ}$ C<br>Duration of immersion : $2.0\pm 0.5$ s.  |
| Resistance to soldering heat             | $\pm (1.0\%+0.005\Omega)$<br>No remarkable abnormality on the appearance.                      | JIS C 5201-1 4.18<br>Soldering condition : $260\pm 5^{\circ}$ C<br>Duration of immersion : $10\pm 1$ s.  |
| Rapid change of temperature              | $\pm (1.0\%+0.005\Omega)$  | JIS C 5201-1 4.19<br>Test temp. : $-55^{\circ}$ C to $+125^{\circ}$ C 5cyc   |
| Damp heat, steady state                  | $\pm (3.0\%+0.005\Omega)$  | JIS C 5201-1 4.24<br>$40^{\circ}$ C, 93%RH<br>Test time : 56days   |
| Endurance at $70^{\circ}$ C              | $\pm (3.0\%+0.005\Omega)$  | JIS C 5201-1 4.25.1<br>$70^{\circ}$ C, Rated voltage<br>1.5h : ON – 0.5h : OFF<br>Test time : 1,000h   |
| Endurance                                | $\pm (3.0\%+0.005\Omega)$  | JIS C 5201-1 4.25.3<br>$155^{\circ}$ C<br>Test time : 1,000h to 1,048h   |
| Resistance to solvent                    | $\pm (0.5\%+0.005\Omega)$  | JIS C 5201-1 4.29<br>$23^{\circ}$ C $\pm 5^{\circ}$ C, Immersion cleaning, $5\pm 0.5$ min.<br>Solvent : 2-propanol   |
| Bend strength of the end face plating    | $\pm (1.0\%+0.005\Omega)$<br>Without mechanical damage such as breaks.                         | JIS C 5201-1 4.33  |

Resistors

●Dimensions (Unit : mm)

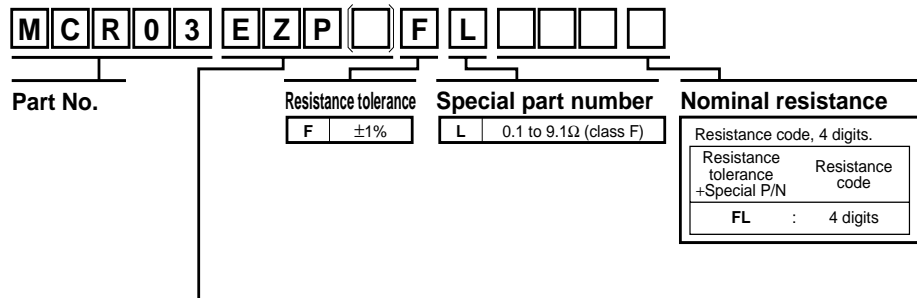
| No. | Material                                   |
|-----|--|
| ①   | Resistive element (Oxide metal thick film) |
| ②   | Silver thick film electrode                |
| ③   | Nickel electrode                           |
| ④   | Sn electrode                               |
| ⑤   | Alumina substrate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

●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><math>\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}</math></td> <td><math>\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}</math></td> <td><math>13 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}</math></td> <td><math>\phi 13 \pm 0.2</math></td> </tr> </tbody> </table> | A   | B  | C                 | D             | $\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}$ | $\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$ | $13 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ | $\phi 13 \pm 0.2$ | <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><math>8.0 \pm 0.3</math></td> <td><math>3.5 \pm 0.05</math></td> <td><math>1.75 \pm 0.1</math></td> <td><math>1.1 \pm 0.1</math></td> <td><math>1.9 \pm 0.1</math></td> </tr> <tr> <th>D0</th> <th>P0</th> <th>P1</th> <th>P2</th> <th>T2</th> </tr> <tr> <td><math>\phi 1.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}</math></td> <td><math>4.0 \pm 0.1</math></td> <td><math>4.0 \pm 0.1</math></td> <td><math>2.0 \pm 0.05</math></td> <td>Max. 1.1</td> </tr> </tbody> </table> | W | F | E | A0 | B0 | $8.0 \pm 0.3$ | $3.5 \pm 0.05$ | $1.75 \pm 0.1$ | $1.1 \pm 0.1$ | $1.9 \pm 0.1$ | D0 | P0 | P1 | P2 | T2 | $\phi 1.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}$ | $4.0 \pm 0.1$ | $4.0 \pm 0.1$ | $2.0 \pm 0.05$ | Max. 1.1 |
| A  | B   | C  | D                 |               |  |   |  |                   |  |   |   |   |    |    |               |                |                |               |               |    |    |    |    |    |  |               |               |                |          |
| $\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}$   | $\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$ | $13 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ | $\phi 13 \pm 0.2$ |               |  |   |  |                   |  |   |   |   |    |    |               |                |                |               |               |    |    |    |    |    |  |               |               |                |          |
| W  | F   | E  | A0                | B0            |  |   |  |                   |  |   |   |   |    |    |               |                |                |               |               |    |    |    |    |    |  |               |               |                |          |
| $8.0 \pm 0.3$  | $3.5 \pm 0.05$  | $1.75 \pm 0.1$                                       | $1.1 \pm 0.1$     | $1.9 \pm 0.1$ |  |   |  |                   |  |   |   |   |    |    |               |                |                |               |               |    |    |    |    |    |  |               |               |                |          |
| D0   | P0  | P1   | P2                | T2            |  |   |  |                   |  |   |   |   |    |    |               |                |                |               |               |    |    |    |    |    |  |               |               |                |          |
| $\phi 1.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}$   | $4.0 \pm 0.1$   | $4.0 \pm 0.1$  | $2.0 \pm 0.05$    | Max. 1.1      |  |   |  |                   |  |   |   |   |    |    |               |                |                |               |               |    |    |    |    |    |  |               |               |                |          |

Resistors

●Part No. Explanation



Packaging Specifications Code

| Part No. | Code | Resistance tolerance<br>F(±1%) | Packaging specifications | Reel           | Basic ordering unit(pcs) |
|----------|------|--------------------------------|--------------------------|----------------|--------------------------|
| MCR03    | EZP  | ◎                              | Paper tape (4mm Pitch)   | φ180mm (7inch) | 5,000                    |

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

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