

# Thick Film Chip Resistors

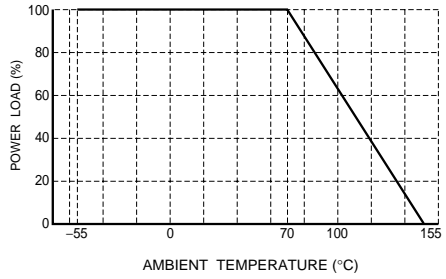
## MCR18 (1206 size: 1 / 4W)

### ●Features

- 1) Power rating of 1 / 4W
- 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) Leading the world in development and mass production.  
Since start of production in 1976 (first in the world), this component has established a solid reputation as a general-purpose chip resistor.
- 5) ROHM resistors have approved ISO9001- / ISO/TS 16949- 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           | Power must be derated according to the power derating curve in Figure 1 when ambient temperature exceeds 70°C.<br><br>Fig.1   | J, F                     | 0.25W (1 / 4W)<br>at 70°C  |
|                       |  | D                        | 0.125W (1 / 8W)<br>at 70°C |
| Rated voltage         | The voltage rating is calculated by the following equation.<br>If the value obtained exceeds the limiting element voltage,<br>the voltage rating is equal to the maximum operating voltage.<br><br>$E = \sqrt{P \times R}$ E: Rated voltage (V)<br>P: Rated power (W)<br>R: Nominal resistance (Ω) | Limiting element voltage | 200V                       |
|                       |  | Nominal resistance       | See Table 1.               |
| Operating temperature | -55°C to +155°C  |                          |                            |

## Resistors

Jumper type

|                       |                 |
|-----------------------|-----------------|
| Resistance            | Max. 50mΩ       |
| Rated current         | 2A              |
| Operating temperature | -55°C to +155°C |

Table 1

| Resistance tolerance | Resistance range (Ω) | Resistance temperature coefficient (ppm / °C) |
|----------------------|----------------------|---|
| D (±0.5%)            | 10 to 91 (E24)       | ±100  |
|                      | 100 to 1M (E24)      | ±50   |
| F (±1%)              | 10 to 2.2M (E24,96)  | ±100  |
| J (±5%)              | 1.0 to 9.1 (E24)     | ±400  |
|                      | 10 to 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  | Jumper type |  |
| Resistance                               | J : ±5%<br>F : ±1%<br>D : ±0.5%  | Max. 50mΩ   | JIS C 5201-1 4.5   |
| Variation of resistance with temperature | See Table.1  |             | JIS C 5201-1 4.8<br>Measurement : -55 / +25 / +125°C   |
| Overload                                 | ± (2.0%+0.1Ω)  | Max. 50mΩ   | JIS C 5201-1 4.13<br>Rated voltage (current) ×2.5, 2s.<br>Maximum overload voltage : 400V                        |
| 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±5°C<br>Duration of immersion : 2.0±0.5s. |
| Resistance to soldering heat             | ± (1.0%+0.05Ω)<br>No remarkable abnormality on the appearance.                                 | Max. 50mΩ   | JIS C 5201-1 4.18<br>Soldering condition : 260±5°C<br>Duration of immersion : 10±1s.                             |
| Rapid change of temperature              | ± (1.0%+0.05Ω)   | Max. 50mΩ   | JIS C 5201-1 4.19<br>Test temp. : -55°C to +125°C 5cyc   |
| Damp heat, steady state                  | ± (3.0%+0.1Ω)  | Max. 100mΩ  | JIS C 5201-1 4.24<br>40°C, 93%RH<br>Test time : 1,000h to 1,048h   |
| Endurance at 70°C                        | ± (3.0%+0.1Ω)  | Max. 100mΩ  | JIS C 5201-1 4.25.1<br>Rated voltage (current), 70°C<br>1.5h : ON - 0.5h : OFF<br>Test time : 1,000h to 1,048h   |
| Endurance                                | ± (3.0%+0.1Ω)  | Max. 100mΩ  | JIS C 5201-1 4.25.3<br>155°C<br>Test time : 1,000h to 1,048h   |
| Resistance to solvent                    | ± (1.0%+0.05Ω)   | Max. 50mΩ   | JIS C 5201-1 4.29<br>23±5°C, Immersion cleaning, 5±0.5min.<br>Solvent : 2-propanol                               |
| Bend strength of the end face plating    | ± (1.0%+0.05Ω)<br>Without mechanical damage such as breaks.                                    | Max. 50mΩ   | JIS C 5201-1 4.33  |

Resistors

●Dimensions (Unit : mm)

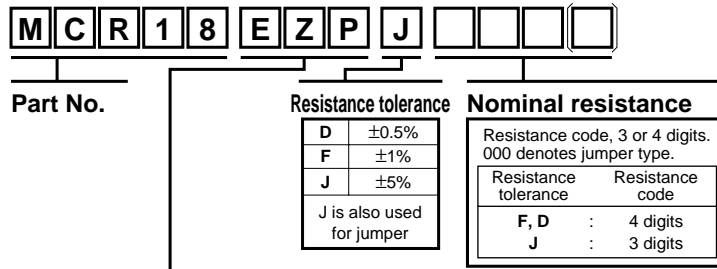
| No. | Material                                   |
|-----|--|
| ①   | Resistive element (Oxide metal thick film) |
| ②   | Silver thick film electrode                |
| ③   | Nickel electrode                           |
| ④   | Sn electrode                               |
| ⑤   | Alumina substrate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

●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>9 \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  | $\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}$ | $\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$ | $9 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ | $\phi 13 \pm 0.2$ | <p>Heat crimp cover/Tape</p> <p>Thick paper mount (Underside paper tape)</p> <p>Chip resistor</p> <p>Square punchout hole</p> <p>(Unit: mm)</p> <table border="1"> <thead> <tr> <th>W</th> <th>F</th> <th>E</th> <th>A<sub>2</sub></th> <th>B<sub>2</sub></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>1.95 \begin{smallmatrix} +0.1 \\ -0.05 \end{smallmatrix}</math></td> <td><math>3.5 \begin{smallmatrix} +0.15 \\ -0.05 \end{smallmatrix}</math></td> </tr> <tr> <th>D<sub>0</sub></th> <th>P<sub>0</sub></th> <th>P<sub>1</sub></th> <th>P<sub>2</sub></th> <th>T<sub>2</sub></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 | A <sub>2</sub> | B <sub>2</sub> | $8.0 \pm 0.3$ | $3.5 \pm 0.05$ | $1.75 \pm 0.1$ | $1.95 \begin{smallmatrix} +0.1 \\ -0.05 \end{smallmatrix}$ | $3.5 \begin{smallmatrix} +0.15 \\ -0.05 \end{smallmatrix}$ | D <sub>0</sub> | P <sub>0</sub> | P <sub>1</sub> | P <sub>2</sub> | T <sub>2</sub> | $\phi 1.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}$ | $4.0 \pm 0.1$ | $4.0 \pm 0.1$ | $2.0 \pm 0.05$ | Max. 1.1 |
| A   | B   | C   | D  |  |  |   |   |                   |   |   |   |   |                |                |               |                |                |  |  |                |                |                |                |                |  |               |               |                |          |
| $\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}$  | $\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$ | $9 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ | $\phi 13 \pm 0.2$  |  |  |   |   |                   |   |   |   |   |                |                |               |                |                |  |  |                |                |                |                |                |  |               |               |                |          |
| W   | F   | E   | A <sub>2</sub>   | B <sub>2</sub>   |  |   |   |                   |   |   |   |   |                |                |               |                |                |  |  |                |                |                |                |                |  |               |               |                |          |
| $8.0 \pm 0.3$   | $3.5 \pm 0.05$  | $1.75 \pm 0.1$                                      | $1.95 \begin{smallmatrix} +0.1 \\ -0.05 \end{smallmatrix}$ | $3.5 \begin{smallmatrix} +0.15 \\ -0.05 \end{smallmatrix}$ |  |   |   |                   |   |   |   |   |                |                |               |                |                |  |  |                |                |                |                |                |  |               |               |                |          |
| D <sub>0</sub>  | P <sub>0</sub>  | P <sub>1</sub>                                      | P <sub>2</sub>   | T <sub>2</sub>   |  |   |   |                   |   |   |   |   |                |                |               |                |                |  |  |                |                |                |                |                |  |               |               |                |          |
| $\phi 1.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}$  | $4.0 \pm 0.1$   | $4.0 \pm 0.1$                                       | $2.0 \pm 0.05$   | Max. 1.1   |  |   |   |                   |   |   |   |   |                |                |               |                |                |  |  |                |                |                |                |                |  |               |               |                |          |

Resistors

●Part No. Explanation



**Packaging Specifications Code**

| Part No.     | Code | Resistance tolerance |        |          | Packaging specifications | Reel          | Basic ordering unit (pcs) |
|--------------|------|----------------------|--------|----------|--------------------------|---------------|---------------------------|
|              |      | J(±5%)               | F(±1%) | D(±0.5%) |                          |               |                           |
| <b>MCR18</b> | EZP  | ◎                    | ◎      | ◎        | Paper tape (4mm Pitch)   | φ180mm (7in.) | 5,000                     |

Reel (φ180) : Compatible with JEITA standard "EIAJ ET-7200B"  
 ◎ : Standard product

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