

# Compact Thick Film Chip Resistors

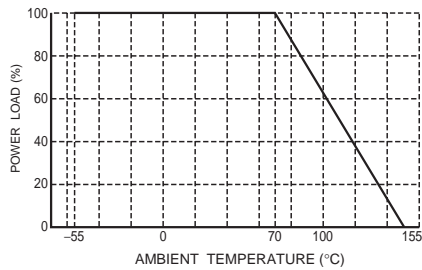
**MCR03 (0603 size : 1 / 10W)**

**●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) Resin protective coating absorbs impact, facilitates mounting.
- 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 supplied with the product 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>	0.10W (1 / 10W) at 70°C		
Rated voltage	<p>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.</p> $E = \sqrt{P \times R}$ <p>E: Rated voltage (V) P: Rated power (W) R: Nominal resistance (Ω)</p>	<table border="1" style="width: 100%;"> <tr> <td>Limiting element voltage</td> <td>50V</td> </tr> </table>	Limiting element voltage	50V
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Nominal resistance	See Table 1.			
Operating temperature		-55°C to +155°C		

## Jumper type

Resistance	Max. 50mΩ
Rated current	1A
Operating temperature	-55°C to +155°C

Table 1

Resistance tolerance	Resistance range (Ω)	Resistance temperature coefficient (ppm/°C)
J (±5%)	1.0 to 9.1 (E24)	±400
	10 to 10M (E24)	±200
FX (±1%)	10 to 10M (E24,96)	±100
D (±0.5%)	10 to 91 (E24)	±100
	100 to 1M (E24)	±50

## ●Characteristics

Item	Guaranteed value		Test conditions (JIS C 5201-1)
	Resistor type	Jumper type	
Resistance	J : ±5% FX : ±1% 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 Measurement : +25 / +125°C
Overload	± (2.0%+0.1Ω)	Max. 50mΩ	JIS C 5201-1 4.13 Rated voltage (current) ×2.5, 2s. Limiting element voltage×2 : 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.	Max. 50mΩ	JIS C 5201-1 4.18 Soldering condition : 260±5°C Duration of immersion : 10±1s.
Rapid change of temperature	± (1.0%+0.05Ω)	Max. 50mΩ	JIS C 5201-1 4.19 Test temp. : -55°C to +125°C 5cyc
Damp heat, steady state	± (3.0%+0.1Ω)	Max. 100mΩ	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)	Max. 100mΩ	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)	Max. 100mΩ	JIS C 5201-1 4.25.3 155°C Test time : 1,000h to 1,048h
Resistance to solvent	± (1.0%+0.05Ω)	Max. 50mΩ	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.	Max. 50mΩ	JIS C 5201-1 4.33

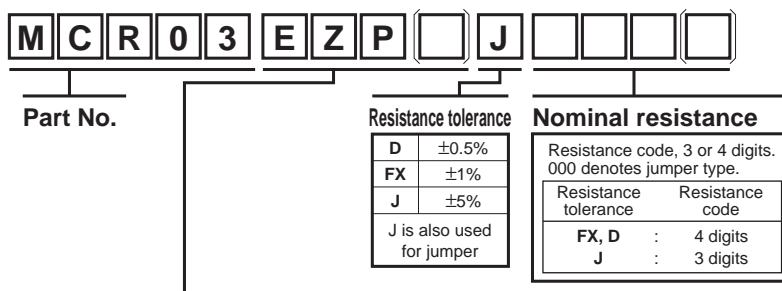
●Dimensions (Unit : mm)

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

●Packaging

Reel	Taping																																																
<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 \\ -3 \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	$\phi 180 \begin{smallmatrix} 0 \\ -3 \end{smallmatrix}$	$\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	$9 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$	$\phi 13 \pm 0.2$	<p>(Unit : mm)</p> <table border="1"> <thead> <tr> <th>W</th> <th>F</th> <th>E</th> <th>A<sub>0</sub></th> <th>B<sub>0</sub></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> <td>D<sub>0</sub></td> <td>P<sub>0</sub></td> <td>P<sub>1</sub></td> <td>P<sub>2</sub></td> <td>T<sub>2</sub></td> </tr> <tr> <td><math>\phi 1.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}</math></td> <td>4.0±0.1</td> <td>4.0±0.1</td> <td>2.0±0.05</td> <td>Max. 1.1</td> </tr> </tbody> </table> <p>Narrow pitch (2mm pitch) version</p> <p>(Unit : mm)</p> <table border="1"> <thead> <tr> <th>W</th> <th>F</th> <th>E</th> <th>A<sub>0</sub></th> <th>B<sub>0</sub></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> <td>D<sub>0</sub></td> <td>P<sub>0</sub></td> <td>P<sub>1</sub></td> <td>P<sub>2</sub></td> <td>T<sub>2</sub></td> </tr> <tr> <td><math>\phi 1.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}</math></td> <td>4.0±0.1</td> <td>2.0±0.5</td> <td>2.0±0.05</td> <td>Max. 1.1</td> </tr> </tbody> </table>	W	F	E	A <sub>0</sub>	B <sub>0</sub>	8.0±0.3	3.5±0.05	1.75±0.1	1.1±0.1	1.9±0.1	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±0.1	4.0±0.1	2.0±0.05	Max. 1.1	W	F	E	A <sub>0</sub>	B <sub>0</sub>	8.0±0.3	3.5±0.05	1.75±0.1	1.1±0.1	1.9±0.1	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±0.1	2.0±0.5	2.0±0.05	Max. 1.1
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<p>Bulk case</p> <p>(Unit : mm)</p> <p>EIAJ ET-7200B compliant</p>																																																	

●Part No. Explanation



Packaging Specifications Code

Part No.	Code	Resistance tolerance			Packaging specifications	Reel	Basic ordering unit (pcs)	Remarks
		J(±5%)	FX(±1%)	D(±0.5%)				
MCR03	EZP	◎	◎	◎	Paper tape (4mm Pitch)	φ180mm(7inch)	5,000	-
MCR03	MZP	◎	◎	-	Paper tape (2mm Pitch)	φ180mm(7inch)	10,000	Narrow pitch type
MCR03	PZPI	◎	◎	-	Bulkcase	-	25,000	-

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

## Notes

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