

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**

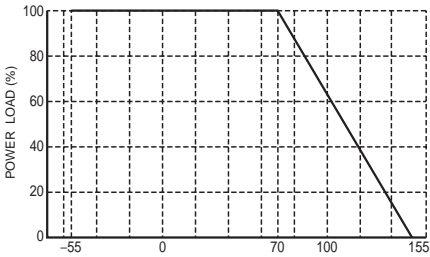
Item	Conditions	Specifications
Rated power	Power must be derated according to the power derating curve in Figure 1 when ambient temperature exceeds 70°C.  <p style="text-align: center;">Fig.1</p>	0.2W (1/5W) at 70°C
Rated voltage	The voltage rating is calculated by the following equation. If the value obtained exceeds the limiting element voltage, the voltage rating is equal to the maximum operating voltage. $E = \sqrt{P \times R}$ <p style="margin-left: 100px;">E: Rated voltage (V) P: Rated power (W) R: Nominal resistance (Ω)</p>	Limiting element voltage 50V
Nominal resistance	See Table 1.	
Operating temperature		-55°C to +155°C

Table 1

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

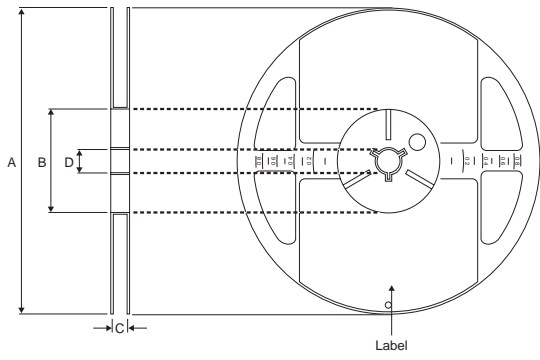
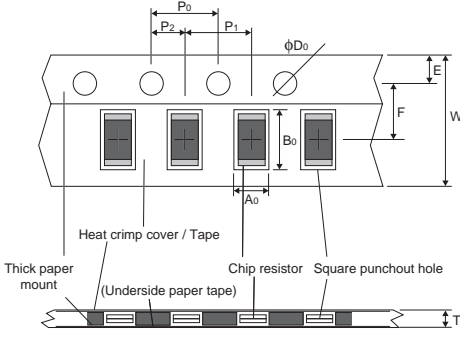
●Characteristics

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 <u>Table.1</u>	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

●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 style="text-align: center;">(Unit: mm)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> <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> </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 style="text-align: center;">(Unit : mm)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <th>W</th> <th>F</th> <th>E</th> <th>A₀</th> <th>B₀</th> </tr> <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±0.1</td> <td>4.0±0.1</td> <td>2.0±0.05</td> <td>Max. 1.1</td> </tr> </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
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 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																									

●Part No. Explanation

E	S	R	0	3	E	Z	P		J																			
Part No.					Resistance tolerance			Nominal resistance																				
					<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>J</td> <td>±5%</td> </tr> <tr> <td>F</td> <td>±1%</td> </tr> <tr> <td>D</td> <td>±0.5%</td> </tr> </table>			J	±5%	F	±1%	D	±0.5%	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2">Resistance code, 3 or 4 digits.</td> </tr> <tr> <td>Resistance tolerance</td> <td>Resistance code</td> </tr> <tr> <td>J</td> <td>: 3 digits</td> </tr> <tr> <td>F</td> <td>: 4 digits</td> </tr> <tr> <td>D</td> <td>: 4 digits</td> </tr> </table>					Resistance code, 3 or 4 digits.		Resistance tolerance	Resistance code	J	: 3 digits	F	: 4 digits	D	: 4 digits
J	±5%																											
F	±1%																											
D	±0.5%																											
Resistance code, 3 or 4 digits.																												
Resistance tolerance	Resistance code																											
J	: 3 digits																											
F	: 4 digits																											
D	: 4 digits																											

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

Notes

No copying or reproduction of this document, in part or in whole, is permitted without the consent of ROHM Co.,Ltd.

The content specified herein is subject to change for improvement without notice.

The content specified herein is for the purpose of introducing ROHM's products (hereinafter "Products"). If you wish to use any such Product, please be sure to refer to the specifications, which can be obtained from ROHM upon request.

Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, ROHM shall bear no responsibility for such damage.

The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM and other parties. ROHM shall bear no responsibility whatsoever for any dispute arising from the use of such technical information.

The Products specified in this document are intended to be used with general-use electronic equipment or devices (such as audio visual equipment, office-automation equipment, communication devices, electronic appliances and amusement devices).

The Products specified in this document are not designed to be radiation tolerant.

While ROHM always makes efforts to enhance the quality and reliability of its Products, a Product may fail or malfunction for a variety of reasons.

Please be sure to implement in your equipment using the Products safety measures to guard against the possibility of physical injury, fire or any other damage caused in the event of the failure of any Product, such as derating, redundancy, fire control and fail-safe designs. ROHM shall bear no responsibility whatsoever for your use of any Product outside of the prescribed scope or not in accordance with the instruction manual.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). ROHM shall bear no responsibility in any way for use of any of the Products for the above special purposes. If a Product is intended to be used for any such special purpose, please contact a ROHM sales representative before purchasing.

If you intend to export or ship overseas any Product or technology specified herein that may be controlled under the Foreign Exchange and the Foreign Trade Law, you will be required to obtain a license or permit under the Law.



Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available, please contact us.

ROHM Customer Support System

<http://www.rohm.com/contact/>