

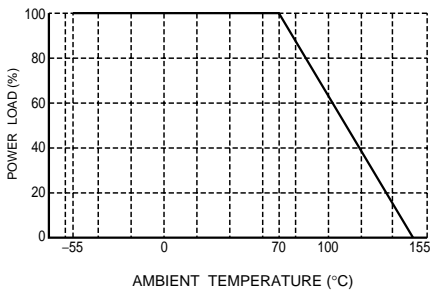
# Endured surge thick film chip resistor

## ESR10 (0805 size : 1 / 4W)

### ●Features

- 1) Power rating of 1 / 4W (Rated power is more than twice that of MCR series)
- 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 certification.  
Design and specifications are subject to change without notice. Carefully check the specification sheet before using or ordering it.

### ●Ratings

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>	0.25W (1 / 4W) 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 style="text-align: center;">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>150V</td> </tr> </table>	Limiting element voltage	150V
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Nominal resistance	See <a href="#">Table 1</a> .			
Operating temperature		-55°C to +155°C		

## Resistors

Table 1

Resistance tolerance	Resistance range ( $\Omega$ )	Resistance temperature coefficient (ppm/ $^{\circ}$ C)
D ( $\pm 0.5\%$ )	$10 \leq R \leq 1M$ (E24,96)	$\pm 100$
J ( $\pm 5\%$ )	$1 \leq R \leq 10M$ (E24)	$\pm 200$

- 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 : $\pm 5\%$ D : $\pm 0.5\%$	JIS C 5201-1 4.5
Variation of resistance with temperature	See Table 1	JIS C 5201-1 4.8 Measurement : $-55 / +25 / +125^{\circ}$ C
Overload	$\pm (2.0\%+0.1\Omega)$	JIS C 5201-1 4.13 Rated voltage (current) $\times 2.5$ , 2s. Maximum overload voltage : 200V
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 : $235 \pm 5^{\circ}$ C Duration of immersion : $2.0 \pm 0.5$ s.
Resistance to soldering heat	$\pm (1.0\%+0.05\Omega)$ No remarkable abnormality on the appearance.	JIS C 5201-1 4.18 Soldering condition : $260 \pm 5^{\circ}$ C Duration of immersion : $10 \pm 1$ s.
Rapid change of temperature	$\pm (1.0\%+0.05\Omega)$	JIS C 5201-1 4.19 Test temp. : $-55^{\circ}$ C to $+125^{\circ}$ C 5cyc
Damp heat, steady state	$\pm (3.0\%+0.1\Omega)$	JIS C 5201-1 4.24 $40^{\circ}$ C, 93%RH Test time : 1,000h to 1,048h
Endurance at $70^{\circ}$ C	$\pm (3.0\%+0.1\Omega)$	JIS C 5201-1 4.25.1 Rated voltage (current), $70^{\circ}$ C 1.5h : ON – 0.5h : OFF Test time : 1,000h to 1,048h
Endurance	$\pm (3.0\%+0.1\Omega)$	JIS C 5201-1 4.25.3 $155^{\circ}$ C Test time : 1,000h to 1,048h
Resistance to solvent	$\pm (1.0\%+0.05\Omega)$	JIS C 5201-1 4.29 $23 \pm 5^{\circ}$ C, Immersion cleaning, $5 \pm 0.5$ min. Solvent : 2-propanol
Bend strength of the end face plating	$\pm (1.0\%+0.05\Omega)$ Without mechanical damage such as breaks.	JIS C 5201-1 4.33
Static electric characteristics	$\pm (5.0\%+0.05\Omega)$	EIAJ ED-4701 1300 Test method 304 Voltage : 3kv R : $1.5k\Omega$ C : 100pF Apply cycle : 1 time

Resistors

●External dimensions (Unit : mm)

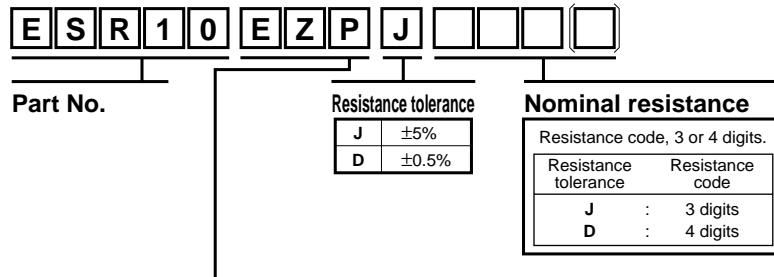
No.	Material
①	Resistive element
②	Silver thick film electrode
③	Nickel electrode
④	Sn electrode
⑤	Alumina substrate
⑥	Overcoating

●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><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>Thick paper mount</p> <p>Heat crimp cover/Tape</p> <p>Chip resistor</p> <p>Square punchout hole</p> <p>(Underside paper tape)</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><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>1.65 \begin{smallmatrix} +0.2 \\ -0.1 \end{smallmatrix}</math></td> <td><math>2.4 \begin{smallmatrix} +0.2 \\ -0.1 \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>0</sub>	B <sub>0</sub>	$8.0 \pm 0.3$	$3.5 \pm 0.05$	$1.75 \pm 0.1$	$1.65 \begin{smallmatrix} +0.2 \\ -0.1 \end{smallmatrix}$	$2.4 \begin{smallmatrix} +0.2 \\ -0.1 \end{smallmatrix}$	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
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Resistors

●Part designation



Packaging Specifications Code

Part No.	Code	Resistance tolerance		Packaging specifications	Reel	Basic ordering unit(pcs)
		J(±5%)	F(±1%)			
<b>ESR10</b>	<b>EZP</b>	◎	◎	Paper tape (4mm Pitch)	φ180mm (7in.)	5,000

Reel (φ180) : JEITA ET-7200B  
 ◎ : Standard product

●Dimensions

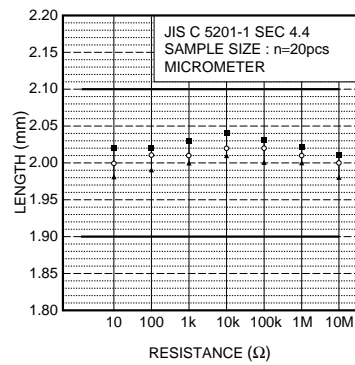


Fig.2 Dimensions (length)

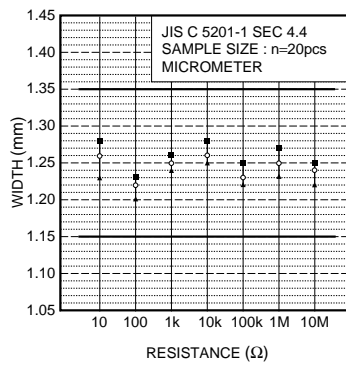


Fig.3 Dimensions (width)

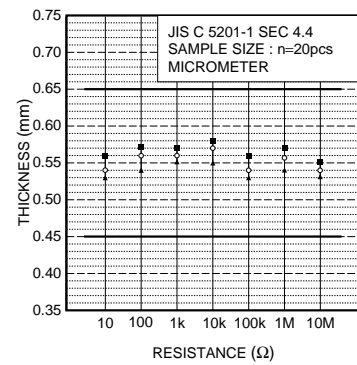


Fig.4 Dimensions (thickness)

●Electrical characteristics

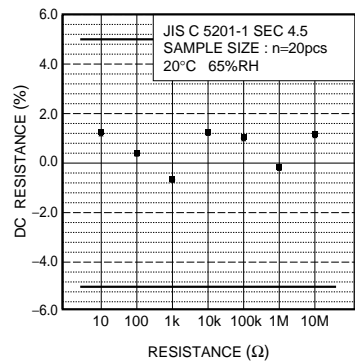


Fig.5 Resistance (J class)

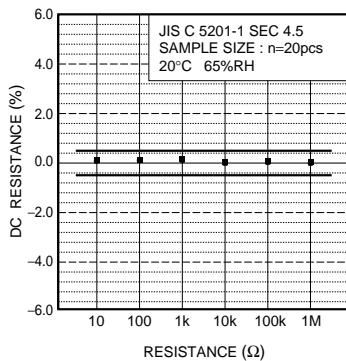


Fig.6 Resistance (D class)

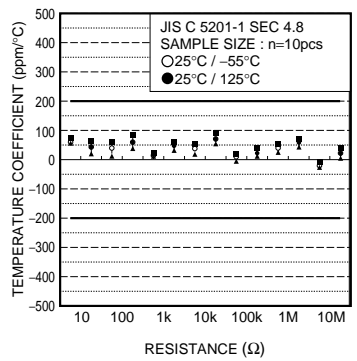


Fig.7 Variation of resistance with temperature (J class)

Resistors

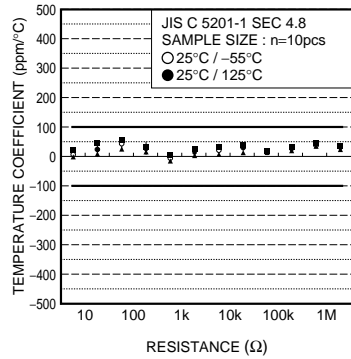


Fig.8 Variation of resistance with temperature (D class)

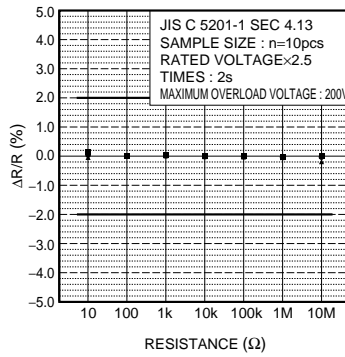


Fig.9 Overload

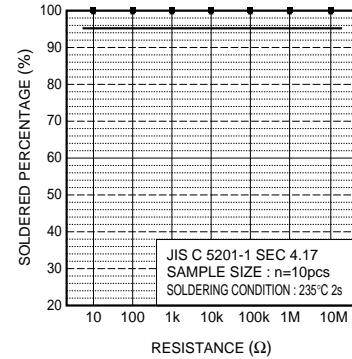


Fig.10 Solderability

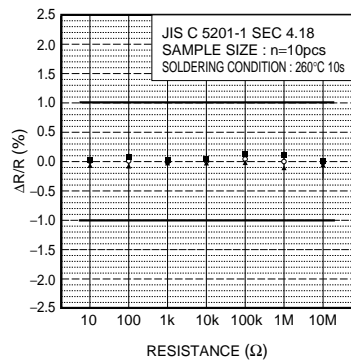


Fig.11 Resistance to soldering heat

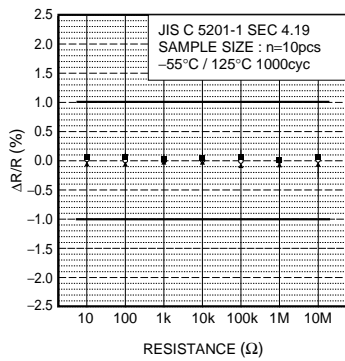


Fig.12 Rapid change of temperature

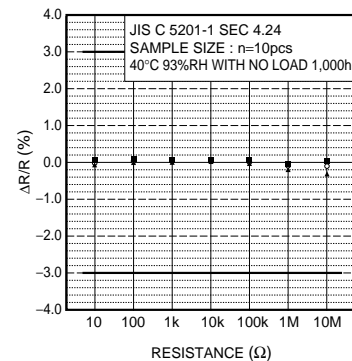


Fig.13 Damp heat, steady state

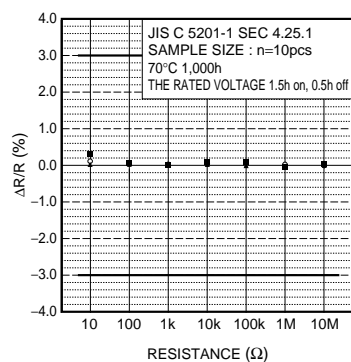


Fig.14 Endurance at 70°C

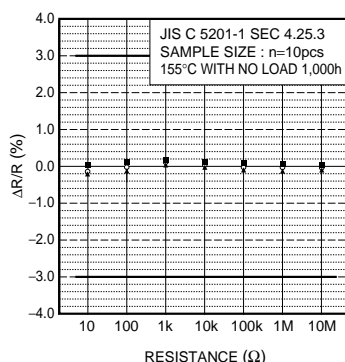


Fig.15 Endurance

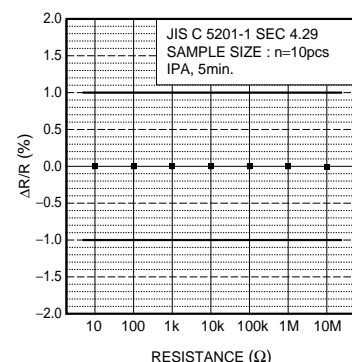


Fig.16 Component solvent resistance

Resistors

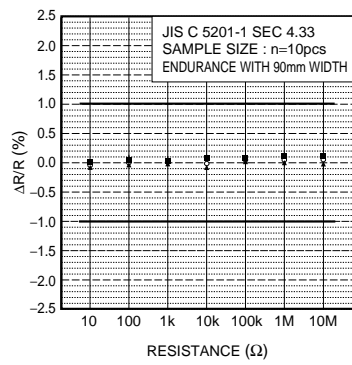


Fig.17 Bend strength of the end face plating

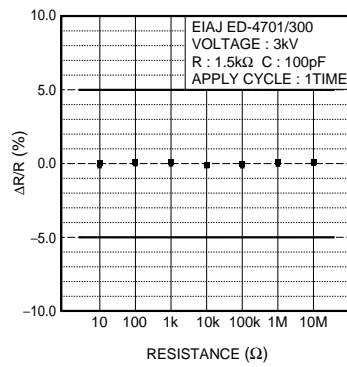


Fig.18 Static electric characteristics

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