

## Resistors

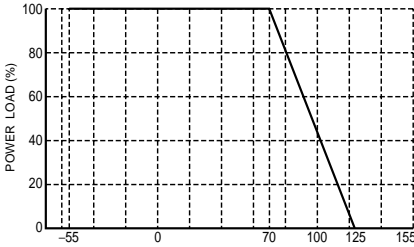
## Chip resistor networks

## MNR02 (1005 × 2 size)

## ●Features

- 1) Extremely small and light  
Area ratio is 60% smaller than that of chip 1616 (MNR12), while weight ratio has been cut 75%.
- 2) High-density mounting  
Can be mounted even more densely than two 1005 chips (MCR01). Also, the cost of mounting has been reduced.
- 3) Compatible with a wide range of mounting equipment.  
Squared corners make it excellent for mounting using image recognition devices.
- 4) Convex electrodes  
Easy to check the fillet after soldering is finished.
- 5) ROHM resistors have obtained 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>	0.063W (1 / 16W) 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>25V</td> </tr> </table>	Limiting element voltage	25V
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Nominal resistance	See <a href="#">Table 1</a> .			
Operating temperature		-55°C to +125°C		

## Resistors

Table 1

Resistance tolerance	Resistance range ( $\Omega$ )	Resistance temperature coefficient (ppm / $^{\circ}\text{C}$ )
J ( $\pm 5\%$ )	10 $\leq$ R $\leq$ 1M (E24)	$\pm 300$

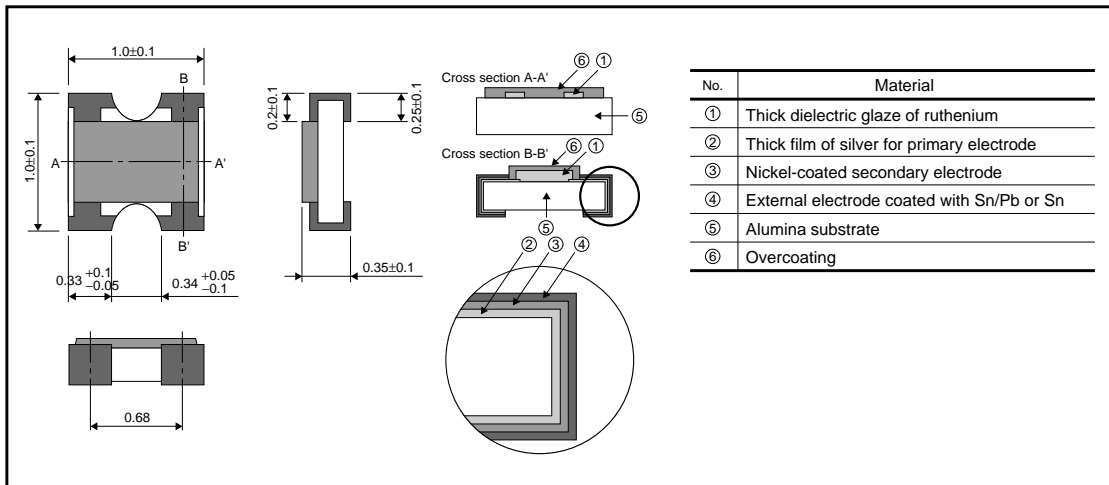
• Before using components in circuits where they will be exposed to transients such as pulse loads (short-duration, high-level loads), be certain to evaluate the component in the mounted state. In addition, the reliability and performance of this component cannot be guaranteed if it is used with a steady state voltage that is greater than its rated voltage.

## ● Characteristics

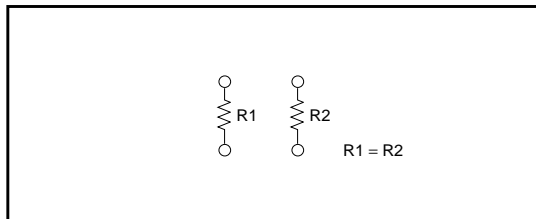
Items	Guaranteed value	Test conditions (JIS C 5201-1)
	Resistor type	
Resistance	J : $\pm 5\%$	JIS C 5201-1 4.5
Variation of resistance with temperature	See <a href="#">Table.1</a>	JIS C 5201-1 4.8 Measurement : $-55 / +25 / +125^{\circ}\text{C}$
Overload	$\pm (2.0\%+0.1\Omega)$	JIS C 5201-1 4.13 Rated voltage (current) $\times 2.5$ , 2s. Limiting Element Voltage $\times 2$ : 50V
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 : $235\pm 5^{\circ}\text{C}$ Duration of immersion : $2.0\pm 0.5\text{s}$ .
Resistance to soldering heat	$\pm (1.0\%+0.05\Omega)$ No remarkable abnormality on the appearance.	JIS C 5201-1 4.18 Soldering condition : $260\pm 5^{\circ}\text{C}$ Duration of immersion : $10\pm 1\text{s}$ .
Rapid change of temperature	$\pm (1.0\%+0.05\Omega)$	JIS C 5201-1 4.19 Test temp. : $-55^{\circ}\text{C}\sim +125^{\circ}\text{C}$ 5cyc
Damp heat, steady state	$\pm (3.0\%+0.1\Omega)$	JIS C 5201-1 4.24 $40^{\circ}\text{C}$ , 93%RH Test time : 1,000h~1,048h
Endurance at $70^{\circ}\text{C}$	$\pm (3.0\%+0.1\Omega)$	JIS C 5201-1 4.25.1 Rated voltage (current), $70^{\circ}\text{C}$ 1.5h : ON – 0.5h : OFF Test time : 1,000h~1,048h
Endurance	$\pm (3.0\%+0.1\Omega)$	JIS C 5201-1 4.25.3 $125^{\circ}\text{C}$ Test time : 1,000h~1,048h
Resistance to solvent	$\pm (1.0\%+0.05\Omega)$	JIS C 5201-1 4.29 $23\pm 5^{\circ}\text{C}$ , Immersion cleaning, $5\pm 0.5\text{min}$ . 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

Resistors

● External dimensions (Units: mm)



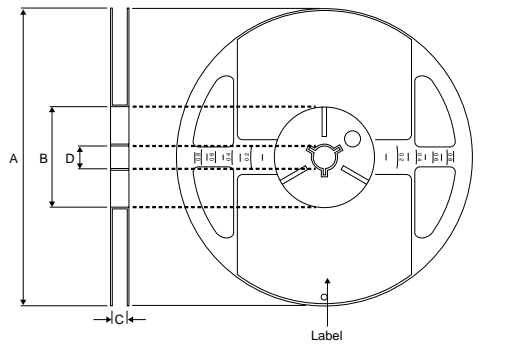
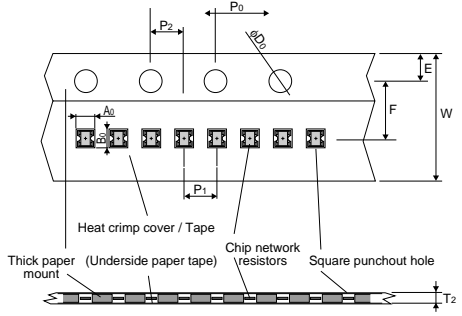
● Equivalent circuit



# MNR02

## Resistors

### ●Packaging

Reel	Taping																												
 <p style="text-align: center;">EIAJ ET-7200A compliant</p> <p style="text-align: center;">(Units: mm)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <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 style="text-align: right;">(Units: mm)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <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>1.17±0.1</td> <td>1.17±0.1</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>4.0±0.1</td> <td>2.0±0.1</td> <td>2.0±0.05</td> <td>Max. 0.5</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	1.17±0.1	1.17±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±0.1	2.0±0.05	Max. 0.5
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### ●Product designation

Part No.

M	N	R	0	2	M	0	A		J			
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Packaging / Processing specifications	Circuit configuration code	Resistance tolerance	Nominal resistance
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Code	Part No.	Packaging	Package style
M0	MNR02	Taping	Paper tape with reel (10,000)

A	MNR02	J	±5%	3-digit IEC coding system
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Resistors

●Electrical characteristics

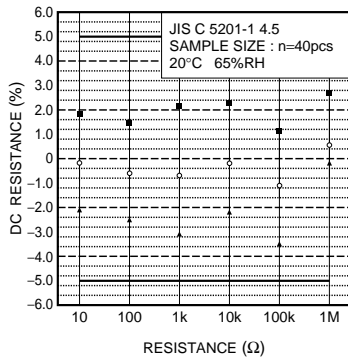


Fig.2 Resistance

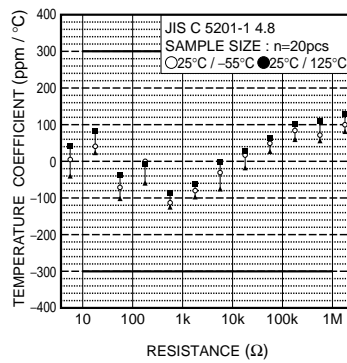


Fig.3 Variation resistance with temperature

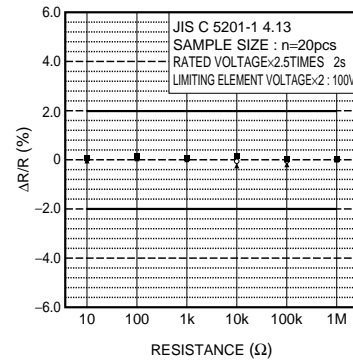


Fig.4 Overload

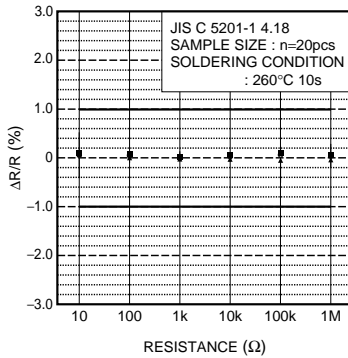


Fig.5 Resistance to soldering heat

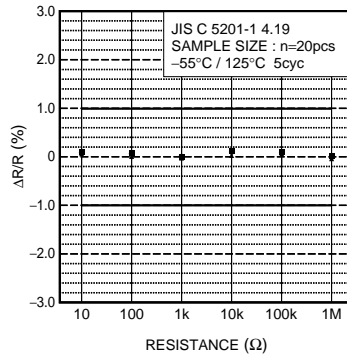


Fig.6 Rapid change of temperature

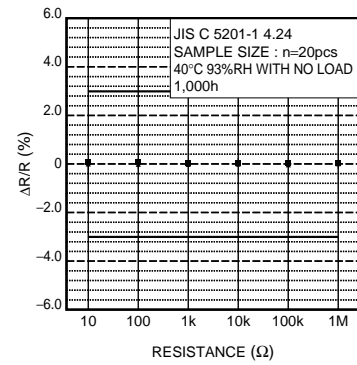


Fig.7 Damp heat, steady state

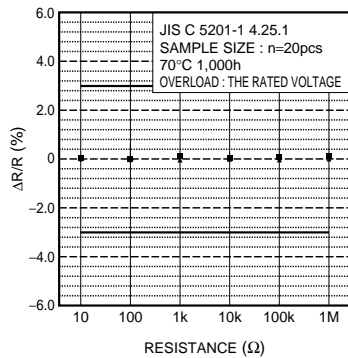


Fig.8 Endurance at 70°C

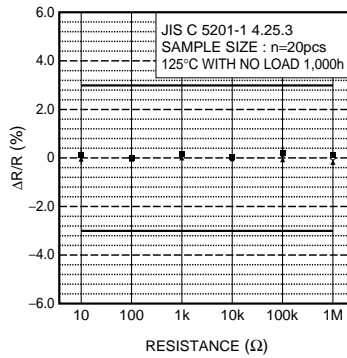


Fig.9 Endurance

