

# 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.

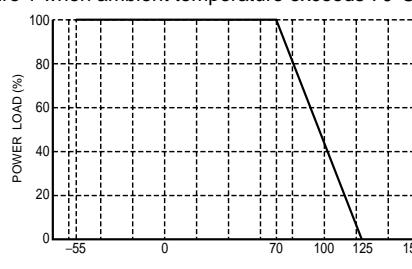
#### 4) Convex electrodes

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	Power must be derated according to the power derating curve in Figure 1 when ambient temperature exceeds 70°C.	0.063W (1 / 16W) at 70°C	
	 <p>Fig.1</p>		
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>E: Rated voltage (V) P: Rated power (W) R: Nominal resistance (<math>\Omega</math>)</p>	Limiting element voltage	25V
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 / °C)
J ( $\pm 5\%$ )	10≤R≤1M (E24)	±300

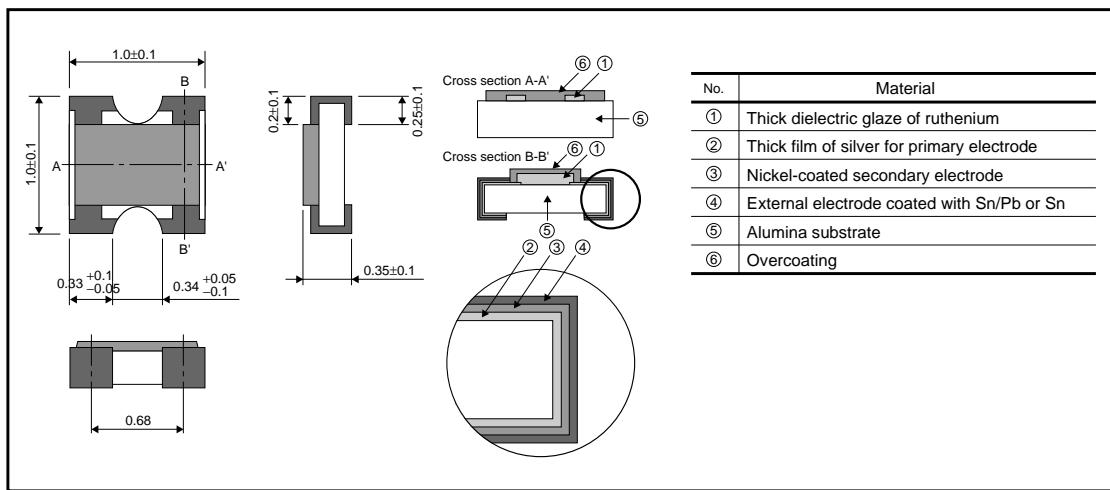
• Before using components in circuits where they will be exposed to transients such as pulse loads (short-duration, high-level loads), be certain to evaluate the component in the mounted state. In addition, the reliability and performance of this component cannot be guaranteed if it is used with a steady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

## ● Characteristics

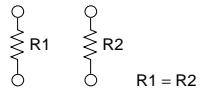
Items	Guaranteed value	Test conditions (JIS C 5201-1)
	Resistor type	
Resistance	J : ±5%	JIS C 5201-1 4.5
Variation of resistance with temperature	See Table.1	JIS C 5201-1 4.8 Measurement : -55 / +25 / +125°C
Overload	± (2.0%+0.1Ω)	JIS C 5201-1 4.13 Rated voltage (current) ×2.5, 2s. Limiting Element Voltage×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±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~+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~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~1,048h
Endurance	± (3.0%+0.1Ω)	JIS C 5201-1 4.25.3 125°C Test time : 1,000h~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

## Resistors

## ● External dimensions (Units: mm)

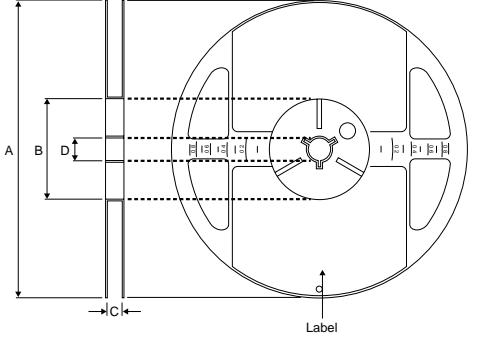
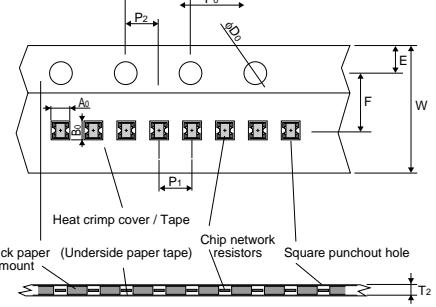


## ● Equivalent circuit



## Resistors

## ●Packaging

Reel	Taping																												
 <p>EIAJ ET-7200A compliant (Units: mm)</p> <table border="1" data-bbox="287 819 647 900"> <tr> <th>A</th><th>B</th><th>C</th><th>D</th></tr> <tr> <td><math>\phi 180 \pm 0.3</math></td><td><math>\phi 60 \pm 1.0</math></td><td><math>9 \pm 1.0</math></td><td><math>\phi 13 \pm 0.2</math></td></tr> </table>	A	B	C	D	$\phi 180 \pm 0.3$	$\phi 60 \pm 1.0$	$9 \pm 1.0$	$\phi 13 \pm 0.2$	 <p>(Units: mm)</p> <table border="1" data-bbox="822 765 1266 923"> <tr> <th>W</th><th>F</th><th>E</th><th>A<sub>0</sub></th><th>B<sub>0</sub></th></tr> <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>1.17 \pm 0.1</math></td><td><math>1.17 \pm 0.1</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 \pm 0.1</math></td><td><math>4.0 \pm 0.1</math></td><td><math>2.0 \pm 0.1</math></td><td><math>2.0 \pm 0.05</math></td><td>Max. 0.5</td></tr> </table>	W	F	E	A <sub>0</sub>	B <sub>0</sub>	$8.0 \pm 0.3$	$3.5 \pm 0.05$	$1.75 \pm 0.1$	$1.17 \pm 0.1$	$1.17 \pm 0.1$	D <sub>0</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	T <sub>2</sub>	$\phi 1.5 \pm 0.1$	$4.0 \pm 0.1$	$2.0 \pm 0.1$	$2.0 \pm 0.05$	Max. 0.5
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## ●Product designation

Part No.									
M N R 0 2 M 0 A					J				
Packaging / Processing specifications					Circuit configuration code		Resistance tolerance		Nominal resistance
Code	Part No.	Packaging	Package style		A	MNR02	J	$\pm 5\%$	3-digit IEC coding system
M0	MNR02	Taping	Paper tape with reel (10,000)						

## Resistors

## ● Electrical characteristics

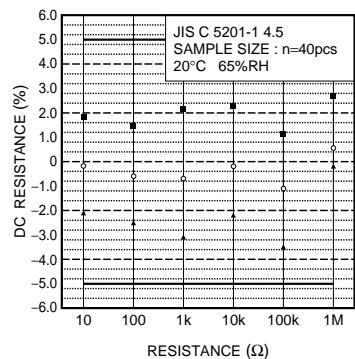


Fig.2 Resistance

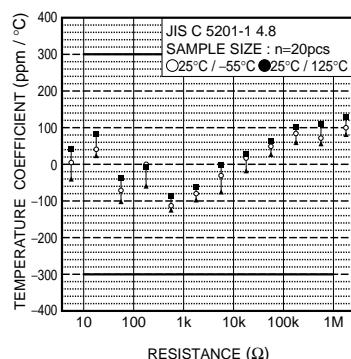


Fig.3 Variation resistance with temperature

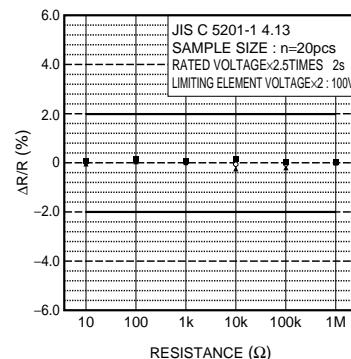


Fig.4 Overload

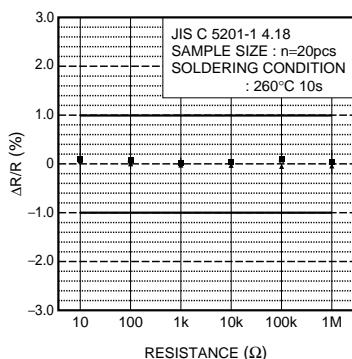


Fig.5 Resistance to soldering heat

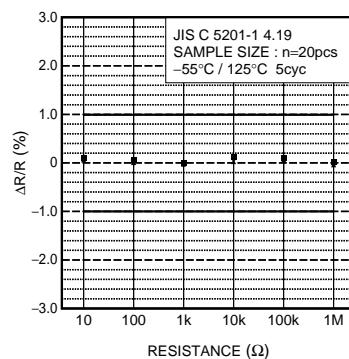


Fig.6 Rapid change of temperature

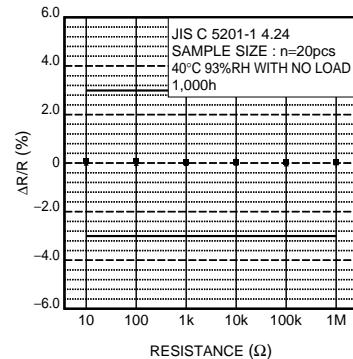


Fig.7 Damp heat, steady state

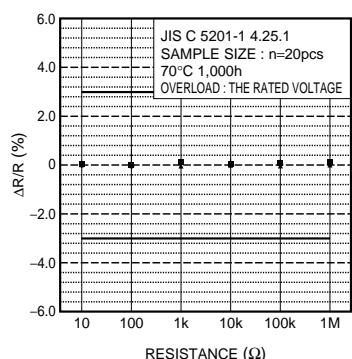


Fig.8 Endurance at 70°C

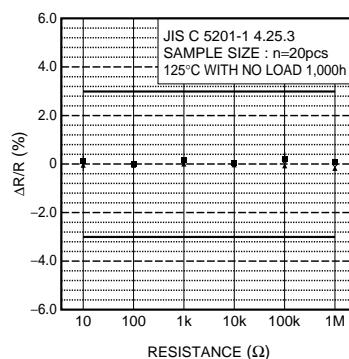


Fig.9 Endurance