

Resistors

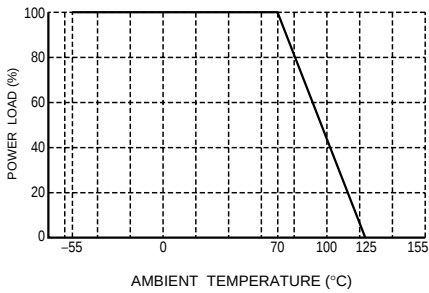
Chip resistor networks

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	Power must be derated according to the power derating curve in Figure 1 when ambient temperature exceeds 70°C.  Fig.1	0.063W (1 / 16W) 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. $E = \sqrt{P \times R}$ E: Rated voltage (V) P: Rated power (W) R: Nominal resistance (Ω)	Limiting element voltage	25V
Nominal resistance	See Table 1.		
Operating temperature		-55°C to +125°C	

Resistors

Table 1

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

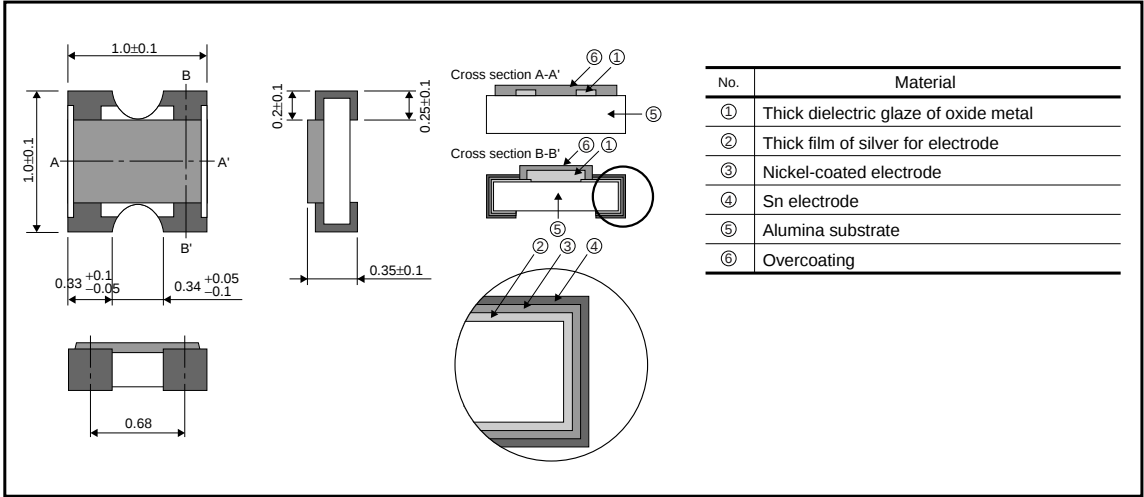
•Before using components in circuits where they will be exposed to transients such as pulse loads (short-duration, high-level loads), be certain to evaluate the component in the mounted state. In addition, the reliability and performance of this component cannot be guaranteed if it is used with a steady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

●Characteristics

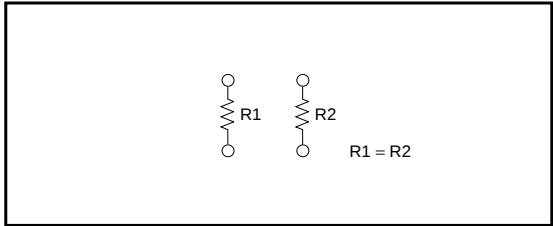
Items	Guaranteed value	Test conditions (JIS C 5201-1)
	Resistor type	
Resistance	J : $\pm 5\%$	JIS C 5201-1 4.5
Variation of resistance with temperature	See Table.1	JIS C 5201-1 4.8 Measurement : $-55 / +25 / +125^{\circ}\text{C}$
Overload	$\pm (2.0\%+0.1\Omega)$	JIS C 5201-1 4.13 Rated voltage (current) $\times 2.5$, 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°C to $+125^{\circ}\text{C}$ 5cyc
Damp heat, steady state	$\pm (3.0\%+0.1\Omega)$	JIS C 5201-1 4.24 40°C , 93%RH Test time : 1,000h to 1,048h
Endurance at 70°C	$\pm (3.0\%+0.1\Omega)$	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	$\pm (3.0\%+0.1\Omega)$	JIS C 5201-1 4.25.3 125°C Test time : 1,000h to 1,048h
Resistance to solvent	$\pm (1.0\%+0.05\Omega)$	JIS C 5201-1 4.29 $23 \pm 5^{\circ}\text{C}$, 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 (Unit: mm)



●Equivalent circuit



Resistors

●Packaging

The diagram shows a top view of a reel. Dimension A is the total width. Dimension B is the width of the central hub. Dimension C is the width of the outer flange. Dimension D is the width of the central hole. A label is shown on the central hub.

Label

EIAJ ET-7200B compliant

(Unit: mm)

A	B	C	D
$\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}$	$\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	$9 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$	$\phi 13 \pm 0.2$

Taping

The diagram shows a top view of a resistor tape. Dimension W is the total width. Dimension F is the width of the central hub. Dimension E is the width of the outer flange. Dimension A₀ is the width of the central hole. Dimension B₀ is the width of the central hole. Dimension D₀ is the diameter of the central hole. Dimension P₀ is the pitch between the central hole and the first resistor. Dimension P₁ is the pitch between the first resistor and the second resistor. Dimension P₂ is the pitch between the second resistor and the third resistor. Dimension T₂ is the thickness of the tape. Labels include: Heat crimp cover / Tape, Thick paper mount, Chip network resistors, and Square punchout hole.

(Unit: mm)

W	F	E	A ₀	B ₀
8.0±0.3	3.5±0.05	1.75±0.1	1.17±0.1	1.17±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	2.0±0.1	2.0±0.05	Max. 0.5

●Product designation

M	N	R	0	2	M	0	A	P	J			
Part No.								Resistance tolerance		Nominal resistance		
								J ±5%		Resistance code, 3 digits, 000 denotes Jumper type.		
								J is also used for jumper.				

Packaging Specifications Code

Part No.	Code	Resistance tolerance J(±5%)	Packaging specifications	Reel	Basic ordering unit (pcs)
MNR02	M0AP	◎	Paper tape (2mmPitch)	φ180mm (7in).	10,000

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

Resistors

●Electrical characteristics

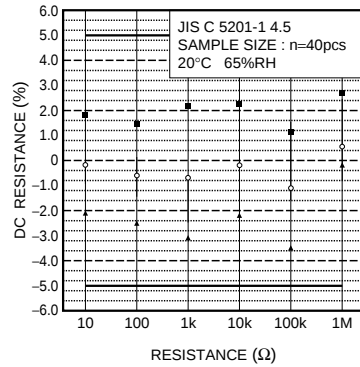


Fig.2 Resistance

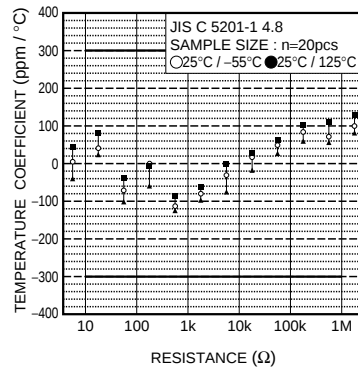


Fig.3 Variation resistance with temperature

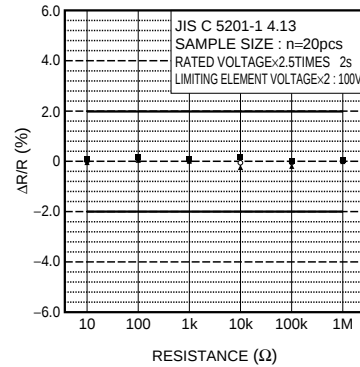


Fig.4 Overload

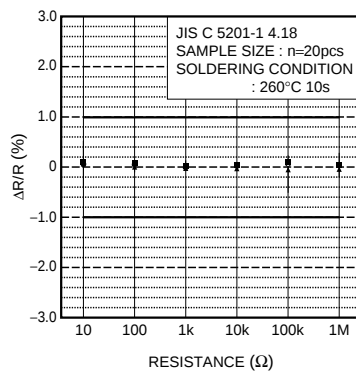


Fig.5 Resistance to soldering heat

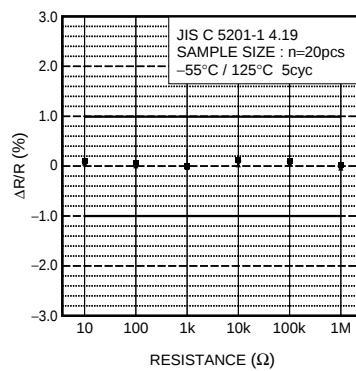


Fig.6 Rapid change of temperature

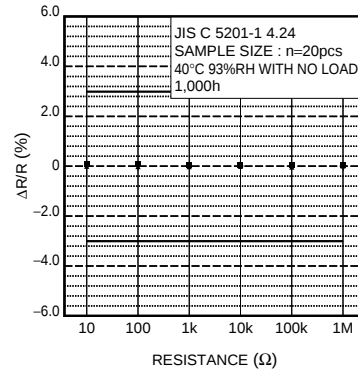


Fig.7 Damp heat, steady state

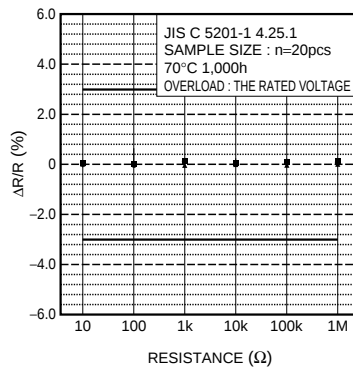


Fig.8 Endurance at 70°C

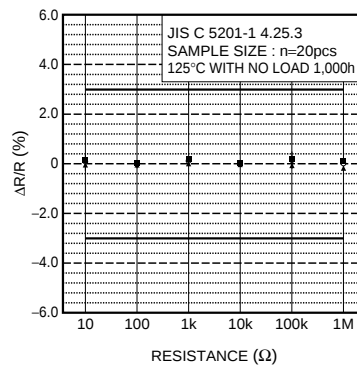


Fig.9 Endurance

Appendix

Notes

- No technical content pages of this document may be reproduced in any form or transmitted by any means without prior permission of ROHM CO.,LTD.
- The contents described herein are subject to change without notice. The specifications for the product described in this document are for reference only. Upon actual use, therefore, please request that specifications to be separately delivered.
- Application circuit diagrams and circuit constants contained herein are shown as examples of standard use and operation. Please pay careful attention to the peripheral conditions when designing circuits and deciding upon circuit constants in the set.
- Any data, including, but not limited to application circuit diagrams information, described herein are intended only as illustrations of such devices and not as the specifications for such devices. ROHM CO.,LTD. disclaims any warranty that any use of such devices shall be free from infringement of any third party's intellectual property rights or other proprietary rights, and further, assumes no liability of whatsoever nature in the event of any such infringement, or arising from or connected with or related to the use of such devices.
- Upon the sale of any such devices, other than for buyer's right to use such devices itself, resell or otherwise dispose of the same, no express or implied right or license to practice or commercially exploit any intellectual property rights or other proprietary rights owned or controlled by
- ROHM CO., LTD. is granted to any such buyer.
- Products listed in this document are no antiradiation design.

The products listed in this document are designed to be used with ordinary electronic equipment or devices (such as audio visual equipment, office-automation equipment, communications devices, electrical appliances and electronic toys).

Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

About Export Control Order in Japan

Products described herein are the objects of controlled goods in Annex 1 (Item 16) of Export Trade Control Order in Japan.

In case of export from Japan, please confirm if it applies to "objective" criteria or an "informed" (by MITI clause) on the basis of "catch all controls for Non-Proliferation of Weapons of Mass Destruction.