

Thick film rectangular

MCR10 (2012 size :1 / 8W)

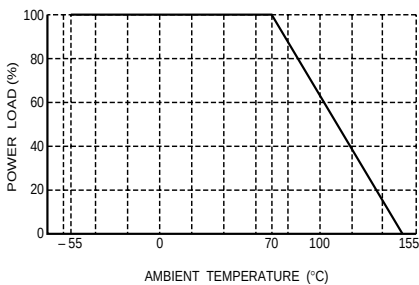
●Features

- 1) Power rating of 1 / 8W
- 2) Highly reliable chip resistor
Ruthenium oxide dielectric offers superior resistance to the elements.
- 3) Electrodes not corroded by soldering
Thick film makes the electrodes very strong.
- 4) Leading the world in development and mass production.
Since start of production in 1982 (first in the world), this component has established a solid reputation as a general-purpose chip resistor.

- 5) 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	Power must be derated according to the power derating curve in Figure 1 when ambient temperature exceeds 70°C.  Fig.1	0.125W (1 / 8W) [0.100W (1 / 10W)]* at 70°C	
Rated voltage	The voltage rating is calculated by the following equation. If the value obtained exceeds the maximum operating 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)	Max. operating voltage	150V
		Max. overload voltage	200V (300V)*
		Max. intermittent overload voltage	200V (300V)*
Nominal resistance	See Table 1.		
Operating temperature		- 55°C to + 155°C	

* At power rating of 0.1W, maximum overload voltage and maximum intermittent overload voltage are 300V.

Resistors

Jumper type

Resistance	Max. 50mΩ
Rated current	2A
Peak current	10A
Operating temperature	– 55°C to + 155°C

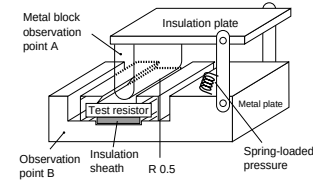
Table 1

Resistance tolerance	Resistance range (Ω)	Resistance temperature coefficient (ppm / °C)
F (± 1%)	10 ≤ R ≤ 2.2M (E24,96)	± 100
J (± 5%)	1.0 ≤ R < 2.2 (E24)	500 ± 350
	2.2 ≤ R < 10 (E24)	± 500
	10 ≤ 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.

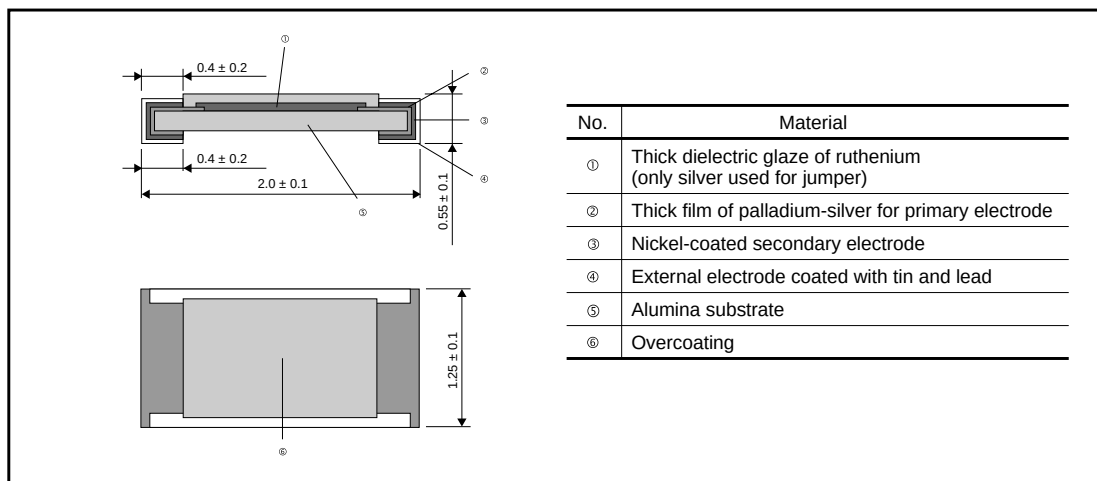
Resistors

● Characteristics

Characteristics	Specifications		Test method
	Chip resistance	Jumper type	
DC resistance	F: $\pm 1\%$ J: $\pm 5\%$	Max. 50m Ω	JIS C 5202 5.1 Applied voltage: A
Resistance temperature characteristics	See Table 1.		JIS C 5202 5.2 Test conditions: + 25 / - 55 / + 25 / + 125°C
Short time overload	$\pm (2.0\% + 0.1\Omega)$	Max. 50m Ω	JIS C 5202 5.5 Rated voltage (current): $\times 2.5$, 5s. Maximum overload voltage: 200V
Insulation resistance	Min. 1,000M Ω between terminal and board		JIS C 5202 5.6 Test voltage: 100V, 1min. <u>Assembled state</u> 
Withstand voltage	Do not damage insulation or cause a short circuit.		JIS C 5202 5.7 Test voltage: 500V
Intermittent overload	$\pm (5.0\% + 0.1\Omega)$	Max. 50m Ω	JIS C 5202 5.8 Rated voltage (current): $\times 2.5$ (1s: ON - 25s: OFF) $\times 10,000$ cyc.
Terminal strength (against bending of circuit board)	$\pm (1.0\% + 0.05\Omega)$ There must be no mechanical damage.	Max. 50m Ω	JIS C 5202 6.1
Resistance to soldering heat	$\pm (1.0\% + 0.05\Omega)$ Outside must not be noticeably damaged.	Max. 50m Ω	JIS C 5202 6.4 Soldering conditions: 260 $\pm$ 5°C Soldering time: 10 $\pm$ 1s.
Solderability	95% of terminal surface must be covered by new soldering, and there must be no soldering corrosion.		JIS C 5202 6.5 Rosin methanol: (25%WT) Soldering conditions: 235 $\pm$ 5°C Soldering time: 2.0 $\pm$ 0.5s.
Resistance to dry heat	$\pm (3.0\% + 0.1\Omega)$	Max. 100m Ω	JIS C 5202 7.2 155°C Test time: 1,000 to 1,048 hrs.
Endurance (under load in damp environment)	$\pm (3.0\% + 0.1\Omega)$	Max. 100m Ω	JIS C 5202 7.10 Rated voltage (current), 70°C 1.5h: ON - 0.5h: OFF Test time: 1,000 to 1,048 hrs.
Endurance (steady state)	$\pm (3.0\% + 0.1\Omega)$	Max. 100m Ω	JIS C 5202 7.9 Rated voltage (current), 60°C, 90%RH 1.5h: ON - 0.5h: OFF Test time: 1,000 to 1,048 hrs.
Resistance to humidity (steady state)	$\pm (3.0\% + 0.1\Omega)$	Max. 100m Ω	JIS C 5202 7.5 85°C, 85%RH Test time: 1,000 to 1,048 hrs.
Temperature cycling	$\pm (1.0\% + 0.05\Omega)$	Max. 50m Ω	JIS C 5202 7.4 Test temperature: - 55°C to + 125°C 100cyc.
Resistance to solvents	$\pm (0.5\% + 0.05\Omega)$ Markings must not be dissolved away.	Max. 50m Ω	JIS C 5202 6.9 Room temperature, static immersion, 1 min. Solvent: Isopropyl alcohol

Resistors

●External dimensions (Units: mm)



- **Packaging**

Reel

Diagram of a reel showing dimensions A, B, C, D, and a label. The reel is shown in a cross-sectional view, with dimensions A, B, C, and D indicating the overall size and internal structure. A label is shown on the side of the reel.

EIAJ ET-7001 compliant

(Units: mm)

A	B	C	D
$\phi 180 \begin{smallmatrix} 0 \\ -3 \end{smallmatrix}$	$\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$	9 ± 0.3	$\phi 13 \pm 0.2$
$\phi 268 \pm 1.5$	$\phi 100 \pm 0.8$	9.4 ± 0.5	$\phi 13 \pm 0.3$
$\phi 330 \pm 2$	Min. $\phi 80$	9.5 ± 0.5	$\phi 13 \pm 0.2$

Taping

Diagram of a tape showing dimensions W, F, E, A0, B0, D0, P0, P1, P2, and T2. The tape is shown in a cross-sectional view, with dimensions W, F, E, A0, B0, D0, P0, P1, P2, and T2 indicating the overall size and internal structure. Labels include "Heat crimp cover/Tape", "Thick paper mount", "(Underside paper tape)", "Chip resistor", "Square punchout hole", and "T2".

(Units: mm)

W	F	E	A ₀	B ₀
8.0 ± 0.3	3.5 ± 0.05	1.75 ± 0.1	$1.65 \begin{smallmatrix} +0.2 \\ -0.1 \end{smallmatrix}$	$2.4 \begin{smallmatrix} +0.2 \\ -0.1 \end{smallmatrix}$
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

Bulk case

Diagram of a bulk case showing dimensions 110 ± 0.7, 12 ± 0.1, 36 0 - 0.2, and labels Shutter, Slider. The bulk case is shown in a cross-sectional view, with dimensions 110 ± 0.7, 12 ± 0.1, and 36 0 - 0.2 indicating the overall size and internal structure. Labels include "Shutter" and "Slider".

EIAJ ET-7201A compliant

(Units: mm)

Part No.

Packaging / Processing specifications

Resistance tolerance

Nominal resistance

Special part number

JIS C 5202 4.3
SAMPLE SIZE : n = 20pcs
MICROMETER

RESISTANCE (Ω)	LENGTH (mm)
0.68	1.985
1	2.000
10	2.000
100	2.000
1k	2.000
10k	2.000
100k	2.005
1M	2.000
10M	2.000

JIS C 5202 4.3
SAMPLE SIZE : n = 20pcs
MICROMETER

Resistance (Ω)	Width (mm)
0.68	1.24
0.68	1.25
0.68	1.26
1	1.23
1	1.25
1	1.26
10	1.23
10	1.25
10	1.26
100	1.23
100	1.25
100	1.26
1k	1.23
1k	1.25
1k	1.26
10k	1.23
10k	1.25
10k	1.26
100k	1.23
100k	1.25
100k	1.26
1M	1.23
1M	1.25
1M	1.26
10M	1.23
10M	1.25
10M	1.26

JIS C 5202 4.3
SAMPLE SIZE : n = 20pcs
MICROMETER

RESISTANCE (Ω)	THICKNESS (mm)
0.68	0.545
1	0.545
10	0.565
100	0.565
1k	0.565
10k	0.565
100k	0.545
1M	0.555
10M	0.560

Figure 10 is a scatter plot showing the relationship between DC Resistance (%) and Resistance (Ω) for JIS C 5202 5.1. The x-axis represents Resistance (Ω) on a logarithmic scale from 0.68 to 10M. The y-axis represents DC Resistance (%) from -8.0 to 8.0. The plot includes data points for JIS C 5202 5.1 (solid circles), SAMPLE SIZE: n = 20pcs (open circles), and 20°C 65%RH (solid squares). The data points are clustered around 0% resistance change across the entire resistance range.

JIS C 5202 5.5
 SAMPLE SIZE : n = 10pcs
 RATED VOLTAGE × 2.5
 TIMES : 5s
 MAXIMUM OVERLOAD VOLTAGE : 200V

RESISTANCE (Ω)	ΔR/R (%)
0.68	0.0
1	0.0
10	0.0
100	0.0
1k	0.0
10k	0.0
100k	0.0
1M	0.0
10M	0.0

Fig.7 Short time overload

Resistors

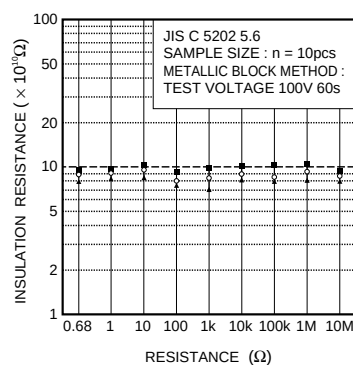


Fig.8 Insulation resistance

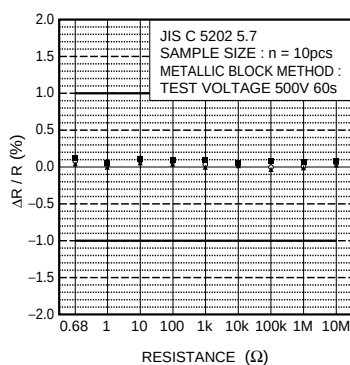


Fig.9 Withstand voltage

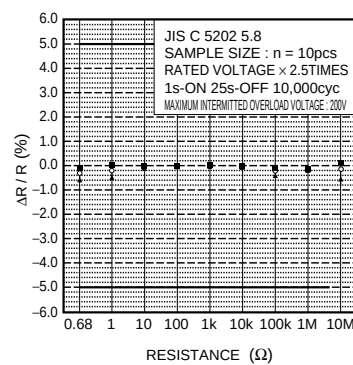


Fig.10 Intermittent overload

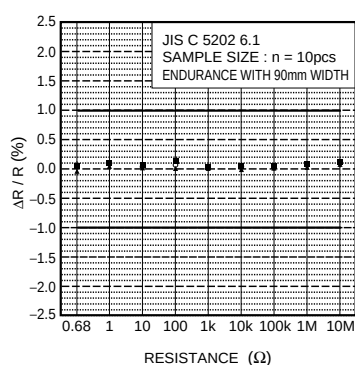


Fig.11 Terminal strength (bending strength characteristics)

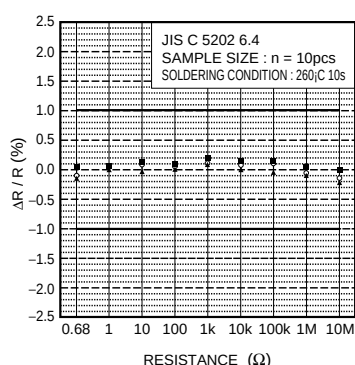


Fig.12 Resistance to soldering heat

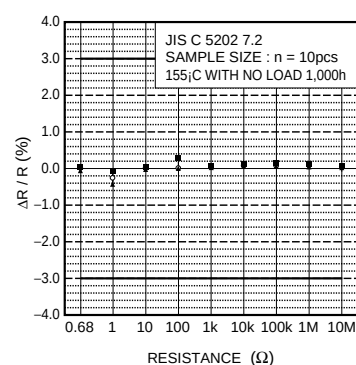


Fig.13 Resistance to dry heat

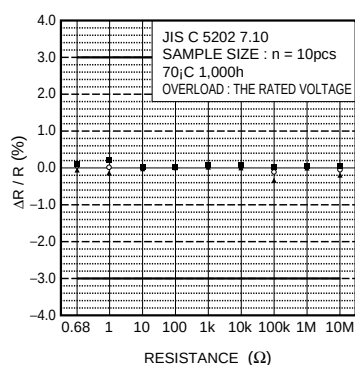


Fig.14 Endurance (rated load)

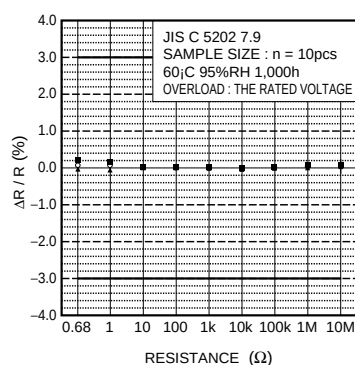


Fig.15 Endurance (under load in damp environment)

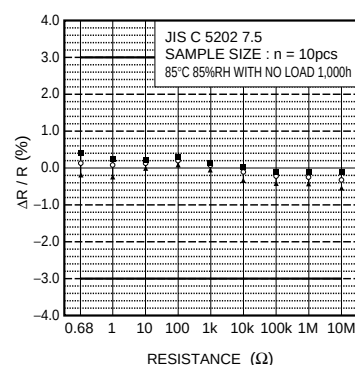


Fig.16 Resistance to humidity (steady state)

Resistors

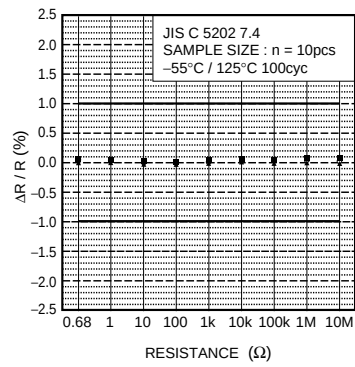


Fig.17 Temperature cycling

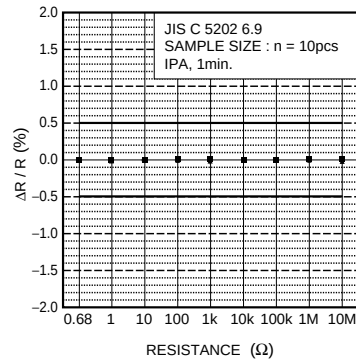


Fig.18 Resistance to solvents