

# Thick film rectangular

## MCR10 (2012 size :1 / 8W)

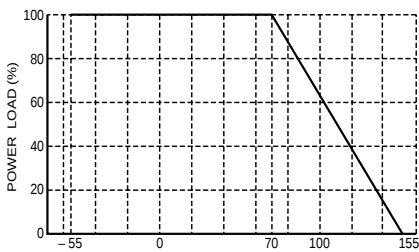
### ●Features

- 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           | <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>                                                                                | 0.125W (1 / 8W)<br>[0.100W (1 / 10W)]*<br>at 70°C |              |
| Rated voltage         | <p>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.</p> $E = \sqrt{P \times R}$ <p style="text-align: right;">E: Rated voltage (V)<br/>P: Rated power (W)<br/>R: Nominal resistance (Ω)</p> | 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 |

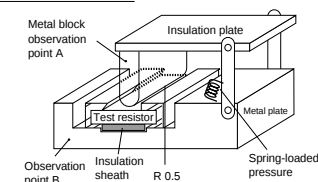
Table 1

| 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.

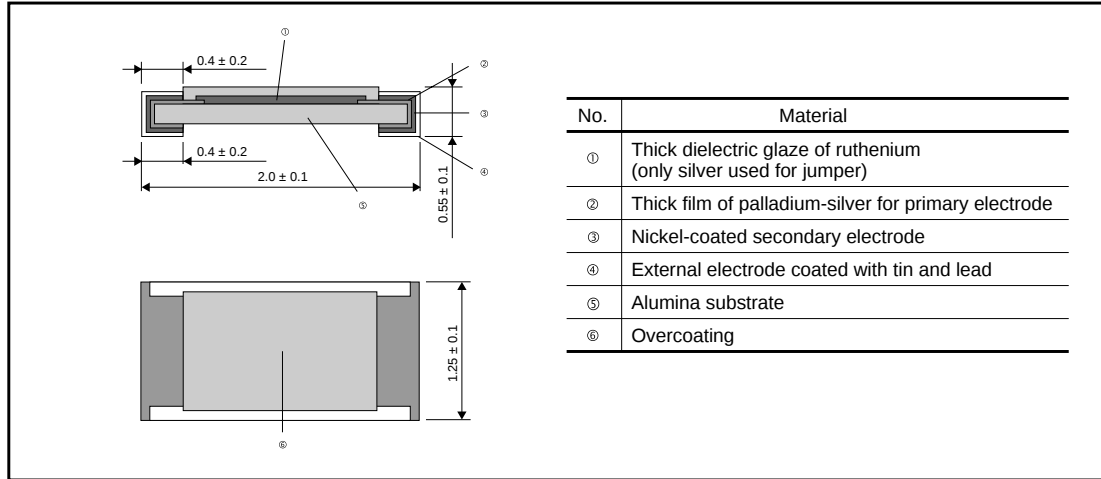
## Resistors

## ● Characteristics

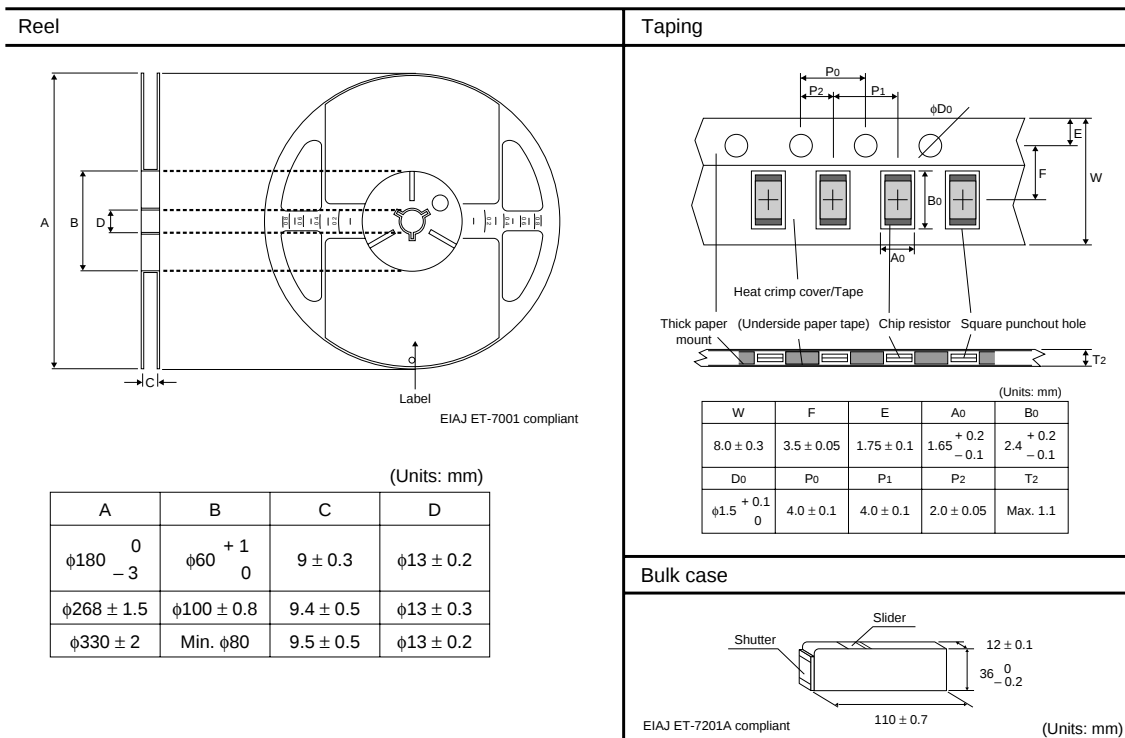
| Characteristics                                         | Specifications                                                                                      |                    | Test method                                                                                                          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

## Resistors

## ●External dimensions (Units: mm)

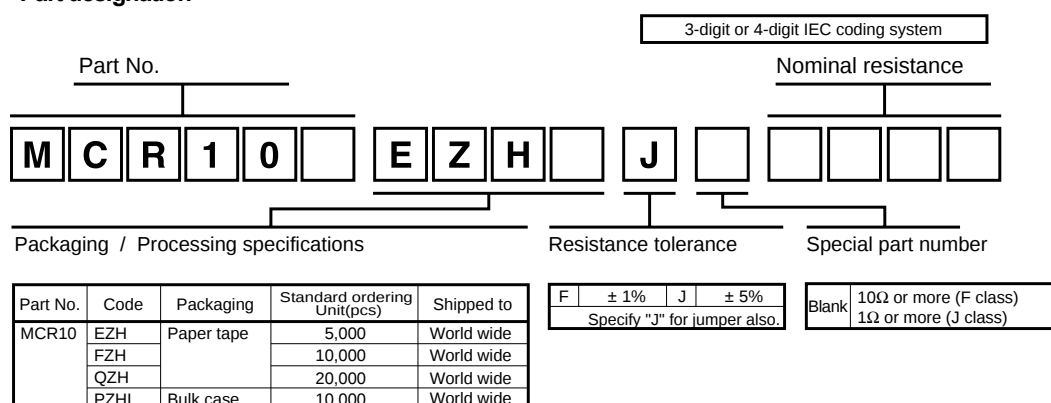


## ●Packaging



## Resistors

## ●Part designation



## ●Dimensions

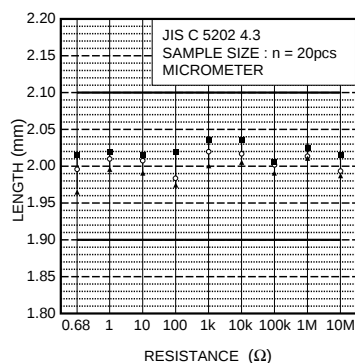


Fig.2 Dimensions (length)

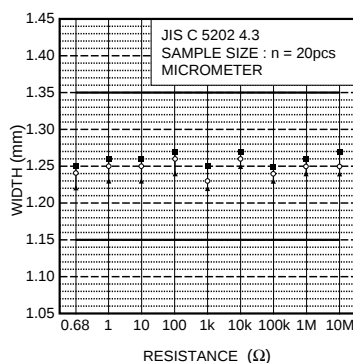


Fig.3 Dimensions (width)

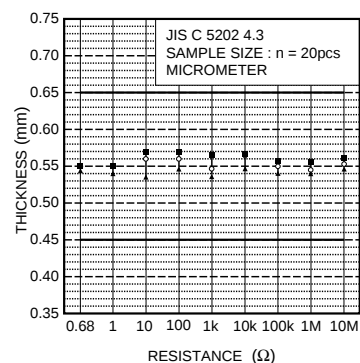


Fig.4 Dimensions (thickness)

## ●Electrical characteristics

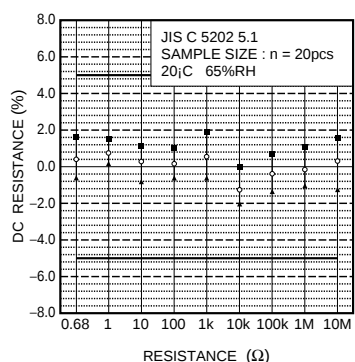


Fig.5 DC resistance

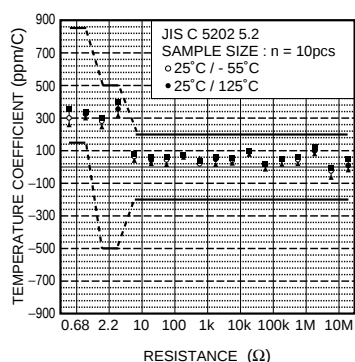


Fig.6 Resistance temperature characteristics

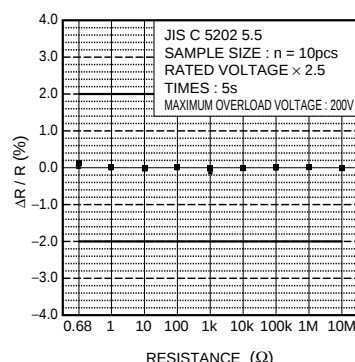


Fig.7 Short time overload

## Resistors

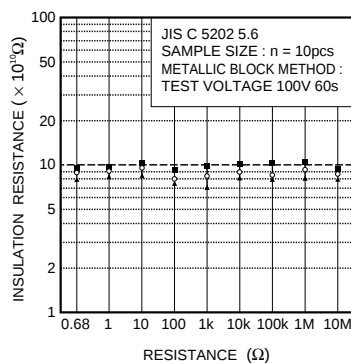


Fig.8 Insulation resistance

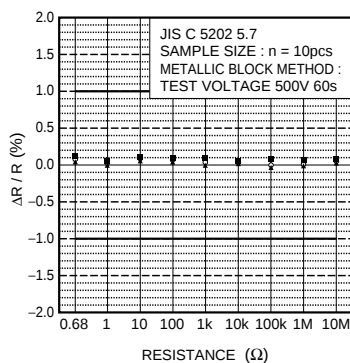


Fig.9 Withstand voltage

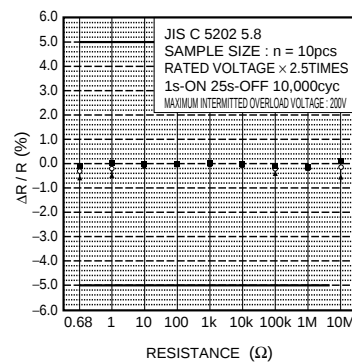


Fig.10 Intermittent overload

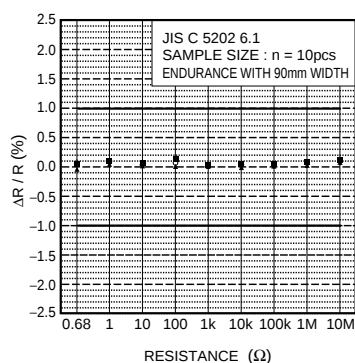


Fig.11 Terminal strength (bending strength characteristics)

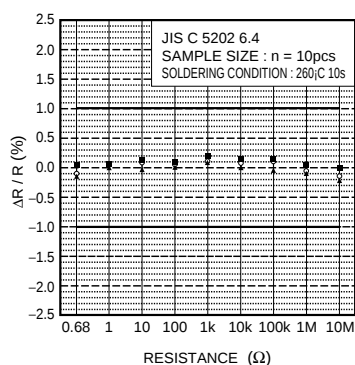


Fig.12 Resistance to soldering heat

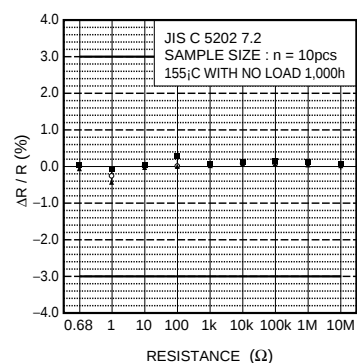


Fig.13 Resistance to dry heat

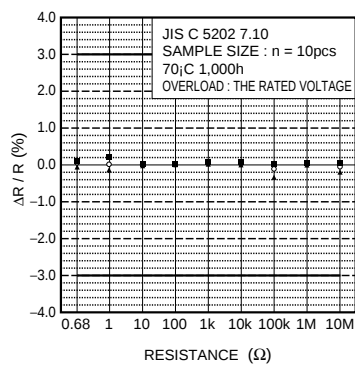


Fig.14 Endurance (rated load)

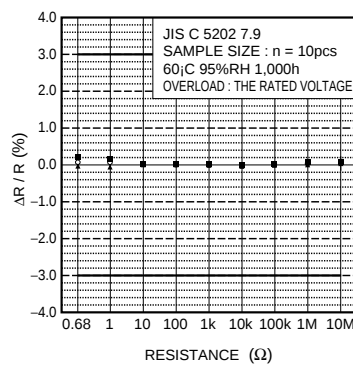


Fig.15 Endurance (under load in damp environment)

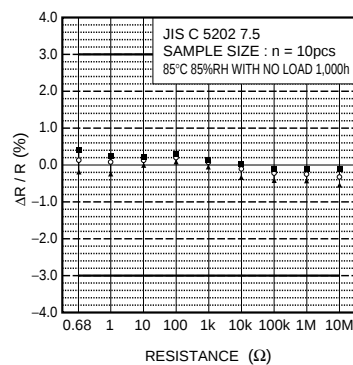


Fig.16 Resistance to humidity (steady state)

## Resistors

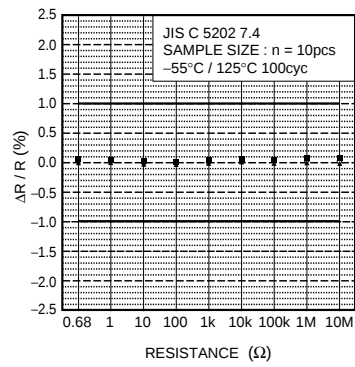


Fig.17 Temperature cycling

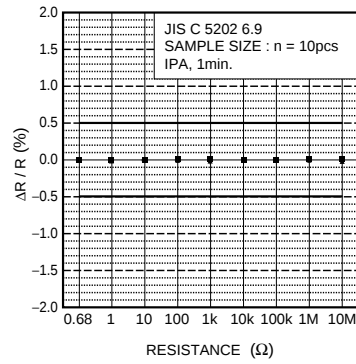


Fig.18 Resistance to solvents