

# Low Ohmic Thick Film Chip Resistors

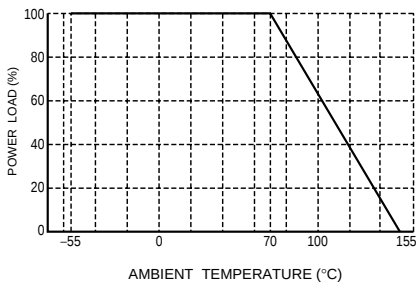
## MCR10 (2012 size (0805 size) : 1 / 4W)

### ●Features

- 1) Power rating of 1 / 4W
- 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) ROHM resistors have approved ISO9001- / ISO/TS16949- certification.

### ●Ratings

Design and specifications are subject to change without notice.  
Carefully check the specification sheet before using or ordering it.

| 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> | 0.25W (1 / 4W)<br>at 70°C |
| Rated voltage         | <p>The voltage rating is calculated by the following equation.</p> $E = \sqrt{P \times R}$ <p>E: Rated voltage (V)<br/>P: Rated power (W)<br/>R: Nominal resistance (Ω)</p>                                                                        |                           |
| Nominal resistance    | See Table 1.                                                                                                                                                                                                                                       |                           |
| Operating temperature |                                                                                                                                                                                                                                                    | -55°C to + 155°C          |

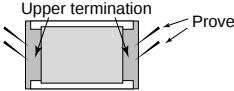
## Resistors

Table 1

| Resistance tolerance | Special specification | Resistance range ( $\Omega$ ) | Resistance temperature coefficient (ppm/ $^{\circ}$ C) |
|----------------------|-----------------------|-------------------------------|--------------------------------------------------------|
| F ( $\pm 1\%$ )      | L                     | 0.1 to 0.13 (E24)             | 400 $\pm$ 200                                          |
|                      | L                     | 0.15 to 9.1 (E24)             | $\pm$ 250                                              |
|                      | S                     | 0.047 to 0.091 (E24)          | 500 $\pm$ 300                                          |
| J ( $\pm 5\%$ )      | L                     | 0.1 to 0.13 (E24)             | 400 $\pm$ 200                                          |
|                      | L                     | 0.15 to 0.91 (E24)            | $\pm$ 250                                              |
|                      | S                     | 0.047 to 0.091 (E24)          | 500 $\pm$ 300                                          |

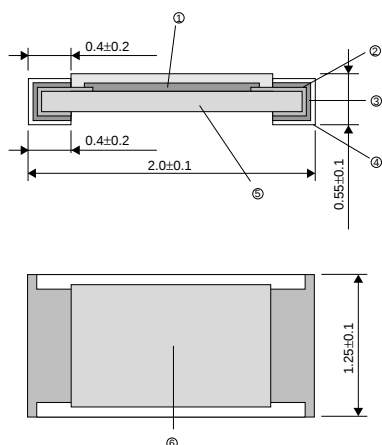
- Before using components in circuits where they will be exposed to transients such as pulse loads (short-duration, high-level loads), be certain to evaluate the component in the mounted state. In addition, the reliability and performance of this component cannot be guaranteed if it is used with a steady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

## ● Characteristics

| Item                                     | Guaranteed value                                                                               | Test conditions (JIS C 5201-1)                                                                                                                                                             |
|------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          | Resistor type                                                                                  |                                                                                                                                                                                            |
| Resistance                               | J : $\pm 5\%$<br>F : $\pm 1\%$                                                                 | JIS C 5201-1 4.5<br>Load voltage : A<br>Measuring method : measure upper termination by 4 probes.<br> |
| Variation of resistance with temperature | See Table.1                                                                                    | JIS C 5201-1 4.8<br>Measurement : $+25 / -55 / +25 / +125^{\circ}\text{C}$                                                                                                                 |
| Overload                                 | $\pm (2.0\% + 0.005\Omega)$                                                                    | JIS C 5201-1 4.13<br>Rated voltage (current) $\times 2.5$ , 2s.                                                                                                                            |
| Solderability                            | A new uniform coating of minimum of 95% of the surface being immersed and no soldering damage. | JIS C 5201-1 4.17<br>Rosin-Ethanol (25%WT)<br>Soldering condition : $235 \pm 5^{\circ}\text{C}$<br>Duration of immersion : $2.0 \pm 0.5\text{s}$ .                                         |
| Resistance to soldering heat             | $\pm (1.0\% + 0.005\Omega)$<br>No remarkable abnormality on the appearance.                    | JIS C 5201-1 4.18<br>Soldering condition : $260 \pm 5^{\circ}\text{C}$<br>Duration of immersion : $10 \pm 1\text{s}$ .                                                                     |
| Rapid change of temperature              | $\pm (1.0\% + 0.005\Omega)$                                                                    | JIS C 5201-1 4.19<br>Test temp. : $-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ 5cyc                                                                                                     |
| Damp heat, steady state                  | $\pm (3.0\% + 0.005\Omega)$                                                                    | JIS C 5201-1 4.24<br>$40^{\circ}\text{C}$ , 93%RH<br>Test time : 56days                                                                                                                    |
| Endurance at $70^{\circ}\text{C}$        | $\pm (3.0\% + 0.005\Omega)$                                                                    | JIS C 5201-1 4.25.1<br>$70^{\circ}\text{C}$ , Rated voltage<br>1.5h : ON – 0.5h : OFF<br>Test time : 1,000h                                                                                |
| Endurance                                | $\pm (3.0\% + 0.005\Omega)$                                                                    | JIS C 5201-1 4.25.3<br>$155^{\circ}\text{C}$<br>Test time : 1,000h to 1,048h                                                                                                               |
| Resistance to solvent                    | $\pm (0.5\% + 0.005\Omega)$                                                                    | JIS C 5201-1 4.29<br>$23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , Immersion cleaning, $5 \pm 0.5\text{min}$ .<br>Solvent : 2-propanol                                                      |
| Bend strength of the end face plating    | $\pm (1.0\% + 0.005\Omega)$<br>Without mechanical damage such as breaks.                       | JIS C 5201-1 4.33                                                                                                                                                                          |

## Resistors

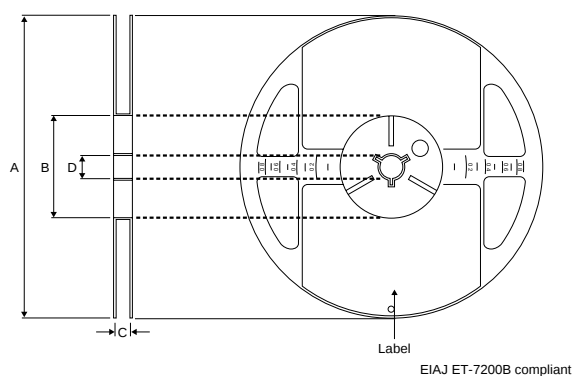
## ●Dimensions (Unit : mm)



| No. | Material                                   |
|-----|--------------------------------------------|
| ①   | Resistive element (Oxide metal thick film) |
| ②   | Silver thick film electrode                |
| ③   | Nickel electrode                           |
| ④   | Sn electrode                               |
| ⑤   | Alumina substrate                          |
| ⑥   | Overcoating (Glass)                        |

## ●Packaging

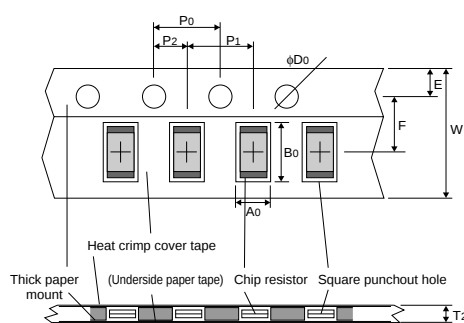
## Reel



(Unit: mm)

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

## Taping

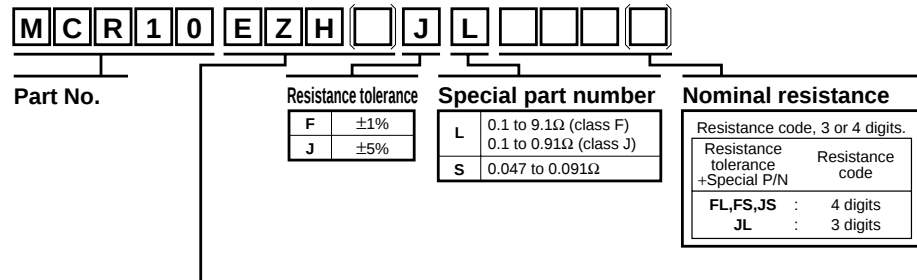


(Unit: mm)

| W                                                          | F              | E              | A0                                                        | B0                                                       |
|------------------------------------------------------------|----------------|----------------|-----------------------------------------------------------|----------------------------------------------------------|
| $8.0 \pm 0.3$                                              | $3.5 \pm 0.05$ | $1.75 \pm 0.1$ | $1.65 \begin{smallmatrix} +0.2 \\ -0.1 \end{smallmatrix}$ | $2.4 \begin{smallmatrix} +0.2 \\ -0.1 \end{smallmatrix}$ |
| D0                                                         | P0             | P1             | P2                                                        | T2                                                       |
| $\phi 1.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}$ | $4.0 \pm 0.1$  | $4.0 \pm 0.1$  | $2.0 \pm 0.05$                                            | Max. 1.1                                                 |

## Resistors

## ●Part No. Explanation



## Packaging Specifications Code

| Part No. | Code | Resistance tolerance |        | Packaging specifications | Reel           | Basic ordering unit(pcs) |
|----------|------|----------------------|--------|--------------------------|----------------|--------------------------|
|          |      | J(±5%)               | F(±1%) |                          |                |                          |
| MCR10    | EZH  | ◎                    | ◎      | Paper tape (4mm Pitch)   | φ180mm (7inch) | 5,000                    |

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

◎ : Standard product

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