

# High Voltage Resistance Chip Resistors

## KTR03 (0603 size : 1 / 10W)

### ●Features

- 1) Power rating of 1 / 10W
- 2) Limiting element voltage of KTR series is 7 times compared with that of MCR series.
- 3) Highly reliable chip resistor  
Ruthenium oxide dielectric offers superior resistance to the elements.
- 4) ROHM resistors have approved ISO9001- / ISO/TS 16949- certification.  
Design and specifications are subject to change without notice. Carefully check the specification sheet before using or ordering it.

### ●Ratings

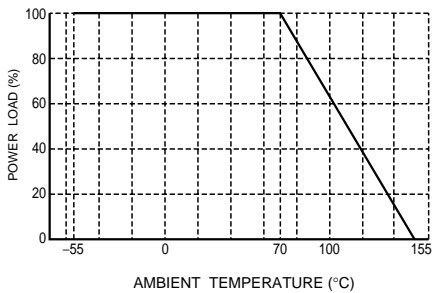
| Item                  | Conditions   | Specifications                  |
|-----------------------|--|---------------------------------|
| Rated power           | Power must be derated according to the power derating curve in Figure 1 when ambient temperature exceeds 70°C.<br><br>Fig.1  | 0.10W (1 / 10W)<br>at 70°C      |
| Rated voltage         | The voltage rating is calculated by the following equation.<br>If the value obtained exceeds the limiting element voltage, the voltage rating is equal to the maximum operating voltage.<br>$E = \sqrt{P \times R}$<br>E: Rated voltage (V)<br>P: Rated power (W)<br>R: Nominal resistance (Ω) | Limiting element voltage   350V |
| Nominal resistance    | See <a href="#">Table 1</a> .  |                                 |
| Operating temperature |  | -55°C to + 155°C                |

Table 1

| Resistance tolerance | Resistance range (Ω) | Resistance temperature coefficient (ppm/°C) |
|----------------------|----------------------|---|
| F (±1%)              | 10 ≤ R ≤ 10M (E24)   | ±100  |
| J (±5%)              | 10 ≤ R ≤ 10M (E24)   | ±200  |

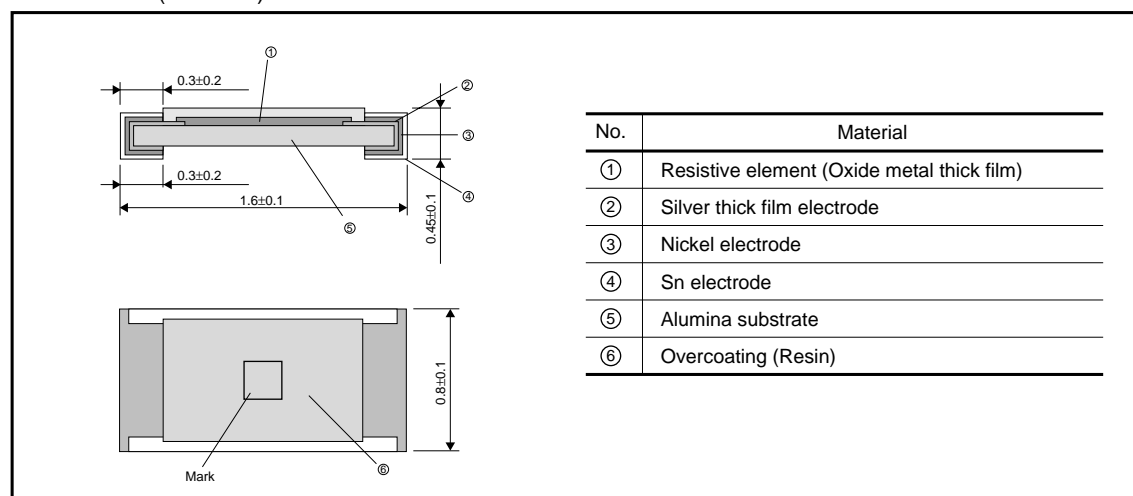
- Before using components in circuits where they will be exposed to transients such as pulse loads (short-duration, high-level loads), be certain to evaluate the component in the mounted state. In addition, the reliability and performance of this component cannot be guaranteed if it is used with a steady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

## Resistors

## ●Characteristics

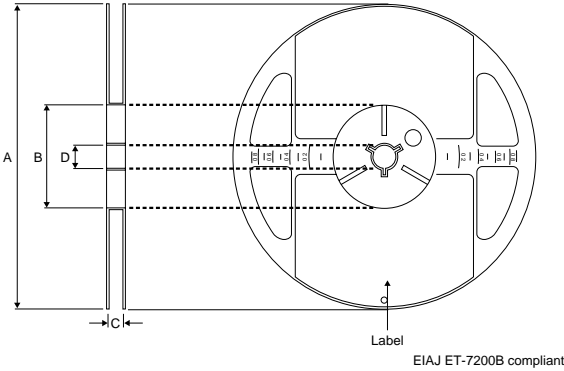
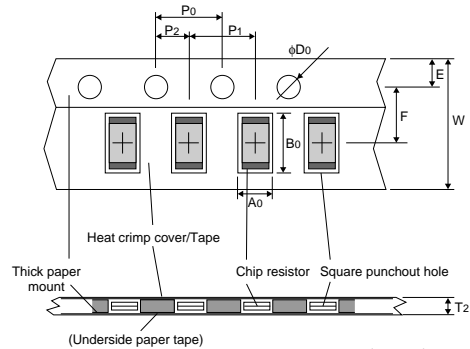
| Item                                     | Guaranteed value   | Test conditions (JIS C 5201-1)   |
|--|--|--|
|  | Resistor type  |  |
| Resistance                               | J : $\pm 5\%$<br>F : $\pm 1\%$   | JIS C 5201-1 4.5   |
| Variation of resistance with temperature | See <u>Table.1</u>   | JIS C 5201-1 4.8<br>Measurement : $-55 / +25 / +125^{\circ}\text{C}$   |
| Overload                                 | $\pm (2.0\%+0.1\Omega)$  | JIS C 5201-1 4.13<br>Rated voltage (current) $\times 2.5$ , 2s.<br>Maximum overload voltage : 500V   |
| 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             | $\pm (1.0\%+0.05\Omega)$<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              | $\pm (1.0\%+0.05\Omega)$   | JIS C 5201-1 4.19<br>Test temp. : $-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$ 5cyc   |
| Damp heat, steady state                  | $\pm (3.0\%+0.1\Omega)$  | JIS C 5201-1 4.24<br>$40^{\circ}\text{C}$ , 93%RH<br>Test time : 1,000h to 1,048h  |
| Endurance at $70^{\circ}\text{C}$        | $\pm (3.0\%+0.1\Omega)$  | JIS C 5201-1 4.25.1<br>Rated voltage (current), $70^{\circ}\text{C}$<br>1.5h : ON – 0.5h : OFF<br>Test time : 1,000h to 1,048h                   |
| Endurance                                | $\pm (3.0\%+0.1\Omega)$  | JIS C 5201-1 4.25.3<br>$155^{\circ}\text{C}$<br>Test time : 1,000h to 1,048h   |
| Resistance to solvent                    | $\pm (1.0\%+0.05\Omega)$   | JIS C 5201-1 4.29<br>$23\pm 5^{\circ}\text{C}$ , Immersion cleaning, $5\pm 0.5\text{min}$ .<br>Solvent : 2-propanol                              |
| Bend strength of the end face plating    | $\pm (1.0\%+0.05\Omega)$<br>Without mechanical damage such as breaks.                          | JIS C 5201-1 4.33  |

## ●Dimensions (Unit : mm)



Resistors

●Packaging

| Reel  | Taping  |   |                   |               |  |   |   |                   |  |   |   |   |    |    |               |                |                |               |               |    |    |    |    |    |  |               |               |                |          |
|---|---|---|-------------------|---------------|--|---|---|-------------------|--|---|---|---|----|----|---------------|----------------|----------------|---------------|---------------|----|----|----|----|----|--|---------------|---------------|----------------|----------|
|  <p style="text-align: center;">(Unit: mm)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">A</td> <td style="text-align: center;">B</td> <td style="text-align: center;">C</td> <td style="text-align: center;">D</td> </tr> <tr> <td style="text-align: center;"><math>\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}</math></td> <td style="text-align: center;"><math>\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}</math></td> <td style="text-align: center;"><math>9 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}</math></td> <td style="text-align: center;"><math>\phi 13 \pm 0.2</math></td> </tr> </table> | A   | B   | C                 | D             | $\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}$ | $\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$ | $9 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ | $\phi 13 \pm 0.2$ |  <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">W</td> <td style="text-align: center;">F</td> <td style="text-align: center;">E</td> <td style="text-align: center;">A0</td> <td style="text-align: center;">B0</td> </tr> <tr> <td style="text-align: center;"><math>8.0 \pm 0.3</math></td> <td style="text-align: center;"><math>3.5 \pm 0.05</math></td> <td style="text-align: center;"><math>1.75 \pm 0.1</math></td> <td style="text-align: center;"><math>1.1 \pm 0.1</math></td> <td style="text-align: center;"><math>1.9 \pm 0.1</math></td> </tr> <tr> <td style="text-align: center;">D0</td> <td style="text-align: center;">P0</td> <td style="text-align: center;">P1</td> <td style="text-align: center;">P2</td> <td style="text-align: center;">T2</td> </tr> <tr> <td style="text-align: center;"><math>\phi 1.5 \begin{smallmatrix} +0.1 \\ 0 \end{smallmatrix}</math></td> <td style="text-align: center;"><math>4.0 \pm 0.1</math></td> <td style="text-align: center;"><math>4.0 \pm 0.1</math></td> <td style="text-align: center;"><math>2.0 \pm 0.05</math></td> <td style="text-align: center;">Max. 1.1</td> </tr> </table> | W | F | E | A0 | B0 | $8.0 \pm 0.3$ | $3.5 \pm 0.05$ | $1.75 \pm 0.1$ | $1.1 \pm 0.1$ | $1.9 \pm 0.1$ | 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 |
| A   | B   | C   | D                 |               |  |   |   |                   |  |   |   |   |    |    |               |                |                |               |               |    |    |    |    |    |  |               |               |                |          |
| $\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}$  | $\phi 60 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$ | $9 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ | $\phi 13 \pm 0.2$ |               |  |   |   |                   |  |   |   |   |    |    |               |                |                |               |               |    |    |    |    |    |  |               |               |                |          |
| W   | F   | E   | A0                | B0            |  |   |   |                   |  |   |   |   |    |    |               |                |                |               |               |    |    |    |    |    |  |               |               |                |          |
| $8.0 \pm 0.3$   | $3.5 \pm 0.05$  | $1.75 \pm 0.1$                                      | $1.1 \pm 0.1$     | $1.9 \pm 0.1$ |  |   |   |                   |  |   |   |   |    |    |               |                |                |               |               |    |    |    |    |    |  |               |               |                |          |
| 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      |  |   |   |                   |  |   |   |   |    |    |               |                |                |               |               |    |    |    |    |    |  |               |               |                |          |

●Part No. Explanation

| K                    | T               | R | 0 | 3 | E | Z | P |  | J |   |     |   |     |   |  |  |  |                      |                 |   |            |   |            |
|----------------------|-----------------|---|---|---|---|---|---|--|---|---|-----|---|-----|---|--|--|--|----------------------|-----------------|---|------------|---|------------|
| <b>Part No.</b>      |                 |   |   |   |   |   |   | <b>Resistance tolerance</b><br><table border="1" style="font-size: small;"> <tr><td style="text-align: center;">F</td><td style="text-align: center;">±1%</td></tr> <tr><td style="text-align: center;">J</td><td style="text-align: center;">±5%</td></tr> </table> |   | F | ±1% | J | ±5% | <b>Nominal resistance</b><br>Resistance code, 3 or 4 digits.<br><table border="1" style="font-size: small;"> <tr> <th style="text-align: center;">Resistance tolerance</th> <th style="text-align: center;">Resistance code</th> </tr> <tr> <td style="text-align: center;">F</td> <td style="text-align: center;">: 4 digits</td> </tr> <tr> <td style="text-align: center;">J</td> <td style="text-align: center;">: 3 digits</td> </tr> </table> |  |  |  | Resistance tolerance | Resistance code | F | : 4 digits | J | : 3 digits |
| F                    | ±1%             |   |   |   |   |   |   |  |   |   |     |   |     |   |  |  |  |                      |                 |   |            |   |            |
| J                    | ±5%             |   |   |   |   |   |   |  |   |   |     |   |     |   |  |  |  |                      |                 |   |            |   |            |
| Resistance tolerance | Resistance code |   |   |   |   |   |   |  |   |   |     |   |     |   |  |  |  |                      |                 |   |            |   |            |
| F                    | : 4 digits      |   |   |   |   |   |   |  |   |   |     |   |     |   |  |  |  |                      |                 |   |            |   |            |
| J                    | : 3 digits      |   |   |   |   |   |   |  |   |   |     |   |     |   |  |  |  |                      |                 |   |            |   |            |

Packaging Specifications Code

| Part No. | Code | Resistance tolerance |        | Packaging specifications | Reel           | Basic ordering unit(pcs) |
|----------|------|----------------------|--------|--------------------------|----------------|--------------------------|
|          |      | J(±5%)               | F(±1%) |                          |                |                          |
| KTR03    | EZP  | ◎                    | ◎      | Paper tape (4mm Pitch)   | φ180mm (7inch) | 5,000                    |

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

### Notes

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