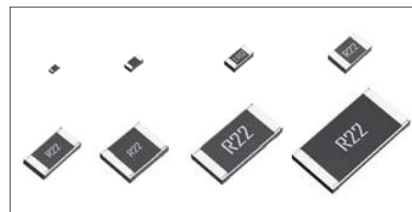


# Low Ohmic Thick Film Chip Resistors

## MCR Series

### ●Features

- 1) Very-low ohmic resistance from 47mΩ is in lineup by thick-film resistive element.
- 2) ROHM resistors have obtained ISO9001 / ISO / TS16949 certification.
- 3) "Automotive" product is AEC-Q200 compliant.



| Part No. | Size |        | Type Code       |                                           | Resistance Range | Packing Specification        | Quantity / Reel           |
|----------|------|--------|-----------------|-------------------------------------------|------------------|------------------------------|---------------------------|
|          | (mm) | (inch) | GENERAL PURPOSE | AUTOMOTIVE<br>*Corresponds to<br>AEC-Q200 |                  |                              |                           |
| MCR006   | 0603 | 0201   | YRT             | YZP                                       | 1Ω to 9.1Ω       | Paper tape<br>(2mm Pitch)    | 15,000                    |
| MCR01    | 1005 | 0402   | MRT             | MZP                                       |                  |                              | 10,000                    |
| MCR03    | 1608 | 0603   | ERT             | EZP                                       |                  | 0.047Ω to 9.1Ω               | Paper tape<br>(4mm Pitch) |
| MCR10    | 2012 | 0805   | EZH             |                                           |                  |                              |                           |
| MCR18    | 3216 | 1206   | EZH             |                                           |                  |                              |                           |
| MCR25    | 3225 | 1210   | JZH             |                                           |                  |                              |                           |
| MCR50    | 5025 | 2010   | JZH             |                                           |                  |                              |                           |
| MCR100   | 6432 | 2512   | JZH             |                                           |                  | Embossed tape<br>(4mm Pitch) | 4,000                     |

\*Please contact us for status of AEC-Q200 on "General purpose" products.

### ●Part Number Description

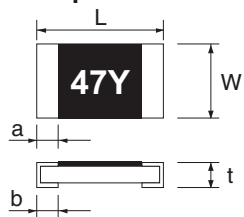
| M               | C | R | 1                                                                                                                                                              | 0 | E                | Z | H | J                           | L                                                                | 1 | R                                                                                                                                    | 0 |
|-----------------|---|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------------|---|---|-----------------------------|------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------|---|
| <b>Part No.</b> |   |   | <b>Size (mm [inch])</b>                                                                                                                                        |   | <b>Type Code</b> |   |   | <b>Resistance Tolerance</b> | <b>Special part code</b>                                         |   | <b>Nominal Resistance</b>                                                                                                            |   |
| MCR             |   |   | 006 (0603 [0201])<br>01 (1005 [0402])<br>03 (1608 [0603])<br>10 (2012 [0805])<br>18 (3216 [1206])<br>25 (3225 [1210])<br>50 (5025 [2010])<br>100 (6432 [2512]) |   |                  |   |   | F (±1%)<br>J (±5%)          | L 0.1 to 9.1Ω (±1%)<br>S 0.1 to 0.91Ω (±5%)<br>S 0.047 to 0.091Ω |   | Resistance code, 3 or 4 digits.<br>Resistance tolerance + Resistance code<br>Special P / N<br>FL, FS, JS : 4 digits<br>JL : 3 digits |   |
|                 |   |   |                                                                                                                                                                |   |                  |   |   |                             |                                                                  |   | Ex.)<br>0.047Ω = R047 (±1%, ±5%)<br>9.1Ω = 9R10 (±1%)<br>9R1 (±5%)                                                                   |   |

## ●Products List

| Part No.      | Type Code | Rated Power<br>(70°C)<br>(W) | Limiting Element<br>Voltage<br>(V) | Maximum<br>Overload<br>Voltage<br>(V) | Temperature<br>Coefficient<br>(ppm / °C) | Resistance<br>Tolerance<br>(%) | Resistance Range                                    | Series | Operating<br>Temperature<br>Range<br>(°C) |
|---------------|-----------|------------------------------|------------------------------------|---------------------------------------|------------------------------------------|--------------------------------|-----------------------------------------------------|--------|-------------------------------------------|
| <b>MCR006</b> | YRT       | 0.05                         | 0.67                               | 1.34                                  | ±600 / -200                              | F(±1%)                         | 1.0Ω to 9.1Ω                                        | E24    | -55 to +125                               |
| <b>MCR01</b>  | MRT       | 0.063                        | 0.76                               | 1.52                                  | ±400                                     | F(±1%)                         | 1.0Ω to 9.1Ω                                        |        | -55 to +155                               |
| <b>MCR03</b>  | ERT       | 0.1                          | 0.95                               | 1.90                                  | ±400                                     | F(±1%)                         | 1.0Ω to 9.1Ω                                        |        |                                           |
| <b>MCR10</b>  | EZH       | 0.25                         | 1.51                               | 3.02                                  | 500±300<br>400±200<br>±250               | J(±5%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 0.91Ω |        |                                           |
|               |           |                              |                                    |                                       | 500±300<br>400±200<br>±250               | F(±1%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 0.91Ω |        |                                           |
| <b>MCR18</b>  | EZH       | 0.25                         | 1.51                               | 3.02                                  | 500±300<br>400±200<br>±250               | J(±5%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 0.91Ω |        |                                           |
|               |           |                              |                                    |                                       | 500±300<br>400±200<br>±250               | F(±1%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 0.91Ω |        |                                           |
| <b>MCR25</b>  | JZH       | 0.5                          | 2.13                               | 4.26                                  | 300±300<br>±200                          | J(±5%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.91Ω                   |        |                                           |
|               |           |                              |                                    |                                       | 300±300<br>±200                          | F(±1%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.91Ω                   |        |                                           |
| <b>MCR50</b>  | JZH       | 0.5                          | 2.13                               | 4.26                                  | 500±300<br>400±200<br>±250               | J(±5%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 0.91Ω |        |                                           |
|               |           |                              |                                    |                                       | 500±300<br>400±200<br>±250               | F(±1%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 0.91Ω |        |                                           |
| <b>MCR100</b> | JZH       | 1                            | 3.01                               | 6.02                                  | 500±300<br>400±200<br>±250               | J(±5%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 0.91Ω |        | -55 to +125                               |
|               |           |                              |                                    |                                       | 500±300<br>400±200<br>±250               | F(±1%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 0.91Ω |        |                                           |

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

## ●Chip Resistor Dimensions and Markings



## &lt;Marking method&gt;

There are three or four digits used for the calculation number according to IEC code and "R" is used for the decimal point.

(Unit : mm)

| Part No.      | Type Code | (mm) | (inch) | L        | W        | t         | a         | b                                     | Marking existence |
|---------------|-----------|------|--------|----------|----------|-----------|-----------|---------------------------------------|-------------------|
| <b>MCR006</b> | YRT       | 0603 | 0201   | 0.6±0.03 | 0.3±0.03 | 0.23±0.03 | 0.15±0.05 | 0.15±0.05                             | No                |
| <b>MCR01</b>  | MRT       | 1005 | 0402   | 1.0±0.05 | 0.5±0.05 | 0.35±0.05 | 0.2±0.1   | 0.25 <sup>+0.05</sup> <sub>-0.1</sub> | No                |
| <b>MCR03</b>  | ERT       | 1608 | 0603   | 1.6±0.1  | 0.8±0.1  | 0.45±0.1  | 0.3±0.2   | 0.3±0.2                               | Yes *             |
| <b>MCR10</b>  | EZH       | 2012 | 0805   | 2.0±0.1  | 1.25±0.1 | 0.55±0.1  | 0.4±0.2   | 0.4±0.2                               | Yes               |
| <b>MCR18</b>  | EZH       | 3216 | 1206   | 3.2±0.15 | 1.6±0.15 | 0.55±0.1  | 0.5±0.25  | 0.5±0.25                              | Yes               |
| <b>MCR25</b>  | JZH       | 3225 | 1210   | 3.2±0.15 | 2.5±0.15 | 0.55±0.15 | 0.5±0.25  | 0.5±0.25                              | Yes               |
| <b>MCR50</b>  | JZH       | 5025 | 2010   | 5.0±0.15 | 2.5±0.15 | 0.55±0.15 | 0.6±0.25  | 0.6±0.25                              | Yes               |
| <b>MCR100</b> | JZH       | 6432 | 2512   | 6.3±0.15 | 3.2±0.15 | 0.55±0.15 | 0.6±0.25  | 0.6±0.25                              | Yes               |

## \*Marking method of MCR03

The description of markings on the chip resistor are as shown below.

## ① Marking method :

•For the resistance value contained in E96 series.

The nominal resistance is expressed in 3 digits. The first 2 digits is symbol to the resistance value and the last one is symbol to multipliers.

Example : 100kΩ = 01d (01d →  $100 \times 10^3 = 100,000\Omega = 100k\Omega$ )

Example : 3.01kΩ = 47b (47b →  $301 \times 10^1 = 3010\Omega = 3.01k\Omega$ )

•For the resistance value not contained in E96 series and contained in E-24 series.

The marking is expressed by E-24 series in 3 digits and one short bar under the last marking letter.

Example : 390Ω = 391

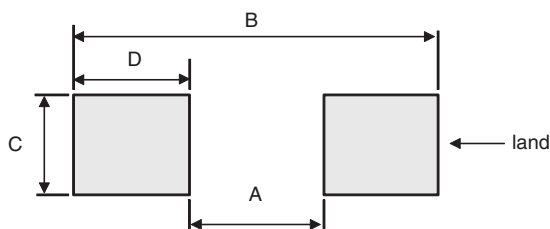
## Symbol for E96 Series nominal resistance value

| Symbol | E96 | Symbol | E96 | Symbol | E96 | Symbol | E96 |
|--------|-----|--------|-----|--------|-----|--------|-----|
| 01     | 100 | 25     | 178 | 49     | 316 | 73     | 562 |
| 02     | 102 | 26     | 182 | 50     | 324 | 74     | 576 |
| 03     | 105 | 27     | 187 | 51     | 332 | 75     | 590 |
| 04     | 107 | 28     | 191 | 52     | 340 | 76     | 604 |
| 05     | 110 | 29     | 196 | 53     | 348 | 77     | 619 |
| 06     | 113 | 30     | 200 | 54     | 357 | 78     | 634 |
| 07     | 115 | 31     | 205 | 55     | 365 | 79     | 649 |
| 08     | 118 | 32     | 210 | 56     | 374 | 80     | 665 |
| 09     | 121 | 33     | 215 | 57     | 383 | 81     | 681 |
| 10     | 124 | 34     | 221 | 58     | 392 | 82     | 698 |
| 11     | 127 | 35     | 226 | 59     | 402 | 83     | 715 |
| 12     | 130 | 36     | 232 | 60     | 412 | 84     | 732 |
| 13     | 133 | 37     | 237 | 61     | 422 | 85     | 750 |
| 14     | 137 | 38     | 243 | 62     | 432 | 86     | 768 |
| 15     | 140 | 39     | 249 | 63     | 442 | 87     | 787 |
| 16     | 143 | 40     | 255 | 64     | 453 | 88     | 806 |
| 17     | 147 | 41     | 261 | 65     | 464 | 89     | 825 |
| 18     | 150 | 42     | 267 | 66     | 475 | 90     | 845 |
| 19     | 154 | 43     | 274 | 67     | 487 | 91     | 866 |
| 20     | 158 | 44     | 280 | 68     | 499 | 92     | 887 |
| 21     | 162 | 45     | 287 | 69     | 511 | 93     | 909 |
| 22     | 165 | 46     | 294 | 70     | 523 | 94     | 931 |
| 23     | 169 | 47     | 301 | 71     | 536 | 95     | 953 |
| 24     | 174 | 48     | 309 | 72     | 549 | 96     | 976 |

## Symbol for multipliers

| Symbol      | A               | b               | C               | d               | E               | F               | X                | Y                |
|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|
| multipliers | 10 <sup>0</sup> | 10 <sup>1</sup> | 10 <sup>2</sup> | 10 <sup>3</sup> | 10 <sup>4</sup> | 10 <sup>5</sup> | 10 <sup>-1</sup> | 10 <sup>-2</sup> |

## ●Land pattern Example

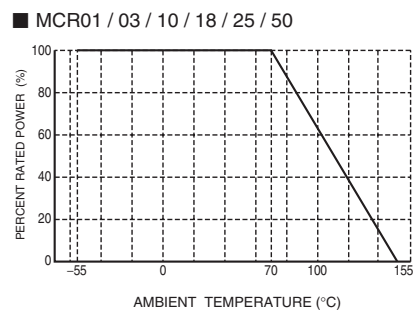
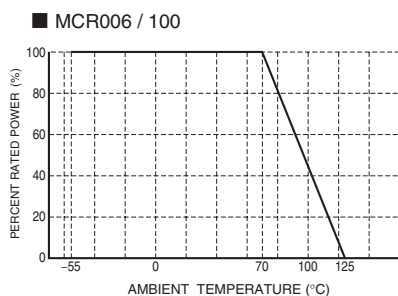


(Unit : mm)

| Part No.      | Type Code | A   | B    | C    | D    |
|---------------|-----------|-----|------|------|------|
| <b>MCR006</b> | YRT       | 0.3 | 0.84 | 0.3  | 0.27 |
| <b>MCR01</b>  | MRT       | 0.5 | 1.3  | 0.5  | 0.4  |
| <b>MCR03</b>  | ERT       | 1.0 | 2.0  | 0.8  | 0.5  |
| <b>MCR10</b>  | EZH       | 1.2 | 2.6  | 1.15 | 0.7  |
| <b>MCR18</b>  | EZH       | 2.2 | 4.0  | 1.5  | 0.9  |
| <b>MCR25</b>  | JZH       | 2.2 | 4.0  | 2.3  | 0.9  |
| <b>MCR50</b>  | JZH       | 3.8 | 6.0  | 2.3  | 1.1  |
| <b>MCR100</b> | JZH       | 5.1 | 8.1  | 3.0  | 1.5  |

### ●Derating Curve

When the ambient temperature exceeds 70°C, power dissipation must be adjusted according to the derating curves below.



### ●Characteristics

| Test Items                               | Guaranteed Value                                                                               | Test Conditions                                                                                                  |
|------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Resistance                               | See "Products List"                                                                            | 20°C                                                                                                             |
| Variation of resistance with temperature | See "Products List"                                                                            | Measurement : +20 / -55 / +20 / +125°C                                                                           |
| Overload                                 | $\pm (2.0\%+0.005\Omega)$                                                                      | Rated voltage (current) $\times 2.5$ , 2s.<br>Maximum overload voltage                                           |
| Solderability                            | A new uniform coating of minimum of 95% of the surface being immersed and no soldering damage. | Rosin-Ethanol : 25% (weight)<br>Soldering condition : 235 $\pm$ 5°C<br>Duration of immersion : 2.0 $\pm$ 0.5s    |
| Resistance to soldering heat             | $\pm (1.0\%+0.005\Omega)$<br>No remarkable abnormality on the appearance.                      | Soldering condition : 260 $\pm$ 5°C<br>Duration of immersion : 10 $\pm$ 1s                                       |
| Rapid change of temperature              | $\pm (1.0\%+0.005\Omega)$                                                                      | Test temp.<br>-55°C to +125°C 100cycle (MCR006)<br>-55°C to +125°C 5cycle (MCR01 / 03 / 10 / 18 / 25 / 50 / 100) |
| Damp heat, steady state                  | $\pm (3.0\%+0.005\Omega)$                                                                      | 40°C, 93%RH (Relative Humidity)<br>Test time : 1,000h to 1,048h                                                  |
| Endurance at 70°C                        | $\pm (3.0\%+0.005\Omega)$                                                                      | 70°C<br>Rated voltage (current)<br>1.5h : ON – 0.5h : OFF<br>Test time : 1,000h to 1,048h                        |
| Endurance                                | $\pm (3.0\%+0.005\Omega)$                                                                      | 125°C (MCR006 / 100)<br>155°C (MCR01 / 03 / 10 / 18 / 25 / 50)<br>Test time : 1,000h to 1,048h                   |
| Resistance to solvent                    | $\pm (1.0\%+0.005\Omega)$ ※MCR006 only<br>$\pm (0.5\%+0.005\Omega)$                            | 23 $\pm$ 5°C, Immersion cleaning, 5 $\pm$ 0.5min<br>Solvent : 2-propanol                                         |
| Bend strength of the end face plating    | Without Open.                                                                                  | —                                                                                                                |

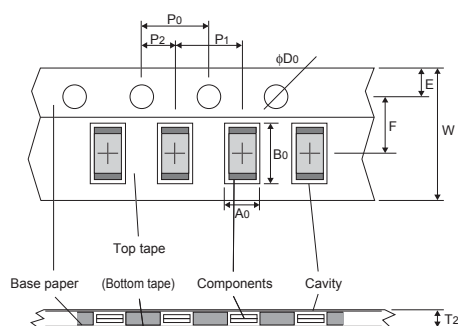
Compliance Standard(s) : IEC60115-8  
JISC 5201-8

### ●Technical data

| Parameter             | Unit  | MCR006<br>YRT                                                                                           | MCR01<br>MRT | MCR03<br>ERT | MCR10<br>EZH | MCR18<br>EZH | MCR25<br>JZH | MCR50<br>JZH | MCR100<br>JZH |
|-----------------------|-------|---------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| Insulation resistance | MΩ    | 1000                                                                                                    | 1000         | 1000         | 1000         | 1000         | 1000         | 1000         | 1000          |
| Failure rate          | Fit   | 0.0185 ( Apr.2011 - Oct.2011 Total shipment quantity $\times 10^6$ : 790 / Failure quantity : 0.92pcs ) |              |              |              |              |              |              |               |
| Weight                | mg/pc | 0.150                                                                                                   | 0.565        | 2.03         | 5.00         | 9.78         | 16.5         | 25.8         | 42.0          |

## ●Tape Dimensions

## ■ Paper Tape

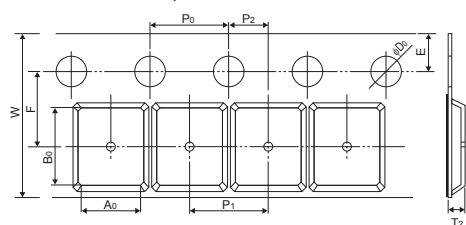


(Unit : mm)

| Part No.      | Type Code | W       | F        | E        | A0                                    | B0                                    |
|---------------|-----------|---------|----------|----------|---------------------------------------|---------------------------------------|
| <b>MCR006</b> | YRT       | 8.0±0.2 | 3.5±0.05 | 1.75±0.1 | 0.38±0.03                             | 0.68±0.03                             |
| <b>MCR01</b>  | MRT       | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 0.7±0.1                               | 1.2±0.1                               |
| <b>MCR03</b>  | ERT       | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 1.0±0.2                               | 1.8±0.1                               |
| <b>MCR10</b>  | EZH       | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 1.65 <sup>+0.2</sup> <sub>-0.1</sub>  | 2.4 <sup>+0.2</sup> <sub>-0.1</sub>   |
| <b>MCR18</b>  | EZH       | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 1.95 <sup>+0.1</sup> <sub>-0.05</sub> | 3.5 <sup>+0.15</sup> <sub>-0.05</sub> |

| Part No.      | Type Code | D0                                | P0      | P1       | P2       | T2      |
|---------------|-----------|-----------------------------------|---------|----------|----------|---------|
| <b>MCR006</b> | YRT       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 2.0±0.05 | 2.0±0.05 | Max 0.5 |
| <b>MCR01</b>  | MRT       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 2.0±0.1  | 2.0±0.05 | Max 1.1 |
| <b>MCR03</b>  | ERT       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 4.0±0.1  | 2.0±0.05 | Max 1.1 |
| <b>MCR10</b>  | EZH       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 4.0±0.1  | 2.0±0.05 | Max 1.1 |
| <b>MCR18</b>  | EZH       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 4.0±0.1  | 2.0±0.05 | Max 1.1 |

## ■ Embossed Tape

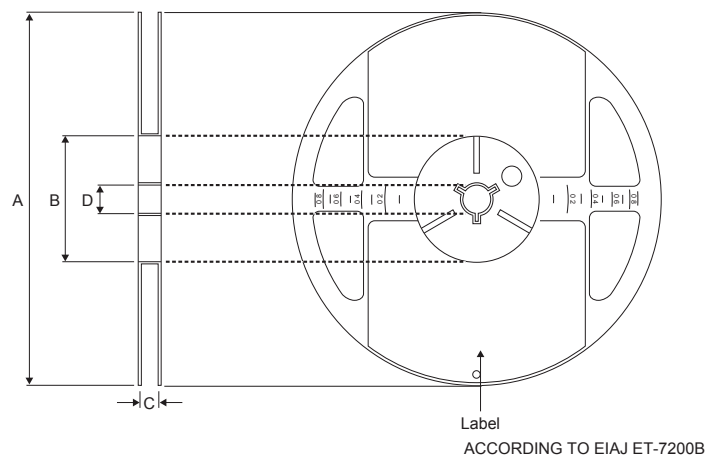


(Unit : mm)

| Part No.      | Type Code | W       | F        | E        | A0      | B0      |
|---------------|-----------|---------|----------|----------|---------|---------|
| <b>MCR25</b>  | JZH       | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 3.0±0.1 | 3.5±0.1 |
| <b>MCR50</b>  | JZH       | 12±0.3  | 5.5±0.05 | 1.75±0.1 | 3.4±0.2 | 5.6±0.2 |
| <b>MCR100</b> | JZH       | 12±0.3  | 5.5±0.05 | 1.75±0.1 | 3.5±0.2 | 6.7±0.2 |

| Part No.      | Type Code | D0                                | P0      | P1      | P2       | T2      |
|---------------|-----------|-----------------------------------|---------|---------|----------|---------|
| <b>MCR25</b>  | JZH       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | Max 1.1 |
| <b>MCR50</b>  | JZH       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | Max 1.1 |
| <b>MCR100</b> | JZH       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | Max 1.1 |

## ●Reel Dimensions



(Unit : mm)

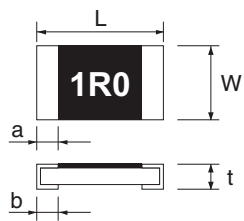
| (Unit: mm) |           |                                                            |                                                           |                                                      |                   |  |
|------------|-----------|------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------|-------------------|--|
| Part No.   | Type Code | A                                                          | B                                                         | C                                                    | D                 |  |
| MCR006     | YRT       | $\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}$ | $\phi 60 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ | $9 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$  | $\phi 13 \pm 0.2$ |  |
| MCR01      | MRT       |                                                            |                                                           |                                                      |                   |  |
| MCR03      | ERT       |                                                            |                                                           |                                                      |                   |  |
| MCR10      | EZH       |                                                            |                                                           |                                                      |                   |  |
| MCR18      | EZH       |                                                            |                                                           |                                                      |                   |  |
| MCR25      | JZH       |                                                            |                                                           | $13 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ |                   |  |
| MCR50      | JZH       |                                                            |                                                           |                                                      |                   |  |
| MCR100     | JZH       |                                                            |                                                           |                                                      |                   |  |

## ●Products List

| Part No.      | Type Code | Rated Power<br>(70°C)<br>(W) | Limiting Element<br>Voltage<br>(V) | Maximum<br>Overload<br>Voltage<br>(V) | Temperature<br>Coefficient<br>(ppm / °C) | Resistance<br>Tolerance<br>(%) | Resistance Range                                    | Series | Operating<br>Temperature<br>Range<br>(°C) |
|---------------|-----------|------------------------------|------------------------------------|---------------------------------------|------------------------------------------|--------------------------------|-----------------------------------------------------|--------|-------------------------------------------|
| <b>MCR006</b> | YZP       | 0.05                         | 0.67                               | 1.34                                  | ±600 / -200                              | F(±1%)                         | 1.0Ω to 9.1Ω                                        | E24    | -55 to +125                               |
| <b>MCR01</b>  | MZP       | 0.063                        | 0.76                               | 1.52                                  | ±400                                     | F(±1%)                         | 1.0Ω to 9.1Ω                                        |        | -55 to +155                               |
| <b>MCR03</b>  | EZP       | 0.1                          | 0.95                               | 1.90                                  | ±400                                     | F(±1%)                         | 1.0Ω to 9.1Ω                                        |        |                                           |
| <b>MCR10</b>  | EZH       | 0.25                         | 1.51                               | 3.02                                  | 500±300<br>400±200<br>±250               | J(±5%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 0.91Ω |        |                                           |
|               |           |                              |                                    |                                       | 500±300<br>400±200<br>±250               | F(±1%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 9.1Ω  |        |                                           |
| <b>MCR18</b>  | EZH       | 0.25                         | 1.51                               | 3.02                                  | 500±300<br>400±200<br>±250               | J(±5%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 0.91Ω |        |                                           |
|               |           |                              |                                    |                                       | 500±300<br>400±200<br>±250               | F(±1%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 9.1Ω  |        |                                           |
| <b>MCR25</b>  | JZH       | 0.5                          | 2.13                               | 4.26                                  | 300±300<br>±200                          | J(±5%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.91Ω                   |        |                                           |
|               |           |                              |                                    |                                       | 300±300<br>±200                          | F(±1%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 9.1Ω                    |        |                                           |
| <b>MCR50</b>  | JZH       | 0.5                          | 2.13                               | 4.26                                  | 500±300<br>400±200<br>±250               | J(±5%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 0.91Ω |        |                                           |
|               |           |                              |                                    |                                       | 500±300<br>400±200<br>±250               | F(±1%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 9.1Ω  |        |                                           |
| <b>MCR100</b> | JZH       | 1                            | 3.01                               | 6.02                                  | 500±300<br>400±200<br>±250               | J(±5%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 0.91Ω | E24    | -55 to +125                               |
|               |           |                              |                                    |                                       | 500±300<br>400±200<br>±250               | F(±1%)                         | 0.047Ω to 0.091Ω<br>0.1Ω to 0.13Ω<br>0.15Ω to 9.1Ω  |        |                                           |

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

## ●Chip Resistor Dimensions and Markings



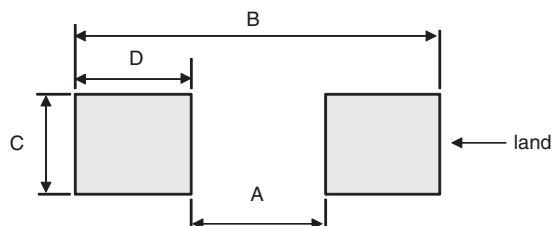
&lt;Marking method&gt;

There are three or four digits used for the calculation number according to IEC code and "R" is used for the decimal point.

(Unit : mm)

| Part No.      | Type Code | (mm) | (inch) | L        | W        | t         | a        | b                                     | Marking existence |
|---------------|-----------|------|--------|----------|----------|-----------|----------|---------------------------------------|-------------------|
| <b>MCR006</b> | YZP       | 0603 | 0201   | 0.6±0.03 | 0.3±0.03 | 0.23±0.03 | 0.1±0.05 | 0.15±0.05                             | No                |
| <b>MCR01</b>  | MZP       | 1005 | 0402   | 1.0±0.05 | 0.5±0.05 | 0.35±0.05 | 0.2±0.1  | 0.25 <sup>+0.05</sup> <sub>-0.1</sub> | No                |
| <b>MCR03</b>  | EZP       | 1608 | 0603   | 1.6±0.1  | 0.8±0.1  | 0.45±0.1  | 0.3±0.2  | 0.3±0.2                               | 3 digits          |
| <b>MCR10</b>  | EZH       | 2012 | 0805   | 2.0±0.1  | 1.25±0.1 | 0.55±0.1  | 0.4±0.2  | 0.4±0.2                               | Yes               |
| <b>MCR18</b>  | EZH       | 3216 | 1206   | 3.2±0.15 | 1.6±0.15 | 0.55±0.1  | 0.5±0.25 | 0.5±0.25                              | Yes               |
| <b>MCR25</b>  | JZH       | 3225 | 1210   | 3.2±0.15 | 2.5±0.15 | 0.55±0.15 | 0.5±0.25 | 0.5±0.25                              | Yes               |
| <b>MCR50</b>  | JZH       | 5025 | 2010   | 5.0±0.15 | 2.5±0.15 | 0.55±0.15 | 0.6±0.25 | 0.6±0.25                              | Yes               |
| <b>MCR100</b> | JZH       | 6432 | 2512   | 6.3±0.15 | 3.2±0.15 | 0.55±0.15 | 0.6±0.25 | 0.6±0.25                              | Yes               |

## ●Land pattern Example

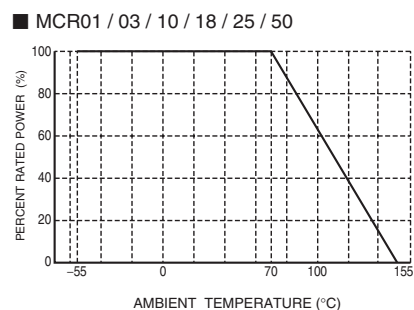
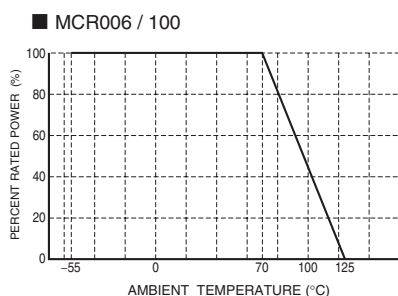


(Unit : mm)

| Part No.      | Type Code | A   | B    | C    | D    |
|---------------|-----------|-----|------|------|------|
| <b>MCR006</b> | YZP       | 0.3 | 0.84 | 0.3  | 0.27 |
| <b>MCR01</b>  | MZP       | 0.5 | 1.3  | 0.5  | 0.4  |
| <b>MCR03</b>  | EZP       | 1.0 | 2.0  | 0.8  | 0.5  |
| <b>MCR10</b>  | EZH       | 1.2 | 2.6  | 1.15 | 0.7  |
| <b>MCR18</b>  | EZH       | 2.2 | 4.0  | 1.5  | 0.9  |
| <b>MCR25</b>  | JZH       | 2.2 | 4.0  | 2.3  | 0.9  |
| <b>MCR50</b>  | JZH       | 3.8 | 6.0  | 2.3  | 1.1  |
| <b>MCR100</b> | JZH       | 5.1 | 8.1  | 3.0  | 1.5  |

## ●Derating Curve

When the ambient temperature exceeds 70°C, power dissipation must be adjusted according to the derating curves below.



## ●Characteristics

| Test Items                               | Guaranteed Value                                                                               | Test Conditions                                                                                                                |
|------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Resistance                               | See "Products List"                                                                            | 20°C                                                                                                                           |
| Variation of resistance with temperature | See "Products List"                                                                            | Measurement : +20 / -55 / +20 / +125°C                                                                                         |
| Overload                                 | $\pm (2.0\%+0.005\Omega)$                                                                      | Rated voltage (current) $\times 2.5$ , 2s.<br>Maximum overload voltage                                                         |
| Solderability                            | A new uniform coating of minimum of 95% of the surface being immersed and no soldering damage. | Rosin-Ethanol : 25% (weight)<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.                       | Soldering condition : $260\pm 5^\circ\text{C}$<br>Duration of immersion : $10\pm 1\text{s}$                                    |
| Rapid change of temperature              | $\pm (1.0\%+0.005\Omega)$                                                                      | Test temp.<br>-55°C to +125°C 100cycle (MCR006)<br>-55°C to +125°C 5cycle (MCR01 / 03 / 10 / 18 / 25 / 50 / 100)               |
| Damp heat, steady state                  | $\pm (3.0\%+0.005\Omega)$                                                                      | 40°C, 93%RH (Relative Humidity)<br>Test time : 1,000h to 1,048h                                                                |
| Endurance at 70°C                        | $\pm (3.0\%+0.005\Omega)$                                                                      | 70°C<br>Rated voltage (current)<br>1.5h : ON – 0.5h : OFF<br>Test time : 1,000h to 1,048h                                      |
| Endurance                                | $\pm (3.0\%+0.005\Omega)$                                                                      | 125°C (MCR006 / 100)<br>155°C (MCR01 / 03 / 10 / 18 / 25 / 50)<br>Test time : 1,000h to 1,048h                                 |
| Resistance to solvent                    | $\pm (1.0\%+0.005\Omega)$ ※MCR006 only<br>$\pm (0.5\%+0.005\Omega)$                            | $23\pm 5^\circ\text{C}$ , Immersion cleaning, $5\pm 0.5\text{min}$<br>Solvent : 2-propanol                                     |
| Bend strength of the end face plating    | Without Open.                                                                                  | —                                                                                                                              |

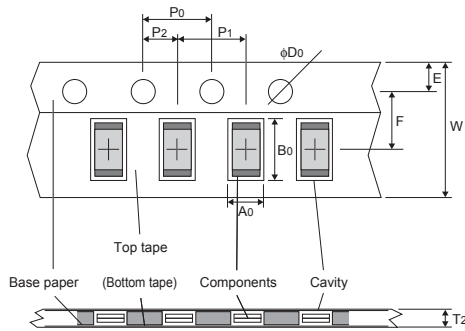
Compliance Standard(s) : IEC60115-8  
JISC 5201-8

## ●Technical data

| Parameter             | Unit  | MCR006<br>YZP | MCR01<br>MZP | MCR03<br>EZP | MCR10<br>EZH | MCR18<br>EZH | MCR25<br>JZH | MCR50<br>JZH | MCR100<br>JZH |
|-----------------------|-------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|
| Insulation resistance | MΩ    | 1000          | 1000         | 1000         | 1000         | 1000         | 1000         | 1000         | 1000          |
| Failure rate          | Fit   | 0.0016        | 0.0002       | 0.0009       | 0.0128       | 0.0155       | 0.0203       | 0.0201       | 0.0586        |
| Weight                | mg/pc | 0.15          | 0.565        | 2.03         | 5.00         | 9.78         | 16.5         | 25.8         | 42.0          |

## ●Tape Dimensions

## ■ Paper Tape

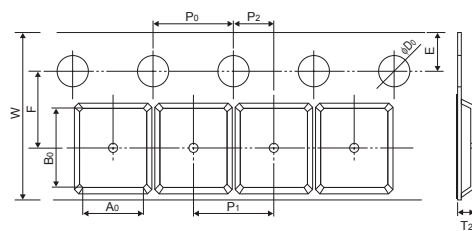


(Unit : mm)

| Part No.      | Type Code | W       | F        | E        | A0                                    | B0                                    |
|---------------|-----------|---------|----------|----------|---------------------------------------|---------------------------------------|
| <b>MCR006</b> | YZP       | 8.0±0.2 | 3.5±0.05 | 1.75±0.1 | 0.38±0.03                             | 0.68±0.03                             |
| <b>MCR01</b>  | MZP       | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 0.7±0.1                               | 1.2±0.1                               |
| <b>MCR03</b>  | EZP       | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 1.1±0.1                               | 1.9±0.1                               |
| <b>MCR10</b>  | EZH       | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 1.65 <sup>+0.2</sup> <sub>-0.1</sub>  | 2.4 <sup>+0.2</sup> <sub>-0.1</sub>   |
| <b>MCR18</b>  | EZH       | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 1.95 <sup>+0.1</sup> <sub>-0.05</sub> | 3.5 <sup>+0.15</sup> <sub>-0.05</sub> |

| Part No.      | Type Code | D0                                | P0      | P1       | P2       | T2      |
|---------------|-----------|-----------------------------------|---------|----------|----------|---------|
| <b>MCR006</b> | YZP       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 2.0±0.05 | 2.0±0.05 | Max 0.5 |
| <b>MCR01</b>  | MZP       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 2.0±0.05 | 2.0±0.05 | Max 1.1 |
| <b>MCR03</b>  | EZP       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 4.0±0.1  | 2.0±0.05 | Max 1.1 |
| <b>MCR10</b>  | EZH       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 4.0±0.1  | 2.0±0.05 | Max 1.1 |
| <b>MCR18</b>  | EZH       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 4.0±0.1  | 2.0±0.05 | Max 1.1 |

## ■ Embossed Tape

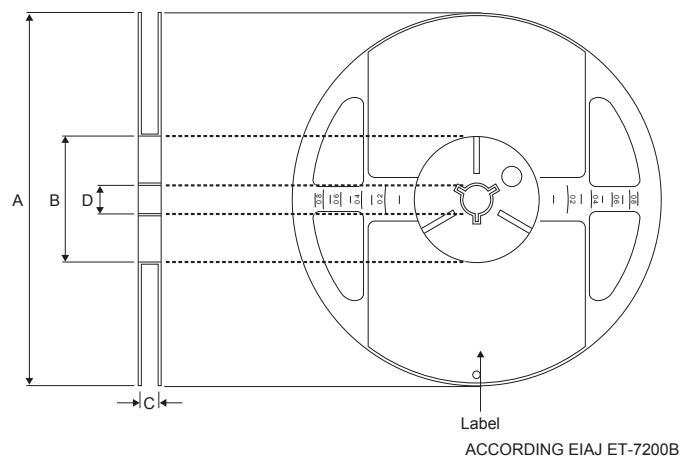


(Unit : mm)

| Part No.      | Type Code | W       | F        | E        | A0      | B0      |
|---------------|-----------|---------|----------|----------|---------|---------|
| <b>MCR25</b>  | JZH       | 8.0±0.3 | 3.5±0.05 | 1.75±0.1 | 3.0±0.1 | 3.5±0.1 |
| <b>MCR50</b>  | JZH       | 12±0.3  | 5.5±0.05 | 1.75±0.1 | 3.4±0.2 | 5.6±0.2 |
| <b>MCR100</b> | JZH       | 12±0.3  | 5.5±0.05 | 1.75±0.1 | 3.5±0.2 | 6.7±0.2 |

| Part No.      | Type Code | D0                                | P0      | P1      | P2       | T2      |
|---------------|-----------|-----------------------------------|---------|---------|----------|---------|
| <b>MCR25</b>  | JZH       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | Max 1.1 |
| <b>MCR50</b>  | JZH       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | Max 1.1 |
| <b>MCR100</b> | JZH       | φ1.5 <sup>+0.1</sup> <sub>0</sub> | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | Max 1.1 |

## ●Reel Dimensions



(Unit : mm)

| Part No. | Type Code | A                                                          | B                                                         | C                                                    | D                 |
|----------|-----------|------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------|-------------------|
| MCR006   | YZP       | $\phi 180 \begin{smallmatrix} 0 \\ -1.5 \end{smallmatrix}$ | $\phi 60 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ | $9 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$  | $\phi 13 \pm 0.2$ |
| MCR01    | MZP       |                                                            |                                                           |                                                      |                   |
| MCR03    | EZP       |                                                            |                                                           |                                                      |                   |
| MCR10    | EZH       |                                                            |                                                           |                                                      |                   |
| MCR18    | EZH       |                                                            |                                                           |                                                      |                   |
| MCR25    | JZH       |                                                            |                                                           |                                                      |                   |
| MCR50    | JZH       |                                                            |                                                           | $13 \begin{smallmatrix} +1.0 \\ 0 \end{smallmatrix}$ |                   |
| MCR100   | JZH       |                                                            |                                                           |                                                      |                   |

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