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## MBR series

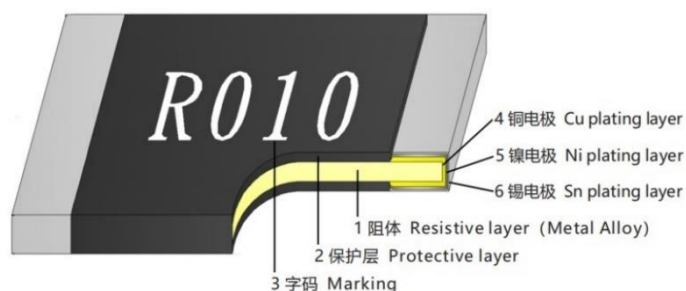
### Application

- Instrument and meter
- Power Amplifier
- Notebook, personal computer
- Precision power supply
- Battery Management system
- Electric Power tool

### Features

- Power rating up to 1.5W
- Excellent temperature coefficient characteristics
- Excellent long-term stability
- Non-inductive resistance
- High application temperature range -55 to +170 °C due to special design
- RoHs compliant and halogen free
- AEC-Q200 qualification

### Product structure



### Part Number Explanation

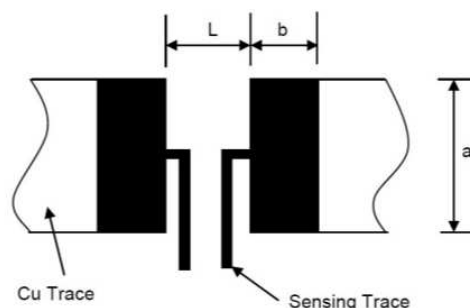
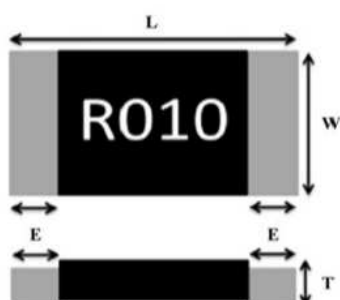
| MBR          | 1206        | B5                                       | F                       | R001                                | S                                     |
|--------------|-------------|------------------------------------------|-------------------------|-------------------------------------|---------------------------------------|
| Product Type | Size (Inch) | Rated Power                              | Tolerance               | Resistance                          | Electrode                             |
| MBR          | 1206        | A5=0.5W<br>B5=1.5W<br>C5=2.5W<br>D5=3.5W | F=±1%<br>G=±2%<br>J=±5% | 0M50=0.5mΩ<br>R001=1mΩ<br>R010=10mΩ | S=Short electrode<br>L=Long electrode |

### Standard Electrical Specifications

| Type | Part Number     | Rated Power /W | TCR ppm/°C | Resistance /mΩ | Marking | Applicable temperature range /°C |
|------|-----------------|----------------|------------|----------------|---------|----------------------------------|
| 1206 | MBR1206B5FR001S | 1.5            | 350        | 1              | R001    | -55~170                          |
|      | MBR1206B5FR002S | 1.5            | 350        | 2              | R002    |                                  |
|      | MBR1206B5FR003S | 1.5            | 350        | 3              | R003    |                                  |
|      | MBR1206B5FR004S | 1.5            | 350        | 4              | R004    |                                  |
|      | MBR1206B5FR005S | 1.5            | 50         | 5              | R005    |                                  |

|  |                 |     |    |        |      |  |
|--|-----------------|-----|----|--------|------|--|
|  | MBR1206B5FR006S | 1.5 | 50 | 6      | R006 |  |
|  | MBR1206B5FR007S | 1.5 | 50 | 7      | R007 |  |
|  | MBR1206B5FR008S | 1.5 | 50 | 8      | R008 |  |
|  | MBR1206B5FR009S | 1.5 | 50 | 9      | R009 |  |
|  | MBR1206B5FR010S | 1.5 | 50 | 10     | R010 |  |
|  | MBR1206B5FR***S | 1.5 | 50 | 11-100 | R*** |  |

## ■ Type Dimension



## ■ Standard Electrical Dimension

Unit: mm

| Type | Resistance Range (mΩ) | Electrode | L       | W       | T       | E       |
|------|-----------------------|-----------|---------|---------|---------|---------|
| 1206 | 1-100                 | Short     | 3.2±0.2 | 1.6±0.2 | 0.6±0.2 | 0.5±0.2 |

## ■ PCB-layout proposal

Unit: mm

| Type | Resistance Range (mΩ) | Electrode | a    | b    | L    |
|------|-----------------------|-----------|------|------|------|
| 1206 | 1-100                 | Short     | 1.80 | 1.70 | 1.60 |

## ■ Power Derating Curve

The Operating Temperature Range: -55°C ~+170°C

For resistors operated in ambient temperatures above 70°C, power rating must be derated in accordance with the curve below

## ■ Rating Current

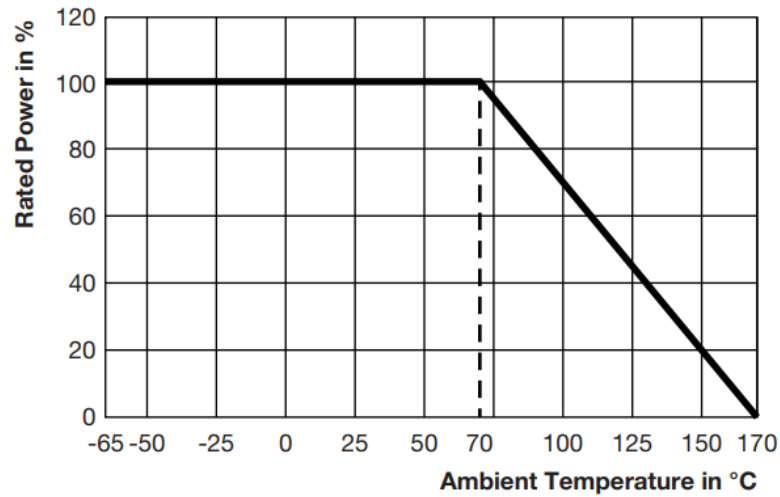
The following equation may be used to determine the DC (Direct Current) or AC (Alternating Current) (RMS, root mean square value) of normal rated power. However, if the result value exceeds the highest current of regulated standards (paragraph 5), the highest normal rated power is to be used

$$I = \sqrt{P/R}$$

I= Rating current (A)

P= Rating Power (W)

R= Resistance(Ω)



## ■ Reliability Test and Requirement

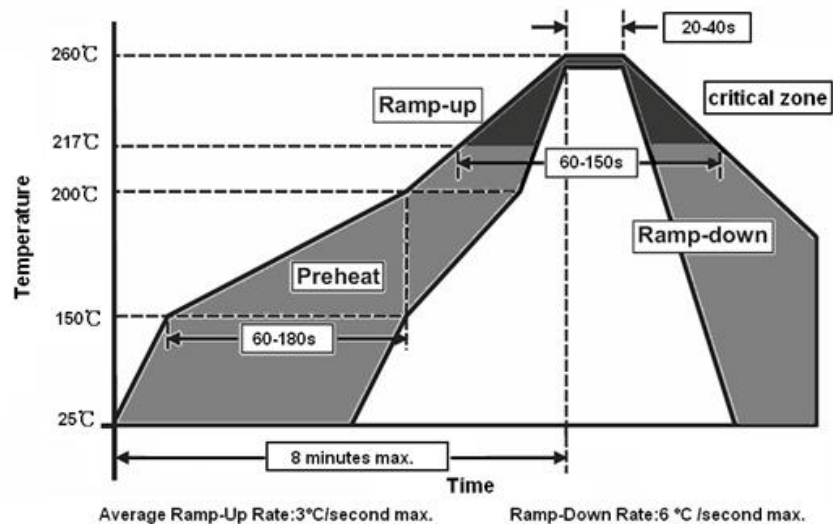
| Test Item                                     | Test Method                | Procedure                                                                                                                 | Requirements                      |
|-----------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Temperature Coefficient of Resistance (T.C.R) | MIL-STD-202 Method 304     | $TCR (ppm/^{\circ}C) = \frac{(R2-R1)}{R1(T2-T1)} \times 10^6$ R1: resistance at 25°C (T1)<br>R2: resistance at 125°C (T2) | Refer to Electrical Specification |
| Short Time Overload                           | JIS C 5201-1 clause 4.13   | The number of rated power are as follows:<br>5 times of rated power<br>Rating power duration: 5secs                       | ±1.0%                             |
| High Temperature Exposure                     | JIS C 5201-1 clause 4.23.2 | 170°C±2°C for 1000hrs                                                                                                     | ±1.0%                             |
| Solderability                                 | JIS C 5201-1 clause 4.17   | 245±5°C for 3 ±0.5secs                                                                                                    | The covered area >95%             |
| Low Temp. Storage                             | JIS C 5201-1 clause 4.23.4 | -55°C±2°C for 1000hrs                                                                                                     | ±1.0%                             |
| Soldering Heat                                | MIL-STD-202 Method 210     | 260±5°C for 10±1 seconds.                                                                                                 | ±1.0%                             |
| Temperature Cycling                           | JIS C 5201-1 clause 4.19   | -55°C to +155°C, 100 cycles                                                                                               | ±1.0%                             |
| Load Life                                     | MIL-STD-202 Method 108     | 70°C± 2°C, 1000 hours, at rated power 1.5 hours "ON", 0.5 hours "OFF"                                                     | ±1.0%                             |
| Temperature Humidity Bias Test                | MIL-STD-202 Method103      | +85°C, 85% RH, 10%bias, 1000hou                                                                                           | ±0.5%                             |
| Mechanical shock                              | MIL-STD-202 Method 213     | 100 g'sec ,6 msec, 5puls                                                                                                  | ±0.5%                             |

|                     |                           |                                                                |       |
|---------------------|---------------------------|----------------------------------------------------------------|-------|
| Vibration           | MIL-STD-202<br>Method 204 | Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h | ±1.0% |
| Moisture resistance | MIL-STD-202<br>Method 106 | MIL-STD-202,method 106, No power, 7a and 7b not required       | ±1.0% |

### ■ Marking Format

- All type products marking are 4 digits.  
 “R” designates the decimal location in ohms  
 e.g. 1mΩ the product marking is R001.  
 5mΩ the product marking is R005 .  
 10mΩ the product marking is R010.  
 “M” designates the decimal location in milli-ohms  
 e.g. 0.5mΩ the product marking is 0M50.  
 1.5mΩ the product marking is 1M50.  
 2.5mΩ the product marking is 2M50.
- The criteria to distinguishing the mark on the surface of products are that characters can be identified.

### ■ Recommended IR Reflow Profile

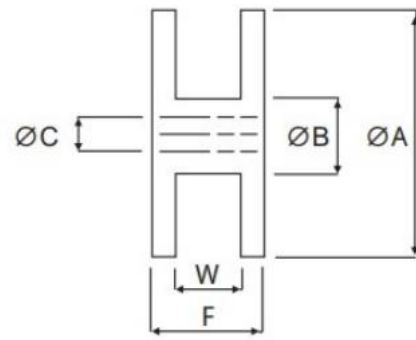


### ■ Quantity of Package

| Type | Resistance Value<br>/mΩ | Electrode | Quantity<br>/Pcs |
|------|-------------------------|-----------|------------------|
| 1206 | 1-100                   | Short     | 5000             |

### ■ Reel Dimensions

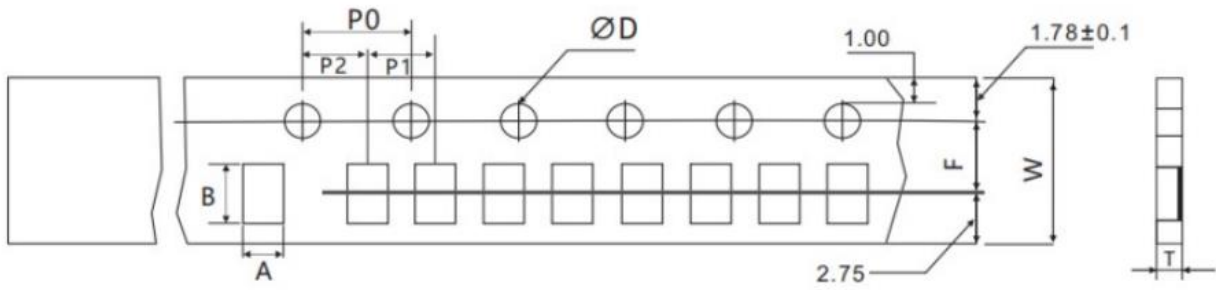
Unit: mm



| TYPE | ΦA        | ΦB       | ΦC       | F        | W       |
|------|-----------|----------|----------|----------|---------|
| 1206 | 178.0±2.0 | 60.0±1.0 | 13.5±0.5 | 11.4±0.1 | 9.0±0.3 |

### Carrier Dimensions

Unit: mm



| MBR Series (1206) |           |    |           |                |             |   |           |
|-------------------|-----------|----|-----------|----------------|-------------|---|-----------|
| A                 | 2.0±0.15  | B  | 3.6±0.20  | ΦD             | 1.5+0.1/0.0 | F | 3.50±0.05 |
| P0                | 4.00±0.10 | P1 | 4.00±0.10 | P <sub>0</sub> | 2.00±0.05   | W | 8.00±0.10 |
| T                 | 0.84±0.10 |    |           |                |             |   |           |

### Peeling Strength of Top Cover Tape

Peeling Strength: 0.1-1.0N at a peel-off speed of 300 mm/min.

### Storage Requirement

Temperature: 5~35°C, Humidity: 45%RH~75%RH

Sealed plastic bags with desiccant shall be used to reduce the oxidation of the termination and shall only be opened prior to use.

The products shall not be stored in areas where harmful gases containing sulfur or chlorine are present.

When the product is finally discarded, it can be treated as general electronic waste, and raw material compositions of CSR can be referred to MSDS.