

## 1. SCOPE

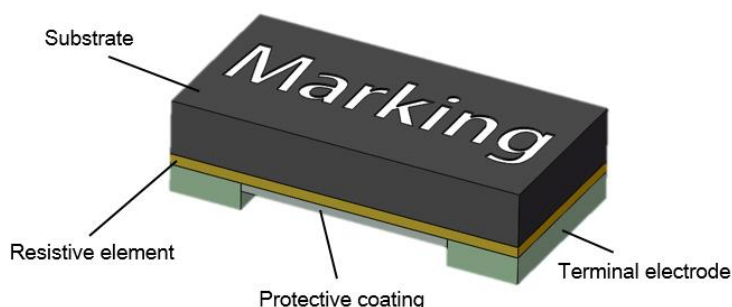
This specification is applicable to lead free and halogen free of RoHS directive for MLR series metal alloy low-resistance resistor.

## 2. Type Designation

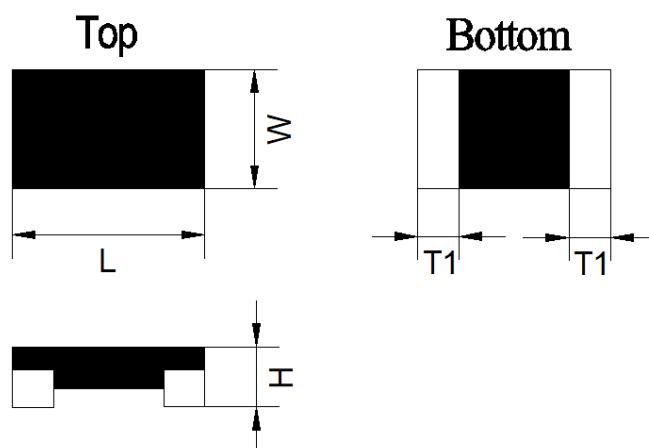
|              |             |             |           |            |
|--------------|-------------|-------------|-----------|------------|
| MLR          | 0805        | 05          | F         | R002       |
| Product Type | Size (Inch) | Rated Power | Tolerance | Resistance |
| MLR          | 0805        | 0.50W       | ±1%       | 2mΩ        |

## 3. Construction and Physical Dimensions

### 3.1 Construction



### 3.2 Physical Dimensions



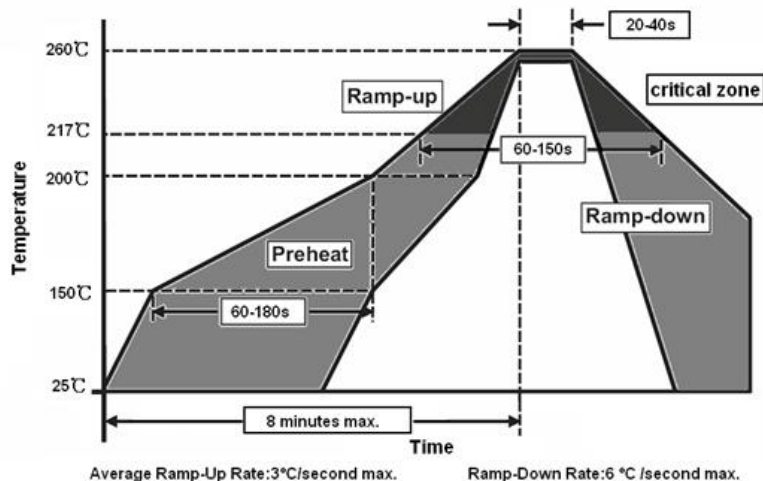
| Type           | Dimensions (mm) |           |           |           |
|----------------|-----------------|-----------|-----------|-----------|
|                | L               | W         | H         | T1        |
| MLR080505FR002 | 2.00±0.25       | 1.25±0.25 | 0.40±0.10 | 0.40±0.20 |

## 4. Product Specifications

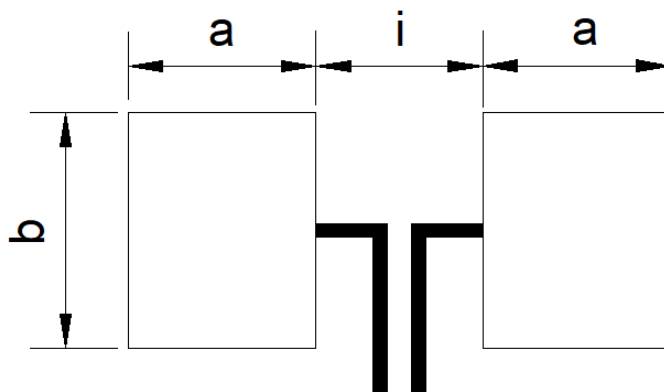
| Type           | Max. Rating Power (W) | Resistance Value (mΩ) | Resistance Tolerance | T.C.R (PPM/°C) | Operation Temp. Range (°C) |
|----------------|-----------------------|-----------------------|----------------------|----------------|----------------------------|
| MLR080505FR002 | 0.5                   | 2                     | ±1%                  | ±75            | -55~ + 155                 |

## 5. Recommended Customer Soldering Parameters

### 5.1 Recommended IR Reflow Profile

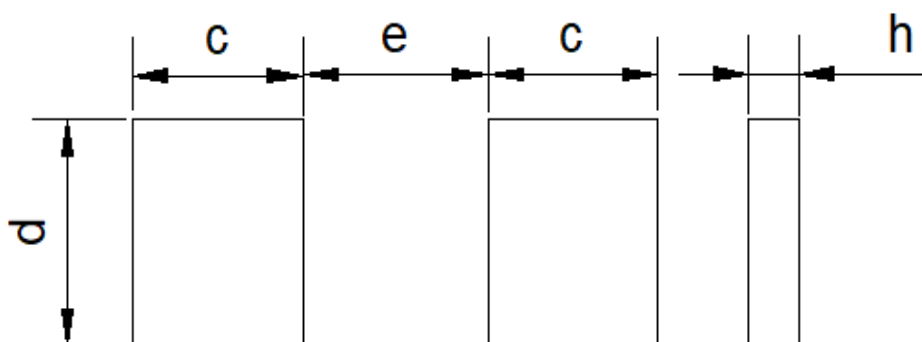


### 5.2 Recommend Solder Pad Layout



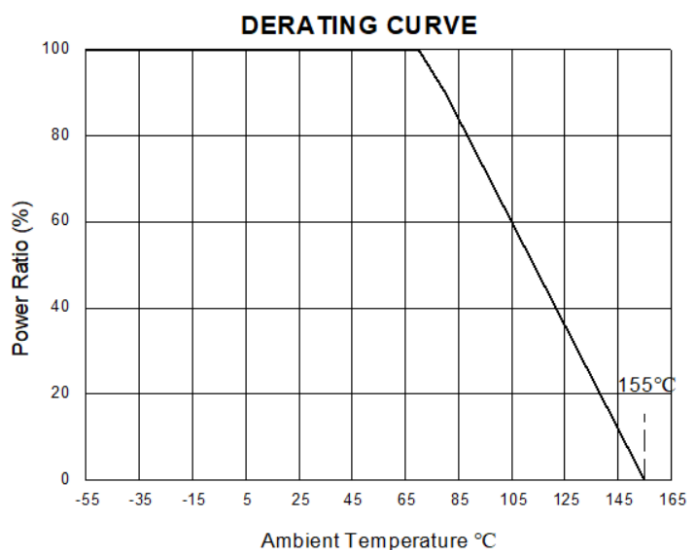
| Type           | a (mm) | b (mm) | i (mm) |
|----------------|--------|--------|--------|
| MLR080505FR002 | 0.90   | 1.40   | 0.80   |

### 5.3 Recommend Steel Net Layout



| Type           | c (mm) | d (mm) | e (mm) | h (mm) |
|----------------|--------|--------|--------|--------|
| MLR080505FR002 | 0.90   | 1.40   | 0.80   | 0.90   |

## 6. Power Derating Curve



## 7. 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, the highest normal rated power is to be used

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

I= Rating current (A)

P= Rating Power (W)

R= Resistance(Ω)

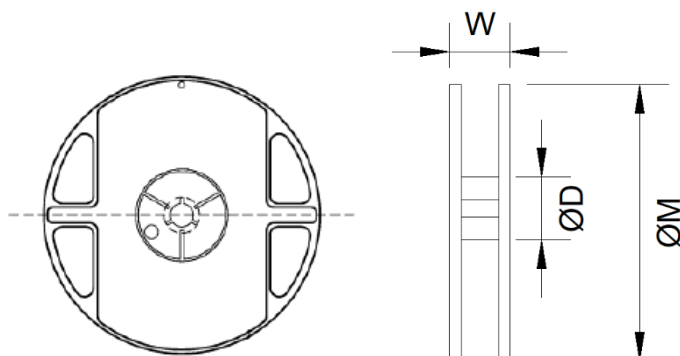
## 8. Reliability Performance

| NO. | Item                                            | Test Method                | Test Condition                                                                                                                       | Specification                     |
|-----|-------------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| 1   | Temperature Coefficient of Resistance ( T.C.R ) | JIS C 5201-1 clause 4.8    | T.C.R. (ppm/°C) = $\frac{(R2-R1)}{R1(T2-T1)} \times 10^6$<br>R1: resistance at room temperature (T1)<br>R2: resistance at 125°C (T2) | Refer to Electrical Specification |
| 2   | Short Time Overload                             | JIS C 5201-1 clause 4.13   | 2.5 times of rated power for 5 sec                                                                                                   | ΔR : ±1%                          |
| 3   | High Temperature Exposure                       | JIS C 5201-1 clause 4.23.2 | + 155°C±2°C for 1000hrs                                                                                                              | ΔR : ±1%                          |
| 4   | Low Temperature Storage                         | JIS C 5201-1 clause 4.23.4 | -55°C±2°C for 1000hrs                                                                                                                | ΔR : ±1%                          |
| 5   | Load Life                                       | JIS C 5201-1 clause 4.25   | Apply rated power at 70±2°C for 1000 hours with 1.5hrs ON and 0.5hrs off                                                             | ΔR : ±1%                          |
| 6   | Soldering Heat                                  | JIS C 5201-1 clause 4.18   | 260±5°C for 10±1 sec                                                                                                                 | ΔR : ±1%                          |
| 7   | Temperature Cycling                             | JIS C 5201-1 clause 4.19   | -55°C to +155°C , 100cycles                                                                                                          | ΔR : ±1%                          |
| 8   | Solderability                                   | JIS C 5201-1 clause 4.17   | 245±5°C for 3±0.5 sec                                                                                                                | Covered area > 95%                |
| 9   | Bending Strength                                | JIS C 5201-1 clause 4.33   | Chips mounted on a 90mm PCB(FR4)<br>2 mm bending<br>Bending time: 60±1 seconds                                                       | ΔR : ±1%                          |

**MLR080505FR002**

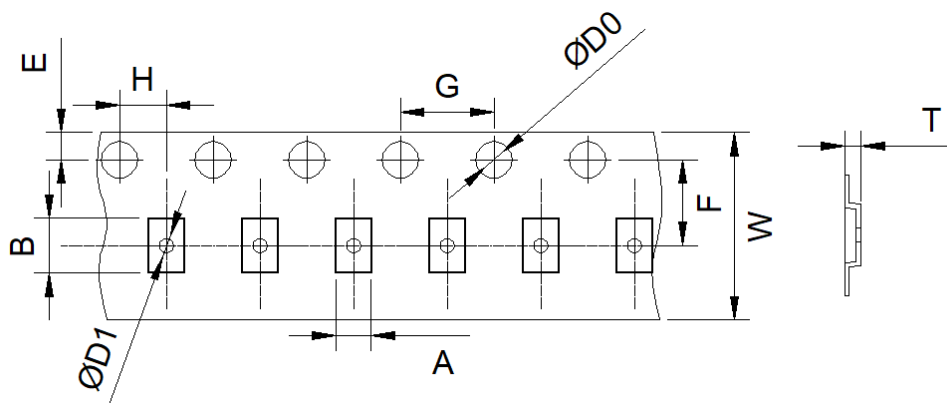
## 9. Packaging Information

### 9.1 Reel Dimensions



| Type           | $\phi D$ (mm) | W (mm)      | $\phi M$ (mm) |
|----------------|---------------|-------------|---------------|
| MLR080505FR002 | 60 $\pm$ 2    | 9.0 $\pm$ 1 | 178 $\pm$ 5   |

### 9.2 Carrier Dimensions (mm)



| Type           | W              | P              | E               | F               | $\phi D0$       | $\phi D1$      |
|----------------|----------------|----------------|-----------------|-----------------|-----------------|----------------|
| MLR080505FR002 | 8.0 $\pm$ 0.10 | 4.0 $\pm$ 0.10 | 1.75 $\pm$ 0.10 | 3.5 $\pm$ 0.05  | 1.55 $\pm$ 0.10 | 1.0 $\pm$ 0.05 |
|                | G              | H              | A               | B               | T               |                |
|                | 4.0 $\pm$ 0.10 | 2.0 $\pm$ 0.05 | 1.52 $\pm$ 0.05 | 2.25 $\pm$ 0.05 | 0.50 $\pm$ 0.05 |                |

### 9.3 Peeling Strength of Top Cover Tape

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

### 9.4 Packaging

| TYPE           | PCS/Reel |
|----------------|----------|
| MLR080505FR002 | 5,000    |

## 10. Storage Temperature and Life

Temperature: 5~35°C, Humidity:  $\leq$ 80%

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.