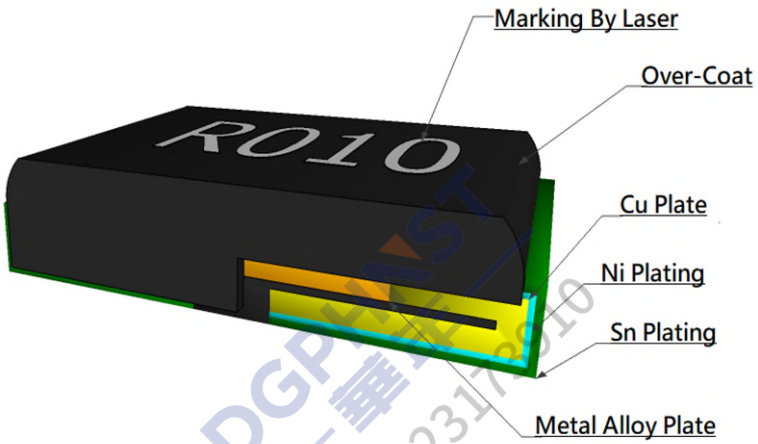
| EVER OHMS | MR Series Type 2818 Metal Alloy Low-Resistance Resistor Product Specifications | Document No. | P-10-01-79-06 |
|---|---|---|---|
| | | Revised Date | 2022/10/24 |
| | | Page No. | 1/6 |

## ■ Metal Alloy Low Resistance Chip Resistor — MR 2818






### ■ Application

— Entertainment equipment

— Power Supply

— Measuring instrument

— Industrial equipment

— Battery management system

### ■ Features

— Low Resistance / Low TCR/ Low Inductance(<5nH)

— Excellent long term stability

— RoHs compliant and halogen free.

— Lead free.

— High precision current sensing and voltage division.

— AEC-Q200 compliant

### ■ Parts Number Explanation

### ■ Example:

| MR | 2818 | 70 | F | R050 | R | Z |
|---|---|---|---|---|---|---|
| Product Type | Size (Inch) | Rated Power | Tolerance | Resistance | Material | Optional |
| | 2818 | 70=7.00W | D：±0.5%<br>F：±1%<br>G：±2%<br>J：±5% | R050=50.0mR | R：NiCrAl<br>S：MnCuSn<br>M：MnCu | Z:Normal Type(Low inductance) |

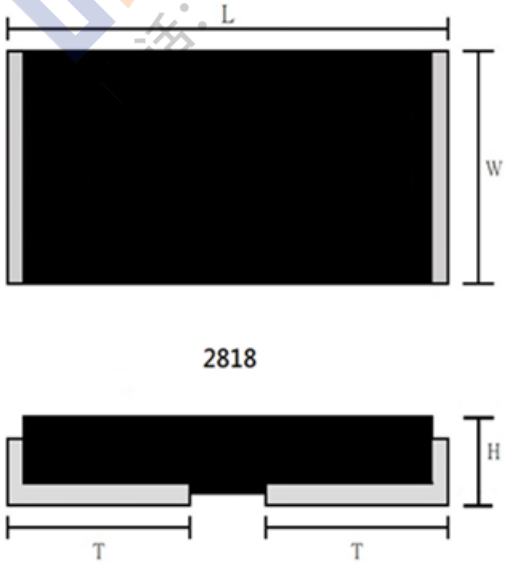
## ■ Standard Electrical Specifications

| Type | Rating Power at 70℃ Note1 | Element TCR Note2 (ppm/℃) | Max. Rating Current | Max. Overload Current | Resistance Range (mΩ) | | Material | Operating Temperature Range (℃) |
|---|---|---|---|---|---|---|---|---|
| | | | | | 0.5% (D) | 1.0% (F) 2.0% (G) 5.0% (J) | | |
| MR2818 | 7W | ≦±50 | 83.66A | 167.33A | - | 1~2 | R001~R002 :MnCuSn | - 55 ~ + 170 |
| | | | 48.30A | 96.60A | 5~7 | 3~7 | R003~R007 : MnCu | |
| | | | 29.58A | 59.16A | 8~50 | 8~50 | R008~R050 : NiCrAl | |

Note1: The MR2818 is rated at 7 W with maximum surface temperature of 180 °C and maximum terminal temperature of 70 °C.

Note2: Element TCR - only applies to the alloy used for the resistor element; refer to Page 4(TCR test) for component temperature coefficient (including copper terminal).

## ■ Type Dimension




## ■ Dimension

Unit：mm

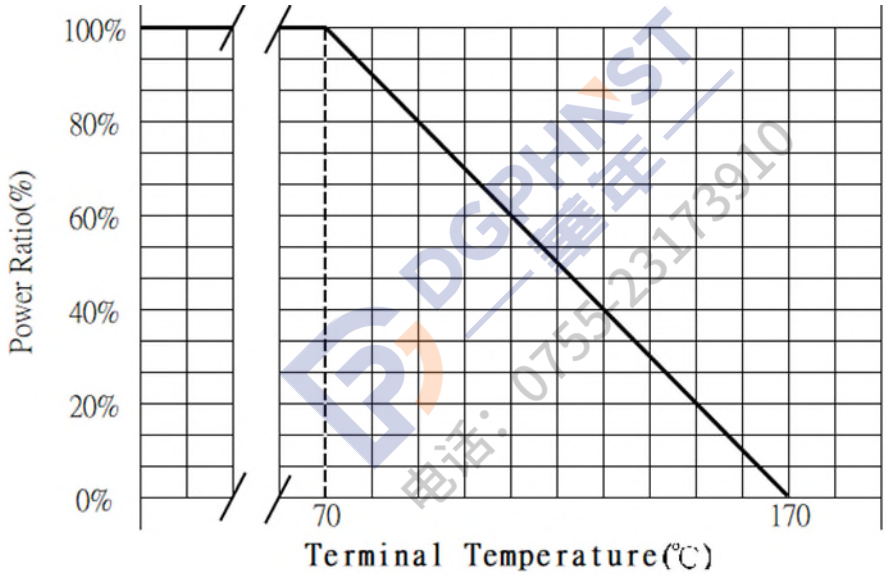
| Type | Resistance Range | L | W | H | T |
|---|---|---|---|---|---|
| MR2818 | 1~50mΩ | 7.20±0.254 | 4.95±0.254 | 1.65±0.254 | 2.90±0.254 |

## ■ Performance Characteristics

### Power Derating Curve

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

For resistors operated in terminal temperatures above 70°C, power rating must be derating in accordance with the curve as 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, the highest normal rated power is to be used

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

I = Rating current (A)
P= Rating Power (W)
R= Resistance(Ω)

## ■ Marking Format:

- All the products marking are 4 digits.
- “R” designates the decimal location in ohms

  e.g. 40mΩ the product marking is R040.
- The criteria to distinguishing the mark on the surface of products are that characters can be identified.

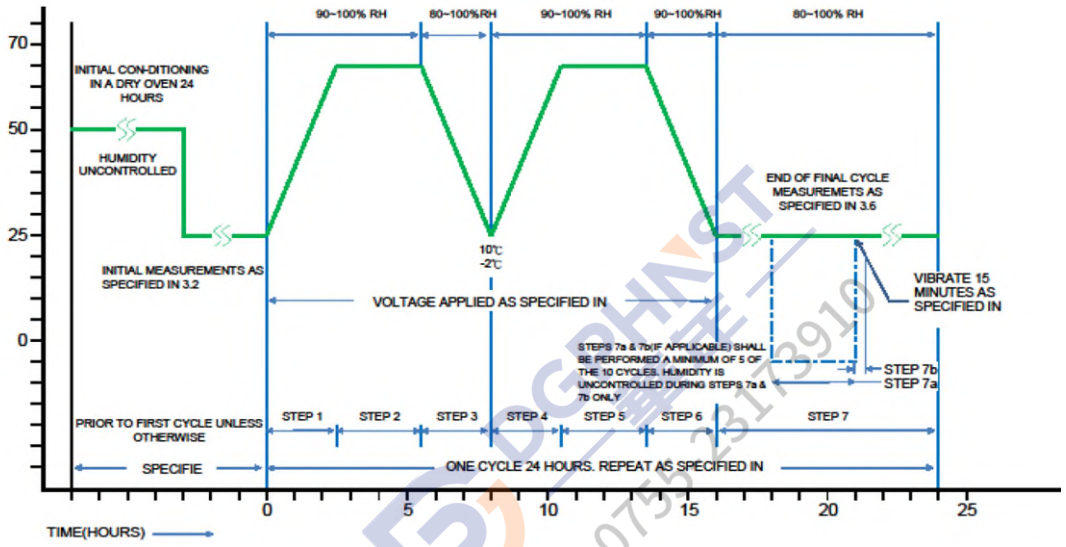
## ■ Reliability Test and Requirement

| Test Item | Test Method | Procedure | Requirements |
|---|---|---|---|
| Component temperature coefficient note1 (including terminal & soldering) | JIS-C-5201-1 4.8<br>IEC-60115-1 4.8 | At +25℃ / +125℃, 25℃ is the reference temperature | 1mΩ: < ±250 ppm/℃<br>2mΩ~7mΩ: < ±200 ppm/℃<br>8mΩ~50mΩ: < ±75 ppm/℃ |
| Short Time Overload note2 | JIS-C-5201-1 4.13<br>IEC-60115-1 4.13 | The number of rated power are as follows:<br>● MR2818-7W: 4 times of rated power note2 for 5 seconds. | ΔR/R1≦±1.0% |
| High Temperature Exposure | JIS-C5201-1 4.25<br>IEC 60068-2-2 | At 170℃ for 1000 hours. | ΔR/R1≦±1.0% |
| Resistance to Soldering Heat | JIS-C-5201-1 4.18<br>IEC-60115-1 4.18 | 260±5℃ for 10 seconds. | ΔR/R1≦± 0.5% |
| Temperature Cycling | JESD22 Method JA-104 | 1000 Cycles (-55°C to +155°C) Measurement at 24±4 hours after test conclusion. 30min maximum dwell time at each temperature extreme. | ΔR/R1≦±1.0% |
| Biased Humidity note2 | MIL-STD-202 Method 103 | 1,000 hours; 85°C / 85% RH, 10% of operating power. Measurement at 24±4 hours after test conclusion. | ΔR/R1≦±1.0% |
| Load Life (Endurance) note2 | JIS-C-5201-1 4.25<br>IEC-60115-1 4.25.1 | 70±2℃, RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs〝ON〞and 0.5 hr〝OFF〞. (note2) | ΔR/R1≦±1.0% |
| Solderability | JIS-C-5201-1 4.17<br>IEC-60115-1 4.17 | 245±5℃ for 3 seconds. | >95% coverage |
| Dielectric Withstanding Voltage | JIS-C5201-1 4.7 | Applied 500VAC for 1 minute. | No short or burned on the appearance. |
| Core Body Strength | JIS-C5201-1 4.15 | Central part pressurizing force：5N , 10 seconds | No broken |
| Terminal Strength (SMD) | AEC Q200-006 | Pressurizing force：17.7N , 60 seconds | No broken |
| Bending Strength | JIS-C-5201-1 4.33<br>IEC-60115-1 4.33 | Bending once for 2mm , 10 seconds | ΔR/R1≦± 0.5%<br>No broken |
| Moisture Resistance | MIL-STD 202 Method 106 | T=24 hours / Cycle ,10Cycles .<br>Steps 7a& 7b not required. Unpowered .<br>(Figure 1) | ΔR/R1≦± 0.5% |

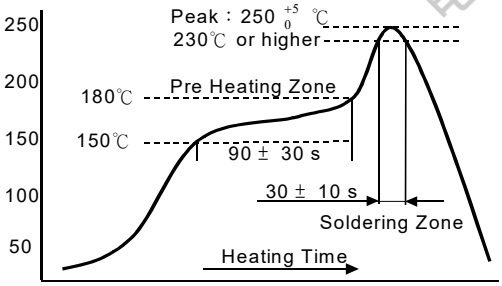
● Note1 : Component TCR - total TCR that includes the TCR effects of the resistor element and the copper terminal and soldering.

● Note2 : All Reliability test should follow De-rating curve , terminal temperature of component should be below 70℃

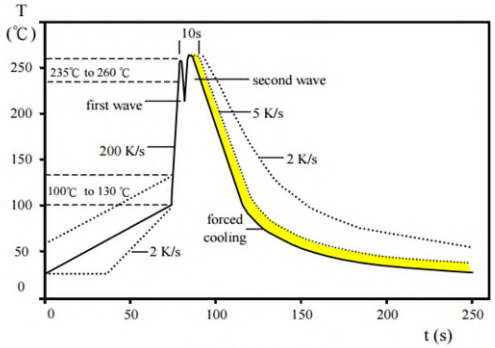
Figure 1




## ■ Soldering Profile



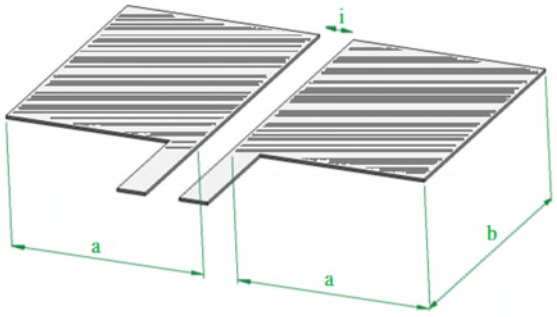

Reflow Soldering




WAVE soldering.

## ■ Recommend Land Pattern Design

**Unit: mm**




## ■ Dimension

| TYPE | Resistance Range | a | b | i |
|---|---|---|---|---|
| MR2818 | 1~50mΩ | 3.50 | 5.30 | 0.60 |

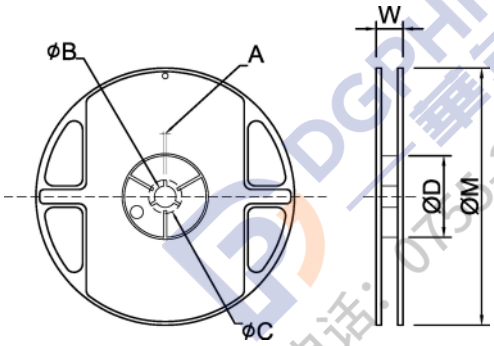
## ■Packing Quantity

| TYPE | PCS /Reel |
|---|---|
| MR2818 | 3,500 |

## ■ Appendix For SMD Chip Resistor

### ● Packaging Information

#### ■ Reel Dimensions

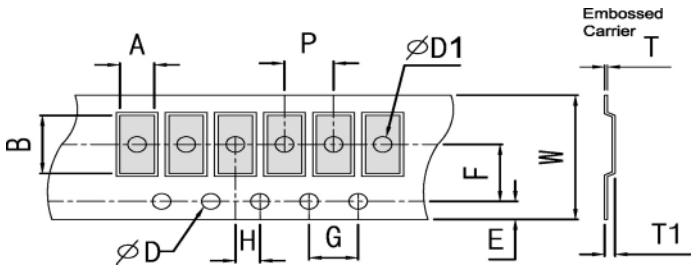



■ Dimension

Unit: mm

| Reel Type / Tape | A | ϕB | ϕC | ϕD | W | ϕM |
|---|---|---|---|---|---|---|
| 13” reel for 16 mm embossed | 2.3±0.5 | 13.5±0.5 | 17.7±0.5 | 99.0±0.5 | 20.7±0.5 | 330±1.0 |

#### ■ Embossed Dimensions




■ Dimension

Unit: mm

| Item | W | P | E | F | ϕD | ϕD1 | G | H | A | B | T1 | T |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MR2818 | 16.0±0.30 | 8.0±0.10 | 1.75±0.10 | 7.5±0.10 | $1.50^{+0.1}_{0}$ | $1.50^{+0.1}_{0}$ | 4.0±0.10 | 2.0±0.10 | 5.21±0.10 | 7.69±0.10 | 1.97±0.10 | 0.30±0.05 |

### ■ Storage Temperature

Temperature：25±5℃, Humidity：60±20%