

MLR_{series}

■ Application

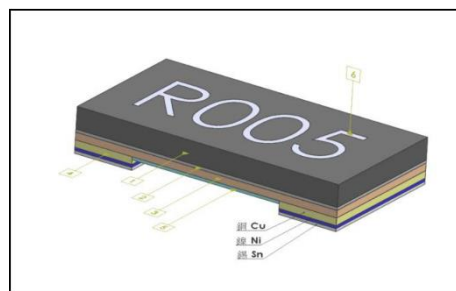
- Computer
- Power supply
- Measuring instrument
- Industrial
- Battery management system
- Automotive

■ Features

- Low Resistance / TCR / EMF(only for MnCu) / Inductance
- Excellent Long term stability
- RoHs compliant and halogen free
- High precision current sensing and voltage division

■ Product structure:

- (1) - Substrate : Epoxy
- (2) - Adhesive : Epoxy
- (3) - Resistive element : Cu – alloy
- (4) - Terminal electrode : Sn、Ni、Cu
- (5) - Protective coating : Flame-retardant epoxy, meets UL- 94-V0 requirements
- (6) - Marking coating : Flame-retardant epoxy, meets UL- 94-V0 requirements (white)



■ Parts Number Explanation

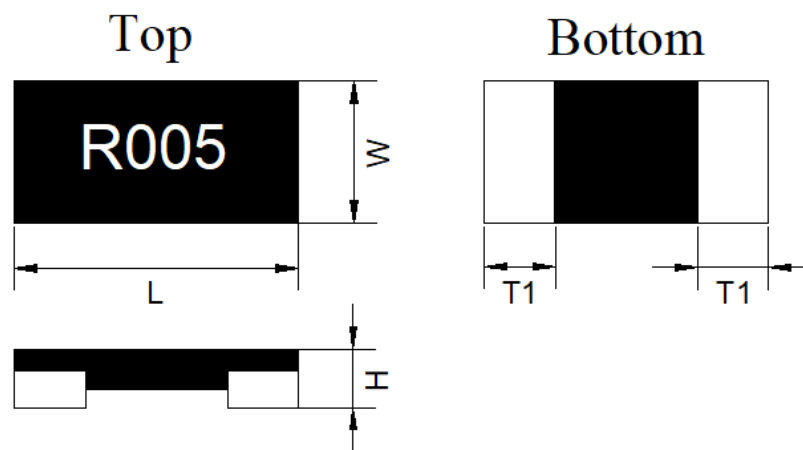
Example:

MLR	1206	10	F	R005
Product Type	Size (Inch)	Rated Power	Tolerance	Resistance
MLR	0201 0402 0603 0805 1206	02=0.20W 03=0.33W 05=0.50W 10=1.00W 15=1.50W 15=1.50W	D=±0.5% F=±1% G=±2%	2M50=2.5mR R005=5.0mR R020=20mR

■ Standard Electrical Specifications

Type	Rating Power at 70°C	T.C.R (ppm/°C)	Max. Rating Current	Max. Overload Current	Resistance Range (mΩ)	Material	Operating Temperature Range (°C)
					1.0% (F)		
MLR0805	0.5W	±150	22.36A	35.35A	1	MnCu	-55~+155
		±100	18.25A	28.86A	1.5		
		±75	15.81A	25.00A	2~5		
MLR1206	1W	±150	31.62A	50A	1		
		±100	31.62A	50A	1.5		
		±75	31.62A	50A	2~4		
		±50	14.14A	22.36A	5~10		

■ Type Dimension



■ Standard Electrical Dimension

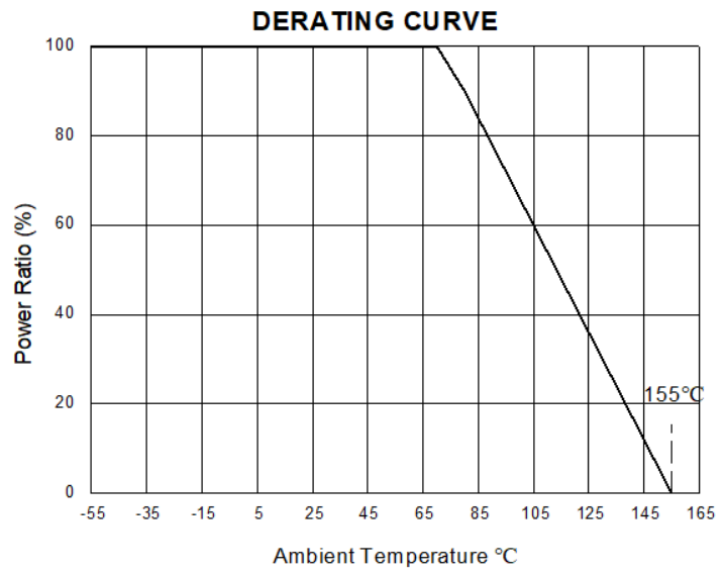
Unit: mm

Type	Power Rating	Resistance Range (mΩ)	L	W	H	T ₁
MLR0805	0.5W	1	2.00±0.25	1.30±0.25	0.40±0.05	0.65±0.20
		1.5	2.00±0.25	1.30±0.25	0.40Max.	0.65±0.20
		2~5	2.00±0.25	1.30±0.25	0.40Max.	0.40±0.20
MLR1206	1W	1	3.20±0.25	1.70±0.25	0.55±0.05	1.00±0.35
		1.5	3.20±0.25	1.70±0.25	0.40Max.	1.05±0.35
		1.5-10	3.20±0.25	1.60±0.25	0.40Max.	0.85±0.35

■ Power Derating Curve

The Operating Temperature Range: -55°C ~+155°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

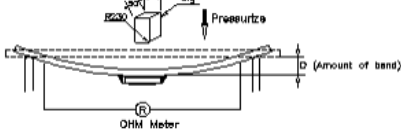
$$I = \sqrt{P/R}$$

I= Rating current (A)

P= Rating Power (W)

R= Resistance(Ω)

■ Reliability Test and Requirement

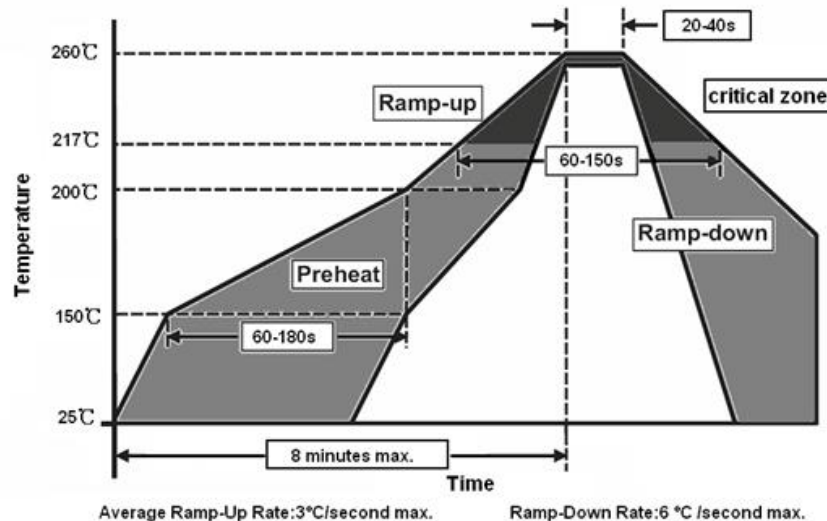
Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	JIS C 5201-1 clause 4.8	$T.C.R. (ppm/^{\circ}C) = \frac{(R2-R1)}{R1(T2-T1)} \times 10^6$ R1: resistance at room temperature (T1) R2: resistance at 125°C (T2)	Refer to Electrical Specification
Short Time Overload	JIS C 5201-1 clause 4.13	The number of rated power are as follows: 2.5 times of rated power Rating power duration: 5secs	±1.0%
High Temperature Exposure	JIS C 5201-1 clause 4.23.2	+ 155°C±2°C for 1000hrs	±1.0%
Low Temp. Storage	JIS C 5201-1 clause 4.23.4	-55°C±2°C for 1000hrs	±1.0%
Soldering Heat	JIS C 5201-1 clause 4.18	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	JIS C 5201-1 clause 4.25	T=70± 2 ° Load with Rated Current 1.5hrs "ON", 0.5hrs "OFF", 1000h	±1.0%
Solderability	JIS C 5201-1 clause 4.17	245±5°C for 3 ±0.5secs	The covered area >95%
Substrate Bending	JIS-C5201-1 clause 4.33	Span between fulcrums:90mm Bend Width:2mm 	±1.0%

■ Marking Format:

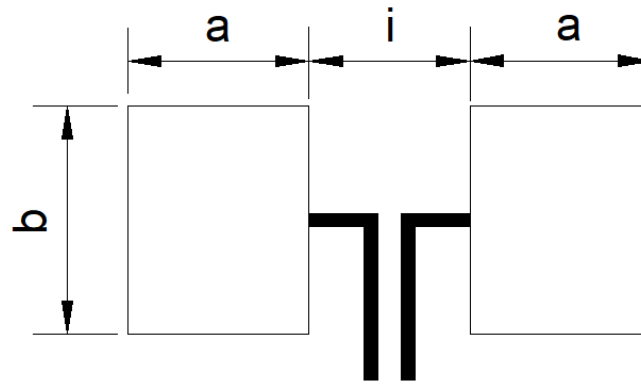
- 0805 type products marking are 3 digits.
“M” designates the decimal location in milli-ohms
e.g. 1m Ω the product marking is 001
10m Ω the product marking is 010.
1.5m Ω the product marking is 1M5.
- 1206 type products marking are 4 digits.
“R” designates the decimal location in ohms
e.g. 1m Ω the product marking is R001.
20m Ω the product marking is R020 .
“M” designates the decimal location in milli-ohms
e.g. 0.25m Ω the product marking is 0M25.
0.5m Ω the product marking is 0M50.
5.5m Ω the product marking is 5M50.
- The criteria to distinguishing the mark on the surface of products are that characters can be identified.
- Jumper NO Marking

● Recommended Customer Soldering Parameters

■ Recommended IR Reflow Profile



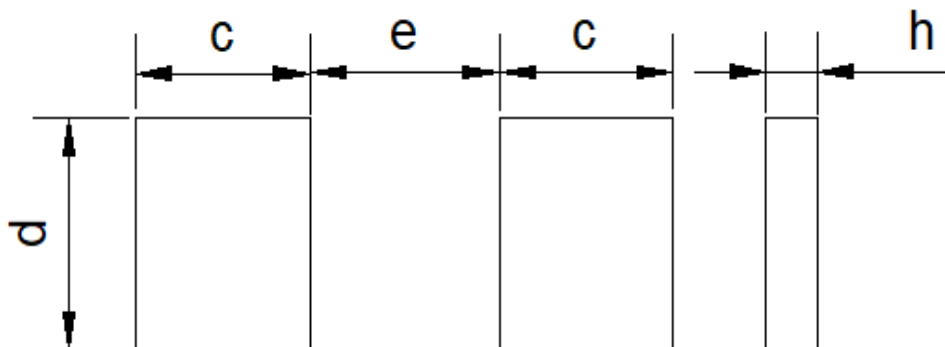
■ Recommend Solder Pad Layout



Unit: mm

Type	Resistance Range (mΩ)	a	b	i
MLR0805-0.5W	1	1.08	1.55	0.55
	1.5	1.05	1.55	0.60
	2~5	0.85	1.40	1.00
MLR1206-1W	1	1.50	1.85	0.90
	1.5	1.50	1.85	0.85
	2~10	1.35	1.70	1.20

■ Recommend Steel Net Layout



Unit: mm

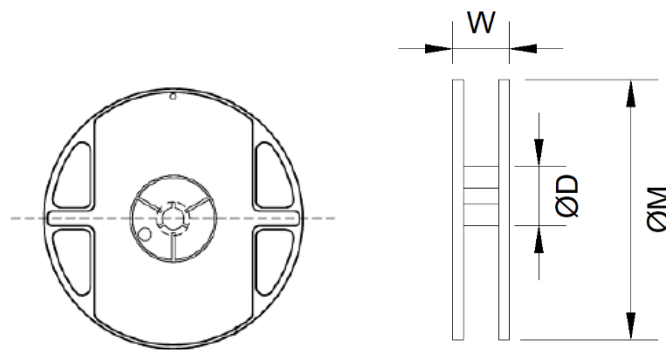
Type	Resistance Range (mΩ)	c	d	e	h
MLR0805-0.5W	1	0.60	1.10	0.65	0.08
	1.5	0.60	1.10	0.73	0.08
	2~5	0.41	1.26	1.04	0.08
MLR1206-1W	1	0.88	1.44	1.09	0.08
	1.5	0.97	1.36	1.06	0.08
	2-10	0.85	1.53	1.30	0.08

■ Packing Quantity

TYPE	PCS/Reel
MLR0805	5,000
MLR1206	5,000

● Appendix For SMD Chip Resistor

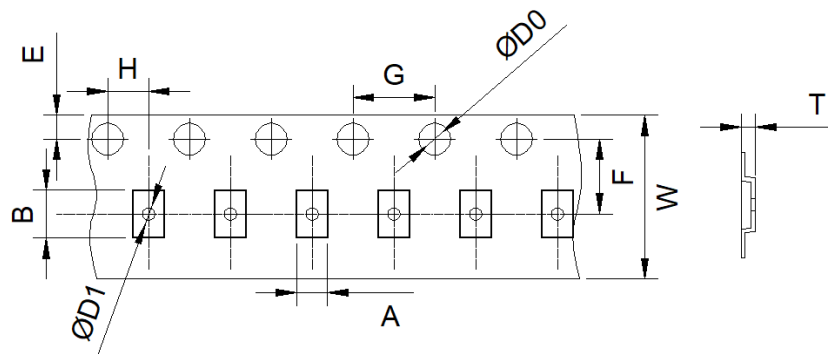
■ Reel Dimensions



Unit: mm

TYPE	ØD	W	ØM
MLR0805	60±2	9.0±1	178±5
MLR1206			

■ Carrier Dimensions



Unit: mm

Item	W	P	E	F	ØD0	ØD1	G	H	A	B	T
MLR0805	8.0±0.30	4.0±0.10	1.75±0.10	3.5±0.10	1.5±0.10	0.6±0.05	4.0±0.10	2.0±0.10	1.55±0.20	2.30±0.10	0.60±0.20
MLR1206									2.05±0.20	3.65±0.10	0.60±0.20

■ Peeling Strength of Top Cover Tape

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

■ Storage Temperature

Temperature: 5~35°C, Humidity: 60±20%

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.

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