Current Sensing Resistors

Wayon Electronics Co., Ltd.
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1. SCOPE

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

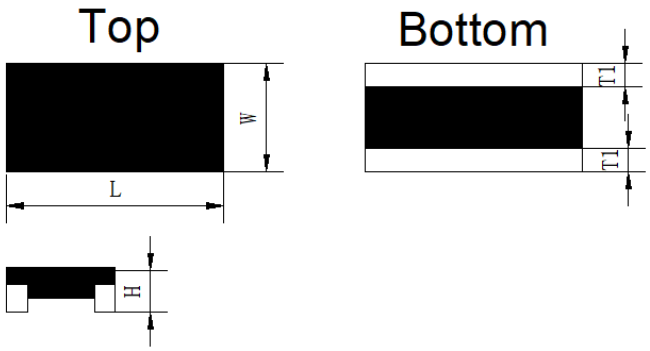
2. Type Designation

MLR	0612	10	F	1M50
Product Type	Size（Inch）	Rated Power	Tolerance	Resistance
MLR	0612	1.0W	±1%	1.5mΩ

3. Construction and Physical Dimensions

3.1 Construction

3.2 Physical Dimensions



Type	Dimensions（mm）			
	L	W	H	T1
MLR061210F1M50	3.20±0.25	1.60±0.25	0.40Max.	0.30±0.15

4. Product Specifications

Type	Max.Rating Power（W）	Resistance Value（mΩ）	Resistance Tolerance	T.C.R（PPM/°C）	Operation Temp. Range（°C）
MLR061210F1M50	1.0	1.5	±1%	±75	-55~ + 155

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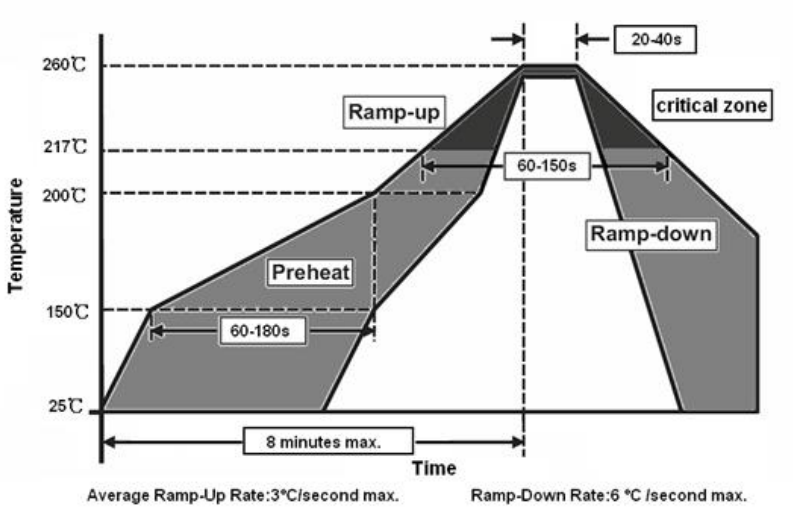
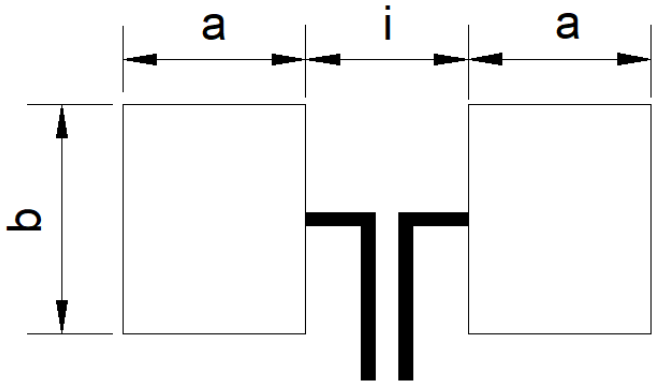
5. Recommended Customer Soldering Parameters

5.1 Recommended IR Reflow Profile

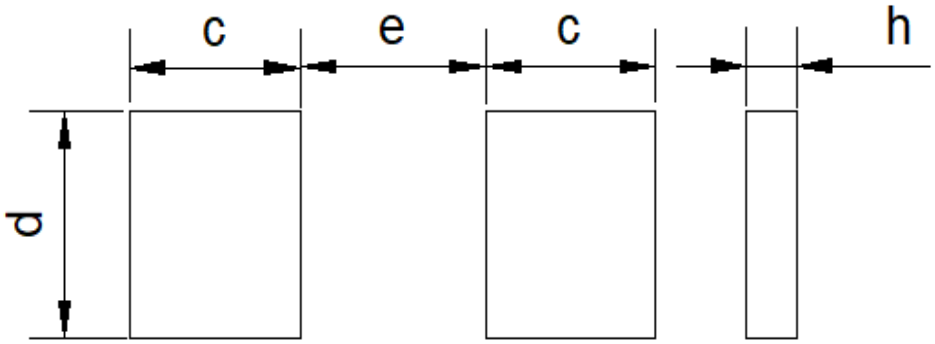


5.2 Recommend Solder Pad Layout



Type	a（mm）	b（mm）	i（mm）
MLR061210F1M50	0.80	3.50	0.80

5.3 Recommend Steel Net Layout



Type	c（mm）	d（mm）	e（mm）	h（mm）
MLR061210F1M50	0.36	2.80	0.84	0.08

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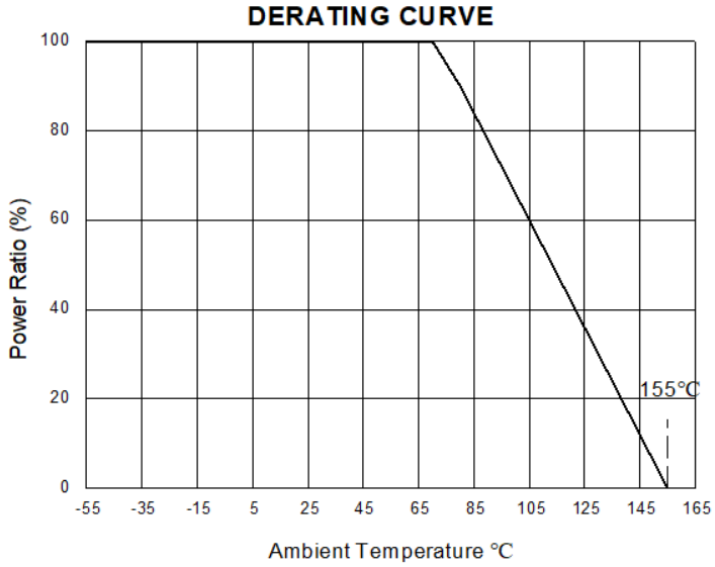
6. Power Derating Curve



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

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

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/ºC) $=\frac{(R2-R1)}{R1(T2-T1)}\times 10^6$ R1: resistance at room temperature (T1) R2: resistance at 125°C (T2)	Refer to Electrical Specification
2	Short Time Overload	JIS C 5201-1 clause 4.13	2.5 times of rated power for 5 sec	△R : ±1%
3	High Temperature Exposure	JIS C 5201-1 clause 4.23.2	+ 155ºC±2ºC for 1000hrs	△R : ±1%
4	Low Temperature Storage	JIS C 5201-1 clause 4.23.4	-55ºC±2ºC for 1000hrs	△R : ±1%
5	Load Life	JIS C 5201-1 clause 4.25	Apply rated power at 70±2ºC for 1000 hours with 1.5hrs ON and 0.5hrs off	△R : ±1%
6	Soldering Heat	JIS C 5201-1 clause 4.18	260±5ºC for 10±1 sec	△R : ±1%
7	Temperature Cycling	JIS C 5201-1 clause 4.19	-55ºC to +155ºC，100cycles	△R : ±1%
8	Solderability	JIS C 5201-1 clause 4.17	245±5ºC 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) 2 mm bending Bending time: 60±1 seconds	△R : ±1%

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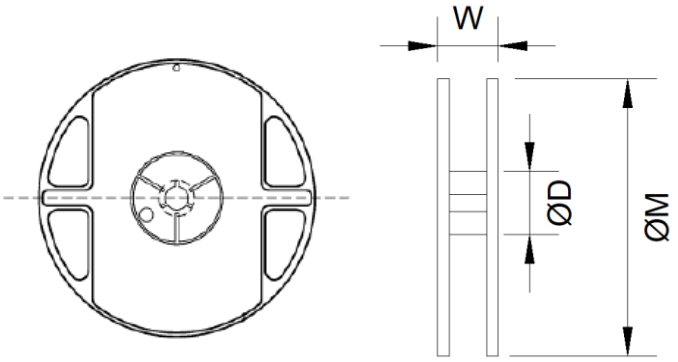
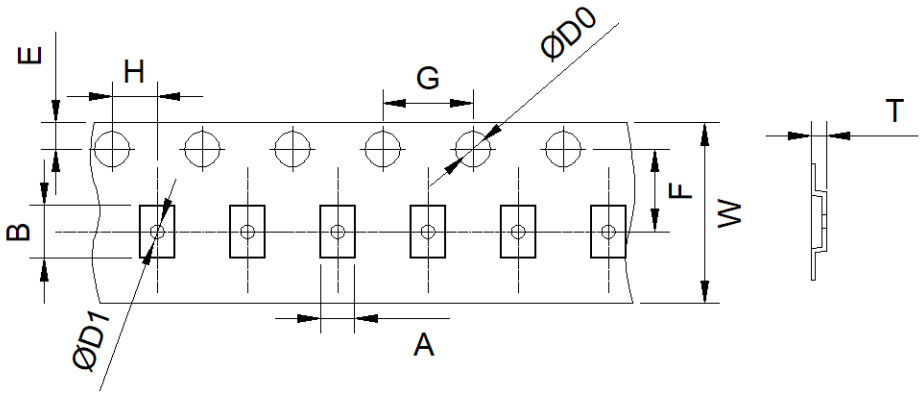
9. Packaging Information

9.1 Reel Dimensions



Type	ΦD （mm）	W（mm）	ΦM（mm）
MLR061210F1M50	60±2	9.0±1	178±5

9.2 Carrier Dimensions (mm)



Type	W	P	E	F	ΦD0	ΦD1
MLR061210F1M50	8.0±0.30	4.0±0.10	1.75±0.10	3.5±0.10	1.5 + 0.10	0.6±0.05
	G	H	A	B	T	
	4.0±0.10	2.0±0.10	2.05±0.20	3.65±0.20	0.60±0.20	

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
MLR061210F1M50	5,000

10. 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.