

SINLOON®

合金低阻值貼片電阻

Power Rating: 1W(1206) ~ 5W(4527)

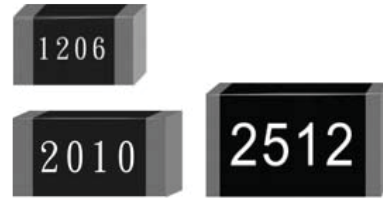
MLR Series

Metal Alloy Low Ohm Chip Resistor

□ Feature

- ◆ Stable high frequency characteristic with reduced lead inductance and excellent frequency response.
- ◆ Excellent frequency response.
- ◆ Low thermal EMF (<1μV/°C).
- ◆ High-temperature performance (up to +275°C).
- ◆ Very low inductance 0.5nH to 5nH
- ◆ Ideal for all types of current sensing, voltage division and pulse applications including switching and linear power supplies, instruments, power amplifiers.
- ◆ Pure tin plating provides compatibility with lead (Pb) and lead containing soldering processes.
- ◆ Excellent stability ( $I\Delta R/RI \leq \pm 0.5\%$  for 1000h at 100°C) different environmental conditions.

FIGURE



□ Application

- ◆ Power supply
- ◆ Battery pack
- ◆ DIY tools
- ◆ PC power pack
- ◆ LED driver
- ◆ Consumer electronics
- ◆ Note book
- ◆ Measurable instrument
- ◆ Others ( Auto tronics ... etc)
- ◆ Inverter / Converter (AC/DC, DC/DC, DC/AC.)

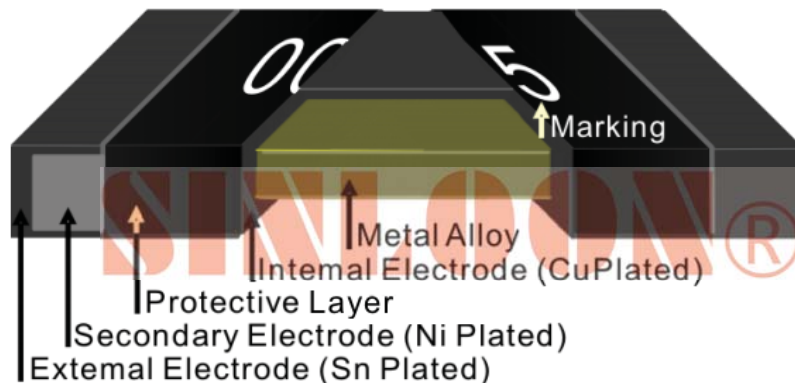
□ ORDERING INFORMATION

Example: S-MLR06FDR050

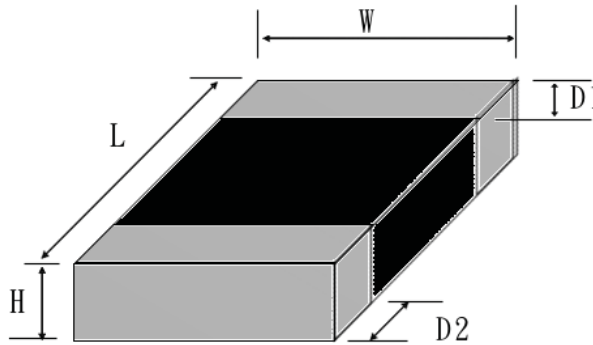
Power Code	Power	Size	Type	Tolerance	TCR(°C)	Resistance	Packing
S	1W	1206	S-MLR06	F = ±1%	S=±5ppm	m5=R0005	4K Reel
S	1W	2010	S-MLR10	D = ±0.5%	B=±10ppm	5m=R005	4K Reel
S	1W	2512	S-MLR12	C = ±0.25%	N=±15ppm	50m=R050	2K Reel
R	1.5W	2512	R-MLR12	B = ±0.1%	C=±25ppm	500m=R500	2K Reel
Q	2W	2512	Q-MLR12	T = ±0.01%	D=±50ppm	1000m=1R00	2K Reel
N	3W	2512	N-MLR12		E=±100ppm		2K Reel
N	3W	2728	N-MLR28				1K Reel
M	3.5W	2728	M-MLR28				1K Reel
L	4W	2725	L-MLR25				1K Reel
L	4W	2728	L-MLR28				1K Reel
K	5W	4527	K-MLR27				500 Reel

□ CONSTRUCTION

Metal Alloy Low ohm Chip Resistor



□ TYPE DIMENSION



□ DIMENSION

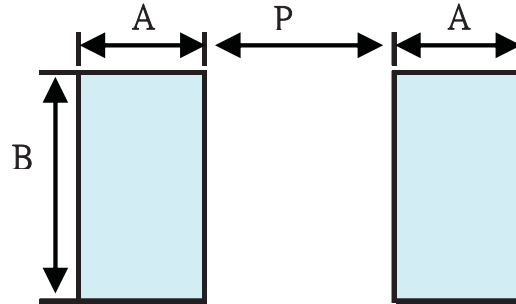
Unit: mm

Power	Size	Type	Resistance	L	W	H	D1	D2
1W	1206	S-MLR06	1~50m Ω	3.15±0.254	1.60±0.254	0.75±0.254	0.50±0.254	0.50±0.254
1W	2010	S-MLR10	0.5~3m Ω	5.10±0.254	2.54±0.254	0.80±0.254	1.30±0.254	1.30±0.254
			4~100m Ω				0.80±0.254	0.80±0.254
1W	2512	S-MLR12	0.5~4m Ω	6.25±0.254	3.30±0.254	0.80±0.254	1.88±0.254	1.88±0.254
			4.1~100m Ω				1.13±0.254	1.13±0.254
1.5W	2512	R-MLR12	0.5~4m Ω	6.25±0.254	3.30±0.254	0.80±0.254	1.30±0.254	1.30±0.254
			4.1~100m Ω				0.80±0.254	0.80±0.254
2W	2512	Q-MLR12	0.5~4m Ω	6.25±0.254	3.30±0.254	0.80±0.254	1.88±0.254	1.88±0.254
			4.1~75m Ω				1.13±0.254	1.13±0.254
3W	2512	N-MLR12	0.5m Ω	6.25±0.254	3.30±0.254	0.80±0.254	1.88±0.254	1.88±0.254
			0.6~2.9m Ω				1.13±0.254	1.13±0.254
			3.0~4.0m Ω				1.68±0.254	1.68±0.254
			4.1~10m Ω				1.13±0.254	1.13±0.254
3W	2728	N-MLR28	4.1~10m Ω	6.70±0.254	7.20±0.254	1.0±0.254	1.15±0.254	1.15±0.254
3.5W		M-MLR28						
4W		L-MLR28						
4W	2725	L-MLR25	0.25~0.5m Ω	6.25±0.254	3.30±0.254	1.0±0.254	2.15±0.254	2.15±0.254
			1.0~1.5m Ω			1.1±0.254		
			2.0m Ω	6.25±0.254	3.30±0.254	0.9±0.254	1.80±0.254	1.80±0.254
			2.5m Ω			1.65±0.254	1.65±0.254	
3.0m Ω		1.30±0.254	1.30±0.254					
5W	4527	K-MLR27	0.50~100m Ω	11.6±0.254	6.75±0.254	1.5±0.254	3.30±0.254	3.30±0.254
							1.90±0.254	1.90±0.254

Remark: 1.0 watts with total solder pad trace size of 100mm<sup>2</sup>  
 1.5 watts with total solder pad trace size of 200mm<sup>2</sup>  
 2.0 watts with total solder pad trace size of 300mm<sup>2</sup>  
 3.0 watts with total solder pad trace size of 300mm<sup>2</sup>  
 3.5 watts with total solder pad trace size of 300mm<sup>2</sup>  
 4.0 watts with total solder pad trace size of 300mm<sup>2</sup>  
 5.0 watts with total solder pad trace size of 625mm<sup>2</sup>



□ Recommend Land Pattern Design ( For Reflow Soldering )



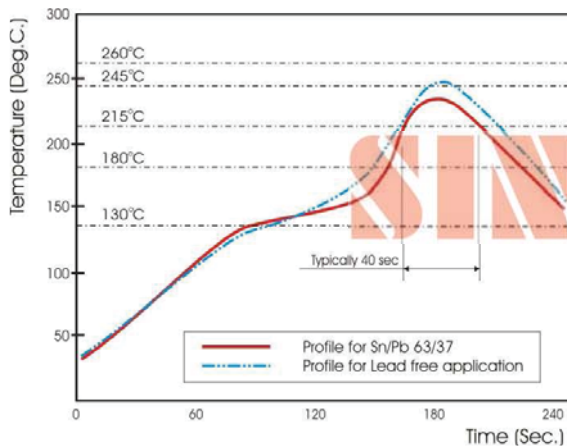
□ DIMENSION

Unit: mm

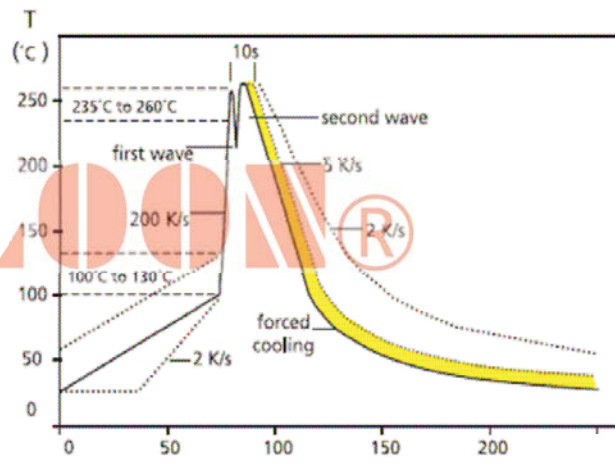
Power	Size	Type	Resistance	A	B	P
1W	1206	S-MLR06	1~50m Ω	1.60	2.18	0.66
1W	2010	S-MLR10	0.5~3m Ω	1.80	2.92	1.22
			4~100m Ω	2.29	2.29	2.41
1W	2512	S-MLR12	0.5~4m Ω	3.05	3.68	1.27
			4.1~100m Ω	2.11	3.68	3.18
1.5W	2512	R-MLR12	0.5~4m Ω	3.05	3.68	1.27
			4.1~100m Ω	2.11	3.68	3.18
2W	2512	Q-MLR12	0.5~4m Ω	3.05	3.68	1.27
			4.1~75m Ω	2.11	3.68	3.18
3W	2512	N-MLR12	0.5m Ω	3.05	3.68	1.27
			0.6~2.9m Ω	2.11	3.68	3.18
			3.0~4.0m Ω			
			4.1~10m Ω			
3W	2728	N-MLR28	4.1~10m Ω	2.75	7.82	3.51
3.5W		M-MLR28				
4W		L-MLR28				
4W	2725	L-MLR25	0.25~0.5m Ω	3.18	6.86	1.32
			1.0~1.5m Ω			
			2.0m Ω			
			2.5m Ω			
5W	4527	K-MLR27	0.50~100m Ω	4.80	8.74	5.51
				3.40	8.74	8.31

□ RECOMMEND SOLDERING CONDITIONS

Surface mount components are tested for solder ability at a temperature of 245°C for 3 seconds. Typical examples of soldering processes that provide reliable joints without any damage are given in below:



Recommended IR Reflow Soldering Profile



Time (Sec) Recommended double-wave Soldering Profile  
Typical values (solid line) / Process limits (dotted)



GENERAL ELECTRICAL SPECIFICATION

Type	Size	Rated Power at 100°C	Maximum Current		Resistance (mΩ)	Tolerance	T.C.R.		Operating Temperature
			Rating	Overload			(ppm/°C)	Resistance	
S-MLR06	1206	1W	3.62A	63.25A	7~50	±0.5%	±15	15.1~50m Ω	-65 ~ +275°C
					1~50	±1%	±25	4.1~15m Ω	
					1~50	±5%	±50	1 ~ 4 mΩ	
S-MLR10	2010	1W	44.72A	89.44A	3~50	±0.5%	±15	7~100mΩ	
					0.5~100	±1%	±25	3.1~6.9 mΩ	
					0.5~100	±5%	±50	0.5~3mΩ	
S-MLR12	2512	1W	44.72A	100A	7~100	±0.5%	±15	7~100 mΩ	
					0.5~100	±1%	±25	3.1~6.9 mΩ	
					0.5~100	±5%	±50	0.5~3 m Ω	
R-MLR12	2512	1.5W	54.77A	122A	7~100	±0.5%	±15	7~100 mΩ	
					0.5~100	±1%	±25	3.1~6.9 mΩ	
					0.5~100	±5%	±50	0.5~3 mΩ	
Q-MLR12	2512	2W	63.25A	126.49A	7~75	±0.5%	±15	7~75 mΩ	
					0.5~75	±1%	±25	3.1~6.9 mΩ	
					0.5~75	±5%	±50	0.5~3 m Ω	
N-MLR12	2512	3W	77.46A	134.16A	7~10	±0.5%	±15	7~10 mΩ	
					0.5~10	±1%	±25	2.1~10 mΩ	
					0.5~10	±5%	±50	0.5~2 mΩ	
N-MLR28	2728	3W	27.39A	47.43A	4~100	±0.5%	±15	7.1~100 mΩ	
						±1%	±25	4~7 mΩ	
						±5%	±50	0.5~3 mΩ	
M-MLR28	2728	3.5W	29.58A	51.23A	4~100	±0.5%	±15	7.1~100 mΩ	
						±1%	±25	4~7mΩ	
						±5%	±50	0.5~3 mΩ	
L-MLR28	2728	4W	31.62A	63.25A	4~50	±0.5%	±15	7.1~50 mΩ	
						±1%	±25	4~7mΩ	
						±5%	±50	0.5~3 mΩ	
L-MLR27	2725	4W	126.49A	252.95A	0.25~3.0	±1%	±50	0.25~0.9 m Ω	
					0.25~3.0	±5%	±25	1.0~3.0 m Ω	
K-MLR27	4527	5W	100	200	0.5~100	±1%	±50	0.5~100mΩ	-55~+170°C
					0.5~100	±5%	±50	0.5~100mΩ	

\* In case resistors operating ambient temperature in excess of the temperature range -65°C ~+275°C power ratio will be derated in accordance with the figure as shown on the right.

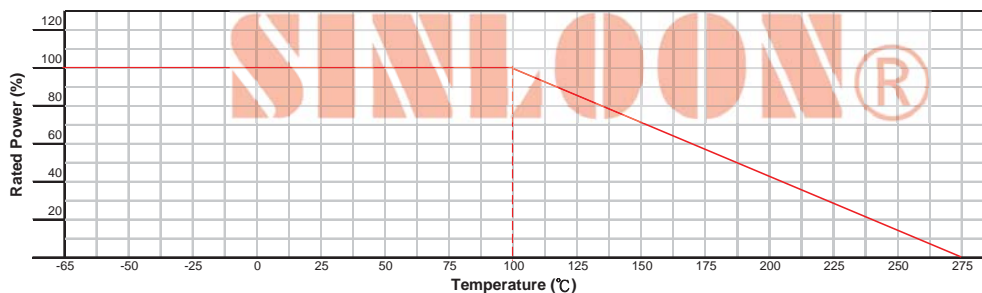
VOLTAGE RATING OR CURRENT RATING

Resistance Range:  $\geq 1\Omega$

Rated Voltage: The resistor shall have a DC continuous working voltage or a RMS AC continuous working voltage at commercial-line frequency and wave form corresponding to the power rating, as determined formula as following:

$E = \sqrt{R \times P}$        $E = \sqrt{R \times P}$        $P = \text{Power rating}$  ( $WR = \text{Nominal resistance}(\Omega)$ )

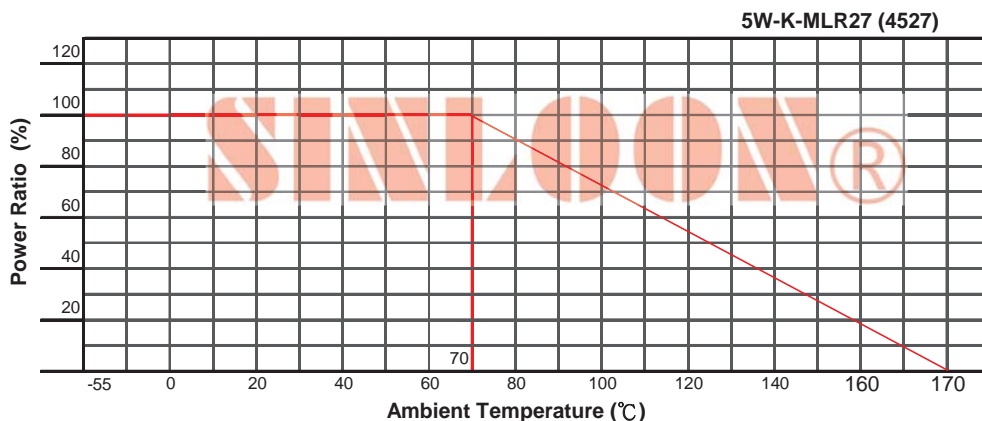
Power Derating Curve



ELECTRICAL PERFORMANCE

TEST ITEM	CONDITIONS OF TEST	TEST METHOD	TEST LIMITS
Temperature Coefficient of Resistance (TCR)	$TCR(ppm^{\circ}C) = \frac{(R1-R1)}{R1(T2-T1)} \times 10^6$ R1: Resistance of room temoerature (T1) R2: Resistance of 150°C (T2)	JIS C 5201 clause 4.8	Per Specification (refer to paragraph 5)
Short Time Overload	3 times rated power for: 3W-N-MLR12 3.5W N-MLR28, 3.5W M-MLR28, 4 times rated power for: 1W-S-MLR06 1W-S-MLR10, 2W-Q-MLR12 4W-L-MLR25, 4W-L-MLR28, 5W-K-MLR27, 5 times rated power for: 1W-S-MLR12 1.5W-R-MLR12 Rating power duration: 5 secs	JIS C 5201 clause 4.13	±(0.5%+m5Ω) ΔR
Insulation Resistance	100±15V <sub>DC</sub> for 1 minute	JIS C 5201 clause 4.6	≥ 10 <sup>9</sup> Ω
Dielectric Withstanding Voltage	Applied 500V <sub>AC</sub> for minute, and Limit surge current 50mA (Max).	JIS C 52011-1 4.7	Without break down
Resistance to Solder Heat	Sloder temperature / Immersion time: 260±5°C, 10±1 secs and 350±10°C, 3.5±0.5 secs	JIS C 5201 clause 4.18	±(0.5%+m5Ω) ΔR
Solder ability test	Specimen prep. : 4 hours ±15 min, Ateam Aging; Solder Bath /Dip and Look Test: 245±5°C, 3±1secs	JIS C 5201 clause 4.17	95% coverage
Vibration	Frequency varied 55Hz in one minute, 3 orientations @ Total duration 12 hours	JIS C 5201 clause 4.22	±(0.5%+m5Ω) ΔR
Resistance to solvent	Immersion time: 60±5secs @ 20°C ~ 25°C.	JIS C 5201 clause 4.29 JIS C 5201 clause 4.30	±(0.5%+m5Ω) ΔR
Mechanical Shock	100 grams for 6 milliseconds, 5 pulses	JIS C 5201 clause 4.21	±(0.5%+m5Ω) ΔR
Low Temperature Exposure (Storage)	1,000 hours @ -55°C	JIS C 5201 clause 4.23.4	±(0.5%+m5Ω) ΔR
High Temperature Exposure (Storage)	1,000 hours @ -155°C	JIS C 5201 clause 4.23.2	±(0.5%+m5Ω) ΔR
Temperature Cycling (Rapid Temperture Change)	Air to air , -55°C+150°C, 1,000 cycles, 15 minutes at extreme, transition 2 to 3 minutes.	JIS C 5201 clause 4.19	±(0.5%+m5Ω) ΔR
Moisture Resistance (Chimatic Sequence)	MIL-STD-202, Method 106, 0% Power, 7a and 7b not require, t=24 hours/cycle, Unpowered.	JIS C 5201 clause 4.23	±(0.5%+m5Ω) ΔR
Bias Humidity	+85°C, 85% RH, 10% Bias, Extended Life Test 1,000hrs. 1.5 hours ON, 0.5 hours OFF.	JIS C 5201 clause 4.24	±(0.5%+m5Ω) ΔR
Load Life	Test temperature 100°C Rated continuous working voltage. Extended Life Test: Extended Life Test: 1000 hours, 1.5 hours [ON] Extended Life Test: 1000 hours, 0.5 hours [OFF]	JIS C 5201 clause 4.25.1	±(1.0%+m5Ω) ΔR

Power Derating Curve **5W-K-MLR27 (4527)**





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Power Rating: 1W(1206) ~ 5W(4527)

MLR Series  
Metal Alloy Low Ohm Chip Resistor

□ **Marking : Example**

Power Code	Power	Size	Type	Fig
S	1W	1206	S-MLR06	Fig-1
S	1W	2010	S-MLR10	Fig-1 & 2
S	1W	2512	S-MLR12	Fig-1 & 2
R	1.5W	2512	R-MLR12	Fig-2
Q	2W	2512	Q-MLR12	
N	3W	2512	N-MLR12	
N	3W	2728	N-MLR28	
M	3.5W	2728	M-MLR28	
L	4W	2725	L-MLR25	
L	4W	2728	L-MLR28	
K	5W	4527	K-MLR27	



Fig-1



Fig-2



□ **PACKAGE SPECIFICATION**

Power	Size	Type	Quantity(ea)			  品質承諾標誌 QUALITY COMMITMENT
			Paper Reel Tape	In Box	Carton	
1W	1206	S-MLR06	4000 pcs	7" Reel	50K pcs	240K pcs
1W	2010	S-MLR10	4000 pcs	7" Reel	50K pcs	240K pcs
1W	2512	S-MLR12	4000 pcs	7" Reel	40K pcs	240K pcs
1.5W	2512	R-MLR12	4000 pcs	7" Reel	40K pcs	240K pcs
2W	2512	Q-MLR12	2000 pcs	7" Reel	20K pcs	120K pcs
3W	2512	N-MLR12	2000 pcs	7" Reel	20K pcs	120K pcs
3W	2728	N-MLR28	1000 pcs	7" Reel	10K pcs	60K pcs
3.5W	2728	M-MLR28	1000 pcs	7" Reel	10K pcs	60K pcs
4W	2725	L-MLR25	1000 pcs	7" Reel	10K pcs	60K pcs
4W	2728	L-MLR28	1000 pcs	7" Reel	10K pcs	60K pcs
5W	4527	K-MLR27	500 pcs	7" Reel	5K pcs	30K pcs

**Paper Reel Tape**

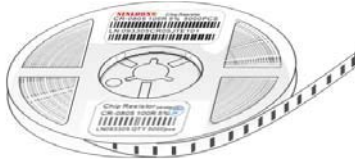


Fig-1

**Reel Tape Label**

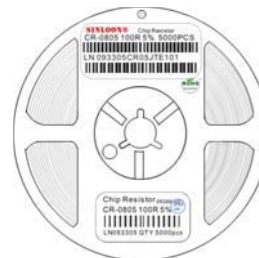


Fig-2

**Carton Pack**

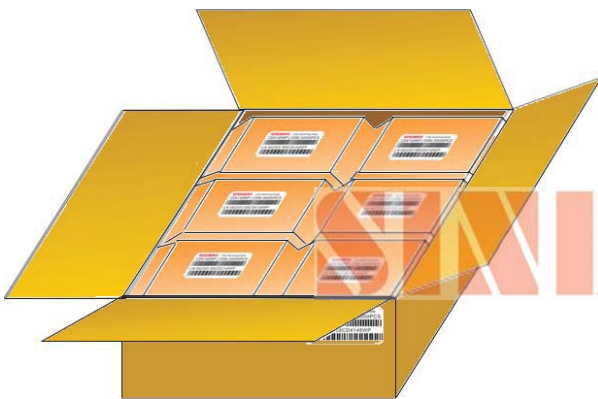


Fig-3

**Inner Box**

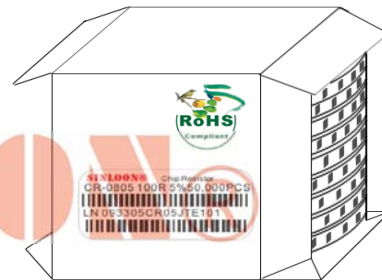


Fig-4

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※Mayloon characteristic parameters of electronic product specification changes or updates without notice to improve.

