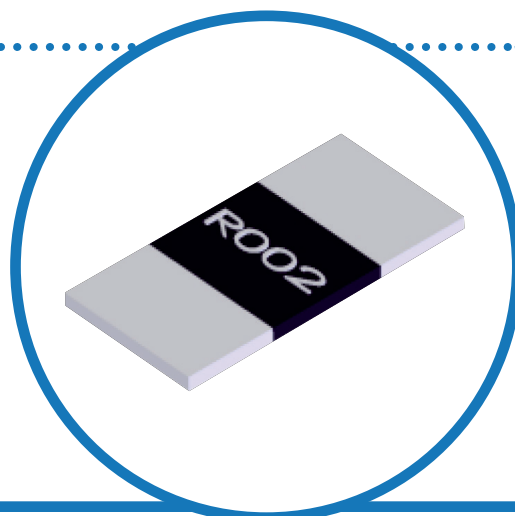


Low Resistance Metal Alloy Resistor

LRMA Series

- Resistance range 0.5mΩ to 100mΩ
- High temperature operation to 170°C
- Low thermal EMF version
- High power version
- Current sensing for power electronics
- RoHS compliant & halogen free
- AEC-Q200 qualified



Electrical Data

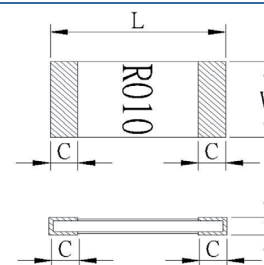
LRMA Version		T (Standard)		P (Power)
Size		2010	2512	2512
Power rating @70°C	W	1.5	≤R01: 2, >R01: 1	3
Overload rating (5s)	W	7.5	≤R01: 10, >R01: 5	15
Resistance range	mΩ	5 to 15	1 to 50	1 to 100
Standard values ¹	mΩ	5, 6, 10, 15	1, 1.5, 2, 3, 3.5, 4, 5, 6, 7, 8, 10, 11, 12, 15, 18, 20, 25, 30, 33, 35, 40, 50	1, 2, 3, 5, 8, 10, 11, 15, 20, 25, 30, 40, 50, 60, 70, 75, 80, 100
Resistance tolerance	%	1, 5		
TCR (25 to 125°C)	ppm/°C	>R01: ±75	>R001 & ≤R01: ±100, R001: ±275	±50
Ambient temperature	°C	-55 to 170		
Insulation resistance	MΩ	>100		
Element alloy		Cu-Ni		Cu-Ni / Mn-Cu
Coating		Black		

LRMA Version		M (Low thermal EMF)			N (Inverse)
Size		0805	1206	2512	0815
Power rating @70°C	W	0.5	1	≤R01: 2, >R01: 1	1 ²
Overload rating (5s)	W	2.5	5	≤R01: 10, >R01: 5	5
Resistance range	mΩ	5 to 25	1 to 30	0.5 to 40	3 to 30
Standard values ¹	mΩ	5, 9, 10, 20, 25	1, 2, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 20, 22, 25, 30	0.5, 0.75, 1, 5, 10, 20, 30, 40	3, 4, 5, 10, 15, 20, 25, 30
Resistance tolerance	%	1, 5			
TCR (25 to 125°C)	ppm/°C	±100	±50	>R01: ±75, >R001 & ≤R01: ±100 ≤R001: ±275	±100
Ambient temperature		-55 to 170°C			
Insulation resistance	MΩ	>100			
Element alloy		Mn-Cu			Cu-Ni
Coating		Black		Green	Black

Notes: 1. Non-standard values may be available for high volume requirements. 2. Requires 300mm² copper pad & trace area

Physical Data (All dimensions in mm and nominal weight in g)

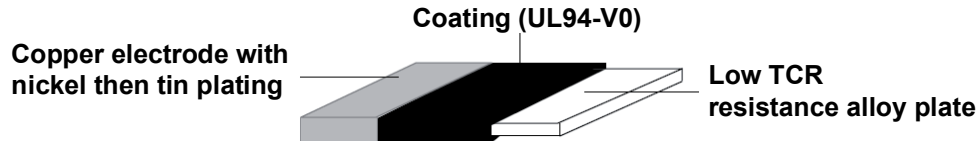
Size	L	W	C	t	Wt
0805	2.0 ±0.1	1.25 ±0.1	0.4 ±0.2	0.6 ±0.2	5.5
1206	3.2 ±0.2	1.6 ±0.2	0.5 ±0.3	0.6 ±0.2	18.3
0815	2.1 ±0.25	3.75 ±0.3	0.5 ±0.2	0.7 ±0.2	14.1
2010	5.0 ±0.2	2.5 ±0.2	0.6 ±0.3	0.6 ±0.2	35.6
2512 <R001	6.4 ±0.2	3.2 ±0.2	2.6 ±0.2	0.65 ±0.25	57 to 63
2512 ≥R001 & ≤R003			2.0 ±0.2		
2512 >R003			0.9 ±0.2		



General Note

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Construction



Marking

The components are marked with ohmic value, e.g. "R002" = 2mΩ, "R010" = 10 mΩ.

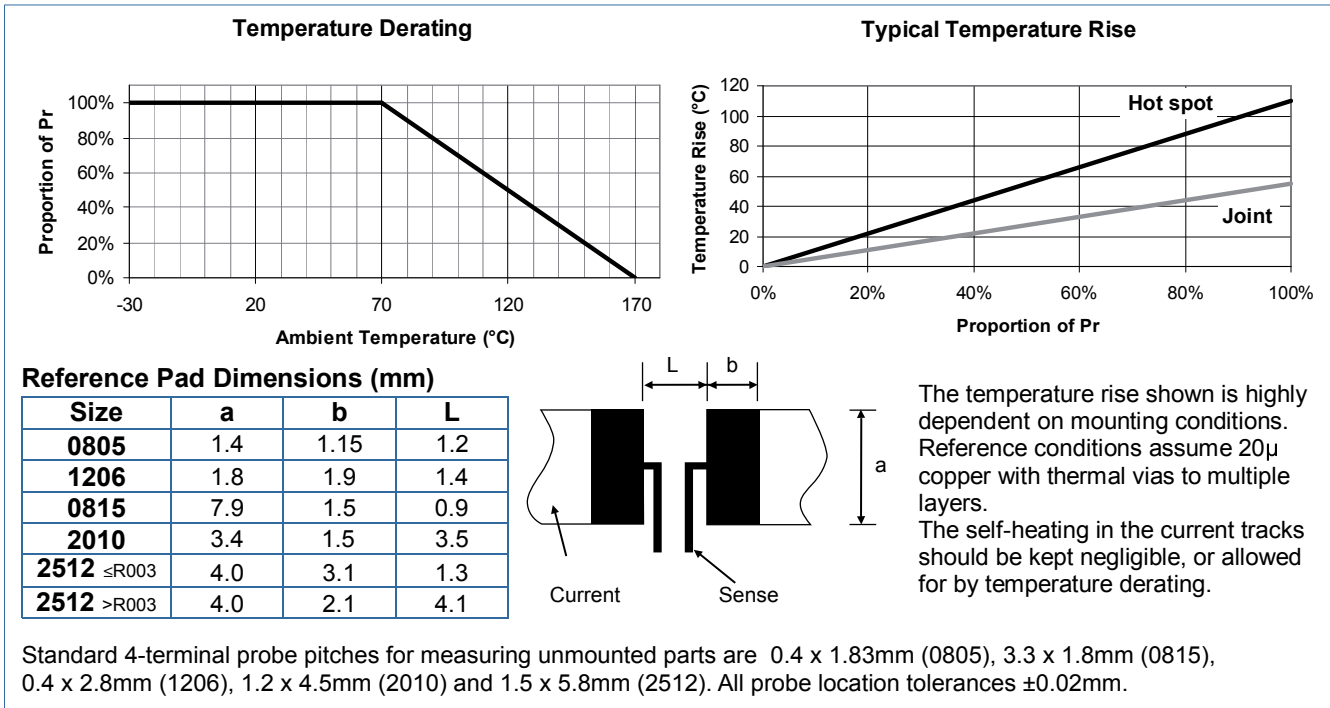
Solvent Resistance

The component is resistant to all normal industrial cleaning solvents suitable for printed circuits.

Performance Data

		Maximum (%)	Typical (%)
Load at rated power (cyclic load, 1000 hours at 70°C)	±ΔR	0805: 1.5 Others 1	0.3
Short term overload (5 x rated power for 5s)	±ΔR	0.5	0.15
Humidity (1000 hours, 85°C, 85%RH)	±ΔR	0805: 1 Others 0.5	0.15
Temperature cycle (-40 to +125°C, 1000 cycles, 15 minute dwell)	±ΔR	0805: 1 Others 0.5	0.15
Resistance to solder heat (260°C ±5°C for 20s ±1s)	±ΔR	0.5	0.3
Solderability (245°C ±5°C for 2s ±0.5s)		>95% coverage	
Dry heat (1000 hours at 170°C)	±ΔR	0805: 1.5 Others 0.5	0.3
Low temperature storage (1000 hours at -55°C)	±ΔR	0.5	0.15
Substrate bending (board 1.6mm, fulcrum spacing 90mm, deflection 2mm)	±ΔR	0805: 1 Others 0.5	0.3
Insulation resistance (1 minute @ 100Vdc)		>100M	

Thermal Performance & Mounting



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Packaging

Size	Tape	A	B	W	F	E	P ₁	P ₂	P ₀	ϕD_0	t	ϕA	ϕB	ϕC	W _r	T _r
0805	Paper	1.6 ±0.15	2.4 ±0.2	8.0 ±0.2	3.5 ±0.05	1.75 ±0.1	4.0 ±0.1	2.0 ±0.1	4.0 ±0.1	1.5 +0.1/-0	0.84 ±0.1	178 ±2	60 ±1	13 ±1	9 ±1	11.4 ±1
1206	Paper	2.0 ±0.15	3.6 ±0.2	8.0 ±0.2	3.5 ±0.05	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	4.0 ±0.1	1.5 +0.1/-0	0.84 ±0.1	178 ±0.2	60 ±1	13 ±1	9 ±1	11.5 ±1
0815	Emboss	2.6 ±0.2	4.5 ±0.2	12 ±0.2	5.5 ±0.1	1.75 ±0.1	4.0 ±0.1	2.0 ±0.2	4.0 ±0.1	1.55 ±0.05	1.1 ±0.1	178 ±0.2	60 ±1	13 ±1	13 ±1	15.4 ±2
2010	Emboss	2.8 ±0.2	5.3 ±0.2	12 ±0.05	5.5 ±0.05	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	4.0 ±0.05	1.5 +0.1/-0	0.85 ±0.15	178 ±0.2	60 ±1	13 ±1	13 ±1	15.4 ±2
2512	Emboss	3.6 ±0.2	6.9 ±0.2	12 ±0.2	5.5 ±0.05	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	4.0 ±0.05	1.5 +0.1/-0	0.85 ±0.15	178 ±0.2	60 ±1	13 ±1	13 ±1	15.4 ±2

Storage

Conditions: 5°C to 35°C and 40% to 75%RH

Shelf life: 2 years from manufacture

Processing

LRMA series resistors are suitable for both wave and IR reflow soldering. The recommended reflow profile for Pb-free SAC305 alloy (Sn 96.5%, Ag 3%, Cu 0.5%) soldering is as follows:

Pre-heat: 60s to 120s at 150°C to 180°C

Soldering: 20s to 40s at ≥230°C

Peak: 5s at 250°C to 255°C

Ordering Procedure

Example: LRMA low thermal EMF version in 2512 size and at 10 milliohms and 1% tolerance packed in tape.

LRMA M 2 5 1 2 -¹R 0 1 F T 4

Type _____

Version _____

T	P	M	N
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Size _____

Value (use IEC62 code) _____

Tolerance (use IEC62 code) _____

F	1%
J	5%

Packing _____

T5	Tape	0805, 1206	5000/reel	Standard
T4		0815, 2010, 2512	4000/reel	

Note 1: For values which require 6 characters, e.g. R00075, the hyphen is omitted.

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