

LRMAH2512

Features:

- Resistance range 0.2mΩ to 10mΩ
- Power rating up to 6W
- Robust welded construction
- Low inductance
- Zero-ohm jumper version
- AEC-Q200 qualified



All parts are Pb-free and comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

Electrical Data

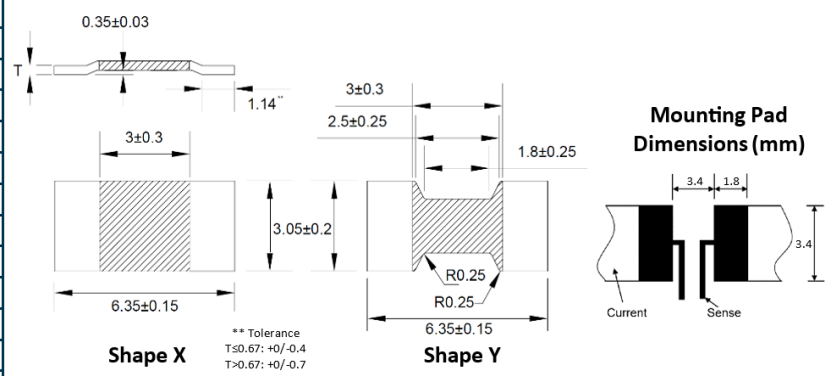
| | | LRMAH2512 | | | | | | | | | | | |
|----------------------------------------------|--------|-------------|-----------|-----------|-----------|---------|-----------|----------|---------|---------|---------|-----------|----------|
| Resistance value | mΩ | 0.2 (L20) | 0.3 (L30) | 0.5 (L50) | 0.7 (L70) | 1 (1L0) | 1.3 (1L3) | 2 (2L0) | 3 (3L0) | 4 (4L0) | 5 (5L0) | 6.8 (6L8) | 10 (10L) |
| Thermal impedance, R _{thi} | °C/W | 4 | | 7 | 10 | 12 | 15 | 17 | 20 | 25 | 40 | 55 | 65 |
| Power rating, P _{r70} ¹ | W | 6 | | | | | 5 | | 4 | 3 | 2.5 | 2 | 1.5 |
| Power rating, P _{r100} ² | W | 3 | | | | | 2 | | | 1.5 | | 1 | |
| Alloy | | E | | | B | | | | C | | | | |
| TCR of resistive alloy | ppm/°C | ±20 | | | | | | 0 to -35 | | | | | |
| TCR of resistor (-55 to 170°C) | ppm/°C | ±225 | ±175 | ±120 | | ±100 | | ±50 | | | | | |
| Resistance tolerance | % | 1 | | | | | | | | | | | |
| Inductance | nH | <2 | | | | | | | | | | | |
| Ambient temperature range | °C | -55 to +170 | | | | | | | | | | | |
| Current rating, zero-ohm (OLO) | A | 100 | | | | | | | | | | | |
| Residual resistance, zero-ohm (OLO) | μΩ | ≤65 | | | | | | | | | | | |

Note 1: Mounted on thermal substrate where the ambient temperature is limited to 70°C – see Ambient Temperature Derating graph for details.

Note 2: Mounted on FR4 board where the terminal temperature is limited to 110°C for 0.5% stability after 2000 hours or to 140°C for 1% stability after 2000 hours – see Terminal Temperature Derating graph for details.

Physical Data

| Dimensions in mm and weight in mg | | | | |
|-----------------------------------|----------|--------|-------|----------|
| Value | Alloy | T ±0.1 | Shape | Wt. nom. |
| OLO | (Z = Cu) | 0.42 | X | 73 |
| L20 | E | 1 | | 161 |
| L30 | | 0.95 | | 152 |
| L50 | | 0.85 | | 137 |
| L70 | | 0.61 | | 101 |
| 1L0 | B | 0.42 | | 70 |
| 1L3 | | 0.33 | | 56 |
| 2L0 | | 0.67 | | 102 |
| 3L0 | C | 0.45 | | 70 |
| 4L0 | | 0.33 | | Y |
| 5L0 | | | 44 | |
| 6L8 | | | 43 | |
| 10L | | | 41 | |



Marking

Values up to and including 4L0 are laser marked with ohmic value (e.g. 1L0 is marked "R001"). Parts with higher values are unmarked.

Solvent Resistance

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

Construction

LRMAH2512 is formed from a continuous band of E-beam welded precision resistive strip. The alloys used depend on the ohmic value.

General Note

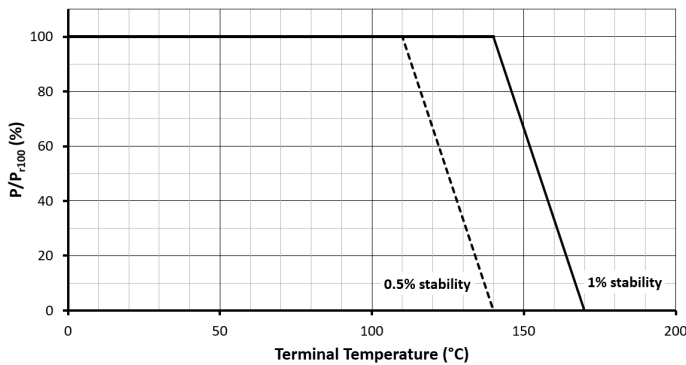
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LRMAH2512

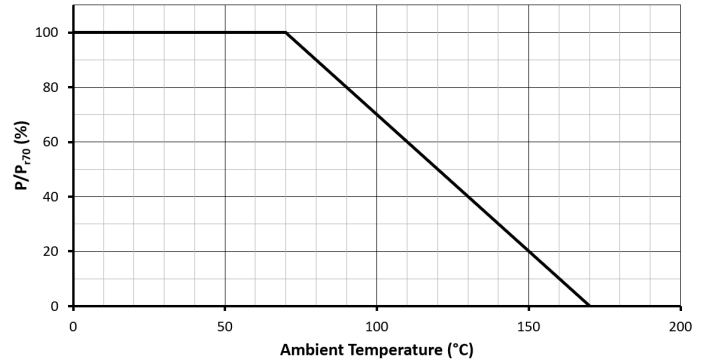
Performance Data

| Test | Methods | Reference | ΔR |
|---------------------------|-------------------------------------------------------------------------------------------------------------------|------------------------|---------------|
| Load life | 2000 hours, cyclic load at $T_A = 125^\circ\text{C}$, rated power per P_{r70} Temperature Derating graph below | MIL-STD-202 Method 108 | $\pm 1\%$ |
| Short Term Overload | $5 \times P_{r100}$ for 5 s | -- | $\pm 1\%$ |
| High Temperature Exposure | 2000 hours, $T_A = 170^\circ\text{C}$, unpowered | MIL-STD-202 Method 108 | $\pm 1\%$ |
| Low Temperature Storage | -65°C for 24hrs | -- | $\pm 0.2\%$ |
| Temperature Cycle | 1000 cycles, -55°C to 150°C , 30 minutes dwell | JESD22 Method JA-104 | $\pm 0.5\%$ |
| Biased Humidity | 1000 hours, $85^\circ\text{C}/85\%\text{RH}$, 10% of P_{r100} | MIL-STD-202 Method 103 | $\pm 0.5\%$ |
| Vibration | 10 - 2000Hz, 5g, 20min, 12 cycles/axis x 3 axes | MIL-STD-202 Method 204 | $\pm 0.2\%$ |
| Mechanical Shock | 100g, 6ms, half-sine | MIL-STD-202 Method 213 | $\pm 0.2\%$ |
| Resistance to Solder Heat | $260 \pm 5^\circ\text{C}$, $10 \pm 1\text{s}$ | MIL-STD-202 Method 210 | $\pm 0.5\%$ |
| Solderability | $235 \pm 5^\circ\text{C}$, $2 \pm 0.5\text{s}$ | J-STD-002 | >95% coverage |
| Resistance to Solvents | Clean with aqueous chemical | MIL-STD-202 Method 215 | No damage |

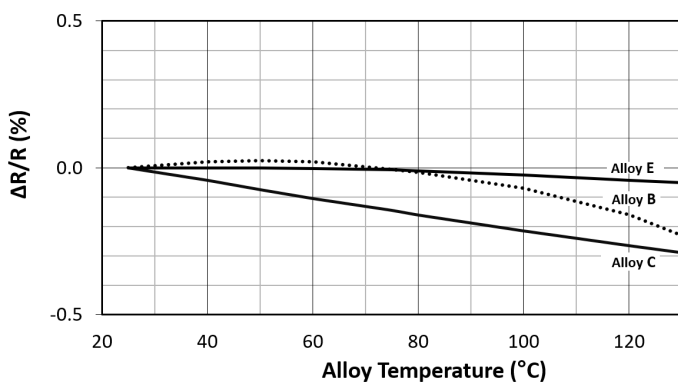
Terminal Temperature Derating (P_{r100})



Ambient Temperature Derating (P_{r70})

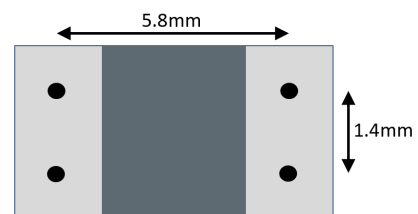


Typical Temperature Characteristic



Value Measurement

Unmounted LRMAH2512 resistors are measured using 4-terminal probes on the lower side of the chip, centred on the chip and at the spacings shown below.



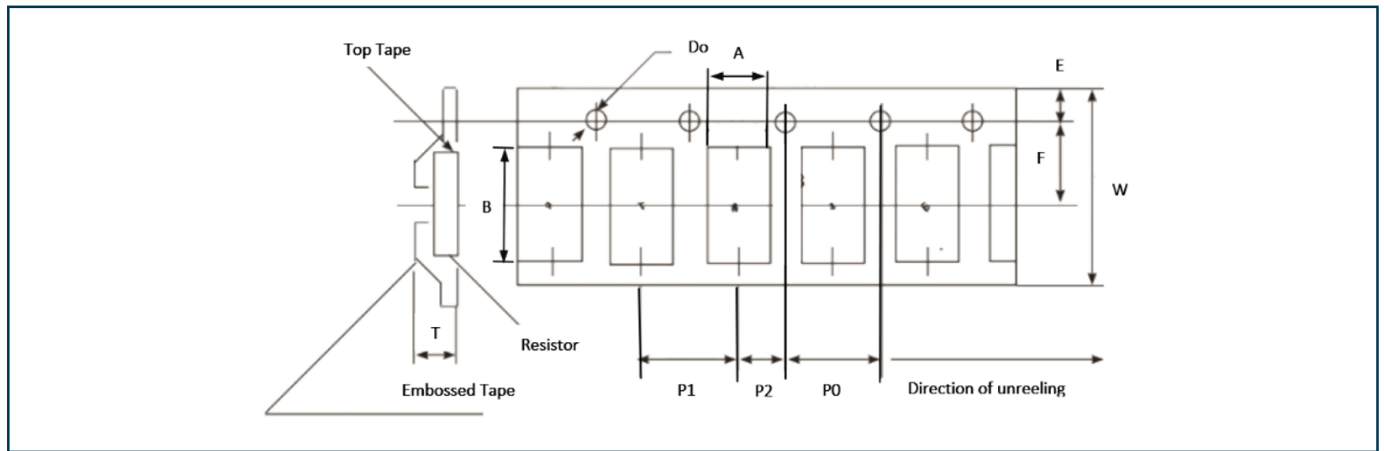
Soldering

LRMAH2512 series resistors are suitable for IR reflow soldering. The recommended reflow profile for Pb-free soldering, for example using SAC387 alloy (Sn 95.5%, Ag 3.8%, Cu 0.7%), is as follows:

- Pre-heat:** 60 to 180s at 150 to 200°C
- Soldering:** 60s to 150s above 217°C
- Peak:** 260°C

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Packaging



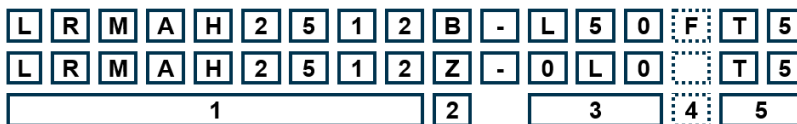
All dimensions in mm (tolerances are ± 0.1 unless otherwise stated)

| Size | A | B | W | E | F | P ₀ | P ₁ | P ₂ | D ₀ | T | Reel dia. |
|------|------|------|----|------|-----|----------------|----------------|----------------|----------------|-----|-----------|
| 2512 | 3.35 | 6.65 | 12 | 1.75 | 5.5 | 4 | 8 | 2 | 1.5 | 1.8 | 330 |

Ordering Procedure

Examples: LRMAH2512B-L50FT5 (0.5 milliohm $\pm 1\%$, Pb-free)

LRMAH2512Z-0L0T5 (zero-ohm link, Pb-free)



| 1 | 2 | 3 | 4 | 5 |
|-----------|-------|----------------|-------------------|------------------------------|
| Type | Alloy | Value | Tolerance | Packing |
| LRMAH2512 | B | 3 characters | F = $\pm 1\%$ | T5 = plastic tape, 5000/reel |
| | C | L = milliohms | Omit for zero-ohm | |
| | E | 0L0 = zero-ohm | | |
| | Z | | | |