

Metal Alloy Long Terminal Resistor for Automotive

Description

- Metal Alloy Long Terminal Low-Resistance Resistor
- Low thermal EMF
- Low TCR
- Low inductance
- AEC-Q200 Qualified Available.

Applications

- Battery pack
- Inverter/Converter
- Consumer electronics
- Laptops

Part number

AMLR 06 A 1 R020 F 1
【1】 【2】 【3】 【4】 【5】 【6】 【7】

【1】 Series Name: Metal alloy Long terminal Resistor for Automotive.

【2】 Chip Size: 06: 0612

【3】 Terminals: A:2 terminals, B:4 terminals

【4】 Power Rating: 1=1W

【5】 Resistance Code: R020: 20mΩ

【6】 Resistance Precision: F:±1%

【7】 Marking Code: 1:No marking 2: Marking

Electrical Characteristics

| Part number | Power Rating at 70°C(W) | Resistance Range (mΩ) | TCR (ppm/°C) | Resistance Tolerance (%) | Rating Current | Operation Temperature Range |
|----------------|-------------------------|-----------------------|--------------|--------------------------|----------------------|-----------------------------|
| AMLR06A1R020F2 | 1 | 20 | ±50 | ±1.0 | (P/R) ^{1/2} | -55°C~+150°C |

Note: P=Rating Power ; R=Resistance Value

Metal Alloy Long Terminal Resistor

AMLR ~Series

Physical Dimensions

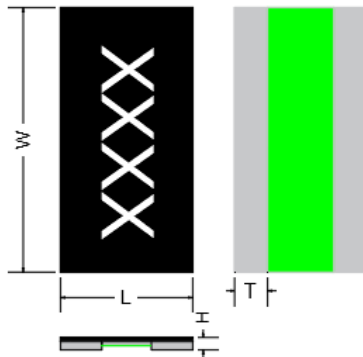


Fig.1

Unit: mm

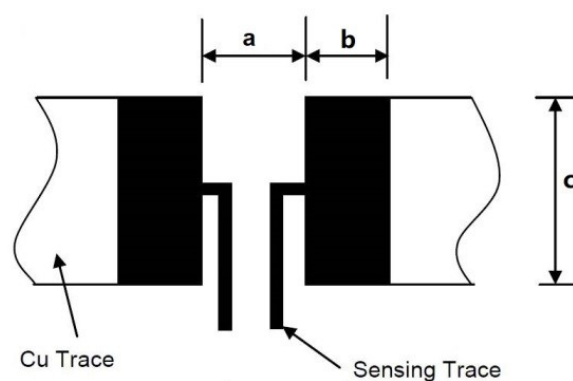
| Part number | L | W | H | T |
|----------------|-----------------|-----------------|----------|-----------------|
| AMLR06A1R020F2 | 1.60 ± 0.20 | 3.20 ± 0.20 | Max 0.40 | 0.40 ± 0.15 |

Marking Instructions

AMLR06A is marked with four digit(Ref to Fig.1). We have two different ways of marking:

- a. "R" designates the decimal location in ohms
e.g. $1\text{m}\Omega$: R001; $10\text{m}\Omega$: R010;
- b. "m" designates the decimal location in milliohms
e.g. $0.5\text{m}\Omega$: 0m50; $5.5\text{m}\Omega$: 5m50;

Recommended Solder Pad Layout



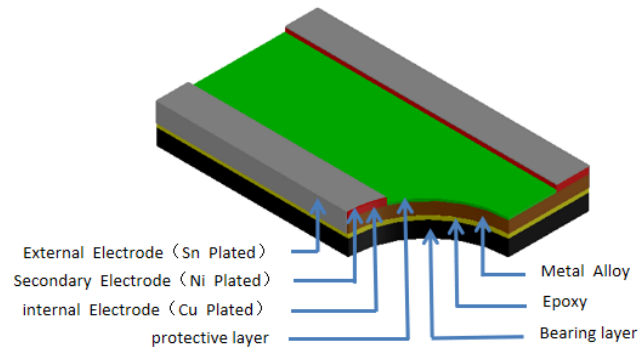
Unit: mm

| Part number | a | b | c |
|----------------|------|------|------|
| AMLR06A1R020F2 | 0.60 | 0.70 | 3.34 |

Metal Alloy Long Terminal Resistor

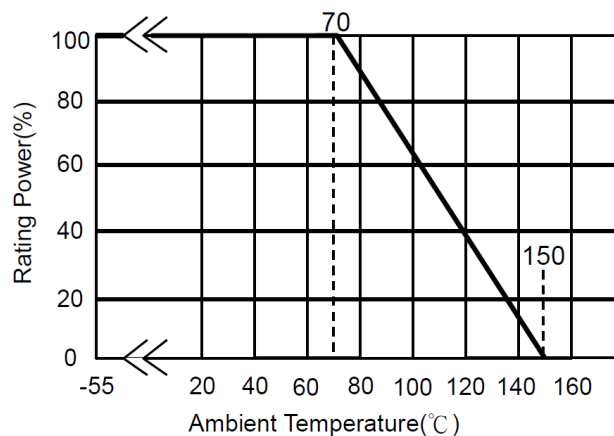
MLR ~Series

Construction

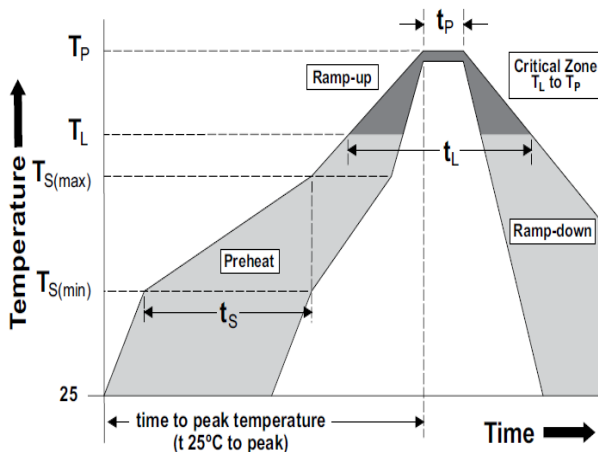


Power Derating Curve

For resistors operated in ambient temperatures 70°C, power rating shall be derated in according with the curve below:



Recommended Solder Curve



| Reflow Condition | | Pb – Free assembly |
|--|------------------------------------|-----------------------|
| Pre heat | - Temperature Min ($T_{S(min)}$) | 150°C |
| | - Temperature Max ($T_{S(max)}$) | 200°C |
| | - Time (Min to Max) (t_s) | 60 – 120 secs |
| Average ramp up rate (Liquidus Temp (T_L) to peak) | | 5°C/second max |
| $T_{S(max)}$ to T_L - Ramp-up Rate | | 5°C/second max |
| Reflow | - Temperature (T_L) (Liquidus) | 217°C |
| | - Temperature (t_L) | 60 – 150 seconds |
| Peak Temperature (T_p) | | 260°C |
| Time within 5°C of actual peak Temperature (t_p) | | 20 – 40 seconds |
| Ramp-down Rate | | 5°C/second max |
| Time 25°C to peak Temperature (T_p) | | 8 minutes Max. |
| Wave Soldering | | Not applicable |
| Hand Soldering | | 350°C, 5 seconds max. |

Metal Alloy Long Terminal Resistor

MLR ~Series

Product Characteristics

| Item | Test condition/ Methods | Limited | Standard | | | | | | |
|---------------------------------------|--|--------------------------|-------------------------|----------------|----------------|-------------|------|----|-----------|
| Resistance | Measuring resistance value at room temperature 25℃ ±5℃ | Refer to Spec | IEC60115-1 4.5 | | | | | | |
| External Visual | There is no need for electrical test, check the device structure, identification and process quality, and electrical test is not required. | Refer to Spec | MIL-STD-883 Method 2009 | | | | | | |
| Physical Dimension | Verify physical dimensions according to device specifications. | Refer to Spec | JESD22-B100 | | | | | | |
| Temperature coefficient of resistance | TCR =(R-R0)/R0(T2-T1)X 106 R0: resistance of room temperature R: resistance of 125℃ T1: Room temperature T2: Temperature at 125℃ | Refer to Spec | MIL-STD-202 Method 304 | | | | | | |
| Short time Overload | Applied Overload for 5 seconds, then measure its resistance variance rate. (Test condition refer to below): | ≤±1.0% | IEC60115-1 4.13 | | | | | | |
| | <table><tr><td>Type</td><td>Resistance(mΩ)</td><td>Rated power</td></tr><tr><td>0612</td><td>20</td><td>2.5 times</td></tr></table> | | | Type | Resistance(mΩ) | Rated power | 0612 | 20 | 2.5 times |
| | Type | | | Resistance(mΩ) | Rated power | | | | |
| 0612 | 20 | 2.5 times | | | | | | | |
| | | | | | | | | | |
| Resistance to Soldering Heat | Condition K, temperature above 217℃, 60s – 150s | ≤±1.0% | MIL-STD-202 Method 210 | | | | | | |
| Solderability | 245℃± 5℃ time: 5sec+0/-0.5sec. | Solder coverage over 95% | J-STD-002 | | | | | | |
| Temperature Cycling | pre-treatments with 3X reflow, -55℃ (15min)/+150℃(15min), 1000 cycles | ≤±1.0% | MIL-STD-202 Method107G | | | | | | |
| High Temperature Storage | 150℃ for 1000hours, No power | ≤±1.0% | IEC60115-1 4.25 | | | | | | |
| Bias Humidity | pre-treatments with 3X reflow, +85℃, 85% RH, 10%bias, 1000hours | ≤±5.0% | MIL-STD-202 Method103 | | | | | | |
| Vibration | 5g's for 20 minutes 12 cycles each of 3 orientations. Test from 10 Hz - 2000 Hz | ≤±1.0% | MIL-STD-202 Method 201 | | | | | | |
| Operational life | pre-treatments with 3X reflow, 70℃± 2℃, 1000 hours, at rated power 1.5 hours “ON”, 0.5 hours “OFF” | ≤±8.0% | MIL-STD-202 Method 108 | | | | | | |
| Mechanical shock | Condition C ,100 g's ,6 msec, 3 mutually perpendicular axes, in 6 directions, three impacts each for a total of 18 times 18 shocks. | ≤±1.0% | MIL-STD-202 Method 213 | | | | | | |
| Bending | Bend the board (D) x = 2 mm minimum, The duration of the applied forces shall be 60 (+ 5) Sec. | ≤±1.0% | AEC-Q200-005 | | | | | | |
| Terminal Strength | Apply a 17.7 N (1.8 Kg) force to the side of a device being tested. This force shall be applied for 60 +1 seconds. | ≤±1.0% | AEC-Q200-006 | | | | | | |
| ESD | Direct Contact Discharge 8KV, Air Discharge 25KV | ≤±1.0% | AEC-Q200-002 | | | | | | |

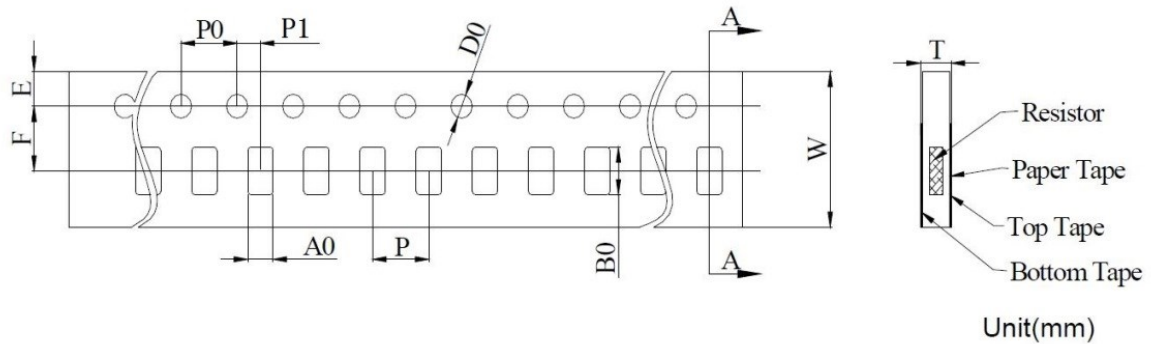
Note : Measurement at 24±4 hours after test conclusion for all reliability tests-parts.

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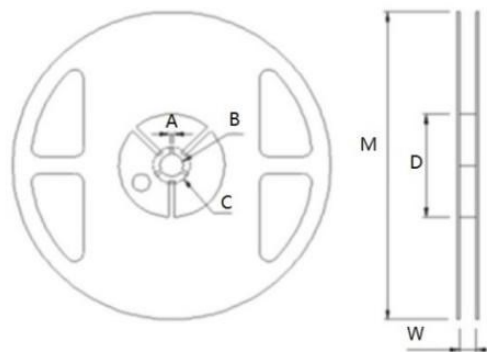
Packaging

Tape Dimensions



| Type | A0 | B0 | E | F | W |
|---------|-----------|-----------|-----------|-----------|-----------|
| AMLR06A | 2.00±0.20 | 3.60±0.20 | 1.75±0.10 | 3.50±0.05 | 8.00±0.20 |
| | P0 | P | P1 | D0 | T |
| | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 | 1.50±0.10 | 0.55±0.20 |

Reel Dimensions



Unit: mm

| Type | M | W | A | B | C | D |
|-------------|-----------|------------|---------|----------|-----------|----------|
| 7 inch reel | 178.0±2.0 | 8.4+0.5/-0 | 2.0±0.5 | 13.2±0.5 | 17.70±0.5 | 60.0±1.0 |

Quantity of Package

| Type | AMLR06A |
|----------------|---------|
| Quantity(pcs) | 5000 |

Storage

The temperature condition must be controlled less than 40°C, The R.H. must be controlled less than 75%. Store in accordance with this requirement, and the validity period is two years after the date of manufacture.

Please avoid the mentioned harsh environment below when storing to ensure product performance and its' weldability. Places exposed to sea breeze or other corrosive gas, such as Cl₂, H₂S, NH₃, SO₂ and NO₂.

When the product is moved and stored, please ensure the correct orientation of the box. Do not drop or squeeze the box. Otherwise, the electrode or the body of the product may be damaged.