THUNDER PRECISION RESISTORS

# APPROVAL SHEET

# YLRF SERIES

## Low Resistance Metal Strip Chip Resistors

| Version | Date | Description of amendment | Draft | Checked |
|---|---|---|---|---|
| A1.0 | 09-Jul-2020 | First edition release | 罗国涛 | 胡紫阳 |
| A1.1 | 05-Jan-2022 | Add the 3637 series | 罗国涛 | 胡紫阳 |
| A1.2 | 11-Jan-2023 | Modify the durability test limit | 罗国涛 | 胡紫阳 |
| A1.3 | 03-Mar-2023 | Update the pulse capability curve | 罗国涛 | 胡紫阳 |
| A1.4 | 24-May-2024 | Update the resistance range corresponding to product accuracy and the tape size parameters | 蒋林帆 | 胡紫阳 |
| A1.5 | 22-Oct-2025 | Increase the temperature drift TCR standard R: ±50 ppm/℃ | 鲁伟 | 曾庆煜 |

# 1.Product Description

**Product name:**YLRF series

**Description:**YLRF series alloy chip resistors provide precise current sensing with low TCR and high power, ideal for automotive and industrial applications.

## 1.1 Part Number Explanation

The part number of the high power precision resistor is identified by the type name, power, TCR,tolerance, size and resistance value.

**Example:** YLRF12-3-10F-L

| Type | Size | Power | Resistance | Tolerance | TCR |
|---|---|---|---|---|---|
| YLRF | 12=2512<br>37=3637 | 3=3W | 10=10mΩ | B=±0.1%<br>D=±0.5%<br>F=±1% | E=-50~0<br>G=-10~0<br>H=0~10<br>L=±10<br>M=±15<br>P=±20<br>N=±25<br>Q=±30<br>R=±50 |

(1) **Type name:** YLRF series

(2) **Size:**12=2512;37=3637

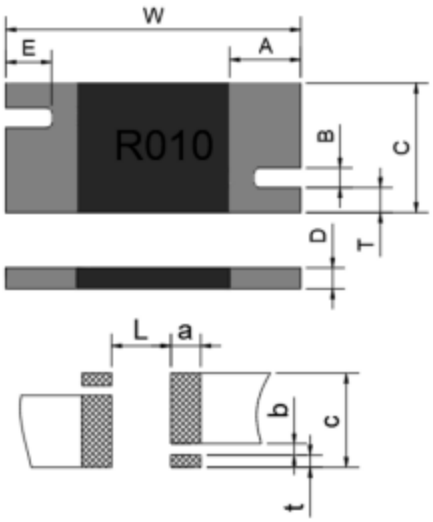
(3) **Power Rating:**3=3W

(4) **Resistance：**10=10mΩ

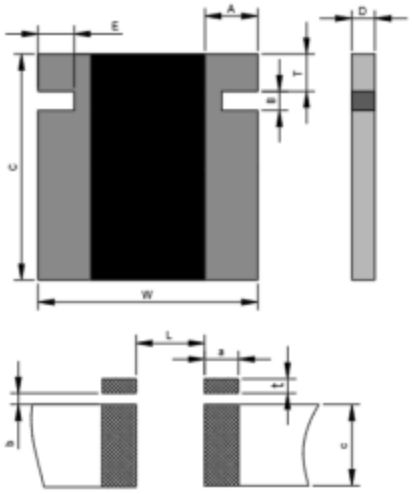
(5) **Tolerance：**B=±0.1%;D=±0.5%;F=±1%

(6) **TCR:**E=-50~0;G=-10~0;H=0~10;L=±10;M=±15;P=±20;N=±25;Q=±30;R=±50

## 1.2 Products & Recommend Pad Dimension




2512



3637



Unit/mm

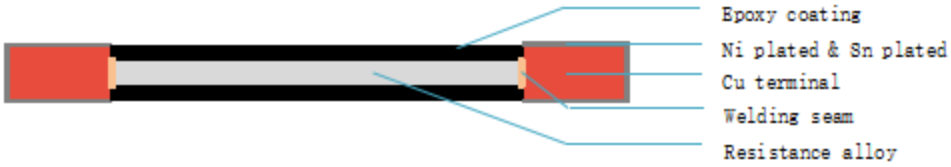
| Type | Resistance (mΩ) | W±0.2 | C±0.2 | A±0.2 | D±0.1 | E±0.2 | B±0.1 | T±0.2 |
|---|---|---|---|---|---|---|---|---|
| YLRF12 | 5~200 | 6.35 | 3.2 | 0.9 | 0.8 | 0.5 | 0.8 | 0.8 |
| YLRF37 | 2~200 | 9.14 | 9.4 | 2.2 | 0.8 | 1.5 | 0.8 | 1.6 |

| Type | Resistance (mΩ) | L | a | c | b | t |
|---|---|---|---|---|---|---|
| YLRF12 | 5~200 | 4.1 | 2.1 | 4 | 0.6 | 1.0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| YLRF37 | 2~200 | 4.5 | 3.0 | 7.5 | 0.6 | 1.8 |

### 1.3 Item Construction

Electron-beam welded constructions




## 2. Standard Electrical Specifications

| Type | Size | Rated Power (W) P70℃ | Material | Resistance /mΩ | Resistance Tolerance (%) | TCR① (ppm/℃) | Operating Temperature (℃) |
|---|---|---|---|---|---|---|---|
| YLRF | 2512 | 2、3 | Karma | 5~19 | ±0.5% ±1% | E:-50~0 G:-10~0 H:0~10 L:±10 M:±15 P:±20 N:±25 Q:±30 | -65℃~170℃ |
| | | | | 20~50 *51~200 | ±0.1% ±0.5% ±1% | | |
| | 3637 | 3、5 | | 2~19 | ±0.5% ±1% | | |
| | | | | 20~50 *51~200 | ±0.1% ±0.5% ±1% | | |

*** Short Time Overload were tested with 2.5×Rated power for 10 s**

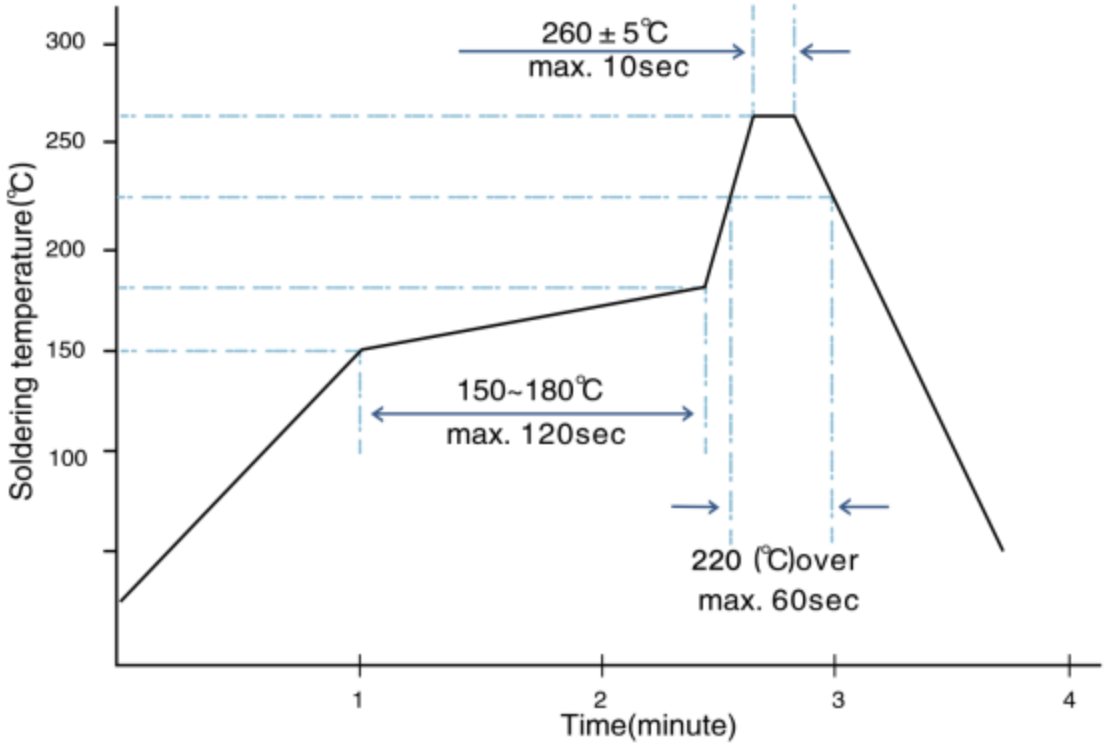
**① TCR（ppm/℃）：Test was conducted from 20℃ to 120℃ while 20℃ worked as the reference.**

# 3. Endurance Test

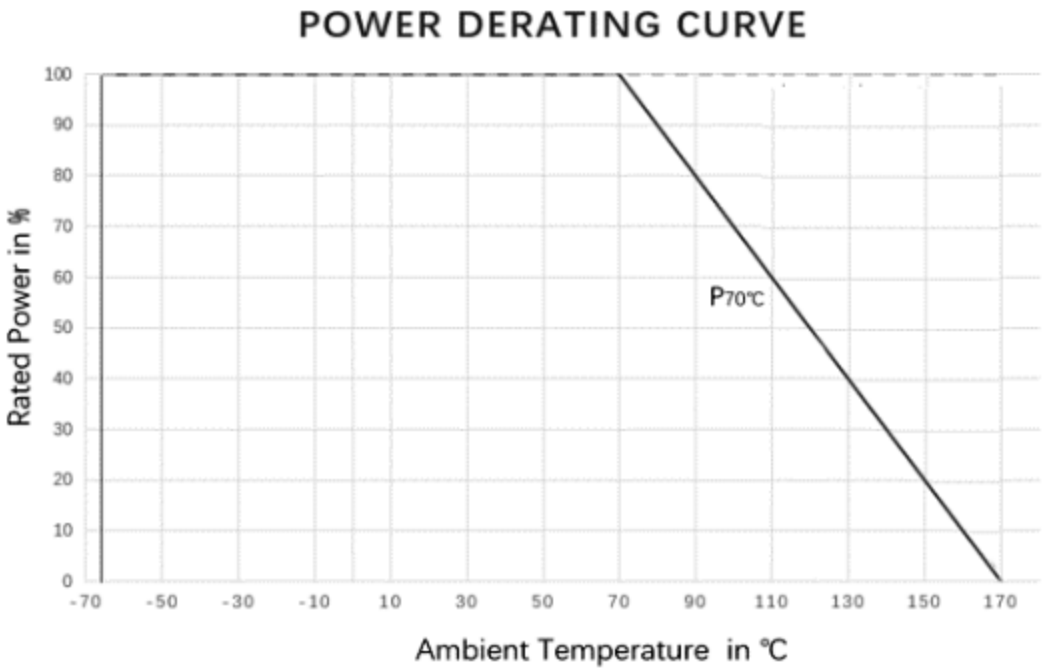
| Items | Additional Requirements | Reference | Limits |
|---|---|---|---|
| Temperature Cycling | 1000 Cycles (-55℃ to +150℃) | JESD22<br>Method JA-104 | ±0.5% |
| ESD Test | 1) Direct Contact (DC): ±6kV;<br>2) Air Discharge (AD): ±12kV, ±16kV, ±25kV; | AEC-Q200 REV D June 1 | ±0.5% |
| High Temperature Exposure | 1000hrs.@T=170℃.Unpowered. | MIL-STD-202<br>Method 108 | ±0.5% |
| Moisture Resistance | t=24hrs/cycle.Note: Steps 7a & 7b not required. Unpowered. | MIL-STD-202<br>Method 106 | ±0.5% |
| Biased Humidity | 1000hrs 85℃/85%RH。<br>Note: Specified conditions:10% of operating power. | MIL-STD-202<br>Method 103 | ±0.5% |
| Operational Life | Condition D Steady State TA=125℃ at rated power. | MIL-STD-202<br>Method 108 | ±0.5% |
| Thermal Shock | 1000X(-55°C to +150°C) | MIL-STD-202Method107G | ±0.5% |
| Solderability | 235℃±5℃,2s±0.5s | J-STD-202 | 95% Coverage Minimum |
| Resistance to Soldering Heat | 260℃±5℃，10s±1s | MIL-STD-202<br>Method 210 | ±0.5% |
| Short Time Overload | 5×Rated power for 5 s<br>* 2.5×Rated power for 10 s | MIL-STD-202<br>Method 201 | ±0.5% |
| Shock | 100g , 6ms , Orientation & Shock time: ±X, ±Y, ±Z; 3 times each orientation, total 18 times. | MIL-STD-202 Metho | ±0.5% |

| Items | Additional Requirements | Reference | Limits |
|---|---|---|---|
| | | d 213 | |
| Vibration | 5 g's for 20 min, 12 cycles each of 3 orientations.<br><br>Note: Use 8"X5" PCB .031" thick 7 secure points on one long side and 2 secure points at corners of<br><br>opposite sides. Parts mounted within 2" from any<br><br>secure point. Test from 10-2000 Hz. | MIL-STD-202Method204 | ±0.5% |

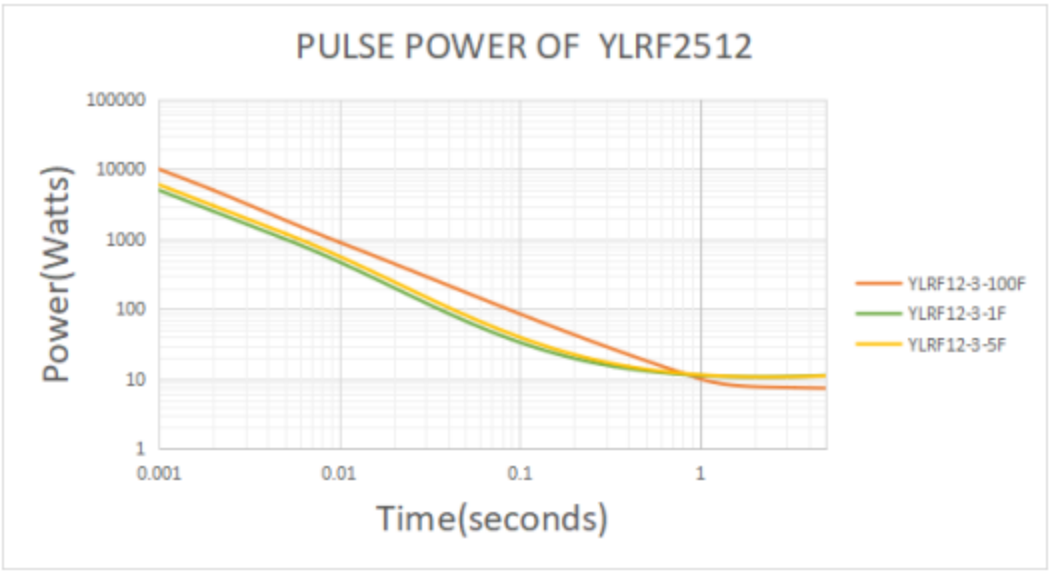
# 4.Solder Reflow Temperature Condition



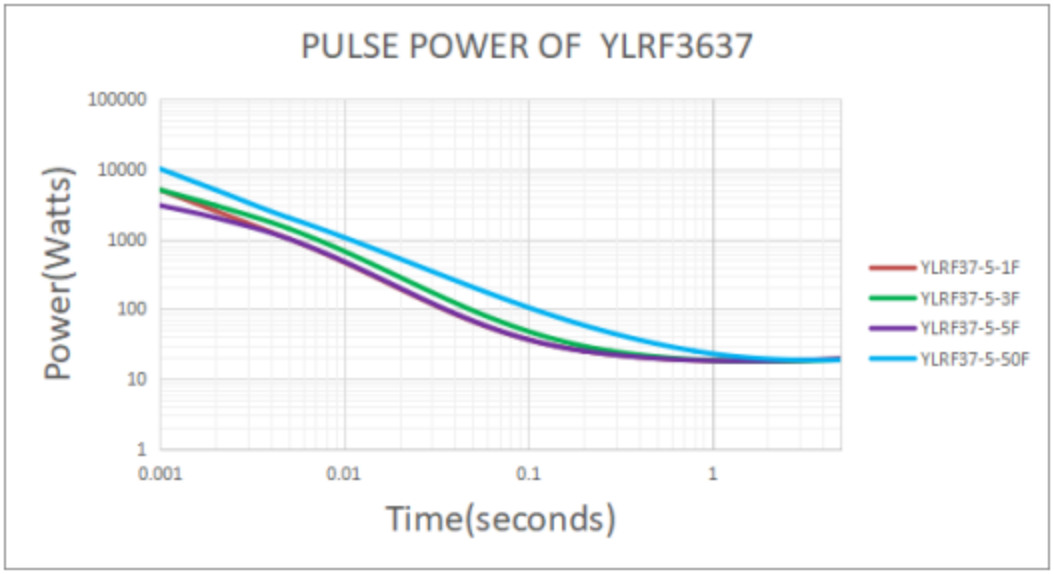
# 5.Power Derating Curve




# 6.Pulse Capability Curve



# 7.Pulse Capability Curve




# 8.Marking

**Laser Marking:**

- All the products marking are 3 or 4 digits. 'R' designates the decimal location in ohms

  E.g., :

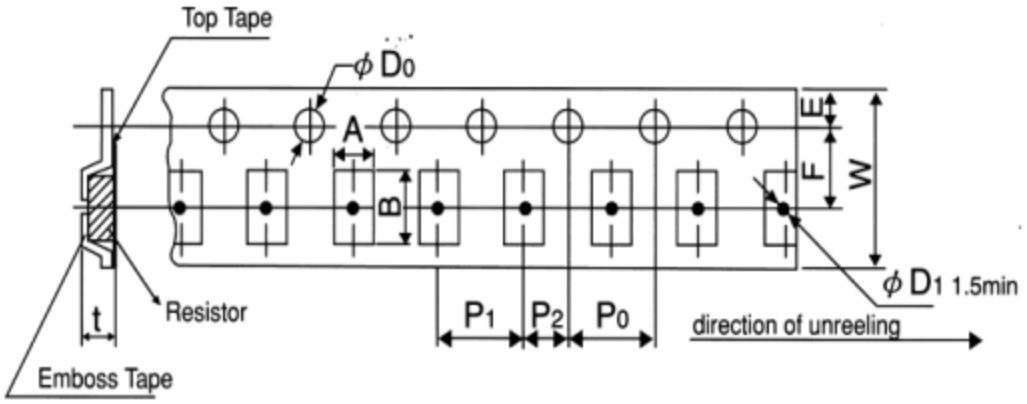
- 3mΩ= R003; 100mΩ=R100； 1.5mΩ=1m50

Laser marking is default. If need white printed marking, pls contact Yezhan sales team.

# 9.Packing

**Storage Conditions:** Storage Conditions: Temperature:5℃~35℃, Humidity:40%~75%

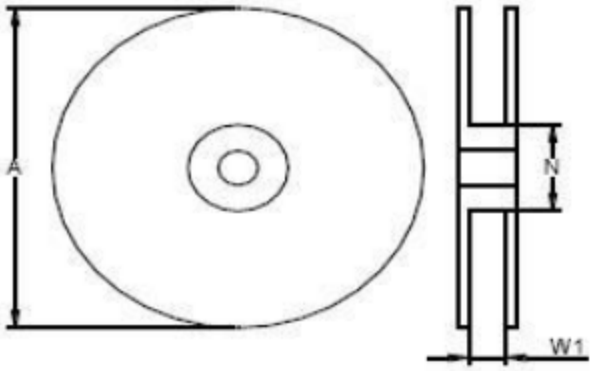
**Packing Type:**Embossed Plastic Tape




Unit/mm

| Type | A±0.2 | B±0.2 | W±0.3 | F±0.1 | E±0.1 | P1±0.1 | P2±0.1 | P0±0.1 | D0±0.1 | t±0.2 | Qty/reel |
|---|---|---|---|---|---|---|---|---|---|---|---|
| YLRF12 | 3.45 | 6.65 | 12 | 5.5 | 1.75 | 4 | 2 | 4 | Φ1.5 | 1.15 | 3000 |
| YLRF37 | 9.8 | 9.5 | 16 | 7.5 | 1.75 | 16 | 2 | 4 | Φ1.5 | 1.18 | 3000 |

# 10.Reel & Tape Specifications




Unit/mm

| Type | A±5 /mm | N±2 /mm | W1±1 /mm |
|---|---|---|---|
| YLRF12 | 178 | 60 | 12 |
| YLRF37 | 330 | 100 | 24 |

This document is a product specification. Contents are subject to change without notice.