

Type RL73 Series

Key Features

- Up to 2 Watts at 70°C
- Values down to R10
- 8 chip sizes
- Ideal for current detection
- Value marked on resistor
- Sizes 0201 to 2512
- 0402, 0603, 0805, 1206, 2512 stocked in distribution
- New Higher Power Version now available

Applications

- Audio
- Communications
- Automotive
- Low voltage power supplies
- Power management applications



TE Connectivity are pleased to offer this thick film chip resistor for current sensing positions. It has a special metal glaze resistive element and a nickel barrier layer beneath the solder to prolong terminal life. Following the developments by semiconductor manufacturers in the production of a range of IC's for battery charge management and low voltage power supplies, the RL73 Series satisfies the demand for a low ohmic shunt resistor to act as a current sensor.

Characteristics - Electrical - Standard Power

| Type | TCR | Power rating @ 70°C | Resistance Range | TDF | TD | TE | Tape |
|---------|---------|---------------------|------------------|------|------|------|-----------------------|
| RL73X1H | 1000PPM | 0.05W | R10 - R13 | 1000 | 5000 | -- | Paper tape |
| RL73V1H | 600PPM | 0.05W | R15 - R47 | 1000 | 5000 | -- | Paper tape |
| RL73N1H | 300PPM | 0.05W | R51 - R91 | 1000 | 5000 | -- | Paper tape |
| RL73N1E | 300PPM | 0.0625W | R10 - R91 | 1000 | 5000 | -- | Paper tape |
| RL73N1J | 300PPM | 0.1W | R10 - R91 | 1000 | 5000 | -- | Paper tape |
| RL73H2A | 100PPM | 0.125W | R10 - R91 | 1000 | 5000 | -- | Paper tape |
| RL73K2A | 200PPM | 0.125W | R10 - R91 | 1000 | 5000 | -- | Paper tape |
| RL73H2B | 100PPM | 0.25W | R10 - R91 | 1000 | 5000 | -- | Paper tape |
| RL73K2B | 200PPM | 0.25W | R10 - R91 | 1000 | 5000 | -- | Paper tape |
| RL73H2E | 100PPM | 0.5W | R10 - R91 | 1000 | 5000 | -- | Paper tape |
| RL73K2E | 200PPM | 0.5W | R10 - R91 | 1000 | 5000 | -- | Paper tape |
| RL73H2H | 100PPM | 0.75W | R10 - R91 | 1000 | -- | 4000 | Embossed plastic tape |
| RL73K2H | 200PPM | 0.75W | R10 - R91 | 1000 | -- | 4000 | Embossed plastic tape |
| RL73H3A | 100PPM | 1W | R10 - R91 | 1000 | -- | 4000 | Embossed plastic tape |
| RL73K3A | 200PPM | 1W | R10 - R91 | 1000 | -- | 4000 | Embossed plastic tape |

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Characteristics - Electrical - High power version

| Type | TCR | Power rating @ 70°C | Resistance Range | TDF | TD | TE | Tape |
|----------|--------|---------------------|------------------|------|------|------|---------|
| RLP73M1E | 400PPM | 0.125W | R051 - R10 | 1000 | 5000 | -- | Paper |
| RLP73N1E | 300PPM | 0.125W | R110 - R47 | 1000 | 5000 | -- | Paper |
| RLP73K1E | 200PPM | 0.125W | R51 - 1R0 | 1000 | 5000 | -- | Paper |
| RLP73M1J | 400PPM | 0.125W | R051 - R10 | 1000 | 5000 | -- | Paper |
| RLP73N1J | 300PPM | 0.125W | R110 - R47 | 1000 | 5000 | -- | Paper |
| RLP73K1J | 200PPM | 0.125W | R51 - 1R0 | 1000 | 5000 | -- | Paper |
| RLP73M2A | 400PPM | 0.25W | R051 - R10 | 1000 | 5000 | -- | Paper |
| RLP73N2A | 300PPM | 0.25W | R110 - R47 | 1000 | 5000 | -- | Paper |
| RLP73K2A | 200PPM | 0.25W | R51 - 1R0 | 1000 | 5000 | -- | Paper |
| RLP73V2B | 600PPM | 0.5W | R010 - R020 | 1000 | 5000 | -- | Paper |
| RLP73M2B | 400PPM | 0.5W | R022 - R047 | 1000 | 5000 | -- | Paper |
| RLP73N2B | 300PPM | 0.5W | R051 - R091 | 1000 | 5000 | -- | Paper |
| RLP73K2B | 200PPM | 0.5W | R10 - 1R0 | 1000 | 5000 | -- | Paper |
| RLP73V3A | 600PPM | 2W | R010 - R020 | 1000 | -- | 4000 | Plastic |
| RLP73M3A | 400PPM | 2W | R022 - R047 | 1000 | -- | 4000 | Plastic |
| RLP73N3A | 300PPM | 2W | R051 - R091 | 1000 | -- | 4000 | Plastic |
| RLP73K3A | 200PPM | 2W | R10 - 1R0 | 1000 | -- | 4000 | Plastic |

Operating Voltage= $\sqrt{P \cdot R}$; Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$; Operating Current= $\sqrt{P/R}$
 Maximum operating temperature -55°C to +155°C

Power Derating Curve



* Recommended Circuit Board Design

For resistors operated in ambient temperatures above 70°C, power rating must be derated in accordance with this curve.

Characteristics - Environmental

| Item | Requirement | Test Method |
|--|---|--|
| Temperature Coefficient of Resistance (TCR): | As Specification | -55°C ~ +125°C, 25°C is the reference temperature |
| Short Time Overload: | $\pm(0.5\%+0.05\Omega)$ for higher Power rating: $\pm(1.0\% + 0.05\Omega)$ | RCWV*2.5 or Max. overload voltage for 5 seconds |
| Insulation Resistance: | $\geq 10G$ | Max. overload voltage for 1 minute |
| Endurance: | $\pm(1.0\%+0.05\Omega)$ | 70 $\pm 2^\circ C$, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" |
| Damp Heat with Load: | $\pm(0.5\%+0.05\Omega)$ | 40 $\pm 2^\circ C$, 90-95% R.H. max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" |
| Dry Heat: | $\pm(0.5\%+0.05\Omega)$ | at +155°C for 1000 hrs |
| Bending Strength: | As Spec. | Bending once for 5 seconds 2010, 2512 sizes: 2mm Other sizes: 3mm |
| Solderability: | 95% min. coverage | 245 $\pm 5^\circ C$ for 3 seconds |
| Resistance to Soldering Heat: | $\pm(0.5\%+0.05\Omega)$ | 260 $\pm 5^\circ C$ for 10 seconds |
| Voltage Proof: | No breakdown or flashover | 1.42 times RCWV (RMS) for 1 minute |
| Leaching: | Individual leaching area $\leq 5\%$ Total leaching area $\leq 10\%$ | 260 $\pm 5^\circ C$ for 30 seconds |
| Thermal Shock: | $\pm(0.5\%+0.05\Omega)$ | -55°C to +155°C, 5 cycles |

Reference Standards: IEC 60115-1, 60068-2-58; JIS-C 5201-1

Storage Temperature: 25 $\pm 3^\circ C$; Humidity < 80%RH

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Dimensions



- | | | |
|--------------------------|----------------------------|--------------------------|
| 1. Alumina Substrate | 4. Edge Electrode (NiCr) | 7. Resistor Layer (NiCr) |
| 2. Bottom Electrode (Ag) | 5. Barrier Layer (Ni) | 8. Overcoat (Epoxy) |
| 3. Top Electrode (Ag-Pd) | 6. External Electrode (Sn) | 9. Marking |

| Part Number | L | W | C | D | t |
|----------------------|------------|------------|------------|------------|------------|
| RL73 1H (0201) | 0.58 ±0.05 | 0.29 ±0.05 | 0.15 ±0.05 | 0.12 ±0.05 | 0.23 ±0.05 |
| RL(P)73 1E (0402) | 1.00 ±0.05 | 0.50 ±0.05 | 0.20 ±0.10 | 0.25 ±0.10 | 0.32 ±0.10 |
| RL(P)73 1J (0603) | 1.60 ±0.10 | 0.80 ±0.10 | 0.30 ±0.20 | 0.30 ±0.20 | 0.45 ±0.10 |
| RL(P)73 2A (0805) | 2.00 ±0.15 | 1.25 ±0.15 | 0.40 ±0.25 | 0.30 ±0.20 | 0.55 ±0.10 |
| RL(P)73 2B (1206) | 3.10 ±0.10 | 1.55 ±0.15 | 0.40 ±0.25 | 0.50 ±0.30 | 0.55 ±0.10 |
| RL(P)73 2E (1210) | 3.10 ±0.10 | 2.50 ±0.15 | 0.50 ±0.25 | 0.50 ±0.30 | 0.55 ±0.10 |
| RL(P)73 2H (2010) | 5.00 ±0.20 | 2.50 ±0.15 | 0.50 ±0.25 | 0.60 ±0.30 | 0.60 ±0.15 |
| RL73 3A (2512) | 6.35 ±0.20 | 3.10 ±0.15 | 0.55 ±0.25 | 0.60 ±0.30 | 0.60 ±0.10 |
| RLP73 3A (2512) <R10 | 6.35 ±0.20 | 3.15 ±0.15 | 0.55 ±0.25 | 0.60 ±0.30 | 0.74 ±0.10 |
| RLP73 3A (2512) ≥R10 | 6.35 ±0.20 | 3.15 ±0.15 | 2.10 ±0.10 | 0.60 ±0.30 | 0.74 ±0.10 |

Recommend Land Pattern



| Type | A | B | C |
|----------------------|------|------|-----------|
| RL73 1H (0201) | 0.25 | 0.3 | 0.40 ±0.2 |
| RL(P)73 1E (0402) | 0.5 | 0.5 | 0.60 ±0.2 |
| RL(P)73 1J (0603) | 0.8 | 1.0 | 0.90 ±0.2 |
| RL(P)73 2A (0805) | 1.0 | 1.0 | 1.35 ±0.2 |
| RL(P)73 2B (1206) | 2.0 | 1.15 | 1.70 ±0.2 |
| RL(P)73 2E (1210) | 2.0 | 1.15 | 2.50 ±0.2 |
| RL(P)73 2H (2010) | 3.6 | 1.4 | 2.50 ±0.2 |
| RL73 3A (2512) | 4.9 | 1.6 | 3.10 ±0.2 |
| RLP73 3A (2512) <R10 | 4.9 | 1.6 | 3.10 ±0.2 |
| RLP73 3A (2512) ≥R10 | 1.0 | 3.55 | 3.10 ±0.2 |

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Packaging Quantity & Reel Specifications



| Type | øA | øB | øC | W | T | Paper Tape | Embossed Plastic Tape |
|-------------------|------------|-----------|-----------|-----------|-----------|-------------|-----------------------|
| RL73 1H (0402) | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 9.5 ±0.1 | 11.5 ±1.0 | 1000 / 5000 | - |
| RL(P)73 1E (0402) | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 9.5 ±0.1 | 11.5 ±1.0 | 1000 / 5000 | - |
| RL(P)73 1J (0603) | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 9.5 ±0.1 | 11.5 ±1.0 | 1000 / 5000 | - |
| RL(P)73 2A (0805) | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 9.5 ±0.1 | 11.5 ±1.0 | 1000 / 5000 | - |
| RL(P)73 2B (1206) | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 9.5 ±0.1 | 11.5 ±1.0 | 1000 / 5000 | - |
| RL(P)73 2E (1210) | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 9.5 ±0.1 | 11.5 ±1.0 | 1000 / 5000 | - |
| RL(P)73 2H (2010) | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 13.5 ±1.0 | 15.5 ±1.0 | - | 1000 / 4000 |
| RL(P)73 3A (2512) | 178.0 ±1.0 | 60.0 +1.0 | 13.5 ±0.7 | 13.5 ±1.0 | 15.5 ±1.0 | - | 1000 / 4000 |

Paper Tape Specification



| Type | A | B | W | E | F | P ₀ | P ₁ | P ₂ | øD ₀ | T |
|------------|------------|------------|-----------|------------|------------|----------------|----------------|----------------|-----------------|------------|
| RL73 1H | 0.38 ±0.05 | 0.68 ±0.05 | 8.0 ±0.20 | 1.75 ±0.10 | 3.50 ±0.05 | 4.00 ±0.10 | 2.00 ±0.05 | 2.00 ±0.05 | 1.50+0.1,-0 | 0.42 ±0.20 |
| RL(P)73 1E | 0.65 ±0.10 | 1.15 ±0.10 | 8.0 ±0.20 | 1.75 ±0.10 | 3.50 ±0.05 | 4.00 ±0.10 | 2.00 ±0.05 | 2.00 ±0.05 | 1.50+0.1,-0 | 0.45 ±0.10 |
| RL(P)73 1J | 1.10 ±0.10 | 1.90 ±0.10 | 8.0 ±0.20 | 1.75 ±0.10 | 3.50 ±0.05 | 4.00 ±0.10 | 4.00 ±0.05 | 2.00 ±0.05 | 1.50+0.1,-0 | 0.70 ±0.10 |
| RL(P)73 2A | 1.60 ±0.10 | 2.40 ±0.20 | 8.0 ±0.20 | 1.75 ±0.10 | 3.50 ±0.05 | 4.00 ±0.10 | 4.00 ±0.05 | 2.00 ±0.05 | 1.50+0.1,-0 | 0.85 ±0.10 |
| RL(P)73 2B | 1.90 ±0.10 | 3.50 ±0.20 | 8.0 ±0.20 | 1.75 ±0.10 | 3.50 ±0.05 | 4.00 ±0.10 | 4.00 ±0.05 | 2.00 ±0.05 | 1.50+0.1,-0 | 0.85 ±0.10 |
| RL(P)73 2E | 2.90 ±0.10 | 3.50 ±0.20 | 8.0 ±0.20 | 1.75 ±0.10 | 3.50 ±0.05 | 4.00 ±0.10 | 4.00 ±0.05 | 2.00 ±0.05 | 1.50+0.1,-0 | 0.85 ±0.10 |

Type RL73 Series

Embossed Plastic Tape Specifications



| Type | A | B | W | E | F | P ₀ | P ₁ | P ₂ | øD ₀ | T |
|------------|-----------|-----------|-----------|-----------|----------|----------------|----------------|----------------|-----------------|-----------|
| RL(P)73 2H | 2.80±0.10 | 5.50±0.10 | 12.0±0.10 | 1.75±0.10 | 5.5±0.05 | 4.00±0.05 | 4.00±0.10 | 2.00±0.05 | 1.50+0.10 | 1.00±0.20 |
| RL73 3A | 3.50±0.10 | 6.70±0.10 | 12.0±0.10 | 1.75±0.10 | 5.5±0.05 | 4.00±0.05 | 4.00±0.10 | 2.00±0.05 | 1.50+0.10 | 1.00±0.20 |
| RLP73 3A | 3.38±0.10 | 6.68±0.10 | 12.0±0.30 | 1.75±0.10 | 5.5±0.01 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 | 1.50+0.05 | 1.45±0.20 |

How to Order

| RL73 | H | 2A | R10 | F | TD |
|---------------|--|--|--|------------------------|---|
| Common Part | TCR | Size | Resistor Value | Tolerance | Packaging |
| RL73 RLP73 | X - 1000PPM V - 600PPM N - 300PPM H - 100PPM K - 200PPM M - 400PPM See above for applicability | 1H -0201 1E -0402 1J -0603 2A -0805 2B -1206 2E -1210 2H -2010 3A -2512 | 0.1 Ohm (100milliOhm) R10 0.91 Ohm (910 milliOhm) R91 | F - ±1% J - ±5% | TDF -1000 REEL TD -5000 REEL TE -4000 REEL See above for applicability |

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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А