

## 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 |

## Type RL73 Series

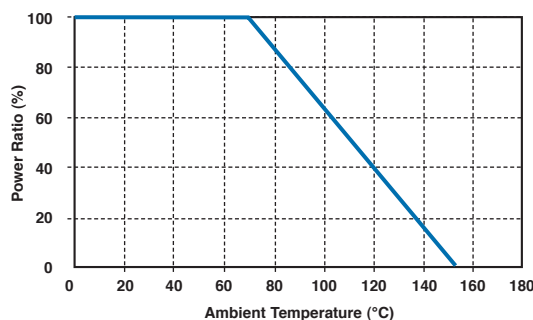
### Characteristics - Electrical - High power version

| Type     | TCR    | Power rating<br>@ 70°C | Resistance<br>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:                         | $\pm(0.5\%+0.05\Omega)$<br>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 $\pm 2^\circ\text{C}$ , 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 $\pm 2^\circ\text{C}$ , 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<br>Other sizes: 3mm                                         |
| Solderability:                               | 95% min. coverage                                                             | 245 $\pm 5^\circ\text{C}$ for 3 seconds                                                                      |
| Resistance to Soldering Heat:                | $\pm(0.5\%+0.05\Omega)$                                                       | 260 $\pm 5^\circ\text{C}$ for 10 seconds                                                                     |
| Voltage Proof:                               | No breakdown or flashover                                                     | 1.42 times RCWV (RMS) for 1 minute                                                                           |
| Leaching:                                    | Individual leaching area $\leq 5\%$<br>Total leaching area $\leq 10\%$        | 260 $\pm 5^\circ\text{C}$ 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 $\pm 3^\circ\text{C}$ ; Humidity < 80%RH

## Type RL73 Series

### 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 |

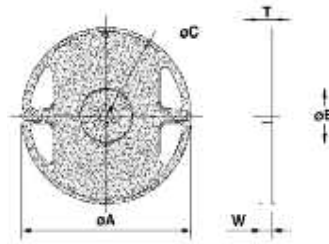
### Recommend Land Pattern



| 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 |

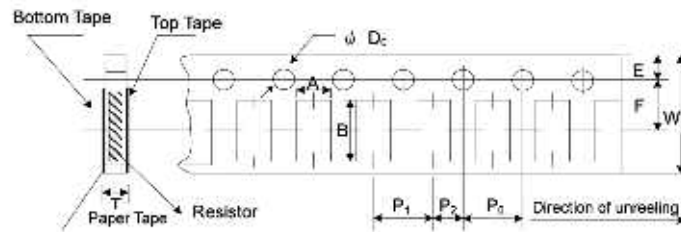
## Type RL73 Series

### 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           |

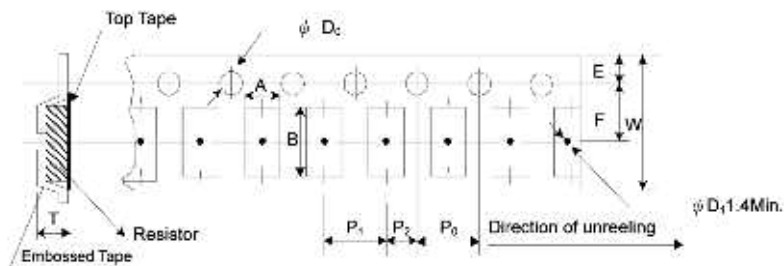
### Paper Tape Specification



| Type       | A          | B          | W         | E          | F          | P <sub>0</sub> | P <sub>1</sub> | P <sub>2</sub> | øD <sub>0</sub> | 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 <sub>0</sub> | P <sub>1</sub> | P <sub>2</sub> | øD <sub>0</sub> | 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<br>RLP73 | X -1000PPM<br>V - 600PPM<br>N - 300PPM<br>H - 100PPM<br>K - 200PPM<br>M - 400PPM<br>See above for applicability | 1H -0201<br>1E -0402<br>1J -0603<br>2A -0805<br>2B -1206<br>2E -1210<br>2H -2010<br>3A -2512 | 0.1 Ohm<br>(100milliOhm)<br>R10<br><br>0.91 Ohm<br>(910 milliOhm)<br>R91 | F - ±1%<br><br>J - ±5% | TDF -1000 REEL<br>TD -5000 REEL<br>TE -4000 REEL<br>See above for applicability |

TE Connectivity, TE connectivity (logo) and TE (logo) are trademarks.

Other logos, product and Company names mentioned herein may be trademarks of their respective owners.

While TE has made every reasonable effort to ensure the accuracy of the information in this datasheet, TE does not guarantee that it is error-free, nor does TE make any other representation, warranty or guarantee that the information is accurate, correct, reliable or current. TE reserves the right to make any adjustments to the information contained herein at any time without notice. TE expressly disclaims all implied warranties regarding the information contained herein, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose. The dimensions in this datasheet are for reference purposes only and are subject to change without notice. Specifications are subject to change without notice. Consult TE for the latest dimensions and design specifications.