

# WIDE TERMINAL CURRENT SENSE RESISTOR

## TYPE RLW73 SERIES

### INTRODUCTION

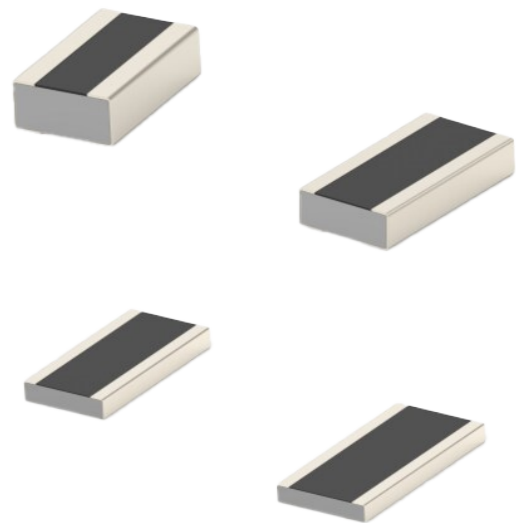
TE Connectivity (TE) is pleased to introduce this wide terminal cousin of our successful RL73 series current sense resistor. With reliable multilayer electrode construction, and high purity alumina substrate for high power dissipation, along with long side terminations, we can offer up to 3W in 1225 configuration with resistance values from 10mΩ ~ 750mΩ

### FEATURES

- Highly reliable multilayer electrode construction
- High power to size ratio
- High purity alumina substrate for high power dissipation
- Long side terminations with higher power rating
- Moisture sensitivity level - MSL1

### APPLICATIONS

- Power management applications
- Over current protection in audio applications
- Voltage regulation module (VRM)



### ELECTRICAL CHARACTERISTICS

| Item<br>Type | Size code | Power rating<br>@70°C (W) | Maximum operating<br>current (A) | Resistance range (mΩ) |           | TCR<br>(ppm/°C) |
|--------------|-----------|---------------------------|----------------------------------|-----------------------|-----------|-----------------|
|              |           |                           |                                  | 1%<br>E24/E96         | 5%<br>E24 |                 |
| RLW73        | A2 0508   | 0.50                      | 7.07                             | 10-27(E24)            |           | ±600            |
|              |           |                           |                                  | 30- 510*              |           | ±200            |
| RLW73        | B2 0612   | 0.75                      | 8.66                             | 10-27(E24)            |           | ±600            |
|              |           |                           |                                  | 30- 510*              |           | ±200            |
| RLW73        | H2 1020   | 1.00                      | 10                               | 10-27(E24)            |           | ±600            |
|              |           |                           |                                  | 30- 750*              |           | ±200            |
| RLW73        | A3 1225   | 1.50                      | 12.24                            | 10-27(E24)            |           | ±600            |
|              |           |                           |                                  | 30- 750*              |           | ±200            |

\*NB Values below 100mΩ only available in E24 series

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### HIGH POWER RATING ELECTRICAL SPECIFICATIONS

| Item<br>Type | Size code | Power rating<br>@70°C (W) | Maximum<br>operating<br>current (A) | Resistance range (mΩ) |           | TCR<br>(ppm/°C) |
|--------------|-----------|---------------------------|-------------------------------------|-----------------------|-----------|-----------------|
|              |           |                           |                                     | 1%<br>E24/E96         | 5%<br>E24 |                 |
| RLW73P       | A2 0508   | 1.00                      | 10                                  | 10 - 27(E24)          |           | ±600            |
|              |           |                           |                                     | 30 - 510*             |           | ±200            |
| RLW73P       | B2 0612   | 1.50                      | 12.2                                | 10 - 27(E24)          |           | ±600            |
|              |           |                           |                                     | 30 - 510*             |           | ±200            |
| RLW73P       | H2 1020   | 2.00                      | 14.1                                | 10 - 27(E24)          |           | ±600            |
|              |           |                           |                                     | 30 - 750*             |           | ±200            |
| RLW73P       | A3 1225   | 3.00                      | 17.3                                | 10 - 27(E24)          |           | ±600            |
|              |           |                           |                                     | 30 - 750*             |           | ±200            |

\* NB Values below 100mΩ only available in E24 series.

Operating Voltage= $\sqrt{(P \cdot R)}$ ; Overload Voltage= $2.5 \cdot \sqrt{(P \cdot R)}$ ; Operating Current= $\sqrt{(P/R)}$ .

Operating Temperature Range: -55 ~ 155°C.

Storage Temperature: 15~28°C; Humidity < 80%RH.

Shelf Life: 2 years from production date.

### ENVIRONMENTAL CHARACTERISTICS

| Item                                           | Requirement       | Test Methods                                                                                                            |
|------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------|
| Temperature coefficient of resistance (T.C.R.) | As Spec.          | JIS C 5201-1 4.8<br>IEC 60115-1 4.8<br>At 25°C/-55°C and 25°C/+125°C, 25°C<br>is the reference temperature              |
| Short time overload                            | ±(2.0%+0.05Ω)     | JIS C 5201-1 4.13<br>IEC 60115-1 4.13<br>RCWV*2 for 5 seconds                                                           |
| Insulation resistance                          | ≥10G              | JIS C 5201-1 4.6<br>IEC 60115-1 4.6<br>Max. Overload Voltage for 1 minute                                               |
| Endurance                                      | ±(2.0%+0.05Ω)     | JIS-C-5201-1 4.25<br>IEC-60115-1 4.25.1<br>70°C ±2°C, RCWV for 1000 hrs with<br>1.5 hrs "ON" and 0.5 hr "OFF"           |
| Damp heat with load                            | ±(2.0%+0.05Ω)     | JIS-C-5201-1 4.24<br>IEC-60115-1 4.24<br>40°C ±2°C, 90-95% R.H., RCWV for 1000hrs<br>with 1.5 hrs "ON" and 0.5 hr "OFF" |
| Dry heat                                       | ±(1.0%+0.05Ω)     | JIS-C-5201-1 4.23<br>IEC-60115-1 4.23.2<br>at +155°C for 1000 hrs                                                       |
| Bending strength                               | ±(1.0%+0.05Ω)     | JIS-C-5201-1 4.33<br>IEC-60115-1 4.33<br>Bending once for 60 seconds with 3mm                                           |
| Solderability                                  | 95% min. coverage | JIS C 5201-1 4.17<br>IEC 60115-1 4.17<br>245°C ±5°C for 3 seconds                                                       |

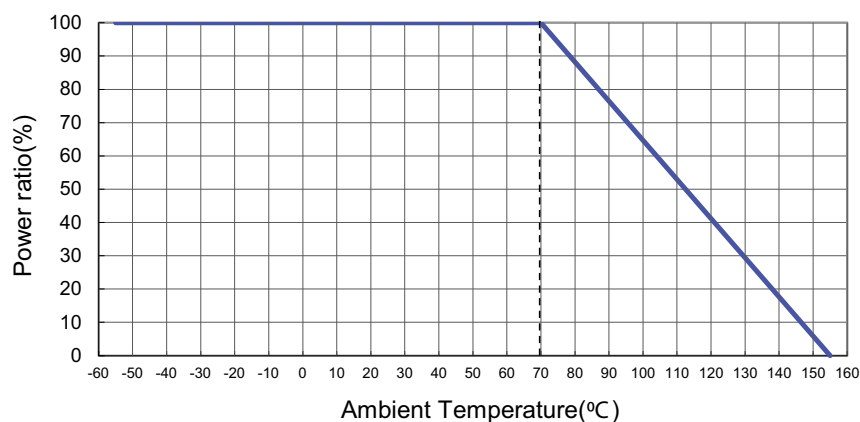
# WIDE TERMINAL CURRENT SENSE RESISTOR

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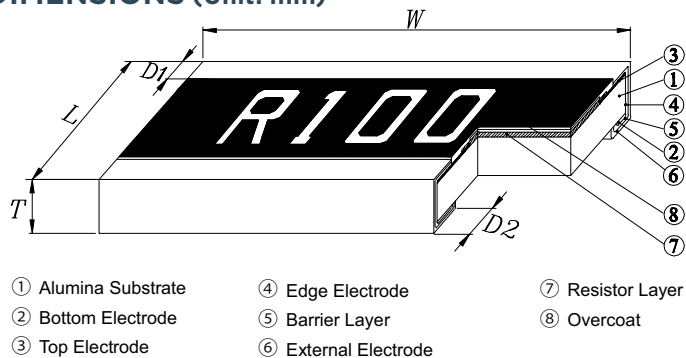
### ENVIRONMENTAL CHARACTERISTICS

| Item                         | Requirement                                                            | Test Methods                                                                                                                |
|------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Resistance to soldering heat | $\pm(1.0\%+0.05\Omega)$                                                | JIS C 5201-1 4.18<br>IEC 60115-1 4.18<br>260°C $\pm 5^\circ\text{C}$ for 10 seconds                                         |
| Voltage proof                | No breakdown or flashover                                              | JIS C 5201-1 4.7<br>IEC 60115-1 4.7<br>1.42 times Max. Operating Voltage for 1-minute<br>RL73WA2:300V<br>RL73WB2/H2/A3:400V |
| Leaching                     | Individual leaching area $\leq 5\%$<br>Total leaching area $\leq 10\%$ | JIS C 5201-1 4.18<br>IEC 60068-2-58 8.2.1<br>260°C $\pm 5^\circ\text{C}$ for 30 seconds                                     |
| Rapid change of temperature  | $\pm(0.5\%+0.05\Omega)$                                                | JIS-C-5201-1 4.19<br>IEC-60115-1 4.19<br>-55°C (30 minutes) / +125°C (30 minutes) , 5 cycles                                |

### DERATING CURVE



### CONSTRUCTION AND DIMENSIONS (Unit: mm)

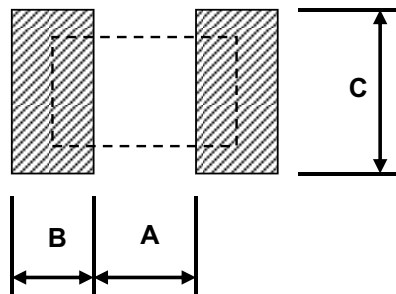


| Type    | Size | L (mm) $\pm 0.15$ | W (mm) $\pm 0.15$ | T (mm) $\pm 0.10$ | D1 (mm) $\pm 0.20$ | D2 (mm) $\pm 0.15$ | Weight (g/1000) |
|---------|------|-------------------|-------------------|-------------------|--------------------|--------------------|-----------------|
| RLW73A2 | 0508 | 1.25              | 2.00              | 0.60              | 0.30               | 0.35               | 6               |
| RLW73B2 | 0612 | 1.60              | 3.20              | 0.60              | 0.30               | 0.45               | 12              |
| RLW73H2 | 1020 | 2.50              | 5.00              | 0.60              | 0.40               | 0.75               | 35              |
| RLW73A3 | 1225 | 3.10              | 6.30              | 0.60              | 0.45               | 0.75               | 48              |

# WIDE TERMINAL CURRENT SENSE RESISTOR

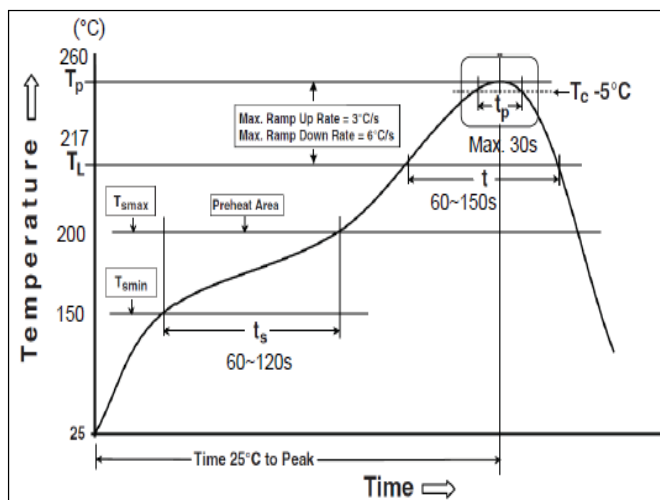
TYPE RLW73 SERIES

## RECOMMENDED LAND PATTERN



| Type    | A (mm) | B (mm) | C (mm) |
|---------|--------|--------|--------|
| RLW73A2 | 0.55   | 0.90   | 2.00   |
| RLW73B2 | 0.70   | 0.80   | 3.20   |
| RLW73H2 | 1.00   | 1.30   | 5.00   |
| RLW73A3 | 1.60   | 1.20   | 6.40   |

## SOLDERING CONDITION (Ref. IPC/JEDEC J-STD-020 & J-STD-002)



| Reflow Profiles                                                                                  |                     |
|--------------------------------------------------------------------------------------------------|---------------------|
| Profile Feature                                                                                  | Pb-Free Assembly    |
| <b>Preheat</b>                                                                                   |                     |
| Minimum temperature (T <sub>min</sub> )                                                          | 150 °C              |
| Maximum temperature (T <sub>max</sub> )                                                          | 200 °C              |
| Preheating time (t <sub>s</sub> ) from (T <sub>min</sub> to T <sub>max</sub> )                   | 60-120 seconds      |
| Ramp-up rate (T <sub>L</sub> to T <sub>p</sub> )                                                 | 3 °C/second maximum |
| Liquidous temperature (T <sub>L</sub> )                                                          | 217 °C              |
| Time (t <sub>L</sub> ) maintained above T <sub>L</sub>                                           | 60-150 seconds      |
| Minimum peak temperature (T <sub>p</sub> min)                                                    | 235°C               |
| Maximum peak temperature (T <sub>p</sub> max)                                                    | 260°C               |
| Time (t <sub>p</sub> ) within 5 °C of the specified classification temperature (T <sub>c</sub> ) | 30 seconds max.     |
| Ramp-down rate (T <sub>p</sub> to T <sub>L</sub> )                                               | 6 °C/second max.    |
| Time 25 °C to peak temperature                                                                   | 8 minutes max.      |

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### MARKING

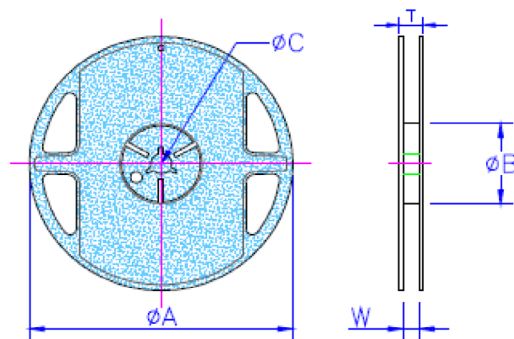
4 digits marking for all sizes.

Example:

| Resistance | 10mΩ | 100mΩ |
|------------|------|-------|
| Marking    | R010 | R100  |

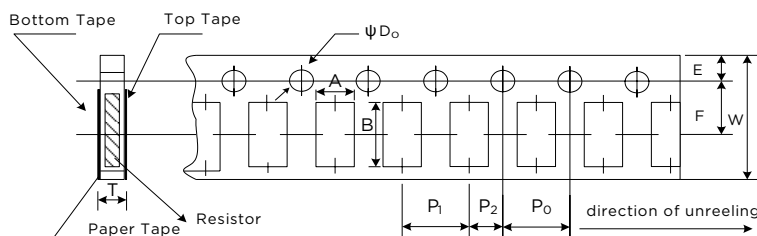
### PACKAGING

Reel Quantity and Specification



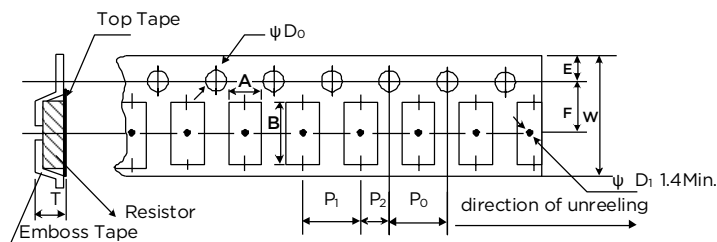
| Size | ØA (mm) ±1.0 | ØB (mm) ±1.0 | ØC (mm) ±0.7 | W (mm) ±1.0 | T (mm) ±1.0 | Paper Tape  | Plastic Tape |
|------|--------------|--------------|--------------|-------------|-------------|-------------|--------------|
| 0508 | 178.0        | 60.0         | 13.5         | 9.5         | 11.5        | 5000 / 1000 |              |
| 0612 | 178.0        | 60.0         | 13.5         | 9.5         | 11.5        | 5000 / 1000 |              |
| 1020 | 178.0        | 60.0         | 13.5         | 13.5        | 15.5        |             | 4000 / 1000  |
| 1225 | 178.0        | 60.0         | 13.5         | 13.5        | 15.5        |             | 4000 / 1000  |

### Paper Tape Specifications



| Size | A (mm) ±0.10 | B (mm) ±0.20 | W (mm) ±0.20 | E (mm) ±0.10 | F (mm) ±0.05 | P <sub>0</sub> (mm) ±0.10 | P <sub>1</sub> (mm) ±0.05 | P <sub>2</sub> (mm) ±0.05 | ØD <sub>0</sub> (mm) +0.1/-0 | T (mm) ±0.10 |
|------|--------------|--------------|--------------|--------------|--------------|---------------------------|---------------------------|---------------------------|------------------------------|--------------|
| 0508 | 1.60         | 2.40         | 8.00         | 1.75         | 3.50         | 4.00                      | 4.00                      | 2.00                      | 1.50                         | 0.85         |
| 0612 | 1.90         | 3.50         | 8.00         | 1.75         | 3.50         | 4.00                      | 4.00                      | 2.00                      | 1.50                         | 0.85         |

### Embossed Plastic Tape Specification



| Size | A (mm) ±0.10 | B (mm)    | W (mm) ±0.30 | E (mm) ±0.10 | F (mm)    | P <sub>0</sub> (mm) | P <sub>1</sub> (mm) ±0.10 | P <sub>2</sub> (mm) ±0.05 | ØD <sub>0</sub> (mm) ±0.10 | T (mm) ±0.20 |
|------|--------------|-----------|--------------|--------------|-----------|---------------------|---------------------------|---------------------------|----------------------------|--------------|
| 1020 | 2.80         | 5.40±0.20 | 12.0         | 1.75         | 5.5 ±0.05 | 4.00±0.05           | 4.00                      | 2.00                      | 1.50                       | 1.00         |
| 1225 | 3.38         | 6.68±0.10 | 12.0         | 1.75         | 5.5 ±0.10 | 4.00±0.10           | 4.00                      | 2.00                      | 1.50                       | 1.00         |

## PRODUCT CODE STRUCTURE

Typical product code  
RLW73 A2 F R047 TD

### Common Part

|               |                                                 |
|---------------|-------------------------------------------------|
| <b>RLW73</b>  | Wide Terminal Current Sense Resistor            |
| <b>RLW73P</b> | High Power Wide Terminal Current Sense Resistor |

### Size Code

|           |      |
|-----------|------|
| <b>A2</b> | 0508 |
| <b>B2</b> | 0612 |
| <b>H2</b> | 1020 |
| <b>A3</b> | 1225 |

### Resistance Tolerance

|          |    |
|----------|----|
| <b>F</b> | 1% |
| <b>J</b> | 5% |

### Resistance Value

|                                |      |
|--------------------------------|------|
| <b>10m<math>\Omega</math></b>  | R010 |
| <b>100m<math>\Omega</math></b> | R100 |

### Packaging

|            |                       |
|------------|-----------------------|
| <b>TD</b>  | Reel 5K (0508 & 0612) |
| <b>TDF</b> | Reel 1K               |
| <b>TE</b>  | Reel 4K (1020 & 1225) |

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