

## Type TLRS Series

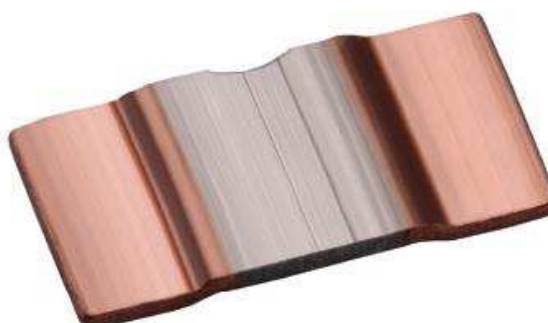
### Key Features

Three Sizes

Power ratings  
to 7W

Resistance  
value from  
0.5mΩ~5mΩ

Electron beam  
welding,  
stable  
performance



### Applications

Current  
sensors for  
Hybrid power  
sources

Frequency  
convertors

High Current  
Handling for  
Automotive  
Engine  
Controls and  
Power  
Management

TE Connectivity is pleased to offer this Low Ohmic Surface Mount Shunt Resistor. Featuring Heavy Copper connectors, electron beam welded to a Manganin or NiCr alloy element, this resistor offers excellent long term stability and low inductance, and can be mounted using re-flow soldering techniques or welding on copper.

### Characteristics – Electrical

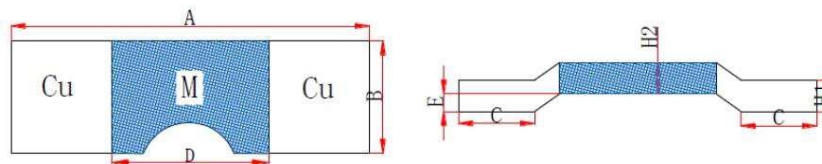
| Type     | Power Rating (W) | Material    | Resistance Range (mΩ) |     | TCR (PPM/°C) |
|----------|------------------|-------------|-----------------------|-----|--------------|
|          |                  |             | ±1%                   | ±5% |              |
| TLRS0630 | 3                | Manganin    | 0.9, 1                |     | ±50          |
|          | 5                | Manganin    | 1                     |     | ±150         |
|          | 5                | Karma alloy | 2, 3, 4               |     | ±50<br>±100  |
| TLRS1050 | 2                | NiCr alloy  | 5                     |     | ±100         |
|          | 2.5              | NiCr alloy  | 4                     |     | ±100         |
|          | 3                | NiCr alloy  | 3                     |     | ±100         |
|          | 4                | Manganin    | 1                     |     | ±60          |
|          | 4                | NiCr alloy  | 2                     |     | ±100         |
|          | 4                | Manganin    | 0.5                   |     | ±75          |
|          | 5                | Manganin    | 0.2, 0.3              |     | ±75          |
| TLRS1575 | 3                | NiCr alloy  | 5                     |     | ±100         |
|          | 3.5              | NiCr alloy  | 3                     |     | ±100         |
|          | 4                | NiCr alloy  | 2                     |     | ±100         |
|          | 6                | Manganin    | 0.5, 1                |     | ±100         |
|          | 6                | Manganin    | 0.4                   |     | ±50          |
|          | 7                | Manganin    | 0.2                   |     | ±50          |

## Environmental Characteristics

| Item                         | Requirement                                                        | Test Methods                           |
|------------------------------|--------------------------------------------------------------------|----------------------------------------|
| Short time Overload          | $\Delta R \leq \pm 0.5\%R$                                         | Rated Power $\times 5$ for 5 seconds   |
| Load Life                    | $\Delta R \leq \pm 1.0\%R$                                         | 70°C Rated Power for 1000 Hours        |
| Resistance to Soldering Heat | $\Delta R \leq \pm 0.5\%R$<br>$\Delta R \leq \pm 1.0\%R$ (0630 5W) | 260°C for 10 $\pm$ 1 seconds           |
| Thermal Shock                | $\Delta R \leq \pm 0.5\%R$<br>$\Delta R \leq \pm 1.0\%R$ (0630 5W) | -55°C/175°C, 30min, 5 cycles           |
| Moisture Resistance          | $\Delta R \leq \pm 1.0\%R$                                         | -55°C, 93 $\pm$ 3%RH, 56 days          |
| High Temperature Exposure    | $\Delta R \leq \pm 1.0\%R$                                         | 175°C for 1000 hours                   |
| Vibration                    | $\Delta R \leq \pm 0.5\%R$                                         | 10~200Hz, 98m/S <sup>2</sup> , 6 hours |

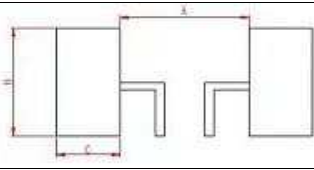
Storage Temperature: 5 ~ 40 °C; Humidity: 55 ~ 75%RH

## Construction and Dimensions:

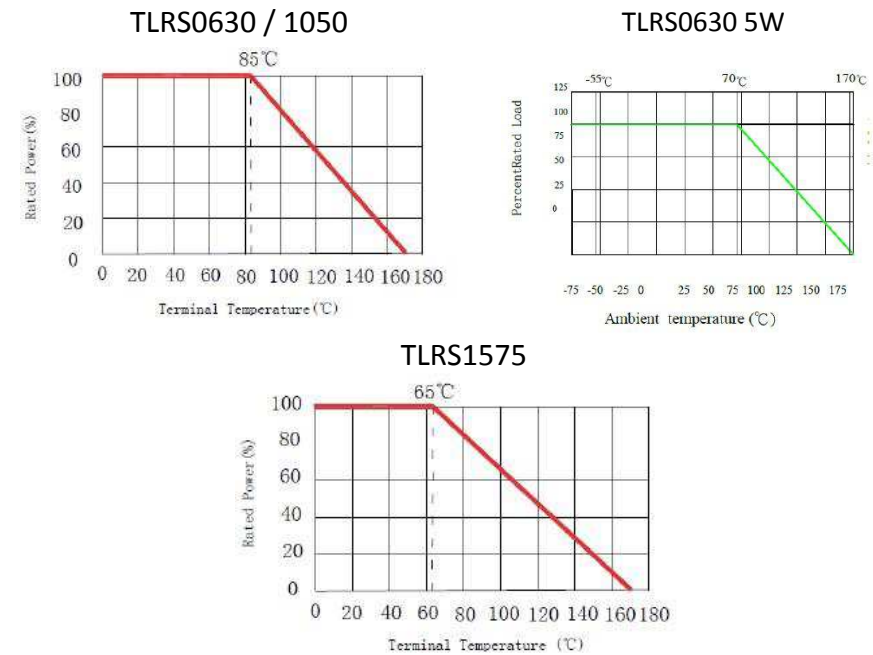


| Type     | Resistance (mΩ) | Material    | A (mm)         | B (mm)         | C $\pm 0.3$ (mm) | D $\pm 0.3$ (mm) | E $\pm 0.1$ (mm) | H1 $\pm 0.1$ (mm) | H2 $\pm 0.1$ (mm) |
|----------|-----------------|-------------|----------------|----------------|------------------|------------------|------------------|-------------------|-------------------|
| TLRS0630 | 0.9             | Manganin    | 6.35 $\pm$ 0.3 | 3.05 $\pm$ 0.3 | 1.14             | 3.0              | 0.35             | 0.45              | 0.45              |
|          | 1               | Manganin    | 6.35 $\pm$ 0.3 | 3.05 $\pm$ 0.3 | 1.14             | 3.0              | 0.35             | 0.5               | 0.5               |
|          | 1               | Manganin    | 6.40 $\pm$ 0.2 | 3.2 $\pm$ 0.25 | 1.14             | 3.0              | 0.35             | 0.42              | 0.42              |
|          | 2               | Karma alloy | 6.40 $\pm$ 0.2 | 3.2 $\pm$ 0.25 | 1.14             | 3.0              | 0.35             | 0.65              | 0.65              |
|          | 3               |             | 6.40 $\pm$ 0.2 | 3.2 $\pm$ 0.25 | 1.14             | 3.0              | 0.35             | 0.43              | 0.43              |
|          | 4               |             | 6.40 $\pm$ 0.2 | 3.2 $\pm$ 0.25 | 1.14             | 3.0              | 0.35             | 0.32              | 0.32              |
| TLRS1050 | 0.2, 0.3        | Manganin    | 10.5 $\pm$ 0.3 | 5.0 $\pm$ 0.3  | 2.0              | 5.0              | 0.50             | 1.5 $\pm$ 0.2     | 1.5 $\pm$ 0.2     |
|          | 0.5             | Manganin    | 10.5 $\pm$ 0.3 | 5.0 $\pm$ 0.3  | 2.0              | 5.0              | 0.50             | 0.95              | 0.95              |
|          | 1               | Manganin    | 10.5 $\pm$ 0.3 | 5.0 $\pm$ 0.3  | 2.0              | 5.0              | 0.50             | 0.43              | 0.43              |
|          | 2               | NiCr alloy  | 10.5 $\pm$ 0.3 | 5.0 $\pm$ 0.3  | 2.0              | 5.0              | 0.50             | 0.65              | 0.65              |
|          | 3               | NiCr alloy  | 10.5 $\pm$ 0.3 | 5.0 $\pm$ 0.3  | 2.0              | 5.0              | 0.50             | 0.43              | 0.43              |
|          | 4               | NiCr alloy  | 10.5 $\pm$ 0.3 | 5.0 $\pm$ 0.3  | 2.0              | 5.0              | 0.50             | 0.28              | 0.28              |
| TLRS1575 | 5               | NiCr alloy  | 10.5 $\pm$ 0.3 | 5.0 $\pm$ 0.3  | 2.0              | 5.0              | 0.50             | 0.28              | 0.28              |
|          | 0.2             | Manganin    | 15.0 $\pm$ 0.3 | 7.75 $\pm$ 0.3 | 4.0              | 5.0              | 0.50             | 1.5 $\pm$ 0.2     | 1.5 $\pm$ 0.2     |
|          | 0.4             | Manganin    | 15.0 $\pm$ 0.3 | 7.75 $\pm$ 0.3 | 4.0              | 5.0              | 0.50             | 0.65              | 0.65              |
|          | 0.5             | Manganin    | 15.0 $\pm$ 0.3 | 7.75 $\pm$ 0.3 | 4.0              | 5.0              | 0.50             | 0.55              | 0.55              |
|          | 1               | Manganin    | 15.0 $\pm$ 0.3 | 7.75 $\pm$ 0.3 | 4.0              | 5.0              | 0.50             | 0.30              | 0.30              |
|          | 2               | NiCr alloy  | 15.0 $\pm$ 0.3 | 7.75 $\pm$ 0.3 | 4.0              | 5.0              | 0.50             | 0.43              | 0.43              |
|          | 3               | NiCr alloy  | 15.0 $\pm$ 0.3 | 7.75 $\pm$ 0.3 | 4.0              | 5.0              | 0.50             | 0.28              | 0.28              |
|          | 5               | NiCr alloy  | 15.0 $\pm$ 0.3 | 7.75 $\pm$ 0.3 | 4.0              | 5.0              | 0.50             | 0.20              | 0.20              |

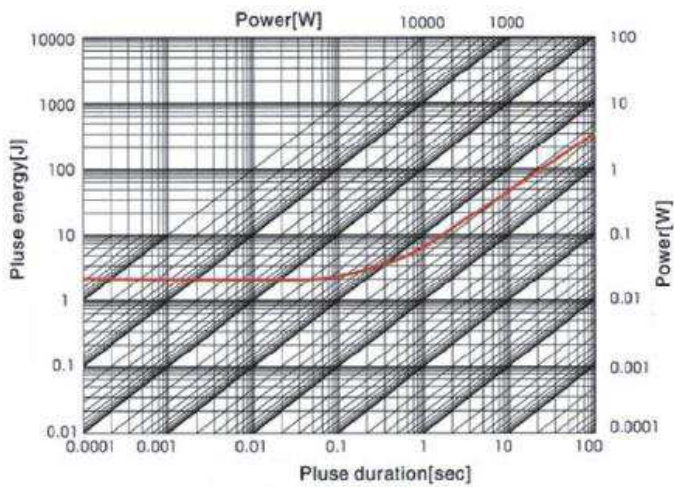
Recommended PCB Plan

|                                                                                   |          |          |          |         |
|-----------------------------------------------------------------------------------|----------|----------|----------|---------|
|  |          | A (mm)   | B (mm)   | C (mm)  |
|                                                                                   | TLRS0630 | 7.0±0.10 | 3.4±0.1  | 1.8±0.1 |
|                                                                                   | TLRS1050 | 5.6±0.15 | 6.2±0.3  | 2.7±0.3 |
|                                                                                   | TLRS1575 | 5.6±0.15 | 8.75±0.3 | 5.2±0.3 |

Derating Curve

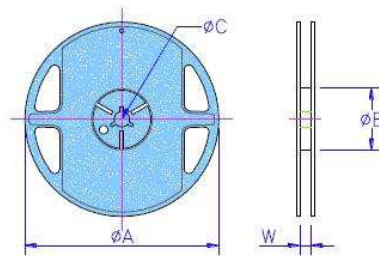


Pulse Energy



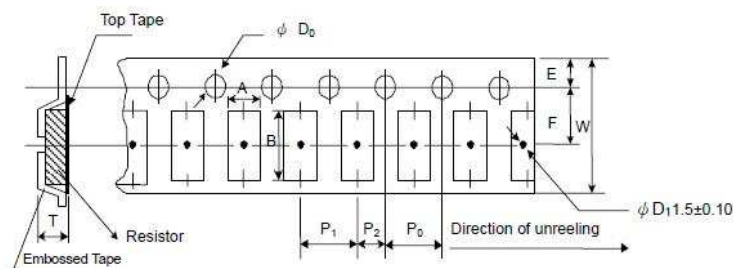
## Packaging

### Reel Dimensions (mm)



| Type        | Quantity | Tape Width (mm) | Reel Diameter (inch) | ØA ±1.0 (mm) | ØB ±0.5 (mm) | ØC +0.3/-0.2 (mm) | W ±0.5 (mm) |
|-------------|----------|-----------------|----------------------|--------------|--------------|-------------------|-------------|
| TLRS0630    | 5K       | 16              | 13                   | 330.5        | 99.5         | 13.2              | 17.4        |
| TLRS0630 5W | 4K       | 16              | 13                   | 330.0 ±2.0   | 60.0 ±1.0    | 13.5 ±0.5         | 17.0 ±1.0   |
| TLRS1050    | 3K       | 24              | 13                   | 330.5        | 99.5         | 13.2              | 25.4        |
| TLRS1575    | 2K       | 24              | 13                   | 330.5        | 99.5         | 13.2              | 25.4        |

### Tape Specifications – Embossed Plastic



| Type    | A ±0.1 (mm) | B ±0.1 (mm) | W ±0.3 (mm) | E ±0.1 (mm) | F ±0.15 (mm) | P <sub>0</sub> ±0.1 (mm) | P <sub>1</sub> ±0.1 (mm) | P <sub>2</sub> (mm) | ØD <sub>0</sub> +0.1/-0 (mm) | T ±0.1 (mm) |
|---------|-------------|-------------|-------------|-------------|--------------|--------------------------|--------------------------|---------------------|------------------------------|-------------|
| 0630    | 3.5         | 6.8         | 16.0        | 1.75        | 7.5          | 4.0                      | 8.0                      | 2.0                 | 1.5                          | 1.45        |
| 0630 5W | 3.5         | 6.8         | 16.0        | 1.75        | 5.5          | 4.0                      | 8.0                      | 2.0                 | 1.5                          | 1.80        |
| 1050    | 5.7         | 11.2        | 24.0        | 1.75        | 11.5         | 4.0                      | 8.0                      | 2.0                 | 1.5                          | 2.05        |
| 1575    | 8.2         | 15.9        | 24.0        | 1.75        | 11.5         | 4.0                      | 12.0                     | 2.0                 | 1.5                          | 2.05        |

### How To Order

| TLRS1050                         | 40                                                              | E                                                                    | R002                        | F                  | TDG                                                     |
|----------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------|--------------------|---------------------------------------------------------|
| Common Part                      | Power Rating                                                    | TCR                                                                  | Resistance Code             | Tolerance Code     | Packaging                                               |
| TLRS0630<br>TLRS1050<br>TLRS1575 | 25 – 2.5W<br>30 – 3W<br>35 – 3.5W<br>40 – 4W<br>50 – 5W<br>Etc. | D - ±50PPM<br>P - ±60PPM<br>W - ±75PPM<br>E - ±100PPM<br>K - ±150PPM | R0002 – 0.2mΩ<br>R001 – 1mΩ | F - ±1%<br>J - ±5% | TDG – Standard Tape and Reel<br>Quantity as above chart |