

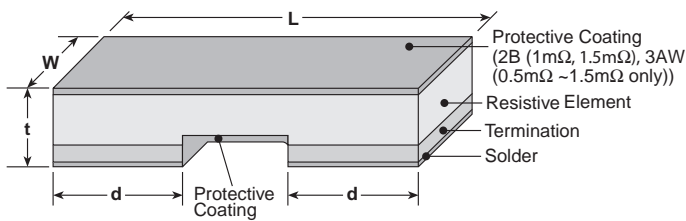


## features

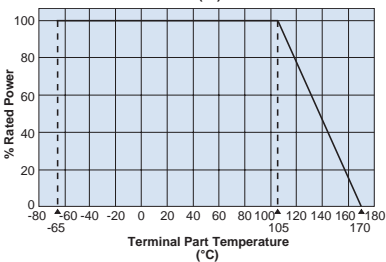
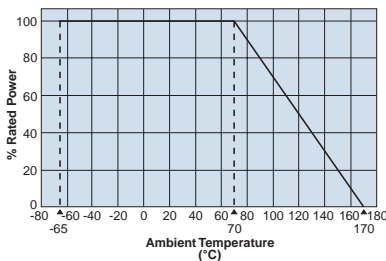
- Ultra low height with a thickness of 0.6mm, suitable for use of small equipment
- Excellent high-frequency characteristics
- Ultra low resistances (0.5mΩ~), suitable for large current sensing
- Suitable for reflow soldering (Not suitable for flow soldering)
- Products meet EU RoHS requirements
- AEC-Q200 Tested

current sense

## dimensions and construction



### Derating Curve



| Size Code       | Resistance   | Dimensions inches (mm)   |                          |  |                          |
|-----------------|--|--------------------------|--------------------------|--|--------------------------|
|                 |  | L                        | W                        | d  | t                        |
| TLR2B<br>TLR2BN | 1m<br>1.5m   | .126±.008<br>(3.20±0.20) | .063±.008<br>(1.60±0.20) | .043±.008<br>(1.10±0.20)                             | .024±.008<br>(0.60±0.20) |
|                 | 2m, 3m, 4m, 5m, 6m, 7m, 8m, 9m, 10m, 11m, 12m, 13m, 15m, 16m, 18m, 20m |                          |                          | .020±.008<br>(0.50±0.20)                             |                          |
| TLR2H           | 1m   | .200±.008<br>(5.00±0.20) | .100±.008<br>(2.50±0.20) | .071±.008<br>(1.80±0.20)                             | .026±.008<br>(0.65±0.20) |
|                 | 2m - 6m<br>7m - 10m  |                          |                          | .060±.008<br>(1.50±0.20)<br>.020±.008<br>(0.50±0.20) |                          |
| TLR3AW          | 0.5mΩ  | .25±.01<br>(6.35±0.25)   | .125±.01<br>(3.18±0.25)  | .107±.01<br>(2.725±0.25)                             | .024±.01<br>(0.60±0.25)  |
|                 | 0.68mΩ, 0.75mΩ, 0.82mΩ   |                          |                          | .105±.01<br>(2.675±0.25)                             |                          |
|                 | 1mΩ, 1.5mΩ, 2mΩ, 3mΩ, 4mΩ  |                          |                          | .087±.01<br>(2.20±0.25)                              |                          |
|                 | 5mΩ, 6mΩ, 7mΩ, 8mΩ   |                          |                          | .047±.01<br>(1.20±0.25)                              |                          |
|                 | 9mΩ, 10mΩ  |                          |                          | .030±.01<br>(0.77±0.25)                              |                          |

## ordering information

|            |  |                                   |   |   |                     |   |
|------------|--|-----------------------------------|---|---|---------------------|---|
| <b>TLR</b> | <b>3AW</b>   | <b>D</b>                          | <b>TE</b>   | <b>2L00</b>   | <b>F</b>            | <b>75</b>   |
| Type       | Power Rating<br>2BN: 0.5W<br>2B: 0.5W<br>2H: 1W<br>3AW: 2W | Termination Material<br>D: SnAgCu | Packaging<br>TE: 7" 8mm pitch embossed plastic (3AW)<br>TE: 7" 4mm pitch embossed plastic (2H only)<br>TD: 7" 4mm pitch punched paper (2B/2BN only) | Nominal Resistance<br>±1%: 4 digits<br>All values less than 0.1Ω (100m) are expressed in mW with "L" as decimal<br>Ex: 2mΩ = 2L00 | Tolerance<br>F: ±1% | T.C.R.<br>50ppm/°C<br>75ppm/°C<br>Blank:<br>150ppm/°C |

For further information on packaging, please refer to Appendix A.

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

11/28/22

## applications and ratings

current sense

| Part Designation | Power Rating | Rated Ambient Temperature | Rated Terminal Part Temperature | T.C.R. (ppm/°C) Max.* | Standard Resistance (Ω)   | Resistance Tolerance | Operating Temperature Range            |
|------------------|--------------|---------------------------|---------------------------------|-----------------------|---|----------------------|--|
| TLR2B            | 1/2W (.5W)   | 70°C                      | 105°C                           | ±50                   | 2m,3m,4m,5m,6m,7m,8m,9m,10m,11m,12m,13m,15m,16m,18m,20m         | F: ±1%               | -65°C to +155°C**<br>-65°C to +170°C** |
|                  |              |                           |                                 | ±75                   | 1m,1.5m,2m,3m,4m,5m,6m,7m,8m,9m,10m,11m,12m,13m,15m,16m,18m,20m |                      |  |
| TLR2BN           |              |                           |                                 | ±150                  | 1m,1.5m,2m,3m,4m,5m,6m,7m,8m,10m,11m,12m,13m,15m,16m,18m,20m    |                      |  |
| TLR2H            | 1W           | 70°C                      | 105°C                           | ±50                   | 1m,2m,3m,4m,5m,6m,7m,8m,9m,10m                                  | F: ±1%               | -65°C to +155°C**<br>-65°C to +170°C** |
|                  |              |                           |                                 | ±75                   |   |                      |  |
| TLR3AW           | 2W           | 70°C                      | 105°C                           | ±50                   | 2m,3m,4m,5m,6m,7m,8m,9m,10m                                     | F: ±1%               | -65°C to +155°C**<br>-65°C to +170°C** |
|                  |              |                           |                                 | ±75                   | 0.5m,0.68m,0.75m,0.82m,1m,1.5m,2m*,3m,4m,5m,6m,7m,8m,9m,10m     |                      |  |
|                  |              |                           |                                 | ±150                  |   |                      |  |

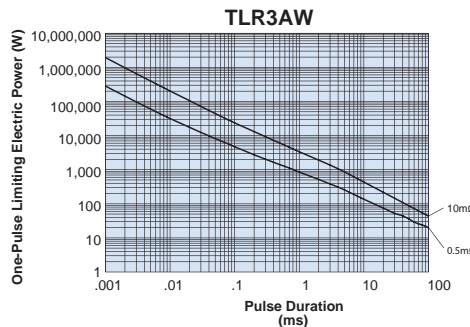
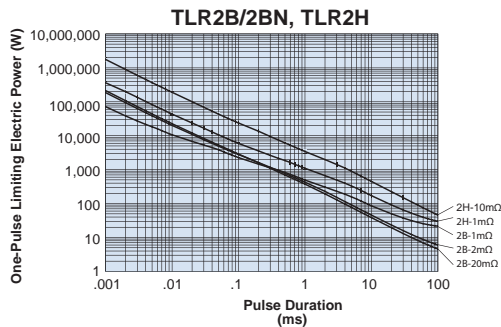
\* Contact factory for 2mΩ dimensions

\*\* Please reference High Temperature Performance Characteristics in the below table

If any questions should arise whether to use the "Rated Ambient Temperature" or the "Rated Terminal Part Temperature," please give priority to the "Rated Terminal Part Temperature." Prior to use and for more details refer to "Introduction of the derating curves on the terminal part temperature" in the beginning of the catalog.

## environmental applications

### One-Pulse Limiting Electric Power



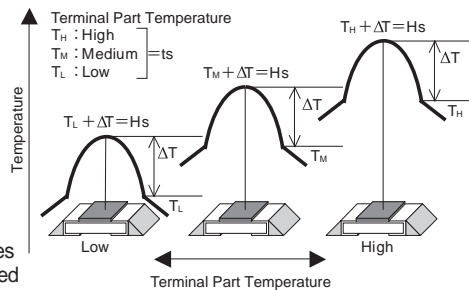
Please ask us about the resistance characteristic of continuous applied pulse. The pulse endurance values are not assured values, so be sure to check the products on actual equipment when you use them.

### Thermal Resistance

| Type | Size      | Resistance (Ω) | Rth (°C/W) |
|------|-----------|----------------|------------|
| TLR  | 2B<br>2BN | 1m             | 11.8       |
|      |           | 2m             | 18.3       |
|      |           | 20m            | 116        |
|      | 2H        | 1m             | 17         |
|      |           | 10m            | 61.1       |
|      | 3AW       | 0.5m           | 6          |
| 10m  |           | 62             |            |

$$R_{th} = (H_s - t_s) / \text{Power}$$

Regarding the temperature rise, the value of the temperature varies per conditions and board for use since the temperature is measured under our measuring conditions. Please refer to us before use.



The temperature of the resistor will increase the same  $\Delta T$  from the standard terminal part temperature regardless of the ambient temperature when the same power is applied. This is because there is hardly any heat dissipation from the resistor surface to the ambient air.

### Performance Characteristics

| Parameter                   | Requirement $\Delta R \pm\%$ |         | Test Method   |
|-----------------------------|------------------------------|---------|---|
|                             | Limit                        | Typical |   |
| Resistance                  | Within regulated tolerance   | —       | 25°C  |
| T.C.R.                      | Within specified T.C.R.      | —       | +25°C/+125°C  |
| Resistance to Solder Heat   | ±0.5%                        | ±0.3%   | 260°C ± 5°C, 10 seconds +2/-0 seconds                     |
| Rapid Change of Temperature | ±0.5%                        | ±0.4%   | -55°C (15 minutes), +150°C (15 minutes), 1000 cycles      |
| Moisture Resistance         | ±0.5%                        | ±0.1%   | MIL-STD-202, Method 106, 0% power, 7a and 7b not required |
| Biased Humidity             | ±0.5%                        | ±0.1%   | 85°C ± 2°C, 85% RH, 1000 hours, 10% bias                  |
| Endurance (Ambient Temp.)   | ±1.0%                        | ±0.3%   | 70°C ± 2°C, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle       |
| High Temperature Exposure** | ±1.0%                        | ±0.6%   | ±155°C (2B, 2H, 3AW), 1000 hours                          |
|                             | ±2.0%                        | —       | ±170°C (2B, 2H, 3AW), 1000 hours                          |

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