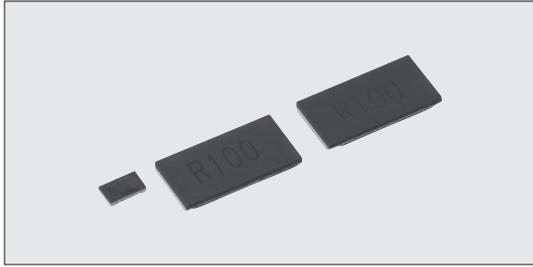
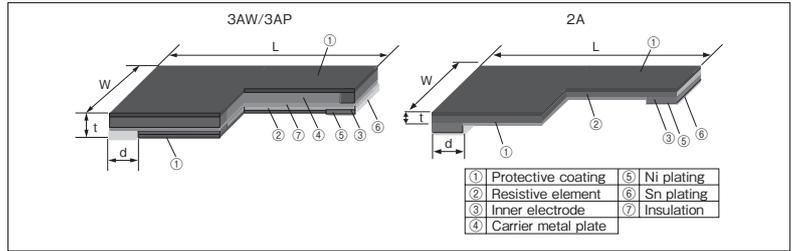


TLRH Metal Plate Chip Type Low Resistance Resistors



Coating color : Black

Construction



Features

- SMD Type of small size, low resistance resistor for current detection.
- Carrier metal plate inside, resistor of high radiation of heat structure. (3AW/3AP)
- High reliability and performance with Low T.C.R.
- Automatic mounting machines are applicable.
- Suitable for reflow soldering. (2A:Not Suitable for flow soldering)
- Products meet EU-RoHS requirements.
- AEC-Q200 qualified.

Applications

- Inverter power supplies
- Motor control
- Mobile PC

Reference Standards

IEC 60115-8
JIS C 5201-8

Dimensions

| Type (Inch Size Code) | Resistance (Ω) | Dimensions (mm) | | | | Weight(g) (1000pcs) |
|--------------------------|----------------------------|-----------------|----------|--------------------|-----------|------------------------|
| | | L | W | d | t | |
| 2A (0805) | 12m~100m | 2.0±0.2 | 1.25±0.2 | 0.35±0.2 | 0.25±0.15 | 4 |
| 3AW (2512) | 10m~270m | 6.3±0.2 | 3.2±0.2 | 0.75±0.2 | 0.5±0.2 | 52 |
| 3AP (2512) | 6m~39m 40m~120m | | | 1.8±0.2 1.3±0.2 | | 60 55 |

Type Designation

Example

| TLRH | 3AW | T | TE | 33L0 | F |
|--------------|--|---------------------------|--|---|----------------------|
| Product Code | Power Rating | Terminal Surface Material | Taping | Nominal Resistance | Resistance Tolerance |
| | 2A(12~27m Ω) : 0.5W 2A(33~50m Ω) : 0.33W 2A(56~100m Ω) : 0.25W 3AW : 2.0W 3AP(6~39m Ω) : 5W 3AP(40~120m Ω) : 4W | T : Sn | TD : 4mm pitch punch paper TE : Plastic embossed BK : Bulk | F : 4 digits EX 33L0 : 33m Ω R100 : 100m Ω | F : ±1% |

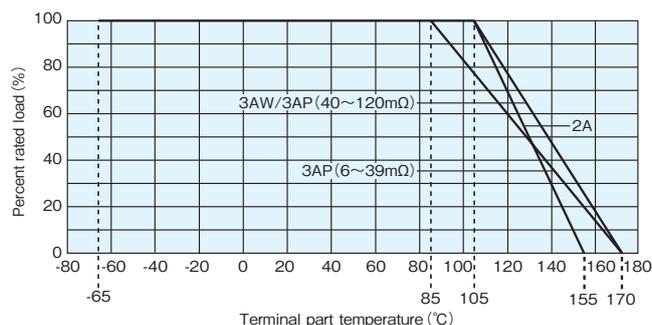
Contact us when you have control request for environmental hazardous material other than The substance specified by EU-RoHS.

For further information on taping, please refer to APPENDIX C on the back pages.

Ratings

| Type | Power Rating | T.C.R. ($\times 10^{-6}/K$) | Resistance Range (Ω) | Rated Terminal Part Temp. | Operating Temp. Range | Taping & Q' ty/Reel (pcs) | |
|---------|--------------|----------------------------------|-------------------------------|---------------------------|-----------------------|---------------------------|-------|
| | | | F : ±1% (E12) | | | TD | TE |
| TLRH2A | 0.25W | ±75 | 56m~100m | 105°C | -65°C~+155°C | 5,000 | - |
| | 0.33W | | 33m~50m | | | | |
| | 0.50W | | 12m~27m | | | | |
| TLRH3AW | 2.0W | ±75 | 10m~22m | 85°C | -65°C~+170°C | - | 2,000 |
| | | | 24m~270m | | | | |
| TLRH3AP | 4.0W | ±50 | 40m, 47m, 50m~120m | 85°C | - | - | 2,000 |
| | 5.0W | | 18m, 20m, 22m, 25m~39m | | | | |
| | | | ±75 | | | | |

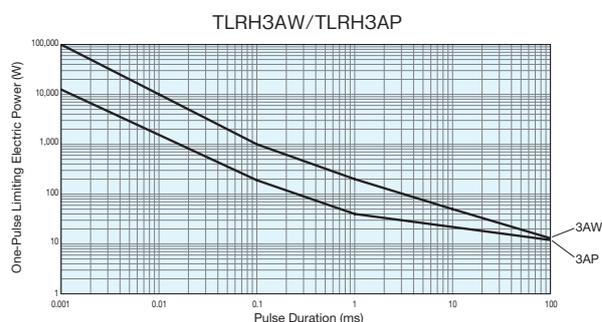
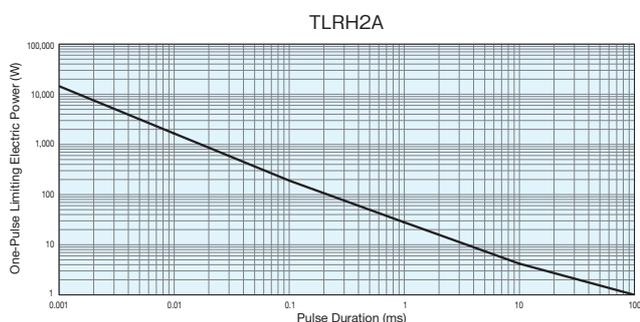
Derating Curve



When the terminal part temperature of the resistor exceeds the rated terminal part temperature shown above, the power shall be derated according to the derating curve.
 ※Please refer to "Introduction of the derating curves based on the terminal part temperature" on the beginning of our catalog before use.

One-Pulse Limiting Electric Power

※The maximum applicable voltage is equal to the max. overload voltage.
 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.



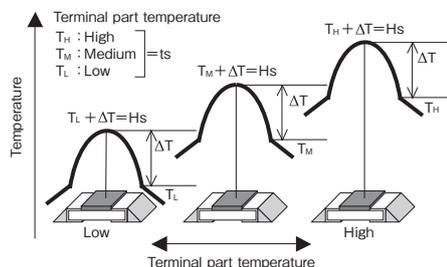
Thermal Resistance

| Type | Size | Resistance (Ω) | Rth (°C/W) |
|------|------|----------------|------------|
| TLRH | 2A | 27m | 123 |
| | | 50m | 195 |
| | | 100m | 280 |
| | 3AW | 10m | 5.2 |
| | | 270m | 7.4 |
| | 3AP | 18m | 7.4 |
| 120m | | 4.1 | |

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

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 ΔT 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

| Test Items | Performance Requirements $\Delta R\%$ | | Test Methods |
|--|---------------------------------------|-----------------------------|---|
| | Limit | Typical | |
| Resistance | Within specified tolerance | — | 25°C |
| T.C.R. | Within specified T.C.R. | — | +25°C/+100°C |
| Overload (Short time) | 0.5 | 0.05 : 2A 0.2 : 3AW/3AP | Rated power $\times 2.5$ for 5s : 2A, 3AW 8W for 5s : 3AP |
| Resistance to soldering heat | 0.5 | 0.1 | 260°C $\pm 5^\circ\text{C}$, 10s~12s |
| Rapid change of temperature | 0.5 | 0.2 : 2A 0.1 : 3AW/3AP | -55°C (15min.) / +150°C (15min.) 1000 cycles |
| Moisture resistance | 0.5 | 0.1 | 85°C $\pm 2^\circ\text{C}$, 85%RH, 1000h, 10% Bias |
| Endurance of Rated Terminal part Temperature | 1 | 0.45 : 2A 0.3 : 3AW/3AP | 105°C $\pm 2^\circ\text{C}$: 2A, 3AW, 3AP (40~120mΩ) 85°C $\pm 2^\circ\text{C}$: 3AP (6~39mΩ) 1000h, 1.5h ON/0.5h OFF cycle |
| Low temperature exposure | 0.5 | 0.05 : 2A 0.02 : 3AW/3AP | -65°C, 96h |
| High temperature exposure | 2 | 0.2 : 3AP | 170°C, 1000h : 3AP (6~12mΩ) |
| | 1 | 0.5 : 2A 0.2 : 3AW/3AP | 155°C, 1000h : 2A/3AP (6~12mΩ) 170°C, 1000h : 3AW/3AP (18~120mΩ) |

Precautions for Use

- In case of using the low ohm resistors as shunt resistors, please lay out a pattern considering the electromagnetic induction with surrounding inductors.
- For resistance values of TLRH the resistance value after soldering may change depending on the size of pad pattern or solder amount. Make sure the effect of decline/increase of resistance value before designing.