



Chip-Type Metal Plate Low-Resistance Resistor Type TLR

1. General

- Products with lead-free terminations meet RoHS requirements
- Metal alloy: superior corrosion & heat resistance
- Applications include current sensing, voltage division and pulse applications
- Ultra low resistance (1mΩ~20mΩ) suitable for large current detecting
- Ultra-low TCR ($\pm 75\text{ppm}/^\circ\text{C}$) available
- Low inductance
- Products with lead-free terminations meet EU RoHS and China RoHS requirements
- AEC-Q200 Qualified: 2B, 2H, 3A & 3AW

2. Type Designation

The type designation shall be the following form:

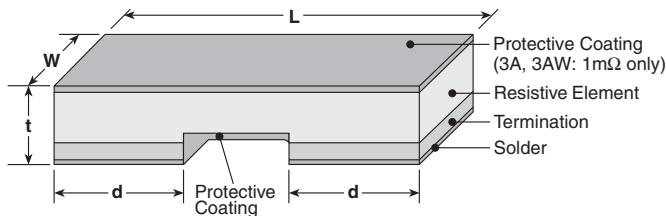
TLR	3A	D	TE	2L00	F	75
Type	Power Rating	Termination Material	Packaging	Nominal Resistance	Tolerance	T.C.R.
	2BN: 0.5W 2B: 0.5W 2BW: 1W 2H: 1W 2HW: 2W 3A: 1W 3AW: 2W 3AP: 3W	D: SnAgCu	TE: 7" 8mm pitch embossed plastic (3A, 3AW, 3AP: 2,000 pcs/reel) TE: 7" 4mm pitch embossed plastic (2H, 2HW only: 4,000 pcs/reel) TD: 4mm pitch punched paper (2B, 2BW: 5,000 pcs/reel paper)	F: 4 digits Ex: 2L00: 2mΩ	F: $\pm 1\%$	50: 50ppm/ $^\circ\text{C}$ 75: 75ppm/ $^\circ\text{C}$ Nil: 100ppm/ $^\circ\text{C}$ Nil: 150ppm/ $^\circ\text{C}$ Nil: 200ppm/ $^\circ\text{C}$
New						
New						
New						

3. Standard Applications

	Part Designation	Power Rating @ 70°C	T.C.R. (ppm/°C) Max.**	Standard Resistance (Ω)	Resistance Tolerance	Rated Ambient Temperature	Terminal Temperature under a Rated Load	Operating Temperature Range
	TLR2B	1/2W (.5W)**	±75	2m,3m,4m,5m,6m,7m, 8m,9m,10m,11m,12m, 13m,15m,16m,18m,20m	F: ±1%	+70°C	—	-65°C to +155°C
NEW	TLR2BW	1W	±75	2m,3m,4m,5m,6m,7m, 8m,9m,10m,11m,12m, 13m,15m,16m,18m,20m	F: ±1%	—	+120°C	-65°C to +155°C
	TLR2H	1W	±75	1m,2m,3m,4m,5m, 6m,7m,8m,9m,10m	F: ±1%	+70°C	—	-65°C to +155°C
NEW	TLR2HW	2W	±50	1m,2m,3m,4m,5m,	F: ±1%	—	+120°C	-65°C to +155°C
			±75	6m,7m,8m,9m,10m				
	TLR3A	1W	±150	1m, 2m	F: ±1%	+70°C	—	-65°C to +170°C
			±200	3m, 4m				
	TLR3AW	2W	±75	*0.5m,1m,1.5m,2m***, 3m,4m,5m,6m,7m, 8m,9m,10m	F: ±1%	+70°C	—	-65°C to +155°C
			±150					
NEW	TLR3AP	3W	±50	2m,3m,4m,5m 6m,7m,8m,9m,10m	F: ±1%	—	0.5m ~ 8m: +110°C	-65°C to +155°C
			±75	0.5m,0.68m,0.82m,1m, 1.5m,2m,3m,4m,5m,6m, 7m,8m,9m,10m			9m, 10m: +90°C	

* Contact factory for values less than 1mΩ ** Please contact factory for T.C.R.: ±50ppm/°C *** Contact factory for 2mΩ dimensions

4. Dimensions & Construction

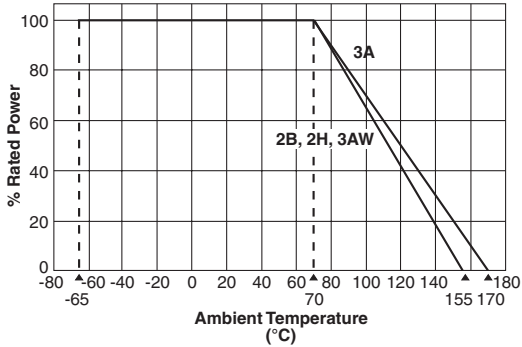


	Size Code	Resistance	Dimensions inches (mm)			
			L	W	d	t
	TLR2B	2m,3m,4m,5m, 6m,7m,8m,9m, 10m,11m,12m, 13m,15m,16m, 18m,20m	.126±.008 (3.20±0.20)	.063±.008 (1.60±0.20)	.020±.008 (0.50±0.20)	.024±.008 (0.60±0.20)
NEW	TLR2BW	1mΩ	.126±.008 (3.20±0.20)	.063±.008 (1.60±0.20)	.051±.008 (1.30±0.20)	.024±.008 (0.60±0.20)
		2mΩ - 20mΩ			.020±.008 (0.50±0.20)	
	TLR2H TLR2HW	1mΩ	.200±.008 (5.00±0.20)	.100±.008 (2.50±0.20)	.071±.008 (1.80±0.20)	.026±.008 (0.65±0.20)
NEW		2mΩ - 6mΩ			.060±.008 (1.50±0.20)	.024±.008 (0.60±0.20)
		7mΩ - 10mΩ			.020±.008 (0.50±0.20)	

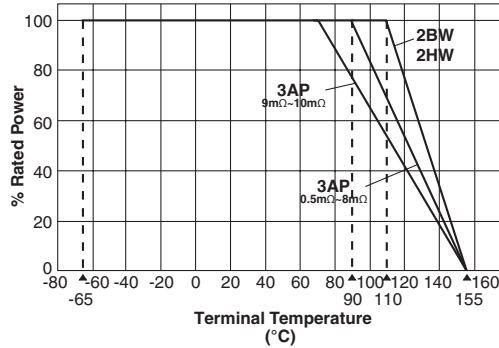
	Size Code	Resistance	Dimensions inches (mm)			
			L	W	d	t
	TLR3A	1mΩ	.25±.01 (6.35±0.25)	.125±.01 (3.18±0.25)	.087±.01 (2.20±0.25)	.024±.01 (0.62±0.25)
		2mΩ			.047±.01 (1.20±0.25)	
		3mΩ			.073±.01 (1.85±0.25)	
		4mΩ			.047±.01 (1.20±0.25)	
	TLR3AW	0.5mΩ	.25±.01 (6.35±0.25)	.125±.01 (3.18±0.25)	.107±.01 (2.725±0.25)	.024±.01 (0.60±0.25)
		1mΩ, 1.5mΩ, 2mΩ, 3mΩ, 4mΩ			.087±.01 (2.20±0.25)	
		5mΩ, 6mΩ, 7mΩ, 8mΩ			.047±.01 (1.20±0.25)	
		9mΩ, 10mΩ			.030±.01 (0.77±0.25)	
NEW	TLR3AP	0.5m	.25±.01 (6.35±0.25)	.125±.01 (3.18±0.25)	.107±.01 (2.725±0.25)	.024±.01 (0.60±0.25)
		0.68m, 0.82m			.105±.01 (2.675±0.25)	
		1m, 1.5m, 3m, 4m			.087±.01 (2.20±0.25)	
		2m			.098±.01 (2.50±0.25)	
		5m, 6m, 7m, 8m			.047±.01 (1.20±0.25)	
		9m, 10m	.030±.01 (0.77±0.25)			

5. Derating Curve

Ambient Temperature - TLR2B/2H/3A/3AW



Terminal Temperature - TLR2BW/2HW/3AP

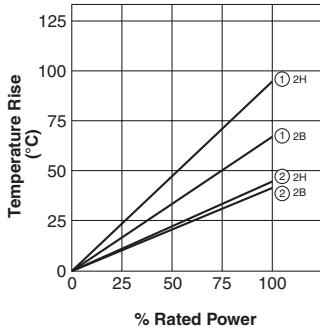


For resistors operated at an ambient temperature of 70°C or above, a power rating shall be derated in accordance with the above derating curve.

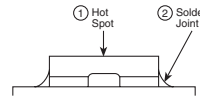
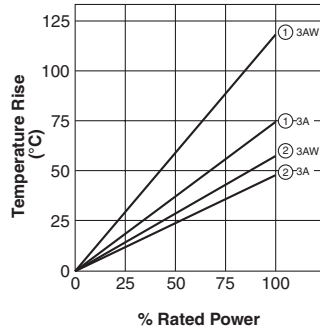
6. Temperature Rise

Temperature Rise

TLR2B/2H 8mΩ



TLR3A/3AW 4mΩ

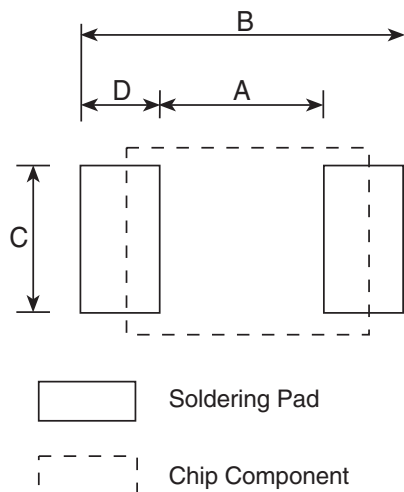


Regarding the temperature rise, the value of the temperature varies per conditions and board for use since the temperature is measured under our measuring conditions.

7. 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/+100°C
Resistance to Solder Heat	$\pm 0.5\%$	$\pm 0.3\%$	260°C $\pm 5^\circ\text{C}$, 10 ~ 12 seconds
Rapid Change of Temperature	$\pm 0.5\%$	$\pm 0.4\%$	-55°C (15 minutes), +150°C (15 minutes), 1000 cycles
Moisture Resistance	$\pm 0.5\%$	$\pm 0.1\%$	MIL-STD-202, Method 106, 0% power, 7a and 7b not required
Biased Humidity	$\pm 0.5\%$	$\pm 0.1\%$	85°C $\pm 2^\circ\text{C}$, 85% RH, 1000 hours, 10% bias; 2BW: maintain in -65°C+3°C for 24 hrs
Endurance (Ambient Temp.)	$\pm 1.0\%$	$\pm 0.3\%$	70°C $\pm 2^\circ\text{C}$, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
Endurance (Terminal Temp.)	$\pm 1.0\%$	$\pm 0.3\%$	120°C (TLR2BW/2HW), 110°C (3AP 0.5m-8mΩ), 90°C (3AP) 9m-10mΩ, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
High Temperature Exposure	$\pm 1.0\%$	$\pm 0.6\%$	$\pm 155^\circ\text{C}$ (2B, 2BW, 2H, 3AW, 3AP), $\pm 170^\circ\text{C}$ (3A), 1000 hours

8. Solder Pad Dimensions

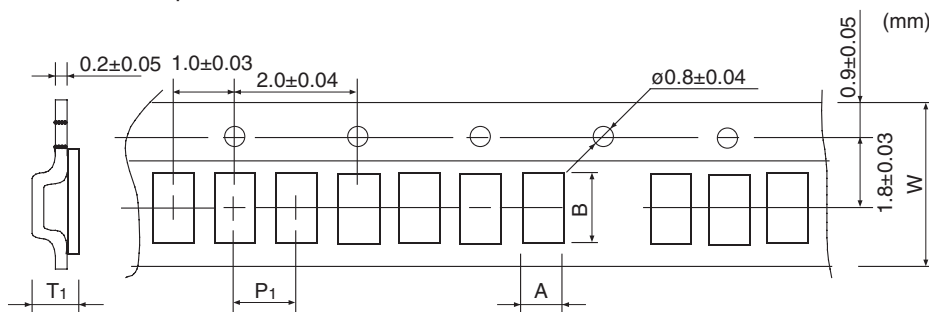


Type	Style	Dimensions millimeters				
		Component Size	A	B	C	D
TLR	1E	1.0 X 0.5	0.2	1.3	0.6	0.55
	2A	2.0 X 1.25	0.5	2.5	1.3	1.0
	2BN, 2B	3.2 X 1.6	1.4	4.0	1.8	1.3
	2H(1mΩ)	5.0 X 2.5	1.0	6.1	3.0	2.55
	2H (2mΩ-6mΩ)	5.0 X 2.5	1.3	6.1	3.0	2.4
	2H (7mΩ-10mΩ)	5.0 X 2.5	3.3	6.1	3.0	1.4
	3A(1mΩ)	6.35 X 3.18	1.45	7.55	3.83	3.05
	3A(2mΩ)	6.35 X 3.18	3.45	7.55	3.83	2.05
	3A(3mΩ)	6.35 X 3.18	2.45	7.55	3.83	2.70
	3A(4mΩ)	6.35 X 3.18	3.45	7.55	3.83	2.05
	3AW (1mΩ-4mΩ)	6.35 X 3.18	1.45	7.55	3.83	3.05
	3AW (5mΩ-8mΩ)	6.35 X 3.18	3.45	7.55	3.83	2.05
	3AW (9mΩ-10mΩ)	6.35 X 3.18	4.40	7.55	3.83	1.575

9. Packaging

9.1 Dimensions of Carrier Tape

● Carrier Tape: TX



Type	Component Size (mm)			Carrier Tape	Quantity/ Reel (Pieces)	Taping (mm)					Reel Size	
	L	W	T			A	B	W	P1	T1		
TLR	1E	1.0	0.5	0.25	TP	10000	1.15±0.05	0.65±0.05	8	2	0.40±0.1	178
	1J	1.6	0.8	0.45	TD	5000	1.10±0.1	1.9	8	4	0.6±0.05	178
	2A	2.0	1.25	0.25	TD	5000	2.4±0.1	1.65±0.1	8	4	0.42+0.02/-0	178
	3A, 3AW	6.4	3.2	0.6	TE	2000	3.55±0.1	6.75±0.2	12.0±0.1	8.0±0.2	1.0±0.1	180
	2B, 2BN	3.2	1.6	0.6	TD	5000	2.0±0.2	3.5±0.2	8.0±0.2	4.0±0.1	0.75+0.2/-0	180
	2H	5.0	2.5	0.6	TE	4000	2.9±0.1	5.35±0.2	12.0±0.1	4.0±0.1	1.0±0.15	180