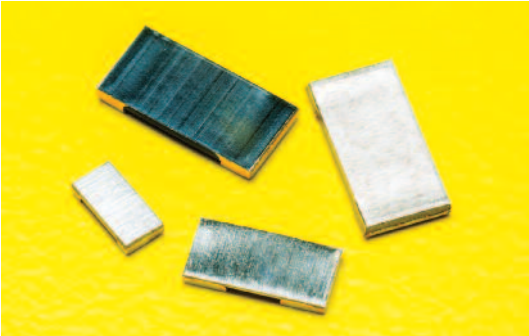
KOA SPEER ELECTRONICS, INC.

TLR-2BW, 2BP, 2HW, 3AP, 3APS

metal plate current sense resistor

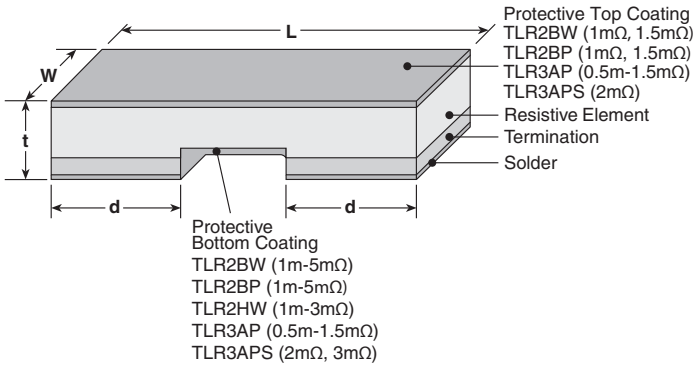
EU RoHS COMPLIANT



features

- Ultra-low TCR (+50ppm/°C) available
- Metal alloy: superior corrosion and heat resistance
- Applications include current sensing, voltage division and pulse applications
- Ultra low resistance (0.5mΩ - 20mΩ)
- Suitable for reflow soldering (Not suitable for flow soldering)
- Products with lead-free terminations meet EU RoHS and China RoHS requirements
- AEC-Q200 Qualified

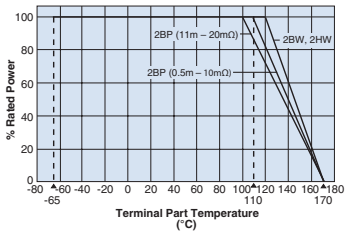
dimensions and construction



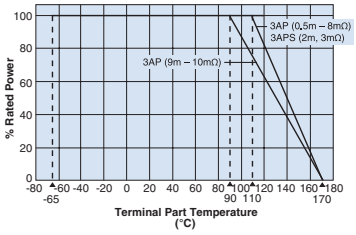
Size Code	Resistance	Dimensions inches (mm) L	W	d	t
TLR2BW	**New** 0.5mΩ	.126±.008 (3.20±0.20)	.063±.008 (1.60±0.20)	.049±.008 (1.25±0.20)	.028±.008 (0.70±0.20)
	1mΩ **New** 1.5mΩ			.043±.008 (1.10±0.20)	.024±.008 (0.60±0.20)
	2mΩ - 20mΩ			.020±.008 (0.50±0.20)	
TLR2BP	**New** 0.5mΩ	.126±.008 (3.20±0.20)	.063±.008 (1.60±0.20)	.049±.008 (1.25±0.20)	.028±.008 (0.70±0.20)
	1mΩ, 1.5mΩ			.043±.008 (1.10±0.20)	.024±.008 (0.60±0.20)
	2mΩ - 20mΩ			.020±.008 (0.50±0.20)	
TLR2HW	**New** 0.5mΩ	.200±.008 (5.00±0.20)	.100±.008 (2.50±0.20)	.075±.008 (1.90±0.20)	.028±.008 (0.70±0.20)
	1mΩ			.071±.008 (1.80±0.20)	.026±.008 (0.65±0.20)
	2mΩ - 6mΩ			.060±.008 (1.50±0.20)	.024±.008 (0.60±0.20)
	7mΩ - 10mΩ			.020±.008 (0.50±0.20)	
TLR3AP	0.5mΩ	.25±.01 (6.35±0.25)	.125±.01 (3.18±0.25)	.107±.01 (2.725±0.25)	.024±.01 (0.62±0.25)
	0.68mΩ, 0.75mΩ, 0.82mΩ			.105±.01 (2.675±0.25)	
	1mΩ, 1.5mΩ, 3mΩ, 4mΩ			.087±.01 (2.20±0.25)	
	2mΩ			.098±.01 (2.50±0.25)	
	5mΩ, 6mΩ, 7mΩ, 8mΩ			.047±.01 (1.20±0.25)	
	9mΩ, 10mΩ			.030±.01 (0.77±0.25)	
TLR3APS	2mΩ, 3mΩ	.25±.01 (6.35±0.25)	.125±.01 (3.18±0.25)	.047±.01 (1.20±0.25)	.024±.01 (0.60±0.25)

Derating Curve

TLR2BW, TLR2BP, TLR2HW



TLR3AP, TLR3APS



For resistors operated at a terminal part temperature of described for each size or above, a power rating shall be derated in accordance with the derating curve.

Please refer to "Introduction of the derating curve based in the terminal part temperature" in the beginning of our catalog before use.

ordering information

TLR	2BW	D	TD	10L0	F	75
Type	**Power Rating**	**Termination Material**	**Packaging**	**Nominal Resistance**	**Tolerance**	**T.C.R.**
	2BW: 1W 2BP: 1.5W 2HW: 2W 3AP: 3W, 5W (**New**) 3APS: 3W	D: SnAgCu	TD: 7" 4mm pitch punched paper TE: 7" 4mm embossed plastic	±1%: 4 digits All values less than 0.1Ω (100m) are expressed in mW with "L" as decimal Ex: 2mΩ = 2L00	F: ±1%	50: 50ppm/°C 75: 75ppm/°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. 11/22/19

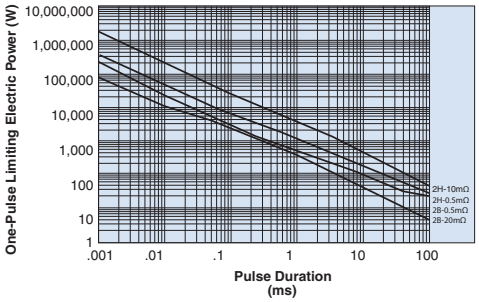
applications and ratings

Part Designation	Power Rating	T.C.R. (ppm/°C) Max.**	Standard Resistance (Ω)	Resistance Tolerance	Rated Terminal Part Temperature	Operating Temperature Range
TLR2BW	1W	±50	2m,3m,4m,5m,6m,7m,8m, 9m,10m,11m,12m,13m, 15m,16m,18m,20m	F: ±1%	+120°C and less	-65°C to +170°C
		±75	0.5m,1m,1.5m,2m,3m,4m,5m, 6m,7m,8m,9m,10m,11m,12m, 13m,15m,16m,18m,20m			
TLR2BP	1.5W	±50	2m,3m,4m,5m,6m,7m,8m,9m,10m	F: ±1%	+110°C and less	-65°C to +170°C
			11m,12m,13m,15m,16m,18m,20m		+100°C and less	
		±75	0.5m,1m,1.5m,2m,3m,4m, 5m,6m,7m,8m,9m,10m		+110°C and less	
			11m,12m,13m,15m,16m,18m,20m		+100°C and less	
TLR2HW	2W	±50	0.5m,1m,2m,2.5m,3m,4m,5m,6 m,7m,8m,9m,10m	F: ±1%	+120°C and less	-65°C to +170°C
		±75				
TLR3AP	3W	±50	2m,3m,4m,5m 6m,7m,8m,9m,10m	F: ±1%	0.5m ~ 8m: +110°C and less	-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		9m, 10m: +90°C and less	
	5W (**New**)	±50	2m,3m,4m	F: ±1%	+110°C and less	-65°C to +170°C
		±75	1m,2m,3m,4m			
TLR3APS	3W	±50, ±75	2m,3m	F: ±1%	+110°C and less	-65°C to +170°C

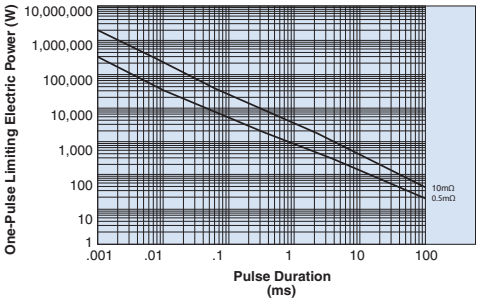
environmental applications

One-Pulse Limiting Electric Power

TLR2BW/2BP, TLR2HW



TLR3AW/3AP



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

Please ask us about the resistance characteristic of continuous applied pulse.

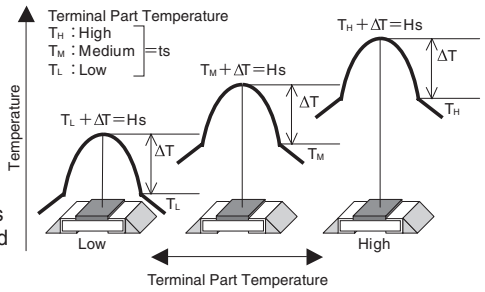
The pulse endurance values are not assured values, so be sure to check the products on actual equipment when you use them.

Thermal Resistance

Type	Size	Resistance (Ω)	Rth (°C/W)
TLR	2BW	0.5m	7.2
		20m	116
	2HW	0.5m	9
		10m	61.1
	3AP	0.5m	6
		10m	62

Rth=(Hs-ts)/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 ⊿T from the standard terminal part temperature regardlless 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 ⊿ R ±% Limit	Typical	Test Method
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 ± 2 seconds
Rapid Change of Temperature	±0.5%	±0.3%	-55°C (15 minutes), +150°C (15 minutes), 1000 cycles
Moisture Resistance	±0.5%	±0.1%	MIL-STD-202-106, 0% power, 7a and 7b not required
Biased Humidity	±0.5%	±0.1%	85°C ± 2°C, 85% RH, 1000 hours, 10% bias
Endurance of Rated Terminal Part Temperature	±1.0%	±0.3%	120°C ± 2°C (2BW, 2HW), 110°C ± 2°C (3AP 0.5mΩ~8mΩ) 90°C ± 2°C (3AP 9mΩ~10mΩ), 110°C±2°C (2BP 1mΩ-10mΩ) 100°C±2°C (2BP 11mΩ-20mΩ), 110°C±2°C (3APS 2mΩ, 3mΩ) 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
High Temperature Exposure	±1.0%	±0.6%	±155°C, 1000 hours
	±2.0%	±0.8%	±170°C, 1000 hours

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