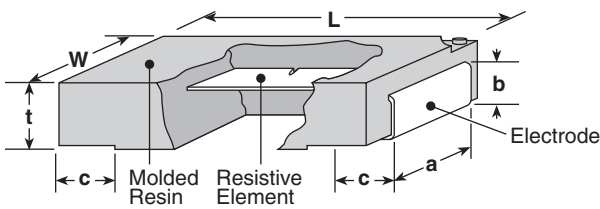


### features

- Surface mount type
- Flameproof UL94V0 molded polymer case
- Excellent dimension accuracy, mountability and shock resistance
- Low profile type available (TSL)
- Products with lead-free terminations meet EU RoHS requirements. EU RoHS regulation is not intended for Pb-glass contained in electrode, resistor element and glass.
- AEC-Q200 Qualified

### dimensions and construction



Size Code	Dimensions inches (mm)					
	L	W	t	a	b	c
<b>SL07 (2010)</b>	.197±.012 (5.0±0.3)	.098±.008 (2.5±0.2)	.067±.008 (1.7±0.2)	.079±.008 (2.0±0.2)	.047±.008 (0.9±0.2)	.035±.012 (1.2±0.3)
<b>TSL1 (2512)</b>	.248±.012 (6.3±0.3)	.122±.008 (3.1±0.2)	.039±.008 (1.0±0.2)	.094±.008 (2.4±0.2)	.028±.008 (0.7±0.2)	.047±.012 (1.2±0.3)
<b>SL1,SLZ1 (2512)</b>	.248±.012 (6.3±0.3)	.122±.008 (3.1±0.2)	.075±.008 (1.9±0.2)	.094±.008 (2.4±0.2)	.047±.008 (1.2±0.2)	.047±.012 (1.2±0.3)
<b>SL2 (4527)</b>	.453±.012 (11.5±0.3)	.276±.008 (7.0±0.2)	.098±.008 (2.5±0.2)	.197±.008 (5.0±0.2)	.067±.008 (1.7±0.2)	.102±.02 (2.6±0.5)
<b>SLN2 (4527)</b>	.453±.012 (11.5±0.3)	.276±.008 (7.0±0.2)	.094±.008 (2.4±0.2)	.217±.008 (5.5±0.2)	.063±.008 (1.6±0.2)	.100±.016 (2.55±0.4)
<b>SL3 (4527)</b>	.453±.012 (11.5±0.3)	.276±.008 (7.0±0.2)	.098±.008 (2.5±0.2)	.197±.008 (5.0±0.2)	.067±.008 (1.7±0.2)	.102±.02 (2.6±0.5)

### ordering information

SL	1	T	TE	10L0	F	75
Type	Power Rating	Termination Material	Packaging	Nominal Resistance	Tolerance	T.C.R. (x10 <sup>-4</sup> /K)
TSL SL SLN SLZ	07: 0.75W 1: 1W 2: 2W 3: 3W	T: Sn L: Sn/Pb*	TE: 7" embossed plastic For further information on packaging please refer to Appendix A	±0.5%, ±1%: 4 digits ±2%, ±5%: 3 digits All values less than 0.1Ω (100m) are expressed in mΩ with "L" as decimal Ex: 2mΩ = 2L00 0.1Ω: R100; 5mΩ: 5L0	D: ±0.5% F: ±1% G: ±2% J: ±5%	Nil: 0-150 0-200 ±75 (SLN2) ±100 ±110 ±180 50: ±50 (SL1) 75: ±75 (SL1)

\* SL07 and SLN2, only the symbol T is available as the terminal surface material

### applications and ratings

Part Designation	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temperature	Resistance Range ( $\Omega$ )*				T.C.R. (ppm/ $^{\circ}$ C) Max.	Operating Temp. Range
				D: $\pm 0.5\%$ E24, E96***	F: $\pm 1\%$ E24, E96***	G: $\pm 2\%$ E24	J: $\pm 5\%$ E24		
SL07	0.75W	70 $^{\circ}$ C	125 $^{\circ}$ C	—	5m - 100m	—	5m - 100m	0~200: R<11m $\Omega$ 0~150: R=>11m $\Omega$	-55 $^{\circ}$ C to +180 $^{\circ}$ C
TSL1	1W		125 $^{\circ}$ C	10m - 100m	5m - 100m	—	5m - 100m	$\pm 180$ : R<15m $\Omega$ $\pm 100$ : R=>15m $\Omega$	
SL1	1W		125 $^{\circ}$ C	10m - 102m	5m - 102m	3m, 4m	5m - 100m	$\pm 180$ : R<15m $\Omega$ $\pm 100$ : R=>15m $\Omega$	
SL1 (TCR $\pm 50$ ppm)	1W		125 $^{\circ}$ C	34.8m - 200m	34.8m - 200m	—	36m - 200m	$\pm 50$ ppm	
SL1 (TCR $\pm 75$ ppm)	1W		125 $^{\circ}$ C	20m - 200m	20m - 200m	—	20m - 200m	$\pm 75$ ppm	
SL2	2W		125 $^{\circ}$ C	10m ~ 360m	5m ~ 360m	3m, 4m	3m ~ 360m	$\pm 180$ : R<11m $\Omega$ $\pm 100$ : R=>11m $\Omega$	
SLN2	2W		105 $^{\circ}$ C	5m - 200m	5m - 200m	—	5m - 200m	$\pm 110$ : R<10m $\Omega$ $\pm 75$ : R=>10m $\Omega$	
SL3	3W		125 $^{\circ}$ C: R $\leq$ 100m $\Omega$ 90 $^{\circ}$ C: R $\geq$ 110m $\Omega$	10m $\Omega$ - 100m $\Omega$	5m $\Omega$ - 100m $\Omega$	—	5m $\Omega$ - 100m $\Omega$	$\pm 180$ : R $\leq$ 10m $\Omega$ $\pm 100$ : R=>11m $\Omega$	
SLZ1**	—		—	—	0.5m $\Omega$ Max.	0.5m $\Omega$ Max.	0.5m $\Omega$ Max.	0.5m $\Omega$ Max.	

\* 3m, 4m, 5m, 6m, 7m, 8m, 9m also available inside each resistance range

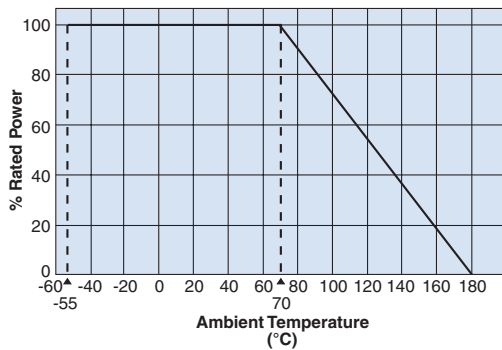
\*\* SLZ1: Current rating: 44A

\*\*\* SL07 and SL1 (T.C.R.:  $\pm 50/\pm 75$  ppm, 102m $\Omega$ =<R=<200m $\Omega$ ) offer only E24 series

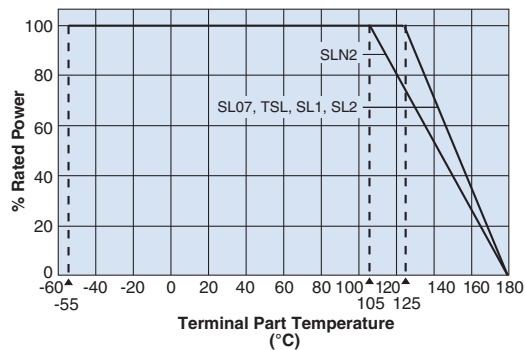
If any questions should arise whether to use the "Rated Ambient Temperature" or the "Rated Terminal Part Temperature," please give priority to the "Rated Terminal Part Temperature." Prior to use and for more details refer to "Introduction of the derating curves on the terminal part temperature" in the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

### environmental applications

#### Derating Curve



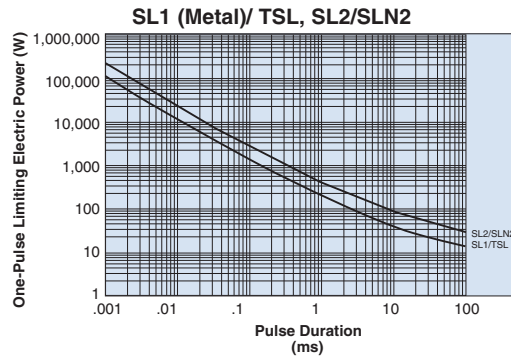
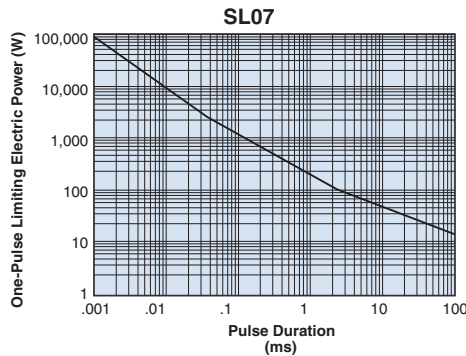
For resistors operated at an ambient temperature of 70 $^{\circ}$ C or above, a power rating shall be derated in accordance with the above derating curve.



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 on the terminal part temperature" in the beginning of our catalog before use.

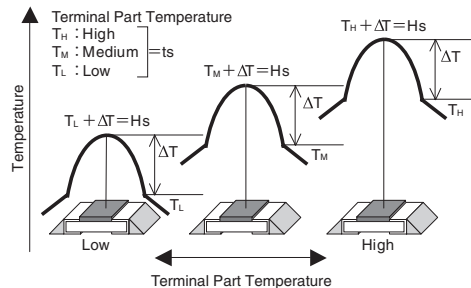
### One-Pulse Limiting Electric Power



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	Resistance (Ω)	Rth (°C/W)
SL07	5m	26
	22m	48
	100m	78
SL1 TSL	5m	16
	20m	39
	100m	59
SL2	5m	16
	20m	41
	200m	55
SLN2	5m	19
	11m	24
	200m	46



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.

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

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.

### Performance Characteristics

Parameter	Requirement $\Delta R$ $\pm\%$		Test Method
	Limit	Typical	
Resistance	Within specified tolerance	—	25°C
T.C.R.	Within specified T.C.R.	—	+25°C/+125°C
Overload (Short time)	$\pm 1\%$ : SL07, TSL1, SL1, SL2, SL3 $\pm 0.5\%$ : SLN2	$\pm 1\%$ : SL07, TSL1, SL1, SL2, SL3 $\pm 0.25\%$ : SLN2	SL07: Rated power x 4 for 5 seconds, TSL1: Rated power x 2.5 for 5 seconds, SL1, SL2, SLN2, SL3: Rated power x 5 for 5 seconds, SL1 (T.C.R.: +50/+75): Rated power x4 for 5 seconds
Resistance to Solder Heat	$\pm 1\%$ : SL07, TSL1, SL1, SL2, SL3	$\pm 1\%$ : SL07, TSL1, SL1, SL2, SL3	260°C $\pm$ 5°C, 10 $\pm$ 1 second
	$\pm 0.5\%$ : SLN2	$\pm 0.5\%$ : SLN2	260°C $\pm$ 5°C, 10~12 seconds
Rapid Change of Temperature	$\pm 1\%$ : SL07, TSL1, SL1, SL2, SL3	$\pm 0.5\%$ : SL07, TSL1, SL1, SL2, SL3	-55°C (30 minutes), +150°C (30 minutes), 100 cycles
	$\pm 0.5\%$ : SLN2	$\pm 0.25\%$ : SLN2	-55°C (15 minutes), +150°C (15 minutes), 1000 cycles
Moisture Resistance	$\pm 2\%$ : SL07, TSL1, SL1, SL2, SL3	$\pm 0.5\%$ : SL07, TSL1, SL1, SL2, SL3	40°C $\pm$ 2°C, 90%~95%RH, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
	$\pm 0.5\%$ : SLN2	$\pm 0.25\%$ : SLN2	85°C $\pm$ 2°C, 85% $\pm$ 3%RH, 1000 hours, Rated power x 0.1
Endurance at 70°C	$\pm 2\%$ : SL07, TSL1, SL1, SL2, SL3 $\pm 1\%$ : SLN2	$\pm 1\%$	70°C $\pm$ 2°C, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
Low Temperature Exposure	$\pm 0.5\%$	$\pm 0.25\%$	SL07, TSL1, SL1, SL2, SL3: -55°C, 1 hour; SLN2: -65°C, 24 hours

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