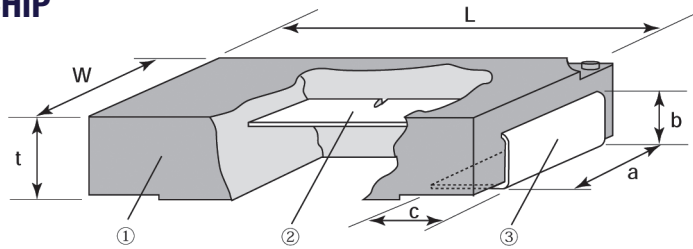


# METAL PLATE / THICK FILM

## CURRENT SENSING CHIP

### HIGH TEMPERATURE

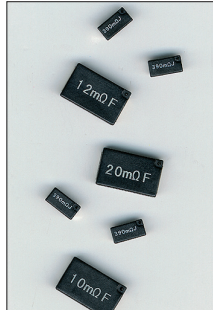
### SL • SLN • TSL



### STRUCTURE

- 1 Mold resin
- 2 Resistive element\*
- 3 Electrode

\* SL1: for R > 102 mΩ an internal thick film resistor is used  
SL2: for R > 360 mΩ an internal thick film resistor is used



### IDENTIFICATION

TYPE	COATING COLOR	MARKING
SL, SLN, TSL	Black	White (resistance and tolerance)

Products with Pb-free terminations meet EU-RoHS requirements

### TYPE DESIGNATION (HOW TO ORDER)

SL	1	T	TE	5L00	F	Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS
PRODUCT CODE SL, SLN TSL	POWER RATING 07 = 0.75 W 1W, 2W, 3W	TERMINATION SURFACE MATERIAL T: Sn (L: Sn/Pb)	TAPING* TE, BK <small>*Please see "PACKAGING"</small>	NOMINAL RESISTANCE D, F: 4 digits G, J: 3 digits	TOLERANCE D: (±0.5%) F: (±1%) G: (±2%) J: (±5%)	

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

### FEATURES

- Current detecting resistors with ultra low resistance (3mΩ...) and high accuracy (±0.5%)
- Excellent terminal strength and solderability due to structure of a metal plate terminal electrode
- Non-wirewound structure and excellent frequency characteristics
- Excellent dimension accuracy, mountability and shock resistance due to molding
- Easily absorbs thermal expansion and shrinkage because of metal plate terminal structure
- Encapsulated with flame retardant resin molding (UL94 V-0)
- For high ohmic values (up to 22MΩ) an internal thick film resistor is used
- TSL-series is the low profile version
- Ideal for current detection in notebooks, battery packs, AC adapters, DC/DC converters etc.
- TSL1, SL1 and SL2 are tested according to AEC-Q200 requirements
- Meets or exceeds IEC 60115-1, JIS C 5201-1
- Rated ambient temperature: +70°C
- Operating temperature range: -55°C...+180°C
- Suitable for reflow, wave and iron soldering

### DIMENSIONS (mm)

TYPE	L ±0.3	W ±0.2	t ±0.2	a ±0.2	b ±0.2	c
SL07	5.0	2.5	1.7	2.0	0.9	1.2 ± 0.3
TSL1	6.3	3.1	1.0	2.4	0.7	1.2 ± 0.3
SL(Z)1	6.3	3.1	1.9	2.4	1.2	1.2 ± 0.3
SL2	11.5	7.0	2.5	5.0	1.7	2.6 ± 0.5
SLN2	11.5	7.0	2.4	5.5	1.6	2.55 ± 0.4
SL3	11.5	7.0	2.5	5.0	1.7	2.6 ± 0.5
SLN3	11.5	7.0	2.4	5.5	1.6	2.55 ± 0.4

### RATING

SIZE	TYPE	T.C.R. (ppm/K)	POWER* RATING	MAX. WORKING VOLTAGE	MAX. OVERLOAD VOLTAGE	RESISTANCE RANGE**			
						D (±0.5%) E24 • E96***	F (±1%) E24 • E96	G (±2%) E24	J (±5%) E24
2010	SL07	0 ~ +200 0 ~ +150	0.75 W	$\sqrt{P \cdot R}$	$\sqrt{P \cdot R}$	-	5 mΩ...10 mΩ*** 11 mΩ...100 mΩ***	-	5 mΩ...10 mΩ 11 mΩ...100 mΩ
2512	TSL1 SL1	± 180 (R ≤ 13 mΩ) ± 100 (R ≥ 15 mΩ)	1 W	200 V	400 V	10 mΩ...1 MΩ	5 mΩ...1 MΩ	-	5 mΩ...100 mΩ 3 mΩ...22 MΩ
4528	SL2	± 180 (R ≤ 10 mΩ) ± 100 (R ≥ 11 mΩ)	2 W	500 V	1000 V	10 mΩ...1 MΩ	5 mΩ...1 MΩ	3 mΩ, 4 mΩ	3 mΩ...22 MΩ
4528	SLN2	± 110 (R < 10 mΩ) ± 75 (R ≥ 10 mΩ)	2 W	$\sqrt{P \cdot R}$	$\sqrt{P \cdot R}$	5 mΩ...200 mΩ	5 mΩ...200 mΩ	-	5 mΩ...200 mΩ
4528	SL3	± 180 (R ≤ 10 mΩ) ± 100 (R ≥ 11 mΩ)	3 W	$\sqrt{P \cdot R}$	$\sqrt{P \cdot R}$	10 mΩ...100 mΩ	5 mΩ...100 mΩ	-	5 mΩ...100 mΩ
4528	SLN3	± 110 (R < 10 mΩ) ± 75 (R ≥ 10 mΩ)	3 W	$\sqrt{P \cdot R}$	$\sqrt{P \cdot R}$	5 mΩ...110 mΩ	5 mΩ...110 mΩ	-	5 mΩ...110 mΩ

\* For resistors operated at an ambient temperature of +70°C or above, the power rating shall be derated in accordance with the "DERATING CURVE".  
Rated voltage =  $\sqrt{\text{Power rating} \times \text{resistance value}}$  or max. working voltage, whichever is lower.

\*\* Within the mentioned ranges, the following ohmic values are also available: 3mΩ, 4mΩ, 5mΩ, 6mΩ, 7mΩ, 8mΩ, 9mΩ.

\*\*\* E-96 values upon request.

Please confirm recommended land pattern with KOA and please contact KOA for further performance characteristics and order the technical specification for this product before you order and use this series.

#### Precautions:

In case of using these low ohm resistors as shunt resistors, please lay out a pattern considering the electromagnetic induction with surrounding inductors.  
In the resistance values of 50 mΩ or under, 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.

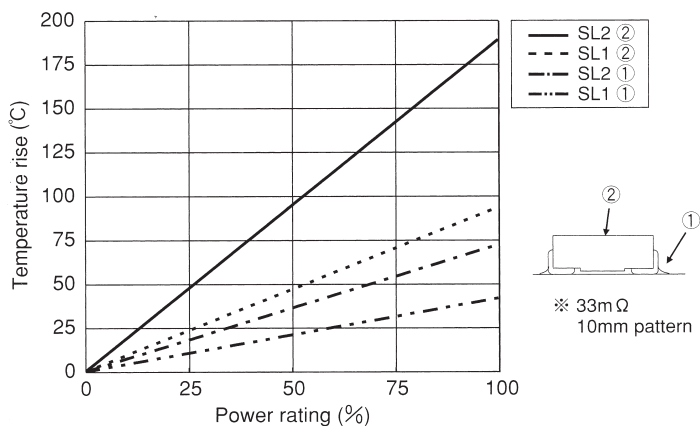
**PREFERRED TOLERANCES**

Contact our sales representatives before you use our products for applications including automobiles, medical equipment and aerospace equipment. Malfunction or failure of the products in such applications may cause loss of human life or serious damage.

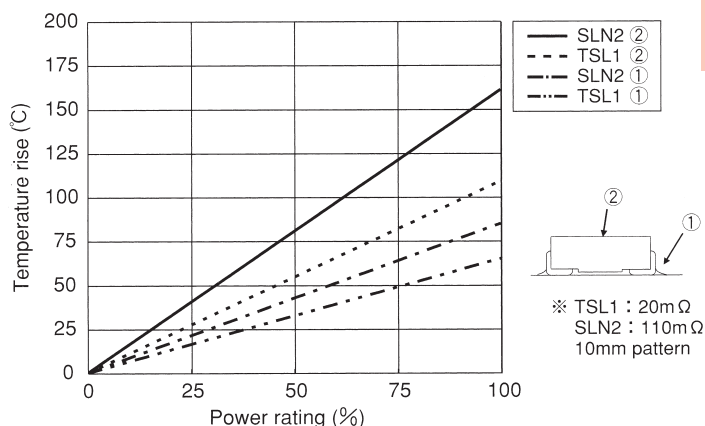
## METAL PLATE / THICK FILM CURRENT SENSING CHIP HIGH TEMPERATURE SL • SLN • TSL

### TEMPERATURE RISE

#### SL1 / SL2

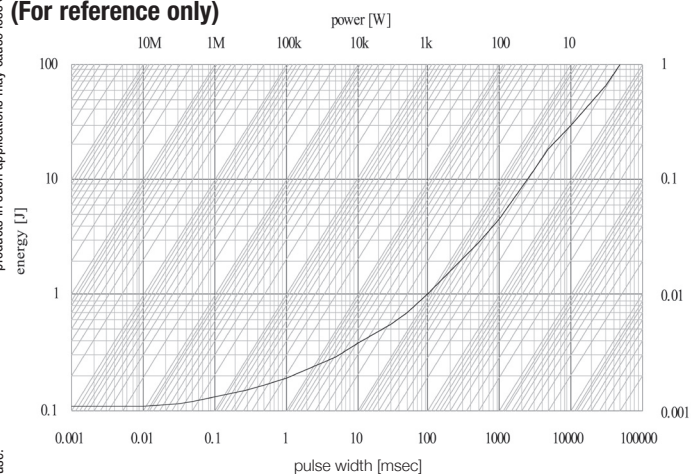


#### TSL1 / SLN2



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.

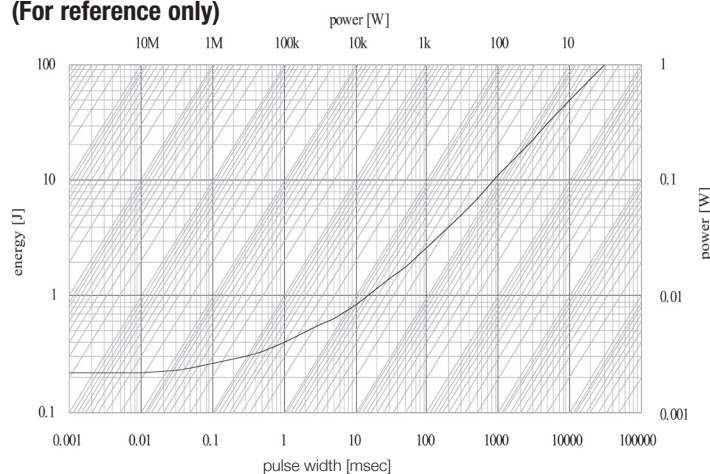
#### ONE PULSE LIMIT SL1 (For reference only)



This curve shows the minimum pulse power of the SL1 in the ohmic range 3mΩ ... 100 mΩ\*

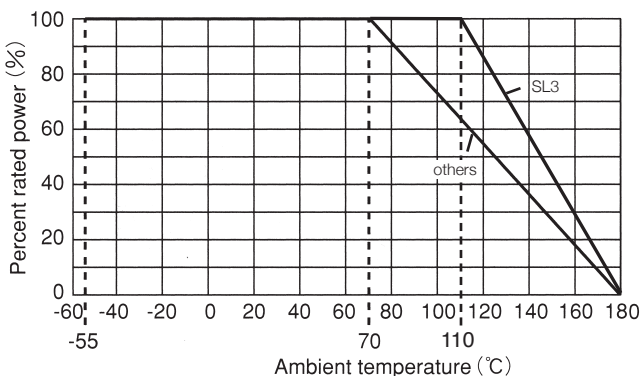
\* Please contact KOA Europe for pulse power curves of specific ohmic values or if any further information is required.

#### ONE PULSE LIMIT SL2 (For reference only)



This curve shows the minimum pulse power of the SL2 in the ohmic range 3mΩ ... 360 mΩ\*

#### DERATING CURVE



#### JUMPER RATINGS

TYPE	CURRENT RATING	RESISTANCE	T.C.R. (ppm/K)
<b>NEW</b> SLZ 1	44 A	0.5 mΩ max.	±4000 max.

#### TYPE DESIGNATION (HOW TO ORDER)

SLZ	1	T	TE
PRODUCT CODE SLZ: Jumper	STYLE 1	TERMINATION SURFACE MATERIAL T: Sn	TAPING* TE, BK

\*Please see "PACKAGING"

Contact our sales representatives before you use our products for applications including automobiles, medical equipment and aerospace equipment. Malfunction or failure of the products in such applications may cause loss of human life or serious damage.

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

LOW OHM