KOA SPEER ELECTRONICS, INC.

# SL, SLN, TSL

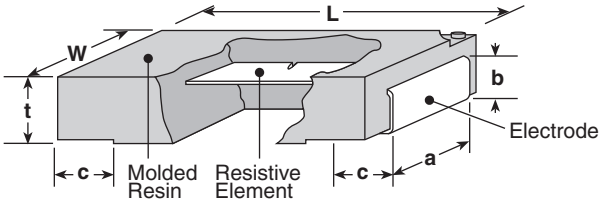
## surface mount molded current sense resistors

EU RoHS COMPLIANT

## features

- Surface mount type
- Flameproof UL94V0 molded polymer case
- Excellent dimension accuracy, mountability and shock resistance
- Low profile type available (TSL)
- Marking: Black body color with white marking or laser marking
- 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.

## dimensions and construction




| Size Code | Dimensions inches (mm) | | | | | |
|---|---|---|---|---|---|---|
| | L | W | t | a | b | c |
| SL07 | .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) |
| SL1/SLZ1 | .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) |
| SL2 | .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) |
| SLN2 | .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) |
| SL3 | .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) |
| TSL1 | .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) |

## ordering information

New Part #

| SL | 1 | T | TE | 20L0 | F |
|---|---|---|---|---|---|
| **Type** | **Size** | **Termination Material** | **Packaging** | **Nominal Resistance** | **Tolerance** |
| SL<br>SLN<br>SLZ<br>TSL | 07: 0.75W<br>1: 1W<br>2: 2W<br>3: 3W | T: Sn<br>(Other termination styles may be available, please contact factory for options) | SL07, SL1, SLZ1, TSL-<br>(TE: 7" embossed plastic)<br>SL2, SLN2, SL3-<br>TED: 10" embossed plastic<br>For further information on packaging please refer to Appendix A | ±2%, ±5%: 2 significant figures + 1 multiplier "R" indicates decimal on value <10Ω<br>±0.5%, ±1%: 3 significant figures + 1 multiplier "R" indicates decimal on value <100Ω<br>All values less than 0.1Ω (100mΩ) are expressed in mΩ with "L" as decimal<br>Example: 20mΩ, 1% = 20L0 | D: ±0.5%<br>F: ±1%<br>G: ±2%<br>J: ±5% |

## applications and ratings

| Part Designation | Power Rating | T.C.R. (ppm/°C) Max. | Resistance Range | Resistance Tolerance E-24* | Absolute Maximum Working Voltage | Absolute Maximum Overload Voltage | Operating Temperature Range |
|---|---|---|---|---|---|---|---|
| SL07 | 0.75W | 0~200: R=<10mΩ<br>0~150: R=>11mΩ | 5mΩ - 100mΩ | (F: ±1%)<br>(J: ±5%) | — | — | -55°C to +180°C |
| SL1 | 1W | ±180: R=<13mΩ<br>±100: R=>15mΩ | 10mΩ - 1MΩ | (D: ±0.5%) | 200V | 400V | |
| | | | 5mΩ - 1MΩ | (F: ±1%) | | | |
| | | | 3mΩ, 4mΩ | (G: ±2%) | | | |
| | | | 3mΩ ~ 22MΩ | (J: ±5%) | | | |

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

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## applications and ratings (cont.)

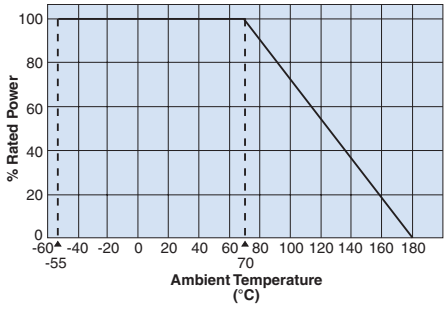
| Part Designation | Power Rating | T.C.R. (ppm/°C) Max. | Resistance Range | Resistance Tolerance E-24* | Absolute Maximum Working Voltage | Absolute Maximum Overload Voltage | Operating Temperature Range |
|---|---|---|---|---|---|---|---|
| SL2 | 2W | ±180: R=<10mΩ<br>±100: R=>11mΩ | 10mΩ - 1MΩ | (D: ±0.5%) | 500V | 1000V | -55°C to +180°C |
| | | | 5mΩ ~ 1MΩ | (F: ±1%) | | | |
| | | | 3mΩ, 4mΩ | (G: ±2%) | | | |
| | | | 3mΩ - 22MΩ | (J: ±5%) | | | |
| SLN2 | 2W | ±110: R<10mΩ<br>±75: R=>10mΩ | 5mΩ - 200mΩ | (D: ±0.5%)<br>(F: ±1%)<br>(J: ±5%) | — | — | |
| SL3 | 3W | ±180: R=<10mΩ<br>±100: R=>11mΩ | 10mΩ - 100mΩ | (D: ±0.5%) | — | — | |
| | | | 5mΩ - 100mΩ | (F: ±1%)<br>(J: ±5%) | | | |
| SLZ1** | — | 4000 Max. | 0.5mΩ Max. | — | — | — | |
| TSL1 | 1W | ±180: R=<13mΩ<br>±100: R=>15mΩ | 10mΩ - 100mΩ | (D: ±0.5%) | — | — | |
| | | | 5mΩ - 100mΩ | (F: ±1%)<br>(J: ±5%) | | | |

* 3m, 4m, 5m, 6m, 7m, 8m, 9m resistance values also available

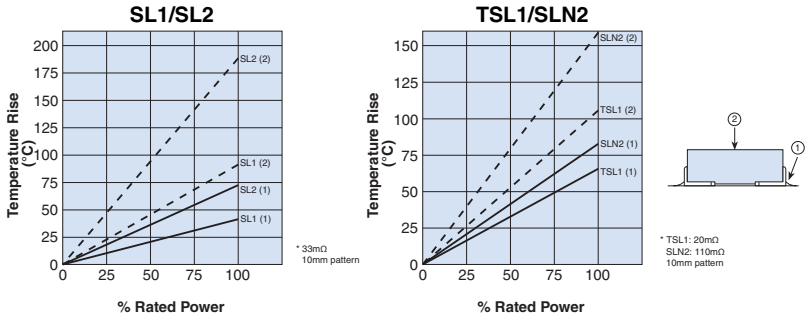
** SLZ1: Current rating: 44A

## environmental applications

### Derating Curve




### Surface Temperature Rise




### Performance Characteristics

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