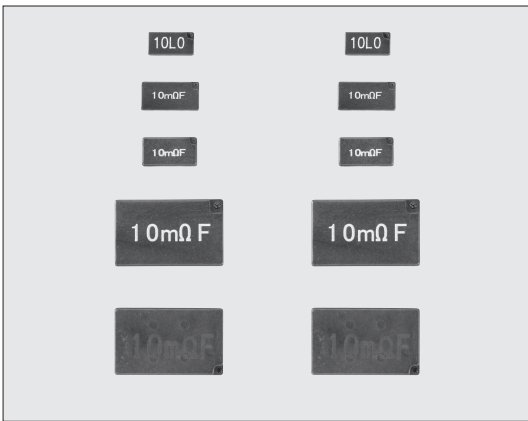


TSL • SL • SLN | 电流检测用片式电阻器 Current Detecting Chip Resistors

电流检测用片式电阻器
Current Detecting Chip Resistors



外观颜色: 黑色 Coating color: Black

■ 特点 Features

- 是小型、超低电阻值 ($3\text{m}\Omega \sim$)、高精度 ($\pm 0.5\%$)、SMD形状的电流检测用电阻器。
- 是难燃性树脂 (UL94 V-0) 模压密封型。
- 由于是模压成形, 尺寸精度高, 装裁性、耐冲击性好。
- 由于是金属端子电极, 端子强度、焊接性优异。
- 是金属板端子电极结构, 吸收热膨胀收缩。
- 对应波峰焊、回流焊、烙铁焊接。
- 端子无铅品, 对应欧盟RoHS。电极、电阻膜层、玻璃中所含铅玻璃, 不包含在欧盟RoHS指令中。
- SMD type of small size, ultra-low resistance ($3\text{m}\Omega \sim$) and high accuracy ($\pm 0.5\%$) resistor for current detection.
- Encapsulated with flame retardant resin molding. (UL94 V-0)
- Excellent dimension accuracy, mountability and shock-resistance due to molded products.
- Excellent terminal strength and solderability due to structure of a metal plate terminal electrode.
- Easy to absorb the thermal expansion and shrinkage because of a metal plate terminal structure.
- Suitable for flow, reflow and iron solderings.
- Products with lead free termination meet EU-RoHS requirements. EU-RoHS regulation is not intended for Pb-glass contained in electrode, resistor element and glass.

■ 用途 Applications

- 笔记本电脑 Note PCs
- 移动电脑 Mobile PCs
- 电池组 Battery packs
- AC适配器 AC Adapters
- DC-DC换流器 DC-DC converters, etc.

■ 额定值 Ratings

型号 Type	额定功率 Power Rating	电阻值范围 ^{※3} Resistance Range (Ω) (E24)				电阻温度系数 T.C.R. ($\times 10^{-6}/\text{K}$)	最高使用电压 Max. Working Voltage	最高过载电压 Max. Overload Voltage	额定环境温度 Rated Ambient Temp.	使用温度范围 Operating Temp. Range	编带和包装数/卷 Taping & Q'ty / Reel (pcs) TE
		D: $\pm 0.5\%$	F: $\pm 1\%$	G: $\pm 2\%$	J: $\pm 5\%$						
SL07	0.75W	-	5m~100m	-	5m~100m	0~200:R \leq 10m Ω 0~150:R \geq 11m Ω	-	-	+70 $^{\circ}\text{C}$	-55 $^{\circ}\text{C}$ ~ +180 $^{\circ}\text{C}$	2,000
TSL1	1W	10m~100m	5m~100m	-	5m~100m	± 180 :R \leq 13m Ω ± 100 :R \geq 15m Ω	-	-			3,000
SL1	1W	10m~1M	5m~1M	3m, 4m	3m~22M	± 180 :R \leq 10m Ω ± 100 :R \geq 11m Ω	200V	400V			1,000
SL2	2W	10m~1M	5m~1M	3m, 4m	3m~22M	± 180 :R \leq 10m Ω ± 100 :R \geq 11m Ω	500V	1,000V			
SLN2	2W	5m~200m	5m~200m	-	5m~200m	± 110 :R $<$ 10m Ω ± 75 :R \geq 10m Ω	-	-			

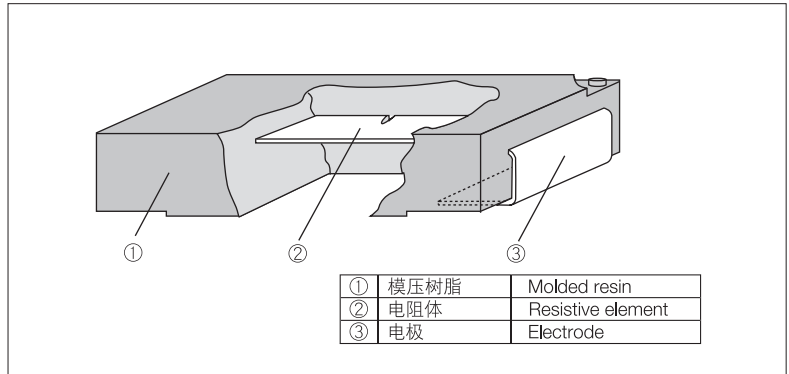
额定电压是 $\sqrt{\text{额定功率} \times \text{公称电阻值}}$ 所算出的值或表中最高使用电压两者中小值为额定电压。

Rated voltage = $\sqrt{\text{Power Rating} \times \text{Resistance value}}$ or Max. working voltage, whichever is lower.

※3在电阻值范围内, 3m、4m、5m、6m、7m、8m、9m Ω 都对应

※3 Available for 3m, 4m, 5m, 6m, 7m, 8m and 9m Ω inside each resistance range.

■ 结构图 Construction



■ 品名构成 Type Designation

实例 Example	品种 Product Code	额定功率 Power Rating	端子表面材质 Terminal Surface Material	二次加工 Taping	公称电阻值 Nominal Resistance	阻值允许偏差 Resistance Tolerance
TSL	SL	0.7:0.75W	T: Sn	TE: Plastic	D,F: 4 digits	D: $\pm 0.5\%$
SL	SL	1: 1W	(L: Sn/Pb ^{※2})	embossed	J,G: 3 digits	F: $\pm 1\%$
SLN	SLN	2: 2W		BK: Bulk	Ex. ^{※1}	G: $\pm 2\%$
					0.1 Ω :R10	J: $\pm 5\%$
					5m Ω :5L0	

※1	电阻值范围 (Ω) Resistance Value	3位显示 3 digits	电阻值范围 (Ω) Resistance Value	4位显示 4 digits
	3m~9.1m	3L0~9L1	5m~9.1m	5L00~9L10
	10m~91m	10L~91L	10m~91m	10L0~91L0
	0.1~0.91	R10~R91	0.1~0.91	R100~R910
	1~9.1	1R0~9R1	1~9.1	1R00~9R10

※2 对于SLN2, 端子表面材质只有T标记对应。

※2 With SLN2, only the symbol T is available as the terminal surface material.

端子表面材质, 以无铅品为准。

预知关于此产品含有的环境负荷物质详情 (除EU-RoHS以外), 请与我们联系。编带细节请参考卷末附录C。

The terminal surface material lead free is standard.

Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.

For further information on taping, please refer to APPENDIX C on the back pages.

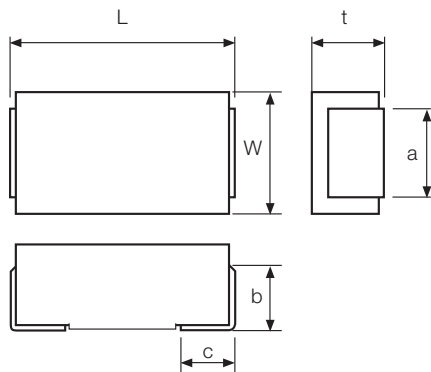
■ 参考标准 Reference Standards

- IEC 60115-1
- JIS C 5201-1

■ Jumper规格 Jumper Ratings

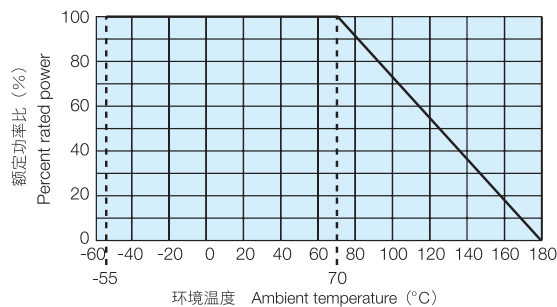
型号 Type	电阻值 Resistance	额定电流 Current Rating	电阻温度系数 T.C.R. ($\times 10^{-6}/\text{K}$)
SLZ1	0.5m Ω 以下 0.5m Ω max.	44A	4000以下 4000 max.

外形尺寸 Dimensions



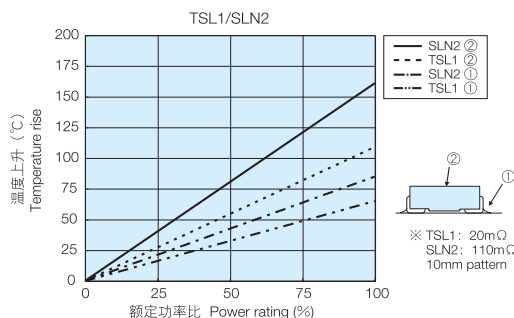
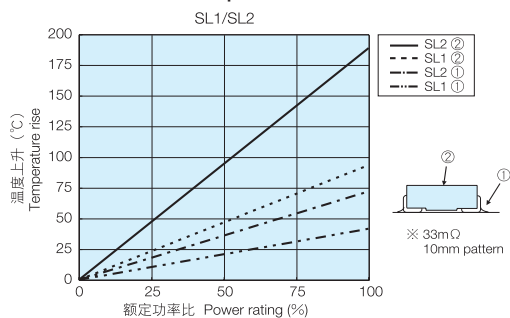
型号 Type	尺寸 Dimensions (mm)						Weight (g) (1000pcs)
	L±0.3	W±0.2	t±0.2	a±0.2	b±0.2	c	
SL07	5.0	2.5	1.7	2.0	0.9	1.2±0.3	45
TSL1	6.3	3.1	1.0	2.4	0.7	1.2±0.3	41
SL1	6.3	3.1	1.9	2.4	1.2	1.2±0.3	90
SL2	11.5	7.0	2.5	5.0	1.7	2.6±0.5	476
SLN2	11.5	7.0	2.4	5.5	1.6	2.55±0.4	500

负荷特性曲线 Derating Curve



在环境温度70℃以上使用时，应按照上图负荷特性曲线，减小额定功率。
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.

温度上升 Temperature Rise



表面温度上升，是以本公司测定条件测定的，由于使用状况、使用基板不同，数值也会有所不同，因此，在使用时请另行询问。

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.

性能 Performance

试验项目 Test Items	标准值 Performance Requirements ΔR±%		试验方法 Test Methods
	保证值 Limit	代表值 Typical	
电阻值 Resistance	在规定的允许偏差内 Within specified tolerance	-	25°C
电阻温度系数 T.C.R.	在规定的允许偏差内 Within specified T.C.R.	-	25°C/+125°C
过载 (短时间) Overload (Short time)	1: SL07, TSL1, SL1, SL2 0.5: SLN2	1: SL07, TSL1, SL1, SL2 0.25: SLN2	SL07: 额定功率×4倍施加5秒钟 Rated power×4 for 5s TSL1: 额定功率×2.5倍施加5秒钟 Rated power×2.5 for 5s SL1, SL2: 额定功率×5倍施加5秒钟 Rated power×5 for 5s
耐焊接热 Resistance to soldering heat	1: SL07, TSL1, SL1, SL2 0.5: SLN2	1: SL07, TSL1, SL1, SL2 0.5: SLN2	260°C±5°C, 10s±1s 260°C±5°C, 10s~12s
温度突变 Rapid change of temperature	1: SL07, TSL1, SL1, SL2 0.5: SLN2	0.5: SL07, TSL1, SL1, SL2 0.25: SLN2	-55°C (30min.) / +150°C (30min.) 100 cycles -55°C (15min.) / +150°C (15min.) 1000 cycles
耐湿负荷 Moisture resistance	2: SL07, TSL1, SL1, SL2 0.5: SLN2	0.5: SL07, TSL1, SL1, SL2 0.25: SLN2	40°C±2°C, 90%~95%RH, 1000h 1.5小时ON、0.5小时OFF的周期 1.5h ON/0.5h OFF cycle 85°C±2°C, 85%RH±3%RH, 1000h 额定功率×0.1倍 Rated power×0.1
在70℃时的耐久性 Endurance at 70°C	2: SL07, TSL1, SL1, SL2 1: SLN2	0.5	70°C±2°C, 1000h 1.5小时ON、0.5小时OFF的周期 1.5h ON/0.5h OFF cycle
低温放置 Low temperature exposure	0.5	0.25	SL07, TSL1, SL1, SL2: -55°C, 1h SLN2: -65°C, 24h

使用注意事项 Precautions for Use

- 作为分流电阻使用时，应考虑和周围线圈的电磁感应后配置模式。
- 在50 mΩ以下的电阻值，根据焊接区模式大小和接续焊接的量，焊接后的电阻值会变动。应在事前确认电阻值降低/提高的影响后，进行设备设计。
- In case of using the low ohm resistors as shunt resistors, please lay out a pattern considering the electromagnetic induction with surrounding inductors.
- In the resistance values of 50mΩ 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.