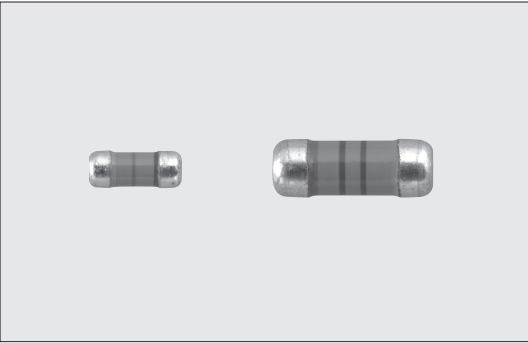


THERMAL SENSORS



温度传感器
Thermal Sensors

MLT MELF型正温线性温度传感器
MELF Type Linear Positive Temp.Coefficient Resistor



外观颜色：灰色 Coating color: Gray
表示：3色带 Color code: 3-color bands

特点 Features

- 表面安装的金属膜线性电阻器。
- 因为是圆筒形的，所以没有安装时的方向性。
- T.C.R.范围广。
- 电极强度牢固。
- 对温度的直线性良好。
- 对应波峰流、回流焊、烙铁焊接。
- 对应欧盟RoHS。
- SMD style linear positive temp. metal film resistors.
- Free direction for mounting due to cylindrical design.
- The electrode strength is firm.
- Wide TCRs are available.
- Superior in the linearity of resistance change to temperature.
- Suitable for reflow, flow and iron solderings.
- Products with lead free termination meet EU-RoHS requirements.

用途 Applications

- 电动机操作电路的温度补偿。
- Thermal compensation for motor control circuits

参考标准 Reference Standards

IEC 60115-1
JIS C 5201-8

额定值 Ratings

型 号 Type	额定功率 Power Rating	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 Temperature	使用温度范围 Operating Temp. Range	编带和包装数/卷 Taping & Qty/Reel (pcs)	
						箱 Box	卷 Reel
2ES	0.125W	150V	300V	+70℃	-40℃~+125℃	40,000	3,000
2E	0.25W	250V	500V			10,000	1,500

电阻温度系数和电阻值范围 T.C.R. and Resistance Range

电阻温度系数 T.C.R. (×10 ⁻⁶ /K)	电阻温度系数允许偏差 T.C.R. Tolerance	电阻值范围 Resistance Range (Ω) E24		阻值允许偏差 Resistance Tolerance
		2ES	2E	
2000	±10%	5.1k~9.1k	—	J: ±5%
2800		—	1k~4.7k	
3000		1k~4.7k	—	
3300		1k~4.7k	1k~7.5k	
3600		1k~5.1k	1k~6.8k	
3900		1k~3.3k	1k~6.2k	

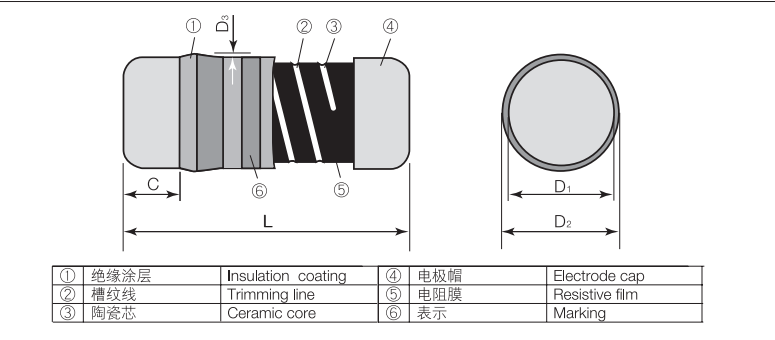
※关于上述以外的T.C.R.和电阻值，请和我们商谈

※Contact us for T.C.R. and resistance other than those above.

额定电压是√额定功率×公称电阻值所算出的值或表中最高使用电压两者中小的值为额定电压。

Rated voltage = √Power Rating×Resistance value or Max. working voltage, whichever is lower.

结构图 Construction



外形尺寸 Dimensions

型号 Type (Inch Size Code)	尺寸 Dimensions (mm)					Weight (g) (1000pcs)
	L±0.2	C min.	D1±0.1	D2 max.	D3 max.	
2ES (1406)	3.5	0.5~0.9	1.4	1.55	0.1	20
2E (2309)	5.9	0.5	2.2	2.4	0.15	75

品名构成 Type Designation

实例 Example

MLT	2B	T	TE	102	J	0600
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	电阻温度系数 T.C.R. (×10 ⁻⁶ /K)
	2ES:0.125W 2E:0.25W	T:Sn (L:Sn/Pb)	TE:编带 TE:Taping BK:散装 BK:Bulk	3 digits	J:±5%	4 digits

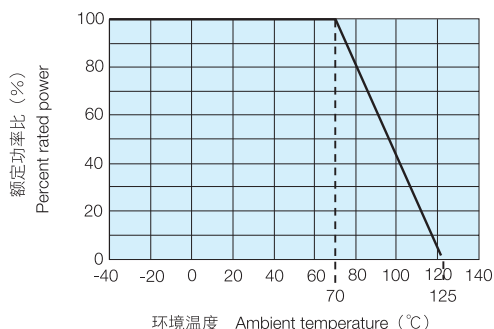
预知关于此产品含有的环境负荷物质详情（除EU-RoHS以外），请与我们联系。
编带细节请参考卷末附录C。

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.

本样本手册中记载的产品规格如有变更，恕不一一奉告。订购以及使用之前，请仔细确认规格表的内容。
用于车载设备、医疗设备、航空设备以及其它涉及人身安全、或可能引起重大损失的设备上时，请务必事先与我公司联系。这些产品在这类用途中出现故障或失灵可能导致人身事故或严重损坏。
Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.
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.

■ 负荷特性曲线 Derating Curve

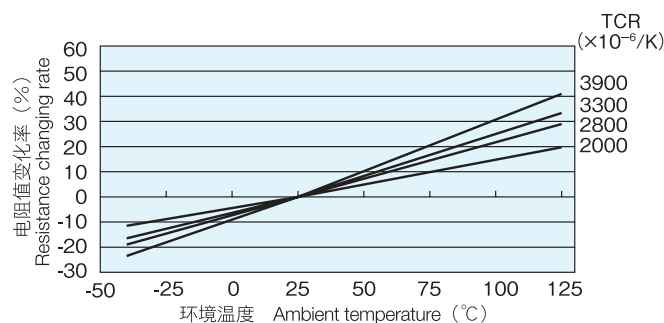


在环境温度70℃以上使用时，应按照上图负荷特性曲线，减小额定功率。

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.

■ 电阻温度特性实例

Examples of Temperature Characteristics of Resistance



※ 保证温度范围，室温+50℃以上。

※ Guaranteed temperature range : Room temperature + 50°C.

■ 电阻温度特性近似式 Approximate Expression for Resistance-Temperature Characteristics

(是代表值，不是保证值。 Values are not guaranteed but typical.)

$$R_T = R_{25} (C_0 + C_1 T + C_2 T^2)$$

R_T : T℃时的电阻值 R_T : Resistance value at T℃
 R_{25} : 25℃时的电阻值 R_{25} : Resistance value at 25℃
 T : 环境温度 (℃) T : Ambient temperature (℃)
 C_0, C_1, C_2 : 常数 C_0, C_1, C_2 : Constants

T.C.R. (×10 ⁻⁶ /K)	C ₀	C ₁	C ₂
3000	0.9288	0.0028	1.9983×10 ⁻⁶
3300	0.9232	0.0030	2.9980×10 ⁻⁶
3600	0.9175	0.0032	4.0000×10 ⁻⁶
3900	0.9099	0.0035	4.0064×10 ⁻⁶

■ 性能 Performance

试验项目 Test Items	标准值 Performance Requirements ΔR± (%+0.05 Ω)		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℃
电阻温度系数 T.C.R.	在规定值以内 Within specified T.C.R.	—	室温+50℃ Room temperature + 50℃
过载 (短时间) Overload (Short time)	1	0.75	额定电压的2.5倍施加5秒钟。 Rated voltage × 2.5 for 5s.
耐焊接热 Resistance to soldering heat	1	0.75	260℃ ± 5℃, 10s ± 1s
温度突变 Rapid change of temperature	1	0.75	−55℃ (30min.) / +125℃ (30min.) 5 cycles
耐湿负荷 Moisture resistance	3	2	40℃ ± 2℃, 90%~95%RH, 1000h 1.5小时ON、0.5小时OFF的周期 1.5h ON/0.5h OFF cycle
在70℃时的耐久性 Endurance at 70℃	3	2	70℃ ± 2℃, 1000h 1.5小时ON、0.5小时OFF的周期 1.5h ON/0.5h OFF cycle

■ 使用注意事项 Precautions for Use

- 焊剂等在本产品和安装的印刷电路板上附着离子性杂质时，其耐湿性・耐腐蚀性将受到影响。焊剂内有时含有氯・酸等离子性物质，为除去这些离子性物质应进行清洗。特别是使用无铅焊剂时，由于湿润性提高了，有时会含有大量离子性物质，所以在使用RMA系的焊锡或焊剂时，应充分进行清洗。并且，保管环境和安装条件、环境等，附着了汗・盐等离子性物质时，其耐湿性・耐腐蚀性也将受到影响。对于这种污染，为了除去这些离子性物质，应当进行清洗。
- Ionic impurities such as flux etc. that are attached to these products or those mounted onto a PCB, negatively affect their moisture resistance, corrosion resistance, etc. The flux may contain ionic substances like chlorine, acid, etc. Please wash them to get rid of these ionic substances especially when using lead-free solder that may contain much of the said substances for improving a wetting characteristic. Using RMA solder or RMA flux, or well-washing is needed. Also, attaching ionic substances such as perspiration, salt etc. by storage environments or mounting conditions/environments negatively affects their moisture resistance, corrosion resistance etc. Please wash them to remove the ionic substances when they are polluted.