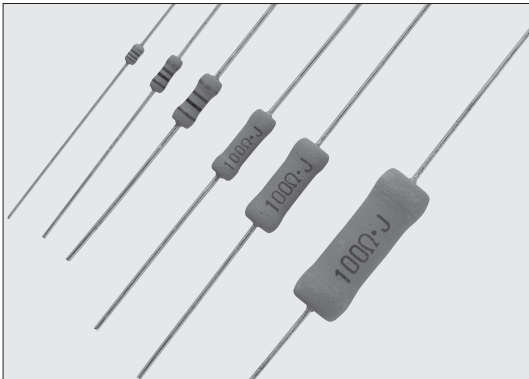


## SPR 特殊功率型电阻器 Special Power Resistors (Small type)

## SPRX 小型金属膜固定电阻器 Fixed Metal Film Resistors (Small type)



外观颜色: 浅绿色 Coating color: Light green

表示: 颜色代码 (0.25W,0.5W,1W)

文字表示 (2W,3W,5W)

Marking: Color code (0.25W,0.5W,1W)

Alphanumeric (2W,3W,5W)

### 特点 Features

- 是小型功率型电阻器。
- 阻燃性涂层 (相当UL94 V-0)。
- 可用于自动插入。
- 可进行各种成形。
- 高信赖性。
- 是冲击耐受电压特性优异的产品。
- 符合欧盟RoHS。
- 由于对应表面贴装成形, 所以可自动贴装。
- Small size power type resistors.
- Flame retardant coating. (Equivalent to UL94 V-0)
- Automatic insertion is applicable.
- Various types of formings are available.
- High reliability.
- Excellent in pulse characteristic.
- Products meet EU-RoHS requirements.
- Automatic mounting machine is applicable by surface mounted, device style led forming.

### 二次加工对应表 Taping & Forming Matrix

型号 Type	轴向编带 Axial Taping				成型编带 Stand-off Axial Taping			VT径向编带 VT Radial Taping				GT径向编带 GT Radial Taping	L成形 L Forming							U成形 U Forming	M成形 M Forming				N成形 N Forming		
	T26	T52	T521	T631	L52	L521	L631	VT	VTP	VTE	VTF	GT	L10A	L12.5A	L15A	L20A	L25A	L30A	L35A	U	M10	M12.5	M15	M20	N17	N20	
SPR (X) 1/4	○	○	-	-	-	-	-	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SPR (X) 1/2	○	○	-	-	○	-	-	○	○	-	-	-	○	-	-	-	-	-	-	-	-	M10F	-	-	-	-	-
SPR (X) 1	-	○	-	-	○	-	-	○	-	-	-	○	-	○	-	-	-	-	-	-	-	M12.5D	M15F	-	-	-	-
SPR (X) 2	-	○	○	-	○	-	-	○	-	○	-	○	-	○	-	-	-	-	-	-	-	-	M15E	M20U	○	-	
SPR (X) 3	-	-	○	○	-	○	○	-	-	-	-	○	-	-	-	○	○	-	-	-	-	-	-	M20E	-	○	
SPR (X) 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	○	○	-	-	-	-	-	-	-	

### 额定值 Ratings

型号 Type	额定功率 Power Rating	电阻值范围 Resistance Range (Ω)			电阻温度系数 T.C.R.(×10 <sup>-6</sup> /K)	最高使用电压 Max. Working Voltage	最高过载电压 Max. Overload Voltage	耐电压 Dielectric Withstanding Voltage	编带和包装数/AMMO包装 Taping & Q'ty/AMMO pack (pcs)				
		F: ±1% (E24•E96) <sup>※2</sup>	G: ±2% (E24) <sup>※2</sup>	J: ±5% (E24)					T26A	T52A	T521A	T631A	
SPR1/4	0.25W	-	-	2.2~10k	±350	E = √P×R	500V	300V	2,000	2,000	-	-	
SPR1/2	0.5W	-	-	-			800V	500V	2,000	2,000	-	-	
SPR1	1W	10~91k	10~91k	2.2~91k			1,000V	700V	-	2,000	1,000	-	-
SPR2	2W						500V	-	-	500	1,000		
SPR3	3W						600V	-	-	500	1,000		
SPR5	5W	10~100k	10~100k	2.2~110k		1,200V	800V	-	-	-	-		
SPRX1/4	0.25W	-	-	-		E = √P×R	E×2.5	300V	2,000	2,000	-	-	
SPRX1/2	0.5W	1.0~2.0	0.1~2.0	0.1~2.0				500V	2,000	2,000	-	-	
SPRX1	1W							-	2,000	-	-		
SPRX2	2W							-	1,000	1,000	-	-	
SPRX3	3W	-	-	-	500			1,000					
SPRX5	5W	-	-	-	800V	-	-	-	-				

※2 如果需要F级、G级产品目录范围以外的电阻值, 请与我们联系。

额定环境温度 Rated Ambient Temperature: +70℃

使用温度范围 Operating Temperature Range: -55℃~+200℃

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值为额定电压。

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

本产品目录中记载的产品规格如有变更, 恕不一一奉告。订购及使用之前, 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, 请务必先与我司联系。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。

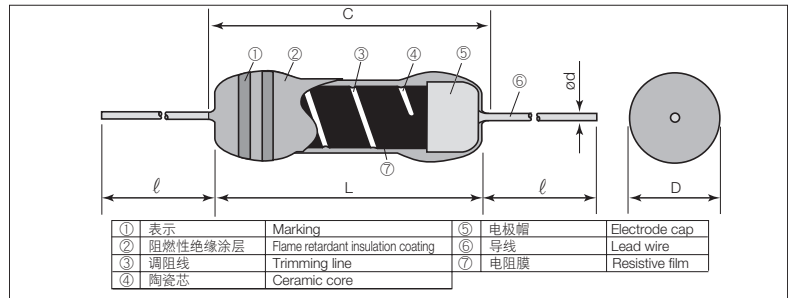
Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

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.

Nov. 2018

### 结构图 Construction



### 外形尺寸 Dimensions

型号 Type	尺寸 Dimensions (mm)				d (Nominal)	φ <sup>※1</sup>	Weight (g) (1000pcs)
	L	C Max.	D				
SPR (X) 1/4	3.3±0.3	3.5	1.7±0.3	0.45	20Min.	140	
SPR (X) 1/2	6.2±0.5	7.1	2.5±0.5	0.6	24Min.	250	
SPR (X) 1	9.0±1.0	11.1	3.5±0.5	0.8		500	
SPR (X) 2	12.0±1.0	15.0	4.2±0.8			800	
SPR (X) 3	15.5±1.0	18.0	6.0±1.0			30±3	1,400
SPR (X) 5	24.5±1.0	28.0	9.0±1.0			38±3	4,600

※1 引线长度按照成型和编带的不同而改变。

※1 Lead length changes depending on taping and forming type.

### 品名构成 Type Designation

实例 Example

SPR	1	C	T52	A	103	J
品种 Product Code	额定功率 Power Rating	端子表面材质 Terminal Surface Material	二次加工 Taping & Forming	包装 Packaging	公称电阻值 Nominal Resistance	阻值允许偏差 Resistance Tolerance
SPR: 特殊功率型电阻器 Special Power Resistors (Small type) SPRX: 小型金属膜固定电阻器 Fixed Metal Film Resistors (Small type)	1/4: 0.25W 1/2: 0.5W 1: 1W 2: 2W 3: 3W 5: 5W	C: SnCu	参照下述 See table below	A: AMMO包装 A: AMMO R: 卷 R: REEL 空栏: 箱子 Nil: BOX TEB: TEG: Plastic embossed (N forming)	F: 4 digits G, J: 3 digits	F: ±1% G: ±2% J: ±5%

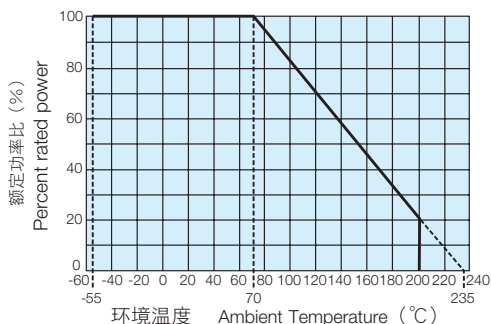
欲知关于此产品含有的环境负荷物质详情 (除EU-RoHS以外), 请与我们联系。

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.

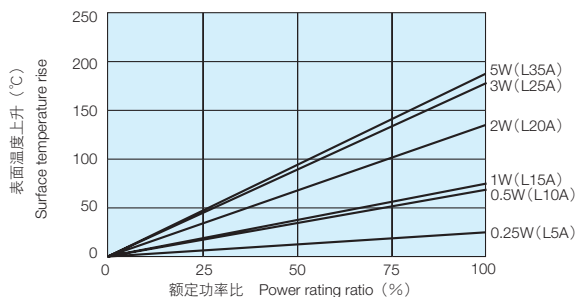
For further information on taping, please refer to APPENDIX C on the back pages.

## ■ 负荷减轻特性曲线 Derating Curve

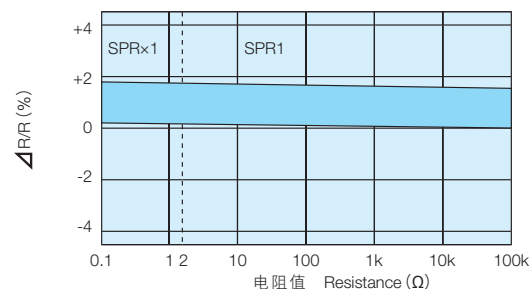


在环境温度70℃以上使用时，应参照左图负荷减轻特性曲线，减小额定功率。  
For resistors operated at an ambient temperature of 70°C or above, a power rating shall be derated in accordance with the left derating curve.

## ■ 表面温度上升 Surface Temperature Rise



## ■ 耐久性 (额定负荷) Load Life At 70°C 1000h



## ■ 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	-	测定处应离主体10mm ± 1mm Measuring points are 10mm ± 1mm from the end cap.
电阻温度系数 T.C.R.	在规定的允许偏差内 Within specified tolerance	-	+25°C / +125°C
过载 (短时间) Overload (Short time)	± (1% + 0.1Ω)	0.5	额定电压 × 2.5 倍或最高过载电压中低的一方施加5秒钟。 Rated voltage × 2.5 or Max. overload vol., whichever is lower, for 5s
耐焊接热 Resistance to soldering heat	1	0.5	260°C ± 5°C, 10s ± 1s
端子强度 Terminal strength	应当导线没有脱落、端子没有松动 No lead-coming off and loose terminals	-	Twist 360°, 5 times
温度突变 Rapid change of temperature	1	0.5	-55°C (30min.) / +155°C (30min.) 5 cycles
耐湿负荷 Moisture resistance	± (3% + 0.1Ω) : 1/4W~2W ± (5% + 0.1Ω) : 3W, 5W	1.5: 1/4W~2W 2.5: 3W, 5W	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
在70°C时的耐久性 Endurance at 70°C	± (3% + 0.1Ω) : 1/4W~2W ± (5% + 0.1Ω) : 3W, 5W	1.5: 1/4W~2W 2.5: 3W, 5W	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
耐溶剂性 Resistance to solvent	应当外观没有异常，表示容易辨认 No abnormality in appearance. Marking shall be easily legible	-	进行异丙醇的超声波清洗2分钟 Ultrasonic washing with Isopropyl alcohol for 2 min. 输出 Power : 0.3W/cm², 频率 f : 28kHz, 温度 Temp : 35°C ± 5°C
阻燃性 Flame retardant	应不发火和自动发火。 No evidence of flaming or self-flaming.	-	耐火性：把试验火焰在主体上烧15秒钟，取下15秒钟，5次循环。 Flame test : The test flame shall be applied and removed for each 15 sec respectively to repeat the cycle 5 times. 过载耐火性：把相当于额定功率2倍、4倍、8倍、16倍、32倍的电力 (AC) 分别施加1分钟直至断线。 但施加电压不应超过最高使用电压的4倍。 Overload flame retardant : Power (AC) corresponding to 2, 4, 8, 16 and 32 times the power rating shall be applied for each 1min. until disconnection occurs. However the applied voltage shall not exceed the value of 4 times the maximum operating voltage.

## ■ 使用注意事项 Precautions for Use

- 在高阻值范围，水和湿气直接影响阻值的变化。在使用的时候请注意使用的场合以避免产品损坏。
- 助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。助焊剂内有时含有氯·酸等离子性物质，为除去这些离子性物质应进行清洗。特别是使用无铅助焊剂时，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系的焊锡或助焊剂时，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。
- 由于包装涂层是阻燃性特种涂料，对外部冲击比较弱，使用时应注意。清洗应在最小限度清洗后涂层膜相当脆弱。因此，在充分干燥前不要在涂层膜上施加外力。由于要在干燥后才能恢复到原来强度，因此，应注意在清洗后约20分钟内不要在电阻的涂层膜上施加外力。特别不要进行基板的堆叠等。
- Water and moisture may affect and change the high resistance range of this product largely. Consult us in advance when you consider using this product for such applications that may cause serious damage.
- 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.
- Be careful to handle these resistors because outer coatings are comparatively weak to outer shock due to flameproof special coats. Please wash them to a minimum. No external force is given to the coating films until they are well dried because the coating films become weaker right after washing. The original strength will be returned after they are dried, so please pay attention not to apply any external force onto the coating film of resistors for 20 minutes after drying. Especially no PC boards shall be piled up.