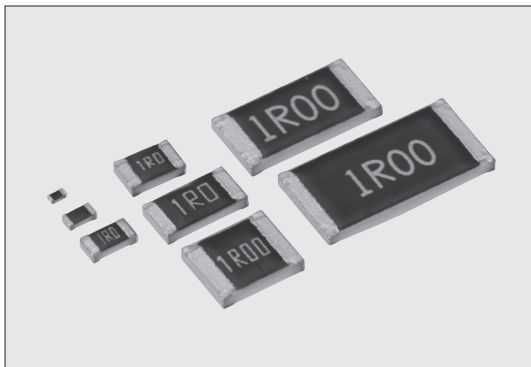


# THICK FILM (LOW RESISTANCE)



## SR73 矩形低阻值片式电阻器 Low Resistance Flat Chip Resistors



外观颜色: 黑色(1H) 紫色(1E, 1J, 2A, 2B, 2E, W2H, W3A, W3A2)  
Coating color: Black (1H)  
Indigo (1E, 1J, 2A, 2B, 2E, W2H, W3A, W3A2)

### 特点 Features

- 是电源电路、电动机电路等的电流检测电阻器。
- 是阻值允许偏差±0.5%、电阻温度系数±100×10<sup>-6</sup>/K的高信赖性、高性能产品。
- 对应回流焊、波峰焊。
- 端子无铅电镀品,符合欧盟RoHS。电极、电阻膜层、玻璃中所含的铅玻璃不适用欧盟RoHS指令。
- AEC-Q200相关数据已取得(除1H)。
- Current detecting resistors for power supply, motor circuits, etc.
- High reliability and performance with resistance tolerance ±0.5%, T.C.R. ±100×10<sup>-6</sup>/K
- Suitable for both flow and reflow 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.
- AEC-Q200 qualified (Exemption 1H).

### 用途 Applications

- 汽车电子装置、电脑、HDD、手机、电源、电动机等。
- Car electronics, Computers, HDDs, Cellular-telephones, Power supplies, and Motor circuits, etc.

### 品名构成 Type Designation

实例 Example

SR73	2B	T	TD	R10	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	公称电阻值 Nominal Resistance	阻值允许偏差 Resistance Tolerance
	1H:0.1W 1E:0.166W 1J:0.2W 0.25W 2A:0.33W 0.5W 2B:0.33W 0.5W 2E:0.5W 0.66W W2H:0.75W W3A:1.0W W3A2:2.0W	T:Sn G:Au <sup>※3</sup> (L:Sn/Pb) <sup>※6</sup>	TCM:2mm pitch press paper TPL:TP:2mm pitch punch paper TD:4mm pitch punch paper TE:4mm pitch plastic embossed BK:Bulk	D,F:4 digits G,J:3 digits Ex. 0.1Ω:R100 47mΩ:47L	D:±0.5% F:±1% G:±2% J:±5%

※2 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
24m~91m	24L~91L	0.1~0.976	R100~R976
0.1~0.91	R10~R91	1~9.76	1R00~9R76
1~9.1	1R0~9R1	10	10R0
10	100		

※2 镀金电极品,以1J、2A、2B(0.1Ω~10Ω)对应。由于规格有一定不同,请向本公司咨询。  
※3 Products with gold plated electrodes are also available only 1J, 2A and 2B type (0.1Ω~10Ω), so please consult with us.

※6 1H及W2H、W3A、W3A2只对应端子表面材质T。

※6 With type 1H, W2H and W3A, W3A2 only T is available as the terminal surface material. 端子表面材质,以无铅品为准。

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。

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.

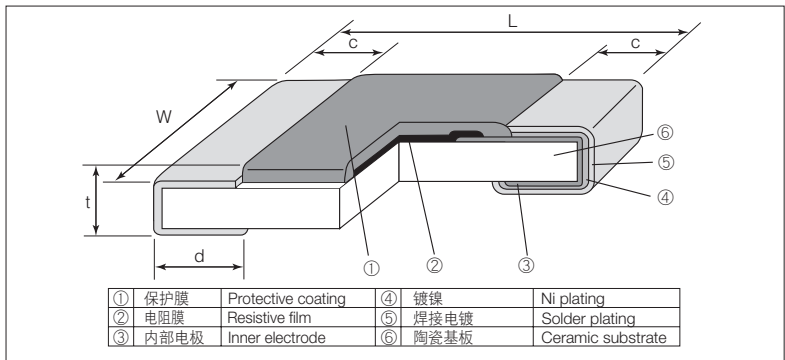
For further information on taping, please refer to APPENDIX C on the back pages.

### 参考标准 Reference Standards

IEC 60115-8  
JIS C 5201-8  
EIAJ RC-2134C

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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.

### 结构图 Construction



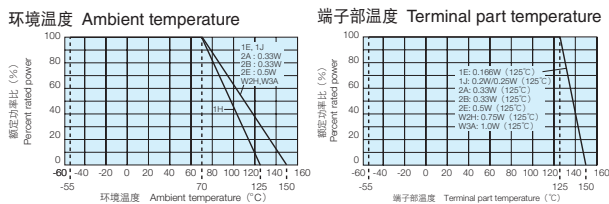
### 外形尺寸 Dimensions

型号 Type (Inch Size Code)	尺寸 Dimensions (mm)					Weight (g) (1000pcs)
	L	W	c	d	t	
1H (0201)	0.6±0.03	0.3±0.03	0.1±0.05	0.15±0.05	0.23±0.03	0.14
1E (0402)	1.0 <sup>+0.1</sup> <sub>-0.05</sub>	0.5 <sup>+0.1</sup> <sub>-0.05</sub>	0.25±0.1	0.25±0.1	0.35±0.05	0.68
1J (0603)	1.6±0.2	0.8 <sup>+0.15</sup> <sub>-0.1</sub>	0.35±0.1	0.35±0.1	0.45±0.1	2.14
2A (0805)	2.0±0.2	1.25±0.1	0.4±0.2	0.3 <sup>+0.2</sup> <sub>-0.1</sub>	0.5±0.1	4.54
2B (1206)	3.2±0.2	1.6±0.2	0.5±0.3	0.4 <sup>+0.2</sup> <sub>-0.1</sub>	0.6±0.1	9.14
2E (1210)		2.6±0.2				15.5
W2H (2010) <sup>※1</sup>	5.0±0.2	2.5±0.2	0.65±0.15			24.3
W3A (2512) <sup>※1</sup>	6.3±0.2	3.1±0.2				37.1

※1 SR73 2H和SR73 3A·3A2也对应(“d”尺寸不同。“d”尺寸=0.4<sup>+0.2</sup><sub>-0.1</sub> mm)

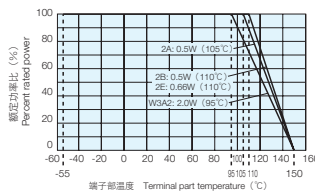
※1 SR73 2H, SR73 3A and 3A2 are also still available (different “d” dimensions=0.4<sup>+0.2</sup><sub>-0.1</sub> mm)

### 负荷减轻特性曲线 Derating Curve



在环境温度70℃以上使用时,应按照上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 above derating curve.

端子部温度 Terminal part temperature  
SR73 2A (0.5W), SR73 2B (0.5W),  
SR73 2E (0.66W), SR73 W3A2



超过上述端子部温度使用时,请根据负荷减轻特性曲线减小额定功率后使用。  
※关于使用方法,请参照卷首的“端子部温度负荷减轻特性曲线的说明”。

For resistors operated terminal part temperature of described for each size or above, a power rating shall be derated in accordance with derating curve.  
※Please refer to “Introduction of the derating curves based on the terminal part temperature” on the beginning of our catalog before use.

## ■ 额定值 Ratings

型号 Type	额定功率 Power Rating	额定环境温度 Rated Ambient Temp.	额定端子部温度 Rated Terminal Part Temp.	电阻温度系数 T.C.R. ( $\times 10^{-6}/K$ )	电阻值范围 Resistance Range ( $\Omega$ )				编带和包装数/卷 Taping & Q'ty/Reel (pcs)			
					D: $\pm 0.5\%$ E24 · E96	F: $\pm 1\%$ E24 · E96	G: $\pm 2\%$ E24	J: $\pm 5\%$ E24	TCM	TPL · TP	TD	TE
1H <sup>*4</sup>	0.1W	70°C	-	0~+400 0~+500	-	1~10	-	0.27~10 0.18~0.24	TCM: 15,000	-	-	-
1E <sup>*4</sup>	0.166W	70°C	125°C	$\pm 200$ $\pm 300$ $\pm 500$	-	0.51~10 0.2~0.47 0.1~0.18	0.51~10 0.2~0.47 0.1~0.18	0.51~10 0.2~0.47 0.1~0.18	-	TPL: 20,000 TP: 10,000	-	-
1J	0.2W 0.25W	70°C 70°C	125°C 125°C	$\pm 200$	-	1.02~10 0.1~1	1.1~10 0.1~1	1.1~10 0.1~1	-	TP: 10,000	5,000	-
2A	0.33W 0.5W <sup>*5</sup>	70°C -	125°C 105°C	$\pm 100$ $\pm 200$ $\pm 500$ $\pm 800$ $\pm 100$ $\pm 200$ $\pm 500$ $\pm 800$	0.15~10	0.1~10 -	- 0.1~10 -	- 0.1~10 0.051~0.091 0.03~0.047	-	TP: 10,000	5,000	4,000
2B	0.33W 0.5W <sup>*5</sup>	70°C -	125°C 110°C	$\pm 100$ $\pm 200$ $\pm 500$ $\pm 800$ $\pm 100$ $\pm 200$ $\pm 500$ $\pm 800$	0.15~10	0.1~10 -	- 0.1~10 -	- 0.1~10 0.056~0.091 0.03~0.051	-	-	5,000	4,000
2E	0.5W 0.66W <sup>*5</sup>	70°C -	125°C 110°C	$\pm 100$ $\pm 200$ $\pm 500$ $\pm 1000$ $\pm 100$ $\pm 200$ $\pm 500$ $\pm 1000$	-	0.1~10 -	0.1~10 -	0.047~10 0.036~0.043 0.024~0.033	-	-	5,000	4,000
W2H	0.75W	70°C	125°C	$\pm 100$ $\pm 200$ $\pm 500$ $\pm 800$	-	0.1~10 -	0.1~10 -	0.1~10 0.056~0.091 0.033~0.051	-	-	-	4,000
W3A	1W	70°C	125°C	$\pm 100$ $\pm 200$ $\pm 500$ $\pm 800$	-	0.1~10 -	0.1~10 -	0.1~10 0.056~0.091 0.039~0.051	-	-	-	4,000
W3A2	2W	-	95°C	$\pm 100$ $\pm 200$ $\pm 500$ $\pm 800$	-	0.1~10 -	0.1~10 -	0.1~10 0.056~0.091 0.039~0.051	-	-	-	4,000

使用温度范围 Operating Temperature Range: -55°C~+125°C (1H), -55°C~+150°C (1E, 1J, 2A, 2B, 2E, W2H, W3A, W3A2)

额定电压是 $\sqrt{\text{额定功率} \times \text{公称电阻值}}$ 所算出的值。

Rated voltage =  $\sqrt{\text{Power Rating} \times \text{Resistance value}}$

※4 SR73 1H, SR73 1E (F:  $\pm 1\%$ ) 的公称电阻值只成为E24系列。 ※4 The nominal resistance value for SR73 1H, SR73 1E (F:  $\pm 1\%$ ) is in E24.

按照※5的额定功率使用时, 请使用上页下侧端子部温度的负荷减轻特性曲线。

If you want to use at the rated power of ※5 please use the lower derating curves based on the terminal part temperature on the previous page.

根据客户的使用状况, 如果不清楚是该使用额定环境温度还是额定端子部温度, 请以额定端子部温度为优先。

详情请参照14~17页的“端子部温度负荷特性曲线的说明”。

If any questions arise whether to use the “Rated Ambient Temperature” or the “Rated Terminal Part Temperature” in your usage conditions, please give priority to the “Rated Terminal Part Temperature”.

For more details, please refer to “Introduction of the derating curves based on the terminal part temperature” in page 14 to 17.

在高功率下使用时, 根据基板散热条件的不同, 部件温度可能会升高。

请务必在确认端子部温度及产品规格书、使用注意事项后使用。

While using under high power, the temperature of the product may increase depending on the condition of heat dissipation from PCB.

Be sure to check the terminal part temperature as well as precautions to use on delivery specifications before use.

## ■ 性能 Performance

试验项目 Test Items	标准值 Performance Requirements $\Delta R \pm$ (%+0.005 $\Omega$ )		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.	在规定的值以内 Within specified T.C.R.	-	+25°C/-55°C and +25°C/+125°C
过载(短时间) Overload (Short time)	2	0.5	额定电压 $\times 2.5$ 倍施加5秒钟 (W3A2为额定电压 $\times 2.0$ 倍) Rated voltage $\times 2.5$ for 5s (W3A2: Rated voltage $\times 2.0$ for 5s)
耐焊接热 Resistance to soldering heat	3: 1H 1: 1E~W3A2	0.75: 1H 0.3: 1E~W3A2	260°C $\pm 5^\circ\text{C}$ , 10s $\pm 1\text{s}$
温度突变 Rapid change of temperature	1	0.3	-40°C (30min.) / +125°C (30min.) 100 cycles
耐湿负荷 Moisture resistance	3: 1H 2: 1E~W3A2	1	40°C $\pm 2^\circ\text{C}$ , 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: 1H 2: 1E~W3A2	1	70°C $\pm 2^\circ\text{C}$ , 1000h 1.5小时ON、0.5小时OFF的周期 1.5h ON/0.5h OFF cycle
高温放置 High temperature exposure	1	0.3	+125°C, 1000h: 1H +150°C, 1000h: 1E, 1J, 2A, 2B, 2E, W2H, W3A, W3A2

## ■ 使用注意事项 Precautions for Use

- 片状电阻器的基材是氧化铝。由于和安装基板的热膨胀系数不同, 在反复提供热循环等热应力时, 结合部的焊锡(焊接部)有时会发生裂纹。特别是W2H/W3A/W3A2的大型情况, 由于热膨胀大, 而且自身发热也大, 环境温度的变动有大的反复和载荷后闭有反复时, 需要注意裂纹的发生。用环氧树脂印刷电路板(FR-4)作一般性热循环试验, 在使用温度范围的上下限进行, 1H~2E的类型, 不容易发生裂纹, 而W2H/W3A/W3A2型, 则有易于发生裂纹的倾向。由于热应力而发生裂纹, 取决于安装的焊接区的大小、焊接量、安装基板的散热性等。因此, 在环境温度有大的变化和载荷 ON / OFF 使用条件时, 应充分注意后进行设计。
- 根据焊盘图案的大小和焊接焊接的量, 焊接后的电阻值会有变动。应事前在确认电阻值降低/上升的影响后, 进行设备设计。
- The substrate of chip resistors is alumina. Cracks may occur at the connection of solder (solder fillet portion) due to the difference of the coefficient of thermal expansion from a mounting board when heat stress like heat cycle, etc. are repeatedly given to them. Care should be taken to the occurrence of the cracks when the change in ambient temperature or ON / OFF of load is repeated, especially when large types of W2H/W3A/W3A2 which have large thermal expansion and also self heating. By general temperature cycle test using glass-epoxy (FR-4) boards under the maximum/minimum temperatures of operating temperature range, the crack does not occur easily in the types of 1H~2E, but the crack tends to occur in the types of W2H/W3A/W3A2. The occurrence of the crack by heat stress may be influenced by the size of a pad, solder volume, heat radiation of mounting board etc., so please pay careful attention to designing when a big change in ambient temperature and conditions for use like ON/OFF of load can be assumed.
- 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.

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Malfunction or failure of the products in such applications may cause loss of human life or serious damage.