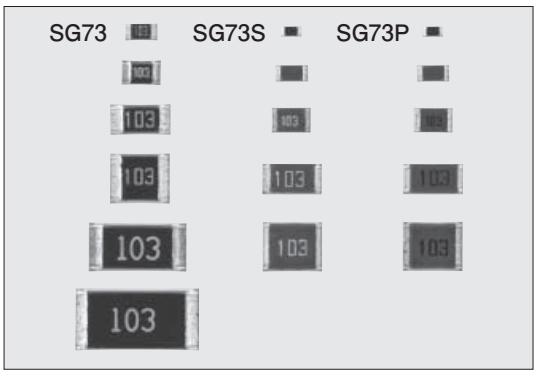
SG73•SG73S•SG73P-RT 矩形浪涌片式电阻器（抗硫化）

Surge Current Flat Chip Resistors (Anti Sulfuration)



外观颜色：深红色（SG73）、黑色（SG73S、SG73P 1E）
绿色（SG73S、SG73P 1J、2A、2B、2E）

Coating color：Wine red（SG73), Black（SG73S, SG73P 1E）
Green（SG73S, SG73P 1J, 2A, 2B, 2E）

■ 特点 Features

- 由于使用高度抗硫化的电极内端覆盖材料，所以不会因内部电极硫化而断线。
- 与片状电阻器（RK73）相比，突波耐压和冲击耐受电压优异。
- SG73S（用于浪涌）和SG73P（用于脉冲）可以选择±0.5%的阻值允许偏差。
- 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。
- Excellent anti-sulfuration characteristic due to using high sulfuration-proof inner top electrode material.
- Superior to RK73 series chip resistors in surge withstanding voltage and pulse withstanding voltage.
- SG73S (for surge) and SG73P (for pulse) are able to select resistance tolerance from ±0.5%.
- Suitable for both reflow and flow 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.

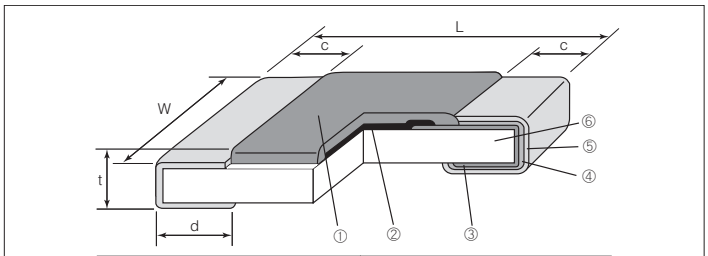
■ 用途 Applications

- 汽车电子技术、电源、工业机器。
- Car electronics, Power supply, Industrial robot

■ 参考标准 Reference Standards

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

■ 结构图 Construction



①	保护膜	Protective coating	④	镀镍	Ni plating
②	电阻膜	Resistive film	⑤	焊接电镀	Solder plating
③	内部电极	Inner electrode	⑥	陶瓷基板	Ceramic substrate

■ 外形尺寸 Dimensions

型号 Type (Inch Size Code)	尺寸 Dimensions (mm) L	W	c	d	t	Weight (g) (1000pcs)
1J（0603）	1.6±0.2	0.8±0.1	0.3±0.1	0.3±0.1	0.45±0.1	2.14
2A（0805）	2.0±0.2	1.25±0.1	0.4±0.2	$0.3^{+0.2}_{-0.1}$	0.5±0.1	4.54
2B（1206）	3.2±0.2	1.6±0.2	0.5±0.3	$0.4^{+0.2}_{-0.1}$	0.6±0.1	9.14
2E（1210）		2.6±0.2				15.5
W2H（2010）	5.0±0.2	2.5±0.2		0.65±0.15		24.3
W3A（2512）	6.3±0.2	3.1±0.2				37.1
SG73S1E, SG73P1E (0402)	$1.0^{+0.1}_{-0.05}$	0.5±0.05	0.15±0.1	$0.25^{+0.05}_{-0.1}$	0.35±0.05	0.68
SG73S1J, SG73P1J (0603)	1.6±0.2	0.8±0.1	0.3±0.1	0.3±0.1	0.45±0.1	2.14
SG73S2A, SG73P2A (0805)	2.0±0.2	1.25±0.1	$0.3^{+0.2}_{-0.1}$	$0.3^{+0.2}_{-0.1}$	0.5±0.1	4.54
SG73S2B, SG73P2B (1206)	3.2±0.2	1.6±0.2	$0.4^{+0.2}_{-0.1}$	$0.4^{+0.2}_{-0.1}$	0.6±0.1	9.14
SG73S2E, SG73P2E (1210)		2.6±0.2				15.5

※1 SG73 2H 和 SG73 3A可以对应（“d”尺寸不同。“d”尺寸＝$0.4^{+0.2}_{-0.1}$ mm）
※1 SG73 2H and SG73 3A are also still available (different “d” dimensions=$0.4^{+0.2}_{-0.1}$ mm)

■ 品名构成 Type Designation

实例 Example

SG73	2A	RT	TD	103	K
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
SG73 SG73S SG73P	SG73: 1J : 0.1W 2A : 0.125W 2B : 0.25W 2E : 0.33W W2H:0.75W W3A:1W SG73S SG73P: 1E : 0.125W 1J : 0.2W 2A : 0.25W 2B : 0.33W 2E : 0.5W	RT : Sn	TP : 2mm pitch punch paper TD : 4mm pitch punch paper TE : 4mm pitch plastic embossed BK : Bulk	D,F:4 digits G,J,K,M: 3 digits	D : ±0.5% F : ±1% G : ±2% J : ±5% K : ±10% M : ±20%

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.

■ 额定值 Ratings

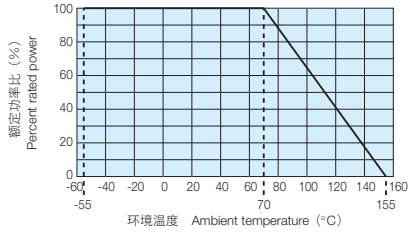
型 号 Type	额定功率 Power Rating	电阻温度系数 T.C.R. (×10⁻⁶/K)	电阻值范围 Resistance Range (Ω) D:±0.5% E24・E96	F:±1% E24・E96	G:±2% E24	J:±5% E24	K:±10% M:±20% E12	最高使用电压 Max. Working Voltage	最高过载电压 Max. Overload Voltage	额定环境温度 Rated Ambient Temp.	额定端子部温度 Rated Terminal Part Temp.	二次加工和包装数量/卷 Packaging & Q'ty/Reel (pcs) TP	TD	TE
SG73 1J	0.1W	±400	—	—	—	—	1～8.2	50V	100V	70℃	80℃	10,000	5,000	—
		±200					10～1M							
SG73 2A	0.125W	±400					1～8.2	150V	200V		85℃	10,000	5,000	4,000
		±200					10～1M							
SG73 2B	0.25W	±400					1～8.2	200V	400V		100℃	—	5,000	4,000
		±200					10～1M							
SG73 2E	0.33W	±400					1～8.2					—	5,000	4,000
		±200					10～1M							
SG73 W2H	0.75W	±400					1～8.2				125℃	—	—	4,000
		±200					10～1M							
SG73 W3A	1.0W	±400					1～8.2					—	—	4,000
		±200					10～1M							
SG73S 1E SG73P 1E	0.125W (0.2W※3)	±200	100～1M	10～1M	10～10M	1～10M	—	50V	100V	70℃	85℃	10,000	—	—
SG73S 1J SG73P 1J	0.2W (0.25W※3)	±100※2									95℃	10,000	5,000	—
SG73S 2A SG73P 2A	0.25W (0.33W※3)	±200						150V (※3 200V)	200V (※3 400V)		100℃	10,000	5,000	4,000
SG73S 2B SG73P 2B	0.33W (0.5W※3)							200V	400V			—	5,000	4,000
SG73S 2E SG73P 2E	0.5W										110℃	—	5,000	4,000

使用温度范围 Operating Temperature Range：-55℃～+155℃
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的值为额定电压。
Rated voltage = $\sqrt{\text{Power Rating}\times\text{Resistance value or Max. working voltage, whichever is lower.}}$

※2 SG73P/S 1J的冷T.C.R.为±150×10⁻⁶/K。
※2 Cold T.C.R. of SG73P/S 1J is ±150×10⁻⁶/K.
※3 关于（ ）内的最高使用电压、最高过载电压，请您咨询。
※3 Please consult with us about the power rating, the Max. working voltage and the Max. overload voltage with（ ）.

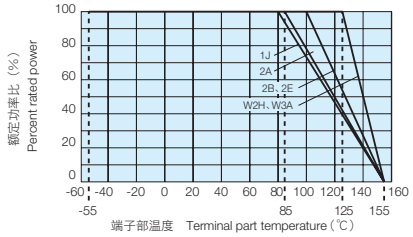
■ 负荷减轻特性曲线　Derating Curve

环境温度 Ambient temperature
（SG73/SG73P/SG73S）

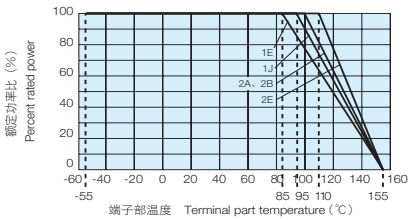


在环境温度70℃以上使用时，应按照上图负荷减轻特性曲线，减小额定功率。
For resistors operated at an ambient temperature of 70ºC or above, a power rating shall be derated in accordance with the above derating curve.

端子部温度 Terminal part temperature
（SG73）



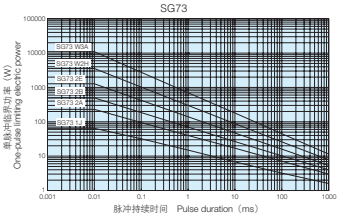
（SG73P/SG73S）



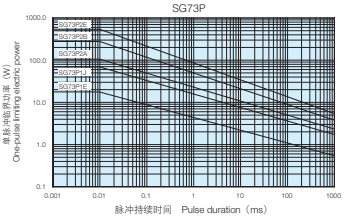
超过上述端子部温度使用时，请根据负荷减轻特性曲线减小额定功率后使用。
※ 有关使用方法，请参照卷首的“端子部温度负荷减轻特性曲线的说明”。
For resistors operated terminal part temperature of described for each size or above, a power rating shall be derated in accordance with derating curve.
※Please refer to “Introduction of the derating curves based on the terminal part temperature” on the beginning of our catalog before use.

■ 单脉冲临界功率曲线　One-Pulse Limiting Electric Power

SG73

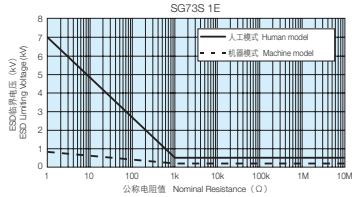


SG73P

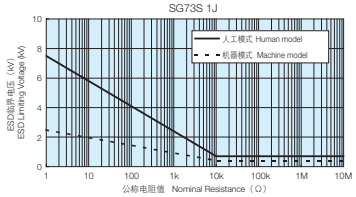


■ ESD临界电压　ESD Limiting Voltage

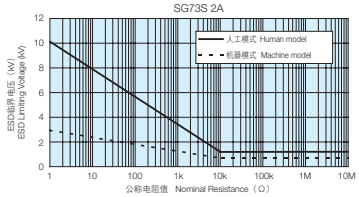
SG73S 1E



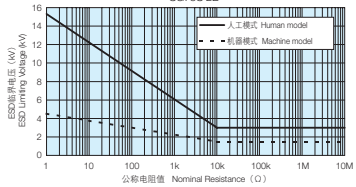
SG73S 1J



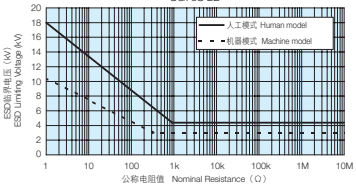
SG73S 2A



SG73S 2B



SG73S 2E



■ 性能　Performance

试验项目 Test Items	标准值　Performance Requirements ΔR±（%+0.1 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.	–	+25℃/−55℃ and +25℃/+125℃
过载（短时间） Overload（Short time）	2	0.5	额定电压×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	0.5	0.3	-55℃ (30min.) /+125℃ (30min.) 100cycles
耐湿负荷 Moisture resistance	3	0.75	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	0.75	70℃±2℃, 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	+155℃, 1000h
硫化试验 Sulfuration test	5	–	用含硫3.5%的工业油浸渍105℃±3℃ 500h Soaked in industrial oil with sulfur substance 3.5% contained 105℃±3℃ 500h

■ 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，在反复施加热循环等热应力时，连接部的焊缝会发生裂纹。特别是大型尺寸W2H/W3A，由于热膨胀大，而且本身发热也大，使环境温度变动有较大反复和，载荷的ON/OFF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），在使用温度范围的上、下限进行一般性的热循环试验时，1E~2E的类型不容易发生裂纹，而W2H/W3A型则有容易发生裂纹的倾向。因热应力而发生裂纹，取决于所安装的区域的大小、焊接量、安装基板的散热性等，因此应设想到环境温度有大的变化和载荷的ON/OFF使用条件，充分注意后进行设计。
- 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 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 1E～2E, but the crack tends to occur in the types of W2H/W3A. 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.