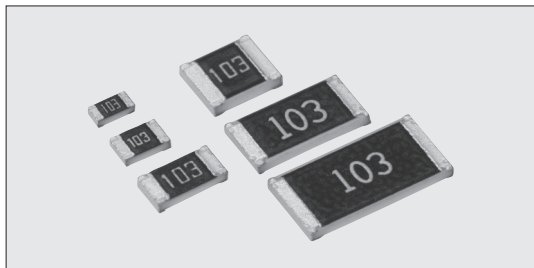


THICK FILM (ANTI SURGE)



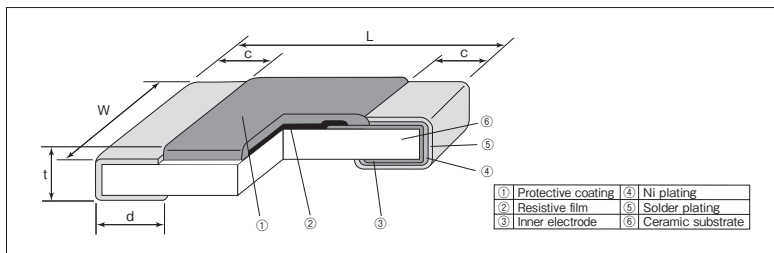
Flat Chip Resistors

SG73 Surge Current Flat Chip Resistors



Coating color : Wine red

Construction



Features

- Superior to RK73 series chip resistors in surge withstanding voltage and pulse withstanding voltage.
- 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 Tested.

Applications

- E.C.U.
- Circuits to catch inductive lighting surge.

Reference Standards

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

Dimensions

| Type (Inch Size Code) | Dimensions (mm) | | | | | Weight (g) (1000pcs) |
|--------------------------|-----------------|----------|-----------|--------------------------------------|-------|-------------------------|
| | L±0.2 | W | c | d | t±0.1 | |
| 1J(0603) | 1.6 | 0.8±0.1 | 0.3±0.1 | 0.3±0.1 | 0.45 | 2.14 |
| 1J AT (0603) | | | 0.35±0.15 | 0.5±0.2 | | |
| 2A(0805) | 2.0 | 1.25±0.1 | 0.4±0.2 | 0.3 ^{+0.02} _{-0.1} | 0.55 | 4.54 |
| 2A AT (0805) | | | 0.45±0.25 | 0.6±0.2 | | |
| 2B(1206) | 3.2 | 1.6±0.2 | 0.5±0.3 | 0.4 ^{+0.02} _{-0.1} | 0.6 | 9.14 |
| 2B AT (1206) | | | 0.55±0.35 | 0.8±0.2 | | |
| 2E(1210) | | 2.6±0.2 | | 0.4 ^{+0.02} _{-0.1} | | 15.5 |
| W2H (2010) ^{*1} | 5.0 | 2.5±0.2 | 0.5±0.3 | 0.65±0.15 | | 24.3 |
| W3A (2512) ^{*1} | 6.3 | 3.1±0.2 | | | | |

*1 SG73 2H and SG73 3A are also still available (different "d" dimensions=0.4^{+0.03}_{-0.1}mm)

Type Designation

Example

| SG73 | 2A | | T | TD | 103 | K |
|--------------|--------------------------------------------------------------------|---------------------------------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------|--------------------|----------------------|
| Product Code | Power Rating | Characteristic | Terminal Surface Material | Taping | Nominal Resistance | Resistance Tolerance |
| | 1J:0.1W 2A:0.125W 2B:0.33W 2E:0.5W W2H:0.75W W3A:1W | Nil: Standard A: Heat shock resistance ^{*2} | T: Sn (L: Sn/Pb ^{*3}) | TP:2mm pitch punch paper TD:4mm pitch punch paper TE:4mm pitch plastic embossed BK:Bulk | 3桁 | K:±10% M:±20% |

*2 With type A(1J,2A,2B), only T is available as the terminal surface material.

No resistance marking.

*3 With SG73 W2H, W3A only the symbol T is available as the terminal surface material.

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.

Ratings

| Type | Power Rating | Rated Ambient Temp. | Rated Terminal Part Temp. | T.C.R. (×10 ⁻⁶ /K) | Resistance Range (Ω) K: ±10% M: ±20% E12 | Max. Working Voltage | Max. Overload Voltage | Packaging & Q'ty/Reel (pcs) | | |
|------|--------------|---------------------|---------------------------|----------------------------------|---------------------------------------------------|----------------------|-----------------------|-----------------------------|-------|---------------------|
| | | | | | | | | TP | TD | TE |
| 1J | 0.1W | 70°C | 125°C | ±400 | 1~8.2 | 50V | 100V | 10,000 ^{*4} | 5,000 | — |
| | | | | | 10~1M | | | | | |
| 2A | 0.125W | 70°C | 125°C | ±400 | 1~8.2 | 150V | 200V | 10,000 ^{*4} | 5,000 | 4,000 ^{*4} |
| | | | | | 10~1M | | | | | |
| 2B | 0.33W | 70°C | 125°C | ±400 | 1~8.2 | 200V | 400V | — | 5,000 | 4,000 ^{*4} |
| | | | | | 10~1M | | | | | |
| 2E | 0.5W | 70°C | 125°C | ±400 | 1~8.2 | 200V | 400V | — | 5,000 | 4,000 ^{*4} |
| | | | | | 10~1M | | | | | |
| W2H | 0.75W | 70°C | 125°C | ±400 | 1~8.2 | 200V | 400V | — | — | 4,000 |
| | | | | | 10~1M | | | | | |
| W3A | 1.0W | 70°C | 125°C | ±400 | 1~8.2 | 200V | 400V | — | — | 4,000 |
| | | | | | 10~1M | | | | | |

Operating Temperature Range : -55°C~+155°C

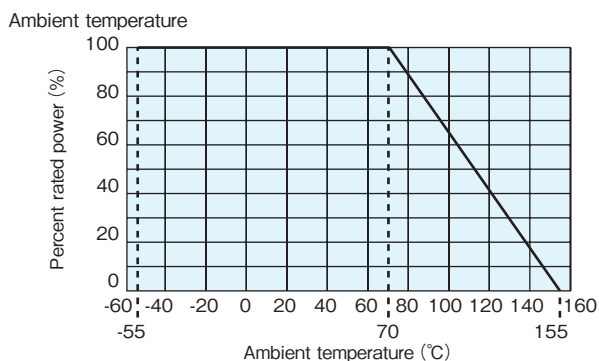
Rated voltage=√Power Rating×Resistance value or Max. working voltage, whichever is lower.

*4 Standard packaging : TD(4mm pitch punch paper)

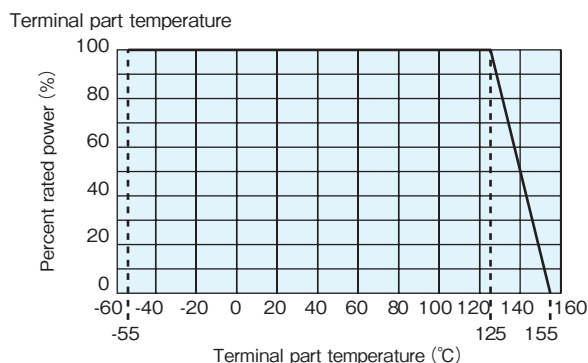
If any questions arise whether to use the "Rated Ambient Temperature" or the "Rated Terminal Part Temperature" in your usage conditions, please give priority to the "Rated Terminal Part Temperature".

For more details, please refer to "Introduction of the derating curves based on the terminal part temperature" on the beginning of our catalog.

Derating Curve



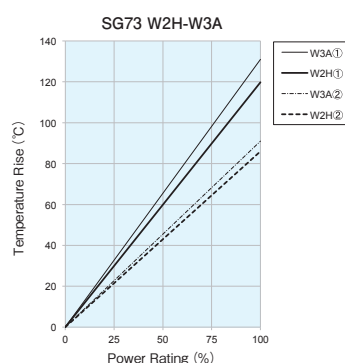
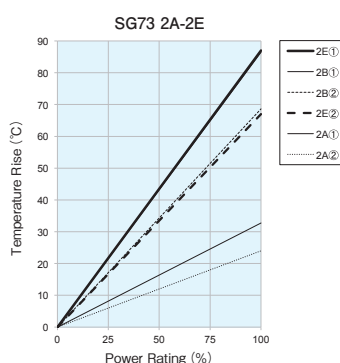
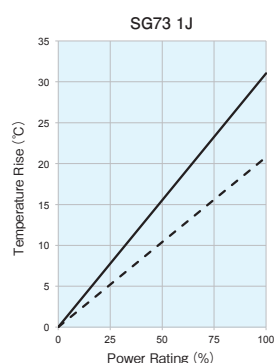
For resistors operated at an ambient temperature of 70°C or higher, the power shall be derated in accordance with the above derating curve.



When the terminal part temperature of the resistor exceeds the rated terminal part temperature shown above, the power shall be derated according to the derating curve.

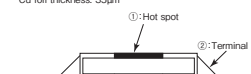
※Please refer to "Introduction of the derating curves based on the terminal part temperature" on the beginning of our catalog before use.

Temperature Rise

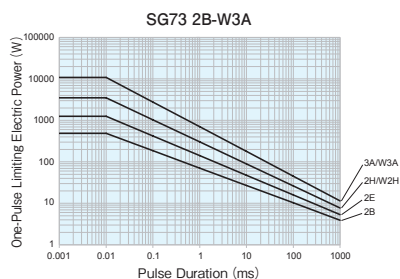
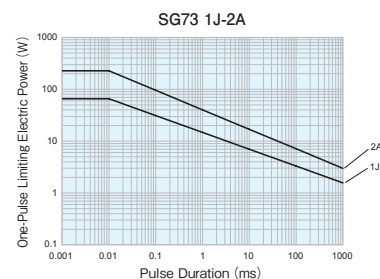


Regarding the temperature rise, the value of the temperature varies per conditions and board for use since the temperature is measured under our measuring conditions.

Measurement condition
Room temperature: 25°C
PCB: FR-4t = 1.6mm
Cu foil thickness: 35µm



One-Pulse Limiting Electric Power



The maximum applicable voltage is equal to the max. overload voltage. Please ask us about the resistance characteristic of continuous applied pulse. The pulse endurance values are not assured values, so be sure to check the products on actual equipment when you use them.

Performance

| Test Items | Performance Requirements $\Delta R \pm (\% + 0.1 \Omega)$ | | Test Methods |
|------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Limit | Typical | |
| Resistance | Within specified tolerance | — | 25°C |
| T.C.R. | Within specified T.C.R. | — | +25°C/-55°C and +25°C/+125°C |
| Overload (Short time) | 2 | 0.5 | Rated voltage $\times 2.5$ for 5s |
| Resistance to soldering heat | 1 | 0.75 | 260°C $\pm 5^\circ\text{C}$, 10s ± 1 s |
| Rapid change of temperature | 0.5: Characteristic [Ni] (Standard) 1: Characteristic [A] (Heat shock resistance) | 0.3: Characteristic [Ni] (Standard) 0.5: Characteristic [A] (Heat shock resistance) | Characteristic [Ni] (Standard): -55°C (30min.)/+125°C (30min.) 100 cycles Characteristic [A] (Heat shock resistance): -55°C (30min.)/+125°C (30min.) 1000 cycles |
| Moisture resistance | 3 | 0.75 | 40°C $\pm 2^\circ\text{C}$, 90%~95%RH, 1000h 1.5h ON/0.5h OFF cycle |
| Endurance at 70°C or rated terminal part temperature | 3 | 0.75 | 70°C $\pm 2^\circ\text{C}$ or rated terminal part temperature $\pm 2^\circ\text{C}$ 1000h 1.5h ON/0.5h OFF cycle |
| High temperature exposure | 1 | 0.3 | +155°C, 1000h |

Precautions for Use

- 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 1J~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.