FEATURE

- Superior Anti-Surge Voltage performance.
- Superior high-power performance
- High accuracy and stability
- RoHS complaint.
- Compatible with Reflow and Wave soldering
- Applications:
  - Computer, notebook, workstation, tablet and peripherals
  - Monitors
  - Power supply
  - Security monitoring
  - etc.

MANUFACTURER PART NO.

For example: SA1206J100KT5G00-SA1206 ±5% 100KΩ T/R-5000

Series	Size	Tol.	Nominal Resistance Value	PKG	SPQ	Feature	TCR
2 codes	4 codes	1 code	2~5 codes	1 code	1 code	1 code	2 codes
SA	1206	J	100K	T	5	G	00
Anti-Surge High Accuracy Thick Film Chip Resistors	0402 0603 0805 1206 1210 2010 2512	F=±1% J=±5%	0R1①=0.1Ω 1R=1Ω 4R7=4.7Ω 4K7②=4.7KΩ 100K=100KΩ 4M7③=4.7MΩ	T=T/R④	4=4K 5=5K A=10K	G=Std. S=P.C.⑤	00=Refer to table as below.

Note:
① R=Radix, 10^0, Ω ② K=Kilo, 10^3, KΩ ③ M=Mega, 10^6, MΩ
④ T/R=Taping in Reel packing type ⑤ P.C.=Personal and Customized.

CHARACTERISTIC

Type	Rated Power	MWV①	MOV②	Tolerance	Value Range
SA0402	1/8W	50V	100V	±1% / ±5%	1Ω-10MΩ
SA0603	1/4W	75V	150V	±1% / ±5%	1Ω-10MΩ
SA0805	1/3W	150V	300V	±1% / ±5%	1Ω-10MΩ
SA1206	1/2W	200V	400V	±1% / ±5%	0.1Ω-10MΩ
SA1210	3/4W	200V	500V	±1% / ±5%	0.1Ω-10MΩ
SA2010	1.25W	400V	800V	±1% / ±5%	1Ω-10MΩ
SA2512	2W	500V	1000V	±1% / ±5%	0.1Ω-10MΩ

Note: ① MWV=Max. Working Voltage ② MOV=Max. Overload Voltage ③ MOC=Max. Overload Current

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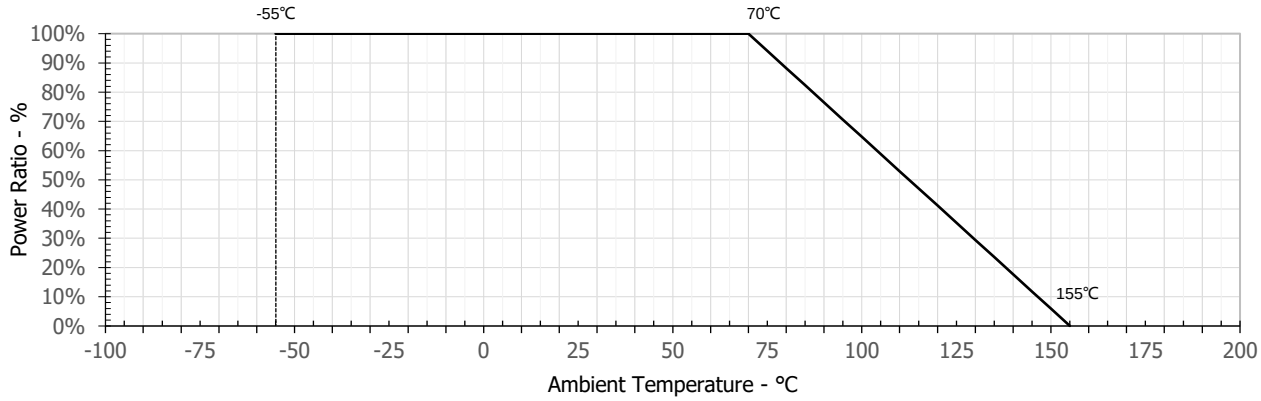
POWER DERATING CURVE



Note: Operating Temperature Range: -55℃~+155℃

RATED VOLTAGE

Resistors should have a Rated Voltage DC or AC corresponding to Rated Power which can be calculated by formula as below.

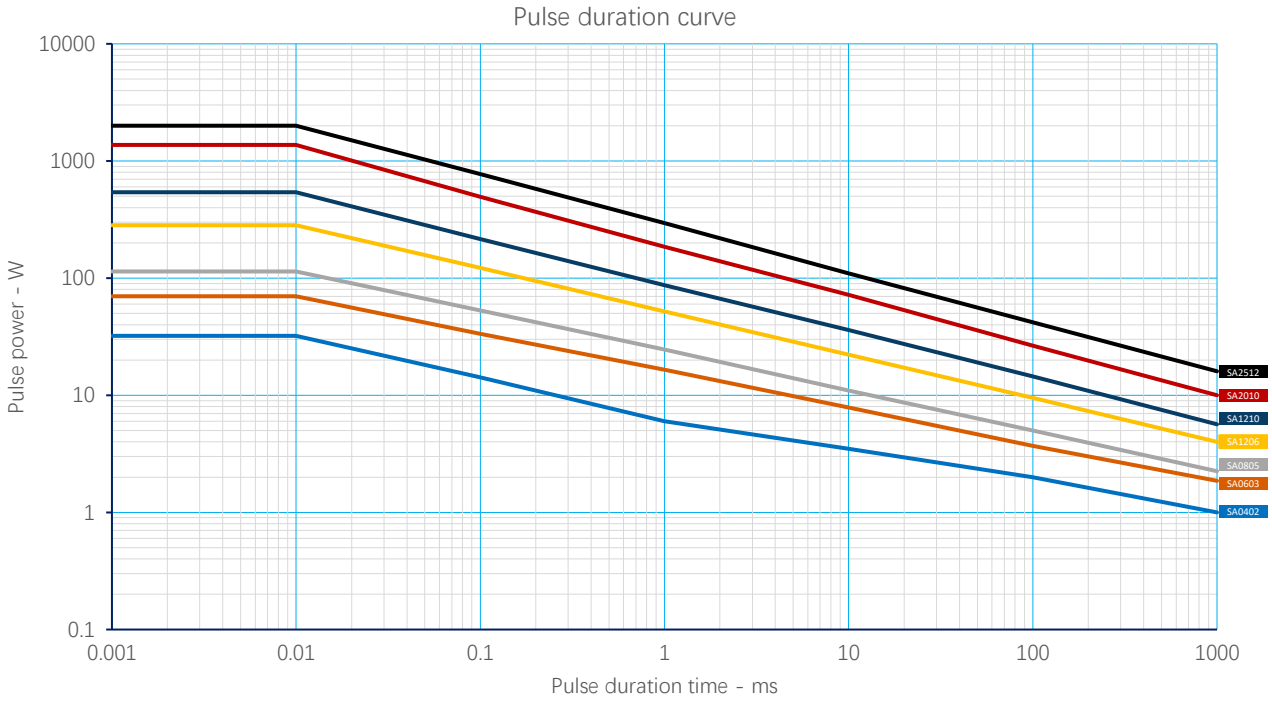
The Rated Voltage of certain resistance value should be the calculated result or Max. Working Voltage of product series whichever less.

Formula:

$$E = \sqrt{P \times R}$$

E=Rated voltage(V)
P=Rated power(W)
R=Nominal resistance(Ω)

PULSE POWER CURVE



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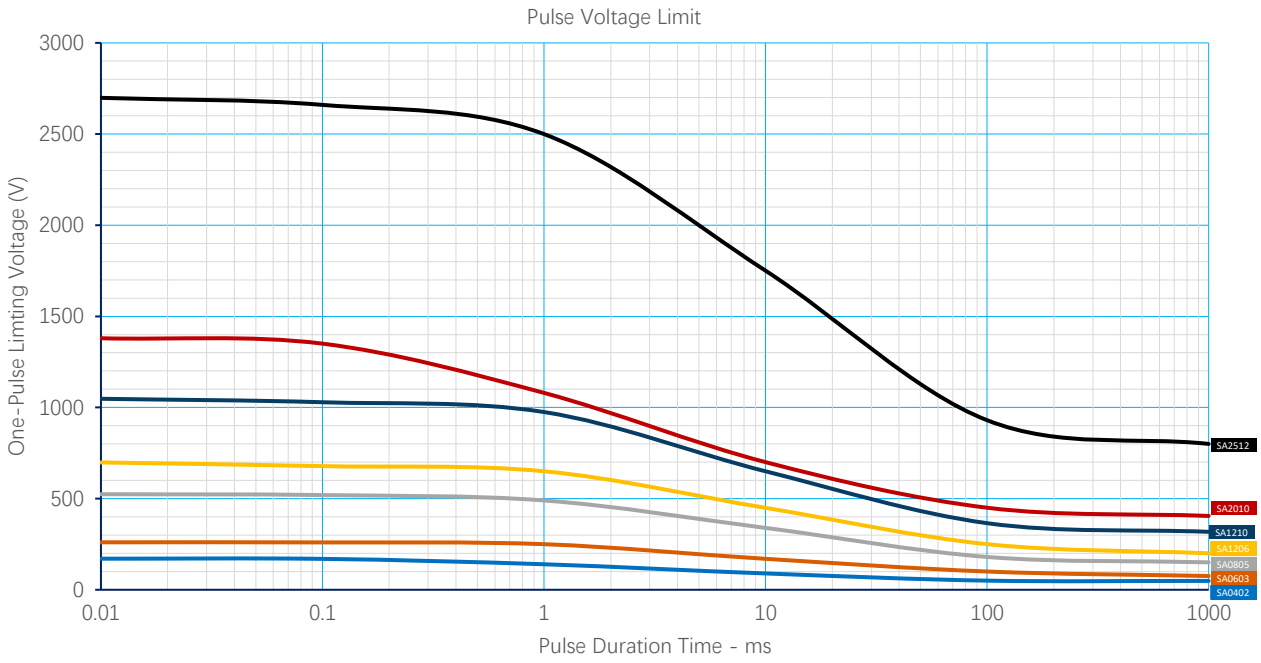
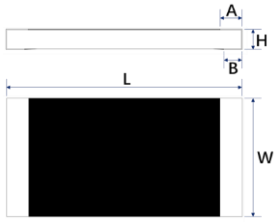
PULSE VOLTAGE CURVE



DIMENSIONS

Unit: mm

Figure	Type	L	W	H	A	B
	SA0402	1.00±0.10	0.50±0.05	0.30±0.05	0.20±0.10	0.25±0.10
	SA0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.15	0.30±0.15
	SA0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.35±0.15
	SA1206	3.05±0.10	1.55±0.10	0.50±0.10	0.45±0.20	0.35±0.15
	SA1210	3.05±0.10	2.55±0.10	0.55±0.10	0.50±0.20	0.50±0.20
	SA2010	5.00±0.20	2.50±0.20	0.55±0.10	0.60±0.20	0.60±0.20
	SA2512	6.30±0.20	3.20±0.20	0.55±0.10	0.60±0.20	0.60±0.20

RELIABILITY

Item	Test Method	Acceptable criterion
Temperature Coefficient of Resistance (T.C.R.)	$TCR(PPM/℃)=\frac{(R_2-R_1)}{R_1\times(T_2-T_1)}\times10^6$ R_1=Value in room temperature R_2=Value in test temperature -55℃ or +125℃ T_1 =Room temperature T_2 =Test temperature -55℃ or +125℃ Reference: IEC 60115-1 6.2	1Ω≤ R≤10Ω: ±200PPM/℃ 10Ω < R≤10M: ±100PPM/℃
Insulation Resistance	Using the parallel clamp method: 100±15V_{DC} voltage is applied between the electrode and the substrate within 60 seconds. Test the insulation resistance between the terminal and the back of the part. Reference: IEC 60115-1 12.1.3.5	⩾ 10^9Ω
Dielectric Withstanding Voltage	An alternating current with an effective value of the maximum overload voltage is applied between the electrode and the substrate at a rate of approximately 100V/s Pressure, maintain 60±5 sec. The test voltage reference to the DWV in characteristics. Reference: IEC 60115-1 12.2.4	Without arc or breakdown cause of current ⩾10uA

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Item	Test Method	Acceptable criterion
Short Time Over Load	Apply 2.5 times of rated voltage or maximum overload voltage whichever is less in 5 seconds Reference: IEC 60115-1 8.1.4.2	1% series: △R/R=±1.0% 5% series: △R/R=±2.0%
Intermittent Overload	Put the specimens in the thermostat, then load 2.5 times of rated voltage on them with $10{,}000^{+400}_{0}$ cycles by 1 second ON, 25 seconds OFF. And take them out to stabilized 60 minutes, measuring the change rate of resistance value. Reference: IEC 60115-1 8.4.4	△R/R=±5.0%
Resistance to Solvent	Immerse in isopropanol solvent at room temperature (23±5) for 5min, wipe 10 times with a hard toothbrush, repeat 3 times, take out and blow dry for examination Reference: IEC 60115-1 11.3.2 method1	No obvious damage, peeling, swelling phenomenon
Solderability	Pretreatment: dry heat 155℃, 4H or PCT aging for 4 hours (equivalent), after take out, stand at room temperature for 2 hours. Test method: 1. Dip the resistance in a tin furnace at 245±3℃ for 3 seconds, then take it out and observe the solder area under a microscope; 2. Reflow soldering test, Peak Temperature: 235℃, T=40± 5S Reference: IEC 60115-1 11.1.4.3	1. Solder coverage over 95% 2. No welding refusal phenomenon, side soldering height is greater than 1/2 of the height
Leaching	Pretreatment: dry heat 155℃, 4H or PCT aging for 4 hours (equivalent), after take out, stand at room temperature for 2 hours. dip in a tin furnace at 260+5/-0℃ for 30+1/-0 seconds, remove and wash. Observe the area of solder under a microscope Reference: IEC-60068-2-58	No electrode is eroded to expose the substrate phenomenon
Resistance to Soldering Heat	The tested resistor be immersed into molten solder of 260+5/-0℃ for 10 seconds. Then the resistor is left in the room for 1 hour, then measure the change rate of resistance value Reference: IEC 60115-1 11.2.4.3	△R/R=±1.0%
Thermal Shock	High and low temperature test is carried out according to the upper and lower limits of the application temperature of the parts, the residence time of the upper and lower limits of the temperature is 30min, and the temperature conversion time is less than 30s, lasting 500 cycles Reference: IEC 60115-1 10.1.4	△R/R=±1.0%
Solder Joint Endurance Test	The SMD resistance was welded to the test board and bent with the standard pressure block. After standing for 60s under the corresponding deformation condition, the change rate of resistance value of the part was tested. Size: 0402, 0603, 0805 | 0201, 1206, 1210 | 2010, 2512 Depth: 5mm | 3mm | 2mm Reference: IEC 60115-1 9.8.4	△R/R=±1.0%
Resistance to Dry Heat	Put the specimens in an oven at 155±5℃ for 1000+48/-0 hrs., then take them out to stabilized 1hr., measuring the change rate of resistance value Reference: IEC 60115-1 7.3	1% series: △R/R=±1.0% 5% series: △R/R=±3.0%
Loading Life in Moisture	Put the specimens in constant temperature and humidity box with 40±2℃ and 90~95%RH, load the rated voltage for 1000hrs. with cycles about 90 minutes ON and 30minutes OFF. Take them out to stabilized in 60 minutes, measuring the change rate Reference: IEC 60115-1 10.4	1% series: △R/R=±1.0% 5% series: △R/R=±3.0%
Load Life	Put in an oven at 70±2℃, apply rated voltage, 90 min ON, 30 min OFF, 1000 HRS, take out and stand for more than 60 min, then measure the resistance change rate. Reference: IEC 60115-1 7.1	1% series: △R/R=±1.0% 5% series: △R/R=±3.0%
Low temperature load test	-55℃, unpowered for 1 hour, rated voltage/current for 45 minutes, unpowered for 15 minutes, return to room temperature, take out and stand for 24 hours, then measure the change rate of resistance value. Reference: IEC 60115-1 10.2.4	1% series: △R/R=±1.0% 5% series: △R/R=±2.0%

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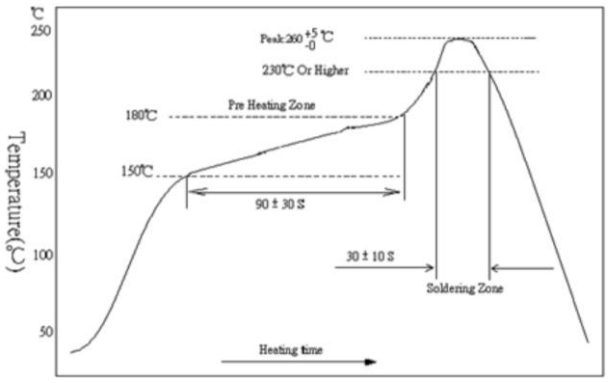
Item	Test Method	Acceptable criterion
Shear force test	Weld the part to the PCB. Apply the corresponding test stress from the side of the part with the test terminal for 10s. Check the appearance of the welded end of the part under the stress condition 0201:2N 0402,0603: 5N 0805:9N 1206,1210:25N 2010,2512:45N Reference: IEC 60115-1 9.7	Without obvious injury
Impulse testing	Test pulse curve and type, pulse time, voltage / current according to specification standards	△R/R=±1.0%

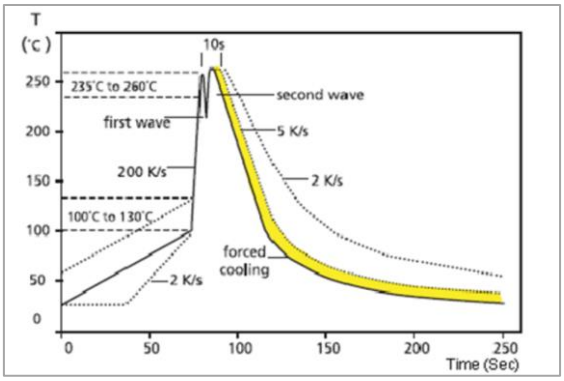
SOLDERING

Lead Free IR Reflow Soldering Profile



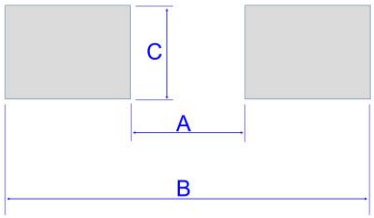
- Top temperature should be under 260 +5/-0 ℃ ,10Sec.
- Reference: J-STD-020D

Lead Free Double-Wave Soldering Profile



- Suitable for 0603 above size products
- 350±10℃ within 3 Sec. if soldering iron.

SOLDERING PAD



Unit: mm

型别	A	B	C
SA0402	0.5	1.5	0.6
SA0603	0.8	2.1	0.9
SA0805	1.2	3.0	1.3
SA1206	2.2	4.2	1.6
SA1210	2.2	4.2	2.8
SA2010	3.5	6.1	2.8
SA2512	3.8	8.0	3.5

WORKING ENVIRONMENT

If user intends to use products in special environments or states (including but not limited to the following), it is necessary to approve special characteristics and reliability for the following or other application environments.

A. High temperature.
B. Near the sea, or corrosive gas, such as Cl_2, H_2S, NH_3, SO_2 and NO_2, etc.
C. Unverified liquids, such as water, oil, chemical or organic solvent.
D. Unverified resin or paint to cover products.
E. Products should be washed with water soluble cleaner even if non cleaning flux.

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STORAGE / CARRY CONDITIONS

A. Temperature: 25±5℃
B. Humidity: 60±15%RH
C. Storage life: 2 years. FIFO
D. Please hold box correct orientation when storing and carrying. It is strictly prohibited to fall or squeeze the box, otherwise the product electrode or body may be damaged.

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VERSION HISTORY

Version	Date	Change Item(s)	Description
A	2022/06/05	-	First version
B	2022/11/10	Reliability	Update test items, method and acceptable criterion.

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