

Document No : G-E04

ASIA AKITA ELECTRONIC TECHNOLOGY (SHENZHEN) CO., LTD

CEMENT RESISTORS

Specification : SPS 10W 300R J B1 P1

RESISTOR SPECIFICATION


MADE PRODUCT :

ASIA AKITA ELECTRONIC

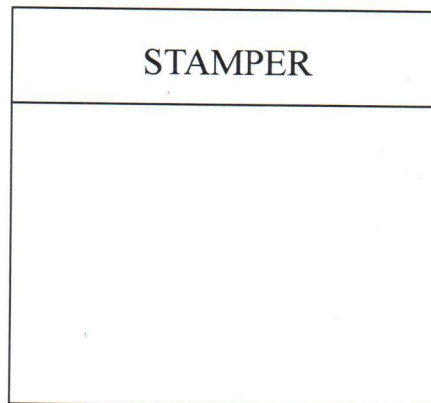
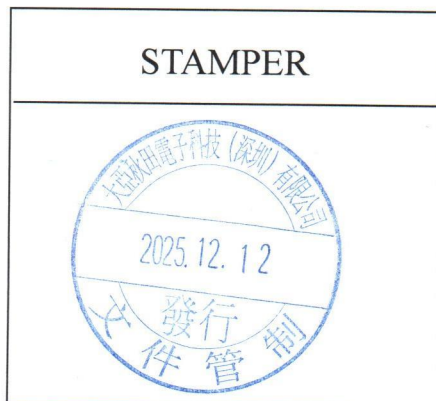
TECHNOLOGY (SHENZHEN) CO., LTD

USE PRODUCT :

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APPROVED	REVIEWED	PRODUCED



CEMENT RESISTORS

1. Applicable Scope:

This SQ type standard specification is for use in consumer electronics, computer, telecommunications equipments...etc.

2. Part Number:

It is composed by Type, Rated Wattage, Nominal Resistance, Tolerance, Lead Length and Marking. e.g.

<u>SPS</u>	<u>10W</u>	<u>300R</u>	<u>J</u>	<u>B1</u>	<u>P1</u>
Type	Rated Wattage	Nominal Resistance	Tolerance	Lead Length	Marking

2.1 Type:

Cement Resistors are called "SPS".

2.2 Rated Wattage:

Shown by 'W', such as 10W.

2.3 Nominal Resistance:

Ω , $K\Omega$ are its unit which be in accordance with JIS-C6409 article 6 (EIA RS-196A) series.

Letter "300R" indicates resistance value 300Ω .

Letter "10K" indicates resistance value $10K\Omega$.

2.4 Tolerance:

It is measured by Bridge-method at room temperature and expressed by a capital letter.

J= $\pm 5\%$.

2.5 Lead Length:

Letter "B1" indicates lead length.

2.6 Marking:

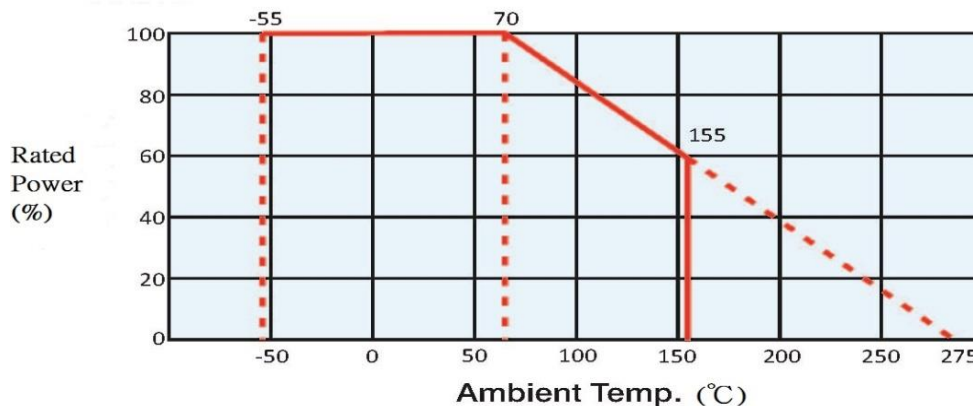
Letter "P1" indicates marking.

Remark: Cement Resistors are RoHS & Halogen Free Compliant.

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3. Rated Power:

Rated power is the value of Max load wattage specified at the ambient temperature of 70°C, and shall meet the functions of electrical and mechanical performance. When the ambient temperature surpasses above mentioned temperature, the value declines as per following DERATING CURVE.



3.1 Rated Voltage:

It is calculated through the following formula:

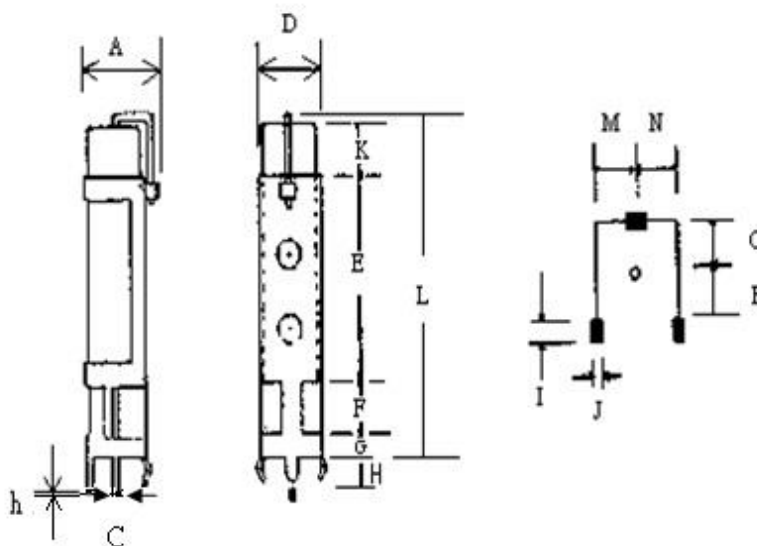
$$V = \sqrt{P \times R}$$

where V: rated voltage
P: rated power
R: total nominal resistance

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4. Dimension & Structure:

4.1 Dimension:



TYPE	Dimension(mm)															
SPS	A ±1	C ±0.1	D ±1	E ±0.5	F ±0.5	G ±0.2	H ±0.3	I ±0.1	J ±0.1	K ±1	L ±1.5	M ±0.5	N ±0.5	O ±0.5	P ±0.5	h
10W	12	0.8	11	28	7	3	4	1.5	0.5	20	60	5	5	5	5	0+0.5/-0

TYPE	Resistance Range(Ω)		Max Working Voltage
SPS	Wire Wound	Power Film	
10W	0.1~470	471~50K	750V

Notes: 1. Max Overload Voltage is 2 times of Max Working Voltage.
2. Too low or too high ohmic value can be supplied only case by case.

4.2.1 Terminal:

Terminal is to be firmly connected with resistors element, both electrically and mechanically, and allow easy soldering.

4.2.2 Stuffing:

Stuffing is made by flameproof cement (resistant to 800°C) which is solid enough to be free from looseness, crack and easy breakage.

4.2.3 Marking:

Marking is made on the surface.

5. Operating Temperature Range:-55°C ~155°C

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6. Mechanical Performance:

6.1 Terminal tensile:

To fix the resistor body, a static load of 4.5kg. is to be gradually applied into the terminal for 10 seconds without causing any looseness and fall.

6.2 Twist withstand:

To bend the lead wire at the point of about 6mm from resistor body to 90°, then catch the wire at 1.2 ±0.4mm apart from the bent point end and turn it (clockwise) by 360 degrees perpendicular to the resistor axis at speed of 5 seconds per turn, and do the same counterclockwise again which constitute a whole turn. Repeat the turn for 2 times without causing any break and looseness.

7. Electrical Performance:

7.1 Resistance Temperature Coefficient:

It shall be within ±300ppm/°C and if the ohmic value is under 1 Ω the T.C. shall be within ±600ppm/°C.

$$\text{T.C. (ppm/°C)} = [(R2 - R1) \div R1] \times [1 \div (T2 - T1)] \times 10^6$$

where

R1: resistance value at reference temperature

R2: resistance value at test temp.

T1: reference temp.

T2: test temp.

7.2 Temperature Cycle:

Following temp. cycles are to be made 5 times and then put at room temp. for one hour, the resistance value change rate between pre-and-post test shall be within ±1%.

Steps	Temperature(°C)	Time (minutes)
1 st step	-55±3	30
2 nd step	Room temp.	3
3 rd step	155±3	30
4 th step	Room temp.	3

7.3 Short Time Over Load:

When the resistors are applied 10 times (Power Film: 5 times) as much as rated power for 5 seconds continuously, it shows no evidence of arc, flame...etc.

Removing the voltage and place the resistors to the normal condition for 30 minutes, the resistance value change rate between pre-and-post test shall be within ±2%.

7.4 Insulation Character :

Resistors are located in a V-shaped metal trough. Using the DC 500V megger instrument 2 poles to clutch either side of lead wires and metal trough, measuring the Insulation Resistance which shall be over 1000M Ω.

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7.5 Voltage Withstanding:

Resistors are located in a V-shaped metal trough. Applying AC 1000V for one minute and should find no physical damage to the resistors, such as arc, char ...etc.

7.6 Load Life:

The resistors arrayed are sent into the 70°C oven, applying rated voltage at the cycle of 1.5 hours ON, 0.5 hour OFF for 1000^{+48}_{-0} hours in total. Then, after removing the voltage, take the resistors out of the oven and left under normal temp. for one hour cooling. The resistance value change rate between pre-and-post test shall be within $\pm 5\%$.

7.7 Moisture-proof Load Life:

The resistors arrayed are placed into a constant temp./humidity oven at the temp. of $40 \pm 2^\circ\text{C}$ and the humidity of 90~95%, rated power is applied for 1.5 hours and cut off for 0.5 hour. The similar cycle will be repeated for 1000^{+48}_{-0} hours in total (including cut-off time). Then remove the voltage, taking the resistors out of the oven and leaving them at room temp. for one hour. The resistance value change rate between pre-and-post test shall be within $\pm 5\%$. There also shall be no evidence of remarkable change on appearance, and the marking shall not be illegible.

7.8 Solder-ability:

The leads with flux are dipped in a melted solder of $235 \pm 5^\circ\text{C}$ for 2 seconds, more than 95% of the circumference of the lead wires shall be covered with solder.

7.9 Resistance to Soldering Heat:

Two leads are together dipped in a melted solder of $270 \pm 5^\circ\text{C}$ for 10 ± 1 seconds, or $350 \pm 10^\circ\text{C}$ for 3.5 ± 0.5 seconds, Then remove the resistors and leaving them at room temp. for one hour. The resistance value change rate between pre-and-post test shall be within $\pm 1\%$.

7.10 Nonflammability:

The resistors are applied the power of 16 times the rated wattage for 5 min. and shall not get flame.

7.11 Storage Conditions:

The resistors with appropriate package would have a preservative duration of 1 year, under the following conditions.

$T=5^\circ\text{C} \sim 35^\circ\text{C}$ $H=40\% \sim 75\%$