Approval Sheet

for

Cement Resistors
Axial Lead Type

SQP & NSP series

±5%

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00	issue new spec.	Jul 16, 2007	Sara Lin	Joyce Chung

Description	Cement Resistors, Axial Lead Type / Normal & Non-Inductive Style		
Series	SQP/NSP	Rev.	00

1. PRODUCT:

CEMENT RESISTORS AXIA LEAD TYPE.

(SQP & NSP SERIES)

2. PART NUMBER:

Part number of the cement resistor is identified by the name, power, tolerance, packing, temperature coefficient, special type and resistance value.

Example：

SQP	**200**	**J**	**B**	**-**	**100R**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Series Name	Power Rating	Resistance Tolerance	Packing Style	Temperature Coefficient	Resistance Value of Resistance

(1) Style：SQP & NSP SERIES

(2) Power Rating： 200=2W、300=3W、500=5W、700=7W、10A=10W、15A=15W、20A=20W、25A=25W

(3) Tolerance： J = ±5%

(4) Packaging Type： B ＝ Bulk with wirewound or metal oxide
W ＝ Bulk with wirewound sub-assembly for resistance value
M ＝ Bulk with metal oxide sub-assembly for resistance value

(5) Temperature Coefficient ： 300ppm/℃

(6) Resistance Value：E24 Series

Example：0R1, 1R、10R、100R、10K……

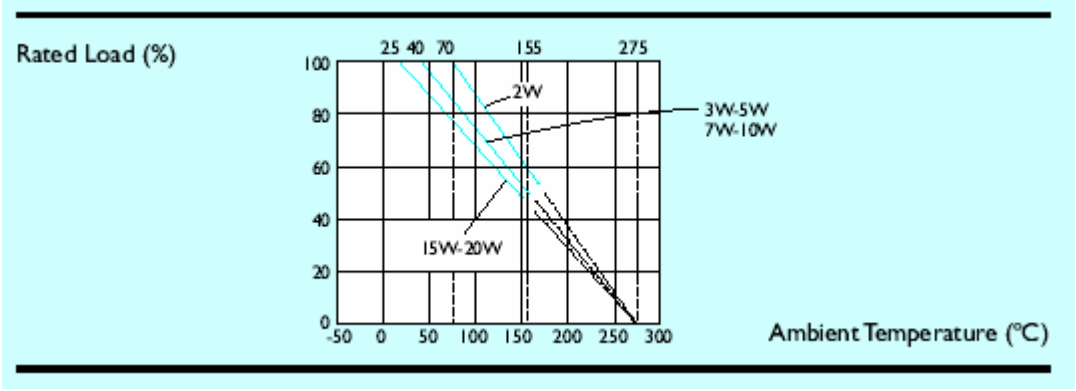
3. ELECTRICAL CHARACTERISTICS

STYLE	SQP200	SQP300	SQP500	SQP700	SQP10A	SQP15A	SQP20A	SQP25A
Power Rating at 70 ℃	2W	3W	5W	7W	10W	15W	20W	25W
Maximum Working Voltage	250V	350V		500V				
Maximum Overload Voltage	500V	700V		1000V				
Dielectric Withstanding Voltage	500V	700V		1000V				
Resistance range (Wirewound)	0.1Ω~36Ω	0.18Ω~180Ω		0.39Ω~430Ω	0.62Ω~620Ω	0.82Ω~820Ω	1Ω~1KΩ	1.2Ω~1K5Ω
Resistance range (Metal Oxide Film)	39Ω~47KΩ	100Ω~100KΩ	100Ω~200KΩ			100Ω~100KΩ		
Operating Temp. Range	- 55 ℃ to + 155 ℃							
Temperature Coefficient	± 300ppm/ ℃							

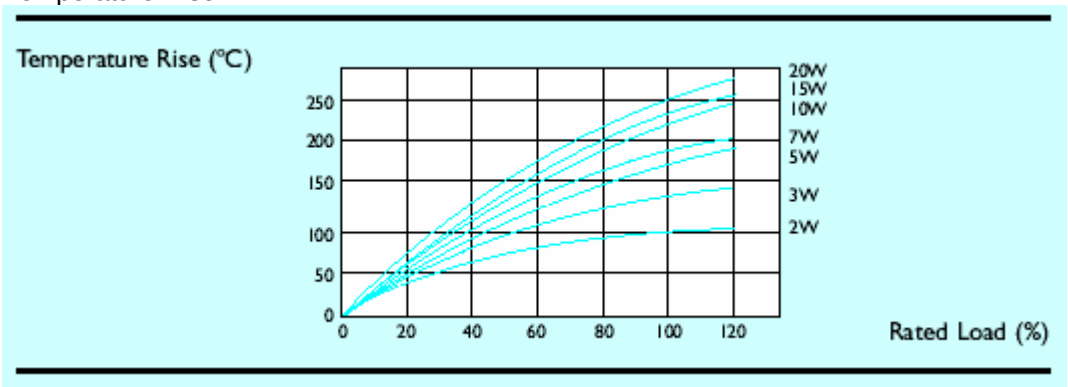
＊ 1. Below or over this resistance range on request.
＊ 2. Non-Inductive type up to 50Ω only.

4. DERATING CURVE & TEMPERATURE RISE

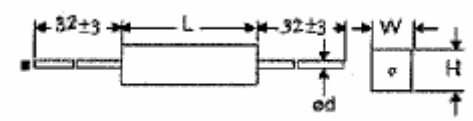
Derating Curve



Temperature Rise



5. DIMENSIONS



Unit：mm

STD	Non-Inductive	L	W	H	φd
SQP200	NSP200	18±1.0	7.0±1.0	7.0±1.0	0.8±0.05
SQP300	NSP300	22±1.5	8.0±1.0	8.0±1.0	0.8±0.05
SQP500	NSP500	22±1.5	9.5±1.0	9.0±1.0	0.8±0.05
SQP700	NSP700	35±1.5	9.5±1.0	9.0±1.0	0.8±0.05
SQP10A	NSP10A	48±1.5	9.5±1.0	9.0±1.0	0.8±0.05
SQP15A	NSP15A	48±1.5	12.5±1.0	12.5±1.0	0.8±0.05
SQP20A	NSP20A	60±2.0	12.5±1.0	12.5±1.0	0.8±0.05
SQP25A	NSP25A	60±2.0	14.0±1.5	13.0±1.5	0.8±0.05

6. ENVIRONMENTAL CHARACTERISTICS

(1) Short Time Over Load Test

At 2.5 times of the rated voltage. (If the voltage exceeds the maximum load voltage, the maximum load voltage will be used as the rated voltage) applied for 5 seconds, the resistor should be free from defects after the resistor is released from load for about 30 minutes

Short Time Overload Voltage = $2.5*\sqrt{\text{Power Rating}\times\text{Resistance Value}}$

The change of the resistance value should be within ± (2 % + 0.05Ω)

(2) Dielectric Withstanding Voltage

The resistor is placed on the metal V Block. Apply a Table I dielectric withstanding between the terminals connected together with the block for about 60 seconds.
The resistor shall be able to withstand without breakdown or flashover.

(3) Temperature Coefficient Test

Test of resistors above room temperature 125°C to 130°C (Testing Temperature) at the constant temperature silicon plate for over 4 to 5 minutes. Then measure the resistance value.
The Temperature Coefficient is calculated by the following equation and its value should be within the range of requested.

$$\text{Resistor Temperature Coefficient} = \frac{R - R_0}{R_0} \times \frac{1}{t - t_0} \times 10^6$$

- **R** = Resistance value under the testing temperature
- **R_0** = Resistance value at the room temperature
- **t** = The testing temperature
- **t_o** = Room temperature

(4) Insulation Resistance

Apply test terminal on lead and resistor body.
The test resistance should be high than 100M ohm.

(5) Solderability

Immerse the specimen into the solder pot at 260 ± 5 °C for 5 ± 0.5 seconds.
At least 95% solder coverage on the termination.

(6) Resistance to Solvent

The specimen into the appropriate solvent of Methyleme Chloride condition of ultrasonic machine for 1 minutes.
The specimen is no deterioration of coatings and color code.

(7) Terminal Strength

Direct Load – Resistors shall be held by one terminal and the load shall be gradually applied in the direction of the longitudinal axis of the resistor unit the applied load reacheds 5 pounds。
The load shall be held for 10 seconds. The load of weight shall be ≧ 2.5 kg (24.5N).

(8) Pulse Overload

Apply 4 times of rated voltage to the specimen at the 1 second on and 25 seconds off cycle, subjected to voltage application cycles specified in 10,000 times。
The change of the resistance value shall be within ± (2.0% + 0.05 Ω)

(9) Load Life in Humidity

Place the specimen in a test chamber at 40 ± 2 °C and 90 ~ 95 % relative humidity. Apply the rated voltage to the specimen at the 1.5 hours on and 0.5 hour off cycle. The total length of test is 1,000 hours
The change of the resistance value shall be within ± (5 % + 0.05 Ω).

(10) Load Life Test

Placed in the constant temperature chamber of 70 ± 3 °C the resistor shall be connected to the lead wire at the point of 25mm. Length with each terminal, the resistors shall be arranged not much effected mutually by the temperature of the resistors and the excessive ventilation shall not be performed, for 90 minutes on and 30 minutes off under this condition the rated D.C. voltage is applied continuously for 1000+48/-0 hours then left at no-load for 1hour, measured at this time the resistance value。
The change of the resistance value shall be within ± (5 % + 0.05 Ω).

There shall be no remarkable change in the appearance and the color code shall be legible after the test.

(11) Temperature Cycling Test

The temperature cycle shown in the following table shall be repeated 5 times consecutively. The measurement of the resistance value is done before the first cycle and after ending the fifth cycle, leaving in the room temperature for about 1 hour.

Temperature Cycling Conditions:

Step	Temperature(°C)	Time (minute)
1	+25 +10 -5	10 to 15
2	+65 +0 -3	30
3	+25 +10 -5	10 to 15
4	+150 +3 -0	30

The change of the resistance value shall be within ± (2.0 % + 0.05 Ω)
After the test the resistor shall be free from the electrical or mechanical damage.

(12) Resistance to Soldering Heat

The terminal lead shall be dipped into the solder pot at 350 ± 10 °C for 3 ± 0.5 seconds up to 3 mm.
The change of the resistance value shall be within ± (1.0 % + 0.05 Ω).

7. Plant Address

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