TY-OHM

Document No.: S-E16-1608

TY-OHM ELECTRONIC WORKS CO.,LTD.

THERMAL FUSE INCORPORATED CEMENT RESISTORS

RESISTOR SPECIFICATION

Version : 2016.A

APPROVED BY

APPROVED	REVIEWED	PREPARED
Jason Chen May 11, 2016	Jason Chen May 11, 2016	Rob Lo May 11, 2016

THERMAL FUSE INCORPORATED CEMENT RESISTORS

1. Applicable Scope:

Since thermal fuses are incorporated, cement resistors respond quickly to overloading as external overheating. These resistors also provide outstanding features againt surges. Therefore they are suitable for the prevention of inrush current for switching regulators.

2. Part Number:

It is composed by Type, Nominal resistance and Tolerance. e.g.

SQF10	4R5	J	B	187	10A	N
Type	Nominal Resistance	Tolerance	Special Wire	Standard Operating Temperature (187℃)	Max Working Current	RoHS Compliant

2.1 Type :

Thermal Fuse Incorporated Cement Resistors upon the rated power are called"SQF10".

2.2 Nominal Resistance:

Ω, KΩ are its unit which be in accordance with IEC publication 63 E24 series.

Letter "4R5" indicates resistance value 4.5Ω.

2.3 Tolerance:

It is measured by Bridge-method at room temperature and expressed by a capital letter. J=±5%.

2.4 Special Wire：

Letter ”B” indicates special wire.

2.5 Standard Operating Temperature:

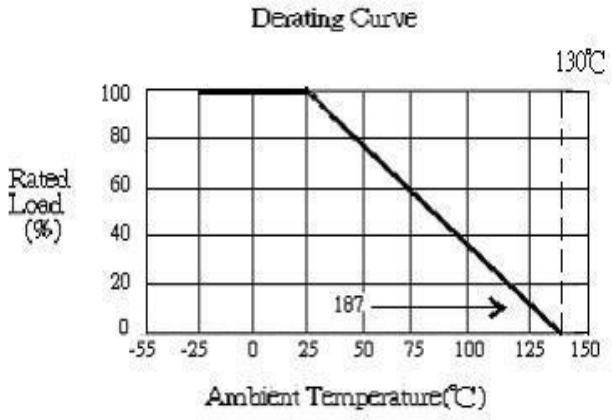
Type	Resistance Range(Ω)	Tolerance	Fuse Type(℃)		Rated Wattage (continued)	Rated Wattage (momentary)	Max Working Voltage	Max Working Current
			Rated Temperature	CUT-OFF Temperature				
SQF10	0.1~300	J: ± 5%	187	182+1/-3	4.2W	10W	250V	10 A

2.6 RoHS Compliant:

Letter ”N” indicates RoHS Compliant.

3. Rated Power:

Rated power is the value of Max load power specified at the ambient temperature of 25℃, 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:

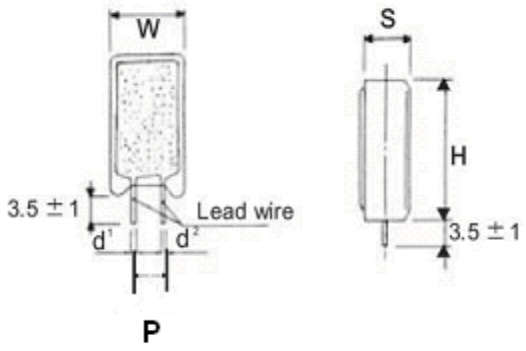
$$E = \sqrt{PXR}$$

where E: rated voltage (V)
P: rated power (W)
R: total nominal resistance (Ω)

However, in case the voltage calculated exceeds the maximum load voltage, such the maximum load voltage shall be regarded as its rated voltage, means whichever less.

4. DIMENSION & STRUCTURE:

4.1 DIMENSION:



TYPE	Dimension (mm)					
	W	S±1	H	P+2/-1	d^1±0.1	d^2±0.1
SQF10	20max.	9	25max.	12.5	0.8	0.8

4.2 STRUCTURE:

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℃) which is solid enough to be free from looseness, crack and easy breakage.

4.2.3 Marking:

Marking is made on the surface with Type, Nominal Resistance, Tolerance, special wire and Maker's trade mark (TY-OHM).

4.2.4 Thermal Fuse:

10A/250V 187℃

5. Operating Temperature Range: -25℃～130℃

6. Mechanical Performance:

6.1 Terminal tensile:

To fix the resistor body, a static load of 4.5kgs. 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/℃ and if the ohm value is under 1Ω the T.C. shall be within ±600ppm/℃.

T.C. (ppm/℃) = 〔(R2－R1)÷R1〕×〔1÷(T2－T1)〕×10^6

where R1: resistance value at reference temperature
R2: resistance value at test temp.
T1: reference temp. (usu. 25℃)
T2: test temp. (about 75℃)

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(℃)	Time (minutes)
1st step	-25±3	30
2nd step	Room temp.	2
3rd step	130±3	30
4th step	Room temp.	2

7.3 Short Time Over Load:

When the resistors are applied 10 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 1000MΩ.

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 25℃ 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 ±5%.

7.7 Moisture-proof Load Life:

The resistors arrayed are placed into a constant temp./humidity oven at the temp. of 40±2℃ 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 500^{+24}_{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 ±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±5℃ for 2 seconds, more than 95% of the circumference of the lead wires shall be covered with solder.

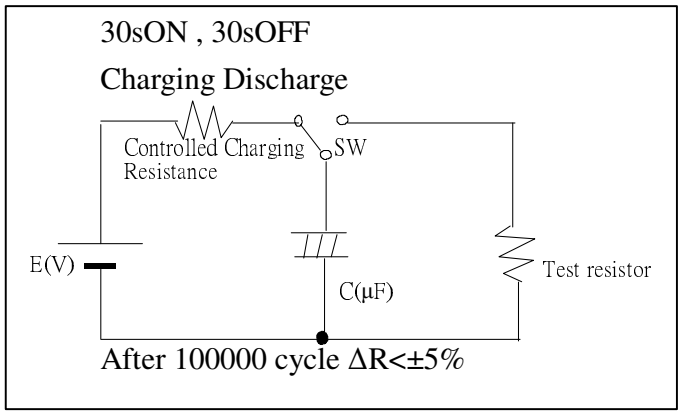
7.9 Resistance to Soldering Heat:

Two leads are together dipped in a melted solder of 265 ±5℃(the ambient temp. is 110℃) for 10 ±1 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 ±1%.

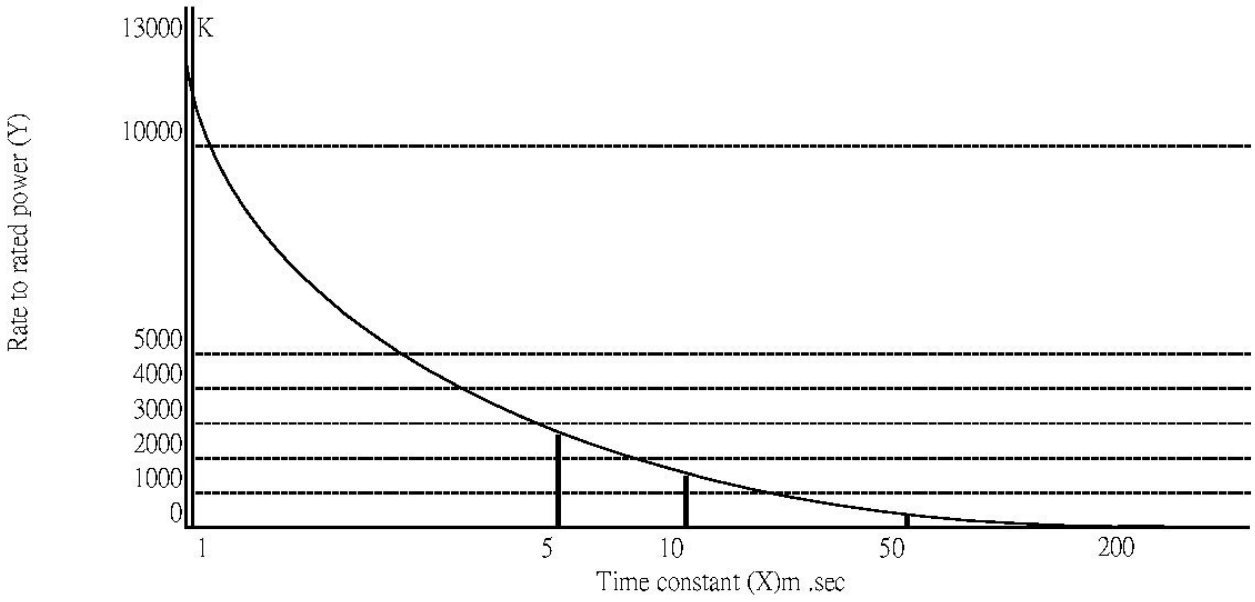
7.10 Nonflammability:

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

7.11 Surge Withstanding:



Where **Y: Multiple of momentary rated power of test resistor**
However,a converted value shall not exceed 750 V in any case.
K: Constant,13000
X: Discharging time constant
However,it shall not exceed 200 m.sec in any case
C: Any capacitance to calculate a desired discharging time constant
E: Any voltage satisfying desired test condition
R: Test resistor



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