

Cement Resistors

RoHS
Compliant



Application

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

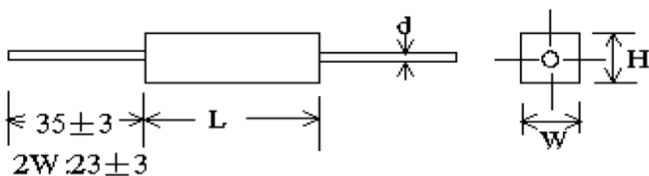
Specification

Part Number	Resistance Ω	Rated Power	Tolerance	Maximum Working Voltage	Element Type
46-000033	33	5W	$\pm 5\%$	350V	Cement Resistors
46-000200	2			750V	
47-001000	10	10W			

Structure

- Terminal : Terminal is to be firmly connected with resistors element, both electrically and mechanically, and allow easy soldering.
- Stuffing : Stuffing is made by flameproof cement (resistant to 800°C) which is solid enough to be free from looseness, crack and easy breakage.
- Marking : Marking is made on the surface with Rated Wattage, Nominal Resistance, Tolerance and Maker's trade mark (TY-OHM).
- Operating Temperature Range : -55°C to 155°C

Dimension



Dimensions : Millimetres

Part Number	Dimension(mm)				Resistance Range(Ω)	
	W ± 1	H ± 1	L ± 1.5	d ± 0.1	Wire Wound	Power Film
46-000033	10	9	22	0.8	0.1~150	151~50K
46-000200			48			
47-001000						

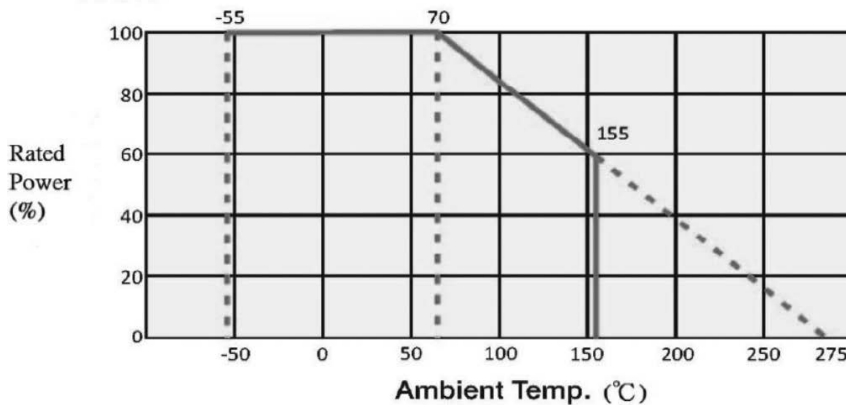
- Notes: 1. Max Overload Voltage is 2 times of Max Working Voltage.
 2. Too low or too high ohmic value can be supplied only case by case.
 3. Max Working Voltage is applying for all parts.
 4. Power Film means cutting resistance values instead of wound by resistance wires.
 5. Non-Inductive types are also supplied.

Cement Resistors



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.



Dimensions : Millimetres

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.

Electrical Performance

Resistance Temperature Coefficient : It shall be within $\pm 300 \text{ppm}/^\circ\text{C}$ and if the ohmic value is under 1Ω the T.C. shall be within $\pm 600 \text{ppm}/^\circ\text{C}$.

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

where

R1: resistance value at reference temperature

R2: resistance value at test temp.

T1: reference temp. (usu. 25°C)

T2: test temp. (about 75°C)

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 $\pm 1\%$.

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

Short Time Over Load

: When the resistors are applied 10 times (Power Film: 5 times) as much as rated wattage 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 $\pm 2\%$.





Cement Resistors

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.
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.
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 ±5%.
Moisture-proof Load Life	: The resistors arrayed are placed into a constant temp./humidity oven at the temp. of 40±2°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 ±5%. There also shall be no evidence of remarkable change on appearance, and the marking shall not be illegible.
Solder-ability	: The leads with flux are dipped in a melted solder of 235 ±5°C for 2 seconds, more than 95% of the circumference of the lead wires shall be covered with solder.
Resistance to Soldering Heat	: Two leads are together dipped in a melted solder of 270 ±5°C for 10 ±1 seconds, or 350 ±10°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 ±1%.
Nonflammability	: The resistors are applied the power of 16 times the rated wattage for 5 min. and shall not get flame.

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