MOUNTING OF THICK FILM POWER RESISTORS TYPE PR250

As explained in the Catalogue, to assembly PR250 resistors on aluminium heatsink, it is necessary to use a suitable thermal compound.

The substratum base under the resistor juts out from the container frame about some millimeter tenth; when the resistor will be screw to the heatsink it is helped by a central spring to adjusts itself to reproduce the heatsink surface.

The base appears metalized silver to avoid the partial discharges.

In order to ensure that produced heat is transferred to the heatsink, a thermal compound with a good thermal conductivity must be placed between resistor base and the heatsink surface (minimum 1 W/mK).

The heatsink planarity required is about 0,05mm and the surface finish 6,3 µm. When the resistor will be fixed to the heatsink thermal compound will fill up all cavities, so knowing resistor and heatsink surface planarity we suggest a thickness of 0,1mm.

For an area 50,8 x 50,8mm and a thickness of 0,1mm you have to use approx. 0,26 cm^3 of thermal compound, the density is usually 2 ÷ 3 gr/cm^3, so you have to use about 0,6 ÷ 0,8g of product.

Thermal compound must be uniformly applied on the resistor base with a spatula or for maximum uniformity with the serigraphic method on the heatsink.

For high power applications the difference of temperature between the resistor base and the heatsink doesn't however overcome 20°C.

Following there are the best thermal compounds that we know:

1) Thermal compound HTCP (Electrolube) 2.5 W/mK 3g/cm³
2) Thermal compound HTSP (Electrolube) 3 W/mK 3g/cm³
3) Thermal compound PTK-002 (Cooler Master) 4,5W/mK 2,6g/cm³
4) Thermal compound Silver 5 (Arctic Silver) 9W/mK

Of course the best performances are achieved with the higher values thermal compounds, the thermal resistance Rth = 0,15°C/W indicated on catalogue is for thermal compound of 1W/mK.

The resistor assembly must be done with the following instructions:

1) Place the resistor upon the heatsink and fix it with one screw without tighten it.
2) Turn it of few degree to arrange the thermal compound then screw in alternatively the two screws until 2 Nm each.

The superfluous thermal compound is escaped by the spring. This works with about 200N and helps the resistor joining to the heatsink surface.

Handle with care to avoid bump to the exposed Alumina and make sure that extraneous parts are not present between the Alumina and the heatsink. They could cause the fracture of the substrate and therefore they can reduce the dielectric strength and/or open the resistor.

ATE Electronics
Via Scaletta 13, IT10094 Giaveno, Italy
☏ +39 (0) 11 9378575
🖷 +39 (0) 11 9376463
✉ info@ate-electronics.com
www.ate-electronics.com