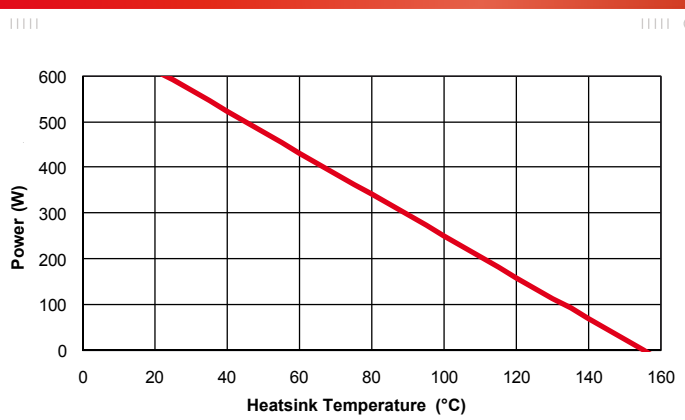
PR Series

THICK FILM POWER RESISTORS PR250

FEATURES

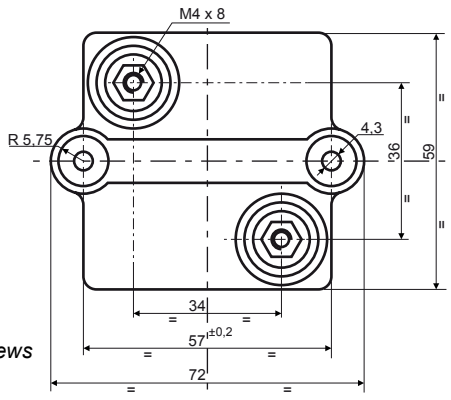
Very good ratio Power / Volume
Easy mounting and wiring with significant cost advantages.
Non inductive performance for high frequency applications.
One models for power applications up to 500W.
Suited to ULV94-V0 application.



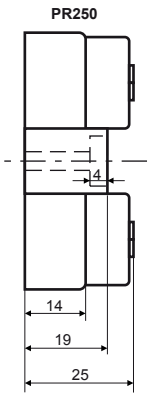
Specifications

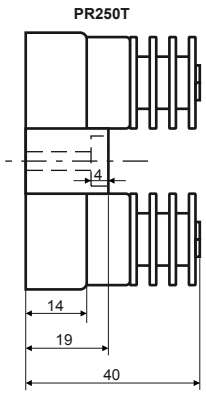
ELECTRICAL SPECIFICATIONS

-Power rating: 250W (heatsink at 100°C)
-Resistance range: From 1R0 to 1MOhm, E12 series
-Tolerance: Standard 10%, up to 1% on request
-Temperature coefficient: ±100 ppm/°C
-Max Work. Voltage: 5000 Vac
-Work Temp. Range: Da -55°C a +155°C
-Dielectric Strength: 7000 Vac (12000 Vac x PR250T)
-Insulation resistance: > 10^5 MOhm at 500V
-Creep distance: 42 mm (65 mm x PR250T)
-Air gap distance: 16 mm (29mm x PR250T)
-Partial discharge: < 10 pC @ 5000 Vac
-Self inductance: 80 nH
-Parallel capacitance: 40 pF
-Capacitance to heatsink: < 120 pF
-Overload : 4 Pn x 10 s
-Thermal resistance: 0.15 °C/W
-Heatsink flatness: 0.05 mm Max
-Heatsink surface finish: 6.3 µm Max
-Thermal grease: Required
-Max torque for contacts: 2Nm (static)
-Max torque for mounting: 2Nm (static)
-Weight: 100 g (130 gx PR250T)
*-Options: - For values R039 <R< 1R0 is available Metal Foil type **PR250M***
*- Cable terminals **PR250C / PR250TC***

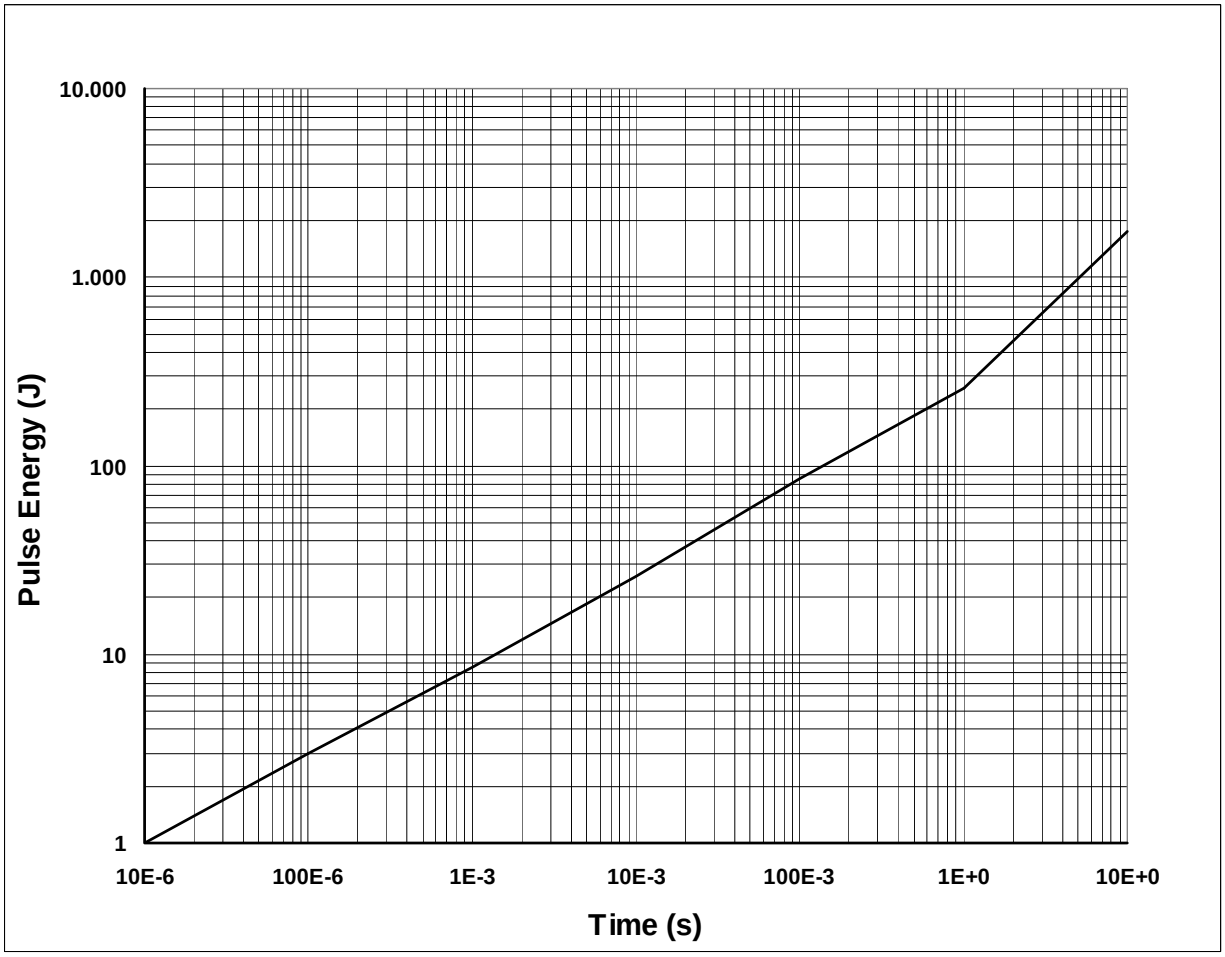


Connection and mounting screws supplied with the resistor





The maximum load capability for application between 10µs and 10s is indicated by the line on the graph below (Maximum heatsink temperature: 70°C).
If the temperature is higher than 70°C, You have to reduce proportionally the overload (derating: E = 0J @ 155°C)
If the pulse is repeated more times, please contact ATE Electronics technical support.



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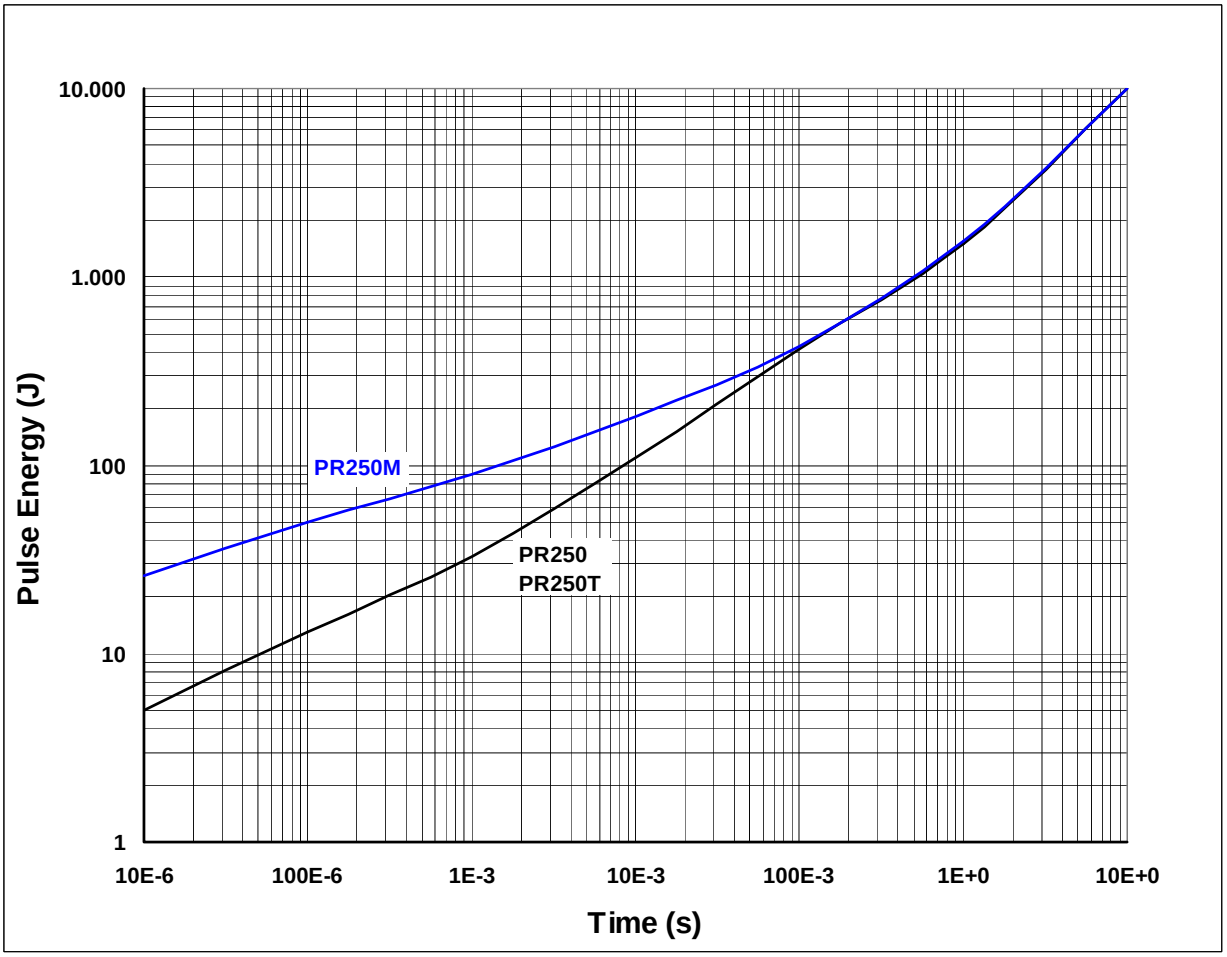

As explained in the Catalogue, to assembly PR250 resistors on aluminium heatsink, it is necessary to use a suitable thermal compound.
The substratum base under the resistor juts out from the container frame about some millimeter tenth; when the resistor will be screw to the heatsink it is helped by a central spring to adjusts itself to reproduce the heatsink surface.
The base appears in metallized silver to avoid the partial discharges.
In order to ensure that produced heat could be 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/cm^3
2) Thermal compound HTSP (Electrolube) 3 W/mK 3g/cm^3
3) Thermal compound PTK-002 (Cooler Master) 4,5W/mK 2,6g/cm^3
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:
a) Place the resistor upon the heatsink and fix it with one screw without tighten it.
b) 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

Verification		Approval	
Technical Function	Signature Dalmasso	General Manager	Signature

ATE ELECTRONICS s.r.l.

MSDS

PR250 *- all values*

		%	Peso tot (g)	Peso% (g)
Ceramic base:	Allumina		13,14	
	1344-28-1	97,0%		12,75
	7440-50-8	3,0%		0,39
	Steatite		24,75	
	63210-56-0	100,0%		24,75
Resistive element:	ThickFilm		-	-
	proprietary			
Plastic case (UL94V0):	PBT		34,26	
	37640-57-6	5,0%		1,71
Encapsulant:	Silicone		12,70	
	14808-60-7	31,0%		3,94
	1314-13-2	1,0%		0,13
Terminals:	Tinned brass		9,55	
	7440-50-8	69,0%		6,59
	7440-66-6	30,5%		2,91
	7440-02-0	0,1%		0,01
	7440-31-5	0,4%		0,04