Power Resistors for Mounting onto a Heatsink
Thick Film Technology



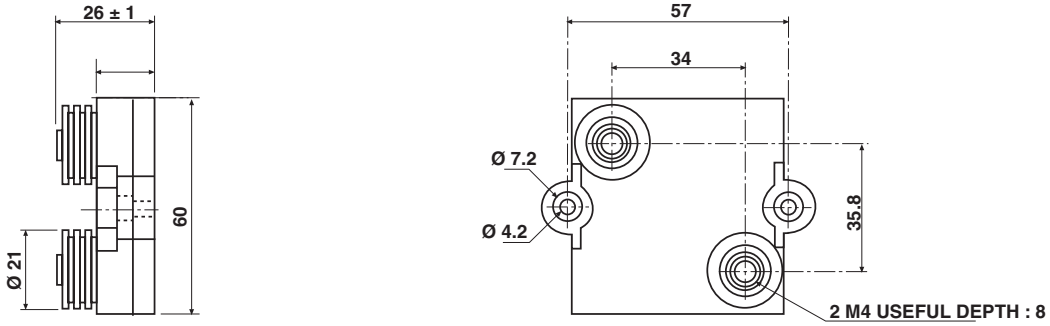
FEATURES

- High power rating
- High overload capability
- Easy mounting
- Low thermal radiation of the case

This range has been developed specifically for electrical traction applications and is capable of dissipating 500W at +70°C. The remarkable performance characteristics are evident when used in severe pulse conditions. The copper base allows easy mounting on the heatsink and provides optimal dissipation conditions.

DIMENSIONS in millimeters

RPS 500D



• Tolerance unless stated: ± 0.2mm

MECHANICAL SPECIFICATIONS

Mechanical Protection	Insulated case
Substrate	Alumina onto base of nickel coated copper
Resistive Element	Cermet
End Connections	Screws M4 (M5 on request)
Tightening Torque on Connections	2Nm
Tightening Torque on Heatsink	4Nm
Weight	250g ± 10%

ENVIRONMENTAL

Thermal Resistance	RTH (j-c) 0.11°C/W
Temperature Range	- 55°C to + 125°C
Climatic Category	55/125/56

ELECTRICAL SPECIFICATIONS

Resistance Range	0.24 to 1M E24 series
Tolerances	± 1% to ± 10%
Power Rating Chassis mounted	500W at 70°C continuous 1000W at 25°C for 10 seconds
Temperature Coefficient Standard	± 300ppm/°C < 1Ω ± 150ppm/°C > 1Ω
Limiting Element Voltage	5kVRMS
Dielectric Strength*	L:7kVRMS - H: 12kVRMS
Insulation Resistance	> 10^6MΩ
Inductance	< 50 nH

*MIL STD 202, 1 Minute, 10mA Max

PERFORMANCE		
TESTS	**CONDITIONS**	**TYPICAL DRIFTS**
Momentary Overload	NF EN 140000 CEI 115_1 2Pn/10 seconds	< ± (0.25% + 0.05Ω)
Rapid Temperature Change	NF EN 140000 CEI 68214 Test Na 5 cycles - 55°C to + 125°C	< ± (0.25% + 0.05Ω)
Load Life (chassis mounted)	NF EN 140000 CEI 115_1 1000 hours 500 W/70°C (no cycling)	< ± (0.5% + 0.05Ω)
Humidity (steady state)	MIL STD 202 Method 103 B and D 56 days 95% R.H.	< ± (0.5% + 0.05Ω)

RESISTANCE VALUE IN RELATION TO TOLERANCE AND TCR		
Ohmic	< 1Ω	> 1Ω
Standard Tolerance	± 5%	± 5%
Standard T.C.R.	± 300ppm/°C	± 150ppm/°C
Tolerance On Request	± 1% - ± 2% - ± 10%	

CHOICE OF THE HEATSINK

The user must choose the heatsink according to the working conditions of the component (power, room temperature). Maximum working temperature must not exceed 125°C.

The dissipated power is simply calculated by the following ratio:

$$P = \frac{\Delta T}{[R_{TH}\,(j\text{-}c) + R_{TH}\,(c\text{-}a)]} \quad (1)$$

P: expressed in W

ΔT: difference between maximum working temperature and room temperature.

R_{TH}: (j-c): thermal resistance value measured between resistive layer and outer side of the resistor. It is the thermal resistance of the component: 0.11°C/W.

R_{TH}: (c-a): thermal resistance value measured between outer side of the resistor and room temperature. It is the thermal resistance of the heatsink, depending on the heatsink itself (type, shape) and the quality of the fastening device.

RECOMMENDATIONS FOR MOUNTING ONTO A HEATSINK

Surfaces in contact must be carefully cleaned.

The heater must have an acceptable flatness: from 0.05mm to 0.1mm/100mm.

Roughness of the heatsink must be around 6.3µm.

In order to improve thermal conductivity, surfaces in contact (alumina, heatsink) should be coated with a silicon grease (type SI 340 Rhône-Poulenc or Dow Corning).

The fastening of the resistor to the heatsink is under pressure control of two screws. Tightening torque: 4Nm.

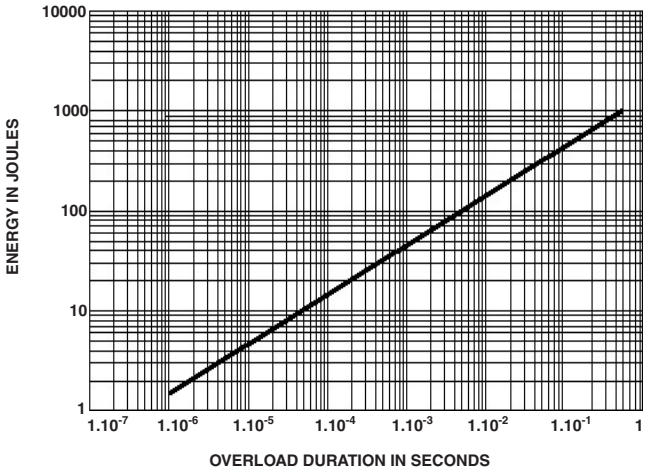
The following accessories are supplied with each product: 2 off M 4 x 16, 2 off M4 TE 4 x 0.6 and 2 off M4 washers.

OVERLOADS

Short time overload: 2Pn/10 seconds

Accidental overload: The values indicated in the graph below are applicable to resistors in air or mounted onto a heatsink.

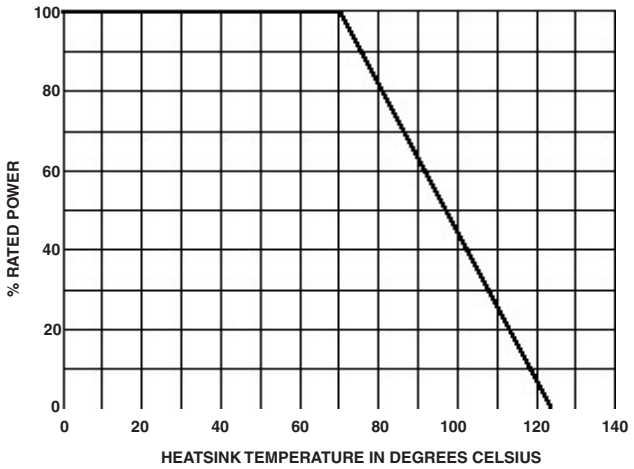
ENERGY CURVE



POWER RATING CHART

The heatsink temperature should be maintained at the values specified in fig. 2.

To optimise the thermal conduction, contacting surfaces should be coated with silicone grease and heatsink mounting screws tightened to 4Nm.



MARKING

Series, style, ohmic value (in), tolerance (in), tolerance (in %), manufacturing date, VISHAY trade mark.

ORDERING INFORMATION

RPS	500D	H	100Ω	± 10%	xxx
MODEL	STYLE	CONNECTIONS	RESISTANCE VALUE	TOLERANCE	CUSTOM DESIGN
		Optional H: dielectric strength 12kV L: dielectric strength 7kV		Optional ± 1% ± 2% ± 5% ± 10%	Options on request T.C.R., shape, etc.

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