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RPS 500

Vishay Sfernice

Power Resistors for Mounting onto a Heatsink Thick Film Technology

FEATURES

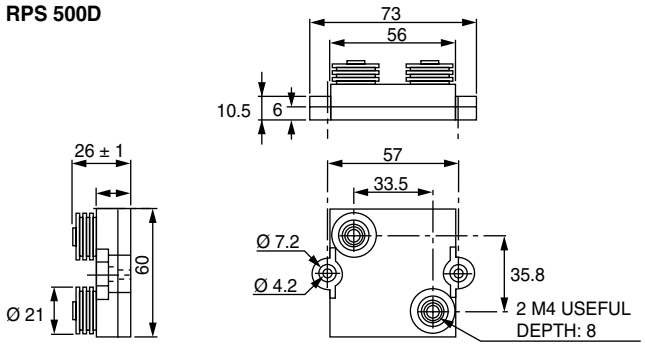
- High power rating: 500 W
- High overload capability up to 2 times rated Power (see energy curve)
- Heatsink mounting
- Low thermal radiation of the case

RoHS COMPLIANT

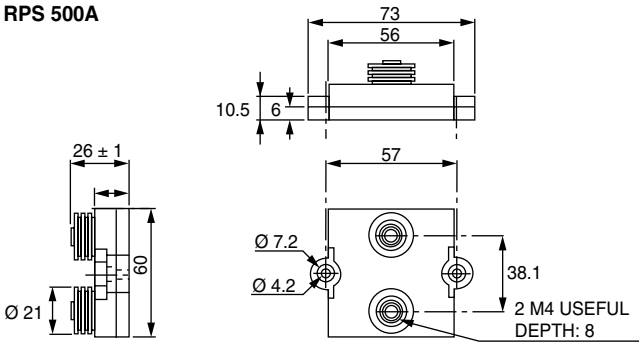
This range has been developed specifically for electrical traction applications and is capable of dissipating 500 W at + 70 °C. The remarkable performance characteristics are evident when used in severe pulse conditions. The copper base allows easy mounting on the heatsink and provides optimal dissipation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

DIMENSIONS in millimeters

RPS 500D



RPS 500A



* Tolerances unless stated: ± 0.2 mm

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	2 Nm
Tightening Torque on Heatsink	4 Nm
Weight	250 g ± 10 %

ENVIRONMENTAL SPECIFICATIONS

Temperature Range	- 55 °C to + 125 °C

ELECTRICAL SPECIFICATIONS	
Resistance Range	0.24 to 1M E24 series
Tolerances	± 1 % to ± 10 %
Rated Power (Pr_{70}) Chassis Mounted at 70 °C (Case Temperature)	500 W continuous load
Thermal Resistance of the Component	$R_{th(j-c)}$: 0.11 °C/W
Temperature Coefficient, TC	± 300 ppm/°C < 1 Ω ± 150 ppm/°C > 1 Ω
Limiting Element Voltage U_L	5 kV_{RMS}
Dielectric Strength (1)	L: 7 kV_{RMS} - H: 12 kV_{RMS} MIL STD 202 Method 301: 1 min/10 mA max.
Insulation Resistance	> 10^6 MΩ under U_{ins} = 500 V_{DC} IEC 60115-1
Inductance	< 50 nH

For technical questions, contact: sfer@vishay.com

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Revision: 14-Nov-08

PERFORMANCE		
TESTS	**CONDITIONS**	**REQUIREMENTS**
Momentary Overload	IEC 60115-1 2 Pr/10 s U_L = 5000 V	< ± (0.25 % + 0.05 Ω)
Rapid Temperature Change	IEC 60115-1/IEC60068-2-14 Test Na 5 cycles - 55 °C to + 125 °C	< ± (0.25 % + 0.05 Ω)
Load Life (Chassis Mounted)	IEC 60115-1 Pr (i.e. 500 W)/1000 h/70 °C (no cycling) (1)	< ± (0.5 % + 0.05 Ω)
Humidity (Steady State)	MIL STD 202 Method 103 B and D 56 days 95% RH/40 °C	< ± (0.5 % + 0.05 Ω)

Note:

(1) Resistors are not tested and guaranteed in cycling conditions

RESISTANCE VALUE IN RELATION TO TOLERANCE AND TCR		
Ohmic	< 1 Ω	> 1 Ω
Standard Tolerance	± 5 %	± 5 %
Standard TCR (- 55 °C to + 125 °C)	± 300 ppm/°C	± 150 ppm/°C
Tolerance on Request	± 1 %, ± 2 %, ± 10 %	

CHOICE OF THE HEATSINK

The user must choose 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:

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

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.

$R_{TH\ (c\ -\ 4)}$: 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 0.05 mm to 0.1 mm/100 mm.

Roughness of the heatsink must be around 6.3 µm.

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).

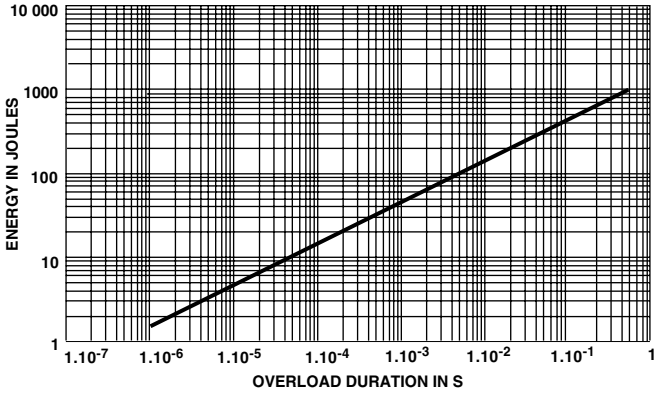
The fastening of the resistor to the heatsink is under pressure control of two screws tightened at 4 Nm for full power availability

The following accessories are supplied with each product: 2 off CHC M4 x 16/16 class 12.9 for heatsink mounting,
2 off TH M4 x 6/6 and 2 M4 contact lock washers for connections.

OVERLOADS

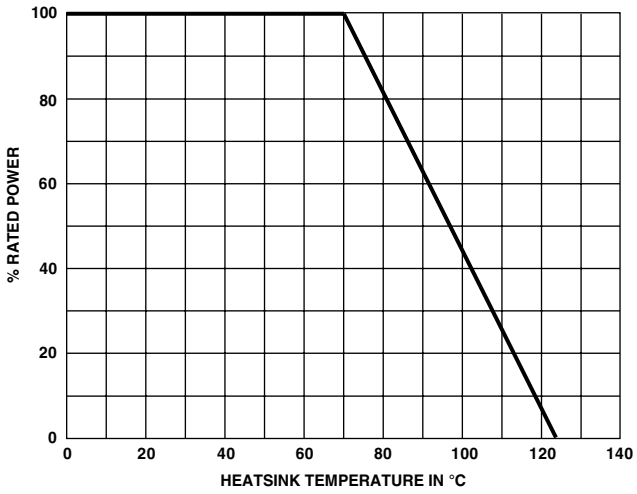
Short time overload: 2 Pn/10 s
Accidental overload: The values indicated in the graph below are applicable to resistors in air or mounted onto a heatsink.

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 4 Nm.



PACKAGING

Box of 15 units

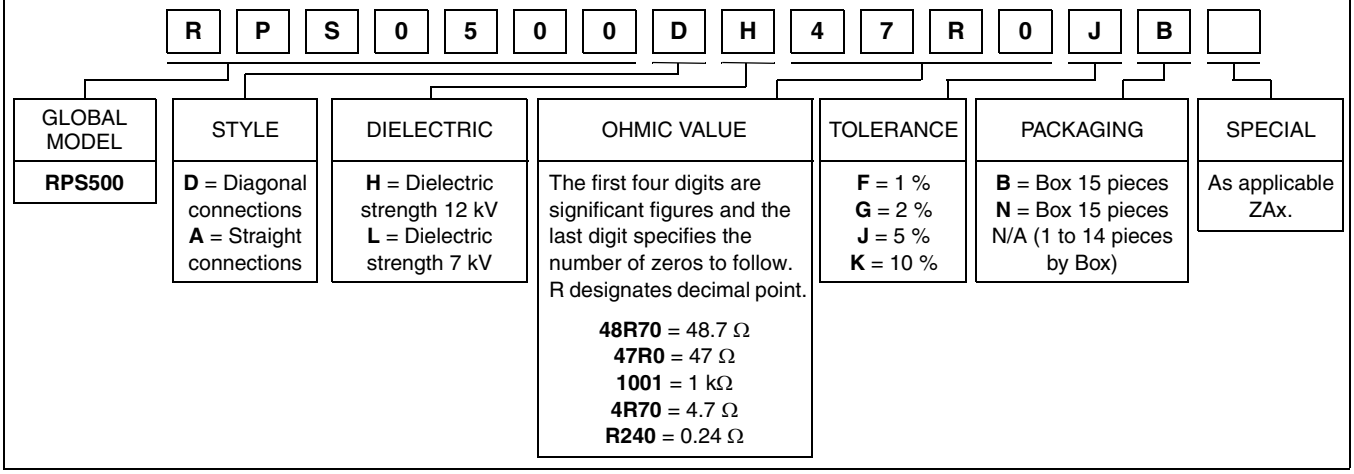
MARKING

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

ORDERING INFORMATION

RPS	500	DH	100 Ω	10 %	XXX	BO15	E
MODEL	STYLE	CONNECTIONS Optional H: Dielectric strength 12 kV L: Dielectric strength 7 kV	RESISTANCE VALUE	TOLERANCE ± 1 % ± 2 % ± 5 % ± 10 %	CUSTOM DESIGN Options on request TCR, shape, etc.	PACKAGING	LEAD (Pb)-FREE

SAP PART NUMBERING GUIDELINES



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