

Power Resistor for Mounting onto a Heatsink Thick Film Technology

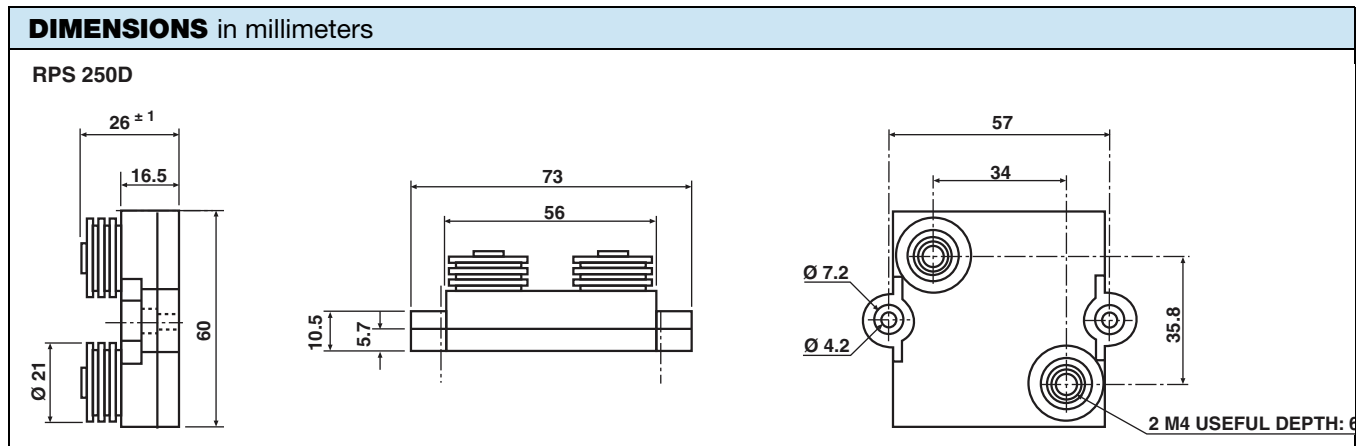


FEATURES

- High power rating: 250 W
- High overload capability up to 4 times nominal power (see energy curve)
- Easy mounting
- Low thermal radiation of the case
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


**RoHS
COMPLIANT**

Developed for specific applications such as railroad electrical traction, this series can bear short overloads as high as fifteen times the nominal power. Designed to be mounted onto a heatsink, these power resistors exhibit remarkable characteristics.


Note

- Tolerance unless stated: ± 0.2 mm

STANDARD ELECTRICAL SPECIFICATIONS						
MODEL	SIZE	RESISTANCE RANGE Ω	RATED POWER $P_{25^\circ\text{C}}$ W	LIMITING ELEMENT VOLTAGE U_L V	TOLERANCE $\pm \%$	TEMPERATURE COEFFICIENT \pm ppm/ $^\circ\text{C}$
RPS 250	250	0.24 to 1M ⁽¹⁾	1000	5000	1, 2, 5, 10	150

Note

⁽¹⁾ E24 series

MECHANICAL SPECIFICATIONS	
Mechanical Protection	Insulated case
Resistive Element	Cermet
Substrate	Alumina onto aluminum base
End Connections	Screws M4 (M5 on request)
Tightening Torque Connections	2 Nm
Weight	170 g $\pm 10 \%$

ENVIRONMENTAL SPECIFICATIONS	
Thermal Resistance	$R_{th(j-c)}$ 0.22 $^\circ\text{C}/\text{W}$
Temperature Range	- 55 $^\circ\text{C}$ to 125 $^\circ\text{C}$
Climatic Category	55/125/56

TECHNICAL SPECIFICATIONS	
Power Rating Chassis Mounted	250 W at 50 $^\circ\text{C}$ continuous 1000 W at 25 $^\circ\text{C}$ for 10 s
Temperature Coefficient Standard	± 250 ppm/ $^\circ\text{C}$ < 1 Ω ± 150 ppm/ $^\circ\text{C}$ > 1 Ω
Dielectric Strength MIL STD 202 (301), min, 10 mA max.	L connections 7 kV _{RMS} H connections 12 kV _{RMS}
Insulation Resistance	> 10 ⁶ M Ω
Inductance	< 50 nH
Capacitance Resistor/Ground	< 40 pF < 120 pF

PERFORMANCE		
TESTS	CONDITIONS	REQUIREMENTS
Momentary Overload	NF EN 140000 CEI 115_1 4 Pr/10 s/ $U_L = 5000$ V	$< \pm (0.25 \% + 0.05 \Omega)$
Rapid Temperature Change	NF EN 140000 CEI 68214 Test Na 5 cycles - 55 °C + 125 °C	$< \pm (0.25 \% + 0.05 \Omega)$
Load Life	NF EN 140000 CEI 115_1 1000 h Pr at 70 °C	$< \pm (0.5 \% + 0.05 \Omega)$
Humidity (Steady State)	MIL STD 202 Method 103 B and D 56 days R.H. 95 %	$< \pm (0.5 \% + 0.05 \Omega)$

RESISTANCE VALUE IN RELATION TO TOLERANCE AND TCR		
Ohmic Value	$< 1 \Omega$	$> 1 \Omega$
Standard Tolerance	$\pm 5 \%$	$\pm 5 \%$
Standard TCR (- 55 °C to + 125 °C)	± 250 ppm/°C	± 150 ppm/°C
Tolerance on Request	$\pm 1 \% / \pm 2 \% / \pm 10 \%$	

RECOMMENDATIONS FOR MOUNTING ONTO A HEATSINK

- Surfaces in contact must be carefully cleaned.
- The heatsink must have an acceptable flatness: From 0.05 mm to 0.1 mm/100 mm.
- Roughness of the heatsink must be around 6.3 μ m. In order to improve thermal conductivity, surfaces in contact (alumina, heatsink) should be coated with a silicone grease (type SI 340 from Rhône-Poulenc or Dow 340 from Dow Corning).
- The fastening of the resistor to the heatsink is under pressure control of four screws (not supplied).

Tightening Torque on Heatsink	RPS 250
	3 Nm

- In order to improve the dissipation, either forced-air cooling or liquid cooling may be used.
- Do not forget to respect an insulation value between two resistors (dielectric strength in dry air 1 kV/mm).
- In any case the hot spot temperature, measured locally on the case must not exceed 125 °C.
- Test should be performed by the user.

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:

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

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: (see Environmental Specifications).

$R_{TH(c-a)}$: 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.

Example:

$R_{TH(c-a)}$: for RPS 250 power dissipation 180 W at + 50 °C room temperature.

$$\Delta T \leq 125 \text{ °C} - 50 \text{ °C} \leq 75 \text{ °C}$$

$$R_{TH(j-c)} + R_{TH(c-a)} = \frac{\Delta T}{P} = \frac{75}{180} = 0.42 \text{ °C/W}$$

$$R_{TH(j-c)} = 0.22 \text{ °C/W}$$

$$R_{TH(c-a)} \leq 0.42 \text{ °C/W} - 0.22 \text{ °C/W} \leq 0.20 \text{ °C/W}$$



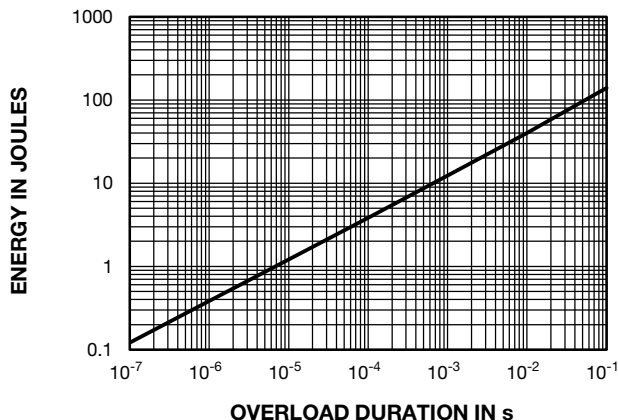
OVERLOADS

In any case the applied voltage must be lower than $2.5 U_n$.
 $U_{max.} < 2.5 U_n < 12\ 500\ V$.

Short time overload: 4 Pr/10 s

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

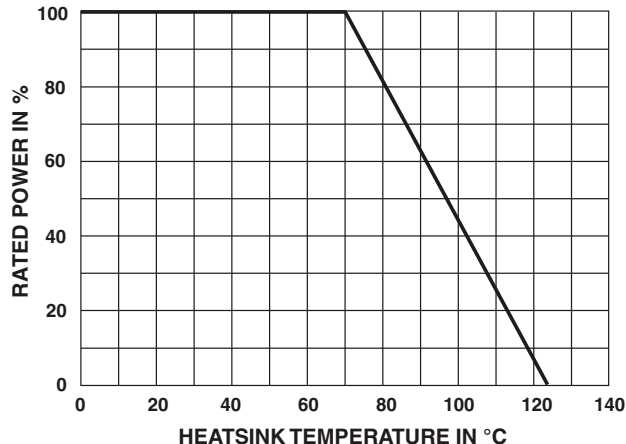
ENERGY CURVE



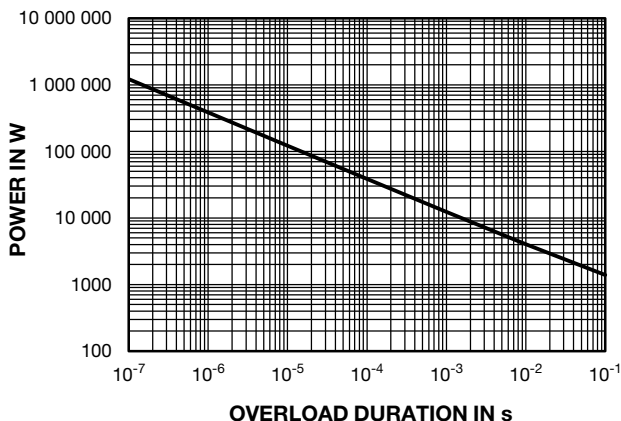
POWER RATING

The temperature of the heatsink should be maintained in the limit specified.

To improve the thermal conductivity, surfaces in contact should be coated with a silicone grease.



POWER CURVE



PACKAGING

Box of 15 units

MARKING

Series, style, ohmic value (in Ω), tolerance in %, manufacturing date, Vishay Sfernice trademark

GLOBAL PART NUMBER INFORMATION

R P S 0 2 5 0 D L 2 R 2 0 J B Z A 3													
GLOBAL MODEL	STYLE	DIELECTRIC	OHMIC VALUE			TOLERANCE	PACKAGING	TYPE					
RPS250	D = Diagonal connections A = Straight connections	H = Dielectric strength 12 kV L = Dielectric strength 7 kV	The first three digits are significant figures and the last digit specifies the number of zeros to follow. R designates decimal point. 2R20 = 2.20 Ω 48R7 = 48.7 Ω 47R0 = 47 Ω 1001 = 1 kΩ 4R70 = 4.7 Ω R240 = 0.24 Ω			F = 1 % G = 2 % J = 5 % K = 10 %	B = Box, 15 pcs N = Box, 15 pcs N/A (1 to 14 pcs by box)	Standard RPS250A = Blank Standard RPS250D = ZA3 Special = Blank (for RPS250D) or as applicable = ZAx					



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.



Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331