

## Charging Resistor for EV Hybrid Wirewound Technology


**RoHS  
COMPLIANT**
**FEATURES**

- Technology: hybrid wirewound
- High energy / volume ratio
- Easy mounting (faston connection 6.35 [0.250"])
- Possibility to mount on heatsink
- AEC-Q200 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

**APPLICATIONS**

- Precharge
- Discharge
- Active discharge resistor

**LINKS TO ADDITIONAL RESOURCES**

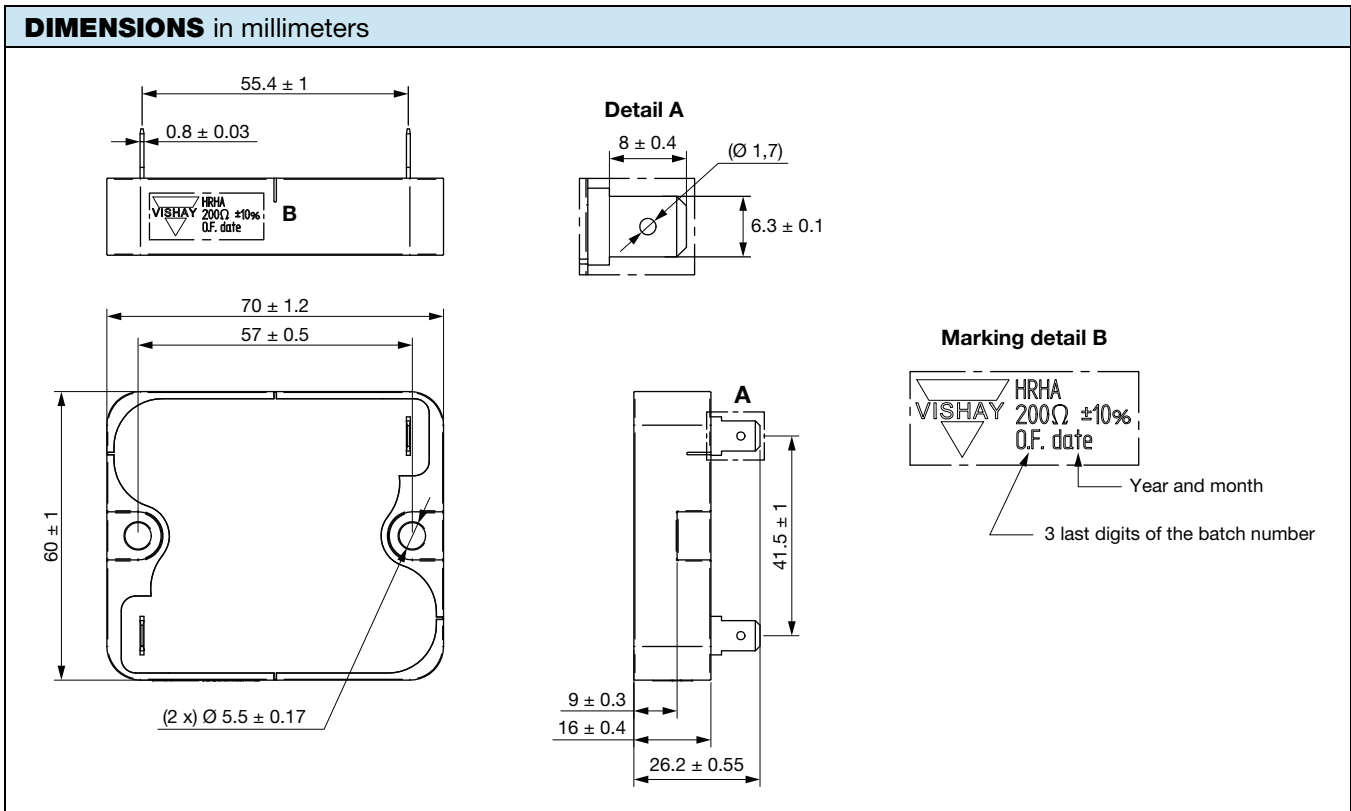

3D Models

STANDARD ELECTRICAL SPECIFICATIONS				
GLOBAL MODEL	POWER RATING ON STAINLESS STEEL <sup>(1)</sup> W	POWER RATING ON PAMITHERM <sup>(1)</sup> W	RESISTANCE RANGE Ω	TOLERANCE ± %
HRHA	90	54	1 to 1K	5, 10

**Note**
<sup>(1)</sup> 6 mm thickness, see Fig. 2

TECHNICAL SPECIFICATIONS		
PARAMETER	UNIT	RESISTOR CHARACTERISTICS
Temperature coefficient	ppm/°C	± 100 (typical)
Operating temperature range	°C	-55 to +250

GENERAL CHARACTERISTICS	
Dielectric base	Ceramic
Resistive circuit	Hybrid wirewound
Terminals	Stainless steel
Ohmic values	E24 (other on request)
Maximum operating voltage between terminals (by design)	1000 V <sub>DC</sub>
Dielectric voltage	3000 V <sub>RMS</sub> (higher on request), 50 Hz, 1 min
Creepage distance	14 mm
Clearance distance	14 mm
Weight	160 g max.



**MOUNTING**

For soldering recommendations please see [www.vishay.com/doc?32595](http://www.vishay.com/doc?32595)

**DISSIPATION**

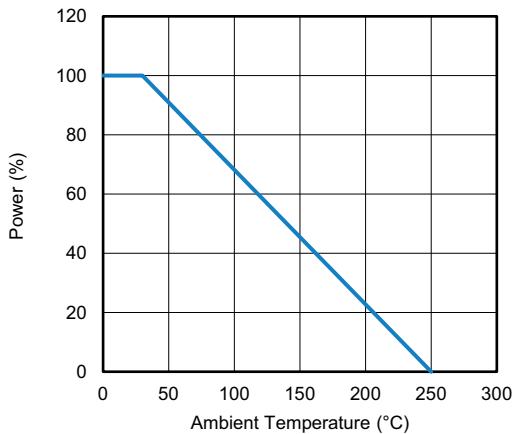


Fig. 1 - Permanent Applicable Power as a Function of Ambient Temperature

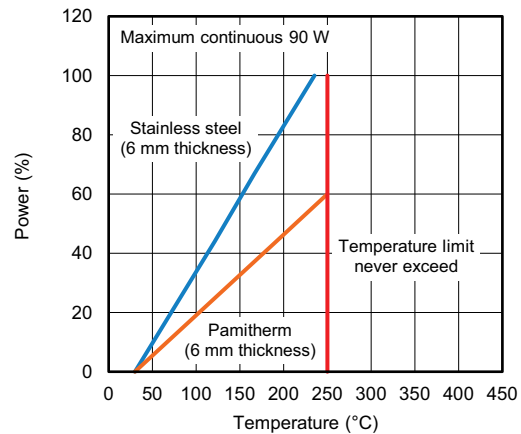


Fig. 2 - Bottom Case Temperature as a Function of the Power Applied at  $T_{amb} = 30 \text{ }^\circ\text{C}$

<b>ENERGY</b>		
<b>Energy mode at 30 °C room temperature</b>	Stainless steel (6 mm thickness)	Pamitherm (6 mm thickness)
<b>Refer to Fig. 2 for bottom case temperature vs. pulse number</b>	PULSE – DURATION – WAIT <sup>(1)</sup>	PULSE – DURATION – WAIT <sup>(1)</sup>
<b>Continuous cycle - short circuit wave (refer to Fig. 3)</b>	9000 J - 1.8 s - 100 s	9000 J - 1.8 s - 167 s
<b>Continuous cycle - RC discharge wave (refer to Fig. 4)</b>	1850 J - 0.74 s - 30 s	1850 J - 0.74 s - 34 s

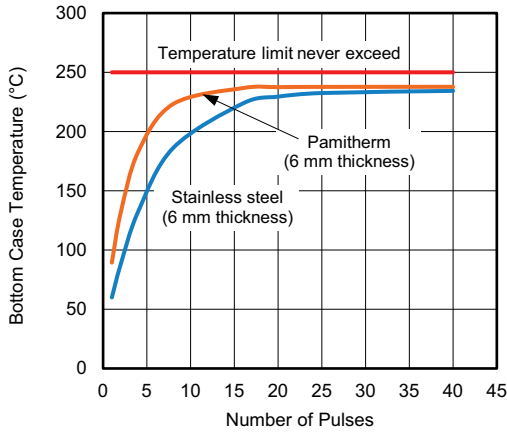


Fig. 3 - Bottom Case Temperature With Continuous Short Circuit Cycle 9000 J at  $T_{amb} = 30\text{ °C}$

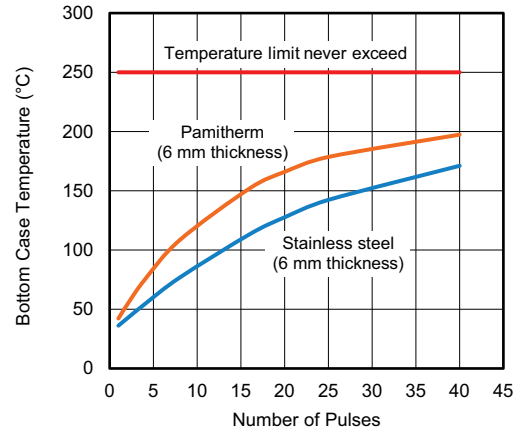


Fig. 4 - Bottom Case Temperature With Continuous RC Discharge Cycle 1850 J at  $T_{amb} = 30\text{ °C}$

<b>ORDERING INFORMATION</b>					
<b>HRHA</b>	<b>F</b>	<b>N</b>	<b>22U</b>	<b>5 %</b>	<b>BO12</b>
MODEL	TERMINATION	COATING	RESISTANCE VALUE	TOLERANCE	PACKAGING

<b>GLOBAL PART NUMBER INFORMATION</b>						
H	R	H	A	F	C	2 0 0 0
1				2	3	4
1	2	3	4	5	6	7
PRODUCT TYPE	TERMINATION	COATING (if applicable)	RESISTANCE VALUE	TOLERANCE	PACKAGING	INDUSTRIALIZATION NUMBER
HRHA	F = faston	C = coated N = not coated	The first three digits are significant figures and the last specifies the number of zeros to follow, R designates decimal point. 4702 = 47 kΩ 47R0 = 47 Ω	J = 5 % K = 10 %	B = box Box quantity depends of model and size	Specific digits for custom design (if applicable)

<b>EXAMPLES</b>		
MODEL	DESCRIPTION	PART NUMBER
HRHA	HRHAFN22R0JB	HRHA F N 22U 5 % BO12
HRHA	HRH AFC22R0JB	HRHA F C 22U 5 % BO12



## 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.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

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.