

High Current Thermal Fuse



The HCTF CP series is especially designed for high current applications with an operating temperature up to 160 °C. In case of excess heat in the range of the functioning body temperature of $(235 \pm 15) ^\circ\text{C}$ the thermo fuse opens automatically and disconnects the circuit. Typical applications are automotive power electronics that are connected to steady battery power (B+ or terminal number 30).

FEATURES

- Functioning body temperature: $\vartheta_F = (235 \pm 15) ^\circ\text{C}$
- Holding body temperature: $\vartheta_H = 160 ^\circ\text{C}$
- Current: $\leq 50 \text{ A}$
- Suitable for insert assembly systems
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

APPLICATIONS

- Automotive
 - Fan control units
 - ABS
 - Diesel glow plug relays
 - Diesel pre-heaters
 - Electric coolant pumps

TECHNICAL SPECIFICATIONS	
DESCRIPTION	HCTF 235 CP
Functioning body temperature ϑ_F	$(235 \pm 15) ^\circ\text{C}$
Holding body temperature ϑ_H (1000 h)	160 °C
Voltage U_{DC}	24 V
Current $I_{DC}^{(1)}$	$\leq 50 \text{ A}$
Cold resistance R_{cold}	$\leq 0.1 \text{ m}\Omega$
Residual resistance R_s after breaking	$> 1 \text{ M}\Omega$

Note

⁽¹⁾ Current rating depends on external thermal management



PACKAGING

TYPE	CODE	QUANTITY	PACKAGING STYLE	WIDTH	PITCH	PACKAGING DIMENSIONS
HCTF CP	BR	750	Blister tape acc. IEC 60286-3, Type 3	44 mm	12 mm	Ø 360 mm / 14.2"

PART NUMBER AND PRODUCT DESCRIPTION

Part Number: HCTF235L150000BR00

H	C	T	F	2	3	5	L	1	5	0	0	0	0	B	R	0	0
TYPE / FUNCTIONING BODY TEMPERATURE			TOLERANCE			VERSION			CURRENT				PACKAGING		SPECIAL		
HCTF235			L = ± 15 °C			1 digit 1 = clamp			Current in mA. 50000 = 50 A				BR		Up to 2 digits 00 = standard		

Product Description: HCTF 235 15 °C CP BR 50A0

HCTF	235	15 °C	CP	BR	50A0
TYPE	FUNCTIONING BODY TEMPERATURE	TOLERANCE	VERSION	PACKAGING	CURRENT
HCTF	235	± 15 °C	CP = clamp	BR	50A0 = 50 A

Note

- Products can be ordered using either the PART NUMBER or the PRODUCT DESCRIPTION



DESCRIPTION

Production is strictly controlled and follows an extensive set of instructions established for reproducibility.

The result of the determined production is verified by an extensive testing procedure performed on 100 % of the individual high current thermal fuses. This includes full screening for the elimination of products with a potential risk of early field failures. Only accepted products are laid directly into the blister tape in accordance with **IEC 60286-3, Type 3** ⁽¹⁾.

ASSEMBLY

The high current thermal fuse HCTF 235 CP is suitable for processing on e.g. automatic clamp or crimp terminations insert assembly systems. Any deformation and overheating of the component body to levels above the holding body temperature has to be avoided during the assembly.

MATERIALS

Vishay acknowledges the following systems for the regulation of hazardous substances:

- IEC 62474, Material Declaration for Products of and for the Electrotechnical Industry, with the list of declarable substances given therein ⁽²⁾
- The Global Automotive Declarable Substance List (GADSL) ⁽³⁾
- The REACH regulation (1907/2006/EC) and the related list of substances with very high concern (SVHC) ⁽⁴⁾ for its supply chain

The products do not contain any of the banned substances as per IEC 62474, GADSL, or the SVHC list, see www.vishay.com/how/leadfree.

Hence the products fully comply with the following directives:

- 2000/53/EC End-of-Life Vehicle Directive (ELV) and Annex II (ELV II)
- 2011/65/EU Restriction of the Use of Hazardous Substances Directive (RoHS) with amendment 2015/863/EU
- 2012/19/EU Waste Electrical and Electronic Equipment Directive (WEEE)

Vishay pursues the elimination of conflict minerals from its supply chain, see the Conflict Minerals Policy at www.vishay.com/doc?49037.

RELATED PRODUCTS

A version for automatic electric welding assembly systems is available, too.

See datasheet: HCTF 235 Series
(www.vishay.com/doc?28798)

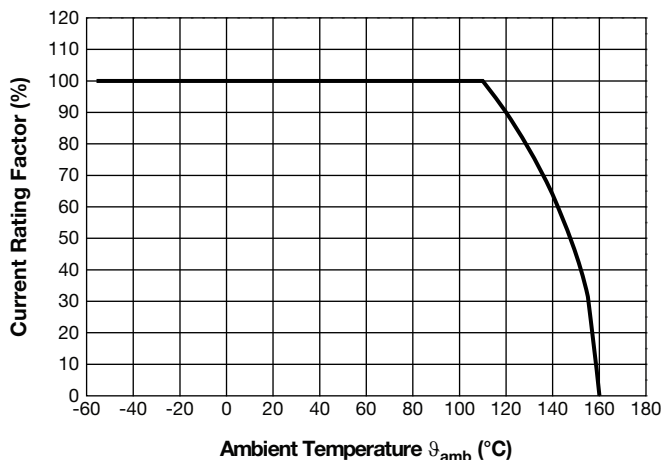
Notes

⁽¹⁾ The quoted IEC standards are also released as EN standards with the same number and identical contents

⁽²⁾ The IEC 62474 list of declarable substances is maintained in a dedicated database, which is available at <http://std.iec.ch/iec62474>

⁽³⁾ The Global Automotive Declarable Substance List (GADSL) is maintained by the American Chemistry Council and available at www.gadsl.org

⁽⁴⁾ The SVHC list is maintained by the European Chemical Agency (ECHA) and available at <http://echa.europa.eu/candidate-list-table>

FUNCTIONAL PERFORMANCE

Current Rating Factor vs. Ambient Temperature θ_{amb}
Note

- The current rating factor depends on the mounting and environmental conditions. The power dissipation on the thermal fuse generates a temperature rise against the local ambient, depending on the heat flow supported by additional conductive materials as electrical wires, lead frames or other electrical connections (thermal resistance). Please contact the factory (please refer to e-mail contact below) for support and further technical details.

TESTS AND REQUIREMENTS

All tests are carried out in accordance with the following test procedures and specifications:

IEC 60115-1
IEC 60068-1
IEC 61340-3-1
MIL-STD-202

The tests are carried out under standard atmospheric conditions in accordance with IEC 60068-1, 5.3.

Unless otherwise specified the following values apply:

Temperature: 15 °C to 35 °C

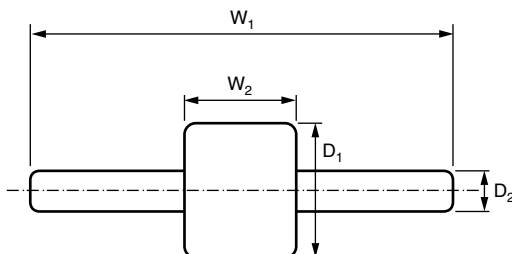
Relative humidity: 25 % to 75 %

Air pressure: 86 kPa to 106 kPa (860 mbar to 1060 mbar).

TEST PROCEDURES AND REQUIREMENTS				
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
4.25.3	-	Endurance	Unpowered; 160 °C; 500 h	$R \leq 0.2 \text{ m}\Omega$
-	-	Operational life acc. to MIL-STD-202 METHOD 108A	50 A; 1000 h; body temperature max. 160 °C	$R \leq 0.2 \text{ m}\Omega$
4.19	14 (Na)	Rapid change of temperature	10 min at -55 °C and 10 min at 155 °C; transition time < 10 s; 1000 cycles	$R \leq 0.2 \text{ m}\Omega$
4.23.6	30 (Db)	Damp heat, cyclic	55 °C; 5 days > 90 % RH; 5 cycles	$R \leq 0.2 \text{ m}\Omega$
-	27 (Ea)	Mechanical shock	Half sine pulse shape; 6 ms; peak acceleration 100 g; 3 shocks in both directions of each axis	$R \leq 0.2 \text{ m}\Omega$

TEST PROCEDURES AND REQUIREMENTS				
EN 60115-1 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE	REQUIREMENTS
4.22	6 (Fc)	Vibration	f_1 : 10 Hz; f_2 : 2000 Hz amplitude ± 1.5 mm or acceleration 50 m/s^2 (5 g), whatever is less severe 20 min/cycle ($f_1 - f_2 - f_1$); 10 cycles each for 3 axes	$R \leq 0.2 \text{ m}\Omega$
4.38	-	Electrostatic discharge (Human Body Model)	IEC 61340-3-1 ⁽¹⁾ ; 3 pos. + 3 neg. discharges 4 kV	$R \leq 0.2 \text{ m}\Omega$
-	-	Time until opening	Unpowered; pre-heated at 200°C oil bath at $275^\circ\text{C} \pm 5 \text{ K}$	$\leq 2.0 \text{ min}$
4.16	21 (Ua1)	Robustness of terminations	Tensile force (40 ± 4) N; 10 s	$R \leq 0.2 \text{ m}\Omega$
4.35	-	Flammability	Needle flame test; 10 s	No burning after 30 s

Note
⁽¹⁾ The quoted IEC standards are also released as EN standards with the same number and identical contents

DIMENSIONS


DIMENSIONS AND MASS					
TYPE	W_1 (mm)	W_2 (mm)	D_1 (mm)	D_2 (mm)	MASS (g)
HCTF CP	26 ± 0.5	6.5 ± 0.5	7.7 ± 0.3	1.8 ± 0.2	1.45 ± 0.3



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.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. 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.