

## 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 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 temperature:  $\vartheta_F = (235 \pm 15) ^\circ\text{C}$
- Holding 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](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### APPLICATIONS

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

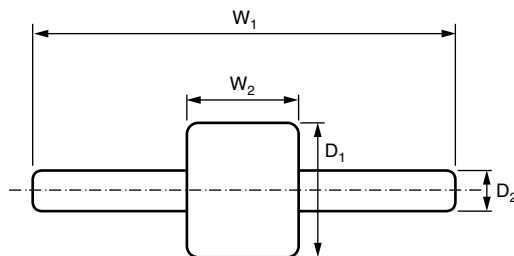
### TECHNICAL SPECIFICATIONS

| DESCRIPTION                                | HCTF 235 CP                   |
|--------------------------------------------|-------------------------------|
| Functioning temperature $\vartheta_F$      | $(235 \pm 15) ^\circ\text{C}$ |
| Holding temperature $\vartheta_H$ (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 $R_s$                  | $> 1 \text{ M}\Omega$         |

#### Note

<sup>(1)</sup> Current rating depends on external thermal management.

### DIMENSIONS



### DIMENSIONS - Mass and relevant physical dimensions

| TYPE    | $W_1$<br>(mm) | $W_2$<br>(mm) | $D_1^{(2)}$<br>(mm) | $D_2$<br>(mm) | MASS<br>(g)    |
|---------|---------------|---------------|---------------------|---------------|----------------|
| HCTF CP | $26 \pm 0.5$  | $6.5 \pm 0.5$ | $7.7 \pm 0.3$       | $1.8 \pm 0.2$ | $1.45 \pm 0.3$ |

#### Note

<sup>(2)</sup> Between sleek surfaces

**PART NUMBER AND PRODUCT DESCRIPTION <sup>(1)</sup>****PART NUMBER: HCTF235L150000BR00**

|                                     |   |             |   |                      |   |                                |   |           |   |                                 |   |   |   |   |   |   |   |
|-------------------------------------|---|-------------|---|----------------------|---|--------------------------------|---|-----------|---|---------------------------------|---|---|---|---|---|---|---|
| H                                   | C | T           | F | 2                    | 3 | 5                              | L | 1         | 5 | 0                               | 0 | 0 | 0 | B | R | 0 | 0 |
| TYPE/<br>FUNCTIONING<br>TEMPERATURE |   | TOLERANCE   |   | SPECIAL              |   | CURRENT                        |   | PACKAGING |   | SPECIAL                         |   |   |   |   |   |   |   |
| HCTF235                             |   | L = ± 15 °C |   | 1 digit<br>1 = Clamp |   | Current in mA.<br>50000 = 50 A |   | BR        |   | Up to 2 digits<br>00 = Standard |   |   |   |   |   |   |   |

**PRODUCT DESCRIPTION: HCTF 235 15 °C CP BR 50A0**

|      |                            |           |            |           |                     |
|------|----------------------------|-----------|------------|-----------|---------------------|
| HCTF | 235                        | 15 °C     | CP         | BR        | 50A0                |
| TYPE | FUNCTIONING<br>TEMPERATURE | TOLERANCE | SPECIAL    | PACKAGING | RATED CURRENT VALUE |
| HCTF | 235                        | ± 15 °C   | CP = Clamp | BR        | 50A0 = 50 A         |

**Note**

(1) Products can be ordered using either the PART NUMBER or the PRODUCT DESCRIPTION

**PACKAGING**

| TYPE    | CODE | QUANTITY | CARRIER TAPE                                 | WIDTH | PITCH | REEL<br>DIAMETER |
|---------|------|----------|----------------------------------------------|-------|-------|------------------|
| HCTF CP | BR   | 750      | Blister tape<br>acc. IEC 60286-3<br>Type III | 44 mm | 12 mm | 360 mm/14.2"     |

**ASSEMBLY**

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

The HCTF 235 CP complies with the JIG 101 list of legal restrictions on hazardous substances.

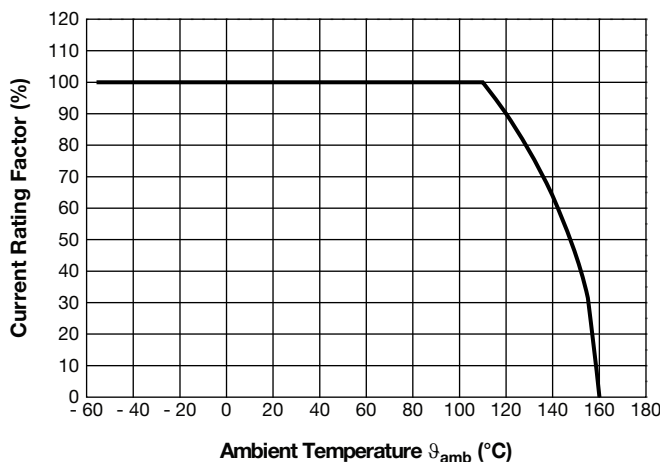
This includes full compliance with the following directives:

- 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)
- 2002/96/EC Waste Electrical and Electronic Equipment Directive (WEEE)

**RELATED PRODUCTS**

A version for automatic electric resistance welding assembly systems is available, too. See the datasheet:

- HCTF 235 Series: [www.vishay.com/doc?28798](http://www.vishay.com/doc?28798)

**FUNCTIONAL PERFORMANCE**

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



| TEST PROCEDURES AND REQUIREMENTS |                               |                                                   |                                                                                                                                                                                                      |                              |
|----------------------------------|-------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| EN 60115-1<br>CLAUSE             | IEC 60068-2<br>TEST<br>METHOD | TEST                                              | PROCEDURE                                                                                                                                                                                            | REQUIREMENTS                 |
| 4.22                             | 6 (Fc)                        | Vibration                                         | $f_1$ : 10 Hz; $f_2$ : 2000 Hz<br>amplitude $\pm 1.5$ mm or<br>acceleration $50 \text{ m/s}^2$ (5 g),<br>whatever is less severe<br>20 min/cycle ( $f_1 - f_2 - f_1$ );<br>10 cycles each for 3 axes | $R \leq 0.2 \text{ m}\Omega$ |
| 4.40                             | -                             | ESD;<br>Human body model<br>acc. to IEC 61340-3-1 | $U = 4 \text{ kV}$ ; $C = 100 \text{ pF}$ ; $R = 1.5 \text{ k}\Omega$ ;<br>3 pos. + 3 neg.                                                                                                           | $R \leq 0.2 \text{ m}\Omega$ |
| -                                | -                             | Time until opening                                | Unpowered;<br>pre-heated at $200^\circ\text{C}$<br>oil bath at $275^\circ\text{C} \pm 5 \text{ K}$                                                                                                   | $\leq 2.0 \text{ min}$       |
| 4.16                             | 21 (Ua1)                      | Robustness of<br>terminations                     | Tensile force<br>( $40 \pm 4$ ) N;<br>10 s                                                                                                                                                           | $R \leq 0.2 \text{ m}\Omega$ |
| 4.35                             | -                             | Flammability                                      | Needle flame test; 10 s                                                                                                                                                                              | No burning after 30 s        |



## 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.