

## 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  $(235 \pm 15) \text{ }^\circ\text{C}$  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:  $\vartheta_F = (235 \pm 15) \text{ }^\circ\text{C}$
- Holding body temperature:  $\vartheta_H = 160 \text{ }^\circ\text{C}$
- 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 body temperature $\vartheta_F$      | $(235 \pm 15) \text{ }^\circ\text{C}$ |
| Holding body 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 $R_s$ after breaking        | $> 1 \text{ M}\Omega$                 |

#### Note

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



| PACKAGING |      |          |  |       |       |                      |
|-----------|------|----------|--|-------|-------|----------------------|
| TYPE      | CODE | QUANTITY | PACKAGING STYLE                          | WIDTH | PITCH | PACKAGING DIMENSIONS |
| HCTF CP   | BR   | 750      | Blister tape<br>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<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 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** <sup>(1)</sup>.

### 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 <sup>(2)</sup>
- The Global Automotive Declarable Substance List (GADSL) <sup>(3)</sup>
- The REACH regulation (1907/2006/EC) and the related list of substances with very high concern (SVHC) <sup>(4)</sup> 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](http://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](http://www.vishay.com/doc?49037).

### RELATED PRODUCTS

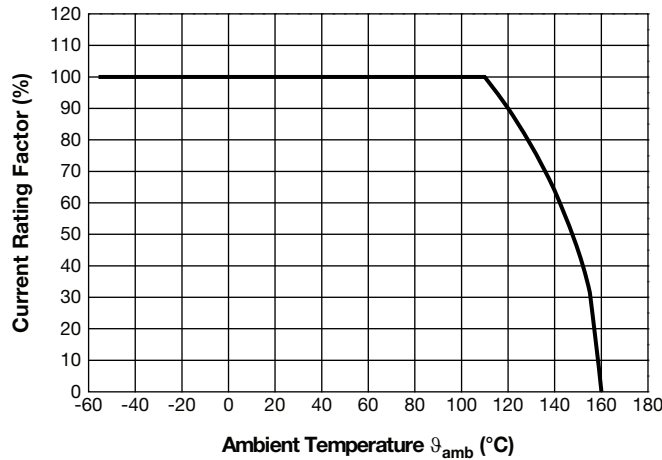
A version for automatic electric welding assembly systems is available, too.

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

### Notes

- <sup>(1)</sup> The quoted IEC standards are also released as EN standards with the same number and identical contents
- <sup>(2)</sup> The IEC 62474 list of declarable substances is maintained in a dedicated database, which is available at <http://std.iec.ch/iec62474>
- <sup>(3)</sup> The Global Automotive Declarable Substance List (GADSL) is maintained by the American Chemistry Council and available at [www.gadsl.org](http://www.gadsl.org)
- <sup>(4)</sup> 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  $\vartheta_{amb}$**

**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

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).

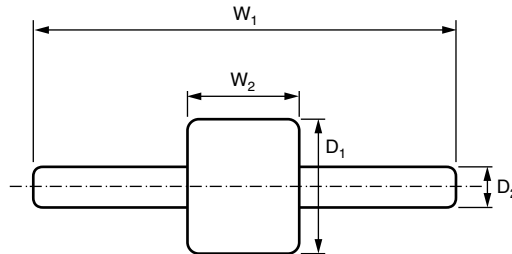
The tests are carried out under standard atmospheric conditions in accordance with IEC 60068-1, 5.3.

| <b>TEST PROCEDURES AND REQUIREMENTS</b> |                                |  |   |                              |
|---|--------------------------------|--|---|------------------------------|
| <b>EN 60115-1 CLAUSE</b>                | <b>IEC 60068-2 TEST METHOD</b> | <b>TEST</b>                                      | <b>PROCEDURE</b>  | <b>REQUIREMENTS</b>          |
| 4.25.3                                  | -                              | Endurance  | Unpowered;<br>160 °C; 500 h   | $R \leq 0.2 \text{ m}\Omega$ |
| -                                       | -                              | Operational life acc. to MIL-STD-202 METHOD 108A | 50 A;<br>1000 h;<br>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<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 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 | $R \leq 0.2 \text{ m}\Omega$ |
| 4.38                             | -                             | Electrostatic discharge<br>(Human Body Model) | IEC 61340-3-1 <sup>(1)</sup> ;<br>3 pos. + 3 neg. discharges<br>4 kV   | $R \leq 0.2 \text{ m}\Omega$ |
| -                                | -                             | Time until opening                            | Unpowered;<br>pre-heated at $200 \text{ }^\circ\text{C}$<br>oil bath at $275 \text{ }^\circ\text{C} \pm 5 \text{ K}$   | $\leq 2.0 \text{ min}$       |
| 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        |

**Note**

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

**DIMENSIONS**


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



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