

## 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

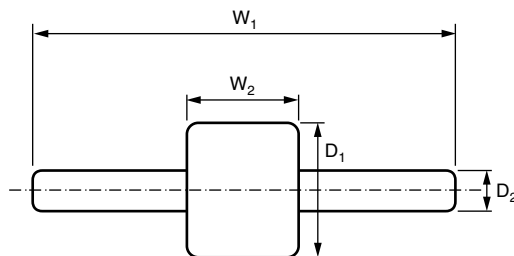
### TECHNICAL SPECIFICATIONS

| 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.

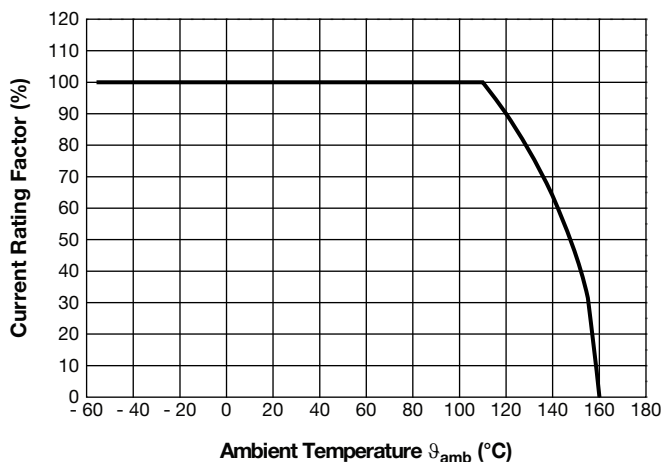
This includes full compliance with the following directives:

- 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).

| <b>TEST PROCEDURES AND REQUIREMENTS</b> |                               |                                                        |                                                                                                            |                              |
|-----------------------------------------|-------------------------------|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------|
| 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        |



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