

## 600 V / 1000 V PTC Thermistors for Overload Protection



### FEATURES

- Fast response time for rapid protection
- Automatic resetting once overload is removed
- Operates on DC or AC voltage
- UL approved types available (E148885)
- Material categorization:  
for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### APPLICATIONS

Over-temperature/over-load protection for metering, low current signal protection, digital signal protection against over-voltage

### DESCRIPTION

Test and measuring instruments, such as oscilloscopes and digital multimeters, can be easily damaged if excessive voltages are applied across their input terminals.

Simple and effective overload protection can be provided by connecting a high-voltage PTC thermistor in series with the instrument; see Typical Connection of the PTC Thermistor for Digital Multimeter Protection drawing. Under normal conditions, the resistance of the PTC thermistor is low, so the test voltage will be measured by the instrument. Under an overload condition, the PTC thermistor will switch to its high-resistance state, absorbing the overload current and protecting the instrument. When the overload is removed, the PTC thermistor will return to its low-resistance state, ready to resume its protective function.

### QUICK REFERENCE DATA

| PARAMETER                                    | VALUE       | UNIT             |
|----------------------------------------------|-------------|------------------|
| Maximum rated voltage                        | 600 to 1000 | V <sub>RMS</sub> |
| Nominal holding current (Int)                | 10          | mA               |
| Resistance at 25 °C ( $R_{25}$ )             | 400 to 1600 | $\Omega$         |
| Tolerance on $R_{25}$ value                  | 20 to 30    | %                |
| Maximum overload current $I_{ol}$            | 0.5 to 2.0  | A                |
| Switching temperature                        | 90 to 115   | °C               |
| Operating temperature range at rated voltage | -20 to 85   | °C               |

### ELECTRICAL DATA AND ORDERING INFORMATION

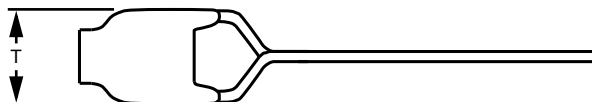
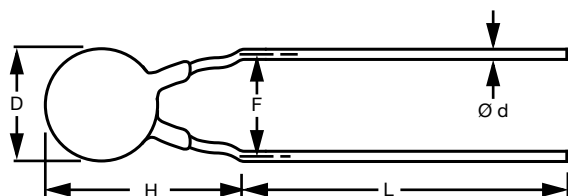
| INT MAX.<br>at 25 °C<br>(mA) | IT MIN.<br>at 25 °C<br>(mA) | $R_{25}^{(2)}$<br>( $\Omega$ ) | MAXIMUM<br>VOLTAGE <sup>(1)</sup><br>(V) | INSULATION<br>VOLTAGE<br>(V) | UL APPROVAL | ORDERING PART<br>NUMBERS |
|------------------------------|-----------------------------|--------------------------------|------------------------------------------|------------------------------|-------------|--------------------------|
| 10                           | 20                          | 1600 ± 300                     | 600                                      | -                            | UL          | PTCCL05H100SBE           |
| 10                           | 25                          | 1500 ± 450                     | 1000                                     | -                            | -           | PTCCL07H100VBE           |
| 10                           | 50                          | 400 ± 100                      | 600                                      | > 1000                       | UL          | PTCCL10H010SBE           |

#### Notes

- (1) These PTCs can handle maximum voltage without series resistance  
(2) Other resistance values and voltage levels on request

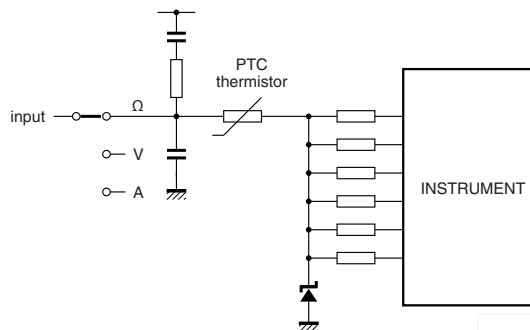
### COMPONENT DIMENSIONS in millimeters

#### PTC THERMISTORS IN BULK

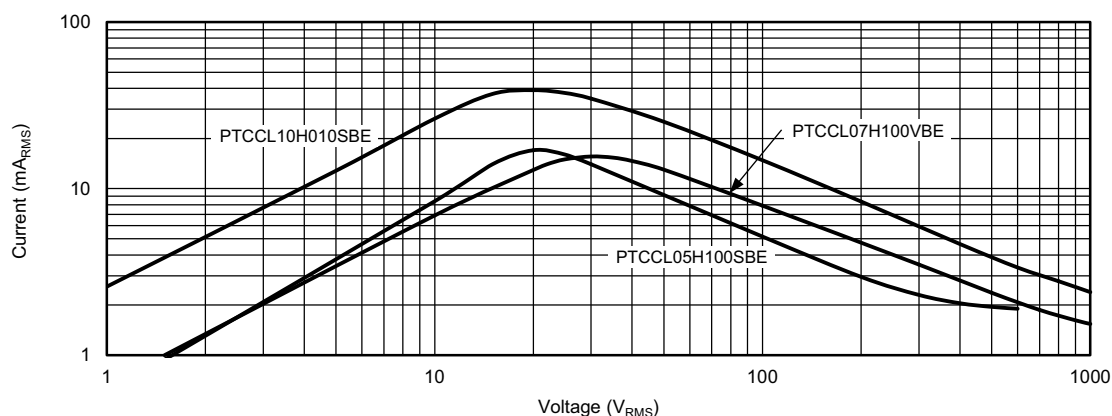


| H<br>MAX. | L         | D<br>MAX. | T<br>MAX. | F    | Ø d | MASS<br>(g) | SPQ | PART NUMBER    |
|-----------|-----------|-----------|-----------|------|-----|-------------|-----|----------------|
| 10.4      | 20 ± 3    | 5         | 4.5       | 5.0  | 0.6 | ~ 0.5       | 500 | PTCCL05H100SBE |
| 12        | 20 ± 3    | 7         | 5.0       | 5.0  | 0.6 | ~ 0.60      | 250 | PTCCL07H100VBE |
| 13.5      | 3.1 ± 0.5 | 10        | 6.5       | 8.12 | 0.8 | ~ 1.8       | 500 | PTCCL10H010SBE |

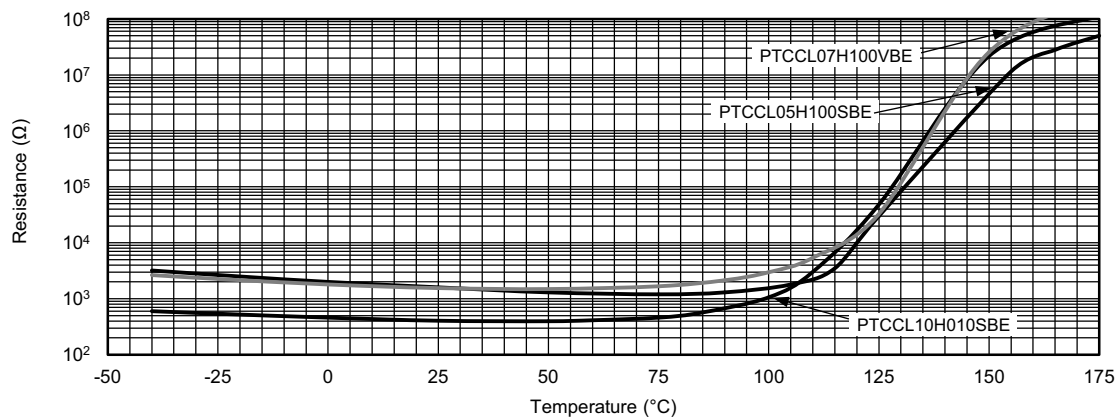
## TYPICAL CONNECTION OF THE PTC THERMISTOR FOR DIGITAL MULTIMETER PROTECTION



## TYPICAL CURRENT / VOLTAGE CHARACTERISTIC



## TYPICAL RESISTANCE / TEMPERATURE CHARACTERISTIC ( $\leq 5 V_{DC}$ )





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