

## PTC Thermistors, For Temperature Protection



### QUICK REFERENCE DATA

PARAMETER	VALUE	UNIT
Maximum resistance at 25 °C	100	Ω
Minimum resistance at (T <sub>n</sub> + 15) °C	4000	Ω
Maximum (DC) voltage	30	V
Thermal time constant	± 8.0	s
Temperature range	- 40 to (T <sub>n</sub> + 15)	°C
Weight:	± 2.0	g
Climatic category	40/125/56	

### FEATURES

- Well-defined protection temperature levels
- Fast reaction time (< 30 s in still air)
- Accurate resistance for ease of circuit design
- Excellent long term behavior (< 1 °C or 5 % after 1000 h at T<sub>n</sub> + 15 °C)
- Wide range of protection temperatures (70 °C to 150 °C)
- No need to reset supply after overtemperature switch
- Small size and rugged
- Coated leaded and naked devices available
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

### APPLICATIONS

- Industrial electronics
- Power supplies
- Electronic data processing
- Motor protection

### DESCRIPTION

These directly heated thermistors have a positive temperature coefficient and are primarily intended for sensing.

### NOMINAL WORKING TEMPERATURES AND ORDERING INFORMATION

NOMINAL WORKING TEMPERATURE			CATALOG NUMBER 2381 671 .....
T <sub>n</sub> (°C)	R <sub>max.</sub> at T <sub>n</sub> - 5 °C (Ω)	R <sub>min.</sub> at T <sub>n</sub> + 5 °C (Ω)	LUG DEVICE
70	570	570	91202
80	550	1330	91203
90	550	1330	91204
100	550	1330	91205
110	550	1330	91206
120	550	1330	91207
130	550	1330	91209
140	550	1330	91212
150	550	1330	91214

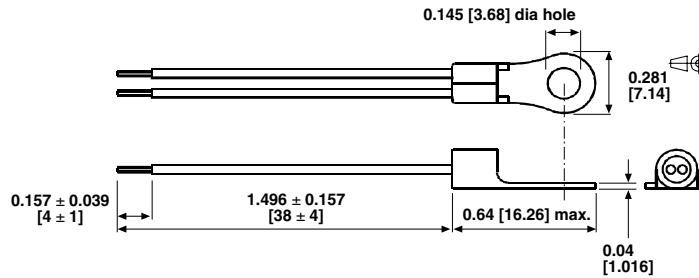
### ELECTRICAL CHARACTERISTICS

PARAMETER	VALUES
Maximum resistance at 25 °C	100 Ω
Maximum resistance at (T <sub>n</sub> - 5) °C	see Nominal Working Temperatures and Ordering Information table
Minimum resistance at (T <sub>n</sub> + 5) °C	see Nominal Working Temperatures and Ordering Information table
Minimum resistance at (T <sub>n</sub> + 15) °C	4000 Ω
Maximum voltage	30 V (AC or DC)



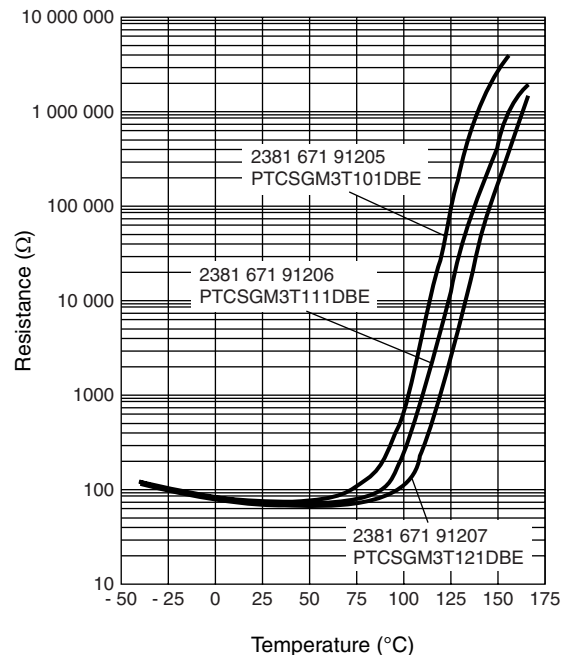
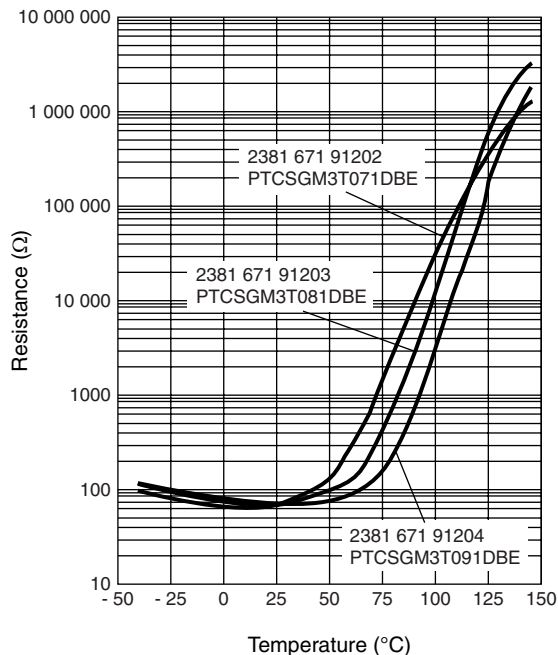
CATALOG NUMBERS AND PACKAGING		
12 NC	SAP	SPQ
2381 671 91202	PTCSGM3T071DBE	200
2381 671 91203	PTCSGM3T081DBE	200
2381 671 91204	PTCSGM3T091DBE	200
2381 671 91205	PTCSGM3T101DBE	200
2381 671 91206	PTCSGM3T111DBE	200
2381 671 91207	PTCSGM3T121DBE	200
2381 671 91209	PTCSGM3T131DBE	200
2381 671 91212	PTCSGM3T141DBE	200
2381 671 91214	PTCSGM3T151DBE	200

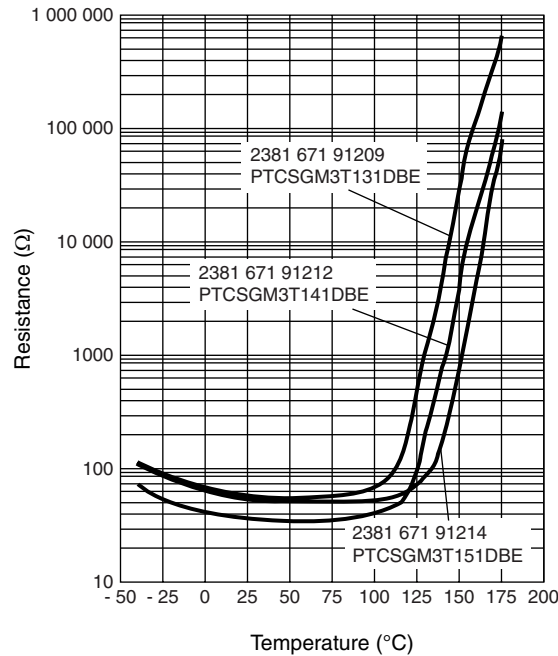
**COMPONENT OUTLINES** dimensions in millimeters



Component outline for 2381 671 91202 to 91214

**TYPICAL RESISTANCE/TEMPERATURE CHARACTERISTIC**





**APPLICATION SPECIFIC DATA**

Negative Temperature Coefficient (NTC) thermistors are well known for temperature sensing. What is not well known, however, is that Positive Temperature Coefficient (PTC) thermistors can be used for thermal protection. Although their operating principles are similar, the applications are very different; whereas NTC thermistors sense and measure temperature over a defined range, PTC thermistors switch at one particular temperature.

Just like thermostats they protect such equipment and components as motors, transformers, power transistors and thyristors against overtemperature. A PTC thermistor is less expensive than a thermostat, and its switch temperature can be more accurately specified. It is also smaller and easier to design-in to electronic circuitry.

So how does it work? The PTC thermistor is mounted in thermal contact with the equipment to be protected, and connected into the bridge arm of a comparator circuit, such as shown in Fig. 1. At normal temperature, the PTC thermistor resistance ( $R_p$ ) is lower than  $R_s$  (see Fig. 2), so the comparator's output voltage  $V_o$  will be low. If an equipment overtemperature occurs, the PTC thermistor will quickly heat up to its trigger or nominal reference temperature  $T_n$ , whereupon its resistance will increase to a value much higher than  $R_s$ , causing  $V_o$  to switch to a high level sufficient to activate an alarm, relay or power shutdown circuit.

**APPLICATION EXAMPLES**

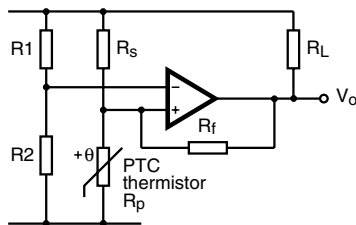


Fig. 1 Typical comparator circuit

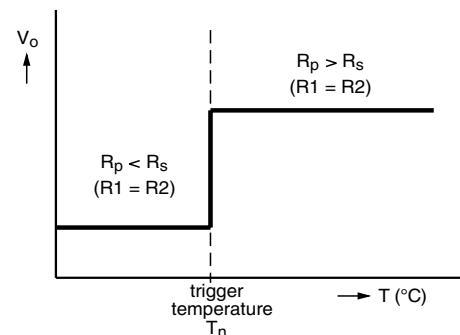
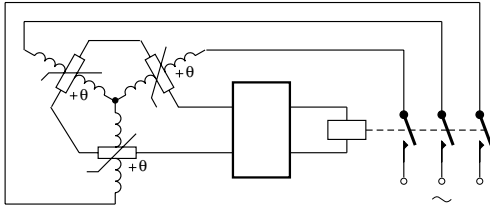
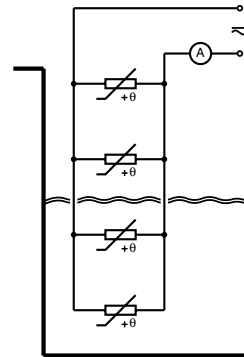


Fig. 2 Typical switch characteristic



As soon as one or more of the windings becomes too hot, the motor is switched off.

Fig. 3 Temperature protection of electric motors



The PTC thermistors located above the fluid level will be heated to a temperature greater than  $T_n$ . When immersed they are cooled such that their resistance value is reduced.

Fig. 4 Liquid-level indication



## Disclaimer

All product specifications and data are subject to change without notice.

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 herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

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.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

单击下面可查看定价，库存，交付和生命周期等信息

[>>Vishay\(威世\)](#)