

1. What is PTC Thermistor

Definition

PTC Thermistor is Positive Temperature Coefficient of Thermal Resistor.

Features

■ Main composition

- Ceramic material : BaTiO₃

■ Semi-conductive property

- Its resistance value rises sharply with increasing temperature has been exceeded. This feature makes it use in many applications of electronic devices as resettable fuse against current overload.



2. Technical Information on PTC Thermistor

Temperature dependence of resistance

The zero-power resistance value $R(T)$ is the resistance value measured at a given temperature T with the electrical load kept so small that there is no noticeable change in the resistance value if the load is further reduced.

For test voltages, please refer to the individual types (mostly $\leq 1,5V$).

Figure shows the typical dependence of the zero-power resistance on temperature. Because of the abrupt rise in resistance (the resistance value increases by several powers of ten), the resistance value is plotted on a logarithmic scale (ordinate) against a linear temperature scale (abscissa).

Typical resistance/temperature characteristic

$$R_{PTC} = f(T_{PTC})$$

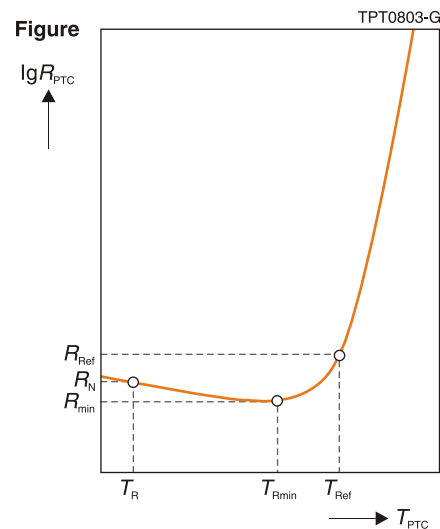
R_N Rated PTC resistance (resistance value at T_N)

R_{min} Minimum resistance (resistance value at T_{Rmin})

T_{Rmin} Temperature at R_{min} (α becomes positive)

R_{Ref} Reference resistance $R_{Ref} = 2 \cdot R_{min}$
(resistance value at T_{Ref})

T_{Ref} Reference Temperature (resistance rises sharply)



Certain parameters have tolerances.

These are specified in the tables in the data sheet section.

Rated resistance R_N

The rated resistance R_N is the resistance value at temperature T_N . PTC thermistors are classified according to this resistance value. The temperature T_N is 25 °C, unless otherwise specified.

Minimum resistance R_{min}

The beginning of the temperature range with a positive temperature coefficient is specified by the temperature T_{Rmin} . The value of the PTC resistance at this temperature is designated as R_{min} . This is the lowest zero-power resistance value which the PTC thermistor is able to assume. R_{min} is often given as a calculable magnitude without stating the corresponding temperature. The R_{min} values specified in this data book allow for the R tolerance range of the individual types and represent the lower limit. Exceptions are PTC heaters, where the R_{min} values given in the data sheet section are measured at the rated voltage.

Reference resistance R_{Ref} at reference temperature T_{Ref}

The start of the steep rise in resistance, marked by the reference temperature T_{Ref} , which corresponds approximately to the ferroelectric Curie point, is significant for the application. For the individual types of PTC thermistors it is defined as the temperature at which the zero-power resistance is equal to the value $R_{Ref} = 2 \cdot R_{min}$. In the data sheet section we specify typical values of T_{Ref} .