PTC Thermistors

GENERAL
As one of the market leaders in non-linear ceramic technology, Vishay BCcomponents offers a comprehensive selection of thermistors. For overload protection of equipment such as motors, transformers, lamps, rechargeable batteries and power supplies, we offer a full range of Positive Temperature Coefficient (PTC) thermistors. They provide reliable protection time and time again, opposed to a normal fuse, which is usually slower and only gives one-shot protection.

Compared to conductive-polymer technology, ceramic PTCs give a more reliable protection in time with regard to the number of trip cycles, stability and operation at mains voltages.

For specific areas like telecommunication they offer very good resetability with low drift, which guarantees a high performance connection over the whole lifetime.

PTC thermistors have well-defined trip and non-trip currents and react quickly to overloads. Low, medium and high voltage ratings make them suitable for a wide range of applications, from low-voltage automotive systems to worldwide mains circuits.

Positive Temperature Coefficient (PTC) thermistors exhibit a high positive temperature coefficient of resistance. They differ from Negative Temperature Coefficient (NTC) thermistors in the following manner:

1. The temperature coefficient of a PTC thermistor is positive only between certain temperatures. Outside this range, the temperature coefficient is either zero or negative.

2. The absolute value of the temperature coefficient of PTC thermistors is much higher than that of NTC thermistors.

PTC thermistors are used in a variety of applications, including current limiting, temperature sensing, degaussing and for protection against overheating in equipment such as electric motors. They may also be used in level indicators, time delay devices, thermostats, and as compensation resistors. For further details, refer to chapter “Applications”.

FEATURES
- Fast-acting for reliable protection time and time again
- Well-defined protection trip levels
- Low, medium and high voltage ratings
- Stable over a long life
- No current adjustment necessary
- No RF noise generated
- Small size
- Leadless, leaded and SMD versions available
- Customized design, particularly for telecommunication application

APPLICATIONS
The applications for PTC thermistors can be divided into three main categories:

1. Degaussing
2. Temperature protection and sensing
3. Overload (current sensitive action) protection.

These applications are based on two principles:

1. Applications where the temperature (hence the resistance) is primarily determined by the current flowing through the thermistor.

2. Applications where the temperature is primarily determined by the temperature of the ambient medium.

Applications are wide, varied and include the following:

General industries
- Transformers
- Battery chargers
- Delay lines
- Rechargeable batteries
- Switched-mode power supplies
- Measuring equipment

Automotive systems
- Wiper motors
- Gear boxes
- Air flow controls
- Window motors
- Car door lock defrosting systems

Consumer electronics
- Loudspeaker boxes
- Video recorders, compact disc players and stereo equipment
- Electronic lighting ballast
- Color televisions
- Set-top boxes

Domestic appliances
- Boilers
- Shaver socket transformers
- Coffee grinders
- Hobby tools
- Ice makers
- Washing machines

Telecommunications
- Line protection
- Main Distribution Frame (MDF)
- Set-top boxes
- Base stations for cordless telephones
- Regulation of telephones, facsimiles and modems
- Integrated Services Data Network (ISDN)