LM35 SERIES PRECISION INTEGRATED-CIRCUIT TEMPERATURE SENSORS

The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. The LM35 thus has an advantage over linear temperature sensors calibrated in degree Kelvin.

LM35 Feature

- Calibrated directly in degree Celsius (Centigrade)
- Linear + 10.0 mV/degree C scale factor
- 0.5 degree C accuracy guarantee able (at +25 degree C)
- Rated for full -55 degree to +150 degree C range
- Suitable for remote applications

- Low cost due to wafer-level trimming
- Operates from 4 to 30 volts
- Less than 60 microA current drain
- Low self-heating, 0.08 degree C in still air
- Nonlinearity only + - 1/4 degree C typical
- Low impedance output, 0.1 W for 1 mA load.

LM35 Testing

To test the temperature sensor connect the positive terminal of 5V dc supply to the VCC pin and ground the GND pin by connecting it to the negative terminal of 5V supply.

Connect the output terminal to a DMM bring solder gun close to the sensor and the output voltage on the DMM.

The output of LM35 linearly varies with the temperature that is 10mV per degree C . So for room temp ie 27 degree C , 270 mV will be observed on the DMM.

Thermistor

A Thermistor is a type of resistor with resistance proportional to its temperature. Thermistors are widely used as inrush current limiters, temperature sensors, self-resetting overcurrent protectors, and self-regulating heating elements.

Thermistors differ from resistance temperature detectors (RTD) in that the material used in a thermistor is generally a ceramic or polymer, while RTDs use pure

metals. The temperature response is also different; RTDs are useful over larger temperature ranges, while thermistors typically achieve a higher precision within a limited temperature range.

Basic operation

Assuming, as a first-order approximation, that the relationship between resistance and temperature is linear, then:

Change in resistance R = k X change in Temperature

k = first - order temperature coefficient of resistance.

Thermistors can be classified into two types depending on the sign of k.

If k is positive, the resistance increases with increasing temperature, and the device is called a positive temperature coefficient (PTC) thermistor, or posistor.

If k is negative, the resistance decreases with increasing temperature, and the device is called a negative temperature coefficient (NTC) thermistor.

Resistors that are not thermistors are designed to have a k as close to zero as possible, so that their resistance remains nearly constant over a wide temperature range.

Source: http://mediatoget.blogspot.in/2012/02/lm35-series-precision-integrated.html