THERMOMETRICS
A COMMITMENT TO EXCELLENCE

Product Spotlight

Digital Temperature Sensors vs. NTC Thermistors

NTC Thermistors – NTC stands for Negative Temperature Coefficient, meaning they reduce in impedance as temperature increases resulting in an analog voltage which varies with temperature.

Digital Temperature Sensors – Provide a digital output to transfer the temperature data by communicating with a microcontroller or processor.

Digital Temperature Sensors

Features & Benefits

- Digital interface to microcontroller:
  - Typically 1-2 wire communication interface
  - Buss can be shared with other sensors
- Most are single output format:
  - Normally unsigned value
  - Requires processing to accommodate negative portion of range (Offset)
  - Digital result needs conversion to °F/°C
- Most are low power, making them suitable for battery applications
- Operating Temperature Range: -55°C to 150°C typically

Limitatations

- Very localized measurement, limited capability for remote sensing
  - May require separate board to place at optimum location for sensor
- Requires careful placement and PCB layout so accuracy not influenced by other devices nearby or power through PCB
- Requires processor to interpret signal
- Not recommended for harsh environments
  - Small plastic housing will not withstand harsh environments

Applications

- Thermostats
- Indoor Air Quality
- Internal Temperature Monitor

NTC Thermistors

Features & Benefits

- Flexible form factor allows sensor to be placed where needed
- Capable of withstanding harsh environments
- Very wide operating temperature range with numerous impedance options:
  - Some ranges as low as -196°C and up to 300°C
  - Some as high as 300°C
  - Custom ranges available
- Repeatable and accurate
- Easy to process analog signal
  - A/D conversion with simple voltage divider
  - Calculation using curve coefficients
  - Lookup table
- Can be applied within control circuit for real-time temperature compensation
- Customizable

Market / Applications

- Automotive
  - Transmission Fluid Temperature
  - HVAC – Evaporator Air Temperature
  - Electric Vehicle – Battery Temperature
- Medical
  - Esophageal Temperature
  - Catheters
  - Thermometers
- Electrical - Buss Bar Temperature
- Control - Temperature Compensation

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