



Temperature Sensors Family

The IDT TS3000B3 and TSE2002B3 temperature sensors offer the industry an optimized blend of very high accuracy, digital sensing and small packaging for demanding applications in computing, consumer, and communications systems.

Typical Applications

- **Servers, workstations, laptops, ultra-portables**
 - Motherboards
 - DIMM modules (DDR2, DDR3)
 - Hard disk drives
 - Solid-state drives
- **Consumer electronics**
 - Audio / Video equipment
 - Portable devices
- **Communications**
 - Networking equipment
 - Base stations
- **PC peripherals**
 - Printers, fax machines, copiers
 - Backup storage
- **Industrial and Automotive**

Why temperature sensing matters

Because temperature affects most physical, electronic and mechanical systems, it is one of the most often-measured environmental parameters. Many processes function optimally only within a narrow range of temperatures, so control systems that keep that temperature within the specified limits are essential. Temperature sensors provide valuable inputs to these control systems.

IDT temperature sensing

The family of digital temperature sensor products from Integrated Device Technology, with accuracy up to $\pm 0.5^{\circ}\text{C}$ typical, is designed for applications demanding the highest level of temperature readout. The TS3000B3 is a stand-alone local temperature sensor, while the TSE2002B3 also includes an integrated 256 byte EEPROM for storage of vendor information and system configuration.

The sensors come with several user-programmable registers to provide maximum flexibility for temperature sensing applications. These registers allow specifying critical, upper and lower temperature limits as well as hysteresis settings. The sensors use an industry standard 2-wire, I²C / SMBus serial interface and allow up to eight devices to be controlled on the bus. The sensors are fully compliant with JEDEC JC42.4 component specification.

Features	Benefits
Accuracy up to $\pm 0.5^{\circ}\text{C}$ typical (over industrial temperature range)	- Very high accuracy makes this part suitable for most applications
Resolution up to 0.0625°C	- Provides ability to track even small temperature changes - Ideal for applications where temperature changes rapidly
SMBus timeout: 25ms (min), 35ms (max)	- Meets latest Intel [®] timeout requirements - Suitable for current and future Intel platforms - Compatible with most other platforms
Timeout supported in all modes (Active, standby, shutdown)	- Guarantees continuous availability of timeout function
Input hysteresis ($>150\text{mV}$) and Input glitch filtering (up to 50ns)	- Eliminates clock and data input signal noise - Provides robust, hang-up free, SMBus communication at all speeds
Conversion times below 100ms at any resolution	- Allows very fast temperature tracking
Clock frequency up to 400 KHz	- Reduces test times in customer applications
EEPROM write protection (TSE2002B3 only)	- Allows customers to lock 128 bytes of data from any future overwrites
EEPROM timeout (TSE2002B3 only)	- Makes EEPROM compatible with Intel bus specifications - Compatible with most other platforms
No restrictions on power supply power-up and power-down time	- Compatibility with power-up sequences in all platforms and applications
Selectable 0° , 1.5°C , 3°C , 6°C Hysteresis	- Eliminate spurious temperature alarm events on the boundary of T_{HIGH} , T_{LOW} , and T_{CRIT} temperature thresholds

Temp Sensor Product Features

- Temperature Sensor unit
- 256 byte Serial EEPROM (TSE2002B3 only)
- Single supply: 3V to 3.6V
- Accurate timeout support
- Timeout supported for Temp Sensor and EEPROM
- Timeout supported in all modes
- Schmidt trigger and noise filtering on bus inputs
- 2-wire Serial Interface: 10-400 kHz I²C / SMBus

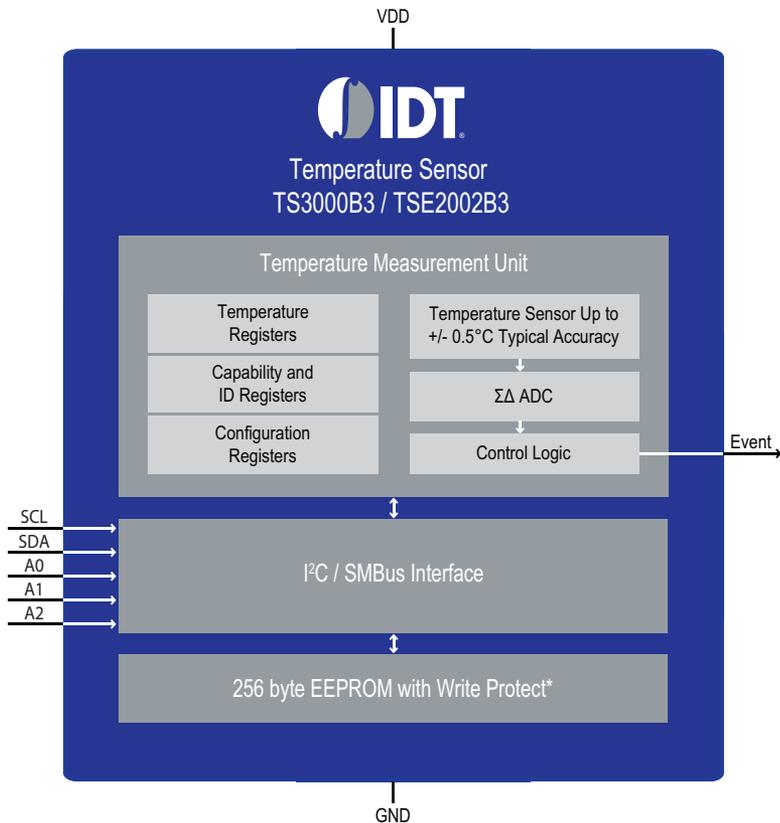


Figure 1. TS3000B3 / TSE2002B3 Functional block diagram

*Only available in the TSE2002B3

Things to Consider:

- **Do you use on-board temperature sensing in your application?**

If yes, consider using the TS3000B3 for better accuracy

- **Do you also use 256 byte or smaller EEPROM or flash memory?**

If yes, consider using the TSE2002B3 to replace the multiple components with a single package

Orderable Part Numbers

TS3000B3 Local Temperature Sensor

TS3000B3ANCG	TDFN-8, Bulk
TS3000B3ANCG8	TDFN-8, Tape & Reel
TS3000B3ANRG	DFN-8, Bulk
TS3000B3ANRG8	DFN-8, Tape & Reel

TSE2002B3 Temperature Sensor with Integrated EEPROM

TSE2002B3CNCG	TDFN-8, Bulk
TSE2002B3CNCG8	TDFN-8, Tape & Reel
TSE2002B3CNRG	DFN-8, Bulk
TSE2002B3CNRG8	DFN-8, Tape & Reel

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