World's Highest Performance Digital Temperature Sensors

Flagship Products

- ADT7420: I²C
- ADT7320: SPI

Features

- Industry-leading accuracy; max accuracy range: −20°C to +105°C
- Operating temperature range: −40°C to +150°C
- 16-bit temperature resolution: 0.0078°C
- No calibration required
- No self heating or linearity correction required
- Power saving mode (1 SPS)
- Critical temperature indicator
- Over/undertemperature interrupt
- 16-lead LFCSP RoHS compliant package

Key Applications

- RTD and thermistor replacement
- Medical equipment
- Cold junction compensation
- Industrial control and test
- Food transportation and storage
- Environmental monitoring and HVAC

Analog Devices' Digital Temperature Sensors Achieve Highest Accuracy of ±0.25°C Over Industry's Widest Temperature Range

The ADT7420 and ADT7320 digital temperature sensors are fully calibrated, 16-bit resolution, high linearity sensors that achieve ±0.25°C accuracy over a −20°C to +105°C temperature range. The higher accuracy eliminates the need to average results, ensuring faster data measurement, higher precision control loops, and improved energy efficiency and reliability in industrial, instrumentation, and medical applications.

The ADT7420 and ADT7320 digital temperature sensors are plug-in ready and require no additional signal conditioning or calibration. The offerings are available with I²C (ADT7420) or SPI (ADT7320) digital interfaces, both of which allow system designers to easily integrate the devices into data acquisition, optical communications, environmental control systems, medical imaging systems, or food and pharmaceutical temperature monitors. The new digital temperature sensors also provide highly accurate system reference temperature measurement to reduce errors in software-based thermocouple cold junction compensation applications and infrared imaging systems.

These digital temperature sensors are guaranteed to operate over supply voltages from 2.7 V to 5.5 V with an operating temperature range of −40°C to +150°C. Operating at 3.3 V, the supply current is 210 μA (typical). The sensors include a low power, one-sample-per-second mode that draws only 46 μA (typical) at 3.3 V and also offer a shutdown mode that reduces supply current to just 2 μA. Programmable options include over/undertemperature and critical temperature indicators.

ADI offers a complete range of analog and digital temperature sensors with the diversity to be used in a broad range of applications. For more information, visit www.analog.com/temp-sensors.

Temperature Sensor Achieves Highest Accuracy of ±0.25°C

ANALOG DEVICES
16-Bit Digital Temperature Sensor

Refrigerated Transport

ANALOG DEVICES

Temperature Sensors

Part Number	Interface	Function/ Resolution	Max Accuracy	Operating Range (°C)	Supply Range (V)	Max Current	Packages	Features
Analog Output								
AD590	Current output	1 µA/K	±1.0°C @ −55°C to +150°C	−55 to +150	4 to 30	298.2 µA	TO-52, 2-lead FP, 8-lead SOIC, die, 4-lead LFCSP	2-terminal temperature transducer
AD592	Current output	1 µA/K	±1.0°C @ −25°C to +105°C	−25 to +105	4 to 30	298.2 µA	TO-92, die	2-terminal temperature transducer
TMP35/ TMP36	Voltage output	10 mV/°C	±2°C @ +25°C	−40 to +125	2.7 to 5.5	50 µA	TO-92, 5-lead SOT-23, 8-lead SOIC	Voltage output, wide temperature range
TMP37	Voltage output	20 mV/°C	±2°C @ +25°C	+5 to +100	2.7 to 5.5	50 µA	TO-92, 5-lead SOT-23, 8-lead SOIC	Voltage output, limited temperature range
AD22100	Voltage output	22.5 mV/°C	±2°C @ −50°C to +150°C	−50 to +150	4 to 6.5	650 µA	TO-92, 8-lead SOIC, die	Ratiometric sensor
AD22103	Voltage output	28 mV/°C	±2.5°C @ 0°C to +100°C	0 to +100	2.7 to 3.6	600 µA	TO-92, 8-lead SOIC	Ratiometric sensor
Digital Output								
ADT7420	I²C/SMBus	16-bit local	±0.25°C @ −20°C to +105°C	−40 to +150	2.7 to 5.5	270 µA	16-lead LFCSP	16-bit digital temperature sensor, critical temperature indicator, programmable interrupt
ADT7320	SPI	16-bit local	±0.25°C @ −20°C to +105°C	−40 to +150	2.7 to 5.5	270 µA	16-lead LFCSP	16-bit digital temperature sensor, critical temperature indicator, programmable interrupt
ADT7410	I²C/SMBus	16-bit local	±0.5°C @ −40°C to +105°C	−55 to +150	2.7 to 5.5	270 µA	8-lead SOIC, 16-lead LFCSP	16-bit digital temperature sensor, critical temperature indicator, programmable interrupt
ADT7310	SPI	16-bit local	±0.5°C @ −40°C to +105°C	−55 to +150	2.7 to 5.5	270 µA	8-lead SOIC, 16-lead LFCSP	16-bit digital temperature sensor, critical temperature indicator, programmable interrupt
ADT7311	SPI	16-bit local	±0.5°C @ −40°C to +105°C	−55 to +150	2.7 to 5.5	270 µA	8-lead SOIC	Automotive qualified, 16-bit digital temperature sensor
ADT7312	SPI	16-bit local	±1°C @ −40°C to +175°C	−55 to +175	2.7 to 5.5	350 µA	Die form	Automotive qualified, 16-bit digital temperature sensor
ADT75	I²C/SMBus	12-bit local	±1°C @ 0°C to +70°C	−55 to +125	2.7 to 5.5	525 µA	8-lead SOIC, 8-lead MSOP	12-bit digital temperature sensor
ADT7301	SPI	13-bit local	±1°C @ 0°C to +70°C	−40 to +150	2.7 to 5.25	1.6 mA	6-lead SOT-23, 8-lead MSOP	13-bit digital temperature sensor
ADT7302	SPI	13-bit local	±2°C @ 0°C to +70°C	−40 to +150	2.7 to 5.25	1.6 mA	6-lead SOT-23, 8-lead MSOP	13-bit digital temperature sensor
TMP05/ TMP06	PWM	0.025°C resolution	±1°C @ 0°C to +70°C	−40 to +150	2.7 to 5.5	0.6 mA	5-lead SC70, 5-lead SOT-23	Open-drain, push-pull, daisy-chain mode, one shot mode
AD7414/ AD7415	I²C/SMBus	10-bit local	±1.5°C @ −40°C to +70°C	−40 to +125	2.7 to 5.5	0.1 mA	6-lead SOT-23, 5-lead SOT-23, 8-lead MSOP	10-bit digital temperature sensor, supports SMBus alert function
AD7814	SPI	10-bit local	±2°C @ 0°C to +85°C	−55 to +125	2.7 to 5.5	400 µA	6-lead SOT-23	10-bit digital temperature sensor
ADT7408	I²C/SMBus	10-bit local	±3°C @ +40°C to +125°C	−20 to +125	3 to 3.6	550 µA	8-lead LFCSP	12-bit digital temperature sensor
TMP03/ TMP04	PWM	0.1°C/LSB	±4°C @ −20°C to +100°C	−40 to +150	4.5 to 7	1.3 mA	TO-92, 8-lead SOIC, 8-lead TSSOP	Open collector, CMOS-/TTL-compatible output
Trip Point								
ADT6501/ ADT6503	Factory set	10°C increments	±4°C @ −15°C to +15°C	−55 to +125	2.7 to 5.5	50 µA	5-lead SOT-23	Factory set over/undertemperature indicators; open-drain output
ADT6502/ ADT6504	Factory set	10°C increments	±4°C @ −15°C to +15°C	−55 to +125	2.7 to 5.5	50 µA	5-lead SOT-23	Factory set over/undertemperature indicators; push-pull output
ADT6401	Pin selectable	10°C increments	±4°C @ −15°C to +15°C	−55 to +125	2.7 to 5.5	50 µA	6-lead SOT-23	Pin set over/undertemperature indicators; open-drain output
ADT6402	Pin selectable	10°C increments	±4°C @ −15°C to +15°C	−55 to +125	2.7 to 5.5	50 µA	6-lead SOT-23	Pin set over/undertemperature indicators; push-pull output
TMP01	Resistor programmable	Voltage output (+5 mV/K)	±1.5°C @ +25°C	−55 to +125	4.5 to 13.2	500 µA	8-lead SOIC, 8-lead PDIP	Resistor programmable window comparator; voltage output
Integrated Digital Output with DACs/ADCs/Both								
AD7417	I²C/SMBus	10-bit local	±1°C @ +25°C	−40 to +125	2.7 to 5.5	0.6 mA	16-lead SOIC, 16-lead TSSOP	4-channel external 10-bit ADC input and temperature sensor
AD7418	I²C/SMBus	10-bit local	±1°C @ +25°C	−40 to +125	2.7 to 5.5	0.6 mA	8-lead SOIC, 8-lead MSOP	1-channel external 10-bit ADC input and temperature sensor
AD7817	SPI	10-bit local	±1°C @ +25°C	−55 to +125	2.7 to 5.5	2 mA	16-lead SOIC, 16-lead TSSOP	4-channel external ADC input and temperature sensor
AD7818	SPI	10-bit local	±2°C @ +25°C	−55 to +125	2.7 to 5.5	2 mA	8-lead SOIC, 8-lead MSOP	1-channel external ADC input and temperature sensor
ADT7516	SMBus/SPI	10-bit local and 10-bit remote	±2°C @ 0°C to +85°C	−40 to +125	2.7 to 5.5	3 mA	16-lead QSOP	12-bit quad DAC; 10-bit, 4-channel ADC; 10-bit temperature sensors
ADT7411	SMBus/SPI	10-bit local	±3°C @ 0°C to +85°C	−40 to +125	2.7 to 5.5	3 mA	16-lead QSOP	10-bit, 8-channel ADC with 10-bit local and remote temperature sensors
ADT7316	SMBus/SPI	10-bit local	±3°C @ 0°C to +85°C	−40 to +125	2.7 to 5.5	3 mA	16-lead QSOP	12-bit quad DAC with 10-bit local and remote temperature sensors
Fan Controllers								
ADT7470	I²C/SMBus	PWM fan control	Connects to TMP05/TMP06	−40 to +125	3.0 to 5.5	0.8 mA	16-lead QSOP	4-channel PWM fan control using TMP05/TMP06 temperature sensor

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