



AD592

Temperature Sensor

Vers. 1.0 – March 2014

Product Description

AD592, are popular, linear temperature sensors (manufactured by Analog Devices). It is a two terminal monolithic integrated circuit temperature transducer that provides an output current proportional to absolute temperature. For a wide range of supply voltages the transducer acts as a high impedance temperature dependent current source of 1 mA/K.

Improved design and laser wafer trimming of the IC's thin film resistors allows the AD592 to achieve absolute accuracy levels and nonlinearity errors previously unattainable at a comparable price.

The AD592 can be employed in applications between -25°C and $+105^{\circ}\text{C}$ where conventional temperature sensors (i.e., thermistor, RTD, thermocouple, diode) are currently being used.

The inherent low cost of a monolithic integrated circuit in a plastic package, combined with a low total parts count in any given application, make the AD592 one of the most cost effective temperature transducers currently available. Expensive linearization circuitry, precision voltage references, bridge components, resistance measuring circuitry and cold junction compensation are not required with the AD592.

Typical application areas include: appliance temperature sensing, automotive temperature measurement and control, HVAC (heating/ventilating/air conditioning) system monitoring, industrial temperature control, thermocouple cold junction compensation, board-level electronics temperature diagnostics, temperature readout options in instrumentation, and temperature correction circuitry for precision electronics. Particularly useful in remote sensing applications, the AD592 is immune to voltage drops and voltage noise over long lines due to its high impedance current output.



The sensor is chip type built in a 59mmX5.9mm metal stainless steel metal probe type tube, insulated with special silicone type adhesive and a cable of 2X1mm, 1.5 m length.

Note: Because AD592 is a current sensor the cable length can be extended up to 100 meters using a typical cable.

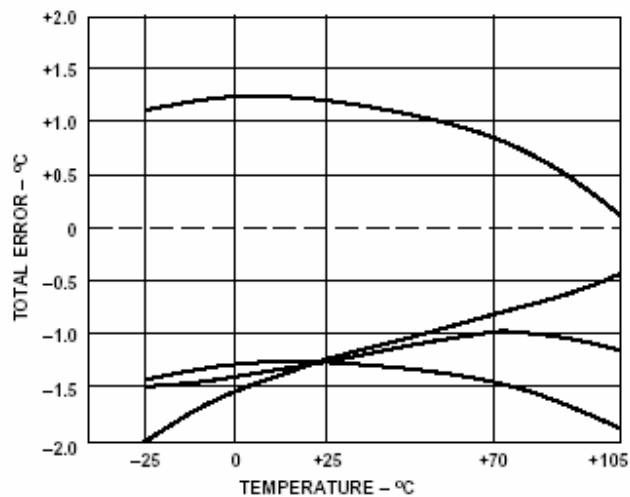
Sensor	Physical range	Resolution
AD592	-25..105°C	0.094 °C/bit

The AD592 is an integrated circuit temperature transducer that provides an output current proportional to absolute temperature. For a wide range of supply voltages the transducer acts as a high impedance temperature dependent current source of 1 μ A/K. The AD592 delivers 248 μ A at -25° C.

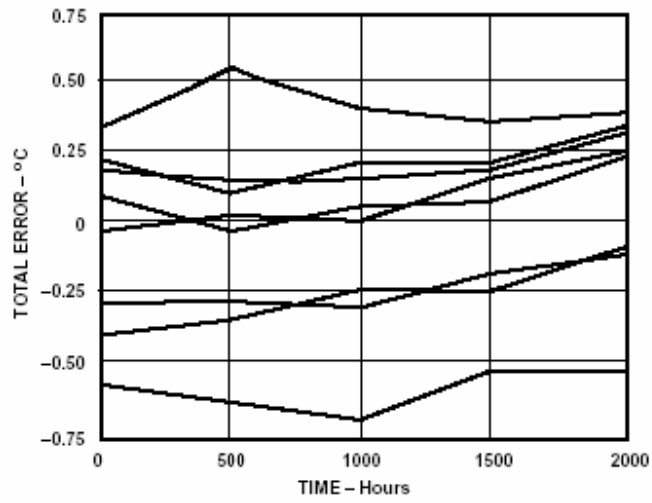
Product Highlights

1. With a single supply (4 V to 30 V) the AD592 offers 0.5°C temperature measurement accuracy.
2. A wide operating temperature range (-25° C to $+105^{\circ}$ C) and highly linear output make the AD592 an ideal substitute for older, more limited sensor technologies (i.e., thermistors, RTDs, diodes, thermocouples).
3. The AD592 is electrically rugged; supply irregularities and variations or reverse voltages up to 20 V will not damage the device.

4. Because the AD592 is a temperature dependent current source, it is immune to voltage noise pickup and IR drops in the signal leads when used remotely.
5. The high output impedance of the AD592 provides greater than 0.5°C/V rejection of supply voltage drift and ripple.
6. Initial system accuracy will not degrade significantly over time. The AD592 has proven long term performance and repeatability advantages inherent in integrated circuit design and construction.



AD592AN Accuracy Over Temperature



Long-Term Stability @ +85°C and 85% Relative Humidity

Model	AD592AN		
	Min	Typ	Max
ACCURACY			
Calibration Error @ +25°C ¹ T _A = 0°C to +70°C		1.5	2.5
Error over Temperature Nonlinearity ²		1.8	3.0
T _A = -25°C to +105°C		0.15	0.35
Error over Temperature ³		2.0	3.5
Nonlinearity ²		0.25	0.5
OUTPUT CHARACTERISTICS			
Nominal Current Output @ +25°C (298.2K)		298.2	
Temperature Coefficient		1	
Repeatability ⁴			0.1
Long Term Stability ⁵			0.1
ABSOLUTE MAXIMUM RATINGS			
Operating Temperature	-25		+105
Package Temperature ⁶	-45		+125
Forward Voltage (+ to -)			44
Reverse Voltage (- to +)			20
Lead Temperature (Soldering 10 sec)			300
POWER SUPPLY			
Operating Voltage Range	4		30
Power Supply Rejection			
+4 V < V _S < +5 V			0.5
+5 V < V _S < +15 V			0.2
+15 V < V _S < +30 V			0.1

Ordering Information:

AD-592-AN Temperature sensor -25°C...+105°C - max. non-linearity error ±0.25°C

 AD-592-BN Temperature sensor -25°C...+105°C - max. non-linearity error ±0.20°C
 CALL FOR AVAILABILITY