



PRODUCT NAME : TMP36 Precision Celsius Temperature Sensors for Arduino/Raspberry-Pi/Robotics

PRICE : Rs 59.00

SKU : RM1928



DESCRIPTION

Features

- Calibrated Directly in Degrees Celcius
- Temperature Range from -40°C to +125°C
- 2°C Initial Accuracy
- Less Than 50µA Current Drain
- Low Self Heating



Low Voltage Temperature Sensors

Data Sheet

TMP35/TMP36/TMP37

FEATURES

- Low voltage operation (2.7 V to 5.5 V)
- Calibrated directly in °C
- 10 mV/°C scale factor (20 mV/°C on **TMP37**)
- ±2°C accuracy over temperature (typ)
- ±0.5°C linearity (typ)
- Stable with large capacitive loads
- Specified -40°C to +125°C, operation to +150°C
- Less than 50 µA quiescent current
- Shutdown current 0.5 µA max
- Low self-heating
- Qualified for automotive applications

APPLICATIONS

- Environmental control systems
- Thermal protection
- Industrial process control
- Fire alarms
- Power system monitors
- CPU thermal management

GENERAL DESCRIPTION

The **TMP35/TMP36/TMP37** are low voltage, precision centi-grade temperature sensors. They provide a voltage output that is linearly proportional to the Celsius (centigrade) temperature. The **TMP35/TMP36/TMP37** do not require any external calibration to provide typical accuracies of ±1°C at +25°C and ±2°C over the -40°C to +125°C temperature range.

The low output impedance of the **TMP35/TMP36/TMP37** and its linear output and precise calibration simplify interfacing to temperature control circuitry and ADCs. All three devices are intended for single-supply operation from 2.7 V to 5.5 V maximum. The supply current runs well below 50 µA, providing very low self-heating—less than 0.1°C in still air. In addition, a shutdown function is provided to cut the supply current to less than 0.5 µA.

The **TMP35** is functionally compatible with the LM35/LM45 and provides a 250 mV output at 25°C. The **TMP35** reads temperatures from 10°C to 125°C. The **TMP36** is specified from -40°C to +125°C, provides a 750 mV output at 25°C, and operates to 125°C from a single 2.7 V supply. The **TMP36** is functionally compatible with the LM50. Both the **TMP35** and **TMP36** have an output scale factor of 10 mV/°C.

FUNCTIONAL BLOCK DIAGRAM

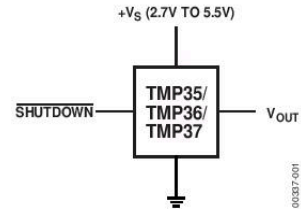


Figure 1.

PIN CONFIGURATIONS

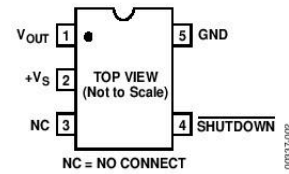


Figure 2. RJ-5 (SOT-23)

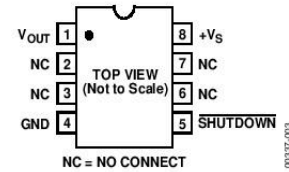


Figure 3. R-8 (SOIC_N)

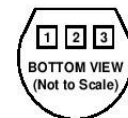


Figure 4. T-3 (TO-92)

The **TMP37** is intended for applications over the range of 5°C to 100°C and provides an output scale factor of 20 mV/°C. The **TMP37** provides a 500 mV output at 25°C. Operation extends to 150°C with reduced accuracy for all devices when operating from a 5 V supply.

The **TMP35/TMP36/TMP37** are available in low cost 3-lead TO-92, 8-lead SOIC_N, and 5-lead SOT-23 surface-mount packages.

Rev. H **Document Feedback**
 Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

Data Sheet

TMP35/TMP36/TMP37

SPECIFICATIONS

$V_S = 2.7\text{ V to }5.5\text{ V}$, $-40^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$, unless otherwise noted.

Table 1.

Parameter ¹	Symbol	Test Conditions/Comments	Min	Typ	Max	Unit
ACCURACY						
TMP35/TMP36/TMP37 (F Grade)		$T_A = 25^\circ\text{C}$		±1	±2	°C
TMP35/TMP36/TMP37 (G Grade)		$T_A = 25^\circ\text{C}$		±1	±3	°C
TMP35/TMP36/TMP37 (F Grade)		Over rated temperature		±2	±3	°C
TMP35/TMP36/TMP37 (G Grade)		Over rated temperature		±2	±4	°C
Scale Factor, TMP35		$10^\circ\text{C} \leq T_A \leq 125^\circ\text{C}$		10		mV/°C
Scale Factor, TMP36		$-40^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$		10		mV/°C
Scale Factor, TMP37		$5^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$		20		mV/°C
		$5^\circ\text{C} \leq T_A \leq 100^\circ\text{C}$		20		mV/°C
		$3.0\text{ V} \leq V_S \leq 5.5\text{ V}$				
Load Regulation		$0\ \mu\text{A} \leq I_L \leq 50\ \mu\text{A}$				
		$-40^\circ\text{C} \leq T_A \leq +105^\circ\text{C}$		6	20	m°C/μA
		$-105^\circ\text{C} \leq T_A \leq +125^\circ\text{C}$		25	60	m°C/μA
Power Supply Rejection Ratio	PSRR	$T_A = 25^\circ\text{C}$		30	100	m°C/V
		$3.0\text{ V} \leq V_S \leq 5.5\text{ V}$		50		m°C/V
Linearity				0.5		°C
Long-Term Stability		$T_A = 150^\circ\text{C}$ for 1000 hours		0.4		°C
SHUTDOWN						
Logic High Input Voltage	V_{IH}	$V_S = 2.7\text{ V}$	1.8			V
Logic Low Input Voltage	V_{IL}	$V_S = 5.5\text{ V}$			400	mV
OUTPUT						
TMP35 Output Voltage		$T_A = 25^\circ\text{C}$		250		mV
TMP36 Output Voltage		$T_A = 25^\circ\text{C}$		750		mV
TMP37 Output Voltage		$T_A = 25^\circ\text{C}$		500		mV
Output Voltage Range			100		2000	mV
Output Load Current	I_L		0		50	μA
Short-Circuit Current	I_{SC}	Note 2			250	μA
Capacitive Load Driving	C_L	No oscillations ²	1000	10000		pF
Device Turn-On Time		Output within $\pm 1^\circ\text{C}$, 100 kΩ 100 pF load ²		0.5	1	ms
POWER SUPPLY						
Supply Range	V_S		2.7		5.5	V
Supply Current	I_{SY} (ON)	Unloaded			50	μA
Supply Current (Shutdown)	I_{SY} (OFF)	Unloaded		0.01	0.5	μA

¹ Does not consider errors caused by self-heating.

² Guaranteed but not tested.

