TMP36 Temperature Sensor

Introduction

The TMP36 is low voltage, precision centigrade temperature sensor. It provides a voltage output that is linearly proportional to the Celsius (Centigrade) temperature. The TMP36 does 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 TMP36 and its linear output and precise calibration simplify interfacing to temperature control circuitry and A/D converters. It is intended for single-supply operation from 2.7 V to 5.5 V maximum. 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 supply current to less than 0.5 µA.

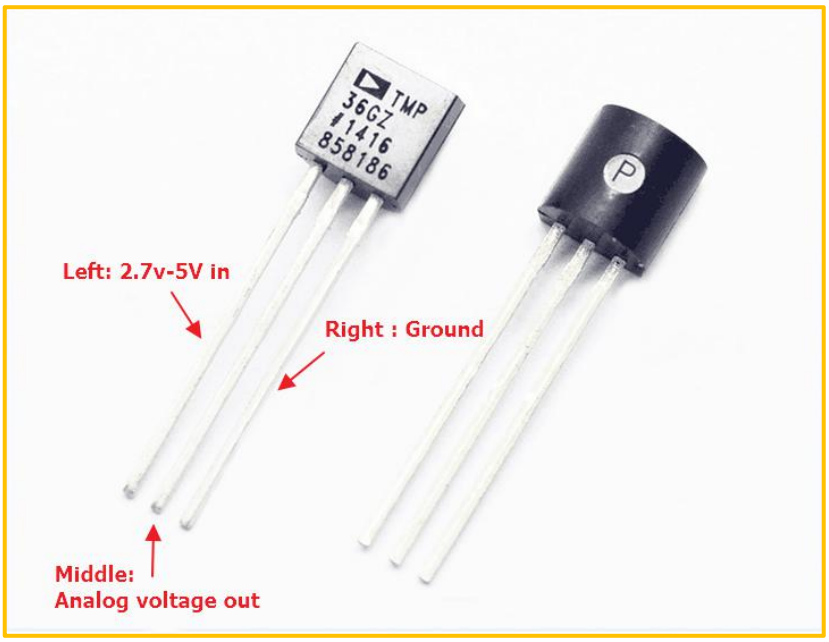
The TMP36 is specified from –40°C to +125°C, provides a 750 mV output at 25°C, and operates to +125°C from a single 2.7 V supply. The TMP36 is functionally compatible with the LM50. The TMP36 has an output scale factor of 10 mV/°C and it is available in low cost 3-lead TO-92, SOIC-8, and 5-lead SOT-23 surface-mount packages.

Features

1. Low Voltage Operation (2.7 V to 5.5 V)
2. Calibrated Directly in °C
3. 10 mV/°C Scale Factor (20 mV/°C on TMP37)
4. ±2°C Accuracy over Temperature (Typ)
5. ±0.5°C Linearity (Typ)
6. Stable with Large Capacitive Loads
7. Specified –40?C to +125°C, Operation to +150°C
8. Less than 50 ?A Quiescent Current
9. Shutdown Current 0.5µA Max
10. Low Self-Heating

Applications

1. Environmental Control Systems
2. Thermal Protection
3. Industrial Process Control
4. Fire Alarms
5. Power System Monitors
6. CPU Thermal Management

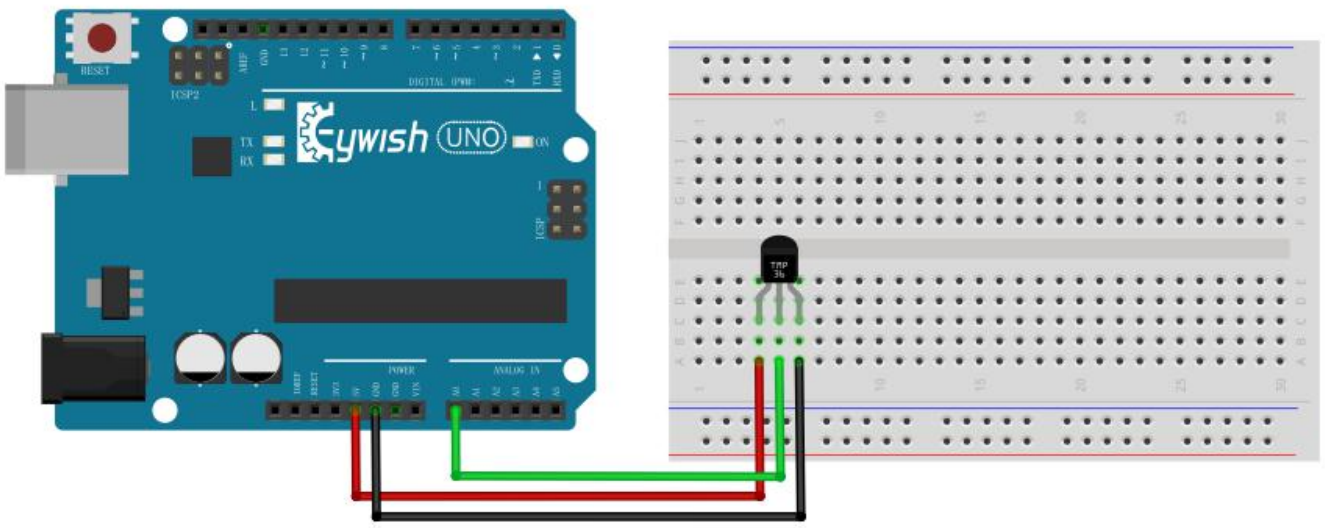


Component List

- Keywish Arduino UNO R3 mainboard
- Breadboard
- USB cable
- TMP36 module*1
- Some wires

Wiring of Circuit

Arduino UNO	TMP36 module
+5V	left
A0	middle
GND	right


RESET
ICSP2
Eywish UNO
ON
ICSP
POWER
ANALOG IN

Code

```
int sensorPin = 0;
//the analog pin the TMP36's Vout (sense) pin is connected to
//the resolution is 10 mV / degree centigrade with a
//500 mV offset to allow for negative temperatures
void setup()
{
  Serial.begin(9600);
//Start the serial connection with the computer
//to view the result open the serial monitor
}

void loop()
{

 int reading = analogRead(sensorPin);
//getting the voltage reading from the temperature sensor
 float voltage = reading * 5.0;
 voltage /= 1024.0;
 Serial.print(voltage); Serial.println(" volts");
 float temperatureC = (voltage - 0.5) * 100 ;
//converting from 10 mv per degree wit 500 mV offset
//to degrees ((volatge - 500mV) times 100)
 Serial.print(temperatureC);
 Serial.println(" degrees C");
 float temperatureF = (temperatureC * 9.0 / 5.0) + 32.0;
 Serial.print(temperatureF);
 Serial.println(" degrees F");
 delay(1000);
}
```

Experiment Result