

**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**

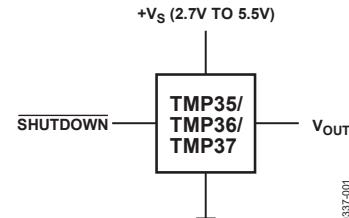
- Environmental control systems
- Thermal protection
- Industrial process control
- Fire alarms
- Power system monitors
- CPU thermal management

**GENERAL DESCRIPTION**

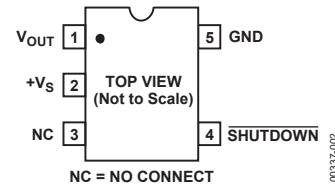
The TMP35/TMP36/TMP37 are low voltage, precision centigrade temperature sensors. They provide a voltage output that is linearly proportional to the Celsius (centigrade) temperature. The TMP35/TMP36/TMP37 do not require any external calibration to provide typical accuracies of ±1°C at +25°C and ±2°C over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

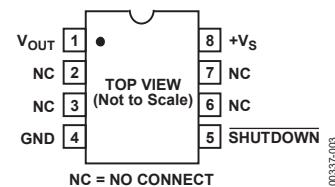
The TMP35 is functionally compatible with the LM35/LM45 and provides a 250 mV output at 25°C. The TMP35 reads temperatures from 10°C to 125°C. The TMP36 is specified from –40°C to +125°C, provides a 750 mV output at 25°C, and operates to 125°C from a single 2.7 V supply. The TMP36 is functionally compatible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

**FUNCTIONAL BLOCK DIAGRAM**

*Figure 1.*

00337-001

**PIN CONFIGURATIONS**

*Figure 2. RJ-5 (SOT-23)*

00337-002


*Figure 3. R-8 (SOIC\_N)*

00337-003



PIN 1, +Vs; PIN 2, Vout; PIN 3, GND

00337-004

*Figure 4. T-3 (TO-92)*
**Rev. G**

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**Document Feedback**

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.

## TYPICAL PERFORMANCE CHARACTERISTICS

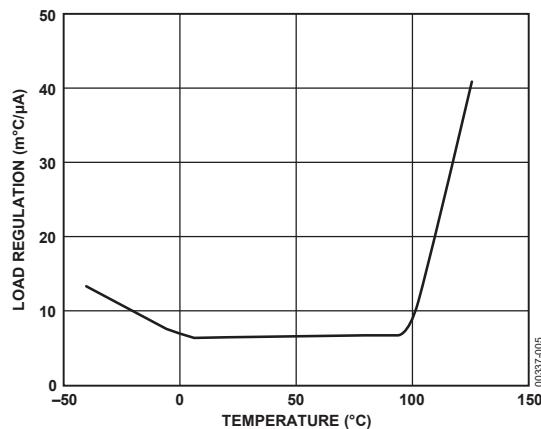
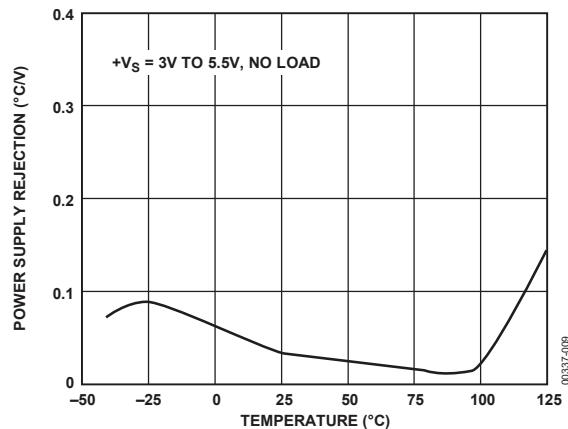
Figure 5. Load Regulation vs. Temperature ( $m^{\circ}\text{C}/\mu\text{A}$ )

Figure 8. Power Supply Rejection vs. Temperature

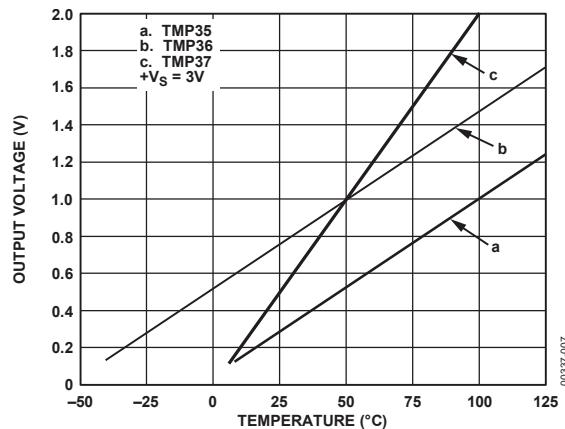


Figure 6. Output Voltage vs. Temperature

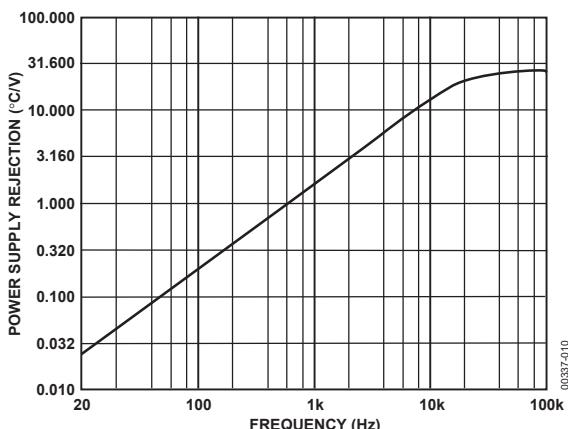


Figure 9. Power Supply Rejection vs. Frequency

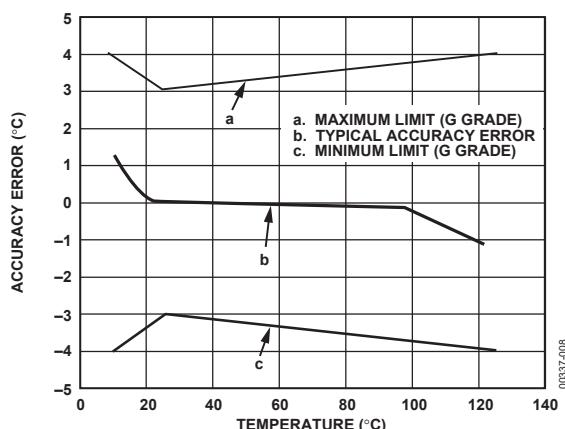


Figure 7. Accuracy Error vs. Temperature

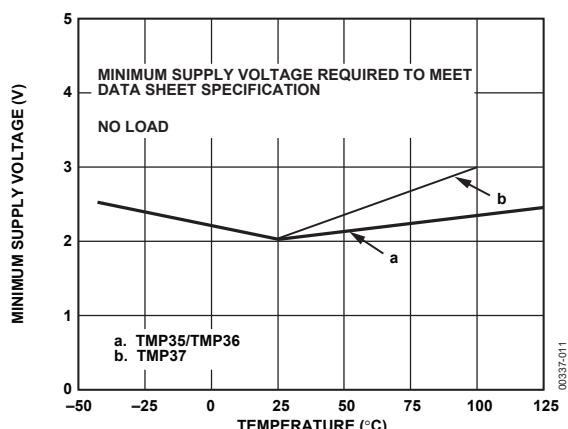


Figure 10. Minimum Supply Voltage vs. Temperature