

LabJack

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LM34CAZ Silicon Temperature Sensor

The LM34CAZ is ideal for cold-junction compensation(CJC) temperature measurements. Customers who are using thermocouples on an external CB37 terminal board can wire this sensor to a nearby analog input, and correlate the CJC offset within software. Simply connect +Vs to LabJack VS, GND to LabJack GND, and Vout to a LabJack AIN terminal (FIO/EIO is best on the U3). It has a very convenient output of 10mV per °F, so 0.78V would correspond with 78°F.

- TO-92 Package
- Typical Accuracy $\pm 0.4^\circ\text{F}$
- Operating Range 0°F to $+230^\circ\text{F}$ (-17 to $+110^\circ\text{C}$) when powered by 0/5 volts.
- Output Voltage 10mV/°F
- See [LM34 Datasheet](#) for Complete Specifications

The LM34CAZ is the most accurate version of the LM34 precision temperature sensor made by Texas Instruments; it is not manufactured by LabJack, so the [LM34 datasheet](#) is hosted by Texas Instruments. Some soldering may be necessary to add length to the sensor wires. For more details about this sensor and a detailed look at different kinds of temperature sensors, see our [temperature sensor app note](#).

How about the LM35?

Note that even if you want to measure in Celsius, the LM34 is better than the LM35 because you get more voltage per temperature ($18\text{ mV}/^\circ\text{C}$ versus $10\text{ mV}/^\circ\text{C}$) and you can measure lower with a single supply (-17°C versus $+1^\circ\text{C}$).

Adding a Cable

Very little current is flowing, so any type of signal cable will work fine. The LM34 output can easily go unstable when presented with capacitive load, so regardless of cable length we always recommend a 10k resistor from Vout to GND (preferably right at the sensor), and this is usually good for cables up to 25ft. This increases the current draw of the sensor from the typical $75\text{ }\mu\text{A}$ up to a few hundred μA (additional current is output voltage/10k). Beyond 25ft see the "Capacitive Loads" section in the LM34 datasheet and consider adding a series resistor.

Local Temperature

One of the pictures above shows an LM34 plugged directly into a screw terminal block. Not only is the sensor package close to the screw terminal, but the short leads will readily conduct heat between the screw-terminal and the inside of the LM34, thus this will give you a very good reading of the temperature of the screw terminal (good for cold junction compensation).

Screw terminals on a passive device, such as the CB37, will be the same temperature as the surrounding air. So the LM34 will read the same whether plugged right into the screw terminal or with a short cable added.

Screw terminals on an active device, such as the T4/T7, will be warmer than the surrounding air due to the power consumption of the device. For example, the typical temperature rise of a T4/T7 with USB & Ethernet enabled is 4.9 °C. An LM34 plugged directly into a screw terminal on the T4/T7 will read warmer than ambient.

Cold Junction Compensation

The main reason we sell this sensor is to measure the temperature of a thermocouple's cold junction so cold junction compensation (CJC) can be done. The voltage produced by a thermocouple is related to the difference in temperature between the remote end and the local end, so for CJC you need to know the temperature of the local end of the thermocouple. For example, if a thermocouple is connected to a screw-terminal block on a CB37, you need to know the temperature of that screw-terminal block (which with the CB37 is typically the same as ambient).

One of the pictures above shows an LM34 plugged directly into a screw terminal block. Not only is the sensor package close to the screw terminal, but the short leads will readily conduct heat between the screw-terminal and the inside of the LM34, thus this will give you a very good reading of the temperature of the screw terminal. Note in the picture that the leads have to be bent awkwardly ... we suggest putting little pieces of electrical tape between the leads to keep them from touching each other, and recommend you have extra LM34s as the leads break off easily if over manipulated. We just sell the LM34CAZ as a convenience for customers, and our feelings are not hurt if you buy them from a less expensive source.

10k Resistor

A 10k resistor ships with the LM34 when ordered from us. We recommend using this resistor from Vout to GND to prevent the signal from going unstable.

Information

Stock Status: In Stock

Compatible Products:

U3

T7

U6

UE9

U12

T4

\$12.00

Quantity Discounts:

1+ = \$12.00 per unit

Quantity

1

Add to cart
