

Touch Sensor Lab

Task for Lab

You will be building a very sensitive temperature sensing device which should be able to detect the change of temperature when you touch and hold the thermistor. When the temperature of the thermistor changes as soon as you touch and hold it, the LED should light up.

Components provided and their data sheet.

Op amp LM741: <http://www.ti.com/lit/ds/symlink/lm741.pdf>

LED Red: <http://media.digikey.com/pdf/Data%20Sheets/CREE%20Power/C566C-RFx,GFx,BFx,AFx.pdf>

LED

green: <http://www.cree.com/~media/Files/Cree/LED%20Components%20and%20Modules/HB/Data%20Sheet/s/C503B%20BAS%20BAN%20BCS%20BCN%20GAS%20GAN%20GCS%20GCN%201094.pdf>

LED yellow: <http://media.digikey.com/pdf/Data%20Sheets/CREE%20Power/C566C-RFx,GFx,BFx,AFx.pdf>

5 potentiometers 1K

Component that you will need to bring

You will need an extra 9V battery. We will bring about 10-15 used 9V battery but it will not be enough for everyone.

Circuit Design

You will need to use the op amp to design a comparator circuit which will trigger the LED to light up when the temperature changes. You will need to calculate and use the resistor required for the LED based on the data sheet info. You may use all the (0 Ohm - 1K Ohm) potentiometers provided to adjust to the resistance that you need. Since salvaging resistors from the small containers may be a hassle, you will need to rely on the potentiometers to create the required resistance.

Grading

There will be a pass/fail grading for your device. Before the end of the class you will have to show us that your device worked. Everyone will build their individual devices and you can help each other out if needed. We highly recommend you to draw out the circuit on the breadboard before class, so when you come into class you can build quickly and start trouble shooting/optimizing. Please come to class early on Monday so we can set up quickly.

Extra components

Instrumentation amplifier

capacitor 1nF and 1uF

Questions

Let us know if you have any questions. It will be a fun lab if you come prepared.