



DON BOSCO TECHNICAL COLLEGE

ON-OFF TOUCH SENSOR SWITCH CIRCUIT

In Partial Fulfillment
of the Course Requirements for
Basic Electronic Laboratory (BELECS-LAB)

by

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OBJECTIVES

A touch sensor is a type of electronic sensor that uses physical touch to activate. It is a low-cost component that is made to substitute the old mechanical on/off switch. Likewise, instead of utilizing the conventional on/off switch, the students' aim for the lab project is to build a circuit with an LED that can be turned on and off with a single touch. The project will use a 555 timer IC, an integrated circuit that is used to create precise delays in timing, and oscillations. It will be used to create a sensor that will activate once it is touched. Upon Completion of the lab project, it is expected that the LED would light up when the finger is placed on the touch sensor which is the copper wire, and also to gain familiarity with the 555 timer IC and its function.

FEATURES

The mechanism of the switch relies on the human body's property called body capacitance, which enables it to have excellent electrical characteristics. The switch continually charges and discharges its metallic surface to detect any variations in capacitance. If an individual touches the switch, their body's capacitance increases, leading to the activation of the switch.

In addition, focusing on the main component, the proposed circuit will employ an integrated circuit known as the 555 timer IC, which is capable of generating precise time delays and oscillations. The 555 timer IC has eight pins that serve distinct functions: Ground, Trigger, Output, Reset, Positive VCC, Discharge, Threshold, and Control voltage. The circuit will utilize



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the Trigger, Output, and Threshold pins to establish an on/off mechanism. The Output pin will turn on when the Trigger pin identifies a voltage lower than one-third of the supply voltage, while the Output pin will turn off when the Threshold pin detects a voltage greater than two-thirds of the supply voltage.

EQUIPMENT AND CIRCUIT COMPONENTS

I. Equipment and Accessories

- Connector Wires
- Copper Wires
- Breadboard
- 12V Power Supply

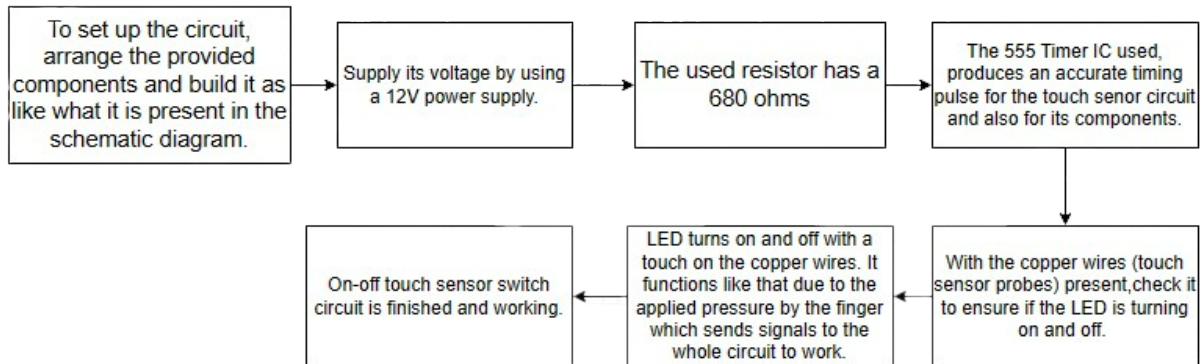
II. Circuit Components

- Light Emitting Diode (LED)
- 680 ohms Resistor
- 555 Timer IC



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BLOCK DIAGRAM



SET-UP/SCHEMATIC DRAWINGS

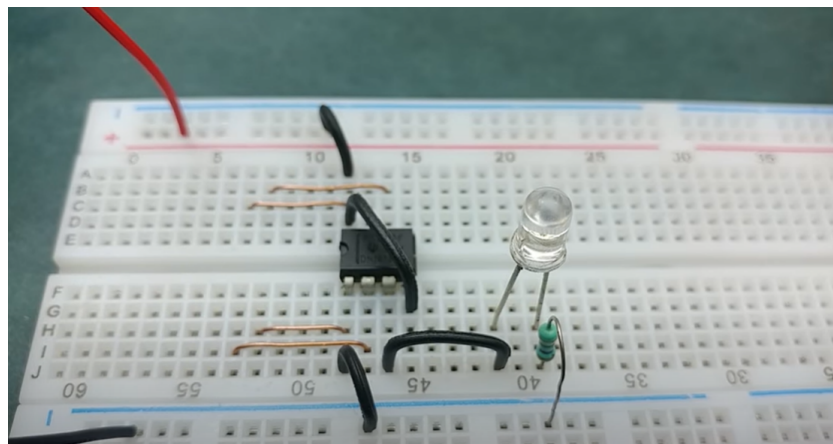


Figure 1. Set-up



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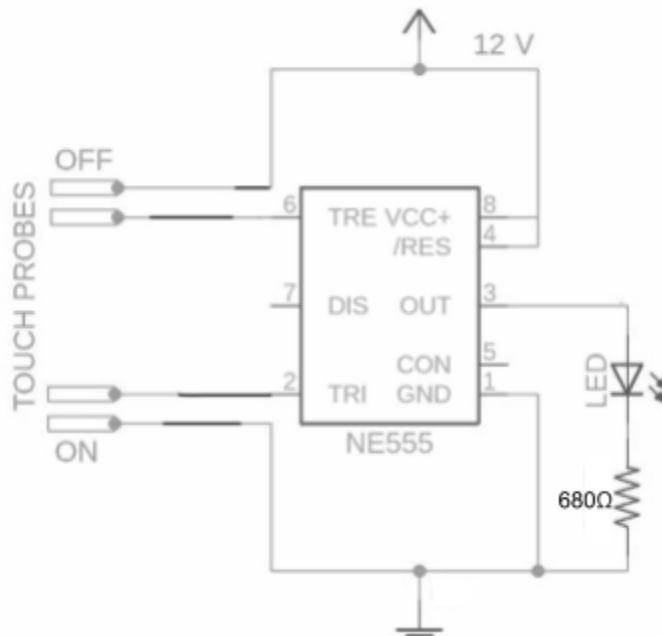


Figure 2. Schematic Drawing

PROCEDURES

To set up the circuit, arrange the provided components, which include a Light Emitting Diode (LED), a 680 ohms Resistor, and a 555 Timer IC, on the breadboard. The IC 555 Timer should be placed between the positive and negative rail, and the touch contacts should be placed at pins eight, six, one, and two on the breadboard. You will need to connect pin four of the IC to the positive rail and pin one to the negative rail. The reset pin, which is located at pin four, should be connected to pin eight. Place the LED on the breadboard and connect a node to it and the output of the 555 Timer IC. The LED's cathode should be connected from the negative rail to a 680 ohms Resistor. Finally, connect the 12V power supply to the circuit and test if the LED is turning on and off by touching the copper wire(touch sensor probes).



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