



# INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, NAGPUR

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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AIM : TO DESIGN AN ON/OFF SENSOR USING IC 555 TIMER

## INTRODUCTION:

A touch sensor is a device that captures and records physical touch on a device and/or object. It enables a device or object to detect touch, typically by a human user or operator. A touch sensor may also be called a touch detector. It is made by using IC 555 timer p

Figure 1: .

## APPARTUS REQUIRED:

- IC 555;
- Resistors of 100 ohm and 330 ohm;
- LED lights(2);
- Copper wires (or) metal plates;
- Capacitors;
- Connecting wires;
- Power supply of 9V.
- Bread board.

## WORKING OF CIRCUIT:

10(00,12) The internal architecture of the 555 timer IC is such that, whenever Pin-2 (Trigger Pin) senses a voltage less than 1/3rds of supply voltage, it turns ON the output. Similarly when Pin-6 (Threshold Pin) senses a voltage greater than 2/3rds of supply voltage, it turns OFF the output.

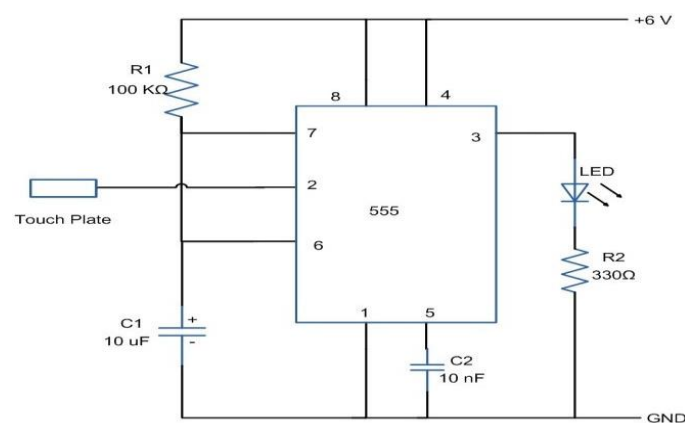


Figure 3: Circuit diagram of touch sensor.

10(00,16) Whenever someone touches the contacts at Pin-2 and 0V, since Pin-2 senses 0V because of current flowing through finger, it turns ON the output. And when we touch the contacts at Pin-6 and +ve Voltage, since Pin-6 senses +ve Voltage (which is more than 2/3rds of supply voltage), it turns OFF the output. Also the influence of 10M resistor is negligible when we touch the contacts with our finger, since the resistance at the finger will be much lesser.

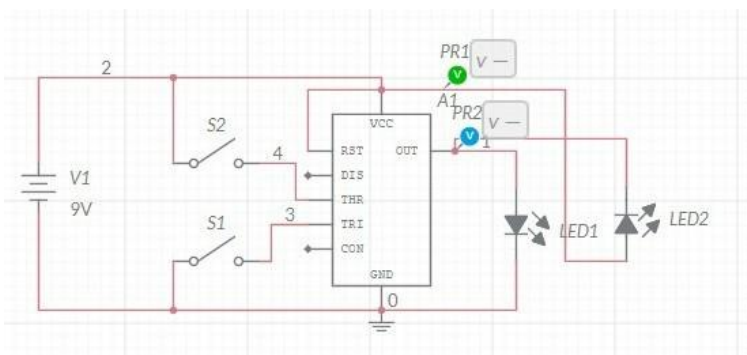
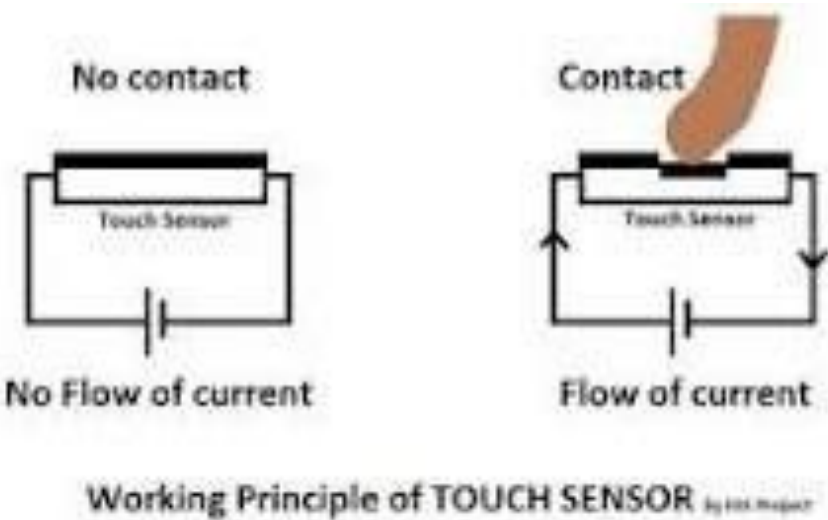


Figure 4: multisim circuit of touch sensor

10(02,00)

## PRINCIPLE OF TOUCH SENSOR:

A touch sensor works like a switch, where when there's contact, touch, or pressure on the surface of a touch sensor, it opens up an electrical circuit and allows currents to flow through



Working Principle of TOUCH SENSOR by Rishabh

Figure 5: working principle

## ABOUT PINS OF IC555:

- Pin-1 is a GND pin which is used to supply a zero voltage to the IC.;
- Pin-2 is a trigger pin which is used to convert the FF from set to RST (reset)
- Pin-3 is an output pin.
- Pin-4 is a RST pin.
- Pin-5 is the control voltage pin used to control the pulse width of the output waveform
- Pin-6 is the threshold pin, when the voltage is applied to threshold pin, then it contrasts with a reference voltage
- Pin-7 is the discharge pin
- Pin-8 is the voltage supply pin which is used to supply the voltage to the IC with respect to the ground terminal.

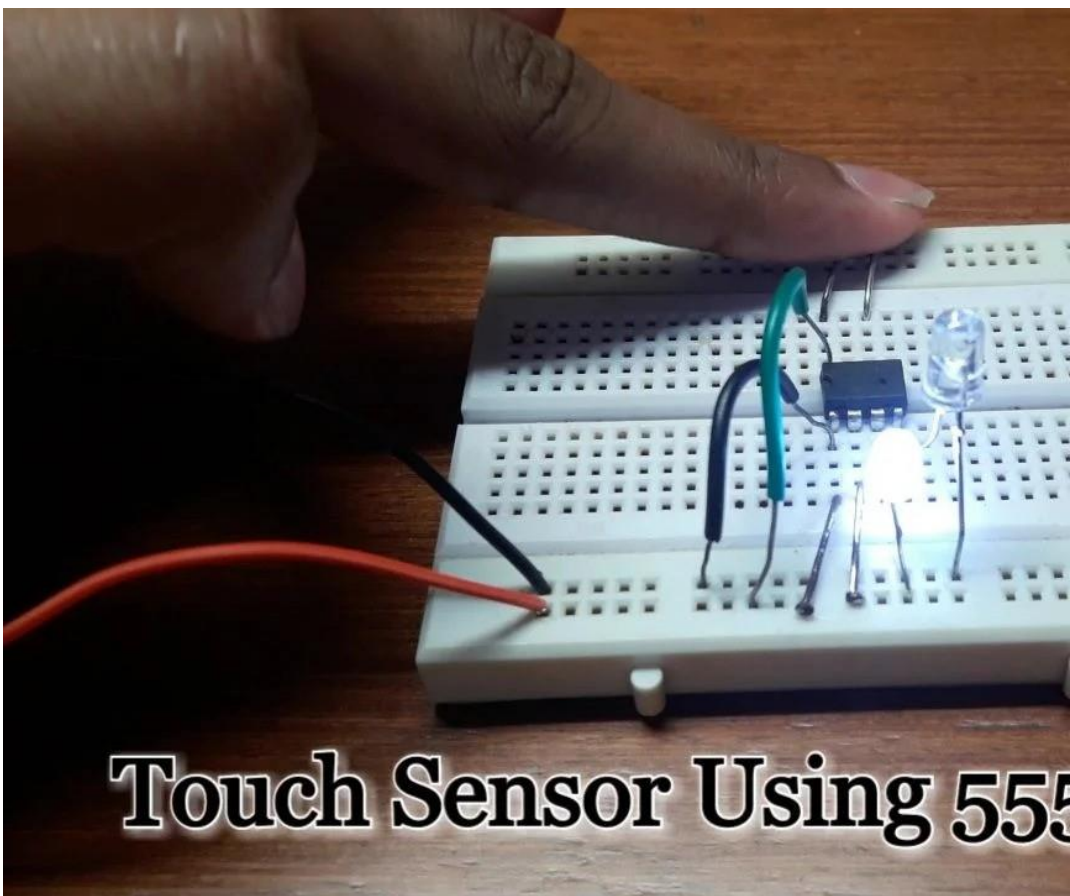


Figure 6: practical picture of touch on-off sensor

## APPLICATIONS :

The following are the applications:

- This touch ON - OFF switch circuit, after adding a relay to its output, can be used to replace physical ON-OFF switches that we use in our homes ;

- Multiple circuits can be cascaded to make a security system, where the output turns ON only when a certain pre-defined combination of touches are made on the available touch contacts ;

- As a better ergonomic replacement for Momentary Push Button Switch ;

## MENTOR NAME :

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## REFERENCES :

- 1.Touch on-off sensor switch circuit using 555 timer IC ,elonics.org
- 2.What is 555 timer IC and its working , watelectronics.com

