

Touch Detector

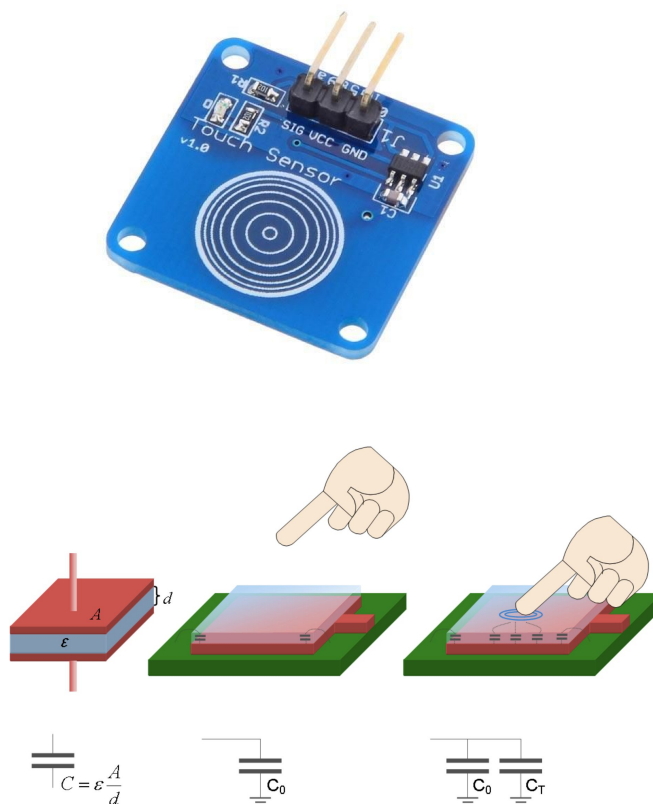
(Technical Note)

What is a Touch Detector?

A touch detector converts the capacitance of our body into a signal to detect finger touch. Capacitive touch sensors are found in common home appliances, automotive interface, and industrial applications. Touch sensors, unlike mechanical devices, does not comprise of any moving part. Hence, they are more durable than mechanical input devices. Touch sensors are robust as there are no openings for either humidity or dust to enter.

Touch Sensor Principle: untouched sensor pad with parasitic capacitance C_0 , touched sensor pad with additional touch capacitance C_T

Whenever a conductive object like a human finger touches the sensor or approaches the electrode, the output capacitance increases and the sensor creates a trigger signal.



Capacitive Touch Sensors (Fujitsu.com)

Other Names: Touch Sensor, Capacitive Touch Sensor

Applications

Musical Instruments:

Instruments like keyboards and piano in which the applied pressure produces sound are all based on the resistive type touch sensor.

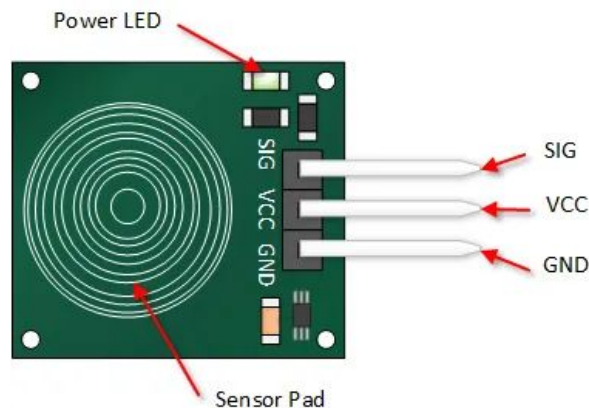
Home Appliances:

Appliances like microwave ovens, dish washers and laundry use touch sensors since they can be cleaned easily.

Touch screen devices:

Modern day devices ranging from electronic devices like your cell phones to complex automobiles are all trying to inculcate touch screen technologies. Most widely, capacitive touch sensor are employed for such applications.

Connection Information



Touch Detector

(Application Note)



Project

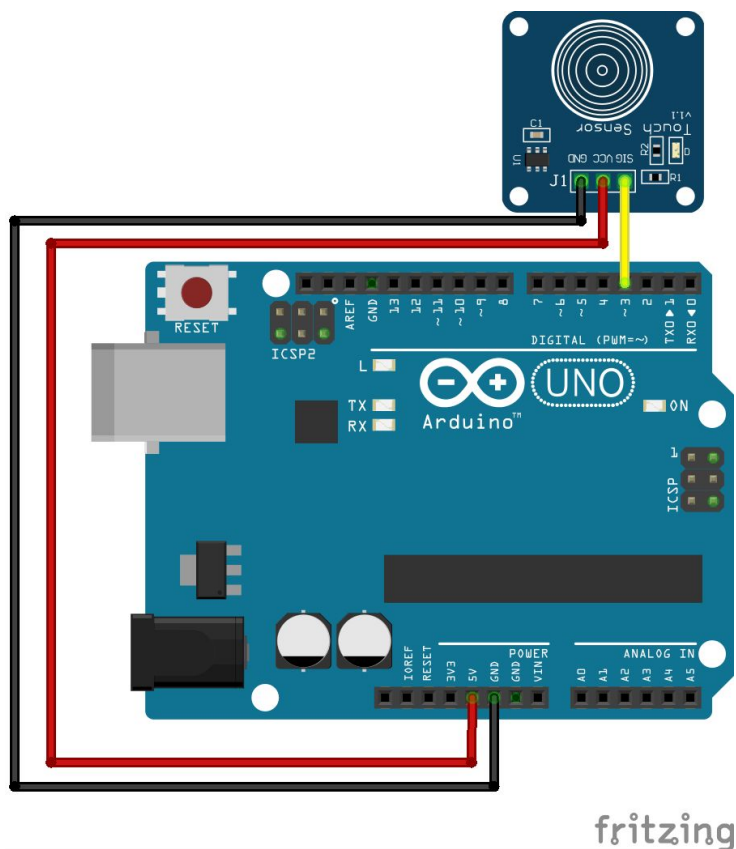
Detect a finger touch and report status by serial communication to the computer.

Procedure

Touch Sensor

- Connect **Vcc** pin of sensor to **5V** of Arduino
- Wire **GND** pin of the sensor to **GND** of the Arduino
- Connect **SIG** pin to **Pin 3** of Arduino
- Read and understand the code given
- Upload the code
- Use Serial terminal on Arduino application to view the messages from the board

Schematic



Components Required

Component	Part No.	Qty
Arduino UNO	EMX-00001-A	1
Touch Sensor	EMS-00014-A	1
Jumper Wires - M-F	EDA-00001-A	3

Code

```
int touch = 3; /*declaring an integer type
variable named "touch" and giving it a
value of 3 */
void setup()
{
    Serial.begin(9600); /*Setting the baud rate
of serial communication be 9600 */
    pinMode(touch, INPUT); /*Making the touch
sensor to provide Input to Arduino */
}
void loop()
{
    int touchval =
digitalRead(touch); /*declared an integer
type variable named "touchval" to store
read value of the sensor */
    if (touchval == HIGH) /*Checking if the
Input value from the sensor is HIGH */
    {
        Serial.println("TOUCHED"); /*if the Input
value is HIGH, print "TOUCHED" on the
serial monitor */
    }
    else
    {
        Serial.println("not
touched"); /*Otherwise print "not touched"
on the serial monitor */
    }
    delay(500); /*adding a delay of 500ms to
the system */
}
```

Challenge Yourself

1. **LED Blinker:** Modify the code to blink the onboard LED (L) on pin 13 while the sensor is touched
2. **Music Box:** Design a music box to play short jingles when the sensor is touched. Hint: Use **tone()** function to create notes.