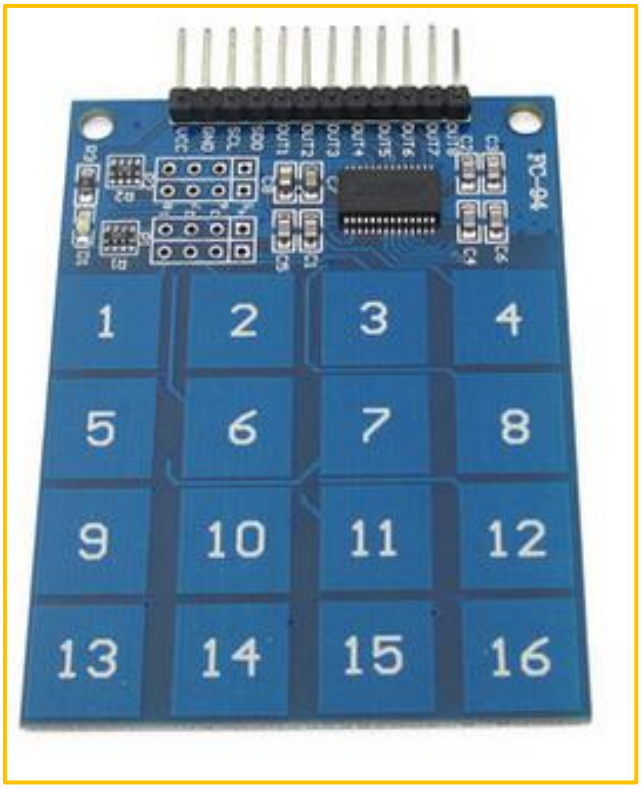
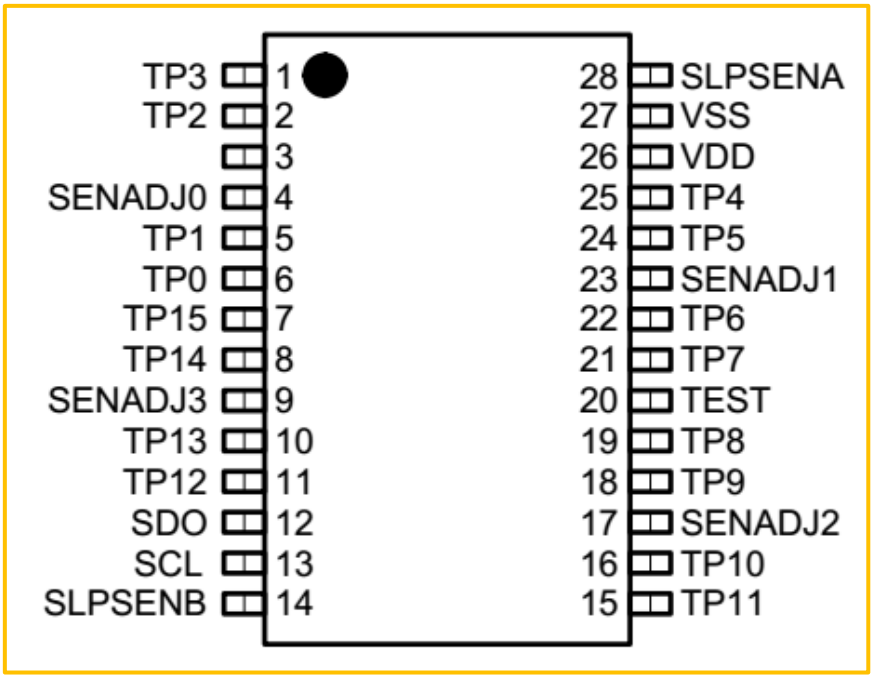
TTP229 Touch Pad

Introduction

The TTP229 TonTouchTM IC is capacitive sensing design specifically for touch pad controls. The device built in regulator for touch sensor. Stable sensing method can cover diversity conditions. Human interfaces control panel links through non-conductive dielectric material. The main application is focused at replacing of the mechanical switch or button. The ASSP can independently handle the 8 touch pads or up to 16 touch pads.



Pin Description



Symbol	Pin	I/O type	Description
TP3	1	I/O	Touch pad input pin(KEY-3) Key action function option-1(Single-key/Multi-key) Default is all single-key
TP2	2	I/O	Touch pad input pin(KEY-2) Key number function option(8-keys/16-keys) Default is 8-keys
NONE	3	NONE	NONE
SENADJ0	4	I/O	Touch pad TP0~3 sensitivity adjust common pin
TP1	5	I/O	Touch pad input pin(KEY-1) Output type function option(Active High/Low) Default is active-high for TPQ0~7, active-low for 2-wires serial type(SCL and SDO)
TP0	6	I/O	Touch pad input pin(KEY-0) Output type function option(CMOS/OD/OC for 8-keys) Default is CMOS

			Touch pad input pin(KEY-15)
TP15	7	I/O	8-keys direct output pin(TPQ7)
			Touch pad input pin(KEY-14)
TP14	8	I/O	8-keys direct output pin(TPQ6)
SENADJ3	9	I/O	Touch pad TP12~15 sensitivity adjust common pin
			Touch pad input pin(KEY-13)
TP13	10	I/O/OD	8-keys direct output pin(TPQ5)
			Touch pad input pin(KEY-12)
TP12	11	I/O/OD	8-keys direct output pin(TPQ4)
SDO	12	O	Data pin for the 2-wires serial output, option active Low/High by TP1
			Serial clock input pin for serial type
			At 2-wires serial type can be set active Low/High by
SCL	13	I	TP1
SLPSENB	14	I/O	Sleep mode sensitivity adjustment pin for group-B(TP8~15)
			Touch pad input pin(KEY-11)
TP11	15	I/O/OD	8-keys direct output pin(TPQ3)
			Touch pad input pin(KEY-10)
TP10	16	I/O/OD	8-keys direct output pin(TPQ2)
SENADJ2	17	I/O	Touch pad TP8~11 sensitivity adjust common pin
			Touch pad input pin(KEY-9)
TP9	18	I/O/OD	8-keys direct output pin(TPQ1)
			Touch pad input pin(KEY-8)
TP8	19	I/O/OD	8-keys direct output pin(TPQ0)
TEST	20	I-PL	Only for test
			Touch pad input pin(KEY-7)
			Maximum key-on time function
			option(Infinite/60sec)
TP7	21	I/O	Default is infinite
			Touch pad input pin(KEY-6)
			Sleep mode sampling length function
			option(4.0/2.0mS)
TP6	22	I/O	Default is 4.0ms
SENADJ1	23	I/O	Touch pad TP4~7 sensitivity adjust common pin

TP5	24	I/O	Touch pad input pin(KEY-5) Sampling rate at sleep mode function option(8Hz/64Hz) Default is 8Hz
TP4	25	I/O	Touch pad input pin(KEY-4) Key action function option-0(Single-key/Multi-key) Default is all single-key
VDD	26	P	Positive power supply
VSS	27	P	Negative power supply, ground
SLPSENA	28	I/O	Sleep mode sensitivity adjustment pin for group-A(TP0~7)

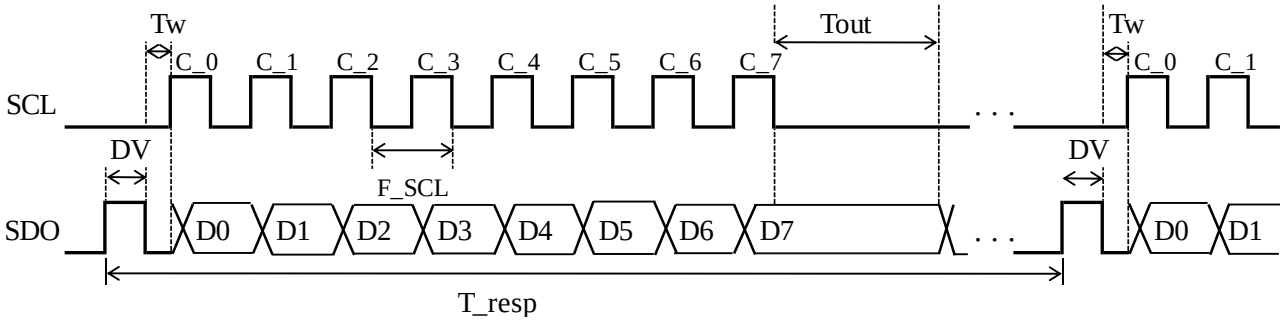
Working Principle

The TTP229 has 8 keys input mode and 16 keys input mode. These modes are selected via high-value resistor connected to the TP2(KYSEL) pin to VSS, or not. The default that TP2(KYSEL) pin is not used resistor connected to VSS is selected 8 keys input mode. Another is selected 16 keys input mode that has used a high-value resistor connected to VSS.

The communication between TTP229 and MCU is 2-wires serial interface mode whose timing shows as below：

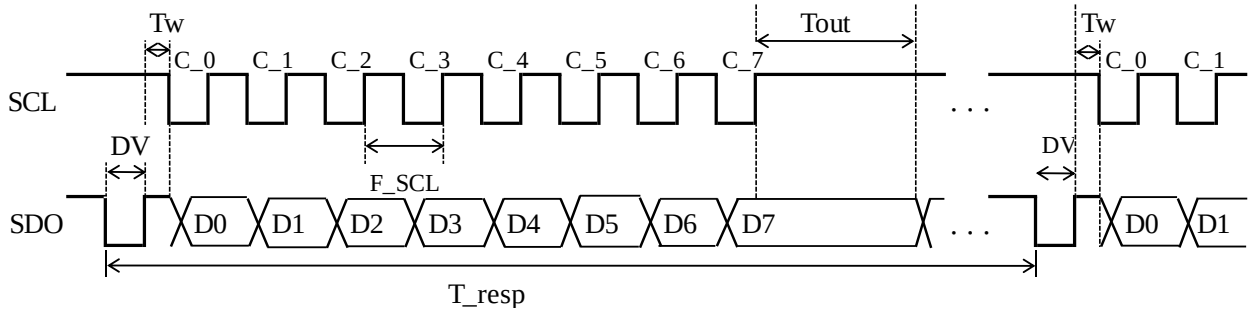
The D0~D15 correspond to data of the TP0~TP15.

When TP1=0, TP2=1：Set 8-keys active-high



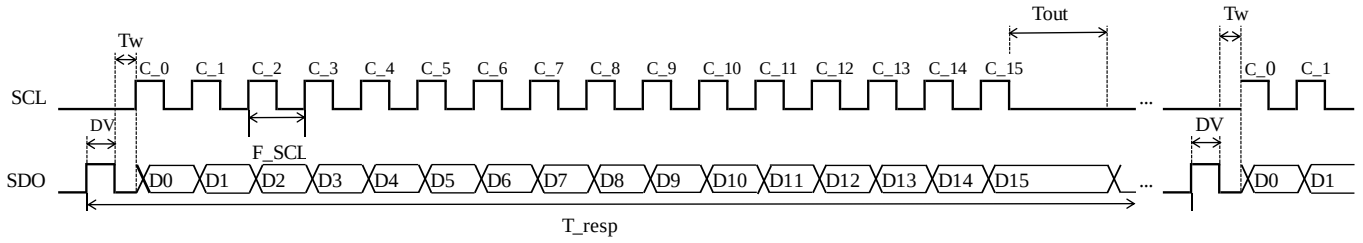
The timing for 8 input keys and active-high

When TP1=1, TP2=1：Set 8-keys active-low



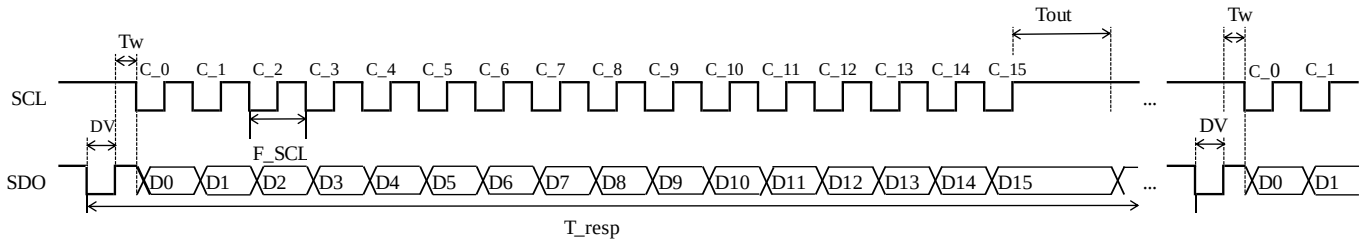
The timing for 8 input keys and active-low

When TP1=0, TP2=0：Set 16-keys active-high



The timing for 16 input keys and active-high

When TP1=1, TP2=0：Set 16-keys active-low



The timing for 16 input keys and active-low

According to the figures above, it can be found that the TP0 ~ TP7 default is high, TP1 = 1 TP2 = 1, the module is activated via a high level.

Experiment Purpose

This experiment aims at touching the keys on keyboard in 8 and 16 keys mode, then a serial port prints out the corresponding value respectively.

Component List

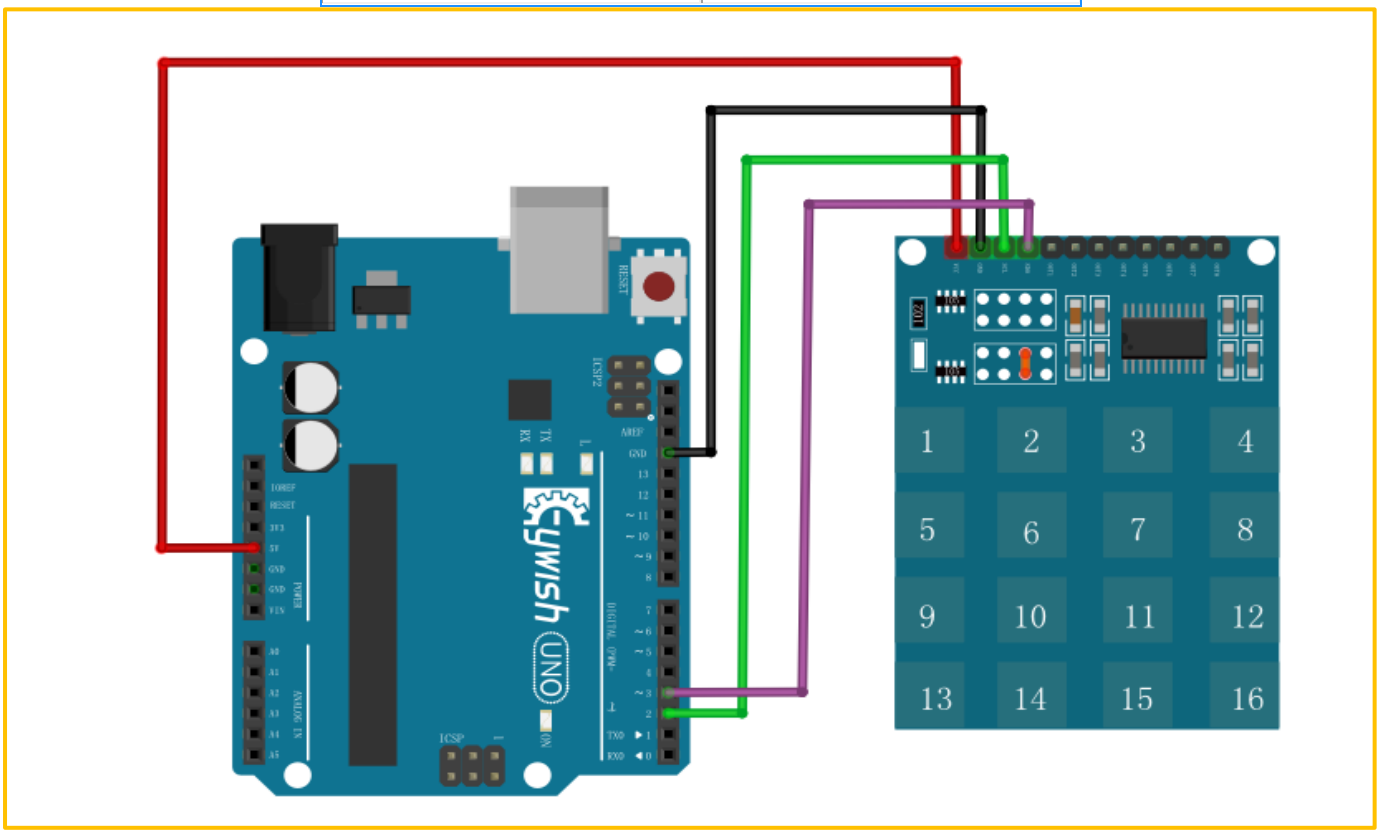
- Keywish Arduino UNO R3 mainboard

- TTP229 Touch Pad*1
- Some Wires

Schematic Diagram

Wiring of Circuit

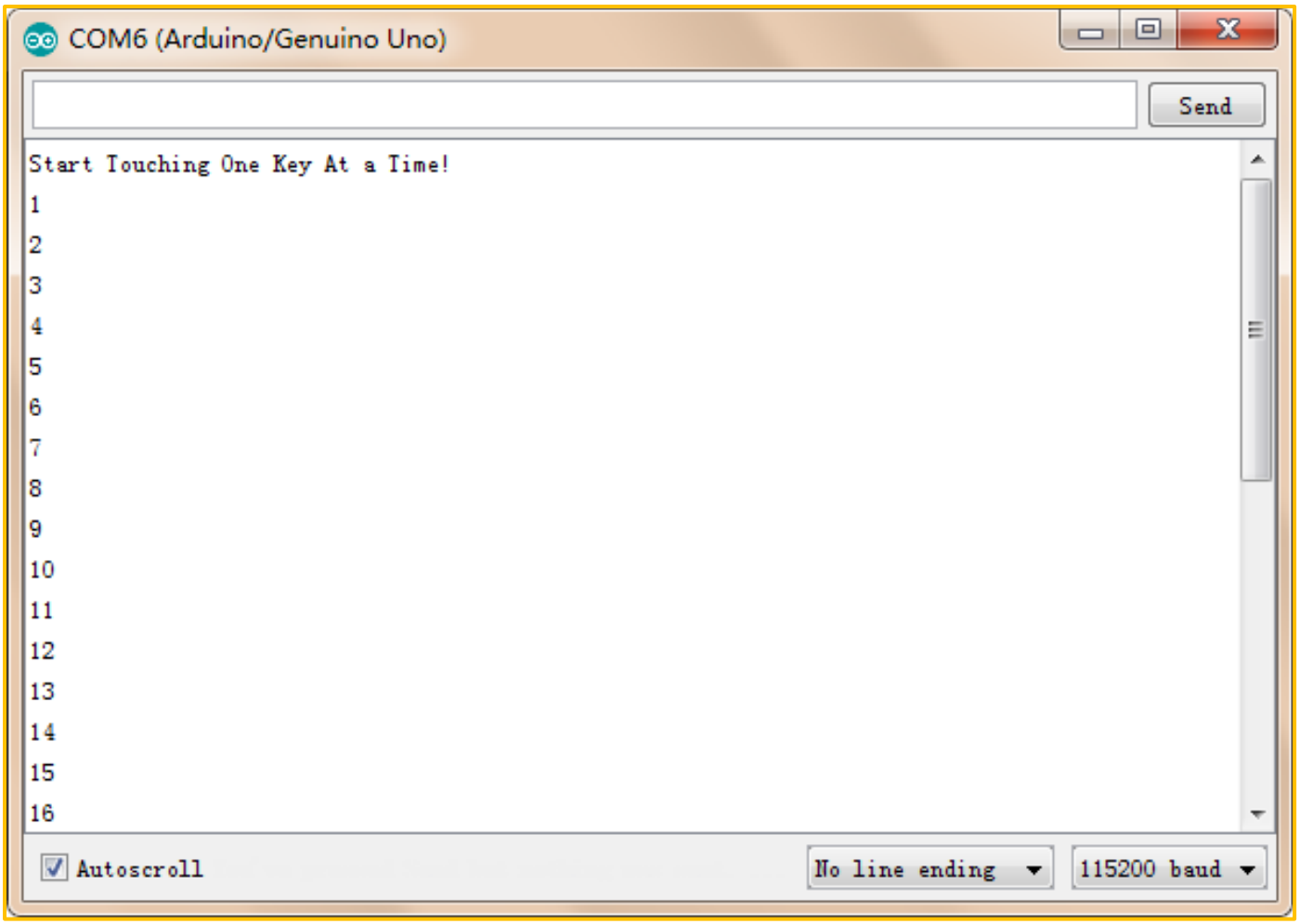
arduino Uno	TTP229
5V	VCC
GND	GND
2	SCL
3	SDO

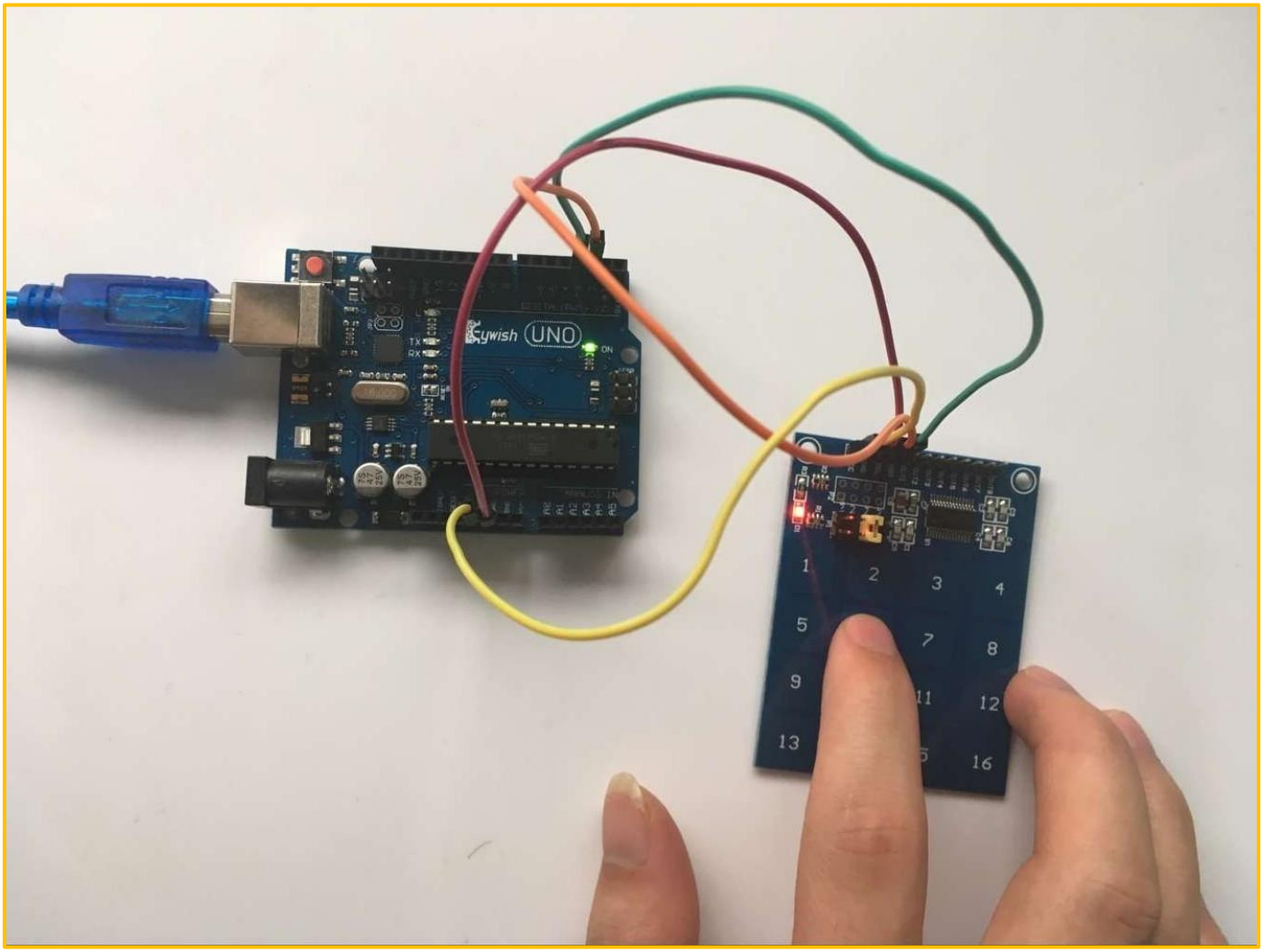


Code

```
#include <TTP229.h>

const int SCL_PIN = 2;  // The pin number of the clock pin.
const int SDO_PIN = 3;  // The pin number of the data pin.

TTP229 ttp229(SCL_PIN, SDO_PIN); // TTP229(sclPin, sdoPin)

void setup()
{
   Serial.begin(115200);
   Serial.println("Start Touching One Key At a Time!");
}

void loop()
{
   uint8_t key = ttp229.ReadKey16(); // Blocking
   if (key) Serial.println(key);

//  uint8_t key = ttp229.GetKey16(); // Non Blocking
//  Serial.println(key);
}
```

Experiment Result




Eywish UNO
TX
RX
ON
1
2
3
4
5
7
8
9
11
12
13
16