1. Introduction to Testing Platform

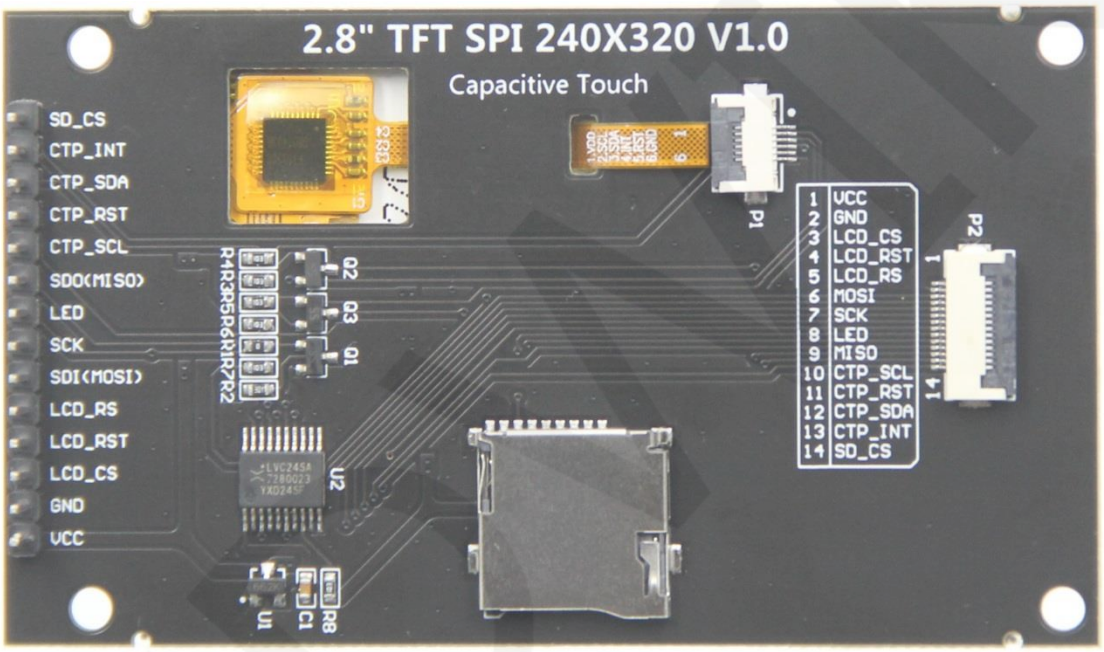
Development board: STC89/STC12 development board

MCU ： STC89C52RC、STC12C5A60S2

Frequency : 11.0592MHZ

2. Pin connection instructions

The display module is connected to the microcontroller using a DuPont cable, with specific instructions as follows:



Module Back Pins

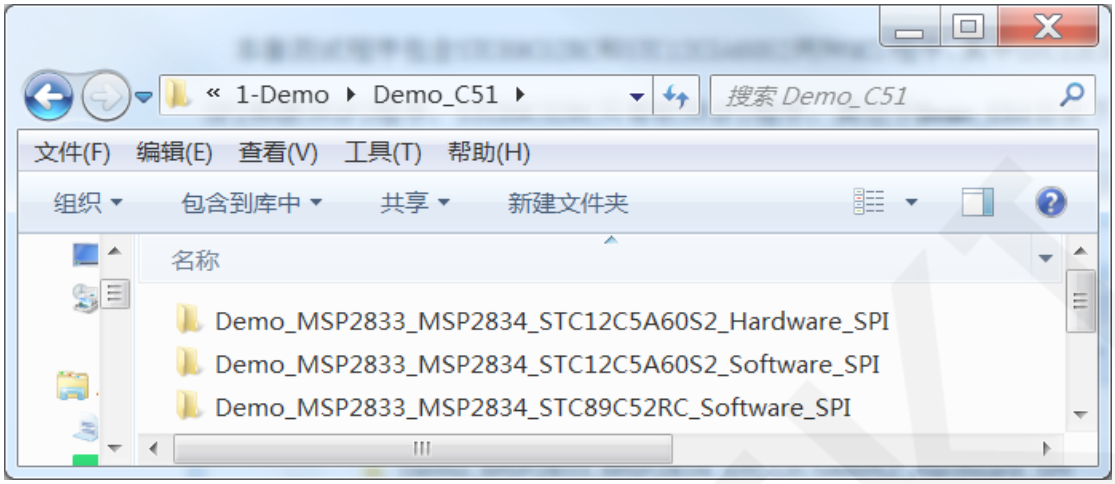
STC89C52RC and STC12C5A60S2 microcontroller test program wiring instructions			
Number	**Module Pin**	**Corresponding to STC89/STC12 development board wiring pin**	**Remarks**
1	**VCC**	5V	LCD power positive
2	**GND**	GND	LCD Power ground
3	**LCD_CS**	P13	LCD selection control signal, Low level active
4	**LCD_RST**	P33	LCD reset control signal, Low level reset

5	**LCD_RS**	P12	LCD command / data selection control signal High level: data, low level: command
6	**SDI(MOSI)**	P15	SPI bus write data signal(SD card and LCD screen used together)
7	**SCK**	P17	SPI bus clock signal(SD card and LCD screen used together)
8	**LED**	P32	LCD backlight control signal (If you need control, please connect the pins. If you don't need control, you can skip it)
9	**SDO(MISO)**	P16	SPI bus read data signal (SD card and LCD screen used together)
10	**CTP_SCL**	P36	Capacitive touch screen IIC bus clock signal (modules without touch screens do not need to be connected)
11	**CTP_RST**	P37	Capacitor touch screen reset control signal, low-level reset (modules without touch screens do not need to be connected)
12	**CTP_SDA**	P34	Capacitive touch screen IIC bus data signal (modules without touch screens do not need to be connected)
13	**CTP_INT**	P35	Capacitor touch screen IIC bus touch interrupt signal, when generating touch, input low level to the main control (modules without touch screens do not need to be connected)
14	**SD_CS**	NC	SD card selection control signal, low level active (without SD card function, can be disconnected)

3. Demo Function Description

This testing program includes two types of MCU programs: STC89C52RC and STC12C5A60S2. STC12C5A60S2 includes software SPI and hardware SPI programs, while STC89C52RC only has software SPI programs, which are located in

Demo_ Under the C51 directory, as shown in the following figure:



The ROM of the STC89C52RC microcontroller is only 25KB and cannot store overly complex and large programs, so only simple screen swiping tests are performed;

STC12C5A60S2 microcontroller test program contains the following test items:

A. The main interface displays the test;

B. Display screen ID and GRAM color value reading test (only software SPI is supported, and there are exceptions when hardware SPI reads ID);

C. simple brush test;

D. rectangular drawing and filling test;

E. circular drawing and filling test;

F. triangle drawing and filling test;

G. English display test;

H. Chinese display test;

I. picture display test;

J. Dynamic digital display test

K. rotating display test;

L. Capacitive touch screen testing (including touch button testing and handwriting line testing)

Display direction switching instructions:

Find the macro definition **USE_HORIZONTAL** in **lcd.h** as shown below:

```
//////////////////////////////////////用户配置区///////////////////////////////////
#define USE_HORIZONTAL      0//定义液晶屏顺时针旋转方向  0-0度旋转，1-90度旋转，2-180度旋转，3-270度旋转
```

```
USE_HORIZONTAL  0   //0° Rotate
USE_HORIZONTAL  1   //90° Rotate
USE_HORIZONTAL  2   //180° Rotate
USE_HORIZONTAL  3   //270° Rotate
```

4. Demo Usage Instructions

✧ Installing development tool software

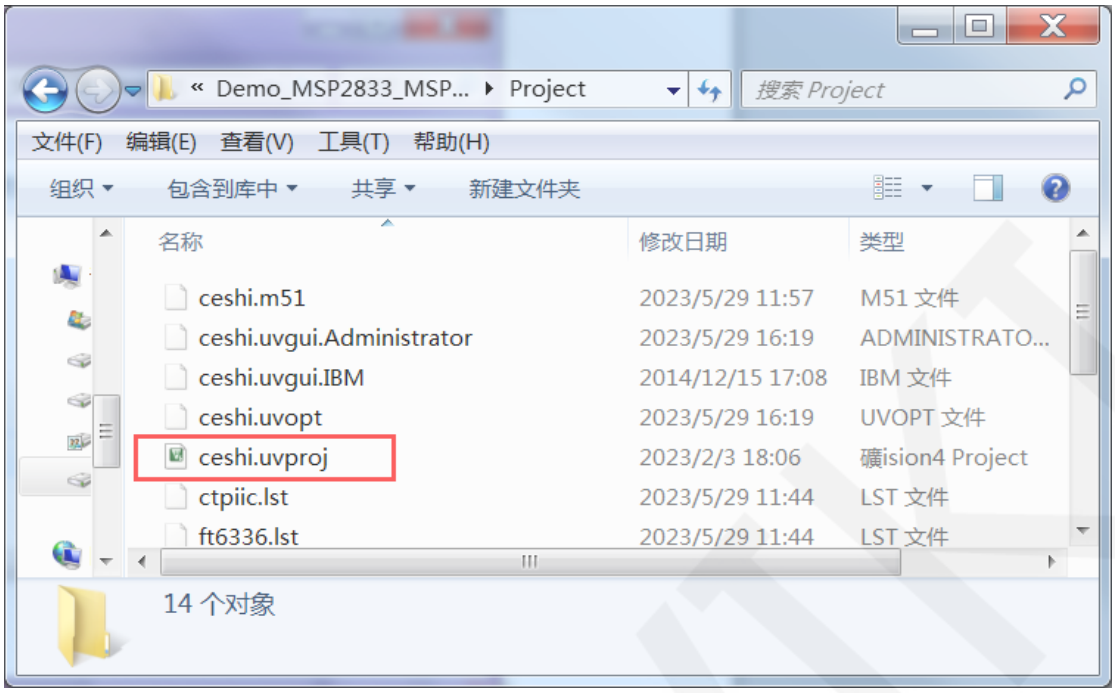
Firstly, you need to install the development tool software. Keil5 and stc-isp software are used here, where Keil5 is used for code editing and compilation, and stc-isp is used for download. Please refer to the online download and installation methods for both software.

✧ Installing chip packages

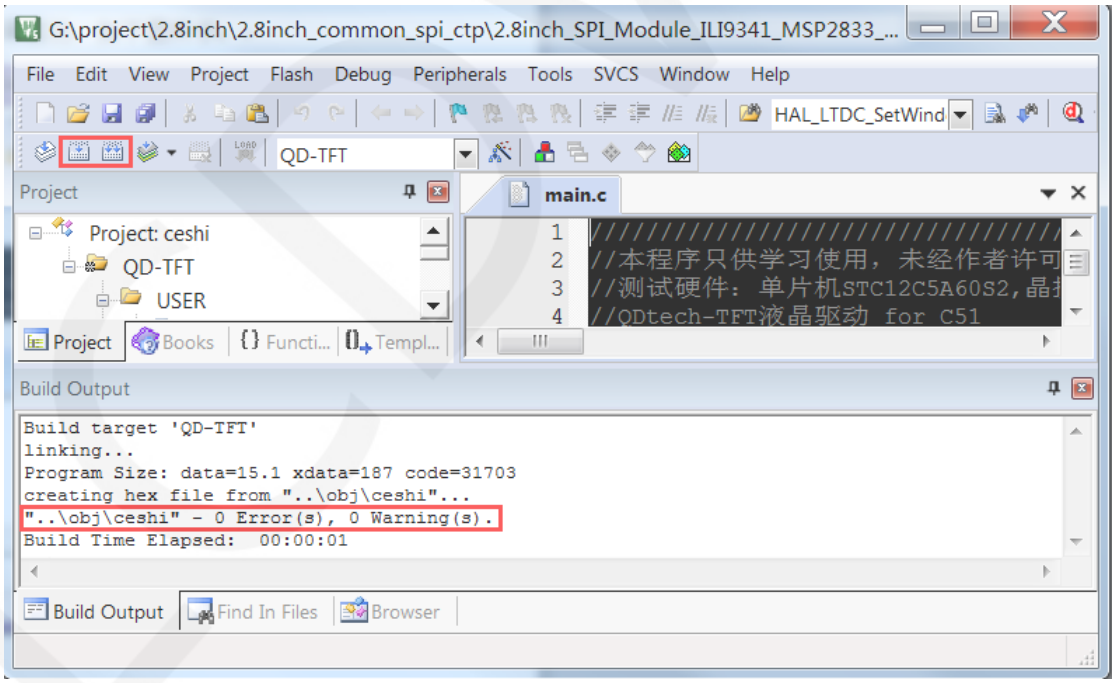
After installing keil5, it is necessary to install the C51 chip package, otherwise the C51 chip cannot be found and the C51 project cannot be created.Please consult online for specific installation methods.

✧ Compiling Programs

After the development tool and chip package are successfully installed, open the **PROJECT** directory under the sample program, locate the **uvprojx** file, double-click to open the sample project, as shown in the following figure:



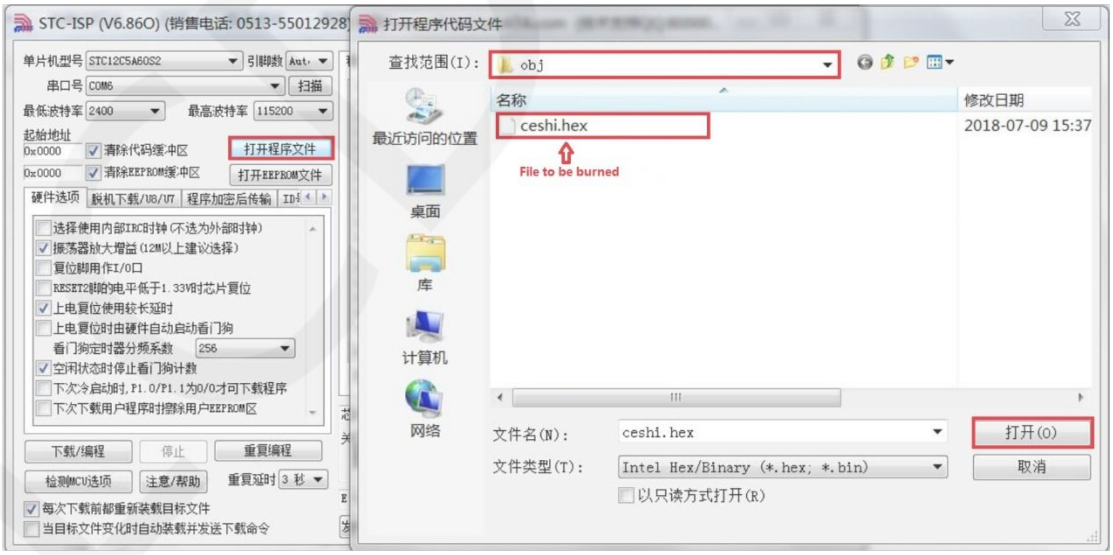
After opening the sample project, you can make modifications to the project code (or not). After the modifications are completed, click the compile button to compile the code. The following prompt appears, indicating successful compilation, as shown in the following figure:



✧ Download and Run Programs

A. Open the **STC-ISP** software for program download, first select the correct microcontroller model and baud rate, and set them as shown in the following figure:

B. Click to **open the program file** ->**select the directory where the compiled hex file is located** ->**select the hex file** ->click the **open** button, as shown in the following figure:



C. Click the **download** button to power on the microcontroller again, and the program will be burned. When the "**Operation successful**" prompt appears, it indicates

successful burning. The operation is shown in the following figure:

D. If the display module displays characters and graphics normally, it indicates that the program has run successfully.