# 1. Introduction to Testing Platform

Development board: STC89/STC12 development board

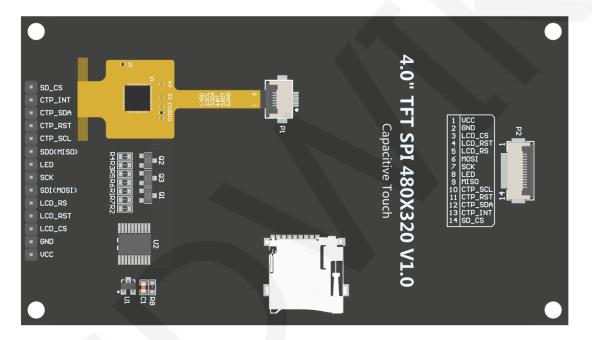
MCU : STC89C52RC, STC12C5A60S2

Frequency: 11.0592MHZ

# 2. Pin connection instructions

The display module is connected to the microcontroller using a DuPont cable,

with specific instructions as follows:



# Picture1. Module Back Pins

STC	39C52RC a	and STC12C5A60S2 micr wiring instruction	
Number	Module Pin	Corresponding to STC89/STC12 development	Remarks
		board wiring pin	
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

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5	LCD_RS	P12	LCD command / data selection control signal High level: data, low level:
6	SDI(MOSI)	P15	command 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	Р35	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:

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$\bigcirc$	ァ 📙 « 1-Demo ▸ Demo_C51  🔹 😽 搜索 Demo	o_C51	_	Q
文件(F) 约	扁辑(E) 查看(V) 工具(T) 帮助(H)			
组织 ▼	包含到库中▼ 共享▼ 新建文件夹			0
*	名称			-
	Demo_MSP4030_MSP4031_STC12C5A60S2_Hardware_SP	I		=
	Demo_MSP4030_MSP4031_STC12C5A60S2_Software_SPI			
2	Demo_MSP4030_MSP4031_STC89C52RC_Software_SPI			-
	< III			•

# ♦ Description of sample program content

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 **Icd.h** as shown below:

#### #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

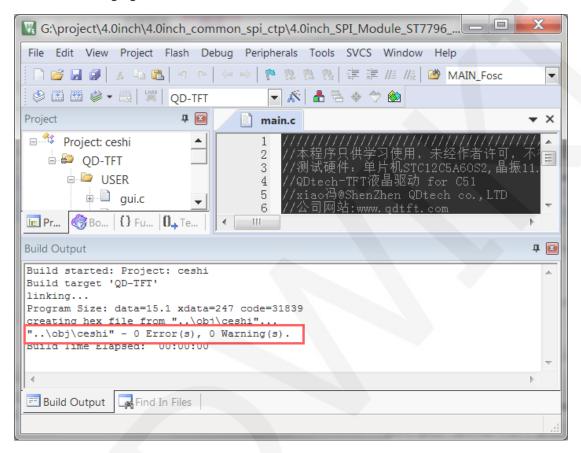
After installing keil5, it is necessary to install the C51 chip package, otherwise the C51 chip cannot be found and the C51 project cannot be created.Please consult online for specific installation methods.

## 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:

	▶ « Demo_MSP4030_MSP4031_STC ►	Project - 4		<u>ح</u>
文件(F) 编	编辑(E) 查看(V) 工具(T) 帮助(H)	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Dest Hoject	
组织▼	包含到库中▼ 共享▼ 新建文件夹		•==- <b>•</b>	
	名称 ceshi.uvgui.Administrator ceshi.uvgui.IBM ceshi.uvopt Ceshi.uvproj ctpiic.lst ft6336.lst	修改日期 2023/11/30 15:4/ 2014/12/15 17:08 2023/11/30 15:47 2023/11/30 10:13 2023/11/30 15:14 2023/11/30 15:34	类型 ADMINISTRATU IBM 文件 UVOPT 文件 礦ision4 Project LST 文件 LST 文件	大小 1/4 77 9 16 13 15 <del>、</del>
	▲ 15 个对象			4

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:

单片机型号 STC12C5A60S2 ▼ 引脚数 Aut, ▼	程序文件	EEPROM文		串口則				设置	1		格/样品		例程序	1	4
串口号 COM6 ▼ 扫描	00000h 00010h	02 64	3F					00 0		00		00 0 A 0A	00	.d?	*
最低波特率 2400 ▼ 最高波特率 115200 ▼	00020h	00 00	00			00			4 14		14 07		OA		III
2始地址	00030h	0A 00	00		4 1E				C 14	-	OF O				
x0000 🔽 清除代码缓冲区 打开程序文件	00040h	00 12	15	OD 0	A 14	2C	2A	12 0	0 00	00	00 04	4 0A	AO	,	
	00050h	1E 15	15	09 3	6 00	00	00	02 0	2 01	00	00 00	0 00	00	6	
x0000 了清除EEPROM缓冲区 打开EEPROM文件	00060h	00 00	00	00 2	0 10	08	80	08 0	8 08	80	10 20	00 0	00		
硬件选项 脱机下载/U8/U7 程序加密后传输 ID4 < >	00070h	02 04	80	08 0					2 00		00 00		15		
	00080h	OE OE	15	04 0					4 04		1F 04		04		
选择使用内部IRC时钟(不选为外部时钟)	00090h 000A0h	00 00	00	00 0		~~			0 00		02 02		00		
✓ 振荡器放大增益(12M以上建议选择)	000B0h	00 00	00	00 0					8 08		00 00		00		
	000C0h	02 01	00		0 0E				1 11		0E 00				
RESET2脚的电平低于1.33V时芯片复位	000D0h	00 04	06	04 0	4 04	04			0 00		00 01				
	000E0h	08 04	02	01 1	F 00	00	00	00 0	E 11	. 10	OC 10	0 10	11		
✓上电复位使用较长延时	000F0h	0E 00	00	00 0	0 08	OC	AO	OA O	9 1E	: 08	18 00	00 0	00		
上电复位时由硬件自动启动看门狗	00100h	00 1F	01	01 0	F 10	10	11	OE O	0 00	00	00 01	E 09	01		-
看门狗定时器分频系数 256 🔹	4					111									
✓ 空闲状态时停止看门狗计数	(Date La sta		12.0			_		riete à		-					
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下次下载用户程序时擦除用户BEPROM区 -	芯片型号:	STC12C5A	60S2												
	关于此芯片	的重要沿向	Β.												=
下载/编程 停止 重复编程	大工町公石	印里安说印 在v7.1及り	Į Hé	的芯片	ÉNEEP	ROM	: 20	48字:	节 (00	008-0	O7FFH)				1
	固件版本	在v7.1及以低于v7.1日	远》	TOTEE	PROM		: 10	124字	节 (00	00H-0	D3FFH)				-
检测MCU选项 注意/帮助 重复延时 3 秒 ▼															

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:

🔜 STC-ISP (V6.86O) (销售电话: 0513-55012928) 🔜 打	开程序代码文	件	AND ADDRESS OF THE OWNER		X
単片机型号 (STC12C5A60S2 ◆ 引脚数 Aut. ▼ 車口号 COM6 ◆ 扫描 最低波特率 (2400 ▼ 最高波特率 (115200 ▼		▶ obj 名称 Ceshi.hex Pile to be burne	• ed	] @ ♪ ₽	修改日期 2018-07-09 15:37
下次今启动街, P1.0/P1.1为0/0才可下载程序   下次下载用户程序时指除用户EZEX08区   下载/编程   停止   重夏编程   检测mords项   注意/帮助   重夏知时 9 秒   季   公本下载前都重新表载目标文件   当目标文件变化的自动装载并发送下载命令	<b>《</b> 网络	∢ 文件名(N): 文件类型(T):	Ⅲ ceshi.hex Intel Hex/Binary (*.hex; *. □ 以只读方式打开(R)	▼ bin) ▼	▶ 打开(0) 取消

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:

下次1	「载用户程序时擦除用户EE	-	固件版2   操作成功	达号: 7.1 !(2018-0	2.575	15:48	:59)	¢	ownl	oad s	ucce	ssful					-
	状态时停止看门狗计数 ≷启动时,₽1.0/₽1.1为0/0⊃	才可下载程序	代码长期	度 6AE4H	校	<b>脸和</b> :	33F16/	AH [	区域	填充		清空区	域	佰	存数据		
	向定时器分频系数 256	•	1					111								Þ	
	夏位时由硬件自动启动看门:	狗	001001	00 1	LF 01	01	OF 10	10	11 (	DE 00	00	00 00	0 0E	09	01		Ŧ
	夏位使用较长延时		OOOFOR		00 00		00 08							00			
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	10 d f l = 1 = 1		000000		01 00		00 OE		04 0	L1 11		11 01		00			
	如用作I/O口	1+)	000B01				02 00			10 08		08 0		02			
	影放大增益(12M以上建议洗	HI	000A01				1F 00			00 00		00 00		00			
一选择位	使用内部IRC时钟(不洗为外·	各田寸生中)	000901		00 00	00	00 00	00	00 0	00 00	00	00 03	2 02	01	00		
硬件选项	脱机下载/08/07 程序加	密后传输   ID-	000801		DE 15		00 00			00 04		04 1		04			
			000001				20 10			08 08		08 1		00			
x 0000	▼ 清除EEPROM缓冲区	打开EEPROM文件	000501	-			36 00			02 02				00		6	
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		▼ 引脚数 Aut, 、		EEPROM	XIT [	串口」	1 - 1 (8	Veir	が長い	хшI	地主	/价格/	1+00	12	例程序	波特率	10000

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