Test platform introduction:

This set of STM32 test programs use the development board of the ALIENTEK, as follows:

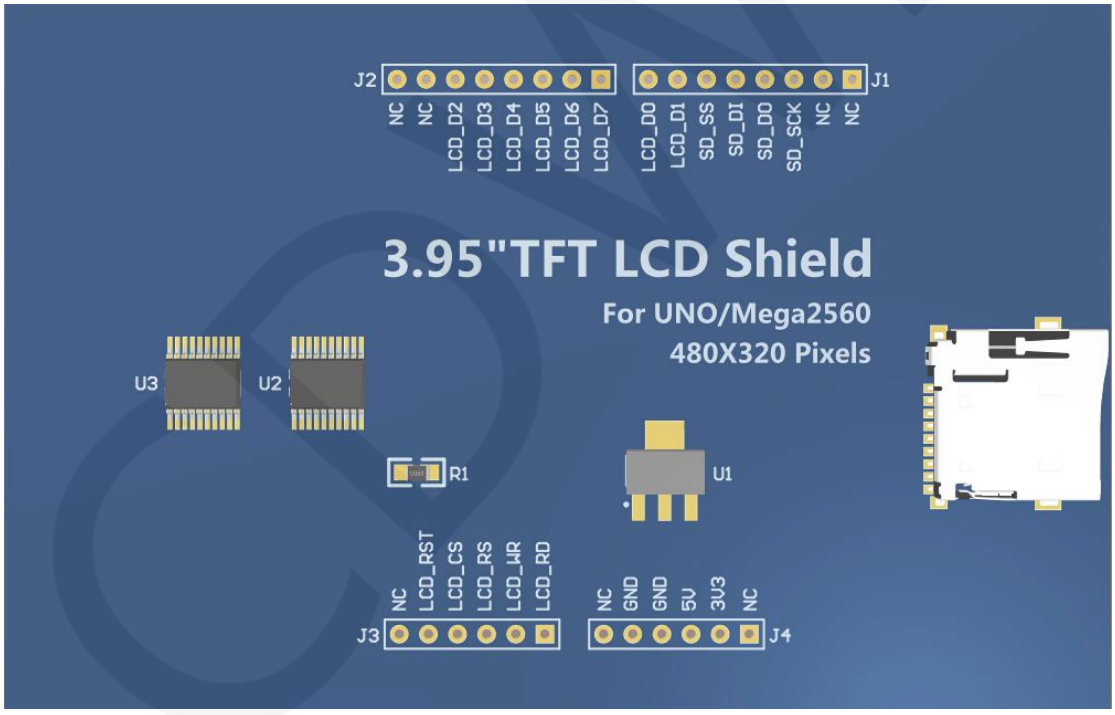
Development board: MiniSTM32, Elite STM32, Explorer STM32F4, Apollo STM32F4/F7

MCU: STM32F103RCT6, STM32F103ZET6, STM32F407ZGT6, STM32F429IGT6, STM32F767IGT6, STM32H743IIT6

Main frequency: 72MHz, 72MHz, 168MHz, 180MHz,216MHz,400MHz (Corresponding to the above MCU)

Crystal frequency: 8MHz, 8MHz, 8MHz, 25MHz, 25MHz, 25MHz (Corresponding to the above MCU)

Wiring instructions:



Picture1. Pin silk screen picture

Note:

1. **The pins labeled NC in figure 1 are not used and do not require wire connection；**

Important Note:

1. The following pin numbers 1~20 are the pin number of Module pin with PCB backplane of our company. If you purchase a bare screen, please refer to the pin definition of the bare screen specification, refer to the wiring according to the signal type instead of directly Wire according to the following module pin numbers. For example: LCD_CS is 13 pin on our module. It may be x pin on different size bare screen. The following wiring program instructions tell you to connect LCD_CS signal to the PC9 pin of STM32 microcontroller.
2. About VCC supply voltage: If you purchase a module with PCB backplane, VCC/VDD can be connected to 5V (module has integrated ultra low dropout 5V to 3.3V circuit), if you buy a bare screen LCD, remember only Can connect to 3.3V.
3. About the backlight voltage: the module with the PCB backplane has access to 3.3 V and no more manual access is required. If you are buying a bare screen, the LEDA is connected to 3.0V-3.3V and the LEDKx is grounded.

STM32F103RCT6 microcontroller test program wiring instructions			
Number	**Module Pin**	**Corresponding to MiniSTM32 development board wiring pin**	**Remarks**
1	**5V**	5V	Power positive 5V pin
2	**3V3**	3.3V	Power positive 3.3V pin
3	**GND**	GND	Power ground pin
4	**LCD_D0**	PB0	8-bit data bus pin
5	**LCD_D1**	PB1	
6	**LCD_D2**	PB2	
7	**LCD_D3**	PB3	
8	**LCD_D4**	PB4	

9	LCD_D5	PB5	
10	LCD_D6	PB6	
11	LCD_D7	PB7	
12	LCD_RST	PC10	LCD reset control pin
13	LCD_CS	PC9	LCD chip select control pin
14	LCD_RS	PC8	LCD register / data selection control
15	LCD_WR	PC7	LCD write control pin
16	LCD_RD	PC6	LCD read control pin
17	SD_SS	No need to connect	Extended function: SD card selection control pin
18	SD_DI	No need to connect	Extended function: SD card input pin
19	SD_DO	No need to connect	Extended function: SD card output pin
20	SD_SCK	No need to connect	Extended function: SD card clock control pin

STM32F103ZET6 microcontroller test program wiring instructions

Number	Module Pin	Corresponding to Elite STM32 development board wiring pin	Remarks
1	5V	5V	Power positive 5V pin
2	3V3	3.3V	Power positive 3.3V pin
3	GND	GND	Power ground pin
4	LCD_D0	PF0	8-bit data bus pin
5	LCD_D1	PF1	
6	LCD_D2	PF2	
7	LCD_D3	PF3	
8	LCD_D4	PF4	
9	LCD_D5	PF5	
10	LCD_D6	PF6	
11	LCD_D7	PF7	
12	LCD_RST	PC10	LCD reset control pin
13	LCD_CS	PC9	LCD chip select control pin
14	LCD_RS	PC8	LCD register / data selection control pin

15	LCD_WR	PC7	LCD write control pin
16	LCD_RD	PC6	LCD read control pin
17	SD_SS	No need to connect	Extended function: SD card selection control pin
18	SD_DI	No need to connect	Extended function: SD card input pin
19	SD_DO	No need to connect	Extended function: SD card output pin
20	SD_SCK	No need to connect	Extended function: SD card clock control pin

STM32F407ZGT6 microcontroller test program wiring instructions

Number	Module Pin	Corresponding to Explorer STM32F4 development board wiring pin	Remarks
1	5V	5V	Power positive 5V pin
2	3V3	3.3V	Power positive 3.3V pin
3	GND	GND	Power ground pin
4	LCD_D0	PG0	8-bit data bus pin
5	LCD_D1	PG1	
6	LCD_D2	PG2	
7	LCD_D3	PG3	
8	LCD_D4	PG4	
9	LCD_D5	PG5	
10	LCD_D6	PG6	
11	LCD_D7	PG7	
12	LCD_RST	PC10	LCD reset control pin
13	LCD_CS	PC9	LCD chip select control pin
14	LCD_RS	PC8	LCD register / data selection control pin
15	LCD_WR	PC7	LCD write control pin
16	LCD_RD	PC6	LCD read control pin
17	SD_SS	No need to connect	Extended function: SD card selection control pin
18	SD_DI	No need to connect	Extended function: SD card input pin

19	SD_DO	No need to connect	Extended function: SD card output pin
20	SD_SCK	No need to connect	Extended function: SD card clock control pin

STM32F429IGT6、STM32F767IGT6、STM32H743IIT6 microcontroller test program wiring instructions			
Number	**Module Pin**	**Corresponding to Apollo STM32F4/F7 development board wiring pin**	**Remarks**
1	5V	5V	Power positive 5V pin
2	3V3	3.3V	Power positive 3.3V pin
3	GND	GND	Power ground pin
4	LCD_D0	PE0	8-bit data bus pin
5	LCD_D1	PE1	
6	LCD_D2	PE2	
7	LCD_D3	PE3	
8	LCD_D4	PE4	
9	LCD_D5	PE5	
10	LCD_D6	PE6	
11	LCD_D7	PE7	
12	LCD_RST	PC10	LCD reset control pin
13	LCD_CS	PC9	LCD chip select control pin
14	LCD_RS	PC8	LCD register / data selection control pin
15	LCD_WR	PC7	LCD write control pin
16	LCD_RD	PC6	LCD read control pin
17	SD_SS	No need to connect	Extended function: SD card selection control pin
18	SD_DI	No need to connect	Extended function: SD card input pin
19	SD_DO	No need to connect	Extended function: SD card output pin
20	SD_SCK	No need to connect	Extended function: SD card clock control pin

Demo function description:

1.This test program is applicable to STM32F103RCT6, STM32F103ZET6, STM32F407ZGT6, STM32F429IGT6, STM32F767IGT6, STM32H743IIT6 six STM32 MCU platforms;

2. Please follow the wiring instructions above to find the corresponding development board for wiring;

3. This set of test program supports 8-bit and 16-bit data bus mode switching, but the product module can only use 8-bit data bus mode. For the specific switching method, see the following mode switching instructions;

4. This set of test program supports display switching in four directions. For details, see the following instructions for switching directions;

5. This set of test procedures contains the following test items:

   A. the main interface displays the test;

   B. read ID and color value test;

   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. rotating display test;

Mode switching instructions:

Find the macro definition LCD_USE8BIT_MODEL in lcd.h, as shown below:

```
#define LCD_USE8BIT_MODEL   1    //定义数据总线是否使用8位模式 0,使用16位模式.1,使用8位模式
//////////////////////////////////////////////////////////////////////////////////
```

LCD_USE8BIT_MODEL 0 // Use 16-bit data bus mode

LCD_USE8BIT_MODEL 1 // Use 8-bit data bus mode

Note:

1. **This module can only use 8-bit data bus mode;**
2. **Not every LCD screen supports 8-bit/16-bit mode. Please check with us to see if you have purchased it;**
3. **If the software has done 8/16 bit switching, the hardware needs to be changed to the corresponding mode to be able to drive normally. The module hardware does not support 8/16-bit switching. For details, please refer to the module schematic. Please consult us how to modify the bare screen;**

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