STM32 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

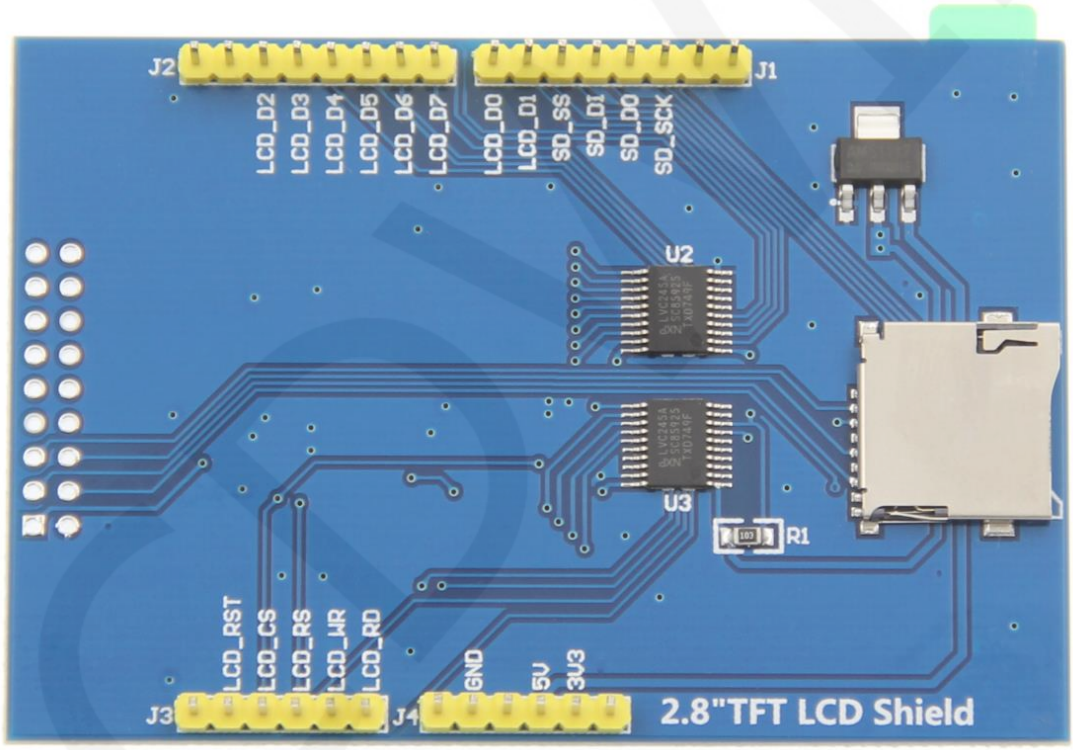
MCU: STM32F103RCT6, STM32F103ZET6, STM32F407ZGT6, STM32F429IGT6

(Corresponding to the above development boards)

Main frequency: 72M, 72M, 168M, 180M(Corresponding to the above MCU)

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

Wiring instructions:



Pin silk screen picture

Note: Pins that are not marked with silkscreen are not used.

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**	PB8	8-bit data bus pin
5	**LCD_D1**	PB9	
6	**LCD_D2**	PB10	
7	**LCD_D3**	PB11	
8	**LCD_D4**	PB12	
9	**LCD_D5**	PB13	
10	**LCD_D6**	PB14	
11	**LCD_D7**	PB15	
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	PF8	8-bit data bus pin
5	LCD_D1	PF9	
6	LCD_D2	PF10	
7	LCD_D3	PF11	
8	LCD_D4	PF12	
9	LCD_D5	PF13	
10	LCD_D6	PF14	
11	LCD_D7	PF15	
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

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	PG8	8-bit data bus pin
5	LCD_D1	PG9	
6	LCD_D2	PG10	

7	LCD_D3	PG11	
8	LCD_D4	PG12	
9	LCD_D5	PG13	
10	LCD_D6	PG14	
11	LCD_D7	PG15	
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

STM32F429IGT6 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	PE8	8-bit data bus pin
5	LCD_D1	PE9	
6	LCD_D2	PE10	
7	LCD_D3	PE11	
8	LCD_D4	PE12	
9	LCD_D5	PE13	
10	LCD_D6	PE14	
11	LCD_D7	PE15	
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

Demo function description:

1. This test program contains four test procedures for STM32 MCU, namely: STM32F103RCT6, STM32F103ZET6, STM32F407ZGT6, STM32F429IGT6;
2. This module uses 8-bit parallel port to transfer data, so the test program needs to be set to 8-bit mode. For details, see the mode switching instructions;
3. Please follow the wiring instructions above to find the corresponding development board and MCU for wiring;
4. This set of tests supports display switching in four directions. For details, see the display direction switching instructions
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 mode

LCD_USE8BIT_MODEL 1 // Use 8-bit mode

Note: Different hardware corresponds to different modes. If the mode is switched on the software, the hardware should be modified accordingly. Otherwise, the module will not work properly if the hardware and software modes do not match.

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