Test platform introduction:

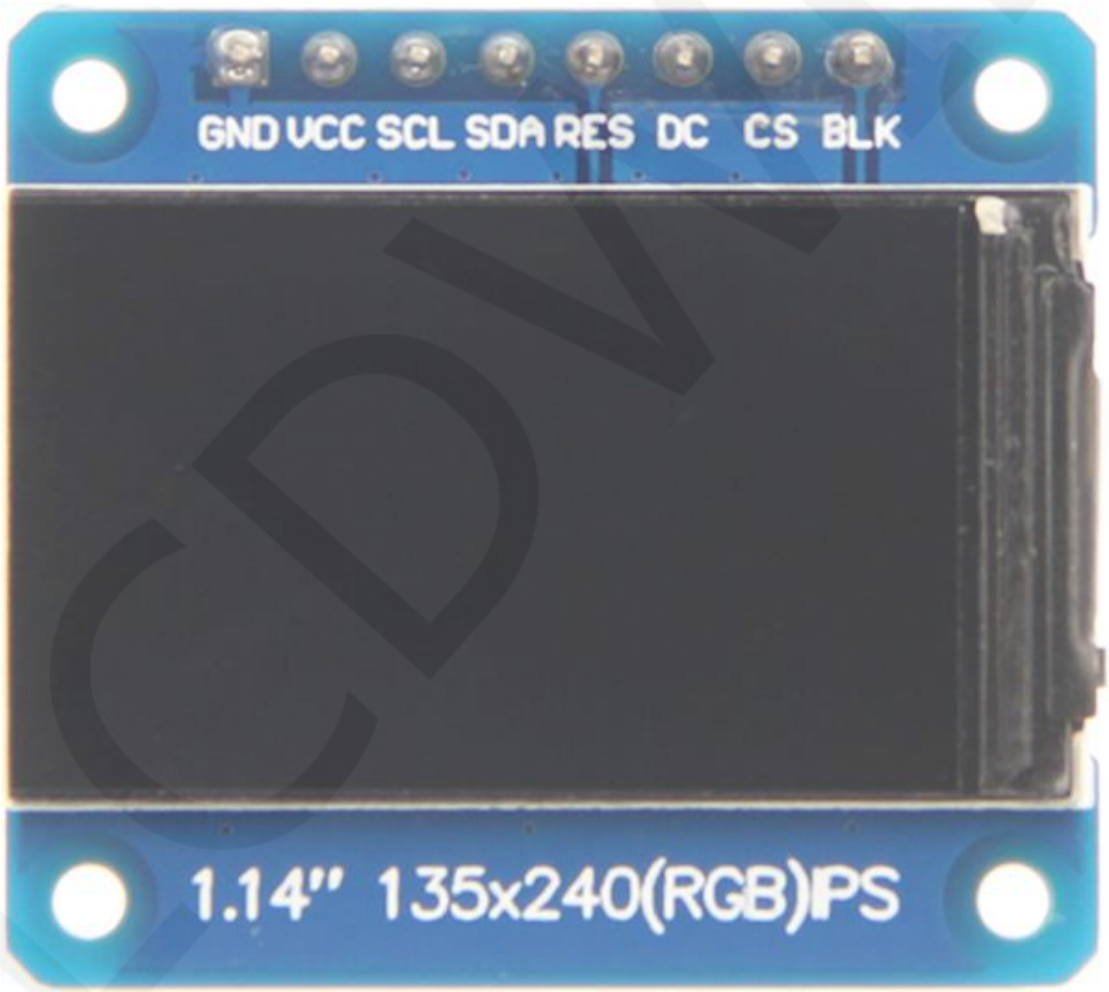
Development board: MiniSTM32, Elite STM32, Explorer STM32F4, Apollo STM32F4/F7

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 silkscreen picture

important:

1. The following pin numbers 1~8 refer to the module pin numbers of our company with PCB backplane. If you are buying 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 according to the following. The module pin number is used for wiring. For example: DC is 6 feet on our module. It may be x pin on different size bare screen. The following wiring instructions tell you that the DC signal is connected to the PB10 pin of the MCU. of.
2. About VCC supply voltage: The IPS display module can only be connected to 3.3V.
3. About backlight voltage: The module with PCB backplane has integrated triode backlight control circuit, only need to input high level or PWM wave on BL pin to backlight. If you are buying a bare screen, the LEDAx is connected to 3.0V-3.3V, and the LEDKx can be grounded.

STM32F103RCT6 microcontroller test program wiring instructions			
Number	Module Pin	Corresponding to MiniSTM32 development board wiring pin	Remarks
1	GND	GND	LCD Power ground
2	VCC	3.3V	LCD power supply is positive (3.3V)
3	SCL	PB13	LCD SPI bus clock signal
4	SDA	PB15	LCD SPI bus write data signal
5	RES	PB12	LCD reset control signal(Low level reset)
6	DC	PB10	LCD register / data selection control signal(Low level: register, high level: data)

7	CS	PB11	LCD chip select control signal (low level enable)
8	BLK	PB9	LCD backlight control signal (high level lighting, if you do not need control, please connect 3.3V)

STM32F103ZET6 microcontroller test program wiring instructions			
Number	**Module Pin**	**Corresponding to Elite STM32 development board wiring pin**	**Remarks**
1	GND	GND	LCD Power ground
2	VCC	3.3V	LCD power supply is positive (3.3V)
3	SCL	PB13	LCD SPI bus clock signal
4	SDA	PB15	LCD SPI bus write data signal
5	RES	PB12	LCD reset control signal(Low level reset)
6	DC	PB10	LCD register / data selection control signal(Low level: register, high level: data)
7	CS	PB11	LCD chip select control signal (low level enable)
8	BLK	PB9	LCD backlight control signal (high level lighting, if you do not need control, please connect 3.3V)

STM32F407ZGT6 microcontroller test program wiring instructions			
Number	**Module Pin**	**Corresponding to Explorer STM32F4 development board wiring pin**	**Remarks**
1	GND	GND	LCD Power ground
2	VCC	3.3V	LCD power supply is positive (3.3V)

3	SCL	PB3	LCD SPI bus clock signal
4	SDA	PB5	LCD SPI bus write data signal
5	RES	PB12	LCD reset control signal(Low level reset)
6	DC	PB14	LCD register / data selection control signal(Low level: register, high level: data)
7	CS	PB15	LCD chip select control signal (low level enable)
8	BLK	PB13	LCD backlight control signal (high level lighting, if you do not need control, please connect 3.3V)

STM32F429IGT6 microcontroller test program wiring instructions			
Number	**Module Pin**	**Corresponding to Apollo STM32F4/F7 development board wiring pin**	**Remarks**
1	GND	GND	LCD Power ground
2	VCC	3.3V	LCD power supply is positive (3.3V)
3	SCL	PF7	LCD SPI bus clock signal
4	SDA	PF9	LCD SPI bus write data signal
5	RES	PD12	LCD reset control signal(Low level reset)
6	DC	PD5	LCD register / data selection control signal(Low level: register, high level: data)
7	CS	PD11	LCD chip select control signal (low level enable)
8	BLK	PD6	LCD backlight control signal (high level lighting, if you do not need control, please connect 3.3V)

STM32F767IGT6 and STM32H743IIT6 microcontroller test program wiring instructions			
Number	Module Pin	Corresponding to Apollo STM32F4/F7 development board wiring pin	Remarks
1	GND	GND	LCD Power ground
2	VCC	3.3V	LCD power supply is positive (3.3V)
3	SCL	PB13	LCD SPI bus clock signal
4	SDA	PB15	LCD SPI bus write data signal
5	RES	PD12	LCD reset control signal(Low level reset)
6	DC	PD5	LCD register / data selection control signal(Low level: register, high level: data)
7	CS	PD11	LCD chip select control signal (low level enable)
8	BLK	PD6	LCD backlight control signal (high level lighting, if you do not need control, please connect 3.3V)

Demo function description:

1. This test program contains six test procedures for STM32 MCU, namely: STM32F103RCT6, STM32F103ZET6, STM32F407ZGT6, STM32F429IGT6, STM32F767IGT6, STM32H743IIT6;
2. This module uses 4-line-SPI communication interface;
3. This test program includes two functional tests: software SPI and hardware SPI;
4. Please follow the above wiring instructions to find the corresponding development board and MCU for wiring;
5. This set of tests supports display switching in four directions. For details, see the display direction switching instructions.
6. This set of test procedures contains the following test items:

   A. the main interface display test

B. 3D menu display 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;

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