

## 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,

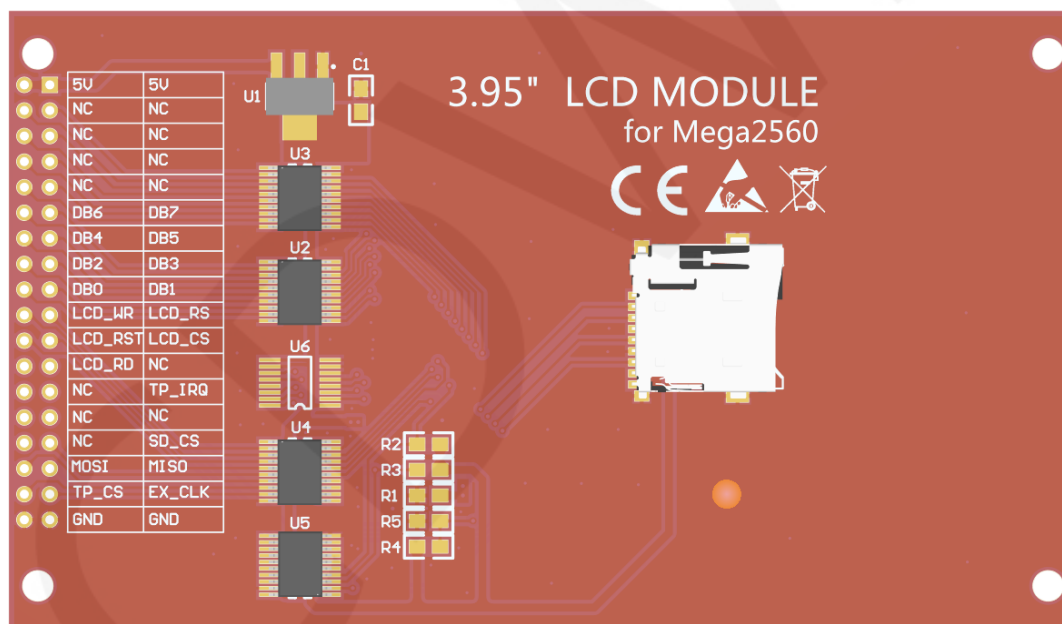
STM32F429IGT6, STM32F767IGT6, STM32H743IIT6

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 silkscreen 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 1~30 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 20 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 pin
2	DB0	PB0	Data bus 8-bit pin
3	DB1	PB1	
4	DB2	PB2	
5	DB3	PB3	
6	DB4	PB4	
7	DB5	PB5	
8	DB6	PB6	
9	DB7	PB7	

10	NC	no need to connect	Undefined, reserved
11	NC		
12	NC		
13	NC		
14	NC		
15	NC		
16	NC		
17	NC		
18	LCD_RS	PC8	LCD register / data selection pin
19	LCD_WR	PC7	LCD write control pin
20	LCD_CS	PC9	LCD chip select control pin
21	LCD_RST	PC10	LCD reset control pin
22	LCD_RD	PC6	LCD read control pin
23	NC	no need to connect	Undefined, reserved
24	TP_IRQ	PC1	Touch screen interrupt control pin
25	SD_CS	no need to connect	Extended reference: SD card select pin
26	MISO	PC2	SPI bus input pin (extended application)
27	MOSI	PC3	SPI bus output pin (extended application)
28	TP_CS	PC13	Touch screen chip select pin
29	EX_CLK	PC0	SPI bus clock pin (extended application)
30	GND	GND	Power ground pin

### STM32F103ZET6 microcontroller test program wiring instructions

Number	Module Pin	Corresponding to Elite STM32 development board wiring pin	Remarks
1	5V	5V	Power pin
2	DB0	PF0	Data bus low 8-bit pin
3	DB1	PF1	
4	DB2	PF2	
5	DB3	PF3	
6	DB4	PF4	

7	DB5	PF5	
8	DB6	PF6	
9	DB7	PF7	
10	NC	no need to connect	Undefined, reserved
11	NC		
12	NC		
13	NC		
14	NC		
15	NC		
16	NC		
17	NC		
18	LCD_RS	PC8	LCD register / data selection pin
19	LCD_WR	PC7	LCD write control pin
20	LCD_CS	PC9	LCD chip select control pin
21	LCD_RST	PC10	LCD reset control pin
22	LCD_RD	PC6	LCD read control pin
23	NC	no need to connect	Undefined, reserved
24	TP_IRQ	PC1	Touch screen interrupt control pin
25	SD_CS	no need to connect	Extended reference: SD card select pin
26	MISO	PC2	SPI bus input pin (extended application)
27	MOSI	PC3	SPI bus output pin (extended application)
28	TP_CS	PC13	Touch screen chip select pin
29	EX_CLK	PC0	SPI bus clock pin (extended application)
30	GND	GND	Power ground pin

### STM32F407ZGT6 microcontroller test program wiring instructions

Number	Module Pin	Corresponding to Explorer STM32F4 development board wiring pin	Remarks
1	5V	5V	Power pin

2	DB0	PG0	Data bus low 8-bit pin
3	DB1	PG1	
4	DB2	PG2	
5	DB3	PG3	
6	DB4	PG4	
7	DB5	PG5	
8	DB6	PG6	
9	DB7	PG7	
10	NC	no need to connect	Undefined, reserved
11	NC		
12	NC		
13	NC		
14	NC		
15	NC		
16	NC		
17	NC		
18	LCD_RS	PC8	LCD register / data selection pin
19	LCD_WR	PC7	LCD write control pin
20	LCD_CS	PC9	LCD chip select control pin
21	LCD_RST	PC10	LCD reset control pin
22	LCD_RD	PC6	LCD read control pin
23	NC	no need to connect	Undefined, reserved
24	TP_IRQ	PC1	Touch screen interrupt control pin
25	SD_CS	no need to connect	Extended reference: SD card select pin
26	MISO	PC2	SPI bus input pin (extended application)
27	MOSI	PC3	SPI bus output pin (extended application)
28	TP_CS	PC13	Touch screen chip select pin
29	EX_CLK	PC0	SPI bus clock pin (extended application)
30	GND	GND	Power ground 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 pin
2	DB0	PE8	PE0	Data bus low 8-bit pin
3	DB1	PE9	PE1	
4	DB2	PE10	PE2	
5	DB3	PE11	PE3	
6	DB4	PE12	PE4	
7	DB5	PE13	PE5	
8	DB6	PE14	PE6	
9	DB7	PE15	PE7	
10	NC	no need to connect		Undefined, reserved
11	NC			
12	NC			
13	NC			
14	NC			
15	NC			
16	NC			
17	NC			
18	LCD_RS	PC8		LCD register / data selection pin
19	LCD_WR	PC7		LCD write control pin
20	LCD_CS	PC9		LCD chip select control pin
21	LCD_RST	PC10		LCD reset control pin
22	LCD_RD	PC6		LCD read control pin
23	NC	no need to connect		Undefined, reserved
24	TP_IRQ	PH10		Touch screen interrupt control pin
25	SD_CS	no need to connect		Extended reference: SD card select pin
26	MISO	PH11		SPI bus input pin (extended application)

27	MOSI	PH12	SPI bus output pin (extended application)
28	TP_CS	PH13	Touch screen chip select pin
29	EX_CLK	PH9	SPI bus clock pin (extended application)
30	GND	GND	Power ground 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 and MCU for wiring;
3. This set of test program supports 8-bit and 16-bit data bus mode switching. For details, see the following mode setting instructions (This module only supports 8-bit data bus mode);
4. This set of tests supports display switching in four directions. For details, see the following display direction switching instructions
5. This set of test procedures contains the following test items:
  - A. the main interface displays the test;
  - B. simple brush test;
  - C. rectangular drawing and filling test;
  - D. circular drawing and filling test;
  - E. triangle drawing and filling test;
  - F. English display test;
  - G. Chinese display test;
  - H. picture display test;
  - I. rotating display test;
  - J. touch 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 hardware only supports 8-bit data bus mode. the corresponding software should be set to 8 as the mode, otherwise the module will run abnormally.

## 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`