1.8 inch SPI Module

JC1216S018

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Product Description

The LCD module uses a 4-wire SPI communication method with a driver IC of ST7735S and a resolution of 128x160. The module contains an LCD display and backlight control circuitry.

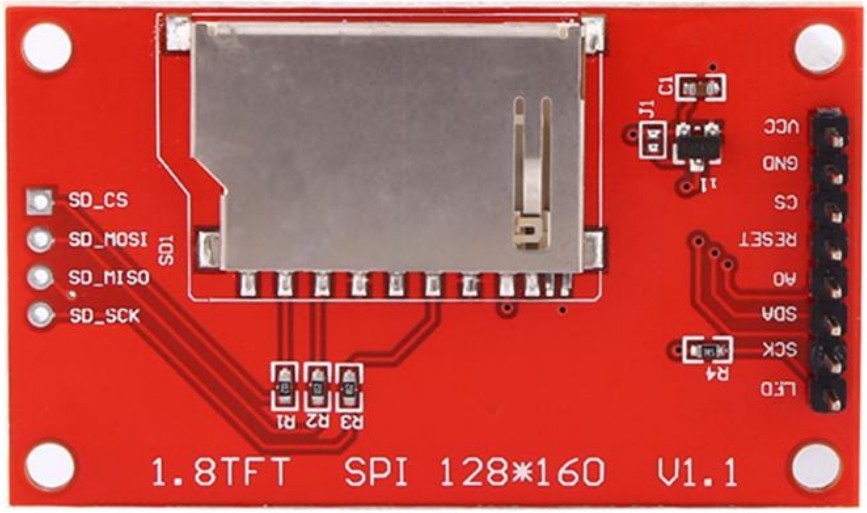
Product Features

- 1.8-inch color screen,support 65K color display,display rich colors
- 128X160 resolution, clear display
- Using the SPI serial bus, it only takes a few IOs to illuminate the display
- Easy to expand the experiment with SD card slot
- Military-grade process standards, long-term stable work
- Provide underlying driver technical support

Product Parameters

Name	Description	remark
Dis Play color	RGB 65K color	
SKU	JC1216S018N	
Screen size	1.8 inch	
Type	TFT	
Driver IC	ST7735S	
Resolution	128*160(Pixel)	
Module interface	module interface	
Active area	28.03x35.04 (mm)	
Module PCB Size	34.5x58.0 (mm)	
Angle of view	>60°	
Operating Temperature	-10℃~60℃	
Storage Temperature	-20℃~70℃	
Operating Voltage	3.3V-5V	
Power Consumption	About 90mA	
Product weight	About 14g	

Interface Description



Number	Module Pin	Pin Description
1	VCC	LCD power supply is positive (3.3V~5V)
2	GND	LCD Power ground
3	CS	LCD selection control signal
4	RESET	LCD reset control signal
5	A0	LCD register / data selection control signal
6	SDA	LCD SPI bus write data signal
7	SCK	LCD SPI bus clock signal
8	LED	LCD backlight control signal (high level lighting, if you do not need control, please connect 3.3V)

Hardware Configuration

The LCD module hardware circuit comprises two parts: an LCD display control circuit and a backlight control circuit.

The LCD display control circuit is used to control the pins of the LCD,

including control pins and data transfer pins.

The backlight control circuit is used to control the backlight to be on and off. Of course, if the backlight is not required to be controlled, the backlight control pin can be directly connected to the 3.3V power supply without using the circuit.

Working principle

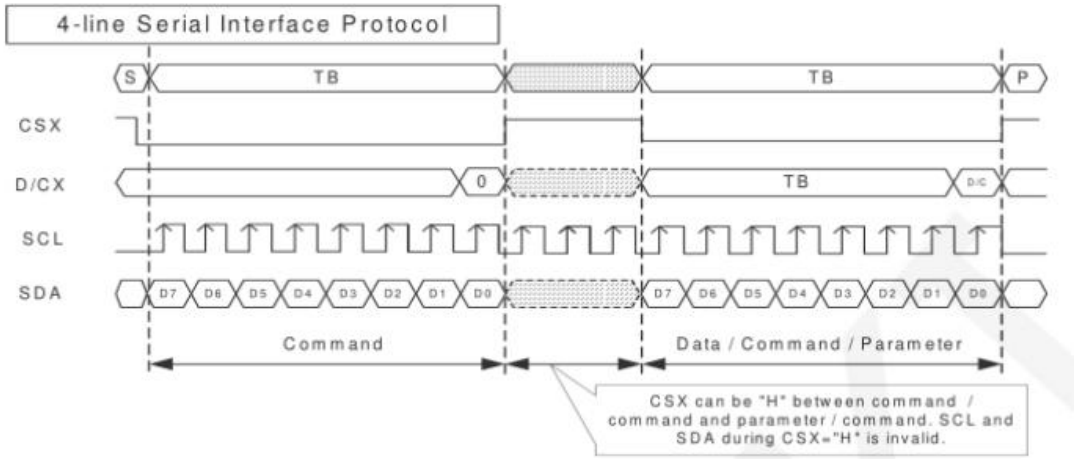
1. Introduction to ST7735S Controller

The ST7735S controller supports a maximum resolution of 132*162 and a 48114-byte GRAM. It also supports 8-bit, 9-bit, 16-bit, and 18-bit parallel port data buses. It also supports 3-wire and 4-wire SPI serial ports. Since parallel control requires a large number of IO ports, the most common one is SPI serial port control. The ST7735S also supports 65K, 262K RGB color display, display color is very rich, while supporting rotating display and scroll display and video playback, display in a variety of ways.

The ST7735S controller uses 16bit (RGB565) to control a pixel display, so it can display up to 65K colors per pixel. The pixel address setting is performed in the order of rows and columns, and the incrementing and decreasing direction is determined by the scanning mode. The ST7735S display method is performed by setting the address and then setting the color value.

2. Introduction to SPI communication protocol

The 4-wire SPI bus write mode timing is shown in the following figure:



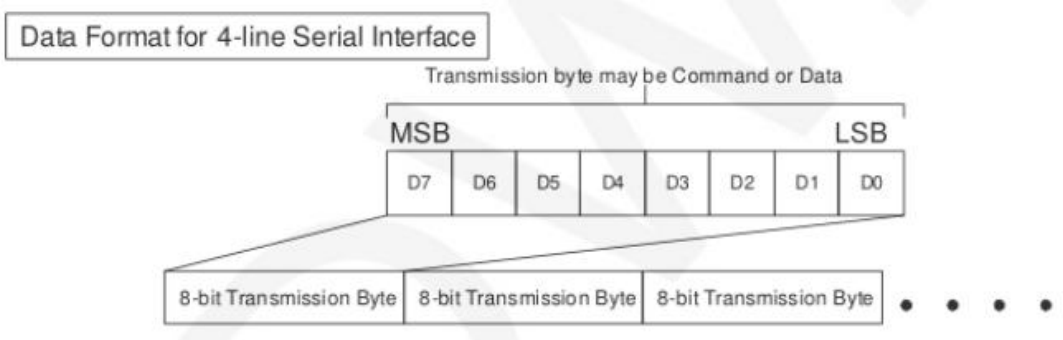
CSX is a slave chip select, and the chip is enabled only when CSX is low.

D/CX is the data/command control pin of the chip. When DCX is low, the command is written. When it is high, the data is written.

SCL is the SPI bus clock, and each rising edge transmits 1 bit of data;

SDA is the data transmitted by SPI, and it transmits 8-bit data at a time.

The data format is as shown below:



The high position is in front and transmitted first.

For SPI communication, the data has a transmission timing, that is, a combination of clock phase (CPHA) and clock polarity (CPOL):

The CPOL level determines the idle state level of the serial synchronous clock, CPOL = 0, which is low. CPOL does not have a lot of impact on the transport protocol;

The level of CPHA determines whether the serial synchronous clock is acquired on the first clock transition edge or the second clock transition edge.

When CPHL = 0, data acquisition is performed on the first edge of the transition;

The combination of the two becomes the four SPI communication methods. SPI0 is usually used in China, that is, CPHL = 0, CPOL = 0.