GODIYMODULES 2.25 Inch TFT LCD Display Module

GODIYMODULES 2.25 Inch TFT LCD Display Module ST7789 User Manual

Model: 2.25 Inch TFT LCD Display Module

1. Product Overview

This manual provides detailed instructions for the GODIYMODULES 2.25 Inch TFT LCD Display Module. This module features a 2.25-inch color screen with a resolution of 76x284 pixels, driven by the ST7789 controller, and communicates via a Serial Peripheral Interface (SPI).

It is designed for integration into various electronic projects requiring a compact, high-resolution display.

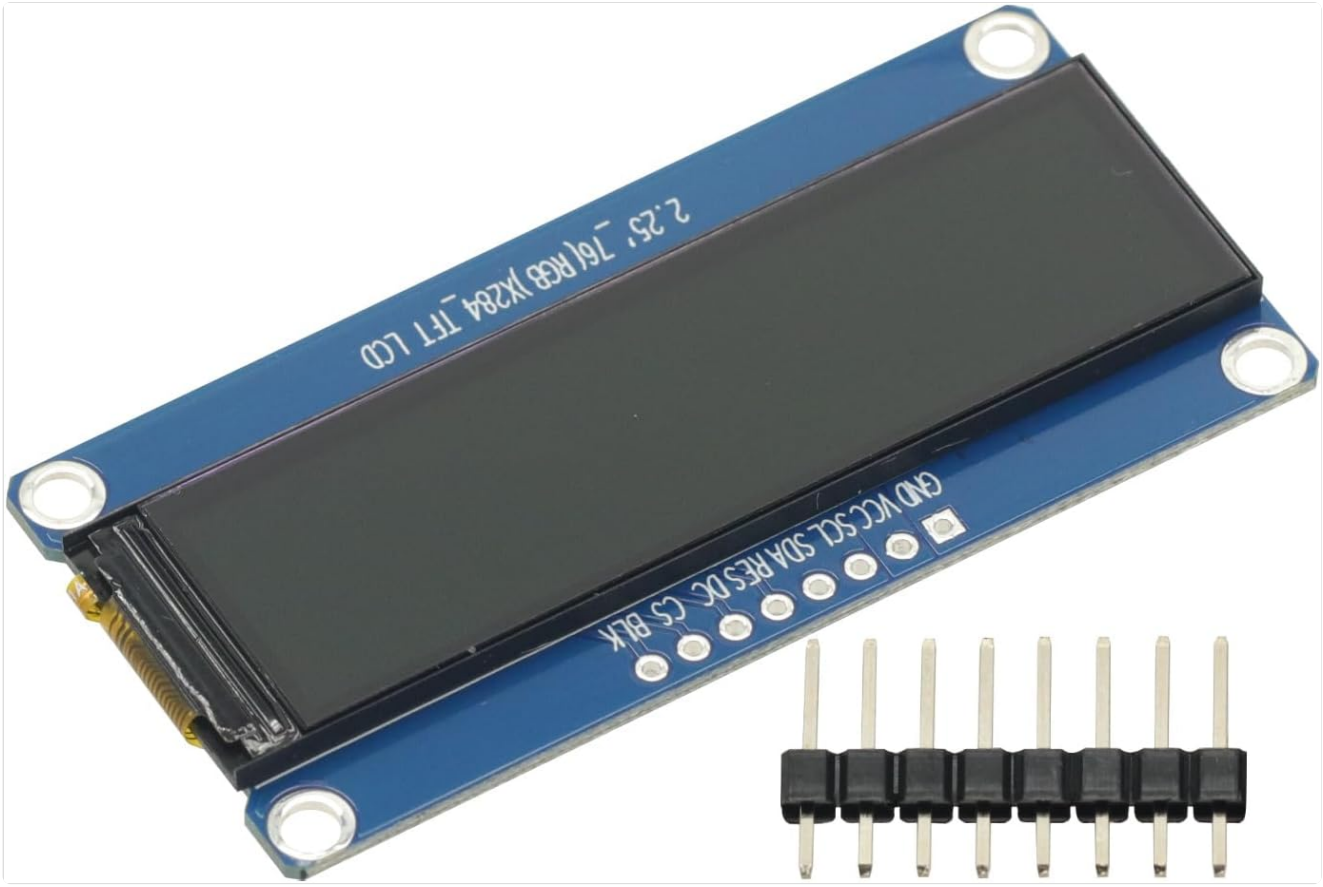
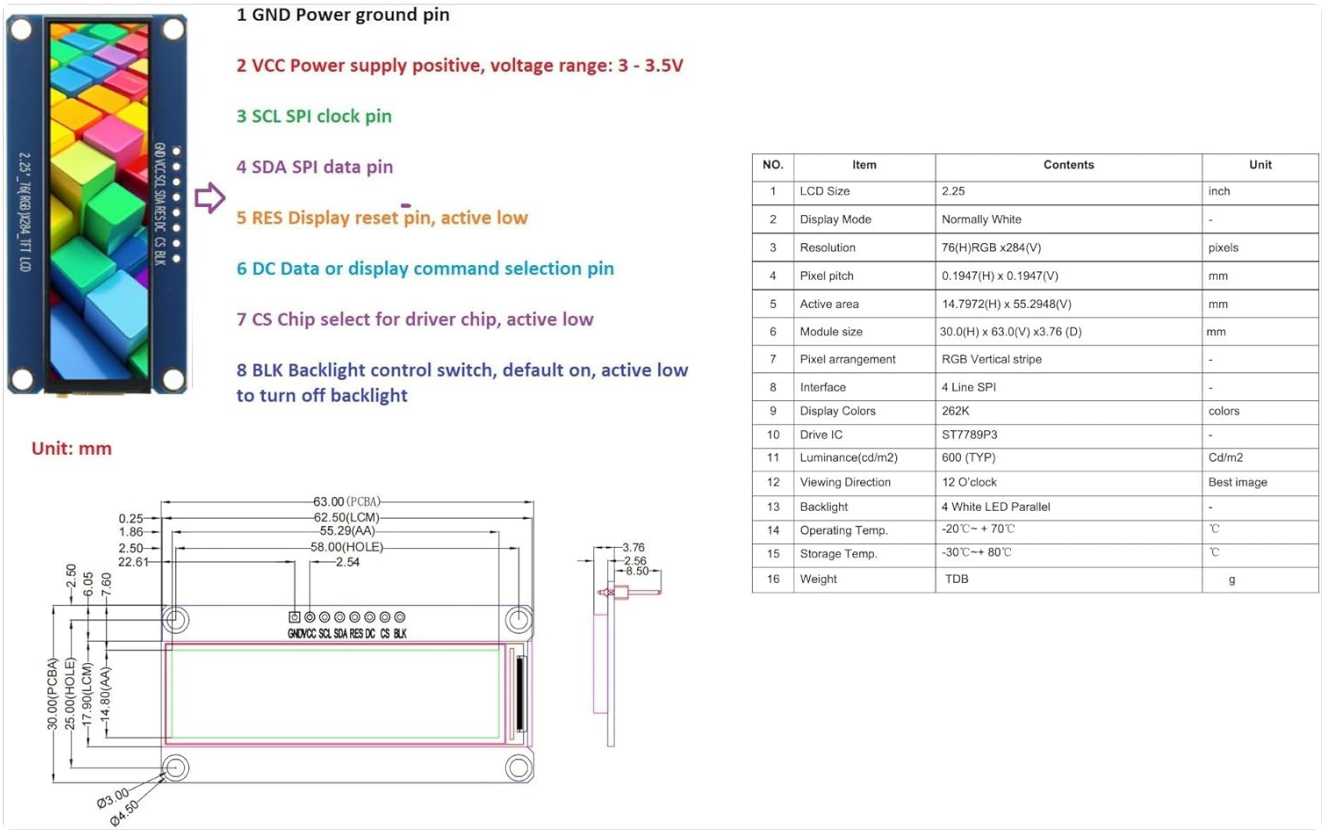


Figure 1: Front view of the 2.25 Inch TFT LCD Display Module with included pin headers.

2. Specifications

Key technical specifications for the 2.25 Inch TFT LCD Display Module are listed below:



NO.	Item	Contents	Unit
1	LCD Size	2.25	inch
2	Display Mode	Normally White	-
3	Resolution	76(H)RGB x284(V)	pixels
4	Pixel pitch	0.1947(H) x 0.1947(V)	mm
5	Active area	14.7972(H) x 55.2948(V)	mm
6	Module size	30.0(H) x 63.0(V) x3.76 (D)	mm
7	Pixel arrangement	RGB Vertical stripe	-
8	Interface	4 Line SPI	-
9	Display Colors	262K	colors
10	Drive IC	ST7789P3	-
11	Luminance(cd/m2)	600 (TYP)	Cd/m2
12	Viewing Direction	12 O'clock	Best image
13	Backlight	4 White LED Parallel	-
14	Operating Temp.	-20℃~ + 70℃	℃
15	Storage Temp.	-30℃~+ 80℃	℃
16	Weight	TDB	g

Figure 2: Detailed pinout and specifications table.

Table 1: Technical Specifications

Feature	Description
LCD Size	2.25 inches
Resolution	76(H) x 284(V) pixels
Display Mode	Normally White
Driver IC	ST7789
Interface	4-Line SPI
Voltage Range	3 - 3.5V
Pixel Pitch	0.1947(H) x 0.1947(V) mm
Active Area	14.7972(H) x 55.2948(V) mm
Module Size	30.0(H) x 63.0(V) x 3.76(D) mm
Pixel Arrangement	RGB Vertical stripe
Luminance	600 (TYP) Cd/m2
Viewing Direction	12 O'clock (Best image)
Backlight	4 White LED Parallel
Operating Temperature	-20°C ~ +70°C
Storage Temperature	-30°C ~ +80°C

3. Setup and Connection

The display module uses an SPI interface for communication. Ensure your microcontroller or development board supports SPI and provides the necessary voltage levels.

3.1 Pin Description

Refer to the pinout diagram for correct connections. The module operates within a voltage range of 3V to 3.5V.

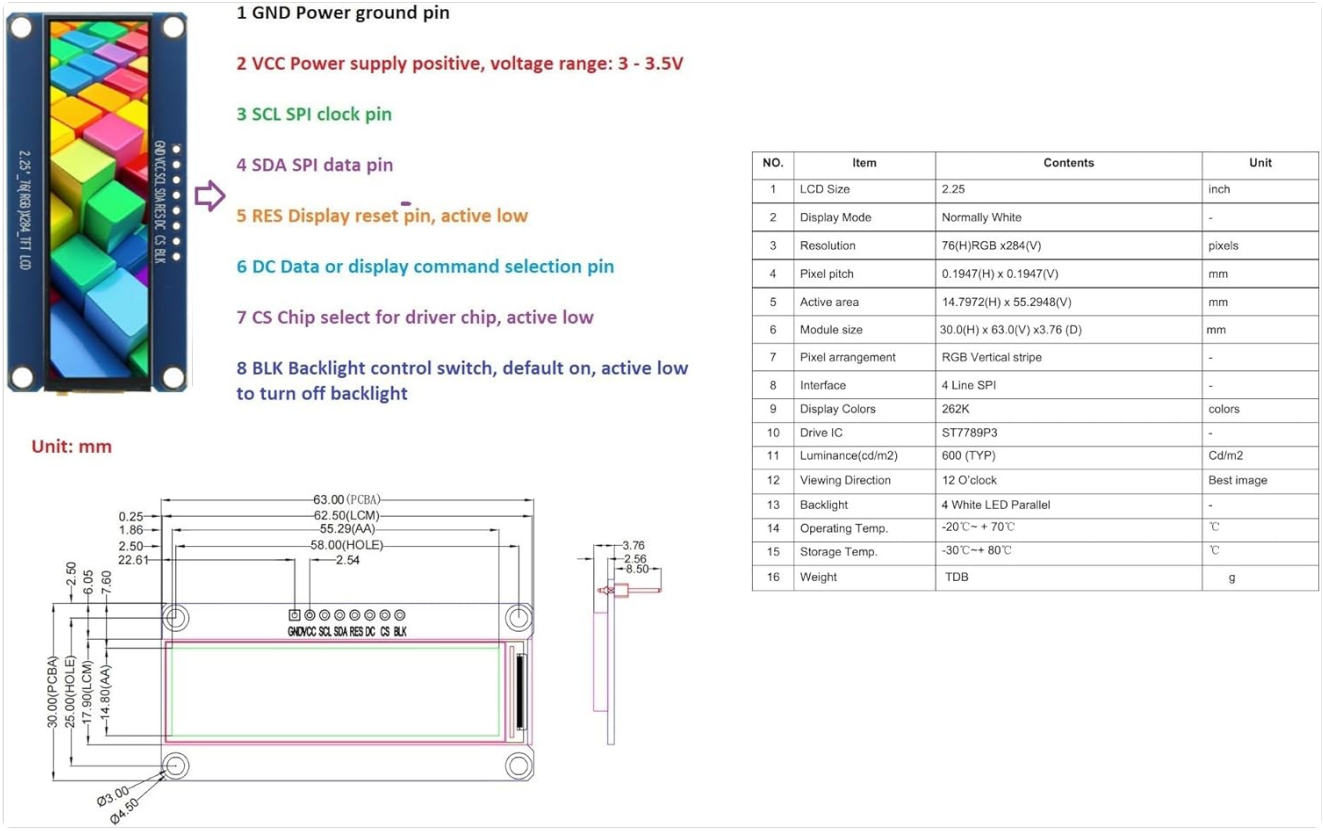


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Figure 3: Pinout diagram with descriptions.

1. **GND:** Power ground pin.
2. **VCC:** Power supply positive, voltage range: 3 - 3.5V.
3. **SCL:** SPI clock pin.
4. **SDA:** SPI data pin.
5. **RES:** Display reset pin, active low.
6. **DC:** Data or display command selection pin.
7. **CS:** Chip select for driver chip, active low.
8. **BLK:** Backlight control switch, default on, active low to turn off backlight.

3.2 Connection Procedure

- Connect the GND pin of the module to the ground of your microcontroller.
- Connect the VCC pin to a stable 3V-3.5V power supply.
- Connect SCL, SDA, RES, DC, CS, and BLK pins to the corresponding SPI and control pins on your microcontroller. Refer to your microcontroller's documentation for specific SPI pin assignments.
- Ensure all connections are secure to prevent intermittent operation.

4. Operating Instructions

Once the module is correctly wired, software configuration is required to initialize and control the display.

4.1 Software Initialization

- Utilize a library compatible with the ST7789 driver for your chosen programming environment (e.g., Arduino, MicroPython, LVGL).
- Initialize the SPI communication protocol, specifying the correct clock speed and data mode.
- Send initialization commands to the ST7789 driver as per its datasheet or library documentation. This typically involves setting display orientation, pixel format, and enabling the display.

4.2 Displaying Content

- Use the display library functions to draw graphics, text, and images.
- The display supports 262K colors. Ensure your image data is formatted correctly for the ST7789 controller.
- For optimal color representation, it may be necessary to **invert color data bits** in your software configuration if colors appear incorrect or "funky".

5. Maintenance

Proper care ensures the longevity and performance of your display module.

- **Cleaning:** Gently wipe the display surface with a soft, lint-free cloth. Avoid abrasive materials or harsh chemical cleaners.
- **Handling:** Avoid applying excessive pressure to the display surface. Handle the module by its edges to prevent damage to the screen or components.
- **Storage:** Store the module in a dry, dust-free environment within the specified storage temperature range (-30°C to +80°C).
- **Power:** Always ensure the power supply is within the specified 3V-3.5V range. Over-voltage can damage the module.

6. Troubleshooting

If you encounter issues with your display module, consider the following troubleshooting steps:

- **No Display/Blank Screen:**
  - Verify all power connections (VCC, GND) are correct and within the 3V-3.5V range.
  - Check SPI connections (SCL, SDA, CS, DC, RES) for continuity and correct pin assignment.
  - Ensure the BLK pin is not active low (turned off). If connected, try setting it high or leaving it unconnected if default-on is desired.
  - Confirm that the ST7789 driver is correctly initialized in your software.
- **Incorrect or "Funky" Colors:**
  - As noted by users, you may need to **invert color data bits** in your display library or driver configuration. This is a common requirement for some ST7789 implementations.
  - Ensure your image or color data is in the correct format (e.g., RGB565, RGB888) expected by the driver.
- **Flickering Display:**
  - Check the SPI clock speed. A speed that is too high or too low for your microcontroller or wiring can cause issues.
  - Ensure power supply is stable and free from noise.
- **Difficulty in Setup:**
  - Refer to online resources and community forums for ST7789 and SPI display examples with your specific microcontroller.
  - Double-check all wiring against the pinout diagram.

7. Warranty Information

The GODIYMODULES 2.25 Inch TFT LCD Display Module is covered by the manufacturer's standard warranty. For

specific details regarding warranty duration, terms, and conditions, please refer to the documentation provided at the time of purchase or contact GODIYMODULES directly.

Typically, warranty covers defects in materials and workmanship under normal use. Damage resulting from improper installation, misuse, or unauthorized modifications is generally not covered.

8. Support

For technical assistance, additional documentation, or inquiries not covered in this manual, please contact the seller or GODIYMODULES customer support. When contacting support, please provide your product model number and a detailed description of the issue.

You may also find helpful resources and community support online for projects involving ST7789-based SPI displays.