Waveshare 2.8inch Resistive Touch LCD

Waveshare 2.8inch Resistive Touch LCD User Manual

Model: 2.8inch Resistive Touch LCD

1. Introduction

This manual provides detailed instructions for the setup, operation, and maintenance of the Waveshare 2.8inch 320x240 Pixels IPS LCD with 4-Wire Resistive Touch Screen. This display module is designed for embedded systems and features an SPI communication interface.

Figure 1: Front view of the Waveshare 2.8inch Resistive Touch LCD module.

2. Features

- Multicolor graphic IPS LCD display, 2.8inch diagonal, 320×240 pixels.
- Integrated 4-wire resistive touch screen.
- Onboard touch controller for smoother touch experience.
- SPI interface, requiring minimal pin connections.
- Programmable backlight control for power efficiency.
- Accompanied by development resources and example code (for STM32/AVR/PIC).

3. Setup

3.1 Interface Definition

The display module utilizes an SPI communication interface. Refer to the following table and image for pin definitions and connections.

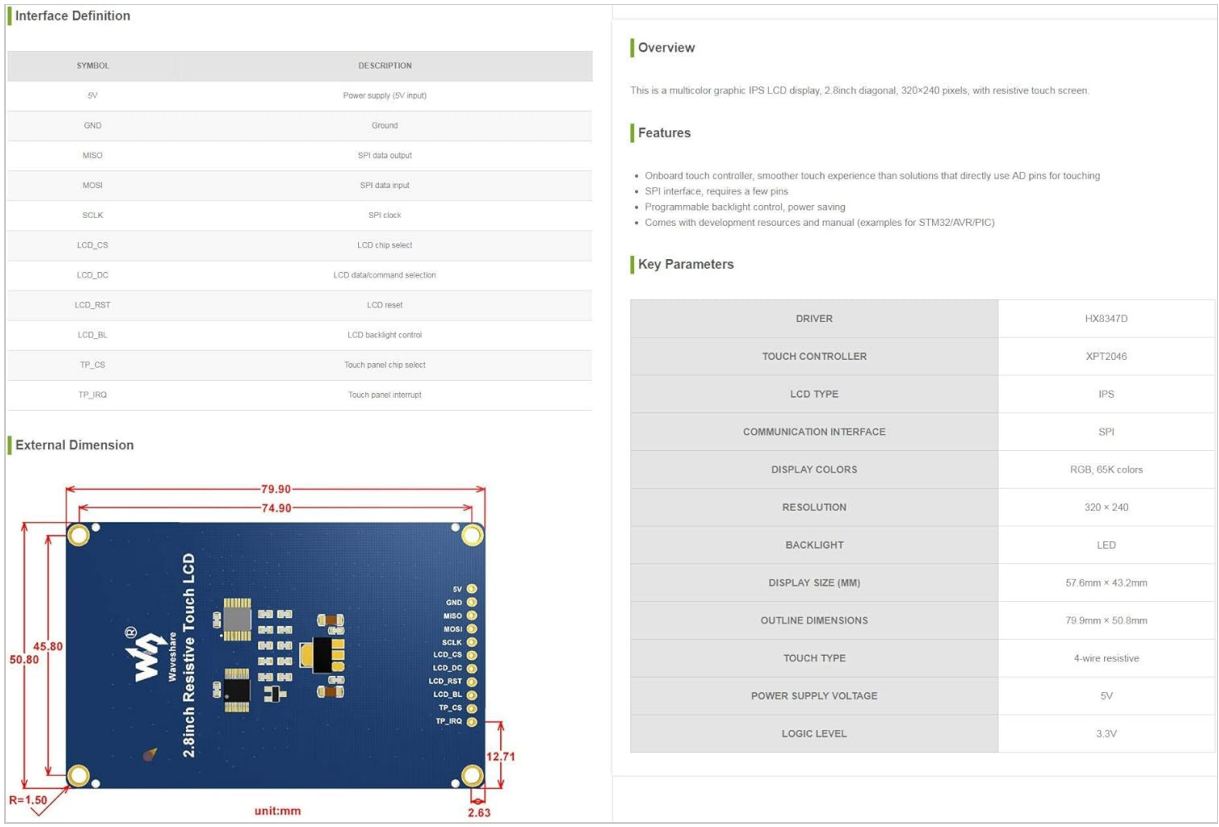

Figure 2: Interface Definition and Key Parameters of the LCD module.

Table 1: Interface Pin Descriptions

Symbol	Description
5V	Power supply (5V input)
GND	Ground
MOSI	SPI data output
MISO	SPI data input

Symbol	Description
SCLK	SPI clock
LCD_CS	LCD chip select
LCD_DC	LCD data/command selection
LCD_RST	LCD reset
LCD_BL	LCD backlight control
TP_CS	Touch panel chip select
TP_IRQ	Touch panel interrupt

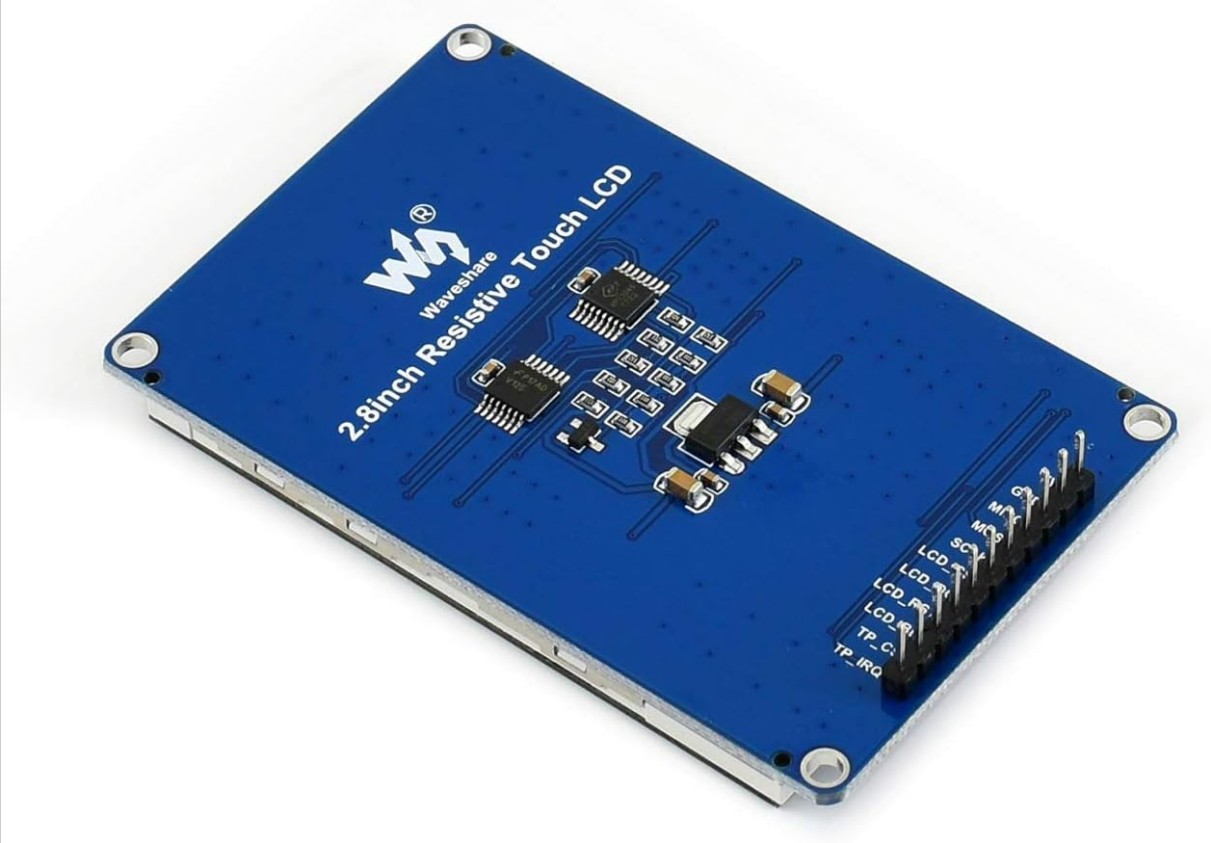

Figure 3: Back view of the LCD module showing pin labels and components.

3.2 Initial Connection

Connect the display module to your microcontroller or development board using the SPI interface. Ensure correct voltage (5V) and ground connections. Refer to the pin definitions for proper wiring of data, clock, chip select, and control lines for both the LCD and touch panel.

Waveshare provides comprehensive development resources and example code for various platforms such as STM32, AVR, and PIC. These resources are essential for initial setup and programming. Please visit the official Waveshare website for detailed documentation and code examples.

4. Operating Instructions

4.1 Display Operation

Once correctly connected and powered, the LCD can be initialized and controlled via the SPI interface. Use

the provided example code as a starting point to display graphics, text, and other visual information. The display supports 320x240 pixels resolution with 65K colors.

Figure 4: The LCD module displaying text content.

4.2 Touch Screen Functionality

The integrated 4-wire resistive touch screen allows for user interaction. The onboard touch controller (XPT2046) handles touch input, providing coordinates via the SPI interface. Implement touch detection and coordinate reading in your software using the provided examples.

4.3 Backlight Control

The backlight of the LCD is programmable, allowing for dynamic adjustment of brightness. This feature can be utilized to optimize power consumption or adapt to different lighting environments. Refer to the documentation for specific commands or methods to control the backlight via the LCD_BL pin.

5. Maintenance

- **Cleaning:** Use a soft, dry, lint-free cloth to clean the display surface. Avoid abrasive cleaners or solvents that may damage the screen or touch layer.
- **Handling:** Handle the module by its edges to avoid touching the display area or electronic components.
- **Storage:** Store the module in a cool, dry environment, away from direct sunlight and extreme temperatures.
- **Power:** Always ensure the correct power supply voltage (5V) is used to prevent damage to the module.

6. Troubleshooting

- **Display not lighting up:** Check power connections (5V, GND) and ensure the backlight control (LCD_BL) is correctly configured and enabled.
- **No display output:** Verify SPI communication lines (MOSI, MISO, SCLK, LCD_CS, LCD_DC, LCD_RST) are correctly wired and that the LCD initialization sequence in your code is correct.
- **Touch screen unresponsive:** Check touch panel connections (TP_CS, TP_IRQ) and ensure the touch controller (XPT2046) is correctly initialized and polled in your software.
- **Incorrect colors or distorted image:** Ensure the display driver (HX8347D) is correctly initialized with the appropriate settings for resolution and color depth.

7. Specifications

Key technical specifications for the Waveshare 2.8inch Resistive Touch LCD module:

Table 2: Product Specifications

Parameter	Value
Display Size	2.8 inch
Resolution	320 × 240 pixels
Display Type	IPS LCD
Display Colors	RGB, 65K colors
Touch Type	4-wire Resistive
Communication Interface	SPI
Display Driver	HX8347D
Touch Controller	XPT2046
Backlight	LED (Programmable)
Power Supply Voltage	5V
Logic Level	3.3V
Outline Dimensions	79.9mm × 50.8mm
Display Area (mm)	57.6mm × 43.2mm
Item Weight	1.12 ounces (approx. 31.75g)
Package Dimensions	4.21 x 3.11 x 1.14 inches

8. Warranty and Support

Waveshare products are typically covered by a standard manufacturer's warranty. For specific warranty details, technical support, or to access the latest development resources and documentation, please visit the official Waveshare website or contact their customer service directly. Ensure you have your product model number (2.8inch Resistive Touch LCD) and purchase information available when seeking support.

Official Waveshare Website: www.waveshare.com