4.3-inch TFT ESP32-S3 Display Module Product Specification

Version	Record	Date
V1.0	First Release	2026-01-09

Contents

1. Overview

1.1. Product Introduction

ES3R43T is a 4.3-inch TFT display module with a built-in ESP32-S3 main controller and a resistive touch screen. It adopts the ST7282 display driver IC with a resolution of 480*272, and can connect to a variety of peripherals such as I2C interface devices, MicroSD cards, UART, and extended IO devices. It also has a built-in touch function, which greatly facilitates users to perform various DIY projects and meets the needs of IoT and human-computer interaction function development.

1.2. Image Display

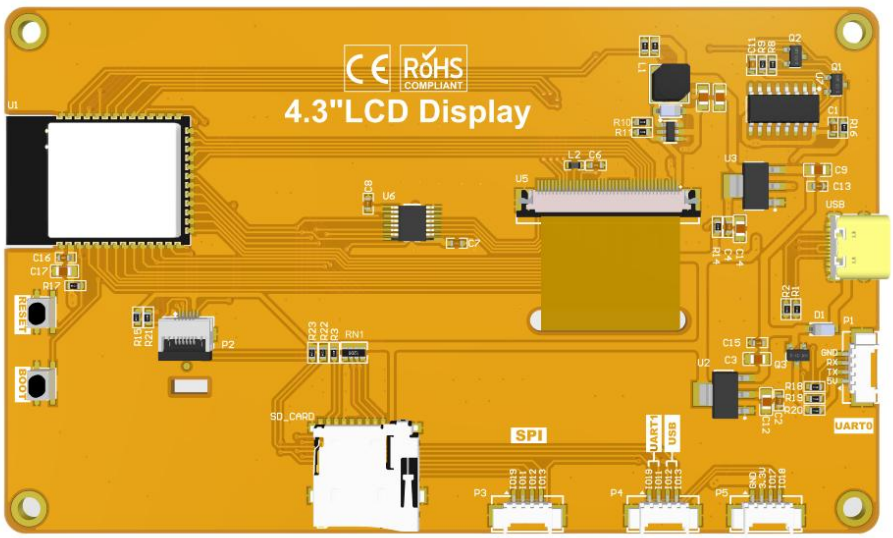

Figure 1.1 Product Diagram

1.3. Accessory List

Equipped with one 4P 1.25mm to 2.54mm terminal wire and one Type-C data power cable. The terminal wire is about 20cm in length, and the Type-C cable is about 1m in length.

Figure 1.2 4P 1.25mm to 2.54mm Terminal Wire

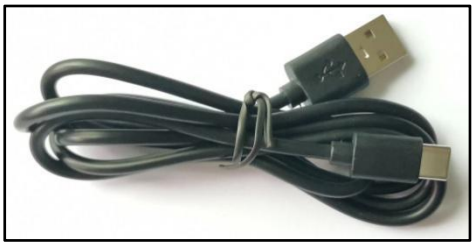

Figure 1.3 Type-C Data Power Cable

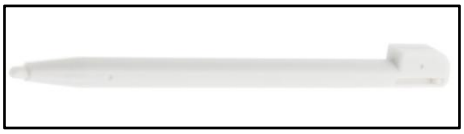

Figure 1.4 Resistive Touch Pen

2. Product Features

2.1. Feature Description

- Built-in ESP32-S3 main control chip with sufficient development resources and easy development
- 4.3-inch color screen with 480x272 resolution, supporting RGB565 for rich display colors
- Rich interfaces for connecting various peripherals (SPI, UART, extended IO, etc.)
- Built-in resistive touch screen for convenient human-computer interaction
- Standard TYPE-C interface for easy program downloading and power supply
- Built-in micro TF card slot for convenient storage expansion
- Provides abundant demo programs for easy learning
- Offers underlying driver technical support and online updates of WIKI materials
- The module undergoes multiple aging tests to meet military-grade standards, supporting long-term stable operation

3. Product Parameters

3.1. ESP32S3 Parameters

Item	Parameter	Unit
Main Control Chip	ESP32-S3	-
CPU	Xtensa LX7 32-bit dual-core processor	-
Maximum Frequency	240MHz（MAX）	-
Storage	384 KB ROM + 512KB SRAM + 16 KB RTC SRAM + 8M Built-in OPI PSRAM + 16M External QSPI Flash	-
WIFI	2.4GHz, 802.11b/g/n mode	-
Bluetooth	Bluetooth V5.0 BR/EDR and Bluetooth LE standards	-
Operating Voltage	3.0~3.6	V

3.2. LCD Screen Parameters

Item	Parameter	Unit
Screen Size	4.3	inch
Screen Type	TN	-
Touch Screen Type	Resistive Touch Screen	-
Screen Resolution	480xRGBx272	pixels
Active Display Area	95.04(W)x53.86(H)	mm
Visible Window Size	96.04±0.15(W)x54.86±0.15(H)	mm
Active Touch Area	106.04±0.15(W)x67.74±0.15(H)	mm
Driver IC	ST7282	-
Display Interface	RGB (connected to ESP32-S3)	-
Viewing Angle	6 ’CLOCK	deg
Number of Colors	65K（RGB565）	-
Backlight Brightness (Typical Value)	350	cd/m^2
Backlight Type	White LED * 7	-
Operating Temperature	-20~60	℃
Storage Temperature	-30~70	℃

3.3. Dimension Parameters

Item	Parameter	Unit
LCD Dimension	106.04±0.15(W)x67.74±0.15(H)x3.0±0.1(D) (excluding cable and adhesive)	mm
Module Dimension	123.00(W)x74.00(H)x8.70(D)	mm

3.4. Electrical Parameters

Item	Parameter	Unit
Operating Voltage	5.0	V
Backlight Current	20	mA
Backlight Brightness (Actual Value)	350	cd/m^2
Total Current	190	mA
Power Consumption	0.95	W

3.5. Other Parameters

Item	Parameter	Unit
SKU	ES3R43T	-
Power Supply Interface	TYPE-C	-
Weight (Including Packaging)	170	g

4. Product Interfaces

4.1. Interface Function Description

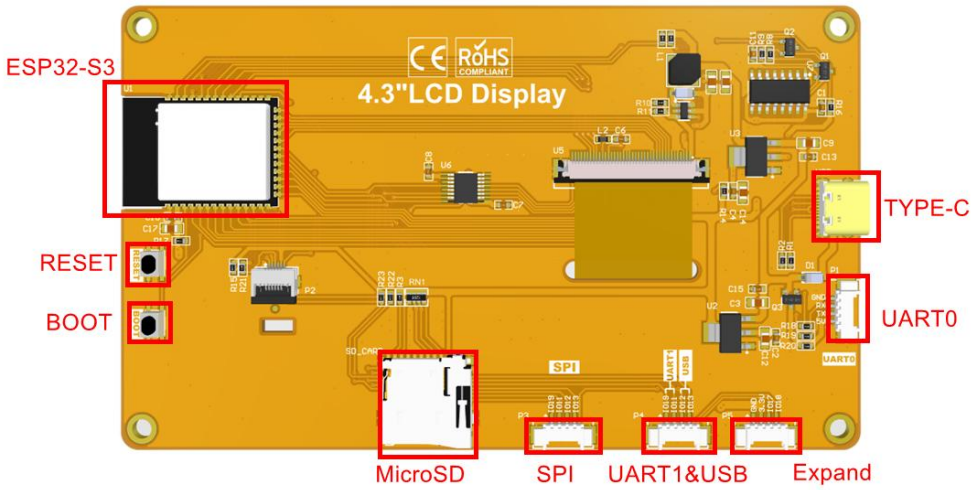

Figure 4.1 Product Interface Diagram

Interface Name	Function Description
ESP32-S3 Chip	The main controller of the display module, working with
MicroSD Card Slot	Insert a Micro SD card to expand storage space for storing large data such as font libraries, pictures, and audio files.
UART	1.25mm 4P socket. Can be used for UART debugging, downloading, and communication. An external USB-to-UART module is required.
BOOT Button	Used to enter download mode or for button testing. Press and hold this button to power on, then release to enter download mode; or after powering on, press and hold this button, then press the RESET button, release the RESET button, and then release this button to enter download mode. When download mode is not needed, this button can be used as a normal button.
TYPE-C Interface	It is used for module power supply and program downloading. This interface is connected to the one-click download circuit on the module, enabling automatic entry into the download mode (without pressing the BOOT key).
RESET Button	Used for resetting the ESP32-S3 main controller and LCD. Pressing it triggers a low-level reset.
Extended Pins	1.25mm 4P socket. Leads out two free pins: GPIO17 and GPIO18. Can be used to connect other peripherals
UART1 and USB Interface	1.25mm 4P socket. Leads out four free pins: GPIO17, GPIO18, GPIO19, and GPIO20. GPIO17 and GPIO18 can be used for UART1, and GPIO19 and GPIO20 can be used for USB protocol.

SPI Peripheral Interface	1.25mm 4P socket. Used for connecting external SPI communication devices. This SPI interface is shared with the resistive touch screen and SD card. If the touch screen or SD card is not used, it can be used as normal IO.

4.2. ESP32-S3 Pin Assignment

ESP32-S3 Pin Assignment Description			
On-board Device	On-board Device Pin	ESP32-S3 Connected Pin	Description
LCD	LCD_DE	IO40	Pixel Clock Control Pin
	LCD_VSYNC	IO41	5-bit RED Data Pin
	LCD_HSYNC	IO39	6-bit GREEN Data Pin
	LCD_PCLK	IO42	Pixel Clock Control Pin
	PIN_R0	IO45	5-bit RED Data Pin
	PIN_R1	IO48	
	PIN_R2	IO47	
	PIN_R3	IO21	
	PIN_R4	IO14	
	PIN_G0	IO5	6-bit GREEN Data Pin
	PIN_G1	IO6	
	PIN_G2	IO7	
	PIN_G3	IO15	
	PIN_G4	IO16	
	PIN_G5	IO4	
	PIN_B0	IO8	5-bit BLUE Data Pin
	PIN_B1	IO3	
	PIN_B2	IO46	
	PIN_B3	IO9	
	PIN_B4	IO1	

RTP	TP_SCK	IO12	Resistive Touch Screen SPI Bus Clock Control Pin
	TP_MISO	IO13	Resistive Touch Screen SPI Bus Data Write Control Pin
	TP_MOSI	IO11	Resistive Touch Screen SPI Bus Data Read Control Pin
	TP_CS	IO38	Resistive Touch Screen SPI Bus Chip Select Control Pin
	TP_INT	IO18	Resistive Touch Screen SPI Bus Interrupt Control Pin
SD	SD_CS	IO10	SD Card SPI Bus Chip Select Control Pin
	SD_MOSI	IO11	SD Card SPI Bus Data Read Control Pin
	SD_MISO	IO13	SD Card SPI Bus Data Write Control Pin
	SD_SCLK	IO12	SD Card SPI Bus Clock Control Pin
KEY	KEY_BOOT	IO0	Download Mode Selection Button (Press this button to power on, then release to enter download mode)
	KEY_RESET	EN	ESP32-S3 Reset Button, Active Low Reset
UART0	TX0	IO43	ESP32-S3 UART0 Transmit Signal Pin
	RX0	IO44	ESP32-S3 UART0 Receive Signal Pin

5. Product Dimension Drawing

5.1. Product Dimension Drawing

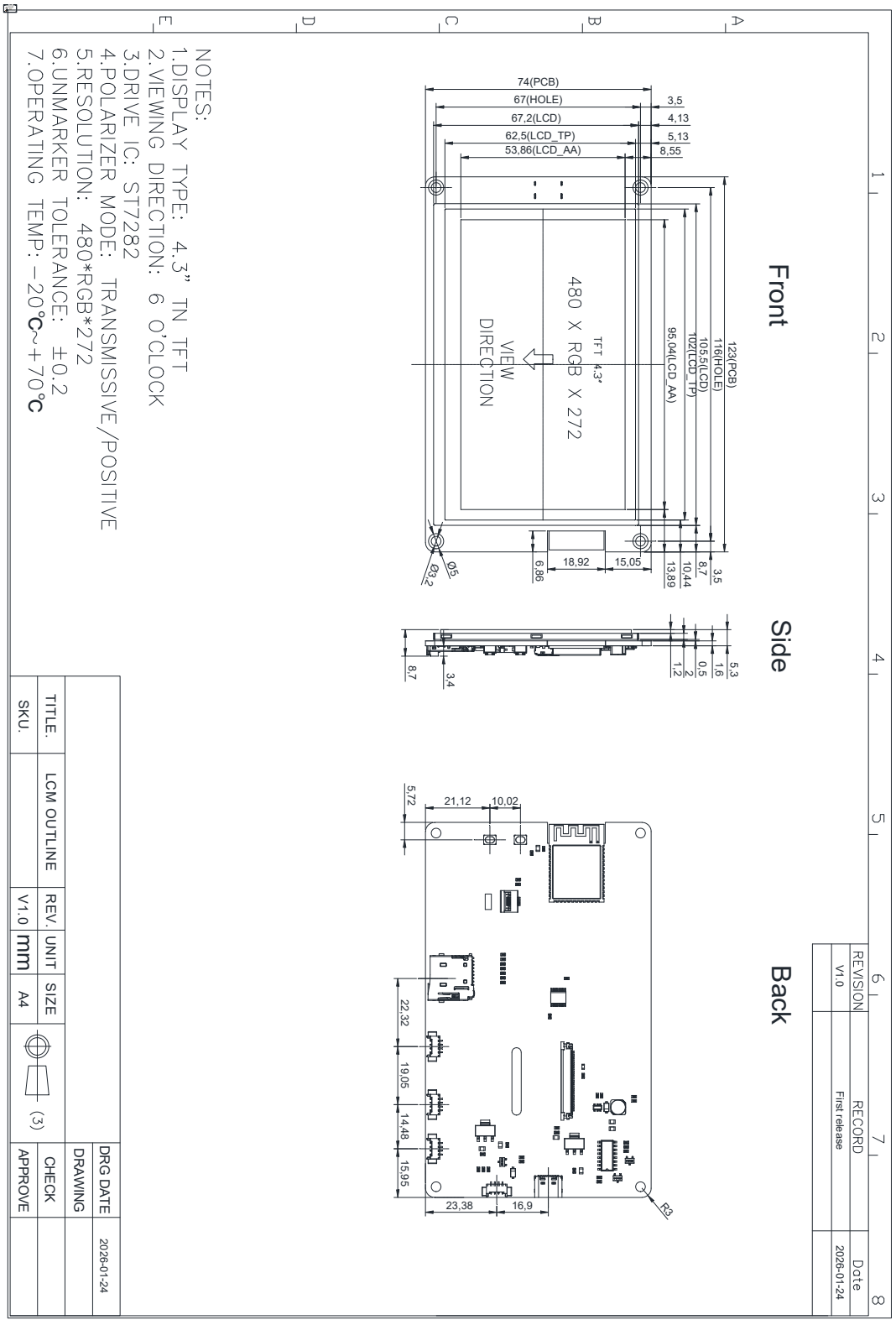

Figure 5.1 Product Dimension Drawing

6. Precautions

6.1. Safe Product Usage

- Do not press or strike the screen violently to avoid damaging it
- Do not scratch the screen with hard objects to avoid scratching
- Do not place heavy objects on the product to avoid crushing the screen
- Keep the product clean and do not drop water or oil on the screen
- Wipe the screen with a clean, soft, and dry cloth; do not spray water or cleaning agents directly on the screen
- Do not disassemble the product at will to avoid damaging the screen or cable
- Do not place the product in a high-temperature or high-humidity environment
- Place the product upwards on a stable surface to avoid falling and breaking
- Use the correct voltage to power the product to avoid damage due to excessive voltage
- When using the product, do not touch components or pins with wet hands to avoid short circuits and damage to the product
- When the product is not in use for a long time, please unplug the power supply

6.2. Frequently Asked Questions (FAQ)

- **Question 1: After burning the program and powering on the product, the backlight is on but there is no display**

  Analysis:

  The lit backlight indicates that the module is powered on normally, but normal display requires complete normal RPG communication and control signals. Check if the burned program matches correctly, including burning configuration definitions such as Flash size, partition table, PSRAM, etc.

  It is recommended to use our tested demo program for the first use. Compile and download the program without any modifications first, which can rule out the factor of failure to light up due to program modifications. Also, pay attention to whether the compilation and download of the demo program are successful and whether the display module operates normally.

  If the screen still cannot display normally after multiple attempts as above, use

necessary tools such as a multimeter/oscilloscope/logic analyzer to analyze and detect the signals, and contact our technical staff for assistance.

- **Question 2: The product displays normally but the touch function does not respond**

  Analysis:

  This situation may be caused by the following reasons:

  - The burned test program does not have touch function;
  - The GPIO related to touch screen control in the test software is not defined or is defined incorrectly;
  - Hardware damage, including damage to the touch control IC, damage or breakage of the touch screen cable, etc

- **Question 3: The product displays normally, but the backlight brightness is unstable (flickering or dimming)**

  Analysis:

  The backlight circuit of this product is driven by a field-effect transistor. The backlight is turned on when a high level is input to the backlight control pin, and turned off when a low level is input. PWM signals can also be input through the backlight control pin to achieve dimming. If the voltage of the backlight control pin changes, the backlight brightness will also change, which may cause unstable backlight. In addition, unstable power supply voltage can also cause this phenomenon.

- **Question 4: Failed to burn the program to the product**

  Analysis:

  When using USB-to-UART to burn the program to this product, the burning failure may be caused by the following reasons:

  - The CH340 driver is not installed. The CH340 driver package is included in the tool software provided with our data and can be downloaded directly.
  - The burned program malfunctions during operation, causing the ESP32-S3 main controller to fail to enter the burning mode. At this time, press and hold the BOOT button, then power on the module and release the BOOT button; or when the module is already powered on, press and hold the BOOT button, then

press and release the RESET button, and finally release the BOOT button. This will force the ESP32-S3 main controller to enter the download mode, and then re-burn the program

- Abnormal operation of the computer's serial port, incorrect selection of the serial port connected to the product, and occupation of the serial port by other programs can all lead to burning failure.
- There is a problem with the USB cable. Try replacing the USB cable (preferably use the original mobile phone charging cable).