

Hosyond ESP32-S3 Touchscreen Module

Hosyond ESP32-S3 2.8-inch Touchscreen Module User Manual

Model: ESP32-S3 Touchscreen Module

INTRODUCTION

This manual provides detailed instructions for the Hosyond ESP32-S3 2.8-inch Touchscreen Module. This module integrates an ESP32-S3 microcontroller with a 2.8-inch 240x320 IPS LCD capacitive touchscreen, offering Wi-Fi and Bluetooth connectivity for various IoT and embedded projects. It is designed for developers and hobbyists working with Arduino and similar platforms.

Key Features:

- **Powerful ESP32-S3 Core:** Xtensa LX7 dual-core processor (up to 240MHz), 16MB Flash, built-in Wi-Fi & Bluetooth.
- **2.8-Inch IPS Touchscreen Display:** 240x320 resolution, 262K colors (RGB666), wide viewing angles, capacitive touch.
- **Rich Audio & Interface Support:** Built-in microphone, external speaker support, I2C, UART, SPI.
- **Battery & Storage Friendly Design:** External lithium battery support, micro TF card slot, integrated battery management.
- **Easy Development & AI Voice Chat:** USB Type-C for programming, AI voice chat support, abundant sample programs.

PACKAGE CONTENTS

Verify that all items listed below are included in your package:

- 1 x Hosyond ESP32-S3 2.8-inch Touchscreen Module
- 1 x USB-C Cable
- 1 x Speaker
- 1 x Jumper Cable Set

Touch screen parameters

Item	parameters
Effective area size	2.8 inch
Touch screen type	Capacitive touch screen
Valid Area	240x320(pixels)
Drive IC	D-FT6336G
Visual Area	45.20(W)x59.45(H)(mm)
interface	IIC
Operation Temperature	-30~80(°C)
Storage Temperature	-30~80(°C)

Electrical parameters

Item	parameters
Operation Temperature	5.0V
Backlight current	79mA
Backlight brightness(actual value)	touch screen: 230cd/m ² Touchless screen: 270cd/m ²
Total current	ESP32-S3 reset: 0 Only display works: 140 Display, speaker, battery charging all work: 560
Power	0.7 (Only the display works) 2.8 (Display, speaker, battery charging all work)

Image: Hosyond ESP32-S3 Touchscreen Module with included USB-C cable, speaker, and jumper cables.

PRODUCT OVERVIEW

The Hosyond ESP32-S3 module features a compact design with various interfaces for connectivity and expansion. Understanding the layout of the board is crucial for proper setup and development.

Item	parameters
ESP32-S3	Main control of the display module, controlling on-board and external peripherals
MicroSD Interface	Insert a Micro SD card to expand the storage space, such as storing font library, pictures, audio files and other large data content.
RGB	LED lights with red, green, and blue colors, controlled by a single IO port.
Uart	1.25mm 4P socket. Can be used for serial port debugging, downloading and communication. An external USB to serial port module is required
Battery interface	1.25mm 2P socket. Used to connect to 3.7V polymer lithium battery, charge the battery through the battery charging management circuit, also used for battery power supply. Note the positive and negative terminals of the interface
BOOT key	For entering the download mode or key test. Press and hold this key to power up, then release to enter the download mode, or after powering up, and hold this key, then press the RESET key, release the RESET key and then release this key, you can also enter the download mode. When it is not necessary enter the download mode, this key can be used as a normal key.
TYPE-C interface	For module power and program downloading. This interface is connected to the one-key download circuit on the module, which can realize automatic entry into the download mode (without the BOOT key).
RESET key	For ESP32S3 main control and LCD reset, press to reset the level.
Expand pin	1.25mm 4P socket. Pins GPIO2/3/14/21 are brought out
Horn interface	1.25mm 2P socket. For connecting to speaker to play audio. For connecting to speaker to play audio (max 1.5W(Ω) or 2W (4 Ω) speaker).
IIC interface	1.25mm 4P socket. For external SPI communication device, this SPI interface and MicroSD share. Can be used as ordinary IO1.25mm 4P socket. For external IIC communication device, this IIC interface and capacitive touch screen share. Can be used as ordinary.

Image: Front and back views of the ESP32-S3 module, highlighting the display and main components.

Component Identification:

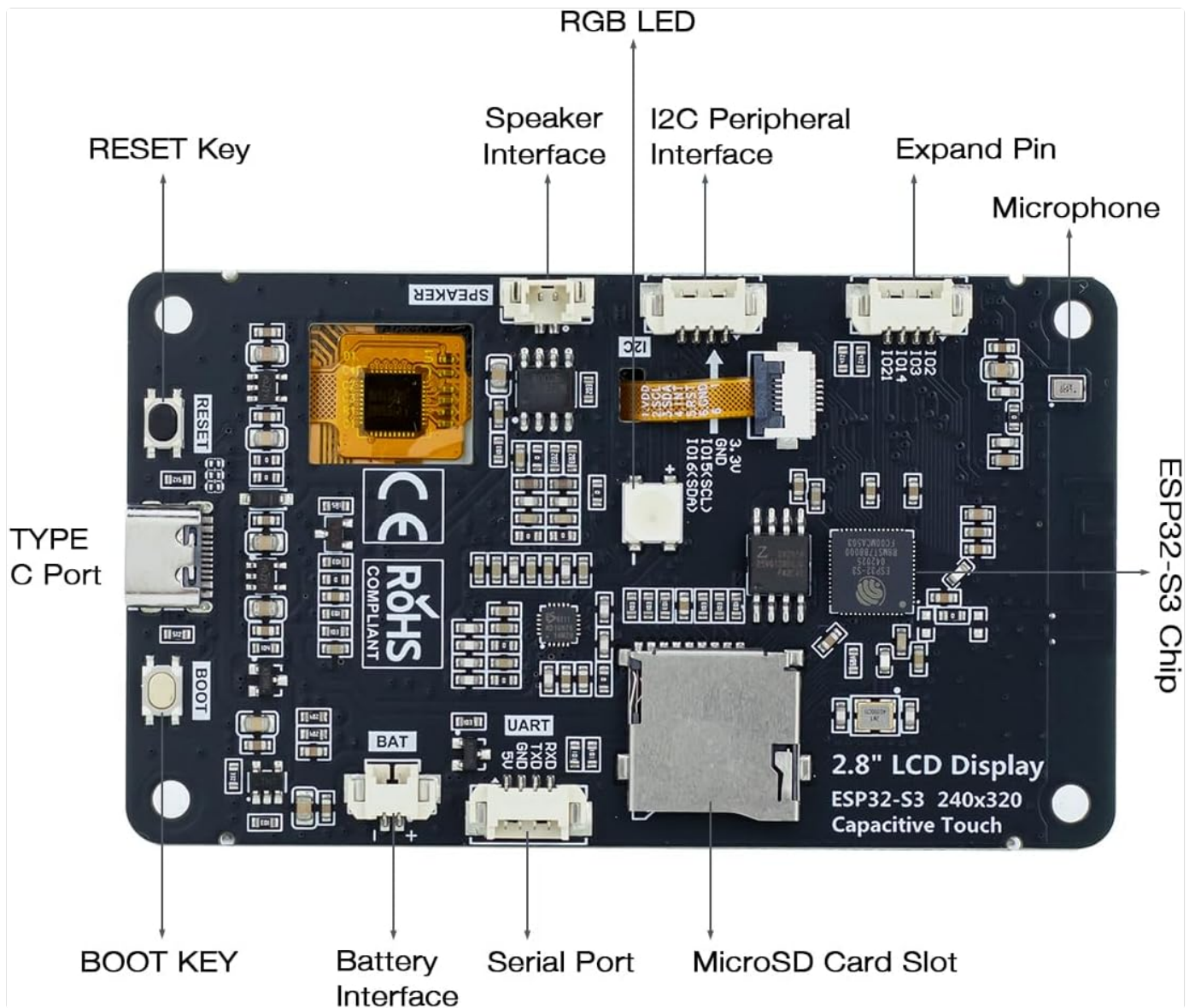


Image: Detailed back view of the module, showing the location of the ESP32-S3 chip, MicroSD card slot, USB Type-C port, and various interfaces.

- **ESP32-S3 Chip:** The main control unit for the display module and peripherals.
- **2.8" LCD Display:** 240x320 resolution, capacitive touch.
- **Type-C Port:** For power supply and program downloading.
- **RESET Key:** Resets the ESP32-S3 main control and LCD.
- **BOOT Key:** Used to enter download mode for flashing firmware.
- **Battery Interface:** 1.25mm 2P socket for 3.7V lithium battery connection and charging.
- **MicroSD Card Slot:** For expanding storage, useful for fonts, audio, and large data.
- **Speaker Interface:** 1.25mm 2P socket for connecting the included speaker (max 1.5W or 2W (4Ω) speaker).
- **Microphone:** Built-in for audio input.
- **RGB LED:** Single-line RGB three-color LED on GPIO 42 for status indication.
- **I2C Peripheral Interface:** 1.25mm 4P socket for external I2C communication.
- **Serial Port (UART):** 1.25mm 4P socket for serial port debugging, downloading, and communication.
- **Expand Pin:** 1.25mm 4P socket, bringing out GPIO2/3/14/21 for additional functionality.

Detailed and Rich Documents

2.8inch ESP32-S3 Touchscreen

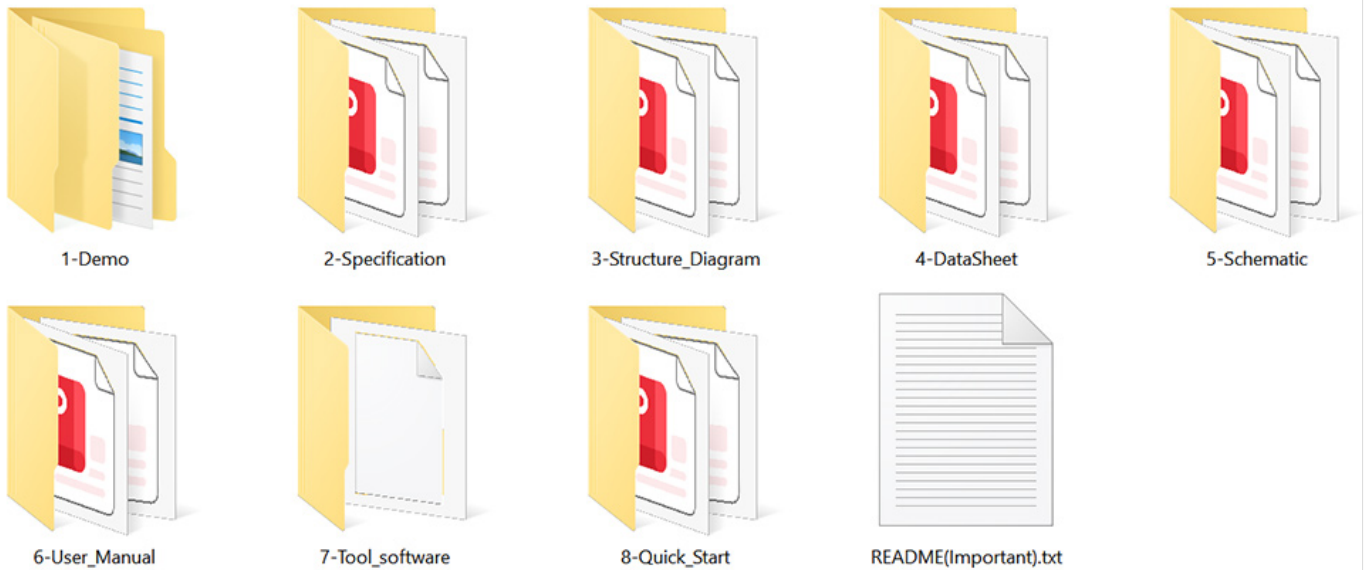


Image: Visual representation of the IPS display panel's features, including ESP32-S3 processor, capacitive touch, Wi-Fi, BLE, 262K color, and multiple interfaces.

SETUP GUIDE

1. Powering the Module:

- **USB-C Power:** Connect the provided USB-C cable to the module's Type-C port and to a computer or a 5V USB power adapter. This will power the module and allow for data communication.
- **Battery Power:** For portable applications, connect a 3.7V lithium battery to the battery interface (1.25mm 2P socket). The module includes a battery management circuit for safe charging and discharging.

2. Connecting Peripherals:

- **Speaker:** Connect the included speaker to the speaker interface (1.25mm 2P socket).
- **MicroSD Card:** Insert a MicroSD card into the dedicated slot for additional storage.
- **External Modules:** Use the I2C, UART, or Expand Pin interfaces to connect other sensors or modules as required by your project. Refer to the pinout diagram for specific GPIO assignments.

3. Software Development Environment:

The ESP32-S3 module is compatible with various development environments, including Arduino IDE, ESP-IDF, and PlatformIO. Hosyond provides sample programs and documentation online to assist with development.

- **Drivers:** Ensure necessary USB-to-serial drivers are installed on your computer. For ESP32-S3, native USB-CDC is used, but a boot delay might be needed for serial communication to initialize properly (e.g., `delay(3000)` after `Serial.begin()`).
- **Flashing Firmware:** To upload new firmware, connect the module via USB-C. Press and hold the **BOOT Key**, then press and release the **RESET Key**, and finally release the **BOOT Key** to enter download mode.

- **Libraries:** For display and touch functionality, libraries like TFT_eSPI and specific touch drivers (e.g., for FT6336G) are commonly used. Refer to Hosyond's official documentation for recommended libraries and configuration settings.

Your browser does not support the video tag.

Video: An overview of the Hosyond 2.8" Touchscreen with ESP32-S3 Module, demonstrating its features and potential applications. This video is provided by the seller.

OPERATION

Once programmed, the ESP32-S3 module operates according to the uploaded firmware. Here are general operational aspects:

- **Touchscreen Interaction:** The capacitive touchscreen allows for intuitive user input. Implement touch event handling in your code to respond to taps, swipes, and other gestures.
- **Display Output:** The 2.8-inch IPS LCD provides a clear visual interface for displaying data, graphics, and user interfaces.
- **Wireless Communication:** Utilize the integrated Wi-Fi and Bluetooth capabilities for network connectivity, data exchange, and communication with other devices.
- **Audio:** The built-in microphone can capture audio, and the connected speaker can play sound, enabling voice commands or audio feedback in your projects.
- **MicroSD Storage:** Access files stored on the MicroSD card for dynamic content display or data logging.

Product Interface Introduction

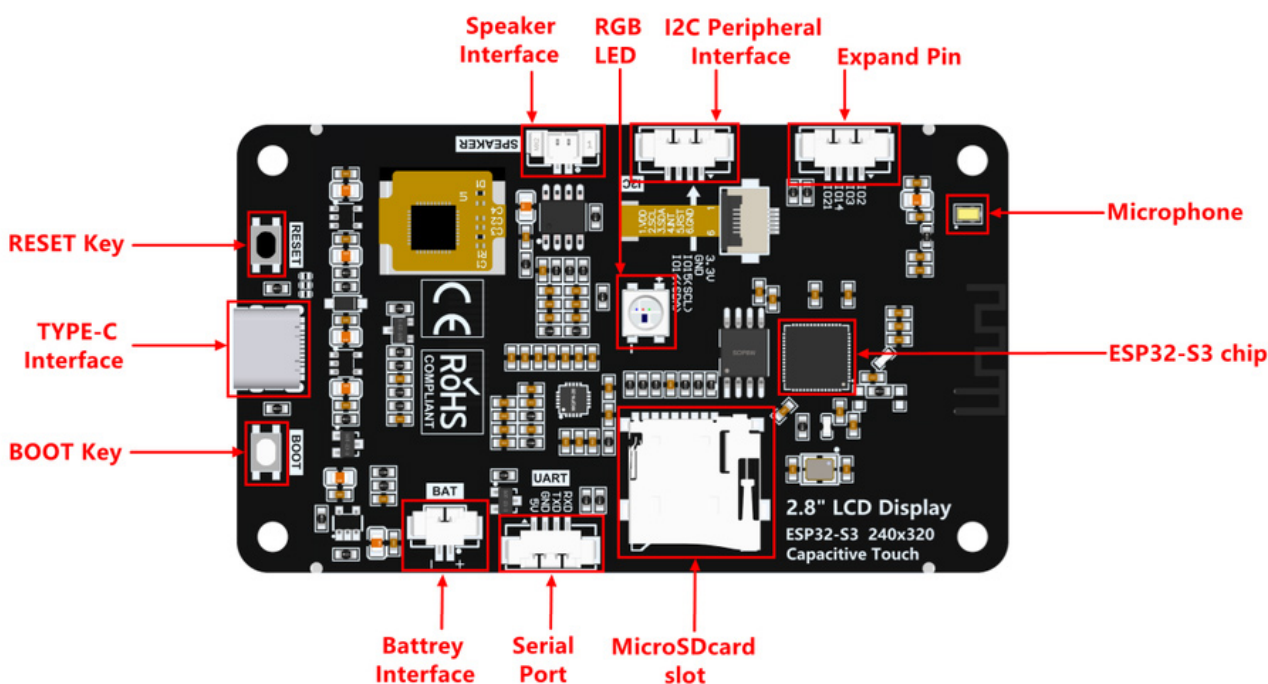


Image: Examples of application scenarios, including image and audio outputs, human-machine interfaces, and LVGL GUI development.

MAINTENANCE

To ensure the longevity and optimal performance of your Hosyond ESP32-S3 Touchscreen Module, follow these maintenance guidelines:

- **Cleaning:** Gently wipe the touchscreen with a soft, lint-free cloth. Avoid using abrasive cleaners or solvents that could damage the display or casing.
- **Storage:** Store the module in a dry, cool environment, away from direct sunlight and extreme temperatures.
- **Handling:** Handle the module by its edges to avoid touching sensitive components. Static electricity can damage electronic components, so use anti-static precautions when necessary.
- **Firmware Updates:** Regularly check for firmware updates or library improvements from Hosyond or the ESP32 community to benefit from new features and bug fixes.
- **Power Supply:** Use a stable 5V power supply. If using a battery, ensure it is a compatible 3.7V lithium battery and monitor its charge level.

TROUBLESHOOTING

If you encounter issues with your ESP32-S3 module, refer to the following common problems and solutions:

- **Module Not Detected by Computer:**
 - Ensure the USB-C cable is securely connected and is a data-capable cable.
 - Install the necessary USB-to-serial drivers for ESP32-S3 (if not automatically installed).
 - Try a different USB port or cable.
- **Firmware Upload Fails:**
 - Verify the module is in download mode: press and hold BOOT, then press and release RESET, then release BOOT.
 - Check your IDE settings for correct board selection (e.g., esp32-s3-devkitc-1 with 16MB flash and OPI PSRAM for PlatformIO).
 - Ensure correct build flags are set, especially for SPI and display inversion (e.g., -DUSE_FSPI_PORT=1, -DTFT_INVERSION_ON=1).
- **Blank or Incorrect Display Output:**
 - Confirm display initialization code is correct for the ILI9341 driver.
 - Check pin mappings in your code against the module's pinout.
 - Ensure power supply is stable.
- **Touchscreen Unresponsive:**
 - Verify the I2C connection for the FT6336G capacitive touch controller.
 - Check I2C address (0x38) and pin assignments (SDA: GPIO 16, SCL: GPIO 15, INT: GPIO 21).
 - Ensure the touch library is correctly initialized and polling for events.
- **No Serial Output via USB-C:**
 - For ESP32-S3, native USB-CDC might require a delay after Serial.begin() (e.g., delay(3000)) and specific build flags (-DARDUINO_USB_MODE=1, -DARDUINO_USB_CDC_ON_BOOT=1).
 - Alternatively, use the UART port with an external UART-to-USB adapter for serial debugging.

For further assistance, consult the official Hosyond documentation and community forums for ESP32-S3 development.

TECHNICAL SPECIFICATIONS

Below are the detailed technical specifications for the Hosyond ESP32-S3 2.8-inch Touchscreen Module:

Feature	Parameter
Module	ESP32-S3
CPU	Xtensa LX7 32-bit dual-core processor
Clock Rate	Up to 240 MHz
Memory	384KB ROM + 512KB SRAM + 16KB RTC SRAM + 8MB internal OPI PSRAM + 16MB external SPI Flash
Wi-Fi	2.4GHz, 802.11b/g/n mode
Bluetooth	Bluetooth V5.0 BR/EDR and Bluetooth LE standard
Operation Voltage	3.0~3.6V
Effective Area Size	2.8 inches
Touch Screen Type	Capacitive touch screen
Valid Area	240x320 pixels
Drive IC	D-FT6336G
Visual Area	45.20(W) x 59.45(H) mm
Interface	IIC (for touch), SPI (for display)
Operating Temperature	-30 to 80 (°C)
Storage Temperature	-30 to 80 (°C)
Power Operation Voltage	5.0V (USB-C)
Backlight Current	79mA
Backlight Brightness (actual value)	Touch screen: 230cd/m², Touchless screen: 270cd/m²
Total Current (Display works only)	ESP32-S3 reset: 0.7A, Display, speaker, battery charging all work: 2.8A
UPC	712490971738
ASIN	B0FKG7WRWV



Image: Physical dimensions of the module: 8.1 cm (3.19 inches) in height and 5 cm (1.97 inches) in width.

Pin Parameters:

Device	Pin	Pin parameters
LCD	IO10	LCD screen chip select control signal, low level active
	IO46	LCD command/data select control signal; High level: data; low level: command.
	IO12	LCD SPI bus clock signal
	IO11	LCD SPI bus write data signal
	IO13	LCD SPI bus read data signal
	RST	LCD reset control signal, low level reset (share reset pin with ESP32-S3 main control)
	IO45	LCD backlight control signal (high level to turn on backlight, low level to turn off backlight)
Touch Screen	IO16	Capacitive touch screen I2C bus data signal
	IO15	Capacitive touch screen I2C bus clock signal
	IO18	Capacitive touch screen reset control signal, low level reset
	IO17	Capacitive touch screen interrupt input signal, low level input when a touch event occurs.
RGB	IO42	Single-line RGB three-color LED light, which can control the internal red, green, and blue three kinds of light beads separately according to different signals
MicroSD	IO38	SD card SDIO bus clock signal
	IO40	SD card SDIO bus command signal
	IO39/41/48/47	SD card SDIO bus data signals (DATA0~DATA3 four data lines)
Audio	IO1	Audio output enable signal, low level enable, high level disable
	IO4	Audio I2S bus master clock signal
	IO5	Audio I2S bus bit clock signal
	IO6	Audio I2S bus bit output data signal
	IO7	Audio I2S bus left and right channel selection signal. High level: right channel; low level: left channel.
	IO8	Audio I2S bus bit input data signal
Key	IO0	Download mode selection key (hold this key to power on, then release to enter download mode)
	EN	ESP32-s3 reset button, low level reset (share with LCD reset)
Uart	RXD0(IO43)	ESP32-S3 UART0 RX signal
	TXD0(IO44)	ESP32-S3 UART0 TX signal
BATTERY	IO9	Battery voltage ADC value acquisition input signal
Expand pin	IO2	Can be used as a normal IO
	IO3	Can be used as a normal IO
	IO14	Can be used as a normal IO
	IO21	Can be used as a normal IO
IIC interface	IO16	I2C bus data signal
	IO15	I2C bus clock signal

Image: Detailed table outlining the pin assignments for LCD, Touch Screen, RGB, MicroSD, Audio, Key, Uart, Battery, and Expand pins.

WARRANTY AND SUPPORT

Warranty Information:

This product is provided without an explicit warranty. Please refer to the retailer's return policy for details on returns or exchanges.

Technical Support:

For technical assistance, detailed documentation, sample code, and community support, please refer to the official Hosyond website or relevant ESP32-S3 developer forums. The manufacturer provides technical support for low-level drivers and WIKI materials are updated online. You can often find valuable information and solutions from the broader ESP32 development community.

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Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

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