

ESP32-S3 Gold Edition

16 MB flash, 8 MB PSRAM and two USB-C sockets. The pins, the sockets, and the setting that tells them apart.

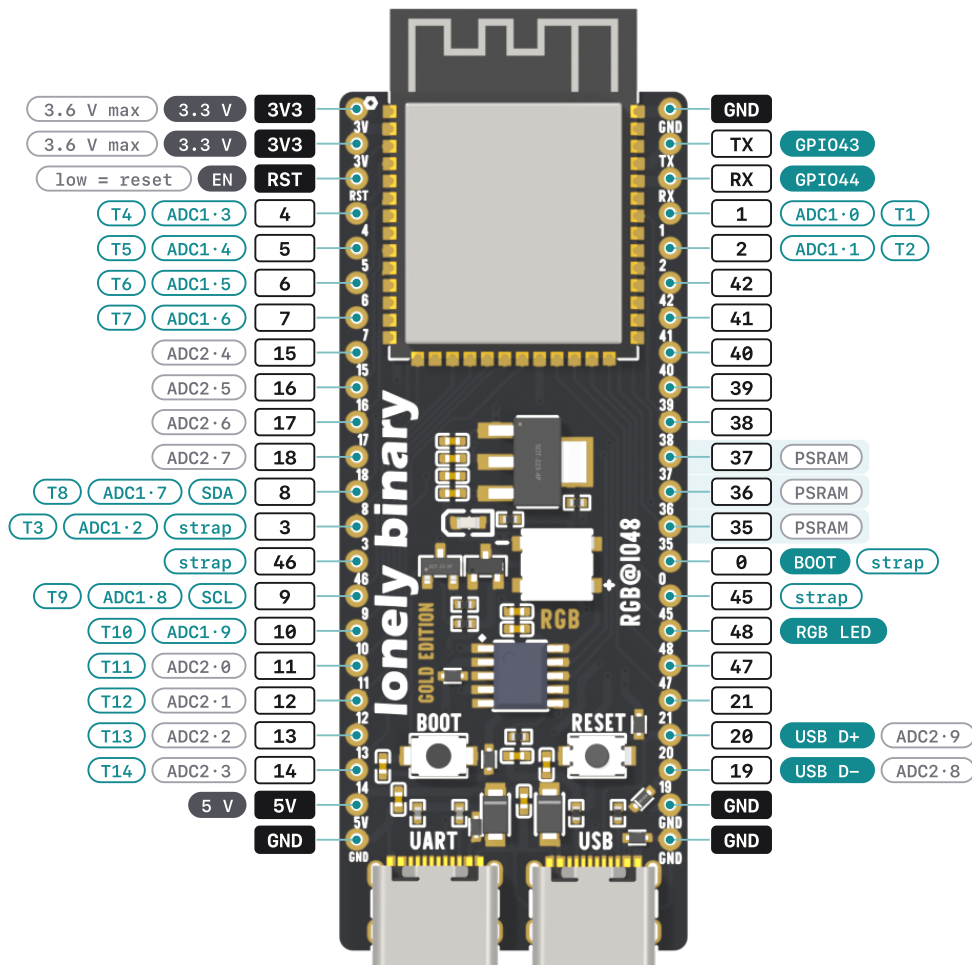


3.3 V logic

No GPIO takes 5 V, and the 3V3 pin takes 3.6 V at most. A lithium cell reads 4.2 V charged: feed it to 5V, never to 3V3.

44 holes, as printed on the top

Antenna up, USB-C sockets down. The back prints the same names, mirrored.



BOOT Already used by this board

PSRAM Taken by the 8 MB PSRAM. Leave free

strap Read at reset. Keep quiet at power-up

ADC1·3 Analog input, works with Wi-Fi on

ADC2·0 Analog input, stops once Wi-Fi starts

T4 Capacitive touch channel

Two sockets, one setting

UART, left

CH340K USB-to-serial bridge chip

USB CDC On Boot: Disabled

The bridge owns this port, so it survives a reset or a crash. The boot log always comes out here.

USB, right

Native the S3's own USB, GPIO 19 and 20

USB CDC On Boot: Enabled

Your sketch creates this port, so a reset, deep sleep or crash takes it away.

Empty Serial Monitor?

Check USB CDC On Boot first. It must match the socket the cable is in, and it is compiled into the sketch, so upload again after changing it.

Out of the box the two sockets share no 5 V rail, so a USB device on the USB socket gets data and no power. The solder pad J1 on the back joins them.

First sketch: the RGB LED

Install FastLED by Daniel Garcia from the Library Manager first.

```
#include <FastLED.h>    // FastLED by Daniel Garcia
#define LED_PIN    48    // printed on the board as RGB@IO48
#define NUM_LEDS    1
#define BRIGHTNESS    40    // 0-255; 255 is hard to look at
CRGB leds[NUM_LEDS];

void setup() {
    FastLED.addLeds<WS2812, LED_PIN, GRB>(leds, NUM_LEDS); // GRB
    FastLED.setBrightness(BRIGHTNESS);
    FastLED.clear();
    FastLED.show();
}

void flash(CRGB colour) {
    leds[0] = colour;
    FastLED.show();           // nothing changes until show()
    delay(1000);
    leds[0] = CRGB::Black;
    FastLED.show();
    delay(400);
}

void loop() {
    flash(CRGB::Red);
    flash(CRGB::Green);
    flash(CRGB::Blue);
}
```

red · green · blue, one second each
What the LED beside the regulator should do. Red showing green means RGB where the sketch says GRB.

When it does not work

The upload succeeds and Serial Monitor stays empty

USB CDC On Boot does not match the socket. Enabled on USB, Disabled on UART, then upload again.

It printed flash 4 MB, PSRAM 0 MB

Both are menu rows, not hardware. Set Flash Size to 16MB, the 16M partition scheme, and PSRAM to OPI PSRAM.

Nothing lights up when it is plugged in

Almost always a charge-only cable. Try one that has moved a file, then try the other socket.

Three ways to power it

INTO	WHAT HAPPENS	WATCH FOR
Either USB-C	5 V from the cable, through a Schottky diode per socket, to the AMS1117-3.3	The 5V pin then reads about 4.6 V. Normal
5V pin	Straight into the AMS1117-3.3, which burns everything above 3.3 V as heat	Not a Vin pin: above about 5.5 V the extra is only heat
3V3 pin	Past the regulator, straight onto the module	3.6 V at most, and nothing on the board protects it

Specifications

Module	ESP32-S3-WROOM-1 (N16R8)	CPU	dual-core Xtensa LX7, up to 240 MHz
Memory	16 MB flash · 8 MB octal PSRAM · 512 kB SRAM	Radio	2.4 GHz Wi-Fi and Bluetooth LE
USB	2 × USB-C: CH340K bridge, and native USB	RGB LED	WS2812B on GPIO 48
Header	2 × 22 holes, 2.54 mm pitch, rows 22.86 mm apart	Board	62.74 × 25.40 mm, 1.6 mm thick; AMS1117-3.3

Arduino IDE settings

TOOLS MENU	SET TO
Board	ESP32S3 Dev Module
USB CDC On Boot	Enabled on USB · Disabled on UART
Flash Size	16MB (128Mb)
Flash Mode	QIO 80MHz
Partition Scheme	16M Flash (3MB APP/9.9MB FATFS)
PSRAM	OPI PSRAM
Upload Mode	UART0 / Hardware CDC
USB Mode	Hardware CDC and JTAG

Flash Size, Partition Scheme and PSRAM move together. Left at their defaults, the board reports 4 MB of flash and no PSRAM at all.

Failed to connect: No serial data received

The chip never entered download mode. Hold BOOT, tap RESET, keep holding BOOT a second longer, then upload.

The upload stops a few per cent in

A link problem, not a mode problem. Drop Upload Speed to 115200: a long or thin cable fails at 921600.

The USB port vanishes on every reset

Expected: the sketch creates that port. Debug anything that crashes on the UART socket, which stays up.