

ESP32-S3 Expansion Base

Two strips of 2.54 mm pins down each edge, on the same nets, and the standard 15-way display plug.

✗ Seat the board first, plug the cable in second

The ESP32-S3 fits end for end as well, and that way its 3.3 V output lands on the base's ground: a short across the regulator. Its two USB sockets go over the two boxes printed USB.

The base



Pin 1 of each strip is at the display plug. The two strips on an edge are the same copper hole for hole: use whichever your wire end fits.

The strips, top to bottom

Left 3V3 GND 4 5 6 7 15 16 17 18 8 3 9 10 11 12 13 14 GND 3V3

Right 3V3 5V GND GND 1 2 42 41 40 39 38 48 47 21 20 19 GND GND 5V 3V3

28 of the 36 GPIOs come out, each twice. Not brought out: 0, 35, 36, 37, 43, 44, 45, 46 and RST. GPIO 19 and 20 are the native USB port.

The display plug: contact to GPIO

#	SIGNAL	ESP32-S3	WHAT IT DOES
1	GND	GND	ground
2	3V3	3V3	the display's supply, 3.3 volts
3	BL	GPIO 41	backlight: the lamp behind the glass
4	RST	GPIO 42	reset: a clean start for the controller
5	DC	GPIO 2	data or command: says what the byte on the wire is
6	MISO	GPIO 13	data back from the display; a write-only panel leaves it unused
7	SCK	GPIO 12	the SPI clock
8	MOSI	GPIO 11	the pixels and commands, out to the display
9	CS	GPIO 10	chip select: this display is the one being addressed
10	D2	GPIO 1	spare, a TFT panel leaves it unused
11	D3	GPIO 15	spare, a TFT panel leaves it unused
12	D4	GPIO 7	spare, a TFT panel leaves it unused
13	D5	GPIO 4	spare, a TFT panel leaves it unused
14	D6	GPIO 6	spare, a TFT panel leaves it unused
15	D7	GPIO 5	spare, a TFT panel leaves it unused

Any Lonely Binary display with the 15-way ribbon plugs straight in: contacts 1 to 9 are in the same order on every one. The back of the board prints contacts 10 and 11 as 20 and 22; the wiring above is right. A screen drives its GPIOs, so keep a sensor off the same holes.

Power comes from the ESP32-S3

There is no regulator on the base. Every 3V3 hole is the plugged-in board's own 3.3 V output, at both ends of each strip. 5V is on the right strips only, the board's 5V pin, a little under 5 V while USB is plugged in. Ground is on both edges.

The first program, blink an LED on a strip

Arduino IDE · Board ESP32S3 Dev Module · USB CDC On Boot Enabled · Flash 16MB · PSRAM OPI PSRAM · Serial Monitor 115200 · one LED and a resistor

```
// ESP32-S3 Expansion Base: blink an LED on a strip.
//
// Wiring: GPIO 4 -> 330 ohm resistor -> LED long leg.
//         LED short leg -> GND.
// On the left strip GPIO 4 is the third hole from the display plug and
// GND the second, so the LED sits at the top of the edge.
//
// Arduino IDE, Tools menu:
//   Board           ESP32S3 Dev Module
//   USB CDC On Boot Enabled
//   Flash Size      16MB (128Mb)
//   PSRAM           OPI PSRAM
//   Serial Monitor   115200
// No library needed.

const int LED_PIN = 4;

void setup() {
  Serial.begin(115200);
  pinMode(LED_PIN, OUTPUT);
}

void loop() {
  digitalWrite(LED_PIN, HIGH);
  Serial.println("GPIO 4 high");
  delay(500);
  digitalWrite(LED_PIN, LOW);
  delay(500);
}
```

GPIO 4 high
The LED lights for half a second and goes dark for half a second. If it stays dark, turn the LED round: the long leg goes to the resistor.

When it does not work

The pin I need is not on any strip

0, 35, 36, 37, 43, 44, 45, 46 stop on the socket: PSRAM, serial and boot pins. Use one of the 28 that come out.

My jumper wire does not fit the strip

Two strips an edge, one copper. The outer strip is pins and the inner is a yellow socket: use the one your wire end suits.

A display and a wire on the same GPIO disagree

The display plug is wired to 13 strip holes. A fitted screen owns them: pick a GPIO it does not use.

Nothing lights, not even the red LED on the ESP32-S3

Unplug the cable. The USB sockets go over the two boxes printed USB. End for end, 3V3 lands on ground.

There is no 5V on the left edge

By design. 5V is on the right strips only, second and second-last hole. The left has 3V3 and GND.

A pin reads random values with nothing wired to it

No pull-ups here, so a free input floats. Make it an OUTPUT, or use INPUT_PULLUP.

Specifications

Fits	44-pin ESP32-S3, rows 22.86 mm apart	GPIOs at the edge	28, on two strips each
Strips	4 × 20-way, 2.54 mm	Dev board sockets	2 × 22-way, 2.54 mm
Display plug	15-way FPC, 1.0 mm	Active parts	none: no regulator, no LED
Mounting	4 holes, 4.8 mm	Size	48 × 72 mm, 10.1 mm tall