

ESP32-C3 Mini Development Board

Integrated 0.42" OLED Display, Wi-Fi 4 & Bluetooth 5 (LE)

TECHNICAL DATASHEET

Product Page: Otronic.nl

MCU: RISC-V ESP32-C3

Doc Rev: 1.0 (August 2026)

⚡ 32-bit RISC-V @ 160MHz • 🖥️ 0.42" OLED (SSD1306/I2C) • 📶 Wi-Fi 2.4GHz & BLE 5.0 •
💾 4MB Flash / 400KB SRAM • 🔌 USB-C Interface

BOARD OVERVIEW



Figure 1: Board Layout, Screen & Pinout

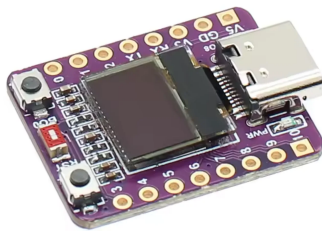


Figure 2: Isometric View (USB-C & Buttons)

KEY FEATURES

- Core SoC:** Espressif ESP32-C3 single-core 32-bit RISC-V CPU up to 160 MHz.
- Onboard Display:** Integrated 0.42-inch monochrome OLED (72x40 pixels effective).
- Wireless:** 2.4 GHz Wi-Fi (802.11 b/g/n) & Bluetooth 5 (LE) with onboard ceramic antenna.
- Form Factor:** Ultra-miniature 24.8mm × 20.5mm with 2.54mm (17.78mm / 700mil gap) breadboard layout.
- USB Interface:** USB-C connector for 5V power, serial debugging, and automated flashing.
- Controls & LEDs:** Onboard RST & BO0 buttons, User/Status LED (GPIO8), Power LED.

TECHNICAL SPECIFICATIONS

Microcontroller	ESP32-C3 RISC-V @ 160 MHz
Memory	4MB SPI Flash, 400KB SRAM, 384KB ROM
OLED Driver	SSD1306 (I2C Address: 0x3C)
OLED Resolution	72 × 40 px (Virtual Framebuffer 128x64)
OLED I2C Pins	SDA: GPIO 5 SCL: GPIO 6
Logic Voltage	3.3V Logic Level
Input Voltage	5V DC via USB-C or V5 Pin (3.3V–6V)
Power Draw	~200mA peak (Wi-Fi TX active)
User LED	Onboard LED on GPIO 8
ADC Channels	Up to 6x 12-bit SAR ADC channels
Interfaces	1x I2C, 1x SPI, 2x UART, 11x GPIO / PWM
Dimensions	24.8 mm × 20.5 mm (0.98" × 0.81")

PINOUT & IO ASSIGNMENT

Pin	GPIO	Primary Functions / Description
V5	—	5V IN USB / External 5V Power
GD	GND	GND Common System Ground
V3	3.3V	3.3V OUT Regulated Power Output
RX/TX	IO20 / IO21	UART0 Hardware Serial (RX0/TX0)
0, 1, 2	IO0, IO1, IO2	GPIO / ADC Digital IO, ADC1 Channels
3, 4	IO3, IO4	GPIO / ADC General Purpose IO / ADC
5, 6	IO5, IO6	I2C (OLED) SDA (IO5), SCL (IO6) for Display
7, 8, 9, 10	IO7 - IO10	GPIO / LED IO8 attached to Onboard Blue LED

ARDUINO IDE & U8G2 QUICK START GUIDE

```
// Sample Code using U8g2 Library for OLED
#include <Arduino.h>
#include <U8g2lib.h>

// U8g2 constructor for SSD1306 72x40 on GPIO 5 (SDA) &
// GPIO 6 (SCL)
U8G2_SSD1306_72X40_ER_F_HW_I2C u8g2(U8G2_R0,
U8X8_PIN_NONE, 6, 5);

void setup() {
  u8g2.begin();
  u8g2.clearBuffer();
  u8g2.setFont(u8g2_font_6x10_tf);
  u8g2.drawStr(0, 20, "ESP32-C3 OLED");
  u8g2.drawStr(0, 35, "Otronic.nl");
  u8g2.sendBuffer();
}

void loop() { }
```

Programming & Flashing Notes:

- **Boot Mode:** If code upload fails, press and hold the B00 button while connecting USB-C, then release to enter flashing mode. Press RST after flashing.
- **OLED Configuration:** Driven by SSD1306 via I2C. In Adafruit_SSD1306, apply an offset of (30, 12) for correct display alignment.
- **Arduino IDE Setup:** Select board ESP32C3 Dev Module or 01Space ESP32C3 OLED. Enable USB CDC On Boot for Serial printing over USB-C.