

ESP32 Wi-Fi & Bluetooth 0.96" OLED Board

Integrated ESP-WROOM-32, 0.96" SSD1306 OLED Display & 18650 Battery Holder

PRODUCT OVERVIEW

The **ESP32 OLED 18650 Development Board** is an all-in-one IoT prototyping platform. It combines the powerful dual-core ESP-WROOM-32 microcontroller with an integrated 0.96-inch monochrome OLED display (SSD1306) and a complete 18650 lithium battery management circuit.

Ideal for portable IoT devices, smart home sensors, wireless monitoring systems, and wearable projects requiring uninterrupted battery power and on-board visual status updates.

KEY FEATURES

- Core MCU:** ESP-WROOM-32 (240MHz dual-core, 520KB SRAM, 4MB Flash).
- Integrated Display:** 0.96" 128x64 Blue OLED driven via I2C (SSD1306).
- Power System:** Built-in 18650 single-cell holder with TP4056 charge control & protection.
- Wireless Connectivity:** 802.11 b/g/n Wi-Fi + Bluetooth v4.2 BR/EDR & BLE.
- USB Interface:** Micro-USB port for programming, serial communication, and battery charging.
- Controls & Indicators:** On/off slide switch, Reset (EN) & Boot buttons, LED indicators.

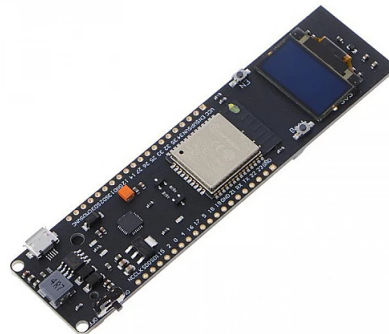


Figure 1: ESP32 OLED 18650 Development Board Overview

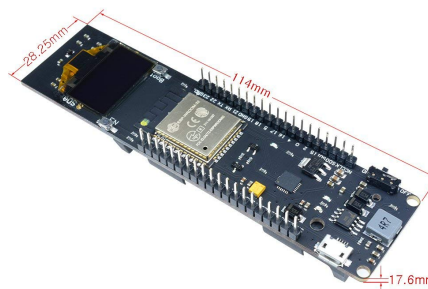


Figure 2: Mechanical Dimensions (114mm x 28.25mm x 17.6mm)

TECHNICAL SPECIFICATIONS

Microcontroller Module

ESP-WROOM-32 (Tensilica Xtensa 32-bit LX6 dual-core @ 240 MHz)

Wireless Protocols

Wi-Fi 802.11 b/g/n (up to 150 Mbps) & Bluetooth v4.2 / BLE

Display Specifications

0.96" Blue/Yellow-Blue OLED (128x64 resolution, SSD1306 driver)

Display I2C Pins

SDA: GPIO 5 | **SCL:** GPIO 4

Battery Compatibility

Standard 18650 Rechargeable Li-Ion Cell (3.7V nominal)

Charging Interface

Micro-USB (5V DC input), integrated charging status LEDs

Protection Circuits	Over-charge protection, over-discharge protection, polarity safety
Dimensions	114 mm (Length) x 28.25 mm (Width) x 17.6 mm (Height)
On-Board Interfaces	Boot Button, EN/Reset Button, Power ON/OFF Switch, Micro-USB

ESP32 OLED 18650 Board Pinout

PIN MAPPING & ASSIGNMENT

The board breaks out all major GPIOs, power rails (3.3V, 5V, GND), and analog inputs. Note that **GPIO 4 (SCL)** and **GPIO 5 (SDA)** are internally connected to the 0.96" OLED display.

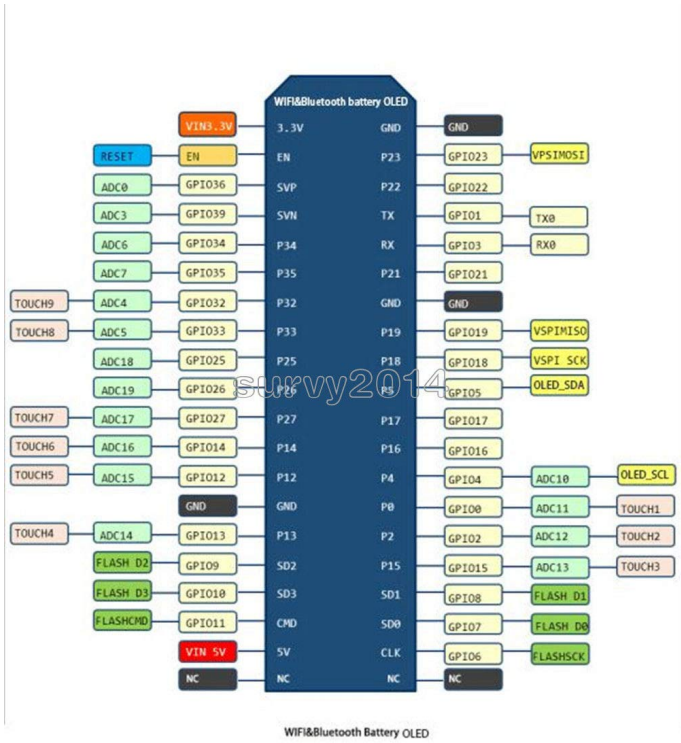


Figure 3: Detailed Pinout & GPIO Functional Mapping Diagram

POWERING & BATTERY MANAGEMENT GUIDELINES

Battery Installation	Ensure correct polarity when inserting the 18650 battery (+ and - markings on the holder).
Charging Status	Red LED indicates active charging via Micro-USB. Green/Blue LED indicates charge complete.
Power Switch	Controls power from the battery to the ESP32 and peripheral bus rails.
Output Voltage Rails	Provides stabilized 3.3V and 5V output pins for powering external sensors and modules.