

AITRIP EC1692140

AITRIP ESP32-DevKitC V4 Development Board User Manual

Model: EC1692140 | Brand: AITRIP

1. INTRODUCTION

This manual provides essential information for getting started with the AITRIP ESP32-DevKitC V4 development board. The ESP32-DevKitC V4 is a compact, ESP32-based development board designed by Espressif, featuring the ESP32-WROOM-32D module. It is engineered for a wide range of applications, offering reliability and scalability. Most of its I/O pins are exposed via pin headers, facilitating easy interfacing with external components or breadboards.

This package includes three ESP32-WROOM-32D modules, providing multiple units for various projects or replacements.

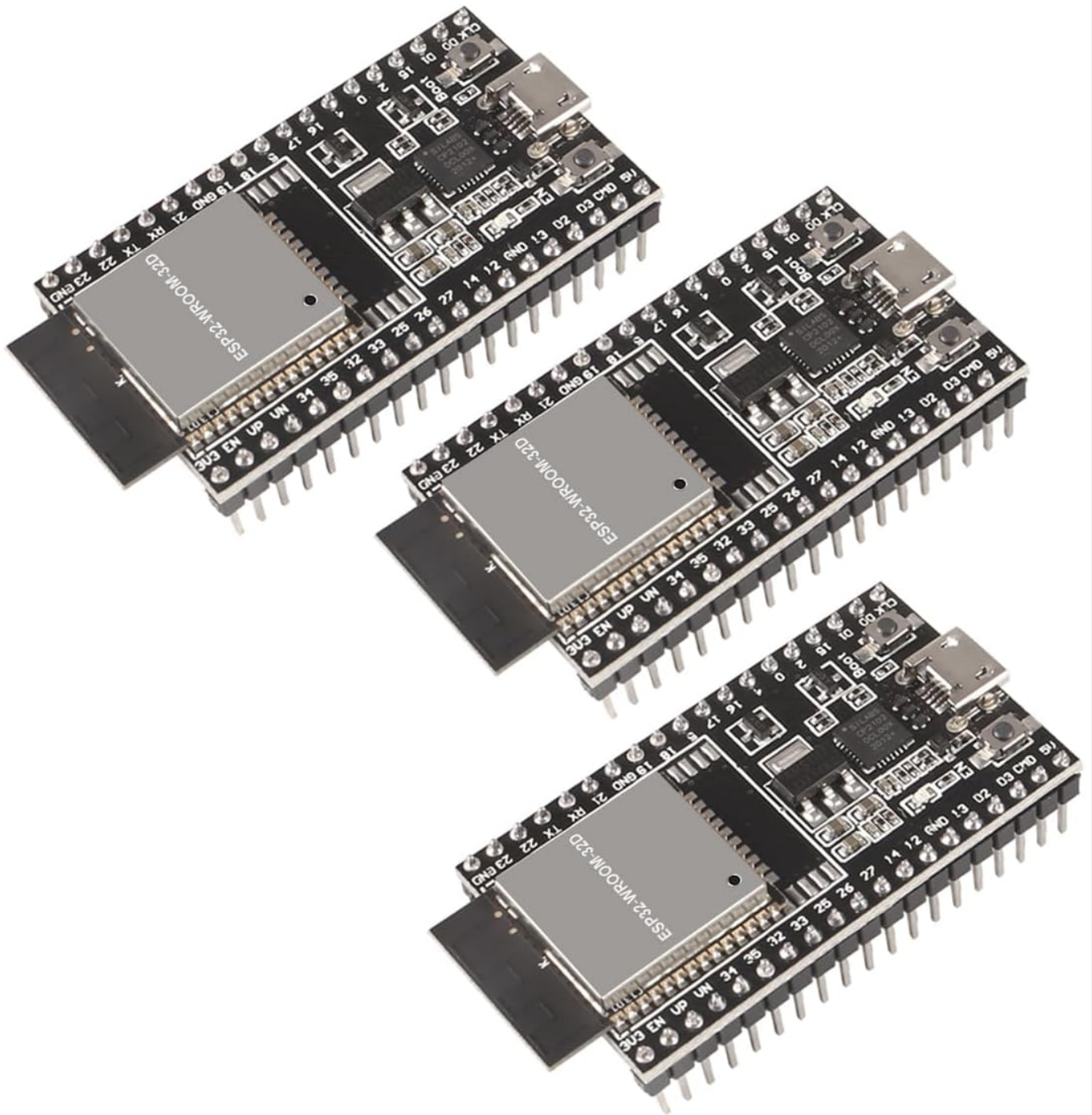


Figure 1: Three AITRIP ESP32-DevKitC V4 development boards, showcasing the compact design and multiple units included in the package.

2. WHAT YOU NEED

To begin using your ESP32-DevKitC V4 board, ensure you have the following items:

- ESP32-DevKitC V4 board (included in this package)
- USB A to Micro USB B cable
- Computer running Windows, Linux, or macOS operating system

3. OVERVIEW OF ESP32-DevKitC V4

The ESP32-DevKitC V4 is a versatile development board. Its design allows developers to easily connect peripherals using jumper wires or mount the board on a breadboard for prototyping. The board integrates the ESP32-WROOM-32D module, which provides Wi-Fi and Bluetooth connectivity, along with a powerful dual-core processor.

3.1 Board Components

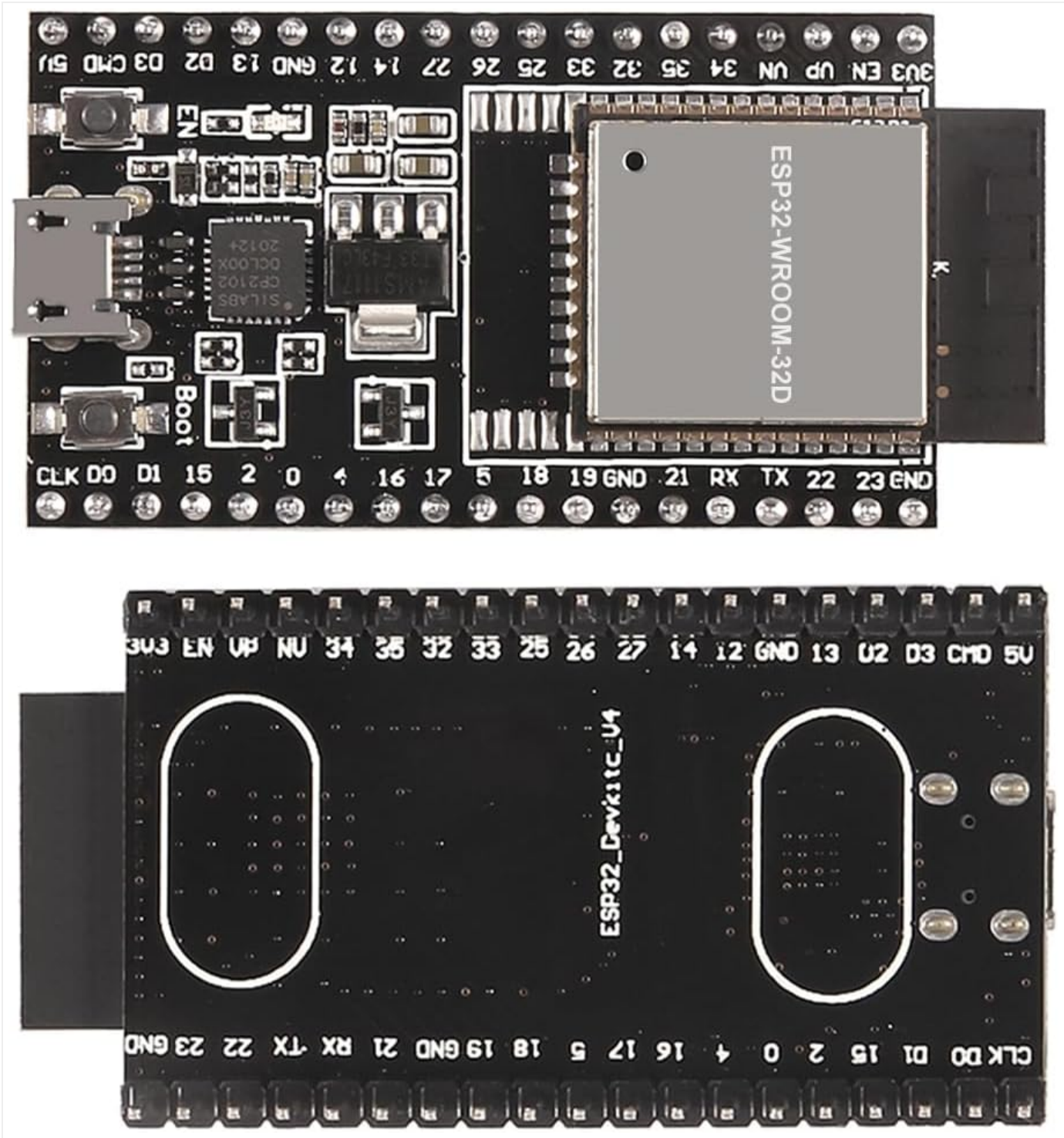


Figure 2: Top and bottom view of the ESP32-DevKitC V4 board, highlighting the ESP32-WROOM-32D module, USB port, and pin headers.

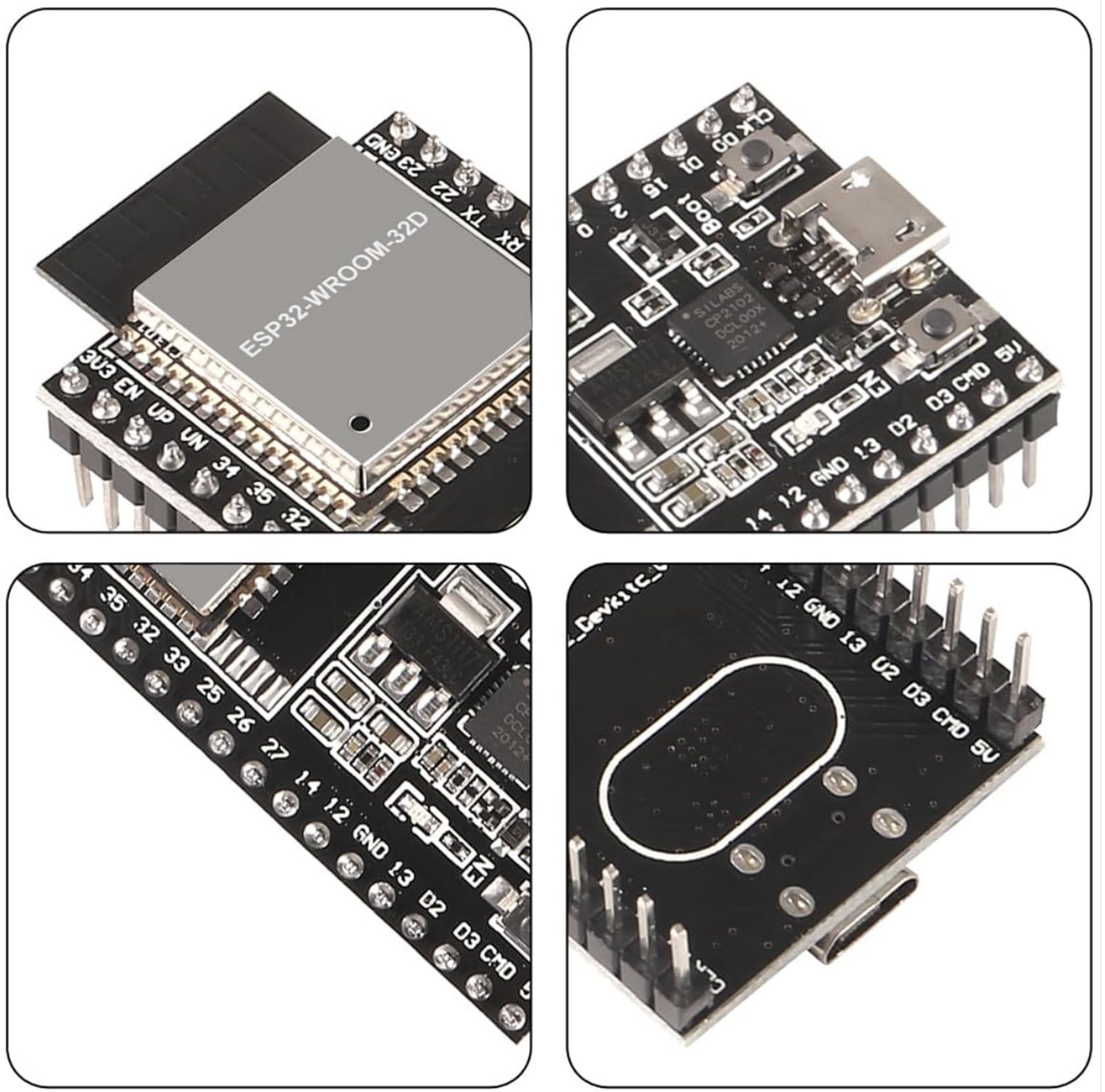


Figure 3: Detailed close-up views of key components on the ESP32-DevKitC V4 board, including the ESP32-WROOM-32D module, micro-USB port, and various integrated circuits.

3.2 Pinout Diagram

Understanding the pinout is crucial for connecting peripherals and utilizing the board's full capabilities. The diagram below illustrates the function of each pin.

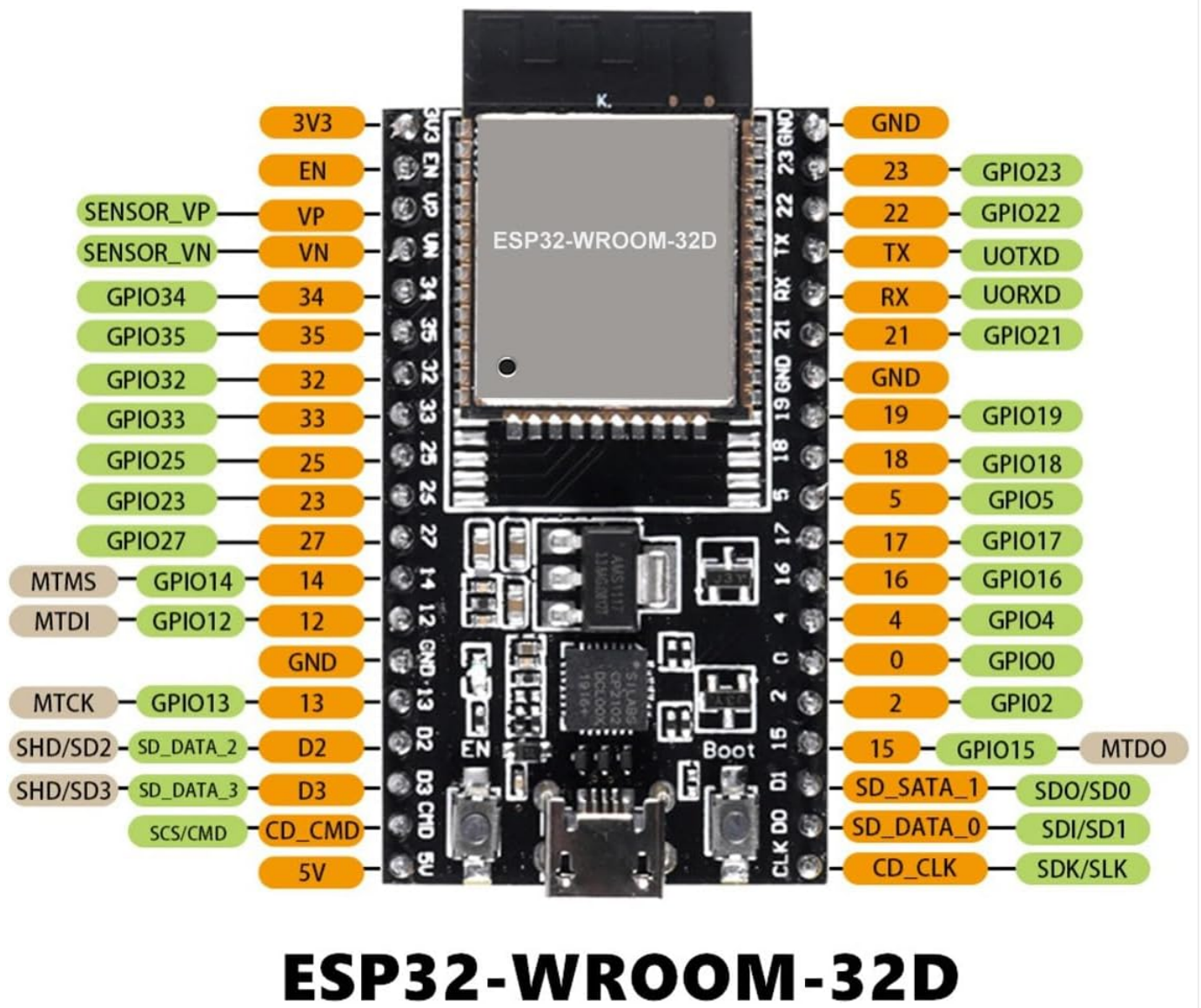


Figure 4: Comprehensive pinout diagram for the ESP32-DevKitC V4 board with ESP32-WROOM-32D, labeling all GPIO pins, power pins, and special function pins.

4. SETUP AND GETTING STARTED

4.1 Connecting the Board

1. Connect one end of the Micro USB B cable to the Micro USB port on the ESP32-DevKitC V4 board.
2. Connect the other end of the USB A cable to an available USB port on your computer.
3. The board should power on, indicated by a power LED (if present).

4.2 Software Setup (Arduino IDE)

The ESP32-DevKitC V4 is compatible with the Arduino IDE, offering a familiar development environment. Follow these steps to set up your development environment:

1. **Install Arduino IDE:** Download and install the latest version of the Arduino IDE from the official Arduino website (www.arduino.cc/en/software).
2. **Install ESP32 Board Support:** Follow the instructions on the Espressif GitHub page or a reliable tutorial (e.g., Random Nerd Tutorials) to add ESP32 board support to your Arduino IDE. This typically involves adding a URL to the Board Manager URLs in preferences and then installing the ESP32 boards package.
3. **Install USB-to-Serial Driver (CP2102):** These boards use the CP2102 USB-to-Serial bridge. You may need to download and install the appropriate CP2102 driver for your operating system (Windows, Linux, macOS) from the

Silicon Labs website (www.silabs.com/developers/usb-to-uart-bridge-vcp-drivers). Without this driver, your computer may not recognize the board as a serial port.

4. **Select Board and Port:** In the Arduino IDE, go to **Tools > Board** and select the appropriate ESP32 Dev Module. Then, go to **Tools > Port** and select the serial port corresponding to your connected ESP32 board.

4.3 Uploading Code (Flashing Mode)

To upload your sketch to the ESP32 board, it needs to be in flashing mode. This can typically be achieved by:

- **Automatic Mode:** For many setups, the Arduino IDE can automatically put the board into flashing mode. Simply click the 'Upload' button.
- **Manual Mode:** If automatic upload fails, you may need to manually enter flashing mode. Press and hold the **BOOT** button, then press the **EN** (Enable/Reset) button briefly, and then release the **BOOT** button. The board should now be in flashing mode, ready to receive code.

5. OPERATING PRINCIPLES

The ESP32-DevKitC V4 operates on 3.3V logic. When interfacing with other components, ensure voltage compatibility to prevent damage. The board offers ultra-low power consumption, making it suitable for battery-powered applications. It supports various communication protocols and can be programmed for a wide array of IoT and embedded projects.

6. TECHNICAL SPECIFICATIONS

Below are the key technical specifications for the AITRIP ESP32-DevKitC V4 board with ESP32-WROOM-32D module:

Feature	Specification
Model Name	ESP32-DevKitC core Board
Item Model Number	EC1692140
Processor	Espressif (Dual-core)
RAM	LPDDR (Integrated with ESP32 module)
Wireless Type	802.11b (Wi-Fi)
Connectivity Technology	USB
Operating System Compatibility	Windows, Linux, macOS
Item Weight	1.13 ounces (approx. 32g)
Package Dimensions	4.8 x 3.43 x 0.91 inches

6.1 Physical Dimensions

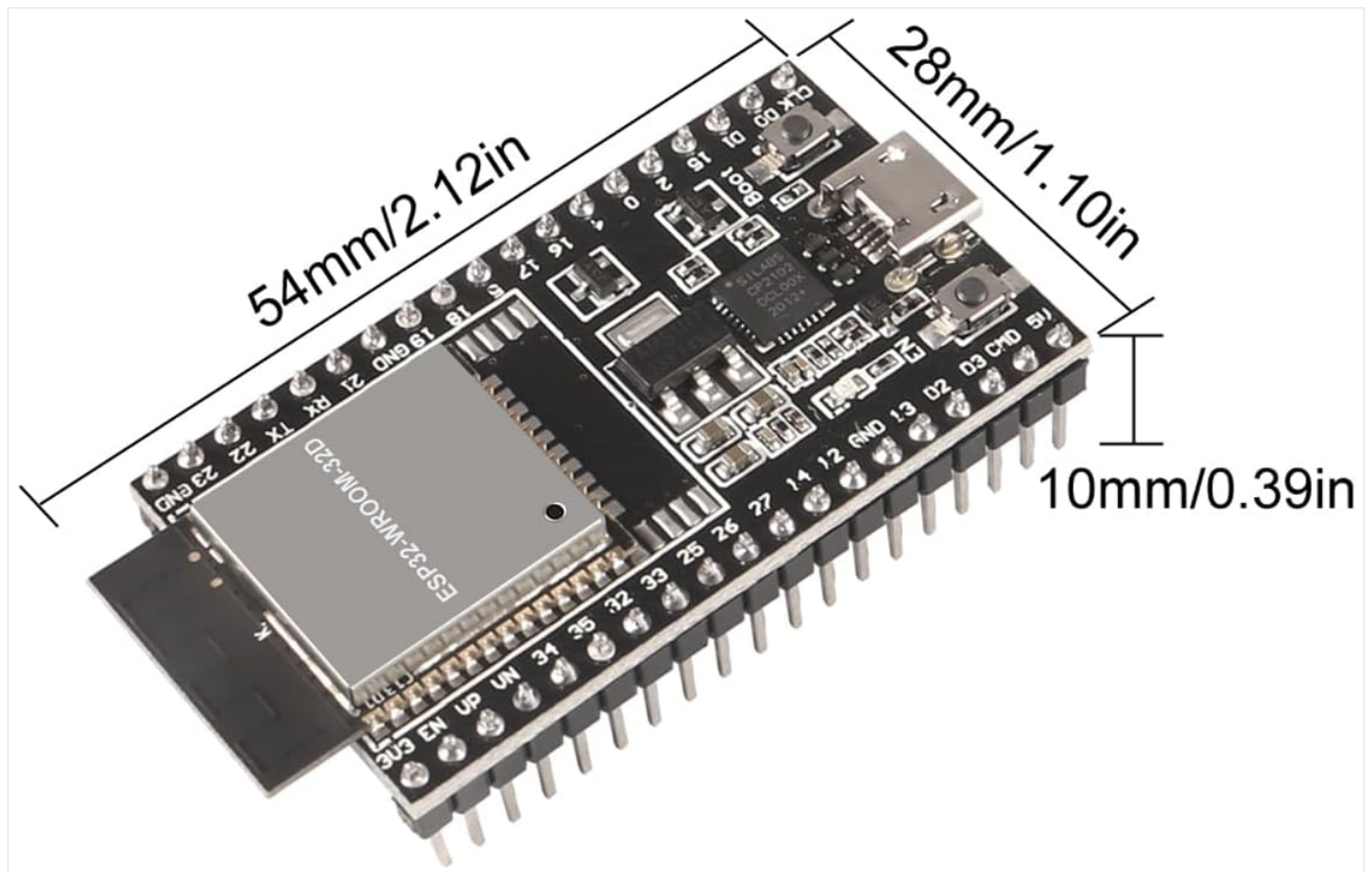


Figure 5: Dimensional drawing of the ESP32-DevKitC V4 board, indicating its length (54mm/2.12in), width (28mm/1.10in), and height (10mm/0.39in).

7. MAINTENANCE

The ESP32-DevKitC V4 board requires minimal maintenance. Keep the board clean and free from dust and moisture. Avoid exposing it to extreme temperatures or static electricity. When not in use, store the boards in their original anti-static bags to protect them from electrostatic discharge.

8. TROUBLESHOOTING

This section addresses common issues you might encounter while using the ESP32-DevKitC V4 board.

8.1 Board Not Recognized by Computer

- **Driver Installation:** Ensure the correct CP2102 USB-to-Serial driver is installed for your operating system. Refer to Section 4.2 for driver download information.
- **USB Port Conflict:** If you use multiple types of development boards (e.g., those with CH340 drivers), there might be conflicts. Try connecting the ESP32-DevKitC V4 to a different USB port or ensure only one type of board is connected at a time.
- **Cable Check:** Verify that the USB cable is functional and securely connected to both the board and the computer.

8.2 Upload Errors in Arduino IDE

- **Incorrect Board/Port Selection:** Double-check that you have selected the correct ESP32 Dev Module and the corresponding serial port under **Tools** in the Arduino IDE.
- **Flashing Mode:** Ensure the board is in flashing mode before attempting to upload. Refer to Section 4.3 for instructions on entering flashing mode.
- **RX/TX Pin Configuration (for external programmers):** If using an external FT232TTL programmer, ensure the RX and TX pins are crossed (FT232TTL RX to ESP32 TX, FT232TTL TX to ESP32 RX). Also, ensure 3.3V and GND connections are correct.

- **I00 to GND for Flashing:** For some specific scenarios or older boards, temporarily connecting GPIO0 to GND during power-up or reset can force the board into programming mode. Remove this connection after flashing.

8.3 No Onboard User LED

Please note that the AITRIP ESP32-DevKitC V4 modules typically do not include an onboard user-addressable LED. If your project requires an indicator LED, you will need to connect an external LED with an appropriate current-limiting resistor to a GPIO pin.

8.4 WLED Firmware Issues

Some users have reported power cycling issues when using specific firmware like WLED on certain variants of this board. If you encounter such problems, consult the WLED community forums or consider alternative firmware versions.

9. WARRANTY AND SUPPORT

For technical support, additional documentation, or warranty inquiries, please refer to the official AITRIP support channels or the Espressif Systems website for comprehensive technical information regarding the ESP32 platform.

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