

## Espressif ESP32-C6-DevKitC-1-N8

# ESP32-C6-DevKitC-1-N8 Development Board User Manual

Model: ESP32-C6-DevKitC-1-N8

## 1. PRODUCT OVERVIEW

The ESP32-C6-DevKitC-1-N8 is a general-purpose development board designed by Espressif, based on the ESP32-C6-WROOM-1 module. This board exposes all ESP32-C6 pins, facilitating easy connection and use for various development projects. Most I/O pins are broken out to pin headers on both sides, allowing developers to connect peripherals using jumper wires or mount the board on a breadboard.

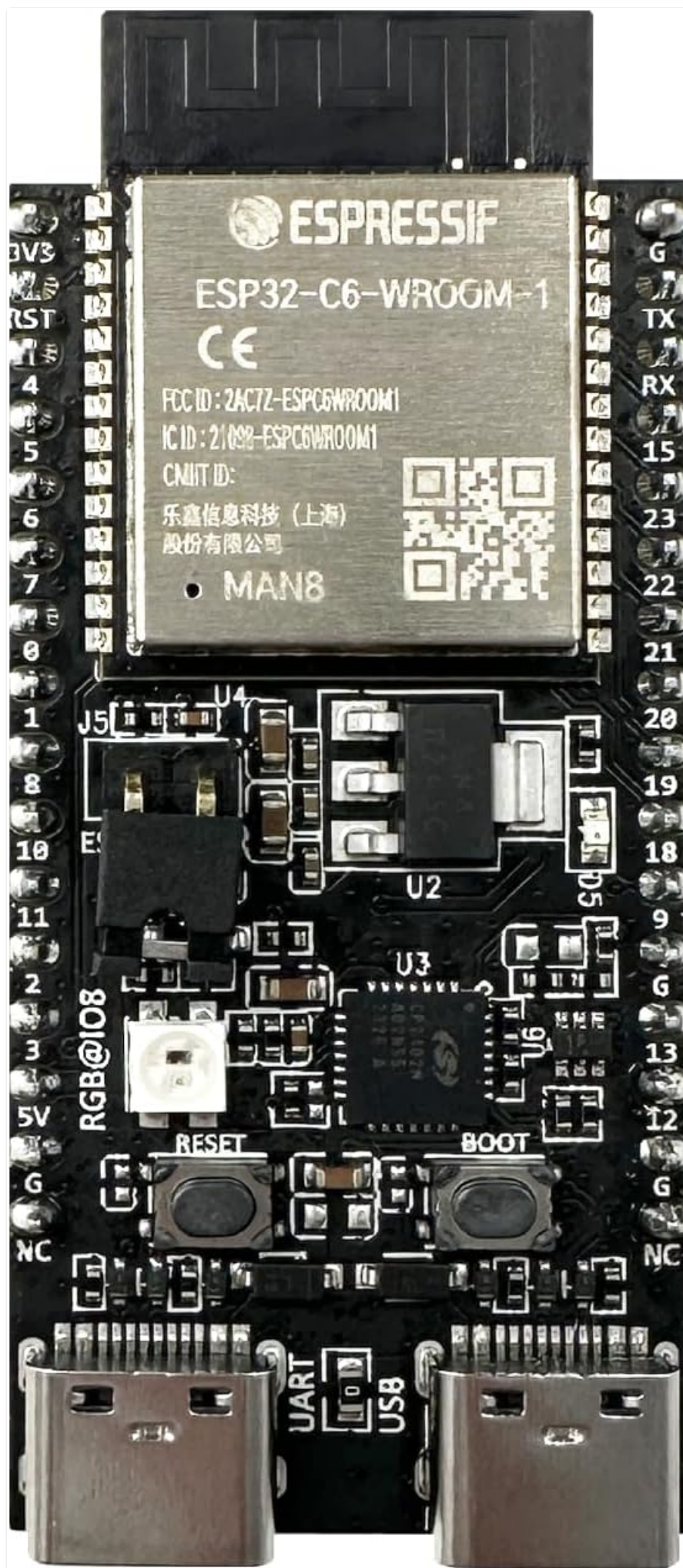


Figure 1: ESP32-C6-DevKitC-1-N8 Development Board. This image displays the top view of the development board. Key

components visible include the ESPRESSIF ESP32-C6-WROOM-1 module with its FCC ID and IC ID. The board features pin headers along both long edges, labeled with pin numbers (e.g., 3V3, RST, G, TX, RX, 1-15, 18-23). An RGB LED is present near pin 8, labeled "RGB@IO8". Two buttons, "RESET" and "BOOT", are located near the bottom center. The board also includes two USB-C ports, labeled "UART" and "USB", at the bottom. Various integrated circuits (U2, U3) and passive components are distributed across the board.

## 2. SETUP GUIDE

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To begin using your ESP32-C6-DevKitC-1-N8 Development Board, follow these steps:

1. **Connect to PC:** Use a USB-C cable to connect the board to your computer via the USB port. The board supports PC connectivity via USB.
2. **Driver Installation:** Ensure necessary USB-to-UART bridge drivers are installed on your operating system. For macOS, Silicon Labs drivers are often required and can be found on their official website.
3. **Software Development Kit (SDK):** Download and install the Espressif IoT Development Framework (ESP-IDF). This SDK provides the necessary tools, libraries, and examples for developing applications for the ESP32-C6. Alternatively, the Arduino IDE with appropriate board support can be used for development.
4. **Power Supply:** The board is typically powered via the USB connection. Ensure your USB port provides sufficient power.

## 3. OPERATING INSTRUCTIONS

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The ESP32-C6-DevKitC-1-N8 is a versatile development platform. Here are general guidelines for operation:

- **Programming:** Upload your compiled firmware to the board using the ESP-IDF tools or the Arduino IDE. The board features a 32-bit RISC-V MCU.
- **Wireless Communication:** Utilize the integrated 2.4 GHz Wi-Fi 6, Bluetooth 5 (LE), and IEEE 802.15.4 capabilities for wireless connectivity in your projects.
- **GPIO Usage:** Connect external sensors, actuators, and other peripherals to the exposed I/O pins. Refer to the official ESP32-C6 datasheet and DevKitC-1 schematic for detailed pinout information.
- **Reset and Boot Buttons:** The "RESET" button restarts the board. The "BOOT" button, often used in conjunction with the "RESET" button, puts the chip into download mode for flashing new firmware.
- **Operating System:** The board typically runs FreeRTOS, a real-time operating system, which is integrated into the ESP-IDF.

## 4. MAINTENANCE

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Proper care and maintenance will ensure the longevity and reliable operation of your development board:

- **Handling:** Always handle the board by its edges to avoid touching sensitive components and to prevent electrostatic discharge (ESD).
- **Storage:** Store the board in a dry, cool environment, away from direct sunlight and extreme temperatures. Use anti-static bags if available.
- **Cleaning:** If necessary, gently clean the board with a soft, dry brush or compressed air to remove dust. Avoid using liquids or abrasive materials.
- **Power Off:** Disconnect power before making any physical connections or disconnections to the board.

## 5. TROUBLESHOOTING

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If you encounter issues with your ESP32-C6-DevKitC-1-N8, consider the following common troubleshooting steps:

- **Board Not Detected:**
  - Verify USB cable connection.
  - Ensure USB-to-UART drivers are correctly installed for your operating system.
  - Try a different USB port or cable.
- **Firmware Upload Issues:**
  - For Arduino IDE users, some versions may require switching to a legacy bootloader version for successful code uploads. Consult online forums or Espressif documentation for specific instructions.
  - Ensure the board is in download mode (often by holding the BOOT button while pressing and releasing RESET, then releasing BOOT).
  - Check your development environment settings (e.g., correct COM port, board selection).
- **Unexpected Behavior:**
  - Review your code for logical errors.
  - Check power supply stability.
  - Ensure all connections to peripherals are secure and correct.

For comprehensive technical documentation, including schematics and detailed pinouts, please refer to the official Espressif website by searching for "ESP32-C6-DevKitC-1" documentation.

## 6. TECHNICAL SPECIFICATIONS

Feature	Detail
Model Name	ESP32-C6-DevKitC-1-N8
Processor	32-bit RISC-V MCU
Wireless Connectivity	2.4 GHz Wi-Fi 6 (802.11ax), Bluetooth 5 (LE), IEEE 802.15.4
RAM	PSRAM
Flash Memory	8 MB (Note: Exact Flash size may vary, refer to product description)
Operating System	FreeRTOS
PC Connectivity	USB
Item Weight	1.44 ounces
Product Dimensions	3 x 15 x 14 inches
Manufacturer	Espressif
Country of Origin	China



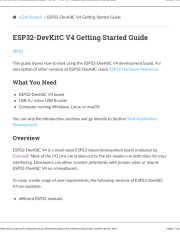
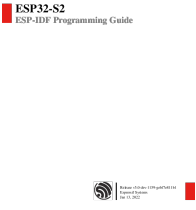
## 7. WARRANTY AND SUPPORT

For any business or technical questions regarding the ESP32-C6-DevKitC-1-N8 Development Board, please

contact Espressif Systems directly.

- **Technical Support:** For detailed technical inquiries or assistance with development, please reach out to [sales@espressif.com](mailto:sales@espressif.com).
- **Official Documentation:** Comprehensive documentation, including datasheets, schematics, and programming guides, can be found on the official Espressif website.
- **Manufacturer:** Espressif Systems

Related Documents - ESP32-C6-DevKitC-1-N8

	<p><a href="#">Espressif ESP32-C6-DevKitC-1 v1.2 Development Board User Guide</a></p> <p>Comprehensive user guide for the Espressif ESP32-C6-DevKitC-1 v1.2 development board. Learn about its features, hardware components, setup, and application development for Wi-Fi, Bluetooth LE, Zigbee, and Thread.</p>
	<p><a href="#">Espressif ESP-Dev-Kits: Supported Development Boards Guide</a></p> <p>Explore Espressif's range of ESP-Dev-Kits, detailing supported development boards, their features, hardware specifications, and getting started guides for engineers and developers. Includes information on ESP32 series, HMI kits, touch sensors, and development tools.</p>
	<p><a href="#">ESP32-DevKitC V4 Getting Started Guide   Espressif</a></p> <p>A comprehensive guide to getting started with the ESP32-DevKitC V4 development board from Espressif. Learn about its features, components, and pinouts for easy interfacing and application development.</p>
	<p><a href="#">ESP32-S2 ESP-IDF Programming Guide</a></p> <p>Comprehensive guide for developing IoT applications with the ESP32-S2 microcontroller using Espressif's IoT Development Framework (ESP-IDF). Covers setup, API references, and best practices.</p>

<div data-bbox="140 114 288 302"><p>ESP32-C3-DevKitM-1</p><p>This user guide will help you get started with ESP32-C3-DevKitM-1 and will also provide you with some background.</p><p>ESP32-C3-DevKitM-1 is a mini module containing a System on Chip (SOC) ESP32-C3, a USB-to-UART bridge, and a USB-to-UART bridge.</p><p>Based on the V1 pinout, the ESP32-C3-DevKitM-1 module can be used to develop applications for Wi-Fi and Bluetooth LE projects.</p><p>ESP32-C3-DevKitM-1</p><p>The document is located at the following page address:</p></div>	<p><a href="#">ESP32-C3-DevKitM-1 Development Board User Guide   Espressif</a></p> <p>Comprehensive user guide for the Espressif ESP32-C3-DevKitM-1 development board, covering hardware setup, component descriptions, pinouts, and related documentation for Wi-Fi and Bluetooth LE projects.</p>
<div data-bbox="140 407 288 539"><p>ESP32-P4-Function-EV-Board</p><p>This user guide will help you get started with ESP32-P4-Function-EV-Board and will also provide you with some background.</p><p>ESP32-P4-Function-EV-Board is a mini module containing a System on Chip (SOC) ESP32-P4, a USB-to-UART bridge, and a USB-to-UART bridge.</p><p>Based on the V1 pinout, the ESP32-P4-Function-EV-Board module can be used to develop applications for Wi-Fi and Bluetooth LE projects.</p><p>ESP32-P4-Function-EV-Board</p><p>The document is located at the following page address:</p></div>	<p><a href="#">ESP32-P4-Function-EV-Board User Guide and Technical Overview</a></p> <p>Comprehensive user guide for the Espressif ESP32-P4-Function-EV-Board, detailing its features, components, hardware setup, and software development. Includes technical specifications and component descriptions.</p>