ESP32-C6-DevKitC-1 v1.2

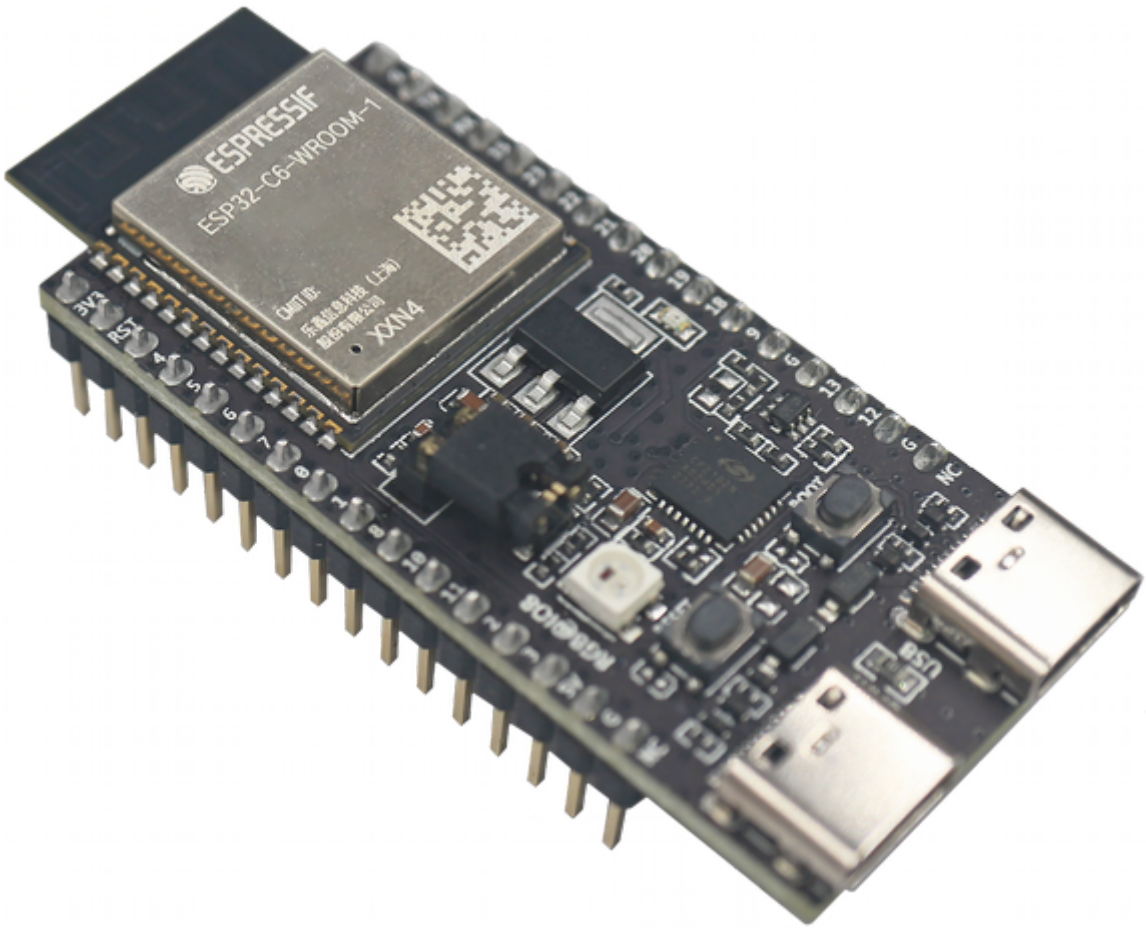
[中文]

The older version: ESP32-C6-DevKitC-1 v1.1

This user guide will help you get started with ESP32-C6-DevKitC-1 and will also provide more in-depth information.

ESP32-C6-DevKitC-1 is an entry-level development board based on ESP32-C6-WROOM-1(U), a general-purpose module with a 8 MB SPI flash. This board integrates complete Wi-Fi, Bluetooth LE, Zigbee, and Thread functions.

Most of the I/O pins are broken out to the pin headers on both sides for easy interfacing. Developers can either connect peripherals with jumper wires or mount ESP32-C6-DevKitC-1 on a breadboard.



ESP32-C6-DevKitC-1

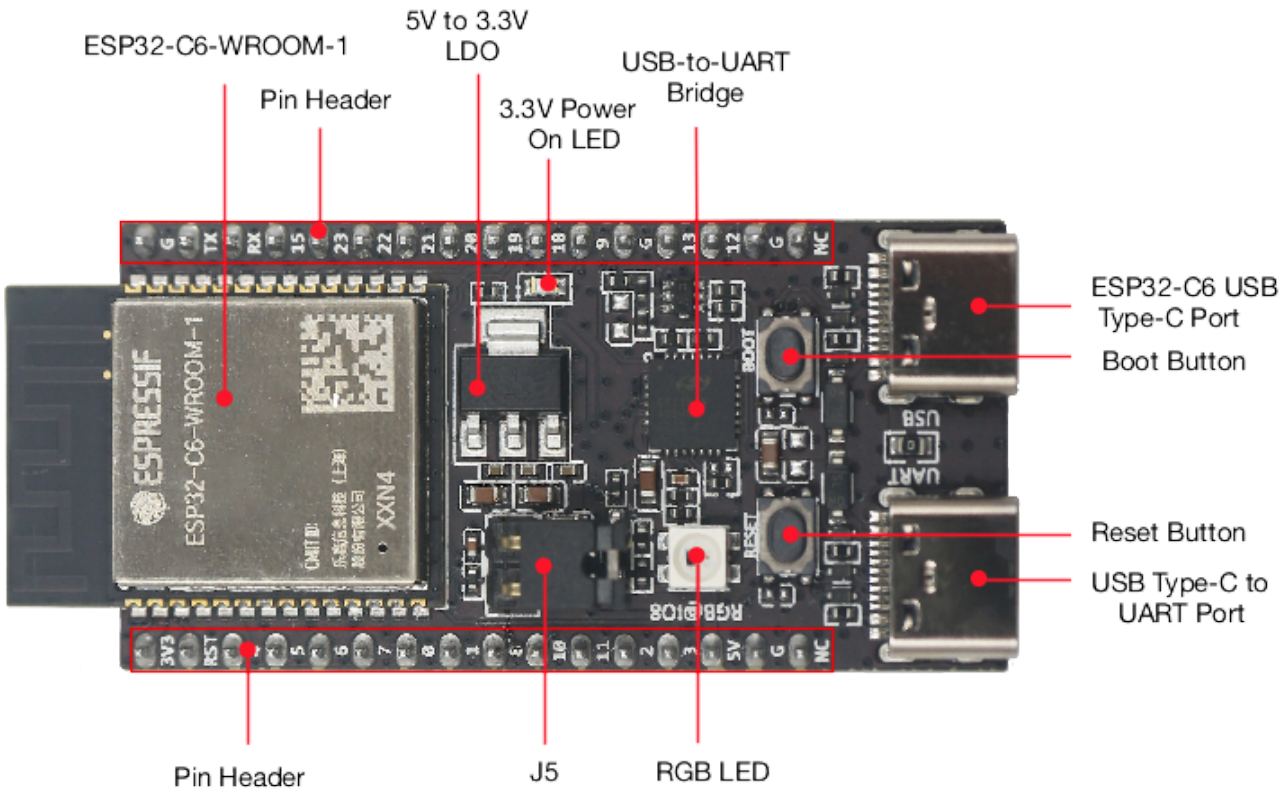
The document consists of the following major sections:

- Getting Started: Overview of ESP32-C6-DevKitC-1 and hardware/software setup instructions to get started.
- Hardware Reference: More detailed information about the ESP32-C6-DevKitC-1's hardware.
- Hardware Revision Details: Revision history, known issues, and links to user guides for previous versions (if any) of ESP32-C6-DevKitC-1.
- Related Documents: Links to related documentation.

Getting Started

This section provides a brief introduction of ESP32-C6-DevKitC-1, instructions on how to do the initial hardware setup and how to flash firmware onto it.

Description of Components



ESP32-C6-DevKitC-1 - front

The key components of the board are described in a clockwise direction.

Key Component	Description
ESP32-C6-WROOM-1 or ESP32-C6-WROOM-1U	ESP32-C6-WROOM-1 and ESP32-C6-WROC
Pin Header	All available GPIO pins (except for the SPI bus
5 V to 3.3 V LDO	Power regulator that converts a 5 V supply int
3.3 V Power On LED	Turns on when the USB power is connected t
USB-to-UART Bridge	Single USB-to-UART bridge chip provides tra

Key Component	Description
ESP32-C6 USB Type-C Port	The USB Type-C port on the ESP32-C6 chip c
Boot Button	Download button. Holding down **Boot** and th
Reset Button	Press this button to restart the system.
USB Type-C to UART Port	Used for power supply to the board, for flashi
RGB LED	Addressable RGB LED, driven by GPIO8.
J5	Used for current measurement. See details in

Start Application Development

Before powering up your ESP32-C6-DevKitC-1, please make sure that it is in good condition with no obvious signs of damage.

Required Hardware

- ESP32-C6-DevKitC-1
- USB-A to USB-C cable
- Computer running Windows, Linux, or macOS

Note

Be sure to use a good quality USB cable. Some cables are for charging only and do not provide the needed data lines nor work for programming the boards.

Software Setup

Please proceed to ESP-IDF Get Started, which will quickly help you set up the development environment then flash an application example onto your board.

Contents and Packaging

Retail orders

If you order a few samples, each ESP32-C6-DevKitC-1 comes in an individual package in either antistatic bag or any packaging depending on your retailer.

For retail orders, please go to https://www.espressif.com/en/company/contact/buy-a-sample.

Wholesale Orders

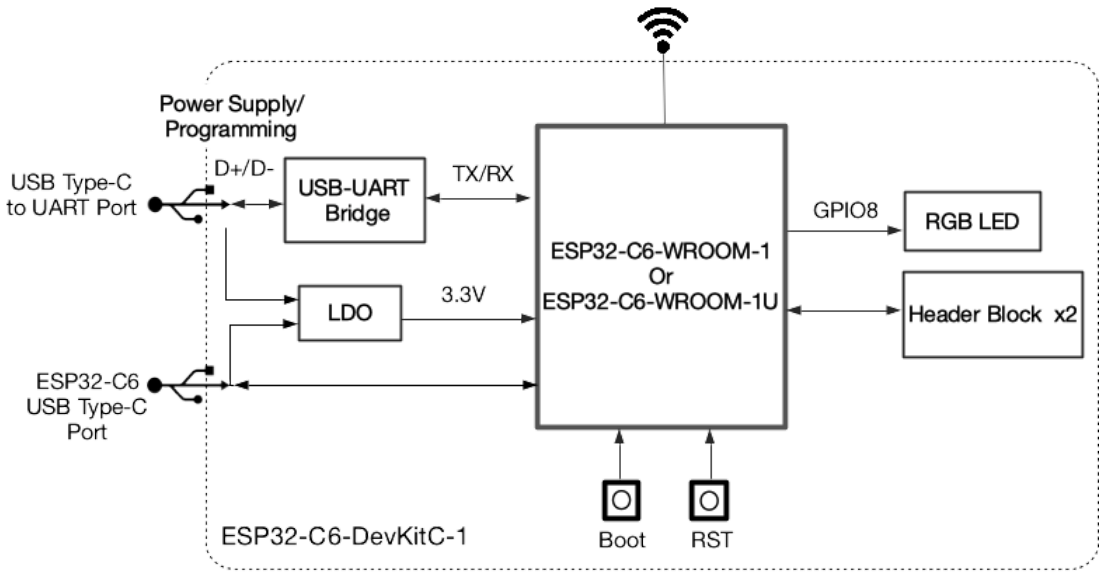
If you order in bulk, the boards come in large cardboard boxes.

For wholesale orders, please check Espressif Product Ordering Information (PDF)

Hardware Reference

Block Diagram

The block diagram below shows the components of ESP32-C6-DevKitC-1 and their interconnections.



ESP32-C6-DevKitC-1 (click to enlarge)

Power Supply Options

There are three mutually exclusive ways to provide power to the board:

- USB Type-C to UART Port and ESP32-C6 USB Type-C Port (either one or both), default power supply (recommended)
- 5V and GND pin headers
- 3V3 and GND pin headers

Current Measurement

The J5 headers on ESP32-C6-DevKitC-1 (see J5 in Figure ESP32-C6-DevKitC-1 - front) can be used for measuring the current drawn by the ESP32-C6-WROOM-1(U) module:

- Remove the jumper: Power supply between the module and peripherals on the board is cut off. To measure the module's current, connect the board with an ammeter via J5 headers.
- Apply the jumper (factory default): Restore the board's normal functionality.

Note

When using 3V3 and GND pin headers to power the board, please remove the J5 jumper, and connect an ammeter in series to the external circuit to measure the module's current.

Header Block

The two tables below provide the **Name** and **Function** of the pin headers on both sides of the board (J1 and J3). The pin header names are shown in Figure ESP32-C6-DevKitC-1 - front. The numbering is the same as in the ESP32-C6-DevKitC-1 Schematic (PDF).

J1

No.	Name	Type [1]	Function
1	3V3	P	3.3 V power supply
2	RST	I	High: enables the chip; Low: disables the chip.
3	4	I/O/T	MTMS [3], GPIO4, LP_GPIO4, LP_UART_RXD, ADC1_CH4, FSPIHD
4	5	I/O/T	MTDI [3], GPIO5, LP_GPIO5, LP_UART_TXD, ADC1_CH5, FSPIWP
5	6	I/O/T	MTCK, GPIO6, LP_GPIO6, LP_I2C_SDA, ADC1_CH6, FSPICLK
6	7	I/O/T	MTDO, GPIO7, LP_GPIO7, LP_I2C_SCL, FSPID
7	0	I/O/T	GPIO0, XTAL_32K_P, LP_GPIO0, LP_UART_DTRN, ADC1_CH0
8	1	I/O/T	GPIO1, XTAL_32K_N, LP_GPIO1, LP_UART_DSRN, ADC1_CH1
9	8	I/O/T	GPIO8 [2] [3]
10	10	I/O/T	GPIO10
11	11	I/O/T	GPIO11
12	2	I/O/T	GPIO2, LP_GPIO2, LP_UART_RTSN, ADC1_CH2, FSPIQ
13	3	I/O/T	GPIO3, LP_GPIO3, LP_UART_CTSN, ADC1_CH3
14	5V	P	5 V power supply
15	G	G	Ground
16	NC	–	No connection

J3

No.	Name	Type	Function
1	G	G	Ground
2	TX	I/O/T	U0TXD, GPIO16, FSPICS0
3	RX	I/O/T	U0RXD, GPIO17, FSPICS1
4	15	I/O/T	GPIO15 [3]

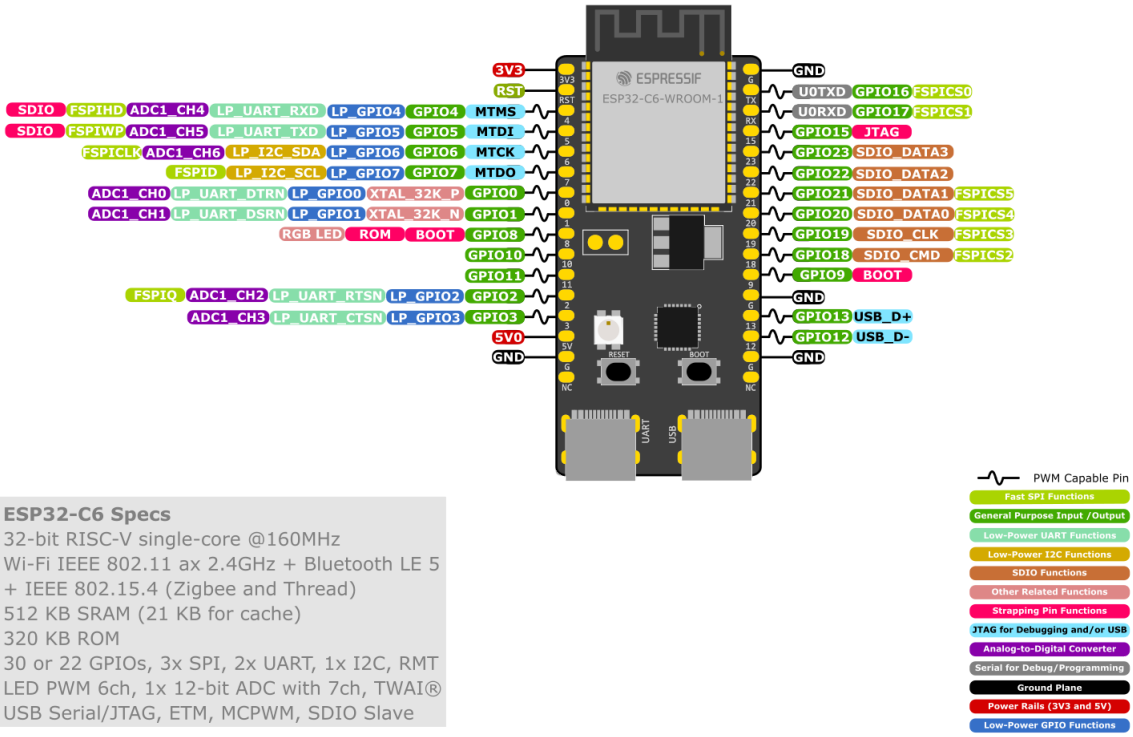
No.	Name	Type	Function
5	23	I/O/T	GPIO23, SDIO_DATA3
6	22	I/O/T	GPIO22, SDIO_DATA2
7	21	I/O/T	GPIO21, SDIO_DATA1, FSPICS5
8	20	I/O/T	GPIO20, SDIO_DATA0, FSPICS4
9	19	I/O/T	GPIO19, SDIO_CLK, FSPICS3
10	18	I/O/T	GPIO18, SDIO_CMD, FSPICS2
11	9	I/O/T	GPIO9 [3]
12	G	G	Ground
13	13	I/O/T	GPIO13, USB_D+
14	12	I/O/T	GPIO12, USB_D-
15	G	G	Ground
16	NC	–	No connection

[1] : P: Power supply; I: Input; O: Output; T: High impedance.

[2] : Used to drive the RGB LED.

[3] (1,2,3,4,5): MTMS, MTDI, GPIO8, GPIO9, and GPIO15 are strapping pins of the ESP32-C6 chip. These pins are used to control several chip functions depending on binary voltage values applied to the pins during chip power-up or system reset. For description and application of the strapping pins, please refer to ESP32-C6 Datasheet > Section *Strapping Pins*.

Pin Layout



ESP32-C6 Specs
32-bit RISC-V single-core @160MHz
Wi-Fi IEEE 802.11 ax 2.4GHz + Bluetooth LE 5 + IEEE 802.15.4 (Zigbee and Thread)
512 KB SRAM (21 KB for cache)
320 KB ROM
30 or 22 GPIOs, 3x SPI, 2x UART, 1x I2C, RMT
LED PWM 6ch, 1x 12-bit ADC with 7ch, TWAI®
USB Serial/JTAG, ETM, MCPWM, SDIO Slave

ESP32-C6-DevKitC-1 Pin Layout (click to enlarge)

Hardware Revision Details

ESP32-C6-DevKitC-1 v1.2

- For boards with the PW number of and after PW-2023-02-0139 (on and after February 2023), J5 is changed from straight headers to curved headers.
- For boards with the PW number of and after PW-2023-07-XXXX (on and after July 2023), multi-point calibration is performed on ADC instead of two-point calibration, and the measurement range and accuracy are illustrated in ESP32-C6 Datasheet > Section ADC Characteristics. For boards with eariler PW number, please ask our sales team to provide the actual range and accuracy according to batch.

Note

The PW number can be found in the product label on the large cardboard boxes for wholesale orders.

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Initial release

Related Documents

- ESP32-C6 Datasheet (PDF)

- ESP32-C6-WROOM-1 Datasheet (PDF)
- ESP32-C6-DevKitC-1 Schematic (PDF)
- ESP32-C6-DevKitC-1 PCB Layout (PDF)
- ESP32-C6-DevKitC-1 Dimensions (PDF)
- ESP32-C6-DevKitC-1 Dimensions source file (DXF)

For further design documentation for the board, please contact us at sales@espressif.com.

Provide feedback about this document