

ESP32C3-CORE Development Board

special attention

The classic model (the version with TTL serial port to USB) must install the CH343 driver to download the firmware normally. The default CDC driver can only print logs, but the download speed will fail if the speed is too slow. [drive portal](#)

The new model (USB direct connection) can be directly burned, and Win8 and above systems do not need to install drivers. You can use Luatools to burn normally, but you cannot use LuatIDE. USBExcept that you need to select the firmware with words when programming , *GPIO18/19 will be occupied as USB pins* , which should be avoided, and there is no difference in other functions.

Remark

Note, since **the win7** system does not have its own winusbdriver, and Microsoft has stopped supporting this system as early as 2020, so if you need to use it, 简约版开发板 please upgrade to **a system above win8** , or go to [the Espressif original manual](#) to install the driver

warn

If you need to use GPIO18/19 for the new model, you can connect USB-TTL to UART0 for flashing and viewing logs, and do not use the onboard TypeC for flashing and logging.

Flashing and Burning Tutorial

[Serial port burning tutorial](#) , **the log baud rate is 921600**

1. Product Description

CORE ESP32 core board is a core board designed based on Espressif ESP32-C3, the size is only 21mm*51mm, and the edge of the board is designed with stamp holes, which is convenient for developers to use in different scenarios. The core board supports UART, GPIO, SPI, I2C, ADC, PWM and other interfaces, which can be selected according to actual needs.

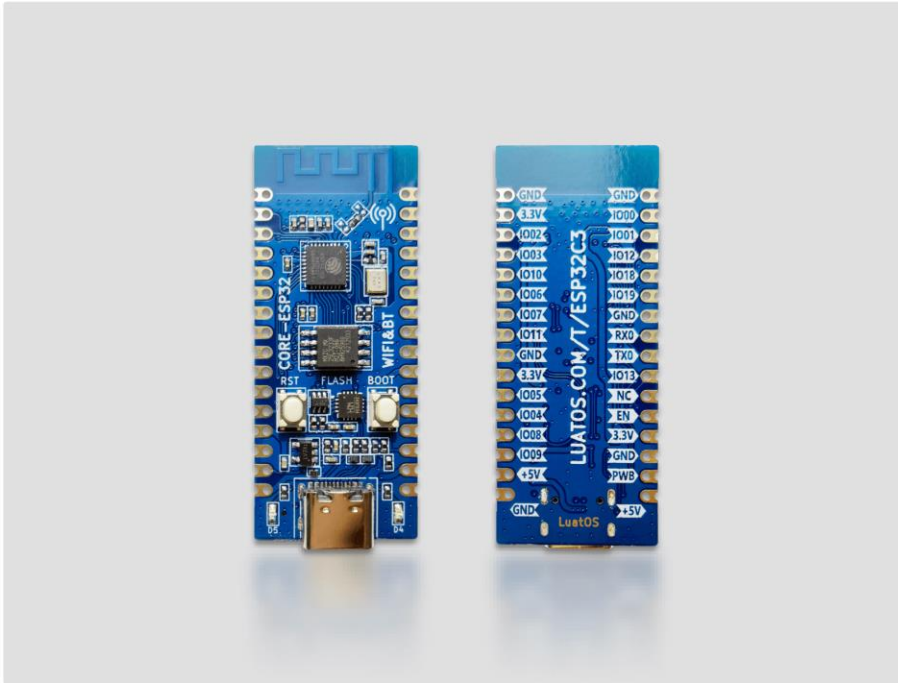
2. Hardware resources

- Size length and width 21mm*51mm
- 1 way SPI FLASH, onboard 4MB, support up to 16MB
- 2-way UART interface, UART0~UART1, among which the download port is UART0
- 5 channels of 12-bit ADC, the highest sampling rate is 100KSPS
- 1 low-speed SPI interface, support master mode
- 1 way IIC controller
- 4-way PWM interface, any GPIO can be used
- 15 GPIO external pins, reusable
- 2-way SMD LED indicator light
- 1 way reset button + 1 way BOOT button
- 1 USB to TTL download and debug port
- 2.4G PCB onboard antenna

3. Pin definition

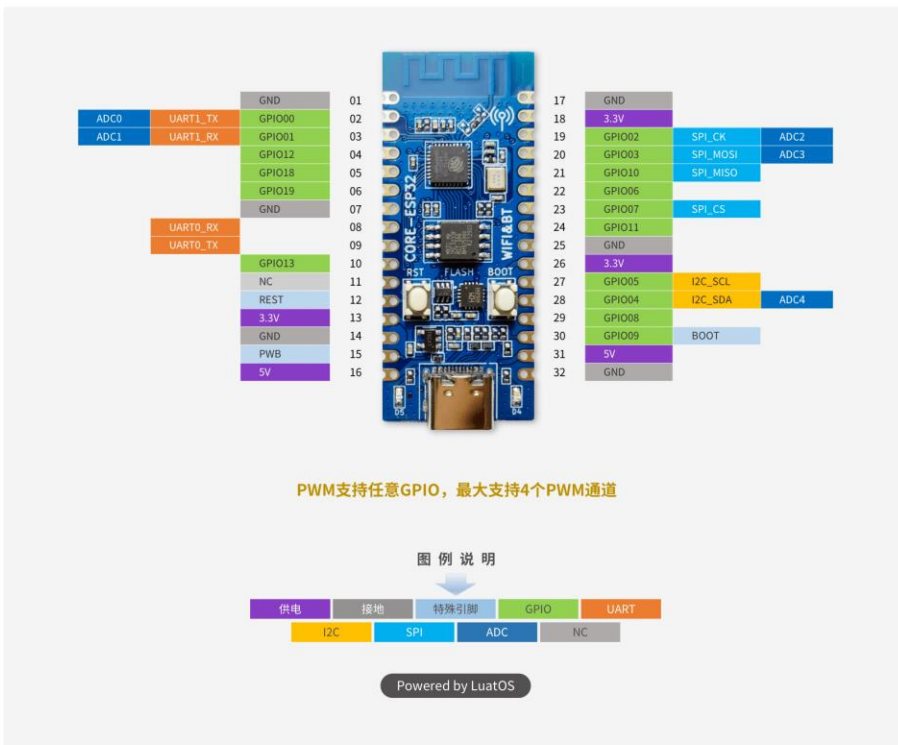
合宙ESP32-C3开发板正反面实拍图

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合宙ESP32-C3开发板PinOut示意图

- V4.22110201 -



Detailed pin description

serial number	name	Default function after reset	multiplexing function	power domain	Pull-up and pull-down ability
32	GND	grounding			
31	5V	5V power interface, connected to VBUS of USB			
30	BOOT	GPIO09, input	BOOTMODE	VDD3P3_CPU	UP/DOWN
29	IO08	GPIO08, input, output, high impedance		VDD3P3_CPU	UP/DOWN
28	IO04	GPIO04, input, output, high impedance	I2C_SDA/ADC_4	VDD3P3_RTC	UP/DOWN
27	IO05	GPIO05, input, output, high impedance	I2C_SCL/ADC_5	VDD3P3_RTC	UP/DOWN
26	3.3V	Chip power supply, 3.3V			
25	GND	grounding			
twenty four	PB_11	GPIO11, input, output, high impedance	VDD_SPI	VDD3P3_CPU	UP/DOWN
twenty three	IO07	GPIO07, input, output, high impedance	SPI2_CS	VDD3P3_CPU	UP/DOWN
twenty two	IO06	GPIO06, input, output, high impedance		VDD3P3_CPU	UP/DOWN
twenty one	IO10	GPIO10, input, output, high impedance	SPI2_MISO	VDD3P3_CPU	UP/DOWN
20	IO03	GPIO03, input, output, high impedance	SPI2_MOSI/ADC_3	VDD3P3_RTC	UP/DOWN
19	IO02	GPIO02, input, output, high impedance	SPI2_CK/ADC_2	VDD3P3_CPU	UP/DOWN
18	3.3V	Chip power supply, 3.3V			
17	GND	grounding			
16	5V	5V power interface, connected to VBUS of USB			
15	PWB	Chip 3.3V power supply control, high level is effective, can be suspended when not in use			
14	GND	grounding			
13	3.3V	Chip power supply, 3.3V			
12	RESET	chip reset		VDD3P3_RTC	
11	NC				
10	IO13	GPIO13, input, output, high impedance		VDD3P3_CPU	UP/DOWN

serial number	name	Default function after reset	multiplexing function	power domain	Pull-up and pull-down ability
09	U0_RX	GPIO20, input, output, high impedance	UART0_RX	VDD3P3_CPU	UP/DOWN
08	U0_TX	GPIO21, input, output, high impedance	UART0_TX	VDD3P3_CPU	UP/DOWN
07	GND	grounding			
06	IO19	GPIO19, input, output, high impedance	USB_D+	VDD3P3_CPU	UP/DOWN
05	IO18	GPIO18, input, output, high impedance	USB_D-	VDD3P3_CPU	UP/DOWN
04	IO12	GPIO12, input, output, high impedance	SPIHD	VDD3P3_CPU	UP/DOWN
03	IO01	GPIO1, input, output, high impedance	UART1_RX/ADC_1	VDD3P3_CPU	UP/DOWN
02	IO00	GPIO0, input, output, high impedance	UART1_TX/ADC_0	VDD3P3_CPU	UP/DOWN
01	GND	grounding			

- Any GPIO can be used as a PWM pin, and the number is the same as GPIO, but 同时只能开启4路PWMit must be noted

4. Function Introduction

1. Power supply

CORE-ESP32-C3 core board supports the following 3 ways of power supply:

- Type-C interface power supply (default)
- 5V and GND pin header power supply
- 3V3 and GND pin header power supply



The preferred power supply method during debugging: TYPE-C USB interface power supply.

2. LED Control

The Hezhou CORE ESP32 core board has 2 LEDs on board. Developers can refer to Table 4-1 to control the corresponding pins.

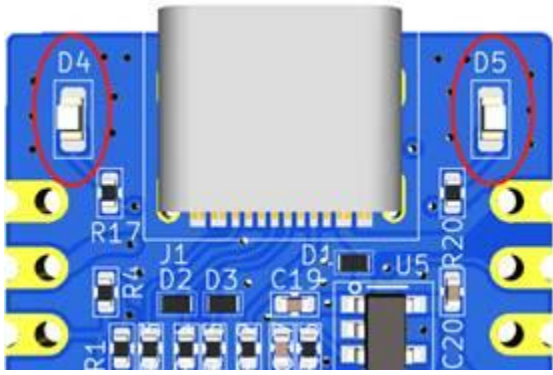


Table 4-1

LED number	Corresponding to GPIO	pin function	describe
D4	IO12	GPIO12 configuration	active high
D5	IO13	GPIO13 configuration	active high

3. Button Introduction

There are two buttons on Hezhou CORE ESP32 core board, among which the BOOT button can realize the BOOT download function, and the RST button can realize the reset function, and the pin control refers to Table 4-2.

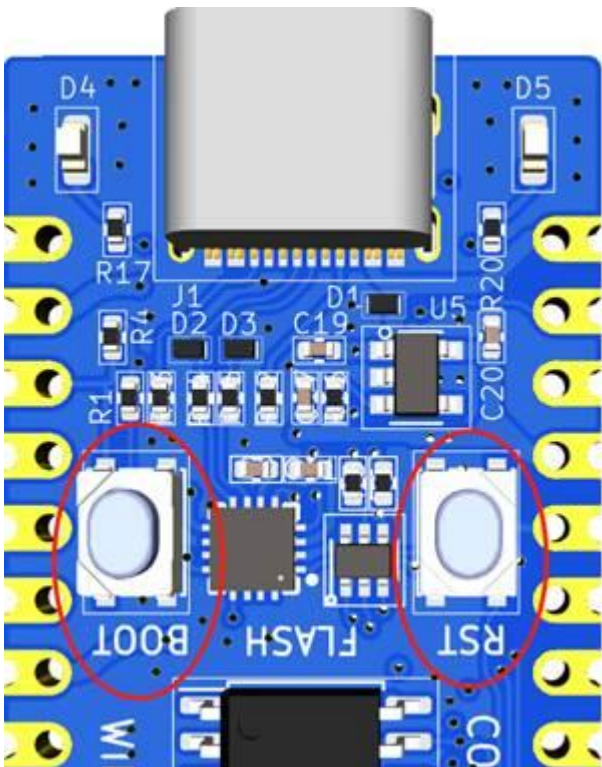


Table 4-2

key number	pin function	describe
BOOT/GPIO9	When the button is pressed, the chip enters the download mode	active low
RST	When the button is pressed, the chip resets	active low

4. External SPI FLASH control

For pin control, refer to Table 4-3.

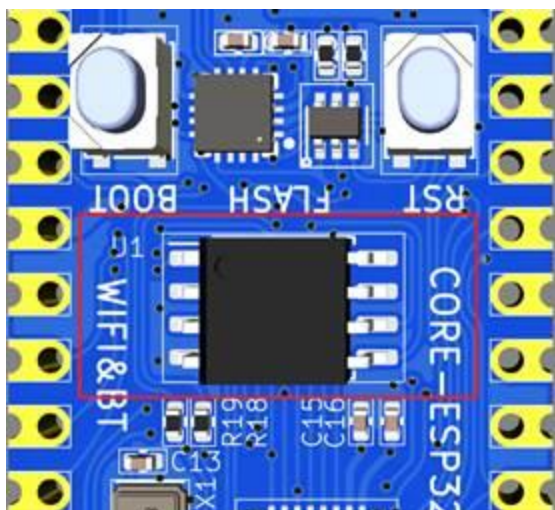


Table 4-3

flash pin label	Corresponding to GPIO	pin function	Pull-up and pull-down ability
SPICS0	-	GPIO14 configuration, FLASH_CS, chip select	UP/DOWN
SPIQ	-	GPIO17 configuration, FLASH_D1, data pin 1	UP/DOWN
SPID	-	GPIO16 configuration, FLASH_D0, data pin 0	UP/DOWN
SPICLK	-	GPIO15 configuration, FLASH_CK, clock	UP/DOWN

Note: The CORE ESP32 core board equipped with ESP32-C3 is the version without built-in FLASH, and the external SPI FLASH is mounted by default. If you encounter a core without external SPI FLASH, you need to pay attention to the specific model of the main chip. Using built-in Flash GPIO11/12/13 is not available.

Schedule 4-4

订购型号	嵌入式 flash	环境温度 (°C)	封装 (mm)
ESP32-C3	—	-40 ~ 105	QFN32 (5*5)
ESP32-C3FN4	4 MB	-40 ~ 85	QFN32 (5*5)
ESP32-C3FH4	4 MB	-40 ~ 105	QFN32 (5*5)

Precautions for use

1. **The BOOT (IO09) pin cannot be pulled down before power-on, and the ESP32 will enter the download mode.**
2. **Use the IO08 pin for design, and it is not recommended to pull it down directly, because when downloading and programming, the IO08 pin is at low level, and the serial port cannot be used for downloading.**
3. **IO12 (GPIO12) and IO13 (GPIO13) are multiplexed for SPI signals SPIHD and SPIWP in QIO mode. In order to increase the number of available GPIOs, the development board chooses the DIO mode of 2-wire SPI. IO12 and IO13 are not connected to flash. Use your own compilation. When installing the software, you need to pay attention to configure the flash as DIO mode.**
4. **The VDD of the external SPI flash has been linked to the 3.3V power supply system. It does not need to configure other power supplies when using it. The common 2-wire SPI communication method is adopted. The corresponding pins are shown in Table 4-3.**
5. **GPIO11 is the VDD pin of SPI flash by default, it needs to be configured before it can be used as GPIO.**