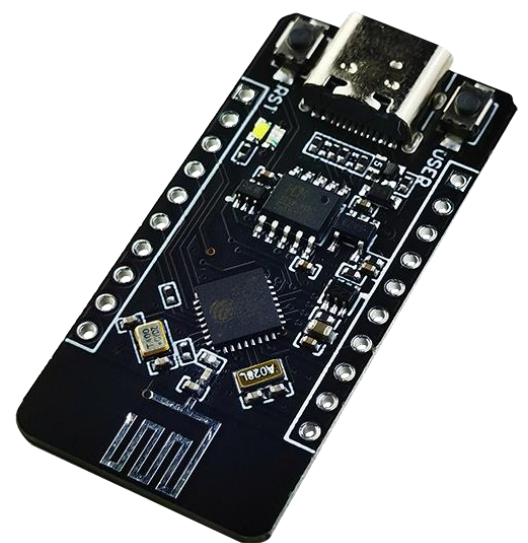




## ESP32-C3

## Development Board



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## Document version

Version	Time	Description	Remark
V1.0	2022-08-16	Documents creating	肖鸿
V1.1	2022-09-21	Document structure update	Aaron



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# 1. Description

## 1.1 Overview

ESP32-C3 is a development board based on ESP32-C3FN4 chip.

ESP32-C3FN4 is a 32-bit microprocessor based on RISC-V architecture. It is a very low-power and high integration MCU system-level chip (SOC), integrating 2.4 GHz Wi-Fi and low-power Bluetooth (Bluetooth® LE) dual mode wireless communication. Internal integration 4MB flash, contains SPI, I2C, UART, ADC, etc.

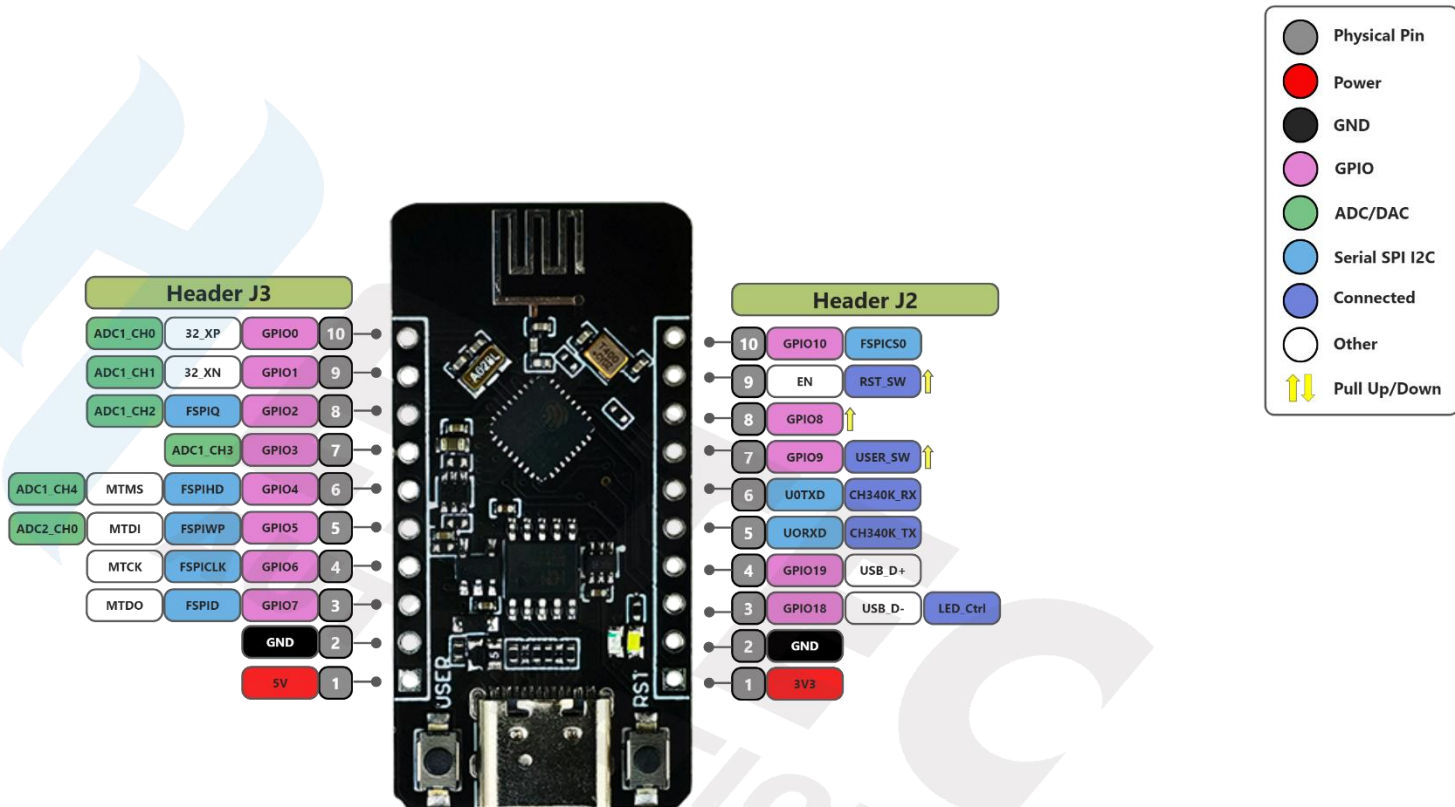
## 1.2 Product features

- Microprocessor: ESP32-C3FN4 (RISC-V architecture 32-bit, main frequency up to 160 MHz)
- Type-C USB interface with a complete voltage regulator, ESD protection, short circuit protection, RF shielding, and other protection measures;
- Onboard SH1.25-2 battery interface, integrated lithium battery management system (charge and discharge management, overcharge protection, battery power detection, USB / battery power automatic switching);
- Integrated WiFi, Bluetooth two network connections, onboard Wi-Fi, Bluetooth dedicated 2.4GHz PCB antenna;
- Integrated CH340K USB to serial port chip, convenient for program downloading, debugging information printing;
- Support the [Arduino development environment](https://heltec.org);
- With good RF circuit design and basic low-power design, it is convenient for IoT application vendors to quickly verify solutions and deploy applications.

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## 2. Pin Definition

### 2.1 Pin assignment



ESP32-C3-DevBoard  
Pin map



### 2.2 Pin description

- Header J2

Table 2.2-1: Pin description



No.	Name	Type	Function
1	3V3	P	3.3V Power Supply.
2	GND	P	Ground.
3	18	I/O	GPIO18, USB_D <sup>-1</sup> , connected to LED write.
4	19	I/O	GPIO19, USB_D <sup>+2</sup> .
5	RX	I/O	U0RXD, GPIO20, connected to CH340K TX.
6	TX	I/O	U0TXD, GPIO21, connected to CH340K RX.
7	9	I/O	GPIO9, connected to USER Switch.
8	8	I/O	GPIO8.
9	EN	I	CHIP_EN, connected to RST Switch.
10	10	I/O	GPIO10, FSPICS0.

**Header J3**

Table 2.2-2: Pin description

No.	Name	Type	Function
1	5V	P	5V Power Supply.
2	GND	P	Ground.
3	7	I/O	GPIO7, FSPID, MTDO.
4	6	I/O	GPIO6, FSPICK, MTCK.
5	5	I/O	GPIO5, ADC2_CH0, FSPIWP MTDI.
6	4	I/O	GPIO4, ADC1_CH4, FSPIHD, MTMS.
7	3	I/O	GPIO3, ADC1_CH3.

<sup>1</sup> DN pin connectable to USB socket, solder R4;  
<sup>2</sup> DP pin connectable to USB socket, solder R10.

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8	2	I/O	GPIO2, ADC1_CH2, FSPIQ.
9	1	I/O	GPIO1, ADC1_CH1, connected to 32K_XN.
10	0	I/O	GPIO0, ADC1_CH0, connected to 32K_XP.

### 3. Specifications

#### 3.1 General specifications

Table 3.1: General specifications

Parameters	Description
Master Chip	ESP32-C3FN4(32-bit@RISC-V architecture)
USB to Serial Chip	CH340K
WiFi	802.11 b/g/n, up to 150Mbps
Bluetooth	Bluetooth LE: Bluetooth 5, Bluetooth mesh
Hardware Resource	5*ADC1+1*ADC2; 2*UART; 1*I2C; 3*SPI; etc.
Memory	384KB ROM; 400KB SRAM; 8KB RTC SRAM; 4MB SiP Flash
Interface	Type-C USB; 2*1.25 lithium battery interface, 2*10*2.54 Header Pin
Battery	3.7V lithium battery power supply and charging
Power consumption	Deep Sleep 5.5uA
Operating temperature	-20~70°C
Dimensions	40.64 * 20.32 * 7.6 mm

#### 3.2 Power supply

Except when USB or 5V Pin is connected separately, lithium battery can be connected





to charge it. In other cases, only a single power supply can be connected.

Table 3.2: Power supply

Power supply mode	Minimum	Typical	Maximum	Company
Type-C USB( $\geq 500\text{mA}$ )	4.7	5	6	V
Lithium battery( $\geq 250\text{mA}$ )	3.3	3.7	4.2	V
5V pin( $\geq 500\text{mA}$ )	4.7	5	6	V
3V3 pin( $\geq 150\text{mA}$ )	2.7	3.3	3.5	V

### 3.3 Power output

Table 3.3: Power output

Output Pin	Minimum	Typical	Maximum	Company
3.3V Pin			500	mA
5V Pin (USB Powered only)			500	mA

### 3.4 Power characteristics

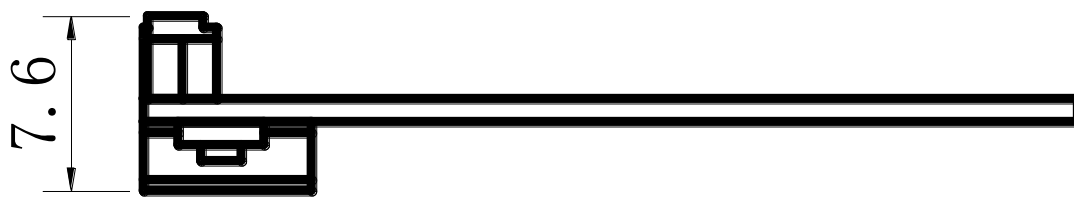
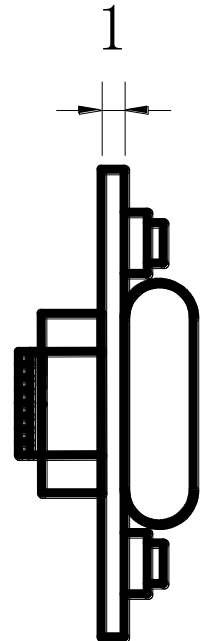
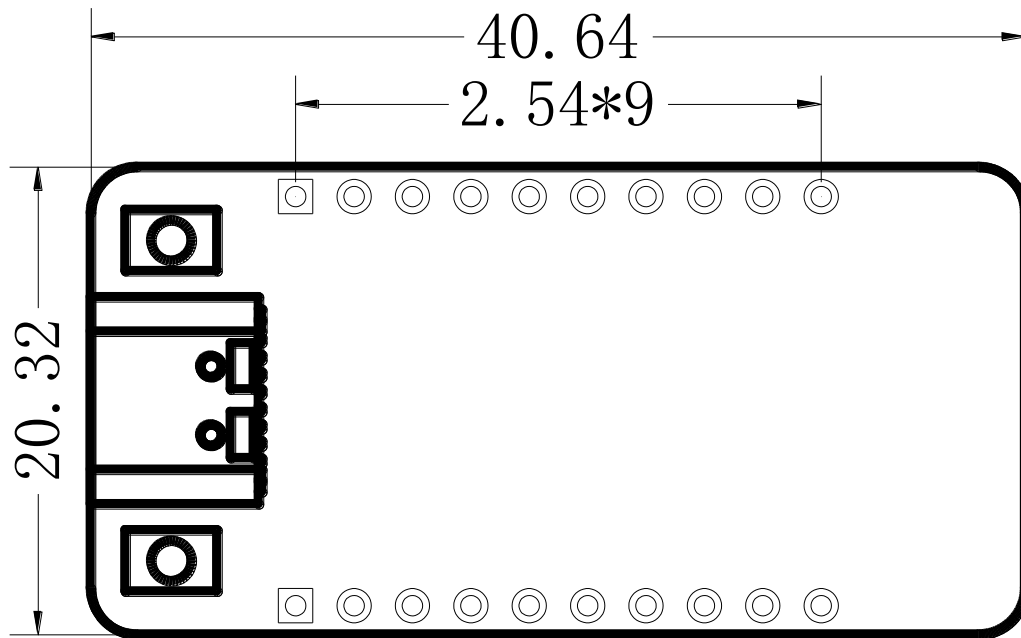
Table 3.4: Power characteristics

Mode	Condition	Min.	Typical	Max.	Company
WiFi Scan	USB powered		85		mA
WiFi AP	USB powered		115		mA
BT Scan	USB powered		90		mA
sleep	USB powered		6		mA
	VBAT/battery powered		12		uA
	3.3V header powered		5.5		uA



## 4. Hardware resource

### 4.1 Physical dimensions





## 5. Resource

### 5.1 Relevant Resource

- Source Code
  - [Heltec ESP \(ESP32 & ESP8266\) framework](#) (Already included Heltec ESP32 LoRaWAN library)
  - [Heltec ESP32 library](#)
- [Schematic diagram](#)
- [Pin map](#)
- [Downloadable resource](#)

### 5.2 Contact Information

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