



ESP32 C3 Super Mini

Development Board Code name: `ESP32C3_DEV`

ESP32C3

SUPERMINI

ESP32 C3 Super Mini is a development board based on the [ESP32C3 microcontroller](#) using RISCV32 architecture.

This board features a maximum CPU frequency of 160 MHz and 4MB flash memory.

About ESP32 C3 Super Mini

⚠ If you have the red board, check [ESP32 C3 Supermini Plus](#).

The **ESP32-C3 SuperMini** is a tiny yet powerful development board built around the **Espressif ESP32-C3** chip. With **WiFi 802.11b/g/n** and **Bluetooth 5 (LE)**, it's perfect for IoT projects that need reliable wireless connectivity.

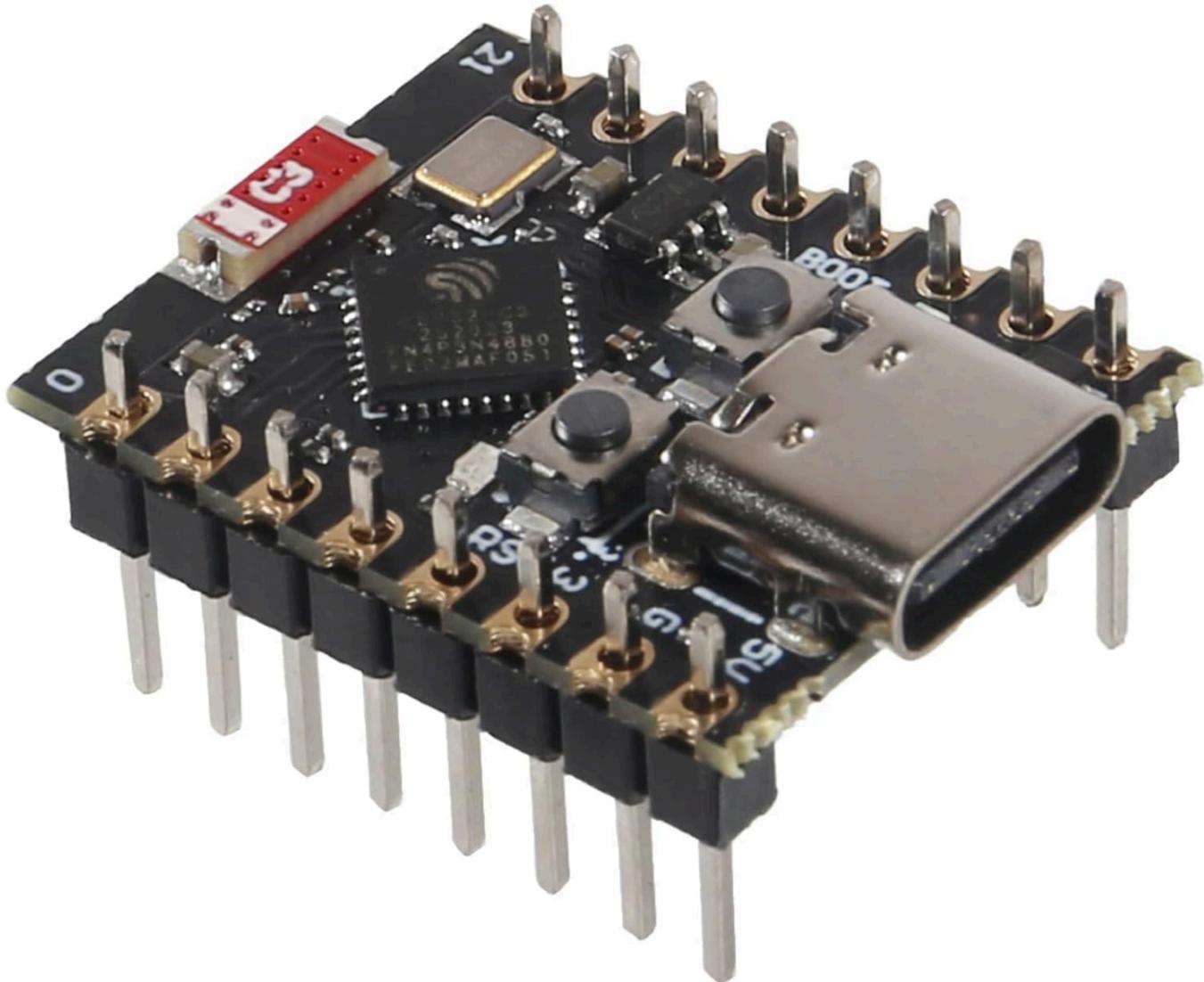
Designed with a **compact form factor**, this board is easy to integrate into space-constrained projects. Its **PCB antenna** ensures stable wireless performance without needing an external antenna.

For ease of use, it includes a **reset button** and a **bootloader mode button**, making development and debugging smooth.

With its **versatile interfaces** (UART, I2C, SPI) and plenty of GPIOs, the **ESP32-C3 SuperMini** is a

great choice for your next embedded project! 🌐

Wondering how the **ESP32-S3 SuperMini** compares to other SuperMini boards? Check out our [full comparison guide](#) to see how it stacks up against the C3, C3 Plus, C6, and H2.



📋 Technical Specifications

Complete technical specification details for ESP32 C3 Super Mini

🔌 USB

Type	USB-C
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Serial Chip	Native
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📡 Connectivity

WiFi	802.11 b/g/n (2.4 GHz)
Bluetooth	5.0
BLE	5.0

🧠 Microcontroller

Model	ESP32C3
Clock Speed	160 MHz
Flash Size	4MB
Architecture	RISCV32

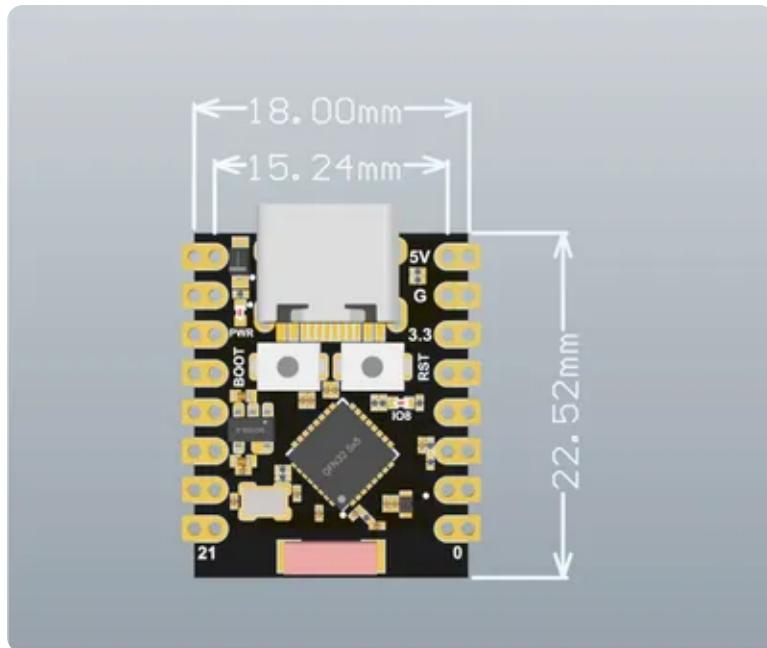
✨ Features & Pins

Digital IO	11
Analog Input	6
PWM	11
Interrupts	22

- Ultra-small size: As small as the thumb (22.52 x 18 mm)
- Ultra-low power consumption: deep sleep power consumption of about 43µA
- Onboard LED blue light: GPIO8 pin

ESP32 C3 Super Mini Board Dimensions

Physical measurements for ESP32 C3 Super Mini



Width

18 mm

Length

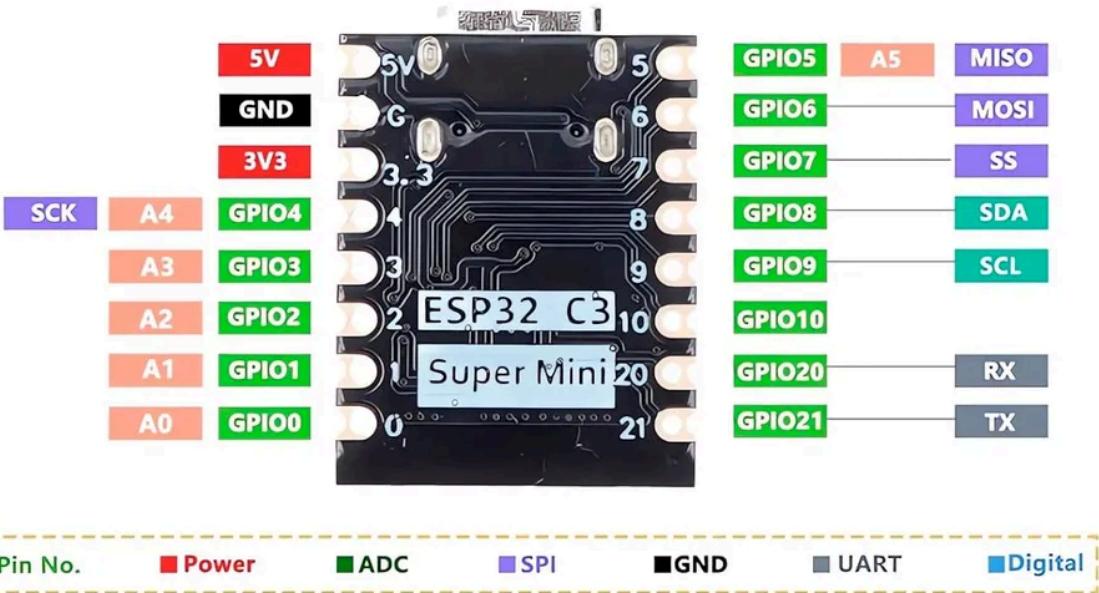
22.50 mm

Pin Gap

2.54 mm

ESP32 C3 Super Mini Pinout Diagram

Complete pin reference for ESP32 C3 Super Mini

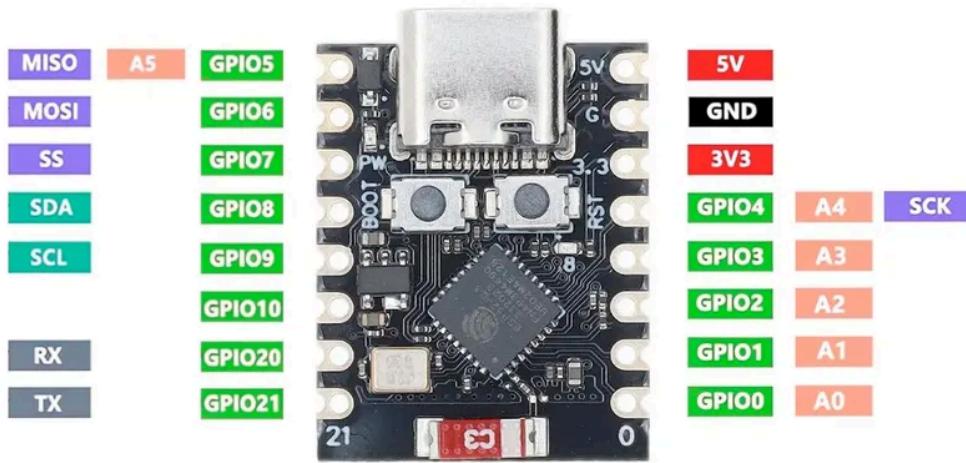


The **ESP32-C3 Super Mini pinout** is designed to provide maximum functionality in a most compact package. The ESP32-C3 Supermini features key power pins like 5V, 3.3V, and GND, ensuring stable power delivery for various peripherals and components.

The pinout includes dedicated communication pins, such as RX and TX for UART, SDA and SCL for I2C, and MISO, MOSI, SCK, and SS for SPI protocols. These allow seamless integration with a wide range of devices, from sensors to displays and external storage.

For analog input, the **ESP32-C3 Super Mini** offers ADC pins labeled A0 to A5, ideal for reading sensor data or measuring voltage levels. This flexibility makes the ESP32-C3 Supermini pinout suitable for both simple and complex projects.

Overall, the **ESP32-C3 Super Mini** provides a well-rounded pinout that supports digital I/O, analog input, and multiple communication protocols, despite being very small.



✓ Safe Pins to Use

These pins are safe for general GPIO usage without boot or system conflicts

IO0

IO1

IO3

IO10

💡 Why Are These Pins Safe?

- ✓ No boot sequence involvement
- ✓ No flash/PSRAM connections
- ✓ No USB or JTAG conflicts
- ✓ Freely assignable without issues

⚠ Pins to Avoid or Use with Caution

Reserved for critical functions. Misuse may cause boot failures, programming issues, or system conflicts.

Strapping Pins

Boot behavior & flash voltage

JTAG Debugging

Low-level debugging interface

USB Pins

USB Serial/JTAG communication

Flash/SPI Pins

Memory & PSRAM connections

UART Serial

Debugging & firmware uploads

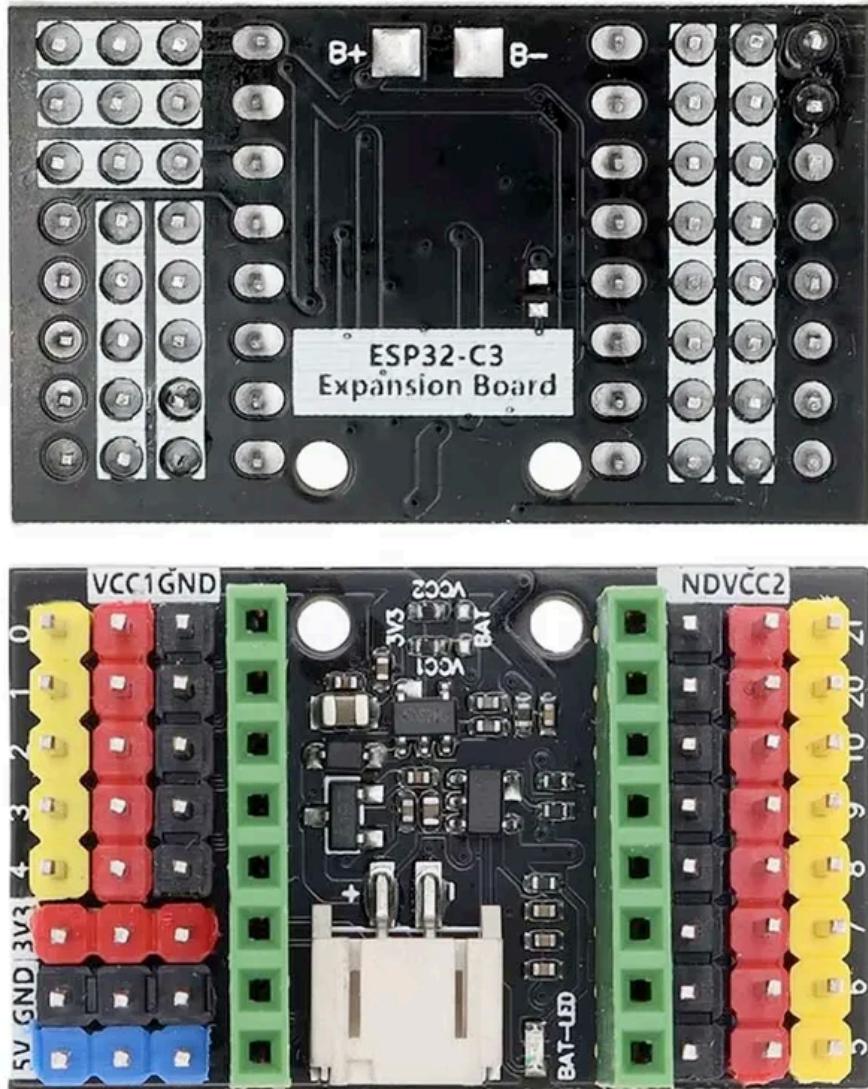
PIN	Label	Why Avoid	Type
IO2	GPIO2	Must be held high during boot (if low on reset, normal flash boot may fail)	 Strapping
IO4	MTMS	Used during boot; JTAG TMS for debugging; acts as Quad-SPI flash IO (hold data line) in internal-flash variants	 JTAG
IO5	MTDI	Used during boot; JTAG TDI for debugging; acts as Quad-SPI flash IO (write-protect data line) in internal-flash variants	 JTAG
IO6	MTCK	Used during boot; JTAG TCK for debugging; provides flash clock in internal-flash variants	 JTAG
IO7	MTDO	Used during boot; JTAG TDO for debugging; acts as Quad-SPI flash IO (data line) in internal-flash variants	 JTAG
IO8	GPIO8	Must be held high during reset (if low, UART flashing/boot may not work)	 Strapping

PIN	Label	Why Avoid	Type
IO9	GPIO9	Controls boot mode on reset (HIGH for normal flash boot, LOW enters serial download mode)	 Strapping
IO21	U0TXD	Used as UART0 transmit (console/bootloader); repurposing may disable serial console output and printing	 UART
IO20	U0RXD	Used as UART0 receive (console/bootloader); repurposing may disable serial programming and debug logs	 UART

Show Less

ESP32 C3 Super Mini Additional Information

More details about ESP32 C3 Super Mini



ESP32-C3 SuperMini Expansion Board

💡 Key Features

- **Lithium Battery Compatibility:** Supports 3.7V lithium battery input for portable power solutions.
- **USB Charging with LED Indicator:** Green LED lights up during charging and turns off when the battery is full.
- **Full IO Access:** Breaks out all ESP32-C3 SuperMini GPIOs for easy connectivity to sensors and modules.
- **Compact Size:** Measures only 37.4mm x 22.5mm x 15.2mm, ideal for compact projects.

Advanced Power Configuration – Dual Voltage Outputs

The expansion board includes two independent power outputs: **VCC1** and **VCC2**, both defaulting to 3.3V. You can reconfigure them to output 3.7V if needed.

How to Switch to 3.7V Output:

1. Remove the pre-installed **0Ω resistor** for the desired rail (VCC1 or VCC2).
2. Short the three solder pads using tin to reroute the output to 3.7V.

This allows you to adapt the voltage to match your specific module or sensor requirements.

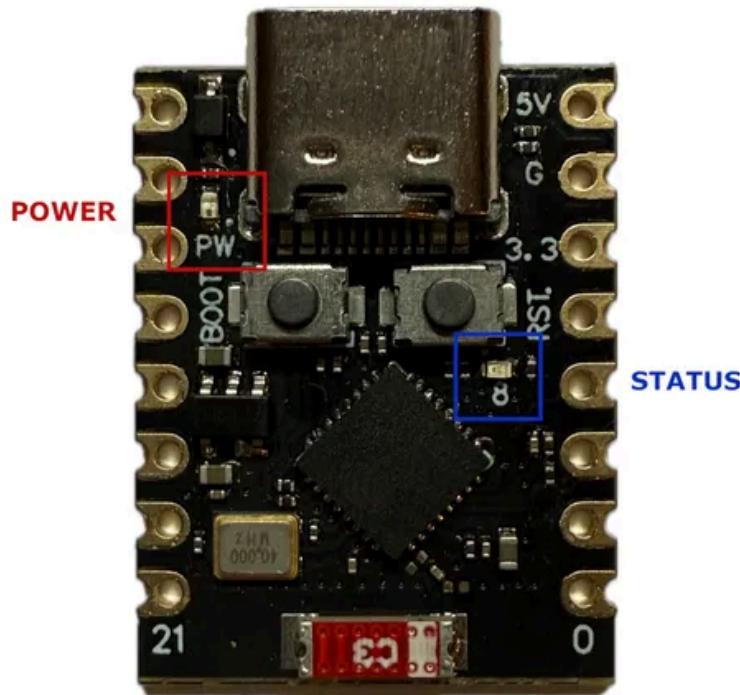


Final Thoughts

This expansion board is a powerful upgrade for the ESP32-C3 SuperMini, bringing flexibility, better power control, and seamless sensor integration.

On-Board LEDs

LED indicators on ESP32 C3 Super Mini



The ESP32-C3 Supermini features two onboard LEDs with specific functions and GPIO assignments. Below is a breakdown of their roles and how to use the controllable one in both Arduino and ESPHome.

● Red LED – Power Indicator

GPIO: None

Control: Not controllable via GPIO

Behavior: Always on when the board is powered

● Blue LED – User Controllable

GPIO: GPIO8

Control: `digitalWrite()`, ESPHome GPIO output

Arduino Example:

```
void setup() {
    pinMode(8, OUTPUT);
}

void loop() {
    digitalWrite(8, HIGH);
    delay(1000);
    digitalWrite(8, LOW);
```

```
delay(1000);
}
```

ESPHome Example:

```
output:
- platform: gpio
  pin: 8
  id: blue_led

light:
- platform: binary
  name: "Blue LED"
  output: blue_led
```

[ESPHome GPIO Output Documentation →](#)

ESP32 C3 Super Mini Custom Pin Mapping

Pin configuration and GPIO mapping for ESP32 C3 Super Mini

11

Digital I/O Pins

22

Interrupt Pins

6

Analog Inputs

11

PWM Pins

Pin	Function	ESP Pin	I/O Type	Description
1	5V	5V	POWER INPUT	5V power input for the board
2	GND	GND	POWER GROUND	Ground connection
3	3V3	3.3V	POWER OUTPUT	3.3V power output
4	IO0	A0	BIDIRECTIONAL	GPIO, ADC pin, PWM

Pin	Function	ESP Pin	I/O Type	Description
5	IO1	A1	BIDIRECTIONAL	GPIO, ADC pin, PWM
6	IO2	A2	BIDIRECTIONAL	GPIO, ADC pin, PWM
7	IO3	A3	BIDIRECTIONAL	GPIO, ADC pin, PWM
8	IO4	A4	BIDIRECTIONAL	GPIO, ADC pin, SCK, PWM
9	IO5	A5	BIDIRECTIONAL	GPIO, ADC pin, SPI Master In Slave Out, PWM
10	IO6	MISO	BIDIRECTIONAL	GPIO, SPI Master Out Slave In, PWM
11	IO7	SS	BIDIRECTIONAL	GPIO, SPI Slave Select, PWM
12	IO8	SDA	BIDIRECTIONAL	GPIO, I2C Data line, PWM
13	IO9	SCL	BIDIRECTIONAL	GPIO, I2C Clock line, PWM
14	IO10	RX	BIDIRECTIONAL	GPIO, PWM
15	IO21	TX	BIDIRECTIONAL	GPIO, UART Transmit
16	IO20	RX	BIDIRECTIONAL	GPIO, UART Receive (secondary)

LEGEND

Function Pin role

GPIO ESP32 pin

I/O Direction

Pin number

Pin Mappings

Complete pinout and GPIO mapping for ESP32 C3 Super Mini

11

Digital I/O Pins

22

Interrupt Pins

6

Analog Inputs

11

PWM Pins

Pin	Analog	Touch	PWM	Other
0	A0			
1	A1			
2	A2			
3	A3			
4	A4		SCK	
5	A5		MISO	
6			MOSI	
7			SS	
8			LED_BUILTIN	SDA
9			SCL	

Pin	Analog	Touch	PWM	Other
20				RX
21				TX

LEGEND

- A0 Analog input
- T0 Touch sensor
- PWM PWM capable
- RX/TX Serial pins
- LED Built-in LED
- # Pin number

Default Tools & Configuration

Build and upload settings for ESP32 C3 Super Mini

Setting	Value
Bootloader tool	esptool_py
Uploader tool	esptool_py
Network uploader tool	esp_ota
Bootloader address	0x0
Flash mode	qio
Boot mode	qio
Maximum upload size	1280 KB (1310720 bytes)
Maximum data size	320 KB (327680 bytes)
CONFIGURATION SUMMARY	

The **ESP32 C3 Super Mini** uses **esptool_py** for uploads , **esp_ota** for OTA updates, and **esptool_py** bootloader at `0x0` .

Flash mode: **qio** | Boot mode: **qio**

Max sketch size: **1280 KB** | Max data size: **320 KB**