



ESP32-C3-MINI-1U

User Manual



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1 Product Overview

1.1 Introduction

ESP32-C3-MINI-1U is a WIFI module based on the ESP32-C3 chip.

ESP32-C3-MINI-1U is a general-purpose Wi-Fi module, small in size, rich in peripheral interfaces, equipped with 4 MB embedded flash and a RISC-V 32-bit single-core processor. The chip integrates rich peripherals, including UART, I2C, I2S, infrared remote control module (remote control peripheral), LED PWM controller, general DMA controller, TWAI® controller, USB serial port/JTAG controller, temperature sensor and analog /Digital converter, also has single-wire, two-wire, four-wire SPI interface.

It can be used in smart home, industrial automation, healthcare, consumer electronics and other fields.



1.2 Feature

- 4 MB embedded flash;
- Support AT command;
- Serial communication and flow control available. The baud rate supports up to 128000;
- Support automatic and manual networking.

2 Electric Feature

2.1 Absolute Maximum Ratings

Symbol	Parameter	Min	Max	Unit
VDD33	Power pin voltage	−0.3	3.6	V
TSTORE	Storage temperature	−40	85	°C

Table 2- 1 Absolute Maximum Ratings

2.2 Recommended Working Conditions

Symbol	Parameter	Min	Typ	Max	Unit
VDD33	Power pin voltage	3.0	3.3	3.6	V
IVDD	Supply current of external power supply	0.5	—	—	A
T	Recommended working temperature	−40	—	85	°C
Humidity	Humidity	—	85	—	%RH

Table 2-2 Recommended Working Conditions

Table 2- 3 RF characteristics

3.1 Size and Pins Definition



Name	Number	Type	Function
GND	1, 2, 11, 14,	P	Ground

	36-53		
3V3	3	P	Power
NC	4, 7, 9, 10, 15, 17, 24, 25, 28, 29, 32-35	—	Empty pins
IO2	5	I/O/T	GPIO2, ADC1_CH2, FSPIQ
IO3	6	I/O/T	GPIO3, ADC1_CH3
EN	8	I	High level: chip enabled; Low level: chip disabled Note: Pin EN cannot be floated
IO0	12	I/O/T	GPIO0, ADC1_CH0, XTAL_32K_P
IO1	13	I/O/T	GPIO1, ADC1_CH1, XTAL_32K_N
IO10	16	I/O/T	GPIO10, FSPICS0
IO4	18	I/O/T	GPIO4, ADC1_CH4, FSPIHD, MTMS
IO5	19	I/O/T	GPIO5, ADC2_CH0, FSPIWP, MTDI
IO6	20	I/O/T	GPIO6, FSPICLK, MTCK
IO7	21	I/O/T	GPIO7, FSPID, MTDO
IO8	22	I/O/T	GPIO8
IO9	23	I/O/T	GPIO9
IO18	26	I/O/T	GPIO18, USB_D-
IO19	27	I/O/T	GPIO19, USB_D+
RXD0	30	I/O/T	GPIO20, U0RXD
TXD0	31	I/O/T	GPIO21, U0TXD

1 P: Power; I: Input; O: Output; T: Three-state logic.

Table 3-2 Pins Definition

Note:

Function	ESP Dev Pins	Other device pins
Download firmware/Output diary 1	UART0: GPIO20 (RX) , GPIO21(TX)	PC: TX、RX
AT Command/Respond 2	UART1: GPIO6(RX), GPIO7(TX), GPIO5(CTS), GPIO4(RTS)	USB to UART module: TX, RX, RTS, CTS

Please refer to *AT Command Sets* for more details.

Table 3-3 ESP32-C3 series hardware connection pins

3.2 Schematic

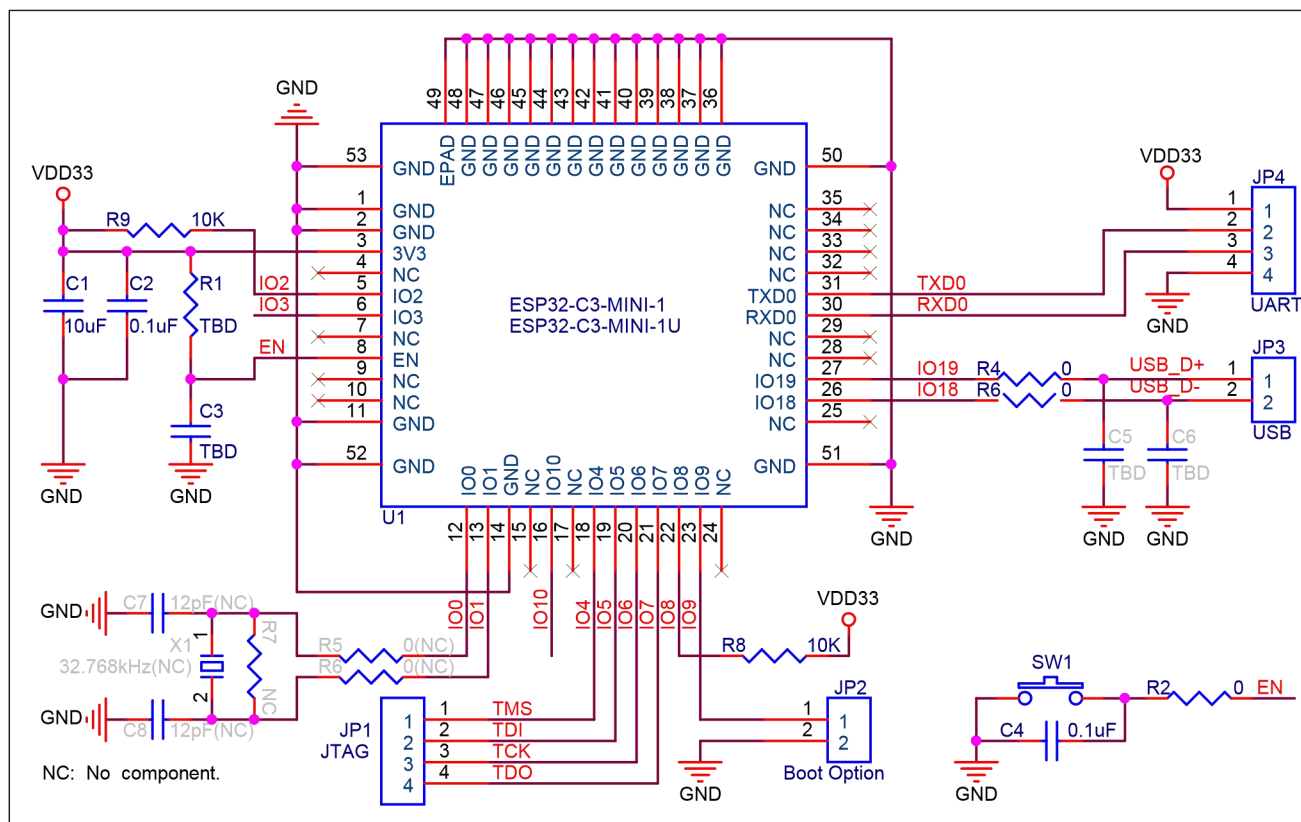


Figure 3-3 Schematic

3.3 Module Size

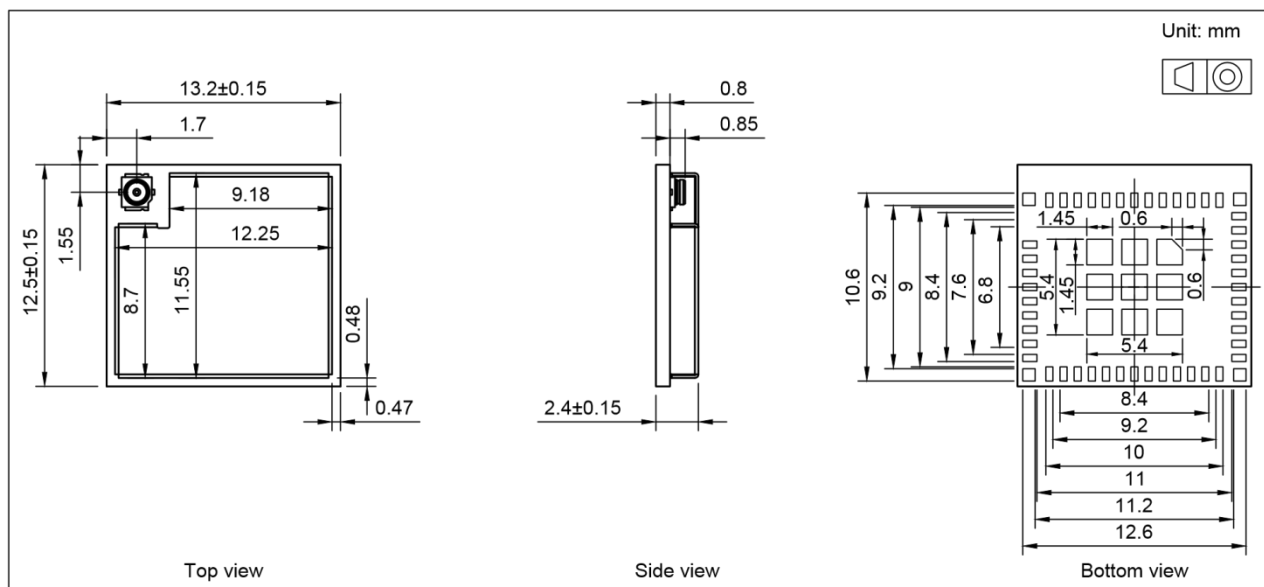


Figure 3-4 Module Size

3.4 PCB Package

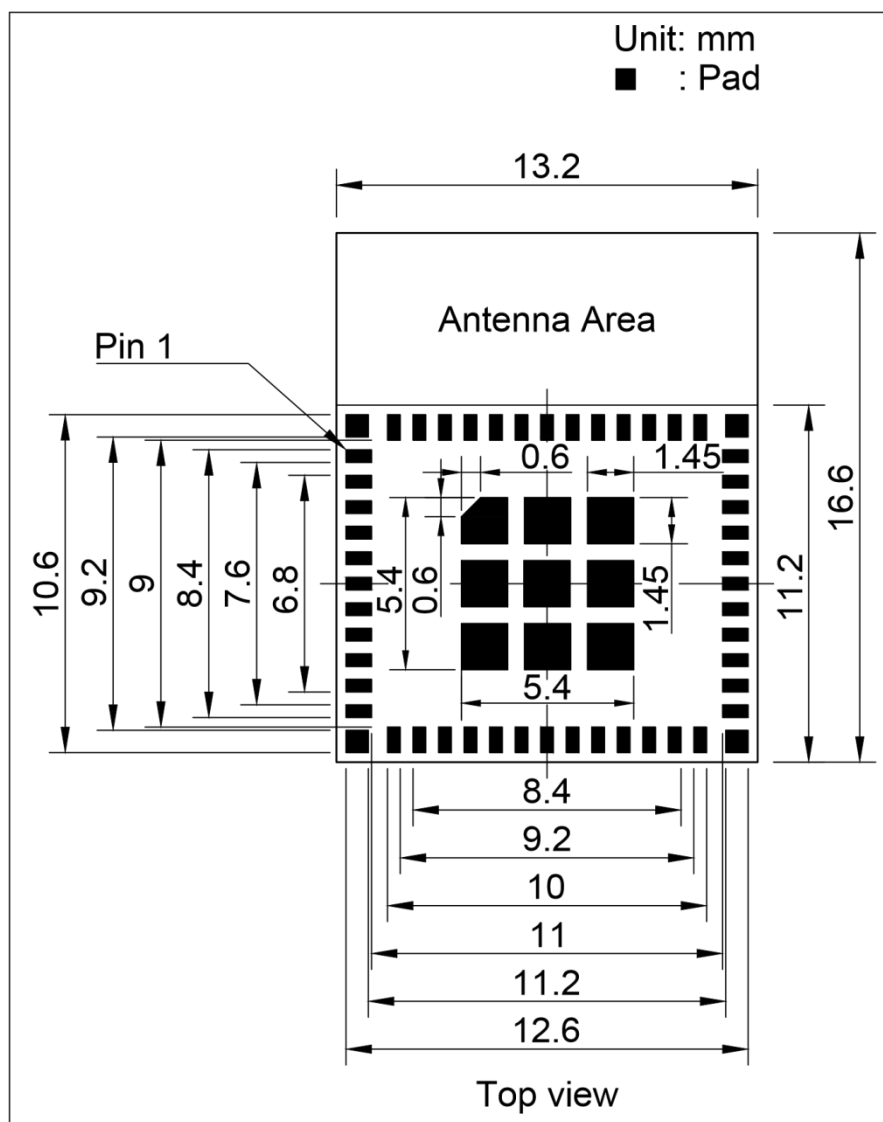


Figure 3- 5 PCB Package

3.5 External Antenna Connector Size

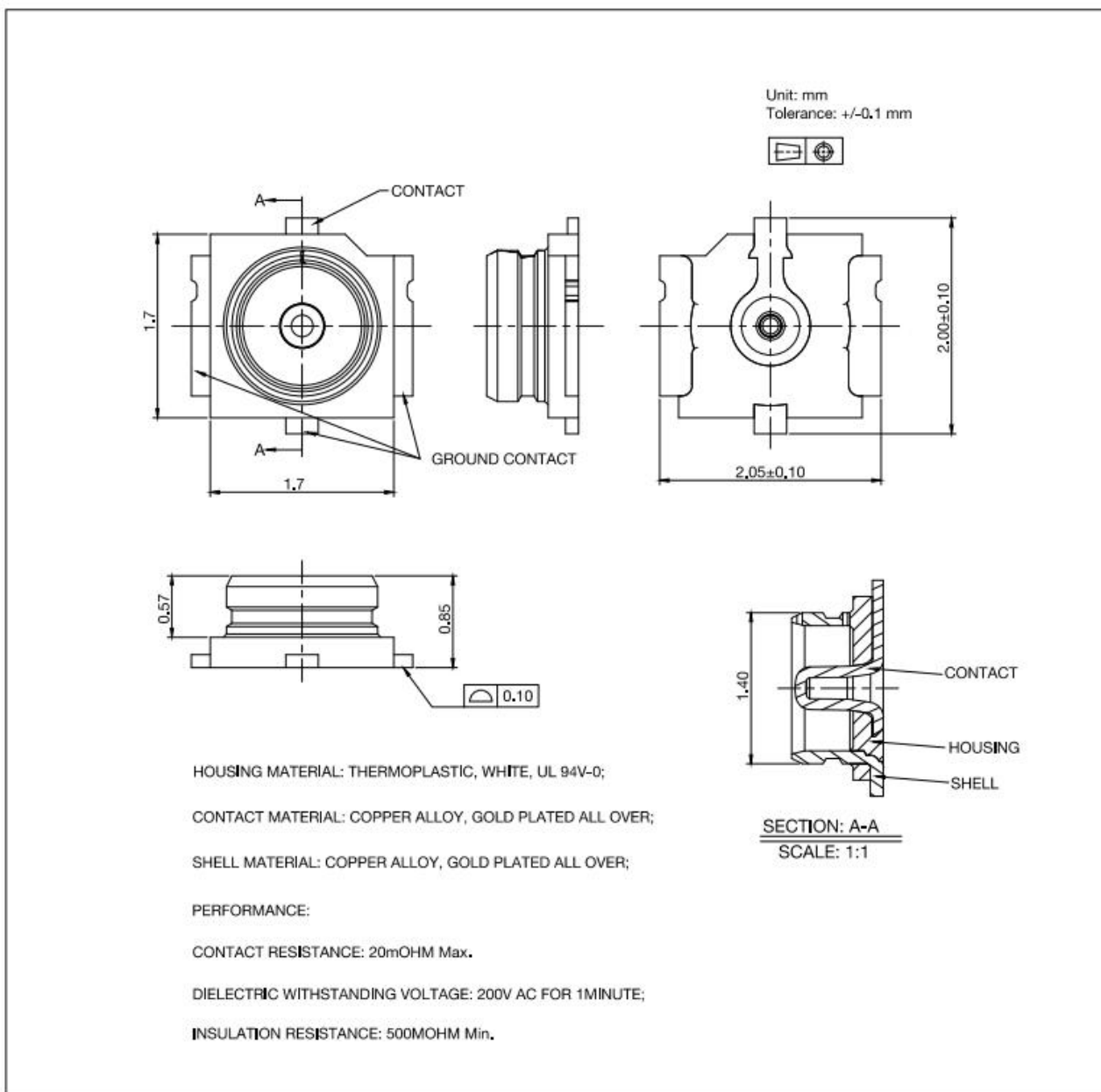


Figure 3-6 External antenna connector size

4 AT Command

Please download file *ESP32-C3-MINI-1U_AT_Bin_V2.2.0.0* from Ebyte website.

5 FAQ

5.1 Communication range is too short

- The communication distance will be affected when obstacle exists.
- Data lose rate will be affected by temperature, humidity and co-channel interference.
- The ground will absorb and reflect wireless radio wave, so the performance will be poor when testing near ground.
- Sea water has great ability in absorbing wireless radio wave, so performance will be poor when testing near the sea.
- The signal will be affected when the antenna is near metal object or put in a metal case.
- Power register was set incorrectly, air data rate is set as too high (the higher the air data rate, the shorter the distance).
- The power supply low voltage under room temperature is lower than recommended value, the lower the voltage, the lower the transmitting power.

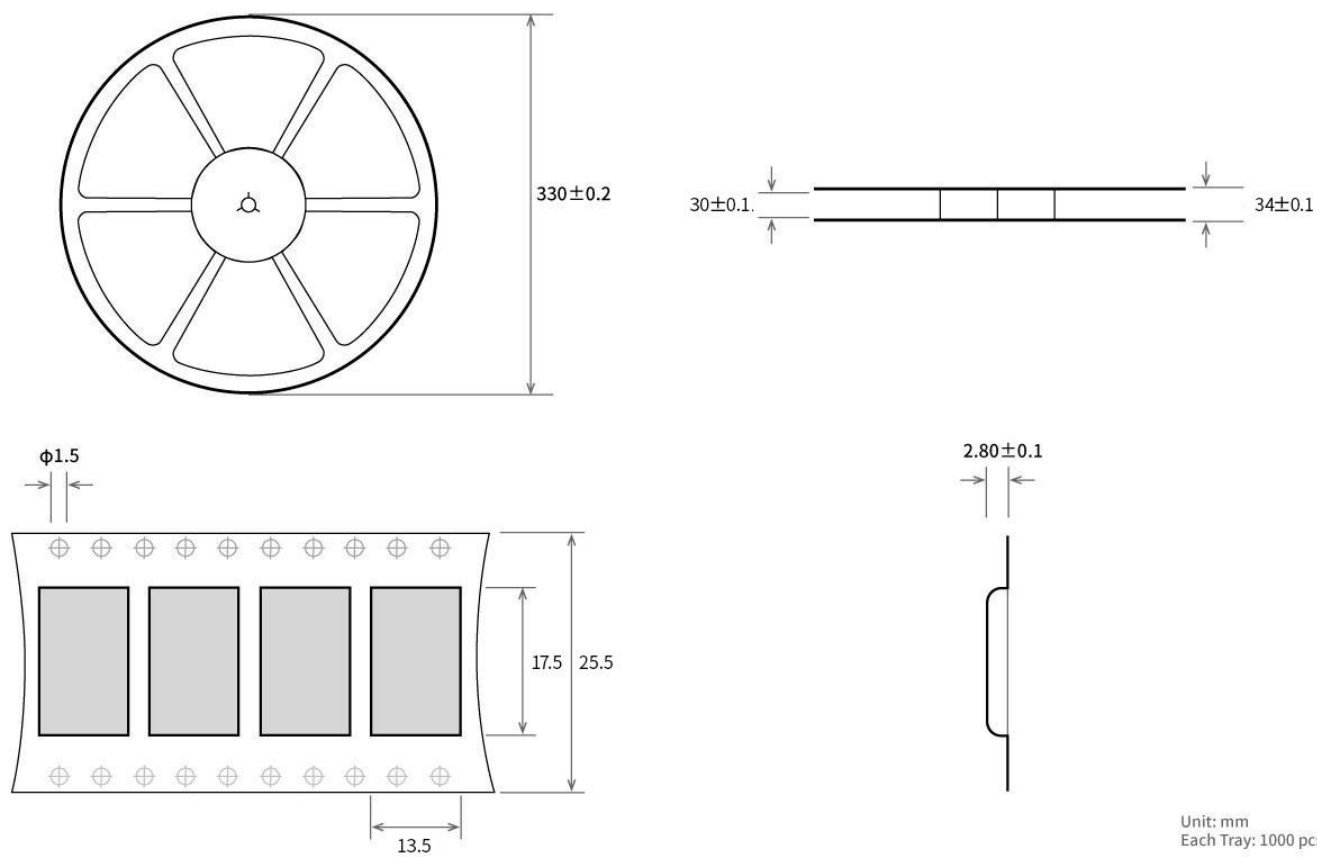
5.2 Module is easy to damage

- Please check the power supply source, ensure it is in right range, voltage higher than maximum value will damage the module.
- Please check the stability of power source, the voltage cannot fluctuate too much.
- Please make sure antistatic measure are taken when installing and using, high frequency devices have electrostatic susceptibility.
- Please ensure the humidity is within limited range, some parts are sensitive to humidity.
- Please avoid using modules under too high or too low temperature.

5.3 BER(Bit Error Rate) is high

- There are co-channel signal interference nearby, please be away from interference sources or modify frequency and channel to avoid interference;
- The clock waveform on the UART is not standard. Check whether there is interference on the UART line;
- The power supply is not ideal and may cause messy code. It is necessary to ensure the reliability of the power supply;

7 Package for Batch Order



Revision History

Version	Date	Description	Issued by
1.0	2021-12-14	Initial version	-
1.1	2022-10-26	Content updated	Hao
1.2	2023-1-5	Content updated	Hao

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