E101-C3 Series

User Manual



Chengdu Ebyte Electronic Technology Co.,Ltd.

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1 Product Overview

1.1 Introduction

E101-C3MN4-PS&E101-C3MN4-XS is a WIFI module based on the ESP32-C3 chip.

E101-C3MN4-PS&E101-C3MN4-XS 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.The following two modules are only different for packages.

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.

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2 Electric Feature

2.1 Absolute Maximum Ratings

Symbol	Parameter	Min	Max	Unit
VDD33	Power pin voltage	–0.3	3.6	V
T*STORE*	Storage temperature	–40	85	°C

Table 0-1 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
Imax	Peak current			400	mA
I	Average current			100	mA

Table 0-2 Recommended Working Conditions

2.3 RF Characteristics

Working channel central frequency		**2412~2484MHz**
Wi-Fi		IEEE802.11b/g/n
Antenna		The IPEX third-generation interface
Distance	Module and router	300m
	Between modules	300m

Table 0-3 RF characteristics

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3 Hardware Description

3.1 Size and Pins Definition

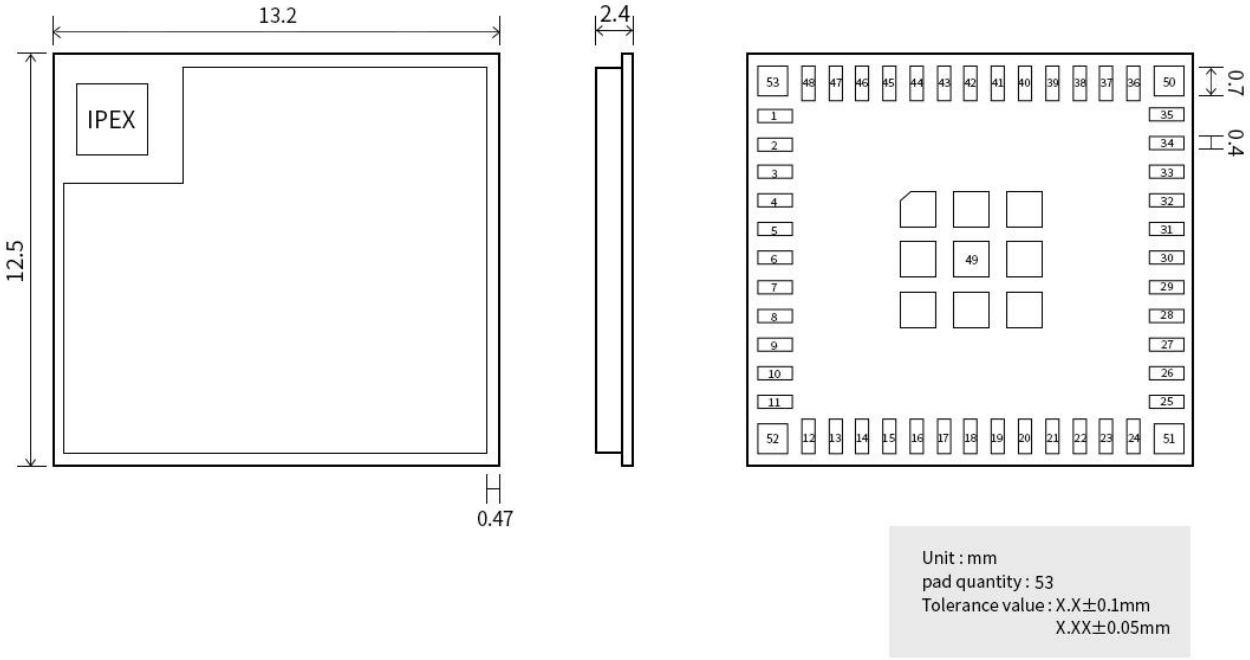


Figure 0-1 Pins Layout（top view）

Pin definition: The pin layout of the E101-C3MN4-XS is the same as that of the E101-C3MN4-PS. The above pin diagram takes the E101-C3MN4-XS as an example,See section 3.3 for detailed dimensions.

Name	Number	Type	Function
GND	1, 2, 11, 14, 36-53	P	Ground
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

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			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 0-1 Pins Definition

Note：

Function	ESP Dev Pins	Other device pins
Download firmware/Output diary 1	UARTO：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 0-3 E101-C3 series hardware connection pins

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3.2 Schematic

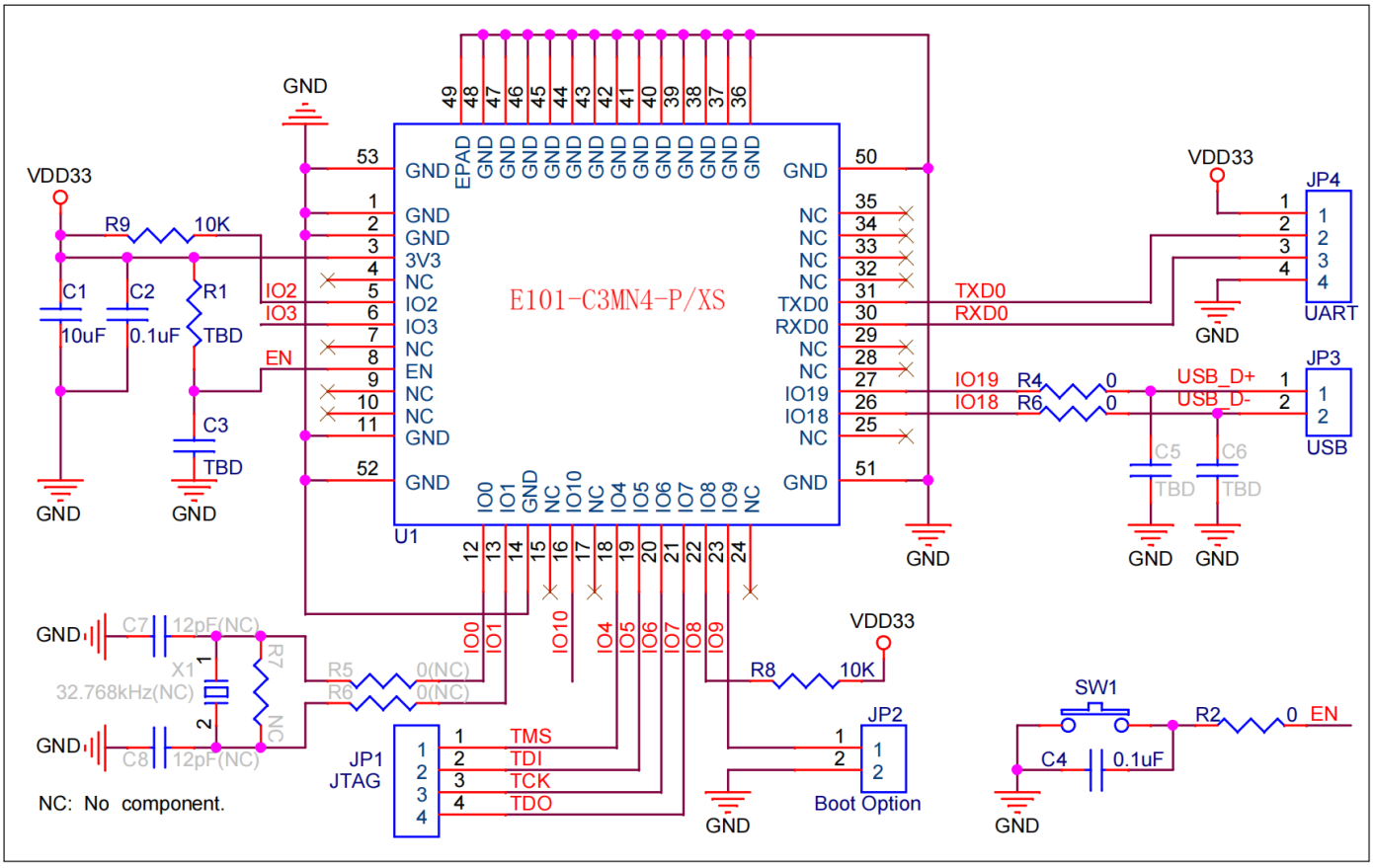


Figure 0-2 Schematic

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3.3 Module Size

3.3.1 E101-C3MN4-XS

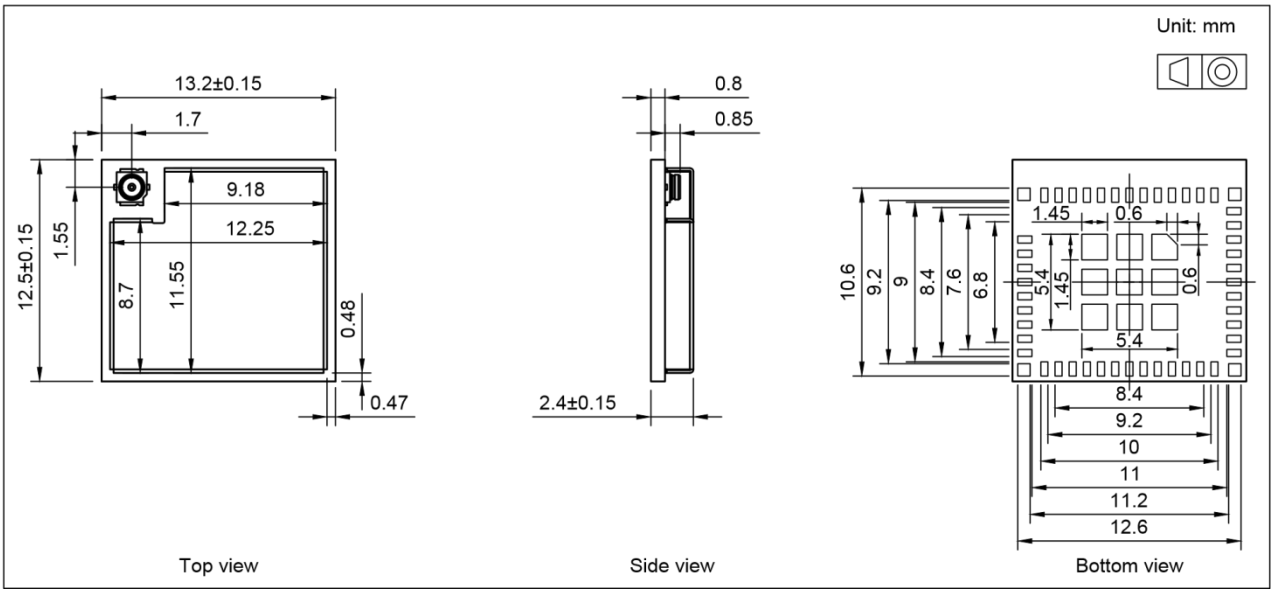


Figure 0-3 Module Size

3.3.2 E101-C3MN4-PS

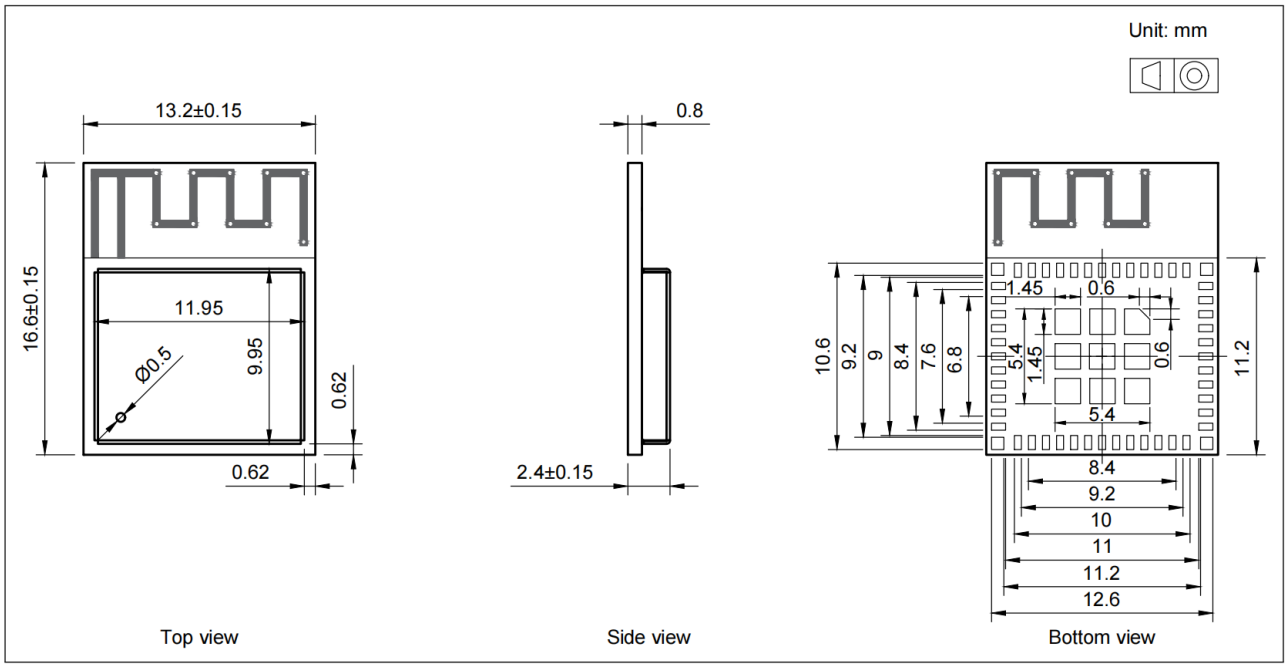


Figure 0-5 Module Size

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3.4 PCB Package

3.4.1 E101-C3MN4-PS

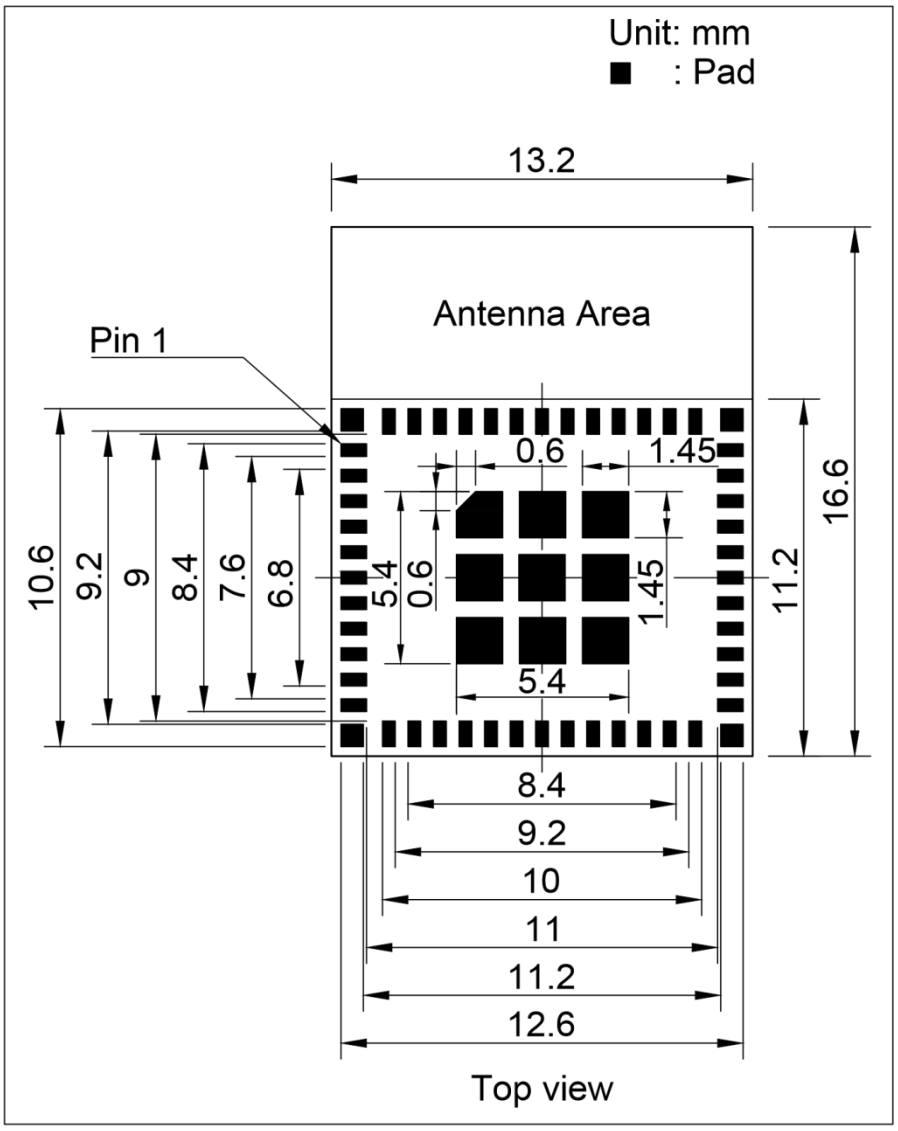


Figure 0-6 PCB Package

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3.4.1 E101-C3MN4-XS

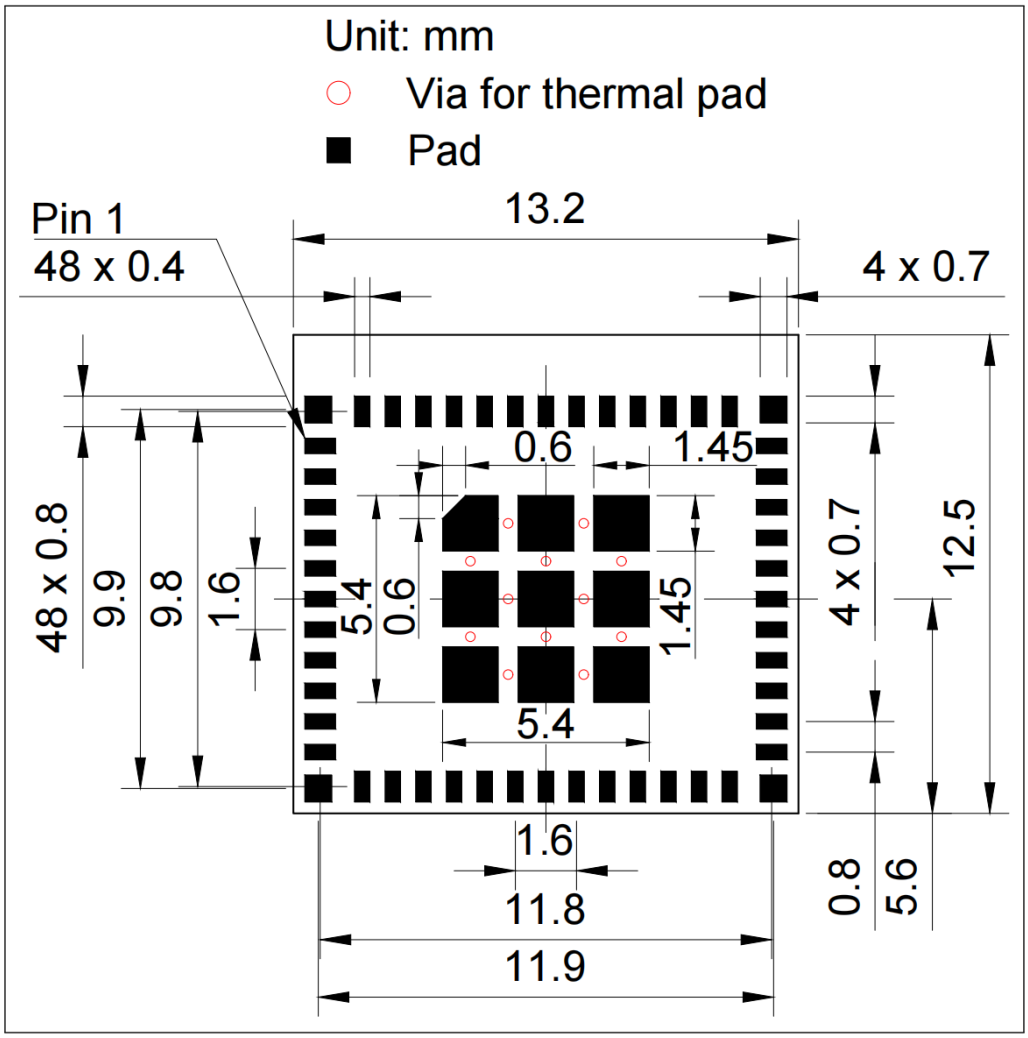


Figure 0-7 PCB Package

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3.5 External Antenna Connector Size

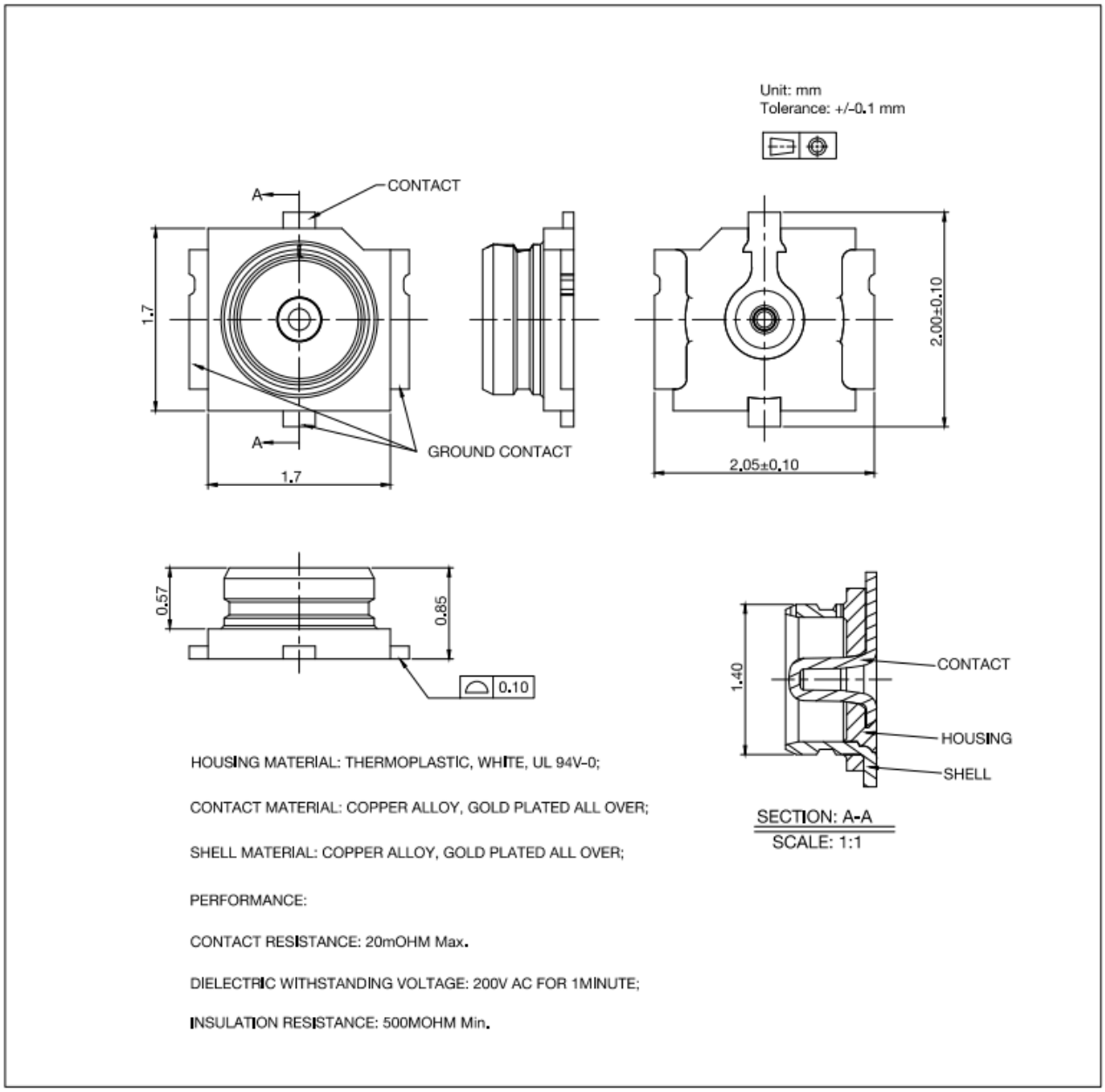


Figure 0-8 External antenna connector size

4 AT Command

AT instructions See download page AT Instruction Set.

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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;

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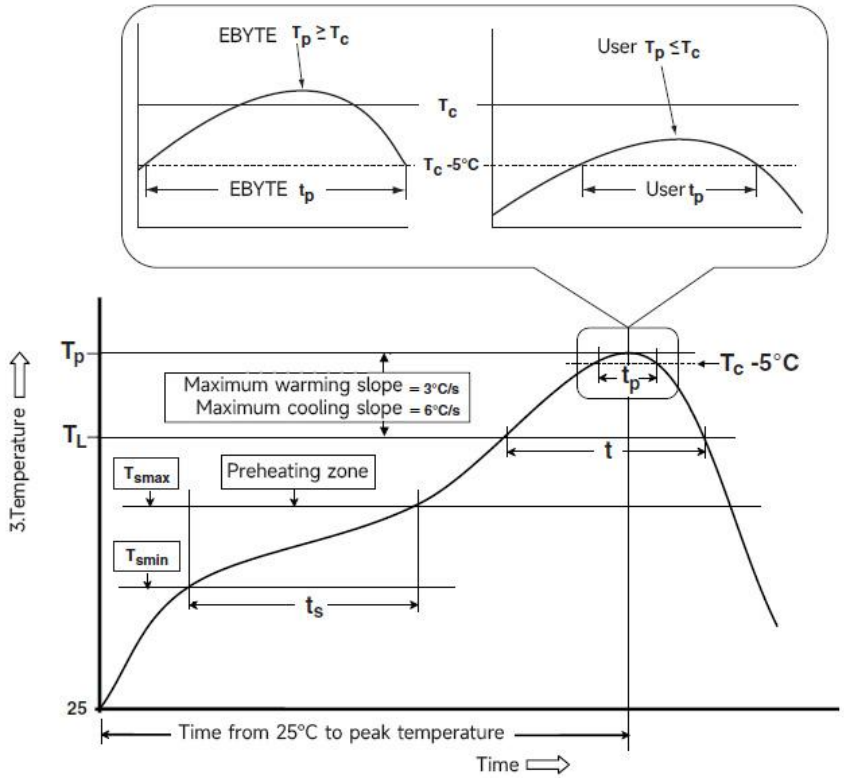
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6 Production Guidance

6.1 Reflow Soldering Temperature

Profile Feature	Sn-Pb Assembly	Pb-Free Assembly
Solder Paste	Sn63/Pb37	Sn96.5/Ag3/Cu0.5
Preheat Temperature min （Tsmin）	100℃	150℃
Preheat temperature max (Tsmax)	150℃	200℃
Preheat Time (Tsmin to Tsmax)(ts)	60-120 sec	60-120 sec
Average ramp-up rate(Tsmax to Tp)	3℃/second max	3℃/second max
Liquidous Temperature (TL)	183℃	217℃
Time（tL）Maintained Above（TL）	60-90 sec	30-90 sec
Peak temperature（Tp）	220-235℃	230-250℃
Aveage ramp-down rate（Tp to Tsmax）	6℃/second max	6℃/second max
Time 25℃ to peak temperature	max 6 minutes	max 8 minutes

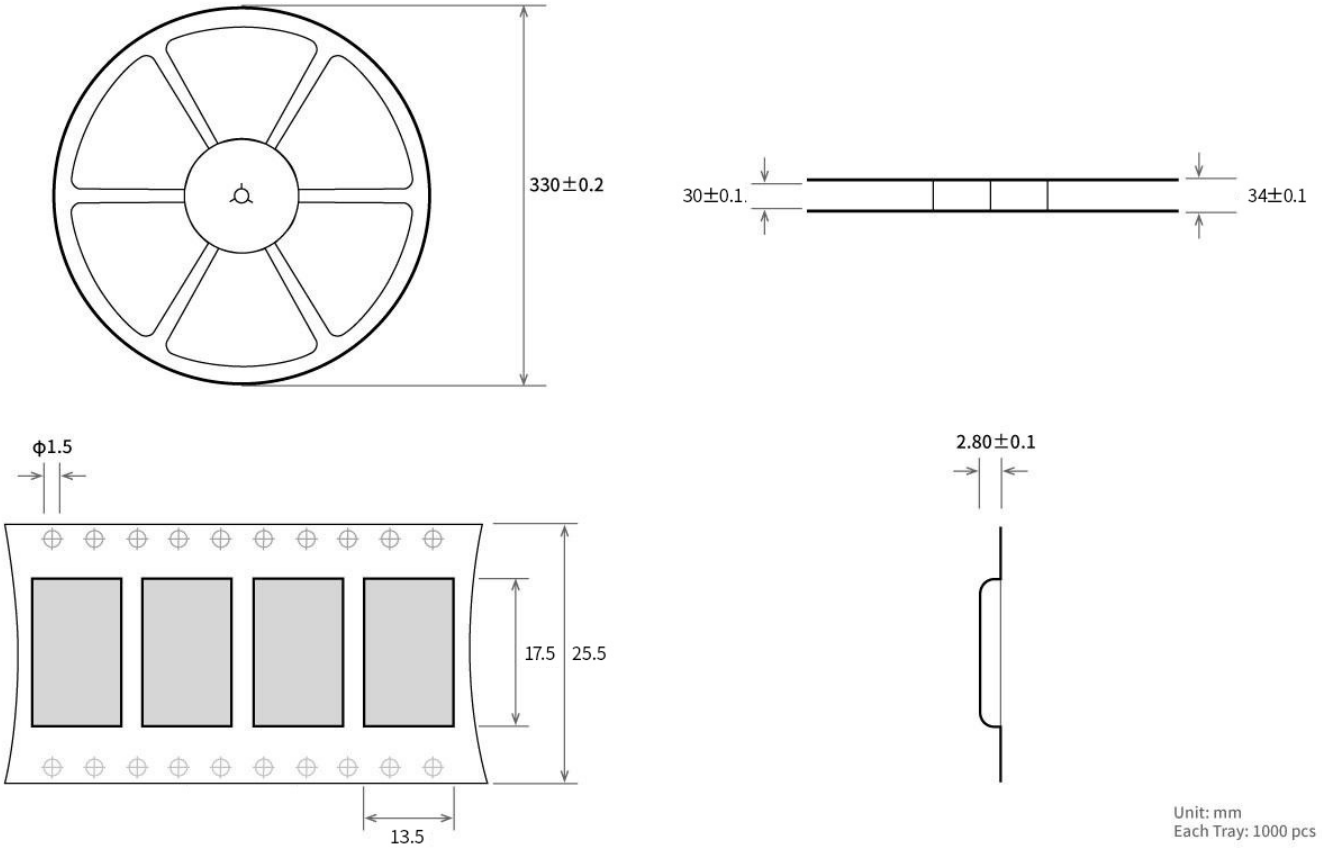
6.2 Reflow Soldering Curve



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7 Package for Batch Order



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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
1.3	2025-1-23	Model combination	Hao
1.4	2025-3-19	Add antenna instructions	Hao
1.5	2025-4-14	Add pin description	Hao

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