E34-2G4Hxxxx User manual

2.4GHz TTL Full-duplex Wireless Module



Chengdu Ebyte Electronic Technology Co.,Ltd.

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1 Introduction

1.1 Product Introduction

E34-2G4 Hxxx series products are wireless data transmission modules developed by Chengdu Yibite Electronic Technology Co., Ltd. They operate in the 2.4~2.518GHz frequency band, with optional transmission power of 11dBm/20dBm/27dBm, half-duplex, TTL level output, compatible with 3.3V and 5V IO port voltages, and use serial ports for data transmission and reception, which lowers the threshold for wireless applications.

The module has the characteristics of automatic frequency hopping, strong anti-interference ability, high transmission rate and small delay; the automatic frequency hopping technology is to ensure the confidentiality and anti-interference of communication. Compared with fixed frequency communication, frequency hopping communication is more concealed and difficult to be intercepted. Frequency hopping communication also has good anti-interference ability. Even if some frequencies are interfered, normal communication can still be carried out on other frequencies that are not interfered.

1.2 Features

- Support automatic frequency hopping, greatly improving the communication anti-interference ability;
- Supports fixed-frequency communication, fast transmission speed and low delay;
- Support automatic retransmission of lost packets;
- Supports fixed-point transmission and is easy to network and communicate;
- Built-in PA +LNA , the transmission power is increased to 500mW, and the communication distance can reach 5km;
- The module transmission power can be selected from 11dBm/20dBm/27dBm , and supports multi-level adjustment by software;
- Supports the global license-free ISM 2.4GHz frequency band;
- Support air rate 250k ～ 2M bps ;
- Support advanced GFSK modulation;
- Industrial standard design, supports long-term use at -40 ~ + 85 ℃ ;

1.3 Application Scenario

- Wearable devices;
- Smart home and industrial sensors, etc.
- Security system, positioning system;
- Wireless remote control, drone;
- Wireless game remote control;
- Healthcare products;
- Wireless voice, wireless headset;
- Automotive industry applications.

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2 Specification and parameter

2.1 RF parameters

RF parameters	unit	model			Remark
		E 34-2G4 H11S	E 34-2G4 H20SX E 34-2G4 H20D	E 34-2G4 H27SX E 34-2G4 H27D	
Maximum transmit power	dBm	11.0 ± 0.5	2 0 .0± 0.5	27.0 ± 0.5	-
Receiving sensitivity	dBm	- 90	-101 ～ -103	-101 ～ -103	The air rate is 250kbps
Reference distance	m	130	2 5 00	5000	In a clear and open environment, the antenna gain is 5dBi, the antenna height is 2.5 meters, and the air rate is 250 kbps .
Working frequency band	MHz	2400 ～ 2518			Support ISM band
Air speed	bps	2 50k ~ 2M			The higher the air rate, the shorter the communication distance
Blocking power	dBm	10	10	10	There is a risk of burning when used at close range
Launch length	B tye	29	29	29	Maximum length of a single transmission
Cache capacity	B tye	256	256	256	

2.2 Electrical parameters

Electrical parameters	unit	model			Remark
		E34-2G4 H11S	E34-2G4H20SX E34-2G4H20D	E34-2G4 H27SX E34-2G4 H27D	
Operating voltage	V	2.5 ~ 3.6 V	2.3～5.5	3.3～5.5	≥ 5 V can guarantee the output power , and exceeding 5.5 V may burn the module .

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Communication level		V	3.3V			Using 5V TTL may burn out
Power consumption	Emission current	mA	50	1 10	550	Instantaneous power consumption
	Receiving current	mA	23	21.5	27	
	Sleep current	uA	3	75	270	Software shutdown
temperature	Operating temperature	℃	-40 ～ + 85			Industrial-grade design
	Storage temperature	℃	-40 ～ + 125			Industrial-grade design

2.3 Hardware Parameters

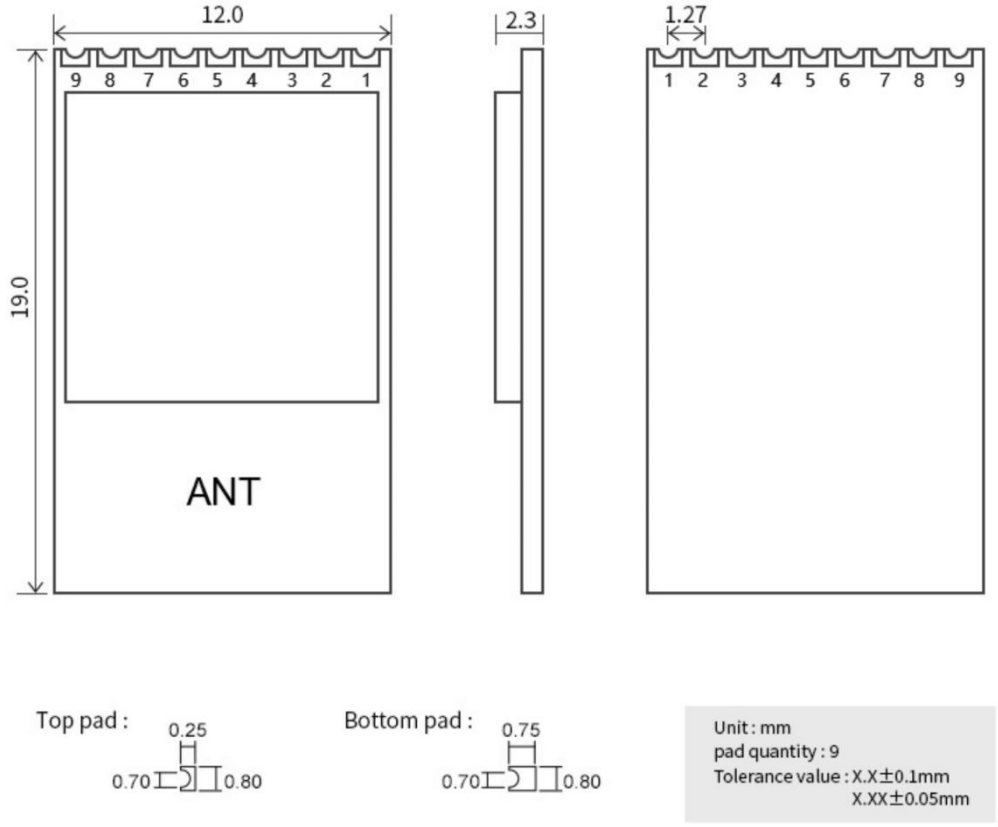
Hardware Parameters	Model			Remark
	E34-2G4 H11S	E34-2G4H20SX E34-2G4H27SX	E34-2G4 H20D E34-2G4 H27D	
Modulation	GFSK	GFSK	GFSK	New generation LoRa modulation technology
Interface	1.27 mm stamp hole	1.27 mm stamp hole	2.54mm pin header	
Communication interface	UART Serial Port	UART Serial Port	UART Serial Port	TTL level
Packaging	SMD	SMD	Direct plug-in	-
Antenna interface	PCB onboard antenna	IPEX/Stamp Hole	SMA-K	Equivalent impedance is about 50 Ω
size	12 * 19 mm	16*26mm	21*36mm	±0.2mm

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3 Size and pin definition

3.1 E34-2G4H11S dimensions and pin definition



Pin definition:

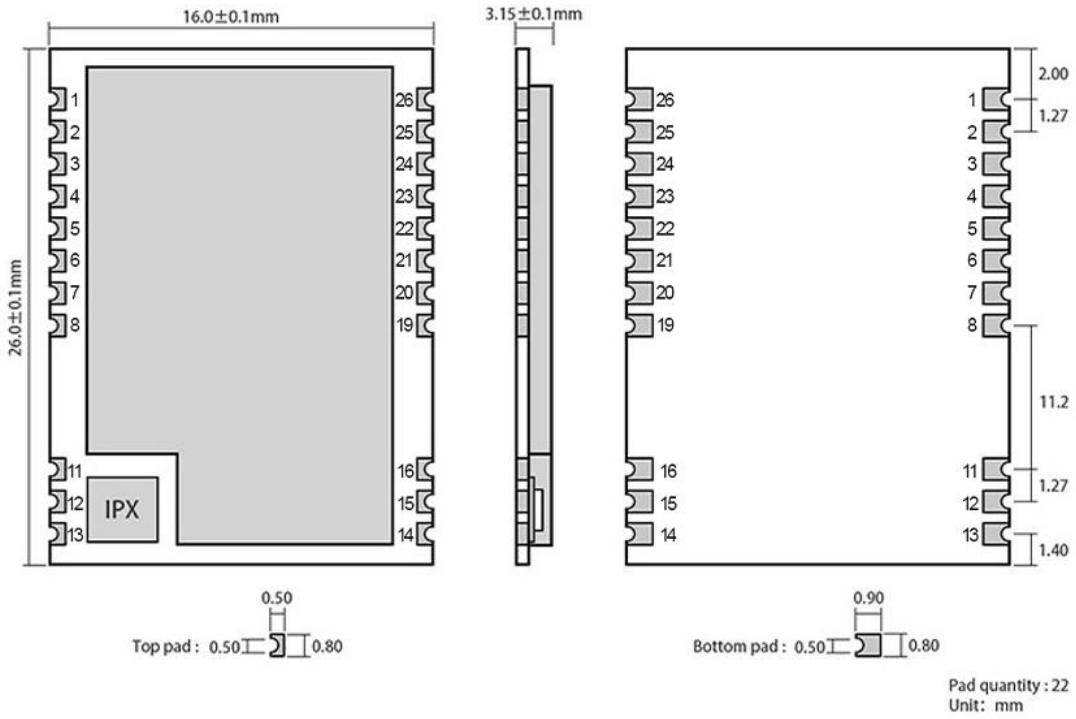
Pin number	Pin Name	Pin Direction	Pin Purpose
1	M0	Input (very weak pull-up)	Cooperate with M1 to determine the 4 working modes of the module (cannot be left floating, can be grounded if not used)
2	M1	Input (very weak pull-up)	Cooperate with M0 to determine the 4 working modes of the module (cannot be left floating, can be grounded if not used)
3	RxD	enter	TTL serial port input, connected to external TXD output pin.
4	TXD	Output	TTL serial port output, connected to external RXD input pin.
5	AUX	Output	Used to indicate the working status of the module (can be left floating) The user wakes up the external MCU and outputs a low level during the power-on self-test initialization .
6	VCC		Module power positive reference, voltage range: 2.5 ~ 3.6 V DC
7	GND	enter	Module ground wire

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8	RESET	enter	Module reset pin, low level is effective
9	NC		Reserved foot

3.2 E34-2G4 H20SX & E34-2G4H27SX Dimensions and Pin Definition



Pin definition:

Pin number	Pin Name	Pin Direction	Pin Purpose
1	RESET	enter	Module reset pin, 3.3V.
2	GND	-	Module ground wire
3	NC	-	Empty foot (not open for use, users do not need to care)
4	NC	-	Empty foot (not open for use, users do not need to care)
5	NC	-	-
6	NC	-	-
7	NC	-	-
8	GND	-	Module ground wire
11	GND	-	Module ground wire
12	ANT	-	Antenna interface (high frequency signal output, 50 ohm characteristic impedance)
13	GND	-	Module ground wire
14	GND	-	Module ground wire
15	GND	-	Module ground wire
16	GND	-	Module ground wire

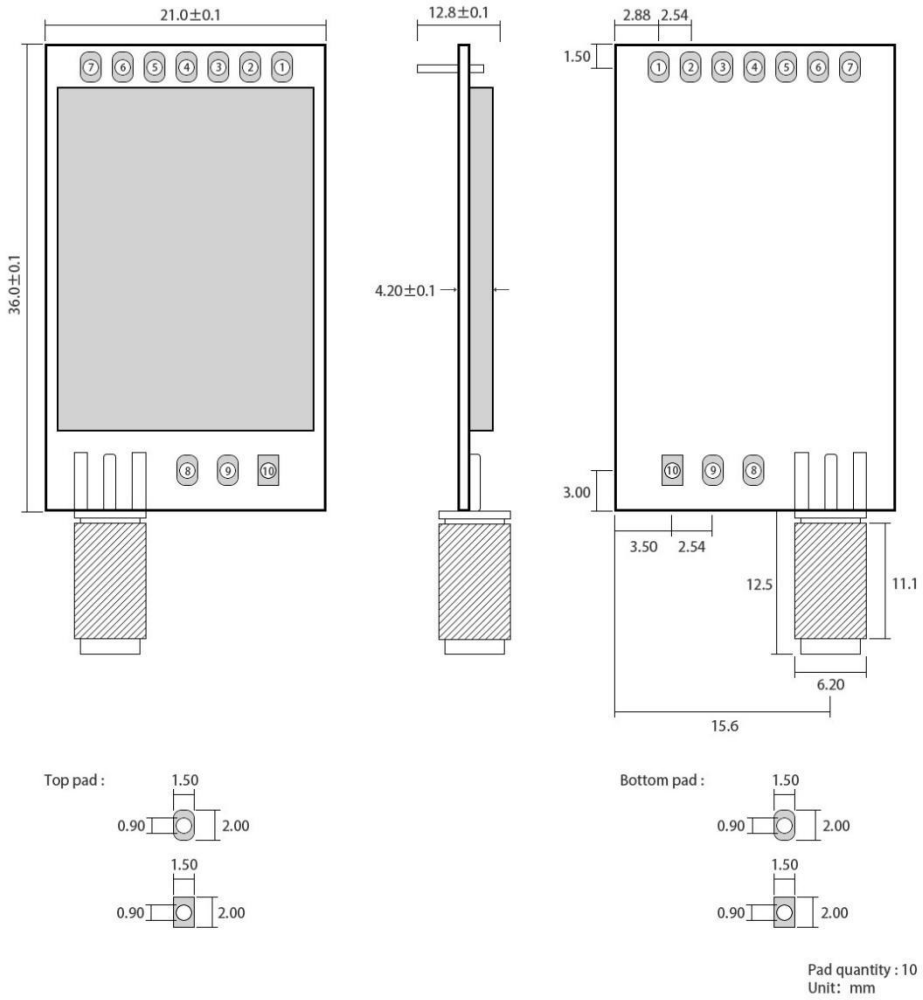
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19	GND	-	Module ground wire
20	M0	Input (very weak pull-up)	Cooperate with M1 to determine the 4 working modes of the module (cannot be left floating, can be grounded if not used)
twenty one	M 1	Input (very weak pull-up)	with M0 to determine the 4 working modes of the module (cannot be left floating, can be grounded if not used)
twenty two	RxD	enter	TTL serial port input, connected to external TXD output pin;
twenty three	TXD	Output	TTL serial port output , connected to external RXD output pin;
twenty four	AUX	Output	Used to indicate the working status of the module; the user wakes up the external MCU, and outputs a low level during the power-on self-test initialization period; (can be left floating)
25	VCC	-	Module power positive reference, voltage range: 2.3 ~ 5.5V DC
26	GND	-	Module ground wire

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3.3 E34-2G4H20D & E34-2G4H27D Dimensions and Pin Definition

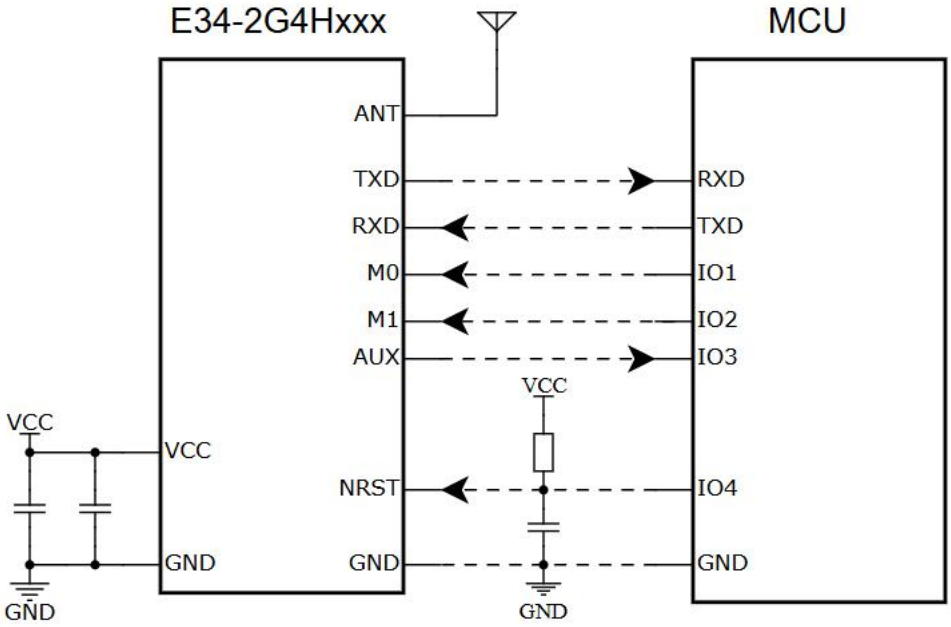


Pin number	Pin Name	Pin Direction	Pin Purpose
1	M0	Input (very weak pull-up)	Cooperate with M1 to determine the 4 working modes of the module (cannot be left floating, can be grounded if not used)
2	M1	Input (very weak pull-up)	Cooperate with M0 to determine the 4 working modes of the module (cannot be left floating, can be grounded if not used)
3	RxD	enter	TTL serial port input, connected to the external TXD output pin; Can be configured as open drain or pull-up input, see parameter settings for details.
4	TXD	Output	TTL serial port output, connected to the external RXD input pin; Can be configured as open drain or push-pull output, see parameter settings for details.
5	AUX	Output	Used to indicate the working status of the module (can be left floating) The user wakes up the external MCU, and the power-on self-test initialization period outputs a low level; Can be configured as open-drain output or push-pull output, see

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			parameter settings for details.
6	VCC		Module power positive reference, voltage range: 2.3 ~ 5.5V DC
7	GND	enter	Module ground wire
8	Fixing holes	enter	Fixing holes
9	Fixing holes		Fixing holes
10	Fixing holes		Fixing holes

4 Recommended Connection Diagram

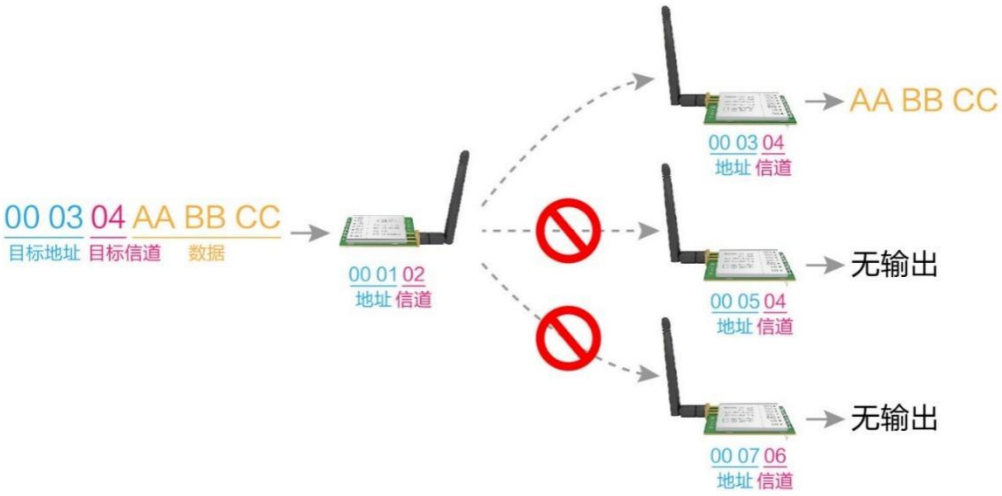


Serial number	Brief connection instructions between the module and the MCU (the above figure takes the STM8L MCU as an example)
1	The wireless serial port module is TTL level, please connect it to the TTL level MCU.
2	~ 10K pull-up resistors to the TXD and AUX pins of the module .

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5 Functional Details

5.1 Fixed - point transmission



5.2 Module reset

- After the module is powered on, AUX will immediately output a low level, perform a hardware self-check, and set the working mode according to user parameters;
  During this process, AUX maintains a low level. After completion, AUX outputs a high level and starts working normally according to the working mode composed of M1 and M0.
  Therefore, the user needs to wait for the AUX rising edge as the starting point for the module to work normally.

5.3 AUX Detailed Explanation

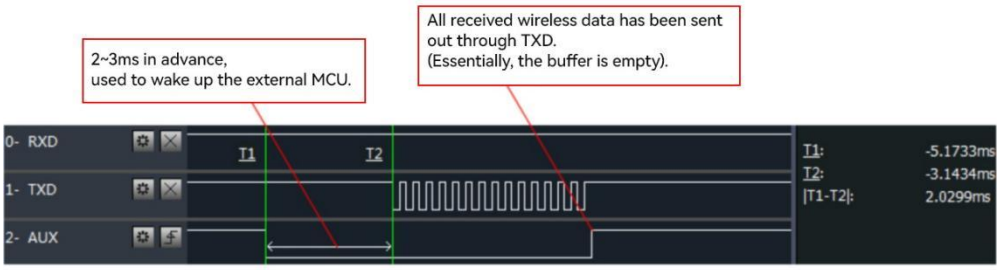
- AUX is used for wireless transceiver buffer indication and self-test indication;
- It indicates whether the module has data that has not been transmitted wirelessly, or whether the received wireless data has not been sent out through the serial port, or the module is in the process of initializing self-test.

5.3.1 Serial port data output indication

- Used to wake up the external MCU in sleep mode;

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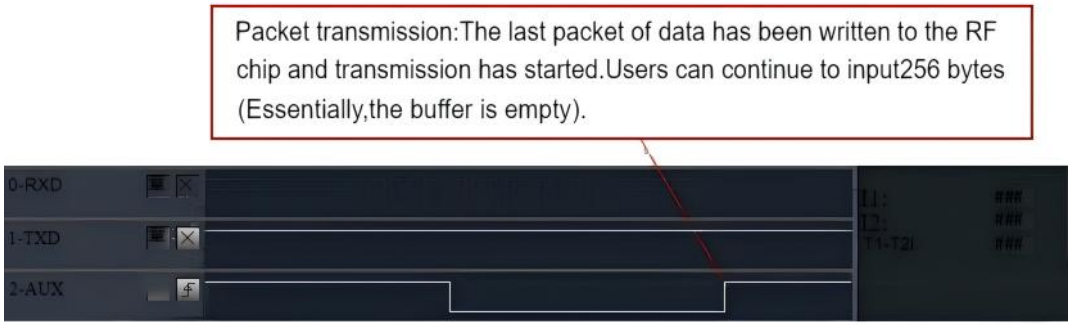
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AUX pin timing diagram when module serial port sends out data.

5.3.2 Wireless transmission indication

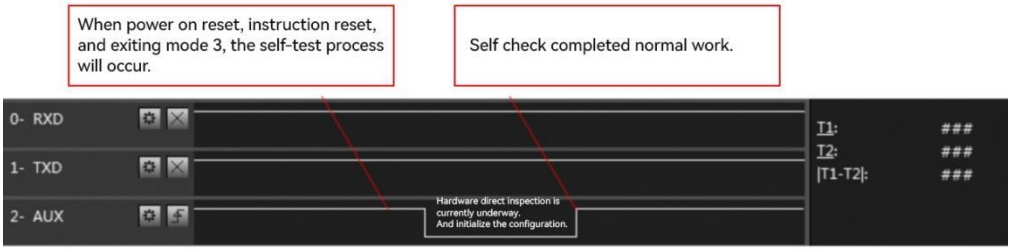
- Buffer empty: The data in the internal 256-byte buffer are all written to the wireless chip (automatically divided into packets). When AUX=1, the user continuously sends data less than 256 bytes without overflow;
  When AUX=0, the buffer is not empty: the data in the internal 256-byte buffer has not been fully written to the wireless chip and the transmission has not yet started. At this time, the module may have timed out waiting for the end of user data, or is transmitting wireless packets;
  【Note】: When AUX=1, it does not mean that all serial port data of the module has been transmitted wirelessly. It is also possible that the last packet of data is being transmitted.



AUX pin timing diagram when the module receives serial port data.

5.3.3 The module is being configured

- Only when resetting and exiting sleep mode;



During self check, AUX pin timing diagram.

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5.3.4 AUX Notes

- For the above functions 1 and 2, the output low level is given priority, that is, if any low level output condition is met, AUX will output a low level; when all low level conditions are not met, AUX will output a high level.
- When AUX outputs a low level, it means the module is busy and the working mode detection will not be performed at this time; when the module AUX outputs a high level within 1ms, the mode switching will be completed.
- After the user switches to a new working mode, the module will not actually enter this mode until at least 2ms after the AUX rising edge. If AUX is always at a high level, the mode switch will take effect immediately.
- When the user enters other modes from mode 3 (sleep mode) or during the reset process, the module will reset the user parameters, during which AUX outputs a low level.

6 Working Mode

The module has four working modes, which are controlled by pins M0 , M1 Settings; details are shown in the following table:

Mode (0-3)	M0	M1	Mode Introduction	Remark
0 Fixed frequency mode	0	0	Serial port open, wireless open, transparent transmission	The receiver must be in mode 0 or 2
1 Frequency Hopping Mode	1	0	Differences from mode 0: The module will change the frequency during the transmission and reception process according to certain algorithm rules. The range of change is not limited to the basic frequency set by the user. The module has a specific spread spectrum sequence.	The receiver must be in mode 1
2 Reserved mode	0	1	Reserved mode	Same as mode 0
3 Sleep mode	1	1	The module enters sleep mode and can receive parameter setting commands.	See the detailed working parameters for details.

6.1 Mode Switching

- The user can combine M1 and M0 with high and low levels to determine the module working mode;
  The MCU's two GPIOs can be used to control mode switching;
  changing M1 and M0: if the module is idle, it can start working in the new mode after 1ms;
  If the module has serial port data that has not been transmitted wirelessly, it can enter a new working mode only after the transmission is completed;
  If the module receives wireless data and sends data out through the serial port, it needs to finish sending before entering the new working mode;
  Therefore, mode switching is only effective when AUX output is 1, otherwise the switching will be delayed.
- For example: In mode 0 or mode 1, if the user continuously inputs a large amount of data and switches modes at the same time, the mode switching operation is invalid.

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The module will process all user data before detecting new patterns;

Therefore, the general recommendation is: detect the output status of the AUX pin and wait for 2ms after AUX outputs a high level before switching.

6.2 Fixed frequency mode (mode 0)

type	When M0 = 0, M1 = 0, the module works in mode 0
emission	The module receives user data from the serial port. The length of the wireless data packet transmitted by the module is 27 bytes. When the amount of data input by the user reaches 27 bytes, the module will start wireless transmission. At this time, the user can continue to input the data to be transmitted . When the bytes that the user needs to transmit are less than 27 bytes, the module waits for 3 bytes. If there is no more user data input, it is considered that the data is terminated. At this time, the module sends all data packets wirelessly . When the module receives the first user data, AUX outputs a low level. When the module puts all the data into the RF chip and starts transmitting, AUX outputs a high level . At this time, it indicates that the last packet of wireless data has been started to be transmitted, and the user can continue to input data up to 256 bytes . Data packets sent in mode 0 can only be received by receiving modules in mode 0 or mode 2.
take over	The module keeps the wireless receiving function on and can receive data packets from mode 0 and mode 2 . After receiving the data packet, the module AUX outputs a low level, and after a delay of 5ms, it starts to send the wireless data through the serial port TXD pin. After all the wireless data are output through the serial port, the module AUX outputs a high level.
Notice	When the module is transmitting data, it cannot receive data. At the same time, when the module is receiving data, it cannot send data.

6.3 Frequency Hopping Mode (Mode 1)

type	When M0 = 1, M1 = 0, the module works in mode 1
emission	The conditions for the module to start transmitting data packets and the AUX function are the same as those in mode 0. The only difference is that the module will change the frequency during the transmission and reception process according to certain algorithm rules. The range of change is not limited to the basic frequency set by the user. The module has a specific spreading sequence. The user does not need to worry about this sequence. The data packets sent through mode 1 can only be received by the receiving module in mode 1.
take over	It is equivalent to mode 0, the only difference is that the module can only receive data packets sent from mode 1.
Notice	When the module is transmitting data, it cannot receive data. At the same time, when the module is receiving data, it cannot send data.

6.4 Reserved mode (mode 2)

type	When M0 = 0, M1 = 1, the module works in mode 2
emission	Equivalent to mode 0.

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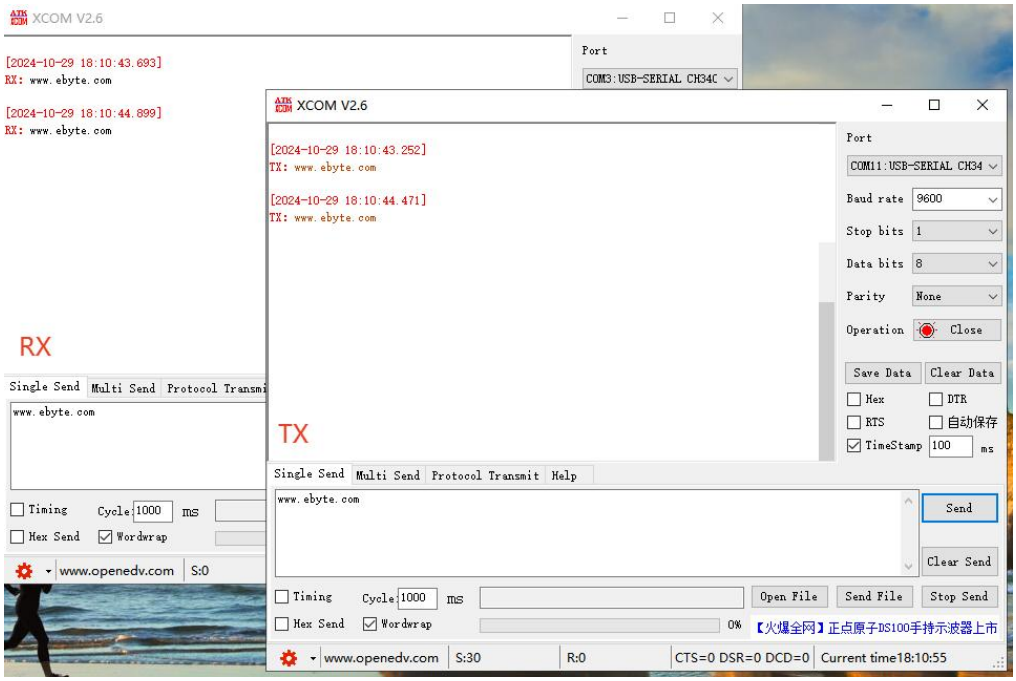
take over	Equivalent to mode 0.

6.5 Sleep mode (mode 3)

type	When M0 = 1, M1 = 1, the module works in mode 3
emission	Unable to transmit wireless data.
take over	Unable to receive wireless data.
Configuration	The sleep mode can be used to set the module parameters. Use the serial port 9600 and 8N1 to set the module working parameters through a specific instruction format.
Notice	When entering other modes from setting mode, the module will reconfigure parameters. During the configuration process, AUX remains at a low level; After completion, it outputs a high level, so it is recommended that users detect the rising edge of AUX.

6.6 Quick communication test

step	Specific operations
1	Plug the USB test board (E15-USB-T2) into the computer and make sure the driver has been installed correctly; Plug in the mode selection jumper on the USB test board (i.e. M1=0, M0=0).
2	You can choose 3.3V or 5V power supply (the module supports 3.3 ~ 5.5V).
3	Run the "Serial Port Debug Assistant" software, select the correct serial port number, and observe the sending window and the corresponding receiving window.



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7 Instruction Format

- the setup mode (mode 3: M0=1, M1=1), the supported commands are listed as follows (**during setup, only 9600, 8N1 format is supported**):

Serial number	Instruction Format	Detailed description
1	C0+ Operating Parameters	Send C0+5 bytes of working parameters in hexadecimal format, a total of 6 bytes, must be sent continuously (save when power is off)
2	C1+C1+C1	Send three C1s in hexadecimal format, and the module returns the saved parameters. They must be sent continuously.
3	C2+ Operating Parameters	Send C2+5 bytes of working parameters in hexadecimal format , a total of 6 bytes, must be sent continuously (not saved when power is off)
4	C3+C3+C3	Send three C3 in hexadecimal format, and the module returns version information. It must be sent continuously.
5	C4+C4+C4	Send three C4s in hexadecimal format and the module will generate a reset. This must be sent continuously.

7.1 Factory default parameters

model	Factory default parameter value: C0 00 00 18 00 40						
Module Model	frequency	address	Channel	Air speed	Baud rate	Serial port format	Transmit power
E34-2G4H11S	2.4GHz	0x0000	0x00	2 50 kbps	9600	8N1	13 mW
E34 - 2G4H20 SX	2.4GHz	0x0000	0x00	2 50 kbps	9600	8N1	100mW
E34 - 2G4H27 SX	2.4GHz	0x0000	0x00	2 50 kbps	9600	8N1	500mW
E34 - 2G4H20D	2.4GHz	0x0000	0x00	2 50 kbps	9600	8N1	100mW
E34 - 2G4H27D	2.4GHz	0x0000	0x00	2 50 kbps	9600	8N1	500mW

7.2 Reading working parameters

Instruction Format	Detailed description
C1+C1+C1	In sleep mode (M0=1, M1=1), send a command to the module serial port (HEX format): C1 C1 C1, The module will return the current configuration parameters, for example: C0 00 00 18 00 40.

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7.3 Version number reading

Instruction Format	Detailed description
C3+C3+C3	In the setting mode (M0=1, M1=1), send the command (HEX format) to the module serial port: C3 C3 C3, The module will return the current configuration parameters, for example: C3 39 xx yy; Here, 39 represents the module model (E39 series), xx is the version number, and yy refers to other features of the module.

7.4 Reset Instructions

Instruction Format	Detailed description
C4+C4+C4	In the setting mode (M0=1, M1=1), send the command (HEX format) to the module serial port: C4 C4 C4, The module will generate a reset; During the reset process, the module performs self-test and AUX outputs a low level. After the reset is completed, AUX outputs a high level and the module starts to work normally. At this time, you can switch modes or initiate the next instruction.

7.5 Parameter setting instructions

	name	describe				Remark
0	HEAD	Fixed 0xC0 or 0xC2, indicating that this frame data is a control command				Must be 0xC0 or C2 C0: The set parameters will be saved when power is off. C2: The set parameters will not be saved when the power is off.
1	ADDH	7, 6, 5, 4 Number of packet loss retransmissions (valid only in modes 0 and 2)				The default is 15 times (default F) ; when there are multiple receivers with the same address, conflicts may occur, so please set it to 0
		3, 2, 1, 0 module address high 4 bits (default F 0H)				Default 0
2	ADDL	Module address low byte (default 00H)				00H-0FFH
3	SPED	7	6	Serial port check digit		The serial port modes of the two communicating parties can be different
		0	0	8N1 (default)		
		0	1	8O1		
		1	0	8E1		
		1	1	8N1 (equivalent to 00)		
		5	4	3	TTL serial port rate (bps)	The baud rates of the two communicating parties can be different; The serial port baud rate has nothing to do with the wireless transmission parameters and does not affect the wireless transceiver characteristics.
		0	0	0	The serial port baud rate is 1200	
		0	0	1	The serial port baud rate is 2400	
		0	1	0	The serial port baud rate is 4800	
		0	1	1	The serial port baud rate is 9600 (default)	
		1	0	0	The serial port baud rate is 19200	

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<table>
<tr><td rowspan="13"></td><td rowspan="13"></td><td>1</td><td>0</td><td>1</td><td>The serial port baud rate is 38400</td><td rowspan="3"></td></tr>
<tr><td>1</td><td>1</td><td>0</td><td>The serial port baud rate is 57600</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>The serial port baud rate is 115200</td></tr>
<tr><td>2</td><td colspan="3">Reserved for future use</td><td>It is recommended to write 0</td></tr>
<tr><td>1</td><td>0</td><td colspan="2">Wireless air rate (bps)</td><td rowspan="6">The wireless transmission rate of both communicating parties must be the same in the air ;

The lower the air rate, the longer the distance, the stronger the anti-interference performance and the longer the transmission time.</td></tr>
<tr><td>0</td><td>0</td><td colspan="2">Air rate 2 50 k (default)</td></tr>
<tr><td>0</td><td>1</td><td colspan="2">Air speed 1M</td></tr>
<tr><td>1</td><td>0</td><td colspan="2">Air speed 2M</td></tr>
<tr><td>1</td><td>1</td><td colspan="2">Air speed 2M (equivalent to 1 0)</td></tr>
<tr><td colspan="5">7, 6 , 5 , 4 Reserved for future use</td><td>It is recommended to write 0</td></tr>
<tr><td colspan="5">3 , 2, 1, 0 Communication Channel
Fixed frequency mode (mode 0)
Channel 0-5 corresponding frequency: 2400M + CHAN * 2M
Channel 6-11 corresponding frequency: 2508M + (CHAN-6) * 2M
Frequency hopping mode (mode 1)
Channel 0-11 corresponding frequency: 2412M + CHAN * 2M</td><td>00H～ 0BH , a total of 12 channels ;</td></tr>
<tr><td rowspan="13">5</td><td rowspan="13">OPTION</td><td>7</td><td colspan="3">Fixed-point transmission enable bit (similar to MODBUS)</td><td rowspan="3">When it is 1, the first 3 bytes of each user data frame are used as high and low addresses and channels. When transmitting, the module changes its own address and channel, and restores the original settings after completion .</td></tr>
<tr><td>0</td><td colspan="3">Transparent transmission (default)</td></tr>
<tr><td>1</td><td colspan="3">Fixed-point transmission</td></tr>
<tr><td>6</td><td colspan="3">IO driver mode (default 1)</td><td rowspan="3">This bit is used to enable the module's internal pull-up resistor;
The open-drain mode has stronger level adaptability and may require an external pull-up resistor in some cases.</td></tr>
<tr><td>1</td><td colspan="3">TXD, AUX push-pull output, RXD pull-up input</td></tr>
<tr><td>0</td><td colspan="3">TXD, AUX open circuit output, RXD open circuit input</td></tr>
<tr><td colspan="4">5 , 4, 3, 2 Reserved for future use</td><td>It is recommended to write 0</td></tr>
<tr><td>1</td><td>0</td><td colspan="2">Transmit power (approximate)</td><td rowspan="5">The external power supply must provide a current output capability of more than 800 mA and ensure that the power ripple is less than 100mV ;

It is not recommended to use a lower power transmission because its power utilization efficiency is not high.</td></tr>
<tr><td>0</td><td>0</td><td colspan="2">11/20/27 dBm (default)</td></tr>
<tr><td>0</td><td>1</td><td colspan="2">7/17/21 dBm</td></tr>
<tr><td>1</td><td>0</td><td colspan="2">7/14/15 dBm</td></tr>
<tr><td>1</td><td>1</td><td colspan="2">-1/10/9 dBm</td></tr>
</table>

Example (the meaning of the byte "SPED" in sequence number 3):

The binary bits of the byte	7	6	5	4	3	2	1	0
Specific value (user configuration)	0	0	0	1	1	0	0	0
Representative significance	Serial port check digit 8N1		The serial port baud rate is 9600			Air rate 2 50 kbps		
Corresponding hexadecimal	1			8				

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8 Hardware Design

- It is recommended to use a DC regulated power supply to power the module. The power supply ripple coefficient should be as small as possible and the module should be reliably grounded.
- Please pay attention to the correct connection of the positive and negative poles of the power supply. Reverse connection may cause permanent damage to the module.
- Please check the power supply to ensure that it is within the recommended power supply voltage. If it exceeds the maximum value, the module will be permanently damaged.
- Please check the stability of the power supply. The voltage should not fluctuate greatly or frequently.
- When designing the power supply circuit for the module, it is often recommended to retain more than 30% margin, which is conducive to long-term stable operation of the whole machine;
- The module should be kept as far away as possible from power supplies, transformers, high-frequency wiring and other parts with large electromagnetic interference;
- High-frequency digital routing, high-frequency analog routing, and power routing must avoid the bottom of the module. If it is necessary to pass under the module, assuming that the module is soldered on the Top Layer, ground copper should be laid on the Top Layer of the module contact part (all copper should be laid and well grounded), and it must be close to the digital part of the module and routed on the Bottom Layer ;
- Assuming the module is soldered or placed on the Top Layer, it is also wrong to randomly route the wires on the Bottom Layer or other layers, which will affect the module's spurious signal and receiving sensitivity to varying degrees ;
- If there are devices with large electromagnetic interference around the module, it will also greatly affect the performance of the module. It is recommended to keep them away from the module according to the intensity of the interference. If possible, appropriate isolation and shielding can be performed.
- If there are traces with large electromagnetic interference around the module (high-frequency digital, high-frequency analog, power traces), it will also greatly affect the performance of the module. It is recommended to keep them away from the module according to the intensity of the interference. If possible, appropriate isolation and shielding can be performed.
- If the communication line uses 5V level, a 1k-5.1k resistor must be connected in series (not recommended, there is still a risk of damage) ;
- Try to stay away from some TTL protocols whose physical layer is also 2.4GHz, such as USB3.0;
- When the module is installed inside the enclosure, you can use a high-quality antenna extension cable to extend the antenna to the outside of the enclosure and preferably vertically upward.

9 FAQ

9.1 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;

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- 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 2.5V, the lower the voltage, the lower the transmitting power;
- Due to antenna quality or poor matching between antenna and module.

9.2 Module is easy to damage

- Please check the power supply source, ensure it is 2.0V~3.6V, voltage higher than 3.6V 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.

9.3 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;
- Poor power supply may cause messy code. Make sure that the power supply is reliable;
- The extension line and feeder quality are poor or too long, so the bit error rate is high.

10 Welding Operation Instructions

This product is a plug-in module. When welding the module, the welder must follow the static discharge operation specifications;

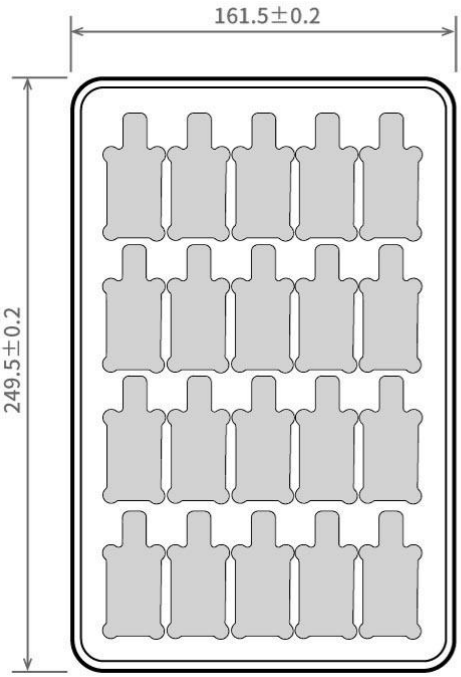
This product is electrostatically sensitive. If you solder the module without following the rules, the module may be permanently damaged.

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11 Bulk packaging method

11.1 E34-2G4H20D & E34-2G4H27D

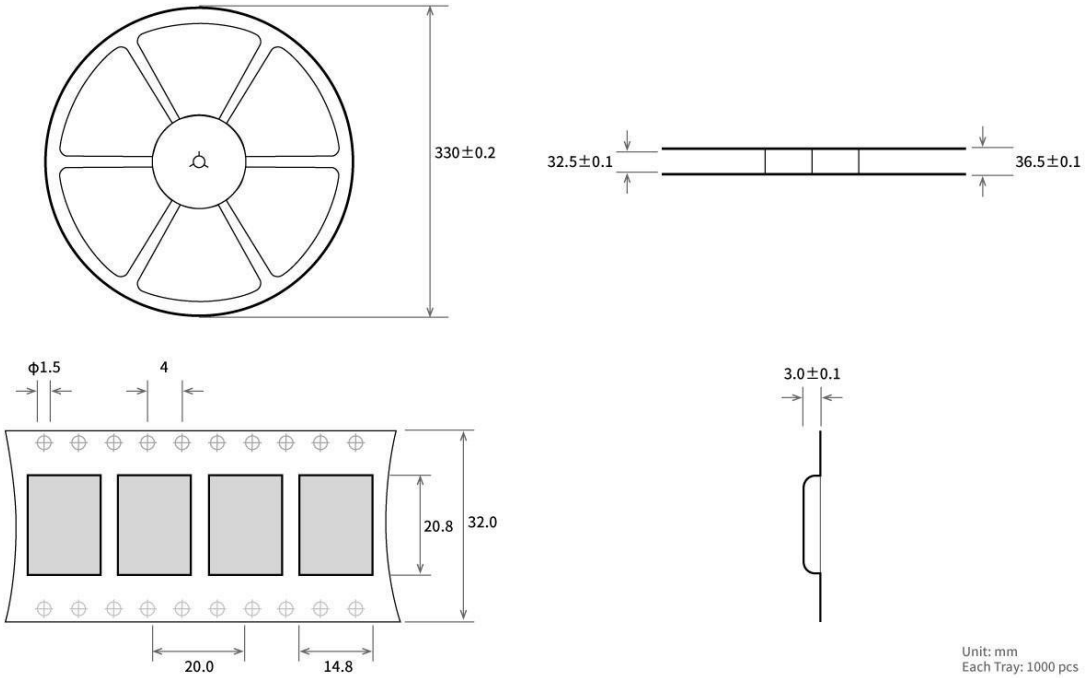




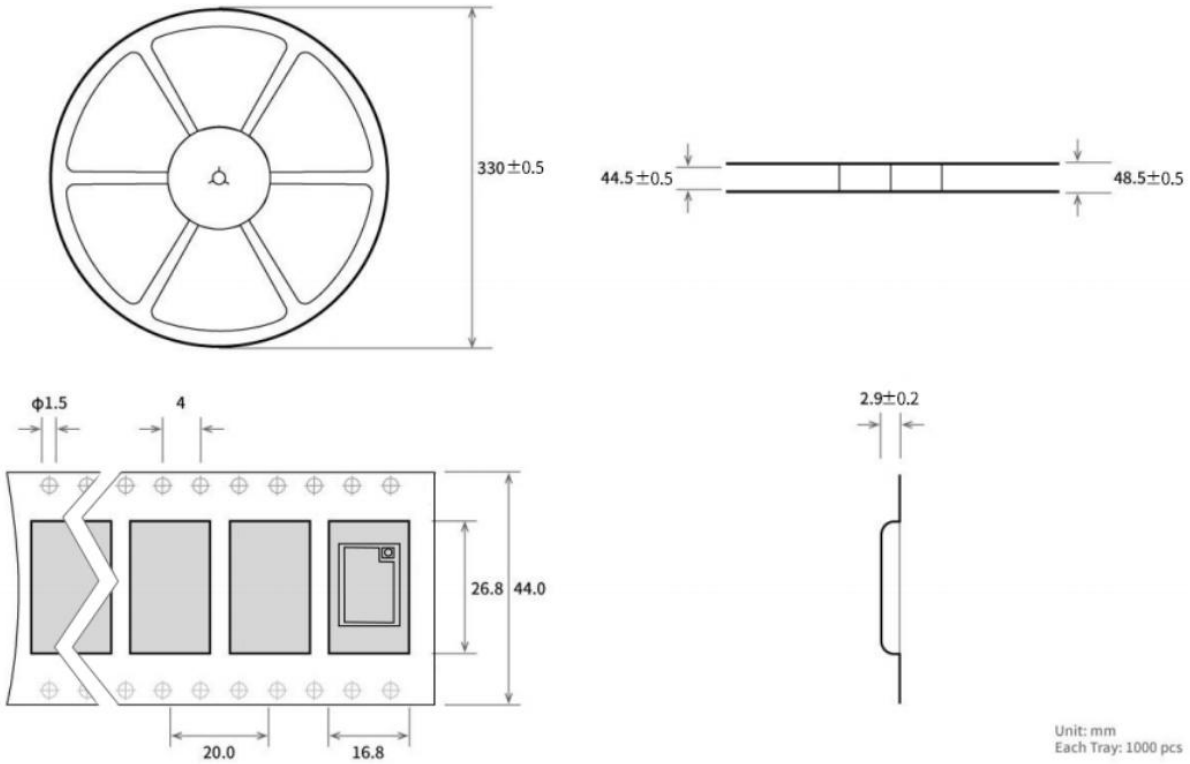
Unit: mm
Each Layer: 20 pcs
Each Package: 5 layers

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11.2 E34-2G4H20SX & E34-2G4H27SX



11.2 E34-2G4H11S



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Revision History

Version	Revision Date	Revision Notes	Maintainer
V1.0	2024-10-9	Initial release	Hao
V1.1	2025-11-26	Edit content	Hao

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