E22-xxxTBH-02 User Manual

SX1268/SX1262/SX1278 37dBm LoRa Spread Spectrum



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1. Module Introduction

1.1 Features

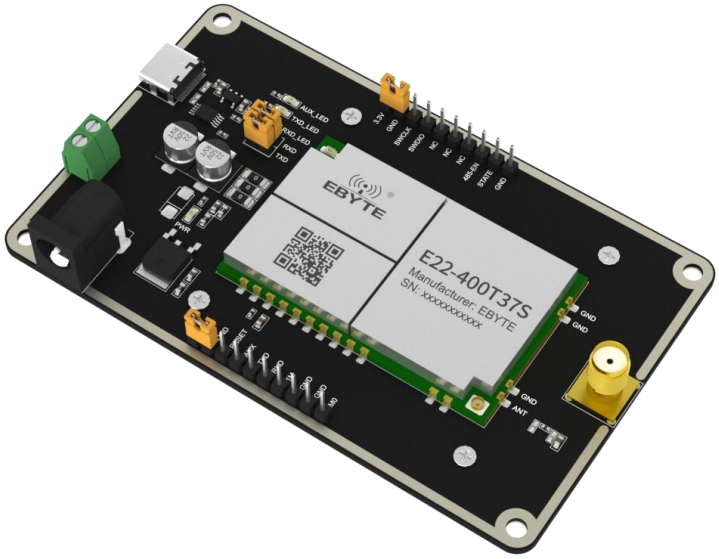


Fig. 1 Physical drawing of the module

The E22/E32-xxxTBH-02 is an entry-level development board that uses the E22-400T37S, E22-230T37S, and E32-433T37S modules, which are known for their high-power long-distance communication. The board has multiple transmission modes, works in 230/433/470MHz band, LoRa spread spectrum technology, TTL level output, and supports 4.5V~15V power supply voltage. Most of the pins of the module on the board have already been led out to the two sides of the row of pins, developers can easily connect a variety of peripheral devices through the jumper according to the actual needs of the developer, and also can be used in the breadboard to plug in the development of the board.

1.2 Parameters

Serial Number	Parameters	Parameter value	Comments
1	Support Modules	E22-400T37S E22-230T37S E32-433T37S	LoRa Wireless Module
2	Test board size	59.5*97mm	-
3	Production process	Lead Free Process, Machine Attached	Wireless products must be machine applied to ensure batch consistency and reliability.
4	Power		-

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	supply interface		
5	communications interface	USB	uart to usb
6	operating temperature	-40 ~ +85℃	industrial grade
7	Operating humidity	10% ~ 90%	Relative humidity, non-condensing
8	Storage temperature	-40 ~ +125℃	industrial grade

2. Brief description of function

2.1 Component Introduction

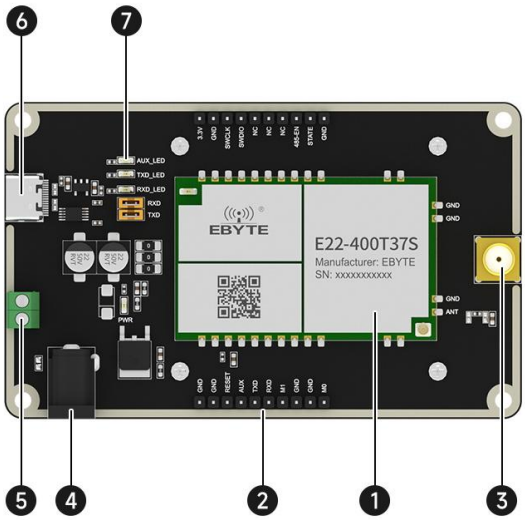


Figure 2. Diagram of major components

Serial Number	Main Firmware	Introduction
1	E22-400T37S E22-230T37S E32-433T37S	E22-400T37S is a new generation of LoRa wireless module, based on SX1268 RF chip wireless serial module (UART), with multiple transmission modes, working in 230/433/470MHz frequency band, LoRa spread spectrum technology, TTL level output, supporting 4.5V~15V power supply voltage. It supports

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		Wake-on-Air, Wireless Configuration, Carrier Listening, Auto Relay, Communication Key, etc. It also supports packet length setting.
2	Pin	All available GPIO pins (except the SPI bus for flash) have been routed to the development board's header pins.
3	SMA	SMA Antenna Mount
4	DC header	5-12V power supply DC connector (DC header and green terminal are optional)
5	green terminal	5-12V power supply terminal connector (DC header and green terminal are optional)
6	TYPE-C USB port	USB interface. Can be used as a communication interface between a PC and the E22-400T37S module.
7	AUX indicator	AUX is used for wireless transceiver buffer indication and self-test indication.

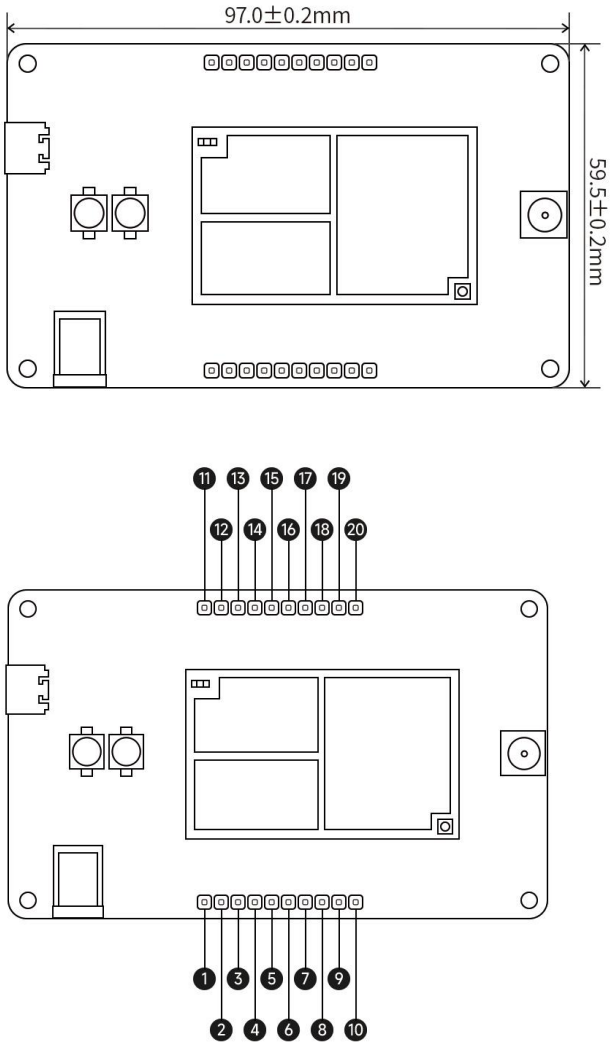
Note: Please refer to the E22-400T37S, E22-230T37S, and E32-433T37S module user's manuals for specific function detail instructions.

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2.2 Pin Definitions

The following diagram shows the dimensions and pin definitions of the E22/E32-xxxTBH-02:



Pin Number	Pin Name	Type	Pin Usage
1	GND	Input	Module Ground
2	GND	Input	Module Ground
3	RESET	Input	Module Reset Pin
4	AUX	Output	Used to indicate the working status of the module; the user wakes up the external MCU and outputs a low level during power-on self-test initialisation; (can be suspended)
5	TXD	Output	TTL serial output connected to external RXD input pin;
6	RXD	Input	TTL serial input connected to an external TXD output pin;

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7	M1	Input	In conjunction with M0, determines the 4 modes of operation of the module (cannot be left unattended, but can be grounded if not in use).
8	GND	Input	Module Ground
9	GND	Input	Module Ground
10	M0	Input	In conjunction with the M1, determines the 4 modes of operation of the module (non-hovering, can be grounded if not in use)
11	3.3V	-	No need to care, hovering treatment
12	GND	Input	Module Ground
13	SWCLK	-	No need to care, hovering treatment
14	SWDIO	-	No need to care, hovering treatment
15	NC	-	No need to care, hovering treatment
16	NC	-	No need to care, hovering treatment
17	NC	-	No need to care, hovering treatment
18	485-EN	Input/Output	Enable control pin of the external 485 chip, if it is not used, it can be dealt with by suspending it.
19	STATE	Output	Module status indication output, if not used suspension handling is sufficient
20	GND	Input	Module Ground

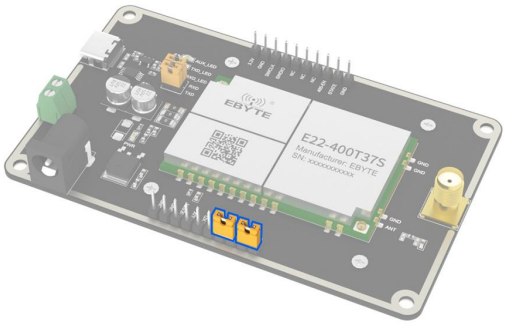
Note: 1.P: power supply; I: input; O: output; T: can be set to high resistance.

2. The power supply mode is green terminal and DC head, power supply range 4.5V~15V (green terminal is invalid when DC head is inserted).

3. Working mode

The operating modes of the control module are customised according to the characteristics of the product being used, and the following four operating modes are explained by the settings of pins M0 and M1, as shown in the figure below:

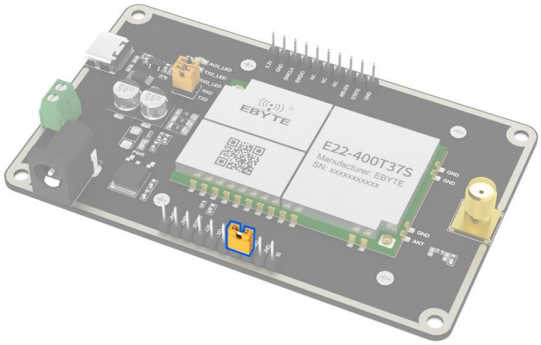
- General Mode (Mode 0, short-circuit bubbles all plugged in): serial port open, wireless open, transparent transmission, supports special command over-the-air configuration.



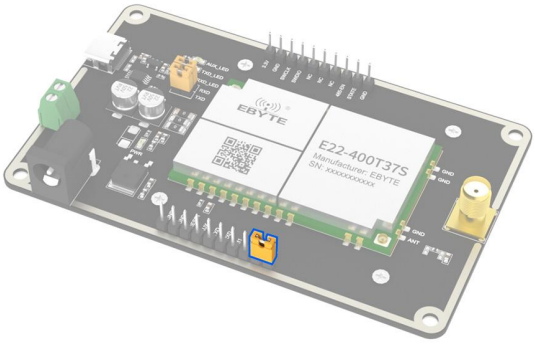
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- WOR Mode (Mode 1, remove M0 short-circuit bubble): can be defined as WOR sender and WOR receiver, supports wake-on-air.



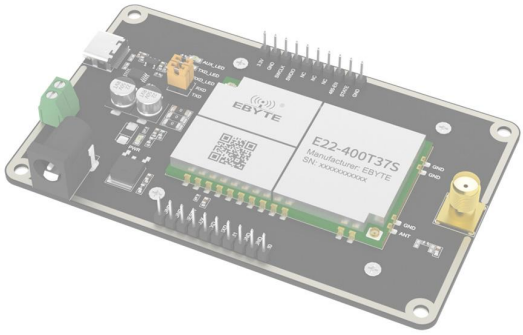
- Configuration Mode (Mode 2, remove M1 short-circuit bubble): Users can access the registers through the serial port to control the module working status.



- Deep Hibernation (mode 3, short-circuit bubbles all removed): the module enters hibernation.

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4. Parameter Configuration

Steps	Operation	Explanation
1	Installation of drivers	Please install the USB adapter board driver (CH340X) in the package first.
2	Unplug the jumper	Unplug the jumper caps at M0 and M1 on the USB adapter board as shown in the figure below; either 3.3V or 5V can be selected for the power jumper cap.
3	connection module	Insert the module into the 7PIN holder of the adapter board with the antenna end facing outward; then insert the adapter board into the USB port of your computer.
4	Open the serial port	Open our parameter configuration software, select the corresponding serial port number and click "Open Serial Port";
5	Getting to the interface	Click "Read Module Parameters", the interface is shown as below; If the reading fails, please check whether the module is in mode 3, or whether the adapter driver has been installed.
6	Write parameters	If you need to change the corresponding configuration, please adjust the parameters to be modified; click the "Write" button to write the new parameters to the module.
7	Finish the operation	If you need to reconfigure, please follow "Step 5"; if the configuration is finished, please click "Close Serial Port" first and then remove the module.
8	Command Configuration	The microcontroller can use commands to configure the module parameters, see "Command Format-Parameter Setting Command" above for details of the configuration.

5. Version information

Version	Revision date	Revised description	Maintainer
1.0	2024-3-6	Initial version	Hao

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