E28-2G4TBM-01 Development Board User Manual



Chengdu Ebyte Electronic Technology Co.,Ltd.

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1 Module Introduction

1.1 Features Overview

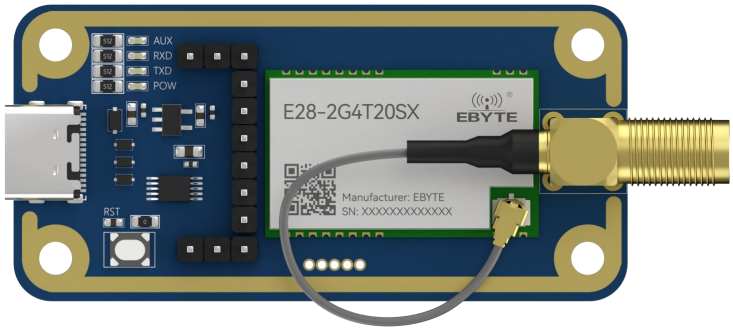


Figure 1 Product Appearance Diagram

The E28-2G4TBM-01 is an entry-level development board featuring the E28-2G4T20SX high-speed, long-range 2.4GHz transmission module. This board provides complete high-speed continuous transmission functionality, with most module pins brought out to header pins. Developers can easily connect various peripheral devices via jumpers according to actual requirements, facilitating testing.

1.2 Parameter Introduction

Serial Number	Parameter	Value	Note
1	Support Module	E28-2G4T20SX	Serial Port Module
2	Module Dimensions	58*28mm	-
3	Production Process	Lead-free process, machine-applied	Wireless products must be surface-mounted to ensure batch consistency and reliability.
4	Power supply interface	USB	-
5	Communication Interface	TTL	-
6	Operating Temperature	-40～+85℃	Industrial-grade
7	Operating Humidity	10%～90%	Relative humidity, no condensation
8	Storage temperature	-40～+125℃	Industrial-grade

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2 Function Overview

2.1 Component Introduction

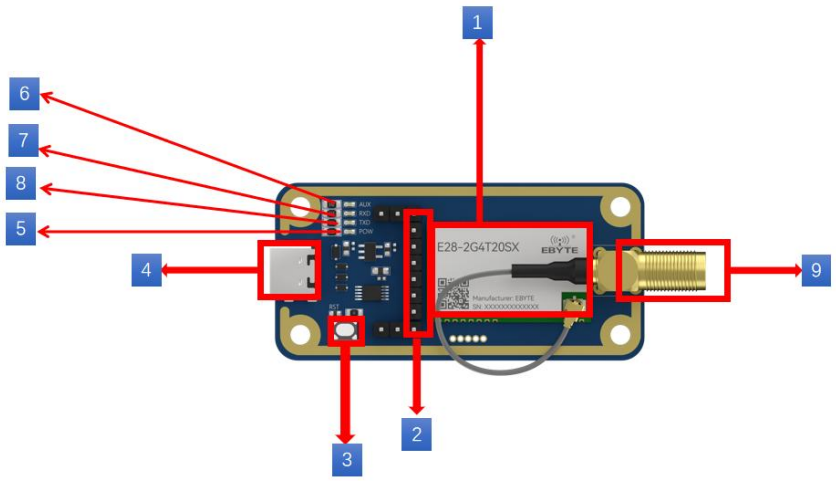


Figure 2 Component Layout Diagram

Serial Number	Main components	Introduction
1	E28-2G4T20SX	E28-2G4T20SX is a wireless serial port module (UART) based on SEMTECH's SX1281 RF chip. It operates in transparent transmission mode at the 2.4GHz frequency band, supporting three modulation technologies: LoRa, FLRC, and GFSK. The module features TTL-level output and is compatible with both 3.3V and 5V I/O port voltages.
2	pin header	All available pins of the module are routed to the header pins on the development board. For details, refer to the pin definition description in Section 2.2.
3	Reset	Reset button.
4	Type-C USB port	USB port. Can be used as a communication interface between the PC and the E28-2G4T20
5	Power indicator light	After connecting the development board to a USB power source, this indicator light illuminates.
6	AUX indicator light	AUX is used for wireless transmission/reception buffer indication and self-test indication.
7	Receive Indicator	When receiving data, the LED flashes.
8	Launch Indicator Light	When transmitting data, the LED flashes.
9	Antenna Interface	SMA, external thread with internal hole

Note: For specific functional instructions, please refer to the user manual for the E28-2G4T20SX.

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2.2 Pin Definitions and Dimensions

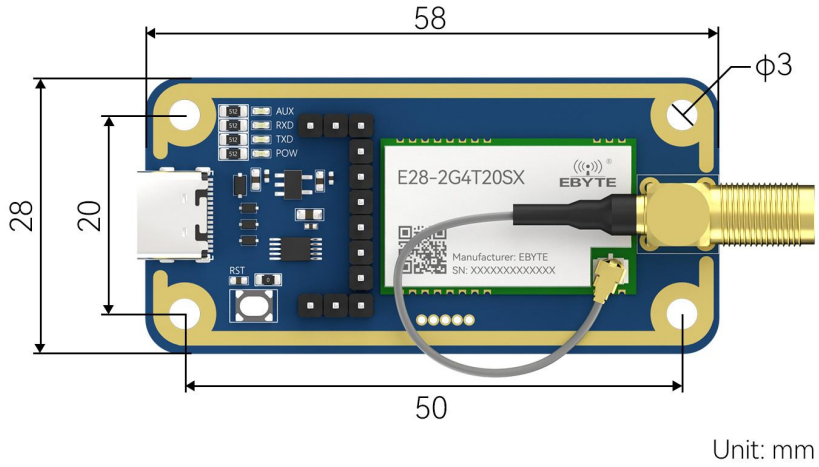


Figure 3: Dimension Drawing

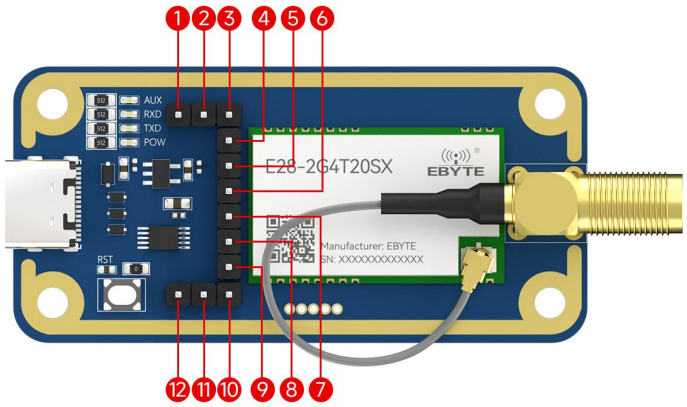


Figure 4: Pinout Diagram

Pin Number	Pin name	Type	Pin Function
1	5V	P	5V power supply
2	VDD	P	-
3	VDD	P	-
4	GND	G	Grounding
5	TX	T	TTL serial port output
6	RX	I	TTL serial port input
7	GND	G	Grounding
8	M1	I	The combination of M2, M1, and M0 determines the module's eight operating modes. For details, refer to the mode configuration section in Chapter 3.
9	GND	G	Grounding
10	M0	I	The combination of M2, M1, and M0 determines the module's eight operating modes. For details, refer to the mode configuration section in Chapter 3.
11	GND	G	Grounding
12	M2	I	The combination of M2, M1, and M0 determines the module's eight

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Pin Number	Pin name	Type	Pin Function
			operating modes. For details, refer to the mode configuration section in Chapter 3.

Note: 1. P: Power supply; I: Input; O: Output; T: Can be set to high impedance.

2. Power supply methods: Type-C USB port (default), VDD and GND header pins (requires disconnecting the 5V and VDD jumper caps).

3 Mode Switching Guide

Customize the operating mode of the control module based on the characteristics of the product being used. The following explains the five operating modes set by pins M0 and M1, detailed as shown in the table below:

Mode（0-3）	M2	M1	M0	Mode Introduction	Note
0 Transmission Mode	1	0	0	Serial port enabled, wireless enabled, continuous transparent transmission	Airspeed supports manual configuration and adaptive baud rate adjustment; in continuous transmission mode, both parties must use the same baud rate.
1 RSSI Mode	1	0	1	Serial port enabled, wireless enabled, RSSI function enabled	The module outputs RSSI strength values via the serial port every 100 milliseconds.
2 Standby Mode	1	1	0	Retain	-
3 Configuration Mode	1	1	1	Serial port open, wireless disabled, for parameter configuration.	Baud rate fixed at 9600 8N1
4 Low Power Mode	0	x	x	Low-power mode, with power consumption at its lowest	When M2 is set high, it operates in normal mode. When M2 is set low, it enters low-power mode.

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3.1 Steps for Mode Switching

- Transmission Mode (Mode 0, jumper cap inserted at M1 and M0): In this mode, data is transmitted transparently—meaning whatever data the sender transmits is exactly what the receiver receives. In Normal Mode, as long as both modules share the same baud rate, address, and channel, transparent transmission is supported. In Continuous Transmission Mode, both modules must operate at the same baud rate to ensure transparent transmission. This mode supports continuous transmission of large files at baud rates ranging from 1200 to 115200.



Figure 5 Mode 0

- RSSI Mode (Mode 1, jumper cap inserted at M1): In this mode, the module outputs the RSSI value of the current 2.4GHz signal in the air at 100ms intervals to detect channel quality. The output value is in hexadecimal two's complement format.

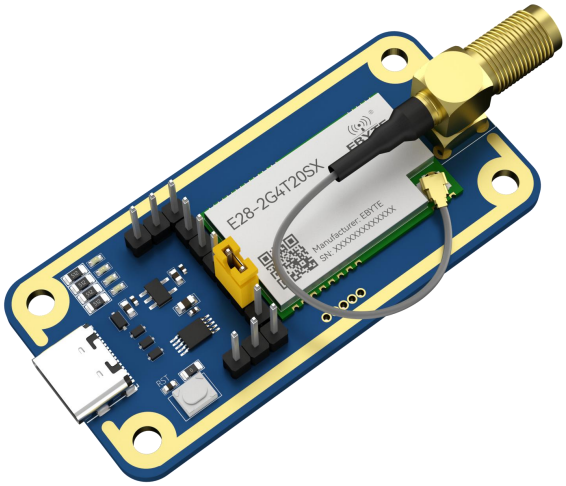


Figure 6: Mode 1

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- Reserved Mode (Mode 2, jumper cap inserted at M0): This mode currently has no additional functionality; it is reserved for future use.

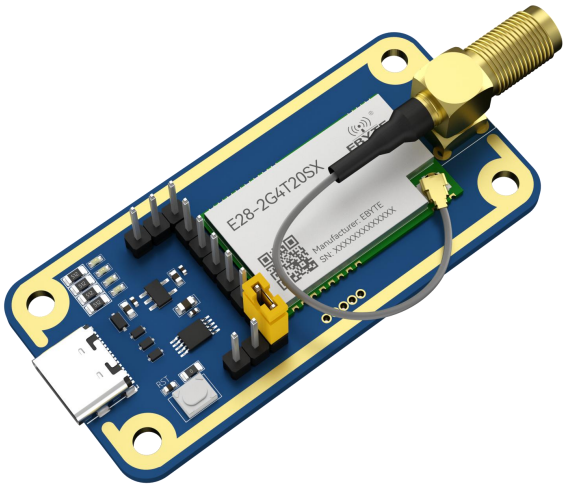


Figure 7: Mode 2

- Configuration Mode (Mode 3, with M2, M1, and M0 jumper caps removed): In this mode, the baud rate is fixed at 9600, 8N1. Refer to the corresponding parameters in the command format settings module.

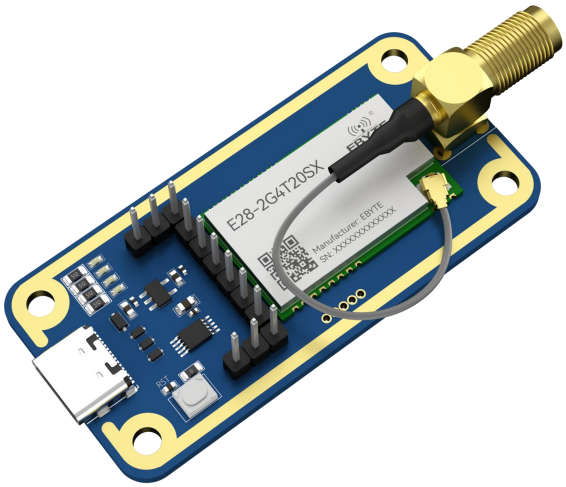


Figure 8: Mode 3

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- Low-Power Mode (Mode 4, jumper cap inserted at M2, M1 and M0 not set): This mode operates in a low-power state.

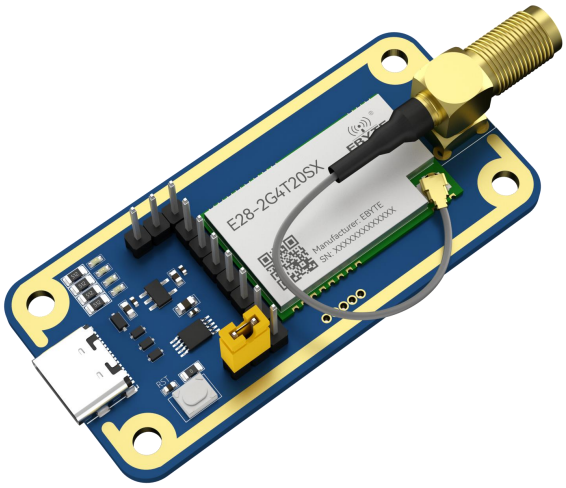


Figure 9: Mode 4

4 Version Information

Version	Date	Description	Issued by
1.0	2025-12-29	Initial version	Hao

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