E28-2G4TBL-01

Development Board User Manual



Chengdu Ebyte Electronic Technology Co.,Ltd.

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Contents

E28-2G4TBL-01 0
1 Introduction 3
1.1 Brief Introduction 3
1.2 Parameter Introduction 3
2 Function Overview 4
2.1 Component Introduction 4
2.2 Pin Definitions and Dimensions 5
3 Mode Switching Guide 6
3.1 Steps for mode switching 7
4 Version Information 9
5 About us 9

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1 Introduction

1.1 Brief Introduction

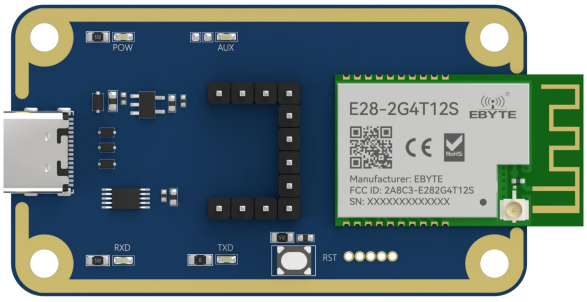


Figure 1 Product Appearance Diagram

The E28-2G4TBL-01 is an entry-level development board featuring the E28-2G4T12S high-speed, long-range 2.4GHz transmission module. This board provides comprehensive high-speed continuous transmission functionality, with most module pins routed to header pins. Developers can easily connect various peripheral devices via jumpers according to specific requirements, facilitating testing.

1.2 Parameter Introduction

No	Parameter Name	Parameter value	Note
1	Support Module	E28-2G4T12S	Serial port module
2	Module Dimensions	60*34mm	-
3	Manufacturing 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, non-condensing
8	Storage Temperature	-40～+125℃	Industrial grade

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2 Function Overview

2.1 Component Introduction

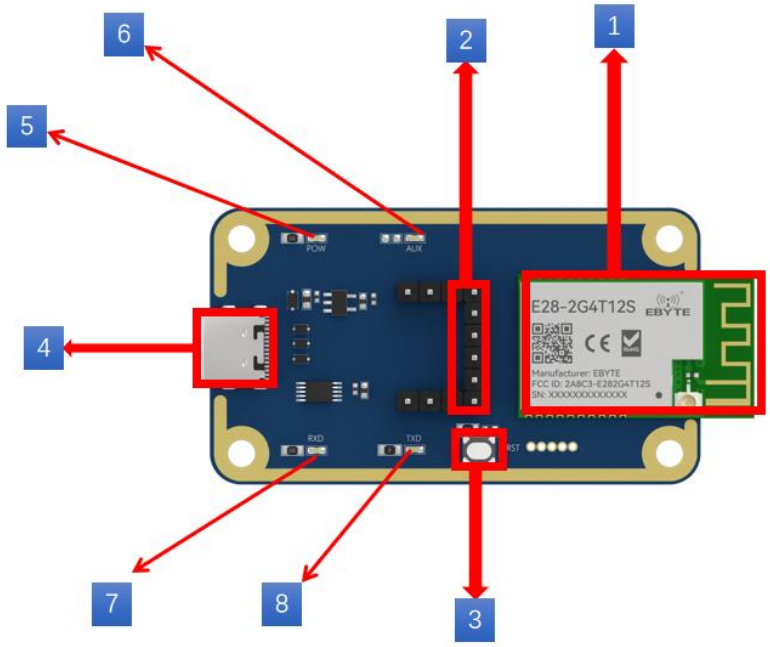


Figure 2 Component Layout Diagram

No	Main components	Introduction
1	E28-2G4T12S	The E28-2G4T12S is a wireless serial port module (UART) based on SEMTECH's SX1281 RF chip. Operating in transparent transmission mode within the 2.4GHz frequency band, it supports three modulation technologies: LoRa, FLRC, and GFSK. It features TTL-level outputs and is compatible with both 3.3V and 5V I/O port voltages.
2	Pin header	All accessible 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 button	Reset button.
4	Type-C USB port	USB interface. Serves as the communication interface for both the PC and the E28-2G4T12S module.
5	Power indicator light	This indicator illuminates when the development board is connected to a USB power supply.
6	AUX indicator light	AUX is used for wireless transmission/reception buffer indication and self-test indication.
7	Receive indicator light	The LED flashes when receiving data.
8	Transmit indicator light	When transmitting data, the LED flashes.

Note: For specific functional instructions, please refer to the user manual for the E28-2G4T12S.

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2.2 Pin Definitions and Dimensions

The following image shows the front view of the test board:

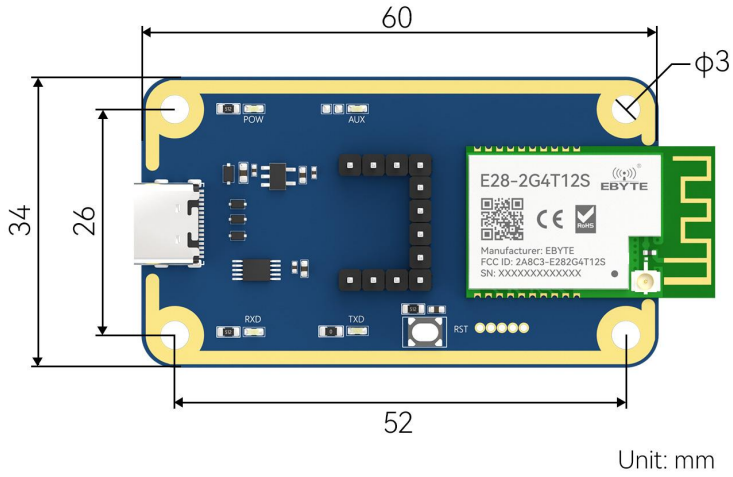


Figure 3: Dimensional Drawing

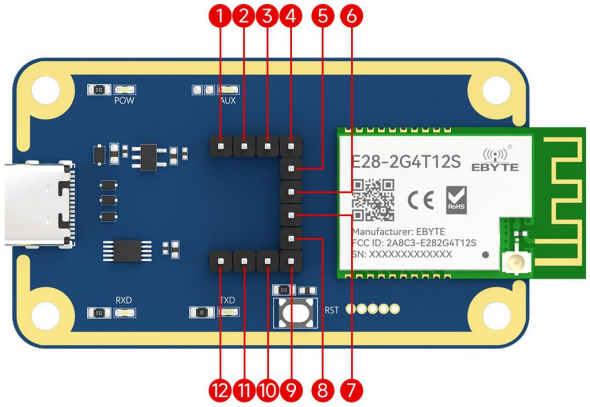


Figure 4 Pinout Diagram

No	Pin name	Type	Pin Function
1	5V	P	5V power supply
2	VDD	P	-
3	VDD	P	-
4	GND	G	Ground
5	RX	I	TTL serial input
6	TX	T	TTL serial output
7	M2	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 Three.
8	GND	G	Ground
9	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

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No	Pin name	Type	Pin Function
			Chapter Three.
10	GND	G	Ground
11	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 Three.
12	GND	G	Ground

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

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

3 Mode Switching Guide

Customise the operating mode of the control module according to the characteristics of the product in use. The following section details five operating modes determined by the settings of pins M0 and M1, as illustrated in the table below:

Mode（0-3）	M2	M1	M0	Mode Overview	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 identical baud rates.
1 RSSI Mode	1	0	1	Serial port enabled, wireless enabled, RSSI functionality enabled	The module outputs RSSI strength values via the serial port every 100 milliseconds.
2 Standby Mode	1	1	0	Reserved	-
3 Configuration Mode	1	1	1	Serial port enabled, wireless disabled, for parameter configuration	Baud rate fixed at 9600 8N1
4 Low Power Mode	0	x	x	Low-power mode, minimal power consumption	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): This mode enables transparent data transmission, whereby the receiver receives exactly the same data as transmitted by the sender. In standard mode, provided both modules share identical baud rate, address and channel, transparent transmission operates normally. In serial transmission mode, identical baud rates are required for reliable data pass-through. This mode supports continuous transmission of large files at baud rates ranging from 1200 to 115200.

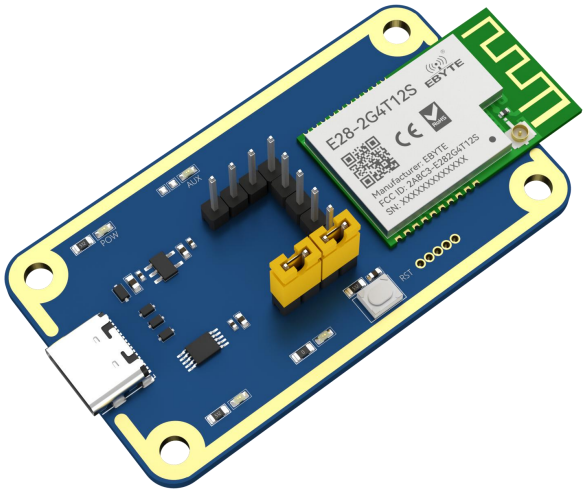


Figure 5 Pattern 0

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, used to detect channel quality in the air. The output value is in hexadecimal two's complement format.

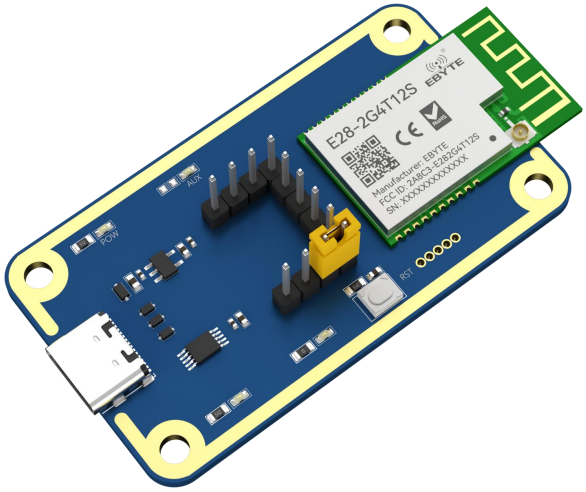


Figure 6 Pattern 1

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

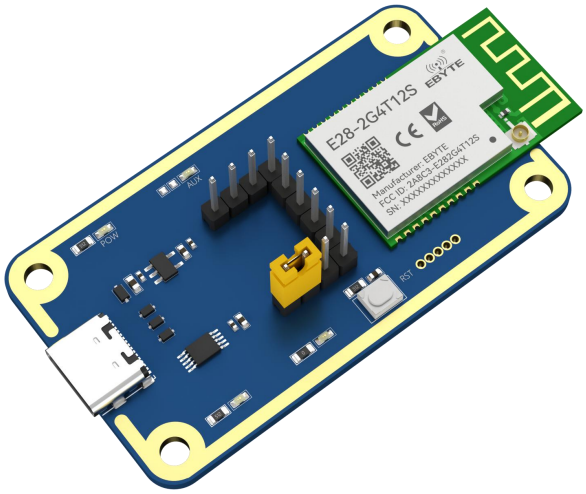


Figure 7: Pattern 2

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.

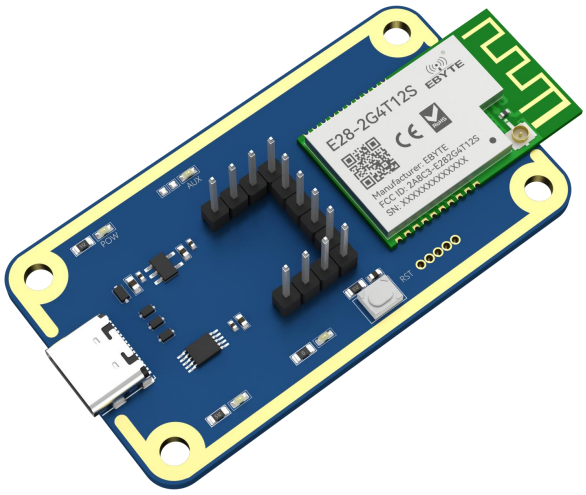


Figure 8 Mode 3

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- Low-power mode (Mode 4, jumper cap inserted at M2, M1 and M0 temporarily unconfigured): This mode operates in a low-power state.

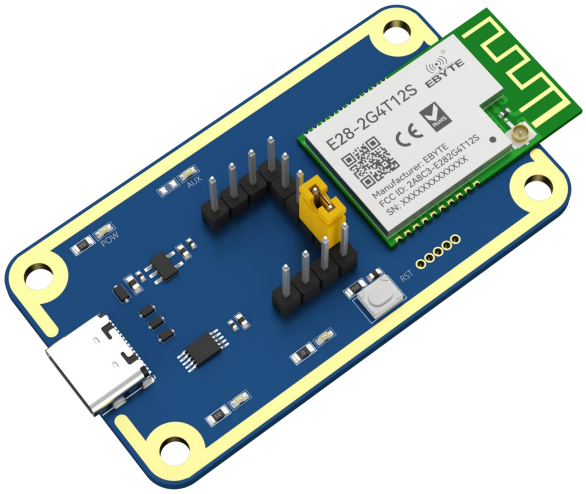


Figure 9 Pattern 4

4 Version Information

Version	Revision date	Revision Notes	Maintainer
1.0	2025-12-29	Initial Version	Hao

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