

XT-ZB2

— Zigbee3.0 and BLE5.0 Coexistence Module

Product Specification

Version: 1.0

Date: Sept.2, 2021

Features

■ General

- Chip: BL702, 8Mbit Flash embedded
- Module Size: 15mm*17.3mm*3mm
- Bluetooth® Specification v5.0
- Zigbee 3.0, Base Device Behavior, Core Stack R21, Green Power
- 2.4 GHz RF transceiver
- Support BLE & Zigbee coexistence

■ Standards Supported

- IEEE 802.15.4 MAC/PHY
- Bluetooth® Low Energy 1Mbps and 2Mbps
- Bluetooth® Long Range Coded 500Kbps and 125Kbps
- Integrated balun, PA/LNA

■ MCU Features

- 32-bit RISC CPU with FPU
- One RTC timer update to one year
- CPU frequency configurable from 1MHz to 144MHz
- JTAG development support
- XIP QSPI Flash/pSRAM with hardware encryption support
- 132KB RAM
- 192KB ROM
- 1Kb eFuse

■ Peripheral Interfaces

- GPIO * 7;
- UART *1;
- EN * 1;
- PWM *3;

■ Working temperature: -30°C-105°C

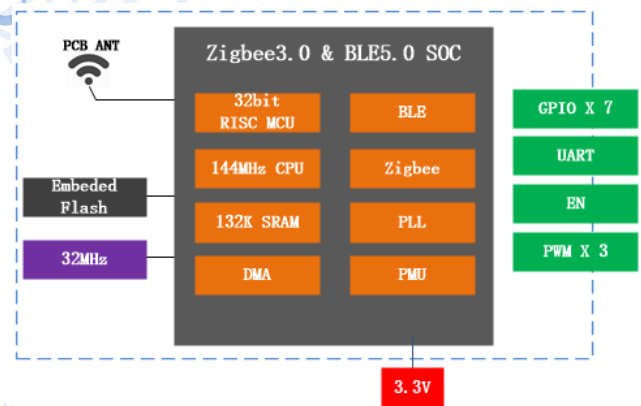
Applications

- Serial transparent transmission;
- Smart power plug/Smart LED light;
- Sensor networks;
- Industrial wireless control;

Module Type

Name	Antenna Type
XT-ZB2	PCB ANT

Module Structure



Update Record

Date	Version	Update
2021-9-2	V1.0	First released

Shenzhen Xiaoteng Technology CO.,LTD

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1. Introduction

XT-ZB2 is highly integrated BLE and Zigbee combo module for IoT applications.

XT-ZB2's wireless subsystem contains 2.4G radio, BLE + Zigbee baseband and MAC designs. Microcontroller subsystem contains 32-bit RISC CPU, high-speed cache and memories. Power Management Unit controls ultra-low-power modes. Moreover, varieties of security features are supported. Peripheral interfaces include UART ISO 17987, PWM and GPIOs.

XT-ZB2 has a gold-finger interface, and can be used for smart plug applications.

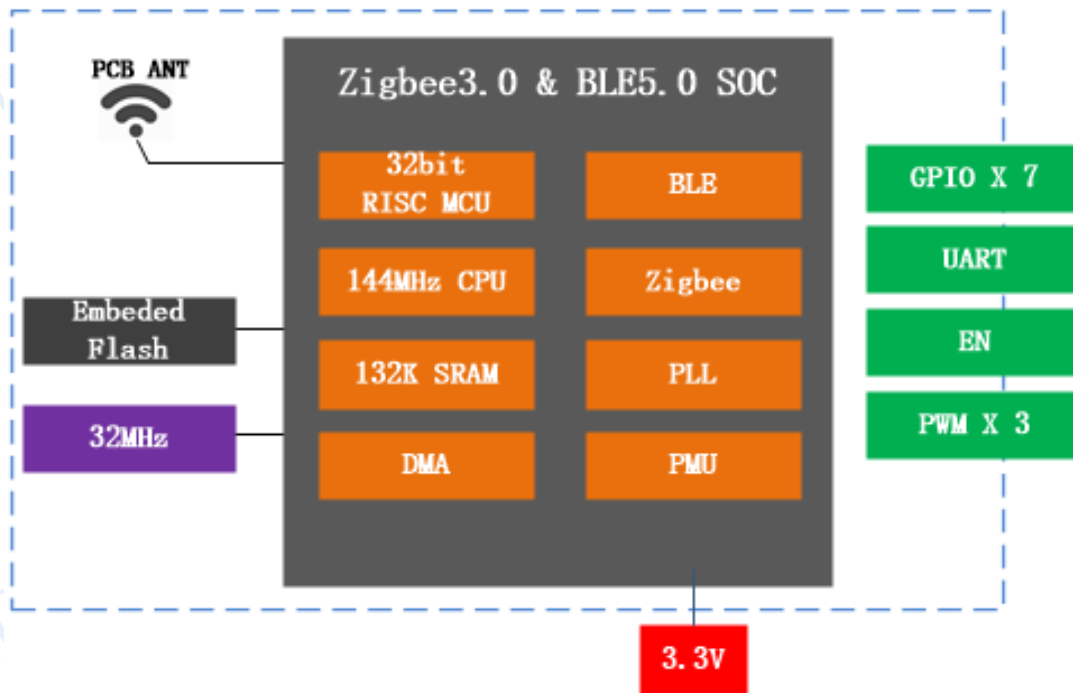


Fig.1.1 XT-ZB2 Module Structure

Technical parameters for XT-ZB2 are listed as follows.

Table 1.1 XT-ZB2 Parameters

Types	Items	Parameters
RF	Zigbee Sensitivity	-104 dBm @250Kbps
	BLE Sensitivity	-104 dBm @120Kbps
		-100 dBm @500Kbps
		-97 dBm @1Mbps
		-94 dBm @2Mbps
	TX Power	0-14 dBm
	TX EVM	11%
Antenna	PCB antenna	
Hardware	CPU	32-bit RISC CPU
	Interface	UART/GPIO/PWM
	Working voltage	2.5V ~ 3.6V
	Working current	3.5mA @RF only
		17mA @TX 10dBm
		45mA @TX 14dBm
	Working temperature	-30 ℃ ~105 ℃
	Storage temperature	-45 ℃ ~ 135 ℃
Shape	15mm x 17.3mm x 3mm	
Software	Encryption type	AES 128/192/256
	Update firmware	UART Download
	Software develop	SDK

2. Interface Definition

XT-ZB2 module interface definition is shown as below.

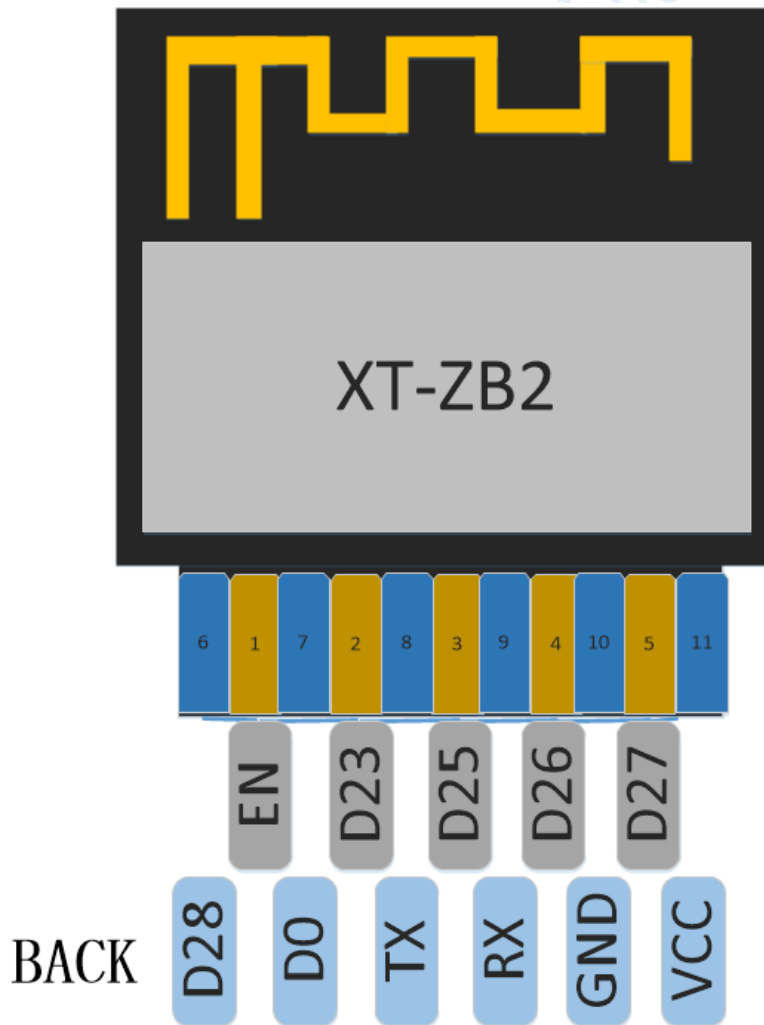


Fig.2.1 XT-ZB2 Pin Definition

Working mode and pins function are shown in Table 2.1.

Table.2.1 Working mode

Mode	GPIO28
UART Download Mode	HIGH
Flash Boot Mode	LOW(default)

Table.2.2 Pins Function Definition

Num.	Pin Name	Type	Function
1	EN	I/O	Chip enable; Built-in Pull-up
2	D23	I/O	GPIO23,SCLK, I2S_DI, SPI,SDA,PWM_CH3,IRTX
3	D25	I/O	GPIO25,MISO/MOSI,SDA,I2S_FS,PWM_CH0
4	D26	I/O	GPIO26,SS,SCL,I2S_DIO,PWM_CH1
5	D27	I/O	GPIO27,SCLK,SDA,I2S_FS,PWM_CH2
6	D28	I/O	GPIO28,MISO/MOSI,SCL,I2S_BCLK,PWM_CH3
7	D0	I/O	GPIO0,MISO/MOSI,SCL,I2S_BCLK,PWM_CH0
8	TX	I/O	GPIO14,SS,SCL,ADC_CH5,I2S_DIO,PWM_CH4
9	RX	I/O	GPIO15,SCLK,SDA,ADC_CH1,I2S_DIO,PWM_CH0
10	GND	P	Power ground
11	VCC	P	Power, 3.3V

3. Size and Layout

Shape for XT-ZB2 can be shown as follows.

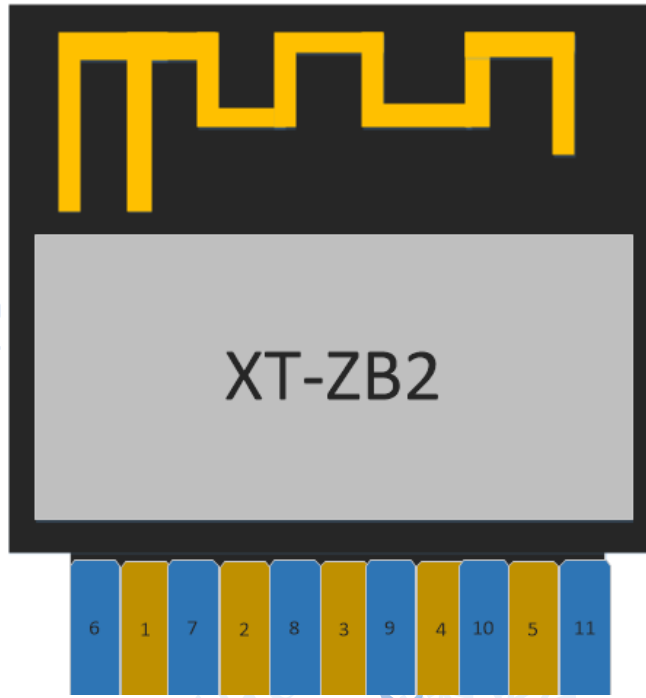
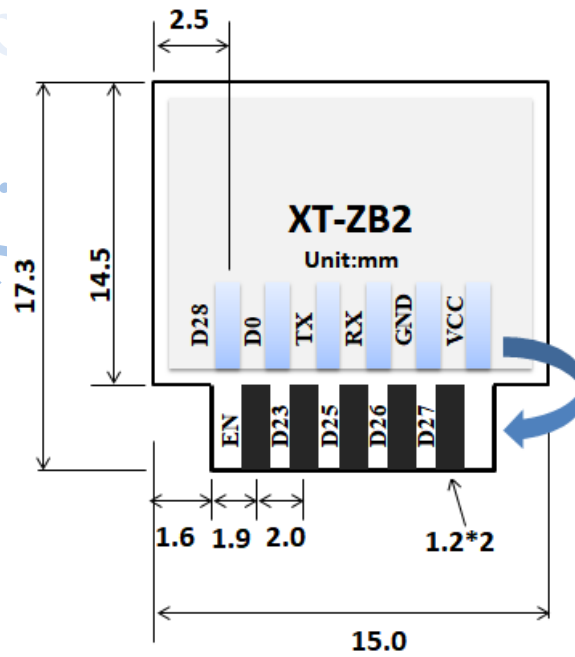


Fig.3.1 Shape for XT-ZB2



(a) Vertical View



Fig.3.2 Size for XT-ZB2

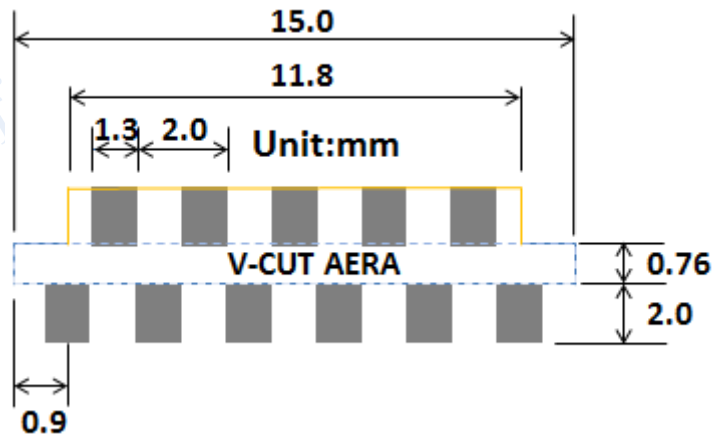


Fig.3.3 PCB Layout for XT-ZB2

4. Electrical Characteristics

Table.4.1 Electrical Characteristics

Parameters	Condition	Min	Classical	Max	Unite
Store Temperature	-	-40	Normal	125	°C
Sold Temperature	IPC/JEDEC J-STD-020	-	-	260	°C
Working Voltage	-	2.5	3.3	3.6	V
I/O	V _{IL} /V _{IH}	-	-	0.8/-	V
	V _{OL} /V _{OH}	-	-	0.4/-	
Electrostatic release quantity (Human model)	TAMB=25°C	-	-	2	KV
Electrostatic release quantity (Machine model)	TAMB=25°C	-	-	0.5	KV

5. Power Consumption

Table.5.1 Power Consumption

Parameters	Min	Classical	Max	Unit
RX only	-	3.5	-	mA
TX 0dbm	-	4.8	-	mA
TX 10dbm	-	17	-	mA

TX 14dbm	-	45	-	mA
Run in RAM @RC32M 144MHz	-	8.44	-	mA
Run in RAM @RC32M 32MHz	-	3.36	-	mA
Run in FLASH @RC32M 144MHz	-	7.72	-	mA
Run in FLASH @RC32M 32MHz	-	3.39	-	mA
Hibernate Mode	-	1.2	-	uA
Shut Down	-	0.1	0	uA

6. RF Characteristics

The data in the following Table is gotten when voltage is 3.3V in the indoor temperature environment.

Table.6.1 RF Characteristics

Parameters	Min	Classical	Max	Unite
TX				
TX Power	0	0	14	dBm
TX EVM	-	11	13	%
Sensibility				
Zigbee @250Kbps	-	-104	-	dBm
BLE @125Kbps	-	-104	-	dBm
BLE @500Kbps	-	-100	-	dBm
BLE @1Mbps	-	-97	-	dBm
BLE @2Mbps	-	-94	-	dBm

7. Recommended Sold Temperature Curve

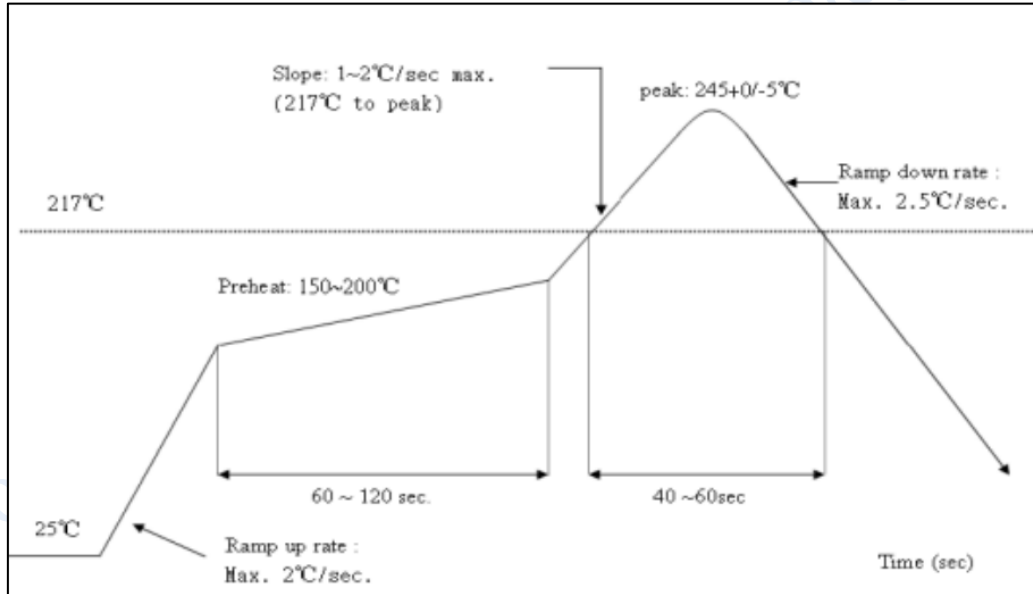


图 7.1 Temperature Curve when Sold

8. Minimum User System

This module can work just at 3.3V working voltage;

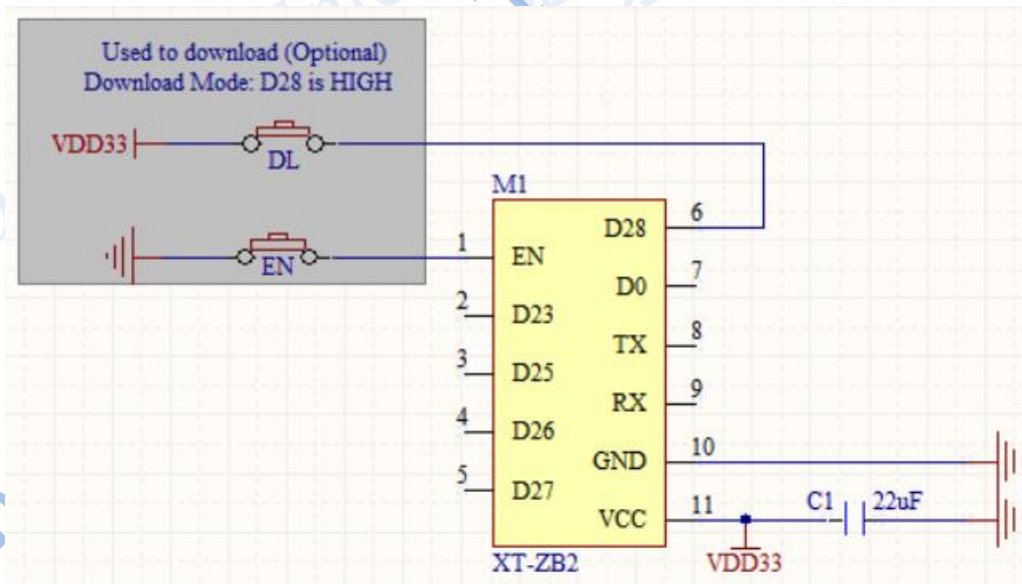


Fig.8.1 Minimum System

Note

- (1) The working voltage for module is DC 3.3V;
- (2) The max current from IO of this module is 12mA;
- (3) Zigbee module is at download mode: D28 are High level, then module reset to power on;

(4) Zigbee module is connected to RXD of the other MCU, and TXD is connected to RXD of the other MCU.

9. The Recommended PCB Design

XT-ZB2 module can be sold on PCB board directly. For the high RF performance for the device, please notice the placement of the module.

Please place XT-ZB2 module at PCB board side. And there are not metal materials within 15mm distance.

10. Peripheral Design Suggestion

XT-ZB2 module is already integrated into high-speed GPIO and Peripheral interface, which may be generated the switch noise. If there is a high request for the power consumption and EMI characteristics, it is suggested to connect a serial 10~100 ohm resistance, which can suppress overshoot when switching power supply, and can smooth signal. At the same time, it also can prevent electrostatic discharge (ESD).