XT-BL201

——2.4GHz Wi-Fi and BLE5.0 Coexistence Module

Product Specification

Version: 1.0 Date: Nov.6, 2021

Features

- **General**
  - Chip: BL602
  - Module Size:8.5mm*13.5mm*1mm
  - Color: White
- **Wireless**
  - 2.4GHz RF transceiver
  - Wi-Fi 802.11b/g/n
  - Bluetooth Low Energy 5.0
  - Wi-Fi 20 MHz bandwidth and 72.2 Mbps PHY rate
  - Wi-Fi Security WPS/WEP/WPA/WPA2
  - STA, Soft-AP and sniffer modes
  - Wi-Fi fast connection with BLE assistance
  - Wi-Fi and BLE coexistence
  - Integrated balun, PA/LNA
  - Power saving mechanism
- **MCU**
  - 32-bit RISC CPU with FPU
  - Level-1 cache
  - Four DMA channels
  - One RTC timer update to one year
  - DFS from 1 MHz to 192 MHz
- **Peripheral Interfaces**
  - GPIO * 5;
  - PWM * 5;
- **Working temperature:** -20℃-105℃

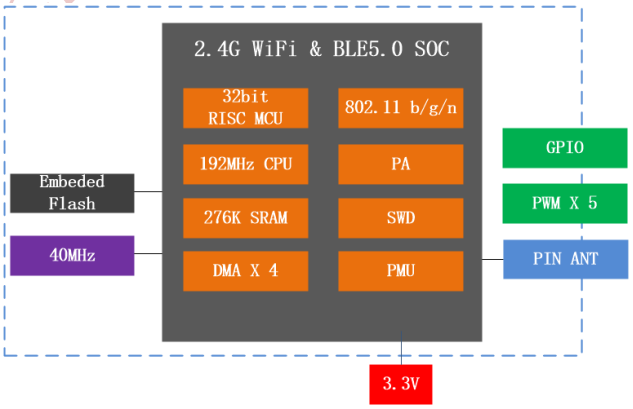
Applications

- Wi-Fi prober;
- Smart power plug/Smart LED light;
- Mesh networks;
- Sensor networks;
- Wireless location recognition;
- Wireless location system beacon;
- Industrial wireless control;

Module Type

Name	Antenna Type
XT-BL201	PIN ANT

Module Structure



Update Records

Date	Version	Update
2021-11-06	V1.0	First released

Table of Contents

1. Introduction

XT-BL201 Wi-Fi and BLE coexistence Module is a highly integrated single-chip low power 802.11n Wireless LAN (WLAN) network controller. It combines an RISC CPU, WLAN MAC, a 1T1R capable WLAN baseband, RF, and Bluetooth in a single chip. It also provides a bunch of configurable GPIO, which are configured as digital peripherals for different applications and control usage.

XT-BL201 Wi-Fi Module use BL602 as Wi-Fi and BLE coexistence SOC chip.

XT-BL201 Wi-Fi Module integrates internal memories for complete WI-FI protocol functions. The embedded memory configuration also provides simple application developments.

XT-BL201 Wi-Fi module supports the standard IEEE 802.11 b/g/n/e/i protocol and the complete TCP/IP protocol stack. User can use it to add the Wi-Fi function for the installed devices, and also can be viewed as an independent network controller. Anyway, XT-BL201 Wi-Fi module provides many probabilities with the best price.

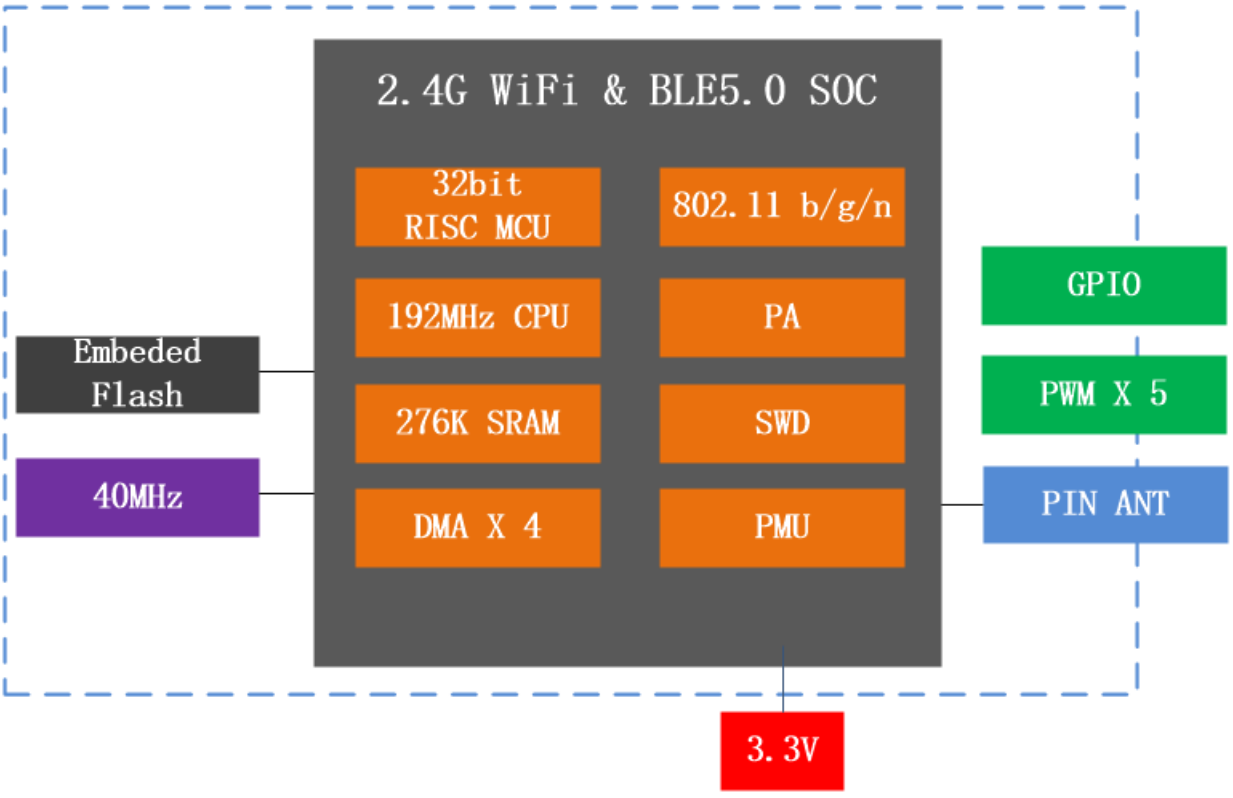


Fig.1.1 XT-BL201 Module Structure

Technical parameters for XT-BL201 are listed as follows.

Table 1.1 XT-BL201 Parameters

Types	Items	Parameters
Wi-Fi	Frequency	2.4G~2.5G(2400M~2483.5M)
	Transmit power	802.11b: +19 dBm
		802.11g: +18 dBm
		802.11n: +17 dBm
	Receiver sensitivity	802.11b: -91 dBm (11Mbps)
		802.11g: -77 dBm（54Mbps）
		802.11n: -73 dBm（MCS7）
	EVM	<-28dB @802.11g
		<-28dB @802.11n
	Antenna	PCB antenna
Hardware	CPU	32-bit RISC CPU
	Interface	UART/SDIO/SPI/I2C/GPIO/PWM
	Working voltage	2.8V ~ 3.6V
	Working current	Deep Sleep Mode:22mA
		Deep Standby Mode:2mA
		Average: 120mA
	Working temperature	-20°C ~105°C
	Environment temperature	-30°C ~ 155°C
	Shape	8.5mm x 13.5mm x 1mm
Software	Wi-Fi working mode	STA, Soft-AP and sniffer modes
	Security mode	WPS / WEP / WPA / WPA2 / WPA3
	Encryption type	AES
	Update firmware	UART Download
	Software develop	SDK
	Network protocol	IPv4, TCP/UDP/HTTP/FTP/MQTT

2. Interface Definition

XT-BL201 module interface definition is shown as below。

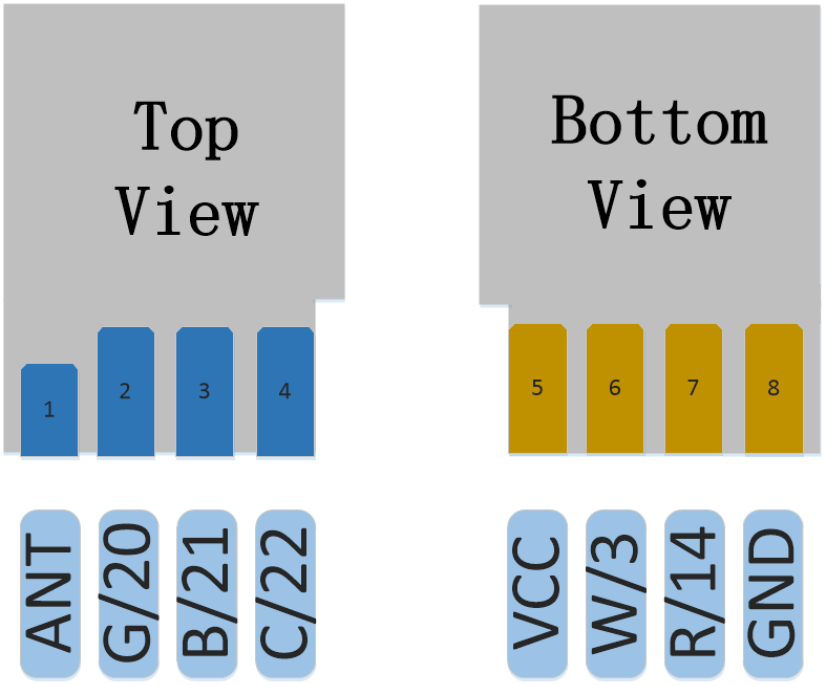


Fig.2.1 XT-BL201 Pin Definition

Working mode and pins function are shown in Table 2.1.

Table.2.1 Working mode

Mode	GPIO8
UART Download Mode	High
Flash Boot Mode	LOW(default)

Table.2.2 Pins Function Definition

Num.	Pin Name	Type	Function
1	ANT	-	Antenna, 2.4GHz
2	G/20	I/O	GPIO20, SPI, I2C, UART, PWM, Green Color Control
3	B/21	I/O	GPIO21, SPI, I2C, UART, PWM, Blue Color Control
4	C/22	I/O	GPIO22, SPI, I2C, UART, PWM, Cold White Color Control
5	VCC	P	Power

6	W/3	I/O	GPIO3, SPI, I2C, PWM, Warm White Color Control
7	R/14	I/O	GPIO14, I2C, PWM, Red Color Control
8	GND	P	Power

3. Size and Layout

Size for XT-BL201 can be shown as follows.

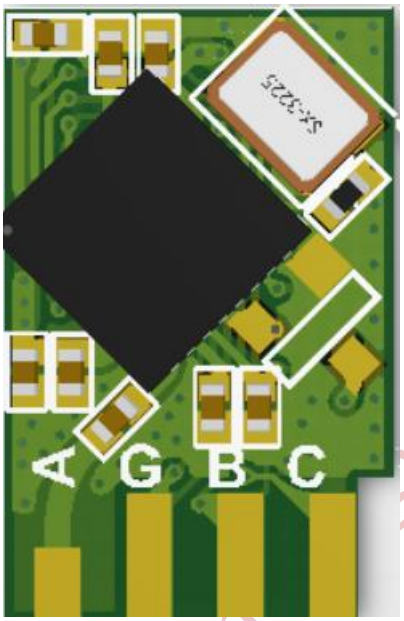
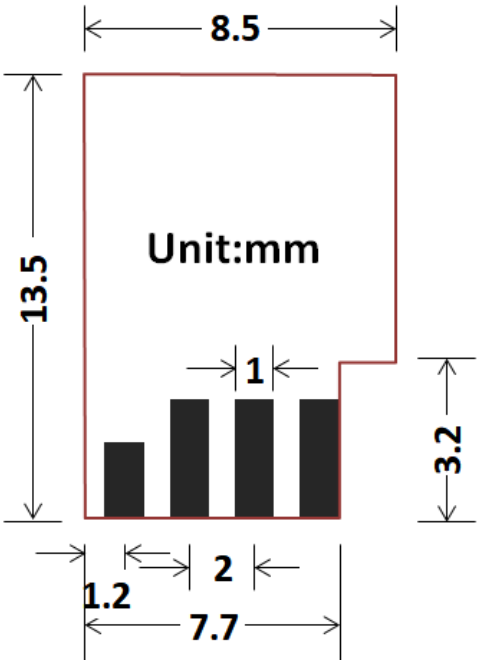


Fig.3.1 Shape for XT-BL201



(a) Vertical View

(b) Side View

Fig.3.2 Size for XT-BL201

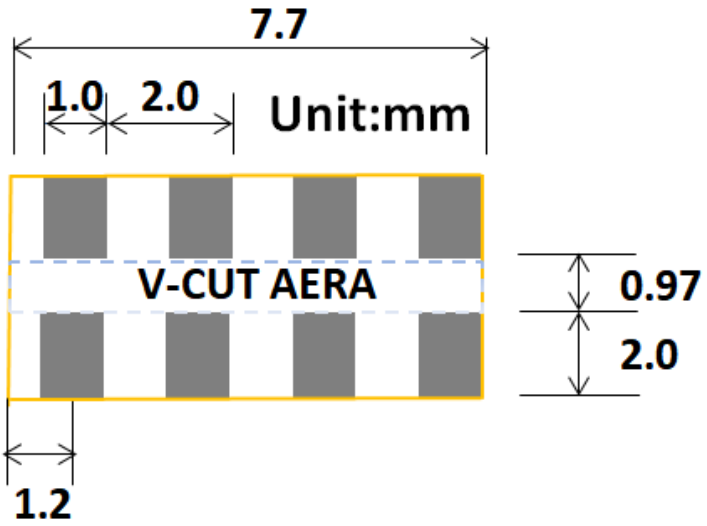


Fig.3.3 PCB Layout for XT-BL201

4. Electronica Characteristics

Table.4.1 Electronica Characteristics

Parameters		Condition	Min	Classical	Max	Unit
Store Temperature		-	-30	Normal	105	℃
Sold Temperature		IPC/JEDEC J-STD-020	-	-	260	℃
Working Voltage		-	3.0	3.3	3.6	V
I/O	V_{IL}/V_{IH}	-	-/2.0	-	0.8/-	V
	V_{OL}/V_{OH}	-	-/2.4	-	0.4/-	
Electrostatic release quantity (Human model)		TAMB=25℃	-	-	2	KV
Electrostatic release quantity (Machine model)		TAMB=25℃	-	-	0.5	KV

5. Power Consumption

Table 5.1 Power Consumption

Parameters	Min	Classical	Max	Unit
RX 11b	-	35	-	mA
RX 11g		39		mA
RX 11n		39		mA
TX (11b - 11Mbps @20dBm)	-	310	-	mA
TX (11g - 54Mbps@18dBm)	-	230	-	mA
TX (11n - MCS7@17dBm)	-	215	-	mA

MCU (Run Freq.@ 192MHz)	-	22	-	mA
MCU (Standby Freq.@<10MHz)	-	2	-	mA

6. RF Characteristics

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

Table.6.1 Wi-Fi RF Characteristics

Parameters	Min	Classical	Max	Unite
Input frequency	2412	-	2484	MHz
Input impedance	-	50	-	Ω
Input reflection	-	-	-10	dB
At 11b mode, output power consumption	-	20	-	dBm
At 11g mode, output power consumption	-	18	-	dBm
At 11n mode, output power consumption	-	17	-	dBm
Sensibility				
802.11b, 1Mbps	-	-98	-	dBm
802.11g, 64Mbps	-	-93	-	dBm
802.11n, MCS7	-	-73	-	dBm

7. The Recommended Sold Temperature Curve

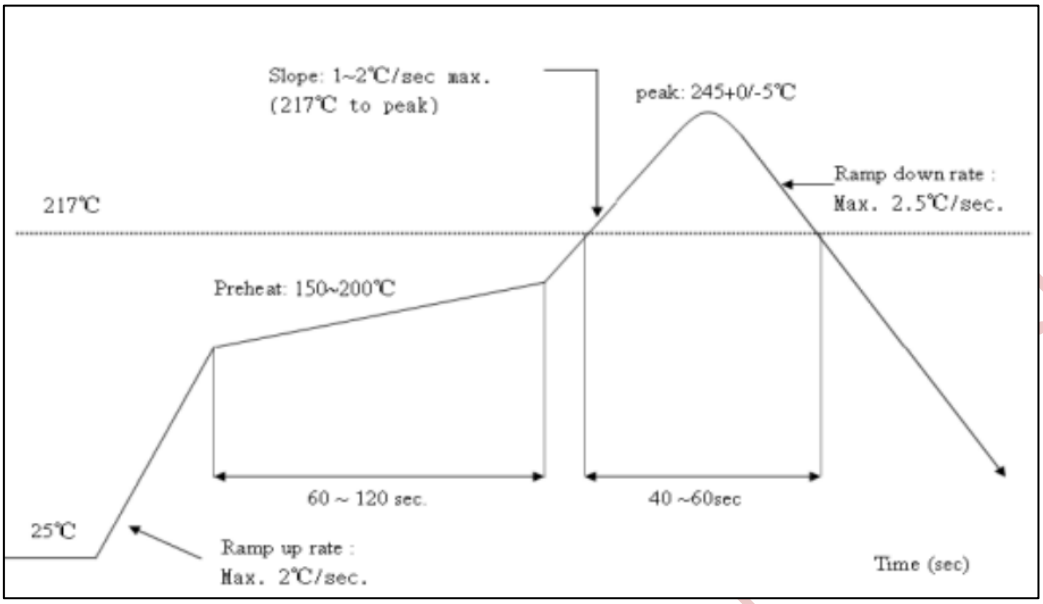


Fig.7.1 Temperature Curve when Sold