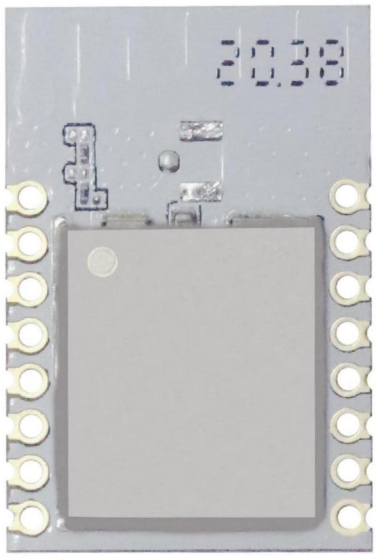
XJ-WB60

TGW206-16 Module



Catalogue

1.summary

1.2 function

1.1.1Product characteristics

- 802.11b/g/n，Wi-Fi+Bluetooth LE5. 0 combo, supports STA, soft AP and sniffer (Bluetooth LE5.0 Only support BT/BLE 1M)
- Open source self controllable risc-v CPU, 1-160mhz adjustable, 276KB SRAM
- Ultra low power consumption: sleep power consumption is only 0.5ua, networking standby power consumption is only 40ua (dtim10)
- Super fast connection: cold start fast connection only 70ms
- Ultra long distance: maximum transmission power 15.05 dBm, sensitivity - 98dbm, more than one wall
- High security: support safe startup, safe debugging, AES 128 / 192 / 256 encryption engine, WPA3, MD5, SHA-1 / 224 / 256, PKA

  (RSA / ECC) encryption engine
- Support the coexistence of Wi Fi and Bluetooth le

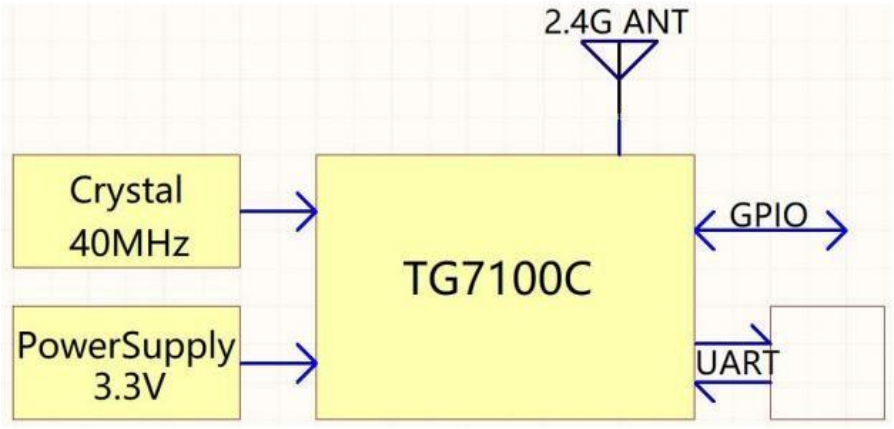
1.1.2 Application scenario

- Intelligent lighting
- Smart switch
- Smart socket
- Smart home appliances
- Monitoring and remote control

1.2 describe

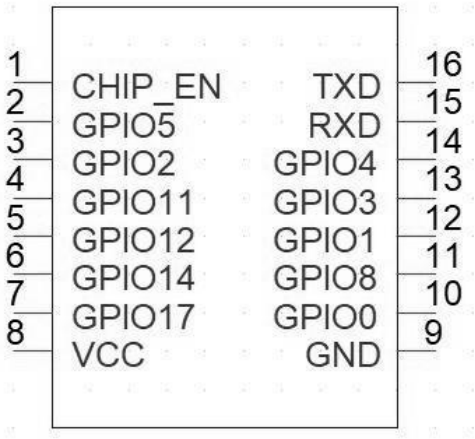
XJ-WB60 is an intelligent new generation of highly integrated Wi Fi and Bluetooth Le chip. The wireless subsystem includes 2.4G RF, Wi Fi 802.11b/g/n and ble baseband / MAC design. The microcontroller subsystem includes a low-power 32-bit RISC CPU, cache and memory. The power management unit provides flexible settings to realize low power consumption mode and supports multiple security functions.

1.3 Functional block diagram



2.Pin pin definition

1. 1Module**PIN** Interface diagram



2.2Pin function

NO	Name	IO Type	Description	Configurable Functions
1	CHIP_EN	I/O	Chip enable pin (active high)	
2	GPIO5	I/O	GPIO5	SDIO,SPI, I2C, UART, PWM0, ADC,ACOMP
3	GPIO2	I/O	GPIO2	SDIO, SFLASH, SPI, I2C, UART, PWM2
4	GPIO11	I/O	GPIO11	SPI, I2C, UART, PWM1, ADC,
5	GPIO12	I/O	GPIO12	SPI, I2C, UART, PWM2, ADC, ACOMP
6	GPIO14	I/O	GPIO14	SPI, I2C, UART, PWM4, ADC, ACOMP, DAC
7	GPIO17	I/O	GPIO17	SPI, I2C, UART, PWM2,
8	VCC	P	Power supply. 3.3V is required	
9	GND	P	Ground connections	
10	GPIO0	I/O	GPIO0	SDIO, SFLASH, SPI, I2C, UART, PWM0
11	GPIO8	I/O	GPIO8 (Boot option).	SPI, I2C, UART, PWM3
12	GPIO1	I/O	GPIO1	SDIO, SFLASH, SPI, I2C, UART, PWM1
13	GPIO3	I/O	GPIO3	SDIO, SPI, I2C, pwm3, user communication serial port RXD
14	GPIO4	I/O	GPIO4	SDIO, SPI, I2C, pwm4, ADC, acomp, user communication Serial port TXD
15	RXD	I/O	UART RX	This serial port can only be used as a serial port for burning and log output
16	TXD	I/O	UART TX	

Description: 1.The standard transparent firmware uses gpio3 (user communication serial port RXD) and gpio4 (user communication serial port TXD) as communication serial ports with MCU.

2.The module supports up to five PWM outputs, and only one GPIO port can be set for thePWM of the same group.

3.Module characteristics and specifications

3.1WiFi RF specification

Product Name	TGW206-16 Module
Standard	IEEE 802.11b/g/n
Frequency Band	2.4~2.4835GHz ISM Band
Modulation Type	DSSS,OFDM(WIFI)
Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,65,72.2Mbps
Spread Spectrum	IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum)
	IEEE802. 11g/n: OFDM (Orthogonal Frequency Division Multiplexing)
RX Sensitivity	11b-1Mbps: -98dBm
	11b-11Mbps: -91dBm
	11g-54Mbps: -77dBm
	11n HT20-MCS0: -92dBm
	11n HT20-MCS7: -73dBm
Maximum Input Level	11b: 5dBm
	MCS0: -4dBm
	MCS7: -13dBm
Output Power	11b: 11.92dBm
	11g: 14.89dBm
	11n: 15.05dBm
Interface	UART
Power Supply	DC3. 3V
Operating Temperature	-30℃ to +85℃
Size:	24mm×16mm×2.75mm

3.2 Ble RF specification

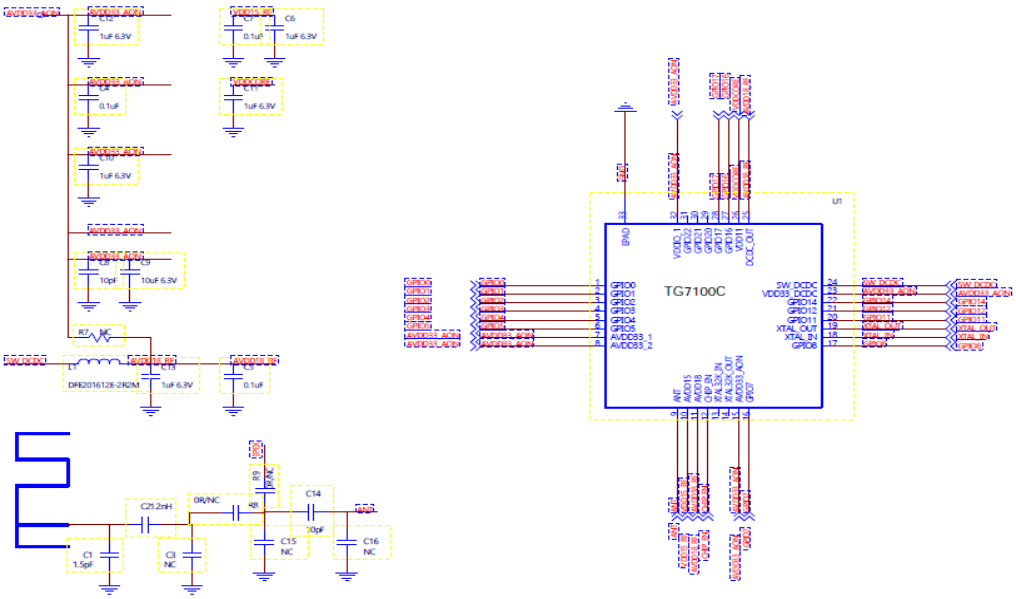
Parameter	Conditions	Minimum	Typical	Maximum	Unit
Frequency range		2402		2480	MHz
RX sensitivity	1 Mbps	-	-93	-	dBm
Initial carrier frequency offset		-24	5	24	KHz
Output power	BLE 1M	-	-	4.06	dBm

3.3 Module electrical parameters

parameter	minimum value	Typical value	Maximum	Company
VDD	2.2	3.3	3.6	V
Distribution network current	-	120	-	mA
Working electric current	-	55	-	
Standby current	-	23	-	

4. Reference application and PCB layout

4.1 Application schematic reference



4.2 PCB layout reference

4.2.1 Keep clearance at the module antenna

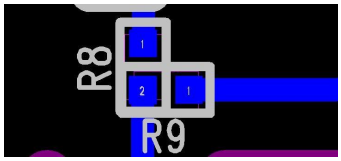
4.2.2 The module is far away from strong interference sources

4.2.3 The capacitance shall be increased at the power supply, and the wiring shall be short and thick

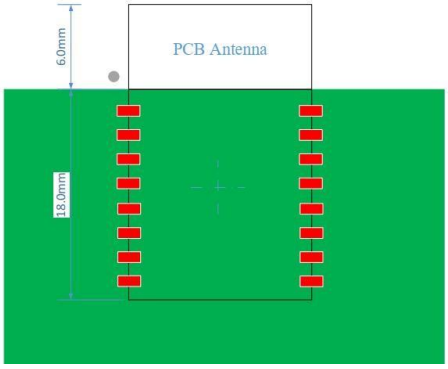
4.2.4 The module can be pasted on the PCB board or welded on the PCB board with 2.0 rows of pins

4.2.5 PCB can use on-board antenna or IPEX base to connect external antenna (as shown below). This version is on-board antenna

- ●Onboard antenna: R8 (0r) / R9 (NC)
- ●PEX sub external antenna: R8 (NC) / R9 (0r)

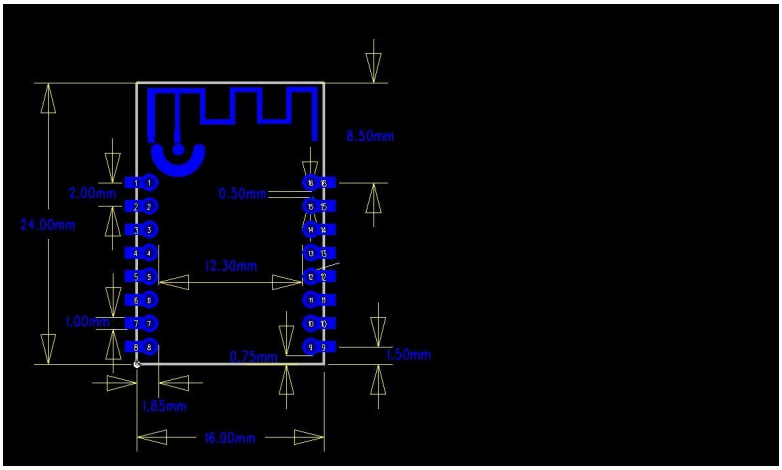


4.2.6The module layout is recommended as follows:

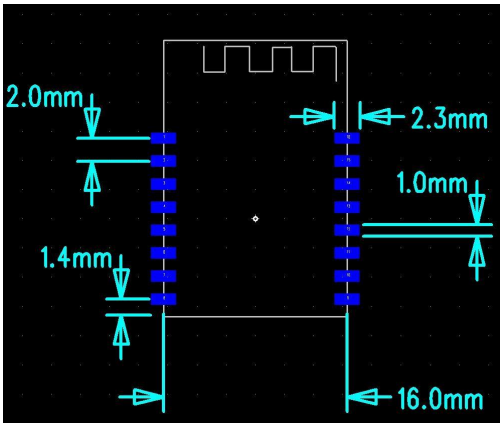


5. Reference PCB package

5.1 Package size:



5.2 Recommended pads



6.Revision history

	Modification:	Modified by:	date
V0.one	First edition	Zhong Yongwu	2020.08.09
V0.two	Update series naming	Zhong Yongwu	2020.10.27
V0.three	Update GPIO function description	MJ	2022.01.13

FCC Caution:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IMPORTANT NOTE:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM

Manual v01

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular.

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

2.4 Limited module procedures

Not applicable

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

To maintain compliance with FCC's RF Exposure guidelines.

2.7 Antennas

This radio transmitter FCC ID: 2AXSO-XJ-WB60 has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna Description	Antenna Type	Frequency Range (MHz)	Maximum antenna gain(dBi)
BT/WiFi Antenna	PCB	2402-2480MHz/2412-2472MHz	2.0dBi

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following"

Contains FCC ID: **2AXSO-XJ-WB60**"

2.9 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B