



Wi-Fi module (XY3721-B3C) specifications

User's Guide

Version updated date 2023-12-18

1

Product Overview

XY3721-B3C is a low-power embedded Wi-Fi module developed by Shenzhen Xiyun Technology Co., LTD. It is equipped with

Bluetooth 5.2 and Wi-Fi 802.11nA chips, which can run independently or as a slave in other MCUS.

When the module is equipped with external applications and is the only application processor in the device, it can be booted directly from the built-in Flash; also

Contains low power consumption, maximum main frequency 160MHz, built-in 288KB RAM, 2Mbyte flash and rich peripheral resources.

XY3721-B3 WiFi module supports IEEE 802.11b /g/n protocol standard, BLE5.2, and lightweight TCP/IP

Protocol stack, and support STA, AP, AP+STA mode. Users can use this module to add networking power to existing devices

Can, or can build a separate network controller.

To provide customers with a complete hardware, software reference scheme, in order to shorten your product development cycle, for you to save cost investment.

1.1 Features

- Supports the 802.11b /g/n/BLE5.2 standard protocol
- Built-in lightweight TCP/IP protocol stack
- Built-in TR switch, Balun, LNA, PA, and integrated onboard antenna (compatible with external antenna)
- MCU up to 160M clock frequency +288KB RAM
- Built-in 2Mbit Flash

- Supports remote firmware OTA upgrade, which can be started by the mobile APP, AT command
- Support STA+AP+STA working mode
- Support WEP/TKIP/WPA/WPA2 security protocol
- Support 802.11e and WMM/WMM PS protocol
- Support Smart Link intelligent networking function
- Support HT20
- Supports 6-way hardware PWM
- Max output power of +16dBm in Wi-Fi 802.11b mode
- Bluetooth Max output power +6dBm
- Voltage range 2.7V~3.6VDC, 3.3V 500mA single power supply is recommended
- Onboard antenna, compatible with external antennas

1.2 Main application areas

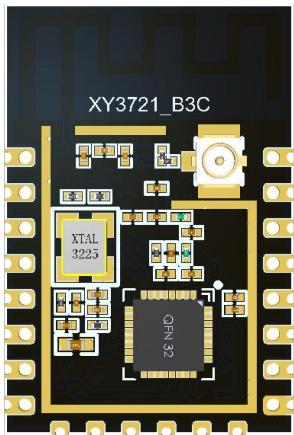
- Smart lighting
- Smart home
- Smart Sensing
- Smart Office
- Smart Gateway
- Smart indus

2 Module Interface

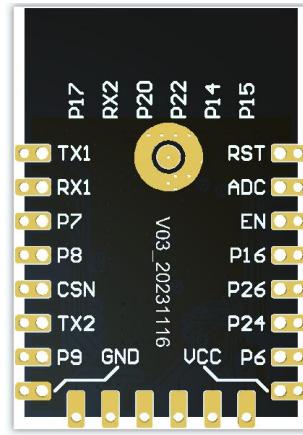
2.1 Dimensional Package

The XY3721-B3C Wi-Fi module has 3 rows of pins, a total of 22, and the pin spacing is 2mm. XY3721-B3Wi-Fi module size: 16

$\pm 0.35\text{mm}$ (W) $\times 24 \pm 0.35\text{mm}$ (L) $\times 3.0 \pm 0.15\text{mm}$ (H), where the PCB thickness is $0.8\text{mm} \pm 0.1\text{mm}$, the package is shown in Figure 2.1:



Top view



Bottom attempt

2.2 Pin definition

Pin Serial Number	Symbol	IO type	Features
1	RST	I	Hardware reset pin (active low), corresponding to the CEN of the IC
2	ADC	I/O	ADC port, which can be reused as ordinary IO, corresponding to the P28 of the IC
3	EN	I	Module enable pin, internal pull up processing, compatible with other module design docking
4	P16	I/O	Common I/O port, corresponding to P16 of the IC
5	P26	I/O	Ordinary IO port, can do LED driver PWM output, corresponding to IC P26, PWM5
6	P24	I/O	Ordinary IO port, can do LED driver PWM output, corresponding to IC P24, PWM4
7	P6	I/O	Ordinary IO port, can do LED drive PWM output, corresponding to IC P6, PWM0
8	VCC	P	Module power supply pin (typical value 3.3V)
9	GND	P	Power reference place
10	P9	I/O	Ordinary IO port, can do LED driver PWM output, corresponding to IC P9, PWM3
11	TX2	I/O	Common I/O port, configured as UART_RXD2 debug output by default, corresponding to P0 of the IC
12	CSN	I/O	Common I/O port, corresponding to P21 of the IC
13	P8	I/O	Ordinary IO port, can do LED drive PWM output, corresponding to IC P8, PWM2
14	P7	I/O	Ordinary IO port, can do LED driver PWM output, corresponding to IC P7, PWM1
15	RXD	I/O	Serial port receiving pin UART_RXD1, which can be reused as a common I/O port, corresponding to P10 of the IC

16	TXD	I/O	Serial port receiving pin UART_RXD1, which can be reused as a common I/O port, corresponding to P11 of the IC
17	P15	I/O	Normal IO port
18	P14	I/O	Normal IO port
19	P22	I/O	Normal IO port
20	P20	I/O	Normal I/O port -
21	RX2	I/O	Common I/O port. The default value is UART_RXD2, which corresponds to P1 of the IC
22	P17	I/O	Normal IO port

Description: VCC stands for power pin, I/O stands for input/output pin, ADC stands for analog input

3 Electrical parameters

Parameters	Numerical values
Operating frequency	2.4GHz ISM band
Wireless standards	Wi-Fi 802.11n + BLE 5.2
Antenna type	Board PCB antenna or IPX antenna interface
Storage temperature	-55°C ~ +125°C
Supply voltage	From 2.7 V to 3.6 V
Electrostatic release voltage (mannequin)	TAMB-25°C 4KV
Electrostatic release voltage (machine model)	TAMB-25 ° C 0.2KV
Operating voltage	3.3 V
Operating temperature	-40°C ~ +85°C

3 RF output power

Parameters	Minimum value	Typical value	Maximum value	Units
Working frequency Wi-Fi	2412		2462	MHz
Operating frequency BLE	2402		2480	MHz
Input impedance		50		Ω

3.1 RX receiving sensitivity

Parameters	Minimum value	Typical value	Maximum value	Units
Sensitivity (802.11b@11Mbps,CCK)		- 88.		dBm
Sensitivity (802.11g@54Mbps,OFDM)		- 75.		dBm
Sensitivity (802.11n@HT20,MCS7)		- 72.		dBm
Sensitivity (BLE@1M)		- 92.		dBm

3.2 Transmit power

Parameters	Minimum value	Typical value	Maximum value	Units
Power output (802.11b@11Mbps)			17.19	dBm
BLE output power (802.11g@54Mbps)			16.89	dBm
Output power (802.11n@HT20,MCS7)			15.42	dBm
Output power (BLE@1M)			3.37	dBm

3.3 Power consumption

The following power consumption data are measured data under 3.3V power supply

Working state	Mode	Rate	Launch work Rate/reception	Average	Peaks (typical values)	Units
send	802.11 b	11Mbps	16dBm	81	270	mA
Launch	802.11 g	54Mbps	15dBm	82	260	mA
Launch	802.11 n	MCS7	14dBm	85	253	mA
Receiving	802.11 b	11Mbps	Continuous reception	73	73	mA
Receiving	802.11 g	54Mbps	Continuous reception	75	75	mA
Receiving	802.11 n	MCS7	Continuous reception	75	75	mA

4 Antenna Information

4.1 Antenna Types

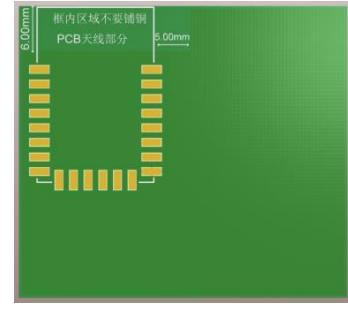
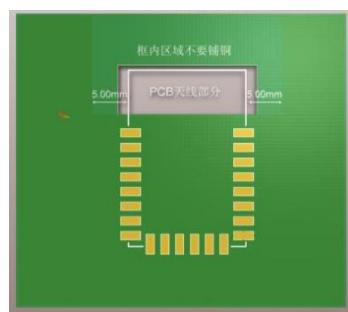
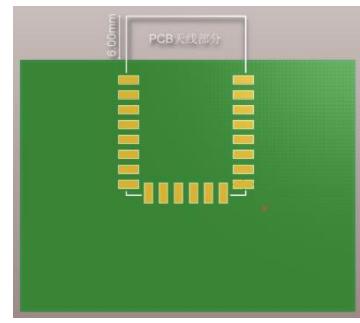
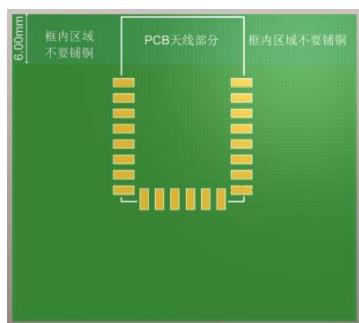
The XY3721-B3C Bluetooth module uses an onboard PCB antenna or IPX antenna interface

4.2 Reduce antenna interference

To ensure optimal RF performance, it is recommended to keep the distance between the antenna part of the module and other metal parts at least 15mm. If using the environment

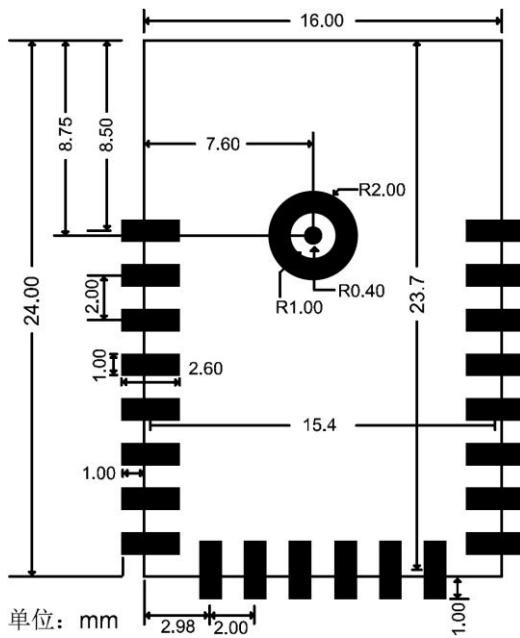
The antenna is surrounded by metal materials, which greatly attenuates the wireless signal and deteriorates the RF performance. Since the module is installed as a plug-in,

Be careful to leave enough space for the antenna area.



5 Module Package

Top view:



Note: The default module external dimension tolerance is $\pm 0.35\text{mm}$, the key dimension tolerance is $\pm 0.1\text{mm}$

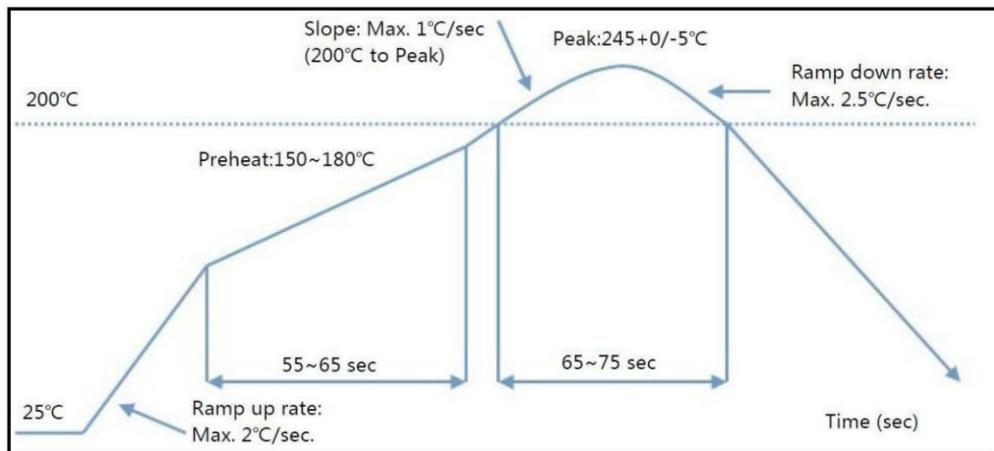
The circular pad in the left center of the module is the RF test point of the module, and this part of the pad is not shown in the package library.

6

Recommend the furnace

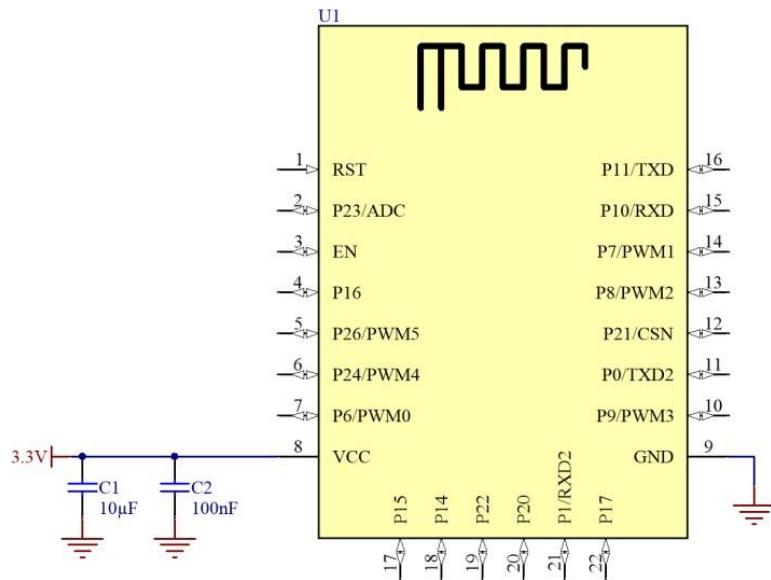
Please apply the SMT patch according to the reflow graph, the peak temperature is 245°C, and the reflow temperature curve is shown in the figure below: Refer to

IPC/JEDEC standard; Peak Temperature:<250 ° C; Number of Times: ≤2 times



7

Appendix: Schematic diagram



Module MOQ with packaging information

Product Model number	MOQ (PCS)	Shipping packing method	Quantity of shipping packaging	Number of packaging rolls per box
XY3721-B3C	3600	Carry tape reels	900	4

8 List of applicable FCC rules FCC Part 15 Subpart C 15.247 & 15.209

Specific operational use conditions.

The module can be used for mobile applications with a maximum 2.54dBi antenna. The manufacturer installing this module into their product must ensure that the final composition of the product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation. The host manufacturer has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information / warning as shown in this manual.

Limited module procedures. Not applicable.

The module is a single module and complies with the requirement of FCC part 15.212.

Trace antenna designs. Not applicable.

The module has its own antenna, and doesn't need a host printed board microstrip trace antenna etc

RF exposure considerations.

The module must be installed in the host equipment such that at least 20cm is maintained between the antenna and user's body, and if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module through a change in FCC ID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Antennas: Antenna Specification are as follows:

Type : PCB Antenna

Gain : 2.54dBi Max

This device is intended only for host manufacturers under the following conditions: The module shall be only used with the internal antennas (that has been originally tested and certified with this module). The antenna must be either permanently attached or employ a unique antenna coupler. As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with his module installed for example, digital device emissions, PC peripheral requirements, etc. :)

Label and compliance information

Host product manufacturers need to provide a physical or e-label stating "Contains FCC ID: 2A9TO-XY3721-B3C with their finished product.

Information on the modes and additional testing requirements

Host manufacturers must pass some of the following tests and spurious emission in all test modes for a stand-alone modular transmitter in host, as well as for multi-silicon ramming modules or other transmitters in a host product. Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

Additional testing, Part 15 subpart B disclaimer: The modular transmitter is only FCC authorized for FCC Part 15 Subpart C 15.247 & 15.209 and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

If the grantee markets their product as being part 15 Subpart B compliant when it also contains unintentional-radiator digital circuitry, then the grantee shall provide a notice stating that the final host product still requires part 15 Subpart B compliance testing.

CAUTION: Any changes or modifications not expressly approved could void the user's authority to operate the equipment.

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.

Note: This equipment has been tested and found to comply with the limits 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.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.