宁波小匠物联网科技有限公司

Ningbo Xiaojiang IoT Technology Co Ltd

XJ-B23

Product Specification

Product Name：XJ-B23

File Version：Rev04

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Document Revision History

No.	Modify	Modified by	Reviewed by	version	Date
1	Initial Version	gq	sxt	Rev01	2020-6-9
2	1，Add flash operation instructions；2，Typical circuit description；	gq	sxt	Rev02	2020-8-11
3	1. Correct the repeated pin description; 2. Add distance description	gq	sxt	Rev03	2020-10-10
4	Correct writing errors	gq	sxt	Rev04	2021-01-29

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Chapter 1 Overview

XJ-B23 series low-power Bluetooth module is a high-performance Bluetooth module developed based on telink low-power Bluetooth SOC tlsr8250 chip. The module adopts stamp type and side plug-in interface, which is exquisite, compact, full port led out and easy to use. It helps users bypass the cumbersome rf hardware design, development and production. Users can easily realize the development of Bluetooth applications on this basis, Shorten the R & D cycle and help you seize the market opportunity.

Table 1-1 Model Description

Model	Description
XJ-B23	PCB antenna,not include software. If it is a product with software, please communicate the specific model and MPQ with the sales department

1.1 Module Function Characteristics

- Operation Voltage：1.8 to 3.6 V
- Operation Freq：2400MHz to 2483.5MHz
- TX Power：Max 10dBm（@3.3V）
- Rx Sensitivity：-95dBm （@1Mbps）

1.2 Application occasion

- Smartphone and tablet peripheral products
- Wireless sensor networks such as data collection
- Wireless wearable Bluetooth device
- Smart home, Smart city

Chapter 2 Specifications

Table 2-1 Absolute Maximum Ratings

	MIN	MAX	Unit
Supply Voltage(VDD)	-0.3	3.6	V
Supply Voltage(IO)	-0.3	VDD+0.3	V
Storage Temperature（℃）	-40	150	℃

Table 2-2 General Characteristics @Ta=25℃，VDD=3.3V

Parameter		Characteristics			Remarks
		MIN	TYP	MAX	
Operating Voltage（V）		1.8	3.3	3.6	
Operating Temperaturt（℃）		-40	/	85	
Freq (MHz)		2400	/	2483.5	
Channels		/	40	/	
Power	Tx Current(mA)	/	6.3	/	@0dBm
		/	18	/	@10dBm
	Rx Current(mA)	/	6	/	
	Sleep current (uA)	/	0.4	/	
TX(dBm)		/	10	/	
RX(dBm)		/	-95	/	BLE @1Mbps，PER≤30.8%@1500packets
Protocol		BLE 5.0			
Interface Type		3 sides stamp hole			
Communication Distance[1]		150m			Private agreement,Free environment

1."Communication distance" is affected by the surrounding environment, air humidity and other factors. The distance is measured through the communication between the mobile phone and the module for reference only.

Chapter 3 Hardware Layout and Interface Description

3.1 Overall Dimension Drawing

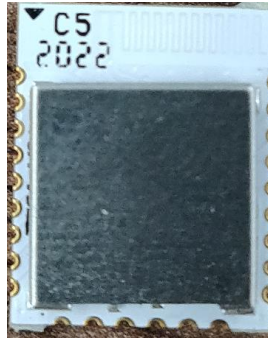XJ-B23 Module physical drawing is shown in the figure 3-1：

Fig. 3-1 XJ-B23 Module Picture

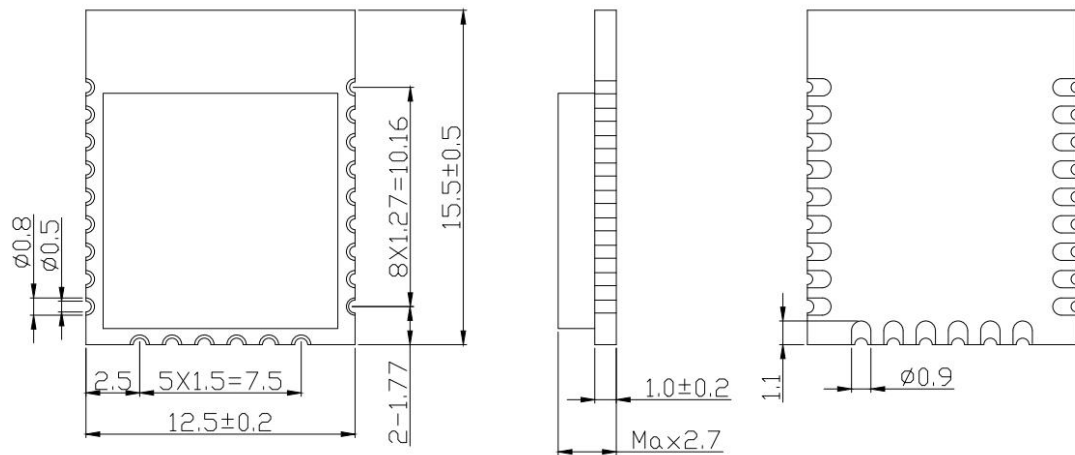XJ-B23 Module physical Dimensions are shown in the figure 3-2：

Fig.3-2 XJ-B23

A. All linear dimensions are in millimeters.

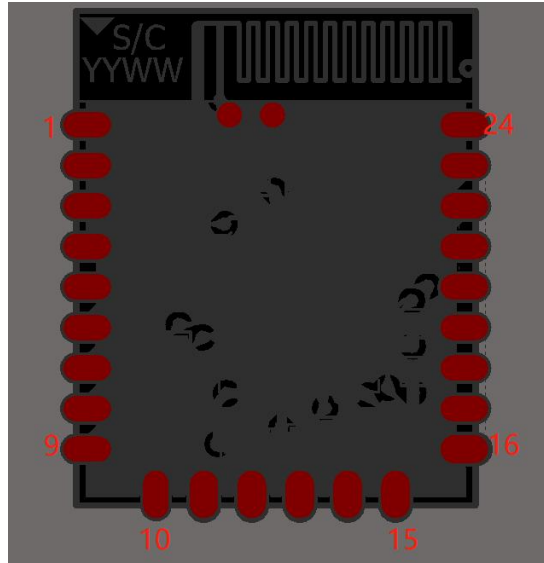B. Dimensioning and tolerancing per GB/T1804-m

3.2 Pin Diagram

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Fig.3-3 Package 24-Pin SMD

Table 3-1 XJ-B23 Pin Description

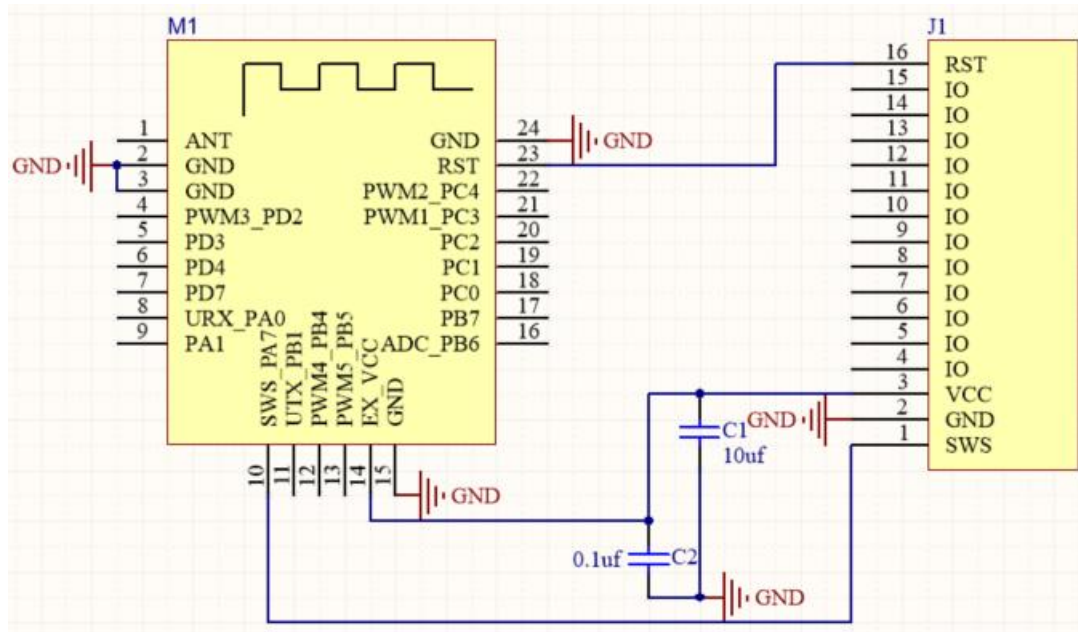| Module Pin	IC Pin	Name	Fuction	Remarks
1	/	ANT	External Antenna Interface	
2	0	GND	GND	All GND shuld be connected
3	0	GND	GND	All GND shuld be connected
4	31	PWM3/PD2	General IO/PWM	
5	32	PWM1_N/PD3	General IO/PWM	
6	1	PWM2_N/PD4	General IO/PWM	
7	2	PD7	General IO	
8	3	UART_RX/PA0	General IO/UART RX	
9	4	PA1	General IO	
10	5	SWS/PA7	Debug/General IO	
11	6	UART_TX/PB1	General IO/UART TX	
12	14	PWM4/PB4	General IO/PWM	
13	15	PWM5/PB5	General IO/PWM	
14	18	VCC	Power	
15	0	GND	GND	All GND shuld be connected
16	16	ADC/PB6	General IO/ADC	
17	17	ADC/PB7	General IO	
18	20	PWM4_N/PC0	General IO/PWM	
19	21	PWM_1/PC1	General IO/PWM	
20	22	PWM0/PC2	General IO/PWM	
21	23	PWM1/PC3	General IO/PWM	
22	24	PWM2/PC4	General IO/PWM	
23	25	RST	Reset	Active low
24	0	GND	GND	All GND shuld be connected

3.3 Typical Circuit
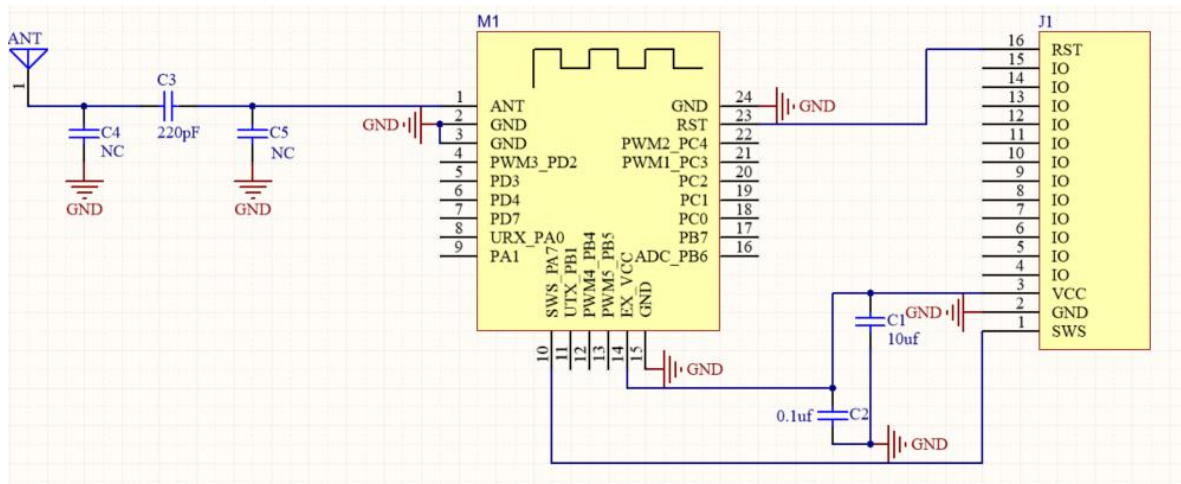

Fig.3-4 Typical Circuit(PCB antenna)

Fig.3-5 Typical Circuit(External antenna)

Chapter 4 Production Guidance

4.1 Production Guide

It is suggested the stamp hole packaging module mounted by an SMT machine, and the mounting shall be finished within 24 hours after unpacking. Otherwise, its need to repackage by

vacuumizing, so as to prevent poor mounting effect due to damp.

If the package includes a humidity indicator card, it is suggested judging if the module needs to be baked according to the indication of the humidity indicator card. The baking conditions are as follows:

Baking temperature: 125℃±5℃;

The alarm temperature is set to be 130℃ ;

SMT mounting can be carried out after the temperature cools down to be <36℃ under natural conditions;

If the product is unpacked for over 3 months, please pay special attention if the product is affected with damp, because the PCB gold immersion process may lead to the oxidation of the land after more than 3 months, and may lead to such problems as false welding and missing welding during the mounting process.

In order to ensure the pass rate of reflow, it is suggested picking 10% of products for visual inspection
and AOI detection in the first time of mounting, so as to ensure the reasonableness of the furnace temperature, device absorption method and placement method;

Operators at all stations must wear the anti-electrostatic gloves during the whole production process;

4.2 Requirements on Positions of Module on Backplane

It is suggested the green oil thickness at the module position of the backplane be less than 0.02mm, so as to prevent the phenomenon that the green oil is too thick, the module is blocked up and cannot be effectively contacted with solder paste, and the welding quality is affected.

In addition, it is necessary to consider that other devices cannot be arranged within 2mm around the interface board module to ensure the maintenance of the module.

4.3 Opening Design of Steel Mesh

The thickness of the steel mesh on the backplane shall be selected by comprehensively considering the packaging type of the devices in the board, and special attention shall be paid to the following requirement ：
The land position of the module can be locally thickened to 0.15~0.20mm, so as to prevent void solder;
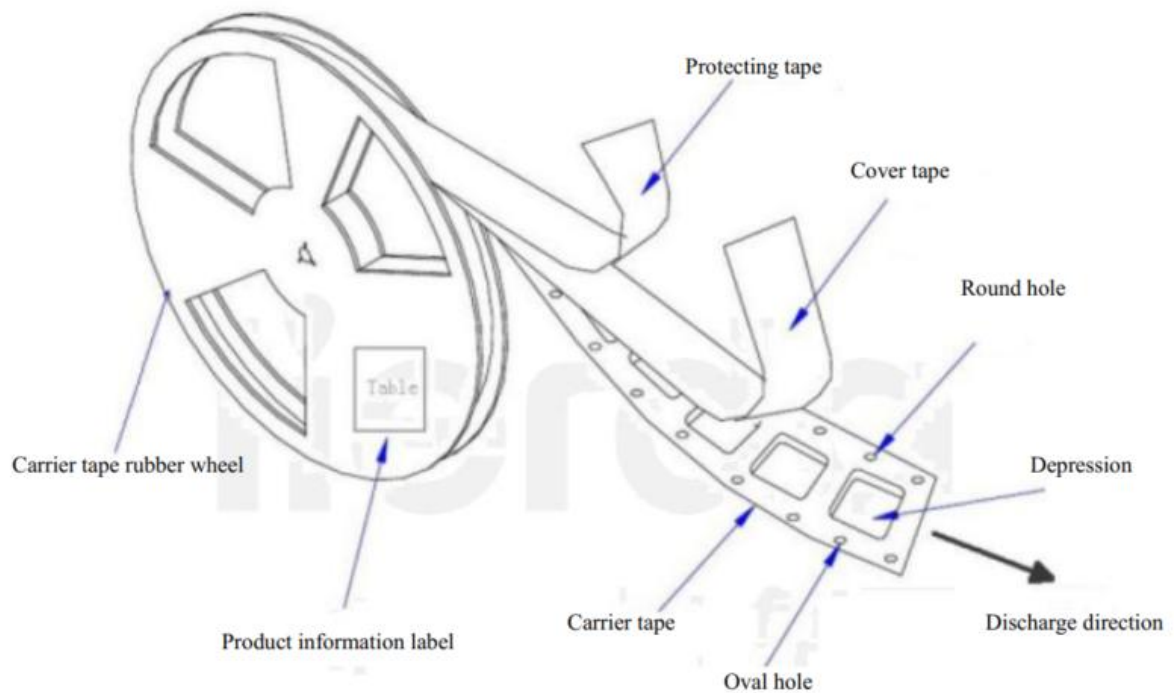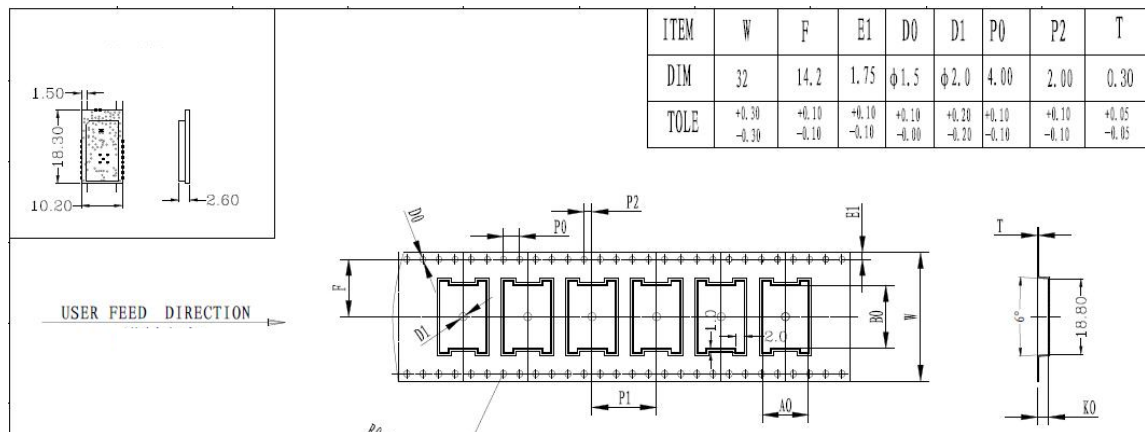
Chaper 5 Product Package

5.1 Packaging Method

■ Tape ☐ Foam ☐ Electrostatic bag

5.2 Strip Size

ITEM	W	F	E1	D0	D1	P0	P2	T
DIM	32	14.2	1.75	φ1.5	φ2.0	4.00	2.00	0.30
TOLE	+0.30 -0.30	+0.10 -0.10	+0.10 -0.10	+0.10 -0.00	+0.20 -0.20	+0.10 -0.10	+0.10 -0.10	+0.05 -0.05

USER FEED DIRECTION

Protecting tape

Cover tape

Round hole

Depression

Discharge direction

Carrier tape rubber wheel

Product information label

Carrier tape

Oval hole

Caution：

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 A and 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-B23** 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 Type	Antenna Gain	Impedance	Frequency Range
PCB	-3.3dBi	50Ω	2.4~2.5GHz

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-B23**"

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