JXC8721-65

Module Specifications

Document version: V1.2

Manufacturer

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Change History

Version	Modify the description	Write	Date
V1.0	Prepared by	JZP	2022/03/10
V1.1	Revised external antenna info.	JZP	2022/05/18
V1.2	Increase note information	JZP	2022/08/29

Table of Contents

Fig 1 Module physical drawing (TOP)

Fig 2 Module physical drawing (BOT)

* Pictures are for reference only, please refer to the received modules.

1 Overview

JXC8721-65 module is WiFi 2.4Ghz &5GHz and Bluetooth dual-mode module, which meets the wireless IEEE 802.11A/B/G/N standard and BLE 5.0 standard. JXC8721-65 single dual-mode module can access the network through Bluetooth and WIFI network configuration, greatly improving the success rate of network configuration and customer experience. Designed specifically for IoT products, the module supports a wide range of product forms including gateways, smart sockets and lights.

2 Features

- WIFI and Bluetooth dual mode module
- Support WiFi 2.4Ghz and 5GHz
- Support Bluetooth access to the network and WIFI network
- Support local Bluetooth control and WIFI remote control
- Restoring automatically after the WIFI connection is disconnected

- OTA upgrade is supported
- interface Provides UART, GPIO, PWM, ADC and other interfaces
- External antenna
- Module size 25x20x3.4mm
- Working temperature:

  -20 to 85 ℃

3 Application Fields

- Gateway
- Smart home
- Smart lighting

4 Pin definition

4.1 Pin layout diagram

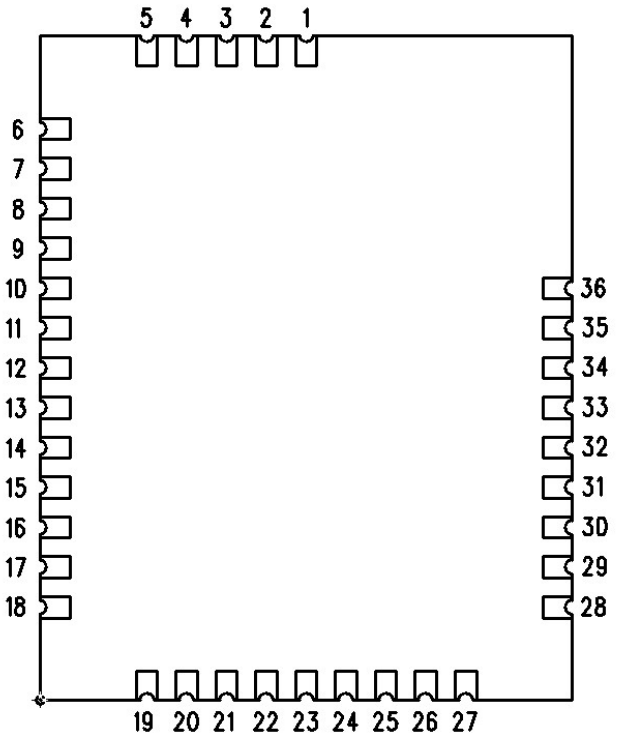


FIG 4 Pin assignment diagram (TOP View)

4.2 Table of pin definitions

Tab 1 Module pin description table

Module feet	Name	Type	Pin description	Correspond to IC pins
1	GND	P	Power GND	\
2	PA12	I/O	PA12/PWM0/UART_TXD/SPI1_MOSI/I2S_MCLK	PIN25
3	PA13	I/O	PA13/PWM1/UART_RXD/SPI1_MISO/I2S_SD_TX1	PIN26
4	PA14	I/O	PA14/SPI1_CLK/I2S_SD_TX2	PIN27
5	PA15	I/O	PA15/SPI1_CS	PIN28
6	PA16	I/O	PA16/SPI0_MOSI	PIN29
7	PA17	I/O	PA17/SPI0_MISO	PIN30
8	PA18	I/O	PA18/HS_UART0_TXD/SPI0_CLK	PIN31
9	PA19	I/O	PA19/HS_UART0_RXD/SPI0_CS	PIN32
10	PA27	I/O	PA27/SWD_DATA	PIN33
11	PA30	I/O	PA30/PWM1	PIN36
12	PA28	I/O	PA28/PWM0	PIN38
13	PA26	I/O	PA26/PWM5/UART_TXD/I2C_SDA/IR_RX	PIN39
14	PA25	I/O	PA25/PWM4/UART_RXD/I2C_SCL/IR_TX	PIN40
15	PB1	I/O	PB1/ADC4/UART_TX/DMIC_CLK	PIN41
16	PB2	I/O	PB2/ADC5/UART_RX/DMIC_DATA	PIN42
17	PB3	I/O	PB3/SWD_CLK	PIN43
18	PB4	I/O	PB4/ADC0/PWM2/SPI1_MOSI/I2S_SD_TX1	PIN44
19	GND	P	Power GND	\
20	VDD33	P	Module power supply 3.3V, ripple less than 120mVpp	\
21	PB5	I/O	PB5/ADC1/PWM3/IIC_SCL/SPI1_MISO/I2S_SD_TX2	PIN45
22	PB6	I/O	PB6/ADC2/IIC_SDA/SPI1_CLK	PIN46
23	PB7	I/O	PB7/ADC3/PWM5/SPI1_CS	PIN47
24	VBAT_MEAS	I/O	VBAT_MEAS	PIN48
25	PB22	I/O	PB22/SPI_DATA3/PWM2/IR_RX/I2S_SD_RX	PIN60
26	PB23	I/O	PB23/SPI_DATA2/PWM3/IR_TX/I2S_MCLK	PIN61
27	PB26	I/O	PB26/I2S_SD_TX0	PIN63
28	PB29	I/O	PB29/IR_RX/I2S_CLK	PIN64

Module feet	Name	Type	Pin description	Correspond to IC pins
29	PB31	I/O	PB31/IR_TX/I2S_WS	PIN65
30	PA0	I/O	PA0/I2S_SD_RX	PIN2
31	PA4	I/O	PA4/I2S_WS	PIN3
32	PA2	I/O	PA2/I2S_CLK	PIN4
33	CHIP_EN	I/O	CHIP_EN	PIN6
34	PA7	I/O	PA7/UART_LOG_TXD	PIN7
35	PA8	I/O	PA8/UART_LOG_RXD	PIN8
36	GND	P	Power GND	\

5 Electrical Characteristics

5.1 RF characteristics

Tab 2 RF characteristic table

RF characteristic					
WIFI					
Web standards	Wireless standards: IEEE 802.11a、IEEE 802.11b、IEEE 802.11g、IEEE 802.11n				
Channel number	2.4GHz1-14、5GHz36-165, (Channel is different according to different national standards)				
Frequency range	2.412-2.484GHz、5.180-5.825GHz, (Frequency range varies according to different national standards)				
Transmission power	The test item	Min	Typ	Max	unit
	802.11a 54M,RF Average output power	-	12	20	dBm
	802.11b 11M,RF Average output power	-	17	20	dBm
	802.11g 54M,RF Average output power	-	13	20	dBm
	802.11n(HT20-2.4G) MCS7,RF Average output power	-	12	20	dBm
	802.11n(HT40-2.4G) MCS7,RF Average output power	-	12	20	dBm
	802.11n(HT20-5G) MCS7,RF Average output power	-	11	20	dBm
	802.11n(HT40-5G) MCS7,RF Average output power	-	11	20	dBm
	The frequency error	-30	+/-10	30	KHZ
EVM	802.11a 54M EVM	-	-32	-25	dB
	802.11b 11M EVM	-	-20	-10	dB
	802.11g 54M EVM	-	-35	-25	dB
	802.11n(HT20-2.4G) MCS7 EVM	-	-35	-27	dB
	802.11n(HT40-2.4G) MCS7 EVM	-	-33	-27	dB
	802.11n(HT20-5G) MCS7 EVM	-	-32	-27	dB
	802.11n(HT40-5G) MCS7 EVM	-	-31	-27	dB
Reception	802.11a 54M Reception sensitivity	-	-75	-65	dBm

sensitivity	802.11b 11M Reception sensitivity	-	-90	-76	dBm
	802.11g 54M Reception sensitivity	-	-77	-65	dBm
	802.11n(HT20-2.4G) MCS7 Reception sensitivity	-	-74	-64	dBm
	802.11n(HT40-2.4G) MCS7 Reception sensitivity	-	-71	-64	dBm
	802.11n(HT20-5G) MCS7 Reception sensitivity	-	-73	-64	dBm
	802.11n(HT40-5G) MCS7 Reception sensitivity	-	-70	-61	dBm
bluetooth					
Wireless standards	BLE 5.0				
Frequency range	2402-2480MHZ				
power	Max. 10dBm				
The sensitivity 1Mbps	-99dBm				

5.2 The DC feature

Tab 3 Electrical characteristic table

DC Electrical characteristics				
parameter	Min	Typ	Max	unit
Working voltage	3.0	3.3	3.6	V
3.3V Power consumption	-	-	450	mA
Input high level	2.0	-	3.6	V
Input low level	-	-	0.8	V
Output high level	2.4	-	-	V
Output low level	-	0	0.4	V
Output Output current at normal high voltage	-	5	-	mA

Output Output current at low voltage	-	5	-	mA

*Note: Please ensure that the voltage supplied to module is within the specified range. Any sudden voltage rise such as voltage surges or spikes may damage the chipset .Hence it is advised to add TVS to protect against ESD.

5.3 Power consumption characteristics

Tab 4 Power consumption characteristics table

Working state	model	rate	Transmit power/receive power	Typical values	unit
Transmission	WIFI 11b	11M	17dBm	276	mA
	WIFI 11g	54M	14dBm	178	mA
	WIFI 11n bw20-2.4G	MCS7	13dBm	172	mA
	WIFI 11n bw40-2.4G	MCS7	13dBm	148	mA
	WIFI 11a	54M	13dBm	208	mA
	WIFI 11n bw20-5G	MCS7	12dBm	200	mA
	WIFI 11n bw40-5G	MCS7	12dBm	173	mA
	Bluetooth BLE	1M	4dBm	105	mA
receive	WIFI 11b/g/n	\	continuous	62	mA
	Bluetooth BLE	1M	continuous	60	mA
Networking status Standby power consumption	\	\	\	59	mA

6 Module Structure

6.1 Module size

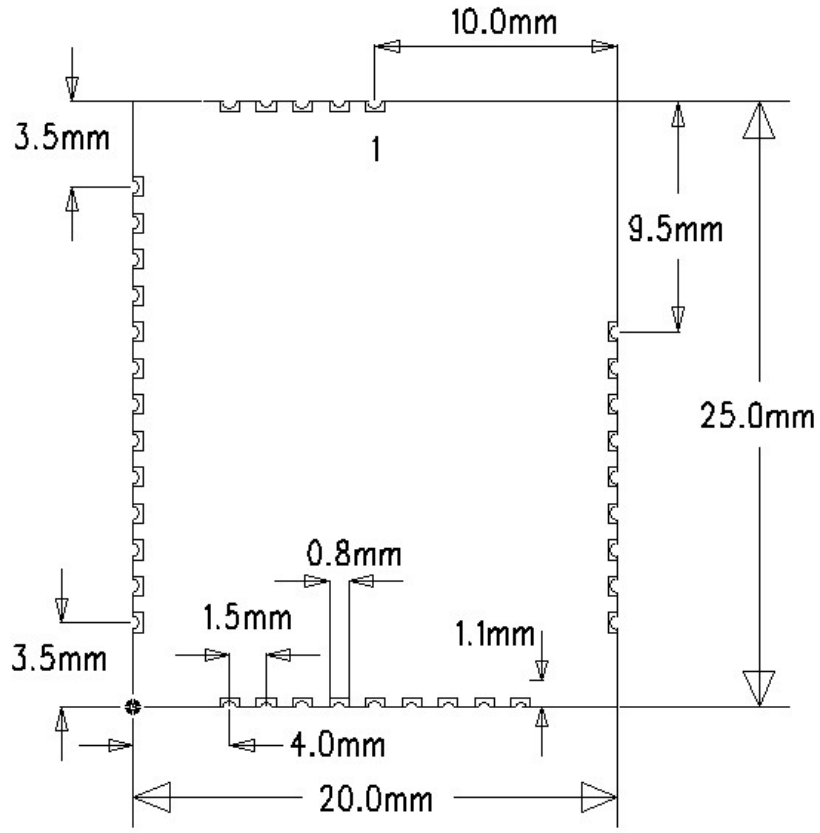


Fig 5 Structural dimension drawing (TOP View)

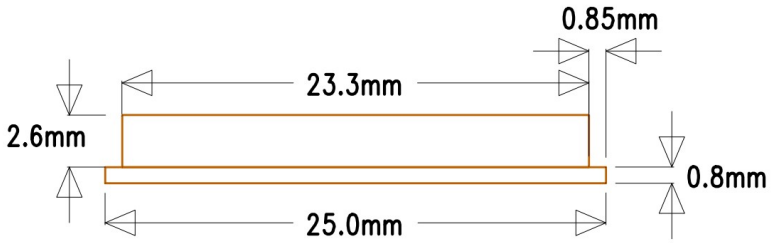


Fig 6 The strakes

※ PCB thickness :0.8mm, shield cover height: 2.6mm, the total height with shield cover is 3.4mm。

※ All dimension tolerance shall meet the standard GB/T1804-m , unless otherwise specified.

6.2 Capsulation Reference

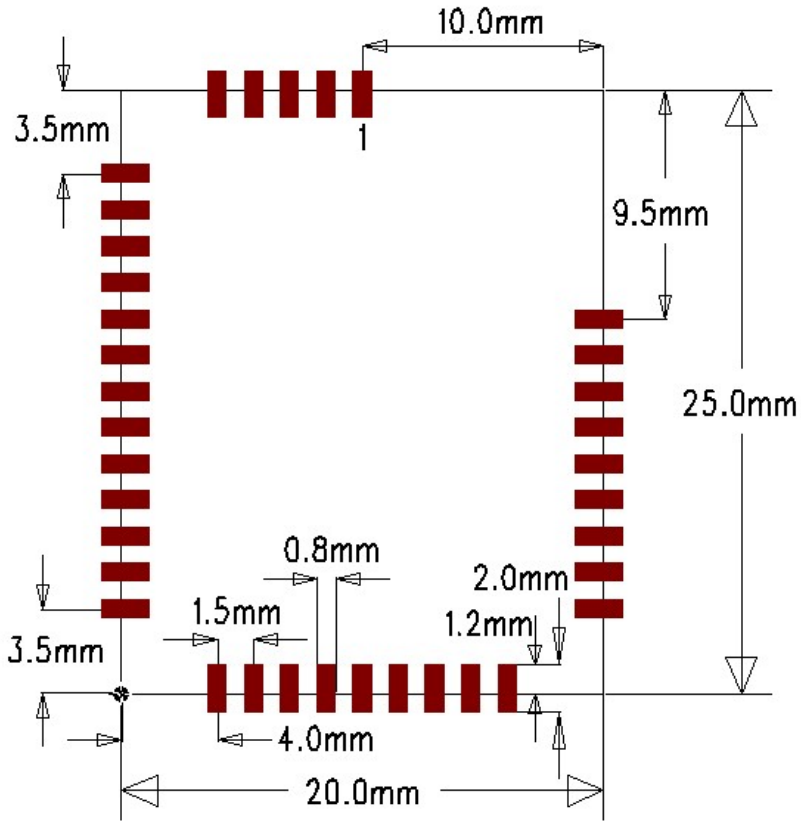
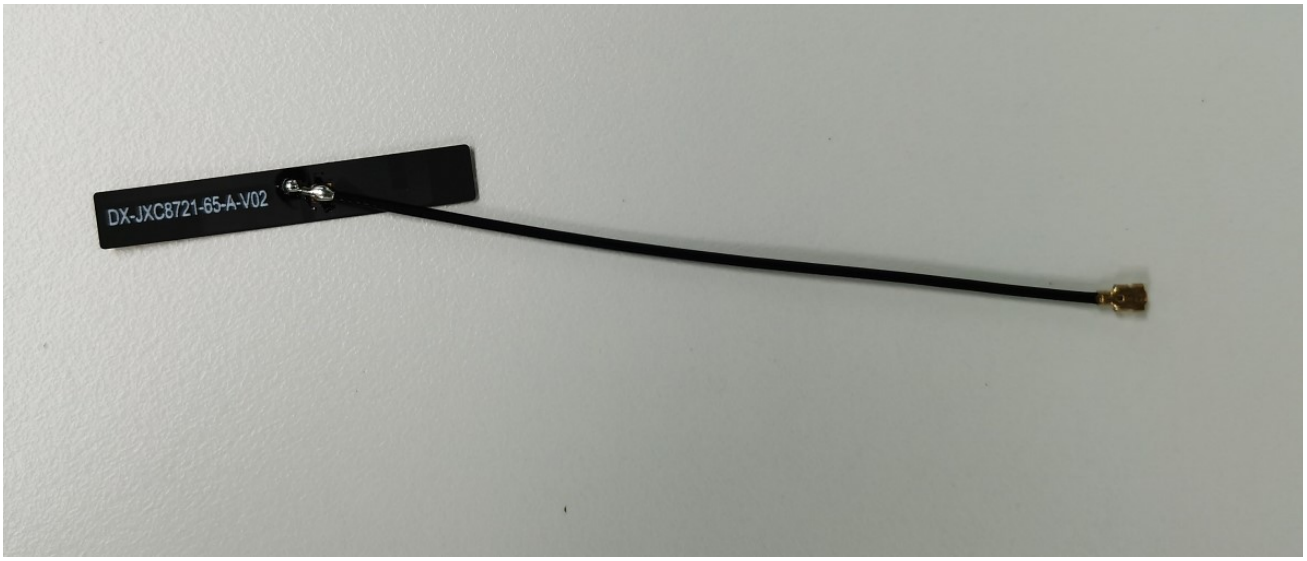


Fig 3 PCB Layout reference (TOP View)

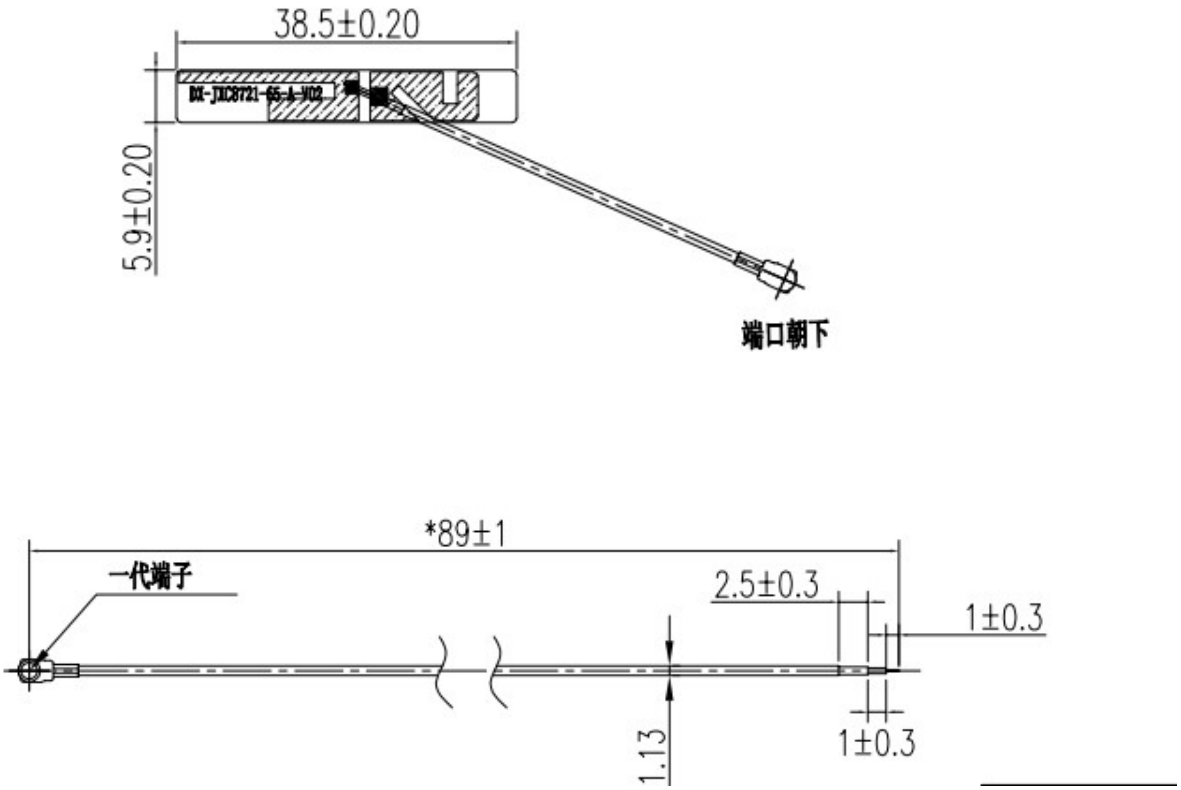
※ The above package is for reference only, the above sealing pad is in the BOTTOM layer, please adjust according to the process, installation mode and other factors.

7 External antenna

7.1 Antenna figure



7.2 Dimension



Unit：mm

7.3 Specifications

Item		Specifications
Antenna	Frequency Range	2400~2483.5MHz 5150~5850MHz
	Polarization	Linear
	Peak Gain	2400~2483.5MHz -2.72dBi; 5150~5850MHz 4.1dBi
	Impedance	50Ω
	Connector	IPEX generation 1 interface

8 Notes

The module supports external antennas. The following are precautions for using antennas。

1》The module has IPEX 1 generation antenna interface to provide connection with external antenna. The antenna ports are shown in the following figure. The 4mmx5mm area under the bottom plate of the antenna base shall be shielded from the air. No devices shall be placed, and no wiring or floor laying shall be performed.

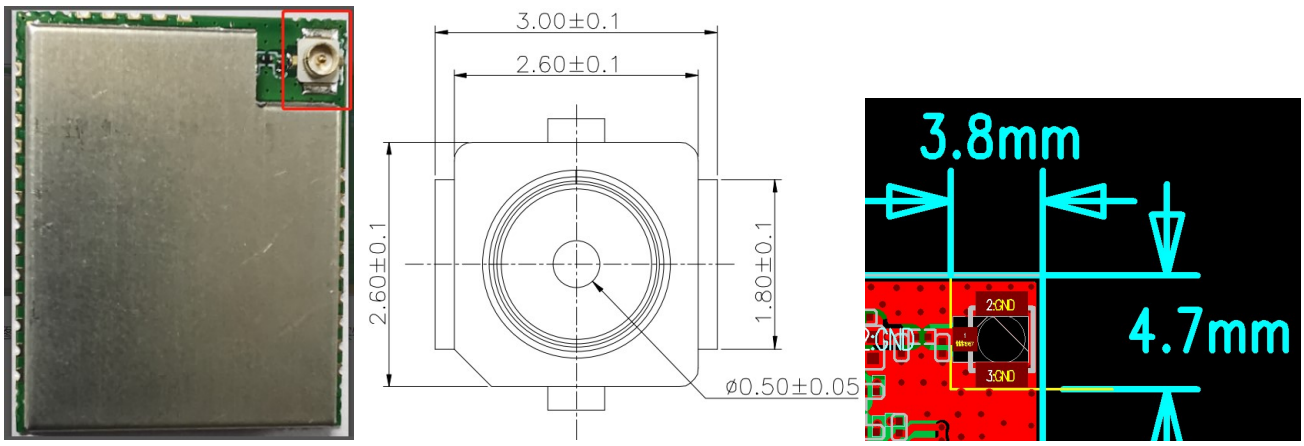


Fig 10 Module antenna interface

2》The module supports WiFi 2.4ghz and 5GHz, and antennas of corresponding frequencies need to be selected.

3》Keep the antenna away from metal, at least 10 mm away from the surrounding metal and components.

4》The part of the antenna should not be covered by the metal shell. You can contact crystal technical support personnel for the placement of the antenna.

Integration instructions for host product manufacturer

1. List of applicable FCC rules:

FCC Part 15.247, FCC Part 15.407

2. Specific operational use conditions

OEM integrator has be limited the operation channels in channel 1-11 for 2.4G band for WIFI.

3. Limited module procedures

Not Applicable.

4. Trace antenna designs

Not Applicable.

5. RF exposure consideratons

The application shall define as mobile device and the antenna shall at least 20 cm from a person's body. If this condutions cannot provided, a separate approval is required, and host product manufacturer should take responsibility of it.

6. Antennas

This module has been approved to operate with the antenna types listed below, with the maximum permissible gain indicated:

Model Number	Connector	Frequency	Peak Gain
		MHz	dBi
DX-JXC8721-65-A	IPEX	2400~2483.5	-2.72
		5150~5250	2.15
		5250~5350	2.43
		5470~5725	4.1
		5725~5845	2.41

7. Label and compliance information

The host product must be labeled in a visible area with the following “Contains FCC ID: PUU-KEYPADSG2A” and “Contains IC: 10798A-KEYPADSG2A”.

8. Information on test modes and additional testing requirements

The host manufacturer can use the software of “RTLBTAPP” to make Bluetooth transmit and use the software of “UI_mptool” to make WIFI transmit.

9. Additional testing, Part 15 Subpart B disclaimer

The module is only FCC authorized for the specific rule parts 15.247, 15.407 listed on the grant. The host product manufacturer is responsible for the compliance to any other FCC rules that apply to the host not coverd by the modular transmitter grant of certification.

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FCC warnings：

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.

The grantee is not responsible for any changes or modifications not expressly approved by the

party responsible for compliance. Such modifications could void the user’ s authority to operate the equipment.

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.

This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.

IC warnings：

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Avis: Pour répondre à la IC d'exposition pour les besoins de base etmobiles dispositits de transmission de la station, sur une distance deséparation de 20 cm ou plus do it être maintenue entre l'antenne de cetappareil et les personnes en cours de fonctionnement. Pour a ssurer lerespect, l'exploitation de plus près à cette distance n'est pasrecommandée. L'antenne (s) utilisé pour cet émetteur ne doit pas êtreco-localisés ou fonctionner conjointement avec une autre antenne outransmetteur.

Caution:

1) The device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

2) For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;

3) For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p limits specified for point-to-point and non-point-to-point operation as appropriate;

And DFS(Dynamic Frequency Selection) products that operate in the bands 5250-5350MHz, 5470-5600MHz, and 5650-5725MHz.

Avertissement:

1) Le dispositif fonctionnant dans la bande 5150-5250 MHz est réservé uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;
2) Le gain maximal d'antenne permis pour les dispositifs avec antenne(s) amovible(s) utilisant les bandes 5250-5350 MHz et 5470-5725 MHz doit se conformer à la limitation P.I.R.E.;
3) Le gain maximal d'antenne permis pour les dispositifs avec antenne(s) amovible(s) utilisant la bande 5725-5850 MHz doit se conformer à la limitation P.I.R.E spécifiée pour l'exploitation point à point et non point à point, selon le cas.

Les produits utilisant la technique d'atténuation DFS (sélection dynamique des fréquences) sur les bandes 5250- 5350 MHz, 5470-5600MHz et 5650-5725MHz.