

WF122

Revision	V1.0		
Date	2021-10-14		
Model Name	WF122		
Product Name	IEEE 802.11a/b/g/n/ac(1T 1R) USB2.0 WLAN Module		
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Engineer	QC	Sales	
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Customer Approve Field			
Engineer	QC	Manufactory	Purchasing

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Revision History

Date	Document Revision	Product Revision	Description
2021/10/14	1.0	V1.0	Initial released

1. Introduction

1.1 General Description

WF122 is the module designed by a highly integrated IEEE 802.11a/b/g/n/ac MAC/Baseband/RF WLAN single chip. It combines a WLAN MAC, a ITIR capable WLAN baseband, modem, and WLAN RF in a single chip. The module provides a complete solution for a high-performance wireless LAN.

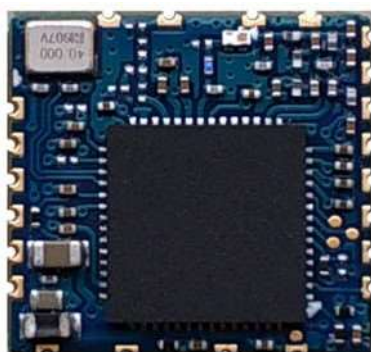


Figure 1 Top View

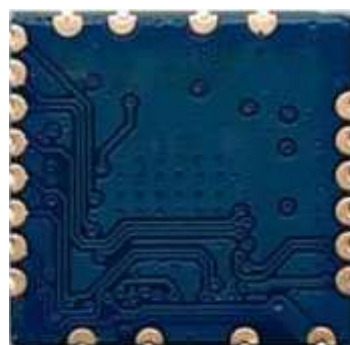


Figure 2 Bottom View

Note: The above pictures are for reference only.

1.2 Features

- Operating Frequencies : 2.412GHz 2.4835GHz /5.18GHz 5.835GHz
- IEEE Standards : IEEE 802.11a/b/g/n/ac
- Wireless data rate can reach up to 433.3Mbps
- Connect to external antenna through the half hole
- Power Supply:3.3V 0.2V

1.3 Applications

- 0 MID
- 0 IP Camera
- 0 STB
- Smart TV
- 0 E—book
- 0 Other devices which need to be supported by wireless network

2. Functional Block Diagram

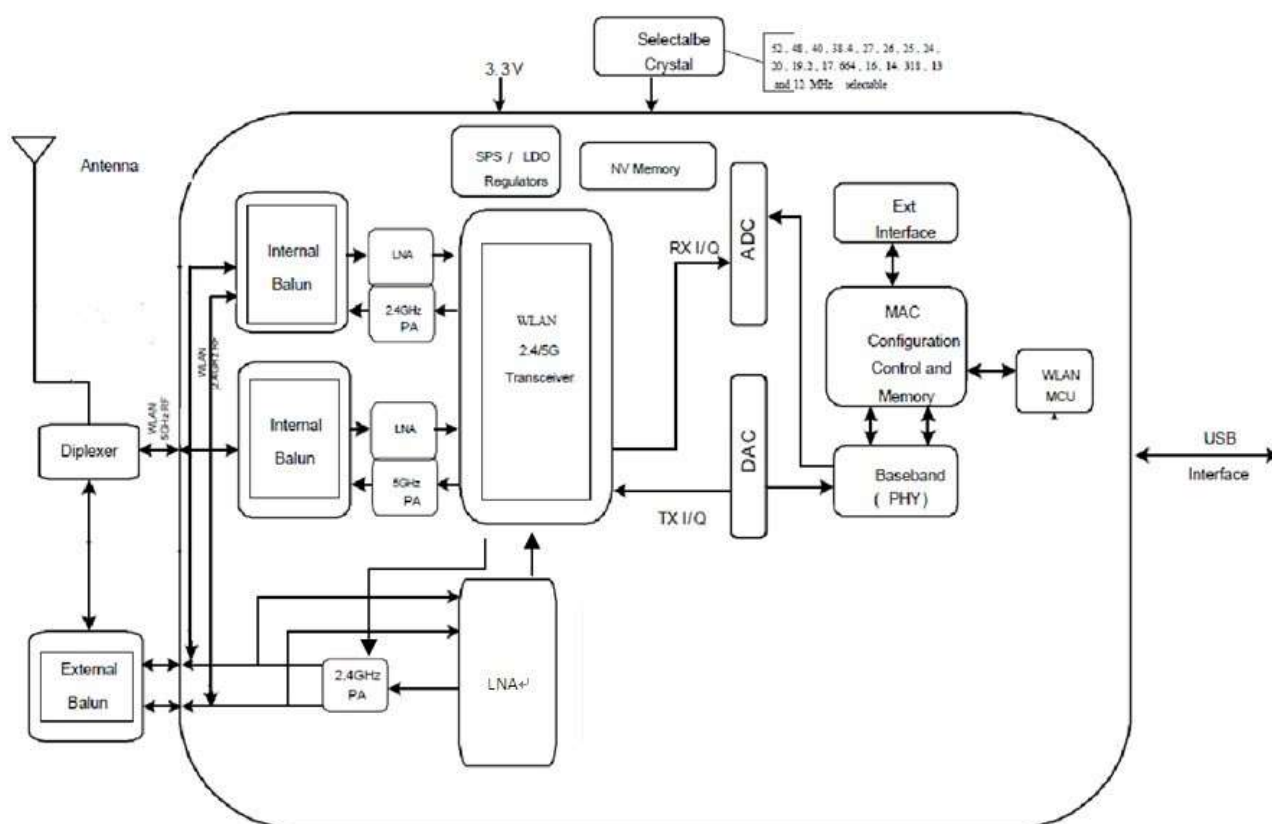


Figure 3 BKW-WF122 block diagram

3. Product Technical Specifications

3.1 General Specifications

Item	Description
Product Name	BKW-WF122
Main Chip	RTL881 ICU-CG
Host Interface	USB 2.0
IEEE Standards	IEEE 802.11a/b/g/n/ac

Operating Frequencies	2.412GHz 2.4835GHz /5.18GHz 5.835GHz
Modulation	802.11b: CCK, DQPSK, DBPSK 802.11a/g: 64-QAM, 16-QAM, QPSK, BPSK 802.11n: 64-QAM, 16-QAM, QPSK, BPSK 802.11ac: 256-QAM, 64-QAM, 16-QAM, QPSK, BPSK
Working Mode	Infrastructure, Ad-Hoc
Wireless Data Rate	802.11b: 1, 2, 5.5, 11Mbps 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0 7> HT20 reach up to 72.2Mbps, HT40 reach up to 150Mbps 802.11ac: MCS0 8> VHT20 reach up to 173.3Mbps, VHT40 reach up to 239Mbps, MCS0 9> VHT80 reach up to 433.3Mbps

Antenna Type	Connect to the external antenna through the half hole
Dimension(L*W*H)	13.0*12.2*1.5mm (LxWxH) Tolerance: +/-0.15mm
Power Supply	3.3V I 0.2V
Clock Source	40MHz
Working Temperature	-20° C to +70° C
Storage Temperature	-40° C to +85 ° C

4. Pin Assignments

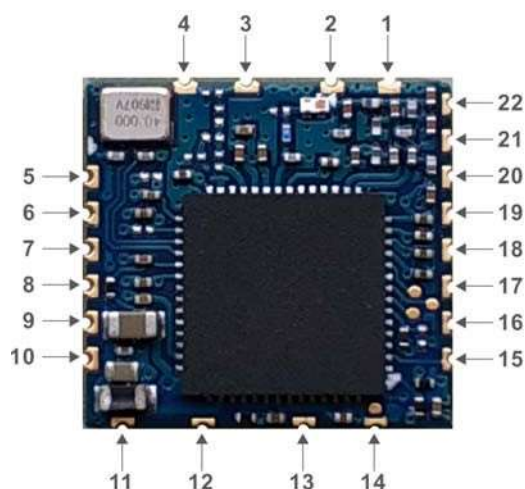


Figure 4 Pin Assignments (Top view)

The following signal type codes are used in the tables:

I:Input

O:Output

O/D: Open Drain

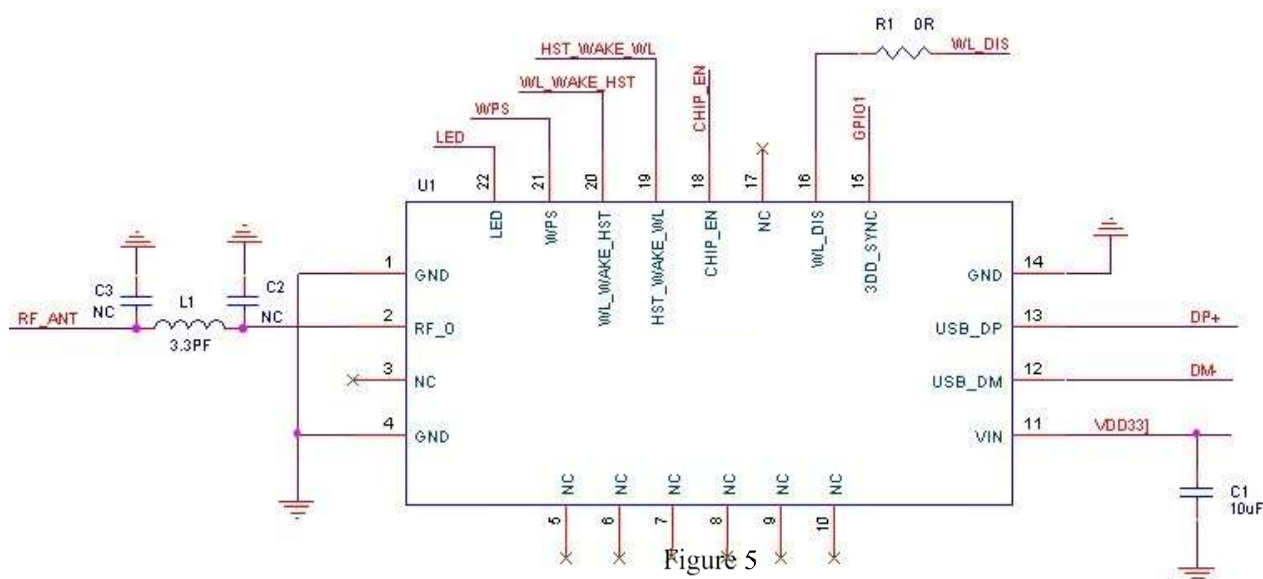
P:Power Pin

PIN	Function	Type	Description
1	GND	P	Ground
2	RF_0	I/O	2G/5G WIFI ANT
3	NC	P	No connection(floating)
4	GND		Ground
5	NC		No connection(floating)
6	NC		No connection(floating)
7	NC		No connection(floating)
8	NC		No connection(floating)
9	NC		No connection(floating)
10	NC		No connection(floating)
11	VIN	P	VDD 3.3V Power Supply
12	USB_DM	I/O	USB Transmitter/Receiver Differential Pair
13	USB_DP	I/O	USB Transmitter/Receiver Differential Pair
14	GND	P	ground
15	3DD_SYNC	I/O	PCM_OUT/GPIO1
16	WL_DIS	I	WIFI DISABLE (Low potential
17	NC		No connection(floating)
18	CHIP_EN	I	High asserting for use/ Low asserting reset

19	HST_WAKE_WL	I	HOST to wake up WIFI
20	WL_WAKE_HST	O	WIFI to wake up HOST
21	WPS	I	WPS Switch
22	LED	I	External LED Control

5. Application Information

5.1 Typical Application Circuit



NOTE:

- RF trace need to keep 50 ohm impedance
- USB differential pair need to keep 90ohm impedance.
- C1 10uF closed to Module pin 11
- Reserved 0R between Module pin 16 and Host
- LED active low.

6. Mechanical Specifications

Module dimension: Typical (L*W*H): 13.0mm*12.2mm*1.5mm Tolerance : +/-0.15 mm

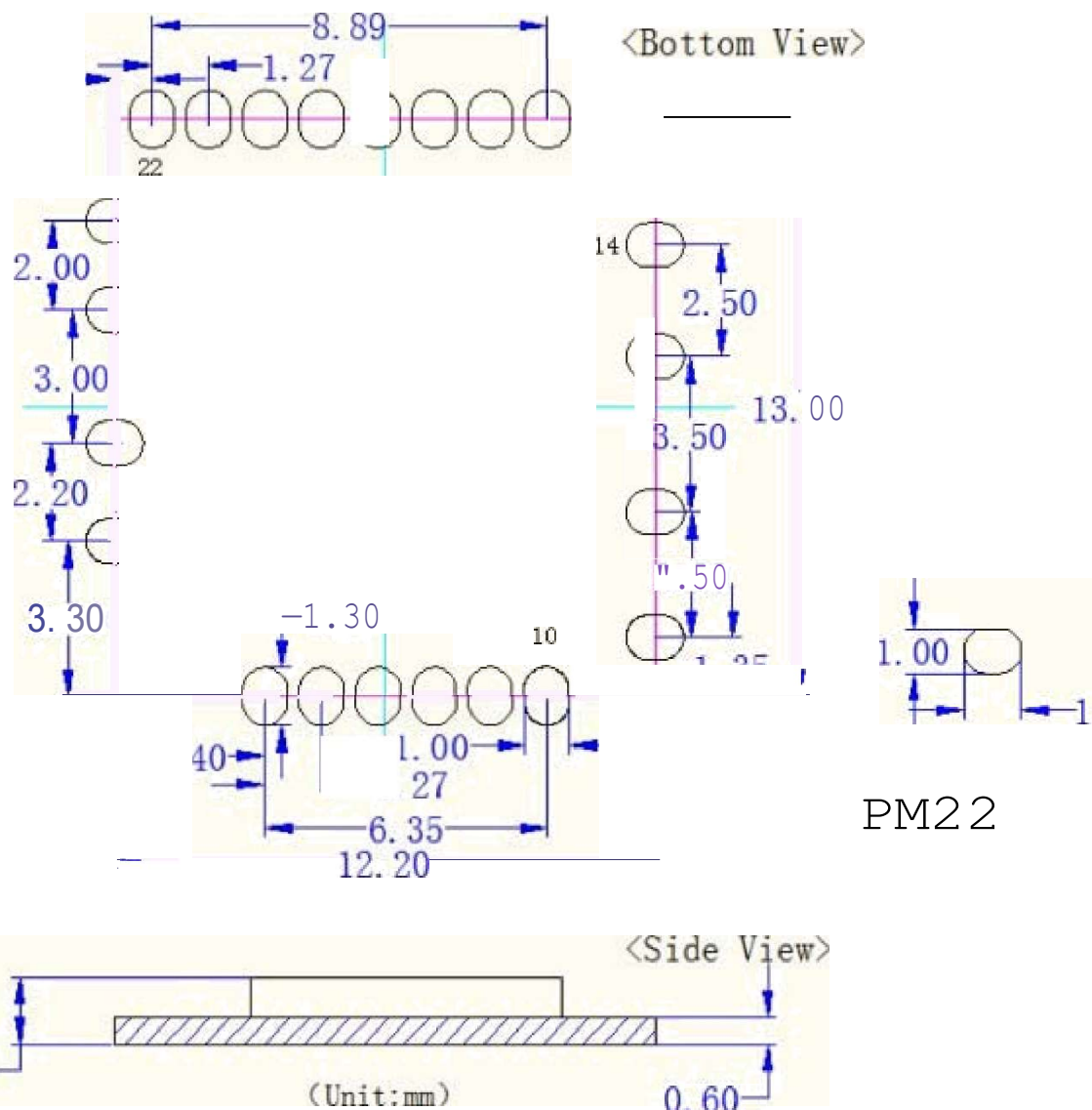


Figure6 Module dimension

7. Others

7.1 Package Information



Figure7 Package Information

7.2 Storage Temperature and Humidity

1. Storage Condition: Moisture barrier bag must be stored under 30°C, humidity under 85% RH.
The calculated shelf life for the dry packed product shall be a 12 months from the bag seal date.
Humidity indicator cards must be blue, <30%.
2. Products require baking before mounting if humidity indicator cards reads >30% temp 30°C, humidity < 70% RH, over 96 hours.
Baking condition: 125°C, 12 hours.
Baking times: 1 time.

8. Typical Solder Reflow Profile

The soldering profile depends on various parameters necessitating a set up for each application. The data here is given only for guidance on solder reflow.

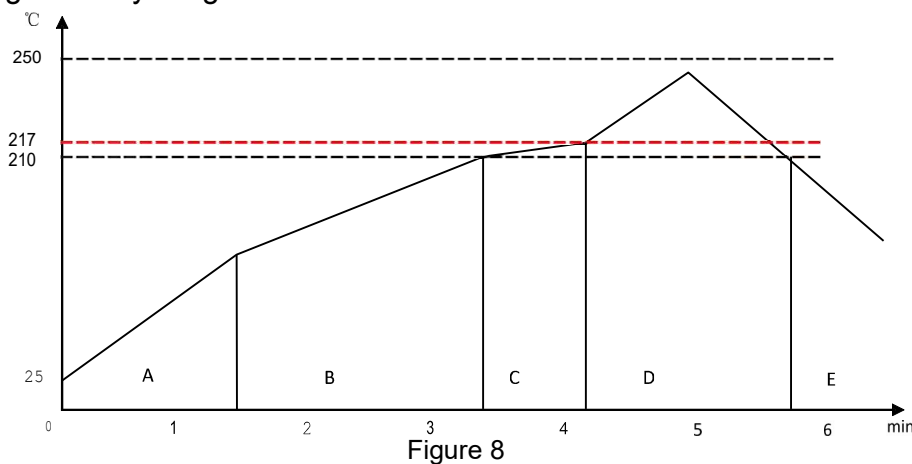


Figure 8

Pre-heat zone (A) — This zone raises the temperature at a controlled rate, typically 0.5—2 °C/s. The purpose of this zone is to preheat the PCB board and components to 120°—150 °C. This stage is required to distribute the heat uniformly to the PCB board and completely remove solvent to reduce the heat shock to components.

Equilibrium Zone 1 (B) — In this stage the flux becomes soft and uniformly encapsulates solder particles and spread over PCB board, preventing them from being re-oxidized. Also with elevation of temperature and liquefaction of flux, each activator and rosin get activated and start eliminating oxide film formed on the surface of each solder particle and PCB board. The temperature is recommended to be 150° to 210° for 60 to 120 second for this zone.

Equilibrium Zone 2 (C) (optional) — In order to resolve the upright component issue, it is recommended to keep the temperature in 210 —217 ° for about 20 to 30 second.

Reflow Zone (D) — The profile in the figure is designed for Sn/Ag3.0/Cu0.5. It can be a reference for other lead-free solder. The peak temperature should be high enough to achieve good wetting but not so high as to cause component discoloration or damage. Excessive soldering time can lead to intermetallic growth which can result in a brittle joint. The recommended peak temperature (Tp) is 230 °—250 °C. The soldering time should be 30 to 90 second when the temperature is above 217 °C.

Cooling Zone (E) — The cooling rate should be fast, to keep the solder grains small which

Cooling Zone (E) — The cooling rate should be fast, to keep the solder grains small which will give a longer lasting joint. Typical cooling rate should be 4 °C.

FCC Statement

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.

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

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 important announcement

Important Note:

Radiation Exposure Statement

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

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

Country Code selection feature to be disabled for products marketed to the US/Canada.

This device is intended only for OEM integrators under the following conditions:

1. The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2. The transmitter module may not be co-located with any other transmitter or antenna,
3. For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change. (if modular only test Channel 1-11)

As long as the three conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

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

Contains **FCC ID: 2A6YQ-WF122** "

Manual Information to the End User

The OEM integrator 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 show in this manual.

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 transmitter

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

This module is Limited modular without shielding, host manufacturer have to consult with module manufacturer for the module limiting conditions when integrate the module in the host. module manufacturer should reviews detailed test data or host designs prior to giving the host manufacturer approval.

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

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

2.7 Antennas

This radio transmitter **FCC ID:2A6YQ-WF122** 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 No.	Type of antenna:	Gain of the antenna (Max.)	Frequency range:
2.4GWIFI	Metal Shrapnel Antenna	2.0dBi for 2400-2500MHz	
5GWIFI	Metal Shrapnel Antenna	2.0dBi for 5000-6000MHz	

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains FCC ID: 2A6YQ-WF122".

2.9 Information on test modes and additional testing requirements

Host manufacturer which install this modular with limit modular approval should perform the test of radiated emission and spurious emission according to FCC part 15C:15.247&15.407 and 15.209&15.207 requirement, only if the test result comply with FCC part 15.247&15.407 and 15.209&15.207 requirement, then the host can be sold legally.

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.

ISED Statement

- English: This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

The digital apparatus complies with Canadian CAN ICES-3 (B)/NMB-3(B).

- French: Le présent appareil est conforme aux CNR d'Industrie 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, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

L'appareil numérique du CIEM conforme canadien peut - 3 (b) / nmb - 3 (b).

This device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS 102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

Cet appareil est conforme à l'exemption des limites d'évaluation courante dans la section 2.5 du CNR - 102 et conformité avec RSS 102 de l'exposition aux RF, les utilisateurs peuvent obtenir des données canadiennes sur l'exposition aux champs RF et la conformité.

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé.

This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Cet équipement doit être installé et utilisé à une distance minimale de 20 cm entre le radiateur et votre corps.

ISED Modular Usage Statement

NOTE 1: When the ISED certification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use the wording "Contains transmitter module IC: 28733-WF122" or "Contains IC: 28733-WF122".

NOTE 1: Lorsque le numéro de certification ISED n'est pas visible lorsque le module est installé dans un autre appareil, l'extérieur de l'appareil dans lequel le module est installé doit également afficher une étiquette faisant référence au module inclus. Cette étiquette extérieure peut être libellée Contient le module émetteur IC: 28733-WF122 ou Contient IC: 28733-WF122.