

# User manual

WLAN Module: R-1FJ

2019/10/20

## The revision history of the product specification

Issued Date	Revision Code	Revision Page	Changed Items
Oct.20.2019	-	-	Issuance of pre-approval

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## 1 Scope

This specification is applied to the IEEE802.11b/g/n W-LAN.

- Module size :21.0 x 10.0 mm typ., t = 2.0 mm max.
- IC/Firmware :Broadcom BCM4343W
- Interface :SDIO
- Reference Clock :37.4MHz Crystal Oscillator embedded  
32kHz LPO embedded
- ROM :Internal OTP
- Weight :0.42g

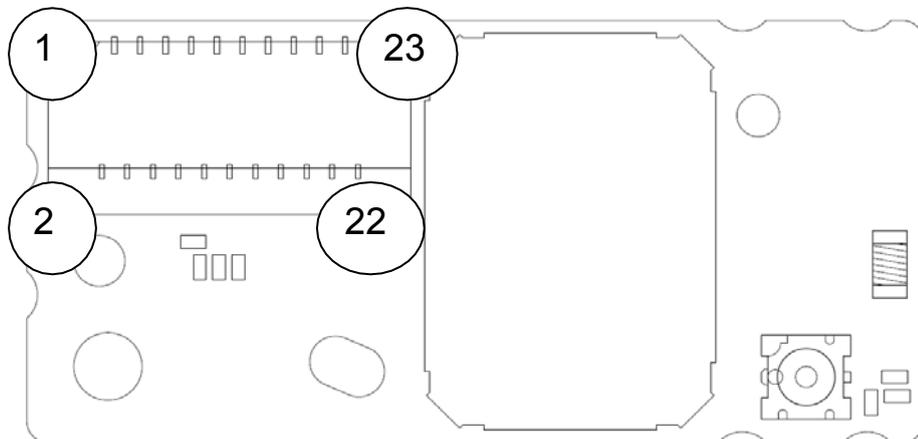
## 2 Part Number

Sample Part Number
LBEE5ZZ1FJ-957



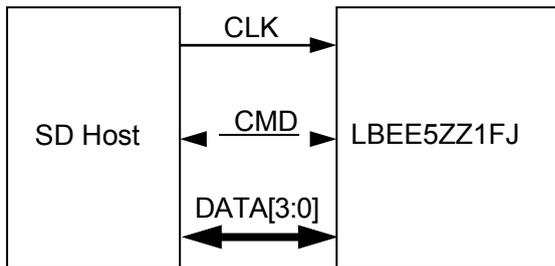
## Terminal Configurations

	Terminal Name	Pin Type	I/O	Description
1	VBAT	VDD	PI	Battery voltage input
2	VBAT	VDD	PI	Battery voltage input
3	Temp	-	PO	Thermistor Output
4	VIO	VIO	PI	SDIO I/O and Digital I/O supply
5	GND	-	-	GND
6	-	-	-	-
7	-	-	-	-
8	WL_REG_ON	VIO	PI	WiFi Power ON/OFF(WiFi RESET)
9	-	-	-	-
10	WL_HOST_WAKE	VIO	PO	WiFi Interrupt
11	GND	-	-	GND
12	-	-	-	-
13	-	-	-	-
14	-	-	-	-
15	-	-	-	-
16	GND	-	-	GND
17	SDIO_D0	SDIO	I/O	SDIO data line 0
18	SDIO_D1	SDIO	I/O	SDIO data line 1
19	SDIO_D2	SDIO	I/O	SDIO data line 2
20	SDIO_D3	SDIO	I/O	SDIO data line 3
21	SDIO_CMD	SDIO	I/O	SDIO command line
22	GND	-	-	GND
23	SDIO_CLK	SDIO	I	SDIO clock

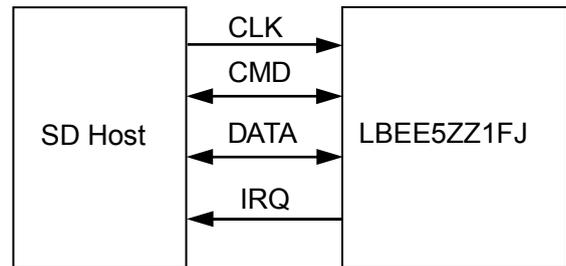


## SDIO Pin Description

No.	Pin Name	(i) SD 4-bit Mode		(ii) SD 1-bit Mode	
23	SDIO_CLK	CLK	Clock	CLK	Clock
17	SDIO_D0	DATA0	Data line 0	DATA	Data line
18	SDIO_D1	DATA1	Data line 1 /Interrupt	IRQ	Interrupt
19	SDIO_D2	DATA2	Data line 2	NC	Not used
20	SDIO_D3	DATA3	Data line 3	NC	Not used
21	SDIO_CMD	CMD	Command line	CMD	Command line



(i) SD 4-bit Mode



(ii) SD 1-bit Mode

Note : 10 to 100kΩ pull-ups are required on the four DATA lines and the CMD line. This requirement must be met during all operating states by using external pull-up resistors or properly programming internal SDIO host pull-ups.

## 4 Rating

		min.	max.	unit
Storage Temperature		-30	+70	deg.C
Supply Voltage	VBAT	-0.5	6.0	V
	VDDIO	-0.5	+3.9	V

Stresses in excess of the absolute ratings may cause permanent damage. Functional operation is not implied under these conditions. Exposure to absolute ratings for extended periods of time may adversely affect reliability. No damage assuming only one parameter is set at limit at a time with all other parameters are set within operating condition.

## 5 Operating Condition

		min.	typ.	max.	unit
Operating Temperature Range		-30	+25	+70	deg.C
Specification Temperature Range		-10	+25	+55	deg.C
Supply Voltage	VBAT	3.0	3.3	3.6	V
	VDDIO	1.71	1.8 or 3.3	3.63	V

[Note] All RF characteristics in this datasheet are defined by Specification Temperature Range

## 6 Input / Output DC Terminal Characteristics

### SDIO Interface I/O Pins

	Sym	min.	typ.	max.	unit
VDDIO = 3.3V					
Input high voltage	$V_{IH}$	0.625xVDDIO	-	-	V
Input low voltage	$V_{IL}$	-	-	0.25xVDDIO	V
Output high voltage @2mA	$V_{OH}$	0.75xVDDIO	-	-	V
Output low voltage @2mA	$V_{OL}$	-	-	0.125xVDDIO	V
VDDIO = 1.8V					
Input high voltage	$V_{IH}$	1.27	-	-	V
Input low voltage	$V_{IL}$	-	-	0.58	V
Output high voltage @2mA	$V_{OH}$	1.4	-	-	V
Output low voltage @2mA	$V_{OL}$	-	-	0.45	V

### Other Digital I/O Pins

	Sym	min.	typ.	max.	unit
VDDIO = 3.3V					
Input high voltage	$V_{IH}$	2.0	-	-	V
Input low voltage	$V_{IL}$	-	-	0.8	V
Output high voltage @2mA	$V_{OH}$	VDDIO-0.4	-	-	V
Output low voltage @2mA	$V_{OL}$	-	-	0.4	V
VDDIO = 1.8V					
Input high voltage	$V_{IH}$	0.65xVDDIO	-	-	V
Input low voltage	$V_{IL}$	-	-	0.35xVDDIO	V
Output high voltage @2mA	$V_{OH}$	VDDIO-0.45	-	-	V
Output low voltage @2mA	$V_{OL}$	-	-	0.45	V

## 7 Mechanical performance and environmental performance

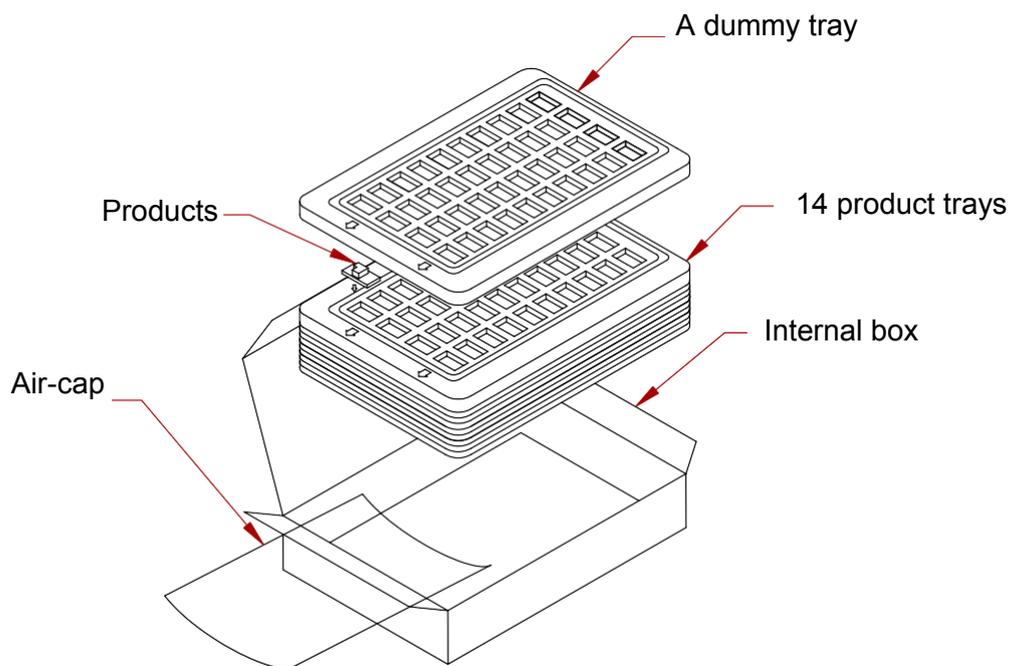
No.	Items	Specifications	Test Methods	
1	Vibration test in packed state	Appearance	No severe damages	
		Performance		No problem for communication
Frequency : 10 to 100 Hz Grms:1.27				
2	Drop Test	Appearance	No severe damages	
		Performance		No problem for communication
1m, 3times - free drop - contact material is concrete				
3	Drop Test in packed state	Appearance	No severe damages	
		Performance		No problem for communication
1m, 2times - free drop - contact material is concrete - X,Y,Z direction, each 2 times				
4	Temperature Cycle	Appearance	No severe damages	
		Performance		No problem for communication
10 cycles(Performance)				
		Step	Temperature (°C)	Time (min)
		1	-40	30 +/- 3
		2	+85	30 +/- 3
5	Humidity Load Life	Appearance	No severe damages	
		Performance		No problem for communication
Temperature : 60 +/-2 °C Humidity : 90 %RH Period : 500 +24/-0 h Room Condition : 2 to 24 h Supply Voltage : Max. Operating Voltage				
6	High Temp. Shelf	Appearance	No severe damages	
		Performance		No problem for communication
Temperature : 85 +/-2 °C Period : 500 +24/-0 h Room Condition : 2 to 24 h Supply Voltage :Max. Operating Voltage				
7	Low Temp. Shelf	Appearance	No severe damages	
		Performance		No problem for communication
Temperature : -40 +/-2 °C Period : 500 +24/-0 h Room Condition : 2 to 24 h				

## 8 Packing

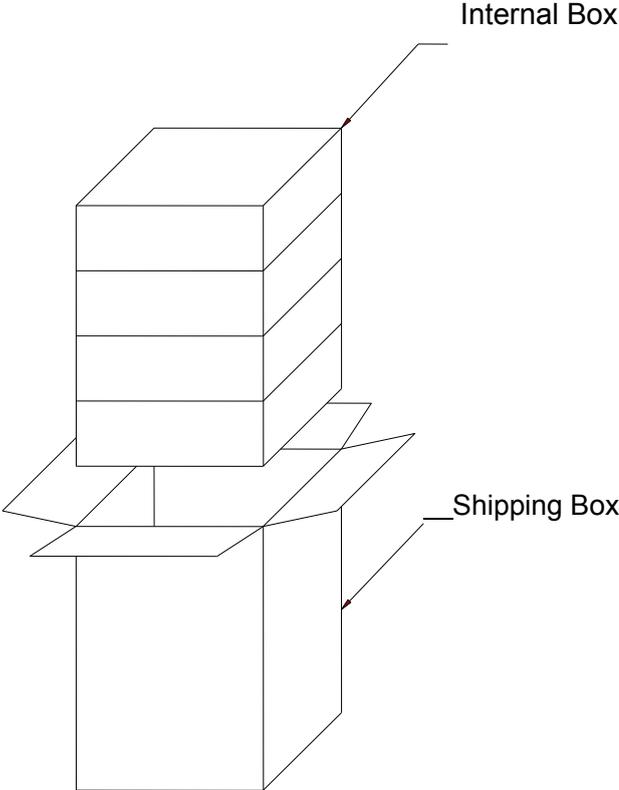
The products shall be packed in the tray as shown blow.



Number of the products in the carton is 1092.  
There is the 78 pcs per tray and 14 pile number of the tray which stored the product.  
A dummy tray is putted on the topmost part of trays.



The package with 4 cartons as below shall be shipped.  
The packing unit is 4368pcs.



Please save below 40 degrees C in packaging, because there is a risk of deformation of the tray.

# Module Integration description

## 1. List of applicable FCC rules

This device complies with part 15.247 of the FCC Rules.

## 2. Summarize the specific operational use conditions

This module can be used in printer . The input voltage to the module should be nominally 3.0~3.6 VDC, typical value 3.3VDC and the ambient temperature of the module should not exceed 85°C. This module using only one kind of antennas. The antenna is not field replaceable. If the antenna needs to be changed, the certification should be re-applied.

## 3. Limited module procedures

NA

## 4. Trace antenna designs

Not applicable

## 5. 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. If the device built into a host as a portable usage, the additional RF exposure evaluation may be required as specified by§ 2.1093.

## 6. Antennas

Module only contains one PCB antenna.

Antenna type: PCB pattern antenna

Antenna Gain: -2.4dBi

## 7. Label and compliance information

The outside of final products that contains this module device must display a label referring to the enclosed module. This exterior label can use wording such as: "Module:R-1FJ, FCC ID: BBP-WL1FJ01, IC: 144D-WL1FJ01", Any similar wording that expresses the same meaning may be used.

## 8. Information on test modes and additional testing requirements

a) The modular transmitter has been fully tested by the module grantee on the required number of channels, modulation types, and modes, it should not be necessary for the host installer to re-test all the available transmitter modes or settings. It is recommended that the host product manufacturer, installing the modular transmitter, perform some investigative measurements to confirm that the resulting composite system does not exceed the spurious emissions limits or band edge limits (e.g., where a different antenna may be causing additional emissions).

b) The testing should check for emissions that may occur due to the intermixing of emissions with the other transmitters, digital circuitry, or due to physical properties of the host product (enclosure). This investigation is especially important when integrating multiple modular transmitters where the certification is based on testing each of them in a stand-alone configuration. It is important to note that host product manufacturers should not assume that because the modular transmitter is certified that they do not have any responsibility for final product compliance.

c) If the investigation indicates a compliance concern the host product manufacturer is obligated to mitigate the issue. Host products using a modular transmitter are subject to all the applicable individual technical rules as well as to the general conditions of operation in Sections 15.5, 15.15, and 15.29 to not cause interference. The operator of the host product will be obligated to stop operating the device until the interference has been corrected.

## 9. Additional testing, Part 15 subpart B disclaimer

The final host / module combination need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.

The host integrator installing this module into their product must ensure that the final composite product

complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation and should refer to guidance in KDB 996369.

### Frequency spectrum to be investigated

For host products with certified modular transmitter, the frequency range of investigation of the composite system is specified by rule in Sections 15.33(a)(1) through (a)(3), or the range applicable to the digital device, as shown in Section 15.33(b)(1), whichever is the higher frequency range of investigation.

### Operating the host product

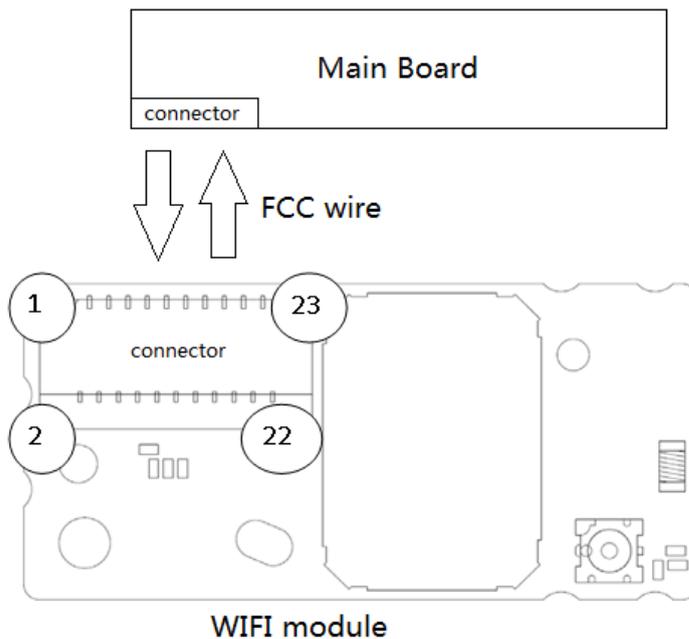
When testing the host product, all the transmitters must be operating. The transmitters can be enabled by using publicly-available drivers and turned on, so the transmitters are active. In certain conditions it might be appropriate to use a technology-specific call box (test set) where accessory devices or drivers are not available. When testing for emissions from the unintentional radiator, the transmitter shall be placed in the receive mode or idle mode, if possible. If receive mode only is not possible then, the radio shall be passive (preferred) and/or active scanning. In these cases, this would need to enable activity on the communication BUS (i.e., PCIe, SDIO, USB) to ensure the unintentional radiator circuitry is enabled. Testing laboratories may need to add attenuation or filters depending on the signal strength of any active beacons (if applicable) from the enabled radio(s). See ANSI C63.4, ANSI C63.10 and ANSI C63.26 for further general testing details. The product under test is set into a link/association with a partnering WLAN device, as per the normal intended use of the product. To ease testing, the product under test is set to transmit at a high duty cycle, such as by sending a file or streaming some media content.

### FCC Statement

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.

## Install introduction

This equipment should be installed and operated with minimum distance 20cm between the radiator& your body. And you can use a FCC wire to connect WIFI module and your main board as below.



## NOTICE

- Please use our product after enough consideration including the heat radiation, because it may become the high temperature.

### 1 Storage Conditions

Please use this product within 6month after receipt.

- The product shall be stored without opening the packing under the ambient temperature from 5 to 35deg.C and humidity from 20 to 70%RH.  
(Packing materials, in particular, may be deformed at the temperature over 40deg.C.)
- The product left more than 6months after reception, it needs to be confirmed the solderbility before used.
- The product shall be stored in non corrosive gas (Cl<sub>2</sub>, NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>x</sub>, etc.).
- Any excess mechanical shock including, but not limited to, sticking the packing materials by sharp object and dropping the product, shall not be applied in order not to damage the packing materials.

### 2 Handling Conditions

Be careful in handling or transporting products because excessive stress or mechanical shock may break products.

Handle with care if products may have cracks or damages on their terminals, the characteristics of products may change. Do not touch products with bear hands that may destroy by static electrical charge.

### 3 Cleaning :

Since this Product is Moisture Sensitive, any cleaning is not permitted.

### 4 Operational Environment Conditions

- Products are designed to work for electronic products under normal environmental conditions (ambient temperature, humidity and pressure). Therefore, products have no problems to be used under the similar conditions to the above-mentioned. However, if products are used under the following circumstances, it may damage products and electric shock and abnormal temperature may occur.
- In an atmosphere containing corrosive gas (CL<sub>2</sub>, NH<sub>3</sub>, SO<sub>x</sub>, NO<sub>x</sub>, etc.).
- In an atmosphere containing combustibile and volatile gases.
- Dusty place.
- Direct sunlight place.
- Water splashing place.
- Humid place where water condenses.
- Freezing place.
- If there are possibilities for products to be used under the preceding clause, consult with Murata before actual use.
- As it might be a cause of degradation or destruction to apply static electricity to products, do not apply static electricity or excessive voltage while assembling and measuring.

### 5 Input Power Capacity

- Products shall be used in the input power capacity as specified in this specifications.  
Inform Murata beforehand, in case that the components are used beyond such input power capacity range.



## CAUTION

PLEASE READ THIS NOTICE BEFORE USING OUR PRODUCTS.

Please make sure that your product has been evaluated and confirmed from the aspect of the fitness for the specifications of our product when our product is mounted to your product.

All the items and parameters in this product specification/datasheet/catalog have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment specified in this specification. You are requested not to use our product deviating from the condition and the environment specified in this specification.

Please note that the only warranty that we provide regarding the products is its conformance to the specifications provided herein. Accordingly, we shall not be responsible for any defects in products or equipment incorporating such products, which are caused under the conditions other than those specified in this specification.

WE HEREBY DISCLAIMS ALL OTHER WARRANTIES REGARDING THE PRODUCTS, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, THAT THEY ARE DEFECT-FREE, OR AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS.

The product shall not be used in any application listed below which requires especially high reliability for the prevention of such defect as may directly cause damage to the third party's life, body or property. You acknowledge and agree that, if you use our products in such applications, we will not be responsible for any failure to meet such requirements. Furthermore, YOU AGREE TO INDEMNIFY AND DEFEND US AND OUR AFFILIATES AGAINST ALL CLAIMS, DAMAGES, COSTS, AND EXPENSES THAT MAY BE INCURRED, INCLUDING WITHOUT LIMITATION, ATTORNEY FEES AND COSTS, DUE TO THE USE OF OUR PRODUCTS IN SUCH APPLICATIONS.

- Aircraft equipment.                      - Aerospace equipment                      - Undersea equipment.
- Power plant control equipment - Medical equipment.
- Transportation equipment (vehicles, trains, ships, elevator, etc.).
- Traffic signal equipment.                      - Disaster prevention / crime prevention equipment.
- Burning / explosion control equipment
- Application of similar complexity and/ or reliability requirements to the applications listed in the above.

We expressly prohibit you from analyzing, breaking, reverse-engineering, remodeling altering, and reproducing our product. Our product cannot be used for the product which is prohibited from being manufactured, used, and sold by the regulations and laws in the world.

We do not warrant or represent that any license, either express or implied, is granted under any our patent right, copyright, mask work right, or our other intellectual property right relating to any combination, machine, or process in which our products or services are used. Information provided by us regarding third-party products or services does not constitute a license from us to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from us under our patents or other intellectual property.

Please do not use our products, our technical information and other data provided by us for the purpose of developing of mass-destruction weapons and the purpose of military use.

Moreover, you must comply with "foreign exchange and foreign trade law", the "U.S. export administration regulations", etc.

Please note that we may discontinue the manufacture of our products, due to reasons such as end of supply of materials and/or components from our suppliers.

By signing on specification sheet or approval sheet, you acknowledge that you are the legal representative for your company and that you understand and accept the validity of the contents herein. When you are not able to return the signed version of specification sheet or approval sheet within 30 days from receiving date of specification sheet or approval sheet, it shall be deemed to be your consent on the content of specification sheet or approval sheet. Customer acknowledges that engineering samples may deviate from specifications and may contain defects due to their development status. We reject any liability or product warranty for engineering samples. In particular we disclaim liability for damages caused by

- the use of the engineering sample other than for evaluation purposes, particularly the installation or integration in the product to be sold by you,
- deviation or lapse in function of engineering sample,
- improper use of engineering samples.

We disclaim any liability for consequential and incidental damages.

If you can't agree the above contents, you should inquire our sales.

**ISED RSS Warning:**

This device complies with Innovation, Science and Economic Development Canada licence-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.

Le présent appareil est conforme aux CNR d'ISED 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.

**ISED RF exposure statement:**

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

Le rayonnement de la classe B respecte ISED fixaient un environnement non contrôlés. Installation et mise en œuvre de ce matériel devrait avec échangeur distance minimale entre 20 cm ton corps. Lanceurs ou ne peuvent pas coexister cette antenne ou capteurs avec d'autres.