

# WNFQ-291BEI(BT)

## Manual

### Specification

|                            |                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Standards</b>           | IEEE 802.11be/ax/ac/a/b/g/n (2T2R)<br>Bluetooth V5.4,V5.3,V5.2, V5.1, V5.0, V4.2, V4.1, V4.0LE, V3.0, V2.1+EDR                                                                                                                                                                                                                                                                                |
| <b>Chipset</b>             | Qualcomm WCN7851                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Data Rate</b>           | 802.11b: 11Mbps<br>802.11a/g: 54Mbps<br>802.11n: MCS0~15<br>802.11ac: MCS0~9<br>802.11ax: MCS0~13<br>802.11be: MCS0~13<br>Bluetooth: 1 Mbps, 2Mbps and Up to 3Mbps                                                                                                                                                                                                                            |
| <b>Operating Frequency</b> | IEEE 802.11 be/ax/ac/a/b/g/n<br>ISM Band, 2.412GHz~2.483GHz, 5.150GHz~5.850GHz ,5.925~7.125GHz<br>*Subject to local regulations                                                                                                                                                                                                                                                               |
| <b>Interface</b>           | WLAN: PCIe<br>Bluetooth: USB                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Form Factor</b>         | M.2 2230 E Key                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Antenna</b>             | 2 x IPEX MHF4 connectors<br>Ant 1: WiFi/BT<br>Ant 2 : WiFi/BT                                                                                                                                                                                                                                                                                                                                 |
| <b>Modulation</b>          | Wi-Fi:<br>802.11b: DSSS (DBPSK, DQPSK, CCK)<br>802.11g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM)<br>802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM)<br>802.11a: OFDM (BPSK, QPSK, 16-QAM, 64-QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, 4096-QAM)<br>802.11be: OFDMA (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM, 1024-QAM, |

|                                      |                                                                                      |
|--------------------------------------|--------------------------------------------------------------------------------------|
|                                      | 4096-QAM)<br>BT:<br>Header: GFSK<br>Payload 2M: $\pi/4$ -DQPSK<br>Payload 3M: 8-DPSK |
| <b>Power Consumption</b>             | 11be<br>TX mode: 1250 mA (MAX)<br>RX mode: 1200 mA (MAX)                             |
| <b>Operating Voltage</b>             | DC 3.3V                                                                              |
| <b>Operating Temperature Range</b>   | -40°~85°C (Operating)                                                                |
| <b>Storage Temperature Range</b>     | -45°C ~+90°C (Storing)                                                               |
| <b>Humidity<br/>(Non-Condensing)</b> | 5%~90% (Operating)<br>5%~90% (Storing)                                               |
| <b>Dimension L x W x H (in mm)</b>   | 30mm( $\pm 0.15$ mm) x 22mm( $\pm 0.15$ mm) x 2.5mm( $\pm 0.3$ mm)                   |
| <b>Weight (g)</b>                    | 3.42g                                                                                |
| <b>Driver Support</b>                | Win11/Linux (Open Source) (TBD)                                                      |
| <b>Security</b>                      | WPS2.0, WAPI, WPA, WPA2, WPA3                                                        |

### Installation

- Connect the Module to the PCIe slot of the computer.
- Install Wi-Fi driver driver.
- After the Wi-Fi Driver is installed , click the Network icon on the Windows, then search the network , and connect the Wireless Network you want.

Preliminary

### **Federal Communication Commission Interference 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.

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 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 Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.

This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

### **FOR PORTABLE DEVICE USAGE (<20m from body/SAR needed)**

#### **Radiation Exposure Statement:**

The product comply with the FCC portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

### Body-worn Operation

This device was tested for typical body-worn operations. To comply with RF exposure requirements, a minimum separation distance of **5 mm** must be maintained between the user's body and the handset, including the antenna. Third-party belt-clips, holsters, and similar accessories used by this device should not contain any metallic components. Body-worn accessories that do not meet these requirements may not comply with RF exposure requirements and should be avoided.

The product comply with the FCC portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. To comply with RF exposure requirements, a minimum separation distance of **5 mm** must be maintained between the user's body including the antenna.

### 6e indoor device

**For 6CD (Dual Client)**  
**Statement in manual**

Operation of transmitters in the 5.925-7.125 GHz band is prohibited for control of or communications with unmanned aircraft systems.

### KDB 996369 D03 OEM Manual v01 rule sections:

#### 2.2 List of applicable FCC rules

This module has been tested for compliance to FCC Part 15.247, 15.407

#### 2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

#### NII-4 Client

This module is authorized for **client** device applications under the control of an indoor access point or subordinate.

The final host product must comply with the following operational restrictions:

- a) Cannot have a direct connection to the internet to source the internet to other clients, access points, subordinates or clients from a wired or direct connection.

#### 6CD

This module is authorized for **Dual Client (6CD)** device applications.

The final host product must comply with the following operational restrictions:

- a) Cannot connect directly to any other client device;
- b) Cannot source internet/network (obtained via wired connection or other means such as cellular) to other clients, access points and subordinate devices or provide any direct peer to peer connections to other clients or subordinates;
- c) Is prohibited for control of or communications with unmanned aircraft systems.

#### 2.4 Limited module procedures

Not applicable.

#### 2.5 Trace antenna designs

Not applicable.

#### 2.6 RF exposure considerations

This equipment complies with FCC mobile 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. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.

#### 2.7 Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module, except as described below. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

**For 6CD:**

Demonstration of compliance to Contention-Based Protocol requirements across U-NII-5/6/7/8 bands has been determined using a lowest antenna gain of **5.16dBi**. The use of antennas with gain lower than this will require a separate Class II permissive change re-evaluation or new certification.

| Antenna Set | RF Chain No. | Brand   | Model     | Antenna Net Gain (dBi) | Frequency Range | Cable Loss (dB) | Antenna Type | Connector Type | Cable Length |
|-------------|--------------|---------|-----------|------------------------|-----------------|-----------------|--------------|----------------|--------------|
| 1           | Chain0/1     | Hong-Bo | 260-25094 | 3.53                   | 2.4~2.4835GHz   | 0.74            | PIFA         | MHF 4L         | 300mm        |
|             |              |         |           | 3.06                   | 5.15~5.25GHz    | 1.16            |              |                |              |
|             |              |         |           | 3.07                   | 5.25~5.35GHz    | 1.18            |              |                |              |
|             |              |         |           | 4.81                   | 5.47~5.725GHz   | 1.26            |              |                |              |
|             |              |         |           | 4.2                    | 5.725~5.850GHz  | 1.26            |              |                |              |
| 2           | Chain0/1     | Hong-Bo | 260-25083 | 5.09                   | 5.850~5.895 GHz | 1.29            | PIFA         | MHF 4L         | 300mm        |
|             |              |         |           | 5.14                   | 5.925~6.425 GHz | 1.35            |              |                |              |
|             |              |         |           | 5.09                   | 6.425~6.525 GHz | 1.38            |              |                |              |
|             |              |         |           | 5.16                   | 6.525~6.875 GHz | 1.45            |              |                |              |
|             |              |         |           | 5.12                   | 6.875~7.125 GHz | 1.50            |              |                |              |
| 3           | Chain0/1     | Hong-Bo | 260-25084 | 3.22                   | 2.4~2.4835 GHz  | 0.49            | Monopole     | MHF 4L         | 200mm        |
|             |              |         |           | 3.35                   | 5.150~5.250 GHz | 0.76            |              |                |              |
|             |              |         |           | 3.42                   | 5.250~5.350 GHz | 0.77            |              |                |              |
|             |              |         |           | 4.77                   | 5.470~5.725 GHz | 0.80            |              |                |              |
|             |              |         |           | 4.72                   | 5.725~5.850 GHz | 0.84            |              |                |              |
|             |              |         |           | 4.71                   | 5.850~5.895 GHz | 0.84            |              |                |              |
|             |              |         |           | 4.75                   | 5.925~6.425 GHz | 0.86            |              |                |              |
|             |              |         |           | 4.29                   | 6.425~6.525 GHz | 0.91            |              |                |              |
|             |              |         |           | 4.81                   | 6.525~6.875 GHz | 0.96            |              |                |              |
|             |              |         |           | 4.74                   | 6.875~7.125 GHz | 0.98            |              |                |              |

**Newly**

| Antenna Set | RF Chain No. | Brand    | Model         | Antenna Net Gain (dBi) | Frequency Range | Cable Loss (dB) | Antenna Type | Connector Type | Cable Length (mm) |
|-------------|--------------|----------|---------------|------------------------|-----------------|-----------------|--------------|----------------|-------------------|
| 4           | Chain0/1     | SparkLAN | AD-513AX      | 3.11                   | 2.4~2.4835      | None            | Dipole       | I-PEX MHF4     | 150               |
|             |              |          |               | 2.97                   | 5.15~5.25       |                 |              |                |                   |
|             |              |          |               | 2.96                   | 5.25~5.35       |                 |              |                |                   |
|             |              |          |               | 4.46                   | 5.47~5.725      |                 |              |                |                   |
|             |              |          |               | 4.07                   | 5.725~5.850     |                 |              |                |                   |
|             |              |          |               | 4.07                   | 5.850~5.895     |                 |              |                |                   |
|             |              |          |               | 4.53                   | 5.925~6.425     |                 |              |                |                   |
|             |              |          |               | 4.06                   | 6.425~6.525     |                 |              |                |                   |
|             |              |          |               | 4.04                   | 6.525~6.875     |                 |              |                |                   |
|             |              |          |               | 3.97                   | 6.875~7.125     |                 |              |                |                   |
| 5           | Chain0/1     | SparkLAN | AD-510AX      | 2.27                   | 2.4~2.4835      | None            | Dipole       | RP-SMA (M)     | 150               |
|             |              |          |               | 2.88                   | 5.15~5.25       |                 |              |                |                   |
|             |              |          |               | 2.69                   | 5.25~5.35       |                 |              |                |                   |
|             |              |          |               | 2.58                   | 5.47~5.725      |                 |              |                |                   |
|             |              |          |               | 2.6                    | 5.725~5.850     |                 |              |                |                   |
|             |              |          |               | 2.6                    | 5.850~5.895     |                 |              |                |                   |
|             |              |          |               | 3.23                   | 5.925~6.425     |                 |              |                |                   |
|             |              |          |               | 3.34                   | 6.425~6.525     |                 |              |                |                   |
|             |              |          |               | 3.52                   | 6.525~6.875     |                 |              |                |                   |
|             |              |          |               | 3.52                   | 6.875~7.125     |                 |              |                |                   |
| 6           | Chain0/1     | SparkLAN | AD-512AX      | 2.35                   | 2.4~2.4835      | None            | Dipole       | RP-SMA (M)     | 150               |
|             |              |          |               | 2.82                   | 5.15~5.25       |                 |              |                |                   |
|             |              |          |               | 2.94                   | 5.25~5.35       |                 |              |                |                   |
|             |              |          |               | 3                      | 5.47~5.725      |                 |              |                |                   |
|             |              |          |               | 2.75                   | 5.725~5.850     |                 |              |                |                   |
|             |              |          |               | 2.80                   | 5.850~5.895     |                 |              |                |                   |
|             |              |          |               | 2.87                   | 5.925~6.425     |                 |              |                |                   |
|             |              |          |               | 3.02                   | 6.425~6.525     |                 |              |                |                   |
|             |              |          |               | 3.02                   | 6.525~6.875     |                 |              |                |                   |
|             |              |          |               | 2.61                   | 6.875~7.125     |                 |              |                |                   |
| 7           | Chain0/1     | SparkLAN | AD-516AX      | 1.65                   | 2.4~2.4835      | -               | Dipole       | I-PEX MHF4     | 250               |
|             |              |          |               | 4.3                    | 5.150~5.850     |                 |              |                |                   |
|             |              |          |               | 4.38                   | 5.850~5.895     |                 |              |                |                   |
|             |              |          |               | 4.43                   | 5.925~6.425     |                 |              |                |                   |
|             |              |          |               | 4.45                   | 6.425~6.525     |                 |              |                |                   |
|             |              |          |               | 4.46                   | 6.525~6.875     |                 |              |                |                   |
|             |              |          |               | 4.48                   | 6.875~7.125     |                 |              |                |                   |
| 8           | Chain0/1     | Johanson | 2450AD18A6050 | 2                      | 2.4~2.4835      | -               | Chip         | I-PEX MHF4     | N/A               |
|             |              |          |               | 1.5                    | 5.150~5.850     |                 |              |                |                   |
|             |              |          |               | 2.7                    | 5.850~5.895     |                 |              |                |                   |
|             |              |          |               | 2.7                    | 5.925~6.425     |                 |              |                |                   |
|             |              |          |               | 2.7                    | 6.425~6.525     |                 |              |                |                   |
|             |              |          |               | 2.7                    | 6.525~6.875     |                 |              |                |                   |
|             |              |          |               | 2.7                    | 6.875~7.125     |                 |              |                |                   |

\*The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

### 2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: “Contains FCC ID: **RYK-WNFQ291BEBT**”. The grantee's FCC ID can be used only when all FCC compliance requirements are met.

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 product user manual shall include all required regulatory information/warning as shown in this manual.

### 2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.

### 2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment.

As long as all conditions above are met, further transmitter test 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.

### **2.11 Note EMI Considerations**

Please follow the guidance provided for host manufacturers in KDB publications 996369 D02 and D04.

### **2.12 How to make changes**

Only Grantees are permitted to make permissive changes. Please contact us should the host integrator expect the module to be used differently than as granted:

Grady Lin / CTO

**SparkLAN Communications, Inc.**

Tel: 886-2-2659-1880

Fax: 886-2-2659-5538

E-mail: [grady.lin@sparklan.com](mailto:grady.lin@sparklan.com)

**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.

## Industry Canada statement

This device complies with ISED's licence-exempt RSSs. 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.

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) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

### Caution:

- (i) 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;
- (ii) 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; **(detachable antenna only)**
- (iii) 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 as appropriate; **(detachable antenna only)**
- (iv) where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

### Avertissement:

Le guide d'utilisation des dispositifs pour réseaux locaux doit inclure des instructions précises sur les restrictions susmentionnées, notamment :

- (i) les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;
- (ii) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis pour les dispositifs utilisant les bandes de 5250 à 5350MHz et de 5470 à 5725MHz doit être conforme à la limite de la p.i.r.e; **(detachable antenna only)**

(iii) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis (pour les dispositifs utilisant la bande de 5725 à 5850MHz) doit être conforme à la limite de la p.i.r.e. spécifiée, selon le cas; (detachable antenna only)

(iv) lorsqu'il y a lieu, les types d'antennes (s'il y en a plusieurs), les numéros de modèle de l'antenne et les pires angles d'inclinaison nécessaires pour rester conforme à l'exigence de la p.i.r.e. applicable au masque d'élévation, énoncée à la section 6.2.2.3, doivent être clairement indiqués

### **FOR PORTABLE DEVICE USAGE (<20m from body/SAR needed)**

#### **Radiation Exposure Statement:**

The product comply with the Canada portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

#### **Déclaration d'exposition aux radiations:**

Le produit est conforme aux limites d'exposition pour les appareils portables RF pour les Etats-Unis et le Canada établies pour un environnement non contrôlé.

Le produit est sûr pour un fonctionnement tel que décrit dans ce manuel. La réduction aux expositions RF peut être augmentée si l'appareil peut être conservé aussi loin que possible du corps de l'utilisateur ou que le dispositif est réglé sur la puissance de sortie la plus faible si une telle fonction est disponible.

#### **For IC Canada**

- The antenna-to-user separation distance must be >20 mm.
- With default power setting, 14mm bystander modular SAR is achieved in the IC grant. To ensure compliance with the radio frequency (RF) exposure guidelines, this device must be used at least 14 mm away from your body or nearby persons. Failure to observe this warning could result in the RF exposure levels exceeding the applicable limits.
- In addition, Modular SAR of 5mm antenna-to-user separation distance is also achieved in the same IC grant with reduced power. Please contact Qualcomm if there is need to implement reduced power to leverage 5mm Modular SAR.

#### **This device is intended only for OEM integrators under the following conditions: (For module device use)**

- 1) The antenna must be installed and operated with greater than 20cm between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further transmitter test 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.

**Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)**

- 1) L'antenne doit être installée et exploitée avec plus de 20 cm entre l'antenne et les utilisateurs, et 2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

**IMPORTANT NOTE:**

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not 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 Canada authorization.

**NOTE IMPORTANTE:**

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considérée comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

**End Product Labeling FOR MOBILE DEVICE USAGE (>20cm/low power)**

This transmitter module is authorized only for use in device where the antenna may be installed and operated with greater than 20cm between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: **6158A-WNFQ291BEBT**".

**Plaque signalétique du produit final**

Ce module émetteur est autorisé uniquement pour une utilisation dans un appareil où l'antenne peut être installée et utilisée à plus de 20 cm entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: **6158A-WNFQ291BEBT**".

**End Product Labeling FOR PORTABLE DEVICE USAGE (<20m from body/SAR needed)**

The product can be kept as far as possible from the user body or set the device to lower output power if such function is available. The final end product must be labeled in a visible area with the following: "Contains IC: **6158A-WNFQ291BEBT**".

### Plaque signalétique du produit final

L'appareil peut être conservé aussi loin que possible du corps de l'utilisateur ou que le dispositif est réglé sur la puissance de sortie la plus faible si une telle fonction est disponible. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: **6158A-WNFQ291BEBT**".

### 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.

### Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

### For 6e statement in manual

#### RSS-248 Issue 2 General statement (all equipment class)

Devices shall not be used for control of or communications with unmanned aircraft systems.

Les dispositifs ne doivent pas être utilisés pour commander des systèmes d' aéronef sans pilote ni pour communiquer avec de tels systèmes.

### Dual Client

- Prohibited for control of or communications with unmanned aircraft systems, including drones. This device is prohibited for control of or communications with unmanned aircraft systems, including drones.

### DETACHABLE ANTENNA USAGE

This radio transmitter [6158A-WNFQ291BEBT] has been approved by Innovation, Science and Economic Development Canada 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.

Le présent émetteur radio [6158A-WNFQ291BEBT] a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

| Antenna Set | RF Chain No. | Brand   | Model     | Antenna Net Gain (dBi) | Frequency Range | Cable Loss (dB) | Antenna Type | Connector Type | Cable Length |
|-------------|--------------|---------|-----------|------------------------|-----------------|-----------------|--------------|----------------|--------------|
| 1           | Chain0/1     | Hong-Bo | 260-25094 | 3.53                   | 2.4~2.4835GHz   | 0.74            | PIFA         | MHF 4L         | 300mm        |
|             |              |         |           | 3.06                   | 5.15~5.25GHz    | 1.16            |              |                |              |
|             |              |         |           | 3.07                   | 5.25~5.35GHz    | 1.18            |              |                |              |
|             |              |         |           | 4.81                   | 5.47~5.725GHz   | 1.26            |              |                |              |
|             |              |         |           | 4.2                    | 5.725~5.850GHz  | 1.28            |              |                |              |
| 2           | Chain0/1     | Hong-Bo | 260-25083 | 5.09                   | 5.850~5.895 GHz | 1.29            | PIFA         | MHF 4L         | 300mm        |
|             |              |         |           | 5.14                   | 5.925~6.425 GHz | 1.35            |              |                |              |
|             |              |         |           | 5.09                   | 6.425~6.525 GHz | 1.38            |              |                |              |
|             |              |         |           | 5.16                   | 6.525~6.875 GHz | 1.45            |              |                |              |
|             |              |         |           | 5.12                   | 6.875~7.125 GHz | 1.50            |              |                |              |
| 3           | Chain0/1     | Hong-Bo | 260-25084 | 3.22                   | 2.4~2.4835 GHz  | 0.49            | Monopole     | MHF 4L         | 200mm        |
|             |              |         |           | 3.35                   | 5.150~5.250 GHz | 0.76            |              |                |              |
|             |              |         |           | 3.42                   | 5.250~5.350 GHz | 0.77            |              |                |              |
|             |              |         |           | 4.77                   | 5.470~5.725 GHz | 0.80            |              |                |              |
|             |              |         |           | 4.72                   | 5.725~5.850 GHz | 0.84            |              |                |              |
|             |              |         |           | 4.71                   | 5.850~5.895 GHz | 0.84            |              |                |              |
|             |              |         |           | 4.75                   | 5.925~6.425 GHz | 0.86            |              |                |              |
|             |              |         |           | 4.29                   | 6.425~6.525 GHz | 0.91            |              |                |              |
|             |              |         |           | 4.81                   | 6.525~6.875 GHz | 0.96            |              |                |              |
|             |              |         |           | 4.74                   | 6.875~7.125 GHz | 0.98            |              |                |              |

**Newly**

| Antenna Set | RF Chain No. | Brand    | Model         | Antenna Net Gain (dBi) | Frequency Range | Cable Loss (dB) | Antenna Type | Connector Type | Cable Length (mm) |
|-------------|--------------|----------|---------------|------------------------|-----------------|-----------------|--------------|----------------|-------------------|
| 4           | Chain0/1     | SparkLAN | AD-513AX      | 3.11                   | 2.4~2.4835      | None            | Dipole       | I-PEX MHF4     | 150               |
|             |              |          |               | 2.97                   | 5.15~5.25       |                 |              |                |                   |
|             |              |          |               | 2.96                   | 5.25~5.35       |                 |              |                |                   |
|             |              |          |               | 4.46                   | 5.47~5.725      |                 |              |                |                   |
|             |              |          |               | 4.07                   | 5.725~5.850     |                 |              |                |                   |
|             |              |          |               | 4.07                   | 5.850~5.895     |                 |              |                |                   |
|             |              |          |               | 4.53                   | 5.925~6.425     |                 |              |                |                   |
|             |              |          |               | 4.06                   | 6.425~6.525     |                 |              |                |                   |
|             |              |          |               | 4.04                   | 6.525~6.875     |                 |              |                |                   |
|             |              |          |               | 3.97                   | 6.875~7.125     |                 |              |                |                   |
| 5           | Chain0/1     | SparkLAN | AD-510AX      | 2.27                   | 2.4~2.4835      | None            | Dipole       | RP-SMA (M)     | 150               |
|             |              |          |               | 2.88                   | 5.15~5.25       |                 |              |                |                   |
|             |              |          |               | 2.69                   | 5.25~5.35       |                 |              |                |                   |
|             |              |          |               | 2.58                   | 5.47~5.725      |                 |              |                |                   |
|             |              |          |               | 2.6                    | 5.725~5.850     |                 |              |                |                   |
|             |              |          |               | 2.6                    | 5.850~5.895     |                 |              |                |                   |
|             |              |          |               | 3.23                   | 5.925~6.425     |                 |              |                |                   |
|             |              |          |               | 3.34                   | 6.425~6.525     |                 |              |                |                   |
|             |              |          |               | 3.52                   | 6.525~6.875     |                 |              |                |                   |
|             |              |          |               | 3.52                   | 6.875~7.125     |                 |              |                |                   |
| 6           | Chain0/1     | SparkLAN | AD-512AX      | 2.35                   | 2.4~2.4835      | None            | Dipole       | RP-SMA (M)     | 150               |
|             |              |          |               | 2.82                   | 5.15~5.25       |                 |              |                |                   |
|             |              |          |               | 2.94                   | 5.25~5.35       |                 |              |                |                   |
|             |              |          |               | 3                      | 5.47~5.725      |                 |              |                |                   |
|             |              |          |               | 2.75                   | 5.725~5.850     |                 |              |                |                   |
|             |              |          |               | 2.80                   | 5.850~5.895     |                 |              |                |                   |
|             |              |          |               | 2.87                   | 5.925~6.425     |                 |              |                |                   |
|             |              |          |               | 3.02                   | 6.425~6.525     |                 |              |                |                   |
|             |              |          |               | 3.02                   | 6.525~6.875     |                 |              |                |                   |
|             |              |          |               | 2.61                   | 6.875~7.125     |                 |              |                |                   |
| 7           | Chain0/1     | SparkLAN | AD-516AX      | 1.65                   | 2.4~2.4835      | -               | Dipole       | I-PEX MHF4     | 250               |
|             |              |          |               | 4.3                    | 5.150~5.850     |                 |              |                |                   |
|             |              |          |               | 4.38                   | 5.850~5.895     |                 |              |                |                   |
|             |              |          |               | 4.43                   | 5.925~6.425     |                 |              |                |                   |
|             |              |          |               | 4.45                   | 6.425~6.525     |                 |              |                |                   |
|             |              |          |               | 4.46                   | 6.525~6.875     |                 |              |                |                   |
|             |              |          |               | 4.48                   | 6.875~7.125     |                 |              |                |                   |
| 8           | Chain0/1     | Johanson | 2450AD18A6050 | 2                      | 2.4~2.4835      | -               | Chip         | I-PEX MHF4     | N/A               |
|             |              |          |               | 1.5                    | 5.150~5.850     |                 |              |                |                   |
|             |              |          |               | 2.7                    | 5.850~5.895     |                 |              |                |                   |
|             |              |          |               | 2.7                    | 5.925~6.425     |                 |              |                |                   |
|             |              |          |               | 2.7                    | 6.425~6.525     |                 |              |                |                   |
|             |              |          |               | 2.7                    | 6.525~6.875     |                 |              |                |                   |
|             |              |          |               | 2.7                    | 6.875~7.125     |                 |              |                |                   |

\*The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

## RSS-248 Issue 3

**For 6e statement in manual****RSS-248 Issue 3 General statement (all equipment class)**

- Devices shall not be used for control of or communications with unmanned aircraft systems.
- Devices shall not be used on oil platforms.
- Devices shall not be used on aircraft, except for the low-power indoor access points, indoor subordinate devices, low-power client devices, and very low-power devices operating in the 5925-6425 MHz band, that may be used on large aircraft as defined in the Canadian Aviation Regulations, while flying above 3,048 metres (10,000 feet).
- Devices shall not be used on automobiles.
- Devices shall not be used on trains.
- Devices shall not be used on maritime vessels.
  
- Les dispositifs ne doivent pas être utilisés pour commander des systèmes d'aéronef sans pilote ni pour communiquer avec de tels systèmes;
- Les dispositifs ne doivent pas être utilisés sur les plateformes de forage pétrolier;
- Les dispositifs ne doivent pas être utilisés dans les aéronefs, à l'exception des points d'accès intérieurs de faible puissance, des dispositifs subordonnés intérieurs, des dispositifs clients de faible puissance et des dispositifs de très faible puissance fonctionnant dans la bande de 5 925 à 6 425 MHz, qui peuvent être utilisés dans les gros aéronefs tel qu'il est défini dans

**This device complies with Directive 2014/53/EU. issued by the Commission of the European Community.**

**- Declaration of Conformity**

Please added certification standard in your user manual which depended on the test standards your device performed.

- If the DoC should be a simplified version, please take below as reference –

Hereby, Sparklan declares that the radio equipment type [designation of type of radio equipment] is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:

The frequency and maximum transmitted power in EU are listed as follows,

2412 - 2472 MHz: 19.87 dBm

5180 - 5250 MHz: 22.95 dBm

5260 - 5320 MHz: 22.84 dBm

5500 - 5700 MHz: 22.86 dBm

5745 - 5865 MHz: 13.92 dBm

5955 - 6415 MHz LPI: 22.92 dBm

5955 - 6415 MHz VLP: 13.83 dBm

2402 - 2480 MHz BT-LE: 18.7 dBm

2402 - 2480 MHz BT-EDR: 19.11 dBm

- WLAN 5GHz:

Operations in the 5.15-5.35GHz band are restricted to indoor usage only.

- WLAN 6GHz:

For Low power indoor (LPI use): Operations in the 5955 - 6415MHz are restricted to indoor usage only.