STRIX V3 USER GUIDE

VERSION 1.7

Shoof Technologies Inc. Proprietary and Confidential

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1. INTRODUCTION

The Strix V3 an FCC part 15.247compliant device that enables communication to the Shoof Technologies data network. The Strix tag operates in the 902-928MHz, 2.4GHz and 433MHz ISM band.

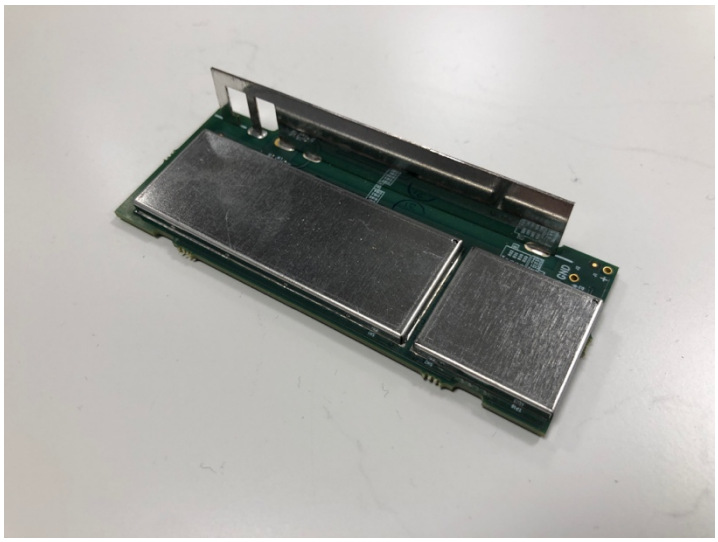

Figure 1 - Strix Tag

2. ANTENNA CONNECTIONS

ONBOARD ANTENNAS

Strix V3 has two onboard antennas:

- Dual band Inverted F antenna – 2.4GHz and 900MHz
- Printed PCB antenna for 433MHz

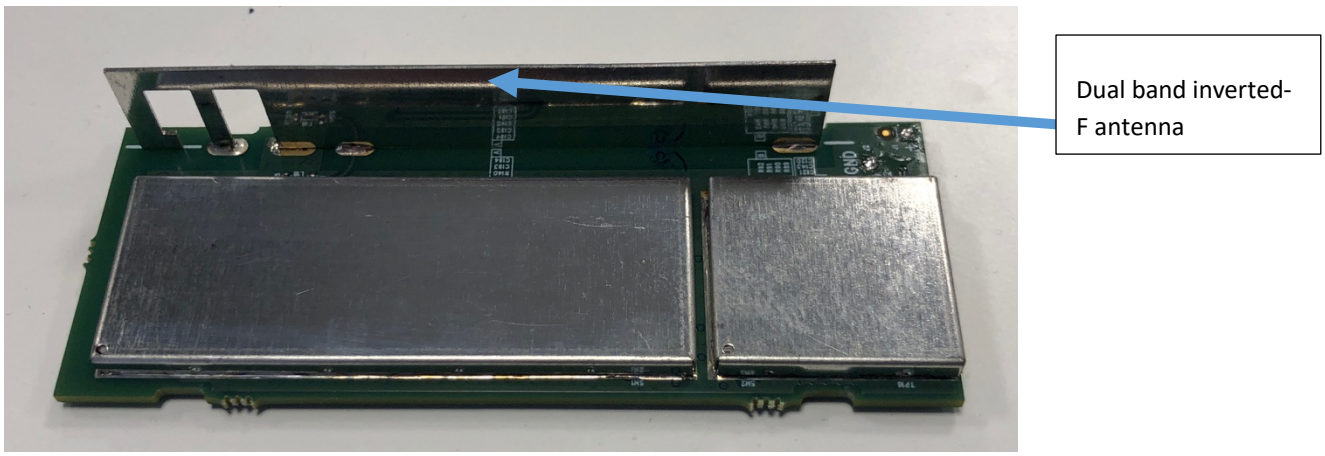

Figure 2 - Top Side of Board

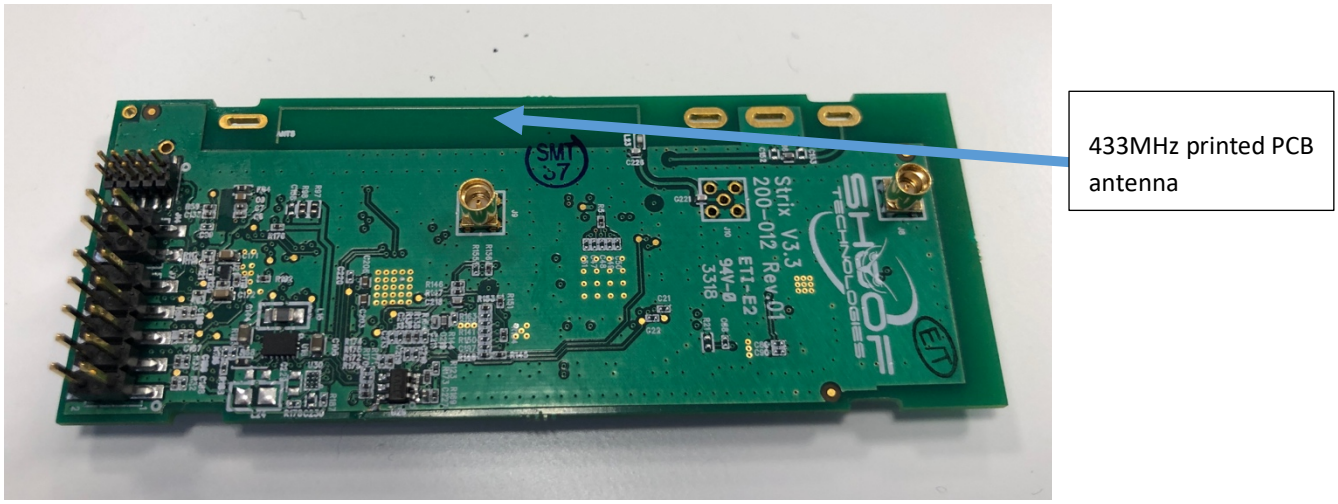

Figure 3 - Bottom Side of Board

OFFBOARD ANTENNA CONNECTION

The Strix V3 has two optional off-board antenna connections. External antennas can be connected to Strix v3 according to the table and figure below:

Port	Connector Type	Antenna type	Maximum gain
J8 - 900MHz	MMCX	Omni	3dBi
J9 - 2.4GHz	MMCX	Omni	4dBi

Table 1 - External Antennas

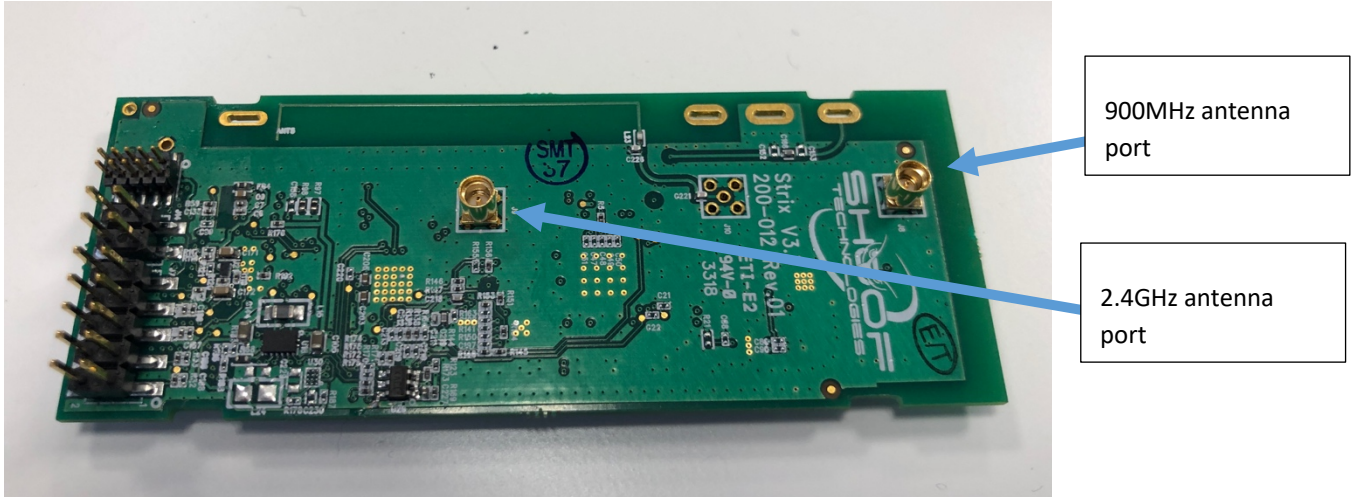

Figure 4 - Offboard Antenna Connections

3. POWER CONNECTION

Power connection can be applied to the Strix V3 via the power port according to the following table and figure:

Table 2 – Power Connections

Port	Function	Board symbol
J1	V+	+
J2	GND	GND

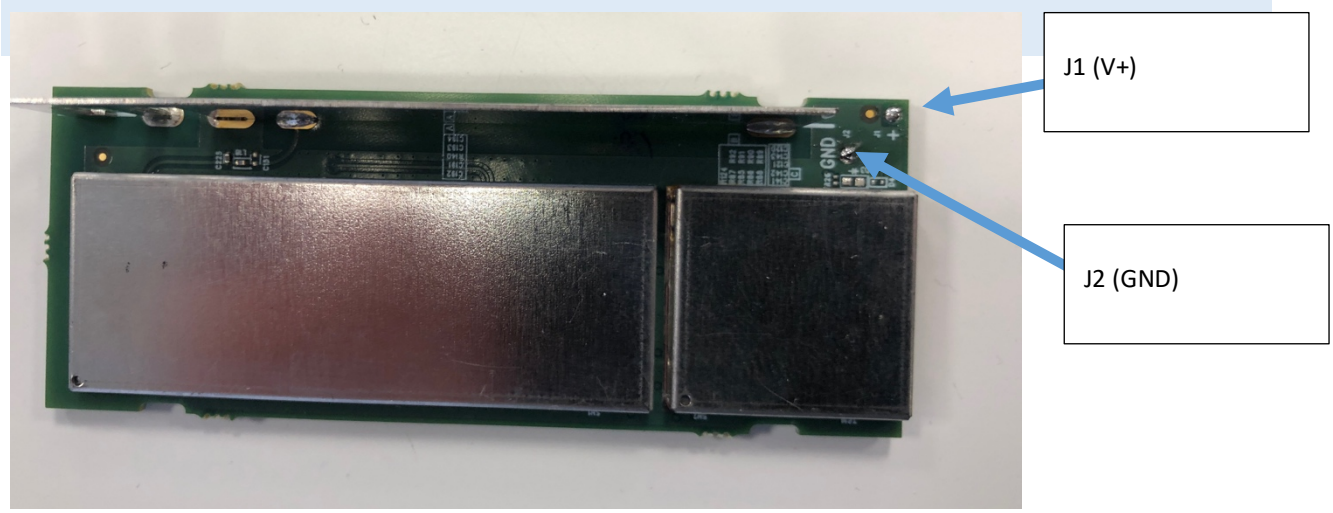

Figure 5 - Power Connections

4. LABELING

The Strix V3 has two labels relevant to final assembly and RMA – the FCC/regulatory label and the Shoof Strix MAC Address label.

Below is an example of the FCC ID label that can be found in the location indicated in **Error! Reference source not found.**. The size of the label is 1.5” x 1.0” inches. The barcode format is Code 3 of 9.

FCC ID: XXXXX **IC: XXXXX**

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.

Figure 6 - Sample FCC ID Label

The barcode below an example of the Strix MAC address label that can be found in the location indicated in Figure 7. The barcode format is Code 3 of 9.

1234567890123456

Figure 7 - Label Locations on bottom side of Strix V3

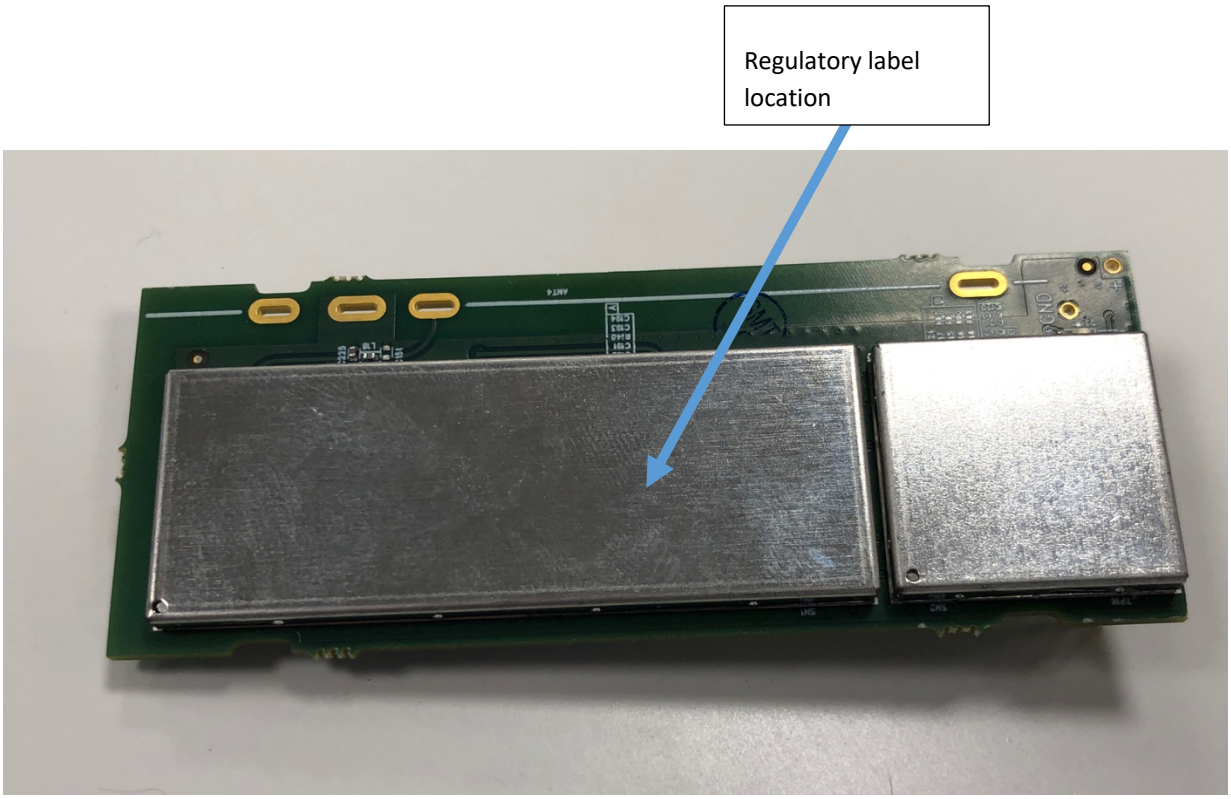

Figure 8 - Top Side of Strix V3

5. MODULE SPECIFICATION

i. Physical specification

Parameter	Value
Size (mm)	92x34x19
Weight (g)	28

ii. Electrical Specification

Parameter	Value	Notes
Operating Frequencies	433MHz, 870-875.6MHz, 902-928MHz, 2.4GHz	
Max output power	0dBm +27dBm +20dBm	433MHz 902-928MHz 2.4GHz
Voltage Supply	3.3V-3.6V	

iii. Environmental Specification

Parameter	Value
Storage Temp	-40 – +125°C
Operating Temp	-40 – +85°C

iv. External antenna maximum gain

Frequency	Maximum gain	Type
902-928MHz	3dBi	Omni
2.4GHz	4dBi	Omni

6. FCC AND INDUSTRY CANADA GOVERNMENT GUIDELINES

FCC ID: XXXX
IC: XXXXX

Modifications (15.21)
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Part 15 Certification Notice (15.19(a)(3)) and RSS-GEN
This device complies with Part 15 of the FCC Rules and Industry Canada license-exempt RSS standard(s). 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 antenna of this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The device should be installed so that people will not come within 20 cm (8 in.) of the antenna.

Information to User for Class B digital device (15.105)
This equipment has been tested and found to comply with Part 15 of the FCC Rules. 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.

Exigences d'Industrie Canada
Le Shoof V3 Tag DOIT être installée par un technicien ayant reçu une formation adéquate. Une installation incorrecte peut annuler l'autorisation de l'utilisateur à se servir de l'équipement.

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'antenne de cet émetteur ne doit pas se trouver à proximité de ou fonctionner en association avec une autre antenne ou un autre émetteur.

L'appareil doit être installé de telle sorte que les gens ne viendront pas au sein de 20 cm (8 in.) de l'antenne.

Les changements ou modifications apportés sans l'approbation expresse de l'autorité responsable de la conformité pourront entraîner l'annulation de l'autorisation d'utilisation de cet équipement.

Labeling Requirements for Host Device (DA 00-1407, RSS-GEN)

The following is an extract from FCC PART 15 UNLICENSED MODULAR TRANSMITTER APPROVAL, DA 00-1407, Released: June 26, 2000, Section 6 describing labeling requirements for devices containing a modular transmitter.

Section 6. The modular transmitter must be labeled with its own FCC ID number, and, if the FCC ID 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 wording such as the following: "Contains Transmitter Module FCC ID: XYZMODEL1" or "Contains FCC ID: XYZMODEL1." Any similar wording that expresses the same meaning may be used. The Grantee may either provide such a label, an example of which must be included in the application for equipment authorization, or, must provide adequate instructions along with the module which explain this requirement.

In the latter case, a copy of these instructions must be included in the application for equipment authorization.

The following is an extract from RSS-GEN, General Requirements and Information for the Certification of Radio Apparatus, Section 3.2.1, describing labeling requirements for a host device integrating a radio module.

The host device shall be properly labelled to identify the modules within the host device.

The Industry Canada certification label of a module shall be clearly visible at all times when installed in the host device, otherwise the host device must be labelled to display the Industry Canada certification number of the module, preceded by the words "Contains transmitter module", or the word "Contains", or similar wording expressing the same meaning, as follows:

Contains transmitter module IC: XXXXXX-YYYYYYYYYYY
where XXXXXX-YYYYYYYYYYY is the module's certification number.
L'extrait suivant provient du Cahier des charges sur les normes radioélectriques (CNR); exigences générales et information relatives à la certification des appareils radio, section 3.2.1, et décrit les

exigences en matière d'étiquetage pour un dispositif hôte intégrant un module radio. Le dispositif hôte doit être correctement étiqueté afin d'identifier les modules qu'il comprend.

L'étiquette de certification Industrie Canada d'un module doit toujours être bien visible lors de l'installation sur un dispositif hôte. Dans le cas contraire, le dispositif hôte doit être étiqueté de façon à afficher le numéro de certification Industrie Canada du module, précédé de l'expression « Contains transmitter module » ou du mot « Contains », ou d'une formulation similaire ayant la même signification. Par exemple :

Contains transmitter module IC : XXXXXX-YYYYYYYYYYY
où XXXXXX-YYYYYYYYYYY représente le numéro de certification du module.

The applicant for equipment certification of the module shall provide with each unit of the module either a label such as described above, or an explanation and instructions to the user as to the host device labelling requirements.

<include a sample label>

External Antenna Integration (RSS-GEN)
This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in Table **3**with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Cet émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le tableau **3** ci-dessous avec le gain maximal admissible et l'impédance d'antenne requise pour chaque type d'antenne indiqué. Les types d'antennes ne figurant pas dans cette liste, ayant un gain supérieur au gain maximum

Antenna	Antenna Type	Gain (dBi)	Frequency
WPANT30211-S1A	Omni Directional	3	902-928MHz
WPANT30211-S1A	Omni Directional	4	2.4GHz

Table 3 - External Antennas

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

FCC Registration Required for Operation under Rule 15.240

Radio transmissions from the Strix tag are governed in the US by FCC Part 15 rules, and in Canada by corresponding Industry Canada regulation RSS-210 . Still other regulations apply in Europe and other countries.

The Strix is shipped with the default mode of operation corresponding to FCC 15.231 disabled. The Strix tag can be configured for operation under this rule only by a provisioning through the Shoof provisioning tool.

There are restrictions in the geographical locations where such equipment may be deployed so as to maintain a 40 km separation from five long-range radar sites in the US and Alaska. The FCC requires notification of the locations where 15.240 operating equipment is to be installed. Shoof Technologies notifies the FCC of the initial activation location. However, it is the responsibility of the end user to mail a notification of installation to the FCC as described in the form provided below upon initial installation. It is also required that the user mail a new notification in the event the equipment is re-located.

The form is to be mailed to:

Experimental Licensing Branch
Office of Engineering & Technology
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554
ATTN: RFID Registration

Selected text from FCC Rule 15.240 Operation in the band 433.5 – 434.5 MHz

(a) "Operation under this section is restricted to devices that use radio frequency energy to identify the contents of commercial shipping containers. Operations must be limited to commercial and industrial areas such as ports, rail terminals and warehouses."

(e) "To prevent interference to Federal Government radar systems, operation under the provisions of this section is not permitted within 40 kilometers of the following locations:"

DoD Radar Site	Latitude	Longitude
Beale Air Force Base	39°08'10"N	121°21'04"W
Cape Cod Air Force Station	41°45'07"N	070°32'17"W
Clear Air Force Station	64°55'16"N	143°05'02"W
Cavalier Air Force Station	48°43'12"	097°54'00"W
Eglin Air Force Base	30°43'12"	086°12'36"W

FCC RFID REGISTRATION FORM
FOR FCC RULE 15.240

To: Experimental Licensing Branch, OET
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554
ATTN: RFID Registration

Subject: Registration for Shoof Technologies, Inc. Model STRIX3 Tag

The following information concerning the end user and installation location is hereby submitted as required by FCC Rule 15.240:

End User Company Name: _____
Individual to Contact: _____
Mailing Address of Contact: _____
_____
_____
Street Address of Contact Office: _____
_____
_____
Contact Telephone Number: _____
Contact E-Mail Address: _____
Street Address of Equipment Installation: _____
_____
_____

Latitude: _____ Longitude:_____

FCC ID of Equipment: 2AR28-STRX33

_____ _____
Contact Signature Date

7. REGULATORY APPROVALS

Japanese Type Approval
Strix V3 complies with the Japanese radio law and is certified according to ARIB STD-T108.
When the product is placed on the Japanese market, it must carry the Specified Radio Equipment marking as shown below:

R210-127121

2.4 DS/FH8

If the certification label cannot be recognized from outside (e.g. installation in a host) appropriate information must be referenced in the user manual.

In case this unit is installed on a fixed, outdoor equipment the following label shall be affixed to the enclosure:

2.4GHz band low-power data
Communication system radio station

Operator: Shoof Technology

To contact: info@shooftech.com
http://www.shooftech.com