JODY-W263

Host-based multiradio module with Wi-Fi and Bluetooth 5

Integration Instructions

Abstract

This document describes the system integration of JODY-W263 module into a host product. This host-based modules support Wi-Fi 802.11n/ac and Bluetooth® 5 and is designed for both simultaneous and independent operations. The JODY-W263 module includes an integrated MAC/baseband processor and RF front-end components. This document is to only be used internally for Foresight Sports, as the grant pertaining to this module is not intended for distribution of the module.

Document Information

Title	**JODY-W2**
Subtitle	Host-based multiradio modules with Wi-Fi and Bluetooth 5
Document type	Integration Instructions
Document name	FSS JODY-W263 System integration manual
Revision and date	Rev 01 19-May-22
Disclosure restriction	Confidential

This document applies to the following products.

Product name
JODY-W263-00B

Table of Contents

1 List of applicable FCC rules

The following FCC rules are applicable to the equipment:

- CFR 47, Part 15, Subpart C
- CFR 47, Part 2, Subpart J – Radiofrequency radiation exposure: portable devices

2 Summary of operational use conditions

2.1 Antenna Configuration and Gain

2.1.1 Antenna Configuration

In addition to the general requirement to use only authorized antennas, the grant also requires a separation distance of at least 20 cm from the antenna(s) to all persons. The antenna(s) must not be co-located with any other antenna or transmitter (simultaneous transmission) as well. If this cannot be met, a Permissive Change as described below must be made to the grant.

☞ In order to support verification activities that may be required by certification laboratories, customers applying for Class-II Permissive changes must implement the setup described in Radio Test Guide for NXP based modules.

If the module is to be co-located with another transmitter, additional measurements for simultaneous transmission are required. The results must be added to the grant file as a Class II Permissive Change.

If the authorized antennas and/or antenna trace design cannot be used, the new antenna and/or antenna trace designs must be added to the grant file. This is done by a Class I Permissive Change or a Class II Permissive Change, depending on the specific antenna and antenna trace design.

- Antennas of the same type and with less or same gain as an already approved antenna can be added under a Class I Permissive Change.
- Antenna trace designs deviating from the reference design and new antenna types are added under a Class II Permissive Change.
- For 5 GHz modules, the combined minimum gain of antenna trace and antenna must be greater than 0 dBi to comply with DFS testing requirements.

2.1.2 Antenna Gain

The antenna gain in each band must not exceed the following:

Wi-Fi Output Power for 2.4GHz band

Channel	Modulation	Channel bandwidth	Data rates	Maximum power setting
1 - 11	CCK and DSSS	20 MHz	1, 2, 5.5, 11 Mbps	12 dBm
1	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	11 dBm
2 – 10	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	16 dBm
11	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	11 dBm
1	OFDM	20 MHz	HT20 MCS0-MCS7	11 dBm
2 – 10	OFDM	20 MHz	HT20 MCS0-MCS7	16 dBm
11	OFDM	20 MHz	HT20 MCS0-MCS7	11 dBm
3	OFDM	40 MHz	HT40 MCS0-MCS7	11 dBm
4 – 8	OFDM	40 MHz	HT40 MCS0-MCS7	16 dBm
9	OFDM	40 MHz	HT40 MCS0-MCS7	11 dBm

Table 1: Wi-Fi power table for operation in the 2.4 GHz band

Wi-Fi Output power for 5 GHz band

Channel	Modulation	Channel bandwidth	Data rates	Maximum power setting
36 - 64	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	15 dBm
36 - 64	OFDM	20 MHz	HT20 MCS0-MCS7	15 dBm
36 - 64	OFDM	20 MHz	VHT20 MCS0-MCS8	15 dBm
38 - 62	OFDM	40 MHz	HT40 MCS0-MCS7	15 dBm
38 - 62	OFDM	40 MHz	VHT40 MCS0-MCS9	15 dBm
42	OFDM	80 MHz	VHT80 MCS0-MCS9	14 dBm

Table 2: Wi-Fi power table for operation in the 5 GHz U-NII-1 and U-NII-2A bands

Channel	Modulation	Channel bandwidth	Data rates	Maximum power setting
100 - 144	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	15 dBm
100 - 144	OFDM	20 MHz	HT20 MCS0-MCS7	15 dBm
100 - 144	OFDM	20 MHz	VHT20 MCS0-MCS8	15 dBm
102	OFDM	40 MHz	HT40 MCS0-MCS7	14 dBm
102	OFDM	40 MHz	VHT40 MCS0-MCS9	14 dBm
110-142	OFDM	40 MHz	HT40 MCS0-MCS7	15 dBm
110-142	OFDM	40 MHz	VHT40 MCS0-MCS9	15 dBm
106 - 138	OFDM	80 MHz	VHT80 MCS0-MCS9	14 dBm

Table 3: Wi-Fi power table for operation in the 5 GHz U-NII-2e band

Channel	Modulation	Channel bandwidth	Data rates	Maximum power setting
149 - 165	OFDM	20 MHz	6, 9, 12, 18, 24, 36, 48, 54 Mbps	15 dBm
149 - 165	OFDM	20 MHz	HT20 MCS0-MCS7	15 dBm
149 - 165	OFDM	20 MHz	VHT20 MCS0-MCS8	15 dBm
151 – 159	OFDM	40 MHz	HT40 MCS0-MCS7	15 dBm
151 – 159	OFDM	40 MHz	VHT40 MCS0-MCS9	15 dBm
155	OFDM	80 MHz	VHT80 MCS0-MCS9	14 dBm

Table 4: Wi-Fi power table for operation in the 5 GHz U-NII-3 band

2.2 Co-location

If the module is to be co-located with another transmitter, additional measurements for simultaneous transmission are required. The results must be added to the grant file as a Class II Permissive Change.

The module is not currently approved for co-location with any other modules.

3 RF Exposure conditions

3.1 Installation Instructions

The module is approved for use in a mobile RF exposure environment. A minimum separation distance of 20 cm must be maintained between the antenna and nearby persons.

The module is not approved for co-location with any other modules.

3.2 Warning

A warning must be placed in the host product user instructions stating that:

1) "This device is approved for use in a mobile rf exposure environment. A minimum separation distance of 20 cm must be maintained between the antenna and nearby persons."
2) The module is not approved for co-location with any other modules.

The host integrator must follow the integration instructions provided by the module manufacturer and ensure that the composite-system end product complies with he FCC requirements by a technical assessment or evaluation to the FCC rules and KDB Publication 996369.

If the required separation distance of 20 cm cannot be fulfilled, a SAR evaluation must be performed. This consists of additional calculations and/or measurements. The result must be added to the grant file as a Class II Permissive Change.

4 Approved Antennas:

The antenna should be installed and operated with minimum distance of 20 cm between the radiator and nearby persons.

See Antenna Gain for limits by band

Antenna(s) approved for Wi-Fi

Brand	Model	Type	Antenna Gain in 2.4 GHz band	Antenna Gain in 5 GHz band
Pulse	W3006	Chip	2.2dBi	5.2dBi

Antenna(s) approved for Bluetooth

Brand	Model	Type	Antenna Gain in 2.4 GHz band	Antenna Gain in 5 GHz band
Pulse	W3006	Chip	2.2dBi	5.2dBi

5 Label and Compliance Information

5.1 Label requirements

5.1.1 United States (FCC)

This section contains the FCC compliance information for the JODY-W263-00B series modules.

Model	ISED certification number
JODY-W263-00B	28505-JODYW263FSS

5.1.2 FCC Compliance statement

JODY-W263 module has modular approval and 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.

⚠ Any changes or modifications NOT explicitly APPROVED could cause the JODY-W263 module to cease to comply with FCC rules part 15 thus void the user's authority to operate the equipment.

The internal / external antenna(s) used for this module must provide a separation distance of at least20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

In accordance with 47 CFR § 15.19, the end product into which this module is integrated shall bear the following statement in a conspicuous location on the device:

"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."

When the end-product is so small or for such use that it is not practical to place the above statement on it, the information shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or on the container in which the device is marketed. However, the FCC ID label must be displayed on the device.

If the end-product will be installed in locations where the end-user is not able to see the FCC ID and/or this statement, the FCC ID and the statement shall also be included in the end-product manual.

☞ The outside of final products containing the JODY-W2 module must display in a user accessible area a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: 2A6QA-JODYW263FSS" or "Contains FCC ID: 2A6QA-JODYW263FSS".

5.1.3 Canada (ISED)

JODY-W2 series module are certified for use in accordance with the Canada Innovation, Science and Economic Development Canada (ISED) Radio Standards Specification (RSS) RSS-247 Issue 2 and RSSGen. Below is the list of the ISED IDs allocated to JODY-W263 module.

Model	ISED certification number
JODY-W263-00B	28505-JODYW263FSS

5.1.4 ISED compliance statement

JODY-W263-00B module complies with ISED (Innovation, Science and Economic Development Canada) license-exempt RSSs. 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.

☞ Any notification to the end user of installation or removal instructions about the integrated radio module is NOT allowed. Unauthorized modification could void authority to use this equipment.

This equipment complies with ISED RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

This radio transmitter IC: 28505-JODYW263FSS has been approved by ISED to operate with the antenna types listed below with the maximum permissible gain 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.

☞ 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;

☞ Operation in the 5600-5650 MHz band is not allowed in Canada. High-power radars are allocated as primary users (i.e., priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

The ISED certification label of a module shall be clearly visible at all times when installed in the host device; otherwise, the host device must be labeled to display the ISED certification number for 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: 28505-JODYW263FSS”.

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.

Cet équipement est conforme aux limites d'exposition de rayonnement d'ISED RSS-102 déterminées pour un environnement non contrôlé. Cet équipement devrait être installé et actionné avec la distance minimum 20 cm entre le radiateur et votre corps.

Cet émetteur radio, IC: 8595A-JODYW263 été approuvé par ISED pour fonctionner avec les types d’antenne énumérés ci-dessous avec le gain maximum autorisé et l’impédance nécessaire pour chaque type d’antenne indiqué. Les types d’antenne ne figurant pas dans cette liste et ayant un gain supérieur au gain maximum indiqué pour ce type-là sont strictement interdits d’utilisation avec cet appareil.

☞ Le dispositif de fonctionnement dans la bande 5150-5250 MHz est réservé à une utilisation en intérieur pour réduire le risque d'interférences nuisibles à la co-canal systèmes mobiles par satellite

☞ Opération dans la bande 5600-5650 MHz n'est pas autorisée au Canada. Haute puissance radars sont désignés comme utilisateurs principaux (c.-àutilisateurs prioritaires) des bandes

5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer des interférences et / ou des dommages à dispositifs LAN-EL.

L'étiquette d'homologation d'ISED d'un module donné doit être posée sur l'appareil hôte à un endroit bien en vue en tout temps. En l'absence d'étiquette, l'appareil hôte doit porter une étiquette sur laquelle figure le numéro d'homologation du module d'ISED, précédé des mots « Contient un module d'émission », ou du mot « Contient », ou d'une formulation similaire allant dans le même sens et qui va comme suit: « Contient le module d'émission IC: 28505-JODYW263FSS ».

This radio transmitter IC: 28505-JODYW263FSS has been approved by ISED to operate with the antenna types listed below with the maximum permissible gain 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.

Le présent émetteur radio IC: 28505-JODYW263FSS a été approuvé par ISED 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, sont strictement interdits pour l'exploitation de l'émetteur.

The internal / external antenna(s) used for this module must provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

☞ The approval type for all JODY-W2 series variants is a single modular approval. Due to ISED Modular Approval Requirements (Source: RSP-100 Issue 10), any application which includes the module must be approved by the module manufacturer (u-blox). The application manufacturer must provide design data for the review procedure.

6 Information on test modes and additional test

For end host implementation the user must refer to the manufacturer integration manual to implement software/firmware that can be used to manipulate the module configuration and put it into to special test modes, set and verify regional power limits and any debugging required.

7 Additional test requirements

Foresight Sports warrants that the modular transmitter fulfills the FCC/ISED regulations when operating in authorized modes on any host product given that the integrator follows the instructions as described in this document.

⚠ The modular transmitter approval of JODY-W263, or any other radio module, does not exempt the end product from being evaluated against applicable regulatory demands.

The evaluation of the end product shall be performed with the JODY-W263 module installed and operating in a way that reflects the intended end product use case. The upper frequency measurement range of the end product evaluation is the 10th harmonic of 5.8 GHz as described in KDB 996369 D04.

The following requirements apply to all products that integrate a radio module:

- Subpart B - UNINTENTIONAL RADIATORS
  To verify that the composite device of host and module comply with the requirements of FCC part 15B, the integrator shall perform sufficient measurements using ANSI 63.4-2014.
- Subpart C - INTENTIONAL RADIATORS
  To validate that the fundamental and out of band emissions of the transmitter part of the composite device complies with the requirements of FCC part 15C, it is required that the integrator carries out sufficient verification measurements using ANSI 63.10-2013.

Revisions

Revision	Description	Date	Author
01	Initial Release	19 May 2022	P. Hicks