

USER MANUAL

WN7911C-LF

1x1 Single Band

802.11 b/g/n SDIO Carrier Module

V 0.1

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Revision History

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1 Introduction

1.1 Introduction

WN7911C is an industrial wireless IEEE 802.11n 1x1 2.4GHz single band SDIO module which enables wireless networking systems to attain data transmission speeds up to 150 megabits-per-second (Mbps). The WN7911C maintains compatibility with legacy IEEE 802.11b.g devices. It supports operation to the IEEE 802.11b and IEEE 802.11g and IEEE 802.11n standards.

1.2 Product Features

- Module form factor: 25mm x 18mm
- Operate at ISM frequency bands (2.4GHz)
- SDIO interface for WiFi
- IEEE standards support: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n
- Security features
 - ✓ WPA, WPA2, AES encryption/decryption
 - ✓ TKIP, 802.1x, WAPI encryption/decryption engine

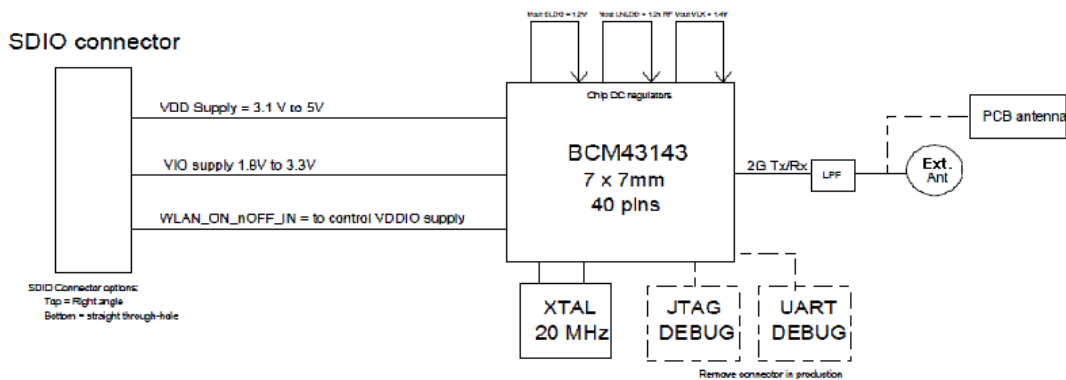
2 Hardware

2.1 General Overview

Module Dimension	25mm x 18mm
Module Interface	SDIO v2.0 (50Mhz, 4-bit) host interface
Standard	IEEE 802.11n, 802.11b/g
Chipset	BCM43143 2.4GHz 802.11 1x1 b/g/n MAC/PHY/Radio
Description	802.11 b/g/n 2.4GHz 1x1 WiFi carrier module
Modulation	802.11b: CCK, DQPSK, DBPSK 802.11g: 64 QAM, 16 QAM, QPSK, BPSK 802.11n: BPSK, QPSK, 16-QAM, 64-QAM
Data Rate	8802.11b: 11, 5.5, 2, 1 Mbps; 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: MCS 0 to 7 for HT20MHz; MCS 0 to 7 for HT40MHz
Operating Frequency	Draft 802.11n Radio: 2.4 GHz 802.11g Radio: 2.4 GHz 802.11b Radio: 2.4 GHz USA – FCC 2412~2462MHz (Ch1~Ch11) Canada – IC 2412~2462MHz (Ch1~Ch11) Europe – ETSI 2412~2472MHz (Ch1~Ch13) Japan – STD-T66/STD-33 2412~2484MHz (Ch1~Ch14)

Operating Channel	WiFi 2.4GHz: 11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe 14(ch1-14)– Japan 2.400GHz ~ 2.4835 GHz
Antenna Connector	One antenna allowing transmission or reception on both, simultaneously
Operating System Supported	Linux
Temperatures	Operating Temperature: -10°C to +70 °C Storage Temperature: -40°C to +80°C (non-operating):
Humidity	5-90

2.2 Block Diagram



2.3 Pin Description

Pin Number	Terminal Name	Pin Type	I/O Type	Description
1	BTCX_RF_ACTIVE	Signal	I	Indicates that the coexistent BT is active: internal pull-down.
2	BTCX_STATUS	Signal	I	Indicates the coexistent BT priority status and RX/TX direction.

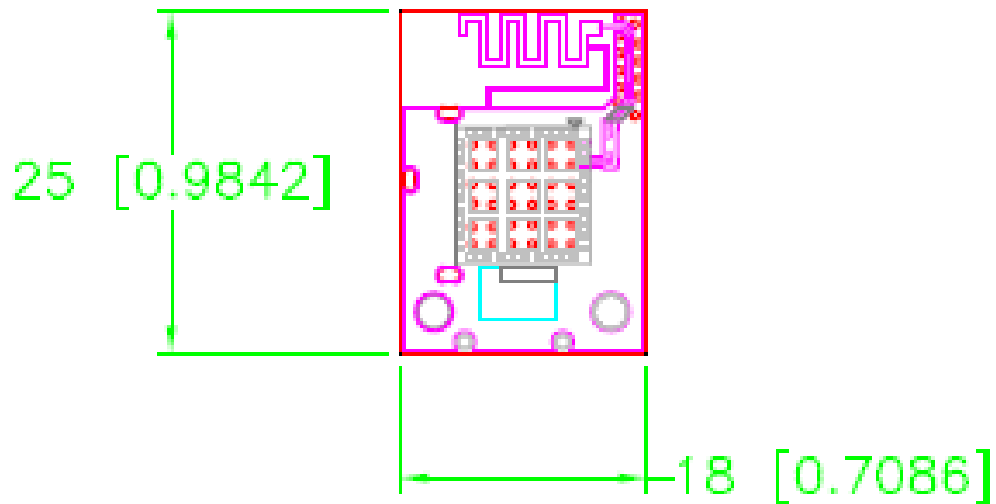
3	USB_AVDD12	Power	I	USB Phy core 1.2V supply
4	USB_AVDD25	Power	I	USB Phy analog 2.5V supply
5	USB_AVDD33	Power	I	USB Phy analog 3.3V supply
6	VDD_AFE	Power	I	1.2V filtered supply for ADC; 1.2V filtered supply for AFE AUX
7	GND	Power	I	Ground
8	USB20_DEV_DPLS	Signal	I/O	USB port data plus
9	USB20_DEV_DMNS	Signal	I/O	USB port data minus
10	GND	Power	I	Ground
11	BTCX_FREQ	Signal	I	Indicates that the coexistent BT is about to transmit on a restricted channel: internal pull-down.
12	GPIO_8	Signal	I/O	General-purpose interface pins.
13	BTCX_TXCONF	Signal	O	Output permission for the coexistent BT to transmit.
14	UART_TX	Signal	O	Serial Input for UART
15	UART_RX	Signal	I	Serial Output for UART
16	GND	Power	I	Ground
17	VIN_LDO	Power	I	Input supply pin for CLDO and LNLDO1
18	VDD_CORE_1.2V	Power	O	1.2V output for core LDO, 200mA
19	VDD_RADIO_PLL_O	Power	O	1.2V output for low noise LNLDO1, 150mA
20	VDD_3.3V	Power	O	Internal PALDO output or feedback of output from external PNP
21	GPIO_0	Signal	I/O	General-purpose interface pins.
22	VDD_2.5V	Power	O	2.5V LDO2p5 output
23	GND	Power	I	Ground
24	VLX	Power	O	Core buck regulator: Output to inductor
25	VIN_3V_5V	Power	I	Battery supply input for PALDO;

				Core buck regulator: Battery voltage input
26	GPIO_2	Signal	I/O	General-purpose interface pins.
27	GND	Power	I	Ground
28	SDIO_CLK	Signal	I/O	SDIO clock
29	GPIO_3	Signal	I/O	General-purpose interface pins.
30	SDIO_DATA_0	Signal	I/O	SDIO data line 0
31	GPIO_1	Signal	I/O	General-purpose interface pins.
32	SDIO_DATA_1	Signal	I/O	SDIO data line 1
33	SDIO_DATA_2	Signal	I/O	SDIO data line 2
34	GPIO_9	Signal	I/O	General-purpose interface pins.
35	RESETn	Signal	I	Low asserting global chip reset: digital input pin. Used by PMU to enable/disable power the internal regulators.
36	SDIO_CMD	Signal	I/O	SDIO command line
37	SDIO_DATA_3	Signal	I/O	SDIO data line 3
38	VDDIO	Power	I	Digital I/O supply (1.8V to 3.3V) VDDIO should be supplied externally; SDIO I/O supply (1.8V to 3.3V)
39	GND	Power	I	Ground
40	VDD_PLL	Power	I	1.2V supply for PLL; 1.2V crystal oscillator filtered power supply
41	GND	Power	I	Ground
42	VDD_RADIO_PLL_I	Power	I	1.2V supply for radio transmit and receive sections
43	GND	Power	I	Ground
44	GND	Power	I	Ground

45	GND	Power	I	Ground
46	ANT	Signal	I/O	Antenna port
47	GND	Power	I	Ground
48	VDD_3.3V	Power	I	RF I/O supply (2.6V to 3.3V); 3.3V OTP power supply (no lower than 3.0V); 3.3V for the internal power amplifiers
G1	GND	Power	I	Ground pad
G2	GND	Power	I	Ground pad
G3	GND	Power	I	Ground pad
G4	GND	Power	I	Ground pad
G5	GND	Power	I	Ground pad
G6	GND	Power	I	Ground pad
G7	GND	Power	I	Ground pad
G8	GND	Power	I	Ground pad
G9	GND	Power	I	Ground pad
G10	GND	Power	I	Ground pad
G11	GND	Power	I	Ground pad
G12	GND	Power	I	Ground pad
G13	GND	Power	I	Ground pad

2.4 PCB Outline & Dimension

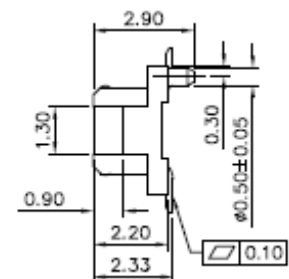
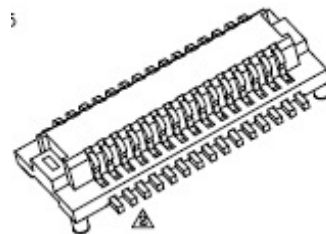
(TOP VIEW)

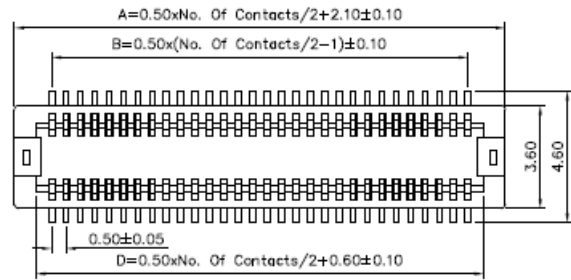


2.5 SDIO Connector Type

2.5.1 Board to Board Male (for Carrier Board)

ACC Part Number: NPV014S07R-H

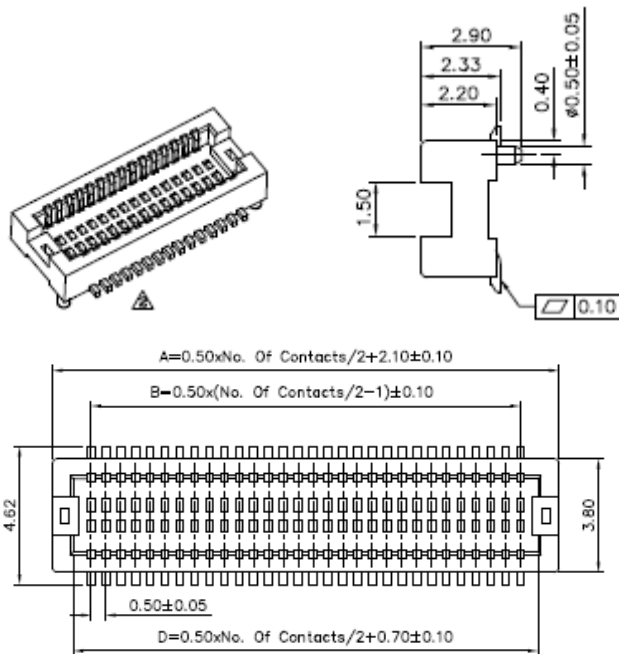




Unit: mm

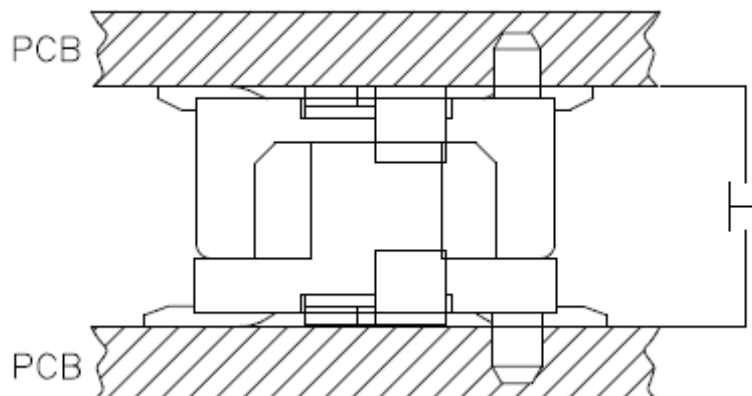
2.5.2 Board to Board Female (for Leapfrog Main Board)

ACC Part Number: NPV014P23R-H



Unit: mm

2.5.3 Connector Mating (Mating Height 3 mm)



Unit: mm

3 Software

3.1 Driver Support

- Android
- Linux
- Windows CE (check for the availability)

4 Specifications

4.1 Frequency Band:

- 802.11n Radio: 2.4 GHz
- 802.11b/g Radio: 2.4 GHz

4.2 Transmit Power and Sensitivity:

- TX Output Power: (Typical)
 - ✓ 11b 16 +/- 1 dBm
 - ✓ 11g 10.5 +/- 1 dBm
 - ✓ 11n 10 +/- 1 dBm
- Rx Sensitivity: (Typical)
 - ✓ -86 dBm @ 11 Mbps
 - ✓ -72 dBm @ 54 Mbps
 - ✓ -68 dBm @ 64-QAM, 20MHz channel spacing
 - ✓ -61 dBm @ 64-QAM, 40MHz channel spacing

4.3 Modulation

- DBPSK @ 1Mbps
- DQPSK @ 2Mbps
- CCK @ 5.5/11Mbps
- BPSK @ 6/9 Mbps
- QPSK @ 12/18Mbps
- 16-QAM @ 24Mbps
- 64-QAM @ 48/54Mbps and above, up to 300Mbps

4.4 Current Consumption:

- TX: 263mA x 3.3V Max
- RX: 81.58mA x 3.3V Max
- Power Saving: 1.25mA x 3.3V
- Deep sleep mode: 130uA

4.5 Temperature and Humidity

- Operating Temperature: 0 ~ 40 °C ambient (TBD)
- Storage Temperature: -10 ~ 70 °C ambient (TBD)
- Humidity: 5 ~ 90% and must be non-condensing (TBD)

4.6 Regulatory and Certification Compliance

TBD

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WARNING

This document is intended for internal use only. A Non-Disclosure Agreement (NDA) is required to release this document under any circumstances

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.

Radiation Exposure Statement:

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

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

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

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

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 FCC authorization is no longer considered valid and the FCC 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 FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: QDX31500". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

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.

Industry Canada statement:

This device complies with RSS-210 of the Industry Canada 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.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet 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.

Radiation Exposure Statement:

This equipment complies with IC 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.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

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

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

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 de telle sorte qu'une distance de 20 cm est respectée 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 considéré 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

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: 4810A-31500".

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 4810A-31500".

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.