USER MANUAL

WN7911A-LF

MPN F0ILF7911000J
(Hirose 1.5 mm Connector)

1x1 Single Band

802.11 b/g/n WiFi Module

V 1.2

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Introduction

1.1 Introduction

WN7911A-LF is a 1x1 single-band 2.4GHz IEEE 802.11 b/g/n WiFi module with on-board PCB printed antenna. WN7911A-LF attains the data transmission speed up to 150 Mbps and provide SDIO physical interface to the board for WiFi. This WiFi module is the low power consumption, high performance and the best WiFi solution for consumer devices which need the compact size embedded WiFi module for wireless connectivity like smart mobile phone, e-book, printer, tablet PC and so on.

1.2 Product Features

- Small form factor: 25mm x 18mm x 2.4mm
- High speed for wireless LAN connection, up to 150 Mbps for uplink and 150 Mbps for downlink
- Backward compatible to the existing IEEE 802.11b/g WLAN infrastructure
- Low power consumption and excellent power management
- Security features
  - WPA^{TM} and WPA2^{TM} (personal) support for powerful encryption and authentication
  - AES and TKIP acceleration hardware for fast data encryption and 802.11i compatibility
  - Cisco Compatible Extension (CCX, CCX 2.0, CCX 3.0, CCX 4.0) certified
  - SecureEasySetup^{TM} for simple WiFi setup and configuration
  - Support WPS
- QOS features
  - 802.11e
  - 802.11h
  - 802.11i
  - 802.11j

2   Bill of Material

Item	QTY	Reference	Part	Description	Vendor P/N	Manufacturer
1	10	C3,C5,C7,C11,C13, C16,C17,C19,C23,C25	0.1uF	C SMD CER 0.1uF 10% 16V X7R 0402 T0.5 HF		MURATA
2	3	C4,C6,C8	10uF	C SMD CER 10uF 20% 6.3V X5R 0603 T0.8mm HF	CC0603MRX5R5BB106	YAGEO
3	7	C9,R19,R20,R21,R22, R23,R26	DNI			
4	8	C10,C12,C14,C18,C20, C22,C24,C26	2.2uF	C SMD CER 2.2uF 10% 6.3V X5R 0603 T0.8mm LT/LF	0603X225K6R3CT	WALSIN
5	1	R17	0 OHM	RES SMD 0ohm 1/16W 0402 T0.35 HF		WALSIN
6	1	C46	1.8pF	C SMD HIGH-Q CER 1.8pF 0.25pF 50V NPO 0402 T0.5 HF		WALSIN
7	1	C48	0.5pF	C SMD HIGH-Q CER 0.5pF +-0.25pF 50V NPO 0402 T0.5 HF		MURATA
8	1	C51	3.3nH	IND SMD 3.3nH +-0.1nH 190 mA 0402 LT/LF		MURATA
9	1	L1	600 OHM	BEAD 100MHz 25% 1Kohm 100mA 0402 HF		TAI-TECH
10	1	L2	INDUCTOR	?!IND SMD 3.3uH 20% 1200mA 2.5x2.0 HF		MURATA
11	1	R1	10K	RES SMD 10Kohm 5% 1/10W 0603 T0.45 HF	WR06X103JTL	WALSIN
12	1	J1	Connector	0.5 mm Pitch 1.5 mm Mating Height 14 Pin Plug Board-to-Board Connector.	DF23C-14DP-0.5V	HIROSE
13	1	U1	WS5700B-ZZ	802.11b/g/n 2.4GHz SDIO SiP Module		Arcadyan
14	1	WN7911A-LF	PCB footprint	R0A3 PCB WN7911A-LF Carrier Board PCB ANT (4L)		Arcadyan

3 Pin Definition

Pin #	Type	Description
1	P	Ground
2	I/O	SDIO Data Line 2
3	I/O	SDIO Clock
4	P	Ground
5	P	Ground
6	I	System Reset
7	I/O	SDIO Data Line 0
8	I/O	SDIO Command
9	P	Ground
10	P	Ground
11	I/O	SDIO Data Line 1
12	I/O	SDIO Data Line 3
13	P	SDIO_VCC 3.3V
14	P	SDIO_VCC 3.3V

4 SiP Module

4.1 General Overview

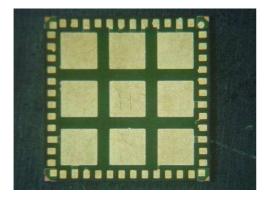| Item	Description
SiP Module Dimension	10mm x 10mm x 1.2mm
Chipset	Broadcom BCM4319 1x1 Single Band (2.4GHz) 802.11n MAC/BB/RF on single chip with integrated CMOS PA.
Module Interface	SDIO (4-bit)
Module Pin Connection	48-pin LGA

4.2 SiP Module Architecture

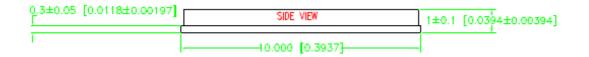### 4.2.1 WS5700B

4.3   Outline Drawing
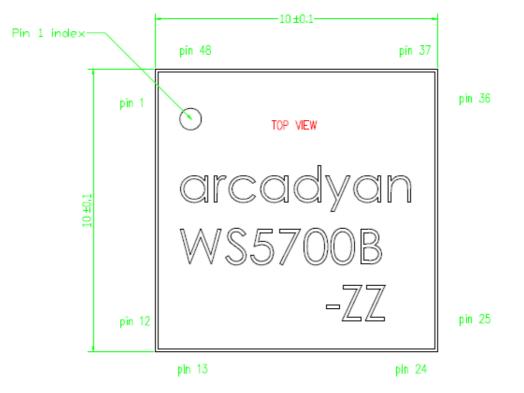
4.3.1 Top Side View
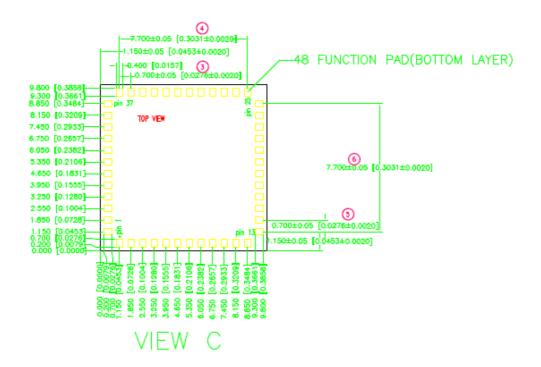

4.3.2 Bottom Side View

4.4   Dimension, Marking and Pin Layout

4.4.1 Side View
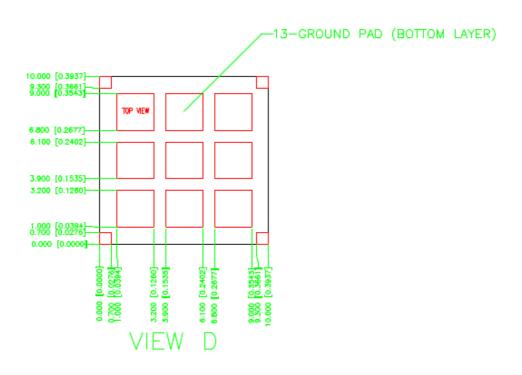
4.4.2 Top Side View
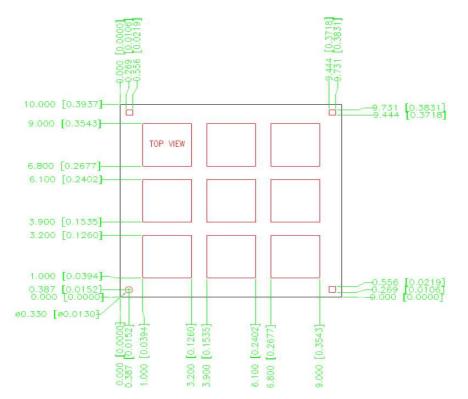

4.4.3 Bottom Side Function Pad (Top View)

4.4.4 Bottom Side Ground Pad (Top View)

4.4.5 Suggested Ground Pad Foot Print (Top View)

4.5   Pin Description

Pin #	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

4.6 Bill of Materials

Item	Quantity	Reference	Part	Description	vendor P/N	Manufacturer
1	10	C5,C7,C9,C13,C16,C17,C19,C23,C25,C40	0.1uF	C SMD CER 0.1uF 10% 6.3V X5R 6.3V 0201 T0.3mm LT/LF MURATA	GRM033R60J104KE19D	MURATA
2	1	C50	10pF	C SMD CER HIGH-Q 10pF +-0.25pF2 50V NPO 0402 T0.5mm LT/LF	C1005C0G1H100CT000F	MURATA
3	3	C6,C8,C39	10uF	C SMD CER 10uF 20% 6.3V X5R 0603 T0.8mm HF	CC0603MRX5R5BB106	YAGEO
4	1	R2	0 OHM	RES SMD 0ohm 5% 1/16W 0402 HF	RC0402JR-070RL	YAGEO
5	1	L2	3.3uH	CHOKE 100KHz 3.3uH 10% 58mohm 2.15A 4.5X4mm LT/LF GOTREND	GSDR43P-3R3K	GOTREND
6	8	C10,C12,C14,C18,C20,C22,C24,C26	2.2uF	C SMD CER 2.2uF 10% 6.3V X5R 0603 T0.8mm LT/LF	0603X225K6R3CT	WALSIN
7	1	L8	0 OHM/0603	RES SMD 0ohm +-5% 1/10W 0603 T0.45 HF	WR06X000PTL	WALSIN
8	1	R1	10K	RES SMD 10Kohm +-5% 1/10W 0603 T0.45 HF	WR06X103JTL	WALSIN
9	1	E1	ANTENNA	2.4GHz single band antenna		Arcadyan
10	1	U1	WS5700B-ZZ	802.11b/g/n 2.4GHZ SDIO SIP module		Arcadyan
11	3	C11,C46,C49	DNI			

5 Software

5.1 Driver Support

- Android v2.2 – v4.0
- Linux v2.6.29 – v2.6.39
- Windows CE (check for availability)

6   Specifications

6.1   Frequency Band:
- 802.11n Radio: 2.4 GHz
- 802.11b/g Radio: 2.4 GHz

6.2   Transmit Power and Sensitivity:
- TX Output Power:
  - ➢   11b   16 +/- 1 dBm
  - ➢   11g   14 +/- 1 dBm
  - ➢   11n   13 +/- 1 dBm

- RX Sensitivity:
  - ➢   -86 dBm @ 11 Mbps
  - ➢   -72 dBm @ 54 Mbps
  - ➢   -68 dBm @ 64-QAM, 20 MHz channel spacing

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

6.4   Operation Voltage & Current Consumptions:
- SDIO_VCC: 2.7V – 5.5V
- VDD_IO: 1.8V or 3.3V (Operational: 1.62V – 3.63V)
- TX: 263mA x 3.3V Max
- RX: 81.58mA x 3.3V Max
- Power Saving Mode: 1.25mA x 3.3V
- Deep Sleep Mode: 130uA

6.5　Module Dimension & Tolerance

- 18 +/- 0.1mm (W) X 25 +/- 0.1mm (L) X 2.4 +/- 0.1mm (H)

6.6　Temperature and Humidity

- Operating Temperature: 0 ~ 40 ^{o}C
- Storage Temperature: -10 ~ 70 ^{o}C
- Humidity: 5 ~ 90% and must be non-condensing

6.7　Regulatory and Certification Compliance

- FCC & CE Compliance

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 <u>transmitter</u> 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 <u>can not be met</u> (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID <u>can not</u> 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: RAXWN7911A". 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.