

## WNSQ-261ACN(BT)

802.11ac/abgn Dual-Band

2T2R Wi-Fi+Bluetooth 5.0 Combo

M.2 LGA Module



### WiFi +Bluetooth Combo Solution M.2 LGA Module

SparkLAN WNSQ-261ACN(BT) is an 802.11ac/b/g/n Dual-Band Wi-Fi+Bluetooth M.2 LGA type 1216 module based on Qualcomm Atheros QCA6174A-5 chipset. It is Dual-Band AC on 2.4GHz+5GHz and incorporates the latest Bluetooth 5.0. The download speed are 300Mbps on N networks and 867Mbps on AC network.

Adopting the latest 802.11ac solution. WNSQ-261ACN(BT) is ideal for next-generation high throughput enterprise networking solution. Incorporated with advanced security encryption, such as WEP, WPA, WPA2, WPS, and 802.1x, it helps prevent user's devices from malicious attacks.

#### Embedded Application

Applications include medical devices, security systems, Point of Sale, digital signs, set-top/net-top box, embedded / tablet PC's, handheld devices, thin client devices, Gaming machine, notebook computer, etc.

#### Key Feature

- Qualcomm Atheros QCA6174A-5
- BT transmission speed including 1M, 2M and 3Mbps EDR operations
- Supports for Simple Pairing (SP) and Enhanced Inquiry Response (EIR) function
- HCI USB interface to work with Windows upper layer stack
- Support MU-MIMO
- Wi-Fi Supports Low Power Pie (w/ L1 substrate) interfaces
- Two-stream spatial multiplexing up to 867Mbps data rate

**Specification**

<b>Standards</b>	IEEE 802.11ac/a/b/g/n (2T2R) Bluetooth V5.0, V4.2, V4.1, V4.0 LE, V3.0+HS, V2.1+EDR
<b>Chipset</b>	Qualcomm Atheros QCA6174A-5
<b>Data Rate</b>	802.11b: 11Mbps / 802.11a/g: 54Mbps / 802.11n: MCS0~15/ 802.11ac: MCS0~9 Bluetooth: 1 Mbps, 2Mbps and Up to 3Mbps
<b>Operating Frequency</b>	IEEE 802.11 ac/a/b/g/n ISM Band, 2.412GHz~2.484GHz, 5.150MHz~5.850MHz *Subject to local regulations
<b>Interface</b>	PCIe: WLAN / USB: Bluetooth
<b>Form Factor</b>	M.2 LGA Type 1216
<b>Antenna</b>	2xIPEX MHF4 connectors Support WiFi/BT co-existence Main:WiFi Aux: WiFi /BT
<b>Modulation</b>	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11a/g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)
<b>Power Consumption</b>	TX: 610mA / RX: 285mA
<b>Operating Voltage</b>	DC 3.3V
<b>Operating Temperature Range</b>	-40°C~70°C
<b>Storage Temperature Range</b>	-40°C~85°C
<b>Humidity (Non-Condensing)</b>	5%~90% (Operating) 5%~90% (Storing)
<b>Dimension (in mm)</b>	12mm x 16mm x 1.5mm
<b>Weight (g)</b>	≤ 0.7g
<b>Driver Support</b>	Windows 7/8.1/10 Linux (Open Source), Recommend Kernel v4.0+
<b>Security</b>	64/128-bits WEP, WPA, WPA2, 802.1x

**OUTPUT POWER & SENSITIVITY**
**802.11b**

Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
11Mbps	18dBm	$\leq$ -76dBm

**802.11g**

Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
54Mbps	16dBm	$\leq$ -65dBm

**802.11n / 2.4GHz**

	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
HT20	MCS7	16dBm	19dBm	$\leq$ -64dBm
	MCS7	16dBm	19dBm	$\leq$ -61dBm

**802.11a**

Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
54Mbps	10.5dBm	$\leq$ -65dBm

**802.11n / 5GHz**

	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
HT20	MCS7	10dBm	13dBm	$\leq$ -64dBm
	MCS7	10dBm	13dBm	$\leq$ -61dBm

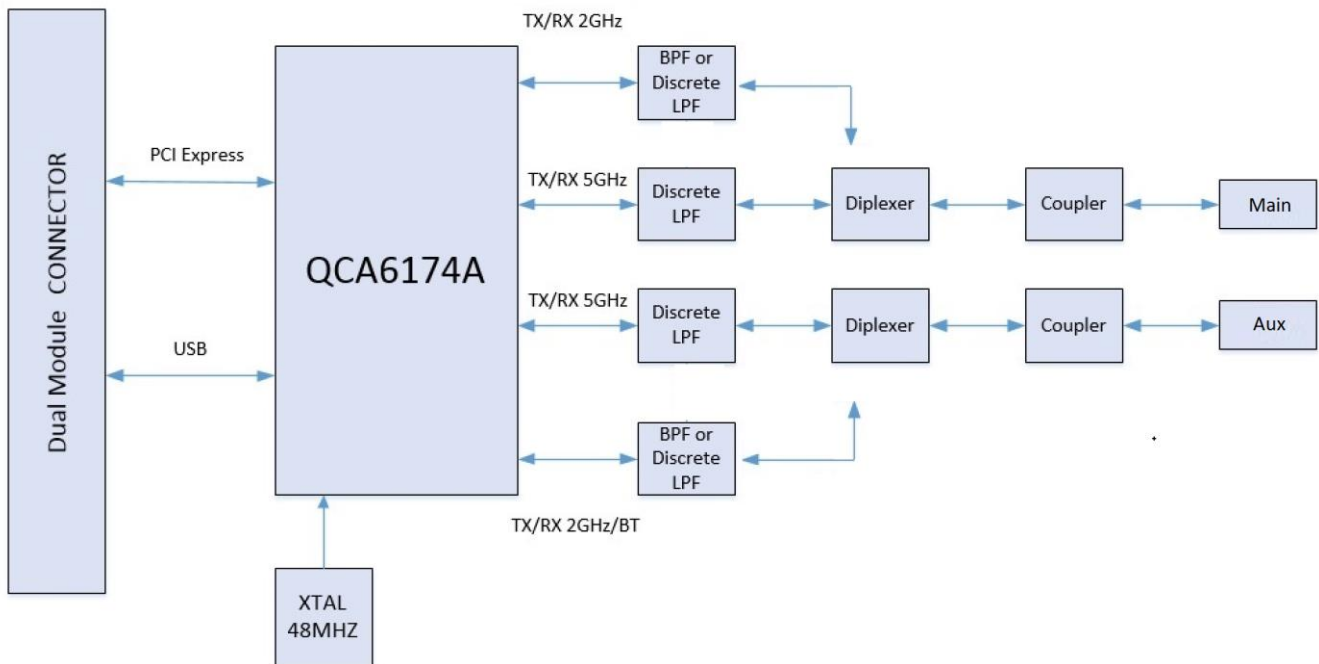
**802.11ac**

	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
VHT80	MCS9	6dBm	9dBm	$\leq$ -51dBm

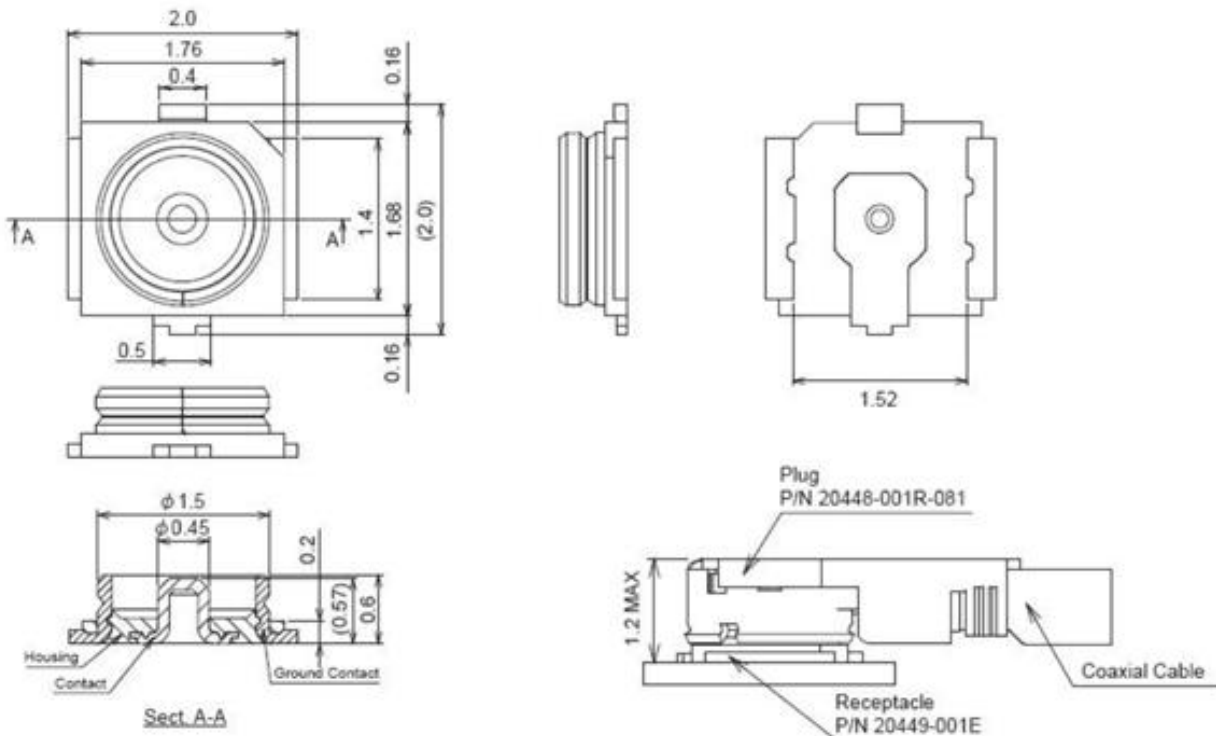
**Bluetooth**

Data Rate	Tx $\pm$ 2dBm (Class 1 Device)	Rx Sensitivity
3Mbps	0 $\leq$ Output Power $\leq$ +10dBm	<0.1% BR, BER at -70dBm

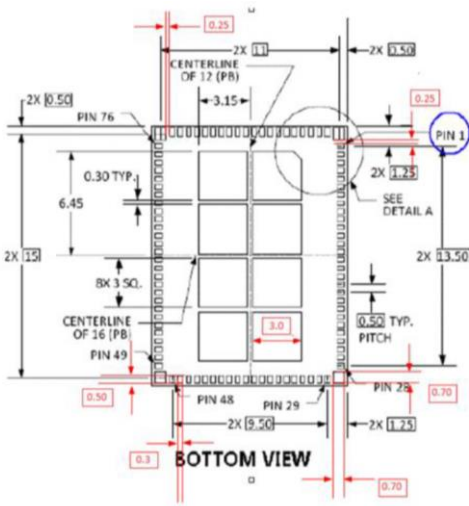
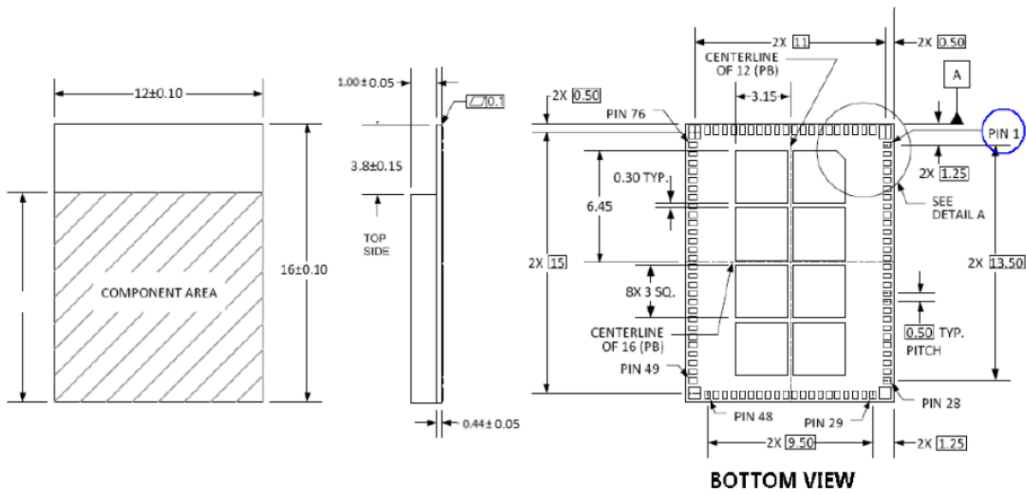
**Block Diagram**



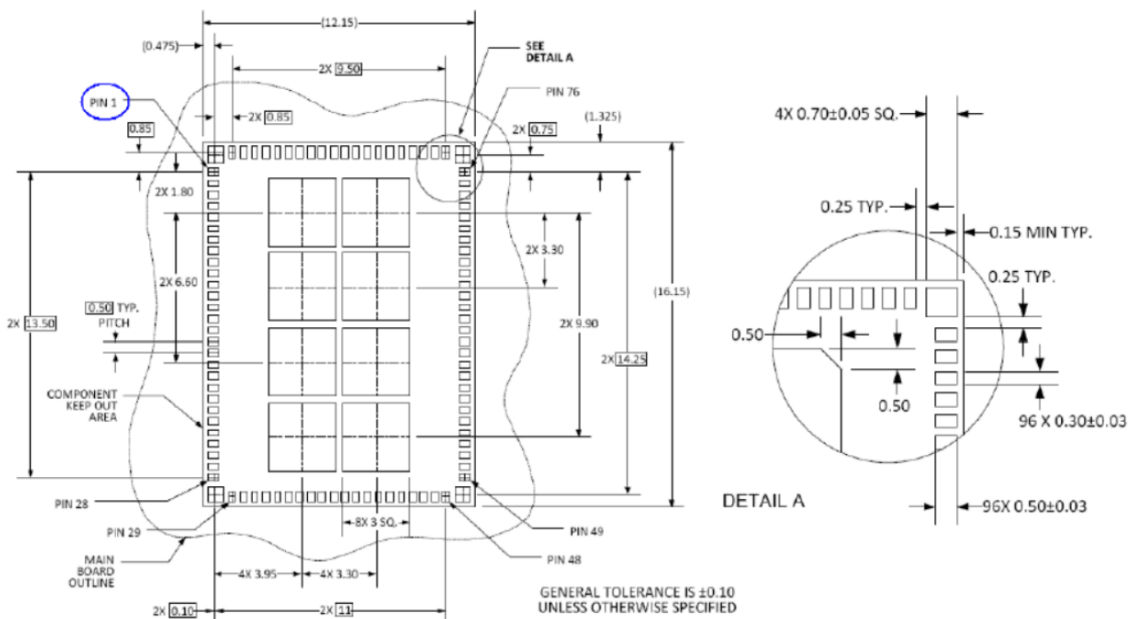
**MHF4 connector**



### Mechanical Dimension (mm)



### RECOMMENED LAND PATTERN



## Pin Assignment

Pin#	Pin Name	Description	Pin#	Pin Name	Description
1	No Connection	-	2	No Connection	-
3	No Connection	-	4	+3.3V	+3.3V
5	+3.3V	+3.3V	6	GND	GND
7	No Connection	-	8	No Connection	-
9	No Connection	-	10	No Connection	-
11	COEX1_SYNC (OPT)	LTE_COEX1	12	COEX2_PRI(OPT)	COEX2_PRI(OPT)
13	COEX3_ACTIVE (OPT)	LTE_COEX3	14	No Connection	-
15	No Connection	-	16	Reserved	-
17	GND	GND	18	No Connection	-
19	No Connection	-	20	GND	GND
21	No Connection	-	22	No Connection	-
23	GND	GND	24	No Connection	-
25	No Connection	-	26	GND	GND
27	SUSCLK(32KHz)	32.768 kHz clock supply input that is provided by PCH to reduce power and cost for the module. SUSCLK will have a duty cycle that can be as low as 30% or as high as 70% 200ppm.	28	W_DISABLE_L (OPT)	Input and active low signal. This signal is used by the system to disable radio operation on add-in cards that implement radio frequency applications. When implemented, this signal requires a pull-up resistor on the card.

## Pin Assignment

Pin#	Pin Name	Description	Pin#	Pin Name	Description
29	WAKE_L	Output and open Drain active Low signal. This signal is used to request that the system return from a sleep/suspended state to service a function initiated wake event.	30	CLKREQ_L	Output for reference clock request signal
31	PCIE_PERST# PERST_L	Input signal for functional reset to the card	32	GND	GND
33	REFCLK-	Input signal for PCI Express differential reference clock (100 MHz)	34	REFCLK+	Input signal for PCI Express differential reference clock (100 MHz)
35	GND	GND	36	PETn0	PCI Express x1 data interface: one differential transmit pair
37	PETp0	PCI Express x1 data interface: one differential transmit pair	38	GND	GND
39	PERn0	PCI Express x1 data interface: one differential receive pair	40	PERp0	PCI Express x1 data interface: one differential receive pair
41	GND	GND	42	No Connection	-
43	No Connection	-	44	No Connection	-
45	WL_EN	WLAN enable. Active high	46	No Connection	-
47	No Connection	-	48	No Connection	-
49	No Connection	-	50	No Connection	-
51	No Connection	-	52	No Connection	-
53	No Connection	-	54	No Connection	-
55	No Connection	-	56	No Connection	-
57	No Connection	-	58	No Connection	-

## Pin Assignment

Pin#	Pin Name	Description	Pin#	Pin Name	Description
59	No Connection	-	60	No Connection	-
61	No Connection	-	62	GND	GND
63	BT_DISABLE_L (OPT)	These pins are reserved for definition with future revisions of this specification.	64	BT_LED	Status indicators via LED devices that will be provided by the system and it is an open drain.
65	WLAN_LED# LED_WLAN_L (OPT)	Defined in the PCI Express Mini card specification and it is an open drain, active low signal, used to allow the PCIe Mini Card add-in card to provide status indicators via LED devices that will be provided by the system.	66	No Connection	-
67	No Connection	-	68	GND	GND
69	USB_D-	USB_D-	70	USB_D+	USB_D+
71	GND	GND	72	+3.3V	+3.3V
73	+3.3V	+3.3V	74	GND	GND
75	GND	GND	76	GND	GND
77~96	GND	GND	97(G1)~ 100(G4)	GND	GND
101~108	GND	GND			-



## Certification

### PIFA Ant.

- FCC
- CE (RED EN 300 328 V2.1.1 / EN 301 893 V2.1.1)
- IC
- MIC
- NCC
- ASNZS

### Dipole Ant.

- FCC
- CE (RED EN 300 328 V2.1.1 / EN 301 893 V2.1.1)
- IC
- MIC
- NCC
- ASNZS

## Ordering Information

Product Name	Part Number	Description
<a href="#">WNFQ-261ACN(BT)</a>	R9701810003	802.11ac/b/g/n WiFi+BT M.2 LGA module,QCA6174A,2T2R 1216

## Optional Accessory

Product Name	Part Number	Description
<a href="#">AD-103AG</a>	R3410110203	2dBi Dipole RP-SMA 5G/2.4GHz
<a href="#">AD-300N</a>	R3410110219	3dBi/5dBi 2.4G/5GHz Dipole RP-SMA
<a href="#">CBIRF-N150</a>	R3470300018	I-PEX/MHF4 to RP-SMA Female ;L:150mm;Coaxial 0.81 Black