

WNSQ-261ACN(BT)

802.11ac/a/b/g/n Dual-Band

2T2R Wi-Fi+Bluetooth 4.2 Combo

M.2 LGA Module



WiFi+Bluetooth Combo Solution M.2 LGA Module

SparkLAN WNSQ-261ACN(BT) is an 802.11ac/a/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 4.2. 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, WPA3, 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

Standards	IEEE 802.11ac/a/b/g/n (2T2R) Bluetooth V4.2, V4.1, V4.0 LE, V3.0+HS, V2.1+EDR
Chipset	Qualcomm Atheros QCA6174A-5
Data Rate	802.11b: 11Mbps 802.11a/g: 54Mbps 802.11n: MCS0~15 802.11ac: MCS0~9 Bluetooth: 1 Mbps, 2Mbps and Up to 3Mbps
Operating Frequency	IEEE 802.11ac/a/b/g/n ISM Band: 2.412GHz~2.484GHz, 5.150GHz~5.850GHz *Subject to local regulations
Interface	WLAN: PCIe Bluetooth: USB
Form Factor	M.2 LGA Type 1216
Antenna	2 x IPEX MHF4 connectors Support WLAN/BT co-existence Main: WLAN Aux: WLAN/BT
Modulation	Wi-Fi: 802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11a: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM) Bluetooth: Header: GFSK Payload 2M: $\pi/4$ -DQPSK Payload 3M: 8-DPSK
Power Consumption	Tx mode: 610mA Rx mode: 285mA
Operating Voltage	DC 3.3V

Operating Temperature Range	-40°C~70°C
Storage Temperature Range	-40°C~85°C
Humidity (Non-Condensing)	5%~90% (Operating) 5%~90% (Storing)
Dimension L x W x H (in mm)	16mm(±0.1mm) x 12mm(±0.1mm) x 1.5mm(±0.05mm)
Weight (g)	0.7g
Driver Support	Windows 7/8.1/10/11 Linux (Open Source), Recommend Kernel v4.0+
Security	64/128-bits WEP, WPA, WPA2, WPA3, 802.1x

OUTPUT POWER & SENSITIVITY

802.11b

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

802.11g

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

802.11n / 2.4GHz

HT20	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
	MCS7	16dBm	19dBm	≤ -64 dBm
HT40	MCS7	16dBm	19dBm	≤ -61 dBm

802.11a

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

802.11n / 5GHz

HT20	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
	MCS7	10dBm	13dBm	≤ -64 dBm
HT40	MCS7	10dBm	13dBm	≤ -61 dBm

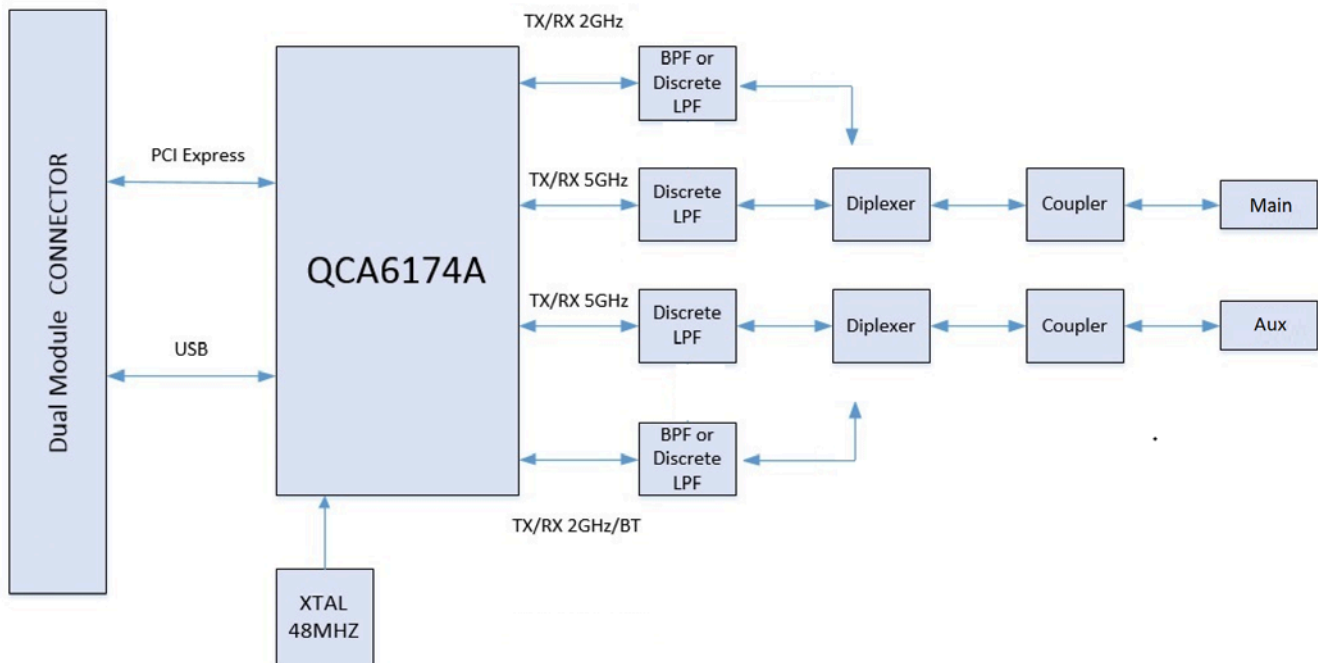
802.11ac

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

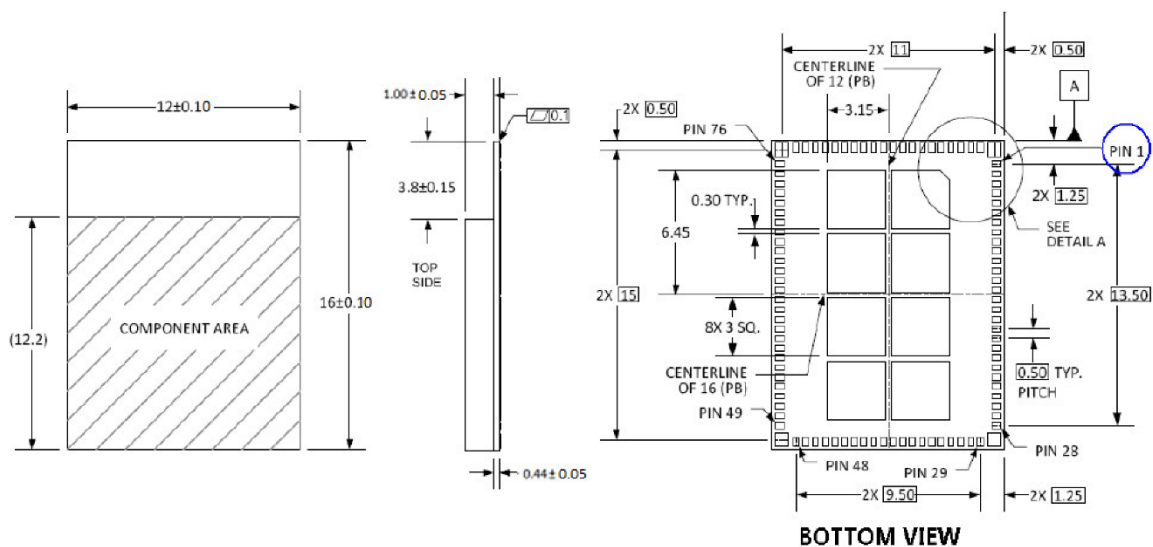
Bluetooth

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

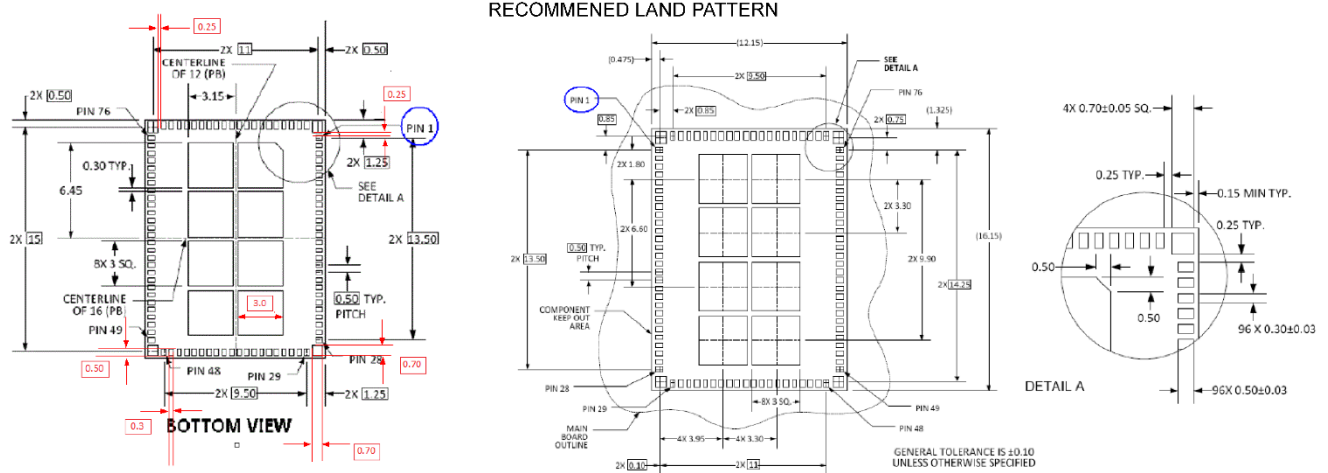
Block Diagram



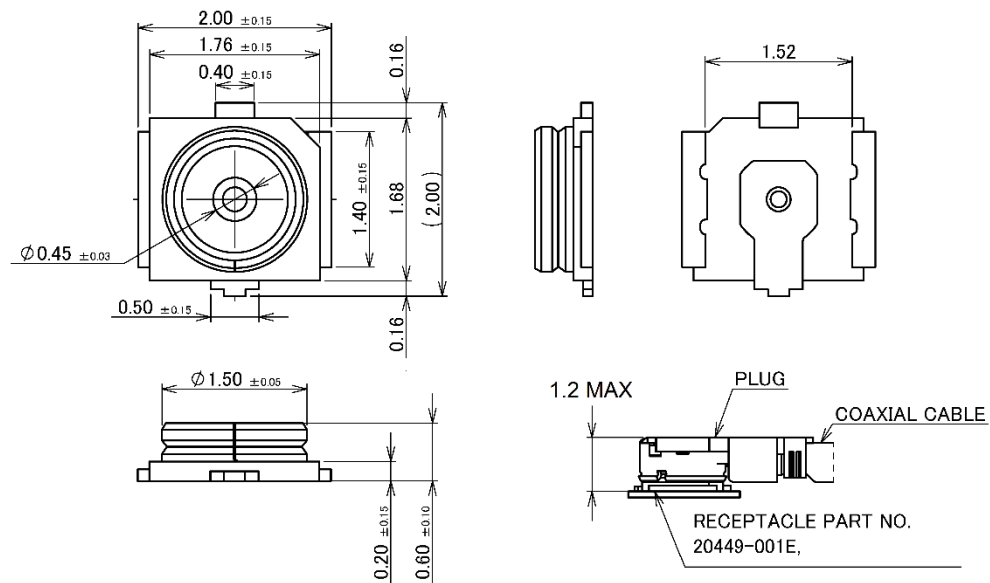
Mechanical Dimension (mm)



Mechanical Dimension (mm)



MHF4 connector spec.



Unit: mm

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	No Connection	12	COEX2_PRI	No Connection
13	COEX3_ACTIVE	No Connection	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.
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

Pin Assignment

Pin#	Pin Name	Description	Pin#	Pin Name	Description
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	-
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.
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.
59	No Connection	-	60	No Connection	-

Pin Assignment

Pin#	Pin Name	Description	Pin#	Pin Name	Description
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☒ IC☒ NCC☒ CE (RED EN 300 328 V2.2.2 / EN 301 893 V2.1.1)☒ MIC☒ ASNZS

Dipole Ant.

☒ FCC☒ IC☐ NCC☒ CE (RED EN 300 328 V2.2.2 / EN 301 893 V2.1.1)☒ MIC☐ ASNZS

Ordering Information

Product Name	Part Number	Description
WNSQ-261ACN(BT)	R9701810003	802.11ac/a/b/g/n Wi-Fi+BT M.2 LGA module, QCA6174A,2T2R 1216

Optional Accessory

Product Name	Part Number	Description
AD-103AG	R3410110203	2dBi Dipole RP-SMA 5G/2.4GHz
AD-300N	R3410110219	3dBi/5dBi 2.4G/5GHz Dipole RP-SMA
CBIRF-NE150	R3470300025	RF Cable, I-PEXMHF4 to RP-SMA(F); L150mm; Coaxial 0.81 Black
CBIRF-NE250	R3470300026	RF Cable, I-PEXMHF4 to RP-SMA(F); L250mm; Coaxial 0.81 Black