

# WNFQ-261ACNI(BT)

802.11ac/a/b/g/n Industrial-Grade

2T2R Wi-Fi+Bluetooth 4.2 Combo

M.2 2230 Module



## Industrial-Grade Wi-Fi+Bluetooth Combo Solution M.2 2230 Module

SparkLAN WNFQ-261ACNI(BT) is an 802.11ac/a/b/g/n Dual-Band Wi-Fi+Bluetooth M.2 230 module based on Qualcomm Atheros QCA6174A chipset. This highly integrated module supports most of WLAN capabilities with seamless roaming and advanced security for enterprise application. The wireless module complies with IEEE 802.11ac/a/b/g/n 2x2 MIMO. The Bluetooth Supports BT 4.2+HS, BLE and is backwards compatible with BT 1.X, 2.X Enhanced Data Rate. The integrated module provides PCIE Interface for Wi-Fi and USB interface for Bluetooth. The download speed are 300Mbps on N networks and 867Mbps on AC network.

Adopting the latest 802.11ac solution. WNFQ-261ACNI(BT) is ideal for next-generation high throughput enterprise networking and Industrial-graded (-40°C~+85°C) solution. Incorporated with advanced security encryption, such as WEP, WPA, WPA2 and 802.1x, it helps prevent user's devices from malicious attacks.

### Embedded Application

Applications include IPC/ Advertising machine/ OTT/ IPTV/ DVB/ STB / DV/ Mini Driving Recorder/ Intelligent Projector Pico/ VR/ AR terminal/ POS machine/ Vehicle mounted front/ Rear Terminal UAV/ Robot/ Intelligent Gateway/ Smart city and other electronic products.

### Key Feature

- Supports low power PCIe (w/L1 substate) interfaces for WLAN and USB1.1 interface for Bluetooth.
- Support Bluetooth 4.2+HS, BLE, ANT+ and be backwards compatible with Bluetooth 1.2, 2.X + enhanced data rate.
- NGFF (M.2) Form factor which is compliant with ROHS requirements.

**Specification**

<b>Standards</b>	IEEE 802.11ac/a/b/g/n (2T2R) Bluetooth 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 802.11ac/a/b/g/n ISM Band, 2.400GHz~2.497GHz, 5.150GHz~5.845GHz *Subject to local regulations
<b>Interface</b>	WLAN: PCIe Bluetooth: USB
<b>Form Factor</b>	M.2 2230
<b>Antenna</b>	2 x IPEX MHF4 connectors (ANT1 for WIFI+BT, ANT2 for WIFI)
<b>Modulation</b>	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
<b>Power Consumption</b>	TX mode: 610mA RX mode: 285mA
<b>Operating Voltage</b>	DC 3.3V
<b>Operating Temperature Range</b>	-40°C~85°C
<b>Storage Temperature Range</b>	-40°C~85°C
<b>Humidity</b>	10%~95% (Operating)

<b>(Non-Condensing)</b>	10%~95% (Storing)
<b>Dimension L x W x H (in mm)</b>	30mm(±0.15mm) x 22mm(±0.15mm) x 1.95mm(±0.2mm)
<b>Weight (g)</b>	2.4g
<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, WPA3, 802.1x

### OUTPUT POWER & SENSITIVITY

#### 802.11b

Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
11Mbps	15dBm	$\leq$ -91dBm

#### 802.11g

Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
54Mbps	15dBm	$\leq$ -75dBm

#### 802.11n / 2.4GHz

	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
HT20	MCS7	13dBm	16dBm	$\leq$ -71dBm
HT40	MCS7	13dBm	16dBm	$\leq$ -69dBm

#### 802.11a

Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
54Mbps	13dBm	$\leq$ -65dBm

#### 802.11n / 5GHz

	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
HT20	MCS7	10dBm	13dBm	$\leq$ -74dBm
HT40	MCS7	10dBm	13dBm	$\leq$ -71dBm

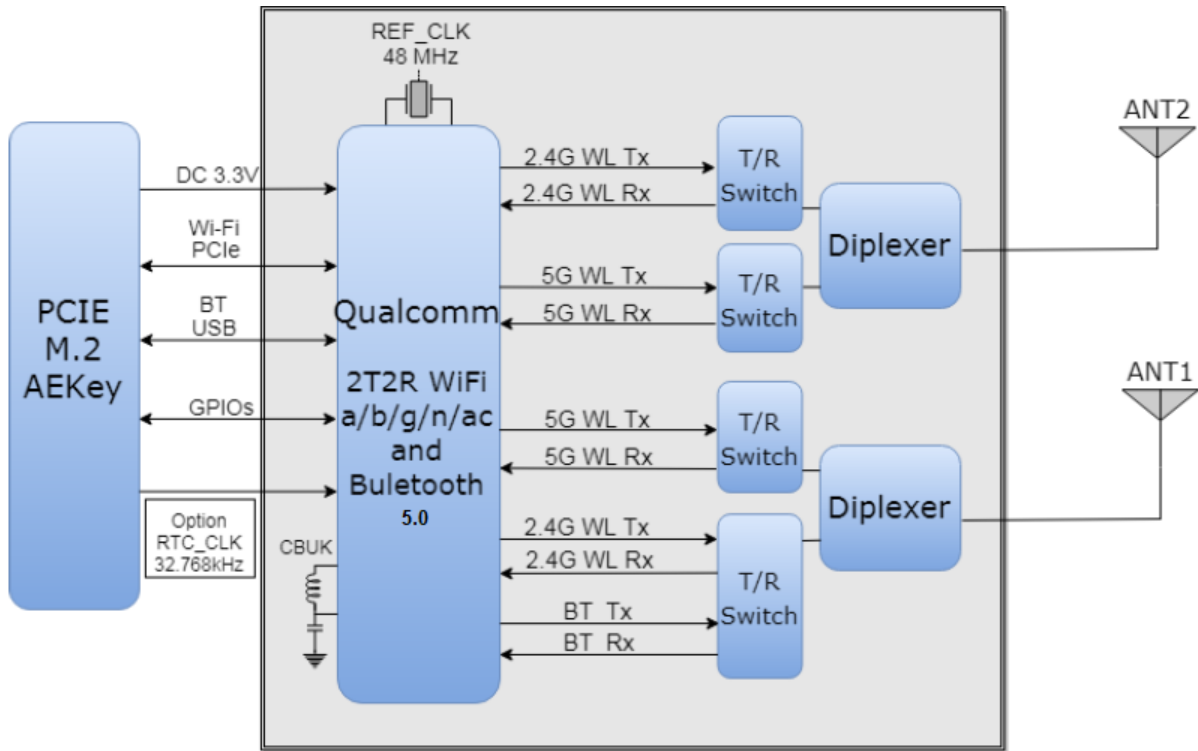
#### 802.11ac

	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
VHT80	MCS9	10dBm	13dBm	$\leq$ -63dBm

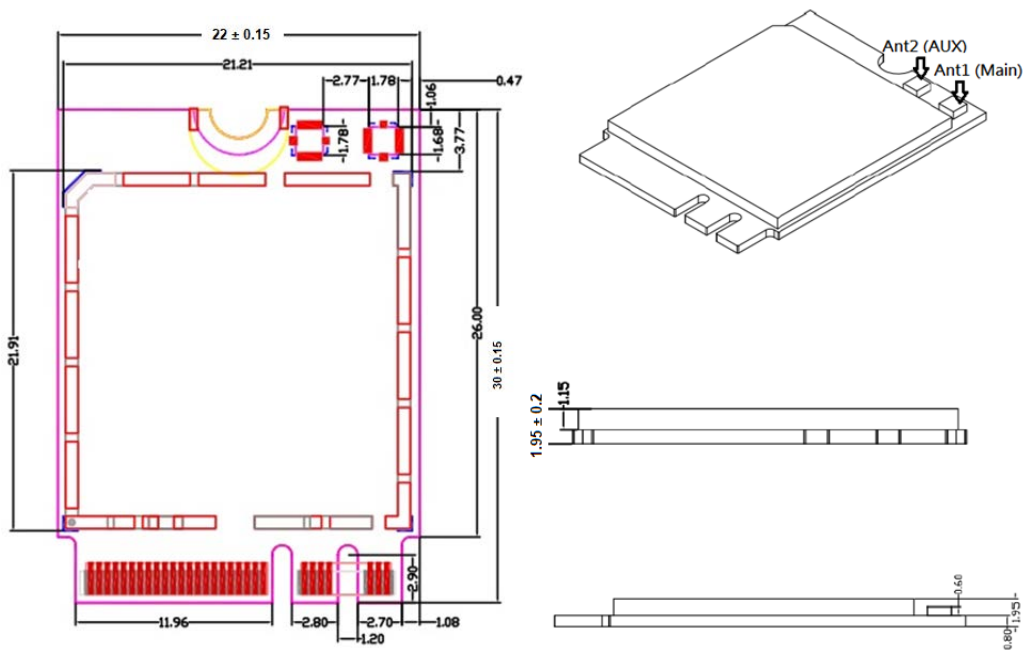
#### Bluetooth

Data Rate	Tx $\pm$ 2dBm (Class 1 Device)	Rx Sensitivity
3Mbps	+2 $\leq$ Output Power $\leq$ 6dBm	<0.1% BR, BER at -83dBm

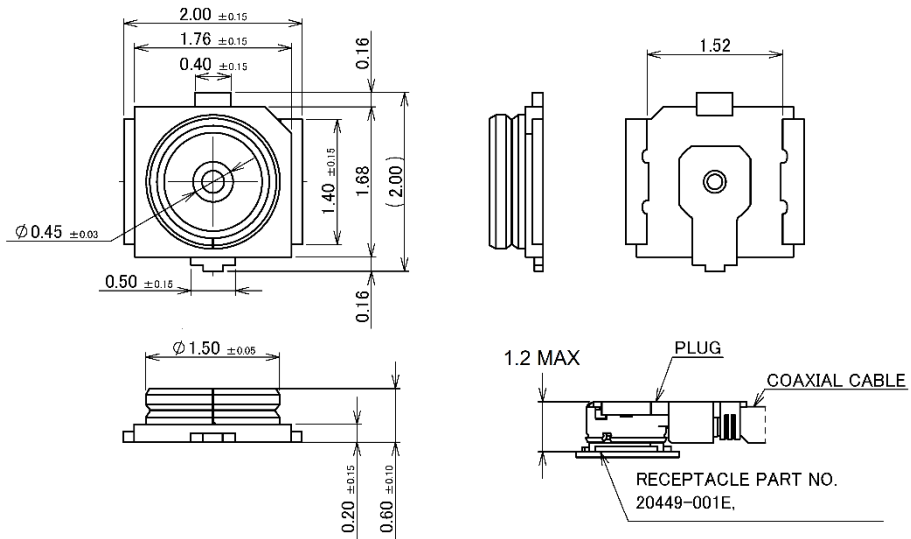
## Block Diagram



## Mechanical Dimension (mm)

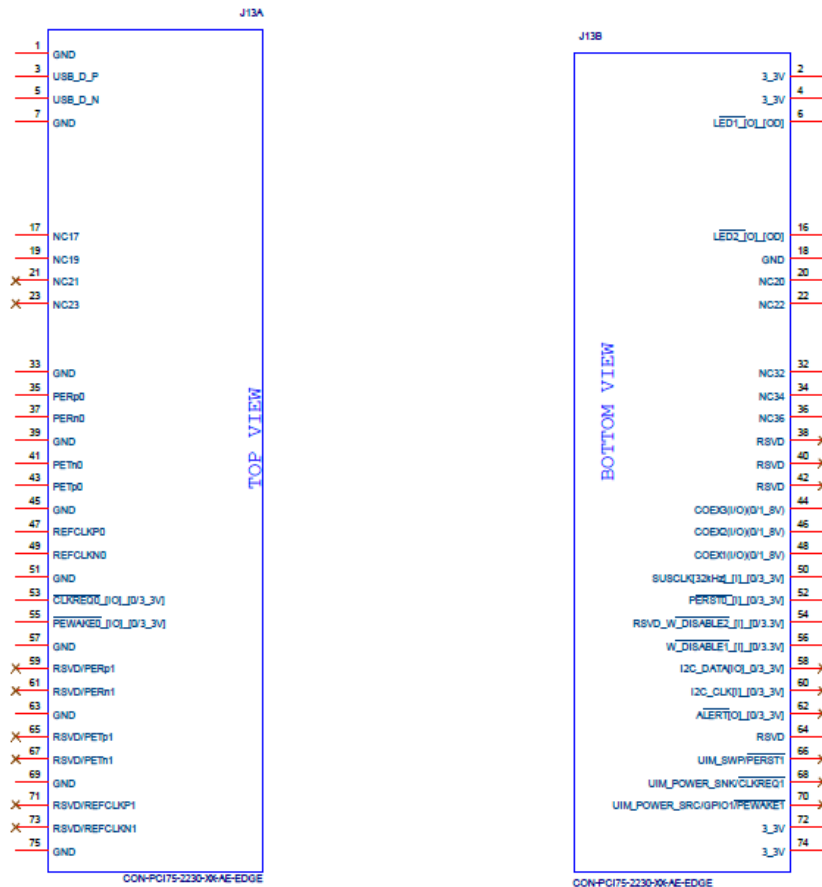


### MHF4 connector spec.



Unit: mm

### Pin Assignment



## Pin Assignment

TOP			
Pin#	Pin Name	Type	Description
1	GND	-	Ground connections
3	USB_D_P	I/O	USB serial differential data Positive
5	USB_D_N	I/O	USB serial differential data Negative
7	GND	-	Ground connections
17	NC	-	No connect
19	NC	-	No connect
21	NC	-	No connect
23	NC	-	No connect
33	GND	-	Ground connections
35	PCIE_RX_P	I	PCI Express receive data-Positive
37	PCIE_RX_N	I	PCI Express receive data-Negative
39	GND	-	Ground connections
41	PCIE_TX_N	O	PCI Express transmit data- Negative
43	PCIE_TX_P	O	PCI Express transmit data- Positive
45	GND	-	Ground connections
47	PCIE_RCLK_P	I	PCI Express differential clock input- Positive
49	PCIE_RCLK_N	I	PCI Express differential clock input- Negative
51	GND	-	Ground connections
53	PCIE_CLKREQ_L	I/O	PCIe clock request
55	PCIE_WAKE_L	O	PCIe wake signal
57	GND	-	Ground connections
59	NC	-	No connect
61	NC	-	No connect
63	GND	-	Ground connections
65	NC	-	No connect
67	NC	-	No connect
69	GND	-	Ground connections
71	NC	-	No connect
73	NC	-	No connect
75	GND	-	Ground connections

## Pin Assignment

BOTTOM			
Pin#	Pin Name	Type	Description
2	VDD_3V3	I	VDD system power supply input
4	VDD_3V3	I	VDD system power supply input
6	WLAN_LED	OD	WLAN LED
16	BT_LED	OD	Bluetooth LED
18	GND	-	Ground connections
20	NC	-	No connect
22	NC	-	No connect
32	NC	-	No connect
34	NC	-	No connect
36	NC	-	No connect
38	NC	-	No connect
40	NC	-	No connect
42	NC	-	No connect
44	NC	-	No connect
46	NC	-	No connect
48	NC	-	No connect
50	32KHz_CLK_IN	I	32.768KHz CLOCK INPUT
52	PCIE_PERST_L	I	PCIe host indication to reset the device Active low.
54	BT_RF_KILL_L	I	Turn off BT RF analog and front-end. Active low.
56	WLAN_RF_KILL_L	I	Turn off WLAN RF analog and front-end. Active low.
58	NC	-	No connect
60	NC	-	No connect
62	NC	-	No connect
64	NC	-	No connect
66	NC	-	No connect
68	NC	-	No connect
70	NC	-	No connect
72	VDD_3V3	I	VDD system power supply input
74	VDD_3V3	I	VDD system power supply input



## Certification

### 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
WNFQ-261ACNI(BT)	R9701810007	802.11ac/a/b/g/n Industrial Grade 2T2R WiFi + BT4.2 M.2 2230 Module

## Optional Accessory

Product Name	Part Number	Description
AD-103AG	R3410110203	Dipole Antenna, 2dBi 2.4GHz/5GHz, RP-SMA(M) connector
AD-302N	R3410110221	Dipole Antenna, 3dBi/2dBi 2.4G/5GHz, RP-SMA(M) connector
AD-303N	R3410110222	Dipole Antenna, 3dBi/3dBi 2.4G/5GHz, RP-SMA(M) connector
AD-305N	R3410110223	Dipole Antenna, 5dBi/5dBi 2.4G/5GHz, RP-SMA(M) connector
CBIRF-NE150	R3470300025	RF Cable, I-PEX/MHF4 to RP-SMA(F); L:150mm; Coaxial 0.81 Black
CBIRF-NE250	R3470300026	RF Cable, I-PEX/MHF4 to RP-SMA(F); L:250mm; Coaxial 0.81 Black