

## WPEQ-261ACN(BT)

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

2T2R Wi-Fi+Bluetooth 5.0 Combo

Half Mini PCIe Module



V2

### Wi-Fi+Bluetooth Combo Solution Half Mini PCIe Module

WPEQ-261ACN(BT) is a single-die wireless local area network (WLAN) and Bluetooth combo solution to support 2x2 multi-user multiple input, multiple output (MU-MIMO) with two spatial streams IEEE 802.11ac/a/b/g/n WLAN standards and Bluetooth 5.0, designed to deliver superior integration of WLAN+Bluetooth and low energy technology.

WPEQ-261ACN(BT) 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. WPEQ-261ACN (BT) integrates the Bluetooth transmission technology for voice and data transfers between devices in a short distance. WPEQ-261ACN (BT) is designed properly for any wireless enabled devices with Half Mini PCIe slot.

#### Embedded Application

Applications include medical devices, security systems, industrial PC, 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 PCIe (w/L1 substrate) interfaces

**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 802.11ac/a/b/g/n ISM Band: 2.412GHz~2.484GHz, 5.150GHz~5.850GHz *Subject to local regulations
<b>Interface</b>	WLAN: PCIe Bluetooth: USB
<b>Form Factor</b>	Half Mini PCIe
<b>Antenna</b>	2 x IPEX MHF4 connectors Support WLAN/BT co-existence Main: WLAN Aux: WLAN /BT
<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~70°C
<b>Storage Temperature Range</b>	-40°C~85°C
<b>Humidity (Non-Condensing)</b>	5%~90% (Operating) 5%~90% (Storing)
<b>Dimension L x W x H (in mm)</b>	30mm(±0.3mm) x 26.8mm(±0.3mm) x 2.5mm(±0.3mm)
<b>Weight (g)</b>	2.6g
<b>Driver Support</b>	Win7/8.1/10 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	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

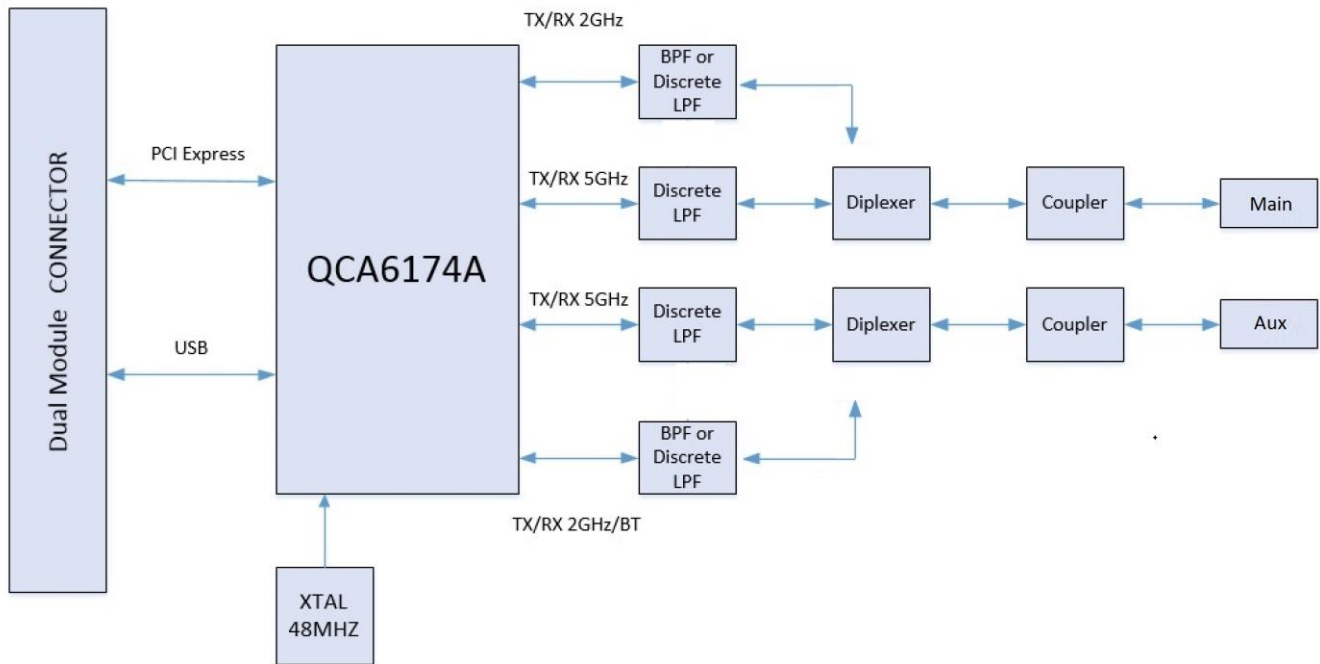
802.11a		
Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
54Mbps	10.5dBm	$\leq$ -65dBm

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

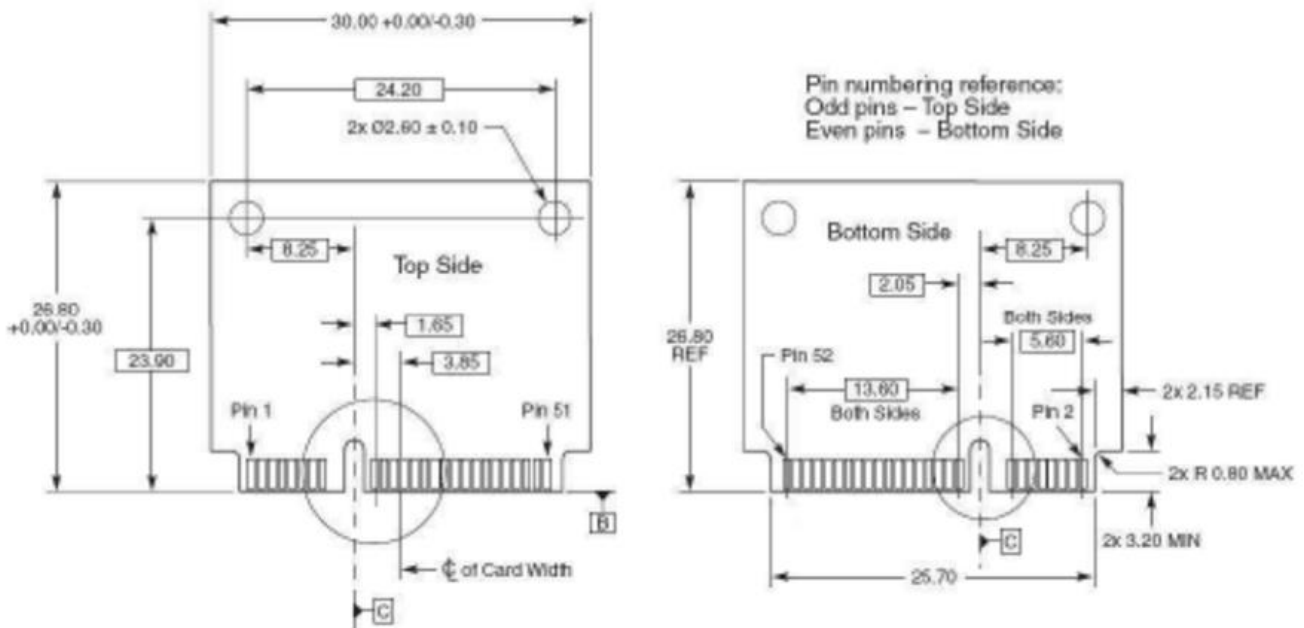
802.11ac				
	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
VHT80	MCS9	6dBm	9dBm	$\leq$ -51dBm

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

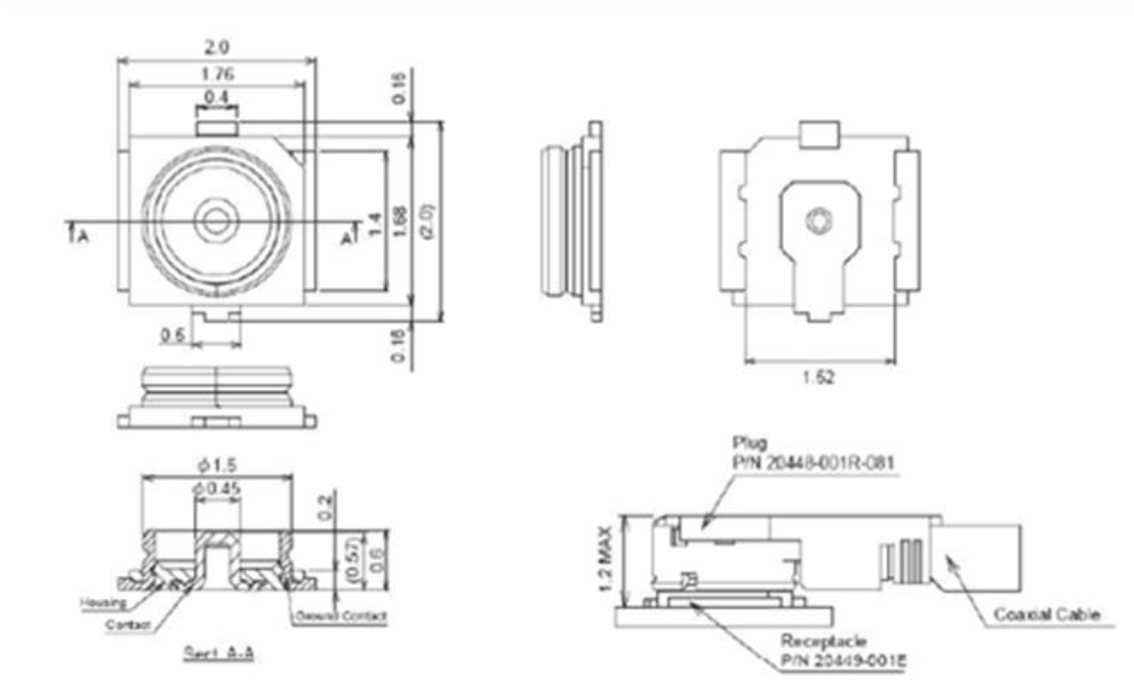
**Block Diagram**



**Mechanical Dimension (mm)**



### MHF4 connector Spec.



### Pin Assignment

Pin#	Pin Name	Description	Pin#	Pin Name	Description
1	WAKE_L(OPT)	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.	2	+3.3V	+3.3V
3	No Connection	-	4	GND	GND
5	No Connection	-	6	No Connection	-
7	CLKREQ_L	Output for reference clock request signal	8	No Connection	-
9	GND	GND	10	No Connection	-
11	REFCLK-	Input signal for PCI Express differential reference clock (100 MHz)	12	No Connection	-
13	REFCLK+	Input signal for PCI Express differential reference clock (100 MHz)	14	No Connection	-
15	GND	GND	16	No Connection	-
17	No Connection	-	18	GND	GND

## Pin Assignment

Pin#	Pin Name	Description	Pin#	Pin Name	Description
19	No Connection	-	20	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.
21	GND	GND	22	PERST_L	Input signal for functional reset to the card
23	PERn0	PCI Express x1 data interface: one differential receive pair	24	No Connection	-
25	PERp0	PCI Express x1 data interface: one differential receive pair	26	GND	GND
27	GND	GND	28	No Connection	-
29	GND	GND	30	No Connection	-
31	PETn0	PCI Express x1 data interface: one differential transmit pair	32	No Connection	-
33	PETp0	PCI Express x1 data interface: one differential transmit pair	34	GND	GND
35	GND	GND	36	USB D-	USB_D-
37	GND	GND	38	USB D+	USB_D+
39	No Connection	-	40	GND	GND
41	No Connection	-	42	No Connection	-
43	GND	GND	44	LED_WLAN_L (OPT)	Output and open drain active low signal. This signal is used to allow the PCI Express Mini Card add-in card to provide status indicators via LED devices that will be provided by the system.
45	No Connection	-	46	No Connection	-
47	No Connection	-	48	No Connection	-
49	No Connection	-	50	GND	GND
51	No Connection	-	52	+3.3V	+3.3V

## Certification

### PIFA Ant.

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> FCC | <input checked="" type="checkbox"/> CE (RED EN 300 328 V2.1.1 / EN 301 893 V2.1.1) |
| <input checked="" type="checkbox"/> IC  | <input checked="" type="checkbox"/> MIC  |
| <input checked="" type="checkbox"/> NCC | <input checked="" type="checkbox"/> ASNZS  |

### Dipole Ant.

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> FCC | <input checked="" type="checkbox"/> CE (RED EN 300 328 V2.1.1 / EN 301 893 V2.1.1) |
| <input checked="" type="checkbox"/> IC  | <input checked="" type="checkbox"/> MIC  |
| <input checked="" type="checkbox"/> NCC | <input type="checkbox"/> ASNZS   |

## Ordering Information

Product Name	Part Number	Description
WPEQ-261ACN(BT)	R9701890021	802.11ac/a/b/g/n Wi-Fi+BT Combo Half Mini PCIe Module

## 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