

# WPEQ-261ACNI(BT)

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

2T2R Wi-Fi+Bluetooth 4.2 Combo

Half mini PCIe Module



## Industrial-Grade Wi-Fi+Bluetooth Combo Solution

WPEQ-261ACNI(BT) is high performance 802.11ac/a/b/g/n dual band 2T2R Industrial-Grade (-40°C ~85°C) Wi-Fi+Bluetooth 4.2 combo mini PCIe module, multiple output (MU-MIMO) with two spatial streams IEEE802.11ac/a/b/g/n WLAN standards and Bluetooth 4.2+HS, designed to deliver superior integration of WLAN+Bluetooth and low energy technology.

It supports Windows and Linux Drivers solution. WPEQ-261ACNI(BT) is using a QCA6174A-5 along with Windows and Linux driver which provide excellent solution for Automation/ Robotic various applications. Adopting the latest 802.11ac solution. WPEQ-261ACNI(BT) 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. WPEQ-261ACNI (BT) is integrates the Bluetooth transmission technology for voice and data transfers between devices in a short distance.

### Embedded Application

Applications include medical devices, security systems, industrial PC, Point of Sale, digital signs, set-top/net-top box, embedded / tablet PC's, Vehicle mounted front, Robot/ Intelligent Gateway, Gaming machine, etc.

### 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.
- Supports 20/40 MHz at 2.4 GHz and supports 20/40/80 MHz at 5 GHz (SW PL determines 2.4 GHz HT40/VHT40 support)
- Compatible for 5 GHz 802.11ac, or 2.4/5 GHz 802.11n WLAN applications.

**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>	Half Mini PCIe
<b>Antenna</b>	2 x IPEX MHF1 connectors (ANT1 for WLAN/BT, ANT2 for WLAN)
<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 (Non-Condensing)</b>	10%~95% (Operating) 10%~95% (Storing)

<b>Dimension L x W x H (in mm)</b>	29.85mm( $\pm$ 0.15mm) x 26.65mm( $\pm$ 0.15mm) x 2.65mm( $\pm$ 0.2mm)
<b>Weight (g)</b>	3.5g
<b>Driver Support</b>	Windows 7/8.1/10/11 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

HT20	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
	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

HT20	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
	MCS7	12.5dBm	15.5dBm	$\leq$ -74dBm
HT40	MCS7	12.5dBm	15.5dBm	$\leq$ -71dBm

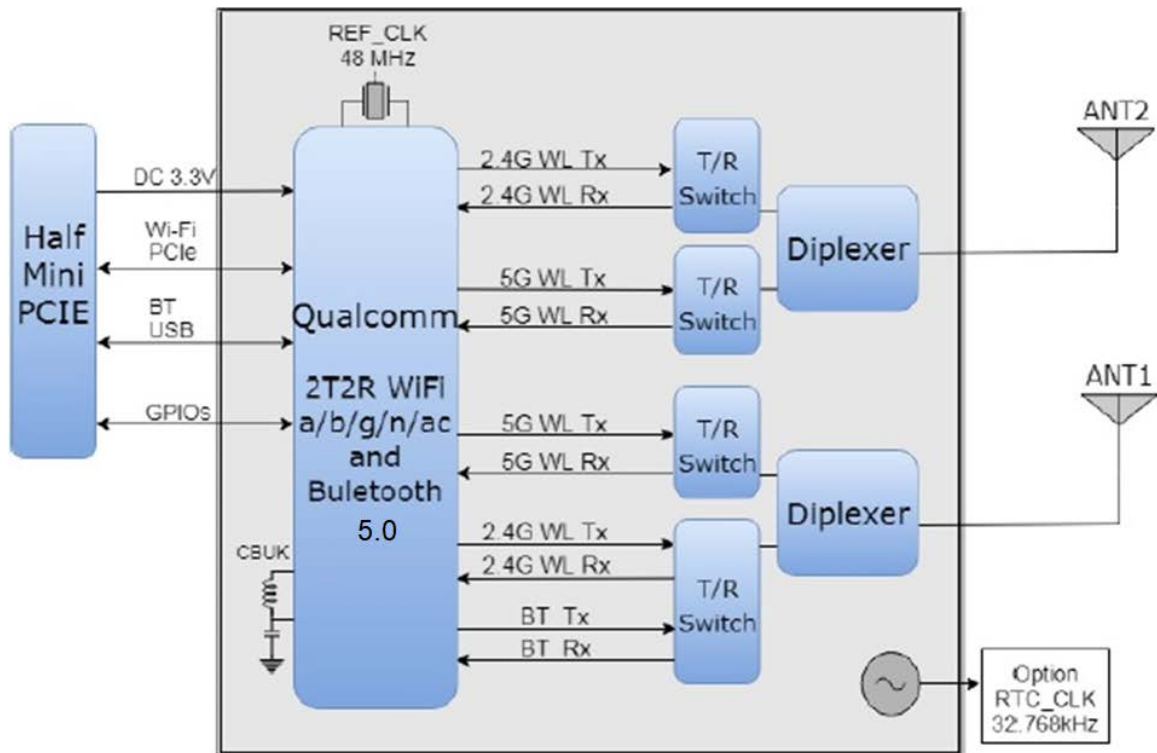
#### 802.11ac

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

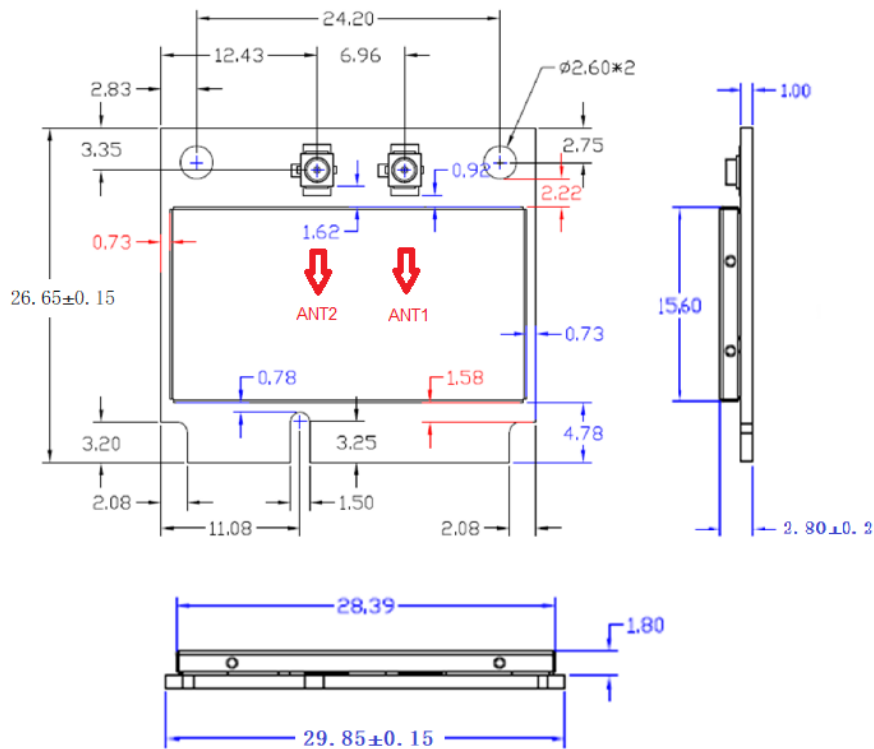
#### Bluetooth

Data Rate	Tx $\pm$ 2dBm (Class 1 Device)	Rx Sensitivity
3Mbps	$3 \leq$ Output Power $\leq$ 7dBm	<0.1% BR, BER at -83dBm

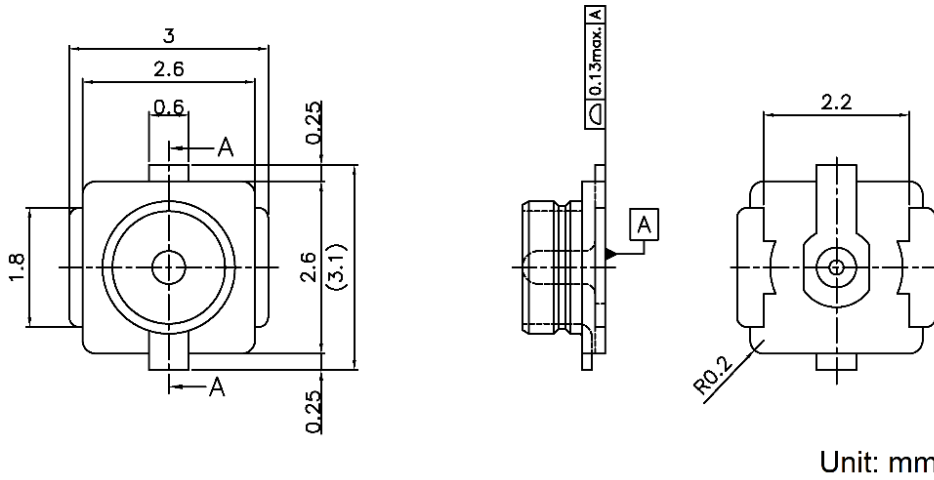
## Block Diagram



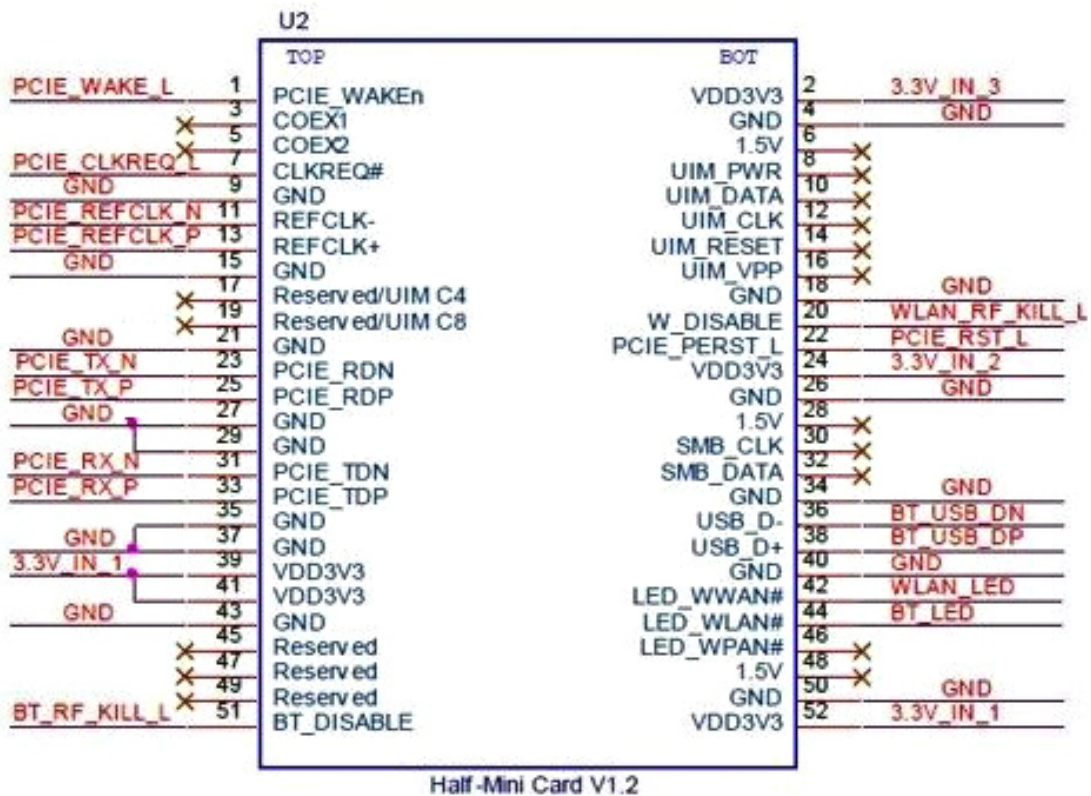
## Mechanical Dimension (mm)



## MHF1 connector spec.



## Pin Assignment



## Pin Assignment

TOP			
Pin#	Pin Name	Type	Description
1	PCIE_WAKE_L	OD	PCIe wake signal
3	NC	-	No connect
5	NC	-	No connect
7	PCIE_CLKREQ_L	OD	PCIe clock request
9	GND	-	Ground connections
11	PCIE_RCLK_N	I	PCI Express differential clock input- Negative
13	PCIE_RCLK_P	I	PCI Express differential clock input- Positive
15	GND	-	Ground connections
17	NC	-	No connect
19	NC	-	No connect
21	GND	-	Ground connections
23	PCIE_TX_N	O	PCI Express transmit data- Negative
25	PCIE_TX_P	O	PCI Express transmit data- Positive
27	GND	-	Ground connections
29	GND	-	Ground connections
31	PCIE_RX_N	I	PCI Express transmit data- Negative
33	PCIE_RX_P	I	PCI Express transmit data- Positive
35	GND	-	Ground connections
37	GND	-	Ground connections
39	VDD_3V3	I	VDD system power supply input
41	VDD_3V3	I	VDD system power supply input
43	GND	-	Ground connections
45	NC	-	No connect
47	NC	-	No connect
49	NC	-	No connect
51	BT_RF_KILL_L	I	Turn off BT RF analog and front-end. Active low

Note: Each pin has a type, that power (P), ground (G), open-drain (OD), input (I), and output (O)

## Pin Assignment

BOTTOM			
Pin#	Pin Name	Type	Description
2	VDD_3V3	I	VDD system power supply input
4	GND	-	Ground connections
6	NC	-	No connect
8	NC	-	No connect
10	NC	-	No connect
12	NC	-	No connect
14	NC	-	No connect
16	NC	-	No connect
18	GND	-	Ground connections
20	WLAN_RF_KILL_L	I	Turn off WLAN RF analog and front-end. Active low.
22	PCIE_PERST_L	I	PCIe host indication to reset the device Active low.
24	VDD_3V3	I	VDD system power supply input
26	GND	-	Ground connections
28	NC	-	No connect
30	NC	-	No connect
32	NC	-	No connect
34	GND	-	Ground connections
36	USB_D-	I/O	USB serial differential data Negative
38	USB_D+	I/O	USB serial differential data Positive
40	GND	-	Ground connections
42	WLAN_LED	OD	WLAN LED
44	BT_LED	OD	Bluetooth LED
46	NC	-	No connect
48	NC	-	No connect
50	GND	-	Ground connections
52	VDD_3V3	I	VDD system power supply input

Note: Each pin has a type, that power (P), ground (G), open-drain (OD), input (I), and output (O)



## 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
WPEQ-261ACNI(BT)	R9701890030	11ac/a/b/g/n Industrial Grade 2T2R WiFi + BT Half Mini PCIe

## 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-ME150	R3470300023	RF Cable, I-PEX/MHF1 to RP-SMA(F); L:150mm; Coaxial 1.37 Black
CBIRF-ME250	R3470300024	RF Cable, I-PEX/MHF1 to RP-SMA(F); L:250mm; Coaxial 1.37 Black