

WPEQ-261ACNI(BT)

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

2T2R Wi-Fi+Bluetooth 5.0 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 5.0 combo mini PCIe module, multiple output (MU-MIMO) with two spatial streams IEEE802.11ac/a/b/g/n WLAN standards and Bluetooth 5.0+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 5.0. 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 5.0 + 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

| | |
|--------------------------------------|---|
| Standards | IEEE 802.11ac/a/b/g/n (2T2R) Bluetooth V5.0, V4.2, V4.1, V4.0 LE, V3.0+HS, V2.1+EDR |
| Chipset | Qualcomm 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: 2.400GHz~2.497GHz, 5.150GHz~5.845GHz *Subject to local regulations |
| Interface | WLAN: PCIe ; Bluetooth: USB |
| Form Factor | Half Mini PCIe |
| Antenna | 2 x IPEX MHF1 connectors (ANT1 for WLAN/BT, ANT2 for WLAN) |
| 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~85°C |
| Storage Temperature Range | -40°C~85°C |
| Humidity (Non-Condensing) | 10%~95% (Operating) 10%~95% (Storing) |

| | |
|------------------------------------|---|
| Dimension L x W x H (in mm) | 29.85mm(± 0.15 mm) x 26.65mm(± 0.15 mm) x 2.65mm(± 0.2 mm) |
| Weight (g) | 3.5g |
| Driver Support | Win7/8.1/10 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 | 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 |
| | MCS7 | 13dBm | 16dBm | \leq -69dBm |

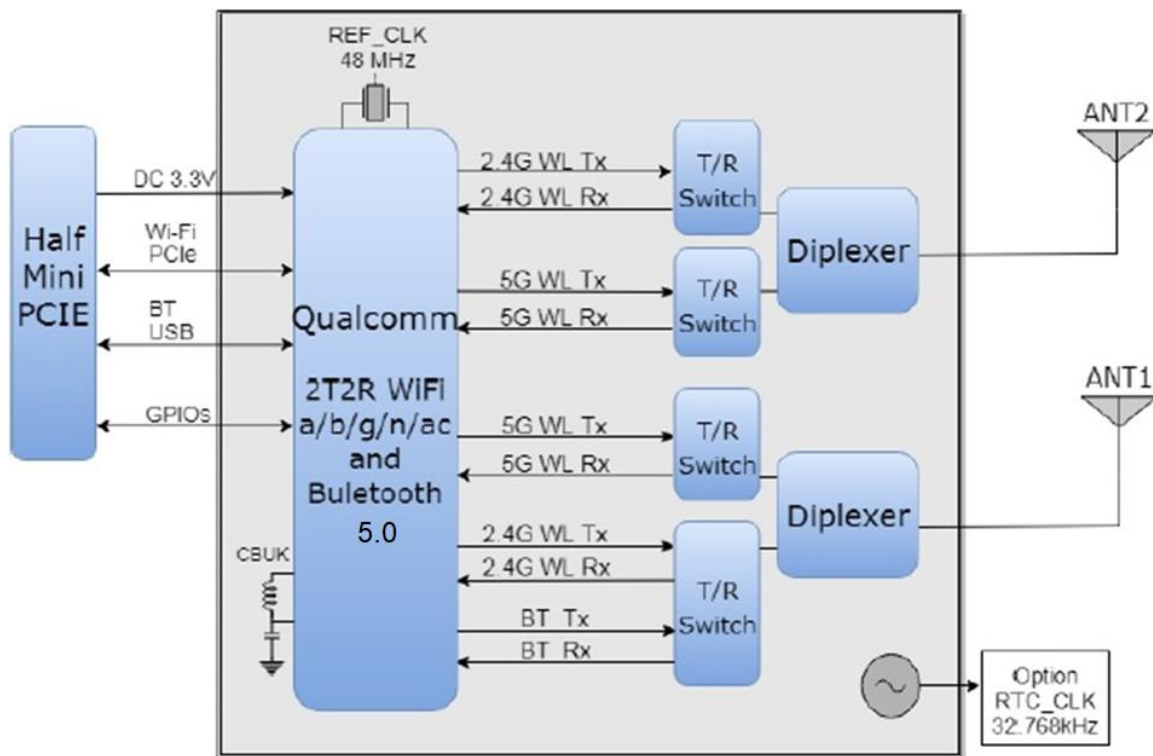
| 802.11a | | |
|-----------|---------------|----------------|
| Data Rate | Tx \pm 2dBm | Rx Sensitivity |
| 54Mbps | 13dBm | \leq -65dBm |

| 802.11n / 5GHz | | | | |
|----------------|-----------|---------------------|---------------------|----------------|
| | Data Rate | Tx \pm 2dBm (1TX) | Tx \pm 2dBm (2TX) | Rx Sensitivity |
| HT20 | MCS7 | 12.5dBm | 15.5dBm | \leq -74dBm |
| | MCS7 | 12.5dBm | 15.5dBm | \leq -71dBm |

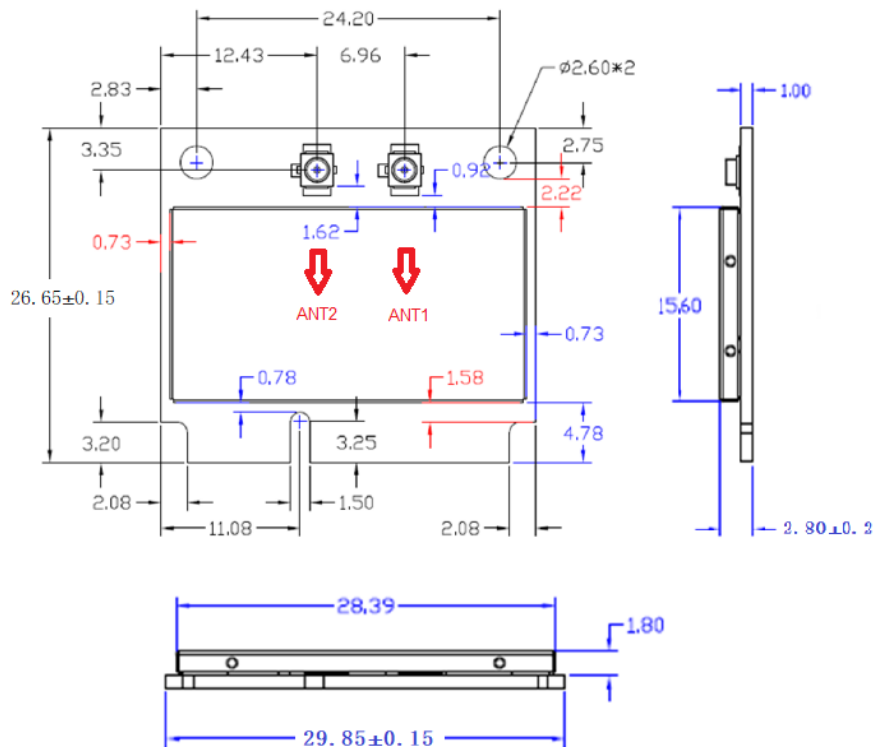
| 802.11ac | | | | |
|----------|-----------|---------------------|---------------------|----------------|
| | Data Rate | Tx \pm 2dBm (1TX) | Tx \pm 2dBm (2TX) | Rx Sensitivity |
| VHT80 | MCS9 | 10dBm | 13dBm | \leq -63dBm |

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

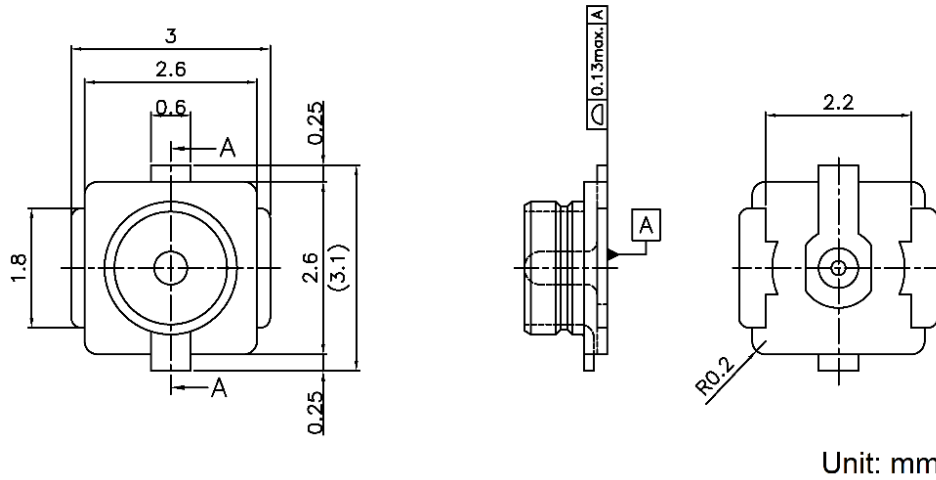
Block Diagram



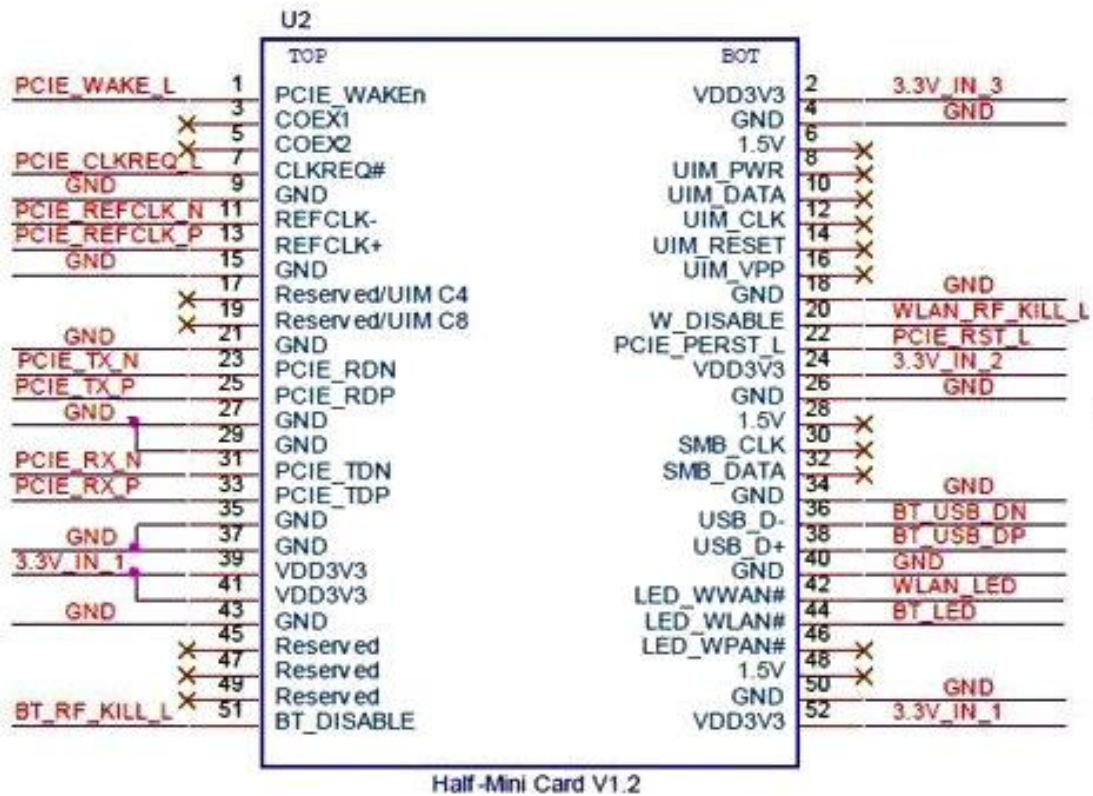
Mechanical Dimension (mm)



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) | R9701890018 | 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 |