

WNFQ-258ACN(BT)

802.11ac/a/b/g/n Dual Band 2T2R

WiFi+ BT 4.1 Combo M.2 Module



WiFi +Bluetooth Combo Solution M.2 Module

Spark LAN WNFQ-258ACN(BT) is an 802.11ac/a/b/g/n Dual -Band WiFi + bluetooth M.2 card based on Qualcomm Atheros QCA6174A chipset. It was opened to test functionality. It is dual band AC on 2.4 and 5GHz and incorporates the latest Bluetooth 4.1. The slot type is M.2 2230. The download speed are 300Mbps on N networks and 867Mbps on AC network.

Adopting the latest 802.11ac solution. WNFQ-158ACN(BT) is ideal for next-generation high throughput enterprise networking solution. Incorporated with advanced security encryption, such as WEP, WPA, WPA2, 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 PCIe (w/ L1 substate) interfaces
- Two-stream spatial multiplexing up to 867Mbps data rate

Specification :

| | |
|------------------------------|---|
| Standards: | IEEE802.11ac/a/b/g/n, Bluetooth 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 BT: 1 Mbps, 2Mbps and Up to 3Mbps |
| Operating Frequency: | IEEE 802.11 ac/a/b/g/n ISM Band, 2.412GHz ~ 2.484GHz, 5.150MHz ~ 5.850MHz *Subject to local regulations |
| Interface: | WiFi: PCI Express BT: USB 2.0 |
| Form Factor: | M.2 2230 |
| Antenna: | 2T2R (Support WiFi/BT co-existence) IPEX MHF4 connector |
| Modulation: | 802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11a/g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM) |
| Power consumption | TX: 405mA RX: 200mA |
| Operating Voltage: | DC 3.3V |
| Temperature Range: | 0°~+70°C (Operating) / -40°~+80°C (Storing) |
| Humidity (Non-Condensing) | Operating Humidity (non-condensing): 5% ~ 90% Storage Humidity (non-condensing): 5% ~ 90% |
| Dimension (in mm): | 22 mm X 30 mm x 2.0 mm |
| Weight (g): | ≤ 2.5g |
| Driver Support: | Win7/Win8.1//Win10 |
| Security | WEP / WPA / WPA2,802.1X |

OUTPUT POWER & SENSITIVITY

802.11b

| Data Rate | Tx \pm 2dBm | Rx Sensitivity |
|-----------|---------------|----------------|
| 11Mbps | 19dBm | ≤ -81 dBm |

802.11g

| Data Rate | Tx \pm 2dBm | Rx Sensitivity |
|-----------|---------------|----------------|
| 54Mbps | 16dBm | ≤ -66 dBm |

802.11n / 2.4GHz

| HT20 | Data Rate | Tx \pm 2dBm (1TX) | Tx \pm 2dBm (2TX) | Rx Sensitivity |
|------|-----------|---------------------|---------------------|----------------|
| | MCS7 | 16dBm | 19dBm | ≤ -65 dBm |
| HT40 | MCS7 | 15dBm | 18dBm | ≤ -61 dBm |

802.11a

| Data Rate | Tx \pm 2dBm | Rx Sensitivity |
|-----------|---------------|----------------|
| 54Mbps | 11dBm | ≤ -66 dBm |

802.11n / 5GHz

| HT20 | Data Rate | Tx \pm 2dBm (1TX) | Tx \pm 2dBm (2TX) | Rx Sensitivity |
|------|-----------|---------------------|---------------------|----------------|
| | MCS7 | 9dBm | 12dBm | ≤ -65 dBm |
| HT40 | MCS7 | 9dBm | 12dBm | ≤ -61 dBm |

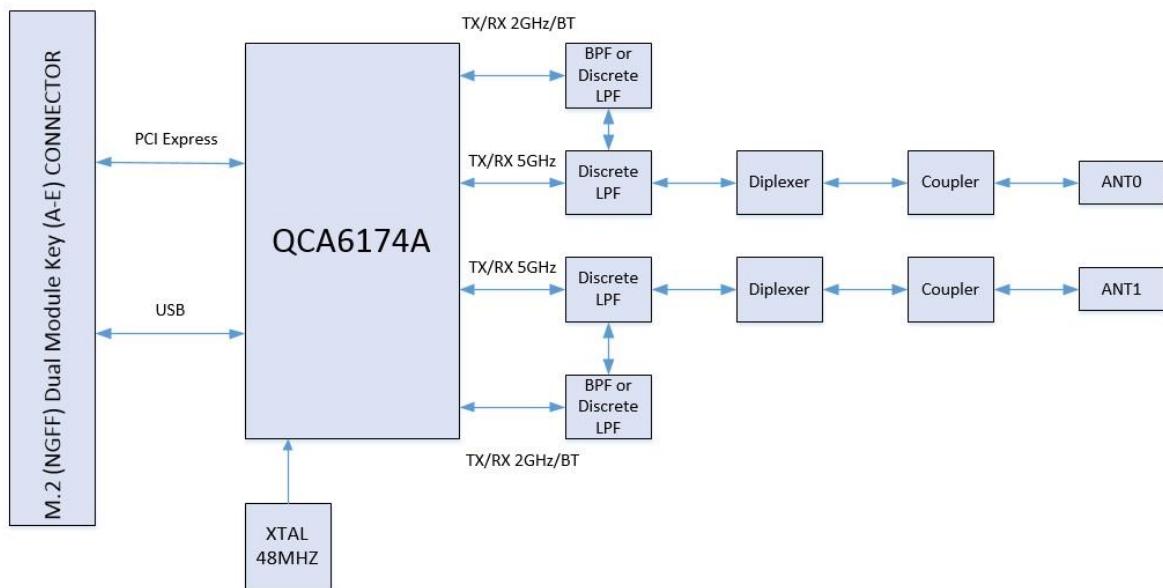
802.11ac

| HT80 | Data Rate | Tx \pm 2dBm (1TX) | Tx \pm 2dBm (2TX) | Rx Sensitivity |
|------|-----------|---------------------|---------------------|----------------|
| | MCS9 | 7dBm | 10dBm | ≤ -56 dBm |

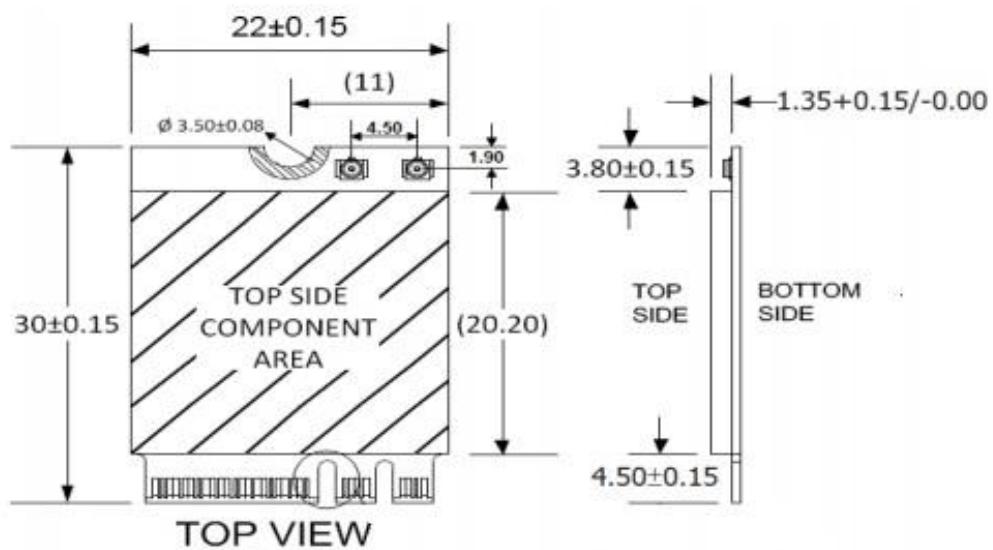
Bluetooth

| Data Rate | Tx \pm 2dBm (Class 2 Device) | Rx Sensitivity |
|-----------|-------------------------------------|---------------------|
| 3Mbps | $0 \leq$ Output Power $\leq +4$ dBm | <0.1% BER at -70dBm |

Block Diagram



Mechanical Dimension (mm)



Pin Assignment

| Pin# | Pin Name | Description | Pin # | Pin Name | Description |
|------|---------------|---|-------|-------------------|---|
| 1 | GND | GND | 2 | +3.3V | +3.3V |
| 3 | USB_D+ | USB_D+ | 4 | +3.3V | +3.3V |
| 5 | USB_D- | USB_D- | 6 | 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. |
| 7 | GND | GND | 8 | No Connection | - |
| 9 | No Connection | - | 10 | No Connection | - |
| 11 | No Connection | - | 12 | No Connection | - |
| 13 | No Connection | - | 14 | No Connection | - |
| 15 | No Connection | - | 16 | BT_LED | Status indicators via LED devices that will be provided by the system and it is an open drain. |
| 17 | No Connection | - | 18 | GND | GND |
| 19 | No Connection | - | 20 | No Connection | - |
| 21 | No Connection | - | 22 | No Connection | - |
| 23 | No Connection | - | 24 | No Connection | - |
| 25 | No Connection | - | 26 | No Connection | - |
| 27 | No Connection | - | 28 | No Connection | - |
| 29 | No Connection | - | 30 | No Connection | - |
| 31 | No Connection | - | 32 | No Connection | - |
| 33 | GND | GND | 34 | No Connection | - |
| 35 | PERp0 | PCI Express x1 data interface: one differential receive pair | 36 | No Connection | - |
| 37 | PERn0 | PCI Express x1 data interface: one differential receive pair | 38 | Reserved | - |
| 39 | GND | GND | 40 | Reserved | - |
| 41 | PETp0 | PCI Express x1 data interface: one differential transmit pair | 42 | Reserved | - |
| 43 | PETn0 | PCI Express x1 data interface: one differential transmit pair | 44 | COEX3_ACTIVE(OPT) | LTE_COEX3 |
| 45 | GND | GND | 46 | COEX2_PRI(OPT) | LTE_COEX2 |
| 47 | REFCLK+ | Input signal for PCI Express differential reference clock (100 MHz) | 48 | COEX1_SYNC(OPT) | LTE_COEX1 |

| Pin# | Pin Name | Description | Pin# | Pin Name | Description |
|------|-------------|---|------|--------------------|--|
| 49 | REFCLK- | Input signal for PCI Express differential reference clock (100 MHz) | 50 | SUSCLK(OPT) | 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. |
| 51 | GND | GND | 52 | PERST_L | Input signal for functional reset to the card |
| 53 | CLKREQ_L | Output for reference clock request signal | 54 | BT_DISABLE_L (OPT) | These pins are reserved for definition with future revisions of this specification. |
| 55 | 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. | 56 | 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 |
| 57 | GND | GND | 58 | No Connection | - |
| 59 | Reserved | - | 60 | No Connection | - |
| 61 | Reserved | - | 62 | No Connection | - |
| 63 | GND | GND | 64 | Reserved | - |
| 65 | Reserved | - | 66 | Reserved | - |
| 67 | Reserved | - | 68 | Reserved | - |
| 69 | GND | GND | 70 | Reserved | - |
| 71 | Reserved | - | 72 | +3.3V | +3.3V |
| 73 | Reserved | - | 74 | +3.3V | +3.3V |
| 75 | GND | GND | | | |

*NA→No active, OPT →Optional

