

WPEA-251ACNI (BT)

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

2T2R Industrial-Grade

Wi-Fi Half Mini PCIe Module



Industrial-Grade Wi-Fi Solution

WPEA-251ACNI(BT) is high performance 802.11ac/a/b/g/n dual band 2T2R Industrial-Grade (-40°C ~+85°C) Wi-Fi mini PCIe module, multiple output (MU-MIMO) with two spatial streams IEEE802.11 ac/a/b/g/n WLAN standards and, designed to deliver superior integration of WLAN and low energy technology.

It supports Windows and Linux Drivers solution. WPEA-251ACNI(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. WPEA-251ACNI(BT) is dual band AC on 2.4GHz+5GHz. The download speed are 300Mbps on N networks and 867Mbps on AC network.

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.
- 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)
Chipset	Qualcomm Atheros QCA6174A-5
Data Rate	802.11b: 11Mbps 802.11a/g: 54Mbps 802.11n: MCS0~15 802.11ac: MCS0~9
Operating Frequency	IEEE 802.11 ac/a/b/g/n ISM Band: 2.412GHz~2.484GHz, 5.150GHz~5.850GHz *Subject to local regulations
Interface	WLAN: PCIe
Form Factor	Half Mini PCIe
Antenna	2 x IPEX MHF1 connectors (J1 for Wi-Fi+BT, J14 for Wi-Fi)
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)
Power Consumption	TX mode: 626mA(Max.) RX mode: 286mA(Max.)
Operating Voltage	DC 3.3V
Operating Temperature Range	-40°C~85°C
Storage Temperature Range	-45°C~90°C
Humidity (Non-Condensing)	5%~90% (Operating) 5%~90% (Storing)
Dimension L x W x H (in mm)	29.85mm(±0.3mm) x 26.65mm(±0.3mm) x 3.2mm(±0.3mm)
Weight (g)	4.5g
Driver Support	Windows 7/8.1/10 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	18dBm	\leq -86dBm

802.11g

Data Rate	Tx \pm 2dBm	Rx Sensitivity
54Mbps	14.5dBm	\leq -72dBm

802.11n / 2.4GHz

	Data Rate	Tx \pm 2dBm (1TX)	Tx \pm 2dBm (2TX)	Rx Sensitivity
HT20	MCS7	14dBm	17dBm	\leq -68dBm
HT40	MCS7	13.5dBm	16.5dBm	\leq -66dBm

802.11a

Data Rate	Tx \pm 2dBm	Rx Sensitivity
54Mbps	11.5dBm	\leq -71dBm

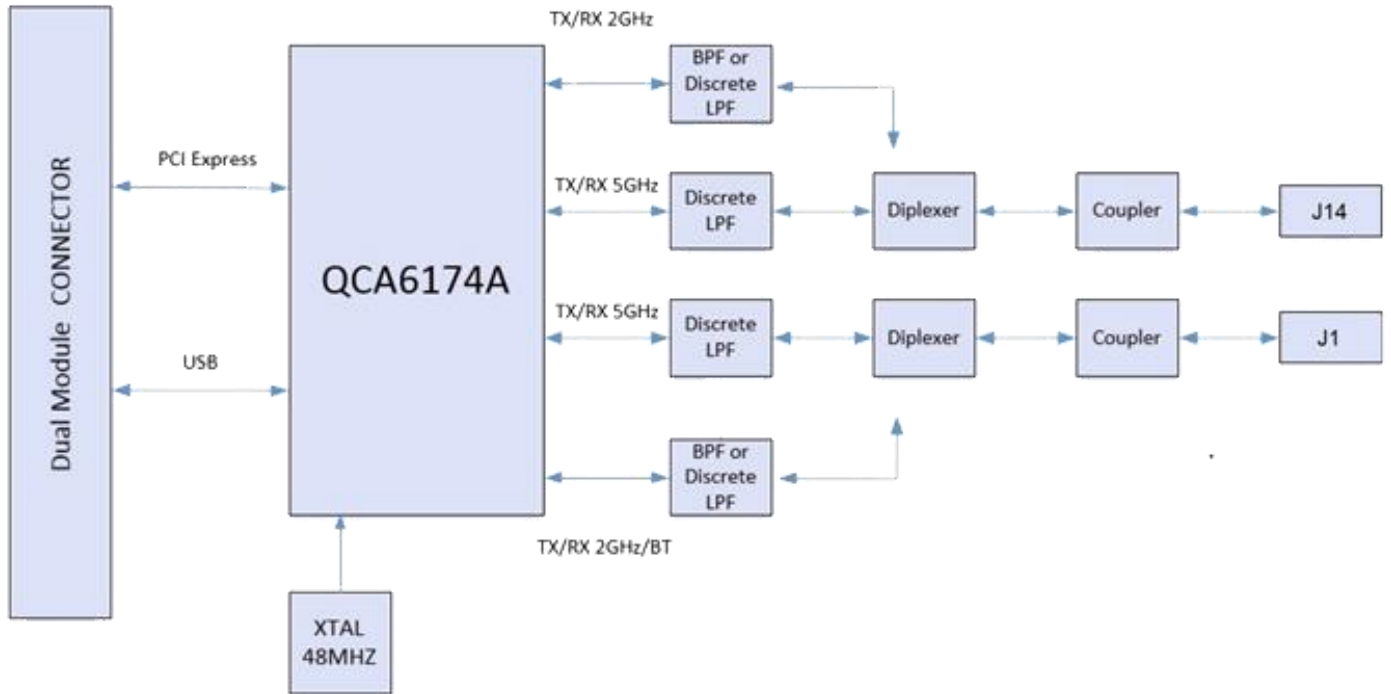
802.11n / 5GHz

	Data Rate	Tx \pm 2dBm (1TX)	Tx \pm 2dBm (2TX)	Rx Sensitivity
HT20	MCS7	11dBm	14dBm	\leq -68dBm
HT40	MCS7	10dBm	13dBm	\leq -67dBm

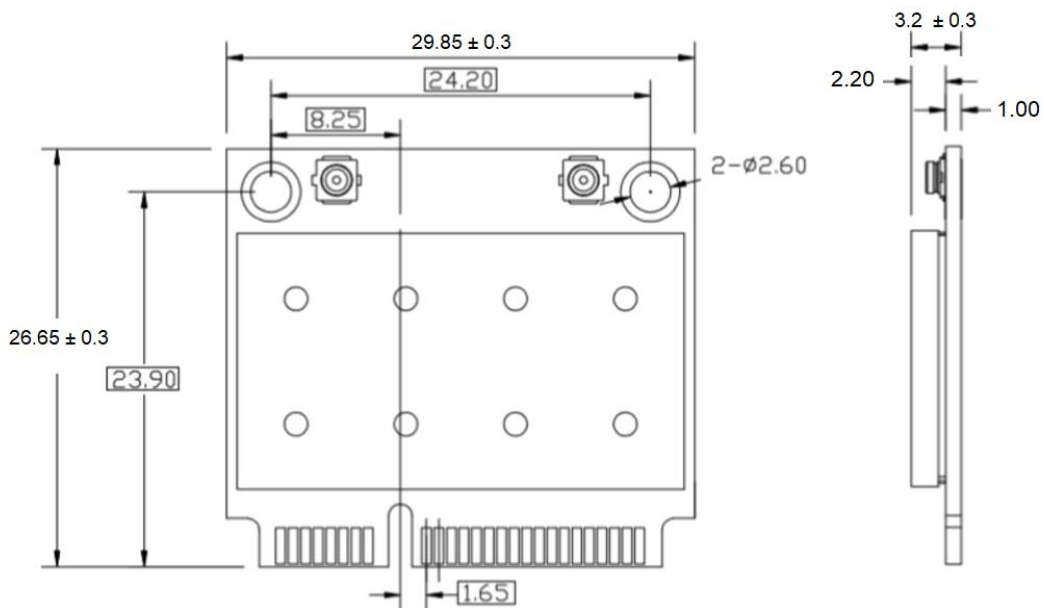
802.11ac

	Data Rate	Tx \pm 2dBm (1TX)	Tx \pm 2dBm (2TX)	Rx Sensitivity
VHT80	MCS9	6.5dBm	9.5dBm	\leq -57dBm

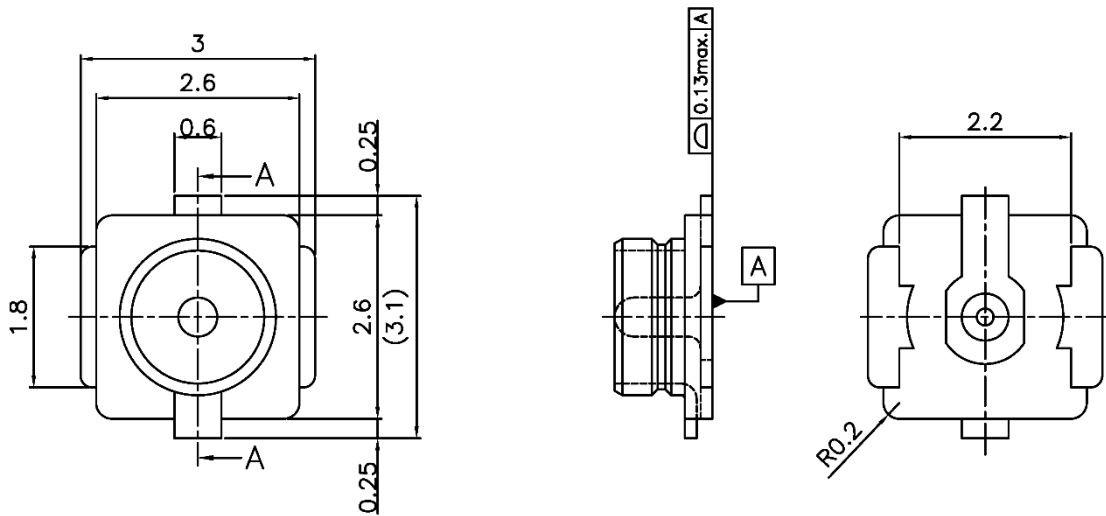
Block Diagram



Mechanical Dimension (mm)



MHF1 connector spec.



Unit: mm

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	WL_DISABLE_L	WL_DISABLE_L	4	GND	GND
5	BT_DISABLE_L	BT_DISABLE_L	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
19	No Connection	-	20	No Connection	-
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	3.3V/AUX	3.3V/AUX

Pin Assignment

Pin#	Pin Name	Description	Pin#	Pin Name	Description
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	No Connection	No Connection	38	USB D+	USB_D+
39	+3.3V	+3.3V	40	GND	GND
41	+3.3V	+3.3V	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	LED_WPAN_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.
47	No Connection	-	48	No Connection	-
49	No Connection	-	50	GND	GND
51	No Connection	-	52	+3.3V	+3.3V

*NA→No active

*OPT →Optional

(This is optional as the function may or may not work under all platform configurations, to ensure this product performs the feature you need, please contact our Sales first with your platform design and configuration details before implementing layout design.)

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
WPEA-251ACNI(BT)	R9701890028	11ac/a/b/g/n Industrial Grade 2T2R WiFi + BT Half Mini PCIe

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
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
CBIRF-ME150	R3470300023	I-PEX/MHF1 to RP-SMA Female; L:150mm; Coaxial 1.37 Black
CBIRF-ME250	R3470300024	I-PEX/MHF1 to RP-SMA Female; L:250mm; Coaxial 1.37 Black