

WPEA-252NIRB

802.11a/b/g/n Industrial Grade

2T2R Mini PCIe Module



Industrial High Performance Mini PCIe Module

The WPEA-252NIRB is powered by Qualcomm Atheros AR9592 is a highly integrated single-chip solution for 2.4 or 5GHz 802.11n wireless local area networks that enables high-performance 2x2 MIMO with 2 Spatial Stream configuration for wireless applications demanding the highest robust link quality and maximum throughput and range. The WPEA-252NIRB implements half-duplex OFDM, CCK, and DSSS baseband process, supporting up to 150 Mbps for 20 MHz and 300 Mbps for 40 MHz channel operations, and IEEE 802.11a/b/g data rates.

It is reliable design for outdoor and rugged environments. High interference immunity for Wi-Fi congested environment and regulatory modular certifications to expedite system integration. WPEA-252NIRB supports frame data transfer to and from the host using a PCIe interface providing interrupt generation and reporting, power save, and status reporting.

Embedded Application

Being able to function in tough environmental conditions, it is ideal for devices such as Industrial PC, outdoor military applications, and in-vehicle communication systems, Aviation , Traffic controller, Fleet management, Outdoor surveillance, etc.

Key Feature

- Qualcomm Atheros QCA9592-AR1B
- Military Temp Range: -40°C to +85°C
- Data Rates: allows link speeds up to 300Mbps.
- Support Linux driver

Specification

Standards	IEEE 802.11a/b/g/n (2T2R)
Chipset	Qualcomm Atheros QCA9592-AR1B
Data Rate	802.11b: 11Mbps 802.11a/g: 54Mbps 802.11n: 300Mbps
Operating Frequency	IEEE 802.11a/b/g/n ISM Band: 2.400GHz ~ 2.4835GHz, 5.1500GHz ~ 5.825GHz *Subject to local regulations
Interface	WLAN: PCIe
Form Factor	Mini PCIe
Antenna	2 x IPEX MHF1 connectors
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)
Power Consumption	TX mode: 700mA RX mode: 300mA
Operating Voltage	DC 3.3V
Operating Temperature Range	-40°C~85°C
Storage Temperature Range	-50°C~90°C
Humidity (Non-Condensing)	10%~85% (Operating) 5%~90% (Storing)
Dimension L x W x H (in mm)	50.80mm(±0.3mm) x 29.85mm(±0.3mm) x 2.86mm(±0.3mm)
Weight (g)	7.2g
Driver Support	Linux
Security	64/128-bits WEP, WPA, WPA2, 802.1x

OUTPUT POWER & SENSITIVITY
802.11b

Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
11Mbps	19dBm	$\leq$ -85dBm

802.11g

Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
54Mbps	16dBm	$\leq$ -77dBm

802.11n / 2.4GHz

HT20	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
	MCS7	15dBm	18dBm	$\leq$ -74dBm
HT40	MCS7	14dBm	17dBm	$\leq$ -71dBm

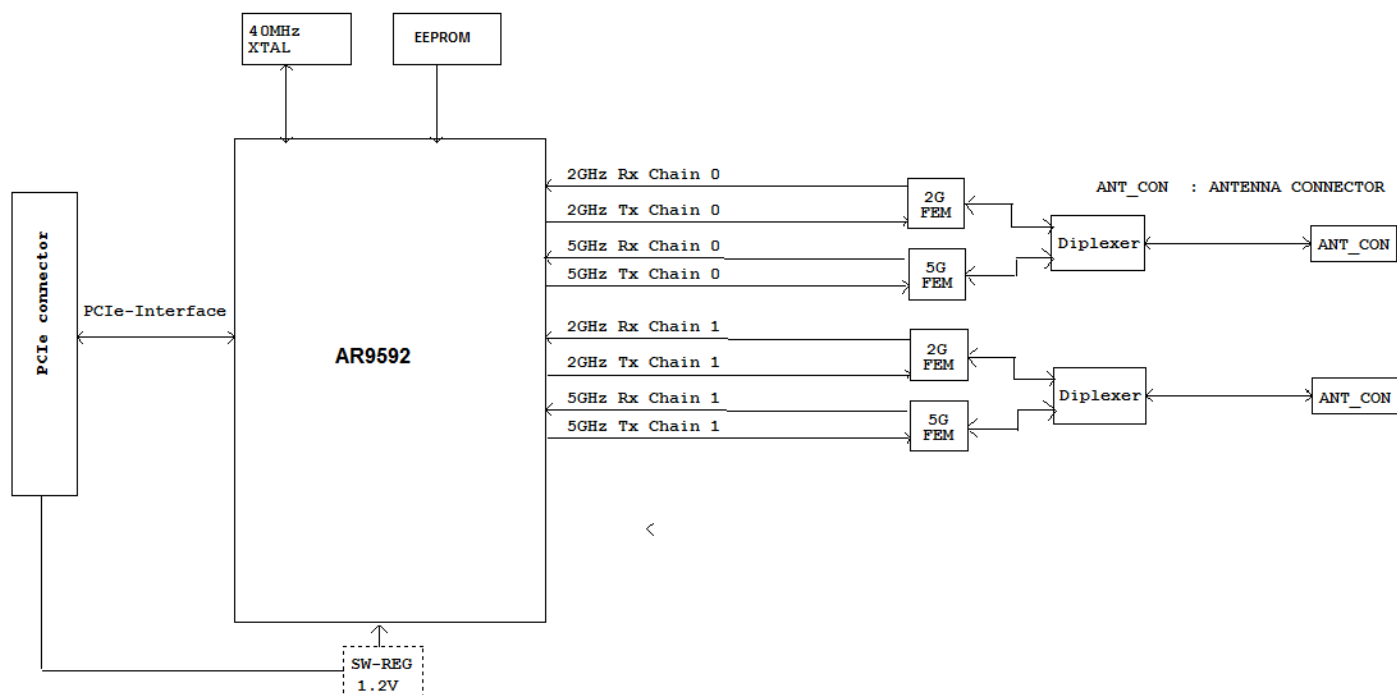
802.11a

Data Rate	Tx $\pm$ 2dBm	Rx Sensitivity
54Mbps	14dBm	$\leq$ -77dBm

802.11n / 5GHz

HT20	Data Rate	Tx $\pm$ 2dBm (1TX)	Tx $\pm$ 2dBm (2TX)	Rx Sensitivity
	MCS7	12dBm	15dBm	$\leq$ -73dBm
HT40	MCS7	11dBm	14dBm	$\leq$ -70dBm

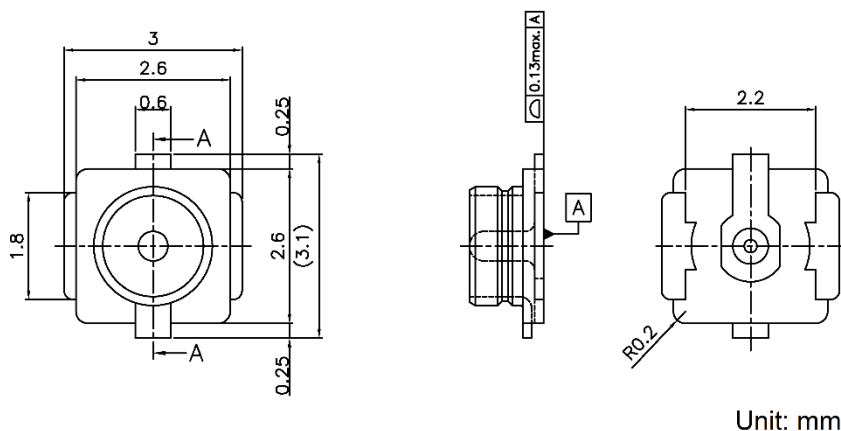
Block Diagram



Mechanical Diagram (mm)



MHF1 connector spec.



Pin Assignment

Pin#	Pin Name	Description	Pin#	Pin Name	Description
1	WAKE_L(NA)	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	GPIO12(OPT)	This pin is reserved for definition with future revisions of this specification.	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	Signal for PCI Express x1 data interfaces: one differential receive pair	24	No Connection	-
25	PERp0	Signal for PCI Express x1 data interfaces: 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	No Connection	-
37	GND	-	38	No Connection	-
39	+3.3V	+3.3V	40	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

Pin Assignment

Pin#	Pin Name	Description	Pin#	Pin Name	Description
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	GPIO13(OPT)	These pins are reserved for definition with future revisions of this specification	48	No Connection	-
49	GPIO14(OPT)	These pins are reserved for definition with future revisions of this specification	50	GND	GND
51	GPIO15(OPT)	These pins are reserved for definition with future revisions of this specification	52	+3.3V	+3.3V

***NA→No active, OPT →Optional**

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-252NIRB	R9701790006	802.11a/b/g/n 2T2R Industrial Grade Mini PCIe Module

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