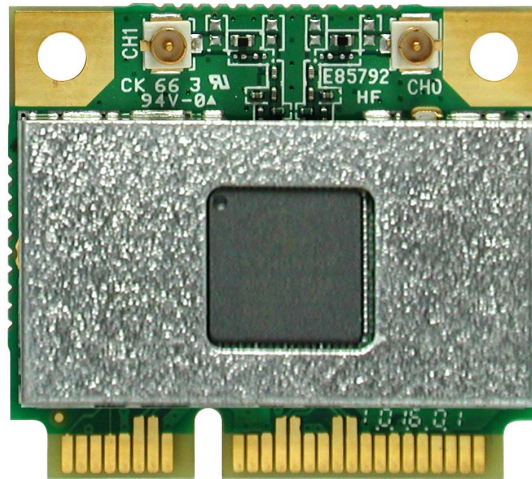




DNXA-97 Information Sheet

802.11n b/g wifi 2x2 PCIe half-size mini card, HB97/AR9287



Overview:

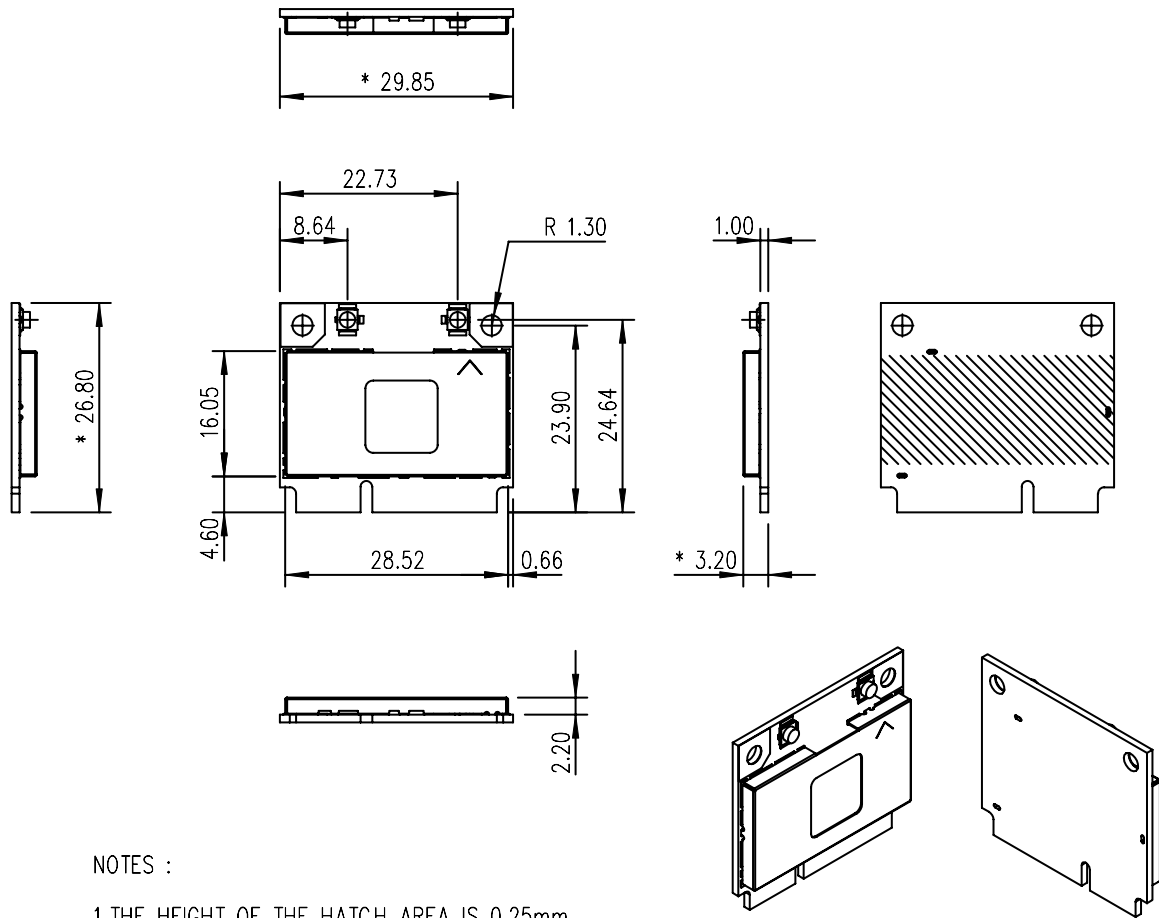
DNXA-97 is a 802.11n b/g 2T2R in the smallest half-size mini card with PCIe form factor. AR9287 single chip solution integrates the MAC/baseband and radio transceiver, two enhanced MIMO power amplifiers and low noise amplifiers, and the transmit/receive switch, which leverages the 802.11n 2-stream specification to provide the optimal balance of performance from legacy 802.11 and 11n 1-stream solutions at comparable price point.

Setting new standards in throughput, range, reliability, and power consumption, DNXA-97 is capable to deliver the ultimate wireless triple play experience for video, voice, and data transmission in the home, for the business, and on the road.

Key Features:

- » The smallest half-size mini card with PCIe form factor in 2Tx/2Rx design is ideal for embedding into ultra-compact devices or embedding additional mini cards with complimentary technologies at comparable price points.
- » Windows 2000/XP/Vista/7 driver enables manufacturers to quickly and easily bring new bandwidth intensive applications to market with trouble-free WiFi integration.
- » Supported by ath9k and FreeBSD providing Linux kernel driver for industrial, academic, or personal projects at highest flexibility and lowest cost.
- » Backward compatible to 802.11g and forward compatible to 802.11n provide the optimal upgrade path from legacy 802.11g and 802.11n 1-stream solutions.
- » Up to 300Mbps PHY rate capability reduces congestion and increases capacity for additional wireless devices.
- » Advanced radio design techniques effectively double the wireless coverage over legacy WLAN.
- » Compliant with IEEE 802.11b, 802.11d, 802.11e, 802.11g standards and 802.11i draft specification
- » RoHS compliance meets environment-friendly requirement.

Mechanical Outline:



NOTES :

1. THE HEIGHT OF THE HATCH AREA IS 0.25mm.
2. THE TOTAL THICKNESS OF PCBA IS 3.45mm.

ISOMETRIC
REFERENCE ONLY

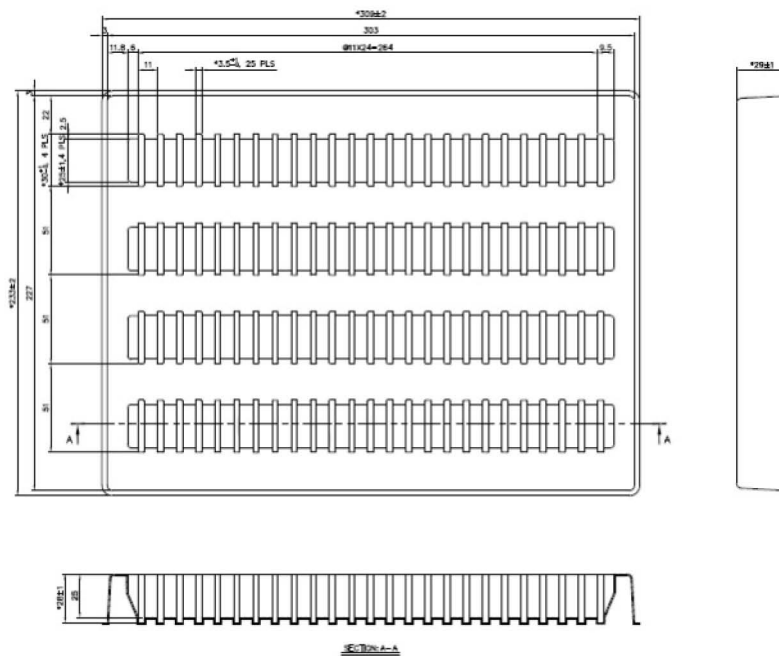
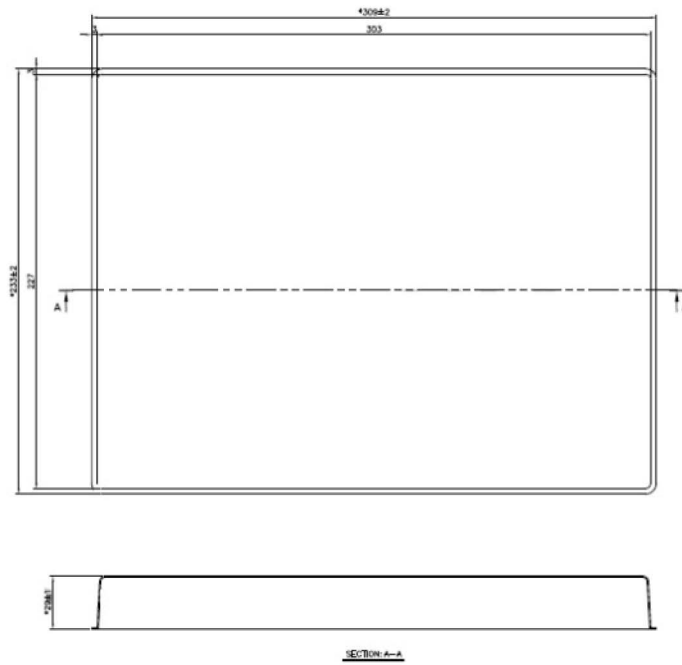
Pin Assignment:

Pin Number	Name	Direction	Description
4,9,15,18,21,26,27,29,34,35 ,43,50	GND	---	Ground.
40	GND	---	No connection.
45,47,49,51	RESERVED	---	No connection.
39,41	RESERVED	---	connection 3.3V
3,5,37	RESERVED	I/O	No connection.
8,10,12,14,16,17,19	NC	---	No connection.
33	PETp0	Analog input signal	Differential receive
31	PETn0	Analog input signal	Differential receive
25	PERPO	Analog output signal	Differential transmit
23	PERNO	Analog output signal	Differential transmit
13	REFCLK+	Analog output signal	Differential reference clock (100MHz).
11	REFCLK-	Analog output signal	Differential reference clock (100MHz).
20	WLAN_DISABLE_L	I/O	WLAN DISABLE
7	CLKREQ_L	A digital output signal with open drain	Reference clock request, open drain
22	PERST_L	Input signals with weak internal pull-down, to prevent signals from floating when left open	PCI Express reset with weak pull down
1	WAKE_L	A digital output signal with open drain	Reserved for 3.3V or WAKE2_L (Request to service a function-initiated wake event, open drain).
32	SMB_DATA	---	No connection.
30	SMB_CLK	---	No connection.
46	LED_WPAN_L	O	No connection.

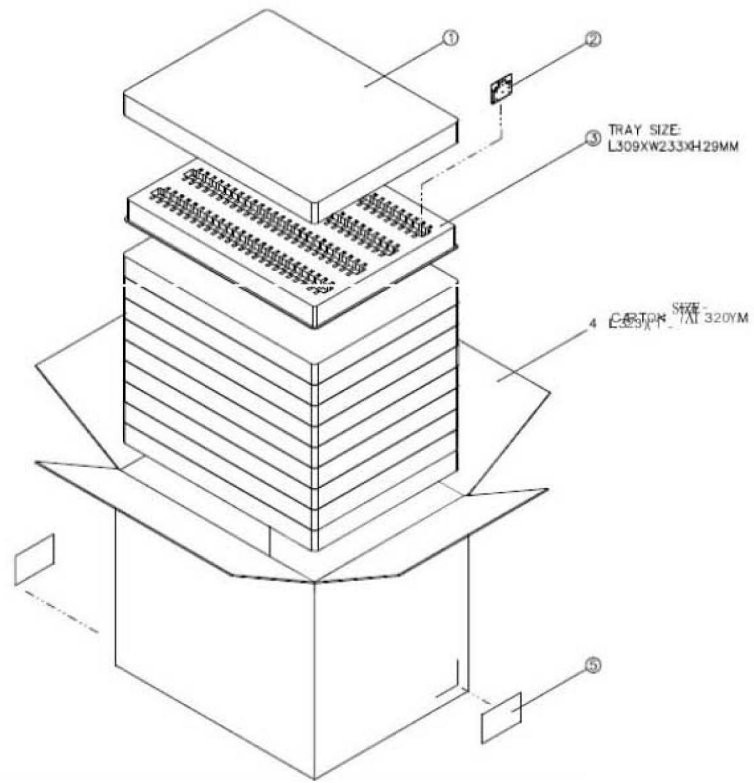
44	LED_WLAN_L	O	GPIO
42	LED_WWAN_L	---	No connection.
38	USB_D+	I/O	USB_P
36	USB_D-	I/O	USB_N
6,28,48	1.5V	---	No connection.
2,52	3.3V	---	3.3V
24	3.3VAUX	---	3.3V or 3.3VAUX

Packing:

Tray Box: 100 pcs/tray box, 309mm (L) x 233mm (W) x 29mm (H)



Carton: 10 tray box/carton or 1,000 pcs/carton, 323mm (L) x 247mm (W) x 320mm (H)



Specifications:

Main Chipset Atheros® AR9287

Tx/Rx 2T2R

Standard
Conformance 802.11b, 802.11g, and 802.11n

Frequency Range » USA: 2.400 ~ 2.483GHz
 » Europe: 2.400 ~ 2.483GHz
 » Japan: 2.400 ~ 2.497GHz
 » China: 2.400 ~ 2.483GHz

Interface PCI Express ® mini-card rev. 1.2

Channel Spacing 20MHz

Operation
Voltage 3.3V ± 5%

Operating
Channels » USA/Canada: 11 (1~11)
 » Major Europe Countries: 13 (1~13)
 » France: 4 (10~13)
 » Japan: 14 on 802.11b (1~13 or 14th), 13 on 802.11g (1~13)
 » China: 13 (1~13)

Data Rate

- » 802.11b: 1, 2, 5.5 and 11Mbps
- » 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps
- » 802.11n:
 - » 20MHz channel:
 - » 1Nss: 65Mbps @ 800GI, 72.2Mbps @ 400GI (Max.)
 - » 2Nss: 130Mbps @ 800GI, 144.4Mbps @ 400GI (Max.)
 - » 40MHz channel:
 - » 1Nss: 135Mbps @ 800GI, 150Mbps @ 400GI (Max.)
 - » 2Nss: 270Mbps @ 800GI, 300Mbps @ 400GI (Max.)

Power Consumption

	802.11n(2.4GHz)
	Avg./Max. (mW)
FTP Tx	1749/1947
AP scanning, no association	264/290

Transmit Power Settings (for each channel, tolerance ± 2 dB)

- » 802.11b: +16dBm
- » 802.11g:
 - » +16dBm @ 6~36Mbps
 - » +14dBm @ 48Mbps
 - » +11dBm @ 54Mbps
- » 802.11n 2.4GHz/HT20:
 - » +16dBm @ MCS 0 ~ 3
 - » +15.5dBm @ MCS 4
 - » +13.5dBm @ MCS 5
 - » +11.5dBm @ MCS 6
 - » +9dBm @ MCS 7
 - » +19dBm @ MCS 8~11
 - » +18.5dBm @ MCS 12
 - » +17dBm @ MCS 13
 - » +15dBm @ MCS 14
 - » +13dBm @ MCS 15

- » 802.11n 2.4GHz/HT40:
 - » +16dBm @ MCS 0 ~ 3
 - » +14.5dBm @ MCS 4
 - » +12.5dBm @ MCS 5
 - » +10.5dBm @ MCS 6
 - » +8dBm @ MCS 7
 - » +19dBm @ MCS 8~11
 - » +17.5dBm @ MCS 12
 - » +15.5dBm @ MCS 13
 - » +13.5dBm @ MCS 14
 - » +11dBm @ MCS 15

Receiver
Sensitivity (Rx0
+ Rx1, Tolerance
±2dB)

- » 802.11b:

Data Rate	IEEE Spec. (dBm)	Typical/Maximum(dBm)
DBPSK(1M)	not specified	-93/-91
DQPSK(5.5M)	not specified	-92/-90
CCK(11M)	not specified	-91/-89

- » 802.11g:

Data Rate	IEEE Spec. (dBm)	Typical/Maximum(dBm)
BPSK(6M)	-82	-93/-90
BPSK(9M)	-81	-92/-89
QPSK(12M)	-79	-91/-88
QPSK(18M)	-77	-90/-87
16-QAM(24M)	-74	-88/-85
16-QAM(36M)	-70	-85/-81
64-QAM(48M)	-66	-81/-78
64-QAM(54M)	-65	-79/-76

» 802.11b/g/n, HT20:

Data Rate	IEEE Spec. (dBm)	Typical/Maximum(dBm)
BPSK(MCS0)	-82	-93/-90
QPSK(MCS1)	-79	-92/-89
QPSK(MCS2)	-77	-89/-86
16-QAM(MCS3)	-74	-87/-84
16-QAM(MCS4)	-70	-86/-83
64-QAM(MCS5)	-66	-79/-76
64-QAM(MCS6)	-65	-77/-74
64-QAM(MCS7)	-64	-75/-72

» 802.11b/g/n, HT40:

Data Rate	IEEE Spec. (dBm)	Typical/Maximum(dBm)
BPSK(MCS0)	-79	-90/-87
QPSK(MCS1)	-76	-89/-86
QPSK(MCS2)	-74	-88/-85
16-QAM(MCS3)	-71	-84/-81
16-QAM(MCS4)	-67	-81/-78
64-QAM(MCS5)	-66	-77/-74
64-QAM(MCS6)	-62	-75/-72
64-QAM(MCS7)	-61	-72/-69

Operation Distance

» 802.11b:

Outdoor	Indoor
» 100m @ 11Mbps,	» 50m @ 11Mbps
» 200m @ 1Mbps	» 100m @ 1Mbps

» 802.11g:

Outdoor	Indoor
» 100m @ 54Mbps,	» 50m @ 54Mbps,
» 200m @ 6Mbps	» 100m @ 6Mbps

» 802.11n:

Outdoor	Indoor
» 30m @ MCS15/40Mhz,	» 30m @ MCS15/40Mhz,
» 200m @ MCS0/20MHz	» 80m @ MCS0/20MHz

MAC Protocol CSMA/CA with ACK architecture 32-bit MAC

Modulation Technique

- » DSSS with CCK, DQPSK, DBPSK
- » OFDM with BPSK, QPSK, 16QAM, 64QAM

Security

- » 64-bit, 128-bit and 152-bit WEP encryption
- » 802.1x authentication
- » AES-CCM & TKIP

Operation Systems Supported

Linux(ath9k), Windows XP, Windows Vista, Windows 7

Dimension

26.65 x 29.85 mm (± 0.15mm) x 1.0 mm (± 0.10mm)

Operation Temperature Range

0°C ~ +70°C ambient

Storage Temperature Range

-20°C ~ +80°C

Operating Humidity

15% ~ 95%, non-condensing

Storage Humidity

max. 95%, non-condensing

Regulation
Compliance

Atheros FCC, CE, IC, Telec... etc. [certification status](#)

Environment-
Friendly
Compliance

RoHS

Antenna

two Hirose U.FL ultra-miniature coaxial antenna connectors

Ordering Information:

DNXA-97

802.11n b/g wifi 2x2 PCIe half-size mini card, HB97/AR9287

EX-11

half size to full size PCIe mini card bracket, 2 mounting screws included.



Wireless radio modules are ESD sensitive, especially the components such as RF switch and the power amplifier. To avoid damage by electrostatic discharge, the following installation procedure is recommended:

- » Touch your hands and the bag or tray containing the radio module to a ground point on the host board (for example one of the mounting holes).
- » Install the radio module in the corresponding socket of host board.
- » Install the pigtail cable in the cutout of the enclosure. This will ground the pigtail to the enclosure.
- » Touch the I-PEX connector of the pigtail to the mounting hole (discharge), then plug onto the radio module.
- » Use external lightning protection for outdoor applications.
- » Make sure all antennas are being connected with the radio module (don't leave I-PEX connector open) before powering on the host device.