



HB97

Product Specification

802.11n/g 2.4GHz (2x2) WLAN PCI Express MiniCard Adapter

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1. Revision History

Revision	Date	Remark
1.00	2011/1/4	▪ Product proposal

1.1. Document Revision History

Revision	Date	Remark
1.00	2011/1/4	▪ Preliminary product proposal
1.01	2011/9/27	▪ Change Tx measured output power in peak value

2. General Description

HB97 is compliant with miniPCI Express v1.1 standard Adapter. The Atheros 802.11g/n technique delivers up to 54Mbps (802.11g) and IEEE802.11n data rate support the channel bandwidth support 20MHz for 150Mbps and 40MHz channel bandwidth for 300Mbps (2Tx2R) and support legacy WLAN standard IEEE802.11b, IEEE802.11g data rate, it use 2 sets of 2.4Ghz Tx / Rx antenna's combinations and applied Transmit Beamforming and Receive combining to focus energy and CDD, MRC to improve 802.11n performance. The IEEE802.11g is OFDM modulation and CCK modulation compliant with IEEE802.11b standard. It supports the Quality of Service for 802.11e. (WMM) and also 802.11e burst mode feature to enable robust wireless streaming of audio and video content while remaining compatible with any 802.11b/g device and with high throughput link

2.1. Features

- Form Factor – a compatible with PCI Express v1.1 MiniCard Adapter
- Support for IEEE 802.11g standard, IEEE802.11b and IEEE802.11n compliant
- Support 802.11e (WMM), 802.11h, 802.11j and
- Security support for WEP, TKIP and AES and IEEE802.11i
- Data rate 802.11b/g: 1,2,5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54-Mbps
802.11n rate at 300Mbps for 40MHz and 150Mbps for 20MHz
- Drivers - Microsoft® Windows® XP, Vista and Win7

2.2. Mechanical Design

The Dimension : L x W (mm): 30mm x27mm



2.3. IC Solution

The IC solution for HB97:

P/N	Functionality	Description
AR9287	A powerful IEEE11g/n MAC/BBP for PCI-e card interface	AR9287 is single chip solution for 2.4GHz 802.11n-ready ; it integrates a multiple protocol MAC, Baseband Processor and ADC/DAC converters with 2x2 MIMO radio transceiver including LNA, PA, and RF Switch and PCIe v1.1 interface; AR9287 implements half duplex OFDM, CCK and DSSS baseband processing supporting up to 130Mbps for 20MHz and 300Mbps for 40MHz channel operations respectively and IEEE802.11b/g data rates.it also provide QoS and CDD, MRC coexistence with Bluetooth. The package is LPCC (76-pin 9x9 mm)

2.4. VID, DID, SVID and SPID assignment

The SVID and SPID may provide from customer.

1. Vendor ID (VID): use Chip's vendor ID = 0x168C
2. Device ID (DID): use Chip's device ID = 0x4013
3. Sub-Vendor ID (SVID): use manufacture's ID = 0x??
4. Sub-Product ID (SPID): use manufacture's product ID = 0x??

3. Technical Specifications

HB97 Specification

Specification	Wireless LAN PC Card
WLAN Standard	IEEE802.11b, IEEE 802.11g; IEEE802.11e, IEEE802.11h; IEEE802.11i; IEEE802.11n standard
Data Rate	IEEE802.11b/g: 1/2/5.5/6/9/11/12/18/24/36/48 and 54Mbps And 802.11n data rate up to 300Mbps (40MHz); 130Mbps (20MHz)
Wireless Medium	Complementary code keying (CCK) and Orthogonal Frequency Division Multiplexing (OFDM); MIMO-OFDM
Frequency Band	2.4GHzband:ISM band 2.412 –2.472, 2.484GHz
Modulation Technique	OFDM: BPSK@6/9 Mbps, QPSK@12/18Mbps, 16-QAM@24Mbps 64-QAM@48/54Mbps DSSS: DBPSK @1Mbps, DQPSK@2Mbps, and CCK@5.5/11Mbps MIMO-OFDM: BPSK, QPSK, 16QAM and 64QAM
Wired Equivalent Privacy	64-bit, 128-bit data encryption
Number of non-overlapping Channels	802.11g: US and EU and Japan 3 channels 802.11b: US and EU and Japan 3 channels 802.11n at 40MHz for 2.4GHz are 2422MHz, 2452MHz channels
Antenna	2X Tx and 2X Rx

HB97 specification (continued)

Specification	Wireless LAN PC Card
Receive Sensitivity	11b@CH6 -86dBm@11Mbps 11g@CH6: -74dBm@54Mbps; CH13: -74dBm@54Mbps 11n-20MHz BW: 2437MHz for MCS7: -70dBm 2437MHz for MCS15: -68dBm 11n-40MHz BW: 2422MHz for MCS7: -68dBm 2422MHz for MCS15: -65dBm
Max output power	11b 19.9dBm@1Mbps 11g 24dBm@6Mbps 11n-20MHz BW : MCS0: 23.8dBm 11n-40MHz BW : MCS0: 22.7dBm
Power consumption	Measured for 2xTx / 2x Rx: For TX: @ HT40: MCS0 1947mW@653mA
Drivers	Windows 2000 and XP
Security	AES
Certification	Prescan the module for FCC Part 15 (North America) Compliant
Form Factor	PCI Expressv1.1 Mini-card
Operating Environment	Temperature: 0~40 (operating) -20~70 (storage) Humidity (non-condensing): 10~90% RH
Dimension (L x W)	30mm x 27 mm

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna,

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: PD5-HB97".

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Industry Canada statement:

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE: (For mobile device use)

Radiation Exposure Statement:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This device is intended only for OEM integrators under the following conditions: (For module device use)

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna,

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: **3970A-HB97**".

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

NOTE IMPORTANTE: (Pour l'utilisation de dispositifs mobiles)

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module)

- 1) L'antenne doit être installée de telle sorte qu'une distance de 20 cm est respectée entre l'antenne et les utilisateurs, et
- 2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne,

Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

NOTE IMPORTANTE:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces

circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: **3970A-HB97**".

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.