

PRODUCT SPECIFICATION

802.11b/g, 54Mbps Wireless LAN miniPCI card

WN2302A

Version 1.8

This document contains confidential proprietary information and is property of LTC. The contents of this document should not be disclosed to unauthorized persons without the written consent of LTC.

Change History:

| Revision | Date | Author | Change List |
|-------------|------------|-----------|---|
| Version 1.0 | 2004/08/05 | Brian Liu | Preliminary |
| Version 1.1 | 2004/12/13 | Brian Liu | Wording modified |
| Version 1.2 | 2005/03/11 | Brian Liu | Wording modified |
| Version 1.3 | 2005/05/20 | Brian Liu | Wording modified |
| Version 1.4 | 2005/07/21 | Brian Liu | Wording modified |
| Version 1.5 | 2005/07/25 | Brian Liu | Rohs compliance added |
| Version 1.6 | 2005/12/29 | Brian Liu | Country/Domain information added |
| Version 1.7 | 2006/04/19 | Brian Liu | Transmit power tolerance added |
| Version 1.8 | 2006/04/24 | Brian Liu | Radio on/off miniPCI pin definition added |

| | |
|-------------------|--------------------------|
| Author: Brian Liu | Approved by: Allen Hsu |
| Editor: Brian Liu | Project Leader: GR Huang |

PRODUCT SPECIFICATION

802.11b/g, 54Mbps Wireless LAN miniPCI Card

WN2302A

Version 1.8

Networking B.U.

Lite-on Technology Corporation

4F, 90, Chien I Rd.

Chung-Ho, Taipei 235, Taiwan, R.O.C.

Phone: 886-2-2222-6181

Fax: 886-2-2222-3882

Contact: Product Marketing

Mr. Brian Liu #8115

E-mail: brian.liu@liteon.com

Customer Approval: _____ (Signature)

_____ (Title)

_____ (Company)

_____ (Date)

(Please Sign Back by FAX. For Confirming the Spec Only, not an Official Agreement for OEM/ODM Business)

CONTENT

| | |
|---|----------|
| PRODUCT DESCRIPTION | 4 |
| PRODUCT FEATURES | 4 |
| PRODUCT SPECIFICATIONS..... | 4 |
| MAIN CHIPSET | 4 |
| FUNCTIONAL SPECIFICATIONS | 4 |
| MECHANICAL..... | 5 |
| BLOCK DIAGRAM..... | 6 |
| EEPROM COUNTRY/REGULATORY INFORMATION..... | 6 |
| ENVIRONMENTAL..... | 6 |
| OPERATING | 6 |
| STORAGE..... | 6 |

PRODUCT DESCRIPTION

The WN2302A is a Wireless LAN miniPCI card designed for notebook/laptop. It works under 2.4GHz bandwidth with max data transfer rate of 54Mbps. WN2302A is compatible with IEEE 802.11 standards, i.e. 802.11b, and 802.11g. It provides full functional wireless access within wireless environments anytime, anywhere at a data rate up to 54Mbps.

The WN2302A is developed using advanced chipsets designed by Atheros Communications. To ensure that user's privacy is well protected, the WN2302A is developed to feature enterprise-class security, i.e. 40-bit, 128-bit, 152-bit Wired Equivalent Privacy (WEP) encryptions, Temporal Key Integrity Protocol (TKIP) and Advanced Encryption Standard (AES) encryptions. A new security feature, WPA (WiFi Protected Access), is also supported. The WPA includes the 802.11x, a centralized, server-based authentication.

We choose Atheros AR2413 which is an all CMOS, single chip solution to develop IEEE802.11b/g wireless miniPCI card. It enables a high performance, low power consumption with competitive cost.

WN2302A also supports Cisco Compatible Extensions (CCX) by using Atheros standard application utility. This feature allows compatibility with Cisco Aironet wireless infrastructure products.

PRODUCT FEATURES

- Operate at ISM frequency bands (2.4GHz) with 54Mbps data rate
- IEEE standards support: IEEE 802.11b, 802.11g
- Enterprise level security which can apply WPA2 certification
- Superior range and throughput
- Full-featured software utility for easy configuration and management
- Power savings features and low power consumptions for mobile powered applications
- Single chip – CMOS solution which allows high performance with competitive cost.
- RoHS compliance

Product specifications

Main chipset

Baseband / MAC / RF: Atheros AR2413

Power Amplifier: GPLUS GP1214

Functional Specifications

| | |
|----------------------|--|
| Standard | IEEE802.11b; IEEE 802.11g; IEEE 802.11i |
| Bus Interface | MiniPCI Card, TypeIIIB |
| Data Rate | 802.11g compliant: 11, 5.5, 2, 1 (DSSS/CCK); 6, 9, 12, 18, 24, 36, 48, 54 (OFDM) Mbps data rates |

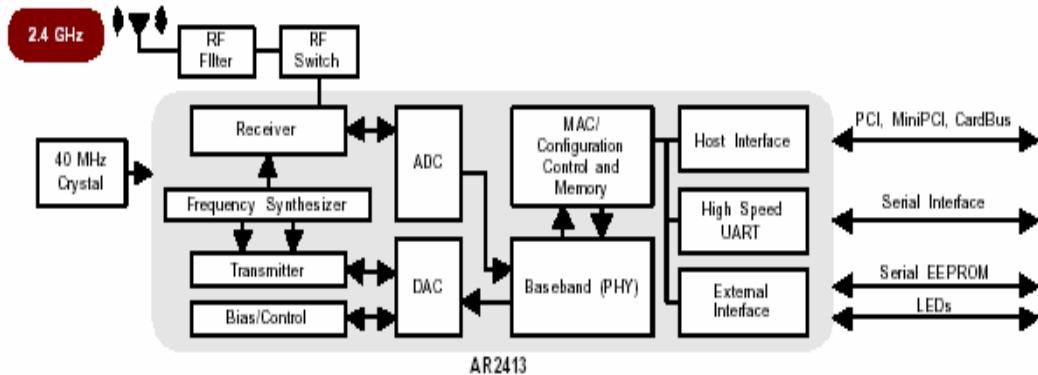
| | | |
|--|---|---|
| Media Access Control | CSMA/CA with ACK | |
| Radio Technology | 802.11g : DSSS/CCK, OFDM (Orthogonal Frequency Division Multiplexing) | |
| Modulation Techniques | Orthogonal Frequency Division Multiplexing (OFDM) / Complementary Code Keying (CCK) | |
| Network architecture | Ad-hoc mode (Peer-to-Peer) Infrastructure mode | |
| Operating Channel | 802.11b & g 11: (Ch. 1-11) – N. America | |
| Frequency Range | 802.11 b & g 2.412 ~ 2.462 GHz – N. America | |
| Transmit Output Power (Tolerance: +1dBm, -1dBm) | 802.11b 18.37 dBm | 802.11 g 18.19 dBm |
| Receiver Sensitivity | 802.11b 11 Mbps: -83 dBm 5.5 Mbps: -86 dBm 2 Mbps: -87 dBm 1 Mbps: -89 dBm | 802.11 g 54 Mbps: -70 dBm 48 Mbps: -71 dBm 36 Mbps: -75 dBm 24 Mbps: -79 dBm 18 Mbps: -82 dBm 12 Mbps: -84 dBm 9 Mbps: -87 dBm 6 Mbps: -87 dBm |
| Security | 64-bit, 128-bit and 152-bit WEP, AES, TKIP, WPA2 | |
| Operating Voltage | 3.3 V ±5% I/O supply voltage | |
| OS supported | Windows 98SE/ME/2000/XP | |
| Power Consumption | 802.11b Rx: 260-270mA Tx: 340-350mA Sleep: 35mA | 802.11g Rx: 280-290mA Tx: 350-360mA Sleep: 35mA |
| Antenna Type | Dual antenna connector | |
| Radio ON/OFF Switch | Enabled, high signal enable radio, low signal disable radio, pin 13 on miniPCI interface | |

Mechanical

Dimensions (L x W x H): 2.35 x 1.79 x 0.18 in (59.8 x 45.5 x 4.5 mm)

Weight: 0.46 oz (13 g)

Block Diagram



EEPROM COUNTRY/REGULATORY INFORMATION

EEPROM Hex: 0x0000 (Atheros Default Value – North America (FCC) setting)

ENVIRONMENTAL

Operating

Operating Temperature: 0 to 55 °C (32 to 131 °F)

Relative Humidity: 5-90% (non-condensing)

Storage

Temperature: -20 to 70 °C (-4 to 158 °F)

Relevant Humidity: 5-95% (non-condensing)

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.

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

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

OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions cannot 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 cannot 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.

The host integrate this module is limited to those with 3.3VDC regulator for providing this module stable power source.

Modular OEM Integrator Notice

End Product Labeling

The final end product must be labeled in a visible area with the following: "Contains TX FCC ID: VAQ-CIRARP100110".