Product Specifications

WN4403A-LF-17

IEEE 802.11b/g miniPCI

V 0.1

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Subject to Change without Notices

Table of Contents

Revision History

Edition #		Reason for revision	Issue date	Written by
V 0.1	♦	Initial Document	Dec. 5, 2008	Katherine Hsieh
	♦			
	♦			

Chapter 1   Introduction

1.   Introduction

WN4403A is an industrial miniPCI Card which enables wireless networking systems to attain data transmission speeds at least up to 54 megabits-per-second (Mbps), while remaining backward compatible to the existing installed base of over 15 million Wi-Fi systems worldwide. The product must be RoHS compliant and supports operation to both the IEEE 802.11b and IEEE 802.11g standards.

WN4403A will enable a next generation of high-data-rate platforms for operation in the 2.4 GHz band that deliver a five-fold speed increase.   It is fully IEEE 802.11g standard compliant, and uses prioritization algorithms and enhanced protection mechanisms to significantly increase pure 802.11g as well as mixed-mode network performance. The cost and performance advantages will make it an ideal solution for high bandwidth enterprise applications, such as wireless video conferencing and large file transfers, as well as advanced home networking applications such as multi-channel CD-quality audio and DVD-quality video streaming. WN4403A incorporates the 802.11g Standard's mandatory modulation schemes—Complementary Code Keying (CCK), which is used in 802.11b, and Orthogonal Frequency Division Multiplexing (OFDM) used in 802.11g. Using CCK ensures backward-compatibility with the installed Wi-Fi 802.11b base, while OFDM provides the speed required for today's high-bandwidth applications.

1.1   Product Features

♦   High speed for wireless LAN connection, up to 54 Mbps data rate.

♦   IEEE 802.11g

♦   Backward compatible to the existing IEEE 802.11b WLAN infrastructure.

♦   Wireless data encryption using WEP 64, 128-bit encryption for security.

♦   Support for WPA-PSK

♦   Hardware AES Accelerator.

♦   Built-in Hirose antenna connectors.

♦   Firmware upgrade-able by only changing driver.

1.2   Applications

♦   Home networking for device sharing.

♦   Wireless office for extension Ethernet range.

♦   Mobile networking for notebook PC, PDA, We or Wireless Gateway Built-in Application.

Chapter 2   Hardware

2.1   General Overview

♦   Power: 3.3V, DC input.

♦   Antenna connector: One Hirose, FL-R-SMT (01) coaxial connectors.

2.2   Hardware Architecture
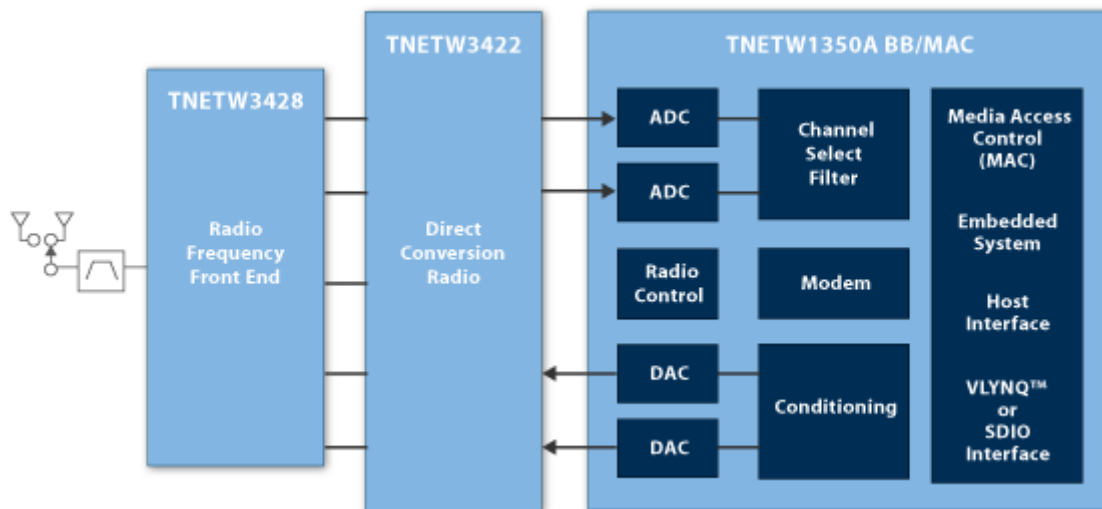
2.3   Main Chipset Information

TNETW1350A :

-An IEEE 802.11g MAC + Baseband processor

-TI G++ technology with 2x extended range/ 50% greater throughput / Superior performance in the presence of interference

-Security: WPA/WPA2

-WMM for multimedia

TNETW3422:

TNETW3422 is a highly optimized 2.4-GHz single-chip radio frequency (RF) transceiver that supports the 802.11b/g

Chapter 3　　Software

3.1　Operating System Supported

♦　Windows 98SE, Windows 2000 and Windows XP

3.2　Wireless Mode Supported

♦　AP (Infrastructure) mode

♦　Ad-hoc mode

3.3　Security

♦　AP (Infrastructure) mode supports

　　♦　Static WEP that support both 64 and 128 bit keys.

　　♦　WPA(TKIP) with PSK

　　♦　802.1X(Option)

♦　Ad-hoc mode supports

　　♦　None (plaintext)

　　♦　Static WEP that supports both 64 and 128 bit keys.

3.4　Configuration

♦　User should be able to select

　　♦　Mode of operations: AP or ad-hoc mode

　　♦　Different security modes: none (plaintext), static WEP, WPA(TKIP)/PSK or 802.1X/LEAP as supported by the respective operating mode.

　　♦　Channel to operate on

♦　User should be able to perform key management on WPA/PSK and static WEP as supported by the respective operating mode

♦　A Utility to set SSID, WEP key, site survey, profile manager and dynamically view configuration and receiving signal quality.

♦　Support for transmitting power configurable.

♦　Support TI G++

Chapter 4   Appearance

TBD

Chapter 5   Specifications

- Frequency Band:
    - 802.11g Radio: 2.4 GHz
    - 802.11b Radio: 2.4 GHz

USA – FCC	2412~2462MHz (Ch1~Ch11)
Canada – IC	2412~2462MHz (Ch1~Ch11)

- Modulation TYPE:
    - DSSS   BPSK, QPSK, CCK
    - OFDM   BPSK, QPSK, 16QAM, 64QAM

- Operating Channels:
    - IEEE 802.11b compliant:
        - 11 channels (US, Canada)
    - IEEE 802.11g compliant:
        - 11 channels (US, Canada)

- Security: 64/128-bit WEP/TKIP/AES-CCM/AES-OCB/ 802.1x, and WPA

- Operating Voltage: 3.15V ~ 3.45V

- Transmitted Power: *See Table 1(Will update later)*

- Rates/Sensitivity/Allowable Path Loss: *See the Table 2(Will update later)*

- Mechanical specification:
    - MiniPCI Type 3B

- Regulatory compliance:
    - Power Limit: FCC 15.247

- Current consumption: TX:470 mA Max; RX: 340mA Max; Power Saving: 20mA

- Operating Temperature: 0 ~ 55 ^{o}C ambient

- Storage Temperature: -20 ~ 70 ^{o}C ambient

- Humidity: 5 ~ 90% and must be non-condensing

- ESD: EN61000-4-2, which specifies 4kV contact and 8kV air discharge.

Table 1: Modulation Scheme and Nominal Transmit Power

Modulation Rate	Output Power 2.4-2.5GHz	Output Power 5.15-5.25GHz	Output Power 5.25-5.725GHz	Output Power 5.725-5.850GHz
802.11b (1Mbps)	18	NA	NA	NA
802.11b (2Mbps)	18	NA	NA	NA
802.11b (5.5Mbps)	18	NA	NA	NA
802.11b (11Mbps)	18	NA	NA	NA
802.11g (6Mbps)	17	NA	NA	NA
802.11g (9Mbps)	17	NA	NA	NA
802.11g (12Mbps)	17	NA	NA	NA
802.11g (18Mbps)	17	NA	NA	NA
802.11g (24Mbps)	17	NA	NA	NA
802.11g (36Mbps)	17	NA	NA	NA
802.11g (48Mbps)	16	NA	NA	NA
802.11g (54Mbps)	16	NA	NA	NA

Note:

1. **The listed output power is nominal value.**

2. **The acceptable tolerance for power variation is +1, -1.5dB from nominal value.**

3. **For channel 1 and channel 11, the output power is lower 2dBm than other channels due to FCC band-edge limit.**

Table 2: Typical Range at Which Frame (1000 Bytes PDUs) Packet Error Rate=10%

Modulation Rate	Receiver Sensitivity (dBm) 2.412 ~ 2.484 GHz
802.11b – 1Mbps	-88
802.11b – 2Mbps	-87
802.11b – 5.5Mbps	-85
802.11b– 11Mbps	-82

Modulation Rate	Receiver Sensitivity 2.4GHz (dBm)	Receiver Sensitivity 5.15-5.25GHz (dBm)	Receiver Sensitivity 5.25-5.35GHz (dBm)	Receiver Sensitivity 5.725-5.85GHz (dBm)
6Mbps	-88	NA	NA	NA
9Mbps	-86	NA	NA	NA
12Mbps	-85	NA	NA	NA
18Mbps	-83	NA	NA	NA
24Mbps	-80	NA	NA	NA
36Mbps	-76	NA	NA	NA
48Mbps	-71	NA	NA	NA
54Mbps	-68	NA	NA	NA

References

♦ **TI Design Functional Specification**
♦ **IEEE 802.11b Standard Specification**
♦ **IEEE 802.11g Standard Specification**

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WARNING

This document is intended for internal use only. A Non-Disclosure Agreement (NDA) is required to release this document under any circumstances

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.

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.

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.

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.

2.4GHz operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.