

Moxa IEEE 802.11a/b/g MiniPCI Module

WAPA003 User's Manual

www.moxa.com

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MOXA®

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WAPA003 User's Manual

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Introduction

The following topics are covered in this chapter:

- Overview**
- Features**
- Specifications**

Overview

WAPA003 Mini-PCI Module is designed to provide wireless communication for all wireless device based systems. It communicates via the standard 802.11a/b/g protocols. The WAPA003 uses the AR5414 wireless chipset from Atheros. This module is connected to the PCI bus through a Mini-PCI connector and special circuitry to allow for compatibility with either 3.3V or 5V PCI signaling.

Features

- All-CMOS single chip for IEEE 802.11a/b/g compatible WLANs
- No external VCOs or SAW filters needed
- Baseband in-phase (I) and quadrature (Q) signals, converts them to the desired frequency, and drives the RF signal off-chip
- Integrated low-noise amplifier (LNA)
- External PA and/or LNA can be used for special applications
- Advanced wideband receiver with best path sequencer for better range and multipath resistance than conventional equalizer-based designs
- Extended tuning range (2.300-2.500 & 4.900-5.850 GHz) for worldwide use
- High speed UART with DMA supports data rates up to 1 Mbps

Specification

Features	WAPA003
Chipset	Atheros AR5414
Receive Sensitivity	802.11b :-84dBm(typically) 802.11a/g : -80dBm(typically)
Baseband Processor (BBP)	<ul style="list-style-type: none"> · 802.11b support rate: 1M, 2M, 5.5M, 11M bps · 802.11a/g support rate : 6M, 9M, 12M,18M,24M, 36M, 48M, 54M bps · Modulation scheme: BPSK, QPSK, 16 QAM, 64 QAM, DBPSK,DQPSK, and CCK · 802.11e-compatible bursting · Support for draft IEEE h, i and j standards · Atheros Extended Range feature supported (Turbo Mode), Atheros Super A/G mode with up to 108 Mbps
security engine	WEP64, WEP128, WEP256, AES-CCM, TKIP ,WPS
Bus Interface	Mini PCI standard bus complaint
Connectors	Defined BTB connector is using 2x40 pins header, and Support Mini-PCI standard.
Power requirement	1.8V +/-5% 3.3V +/-10%
Dimension	53mm ×32mm
Weight	15g
Operating Temperature	-40 to +80 °C
Storage Temperature:	-40 to +150°C

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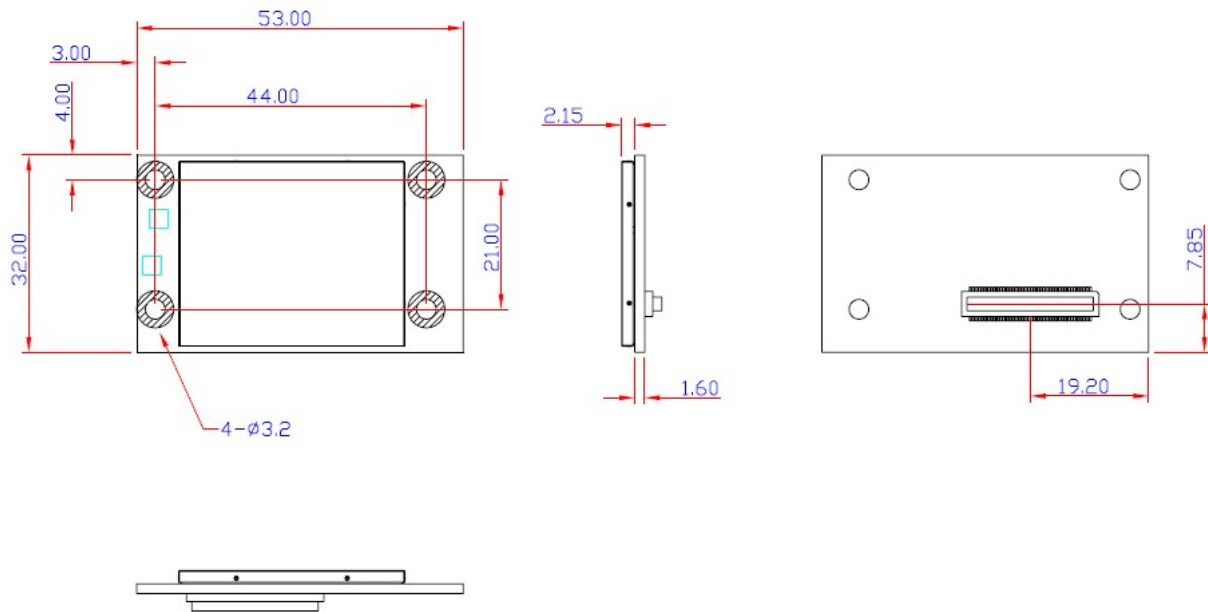
Getting Started

This chapter covers the module layout, and block diagram, hardware installation of the WAPA003. Software installation is covered in the next chapter.

The following topics are covered:

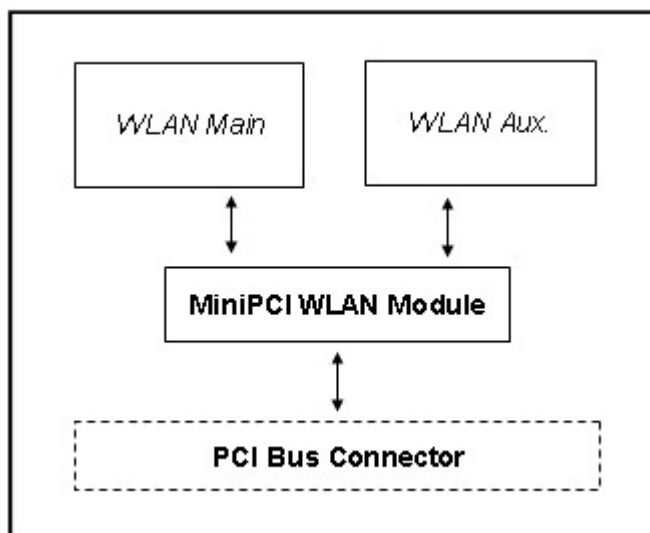
- Module Layout**
- Block Diagram**
- Hardware Installation**
- Software Installation**

Module Layout



Block Diagram

Below is a block diagram of the WAPA003. Primary board components are in bold, while external connections are italicized.



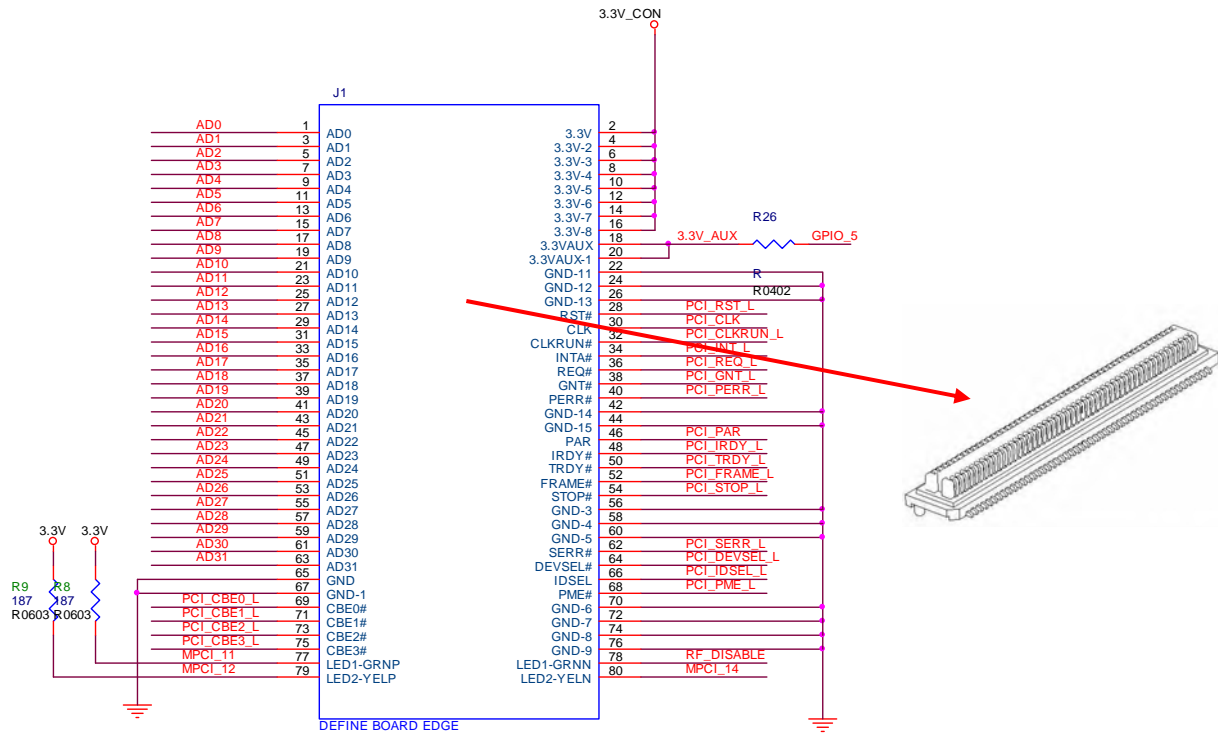
Connector Locations

- J1
Auxiliary Antenna
Connector
- J2
Main Antenna
Connector



- J3
PCI Bus Connector

MiniPCI Bus Connector PIN Assignments



Hardware Installation

The WAPA003 can be installed into all Moxa wireless system board series. It can be located below the CPU.

Step for Installation

1. Attach the Main WLAN antenna to connector J1.
2. If using an Auxiliary WLAN antenna, attach it to connector J2.
3. Install the WAPA 003 miniPCI card on the system board. Apply pressure to both bus connectors and gently press the board onto the stack. The board should slide into the matching bus connectors. Do not attempt to force the board, as this can lead to bent/broken pins.
4. Screw on the WAPA003 miniPCI card.
5. If any power boards are to be stacked above the WAPA003, install them.
6. Screw on the all the necessary chassis.

Software Installation

After physically installing the WAPA003, your operating system must be configured to recognize the new system board.

Step for Installation

1. Apply power to the system board.
2. Connect system board and PC with Ethernet cable.
3. Open a browser and type: 192.168.127.253 to open the system login webpage.
4. Login the webpage with default password: root in order to verify that all of the hardware is install properly.

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:

To assure continued compliance, (example - use only shielded interface cables when connecting to computer or peripheral devices) 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:

This module is restricted to mobile configuration. To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. This transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter

Labeling requirements

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.

RF exposure warning

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20cm 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: SLE-WAPA003-1".

Information for the OEMs and Integrators

The following statement must be included with all versions of this document supplied to an OEM or integrator, but should not be distributed to the end user.

- 1) This device is intended for OEM integrators only.
- 2) Please see the full Grant of Equipment document for other restrictions.

This device is operation in 5.15 – 5.25GHz frequency range, then restricted in indoor use only, Outdoor operations in the 5150~5250MHz is prohibit.

This device is slave equipment, the device is not radar detection and not ad-hoc operation in the DFS band.

This radio transmitter FCCID: SLE-WAPA003-1 has been approved by FCC to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	KINSUN	ANT-WDB-O-2 BK (main)(aux)	2.9dBi in 2.4GHz 2.34dBi in 5GHz
2	KINSUN	ANT-WDB-ANM-0502 (main)(aux)	4.62 dBi in 2.4GHz 1.41dBi in 5GHz

Note: The antenna connector is Reverse SMA type (ANT-WDB-O-2 BK) and N type (ANT-WDB-ANM-0502).

Note:

This is a specific product that requires professional installation and configuration, must be performed by trained technical engineers to install the antenna, the MOXA agents contact information as follows:

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