Moxa IEEE 802.11a/b/g/n Wireless Module WAPN005 User's Manual

First Edition, April 2014

www.moxa.com/product

Moxa IEEE 802.11a/b/g/n Wireless Module WAPN005 User's Manual

The software described in this manual is furnished under a license agreement and may be used only in accordance with the terms of that agreement.

Copyright Notice

Trademarks

Disclaimer

Information in this document is subject to change without notice and does not represent a commitment on the part of Moxa.

Moxa provides this document as is, without warranty of any kind, either expressed or implied, including, but not limited to, its particular purpose. Moxa reserves the right to make improvements and/or changes to this manual, or to the products and/or the programs described in this manual, at any time.

Information provided in this manual is intended to be accurate and reliable. However, Moxa assumes no responsibility for its use, or for any infringements on the rights of third parties that may result from its use.

This product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

Technical Support Contact Information

www.moxa.com/support

Moxa Americas
Toll-free: 1-888-669-2872
Tel: +1-714-528-6777
Fax: +1-714-528-6778

Moxa Europe
Tel: +49-89-3 70 03 99-0
Fax: +49-89-3 70 03 99-99

Moxa India
Tel: +91-80-4172-9088
Fax: +91-80-4132-1045

Moxa China (Shanghai office)
Toll-free: 800-820-5036
Tel: +86-21-5258-9955
Fax: +86-21-5258-5505

Moxa Asia-Pacific
Tel: +886-2-8919-1230
Fax: +886-2-8919-1231

Table of Contents

1

Introduction

This chapter briefly introduces the overview, features and the specifications of the WAPN005 wireless module.

The following topics are covered in this chapter:

❑ **Overview**
❑ **Features**
❑ **Specifications**

Overview

Moxa WAPN005 module is designed to provide wireless communication for all wireless device based systems. It communicates via the standard 802.11a/b/g/n protocols, and uses the AR9344 wireless chipset from Atheros.

Features

- Dynamic frequency selection (DFS) in required 5-GHz bands
- All-CMOS MIMO solution interoperable with IEEE 802.11a/b/g/n WLANs
- No external VCOs or SAW filters needed
- 2.4/5 GHz WLAN MAC/BB processing
- BPSK, QPSK, 16 QAM, 64 QAM, DBPSK,DQPSK, and CCK modulation schemes
- 802.11e-compatible bursting
- Wireless multimedia enhancements quality of service supported (QoS)
- 802.11e-compatible bursting
- WEP, TKIP, and AES hardware encryption
- IEEE 1149.1 standard test access port and boundary scan architecture supported
- Case temperature 85°C

Specifications

| Features	WAPN005 Specifications
Chipset	Atheros AR9344
Baseband Processor (BBP)	·DSSS with DBPSK, DQPSK, CCK ·OFDM with BPSK, QPSK, 16QAM, 64QAM ·802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps,DBPSK @ 11 Mbps ·802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps ·802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps (multiple rates supported)
Security Engine	WEP64,WEP128, WEP256, AES-CCM, TKIP ,WPS
Bus Interface	Moxa proprietary interface
Connector	Board-to-board 2 x 40 pins header
Power Requirement	3.3V +/-10%
Dimensions	60 x 60 x 12 mm (2.36 x 2.36 x 0.47 in)
Weight	15 g
Operating Temperature	-40 to 75℃
Storage Temperature:	-40 to 85℃
Operates in 2.4 and 5 GHz frequency bands.	US: 2.412 to 2.462 GHz (11 channels) 5.180 to 5.320 GHz (8 channels) 5.500 to 5.700 GHz (8 channels - excludes 5.600 to 5.640 GHz) 5.745 to 5.825 GHz (5 channels) EU: 2.412 to 2.472 GHz (13 channels) 5.180 to 5.320 GHz (8 channels) 5.500 to 5.700 GHz (11 channels) JP: 2.412 to 2.484 GHz (14 channels, DSSS) 5.180 to 5.320 GHz (8 channels) 5.500 to 5.700 GHz (11 channels)

2

Getting Started

This chapter describes the hardware introduction, installation, and software installation.

The following topics are covered in this chapter:

❒ **Module Layout**

❒ **Hardware Block Diagram**

❒ **Connector Location**

❒ **Board-to-board Bus Connector PIN Assignments**

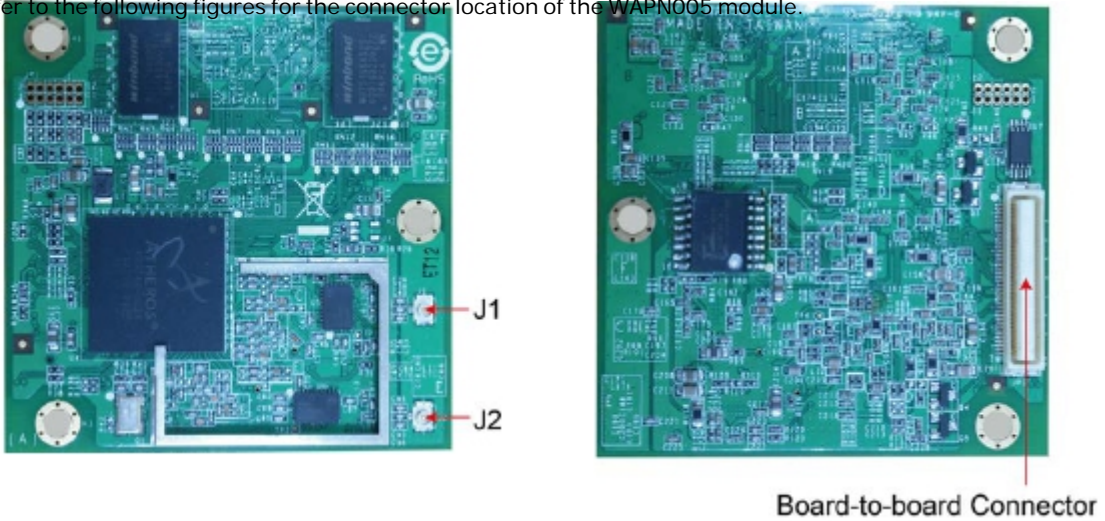❒ **Hardware Installation**

❒ **Software Installation**

Hardware Block Diagram

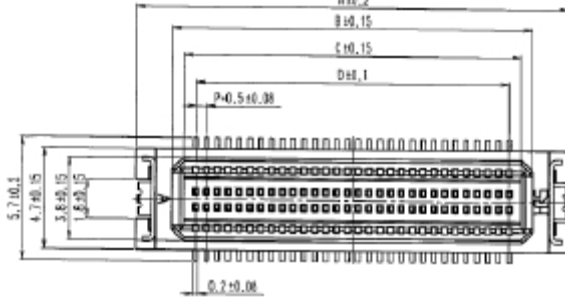Refer to the following figure the hardware block diagram of the WAPN005.
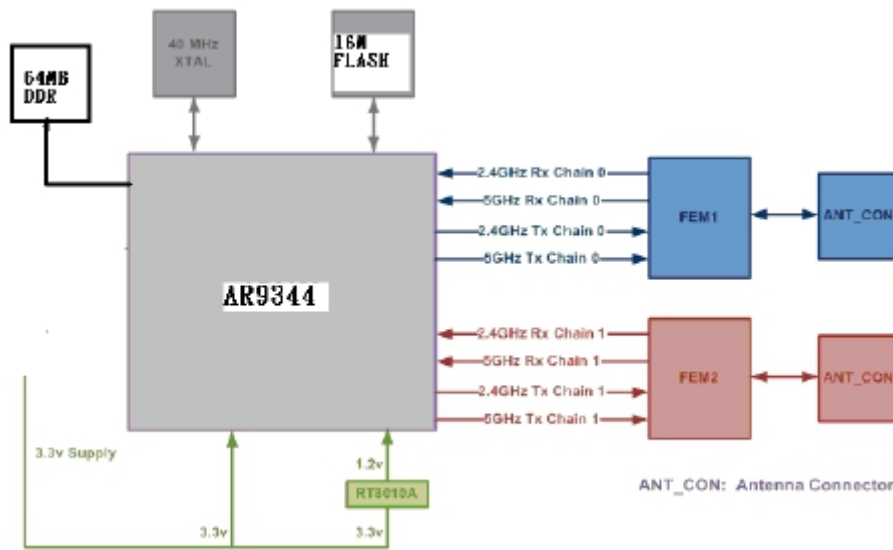
Connector Location

Refer to the following figures for the connector location of the WAPN005 module.

Board-to-board Connector

Board-to-board Bus Connector PIN Assignments

Refer to the following figures and table for the PIN assignment of the WAPN005 module connector.

CODE NO.	CONTACT	A	B	C	D	E	F	G	H	J
CL683-0082-1-57	20	10	6.7	5.6	4.5	9.8	8.2	7	10.4	7.6
CL683-0083-4-57	30	12.5	9.2	8.1	7	12.3	10.7	9.5	12.9	10.1
CL683-0084-7-57	40	15	11.7	10.6	9.5	14.8	13.2	12	15.4	12.6
CL683-0085-0-57	50	17.5	14.2	13.1	12	17.3	15.7	14.5	17.9	15.1
CL683-0086-2-57	60	20	16.7	15.6	14.5	19.8	18.2	17	20.4	17.6
CL683-0087-5-57	70	22.5	19.2	18.1	17	22.3	20.7	19.5	22.9	20.1
CL683-0088-8-57	80	25	21.7	20.6	19.5	24.8	23.2	22	25.4	22.6
CL683-0090-0-57	100	30	26.7	25.6	24.5	29.8	28.2	27	30.4	27.6
CL683-0385-3-57	120	35	31.7	30.6	29.5	34.8	33.2	32	35.4	32.6

Function	Connect to	Pin	Pin	Function	Connect to
3.3v	3.3v	1	2	GND	GND
3.3v	3.3v	3	4	GND	GND
3.3v	3.3v	5	6	ERXD3	PHY RGMII
3.3v	3.3v	7	8	ERXD2	PHY RGMII
3.3v	3.3v	9	10	ERXD1	PHY RGMII
3.3v	3.3v	11	12	ERXD0	PHY RGMII
3.3v	3.3v	13	14	GND	GND
GPIO 16	I2C_SCLK	15	16	GND	GND
GPIO 17	I2C_DATA	17	18	ETX_CLK	ETX_CLK
GND	GND	19	20	GND	GND
GPIO 21	POWER 2	21	22	GND	GND
GPIO 1	JP1 Debug	23	24	ETX_EN	ETX_EN
GND	GND	25	26	GND	GND
GPIO 4	S17_INT	27	28	GND	GND
GND	GND	29	30	ETXD3	PHY RGMII
GPIO 0	I2C_INT0	31	32	ETXD2	PHY RGMII
GND	GND	33	34	ETXD1	PHY RGMII
GPIO 3	UR_DSR	35	36	ETXD0	PHY RGMII
GPIO 9	UR_SIN	37	38	GND	GND
GPIO 10	UR_SOUT	39	40	GND	GND
GPIO 13	MDC	41	42	ERX_CLK	ERX_CLK
GPIO 14	MDIO	43	44	GND	GND
GPIO 20	POWER 1	45	46	GND	GND
GND	GND	47	48	ERX_EN	ERX_EN
GPIO 22	POWER 3	49	50	GND	GND
GND	GND	51	52	GND	GND

GPIO 2	UR_DTR	53	54	EMDC	GIGA PHY
GND	GND	55	56	EMDIO	GIGA PHY
GPIO 11	Reset	57	58	GND	GND
GND	GND	59	60	GND	GND
GPIO 12	LAN 10/100	61	62	TXP0	10/100 LAN
GND	GND	63	64	TXN0	10/100 LAN
GPIO 15	Reserved	65	66	GND	GND
GND	GND	67	68	RXP0	10/100 LAN
SYS_RST_L	GIGA PHY Reset	69	70	RXN0	10/100 LAN
AVDD18	Fast Ethernet bios	71	72	GND	GND
AVDD18	Fast Ethernet bios	73	74	GND	GND
AVDD18	Fast Ethernet bios	75	76	USB_DM	USB port
GND	GND	77	78	USB_DP	USB port
GND	GND	79	80	GND	GND

Hardware Installation

Follow these steps to install the hardware components.

1. Attach the WLAN antenna to the connector J1.
2. Attach the second WLAN antenna to the connector J2.
3. Connect the WAPN005 module on the system board with the board-to-board connector 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 the pins may be distorted or broken.
4. Use the screws to fasten the WAPN005 module.
5. If you require the power board, install it above the WAPN005 module.
6. Fasten all components on the necessary chassis.

Software Installation

Follow these steps to install the software.

1. Power on the system board.
2. Connect system board and PC with an 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** to verify all of the hardware components have been installed properly.

A

Regulatory Statement Approval

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

CAUTION

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

This device is operation in 5.15 – 5.25GHz frequency range, then restricted in indoor use only.

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-WAPN005 "

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.

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 radio transmitter FCCID: SLE-WAPN005 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-0-2-BK (main/A) (aux/B)	2.9dBi in 2.4 GHz 2.3dBi in 5 GHz
2	KINSUN	ANT-WDB-ANM-0502 (main/A) (aux/B)	4.62dBi in 2.4 GHz 1.41dBi in 5 GHz

Note

This is a specific product that requires professional installation and configuration, must be performed by trained technical engineers to install the antenna. Contact Moxa for more information.