NIU X Wi-Fi module
User Manual

ELECTROLUX

Model Name	NIU X Wi-Fi module
Description	IEEE 802.11b/g/n 2.4GHz Module
Version	Release 0.1

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Related Documents

Date	Author	Description
		Qualcomm Atheros QCA4531 datasheet
	IEEE.org	IEEE 802.11n 2.4 specifications

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1. Introduction

NIU X Wi-Fi module is a IoE Smart Network module that enables wireless internet connectivity for any device wishing to be monitored or managed remotely. The NIU X Wi-Fi module is architected for high performance, feature-rich applications.

This module is based on QCA4531, a highly integrated and feature-rich IEEE 802.11n 2x2 2.4 GHz System-on-a-Chip (SoC). External DDR2 and SPI flash memories are provided that support a big variety of applications. Two antenna ports are available for flexible use of external antennas for the appliances in consideration.

2. Features

- 2.412-2.462 GHz for worldwide market.
- IEEE 802.11n two stream radio.
- Full security support: WPS, WPA, WPA2, WAPI, WEP, TKIP.
- On-board memories: 64MB DDR2 and 32MB SPI NOR Flash
- Host interfaces: UART, I2C, GPIO, USB, Ethernet.
- ROM API support.

3. Specification

Model Number	***NIU X Wi-Fi module***
Product Type	802.11n IoE module
Memory Sizes	Memories on-board: SPI Flash: 32MB DDR2:64MB
Host Interface(s)	UART, I2C, GPIO, USB, Ethernet
Embedded MAC Address	Yes
Main Chip	Qualcomm SoC QCA4531
Coating Material	DOW CORNING/3-1953
Wireless Standard(s)	IEEE 802.11b/g/n
Spreading	IEEE 802.11b DSSS and 802.11g/n OFDM
Operating Frequency	2412-2462 MHz ISM band
Antenna	2 metal antennas.
Number of Channels	11 ,
Data Rates	802.11n: up to 300Mbps 802.11g: 54Mbps with fallback to 48, 36, 24, 18, 12, 9 and 6Mbps 802.11b: 11Mbps with fallback to 5.5, 1 and 1Mbps
Modulation Schemes	802.11g/n: 64QAM (up to 300Mbps), 16QAM (39/36/26/24Mbps), QPSK (19.5/18/13/12Mbps), BPSK (9/6.5/6Mbps) 802.11b: CCK (11/5.5Mbps), DQPSK (2Mbps), DBPSK (1Mbps)
Media Access Protocol	CSMA/CA with ACK
Supply Voltage	5V+/- 10%
Power in Standby Modes	220mA
Dimensions	54.74 x55 x 9.06 mm (typical)
Regulatory Conformance	EMI: FCC Part 15B, Part 15C Europe EN 301 489, EN 300 328 Safety : US : UL 60950-1 Europe : EN 60950-1, EN 62311 (MPE) IEC60950-1
RoHS Compliance	Yes
Operating Temperatures	-20 ~ +85^{o}C
MFi support	Ready
Rating Operating Voltage	5V/2A

4. Mechanical Characteristics

4.1 Module Dimensions

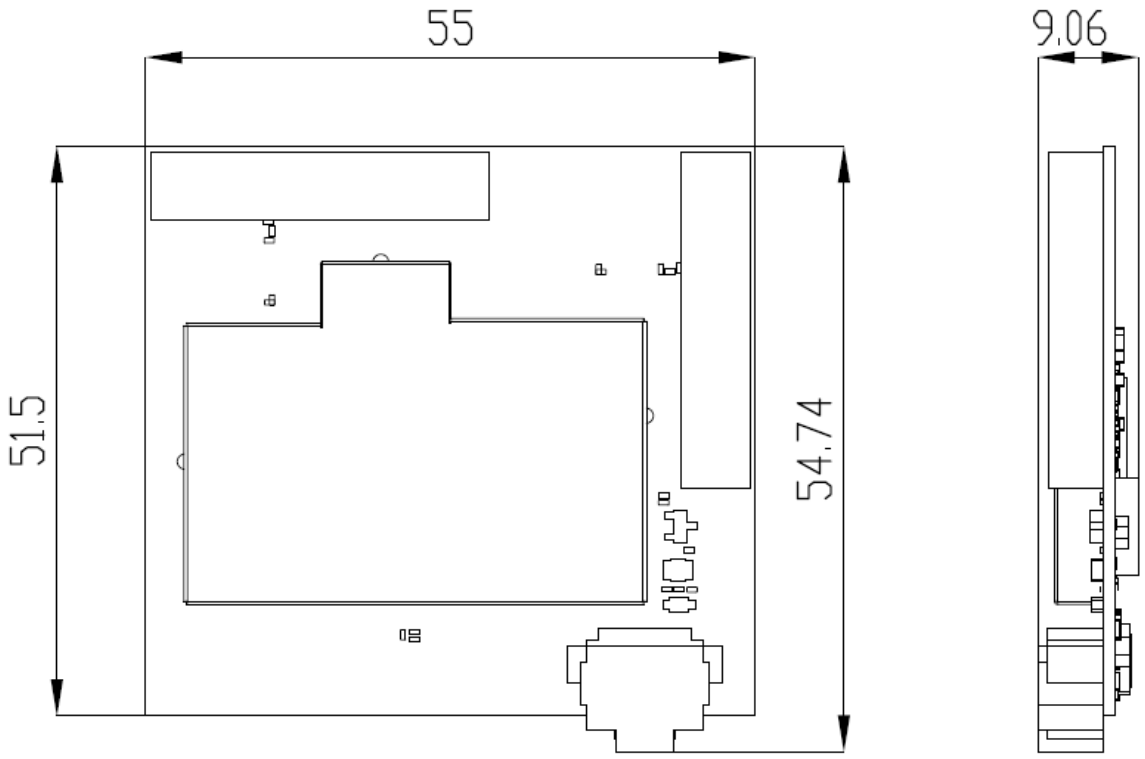

Figure 1: PCB Outline Top View (Unit: mm)

Note:
W:54.74±0.2mm ; L:55±0.2mm ; H:9.06±0.15mm

5. Warranty

One year limited warranty.

6. FCC Statement

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.

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.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with FCC multi-transmitter product procedures.
Refering to the multi-transmitter policy, multiple-transmitter(s) and module(s) can be operated simultaneously without C2P.

IMPORTANT NOTE:
This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated.
Additional testing and certification may be necessary when multiple modules are used.

20cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

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

USERS MANUAL OF THE END PRODUCT:
In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the users manual: This device complies with Part 15 of 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.

LABEL OF THE END PRODUCT:
The final end product must be labeled in a visible area with the following " Contains TX FCC ID: **2AIBX-WD115**". If the size of the end product is larger than 8x10cm, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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 module is intended for OEM integrator. The OEM integrator is still responsible for the IC compliance requirement of the end product, which integrates this module.

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

USERS MANUAL OF THE END PRODUCT:

In the users manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the IC radio-frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. 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.

The module can only be used without additional authorizations if they have been tested and granted under the same intended end-use operational conditions, including simultaneous transmission operations.