

# Product Specification

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## ***WN8122A -65***

**IEEE Dual Band 802.11n USB Module**

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## Revision History

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V 01	◆	Initial Document	March 21 2011	Troy Chen
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# Chapter 1 Introduction

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## 1. Introduction

WN8122A 65 is a dual band wireless 802.11n USB Adapter which enables wireless networking systems to attain data communication speeds up to 300 megabits-per-second (Mbps), while remaining backward compatible to the existing installed base of Wi-Fi systems worldwide. It supports operation to the IEEE 802.11a/b and IEEE 802.11g ,and draft IEEE 802.11n standards.

WN8122A 65 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. 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. It is compatible with 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 and draft 802.11n. 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, RX up at 300 Mbps data rate.
- ◆ Backward compatible to the existing IEEE 802.11a/b/g WLAN infrastructure.
- ◆ User-friendly utility to configure SSID, security setup and site survey.
- ◆ Wireless data encryption with 64, 128 encryption for security.
- ◆ Support USB

### 1.2 Applications

- ◆ Home networking for device sharing.
- ◆ Wireless multimedia.

## Chapter 2 Hardware

### 2.1 General Overview

- ◆ USB Interface and 802.11 n chipset-on-board design.
- ◆ Antenna: 2 internal PCB Antennas on board

### 2.2 Hardware Architecture

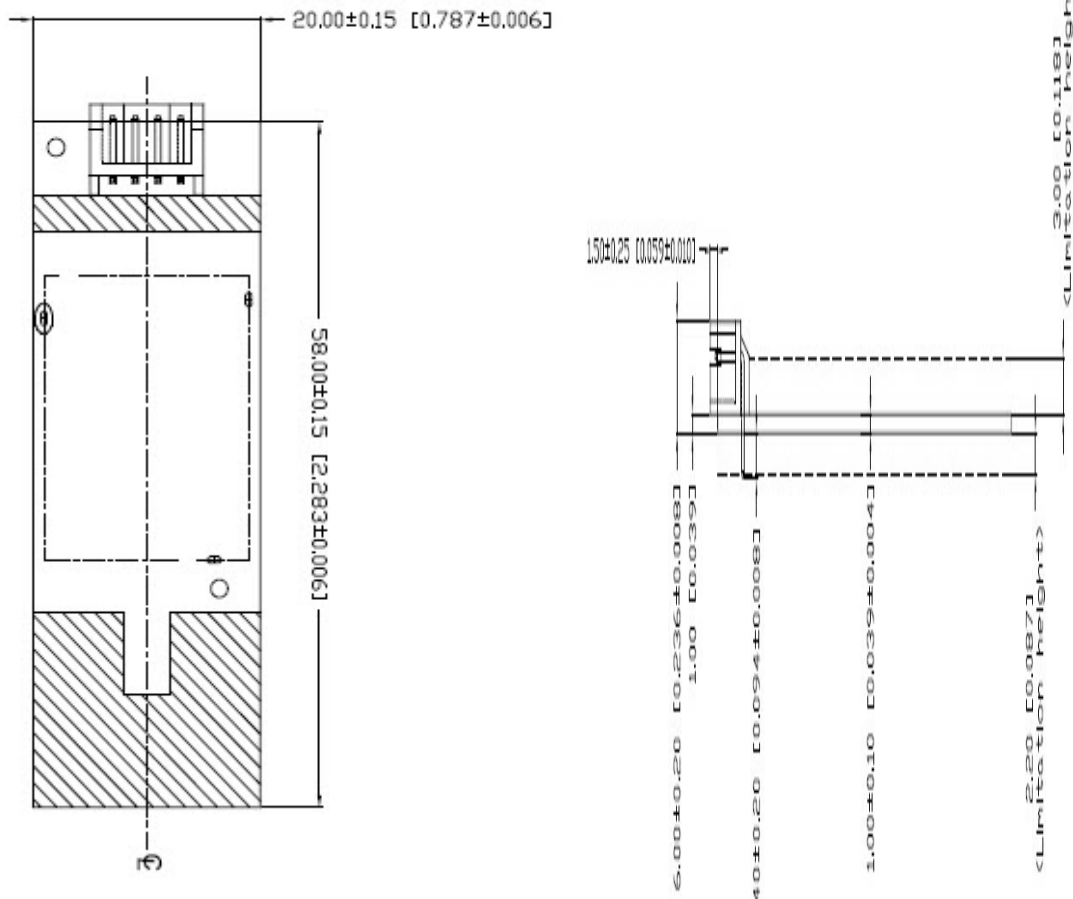
Broadcom 43236 single chip

### 2.3 Main Chipset Information

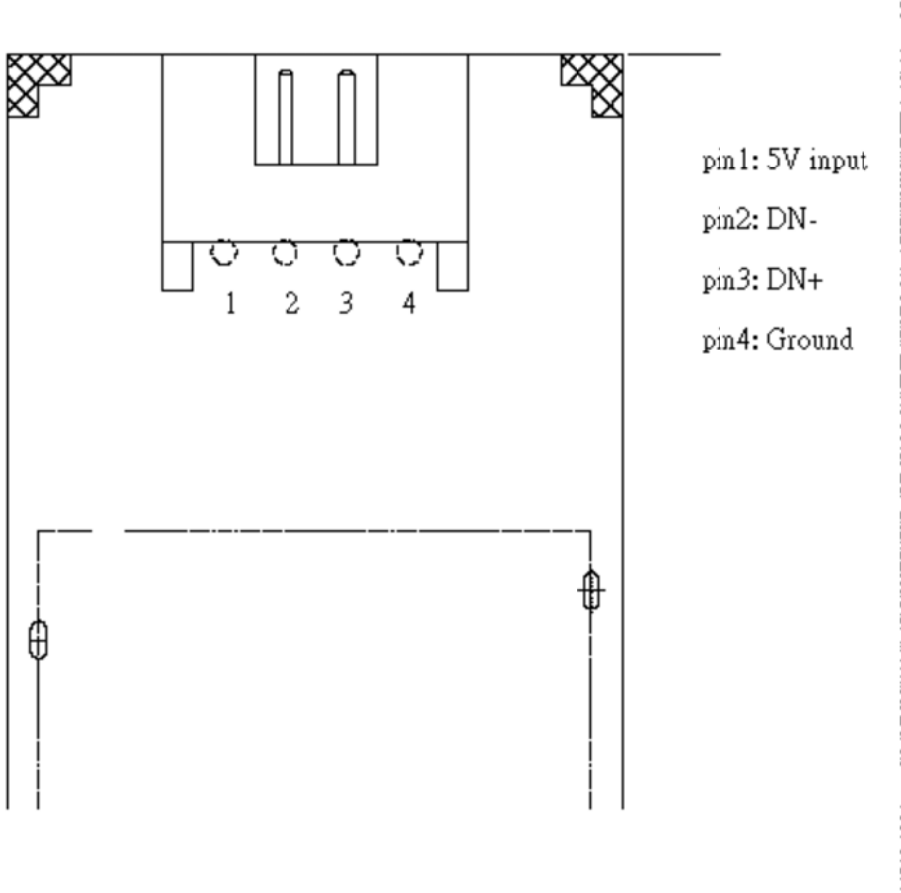
- ◆ **BCM43236** is a dual band IEEE 802.11n-compliant MAC/PHY/Radio complete system on a chip with 2.4Ghz and 5GHz internal PA

### 2.4 PCB dimension

PCB dimension : 58x20 mm



### 2.6 Pin Assignment



## Chapter 3 Software

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### 3.1 Operating System Supported

- ◆ Linux
- ◆ Windows

### 3.2 Wireless Mode Supported

- ◆ AP (Infrastructure) Client mode

### 3.3 Security

- ◆ WPA-PSK(TKIP/AES)
- ◆ WPA2-PSK(TKIP/AES)

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## Chapter 4 Specifications

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◆ Frequency Band:

802.11a: ISM Band 5.150 ~ 5.850Ghz (subject to local regulations)

802.11b: ISM Band 2.400 ~ 2.4835Ghz (subject to local regulations)

802.11g: ISM Band 2.400 ~ 2.4835Ghz (subject to local regulations)

◆ Draft 802.11n: ISM Band

2.4GHz

HT20 2.400 ~ 2.4835Ghz (subject to local regulations)

HT40 2.422 ~ 2.452Ghz (subject to local regulations)

5GHz

Channel	Frequency (GHz)	Location
36	5.180	Indoor Only
40	5.200	Indoor Only
44	5.220	Indoor Only
48	5.240	Indoor Only
52	5.260	DFS required
56	5.280	DFS required
60	5.300	DFS required
64	5.320	DFS required
100	5.500	DFS required
104	5.520	DFS required
108	5.540	DFS required
112	5.560	DFS required
116	5.580	DFS required
120	5.600	DFS required
124	5.620	DFS required
128	5.640	DFS required
132	5.660	DFS required
136	5.680	DFS required
140	5.700	DFS required



149 5.745 North America  
153 5.765 North America  
157 5.785 North America  
161 5.805 North America  
165 5.825 North America

◆ Transmit Power and Sensitivity:

TX Output Power:

- 11b: 16 +/- 1.5 dbm
- 11g: 15 +/- 1.5dbm
- 11n HT20, 2.4GHz: 13 +/- 1.5dbm
- 11n HT40, 2.4GHz: 10.5 +/- 1.5dbm
- 11a : 14.5 +/- 2dbm
- 11n HT20, 5GHz: 13 +/- 2dbm
- 11n HT20, 5GHz: 10.5 +/- 2dbm

Rx Sensitivity:(Typical)

- 802.11a:
  - Typical -70dBm@54Mbps, +/-2dBm
- 802.11n 5GHz HT20: (TBC)
  - MCS=7 -68dBm@54Mbps, +/-2dBm
- 802.11n 5GHz HT40: (TBC)
  - MCS=7 -65dBm@54Mbps, +/-2dBm
- 802.11b:
  - Typical -86dBm@11Mbps, +/-2dBm
- 802.11g:
  - Typical -72dBm @ 54Mbps, +/-2dBm
- Draft 802.11n 2.4GHz HT20:
  - MCS=7 -68dbm, +/-2dBm
- Draft 802.11n 2.4GHz HT40:
  - MCS=7 -65dbm, +/-2dBm

- ◆ Modulation
  - DBPSK @1Mbps
  - DQPSK@2Mbp
  - CCK@5.5/11Mbps
  - BPSK@6/9 Mbps
  - QPSK@12/18Mbps
  - 16-QAM@24Mbps
  - 64-QAM@48/54Mpb and above
  
- ◆ Current consumption(5V DC):
  - TX: 2164mW at 11dBm HT40 CH38 2x2
  - RX: 1405mW at 11dBm HT40 CH38 2x2
  - Power Saving: < 50mA
  - Radio OFF mode: < 100mA
  
- ◆ Operating Temperature: 0 ~ 65 °C ambient
- ◆ Storage Temperature: -20 ~ 70 °C ambient
- ◆ Humidity: under 85% and must be non-condensing
  
- ◆ Regulation and certification compliance available:
  - ◆FCC/IC

## References

- ◆ BRCM Reference Design Functional Specification
- ◆ IEEE 802.11b Standard Specification
- ◆ IEEE 802.11g Standard Specification
- ◆ IEEE 802.11n draft Standard Specification

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### **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.

### **Country Code Statement**

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 or operation in conjunction with any other antenna or transmitter.

This device is going to be operated in 5.15~5.25GHz frequency range, it is restricted in indoor environment only.

Devices will not permit operations on channels 120-132 for 11a and 11n/a which overlap the 5600 -

5650 MHz band.

**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.

**IMPORTANT NOTE:**

This module is intended for OEM integrator. The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module.

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 user's 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 user's 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: RAXWN8122A65 ". 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.

### IC Statement

**This Class B digital apparatus complies with Canadian ICES-003.**

*Cet appareil numérique de la classe B conforme à la norme NMB-003 du Canada.*

### Licence-Exempt Radio Apparatus

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

*Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

### Country Code Statement

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 or operation in conjunction with any other antenna or transmitter.

The device could automatically discontinue transmission in case of absence of information to transmit, or operational failure. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

Dynamic Frequency Selection (DFS) for devices operating in the bands 5250- 5350 MHz, 5470-5600 MHz and 5650-5725 MHz.

The device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems.

The maximum antenna gain permitted (for devices in the bands 5250-5350 MHz and 5470-5725 MHz) to comply with the e.i.r.p. limit.

The maximum antenna gain permitted for devices in the band 5725-5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

This equipment complies with IC RSS-102 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 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.

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 IC RSS-102 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 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. IC statement is required to be available in the user's manual: This Class B digital apparatus complies with Canadian ICES-003. 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 IC : 4711A-WNB122A65 "