

# User Guide

## 802.11n 1x1 MIMO Half Mini Card

### 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.

**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. To maintain compliance with FCC RF exposure compliance requirements, please follow operation instruction as documented in this manual.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna.
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

**IMPORTANT NOTE:** In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

### End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains TX FCC ID: RK9-BCM4313N1T1R”.

### Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user’s manual of the end product which integrates this module.

The users manual for OEM integrators must include the following information in a prominent location “IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements. The antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

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### Canada-Industry Canada (IC)

Operation is subject to the following two conditions:

this device may not cause interference and

this device must accept any interference, including interference that may cause undesired operation of the device.

#### **IMPORTANT NOTE:**

IC Radiation Exposure Statement:

This equipment with IC radiation exposure limits set forth for an uncontrolled environment. To maintain compliance with IC RF exposure compliance requirements, please follow operation instruction as documented in this manual.

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## 1. INTRODUCTION

The BCM4313 provides ultra-high performance (up to 150 Mbps) transmission rate in the 2.4GHz band. Backward compatible with the current 802.11 b/g/n network devices gives your laptop the freedom of wireless connectivity with the performance, security, and manageability industry standards in the security and quality of service (QoS), as the draft 802.11i and 802.11e standards respectively. The BCM4313 is complemented by drivers and networking tools for various versions of the Windows operating system. Extensive technical documentation on integration issues such as antenna design, customizing driver, and management software can be obtained by request.

### Application

- Wireless client cards for desktop and notebook PCI Express.
- Wireless multimedia
- High performance draft 11n access points, routers, and DSL gateways that feature the PCIe host interface.

### PCB Dimension



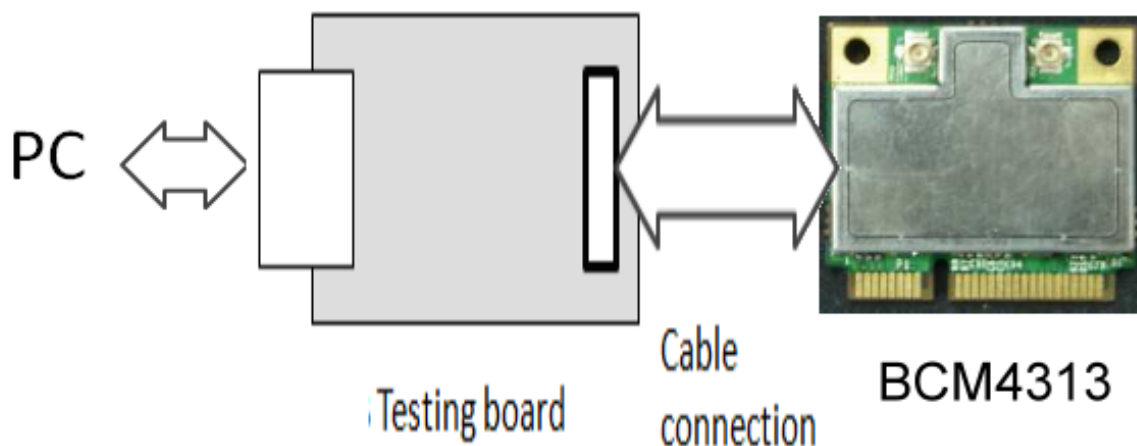
## 2. INSTALLATION

### 2.1 Installed in Laptop PC

The Mainboard of the system should provide a Host connector and Cable connection for wifi module. Please follow the SOP to install & assemble it step by step.

### 2.2 Testing in Lab

The module is embedded inside Notebook or other Equipment. If for testing purpose, we provide the "Testing Board" in order to let tester connect BCM4313 via the special cable connection to PC externally. The Testing Board provides 3.3V conversion from PC Host. Please plug into any con port on your PC.



After Hardware installation, when system find the new hardware, please install the driver / software correctly.

## 3 Product Specifications

Network Processor	BCM4313														
WLAN Standards	IEEE 802.11b/g/n compliant														
Antenna	External antenna & IPEX connector														
Data Rate	802.11b: 11, 5.5, 2 & 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9 & 6 Mbps 802.11n 20MHz BW : MCS 0~7 up to 72.22Mbps														
Modulation	802.11b: CCK(11&5.5 Mbps), DQPSK (2Mbps), DBPSK (1Mbps), 802.11g/n: DBPSK, DQPSK, OFDM, BPSK, QPSK, 16QAM, 64QAM														
Operating Frequencies	2412 ~ 2462 MHz for North America 2412 ~ 2472 MHz for Europe 2412 ~ 2484 MHz for Japan														
Frequency Band	2.4GHz														
Channel Numbers	11 for North America 13 for Europe 14 for Japan														
Output Power	802.11b: 14.0 ~17.0 dBm 802.11g: 14.0 ~17.0 dBm 802.11n: 14.0 ~17.0 dBm														
Power Consumption	Operation (average) < 460mA														
Security	WEP (64-bit/128-bit), 802.1x WPA/WPAs (TKIP, AES)														
Operating System	Windows 2K/XP, Linux														
Maximum Receive Level	-20dBm (with PER<10%)														
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Voltage	3.3 VDC from host (+/- 0.2V)														