

## FCC Statement

**Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.**

The 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.

The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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 or more 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 needed.

Consult the dealer or an experienced radio/TV technician for help.



### **CAUTION:**

To comply with FCC RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons.

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

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

#### **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 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: UOH-AG623T".

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.

**RF Exposure Manual Information That Must be Included**

The users manual for end users must include the following information in a prominent location "IMPORTANT NOTE: 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."

**Additional Information That Must be Provided to OEM Integrators**

The end user should NOT be provided any instructions on how to remove or install the device.

# 1. Introduction

**54Mbps IEEE802.11a/b/g Wireless Network Mini PCI Adapter** is the perfect solution for your wireless network applications based on the IEEE 802.11a/b/g standard offering a data rate of 54Mbps in a wireless LAN environment.

**AG-623** is designed for Access Point, Router, ATUR, Printer Server series, IP Camera series and Internet Video Server gives you wireless access the web and network resource without the wire.

**AG-623** provides high-speed access to network resources and has built-in 40/64-bit, 128 bit and 256 bit of WEP (Wired Equivalent Privacy) data encryption. With Direct Spread Spectrum Signaling (DSSS) and Orthogonal Frequency Division Multiplexing (OFDM), domain access control, WEP encryption and group security, the modules will safeguard all your wireless data transmissions from your nosy neighbors.

**AG-623** allows you to take full advantage of your devices mobility with access to real-time information and online services anytime and anywhere.

## 2. Feature

- . Complies with IEEE 802.11a/b/g Standard for Wireless LAN.
- . Works with All Existing Network Infrastructures.
- . Compatible with Wi-Fi Wireless Products and Services
- . Capable of up to 256-Bit WEP Encryption.
- . Freedom to Roam While staying Connected
- . 54 Mbps High-Speed Transfer Rate
- . Two UF-L Connectors for External Antenna
- . Support Antenna diversity for Better Sensitivity
- . Lower Power Consumption.

### 3.Specification

| Product Description                                                   |                              |              |
|-----------------------------------------------------------------------|------------------------------|--------------|
| IEEE 802.11a/b/g 5 & 2.4 GHz WLAN miniPCI card with Turbo A & Turbo G |                              |              |
| Lead Free                                                             |                              |              |
| RoHs Compliant                                                        |                              |              |
| Host Interface                                                        |                              |              |
| 32-bit miniPCI                                                        |                              |              |
| Operating Voltage                                                     |                              |              |
| DC 3.3 ± 5%                                                           |                              |              |
| Chipset                                                               |                              |              |
| Mac/BB Processor                                                      | Atheros AR5413 (Single chip) |              |
| PA Chip                                                               | RF5824 RFMD                  |              |
| Power Consumption                                                     |                              |              |
| 11A                                                                   | TX: ≤ 550 mA                 | RX: ≤ 450 mA |
| 11B                                                                   | TX: ≤ 550 mA                 | RX: ≤ 450 mA |
| 11G                                                                   | TX: ≤ 550 mA                 | RX: ≤ 450 mA |
| Radio                                                                 |                              |              |
| Antenna                                                               | two U.FL-R-SMT connectors    |              |

|                                                                          |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Sensitivity                                                              | IEEE 802.11a / Super A<br>Sensitivity @ Packet Error Rate: 10%                                                                                                                                                                                                                                                 | IEEE 802.11g / Super G<br>Sensitivity @ Packet Error Rate: 10%                                                                                                                                                                                                                                                 | IEEE 802.11b<br>Sensitivity @ Packet Error Rate: 8%                                                                                                |
|                                                                          | <ul style="list-style-type: none"><li>♦ 54 / 108 Mbps: ≤ -65dBm</li><li>♦ 48 / 96 Mbps: ≤ -66dBm</li><li>♦ 36 / 72 Mbps: ≤ -70dBm</li><li>♦ 24 / 48 Mbps: ≤ -74dBm</li><li>♦ 18 / 36 Mbps: ≤ -77dBm</li><li>♦ 12 / 24 Mbps: ≤ -79dBm</li><li>♦ 9 / 18 Mbps: ≤ -81dBm</li><li>♦ 6 / 12 Mbps: ≤ -82dBm</li></ul> | <ul style="list-style-type: none"><li>♦ 54 / 108 Mbps: ≤ -65dBm</li><li>♦ 48 / 96 Mbps: ≤ -66dBm</li><li>♦ 36 / 72 Mbps: ≤ -70dBm</li><li>♦ 24 / 48 Mbps: ≤ -74dBm</li><li>♦ 18 / 36 Mbps: ≤ -77dBm</li><li>♦ 12 / 24 Mbps: ≤ -79dBm</li><li>♦ 9 / 18 Mbps: ≤ -81dBm</li><li>♦ 6 / 12 Mbps: ≤ -82dBm</li></ul> | <ul style="list-style-type: none"><li>♦ 11Mbps: ≤ -80dBm</li><li>♦ 5.5Mbps: ≤ -83dBm</li><li>♦ 2Mbps: ≤ -84dBm</li><li>♦ 1Mbps: ≤ -87dBm</li></ul> |
| Modulation                                                               | IEEE 802.11a (OFDM/DSSS) <ul style="list-style-type: none"><li>♦ 48/54 Mbps (QAM-64)</li><li>♦ 24/36 Mbps (QAM-16)</li><li>♦ 12/18 Mbps (QPSK)</li><li>♦ 6/9 Mbps (BPSK)</li></ul>                                                                                                                             | IEEE 802.11g (OFDM/DSSS) <ul style="list-style-type: none"><li>♦ 48/54 Mbps (QAM-64)</li><li>♦ 24/36 Mbps (QAM-16)</li><li>♦ 12/18 Mbps (QPSK)</li><li>♦ 6/9 Mbps (BPSK)</li></ul>                                                                                                                             | IEEE 802.11b (DSSS) <ul style="list-style-type: none"><li>♦ 5.5/11 Mbps (CCK)</li><li>♦ 2 Mbps (DQPSK)</li><li>♦ 1 Mbps (DBPSK)</li></ul>          |
| Range Coverage<br>(Typical range in open environment with 0 dBi Antenna) | IEEE 802.11a <ul style="list-style-type: none"><li>♦ 54Mbps: ≥ 60 meter</li></ul>                                                                                                                                                                                                                              | IEEE 802.11g <ul style="list-style-type: none"><li>♦ 54Mbps: ≥ 60 meter</li></ul>                                                                                                                                                                                                                              | IEEE 802.11b <ul style="list-style-type: none"><li>♦ 11Mbps: ≥ 80 meter</li></ul>                                                                  |
| Operating Frequency                                                      | IEEE 802.11a ISM Band <ul style="list-style-type: none"><li>♦ Japan(TELEC): 5.15GHz ~ 5.25GHz, 5.25~5.35GHz</li><li>♦ USA(FCC):5.15GHz ~ 5.25GHz, 5.725~5.850GHz</li></ul>                                                                                                                                     |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
|                                                                          | IEEE 802.11b/g ISM Band <ul style="list-style-type: none"><li>♦ Japan(TELEC): 2.412 GHz ~ 2.472 GHz (CH13 for 802.11g, CH14 for 802.11b)</li><li>♦ USA(FCC):2.412GHz ~ 2.462GHz(CH1~11)</li></ul>                                                                                                              |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
| Software Specification                                                   |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
| Supported OS                                                             | Identical to Atheros Latest Version                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
| Security                                                                 | Identical to Atheros Latest Version                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
| Physical Specification                                                   |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
| Dimension                                                                | 59.6mm(L) * 31.3mm(W) * 4mm(H)                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
| Weight                                                                   | ≤ 50 g                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
| Environment Specification                                                |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
| Temperrature                                                             |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
| Operating                                                                | 0 ~ 65 °C                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
| Storage                                                                  | -20 ~ 80 °C                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
| Warranty                                                                 |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |
| 12 months                                                                |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |

## 4. Hardware Installation

The following sections in this chapter describe how to install AG-623 Module

### 4.1. Installation Overview

**AG-623** wireless module is design for Access Point, Router, ATU-R, Printer Server series, IP Camera series and Internet Video Server only.

### 4.2. Safety Recommendations

The safety guidelines are as follows:

- λ Keep the board area clear and dust-free before, during, and after installation.
- λ Keep tools away from walk areas where you and others could fall over them.
- λ Do not wear loose clothing or jewelry, such as earrings, bracelets, or chains, that could get caught in the board.
- λ Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- λ Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- λ Never attempt to lift an object that is too heavy for one person to handle.

### 4.3. Maintaining Safety with Electricity

**Warning: Before working on a board or working near power supplies, unplug the power cord on AC units; on DC units, disconnect the power at the circuit breaker.**

Follow these guidelines when working on equipment powered by electricity:

- λ Do not work alone if potentially hazardous conditions exist anywhere in your work space.
  - λ Never assume that power is disconnected from a circuit; always check the circuit.
- extension cables, frayed power cords, and missing safety grounds.
- λ If an electrical accident occurs, proceed as follows:
    - Use caution; do not become a victim yourself.
    - Disconnect power from the system.
    - If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help.
    - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

- 7 -

### 4.4. Installing a **AG-623**

- λ Remove the **AG-623** module from its protective packaging.
- λ Avoiding Electrostatic Discharge

Before you install the **AG-623** module, ground yourself by touching a piece of metal to avoid electrostatic discharge (ESD). You should also take the following precautions to prevent damage to the AG-623 module:

- λ Keep the **AG-623** module in its antistatic-shielded bag until you are ready to install it.
- λ Handle the **AG-623** module by its edges.
- λ Ensure the connector is connected to above Model's board tightly.