

# **WirelessHD RX Module**

## **User's Manual**

**0G Module 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 three 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. (3) This module may not be integrated into host devices that are addressed for operation inside airplanes/satellites.

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. 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 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.

**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 RX FCC ID: **TLZ-WH064R** ". 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.

**60G Module IC Statement :**

CAN ICES-3 (B)/NMB-3(B)

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.*

**IMPORTANT NOTE:**

**IC Radiation Exposure Statement:**

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.

**IMPORTANT NOTE:**

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. IC statement is required to be available in the users 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 RX  
IC : **6100A-AWWH064R**

**60G Module CE Statement :**

This equipment complies with EU 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.

# Index

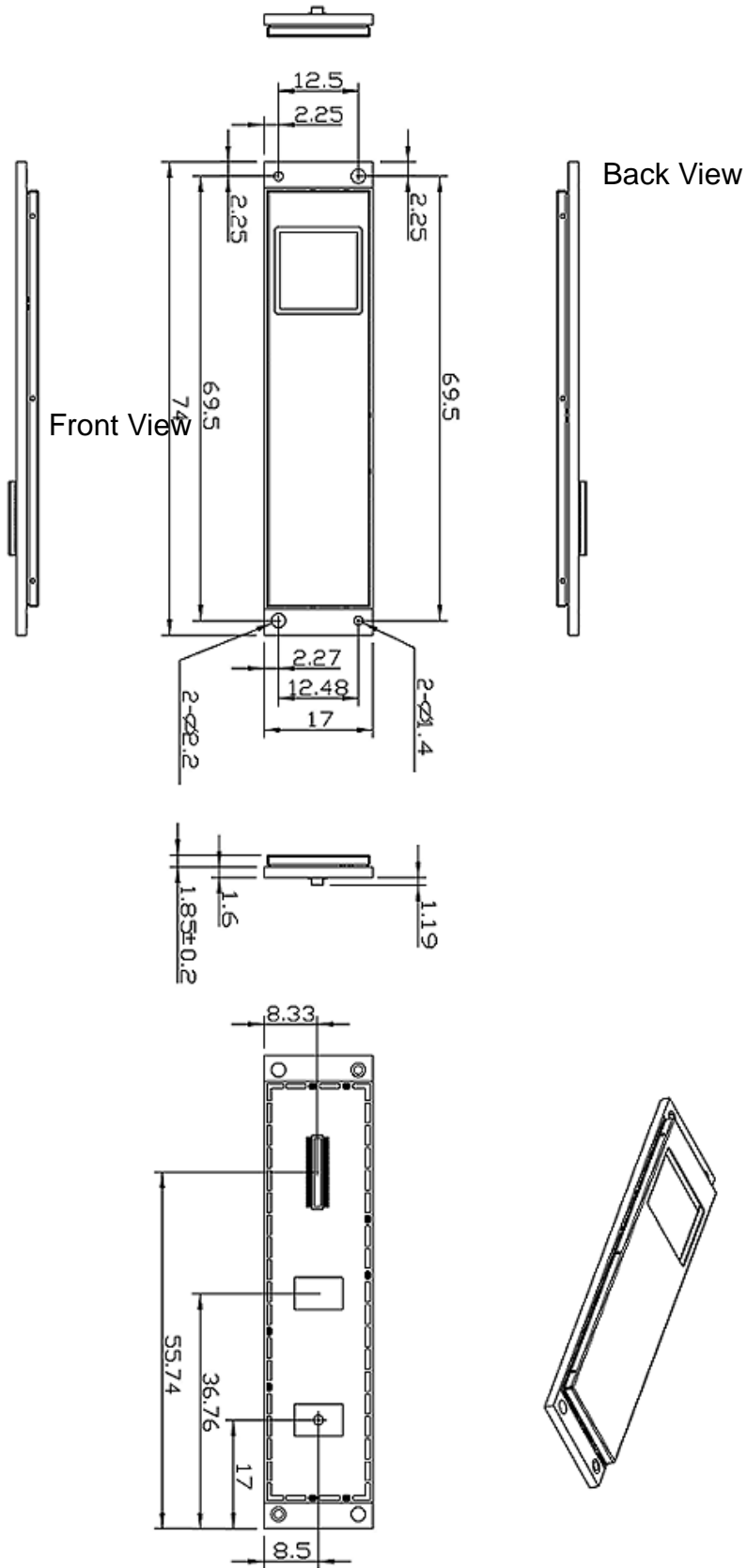
<b>1</b>	<b>Introduction .....</b>	<b>1</b>
<b>1.1</b>	<b>Product Layout .....</b>	<b>2</b>
<b>1.2</b>	<b>Features .....</b>	<b>3</b>
<b>1.3</b>	<b>Package Content .....</b>	<b>3</b>
<b>1.4</b>	<b>Specification Table .....</b>	<b>3</b>
<b>2</b>	<b>Installation Steps .....</b>	<b>錯誤! 尚未定義書籤。</b>

## **1 Introduction**

AzureWave AW-WH064 WirelessHD RX and TX RF modules are able to transmit and receive uncompressed HDMI video, multi-channel audio and control data wirelessly by 60 GHz frequency band with 4Gbps bandwidth. AW-WH064 replaces the HDMI cable and simplifies home theater system installation. The source devices, such as BD player, Set Top Box or Tablet, they don't need to be located near to the TV.



### 1.1 Product Layout



## 1.2 Features

- **Standard: WirelessHD 1.1**
- **Frequency: 60GHz**
- **Data Rate: 4Gbps**
- **Distance: 10m (In Room)**
- **No Video Compression**
- **Latency: <1ms**
- **Support for video resolutions from 480i/576i to 1080p/60Hz**
- **~ 8 Channels Audio (32 ~ 192KHz)**
- **Array Antenna**
- **HDMI 1.4a Compatible**
- **HDCP 2.0 Support, 128-bit AES**

## 1.3 Package Content

The package include the below package content:

- One set of AW-WH064T and AW-WH064R
- Power Adapter
- User’s Manual

## 1.4 Specification Table

<b>Model Name</b>	<b>AW-WH064T &amp; AW-WH064R</b>
<b>Product Description</b>	<b>WirelessHD RF Module</b>
<b>WirelessHD Standard</b>	<b>WirelessHD V1.1</b>
<b>HDMI Standard</b>	<b>HDMI 1.4a</b>
<b>Connector</b>	<b>50pin Board to Board connector</b>
<b>Major Chipset</b>	<b>TX:</b> <b>Sil6310 - WirelessHD RF Transceiver</b> <b>Sil6320 – WirelessHD Transmitter Network Processor</b>  <b>RX:</b> <b>Sil6310 - WirelessHD RF Transceiver</b> <b>Sil6321 –WirelessHD Receiver Network Processor</b>
<b>Dimension</b>	<b>70x15 mm</b>
<b>Antenna</b>	<b>12 Antenna Array support Beam-forming</b>
<b>Operating Conditions</b>	
<b>Voltage</b>	<b>5V</b>

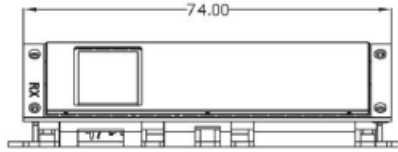
Current	Max: 807mA, Average: 422mA, Min: 226mA														
<b>Display</b>															
Resolution	Up to 1080p @60														
Video Format	4:4:4 36bit Deep Color														
<b>Audio</b>															
Channel	2~8														
Sample Rate	32-192kHz														
Back-channel	HDMI-ARC/LR-Audio														
<b>RF Specifications</b>															
Frequency Range	59.40~63.72GHz														
Modulation	HRP: OFDM with QPSK , 16-QAM LRP: OFDM with BPSK														
Occupied Bandwidth	HRP:1.76Ghz LRP: 92Mhz														
Output Power	<table border="1"> <thead> <tr> <th></th> <th>Min.</th> <th>Typ.</th> <th>Max.</th> </tr> </thead> <tbody> <tr> <td>HRP</td> <td>23 dBm</td> <td>26 dBm</td> <td>28 dBm</td> </tr> <tr> <td>LRP</td> <td>18 dBm</td> <td>21 dBm</td> <td>31 dBm</td> </tr> </tbody> </table>				Min.	Typ.	Max.	HRP	23 dBm	26 dBm	28 dBm	LRP	18 dBm	21 dBm	31 dBm
	Min.	Typ.	Max.												
HRP	23 dBm	26 dBm	28 dBm												
LRP	18 dBm	21 dBm	31 dBm												
Receive Sensitivity	HRP: -69 dBm														
PHY Rates	HRP: Up to 3.81 Gbps MRP: Up to 1.19 Gbps LRP: Up to 10.17 Mbps														
Operating Range	Indoor: 10 m (The transmission speed may vary according to the environment)														
Security	HDCP 2.0, 128-bit AES														
<b>Operation &amp; Storage Environment</b>															
Temperature	Storage: -10~ 60°C Operating: -5~ 50°C														
Humidity	Storage:90% Operating:80%														
<b>Life Time</b>															
MTTF	50,000 Hr(s)														
<b>AW-WH064T Power Consumption</b>															
HRP 1080p	2.445 Watts														
HRP 720p	2.13 Watts														
LRP	2.08 Watts														

Idle mode	2.06 Watts
<b>AW-WH064R Power Consumption</b>	
HRP 1080p	2.26 Watts
HRP 720p	2.025 Watts
LRP	1.75 Watts
Idle mode	1.76 Watts

## 2 Installation Steps

1. Connect AW-WH064T and AW-WH064R to I/O board

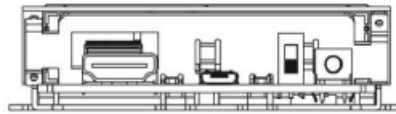
PCBA Front view:



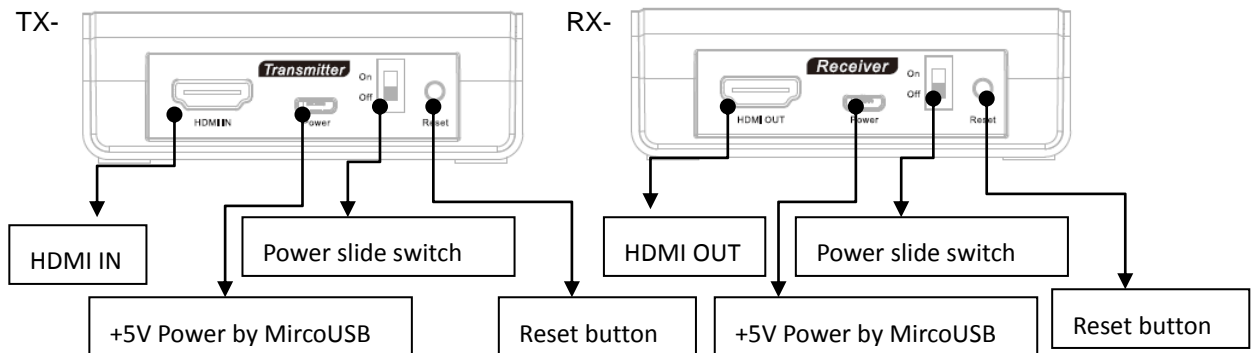
Front view with housing:



PCBA Back view:



Back view with housing:



2. Connect the power adapter to the WirelessHD product and power outlet, both Transmitter and Receiver.
3. Connect HDMI connector on AW-WH064T to media source such as BD Player. One end from media source and the other end to Transmitter HDMI IN.
4. Connect HDMI connector on AW-WH064R to flat panel display such as LCD TV by HDMI cable. One end from Receiver HDMI OUT and the other end to TV HDMI IN.
5. Turn on power; slide the switch to On for both sides.
6. After 10 ~ 30 seconds, it can connect automatically and the TV can display normally for the source content.

### 3 LED and Reset button behavior

Power LED: It is always on after power on.

Link LED behavior:

**LED is OFF.** The module is not powered, has not yet started, or is in Power Save mode if power LED is on.

**LED is blinking slowly.** The module has started but has not yet associated with any network.

**LED is blinking fast.** The module is attached to a network but is disconnected (or not yet connected), meaning no video connections are currently processed.

**LED is ON.** The module is hosting an ongoing audio video connection with a station in the network.

TX Transmitter module Reset Button:

When the module is ON:

**Short press(1 second): NEXT-WVAN.** This function allows users to switch the current association over to the next available network. This disconnects the current connection and triggers a channel scan and association to the next available coordinator. Each time the signal goes LOW, the radio switches to the next network in order of channel priority, when available, until the transmitter module is re-associated with its first network.

**Long press(5 seconds): RESET to FACTORY.** This function allows users to reset the transmitter module to its original shipping condition. All run time settings are erased from memory. The main use of this function is to set the current channel setting to factory default, which is LR2 HR2.

RX Receiver module Reset Button:

When the module is ON:

**Short press(1 second): NEXT-SOURCE.** This function allows users to switch the source of the audio/video to another WirelessHD transmitter in range. This disconnects the current video connection and triggers a connection to the next source available in the current network device list. Each time the signal goes LOW, the audio/video source switches to the next video source, until the receiver module is reconnected to its original audio/video source. If there is only one WirelessHD audio/video source transmitter in range, the short press will not have any effect because there is no video source to switch to.

**Long press(5 seconds): RESET to FACTORY.** This function allows users to reset the receiver module to its original shipping condition. All run time settings are erased from memory. The main use of this function is to set the current channel setting to factory default, which is LR2 HR2.