

# **MWC-434m User Manual**

**60GHz RF/BB Module with USB3.0 interface**

**Rev. 1.1**

**2021-04-02**



**Revision History**

| Date     | Written by | Rev. | Description                           |
|----------|------------|------|---------------------------------------|
| 21.02.15 | Ken. Jung  | 1.0  | MWC-434m User manual .1.0 Release     |
| 21.04.02 | Ken. Jung  | 1.0  | Update Module Integration Instruction |
|          |            |      |                                       |
|          |            |      |                                       |

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**1.Introduction**

## 1.1 Overview

Miliwave's MWC-434m module operates in 60GHz unlicensed frequency band, IEEE802.11ad compliant, and is designed for Point to Multi-Pont (PTMP) or Point to Point (PTP) bridge wireless communication, primarily for Line-of Sight (LOS) operation. The MWC-434m module connects to a Linux based Host Communication Processor board via an available USB 3.0 Type-c port. All required drivers and firmware is pre-installed on the MWC-434M module as a self-contained device. However, the MWC-434m module would not be operational unless it is connected to the Linux-based Host Communication Processor board for PTP or PTMP bridge wireless communication.



For more information, please contact your Miliwave ([sales@miliwave.co.kr](mailto:sales@miliwave.co.kr))

## 1.2 Abbreviations and Acronym Definitions

| Acronym | Definition                                        |
|---------|---------------------------------------------------|
| Gbps    | Giga bits per second                              |
| GHz     | Giga Hertz                                        |
| IEEE    | Institute of Electrical and Electronics Engineers |
| LED     | Light Emitting Diode                              |
| LoS     | line-of-sight                                     |
| Mbps    | Mega bits per second                              |
| MCS     | Modulation and Coding Scheme                      |
| MHz     | Mega Hertz                                        |
| PTMP    | Point-to-multipoint Communication                 |
| QAM     | Quadrature amplitude modulation                   |



### 1.3 MWC-434m Module Description

The Miliwave's MWC-434m module in conjunction with the Host Communication Processor board can function as a PTP or PTMP bridge communication. Main characteristics of the MWC-434m module include:

- Adaptive Modulation and Link Adaptation: Up to 16QAM and MCS0-12 support
- Phased Array Planar Antenna: EIRP 28dBm,
- Beam sweep range : Elevation 100°, Azimuth 100°
- Advanced Security: AES-128
- Compact Form Factor: 45mm x 50mm x25mm
- Connectivity: USB 3.0 Type-C, 60GHz wireless

### 2. Technical Specifications

- Aggregate capacity: Upto 1.4 Gbps uni-directional, Upto 2.8 Gbps bi-directional
- Latency : less than 1 millisecond round-trip
- Security: AES-128
- I/O interface: USB 3.0(Type-C)
- Other Interface: LEDs indicators for connection status

### 3.0 Radio Specifications

- Access Technology: Single Carrier beam-forming physical layer
- Time Division Duplex
- Frequencies: 59.40 ~ 65.88GHz
- Channel Bandwidth: 2.16 GHz
- Antenna: 4x8 Air gap Phased Array Planar Antenna beam-forming with 100degree horizontal and 100 degree vertical
- EIRP: 28 dBm

### 4.0 Mechanical, Power and Environmental Specification

- Dimension: 51.2mm x 45.6mm x25m
- Weight: 70g
- Power Consumption: 4W(Max)
- Operating Temperature: -40°C ~ + 80°C
- Humidity: 5%~95%

### 5.0 Module Throughput

- MCS Index : 0-12,
- Modulation: BPSK,QPSK,16QAM
- Data Rate : Max PHY rate 4620 Mbit/s

### 6.0 Installation

The MWC-434m could only be installed with Host Communication Processor board at the factory level. There is no user serviceable parts in the MWC-434m module

### 7.0 FCC Statement

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.

The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times.



## **8.0 Module Integration Instructions**

### **List of applicable FCC rules**

This module complies with part 15.255 of the FCC rules.

### **Limitation of the module use case**

15.255(a) Operation under the provisions of this section is not permitted for the following products:

- (1) Equipment used on satellites.
- (2) Field disturbance sensors, including vehicle radar systems, unless the field disturbance sensors are employed for fixed operation, or used as short-range devices for interactive motion sensing. For the purposes of this section, the reference to fixed operation includes field disturbance sensors installed in fixed equipment, even if the sensor itself moves within the equipment.

### **Limited module procedures**

Not applicable

### **Trace antenna designs**

Not applicable

### **RF exposure considerations**

This module complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The module is limited to installation in mobile or fixed applications. At least 20 Cm of separation distance between the transmitting antenna and the user's body must be maintained at all times.

The host manual shall include the RF exposure statements.

If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).

### **Antennas**

The module itself has antenna. (Broad band array antenna)

### **Label and compliance information**

The module is labeled with its own FCC. If the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

"Contains FCC ID: 2AVCWMWC434M"



### **Information on test modes and additional testing requirements**

Testing of the host product with all the transmitters installed – referred to as the composite investigation test– is recommended, to verify that the host product meets all the applicable FCC rules. The host manufacturer can use the software to make the WiGig transmit continuously.

### **Host User Manual**

The host manual shall include the following regulatory statement:

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

The antenna(s) must be installed such that a minimum separation distance of at least 20 cm is maintained between the radiator (antenna) and all persons at all times.

