

MWC-740m User Manual

60GHz Bridge

Rev. 1.2

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Revision History

Date	Written by	Rev.	Description
22.07.28	Sun.Lee	1.0	MWC-740m User manual .1.0 Release
22.08.18	Sun.Lee	1.1	Numerical error correction.
22.09.01	Sun.Lee	1.2	Error correction

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1.Introduction

1.1 Overview

Miliwave's MWC-740m module operates in the 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-740m 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-740m module as a self-contained device . However, the MWC-740m module would not be operational unless it is connected to the Linux-based Host Communication Processor board for PTP or PTMP bridge wireless communication.



<Figure 1. MWC-740m Module>

For more information, please contact your Miliwave (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-740m Module Description

The Miliwave's MWC-740m module in conjunction with the Host Communication Processor board can function as a PTP or PTMP bridge communication . Main characteristics of the MWC-740m module include:

- Adaptive Modulation and Link Adaptation: Up to 16QAM and MCS0-12 support
- Phased Array Antena: EIRP 38dBm,
- Beam sweep range : Elevation $\pm 45^\circ$, Azimuth $\pm 45^\circ$
- Advanced Security: AES-128
- Compact Form Factor: 35mm x 50mm
- Connectivity: USB 3.0 Type C, 60GHz wireless

2. Technical Specifications

- Aggregate capacity: 1.4 Gbps uni-directional, 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: 57.24GHz ~ 70.20GHz(CH1~CH6)
- Channel Bandwidth: 2.16 GHz
- Antenna: 16 Phased Array Antena beamforming with $\pm 45^\circ$ horizontal and $\pm 45^\circ$ vertical
- EIRP: 38 dBm (Typical)

4.0 Mechanical, Power and Environmental Specification

- Dimension: 97mm x 52mm x 19mm
- Weight: 270g(with Heatsink)
- Power Consumption: 14W(Max)
- Operating Temperature: $-40^\circ\text{C} \sim +85^\circ\text{C}$
- 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-740m could only be installed with Host Communication Processor board at the factory level. There is no user serviceable parts in the MWC-740m 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 25.15 cm is maintained

between the radiator (antenna) and all persons at all times.

8.0 INTEGRATION INSTRUCTIONS

List of applicable FCC rules

This module complies with part 15.255 of the FCC rules.

Summarize the specific operational use conditions

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.

Typical Host Device Use cases

MWC-740m Module is designed for outdoor/indoor fixed wireless host device such as Point to Point Broadband, Broadband Mesh, and 60GHz to the Home.



Point-to-Point Broadband
Next generation point-to-point broadband links over 20Gb/s, 1 mile, under \$200 per node



WiGig-to-the-Home
WiGig eliminates the need to run fiber from the 'pole to the home', significantly reducing the cost of multi-gigabit internet access



Broadband Mesh
Next generation gigabit internet architecture eliminates need for fiber backbone

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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 25.15 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: 2AVCWMWC-740M"

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 25.15 cm is maintained between the radiator (antenna) and all persons at all times.

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 60GHz transmit continuously

Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

The host product may need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.