

## RF Exposure Report

**Report No.:** SA191227E09

**FCC ID:** 2AF5PMH7021

**Test Model:** MH7021

**Series Model:** MH702XY (where X can be 0, 1, 2, 3, or 4, and Y can be A, B, C, D or blank)

**Received Date:** Dec. 27, 2019

**Test Date:** Feb. 17, 2020

**Issued Date:** Mar. 11, 2020

**Applicant:** MTRLC LLC

**Address:** 225 Franklin St. 26th Floor Boston, MA 02110

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan

**FCC Registration /  
Designation Number:** 723255 / TW2022

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## Table of Contents

|   |          |
|---|----------|
| <b>Release Control Record .....</b>                       | <b>3</b> |
| <b>1     Certificate of Conformity .....</b>              | <b>4</b> |
| <b>2     RF Exposure .....</b>                            | <b>5</b> |
| 2.1   Limits for Maximum Permissible Exposure (MPE) ..... | 5        |
| 2.2   MPE Calculation Formula .....                       | 5        |
| 2.3   Classification .....                                | 5        |
| 2.4   Antenna Gain .....                                  | 6        |
| 2.5   Calculation Result of Maximum Conducted Power ..... | 7        |

### Release Control Record

| Issue No.   | Description       | Date Issued   |
|-------------|-------------------|---------------|
| SA191227E09 | Original release. | Mar. 11, 2020 |

## 1 Certificate of Conformity

**Product:** AC2200 Tri-band Mesh WiFi

**Brand:** Motorola

**Test Model:** MH7021

**Series Model:** MH702XY (where X can be 0, 1, 2, 3, or 4, and Y can be A, B, C, D or blank)

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** MTRLC LLC

**Test Date:** Feb. 17, 2020

**Standards:** FCC Part 2 (Section 2.1091)

IEEE C95.3 -2002

**References Test Guidance:** KDB 447498 D01 General RF Exposure Guidance v06

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by** : Vivian Huang , **Date:** Mar. 11, 2020  
Vivian Huang / Specialist

**Approved by** : Clark Lin , **Date:** Mar. 11, 2020  
Clark Lin / Technical Manager

## 2 RF Exposure

### 2.1 Limits for Maximum Permissible Exposure (MPE)

| Frequency Range (MHz)                                 | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Average Time (minutes) |
|---|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| Limits For General Population / Uncontrolled Exposure |                               |                               |                                     |                        |
| 0.3-1.34  | 614                           | 1.63                          | (100)*                              | 30                     |
| 1.34-30   | 824/f                         | 2.19/f                        | (180/f <sup>2</sup> )*              | 30                     |
| 30-300  | 27.5                          | 0.073                         | 0.2                                 | 30                     |
| 300-1500  | ...                           | ...                           | f/1500                              | 30                     |
| 1500-100,000  | ...                           | ...                           | 1.0                                 | 30                     |

f = Frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Formula

$$Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 34cm away from the body of the user.

So, this device is classified as **Mobile Device**.

## 2.4 Antenna Gain

| Antenna No             | Brand                               | Antenna Gain (dBi) | Frequency range (GHz) | Antenna Type | Connector Type | *Cable Length (mm) | Cable Loss (dB) |
|------------------------|-------------------------------------|--------------------|-----------------------|--------------|----------------|--------------------|-----------------|
| ANT 1<br>(2.4GHz/5GHz) | WALSIN<br>TECHNOLOGY<br>CORPORATION | 2.88               | 2.4~2.5               | PCB          | I-pex          | 85±3               | 0.23            |
|                        |                                     | 4.31               | 5.15~5.85             |              |                |                    | 0.36            |
| ANT 2<br>(2.4GHz/5GHz) |                                     | 3                  | 2.4~2.5               | PCB          | I-pex          | 125±3              | 0.31            |
|                        |                                     | 5.27               | 5.15~5.85             |              |                |                    | 0.5             |
| ANT 3(5GHz)            |                                     | 5.19               | 5.15~5.85             | METAL TUBE   | I-pex          | 110±3              | 0.47            |
| ANT 4(5GHz)            |                                     | 5.37               | 5.15~5.85             | METAL TUBE   | I-pex          | 110±3              | 0.47            |

## 2.5 Calculation Result of Maximum Conducted Power

| Operation Mode    | Evaluation Frequency (MHz) | Max Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|-------------------|----------------------------|----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| WLAN 2.4GHz       | 2437                       | 897.105        | 5.95               | 34            | 0.24304                             | 1                           |
| WLAN 5GHz U-NII-1 | 5240                       | 526.285        | 7.81               | 34            | 0.21880                             | 1                           |
| WLAN 5GHz U-NII-3 | 5795                       | 855.18         | 8.29               | 34            | 0.39709                             | 1                           |

### NOTE:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2.4GHz: Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.95\text{dBi}$   
5GHz U-NII-1: Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 7.81\text{dBi}$   
5GHz U-NII-3: Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.29\text{dBi}$

### Conclusion:

The formula of calculated the MPE is:

$$\text{CPD1} / \text{LPD1} + \text{CPD2} / \text{LPD2} + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

$$\text{WLAN 2.4GHz} + \text{WLAN 5GHz} = 0.24304 / 1 + 0.39709 / 1 = 0.85893$$

**Therefore the maximum calculations of above situations are less than the “1” limit.**

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