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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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 : , **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^2)	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	($180/f^2$)*	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

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

where

Pd = power density in mW/cm^2

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 (2.4GHz/5GHz)	WALSIN TECHNOLOGY CORPORATION	2.88	2.4~2.5	PCB	I-pex	85±3	0.23
		4.31	5.15~5.85				0.36
ANT 2 (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^2)	Limit (mW/cm^2)
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:

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

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + 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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