

RF EXPOSURE REPORT

FOR

Applicant	:	Mercku Inc.
Address	:	51 Breithaupt Street, Suite 100, Kitchener, ON Canada, N2H 5G5
Equipment under Test	:	M6 Mesh Wi-Fi Router
Model No.	:	M6
Trade Mark	:	MERCKU
FCC ID	:	2APR4-M6
Manufacturer	:	Mercku Technology (China), Inc.
Address	:	Block B1, Southern Software Park, No.1 Software Road, Tangjia, Zhuhai, Guangdong, China

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City,
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REPORT

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TEST REPORT DECLARE

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Standard Used: KDB447498 D01 General RF Exposure Guidance v06

We Declare:

The equipment described above is assessed by Dongguan Dongdian Testing Service Co., Ltd and in the configuration assessed the equipment complied with the standards specified above. The assessed results are contained in this report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these assess.

After evaluation, our opinion is that the equipment In Accordance with above standard.

Report No:	DDT-R20110315-1E9		
Date of Receipt:	Nov. 11, 2020	Date of Test:	Nov. 11, 2020 ~ Feb. 05, 2021

Prepared By:

Talent Zhang

Talent Zhang/Engineer

Approved By:



Damon Hu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Feb. 05, 2021	

1. General information

1.1. Description of Equipment

EUT* Name	: M6 Mesh Wi-Fi Router
Model Number	: M6
EUT function description	: Please reference user manual of this device
Power supply	: DC 12V, 1.5A from external AC Adapter
Radio Specification	: IEEE802.11b/g/n, IEEE802.11a/n/ac/ax
Operation frequency	: IEEE 802.11b: 2412MHz-2462MHz IEEE 802.11g: 2412MHz-2462MHz IEEE 802.11n HT20: 2412MHz-2462MHz IEEE 802.11n HT40: 2422MHz-2452MHz IEEE 802.11a, 11n HT20, 11ac HT20, 11ax HT20: 5180MHz-5240MHz, 5745MHz-5825MHz IEEE 802.11n HT40, 11ac HT40, 11ax HT40: 5190MHz-5230MHz, 5755MHz-5755MHz IEEE 802.11ac HT80, 11ax HT80: 5210MHz, 5775MHz
Modulation	: IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM (256QAM, 64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Data rate	: IEEE 802.11b: 1, 2, 5.5, 11 Mbps IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11n HT20: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11n HT20: 14.4, 28.9, 43.3, 57.8, 86.7, 115.6, 130.0, 144.4 Mbps IEEE 802.11n HT40: 30, 60, 90, 120, 180, 240, 270, 300 Mbps IEEE 802.11acHT20: 14.4, 28.8, 43.4, 57.8, 86.6, 115.6, 130, 144.4, 173.4 Mbps IEEE 802.11ac HT40: 30, 60, 90, 120, 180, 240, 270, 300, 360, 400 Mbps IEEE 802.11ac HT80: 65, 130, 195, 260, 390, 520, 585, 650, 780, 866.6 Mbps IEEE 802.11ax HT20: 17.2, 34.4, 51.6, 68.8, 103.2, 137.6, 154.9, 172.1, 206.5, 229.2, 258.1, 286.8Mbps IEEE 802.11ax HT40: 34.4, 68.8, 103.2, 137.6, 206.5, 275.3, 309.7, 344.1, 412.9, 458.8, 516.2, 573.5 Mbps IEEE 802.11ax HT80: 72.1, 144.1, 216.2, 288.2, 432.4, 576.5, 648.5, 720.6, 864.7, 960.8, 1080.9, 1201Mbps
Antenna Type	: Antenna 1: Dedicated antenna, 2.4G band maximum PK gain: 3.5 dBi, 5G band maximum PK gain: 4 dBi : Antenna 2: Dedicated antenna, 2.4G band maximum PK gain: 3.5 dBi, 5G band maximum PK gain: 4 dBi
Exposure category	: General population/uncontrolled environment
Device Type	: Fixed Device
Sample Type	: N/A

2.4G:

Antenna information			
	Ant1 gain	Ant2 gain	MIMO
IEEE 802.11b	3.5	3.5	/
IEEE 802.11g	3.5	3.5	/
IEEE 802.11n HT20	3.5	3.5	6.5
IEEE 802.11n HT40	3.5	3.5	6.5

5G:

Antenna information			
	Ant1 gain	Ant2 gain	MIMO
IEEE 802.11a	4	4	/
IEEE 802.11n HT20	4	4	7
IEEE 802.11n HT40	4	4	7
IEEE 802.11ac VHT20	4	4	7
IEEE 802.11ac VHT40	4	4	7
IEEE 802.11ac VHT80	4	4	7
IEEE 802.11ax VHT20	4	4	7
IEEE 802.11ax VHT40	4	4	7
IEEE 802.11ax VHT80	4	4	7

1.2. Assess laboratory

Dongguan Dongdian Testing Service Co., Ltd.

Add.: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City,
Guangdong Province, China, 523808

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com

CNAS Registration No. CNAS L6451; A2LA Certificate Number: 3870.01;

FCC Designation Number: CN1182; FCC Test Firm Registration Number: 540522

Industry Canada Site Registration Number: 10288A-1

2. RF Exposure Evaluation

2.1. Requirement

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.

Limits for General Population/Uncontrolled Exposure

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2. Calculation method

$$E(\text{V/m}) = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } S(\text{mW/cm}^2) = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (mW)

G = EUT Antenna numeric gain (numeric)=

d = Separation distance between radiator and human body (m)

The formula can be changed to

We can change the formula to:

$$S = \frac{30 \times P \times G}{377 \times d^2} \quad \text{or, } d = \sqrt{\frac{30 \times P \times G}{377 \times S}}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2 m, as well as the gain of the used antenna, the RF power density can be obtained.

2.3. Estimation result

Worst Mode	PK Output power (dBm)	Output power (mW)	Antenna Gain (dBi)	Antenna Gain (linear)	MPE Values (mW/cm ²)	MPE Limit (mW/cm ²)
2.4G wifi 11B SISO	17.85	60.95	3.5	2.24	0.02716	1
5G wifi 11N40MIMO	22.59	181.55	7.0	5.01	0.18094	1

Maximum Simultaneous transmission MPE Ratio for 2.4G WLAN and 5G WLAN

Maximum MPE ratio 2.4G wifi	Maximum MPE ratio 5G wifi	ΣMPE ratios	Limit	Results
0.02716	0.18094	0.20810	1.000	Pass

Note: The estimation distance is 20 cm

Conclusion: The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

END OF REPORT