TEST REPORT

Reference No.	:	WTX24D11274665W005
FCC ID	:	2AKIT-HMG02
Applicant	:	Lumi United Technology Co., Ltd
Address	:	B1, Chongwen Park, Nanshan iPark, Liuxian Avenue, Taoyuan Residential District, Nanshan District, Shenzhen, Guangdong 518000, China
Manufacturer	:	Lumi United Technology Co., Ltd
Address	:	B1, Chongwen Park, Nanshan iPark, Liuxian Avenue, Taoyuan Residential District, Nanshan District, Shenzhen, Guangdong 518000, China
Product	:	Hub M100
Model(s)	:	HM-G02E, HM-G02D
Brand Name	:	Aqara
Standards	:	FCC 47CFR Part 2 Subpart J Section 2.1091
Date of Receipt sample	:	2024-11-27
Date of Test	:	2024-11-28 to 2025-01-02
Date of Issue	:	2025-01-02
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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Approved by:

Deval Qin / Designated Reviewer

2. Contents

3. Revision History

Test Report No.	Date of Receipt Sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTX24D11274665W005	2024-11-27	2024-11-28 to 2025-01-02	2025-01-02	Original	-	Valid

4. General Information

4.1. General Description of E.U.T.

Product:	Hub M100
Model(s):	HM-G02E, HM-G02D
Model Description:	Only the model number and sale channels are different. The model HM-G02E was tested in this report.
Test Sample No.:	1-1/1
Bluetooth Version:	V5.2
Wi-Fi Specification:	2.4G-802.11b/g/n/ax
Hardware Version:	V1.1
Software Version:	V4.3.1_0008

4.2. Details of E.U.T.

Operation Frequency:	2.4G Wi-Fi: 802.11b/g/n(HT20)/ax(HE20): 2412-2472MHz 802.11n(HT40)/ax(HE40): 2422-2462MHz BLE: 2402-2480MHz Zigbee: 2405-2480MHz Thread: 2405-2480MHz
Max. RF output power:	2.4G Wi-Fi: 17.04dBm BLE 1M: 8.51dBm, BLE 2M: 8.06dBm Zigbee: 7.15dBm Thread: 7.97dBm
Modulation Technology:	2.4G Wi-Fi: DSSS, OFDM BLE: GFSK Zigbee: OQPSK Thread: QPSK
Antenna installation:	PCB Antenna
Antenna Gain:	2.4G Wi-Fi: 0dBi BLE: 0dBi Zigbee: 0.25dBi Thread: 0.25dBi

Note:

#: The antenna gain is provided by the applicant, and the applicant should be responsible for its authenticity, WALTEK lab has not verified the authenticity of its information.

Ratings:	Input: 5V⎓0.5A

4.3. Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.

Waltek Testing Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

4.4. Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test Lab: N/A

Lab address: N/A

Test items: N/A

4.5. Abnormalities from Standard Conditions

None.

5. Test Summary

Test Items	Test Requirement	Result
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	FCC Part 2.1091	PASS

6. RF Exposure

Test Requirement:	FCC 47CFR Part 2 Subpart J Section 2.1091 47 CFR Part 1 §1.1307 47 CFR Part 1 §1.1310
Evaluation Method:	KDB 447498 D01 General RF Exposure Guidance v07

6.1. Definitions

According to § 2.1091(b), A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the RF source's radiating structure(s) and the body of the user or nearby persons.

This device belongs to mobile device and with multiple RF sources.

6.2. Method of Evaluation

Determination of Exemption:
For single RF sources

Option A

Option A 1-mW Test Exemption
Applies to all frequencies and all distances

a) Could be considered SAR-based and MPE-based exclusions
b) P < 1mW
c) Limitation–when there are simultaneously operating transmitters this exclusion only applies when all simultaneously operating transmitters meet this exemption
d) Refer 1.1307(b)(3)(i)(A) and 1.1307(b)(3)(ii)(A)

Option B SAR-Based Exemption
Frequency range 300 MHz -6 GHz, 5mm≤distance ≤ 40cm

a) The maximum time-averaged power or effective radiated power (ERP), whichever is greater, ≤P_{th}.
b) P_{th} is calculated based on separation distance d cm from transmitter to person for the device operating at f GHz.

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

Option C MPE-Based Exemption
1.1307(b)(3)(i)(C): ERP is below a threshold calculated based on the distance R between the person and the antenna / radiating structure, where R > λ/ 2π.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.
Note: R in meters, f in MHz	

For multiple RF sources
According to 47CFR 1.1307(b)(3)(ii), the calculation formula is as follow:

$$\sum_{i=1}^{a}\frac{P_i}{P_{th,i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{th,j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k}\leq 1$$

6.3. Evaluation Results

This device belongs to mobile device (separation distance of at least 20 centimeters is normally maintained between the RF source's radiating structure(s) and the body of the user or nearby persons) and with multiple RF sources.

Option B is applicable.

Single Source Transmissions

Description	Frequency GHz	Conducted Power dBm	Gain dBi	Tune-up dB	ERP mW	ERP_{th} mW	Ratio
WLAN	2.412	17.04	0	±1.0	38.83	3060	0.01269
BLE	2.402	8.51	0	±1.0	5.45	3060	0.00178
Zigbee	2.480	7.15	0.25	±1.0	4.22	3060	0.00138
Thread	2.480	7.97	0.25	±1.0	5.10	3060	0.00167

Note:
EIRP= Conducted Power +Gain, ERP=EIRP-2.15

Simultaneous Transmissions

Description	Calculation	Limit
WLAN + Zigbee	0.01407	≤1.0
BLE + Zigbee	0.00316	≤1.0
WLAN + Thread	0.01436	≤1.0
BLE + Thread	0.00345	≤1.0

Note: 1. WLAN and BLE share the same antenna, and cannot transmit simultaneously.

2. Zigbee and Thread share the same antenna, and cannot transmit simultaneously.

Conclusion:

RF Exposure is FCC compliant.

======End of Report======