



TEST REPORT

Reference No..... : WTX20X09067942W-4
 Manufacturer..... : Lumi United Technology Co., Ltd.
 Address : 8th Floor, JinQi Wisdom Valley, No.1 Tangling Road, Liuxian Ave, Taoyuan Residential District, Nanshan District, Shenzhen.China
 Product..... : Hub M2
 Test Model..... : HM2-G01
 Standards..... : EN IEC 62311:2020
 : EN 50665:2017
 Date of Receipt sample : Sept.18, 2020
 Date of Test..... : Sept.18, 2020 to Oct.27, 2020
 Date of Issue : Oct.27, 2020
 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.

Prepared By:

Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road,
Block 70 Bao'an District, Shenzhen, Guangdong, China

Tel.: +86-755-33663308

Fax.: +86-755-33663309

Tested by:

Reviewed By:

Approved & Authorized By:

Jack Huang

Lion Cai

Silin Chen

Jack Huang/ Project Engineer

Lion Cai / RF Manager

Silin Chen / Manager



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Report version

Version No.	Date of issue	Description
Rev.00	Oct.27, 2020	Original
/	/	/



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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Manufacturer:

Lumi United Technology Co., Ltd.

Address of manufacturer:

8th Floor, JinQi Wisdom Valley, No.1 Tangling Road,
Liuxian Ave, Taoyuan Residential District, Nanshan
District, Shenzhen.China

General Description of EUT	
Product Name:	Hub M2
Trade Name:	Aqara
Model No.:	HM2-G01
Adding Model(s):	/
Rated Voltage:	DC 5V, 1A Or DC 5V, 2A
Power Adaptor Model:	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

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Technical Characteristics of EUT	
Wi-Fi(2.4G)	
Support Standards:	802.11b, 802.11g, 802.11n-HT20/40
Frequency Range:	2412-2472MHz for 802.11b/g/n(HT20) 2422-2462MHz for 802.11b/g/n(HT40)
Max.RF Output Power:	Antenna A: 18.53dBm (EIRP) Antenna B: 18.42dBm (EIRP) MIMO: 17.44dBm (EIRP)
Type of Modulation:	DBPSK,BPSK,DQPSK,QPSK,16QAM,64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels	13 for 802.11b/g/n(HT20) 9 for 802.11b/g/n(HT40)
Channel Separation:	5MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	2.0dBi
Bluetooth	
Bluetooth Version:	Bluetooth V5.0(Only BLE)
Frequency Range:	2402-2480MHz
Max.RF Output Power:	1M: 5.50dBm (EIRP) 2M: 5.48dBm (EIRP)
Type of Modulation:	GFSK
Data Rate:	1Mbps
Quantity of Channels	40
Channel Separation:	2MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	0dBi
ZigBee	
Support Standards:	ZigBee
Frequency Range:	2405MHz-2480MHz
Max.RF Output Power:	8.67dBm (EIRP)
Modulation:	OQPSK
Type of Antenna:	PCB Antenna
Antenna Gain:	0dBi



1.2 Compliance Standards

The tests were performed according to following standards:

EN 50665:2017: Generic standard for assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz).

EN IEC 62311:2020: Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz to 300 GHz)

1.3 Test Methodology

All measurements contained in this report were conducted with EN 50665,

The equipment under test (EUT) was configured to measure its highest possible emission level. For more detail refer to the Operating Instructions.

1.4 Test Facility

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

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2. RF EXPOSURE REFERENCE LEVELS

2.1 Standard Applicable

This International Standard applies to electronic and electrical equipment for which no dedicated product- or product family standard regarding human exposure to electromagnetic fields applies. The frequency range covered is 0 Hz to 300 GHz.

The object of this generic standard is to provide assessment methods and criteria to evaluate such equipment against basic restrictions or reference levels on exposure of the general public related to electric, magnetic and electromagnetic fields and induced and contact current.

Normative reference

EN 62311:2008, Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz).

Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to the electromagnetic fields (0Hz to 300GHz) (Official Journal L 197 of 30 July 1999).

Directive 2013/35/EU of 26 June 2013, on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (electromagnetic fields) . Official Journal L179 of 2013-6-29,p. 1-21

2.2 Reference Levels Limit

According to the EN 62311:2008, the criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified 1999/519/EC.

Reference levels of electric, magnetic, and electromagnetic fields
(0MHz to 300GHz, unperturbed rms values)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (nT)	Equivalent plane wave power density S_{Eq} (W/m ²)
0-1Hz	—	3.2×10^4	4×10^4	—
1-8Hz	10000	$3.2 \times 10^4 / f^2$	$4 \times 10^4 / f^2$	—
8-25Hz	10000	$4000 / f$	$5000 / f$	—
0.025-0.8kHz	$250 / f$	$4 / f$	$5 / f$	—
0.8-3kHz	$250 / f$	5	6.25	—
3-150kHz	87	5	6.25	—
0.15-1MHz	87	$0.73 / f$	$0.92 / f$	—
1-10MHz	$87 / f^{1/2}$	$0.73 / f$	$0.92 / f$	—
10-400MHz	28	0.073	0.092	2
400-2000MHz	$1,375 f^{1/2}$	$0.0037 f^{1/2}$	$0.0046 f^{1/2}$	$f / 200$
2-300GHz	61	0.16	0.20	10

**Note:**

1. f as indicated in the frequency range column
2. For frequencies between 100 kHz and 10 GHz, S_{Eq} , E^2 , H^2 , and B^2 are to be averaged over any sixty-minute period.
3. For frequencies exceeding 10GHz, S_{Eq} , E^2 , H^2 , and B^2 are to be averaged over any $68/f^{1.05}$ -minute period (f in GHz).
4. No E-field value is provided for frequencies <1 Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 25 kV/m, Spark discharges causing stress or annoyance should be avoided.

2.3 Evaluation Methods

The antenna of the product, under normal use condition is at least 20 cm away from the body of the user. Warning statement to the user to keeping at least 20 cm separation distance and the prohibition of operating to a person has been printed on the user's manual. So, this product under normal use is located on electromagnetic far field between the human body.

Far Field Calculation Formula

$$E = \eta_0 H = \frac{\sqrt{30PG(\theta, \phi)}}{r}$$

G=antenna gain relative to an isotropic antenna

θ, ϕ =elevation and azimuth angles to point of investigation

r=distance from observation point to the antenna

η_0 =Characteristic impedance of free space

2.4 Evaluation Results**Antenna A**

Mode/CH	Output Power (dBm)	Antenna Gain G(θ, ϕ)	min distance m	E-field Strength (V/m)	E-field Strength Limit (V/m)	Result Pass/Fail
802.11b/1	16.16	1.5849	0.2	7.01	61.00	Pass
802.11b/7	15.86	1.5849	0.2	6.77	61.00	Pass
802.11b/13	16.53	1.5849	0.2	7.31	61.00	Pass
802.11g/1	13.98	1.5849	0.2	5.45	61.00	Pass
802.11g/7	13.62	1.5849	0.2	5.23	61.00	Pass
802.11g/13	13.56	1.5849	0.2	5.19	61.00	Pass



Antenna B

Mode/CH	Output Power (dBm)	Antenna Gain G(θ , ϕ)	min distance m	E-field Strength (V/m)	E-field Strength Limit (V/m)	Result Pass/Fail
802.11b/1	16.3	1.5849	0.2	7.12	61.00	Pass
802.11b/7	16.42	1.5849	0.2	7.22	61.00	Pass
802.11b/13	16.38	1.5849	0.2	7.19	61.00	Pass
802.11g/1	13.55	1.5849	0.2	5.19	61.00	Pass
802.11g/7	13.69	1.5849	0.2	5.27	61.00	Pass
802.11g/13	13.59	1.5849	0.2	5.21	61.00	Pass

MIMO(Antenna A+ B):

Mode/CH	Output Power (dBm)	Antenna Gain G(θ , ϕ)	min distance m	E-field Strength (V/m)	E-field Strength Limit (V/m)	Result Pass/Fail
802.11n-HT20/1	15.44	1.5849	0.2	6.45	61.00	Pass
802.11n-HT20/7	14.94	1.5849	0.2	6.09	61.00	Pass
802.11n-HT20/13	15.16	1.5849	0.2	6.24	61.00	Pass
802.11n-HT40/3	15.12	1.5849	0.2	6.22	61.00	Pass
802.11n-HT40/7	15.01	1.5849	0.2	6.14	61.00	Pass
802.11n-HT40/11	15.46	1.5849	0.2	6.46	61.00	Pass

Mode/CH	Output Power (dBm)	Antenna Gain G(θ , ϕ)	min distance m	E-field Strength (V/m)	E-field Strength Limit (V/m)	Result Pass/Fail
BLE/00	5.17	1	0.2	1.57	61.00	Pass
BLE/19	5.21	1	0.2	1.58	61.00	Pass
BLE/39	5.5	1	0.2	1.63	61.00	Pass

Zigbee

Mode/CH	Output Power (dBm)	Antenna Gain G(θ , ϕ)	min distance m	E-field Strength (V/m)	E-field Strength Limit (V/m)	Result Pass/Fail
Low	8.67	1	0.2	2.35	61.00	Pass
Middle	8.64	1	0.2	2.34	61.00	Pass
High	8.27	1	0.2	2.24	61.00	Pass

Note: $G(\theta, \phi) = 10^{(G/10)}$

Since the maximum E-field strength of this device based on 20cm separation distance cannot exceed the E-field strength of reference levels limit. It is deemed to full fit the requirement of RF exposure basic restriction specified in EC Council Recommendation (1999/519/EC).



EXHIBIT 1 - EUT PHOTOGRAPHS

Please refer to "ANNEX".

**** END OF REPORT ****

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