RF Exposure Evaluation

Client Information:

Applicant:	Aukey Technology Co., Ltd.
Applicant add.:	Room 106, Kangli Information Valley Building, No. 66 Pingji Avenue, Shanglilang Community, Nanwan Street, Longgang District, Shenzhen, China
Manufacturer:	Shenzhen Allsight E-business Co.Ltd
Manufacturer add.:	Room 116, Kangli Information Valley Building, No. 66 Pingji Avenue, Shanglilang Community, Nanwan Street, Longgang District, Shenzhen, China

Product Information:

Product Name:	MagFusion 3-in-1 Pro Qi2 Magnetic Fast Wireless Charging Station with Active Cooling System
Model No.:	LC-MC311A
Brand Name:	AUKEY
Test samples.:	AITSZ24052306001

FCC ID: 2ATIH-LC-MC311A

Applicable standards: FCC CFR 47 PART 1, § 1.1310
KDB 680106 D01 Wireless Power Transfer v04

Prepared By:

Guangdong Asia Hongke Test Technology Limited

B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Tel.: +86 0755-230967639 Fax.: +86 0755-230967639

Date of Receipt:	Jun. 12, 2024	Date of Test:	Jun. 12, 2024 ~ Jun. 19, 2024
Date of Issue:	Jun. 19, 2024	Test Result:	Pass

This device described above has been tested by Guangdong Asia Hongke Test Technology Limited and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Leon Yi

Reviewed by: _____ Leon.yi

Sean She

Approved by: _____ Sean She

GUANGDONG ASIA HONGKE TEST TECHNOLOGY CO.,LTD. TEST REPORT

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Revision History

Revision	Issue Date	Revisions	Revised By
00	Jun. 19, 2024	Initial Issue	Sean She

2 TEST FACILITY

The test facility is recognized, certified or accredited by the following organizations:

FCC-Registration No.: 251906 Designation Number: CN1376

Guangdong Asia Hongke Test Technology Limited 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.

IC —Registration No.: 31737 CAB identifier: CN0165

The 3m Semi-anechoic chamber of Guangdong Asia Hongke Test Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 31737

A2LA-Lab Cert. No.: 7133.01

Guangdong Asia Hongke Test Technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

2.1 Deviation from standard

None

2.2 Abnormalities from standard conditions

None

2.3 Test Location

Guangdong Asia Hongke Test Technology Limited

Address: B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Tel.: +86 0755-230967639 Fax.: +86 0755-230967639

3 GENERAL INFORMATION

Factory:	Mangrove Technology (Shenzhen) Co.,Ltd
Address:	4 Floor, B Building, Huamingcheng Industry Park, Matian Street, Guangming District, Shenzhen city, Guangdong province, China
EUT Name:	MagFusion 3-in-1 Pro Qi2 Magnetic Fast Wireless Charging Station with Active Cooling System
Model No:	LC-MC311A
Serial Model:	N/A
Test sample(s) ID:	AITSZ24052306001
Sample(s) Status:	Engineer sample
Operation frequency:	Coil1: For Phone: 113kHz-205kHz Coil2: For Earphone: 113kHz-205kHz Coil3: Watch: 300kHz-350kHz
Modulation Technology:	ASK
Antenna Type:	Coil1/Coil2/Coil3: Loop coil Antenna
Antenna gain:	Coil1/Coil2/Coil3: 0dBi
Hardware version.:	N/A
Software version.:	N/A
Power supply:	USB-CIn:5V⎓3A/9V⎓3A/12V⎓3A Earphone wireless Out: 5W (Max) Watch magnetic wireless Qut: 5W(Max) Phone magnetic wireless Out: 5W/7.5W/10W/15W(Max)
Model different:	N/A
Note:	For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

4 TEST METHODOLOGY

4.1 Measuring Standard

According to §1.1307(b)(1), systems operating under the provisions of this 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. According to §1.1310 and §2.1091 RF exposure is calculated. According KDB680106 D01: KDB 680106 D01 Wireless Power Transfer v04.

4.2 Requirements

According to the item 3 of KDB 680106 D01v04:

Inductive wireless power transfer applications that meet all of the following requirements are excluded from submitting an RF exposure evaluation.

(1) Mobile Device and Portable Device Configurations

(2) Equipment Authorization Procedures for Devices Operating at Frequencies Below 4 MHz

(3) The aggregate H-field strengths anywhere at or beyond 15 cm surrounding the device, and 20 cm away from the top surface.

4.3 Limits

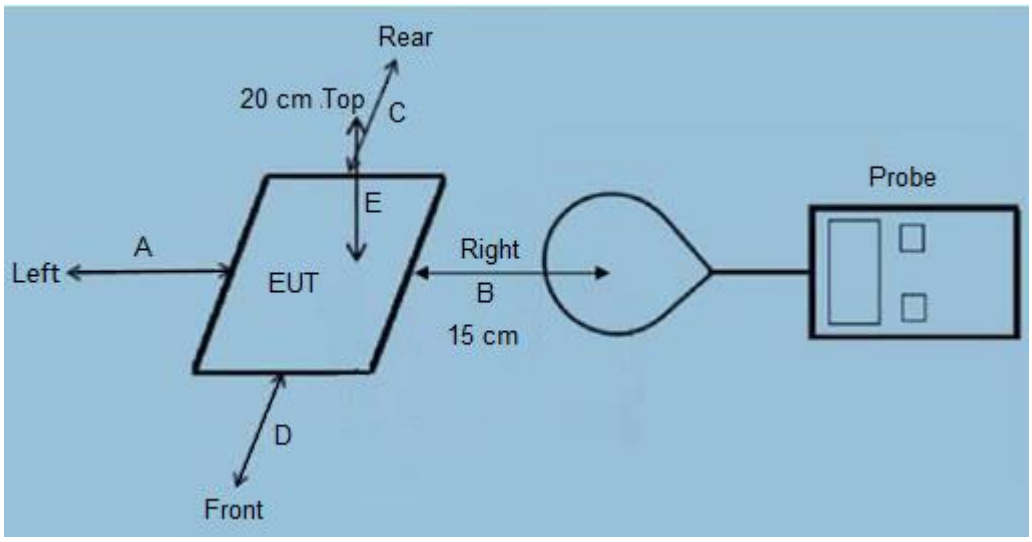
The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f^2)	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5	6
(B) 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
RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

4.4 Test Setup



4.5 Test Procedure

1) The RF exposure test was performed in anechoic chamber.
2) The measurement probe was placed at test distance (15 cm from all sides and 20 cm from the top) which is between the edge of the charger and the geometric center of probe.
3) The highest emission level was recorded and compared with limit as soon as measurement of each points (A, B, C, D, E,F) were completed.
4) The EUT was measured according to the dictates of KDB 680106 D01 Wireless Power Transfer v04.
Remark：The EUT's test position A, B, C, D,E and F is valid for the E and H field measurements.

5 Equipment Approval Considerations

The EUT does comply with KDB 680106 D01 as follow table.

Requirements of section 5 of KDB 680106 D01	Yes / No	Description
Mobile Device and Portable Device Configurations	Yes	Mobile Device
Equipment Authorization Procedures for Devices Operating at Frequencies Below 4 MHz	Yes	The device operate in the frequency range113-205KHz(for mobile phone & earphone) and 300-350KHz(for watch).
RF Exposure compliance may be ensured only for a minimum separation distance that is greater than 20 cm, while use conditions at smaller distances can still be considered unlikely.	Yes	The EUT H-field strengths at 15 cm surrounding the device and 20 cm above the top surface.

5.1 Description of the test mode

Equipment under test was operated during the measurement under the following conditions:

Test Mode	Description	
Mode 1	AC Adapter + EUT + Phone + Earphone + Watch	Record
Mode 2	AC Adapter + EUT + Phone + Earphone	Pre-tested
Mode 3	AC Adapter + EUT + Phone + Watch	Pre-tested
Mode 4	AC Adapter + EUT + Phone	Pre-tested
Mode 5	AC Adapter + EUT + Earphone + Watch	Pre-tested
Mode 6	AC Adapter + EUT + Earphone	Pre-tested
Mode 7	AC Adapter + EUT + Watch	Pre-tested
Mode 8	Test the EUT in idle mode.	Pre-tested
Note: 1. All test modes were pre-tested, but we only recorded the worst case in this report.		

5.2 Peripheral List

No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	Phone	OSCAL	PILOT2	N/A	N/A	N/A
2	Earphone	PocBuds	K6	N/A	N/A	N/A
3	Watch	Apple	S6	N/A	N/A	N/A

5.3 EUT Peripheral List

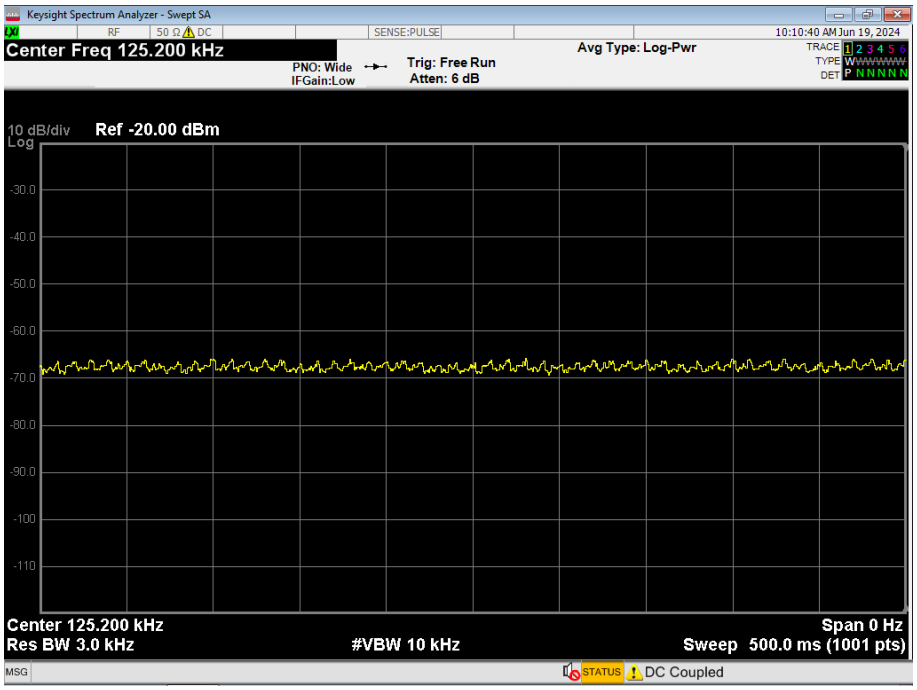
No.	Equipment	Manufacturer	Model No.	Serial No.	Power cord	signal cable
1	Adapter	HNT	PA-F4	N/A	N/A	N/A

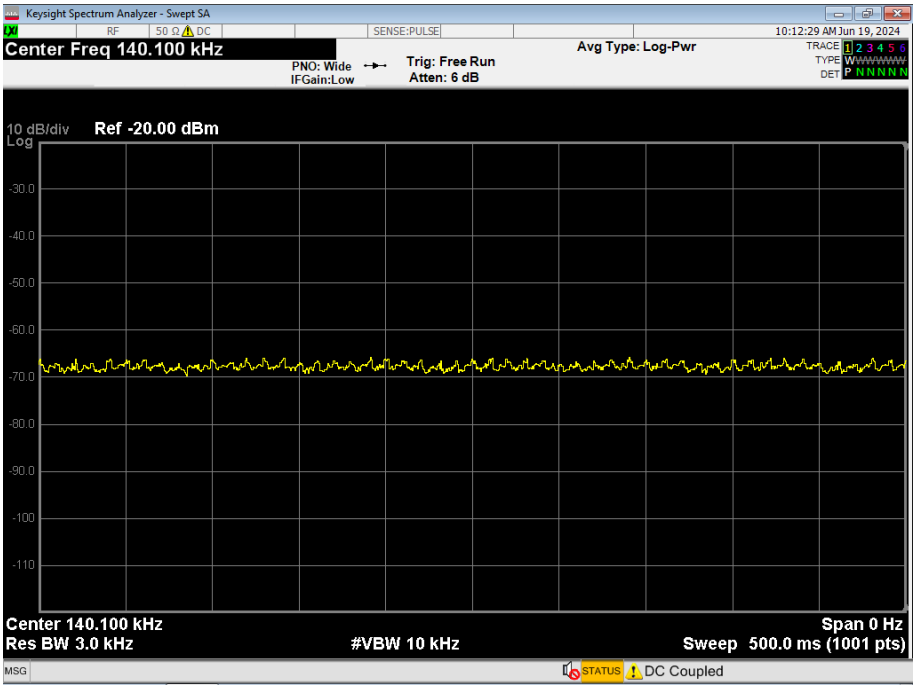
5.4 Test Instruments list

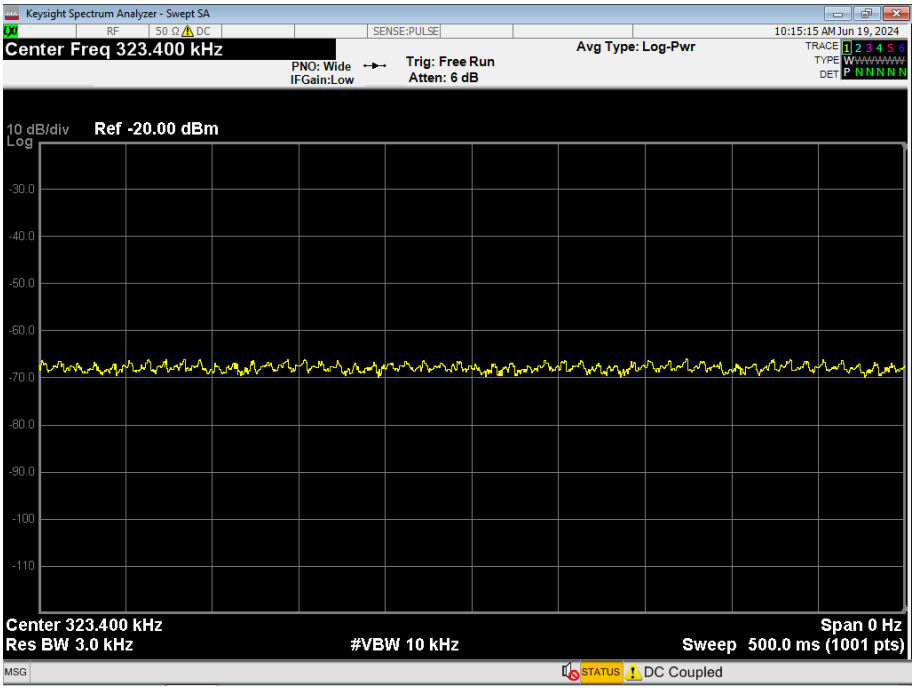
Test Equipment	Manufacturer	Model No.	SN.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
Magnetic Amplitude and Gradient Probe System	SPEAG	MAGPy-8H3D+E3D V2 & MAGPy-DAS V2	3107 & 3097	03.15.2024	03.14.2025

5.5 Duty Cycle

Mode	ON Time(ms)	Period(ms)	Duty Cycle(%)
Operating(125.2kHz)	/	/	100
Operating(140.1kHz)	/	/	100
Operating(323.4kHz)	/	/	100






Keysight Spectrum Analyzer - Swept SA
RF
50 Ω DC
SENSE:PULSE
10:15:15 AM Jun 19, 2024
Center Freq 323.400 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
TRACE 1 2 3 4 5 6
TYPE W W W W W W
DET P N N N N N
10 dB/div
Log
Ref -20.00 dBm
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
-110
Center 323.400 kHz
Res BW 3.0 kHz
#VBW 10 kHz
Span 0 Hz
Sweep 500.0 ms (1001 pts)
MSG
STATUS
DC Coupled

5.6 Test Result

Test Mode 1_MPE_Coil 1_Phone

MPE				
Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	＜ 1%	Top	14.18	0.46
15cm	＜ 1%	Top	14.63	0.59
15cm	＜ 1%	Left	13.82	0.42
15cm	＜ 1%	Right	14.12	0.53
15cm	＜ 1%	Front	14.54	0.30
15cm	＜ 1%	Rear	14.01	0.46
Limit			614	1.63
Margin Limit (%)			2.38%	36.20%

MPE				
Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	＜ 50%	Top	13.18	0.28
15cm	＜ 50%	Top	11.98	0.34
15cm	＜ 50%	Left	12.51	0.20
15cm	＜ 50%	Right	12.64	0.26
15cm	＜ 50%	Front	13.00	0.16
15cm	＜ 50%	Rear	12.87	0.44
Limit			614	1.63
Margin Limit (%)			2.15%	26.99%

MPE				
Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	＜ 99%	Top	13.08	0.19
15cm	＜ 99%	Top	11.67	0.28
15cm	＜ 99%	Left	12.62	0.30
15cm	＜ 99%	Right	12.51	0.24
15cm	＜ 99%	Front	12.48	0.11
15cm	＜ 99%	Rear	12.37	0.10
Limit			614	1.63
Margin Limit (%)			2.13%	18.40%

Test Mode 1_MPE_Coil 2_ Earphone

MPE				
Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	＜ 1%	Top	13.33	0.28
15cm	＜ 1%	Top	13.28	0.27
15cm	＜ 1%	Left	13.27	0.25
15cm	＜ 1%	Right	13.42	0.17
15cm	＜ 1%	Front	13.75	0.30
15cm	＜ 1%	Rear	13.65	0.32
Limit			614	1.63
Margin Limit (%)			2.24%	19.63%

MPE				
Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	＜ 50%	Top	12.19	0.23
15cm	＜ 50%	Top	11.29	0.26
15cm	＜ 50%	Left	11.29	0.14
15cm	＜ 50%	Right	11.38	0.21
15cm	＜ 50%	Front	12.02	0.17
15cm	＜ 50%	Rear	11.73	0.10
Limit			614	1.63
Margin Limit (%)			1.99%	15.95%

MPE				
Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	＜ 99%	Top	12.11	0.23
15cm	＜ 99%	Top	11.04	0.13
15cm	＜ 99%	Left	11.72	0.07
15cm	＜ 99%	Right	11.73	0.12
15cm	＜ 99%	Front	11.24	0.14
15cm	＜ 99%	Rear	11.62	0.14
Limit			614	1.63
Margin Limit (%)			1.97%	14.11%

Test Mode 1_MPE_Coil 3_ Watch

MPE				
Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	＜ 1%	Top	12.94	0.24
15cm	＜ 1%	Top	13.22	0.17
15cm	＜ 1%	Left	13.16	0.14
15cm	＜ 1%	Right	12.80	0.28
15cm	＜ 1%	Front	12.87	0.37
15cm	＜ 1%	Rear	12.54	0.34
Limit			614	1.63
Margin Limit (%)			2.15%	22.70%

MPE				
Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	＜ 50%	Top	11.88	0.20
15cm	＜ 50%	Top	10.78	0.14
15cm	＜ 50%	Left	11.15	0.16
15cm	＜ 50%	Right	11.34	0.18
15cm	＜ 50%	Front	11.69	0.33
15cm	＜ 50%	Rear	11.29	0.25
Limit			614	1.63
Margin Limit (%)			1.93%	20.25%

MPE				
Test distance	Battery levels	Probe from EUT Side	E-field (V/m)	H-field (A/m)
20cm	＜ 99%	Top	11.49	0.17
15cm	＜ 99%	Top	10.03	0.10
15cm	＜ 99%	Left	11.04	0.23
15cm	＜ 99%	Right	10.90	0.16
15cm	＜ 99%	Front	11.03	0.06
15cm	＜ 99%	Rear	10.96	0.31
Limit			614	1.63
Margin Limit (%)			1.87%	19.02%

Note: All test modes were pre-tested, but we only recorded the worst case in this report.

Total exposure

MPE-based total exposure ratio (Worst case):

E-field:

Coil 1+Coil 2+Coil 3 = 0.0238 + 0.0224 + 0.0215 = 0.06788 < 1

H-field:

Coil 1+Coil 2+Coil 3 = 0.3620 + 0.1963 + 0.2270 = 0.7853 < 1

5.7 Test Setup photo

Front

Left

Rear

Right

Top

End of report