FCC TEST REPORT

Test report
On Behalf of
AQUA-AMP, LLC
For
Aqua-Amp ACT Wireless charger
Model No.: AA-01-ACT, NB-A01WC
FCC ID: 2A64N-AA01ACT

Prepared For :	**AQUA-AMP, LLC** **1108 ELDRIDGE ST, CLEARWATER, FL 33755, USA**
Prepared By :	**Shenzhen HUAK Testing Technology Co., Ltd.** **1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China**
Date of Test:	**Jul. 12, 2023 ~ Jul. 19, 2023**
Date of Report:	**Jul. 19, 2023**
Report Number:	**HK2307122999-1E**

TEST RESULT CERTIFICATION

Applicant's name	:	AQUA-AMP, LLC
Address	:	1108 ELDRIDGE ST, CLEARWATER, FL 33755, USA
Manufacture's Name	:	NEWBELL INTERNATIONAL ELECTRONIC CO.,LTD
Address	:	RM701, BLDG-3, NO.19, Du Shi Zhi Gu, JinPeng Road. FengGang. DongGuan, China

Product description

Trade Mark:		N/A
Product name	:	Aqua-Amp ACT Wireless charger
Model and/or type reference	:	AA-01-ACT, NB-A01WC
Standards	:	FCC CFR 47 PART 18

Date of Test	:	
Date (s) of performance of tests	:	**Jul. 12, 2023 ~ Jul. 19, 2023**
Date of Issue	:	**Jul. 19, 2023**
Test Result	:	**Pass**

Testing Engineer : Gary Qian
(Gary Qian)

Technical Manager : Eden Hu
(Eden Hu)

Authorized Signatory : Jason Zhou
(Jason Zhou)

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** Modified History **

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Jul. 19, 2023	Jason Zhou

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1. TEST SUMMARY

1.1. Test Procedures And Results

DESCRIPTION OF TEST	SECTION NUMBER	RESULT
CONDUCTED EMISSIONS TEST	18.307	N/A
RADIATED EMISSION TEST	18.305	COMPLIANT

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

1.2. Information of the Test Laboratory

Shenzhen HUAK Testing Technology Co., Ltd.
Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization：
A2LA Accreditation Code is 4781.01.
FCC Designation Number is CN1229.
Canada IC CAB identifier is CN0045.
CNAS Registration Number is L9589.

1.3. Measurement Uncertainty

Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.71dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	=	3.90dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	=	3.90dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	=	4.28dB, k=2

2. GENERAL INFORMATION

2.1. General Description of EUT

Equipment:	Aqua-Amp ACT Wireless charger
Model Name:	AA-01-ACT
Series Models:	NB-A01WC
Model Difference:	All model's the function, software and electric circuit are the same, only with model named different. Test sample model: AA-01-ACT.
Trade Mark:	N/A
FCC ID:	2A64N-AA01ACT
Antenna Type:	Coil Antenna
Antenna Gain:	0dBi
Operation frequency:	112KHz~205KHz
Test frequency:	140KHz
Modulation Type:	ASK
Power Source:	Input Voltage Range: DC 10-30V(12/24V system) Input Current Max: 2A Output Power: 10W (9V, 1.1A)
Power Rating:	Input Voltage Range: DC 10-30V(12/24V system) Input Current Max: 2A Output Power: 10W (9V, 1.1A)

2.2. Carrier Frequency of Channels

Operation Frequency each of channel	
Channel	Frequency
1	140KHz

2.3. Operation of EUT during testing

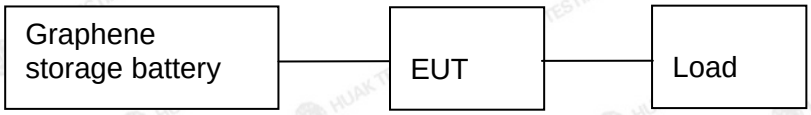
Operating Mode

The mode is used: Transmitting mode

EUT Mode	Description
Working	Full Load
	Half Load
	No Load

2.4. Description of Test Setup

Operation of EUT during testing:



The sample was placed (0.8m (30MHz~1GHz), 0.8m (9KHz~30MHz)) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is X position.

2.5. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/ Trade Mark	Model/Type No.	Specification	Note
1	Aqua-Amp ACT Wireless charger	N/A	AA-01-ACT	N/A	EUT
2	Graphene storage battery	N/A	N/A	12V399Ah	Peripherals
3	Load	YBZ	N/A	15W MAX	Peripherals

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

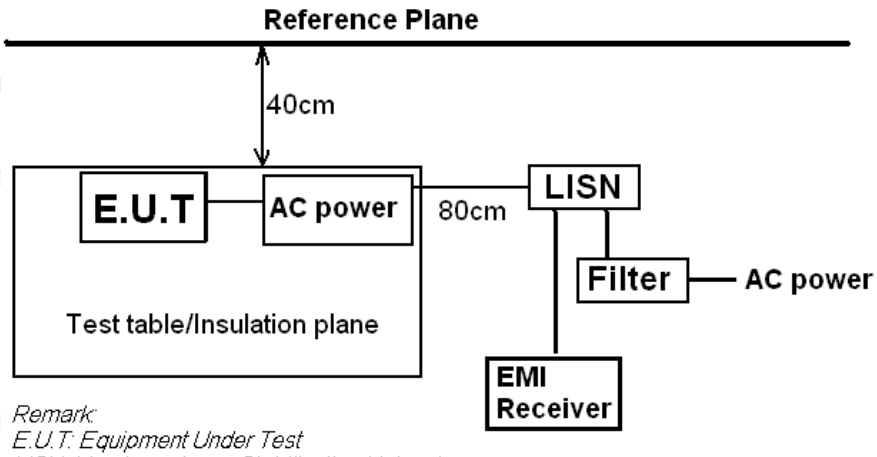
3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

2.6. Measurement Instruments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	R&S	ENV216	HKE-002	Feb. 17, 2023	1 Year
2.	Receiver	R&S	ESR-7	HKE-010	Feb. 17, 2023	1 Year
3.	RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 17, 2023	1 Year
4.	Spectrum analyzer	R&S	FSP40	HKE-025	Feb. 17, 2023	1 Year
5.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 17, 2023	1 Year
6.	Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Feb. 17, 2023	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESCI 7	HKE-010	Feb. 17, 2023	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Feb. 17, 2023	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Feb. 17, 2023	1 Year
10.	Horn Antenna	Schewarzbeck	9120D	HKE-013	Feb. 17, 2023	1 Year
11.	Pre-amplifier	EMCI	EMC051845 SE	HKE-015	Feb. 17, 2023	1 Year
12.	Pre-amplifier	Agilent	83051A	HKE-016	Feb. 17, 2023	1 Year
13.	EMI Test Software EZ-EMC	Tonscend	JS1120-B Version	HKE-083	N/A	N/A
14.	Power Sensor	Agilent	E9300A	HKE-086	Feb. 17, 2023	1 Year
15.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 17, 2023	1 Year
16.	Signal generator	Agilent	N5182A	HKE-029	Feb. 17, 2023	1 Year
17.	Signal Generator	Agilent	83630A	HKE-028	Feb. 17, 2023	1 Year
18.	Shielded room	Shiel Hong	4*3*3	HKE-039	Dec. 09, 2021	3 Year

3. CONDUCTED EMISSION TEST

3.1. Block Diagram of Test Setup



Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m

3.2. Conducted Power Line Emission Limit

According to FCC Part 18.307(b)

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §18.307 Line Conducted Emission Limit is same as above table.

3.3. Test Procedure

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

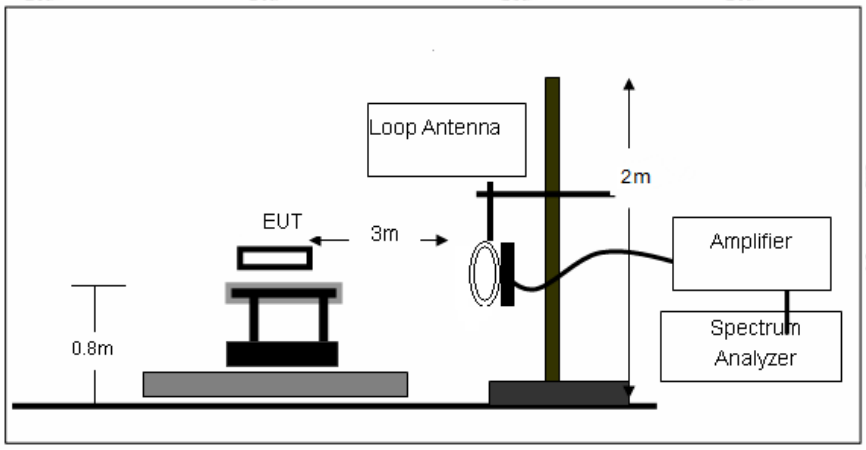
3.4. Test Result

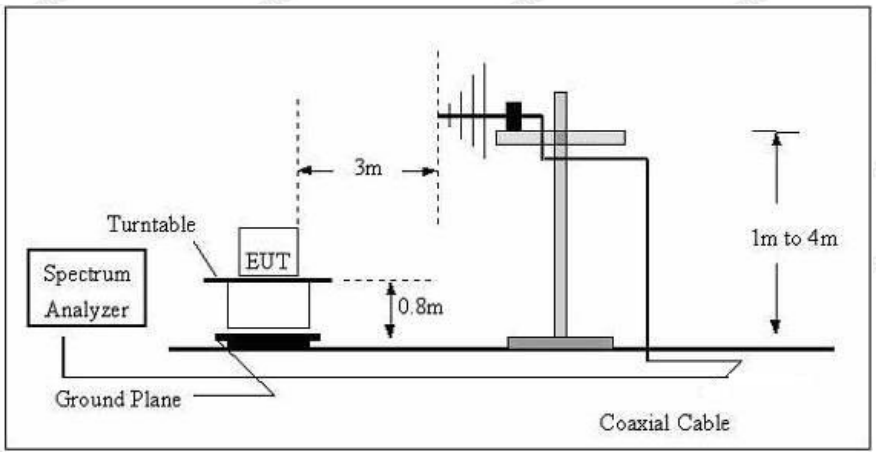
Not applicable

Note: Since EUT is only for on-car use, so this test item not applicable.

4. RADIATED EMISSIONS

4.1. Block Diagram of Test Setup





4.2. Rules and specifications

Except as provided elsewhere in this Subpart 18.305 (b), the field strength levels of emissions which lie outside the bands specified in §18.301, unless otherwise indicated, shall not exceed the following table:

Equipment	Operating frequency	RF Power generated by equipment (watts)	Field strength limit (uV/m)	Distance (meters)
(miscellaneous)				
	Any non-ISM frequency	Below 500 500 or more	15 15 × SQRT(power/500)	300 [1]300

Remark:

(1) Emission level dBuV/m for 0.009~30MHz = 20log (15) + 40log (300/3) dBuV/m;

(2) Calculated according FCC 18.305.

(3) The smaller limit shall apply at the cross point between two frequency bands.

(4) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

4.3. Test Procedure

Measurement distance 3m
For the measurement range up to 30MHz in the following plots the field strength result from 3m
Distance measurements are extrapolated to 300m and 30m distance respectively, by 40dB/decade, Per antenna factor scaling.
Measurements below 1000MHz are performed with a peak detector and compared to average limits,
Measurements with an average detector are not required.

Note:

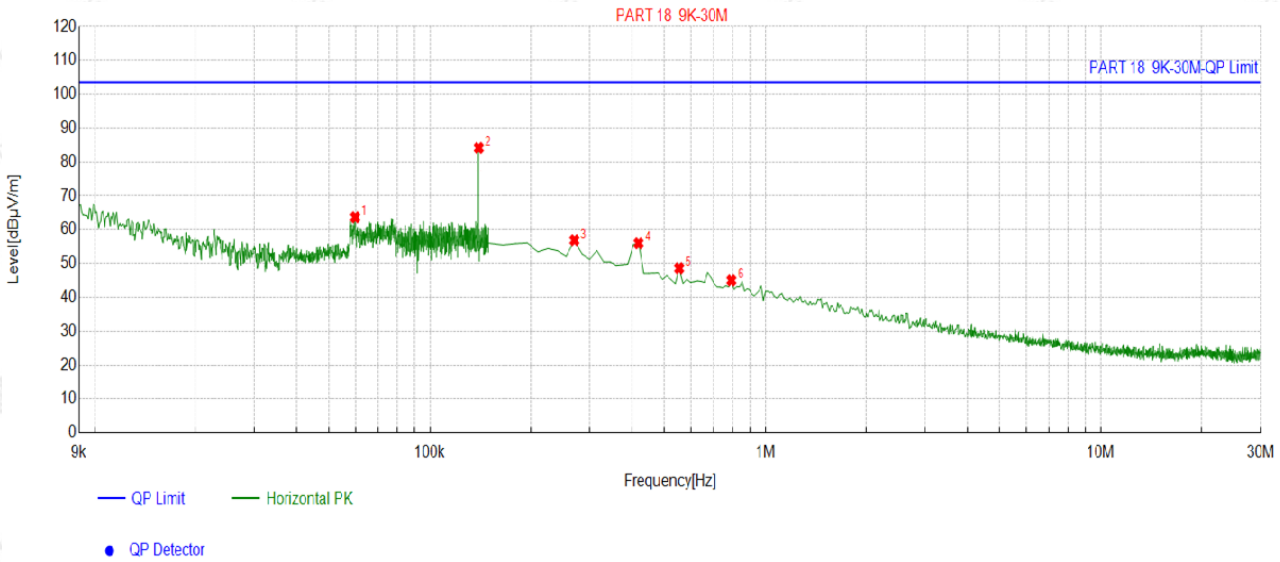
For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4. Test Result

PASS

Note: All the test modes completed for test. Only the worst result (Full Load) was reported as below:

For 9KHz - 30MHz

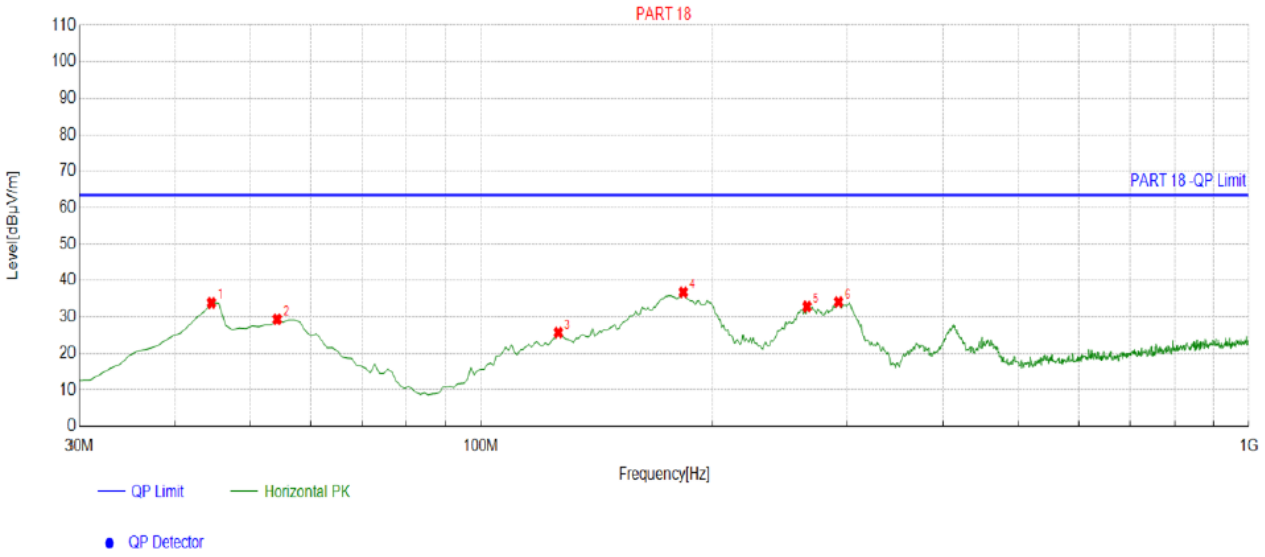


Suspected List						
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
1	0.0598	13.97	49.71	63.68	103.50	39.82
2	0.1397	13.78	70.68	84.46	103.50	19.04
3	0.2695	13.68	43.20	56.88	103.50	46.62
4	0.4188	13.77	42.25	56.02	103.50	47.48
5	0.5532	13.72	34.88	48.60	103.50	54.90
6	0.7921	14.02	31.03	45.05	103.50	58.45

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level

For 30MHz-1GHz

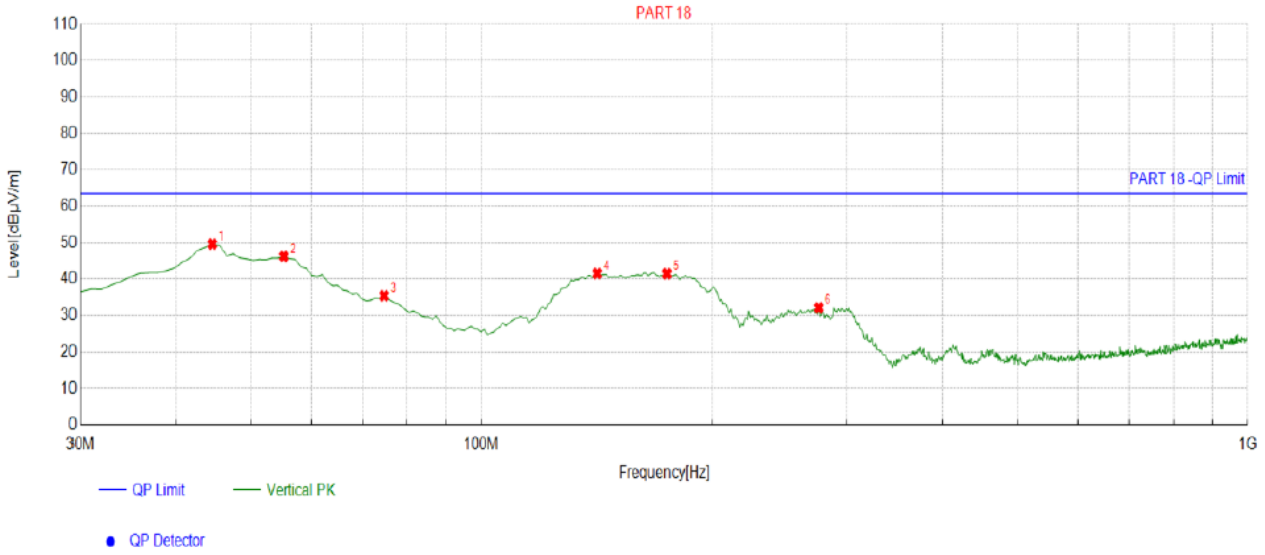
Antenna polarity: H



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	44.5646	-15.07	48.96	33.89	63.50	29.61	100	183	Horizontal
2	54.2743	-14.45	43.83	29.38	63.50	34.12	100	274	Horizontal
3	126.1261	-16.21	41.92	25.71	63.50	37.79	100	289	Horizontal
4	183.4134	-16.65	53.45	36.80	63.50	26.70	100	72	Horizontal
5	265.9459	-12.71	45.54	32.83	63.50	30.67	100	301	Horizontal
6	292.1622	-12.24	46.35	34.11	63.50	29.39	100	313	Horizontal

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level

Antenna polarity: V



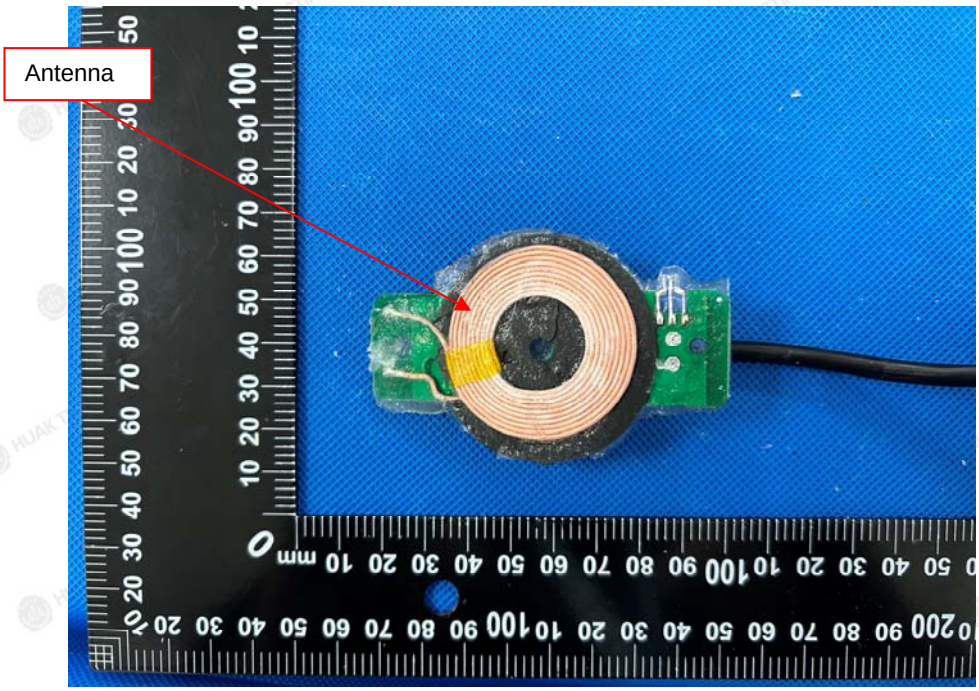
Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	44.5646	-15.07	64.71	49.64	63.50	13.86	100	292	Vertical
2	55.2452	-14.33	60.55	46.22	63.50	17.28	100	276	Vertical
3	74.6647	-16.61	52.09	35.48	63.50	28.02	100	0	Vertical
4	141.6617	-18.11	59.66	41.55	63.50	21.95	100	308	Vertical
5	174.6747	-16.88	58.37	41.49	63.50	22.01	100	308	Vertical
6	275.6557	-12.53	44.69	32.16	63.50	31.34	100	304	Vertical

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level

5. ANTENNA REQUIREMENT

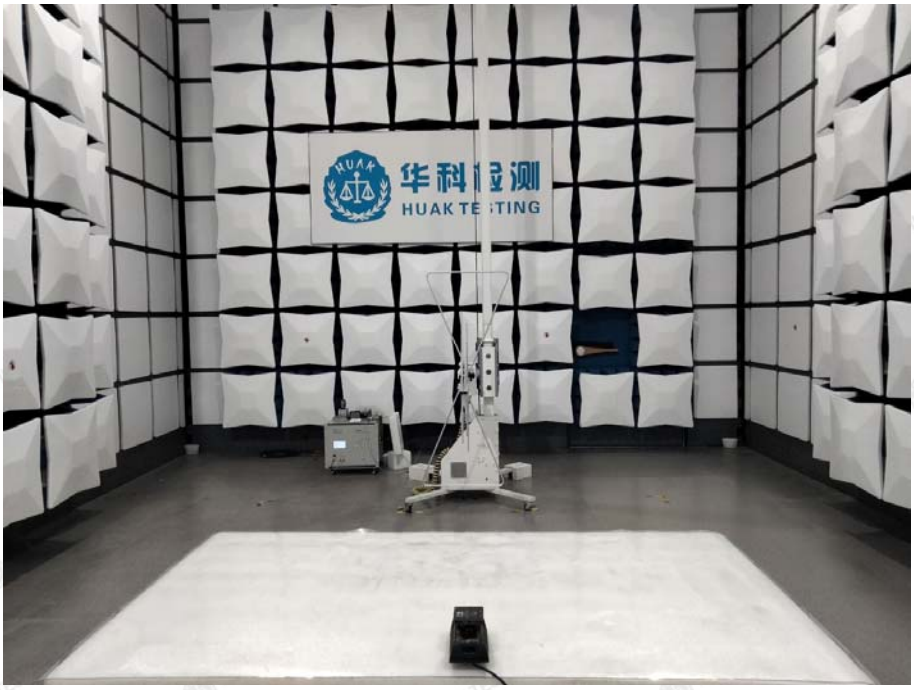
Refer to statement below for compliance.
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

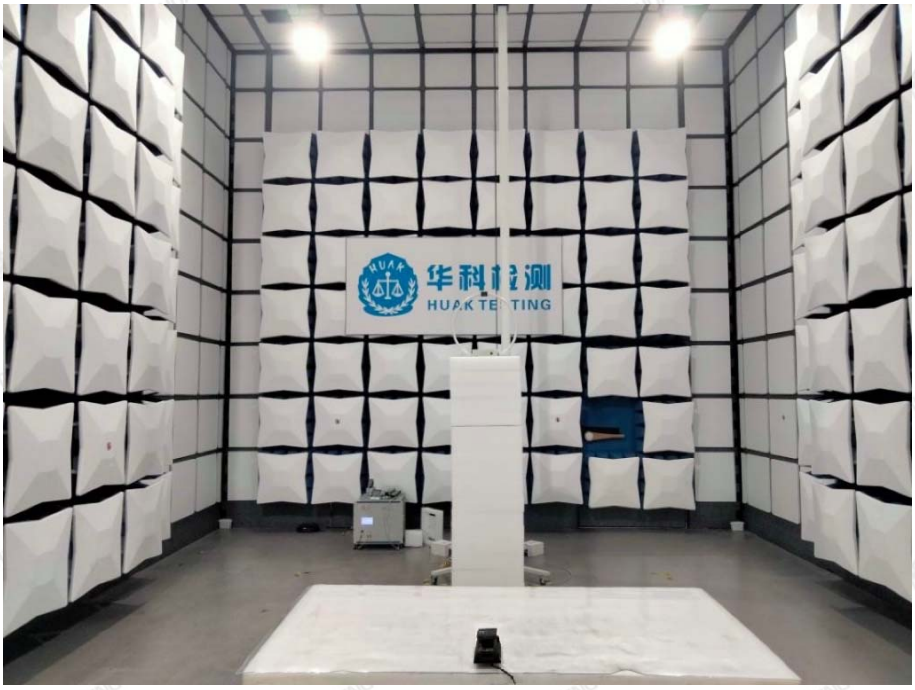
Antenna Connected Construction
The antenna used in this product is a Coil Antenna, which permanently attached. It conforms to the standard requirements. The directional gains of antenna used for transmitting is 0dBi.



6. PHOTOGRAPH OF TEST

Radiated Emission





7. PHOTOS OF THE EUT

Reference to the report: ANNEX A of external photos and ANNEX B of internal photos.

---------End of test report---------

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