FCC Test Report

Test Report
On Behalf of
ShangXing Technology(ShenZhen) Co.,Ltd.
For
3-in-1 Fold Magnetic Wireless Charger
Model No.: X40, X40+, X40S, X40S+, X73, S312Pro, X40M, X40C, X40L, X40SM, X40SC, X40SL, X40M+, X40C+, X40L+, X40SM+, X40SC+, X40SL+

FCC ID: 2APDM-X40-1

Prepared For :	**ShangXing Technology(ShenZhen) Co.,Ltd.** **Room 408, 4th Floor, Building 30.Wisdomland Business Park, Guankou 2nd road, Nantou, Nanshan, Shenzhen, China**
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:	**Feb. 26, 2024 ~ May 28, 2024**
Date of Report:	**May 28, 2024**
Report Number:	**HK2402260800-1E**

Test Result Certification

Applicant's Name	:	ShangXing Technology(ShenZhen) Co.,Ltd.
Address	:	Room 408, 4th Floor, Building 30.Wisdomland Business Park, Guankou 2nd road, Nantou, Nanshan, Shenzhen, China
Manufacturer's Name	:	ShangXing Technology(ShenZhen) Co.,Ltd.
Address	:	Room 408, 4th Floor, Building 30.Wisdomland Business Park, Guankou 2nd road, Nantou, Nanshan, Shenzhen, China

Product Description

Trade Mark	:	N/A
Product Name	:	3-in-1 Fold Magnetic Wireless Charger
Model and/or Type Reference:		X40, X40+, X40S, X40S+, X73, S312Pro, X40M, X40C, X40L, X40SM, X40SC, X40SL, X40M+, X40C+, X40L+, X40SM+, X40SC+, X40SL+
Standards	:	FCC CFR 47 PART 18

Date of Test	:	
Date (s) of performance of tests	:	**Feb. 26, 2024 ~ May 28, 2024**
Date of Issue	:	**May 28, 2024**
Test Result	:	**Pass**

Testing Engineer : Len Liao

(Len Liao)

Technical Manager : Sliver Wan

(Sliver Wan)

Authorized Signatory : Jason Zhou

(Jason Zhou)

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** Modified History **

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	May 28, 2024	Jason Zhou

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Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

1. Test Summary

1.1. Test Procedures and Results

Description of Test	Section Number	Result
Conducted Emissions Test	18.307	COMPLIANT
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 CA100229.
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:	3-in-1 Fold Magnetic Wireless Charger
Model Name:	X40
Series Models:	X40+, X40S, X40S+, X73, S312Pro, X40M, X40C, X40L, X40SM, X40SC, X40SL, X40M+, X40C+, X40L+, X40SM+, X40SC+, X40SL+
Model Difference:	All model's the function, software and electric circuit are the same, only with product appearance, color and model named different. Test sample model: X40.
Trade Mark:	N/A
FCC ID:	2APDM-X40-1
Antenna Type:	Coil Antenna
Operation Frequency:	Mobile Phone + Earbuds :112KHz~205KHz Watch: 314KHz
Test Frequency:	Mobile Phone: 128KHz Earbuds: 123KHz Watch: 314KHz
Modulation Type:	ASK
Power Source:	Input: DC5V/3A, 9V/2.22A, 12V/3A Wireless Output: 3W/5W/7.5W/10W/15W Wireless Output (Mobile Phone) : 5W/7.5W/10W/15W Wireless Output (Earbuds) : 5W Wireless Output (Watch) : 3W/5W
Power Rating:	Input: DC5V/3A, 9V/2.22A, 12V/3A Wireless Output: 3W/5W/7.5W/10W/15W Wireless Output (Mobile Phone) : 5W/7.5W/10W/15W Wireless Output (Earbuds) : 5W Wireless Output (Watch) : 3W/5W
Note: 1.The transfer system includes three coils, 3 coils can work individually or can work at the same time. All the situation has been tested, only the worst situation was recorded in the report. 2. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. 3. The test results in the report only apply to the tested sample.	

2.2. Carrier Frequency of Channels

	Test Frequency
01	128KHz
02	123KHz
03	314KHz

2.3. Test Mode

Test Item	Test Mode	Description
Radiated & Conducted Test Cases	Mode 1	AC/DC Adapter + EUT + Wireless load 1 (Full load) + Wireless load 2 (Full load) + Wireless load 3 (Full load)
	Mode 2	AC/DC Adapter + EUT + Wireless load 1 (Half load) + Wireless load 2 (Half load) + Wireless load 3 (Full load)
	Mode 3	AC/DC Adapter + EUT + Wireless load 1 (Null load) + Wireless load 2 (Null load) + Wireless load 3 (Full load)
	Mode 4	AC/DC Adapter + EUT + Wireless load 1 (Full load) + Wireless load 2 (Full load) + Wireless load 3 (Half load)
	Mode 5	AC/DC Adapter + EUT + Wireless load 1 (Half load) + Wireless load 2 (Half load) + Wireless load 3 (Half load)
	Mode 6	AC/DC Adapter + EUT + Wireless load 1 (Null load) + Wireless load 2 (Null load) + Wireless load 3 (Half load)
	Mode 7	AC/DC Adapter + EUT + Wireless load 1 (Full load) + Wireless load 2 (Full load) + Wireless load 3 (Null load)
	Mode 8	AC/DC Adapter + EUT + Wireless load 1 (Half load) + Wireless load 2 (Half load) + Wireless load 3 (Null load)
	Mode 9	AC/DC Adapter + EUT + Wireless load 1 (Null load) + Wireless load 2 (Null load) + Wireless load 3 (Null load)
	Mode 10	AC/DC Adapter+ EUT + Wireless load 1 (Full load)
	Mode 11	AC/DC Adapter+ EUT + Wireless load 1 (Half load)
	Mode 12	AC/DC Adapter+ EUT + Wireless load 1 (Null load)
	Mode 13	AC/DC Adapter + EUT + Wireless load 2 (Full load)
	Mode 14	AC/DC Adapter + EUT + Wireless load 2 (Half load)
	Mode 15	AC/DC Adapter + EUT + Wireless load 2 (Null load)
	Mode 16	AC/DC Adapter + EUT + Wireless load 3 (Full load)
	Mode 17	AC/DC Adapter + EUT + Wireless load 3 (Half load)
	Mode 18	AC/DC Adapter + EUT + Wireless load 3 (Null load)
	Mode 19	AC/DC Adapter + EUT (Null Load)

Note: 1. All modes and configurations above have been tested, Only the result of the worst case was recorded in the report.

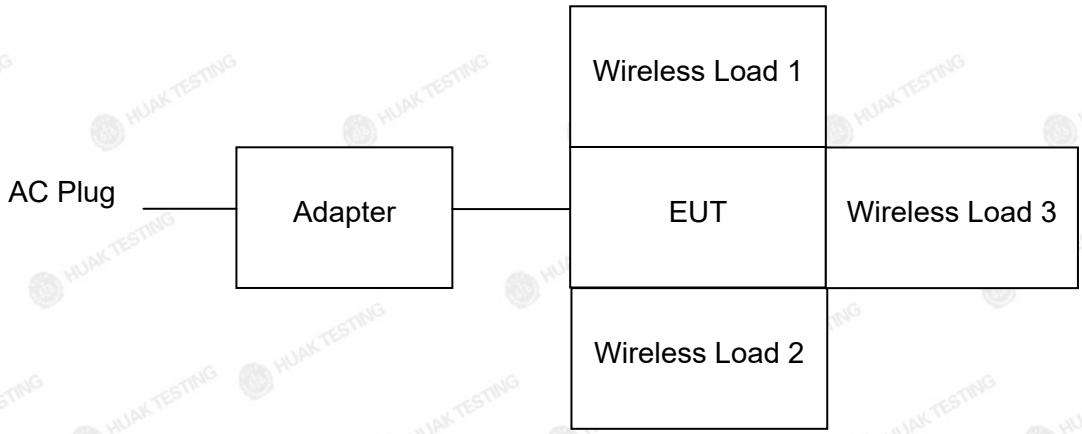
2.For Radiated Emission, 3axis were chosen for testing for each applicable mode, including the mobile phone in vertical and horizontal positions.

3. The wireless load replaces the Mobile Phone, Earbuds and Watch by Lab.

4. According to the manufacturer's design principle, the wireless charging power will reach its maximum when the client device's battery level is between 1% and 10%.

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	Trade Mark	Model/Type No.	Specification	Remark
1	3-in-1 Fold Magnetic Wireless Charger	N/A	X40	N/A	EUT
2	USB Cable	N/A	N/A	Length:1.03m	Accessory
3	Adapter	N/A	191106C	Input: 100-240V, 50/60Hz, 1.8A Output: 5V/3A, 9V3A, 12V/3A, 15V/3A, 20V/3.25A(65W Max)	Accessory
4	Wireless Load 1	YBZ	N/A	Wireless input:15W	Peripheral
5	Wireless Load 2	YBZ	N/A	Wireless input:5W	Peripheral
6	Wireless Load 3	YBZ	N/A	Wireless input:5W	Peripheral

Note:

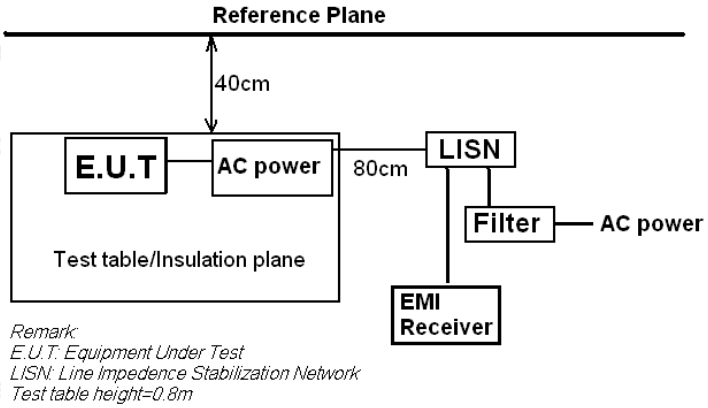
1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

2.6. Measurement Instruments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N.	R&S	ENV216	HKE-002	Feb. 20, 2024	1 Year
2.	L.I.S.N.	R&S	ENV216	HKE-059	Feb. 20, 2024	1 Year
3.	EMI Test Receiver	R&S	ESR	HKE-005	Feb. 20, 2024	1 Year
4.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 20, 2024	1 Year
5.	Spectrum analyzer	R&S	FSV3044	HKE-126	Feb. 20, 2024	1 Year
6.	Preamplifier	EMCI	EMC051845 S	HKE-006	Feb. 20, 2024	1 Year
7.	Preamplifier	Schwarzbeck	BBV 9743	HKE-016	Feb. 20, 2024	1 Year
8.	Preamplifier	A.H. Systems	SAS-574	HKE-182	Feb. 20, 2024	1 Year
9.	6dB Attenuator	Pasternack	6db	HKE-184	Feb. 20, 2024	1 Year
10.	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	Feb. 20, 2024	1 Year
11.	Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	Feb. 21, 2024	2 Year
12.	Loop Antenna	COM-POWER	AL-130R	HKE-014	Feb. 21, 2024	2 Year
13.	Horn Antenna	Schwarzbeck	9120D	HKE-013	Feb. 21, 2024	2 Year
14.	EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	/	/
15.	EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	/	/
16.	10dB Attenuator	Schwarzbeck	VTSD9561F	HKE-153	Feb. 20, 2024	1 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

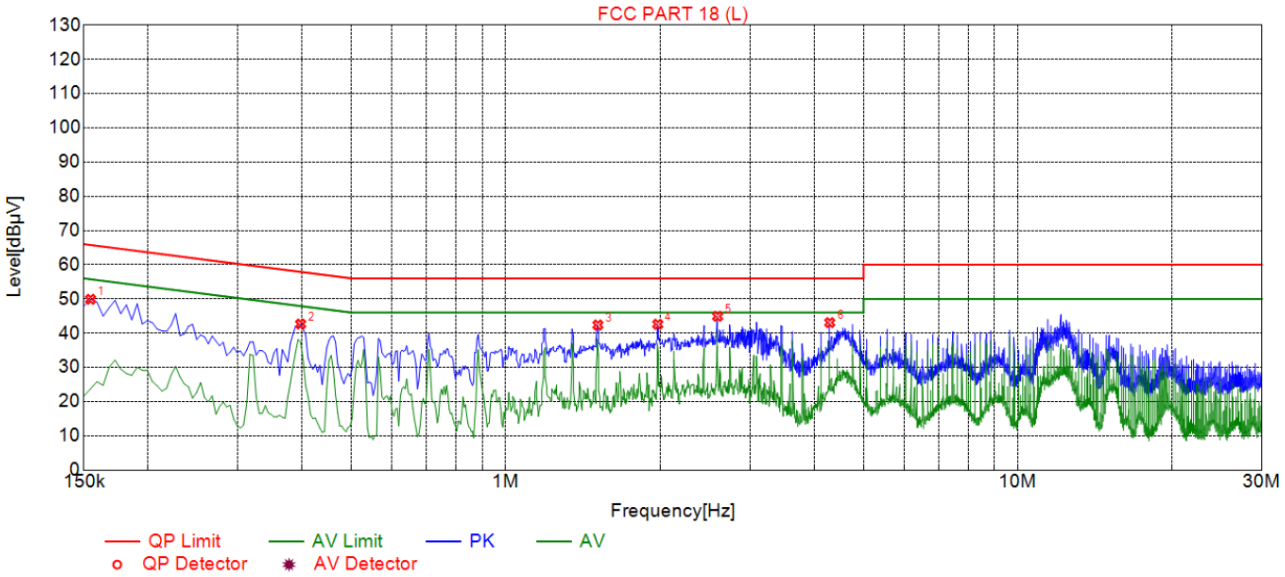
1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2. Support equipment, if needed, was placed as per ANSI 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

PASS

All the test modes completed for test. Only the worst result was reported as below:

Test Specification: Line



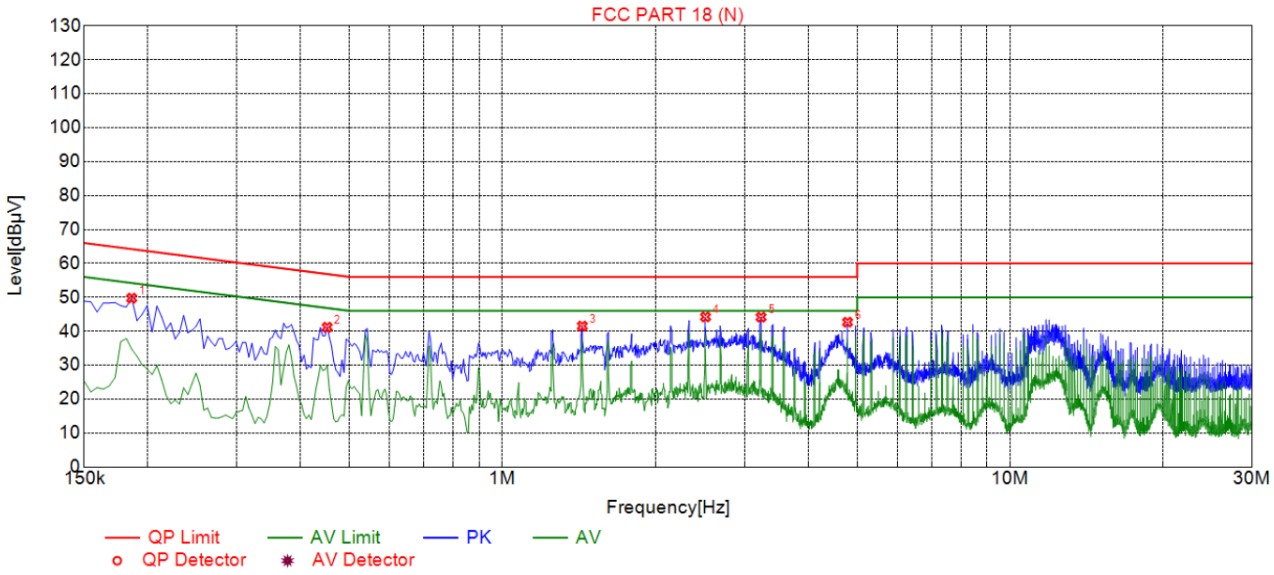
Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1545	49.91	20.03	65.75	15.84	29.88	PK	L
2	0.3975	42.66	20.04	57.91	15.25	22.62	PK	L
3	1.5135	42.39	20.11	56.00	13.61	22.28	PK	L
4	1.9815	42.60	20.14	56.00	13.40	22.46	PK	L
5	2.5935	44.93	20.20	56.00	11.07	24.73	PK	L
6	4.2945	43.08	20.25	56.00	12.92	22.83	PK	L

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

Test Specification: Neutral



Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1860	49.76	20.05	64.21	14.45	29.71	PK	N
2	0.4515	41.18	20.04	56.85	15.67	21.14	PK	N
3	1.4370	41.52	20.10	56.00	14.48	21.42	PK	N
4	2.5125	44.23	20.19	56.00	11.77	24.04	PK	N
5	3.2325	44.15	20.23	56.00	11.85	23.92	PK	N
6	4.7850	42.68	20.26	56.00	13.32	22.42	PK	N

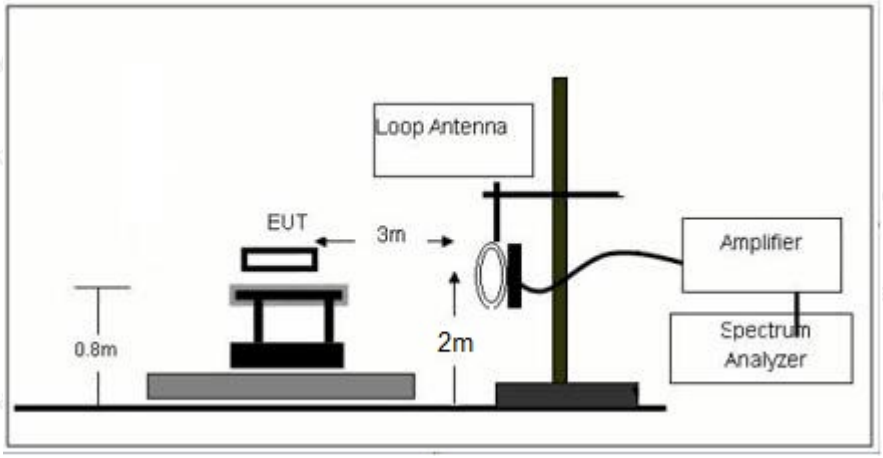
Remark: Margin = Limit – Level

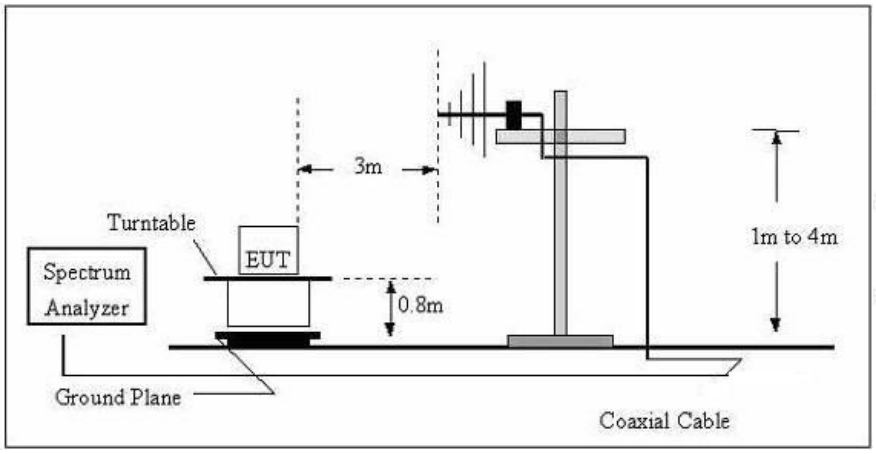
Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

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:

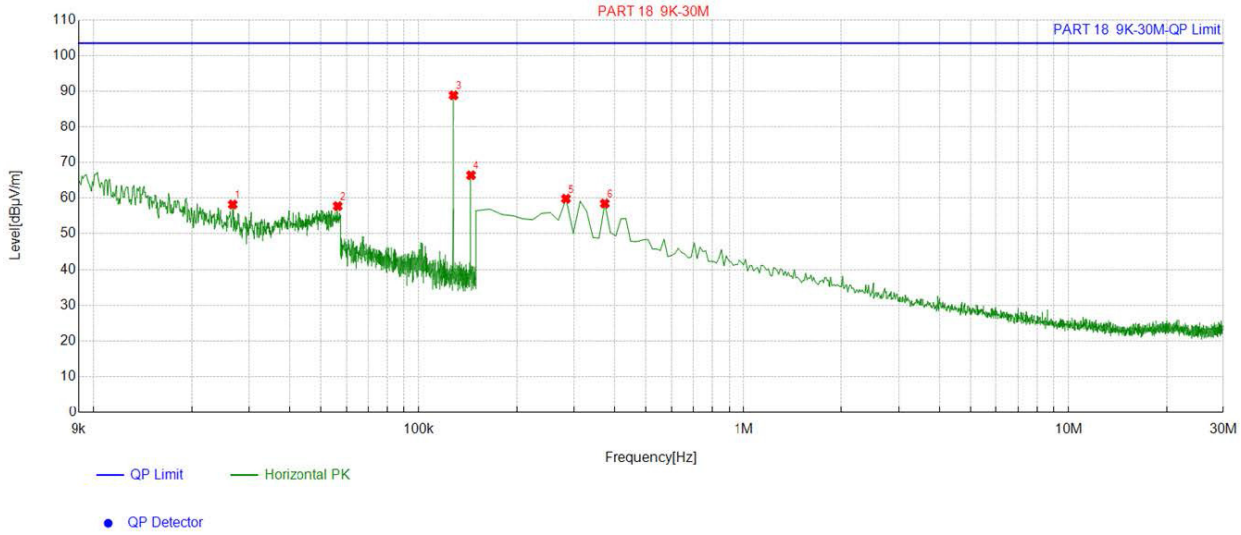
For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4. Test Result

PASS

Mobile phone:

For 9KHz - 30MHz

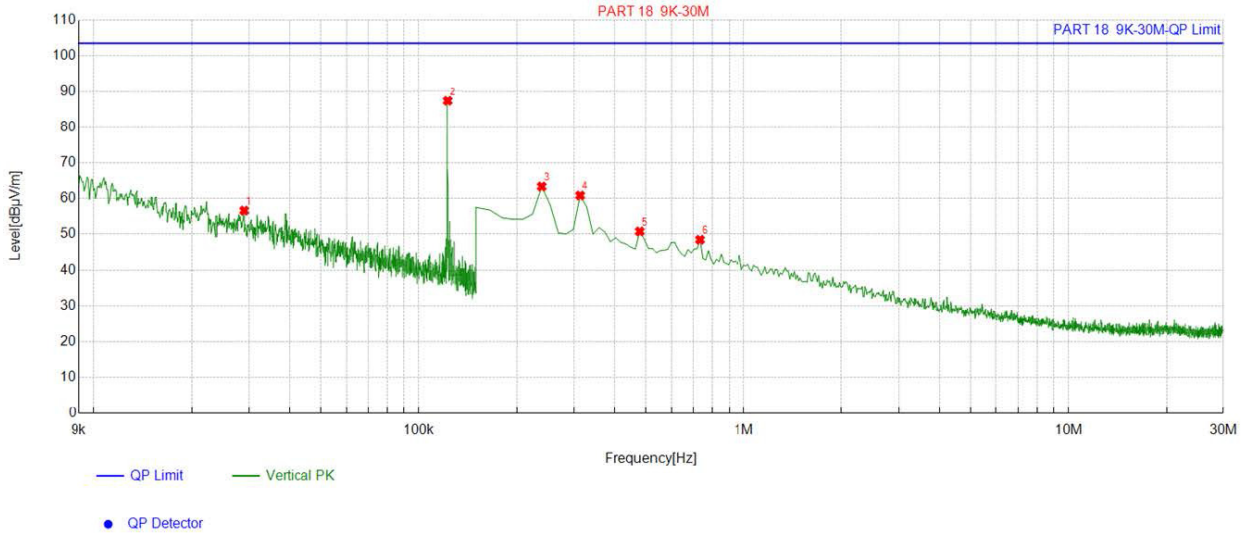


Suspected List						
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
1	0.026704	14.68	43.51	58.19	103.50	45.31
2	0.0564	13.95	43.79	57.74	103.50	45.76
3	0.127711	13.78	75.03	88.81	103.50	14.69
4	0.144498	13.77	52.60	66.37	103.50	37.13
5	0.284392	13.69	46.12	59.81	103.50	43.69
6	0.373987	13.76	44.69	58.45	103.50	45.05

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

Earbuds:

For 9KHz - 30MHz

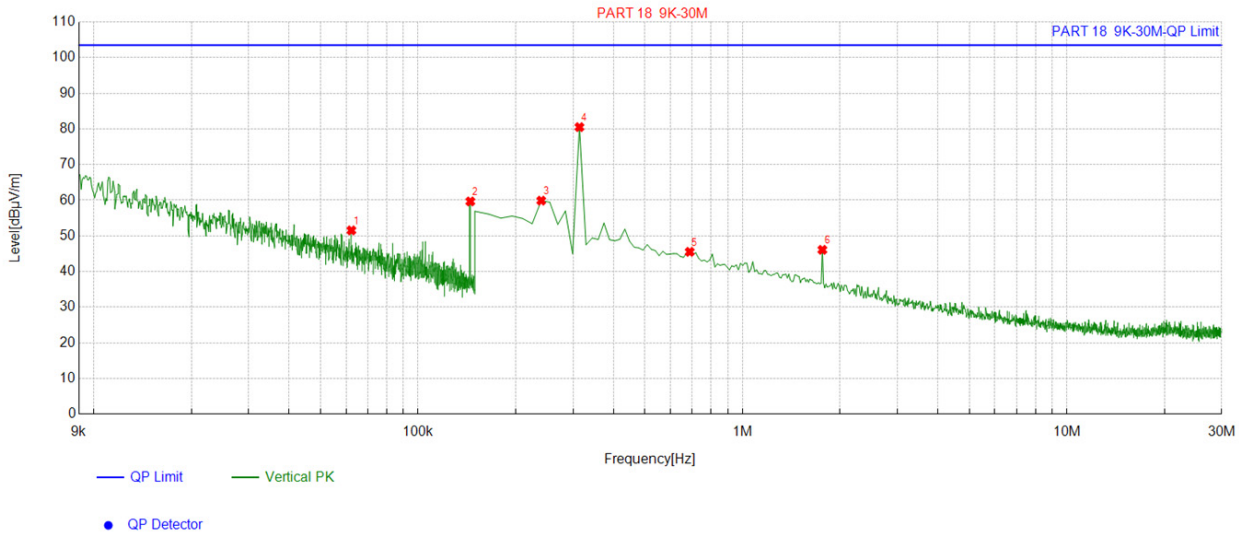


Suspected List						
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
1	0.028961	14.73	41.87	56.60	103.50	46.90
2	0.122562	13.78	73.40	87.18	103.50	16.32
3	0.239595	13.68	49.65	63.33	103.50	40.17
4	0.314257	13.70	47.13	60.83	103.50	42.67
5	0.478514	13.74	37.05	50.79	103.50	52.71
6	0.732366	13.87	34.60	48.47	103.50	55.03

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

Watch:

For 9KHz - 30MHz



Suspected List						
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
1	0.062254	13.97	37.58	51.55	103.50	51.95
2	0.144851	13.77	45.90	59.67	103.50	43.83
3	0.239595	13.68	46.22	59.90	103.50	43.60
4	0.314257	13.70	66.81	80.51	103.50	22.99
5	0.687569	13.79	31.74	45.53	103.50	57.97
6	1.762706	14.43	31.67	46.10	103.50	57.40

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

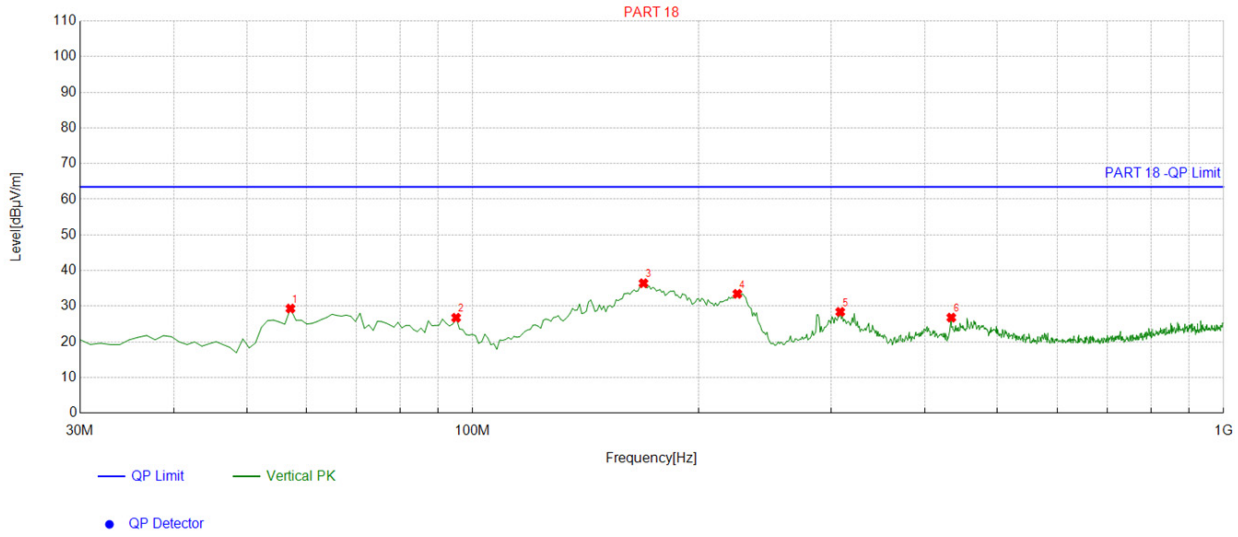
For 30MHz-1GHz

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	63.983984	-14.68	31.73	17.05	63.50	46.45	100	165	Horizontal
2	95.055055	-16.56	35.14	18.58	63.50	44.92	100	352	Horizontal
3	166.90690	-16.93	45.19	28.26	63.50	35.24	100	341	Horizontal
4	228.07807	-13.96	52.10	38.14	63.50	25.36	100	50	Horizontal
5	306.72672	-11.89	42.24	30.35	63.50	33.15	100	359	Horizontal
6	433.92392	-8.21	30.69	22.48	63.50	41.02	100	6	Horizontal

Remark: Factor = Cable loss + Antenna factor + Attenuator – 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	57.187187	-14.41	43.77	29.36	63.50	34.14	100	161	Vertical
2	95.055055	-16.56	43.33	26.77	63.50	36.73	100	92	Vertical
3	168.84884	-17.09	53.54	36.45	63.50	27.05	100	28	Vertical
4	225.16516	-14.01	47.47	33.46	63.50	30.04	100	354	Vertical
5	308.66866	-11.86	40.27	28.41	63.50	35.09	100	211	Vertical
6	433.92392	-8.21	35.02	26.81	63.50	36.69	100	97	Vertical

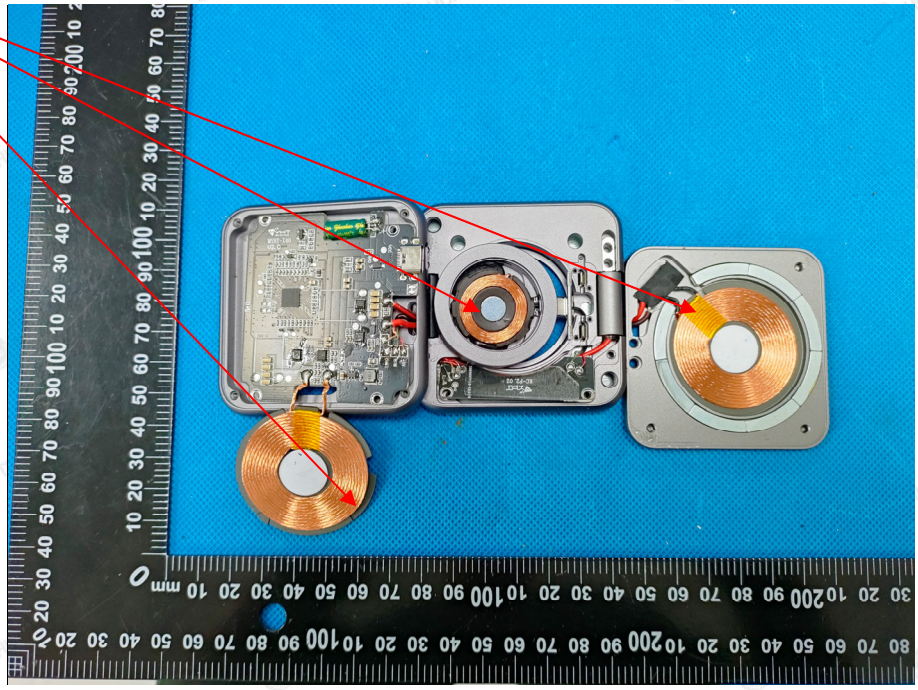
Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

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 Coil Antenna, which permanently attached. It conforms to the standard requirements.

Antenna



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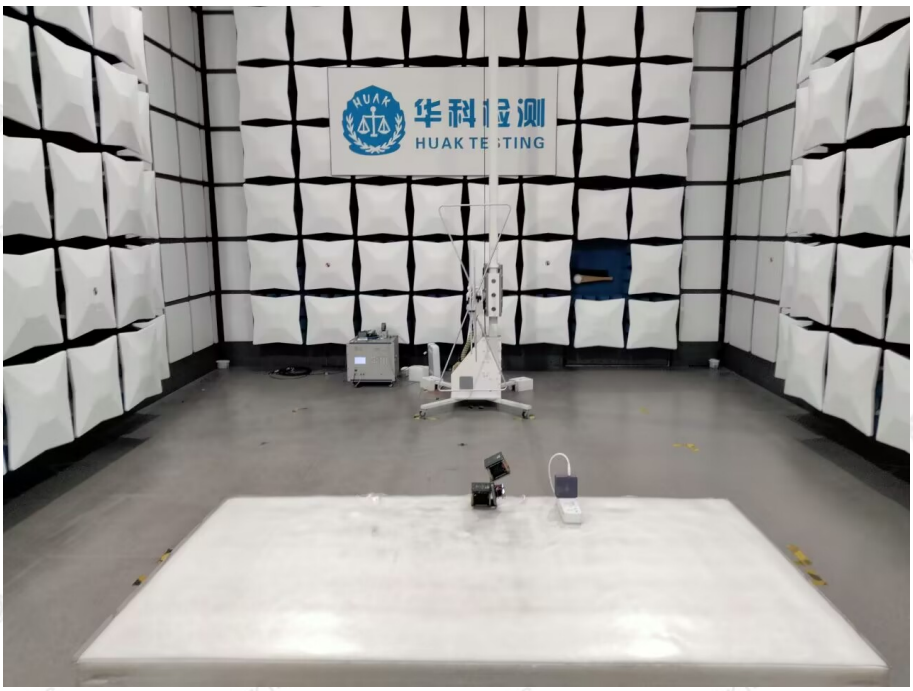
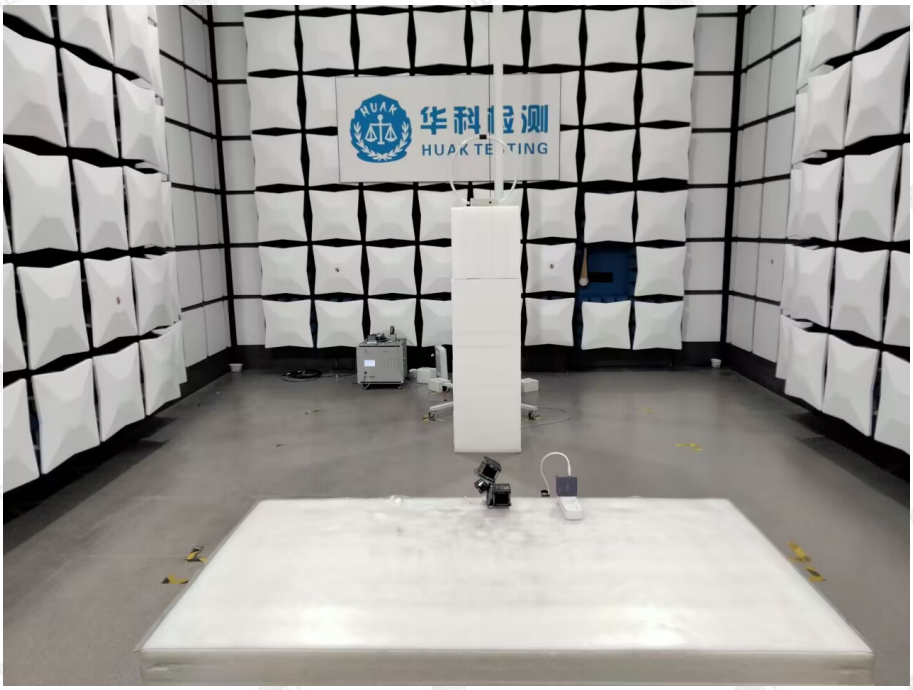
6. Photographs of Test

Radiated Emission





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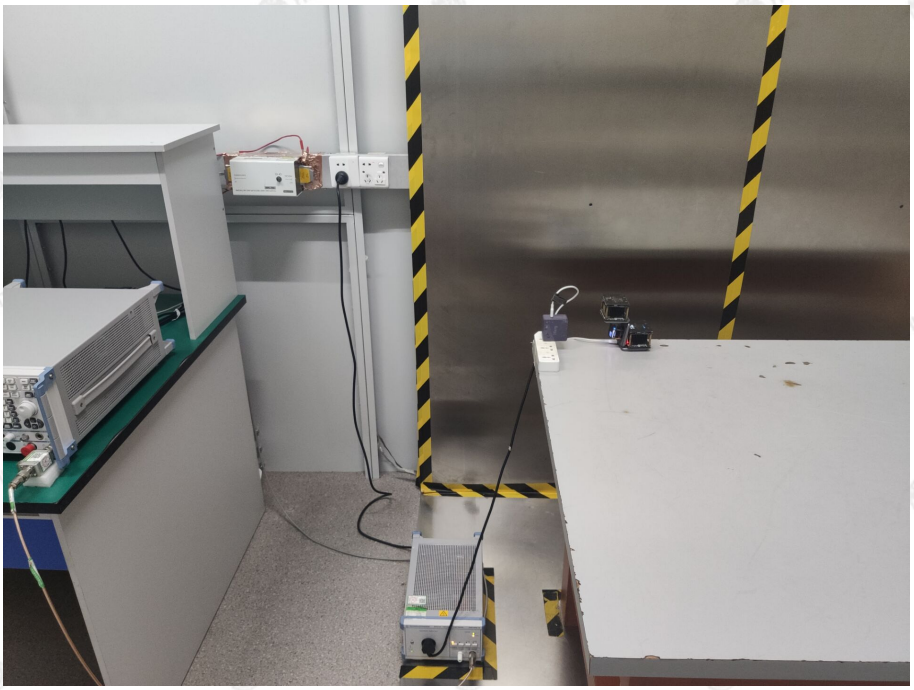
Conducted Emission



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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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