



FCC Test Report

**Test Report
On Behalf of
Shenzhen Yiqizhao Technology Co.,Ltd
For
2-in-1 Wireless Charging
Model No.: N4-1, N4
FCC ID: 2BC2X-N4-1**

Prepared For : Shenzhen Yiqizhao Technology Co.,Ltd
201,Floor 2,Building6,Yunli Intelligent Park,No.3, Changfa
MiddleRoad,YangmeiCommunity,BantianStreet, Shenzhen, China

Prepared By : Shenzhen HUAK Testing Technology Co., Ltd.
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Date of Test: Jun. 20, 2024 ~ Jun. 28, 2024

Date of Report: Jun. 28, 2024

Report Number: HK2406203233-1E



Test Result Certification

Applicant's Name : Shenzhen Yiqizhao Technology Co.,Ltd
201,Floor 2,Building6,Yunli Intelligent Park,No.3, Changfa
Address..... : MiddleRoad,YangmeiCommunity,BantianStreet, Shenzhen,
China
Manufacturer's Name : Shenzhen Yiqizhao Technology Co.,Ltd
Address..... : 310-313 Room 3 Floor A Building Baiwangda Intelligent Park,
Shenzhen, Guangdong, China

Product Description

Trade Mark : N/A
Product Name : 2-in-1 Wireless Charging
Model and/or Type Reference: N4-1, N4

Standards : FCC CFR 47 PART 18

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Date of Test :
Date (s) of performance of tests : Jun. 20, 2024 ~ Jun. 28, 2024
Date of Issue..... : Jun. 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	Jun. 28, 2024	Jason Zhou



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 HUAKE 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 CN3229.

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:	2-in-1 Wireless Charging
Model Name:	N4-1
Series Models:	N4
Model Difference:	All model's the function, software and electric circuit are the same, only with a product model named different. Test sample model: N4-1.
Trade Mark:	N/A
FCC ID:	2BC2X-N4-1
Antenna Type:	Coil Antenna
Operation Frequency:	112KHz~205KHz
Test Frequency:	Mobile Phone: 134KHz Watch: 133KHz
Modulation Type:	ASK
Power Source:	Input voltage: DC5V/3A, DC9V/3A, DC12V/2A Mobile phone /Earphone output: 15W/10W/7.5W/5W Watch output: 2.5W
Power Rating:	Input voltage: DC5V/3A, DC9V/3A, DC12V/2A Mobile phone /Earphone output: 15W/10W/7.5W/5W Watch output: 2.5W
Note: 1. The transfer system includes two coils, 2 coils can work individually or can work at the same time. All situations have 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 cable loss data is obtained from the supplier. 4. The test results in the report only apply to the tested sample.	



2.2. Carrier Frequency of Channels

Operation Frequency each of channel	
Channel	Frequency
01	134KHz
02	133KHz



2.3. Test Mode

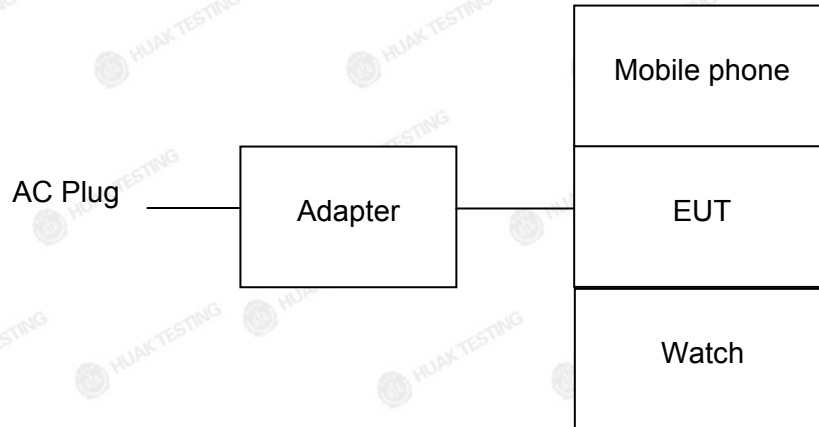
Test Item	Test Mode	Description
Radiated & Conducted Test Cases	Mode 1	AC/DC Adapter + EUT + Mobile phone (Battery Status: <1%) + Watch (Battery Status: <1%)
	Mode 2	AC/DC Adapter + EUT + Mobile phone (Battery Status: <50%) + Watch (Battery Status: <1%)
	Mode 3	AC/DC Adapter + EUT + Mobile phone (Battery Status: >95%) + Watch (Battery Status: <1%)
	Mode 4	AC/DC Adapter + EUT + Mobile phone (Battery Status: <1%) + Watch (Battery Status: <50%)
	Mode 5	AC/DC Adapter + EUT + Mobile phone (Battery Status: <50%) + Watch (Battery Status: <50%)
	Mode 6	AC/DC Adapter + EUT + Mobile phone (Battery Status: >95%) + Watch (Battery Status: <50%)
	Mode 7	AC/DC Adapter + EUT + Mobile phone (Battery Status: <1%) + Watch (Battery Status: >95%)
	Mode 8	AC/DC Adapter + EUT + Mobile phone (Battery Status: <50%) + Watch (Battery Status: >95%)
	Mode 9	AC/DC Adapter + EUT + Mobile phone (Battery Status: >95%) + Watch (Battery Status: >95%)
	Mode 10	AC/DC Adapter + EUT + Mobile phone (Battery Status: <1%)
	Mode 11	AC/DC Adapter + EUT + Mobile phone (Battery Status: <50%)
	Mode 12	AC/DC Adapter + EUT + Mobile phone (Battery Status: >95%)
	Mode 13	AC/DC Adapter + EUT + Watch (Battery Status: <1%)
	Mode 14	AC/DC Adapter + EUT + Watch (Battery Status: <50%)
	Mode 15	AC/DC Adapter + EUT + Watch (Battery Status: >95%)
	Mode 16	AC/DC Adapter + EUT (Null Load)

- Note: 1. All modes and configurations above have been tested, the report only shows the worst-case.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode, including the mobile phone in vertical and horizontal positions.
3. The Mobile Phone, Watch provided 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	2-in-1 Wireless Charging	N/A	N4-1	N/A	EUT
2	Adapter	N/A	191106C	Input: AC100-240V, 1.8A, 50/60Hz Output: DC5V/3A, 9V3A, 12V/3A, 15V/3A, 20V/3.25A, (65W Max)	Peripheral
3	Adapter	N/A	CD289	Input: AC100-240V, 50/60Hz, 2A Max USB-C1 Output: DC5V/3A, 9V3A, 12V/3A, 15V/3A, 20V/5A, 28V/5A 140W MAX USB-C2 Output: DC5V/3A, 9V/3A, 12V/3A, 15V/3A, 20V/5A 100W MAX USB-A Output: DC5V/4.5A, 4.5V/5A, 5V/3A, 9V/2A, 12V/1.5A 22.5W MAX Total Output: 140W Max	Peripheral
4	USB Cable	N/A	N/A	Length: 1m	Peripheral
5	Mobile phone	APPLE	iPhone 13	N/A	Peripheral
6	Watch	Apple	Ultra	N/A	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.
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.

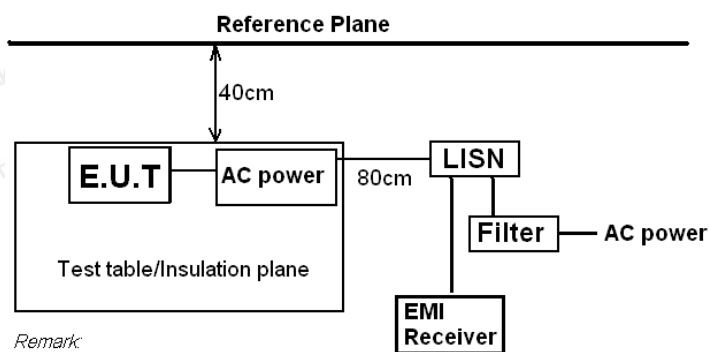
**2.6. Measurement Instruments List**

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N.	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-025	Feb. 20, 2024	1 Year
5.	Spectrum analyzer	R&S	FSV3044	HKE-126	Feb. 20, 2024	1 Year
6.	Preamplifier	EMCI	EMC051845S	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 Impedance 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.

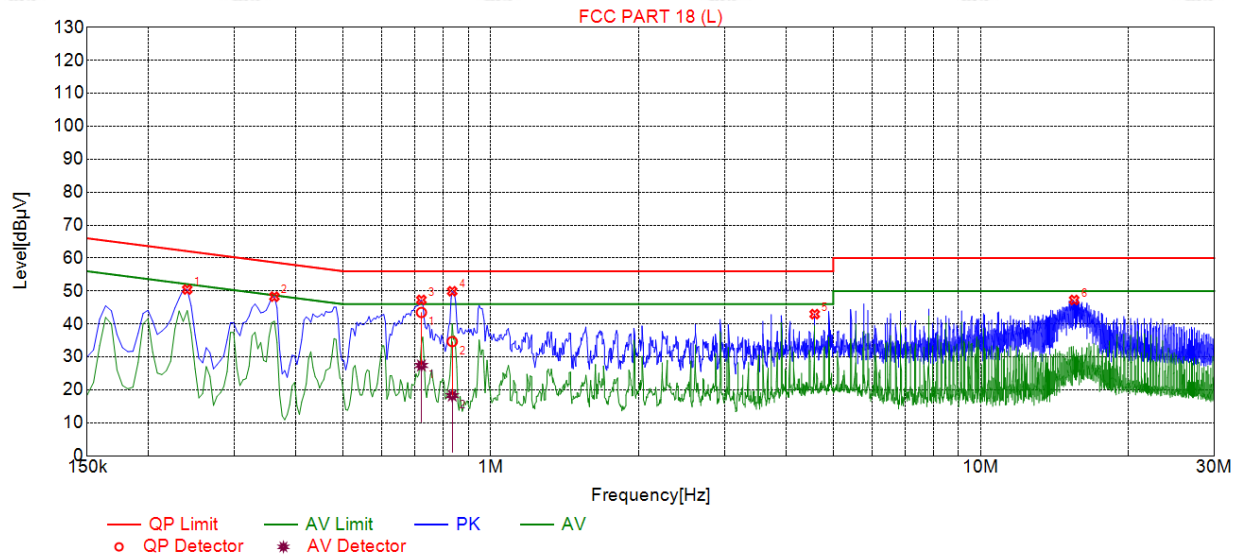


3.4. Test Result

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	0.2400	50.46	19.83	62.10	11.64	30.63	PK	L
2	0.3615	48.28	19.84	58.69	10.41	28.44	PK	L
3	0.7215	47.30	19.86	56.00	8.70	27.44	PK	L
4	0.8340	49.93	19.87	56.00	6.07	30.06	PK	L
5	4.5825	42.99	20.10	56.00	13.01	22.89	PK	L
6	15.5175	47.28	19.81	60.00	12.72	27.47	PK	L

Final Data List

NO.	Freq. [MHz]	Correction factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	QP Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	AV Reading [dBμV]	Type
1	0.7215	19.87	43.50	56.00	12.50	23.63	27.42	46.00	18.58	7.55	L
2	0.8340	19.87	34.68	56.00	21.32	14.81	18.28	46.00	27.72	-1.59	L

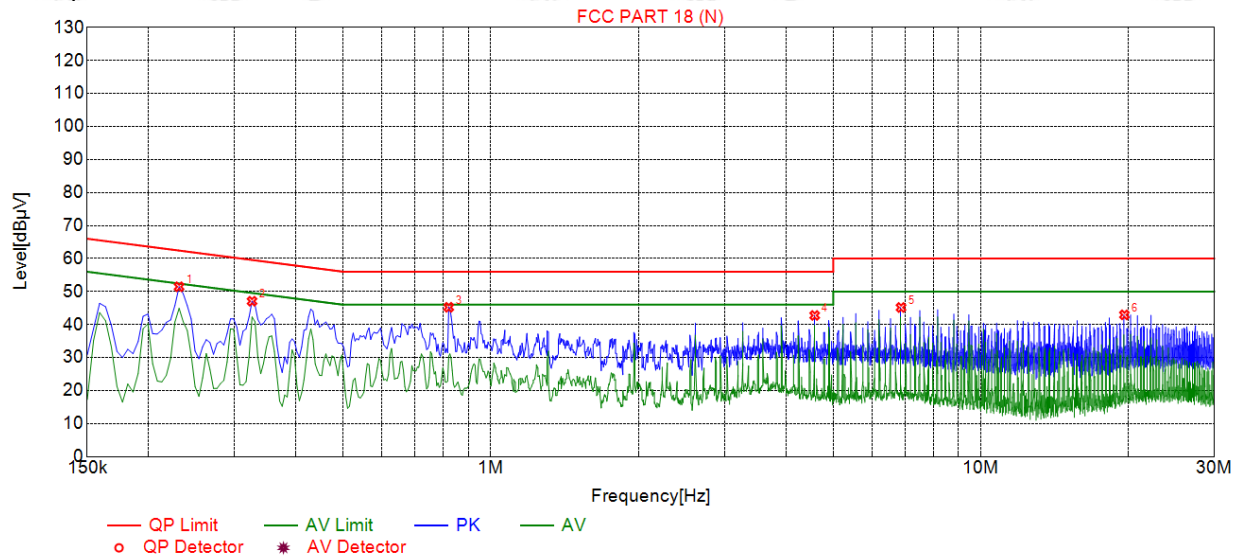
Remark: Margin = Limit – Level

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	0.2310	51.45	19.73	62.41	10.96	31.72	PK	N
2	0.3255	47.07	19.74	59.57	12.50	27.33	PK	N
3	0.8205	45.23	19.74	56.00	10.77	25.49	PK	N
4	4.5825	42.76	19.99	56.00	13.24	22.77	PK	N
5	6.8775	45.17	19.97	60.00	14.83	25.20	PK	N
6	19.6485	42.94	19.97	60.00	17.06	22.97	PK	N

Remark: Margin = Limit – Level

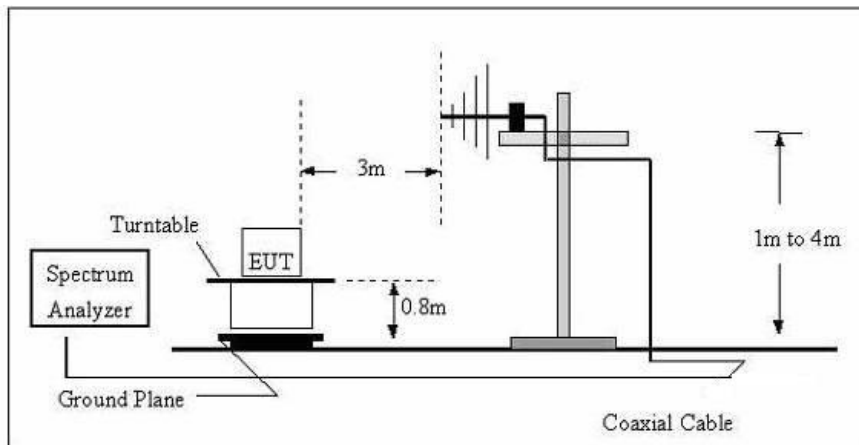
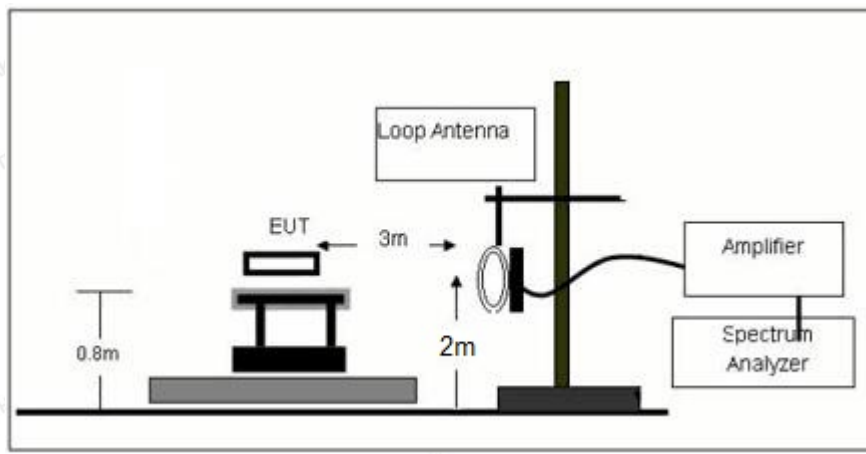
Correction factor = Cable lose + LISN insertion loss

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 1300

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:

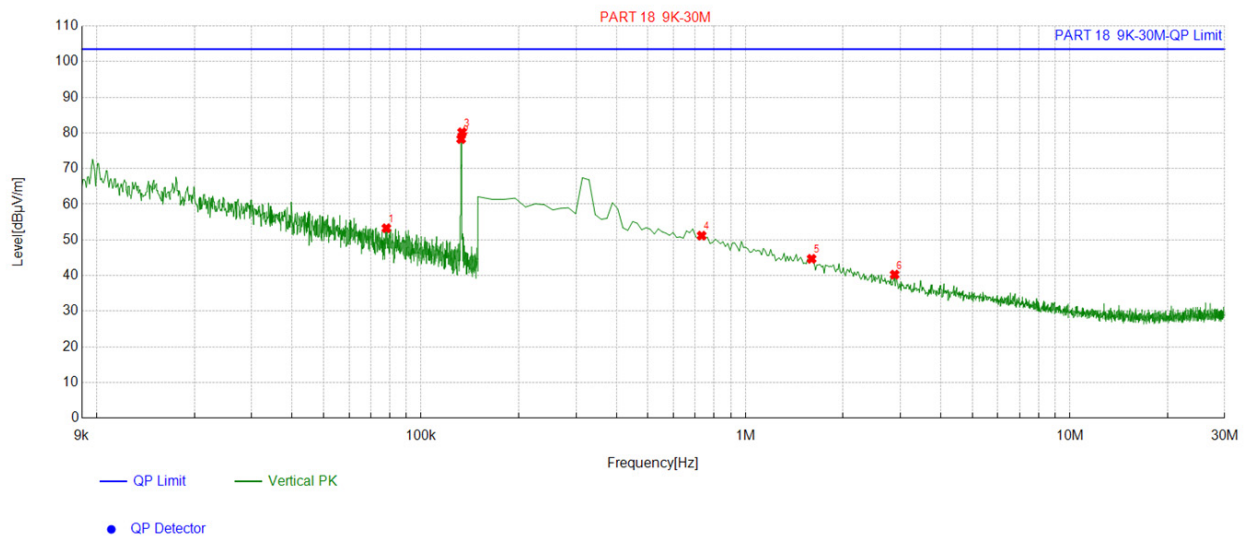
For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4. Test Result

PASS



For 9KHz - 30MHz

**Suspected List**

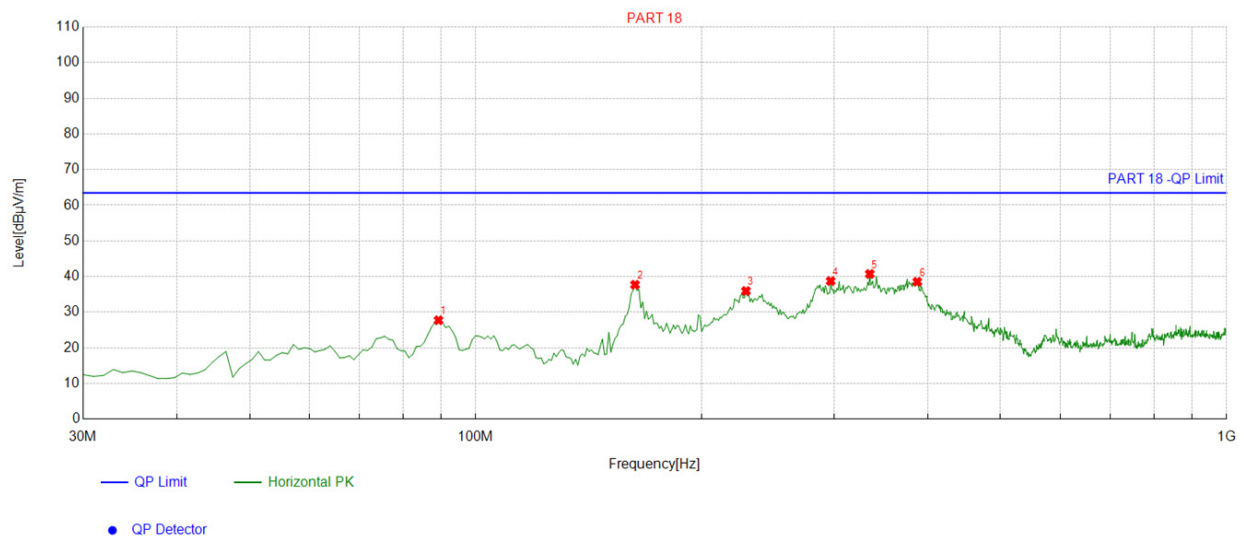
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]
1	0.078125	20.69	32.58	53.27	103.50	50.23
2	0.13286	20.41	57.86	78.27	103.50	25.23
3	0.133706	20.41	59.77	80.18	103.50	23.32
4	0.732366	20.25	30.95	51.20	103.50	52.30
5	1.598449	20.50	24.19	44.69	103.50	58.81
6	2.882641	20.19	20.08	40.27	103.50	63.23

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



For 30MHz-1GHz

Antenna polarity: H

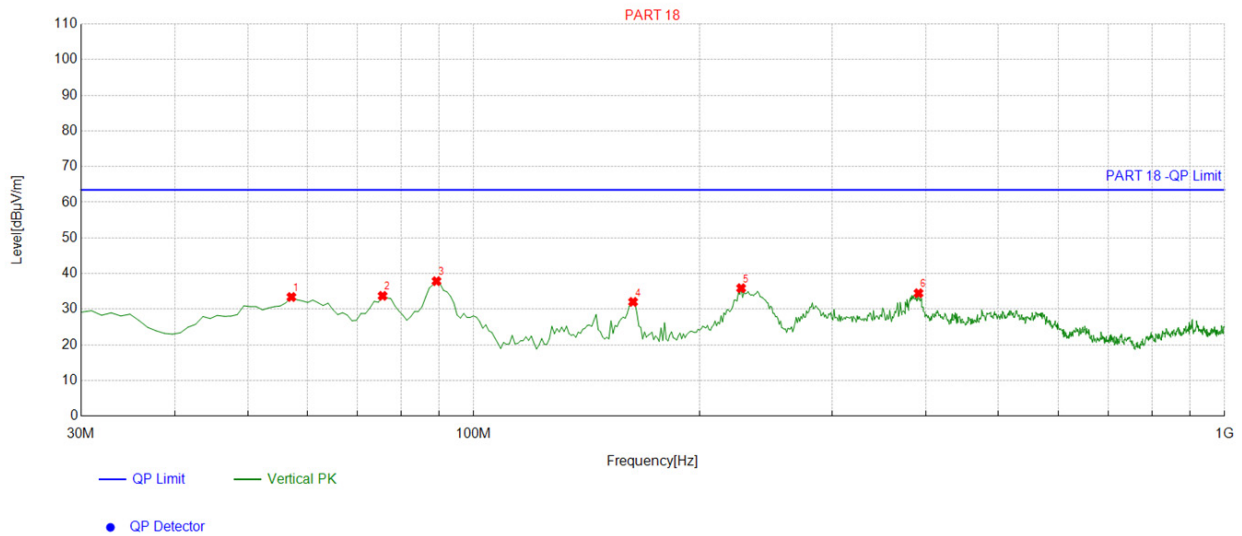


Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	89.229229	-16.75	44.50	27.75	63.50	35.75	100	360	Horizontal
2	163.02302	-17.59	55.29	37.70	63.50	25.80	100	175	Horizontal
3	229.04904	-13.93	49.88	35.95	63.50	27.55	100	97	Horizontal
4	297.01701	-11.84	50.58	38.74	63.50	24.76	100	175	Horizontal
5	334.88488	-10.61	51.34	40.73	63.50	22.77	100	161	Horizontal
6	387.31731	-9.31	47.85	38.54	63.50	24.96	100	142	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	-13.76	47.19	33.43	63.50	30.07	100	254	Vertical
2	75.635636	-17.98	51.73	33.75	63.50	29.75	100	216	Vertical
3	89.229229	-16.75	54.62	37.87	63.50	25.63	100	216	Vertical
4	163.02302	-17.59	49.64	32.05	63.50	31.45	100	57	Vertical
5	227.10710	-13.92	49.82	35.90	63.50	27.60	100	359	Vertical
6	391.20120	-9.51	44.00	34.49	63.50	29.01	100	88	Vertical

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



5. Antenna Requirement

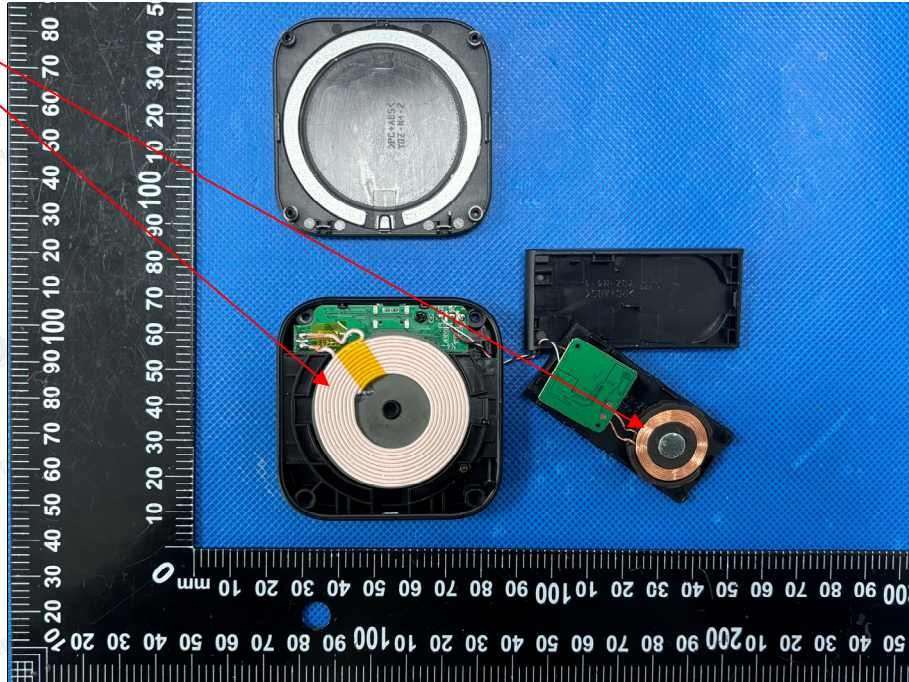
Refer to statement below for compliance.

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.

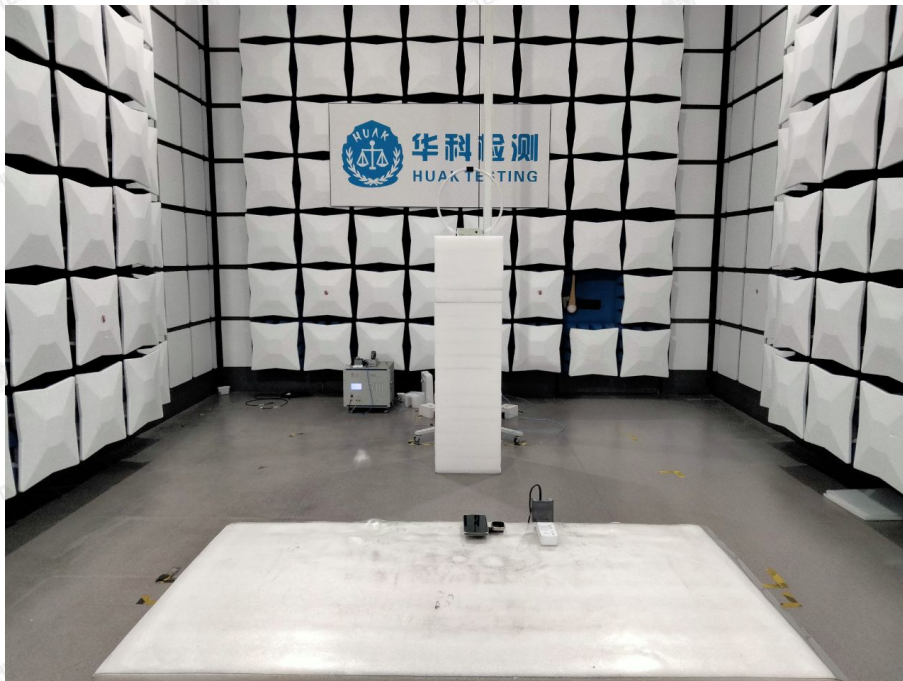
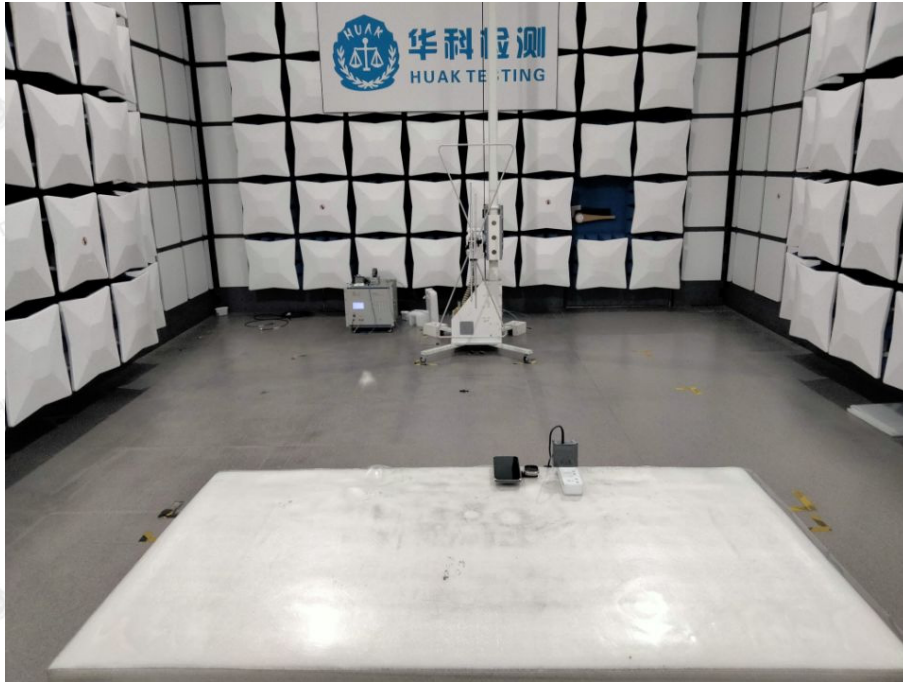
Antenna





6. Photographs of Test

Radiated Emission



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAKE, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

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Conducted 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-----

