



# TEST REPORT

## FCC ID:2A71D-A001

Applicant: Shenzhen Ai Infinite Electronics Co.,Ltd

Address: 1502C, Building C6, Hengfeng Industrial Zone, No.739, Road Zhoushi, Hezhou, Hangcheng Town, Bao'an District, Shenzhen, China

Manufacturer: Shenzhen Ai Infinite Electronics Co.,Ltd

Address: 1502C, Building C6, Hengfeng Industrial Zone, No.739, Road Zhoushi, Hezhou, Hangcheng Town, Bao'an District, Shenzhen, China

EUT: 3-IN-1 Wireless Charger

Trade Mark: N/A

Model Number: A001, A002, A003, A005, A006, A006-A, A008, A009, A010

Date of Receipt: Jun. 16, 2022

Test Date: Jun. 16, 2022 - Jun. 28, 2022

Date of Report: Jun. 28, 2022

Prepared By: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China

Applicable Standards: FCC PART 15 Subpart C  
ANSI C63.10:2013

Test Result: Pass

Report Number: DL-20220629035E

Prepared (Engineer): Lily Fu

Reviewer (Supervisor): Jack Bu

Approved (Manager): Jade Yang



*This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.*

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**1. VERSION**

Version No.	Date	Description
00	Jun. 28, 2022	Original

**2. TEST SUMMARY**

EMC Emission			
Test Item	Section in CFR 47	Result	Remark
AC Power Line Conducted Emission	15.207	PASS	
Spurious Emission	15.209(a)(f)	PASS	
Antenna requirement	15.203	PASS	

## NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2) Test Facility: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China



### 3. GENERAL INFORMATION

#### 3.1 Description of Device (EUT)

Product Name: 3-IN-1 Wireless Charger

Model No.: A001  
A002, A003, A005, A006, A006-A, A008, A009, A010 (All models have same circuits diagram, PCB Layout, construction and rated power, only different was the model name.)

Model Difference: N/A

Serial No.: N/A

Hardware version: N/A

Software version: N/A

Operation Frequency: 110kHz ~ 205KHz

Modulation type: MSK

Antenna Type: Inductive loop coil Antenna

Antenna gain: 0dBi

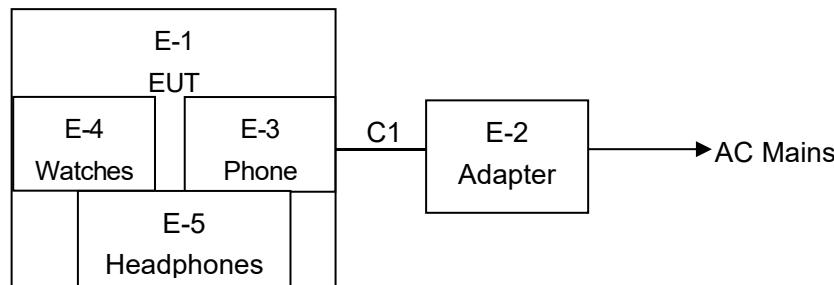
Power supply: Input: 5V 3A/9V 2A/ 12V 1.5A  
Wireless Output: 10W/7.5W/5W

#### 3.2 Tested System Details

None.



### 3.3 Block Diagram of Test Set-up



### 3.4 Test mode

Mode 1	Output: 5W
Mode 2	Output: 7.5W
Mode 3	Output: 10W

Note: Pretest all the Mode, and reported the worst-case Mode 3.

### 3.5 Test Auxiliary Equipment

Item	Equipment	Model/Type No.	Series No.	Note
E-1	3-IN-1 Wireless Charger	A001	N/A	EUT
E-2	Adapter	AD181	N/A	AE
E-3	Phone	iPhone 13	N/A	AE
E-4	Watches	Hua Wei Watch 3 Pro	N/A	AE
E5	Headphones	Xiao Mi Air2S	N/A	AE

Item	Shielded Type	Ferrite Core	Length	Note
C1	No	No	0.5m	Mini USB Line

### 3.6 Test Uncertainty

Conducted Emission Uncertainty (150KHz-30MHz) :  $\pm 2.56\text{dB}$

Radiated Emission Uncertainty (9KHz-1GHz) :  $\pm 3.24\text{dB}$



#### 4. TEST INSTRUMENT USED

Radiation test, Band-edge test and 20db bandwidth test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Dec. 06, 2021	Dec. 05, 2022
2	Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Dec. 06, 2021	Dec. 05, 2022
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Dec. 06, 2021	Dec. 05, 2022
4	Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Dec. 06, 2021	Dec. 05, 2022
5	Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Dec. 06, 2021	Dec. 05, 2022
6	Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Dec. 06, 2021	Dec. 05, 2022
7	Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Dec. 06, 2021	Dec. 05, 2022
8	Amplifier (18GHz-40GHz)	Quanjuda	DLE-161	97	Dec. 06, 2021	Dec. 05, 2022
9	Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Dec. 06, 2021	Dec. 05, 2022
10	RF cableJM-RM01 (9kHz-1GHz)	ChengYu	966	004	Dec. 06, 2021	Dec. 05, 2022
11	RF cables2 (1GHz-40GHz)	ChengYu	966	003	Dec. 06, 2021	Dec. 05, 2022
12	Antenna connector	Florida RF Labs	N/A	RF 01#	Dec. 06, 2021	Dec. 05, 2022
13	Power probe	KEYSIGHT	U2021XA	MY55210018	Dec. 06, 2021	Dec. 05, 2022
14	Signal Analyzer 9kHz-26.5GHz	Agilent	N9020A	MY55370280	Dec. 06, 2021	Dec. 05, 2022
15	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	Dec. 06, 2021	Dec. 05, 2022
16	D.C. Power Supply	LongWei	PS-305D	010964729	Dec. 06, 2021	Dec. 05, 2022

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	843 Shielded Room	ChengYu	843 Room	843	Nov. 25, 2019	Nov. 24, 2022
2	EMI Receiver	R&S	ESR	101421	Dec. 06, 2021	Dec. 05, 2022
3	LISN	R&S	ENV216	102417	Dec. 06, 2021	Dec. 05, 2022
4	843 Cable 1#	ChengYu	CE Cable	001	Dec. 06, 2021	Dec. 05, 2022



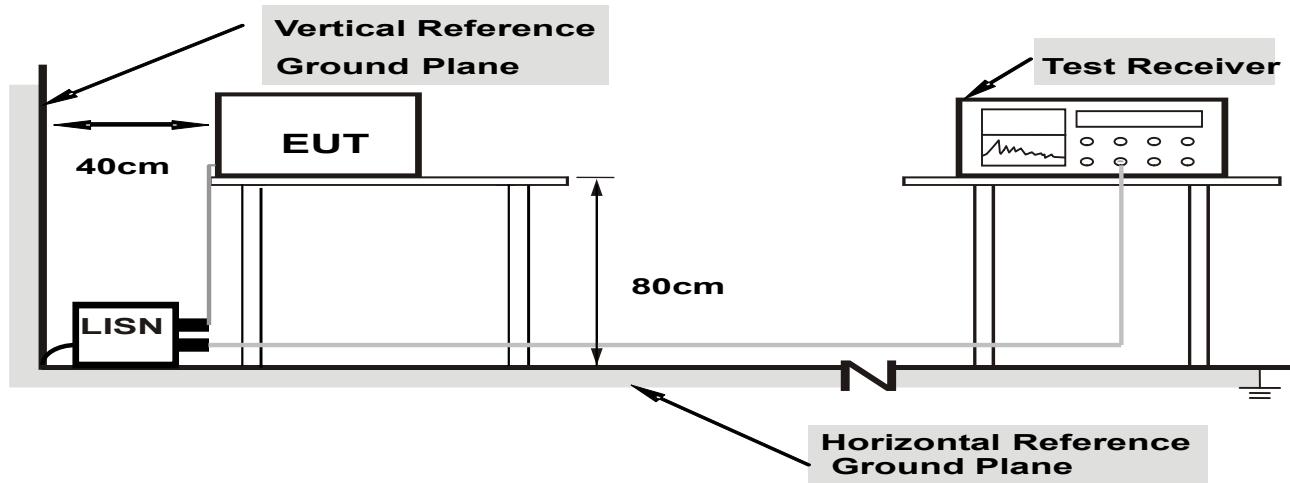
## Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ_EMC	EMC-CON 3A1.1
2	EMC radiation test system	FALA	EZ_EMC	FA-03A2
3	RF test system	MAIWEI	MTS8310	2.0.0.0
4	RF communication test system	MAIWEI	MTS8200	2.0.0.0

## 5. CONDUCTED EMISSION TEST

### 5.1 Block Diagram of Test Setup

#### For Mains Terminals Test



**Note: 1. Support units were connected to second LISN.**

**2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes**

### 5.2 Test Standard and Limit

#### FCC Part 15 Subpart B

Frequency MHz	Limits dB( $\mu$ V)	
	Quasi-peak Level	Average Level
0.15~0.50	66 ~ 56*	55 ~ 46*
0.50~5.00	56	46
5.00~30.00	60	50

Notes: 1. \*Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

### 5.3 EUT Configuration on Test

The following equipment's are installed on conducted emission test to meet FCC Part 15 Subpart B requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

### 5.4 Operating Condition of EUT

5.4.1 Setup the EUT and simulators as shown in Section 5.1.

5.4.2 Turn on the power of all equipments.

5.4.3 Let the EUT work in test modes and test it.



## 5.5 Test Procedure

The EUT is put on the table and connected to the AC mains through a Artificial Mains Network (AMN) or ISN. This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission levels according to the **ANSI C63.4** regulations during conducted emission test.

The bandwidth of the test receiver (R&S Test Receiver ESR) is set at 10KHz.

The frequency range from 150 KHz to 30 MHz is investigated.

Notes:

1.An initial pre-scan was performed on the line and neutral lines with peak detector.

2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.

3.Mesurement Level = Reading level + Correct Factor

We pretest AC 120V and AC 230V, the worst voltage was AC 120V and the data recording in the report.

We pretest all mode, the data only show the worst mode's data.

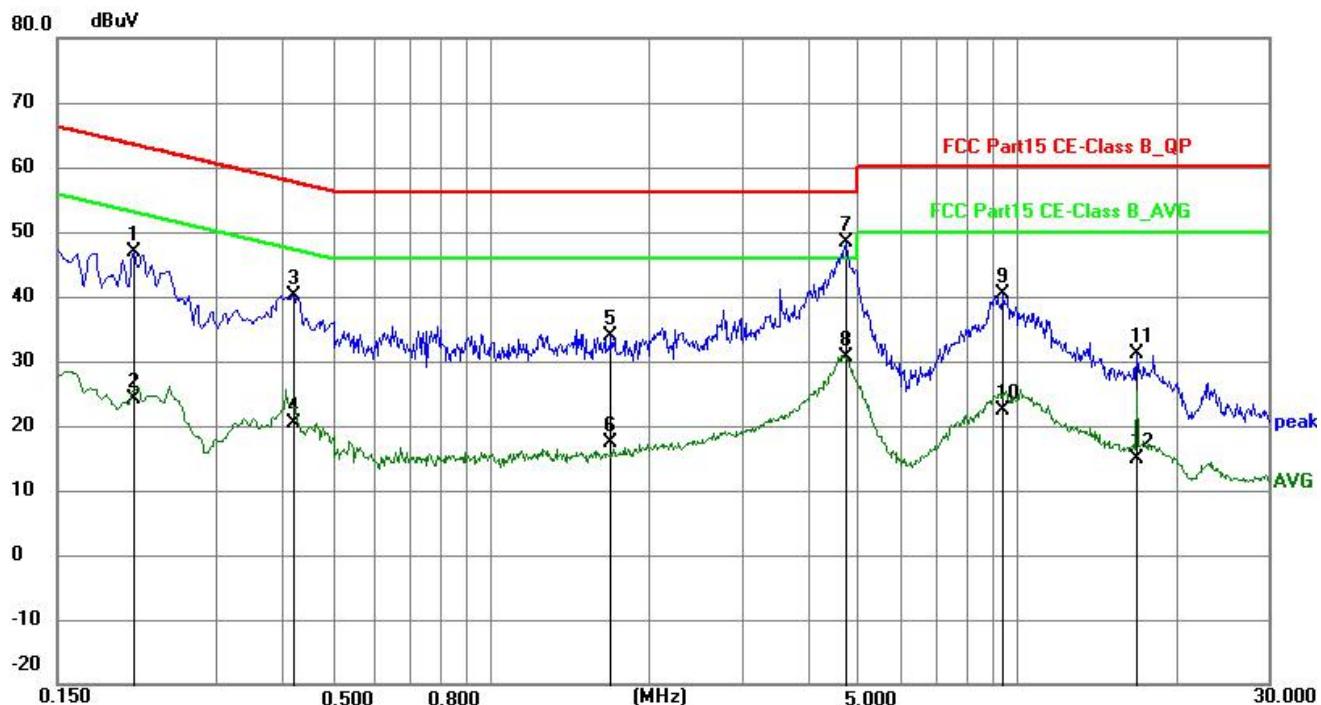
## 5.6 Test Result

PASS

Please refer to the following page.



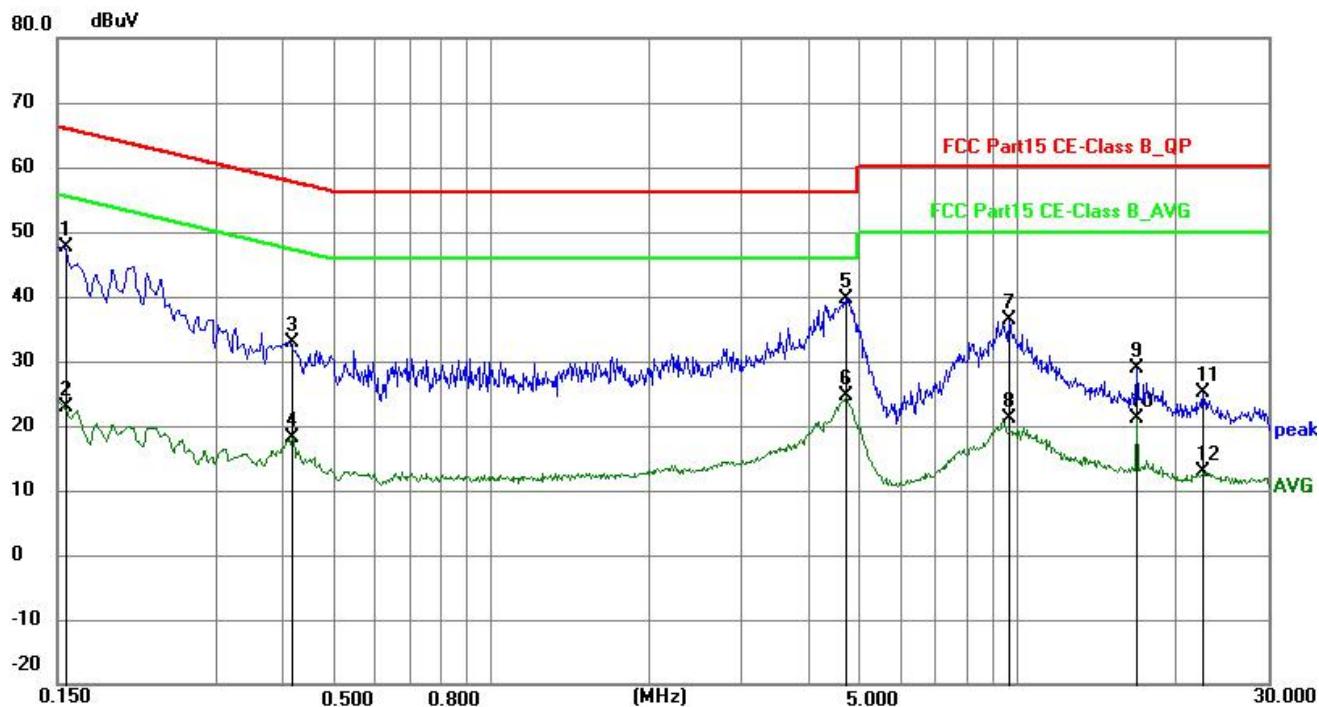
Conducted Emission Test Data			
Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Phase:	Line
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 3



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2084	36.55	10.29	46.84	63.27	16.43	QP
2	0.2084	13.90	10.29	24.19	53.27	29.08	AVG
3	0.4200	29.77	10.32	40.09	57.45	17.36	QP
4	0.4200	10.04	10.32	20.36	47.45	27.09	AVG
5	1.6935	23.52	10.37	33.89	56.00	22.11	QP
6	1.6935	7.11	10.37	17.48	46.00	28.52	AVG
7 *	4.7309	37.88	10.45	48.33	56.00	7.67	QP
8	4.7309	20.28	10.45	30.73	46.00	15.27	AVG
9	9.4458	29.94	10.54	40.48	60.00	19.52	QP
10	9.4458	11.94	10.54	22.48	50.00	27.52	AVG
11	16.8759	20.62	10.62	31.24	60.00	28.76	QP
12	16.8759	4.26	10.62	14.88	50.00	35.12	AVG



Conducted Emission Test Data			
Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Phase:	Neutral
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 3



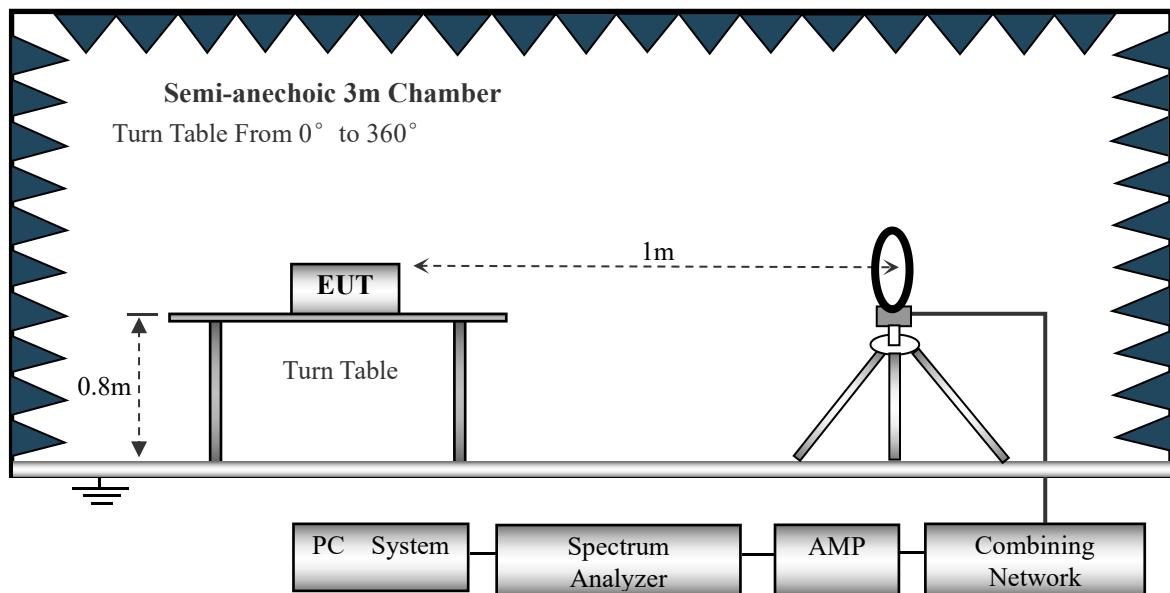
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1545	37.26	10.32	47.58	65.75	18.17	QP
2	0.1545	12.47	10.32	22.79	55.75	32.96	AVG
3	0.4155	22.60	10.34	32.94	57.54	24.60	QP
4	0.4155	7.87	10.34	18.21	47.54	29.33	AVG
5 *	4.7220	29.24	10.47	39.71	56.00	16.29	QP
6	4.7220	14.05	10.47	24.52	46.00	21.48	AVG
7	9.7025	25.77	10.57	36.34	60.00	23.66	QP
8	9.7025	10.60	10.57	21.17	50.00	28.83	AVG
9	16.8759	18.10	10.69	28.79	60.00	31.21	QP
10	16.8759	10.53	10.69	21.22	50.00	28.78	AVG
11	22.5820	14.40	10.76	25.16	60.00	34.84	QP
12	22.5820	2.15	10.76	12.91	50.00	37.09	AVG



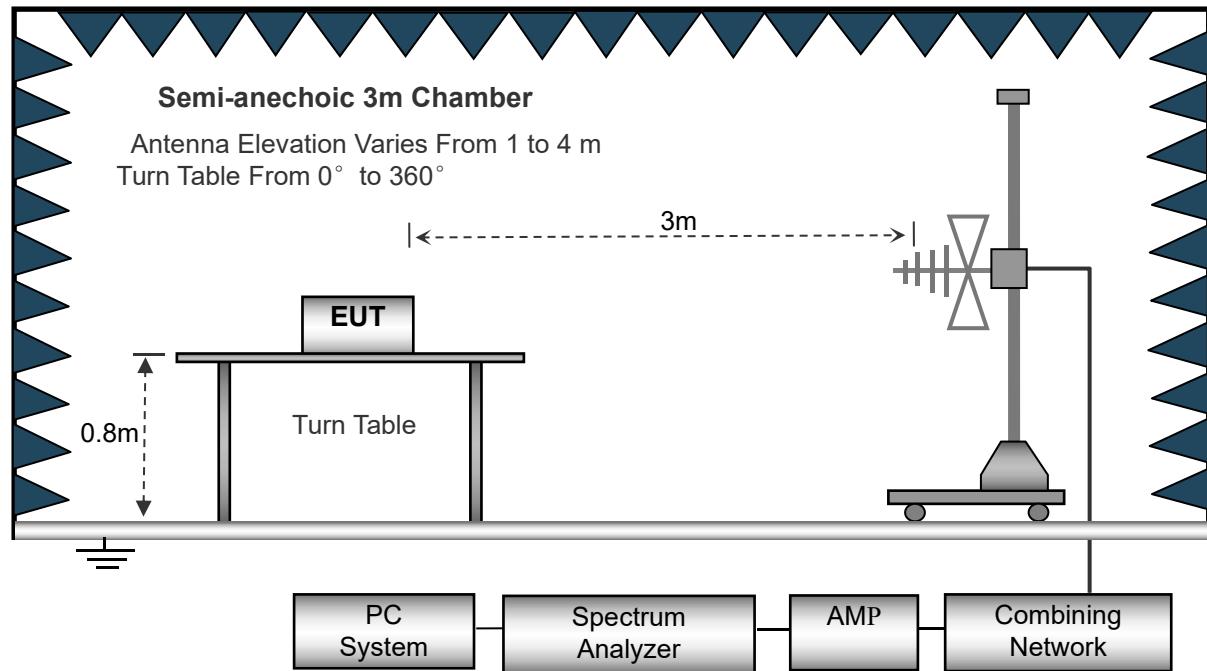
## 6. RADIATION EMISSION TEST

### 6.1 Block Diagram of Test Setup

Radiated Emission Test-Up Frequency Below 30MHz



Below 1GHz



### 6.2 Test Standard and Limit

FCC Part 15 Subpart B



Limits for frequency below 30MHz

Frequency	Limit (uV/m)	Measurement Distance(m)	Remark
0.009-0.490	2400/F(kHz)	300	Quasi-peak Value
0.490-1.705	24000/F(kHz)	30	Quasi-peak Value
1.705-30	30	30	Quasi-peak Value

Above 30MHz

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dB $\mu$ V/m)	Remark
30 ~ 88	3	40.0	Quasi-peak Value
88 ~ 216	3	43.5	Quasi-peak Value
216 ~ 960	3	46.0	Quasi-peak Value
960 ~ 1000	3	54.0	Quasi-peak Value
Above 1000	3	74.0	PEAK
		54.0	AVERAGE

Remark:

- (1) The smaller limit shall apply at the cross point between two frequency bands.
- (2) Distance refers to the distance in meters between the measuring instrument, antenna and the closed point of any part of the device or system.

### 6.3 EUT Configuration on Test

The FCC Part 15 Subpart B regulations test method must be used to find the maximum emission during radiated emission test.

The configuration of EUT is the same as used in conducted emission test.

Please refer to Section 5.3.

### 6.4 Operating Condition of EUT

Same as conducted emission test, which is listed in Section 5.4 except the test set up replaced as Section 6.2.

### 6.5 Test Procedure

- 1) The radiated emissions test was conducted in a semi-anechoic chamber.
- 2) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
- 3) Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.
- 4) The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.
- 5) The bandwidth setting on the field strength meter (R&S Test Receiver ESCI) is set at 120KHz.
- 6) The frequency range from 30MHz to 1000MHz is checked.

We pretest all mode, the data only show the worst mode's data.

We pretest AC 120V and AC 230V, the worst voltage was AC 120V and the data recording in the report.



## 6.6 Test Result

9 kHz~30 MHz

Frequency (kHz)	Meter Reading (dB $\mu$ V)	Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
25.4	44.77	20.15	64.92	139.51	-74.59	PK
25.4	40.86	20.15	61.01	119.51	-58.5	AV
70.6	55.46	20.33	75.79	130.62	-54.83	PK
70.6	50.76	20.33	71.09	110.62	-39.53	AV
125.5	70.54	20.55	91.09	125.63	-34.54	PK
125.5	65.57	20.55	86.12	105.63	-19.51	AV
700.2	33.33	20.64	53.97	70.70	-16.73	QP
965.61	35.95	21.26	57.21	67.91	-10.7	QP
1215.45	25.35	22.32	47.67	65.91	-18.24	QP

Note:

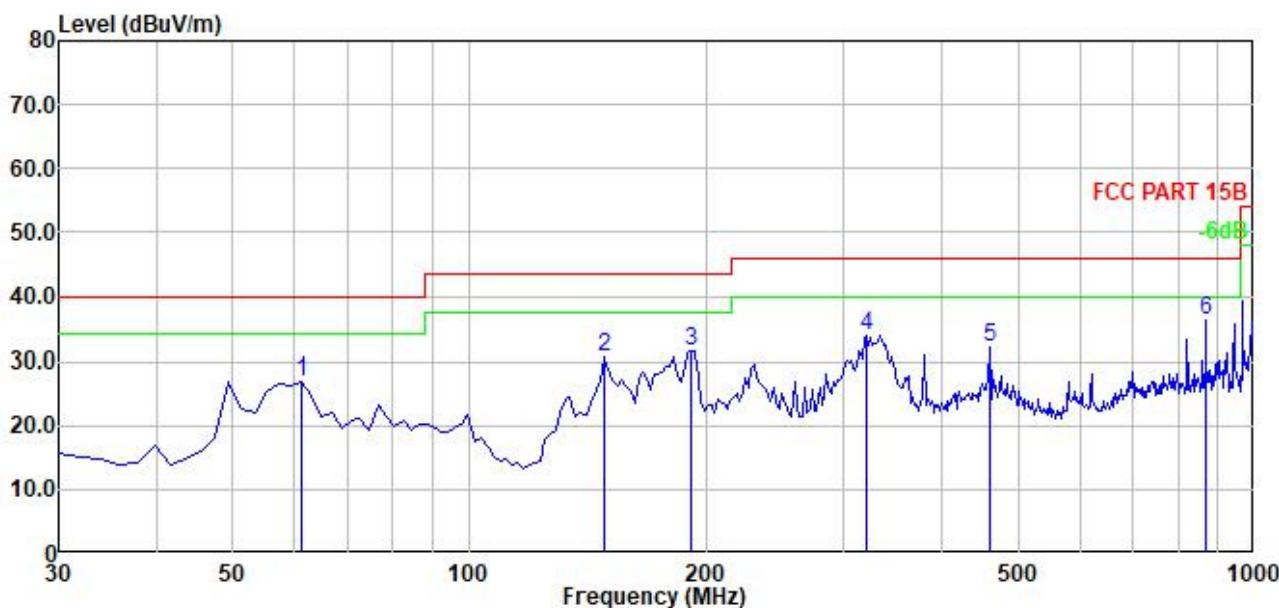
Pre-scan in the all of mode, the worst case in of was recorded.

Factor = antenna factor + cable loss – pre-amplifier.

Margin = Emission Level- Limit.

**Radiation Emission Test Data**

Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 3



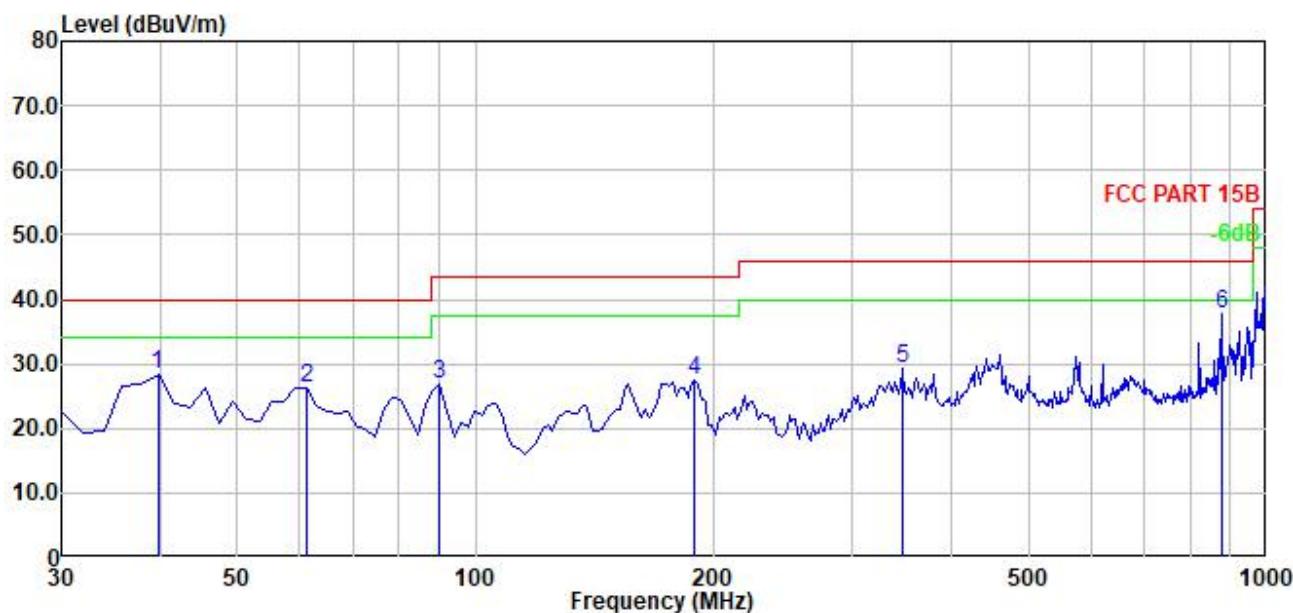
Freq	Read	Limit	Ant	Over	Remark
	Level	Level	Line Factor	Limit Pol/Phase	
1	61.102	48.36	26.85	40.00	11.45 -13.15 Horizontal QP
2	148.577	49.68	30.48	43.50	12.97 -13.02 Horizontal QP
3	191.343	54.02	31.50	43.50	9.42 -12.00 Horizontal QP
4	319.639	51.06	33.79	46.00	13.18 -12.21 Horizontal QP
5	459.599	46.30	32.06	46.00	16.37 -13.94 Horizontal QP
6	867.816	43.13	36.15	46.00	22.04 -9.85 Horizontal QP

**Remarks:**

- 1.Final Level =Receiver Read level + Correct factor (Antenna Factor + Cable Loss – Preamplifier Factor )
- 2.The emission levels of other frequencies are very lower than the limit and not show in test report.

**Radiation Emission Test Data**

Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 3



Freq	Read	Limit	Ant	Over	Remark
	Level	Level	Line Factor	Limit Pol/Phase	
1	39.719	48.58	28.26	40.00	12.93 -11.74 Vertical QP
2	61.102	47.86	26.35	40.00	11.45 -13.65 Vertical QP
3	90.261	51.31	26.96	43.50	8.36 -16.54 Vertical QP
4	189.399	49.90	27.50	43.50	9.55 -16.00 Vertical QP
5	346.854	45.98	29.39	46.00	13.78 -16.61 Vertical QP
6	875.591	44.66	37.79	46.00	22.13 -8.21 Vertical QP

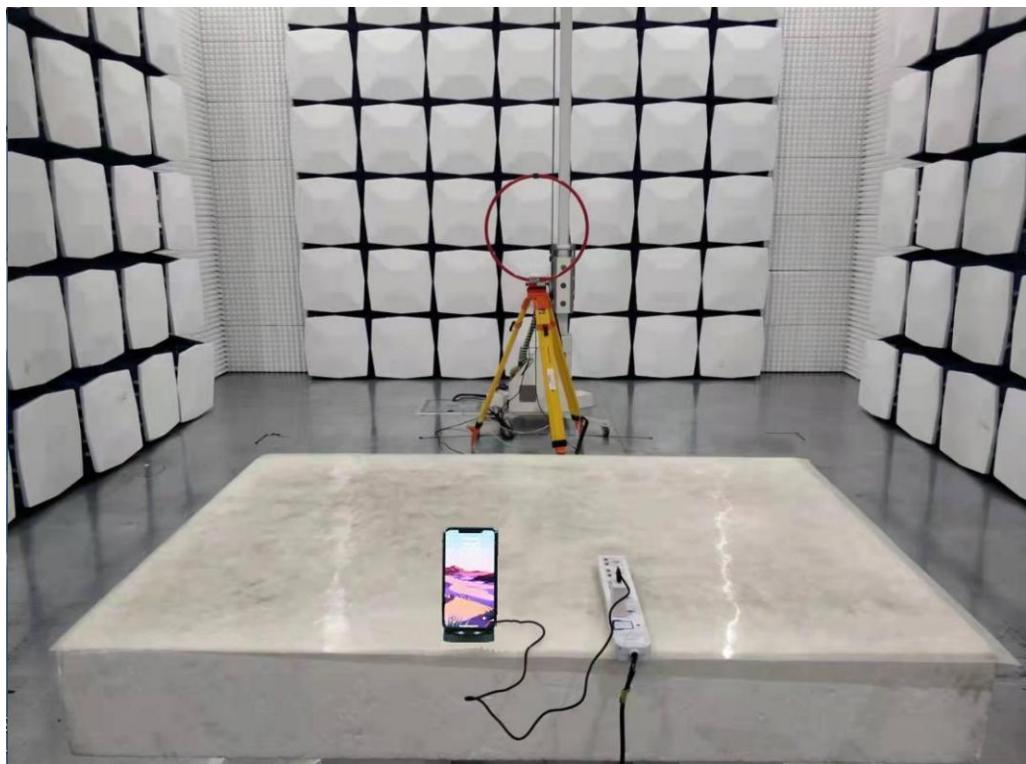
## Remarks:

- 1.Final Level =Receiver Read level + Correct factor (Antenna Factor + Cable Loss – Preamplifier Factor )
- 2.The emission levels of other frequencies are very lower than the limit and not show in test report.

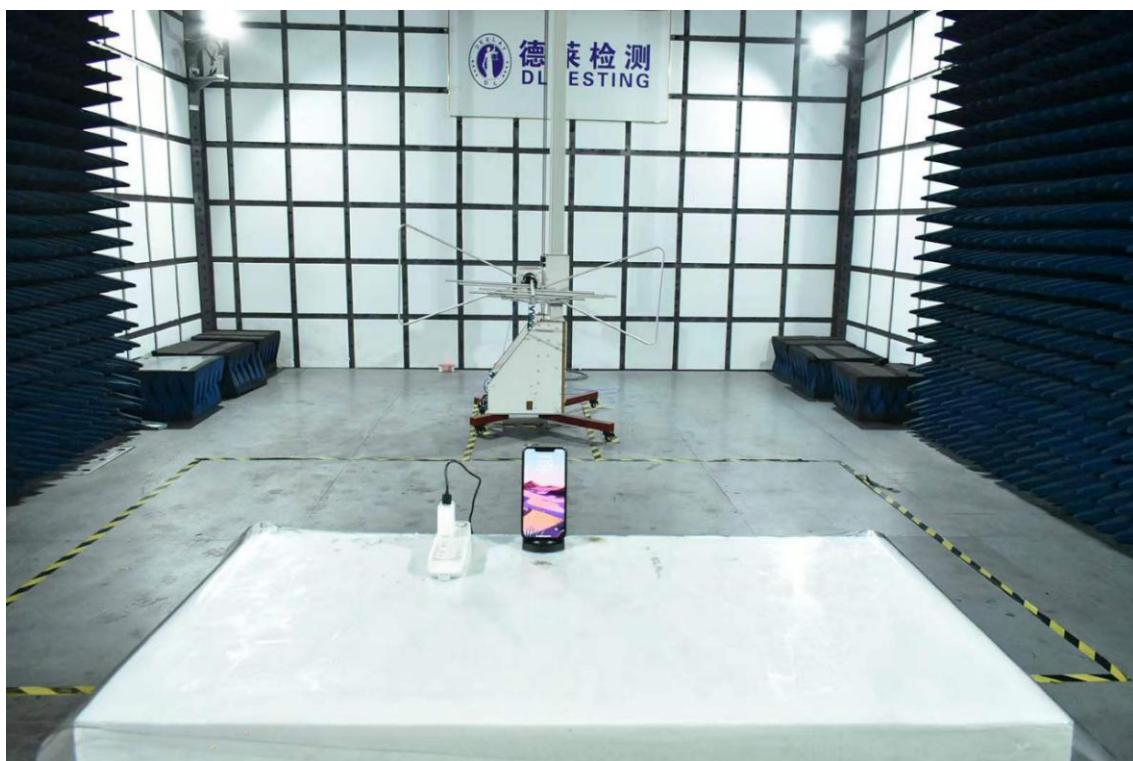


## 7. SETUP PHOTOGRAPHS

### Radiated Measurement Photos Below 30MHz



### Below 1GHz





**Conducted Emission**



\*\*\*\*\* END OF REPORT \*\*\*\*\*