FCC RF Test Report

For

Globe Electric Company Inc.

Test Standards:	FCC Part 15 Subpart C §15.209
Product Description:	Disinfecting Wireless Charging Hub
Tested Model:	60055
Brand Name:	Globe
FCC ID:	2AQUQGE60055
Classification	Low Power Transmitter Below 1705 kHz(DCD)
Report No.:	EC2007044RF01
Tested Date:	2020-07-30 to 2020-11-27
Issued Date:	2020-11-27
Prepared By:	Jack Liu. Jack Liu / Engineer
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Note: The test results in this report apply exclusively to the tested model / sample. Without written approval of Hunan Ecloud Testing Technology Co., Ltd., the test report shall not be reproduced except in full.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	2020.11.27	Valid	Original Report

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APPENDIX A. SETUP PHOTOGRAPHS

Summary of Test RESULT

FCC Rule	Description	Limit	Result	Remark
2.1049	20 dB Bandwidth	-	PASS	-
-	99% Bandwidth	-	PASS	-
15.207	AC Conducted Emission	FCC Part 15.207(a)	PASS	Under limit 1.67 dB at 0.452 MHz
15.209	Radiated Emission	FCC Part 15.209(a)	PASS	Under limit 1.97 dB at 60.070 MHz

1. Test Laboratory

1.1 Test facility

CNAS (accreditation number:L11138)

Hunan Ecloud Testing Technology Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (Designation number:CN1244 , Test Firm Registration Number:793308)

Hunan Ecloud Testing Technology Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

ISED(CAB identifier: CN0012, ISED# :24347)

Hunan Ecloud Testing Technology Co., Ltd. has been listed on the Wireless Device Testing Laboratories list of innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements.

A2LA (Certificate Number:4895.01)

Hunan Ecloud Testing Technology Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

2. General Description

2.1 Applicant

Globe Electric Company Inc.
150 Oneida, Montreal, Quebec, Canada, H9R 1A8

2.2 Manufacturer

Globe Electric Company Inc.
150 Oneida, Montreal, Quebec, Canada, H9R 1A8

2.3 General Description Of EUT

Product	Disinfecting Wireless Charging Hub
Model No.	60055
Brand Name	Globe
Additional No.	N/A
Difference Description	N/A
FCC ID	2AQUQGE60055
Power Supply	5Vdc
Modulation Technology	WPT
Modulation Type	ASK
Operating Frequency	110 kHz ~ 280 kHz
Antenna Type	Loop Antenna
EUT Stage	Production Unit
HW Version	NA
SW Version	NA
I/O Ports	Refer to user’s manual

NOTE:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

2. The measurements of the minimum and the maximum frequency were 126.8 kHz during the test.

2.4 Modification of EUT

No modifications are made to the EUT during all test items.

2.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.209
- ANSI C63.10-2013
- ANSI C63.4-2014

3. Test Configuration of Equipment Under Test

3.1 Descriptions of Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

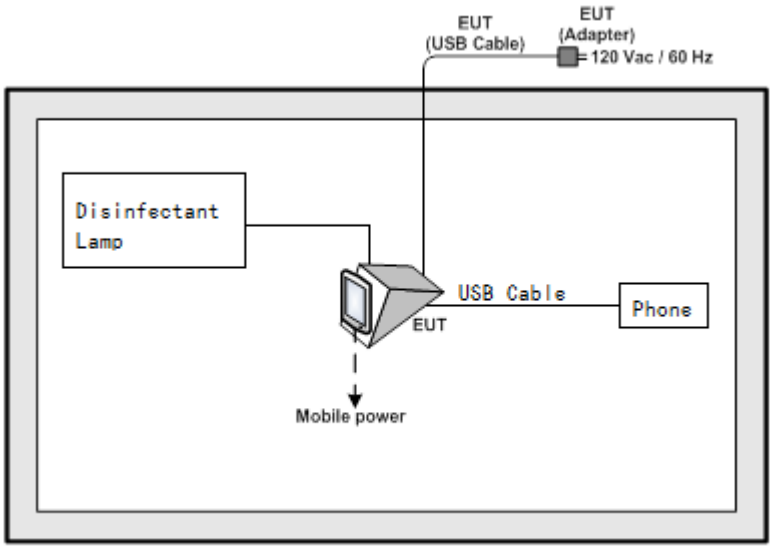
Frequency range investigated: radiation (9 kHz to 1000 MHz)

Test Items	Function Type
AC Conducted Emission	Mode 1 : WPC+ Wired charging by USB port + Disinfectant lamp + AC Power from adapter by Mini USB port <Fig. 1>
Radiated Emission	Mode 1 : WPC+ Wired charging by USB port + Disinfectant lamp + AC Power from adapter by Mini USB port <Fig. 1>

Remark:

1. Charging Mode with client device , Battery status during charging condition
   - Less than 1% of battery
   - Less than 50% of battery
   - 100% of battery
2. For Radiated Emission, Only list the test results of the worst mode Less than 1% of battery

3.2 Connection Diagram of Test System



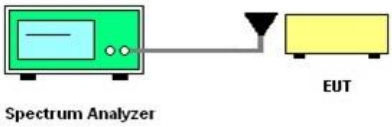
<Fig. 1>

3.3 Support Unit used in test configuration and system

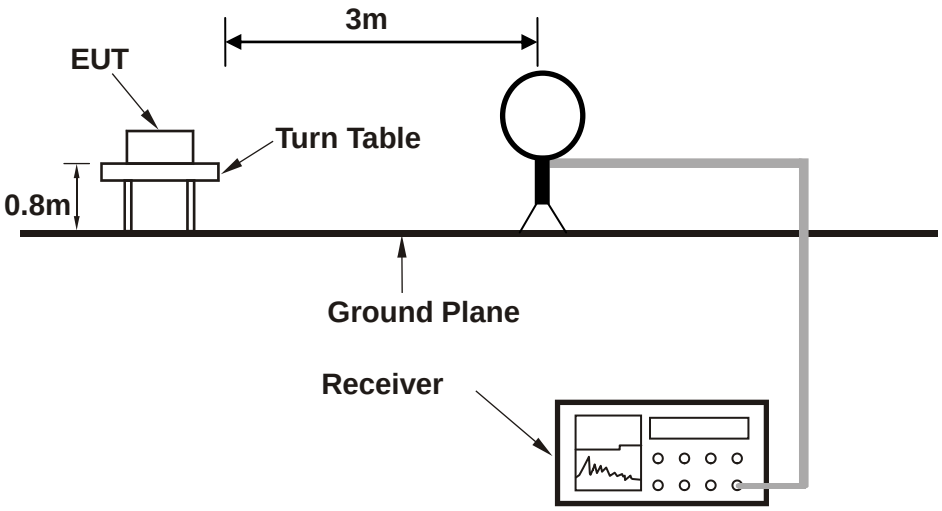
Item	Equipment	Trade Name	Model Name	FCC ID
1.	Iphone 8	Apple	MQ6L2CH/A	BCG-E3159A
2.	HUAWEI nova7	HUAWEI	JEF-AN00	/
3.	AC Adapter	XIAOMI	MDY-08-ES	FCC sDoc
4.	N/A	MicroUSB Cable	N/A	N/A

3.4 Test Setup

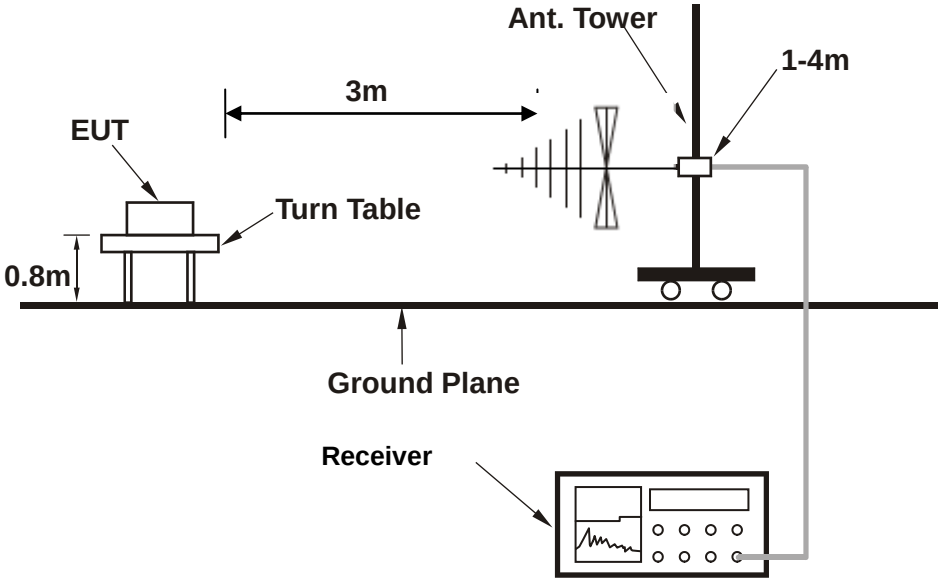
Setup diagram for OBW test



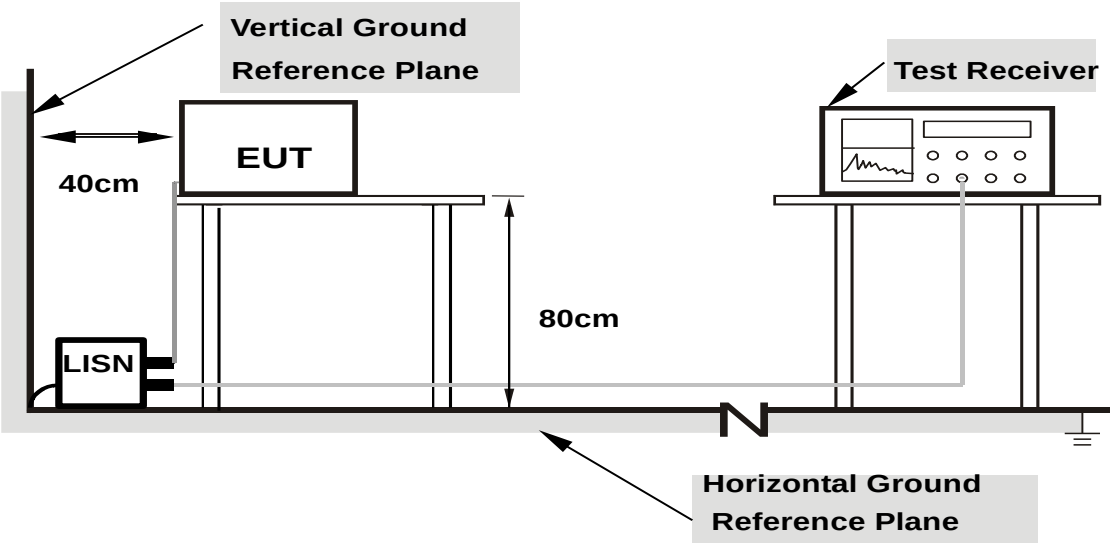
Setup diagram for Radiation(9KHz~30MHz) Test



Setup diagram for Radiation(Below 1G) Test



Setup diagram for AC Conducted Emission Test



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

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

3.5 Measurement Results Explanation Example

For all radiated test items:

Frequency Below 30MHz

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Over Limit (dB μ A/m) = Level(dB μ A/m) - Limit Level (dB μ A/m)

Frequency Above 30MHz

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Over Limit (dB μ V/m) = Level(dB μ V/m) - Limit Level (dB μ V/m)

For AC Conducted Emission test items:

Corrected Reading: Reading Level + LISN Factor + Cable Loss = Level

Over Limit (dB μ V/m) = Level(dB μ V) - Limit Level (dB μ V)

4. Test Result

4.1 20dB and 99% Bandwidth Measurement

4.1.1 Limit of 20dB and 99% Bandwidth

Reporting only

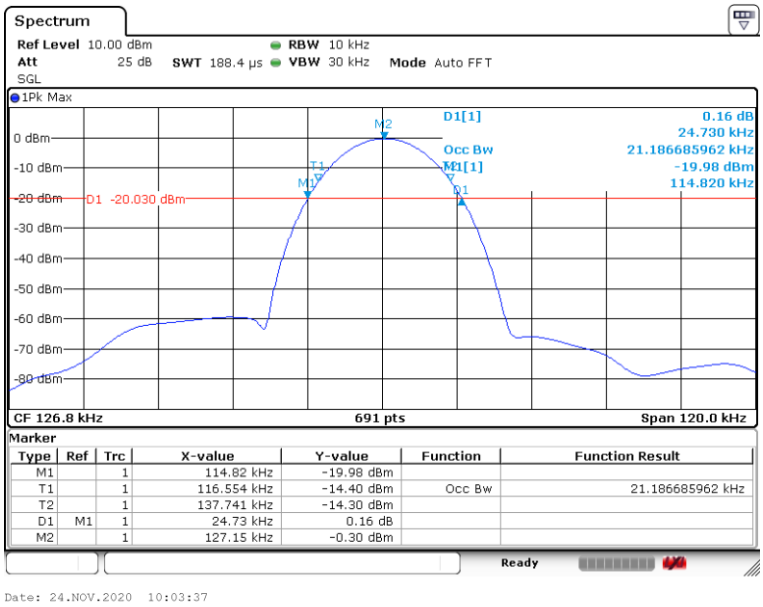
4.1.2 Test Procedures

1. The 20dB bandwidth is measured with a spectrum analyzer connected via a receiver antenna placed near the EUT while wirelessly charging a charging board.
2. Use the following spectrum analyzer settings for 99 % Bandwidth measurement.
   For 99% Bandwidth measurement, the RBW=10kHz, and VBW = 30kHz. Sweep = auto;
3. Measure and record the results in the test report.

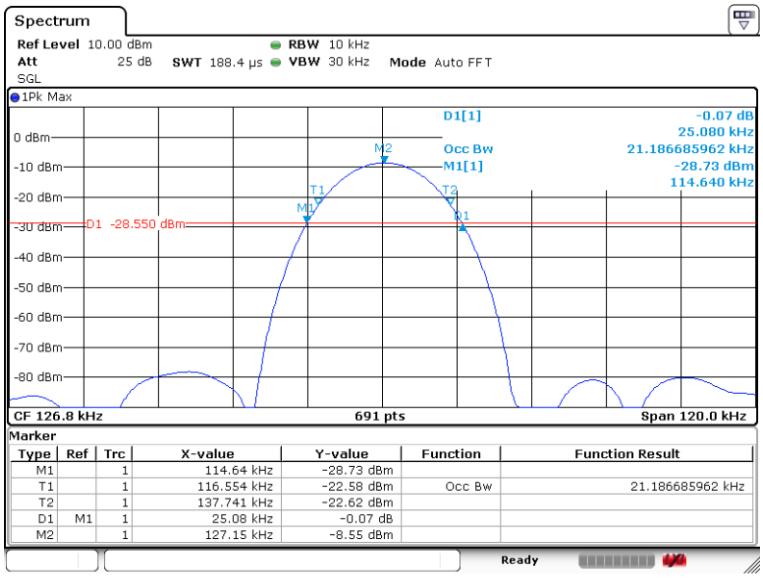
Mode	Frequency	Occupied Bandwidth
Less than 1% of battery	126.8 kHz	21.19 kHz
Less than 50% of battery	126.8 kHz	21.19 kHz
Battery near 100%	126.8 kHz	21.01 kHz

4.1.3 Test Result of 20dB and 99% Bandwidth

Test Engineer :	Jack Liu	**Temperature :**	22~25℃
Test Mode :	WPCTx + Lamp + AC Power supply	**Relative Humidity :**	50~53%
Less than 1% of battery			



Less than 50% of battery



Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	114.64 kHz	-28.73 dBm		
T1		1	116.554 kHz	-22.58 dBm	Occ Bw	21.186685962 kHz
T2		1	137.741 kHz	-22.62 dBm		
D1	M1	1	25.08 kHz	-0.07 dB		
M2		1	127.15 kHz	-8.55 dBm		

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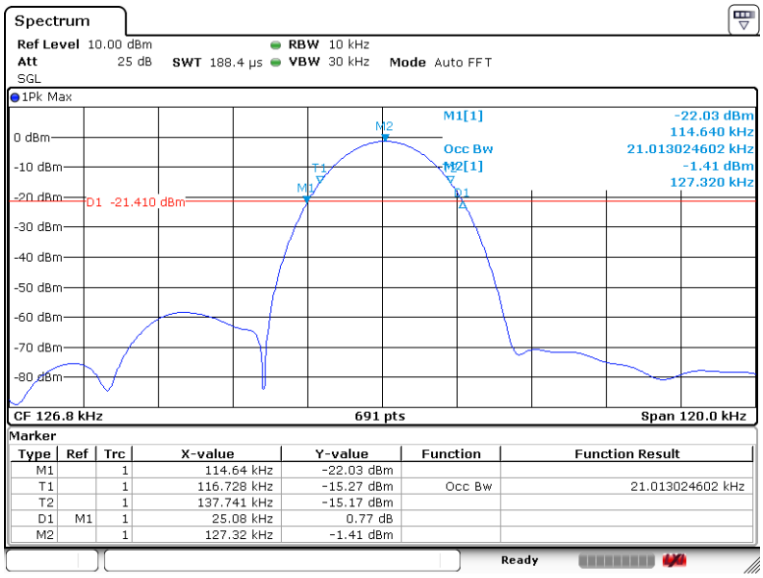
Battery near 100%



Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	114.64 kHz	-22.03 dBm		
T1		1	116.728 kHz	-15.27 dBm	Occ Bw	21.013024602 kHz
T2		1	137.741 kHz	-15.17 dBm		
D1	M1	1	25.08 kHz	0.77 dB		
M2		1	127.32 kHz	-1.41 dBm		

Date: 24.NOV.2020 09:10:11

4.2 Test of AC Conducted Emission Measurement

4.2.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 9 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.009-0.050	110	/
0.050-0.1485	90-80*	/
0.1485-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

4.2.2 Measuring Instruments

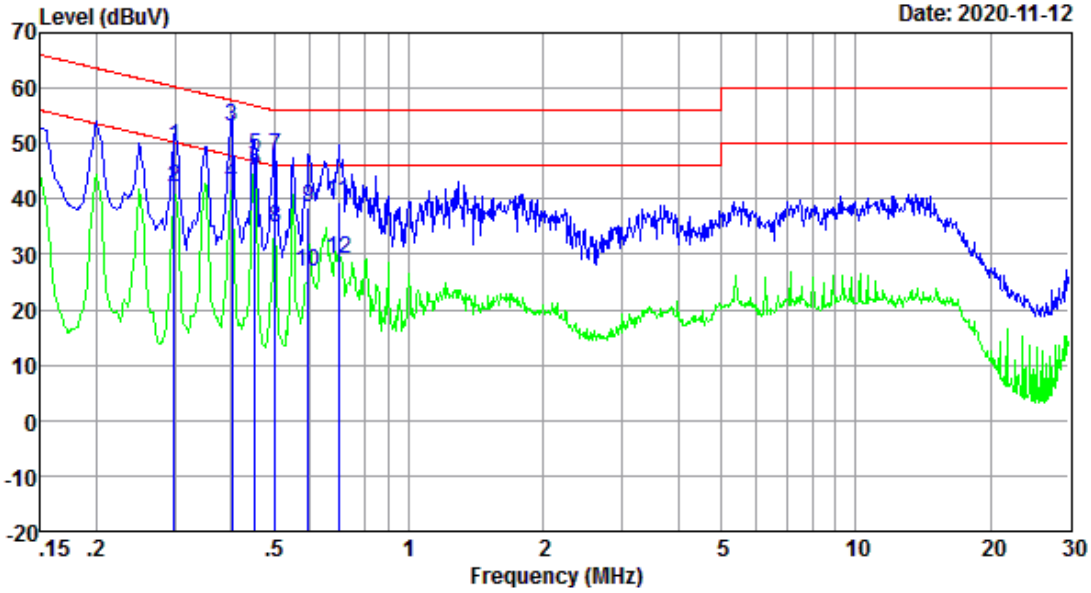
The measuring equipment is listed in the section 3 of this test report.

4.2.3 Test Procedure

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 9 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

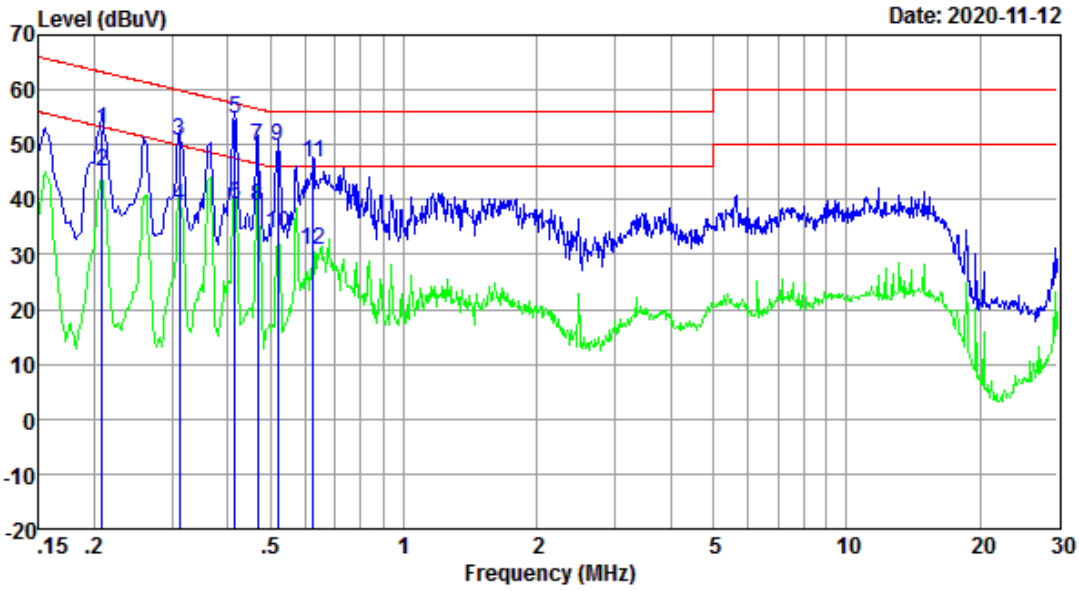
4.2.4 Test Result of AC Conducted Emission

Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Jack Liu	**Relative Humidity :**	46~48%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WPC+ Wired charging by USB port + Disinfectant lamp + AC Power from adapter by Mini USB port		



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Result level dBuV	Limit level dBuV	Over limit dB	Remark
0.299	40.00	9.55	0.03	49.58	60.28	-10.70	QP
0.299	32.60	9.55	0.03	42.18	50.28	-8.10	Average
0.402	43.60	9.56	0.02	53.18	57.81	-4.63	QP
0.402	33.10	9.56	0.02	42.68	47.81	-5.13	Average
0.452	38.20	9.56	0.02	47.78	56.85	-9.07	QP
0.452	35.60	9.56	0.02	45.18	46.85	-1.67	Average
0.502	38.10	9.56	0.02	47.68	56.00	-8.32	QP
0.502	25.20	9.56	0.02	34.78	46.00	-11.22	Average
0.595	28.91	9.56	0.01	38.48	56.00	-17.52	QP
0.595	17.31	9.56	0.01	26.88	46.00	-19.12	Average
0.697	29.90	9.57	0.01	39.48	56.00	-16.52	QP
0.697	19.50	9.57	0.01	29.08	46.00	-16.92	Average

Test Mode :	Mode 1	**Temperature :**	20~22℃
Test Engineer :	Jack Liu	**Relative Humidity :**	46~48%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	WPC+ Wired charging by USB port + Disinfectant lamp + AC Power from adapter by Mini USB port		



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Result level dBuV	Limit level dBuV	Over limit dB	Remark
0.208	43.30	9.56	0.03	52.89	63.27	-10.38	QP
0.208	35.40	9.56	0.03	44.99	53.27	-8.28	Average
0.312	41.08	9.58	0.03	50.69	59.93	-9.24	QP
0.312	29.16	9.58	0.03	38.77	49.93	-11.16	Average
0.415	45.16	9.58	0.02	54.76	57.55	-2.79	QP
0.415	29.62	9.58	0.02	39.22	47.55	-8.33	Average
0.469	40.26	9.59	0.02	49.87	56.54	-6.67	QP
0.469	29.18	9.59	0.02	38.79	46.54	-7.75	Average
0.518	40.21	9.59	0.02	49.82	56.00	-6.18	QP
0.518	24.13	9.59	0.02	33.74	46.00	-12.26	Average
0.624	37.10	9.59	0.01	46.70	56.00	-9.30	QP
0.624	21.26	9.59	0.01	30.86	46.00	-15.14	Average

4.3 Test of Radiated Emission Measurement

4.3.1 Limit of Radiated Emission

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

4.3.1 Measuring Instruments

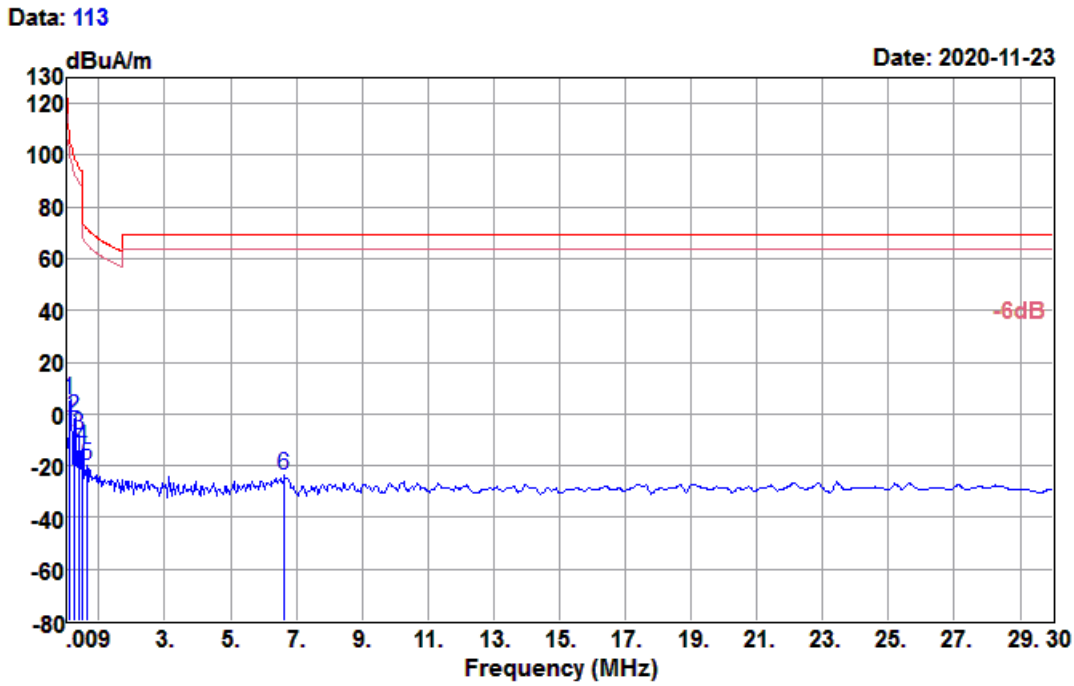
The measuring equipment is listed in the section 3 of this test report.

4.3.2 Test Procedures

- Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

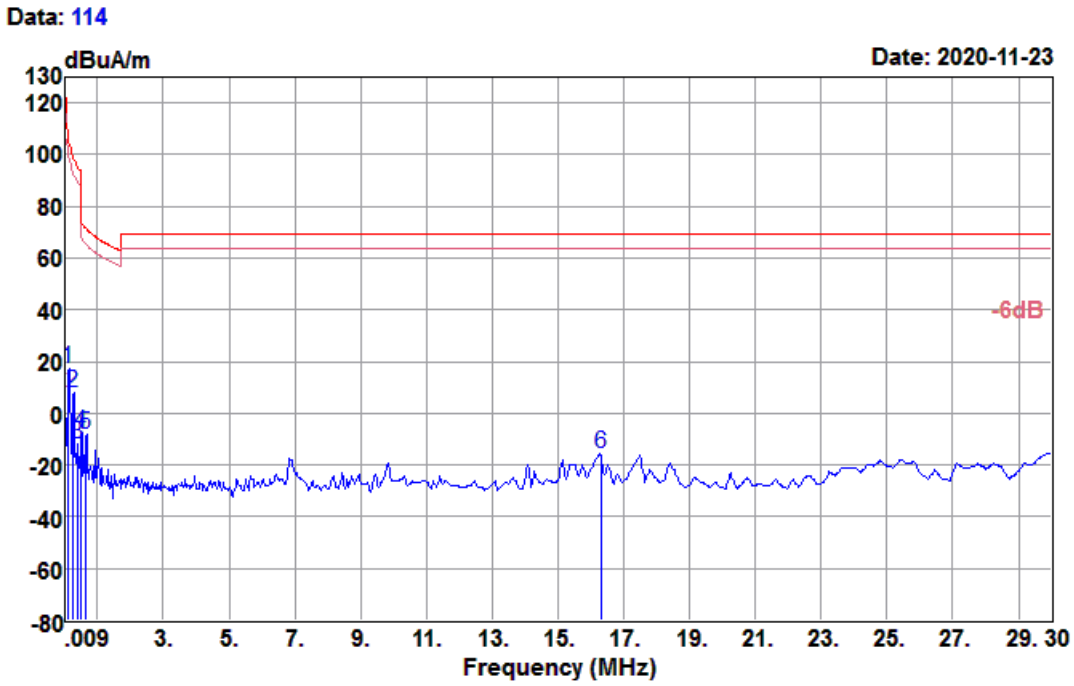
4.3.3 Test Result of Radiated Emission (9kHz ~ 30MHz)

Test Mode :	Mode 1	**Temperature :**	21~23°C
Test Engineer :	Jack Liu	**Relative Humidity :**	48~50%
Test Distance :	3m	**Polarization :**	Horizontal
Function Type :	WPC+ Wired charging by USB port + Disinfectant lamp + AC Power from adapter by Mini USB port		
Remark			



Freq MHz	Reading level dBuV	Antenna factor dBs/m	Cable loss dB	level dBuA/m	Limit level dBuA/m	Over limit dB	Remark
0.127	37.33	-31.90	0.06	5.49	105.55	-100.06	Peak
0.252	30.77	-31.90	0.08	-1.05	99.56	-100.61	Peak
0.379	23.97	-31.90	0.10	-7.83	96.04	-103.87	Peak
0.507	18.44	-31.90	0.11	-13.35	73.50	-86.85	Peak
0.636	11.61	-31.90	0.12	-20.17	71.53	-91.70	Peak
6.635	7.66	-31.84	0.45	-23.73	69.54	-93.27	Peak

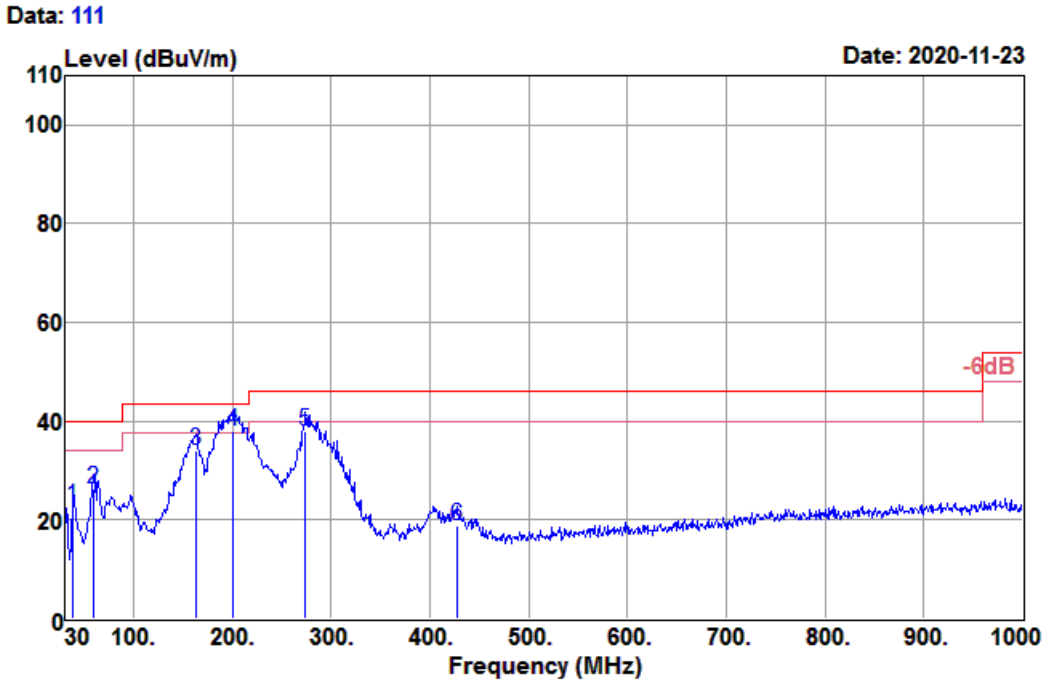
Test Mode :	Mode 1	**Temperature :**	21~23°C
Test Engineer :	Jack Liu	**Relative Humidity :**	48~50%
Test Distance :	3m	**Polarization :**	Vertical
Function Type :	WPC+ Wired charging by USB port + Disinfectant lamp + AC Power from adapter by Mini USB port		
Remark			



Freq MHz	Reading level dBuV	Antenna factor dBs/m	Cable loss dB	level dBuA/m	Limit level dBuA/m	Over limit dB	Remark
0.128	49.12	-31.90	0.06	17.28	105.48	-88.20	Peak
0.257	39.90	-31.90	0.08	8.08	99.42	-91.34	Peak
0.382	20.01	-31.90	0.10	-11.79	95.97	-107.76	Peak
0.511	24.29	-31.90	0.11	-7.50	73.43	-80.93	Peak
0.642	23.71	-31.90	0.12	-8.07	71.46	-79.53	Peak
16.327	15.38	-31.80	0.69	-15.73	69.54	-85.27	Peak

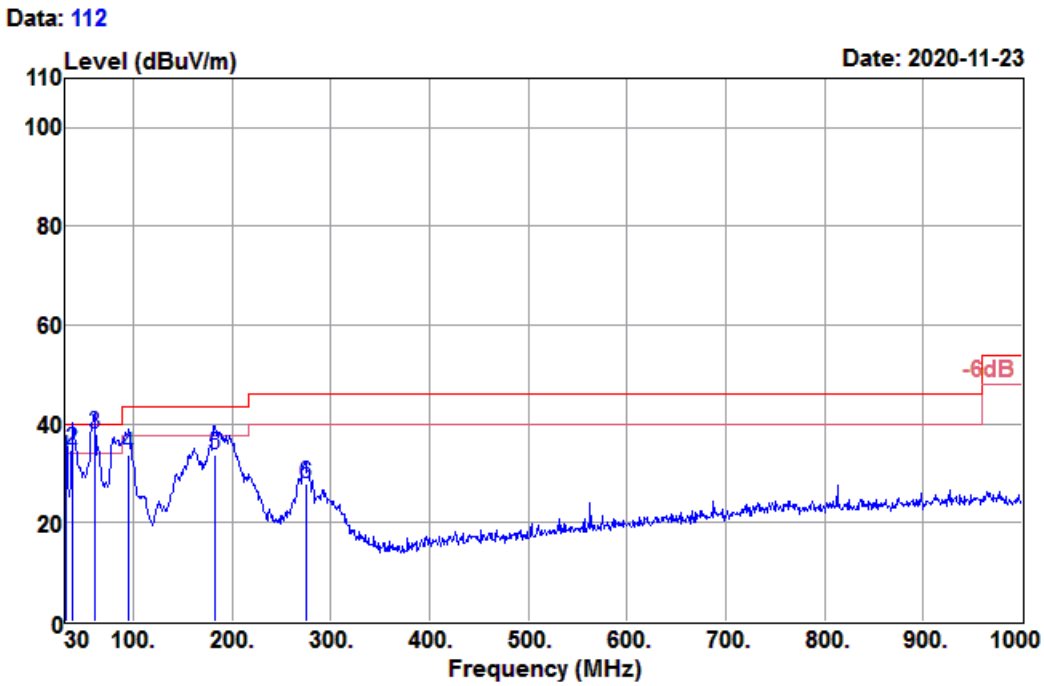
4.3.4 Test Result of Radiated Emission (30MHz ~ 1000MHz)

Test Mode :	Mode 1	**Temperature :**	21~23°C
Test Engineer :	Jack Liu	**Relative Humidity :**	48~50%
Test Distance :	3m	**Polarization :**	Horizontal
Function Type :	WPC+ Wired charging by USB port + Disinfectant lamp + AC Power from adapter by Mini USB port		



MHz	level dBuV	ntenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
38.730	41.50	12.53	1.21	32.47	22.77	40.00	-17.23	QP
59.100	45.95	11.52	1.37	32.51	26.33	40.00	-13.67	QP
162.890	50.57	13.66	2.47	32.48	34.22	43.50	-9.28	QP
199.750	57.03	10.61	2.73	32.47	37.90	43.50	-5.60	QP
273.470	53.62	13.62	3.23	32.48	37.99	46.00	-8.01	QP
426.730	30.57	16.60	4.09	32.57	18.69	46.00	-27.31	QP

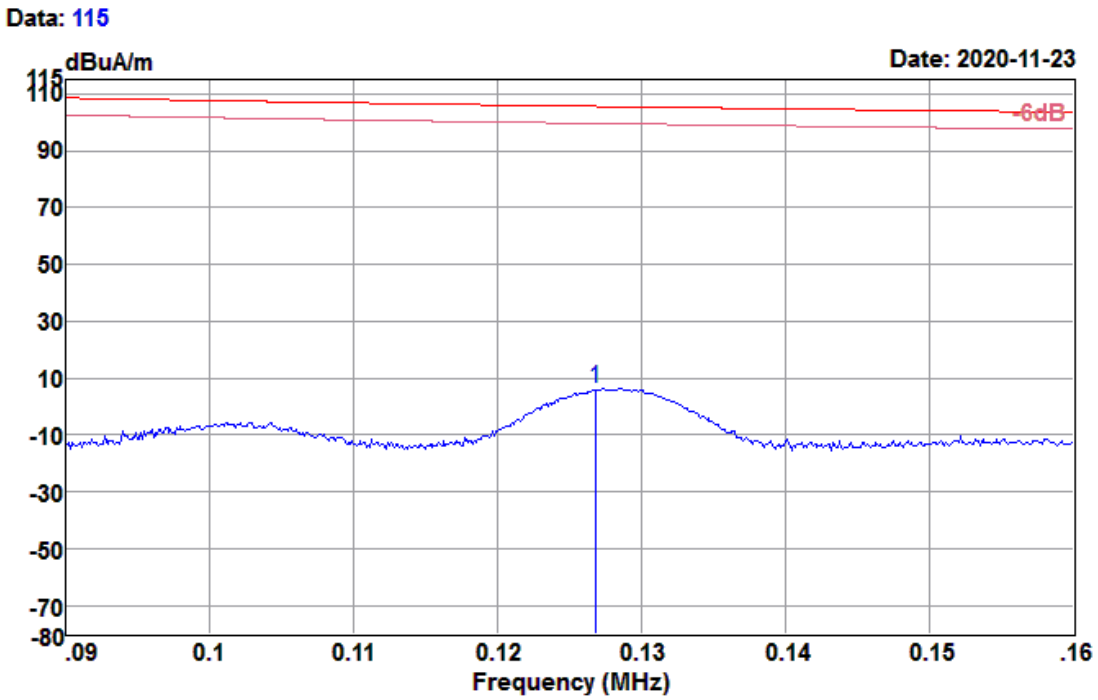
Test Mode :	Mode 1	**Temperature :**	21~23°C
Test Engineer :	Jack Liu	**Relative Humidity :**	48~50%
Test Distance :	3m	**Polarization :**	Vertical
Function Type :	WPC+ Wired charging by USB port + Disinfectant lamp + AC Power from adapter by Mini USB port		



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
31.940	52.86	11.65	1.09	32.44	33.16	40.00	-6.84	QP
38.730	53.52	12.53	1.21	32.47	34.79	40.00	-5.21	QP
60.070	57.80	11.39	1.35	32.51	38.03	40.00	-1.97	QP
94.990	55.82	8.70	1.87	32.49	33.90	43.50	-9.60	QP
182.290	51.97	11.72	2.62	32.47	33.84	43.50	-9.66	QP
274.440	43.58	13.64	3.24	32.48	27.98	46.00	-18.02	QP

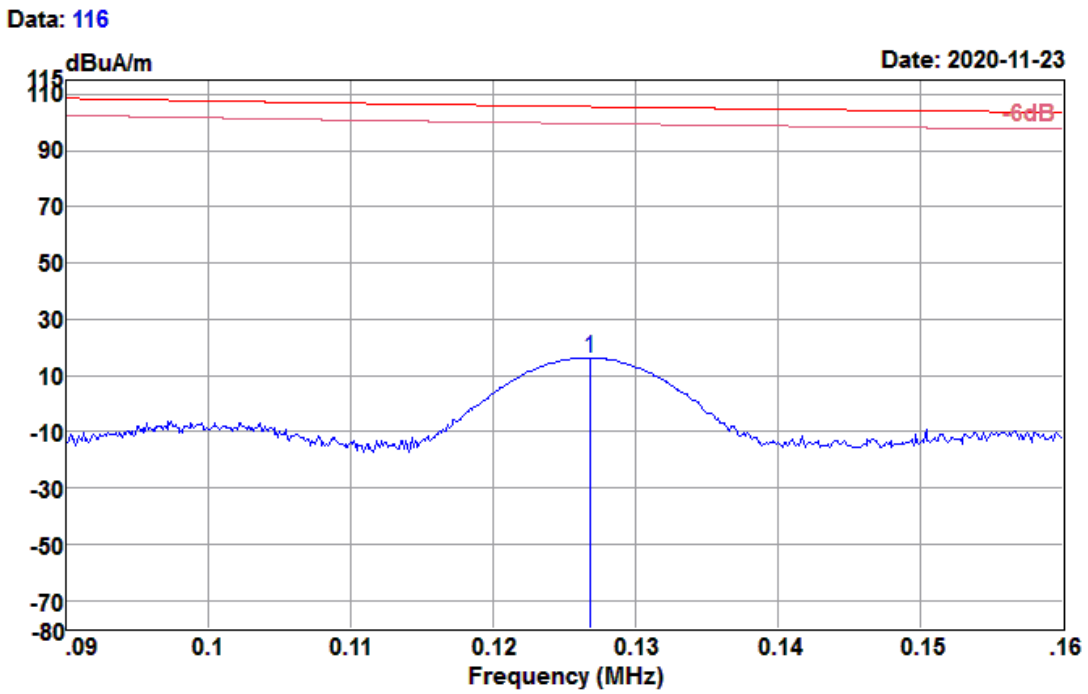
4.3.5 Test Result of Field Strength of Fundamental Emissions

Test Mode :	Mode 1	**Temperature :**	21~23°C
Test Engineer :	Jack Liu	**Relative Humidity :**	48~50%
Test Distance :	3m	**Polarization :**	Horizontal
Function Type :	WPC+ Wired charging by USB port + Disinfectant lamp + AC Power from adapter by Mini USB port		



Freq MHz	Reading level dBuV	Antenna factor dBs/m	Cable loss dB	level dBuA/m	Limit level dBuA/m	Over limit dB	Remark
0.127	38.20	-31.90	0.06	6.36	105.54	-99.18	Peak

Test Mode :	Mode 1	**Temperature :**	21~23°C
Test Engineer :	Jack Liu	**Relative Humidity :**	48~50%
Test Distance :	3m	**Polarization :**	Vertical
Function Type :	WPC+ Wired charging by USB port + Disinfectant lamp + AC Power from adapter by Mini USB port		



Freq MHz	Reading level dBuV	Antenna factor dBs/m	Cable loss dB	level dBuA/m	Limit level dBuA/m	Over limit dB	Remark
0.127	48.13	-31.90	0.06	16.29	105.54	-89.25	Peak

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Due Date
Spectrum Analyzer	R&S	FSV 30	103728	2020/01/19	2021/01/18
Spectrum Analyzer	R&S	FSV 40	101433	2020/01/16	2021/01/15
Amplifier	Sonoma	310	363917	2020/01/15	2021/01/14
Amplifier	Schwarzbeck	BBV 9718	327	2020/01/15	2021/01/14
Loop Antenna	Schwarzbeck	FMZB 1519 B	1519B-051	2020/02/14	2023/02/13
Bilog Antenna	Schwarzbeck	VULB 9168	9168-757	2018/08/27	2021/08/26
Horn Antenna	Schwarzbeck	BBHA 9120 D	1677	2020/02/14	2023/02/13
Test Software	Audix	E3	6.111221a	N/A	N/A
Filter	Micro-Tronics	BRM 50702	G266	N/A	N/A

Note:

1. Test equipment calibration is traceable to the procedure of ISO17025.
2. N/A：No Calibration Required.

6 Uncertainty of Evaluation

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

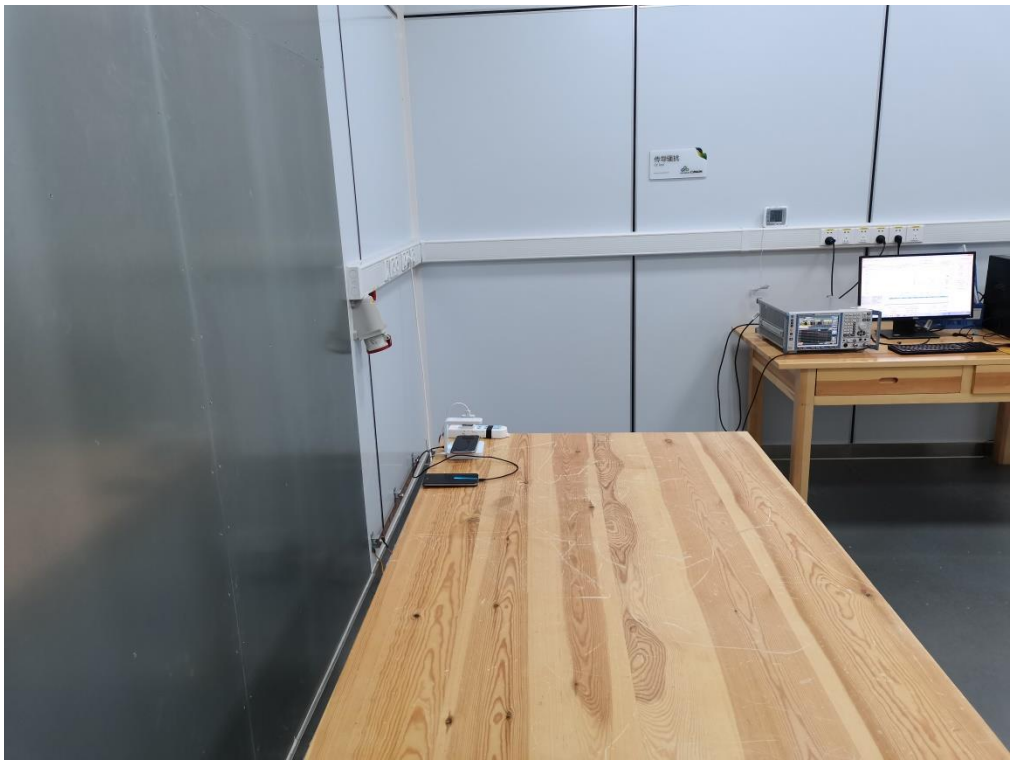
MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.42dB
Radiated emission	30MHz ~ 1GMHz	2.50dB

MEASUREMENT	UNCERTAINTY
Occupied Channel Bandwidth	±196.4Hz

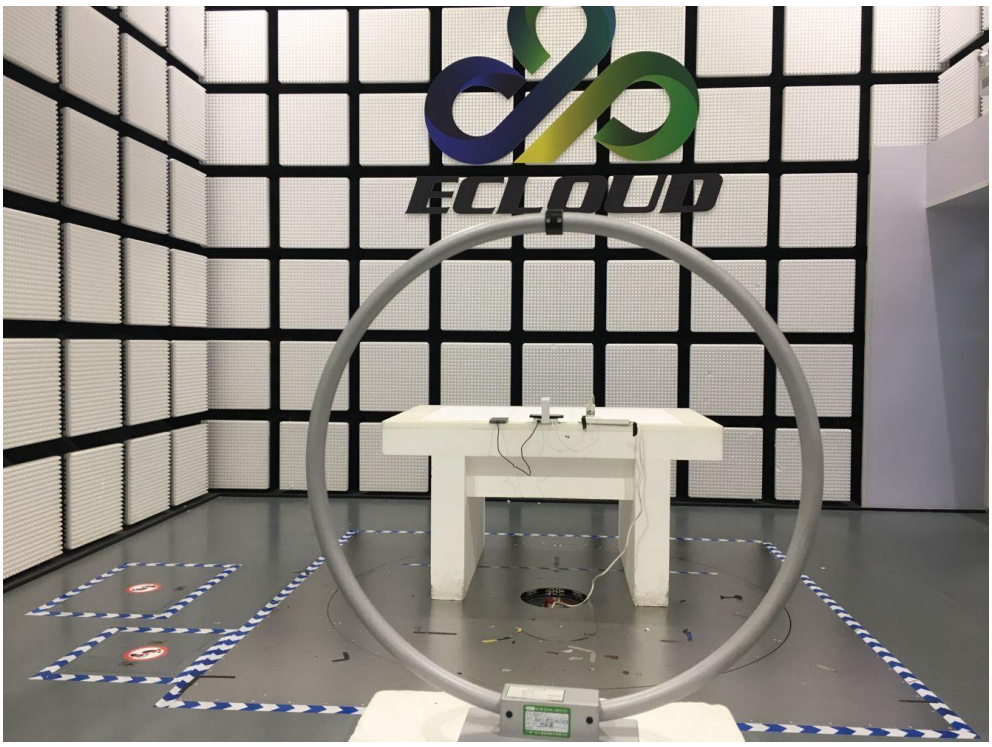
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

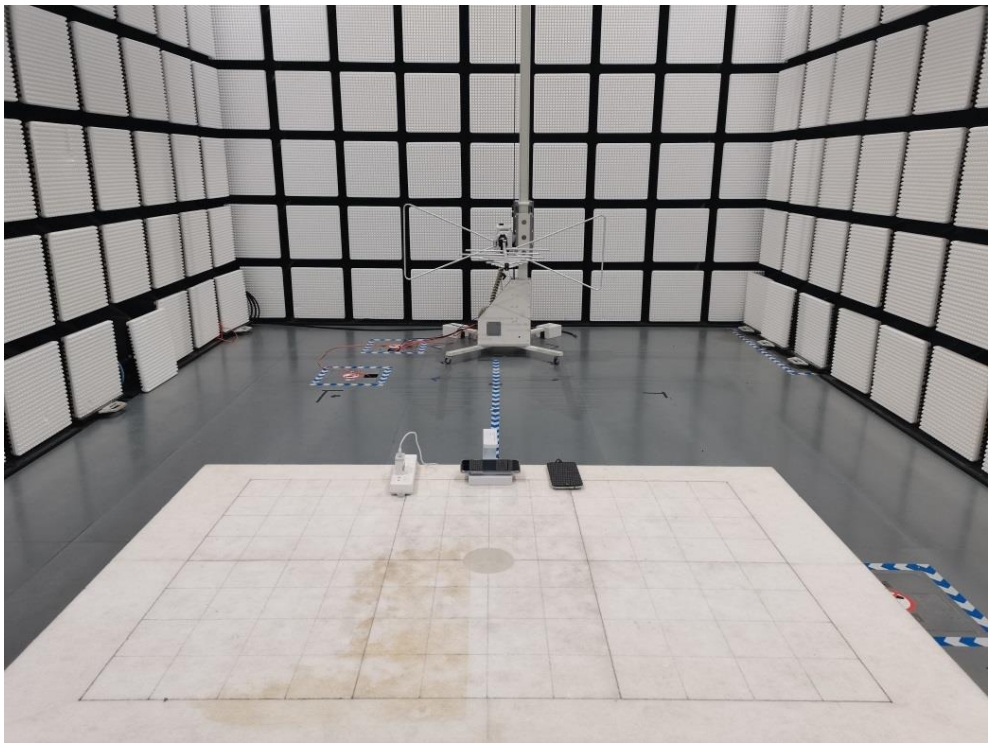
Appendix A. Setup Photographs

Conducted emission:



Radiated emission:





----------End of the report----------