FCC TEST REPORT

Test report
On Behalf of
Leadingplus Electronic Co., Ltd

For
UV Sterilizer with Wireless Charger

Model No.: LP-UN-313-2

FCC ID: 2APTY-LP-UN-313-2

Prepared for :	**Leadingplus Electronic Co., Ltd** **RM337, 3/F B Block, JieMeiKang Creative Industry Park, Donghuan 2nd Road No.57, Longhua Dist., Shenzhen, China**
Prepared By :	**Shenzhen HUAK Testing Technology Co., Ltd.** **1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China**
Date of Test:	**Jun. 08, 2020 ~ Jun. 19, 2020**
Date of Report:	**Jun. 19, 2020**
Report Number:	**HK2006181454-1E**

TEST RESULT CERTIFICATION

Applicant's name	:	Leadingplus Electronic Co., Ltd
Address	:	RM337, 3/F B Block, JieMeiKang Creative Industry Park, Donghuan 2nd Road No.57, Longhua Dist., Shenzhen, China
Manufacture's Name	:	Leadingplus Electronic Co., Ltd
Address	:	RM337, 3/F B Block, JieMeiKang Creative Industry Park, Donghuan 2nd Road No.57, Longhua Dist., Shenzhen, China
Product description		
Trade Mark	:	N/A
Product name	:	UV Sterilizer with Wireless Charger
Model and/or type reference	:	LP-UN-313-2, LP-UN-313, LP-UN-313-1, LP-UN-313-3, LP-UN-313-4
Standards	:	FCC CFR 47 PART 18

Date of Test	:	
Date (s) of performance of tests	:	Jun. 08, 2020 ~ Jun. 19, 2020
Date of Issue	:	Jun. 19, 2020
Test Result	:	**Pass**

Testing Engineer : 

(Gary Qian)

Technical Manager : 

(Eden Hu)

Authorized Signatory : 

(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	COMPLIANT
RADIATED EMISSION TEST	§18.305	COMPLIANT

1.2 TEST FACILITY

Test Firm : Shenzhen HUAK Testing Technology Co., Ltd.

Address	1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China

1.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	=	4.06dB, k=2

2. GENERAL INFORMATION

2.1 General Description of EUT

Equipment	UV Sterilizer with Wireless Charger
Model Name	LP-UN-313-2
Serial No.	LP-UN-313, LP-UN-313-1, LP-UN-313-3, LP-UN-313-4
Model Difference	All models have the same functionality, software and electronics, only the color, front frame shape and model names may differ. Test sample model: LP-UN-313-2
Trade Mark	N/A
FCC ID	2APTY-LP-UN-313-2
Antenna Type	Coil Antenna
Antenna Gain	0dBi
Operation frequency	119.1KHz
Number of Channels	1
Modulation Type	ASK
Power Source	Input: 9V⎓2A/ 5V⎓3A from Micro USB USB Output: 5V⎓2A Wireless Output: 5V⎓2A

2.2. Carrier Frequency of Channels

Operation Frequency each of channel	
Channel	Frequency
1	119.1KHz

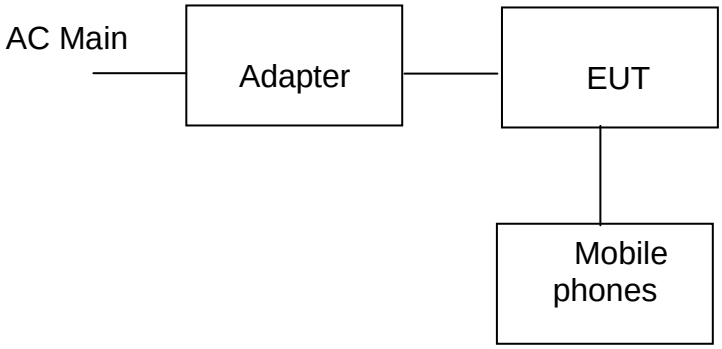
2.3 Operation of EUT during testing

Operating Mode

The mode is used: Transmitting mode

2.4 Description of Test Setup

Operation of EUT during testing



- Mobile phones information
  Model: S6
  Input: 5VDC

- Adapter information
  Model: SAW30-050-3500U
  Input: AC100-240V, 50/60Hz, 0.8A
  Output: DC5V, 3.5A

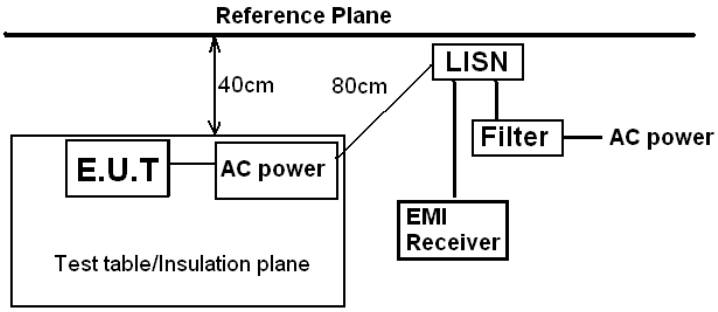
The sample was placed 0.8m height above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and 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 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	Dec. 26, 2019	1 Year
2.	Receiver	R&S	ESCI 7	HKE-010	Dec. 26, 2019	1 Year
3.	RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 26, 2019	1 Year
4.	Spectrum analyzer	R&S	FSP40	HKE-025	Dec. 26, 2019	1 Year
5.	Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 26, 2019	1 Year
6.	Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Dec. 26, 2019	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESCI 7	HKE-010	Dec. 26, 2019	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Dec. 26, 2019	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Dec. 26, 2019	1 Year
10.	Horn Antenna	Schewarzbeck	9120D	HKE-013	Dec. 26, 2019	1 Year
11.	Pre-amplifier	EMCI	EMC051845 SE	HKE-015	Dec. 26, 2019	1 Year
12.	Pre-amplifier	Agilent	83051A	HKE-016	Dec. 26, 2019	1 Year
13.	EMI Test Software EZ-EMC	Tonscend	JS1120-B Version	HKE-083	Dec. 26, 2019	N/A
14.	Power Sensor	Agilent	E9300A	HKE-086	Dec. 26, 2019	1 Year
15.	Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 26, 2019	1 Year
16.	Signal generator	Agilent	N5182A	HKE-029	Dec. 26, 2019	1 Year
17.	Signal Generator	Agilent	83630A	HKE-028	Dec. 26, 2019	1 Year
18.	Shielded room	Shiel Hong	4*3*3	HKE-039	Dec. 26, 2019	1 Year

3. CONDUCTED EMISSION TEST

3.1 Test Specification

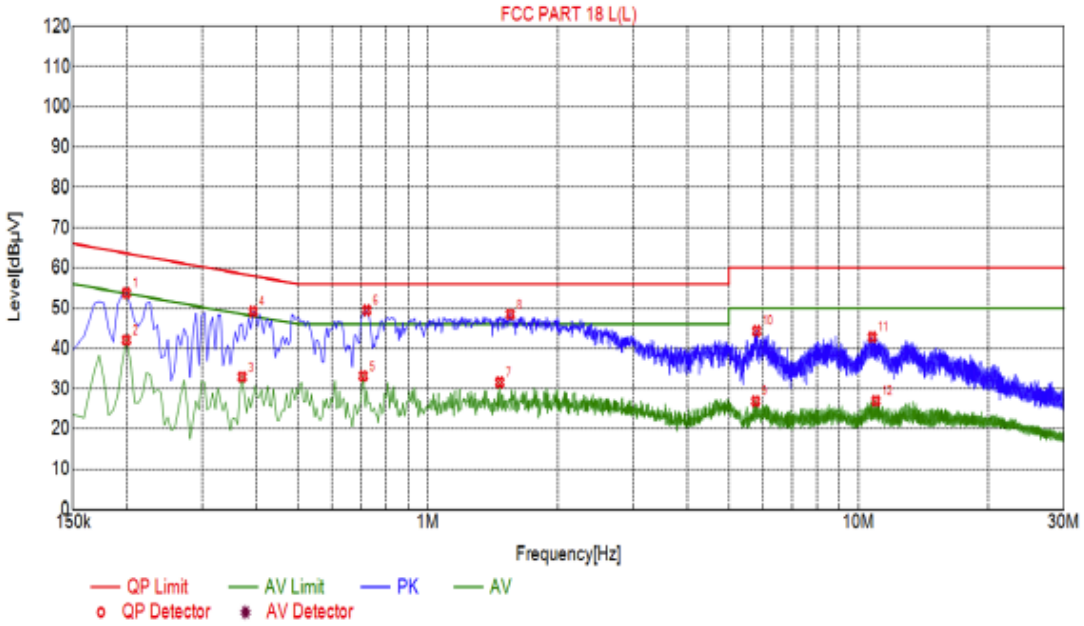
<table>
<tr><td>Test Requirement:</td><td>FCC Part18 Section 18.307</td></tr>
<tr><td>Test Method:</td><td>FCC MP-5</td></tr>
<tr><td>Frequency Range:</td><td>150 kHz to 30 MHz</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9 kHz, VBW=30 kHz, Sweep time=auto</td></tr>
<tr><td>Limits:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
</td></tr>
<tr><td>Test Setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Mode:</td><td>Charging</td></tr>
<tr><td>Test Procedure:</td><td>1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference.</td></tr>
<tr><td>Test Result:</td><td>PASS</td></tr>
</table>

3.2 Test data

Please refer to following diagram for individual

Test Specification: Line



Suspected List

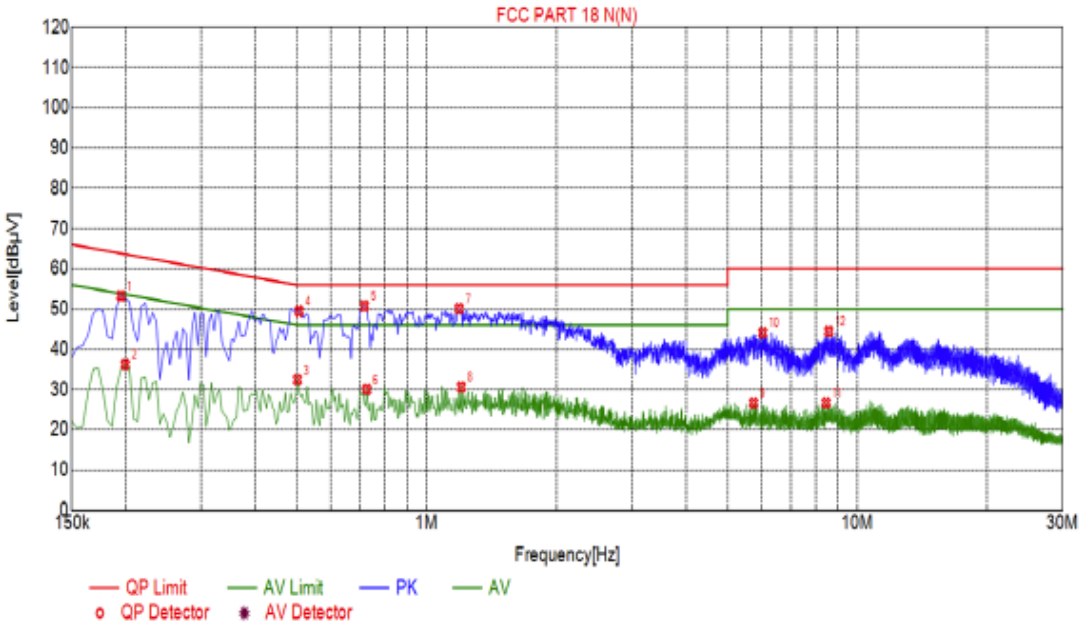
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1995	53.72	10.03	63.65	9.93	43.69	PK	L
2	0.1995	42.11	10.03	53.65	11.54	32.08	AV	L
3	0.3705	32.93	10.05	48.57	15.64	22.88	AV	L
4	0.3930	49.20	10.04	58.03	8.83	39.16	PK	L
5	0.7080	33.19	10.05	46.00	12.81	23.14	AV	L
6	0.7215	49.46	10.06	56.00	6.54	39.40	PK	L
7	1.4685	31.55	10.10	46.00	14.45	21.45	AV	L
8	1.5540	48.49	10.11	56.00	7.51	38.38	PK	L
9	5.7705	26.88	10.24	50.00	23.12	16.64	AV	L
10	5.8020	44.34	10.24	60.00	15.66	34.10	PK	L
11	10.7655	42.79	10.02	60.00	17.21	32.77	PK	L
12	10.9725	26.96	10.01	50.00	23.04	16.95	AV	L

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

Test Specification: Neutral



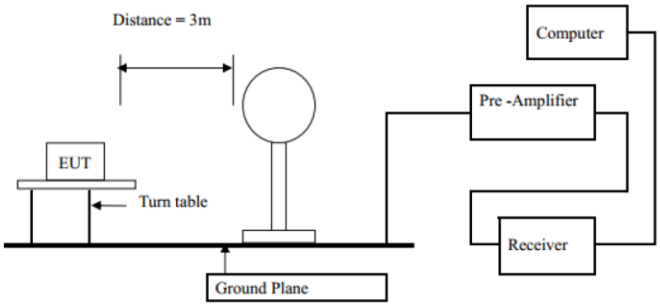
Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1950	53.26	10.03	63.95	10.69	43.23	PK	N
2	0.1995	36.23	10.03	53.65	17.42	26.20	AV	N
3	0.5010	32.42	10.04	46.00	13.58	22.38	AV	N
4	0.5055	49.47	10.04	56.00	6.53	39.43	PK	N
5	0.7170	50.78	10.05	56.00	5.22	40.73	PK	N
6	0.7260	30.01	10.06	46.00	15.99	19.95	AV	N
7	1.1895	50.08	10.09	56.00	5.92	39.99	PK	N
8	1.2030	30.63	10.09	46.00	15.37	20.54	AV	N
9	5.7435	26.68	10.24	50.00	23.32	16.44	AV	N
10	6.0315	44.13	10.23	60.00	15.87	33.90	PK	N
11	8.4660	26.71	10.13	50.00	23.29	16.58	AV	N
12	8.5875	44.44	10.12	60.00	15.56	34.32	PK	N

Remark: Margin = Limit – Level
Correction factor = Cable lose + LISN insertion loss
Level=Test receiver reading + correction factor

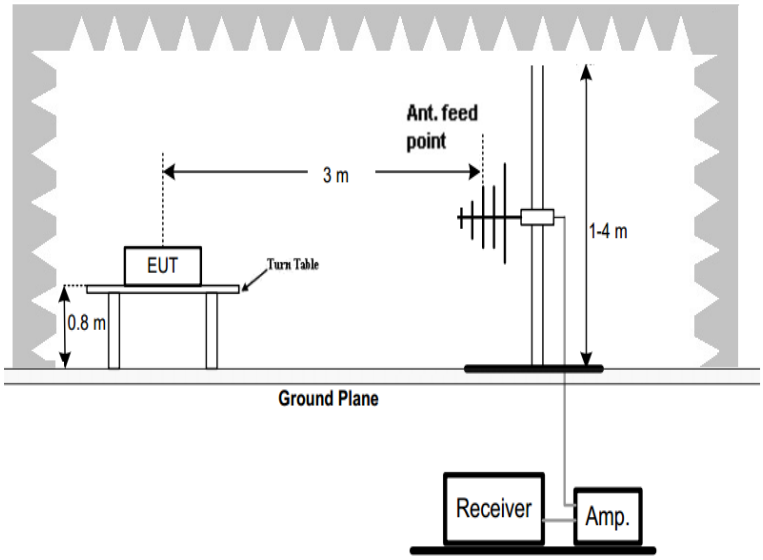
Notes:
1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss.
If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

4. Radiated Spurious Emission Measurement

4.1 Block Diagram of Test Setup

<table>
<tr><td>Test Requirement:</td><td>FCC Part18 Section 18.305</td></tr>
<tr><td>Test Method:</td><td>FCC MP-5</td></tr>
<tr><td>Frequency Range:</td><td>9 kHz to 25 GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Refer to item 4.1</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th rowspan="2">Frequency (MHz)</th><th rowspan="2">Distance (Meters)</th><th colspan="2">Field strength Limit</th></tr>
<tr><th>(dBuV/m)</th><th>Remark</th></tr>
<tr><td>0.009 -30</td><td>3</td><td>103.5</td><td>Quasi-Peak</td></tr>
<tr><td>30-88</td><td>3</td><td>40.0</td><td>Quasi-Peak</td></tr>
<tr><td>88-216</td><td>3</td><td>43.5</td><td>Quasi-Peak</td></tr>
<tr><td>216-960</td><td>3</td><td>46.0</td><td>Quasi-Peak</td></tr>
<tr><td>Above 960</td><td>3</td><td>54.0</td><td>Quasi-Peak</td></tr>
</table>
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.
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions below 30MHz
 

For radiated 30 MHz to 1 GHz emissions</td></tr>
</table>

	
Test Procedure:	1. For the radiated emission test below 1GHz: The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level. 2. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level 3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. 4. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=200Hz for 9K< f <150 KHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 9 KHz, VBW= 30KHz for 150KHz <f 30 MHz for peak measurement.
Test mode:	Refer to section 4.1 for details
Test results:	PASS

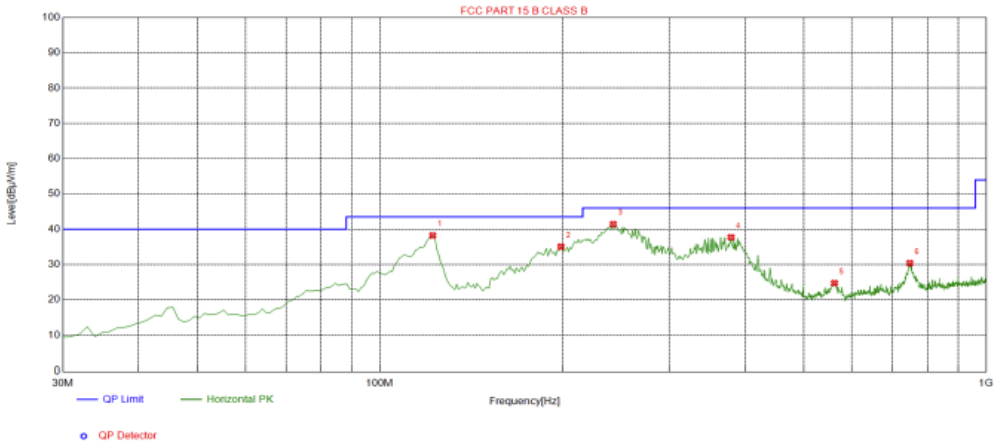
4.2 Test Result

For 9KHz - 30MHz Test Results:

Freq. (MHz)	Detector Mode (PK/QP/AV)	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Level (dBuV/m)	Limits 3m (dBuV/m)	Margin (dBuV/m)
0.110	AV	PK	20.47	24.80	45.27	103.5	58.23
0.1191	AV	PK	43.69	24.80	68.49	103.5	35.01
0.486	AV	PK	27.15	25.03	52.18	103.5	51.32
0.500	PK	PK	25.83	25.03	50.86	103.5	52.64

For30MHz-1GHz

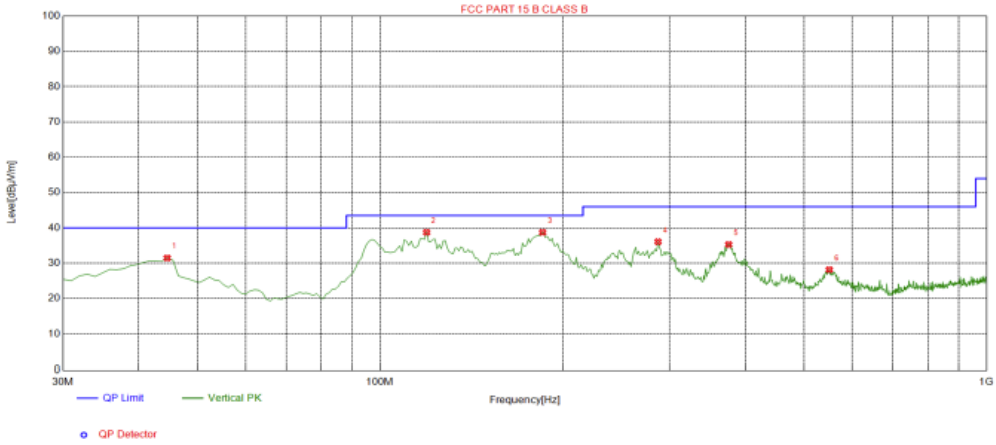
Please refer to following diagram for individual 30MHz-1GHz



Suspected List

Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	122.2422	-17.43	55.67	38.24	43.50	5.26	100	125	Horizontal
2	198.9489	-15.16	50.21	35.05	43.50	8.45	100	317	Horizontal
3	242.6426	-13.73	55.17	41.44	46.00	4.56	100	44	Horizontal
4	379.5496	-10.83	48.54	37.71	46.00	8.29	100	25	Horizontal
5	562.0921	-6.62	31.36	24.74	46.00	21.26	100	15	Horizontal
6	748.5185	-3.78	34.17	30.39	46.00	15.61	100	238	Horizontal

Remark: Margin = Limit – Level
Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
Level=Test receiver reading + correction factor



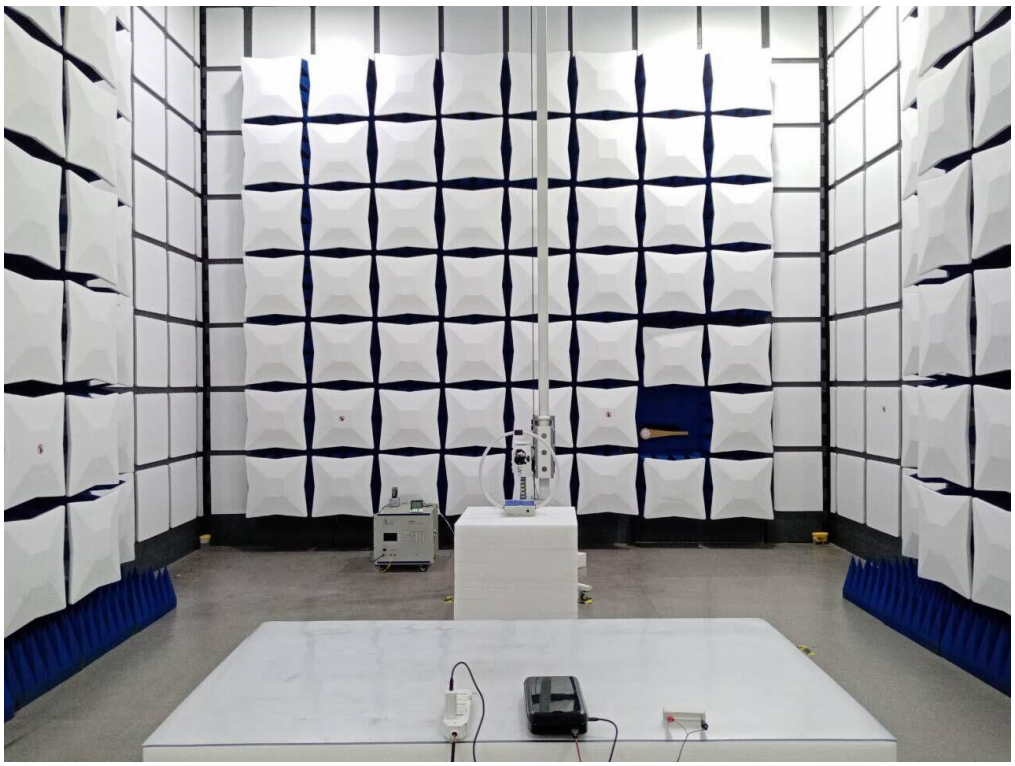
Suspected List

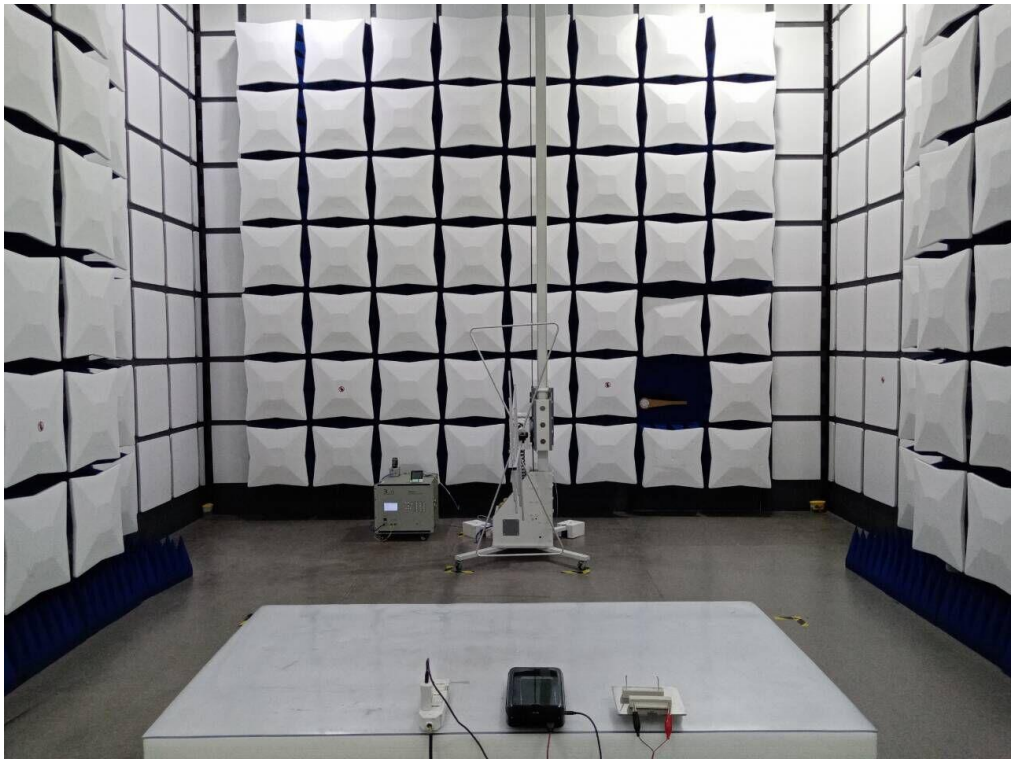
Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	44.5646	-13.73	45.20	31.47	40.00	8.53	100	221	Vertical
2	119.3293	-16.99	55.74	38.75	43.50	4.75	100	247	Vertical
3	185.3554	-16.40	55.14	38.74	43.50	4.76	100	198	Vertical
4	287.3073	-12.95	49.03	36.08	46.00	9.92	100	186	Vertical
5	375.6657	-10.90	46.19	35.29	46.00	10.71	100	280	Vertical
6	550.4404	-6.95	35.12	28.17	46.00	17.83	100	328	Vertical

Remark: Margin = Limit – Level
Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
Level=Test receiver reading + correction factor

5. PHOTOGRAPH OF TEST

5.1 Radiated Emission





5.2 Conducted Emission

6. PHOTOGRAPH OF TEST

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

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