FCC TEST REPORT

Client Name	:	Shenzhen USV Technology Co.,Ltd
Address	:	4th to the south, building B20, Hengfeng Industrial City, Hangchen, Bao'an District, Shenzhen City, Guangdong Province China 518100
Product Name	:	4-IN-1 Magnetic wireless charger
Date	:	Mar. 18, 2022

Shenzhen Anbotek Compliance Laboratory Limited

Contents

TEST REPORT

Applicant	:	Shenzhen USV Technology Co.,Ltd
Manufacturer	:	Shenzhen USV Technology Co.,Ltd
Product Name	:	4-IN-1 Magnetic wireless charger
Model No.	:	T2, T3
Trade Mark	:	N.A.
Rating(s)	:	Input: 5V-9V/2A Phone output: 10W /7.5W/ 5W Watch output: 2.0W Headphone output: 2.5W Pencil: 0.5W
Test Standard(s)	:	**FCC Part15 Subpart C, Paragraph 15.209**
Test Method(s)	:	**ANSI C63.10: 2020**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt	Feb. 21, 2022
Date of Test	Feb. 21~ Mar. 04, 2022

Prepared By

Nian xiu Chen

(Nianxiu Chen)

Approved & Authorized Signer

Kingkong Jin

(Kingkong Jin)

1. General Information

1.1. Client Information

Applicant	:	Shenzhen USV Technology Co.,Ltd
Address	:	4th to the south, building B20, Hengfeng Industrial City, Hangchen, Bao'an District, Shenzhen City, Guangdong Province China 518100
Manufacturer	:	Shenzhen USV Technology Co.,Ltd
Address	:	4th to the south, building B20, Hengfeng Industrial City, Hangchen, Bao'an District, Shenzhen City, Guangdong Province China 518100
Factory	:	Shenzhen USV Technology Co.,Ltd
Address	:	4th to the south, building B20, Hengfeng Industrial City, Hangchen, Bao'an District, Shenzhen City, Guangdong Province China 518100

1.2. Description of Device (EUT)

Product Name	:	4-IN-1 Magnetic wireless charger	
Model No.	:	T2, T3 (Note: All samples are the same except the model number and appearance, so we prepare "T2" for test only.)	
Trade Mark	:	N.A.	
Test Power Supply	:	AC 120V, 60Hz for adapter/ AC 240V, 60Hz for adapter	
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)	
Product Description	:	Operation Frequency:	Phone/Headphone: 110.1-205KHz Watch: 216KHz, 325KHz
		Modulation Type:	ASK
		Antenna Type:	Inductive loop coil Antenna
		Antenna Gain(Peak):	0 dBi (Provided by customer)
		Adapter:	N/A
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.			

1.3. Auxiliary Equipment Used During Test

Adapter	:	Model: MDY-11-EX Input: 100-240V~50/60Hz, 07A Output: 5V⎓3A/ 9V⎓3A/ 12V⎓2.25A/ 20V⎓1.35A/ 11V⎓3A Max
Wireless charging load	:	Manufacturer: Shenzhen Ouju Technology Co., Ltd. M/N: CD2577 Power: 5W/7.5W/10W/15W Last Cal.: Oct. 26, 2021 Cal. Interval: 1 Year
Apple AirPods	:	M/N: AirPods Pro
Apple Watch	:	M/N: WR-50M

1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Wireless Charging Mode (Watch+AirPods+10W Wireless charging load)
Mode 2	Wireless Charging Mode (Watch+10W Wireless charging load)
Mode 3	Wireless Charging Mode (AirPods+10W Wireless charging load)
Mode 4	Wireless Charging Mode(Watch+AirPods)
Mode 5	Wireless Charging Mode(10W Wireless charging load)
Mode 6	Wireless Charging Mode(Apple Watch)
Mode 7	Wireless Charging Mode(Apple AirPods)

For Conducted Emission	
Final Test Mode	Description
Mode 1	Wireless Charging Mode (Watch+AirPods+10W Wireless charging load)
Mode 2	Wireless Charging Mode (Watch+10W Wireless charging load)
Mode 3	Wireless Charging Mode (AirPods+10W Wireless charging load)
Mode 4	Wireless Charging Mode(Watch+AirPods)
Mode 5	Wireless Charging Mode(10W Wireless charging load)
Mode 6	Wireless Charging Mode(Apple Watch)
Mode 7	Wireless Charging Mode(Apple AirPods)

For Radiated Emission	
Final Test Mode	Description
Mode 1	Wireless Charging Mode (Watch+AirPods+10W Wireless charging load)
Mode 2	Wireless Charging Mode (Watch+10W Wireless charging load)
Mode 3	Wireless Charging Mode (AirPods+10W Wireless charging load)
Mode 4	Wireless Charging Mode(Watch+AirPods)
Mode 5	Wireless Charging Mode(10W Wireless charging load)
Mode 6	Wireless Charging Mode(Apple Watch)
Mode 7	Wireless Charging Mode(Apple AirPods)

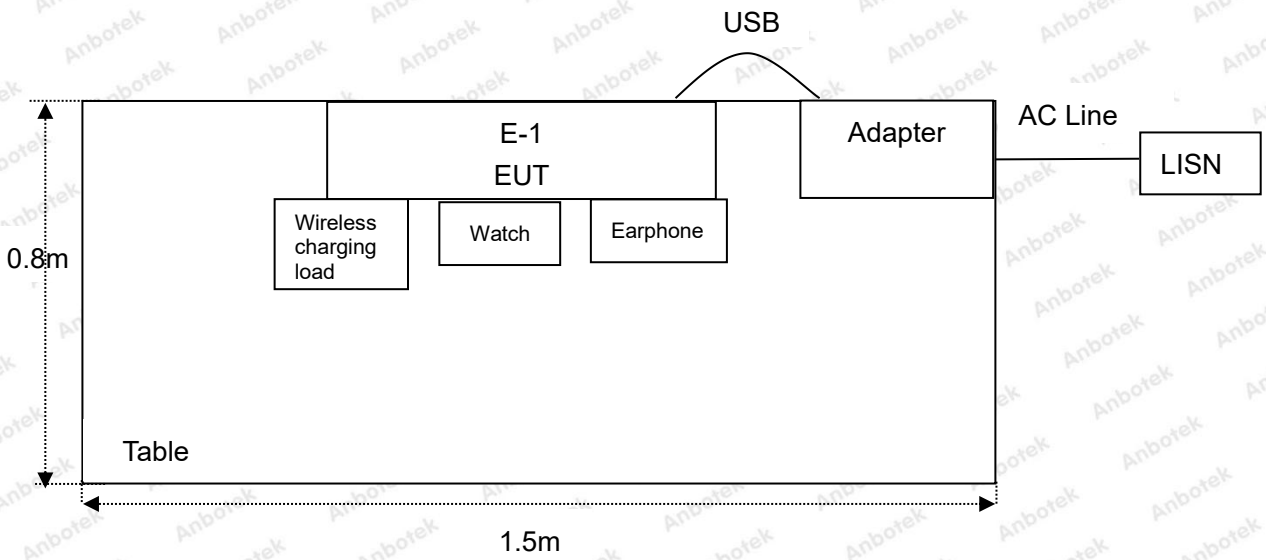
Note: (1)Test channel is 0.1276MHz and 0.325MHz.

(2) All the situation(full load, half load and empty load) has been tested,only the worst situation (full load 14.5W) was recorded in the report.

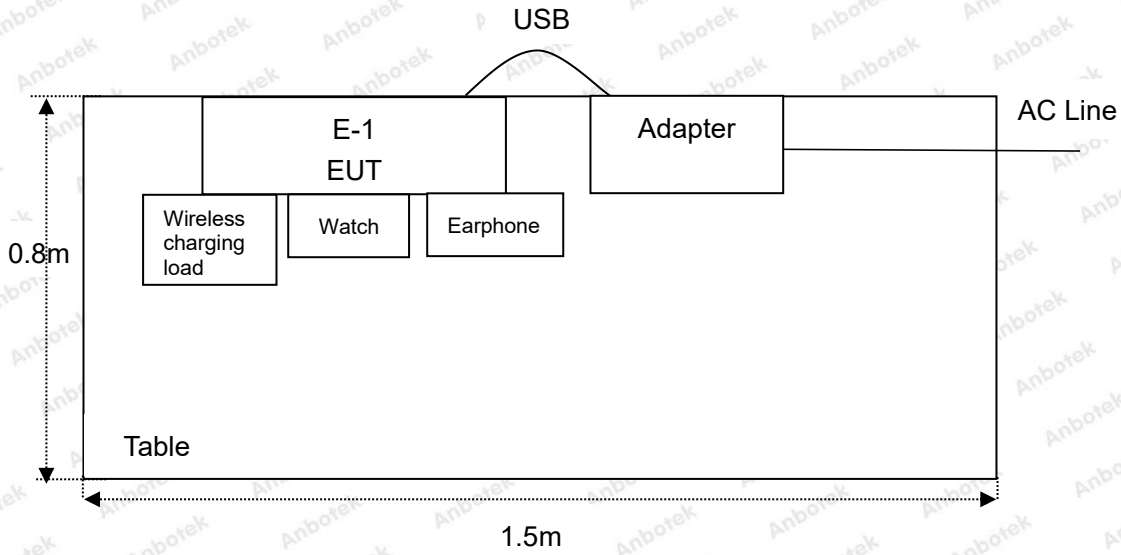
(3) The two frequency points of 0.216MHz and 0.325MHz are the working frequency points of watch wireless charging. Only one of the two frequency points can work at the same time. During the test, 0.325MHz is measured.

1.5. Description Of Test Setup

CE



RE



1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT001	Jul 05, 2021	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 22, 2021	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 22, 2021	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2021	1 Year
5.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 22, 2021	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	Oct. 22, 2021	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Oct. 22, 2021	2 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Oct. 22, 2021	2 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Oct. 22, 2021	2 Year
10.	Horn Antenna	A-INFO	LB-180400-KF	J211060628	Oct. 22, 2021	2 Year
11.	Pre-amplifier	SONOMA	310N	186860	Oct. 22, 2021	1 Year
12.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
13.	RF Test Control System	YIHENG	YH3000	2017430	Oct. 22, 2021	1 Year
14.	Power Sensor	DAER	RPR3006W	15I00041SN045	Oct. 22, 2021	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN046	Oct. 22, 2021	1 Year
16.	MXA Spectrum Analysis	KEYSIGHT	N9020A	MY53280032	Oct. 22, 2021	1 Year
17.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 22, 2021	1 Year
18.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 22, 2021	1 Year
19.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 22, 2021	1 Year
20.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	Oct. 22, 2021	1 Year

1.7. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 3.9 dB (Horizontal)
		Ur = 3.8 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4 dB

1.8. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102

2. Summary of Test Results

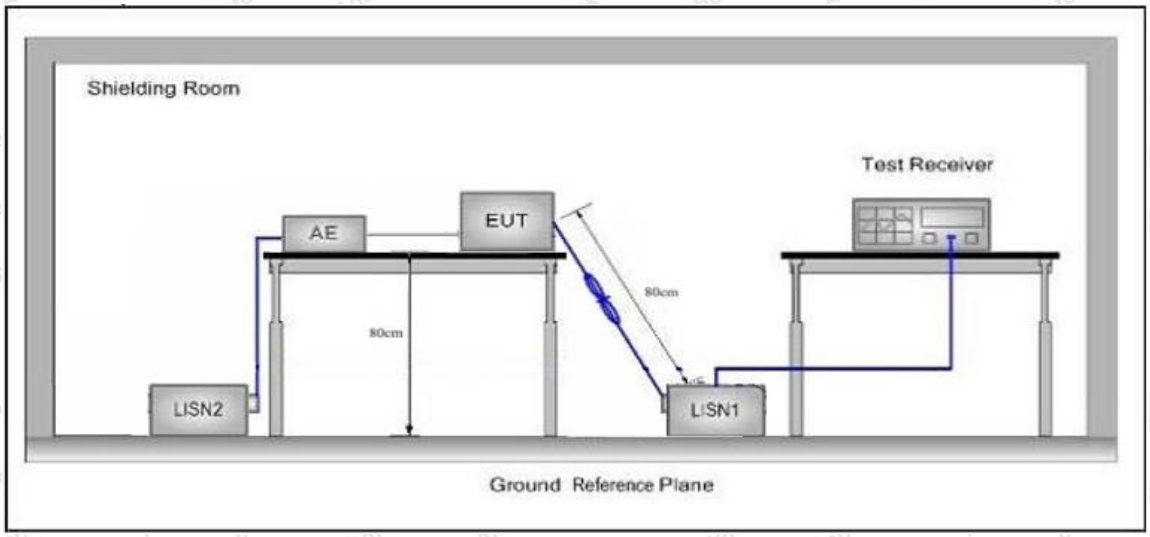
Standard Section	Test Item	Result
FCC Part 15, Paragraph 15.207	Conducted Emission Test	PASS
FCC Part 15, Paragraph 15.209(a)(f)	Spurious Emission	PASS
Part 15.203	Antenna Requirement	PASS

3. Conducted Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
	5MHz~30MHz	60	50
Remark: (1) *Decreasing linearly with logarithm of the frequency. (2) The lower limit shall apply at the transition frequency.			

3.2. Test Setup



3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2020 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

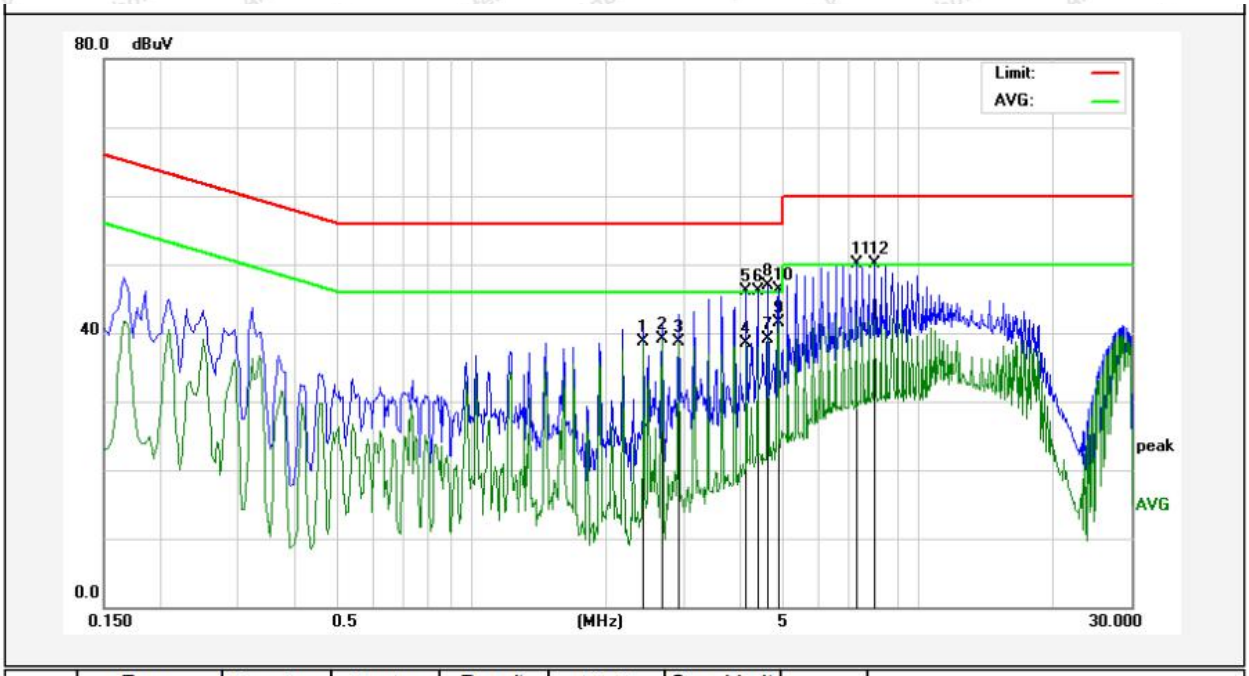
The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

Please to see the following pages

Conducted Emission Test Data

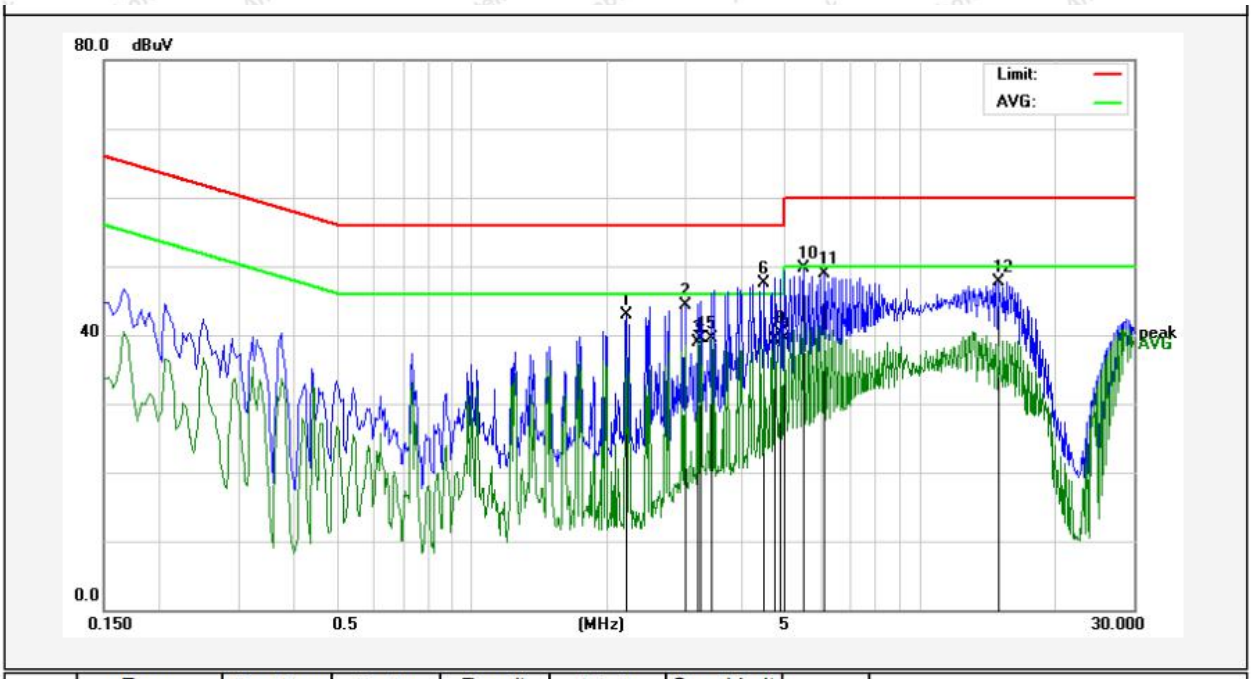
Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 240V, 60Hz for adapter
Comment: Live Line
Tem.: 23.1℃ Hum.: 49%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	2.4260	38.52	0.12	38.64	46.00	-7.36	AVG	
2	2.6659	39.01	0.12	39.13	46.00	-6.87	AVG	
3	2.9100	38.49	0.12	38.61	46.00	-7.39	AVG	
4	4.1219	38.31	0.11	38.42	46.00	-7.58	AVG	
5	4.1220	46.03	0.11	46.14	56.00	-9.86	QP	
6	4.3659	45.91	0.11	46.02	56.00	-9.98	QP	
7	4.6059	39.06	0.11	39.17	46.00	-6.83	AVG	
8	4.6060	46.85	0.11	46.96	56.00	-9.04	QP	
9	4.8498	41.49	0.11	41.60	46.00	-4.40	AVG	
10	4.8500	46.16	0.11	46.27	56.00	-9.73	QP	
11	7.2740	50.09	0.11	50.20	60.00	-9.80	QP	
12	8.0020	49.93	0.12	50.05	60.00	-9.95	QP	

Conducted Emission Test Data

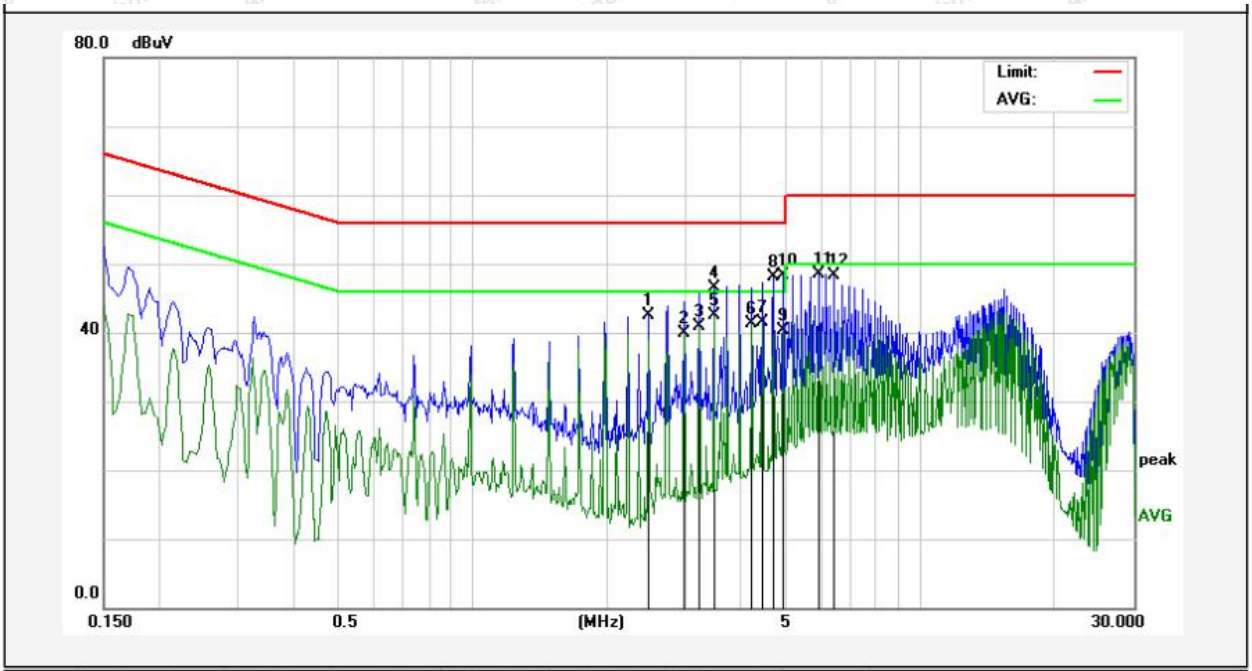
Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 240V, 60Hz for adapter
Comment: Neutral Line
Tem.: 23.1℃ Hum.: 49%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	2.2020	42.70	0.12	42.82	56.00	-13.18	QP	
2	2.9860	44.14	0.12	44.26	56.00	-11.74	QP	
3	3.1819	38.83	0.12	38.95	46.00	-7.05	AVG	
4	3.2378	39.38	0.12	39.50	46.00	-6.50	AVG	
5	3.4260	39.48	0.12	39.60	46.00	-6.40	AVG	
6	4.4820	47.32	0.11	47.43	56.00	-8.57	QP	
7	4.7298	39.29	0.11	39.40	46.00	-6.60	AVG	
8	4.8939	40.19	0.11	40.30	46.00	-5.70	AVG	
9	4.9778	39.46	0.11	39.57	46.00	-6.43	AVG	
10	5.4780	49.63	0.11	49.74	60.00	-10.26	QP	
11	6.1180	48.85	0.11	48.96	60.00	-11.04	QP	
12	15.0620	47.56	0.17	47.73	60.00	-12.27	QP	

Conducted Emission Test Data

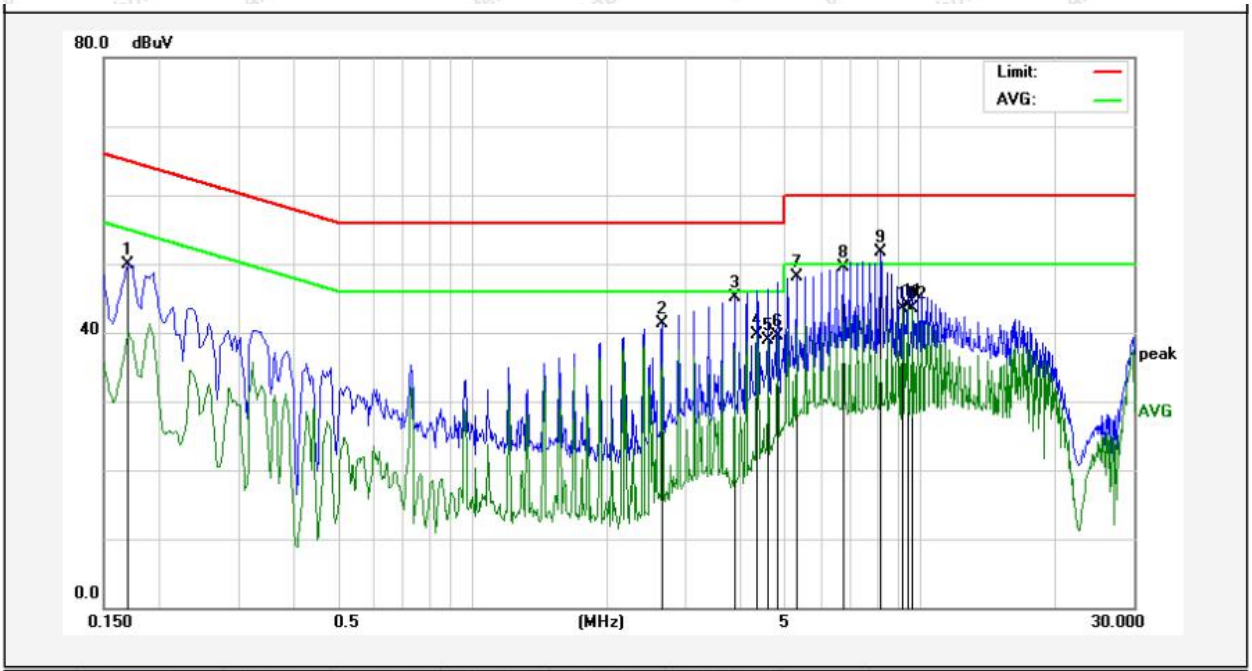
Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 120V, 60Hz for adapter
Comment: Live Line
Tem.: 23.1℃ Hum.: 49%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	2.4739	42.42	0.12	42.54	56.00	-13.46	QP	
2	2.9660	39.85	0.12	39.97	46.00	-6.03	AVG	
3	3.2139	40.78	0.12	40.90	46.00	-5.10	AVG	
4	3.4620	46.34	0.12	46.46	56.00	-9.54	QP	
5	3.4620	42.42	0.12	42.54	46.00	-3.46	AVG	
6	4.2019	41.14	0.11	41.25	46.00	-4.75	AVG	
7	4.4499	41.36	0.11	41.47	46.00	-4.53	AVG	
8	4.6979	48.05	0.11	48.16	56.00	-7.84	QP	
9	4.9458	40.26	0.11	40.37	46.00	-5.63	AVG	
10	4.9460	48.18	0.11	48.29	56.00	-7.71	QP	
11	5.9340	48.32	0.11	48.43	60.00	-11.57	QP	
12	6.4300	48.20	0.11	48.31	60.00	-11.69	QP	

Conducted Emission Test Data

Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 120V, 60Hz for adapter
Comment: Neutral Line
Tem.: 23.1℃ Hum.: 49%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1700	49.84	0.12	49.96	64.96	-15.00	QP	
2	2.6500	41.18	0.12	41.30	56.00	-14.70	QP	
3	3.8540	44.96	0.12	45.08	56.00	-10.92	QP	
4	4.3338	39.59	0.11	39.70	46.00	-6.30	AVG	
5	4.5739	38.75	0.11	38.86	46.00	-7.14	AVG	
6	4.8178	39.48	0.11	39.59	46.00	-6.41	AVG	
7	5.2980	48.05	0.11	48.16	60.00	-11.84	QP	
8	6.7420	49.39	0.11	49.50	60.00	-10.50	QP	
9	8.1899	51.51	0.12	51.63	60.00	-8.37	QP	
10	9.1539	43.31	0.12	43.43	50.00	-6.57	AVG	
11	9.3939	43.86	0.12	43.98	50.00	-6.02	AVG	
12	9.6339	43.41	0.12	43.53	50.00	-6.47	AVG	

4. Radiation Spurious Emission

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209 and 15.205				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	Peak	3

Remark:
(1)The lower limit shall apply at the transition frequency.
(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

4.2. Test Setup

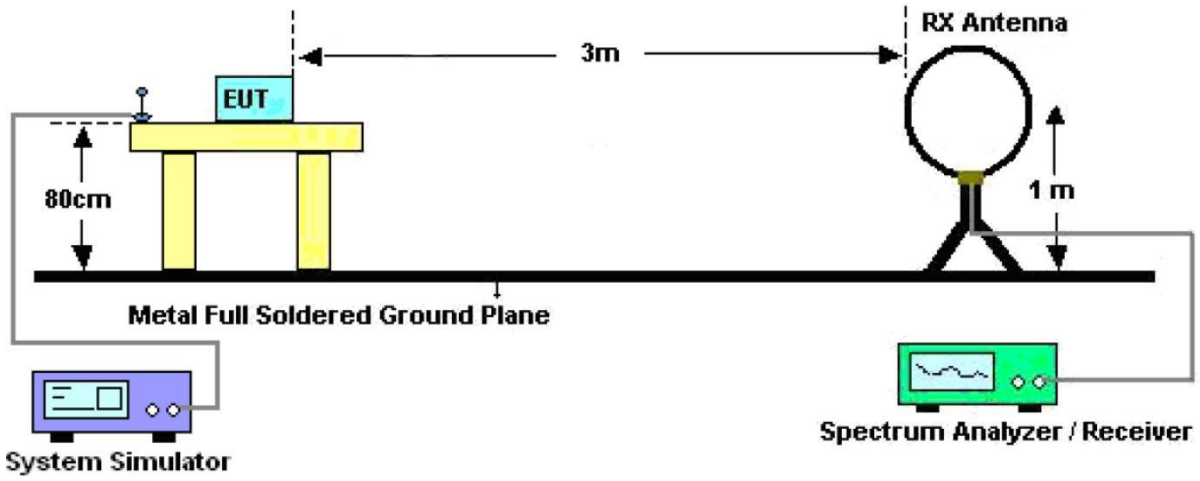


Figure 1. Below 30MHz

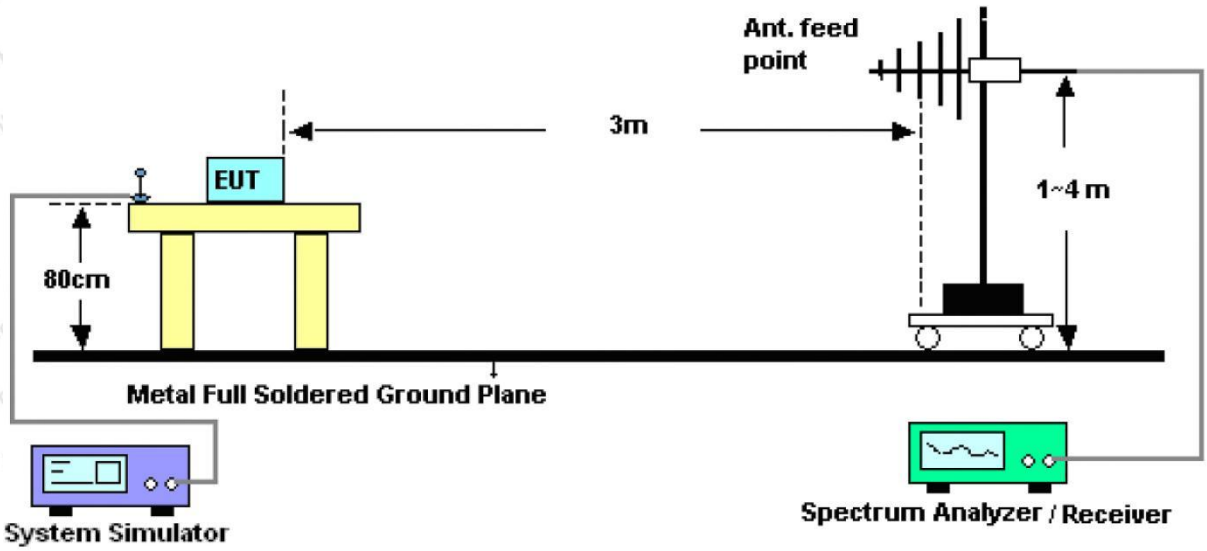


Figure 2. 30MHz to 1GHz

4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.
The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

For 9kHz to 150kHz, Set the spectrum analyzer as:
RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:
RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:
RBW = 100kHz, VBW =300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

4.4. Test Data

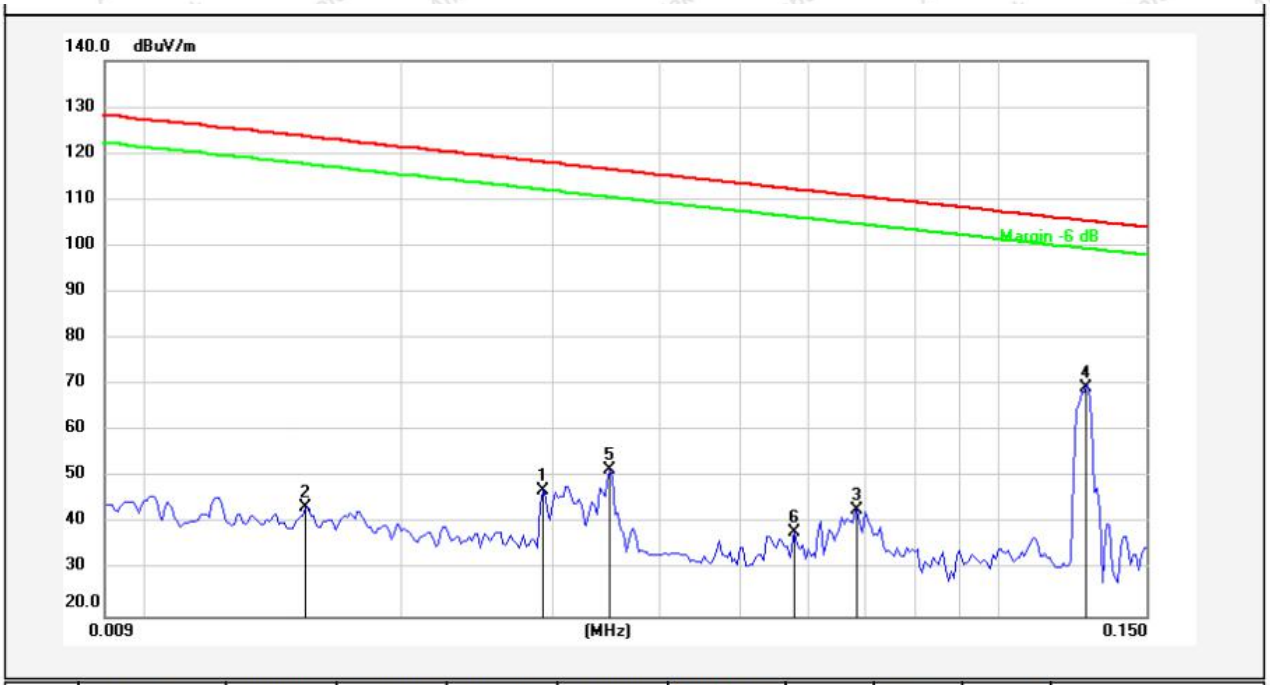
PASS

Note: The data is in TX mode, and this is the worst mode.

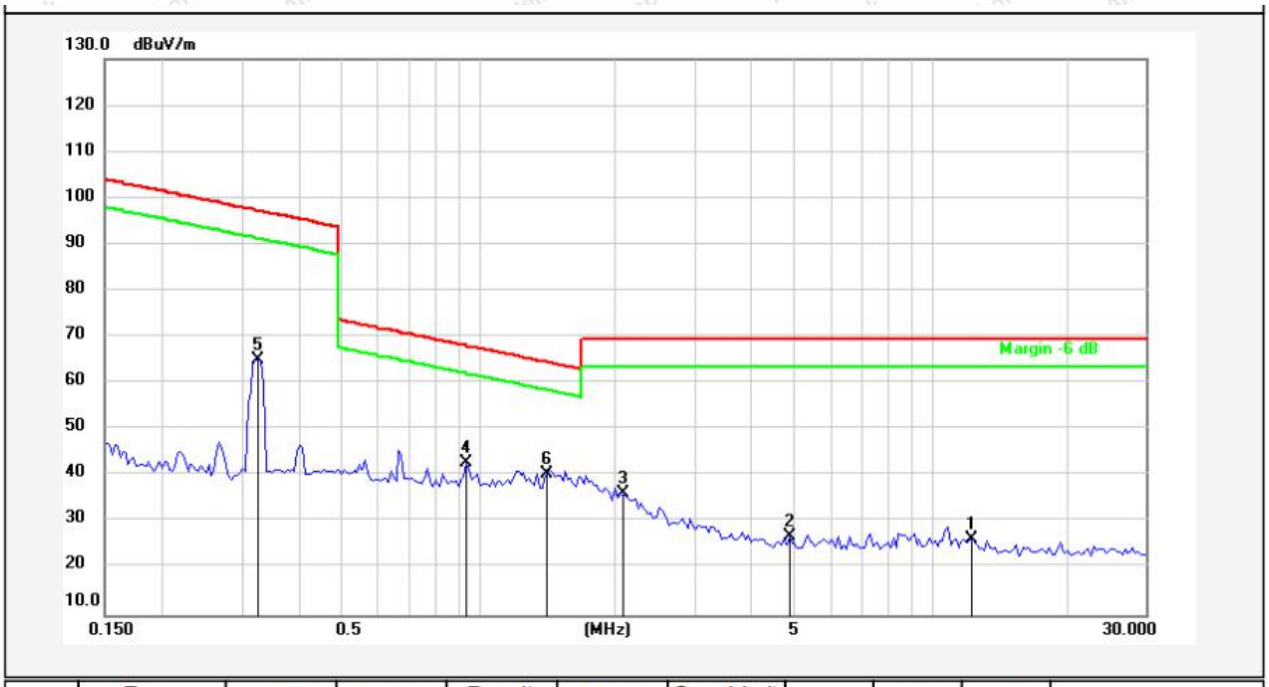
Test Results

(Between 9KHz – 30MHz)

Standard:	**FCC PART15 C _3m**	**Power Source:**	**AC 120V, 60Hz for adapter**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**22.7℃/49%RH**
Test Mode:	**Mode 1**	**Distance:**	**3m**



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	0.0292	26.74	20.44	47.18	118.15	-70.97	AV			
2	0.0154	23.12	20.29	43.41	123.67	-80.26	AV			
3	0.0685	22.64	20.37	43.01	110.79	-67.78	AV			
4	0.1276	49.06	20.34	69.40	105.42	-36.02	AV			
5	0.0352	31.27	20.48	51.75	116.53	-64.78	AV			
6	0.0580	17.68	20.36	38.04	112.22	-74.18	AV			

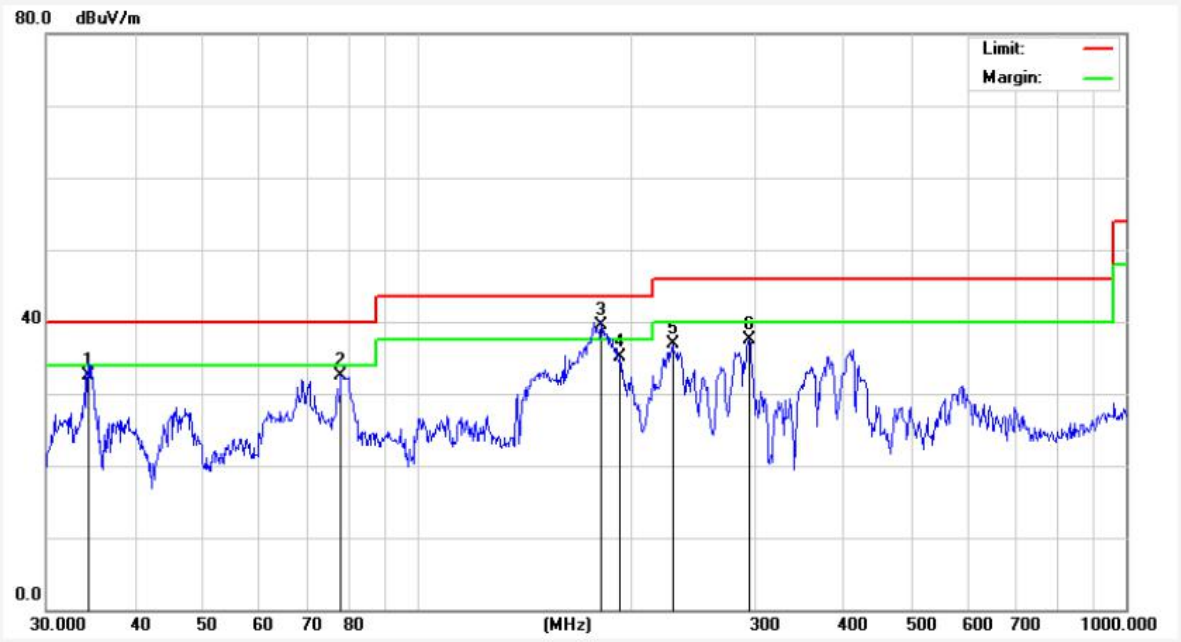


No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	12.3506	5.94	20.53	26.47	69.50	-43.03	QP			
2	4.8867	6.52	20.42	26.94	69.50	-42.56	QP			
3	2.0659	15.98	20.28	36.26	69.50	-33.24	QP			
4	0.9455	22.56	20.26	42.82	68.11	-25.29	QP			
5	0.3250	44.64	20.29	64.93	97.34	-32.41	AV			
6	1.4254	20.10	20.27	40.37	64.55	-24.18	QP			

Remark： According to FCC PART 15.209 (d), the emission limits for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, Radiated emission limits in these three bands are based on measurements employing an average detector.

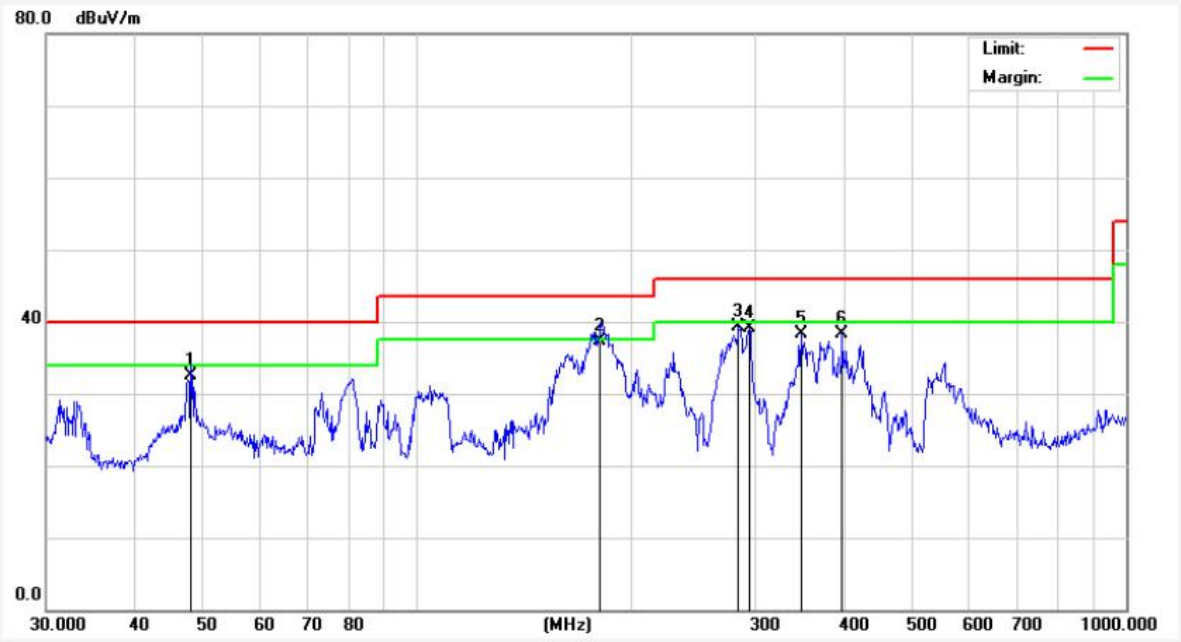
(Between 30MHz –1000 MHz)

Standard:	**FCC PART15 C _3m**	**Polarization:**	**Horizontal**
Test item:	**Radiation Test**	**Power Source:**	**AC 120V, 60Hz for adapter**
Test Mode:	**Mode 1**	**Temp.(C)/Hum.(%RH):**	**21.5℃/49%RH**
Distance:	**3m**		



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	34.3962	51.22	-18.67	32.55	40.00	-7.45	QP			
2	78.1389	55.45	-22.85	32.60	40.00	-7.40	QP			
3	181.9199	62.56	-23.09	39.47	43.50	-4.03	QP			
4	193.0945	57.71	-22.62	35.09	43.50	-8.41	QP			
5	229.2931	58.66	-21.85	36.81	46.00	-9.19	QP			
6	294.1136	55.27	-17.67	37.60	46.00	-8.40	QP			

Standard:	**FCC PART15 C _3m**	**Polarization:**	**Vertical**
Test item:	**Radiation Test**	**Power Source:**	**AC 120V, 60Hz for adapter**
Test Mode:	**Mode 1**	**Temp.(C)/Hum.(%RH):**	**21.5℃/49%RH**
Distance:	**3m**		



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	47.9938	48.05	-15.48	32.57	40.00	-7.43	QP			
2	181.2834	57.88	-20.54	37.34	43.50	-6.16	QP			
3	283.9791	56.18	-16.79	39.39	46.00	-6.61	QP			
4	294.1136	55.50	-16.46	39.04	46.00	-6.96	QP			
5	348.0274	53.31	-15.05	38.26	46.00	-7.74	QP			
6	397.6333	52.70	-14.46	38.24	46.00	-7.76	QP			

5. Antenna Requirement

5.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
Requirement	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

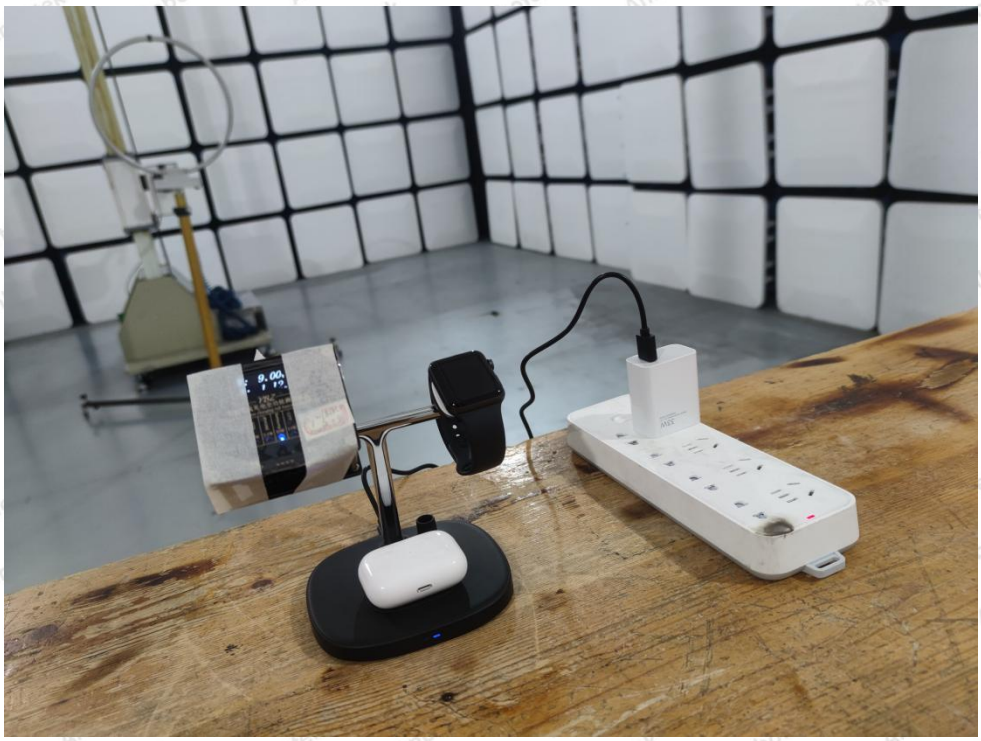
5.2. Antenna Connected Construction

The antenna is a Inductive loop coil Antenna which permanently attached, and the best case gain of the antenna is 0 dBi. It complies with the standard requirement.

APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Conducted Emission Measurement

Photo of Radiation Emission Test



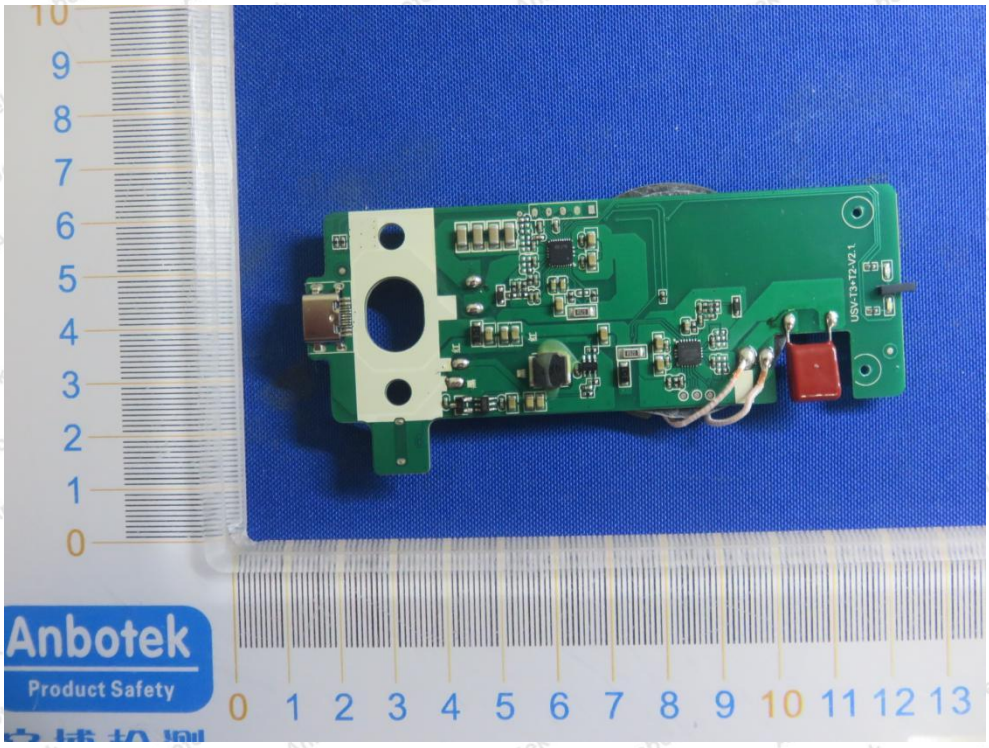
APPENDIX II -- EXTERNAL PHOTOGRAPH

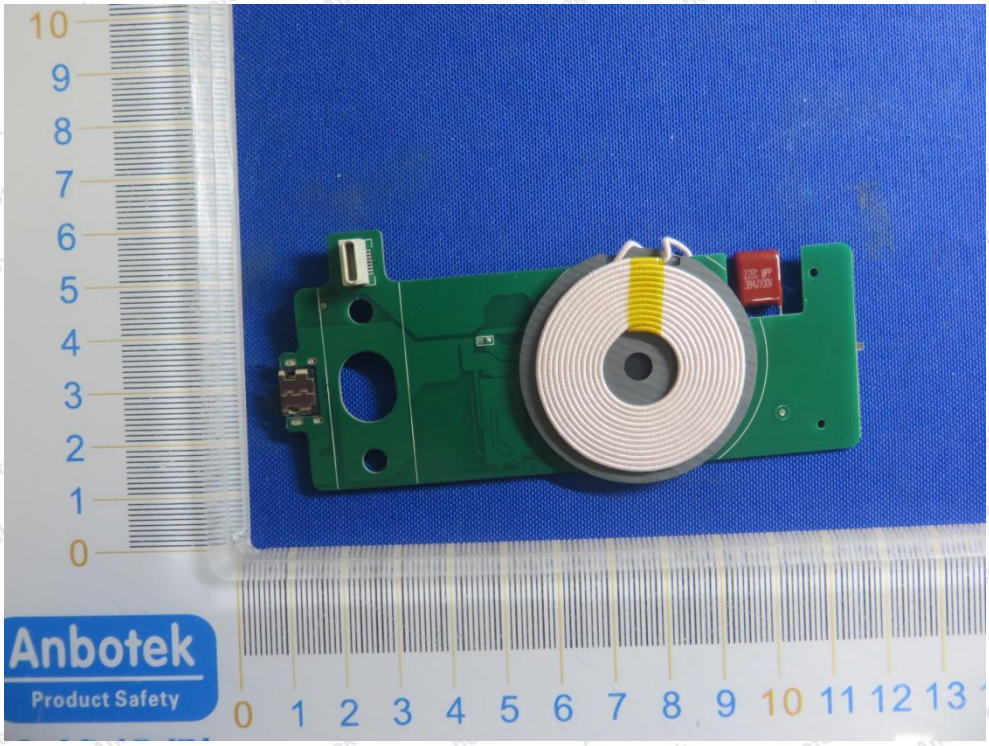

Anbotek
Product Safety

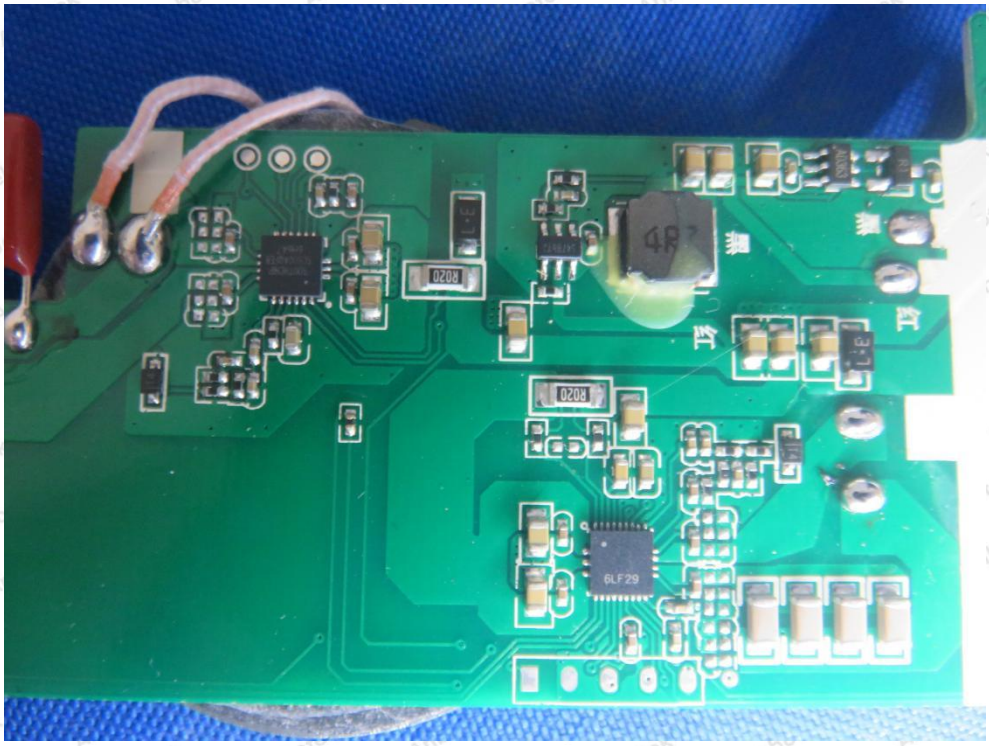

Anbotek
Product Safety


Anbotek
Product Safety

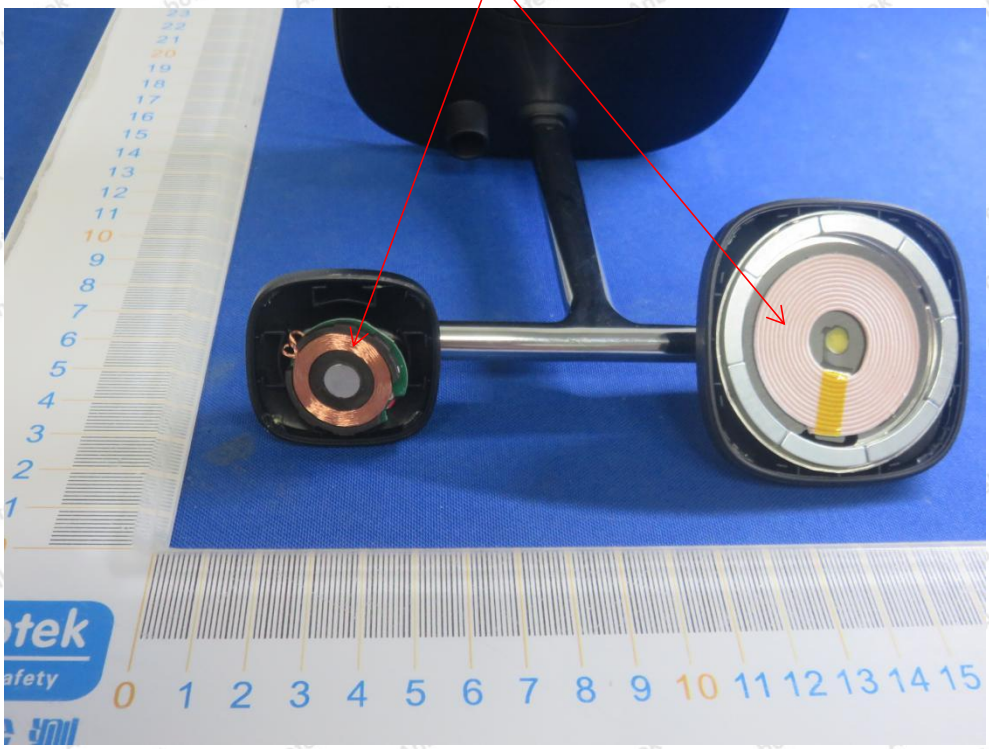
APPENDIX III -- INTERNAL PHOTOGRAPH

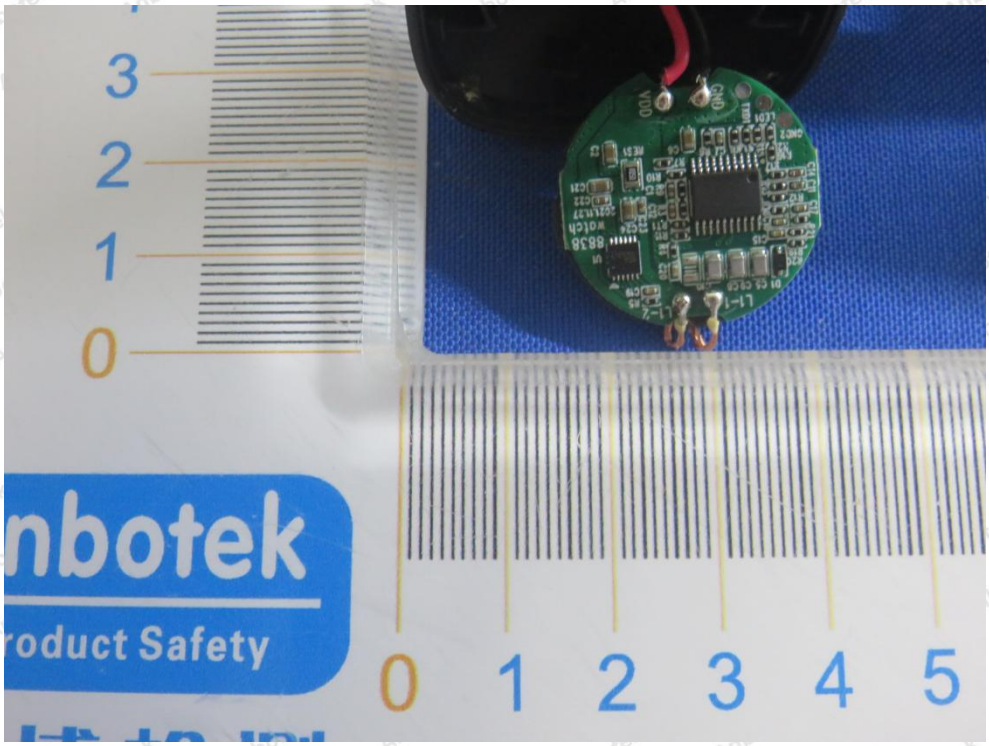


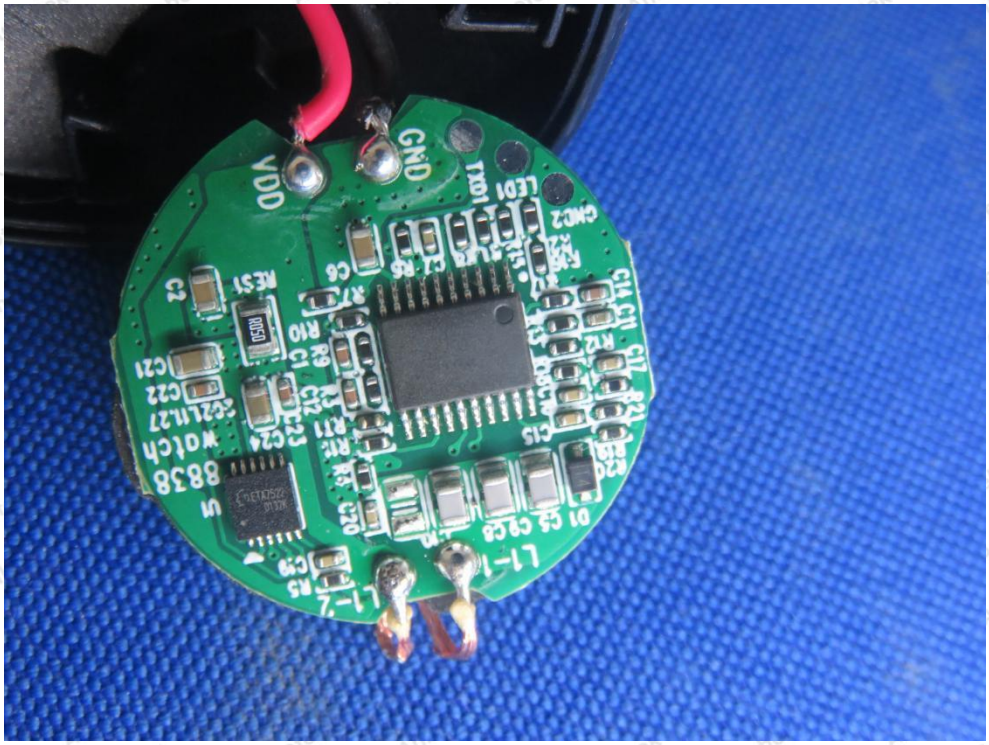

Anbotek
Product Safety



ANT







---------- End of Report ----------