

FCC TEST REPORT

Client Name : Ugreen Group Limited

Address : UGREEN Building, Longcheng Industrial Park
Longguanxi Road, Longhua, ShenZhen, China

Product Name : HiTune T2 True Wireless Earbuds Charging Case

Date : Mar. 12, 2021

Shenzhen Anbotech Compliance Laboratory Limited



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TEST REPORT

Applicant : Ugreen Group Limited
Manufacturer : Ugreen Group Limited
Product Name : HiTune T2 True Wireless Earbuds Charging Case
Model No. : WS105, 80652, 80653, 30613, 30614
Trade Mark : **UGREEN**
Rating(s) : Input: DC 5V, 400mA(with DC 3.7V, 500 mAh Battery inside)
Wireless input: DC 5V, 400mA
Test Standard(s) : **FCC Part15 Subpart C, Paragraph 15.209**
Test Method(s) : **ANSI C63.10: 2013**

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

Jan. 20, 2021

Date of Test

Jan. 20~Feb. 04, 2021

Prepared By

Yilia Zhong

(Engineer / Yilia Zhong)

Reviewer

Bibo Zhang

(Supervisor / Bibo Zhang)

Approved & Authorized Signer

Kingkong Jin

(Manager / Kingkong Jin)

1. General Information

1.1. Client Information

Applicant	:	Ugreen Group Limited
Address	:	UGREEN Building,Longcheng Industrial Park Longguanxi Road,Longhua, ShenZhen, China
Manufacturer	:	Ugreen Group Limited
Address	:	UGREEN Building,Longcheng Industrial Park Longguanxi Road,Longhua, ShenZhen, China
Factory	:	Dongguan Sendonglv Electronics Co.,Ltd
Address	:	111,Nanjiang Road,Humen Town,Dongguan City,China

1.2. Description of Device (EUT)

Product Name	:	HiTune T2 True Wireless Earbuds Charging Case	
Model No.	:	WS105, 80652, 80653, 30613, 30614 (Note: All samples are the same except the model number, so we prepare "WS105" for test only.)	
Trade Mark	:	UGREEN	
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:	111-205KHz
		Modulation Type:	ASK
		Antenna Type:	Inductive loop coil Antenna
		Antenna Gain(Peak):	0 dBi
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	:	M/N: A2013 Input: AC 100-240V, 0.7A, 50-60Hz Output: 3.6-5.5V=3A/ 6.5-9V=2A/ 9-12V=1.5A
Wireless Charger	:	M/N: WD-265B Input: 5V=2A, 9V=1.67A Output: 5V=1A, 9V=1.1A(10W max)

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

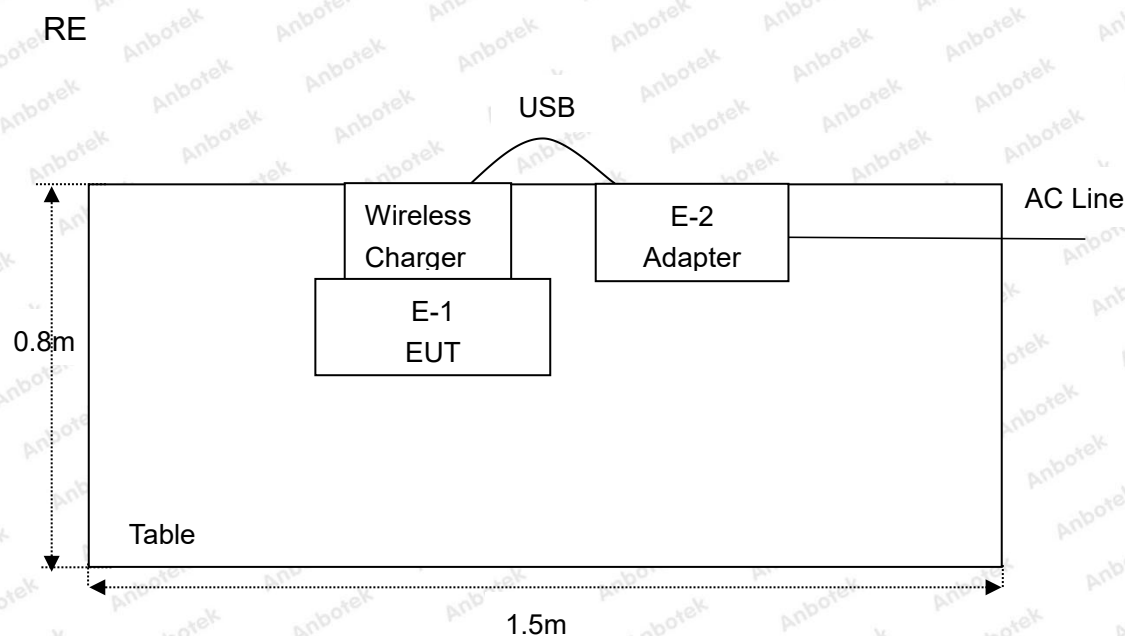
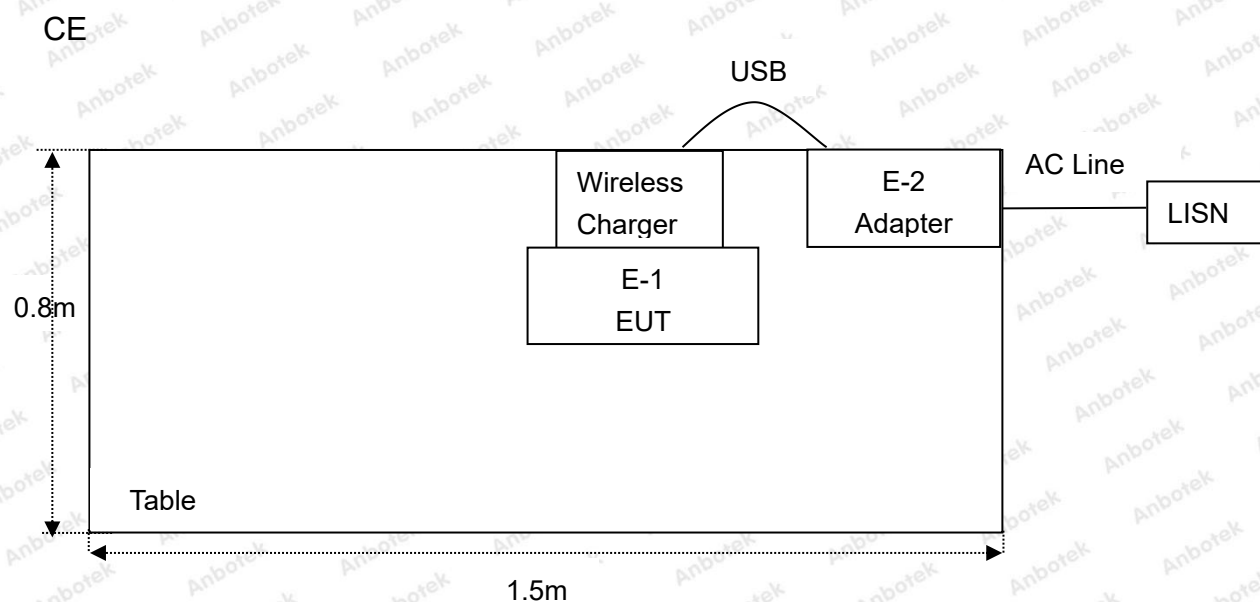
For Conducted Emission	
Final Test Mode	Description
Mode 1	Wireless Charging Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	Wireless Charging Mode

Note: (1)Test channel is 0.1198MHz.

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

1.5. Description Of Test Setup



1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Oct. 26, 2020	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 26, 2020	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 26, 2020	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 26, 2020	1 Year
5.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 26, 2020	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30 D	KD17503	Oct. 26, 2020	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 02, 2020	2 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 02, 2020	2 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Nov. 02, 2020	2 Year
10.	Horn Antenna	A-INFO	LB-180400-K F	J211060628	Nov. 02, 2020	2 Year
11.	Pre-amplifier	SONOMA	310N	186860	Oct. 26, 2020	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. 26, 2020	1 Year
14.	Power Sensor	DAER	RPR3006W	15I00041SN045	Oct. 26, 2020	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN046	Oct. 26, 2020	1 Year
16.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 26, 2020	1 Year
17.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 26, 2020	1 Year
18.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 26, 2020	1 Year
19.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 26, 2020	1 Year
20.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80 B	N/A	Oct. 26, 2020	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 Anbotech 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, September 30, 2020.

ISED-Registration No.: 8058A

Shenzhen Anbotech 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, September 30, 2020.

Test Location

Shenzhen Anbotech 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



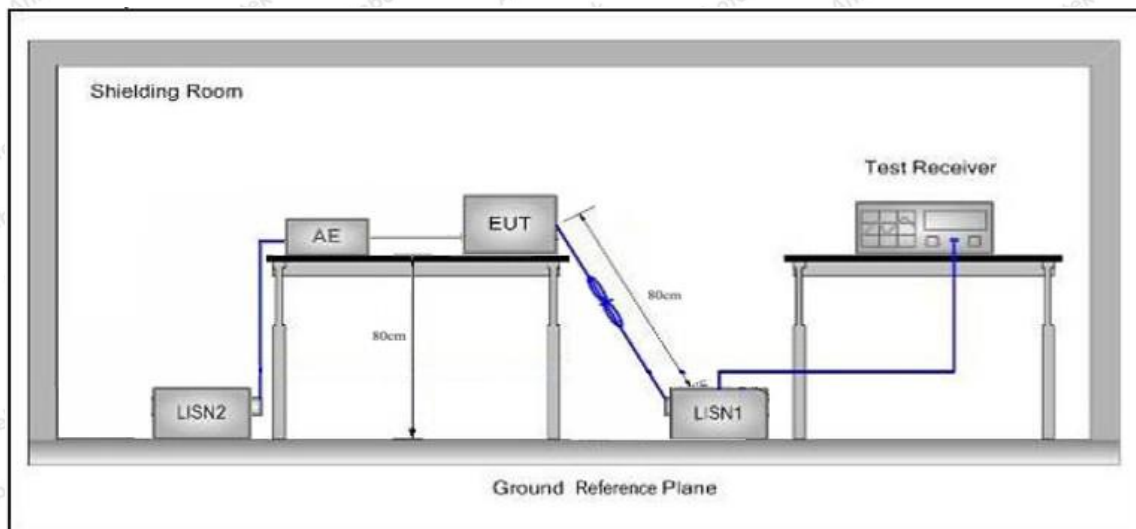
3. Conducted Emission Test

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 C63.10-2013 on Conducted Emission Measurement.

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

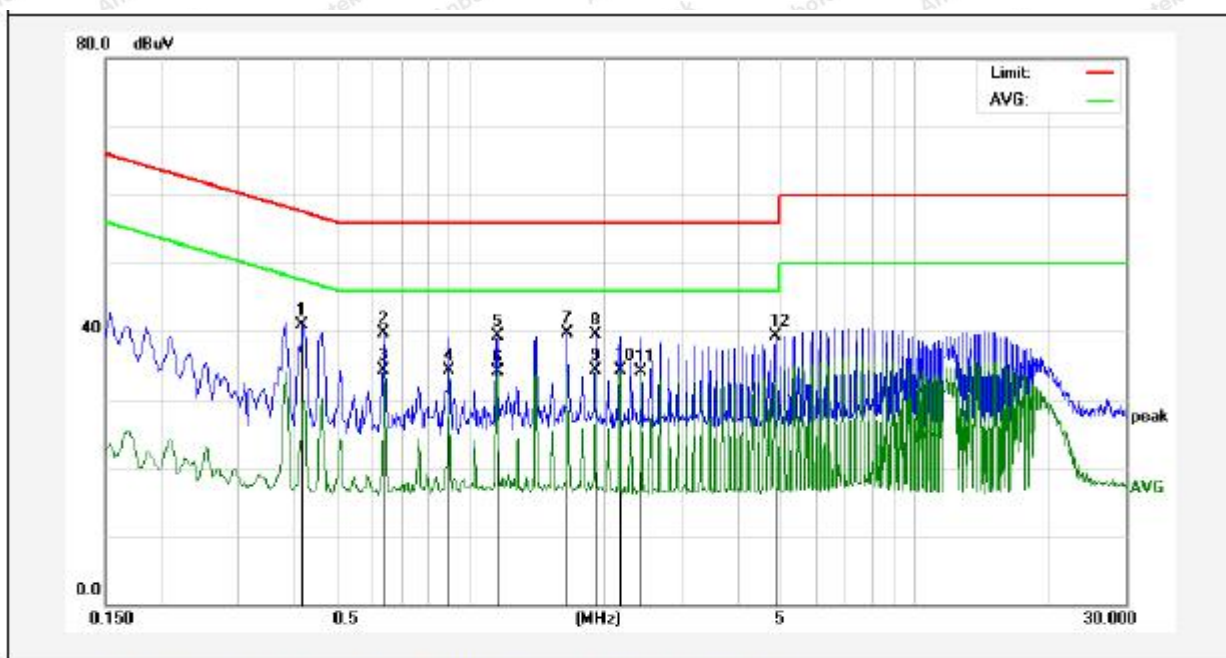
The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

Please to see the following pages

Conducted Emission Test Data

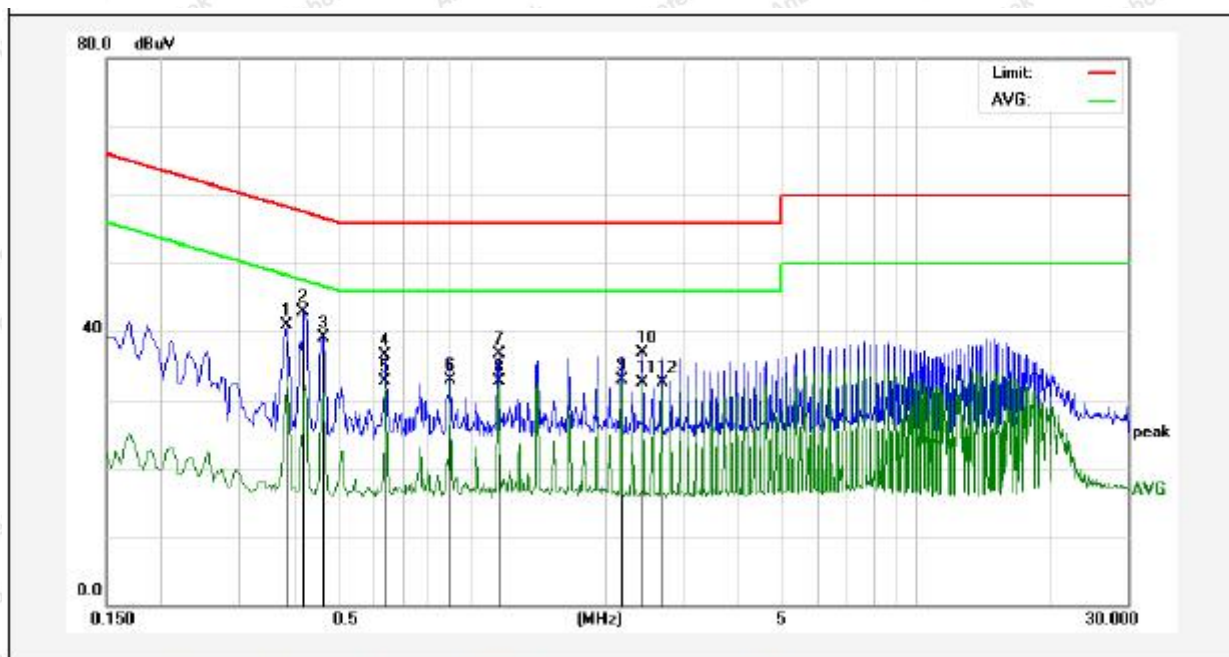
Test Site: 1# Shielded Room
 Operating Condition: Mode 1
 Test Specification: AC 120V, 60Hz for adapter
 Comment: Live Line
 Tem.: 22.3°C Hum.: 50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.4180	20.98	19.94	40.92	57.49	-16.57	QP	
2	0.6380	19.73	20.02	39.75	56.00	-16.25	QP	
3	0.6380	14.23	20.02	34.25	46.00	-11.75	AVG	
4	0.8940	14.23	20.09	34.32	46.00	-11.68	AVG	
5	1.1500	19.27	20.12	39.39	56.00	-16.61	QP	
6	1.1500	14.04	20.12	34.16	46.00	-11.84	AVG	
7	1.6580	19.52	20.13	39.65	56.00	-16.35	QP	
8	1.9140	19.35	20.14	39.49	56.00	-16.51	QP	
9	1.9140	14.24	20.14	34.38	46.00	-11.62	AVG	
10	2.1700	14.12	20.14	34.26	46.00	-11.74	AVG	
11	2.4260	13.87	20.15	34.02	46.00	-11.98	AVG	
12	4.8500	19.09	20.20	39.29	56.00	-16.71	QP	

Conducted Emission Test Data

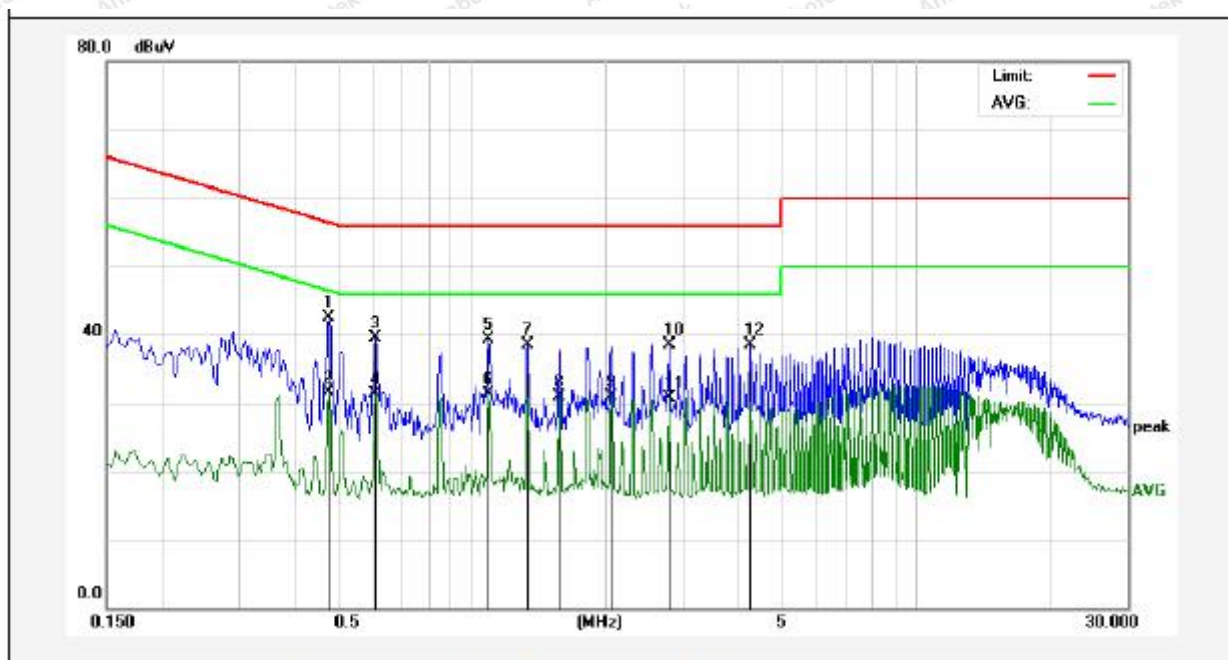
Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 120V, 60Hz for adapter
Comment: Neutral Line
Tem.: 22.3°C Hum.: 50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.3820	20.98	19.93	40.91	58.23	-17.32	QP	
2	0.4180	22.99	19.94	42.93	57.49	-14.56	QP	
3	0.4620	19.23	19.96	39.19	56.66	-17.47	QP	
4	0.6380	16.54	20.02	36.56	56.00	-19.44	QP	
5	0.6380	12.68	20.02	32.70	46.00	-13.30	AVG	
6	0.8940	12.82	20.09	32.91	46.00	-13.09	AVG	
7	1.1500	16.51	20.12	36.63	56.00	-19.37	QP	
8	1.1500	12.57	20.12	32.69	46.00	-13.31	AVG	
9	2.1700	12.70	20.14	32.84	46.00	-13.16	AVG	
10	2.4260	16.67	20.15	36.82	56.00	-19.18	QP	
11	2.4260	12.41	20.15	32.56	46.00	-13.44	AVG	
12	2.6820	12.31	20.15	32.46	46.00	-13.54	AVG	

Conducted Emission Test Data

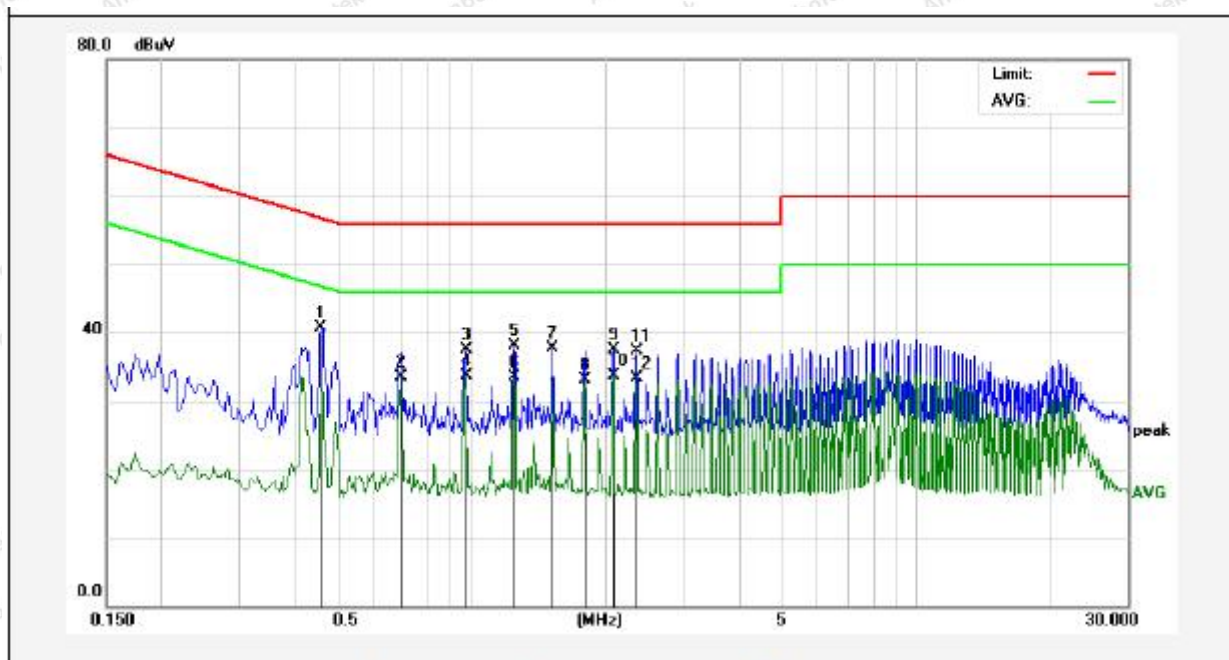
Test Site: 1# Shielded Room
 Operating Condition: Mode 1
 Test Specification: AC 240V, 60Hz for adapter
 Comment: Live Line
 Tem.: 22.3°C Hum.: 50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.4779	22.46	19.97	42.43	56.38	-13.95	QP	
2	0.4779	11.52	19.97	31.49	46.38	-14.89	AVG	
3	0.6059	19.50	20.01	39.51	56.00	-16.49	QP	
4	0.6059	11.29	20.01	31.30	46.00	-14.70	AVG	
5	1.0900	19.09	20.12	39.21	56.00	-16.79	QP	
6	1.0900	11.13	20.12	31.25	46.00	-14.75	AVG	
7	1.3380	18.41	20.13	38.54	56.00	-17.46	QP	
8	1.5740	10.81	20.13	30.94	46.00	-15.06	AVG	
9	2.0579	10.73	20.14	30.87	46.00	-15.13	AVG	
10	2.7900	18.42	20.16	38.58	56.00	-17.42	QP	
11	2.7900	10.64	20.16	30.80	46.00	-15.20	AVG	
12	4.2458	18.30	20.19	38.49	56.00	-17.51	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.: 22.3℃ Hum.: 50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.4580	20.80	19.96	40.76	56.73	-15.97	QP	
2	0.6939	13.48	20.04	33.52	46.00	-12.48	AVG	
3	0.9699	17.43	20.11	37.54	56.00	-18.46	QP	
4	0.9699	13.68	20.11	33.79	46.00	-12.21	AVG	
5	1.2459	17.99	20.12	38.11	56.00	-17.89	QP	
6	1.2459	13.45	20.12	33.57	46.00	-12.43	AVG	
7	1.5180	17.55	20.13	37.68	56.00	-18.32	QP	
8	1.8020	13.06	20.14	33.20	46.00	-12.80	AVG	
9	2.0779	17.32	20.14	37.46	56.00	-18.54	QP	
10	2.0779	13.48	20.14	33.62	46.00	-12.38	AVG	
11	2.3540	17.15	20.15	37.30	56.00	-18.70	QP	
12	2.3540	13.14	20.15	33.29	46.00	-12.71	AVG	

4. Radiation Spurious Emission and Band Edge

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

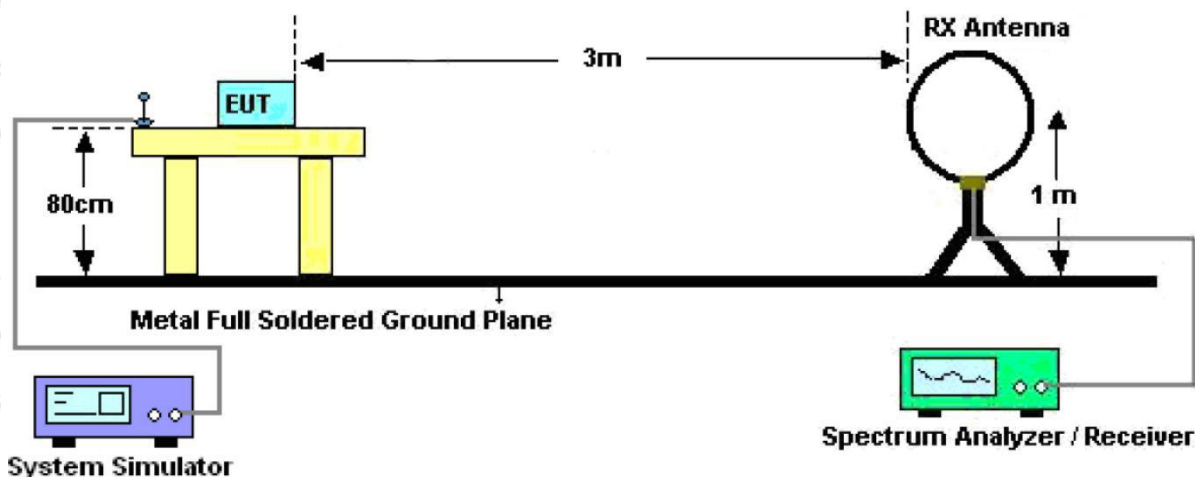


Figure 1. Below 30MHz

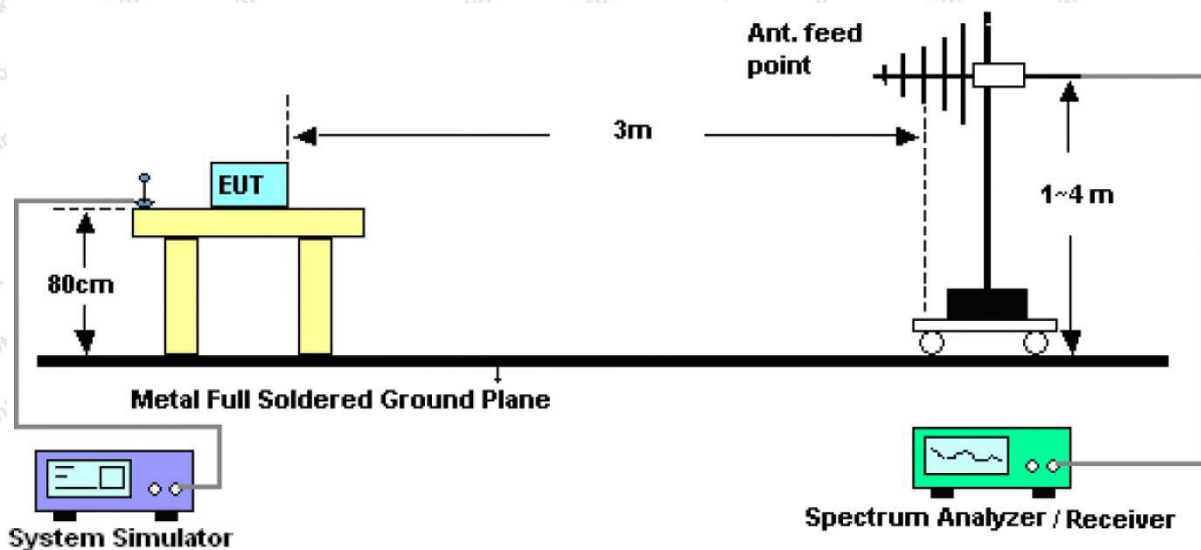


Figure 2. 30MHz to 1GHz

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.

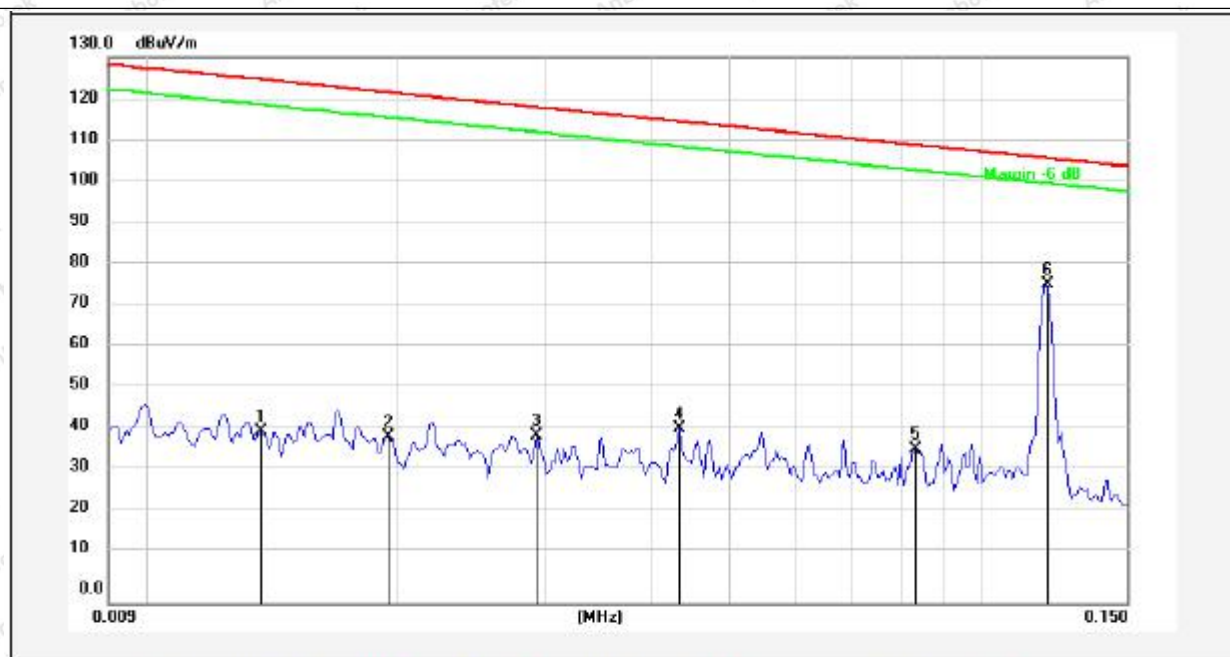
4.4. Test Data

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):** 22.1°C/50%RH**Test Mode:** Mode 1**Distance:** 3m

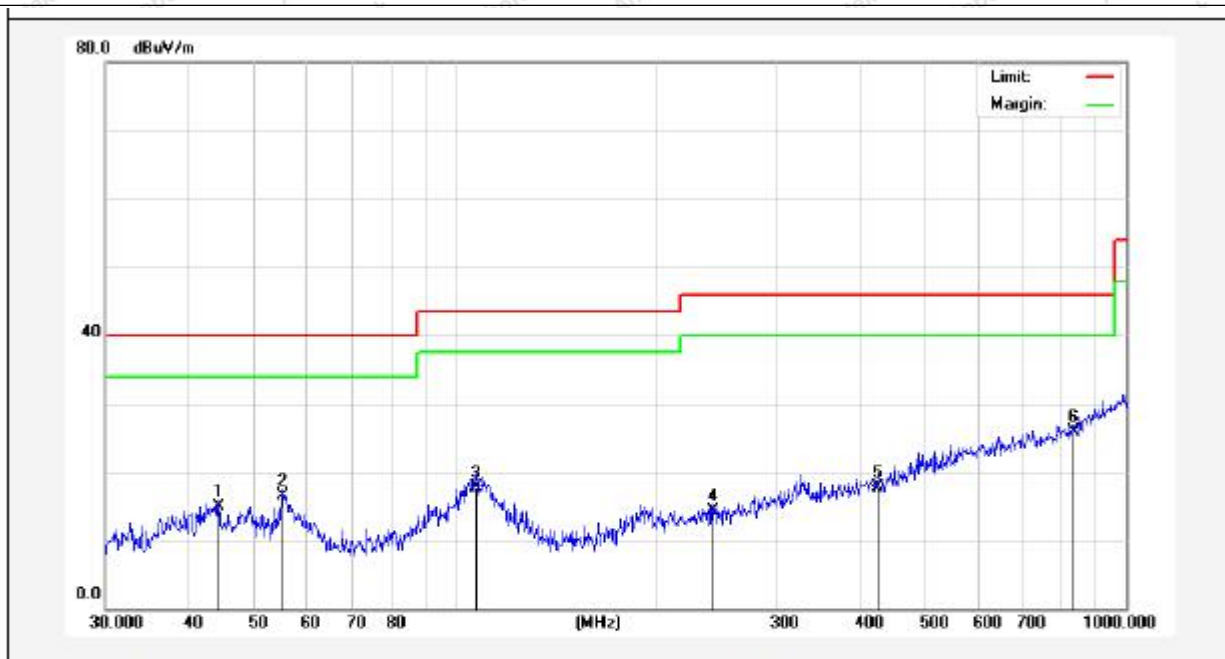
No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	0.0137	20.51	20.17	40.68	124.68	-84.00	AV			
2	0.0194	19.32	20.30	39.62	121.68	-82.06	AV			
3	0.0293	19.34	20.46	39.80	118.12	-78.32	AV			
4	0.0434	20.99	20.45	41.44	114.72	-73.28	AV			
5	0.0834	16.20	20.37	36.57	109.09	-72.52	AV			
6	0.1198	55.61	20.34	75.95	105.96	-30.01	AV			



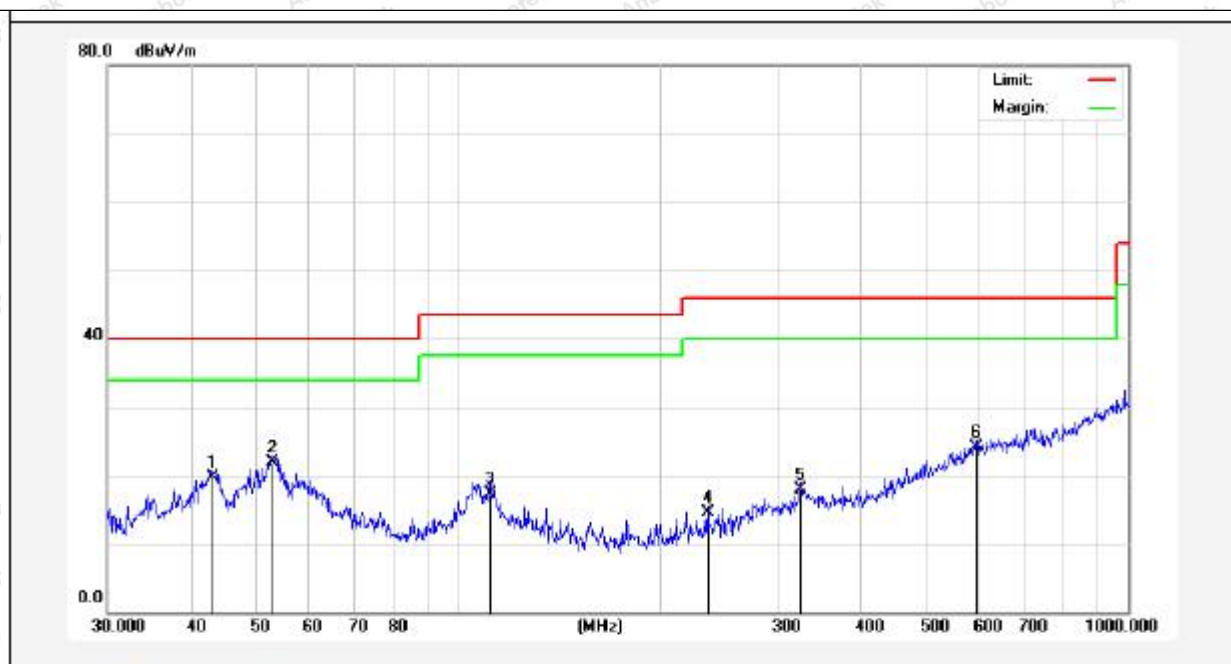
No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	0.5947	26.79	20.27	47.06	72.12	-25.06	QP			
2	1.1842	22.68	20.26	42.94	66.16	-23.22	QP			
3	2.1213	19.11	20.28	39.39	69.50	-30.11	QP			
4	3.7494	12.02	20.35	32.37	69.50	-37.13	QP			
5	7.5658	7.57	20.48	28.05	69.50	-41.45	QP			
6	14.2881	6.86	20.54	27.40	69.50	-42.10	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):****21.2℃/52%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	44.2752	29.32	-14.37	14.95	40.00	-25.05	QP	100	360	
2	55.2207	33.08	-16.51	16.57	40.00	-23.43	QP	100	0	
3	107.1337	38.41	-20.71	17.70	43.50	-25.80	QP	100	0	
4	241.6763	33.32	-19.01	14.31	46.00	-31.69	QP	100	360	
5	425.0280	30.22	-12.51	17.71	46.00	-28.29	QP	100	0	
6	833.3171	29.34	-3.50	25.84	46.00	-20.16	QP	100	360	

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):****21.2°C/52%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	43.0505	33.60	-13.90	19.70	40.00	-20.30	QP	100	360	
2	52.9453	37.73	-15.83	21.90	40.00	-18.10	QP	100	0	
3	111.7380	33.85	-16.52	17.33	43.50	-26.17	QP	100	0	
4	235.8164	30.37	-15.82	14.55	46.00	-31.45	QP	100	360	
5	324.4561	30.65	-12.71	17.94	46.00	-28.06	QP	100	0	
6	593.0497	31.04	-6.91	24.13	46.00	-21.87	QP	100	360	



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 Power Line Conducted Emission Test



Photo of Radiation Emission Test

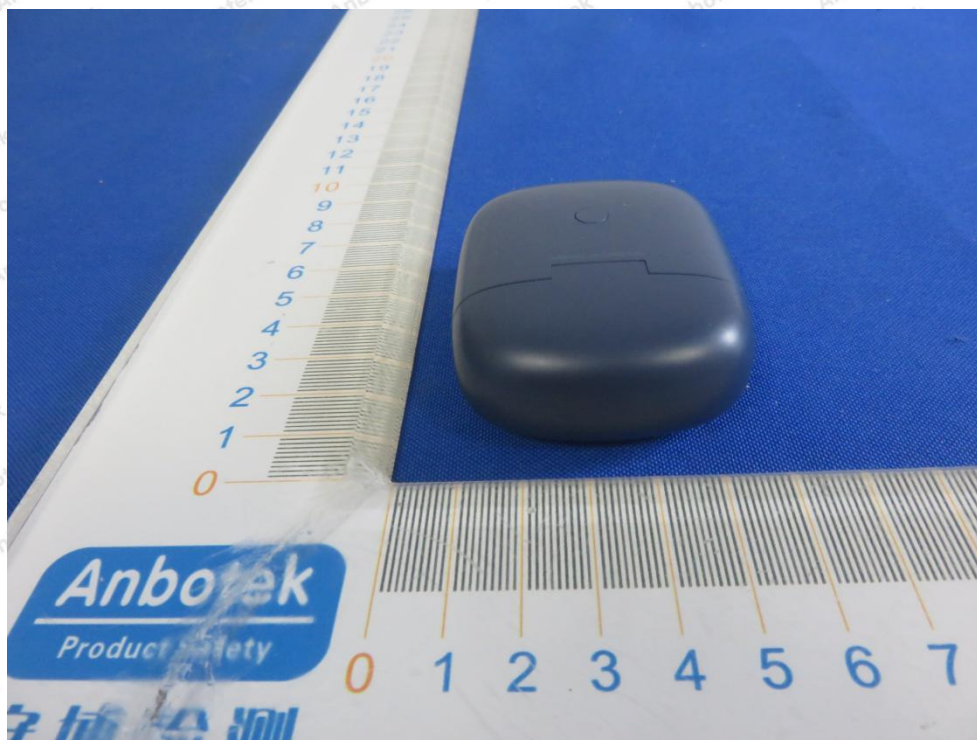


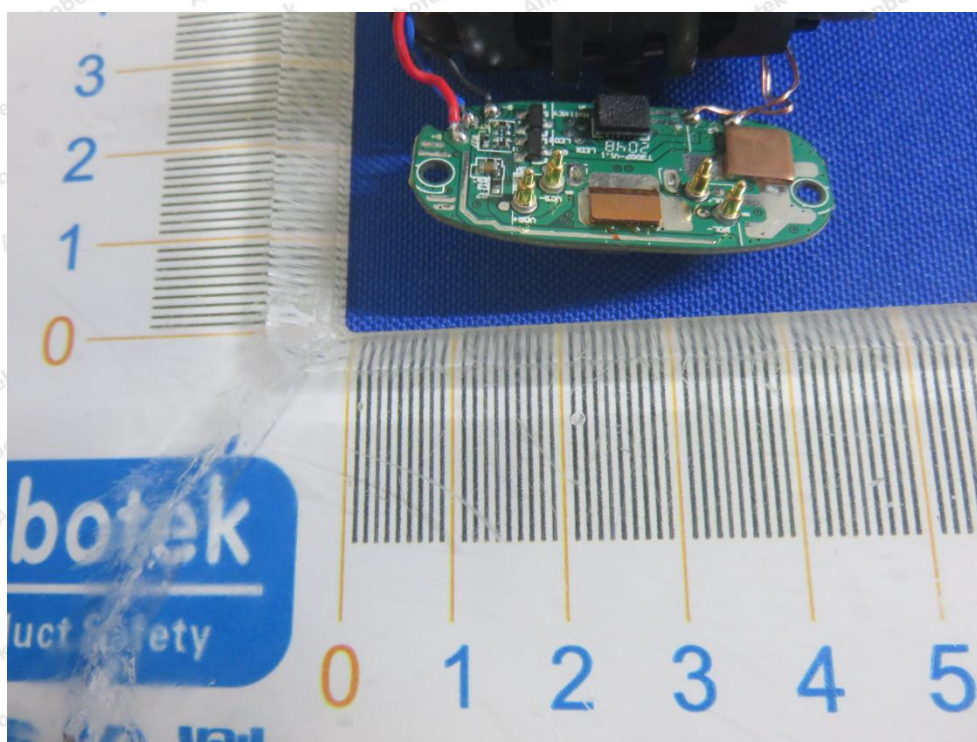


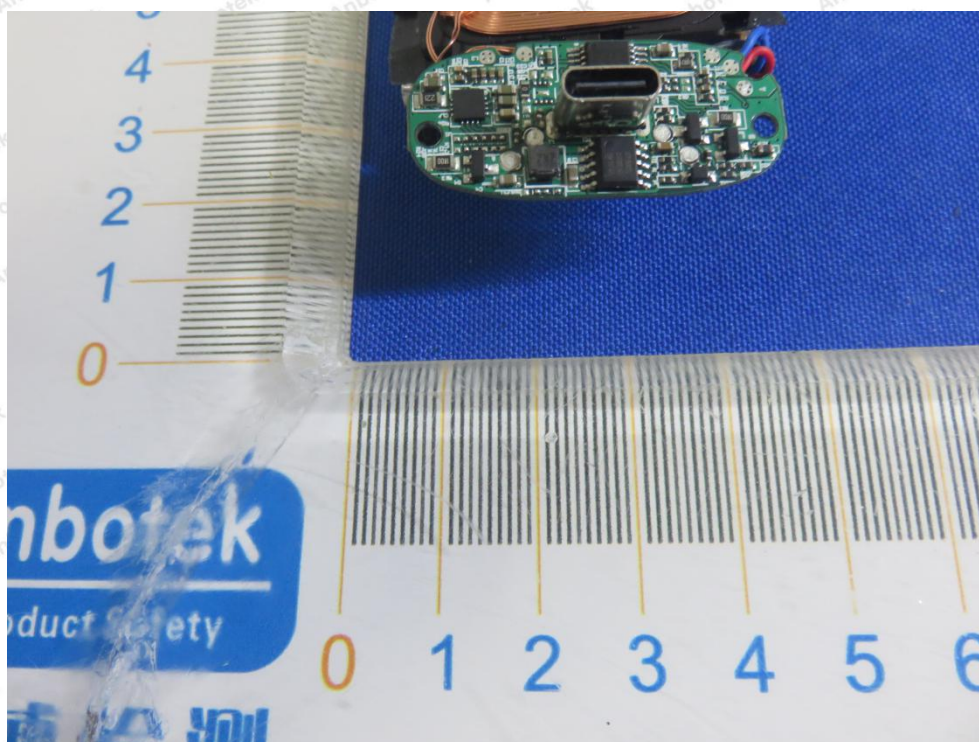
APPENDIX II -- EXTERNAL PHOTOGRAPH



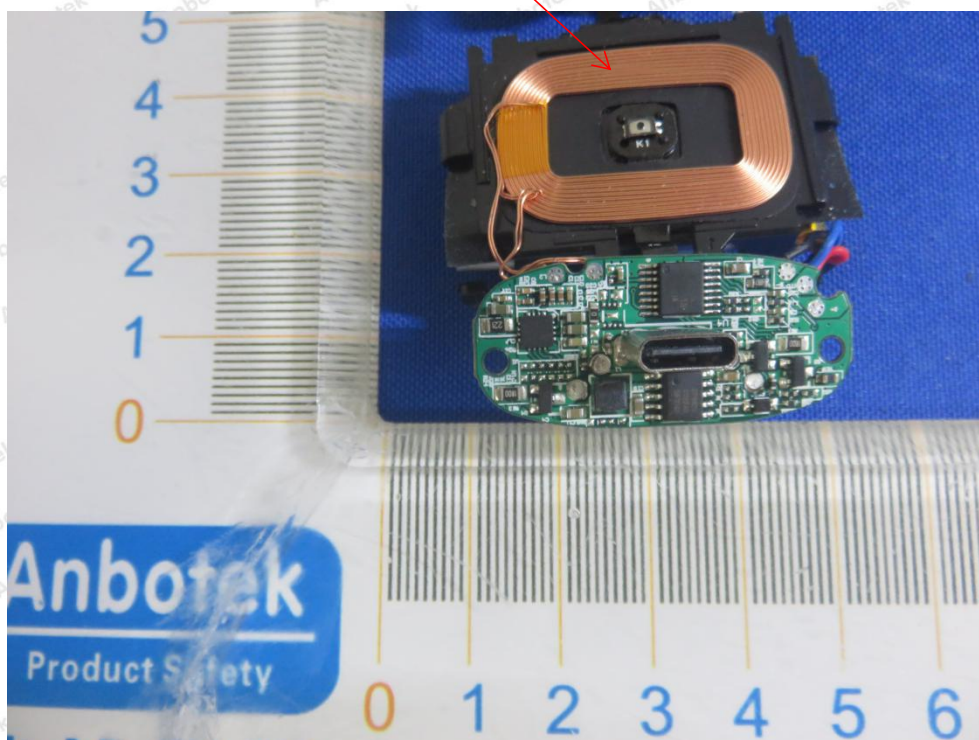


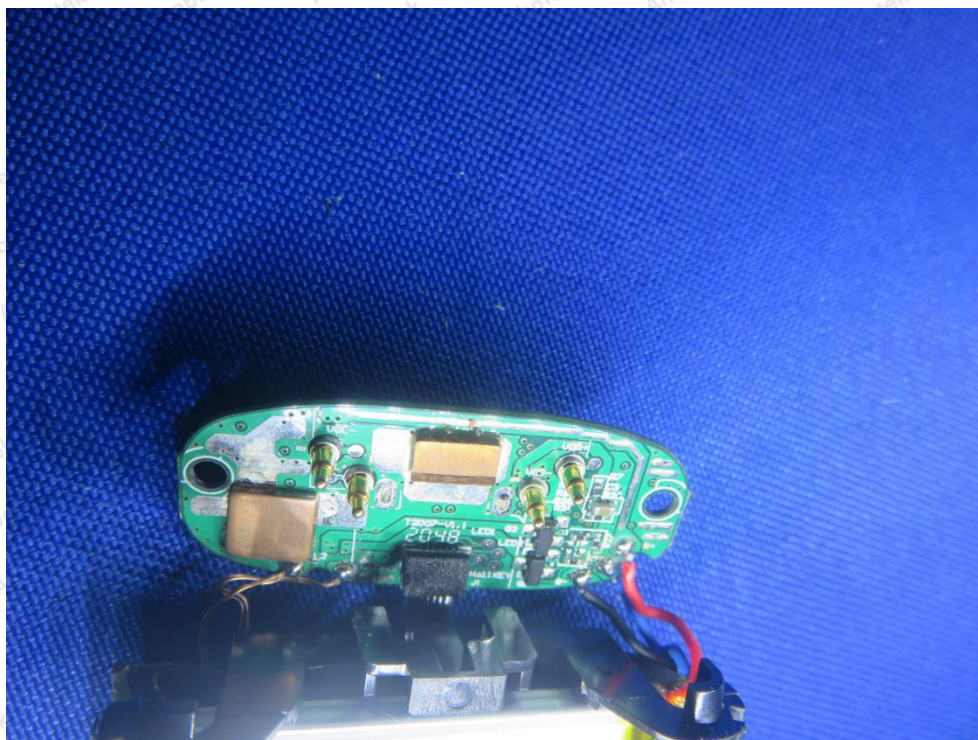
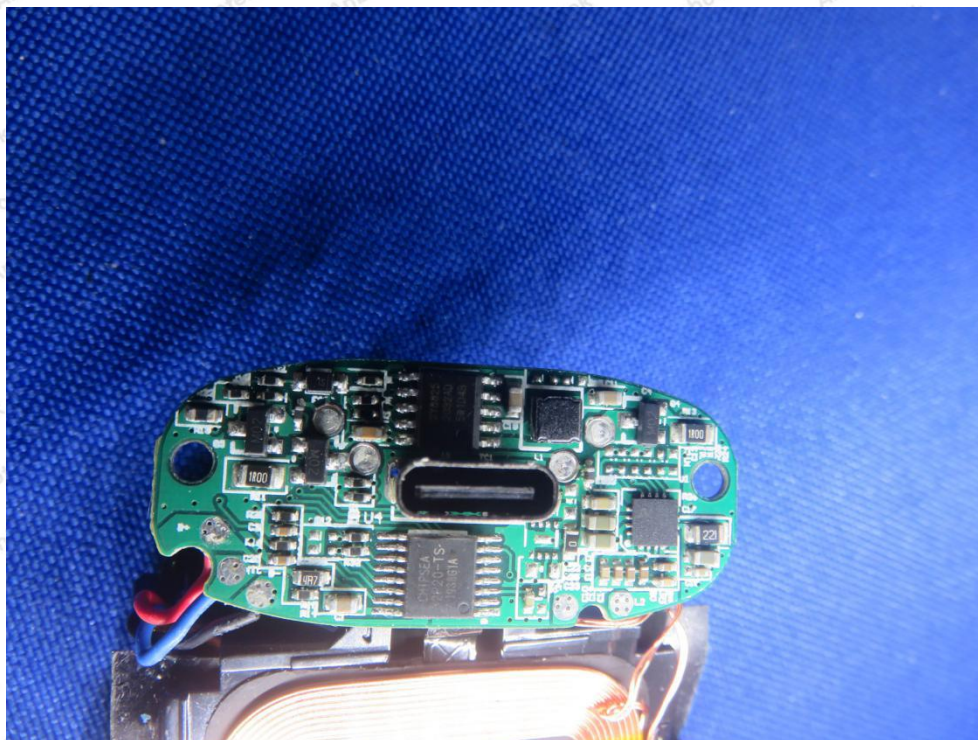


APPENDIX III -- INTERNAL PHOTOGRAPH



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

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