

FCC TEST REPORT

For

Wintop Electronics Co., Limited

Wireless Charger

Model No.: YM-C18, YM-C15, YM-C16, YM-C17, MA-SBW002-A, YM-C20

Prepared For : Wintop Electronics Co., Limited
Address : Unit 04 7/F, Bright Way Tower 33, Mong Kok RD, KL, Hong Kong

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Report Number : SZAWW181018011-01

Date of Receipt : Oct. 18, 2018

Date of Test : Oct. 18~Nov. 26, 2018

Date of Report : Nov. 27, 2018

Contents

1. General Information.....	4
1.1. Client Information.....	4
1.2. Description of Device (EUT).....	4
1.3. Auxiliary Equipment Used During Test.....	4
1.4. Description of Test Modes.....	5
1.5. Description Of Test Setup.....	6
1.6. Test Equipment List.....	7
1.7. Description of Test Facility.....	8
2. Summary of Test Results.....	9
3. Conducted Emission Test.....	10
3.1. Test Standard and Limit.....	10
3.2. Test Setup.....	10
3.3. Test Procedure.....	10
3.4. Test Data.....	10
4. Radiation Spurious Emission and Band Edge.....	15
4.1. Test Standard and Limit.....	15
4.2. Test Setup.....	15
4.3. Test Procedure.....	16
4.4. Test Data.....	17
5. Antenna Requirement.....	23
5.1. Test Standard and Requirement.....	23
5.2. Antenna Connected Construction.....	23
APPENDIX I -- TEST SETUP PHOTOGRAPH.....	24
APPENDIX II -- EXTERNAL PHOTOGRAPH.....	26
APPENDIX III -- INTERNAL PHOTOGRAPH.....	29

TEST REPORT

Applicant : Wintop Electronics Co., Limited
Manufacturer : Shenzhen Wintop Electronics Co., Ltd
Product Name : Wireless Charger
Model No. : YM-C18, YM-C15, YM-C16, YM-C17, MA-SBW002-A, YM-C20
Trade Mark : N.A.
Rating(s) : Input: DC 5V, 2A / 9V, 1.67A
Output: 10W MAX

Test Standard(s) : FCC Part15 Subpart C 2018, Paragraph 15.209

Test Method(s) : ANSI C63.10: 2013

The device described above is tested by Shenzhen Anbotech 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 Anbotech 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 Anbotech Compliance Laboratory Limited.

Date of Test

Oct. 18~Nov. 26, 2018

Prepared By



Oliay Yang

(Engineer / Oliay Yang)

Reviewer

Snowy Meng

(Supervisor / Snowy Meng)

Approved & Authorized Signer

Sally Zhang

(Manager / Sally Zhang)

1. General Information

1.1. Client Information

Applicant	:	Wintop Electronics Co., Limited
Address	:	Unit 04 7/F, Bright Way Tower 33, Mong Kok RD, KL, Hong Kong
Manufacturer	:	Shenzhen Wintop Electronics Co., Ltd
Address	:	No.46 Xinhe Road, Shangmugu Pinghu Town, Longgang District, Shenzhen, China
Factory	:	Shenzhen Wintop Electronics Co., Ltd
Address	:	No.46 Xinhe Road, Shangmugu Pinghu Town, Longgang District, Shenzhen, China

1.2. Description of Device (EUT)

Product Name	:	Wireless Charger	
Model No.	:	YM-C18, YM-C15, YM-C16,YM-C17, MA-SBW002-A, YM-C20 (Note: All samples are the same except the appearance, so we prepare "YM-C18" for test only.)	
Trade Mark	:	N.A.	
Test Power Supply	:	AC 240V, 60Hz for adapter/ AC 120V, 60Hz for adapter	
Test Sample No.	:	S1(Normal Sample), S2(Engineering Sample)	
Product Description	:	Operation Frequency:	111~205KHz
	:	Modulation Type:	MSK
	:	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	:	Model: HA612 Input: 100-240V 50-60Hz 0.5A Output: 5V--- 2.5A/ 9V--- 2A/ 12V--- 1.5A
Mouse	:	Model: WM-799W

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.

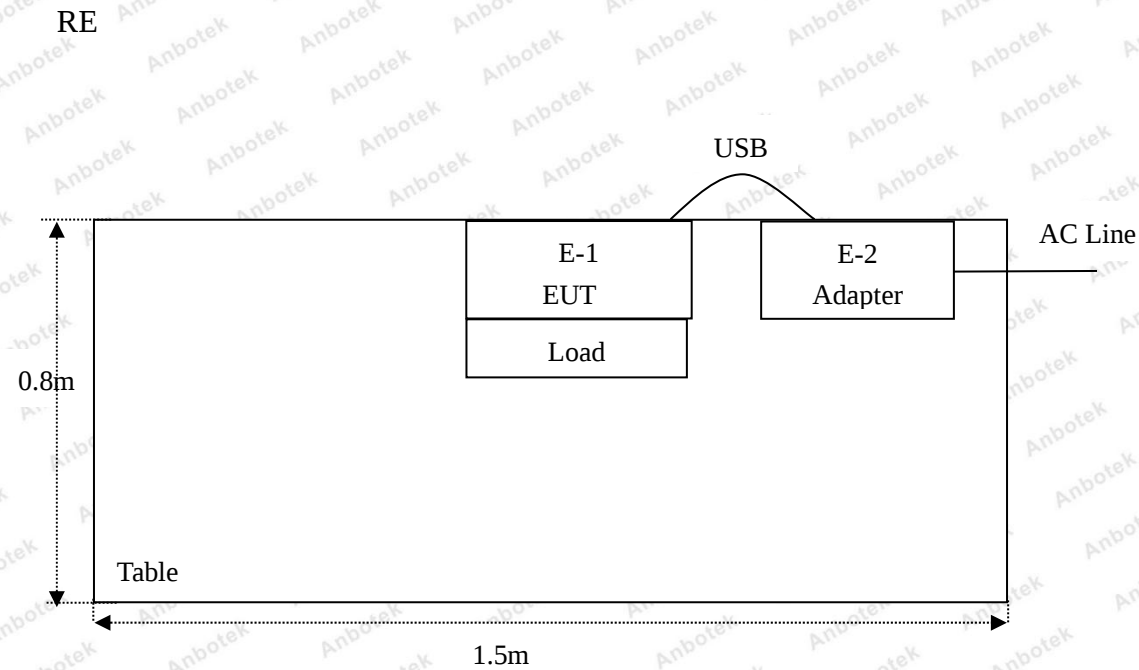
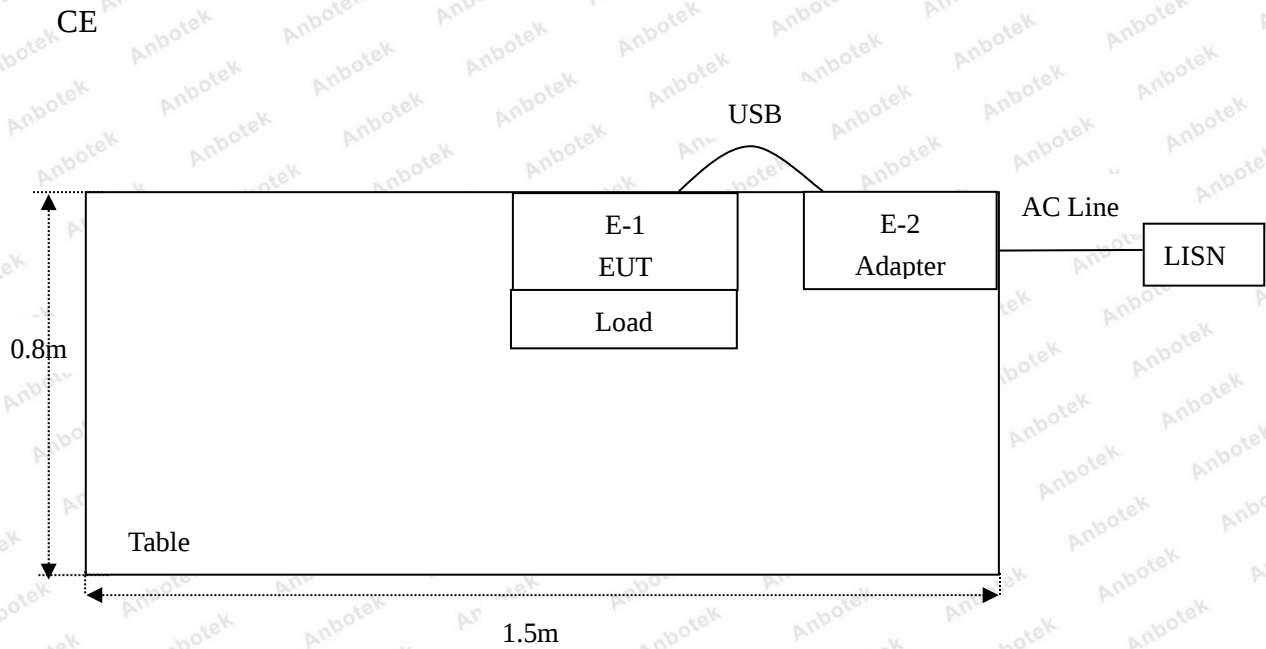
Remark: All the conditions have been tested. It is found that 10W is the worst mode, and the data in the report only reflects the worst mode.

Pretest Mode	Description
Mode 1	Wireless Charge Mode

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

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

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	Nov. 05, 2018	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESPI3	101604	Nov. 05, 2018	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Nov. 05, 2018	1 Year
4.	Spectrum Analysis	Agilent	E4407B	US39390582	Nov. 05, 2018	1 Year
5.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 05, 2018	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	Nov. 05, 2018	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 19, 2018	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 19, 2018	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Nov. 19, 2018	1 Year
10.	Horn Antenna	A-INFO	LB-180400-KF	J211060628	Nov. 20, 2018	1 Year
11.	Pre-amplifier	SONOMA	310N	186860	Nov. 05, 2018	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	Nov. 05, 2018	1 Year
14.	Power Sensor	DAER	RPR3006W	15I00041SN045	Nov. 05, 2018	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN046	Nov. 05, 2018	1 Year
16.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 05, 2018	1 Year
17.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Nov. 05, 2018	1 Year
18.	Signal Generator	Agilent	E4421B	MY41000743	Nov. 05, 2018	1 Year
19.	DC Power Supply	IVYTECH	IV3605	1804D360510	Apr. 02, 2018	1 Year
20.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	Nov. 01, 2018	1 Year

1.7. 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, July 31, 2017.

ISED-Registration No.: 8058A-1

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-1, June 13, 2016.

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

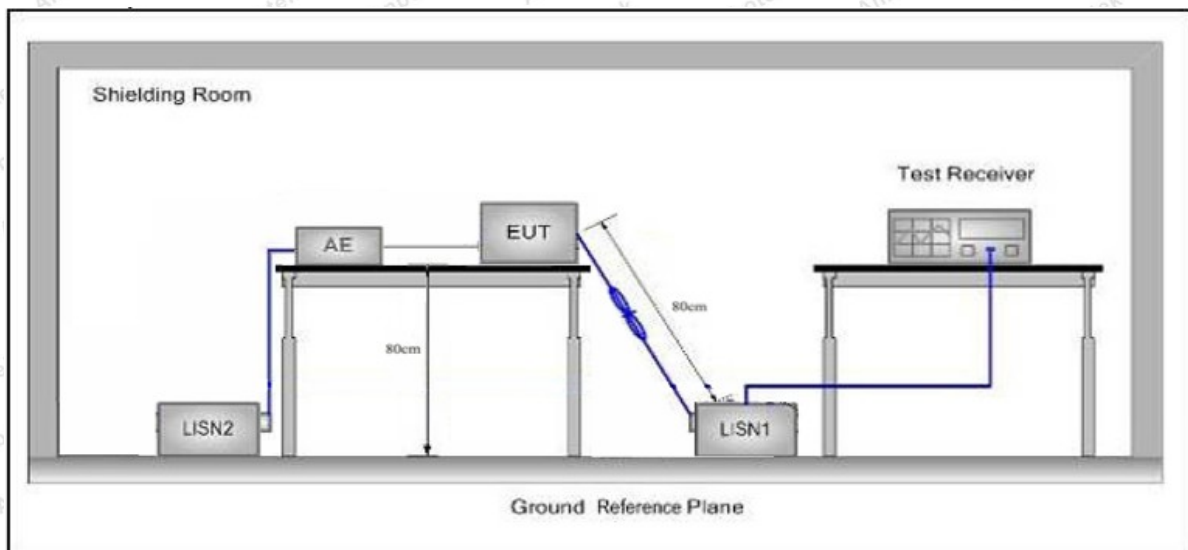
Standard Section	Test Item	Result
FCC Part 15, Paragraph 15.207	Conducted Emission Test	PASS
FCC Part 15, Paragraph 15.209(a)(f)	Spurious Emission	PASS
Part 15.203	Antenna Requirement	PASS

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.

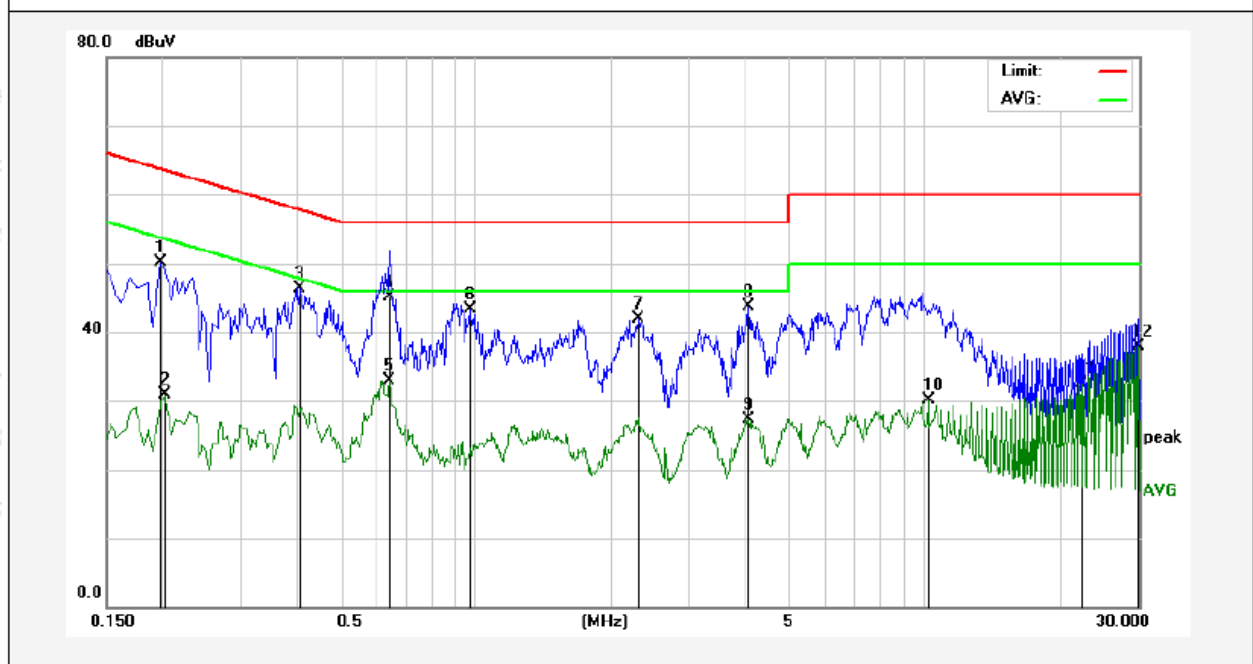
The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

Please to see the following pages

Conducted Emission Test Data

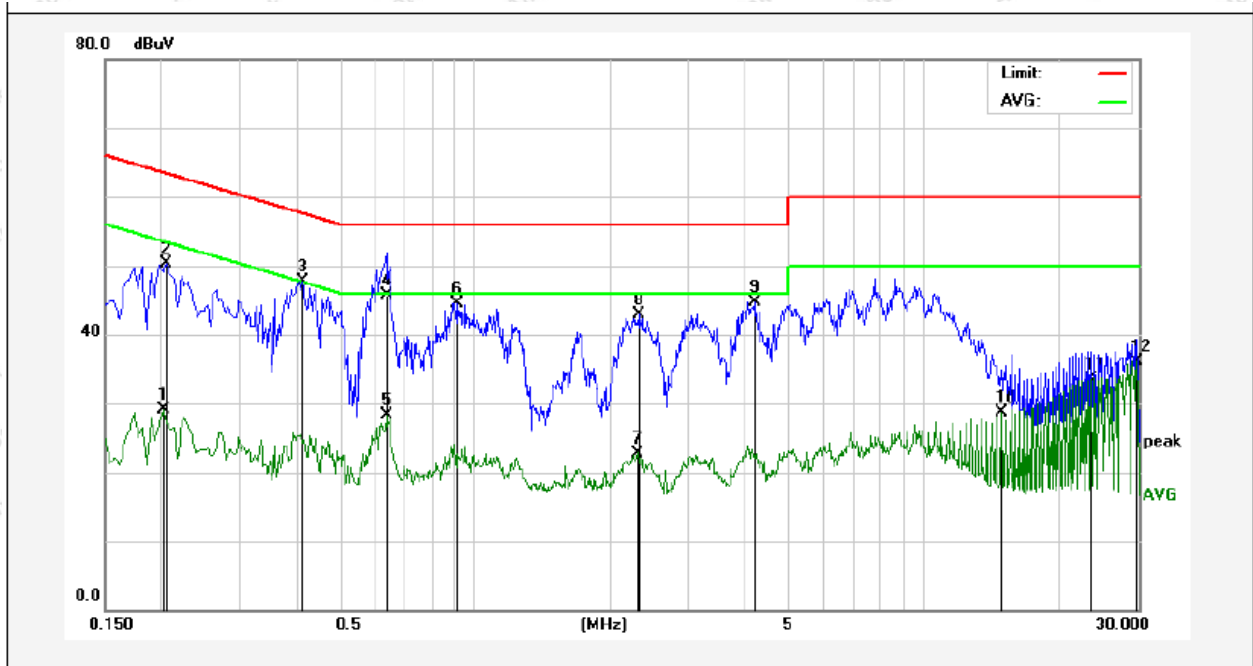
Test Site: 1# Shielded Room
Operating Condition: Wireless Charge Mode
Test Specification: AC 240V, 60Hz for adapter
Comment: Live Line
Tem.: 23.5°C Hum.: 56%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.1980	30.11	19.90	50.01	63.69	-13.68	QP	
2	0.2020	10.92	19.90	30.82	53.52	-22.70	AVG	
3	0.4060	26.46	19.94	46.40	57.73	-11.33	QP	
4	0.6419	25.14	20.02	45.16	56.00	-10.84	QP	
5	0.6419	12.88	20.02	32.90	46.00	-13.10	AVG	
6	0.9700	23.19	20.11	43.30	56.00	-12.70	QP	
7	2.2980	21.84	20.15	41.99	56.00	-14.01	QP	
8	4.0500	23.56	20.18	43.74	56.00	-12.26	QP	
9	4.0500	7.18	20.18	27.36	46.00	-18.64	AVG	
10	10.2140	9.70	20.34	30.04	50.00	-19.96	AVG	
11	22.4460	12.10	20.31	32.41	50.00	-17.59	AVG	
12	29.8700	17.69	20.27	37.96	50.00	-12.04	AVG	

Conducted Emission Test Data

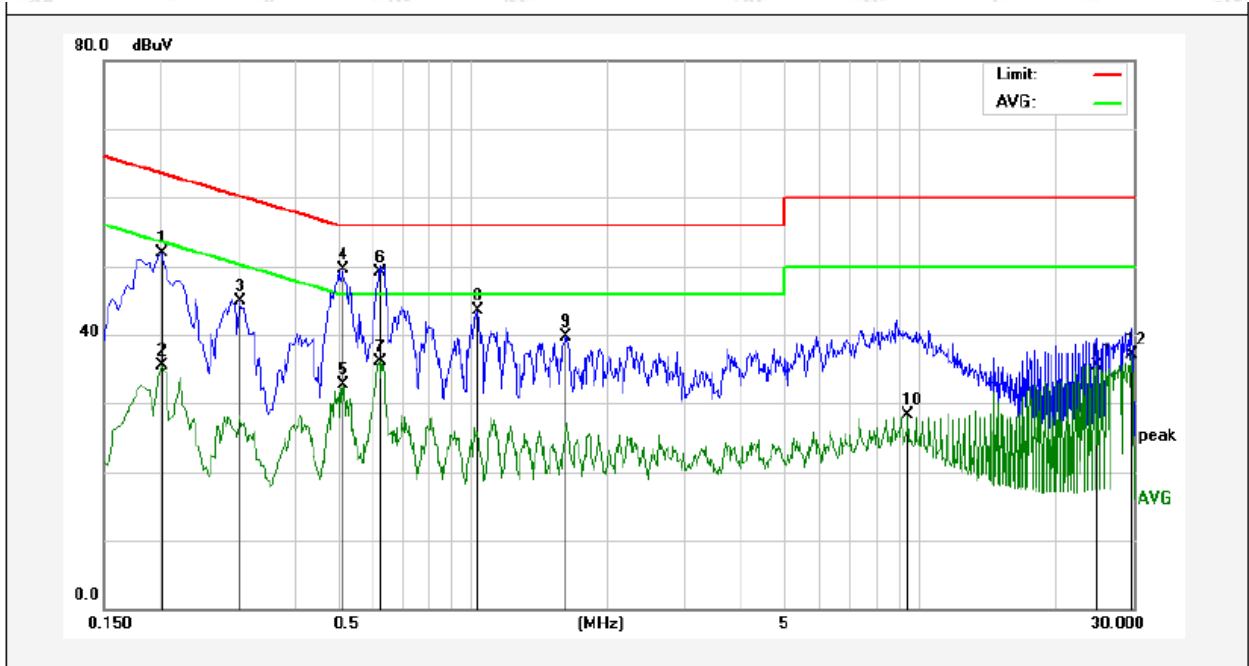
Test Site: 1# Shielded Room
Operating Condition: Wireless Charge Mode
Test Specification: AC 240V, 60Hz for adapter
Comment: Neutral Line
Tem.: 23.5°C Hum.: 56%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.2020	9.22	19.90	29.12	53.52	-24.40	AVG	
2	0.2060	30.40	19.90	50.30	63.36	-13.06	QP	
3	0.4140	27.83	19.94	47.77	57.57	-9.80	QP	
4	0.6340	25.76	20.02	45.78	56.00	-10.22	QP	
5	0.6340	8.36	20.02	28.38	46.00	-17.62	AVG	
6	0.9140	24.47	20.10	44.57	56.00	-11.43	QP	
7	2.2980	2.65	20.15	22.80	46.00	-23.20	AVG	
8	2.3300	22.80	20.15	42.95	56.00	-13.05	QP	
9	4.1900	24.55	20.18	44.73	56.00	-11.27	QP	
10	14.8460	8.53	20.26	28.79	50.00	-21.21	AVG	
11	23.5940	13.26	20.30	33.56	50.00	-16.44	AVG	
12	29.8060	15.77	20.27	36.04	50.00	-13.96	AVG	

Conducted Emission Test Data

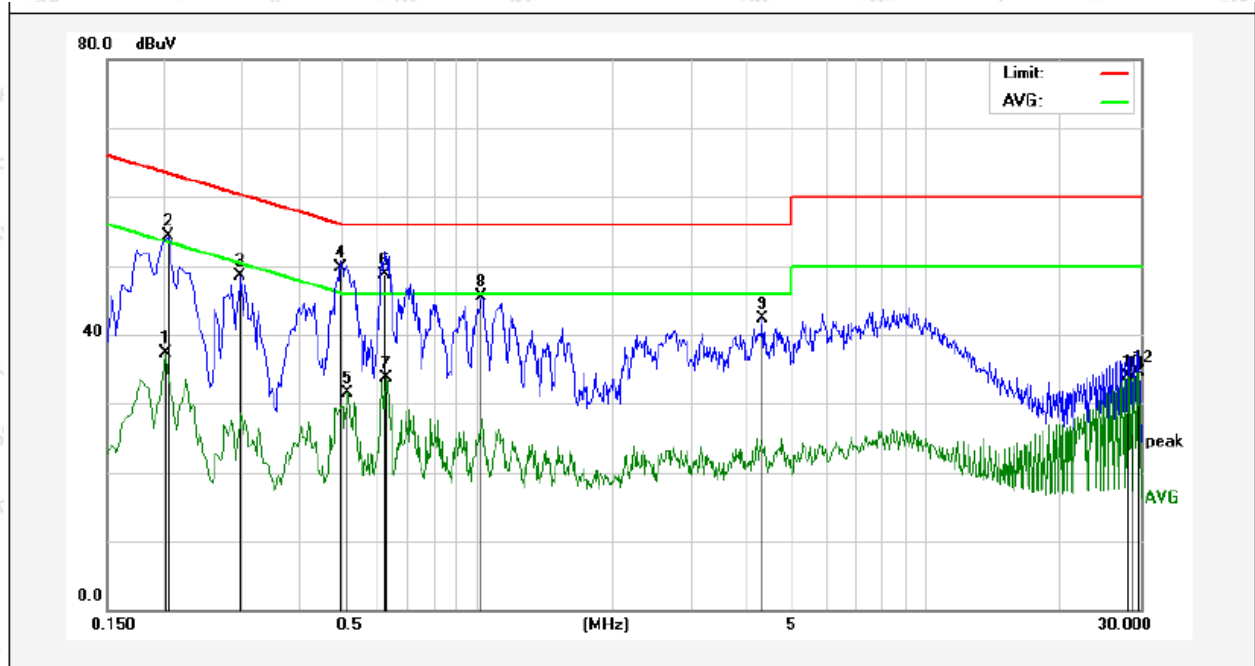
Test Site: 1# Shielded Room
Operating Condition: Wireless Charge Mode
Test Specification: AC 120V, 60Hz for adapter
Comment: Live Line
Tem.: 23.5°C Hum.: 56%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.2020	32.00	19.90	51.90	63.52	-11.62	QP	
2	0.2020	15.57	19.90	35.47	53.52	-18.05	AVG	
3	0.3020	25.04	19.89	44.93	60.19	-15.26	QP	
4	0.5140	29.50	19.98	49.48	56.00	-6.52	QP	
5	0.5180	12.80	19.99	32.79	46.00	-13.21	AVG	
6	0.6220	29.16	20.02	49.18	56.00	-6.82	QP	
7	0.6220	16.10	20.02	36.12	46.00	-9.88	AVG	
8	1.0300	23.35	20.12	43.47	56.00	-12.53	QP	
9	1.6180	19.60	20.13	39.73	56.00	-16.27	QP	
10	9.4420	8.07	20.33	28.40	50.00	-21.60	AVG	
11	25.0020	15.29	20.28	35.57	50.00	-14.43	AVG	
12	29.7220	16.81	20.27	37.08	50.00	-12.92	AVG	

Conducted Emission Test Data

Test Site: 1# Shielded Room
Operating Condition: Wireless Charge Mode
Test Specification: AC 120V, 60Hz for adapter
Comment: Neutral Line
Tem.: 23.5°C Hum.: 56%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.2020	17.39	19.90	37.29	53.52	-16.23	AVG	
2	0.2060	34.36	19.90	54.26	63.36	-9.10	QP	
3	0.2980	28.53	19.89	48.42	60.30	-11.88	QP	
4	0.4980	29.65	19.98	49.63	56.03	-6.40	QP	
5	0.5180	11.58	19.99	31.57	46.00	-14.43	AVG	
6	0.6220	28.61	20.02	48.63	56.00	-7.37	QP	
7	0.6300	13.61	20.02	33.63	46.00	-12.37	AVG	
8	1.0220	25.32	20.12	45.44	56.00	-10.56	QP	
9	4.3180	22.15	20.19	42.34	56.00	-13.66	QP	
10	28.0460	13.61	20.27	33.88	50.00	-16.12	AVG	
11	28.7420	13.51	20.27	33.78	50.00	-16.22	AVG	
12	29.7860	14.18	20.27	34.45	50.00	-15.55	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

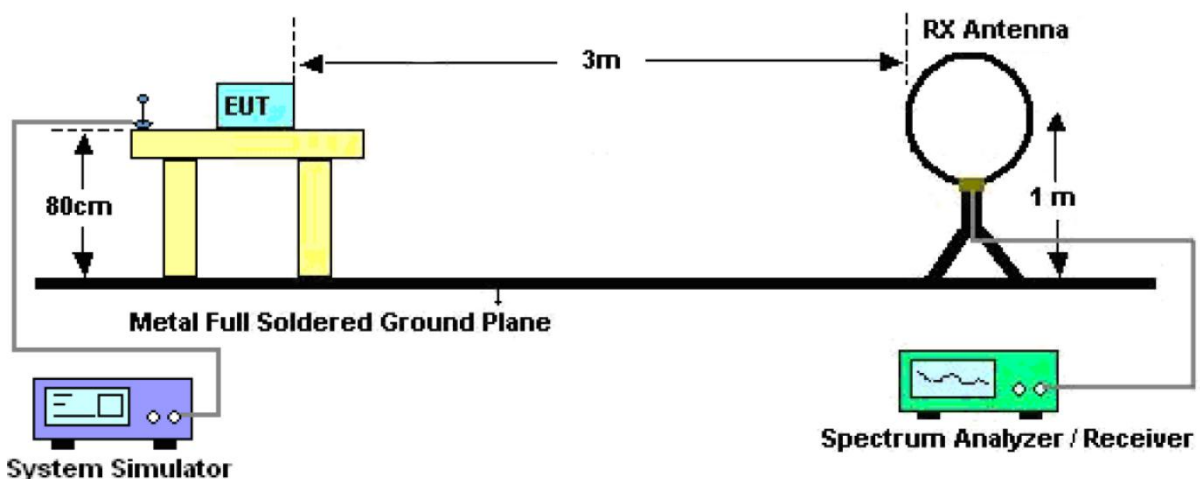


Figure 1. Below 30MHz

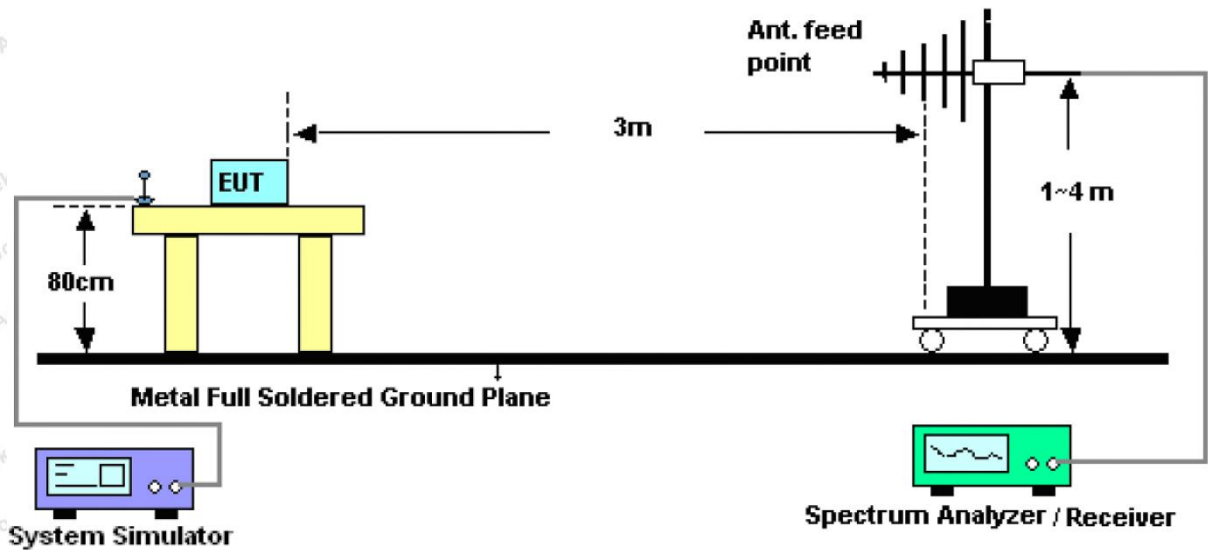


Figure 2. 30MHz to 1GHz

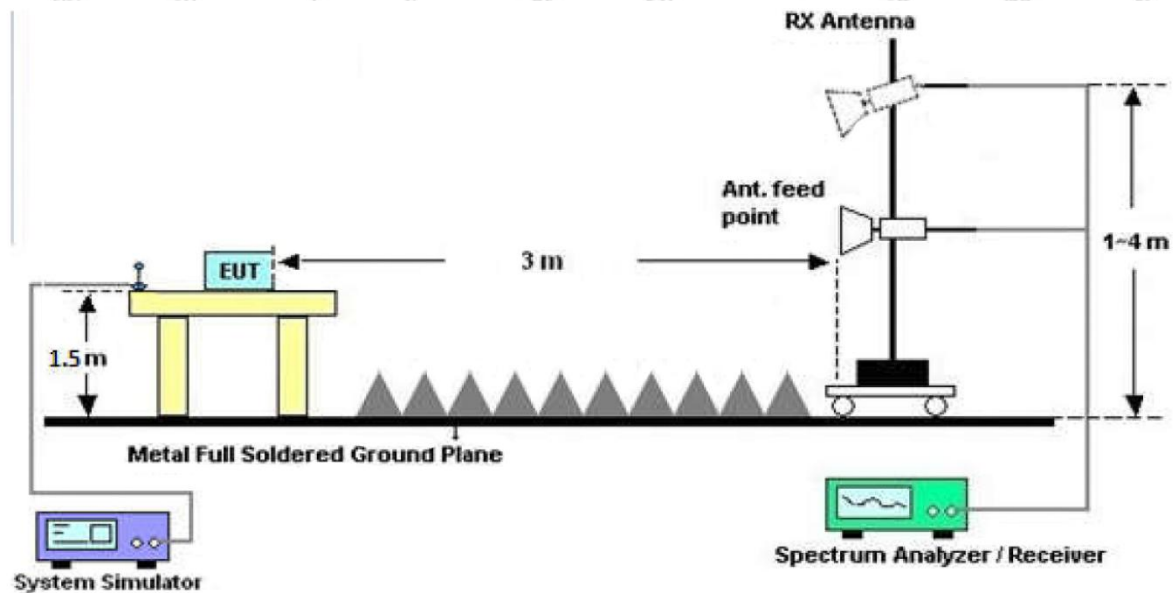


Figure 3. Above 1 GHz

4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m 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.

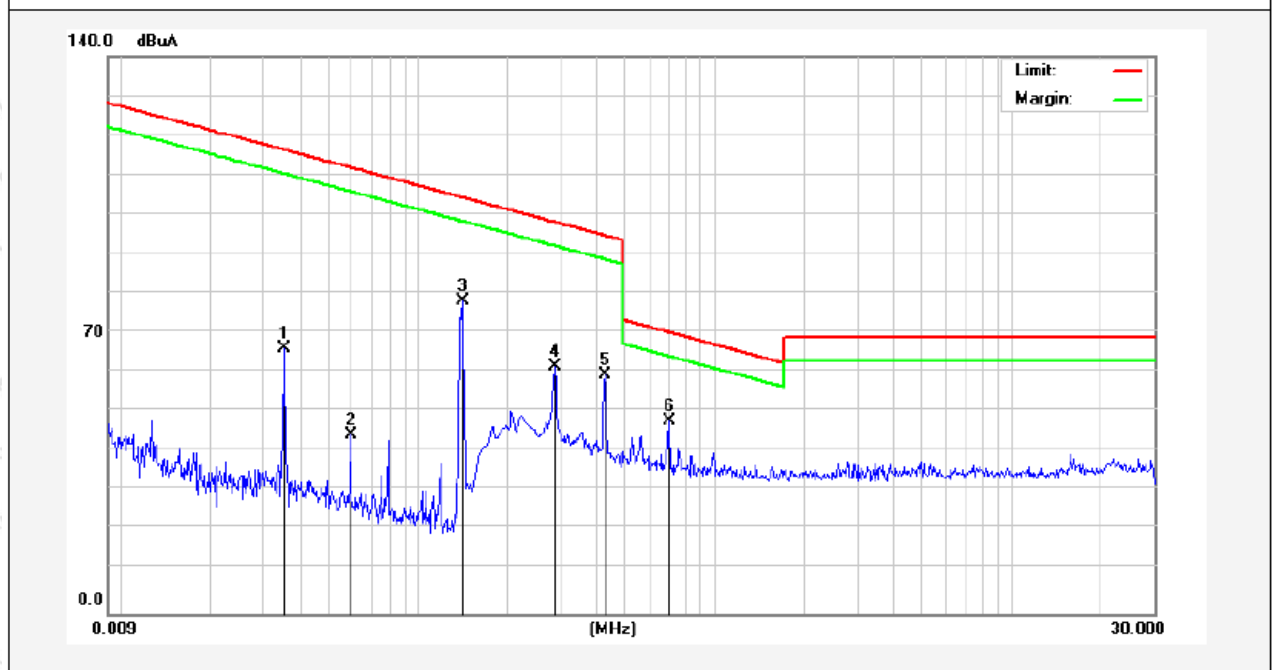
4.4. Test Data

PASS

Test Results

(Between 9KHz – 30MHz)

Job No.:	SZAWW181018011-01		
Standard:	FCC PART15 C _3m	Power Source:	AC 120V, 60Hz for adapter
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.7°C/51%RH
Test Mode:	Mode 1	Distance:	3m

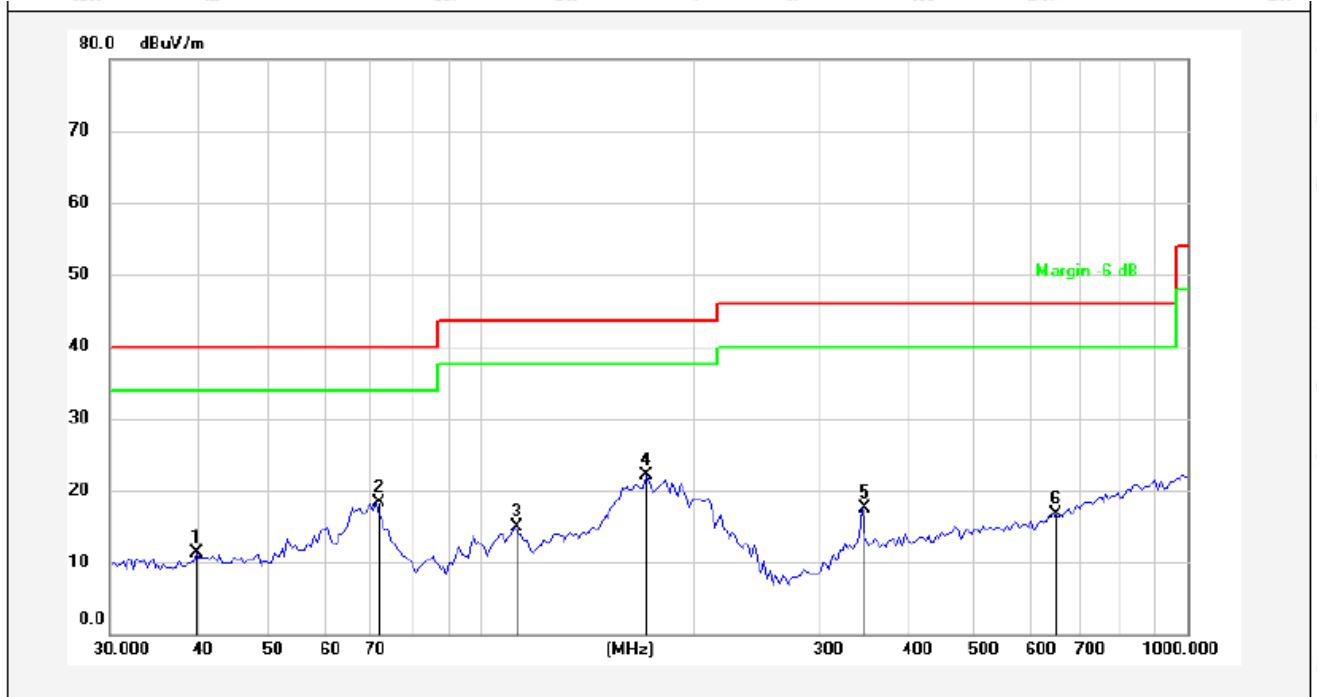


Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	degree (dgc)
0.0352	52.58	19.28	2.53	0	74.39	136.55	-62.16	Peak	62
0.0352	44.77	19.28	2.53	0	66.58	116.55	-49.97	AV	62
0.0592	31.60	19.30	2.54	0	53.44	132.05	-78.61	Peak	159
0.0592	23.29	19.30	2.54	0	45.13	112.05	-66.92	AV	159
0.1408	64.83	19.53	2.59	0	86.95	124.57	-37.62	Peak	96
0.1408	56.35	19.53	2.59	0	78.47	104.57	-26.10	AV	96
0.2872	49.57	19.53	2.59	0	71.69	118.41	-46.72	Peak	327
0.2872	39.94	19.53	2.59	0	62.06	98.41	-36.35	AV	327
0.4259	46.95	20.34	2.59	0	69.88	115.01	-45.13	Peak	225
0.4259	37.17	20.34	2.59	0	60.10	95.01	-34.91	AV	225
0.5261	25.67	20.34	2.59	0	48.60	70.73	-22.13	QP	165

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.

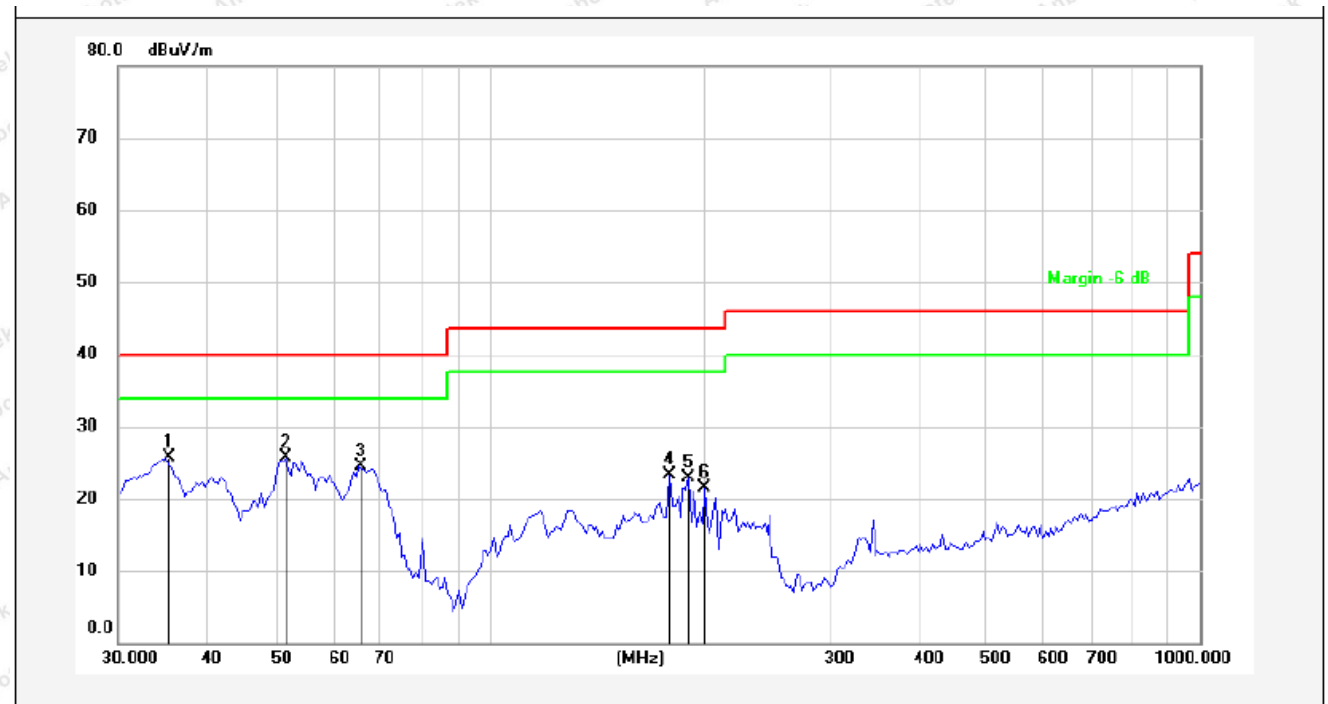
(Between 30MHz -1000 MHz)

Job No.:	SZAWW181018011-01	Polarization:	Horizontal
Standard:	FCC PART15 C _3m	Power Source:	AC 120V, 60Hz for adapter
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3°C/56%RH
Test Mode:	Mode 1	Distance:	3m



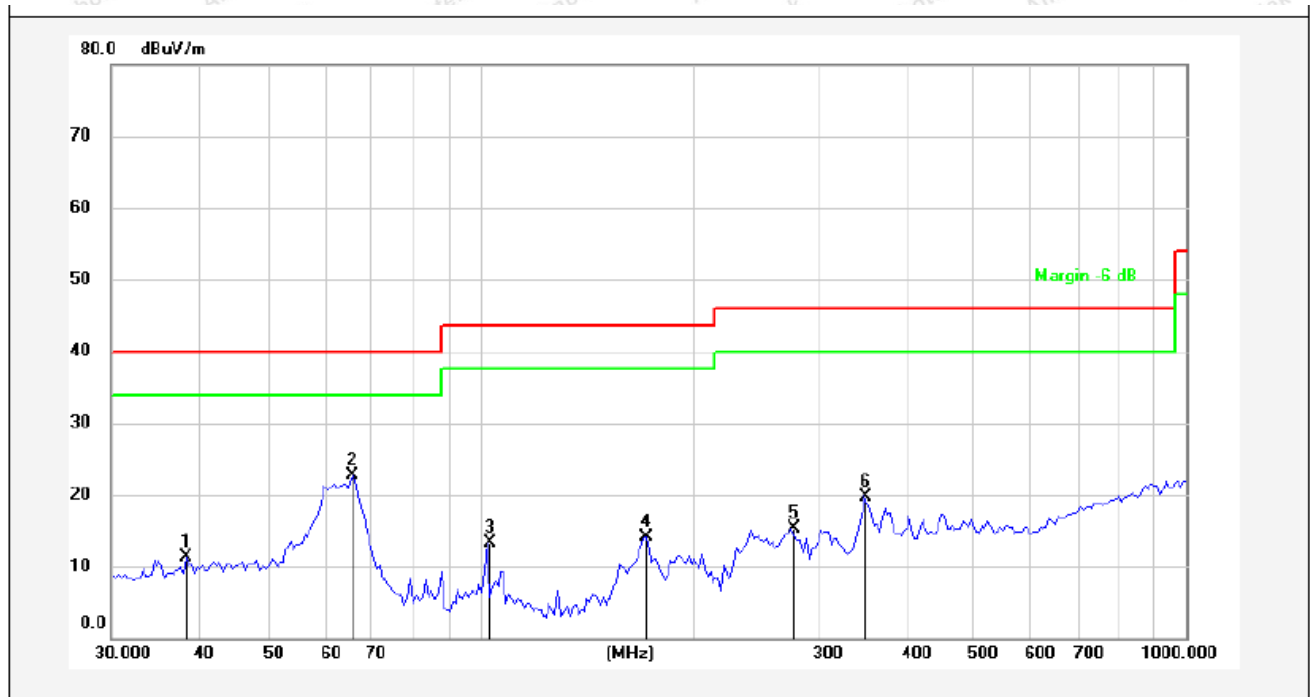
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	39.7146	26.79	-15.58	11.21	40.00	-28.79	QP	300	0	
2	71.4552	38.63	-20.30	18.33	40.00	-21.67	QP	300	74	
3	111.7380	36.57	-21.63	14.94	43.50	-28.56	QP	300	152	
4	171.6933	43.30	-21.21	22.09	43.50	-21.41	QP	300	207	
5	346.2017	33.01	-15.53	17.48	46.00	-28.52	QP	300	295	
6	645.1195	28.48	-11.79	16.69	46.00	-29.31	QP	300	360	

Job No.:	SZAWW181018011-01	Polarization:	Vertical
Standard:	FCC PART15 C _3m	Power Source:	AC 120V, 60Hz for adapter
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3°C/56%RH
Test Mode:	Mode 1	Distance:	3m



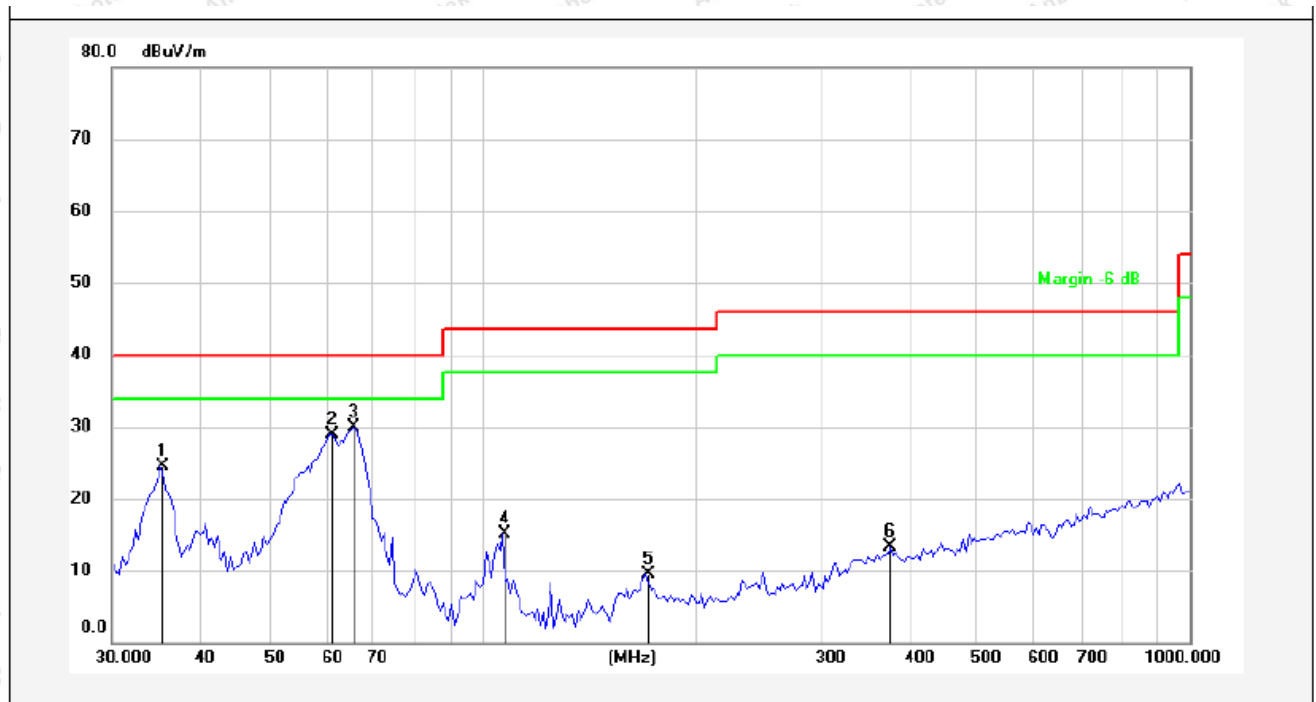
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	35.1278	41.62	-15.92	25.70	40.00	-14.30	QP	300	0	
2	51.6615	40.56	-14.90	25.66	40.00	-14.34	QP	300	69	
3	65.4579	41.75	-17.27	24.48	40.00	-15.52	QP	300	114	
4	179.3863	40.75	-17.44	23.31	43.50	-20.19	QP	300	184	
5	190.7390	39.43	-16.53	22.90	43.50	-20.60	QP	300	255	
6	201.0402	38.07	-16.51	21.56	43.50	-21.94	QP	300	360	

Job No.:	SZAWW181018011-01	Polarization:	Horizontal
Standard:	FCC PART15 C _3m	Power Source:	AC 240V, 60Hz for adapter
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3°C/56%RH
Test Mode:	Mode 1	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	38.3462	27.29	-15.97	11.32	40.00	-28.68	QP	300	0	
2	66.0342	41.14	-18.51	22.63	40.00	-17.37	QP	300	74	
3	102.3597	33.92	-20.70	13.22	43.50	-30.28	QP	300	156	
4	171.6933	35.24	-21.21	14.03	43.50	-29.47	QP	300	210	
5	275.6399	34.54	-19.27	15.27	46.00	-30.73	QP	300	299	
6	349.2500	35.26	-15.46	19.80	46.00	-26.20	QP	300	360	

Job No.:	SZAWW181018011-01	Polarization:	Vertical
Standard:	FCC PART15 C _3m	Power Source:	AC 240V, 60Hz for adapter
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3°C/56%RH
Test Mode:	Mode 1	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	35.1278	40.42	-15.92	24.50	40.00	-15.50	QP	300	0	
2	61.5618	44.67	-15.82	28.85	40.00	-11.15	QP	300	71	
3	66.0342	47.35	-17.51	29.84	40.00	-10.16	QP	300	155	
4	106.9461	30.20	-15.08	15.12	43.50	-28.38	QP	300	196	
5	170.1948	27.58	-18.16	9.42	43.50	-34.08	QP	300	247	
6	377.9211	27.22	-13.98	13.24	46.00	-32.76	QP	300	360	

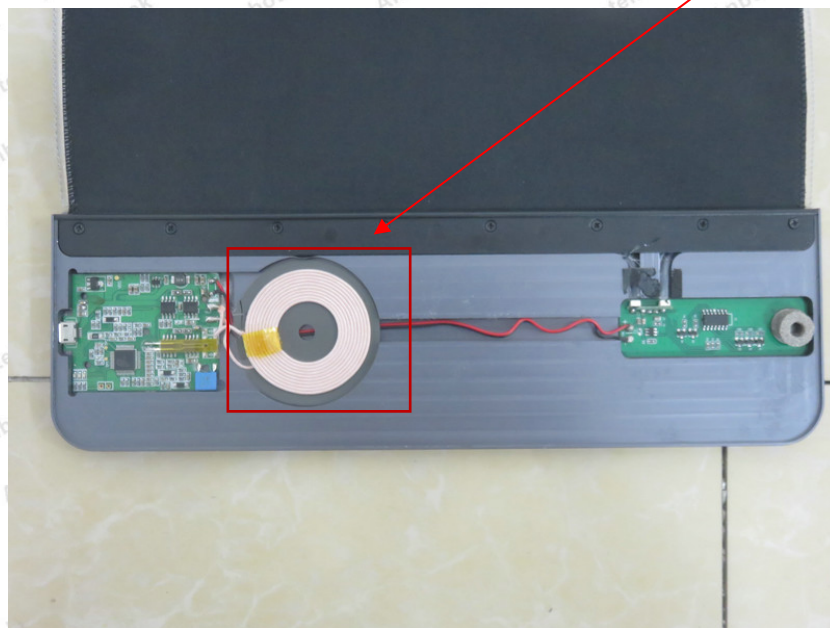
5. Antenna Requirement

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

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.

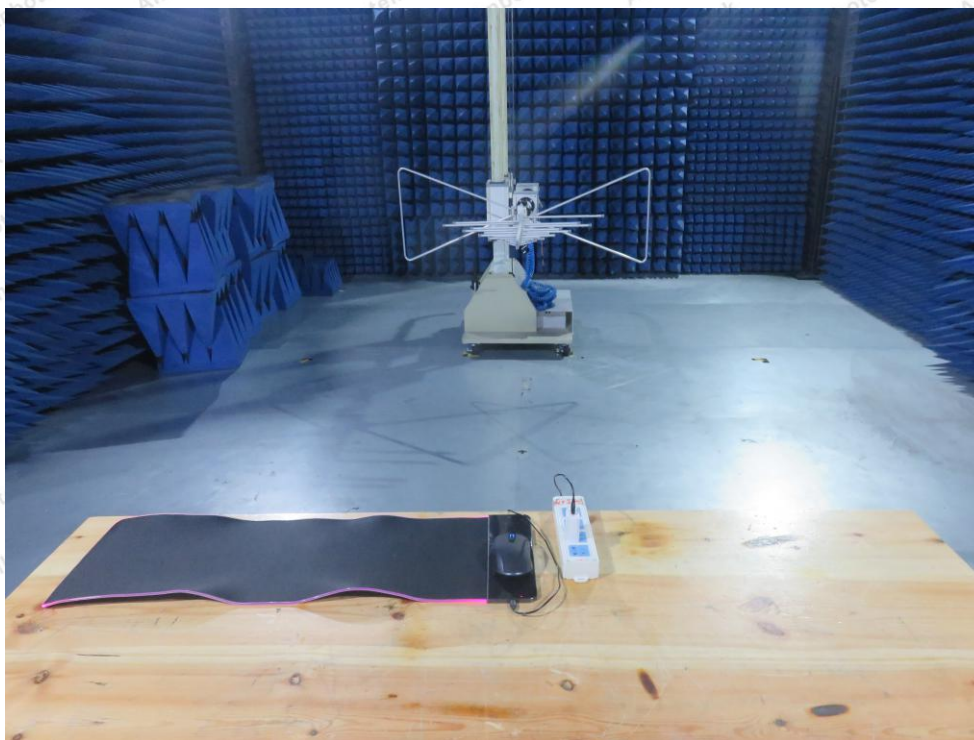


APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Conducted Emission Measurement



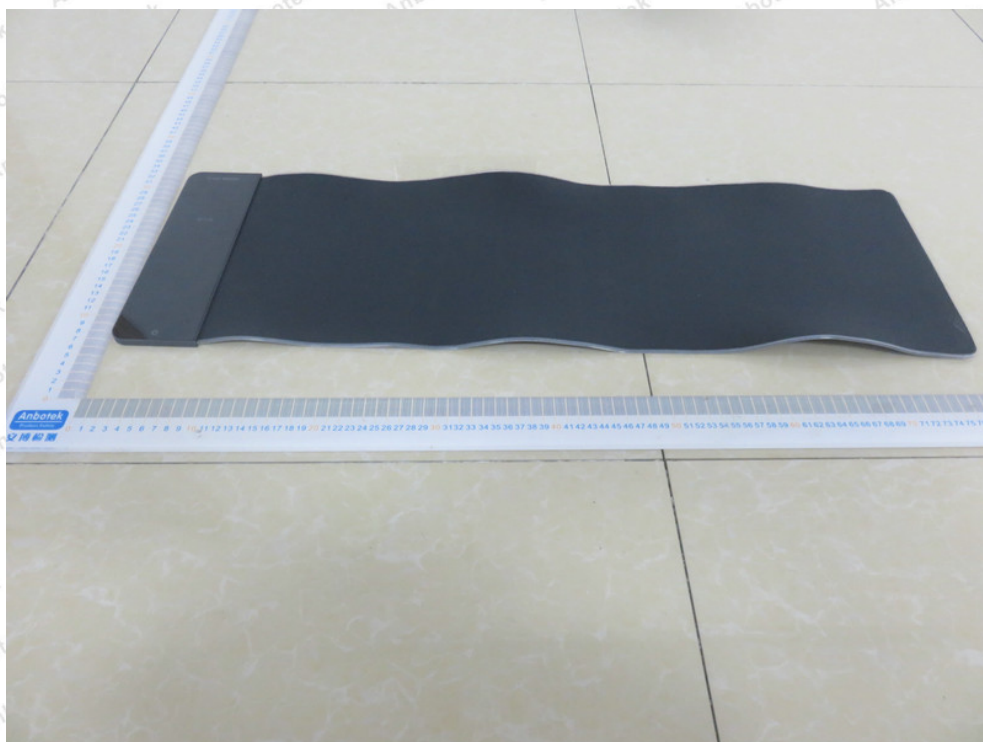
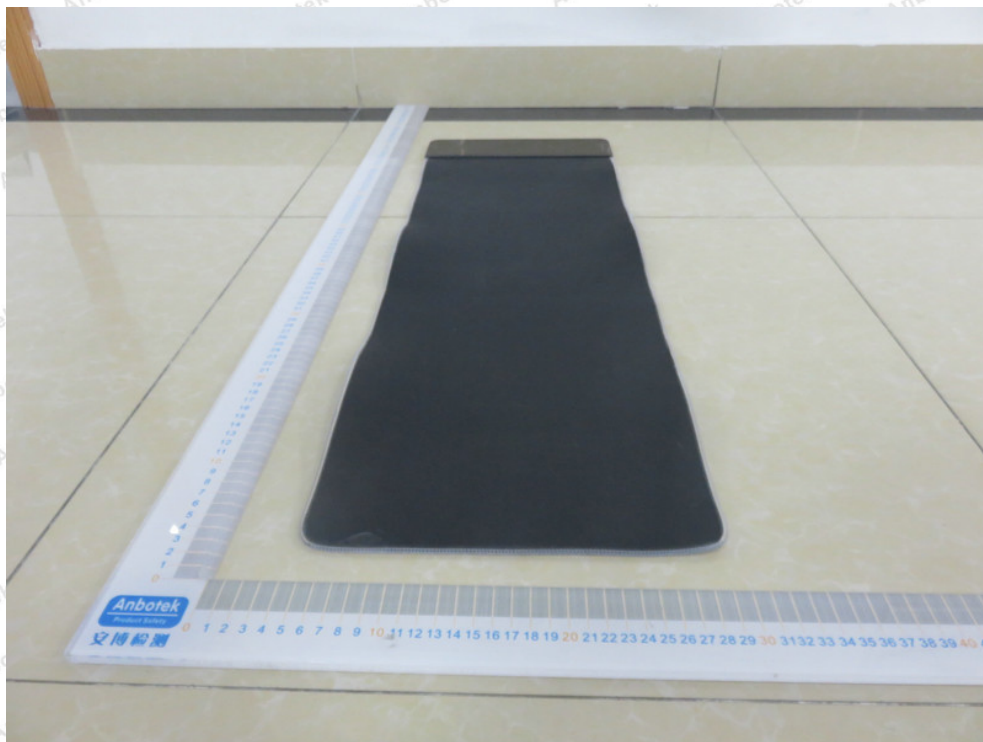
Photo of Radiation Emission Test

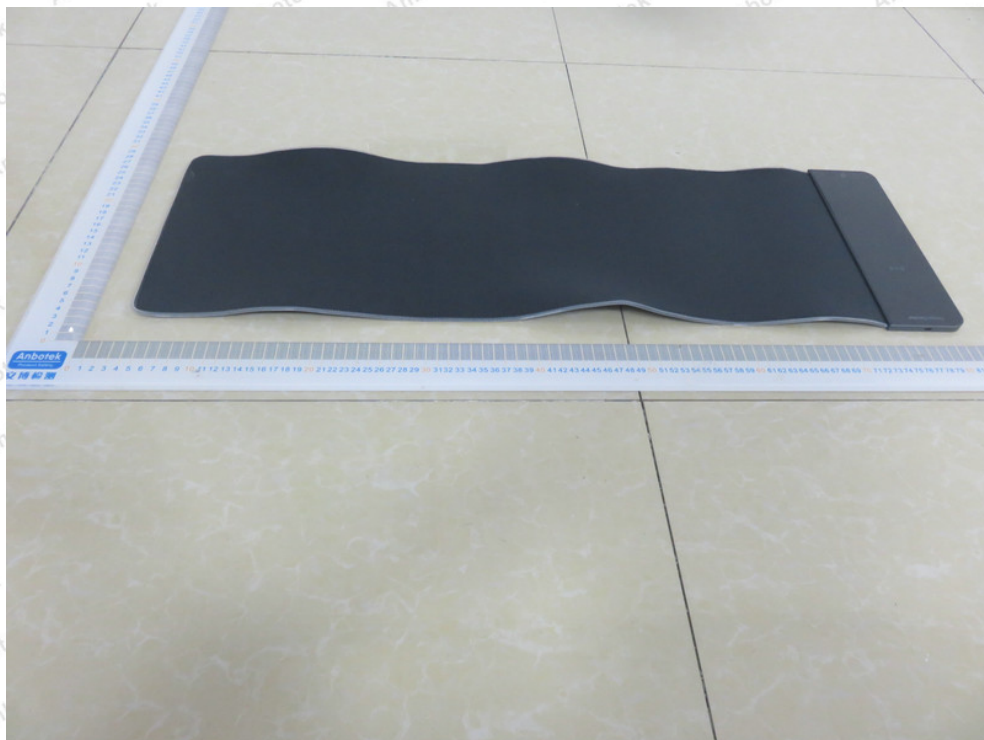
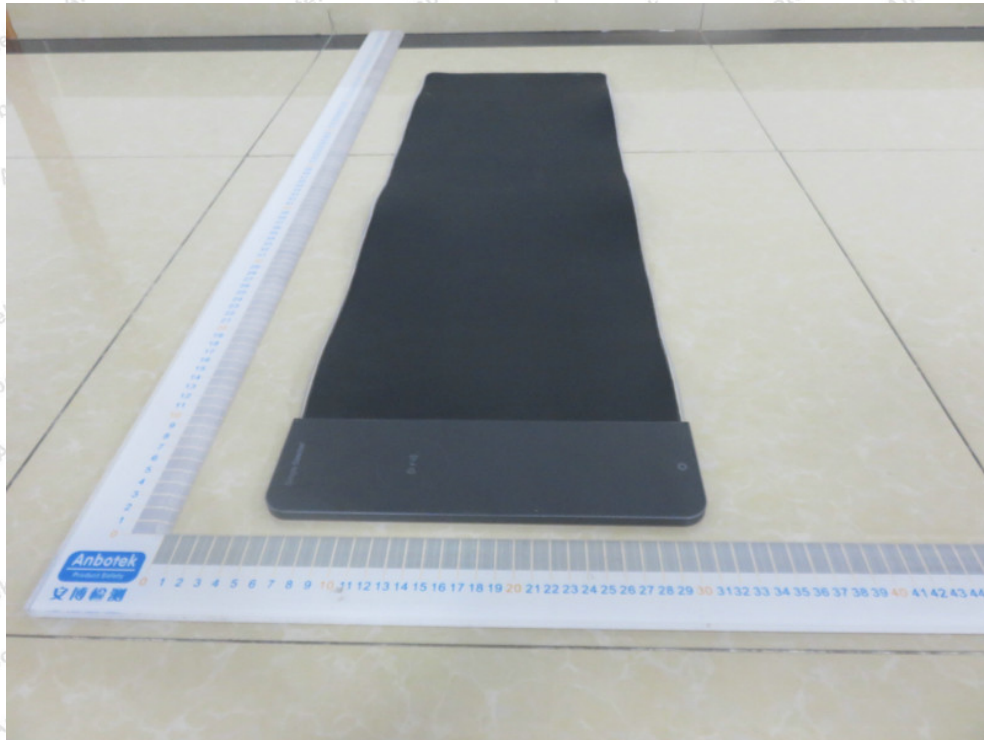




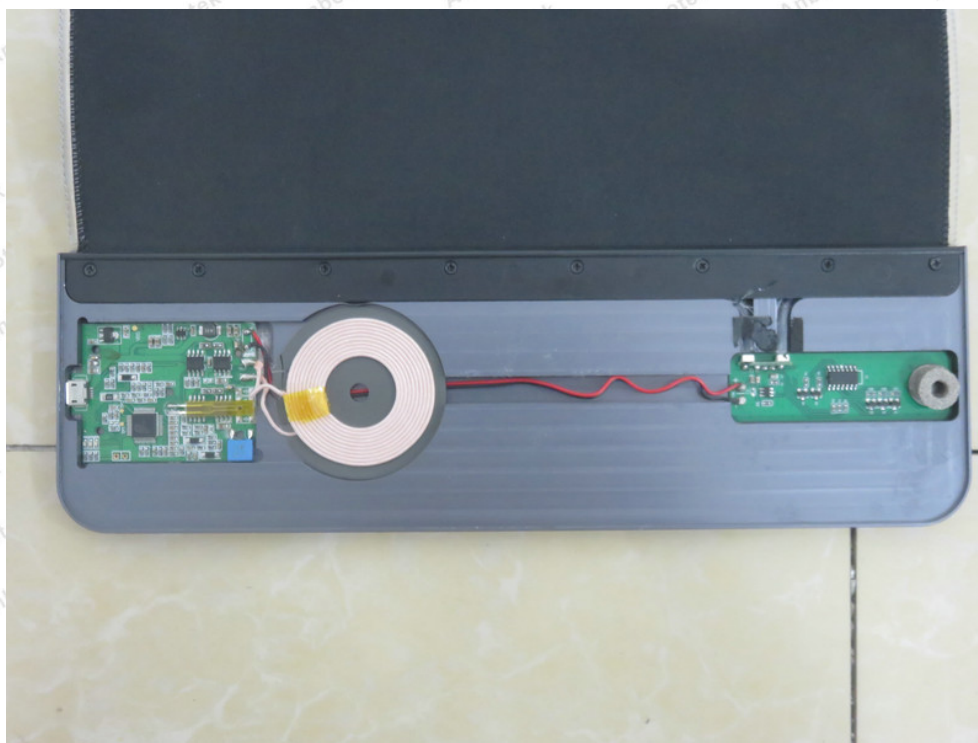
APPENDIX II -- EXTERNAL PHOTOGRAPH

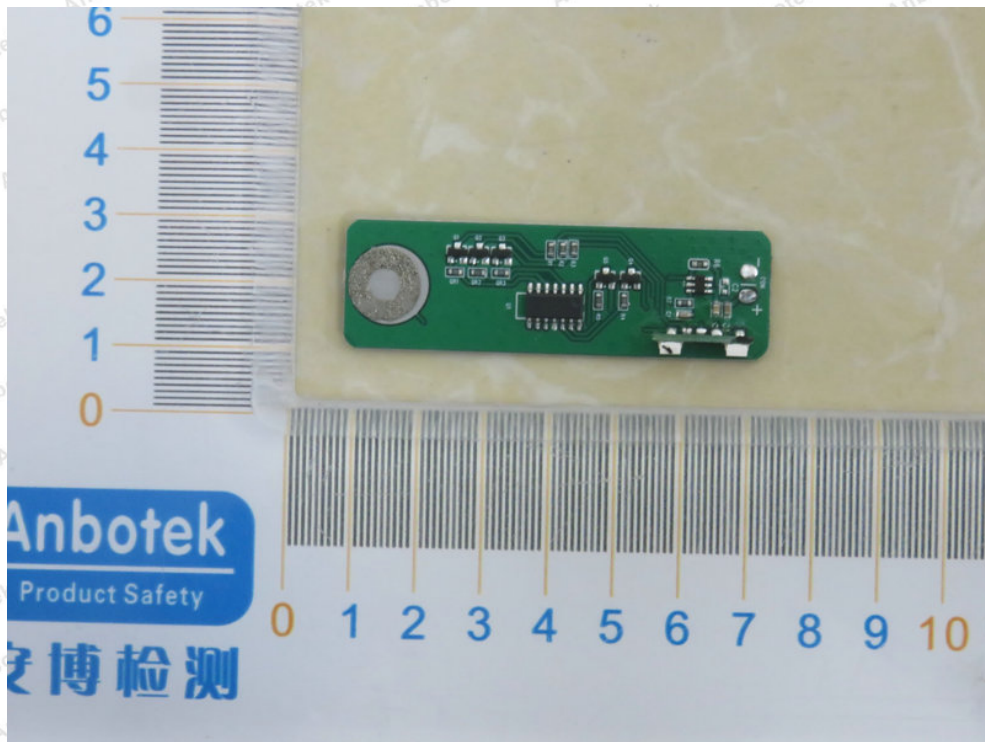


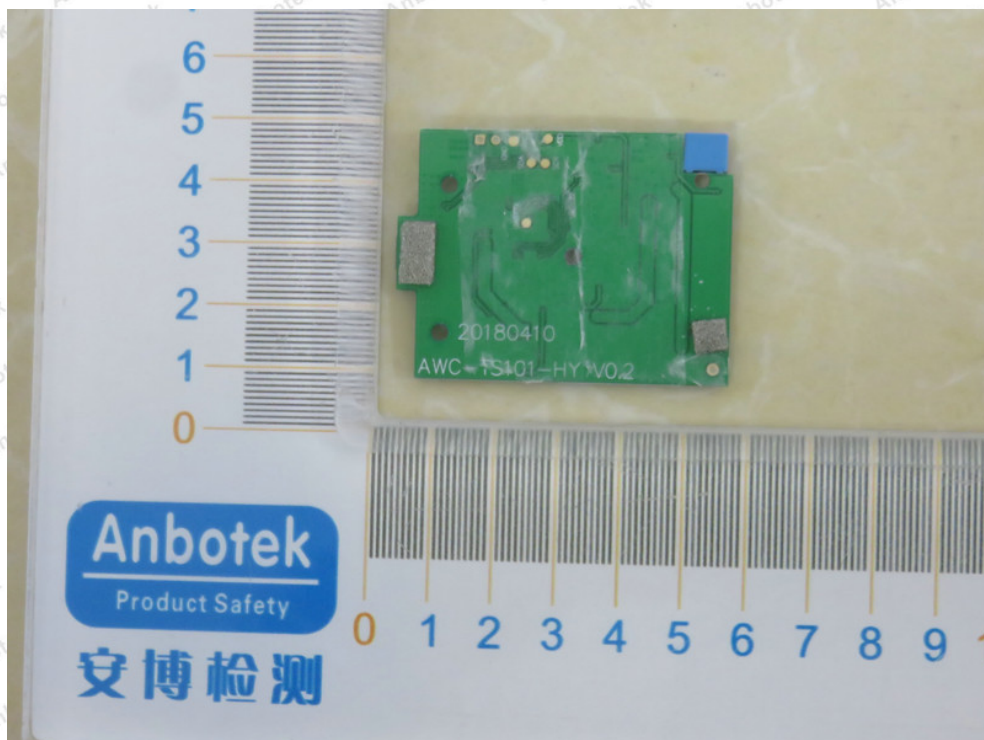
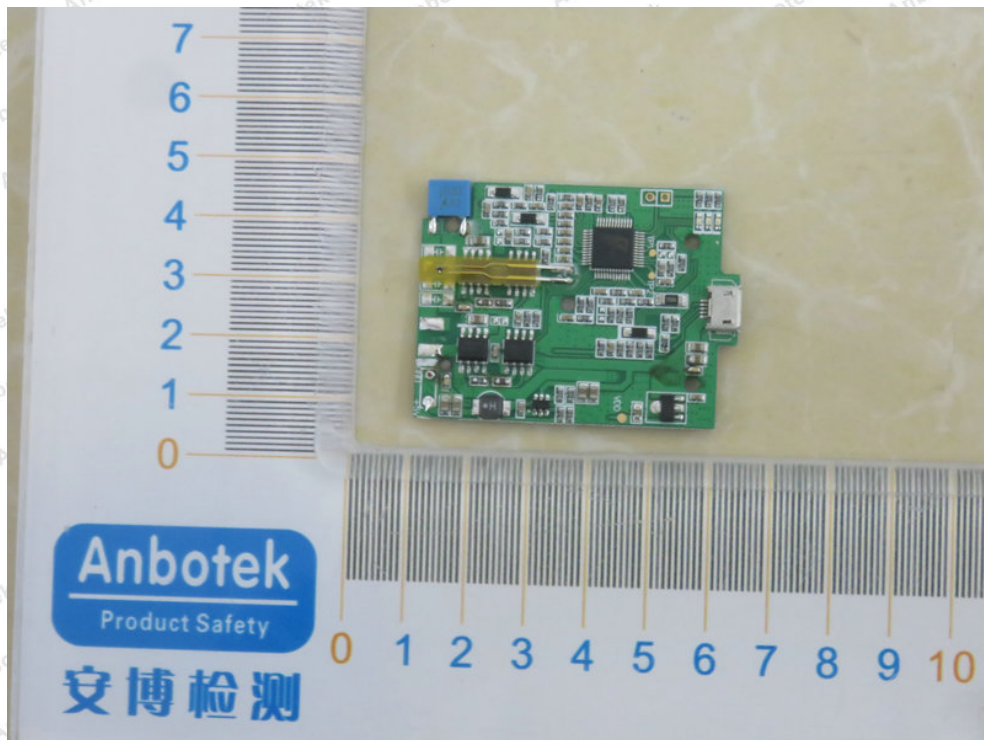


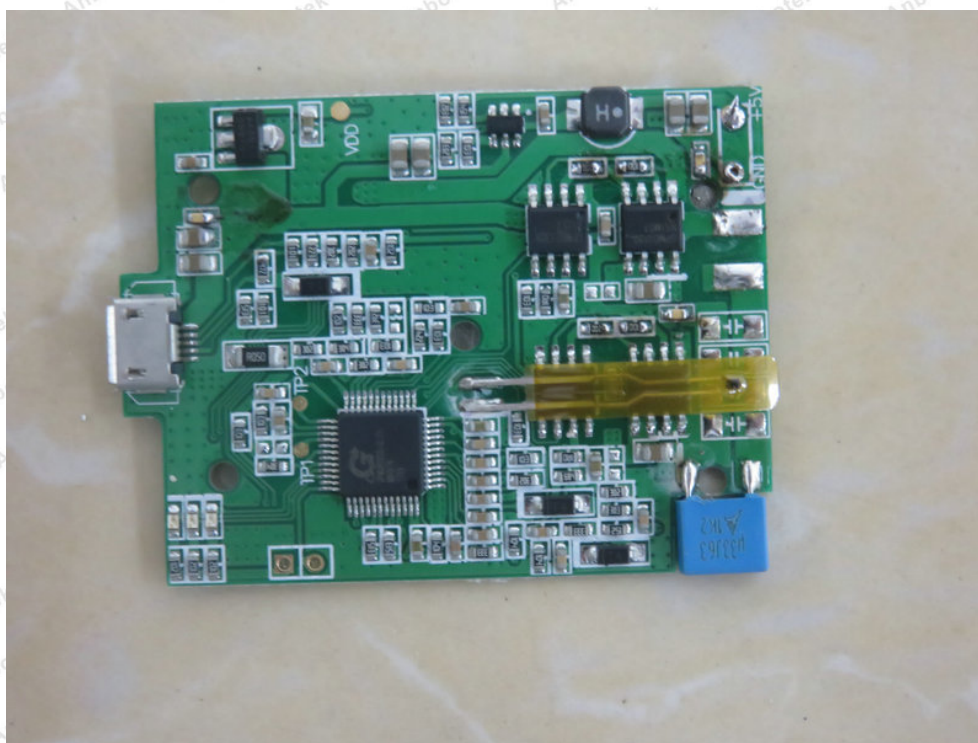


APPENDIX III -- INTERNAL PHOTOGRAPH









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