

FCC TEST REPORT

For

Sariana LLC

Wireless Charger V2

Model No.: ST-IWCBM, ST-IWCBG, ST-IWCBS

Prepared For : Sariana LLC
Address : 7365 Mission Gorge Rd, Suite G, San Diego, CA 92120, USA

Prepared By : Shenzhen Anbotek Compliance Laboratory Limited
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Report Number : SZAWW180829002-01

Date of Receipt : Aug. 29, 2018

Date of Test : Aug. 29~ Sept. 13, 2018

Date of Report : Sept. 13, 2018

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TEST REPORT

Applicant : Sariana LLC
Manufacturer : Sariana LLC
Product Name : Wireless Charger V2
Model No. : ST-IWCBM, ST-IWCBG, ST-IWCBS
Trade Mark : 
Rating(s) : Input: DC 5V, 2A / 9V, 2A
Output: 5W/7.5W/10W

Test Standard(s) : FCC Part15 Subpart C 2017, Paragraph 15.209

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

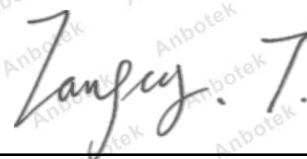
The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen 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 Test

Aug. 29~ Sept. 13, 2018

Prepared by



(Engineer / Tangcy Tang)

Reviewer



(Supervisor / Snowy Meng)

Approved & Authorized Signer



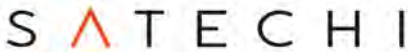
(Manager / Sally Zhang)

1. General Information

1.1. Client Information

Applicant	:	Sariana LLC
Address	:	7365 Mission Gorge Rd, Suite G, San Diego, CA 92120, USA
Manufacturer	:	Sariana LLC
Address	:	7365 Mission Gorge Rd, Suite G, San Diego, CA 92120, USA

1.2. Description of Device (EUT)

Product Name	:	Wireless Charger V2	
Model No.	:	ST-IWCBM, ST-IWCBG, ST-IWCBS (Note: All samples are the same except colour , so we prepare "ST-IWCBM" for test only.)	
Trade Mark	:		
Test Power Supply	:	AC 120V, 60Hz for adapter / AC 240V, 60Hz for adapter	
Test Sample No.	:	S1(Normal Sample), S2(Engineering Sample)	
Product Description	:	Operation Frequency:	127.7KHz
	:	Modulation Type:	FSK
	:	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	:	Input: 100-240V 50-60Hz 0.7A Output: 3.6-6.5V=== 3A/ 6.5-9V=== 2A/ 9-12V=== 1.5A
	:	
Mobile Phone	:	Samsung

1.4. Description of Test Modes

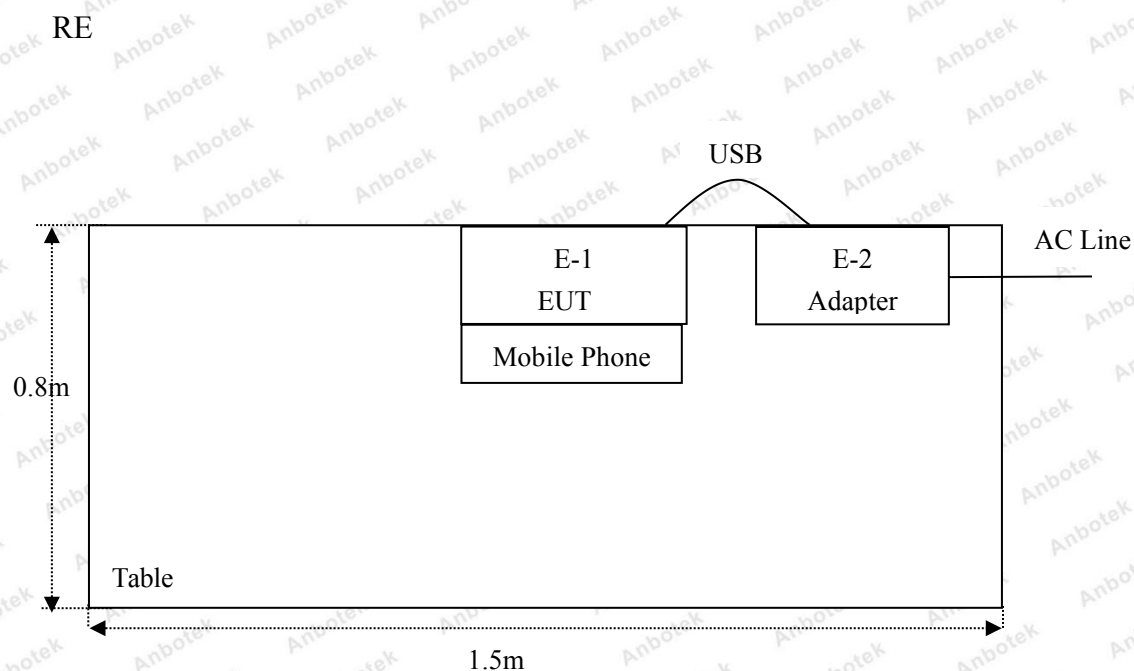
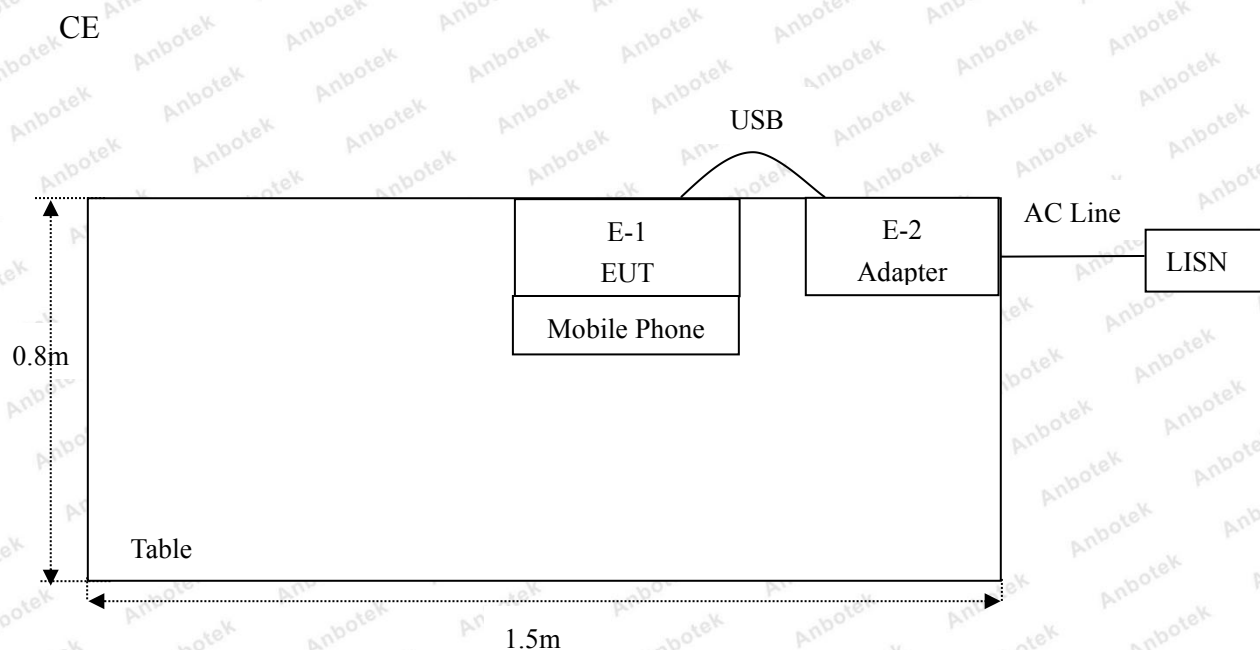
To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration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

Pretest Mode	Description
Mode 1	TX Mode

For Conducted Emission	
Final Test Mode	Description
Mode 1	TX Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	TX 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. 17, 2017	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 17, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Nov. 17, 2017	1 Year
4.	Spectrum Analysis	Agilent	E4407B	US39390582	Nov. 17, 2017	1 Year
5.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 18, 2017	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	Nov. 17, 2017	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 20, 2017	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 20, 2017	1 Year
9.	Loop Antenna	Schwarzbeck	HFH2-Z2	100047	Nov. 17, 2017	1 Year
10.	Horn Antenna	Schwarzbeck	BBHA9170	9170-375	Nov. 17, 2017	1 Year
11.	Pre-amplifier	SONOMA	310N	186860	Nov. 17, 2017	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. 18, 2017	1 Year
14.	Power Sensor	DAER	RPR3006W	15I00041SN045	Nov. 17, 2017	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN046	Nov. 17, 2017	1 Year
16.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 18, 2017	1 Year
17.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Nov. 18, 2017	1 Year
18.	Signal Generator	Agilent	E4421B	MY41000743	Nov. 18, 2017	1 Year
19.	DC Power Supply	LW	TPR-6410D	349315	Nov. 01, 2017	1 Year
20.	Constant Temperature Humidity Chamber	Sertep	ZJ-HWHS80B	ZJ-17042804	Nov. 01, 2017	1 Year

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, July 31, 2017.

ISED-Registration No.: 8058A-1

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-1, June 13, 2016.

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

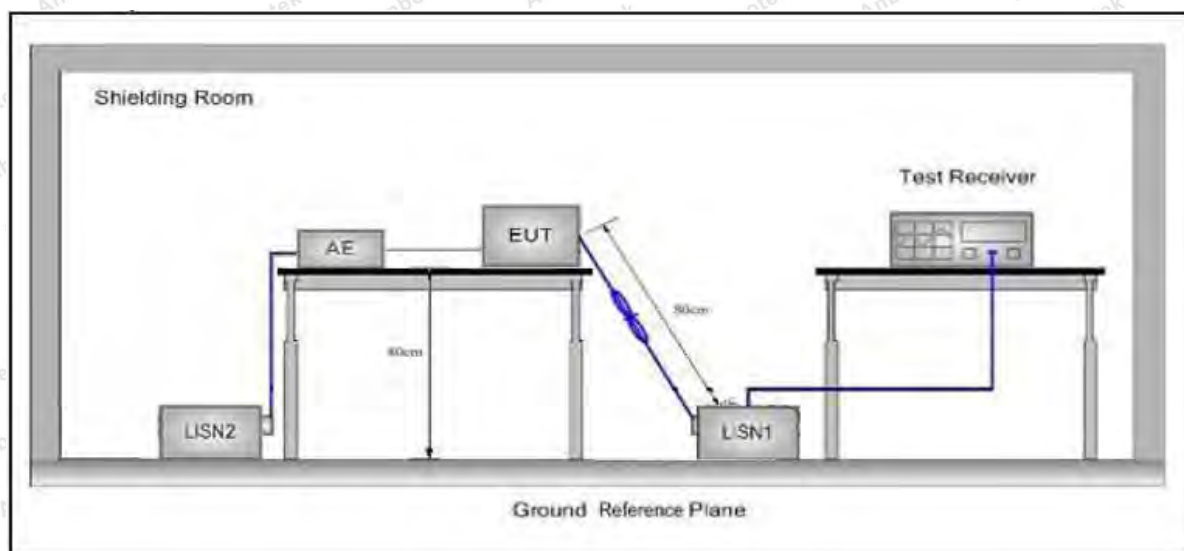
3. Conducted Emission Test

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 C63.10-2013 on Conducted Emission Measurement.

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

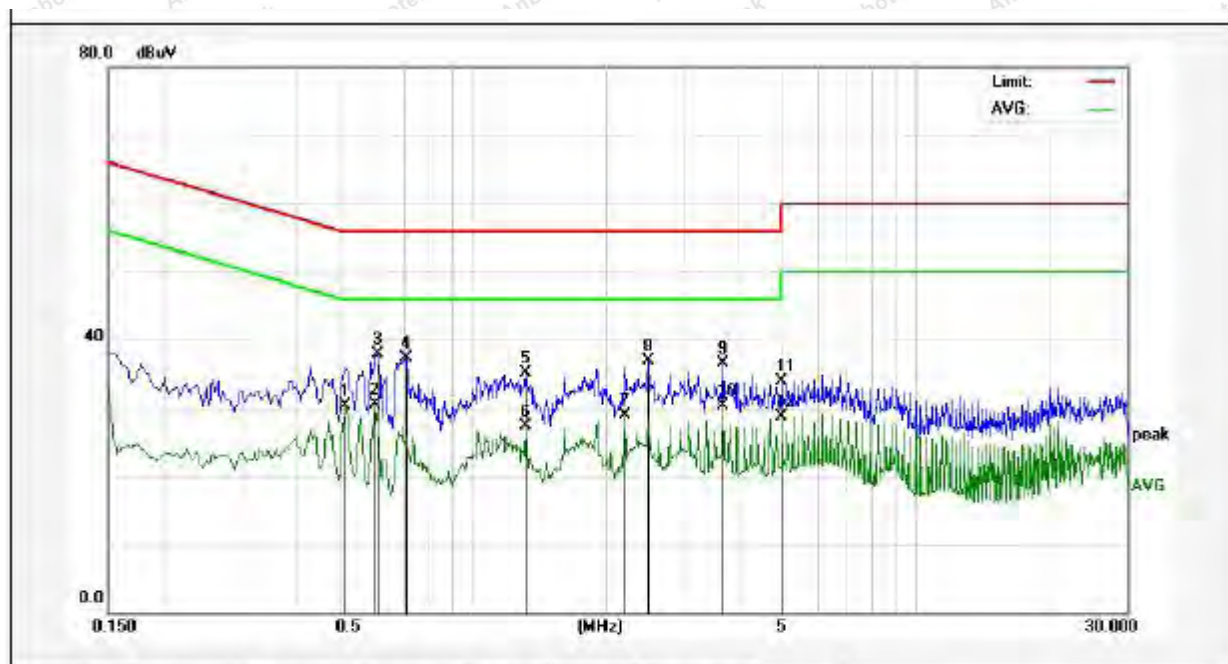
The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

Please to see the following pages

Conducted Emission Test Data

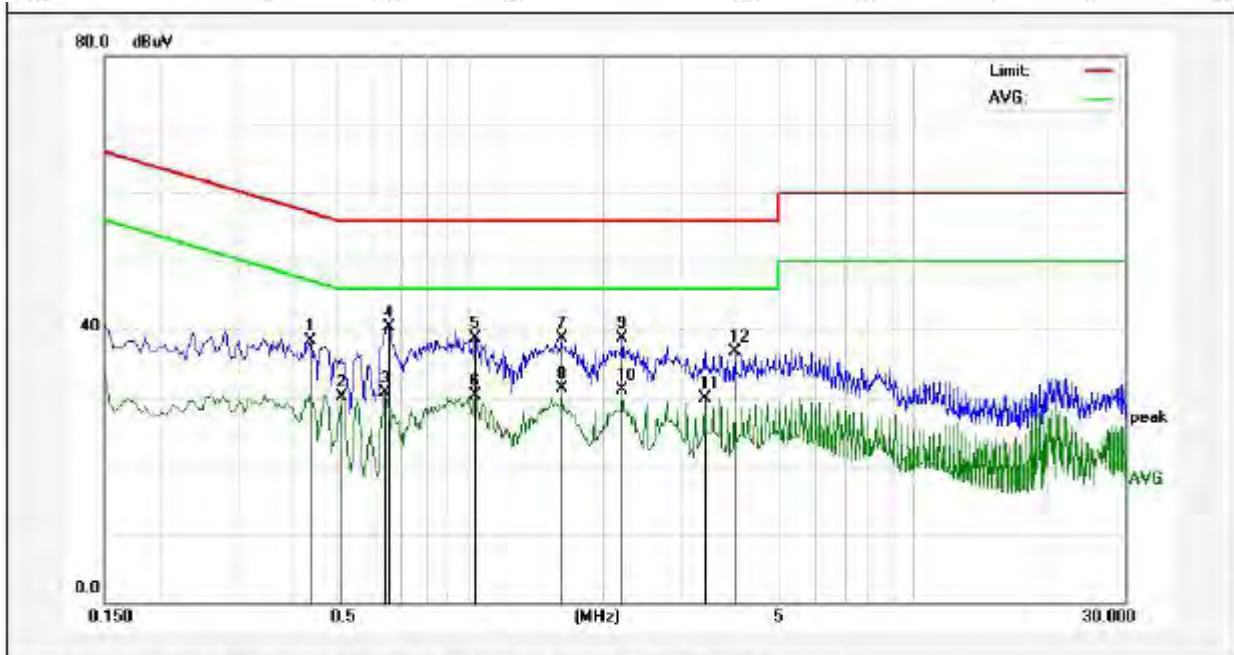
Test Site: 1# Shielded Room
Operating Condition: TX Mode
Test Specification: AC 240V, 60Hz for adapter
Comment: Live Line
Tem.: 23.8°C Hum.: 55%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.5180	10.34	19.99	30.33	46.00	-15.67	AVG	
2	0.6020	10.53	20.01	30.54	46.00	-15.46	AVG	
3	0.6100	17.86	20.01	37.87	56.00	-18.13	QP	
4	0.7060	17.35	20.04	37.39	56.00	-18.61	QP	
5	1.3220	15.05	20.13	35.18	56.00	-20.82	QP	
6	1.3220	7.20	20.13	27.33	46.00	-18.67	AVG	
7	2.2020	8.71	20.14	28.85	46.00	-17.15	AVG	
8	2.4940	16.70	20.15	36.85	56.00	-19.15	QP	
9	3.6700	16.33	20.17	36.50	56.00	-19.50	QP	
10	3.6700	10.21	20.17	30.38	46.00	-15.62	AVG	
11	4.9899	13.75	20.21	33.96	56.00	-22.04	QP	
12	4.9899	8.41	20.21	28.62	46.00	-17.38	AVG	

Conducted Emission Test Data

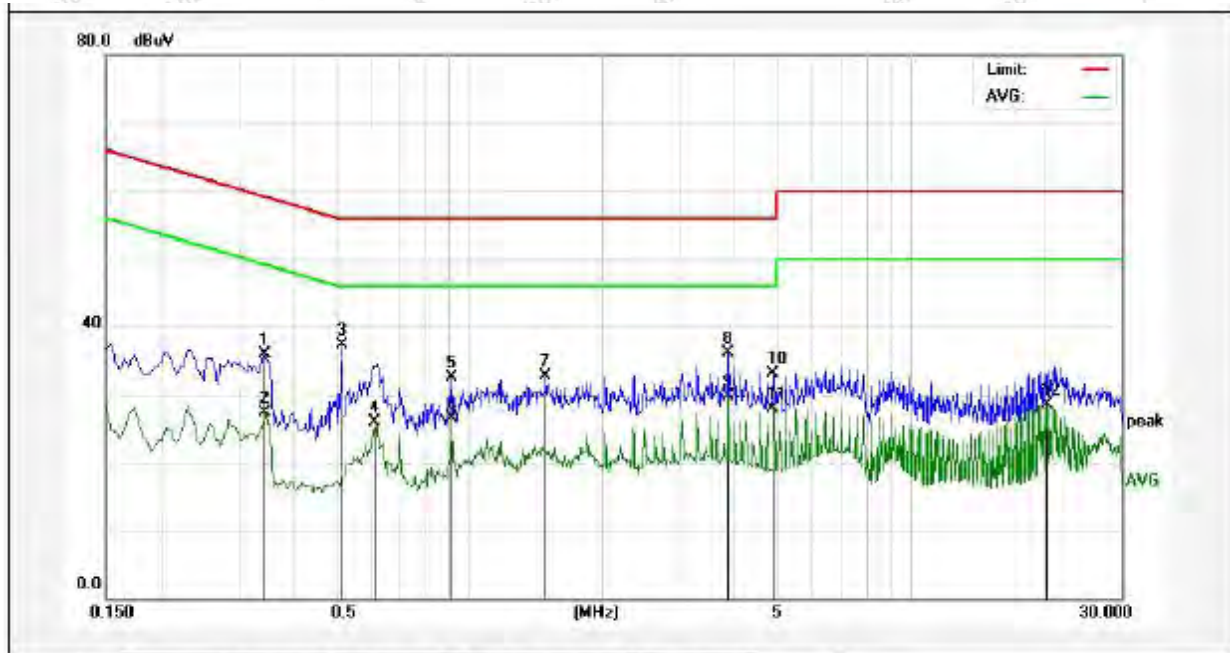
Test Site: 1# Shielded Room
Operating Condition: TX Mode
Test Specification: AC 240V, 60Hz for adapter
Comment: Neutral Line
Tem.: 23.8°C Hum.: 55%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.4380	18.27	19.95	38.22	57.10	-18.88	QP	
2	0.5180	10.20	19.99	30.19	46.00	-15.81	AVG	
3	0.6460	10.65	20.02	30.67	46.00	-15.33	AVG	
4	0.6580	20.31	20.03	40.34	56.00	-15.66	QP	
5	1.0300	18.65	20.12	38.77	56.00	-17.23	QP	
6	1.0300	10.17	20.12	30.29	46.00	-15.71	AVG	
7	1.6180	18.66	20.13	38.79	56.00	-17.21	QP	
8	1.6180	11.09	20.13	31.22	46.00	-14.78	AVG	
9	2.2060	18.52	20.14	38.66	56.00	-17.34	QP	
10	2.2060	11.02	20.14	31.16	46.00	-14.84	AVG	
11	3.3660	9.75	20.17	29.92	46.00	-16.08	AVG	
12	3.9740	16.51	20.18	36.69	56.00	-19.31	QP	

Conducted Emission Test Data

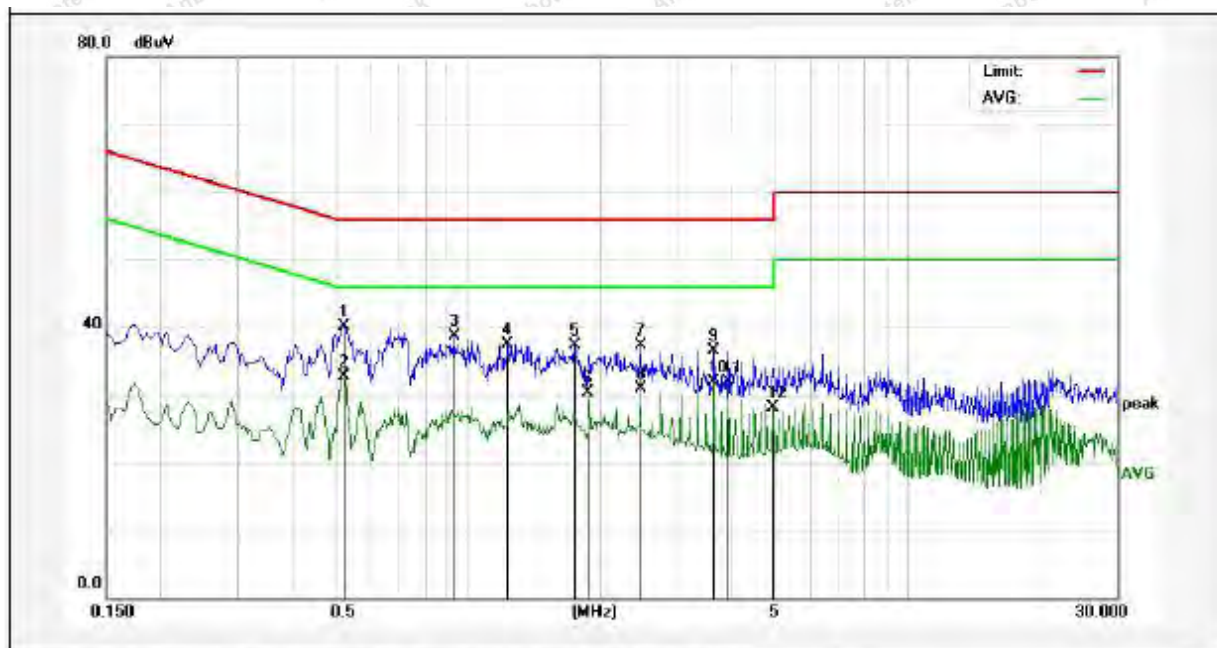
Test Site: 1# Shielded Room
Operating Condition: TX Mode
Test Specification: AC 120V, 60Hz for adapter
Comment: Live Line
Tem.: 23.8°C Hum.: 55%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.3460	16.05	19.91	35.96	59.06	-23.10	QP	
2	0.3460	7.41	19.91	27.32	49.06	-21.74	AVG	
3	0.5140	17.30	19.98	37.28	56.00	-18.72	QP	
4	0.6100	5.83	20.01	25.84	46.00	-20.16	AVG	
5	0.9140	12.46	20.10	32.56	56.00	-23.44	QP	
6	0.9140	6.42	20.10	26.52	46.00	-19.48	AVG	
7	1.4900	12.67	20.13	32.80	56.00	-23.20	QP	
8	3.8740	15.87	20.18	36.05	56.00	-19.95	QP	
9	3.8740	9.50	20.18	29.68	46.00	-16.32	AVG	
10	4.8900	12.98	20.20	33.18	56.00	-22.82	QP	
11	4.8900	7.76	20.20	27.96	46.00	-18.04	AVG	
12	20.3180	8.25	20.34	28.59	50.00	-21.41	AVG	

Conducted Emission Test Data

Test Site: 1# Shielded Room
Operating Condition: TX Mode
Test Specification: AC 120V, 60Hz for adapter
Comment: Neutral Line
Tem.: 23.8°C Hum.: 55%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.5220	20.20	19.99	40.19	56.00	-15.81	QP	
2	0.5220	12.72	19.99	32.71	46.00	-13.29	AVG	
3	0.9300	18.70	20.10	38.80	56.00	-17.20	QP	
4	1.2340	17.44	20.12	37.56	56.00	-18.44	QP	
5	1.7460	17.12	20.13	37.25	56.00	-18.75	QP	
6	1.8860	10.09	20.14	30.23	46.00	-15.77	AVG	
7	2.4660	17.18	20.15	37.33	56.00	-18.67	QP	
8	2.4660	10.73	20.15	30.88	46.00	-15.12	AVG	
9	3.6300	16.38	20.17	36.55	56.00	-19.45	QP	
10	3.6300	11.66	20.17	31.83	46.00	-14.17	AVG	
11	3.9180	11.70	20.18	31.88	46.00	-14.12	AVG	
12	4.9340	7.91	20.20	28.11	46.00	-17.89	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

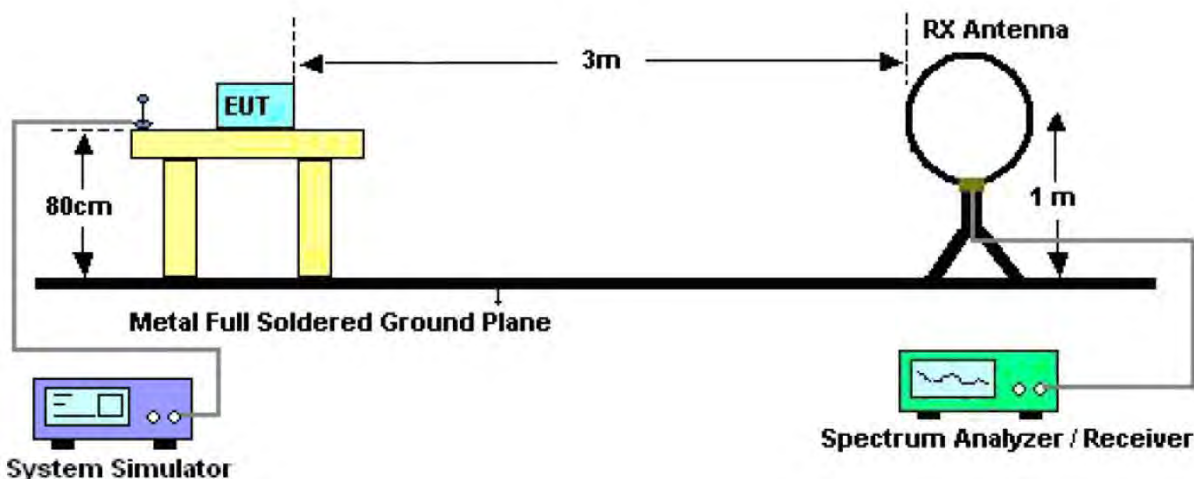


Figure 1. Below 30MHz

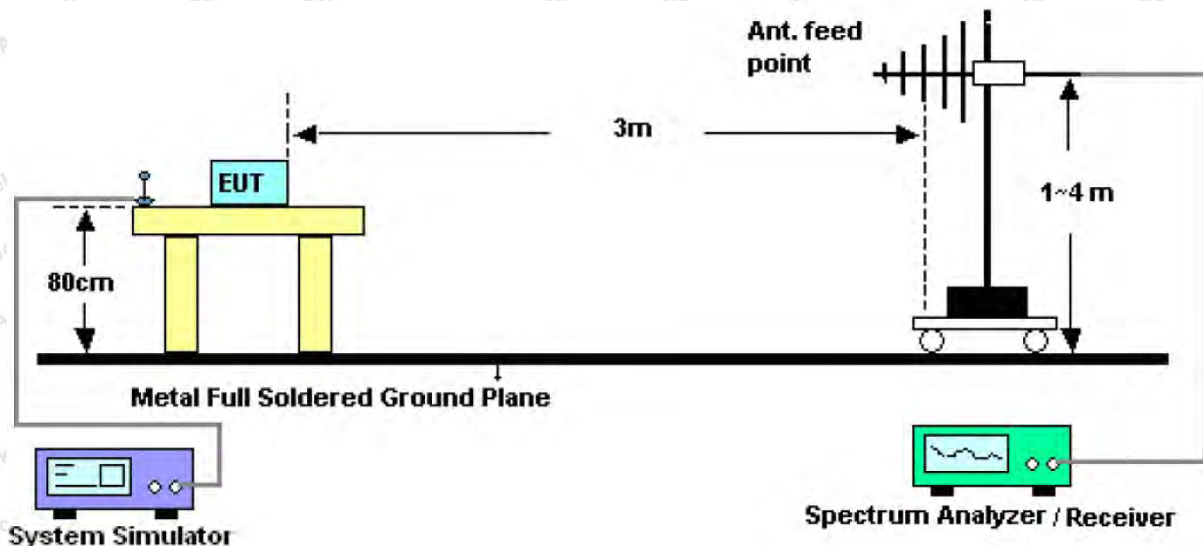


Figure 2. 30MHz to 1GHz

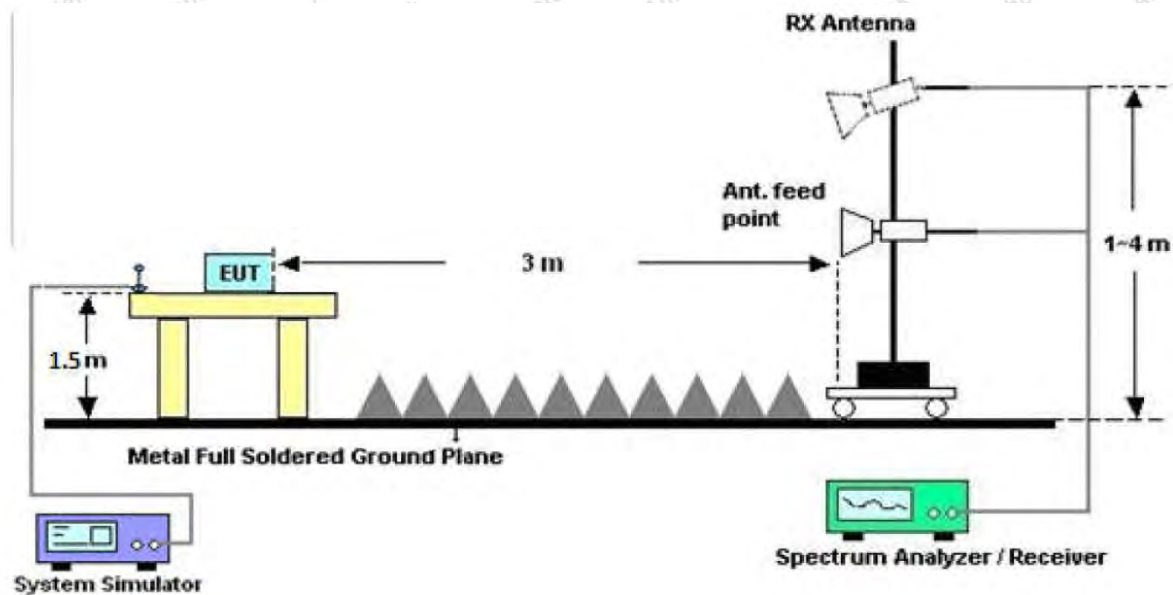


Figure 3. Above 1 GHz

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.: SZAWW180829002-01

Standard: FCC PART15 C_3m

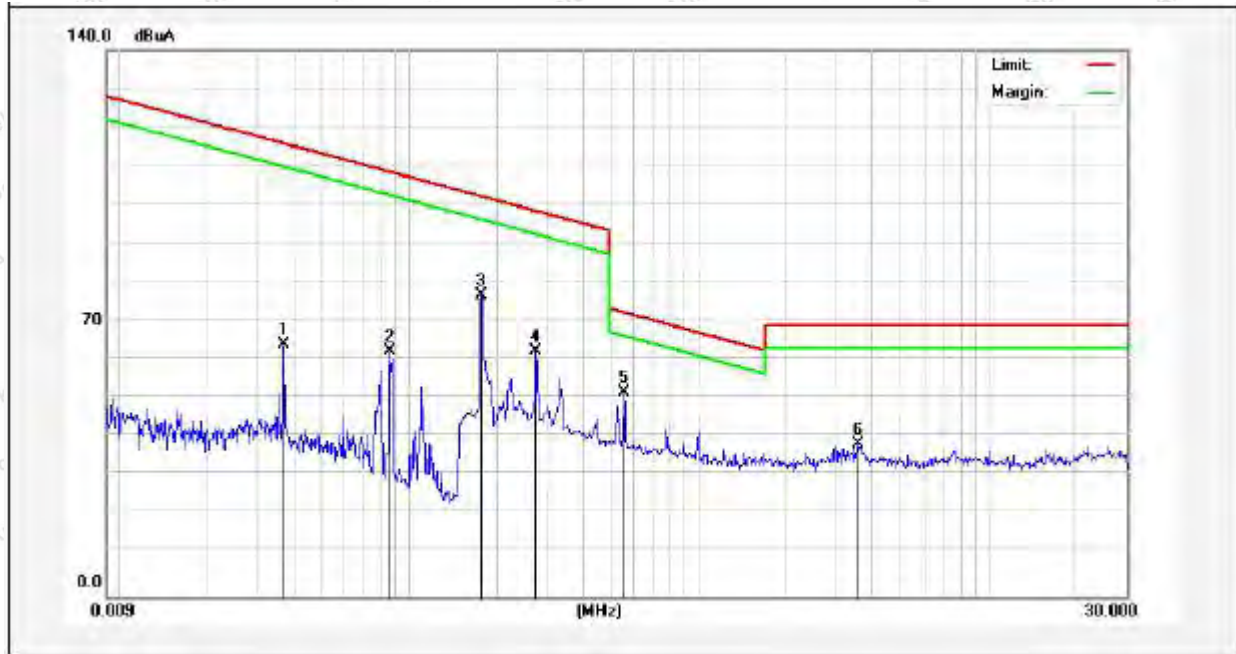
Power Source: AC 120V, 60Hz for adapter

Test item: Radiation Test

Temp.(C)/Hum.(%RH): 25.5(C)/55%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)
0.0371	53.30	19.28	2.53	0	75.11	136.09	-60.98	Peak	126
0.0371	42.89	19.28	2.53	0	64.70	116.09	-51.39	AV	126
0.0859	51.35	19.30	2.54	0	73.19	128.84	-55.65	Peak	317
0.0859	40.99	19.30	2.54	0	62.83	108.84	-46.01	AV	317
0.1779	65.39	19.53	2.59	0	87.51	122.55	-35.04	Peak	294
0.1779	55.02	19.53	2.59	0	77.14	102.55	-25.41	AV	294
0.2740	49.57	19.53	2.59	0	71.69	118.82	-47.13	Peak	59
0.2740	40.65	19.53	2.59	0	62.77	98.82	-36.05	AV	59
0.5540	29.48	20.34	2.59	0	52.41	72.73	-20.32	QP	41
3.5619	15.50	20.87	2.70	0	39.07	69.54	-30.47	QP	227

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.:	SZAWW180829002-01	Polarization:	Horizontal
Standard:	FCC PART15 C_3m	Power Source:	AC 120V, 60Hz for adapter
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	25.5(C)/55%RH
Test Mode:	Mode 1	Distance:	3m



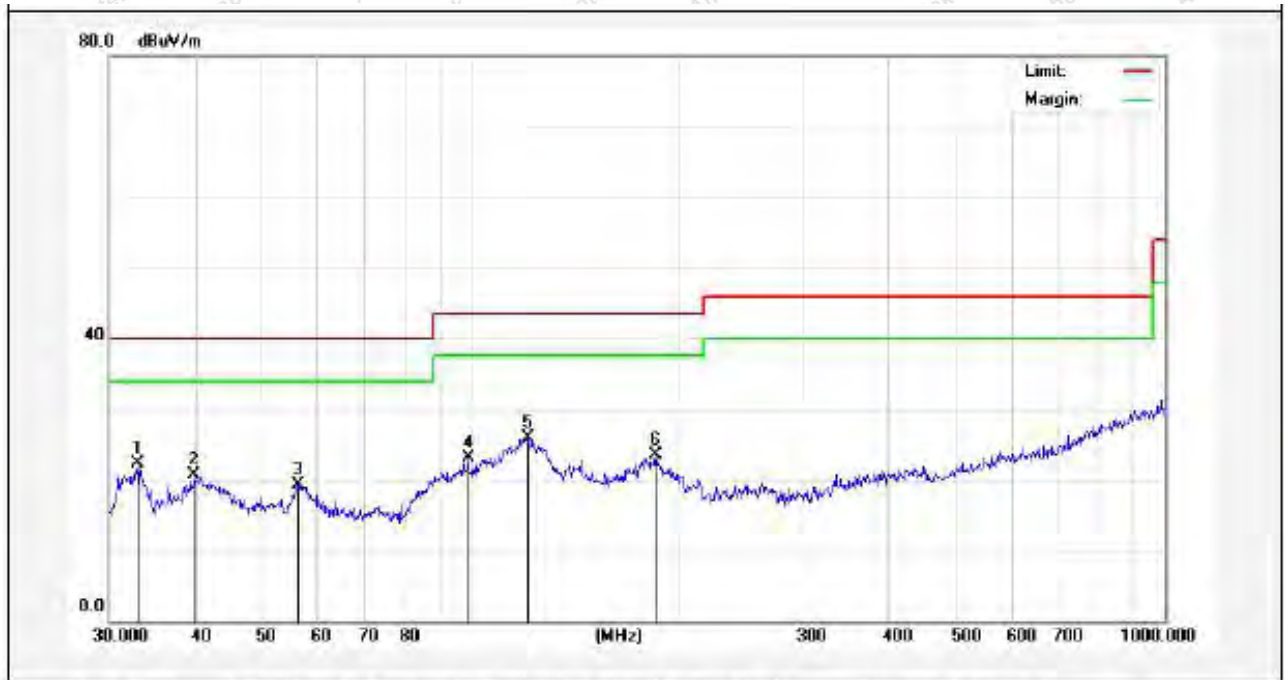
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	31.9546	38.44	-17.98	20.46	40.00	-19.54	QP	300	0	
2	43.8119	34.87	-15.10	19.77	40.00	-20.23	QP	300	37	
3	108.6470	40.48	-20.64	19.84	43.50	-23.66	QP	300	122	
4	178.1327	40.03	-19.80	20.23	43.50	-23.27	QP	300	176	
5	359.1860	34.38	-13.70	20.68	46.00	-25.32	QP	300	270	
6	590.9737	35.30	-11.21	24.09	46.00	-21.91	QP	300	360	

Job No.:	SZAWW180829002-01	Polarization:	Vertical
Standard:	FCC PART15 C_3m	Power Source:	AC 120V, 60Hz for adapter
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	25.5(C)/55%RH
Test Mode:	Mode 1	Distance:	3m



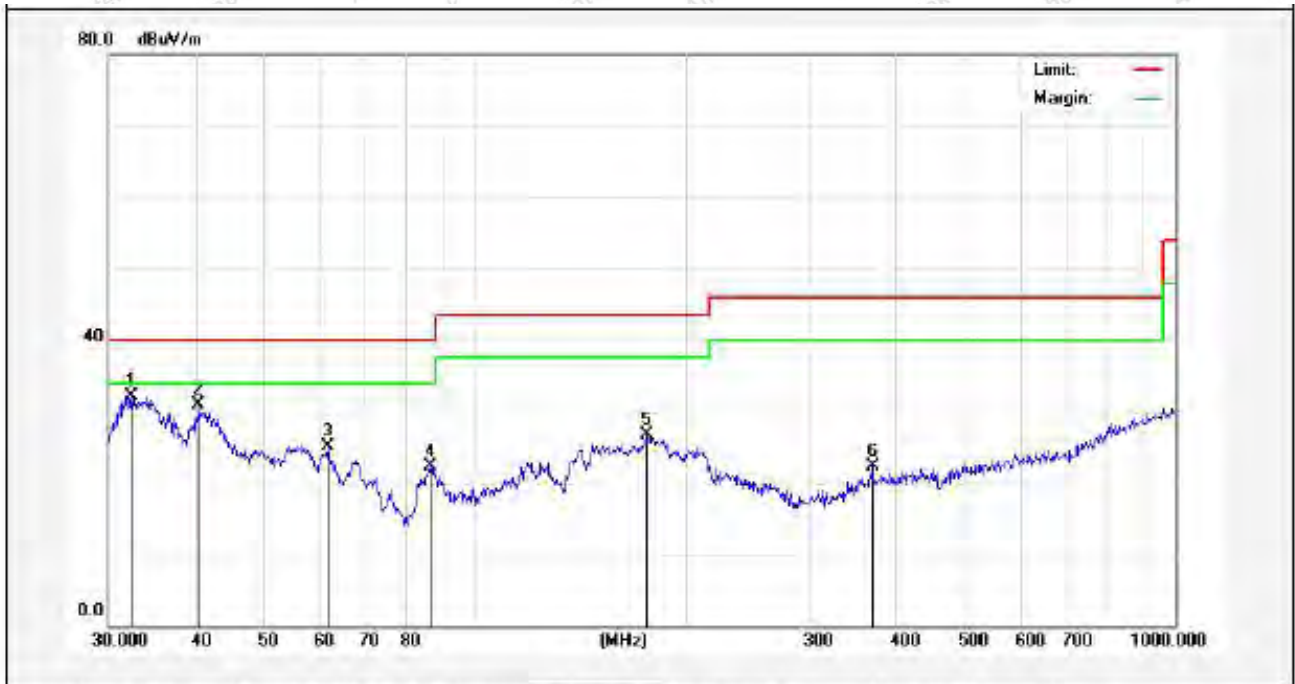
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	35.3750	44.71	-15.89	28.82	40.00	-11.18	QP	300	0	
2	40.5591	42.98	-13.47	29.51	40.00	-10.49	QP	300	36	
3	59.2325	42.09	-15.95	26.14	40.00	-13.86	QP	300	144	
4	125.4457	30.75	-16.14	14.61	43.50	-28.89	QP	300	217	
5	172.5988	36.20	-16.38	19.82	43.50	-23.68	QP	300	296	
6	502.9395	33.06	-10.90	22.16	46.00	-23.84	QP	300	360	

Job No.:	SZAWW180829002-01	Polarization:	Horizontal
Standard:	FCC PART15 C_3m	Power Source:	AC 240V, 60Hz for adapter
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	25.5(C)/55%RH
Test Mode:	Mode 1	Distance:	3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	32.9791	39.94	-17.69	22.25	40.00	-17.75	QP	300	0	
2	39.8542	35.13	-14.45	20.68	40.00	-19.32	QP	300	15	
3	56.1974	36.18	-16.80	19.38	40.00	-20.62	QP	300	172	
4	98.8326	43.98	-20.87	23.11	43.50	-20.39	QP	300	242	
5	120.2766	47.32	-21.34	25.98	43.50	-17.52	QP	300	310	
6	184.4898	43.36	-19.88	23.48	43.50	-20.02	QP	300	360	

Job No.:	SZAWW180829002-01	Polarization:	Vertical
Standard:	FCC PART15 C_3m	Power Source:	AC 240V, 60Hz for adapter
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	25.5(C)/55%RH
Test Mode:	Mode 1	Distance:	3m



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	32.4059	48.99	-16.85	32.14	40.00	-7.86	QP	300	0	
2	40.4172	44.36	-13.44	30.92	40.00	-9.08	QP	300	24	
3	61.7781	41.76	-16.66	25.10	40.00	-14.90	QP	300	63	
4	86.5029	40.08	-17.74	22.34	40.00	-17.66	QP	300	174	
5	175.6516	42.83	-16.16	26.67	43.50	-16.83	QP	300	220	
6	369.4047	34.71	-12.48	22.23	46.00	-23.77	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 bluetooth 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.

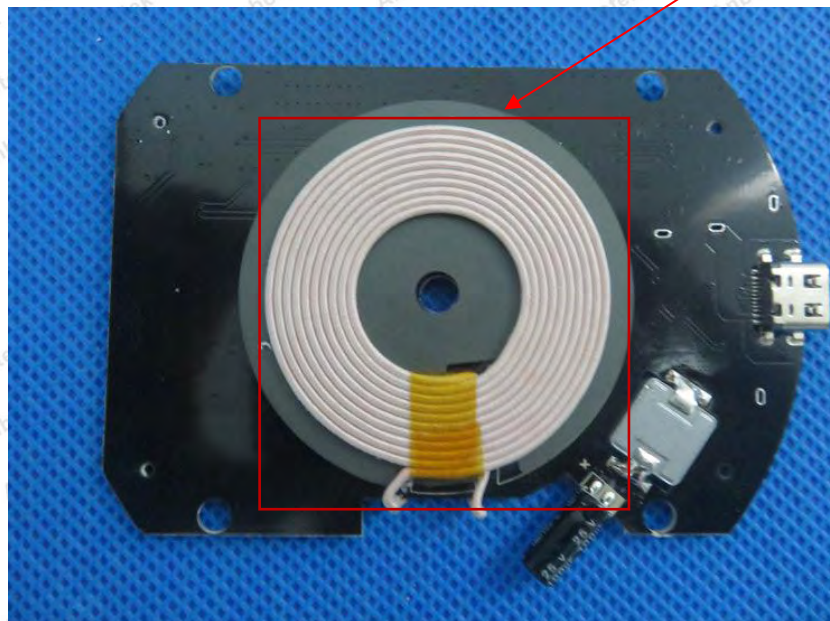
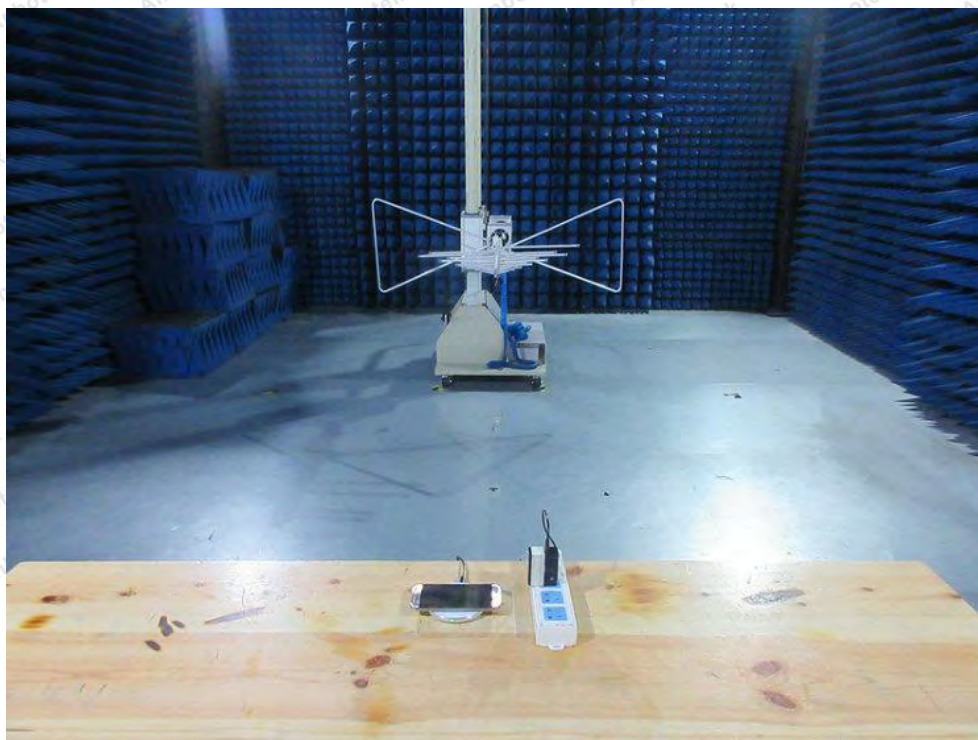


Photo of Conducted Emission Measurement

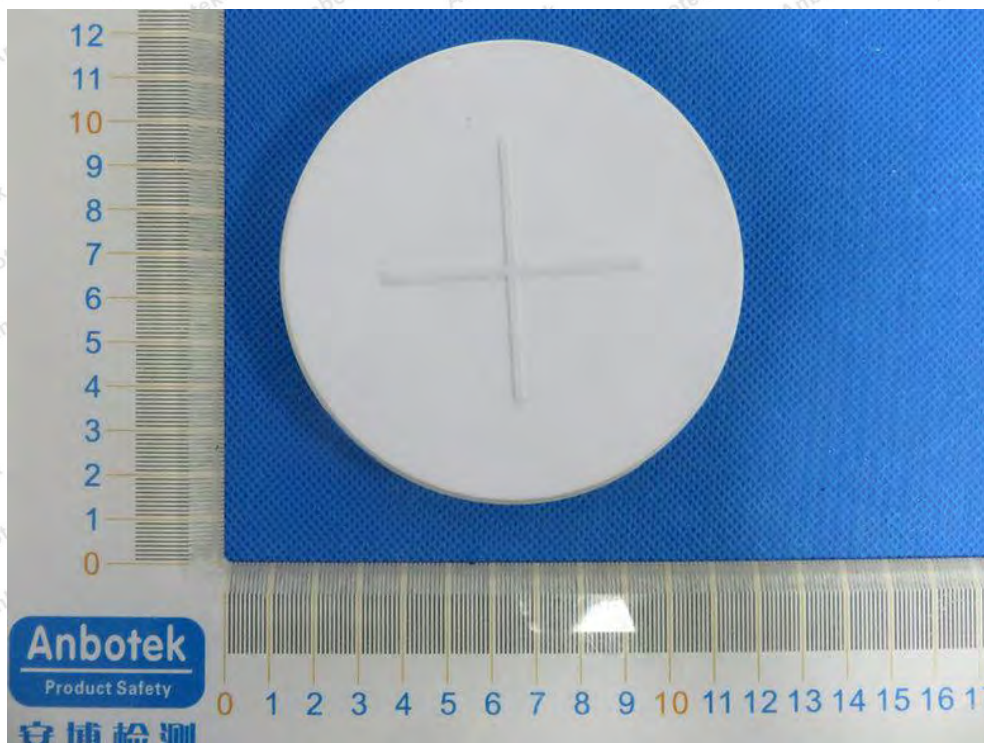


Photo of Radiation Emission Test

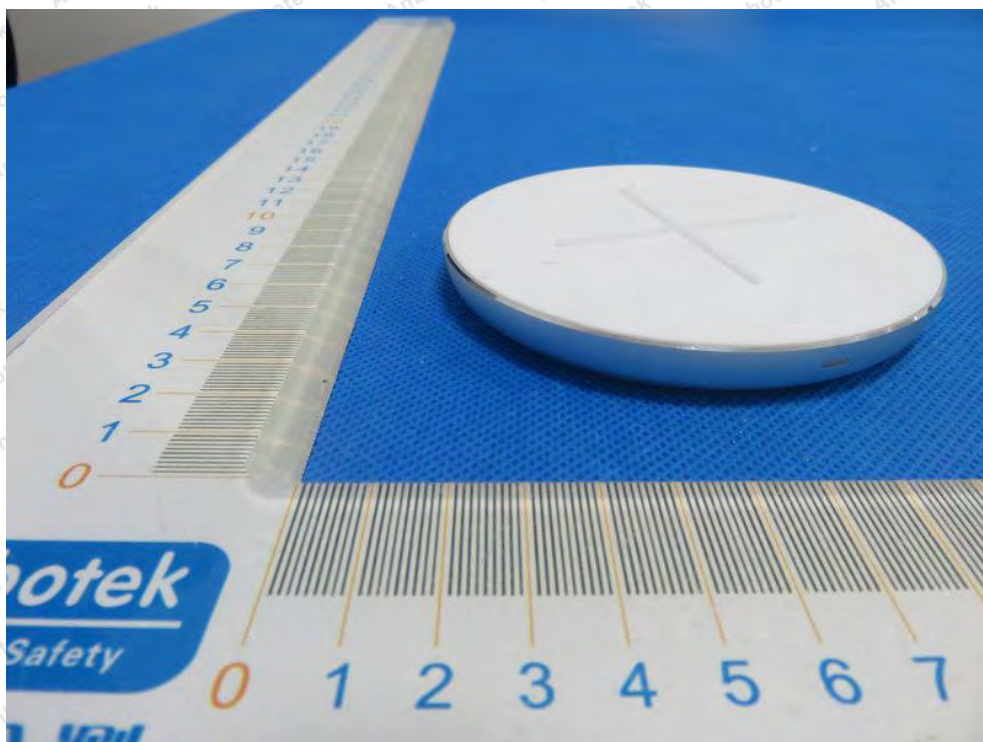
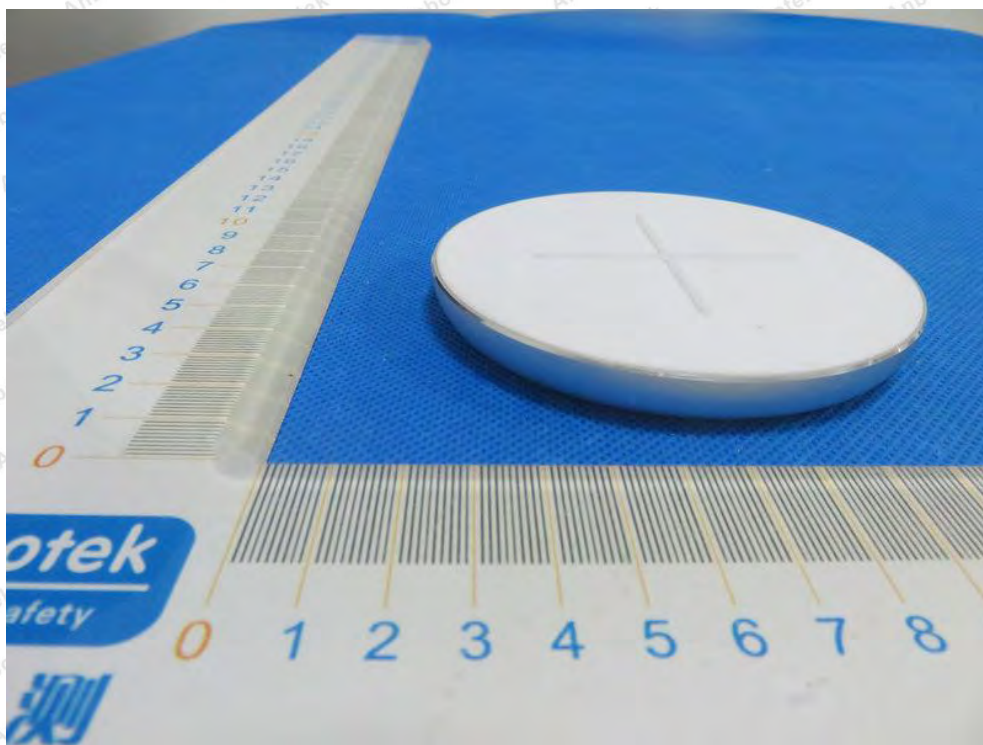


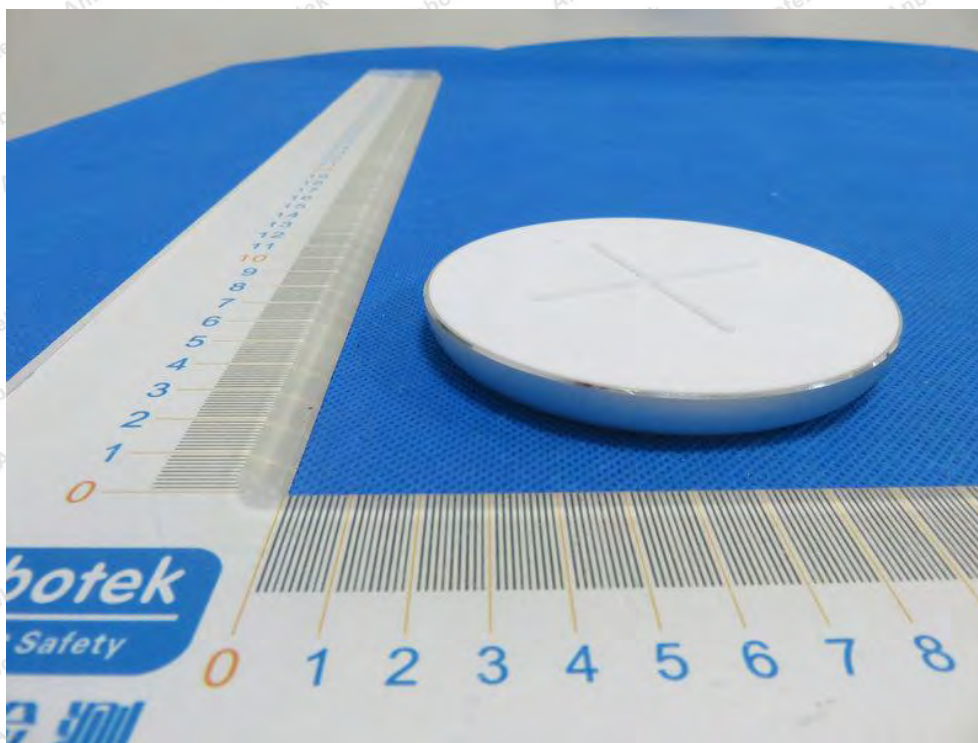


APPENDIX II -- EXTERNAL PHOTOGRAPH

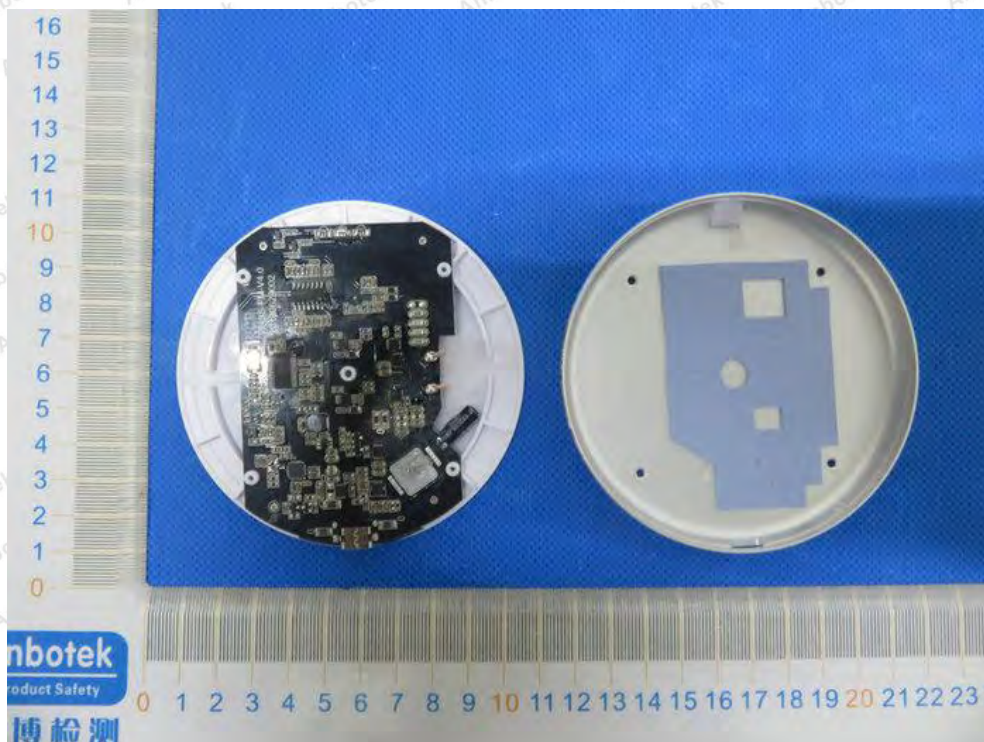


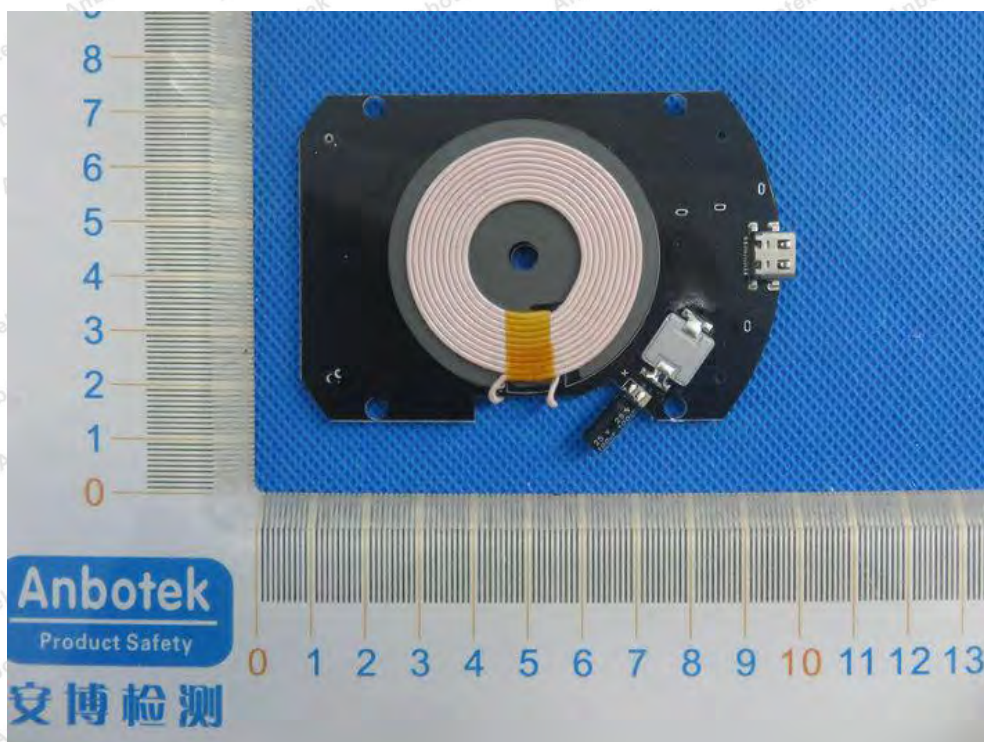






APPENDIX III -- INTERNAL PHOTOGRAPH





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