

FCC TEST REPORT

For

Shenzhen Pilot Technology Co., Ltd

Power Bank

Model No.: WX610N

Prepared For : Shenzhen Pilot Technology Co., Ltd
Address : A1 Building, No.7 Shankeng Road, Shankeng Industrial Park, Shanxia
Community, Pinghu Street, Longgang District, Shenzhen, China

Prepared By : Shenzhen Anbotek Compliance Laboratory Limited
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Report Number : R0217110070W1
Date of Test : Dec. 24, 2017~Jan. 18, 2018
Date of Report : Jan. 18, 2018

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TEST REPORT

Applicant : Shenzhen Pilot Technology Co., Ltd
Manufacturer : Shenzhen Pilot Technology Co., Ltd
Product Name : Power Bank
Model No. : WX610N
Trade Mark : N/A
Rating(s) : Input: DC 5V, 2A (with DC 3.7V, 5000 mAh Battery inside)
Output: DC 5V 2.1A
Wireless Output: DC 5V 1A

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

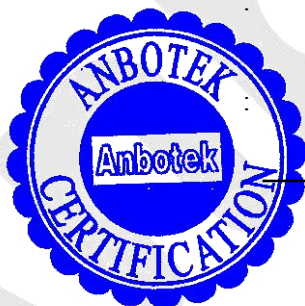
Test Method(s) : ANSI C63.10: 2013

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 : Dec. 24, 2017~Jan. 18, 2018

Prepared by :



Winkey Wang

(Tested Engineer / Winkey Wang)

Reviewer :

Tangcy. T.

(Project Manager / Tangcy. T)

Approved & Authorized Signer :

Tom Chen

(Manager / Tom Chen)

1. General Information

1.1. Client Information

Applicant	:	Shenzhen Pilot Technology Co., Ltd
Address	:	A1 Building, No.7 Shankeng Road, Shankeng Industrial Park, Shanxia Community, Pinghu Street, Longgang District, Shenzhen, China
Manufacturer	:	Shenzhen Pilot Technology Co., Ltd
Address	:	A1 Building, No.7 Shankeng Road, Shankeng Industrial Park, Shanxia Community, Pinghu Street, Longgang District, Shenzhen, China

1.2. Description of Device (EUT)

Product Name	:	Power Bank	
Model No.	:	WX610N	
Trade Mark	:	N/A	
Test Power Supply	:	AC 120V, 60Hz for adapter/AC 240V, 60Hz for adapter DC 3.7V Battery inside	
Product Description	:	Operation Frequency:	110-205KHz
		Number of Channel:	20 Channels
		Modulation Type:	MSK
		Antenna Type:	Loop 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	:	Manufacturer: Samsung M/N: ETA-U90CBC S/N: RT6FB17ZS/B-E Input: AC 100-240V, 50-60Hz, 0.35A Output: DC 5V, 2A
Mobile Phone	:	Manufacturer: NOKIA M/N: N920 S/N: 356355051634804 CE, FCC, DOC

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	CH01
Mode 2	CH10
Mode 3	CH20
Mode 4	Keeping TX mode

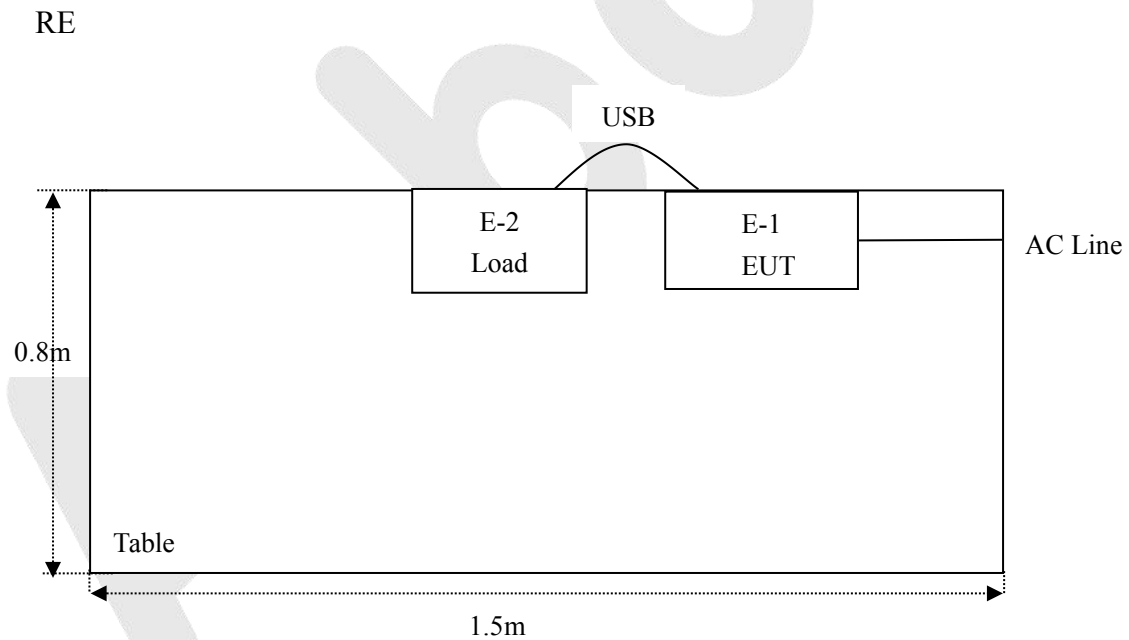
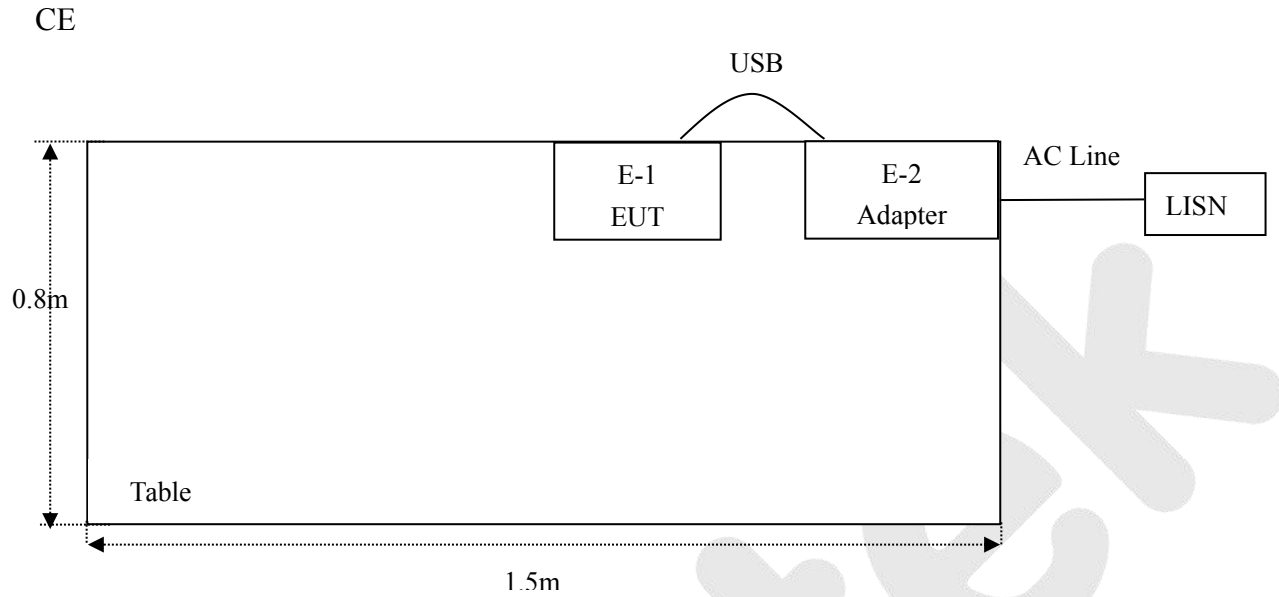
For Conducted Emission	
Final Test Mode	Description
Mode 4	Keeping TX mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH01
Mode 2	CH10
Mode 3	CH20

1.5. List of channels

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	0.110	6	0.135	11	0.160	16	0.185
2	0.115	7	0.140	12	0.165	17	0.190
3	0.120	8	0.145	13	0.170	18	0.195
4	0.125	9	0.150	14	0.175	19	0.200
5	0.130	10	0.155	15	0.180	20	0.205

1.6. Description Of Test Setup



1.7. 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.	Spectrum Analysis	Agilent	N9038A	MY53227295	Nov. 17, 2017	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G3 0D	KD17503	Nov. 17, 2017	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Nov. 17, 2017	1 Year
8.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 20, 2017	1 Year
9.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 20, 2017	1 Year
10.	Loop Antenna	Schwarzbeck	HFH2-Z2	100047	Nov. 17, 2017	1 Year
11.	Horn Antenna	Schewarzbeck	BBHA9170	9170-375	Nov. 17, 2017	1 Year
12.	Pre-amplifier	SONOMA	310N	186860	Nov. 17, 2017	1 Year
13.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
14.	RF Test Control System	YIHENG	YH3000	2017430	Nov. 18, 2017	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN045	Nov. 17, 2017	1 Year
16.	Power Sensor	DAER	RPR3006W	15I00041SN046	Nov. 17, 2017	1 Year
17.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 18, 2017	1 Year
18.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Nov. 18, 2017	1 Year
19.	Signal Generator	Agilent	E4421B	MY41000743	Nov. 18, 2017	1 Year
20.	DC Power Supply	LW	TPR-6410D	349315	Nov. 01, 2017	1 Year
21.	Constant Temperature Humidity Chamber	Sertep	ZJ-HWHS8 0B	ZJ-17042804	Nov. 01, 2017	1 Year

1.8. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 4.1 dB (Horizontal)
		Ur = 4.3 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4dB

1.9. 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

All Emissions tests were performed at
Shenzhen Anbotek Compliance Laboratory Limited. at 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

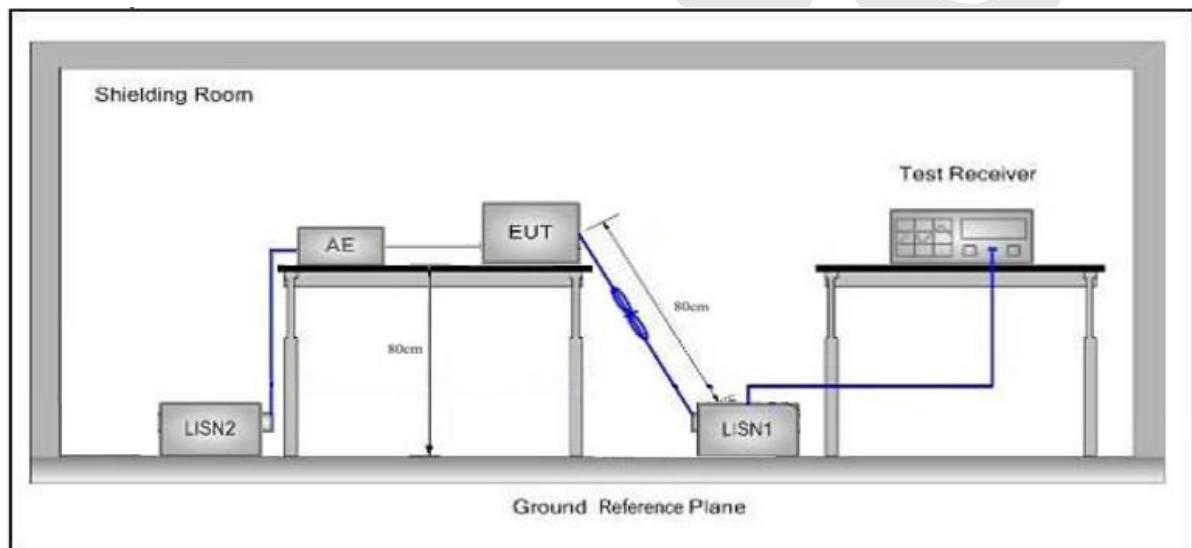
3. Conducted Emission Test

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.

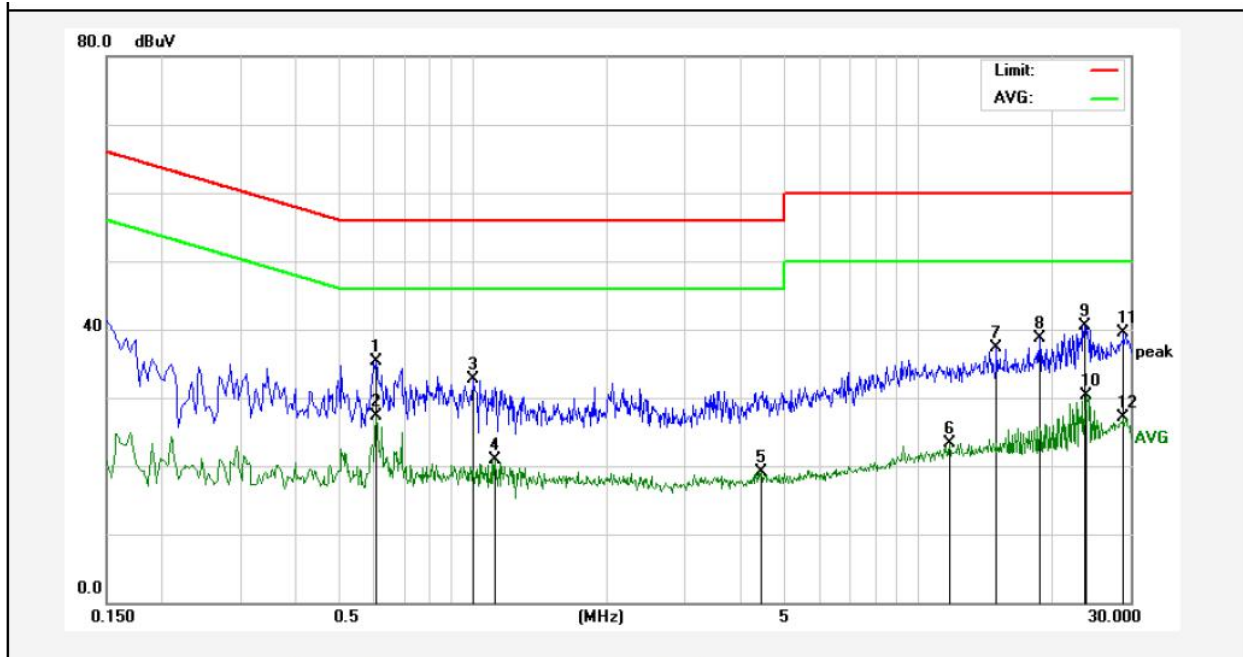
The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

Please to see the following pages

Conducted Emission Test Data

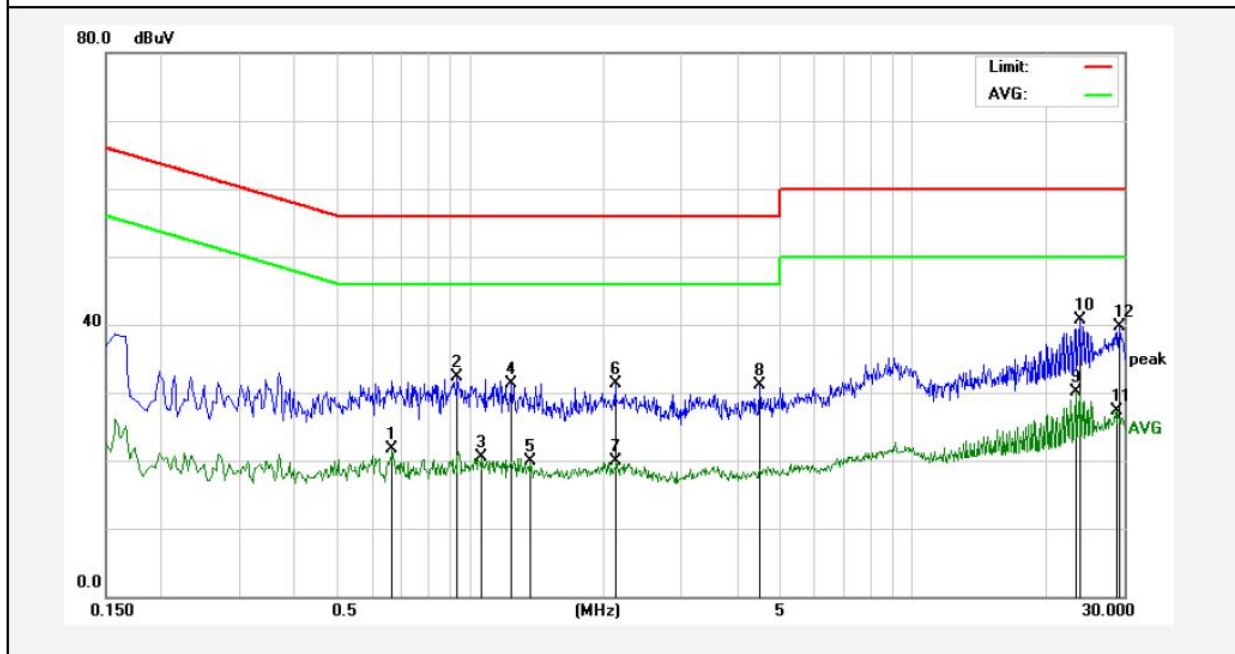
Test Site: 1# Shielded Room
Operating Condition: Keeping TX mode
Test Specification: AC 120V, 60Hz for adapter
Comment: Live Line
Tem.:25°C Hum.:50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.6060	15.29	20.01	35.30	56.00	-20.70	QP	
2	0.6060	7.32	20.01	27.33	46.00	-18.67	AVG	
3	1.0020	12.56	20.12	32.68	56.00	-23.32	QP	
4	1.1220	0.88	20.12	21.00	46.00	-25.00	AVG	
5	4.4340	-1.01	20.19	19.18	46.00	-26.82	AVG	
6	11.7540	2.97	20.31	23.28	50.00	-26.72	AVG	
7	15.0060	16.99	20.26	37.25	60.00	-22.75	QP	
8	18.7580	18.37	20.32	38.69	60.00	-21.31	QP	
9	23.7580	20.12	20.29	40.41	60.00	-19.59	QP	
10	24.0100	10.11	20.29	30.40	50.00	-19.60	AVG	
11	29.0140	19.16	20.27	39.43	60.00	-20.57	QP	
12	29.0140	6.82	20.27	27.09	50.00	-22.91	AVG	

Conducted Emission Test Data

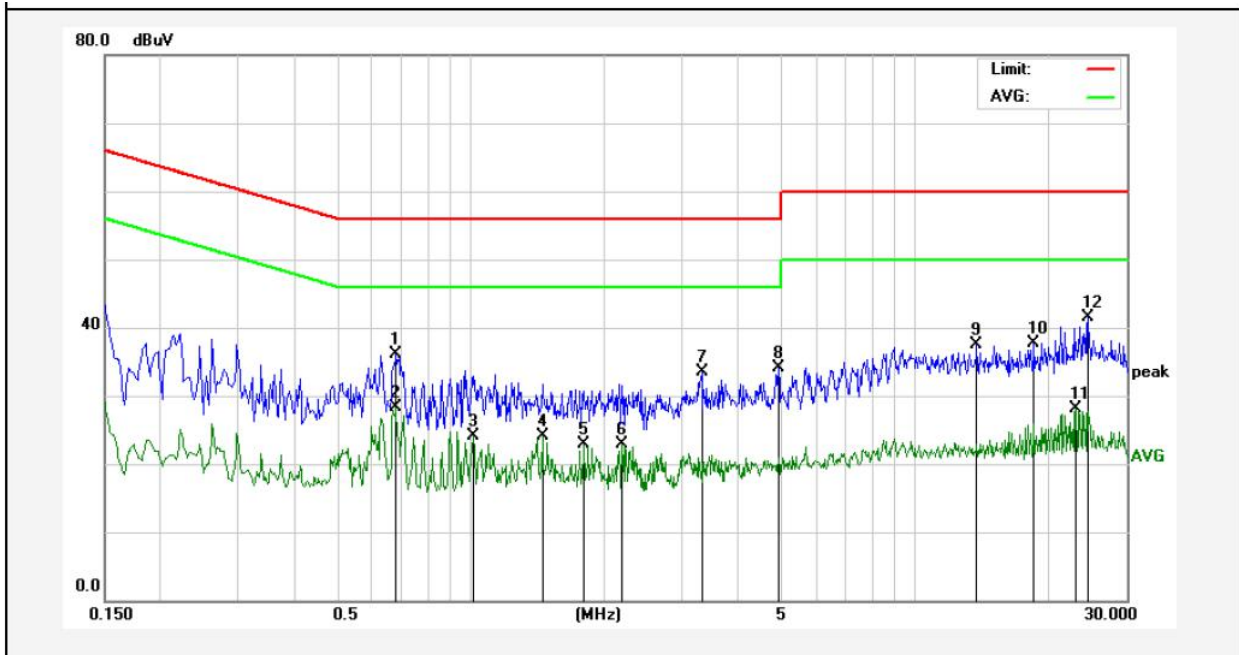
Test Site: 1# Shielded Room
Operating Condition: Keeping TX mode
Test Specification: AC 120V, 60Hz for adapter
Comment: Neutral Line
Tem.:25°C Hum.:50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.6660	1.76	20.03	21.79	46.00	-24.21	AVG	
2	0.9340	12.18	20.10	32.28	56.00	-23.72	QP	
3	1.0620	0.47	20.12	20.59	46.00	-25.41	AVG	
4	1.2380	11.19	20.12	31.31	56.00	-24.69	QP	
5	1.3619	-0.28	20.13	19.85	46.00	-26.15	AVG	
6	2.1300	11.09	20.14	31.23	56.00	-24.77	QP	
7	2.1420	-0.26	20.14	19.88	46.00	-26.12	AVG	
8	4.5020	11.00	20.19	31.19	56.00	-24.81	QP	
9	23.4980	9.86	20.30	30.16	50.00	-19.84	AVG	
10	24.0020	20.36	20.29	40.65	60.00	-19.35	QP	
11	28.9980	7.01	20.27	27.28	50.00	-22.72	AVG	
12	29.3460	19.36	20.27	39.63	60.00	-20.37	QP	

Conducted Emission Test Data

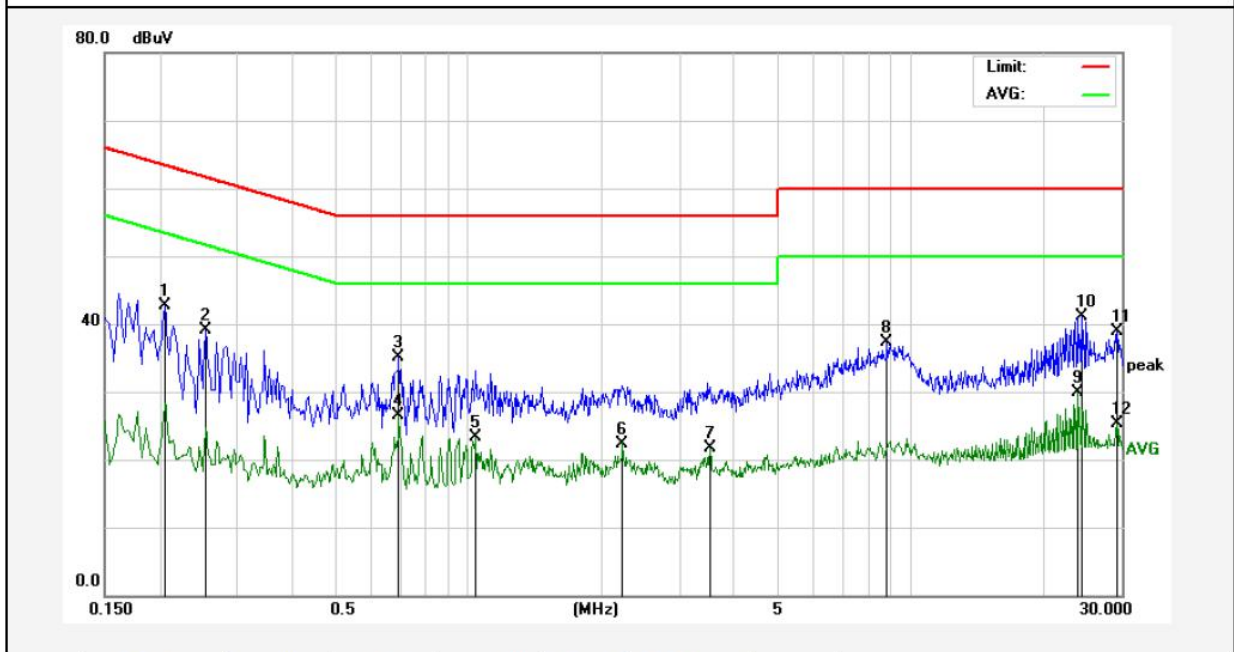
Test Site: 1# Shielded Room
Operating Condition: Keeping TX mode
Test Specification: AC 240V, 60Hz for adapter
Comment: Live Line
Tem.:25℃ Hum.:50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.6820	16.00	20.03	36.03	56.00	-19.97	QP	
2	0.6820	8.21	20.03	28.24	46.00	-17.76	AVG	
3	1.0180	3.99	20.12	24.11	46.00	-21.89	AVG	
4	1.4500	4.02	20.13	24.15	46.00	-21.85	AVG	
5	1.8020	2.71	20.14	22.85	46.00	-23.15	AVG	
6	2.1940	2.73	20.14	22.87	46.00	-23.13	AVG	
7	3.3180	13.26	20.17	33.43	56.00	-22.57	QP	
8	4.9260	13.86	20.20	34.06	56.00	-21.94	QP	
9	13.7700	17.25	20.28	37.53	60.00	-22.47	QP	
10	18.5380	17.31	20.32	37.63	60.00	-22.37	QP	
11	23.0340	7.75	20.30	28.05	50.00	-21.95	AVG	
12	24.5459	21.16	20.29	41.45	60.00	-18.55	QP	

Conducted Emission Test Data

Test Site: 1# Shielded Room
Operating Condition: Keeping TX mode
Test Specification: AC 240V, 60Hz for adapter
Comment: Neutral Line
Tem.:25°C Hum.:50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.2060	22.84	19.90	42.74	63.36	-20.62	QP	
2	0.2540	19.17	19.89	39.06	61.62	-22.56	QP	
3	0.6940	14.98	20.04	35.02	56.00	-20.98	QP	
4	0.6940	6.54	20.04	26.58	46.00	-19.42	AVG	
5	1.0380	3.23	20.12	23.35	46.00	-22.65	AVG	
6	2.2300	2.26	20.14	22.40	46.00	-23.60	AVG	
7	3.5100	1.60	20.17	21.77	46.00	-24.23	AVG	
8	8.8459	16.92	20.31	37.23	60.00	-22.77	QP	
9	23.8300	9.69	20.29	29.98	50.00	-20.02	AVG	
10	24.3180	20.87	20.29	41.16	60.00	-18.84	QP	
11	29.3260	18.57	20.27	38.84	60.00	-21.16	QP	
12	29.3260	5.05	20.27	25.32	50.00	-24.68	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

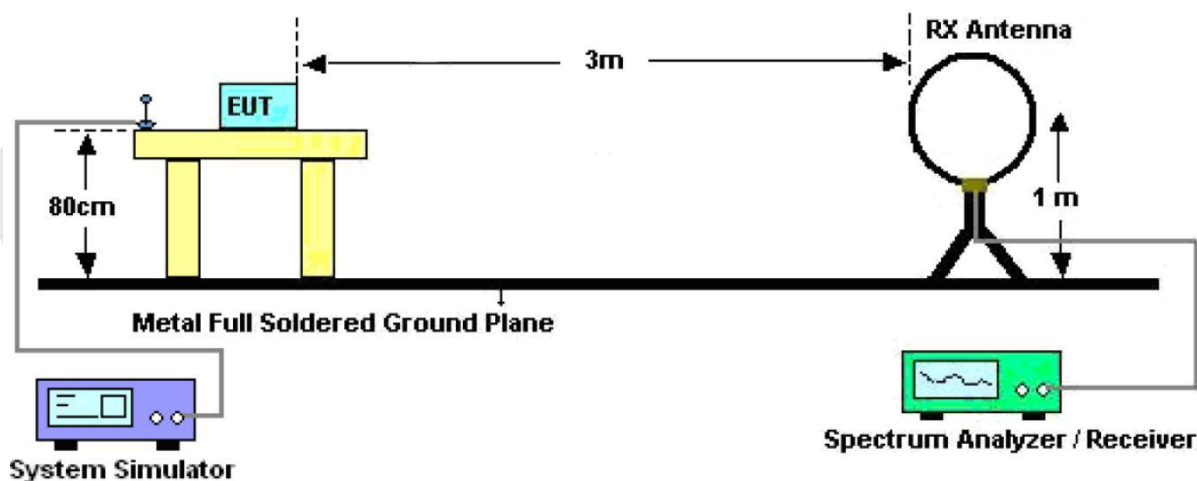


Figure 1. Below 30MHz

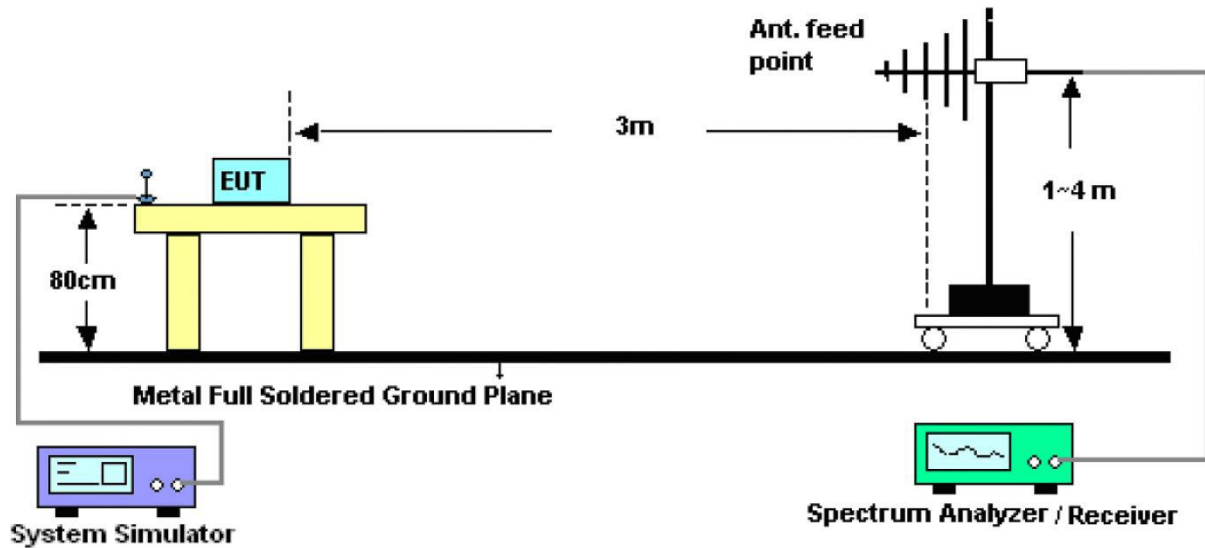


Figure 2. 30MHz to 1GHz

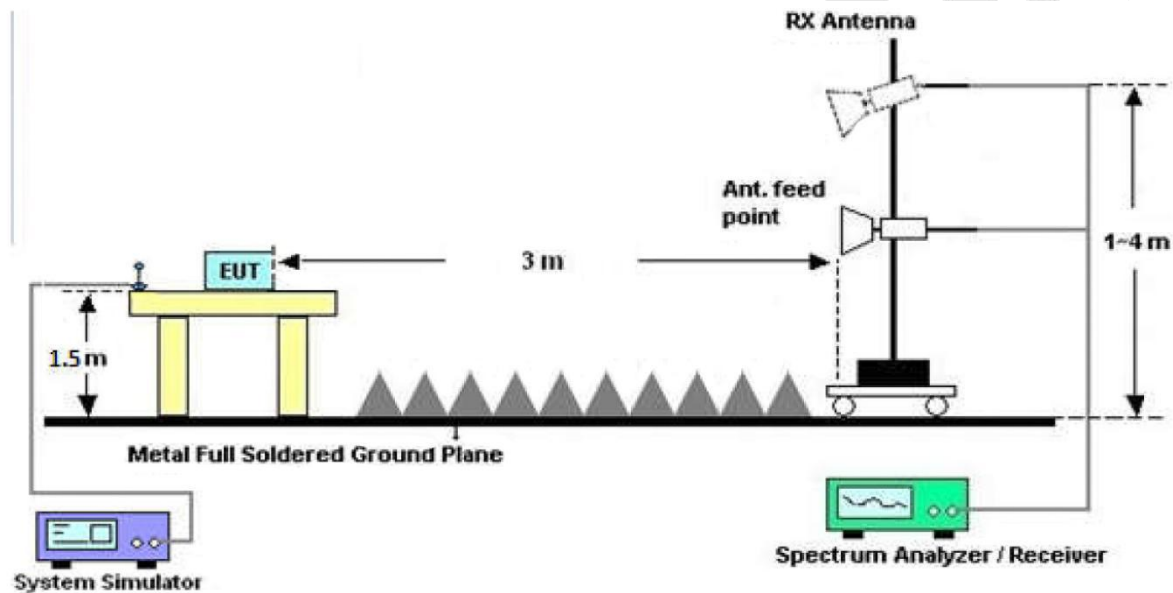


Figure 3. Above 1 GHz

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

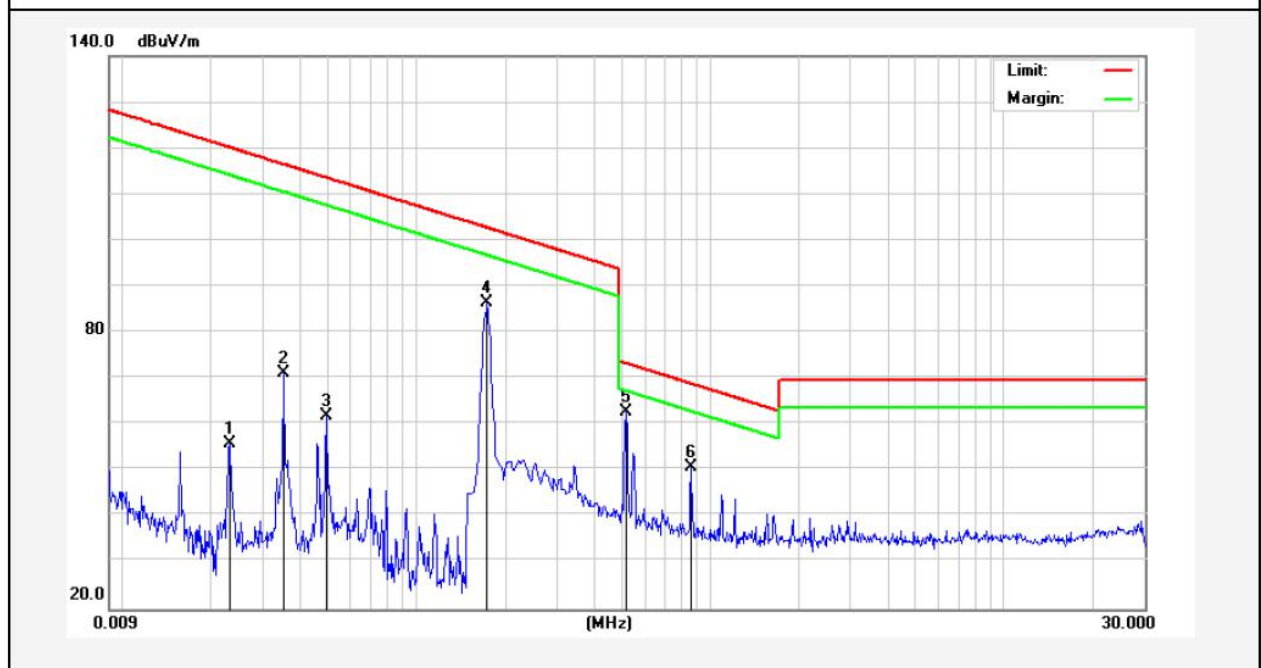
PASS

Anbotek

Test Results

(Between 9KHz – 30MHz)

Job No.:	0217110070W1	Power Source:	AC 120V, 60Hz for adapter
Standard:	FCC PART15 C _3m	Temp.(C)/Hum.(%RH):	24.4(C)/50%RH
Test item:	Radiation Test	Distance:	3m
Test Mode:	TX Mode		

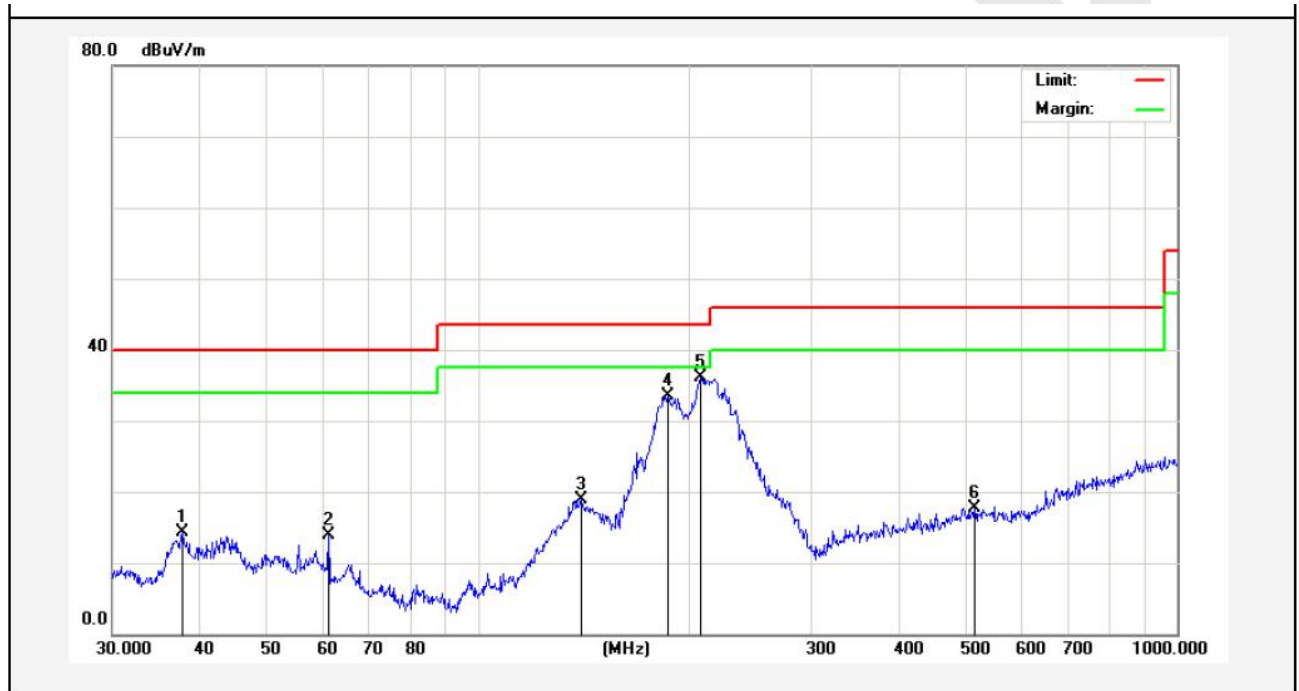


Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	degree (dge)
0.0232	59.92	19.30	2.53	0	81.75	120.15	-38.40	Peak	15
0.0232	57.11	19.30	2.53	0	78.94	100.15	-21.21	AV	15
0.0354	68.76	19.30	2.53	0	90.59	116.45	-25.86	Peak	33
0.0354	59.74	19.30	2.53	0	81.57	96.45	-14.88	AV	33
0.0495	53.68	19.29	2.54	0	75.51	126.08	-50.57	Peak	124
0.0495	46.69	19.29	2.54	0	68.52	106.08	-37.56	AV	124
0.174	50.24	19.36	2.55	0	72.15	102.74	-30.59	Peak	101
0.174	47.71	19.36	2.55	0	69.62	82.74	-13.12	AV	101
0.518	38.23	19.63	2.59	0	60.45	73.32	-12.87	QP	324
0.862	27.03	19.63	2.59	0	49.25	68.69	-19.44	QP	324

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.

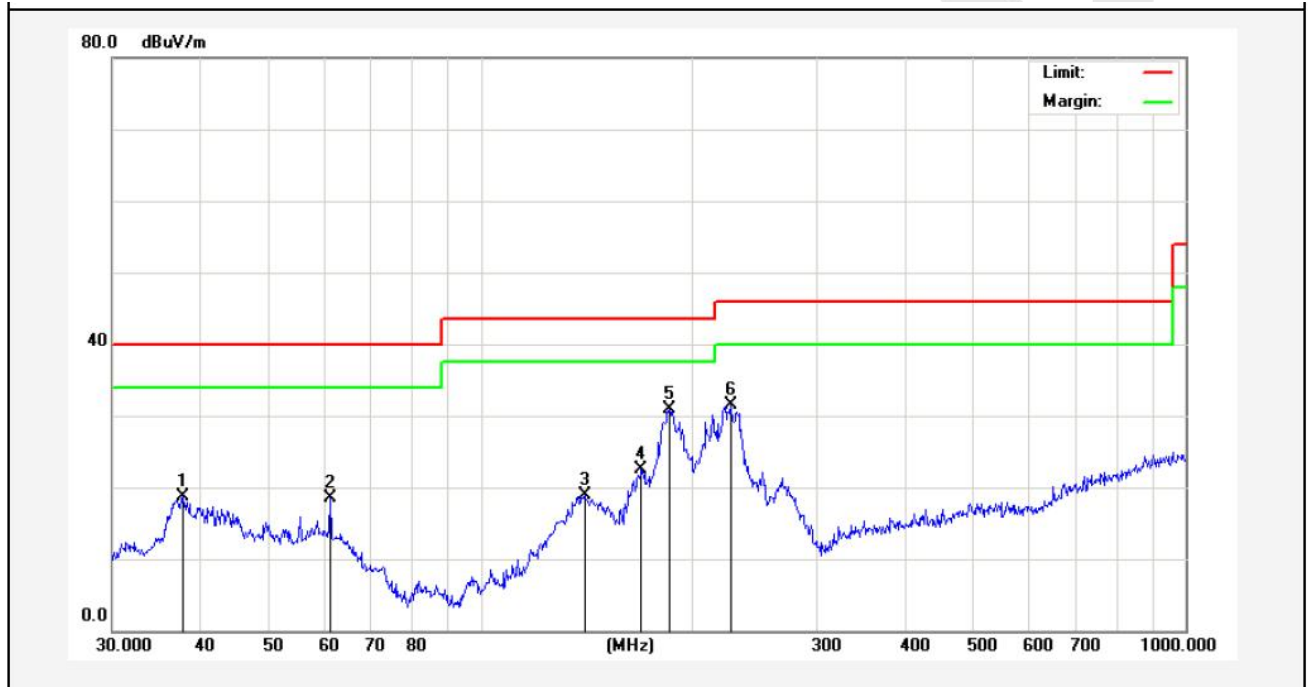
(Between 30MHz –1000 MHz)

Job No.:	0217110070W1	Polarization:	Horizontal
Standard:	FCC PART15 C _3m	Power Source:	AC 120V, 60Hz for adapter
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.4(C)/50%RH
Test Mode:	TX Mode	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	37.8121	29.84	-15.56	14.28	40.00	-25.72	QP	300	24	
2	61.1315	31.40	-17.43	13.97	40.00	-26.03	QP	300	77	
3	140.3420	40.33	-21.48	18.85	43.50	-24.65	QP	300	115	
4	187.0956	53.44	-19.91	33.53	43.50	-9.97	QP	300	167	
5	208.5801	55.10	-19.06	36.04	43.50	-7.46	QP	300	210	
6	513.6331	28.67	-10.99	17.68	46.00	-28.32	QP	300	263	

Job No.:	0217110070W1	Plarization:	Vertical
Standard:	FCC PART15 C _3m	Power Source:	AC 120V, 60Hz for adapter
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.4(C)/50%RH
Test Mode:	TX Mode	Distance:	3m



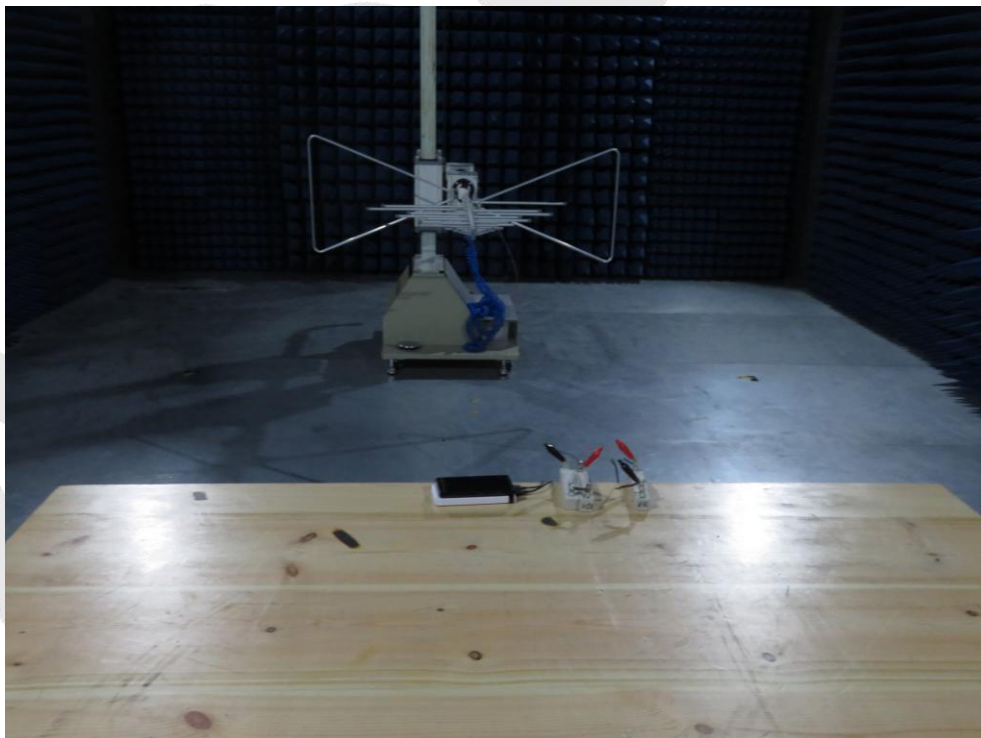
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	37.8121	34.34	-15.56	18.78	40.00	-21.22	QP	300	16	
2	61.1315	35.90	-17.43	18.47	40.00	-21.53	QP	300	77	
3	140.3420	40.33	-21.48	18.85	43.50	-24.65	QP	300	115	
4	169.0054	42.16	-19.70	22.46	43.50	-21.04	QP	300	152	
5	185.1379	50.75	-19.88	30.87	43.50	-12.63	QP	300	179	
6	226.0994	50.34	-18.75	31.59	46.00	-14.41	QP	300	210	

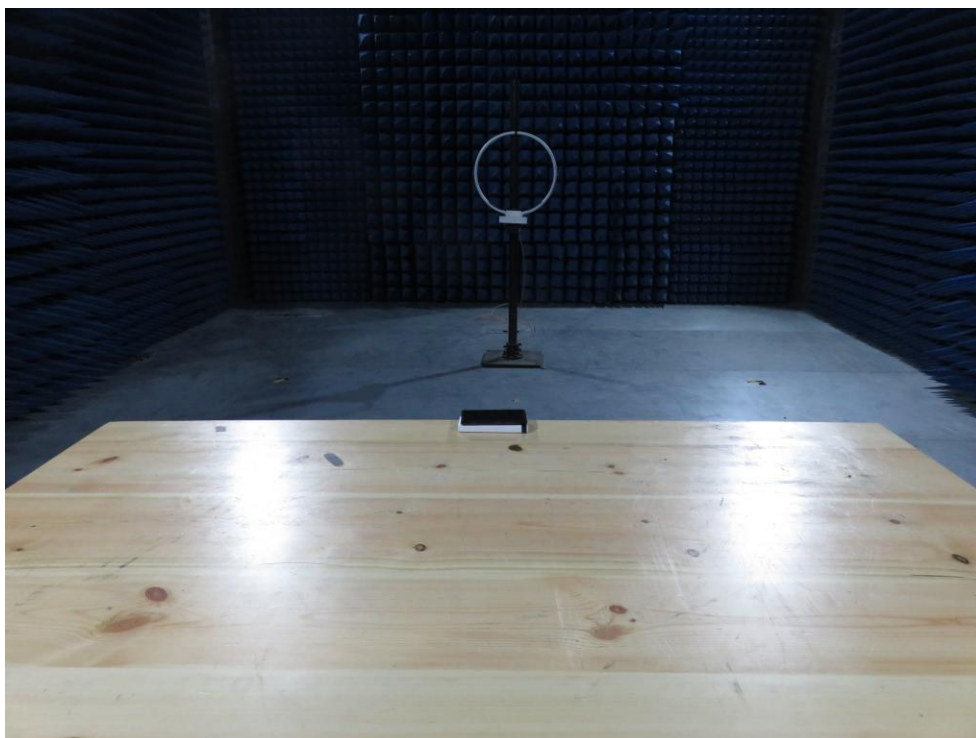
APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Conducted Emission Measurement



Photo of Radiation Emission Test

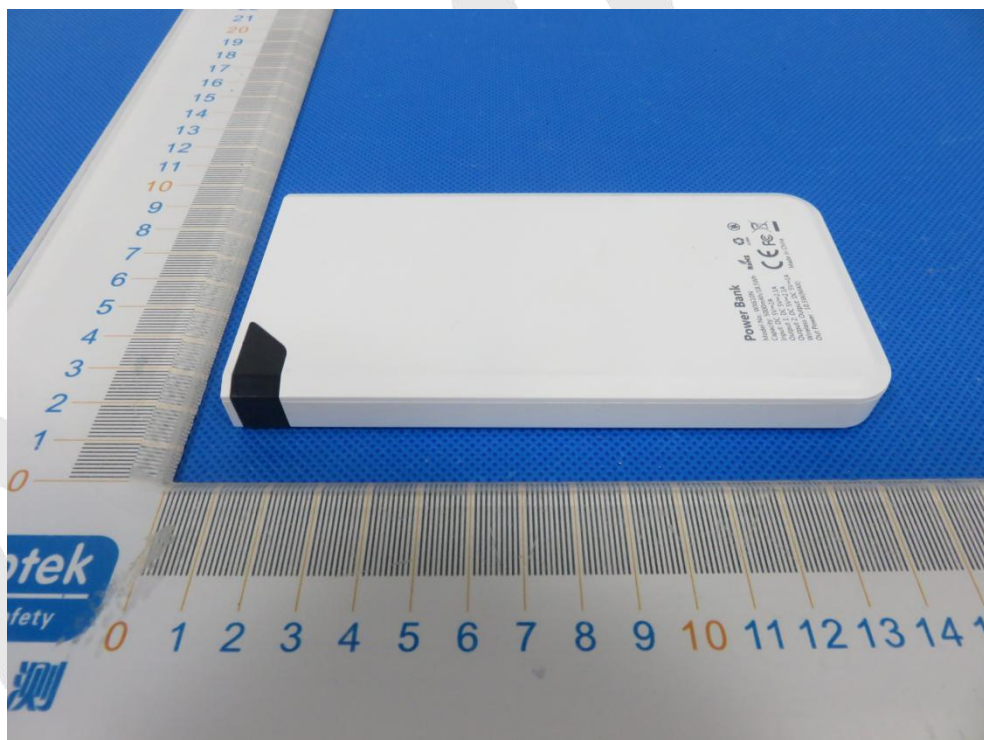




APPENDIX II -- EXTERNAL PHOTOGRAPH

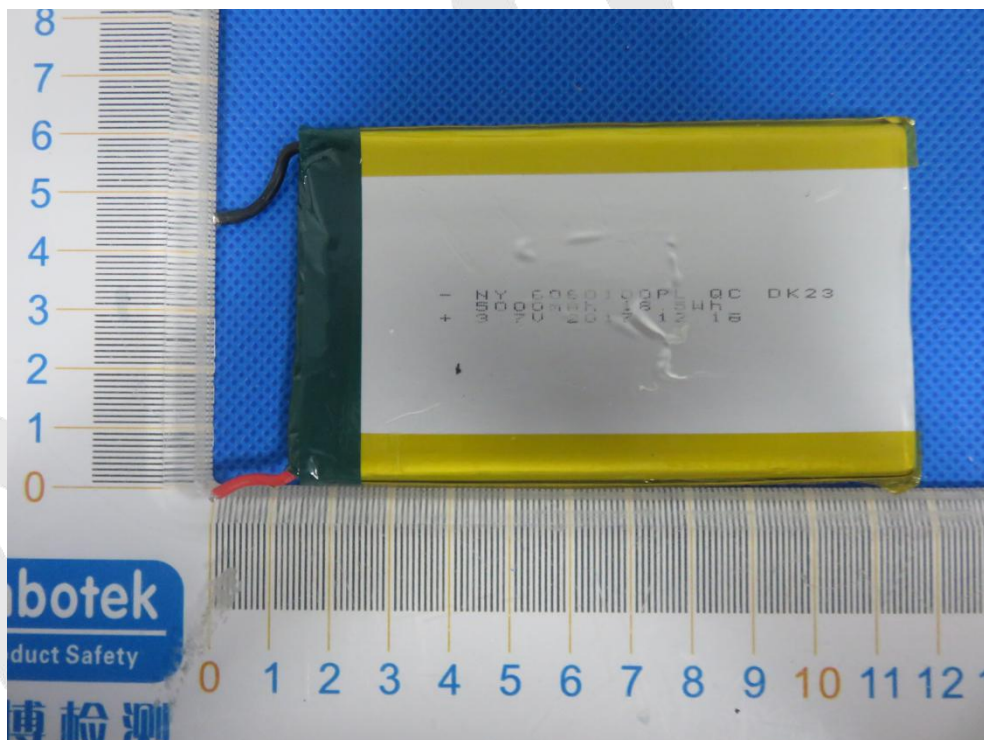


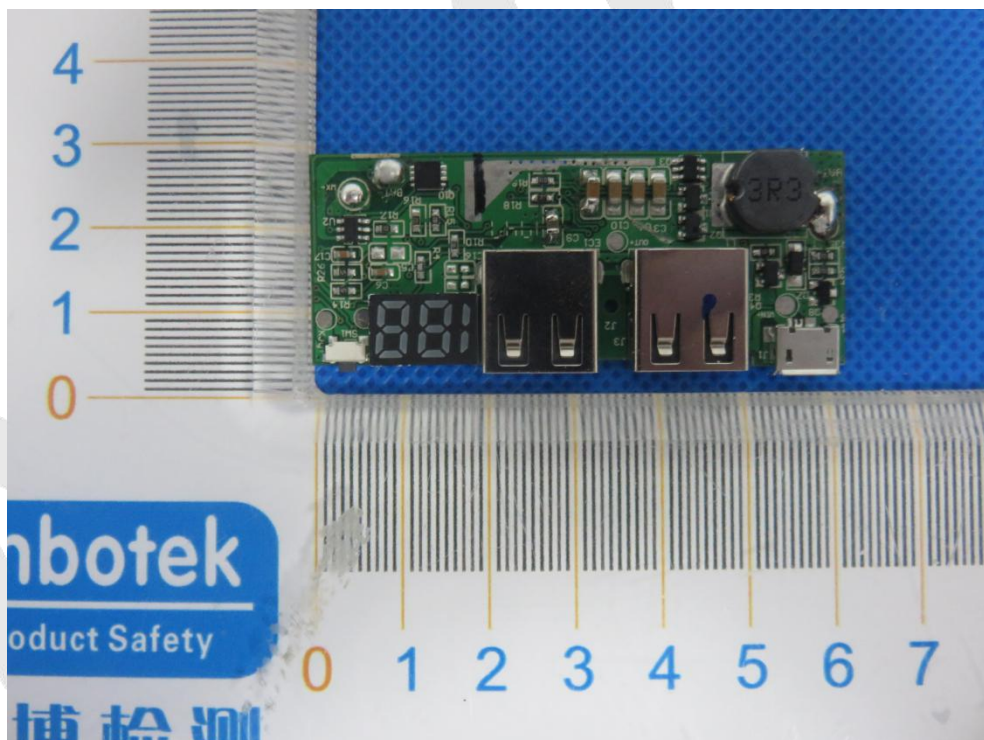
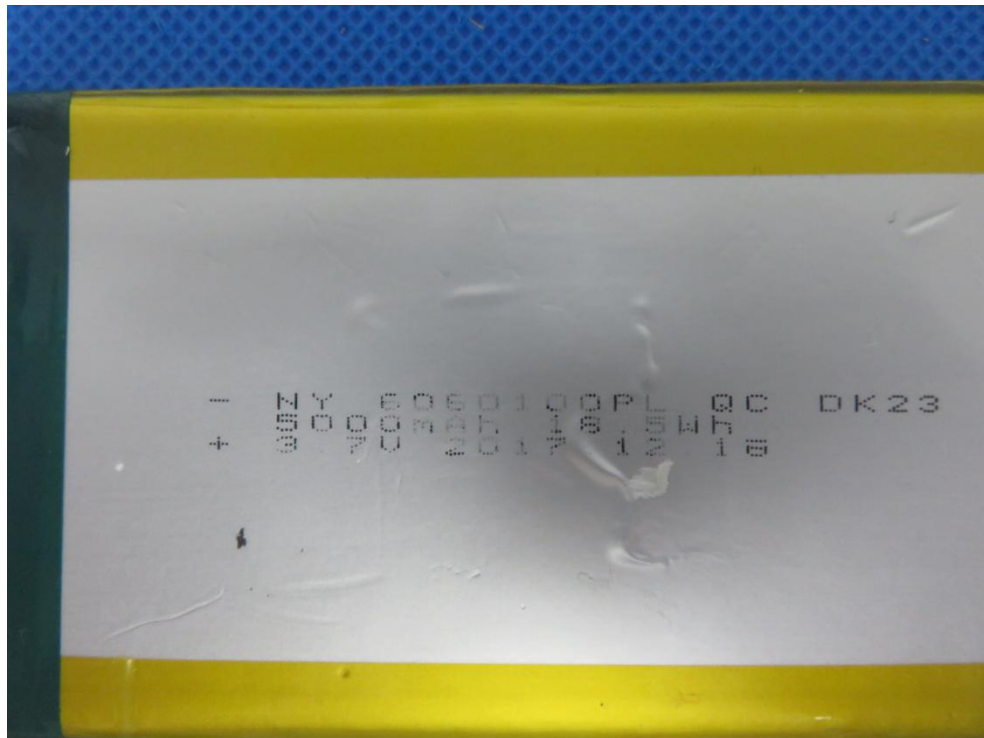


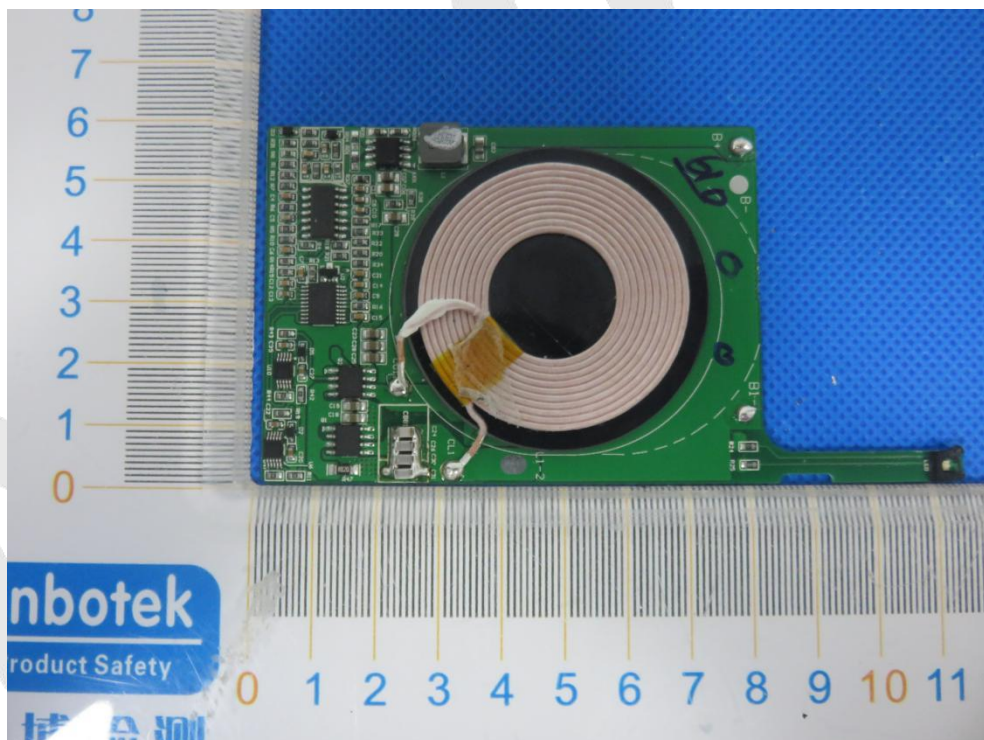
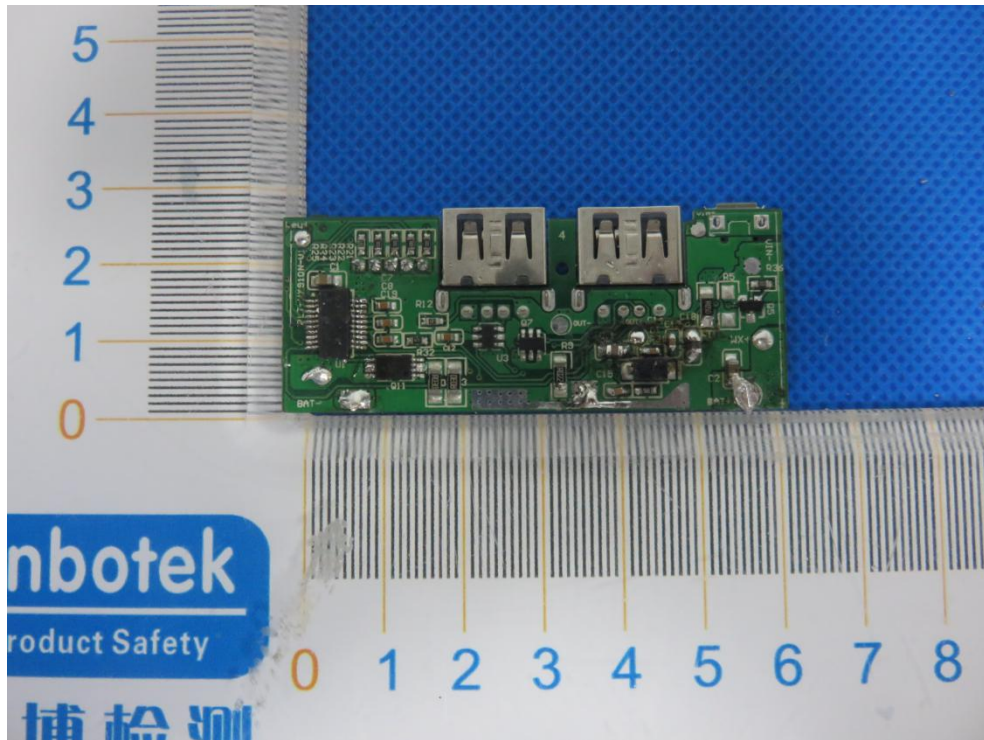


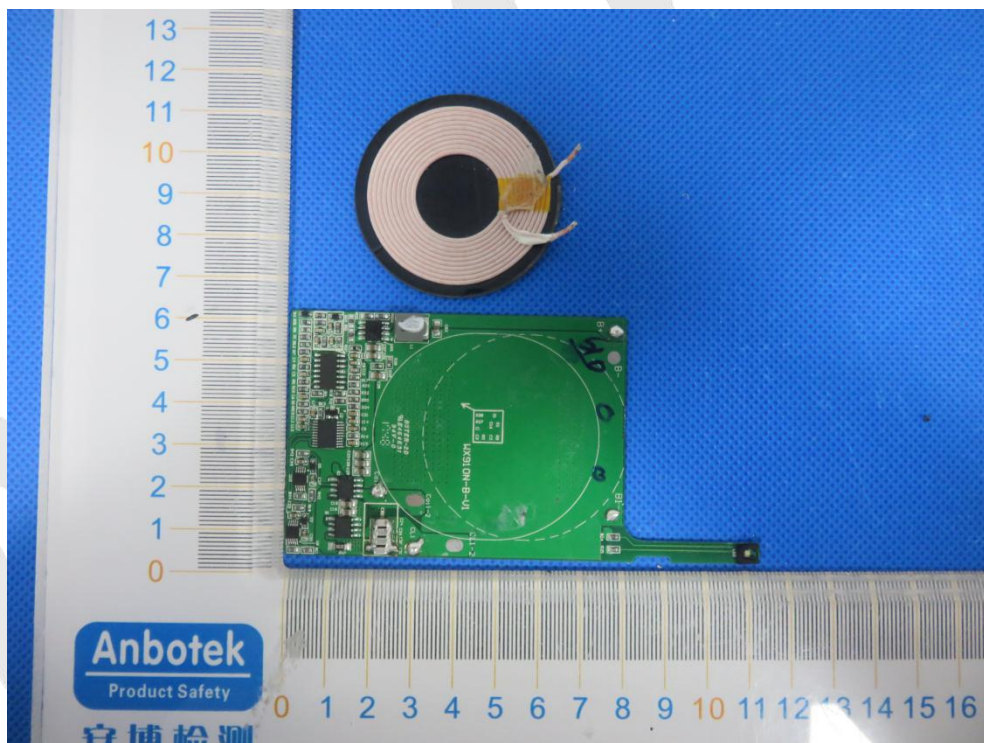
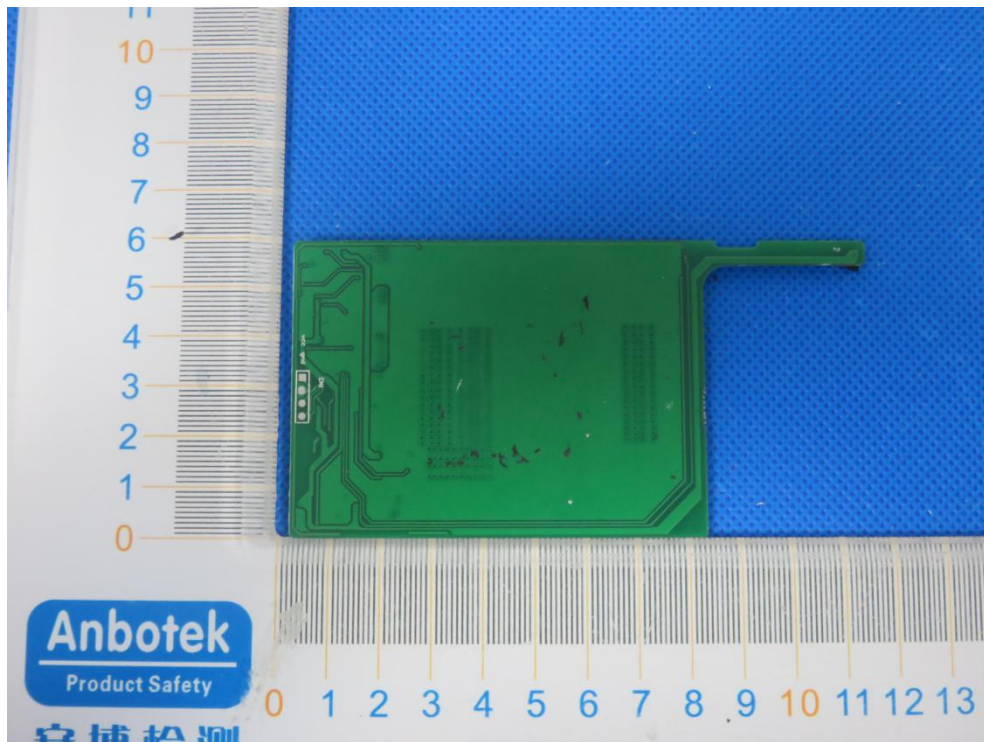
APPENDIX III -- INTERNAL PHOTOGRAPH

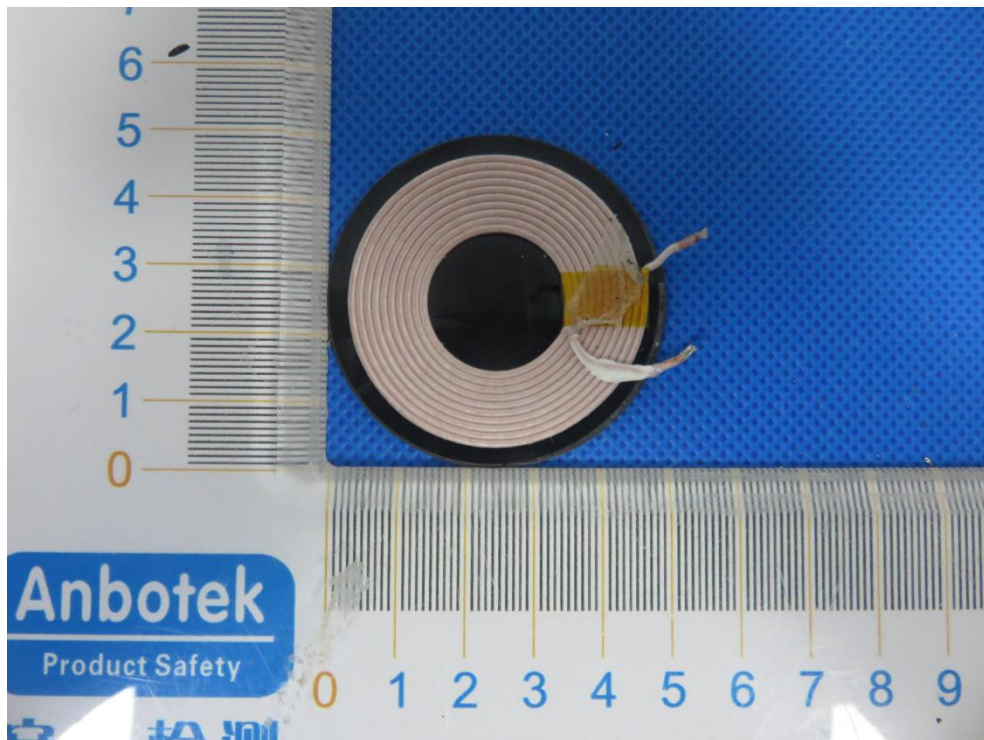












End of Report