FCC TEST REPORT

Client Name	:	Shenzhen Minsuo Industrial Co.,Ltd
Address	:	12th floor, Block B, Tengyao Building, No. 268 Gushu 2nd road,Xixiang Town, Bao'an Shenzhen, Guangdong China
Product Name	:	Mouse Pad with Wireless Charger
Date	:	Jan. 19, 2021

Shenzhen Anbotek Compliance Laboratory Limited

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TEST REPORT

Applicant	:	Shenzhen Minsuo Industrial Co.,Ltd
Manufacturer	:	Shenzhen Minsuo Industrial Co.,Ltd
Product Name	:	Mouse Pad with Wireless Charger
Model No.	:	CM-002
Trade Mark	:	N.A.
Rating(s)	:	Input: 5V/2A; 9V/1.67A Output: 5W/ 10W
Test Standard(s)	:	**FCC Part15 Subpart C 2019, 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	Dec. 24, 2020
Date of Test	Dec. 24, 2020~Jan. 14, 2021

Prepared By

(Engineer / Yilia Zhong)

Reviewer

(Supervisor / Bibo Zhang)

Approved & Authorized Signer

(Manager / Kingkong Jin)

1. General Information

1.1. Client Information

Applicant	:	Shenzhen Minsuo Industrial Co.,Ltd
Address	:	12th floor, Block B, Tengyao Building, No. 268 Gushu 2nd road,Xixiang Town, Bao'an Shenzhen, Guangdong China
Manufacturer	:	Shenzhen Minsuo Industrial Co.,Ltd
Address	:	12th floor, Block B, Tengyao Building, No. 268 Gushu 2nd road,Xixiang Town, Bao'an Shenzhen, Guangdong China
Factory	:	Shenzhen Minsuo Industrial Co.,Ltd
Address	:	12th floor, Block B, Tengyao Building, No. 268 Gushu 2nd road,Xixiang Town, Bao'an Shenzhen, Guangdong China

1.2. Description of Device (EUT)

Product Name	:	Mouse Pad with Wireless Charger	
Model No.	:	CM-002	
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), 1-2-1(Engineering Sample)	
Product Description	:	Operation Frequency:	110.1-205KHz
		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	:	M/N: A2013 Input: 100-240V-0.7A 50-60Hz Output: 3.6-5.5V 3A / 6.5-9V 2A / 9-12V 1.5A
iPhone 12		

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 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

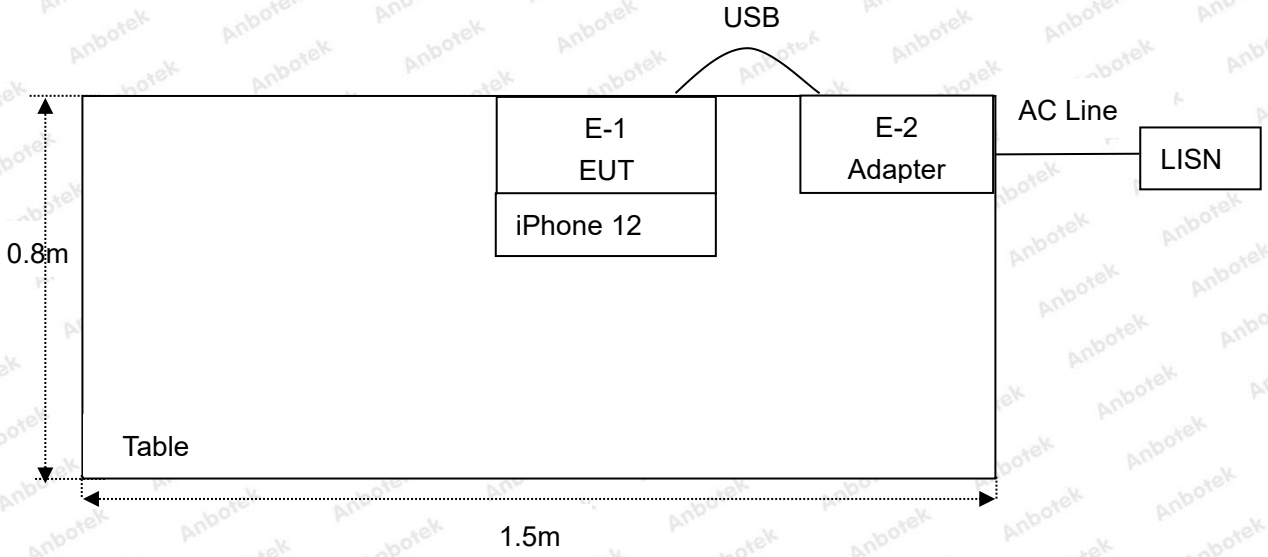
Note: (1) Test channel is 0.1173MHz.

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

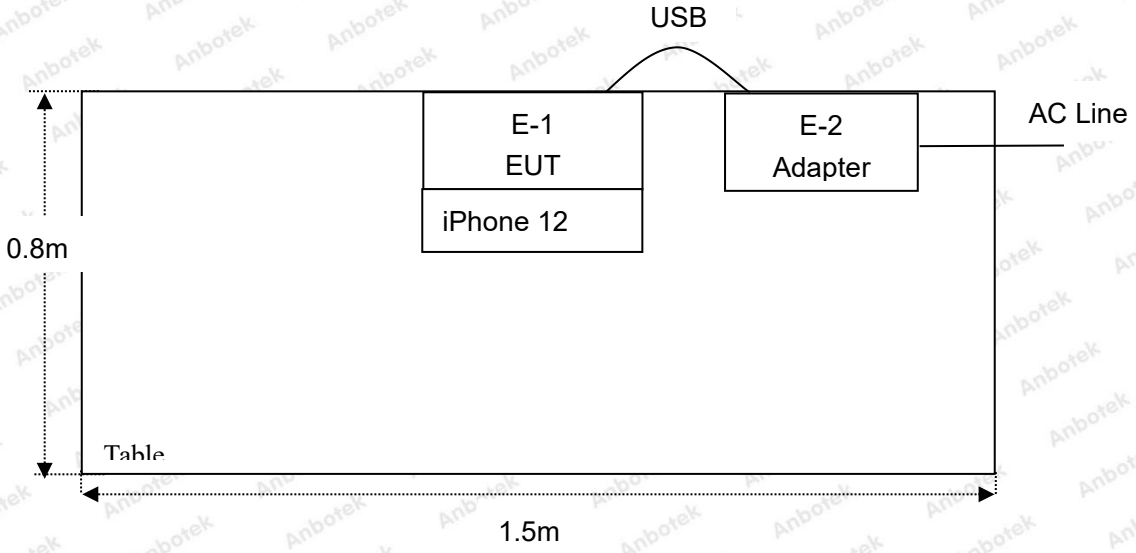
(3) Remark: All the conditions have been tested. It is found that Wireless Output(10W) work simultaneously is the worst mode, and the data in the report only reflects the worst mode.

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.	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	BK1G18G30D	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-KF	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-KHWS80B	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 Anbotek Compliance Laboratory Limited, EMC Laboratory has been registed 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 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, September 30, 2020.

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

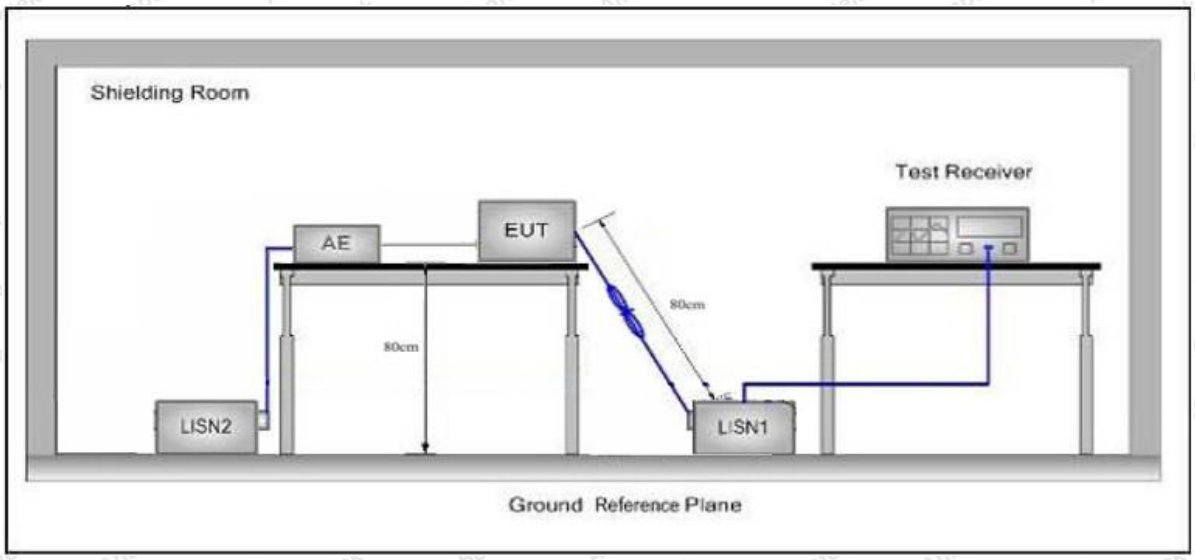
Address: 1/F., Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.
Tel:(86) 755-26066440 Fax: (86) 755-26014772 Email: service@anbotek.com
Hotline 400-003-0500
www.anbotek.com

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.

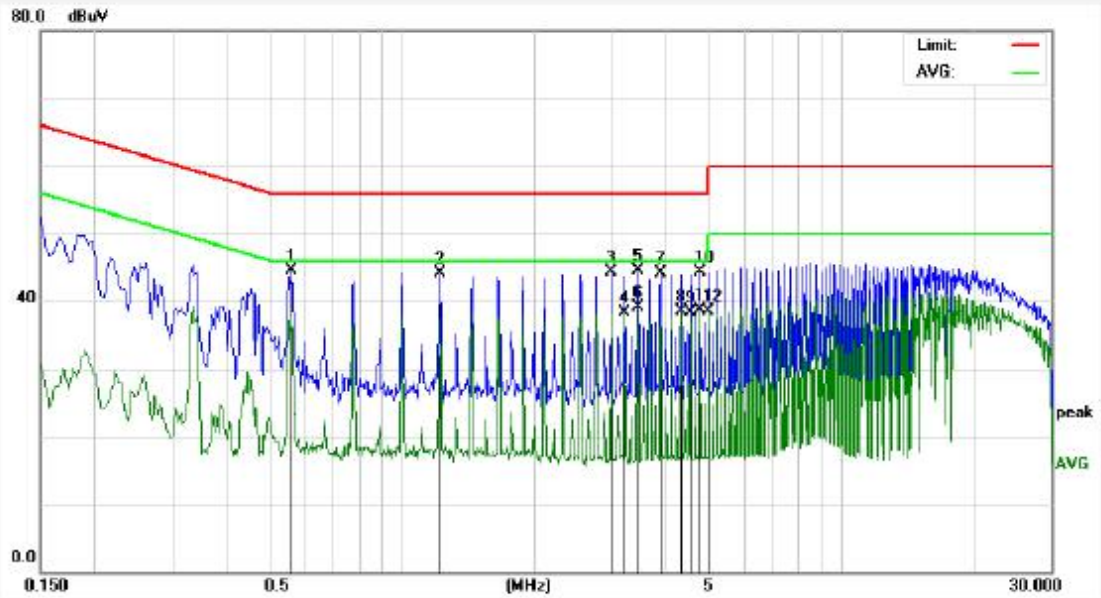
The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

Please to see the following pages

Conducted Emission Test Data

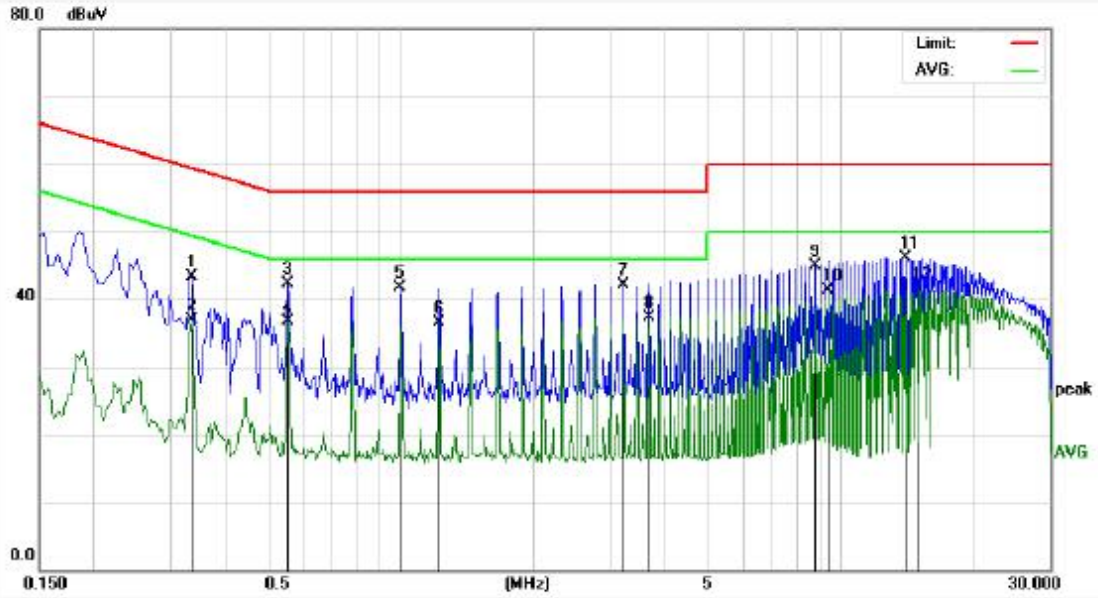
Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 120V, 60Hz for adapter
Comment: Live Line
Tem.: 20.4℃ Hum.: 55%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.5620	24.57	20.00	44.57	56.00	-11.43	QP	
2	1.2220	23.95	20.12	44.07	56.00	-11.93	QP	
3	2.9940	24.09	20.16	44.25	56.00	-11.75	QP	
4	3.2180	18.22	20.16	38.38	46.00	-7.62	AVG	
5	3.4380	24.31	20.17	44.48	56.00	-11.52	QP	
6	3.4380	18.91	20.17	39.08	46.00	-6.92	AVG	
7	3.8820	24.02	20.18	44.20	56.00	-11.80	QP	
8	4.3260	18.26	20.19	38.45	46.00	-7.55	AVG	
9	4.5460	18.16	20.19	38.35	46.00	-7.65	AVG	
10	4.7700	24.09	20.20	44.29	56.00	-11.71	QP	
11	4.7700	18.49	20.20	38.69	46.00	-7.31	AVG	
12	4.9899	18.28	20.21	38.49	46.00	-7.51	AVG	

Conducted Emission Test Data

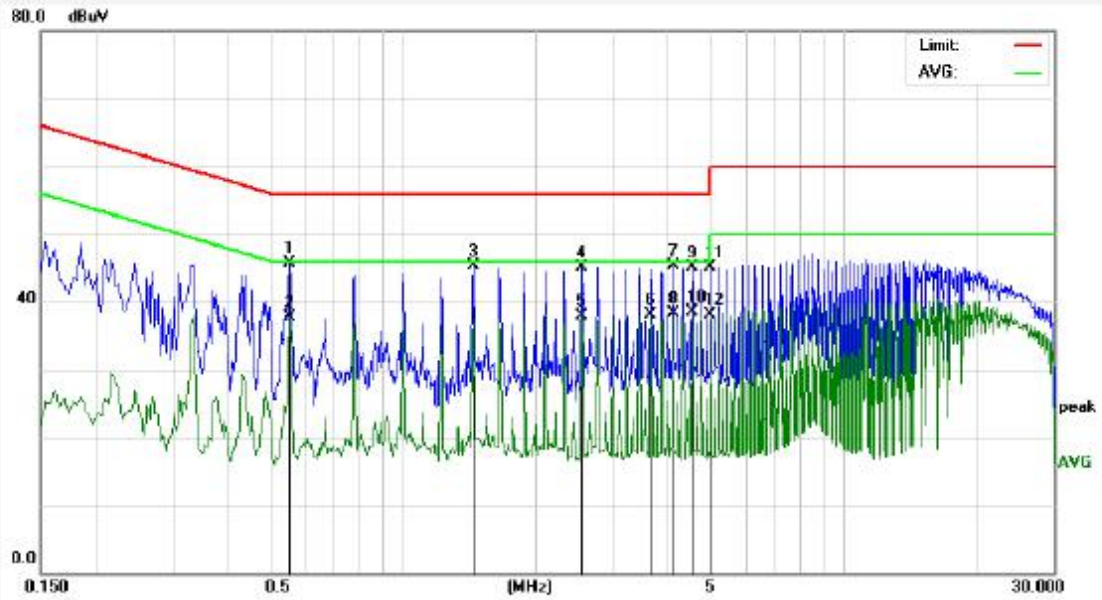
Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 120V, 60Hz for adapter
Comment: Neutral Line
Tem.: 20.4℃ Hum.: 55%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.3339	23.44	19.91	43.35	59.35	-16.00	QP	
2	0.3339	16.98	19.91	36.89	49.35	-12.46	AVG	
3	0.5540	22.24	20.00	42.24	56.00	-13.76	QP	
4	0.5540	16.72	20.00	36.72	46.00	-9.28	AVG	
5	0.9980	21.53	20.12	41.65	56.00	-14.35	QP	
6	1.2220	16.47	20.12	36.59	46.00	-9.41	AVG	
7	3.2180	22.00	20.16	42.16	56.00	-13.84	QP	
8	3.6620	17.11	20.17	37.28	46.00	-8.72	AVG	
9	8.7660	24.66	20.31	44.97	60.00	-15.03	QP	
10	9.4300	21.05	20.32	41.37	50.00	-8.63	AVG	
11	14.0900	25.93	20.27	46.20	60.00	-13.80	QP	
12	14.9780	21.23	20.26	41.49	50.00	-8.51	AVG	

Conducted Emission Test Data

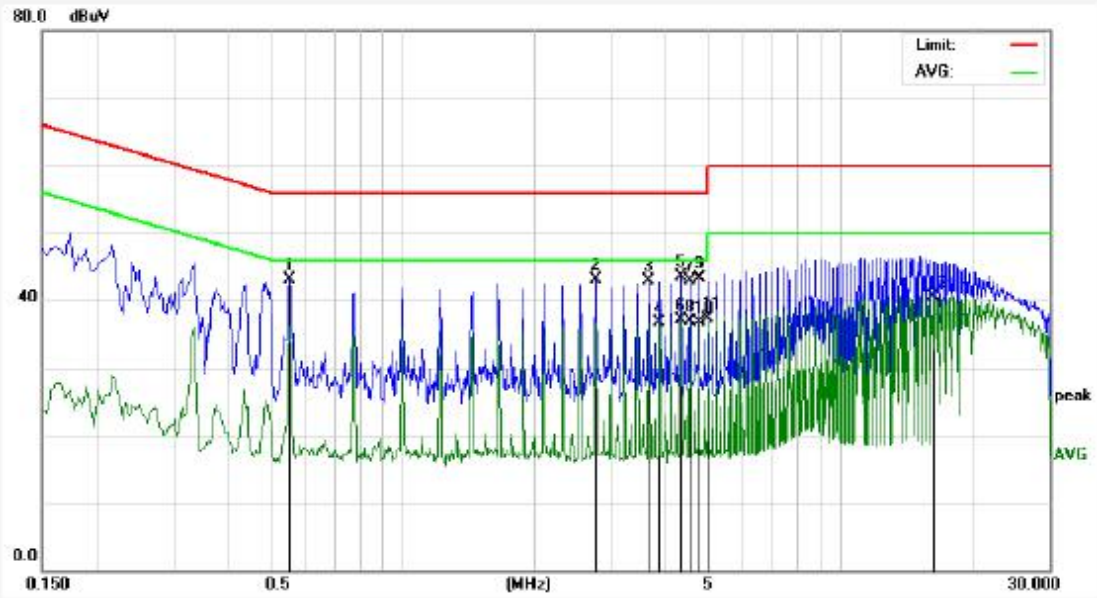
Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 240V, 60Hz for adapter
Comment: Live Line
Tem.: 20.4℃ Hum.: 55%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.5540	25.80	20.00	45.80	56.00	-10.20	QP	
2	0.5540	17.76	20.00	37.76	46.00	-8.24	AVG	
3	1.4420	25.14	20.13	45.27	56.00	-10.73	QP	
4	2.5500	24.99	20.15	45.14	56.00	-10.86	QP	
5	2.5500	17.82	20.15	37.97	46.00	-8.03	AVG	
6	3.6580	17.89	20.17	38.06	46.00	-7.94	AVG	
7	4.1020	25.13	20.18	45.31	56.00	-10.69	QP	
8	4.1020	18.20	20.18	38.38	46.00	-7.62	AVG	
9	4.5460	24.94	20.19	45.13	56.00	-10.87	QP	
10	4.5460	18.29	20.19	38.48	46.00	-7.52	AVG	
11	4.9899	24.92	20.21	45.13	56.00	-10.87	QP	
12	4.9899	17.91	20.21	38.12	46.00	-7.88	AVG	

Conducted Emission Test Data

Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 240V, 60Hz for adapter
Comment: Neutral Line
Tem.: 20.4℃ Hum.: 55%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.5540	23.20	20.00	43.20	56.00	-12.80	QP	
2	2.7700	23.00	20.16	43.16	56.00	-12.84	QP	
3	3.6580	22.72	20.17	42.89	56.00	-13.11	QP	
4	3.8780	16.56	20.18	36.74	46.00	-9.26	AVG	
5	4.3220	23.29	20.19	43.48	56.00	-12.52	QP	
6	4.3220	16.95	20.19	37.14	46.00	-8.86	AVG	
7	4.5420	22.62	20.19	42.81	56.00	-13.19	QP	
8	4.5420	16.80	20.19	36.99	46.00	-9.01	AVG	
9	4.7660	23.01	20.20	43.21	56.00	-12.79	QP	
10	4.7660	16.44	20.20	36.64	46.00	-9.36	AVG	
11	4.9860	17.06	20.21	37.27	46.00	-8.73	AVG	
12	16.2900	20.30	20.28	40.58	50.00	-9.42	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

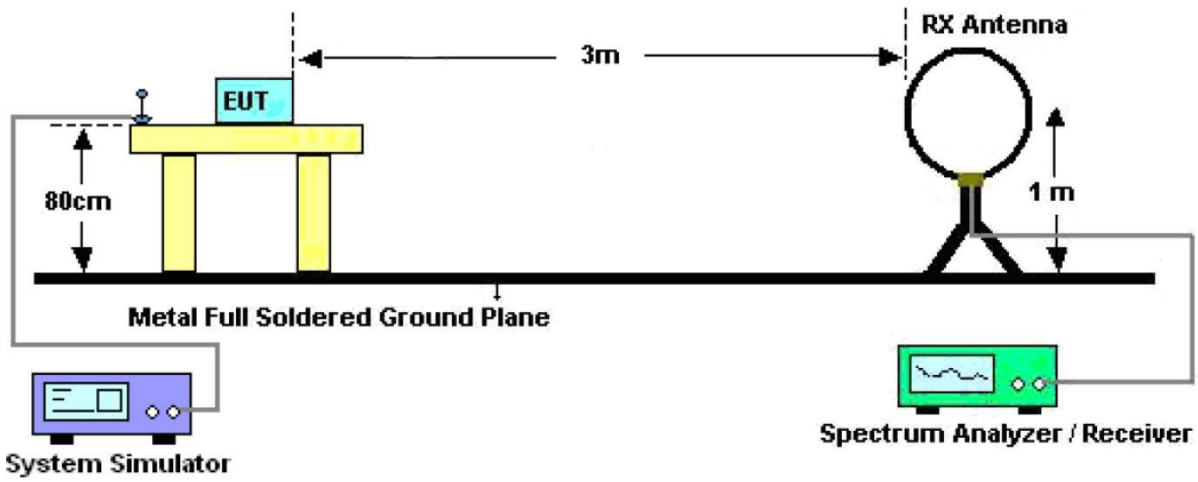


Figure 1. Below 30MHz

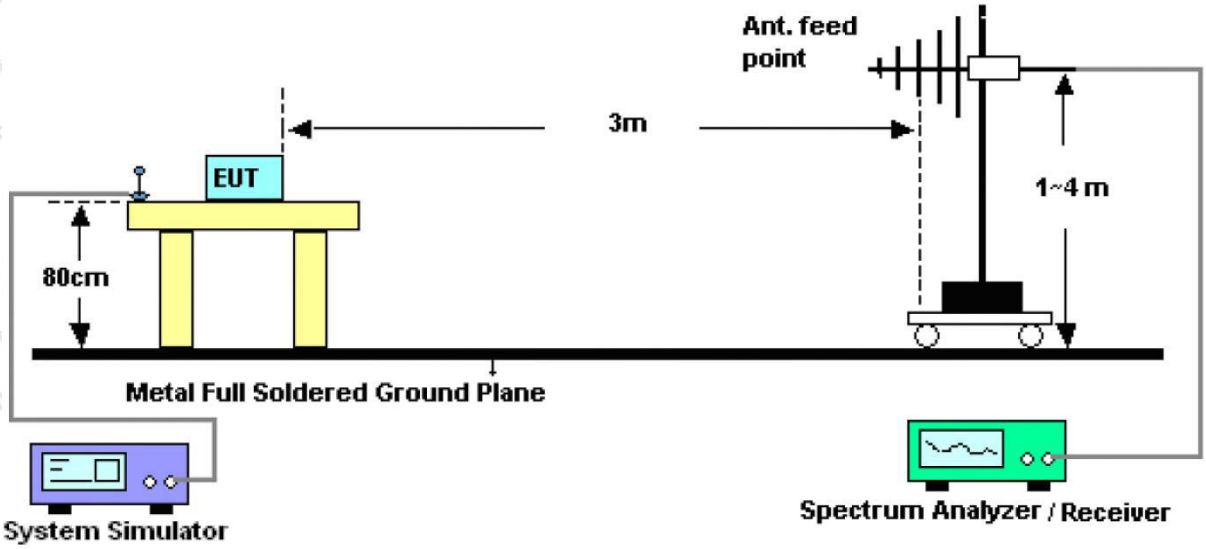


Figure 2. 30MHz to 1GHz

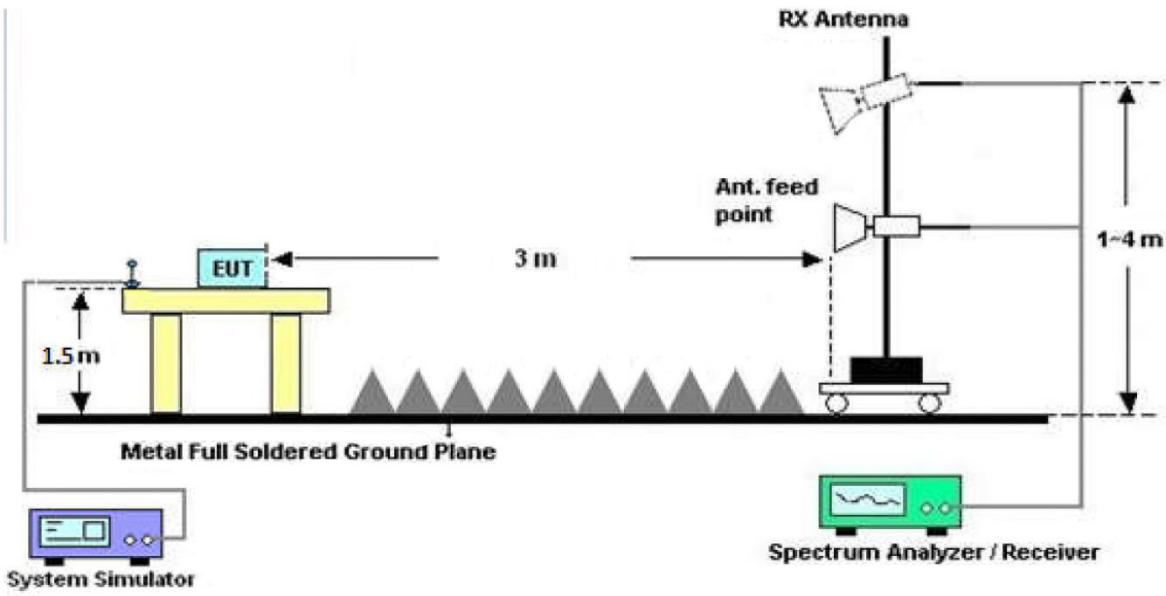


Figure 3. Above 1 GHz

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.

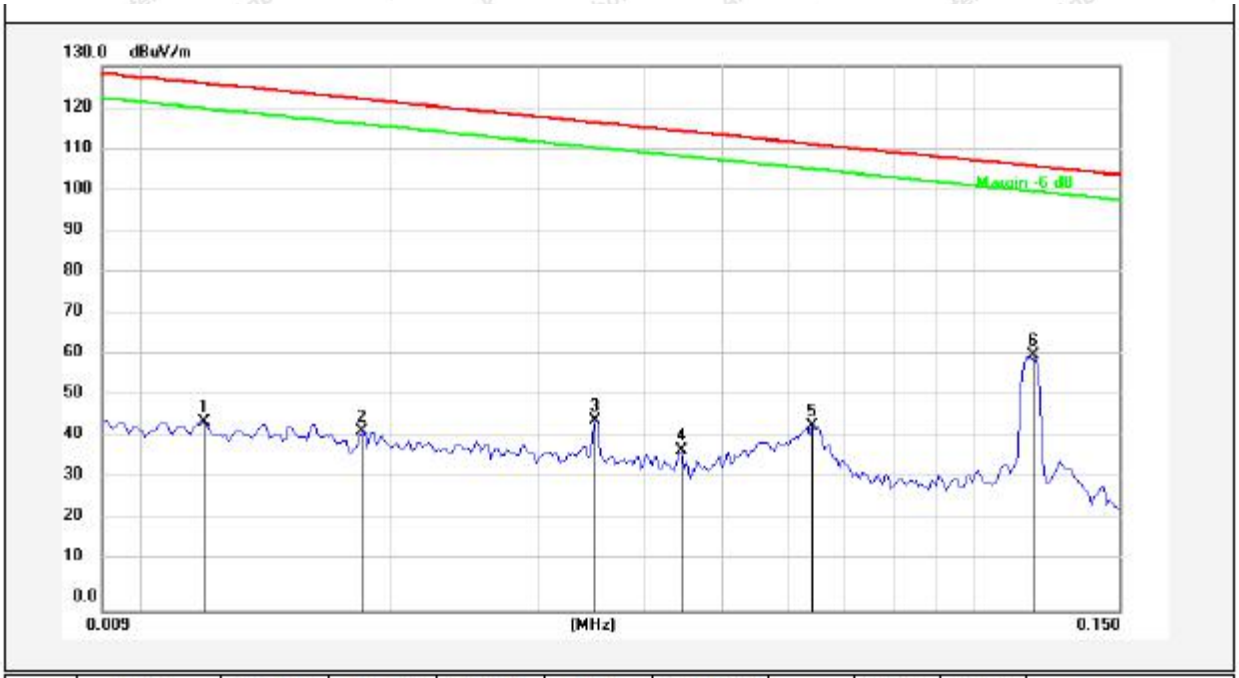
4.4. Test Data

PASS

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

Test Results (9K~15MHz)

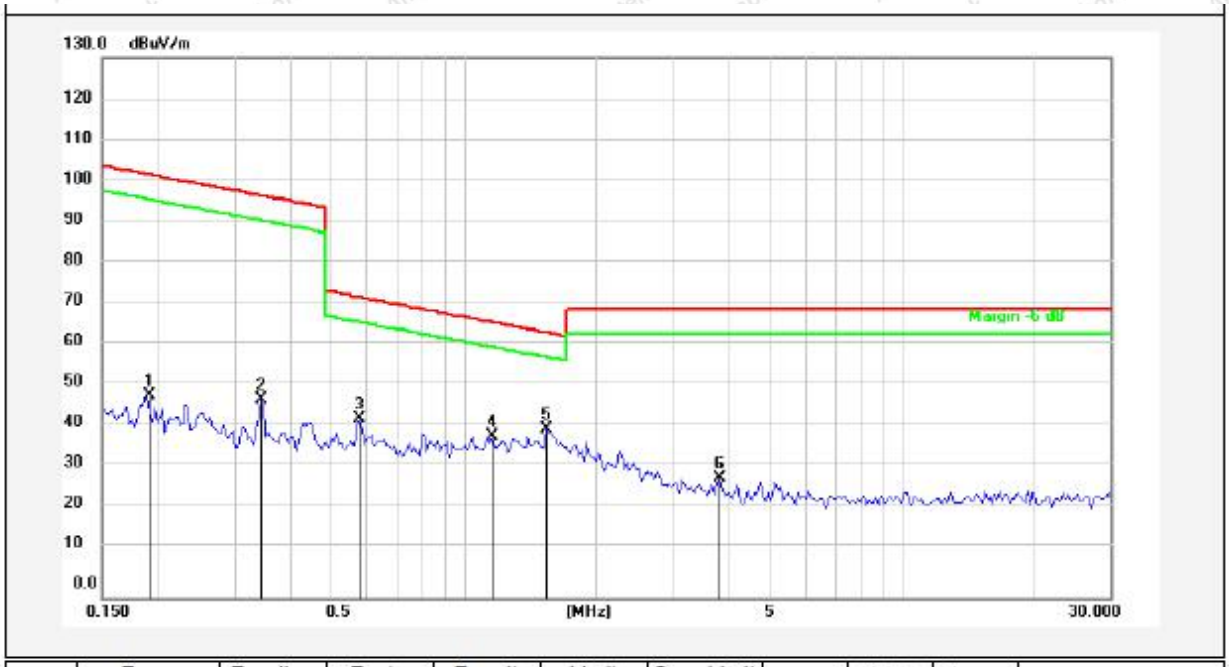
Test Mode:	Mode 1
Power Source:	AC 120V, 60Hz for adapter
Temp.(℃)/Hum.(%RH):	22.1℃/50%RH
Distance:	3m



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	0.0119	24.94	20.11	45.05	125.89	-80.84	peak			
2	0.0184	22.46	20.24	42.70	122.13	-79.43	peak			
3	0.0352	25.01	20.48	45.49	116.53	-71.04	peak			
4	0.0447	17.83	20.46	38.29	114.47	-76.18	peak			
5	0.0640	23.64	20.38	44.02	111.37	-67.35	peak			
6	0.1173	40.51	20.32	60.83	106.14	-45.31	peak			

Test Results (15~30MHz)

Test Mode:	Mode 1
Power Source:	AC 120V, 60Hz for adapter
Temp.(℃)/Hum.(%RH):	22.1℃/50%RH
Distance:	3m



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	0.1904	28.17	20.32	48.49	101.96	-53.47	peak			
2	0.3454	27.30	20.29	47.59	96.82	-49.23	peak			
3	0.5792	22.81	20.27	43.08	72.35	-29.27	peak			
4	1.1688	18.71	20.26	38.97	66.27	-27.30	peak			
5	1.5436	20.06	20.27	40.33	63.86	-23.53	peak			
6	3.8500	8.40	20.36	28.76	69.50	-40.74	peak			

Test Results (30~1000MHz)

Test Mode:	Mode 1
Power Source:	AC 120V, 60Hz for adapter
Polarization:	Vertical
Temp.(℃)/Hum.(%RH):	22.8℃/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	32.1795	45.60	-16.81	28.79	40.00	-11.21	QP	100	0	
2	52.7600	43.38	-15.78	27.60	40.00	-12.40	QP	100	360	
3	68.3908	45.79	-18.37	27.42	40.00	-12.58	QP	100	0	
4	151.5971	55.98	-19.83	36.15	43.50	-7.35	QP	100	360	
5	349.2500	43.13	-12.01	31.12	46.00	-14.88	QP	100	0	
6	478.8456	44.86	-9.26	35.60	46.00	-10.40	QP	100	360	

Test Results (30~1000MHz)

Test Mode:	Mode 1
Power Source:	AC 120V, 60Hz for adapter
Polarization:	Horizontal
Temp.(℃)/Hum.(%RH):	22.8℃/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	70.5836	50.26	-20.80	29.46	40.00	-10.54	QP	100	0	
2	153.2004	57.16	-21.03	36.13	43.50	-7.37	QP	100	360	
3	235.8164	50.35	-19.13	31.22	46.00	-14.78	QP	100	0	
4	325.5958	49.34	-13.63	35.71	46.00	-10.29	QP	100	360	
5	383.9318	46.95	-12.98	33.97	46.00	-12.03	QP	100	0	
6	455.9058	39.94	-11.82	28.12	46.00	-17.88	QP	100	360	

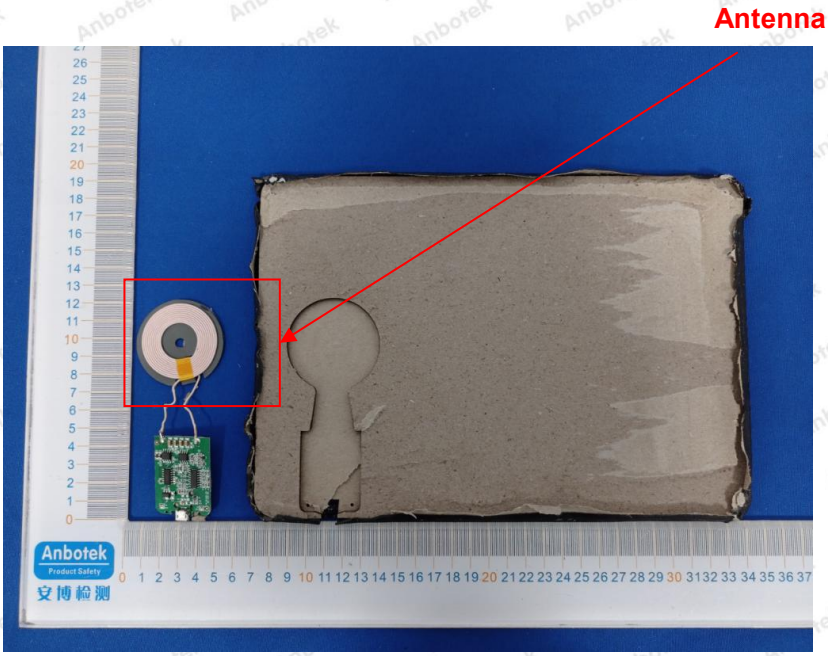
5. Antenna Requirement

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

5.2. Antenna Connected Construction

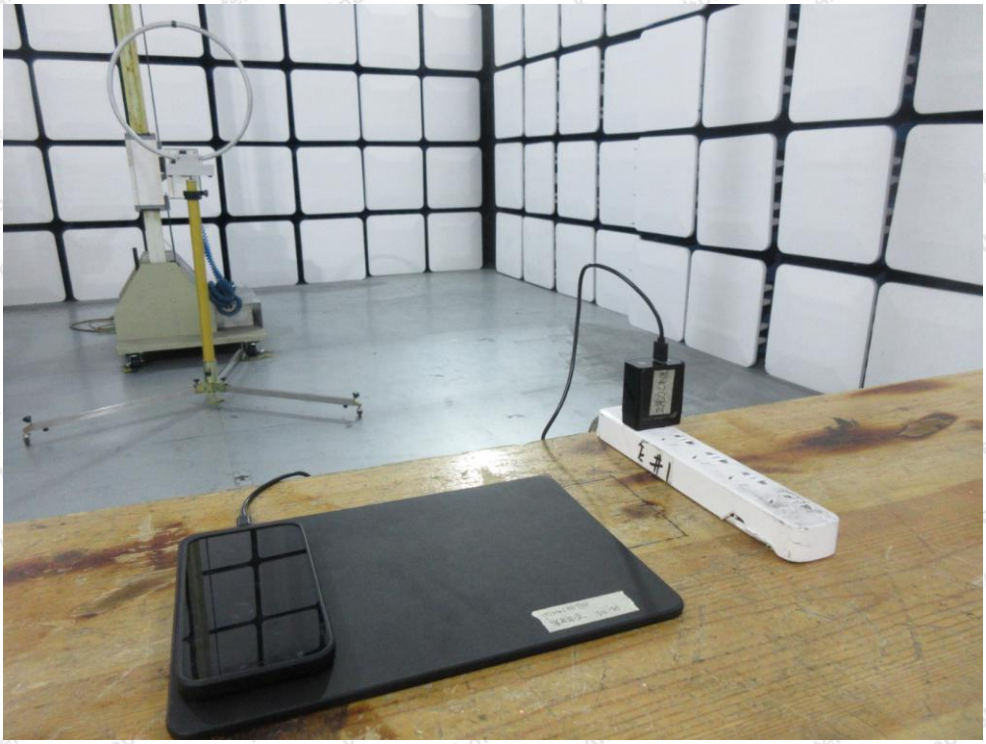
The antenna is a Inductive loop coil Antenna which permanently attached, and the best case gain of the antenna is 0 dBi. It complies with the standard requirement.



APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Conducted Emission Measurement

Photo of Radiation Emission Test



APPENDIX II -- EXTERNAL PHOTOGRAPH

Anbotek
Product Safety
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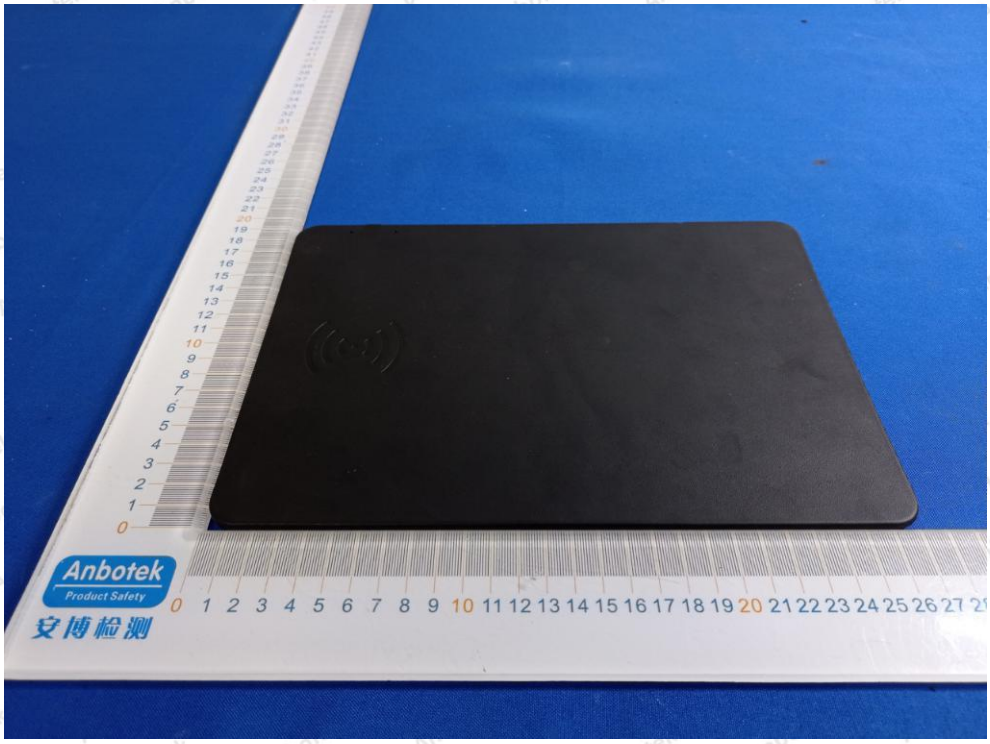
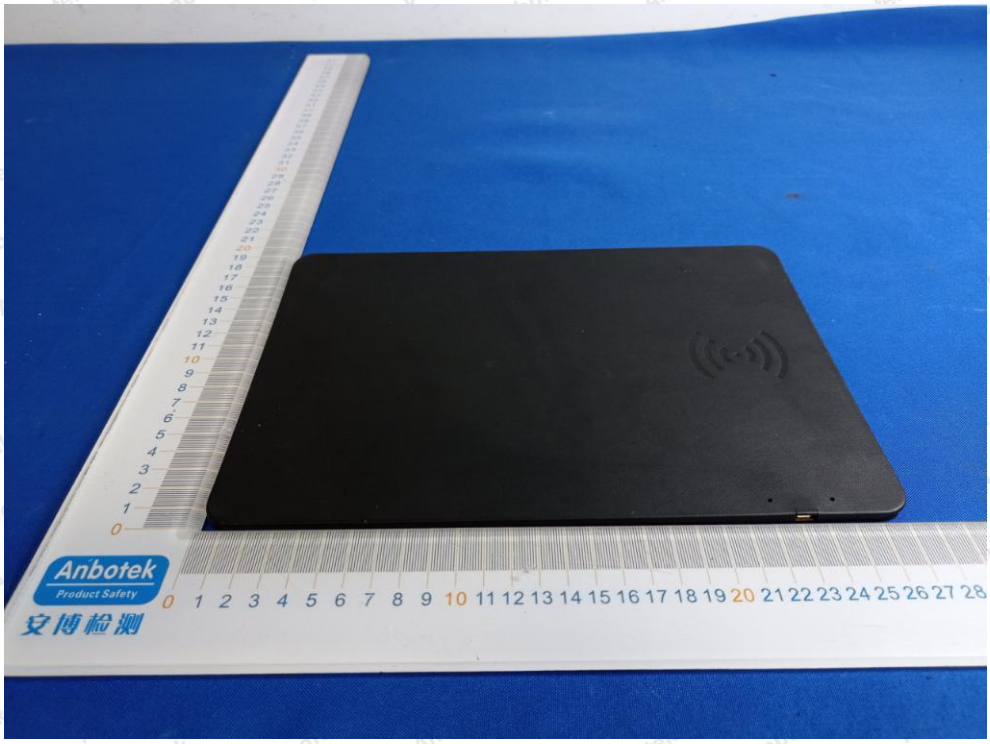
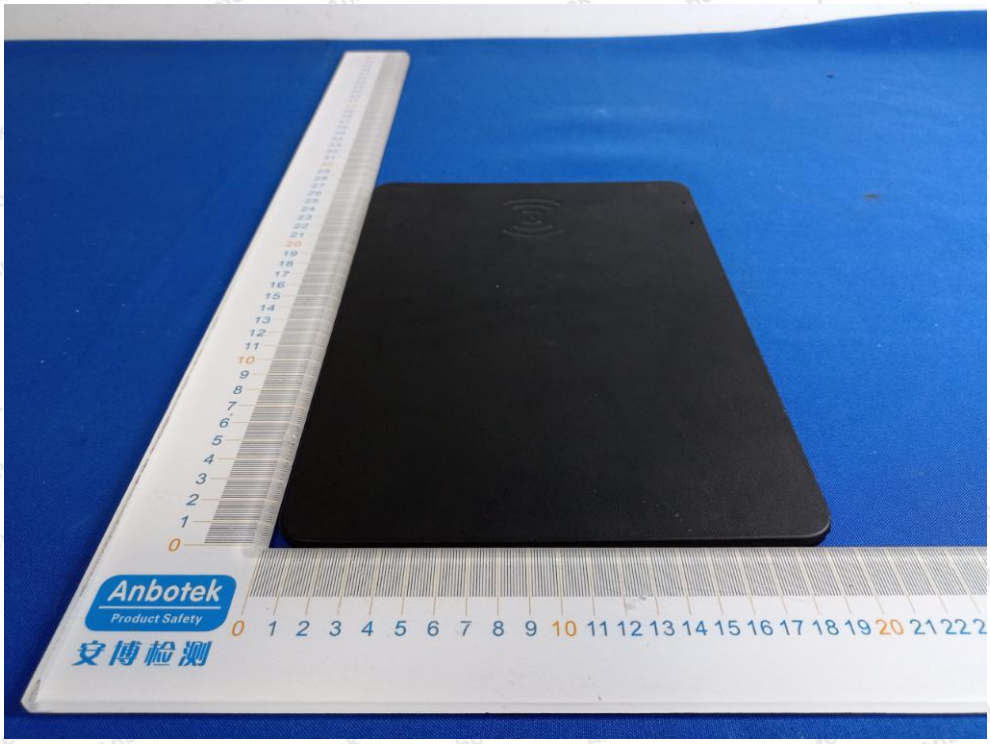

Anbotek
Product Safety
安博检测

Anbotek
Product Safety
安博检测


Anbotek
Product Safety
安博检测


Anbotek
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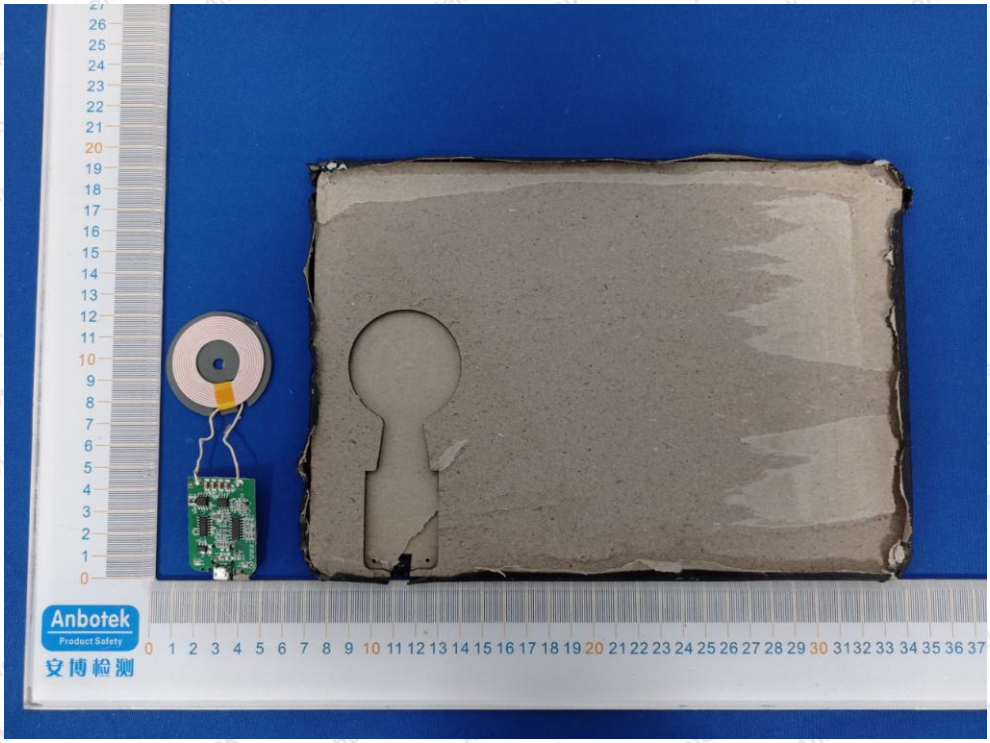
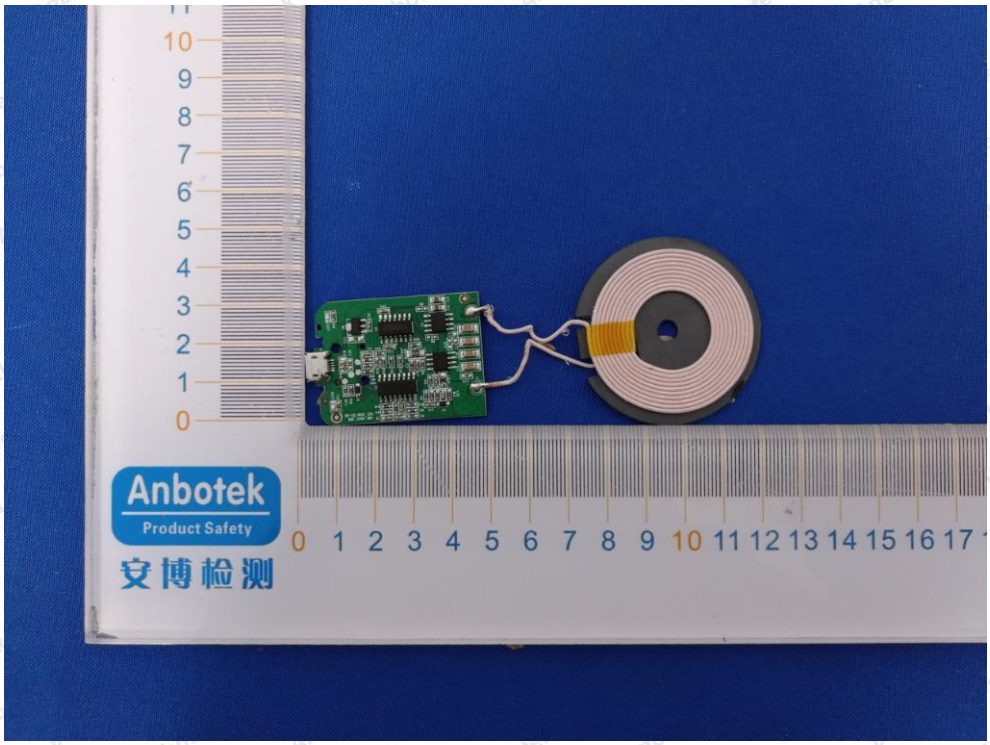
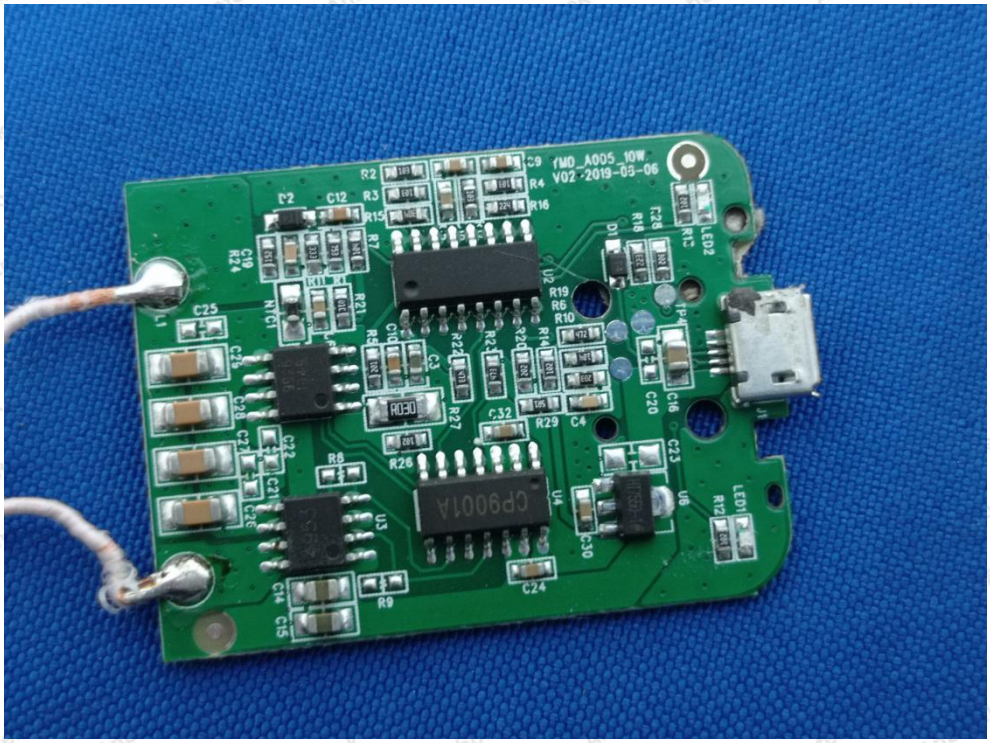
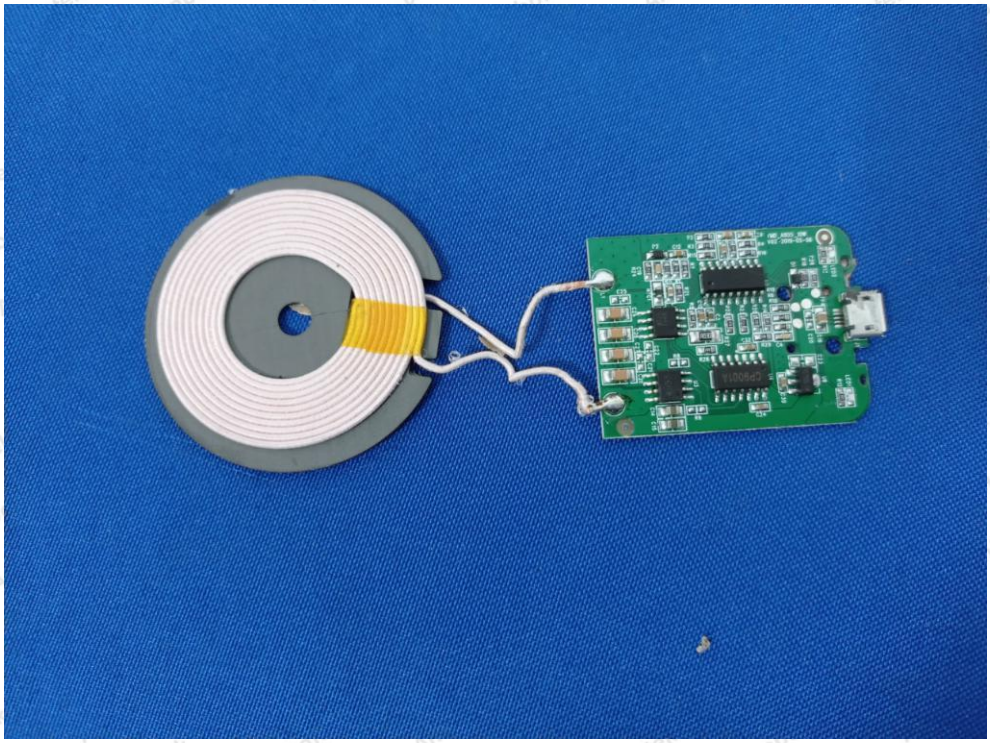
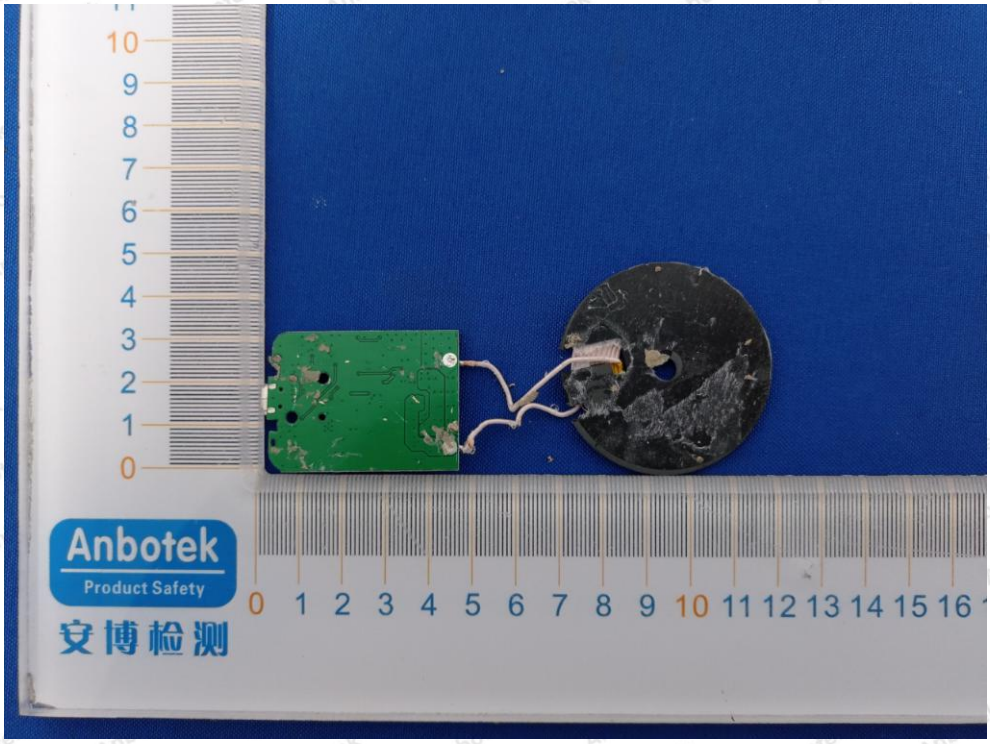
APPENDIX III -- INTERNAL PHOTOGRAPH






CP9001A





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