

FCC TEST REPORT

Client Name : Electronic Silk Road (Shenzhen) Tech Co., Ltd
Address : 7th F,Building 10B,Taihua Wutong Industrial Park,Gushu
Development Zones, Xixiang Street,Bao'an Area,
Shenzhen,China
Product Name : 3 in 1 Wireless Charging Station
Date : Jul. 09, 2020



Shenzhen Anbotech Compliance Laboratory Limited

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TEST REPORT

Applicant : Electronic Silk Road (Shenzhen) Tech Co., Ltd

Manufacturer : Electronic Silk Road (Shenzhen) Tech Co., Ltd

Product Name : 3 in 1 Wireless Charging Station

Model No. : EFC0010

Trade Mark : ESR

Input: DC 5V, 3A, DC 9V, 2A

Rating(s) : Wireless Output1: 10W Max

Wireless Output2: 2.5W Max

USB Output3: 2.5W 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.

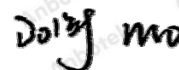
Date of Receipt

Jun. 11, 2020

Date of Test

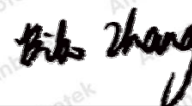
Jun. 11~Jul. 03, 2020

Prepared By



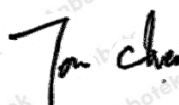
(Engineer / Dolly Mo)

Reviewer



(Supervisor / Bibo Zhang)

Approved & Authorized Signer



(Manager / Tom Chen)

1. General Information

1.1. Client Information

Applicant	:	Electronic Silk Road (Shenzhen) Tech Co., Ltd
Address	:	7th F,Building 10B,Taihua Wutong Industrial Park,Gushu Development Zones, Xixiang Street,Bao'an Area, Shenzhen,China
Manufacturer	:	Electronic Silk Road (Shenzhen) Tech Co., Ltd
Address	:	7th F,Building 10B,Taihua Wutong Industrial Park,Gushu Development Zones, Xixiang Street,Bao'an Area, Shenzhen,China
Factory	:	Electronic Silk Road (Shenzhen) Tech Co., Ltd
Address	:	7th F,Building 10B,Taihua Wutong Industrial Park,Gushu Development Zones, Xixiang Street,Bao'an Area, Shenzhen,China

1.2. Description of Device (EUT)

Product Name	:	3 in 1 Wireless Charging Station
Model No.	:	EFC0010
Trade Mark	:	ESR
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	:	Manufacturer: Anker Innovations Limited
		M/N: A2013 Input: 100-240V~50-60Hz Output: 3.6-6.5V --- 3A/ 6.5-9V --- 2A/ 9-12V --- 1.5A
Apple Watch	:	Manufacturer: Apple
Phone	:	Manufacturer: SAMSUNG M/N: Galaxy S10+(SM-G9750)
Phone	:	Manufacturer: SAMSUNG M/N: Galaxy Note 10+(SM-N9750)

1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly 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	Full load, wireless charger module

For Conducted Emission	
Final Test Mode	Description
Mode 1	Full load, wireless charger module

For Radiated Emission	
Final Test Mode	Description
Mode 1	Full load, wireless charger module

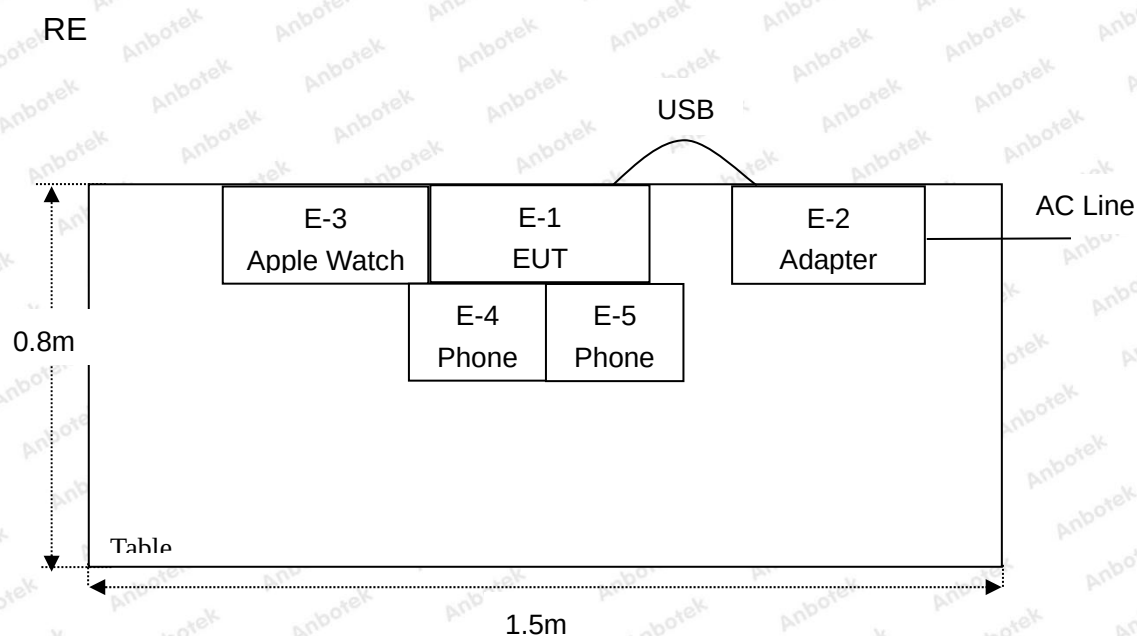
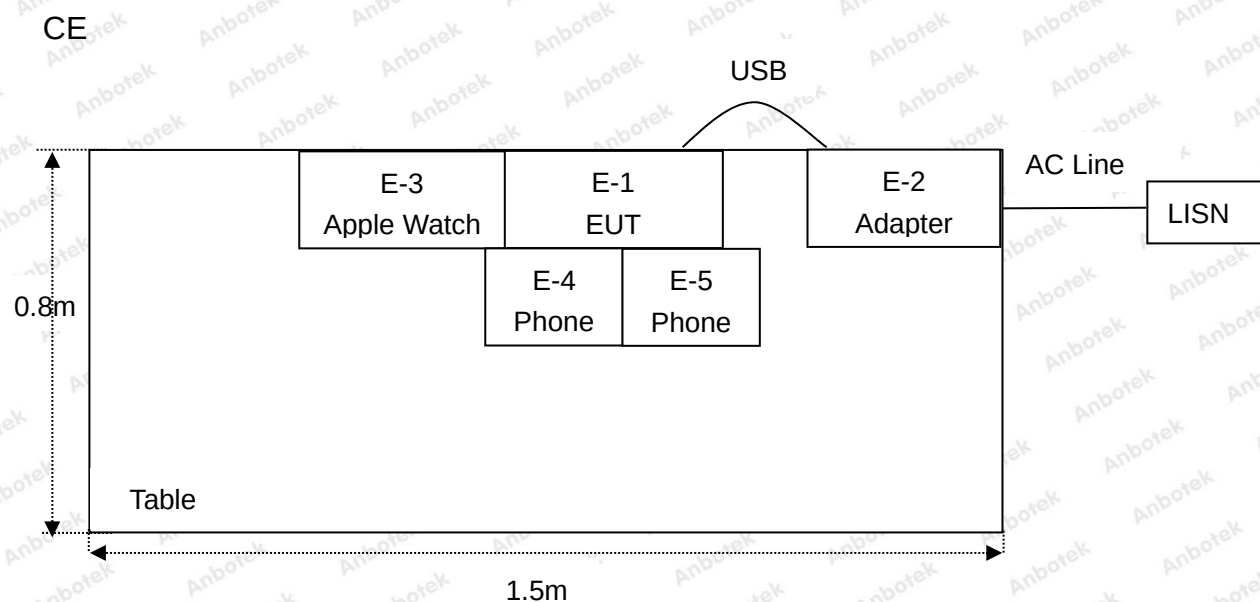
Note: (1) Test channel is 0.1122MHz.

(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) All the conditions have been tested. It is found that Wireless Output1(10W) and Wireless Output2(2.5W) work simultaneously is the worst mode, and the data in the report only reflects the worst 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. 04, 2019	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESPI3	101604	Nov. 04, 2019	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Nov. 04, 2019	1 Year
4.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 04, 2019	1 Year
5.	Preamplifier	SKET Electronic	BK1G18G30 D	KD17503	Nov. 04, 2019	1 Year
6.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 01, 2019	1 Year
7.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 01, 2019	1 Year
8.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Nov. 01, 2019	1 Year
9.	Horn Antenna	A-INFO	LB-180400- KF	J211060628	Nov. 01, 2019	1 Year
10.	Pre-amplifier	SONOMA	310N	186860	Nov. 04, 2019	1 Year
11.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
12.	RF Test Control System	YIHENG	YH3000	2017430	Nov. 04, 2019	1 Year
13.	Power Sensor	DAER	RPR3006W	15I00041SN045	Nov. 04, 2019	1 Year
14.	Power Sensor	DAER	RPR3006W	15I00041SN046	Nov. 04, 2019	1 Year
15.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 04, 2019	1 Year
16.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Nov. 04, 2019	1 Year
17.	Signal Generator	Agilent	E4421B	MY41000743	Nov. 04, 2019	1 Year
18.	DC Power Supply	LW	TPR-6420D	374470	Nov. 04, 2019	1 Year
19.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80 B	N/A	Nov. 04, 2019	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 27, 2019.

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, March 07, 2019.

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

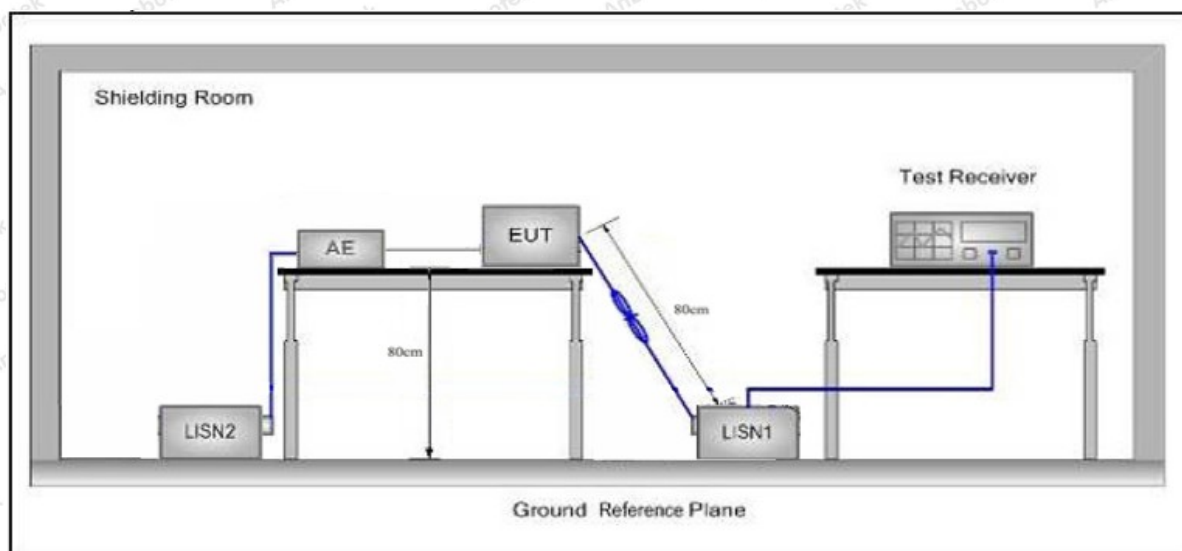
Standard Section	Test Item	Result
FCC Part 15, Paragraph 15.207	Conducted Emission Test	PASS
FCC Part 15, Paragraph 15.209(a)(f)	Spurious Emission	PASS
Part 15.203	Antenna Requirement	PASS

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



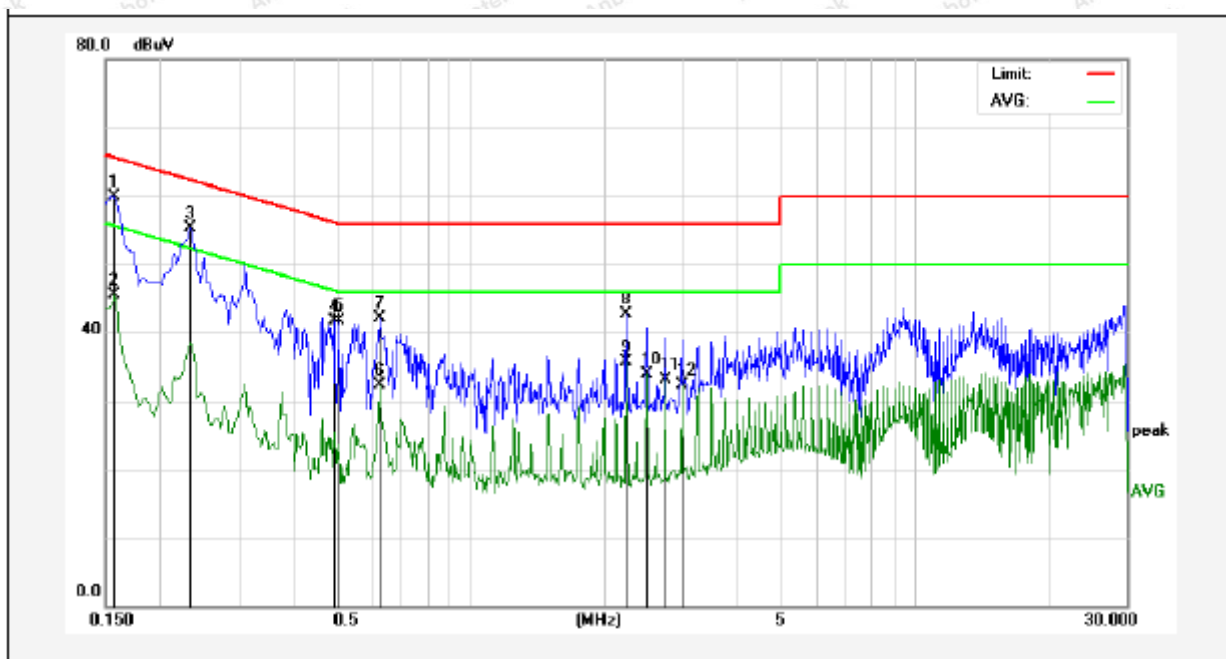
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Conducted Emission Test Data

Test Site: 1# Shielded Room
 Operating Condition: Mode 1
 Test Specification: AC 120V, 60Hz for adapter
 Comment: Live Line
 Tem.: 22.5°C Hum.: 52%

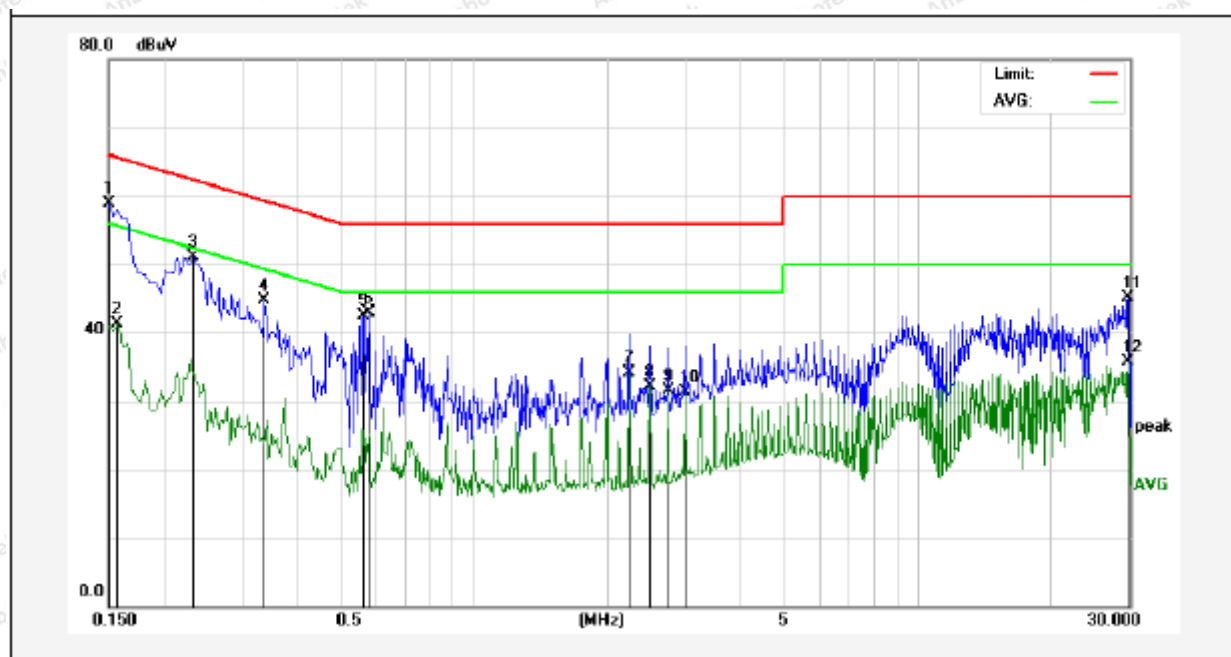


No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1580	40.06	19.90	59.96	65.56	-5.60	QP	
2	0.1580	25.52	19.90	45.42	55.56	-10.14	AVG	
3	0.2340	35.45	19.89	55.34	62.30	-6.96	QP	
4	0.4940	21.77	19.98	41.75	56.10	-14.35	QP	
5	0.5060	21.74	19.98	41.72	56.00	-14.28	QP	
6	0.6220	12.36	20.02	32.38	46.00	-13.62	AVG	
7	0.6260	22.16	20.02	42.18	56.00	-13.82	QP	
8	2.2420	22.48	20.14	42.62	56.00	-13.38	QP	
9	2.2420	15.61	20.14	35.75	46.00	-10.25	AVG	
10	2.4940	13.76	20.15	33.91	46.00	-12.09	AVG	
11	2.7420	12.88	20.15	33.03	46.00	-12.97	AVG	
12	2.9900	12.11	20.16	32.27	46.00	-13.73	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.: 22.5°C Hum.: 52%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1500	39.09	19.90	58.99	65.99	-7.00	peak	
2	0.1580	21.39	19.90	41.29	55.56	-14.27	AVG	
3	0.2340	31.29	19.89	51.18	62.30	-11.12	peak	
4	0.3379	24.71	19.91	44.62	59.25	-14.63	peak	
5	0.5660	22.46	20.00	42.46	56.00	-13.54	peak	
6	0.5820	22.85	20.00	42.85	56.00	-13.15	peak	
7	2.2420	13.97	20.14	34.11	46.00	-11.89	AVG	
8	2.4940	11.91	20.15	32.06	46.00	-13.94	AVG	
9	2.7420	11.41	20.15	31.56	46.00	-14.44	AVG	
10	2.9900	11.13	20.16	31.29	46.00	-14.71	AVG	
11	29.7780	24.86	20.27	45.13	60.00	-14.87	peak	
12	29.7780	15.43	20.27	35.70	50.00	-14.30	AVG	

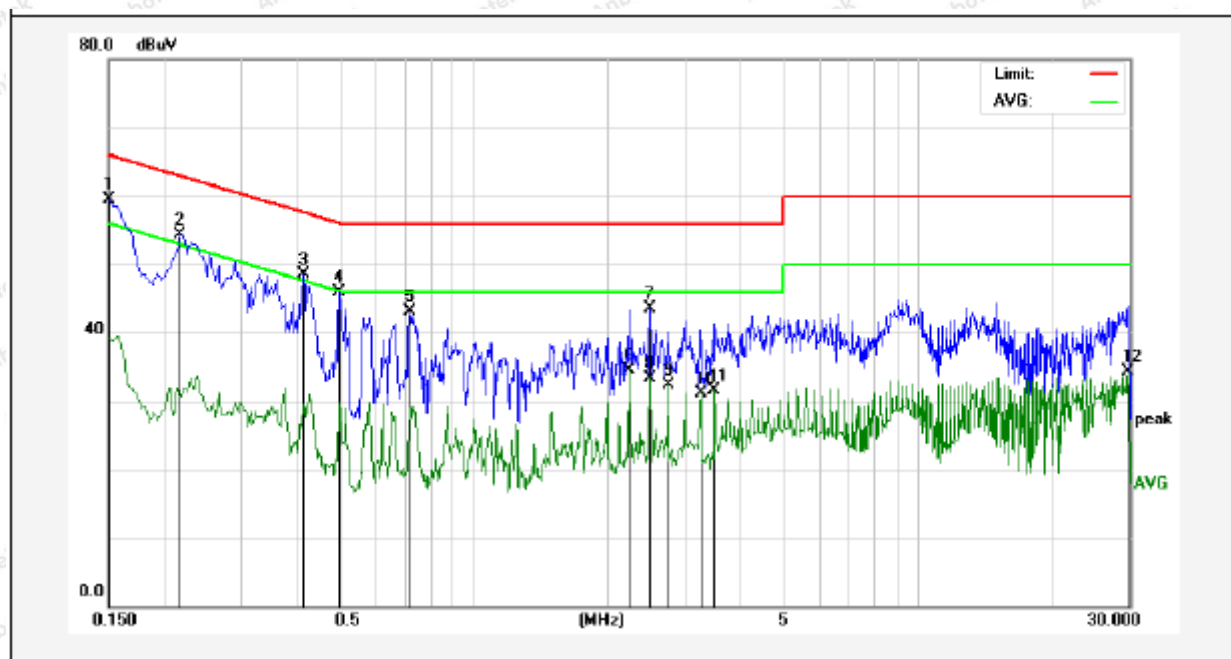
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Conducted Emission Test Data

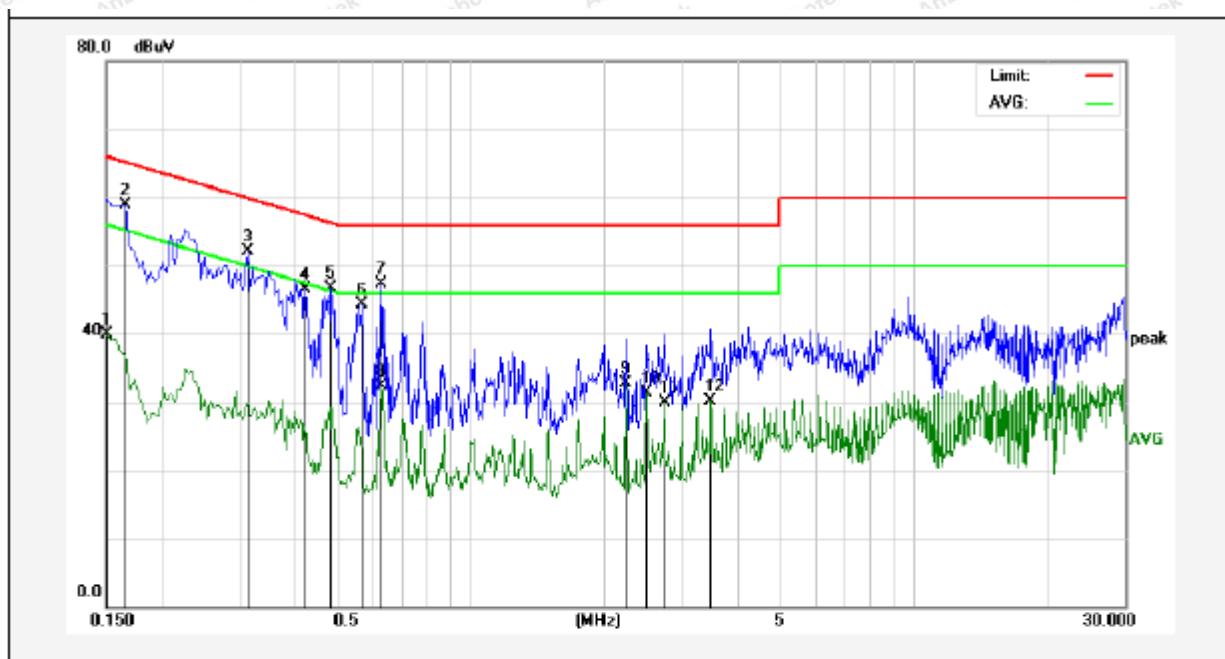
Test Site: 1# Shielded Room
 Operating Condition: Mode 1
 Test Specification: AC 240V, 60Hz for adapter
 Comment: Live Line
 Tem.: 22.5°C Hum.: 52%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1500	39.51	19.90	59.41	65.99	-6.58	QP	
2	0.2180	34.41	19.90	54.31	62.89	-8.58	QP	
3	0.4140	28.50	19.94	48.44	57.57	-9.13	QP	
4	0.4980	25.99	19.98	45.97	56.03	-10.06	QP	
5	0.7180	23.01	20.04	43.05	56.00	-12.95	QP	
6	2.2420	14.46	20.14	34.60	46.00	-11.40	AVG	
7	2.4940	23.43	20.15	43.58	56.00	-12.42	QP	
8	2.4940	13.22	20.15	33.37	46.00	-12.63	AVG	
9	2.7420	12.23	20.15	32.38	46.00	-13.62	AVG	
10	3.2420	10.99	20.16	31.15	46.00	-14.85	AVG	
11	3.4900	11.31	20.17	31.48	46.00	-14.52	AVG	
12	29.7900	14.03	20.27	34.30	50.00	-15.70	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.: 22.5°C Hum.: 52%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1500	19.96	19.90	39.86	55.99	-16.13	AVG	
2	0.1660	39.05	19.90	58.95	65.15	-6.20	QP	
3	0.3140	32.16	19.90	52.06	59.86	-7.80	QP	
4	0.4220	26.51	19.94	46.45	57.41	-10.96	QP	
5	0.4860	26.81	19.97	46.78	56.24	-9.46	QP	
6	0.5700	24.30	20.00	44.30	56.00	-11.70	QP	
7	0.6300	27.27	20.02	47.29	56.00	-8.71	QP	
8	0.6300	12.31	20.02	32.33	46.00	-13.67	AVG	
9	2.2460	12.53	20.14	32.67	46.00	-13.33	AVG	
10	2.4940	11.21	20.15	31.36	46.00	-14.64	AVG	
11	2.7420	9.81	20.15	29.96	46.00	-16.04	AVG	
12	3.4900	9.84	20.17	30.01	46.00	-15.99	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

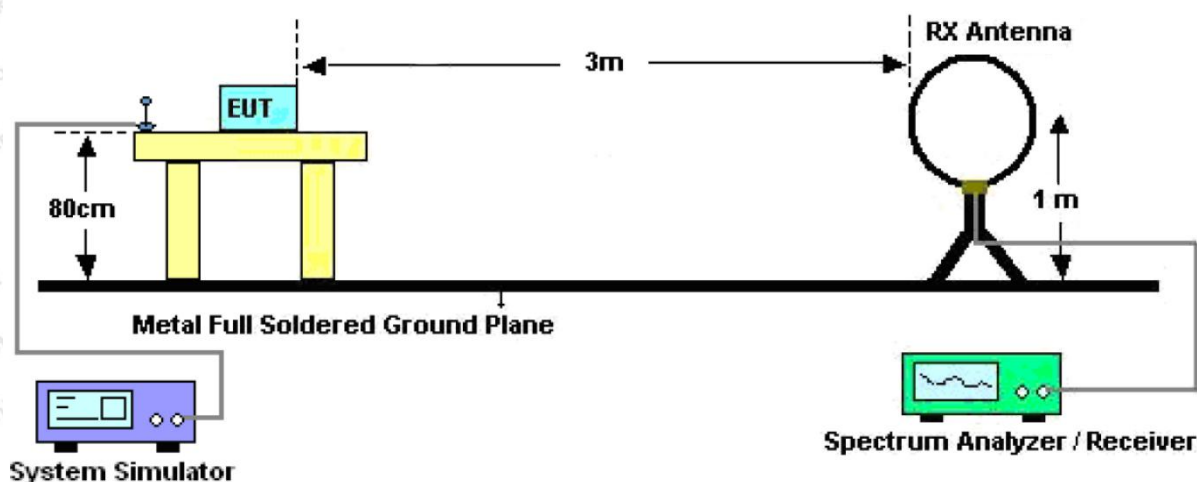


Figure 1. Below 30MHz

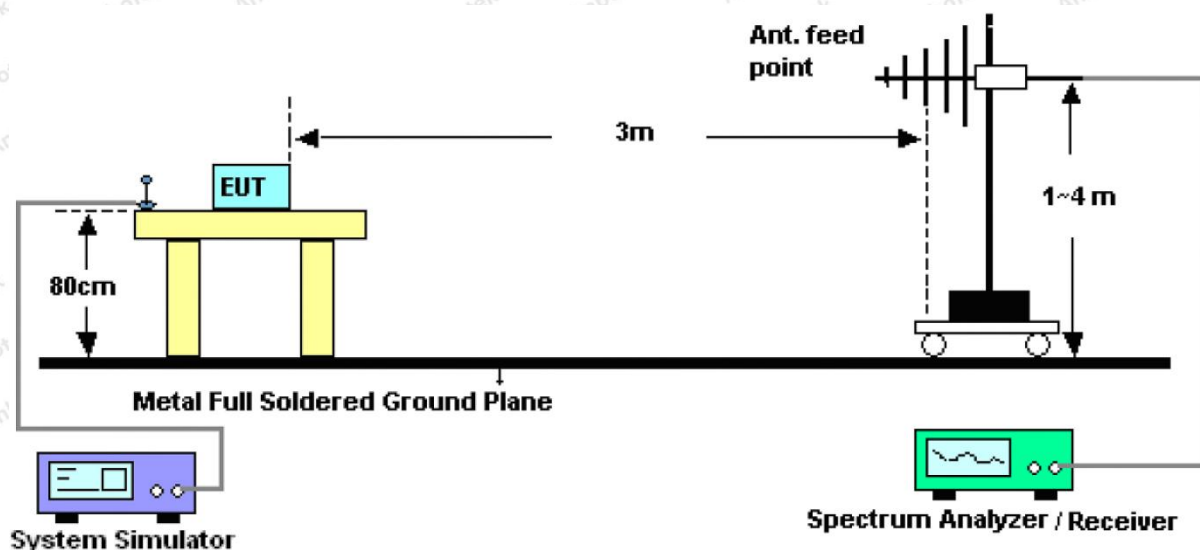


Figure 2. 30MHz to 1GHz

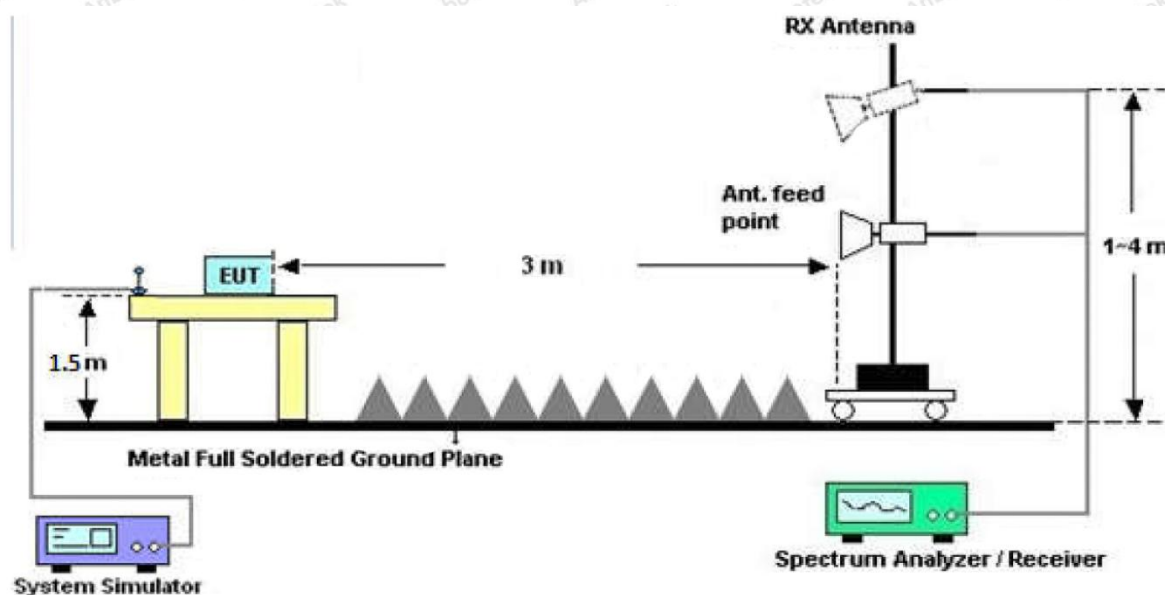


Figure 3. Above 1 GHz

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.

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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

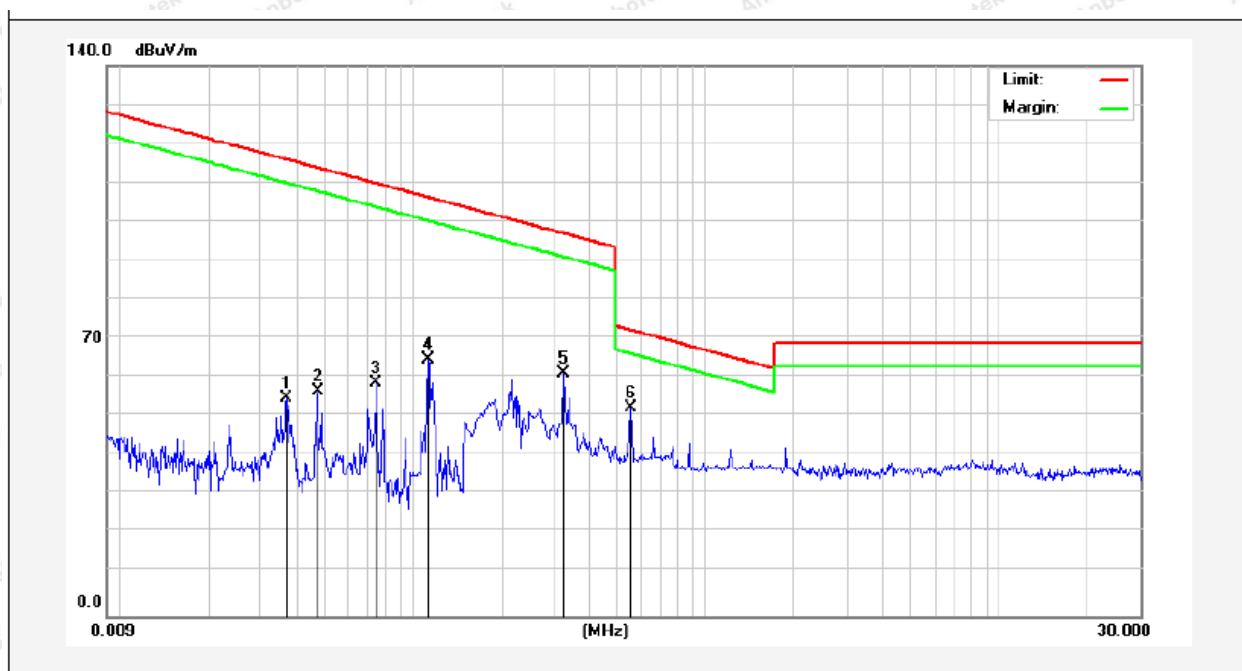
PASS

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



Test Results (9K~30MHz)

Test Mode: Mode 1
 Power Source: AC 120V, 60Hz for adapter
 Temp.(°C)/Hum.(%RH): 22.9°C/49%RH
 Distance: 3m

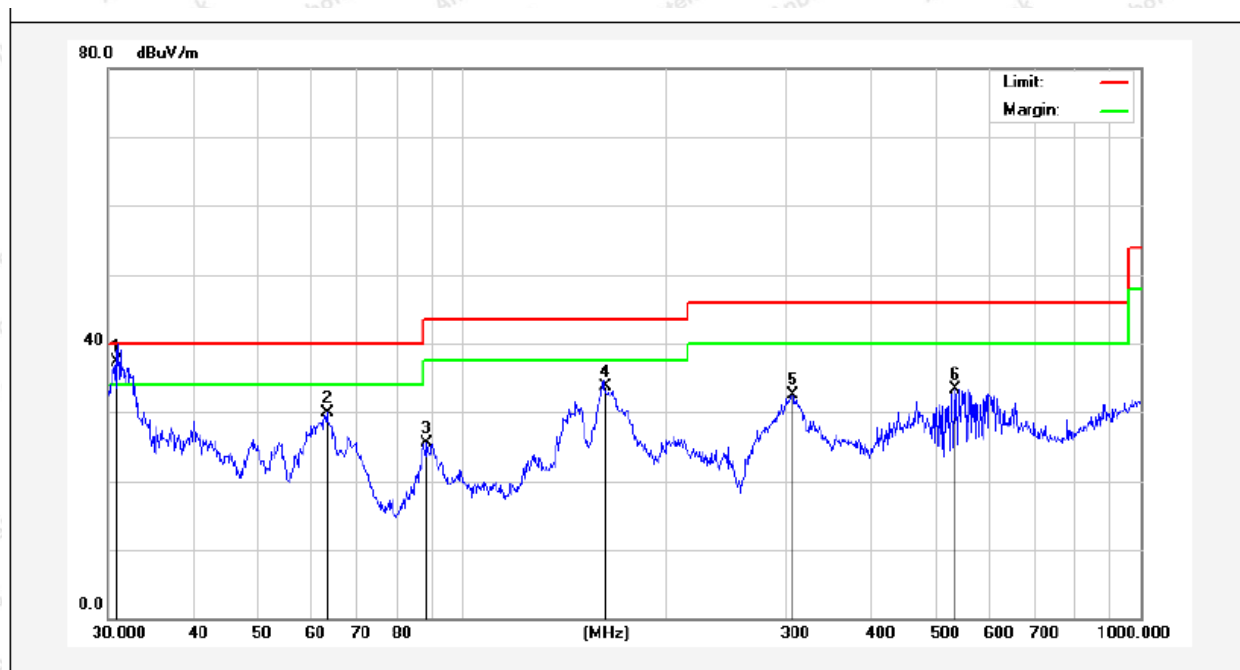


Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	degree (dgc)
0.0369	42.66	19.28	2.53	0	64.47	136.14	-71.67	Peak	362
0.0369	33.66	19.28	2.53	0	55.47	116.14	-60.67	AV	362
0.0471	46.73	19.38	2.55	0	68.66	134.03	-65.37	Peak	49
0.0471	35.18	19.38	2.55	0	57.11	114.03	-56.92	AV	49
0.0748	48.18	19.38	2.55	0	70.11	130.03	-59.92	Peak	157
0.0748	37.34	19.38	2.55	0	59.27	110.03	-50.76	AV	157
0.1122	54.46	19.38	2.55	0	76.39	126.54	-50.15	Peak	88
0.1122	43.44	19.38	2.55	0	65.37	106.54	-41.17	AV	88
0.3260	49.97	19.50	2.64	0	72.11	117.32	-45.21	Peak	269
0.3260	39.28	19.65	2.74	0	61.67	97.32	-35.65	AV	269
0.5500	30.93	19.50	2.64	0	53.07	72.29	-19.22	QP	168

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.

Test Results (30~1000MHz)

Test Mode: Mode 1
Power Source: AC 120V, 60Hz for adapter
Polarization: Vertical
Temp.(°C)/Hum.(%RH): 22.9°C/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	30.8906	54.43	-17.04	37.39	40.00	-2.61	QP	100	0	
2	63.0916	47.12	-17.30	29.82	40.00	-10.18	QP	100	265	
3	88.6524	41.62	-16.05	25.57	43.50	-17.93	QP	100	175	
4	162.8632	52.95	-19.26	33.69	43.50	-9.81	QP	100	360	
5	306.7537	45.74	-13.21	32.53	46.00	-13.47	QP	100	39	
6	533.8321	41.51	-8.20	33.31	46.00	-12.69	QP	100	210	

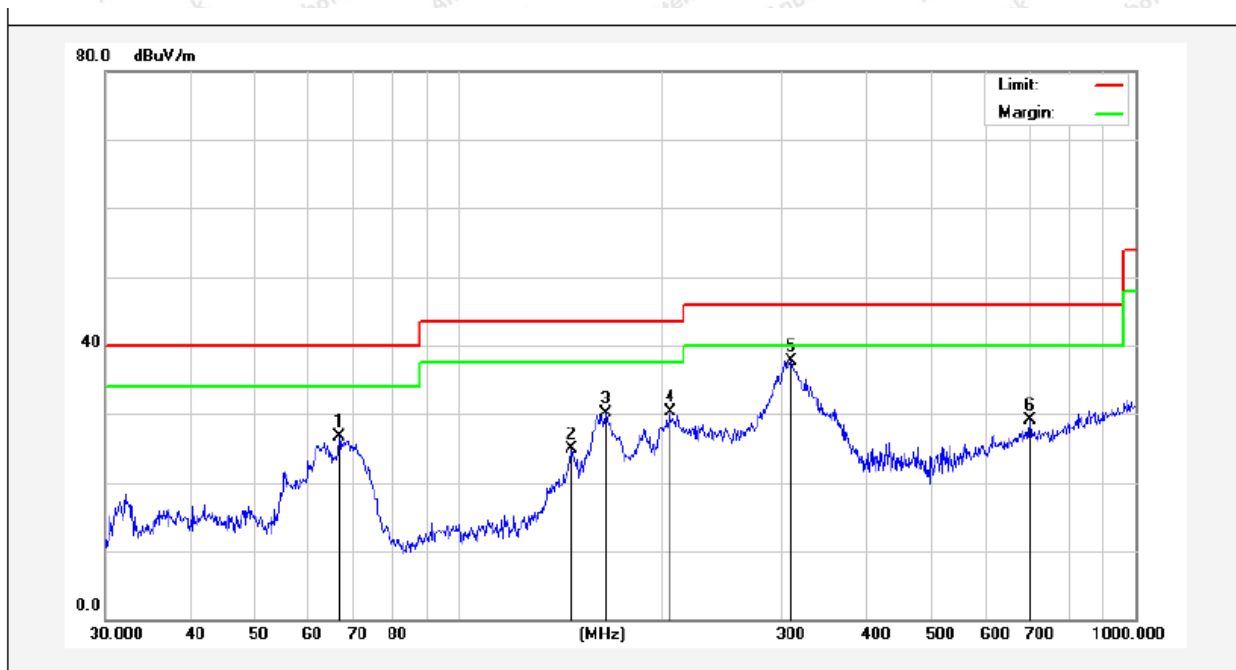
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Test Results (30~1000MHz)

Test Mode: Mode 1
Power Source: AC 120V, 60Hz for adapter
Polarization: Horizontal
Temp.(°C)/Hum.(%RH): 22.9°C/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	66.4989	45.49	-18.84	26.65	40.00	-13.35	QP	100	53	
2	146.3735	45.61	-20.77	24.84	43.50	-18.66	QP	100	69	
3	164.9075	51.73	-21.55	30.18	43.50	-13.32	QP	100	186	
4	204.9551	50.01	-19.76	30.25	43.50	-13.25	QP	100	148	
5	309.9977	51.69	-14.03	37.66	46.00	-8.34	QP	100	23	
6	699.3046	35.18	-6.01	29.17	46.00	-16.83	QP	100	351	



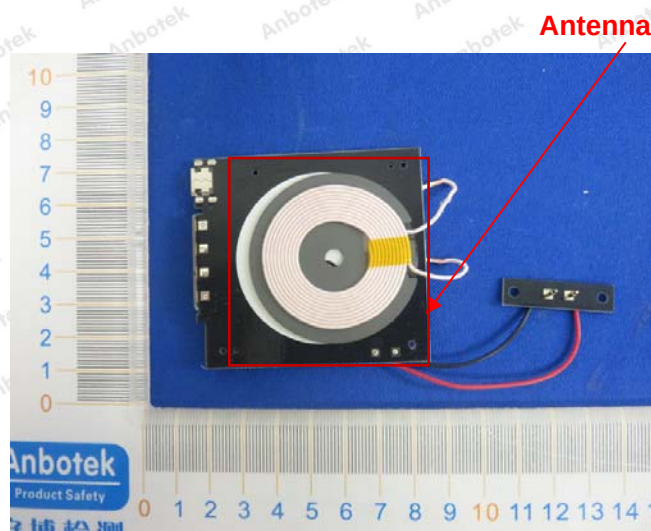
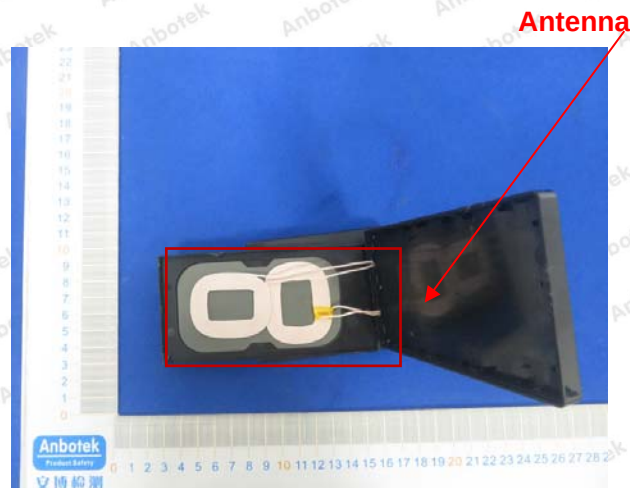
5. Antenna Requirement

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



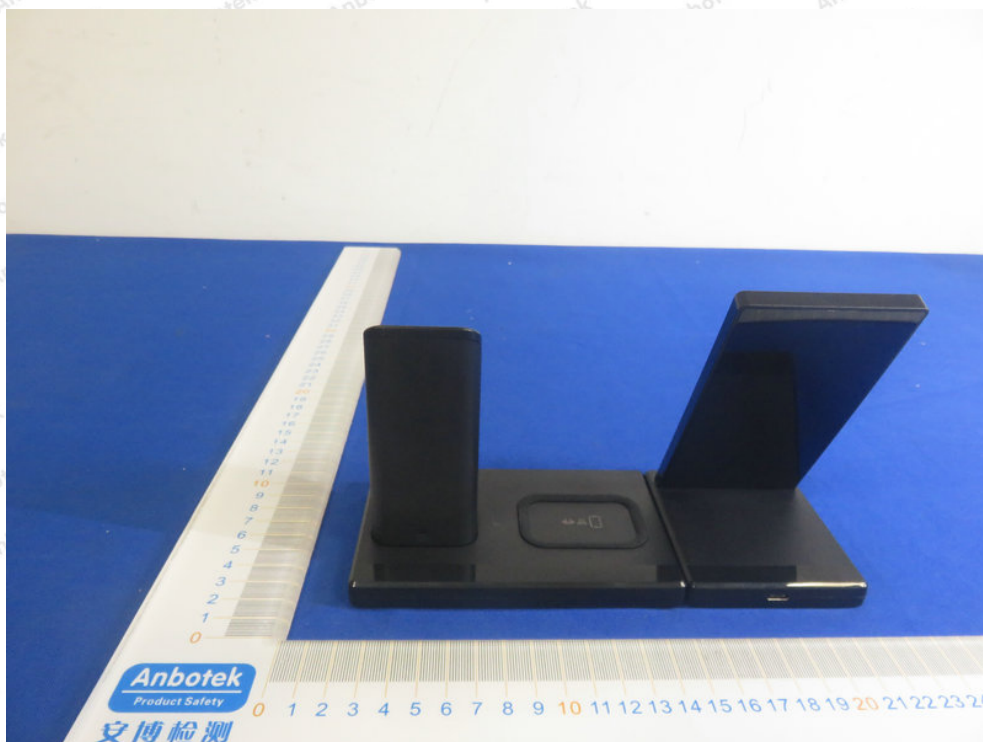
Photo of Radiation Emission Test

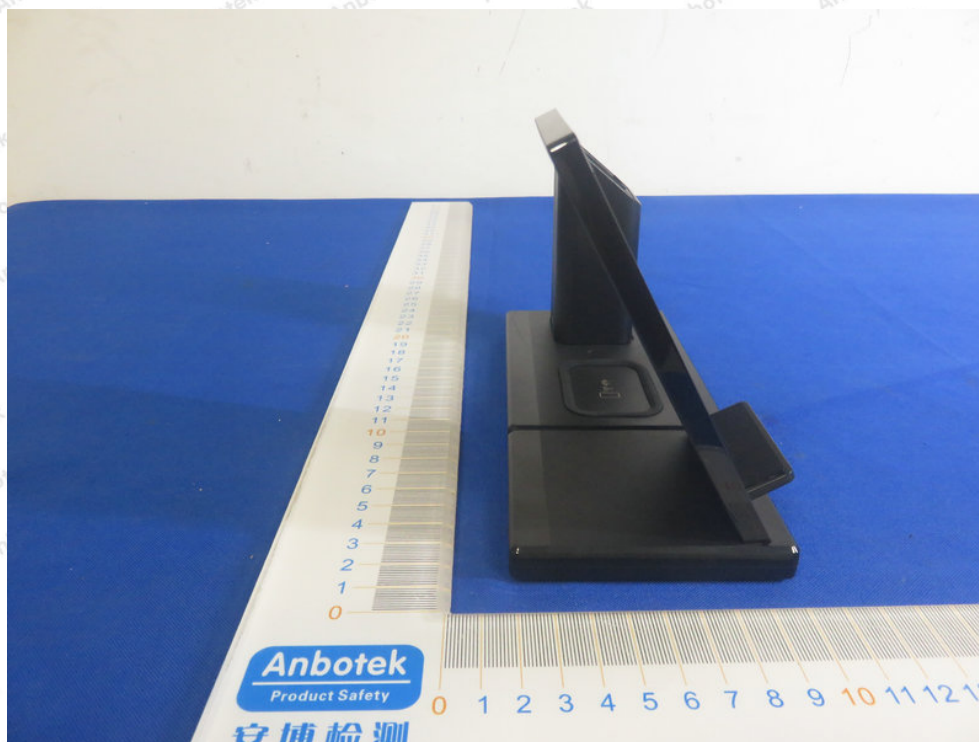


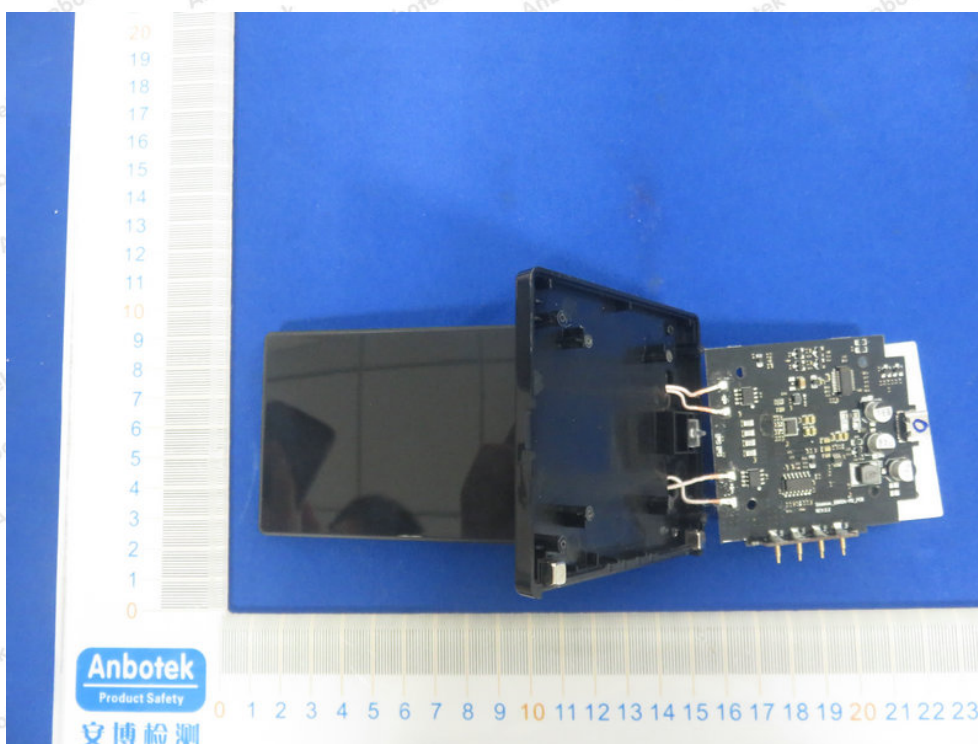
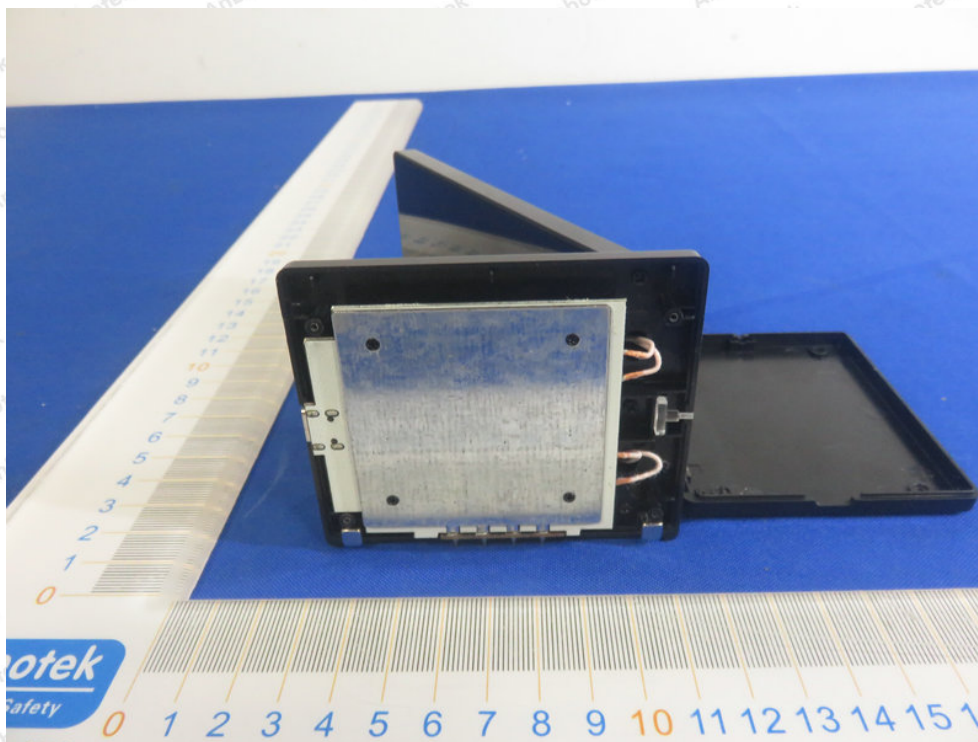


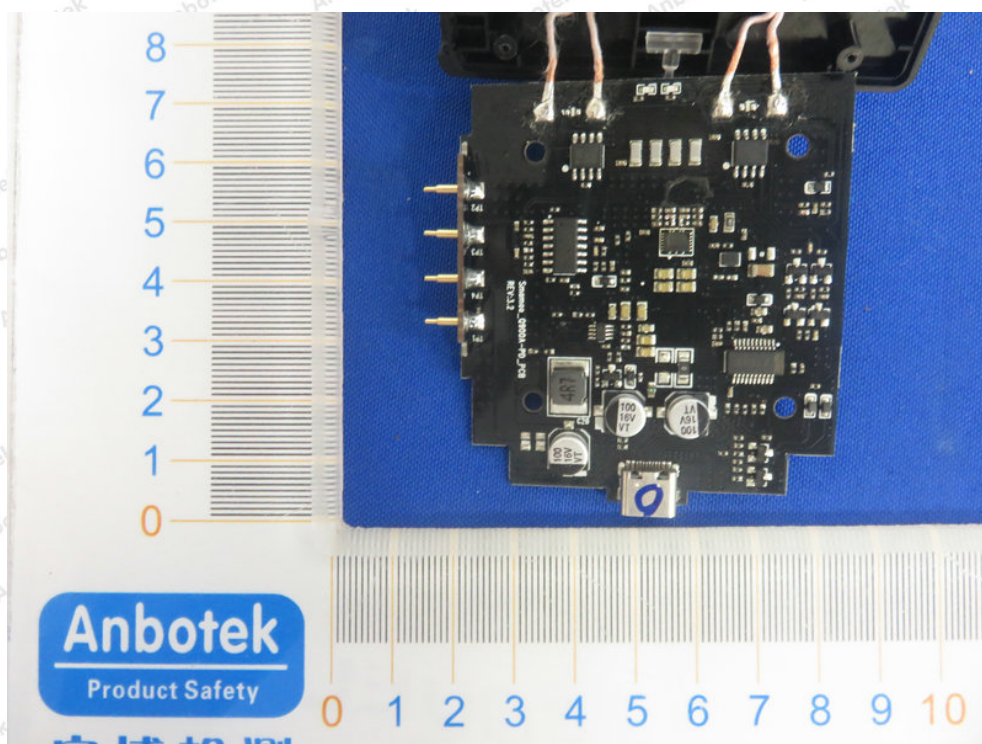
APPENDIX II -- EXTERNAL PHOTOGRAPH

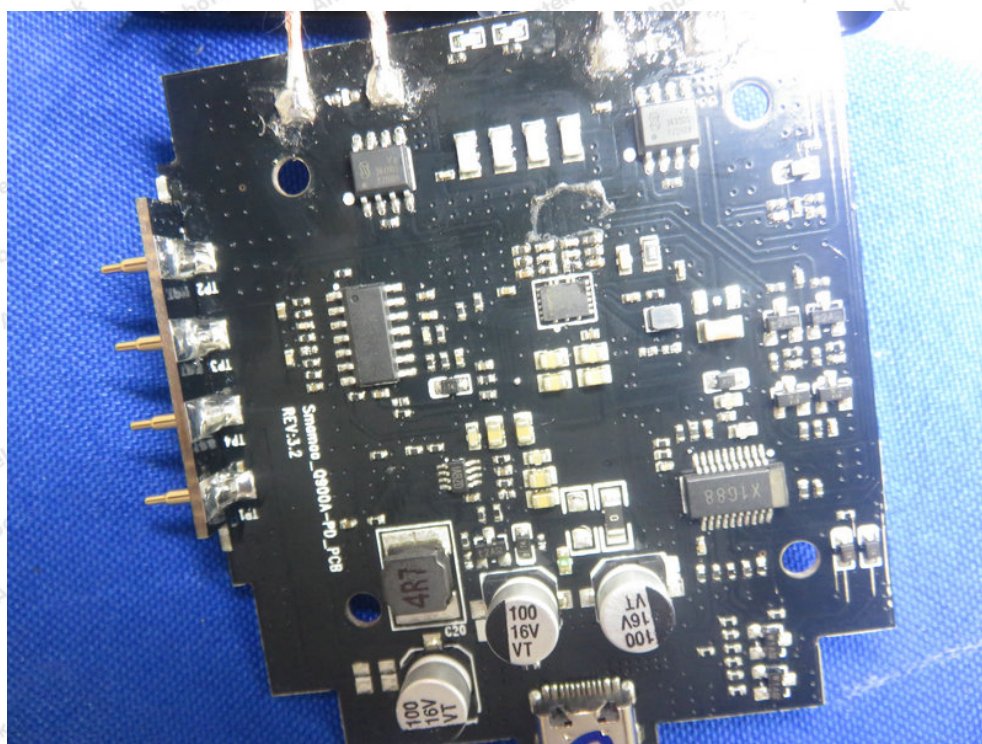
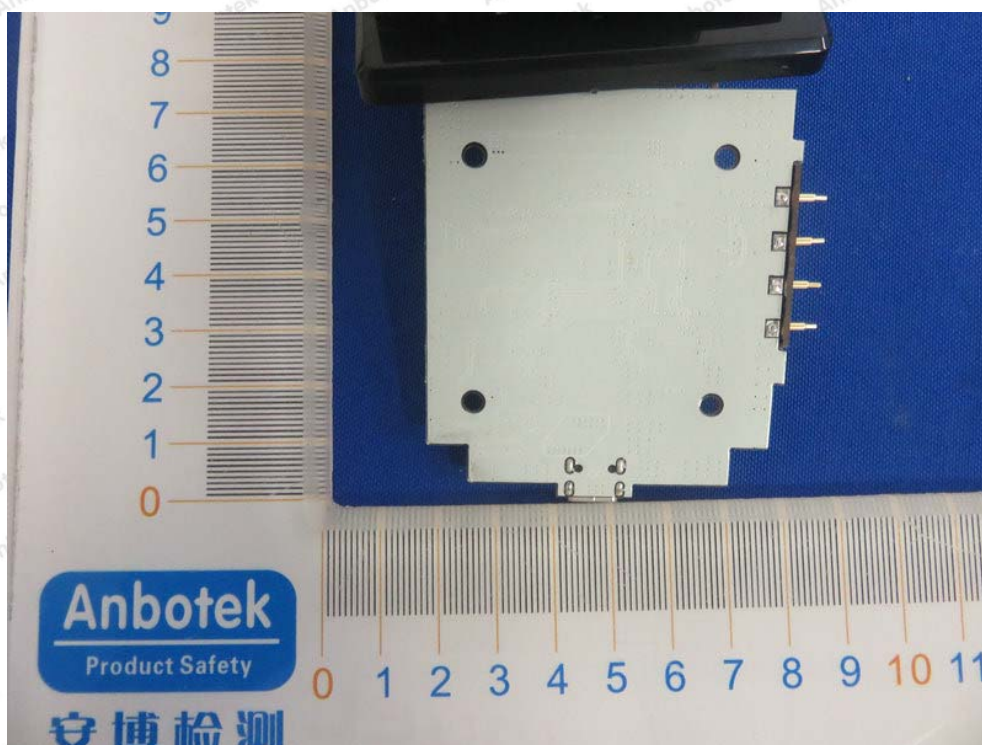


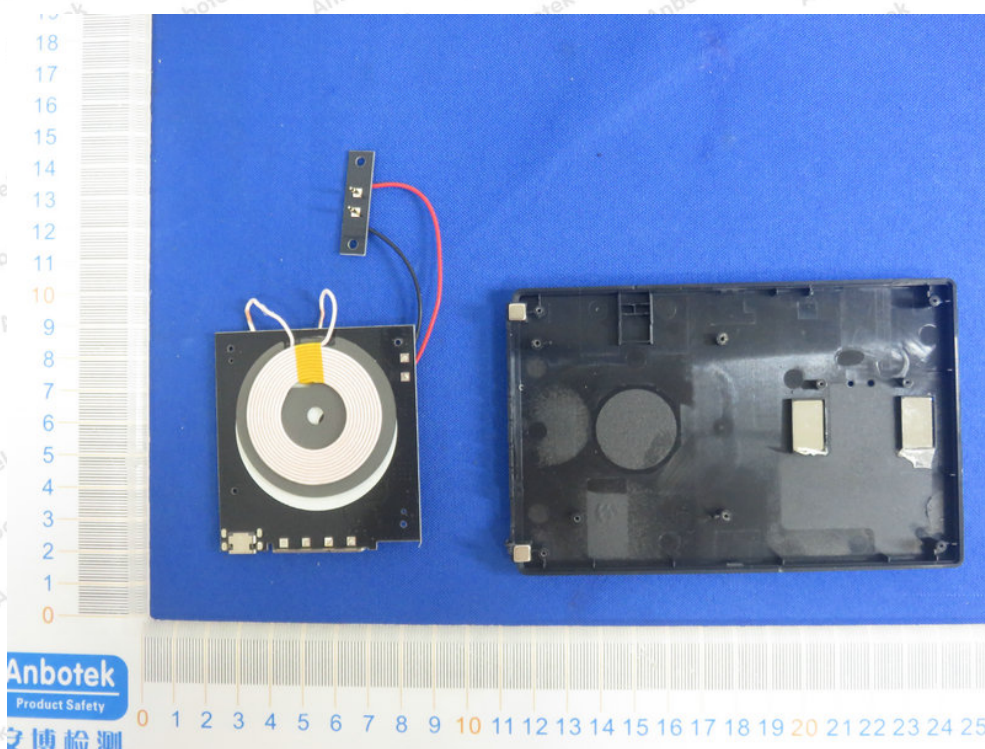


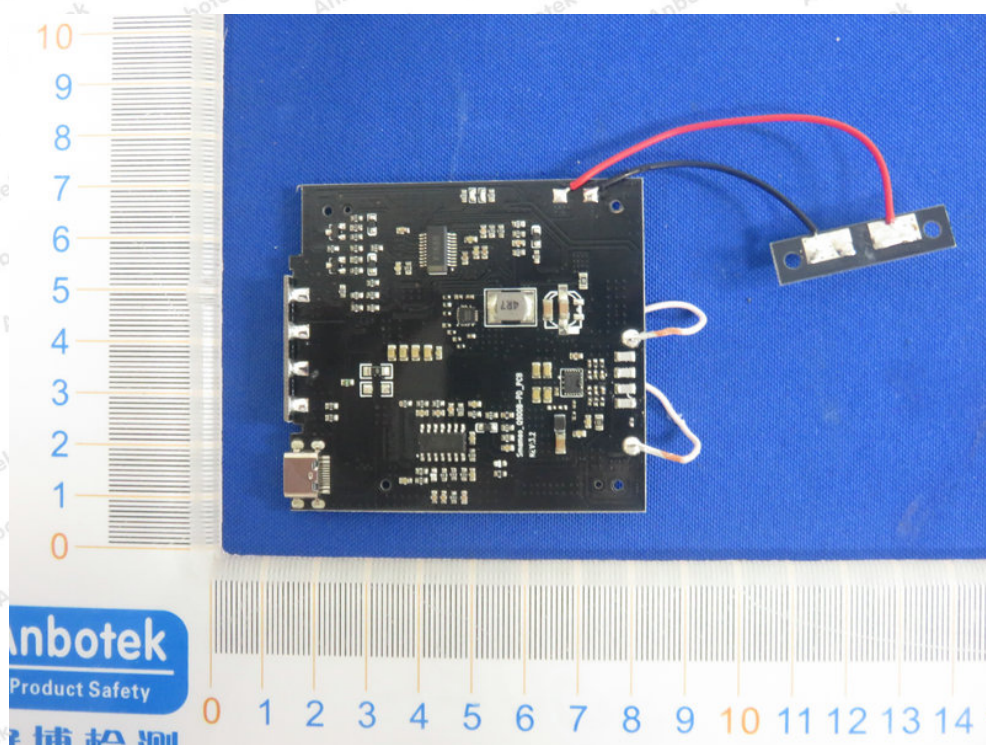
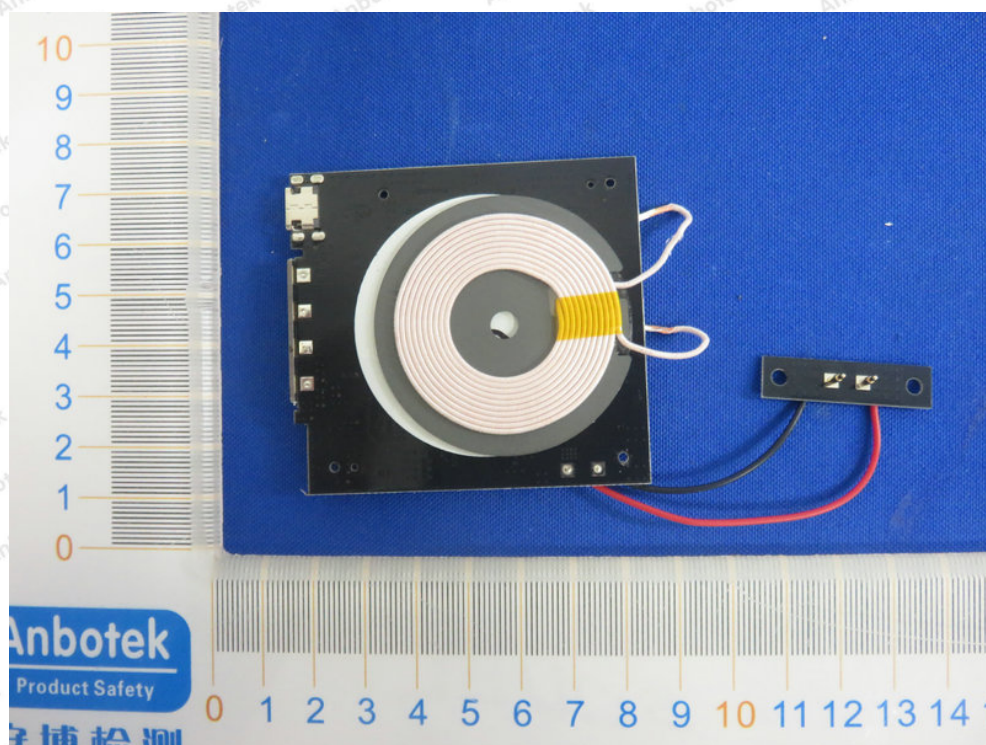


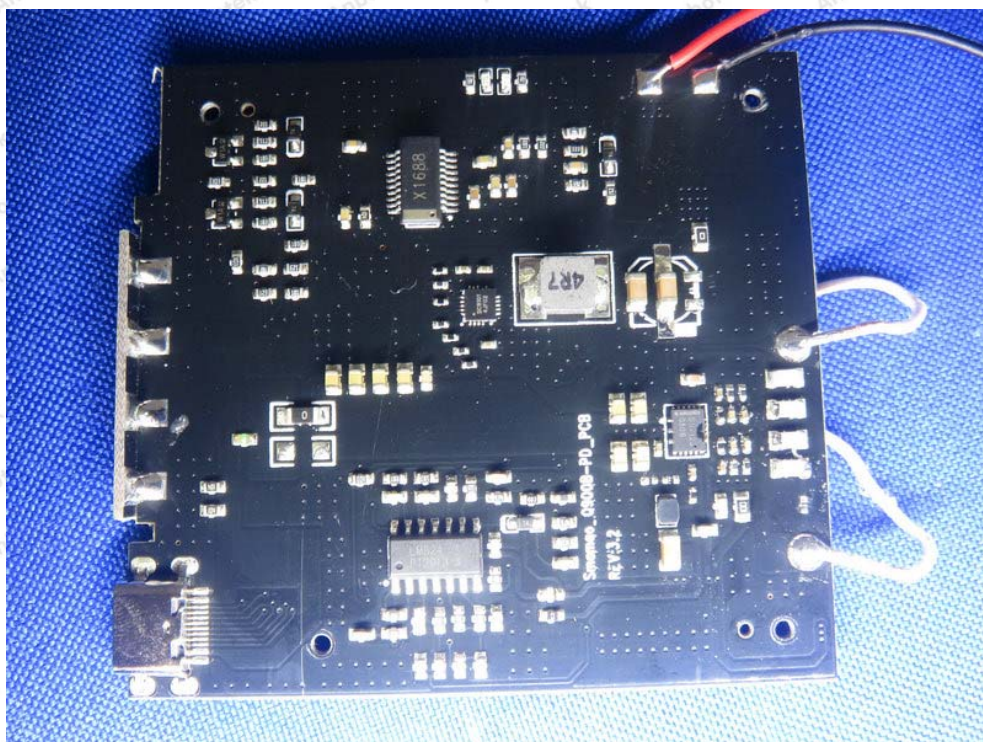
APPENDIX III -- INTERNAL PHOTOGRAPH



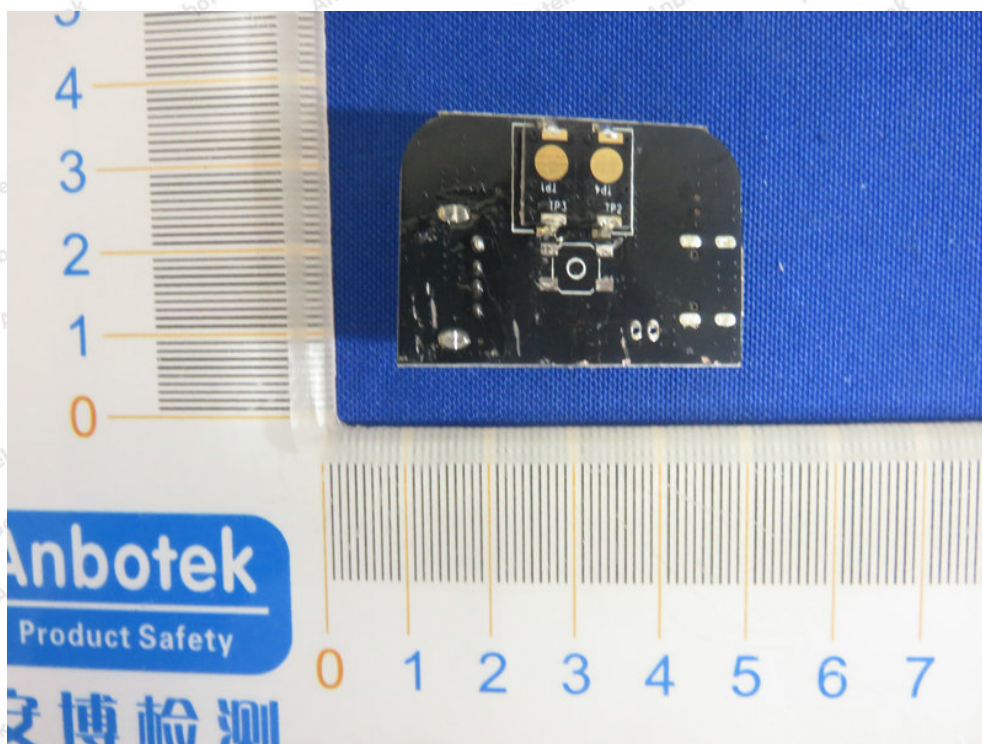
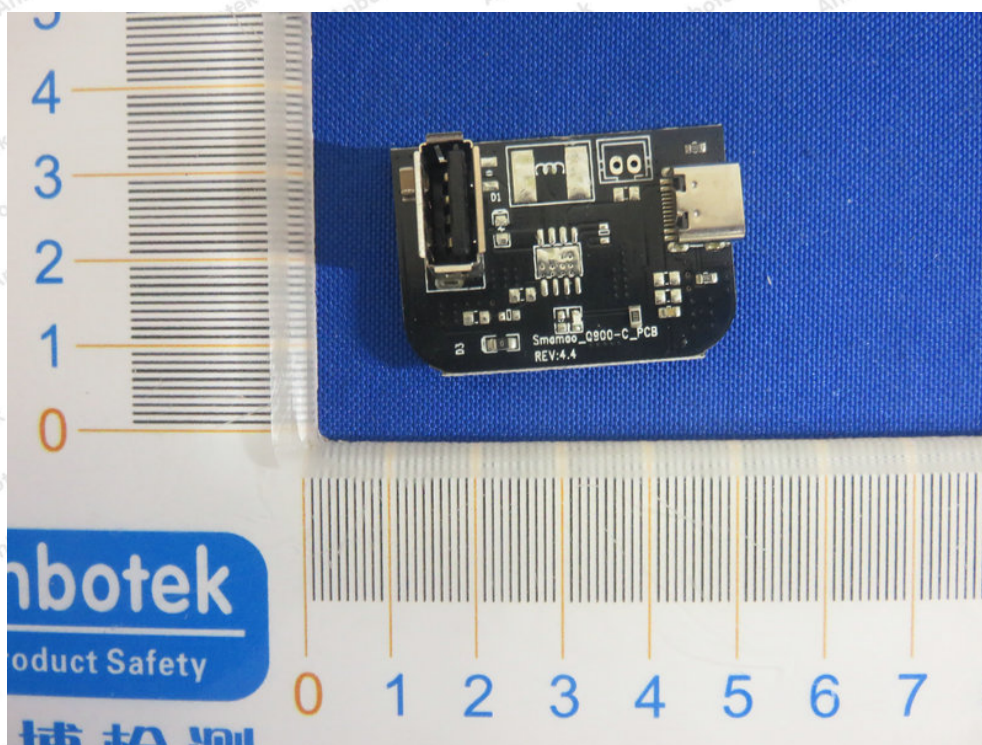


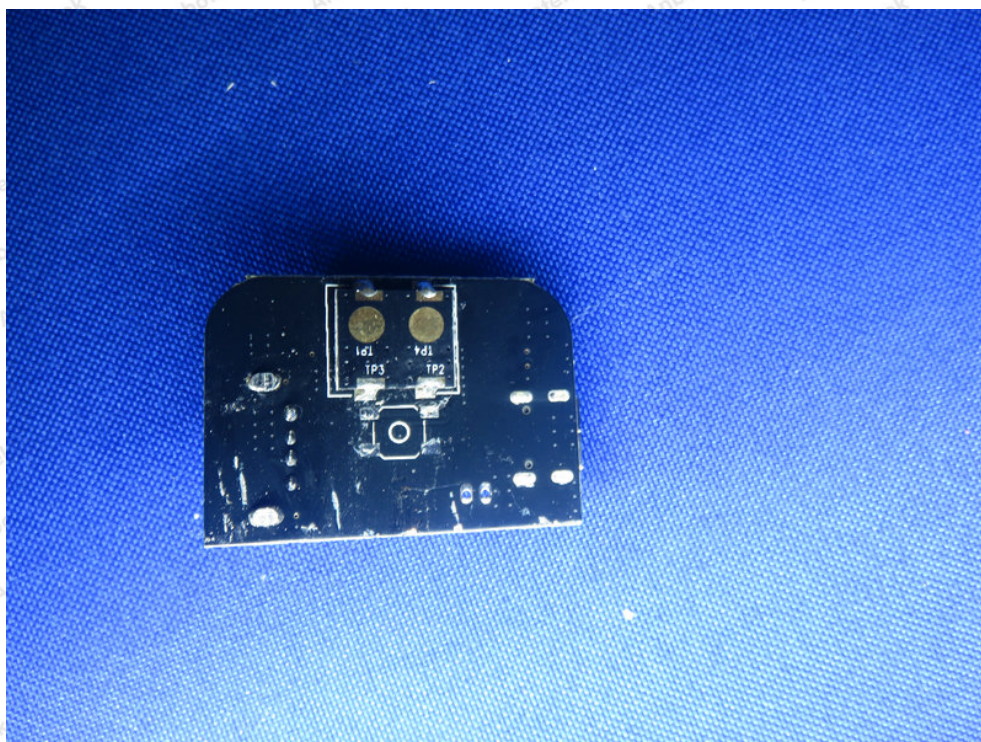
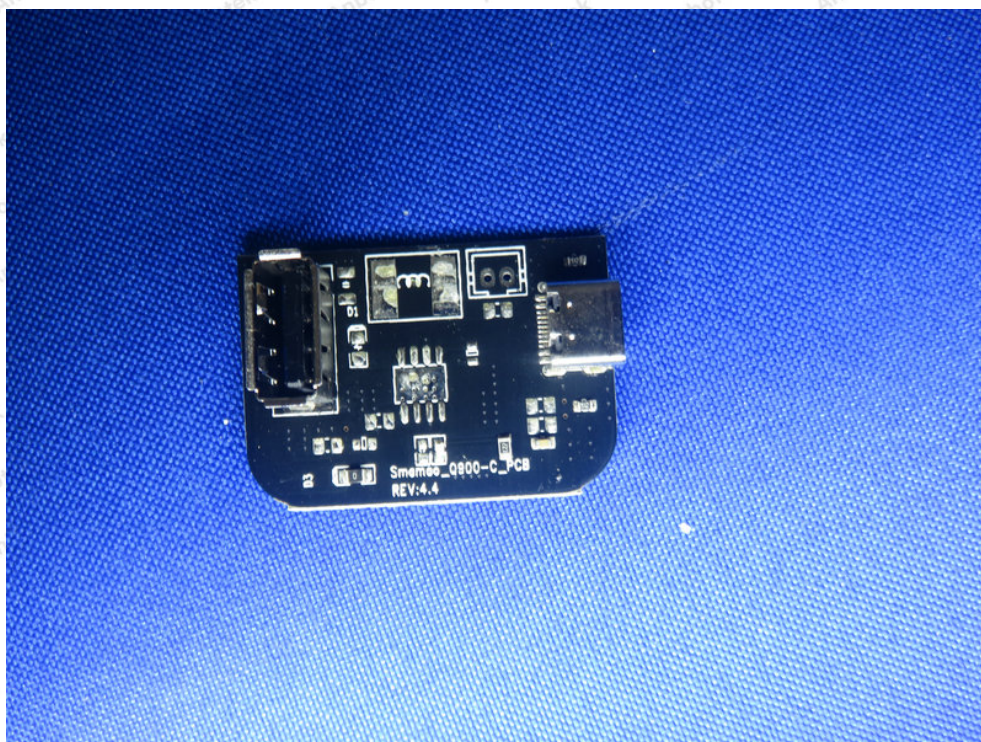












----- End of Report -----