FCC TEST REPORT

FCC ID: AJD-SDAWC01

On Behalf of

PIONEER CORPORATION

High-Speed Wireless Charging Pad

Model No.: SDA-WC01

Prepared for	:	PIONEER CORPORATION
Address	:	28-8, Honkomagome 2-chome, Bunkyo-ku, Tokyo 113-0021, Japan

Prepared By	:	Shenzhen Alpha Product Testing Co., Ltd.
Address	:	Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

Report Number	:	T1881420 01A
Date of Receipt	:	September 10, 2018
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Version Number	:	REV0

TABLE OF CONTENTS

1. Test Result Summary 5
2. General Information 6
   - 2.1. Description of Device (EUT) 6
   - 2.2. Accessories of Device (EUT) 7
   - 2.3. Tested Supporting System Details 7
   - 2.4. Block Diagram of connection between EUT and simulators 7
   - 2.5. Description of Test Modes 7
   - 2.6. Test Conditions 7
   - 2.7. Test Facility 8
   - 2.8. Measurement Uncertainty 8
   - 2.9. Test Equipment List 9
3. Test Results and Measurement Data 10
   - 3.1. Conducted Emission 10
   - 3.2. Radiated Spurious Emission Measurement 14
   - 3.3. Test Specification 21
4. Photos of test setup 23
5. Photographs of EUT 25

TEST REPORT DECLARATION

Applicant	:	PIONEER CORPORATION
Address	:	28-8, Honkomagome 2-chome, Bunkyo-ku, Tokyo 113-0021, Japan
Manufacturer	:	Shenzhen Esorun Technology Co.,LTD
Address	:	10F, Mingzhuo Building, Mingzhuoxing Industrial Park,Guangming Street, Guangming District, Shenzhen, China
EUT Description	:	High-Speed Wireless Charging Pad
		(A) Model No. : SDA-WC01
		(B) Trademark : N/A

Measurement Standard Used:
FCC CFR Title 47 Part 15 Subpart C Section 15.209

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC CFR Title 47 Part 15 Subpart C Section 15.209 requirements.

Tested by (name + signature).....:	Reak Yang Project Engineer	Reak Yang ……
Approved by (name + signature).....:	Simple Guan Project Manager	..... ……
Date of issue…… ……..:	September 20,2018	

Revision History

Revision	Issue Date	Revisions	Revised By
00	September 20,2018	Initial released Issue	Simple Guan

1. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Spurious Emission	§15.209(a)(f)	PASS
Occupied Bandwidth	§15.215 (c)	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

2. General Information

2.1. Description of Device (EUT)

EUT Name	:	High-Speed Wireless Charging Pad
Model No.	:	SDA-WC01
DIFF.	:	N/A
Trademark	:	N/A
Power supply	:	Input : 5 V⎓2A; 9 V⎓1.67A Output: 5 V⎓1A; 9 V⎓1.12A
Operation frequency	:	125-205KHz
Modulation	:	MSK
Antenna Type	:	Coil Antenna, Maximum Gain is 28dBi
Software version	:	V2.1
Hardware version	:	V1.0

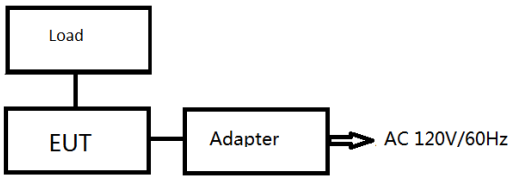
2.2. Accessories of Device (EUT)

Accessories1 : /
Manufacturer : /
Model : /
Ratings : /

2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or DOC
1	Load	--	--	--	--
2	Adapter	Shenzhen Green Power Electronic Technology Co., Ltd.	GS01500500300	--	--

2.4. Block Diagram of connection between EUT and simulators



2.5. Description of Test Modes

Channel	Frequency (KHz)	Channel	Frequency (KHz)	Channel	Frequency (KHz)	Channel	Frequency (KHz)
1	125	6	150	11	175	16	200
2	130	7	155	12	180	17	205
3	135	8	160	13	185	18	
4	140	9	165	14	190	19	
5	145	10	170	15	195	20	

Note: Pre-San all output power mode, and only worst data listed in report (DC 9V/1.12A).

2.6. Test Conditions

Items	Required	Actual
Temperature range:	15-35℃	27℃
Humidity range:	25-75%	56%
Pressure range:	86-106kPa	980kPa

2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd
Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission
Registration Number: 293961

July 25, 2017 Certificated by IC
Registration Number: 12135A

2.8. Measurement Uncertainty

(95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Conducted Emission Test	2.74dB	
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.77dB	Polarize: V
	3.80dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.16dB	Polarize: H
	4.13dB	Polarize: V
Uncertainty for radio frequency	5.4×10^{-8}	
Uncertainty for conducted RF Power	0.37dB	

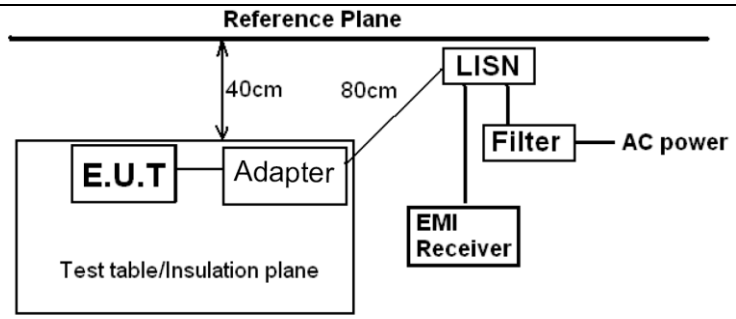
2.9. Test Equipment List

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	2017.09.22	1Year
Spectrum analyzer	Agilent	E4407B	MY46185649	2017.09.22	1Year
Receiver	R&S	ESCI	1166.5950K03-1011	2017.09.22	1Year
Receiver	R&S	ESCI	101202	2017.09.22	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2016.09.30	2Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2016.09.30	2Year
Cable	Resenberger	N/A	No.1	2017.09.22	1Year
Cable	SCHWARZBECK	N/A	No.2	2017.09.22	1Year
Cable	SCHWARZBECK	N/A	No.3	2017.09.22	1Year
Pre-amplifier	Schwarzbeck	BBV9743	9743-019	2017.09.22	1Year
Pre-amplifier	R&S	AFS33-18002650-30-8P-44	SEL0080	2017.09.22	1Year
Temperature controller	Terchy	MHQ	120	2017.09.22	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2017.09.22	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2017.09.22	1 Year
20db Attenuator	ICPROBING	IATS1	82347	2017.09.22	1 Year

3. Test Results and Measurement Data

3.1. Conducted Emission

3.1.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Frequency Range:</td><td>150 kHz to 30 MHz</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9 kHz, VBW=30 kHz, Sweep time=auto</td></tr>
<tr><td>Limits:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
</td></tr>
<tr><td>Test Setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Mode:</td><td>Charging + Transmitting Mode</td></tr>
<tr><td>Test Procedure:</td><td>1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</td></tr>
<tr><td>Test Result:</td><td>PASS</td></tr>
</table>

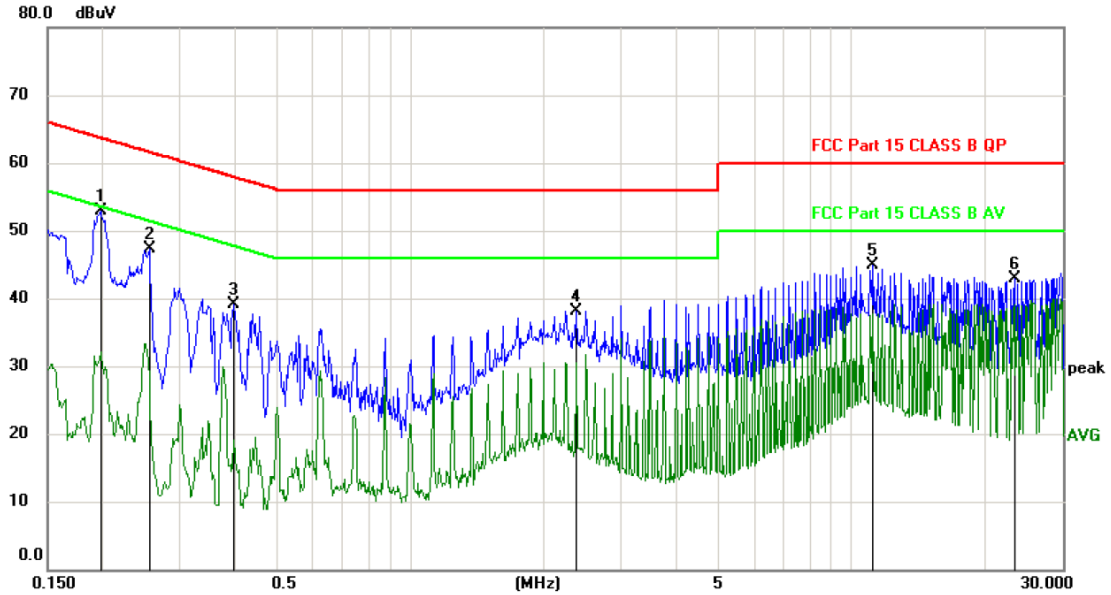
3.1.2. Test data

Please refer to following diagram for individual

Test Mode	:	Full Load
Test Results	:	**PASS**
Note:	The test results are listed in next pages. This mode is worst case mode, so this report only reflected the worst mode. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out. If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.	

Test result for Channel 125KHz, AC 120V/ 60Hz

Line:



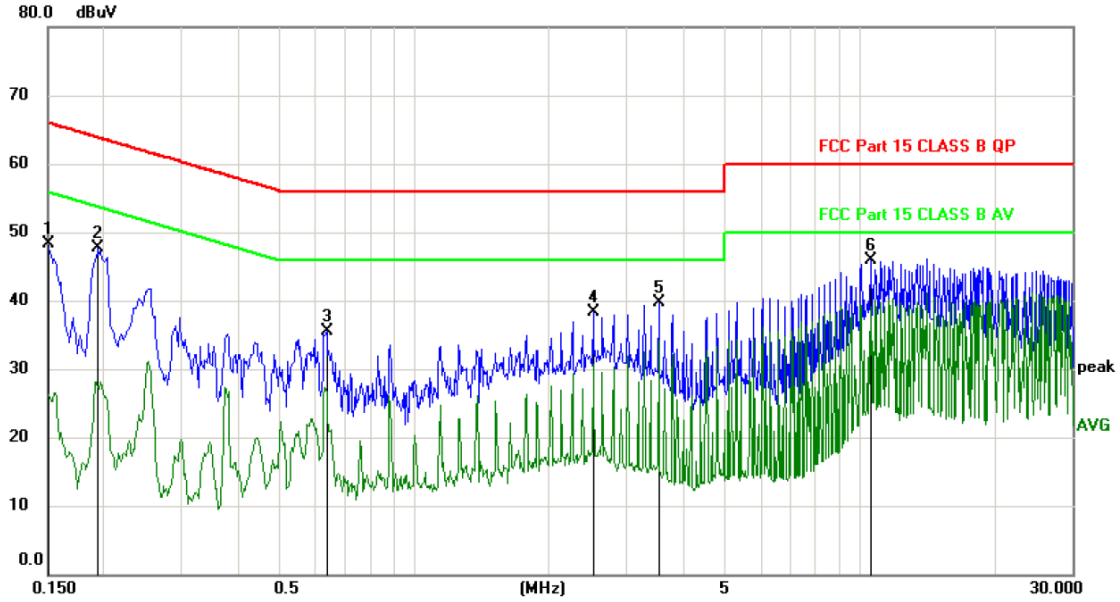
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1980	43.07	9.74	52.81	63.69	-10.88	peak	
2		0.2550	37.50	9.76	47.26	61.59	-14.33	peak	
3		0.3960	29.25	9.77	39.02	57.94	-18.92	peak	
4		2.3699	28.12	9.97	38.09	56.00	-17.91	peak	
5		11.1899	34.64	10.35	44.99	60.00	-15.01	peak	
6		23.4599	32.27	10.68	42.95	60.00	-17.05	peak	

*:Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Test result for Channel 125KHz, AC 120V/ 60Hz

Neutral:



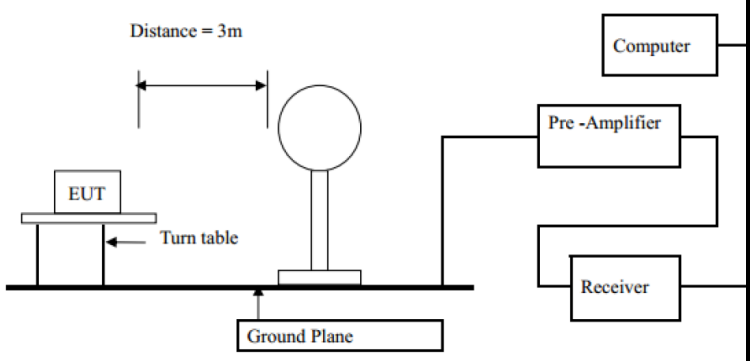
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	38.69	9.66	48.35	66.00	-17.65	peak	
2		0.1949	38.02	9.67	47.69	63.83	-16.14	peak	
3		0.6360	25.73	9.72	35.45	56.00	-20.55	peak	
4		2.5228	28.40	9.94	38.34	56.00	-17.66	peak	
5		3.5339	29.72	10.04	39.76	56.00	-16.24	peak	
6	*	10.6020	35.59	10.34	45.93	60.00	-14.07	peak	

*:Maximum data x:Over limit !:over margin

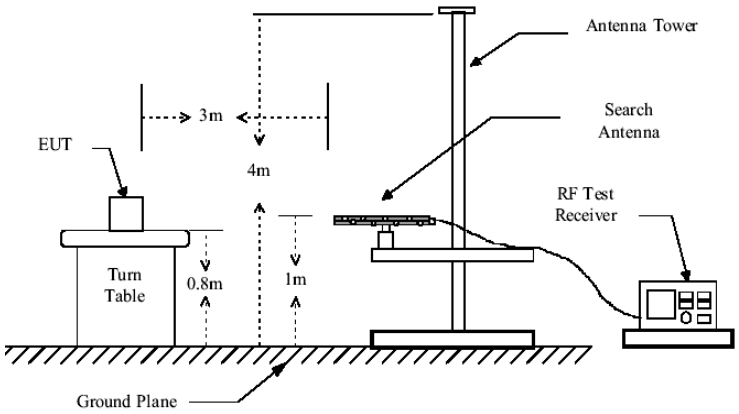
Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

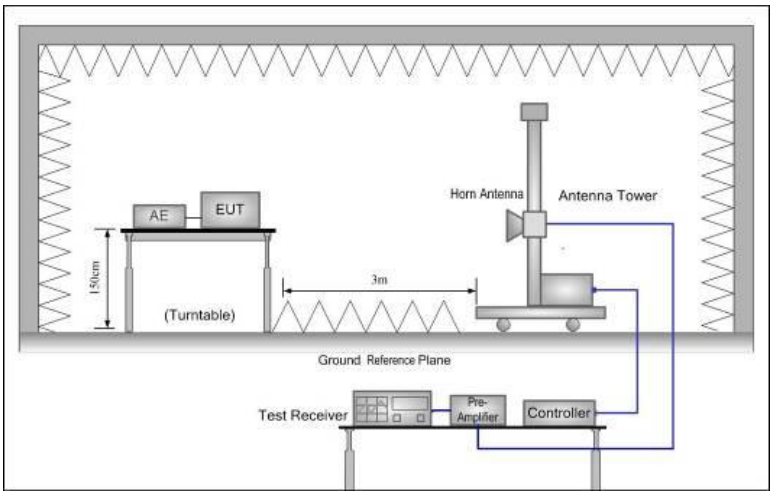
3.2. Radiated Spurious Emission Measurement

3.2.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10: 2013</td></tr>
<tr><td>Frequency Range:</td><td>9 kHz to 25 GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Refer to item 4.1</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Field Strength (microvolts/meter)</td><td>Measurement Distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(KHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(KHz)</td><td>30</td></tr>
<tr><td>1.705-30</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100</td><td>3</td></tr>
<tr><td>88-216</td><td>150</td><td>3</td></tr>
<tr><td>216-960</td><td>200</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
<table>
<tr><td>Frequency</td><td>Field Strength (microvolts/meter)</td><td>Measurement Distance (meters)</td><td>Detector</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>500</td><td>3</td><td>Average</td></tr>
<tr><td>5000</td><td>3</td><td>Peak</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions below 30MHz
 

30MHz to 1GHz</td></tr>
</table>

<table>
<tr>
<td></td>
<td>


Above 1GHz


</td>
</tr>
<tr>
<td>Test Procedure:</td>
<td>1. For the radiated emission test below 1GHz:
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.
For the radiated emission test above 1GHz:
Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which</td>
</tr>
</table>

	maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. 2. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level 3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. 4. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 1 MHz, VBW= 3MHz for f □ 1 GHz for peak measurement. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Test mode:	Refer to section 4.1 for details
Test results:	PASS

3.2.2. Test Data

Please refer to following diagram for individual

Frequency Range	:	9KHz~30MHz
Test Mode	:	TX: channel low, channel mid, channel high
Test Results	:	**PASS**
Note:	1. The test results are listed in next pages. 2. This mode is worst case mode, so this report only reflected the worst mode. 3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.	

Freq.	Reading	Antenna Factor	Cable loss	Amp Factor	Result	Limit	Margin	Detector	State
(MHz)	(dBuV/m)	dB/m	dB	dB	(dBuV/m)	(dBuV/m) at 3 m	(dB)		P/F
0.125	48.65	48.34	0.16	29.87	67.28	126.77	-59.49	PK	PASS
0.125	45.64	48.34	0.16	29.87	64.27	106.77	-42.50	AV	PASS
0.175	92.59	48.34	0.16	29.87	111.22	122.95	-11.73	PK	PASS
0.175	69.10	48.34	0.16	29.87	87.73	102.95	-15.22	AV	PASS
0.205	48.88	48.38	0.17	29.89	67.54	120.76	-53.22	PK	PASS
0.205	46.27	48.38	0.17	29.89	64.93	100.76	-35.83	AV	PASS
0.35	44.28	48.44	0.19	29.89	63.02	117.78	-54.76	PK	PASS
0.35	42.91	48.44	0.19	29.89	61.65	97.78	-36.13	AV	PASS
0.45	44.96	48.47	0.19	29.89	63.73	115.35	-51.62	PK	PASS
0.45	42.00	48.47	0.19	29.89	60.77	95.35	-34.58	AV	PASS
1.928	18.40	49.12	0.2	29.94	37.78	60	-22.22	QP	PASS
1.920	21.59	49.12	0.2	29.94	40.97	60	-19.03	QP	PASS

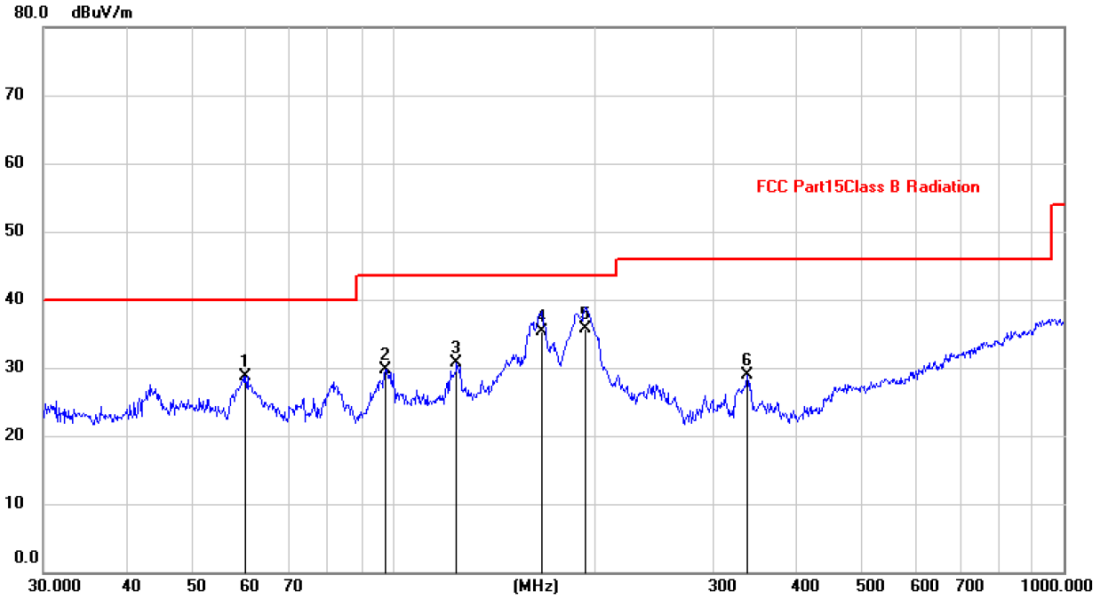
Frequency Range	:	30MHz~1000MHz
Test Mode	:	Full Load
Test Results	:	**PASS**
Note:	1. The test results are listed in next pages. 2. This mode is worst case mode, so this report only reflected the worst mode. 3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.	

Frequency Range	:	Above 1GHz			
EUT	:	/	Test Date	:	/
M/N	:	/	Temperature	:	/
Test Engineer	:	/	Humidity	:	/
Test Mode	:	/			
Test Results	:	N/A			
Note:	1. The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. So the frequency rang above 1GHz radiation test not applicable.				

Test result for Channel 125KHz, AC 120V/ 60Hz

30MHz-1GHz

Horizontal:

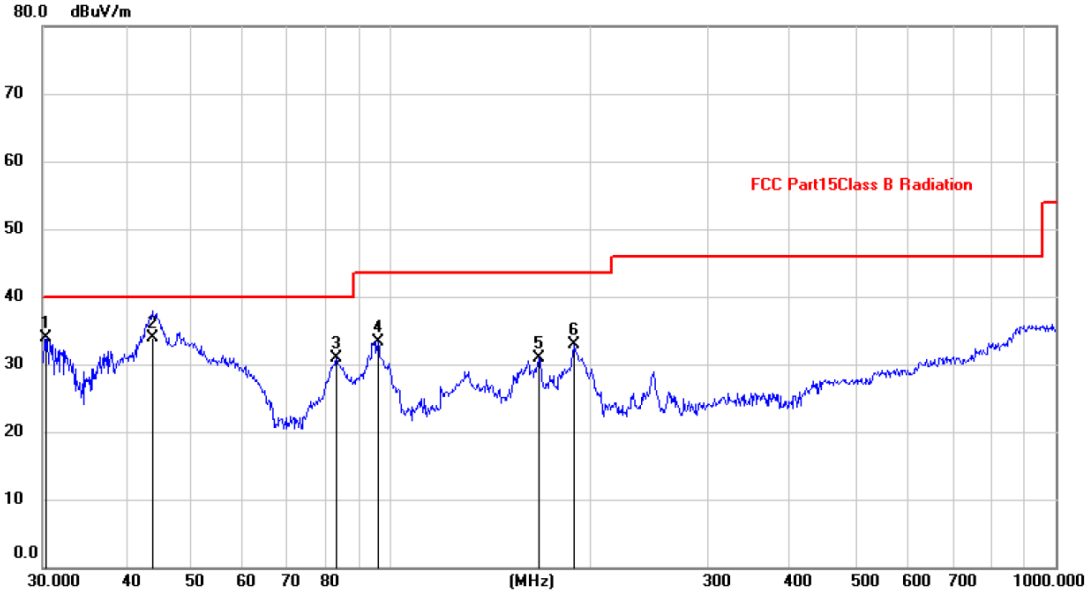


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		60.0690	15.73	12.96	28.69	40.00	-11.31	peak			
2		97.1148	19.29	10.35	29.64	43.50	-13.86	peak			
3		124.1329	17.82	12.86	30.68	43.50	-12.82	peak			
4		167.2366	21.32	14.00	35.32	43.50	-8.18	QP			
5	*	193.7726	25.03	10.70	35.73	43.50	-7.77	QP			
6		337.2155	14.43	14.39	28.82	46.00	-17.18	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Test result for Channel 125KHz, AC 120V/ 60Hz

Vertical:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		30.4237	20.53	13.30	33.83	40.00	-6.17	peak			
2	*	43.8119	20.09	13.89	33.98	40.00	-6.02	QP			
3		82.9385	21.40	9.58	30.98	40.00	-9.02	peak			
4		95.7622	23.12	10.27	33.39	43.50	-10.11	peak			
5		167.8240	16.96	13.95	30.91	43.50	-12.59	peak			
6		189.0741	21.86	11.04	32.90	43.50	-10.60	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Note:

Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

3.3. Test Specification

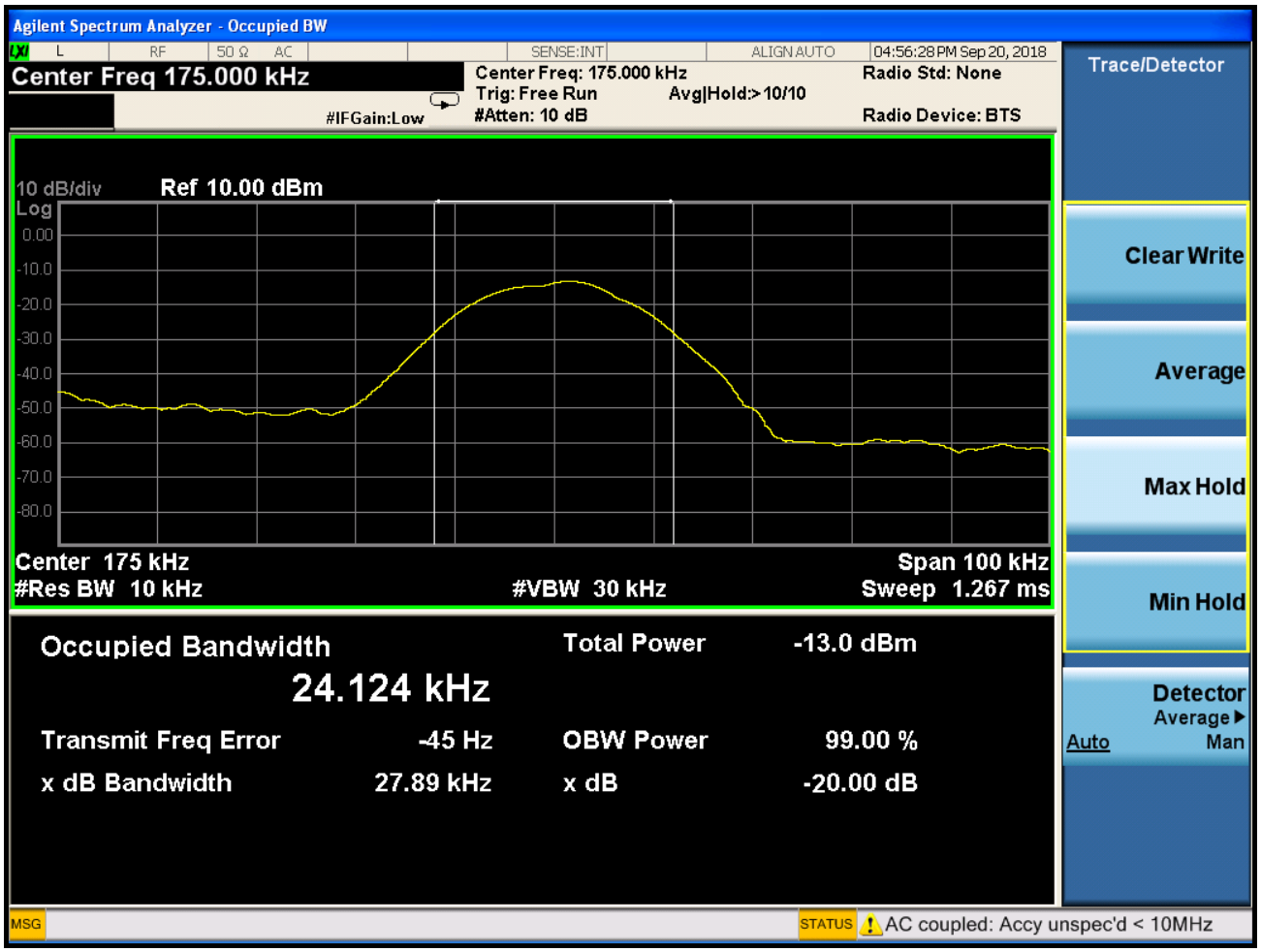
Test Requirement:	FCC Part15 C Section 15.215(c)
Test Method:	ANSI C63.10: 2013
Limit:	N/A
Test Procedure:	1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW≥ 1% of the 20 dB bandwidth; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. 4. Measure and record the results in the test report.
Test setup:	
Test Mode:	Refer to section 4.1 for details
Test results:	PASS

3.3.1. Test data

Frequency(KHz)	20dB Occupy Bandwidth (kHz)	Limit (kHz)	Conclusion
175.0	27.89	---	PASS

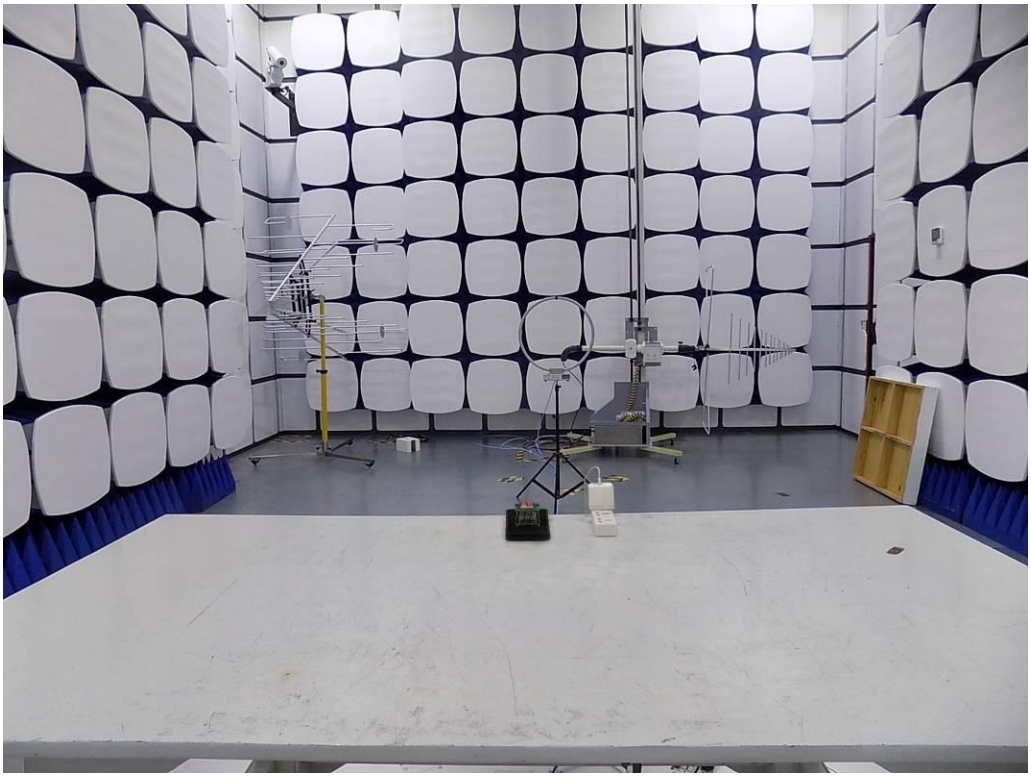
Test plots as follows:

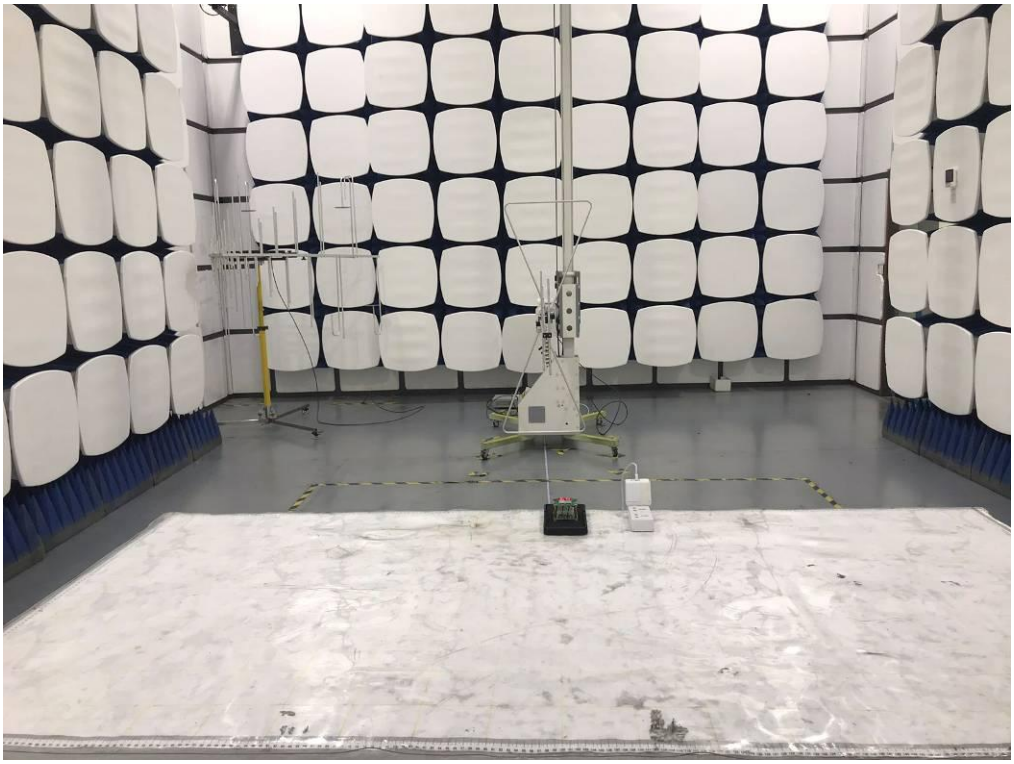
Lowest channel



4. Photos of test setup

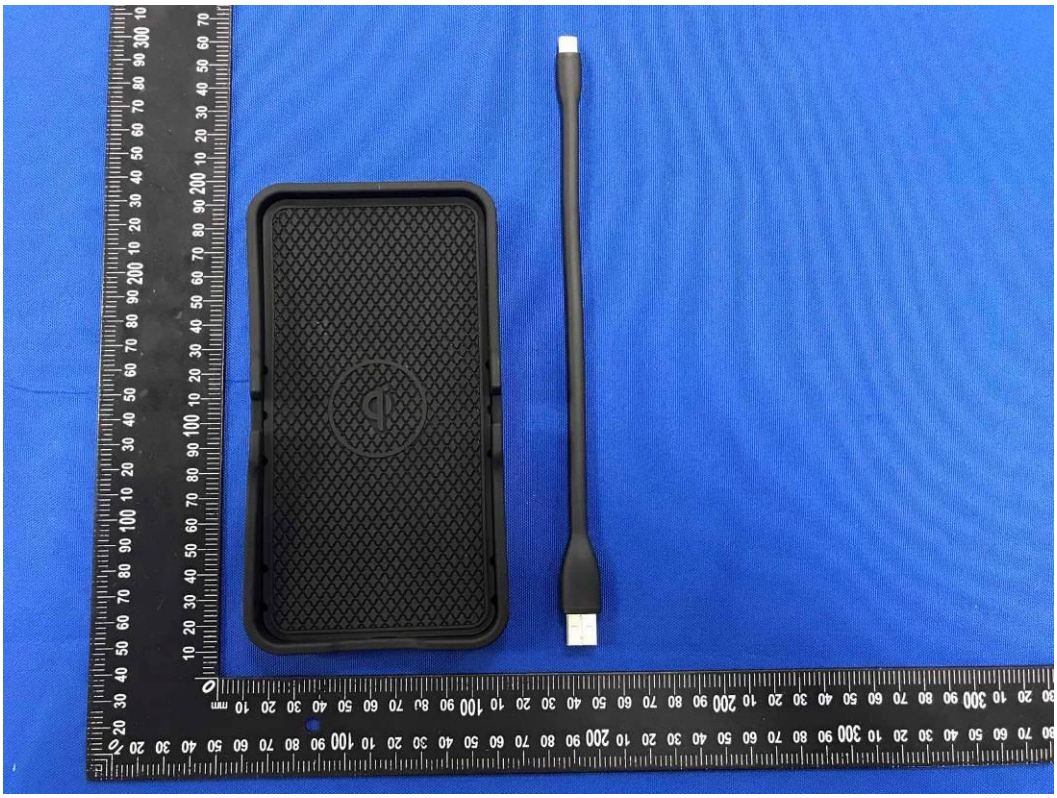
Radiated Emission

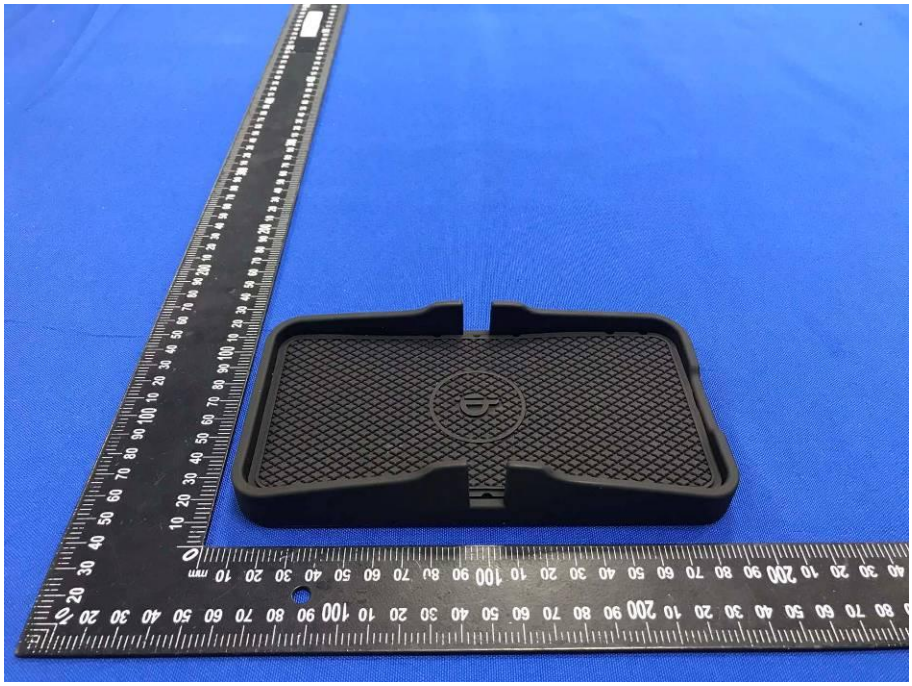


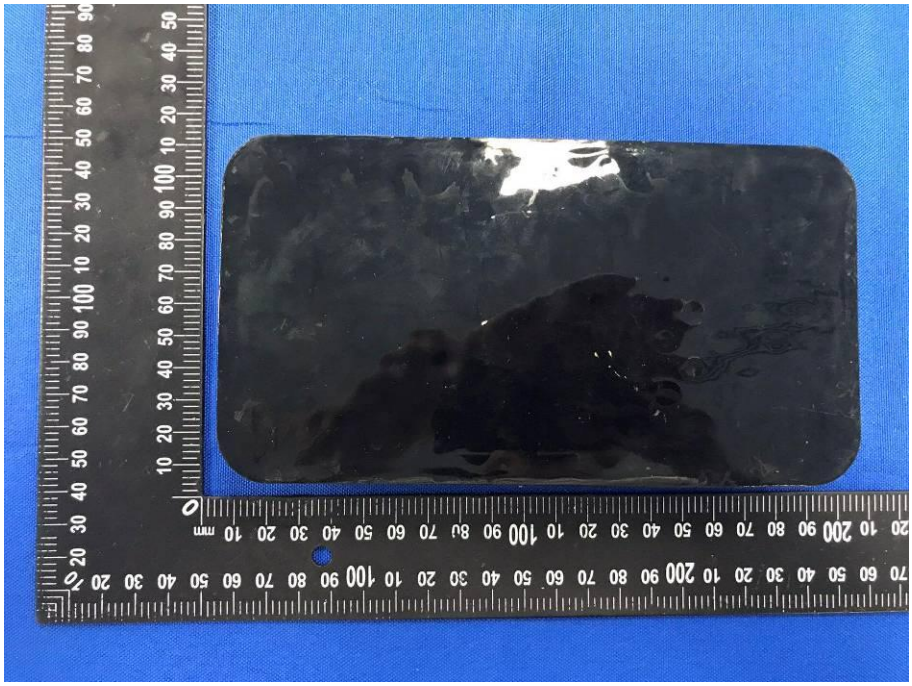


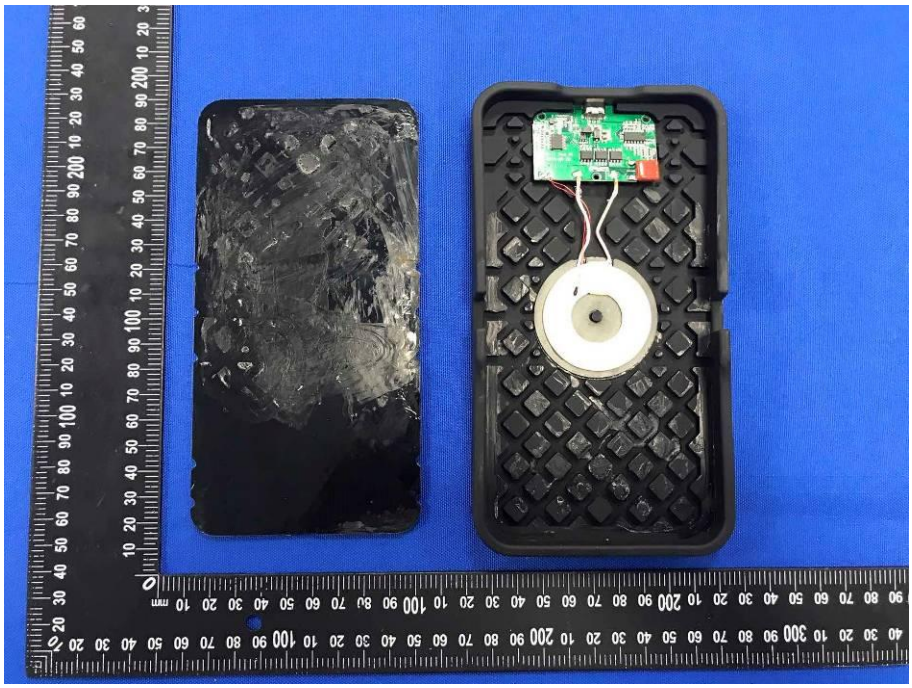
Conducted Emission

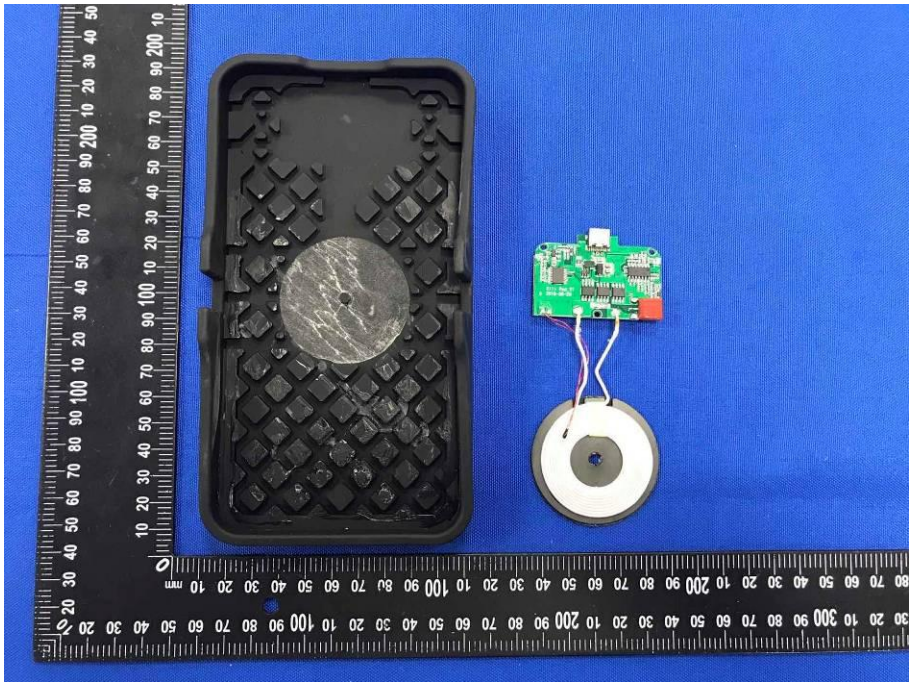
5. Photographs of EUT

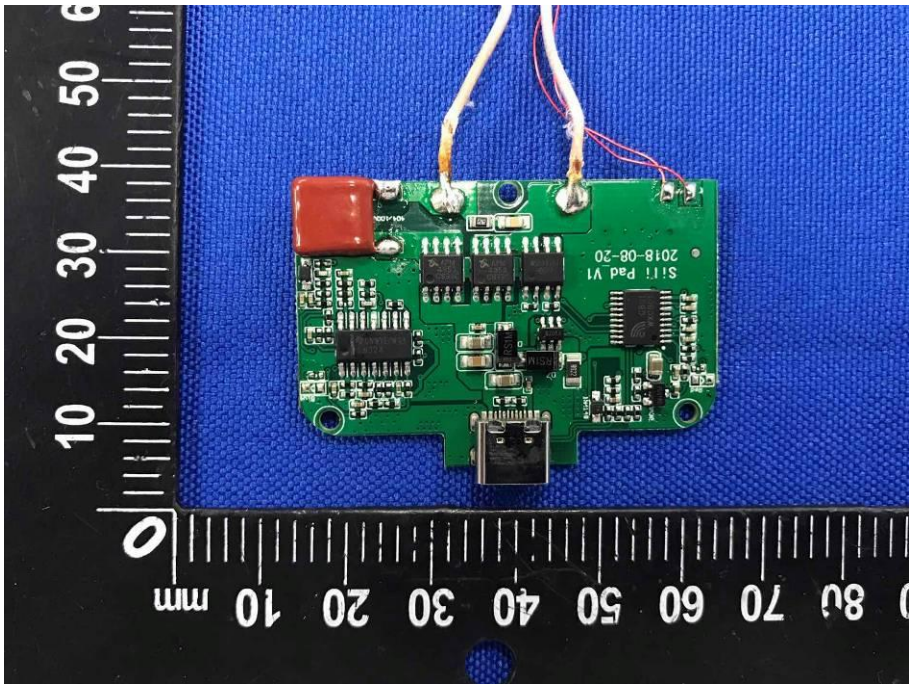


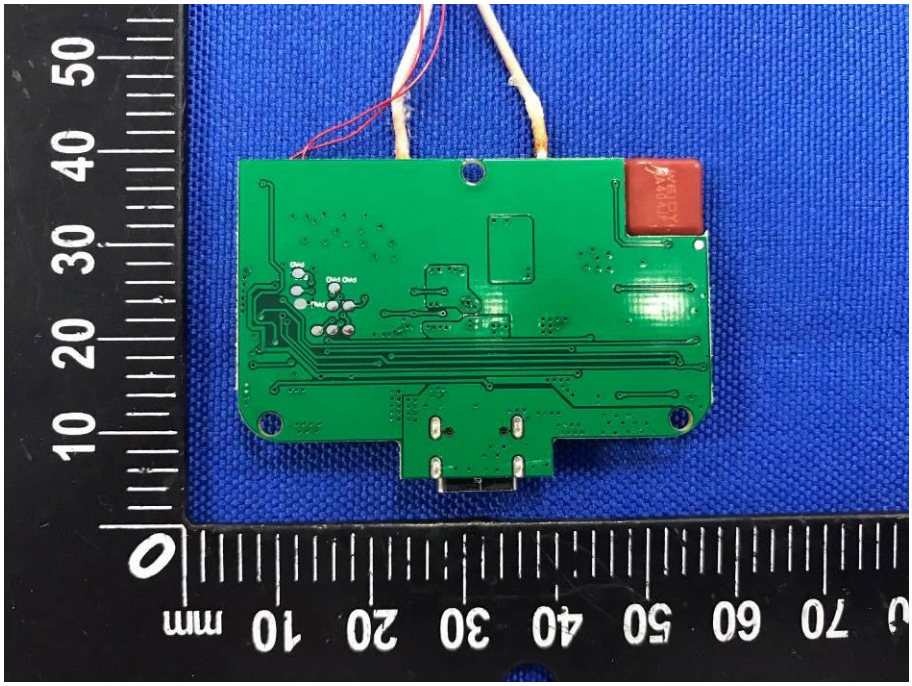









Sitt Pad V1
2018-08-20



------End------