

FCC REPORT

Applicant: Ubio Labs, Inc.

Address of Applicant: 2821 Northup Way, Suite 250 Bellevue, WA 98004 USA

Equipment Under Test (EUT)

Product Name: Wireless Charging Pad

Model No.: AWC1100

Trade mark: ubiolabs

FCC ID: 2ATGY-AWC1100

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.209

Date of sample receipt: 13 Jan., 2021

Date of Test: 14 Jan., to 22 Jan., 2021

Date of report issue: 22 Feb., 2021

Test Result: PASS*

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the JYT product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2 Version

Version No.	Date	Description
00	25 Jan., 2021	Original
01	22 Feb., 2021	1. Updated test setup on page 20. 2. Updated test mode remark on page 5. 3. Removed fundamental field strength. 4. Updated test setup of 9k~30MHz on page 9. 5. Update product name.
02	22 Feb., 2021	1. Updated test data on page 11/12.

Tested By:

Yayo Wu
Test Engineer

Date:

22 Feb., 2021

Reviewed By:

Winner Zhang
Project Engineer

Date:

22 Feb., 2021

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4 Test Summary

Test Item	Section in CFR 47	Result
Spurious emissions	15.209	Pass
20dB Bandwidth	15.215(c)	Pass
Conducted Emission	15.207	Pass
Remark: <ol style="list-style-type: none">1. Pass: The EUT complies with the essential requirements in the standard.2. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer).		
Test Method:	ANSI C63.4-2014 ANSI C63.10-2013	

5 General Information

5.1 Client Information

Applicant:	Ubio Labs, Inc.
Address:	2821 Northup Way, Suite 250 Bellevue, WA 98004 USA
Manufacturer/Factory:	SHENZHEN LANNENGSHITONG ELECTRONICS CO., LTD.
Address:	Floor3 No. 40, Xinhe Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen City, Guangdong Province, China

5.2 General Description of E.U.T.

Product Name:	Wireless Charging Pad
Model No.:	AWC1100
Operation Frequency:	127.70kHz
Modulation type:	ASK
Antenna Type:	Coil Antenna
Test Sample Condition:	The test samples were provided in good working order with no visible defects.
Power supply (Wireless Charger):	Model: AWC1100 Input: DC 15V, 2.5A Output (USB-A): DC 5V,2.4A Output Wireless: 5W, 7.5W, 10W, 15W
AC Adapter:	Model: CHG1151SG Input: AC 110-240V, 50-60 Hz, 0.8A Output: 15V, 2.5A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

5.3 Test mode

Transmitting mode:	Keep the EUT in transmitting mode with modulation
<i>Remark:</i> Pre-scan input: 15V, 2.5A, output: 5W, 7.5W, 10W, 15W of the Power supply, found output: 15W was worse case mode. So the report only reflects the worse mode.	

5.4 Description of Support Units

Manufacturer	Description	Model	S/N	FCC ID/DoC
Skytek	Wireless charging match load	N/A	N/A	N/A

5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 30MHz)	±1.60 dB
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB
Radiated Emission (1GHz ~ 18GHz)	±5.16 dB
Radiated Emission (18GHz ~ 26.5GHz)	±3.20 dB

5.6 Additions to, deviations, or exclusions from the method

No

5.7 Laboratory Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> ● FCC - Designation No.: CN1211 JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551. ● ISED – CAB identifier.: CN0021 The 3m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1. ● A2LA - Registration No.: 4346.01 This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf
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5.8 Laboratory Location

<p>JianYan Testing Group Shenzhen Co., Ltd. Address: No.110~116, Building B, Jinyuan Business Building, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China Tel: +86-755-23118282, Fax: +86-755-23116366 Email: info@ccis-cb.com, Website: http://www.ccis-cb.com</p>
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5.9 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2020	07-21-2021
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-07-2020	03-06-2021
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-07-2020	03-06-2021
Loop Antenna	SCHWARZBECK	FMZB 1519 B	00044	03-07-2020	03-06-2021
EMI Test Software	AUDIX	E3	6.110919b	N/A	N/A
Pre-amplifier	HP	8447D	2944A09358	03-07-2020	03-06-2021
Pre-amplifier	CD	PAP-1G18	11804	03-07-2020	03-06-2021
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-05-2020	03-04-2021
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-05-2020	03-04-2021
Simulated Station	Anritsu	MT8820C	6201026545	03-07-2020	03-06-2021
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2020	03-06-2021
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2020	03-06-2021
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2020	03-06-2021

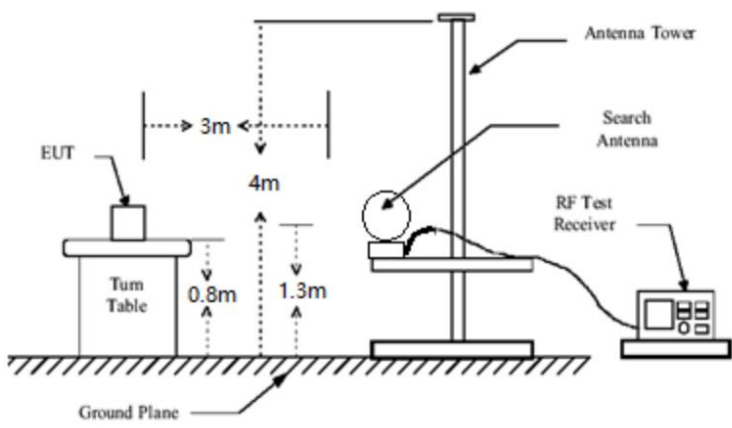
Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-05-2020	03-04-2021
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-05-2020	03-04-2021
LISN	CHASE	MN2050D	1447	03-05-2020	03-04-2021
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2020	07-20-2021
Cable	HP	10503A	N/A	03-05-2020	03-04-2021
EMI Test Software	AUDIX	E3	6.110919b	N/A	N/A

6 Test results and Measurement Data

6.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203
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 antenna jack or electrical connector is prohibited.	
E.U.T Antenna:	The detailed ant information please check internal photos.

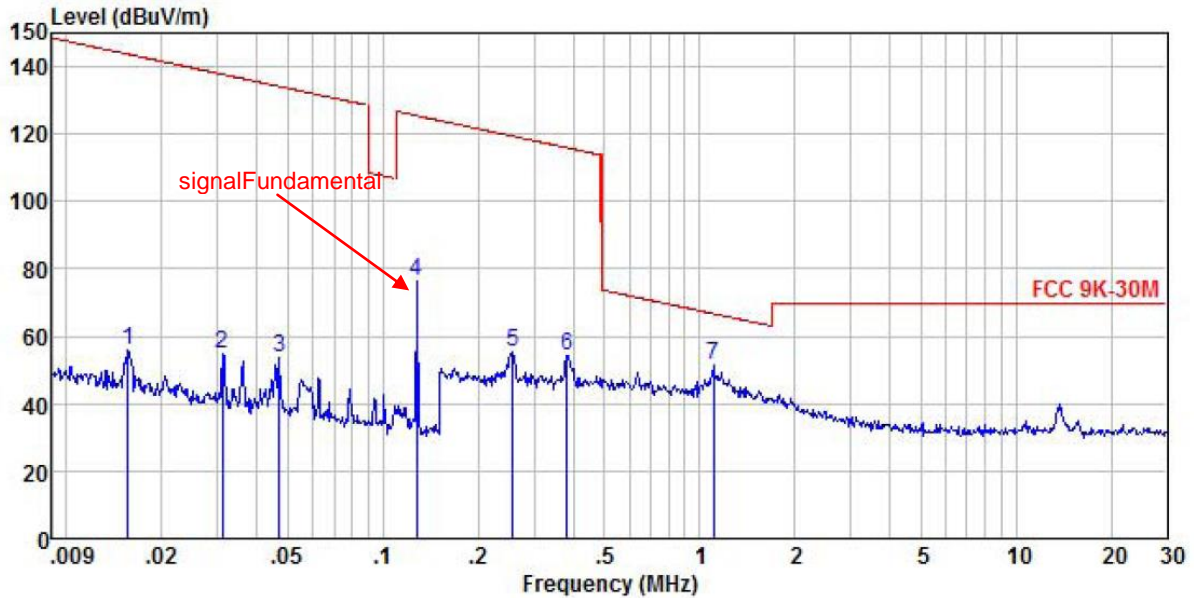
6.2 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.209				
TestFrequencyRange:	9kHz to 1000MHz				
Test site:	Measurement Distance: 3m(Semi-Anechoic Chamber)				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz-150kHz	Quasi-peak	200Hz	600Hz	Quasi-peak Value
	150kHz-30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
Limit:	Frequency (MHz)	Limit (uV/m @3m)		Distance (m)	
	0.009-0.490	2400/F(kHz)		300	
	0.490-1.705	24000/F(kHz)		30	
	1.705-30	30		30	
	30-88	100		3	
	88-216	150		3	
	216-960	200		3	
	Above 1GHz	500		3	
Test Procedure:	<p>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotating table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p>				
Test setup:	9kHz-30MHz				
					
	30MHz-1GHz				

	<p>The diagram illustrates the test setup. An EUT (Equipment Under Test) is placed on a Turn Table at a height of 0.8m from the Ground Plane. The Turn Table is positioned 3m away from the base of the Antenna Tower. The Antenna Tower has a Search Antenna at a height of 4m from the Ground Plane. An RF Test Receiver is connected to the Search Antenna. The Ground Plane is indicated by a hatched line at the bottom.</p>
<p>Test Instruments:</p>	<p>Refer to section 5.9 for details</p>
<p>Test mode:</p>	<p>Refer to section 5.3 for details</p>
<p>Test results:</p>	<p>Pass</p>
<p>Remark:</p>	<p>The emission levels of above 1 GHz are very lower than the limit and not show in test report.</p>

Measurement Data:
Below 1GHz:

Product Name:	Wireless Charging Pad	Product Model:	AWC1100
Test By:	Yaro	Test mode:	Charing mode
Test Frequency:	9kHz~30MHz	Polarization:	Coxial
Test Voltage:	AC 120V/60Hz	Environment:	Temp: 24°C Huni: 57%



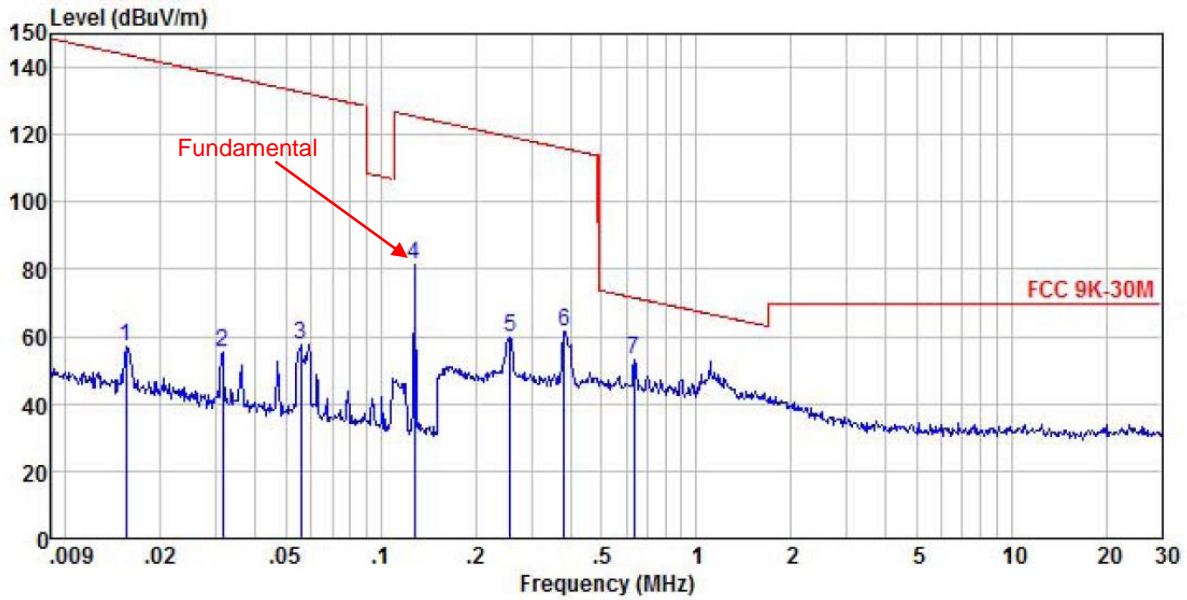
ReadAntenna Cable Preamp Aux Limit Over
Freq Level Factor Loss Factor Factor Level Line Limit Remark

	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB
1	0.016	35.25	20.38	0.01	0.00	0.00	55.64	143.71	-88.07 Peak
2	0.031	34.52	20.23	0.02	0.00	0.00	54.77	137.72	-82.95 Peak
3	0.047	33.05	20.56	0.02	0.00	0.00	53.63	134.13	-80.50 Peak
4	0.128	56.40	19.94	0.03	0.00	0.00	76.37	125.50	-49.13 Peak
5	0.257	34.57	20.47	0.05	0.00	0.00	55.09	119.43	-64.34 Peak
6	0.382	33.78	20.67	0.06	0.00	0.00	54.51	115.97	-61.46 Peak
7	1.105	31.02	20.49	0.17	0.00	0.00	51.68	66.76	-15.08 Peak

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product Name:	Wireless Charging Pad	Product Model:	AWC1100
Test By:	Yaro	Test mode:	Charing mode
Test Frequency:	9kHz~30MHz	Polarization:	Coplanar
Test Voltage:	AC 120V/60Hz	Environment:	Temp: 24°C Huni: 57%

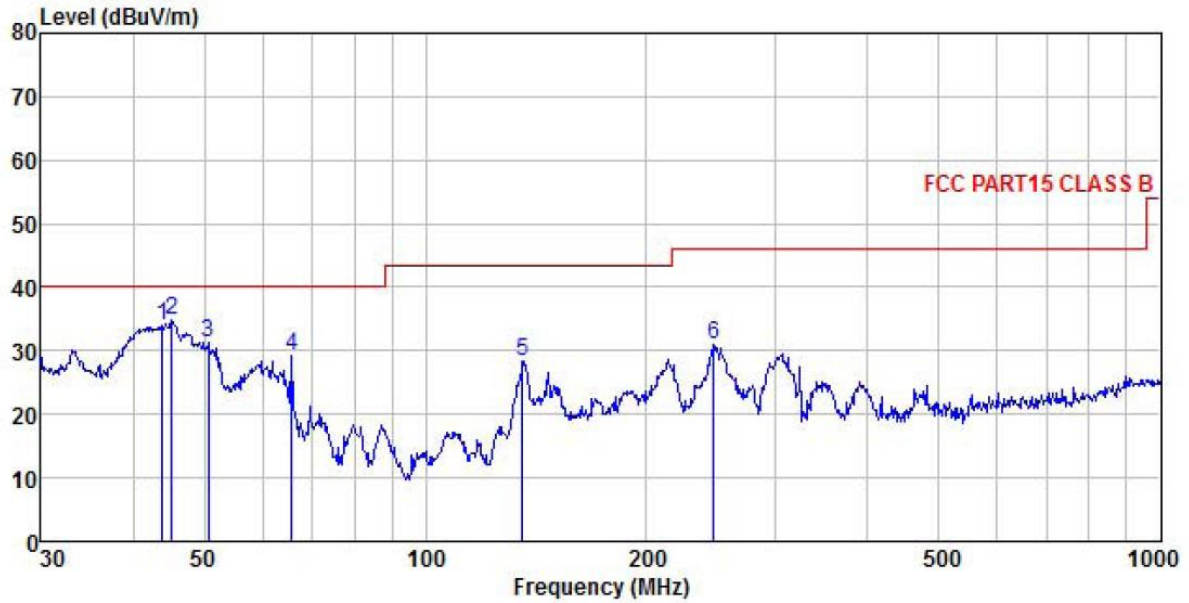


	Read	Antenna	Cable	Preamp	Aux	Limit	Over	
Freq	Level	Factor	Loss	Factor	Factor	Level	Line	Limit Remark
MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB
1	0.015	36.61	20.38	0.01	0.00	0.00	57.00	143.78 -86.78 Peak
2	0.031	34.82	20.24	0.02	0.00	0.00	55.08	137.65 -82.57 Peak
3	0.056	37.22	20.57	0.02	0.00	0.00	57.81	132.65 -74.84 Peak
4	0.128	61.15	19.94	0.03	0.00	0.00	81.12	125.50 -44.38 Peak
5	0.257	39.09	20.47	0.05	0.00	0.00	59.61	119.43 -59.82 Peak
6	0.382	40.80	20.67	0.06	0.00	0.00	61.53	115.97 -54.44 Peak
7	0.636	32.54	20.70	0.09	0.00	0.00	53.33	71.54 -18.21 Peak

Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

Product Name:	Wireless Charging Pad	Product Model:	AWC1100
Test By:	Yaro	Test mode:	Charing mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Environment:	Temp: 24°C Huni: 57%

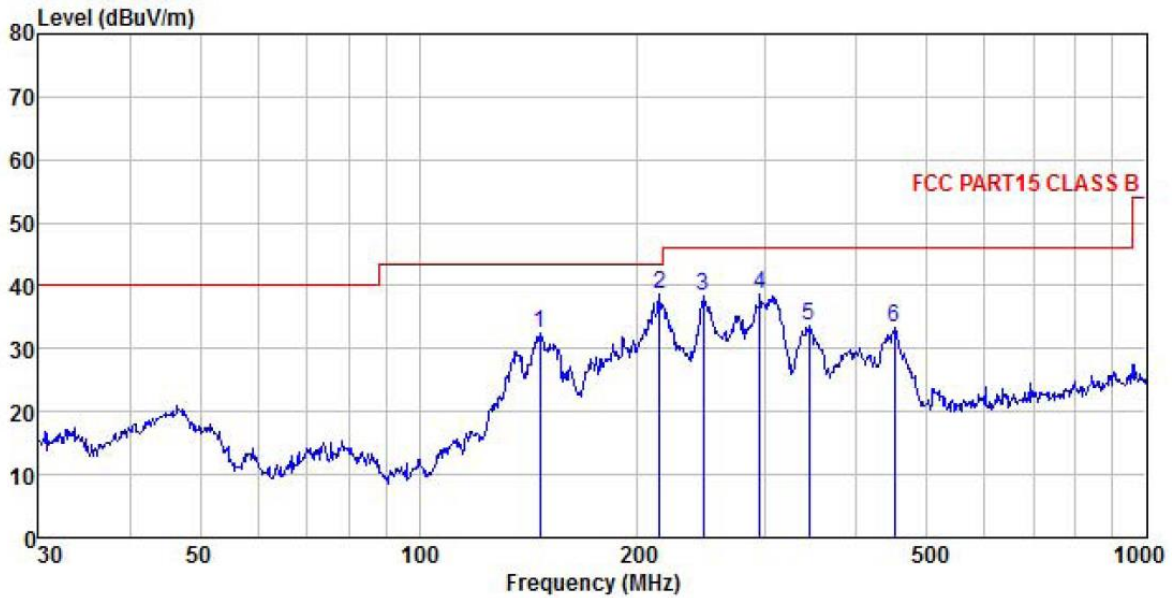


	Read Freq	Antenna Level	Cable Factor	Aux Loss	Preamp Factor	Level	Limit	Over	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	43.812	50.71	12.88	0.37	0.00	29.87	34.09	-5.91	QP
2	45.217	51.46	12.91	0.38	0.00	29.86	34.89	-5.11	QP
3	50.586	47.62	12.99	0.38	0.00	29.82	31.17	-8.83	QP
4	65.803	48.73	9.85	0.43	0.00	29.75	29.26	-10.74	QP
5	135.506	43.56	13.53	0.59	0.00	29.30	28.38	-15.12	QP
6	246.815	40.35	18.49	0.77	0.00	28.56	31.05	-14.95	QP

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Pre-amplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. The Aux Factor is a notch filter switch box loss, this item is not used.

Product Name:	Wireless Charging Pad	Product Model:	AWC1100
Test By:	Yaro	Test mode:	Charing mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Environment:	Temp: 24°C Huni: 57%

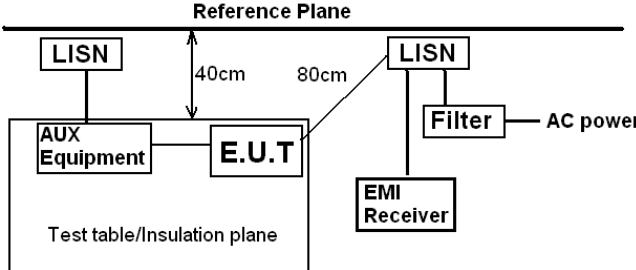


	ReadAntenna	Cable	Aux	Preamp	Limit	Over			
Freq	Level	Factor	Loss	Factor	Factor	Level	Line	Limit	Remark
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	146.888	47.08	14.06	0.61	0.00	29.24	32.51	43.50	-10.99 QP
2	214.514	48.37	18.36	0.73	0.00	28.74	38.72	43.50	-4.78 QP
3	245.951	47.72	18.48	0.77	0.00	28.56	38.41	46.00	-7.59 QP
4	294.114	47.59	18.68	0.85	0.00	28.46	38.66	46.00	-7.34 QP
5	344.386	42.41	18.79	0.92	0.00	28.55	33.57	46.00	-12.43 QP
6	451.135	42.00	19.21	1.05	0.00	28.87	33.39	46.00	-12.61 QP

Remark:

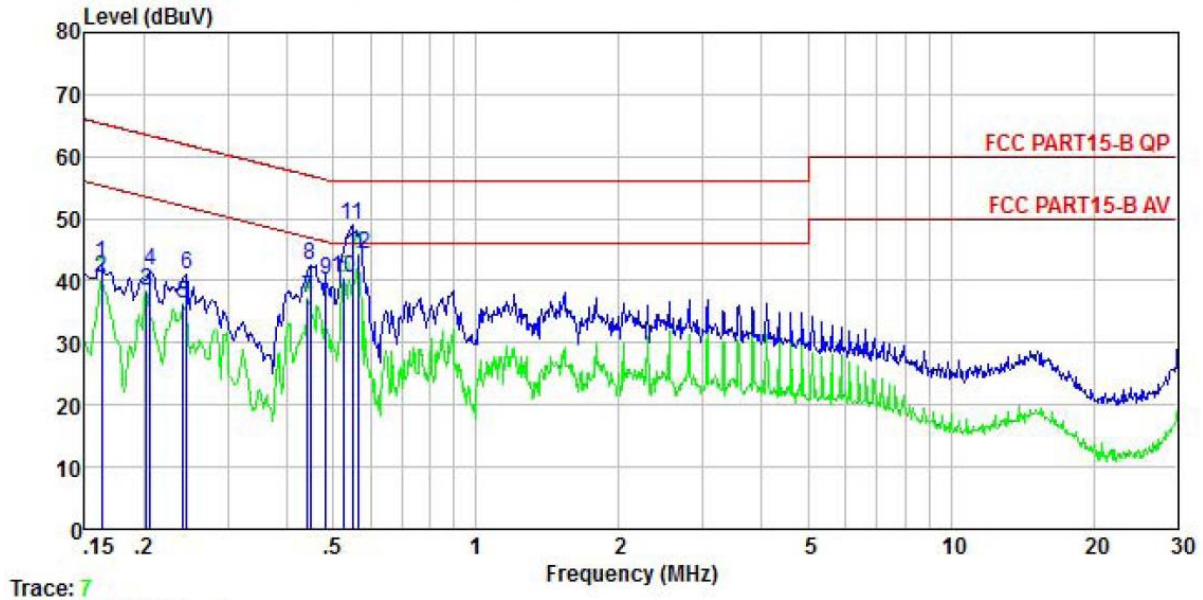
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Pre-amplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. The Aux Factor is a notch filter switch box loss, this item is not used.

6.3 Conducted Emission

Test Requirement:	FCC Part 15 B Section 15.207		
Test Frequency Range:	150kHz to 30MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9kHz, VBW=30kHz		
Limit:	Frequency range (MHz)	Limit (dB μ V)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	0.5-30	60	50
* Decreases with the logarithm of the frequency.			
Test setup:	 <p><i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>		
Test procedure	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide 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 refers 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 C63.4: 2014 on conducted measurement. 		
Test environment:	Temp.:	23 °C	Humid.: 56% Press.: 101kPa
Test Instruments:	Refer to section 5.9 for details		
Test mode:	Refer to section 5.3 for details		
Test results:	Pass		

Measurement data:

Product name:	Wireless Charging Pad	Product Model:	AWC1100
Test by:	Yaro	Test mode:	Charing mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5°C Humi: 55%

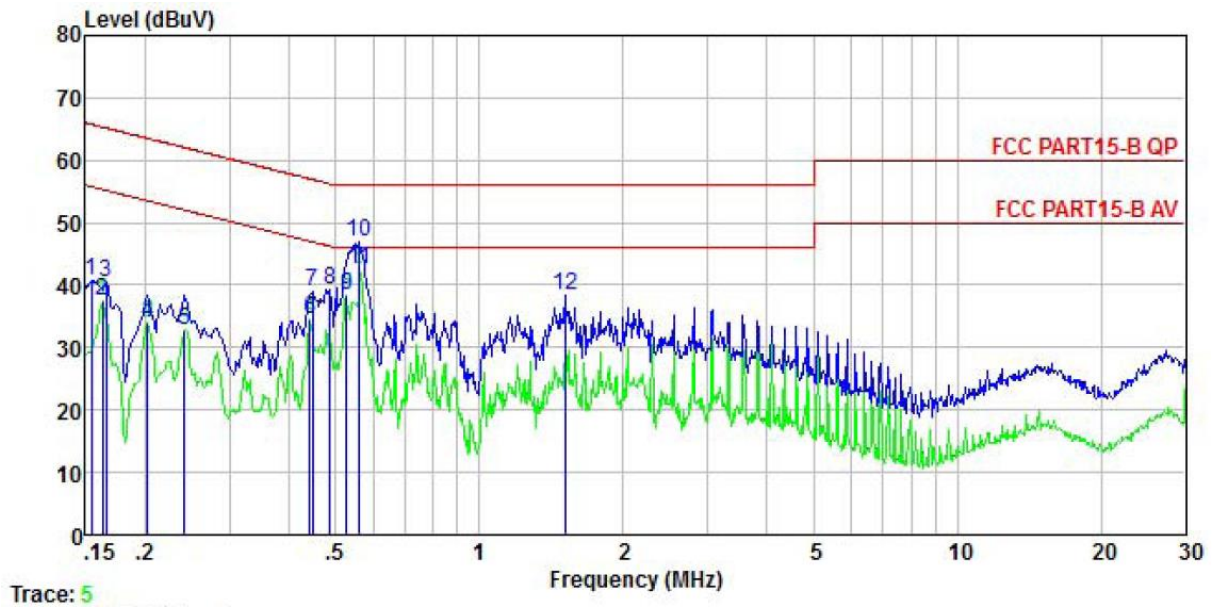


	Read Freq	Read Level	LISN Factor	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.162	32.70	-0.58	-0.08	10.77	42.81	65.34	-22.53	QP
2	0.162	30.34	-0.58	-0.08	10.77	40.45	55.34	-14.89	Average
3	0.202	28.27	-0.59	-0.16	10.76	38.28	53.54	-15.26	Average
4	0.206	31.55	-0.59	-0.17	10.76	41.55	63.36	-21.81	QP
5	0.242	26.43	-0.57	-0.21	10.75	36.40	52.04	-15.64	Average
6	0.246	31.17	-0.57	-0.21	10.75	41.14	61.91	-20.77	QP
7	0.442	26.76	-0.46	0.08	10.74	37.12	47.02	-9.90	Average
8	0.447	32.30	-0.46	0.05	10.74	42.63	56.93	-14.30	QP
9	0.484	30.15	-0.44	-0.24	10.75	40.22	56.27	-16.05	QP
10	0.527	30.56	-0.45	-0.36	10.76	40.51	46.00	-5.49	Average
11	0.549	39.04	-0.46	-0.36	10.76	48.98	56.00	-7.02	QP
12	0.567	34.31	-0.47	-0.37	10.76	44.23	46.00	-1.77	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level=Receiver Read level + LISN Factor + Cable Loss.

Product name:	Wireless Charging Pad	Product Model:	AWC1100
Test by:	Yaro	Test mode:	Charing mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5°C Huni: 55%

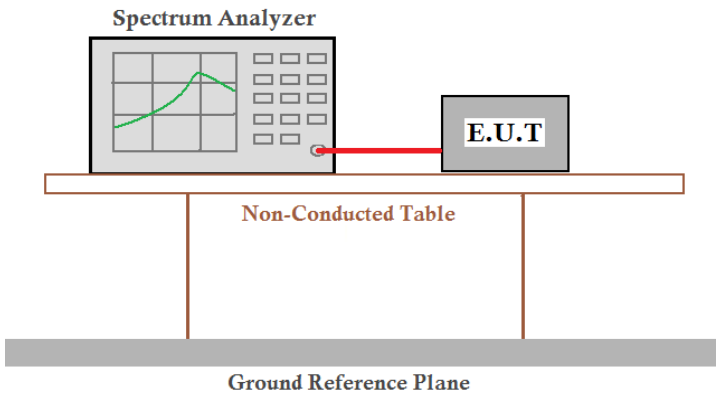


	Freq	Read Level	LISN Factor	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.154	30.70	-0.69	0.01	10.78	40.80	65.78	-24.98	QP
2	0.162	27.54	-0.68	0.01	10.77	37.64	55.34	-17.70	Average
3	0.166	30.22	-0.68	0.01	10.77	40.32	65.16	-24.84	QP
4	0.202	23.94	-0.67	0.00	10.76	34.03	53.54	-19.51	Average
5	0.242	22.66	-0.67	0.00	10.75	32.74	52.04	-19.30	Average
6	0.442	24.47	-0.64	-0.02	10.74	34.55	47.02	-12.47	Average
7	0.447	28.94	-0.64	-0.02	10.74	39.02	56.93	-17.91	QP
8	0.486	29.23	-0.65	0.02	10.76	39.36	56.23	-16.87	QP
9	0.527	28.17	-0.65	0.03	10.76	38.31	46.00	-7.69	Average
10	0.558	36.74	-0.65	0.03	10.76	46.88	56.00	-9.12	QP
11	0.561	32.35	-0.65	0.03	10.76	42.49	46.00	-3.51	Average
12	1.511	27.97	-0.70	0.13	10.92	38.32	56.00	-17.68	QP

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

6.4 20dB Bandwidth

Test Requirement:	FCC Part15 C Section 15.215 (c)
Receiver setup:	RBW=1 kHz, VBW=3 kHz, detector: Peak
Limit:	The fundamentalemission be kept within atleast the central 80% of the permittedband
Test Procedure:	<ol style="list-style-type: none"> 1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set the EUT to proper test channel. 3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. 4. Read 20dB bandwidth.
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data

20dB bandwidth (kHz)	99% OBW (kHz)	Limit (MHz)
2.72	2.32	N/A
<i>Remark: For report purpose only.</i>		

Test plot as follows:

