

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.: AWC1098

Trade mark: ubiolabs

FCC ID: 2ATGY-AWC1098

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

Date of sample receipt: 05 Jan., 2021

Date of Test: 06 Jan., 2021 to 22 Jan., 2021

Date of report issue: 05 Feb., 2021

Test Result: PASS*

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

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	27 Jan., 2021	Original

**Tested By:**

Wen Zhiy
Test Engineer

Date:

05 Feb., 2021

Reviewed By:

Ji
Project Engineer

Date:

05 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: 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.:	AWC1098
Operation Frequency:	128.3kHz
Modulation type:	ASK
Antenna Type:	Coil Antenna
Input & Output (Wireless Charger):	Model: AWC1098 Input: DC 15V, 3.5A Output (USB-C PD 3.0): DC 5V, 3.0A/ DC 9V, 2.22A Output Wireless: 15W/ 10W/ 7.5W/ 5W
AC Adapter:	Model: CHG1088 Input: AC 110-240V, 50-60 Hz 1.1A Output: 15V / 3.5A
Test Sample Condition:	The test samples were provided in good working order with no visible defects.

5.3 Test mode and test samples plans

Transmitting mode:	Keep the EUT in transmitting mode with modulation
<i>Remark:</i> Pre-scan input: 15V, 3.5A, 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
Apple	Mobile phone	iPhone 11 Pro	MWDE2CH/A	Doc

5.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 150kHz)	±1.60 dB
Conducted Emission (150kHz ~ 30MHz)	±2.20 dB
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB
Radiated Emission (30MHz ~ 1000MHz)	±4.40 dB
Radiated Emission (1GHz ~ 18GHz)	±5.20 dB
Radiated Emission (18GHz ~ 26.5GHz)	±4.80 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.: CN1279 Jianyan Test Group Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 892155. ● ISED – CAB identifier.: CN0102 Jianyan Test Group Co., Ltd. has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with ISED#:26114. ● A2LA - Registration No.: 5568.01 This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/5568-01.pdf

5.8 Laboratory Location

<p>JianYan Test Group Co., Ltd. Address: No.760, Fengling Road, Tong'an District, Xiamen, Fujian, China Tel: +86-592-2273071, Fax:+86-592-2273700 Email: quality@xmabr.com, Website: http://www.lets.com/</p>

5.9 Test Instruments list

Radiated Disturbances:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	BOST	CHC-966	966-1#	2019-12-27	2022-12-26
3m SAC	BOST	CHC-966	966-2#	2019-12-27	2022-12-26
EMI Test Receiver	Rohde & Schwarz	ESR 3	102330	2020-08-05	2021-08-04
EMI Test Receiver	Rohde & Schwarz	ESR 3	102329	2020-08-06	2021-08-05
EMI Test Receiver	Rohde & Schwarz	ESR 7	102259	2020-04-12	2021-04-11
Spectrum Analyzer	Agilent	E4407B	MY45115531	2020-12-27	2021-12-26
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102175	2020-04-15	2021-04-14
BiConiLog Antenna	SCHWARZBECK	VULB 9163	1105	2020-12-20	2021-12-19
BiConiLog Antenna	SCHWARZBECK	VULB 9168	1066	2020-04-11	2021-04-10
Horn Antenna	SCHWARZBECK	BBHA 9120 D	911	2020-04-01	2021-03-31
Pre-amplifier	SCHWARZBECK	BBV9743	00009	2020-08-06	2021-08-05
Pre-amplifier	SCHWARZBECK	BBV9744	162	2020-12-22	2021-12-21
Pre-amplifier	SCHWARZBECK	BBV9718C	00014	2020-04-08	2021-04-07
Loop Antenna	DELI	DEVISER	N/A	2019-08-23	2022-08-22
EMI Test Software	Farad	EZ-EMC	Version: V.EMCE-3A1		

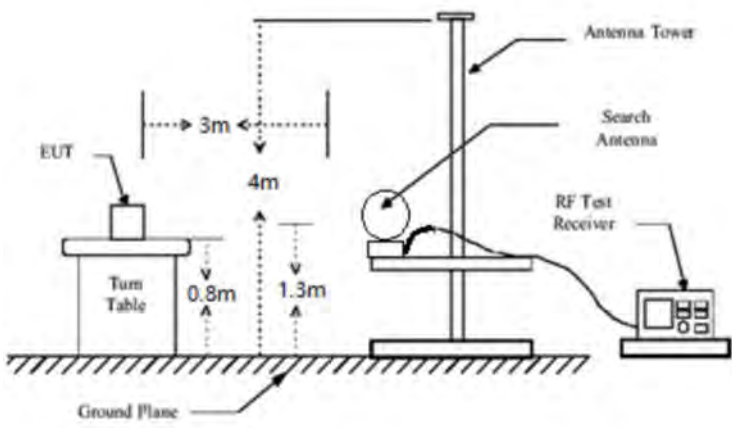
Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESR 3	102330	2020-08-05	2021-08-04
EMI Test Receiver	Rohde & Schwarz	ESR 3	102329	2020-08-06	2021-08-05
EMI Test Receiver	Rohde & Schwarz	ESR 7	102259	2020-04-12	2021-04-11
LISN	Rohde & Schwarz	ENV 216	102240	2020-08-05	2021-08-04
Voltage probe	Schwarzbeck	TK9420+VT9420	814	2020-08-05	2021-08-04
ISN	Schwarzbeck	CAT3 8158	95	2020-08-05	2021-08-04
EMI Test Software	Farad	EZ-EMC	Version: V.EMCE-3A1		

6 Test results and Measurement Data

6.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203
<p>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.</p>	
E.U.T Antenna:	Coil Antenna

6.2 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.209				
Test Frequency Range:	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 rotatable 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:	<p>9kHz-30MHz</p>  <p>30MHz-1GHz</p>				

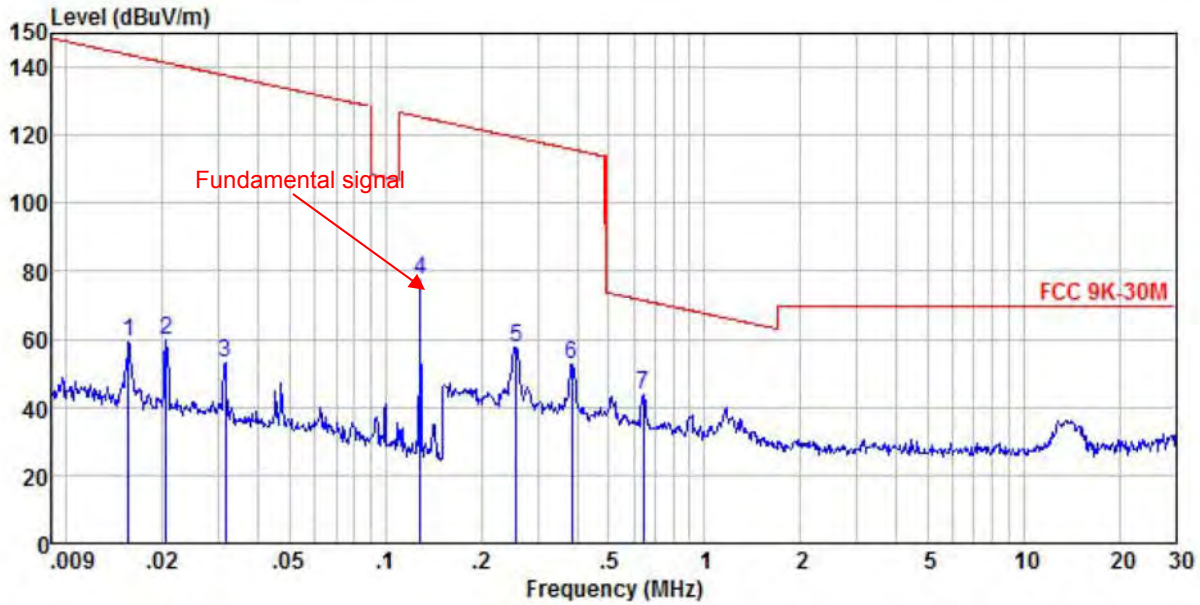
<p>Test Instruments:</p>	<p>Refer to section 5.9 for details</p>
<p>Test mode:</p>	<p>Refer to section 5.3 for details</p>
<p>Test results:</p>	<p>Pass</p>
<p>Remark:</p>	<p>The emission levels of above 1 GHz are very lower than the limit and not show in test report.</p>

Measurement Data:

Radiated spurious:

Below 1GHz:

Product Name:	Wireless charging pad	Product Model:	AWC1098
Test By:	Miles Chen	Test mode:	Maximum Power Output mode
Test Frequency:	9kHz~30MHz	Polarization:	Coxial
Test Voltage:	AC 120V/60Hz	Environment:	Temp: 24°C Huni: 57%

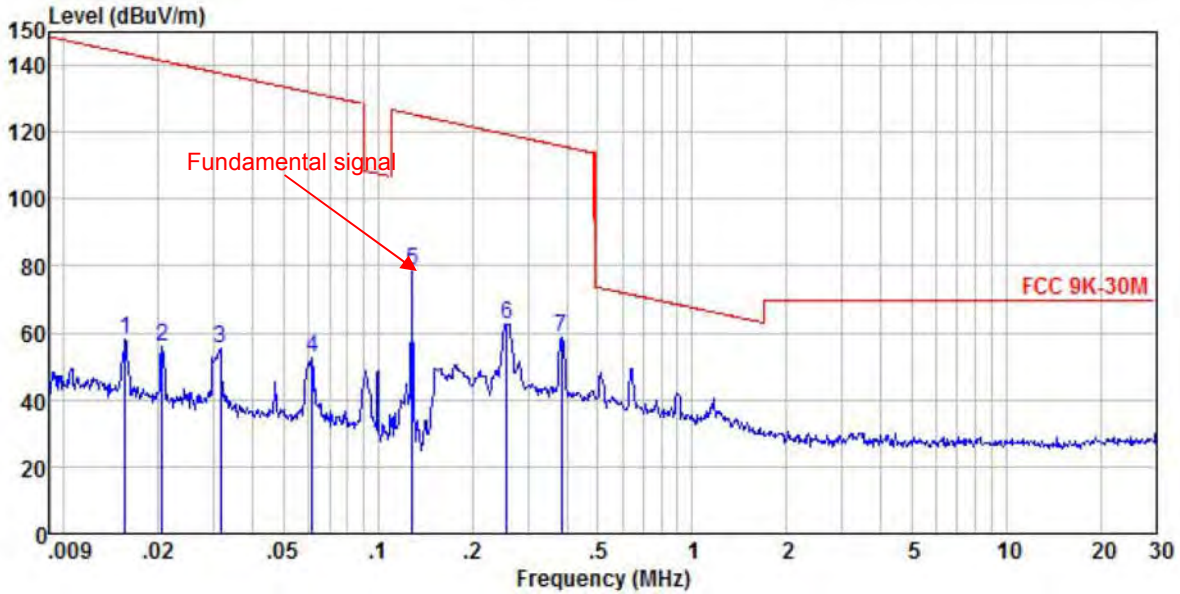


	Read	Antenna	Cable	Preamp	Aux	Limit	Over		
Freq	Level	Factor	Loss	Factor	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	0.016	38.69	20.38	0.01	0.00	0.00	59.08	143.71	-84.63 Peak
2	0.021	39.43	20.30	0.01	0.00	0.00	59.74	141.31	-81.57 Peak
3	0.031	32.69	20.24	0.02	0.00	0.00	52.95	137.65	-84.70 Peak
4	0.129	57.59	19.92	0.03	0.00	0.00	77.54	125.43	-47.89 Peak
5	0.257	36.98	20.47	0.05	0.00	0.00	57.50	119.43	-61.93 Peak
6	0.385	31.98	20.67	0.06	0.00	0.00	52.71	115.90	-63.19 Peak
7	0.642	22.70	20.69	0.09	0.00	0.00	43.48	71.46	-27.98 Peak

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier 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:	AWC1098
Test By:	Miles Chen	Test mode:	Maximum Power Output mode
Test Frequency:	9kHz~30MHz	Polarization:	Coplanar
Test Voltage:	AC 120V/60Hz	Environment:	Temp: 24°C Huni: 57%

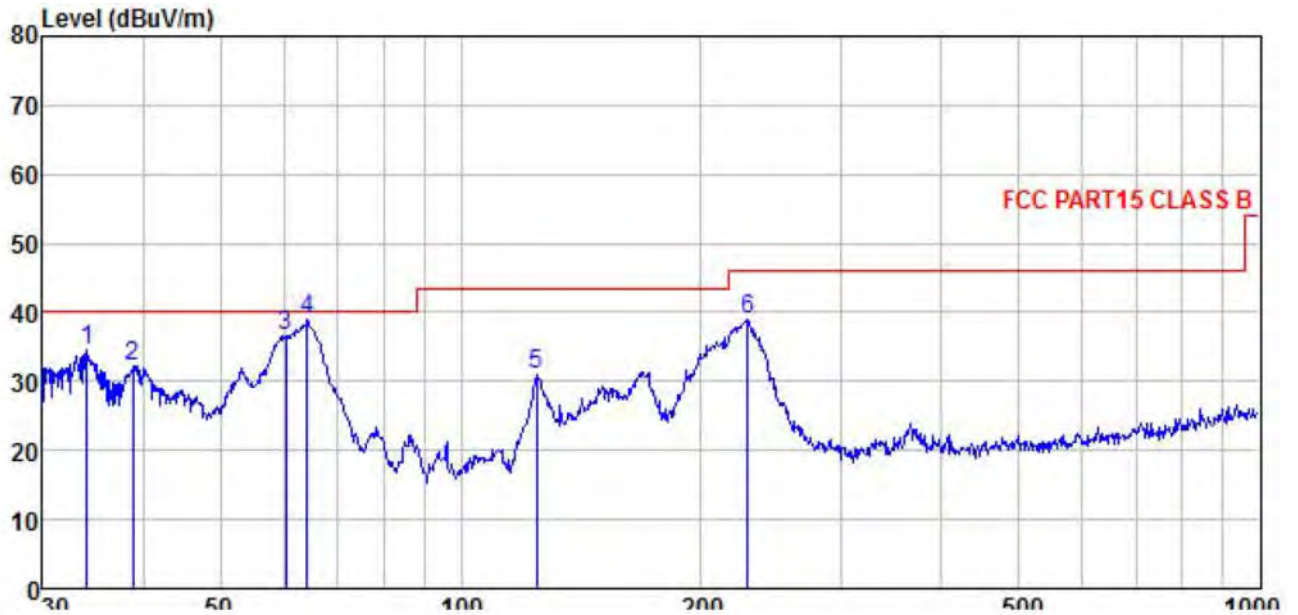


	ReadAntenna	Cable Preamp	Aux	Limit	Over	Remark				
Freq	Level	Factor	Loss	Factor	Line	Limit				
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m				
1	0.016	37.80	20.38	0.01	0.00	0.00	58.19	143.71	-85.52	Peak
2	0.021	35.38	20.30	0.01	0.00	0.00	55.69	141.31	-85.62	Peak
3	0.031	35.36	20.24	0.02	0.00	0.00	55.62	137.65	-82.03	Peak
4	0.062	31.89	20.54	0.02	0.00	0.00	52.45	131.80	-79.35	Peak
5	0.129	58.56	19.92	0.03	0.00	0.00	78.51	125.43	-46.92	Peak
6	0.257	36.26	20.47	0.05	0.00	0.00	56.78	119.43	-62.65	Peak
7	0.385	32.09	20.67	0.06	0.00	0.00	52.82	115.90	-63.08	Peak

Remark:

- Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preampifier 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:	AWC1098
Test By:	Miles Chen	Test mode:	Maximum Power Output mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Environment:	Temp: 24°C Humi: 57%

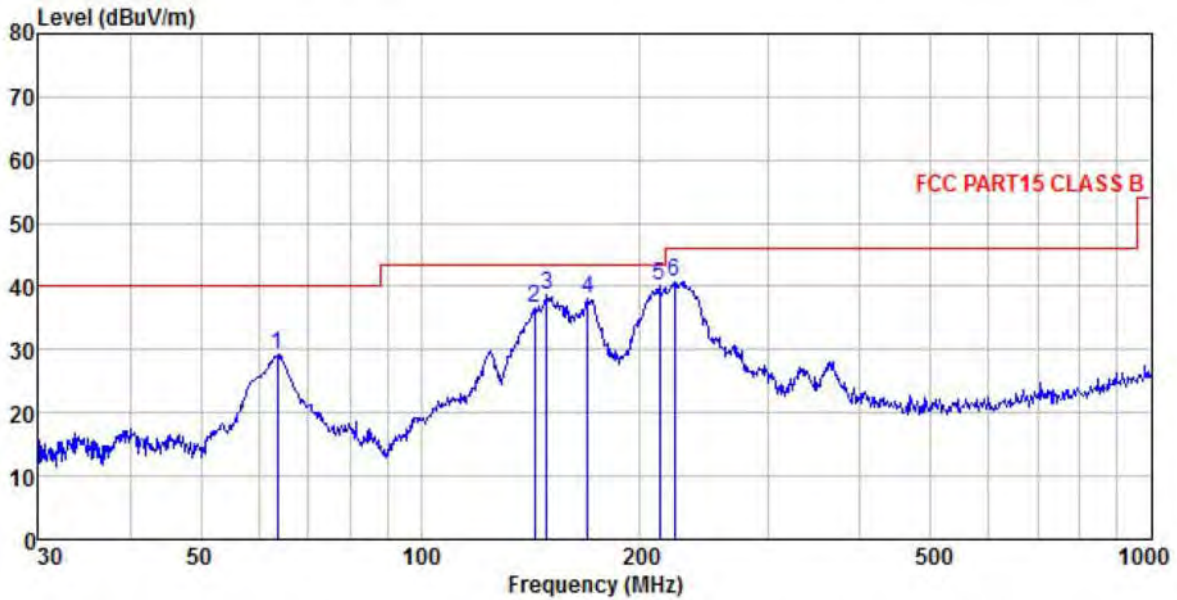


	ReadAntenna	Cable	Aux	Preamp	Limit	Over	Remark			
Freq	Level	Factor	Loss	Factor	Line	Limit				
MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dB			
1	34.037	51.56	12.45	0.35	0.00	29.96	34.40	40.00	-5.60	QP
2	38.888	48.93	12.76	0.35	0.00	29.91	32.13	40.00	-7.87	QP
3	60.492	55.35	10.71	0.42	0.00	29.77	36.71	40.00	-3.29	QP
4	64.208	58.34	9.94	0.43	0.00	29.76	38.95	40.00	-1.05	QP
5	124.569	48.38	11.34	0.58	0.00	29.36	30.94	43.50	-12.56	QP
6	228.490	48.36	18.42	0.75	0.00	28.66	38.87	46.00	-7.13	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:	AWC1098
Test By:	Miles Chen	Test mode:	Maximum Power Output mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Environment:	Temp: 24°C Humi: 57%



	Read Freq	Antenna Level	Antenna Factor	Cable Loss	Aux Factor	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dB	dBuV/m	dBuV/m	dB	
1	63.759	48.49	10.03	0.43	0.00	29.76	29.19	40.00	-10.81	QP
2	143.326	51.42	13.87	0.61	0.00	29.25	36.65	43.50	-6.85	QP
3	148.963	53.10	14.22	0.61	0.00	29.23	38.70	43.50	-4.80	QP
4	169.599	49.97	16.40	0.65	0.00	29.05	37.97	43.50	-5.53	QP
5	212.270	49.81	18.35	0.73	0.00	28.75	40.14	43.50	-3.36	QP
6	222.950	50.42	18.40	0.74	0.00	28.69	40.87	46.00	-5.13	QP

Remark:

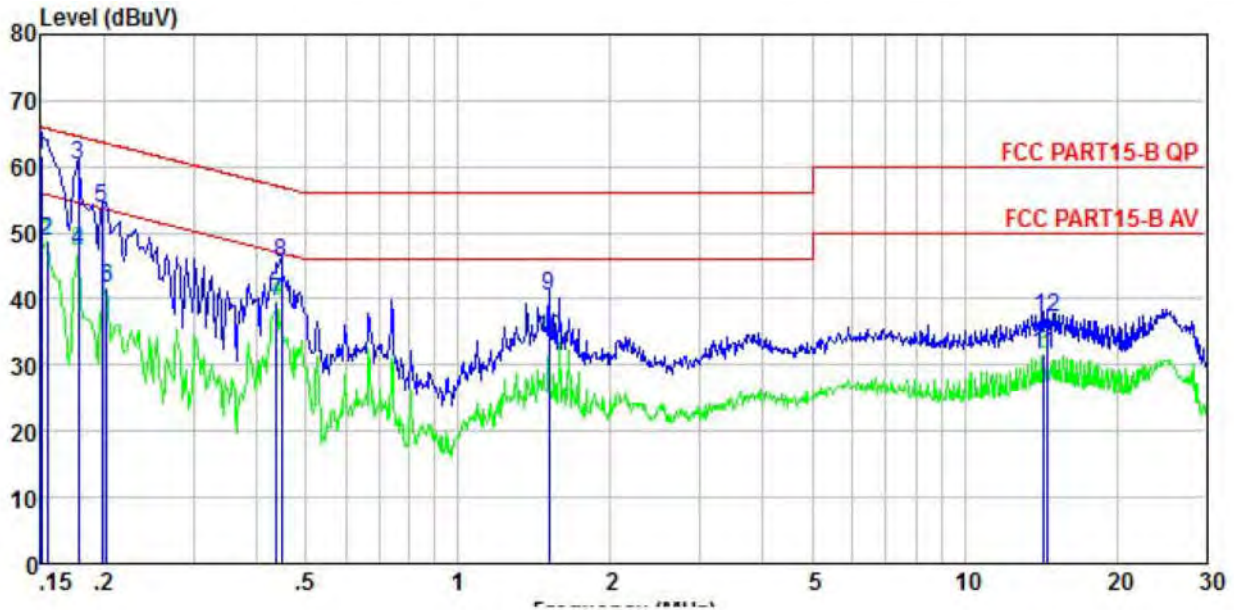
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss + Aux Factor – Pre-amplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. The Aux Factor is a notch filter switch box loss, this item is not used.

6.3 Conducted Emission

Test Requirement:	FCC Part15 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>Remark 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:	AWC1098
Test by:	Miles Chen	Test mode:	Maximum Power Output mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5°C Humi: 55%

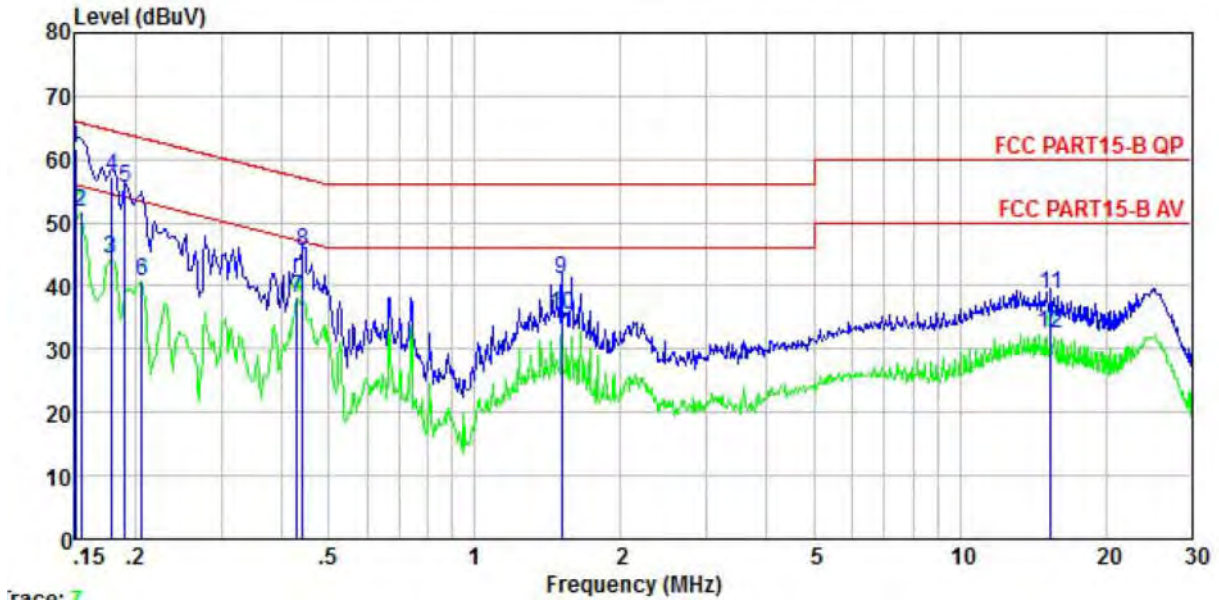


	Read Freq	Level	LISN Factor	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.150	51.45	-0.57	-0.05	10.78	61.61	66.00	-4.39	QP
2	0.154	38.45	-0.57	-0.06	10.78	48.60	55.78	-7.18	Average
3	0.178	50.04	-0.58	-0.12	10.77	60.11	64.59	-4.48	QP
4	0.178	37.04	-0.58	-0.12	10.77	47.11	54.59	-7.48	Average
5	0.198	43.62	-0.59	-0.16	10.76	53.63	63.71	-10.08	QP
6	0.202	31.70	-0.59	-0.16	10.76	41.71	53.54	-11.83	Average
7	0.437	29.26	-0.46	0.11	10.74	39.65	47.11	-7.46	Average
8	0.447	35.03	-0.46	0.05	10.74	45.36	56.93	-11.57	QP
9	1.511	29.98	-0.55	-0.01	10.92	40.34	56.00	-15.66	QP
10	1.511	23.59	-0.55	-0.01	10.92	33.95	46.00	-12.05	Average
11	14.364	17.90	-0.69	3.41	10.90	31.52	50.00	-18.48	Average
12	14.594	23.58	-0.69	3.48	10.90	37.27	60.00	-22.73	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.

Product name:	Wireless charging pad	Product Model:	AWC1098
Test by:	Miles Chen	Test mode:	Maximum Power Output mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120 V/60 Hz	Environment:	Temp: 22.5°C Humi: 55%



Trace: 7

	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	0.150	51.46	-0.69	0.01	10.78	61.56	66.00	-4.44	QP
2	0.154	41.45	-0.69	0.01	10.78	51.55	55.78	-4.23	Average
3	0.178	34.17	-0.68	0.00	10.77	44.26	54.59	-10.33	Average
4	0.179	47.22	-0.68	0.00	10.77	57.31	64.55	-7.24	QP
5	0.190	45.40	-0.67	0.00	10.76	55.49	64.02	-8.53	QP
6	0.206	30.51	-0.67	0.00	10.76	40.60	53.36	-12.76	Average
7	0.431	27.92	-0.64	-0.03	10.73	37.98	47.24	-9.26	Average
8	0.442	35.34	-0.64	-0.02	10.74	45.42	57.02	-11.60	QP
9	1.511	30.68	-0.70	0.13	10.92	41.03	56.00	-14.97	QP
10	1.511	25.03	-0.70	0.13	10.92	35.38	46.00	-10.62	Average
11	15.388	25.70	-0.85	2.87	10.90	38.62	60.00	-21.38	QP
12	15.388	19.52	-0.85	2.87	10.90	32.44	50.00	-17.56	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.

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 fundamental emission be kept within at least the central 80% of the permitted band
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% bandwidth (kHz)	Limits
2.78	2.30	N/A
<i>Remark: For report purpose only.</i>		

Test plot as follows:

