ACCREDITED
TESTING LABORATORY
CERTIFICATE # 4821.01

BACL
Bay Area Compliance Labs Corp.

FCC PART 15C

TEST REPORT

For

Ubio Labs, Inc.

2821 Northup Way, Suite 250, Bellevue, WA 98004, USA

FCC ID: 2ATGY-AWC1095

Report Type:	Product Type:
Original Report	Wireless Charging Station

Report Number:	RSZ200611005-00
Report Date:	2020-07-13
Reviewed By:	Jimmy Xiao RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

Product	Wireless Charging Station
Tested Model	AWC1095
Multiple Models	AWC1095XX (where X should be any Arabian or English letter or blank)
Model Difference	Refer to the DoS letter
Frequency Range	110-205kHz
Antenna Type	Coil
Voltage Range	DC 15V from adapter
Date of Test	2020-06-12 to 2020-06-29
Sample serial number	RSZ200611005-RF-S1 (Assigned by BACL, Shenzhen)
Received date	2020-06-11
Sample/EUT Status	Good Condition
Adapter 1 information	Model: CHG1088 Input: AC 110-240V, 50-60Hz, 1.1A Output: DC 15V, 3.5A
Adapter 2 information	Model: CHG1081 Input: AC 110-240V, 50-60Hz, 1.1A Output: DC 15V, 3.5A

Note: Adapter 1and Adapter 2 is electrically identical, the difference just only model name and color of appearance. The adapter 1 was chosen for testing.

Objective

This report is prepared on behalf of Ubio Labs, Inc. in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communications Commission's rules.

The objective is to determine the compliance of EUT with FCC rules, section 15.203, 15.205, 15.207 and 15.209.

Related Submittal(s)/Grant(s)

No Related Submittal(s)/Grant(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item		Uncertainty
AC Power Line Conducted Emissions		±1.95 dB
Radiated emission	9 kHz~30MHz	±4.52 dB
	30MHz~1 GHz	±5.81 dB
Occupied Bandwidth		±0.5 kHz
Temperature		±3.0 ℃
Humidity		±6 %

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a test mode

The device is a wireless charger operation on frequency 110 kHz - 205 kHz.

EUT Exercise Software

No software used in test.

Support Equipment List and Details

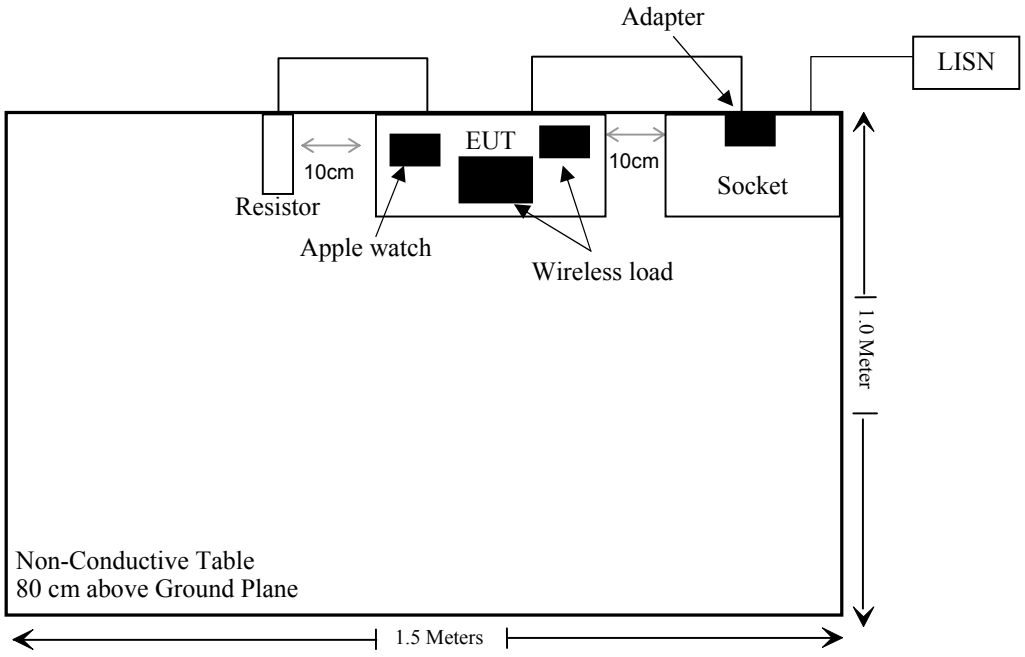
Manufacturer	Description	Model	Serial Number
BULL	Socket	GN-415K	5503290068073
EESON	Wireless load 1	2S	2S
EESON	Wireless load 2	2S	2S
Apple	Apple Watch	SERIES2	SERIES2
Un-known	5Ω Resistor	Un-known	ESA256842

External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded un-detachable AC cable	1.0	Socket	LISN
Unshielded Un-detachable DC Cable	0.5	Resistor	EUT
Unshielded Un-detachable DC cable	2.0	Adapter	EUT

Block Diagram of Test Setup

For conducted emission:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC§1.1310 & §2.1091	Maximum Permissible Exposure(MPE)	Compliance
FCC§15.203	Antenna Requirement	Compliance
FCC§15.207	AC Line Conducted Emission	Compliance
§15.209 §15.205	Radiated Emission Test	Compliance

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
MPE					
Narda	Exposure Level Tester	ELT-400	N-0229	2019/11/15	2021/11/15
Narda	B Field Probe	ELT Probe 100cm^2	M-0666	2019/11/15	2021/11/15
ETS-Lindgreen	Isotropic Field Probe	HI－6005	69461	2018/9/28	2021/9/27
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2019/7/9	2020/7/8
Rohde & Schwarz	LISN	ENV216	101613	2020/1/22	2021/1/21
Rohde & Schwarz	Transient Limitor	ESH3Z2	DE25985	2019/11/29	2020/11/28
Unknown	CE Cable	CE Cable	UF A210B-1-0720-504504	2019/11/29	2020/11/28
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
RF Radiated test					
R&S	EMI Test Receiver	ESR3	102455	2019/7/9	2020/7/8
Sonoma instrument	Pre-amplifier	310 N	186238	2020/4/20	2021/4/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017/12/22	2020/12/21
ETS	Passive Loop Antenna	6512	29604	2018/7/14	2021/7/13
Unknown	Cable	Chamber Cable 4	EC-007	2019/11/29	2020/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1310, §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According with KDB 680106 D01 RF Exposure Wireless Charging Apps v03 clause 3 c)

c) For devices designed for typical desktop applications, such a wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm. E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with the 15 cm measured from the center of the probe(s) to the edge of the device. Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m. A KDB inquiry is required to determine the applicable exposure limits below 100 kHz.

According to KDB 680106 D01 RF Exposure Wireless Charging App v03 clause 5 b)

b) Inductive wireless power transfer applications with supporting field strength results and meeting all of the following requirements are not required to submit a KDB inquiry for devices approved using SDoC or a PAG for equipment approved using certification to address RF exposure compliance. However, the responsible party is required to keep a copy of the test report in accordance with KDB 865664 D02. A copy of the test report is to be submitted with the application if the device is approved using certification.

(1) Power transfer frequency is less than 1 MHz.

(2) Output power from each primary coil is less than or equal to 15 watts.

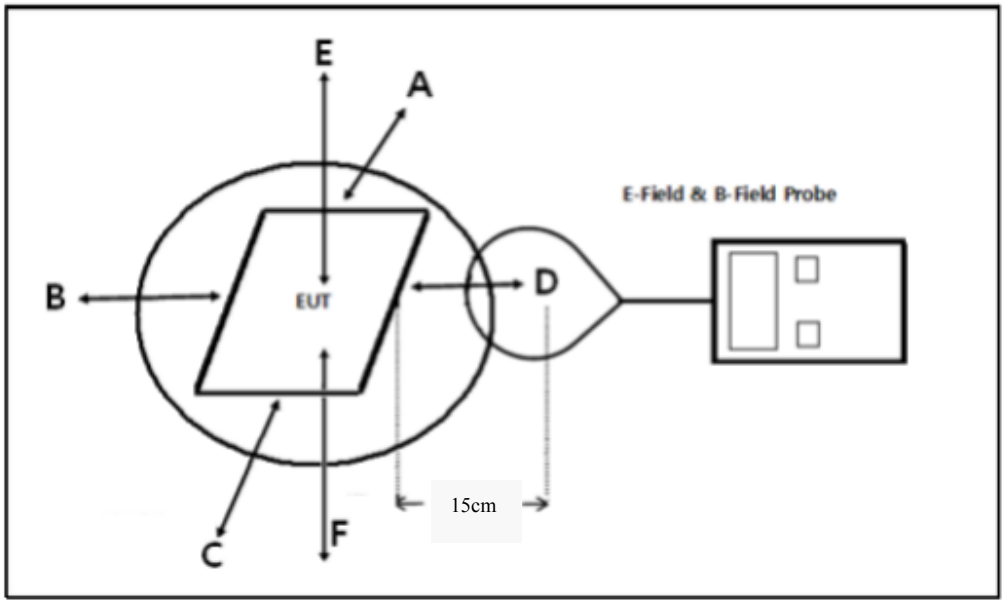
(3) The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.

(4) Client device is placed directly in contact with the transmitter.

(5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).

(6) The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

Block Diagram of Test Setup



Note: 20 cm for Top test.

Test Data

Environmental Conditions

Temperature:	25°C
Relative Humidity:	65 %
ATM Pressure:	101.0 kPa

The testing was performed by Yates Li on 2020-06-12.

Test mode: Wireless Charging (full load)

H-Filed Strength

Frequency Range (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	50% Limit (A/m)	Limit Test (A/m)
110-205	0.355	0.292	0.234	0.402	0.808	0.815	1.63

E-Filed Strength

Frequency Range (kHz)	Position A (V/m)	Position B (V/m)	Position C (V/m)	Position D (V/m)	Position E (V/m)	50% Limit (V/m)	Limit Test (V/m)
110-205	2.204	1.962	2.038	3.831	3.053	307	614

Note: Test with 15cm distance from the center of the probe(s) to the edge of the device, 20 cm for top test.

Result: Pass

Considerations of compliance 680106 D01 RF Exposure Wireless Charging App v03 clause 5 b:

(1) Power transfer frequency is less than 1 MHz.

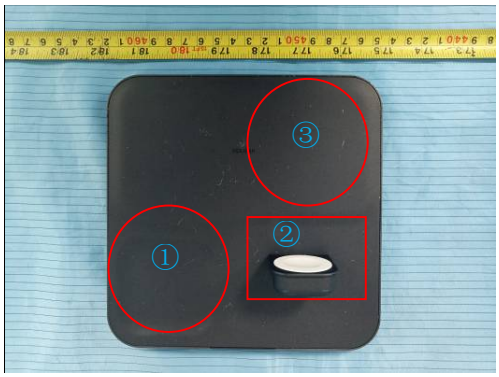
Yes, the operation frequency is 110-205 kHz.

(2) Output power from each primary coil is less than or equal to 15 watts.

Yes, the maximum output power of primary coil is 15 Watts.

(3) The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.

The transfer system includes three coils to detect and allow coupling only between individual pairs of coils.



①Wireless charging area for mobile phone which includes one coil.

② Wireless charging area for Apple watch which include one coil.

③Wireless charging area for mobile phone which includes one coil.

Note: The three wireless charging areas are independent. The coils and clients are able to detect and coupling only between individual pairs of coils.

(4) Client device is placed directly in contact with the transmitter.

Yes, client device is placed directly in contact with the transmitter

(5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).

Yes, mobile exposure conditions only

(6) The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

Yes, the test result for H and E-filed strength less than 50% of the MPE limit.

FCC§15.203 – ANTENNA REQUIREMENT

Applicable Standard

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 shall be considered sufficient to comply with the provisions of this section.

Antenna Connected Construction

The EUT has three coils antennas arrangement, which was permanently attached, fulfill the requirement of this section. Please refer to the EUT photos.

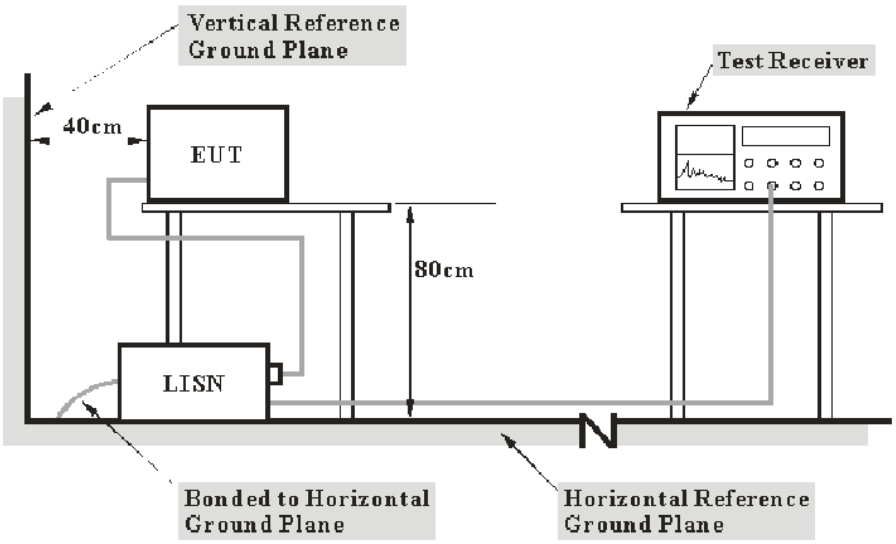
Result: Pass

FCC §15.207 – AC LINE CONDUCTED EMISSION

Applicable Standard

FCC§15.207

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

Test Data

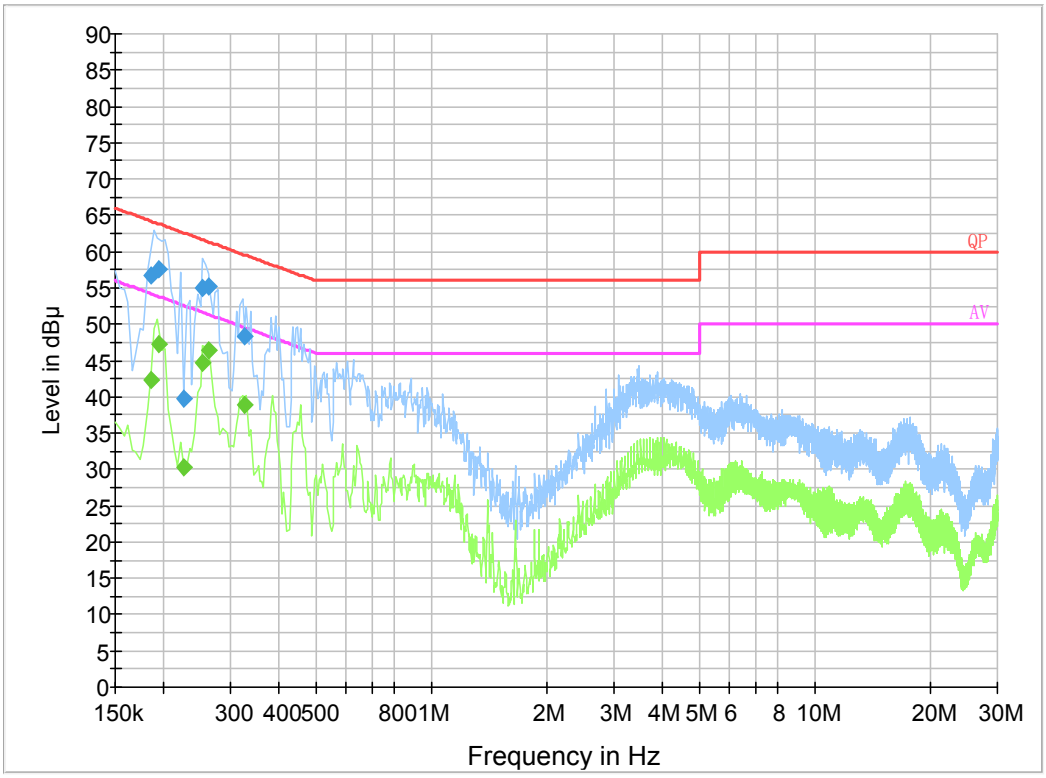
Environmental Conditions

Temperature:	25°C
Relative Humidity:	65 %
ATM Pressure:	101.0 kPa

The testing was performed by Haiguo Li on 2020-06-29.

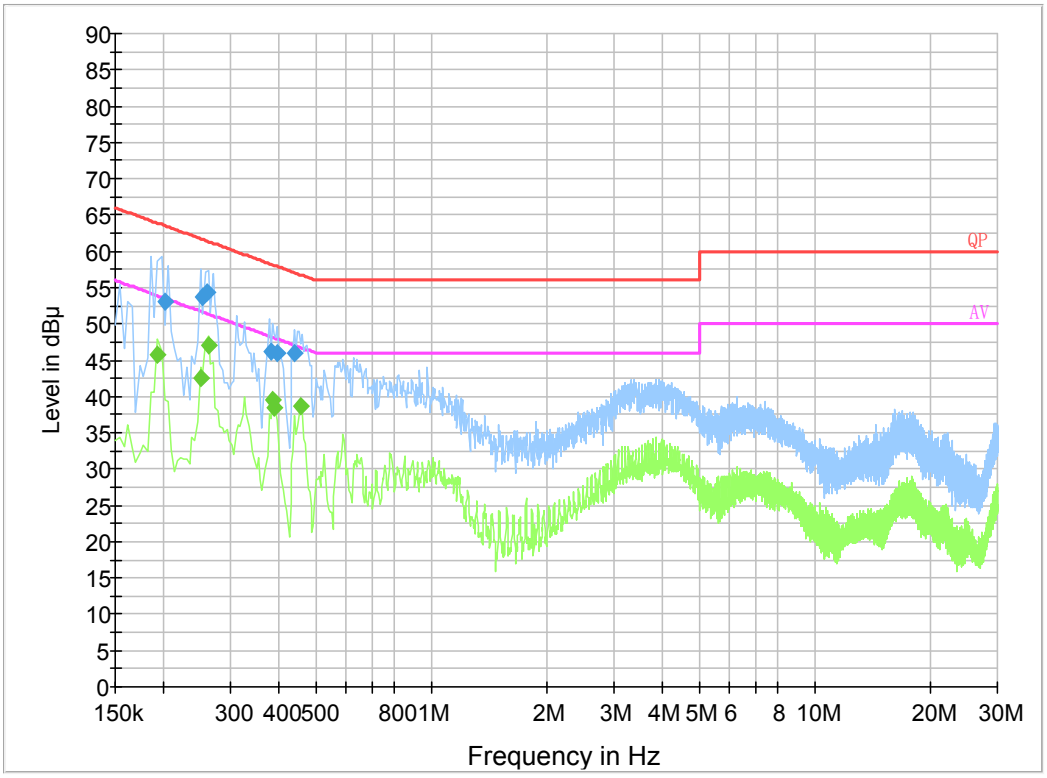
Test mode: Wireless Charging (full load)

AC 120 V/60 Hz, Line:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.186500	56.8	19.8	64.2	7.4	QP
0.194500	57.5	19.8	63.8	6.3	QP
0.226500	39.7	19.8	62.6	22.8	QP
0.253500	55.0	19.8	61.6	6.6	QP
0.262500	55.2	19.8	61.4	6.1	QP
0.326830	48.4	19.8	59.5	11.2	QP
0.186500	42.3	19.8	54.2	11.9	Ave.
0.194500	47.3	19.8	53.8	6.5	Ave.
0.226500	30.3	19.8	52.6	22.2	Ave.
0.253500	44.7	19.8	51.6	6.9	Ave.
0.262500	46.4	19.8	51.4	4.9	Ave.
0.326830	38.8	19.8	49.5	10.7	Ave.

AC 120V/ 60 Hz, Neutral:



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.202500	53.1	19.8	63.5	10.4	QP
0.254500	53.7	19.8	61.6	7.9	QP
0.261500	54.5	19.8	61.4	6.9	QP
0.383670	46.1	19.8	58.2	12.1	QP
0.396030	45.9	19.8	57.9	12.0	QP
0.439370	46.0	19.8	57.1	11.1	QP
0.194000	45.8	19.8	53.9	8.0	Ave.
0.250000	42.5	19.8	51.8	9.3	Ave.
0.262000	47.0	19.8	51.4	4.4	Ave.
0.386000	39.4	19.8	48.1	8.7	Ave.
0.390000	38.4	19.8	48.1	9.7	Ave.
0.458000	38.7	19.8	46.7	8.0	Ave.

Note:
1) Correction Factor =LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
2) Corrected Amplitude = Reading + Correction Factor
3) Margin = Limit – Corrected Amplitude

FCC §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

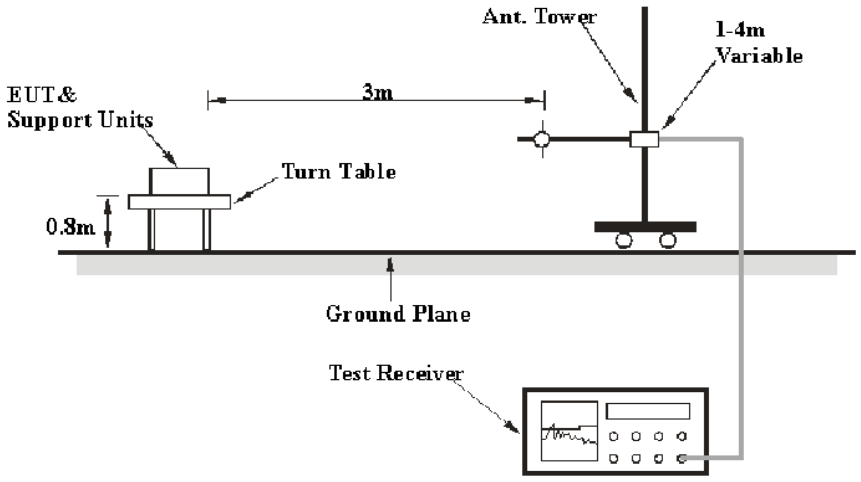
As per FCC Part 15.209

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permItted under other sections of this part, e.g., §§15.231 and 15.241.

EUT Setup



The radiated emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part Subpart C limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 1 GHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	Measurement
9 kHz – 150 kHz	300 Hz	1 kHz	PK
150 kHz – 30 MHz	10 kHz	30 kHz	PK
30 MHz – 1000 MHz	120 kHz	300 kHz	QP

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except 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.

If the maximized peak measured value complies with the limit, then it is unnecessary to perform an QP/Average measurement

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit - Corr. Ampl.

Test Data

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	65 %
ATM Pressure:	101.0 kPa

The testing was performed by Holland Yang on 2020-06-29.

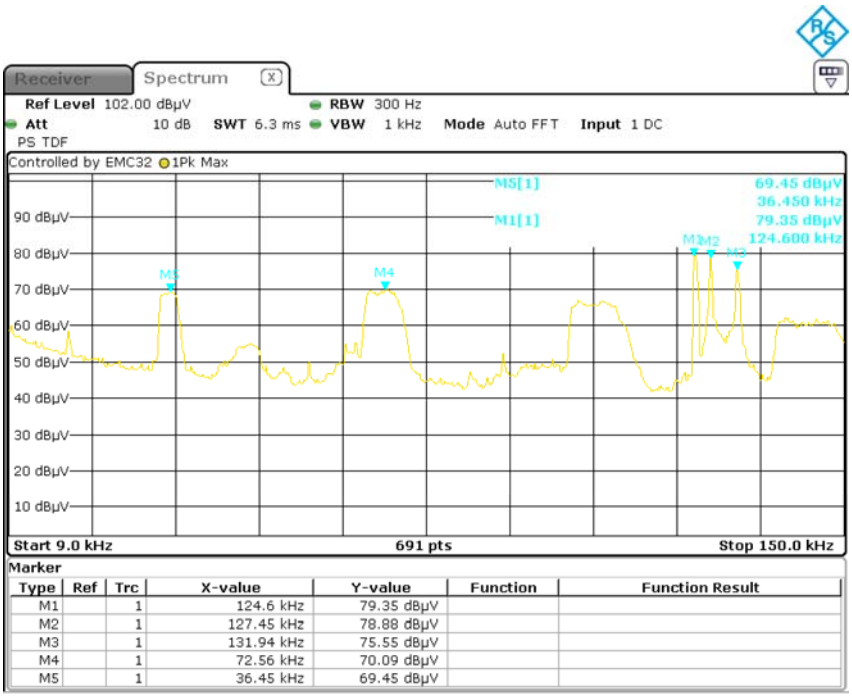
Test mode: Wireless Charging (full load)

1) 9 kHz~30MHz:

Frequency	Corrected Amplitude (dBμV/m)	PK/QP/Ave.	Turntable	Rx Antenna	FCC Part 15.205&15.209		Remark
(MHz)			Degree	Height (m)	Limit (dBμV/m)	Margin (dB)	
0.03645	69.45	PK	153	1.0	116.37	46.92	Spurious emission
0.07256	70.09	PK	229	1.0	110.39	40.30	
0.258	69.49	PK	211	1.0	99.37	29.88	
0.388	57.60	PK	161	1.0	95.83	38.23	
16.112	52.55	PK	142	1.0	69.54	16.99	
0.1246	79.35	PK	169	1.0	105.69	26.34	Fundamental
0.12745	78.88	PK	21	1.0	105.50	26.62	
0.13194	75.55	PK	326	1.0	105.20	29.65	

Note: PK detector data compliance with average and QP detector limit.

9 kHz-150 kHz



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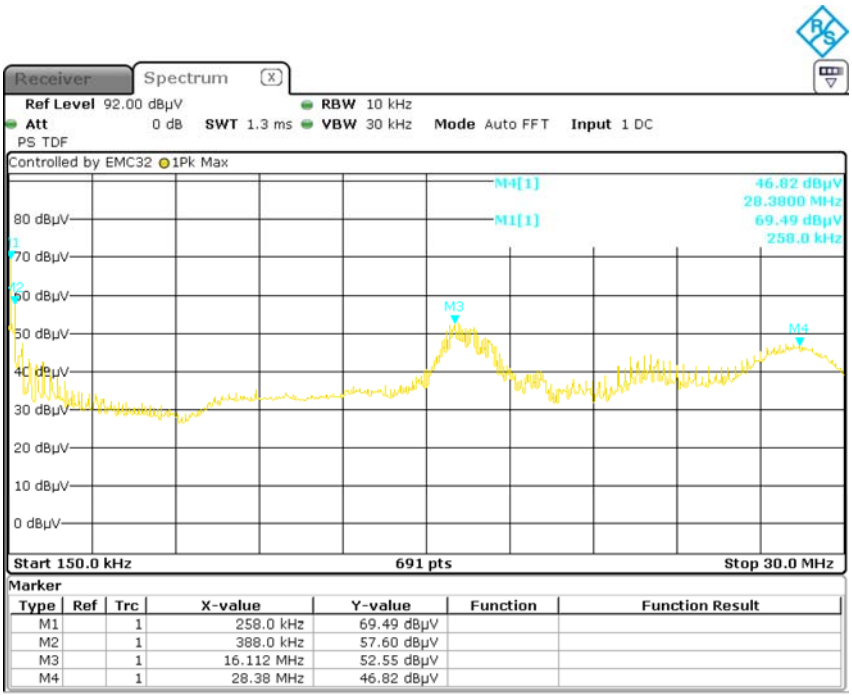
150 kHz-30 MHz



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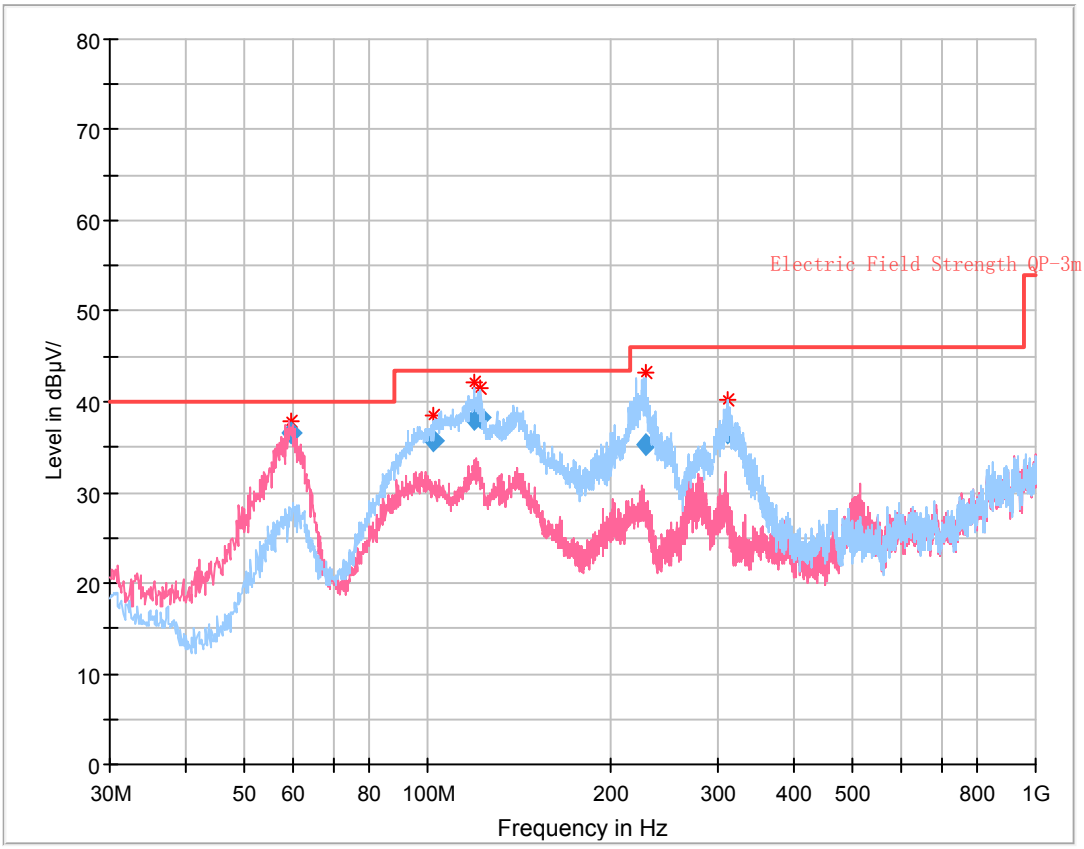
2) 30 MHz ~ 1GHz



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
59.575250	36.59	101.0	V	347.0	-20.1	40.00	3.41
101.926875	35.80	256.0	H	197.0	-16.9	43.50	7.70
119.307500	37.96	272.0	H	20.0	-14.4	43.50	5.54
121.799500	38.25	283.0	H	19.0	-14.2	43.50	5.25
228.223875	35.32	133.0	H	263.0	-14.0	46.00	10.68
311.426125	36.49	108.0	H	246.0	-10.7	46.00	9.51

Note:
Corrected Amplitude = Corrected Factor + Reading
Corrected Factor=Antenna factor (RX) + cable loss - amplifier factor
Margin = Limit- Corr. Amplitude

Result: Pass

******* END OF REPORT *******