ACCREDITED
TESTING LABORATORY
CERTIFICATE # 4821.01

BACL
Bay Area Compliance Labs Corp.

FCC PART 15C

TEST REPORT

For

SDI Technologies Inc.

1299 Main St. Rahway, NJ 07065, United States

FCC ID: EMOIBTW41B

Report Type:	**Product Type:**
Original Report	Bluetooth Stereo Alarm Clock with Qi Wireless, Speaker Phone and USB Charging

Report Number:	SZKA210511-16444E-00
Report Date:	2021-06-03
Reviewed By:	Jimmy Xiao RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★".

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

Product	Bluetooth Stereo Alarm Clock with Qi Wireless, Speaker Phone and USB Charging
Tested Model	iBTW41
Multiple Models	iBTW41BG, iBTW41X (X could be single or multiple digits by any alphabets denote different cabinet color)
Models Differences	Refer to the DoS letter
Frequency Range	110.5-205kHz
Antenna Type	Coil
Voltage Range	DC 9.0V from adapter
Date of Test	2021-05-20 to 2021-05-22
Sample serial number	SZKA210511-16444E-RF-S_5F9 (Assigned by BACL, Shenzhen)
Received date	2021-05-11
Sample/EUT Status	Good condition
Adapter information	Model: BQ30A-0903000-U Input: AC100-240V, 50/60Hz Max, 800mA Output: DC 9.0V, 3000mA

Objective

This test report is 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.

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.

Each test item follows test standards and with no deviation.

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 5F(B-West), 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, 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

EUT Exercise Software

No software used in test.

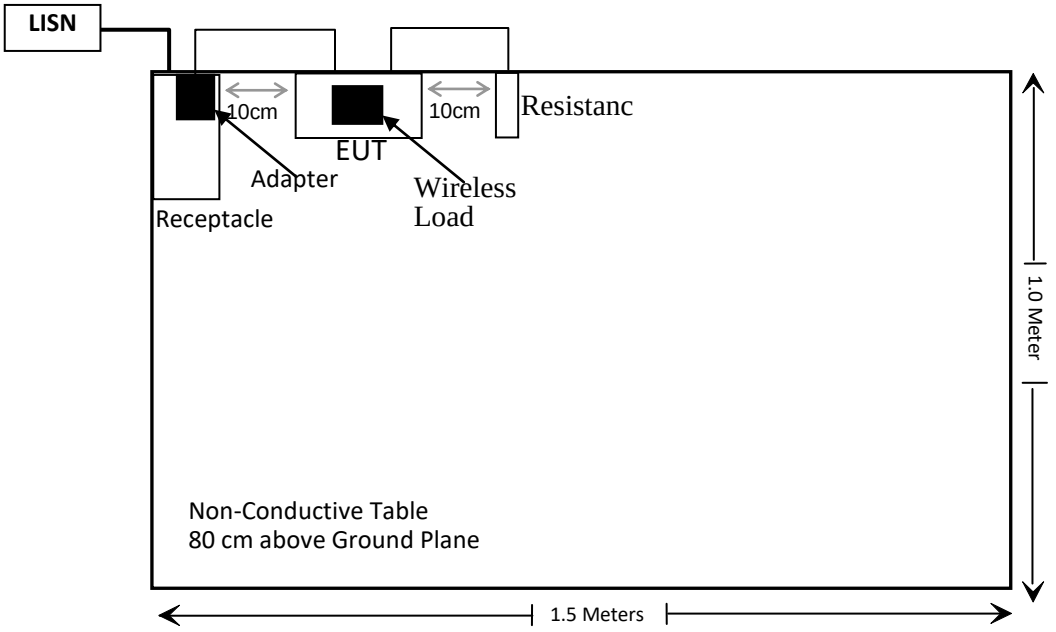
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Unknown	Wireless Load	Unknown	Unknown
Unknown	Resistance	5Ω	Unknown

External I/O Cable

Cable Description	Length (m)	From Port	To
Un-shielding Un-Detachable DC Cable	1.0	Adapter	EUT
Un-shielding Un-Detachable DC Cable	0.6	Resistance	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
MPE					
Narda	Exposure Level Tester	ELT-400	N-0229	2019/11/19	2021/11/18
Narda	B Field Probe	ELT Probe 100cm^2	M-0666	2019/11/19	2021/11/18
ETS-Lindgreen	Isotropic Field Probe	HI－6005	69461	2018/09/28	2021/09/27
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2020/08/04	2021/08/03
Rohde & Schwarz	LISN	ENV216	101613	2020/08/04	2021/08/03
Rohde & Schwarz	Transient Limitor	ESH3Z2	DE25985	2020/11/29	2021/11/28
Unknown	CE Cable	CE Cable	UF A210B-1-0720-504504	2020/11/29	2021/11/28
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
RF Radiated test					
R&S	EMI Test Receiver	ESR3	102455	2020/08/04	2021/08/03
Sonoma instrument	Pre-amplifier	310 N	186238	2020/08/04	2021/08/03
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2020/12/22	2023/12/21
ETS	Passive Loop Antenna	6512	29604	2018/07/14	2021/07/13
Unknown	Cable	Chamber Cable 4	EC-007	2020/11/29	2021/11/28
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 v03r01 clause 3 c)

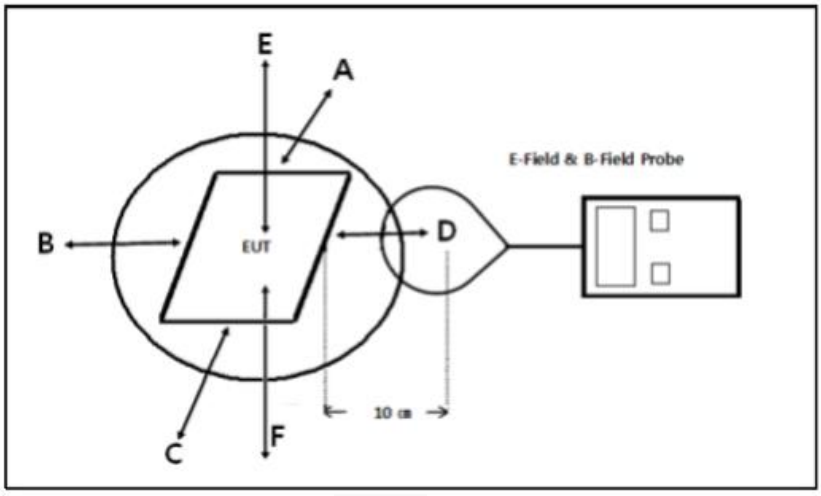
c) For devices designed for typical desktop applications, such a wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm. E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made 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. Below 100 kHz, applicable reference levels for maximum instantaneous exposure field strengths are defined in clause 3.a).(2).

According to KDB 680106 D01 RF Exposure Wireless Charging App v03r01 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 [2]or a PAG[3] 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 system may consist of more than one source primary coils, charging one or more clients. If more than one primary coil is present, the coil pairs may be powered on at the same time.
(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 anywhere at or beyond 15 cm surrounding the device, and 20 cm away from the surface from all coils that by design can simultaneously transmit, and while those coils are simultaneously energized, are demonstrated to be less than 50% of the applicable MPE limit.

Block Diagram of Test Setup



15cm

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 Zero Yan on 2021-05-22.

Test mode: Wireless Charging

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 (A/m)
110.5-205	0.253	0.208	0.137	0.217	0.165	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 (V/m)
110.5-205	1.457	1.264	1.549	1.362	1.218	307	614

Result: Pass

Considerations of compliance 680106 D01 RF Exposure Wireless Charging App v03r01 clause 5 b:

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

Yes, the operation frequency is 110.5-205 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 9Watts.

(3) The system may consist of more than one source primary coils, charging one or more clients. If more than one primary coil is present, the coil pairs may be powered on at the same time.

The transfer system includes one primary coils to detect and allow 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 anywhere at or beyond 15 cm surrounding the device, and 20 cm away from the surface from all coils that by design can simultaneously transmit, and while those coils are simultaneously energized, are demonstrated to be less than 50% of the applicable MPE limit.

Yes, the test result for H and E-Field 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 one coil antenna arrangement which was permanently attached, fulfill the requirement of this section. Please refer to the EUT photos.

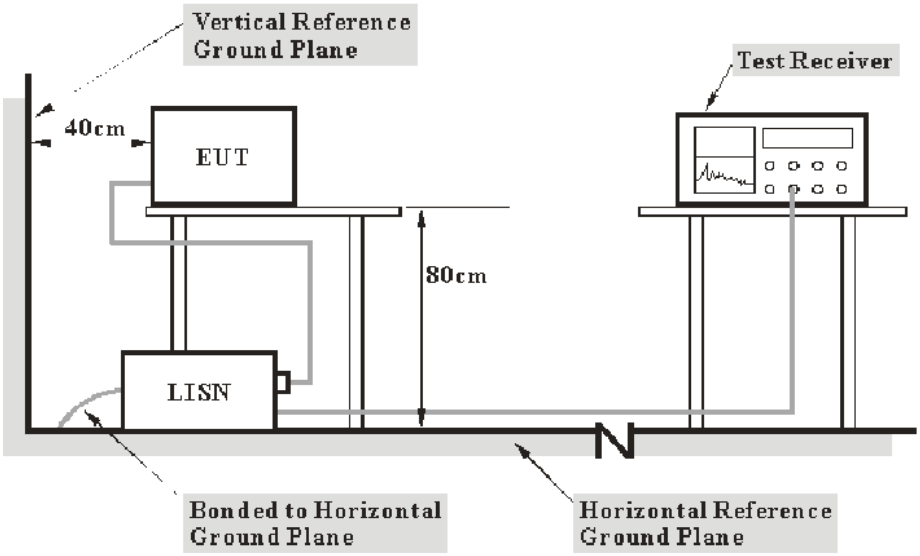
Result: Pass

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 external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.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 Data

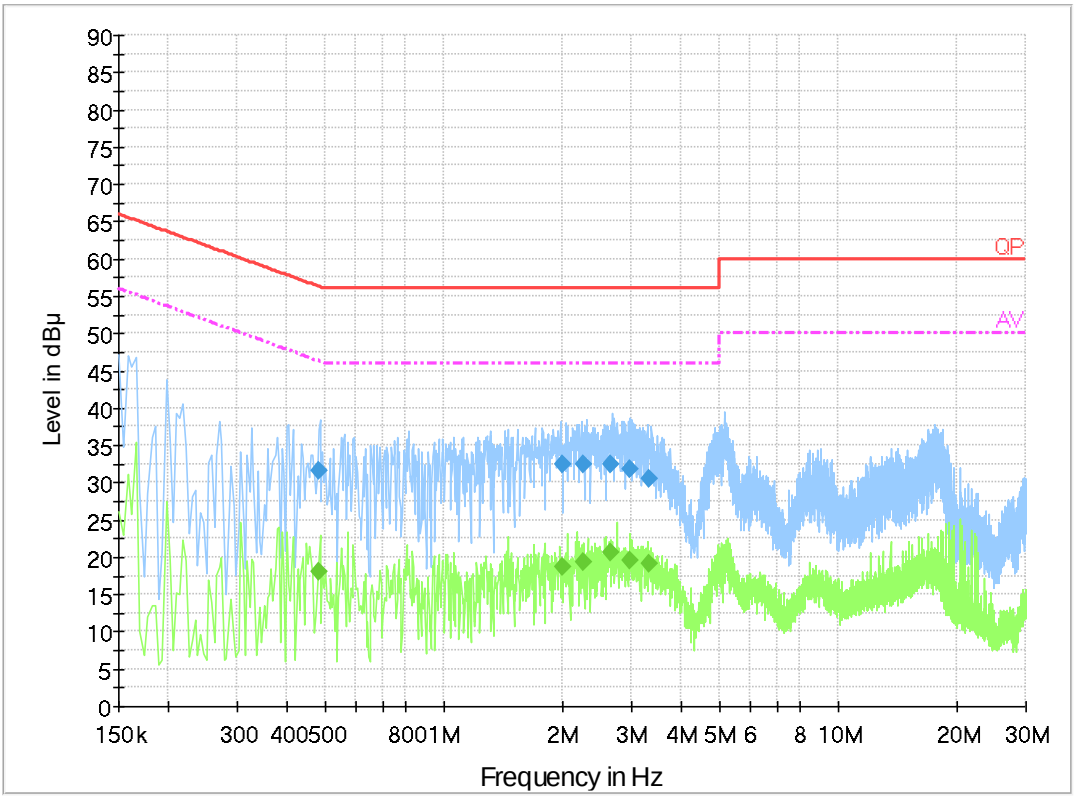
Environmental Conditions

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

The testing was performed by Haiguo Li on 2021-05-20.

Test mode: Wireless Charging (Full Load)

AC 120 V/60 Hz, Line:



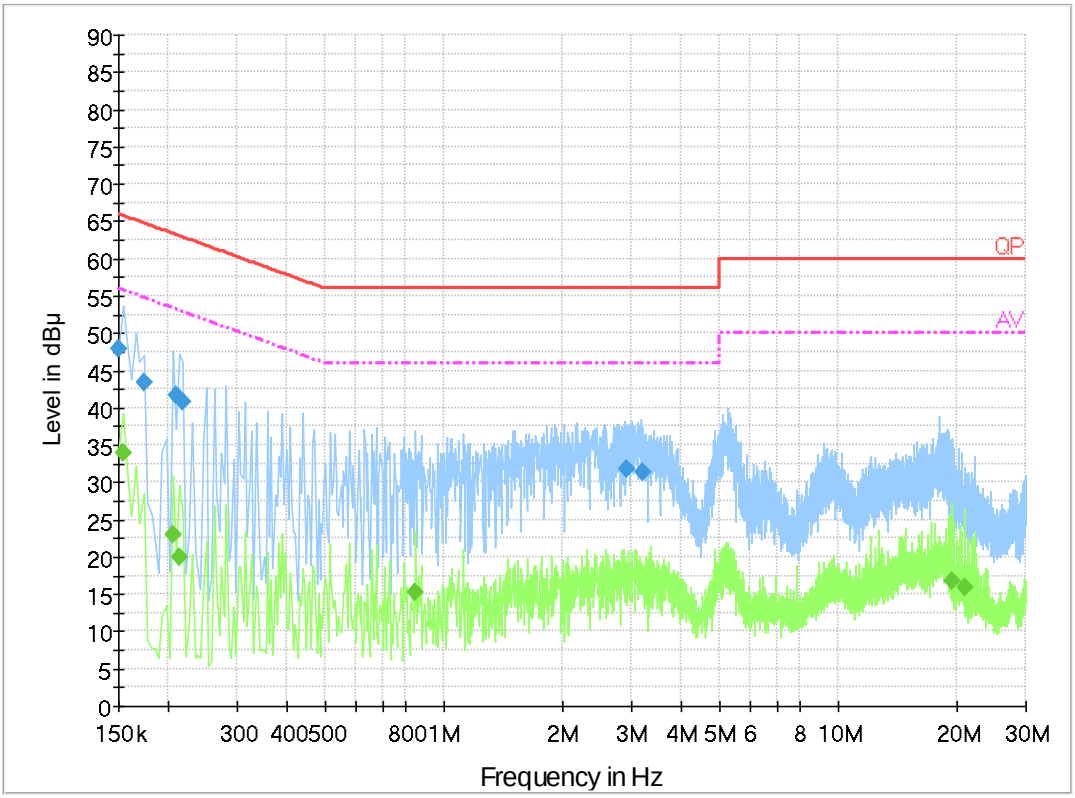
Final Result 1

Frequency (MHz)	QuasiPeak (dBµ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)
0.482710	31.7	9.000	L1	19.8	24.6	56.3
2.007670	32.3	9.000	L1	19.9	23.7	56.0
2.275350	32.5	9.000	L1	19.9	23.5	56.0
2.649710	32.5	9.000	L1	19.9	23.5	56.0
2.961510	31.8	9.000	L1	19.9	24.2	56.0
3.312650	30.4	9.000	L1	19.9	25.6	56.0

Final Result 2

Frequency (MHz)	Average (dBµ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)
0.482710	18.1	9.000	L1	19.8	28.2	46.3
2.007670	18.8	9.000	L1	19.9	27.2	46.0
2.275350	19.3	9.000	L1	19.9	26.7	46.0
2.649710	20.6	9.000	L1	19.9	25.4	46.0
2.961510	19.6	9.000	L1	19.9	26.4	46.0
3.312650	19.2	9.000	L1	19.9	26.8	46.0

AC 120V/ 60 Hz, Neutral:



Final Result 1

Frequency (MHz)	QuasiPeak (dBµ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)
0.150000	47.8	9.000	N	19.8	18.2	66.0
0.173500	43.4	9.000	N	19.8	21.4	64.8
0.209500	41.6	9.000	N	19.8	21.6	63.2
0.217500	40.7	9.000	N	19.8	22.2	62.9
2.921170	31.8	9.000	N	19.9	24.2	56.0
3.198510	31.3	9.000	N	19.9	24.7	56.0

Final Result 2

Frequency (MHz)	Average (dBµ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBµ V)
0.154000	34.0	9.000	N	19.8	21.8	55.8
0.206000	23.1	9.000	N	19.8	30.3	53.4
0.214000	20.0	9.000	N	19.8	33.0	53.0
0.850000	15.1	9.000	N	19.8	30.9	46.0
19.422000	16.8	9.000	N	20.4	33.2	50.0
21.030000	15.9	9.000	N	20.4	34.1	50.0

FCC §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

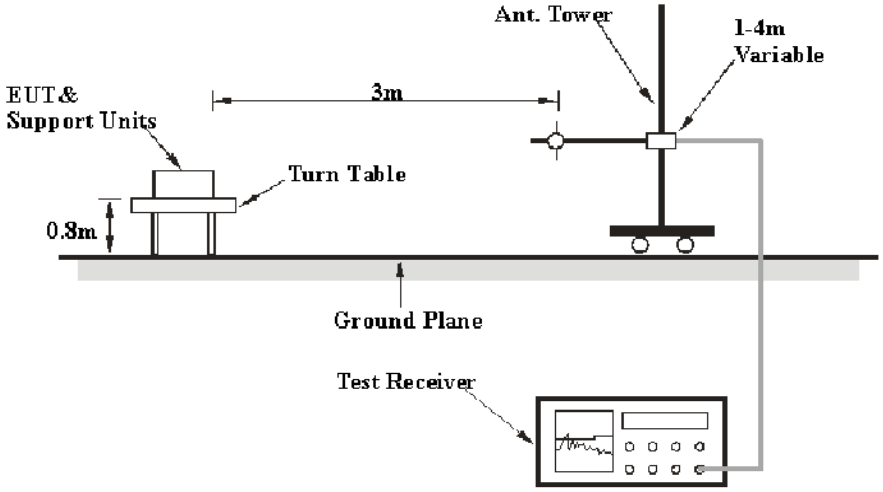
As per FCC Part 15.209

(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

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:	28°C
Relative Humidity:	60 %
ATM Pressure:	101.0 kPa

The testing was performed by Zero Yan on 2021-05-22.

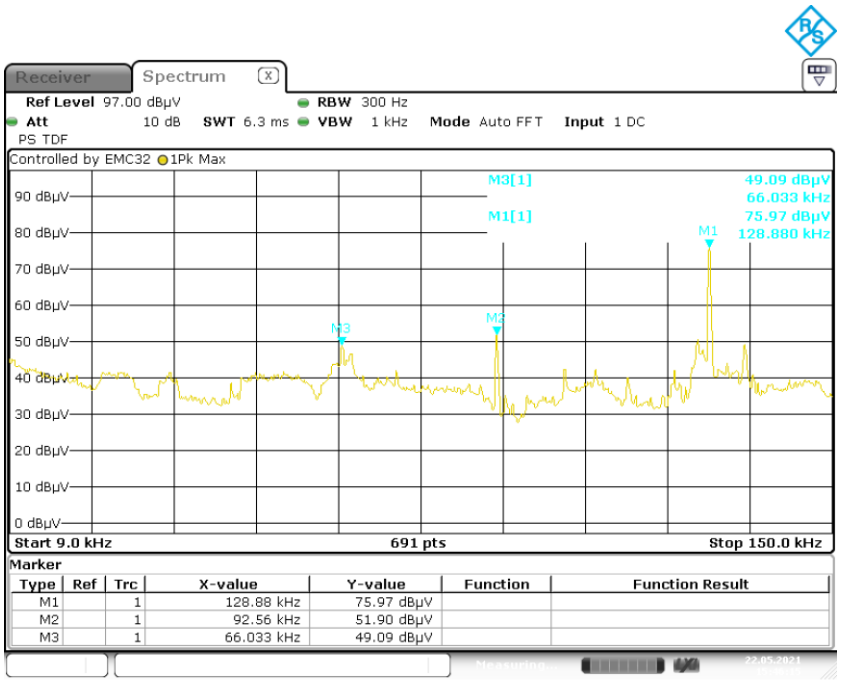
Test mode: Wireless Charging

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)	
0.1288	75.97	PK	254	1.0	105.40	29.43	Fundamental
0.06603	49.09	PK	89	1.0	111.21	62.12	Spurious Emission
0.09256	51.90	PK	256	1.0	108.28	56.38	
0.172	53.98	PK	234	1.0	102.89	48.91	
10.2368	51.62	PK	118	1.0	69.54	17.92	
26.782	43.66	PK	315	1.0	69.54	25.88	

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

9 kHz-150 kHz



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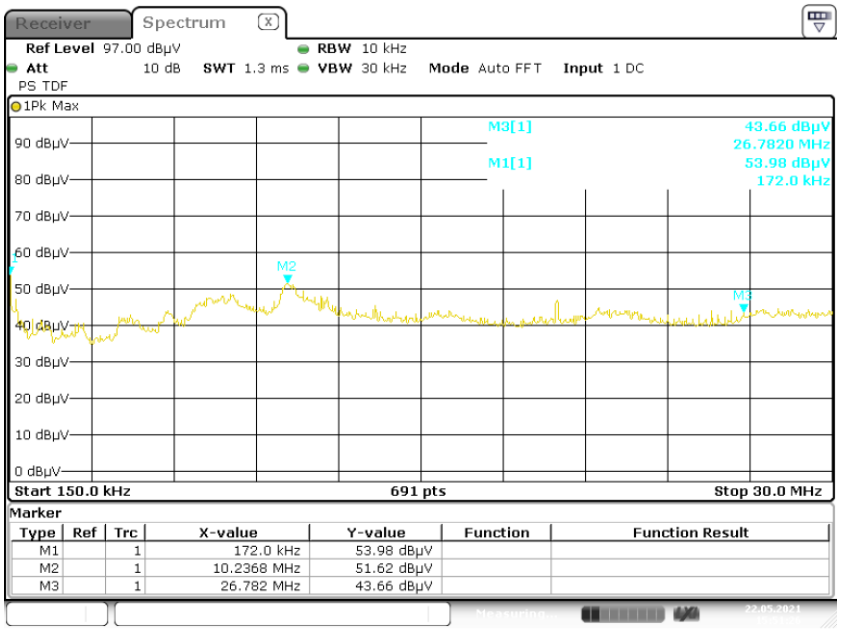
150 kHz-30 MHz



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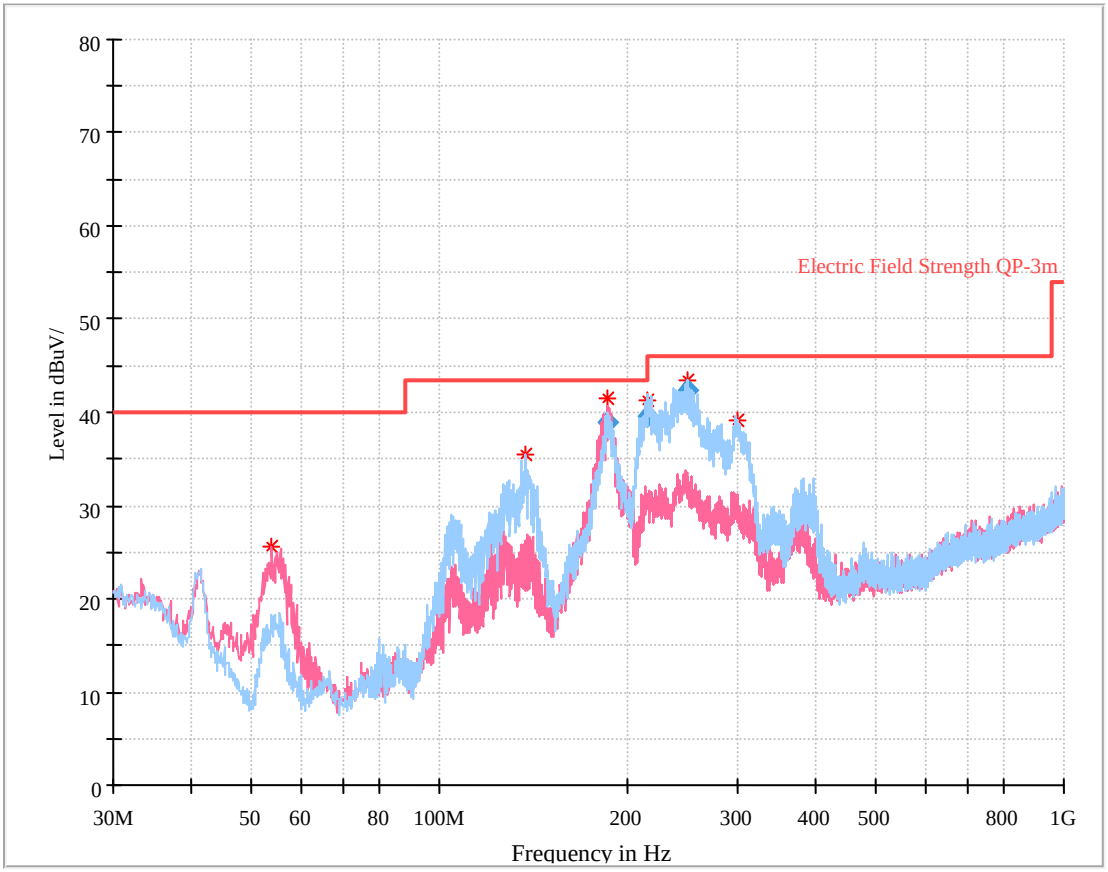
2) 30 MHz ~ 1 GHz



Final_Result

Frequency (MHz)	QuasiPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
185.588125	38.92	43.50	4.58	102.0	V	57.0	-12.3
215.425750	39.51	43.50	3.99	173.0	H	45.0	-11.3
250.305375	42.27	46.00	3.73	134.0	H	70.0	-11.8

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
53.886250	25.52	40.00	14.48	100.0	V	118.0	-16.6
136.942500	35.47	43.50	8.03	200.0	H	218.0	-10.6
299.538750	39.18	46.00	6.82	100.0	H	78.0	-10.0

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