



TEST REPORT

Applicant Name : SDI Technologies Inc.
Address : 1299 Main St. Rahway NJ 07065, United States
Report Number : SZNS211126-61122E-RF-00
FCC ID: EMOTW500B

Test Standard (s)

FCC Part 15C

Sample Description

Product Type: Compact Bedside Alarm Clock Radio with Wireless Charging with USB Charging
Model No.: TW500
Multiple Model(s) No.: TW500B, TW500BC, TW500X (X could be single or multiple digits by any alphabets denote different cabinet color)
(Please refer to DOS for Model difference)
Trade Mark: Timex
Date Received: 2021/11/26
Date of Test: 2021/12/08~2021/12/24
Report Date: 2021/12/28

Test Result:

Pass*

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

Prepared and Checked By:

Ting Lü
EMC Engineer

Approved By:

Robert Li
EMC Engineer

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

Shenzhen Accurate Technology Co., Ltd. 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)

Frequency Range	110.5-205kHz
Antenna Type	Coil
Input Voltage	DC 5V from adapter or DC 3V from battery
Output Power	5Watts
Sample serial number	SZNS211126-61122E-RF-S1 (Assigned by ATC)
Sample/EUT Status	Good condition
Adapter information	Model: OBL-0503000U Input: AC 100-240V, 50/60Hz 1.0A Max Output: DC 5V, 3.0A

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 Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz – 30MHz	2.66dB
	30MHz - 1GHz	4.28dB
Temperature		1°C
Humidity		6%
Supply voltages		0.4%

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 Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. 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.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISED), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a test mode

EUT Exercise Software

No software used in test.

Local Support Equipment

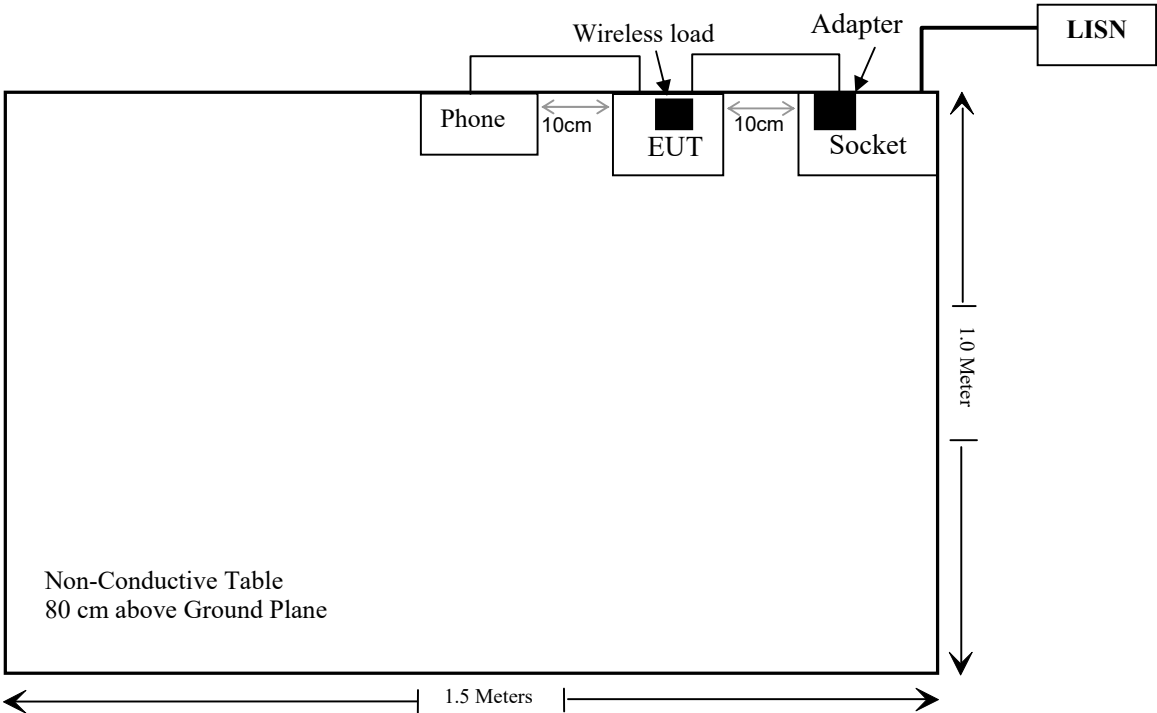
Manufacturer	Description	Model	Serial Number
Huawei	Phone	Nova7	Nova7
Unknown	Wireless load	Unknown	Wireless load

External I/O Cable

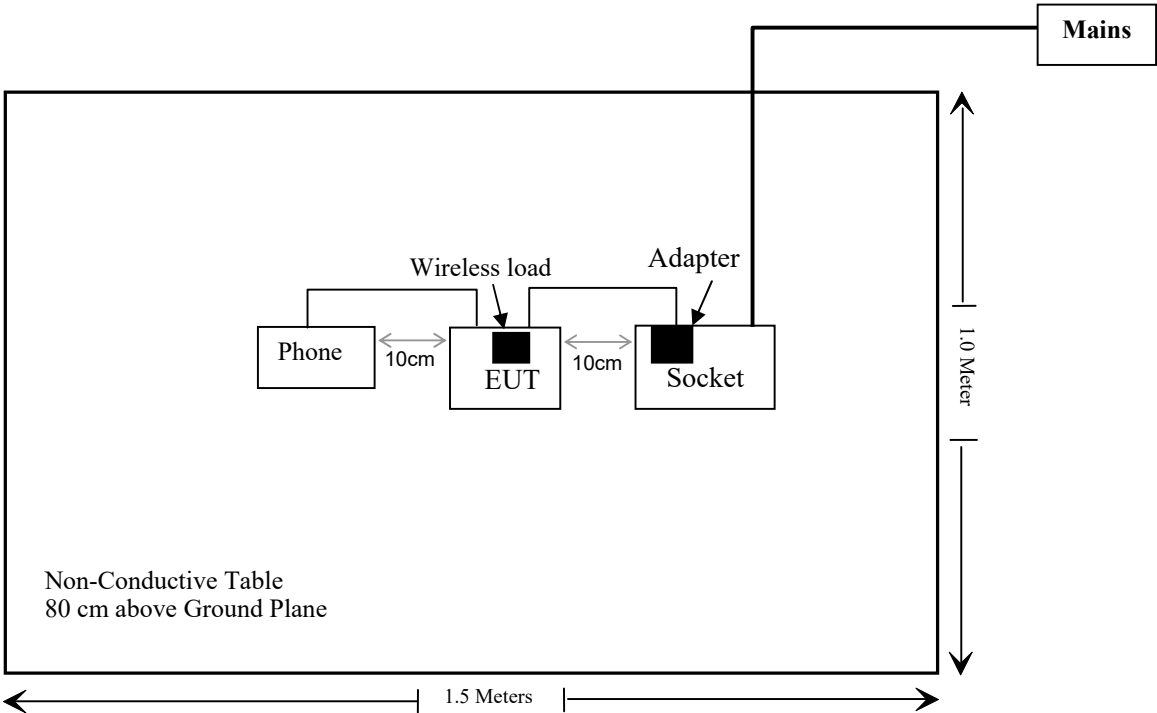
Cable Description	Length (m)	From Port	To
Un-shielded Detachable DC Cable	1.0	Adapter	EUT
Un-shielded Detachable USB Cable	1.0	EUT	Phone

Block Diagram of Test Setup

For Conducted Emissions:



For Radiated Emissions:



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	Magnetic field tester	ELT-400	B-0138	2021/01/06	2024/01/05
NARDA	Magnetic field tester	2300/90.10	B-0137	2021/01/06	2024/01/05
ETS-Lindgreen	Isotropic Field Probe	HI—6005	69461	2018/09/28	2022/09/28
Conducted Emissions Test					
Rohde& Schwarz	EMI Test Receiver	ESCI	100784	2020/12/13	2021/12/12
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2020/12/13	2021/12/12
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2020/12/13	2021/12/12
Unknown	RF Coaxial Cable	No.17	N0350	2020/12/14	2021/12/13
Conducted Emission Test Software: e3 19821b (V9)					
RF Radiated test					
Rohde& Schwarz	Test Receiver	ESR	102725	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2021/11/09	2022/11/08
SCHWARZBECK	LOOP ANTENNA	FMZB1516	1516131	2020/01/05	2023/01/04
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.13	N300	2021/12/14	2022/12/13

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. 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/cm²)	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;

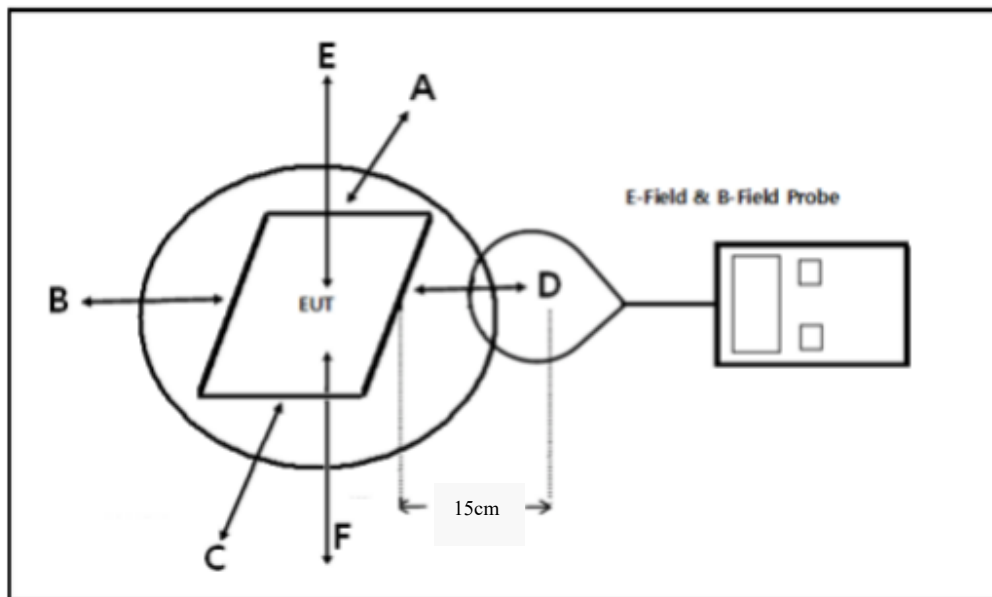
According with KDB 680106 D01 RF Exposure Wireless Charging Apps v03r01 clause 3 c)

- c) For devices designed for typical desktop applications, such as 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 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 SDoC² or a PAG³ 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



Note: 20 cm for Top test.

Test Data

Environmental Conditions

Temperature:	26.5 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Ting Lü on 2021-12-24.

Test Mode: Wireless Charging (Full load)

H-Field 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	0.241	0.245	0.242	0.242	0.263	0.815	1.63

E-Field 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	0.481	0.464	0.431	0.436	0.452	307	614

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

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 110.5-205kHz.

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

Yes, the maximum output power of primary coil is 5Watts.

(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 internal coil antennas arrangement which was permanently attached, fulfill the requirement of this section. Please refer to the EUT photos.

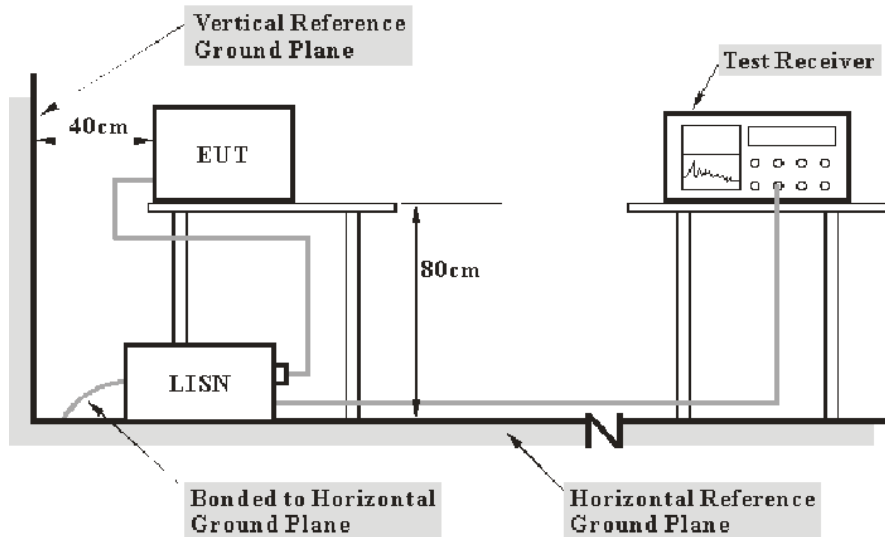
Result: Compliant.

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 Transd factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss. The basic equation is as follows:

$$\text{Transd Factor} = \text{LISN VDF} + \text{Cable Loss}$$

The “**Over limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over limit of -7 dB means the emission is 7 dB below the limit. The equation for calculation is as follows:

$$\begin{aligned}\text{Over Limit} &= \text{Level} - \text{Limit} \\ \text{Level} &= \text{Read Level} + \text{Factor}\end{aligned}$$

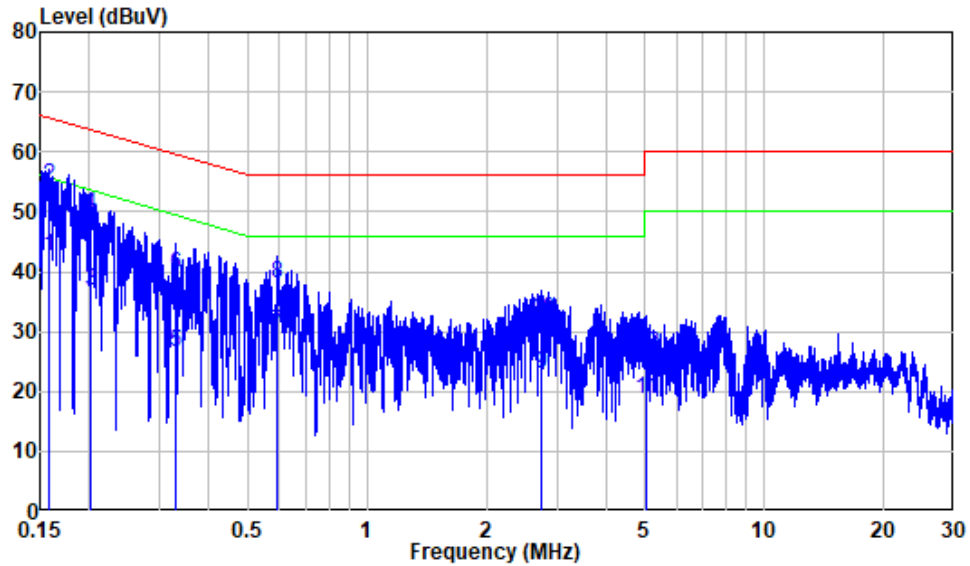
Test Data

Environmental Conditions

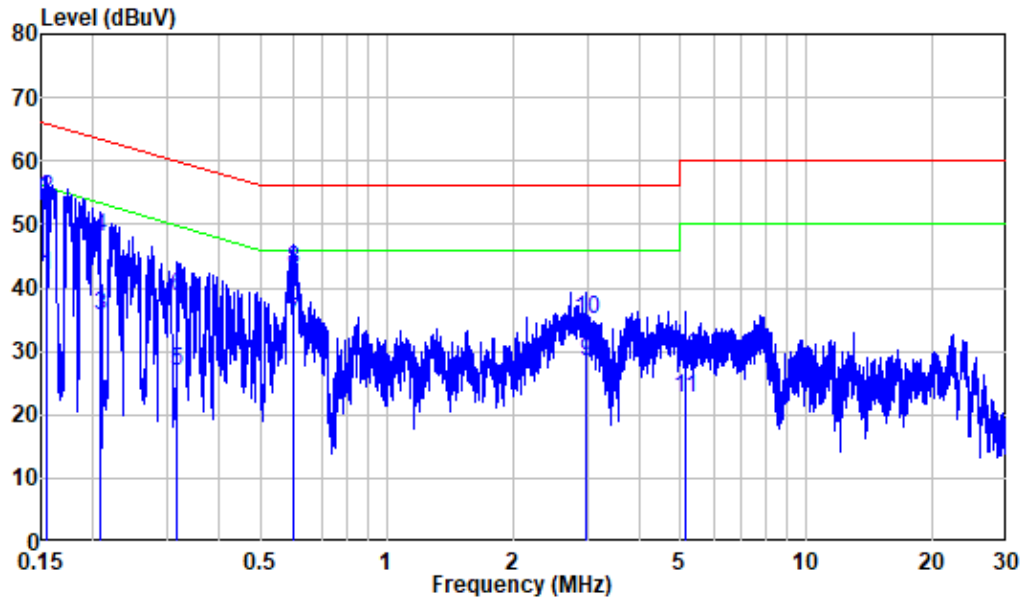
Temperature:	25 °C
Relative Humidity:	64 %
ATM Pressure:	101.0 kPa

The testing was performed by Bin Deng on 2021-12-08.

Test Mode: Wireless Charging (Full load)

AC 120 V/60 Hz, Line:

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.158	9.88	32.67	42.55	55.58	-13.03	Average
2	0.158	9.88	44.53	54.41	65.58	-11.17	QP
3	0.200	9.80	27.15	36.95	53.59	-16.64	Average
4	0.200	9.80	39.74	49.54	63.59	-14.05	QP
5	0.329	9.80	16.83	26.63	49.47	-22.84	Average
6	0.329	9.80	29.83	39.63	59.47	-19.84	QP
7	0.595	9.81	20.21	30.02	46.00	-15.98	Average
8	0.595	9.81	28.21	38.02	56.00	-17.98	QP
9	2.756	9.93	13.02	22.95	46.00	-23.05	Average
10	2.756	9.93	21.95	31.88	56.00	-24.12	QP
11	5.041	9.99	8.59	18.58	50.00	-31.42	Average
12	5.041	9.99	16.40	26.39	60.00	-33.61	QP

AC 120V/ 60 Hz, Neutral:

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.154	9.91	32.16	42.07	55.77	-13.70	Average
2	0.154	9.91	44.22	54.13	65.77	-11.64	QP
3	0.207	10.00	25.66	35.66	53.31	-17.65	Average
4	0.207	10.00	38.07	48.07	63.31	-15.24	QP
5	0.317	9.95	17.02	26.97	49.77	-22.80	Average
6	0.317	9.95	28.73	38.68	59.77	-21.09	QP
7	0.596	9.91	24.70	34.61	46.00	-11.39	Average
8	0.596	9.91	33.01	42.92	56.00	-13.08	QP
9	2.991	9.99	18.25	28.24	46.00	-17.76	Average
10	2.991	9.99	24.89	34.88	56.00	-21.12	QP
11	5.146	10.05	12.59	22.64	50.00	-27.36	Average
12	5.146	10.05	18.82	28.87	60.00	-31.13	QP

FCC §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

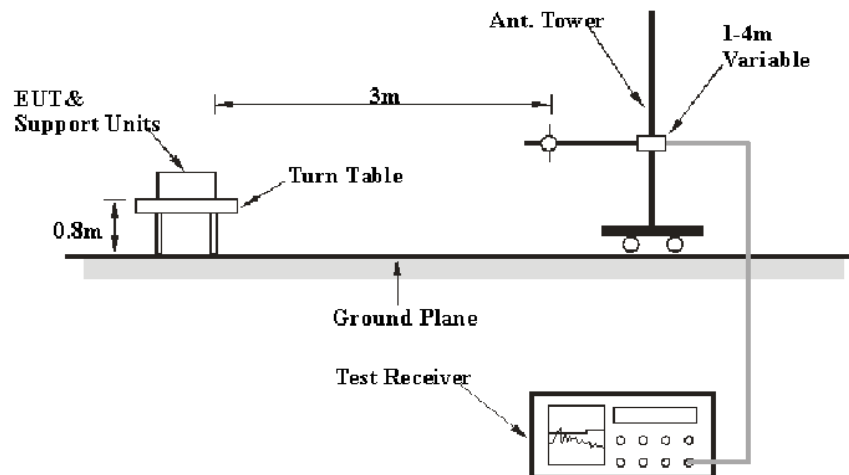
As per FCC Part 15.209

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

$$\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Over Limit/Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit/margin of -7dB means the emission is 7dB below the limit. The equation for calculation is as follows:

$$\begin{aligned}\text{Over Limit/Margin} &= \text{Level} / \text{Corrected Amplitude} - \text{Limit} \\ \text{Level} / \text{Corrected Amplitude} &= \text{Read Level} + \text{Factor}\end{aligned}$$

Test Data

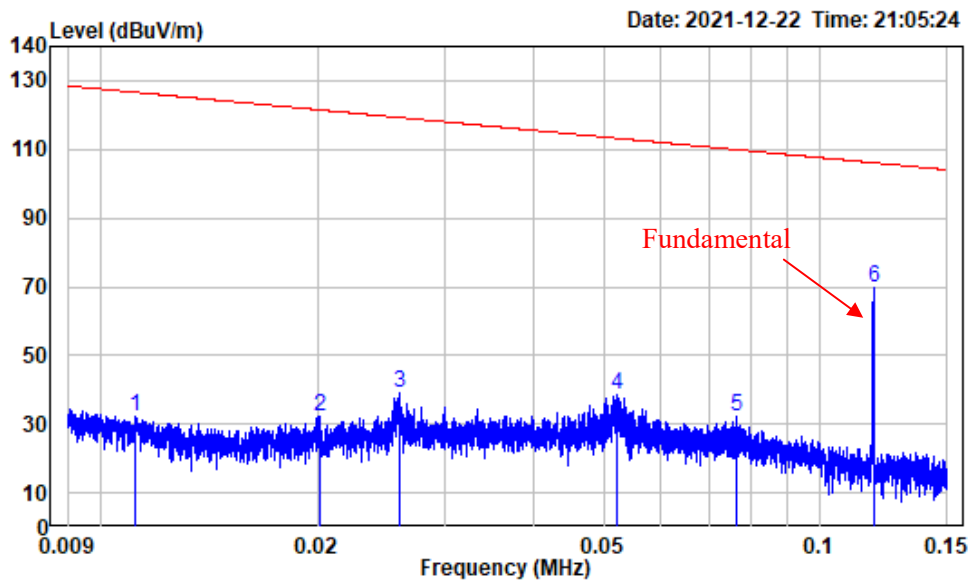
Environmental Conditions

Temperature:	26 °C
Relative Humidity:	64 %
ATM Pressure:	101 kPa

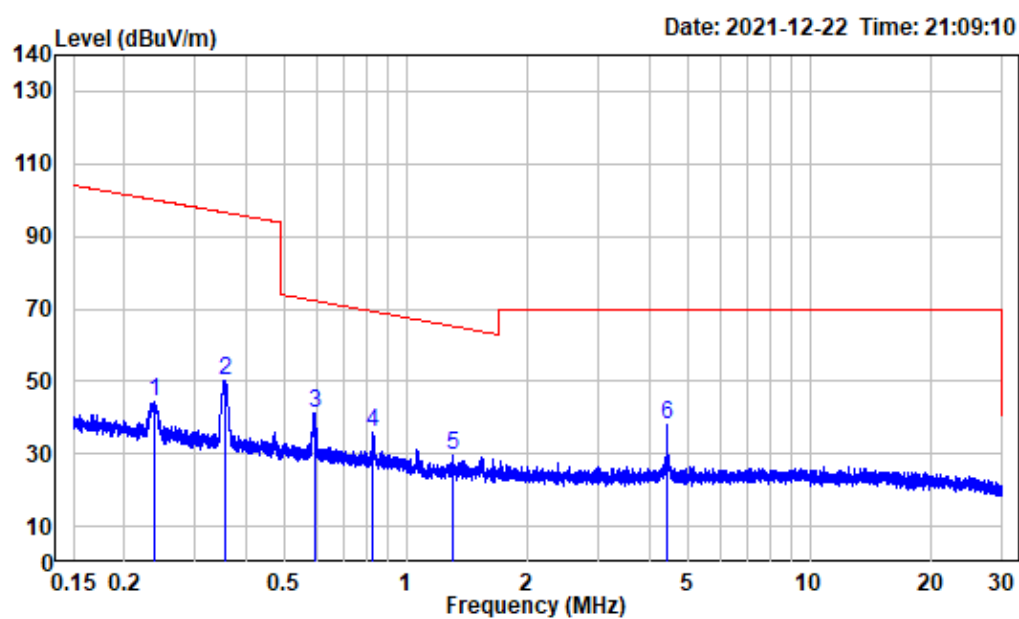
The testing was performed by Bin Deng on 2021-12-22 and 2021-12-24.

Test Mode: Wireless Charging (Full load)

9 kHz~30MHz:

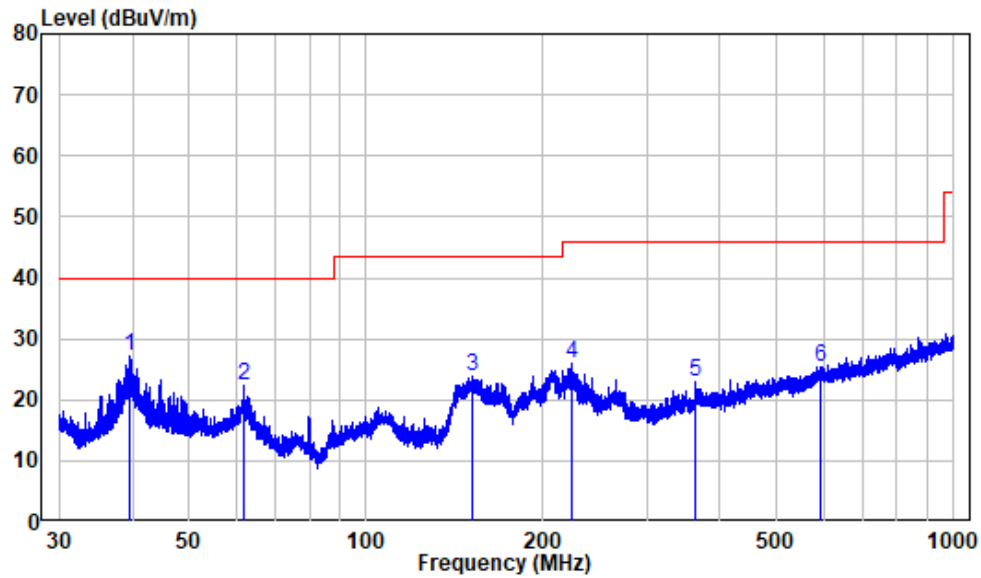


	Freq	Factor	Read	Level	Limit	Over	
	MHz	dB/m	Level	Level	Line	Limit	Remark
			dBuV	dBuV/m	dBuV/m	dB	
1	0.01	-14.58	46.93	32.35	126.63	-94.28	Peak
2	0.02	-14.75	46.92	32.17	121.49	-89.32	Peak
3	0.03	-14.86	53.97	39.11	119.32	-80.21	Peak
4	0.05	-14.94	53.38	38.44	113.27	-74.83	Peak
5	0.08	-14.99	47.16	32.17	109.91	-77.74	Peak
6	0.12	-15.34	85.33	69.99	106.13	-36.14	Peak



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.24	-14.80	59.30	44.50	100.10	-55.60	Peak
2	0.35	-14.65	64.85	50.20	96.60	-46.40	Peak
3	0.59	-14.57	56.02	41.45	72.12	-30.67	Peak
4	0.83	-14.77	50.87	36.10	69.14	-33.04	Peak
5	1.30	-14.85	44.37	29.52	65.12	-35.60	Peak
6	4.43	-14.98	53.24	38.26	69.54	-31.28	Peak

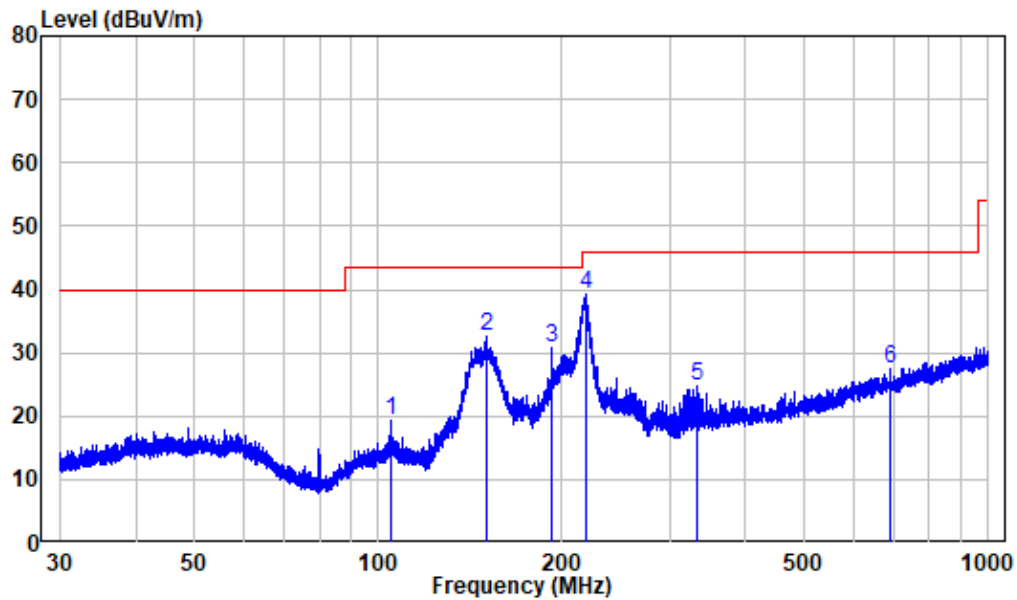
30MHz~1GHz:

Horizontal

Site : chamber
Condition: 3m HORIZONTAL
Job No. : SZNS211126-61122E-RF
Test Mode: FULL LOAD

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	39.70	-10.41	37.67	27.26	40.00	-12.74	Peak
2	61.83	-11.37	33.68	22.31	40.00	-17.69	Peak
3	151.33	-15.19	38.93	23.74	43.50	-19.76	Peak
4	224.62	-11.27	37.15	25.88	46.00	-20.12	Peak
5	362.03	-7.62	30.68	23.06	46.00	-22.94	Peak
6	592.53	-2.72	28.08	25.36	46.00	-20.64	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : SZNS211126-61122E-RF
Test Mode: FULL LOAD

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	104.54	-11.78	30.97	19.19	43.50	-24.31	Peak
2	150.27	-15.26	47.85	32.59	43.50	-10.91	Peak
3	192.67	-11.27	42.11	30.84	43.50	-12.66	Peak
4	219.65	-11.42	50.66	39.24	46.00	-6.76	Peak
5	333.54	-7.73	32.48	24.75	46.00	-21.25	Peak
6	690.47	-1.51	28.91	27.40	46.00	-18.60	Peak

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