



TEST REPORT

Applicant Name : Bytech NY Inc.
Address : 2585 West 13th Street Brooklyn NY 11223 USA
Report Number : SZNS220128-03812E-RF-00-Rev 1
FCC ID: 2AHN6-OPCP521

Test Standard (s)

FCC Part 15C

Sample Description

Product Type: 10W Light Up Charging Pad-BK
Model No.: BY-OP-CP-521-BK
Multiple Model(s) No.: N/A
Trade Mark: **BYTECH**[®]
Date Received: 2022/01/28
Date of Test: 2022/02/17~2022/02/21
Report Date: 2022/04/22

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 "*" .

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DOCUMENT REVISION HISTORY

Revision Number	Description of Revision	Date of Revision
0	Initial	2022/03/04
1	Add the note of the worst case mode recorded on page 11, page 15, page 19	2022/04/22

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	115-205kHz
Antenna Type	Coil
Input Voltage	DC 5V/9V from adapter
Output Power	5W/7.5W/10W
Application Scenarios	Desktop
UPC Number	805112086627
SKU Number	6025112
Lot Number	BY032022
PO No	NJ.7981
Sample serial number	SZNS220128-03812E-RF-S1 (Assigned by ATC)
Sample/EUT Status	Good condition

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
Unknown	Wireless load	Unknown	Unknown
TECNO	adapter	U330TSA	Unknown

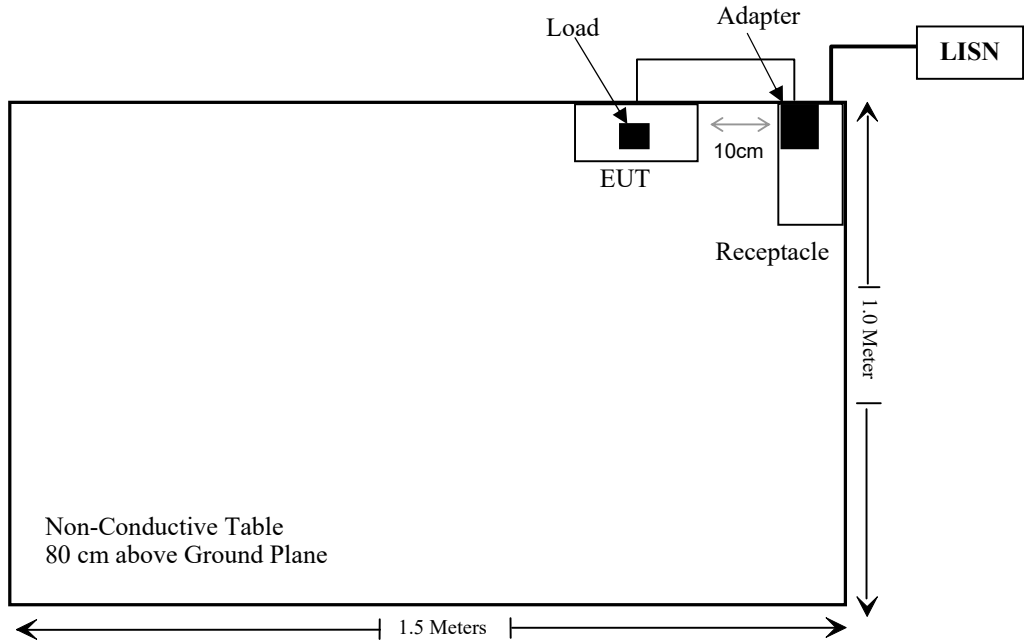
Adapter specification: Input: AC 100-240V 50/60Hz 1.5A
Output: DC 5.0V 3A 15.0W or 10.0V 3.3A 33.0W

External I/O Cable

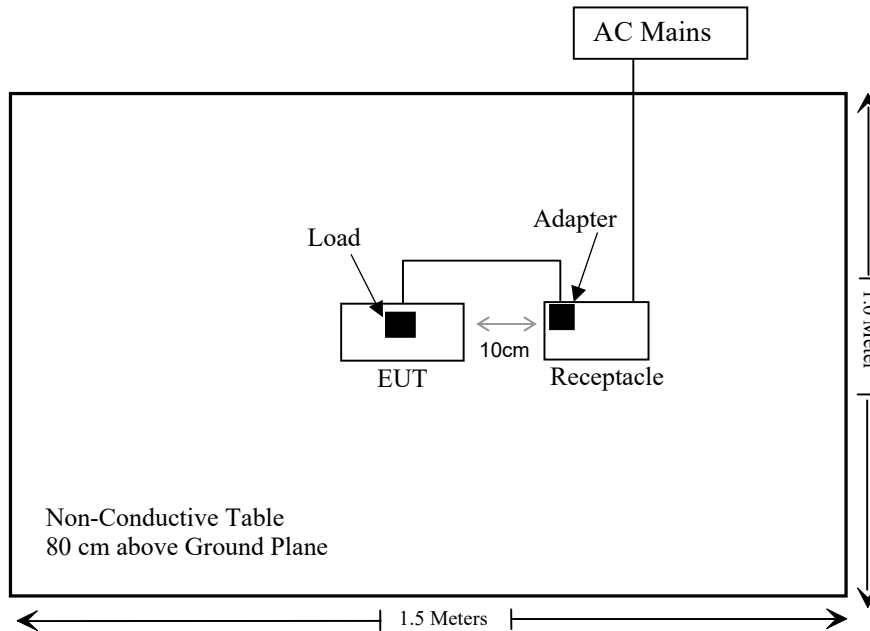
Cable Description	Length (m)	From Port	To
Unshielded Un-Detachable DC Cable	0.5	Adapter	EUT

Block Diagram of Test Setup

For conducted emission:



For Radiated Emission:



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	Electric and Magnetic Field Analyzer	EHP-200AC	180ZX10204	2021/06/07	2024/06/06
Narda	USB-RS232 Converter	Unknown	20042558	NCR	NCR
Narda	Software	EHP200-TS	Unknown	NCR	NCR
Conducted Emissions Test					
Rohde& Schwarz	EMI Test Receiver	ESCI	100784	2021/12/13	2022/12/12
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2021/12/13	2022/12/12
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2021/12/13	2022/12/12
Unknown	RF Coaxial Cable	No.17	N0350	2021/12/14	2022/12/13
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	2021/12/22	2024/12/21
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
Unknown	RF Coaxial Cable	No.14	N800	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;

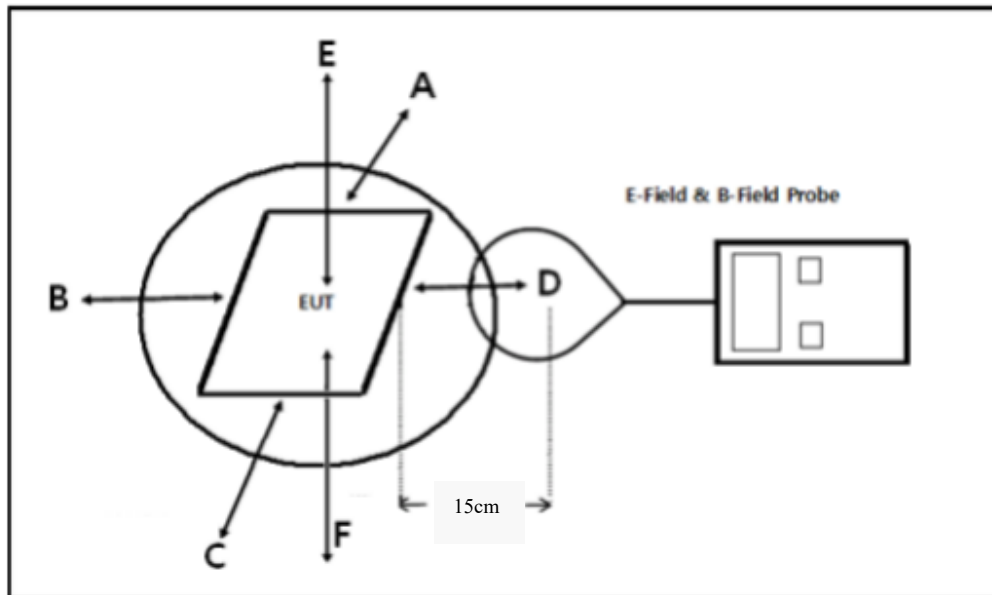
According with KDB 680106 D01 RF Exposure Wireless Charging Apps v03r01 clause 3 c)

- 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: According to KDB 680106 D01 v03r01, section 5(b)(6), 15cm for surrounding, 20 cm for Top test.

Test Data

Environmental Conditions

Temperature:	25.2°C
Relative Humidity:	52%
ATM Pressure:	101.0 kPa

The testing was performed by Black Ding on 2022-02-21.

Test Mode: Wireless Charging

Note: EUT support 5W, 7.5W and 10W wireless output, pre-scan use the wireless load set at 5W, 7.5W and 10W to lead the EUT operate at 5W, 7.5W and 10W full power output, the worst case 10W was recorded in report.

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)
115-205	0.131	0.130	0.141	0.147	0.189	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)
115-205	0.539	0.534	0.582	0.598	0.685	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 v03r01 clause 5 b:**

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

Yes, the operation frequency is 115-205kHz.

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

Yes, the maximum output power of primary coil is 10Watts.

(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 coil 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.

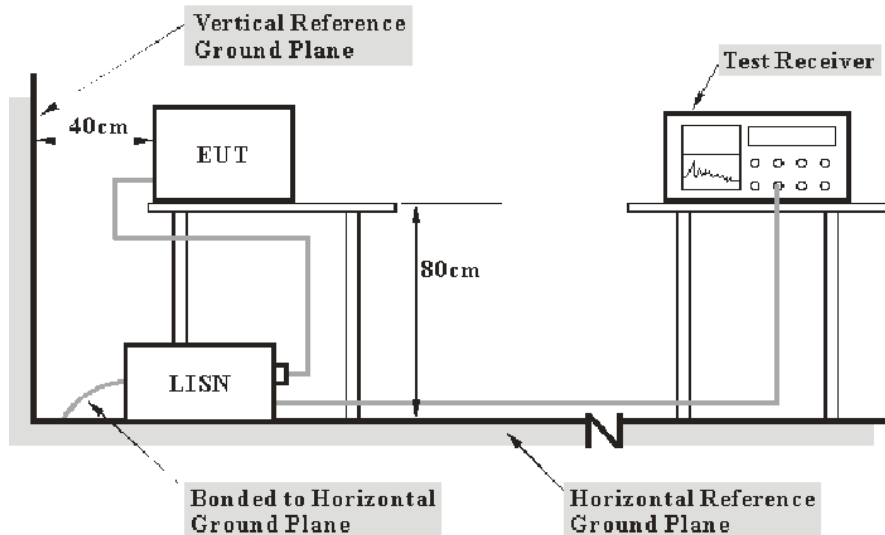
Result: Compliant.

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

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

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:

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

Test Data

Environmental Conditions

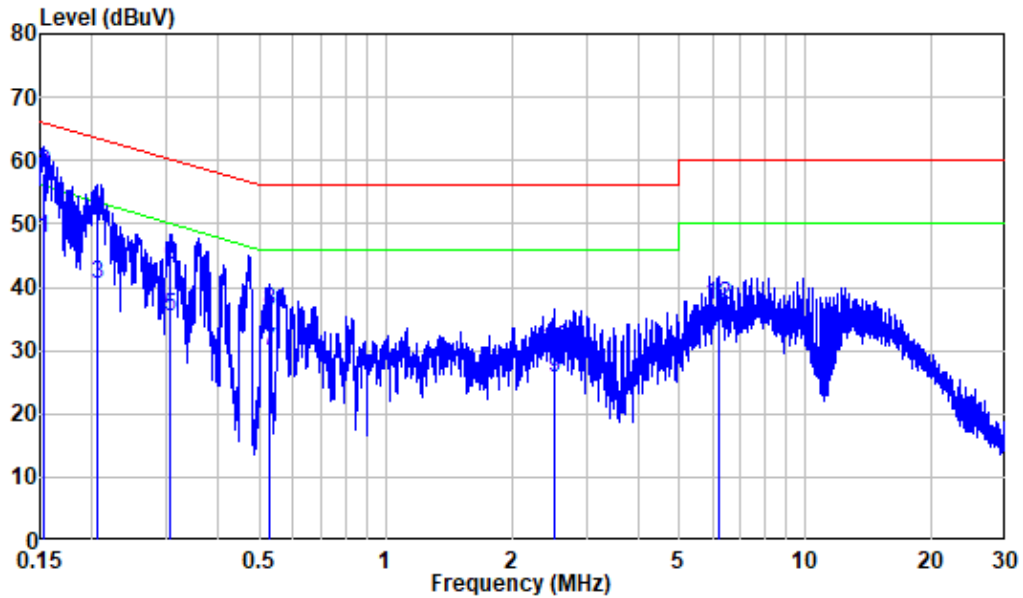
Temperature:	23 °C
Relative Humidity:	53 %
ATM Pressure:	101.0 kPa

The testing was performed by Bin Deng on 2022-02-17.

Test Mode: Wireless Charging

Note: EUT support 5W, 7.5W and 10W wireless output, pre-scan use the wireless load set at 5W, 7.5W and 10W to lead the EUT operate at 5W, 7.5W and 10W full power output, the worst case 10W was recorded in report.

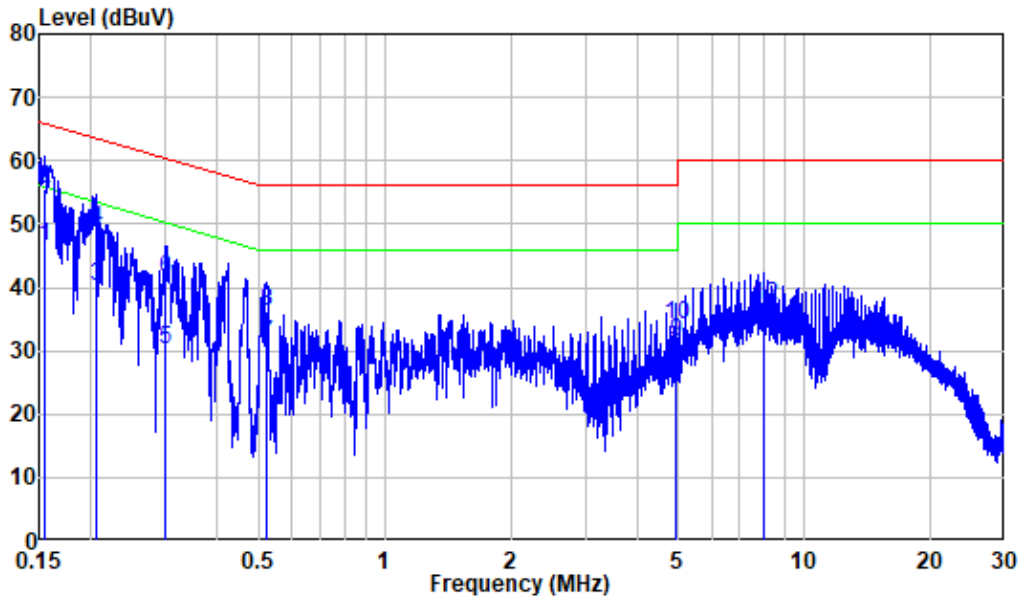
AC 120 V/60 Hz, Line:



Site : Shielding Room
 Condition: Line
 Mode : FULL LOAD
 Model : BY-OP-CP-521-BK
 Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.153	9.89	37.79	47.68	55.83	-8.15	Average
2	0.153	9.89	47.94	57.83	65.83	-8.00	QP
3	0.206	9.80	30.67	40.47	53.38	-12.91	Average
4	0.206	9.80	40.85	50.65	63.38	-12.73	QP
5	0.308	9.80	25.42	35.22	50.03	-14.81	Average
6	0.308	9.80	33.67	43.47	60.03	-16.56	QP
7	0.526	9.81	19.97	29.78	46.00	-16.22	Average
8	0.526	9.81	26.42	36.23	56.00	-19.77	QP
9	2.522	9.93	15.83	25.76	46.00	-20.24	Average
10	2.522	9.93	20.41	30.34	56.00	-25.66	QP
11	6.186	10.04	23.00	33.04	50.00	-16.96	Average
12	6.186	10.04	27.23	37.27	60.00	-22.73	QP

AC 120V/ 60 Hz, Neutral:



Site : Shielding Room
 Condition: Neutral
 Mode : FULL LOAD
 Model : BY-OP-CP-521-BK
 Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.155	9.80	36.72	46.52	55.73	-9.21	Average
2	0.155	9.80	45.84	55.64	65.73	-10.09	QP
3	0.205	9.80	30.45	40.25	53.40	-13.15	Average
4	0.205	9.80	39.27	49.07	63.40	-14.33	QP
5	0.301	9.80	20.36	30.16	50.21	-20.05	Average
6	0.301	9.80	31.50	41.30	60.21	-18.91	QP
7	0.521	9.81	21.17	30.98	46.00	-15.02	Average
8	0.521	9.81	26.27	36.08	56.00	-19.92	QP
9	4.936	9.89	21.63	31.52	46.00	-14.48	Average
10	4.936	9.89	24.09	33.98	56.00	-22.02	QP
11	7.972	9.98	22.76	32.74	50.00	-17.26	Average
12	7.972	9.98	27.06	37.04	60.00	-22.96	QP

FCC §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

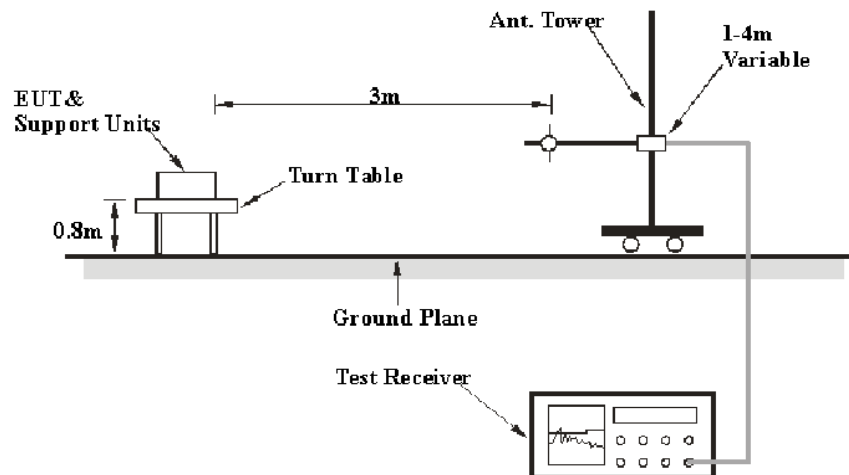
As per FCC Part 15.209

(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



Note: for 9kHz-30MHz, the lowest height of loop antenna is set at 1m above the ground, and three antenna orientations separately (parallel, perpendicular, and ground-parallel).

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 Factor & Margin Calculation

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

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

Test Data

Environmental Conditions

Temperature:	21 °C
Relative Humidity:	62 %
ATM Pressure:	101 kPa

The testing was performed by Chao Mo on 2022-02-17 for below 30MHz and 2022-02-17 for below 1GHz.

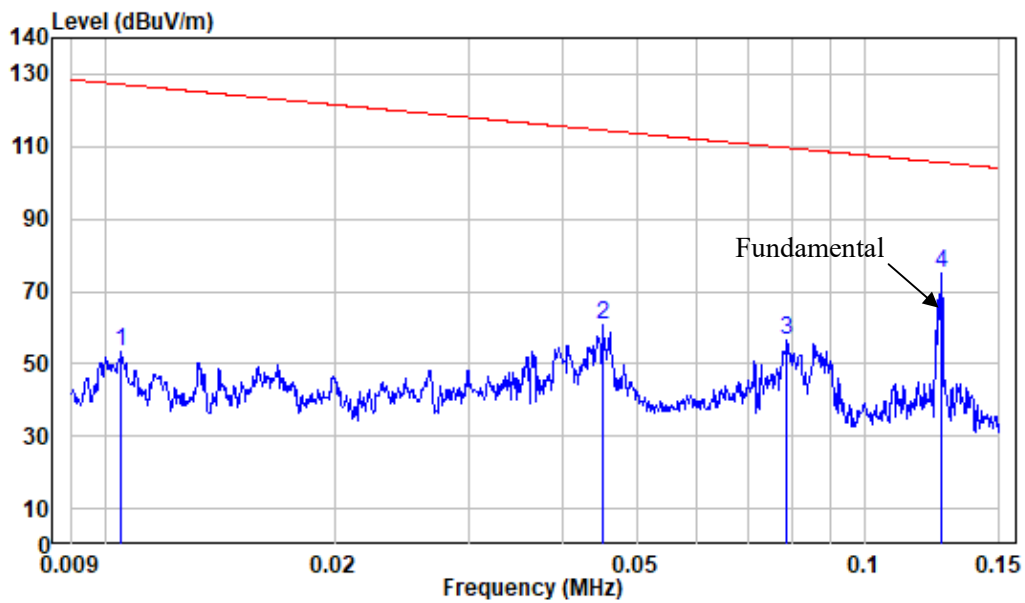
Test Mode: Wireless Charging

Note 1: EUT support 5W, 7.5W and 10W wireless output, pre-scan use the wireless load set at 5W, 7.5W and 10W to lead the EUT operate at 5W, 7.5W and 10W full power output, the worst case 10W was recorded in report.

Note 2: When the result of peak less than the limit of QP more than 6dB, just peak value was recorded.

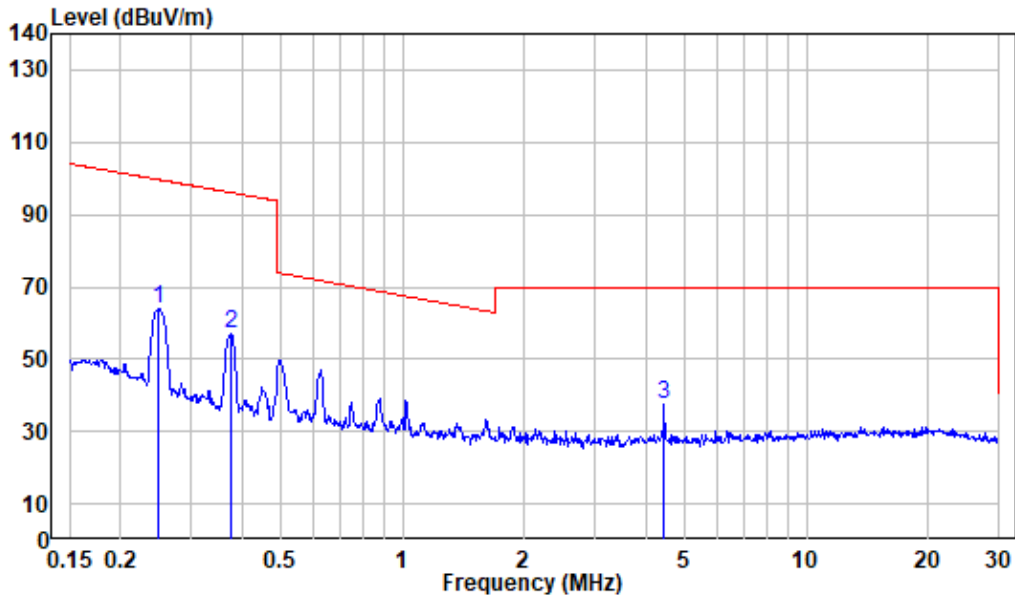
9 kHz~30MHz:

Note: Prescan loop antenna in three antenna orientations separately (parallel, perpendicular, and ground-parallel), the worst case parallel was recorded.



Site : chamber
 Condition: 3m
 EUT : 10W Light up Charging Pad-bk
 Mode : Charging

	Freq	Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.011	-11.38	64.54	53.16	127.18	-74.02	Peak
2	0.045	-11.56	72.36	60.80	114.49	-53.69	Peak
3	0.079	-11.58	67.86	56.28	109.68	-53.40	Peak
4	0.126	-11.84	87.10	75.26	105.60	-30.34	Peak

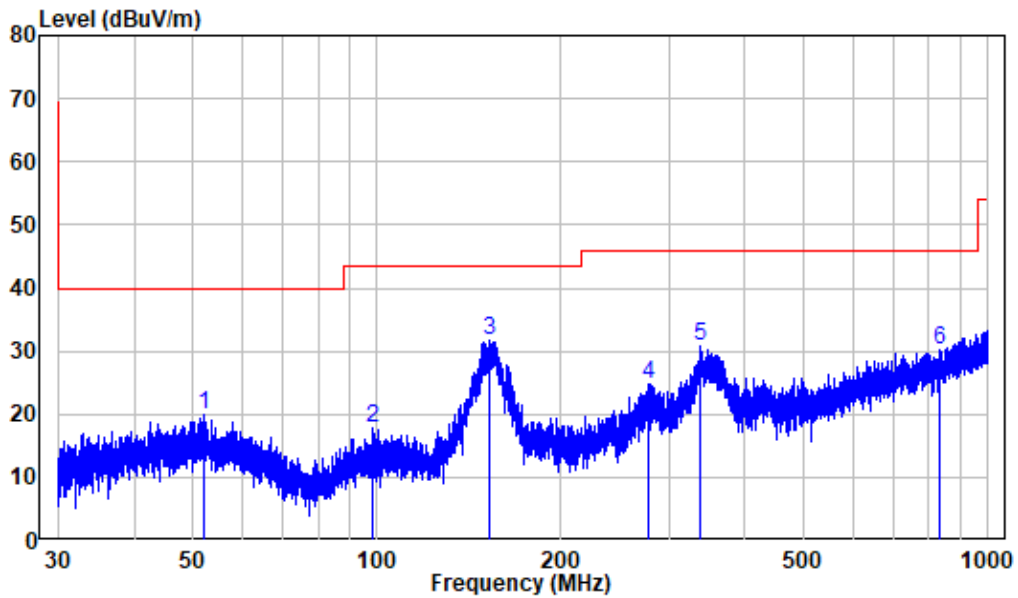


Site : chamber
 Condition: 3m
 EUT : 10W Light up Charging Pad-bk
 Mode : Charging

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.249	-11.89	75.68	63.79	99.66	-35.87	Peak
2	0.377	-11.73	68.71	56.98	96.07	-39.09	Peak
3	4.430	-11.69	49.12	37.43	69.54	-32.11	Peak

30MHz~1GHz:

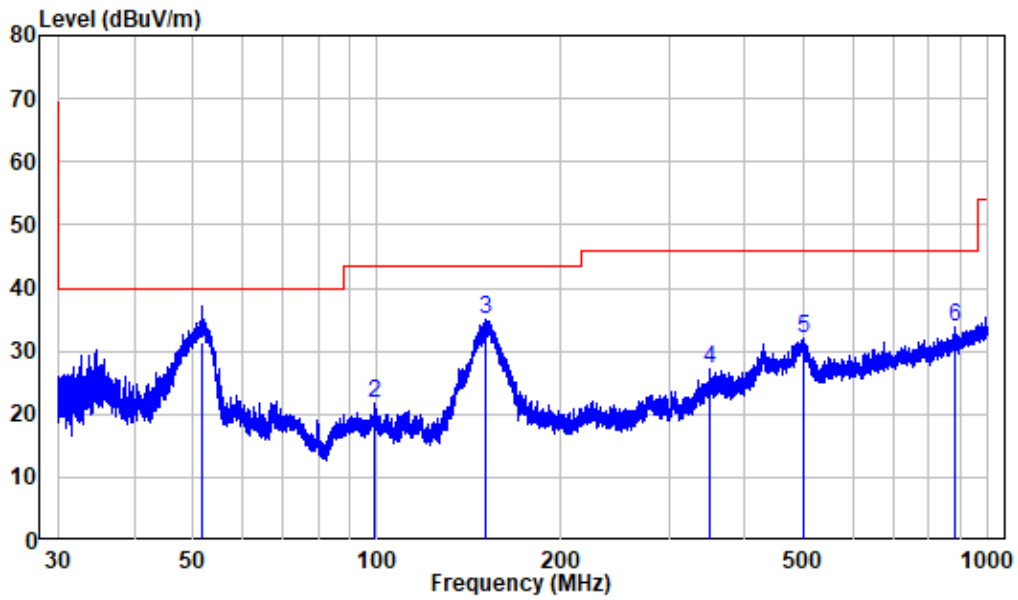
Horizontal



Site : chamber
 Condition: 3m HORIZONTAL
 EUT : 10W Light up Charging Pad-bk
 Mode : Charging

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	52.071	-9.98	29.99	20.01	40.00	-19.99	Peak
2	97.970	-12.25	29.91	17.66	43.50	-25.84	Peak
3	152.664	-15.11	46.89	31.78	43.50	-11.72	Peak
4	278.311	-9.69	34.58	24.89	46.00	-21.11	Peak
5	337.216	-7.53	38.23	30.70	46.00	-15.30	Peak
6	835.145	0.20	30.00	30.20	46.00	-15.80	Peak

Vertical



Site : chamber
 Condition: 3m VERTICAL
 EUT : 10W Light up Charging Pad-bk
 Mode : Charging

	Freq	Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	51.616	-9.96	41.46	31.50	40.00	-8.50	QP
2	98.963	-12.04	33.90	21.86	43.50	-21.64	Peak
3	150.934	-15.21	50.30	35.09	43.50	-8.41	Peak
4	350.016	-7.31	34.40	27.09	46.00	-18.91	Peak
5	498.987	-4.29	36.24	31.95	46.00	-14.05	Peak
6	885.667	1.03	32.70	33.73	46.00	-12.27	Peak

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