



中认信通

CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)



TEST REPORT

Applicant: SP United China

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DIST HOUIE TOWN DONGGUAN CITY GUANGDONG
PROVINCE CHINA

FCC ID: 2ASMH-PCB019

Product Name: Wireless power bank

**Standard(s): 47 CFR Part 15, Subpart C
ANSI C63.10-2013**

The above equipment has been tested and found compliant with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

Report Number: CR230207083-00

Date Of Issue: 2023/7/22

Reviewed By: Sun Zhong *Sun Zhong*

Title: Manager

Test Laboratory: China Certification ICT Co., Ltd (Dongguan)

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Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 442868, the FCC Designation No. : CN1314.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0123.

Declarations

China Certification ICT Co., Ltd (Dongguan) 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 a triangle symbol “▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230207083-00	Original Report	2023/4/17
2.0	CR230207083-00	Update Section 5	2023/7/22

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Wireless power bank
EUT Model:	PCB019
Operation Frequency:	137 kHz
Rated Input Voltage:	DC 5V 2.6A/9V 2A from USB
Wireless Output:	5Watts, 7.5Watts, 10Watts
Serial Number:	229P_1
EUT Received Date:	2023/2/23
EUT Received Status:	Good

Antenna Information Detail ▲:

Antenna Type	input impedance (Ohm)	Frequency Range	Antenna Gain
Coil	50	110-205 kHz	Unknown

The Method of §15.203 Compliance:

- Antenna must be permanently attached to the unit.
- Antenna must use a unique type of connector to attach to the EUT.
- Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Accessory Information:

Accessory Description	Manufacturer	Model
/	/	/

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition:

EUT Operation Mode:	The system was configured for testing in Engineering Mode, which was provided by the manufacturer. The EUT support max 18 Watts input and max 10 Watts wireless output. When charging input and Wireless output work together, the wireless output only support 5 Watts. So select the following modes to test. Test Mode: M1: Charging input by Type-C& Wireless Output 5W M2: Type-C Output 5W & Wireless Output 5W M3: Wireless Output 10W
Equipment Modifications:	No
EUT Exercise Software:	No
Engineering Mode was provided by manufacturer ▲. The maximum power was configured default setting.	

1.2.2 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
SiLiYuan	Wireless Charging Load	MX15W	211013003
Huntkey	Adapter	HKA01105021-XE	0D1805002143
XTOUCH	Phone	S40	04069092900015

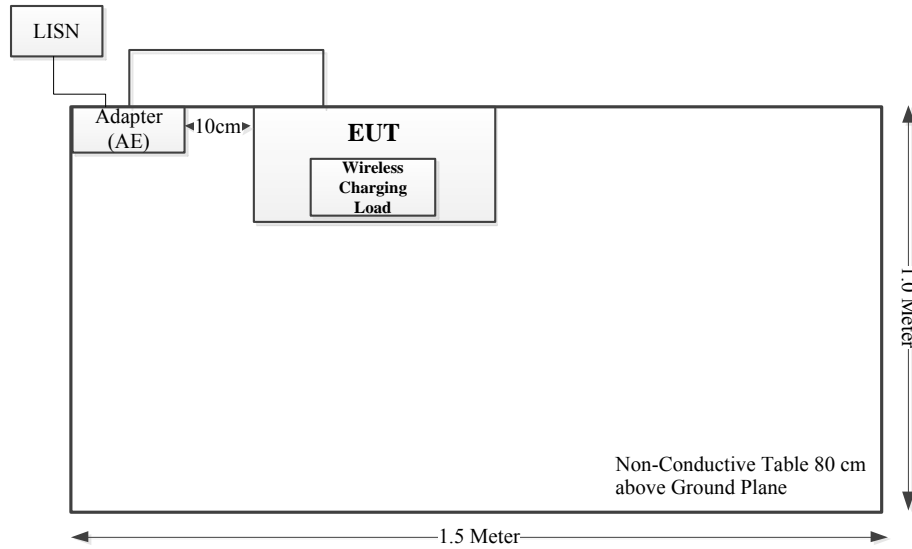
1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	No	No	1	Adapter	EUT
USB Cable	No	No	0.15	Phone	EUT

1.2.4 Block Diagram of Test Setup

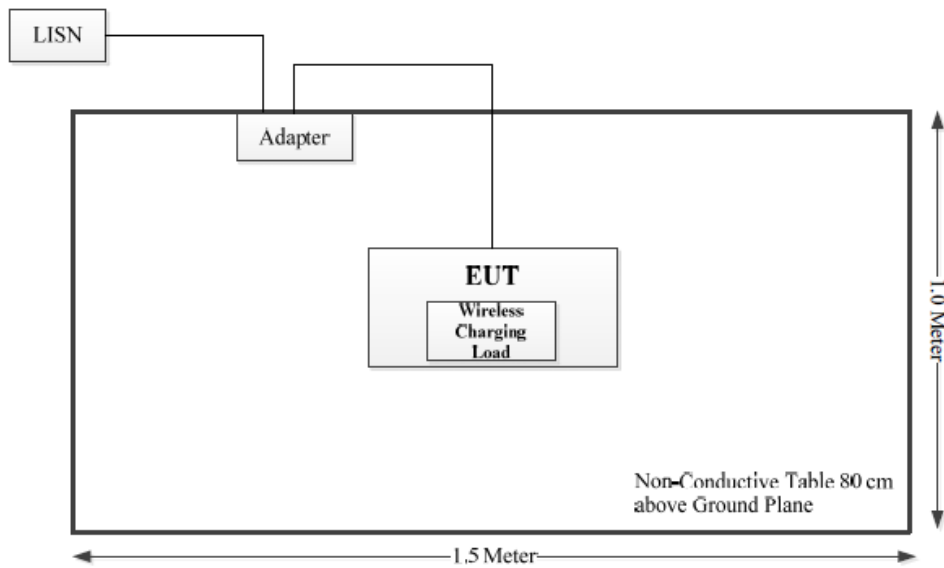
AC Line Conducted Emission:

M1:

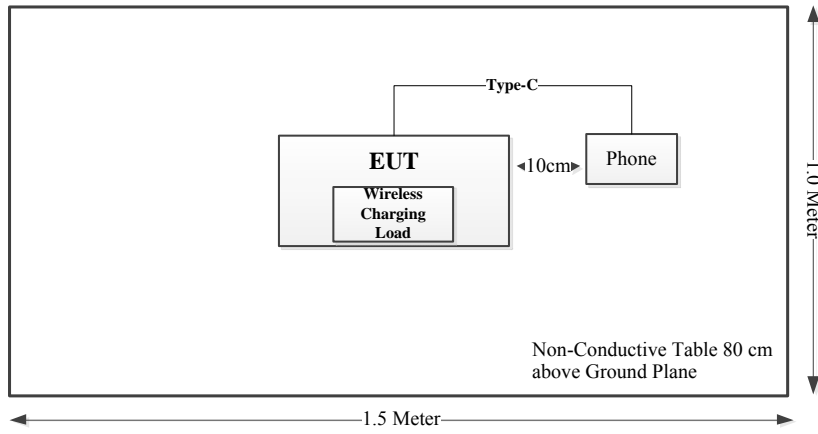


Radiated Emission Test

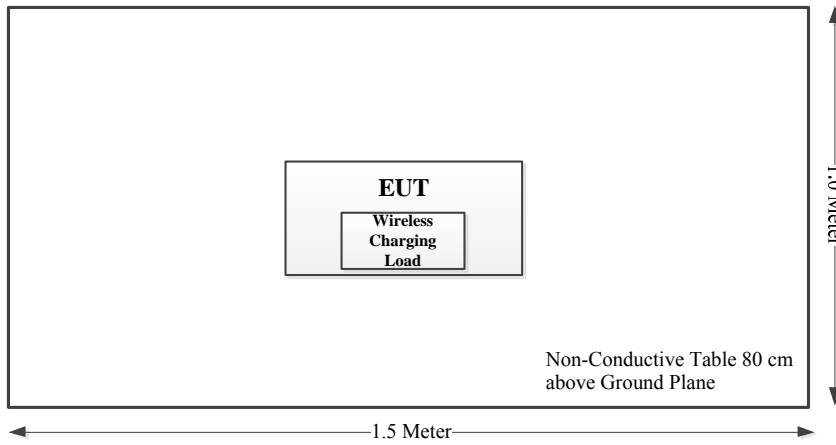
M1:



M2:



M3:



1.3 Measurement Uncertainty

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

Parameter	Measurement Uncertainty
radiated Emissions	9kHz~30MHz: 4.12dB 30M~200MHz: 4.15 dB,200M~1GHz: 5.61 dB,1G~6GHz: 5.14 dB, 6G~18GHz: 5.93 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	2.8 dB (150 kHz to 30 MHz)

2. SUMMARY OF TEST RESULTS

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

3. REQUIREMENTS AND TEST PROCEDURES

3.1 AC Line Conducted Emissions

3.1.1 Applicable Standard

FCC§15.207(a).

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

(b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

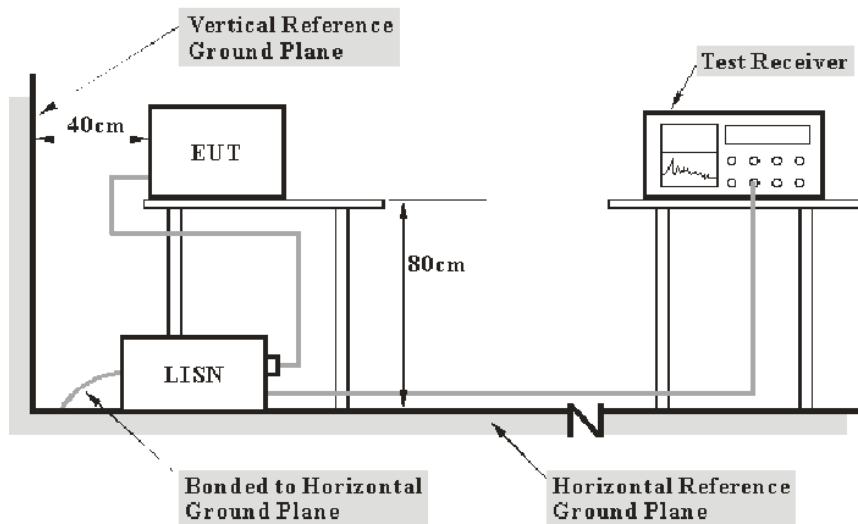
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 μ V within the frequency band 535-1705 kHz, as measured using a 50 μ H/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.205, §15.209, §15.221, §15.223, or §15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

3.1.2 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.

The adapter or EUT was connected to the main LISN with a 125 V/60 Hz AC power source.

3.1.3 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

3.1.4 Test Procedure

The frequency and amplitude of the six highest ac power-line conducted emissions relative to the limit, measured over all the current-carrying conductors of the EUT power cords, and the operating frequency or frequency to which the EUT is tuned (if appropriate), should be reported, unless such emissions are more than 20 dB below the limit. AC power-line conducted emissions measurements are to be separately carried out only on each of the phase (“hot”) line(s) and (if used) on the neutral line(s), but not on the ground [protective earth] line(s). If less than six emission frequencies are within 20 dB of the limit, then the noise level of the measuring instrument at representative frequencies should be reported. The specific conductor of the power-line cord for each of the reported emissions should be identified. Measure the six highest emissions with respect to the limit on each current-carrying conductor of each power cord associated with the EUT (but not the power cords of associated or peripheral equipment that are part of the test configuration). Then, report the six highest emissions with respect to the limit from among all the measurements identifying the frequency and specific current-carrying conductor identified with the emission. The six highest emissions should be reported for each of the current-carrying conductors, or the six highest emissions may be reported over all the current-carrying conductors.

3.1.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$$\text{Result} = \text{Reading} + \text{Factor}$$

$$\text{Factor} = \text{attenuation caused by cable loss} + \text{voltage division factor of AMN}$$

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Result}$$

3.2 Radiation Spurious Emissions

3.2.1 Applicable Standard

FCC §15.209

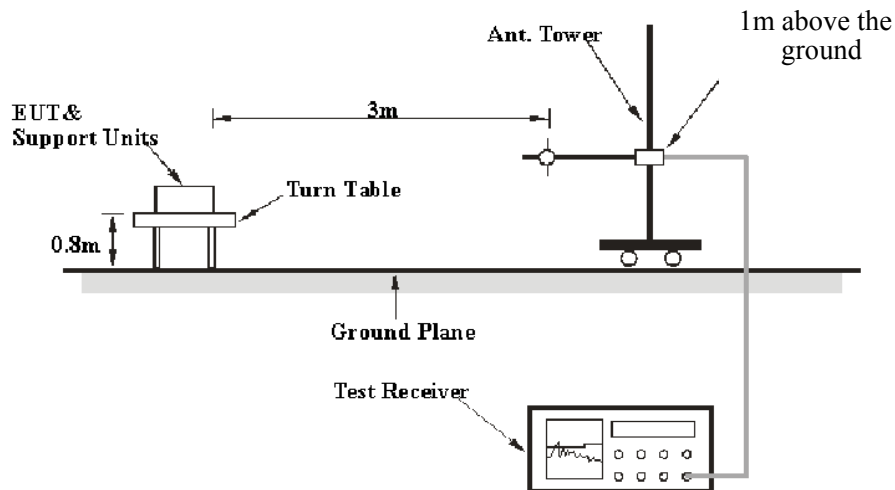
(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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

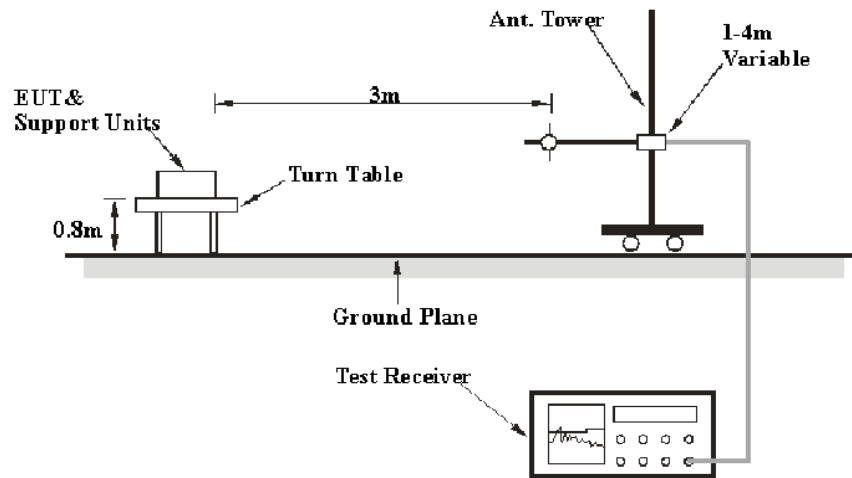
**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this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

3.2.2 EUT Setup

9kHz-30MHz:



30MHz-1GHz:



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 15.209 limits.

The spacing between the peripherals was 10 cm.

For 9kHz-30MHz test, the lowest height of the magnetic antenna shall be 1 m above the ground and three antenna orientations (parallel, perpendicular, and ground-parallel) shall be measured.

3.2.3 EMI Test Receiver & Spectrum Analyzer 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	200 Hz	1 kHz	QP/Average
150 kHz – 30 MHz	9 kHz	30 kHz	QP/Average
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

3.2.4 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor

Factor = Antenna Factor + Cable Loss- Amplifier Gain

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

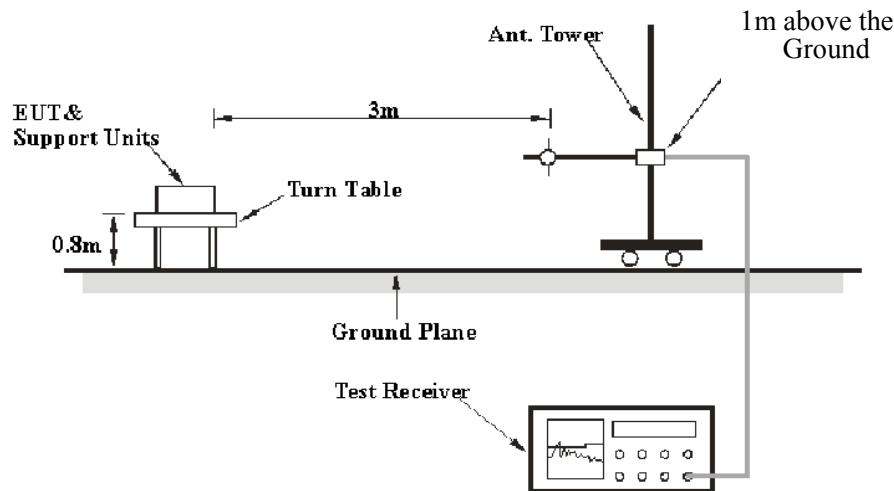
3.3 20 dB Emission Bandwidth:

3.3.1 Applicable Standard

FCC §15.215

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through § 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of band operation.

3.3.2 EUT Setup



3.3.3 Test Procedure

1. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
2. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
3. Measure the 99% Occupied bandwidth use the 99% Occupied bandwidth function of the test equipment.

3.4 Antenna Requirement

3.4.1 Applicable Standard

FCC §15.203

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. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

3.4.2 Judgment

Compliant. Please refer to the Antenna Information detail in Section 1.

4. Test DATA AND RESULTS

4.1 AC Line Conducted Emissions

Serial Number:	229P_1	Test Date:	2023/3/8
Test Site:	CE	Test Mode:	M1
Tester:	Bob Yang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	24	Relative Humidity: (%)	47	ATM Pressure: (kPa)	102
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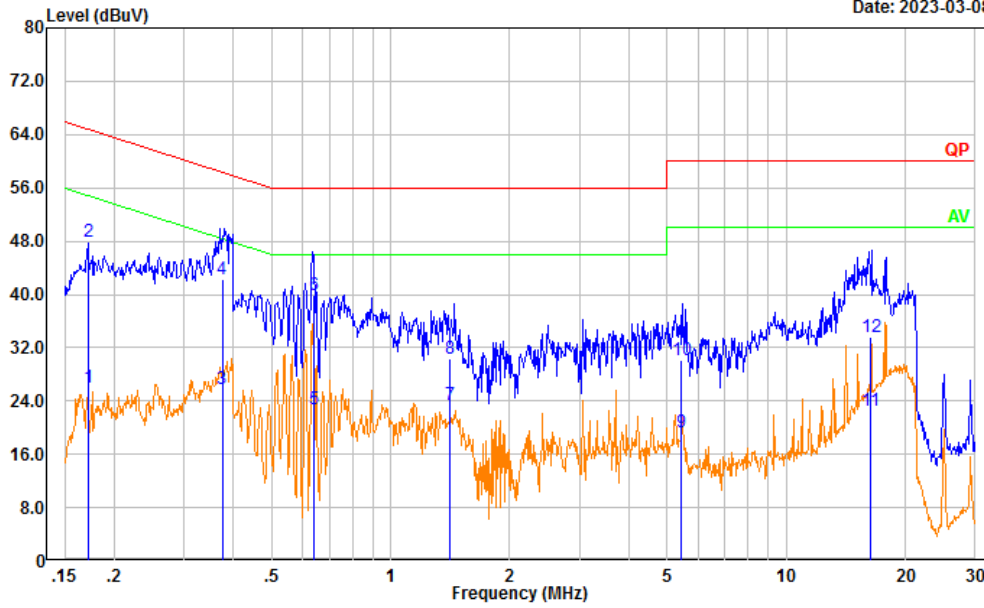
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101134	2022/04/01	2023/03/31
R&S	EMI Test Receiver	ESR3	102726	2022/07/15	2023/07/14
MICRO-COAX	Coaxial Cable	UTIFLEX	C-0200-01	2022/08/07	2023/08/06
Audix	Test Software	E3	190306 (V9)	N/A	N/A

* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Mode: Charging
 Port: Line
 Note:

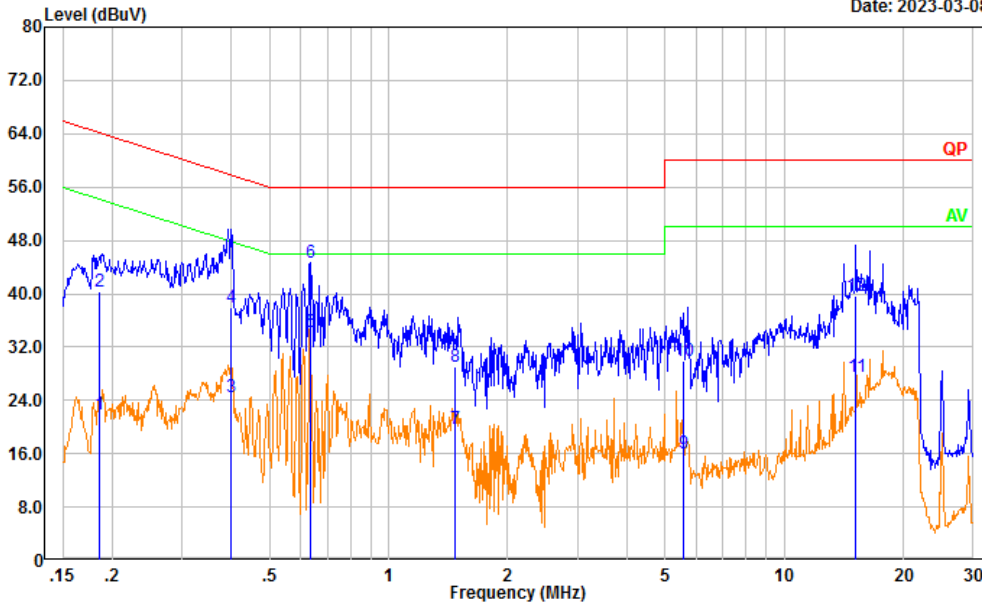
Date: 2023-03-08



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.173	16.32	9.61	25.93	54.83	28.90	Average
2	0.173	38.40	9.61	48.01	64.83	16.82	QP
3	0.375	16.21	9.61	25.82	48.39	22.57	Average
4	0.375	32.56	9.61	42.17	58.39	16.22	QP
5	0.642	13.09	9.62	22.71	46.00	23.29	Average
6	0.642	30.38	9.62	40.00	56.00	16.00	QP
7	1.408	13.75	9.62	23.37	46.00	22.63	Average
8	1.408	20.63	9.62	30.25	56.00	25.75	QP
9	5.426	9.68	9.66	19.34	50.00	30.66	Average
10	5.426	20.49	9.66	30.15	60.00	29.85	QP
11	16.328	12.74	9.72	22.46	50.00	27.54	Average
12	16.328	23.89	9.72	33.61	60.00	26.39	QP

Test Mode: Charging
 Port: neutral
 Note:

Date: 2023-03-08



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.186	12.33	9.61	21.94	54.23	32.29	Average
2	0.186	30.72	9.61	40.33	64.23	23.90	QP
3	0.399	14.91	9.61	24.52	47.87	23.35	Average
4	0.399	28.34	9.61	37.95	57.87	19.92	QP
5	0.636	24.67	9.62	34.29	46.00	11.71	Average
6	0.636	35.01	9.62	44.63	56.00	11.37	QP
7	1.476	10.05	9.62	19.67	46.00	26.33	Average
8	1.476	19.41	9.62	29.03	56.00	26.97	QP
9	5.557	6.37	9.66	16.03	50.00	33.97	Average
10	5.557	20.26	9.66	29.92	60.00	30.08	QP
11	15.187	17.86	9.69	27.55	50.00	22.45	Average
12	15.187	29.90	9.69	39.59	60.00	20.41	QP

4.2 Radiation Spurious Emissions

Serial Number:	229P_1	Test Date:	2023/3/6
Test Site:	966-2	Test Mode:	M1~M3
Tester:	Carl Xue	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	24.2	Relative Humidity: (%)	42	ATM Pressure: (kPa)	102.3
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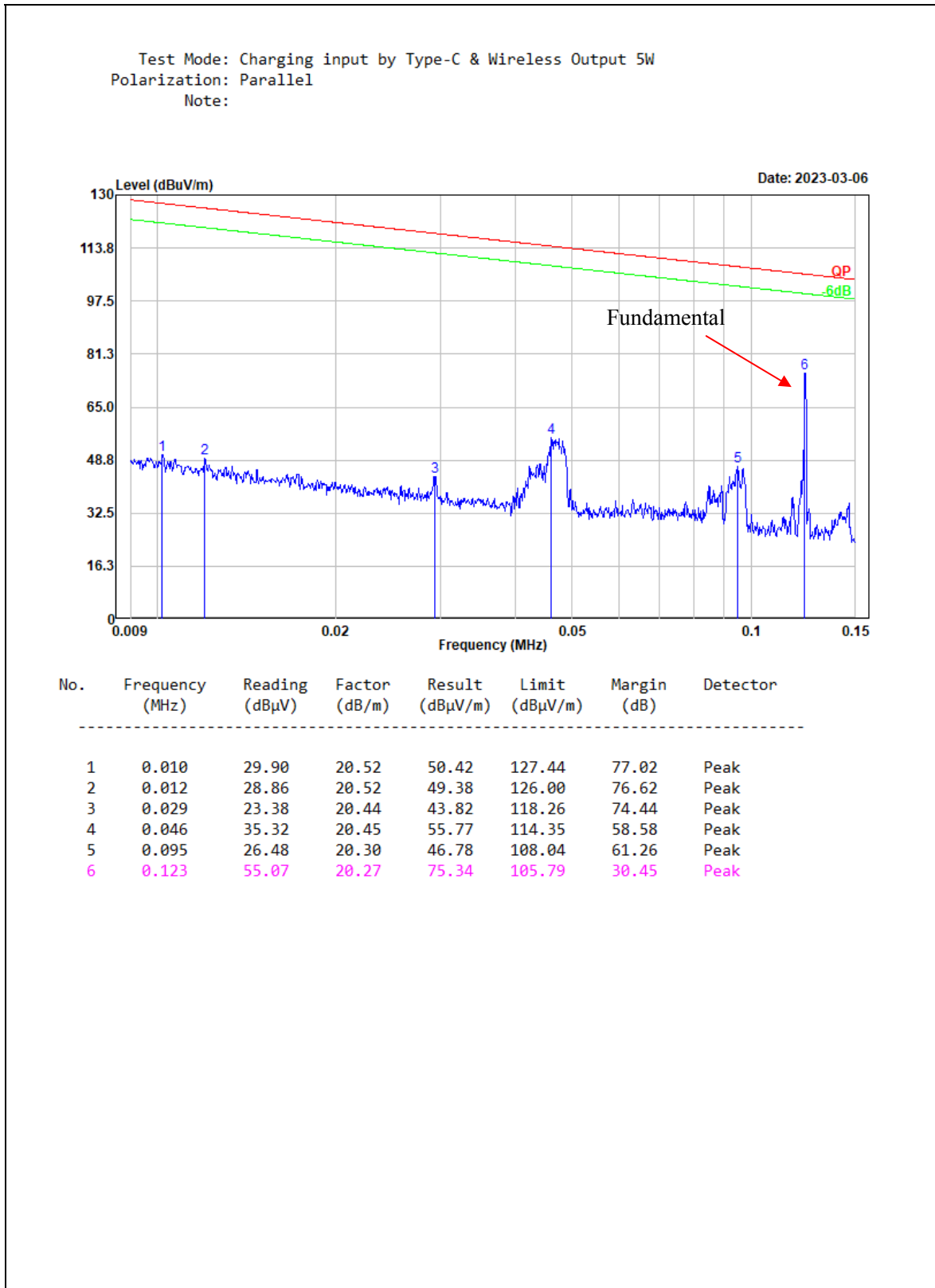
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
TESEQ	HF Loop Antenna	HLA6120	33561	2021/02/03	2024/02/02
Sunol Sciences	Antenna	JB6	A082520-5	2020/10/19	2023/10/18
R&S	EMI Test Receiver	ESR3	102724	2022/07/15	2023/07/14
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2022/07/17	2023/07/16
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2022/07/17	2023/07/16
Sonoma	Amplifier	310N	186165	2022/07/17	2023/07/16
Audix	Test Software	E3	201021 (V9)	N/A	N/A

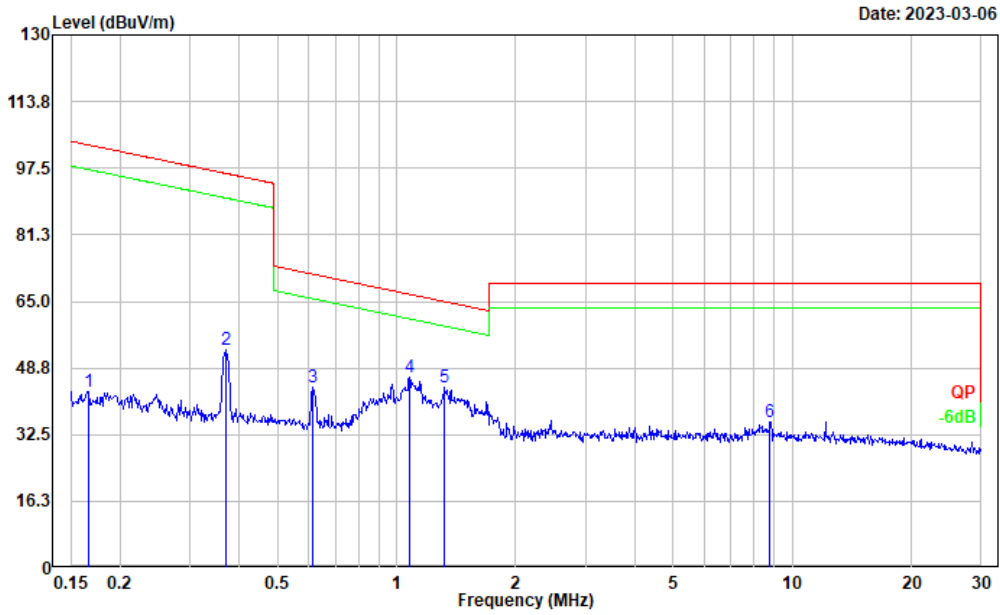
* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

1) 9k-30MHz:

M1:

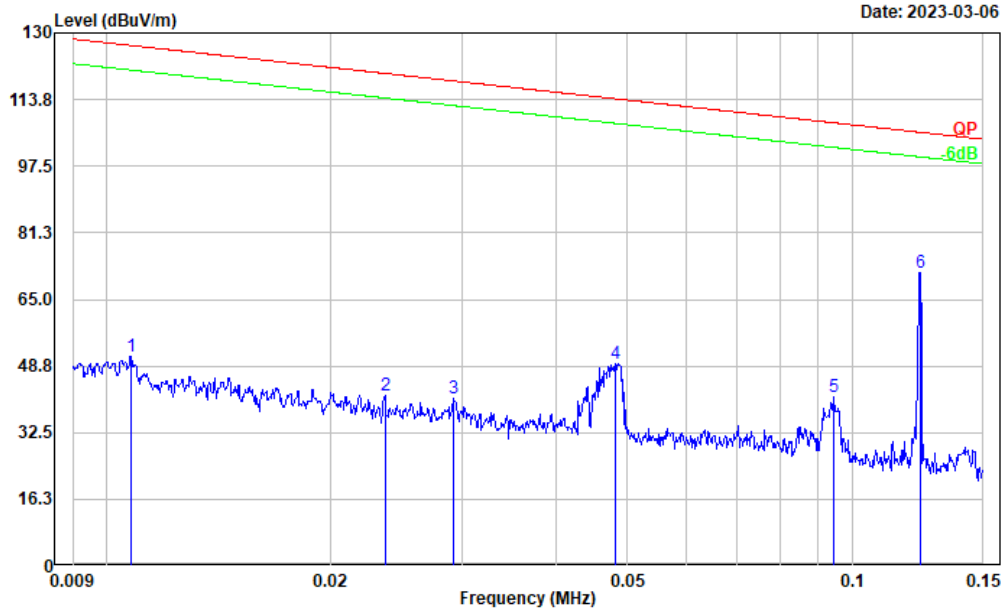


Test Mode: Charging input by Type-C & Wireless Output 5W
 Polarization: Parallel
 Note:



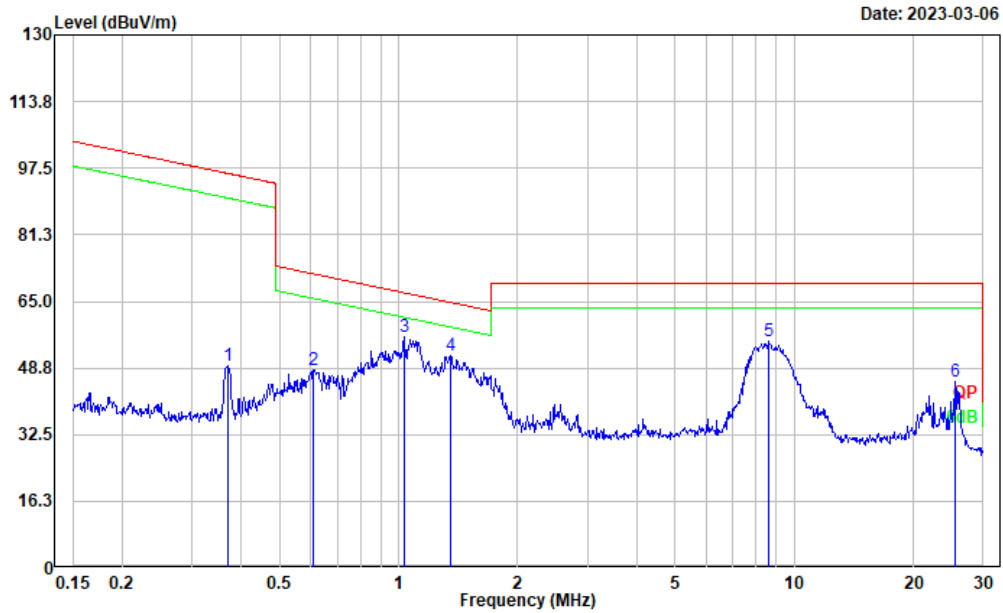
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.166	22.75	20.27	43.02	103.21	60.19	Peak
2	0.371	32.89	20.14	53.03	96.21	43.18	Peak
3	0.614	23.85	20.09	43.94	71.80	27.86	Peak
4	1.077	26.25	20.09	46.34	66.82	20.48	Peak
5	1.324	23.90	20.07	43.97	64.98	21.01	Peak
6	8.776	15.40	20.32	35.72	69.54	33.82	Peak

Test Mode: Charging input by Type-C & Wireless Output 5W
 Polarization: Perpendicular
 Note:



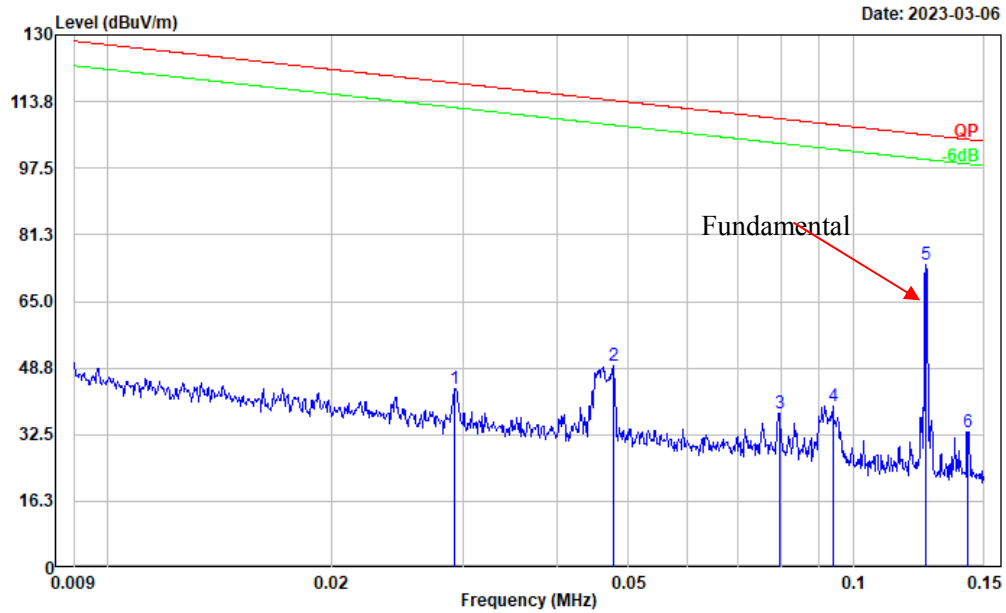
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.011	30.59	20.52	51.11	126.96	75.85	Peak
2	0.024	20.95	20.46	41.41	120.14	78.73	Peak
3	0.029	20.38	20.44	40.82	118.31	77.49	Peak
4	0.048	28.87	20.45	49.32	113.96	64.64	Peak
5	0.095	20.80	20.31	41.11	108.09	66.98	Peak
6	0.124	51.41	20.27	71.68	105.77	34.09	Peak

Test Mode: Charging input by Type-C & Wireless Output 5W
 Polarization: Perpendicular
 Note:



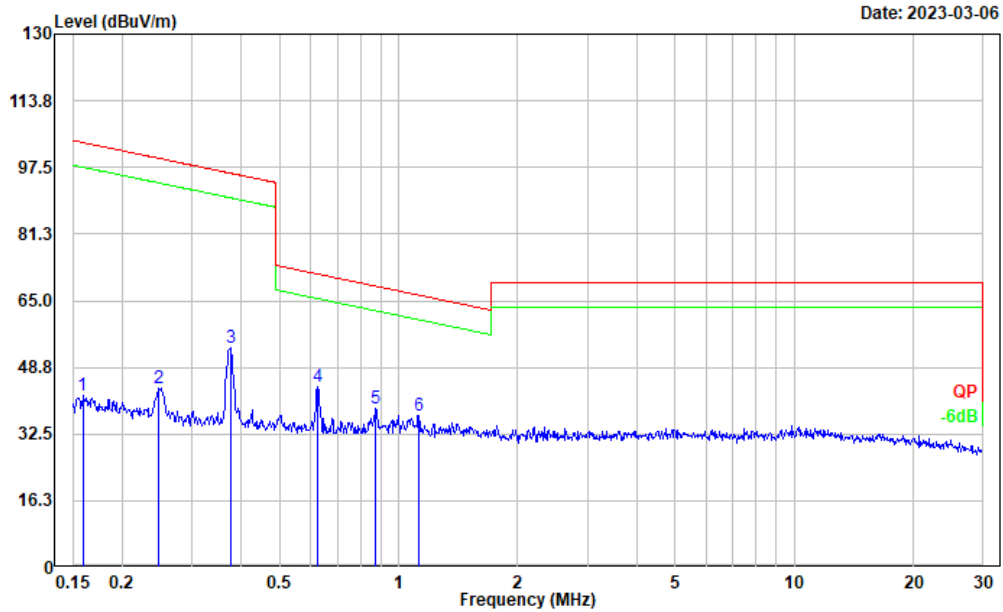
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.369	29.33	20.15	49.48	96.26	46.78	Peak
2	0.611	28.30	20.09	48.39	71.85	23.46	Peak
3	1.032	36.13	20.10	56.23	67.19	10.96	Peak
4	1.352	31.59	20.06	51.65	64.80	13.15	Peak
5	8.592	35.03	20.30	55.33	69.54	14.21	Peak
6	25.456	25.11	20.40	45.51	69.54	24.03	Peak

Test Mode: Charging input by Type-C & Wireless Output 5W
 Polarization: Ground-parallel
 Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.029	23.39	20.44	43.83	118.28	74.45	Peak
2	0.048	28.74	20.45	49.19	114.03	64.84	Peak
3	0.080	17.46	20.40	37.86	109.58	71.72	Peak
4	0.094	19.23	20.31	39.54	108.14	68.60	Peak
5	0.125	53.70	20.27	73.97	105.65	31.68	Peak
6	0.143	12.98	20.27	33.25	104.52	71.27	Peak

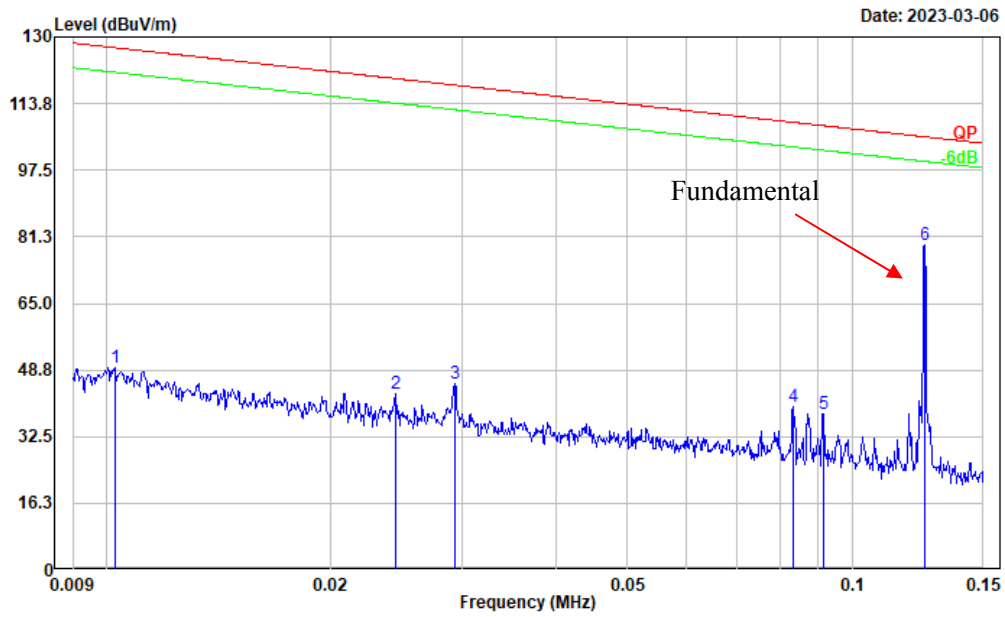
Test Mode: Charging input by Type-C & Wireless Output 5W
 Polarization: Ground-parallel
 Note:



No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	0.159	21.54	20.27	41.81	103.58	61.77	Peak
2	0.248	23.47	20.17	43.64	99.71	56.07	Peak
3	0.375	33.35	20.14	53.49	96.12	42.63	Peak
4	0.624	23.87	20.09	43.96	71.66	27.70	Peak
5	0.876	18.66	20.11	38.77	68.65	29.88	Peak
6	1.123	16.90	20.10	37.00	66.44	29.44	Peak

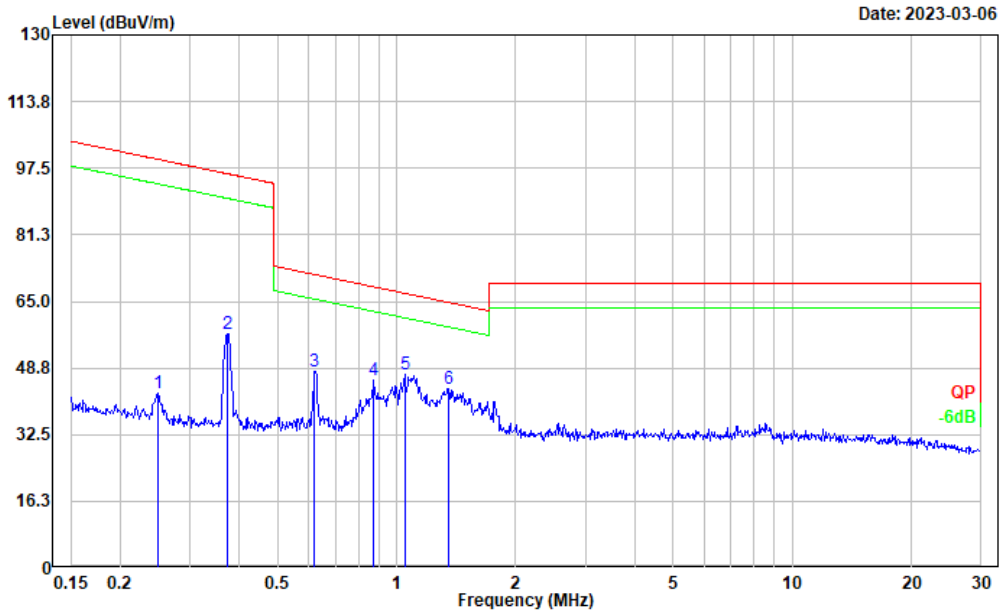
M2:

Test Mode: Type-C Output 5W & Wireless Output 5W
 Polarization: Parallel
 Note:



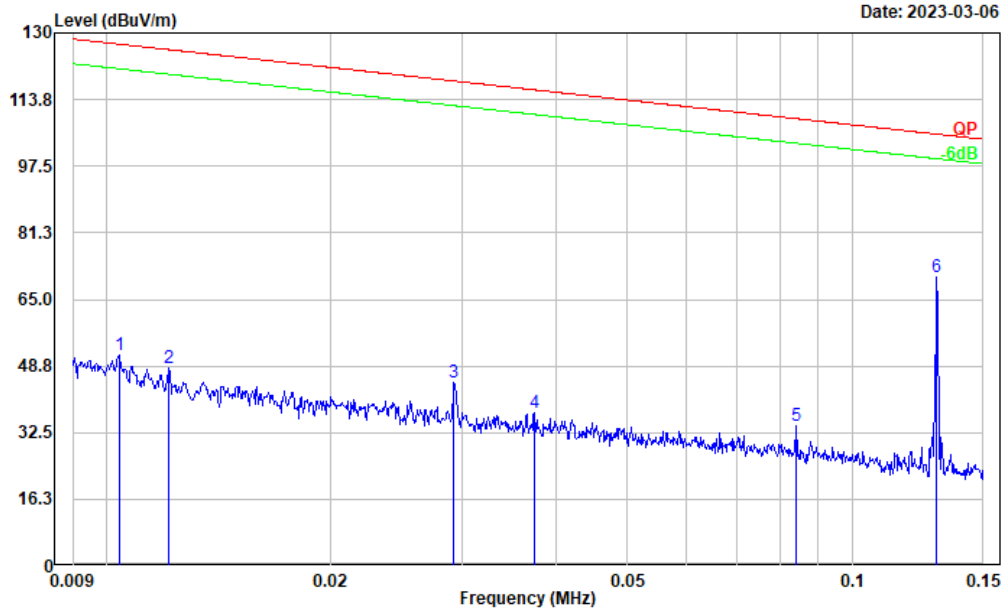
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.010	28.85	20.52	49.37	127.40	78.03	Peak
2	0.024	22.42	20.44	42.86	119.84	76.98	Peak
3	0.029	25.16	20.44	45.60	118.26	72.66	Peak
4	0.083	19.51	20.37	39.88	109.19	69.31	Peak
5	0.091	17.88	20.33	38.21	108.38	70.17	Peak
6	0.125	59.02	20.27	79.29	105.65	26.36	Peak

Test Mode: Type-C Output 5W & Wireless Output 5W
 Polarization: Parallel
 Note:



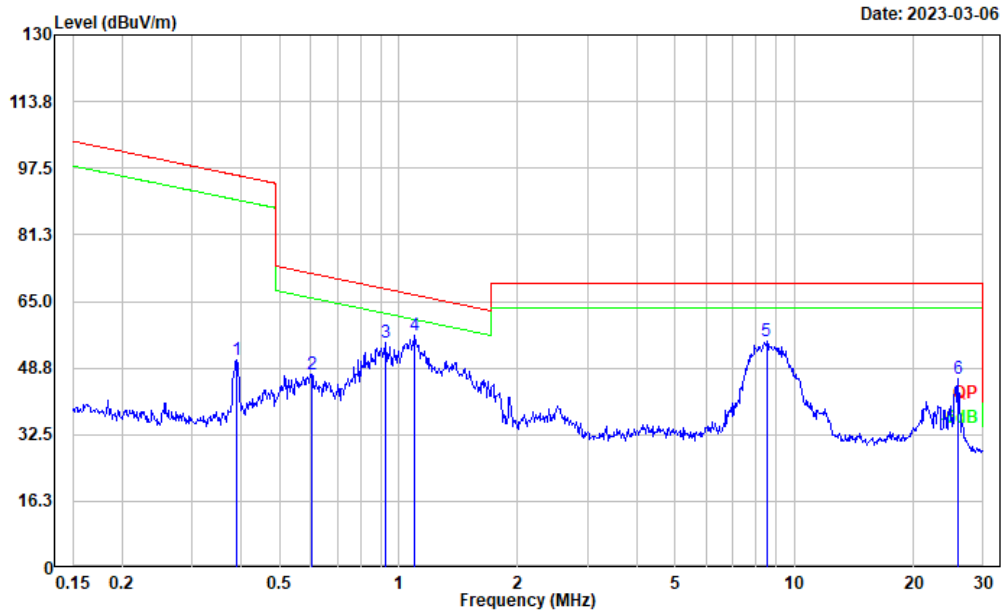
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.249	22.42	20.17	42.59	99.66	57.07	Peak
2	0.373	36.93	20.14	57.07	96.17	39.10	Peak
3	0.621	27.77	20.09	47.86	71.71	23.85	Peak
4	0.876	25.59	20.11	45.70	68.65	22.95	Peak
5	1.049	27.01	20.10	47.11	67.05	19.94	Peak
6	1.352	23.58	20.06	43.64	64.80	21.16	Peak

Test Mode: Type-C Output 5W & Wireless Output 5W
 Polarization: Perpendicular
 Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.010	31.02	20.52	51.54	127.27	75.73	Peak
2	0.012	27.70	20.52	48.22	125.93	77.71	Peak
3	0.029	24.47	20.44	44.91	118.28	73.37	Peak
4	0.037	17.00	20.44	37.44	116.13	78.69	Peak
5	0.084	13.76	20.36	34.12	109.09	74.97	Peak
6	0.130	50.26	20.27	70.53	105.33	34.80	Peak

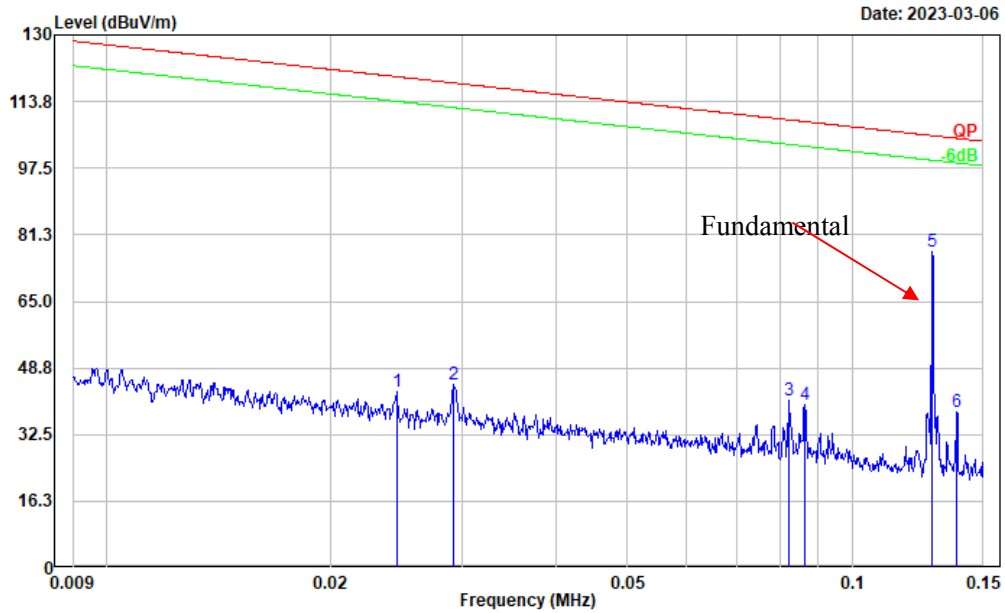
Test Mode: Type-C Output 5W & Wireless Output 5W
 Polarization: Perpendicular
 Note:



Date: 2023-03-06

No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.389	30.43	20.14	50.57	95.80	45.23	Peak
2	0.601	27.27	20.09	47.36	71.99	24.63	Peak
3	0.928	34.89	20.11	55.00	68.13	13.13	Peak
4	1.100	36.78	20.09	56.87	66.63	9.76	Peak
5	8.501	34.89	20.29	55.18	69.54	14.36	Peak
6	26.001	25.82	20.39	46.21	69.54	23.33	Peak

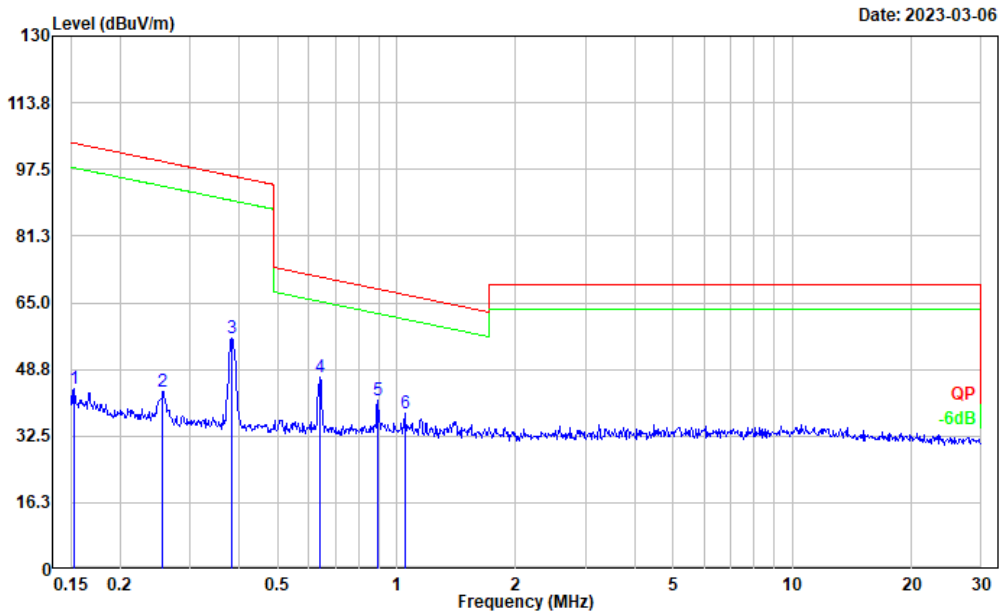
Test Mode: Type-C Output 5W & Wireless Output 5W
 Polarization: Ground-parallel
 Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.025	22.59	20.44	43.03	119.82	76.79	Peak
2	0.029	24.25	20.44	44.69	118.28	73.59	Peak
3	0.082	20.43	20.38	40.81	109.29	68.48	Peak
4	0.086	19.56	20.36	39.92	108.87	68.95	Peak
5	0.128	56.80	20.27	77.07	105.45	28.38	Peak
6	0.138	17.69	20.27	37.96	104.79	66.83	Peak

Test Mode: Type-C Output 5W & Wireless Output 5W
 Polarization: Ground-parallel

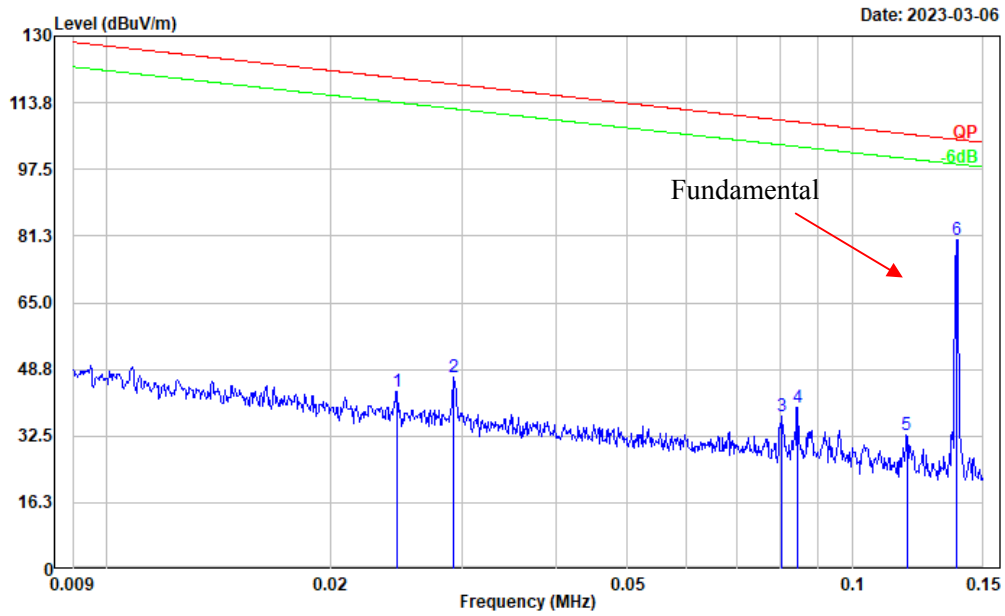
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.153	23.60	20.27	43.87	103.90	60.03	Peak
2	0.256	23.32	20.18	43.50	99.43	55.93	Peak
3	0.383	36.11	20.14	56.25	95.94	39.69	Peak
4	0.641	26.77	20.09	46.86	71.42	24.56	Peak
5	0.894	21.07	20.11	41.18	68.46	27.28	Peak
6	1.049	17.93	20.10	38.03	67.05	29.02	Peak

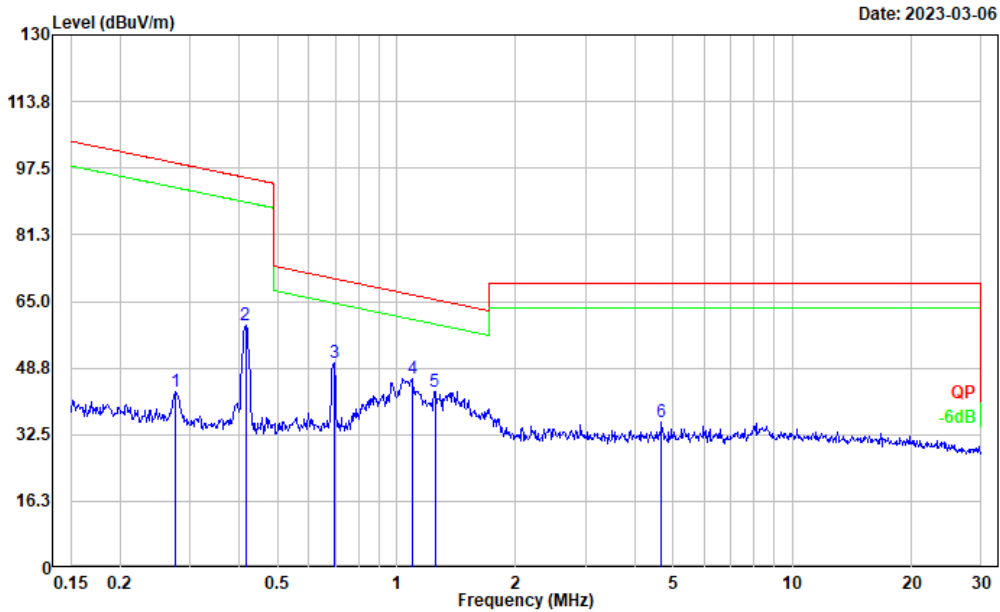
M3:

Test Mode: Wireless Output 10W
 Polarization: Parallel
 Note:



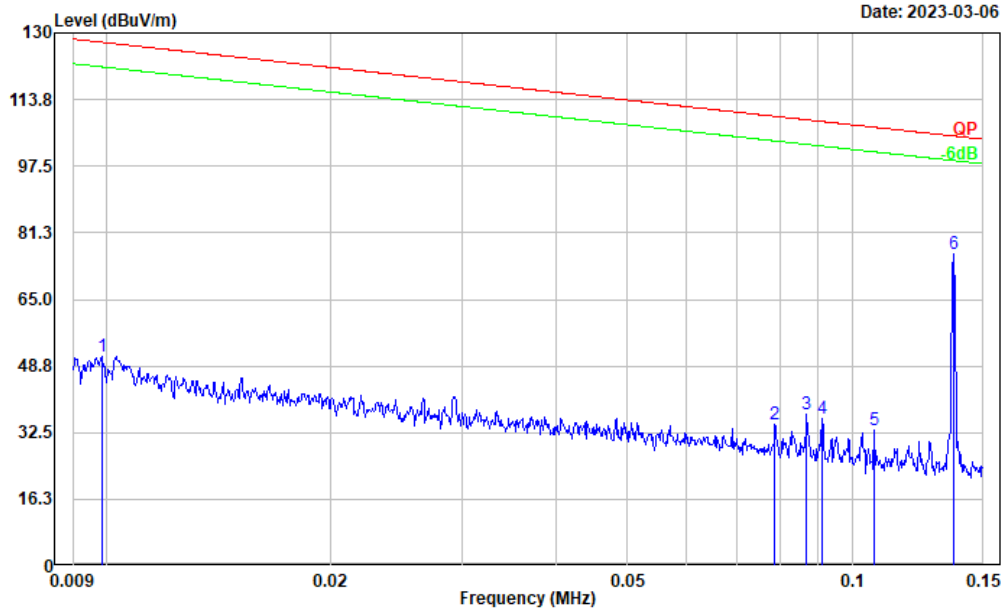
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.025	22.82	20.44	43.26	119.82	76.56	Peak
2	0.029	26.47	20.44	46.91	118.28	71.37	Peak
3	0.081	16.87	20.39	37.26	109.48	72.22	Peak
4	0.085	19.16	20.36	39.52	109.07	69.55	Peak
5	0.118	12.40	20.27	32.67	106.14	73.47	Peak
6	0.138	60.23	20.27	80.50	104.79	24.29	Peak

Test Mode: Wireless Output 10W
 Polarization: Parallel
 Note:



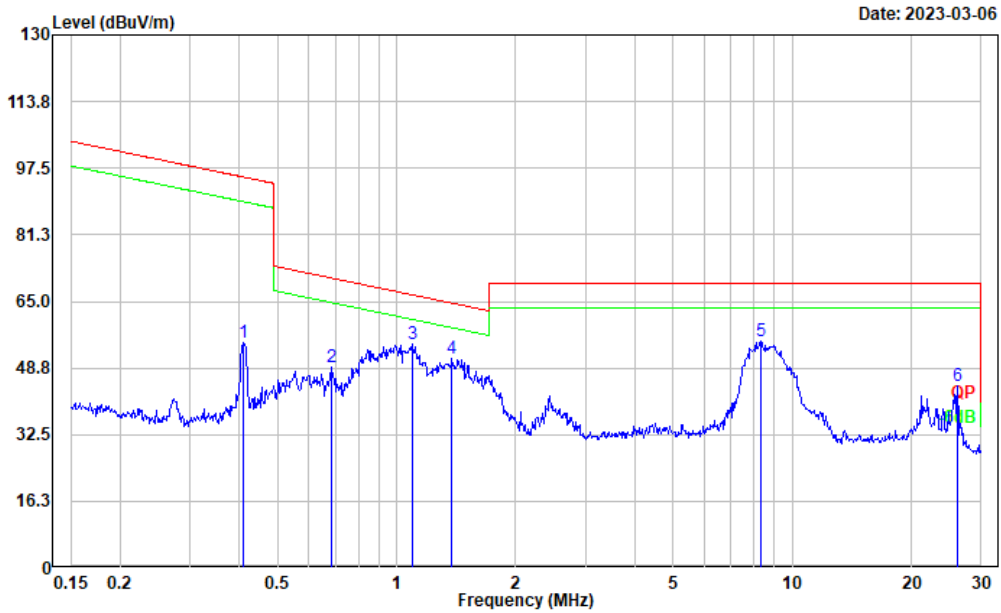
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.276	22.76	20.18	42.94	98.79	55.85	Peak
2	0.415	39.08	20.12	59.20	95.25	36.05	Peak
3	0.694	29.96	20.10	50.06	70.72	20.66	Peak
4	1.094	26.22	20.09	46.31	66.68	20.37	Peak
5	1.249	23.01	20.07	43.08	65.50	22.42	Peak
6	4.672	15.52	20.12	35.64	69.54	33.90	Peak

Test Mode: Wireless Output 10W
 Polarization: Perpendicular
 Note:



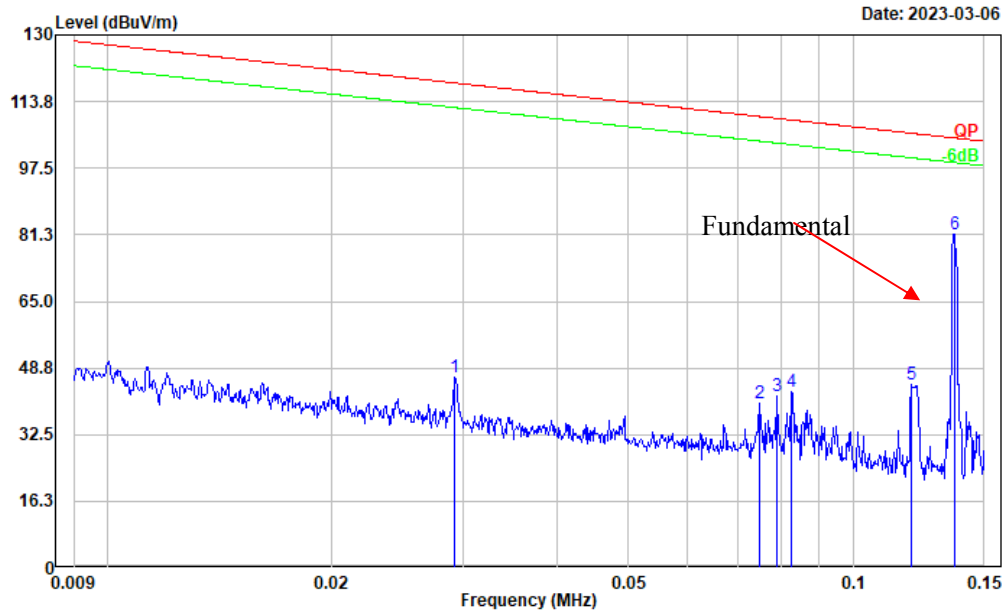
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.010	30.62	20.52	51.14	127.74	76.60	Peak
2	0.079	13.98	20.40	34.38	109.68	75.30	Peak
3	0.087	16.51	20.36	36.87	108.82	71.95	Peak
4	0.091	15.54	20.33	35.87	108.41	72.54	Peak
5	0.107	12.71	20.27	32.98	107.01	74.03	Peak
6	0.137	55.83	20.27	76.10	104.86	28.76	Peak

Test Mode: Wireless Output 10W
 Polarization: Perpendicular
 Note:



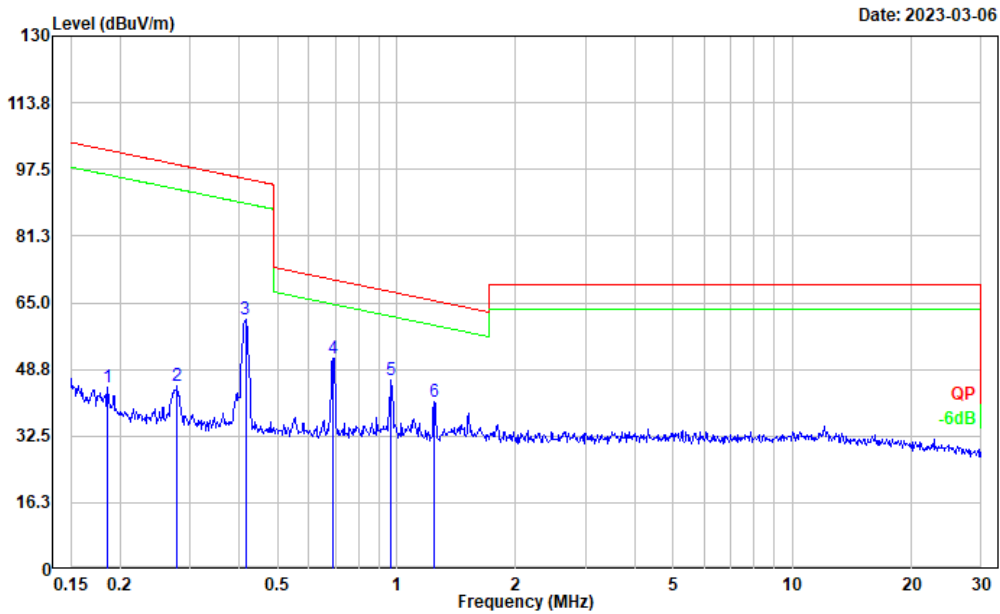
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.410	34.82	20.12	54.94	95.34	40.40	Peak
2	0.686	29.02	20.10	49.12	70.81	21.69	Peak
3	1.100	34.68	20.09	54.77	66.63	11.86	Peak
4	1.381	31.14	20.05	51.19	64.61	13.42	Peak
5	8.323	34.99	20.28	55.27	69.54	14.27	Peak
6	26.139	24.00	20.39	44.39	69.54	25.15	Peak

Test Mode: Wireless Output 10W
 Polarization: Ground-parallel
 Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.029	26.11	20.44	46.55	118.28	71.73	Peak
2	0.075	19.60	20.43	40.03	110.12	70.09	Peak
3	0.079	21.46	20.40	41.86	109.65	67.79	Peak
4	0.083	22.77	20.38	43.15	109.26	66.11	Peak
5	0.120	24.34	20.27	44.61	106.04	61.43	Peak
6	0.137	61.14	20.27	81.41	104.89	23.48	Peak

Test Mode: Wireless Output 10W
 Polarization: Ground-parallel
 Note:

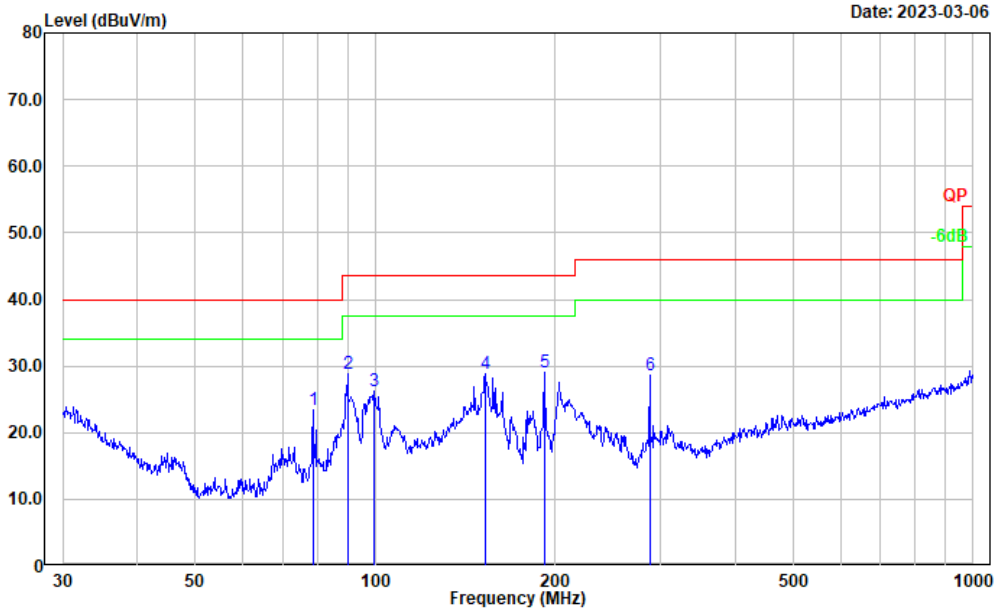


No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	0.186	24.23	20.27	44.50	102.20	57.70	Peak
2	0.279	24.39	20.18	44.57	98.70	54.13	Peak
3	0.415	40.67	20.12	60.79	95.25	34.46	Peak
4	0.690	31.37	20.10	51.47	70.77	19.30	Peak
5	0.968	26.05	20.11	46.16	67.76	21.60	Peak
6	1.242	20.96	20.07	41.03	65.55	24.52	Peak

2)30MHz- 1GHz

M1:

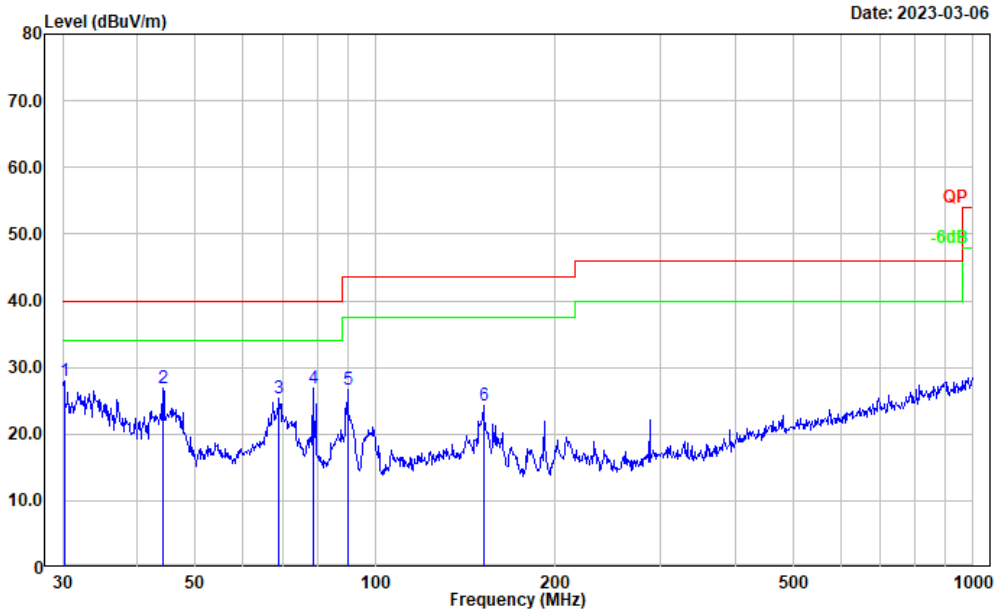
Test Mode: Charging input by Type-C & Wireless Output 5W
 Polarization: horizontal
 Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	78.689	40.77	-17.32	23.45	40.00	16.55	Peak
2	89.905	45.81	-16.93	28.88	43.50	14.62	Peak
3	99.528	40.67	-14.43	26.24	43.50	17.26	Peak
4	152.664	40.75	-12.02	28.73	43.50	14.77	Peak
5	191.745	42.25	-13.21	29.04	43.50	14.46	Peak
6	287.990	39.84	-11.16	28.68	46.00	17.32	Peak

Test Mode: Charging input by Type-C & Wireless Output 5W
 Polarization: vertical

Note:

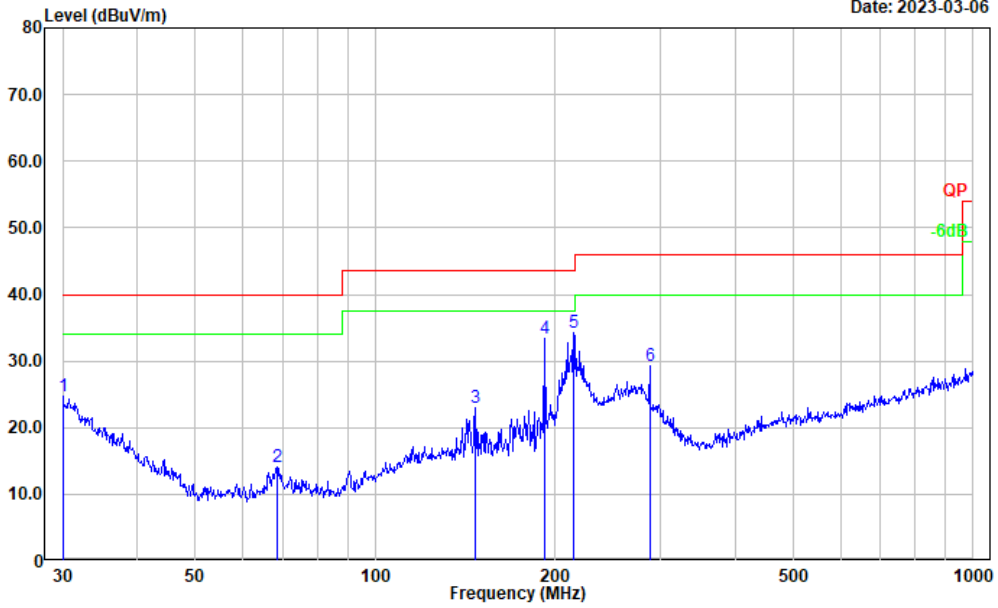


No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.211	31.80	-3.76	28.04	40.00	11.96	Peak
2	44.120	40.64	-13.73	26.91	40.00	13.09	Peak
3	69.114	41.98	-16.59	25.39	40.00	14.61	Peak
4	78.689	44.23	-17.32	26.91	40.00	13.09	Peak
5	89.905	43.64	-16.93	26.71	43.50	16.79	Peak
6	151.597	36.24	-12.03	24.21	43.50	19.29	Peak

M2:

Test Mode: Type-C Output 5W & Wireless Output 5W
 Polarization: horizontal
 Note:

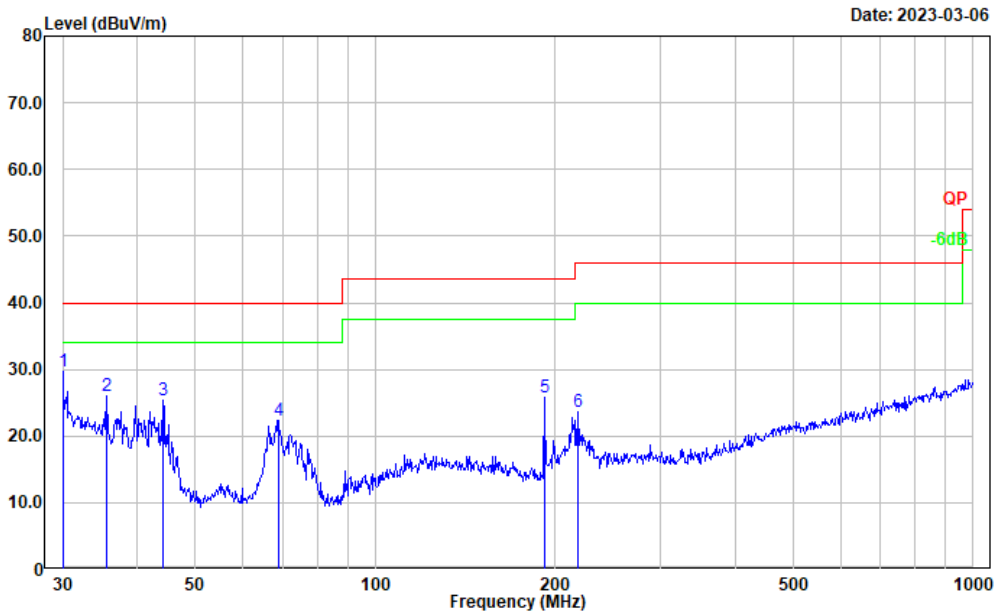
Date: 2023-03-06



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.000	28.30	-3.60	24.70	40.00	15.30	Peak
2	68.391	30.74	-16.65	14.09	40.00	25.91	Peak
3	146.888	35.05	-11.98	23.07	43.50	20.43	Peak
4	191.745	46.56	-13.21	33.35	43.50	10.15	Peak
5	214.514	46.78	-12.60	34.18	43.50	9.32	Peak
6	287.990	40.50	-11.16	29.34	46.00	16.66	Peak

Test Mode: Type-C Output 5W & Wireless Output 5W
 Polarization: vertical

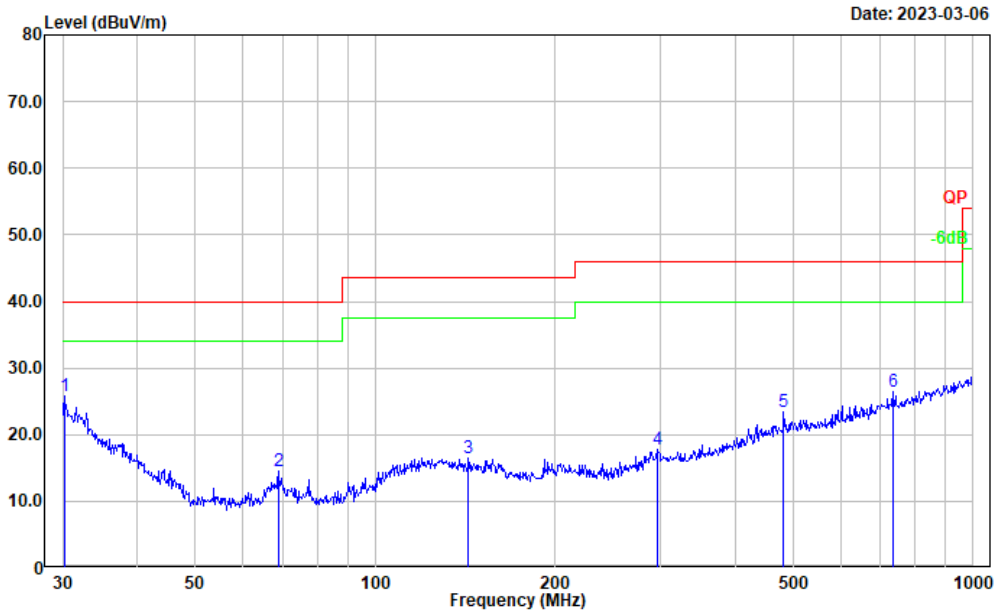
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.000	33.27	-3.60	29.67	40.00	10.33	Peak
2	35.624	34.08	-7.96	26.12	40.00	13.88	Peak
3	44.120	39.11	-13.73	25.38	40.00	14.62	Peak
4	68.872	38.95	-16.61	22.34	40.00	17.66	Peak
5	191.745	39.08	-13.21	25.87	43.50	17.63	Peak
6	218.309	36.44	-12.75	23.69	46.00	22.31	Peak

M3:

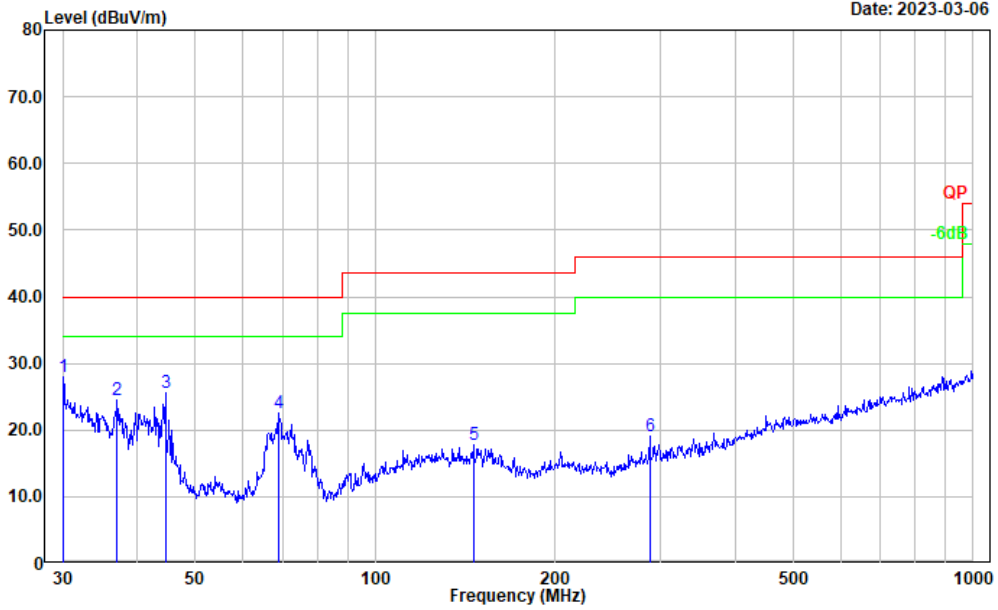
Test Mode: Wireless Output 10W
 Polarization: horizontal
 Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.211	29.59	-3.76	25.83	40.00	14.17	Peak
2	68.872	31.13	-16.61	14.52	40.00	25.48	Peak
3	143.326	28.44	-11.93	16.51	43.50	26.99	Peak
4	297.224	28.58	-10.71	17.87	46.00	28.13	Peak
5	482.216	29.65	-6.27	23.38	46.00	22.62	Peak
6	734.491	29.45	-2.90	26.55	46.00	19.45	Peak

Test Mode: Wireless Output 10W
 Polarization: vertical
 Note:

Date: 2023-03-06



No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
1	30.000	31.59	-3.60	27.99	40.00	12.01	Peak
2	37.025	33.61	-9.03	24.58	40.00	15.42	Peak
3	44.587	39.52	-14.00	25.52	40.00	14.48	Peak
4	68.872	39.13	-16.61	22.52	40.00	17.48	Peak
5	145.861	29.66	-11.97	17.69	43.50	25.81	Peak
6	287.990	30.30	-11.16	19.14	46.00	26.86	Peak

4.3 20 dB Emission Bandwidth

Serial Number:	229P_1	Test Date:	2023/4/14
Test Site:	966-2	Test Mode:	Transmitting
Tester:	Carl Xue	Test Result:	Pass

Environmental Conditions:					
Temperature: (°C)	25.2	Relative Humidity: (%)	55	ATM Pressure: (kPa)	100.5

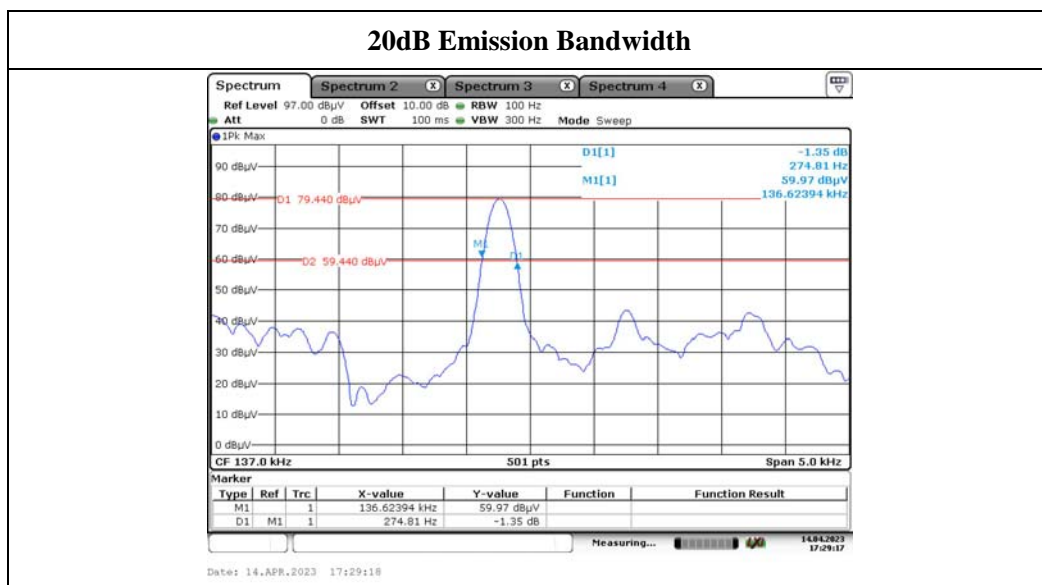
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
TESEQ	HF Loop Antenna	HLA6120	33561	2021/02/03	2024/02/02
R&S	EMI Test Receiver	ESR3	102724	2022/07/15	2023/07/14
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2022/07/17	2023/07/16
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2022/07/17	2023/07/16

* **Statement of Traceability:** China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data:

Test Frequency (kHz)	20 dB Bandwidth (Hz)
137	275



5 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

5.1 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)

(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)

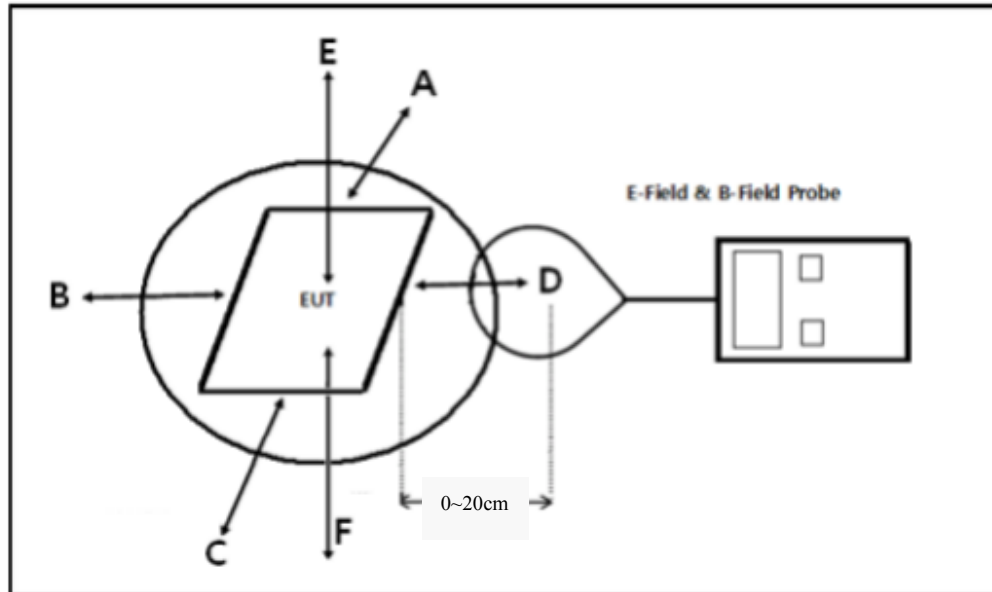
- c) For devices designed for typical desktop applications, such as wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm. E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be 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 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.

5.2 Block Diagram of Test Setup



Note: The EHP-200AC Probe has a diameter of 9.2cm and a radius of 4.6cm.

5.3 Test Procedures

- 1) Perform H-field measurements for each edge/top surface of the host/client pair at every 2 cm, starting from as close as possible out to 20 cm
- 2) The highest emission level was recorded and compared with limit.
- 3) The EUT was measured according to the dictates of TCB Workshop “41-Part-18-&-Wireless-Power-Transfer - April 27, 2022”

5.4 Test Data:

Serial Number:	229P_1	Test Date:	2023/7/21
Test Site:	RF	Test Mode:	M3: Wireless Output 10W was the worst
Tester:	Vic Du	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.3	Relative Humidity: (%)	24	ATM Pressure: (kPa)	100.5
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Narda	Electric and Magnetic Field Probe-Analyzer	EHP-200AC	180ZX10204	2021/06/07	2024/06/06

* Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data:**Test distance: 0-4cm****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)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1205	0.7251	0.2642	0.4084	0.4638	0.2707	44.48	1.63

Test distance: 6cm**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)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1301	0.6221	0.2638	0.3488	0.4552	0.2504	38.17	1.63

Test distance: 8cm**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)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1344	0.253	0.2541	0.3417	0.2649	0.3158	20.96	1.63

Test distance: 10cm**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)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1309	0.2119	0.1802	0.1664	0.1908	0.2867	17.59	1.63

Test distance: 12cm**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)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1197	0.1864	0.143	0.1247	0.1482	0.1224	11.44	1.63

Test distance: 14cm**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)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1221	0.1268	0.1242	0.1249	0.1309	0.1243	8.03	1.63

Test distance: 16cm**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)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1204	0.1274	0.1211	0.1254	0.1411	0.1223	8.66	1.63

Test distance: 18cm**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)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1278	0.1277	0.1244	0.1255	0.1204	0.1201	7.84	1.63

Test distance: 20cm**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)	Position F (A/m)	Max. Percentage (%)	Limit (A/m)
137	0.1246	0.1235	0.1256	0.1211	0.1235	0.1205	7.71	1.63

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 137 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 **10 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.

The transfer system includes only single primary coil, and system 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).

No, both mobile and portable exposure conditions apply.

(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 H-field measurements for each edge/top surface of the host/client pair at every 2 cm, starting from as close as possible out to 20 cm were also evaluated for portable use condition.

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