



中认信通

CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)



TEST REPORT

Applicant: Shenzhen Zhengyun Technology Co., LTD

Address: Room 202, Floor 2, Building A, Rongcheng International, 24 Heping Road, Qinghua Community, Longhua District, Shenzhen China

FCC ID: 2A5TA-I33

Product Name: Magnetic Wireless Charger

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: CR230417469-00

Date Of Issue: 2023/6/6

Reviewed By: Sun Zhong

Sun Zhong

Title: Manager

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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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CONTENTS

TEST FACILITY	2
DECLARATIONS	2
DOCUMENT REVISION HISTORY	4
1. GENERAL INFORMATION	5
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
1.2 DESCRIPTION OF TEST CONFIGURATION	6
1.2.1 EUT Operation Condition:	6
1.2.2 Support Equipment List and Details	6
1.2.3 Support Cable List and Details	6
1.2.4 Block Diagram of Test Setup	7
1.3 MEASUREMENT UNCERTAINTY	9
2. SUMMARY OF TEST RESULTS	10
3. REQUIREMENTS AND TEST PROCEDURES	11
3.1 AC LINE CONDUCTED EMISSIONS	11
3.1.1 Applicable Standard	11
3.1.2 EUT Setup	12
3.1.3 EMI Test Receiver Setup	12
3.1.4 Test Procedure	13
3.1.5 Corrected Amplitude & Margin Calculation	13
3.2 RADIATION SPURIOUS EMISSIONS	14
3.2.1 Applicable Standard	14
3.2.2 EUT Setup	14
3.2.3 EMI Test Receiver & Spectrum Analyzer Setup	15
3.2.4 Corrected Amplitude & Margin Calculation	15
3.3 20 dB EMISSION BANDWIDTH:	16
3.3.1 Applicable Standard	16
3.3.2 EUT Setup	16
3.3.3 Test Procedure	16
3.4 ANTENNA REQUIREMENT	17
3.4.1 Applicable Standard	17
3.4.2 Judgment	17
4. TEST DATA AND RESULTS	18
4.1 AC LINE CONDUCTED EMISSIONS	18
4.2 RADIATION SPURIOUS EMISSIONS	23
4.3 20 dB EMISSION BANDWIDTH	40
5 MAXIMUM PERMISSIBLE EXPOSURE (MPE)	43
5.1 APPLICABLE STANDARD	43
5.2 BLOCK DIAGRAM OF TEST SETUP	44
5.3 TEST DATA:	45

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230417469-00	Original Report	2023/6/6

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Magnetic Wireless Charger
EUT Model:	i33
Operation Frequency:	Watch: 326 kHz Earphone/Phone: 120 kHz/117 kHz Phone: 110.6 kHz
Rated Input Voltage:	DC 9V 3.5A from USB-C
Wireless Output:	Watch: 2.5 Watts Earphone/Phone: 3/5 Watts Phone: 5/7.5/10/15 Watts
Serial Number:	24AV_1
EUT Received Date:	2023/4/12
EUT Received Status:	Good

Antenna Information Detail ▲:

Antenna	Antenna Type	input impedance (Ohm)	Frequency Range	Antenna Gain
Watch	Coil	50	Unknown	Unknown
Earphone	Coil	50	Unknown	Unknown
Phone	Coil	50	Unknown	Unknown
The Method of §15.203 Compliance: <input checked="" type="checkbox"/> Antenna must be permanently attached to the unit. <input type="checkbox"/> Antenna must use a unique type of connector to attach to the EUT. <input type="checkbox"/> 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
USB Type-C Cable	/	/

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition:

EUT Operation Mode:	<p>The system was configured for testing in Engineering Mode, which was provided by the manufacturer.</p> <p>M1: Full load charging (max 2.5W+max 3W+max 15W)</p> <p>M2: Full load charging (max 2.5W+max 5W+max 15W)</p> <p><i>The EUT support max 27 Watts input, max 2.5 Watts wireless output for Watch, max 5 Watts or max 3 Watts wireless output for Earphone, max 15 Watts wireless output for Phone. Both modes listed above have been tested.</i></p>
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
SiLiYuan	Wireless Charging Load	MX5W	CR2305180303
Unknown	charging case	Unknown	CR2305180905
XTOUCH	Phone	S40	04069092900015
Zime	Adapter	PD-33W	CR2306210501

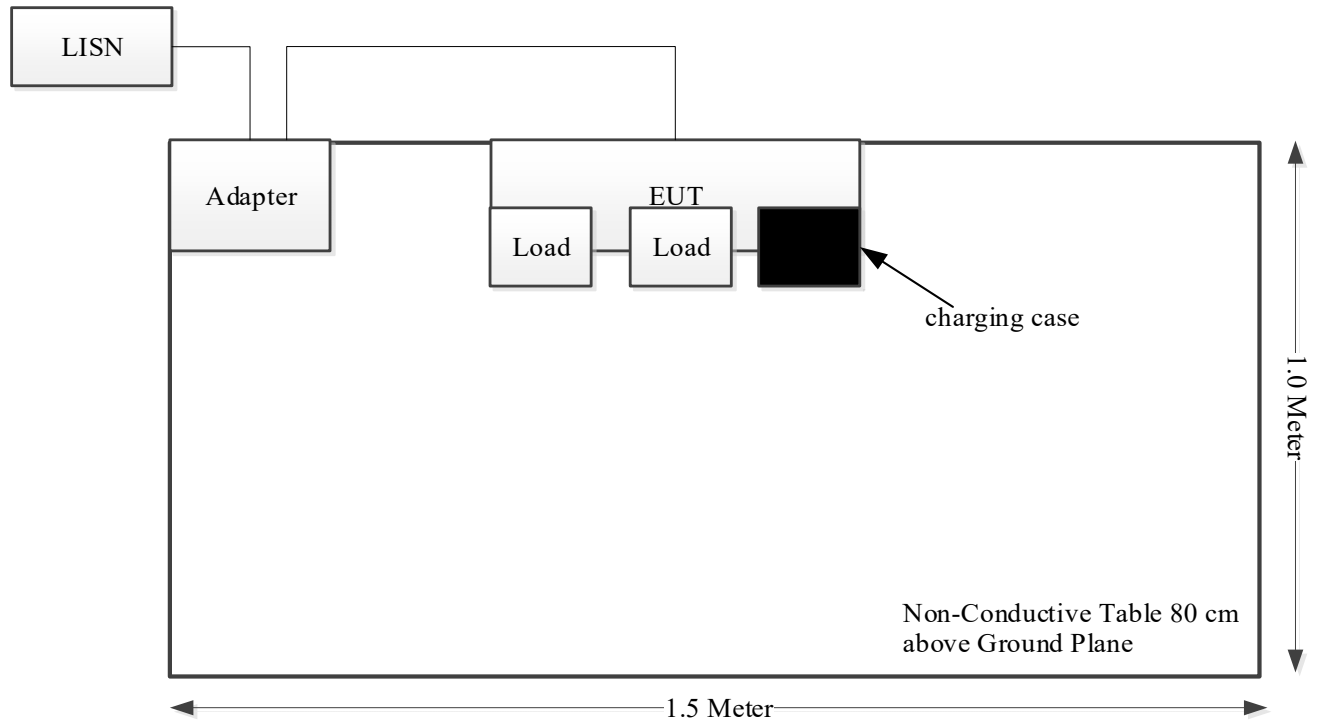
1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Power Cable	NO	NO	1.2	Adapter	EUT

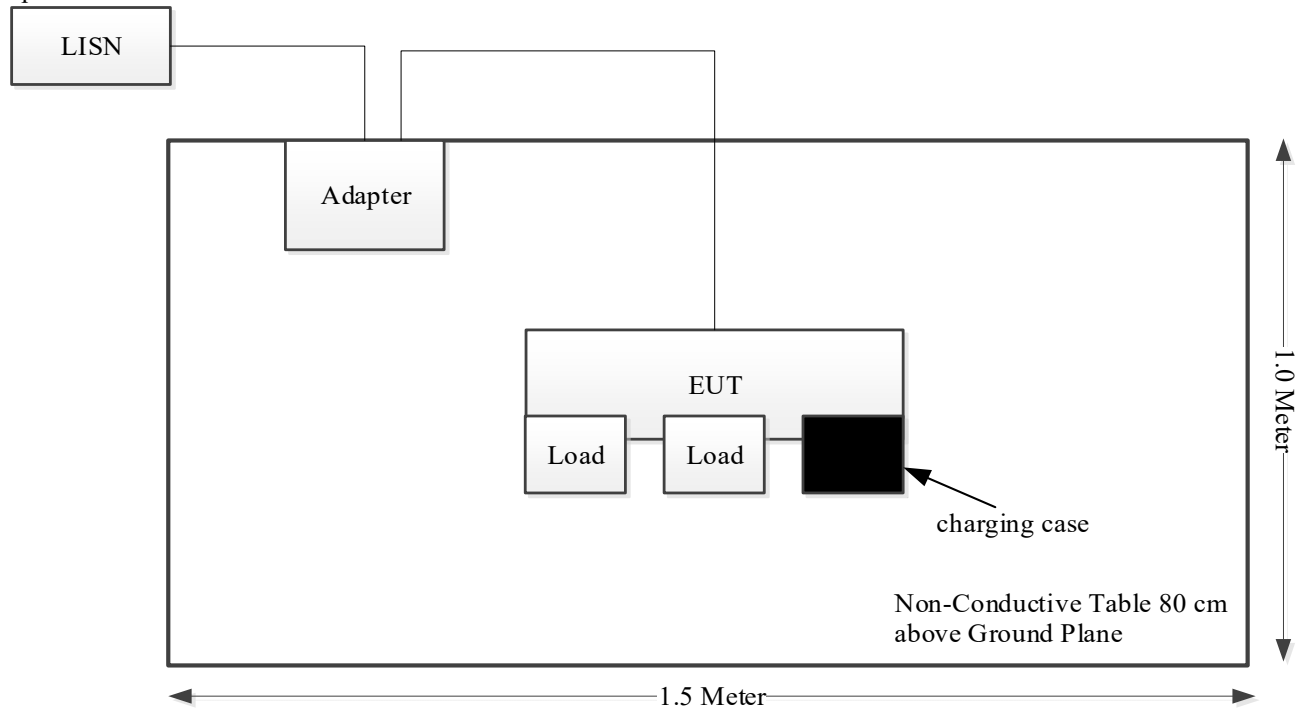
1.2.4 Block Diagram of Test Setup

M1: Full load charging (max 2.5W+max 3W+max 15W)

AC line conducted emissions:

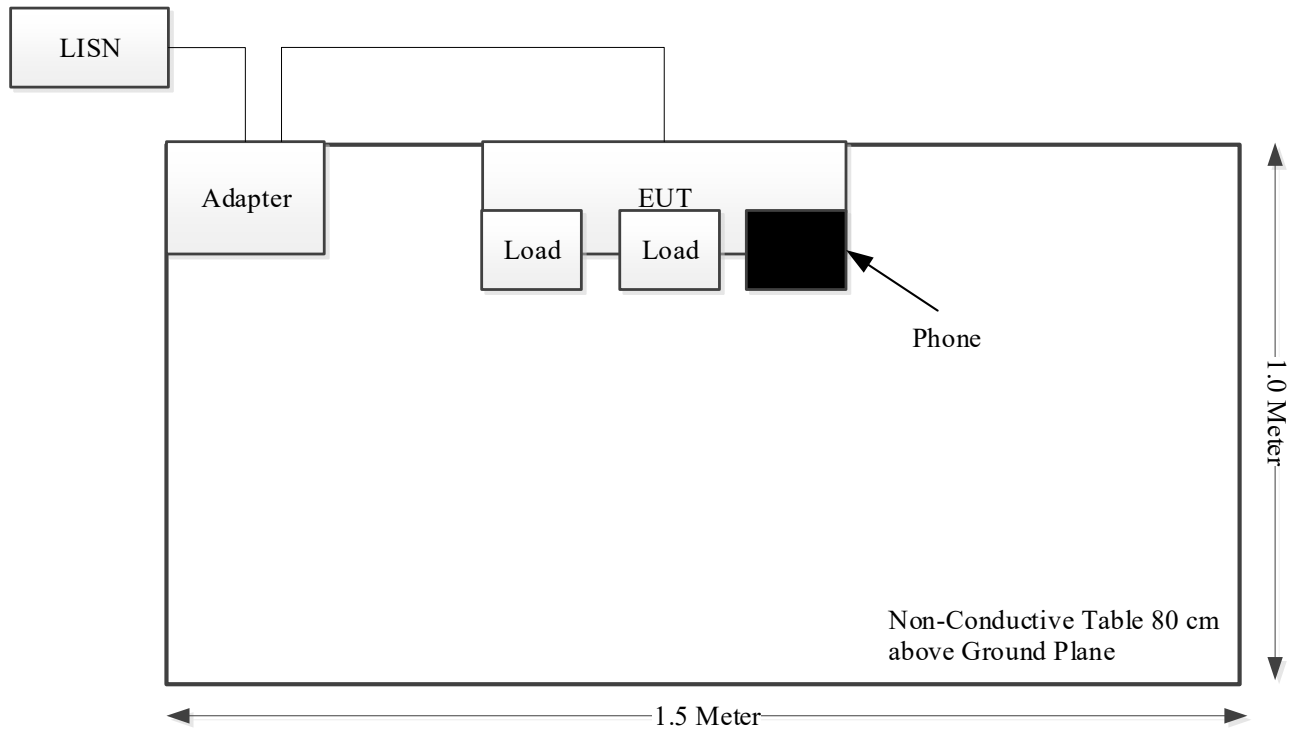


Spurious emissions:

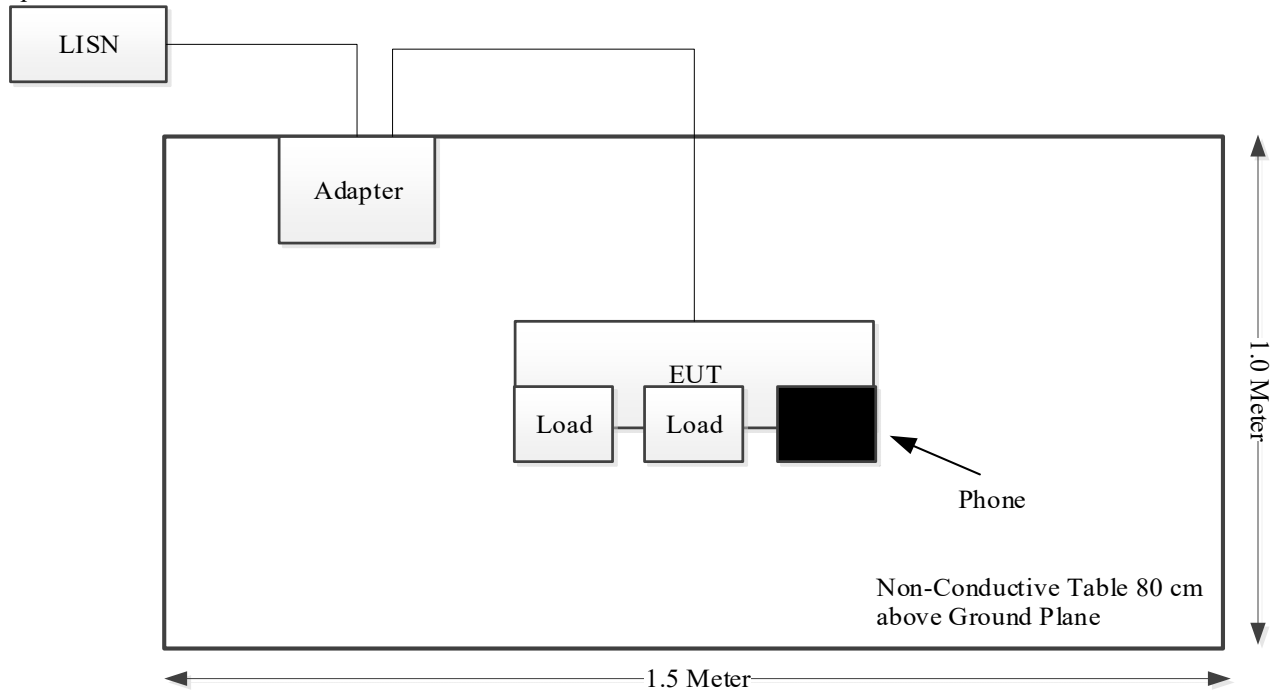


M2: Full load charging (max 2.5W+max 5W+max 15W)

AC line conducted emissions:



Spurious emissions:



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§15.215	20 dB Emission Bandwidth	Compliant
FCC§15.203	Antenna Requirement	Compliant
FCC§1.1310 §2.1091	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:

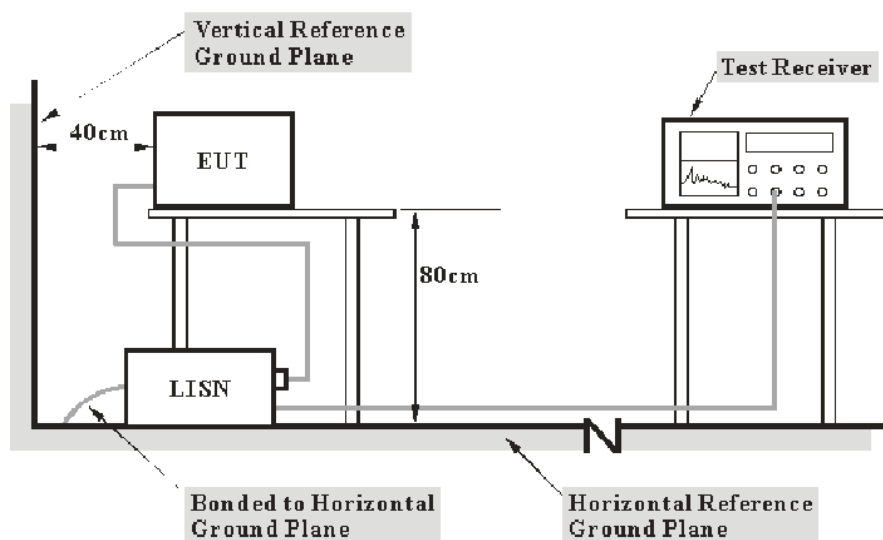
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(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:

Result = Reading + Factor

Factor = attenuation caused by cable loss + 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:

Margin = Limit – Result

3.2 Radiation Spurious Emissions

3.2.1 Applicable Standard

FCC §15.209

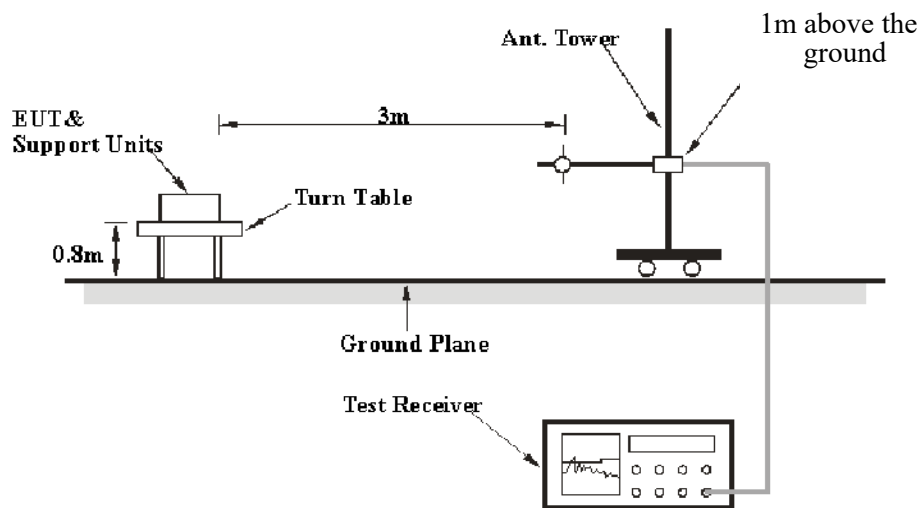
(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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

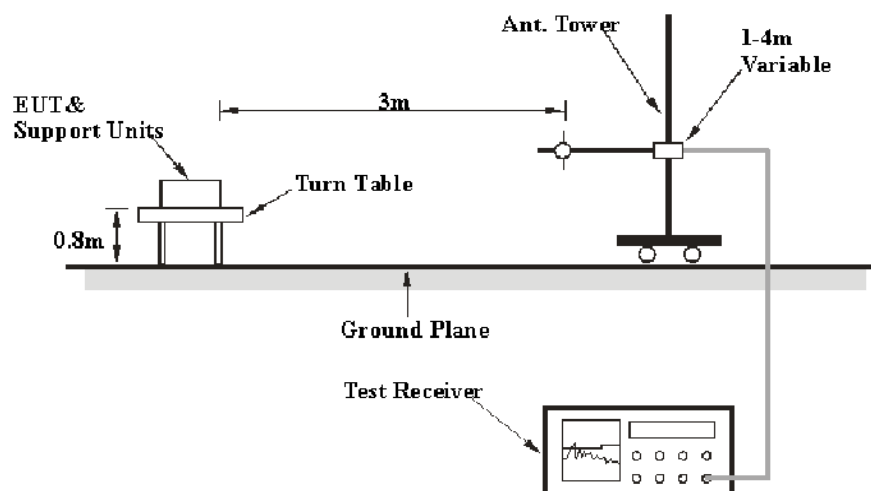
**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this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

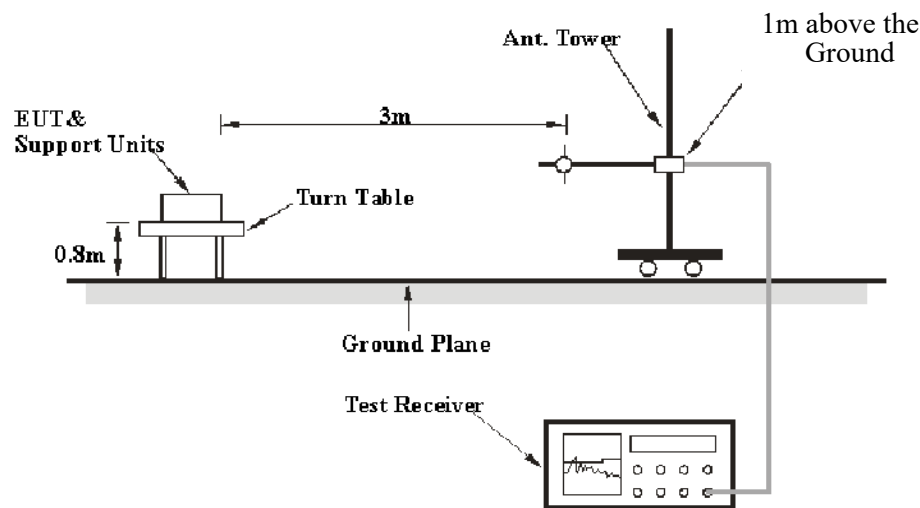
3.3 20 dB Emission Bandwidth:

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:	24AV_1	Test Date:	2023/6/9
Test Site:	CE	Test Mode:	M1,M2
Tester:	David Huang	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	24.4	Relative Humidity: (%)	57	ATM Pressure: (kPa)	99.9
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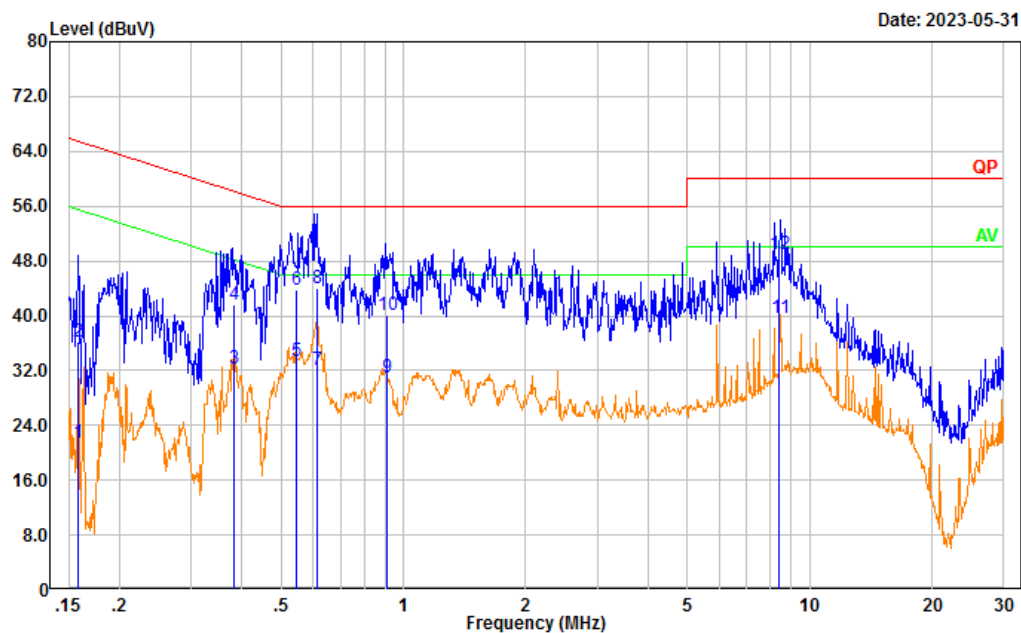
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101134	2023/03/31	2024/03/30
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).*

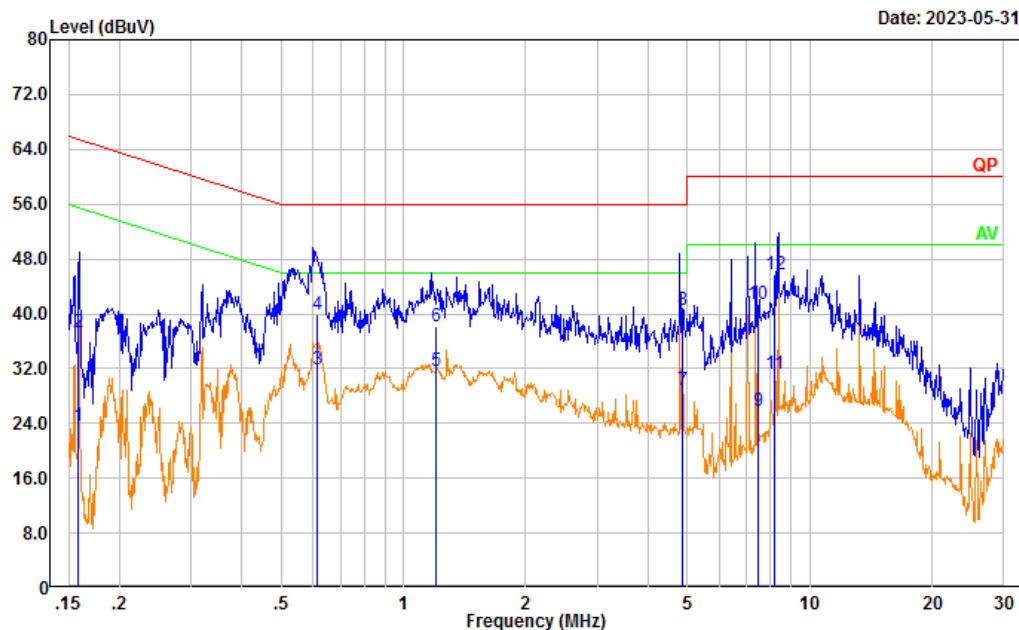
M1: Full load charging (max 2.5W+max 3W+max 15W)

Test Mode: Wireless Charging
Port: Line
Note:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.158	11.85	9.61	21.46	55.57	34.11	Average
2	0.158	26.69	9.61	36.30	65.57	29.27	QP
3	0.382	22.78	9.61	32.39	48.23	15.84	Average
4	0.382	32.07	9.61	41.68	58.23	16.55	QP
5	0.544	23.72	9.61	33.33	46.00	12.67	Average
6	0.544	34.14	9.61	43.75	56.00	12.25	QP
7	0.612	22.52	9.62	32.14	46.00	13.86	Average
8	0.612	34.33	9.62	43.95	56.00	12.05	QP
9	0.912	21.44	9.62	31.06	46.00	14.94	Average
10	0.912	30.58	9.62	40.20	56.00	15.80	QP
11	8.412	30.01	9.67	39.68	50.00	10.32	Average
12	8.412	39.40	9.67	49.07	60.00	10.93	QP

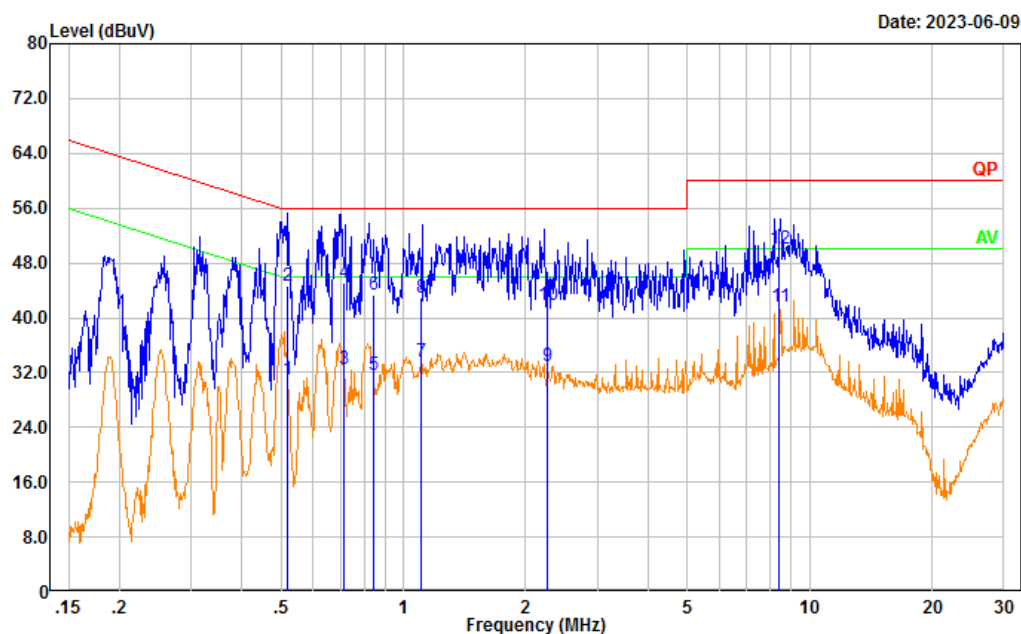
Test Mode: Wireless Charging
Port: neutral
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.158	13.98	9.61	23.59	55.58	31.99	Average
2	0.158	27.66	9.61	37.27	65.58	28.31	QP
3	0.612	22.33	9.62	31.95	46.00	14.05	Average
4	0.612	30.33	9.62	39.95	56.00	16.05	QP
5	1.203	22.03	9.62	31.65	46.00	14.35	Average
6	1.203	28.50	9.62	38.12	56.00	17.88	QP
7	4.873	19.17	9.66	28.83	46.00	17.17	Average
8	4.873	30.80	9.66	40.46	56.00	15.54	QP
9	7.434	16.20	9.66	25.86	50.00	24.14	Average
10	7.434	31.80	9.66	41.46	60.00	18.54	QP
11	8.167	21.57	9.67	31.24	50.00	18.76	Average
12	8.167	36.04	9.67	45.71	60.00	14.29	QP

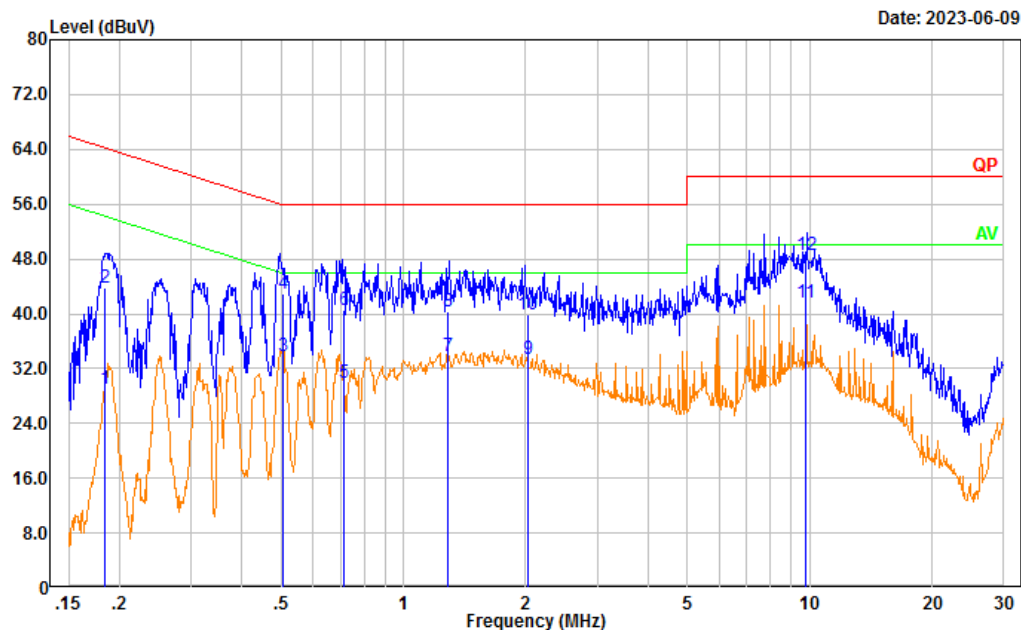
M2: Full load charging (max 2.5W+max 5W+max 15W)

Test Mode: Wireless Charging
Port: Line
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.519	21.30	9.61	30.91	46.00	15.09	Average
2	0.519	34.98	9.61	44.59	56.00	11.41	QP
3	0.714	22.81	9.62	32.43	46.00	13.57	Average
4	0.714	35.46	9.62	45.08	56.00	10.92	QP
5	0.843	22.08	9.62	31.70	46.00	14.30	Average
6	0.843	33.75	9.62	43.37	56.00	12.63	QP
7	1.107	23.96	9.62	33.58	46.00	12.42	Average
8	1.107	33.28	9.62	42.90	56.00	13.10	QP
9	2.267	23.32	9.64	32.96	46.00	13.04	Average
10	2.267	32.14	9.64	41.78	56.00	14.22	QP
11	8.416	31.95	9.67	41.62	50.00	8.38	Average
12	8.416	40.34	9.67	50.01	60.00	9.99	QP

Test Mode: Wireless Charging
Port: neutral
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Detector
1	0.184	19.46	9.61	29.07	54.30	25.23	Average
2	0.184	34.21	9.61	43.82	64.30	20.48	QP
3	0.506	24.25	9.61	33.86	46.00	12.14	Average
4	0.506	33.32	9.61	42.93	56.00	13.07	QP
5	0.712	20.20	9.62	29.82	46.00	16.18	Average
6	0.712	30.85	9.62	40.47	56.00	15.53	QP
7	1.291	24.22	9.62	33.84	46.00	12.16	Average
8	1.291	30.64	9.62	40.26	56.00	15.74	QP
9	2.018	23.70	9.63	33.33	46.00	12.67	Average
10	2.018	30.19	9.63	39.82	56.00	16.18	QP
11	9.747	31.91	9.67	41.58	50.00	8.42	Average
12	9.747	38.90	9.67	48.57	60.00	11.43	QP

4.2 Radiation Spurious Emissions

Serial Number:	24AV_1	Test Date:	2023/6/8~2023/6/9
Test Site:	966-2	Test Mode:	M1,M2
Tester:	Vic Du	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	26.6~27.4	Relative Humidity: (%)	64~65	ATM Pressure: (kPa)	99.8~99.9
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Test Equipment List and Details:

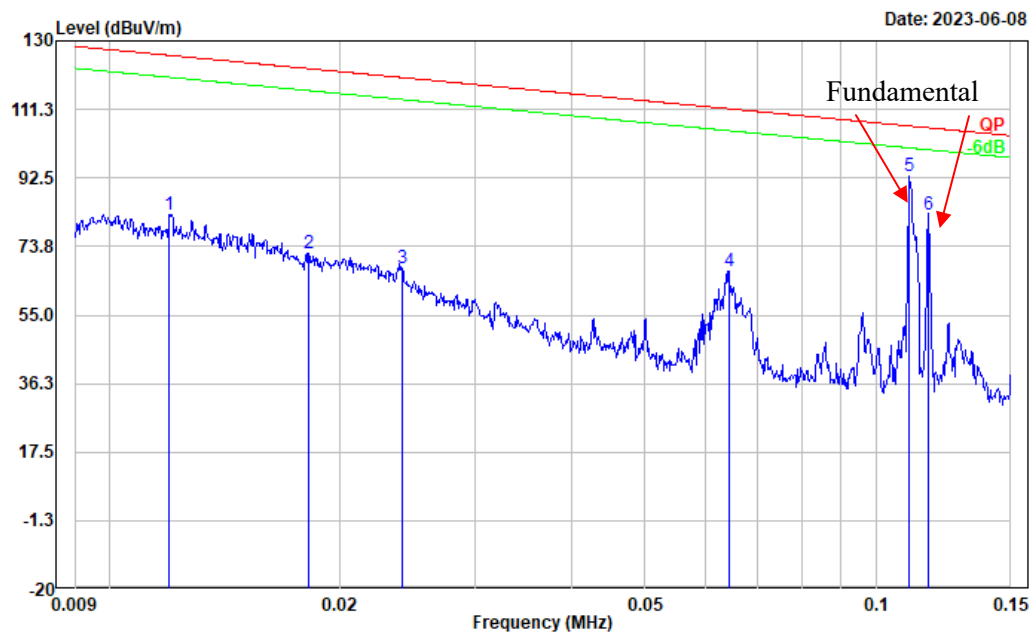
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
TESEQ	HF Loop Antenna	HLA6120	33561	2021/02/03	2024/02/02
Sunol Sciences	Antenna	JB6	A082520-5	2020/10/19	2023/10/18
R&S	EMI Test Receiver	ESR3	102724	2022/07/15	2023/07/14
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	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) 9 kHz -30MHz

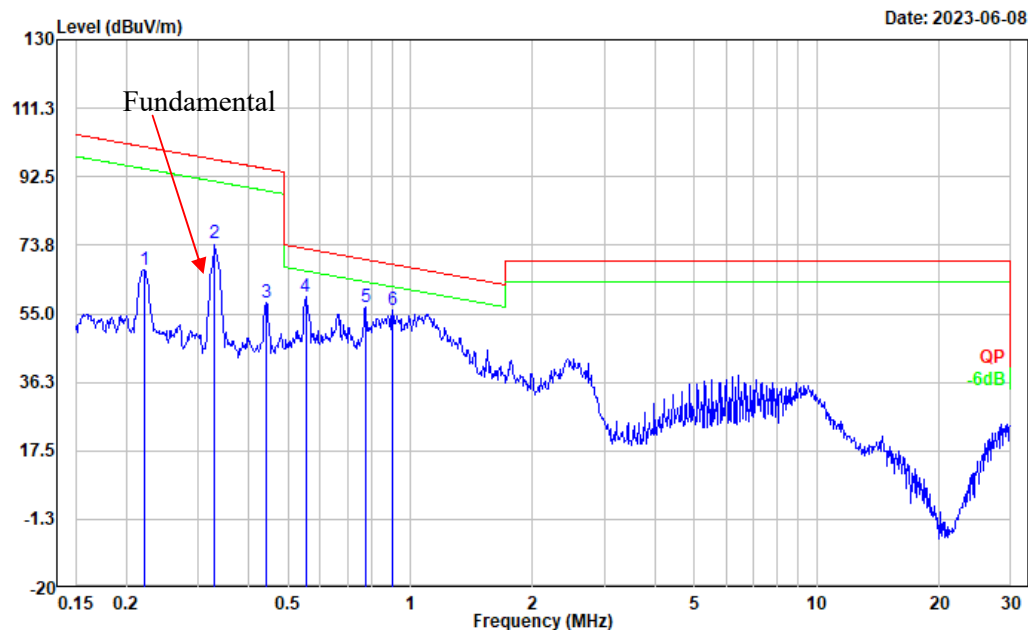
M1: Full load charging (max 2.5W+max 3W+max 15W)

Test Mode: Wireless Charging
Polarization: Parallel
Note:



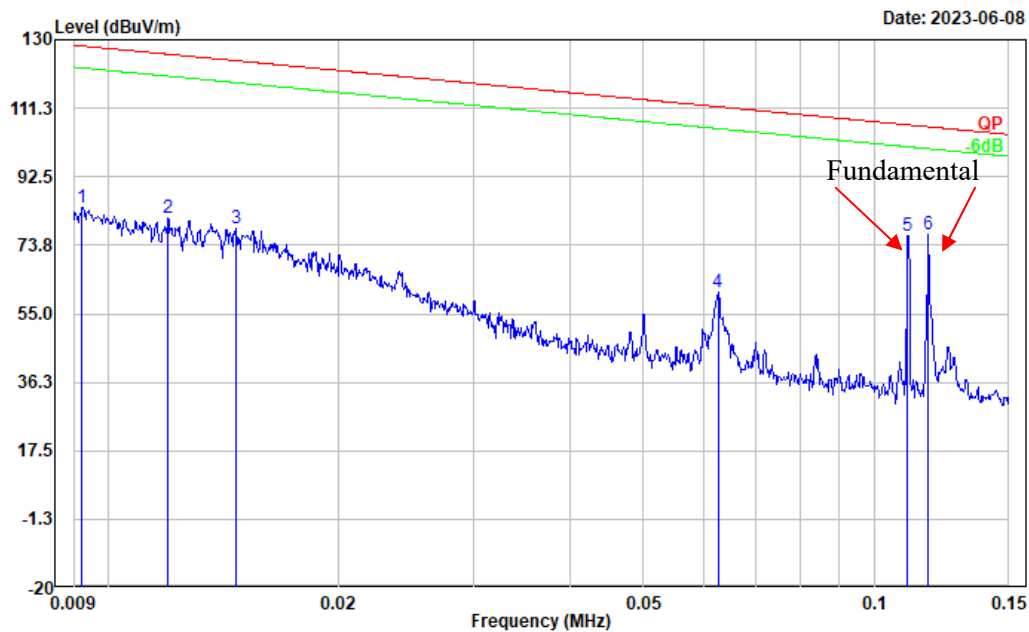
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.012	25.99	56.31	82.30	126.05	43.75	Peak
2	0.018	21.03	50.87	71.90	122.41	50.51	Peak
3	0.024	19.93	47.78	67.71	119.97	52.26	Peak
4	0.064	27.92	39.27	67.19	111.44	44.25	Peak
5	0.111	58.47	34.64	93.11	106.72	13.61	Peak
6	0.117	48.14	34.29	82.43	106.23	23.80	Peak

Polarization: Parallel
Note:



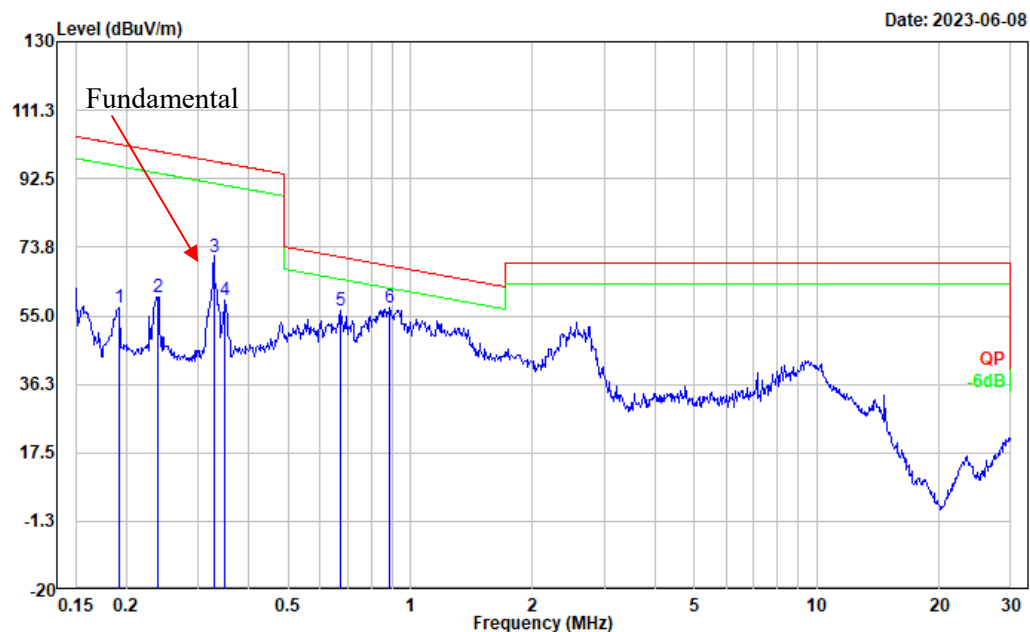
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.221	38.23	28.83	67.06	100.72	33.66	Peak
2	0.330	49.05	25.39	74.44	97.23	22.79	Peak
3	0.442	34.63	23.25	57.88	94.69	36.81	Peak
4	0.552	37.94	21.55	59.49	72.74	13.25	Peak
5	0.775	38.14	18.68	56.82	69.73	12.91	Peak
6	0.904	38.23	17.72	55.95	68.37	12.42	Peak

Test Mode: Wireless Charging
Polarization: Perpendicular
Note:



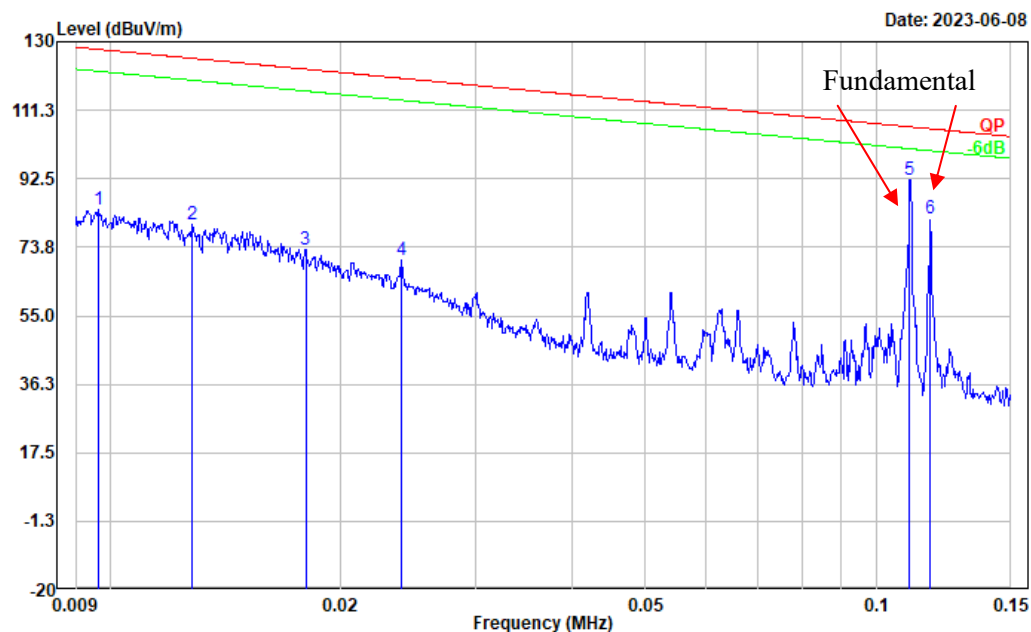
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.009	25.23	58.85	84.08	128.30	44.22	Peak
2	0.012	25.09	56.31	81.40	126.05	44.65	Peak
3	0.015	24.38	53.96	78.34	124.29	45.95	Peak
4	0.063	21.11	39.59	60.70	111.68	50.98	Peak
5	0.111	41.73	34.64	76.37	106.72	30.35	Peak
6	0.118	42.61	34.25	76.86	106.18	29.32	Peak

Test Mode: Wireless Charging
Polarization: Perpendicular
Note:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.191	27.24	30.07	57.31	101.97	44.66	Peak
2	0.239	32.05	28.17	60.22	100.03	39.81	Peak
3	0.329	45.83	25.43	71.26	97.27	26.01	Peak
4	0.348	34.42	25.03	59.45	96.76	37.31	Peak
5	0.672	36.26	20.01	56.27	71.00	14.73	Peak
6	0.890	39.58	17.82	57.40	68.51	11.11	Peak

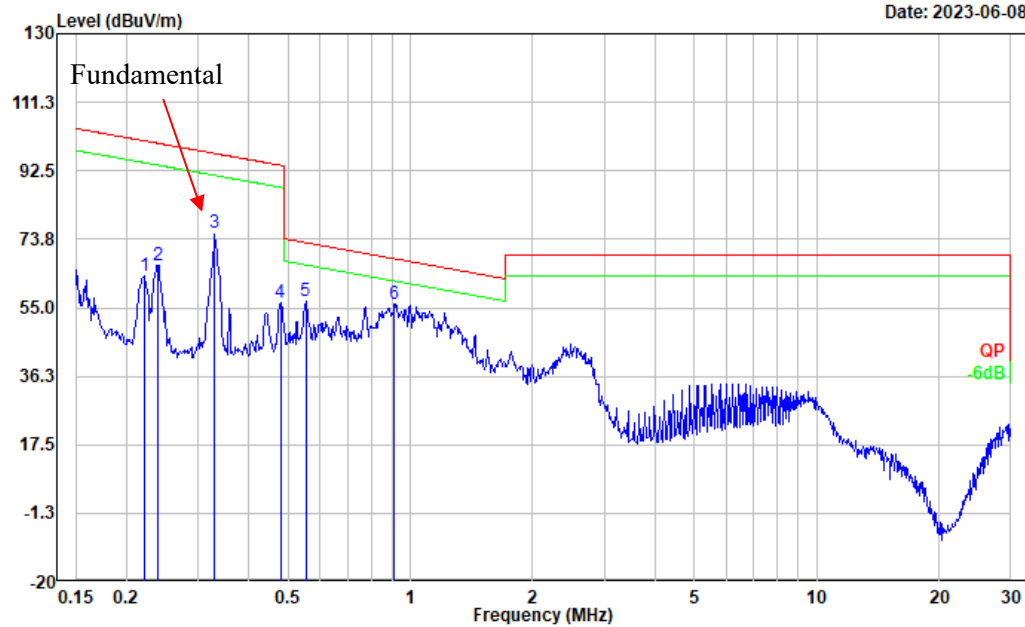
Test Mode: Wireless Charging
Polarization: Ground-parallel
Note:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.010	25.58	58.43	84.01	127.93	43.92	Peak
2	0.013	24.60	55.58	80.18	125.47	45.29	Peak
3	0.018	21.92	51.04	72.96	122.51	49.55	Peak
4	0.024	22.63	47.80	70.43	119.99	49.56	Peak
5	0.111	57.70	34.64	92.34	106.72	14.38	Peak
6	0.118	47.35	34.25	81.60	106.18	24.58	Peak

Test Mode: Wireless Charging
Polarization: Ground-parallel
Note:

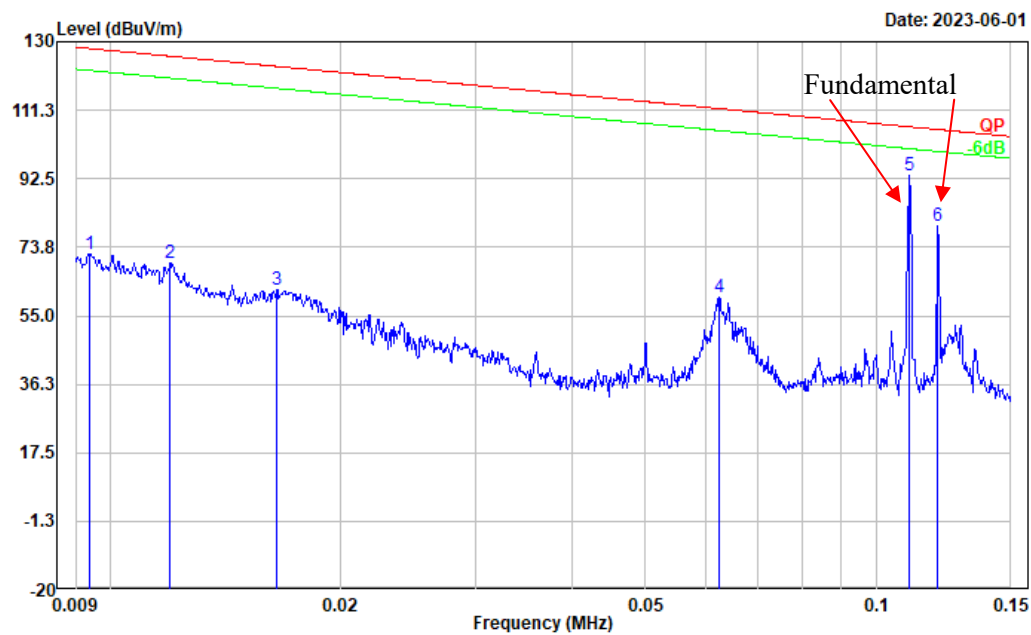
Date: 2023-06-08



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.221	34.72	28.83	63.55	100.72	37.17	Peak
2	0.239	38.45	28.17	66.62	100.03	33.41	Peak
3	0.330	50.24	25.39	75.63	97.23	21.60	Peak
4	0.479	33.74	22.61	56.35	94.00	37.65	Peak
5	0.552	35.46	21.55	57.01	72.74	15.73	Peak
6	0.914	38.32	17.64	55.96	68.27	12.31	Peak

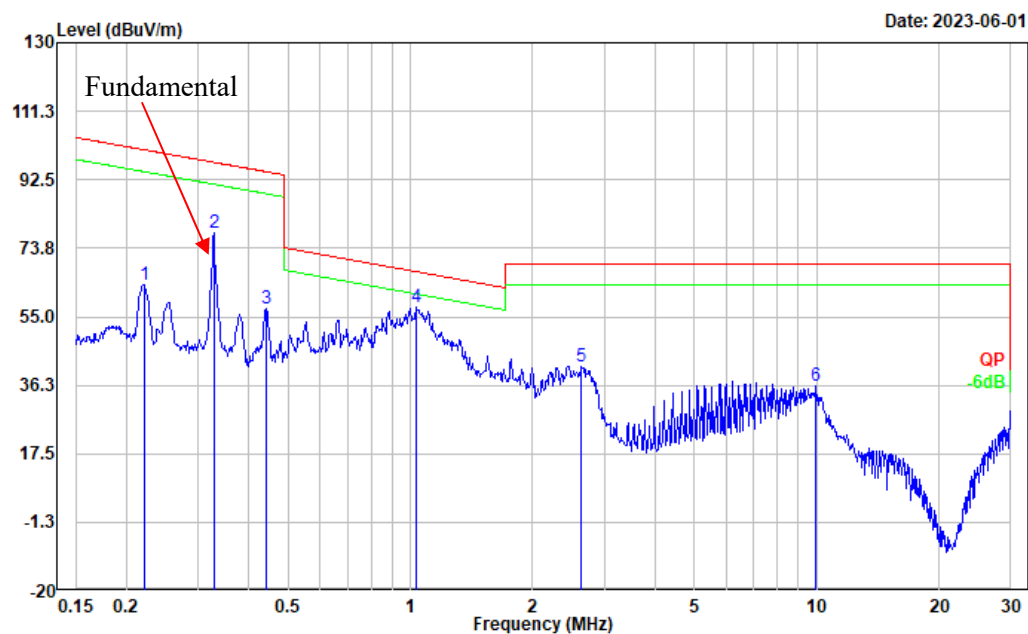
M2: Full load charging (max 2.5W+max 5W+max 15W)

Test Mode: Wireless Charging
Polarization: Parallel
Note:



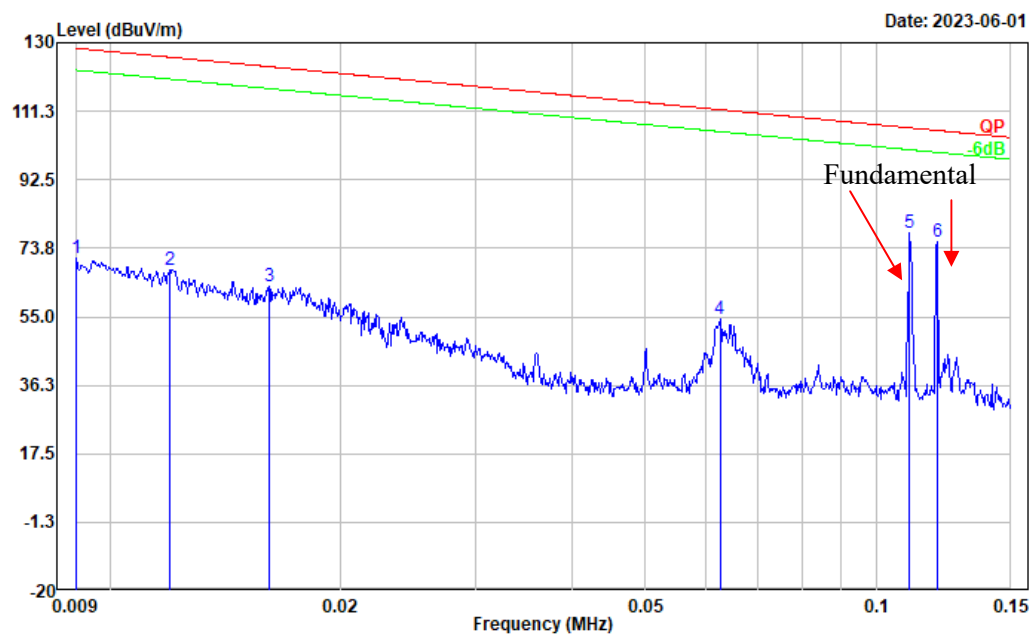
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.009	13.39	58.68	72.07	128.15	56.08	Peak
2	0.012	13.13	56.31	69.44	126.05	56.61	Peak
3	0.016	9.83	52.37	62.20	123.27	61.07	Peak
4	0.062	20.52	39.64	60.16	111.71	51.55	Peak
5	0.111	58.64	34.64	93.28	106.72	13.44	Peak
6	0.120	45.59	34.09	79.68	105.99	26.31	Peak

Test Mode: Wireless Charging
Polarization: Parallel
Note:



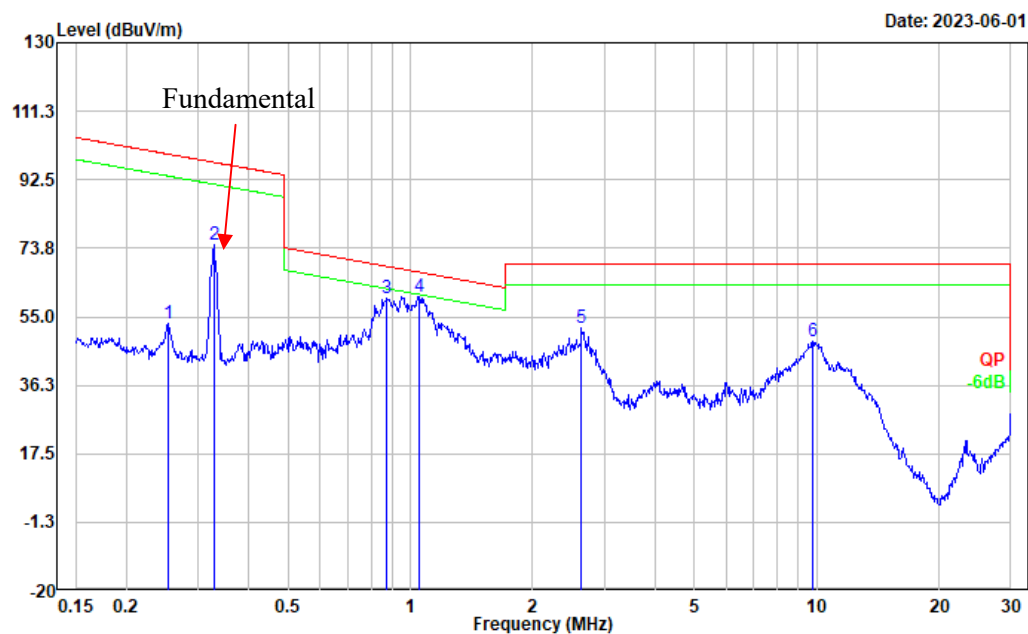
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.221	34.86	28.83	63.69	100.72	37.03	Peak
2	0.329	52.37	25.43	77.80	97.27	19.47	Peak
3	0.442	33.92	23.25	57.17	94.69	37.52	Peak
4	1.037	40.98	16.65	57.63	67.15	9.52	Peak
5	2.636	32.14	9.38	41.52	69.54	28.02	Peak
6	9.966	31.45	4.45	35.90	69.54	33.64	Peak

Test Mode: Wireless Charging
Polarization: Perpendicular
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.009	11.81	59.06	70.87	128.49	57.62	Peak
2	0.012	11.56	56.31	67.87	126.05	58.18	Peak
3	0.016	10.45	52.69	63.14	123.46	60.32	Peak
4	0.063	14.68	39.59	54.27	111.68	57.41	Peak
5	0.111	43.51	34.64	78.15	106.72	28.57	Peak
6	0.120	41.29	34.11	75.40	106.01	30.61	Peak

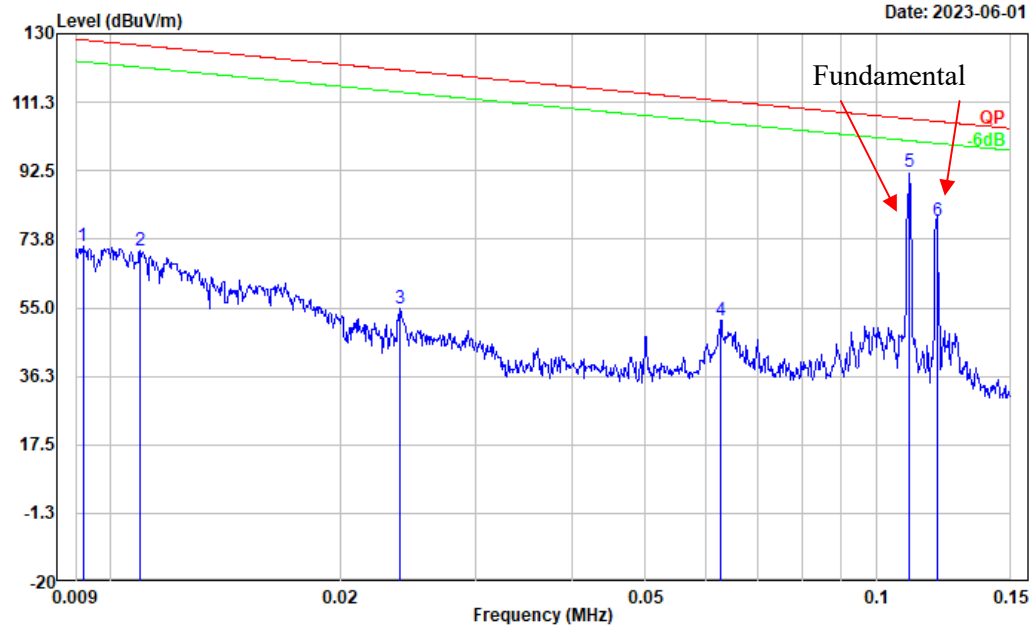
Test Mode: Wireless Charging
Polarization: Perpendicular
Note:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.253	25.35	27.68	53.03	99.53	46.50	Peak
2	0.329	49.28	25.43	74.71	97.27	22.56	Peak
3	0.876	42.21	17.91	60.12	68.65	8.53	Peak
4	1.049	43.93	16.58	60.51	67.05	6.54	Peak
5	2.636	42.39	9.38	51.77	69.54	17.77	Peak
6	9.757	43.76	4.47	48.23	69.54	21.31	Peak

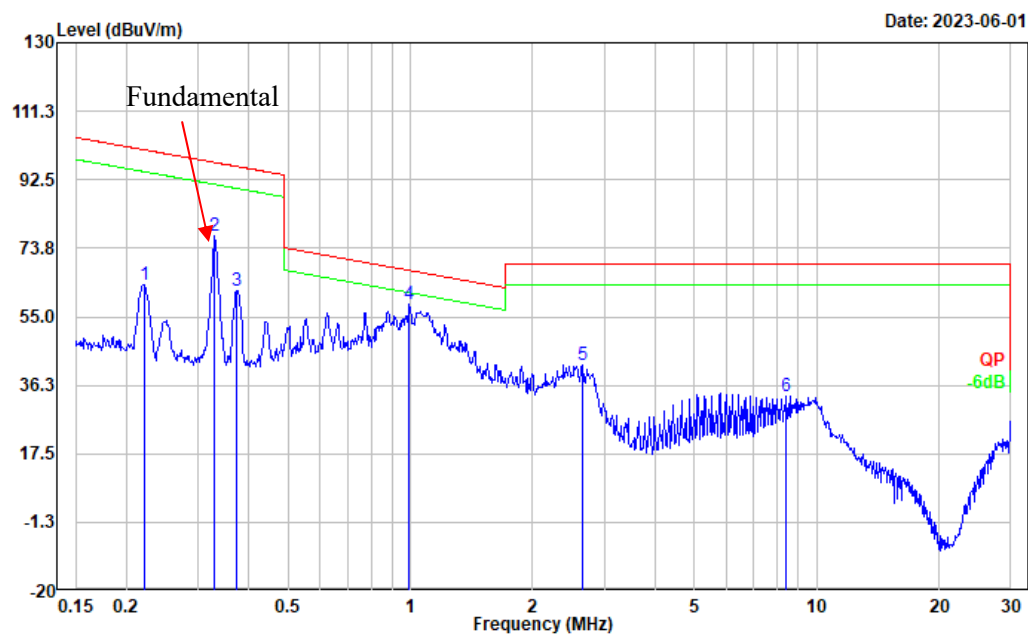
Test Mode: Wireless Charging
Polarization: Ground-parallel
Note:

Date: 2023-06-01



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.009	12.83	58.88	71.71	128.33	56.62	Peak
2	0.011	13.46	57.21	70.67	126.83	56.16	Peak
3	0.024	6.94	47.85	54.79	120.04	65.25	Peak
4	0.063	11.90	39.56	51.46	111.66	60.20	Peak
5	0.111	57.53	34.64	92.17	106.72	14.55	Peak
6	0.120	44.85	34.11	78.96	106.01	27.05	Peak

Test Mode: Wireless Charging
Polarization: Ground-parallel
Note:

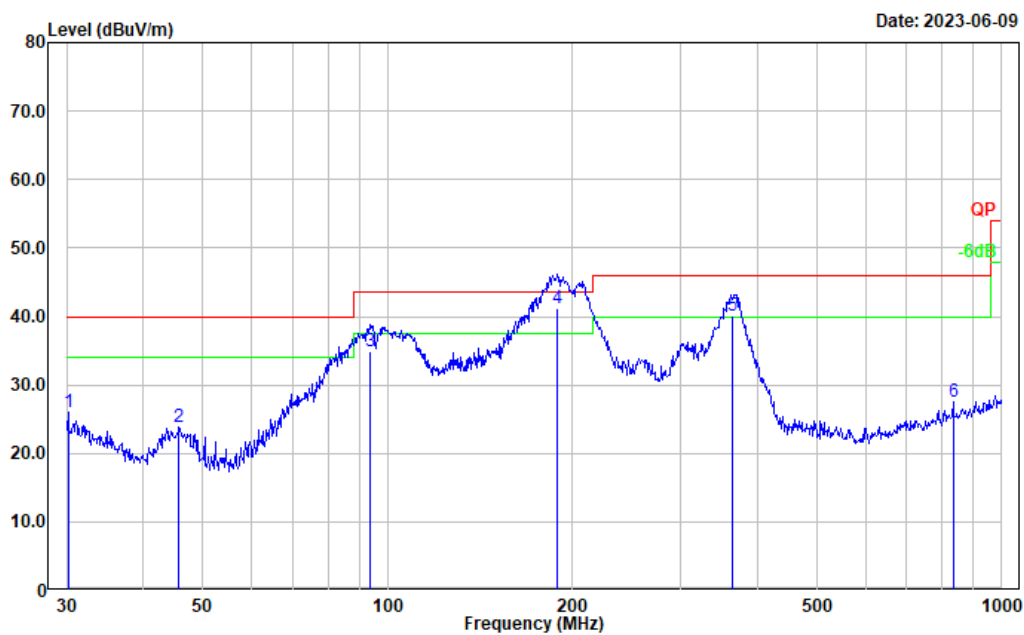


No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	0.221	34.84	28.83	63.67	100.72	37.05	Peak
2	0.330	51.59	25.39	76.98	97.23	20.25	Peak
3	0.373	37.49	24.55	62.04	96.17	34.13	Peak
4	0.994	41.39	16.91	58.30	67.52	9.22	Peak
5	2.650	32.54	9.33	41.87	69.54	27.67	Peak
6	8.412	28.84	4.59	33.43	69.54	36.11	Peak

2) 30MHz- 1GHz

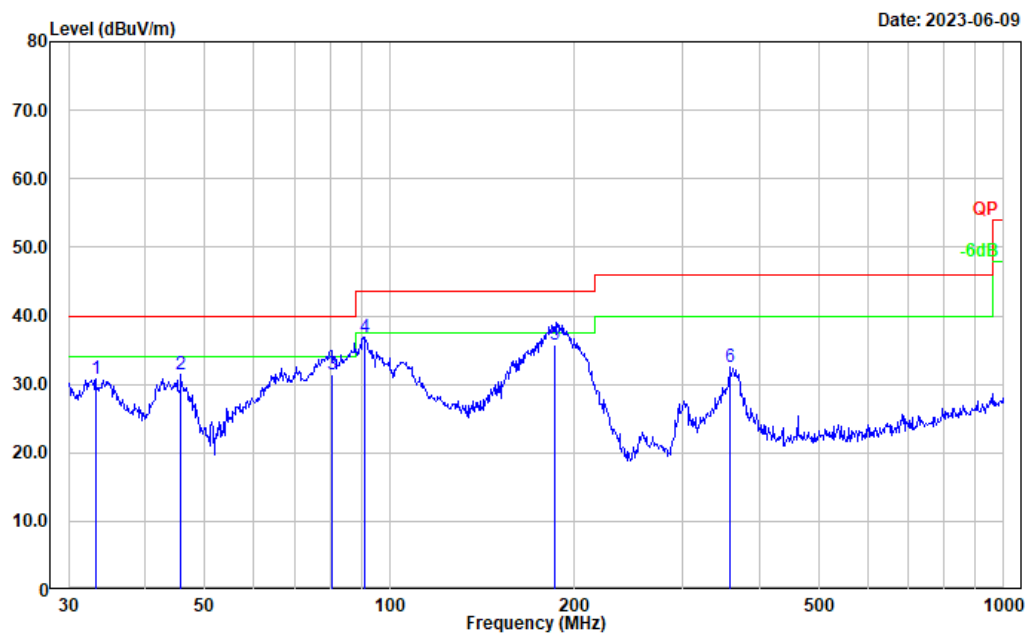
M2: Full load charging (max 2.5W+max 3W+max 15W)

Test Mode: Wireless Charging
Polarization: horizontal
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.211	29.73	-3.76	25.97	40.00	14.03	Peak
2	45.695	38.39	-14.64	23.75	40.00	16.25	Peak
3	93.440	50.87	-16.05	34.82	43.50	8.68	QP
4	189.074	54.73	-13.48	41.25	43.50	2.25	QP
5	363.349	49.86	-9.72	40.14	46.00	5.86	QP
6	833.317	29.10	-1.65	27.45	46.00	18.55	Peak

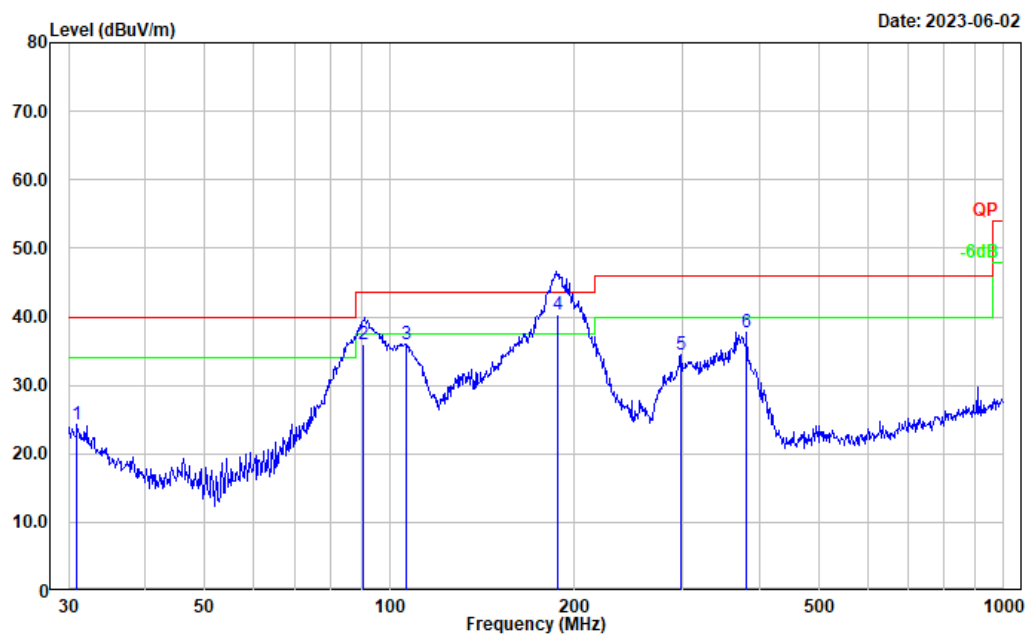
Test Mode: Wireless Charging
Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBUV)	Factor (dB/m)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector
1	33.211	36.76	-6.07	30.69	40.00	9.31	Peak
2	45.695	46.17	-14.64	31.53	40.00	8.47	Peak
3	80.693	48.90	-17.41	31.49	40.00	8.51	QP
4	91.175	53.55	-16.64	36.91	43.50	6.59	Peak
5	185.855	49.37	-13.56	35.81	43.50	7.69	QP
6	359.186	42.40	-9.86	32.54	46.00	13.46	Peak

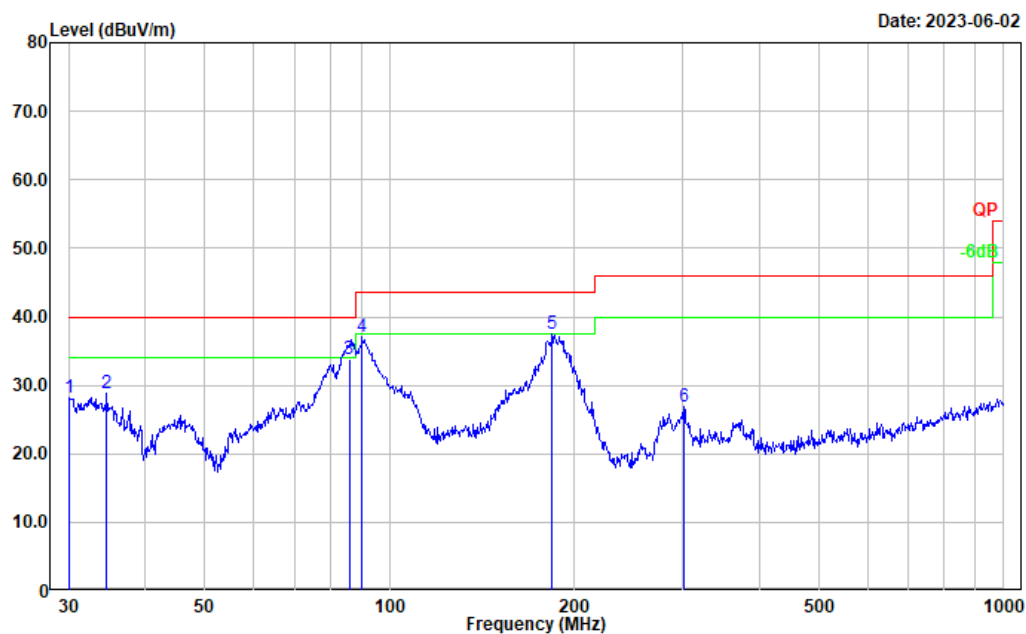
M1: Full load charging (max 2.5W+max 5W+max 15W)

Test Mode: Wireless Charging
Polarization: horizontal
Note:



No.	Frequency (MHz)	Reading (dBUV)	Factor (dB/m)	Result (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector
1	30.962	28.52	-4.34	24.18	40.00	15.82	Peak
2	90.486	52.84	-16.80	36.04	43.50	7.46	QP
3	106.385	49.06	-13.07	35.99	43.50	7.51	Peak
4	187.700	53.89	-13.53	40.36	43.50	3.14	QP
5	298.268	45.07	-10.68	34.39	46.00	11.61	Peak
6	381.249	46.80	-9.07	37.73	46.00	8.27	Peak

Test Mode: Wireless Charging
Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.105	31.85	-3.68	28.17	40.00	11.83	Peak
2	34.639	35.95	-7.19	28.76	40.00	11.24	Peak
3	85.898	50.96	-17.15	33.81	40.00	6.19	QP
4	90.220	53.96	-16.87	37.09	43.50	6.41	Peak
5	183.844	51.05	-13.58	37.47	43.50	6.03	Peak
6	301.422	37.43	-10.61	26.82	46.00	19.18	Peak

4.3 20 dB Emission Bandwidth

Serial Number:	24AV_1	Test Date:	2023/6/2-2023/6/9
Test Site:	966-2	Test Mode:	M1,M2
Tester:	Vic Du	Test Result:	PASS

Environmental Conditions:

Temperature: (°C)	24.1	Relative Humidity: (%)	49	ATM Pressure: (kPa)	101.2
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Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
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).*

Test Data:**M1:**

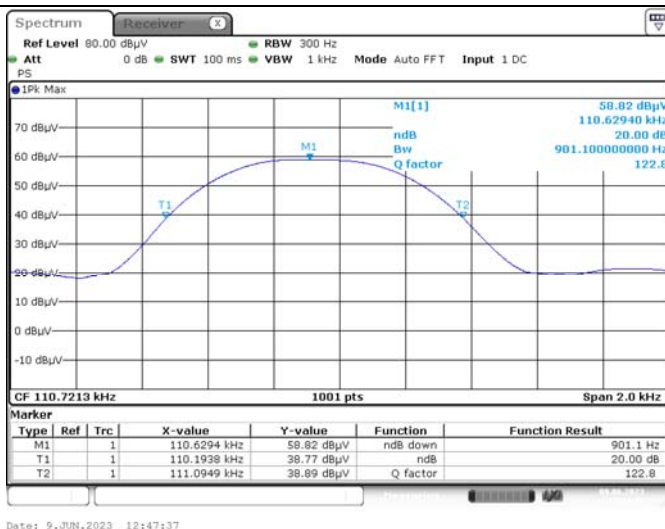
Test Coil	Test Frequency (KHz)	20dB Emission Bandwidth (KHz)	99% Occupied Bandwidth (MHz)
Coil 3	110.6	0.901	0.765
Coil 2	120	0.847	0.725
Coil 1	326	1.108	1.034

M2:

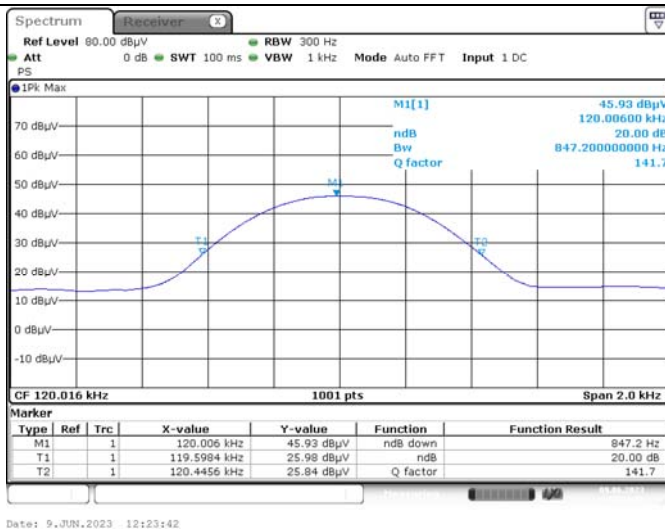
Test Coil	Test Frequency (MHz)	20dB Emission Bandwidth (KHz)	99% Occupied Bandwidth (MHz)
Coil 3	110.6	0.901	0.765
Coil 2	117	0.861	0.791
Coil 1	326	1.108	1.034

20 dB Bandwidth

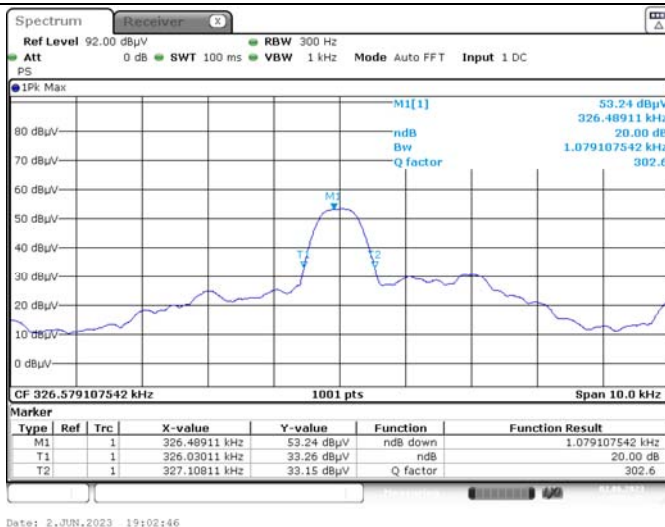
110.6 KHz M1



120 KHz M1

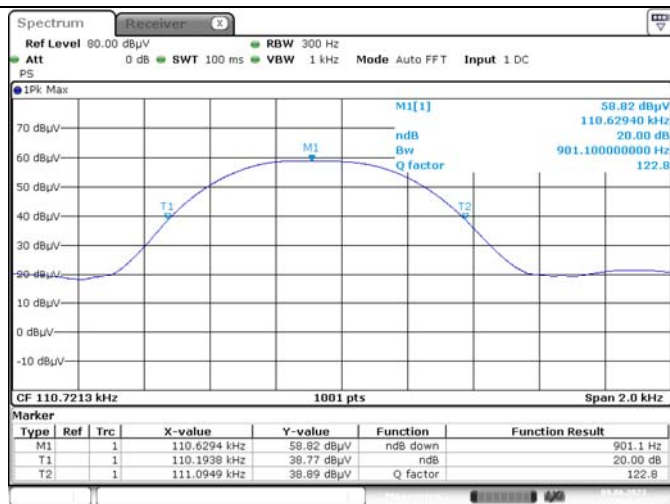


326 KHz M1

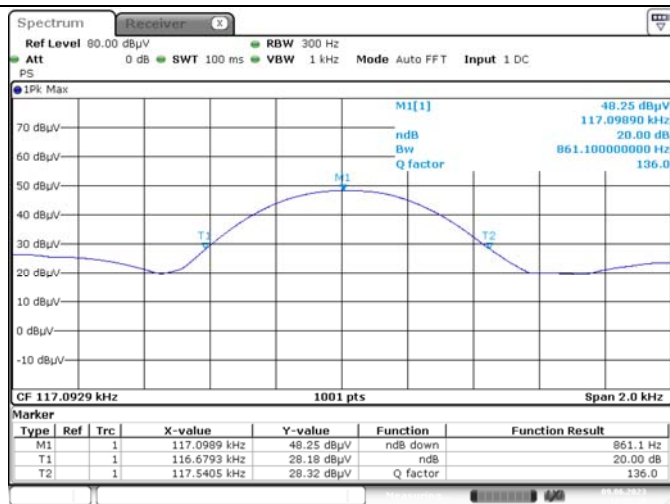


20 dB Bandwidth

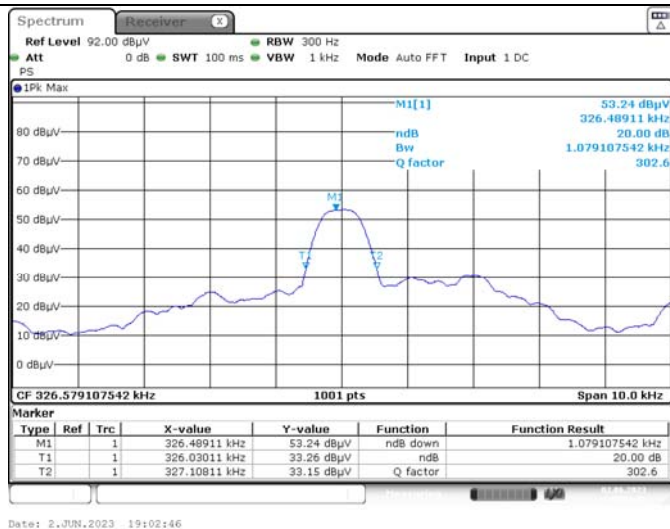
110.6 KHz M2



117 KHz M2



326 KHz M2



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, §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)

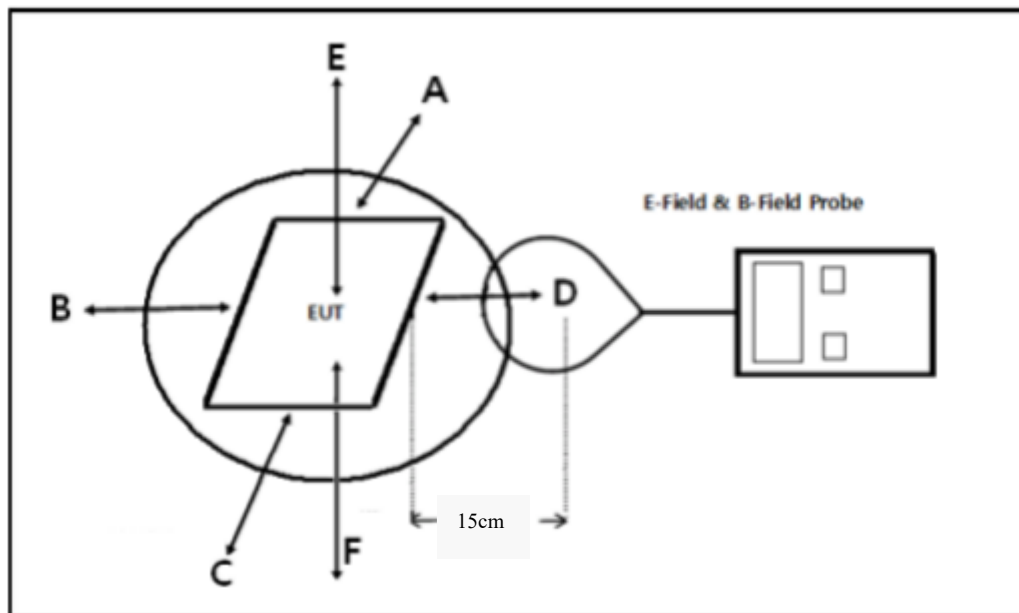
- c) For devices designed for typical desktop applications, such a wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm. E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made 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. 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: 20 cm for Top test.

5.3 Test Data:

Serial Number:	24AV_1	Test Date:	2023/5/30
Test Site:	RF	Test Mode:	Wireless Charging
Tester:	Arthur Su	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	23.6	Relative Humidity: (%)	52	ATM Pressure: (kPa)	100
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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:**M1:****H-Field Strength:**

Test Coil	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)
Coil 3	110.6	0.2242	0.1725	0.2067	0.2433	0.4483	0.815	1.63
Coil 2	120	0.1765	0.1202	0.1856	0.1869	0.2035	0.815	1.63
Coil 1	326	0.0564	0.0723	0.0556	0.0712	0.1524	0.815	1.63

Note: Test with 15cm distance from the center of the probe(s) to the edge of the device, 20 cm for top test.
The Multiple Frequency Summation (worst case at Position E)

$$H_{\text{Watch}}/H_{\text{Limit}} + H_{\text{Earphone}}/H_{\text{Limit}} + H_{\text{Phone}}/H_{\text{Limit}} = 0.1524/0.815 + 0.2035/0.815 + 0.4483/0.815 = 0.987 < 1$$

E-Field Strength:

Test Coil	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)
Coil 3	110.6	5.0205	3.3102	2.8513	4.0638	6.7358	307	614
Coil 2	120	1.2536	1.6754	2.0125	1.7652	2.0635	307	614
Coil 1	326	0.4652	0.5311	0.4864	0.5686	0.6247	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.
The Multiple Frequency Summation (worst case at Position E)

$$E_{\text{Watch}}/E_{\text{Limit}} + E_{\text{Earphone}}/E_{\text{Limit}} + E_{\text{Phone}}/E_{\text{Limit}} = 0.6247/307 + 2.0635/307 + 6.7358/307 = 0.031 < 1$$

M2:**H-Field Strength:**

Test Coil	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)
Coil 3	110.6	0.2354	0.1842	0.2023	0.2411	0.4428	0.815	1.63
Coil 2	117	0.1675	0.1247	0.1746	0.1935	0.2074	0.815	1.63
Coil 1	326	0.0534	0.0842	0.0569	0.0714	0.1561	0.815	1.63

Note: Test with 15cm distance from the center of the probe(s) to the edge of the device, 20 cm for top test.
The Multiple Frequency Summation (worst case at Position E)

$$H_{\text{Watch}}/H_{\text{Limit}} + H_{\text{Earphone}}/H_{\text{Limit}} + H_{\text{Phone}}/H_{\text{Limit}} = 0.1561/0.815 + 0.2074/0.815 + 0.4428/0.815 = 0.989 < 1$$

E-Field Strength:

Test Coil	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)
Coil 3	110.6	5.147	3.3651	2.7456	4.0361	6.1156	307	614
Coil 2	117	0.1254	1.3548	2.0471	1.7742	2.2318	307	614
Coil 1	326	0.5123	0.5247	0.4157	0.5741	0.6354	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.
The Multiple Frequency Summation (worst case at Position E)

$$E_{\text{Watch}}/E_{\text{Limit}} + E_{\text{Earphone}}/E_{\text{Limit}} + E_{\text{Phone}}/E_{\text{Limit}} = 0.6354/307 + 2.2318/307 + 6.1156/307 = 0.029 < 1$$

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 Coil 0: 326 kHz, Coil 1: 117 kHz/120 kHz, Coil 2: 110.6 kHz.

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

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

(3) The 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 three 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).

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.

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