

TEST REPORT

Applicant Name : Shenzhen Mengzheng Technology Co., Ltd.
Address : 401, 28-3, Gongkenglang Industrial Park, Xintian Community,
Guanhu Street, Longhua District, Shenzhen, China
Report Number : RA221130-58035E-RF
FCC ID: 2A9KG-M1

Test Standard (s)

FCC Part 15C

Sample Description

Product Type: Magnetic wireless charging power bank
Model No.: M1, J1,S1,W1,F1
Trade Mark: N/A
Date Received: 2022-11-30
Date of Test: 2022-12-01
Report Date: 2022-12-23

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Roger.Ling

Roger.Ling
EMC Engineer

Approved By:

Candy.Li

Candy Li
EMC Engineer

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

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

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Shenzhen Accurate Technology Co., Ltd.

1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China
Tel: +86 755-26503290 Fax: +86 755-26503396 Web: www.atc-lab.com

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product Type	Magnetic wireless charging power bank
Test Model	M1
Multiple Model	J1,S1,W1,F1 (please refer to DOS)
Frequency Range	110.5-205kHz
Antenna Type	Coil
Input Voltage	5V ⁼⁼ 2.4A
Wireless Output Power	5W/7.5W/10W
Sample serial number	RA221130-58035E-RF-S1 (Assigned by ATC, Shenzhen)
Sample/EUT Status	Good condition

Objective

This test report is in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communications Commission's rules.

The objective is to determine the compliance of EUT with FCC rules, section 15.203, 15.205, 15.207 and 15.209.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

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

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF Frequency		0.082×10^{-7}
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.66dB
	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz - 26.5GHz	5.06dB
	26.5GHz - 40GHz	4.72dB
Temperature		1°C
Humidity		6%
Supply voltages		0.4%

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

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189.

Accredited by American Association for Laboratory Accreditation (A2LA). The Certificate Number is 4297.01

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0016. The Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a test mode.

Test mode 1: USB input + wireless charging(10W)

Test mode 2: USB output + wireless charging(10W)

Note: the EUT support 5W, 7.5W and 10W wireless output, per-scan with this those output level, the worst case is 10W.

EUT Exercise Software

No software used in test.

Local Support Equipment

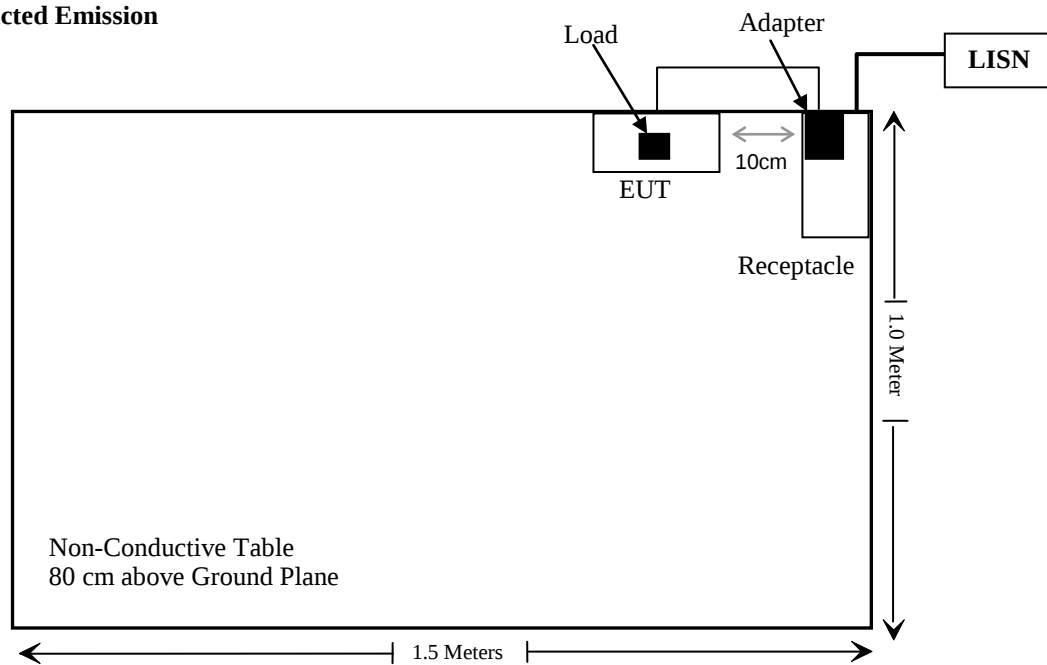
Manufacturer	Description	Model	Serial Number
DLIGHT STAR	Load	DZ0111	Unknown
XIAOMI	adapter	MDY-11-EB	CA62010U101960G

External I/O Cable

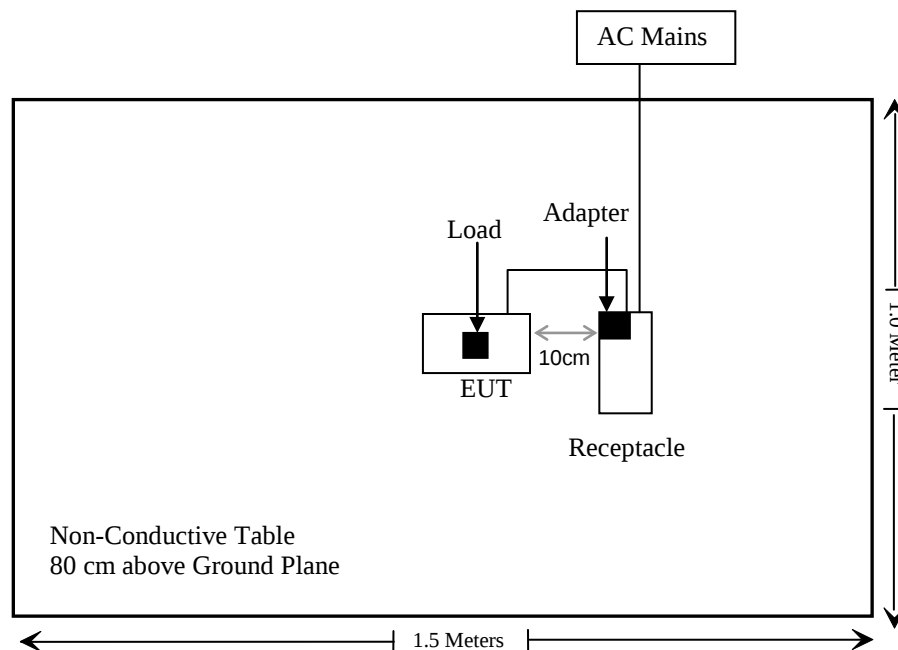
Cable Description	Length (m)	From Port	To
Unshielded Detachable DC Cable	0.8	Adapter	EUT

Block Diagram of Test Setup

For Conducted Emission



For Radiated Emission



SUMMARY OF TEST RESULTS

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

Compliant*: please refer to report: CR221258458-00.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emission test					
Rohde& Schwarz	EMI Test Receiver	ESCI	100784	2021/12/13	2022/12/12
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2021/12/13	2022/12/12
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2021/12/13	2022/12/12
Unknown	RF Coaxial Cable	No.17	N0350	2021/12/14	2022/12/13
Conducted Emission Test Software: e3 19821b (V9)					
RF Radiated test					
Rohde & Schwarz	Test Receiver	ESR	102725	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2022/11/08	2023/11/07
SCHWARZBECK	LOOP ANTENNA	FMZB1516	1516131	2021/12/22	2024/12/21
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.13	N300	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.14	N800	2021/12/14	2022/12/13
Radiated Emission Test Software: e3 19821b (V9)					

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC§15.203 – ANTENNA REQUIREMENT

Applicable Standard

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Antenna Connected Construction

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

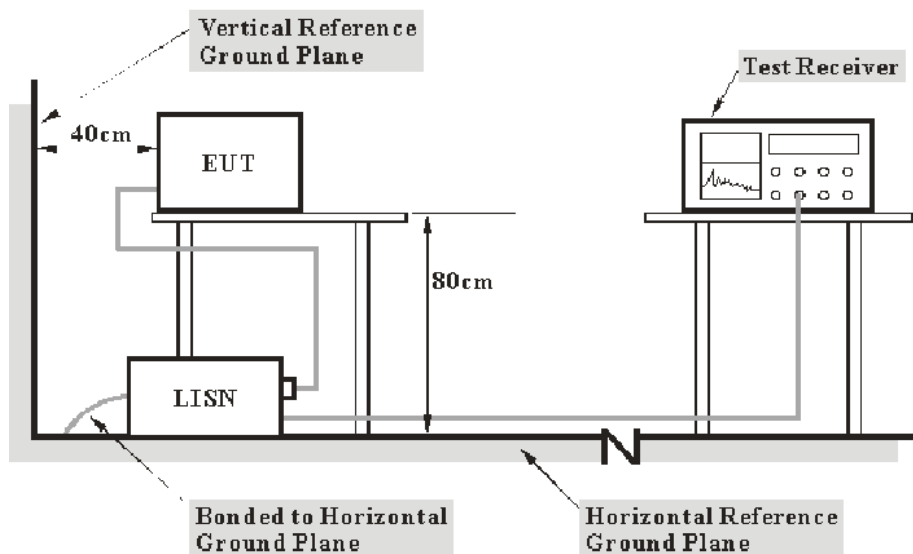
Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

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 measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Factor & Margin Calculation

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

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

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

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

Test Data

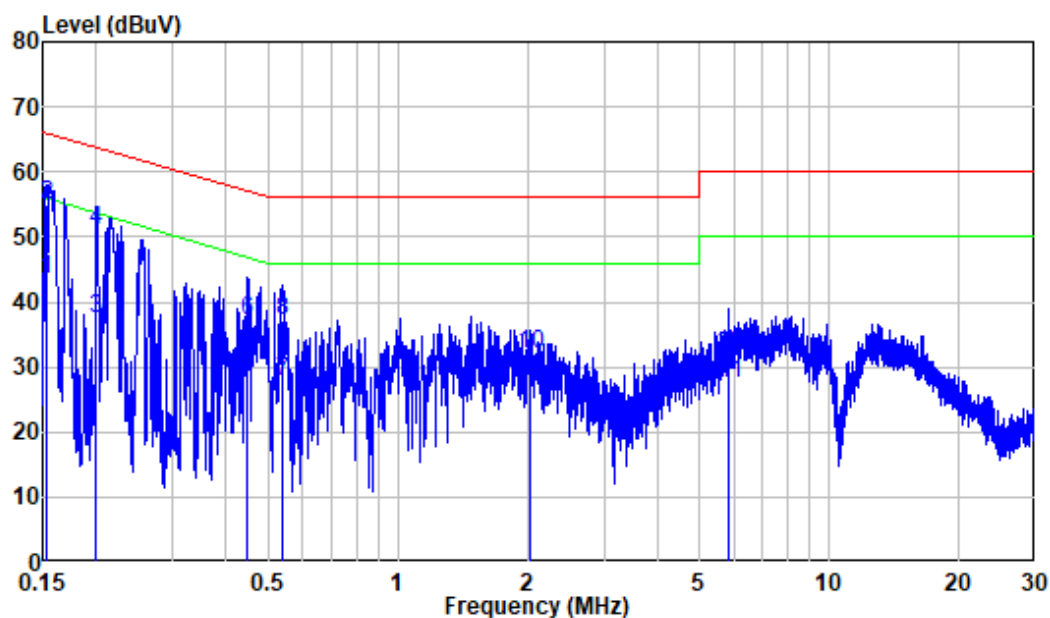
Environmental Conditions

Temperature:	19°C
Relative Humidity:	46%
ATM Pressure:	101.0 kPa

The testing was performed by Chenjie on 2022-12-01.

Test mode 1: USB input + wireless charging(10W)

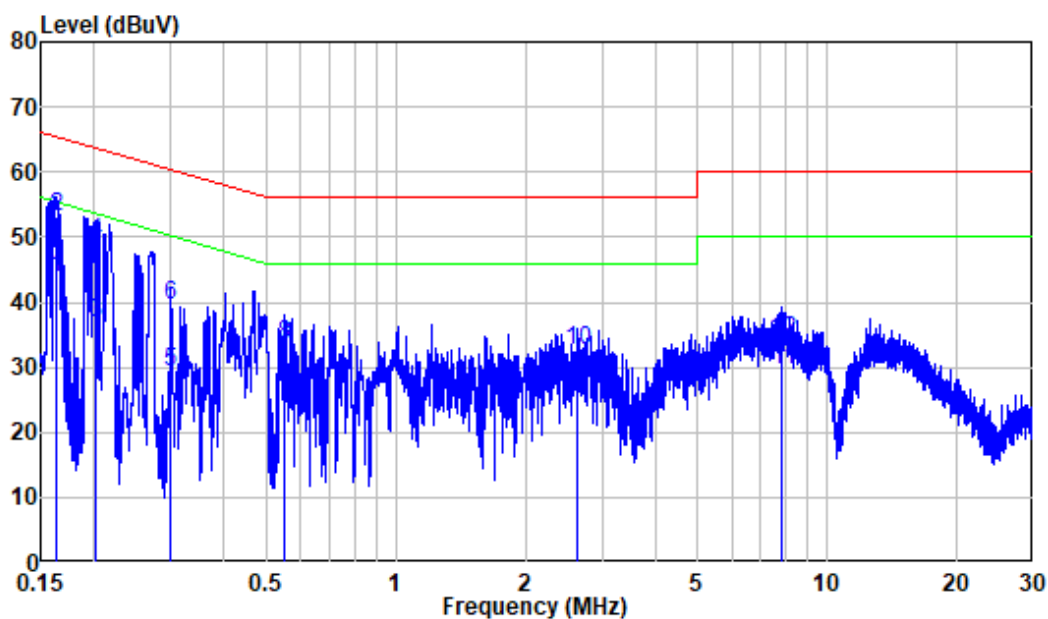
AC 120V/60 Hz, Line



Site : Shielding Room
 Condition: Line
 Job No. : RA221130-58035E-RF
 Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.153	9.80	33.80	43.60	55.82	-12.22	Average
2	0.153	9.80	45.19	54.99	65.82	-10.83	QP
3	0.200	9.80	27.74	37.54	53.61	-16.07	Average
4	0.200	9.80	41.35	51.15	63.61	-12.46	QP
5	0.446	9.80	19.65	29.45	46.96	-17.51	Average
6	0.446	9.80	27.30	37.10	56.96	-19.86	QP
7	0.539	9.81	18.03	27.84	46.00	-18.16	Average
8	0.539	9.81	27.22	37.03	56.00	-18.97	QP
9	2.023	9.82	17.87	27.69	46.00	-18.31	Average
10	2.023	9.82	22.30	32.12	56.00	-23.88	QP
11	5.863	9.86	17.68	27.54	50.00	-22.46	Average
12	5.863	9.86	22.06	31.92	60.00	-28.08	QP

AC 120V/60 Hz, Neutral



Site : Shielding Room
 Condition: Neutral
 Job No. : RA221130-58035E-RF
 Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.162	9.80	33.99	43.79	55.34	-11.55	Average
2	0.162	9.80	43.33	53.13	65.34	-12.21	QP
3	0.202	9.80	26.91	36.71	53.52	-16.81	Average
4	0.202	9.80	39.50	49.30	63.52	-14.22	QP
5	0.300	9.80	19.39	29.19	50.23	-21.04	Average
6	0.300	9.80	29.77	39.57	60.23	-20.66	QP
7	0.550	9.81	15.58	25.39	46.00	-20.61	Average
8	0.550	9.81	23.80	33.61	56.00	-22.39	QP
9	2.627	9.83	18.09	27.92	46.00	-18.08	Average
10	2.627	9.83	22.76	32.59	56.00	-23.41	QP
11	7.872	9.98	19.46	29.44	50.00	-20.56	Average
12	7.872	9.98	24.17	34.15	60.00	-25.85	QP

FCC §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

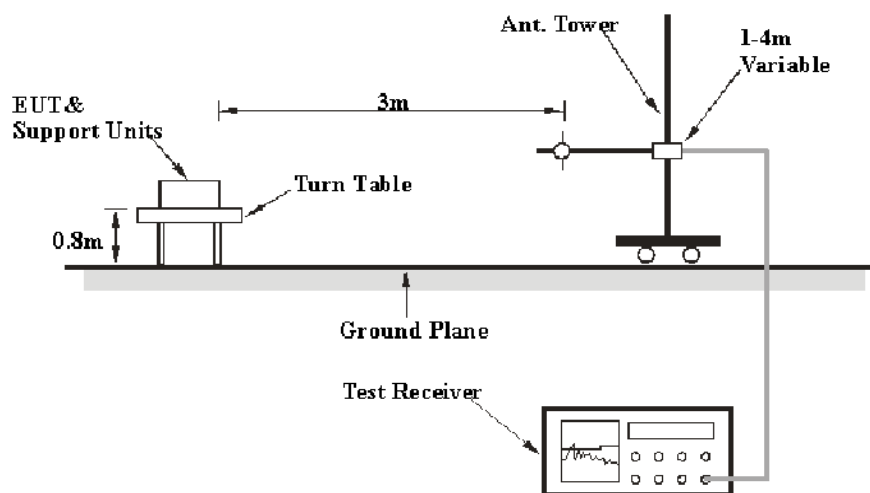
As per FCC Part 15.209

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

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	$2400/F(\text{kHz})$	300
0.490-1.705	$24000/F(\text{kHz})$	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

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

EUT Setup



The radiated emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part Subpart C limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

During the radiated emission test, the EMI test Receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	Measurement
9 kHz – 150 kHz	300 Hz	1 kHz	PK
150 kHz – 30 MHz	10 kHz	30 kHz	PK
30 MHz – 1000 MHz	120 kHz	300 kHz	QP

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

If the maximized peak measured value complies with the limit, then it is unnecessary to perform an QP/Average measurement

Corrected Amplitude & Margin Calculation

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

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

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

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

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	57 %
ATM Pressure:	101.0 kPa

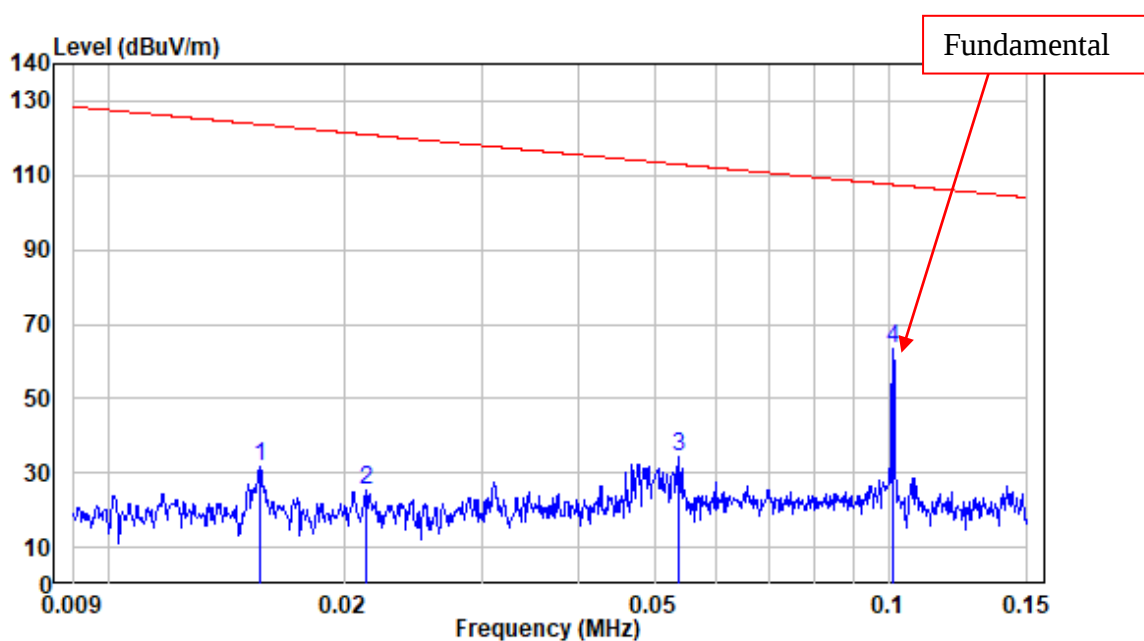
The testing was performed by Jimi Zheng on 2022-12-01.

Test mode 1: USB input + wireless charging(10W)

Note 1: Scan test mode 1 and test mode 2, the worst case test mode 1 was select to test and record.

Note 2: Scan at X axis, Y axis, Z axis, the worst case is at X axis

9 kHz~150kHz:



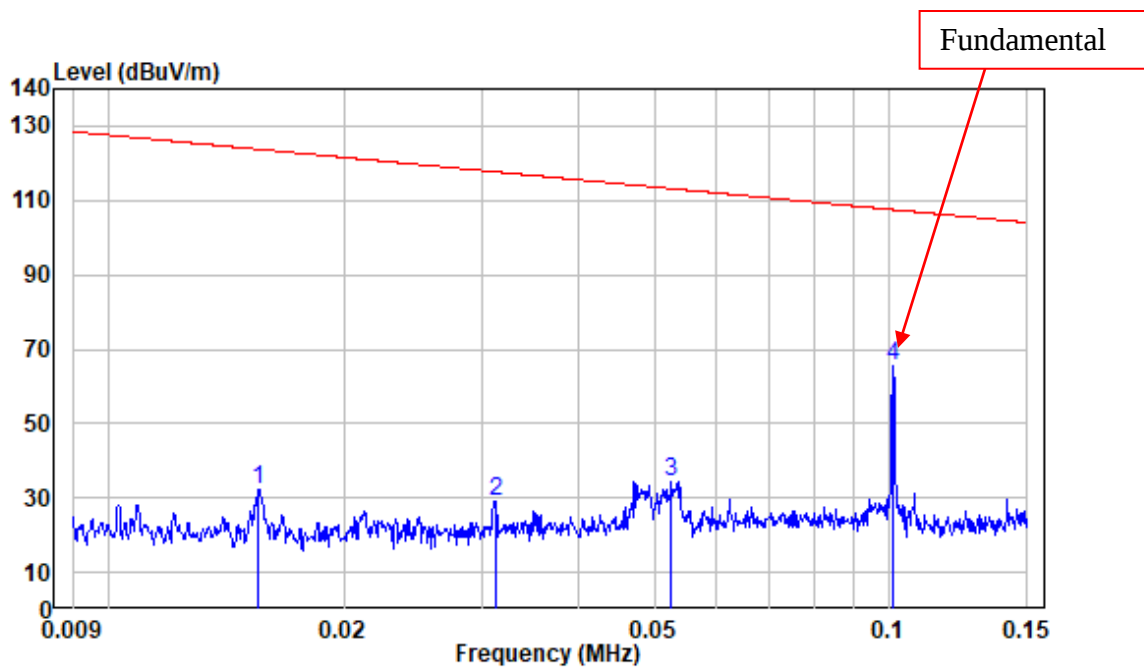
Site : chamber

Condition: 3m

Job No. : RA221130-58035E-RF

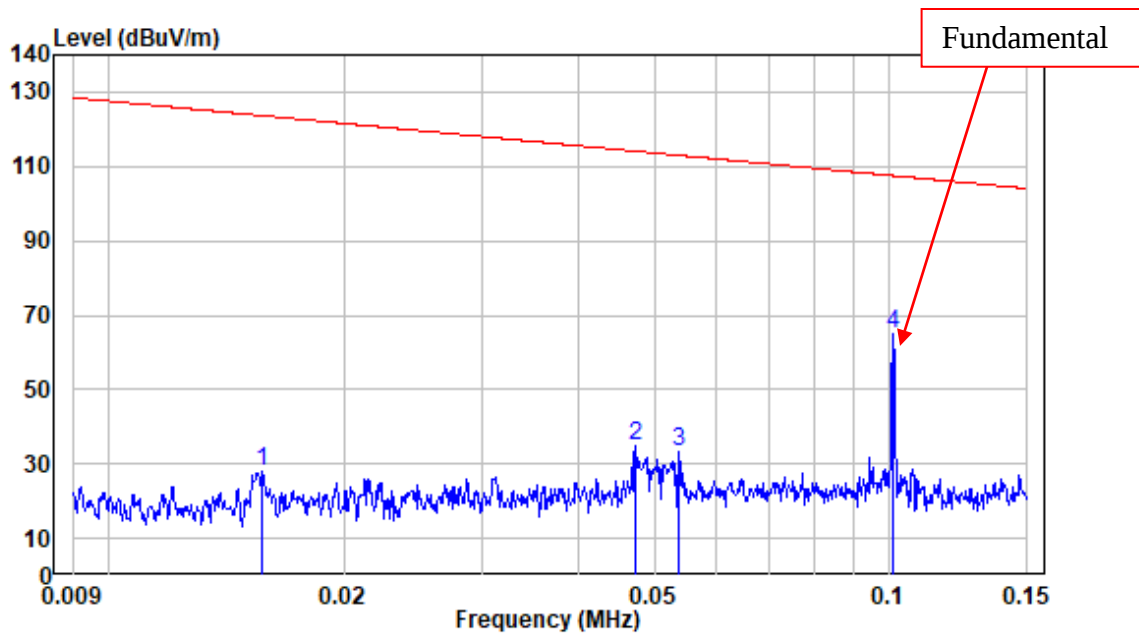
Note : Ground-parallel

	Freq	Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB/m	dBUV	dBUV/m	dBUV/m	dB	
1	0.016	-11.54	43.02	31.48	123.71	-92.23	Peak
2	0.021	-11.69	36.84	25.15	121.02	-95.87	Peak
3	0.054	-11.53	45.68	34.15	113.03	-78.88	Peak
4	0.101	-11.57	75.14	63.57	107.50	-43.93	Peak



Site : chamber
Condition: 3m
Job No. : RA221130-58035E-RF
Note : Perpendicular

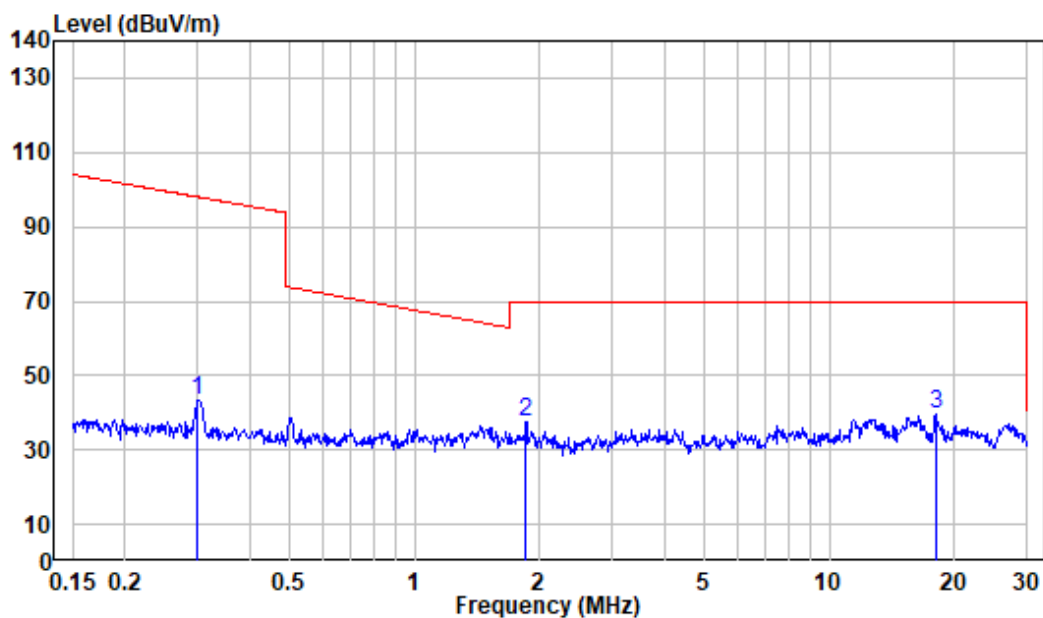
	Freq	Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.016	-11.54	43.95	32.41	123.75	-91.34	Peak
2	0.031	-11.63	40.89	29.26	117.69	-88.43	Peak
3	0.053	-11.54	46.11	34.57	113.20	-78.63	Peak
4	0.101	-11.57	77.04	65.47	107.50	-42.03	Peak



Site : chamber
Condition: 3m
Job No. : RA221130-58035E-RF
Note : Parallel

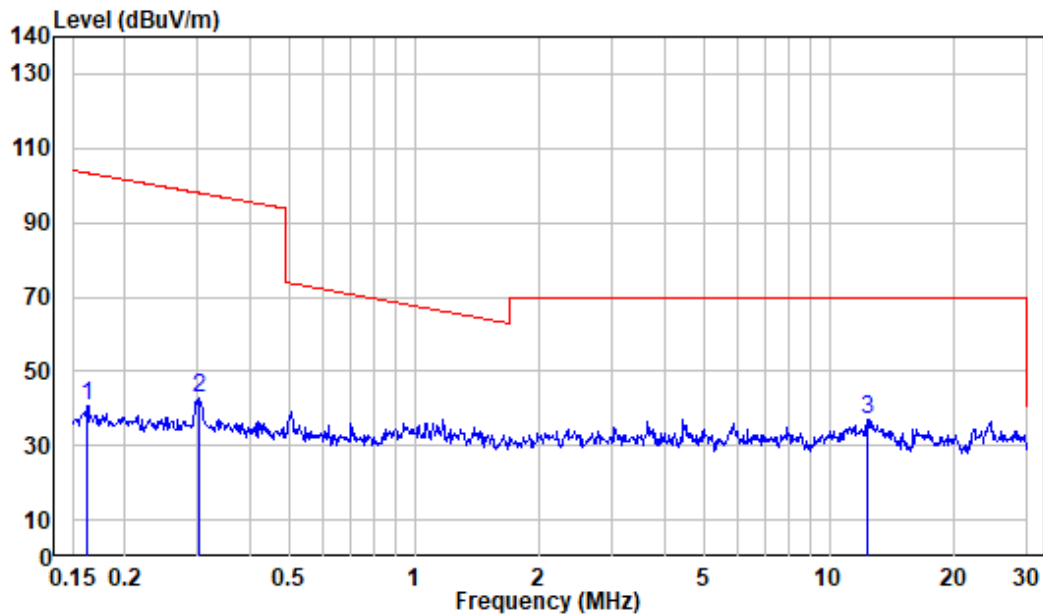
	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.016	-11.54	39.47	27.93	123.66	-95.73	Peak
2	0.047	-11.55	46.18	34.63	114.13	-79.50	Peak
3	0.054	-11.53	44.95	33.42	113.00	-79.58	Peak
4	0.101	-11.57	76.39	64.82	107.50	-42.68	Peak

150kHz~30MHz:



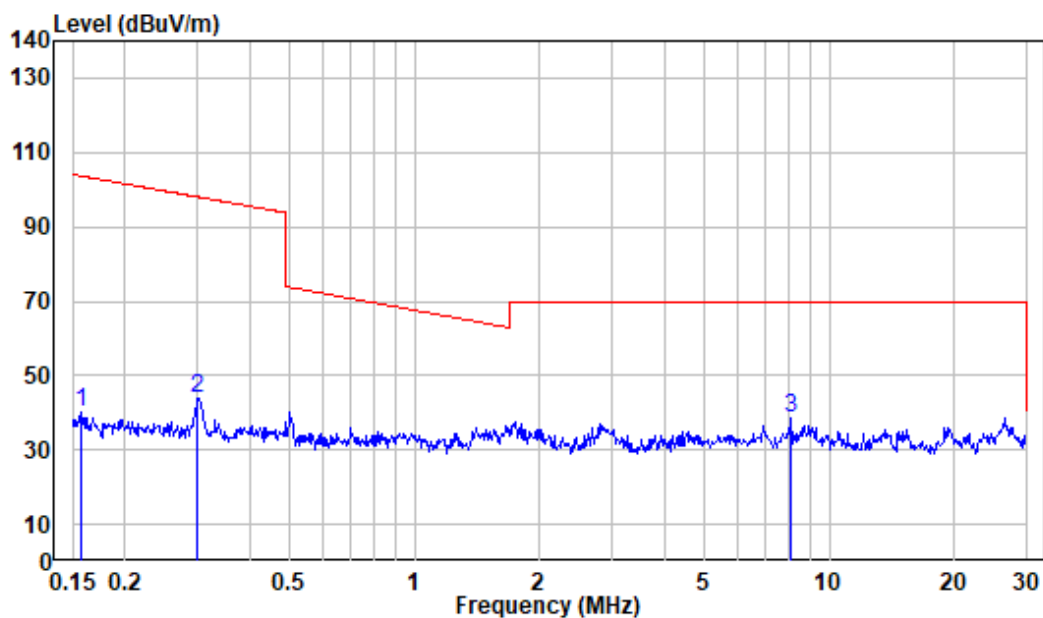
Site : chamber
Condition: 3m
Job No. : RA221130-58035E-RF
Note : Ground-parallel

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.300	-11.82	55.28	43.46	98.05	-54.59	Peak
2	1.858	-11.37	49.03	37.66	69.54	-31.88	Peak
3	18.039	-10.27	50.14	39.87	69.54	-29.67	Peak



Site : chamber
Condition: 3m
Job No. : RA221130-58035E-RF
Note : Perpendicular

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.163	-12.08	52.97	40.89	103.35	-62.46	Peak
2	0.303	-11.82	54.47	42.65	97.96	-55.31	Peak
3	12.318	-10.90	48.03	37.13	69.54	-32.41	Peak

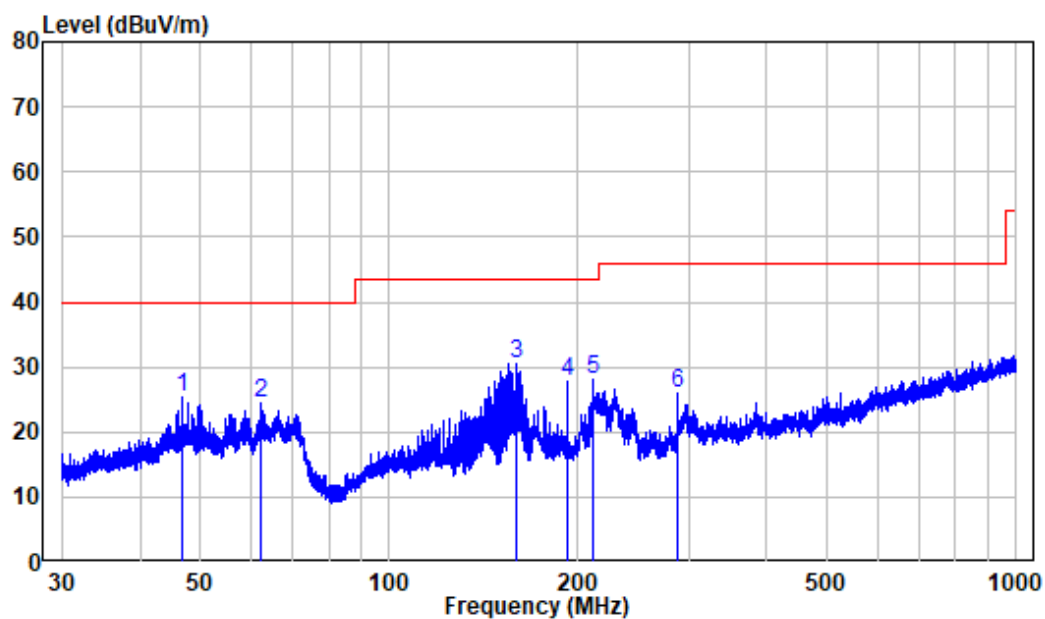


Site : chamber
Condition: 3m
Job No. : RA221130-58035E-RF
Note : Parallel

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.156	-12.11	52.28	40.17	103.71	-63.54	Peak
2	0.300	-11.82	55.91	44.09	98.05	-53.96	Peak
3	8.105	-11.26	49.56	38.30	69.54	-31.24	Peak

30MHz~1GHz:

Horizontal



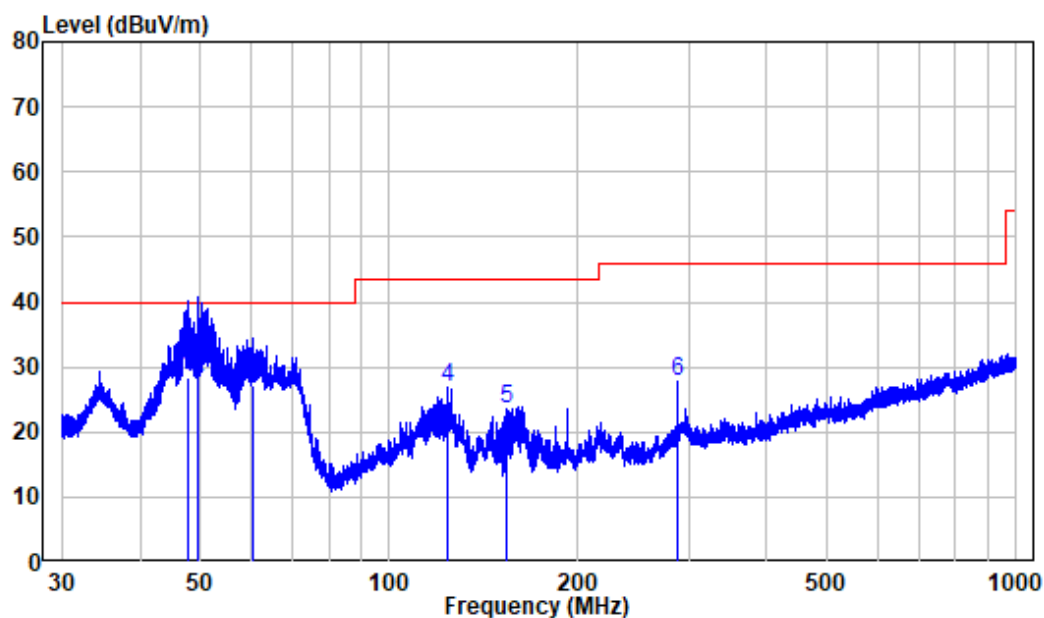
Site : chamber

Condition: 3m HORIZONTAL

Job No. : RA221130-58035E-RF

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	46.666	-10.00	35.25	25.25	40.00	-14.75	Peak
2	62.322	-11.55	35.86	24.31	40.00	-15.69	Peak
3	159.855	-14.21	44.64	30.43	43.50	-13.07	Peak
4	191.997	-11.25	39.09	27.84	43.50	-15.66	Peak
5	211.898	-11.78	39.78	28.00	43.50	-15.50	Peak
6	287.990	-9.36	35.24	25.88	46.00	-20.12	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : RA221130-58035E-RF

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	47.617	-10.00	38.40	28.40	40.00	-11.60	QP
2	49.598	-9.93	38.40	28.47	40.00	-11.53	QP
3	60.386	-10.77	37.99	27.22	40.00	-12.78	QP
4	124.024	-14.21	40.96	26.75	43.50	-16.75	Peak
5	154.279	-15.00	38.50	23.50	43.50	-20.00	Peak
6	287.990	-9.36	37.04	27.68	46.00	-18.32	Peak

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