

TEST REPORT

Applicant Name : Shenzhen Lechong Technology Co., Ltd
Address : Room 301, Building 2, 181 Renmin Road, Xinhe Community,
Fucheng Street, Longhua District, Shenzhen
Report Number : RA230523-28440E-RF
FCC ID: 2A93X-V100

Test Standard (s)

FCC Part 15C

Sample Description

Product Type: V100 Apple Magnetic Wireless Charging
Model No.: V100
Trade Mark: N/A
Date Received: 2023-05-23
Date of Test: 2023-05-25 to 2023-06-02
Report Date: 2023-06-05

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

Prepared and Checked By:

Dave Liang

Dave Liang
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 "★".

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA230523-28440E-RF	Original Report	2023-06-05

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product Type	V100 Apple Magnetic Wireless Charging
Test Model	V100
Frequency Range	123kHz
Antenna Type	Coil
Input Voltage	DC 5V/9V from USB port
Output Power	For charging mobile phone: 7.5W/15W For charging Earphones: 5W (Max) For charging Watch: 2.5W(Max)
Sample serial number	RA230523-28440E-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%
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.74dB
Emissions, Radiated	9kHz – 30MHz	2.06dB
	30MHz - 1GHz	5.08dB
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 Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, Shenzhen, Guangdong, 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 30241.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a test mode.

Note: the device support a max 15W output for charging mobile phone, max 5W output for charging earphone, max 2.5W output for charging watch, pre-scan the three mode, the worst case 15W output was select to test.

EUT Exercise Software

No software used in test.

Local Support Equipment

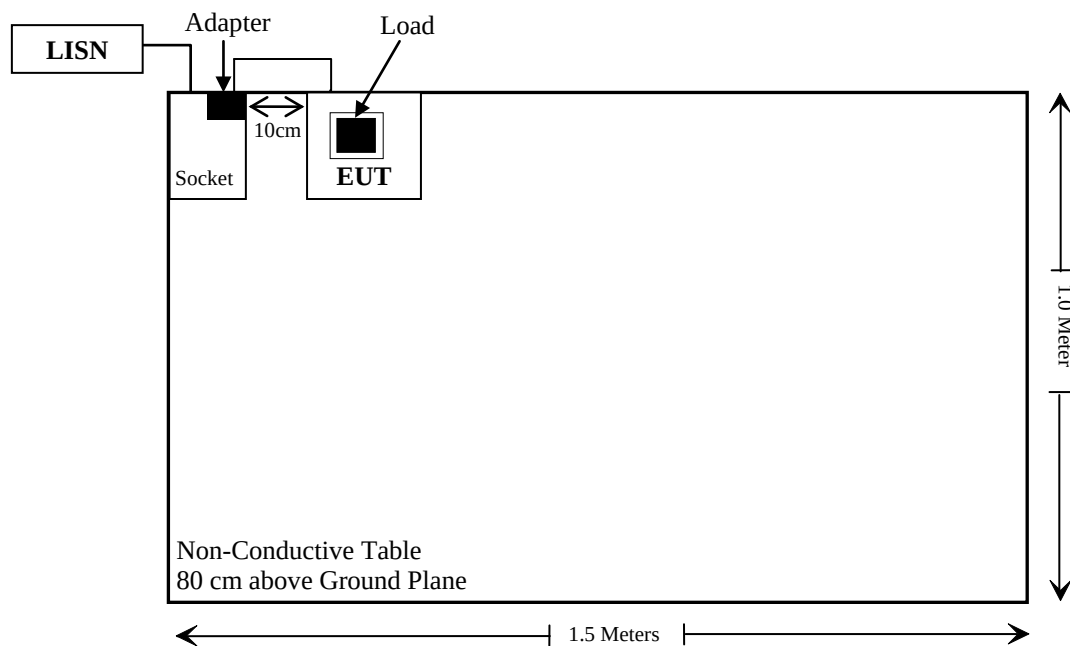
Manufacturer	Description	Model	Serial Number
EESON	Load	2S	Unknown
Unknown	Adapter	CA-43T	Unknown

External I/O Cable

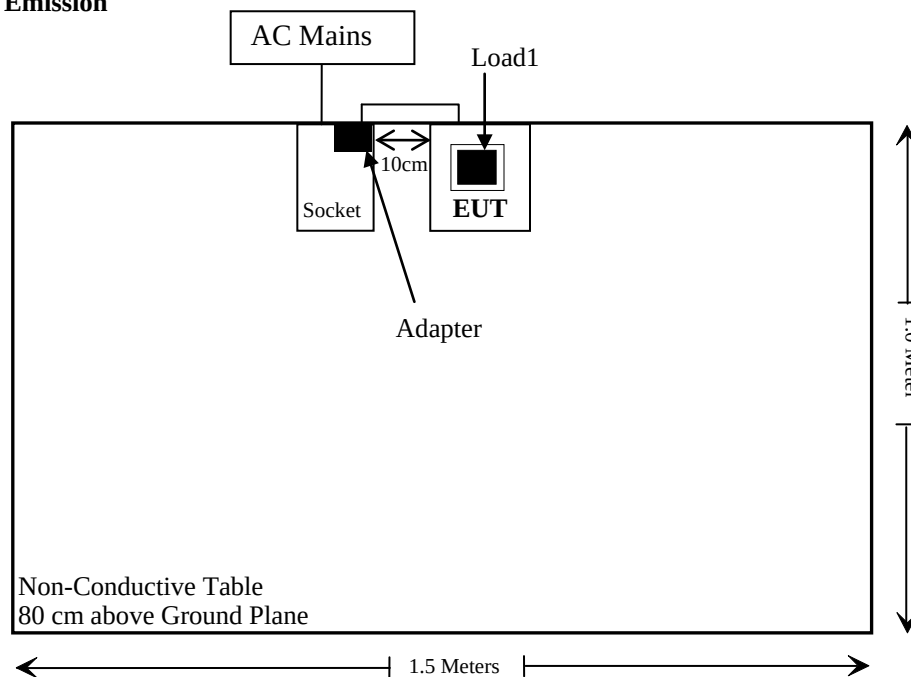
Cable Description	Length (m)	From Port	To
Unshielded Detachable Type-C Cable	0.95	EUT	Adapter

Block Diagram of Test Setup

For Conducted Emission



For Radiated Emission



Note: the support table edge was flush with the center of turntable

SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207	AC Line Conducted Emission	Compliant
§15.209 §15.205	Radiated Emission Test	Compliant
§15.215(c)	20dB Emission Bandwidth	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emission test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100784	2022/11/25	2023/11/24
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2022/11/25	2023/11/24
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2022/12/07	2023/12/06
Unknown	RF Coaxial Cable	No.17	N0350	2022/11/25	2023/11/24
Conducted Emission Test Software: e3 191218 (V9)					
RF Radiated test					
Rohde & Schwarz	Test Receiver	ESR	102725	2022/11/25	2023/11/24
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	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.13	N300	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.14	N800	2022/11/25	2023/11/24
Radiated Emission Test Software:e3 191218 (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 antenna arrangement which was permanently attached, fulfill the requirement of this section. Please refer to the EUT photos.

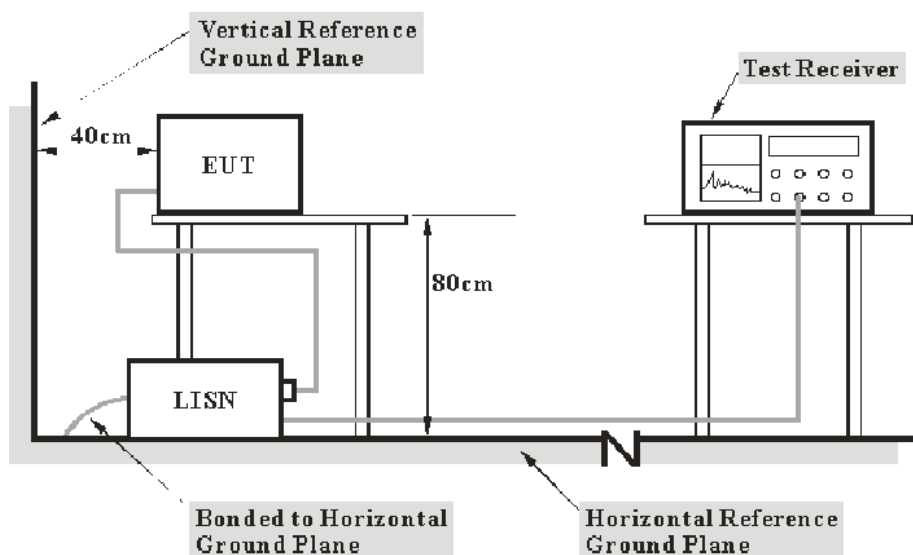
Result: Compliant.

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

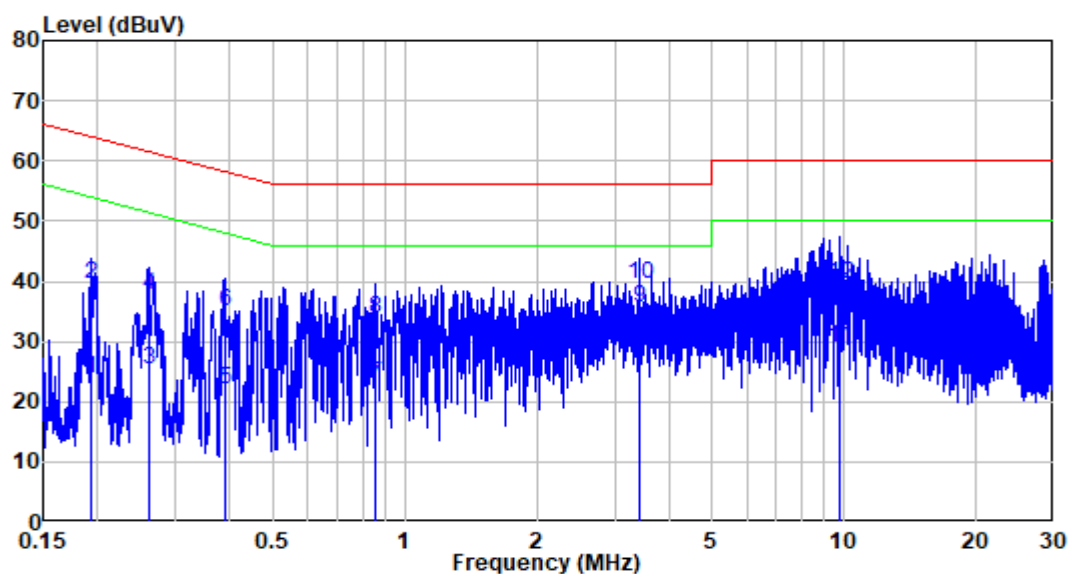
Environmental Conditions

Temperature:	23 °C
Relative Humidity:	49 %
ATM Pressure:	101.0 kPa

The testing was performed by Jerry Wu on 2023-05-31.

EUT operation mode: Full Load (Worst case 15W)

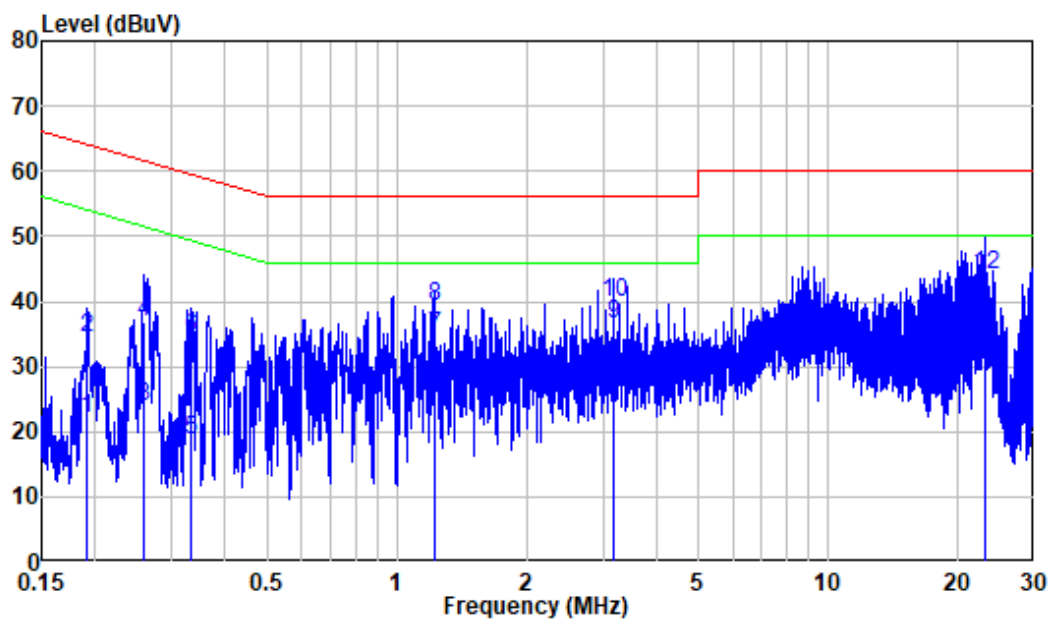
AC 120V/60 Hz, Line



Site : Shielding Room
Condition: Line
Job No. : RA230523-28440E-RF
Mode : Full Load
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.193	10.30	13.66	23.96	53.92	-29.96	Average
2	0.193	10.30	29.33	39.63	63.92	-24.29	QP
3	0.260	10.36	14.97	25.33	51.42	-26.09	Average
4	0.260	10.36	27.50	37.86	61.42	-23.56	QP
5	0.390	10.49	11.69	22.18	48.07	-25.89	Average
6	0.390	10.49	24.44	34.93	58.07	-23.14	QP
7	0.856	10.55	12.33	22.88	46.00	-23.12	Average
8	0.856	10.55	23.15	33.70	56.00	-22.30	QP
9	3.406	10.51	25.25	35.76	46.00	-10.24	Average
10	3.406	10.51	28.90	39.41	56.00	-16.59	QP
11	9.737	10.62	18.30	28.92	50.00	-21.08	Average
12	9.737	10.62	28.88	39.50	60.00	-20.50	QP

AC 120V/60 Hz, Neutral



Site : Shielding Room
 Condition: Neutral
 Job No. : RA230523-28440E-RF
 Mode : Full Load
 Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.192	10.29	11.88	22.17	53.96	-31.79	Average
2	0.192	10.29	24.18	34.47	63.96	-29.49	QP
3	0.260	10.33	13.40	23.73	51.45	-27.72	Average
4	0.260	10.33	26.65	36.98	61.45	-24.47	QP
5	0.333	10.38	8.38	18.76	49.38	-30.62	Average
6	0.333	10.38	24.03	34.41	59.38	-24.97	QP
7	1.218	10.40	24.17	34.57	46.00	-11.43	Average
8	1.218	10.40	28.74	39.14	56.00	-16.86	QP
9	3.167	10.53	26.13	36.66	46.00	-9.34	Average
10	3.167	10.53	29.42	39.95	56.00	-16.05	QP
11	23.033	10.24	21.57	31.81	50.00	-18.19	Average
12	23.033	10.24	33.74	43.98	60.00	-16.02	QP

FCC §15.205 & §15.209 - RADIATED EMISSIONS TEST

Applicable Standard

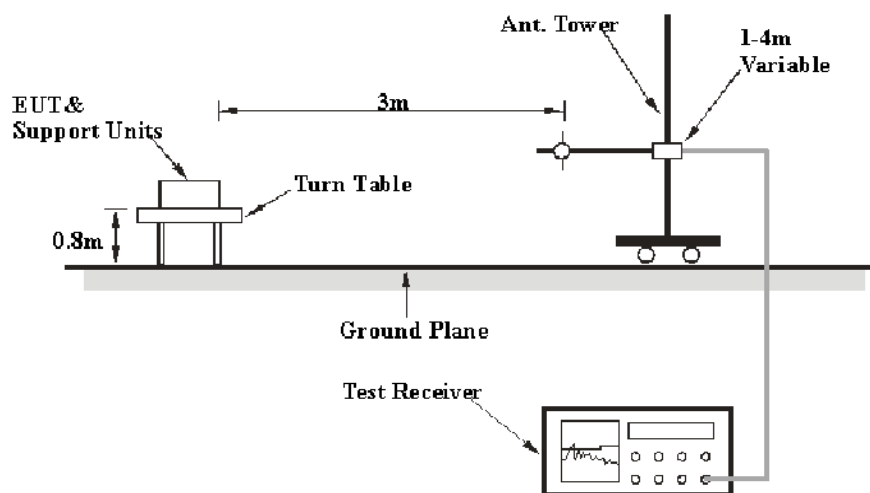
As per FCC Part 15.209

(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 under the QP/Average limit more than 6dB, then it is unnecessary to perform 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:

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

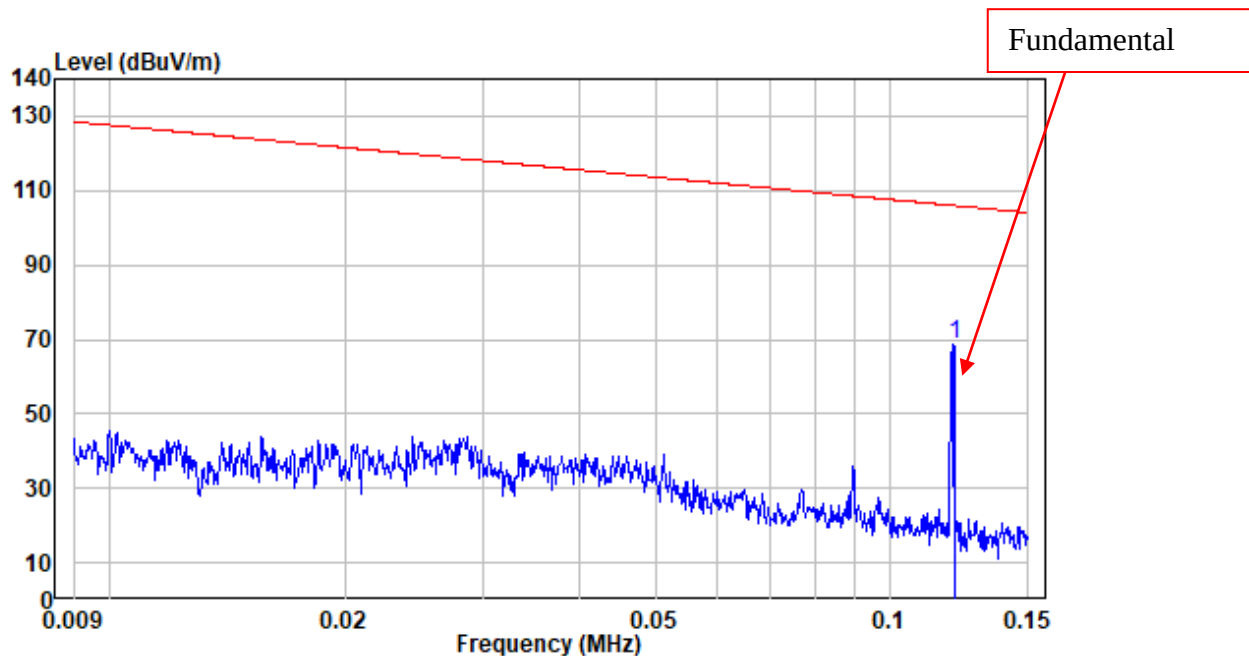
Test Data

Environmental Conditions

Temperature:	23 °C
Relative Humidity:	53-57 %
ATM Pressure:	101.0 kPa

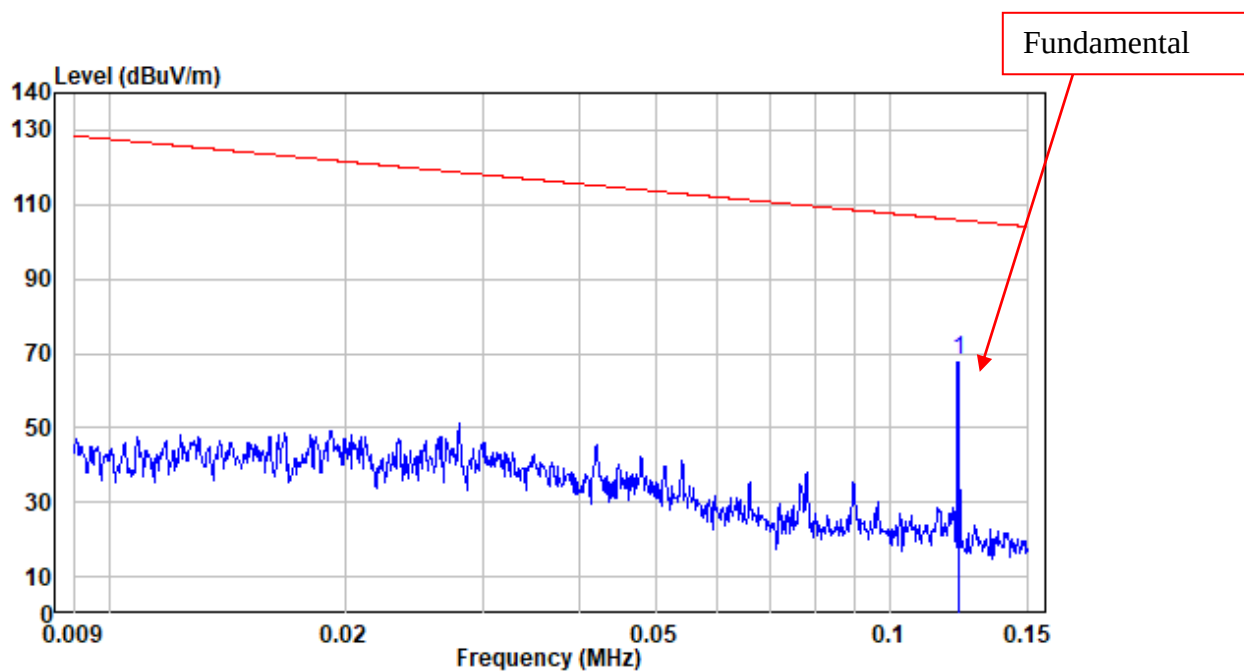
The testing was performed by Jason Liu on 2023-05-25 and 2023-06-03.

Test Mode: Full Load (Worst case 15W)

9 kHz~150kHz:

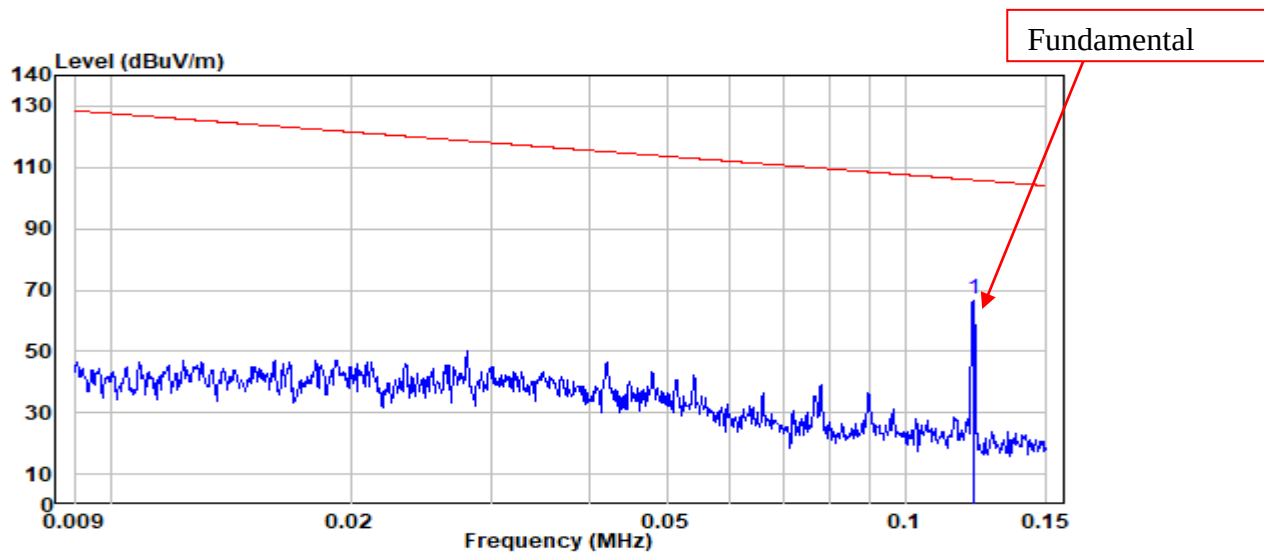
Site : chamber
Condition: 3m
Job No. : RA230523-28440E-RF
Test Mode: Full load
Note : Ground-parallel

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.121	-12.63	81.54	68.91	105.95	-37.04	Peak



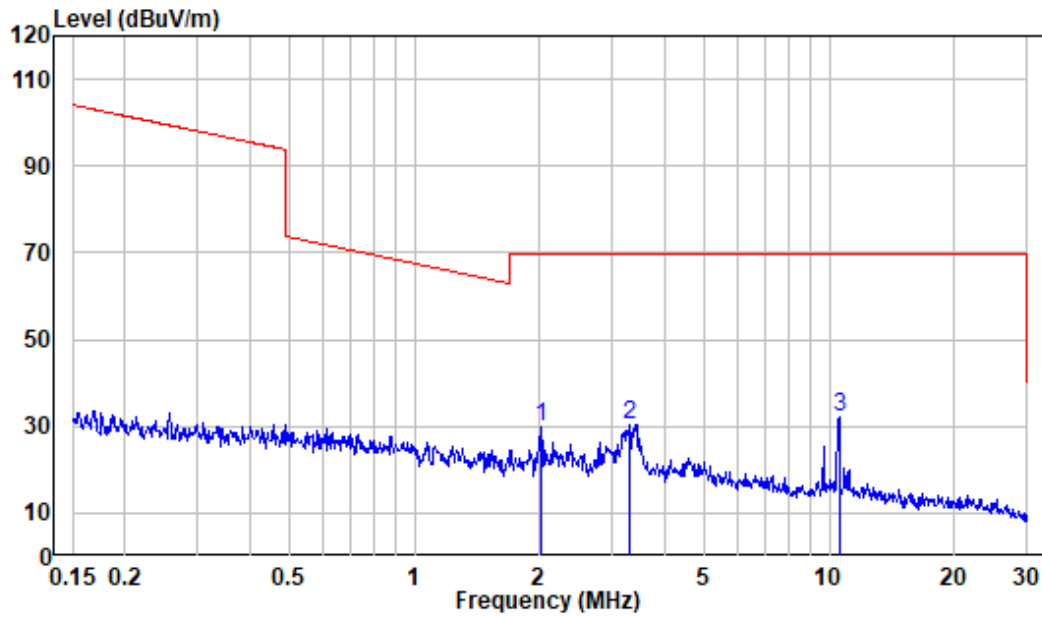
Site : chamber
Condition: 3m
Job No. : RA230523-28440E-RF
Test Mode: Full load
Note : Perpendicular

	Freq	Factor	Read		Limit	Over	Remark
			Level	Level	Line	Limit	
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.122	-12.65	80.89	68.24	105.88	-37.64	Peak



Site : chamber
Condition: 3m
Job No. : RA230523-28440E-RF
Test Mode: Full load
Note : Parallel

	Freq		Read		Limit	Over	Remark
	Factor		Level	Level	Line	Limit	
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.122	-12.64	79.88	67.24	105.91	-38.67	Peak

150kHz~30MHz:

Site : chamber

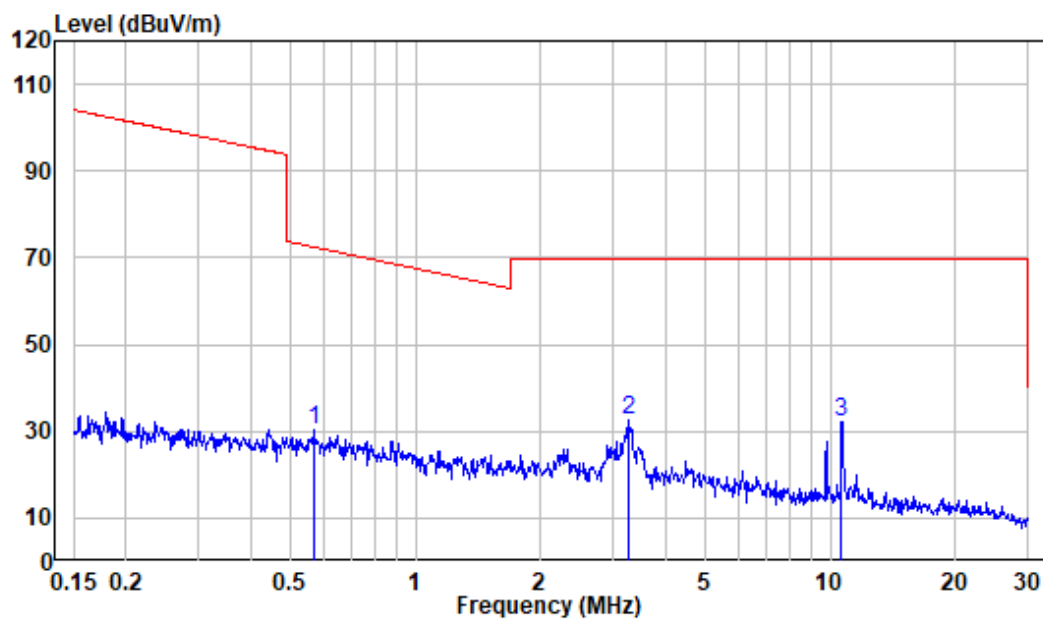
Condition: 3m

Job No. : RA230523-28440E-RF

Test Mode: Full load

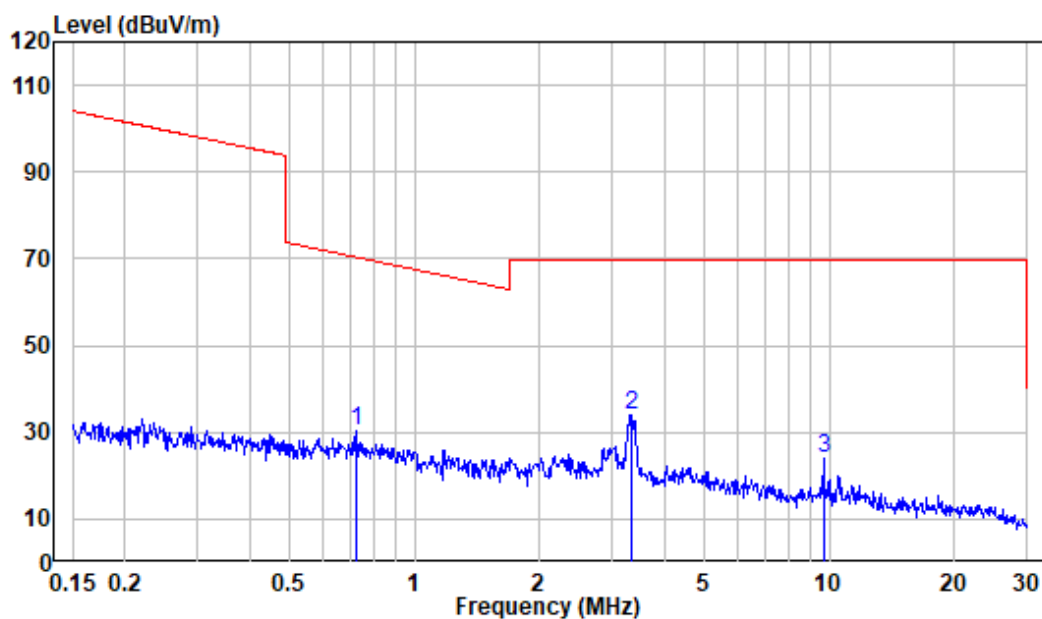
Note : Ground-parallel

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	2.023	-16.00	45.98	29.98	69.54	-39.56	Peak
2	3.310	-15.95	46.22	30.27	69.54	-39.27	Peak
3	10.564	-15.68	47.80	32.12	69.54	-37.42	Peak



Site : chamber
Condition: 3m
Job No. : RA230523-28440E-RF
Test Mode: Full load
Note : Perpendicular

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.567	-15.86	46.39	30.53	72.50	-41.97	Peak
2	3.276	-15.95	48.35	32.40	69.54	-37.14	Peak
3	10.620	-15.69	47.80	32.11	69.54	-37.43	Peak

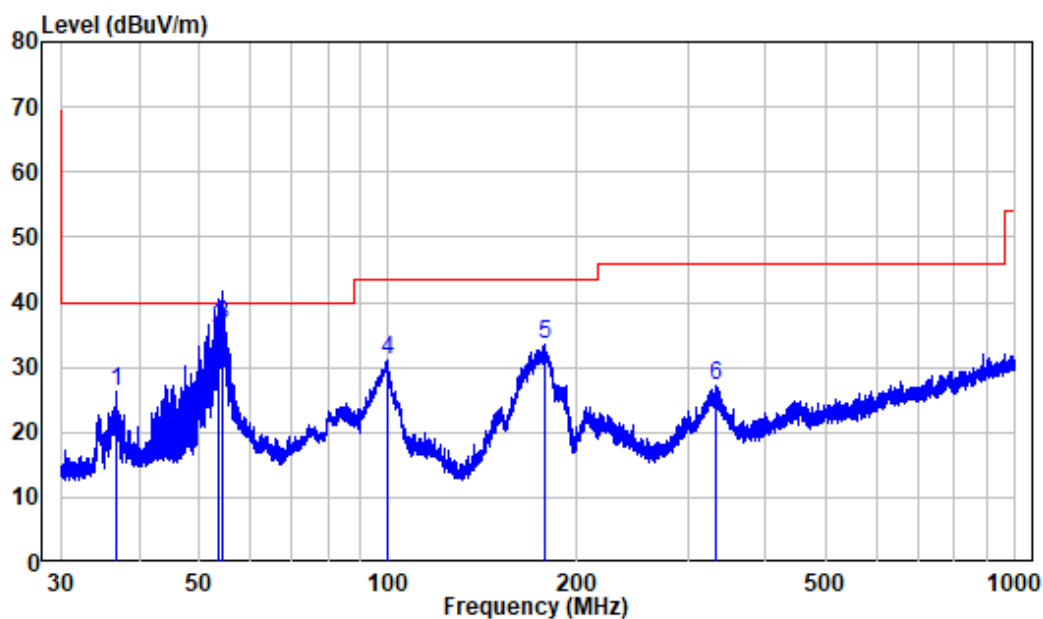


Site : chamber
Condition: 3m
Job No. : RA230523-28440E-RF
Test Mode: Full load
Note : Parallel

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.724	-15.94	46.11	30.17	70.34	-40.17	Peak
2	3.346	-15.95	50.08	34.13	69.54	-35.41	Peak
3	9.705	-15.70	39.81	24.11	69.54	-45.43	Peak

30MHz~1GHz:

Horizontal



Site : chamber

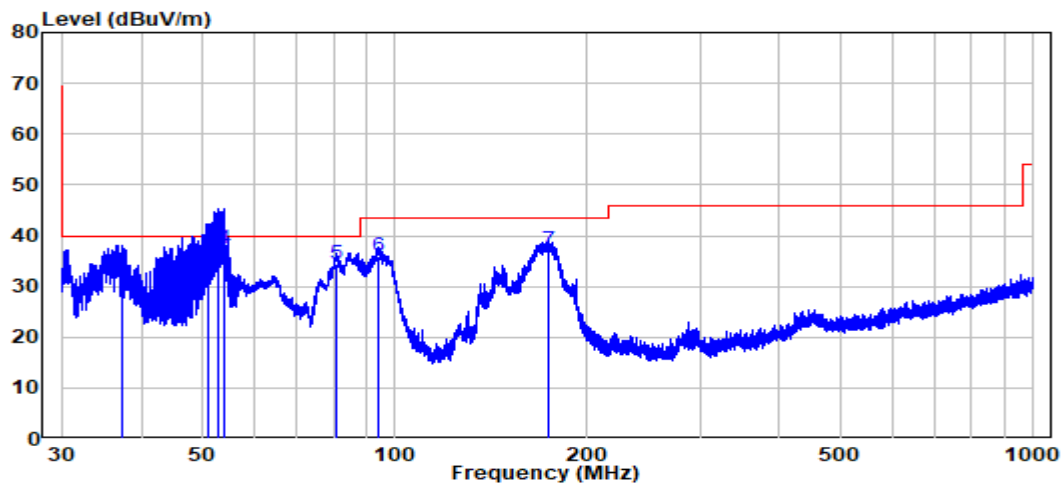
Condition: 3m HORIZONTAL

Job No. : RA230523-28440E-RF

Test Mode: Full load

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	36.782	-11.12	37.31	26.19	40.00	-13.81	Peak
2	53.623	-10.32	46.29	35.97	40.00	-4.03	QP
3	54.237	-10.39	47.04	36.65	40.00	-3.35	QP
4	99.572	-11.87	42.85	30.98	43.50	-12.52	Peak
5	177.587	-12.90	46.44	33.54	43.50	-9.96	Peak
6	333.833	-7.72	34.98	27.26	46.00	-18.74	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : RA230523-28440E-RF
Test Mode: Full load

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	37.318	-11.03	44.21	33.18	40.00	-6.82	QP
2	50.964	-9.97	45.60	35.63	40.00	-4.37	QP
3	52.644	-10.14	47.33	37.19	40.00	-2.81	QP
4	53.953	-10.39	47.79	37.40	40.00	-2.60	QP
5	81.069	-16.73	51.23	34.50	40.00	-5.50	QP
6	94.057	-12.77	48.80	36.03	43.50	-7.47	QP
7	174.042	-13.09	50.10	37.01	43.50	-6.49	QP

FCC§15.215(c) - 20dB EMISSION BANDWIDTH

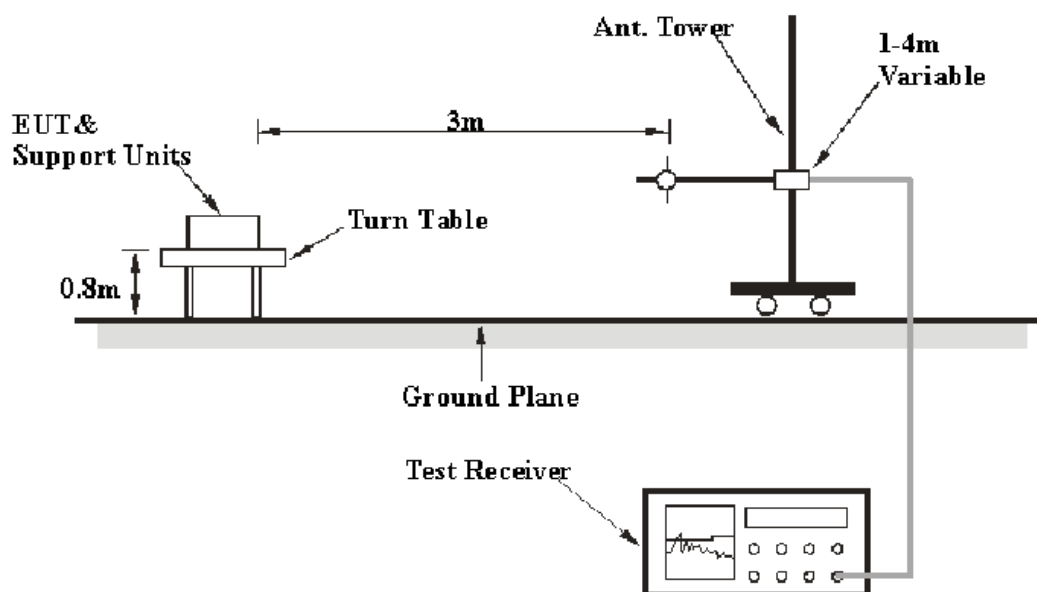
Applicable Standard

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.

Test Procedure

According to ANSI C63.10-2013, section 6.9.2

Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.



Test Data

Environmental Conditions

Temperature:	23 °C
Relative Humidity:	57 %
ATM Pressure:	101.1 kPa

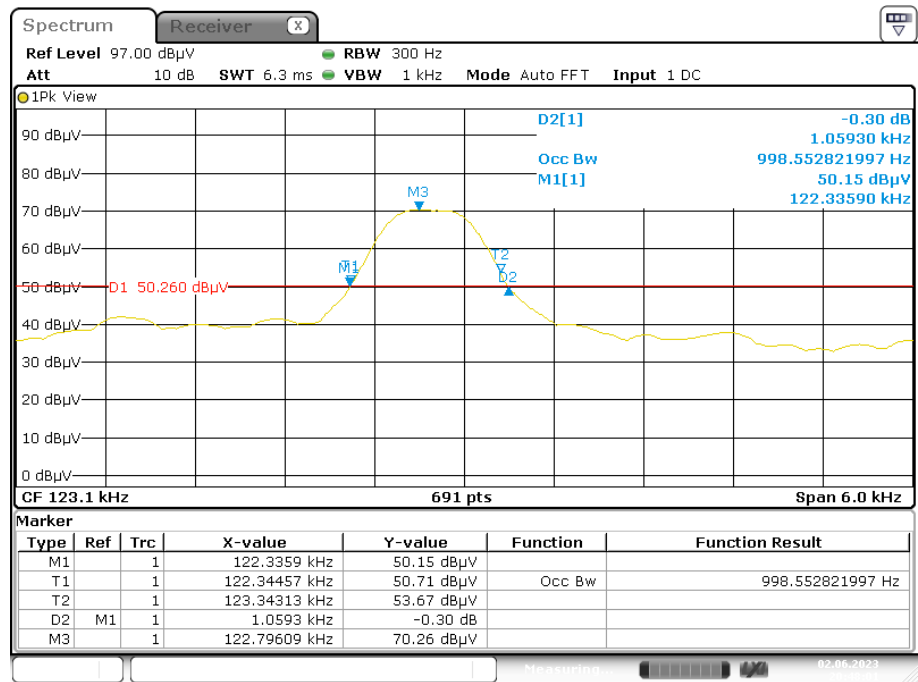
The testing was performed by Jason Liu on 2023-06-02.

Test Mode: Transmitting

Please refer to the following table and plot.

Test Frequency (kHz)	20dB Bandwidth (Hz)
123	1059.30

20 dB Emission Bandwidth



Date: 2.JUN.2023 20:48:01

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