



TEST REPORT

Applicant Name : Zeeva International Limited
Address : Suite 1007B, 10th Floor, Exchange Tower, 33 Wang Chiu Road,
Kowloon Bay, Hong Kong
Report Number : SZNS211119-59684E-RF-00
FCC ID: 2ADM5-ET-0099-49

Test Standard (s)

FCC PART 15.235

Sample Description

Product Type: RC SPEEDBOAT AST
Model No.: ET-0099
Multiple Model(s) No.: N/A
Trade Mark: N/A
Date Received: 2021/11/19
Date of Test: 2021/12/20~2021/12/23
Report Date: 2021/12/27

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

Prepared and Checked By:

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EMC Engineer

Approved By:

Robert Li
EMC Engineer

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

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

Frequency Range	49.86MHz
Antenna Specification	3dBi
UPC Number	Green:1922347900135
SKU Number	Green:5155020
Voltage Range	DC 1.5V*3 AAA batteries
Sample serial number	SZNS211119-59684E-RF-S1 (Assigned by ATC)
Sample/EUT Status	Good condition

Objective

This test report is in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules, section 15.203, 15.205, 15.209, 15.215 and 15.235 rules.

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 output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Line Conducted emission		2.72dB
Emissions, Radiated	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz - 26.5GHz	5.06dB
Temperature		1°C
Humidity		6%
Supply voltages		0.4%

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

Test Facility

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

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISED), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

Special Accessories

No special accessories was used

Equipment Modifications

No modification was made to the EUT.

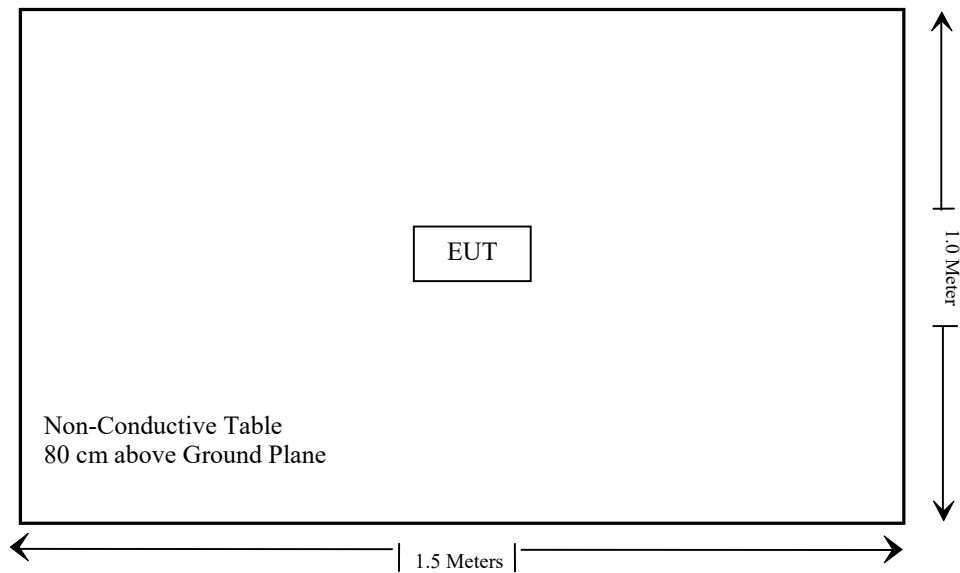
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna requirement	Compliant
§15.207(a)	AC Line Conducted Emissions	Not Applicable
§15.235(a)& 15.235(b)&15.209	Radiated Emissions and Band Edges	Compliant
§15.215	20 dB bandwidth	Compliant

Not Applicable: The EUT is powered by battery.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Unknown	RF Coaxial Cable	N-2m	No.2	2020/12/25	2021/12/24
Rohde& Schwarz	Test Receiver	ESR	102725	2020/12/25	2021/12/24
SONOMA INSTRUMENT	Amplifier	310 N	186131	2020/12/25	2021/12/24
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2020/12/25	2021/12/24
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2020/01/05	2023/01/04
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 Connector Construction

The EUT has a monopole antenna arrangement, which was permanently attached and the antenna gain is 3dBi, fulfill the requirement of this section. Please refer to EUT photos.

Result: Compliance.

FCC §15.235(a) & 15.235 (b) & 15.209 - RADIATED EMISSIONS AND BAND EDGES

Applicable Standard

FCC 15.235(a)

The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

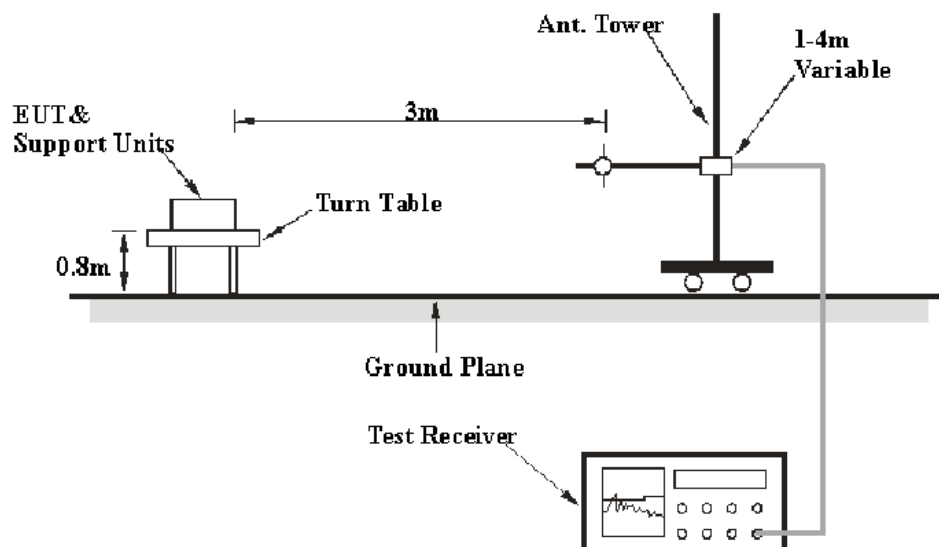
FCC 15.235(b)

The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26 dB below the level of the unmodulated carrier or to the general limits in §15.209, whichever permits the higher emission levels. The field strength of any emissions removed by more than 10 kHz from the band edges shall not exceed the general radiated emission limits in §15.209. All signals exceeding 20 microvolts/meter at 3 meters shall be reported in the application for certification.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

EUT Setup



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.235(a) & 15.235 (b) & 15.209 limits.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 1000 MHz.

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

Frequency Range	RBW	Video B/W
30MHz – 1000 MHz	120 kHz	300 kHz

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All radiated emission data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz, Peak and average detection mode for fundamental test.

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

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

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.235(a) & 15.235 (b) & 15.209.

Test Data**Environmental Conditions**

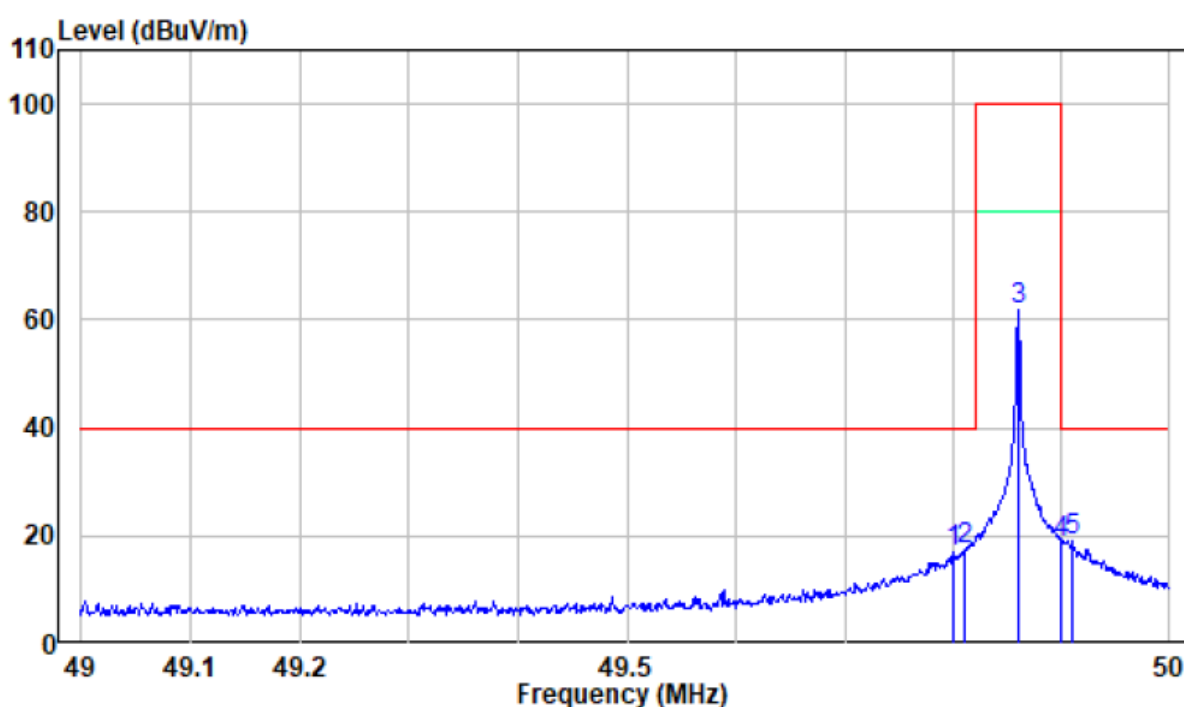
Temperature:	25 °C
Relative Humidity:	64 %
ATM Pressure:	101.0 kPa

The testing was performed by Caro hu on 2021-12-20 and by Chao Mo on 2021-12-23.

Test Mode: Transmitting (Scan with X-AXIS, Y-AXIS, Z-AXIS, the worst case Z-AXIS was recorded)

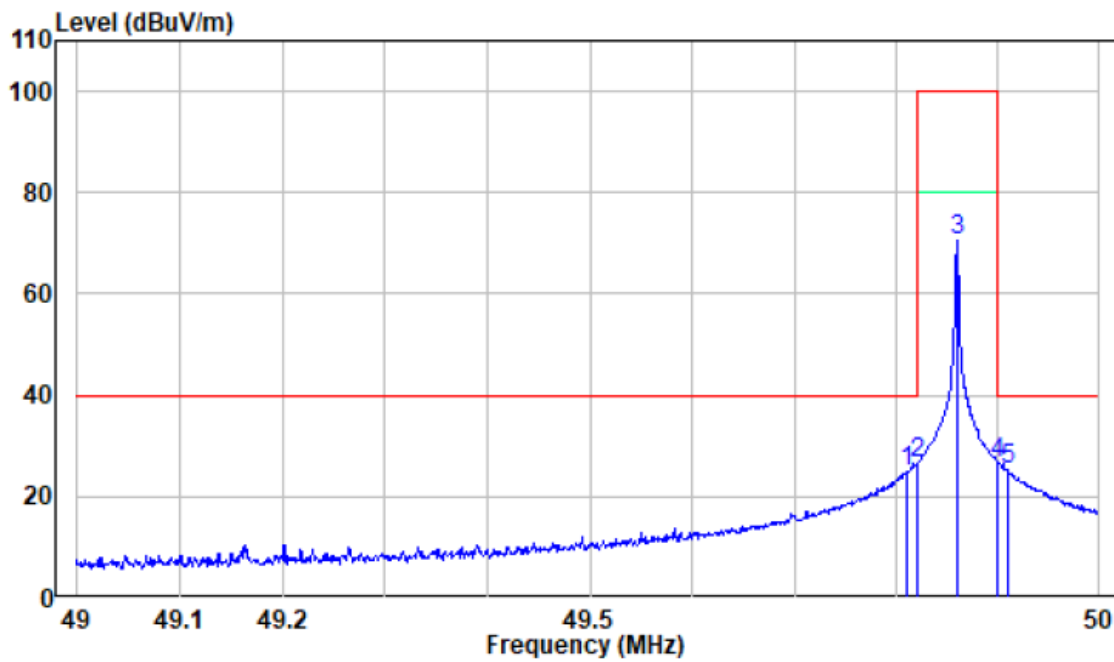
Fundamental and band edges:

Horizontal



	Freq	Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	49.80	-9.92	26.89	16.97	40.00	-23.03	Peak
2	49.81	-9.92	27.15	17.23	40.00	-22.77	Peak
3	49.86	-9.92	71.87	61.95	100.00	-38.05	Peak
4	49.90	-9.91	28.66	18.75	40.00	-21.25	Peak
5	49.91	-9.91	28.86	18.95	40.00	-21.05	Peak

Vertical

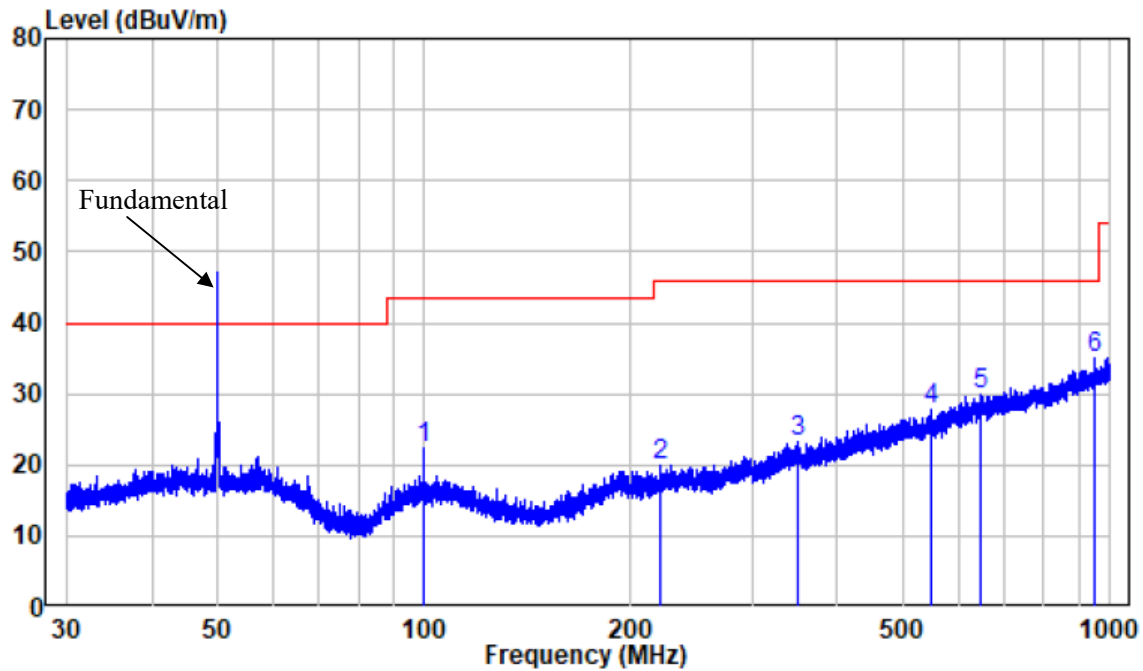


	Freq		Read		Limit	Over	Remark
	Factor		Level	Level	Line	Limit	
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	49.81	-9.92	34.71	24.79	40.00	-15.21	Peak
2	49.82	-9.92	36.41	26.49	40.00	-13.51	Peak
3	49.86	-9.92	80.47	70.55	100.00	-29.45	Peak
4	49.90	-9.91	36.68	26.77	40.00	-13.23	Peak
5	49.91	-9.91	35.31	25.40	40.00	-14.60	Peak

Note: The test result of peak was less than the limit of QP/Average.

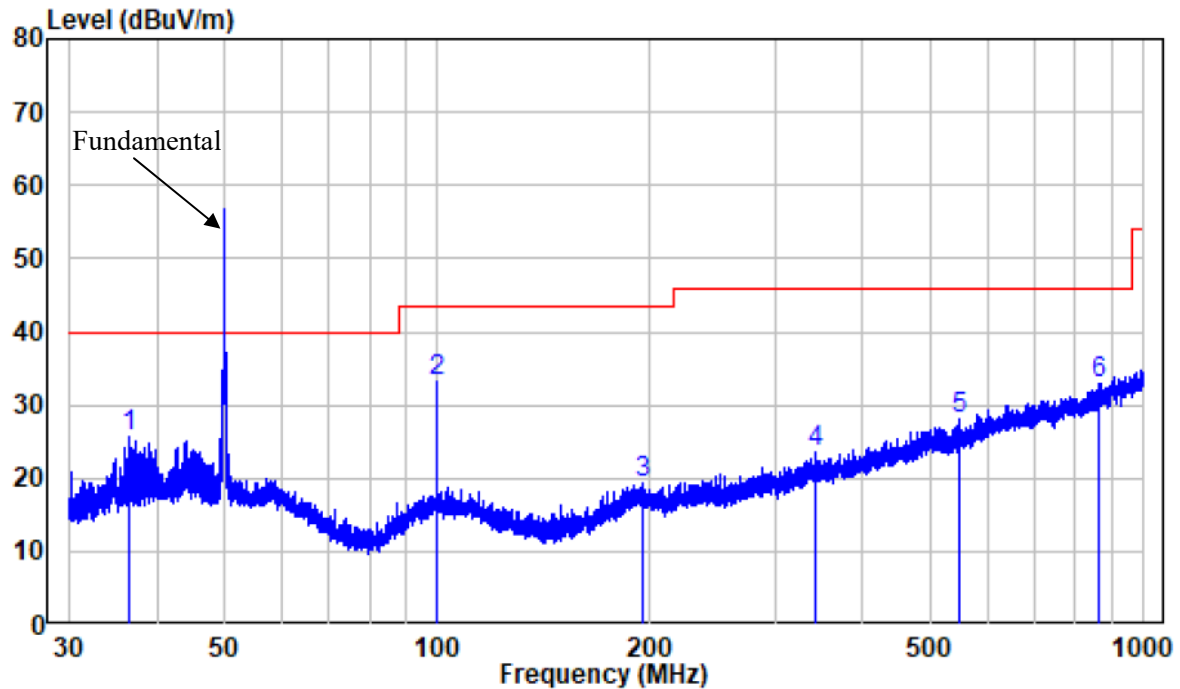
Spurious Emission:**30 MHz ~ 1GHz**

Horizontal



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	99.70	-11.86	34.09	22.23	43.50	-21.27	Peak
2	220.91	-11.38	31.30	19.92	46.00	-26.08	Peak
3	349.40	-7.29	30.56	23.27	46.00	-22.73	Peak
4	548.06	-4.02	31.86	27.84	46.00	-18.16	Peak
5	645.40	-1.86	31.84	29.98	46.00	-16.02	Peak
6	950.01	2.05	32.85	34.90	46.00	-11.10	Peak

Vertical



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	36.48	-11.11	36.73	25.62	40.00	-14.38	Peak
2	99.70	-11.86	45.18	33.32	43.50	-10.18	Peak
3	194.54	-11.38	30.64	19.26	43.50	-24.24	Peak
4	342.73	-7.31	30.97	23.66	46.00	-22.34	Peak
5	548.54	-4.02	32.13	28.11	46.00	-17.89	Peak
6	863.06	0.49	32.56	33.05	46.00	-12.95	Peak

Note: The test result of peak was less than the limit of 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

Per ANSI C63.10-2013 §6.4 & §6.9.

Test Data

Environmental Conditions

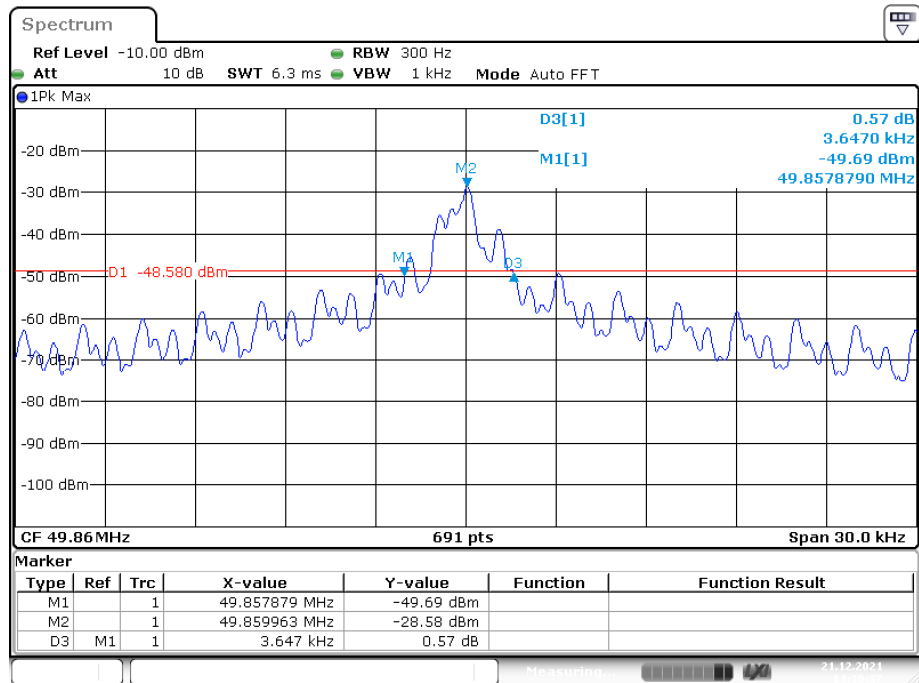
Temperature:	23 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Chao Mo on 2021-12-21.

Test Mode: Transmitting

Please refer to following plot and table.

20 dB Emission Bandwidth



Date: 21.DEC.2021 14:10:37

F_L (MHz)	F_H (MHz)	Permitted frequency range (MHz)	Result
49.857879	49.861562	49.82-49.90	Compliant

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