



TEST REPORT

Applicant Name : Speed Well International Industrial Ltd.
Address : 2/F, West Wing, 822 Lai Chi Kok Road Cheung Sha Wan,
Kowloon Hong Kong China
Report Number : RA230504-23385E-RF-00
FCC ID: 2AVYA-49T23

Test Standard (s)

FCC PART 15.235

Sample Description

Product Type: RC Spin Stunt Cruiser
Model No.: 82592
Multiple Model(s) No.: N/A
Trade Mark: N/A
Date Received: 2023/05/04
Report Date: 2023/05/22

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

Prepared and Checked By:

Approved By:

Dave Liang
EMC Engineer

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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TABLE OF CONTENTS

DOCUMENT REVISION HISTORY	3
GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
TEST METHODOLOGY	4
MEASUREMENT UNCERTAINTY.....	5
TEST FACILITY	5
SYSTEM TEST CONFIGURATION.....	6
JUSTIFICATION	6
SPECIAL ACCESSORIES.....	6
EQUIPMENT MODIFICATIONS	6
SUPPORT EQUIPMENT LIST AND DETAILS	6
EXTERNAL I/O CABLE.....	6
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS	7
TEST EQUIPMENT LIST	8
FCC §15.203 - ANTENNA REQUIREMENT.....	9
APPLICABLE STANDARD	9
ANTENNA CONNECTOR CONSTRUCTION	9
FCC §15.235(A) & 15.235 (B) &15.209 - RADIATED EMISSIONS AND BAND EDGES	10
APPLICABLE STANDARD	10
MEASUREMENT UNCERTAINTY.....	10
EUT SETUP	10
EMI TEST RECEIVER SETUP.....	11
TEST PROCEDURE	11
FACTOR & MARGIN CALCULATION	11
TEST RESULTS SUMMARY	11
TEST DATA	11
FCC§15.215(C) - 20DB EMISSION BANDWIDTH	16
APPLICABLE STANDARD	16
TEST PROCEDURE	16
TEST DATA	16
FCC §1.1307 (B) & §2.1093 – RF EXPOSURE.....	18
TEST RESULT	18

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA230504-23385E-RF-00	Original Report	2023/05/22

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

Frequency Range	49.86MHz
Antenna Specification	Integral antenna
E-field Strength	75.05dBuV/m@3m
Voltage Range	DC 1.5V*2 AA batteries
Sample serial number	25BJ-1 (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 Frequency		0.082×10^{-7}
RF output power, conducted		0.71dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Audio Frequency Response		0.1dB
Low Pass Filter Response		1.2dB
Modulation Limiting		1%
Emissions, Radiated	9kHz - 30MHz	2.06dB
	30MHz - 1GHz	5.08dB
	1GHz - 18GHz	4.96dB
	18GHz - 26.5GHz	5.16dB
	26.5GHz - 40GHz	4.64dB
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 429 7.01.

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 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.

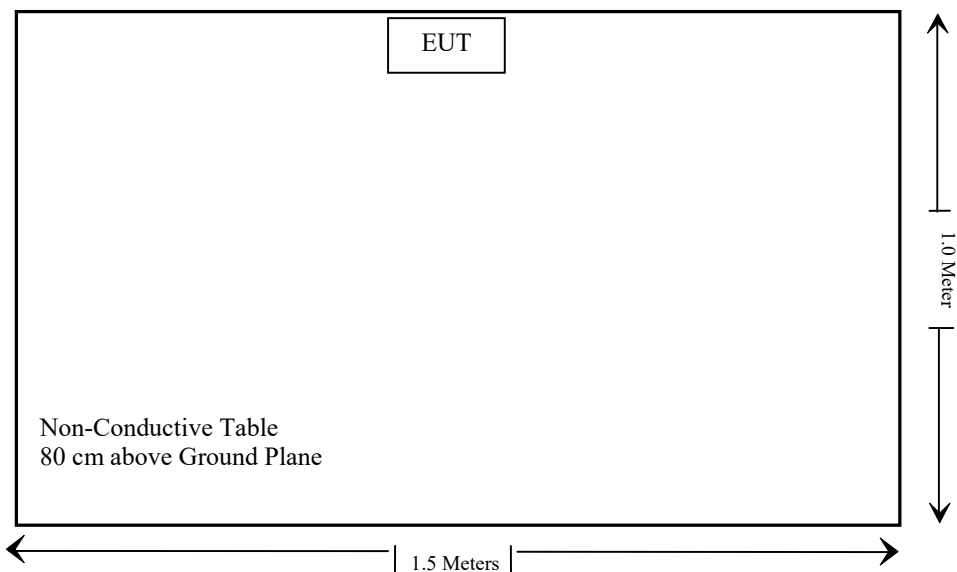
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

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

Block Diagram of Test Setup



Note: the support edge flush with the center of turntable

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
§1.1307 (b) & §2.1093	RF Exposure	Compliant

Not Applicable: The EUT is powered by battery.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
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	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 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, 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.

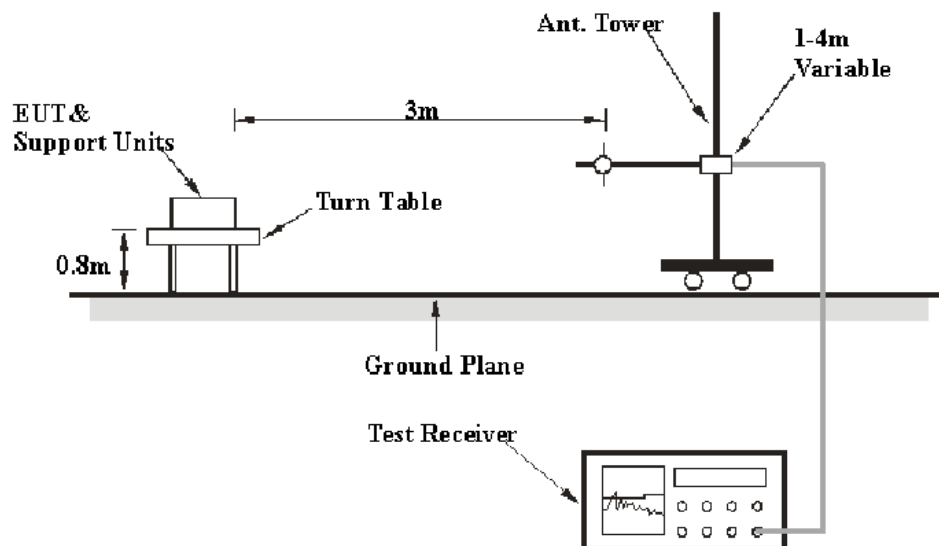
FCC 15.235(b)

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

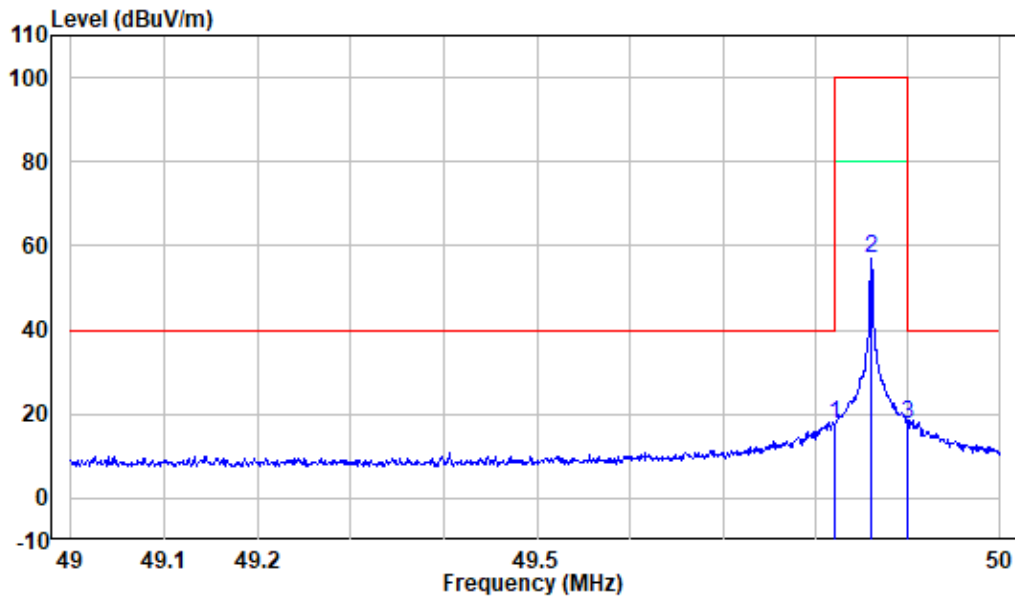
Temperature:	23~24 °C
Relative Humidity:	56~57 %
ATM Pressure:	101.0 kPa

The testing was performed by Jason Liu on 2023-05-11 and Glenn Jiang on 2023-05-11.

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

Fundamental and band edges:

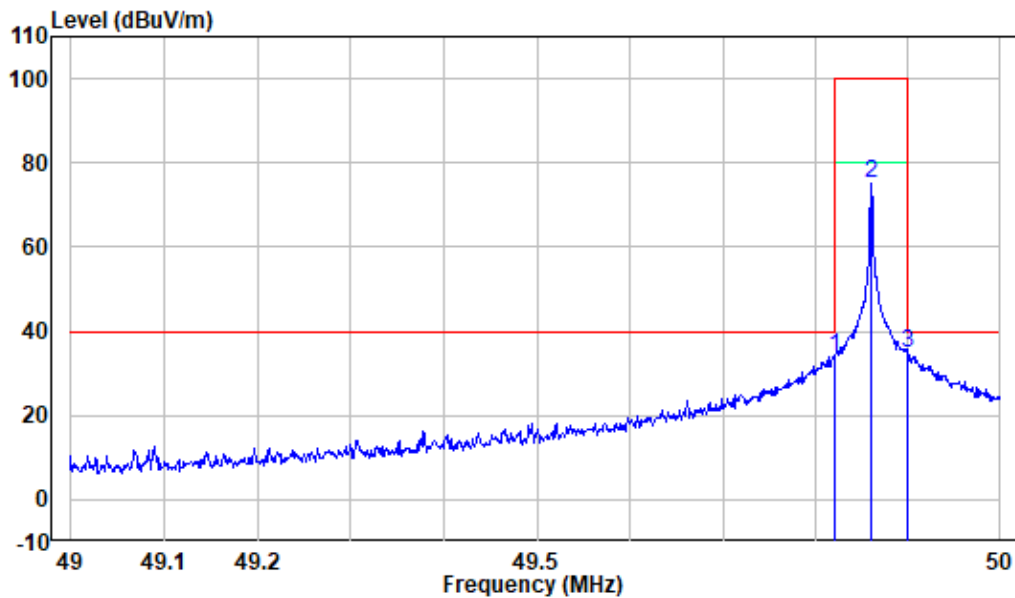
Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : RA230504-23385E-RF
Test Mode: Transmitting

	Freq	Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	49.820	-9.92	27.59	17.67	40.00	-22.33	Peak
2	49.861	-9.92	66.93	57.01	100.00	-42.99	Peak
3	49.900	-9.91	27.32	17.41	40.00	-22.59	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : RA230504-23385E-RF
Test Mode: Transmitting

	Freq	Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	49.820	-9.92	44.02	34.10	40.00	-5.90	Peak
2	49.861	-9.92	84.97	75.05	100.00	-24.95	Peak
3	49.900	-9.91	44.67	34.76	40.00	-5.24	Peak

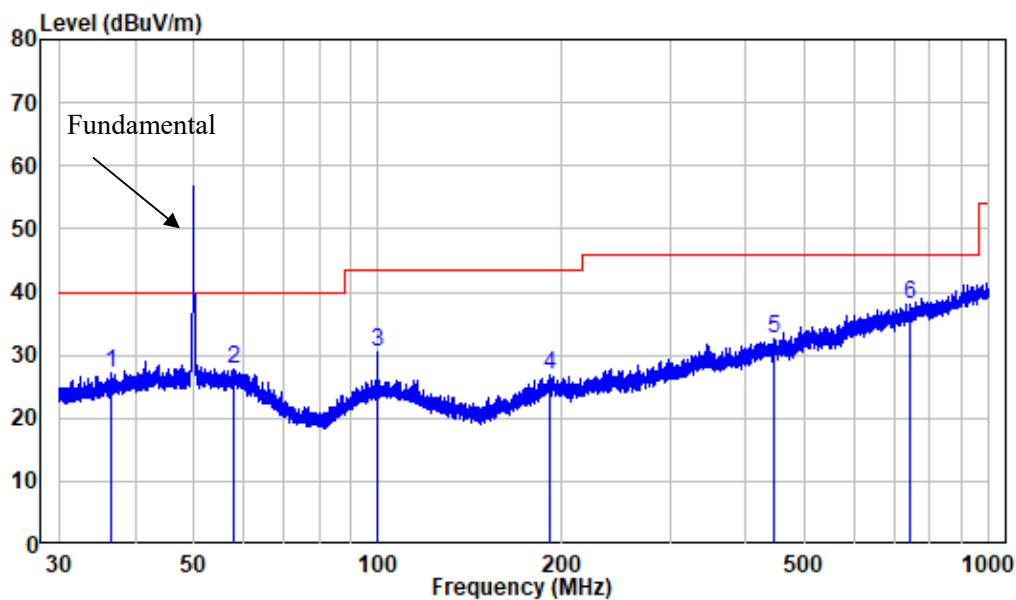
Note:

For Fundamental, the test result of peak was 20dB below to the limit of peak, which can be compliant to the average limit, so just peak value was recorded.

For Band edge, the test result of peak was less than the limit of QP.

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

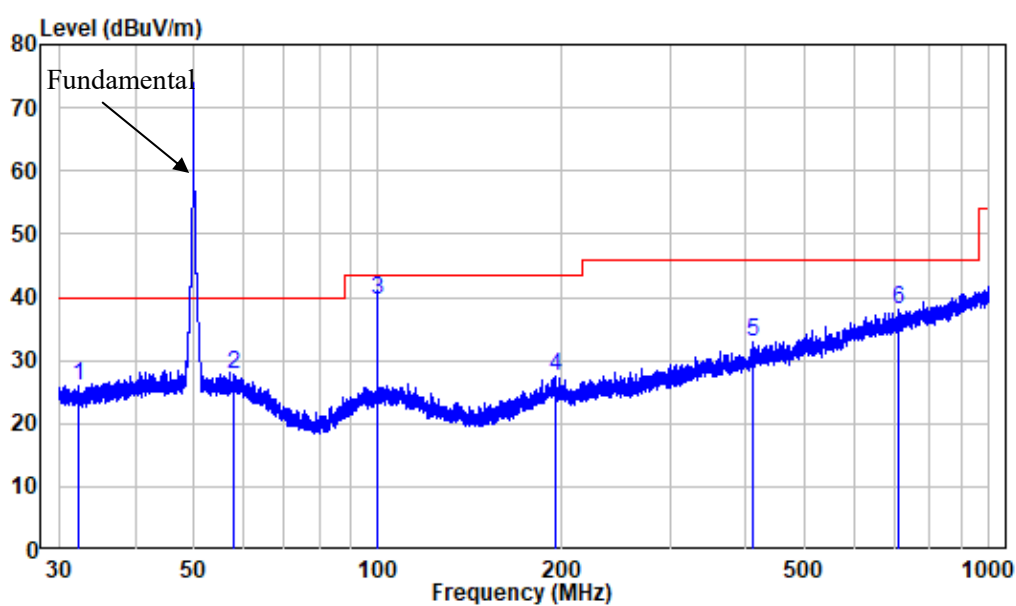
Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : RA230504-23385E-RF
Test Mode: Transmitting

	Freq	Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	36.654	-11.07	38.15	27.08	40.00	-12.92	Peak
2	58.127	-9.95	37.65	27.70	40.00	-12.30	Peak
3	99.746	-11.85	42.33	30.48	43.50	-13.02	Peak
4	190.990	-11.41	38.19	26.78	43.50	-16.72	Peak
5	444.072	-5.64	38.12	32.48	46.00	-13.52	Peak
6	742.584	-0.83	38.85	38.02	46.00	-7.98	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : RA230504-23385E-RF
Test Mode: Transmitting

	Freq	Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	32.222	-12.14	38.02	25.88	40.00	-14.12	Peak
2	58.127	-9.95	37.68	27.73	40.00	-12.27	Peak
3	99.703	-11.86	51.39	39.53	43.50	-3.97	QP
4	195.137	-11.46	38.87	27.41	43.50	-16.09	Peak
5	412.005	-6.29	39.17	32.88	46.00	-13.12	Peak
6	713.235	-1.38	39.45	38.07	46.00	-7.93	Peak

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

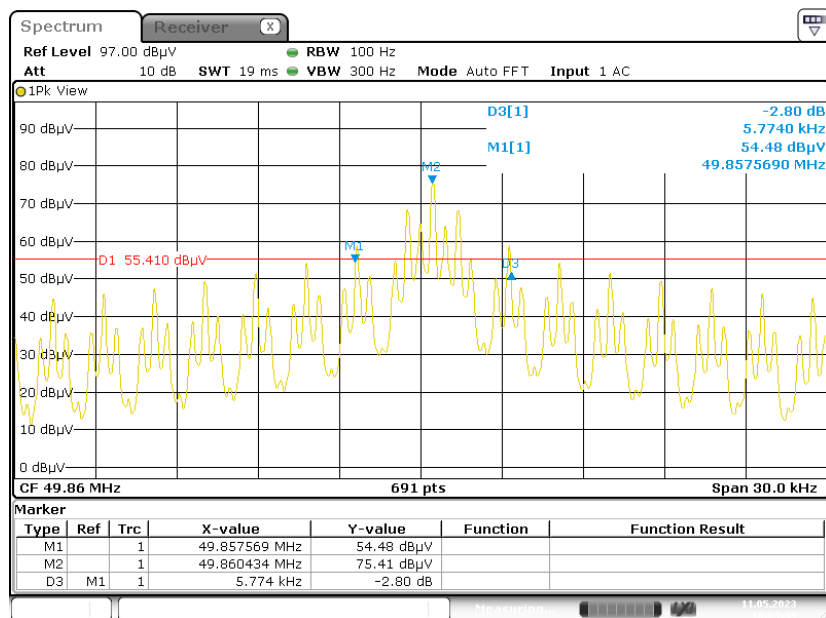
Temperature:	23 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Glenn Jiang on 2023-05-11.

Test Mode: Transmitting

Please refer to following plot and table.

20 dB Emission Bandwidth



20dB Bandwidth (kHz)	F _L (MHz)	F _H (MHz)	Permitted frequency range (MHz)	Result
5.774	49.857569	49.863343	49.82-49.90	Compliant

FCC §1.1307 (b) & §2.1093 – RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D04 Interim General RF Exposure Guidance v01, clause 2.1.2 – 1-mW test Exemption:

Per § 1.1307(b)(3)(i)(A), a single RF source is exempt RF device (from the requirement to show data demonstrating compliance to RF exposure limits, as previously mentioned) if the available maximum time-averaged power is no more than 1 mW, regardless of separation distance.

This exemption applies to all operating configurations and exposure conditions, for the frequency range 100 kHz to 100 GHz, regardless of fixed, mobile, or portable device exposure conditions. This is a standalone exemption, and it cannot be applied in conjunction with any other test exemption.

Test Result

For worst case:

Mode	Frequency	Maximum EIRP		1-mW test Exemption
	(MHz)	(dBm)	(mW)	
SRD	49.86	-20.15	0.01	Yes

Note: Use the maximum E-field strength for the RF exposure evaluation
 $EIRP(dBm) = E\text{-field strength}(dB\mu V/m) - 95.2$, when distance is 3meter
So $EIRP = 75.05dB\mu V/m - 95.2 = -20.15dBm$

Result: Compliant.

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