TEST REPORT

Applicant Name :	JM Manufacturing (HK) Ltd.
Address :	Unit 812, 8/F, Harbour Centre Tower 1, 1 Hok Cheung Street, Hung Hom, Kowloon, Hong Kong
Report Number :	2401Z103649E-RF-00
FCC ID:	2AHGJJMRC069-40-1

Test Standard (s)

FCC PART 15.229

Sample Description

Product Type:	BUILDABLE RC RACE*PPK
Model No.:	9175217
Multiple Model(s) No.:	N/A
Trade Mark:	N/A
Date Received:	2024/11/08
Issue Date:	2024/12/11

Test Result:	Pass▲

▲ In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Bruce Lin

Bruce Lin
RF Engineer

Approved By:

Michelle Zeng

Michelle Zeng
RF Supervisor

Note: The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "▼".

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	2401Z103649E-RF-00	Original Report	2024/12/11

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	BUILDABLE RC RACE*PPK
Tested Model	9175217
Multiple Model(s)	N/A
UPC Number#	1922346315275
SKU Number#	9175217
Modulation Technique	AM
Frequency Range	40.68MHz
Maximum E-Field	57.35 dBuV/m@3m
Voltage Range	powered by battery(1.5V*2)
Sample serial number	2U76-1 (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Adapter Information	N/A

Objective

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

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.209, 15.215 and 15.229 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 Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		109.2kHz(k=2, 95% level of confidence)
AC Power Lines Conducted Emissions	9kHz-150kHz	3.63dB(k=2, 95% level of confidence)
	150kHz-30MHz	3.66dB(k=2, 95% level of confidence)
Radiated Emissions	0.009MHz~30MHz	3.60dB(k=2, 95% level of confidence)
	30MHz~200MHz (Horizontal)	5.32dB(k=2, 95% level of confidence)
	30MHz~200MHz (Vertical)	5.43dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Horizontal)	5.77dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Vertical)	5.73dB(k=2, 95% level of confidence)
Temperature		±1℃
Humidity		±1%
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 Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, 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. : 715558, the FCC Designation No. : CN5045.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical mode.

EUT Exercise Software

No exercise software was used.

Equipment Modifications

No modifications.

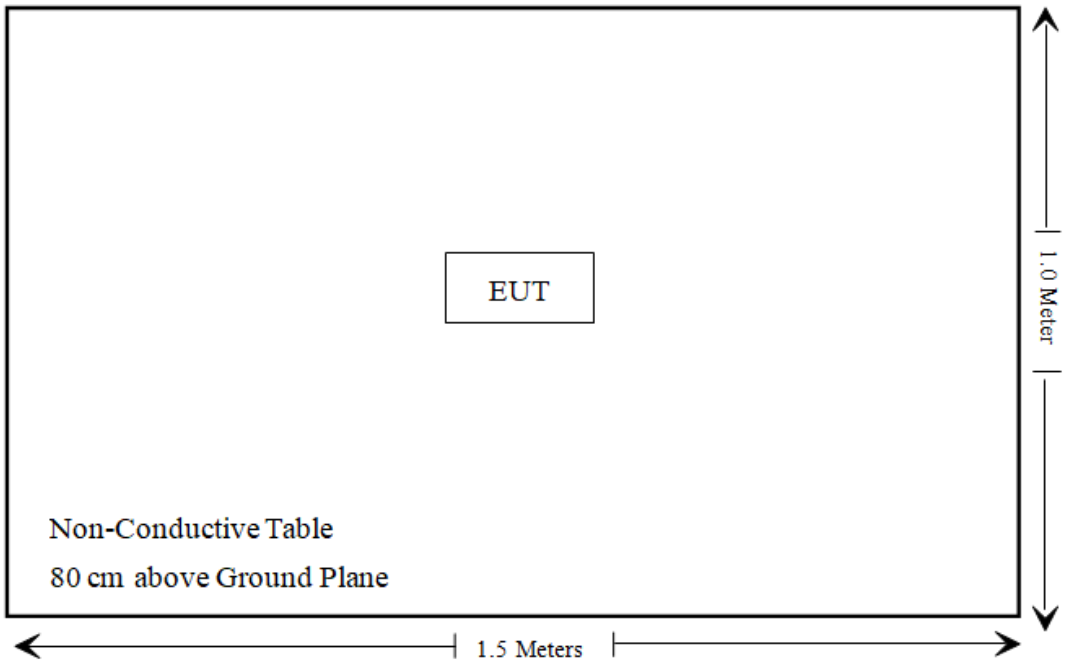
Support Equipment List and Details

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
§ 1.1307(b)(3)(i)(A) & §2.1093	RF Exposure	Compliant
§15.203	Antenna requirement	Compliant
§15.207	AC Line Conducted Emissions	Not Applicable
§15.229 §15.209§15.205	Radiated Emission Test	Compliant
§15.215(c)	20dB Emission Bandwidth	Compliant
§15.229(d)	Frequency Tolerance	Compliant

Not Applicable: The EUT is powered by battery.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESR3	102455	2024/01/16	2025/01/15
Sonoma instrument	Pre-amplifier	310 N	186238	2024/05/21	2025/05/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2023/07/20	2026/07/19
Unknown	Cable	Chamber A Cable 1	N/A	2024/06/18	2025/06/17
Unknown	Cable	XH500C	J-10M-A	2024/06/18	2025/06/17
BACL	Active Loop Antenna	1313-1A	4031911	2024/05/14	2027/05/13
Unknown	Cable	2Y194	0735	2024/05/21	2025/05/20
Unknown	Cable	PNG214	1354	2024/05/21	2025/05/20
Audix	EMI Test software	E3	19821b(V9)	NCR	NCR
instek	DC Power Supply	GPS-3030DD	EM832096	NCR	NCR
Fluke	Digital Multimeter	287	19000011	2024/05/21	2025/05/20
BACL	Temperature & Humidity Chamber	BTH-150-40	30145	2024/01/16	2025/01/15

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §1.1307(b)(3)(i)(A)& §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:

Frequency (MHz)	Maximum EIRP (dBuV/m@3m)	Maximum EIRP (dBm)	Maximum ERP		1-mW test Exemption
			(dBm)	(mW)	
40.68	57.35	-37.85	-40.00	0.0001	Yes

Note: Use the maximum E-field strength for the RF exposure evaluation
EIRP = E-Field – 95.2 @3m
ERP(dBm) = EIRP(dBm)-2.15

Result: Compliant.

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to 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.

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.

Antenna Connector Construction

The EUT has an external antenna arrangement which was permanently attached; fulfill the requirement of this section. Please refer to EUT photos.

Result: Compliant.

FCC§15.229,§15.205&§15.209-RADIATED EMISSIONS TEST

Applicable Standard

As per FCC Part 15.229

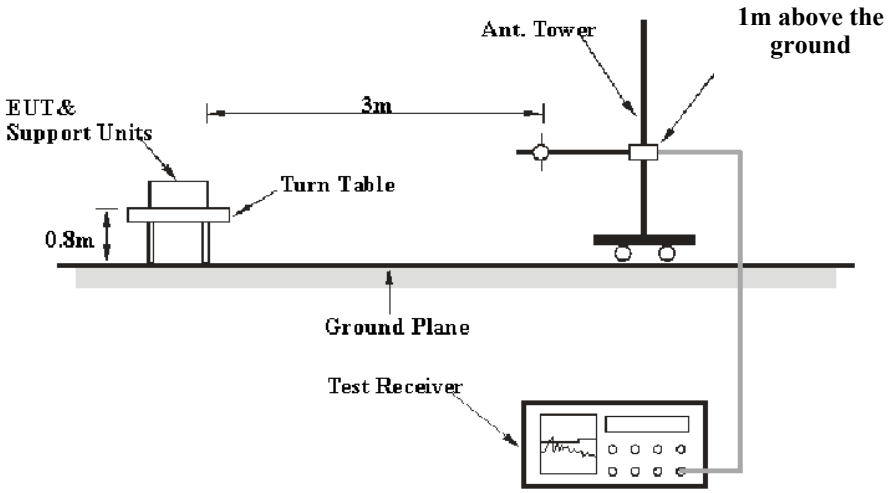
(a) Unless operating pursuant to the provisions in §15.231, the field strength of any emissions within this band shall not exceed 1,000 microvolts/meter at 3 meters.

(b) As an alternative to the limit in paragraph (a) of this section, perimeter protection systems may demonstrate compliance with the following: the field strength of any emissions within this band shall not exceed500microvolts/meterat3meters, as determined using measurement instrumentations employing an average detector. The provisions in §15.35 for limiting peak emissions apply where compliance of these devices is demonstrated under this alternative emission limit.

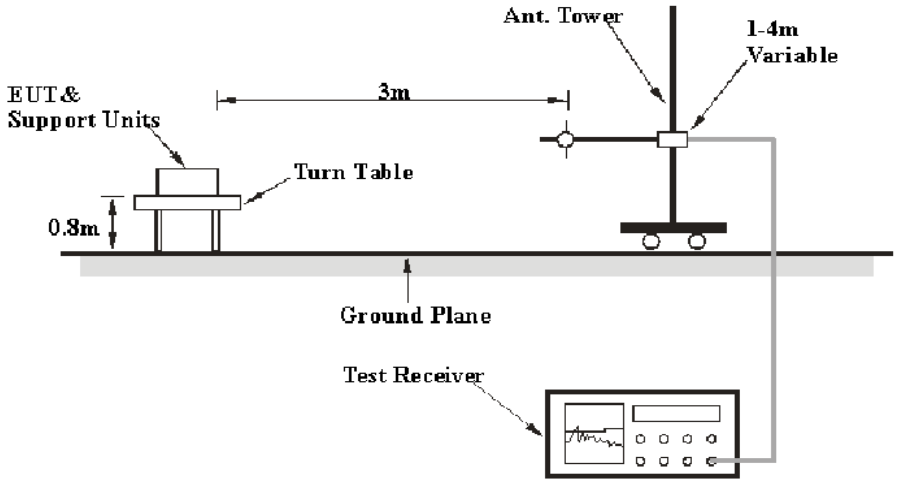
(c) The field strength of any emissions appearing outside of this band shall not exceed the general radiated emission limits in §15.209.

EUT Setup

9 kHz-30MHz:



30MHz-1GHz:



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 15.205 and 15.209 and 15.229 limits.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 1000MHz.

The EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
9 kHz – 150 kHz	/	/	200 Hz	QP
	300 Hz	1 kHz	/	PK
150 kHz – 30 MHz	/	/	9 kHz	QP
	10 kHz	30 kHz	/	PK
30 MHz – 1000 MHz	/	/	120 kHz	QP
	100 kHz	300 kHz	/	PK

Note 1: For the frequency bands 9–90 kHz, 110–490 kHz are based on measurements employing an average detector.
Note 2: If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

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

All final data was recorded in Quasi-peak detection mode for frequency range of 9 kHz -1 GHz.

All emissions under the noise floor have not recorded in the report.

Factor & Over Limit/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:

Factor = Antenna Factor + Cable Loss - 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:

Over Limit/Margin = Level/Corrected Amplitude – Limit
Level / Corrected Amplitude = Read Level + Factor

Test Data

Environmental Conditions

Temperature:	23~25 ℃
Relative Humidity:	54~56 %
ATM Pressure:	101 kPa

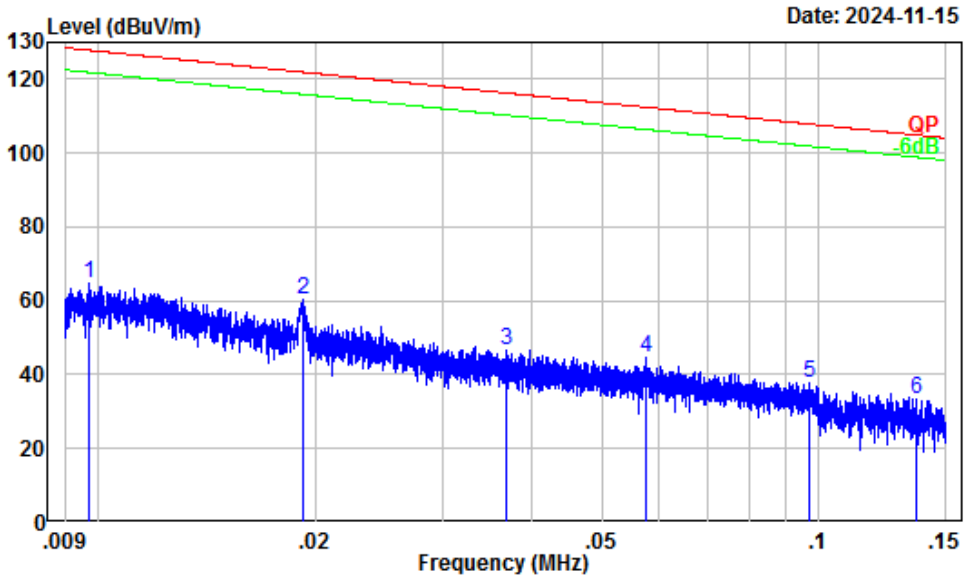
Testing was performed by Anson Su from 2024-11-15 to 2024-12-11.

Test mode: Transmitting

Note: Pre-scan in the X, Y and Z axes of orientation, the worst case Y-axis of orientation was recorded.

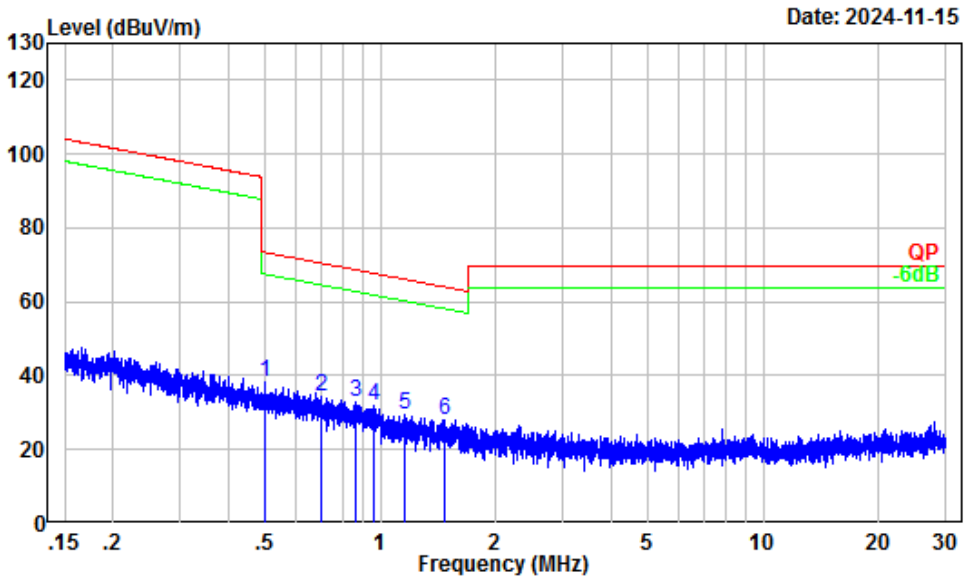
9 kHz~30MHz:

Parallel (worst case)



Site : Chamber A
Condition : 3m
Project Number: 2401Z103649E-RF
Test Mode : Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.010	37.90	27.01	64.91	127.84	-62.93	Peak
2	0.019	32.97	27.23	60.20	121.92	-61.72	Peak
3	0.037	25.97	20.77	46.74	116.28	-69.54	Peak
4	0.057	22.07	22.68	44.75	112.42	-67.67	Peak
5	0.097	17.33	20.31	37.64	107.85	-70.21	Peak
6	0.137	15.35	18.05	33.40	104.90	-71.50	Peak



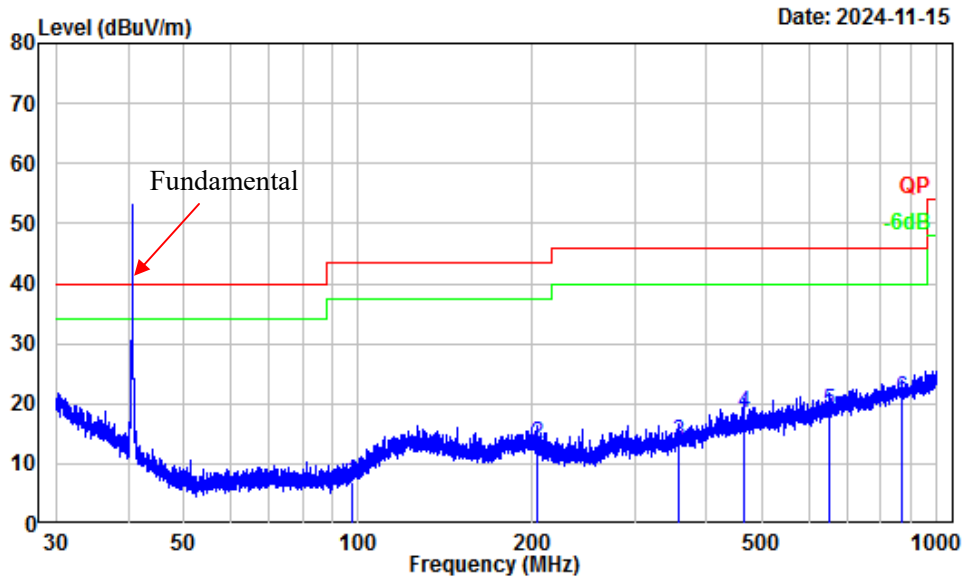
Site : Chamber A
Condition : 3m
Project Number: 2401Z103649E-RF
Test Mode : Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.497	3.54	34.53	38.07	73.67	-35.60	Peak
2	0.700	1.09	33.38	34.47	70.64	-36.17	Peak
3	0.862	-0.57	33.30	32.73	68.79	-36.06	Peak
4	0.966	-1.34	33.32	31.98	67.78	-35.80	Peak
5	1.160	-2.15	31.81	29.66	66.15	-36.49	Peak
6	1.469	-3.22	31.29	28.07	64.06	-35.99	Peak

30 MHz ~ 1GHz

Frequency (MHz)	Corrected Amplitude (dBµV/m)	PK/QP/Ave.	Rx Antenna Polar (H / V)	Corrected Factor (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Remark
40.68	66.73	QP	H	-13.68	53.05	60	-6.95	Fundamental
40.68	71.03	QP	V	-13.68	57.35	60	-2.65	Fundamental
40.66	36.72	PK	V	-13.66	23.06	40	-16.94	Band edge
40.70	36.48	PK	V	-13.69	22.79	40	-17.21	Band edge

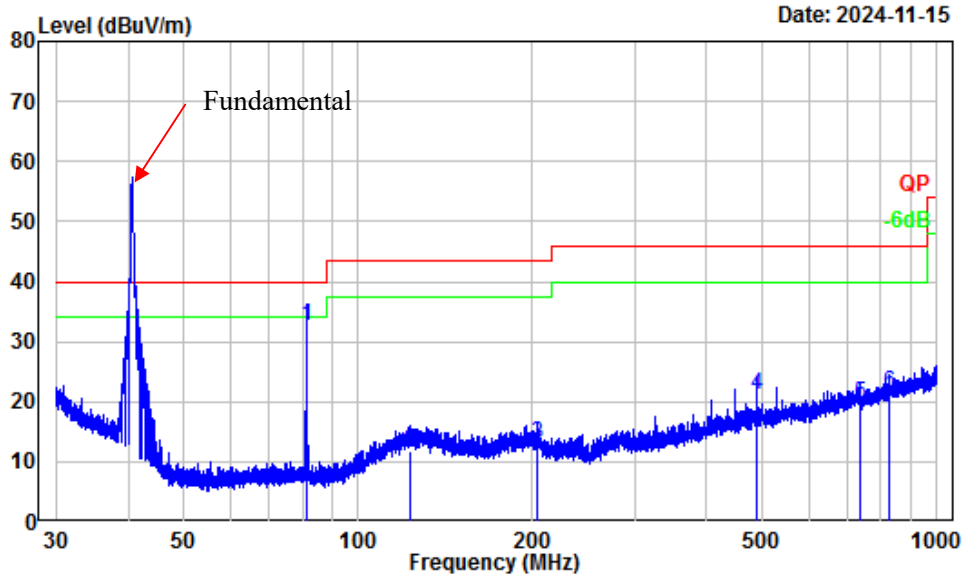
Horizontal



Site : Chamber A
Condition : 3m Horizontal
Project Number: 2401Z103649E-RF
Test Mode : Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	97.54	-17.40	24.35	6.95	43.50	-36.55	QP
2	203.43	-12.90	26.09	13.19	43.50	-30.31	QP
3	358.71	-12.00	25.55	13.55	46.00	-32.45	QP
4	462.95	-9.53	28.00	18.47	46.00	-27.53	QP
5	653.09	-7.03	25.76	18.73	46.00	-27.27	QP
6	871.42	-3.96	24.87	20.91	46.00	-25.09	QP

Vertical



Site : Chamber A
Condition : 3m Vertical
Project Number: 2401Z103649E-RF
Test Mode : Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	81.35	-18.66	51.24	32.58	40.00	-7.42	QP
2	123.32	-12.31	24.00	11.69	43.50	-31.81	QP
3	203.43	-12.90	25.96	13.06	43.50	-30.44	QP
4	488.17	-9.05	30.30	21.25	46.00	-24.75	QP
5	734.49	-5.95	25.50	19.55	46.00	-26.45	QP
6	826.41	-4.59	25.88	21.29	46.00	-24.71	QP

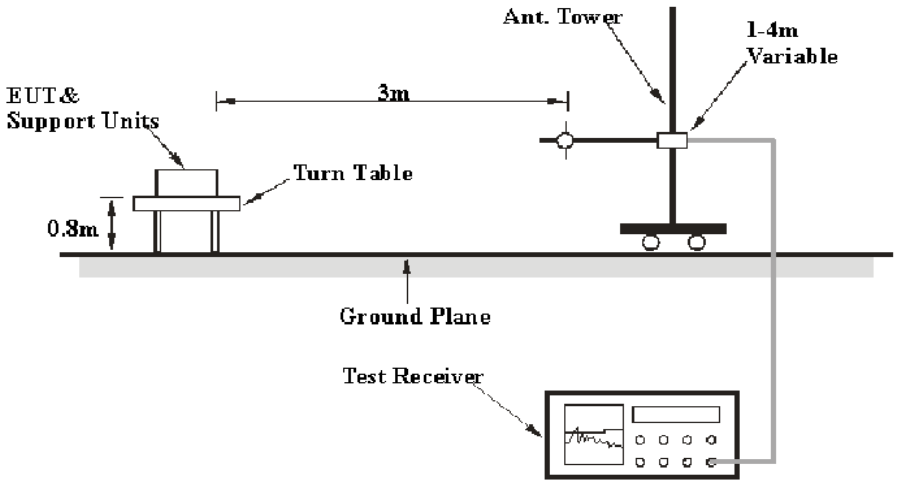
FCC§15.215(c) - 20dB EMISSION BANDWIDTH

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

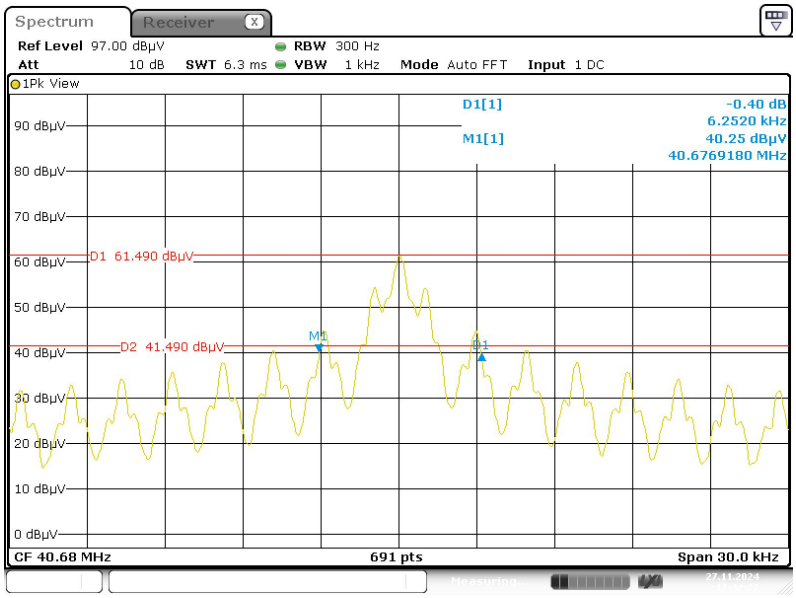
Temperature:	24 ℃
Relative Humidity:	53 %
ATM Pressure:	101 kPa

Testing was performed by Anson Su on 2024-11-27.

Test Mode: Transmitting

Please refer to the following plots.

Frequency (MHz)	20dB Bandwidth (kHz)
40.68	6.252



ProjectNo.:2401Z103649E-RF Tester:Anson Su
Date: 27.NOV.2024 17:42:27

FCC § 15.229(d)– FREQUENCY TOLERANCE

Applicable Standard

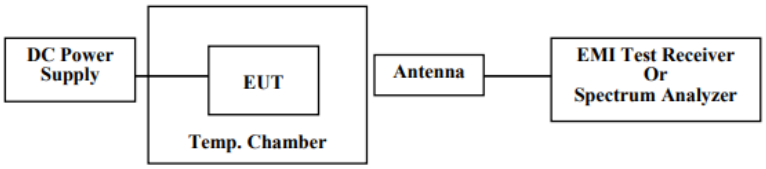
The frequency tolerance of the carrier signal shall be maintained within±0.01% of the operating frequency over a temperature variation of −20 degrees to + 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Data

Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	53 %
ATM Pressure:	101 kPa

Testing was performed by Anson Su on 2024-11-15.

Test Mode: Transmitting

Please refer to the following plots.

fo =40.68 MHz, limit=±0.01%				
Temperature (℃)	**Power Supplied (V_{DC})**	**Measured Frequency (MHz)**	**Frequency Error (%)**	**Limit (%)**
-20	3.0	40.679377	-0.001531	±0.01
-10		40.679169	-0.002043	±0.01
0		40.67903	-0.002384	±0.01
10		40.679241	-0.001866	±0.01
20		40.678619	-0.003395	±0.01
30		40.679657	-0.000843	±0.01
40		40.679742	-0.000634	±0.01
50		40.679691	-0.000760	±0.01
20	2.55	40.678127	-0.004604	±0.01
20	3.45	40.676237	-0.009250	±0.01

EUT PHOTOGRAPHS

Please refer to the attachment 2401Z103649E-RF External photo and 2401Z103649E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2401Z103649E-RF Test Setup photo.

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