



TEST REPORT

Applicant Name: Shenzhen Ysair Technology Co., LTD
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Report Number: RA221031-50472E-RF-00A
FCC ID: 2A3OORA86

Test Standards:

FCC Part 15, Subpart B (Class B)

Sample Description

Product Type: Mobile Radio
Model No.: RA86
Multiple Model: N/A
Trade Mark: RETEVIS
Date Received: 2022/10/31
Report Date: 2022/12/02

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

Prepared and Checked By:

Approved By:

Andy Yu
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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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	462MHz Main channels: 462.5500-462.7250MHz (TX/RX) 462MHz Interstitial channels: 462.5625-462.7125MHz(TX/RX) 467MHz Main channels: 467.5500-467.7250MHz(TX/RX) 467MHz Interstitial channels: 467.5625-467.7125MHz(RX) NOAA Weather channel: 161.65-163.275MHz(RX)
Highest Operation Frequency	467.7250MHz
Voltage Range	DC 13.8V
Sample number	1093-2 for Radiated Emissions 1095-4 for RF Conducted Test (Assigned by ATC)
Sample/EUT Status	Good condition

Objective

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

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15, Class B device.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted 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.

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).

Test mode 1: Receiver at GMRS channel 462.625MHz

Test mode 2: Receiver at GMRS channel 467.625MHz

Test mode 3: NOAA Receiving at 162.4750MHz

EUT Exercise Software

No exercise software.

Special Accessories

No special accessory was used.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

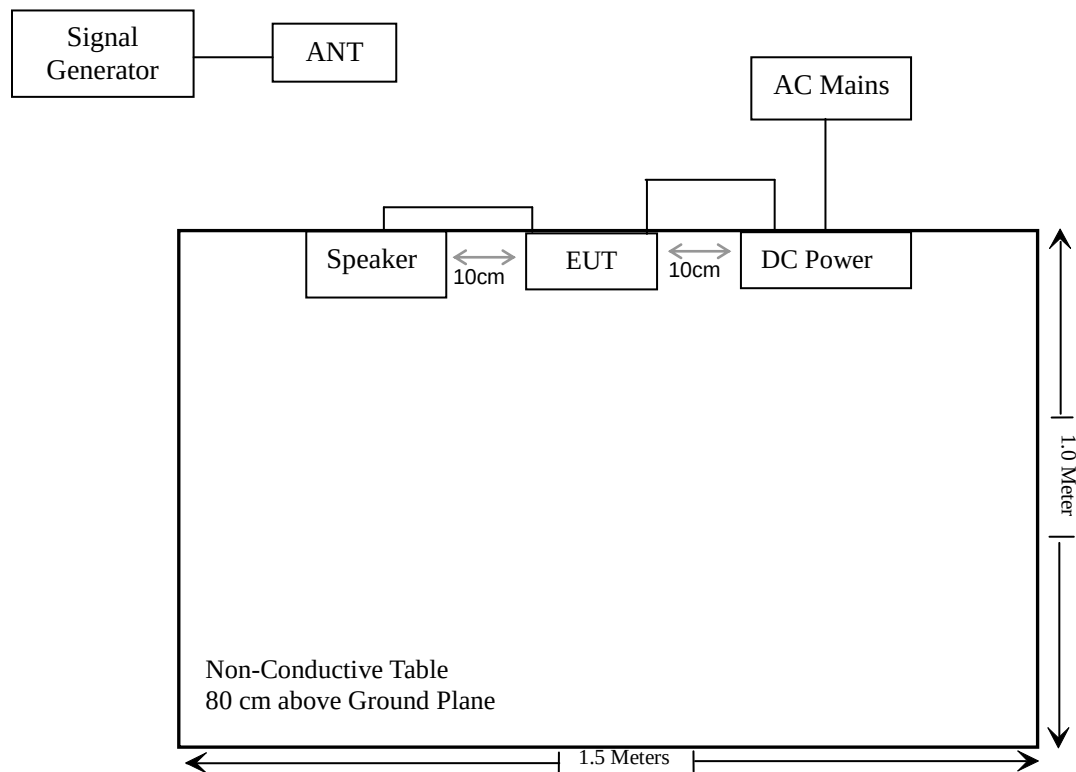
Manufacturer	Description	Model	Serial Number
UNI-T	DC Power	UTP8305M	Unknown
Unknown	Speaker	Unknown	Unknown
Rohde&Schwarz	Vector Signal Generator	SMBV100A	260434

External I/O Cable

Cable Description	Length (m)	From Port	To Port
Unshielded detachable AC cable	1.5	DC Power	LISN
Unshielded Un-detachable DC cable	2.5	DC Power	EUT
Un-shielded detachable Audio cable	1.0	EUT	Speaker

Block Diagram of Radiated Test Setup

For radiated emission



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	Conducted Emissions	Not Applicable
§15.109	Radiated Emissions	Compliant
§15.111	Antenna Conducted Power for receivers	Compliant

Not Applicable: the device is intended for use in vehicle.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emissions Test					
Rohde& Schwarz	Test Receiver	ESR	102725	2021/12/13	2022/12/12
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2022/11/08	2023/11/07
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2022/11/08	2023/11/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
Unknown	RF Coaxial Cable	No.10	N050	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.11	N1000	2021/12/14	2022/12/13
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)					
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2021/12/13	2022/12/12
Unknown	RF Coaxial Cable	No.33	RF-03	Each time	

* **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).

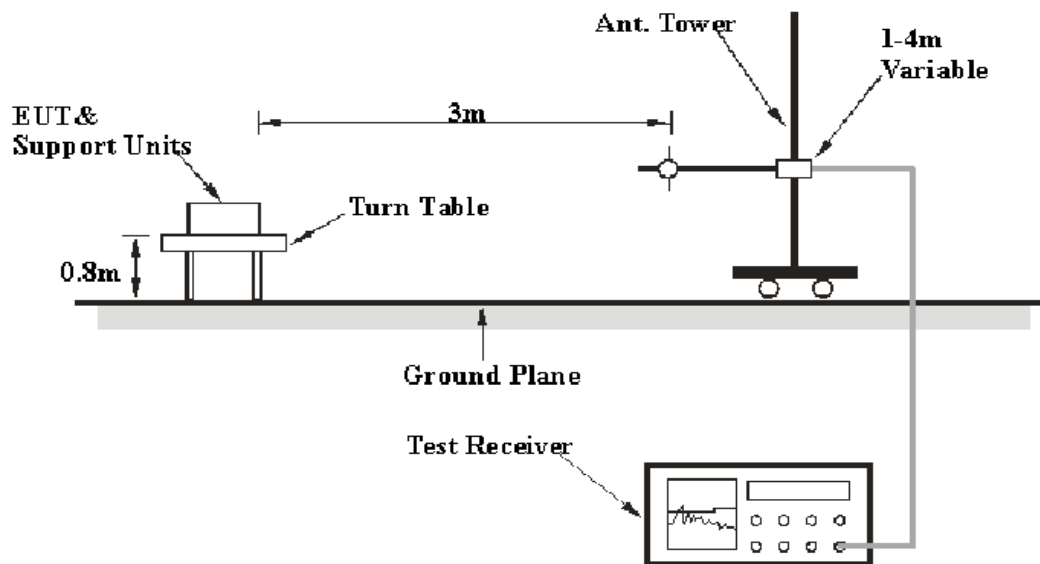
FCC §15.109 - RADIATED EMISSIONS

Applicable Standard

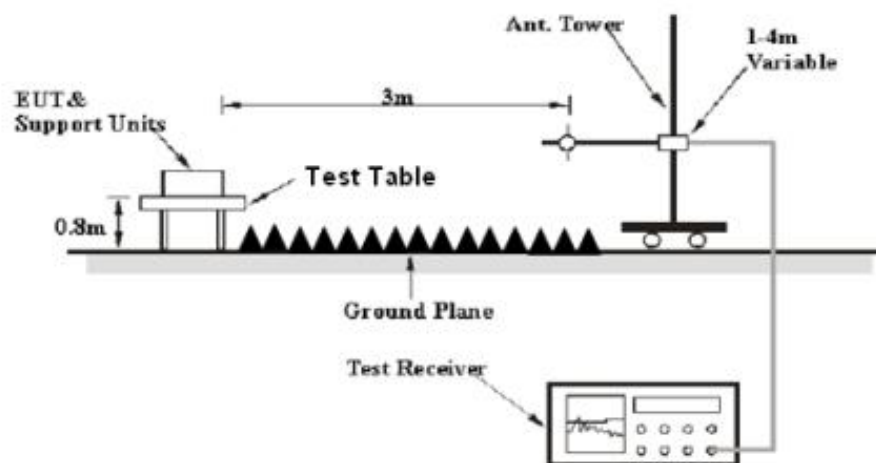
FCC §15.109

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 6 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	120 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	Peak
	1MHz	10Hz	/	AV

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz, Peak and average detection mode above 1 GHz.

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

Test Procedure

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

Factor & Over Limit Calculation

The Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. 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 margin of -7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Over Limit} = \text{Level} - \text{Limit}$$

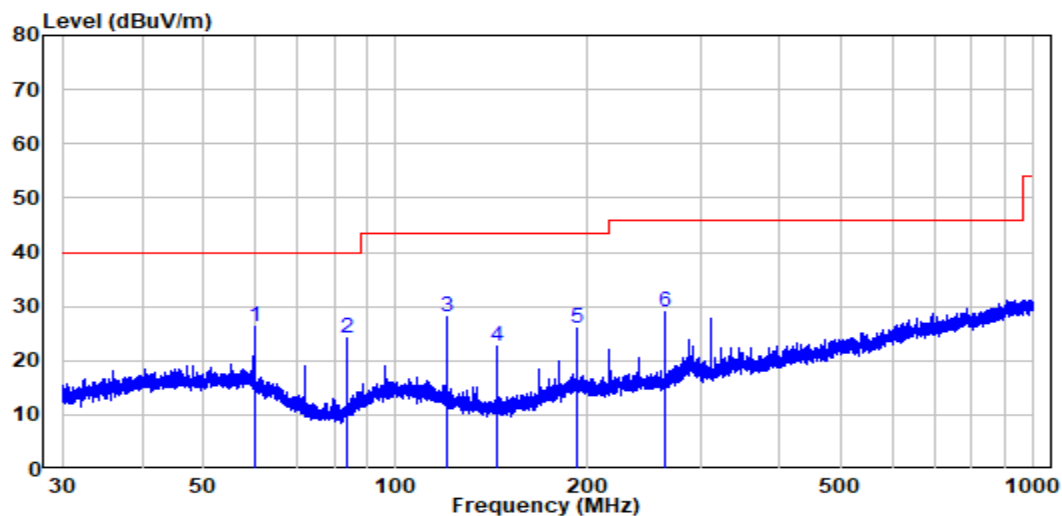
$$\text{Level} = \text{Reading} + \text{Factor}$$

Test Data**Environmental Conditions**

Temperature:	25°C
Relative Humidity:	60 %
ATM Pressure:	101kPa

The testing was performed by Jimi on 2022-11-29 for below 1GHz and Jeff Jiang on 2022-11-14 for above 1GHz.

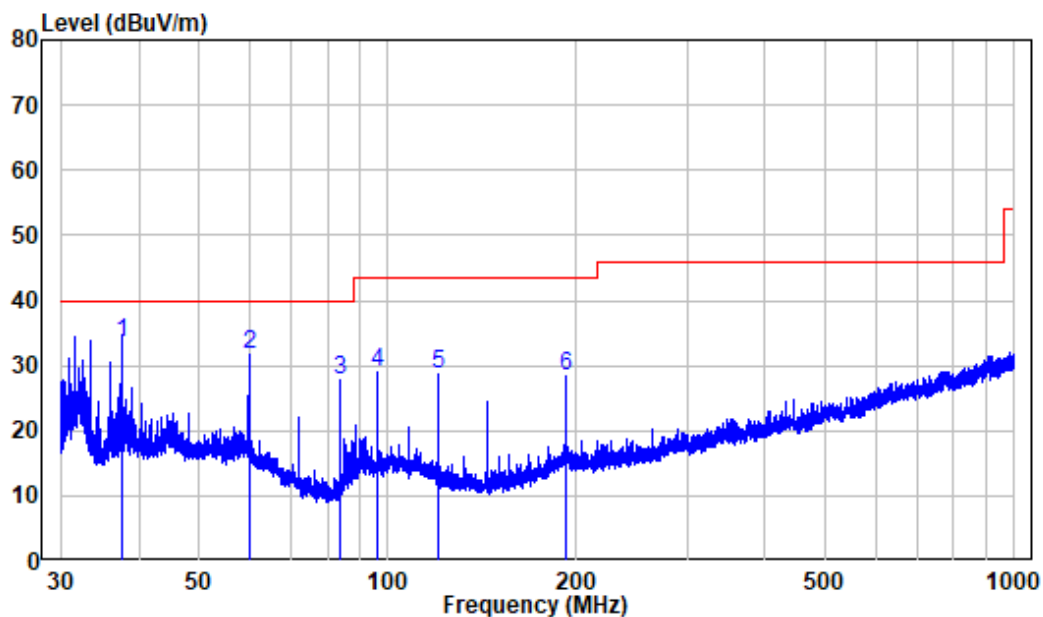
Note: Pre-scan in the X, Y and Z axes of orientation, the worst case Y-axis of orientation was recorded.

30MHz-1GHz:**Test mode 1:****Horizontal:**

Site : chamber
Condition: 3m HORIZONTAL
Job No. : RA221031-50472E-RF
Test Mode: Receiving

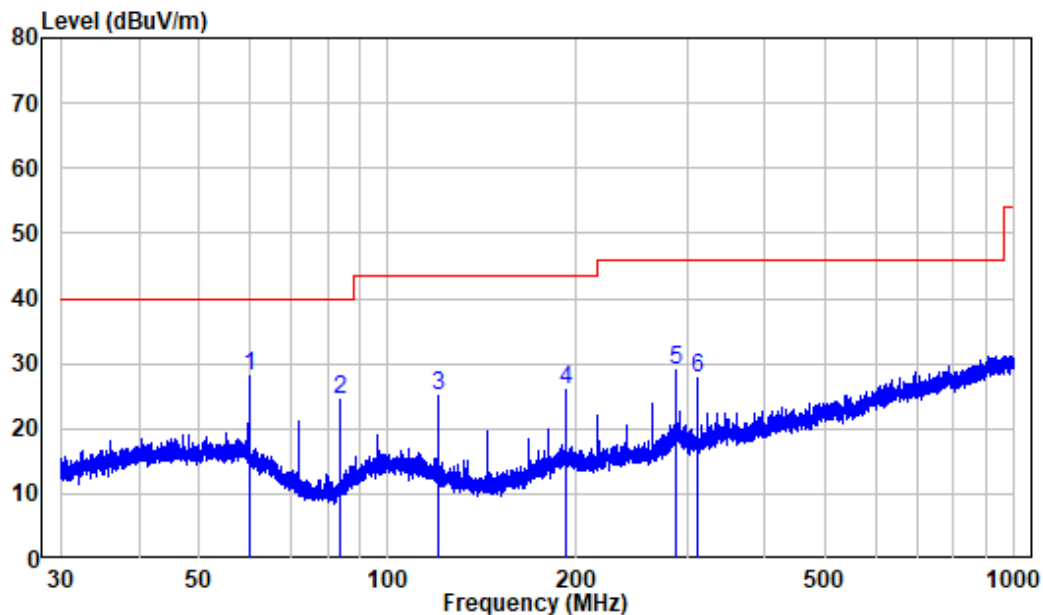
	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	60.016	-10.63	36.82	26.19	40.00	-13.81	Peak
2	83.999	-16.04	40.14	24.10	40.00	-15.90	Peak
3	120.066	-13.54	41.56	28.02	43.50	-15.48	Peak
4	144.019	-15.52	38.08	22.56	43.50	-20.94	Peak
5	192.082	-11.25	37.13	25.88	43.50	-17.62	Peak
6	264.050	-10.48	39.42	28.94	46.00	-17.06	Peak

Vertical



Site : chamber
 Condition: 3m VERTICAL
 Job No. : RA221031-50472E-RF
 Test Mode: Receiving

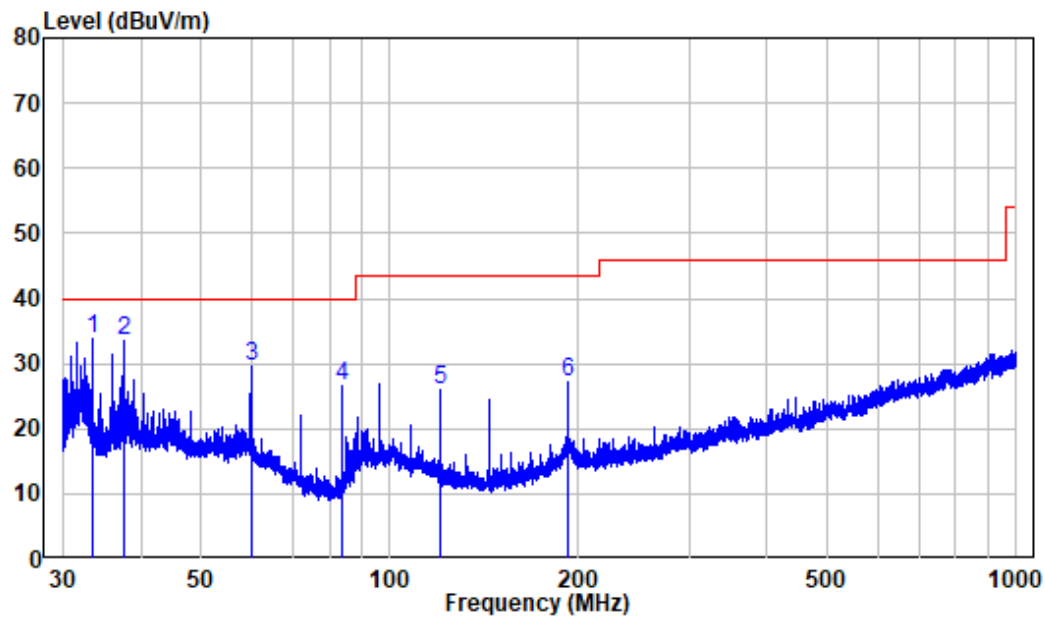
	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	37.564	-10.90	44.30	33.40	40.00	-6.60	QP
2	60.016	-10.63	42.25	31.62	40.00	-8.38	Peak
3	83.999	-16.04	43.68	27.64	40.00	-12.36	Peak
4	96.014	-12.30	41.21	28.91	43.50	-14.59	Peak
5	120.066	-13.54	42.35	28.81	43.50	-14.69	Peak
6	191.997	-11.25	39.53	28.28	43.50	-15.22	Peak

Test mode 2:**Horizontal:**

Site : chamber
Condition: 3m HORIZONTAL
Job No. : RA221031-50472E-RF
Test Mode: Receiving

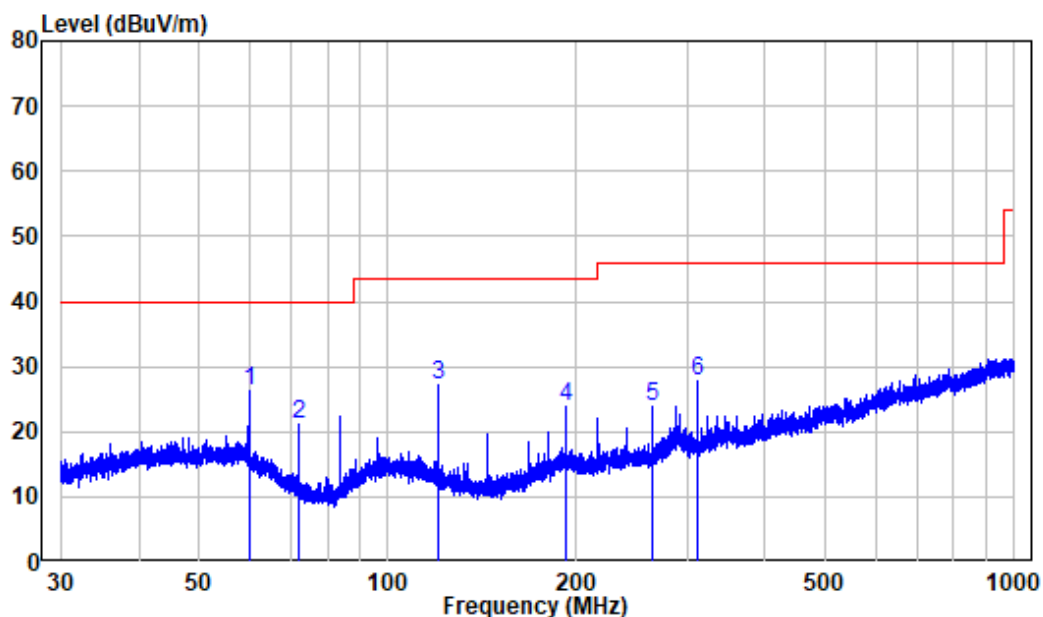
	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	59.990	-10.62	38.79	28.17	40.00	-11.83	Peak
2	84.036	-16.03	40.36	24.33	40.00	-15.67	Peak
3	120.066	-13.54	38.56	25.02	43.50	-18.48	Peak
4	192.082	-11.25	37.13	25.88	43.50	-17.62	Peak
5	287.990	-9.36	38.36	29.00	46.00	-17.00	Peak
6	312.043	-8.82	36.51	27.69	46.00	-18.31	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : RA221031-50472E-RF
Test Mode: Receiving

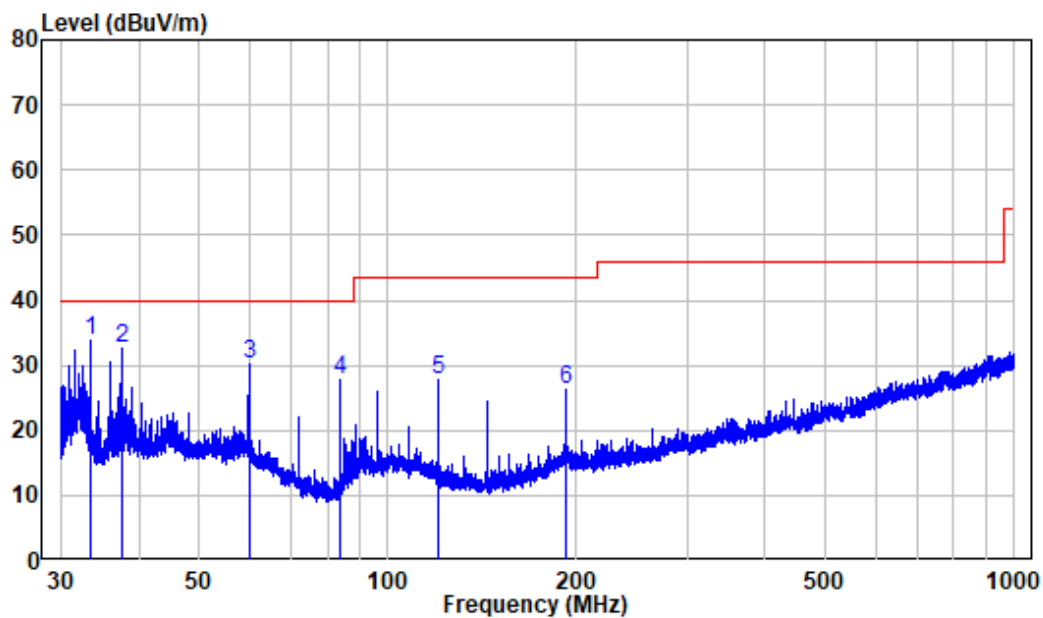
	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	33.607	-11.92	45.66	33.74	40.00	-6.26	Peak
2	37.564	-10.90	44.48	33.58	40.00	-6.42	Peak
3	60.016	-10.63	40.25	29.62	40.00	-10.38	Peak
4	83.999	-16.04	42.68	26.64	40.00	-13.36	Peak
5	120.066	-13.54	39.35	25.81	43.50	-17.69	Peak
6	191.997	-11.25	38.53	27.28	43.50	-16.22	Peak

Test mode 3:**Horizontal:**

Site : chamber
Condition: 3m HORIZONTAL
Job No. : RA221031-50472E-RF
Test Mode: Receiving

	Freq	Factor	Read Level	Level	Limit	Over	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	60.016	-10.63	36.82	26.19	40.00	-13.81	Peak
2	72.021	-15.63	36.77	21.14	40.00	-18.86	Peak
3	120.066	-13.54	40.56	27.02	43.50	-16.48	Peak
4	192.082	-11.25	35.13	23.88	43.50	-19.62	Peak
5	264.050	-10.48	34.42	23.94	46.00	-22.06	Peak
6	312.043	-8.82	36.51	27.69	46.00	-18.31	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : RA221031-50472E-RF
Test Mode: Receiving

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	33.607	-11.92	45.66	33.74	40.00	-6.26	Peak
2	37.564	-10.90	43.48	32.58	40.00	-7.42	Peak
3	60.043	-10.64	40.85	30.21	40.00	-9.79	Peak
4	83.999	-16.04	43.68	27.64	40.00	-12.36	Peak
5	120.066	-13.54	41.35	27.81	43.50	-15.69	Peak
6	191.997	-11.25	37.53	26.28	43.50	-17.22	Peak

Above 1 GHz:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
Test mode 1									
1278.65	51.5	PK	61	2.1	H	-10.17	41.33	74	-32.67
1278.65	50.93	PK	232	2.4	V	-10.17	40.76	74	-33.24
2536.72	55.14	PK	325	2.4	H	-7.00	48.14	74	-25.86
2536.72	54.66	PK	343	2.1	V	-7.00	47.66	74	-26.34
Test mode 2									
1275.86	50.34	PK	293	1.9	H	-10.17	40.17	74	-33.83
1275.86	50.3	PK	326	2.4	V	-10.17	40.13	74	-33.87
2543.65	53.41	PK	157	2.2	H	-7	46.41	74	-27.59
2543.65	53.15	PK	357	2.2	V	-7	46.15	74	-27.85
Test mode 3									
1280.35	49.92	PK	157	1.5	H	-10.17	39.75	74	-34.25
1280.35	50.39	PK	61	1.6	V	-10.17	40.22	74	-33.78
2537.28	53.47	PK	352	2.1	H	-7	46.47	74	-27.53
2537.28	52.96	PK	91	2.2	V	-7	45.96	74	-28.04

Note:

Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

Absolute Level (Corrected Amplitude) = Factor + Reading

Margin = Absolute Level - Limit

The other spurious emission which is in the noise floor level was not recorded.

For above 1GHz, 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.

FCC §15.111 - ANTENNA CONDUCTED POWER FOR RECEIVERS**Applicable Standard**

FCC §15.111

Limit

The antenna conducted power of the receiver as defined in §15.111 shall not exceed the values given in the following tables

Frequency Range	Limit
9 kHz to 5 GHz	2.0 nW (-57 dBm)

EUT Setup**Test Procedure**

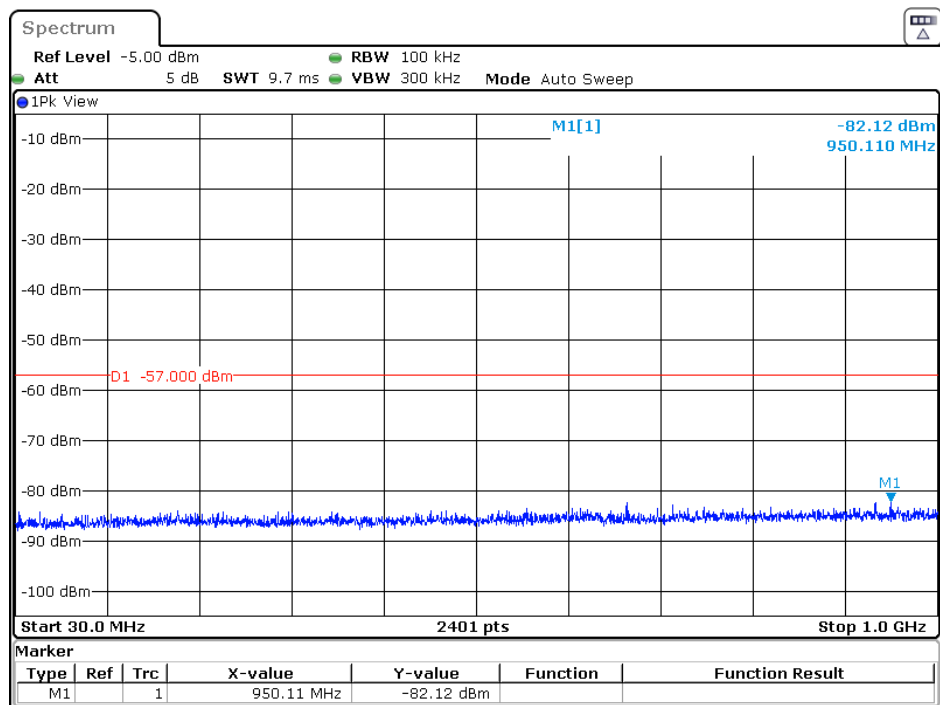
1. The receiver antenna terminal connected to a spectrum analyzer.
2. The test data of the worst case condition was reported on the following Data page.

Test Data**Environmental Conditions**

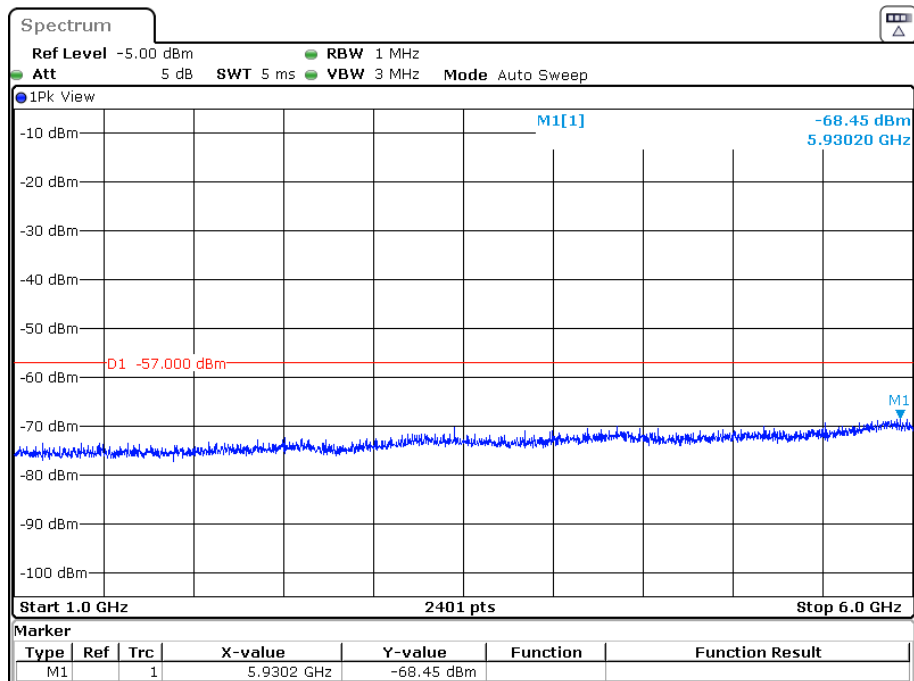
Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	101kPa

The testing was performed by Glenn Jiang on 2022-12-02.

Test mode 1:

Conducted Measurement (30MHz to 1GHz)

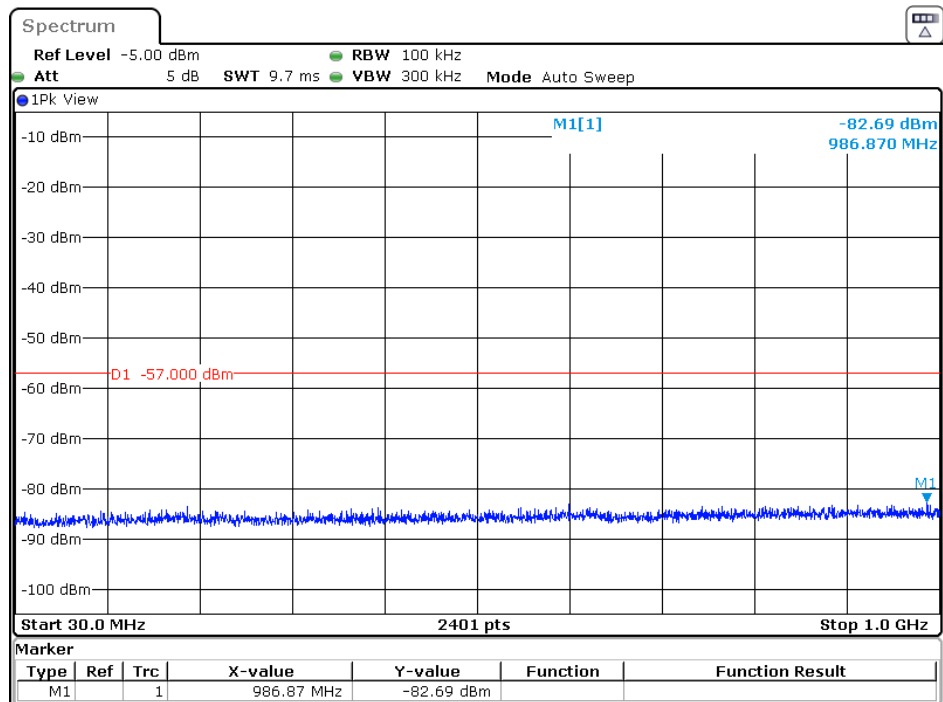
Date: 2.DEC.2022 21:10:51

Conducted Measurement (1GHz to 6GHz)

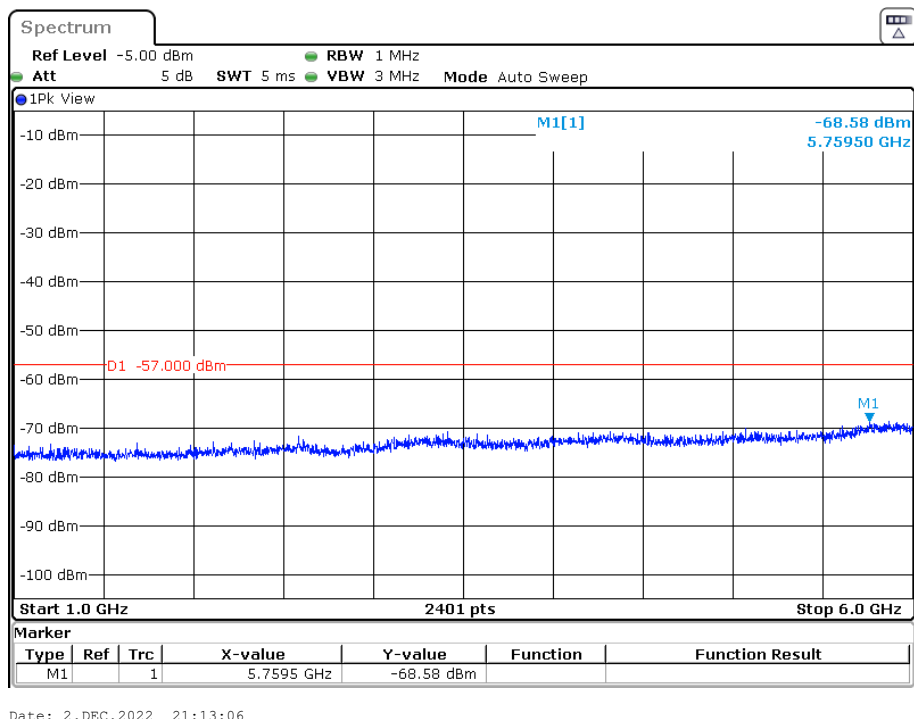
Date: 2.DEC.2022 21:11:45

Test mode 2:

Conducted Measurement (30MHz to 1GHz)

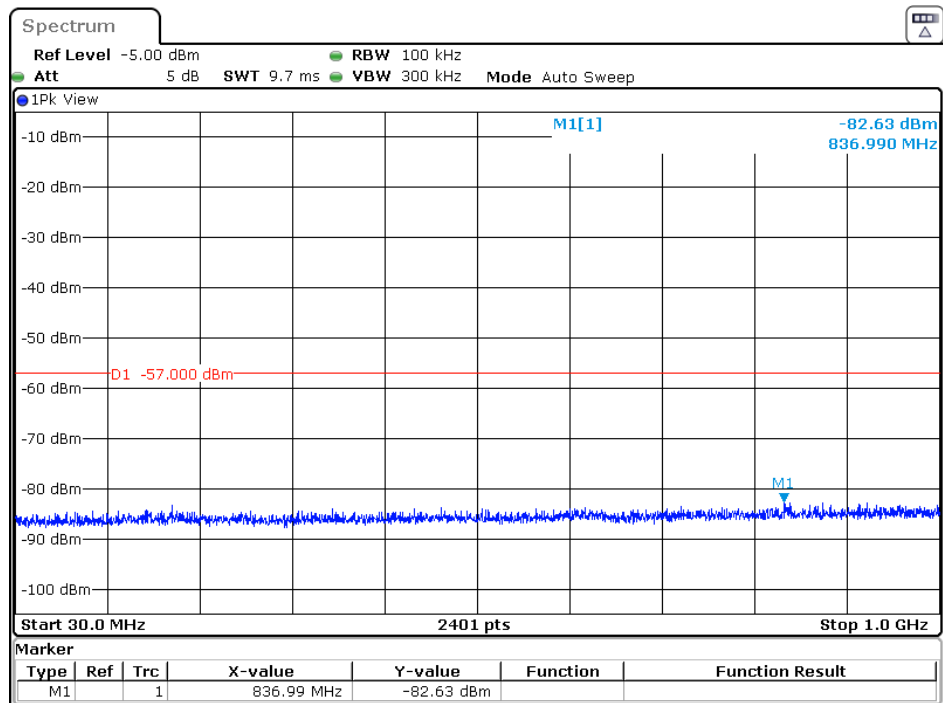


Conducted Measurement (1GHz to 6GHz)



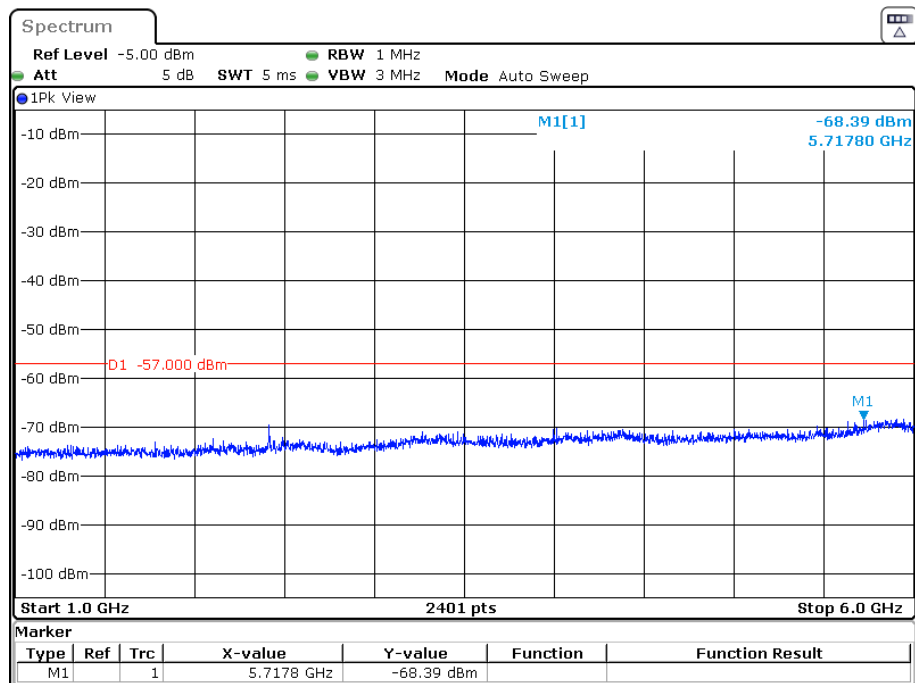
Test mode 3:

Conducted Measurement (30MHz to 1GHz)



Date: 2.DEC.2022 21:13:33

Conducted Measurement (1GHz to 6GHz)



Date: 2.DEC.2022 21:14:37

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