



TEST REPORT

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Report Number: RA221110-53086E-RF-00A
FCC ID: 2A3OORB89

Test Standards:
FCC Part 15, Subpart B (Class B)

Sample Description

Product Type: Two Way Radio
Model No.: RB89
Multiple Model: N/A
Trade Mark: RETEVIS
Date Received: 2022/11/10
Report Date: 2023/01/10

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

Prepared and Checked By:

Nick Fang
EMC Engineer

Approved By:

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	RA221110-53086E-RF-00A	Original Report	2023/01/10

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	462MHz Main channels: 462.5500-462.7250MHz 462MHz Interstitial channels: 462.5625-462.7125MHz 467MHz Main channels: 467.5500-467.7250MHz 467MHz Interstitial channels: 467.5625-467.7125MHz Bluetooth: 2402~2480MHz
Highest Operation Frequency	2480MHz
Voltage Range	DC 7.4V from battery or DC 8.4V from charger
Sample number	1PRY-3 (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 Mode1: Charging

Test Mode2: Receiving

Test Mode3: Scanning

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

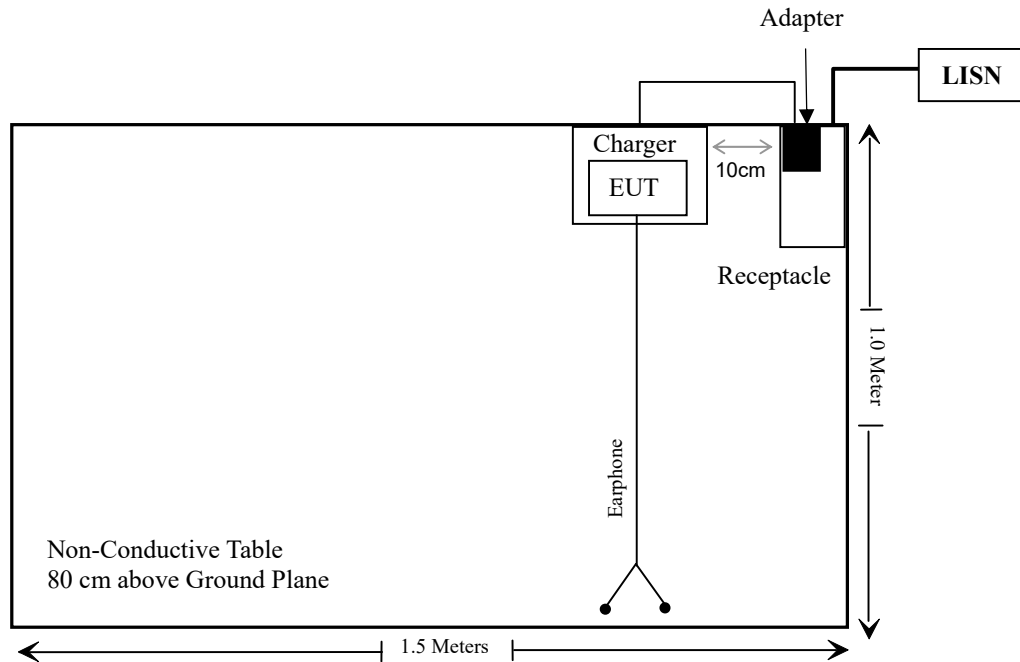
Manufacturer	Description	Model	Serial Number
Youmi	Adapter	HJ-FC017K7-US	01180921D000111

External I/O Cable

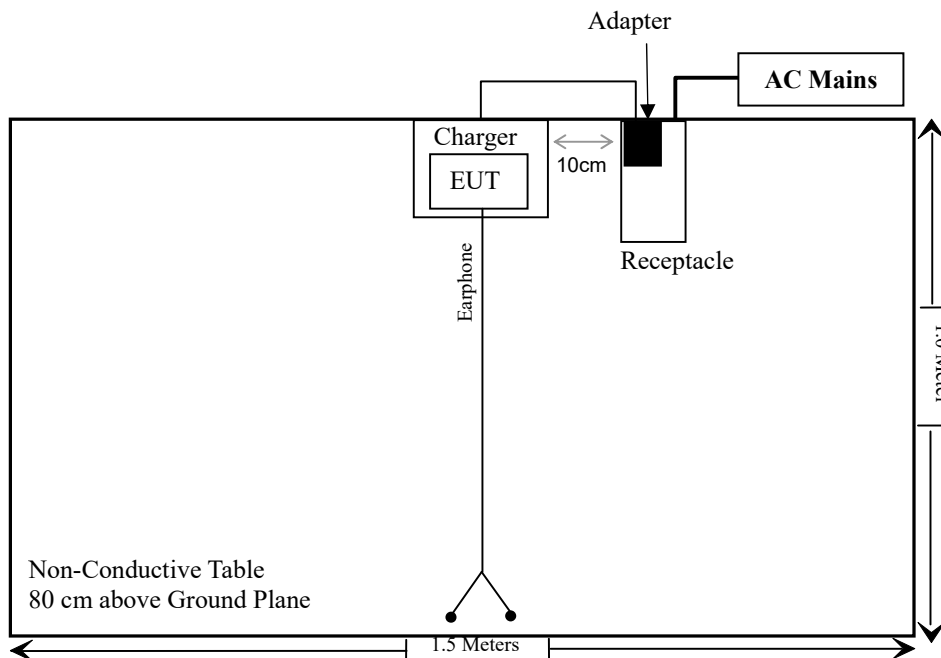
Cable Description	Length (m)	From Port	To Port
Unshielded Un-detachable AC cable	1.0	Receptacle	LISN/AC Mains
Un-shielding Un-Detachable DC Cable	1.0	Charger	Adapter
Unshielded Un-detachable Audio cable	1.0	EUT	Earphone

Block Diagram of Radiated Test Setup

For conducted emission



For radiated emission:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	Conducted Emissions	Compliant
§15.109	Radiated Emissions	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
Unknown	RF Coaxial Cable	No.17	N0350	2022/11/25	2023/11/24
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2022/12/07	2023/12/06
Conducted Emission Test Software: e3 19821b (V9)					
Radiated emission test					
Rohde& Schwarz	Test Receiver	ESR	102725	2022/11/25	2023/11/24
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2022/11/25	2023/11/24
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
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.11	N1000	2022/11/25	2023/11/24
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

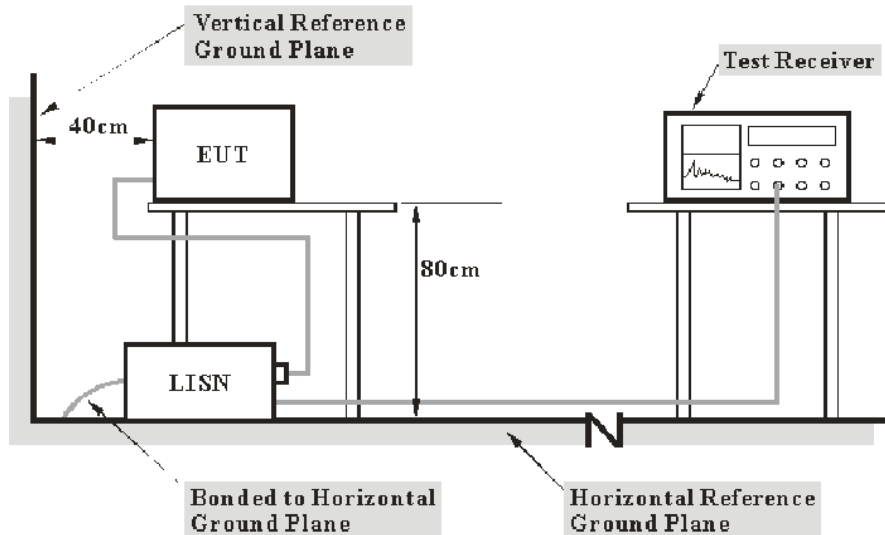
* **Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §15.107 – CONDUCTED EMISSIONS

Applicable Standard

According to FCC§15.107

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 C63.4-2014. The related limit was specified in FCC Part 15.107 Class B.

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 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

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 & Over Limit 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

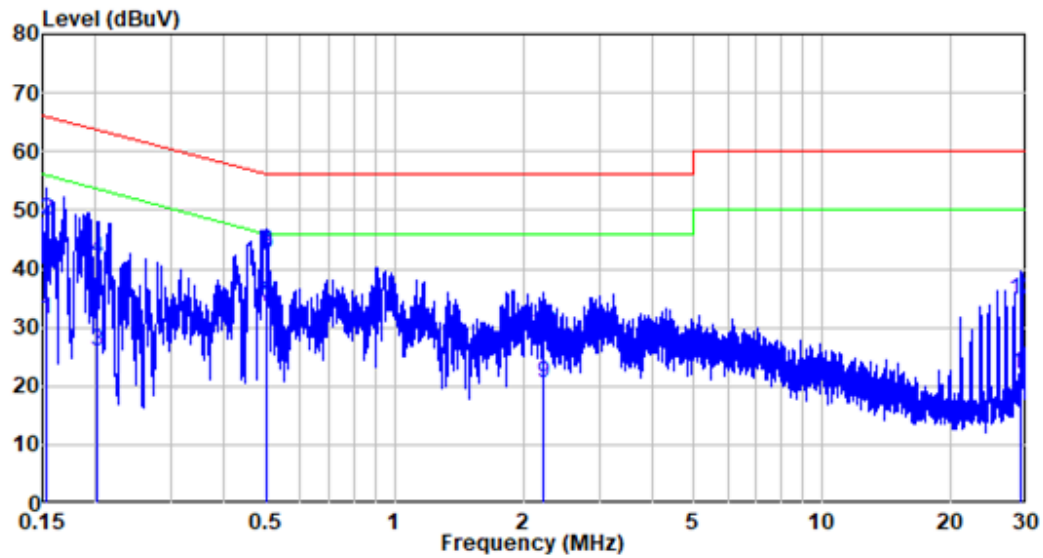
Environmental Conditions

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

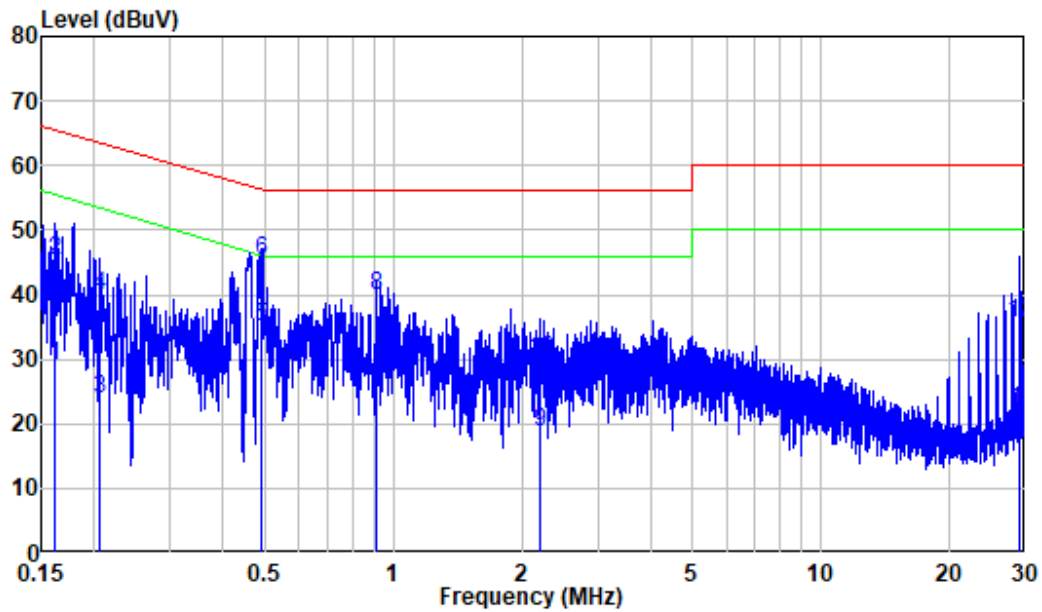
The testing was performed by Jason Liu on 2023-01-06.

EUT operation mode: Test Model (worst case)

AC 120V/60Hz, Line:



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.154	9.80	21.51	31.31	55.79	-24.48	Average
2	0.154	9.80	38.55	48.35	65.79	-17.44	QP
3	0.202	9.80	16.10	25.90	53.52	-27.62	Average
4	0.202	9.80	31.75	41.55	63.52	-21.97	QP
5	0.499	9.80	24.31	34.11	46.02	-11.91	Average
6	0.499	9.80	33.16	42.96	56.02	-13.06	QP
7	0.500	9.80	23.82	33.62	46.00	-12.38	Average
8	0.500	9.80	32.88	42.68	56.00	-13.32	QP
9	2.221	9.82	10.63	20.45	46.00	-25.55	Average
10	2.221	9.82	19.31	29.13	56.00	-26.87	QP
11	29.119	10.09	12.08	22.17	50.00	-27.83	Average
12	29.119	10.09	24.59	34.68	60.00	-25.32	QP

AC 120V/60Hz, Neutral:

	Freq	Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.162	9.80	19.27	29.07	55.38	-26.31	Average
2	0.162	9.80	35.47	45.27	65.38	-20.11	QP
3	0.206	9.80	14.12	23.92	53.36	-29.44	Average
4	0.206	9.80	30.15	39.95	63.36	-23.41	QP
5	0.490	9.80	25.09	34.89	46.16	-11.27	Average
6	0.490	9.80	35.58	45.38	56.16	-10.78	QP
7	0.912	9.81	14.34	24.15	46.00	-21.85	Average
8	0.912	9.81	29.96	39.77	56.00	-16.23	QP
9	2.200	9.82	8.90	18.72	46.00	-27.28	Average
10	2.200	9.82	20.04	29.86	56.00	-26.14	QP
11	29.138	10.19	11.79	21.98	50.00	-28.02	Average
12	29.138	10.19	25.32	35.51	60.00	-24.49	QP

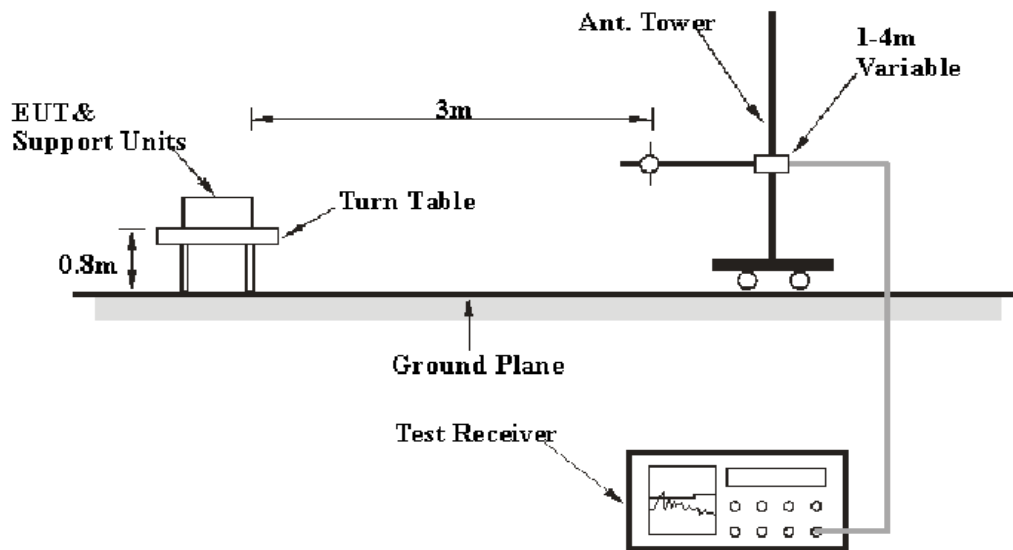
FCC §15.109 - RADIATED EMISSIONS

Applicable Standard

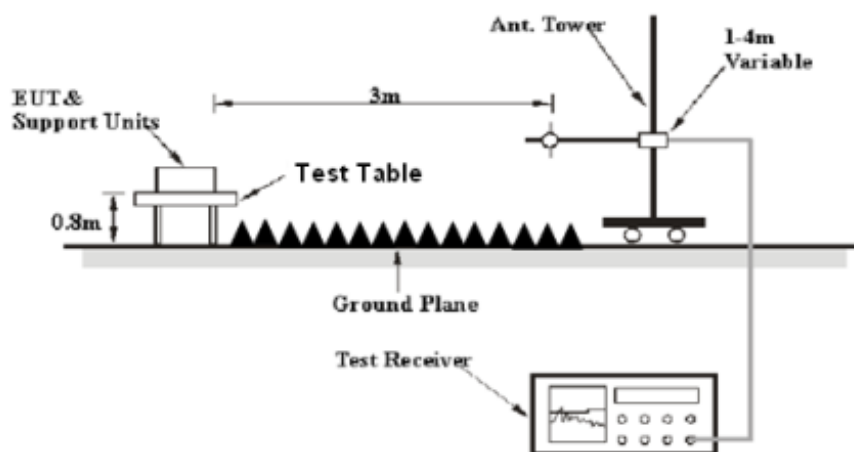
FCC §15.109

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 12.5 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:

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

Test Data**Environmental Conditions**

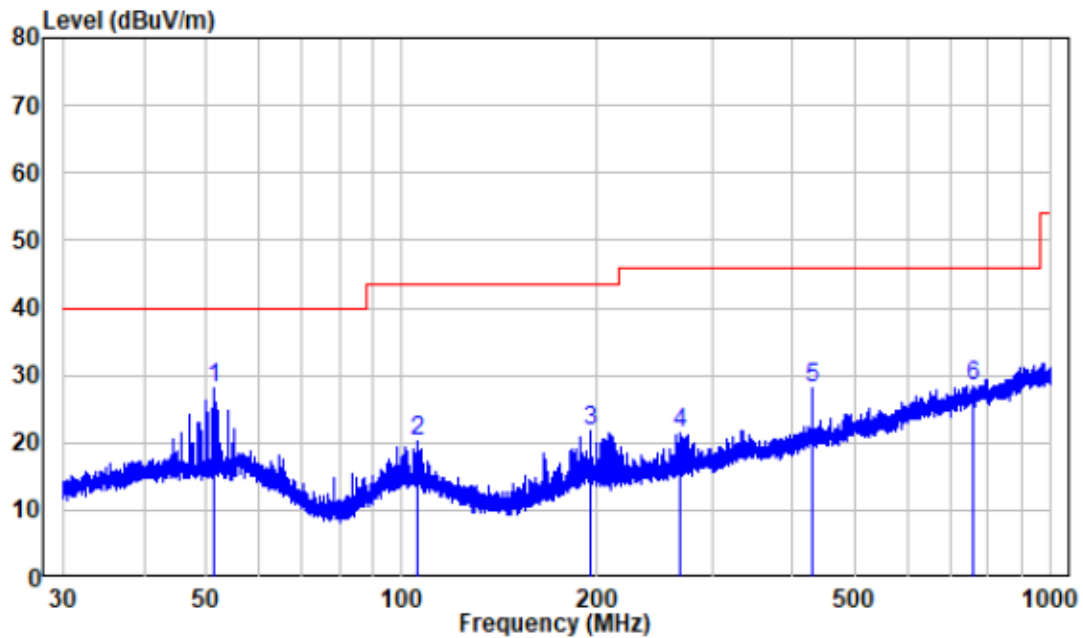
Temperature:	25~26 °C
Relative Humidity:	58~59 %
ATM Pressure:	101.0kPa

The testing was performed by Jack Yang on 2023-01-06 for below 1GHz and Jack Yang on 2023-01-09 for above 1GHz.

EUT operation mode: Test Model (worst case)

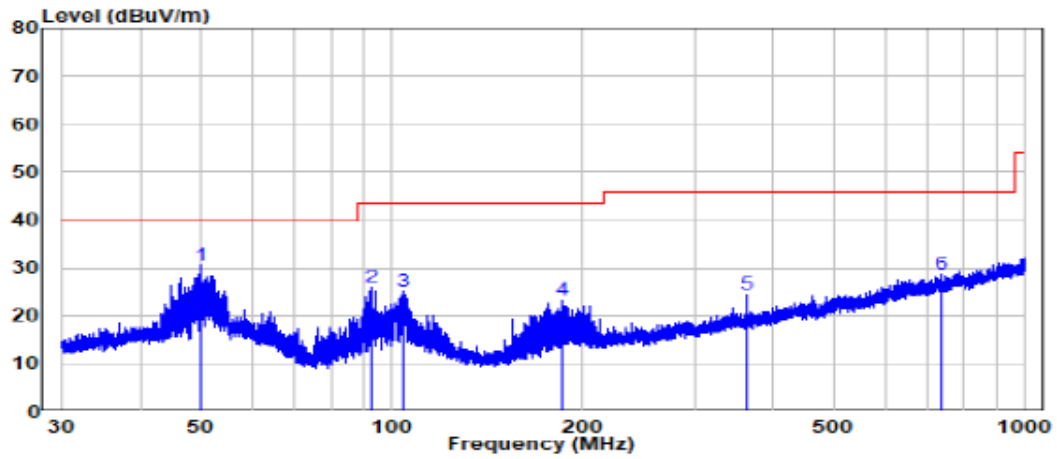
Note: Pre-scan in the X, Y and Z axes of orientation, the worst case Y-axis of orientation was recorded.

Note: when the test result of Peak was below the limit of QP/Average, just the peak value was recorded.

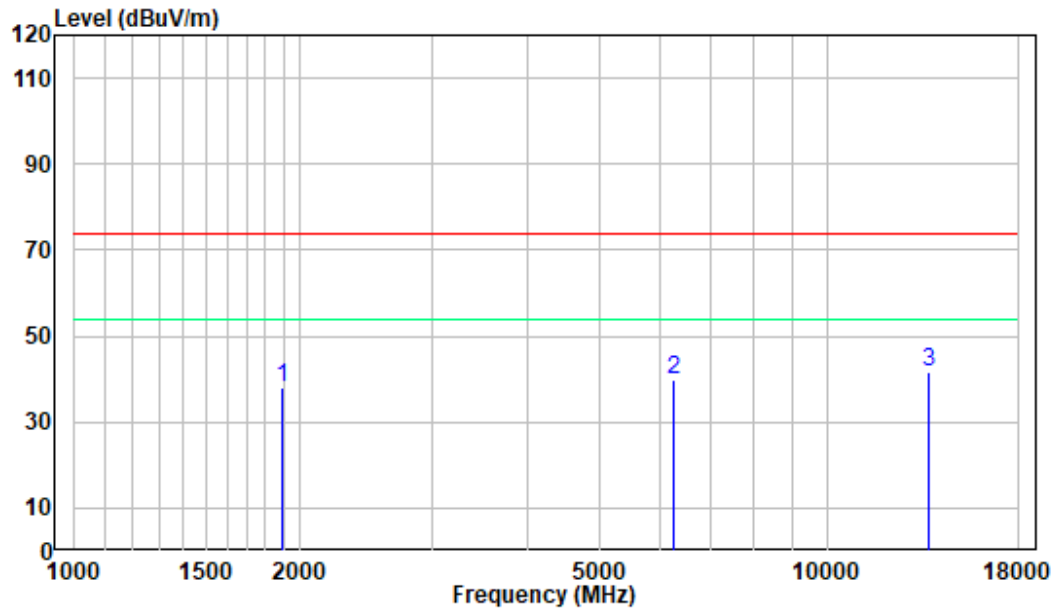
30MHz-1GHz:**Horizontal:**

	Freq	Factor	Read Level	Level	Limit	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	51.481	-9.95	37.89	27.94	40.00	-12.06	Peak
2	105.318	-11.86	32.20	20.34	43.50	-23.16	Peak
3	194.880	-11.42	33.10	21.68	43.50	-21.82	Peak
4	268.368	-10.31	31.86	21.55	46.00	-24.45	Peak
5	429.711	-5.79	33.76	27.97	46.00	-18.03	Peak
6	757.709	-0.65	29.15	28.50	46.00	-17.50	Peak

Vertical

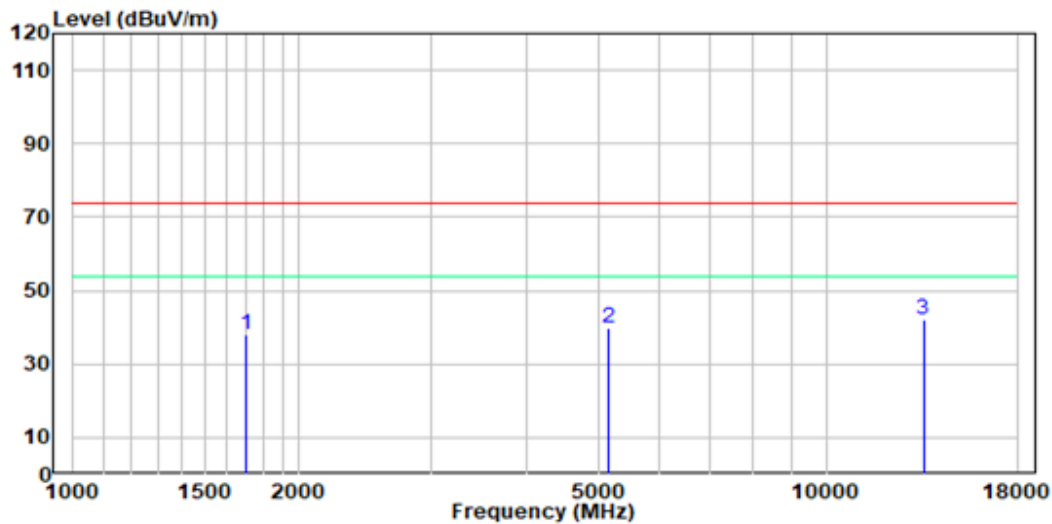


	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	49.881	-9.92	40.43	30.51	40.00	-9.49	Peak
2	93.032	-12.99	38.90	25.91	43.50	-17.59	Peak
3	104.262	-11.77	36.74	24.97	43.50	-18.53	Peak
4	185.300	-12.15	35.35	23.20	43.50	-20.30	Peak
5	362.031	-7.62	32.13	24.51	46.00	-21.49	Peak
6	736.748	-0.70	29.53	28.83	46.00	-17.17	Peak

Above 1 GHz:**Horizontal:**

		Read		Limit	Over	Remark
Freq		Level	Level	Line	Limit	
MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1896.360	-8.06	46.29	38.23	74.00	-35.77 Peak
2	6263.570	-0.56	40.34	39.78	74.00	-34.22 Peak
3	13686.450	7.43	34.26	41.69	74.00	-32.31 Peak

Vertical



	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	1706.310	-8.92	47.16	38.24	74.00	-35.76	Peak
2	5136.330	-2.75	42.38	39.63	74.00	-34.37	Peak
3	13465.360	6.76	35.15	41.91	74.00	-32.09	Peak

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