

FCC Test Report

Applicant : Shenzhen Zaowubang Technology Co.,Ltd.

Address : Rm. 1003, Tanglang Building, Xueyuan Ave,
Nanshan District, Shenzhen, 518100 China

Product Name : GNSS Module for Flipper Zero

Report Date : Jul. 23, 2024

Shenzhen Anbotech Compliance Laboratory Limited



Shenzhen Anbotech Compliance Laboratory Limited

Address: 1/F., Building D, Sogood Science and Technology Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.
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Hotline

400-003-0500

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Report No.: 182513C400052101

FCC ID: 2A8XG-NHEZ107

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TEST REPORT

Applicant : Shenzhen Zaowubang Technology Co.,Ltd.

Manufacturer : Shenzhen Zaowubang Technology Co.,Ltd.

Product Name : GNSS Module for Flipper Zero

Model No. : NHEZ-0107

Trade Mark : N/A

Rating(s) : Input: DC 3.3V

**Test Standard(s) : FCC 47 CFR Part 15 Subpart B
ANSI C63.4-2014**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with above listed standard(s) requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

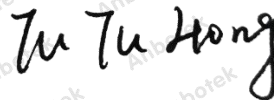
Date of Receipt:

Jul. 10, 2024

Date of Test:

Jul. 18, 2024 to Jul. 22, 2024

Prepared By:



(TuTu Hong)

Approved & Authorized Signer:



(Edward Pan)

Shenzhen Anbotek Compliance Laboratory Limited

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1. General Information

1.1. Client Information

Applicant	:	Shenzhen Zaowubang Technology Co.,Ltd.
Address	:	Rm. 1003, Tanglang Building, Xueyuan Ave, Nanshan District, Shenzhen, 518100 China
Manufacturer	:	Shenzhen Zaowubang Technology Co.,Ltd.
Address	:	Rm. 1003, Tanglang Building, Xueyuan Ave, Nanshan District, Shenzhen, 518100 China
Factory	:	Shenzhen Zaowubang Technology Co.,Ltd.
Address	:	Rm. 1003, Tanglang Building, Xueyuan Ave, Nanshan District, Shenzhen, 518100 China

1.2. Description of Device (EUT)

Product Name	:	GNSS Module for Flipper Zero
Model No.	:	NHEZ-0107
Trade Mark	:	N/A
Test Power Supply	:	DC 3.3V via PC
Test Sample No.	:	1-1-1
Adapter	:	N/A
Remark: (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		



1.3. Auxiliary Equipment Used During Test

Title	Manufacturer	Model No.	Serial No.
Acer Computer	acer	N19W3	2020AJ3862
Acer Computer Adapter	Lite-On Technology Corporation	PA-1650-58	KP06503020

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1.4. Description of Test Modes

Pretest Modes	Descriptions
TM1	GPS Mode(DC 3.3V via PC)
TM2	GLONASS Mode(DC 3.3V via PC)
TM3	BeiDou Mode(DC 3.3V via PC)

1.5. Measurement Uncertainty

Parameter	Uncertainty
Conducted emissions (AMN 150kHz~30MHz)	3.4dB
Radiated emissions (30MHz~1000MHz)	Horizontal: 3.92dB; Vertical: 4.52dB
Radiated emissions (above 1GHz)	1G-6GHz: 4.78dB; 6G-18GHz: 4.88dB
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	



1.6. Test Summary

Test Items	Test Modes	Status
Conducted emissions on AC mains	Mode1,2,3	P
Radiated emissions (Below 1GHz)	Mode1,2,3	P
Radiated emissions (Above 1GHz)	Mode1,2,3	P
Note: P: Pass N: N/A, not applicable		

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1.7. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.:434132

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 434132.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.

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1.8. Test Equipment List

Conducted emissions on AC mains

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due Date
1	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	2024-01-18	2025-01-17
2	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040D T001	2024-01-17	2025-01-16
3	Software Name EZ-EMC	Farad Technology	ANB-03A	N/A	/	/
4	EMI Test Receiver	Rohde & Schwarz	ESPI3	100926	2023-10-12	2024-10-11

Radiated emissions (Below 1GHz)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due Date
1	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	2024-01-23	2025-01-22
2	Pre-amplifier	SONOMA	310N	186860	2024-01-17	2025-01-16
3	Bilog Broadband Antenna	Schwarzbeck	VULB9163	345	2022-10-23	2025-10-22
4	Software Name EZ-EMC	Farad Technology	ANB-03A	N/A	/	/

Radiated emissions (Above 1GHz)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due Date
1	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	2024-01-23	2025-01-22
2	Pre-amplifier	SONOMA	310N	186860	2024-01-17	2025-01-16
3	Bilog Broadband Antenna	Schwarzbeck	VULB9163	345	2022-10-23	2025-10-22
4	EMI Preamplifier	SKET Electronic	LNPA-0118G-45	SKET-PA-002	2024-01-17	2025-01-16
5	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D	02555	2022-10-16	2025-10-15
6	Software Name EZ-EMC	Farad Technology	ANB-03A	N/A	/	/



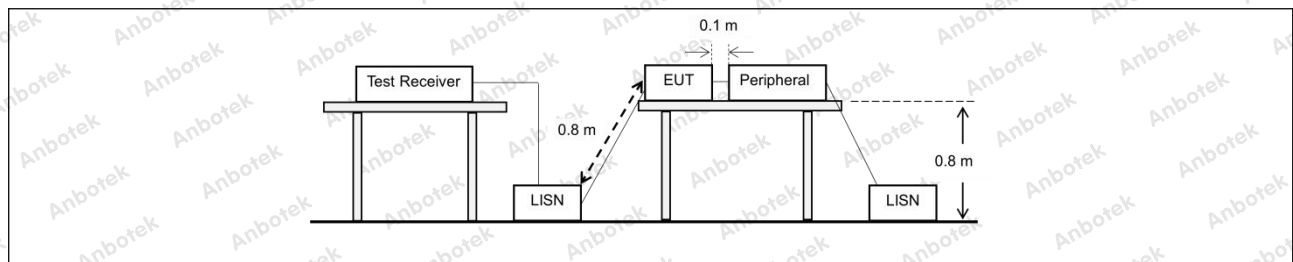
2. Conducted emissions on AC mains

Test Requirement:	15.107, Class B		
Test Limit:	Frequency of emission (MHz)	Conducted limit (dBμV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	*Decreases with the logarithm of the frequency.		
Test Method:	ANSI C63.4-2014		
Procedure:	An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected. Remark: Level= Read Level+ Cable Loss+ LISN Factor		

2.1. EUT Operation

Operating Environment:	
Test mode:	1: TM1: GPS Mode(DC 3.3V via PC) 2: TM2: GLONASS Mode(DC 3.3V via PC) 3: TM3: BeiDou Mode(DC 3.3V via PC)

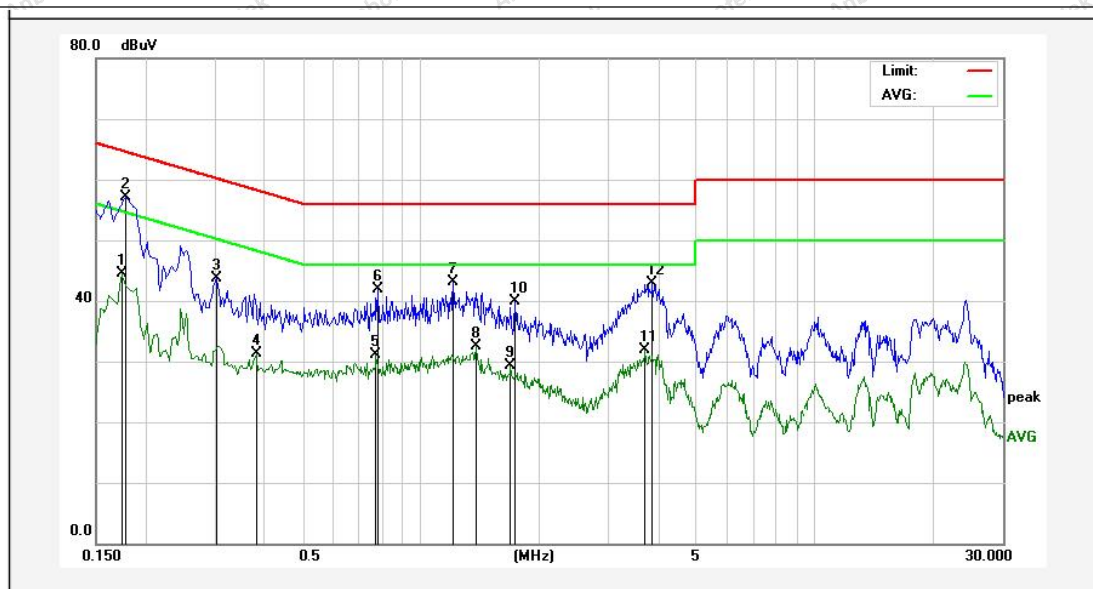
2.2. Test Setup



2.3. Test Data

Temperature:	23.9 °C	Humidity:	50.8 %	Atmospheric Pressure:	101 kPa
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TM1 / Line: Line



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1740	26.76	17.83	44.59	54.76	-10.17	AVG	
2	0.1780	39.33	17.82	57.15	64.57	-7.42	QP	
3	0.3020	25.92	17.84	43.76	60.19	-16.43	QP	
4	0.3820	13.49	17.81	31.30	48.23	-16.93	AVG	
5	0.7740	13.17	17.87	31.04	46.00	-14.96	AVG	
6	0.7820	24.12	17.87	41.99	56.00	-14.01	QP	
7	1.2140	25.16	17.85	43.01	56.00	-12.99	QP	
8	1.3860	14.72	17.86	32.58	46.00	-13.42	AVG	
9	1.6900	11.36	17.85	29.21	46.00	-16.79	AVG	
10	1.7420	21.97	17.85	39.82	56.00	-16.18	QP	
11	3.7020	14.08	17.86	31.94	46.00	-14.06	AVG	
12	3.8780	25.11	17.86	42.97	56.00	-13.03	QP	



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FCC ID: 2A8XG-NHEZ107

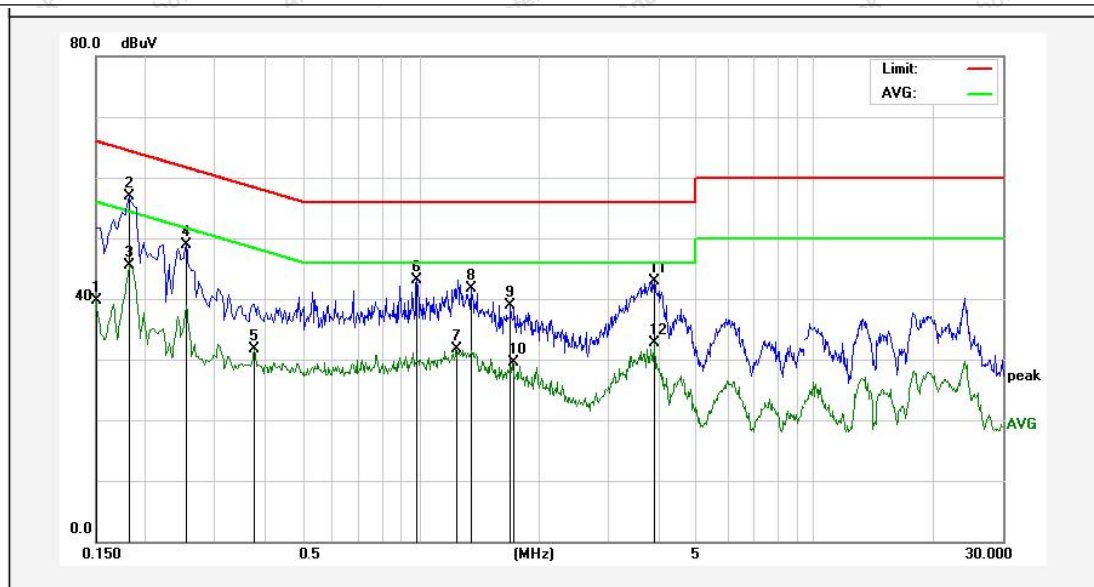
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Temperature: 23.9 °C

Humidity: 50.8 %

Atmospheric Pressure: 101 kPa

TM1 / Line: Neutral



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1499	21.80	17.82	39.62	56.00	-16.38	AVG	
2	0.1819	39.01	17.82	56.83	64.39	-7.56	QP	
3	0.1819	27.69	17.82	45.51	54.39	-8.88	AVG	
4	0.2540	30.97	17.84	48.81	61.62	-12.81	QP	
5	0.3780	13.88	17.81	31.69	48.32	-16.63	AVG	
6	0.9820	25.32	17.86	43.18	56.00	-12.82	QP	
7	1.2300	13.76	17.85	31.61	46.00	-14.39	AVG	
8	1.3460	23.83	17.86	41.69	56.00	-14.31	QP	
9	1.6900	21.07	17.85	38.92	56.00	-17.08	QP	
10	1.7100	11.60	17.85	29.45	46.00	-16.55	AVG	
11	3.9020	24.98	17.86	42.84	56.00	-13.16	QP	
12	3.9020	14.81	17.86	32.67	46.00	-13.33	AVG	

Note: Only record the worst data in the report.



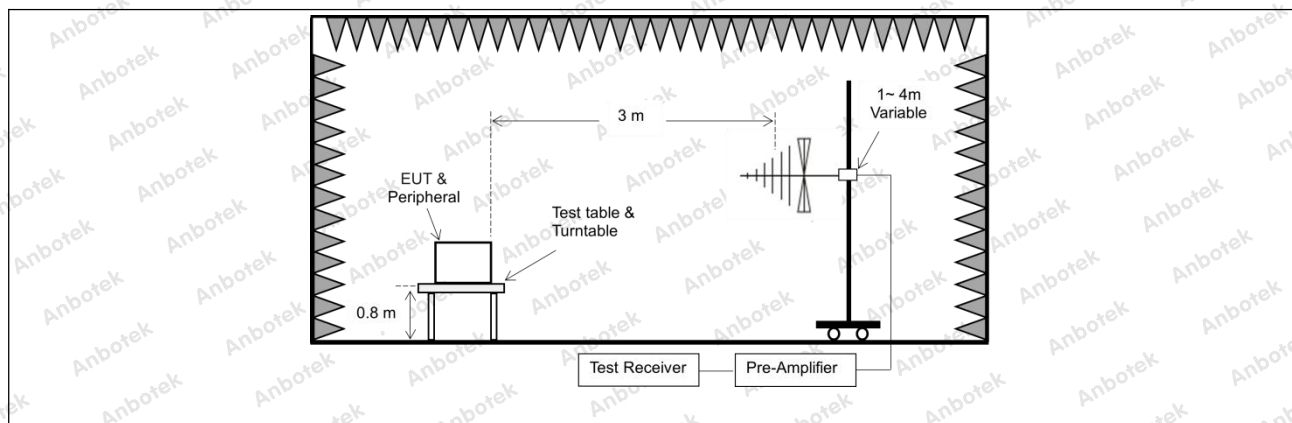
3. Radiated emissions (Below 1GHz)

Test Requirement:	15.109, Class B					
Test Limit:	Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:					
	Frequency of emission (MHz)	Field strength @3m		Field strength @10m		
		(uV/m)	(dBuV/m)	(uV/m)	(dBuV/m)	
		30 – 88	100	40	30	29.5
		88 – 216	150	43.5	45	33.1
		216 – 960	200	46	60	35.6
	Above 960	500	54	150	43.5	
Test Method:	ANSI C63.4-2014					
Procedure:	An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor					

3.1. EUT Operation

Operating Environment:					
Test mode:	1: TM1: GPS Mode(DC 3.3V via PC) 2: TM2: GLONASS Mode(DC 3.3V via PC) 3: TM3: BeiDou Mode(DC 3.3V via PC)				

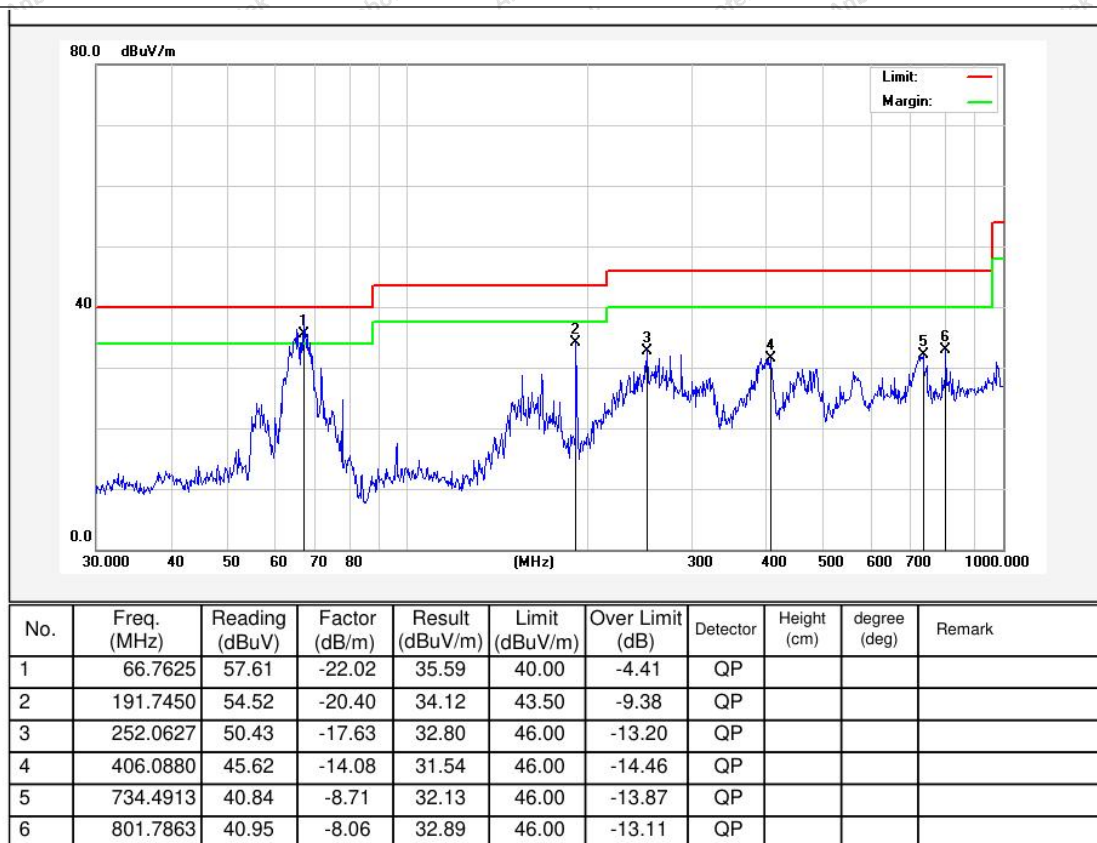
3.2. Test Setup



3.3. Test Data

Temperature:	20.3 °C	Humidity:	46 %	Atmospheric Pressure:	101 kPa
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TM1 / Polarization: Horizontal



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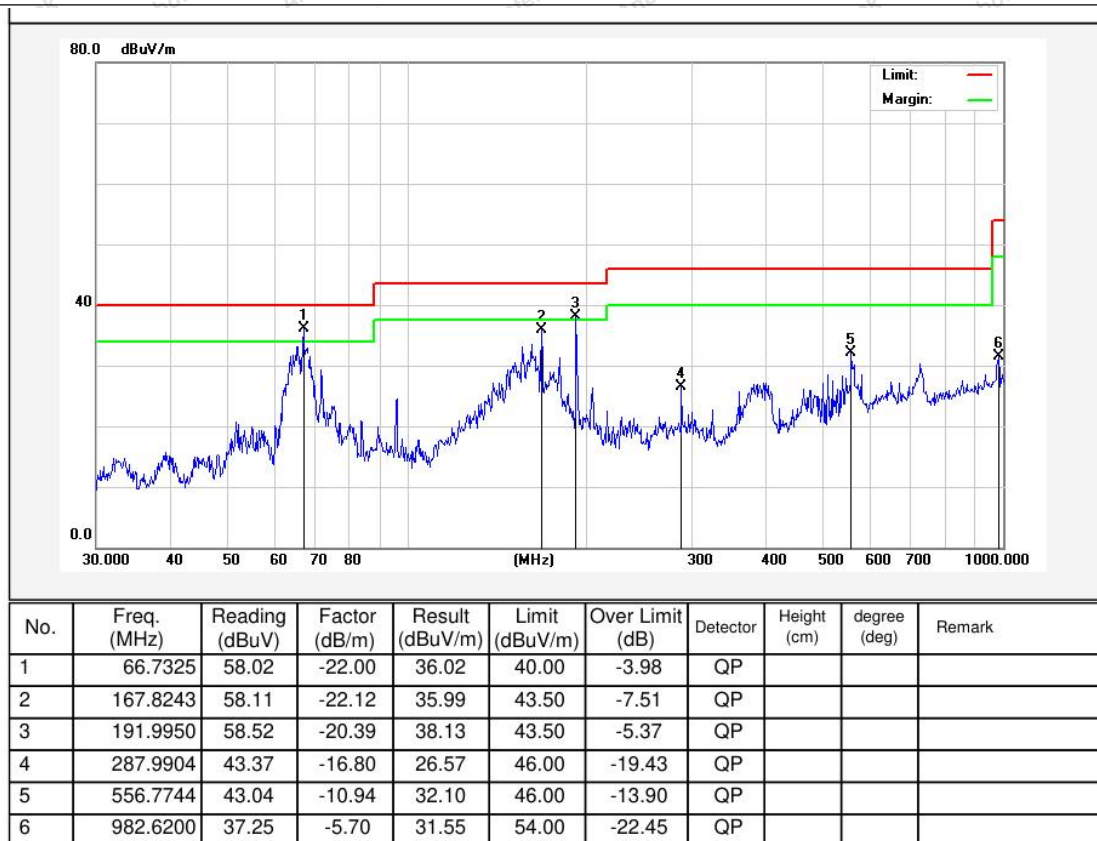
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Temperature: 20.3 °C

Humidity: 46 %

Atmospheric Pressure: 101 kPa

TM1 / Polarization: Vertical



Note: Only record the worst data in the report.



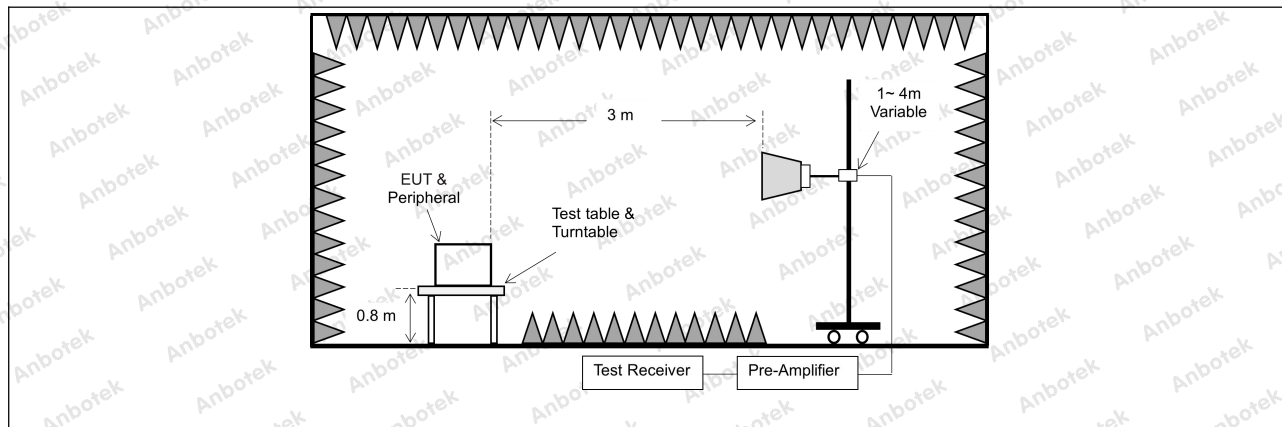
4. Radiated emissions (Above 1GHz)

Test Requirement:	15.109, Class B			
Test Limit:	Frequency of emission (MHz)	Field strength @3m		
		Average (uV/m)	Average(dBuV/m)	Peak (dBuV/m)
	Above 1GHz	500	54	74
Test Method:	ANSI C63.4-2014			
Procedure:	An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. For below 1GHz test, Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. For above 1GHz test, Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities. Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor			

4.1. EUT Operation

Operating Environment:	
Test mode:	1: TM1: GPS Mode(DC 3.3V via PC) 2: TM2: GLONASS Mode(DC 3.3V via PC) 3: TM3: BeiDou Mode(DC 3.3V via PC)

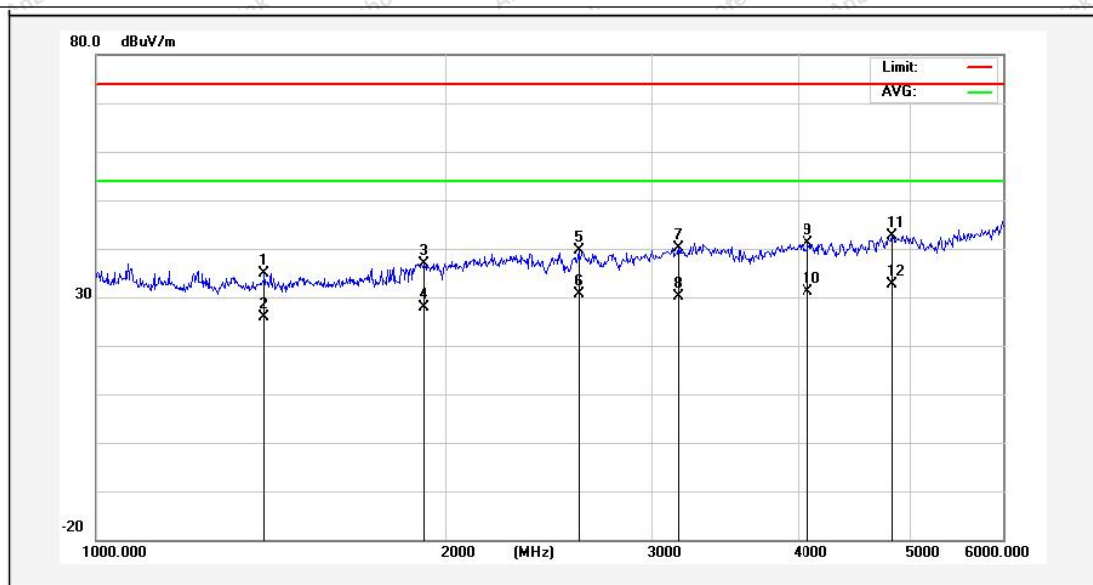
4.2. Test Setup



4.3. Test Data

Temperature:	23.9 °C	Humidity:	50.8 %	Atmospheric Pressure:	101 kPa
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TM1 / Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	1393.022	54.86	-19.92	34.94	74.00	-39.06	peak			
2	1393.022	45.86	-19.92	25.94	54.00	-28.06	AVG			
3	1912.893	55.54	-18.56	36.98	74.00	-37.02	peak			
4	1912.893	46.54	-18.56	27.98	54.00	-26.02	AVG			
5	2594.039	56.42	-16.84	39.58	74.00	-34.42	peak			
6	2594.039	47.42	-16.84	30.58	54.00	-23.42	AVG			
7	3159.171	55.04	-14.89	40.15	74.00	-33.85	peak			
8	3159.171	45.04	-14.89	30.15	54.00	-23.85	AVG			
9	4081.772	53.72	-12.59	41.13	74.00	-32.87	peak			
10	4081.772	43.72	-12.59	31.13	54.00	-22.87	AVG			
11	4821.884	53.31	-10.67	42.64	74.00	-31.36	peak			
12	4821.884	43.31	-10.67	32.64	54.00	-21.36	AVG			



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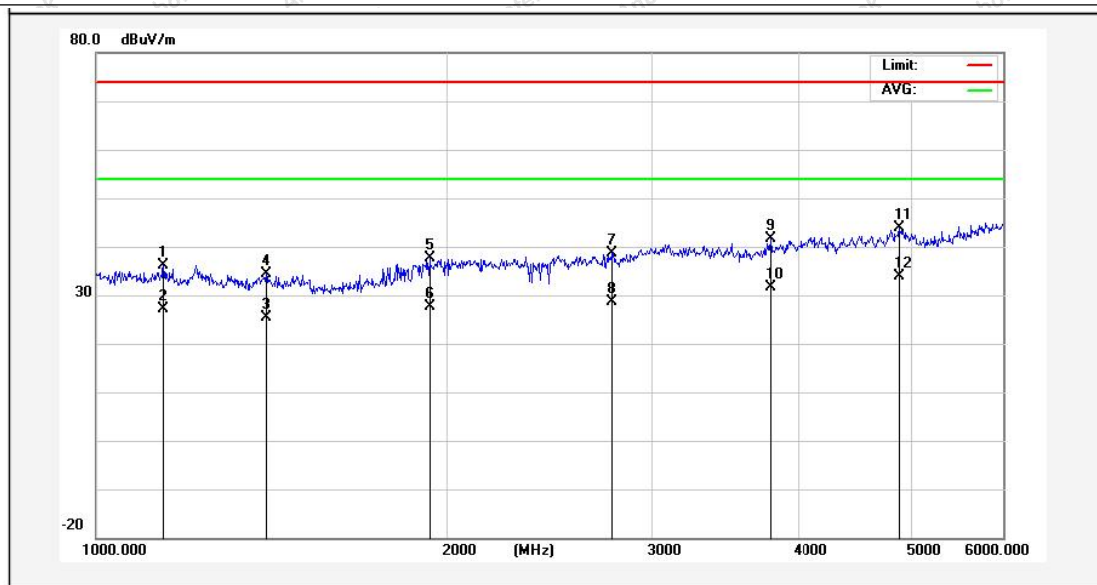
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Temperature: 23.9 °C

Humidity: 50.8 %

Atmospheric Pressure: 101 kPa

TM1 / Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	1141.782	63.57	-27.51	36.06	74.00	-37.94	peak			
2	1141.782	54.57	-27.51	27.06	54.00	-26.94	AVG			
3	1398.023	52.39	-26.91	25.48	74.00	-48.52	peak			
4	1398.023	61.39	-26.91	34.48	54.00	-19.52	AVG			
5	1933.569	63.08	-25.51	37.57	74.00	-36.43	peak			
6	1933.569	53.08	-25.51	27.57	54.00	-26.43	AVG			
7	2766.877	62.21	-23.55	38.66	74.00	-35.34	peak			
8	2766.877	52.21	-23.55	28.66	54.00	-25.34	AVG			
9	3785.876	62.25	-20.52	41.73	74.00	-32.27	peak			
10	3785.876	52.25	-20.52	31.73	54.00	-22.27	AVG			
11	4891.499	61.37	-17.51	43.86	74.00	-30.14	peak			
12	4891.499	51.37	-17.51	33.86	54.00	-20.14	AVG			

Note: Only record the worst data in the report.



APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph_EMC

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

----- End of Report -----

