

FCC Test Report

Report No.: RWAZ202300123M

Applicant: Shenzhen Youmi Intelligent Technology Co., Ltd.

Address: 406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China

Product Name: Smart phone

Product Model: PG3NBG7YA

Multiple Models: N/A

Trade Mark: UMIDIGI

FCC ID: 2ATZ4-G7

Standards: FCC CFR Title 47 Part 15C (§15.225)

Test Date: 2024-1-17~2024-02-22

Test Result: Complied

Report Date: 2024-03-08

Reviewed by: *Abel chen*

Approved by: *Jacob Kong*

Abel Chen
Project Engineer

Jacob Kong
Manager

Prepared by:

World Alliance Testing and Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China



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Revision History

Version No.	Issued Date	Description
00	2024-03-08	Original

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1 General Information

1.1 Client Information

Applicant:	Shenzhen Youmi Intelligent Technology Co., Ltd.
Address:	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China
Manufacturer:	Shenzhen Youmi Intelligent Technology Co., Ltd.
Address:	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China

1.2 Product Description of EUT

The EUT is Smart phone that contains Classic Bluetooth(BDR/EDR), BLE, 2.4G/5G WLAN, GSM/GPRS/WCDMA/LTE and NFC radios, this report covers the full testing of the NFC radio.

Sample Serial Number	36-2 for CE&RE test, 36-1 for RF test conducted test (assigned by WATC)
Sample Received Date	2023-12-15
Sample Status	Good Condition
Frequency Range	13.56 MHz
Maximum E-field Strength:	71.13dBuV/m@3m
Modulation Technology	ASK
Antenna Gain [#]	N/A
Spatial Streams	SISO (1TX, 1RX)
Power Supply	DC 3.87V from battery or DC 5V from adapter
Operating temperature [#]	0 deg.C to +45 deg.C
Adapter 1 Information	Model: HF-0502000U Input: AC 100-240V~50/60Hz, 0.3A Output: DC 5.0V, 2.0A
Adapter 2 Information	Model: HJ-0502000W2-US Input: AC 100-240V~50/60Hz, 0.3A Output: DC 5.0V, 2.0A
Modification	Sample No Modification by the test lab

1.3 Antenna information

<p>15.203 requirement: 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, 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.</p>	
Device Antenna information:	
<p>The BT antenna is an internal antenna which cannot replace by end-user, please see product internal photos for details.</p>	

1.4 Related Submittal(s)/Grant(s)

FCC Part 15, Subpart C, Equipment Class: DTS, FCC ID: 2ATZ4-G7
 FCC Part 15, Subpart C, Equipment Class: DSS, FCC ID: 2ATZ4-G7
 FCC Part 15, Subpart E, Equipment Class: NII, FCC ID: 2ATZ4-G7
 FCC Part 22H/24E/27, Equipment Class: PCE, FCC ID: 2ATZ4-G7

1.5 Measurement Uncertainty

Parameter		Expanded Uncertainty (Confidence of 95%(U = 2Uc(y)))
AC Power Lines Conducted Emissions		±3.14dB
Emissions, Radiated	Below 30MHz	±2.78dB
	Below 1GHz	±4.84dB
	Above 1GHz	±5.44dB
Bandwidth		0.34%
Frequency Error		150Hz
<p>Note 1: 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.</p> <p>Note 2: The Decision Rule is based on simple acceptance with ISO Guide 98-4:2012 Clause 8.2 (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)</p>		

1.6 Laboratory Location

World Alliance Testing and Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Tel: +86-755-29691511, Email: qa@watc.com.cn

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. : 463912, the FCC Designation No. : CN5040.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0160.

1.7 Test Methodology

FCC CFR 47 Part 2

FCC CFR 47 Part 15

ANSI C63.10-2020

2 Description of Measurement

2.1 Test Configuration

Operating channels:					
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
/	13.56	/	/	/	/

According to ANSI C63.10-2020 chapter 5.6.1 Table 11 requirement, the above frequency listed above was tested.

Test Mode:			
Transmitting mode:	Keep the EUT in continuous transmitting with modulation		
Exercise software#:	Engineering mode		
Mode:	NFC	Power Level Setting#:	Default

The exercise software and the maximum power setting that provided by manufacturer.

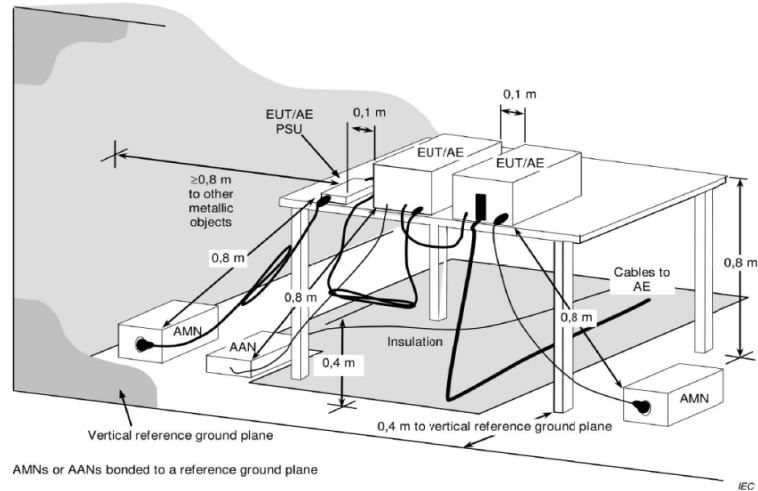
Worst-Case Configuration:
For radiated emissions, EUT was investigated in three orthogonal orientation, the worst-case orientation was recorded in report
For radiated emission 9kHz-30MHz, investigation was done on the three antenna orientations (parallel, perpendicular, ground-parallel), the worst-case antenna orientation was recorded in report.
For radiated emission below 1GHz, according to the test result of BT report, the worst case adapter HF-0502000U was select to test.

2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
/	/	/	/

2.3 Test Setup

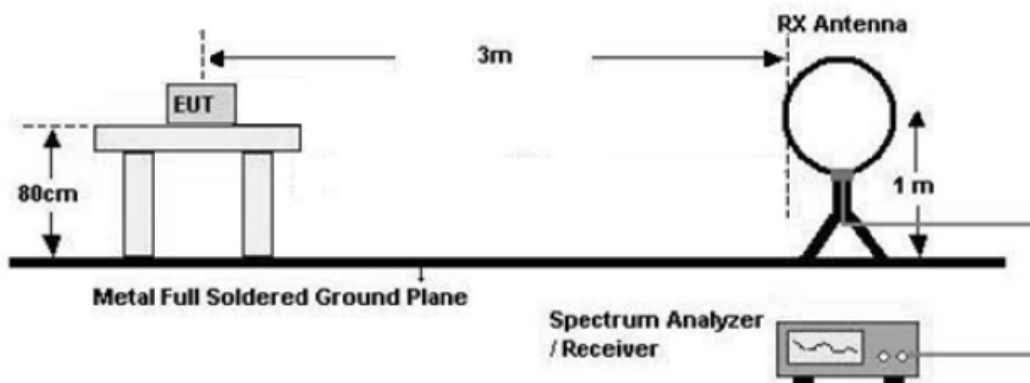
1) Conducted emission measurement:



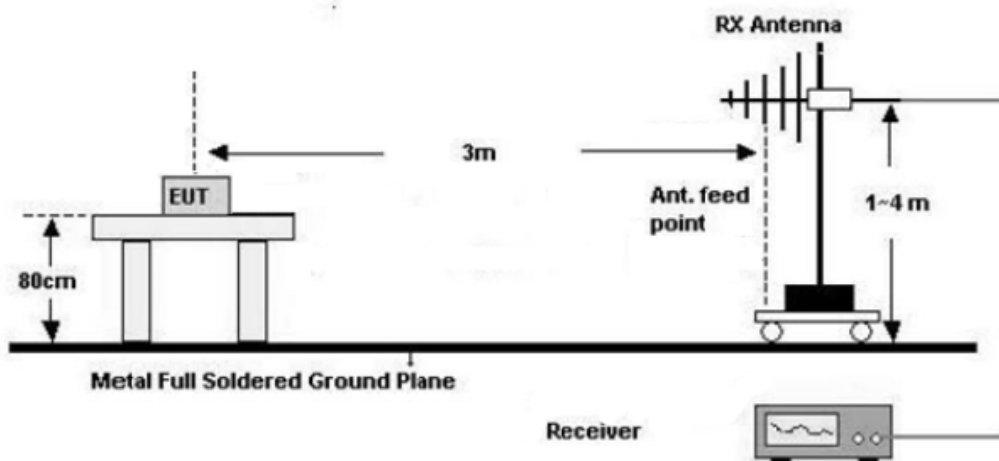
Note: The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

2) Radiated emission measurement:

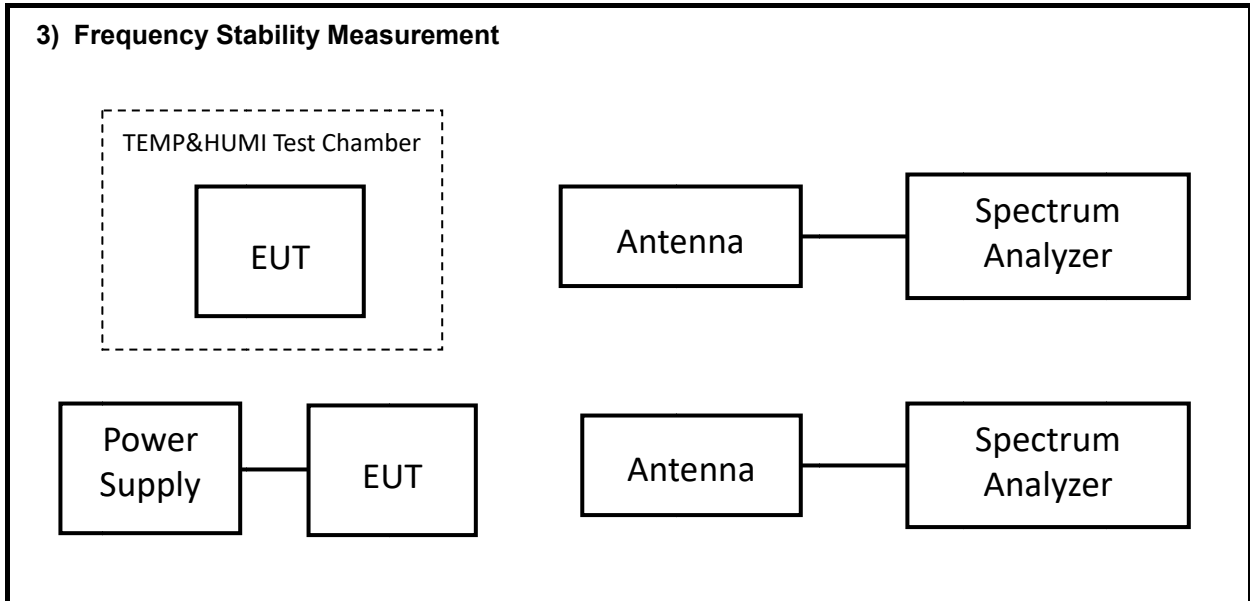
Below 30MHz (3m SAC)



30MHz-1GHz (3m SAC)



3) Frequency Stability Measurement



2.4 Test Procedure

Conducted emission:

1. The E.U.T is placed on a non-conducting table 40cm from the vertical ground plane and 80cm above the horizontal ground plane (Please refer to the block diagram of the test setup and photographs).
2. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
3. Line conducted data is recorded for both Line and Neutral

Radiated Emission Procedure:

a) For below 30MHz

1. All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz- 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were $40 \cdot \log(\text{test distance} / \text{specification distance})$.
2. Loop antenna use, investigation was done on the three antenna orientations (parallel, perpendicular, ground-parallel)

b) For 30MHz-1GHz:

1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.
2. EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations..

Bandwidth Test:

1. Use the same setup for radiated 9kHz ~30MHz, found the maximum fundamental level.
2. Change the spectrum analyzer setting for bandwidth testing
3. Test the bandwidth and record the result

Frequency Stability VS temperature Test:

1. The EUT was supply power with normal voltage and placed in the center of the environmental chamber
2. Adjust the location of the measurement antenna to obtain a suitable signal level in measurement instrument
3. Turn off the EUT and set the temperature control on the chamber to the highest specified in the regulatory requirements and allow the chamber temperature to stabilize.
4. While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency
5. Switch OFF the EUT, Lower the chamber temperature by not more that 10 °C, and allow the temperature inside the chamber to stabilize
6. Repeat step 4 and step 5 down to the lowest specified temperature

Frequency Stability VS Voltage Test:

1. EUT was placed at ambient room temperature (+15 °C to +25 °C) and connect to a power source which can varying supply voltage
2. Adjust the location of the measurement antenna to obtain a suitable signal level in measurement instrument
3. Varying the supply voltage at 85% and 115% of the nominal supply voltage, record the operating frequency

2.5 Measurement Method

Description of Test	Measurement Method
AC Line Conducted Emissions	ANSI C63.10-2020 Section 6.2
Field strength of fundamental and Radiated emission	ANSI C63.10-2020 Section 6.3&6.4&6.5
20dB Emission Bandwidth	ANSI C63.10-2020 Section 6.9.2
Frequency Stability	ANSI C63.10-2020 Section 6.8

2.6 Measurement Equipment

Manufacturer	Description	Model	Management No.	Calibration Date	Calibration Due Date
AC Line Conducted Emission Test					
ROHDE & SCHWARZ	EMI TEST RECEIVER	ESR	101817	2023/7/3	2024/7/2
R&S	LISN	ENV216	101748	2023/8/1	2024/7/30
N/A	Coaxial Cable	NO.12	N/A	2023/7/3	2024/7/2
Farad	Test Software	EZ-EMC	Ver. EMEC-3A1	/	/
Radiated Emission Test					
R&S	EMI test receiver	ESR3	102758	2023/7/3	2024/7/2
SONOMA INSTRUMENT	Low frequency amplifier	310	186014	2023/7/12	2024/7/11
BACL	Loop Antenna	1313-1A	4010611	2024/2/7	2427/2/6
SCHWARZBECK	Log - periodic wideband antenna	VULB 9163	9163-872	2023/7/7	2024/7/6
N/A	Coaxial Cable	N/A	NO.9	2023/8/8	2024/8/7
N/A	Coaxial Cable	N/A	NO.10	2023/8/8	2024/8/7
N/A	Coaxial Cable	N/A	NO.11	2023/8/8	2024/8/7
Audix	Test Software	E3	191218 V9	/	/
Frequency Stability					
R&S	Spectrum Analyzer	FSV40	101419	2023/9/12	2024/9/11
BACL	Loop Antenna	1313-1A	4010611	2024/2/7	2427/2/6
N/A	Coaxial Cable	N/A	NO.9	2023/8/8	2024/8/7
BACL	TEMP&HUMI Test Chamber	BTH-150	30022	2023/7/12	2024/7/11
FLUKE	Digital Multimeter	15B+	N/A	2023/7/12	2024/7/11

Note: All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or International standards.

3 Test Results

3.1 Test Summary

FCC/ISED Rules	Description of Test	Result
FCC §15.203	Antenna Requirement	Compliance
FCC §15.207(a)	AC Line Conducted Emissions	Compliance
FCC §15.205, §15.209, §15.225	Field strength of fundamental and Radiated emission	Compliance
§15.225(e)	Frequency Stability	Compliance
FCC §15.215(c)	20dB Emission Bandwidth	Compliance

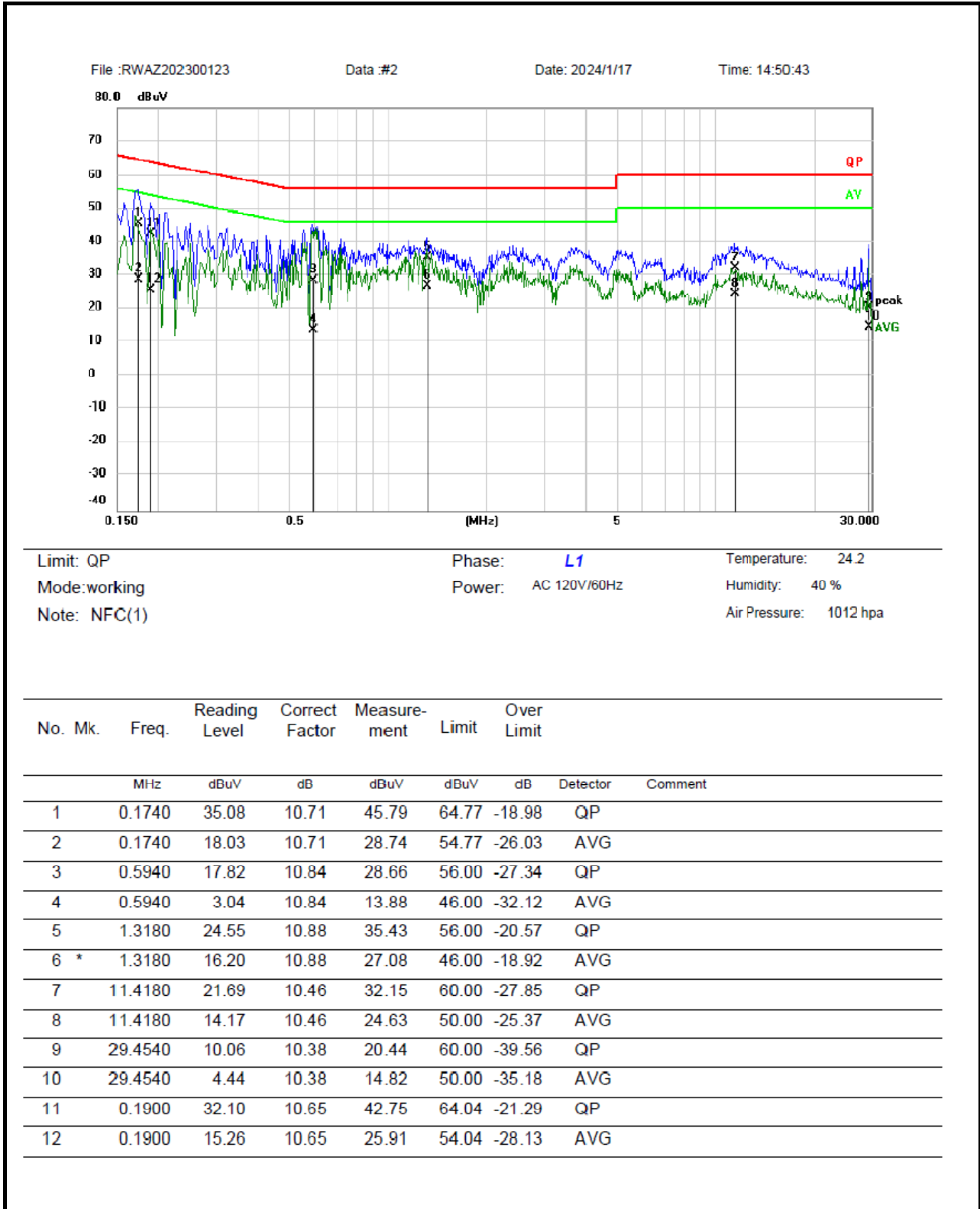
3.2 Limit

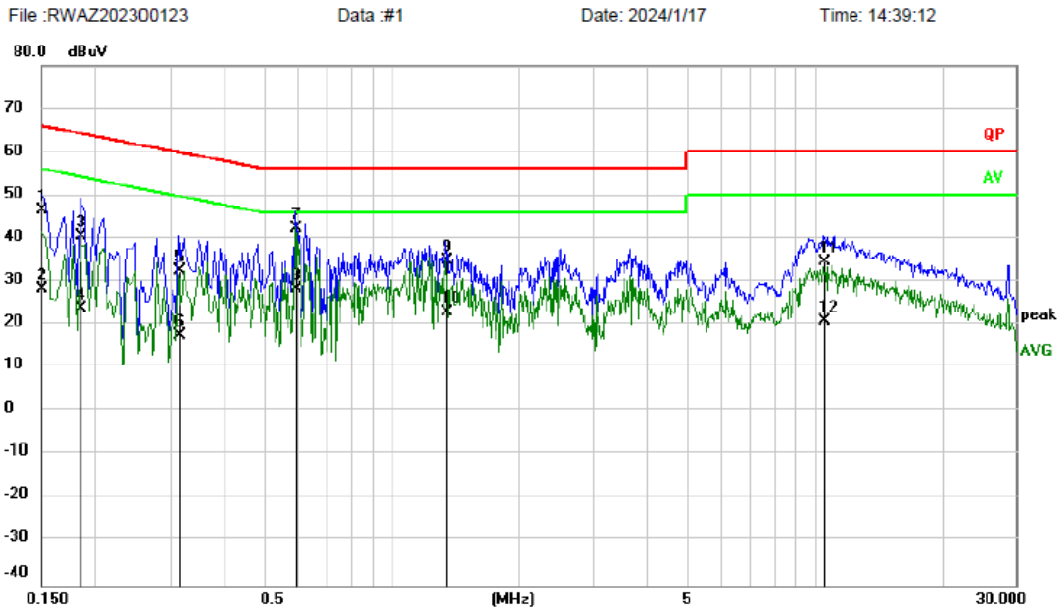
Test items	Limit
AC Line Conducted Emissions	See details §15.207 (a)
Field strength of fundamental and Radiated emission	<p>(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.</p> <p>(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.</p> <p>(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.</p> <p>(d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.</p>
Frequency Stability	The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ 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.
20dB Emission Bandwidth	contained within the frequency band designated

3.3 AC Line Conducted Emissions Test Data

Test Date:	2024-1-17	Test By:	Lirou Li
Environment condition:	Temperature: 24.2°C; Relative Humidity:40%; ATM Pressure: 101.2kPa		

Adapter HF-0502000U



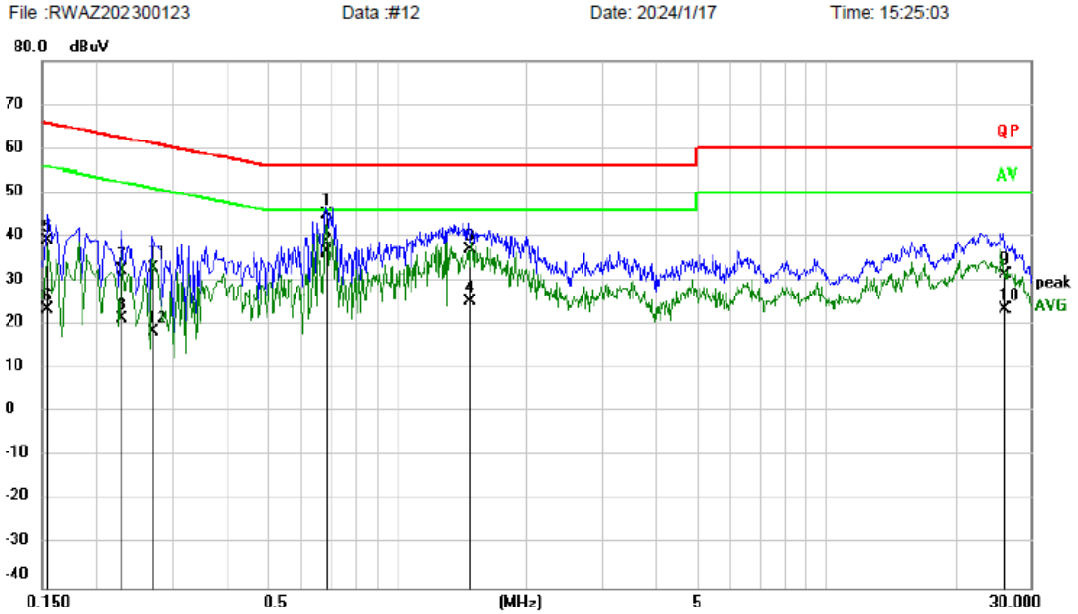


Limit: QP
Mode: working
Note: NFC(1)

Phase: N
Power: AC 120V/60Hz

Temperature: 24.2
Humidity: 40 %
Air Pressure: 1012 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over Limit	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1500	35.89	10.61	46.50	66.00	-19.50	QP	
2		0.1500	17.63	10.61	28.24	56.00	-27.76	AVG	
3		0.1860	29.97	10.47	40.44	64.21	-23.77	QP	
4		0.1860	13.35	10.47	23.82	54.21	-30.39	AVG	
5		0.3140	21.97	10.55	32.52	59.86	-27.34	QP	
6		0.3140	6.79	10.55	17.34	49.86	-32.52	AVG	
7	*	0.5940	31.63	10.65	42.28	56.00	-13.72	QP	
8		0.5940	17.71	10.65	28.36	46.00	-17.64	AVG	
9		1.3460	24.33	10.67	35.00	56.00	-21.00	QP	
10		1.3460	12.25	10.67	22.92	46.00	-23.08	AVG	
11		10.4860	23.91	10.73	34.64	60.00	-25.36	QP	
12		10.4860	9.90	10.73	20.63	50.00	-29.37	AVG	



Limit: QP Phase: *N* Temperature: 24.2
 Mode: transmitting Power: AC 120V/60Hz Humidity: 40 %
 Note: NFC(2) Air Pressure: 1012 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over Limit	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.6860	34.44	10.56	45.00	56.00	-11.00	QP	
2	*	0.6860	25.91	10.56	36.47	46.00	-9.53	AVG	
3		1.4780	26.30	10.67	36.97	56.00	-19.03	QP	
4		1.4780	14.44	10.67	25.11	46.00	-20.89	AVG	
5		0.1539	28.59	10.59	39.18	65.79	-26.61	QP	
6		0.1539	12.75	10.59	23.34	55.79	-32.45	AVG	
7		0.2300	21.90	10.45	32.35	62.45	-30.10	QP	
8		0.2300	10.86	10.45	21.31	52.45	-31.14	AVG	
9		26.0100	20.80	10.73	31.53	60.00	-28.47	QP	
10		26.0100	12.69	10.73	23.42	50.00	-26.58	AVG	
11		0.2700	22.51	10.50	33.01	61.12	-28.11	QP	
12		0.2700	7.83	10.50	18.33	51.12	-32.79	AVG	

Remark:

Measurement (dBuV)= Reading Level (dBuV) + Correct Factor(dB)

Correct Factor(dB)= LISN Voltage Division Factor (dB)+ Cable loss(dB)

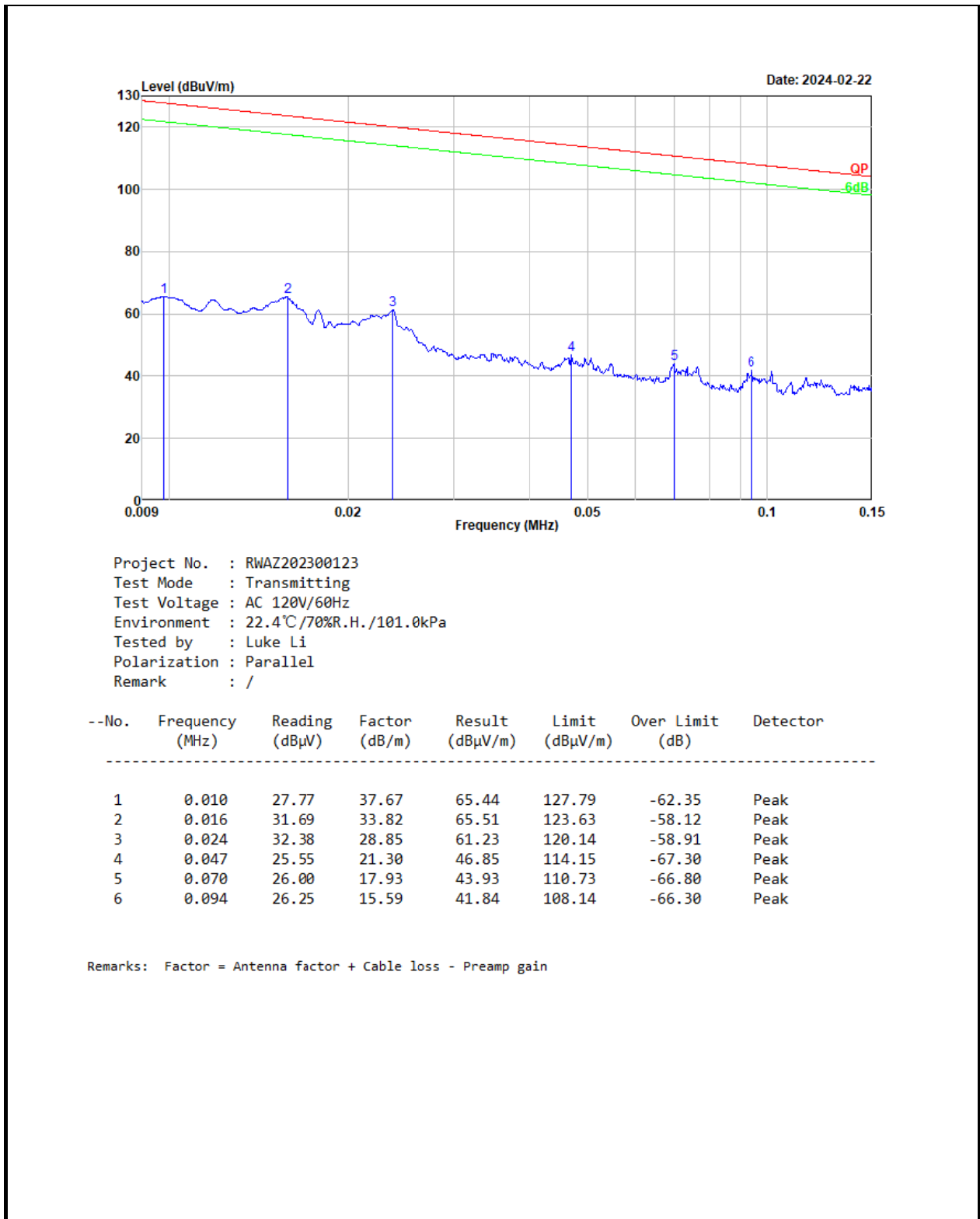
Over Limit = Measurement – Limit

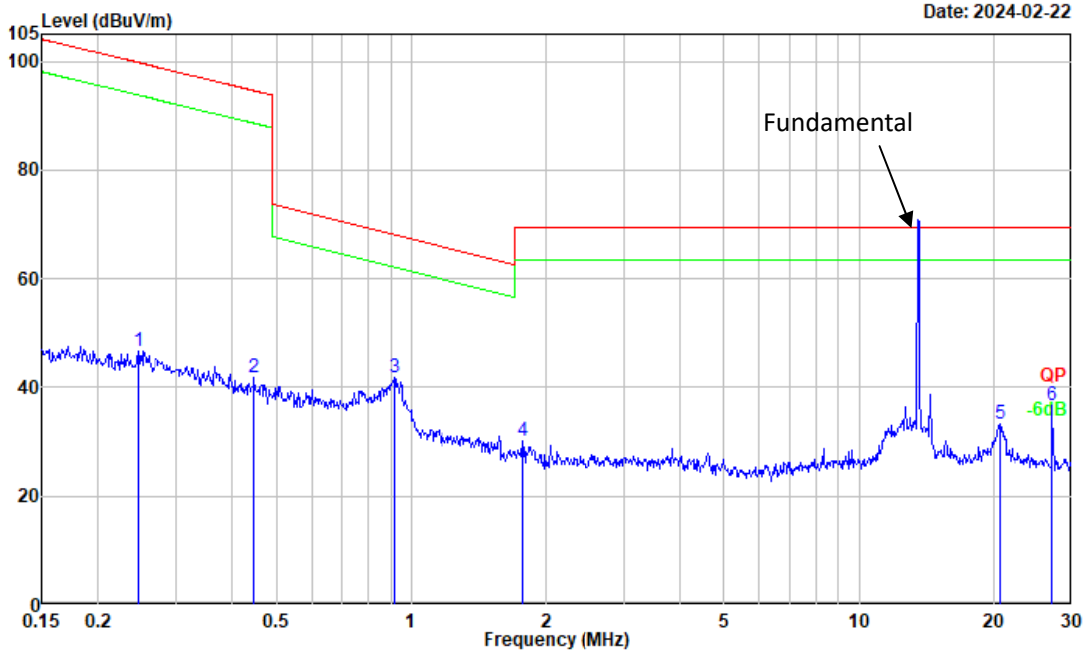
3.4 Radiated emission Test Data

9 kHz-30MHz:

Test Date:	2024-02-22	Test By:	Luke Li
Environment condition:	Temperature: 22.4°C; Relative Humidity:70%; ATM Pressure: 101kPa		

Worst case antenna orientation:

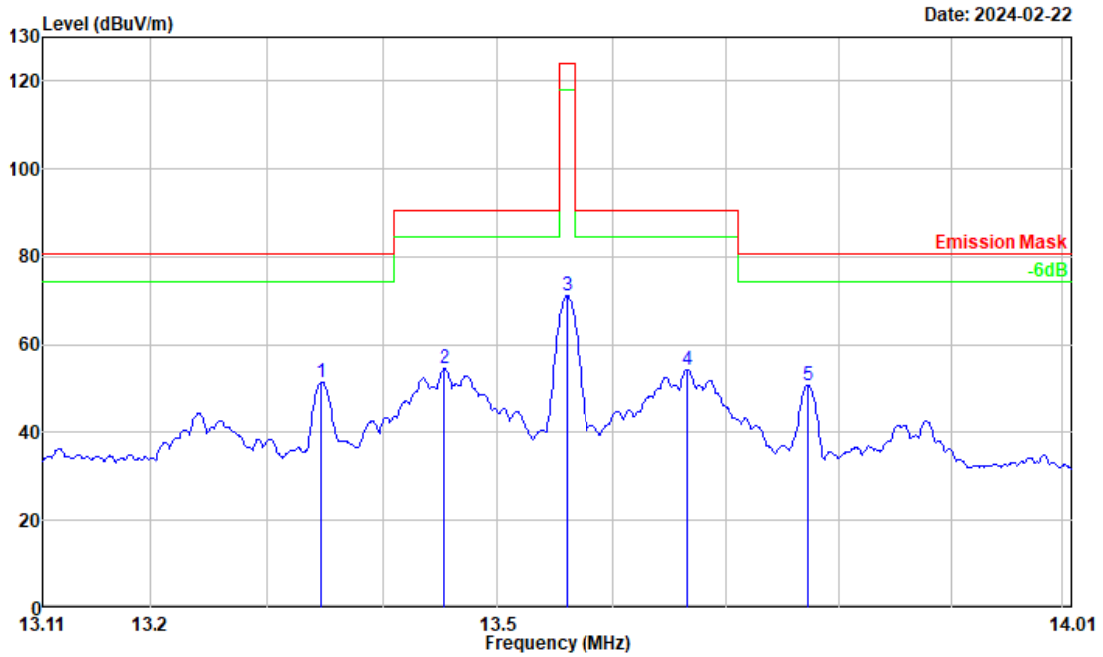




Project No. : RWAZ202300123
 Test Mode : Transmitting
 Test Voltage : AC 120V/60Hz
 Environment : 22.4°C/70%R.H./101.0kPa
 Tested by : Luke Li
 Polarization : Parallel
 Remark : /

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	0.246	35.48	11.13	46.61	99.80	-53.19	Peak
2	0.447	34.91	6.81	41.72	94.60	-52.88	Peak
3	0.918	40.32	1.42	41.74	68.23	-26.49	Peak
4	1.781	31.80	-1.74	30.06	69.54	-39.48	Peak
5	20.704	36.42	-3.27	33.15	69.54	-36.39	Peak
6	27.127	41.02	-4.18	36.84	69.54	-32.70	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain



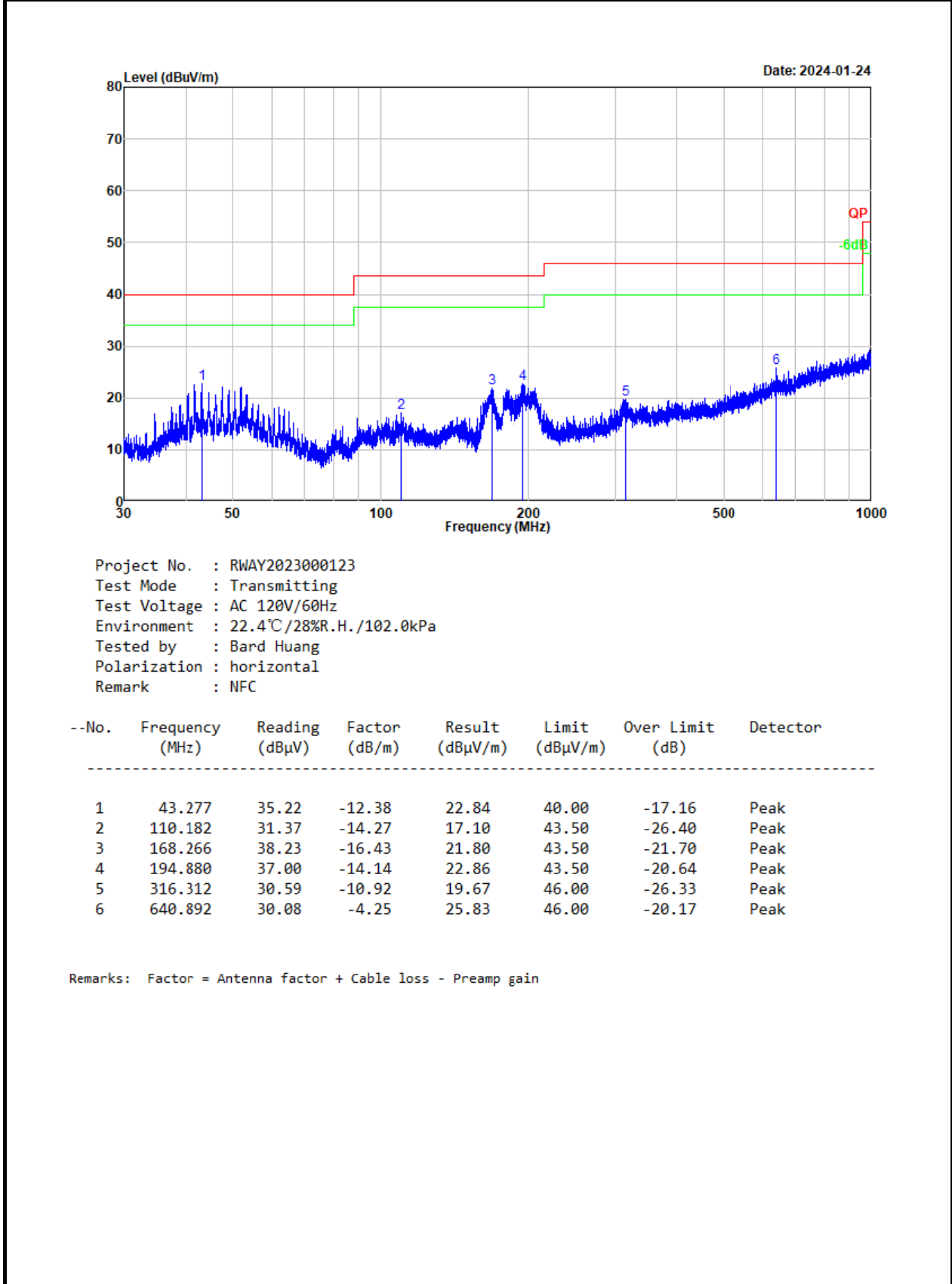
Project No. : RWAZ202300123
 Test Mode : Transmitting
 Test Voltage : AC 120V/60Hz
 Environment : 22.4°C /70%R.H./101.0kPa
 Tested by : Luke Li
 Polarization : Parallel
 Remark : /

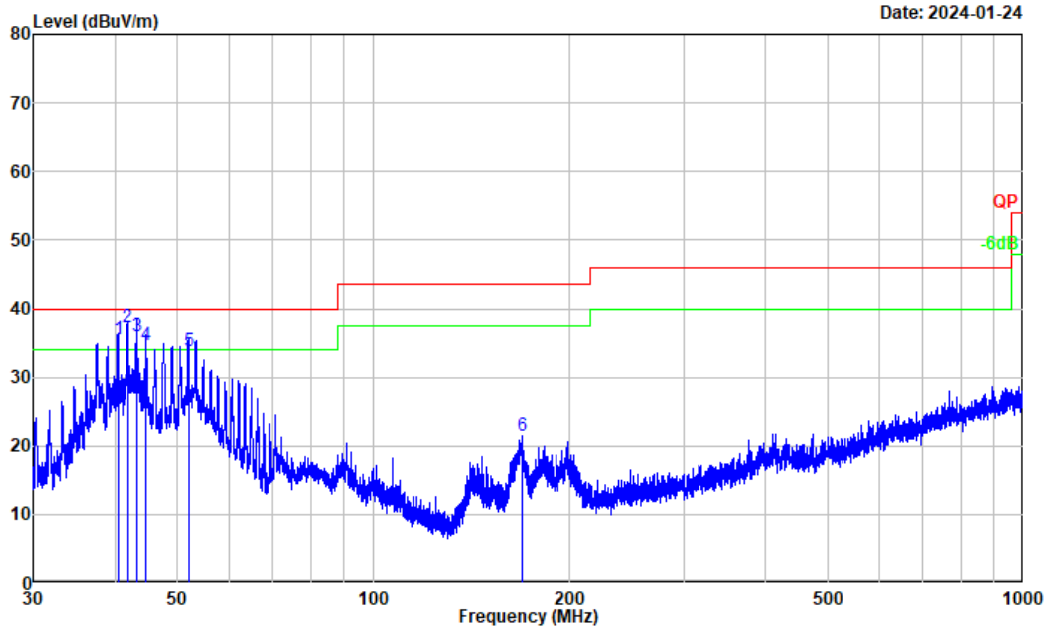
--No.	Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)	Detector
1	13.348	55.01	-3.50	51.51	80.51	-29.00	Peak
2	13.454	58.13	-3.52	54.61	90.47	-35.86	Peak
3	13.560	74.66	-3.53	71.13	124.00	-52.87	Peak
4	13.666	57.87	-3.55	54.32	90.47	-36.15	Peak
5	13.772	54.44	-3.57	50.87	80.51	-29.64	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain

30MHz-1GHz:

Test Date:	2024-01-24	Test By:	Bard Huang
Environment condition:	Temperature: 22.4°C; Relative Humidity:28%; ATM Pressure: 102kPa		





Project No. : RWAY2023000123
 Test Mode : Transmitting
 Test Voltage : AC 120V/60Hz
 Environment : 22.4°C /28%R.H./102.0kPa
 Tested by : Bard Huang
 Polarization : vertical
 Remark : NFC

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	40.435	48.50	-12.99	35.51	40.00	-4.49	QP
2	41.896	49.90	-12.54	37.36	40.00	-2.64	QP
3	43.315	48.31	-12.38	35.93	40.00	-4.07	QP
4	44.743	46.91	-12.23	34.68	40.00	-5.32	QP
5	52.002	46.10	-12.28	33.82	40.00	-6.18	QP
6	169.005	37.75	-16.35	21.40	43.50	-22.10	Peak

Remarks: Factor = Antenna factor + Cable loss - Preamp gain

Remark:

Result = Reading + Factor

Factor = Antenna factor + Cable loss – Amplifier gain

Over Limit = Result – Limit

3.5 Frequency Stability Test Data

Test Date:	2024-02-22	Test By:	Luke Li
Environment condition:	Temperature: 22.4°C; Relative Humidity:70%; ATM Pressure: 101kPa		

Nominal frequency: 13.56MHz					
Temperature (°C)	Voltage Supplied (V _{DC})	Test Frequency (MHz)	Frequency Error (Hz)	Limit (Hz)	Result
-20	3.87	13.551	-90	±1356	Pass
-10		13.554	-60	±1356	Pass
0		13.556	-40	±1356	Pass
10		13.559	-10	±1356	Pass
20		13.561	10	±1356	Pass
25		13.562	20	±1356	Pass
30		13.557	-30	±1356	Pass
40		13.550	-100	±1356	Pass
50		13.564	40	±1356	Pass
20		3.45	13.557	-30	±1356
	4.45	13.559	-10	±1356	Pass

Note 1: Frequency error=test frequency – Nominal frequency

Note 2: the limit is ±100ppm

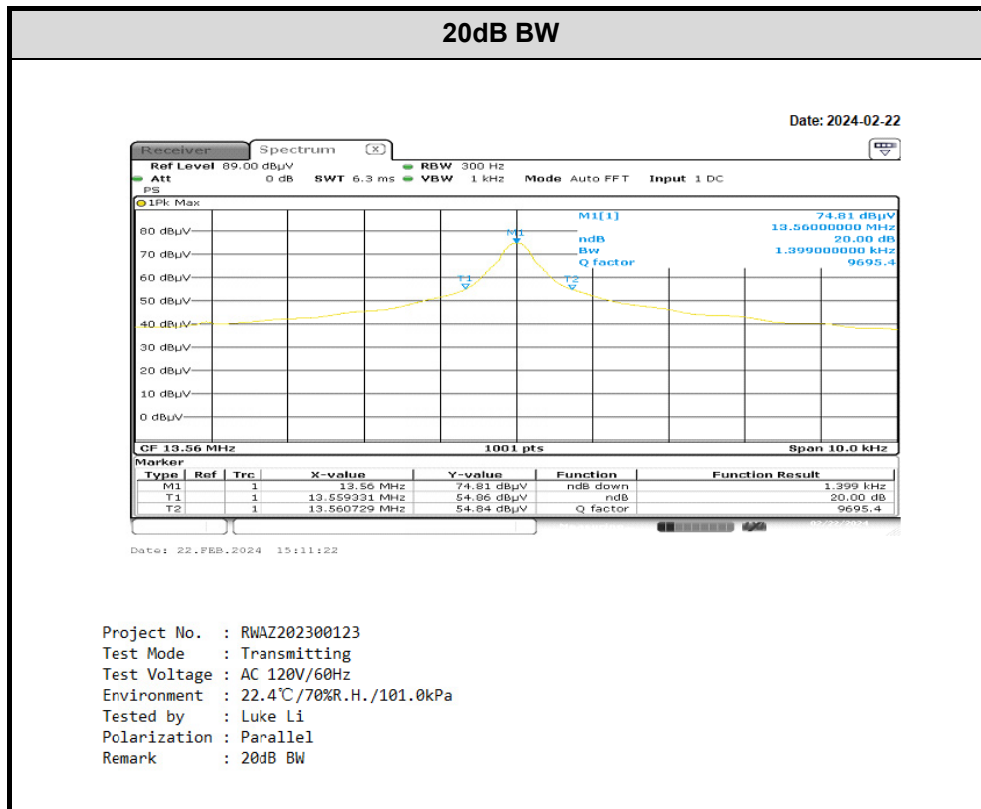
Center frequency is 13.56MHz, so limit=13.56MHz*(±100ppm)= ±1356Hz

3.6 Bandwidth Test Data

Test Date:	2024-02-22	Test By:	Luke Li
Environment condition:	Temperature: 22.4°C; Relative Humidity:70%; ATM Pressure: 101kPa		

Channel Frequency [MHz]	20dB BW [kHz]
13.56	1.399
Note: the 20dB Bandwidth fall within 13.110~14.010MHz range	

Test Plots:



4 Test Setup Photo

Please refer to the attachment RWAZ202300123M Test Setup photo.

5 E.U.T Photo

Please refer to the attachment RWAZ202300123 External photo and RWAZ202300123 Internal photo.

---End of Report---