

# FCC Test Report

**Report No.:** RWAY202300051M

**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:** PA3NB15PA

**Multiple Models:** PA2310GBB

**Trade Mark:** UMIDIGI

**FCC ID:** 2ATZ4-A15PT

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

**Test Date:** 2023-11-16~2023-12-14

**Test Result:** Complied

**Report Date:** 2024-02-04

**Reviewed by:**

*Frank Yin*

**Approved by:**

*Jacob Kong*

Frank Yin

Project Engineer

Jacob Kong

Manager

**Prepared by:**

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## Revision History

Version No.	Issued Date	Description
00	2024-02-04	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	2Z-2 for CE&RE test, 2Z-1 for RF test conducted test (assigned by WATC)
Sample Received Date	2023-11-16
Sample Status	Good Condition
Frequency Range	13.56 MHz
Maximum E-field Strength:	64.97dBuV/m@3m
Modulation Technology	ASK
Antenna Gain <sup>#</sup>	1.5dBi
Spatial Streams	SISO (1TX, 1RX)
Power Supply	DC 3.87V from battery or 5V/9V/12V/15V/20V/11V from adapter
Operating temperature <sup>#</sup>	-30 deg.C to +50 deg.C
Adapter Information	Model: HJ-PD66W-US Input: AC 100-240V~50/60Hz, 1.5A Output: DC 5.0V, 3.0A 15.0W or DC 9.0V 3.0A 27.0W or DC 12.0V 3.0A 36.0W or DC 15.0V 3.0A 45.0W or DC 20.0V 3.25A 65.0W or DC 11.0V 6.0A 66.0W MAX
Modification	Sample No Modification by the test lab

## 1.3 Antenna information

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

## 1.4 Related Submittal(s)/Grant(s)

FCC Part 15, Subpart C, Equipment Class: DTS, FCC ID: 2ATZ4-A15PT  
 FCC Part 15, Subpart C, Equipment Class: DSS, FCC ID: 2ATZ4-A15PT  
 FCC Part 15, Subpart E, Equipment Class: NII, FCC ID: 2ATZ4-A15PT  
 FCC Part 22H/24E/27, Equipment Class: PCE, FCC ID: 2ATZ4-A15PT

## 1.5 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%(U = 2Uc(y)))
AC Power Lines Conducted Emissions	±3.14dB
Emissions, Radiated	Below 30MHz
	Below 1GHz
	Above 1GHz
Bandwidth	0.34%
Frequency Error	150Hz
<p><b>Note 1:</b> 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><b>Note 2:</b> 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](mailto: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		
<b>Mode:</b>	NFC	<b>Power Level Setting#:</b>	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.

### 2.2 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
/	/	/	/

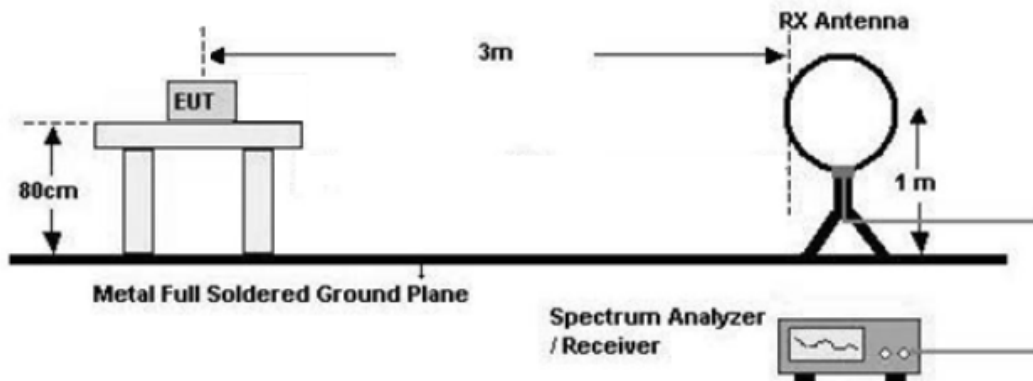
### 2.3 Test Setup

1) Conducted emission measurement:

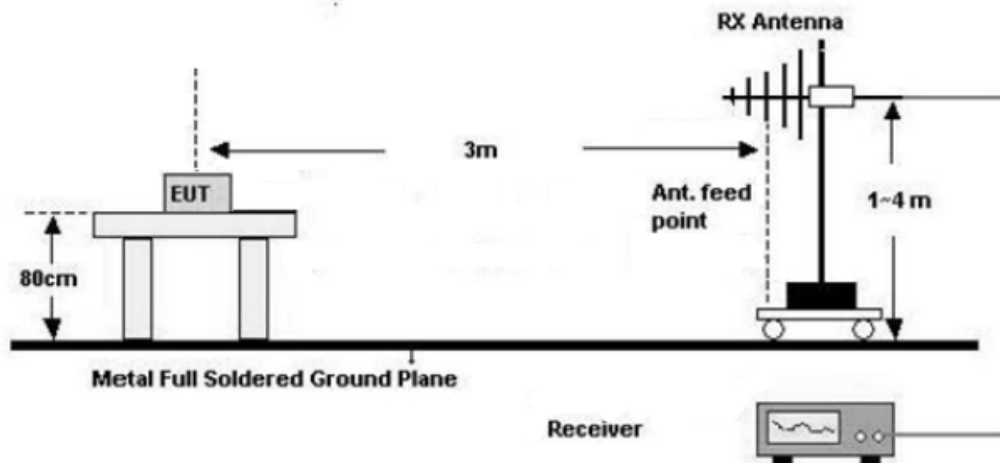
**Note:** The 0.8 m distance specified between EUT/AE/PSU and AMN/AAN, is applicable only to the EUT being measured. If the device is AE then it shall be >0.8 m.

**2) Radiated emission measurement:**

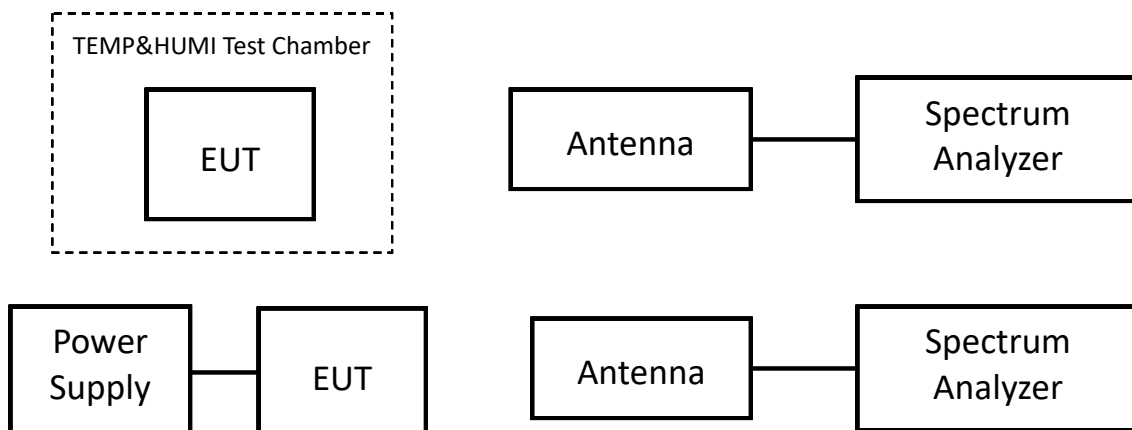
Below 30MHz (3m SAC)



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
<b>AC Line Conducted Emission Test</b>					
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	/	/
<b>Radiated Emission Test</b>					
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
ETS	Passive Loop Antenna	6512	29604	2023/7/7	2024/7/6
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	/	/
<b>Frequency Stability</b>					
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSV40-N	101608	2023/7/3	2024/7/2
FLUKE	Digital Multimeter	15B+	N/A	2023/7/12	2024/7/11
BACL	TEMP&HUMI Test Chamber	BTH-150	30022	2023/7/12	2024/7/11
ETS	Passive Loop Antenna	6512	29604	2023/7/7	2024/7/6
N/A	Coaxial Cable	NO.9	N/A	2023/8/8	2024/8/7

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

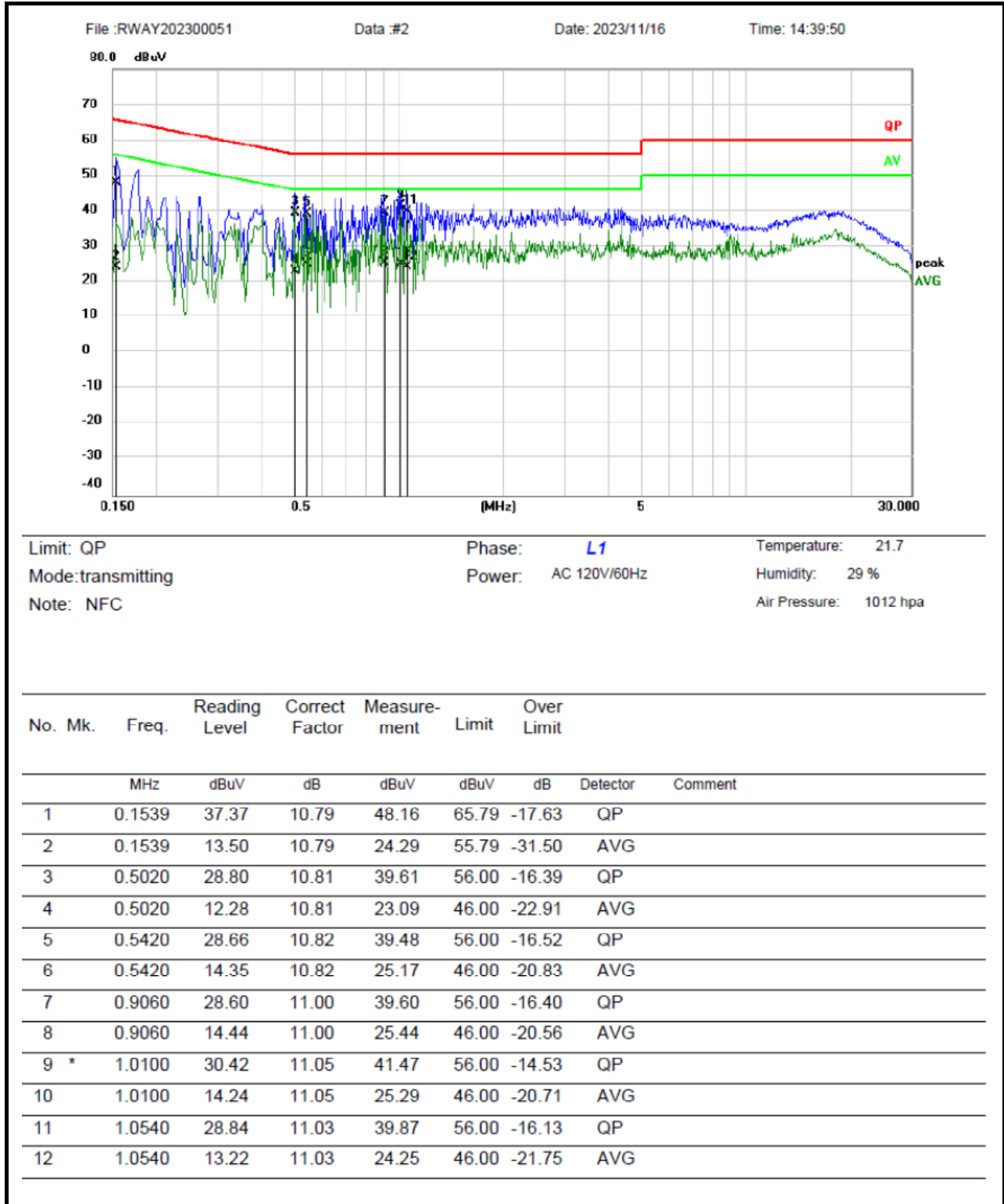
FCC/ISED Rules	Description of Test	Result
FCC §15.203	Antenna Requirement	Compliance
FCC §15.207(a)	AC Line Conducted Emissions	Compliance
FCC §15.205, §15.209, §15.225	Field strength of fundamental and Radiated emission	Compliance
§15.225(e)	Frequency Stability	Compliance
FCC §15.215(c)	20dB Emission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

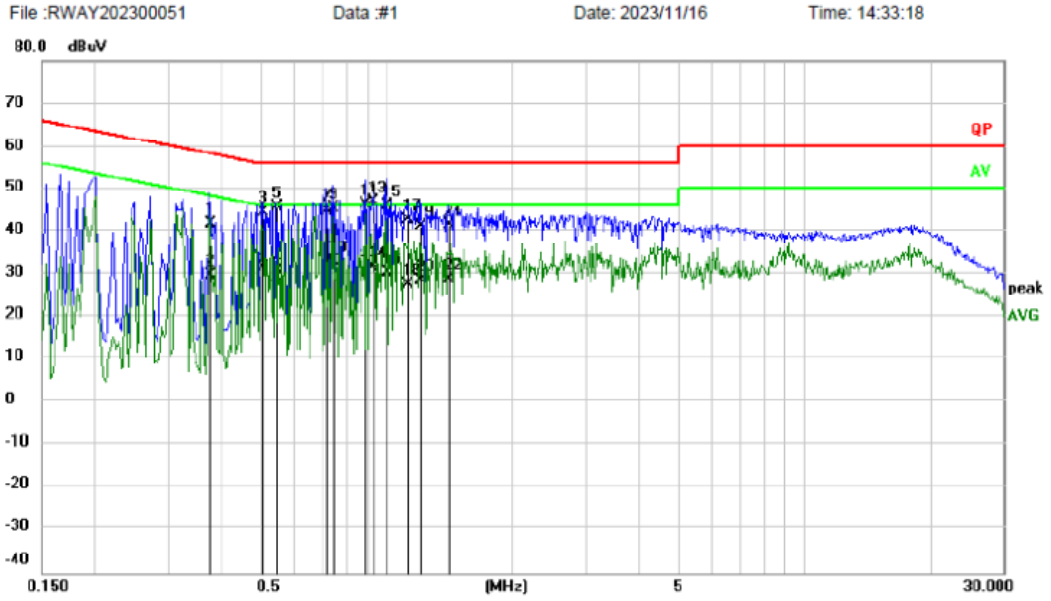
### 3.2 Limit

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

<b>Test Date:</b>	2023-11-16	<b>Test By:</b>	Lirou Li
<b>Environment condition:</b>	Temperature: 21.7°C; Relative Humidity:29%; ATM Pressure: 101.2kPa		





Limit: QP      Phase: *N*      Temperature: 21.7  
 Mode: transmitting      Power: AC 120V/60Hz      Humidity: 29 %  
 Note: NFC      Air Pressure: 1012 hpa

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over Limit	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.3780	31.06	10.77	41.83	58.32	-16.49	QP	
2		0.3780	18.96	10.77	29.73	48.32	-18.59	AVG	
3		0.5060	33.60	10.81	44.41	56.00	-11.59	QP	
4		0.5060	20.82	10.81	31.63	46.00	-14.37	AVG	
5		0.5460	34.78	10.82	45.60	56.00	-10.40	QP	
6		0.5460	18.22	10.82	29.04	46.00	-16.96	AVG	
7		0.7180	34.02	10.87	44.89	56.00	-11.11	QP	
8		0.7180	18.55	10.87	29.42	46.00	-16.58	AVG	
9		0.7460	34.44	10.89	45.33	56.00	-10.67	QP	
10		0.7460	22.30	10.89	33.19	46.00	-12.81	AVG	
11		0.8900	35.22	11.00	46.22	56.00	-9.78	QP	
12		0.8900	18.62	11.00	29.62	46.00	-16.38	AVG	
13	*	0.9300	35.78	11.01	46.79	56.00	-9.21	QP	
14		0.9300	20.53	11.01	31.54	46.00	-14.46	AVG	

Limit: QP	Phase: <b>N</b>	Temperature: 21.7
Mode:transmitting	Power: AC 120V/60Hz	Humidity: 29 %
Note: NFC		Air Pressure: 1012 hpa

No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over Limit		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
15	1.0020	34.75	11.06	45.81	56.00	-10.19	QP	
16	1.0020	19.33	11.06	30.39	46.00	-15.61	AVG	
17	1.1260	31.81	10.98	42.79	56.00	-13.21	QP	
18	1.1260	16.75	10.98	27.73	46.00	-18.27	AVG	
19	1.2059	30.26	10.95	41.21	56.00	-14.79	QP	
20	1.2059	17.61	10.95	28.56	46.00	-17.44	AVG	
21	1.4100	30.75	10.82	41.57	56.00	-14.43	QP	
22	1.4100	18.15	10.82	28.97	46.00	-17.03	AVG	

**Remark:**

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

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

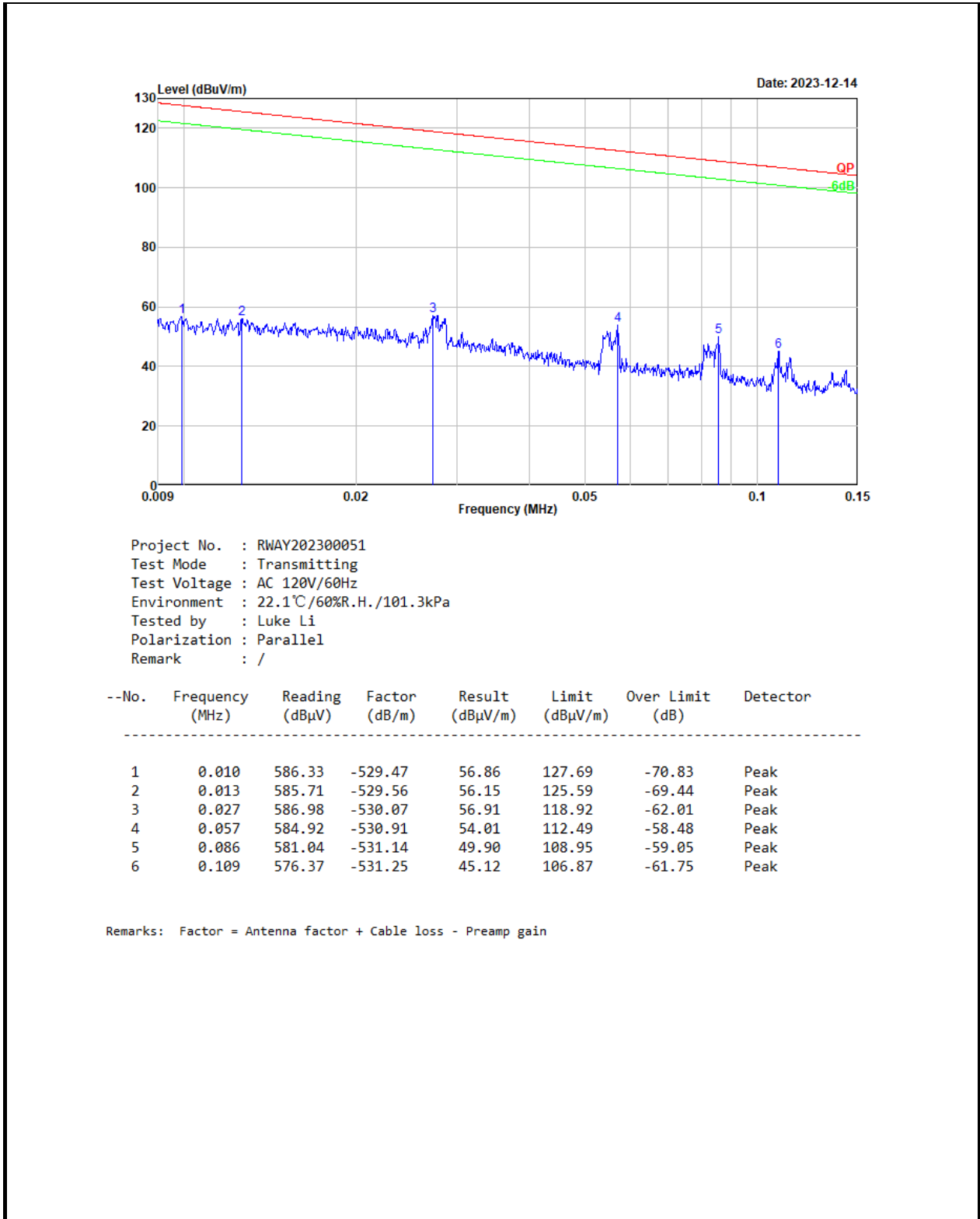
*Over Limit = Measurement – Limit*

### 3.4 Radiated emission Test Data

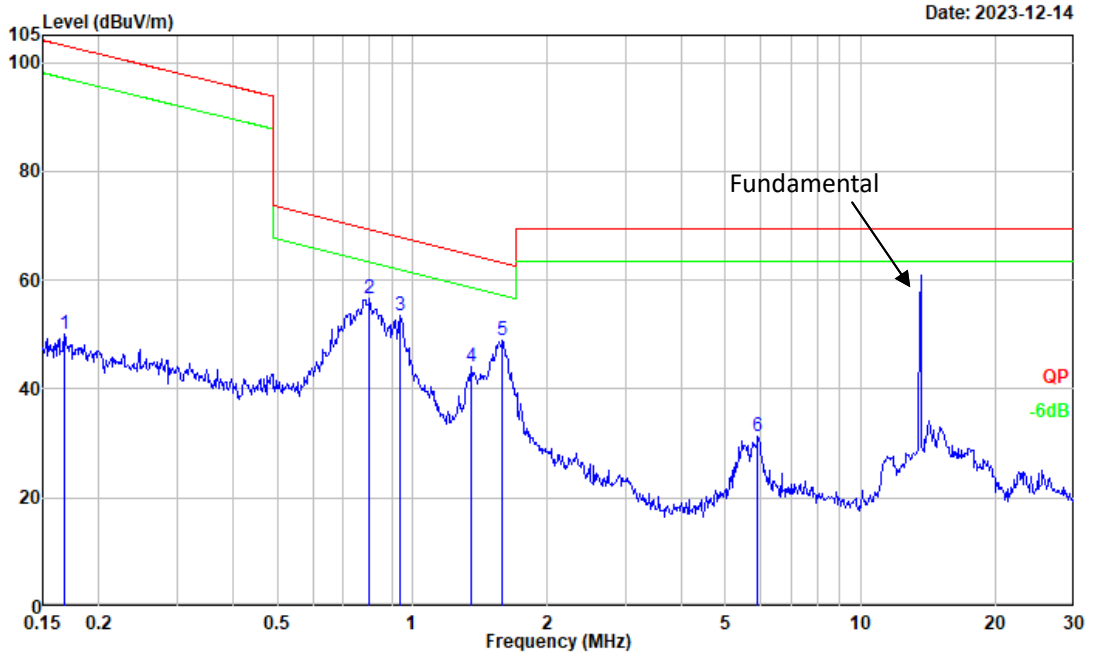
9 kHz-30MHz:

<b>Test Date:</b>	2023-12-14	<b>Test By:</b>	Luke Li
<b>Environment condition:</b>	Temperature: 22.1°C; Relative Humidity:60%; ATM Pressure: 101.3kPa		

**Worst case antenna orientation:**



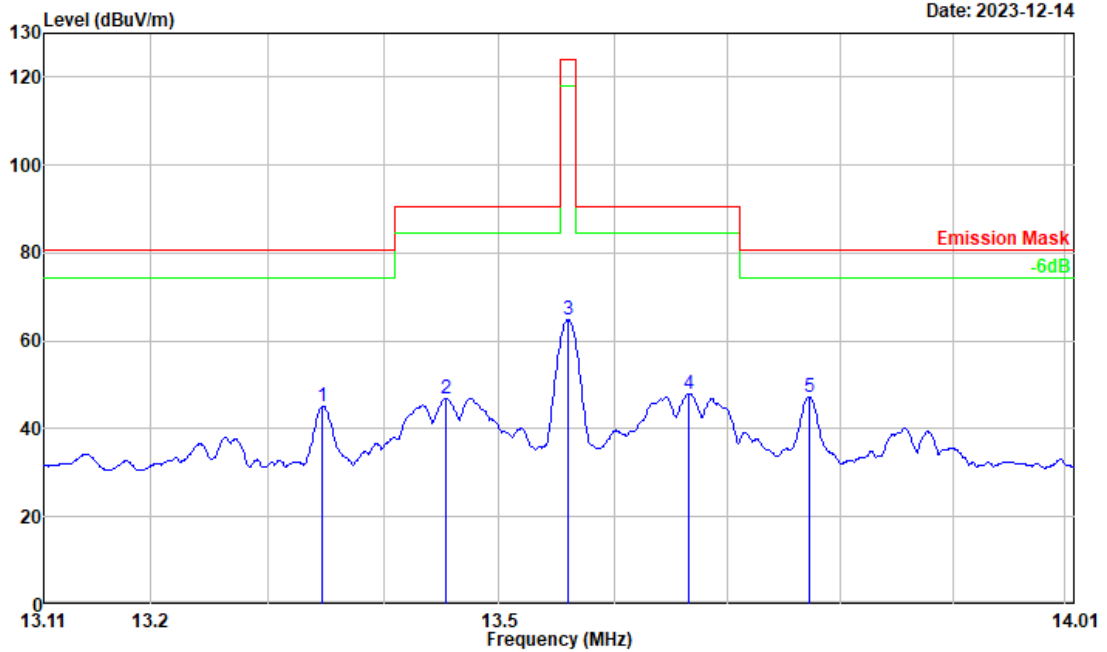




Project No. : RWAY202300051  
 Test Mode : Transmitting  
 Test Voltage : AC 120V/60Hz  
 Environment : 22.1°C/60%R.H./101.3kPa  
 Tested by : Luke Li  
 Polarization : Parallel  
 Remark : /

--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	0.168	581.33	-531.25	50.08	103.12	-53.04	Peak
2	0.804	587.93	-531.23	56.70	69.40	-12.70	Peak
3	0.938	584.74	-531.25	53.49	68.04	-14.55	Peak
4	1.359	575.41	-531.28	44.13	64.75	-20.62	Peak
5	1.593	580.12	-531.28	48.84	63.34	-14.50	Peak
6	5.898	562.49	-531.16	31.33	69.54	-38.21	Peak

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



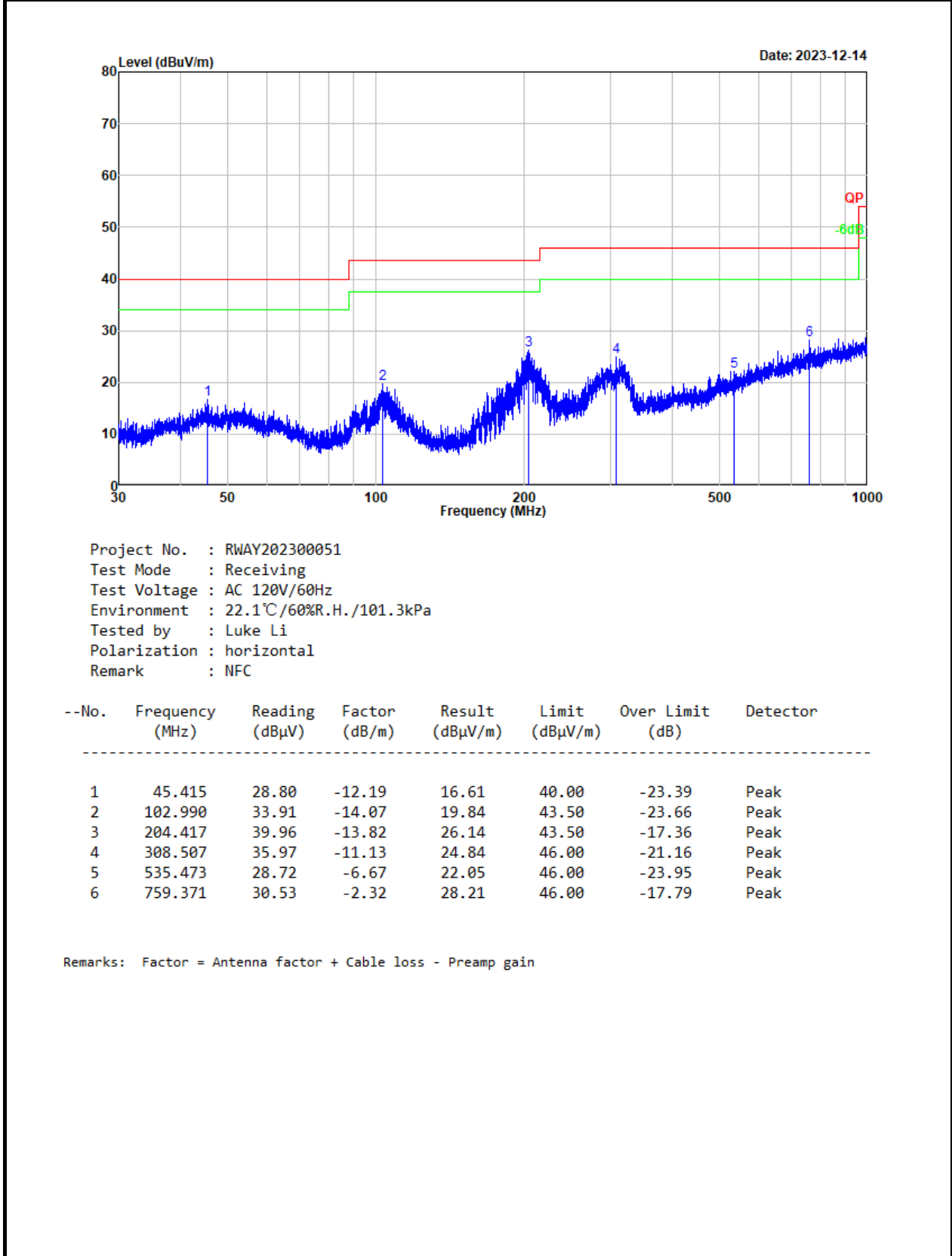
Project No. : RWAY202300051  
 Test Mode : Transmitting  
 Test Voltage : AC 120V/60Hz  
 Environment : 22.1°C/60%R.H./101.3kPa  
 Tested by : Luke Li  
 Polarization : Parallel  
 Remark : /

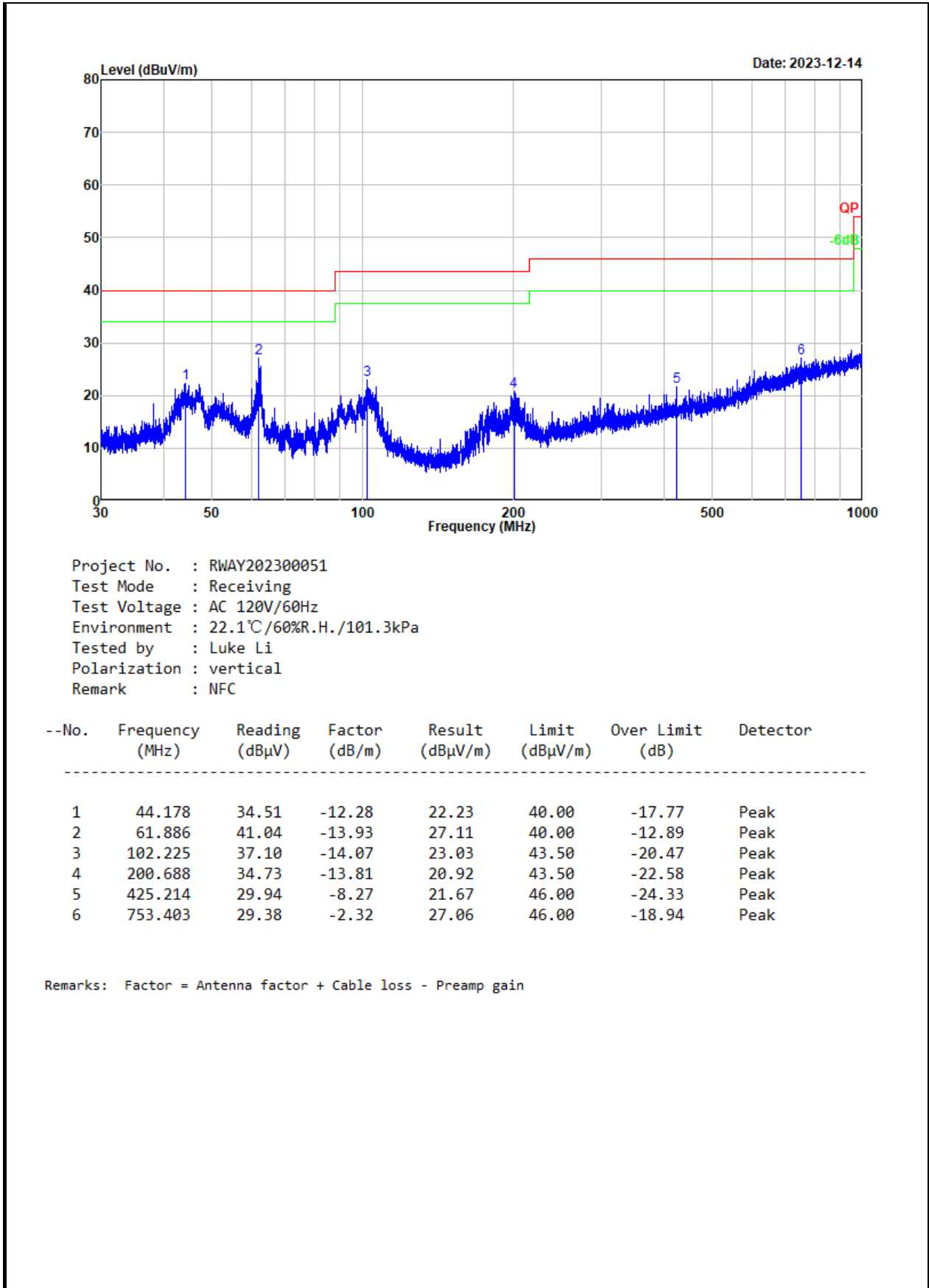
--No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Detector
1	13.348	576.42	-531.23	45.19	80.51	-35.32	Peak
2	13.454	578.16	-531.23	46.93	90.47	-43.54	Peak
3	13.560	596.20	-531.23	64.97	124.00	-59.03	Peak
4	13.666	579.21	-531.23	47.98	90.47	-42.49	Peak
5	13.772	578.53	-531.23	47.30	80.51	-33.21	Peak

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

**30MHz-1GHz:**

<b>Test Date:</b>	2023-12-14	<b>Test By:</b>	Luke Li
<b>Environment condition:</b>	Temperature: 22.1°C; Relative Humidity:60%; ATM Pressure: 101.3kPa		





**Remark:**

Result = Reading + Factor

Factor = Antenna factor + Cable loss – Amplifier gain

Over Limit = Result – Limit

### 3.5 Frequency Stability Test Data

<b>Test Date:</b>	2023-12-14	<b>Test By:</b>	Luke Li
<b>Environment condition:</b>	Temperature: 22.1°C; Relative Humidity:60%; ATM Pressure: 101.3kPa		

Nominal frequency: 13.56MHz					
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Test Frequency (MHz)	Frequency Error (Hz)	Limit (Hz)	Result
-20	3.87	13.560196	196	±1356	Pass
-10		13.560118	118	±1356	Pass
0		13.560165	165	±1356	Pass
10		13.559923	-77	±1356	Pass
20		13.560020	20	±1356	Pass
25		13.560136	136	±1356	Pass
30		13.559976	-24	±1356	Pass
40		13.560049	49	±1356	Pass
50		13.560142	142	±1356	Pass
20		3.45	13.560057	57	±1356
	4.45	13.560084	84	±1356	Pass

Note: Frequency error = (Test Frequency – Nominal frequency)/ Nominal frequency\*100%

Note: the limit is ±0.01% of center frequency

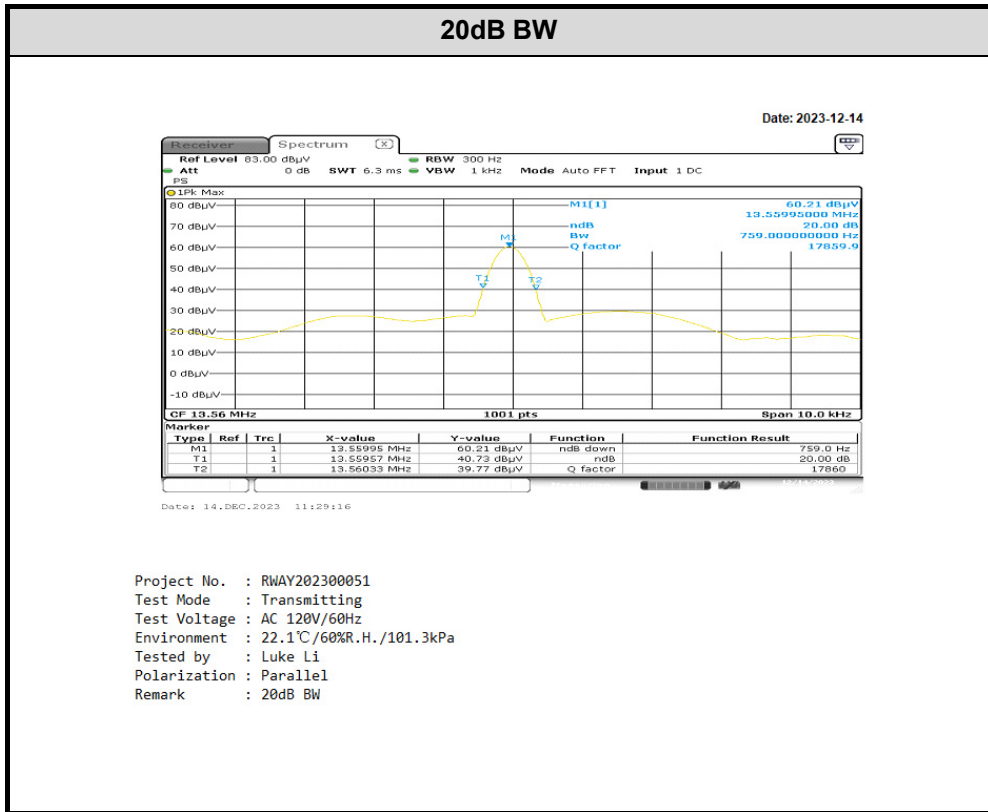
Center frequency is 13.56MHz, so limit=13.56MHz\*(±0.01%)= ±1356Hz

### 3.6 Bandwidth Test Data

<b>Test Date:</b>	2023-12-14	<b>Test By:</b>	Luke Li
<b>Environment condition:</b>	Temperature: 22.1°C; Relative Humidity:60%; ATM Pressure: 101.3kPa		

Channel Frequency [MHz]	20dB BW [kHz]
13.56	0.759
Note: the 20dB Bandwidth fall within 13.110~14.010MHz range	

### Test Plots:



## 4 Test Setup Photo

Please refer to the attachment RWAY202300051M Test Setup photo.

## 5 E.U.T Photo

Please refer to the attachment RWAY202300051 External photo and RWAY202300051 Internal photo.

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