TEST REPORT

Applicant:	Senic GmbH
Address:	Senic GmbH, Leipziger Platz 15, 10117 Berlin, Germany.
Equipment Type:	MoodPlay
Model Name:	C-0004 (refer to section 2.3)
Brand Name:	MoodPlay
FCC ID:	2BEJS-5JW7L94
Test Standard:	47 CFR Part 15 Subpart C ANSI C63.10-2013
Sample Arrival Date:	Dec. 27, 2023
Test Date:	Jan. 02, 2024 - Mar. 05, 2024
Date of Issue:	Mar. 06, 2024

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Liu Chenfang **Checked by:** Xia Long **Approved by:** Liao Jianming (Technical Director)

Liu Chenfang Xia Long

Revision History

Version	Issue Date	Revisions
Rev. 01	Feb. 20, 2024	Initial Issue
Rev. 02	Mar. 06, 2024	Updated the address of applicant and manufacturer Stated the test mode in section 3.2 and added test data of Radiated Emissions (above 1GHz) in ANNEX A.3

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☑ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☐ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Senic GmbH
Address	Senic GmbH, Leipziger Platz 15, 10117 Berlin, Germany.

2.2 Manufacturer Information

Manufacturer	Senic GmbH
Address	Senic GmbH, Leipziger Platz 15, 10117 Berlin, Germany.

2.3 General Description for Equipment under Test (EUT)

EUT Name	MoodPlay
Model Name Under Test	C-0004
Series Model Name	C-0004-003, C-0004-014
Description of Model name differentiation	All models are same with electrical parameters and internal circuit structure, but only differ in case color. (this information provided by the applicant)
Hardware Version	MoodPlay_V1_RevB
Software Version	v1.0.45
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	Bluetooth, WIFI, NFC

The requirement for the following technical information of the EUT was tested in this report:

Modulation Type	ASK
Product Type	☒ Mobile ☐ Portable ☐ Fix Location
Frequency Range	13.56 MHz
Receiver Categorization	3
Number of channel	1
Tested Channel	1
Antenna Type	Coil Antenna

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C	Miscellaneous Wireless Communications Services
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

3.2 Verdict

No.	Description	FCC Part No.	Verdict
1	Antenna Requirement	15.203	Pass Note
2	Emissions Bandwidth	15.215	Pass
3	Field Strength of Fundamental Emissions	15.225(a)	Pass
4	Radiated Emissions	15.225(d) / 15.209	Pass
5	Frequency Stability	15.225(e)	Pass
6	Conducted Emission	15.207	Pass
Note: The EUT has a permanently and irreplaceable attached antenna, which complies with the requirement FCC 15.203. Test Mode: EUT + Type-C Cable + Adapter + ID Card + NFC + BT + WIFI			

3.3 Test Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Conducted emissions (9 kHz-30 MHz)	3.2 dB
Radiated emissions (9 kHz-30 MHz)	4.3 dB
Radiated emissions (30 MHz-1 GHz)-10m	4.8 dB
Radiated emissions (1 GHz-18 GHz)-966#4	5.0 dB

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

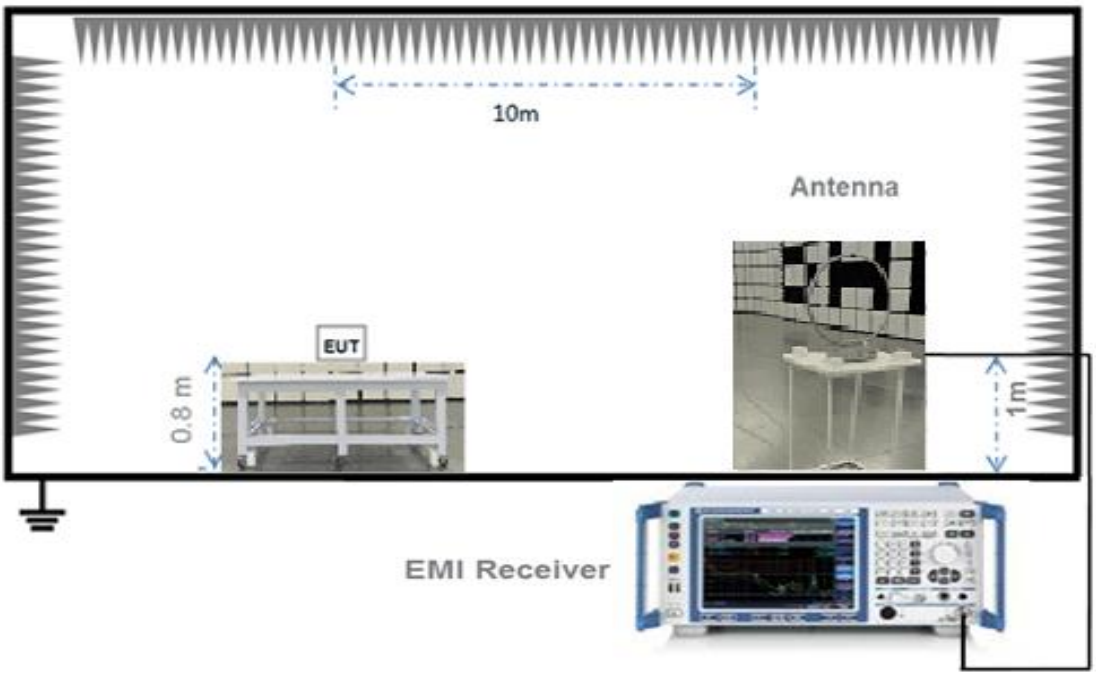
During the measurement, the normal environmental conditions were within the listed ranges:

Relative Humidity	30% to 60%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+22℃ to +25℃
Working Voltage of the EUT	NV (Normal Voltage)	5 V

4.2 Test Setups

Test Setup 1

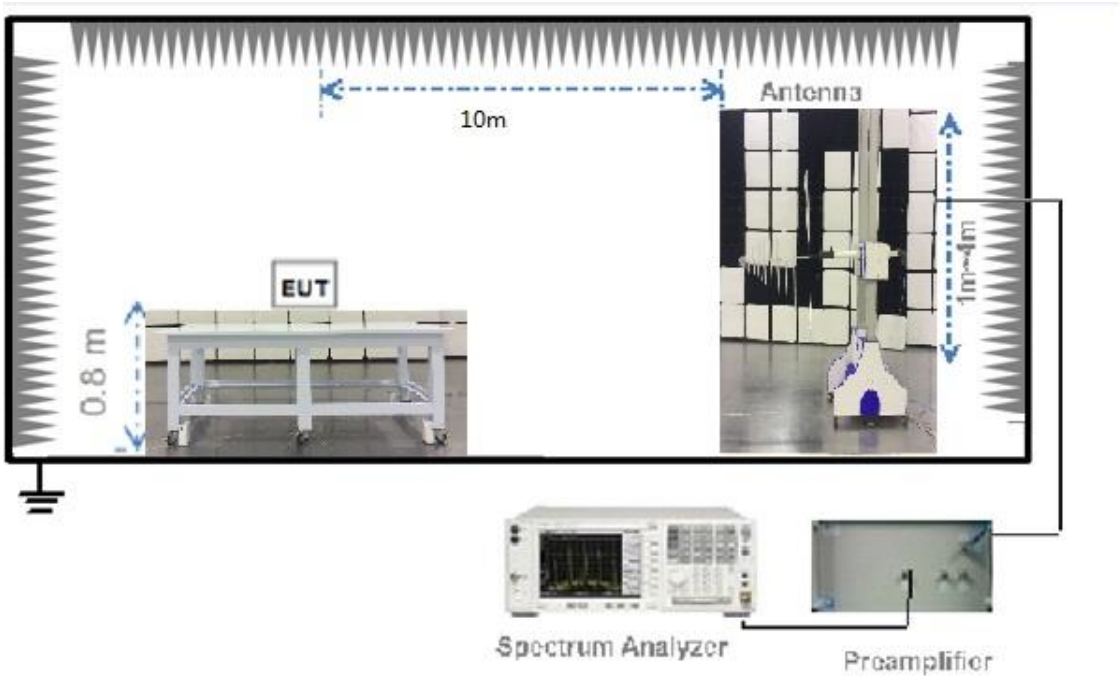
Radiated Test (Below 30 MHz)



(Diagram 1)

Test Setup 2

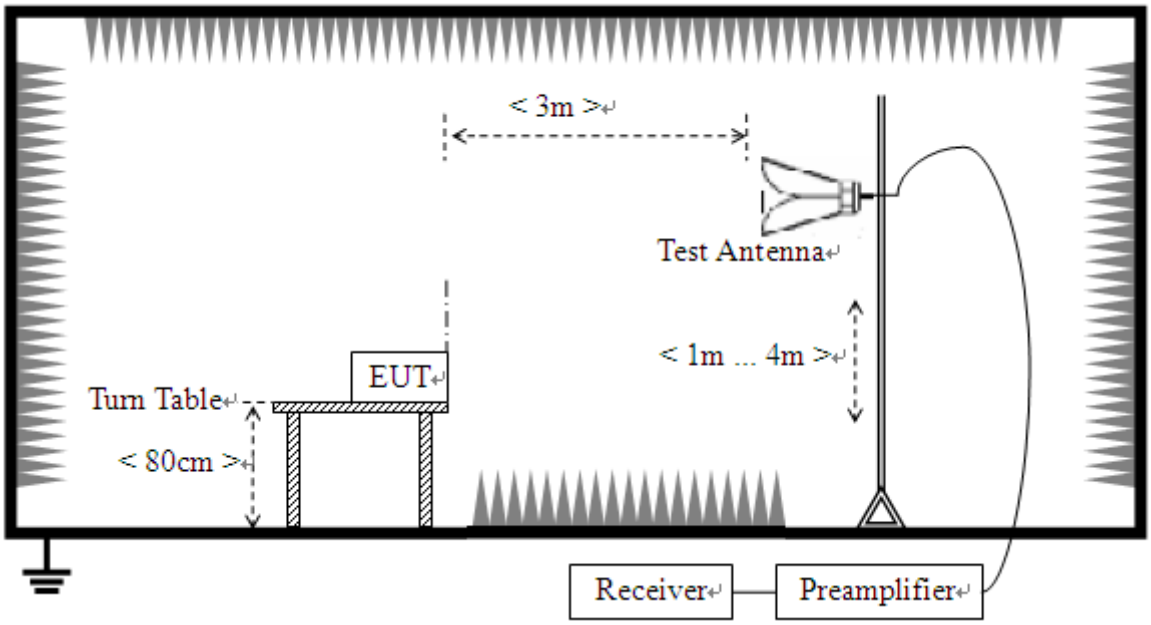
Radiated Test (30 MHz-1 GHz)



(Diagram 2)

Test Setup 3

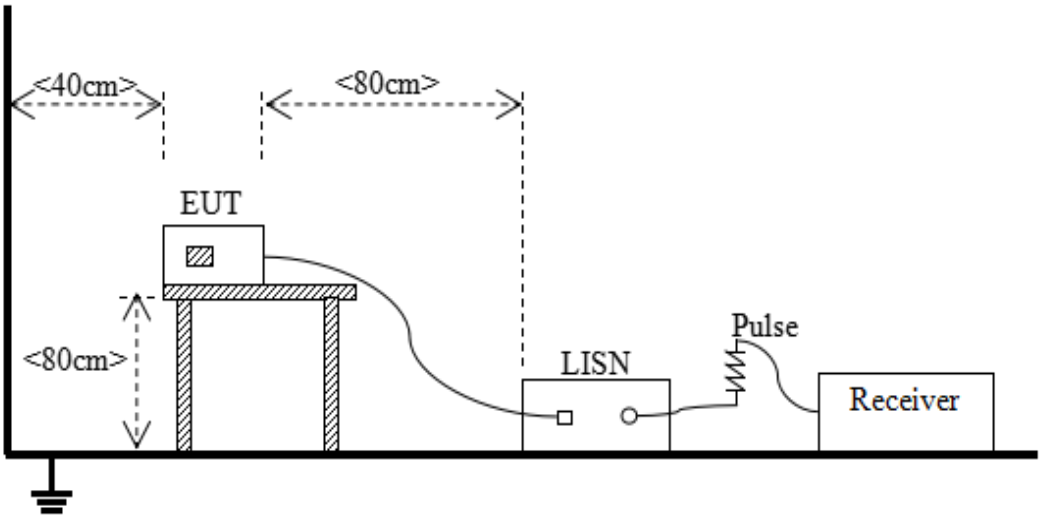
Radiated Test (Above 1 GHz)



(Diagram 3)

Test Setup 4

AC Power Supply Port Test



(Diagram 4)

5 TEST ITEMS

5.1 Antenna Requirements

5.1.1 Relevant Standards

FCC §15.203

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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

5.1.2 Antenna Anti-Replacement Construction

The Antenna Anti-Replacement as following method:

Protected Method	Description
The antenna is embedded in the product.	An embedded-in antenna design is used.

Reference Documents	Item
Photo	Please refer EUT internal photos.

5.2 Emission Bandwidth

5.2.1 Definition

15.215(c);

Intentional radiators operating under the alternative provisions to the general emission limits must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:

• The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

• The detector of the spectrum analyzer shall be set to “Sample”. However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or “Max Hold”) may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.

• The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

5.2.2 Test Setup

See section 4.2(Diagram 1) for test setup for the antenna port. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

The 20dB bandwidth is measured with a spectrum analyzer connected via a receiver antenna placed near the EUT while the EUT is operating in transmission mode.

Use the following spectrum analyzer settings:

Span = between 2 to 5 times the OBW

RBW = 1% to 5% the OBW

VBW ≥ 3RBW

Sweep = auto

Detector function = peak

Trace = max hold

The 99% emission bandwidth is measured with a spectrum analyzer connected via a receiver antenna placed near the EUT while the EUT is operating in transmission mode.

Use the following spectrum analyzer settings:

Span = between 1.5 to 5 times the OBW

RBW = 1% to 5% OBW

VBW ≥ 3RBW

Sweep = auto

Detector function = peak

Trace = max hold

5.2.4 Test Result and Test Equipment List

Please refer to ANNEX A.1

5.3 Field Strength of Fundamental Emissions and Radiated Emissions

5.3.1 Limit

FCC §15.225(a), (b), (c)

According to FCC section 15.225, for <30 MHz, Radiated emissions were measured according to ANSI C63.4. The EUT was set to transmit at the highest output power. The EUT was set 10 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10 kHz. (Note: During testing the receive antenna was rotated about its axis to maximize the emission from the EUT)

There was no detected Restricted bands and Radiated spurious emission below 30MHz. The 30m limit was converted to 3m Limit using square factor(x) as it was found by measurements as follows; 3 m Limit(dBμV/m) = 20log(X)+40log(30/3)= 20log(15848)+40log(30/3) = 124dBμV

Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency range (MHz)	Field Strength@30m		Field Strength@10m	Field Strength@3m
	μV/m	dBμV/m	dBμV/m	dBμV/m
Below 13.110	30	29.5	48.58	69.5
13.110 ~ 13.410	106	40.5	59.58	80.5
13.410 ~ 13.553	334	50.5	69.58	90.5
13.553 ~13.567	15848	84	103.08	124
13.567 ~ 13.710	334	50.5	69.58	90.5
13.710 ~14.010	106	40.5	59.58	80.5
Above 14.010	30	29.5	48.58	69.5

NOTE:

1. Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].
2. In the emission tables above, the tighter limit applies at the band edges.

FCC §15.225(d)

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

1. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

2. For above 1000 MHz, limit field strength of harmonics: 54dBµV/m@3m (AV) and 74dBµV/m@3m (PK).

5.3.2 Test Setup

See section 4.2(Diagram 1, Diagram 2 and Diagram 3) for test setup for the antenna port. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

The measurement frequency range is from 9 kHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented. The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for 30 MHz < f < 1 GHz, 10 kHz for 150 kHz < f < 30 MHz, 300 Hz for f < 150 kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

5.3.4 Test Result and Test Equipment List

Please refer to ANNEX A.2 and A.3

NOTE**:**

1. Results (dBµV/m) = Reading (dBµV) + Factor (dB/m)

The reading level is calculated by software which is not shown in the sheet

2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain (dB)

3. Margin = Limit – Results

5.4 Frequency Tolerance

5.4.1 Limit

FCC §15.225(e)

The frequency tolerance of the carrier signal shall be maintained within ±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.

5.4.2 Test Setup

See section 4.2(Diagram 1) for test setup for the antenna port. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

1. The test is performed in a Temperature Chamber.
2. The EUT is configured as MS + DC Power Supply.

5.4.4 Test Result and Test Equipment List

Please refer to ANNEX A.4.

5.5 Conducted Emission

5.5.1 Limit

FCC §15.207

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

5.5.2 Test Setup

See section 4.2(Diagram 4) for test setup for the antenna port. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.
Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

5.5.4 Test Result and Test Equipment List

Please refer to ANNEX A.5.

NOTE**:**

1. Results (dBμV) = Reading (dBμV) + Factor (dB)

The reading level is calculated by software which is not shown in the sheet

2. Factor = Insertion loss + Cable loss

3. Margin = Limit – Results

ANNEX A TEST RESULT

A.1 Emission Bandwidth

Note: Because the measured signal is CW adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

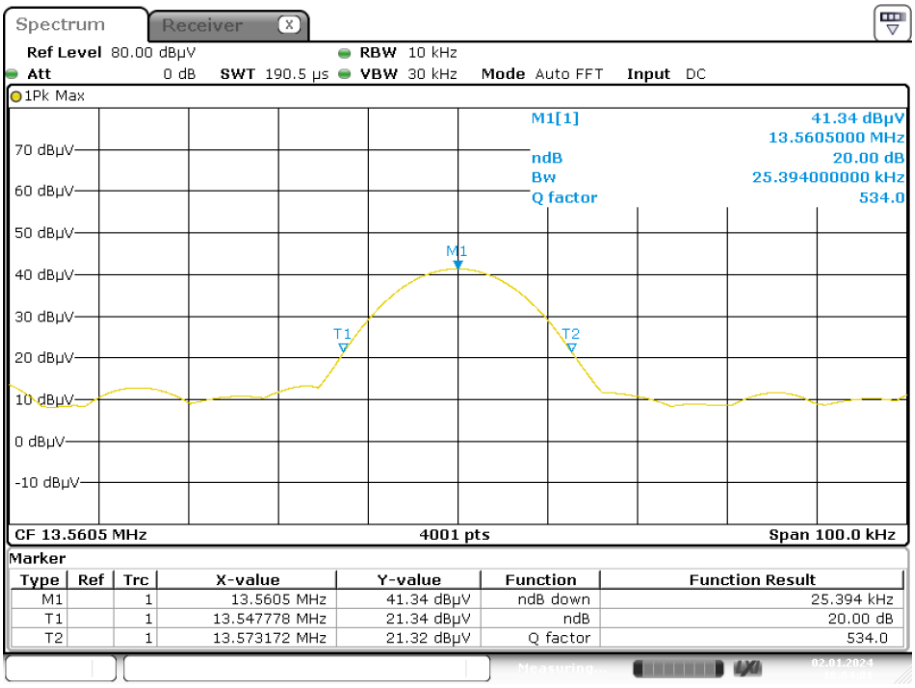
Sample No.	S01	Temperature	22.5℃
Humidity	46%RH	Pressure	101kPa
Test Engineer	Xi Zifeng	Test Date	2024.01.02

Test Data

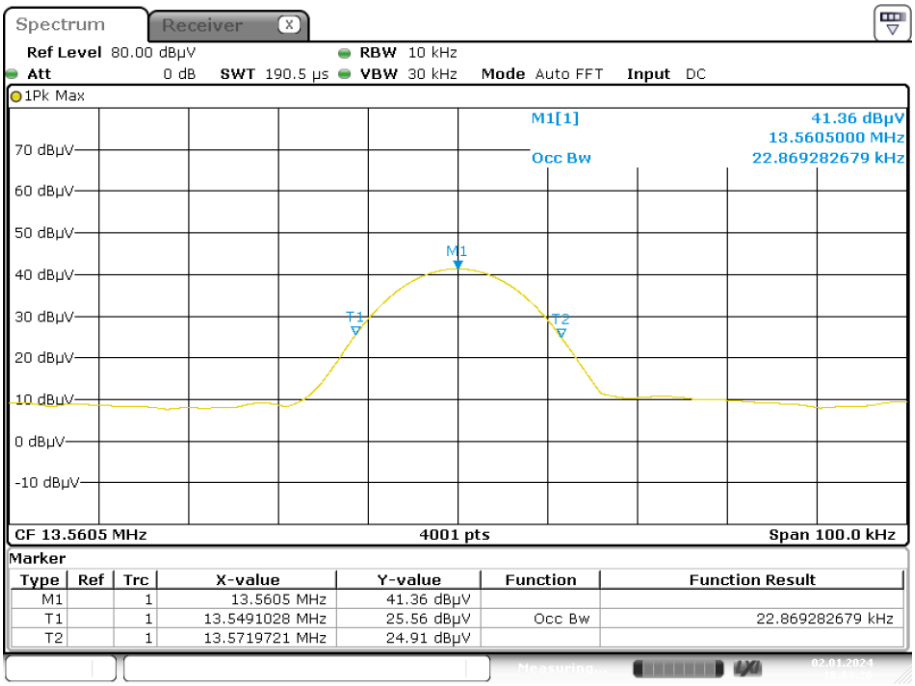
Frequency (MHz)	Emission Bandwidth (20dB down) (kHz)	Occupied Bandwidth (99%) (kHz)
13.56	25.39400	22.86928

Test Plots

Emission Bandwidth



99% Occupied Bandwidth



Date: 2.JAN.2024 18:03:26

Equipment Information						
Equipment Name	Supplier	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2023.09.05	2024.09.04	☒
Test Antenna-Loop	SCHWARZBECK	FMZB 1519	1519-037	2021.04.16	2024.04.15	☒
Anechoic Chamber（10m）	EMC TECHNOLOGY LTD	20.1m*11.6m*7.35m	130	2021.08.15	2024.08.14	☒

A.2 Field Strength of Fundamental Emissions

Note: Field Strength of Fundamental Emissions tests were performed in X, Y, Z axis direction of EUT. And only the worst axis test condition was recorded in this test report.

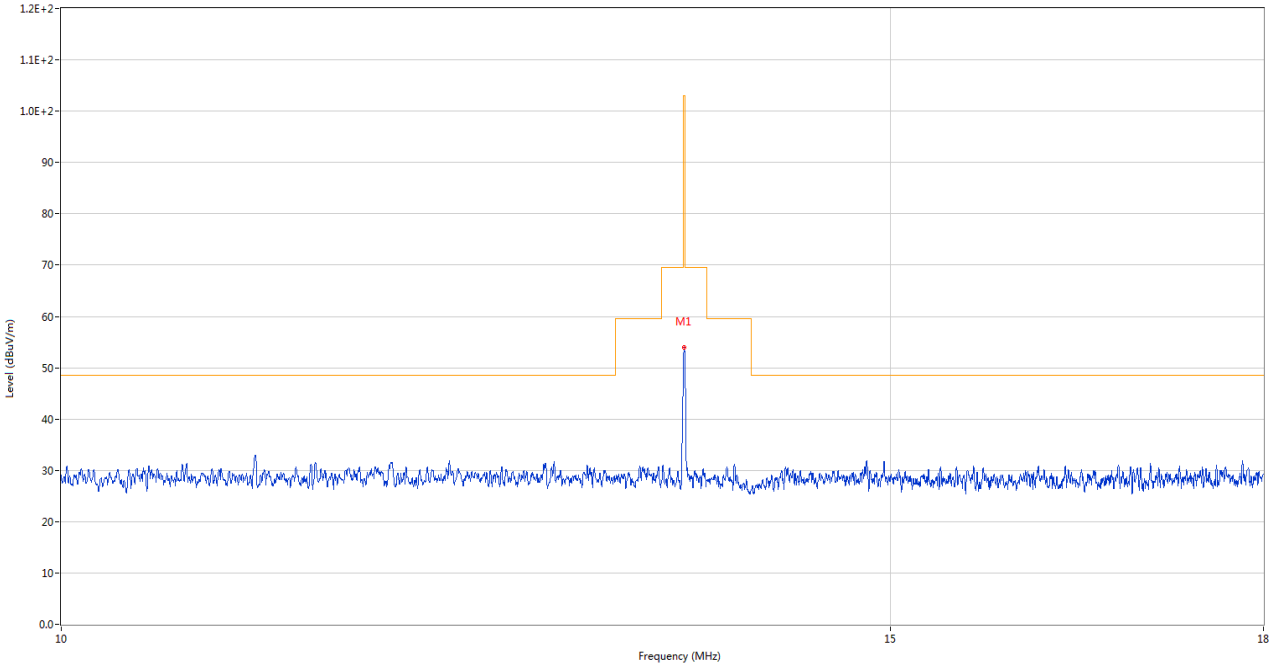
Sample No.	S01	Temperature	22.1℃
Humidity	36%RH	Pressure	101kPa
Test Engineer	Xi Zifeng	Test Date	2024.01.02

Test Data

Field Strength of Fundamental Emissions Value					
Frequency (MHz)	Detector	Field Strength (dBμV/m)	Limit @10m (dBμV/m)	EUT	Margin (dB)
13.560	PEAK	54.03	103.08	Y axis	49.05

Test Plot

Test Antenna-LOOP, EUT Y axis



Equipment Information						
Equipment Name	Supplier	Model	Serial No.	Cal. Date	Cal. Due	Use
Frequency 9kHz-30MHz						
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2023.09.05	2024.09.04	☒
Test Antenna-Loop	SCHWARZBECK	FMZB 1519	1519-037	2021.04.16	2024.04.15	☒
Anechoic Chamber（10m）	EMC TECHNOLOGY LTD	20.1m*11.6m*7.35m	130	2021.08.15	2024.08.14	☒
Description	Supplier	Name	Version	/		Use
Test Software	BALUN	BL410-E	V22.930	/		☒

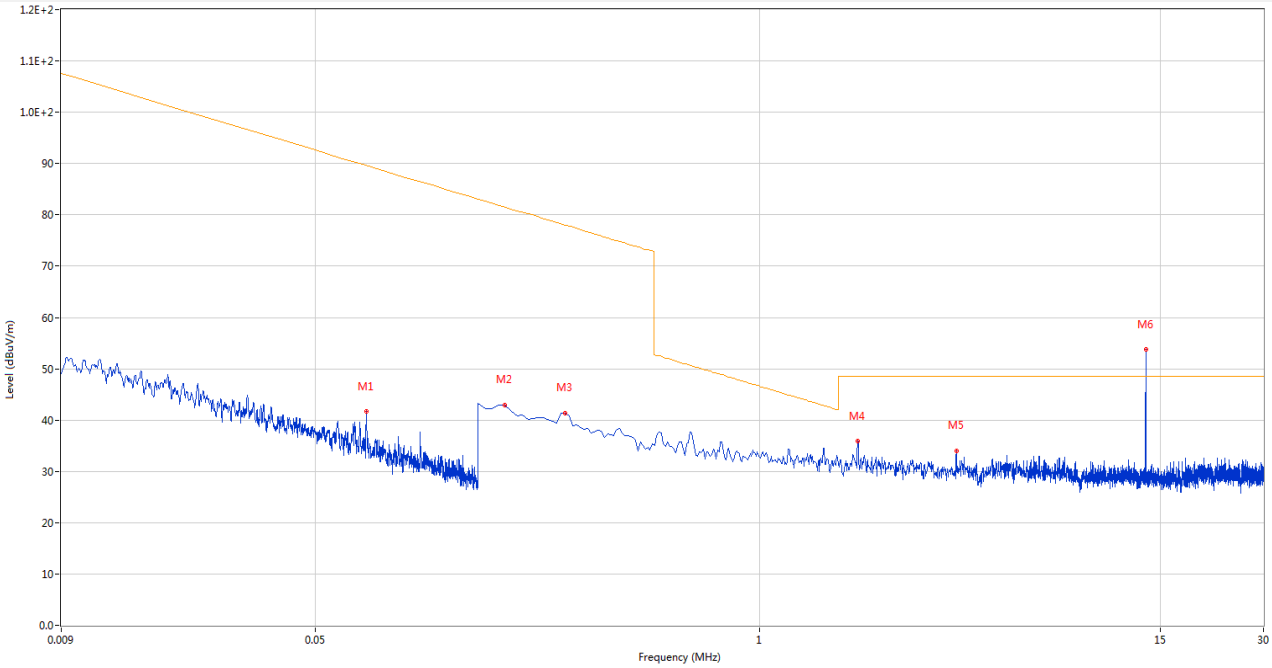
A.3 Radiated Emissions

Note 1: This frequency which near 13.560 MHz with circle should be ignored because they are NFC carrier frequency.
Note 2: All Radiated Emissions tests were performed in X, Y, Z axis direction of EUT. And only the worst axis test condition was recorded in this test report.
Note 3: The marked spikes near 2400 MHz with circle should be ignored because they are Bluetooth or WIFI carrier frequencies.
Note 4: The Radiated Emission is required to be investigated to the upper frequency of 10th harmonic of the highest internal frequency of EUT or 40 GHz, whichever is lower. The test results above 12.75GHz are only noise and are not recorded in the report.

Sample No.	S01	Temperature	22.5℃
Humidity	46%RH	Pressure	101kPa
Test Engineer	Xi Zifeng	Test Date	2024.01.02

The Data and Plots (9 kHz ~ 30 MHz)

ANT-V



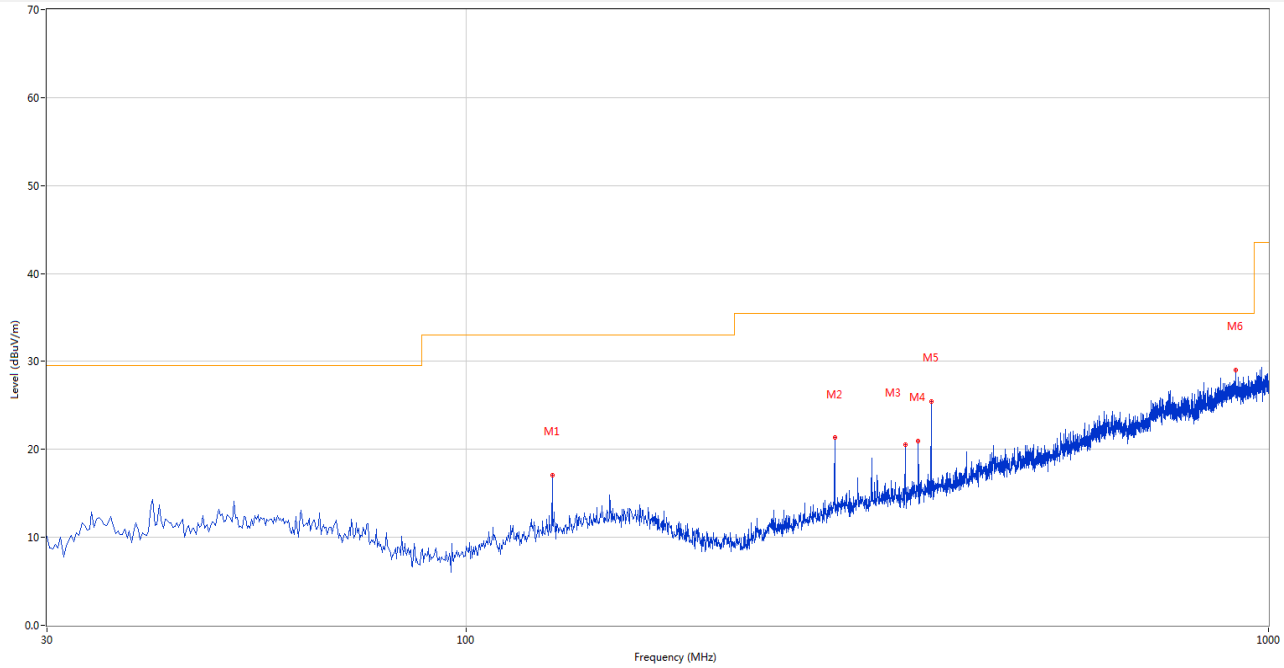
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	0.071	41.67	20.17	89.6	47.93	Peak	215.00	100	Vertical	Pass
2	0.180	42.94	20.10	81.5	38.56	Peak	37.00	100	Vertical	Pass
3	0.269	41.41	20.13	78.0	36.59	Peak	304.00	100	Vertical	Pass
4	1.941	35.90	20.48	48.5	12.60	Peak	97.00	100	Vertical	Pass
5	3.777	33.91	20.64	48.5	14.59	Peak	355.00	100	Vertical	Pass
6	13.560	53.76	20.86	48.5	-5.26	Peak	266.00	100	Vertical	N/A

Equipment Information						
Equipment Name	Supplier	Model	Serial No.	Cal. Date	Cal. Due	Use
Frequency 9kHz-30MHz						
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2023.09.05	2024.09.04	☒
Test Antenna-Loop	SCHWARZBECK	FMZB 1519	1519-037	2021.04.16	2024.04.15	☒
Anechoic Chamber（10m）	EMC TECHNOLOGY LTD	20.1m*11.6m*7.35m	130	2021.08.15	2024.08.14	☒
Description	Supplier	Name	Version	/		Use
Test Software	BALUN	BL410-E	V22.930	/		☒

Sample No.	S01	Temperature	22.5℃
Humidity	46%RH	Pressure	101kPa
Test Engineer	Xi Zifeng	Test Date	2024.01.02

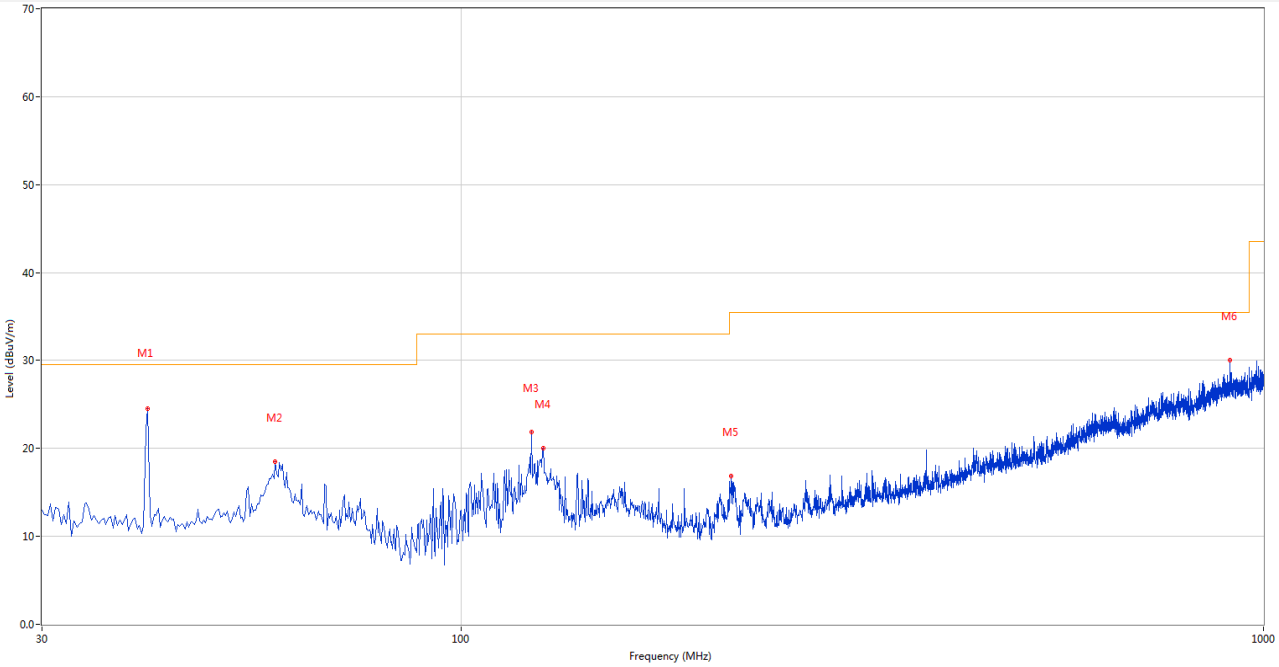
The Data and Plots (30 MHz ~ 1 GHz)

ANT-H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	127.946	17.03	-27.49	33.0	15.97	Peak	140.00	100	Horizontal	Pass
2	287.956	21.31	-25.01	35.5	14.19	Peak	42.00	200	Horizontal	Pass
3	352.444	20.58	-23.90	35.5	14.92	Peak	275.00	200	Horizontal	Pass
4	366.021	20.91	-23.45	35.5	14.59	Peak	275.00	200	Horizontal	Pass
5	379.598	25.48	-22.81	35.5	10.02	Peak	275.00	200	Horizontal	Pass
6	911.025	28.99	-10.51	35.5	6.51	Peak	0.00	200	Horizontal	Pass

ANT-V



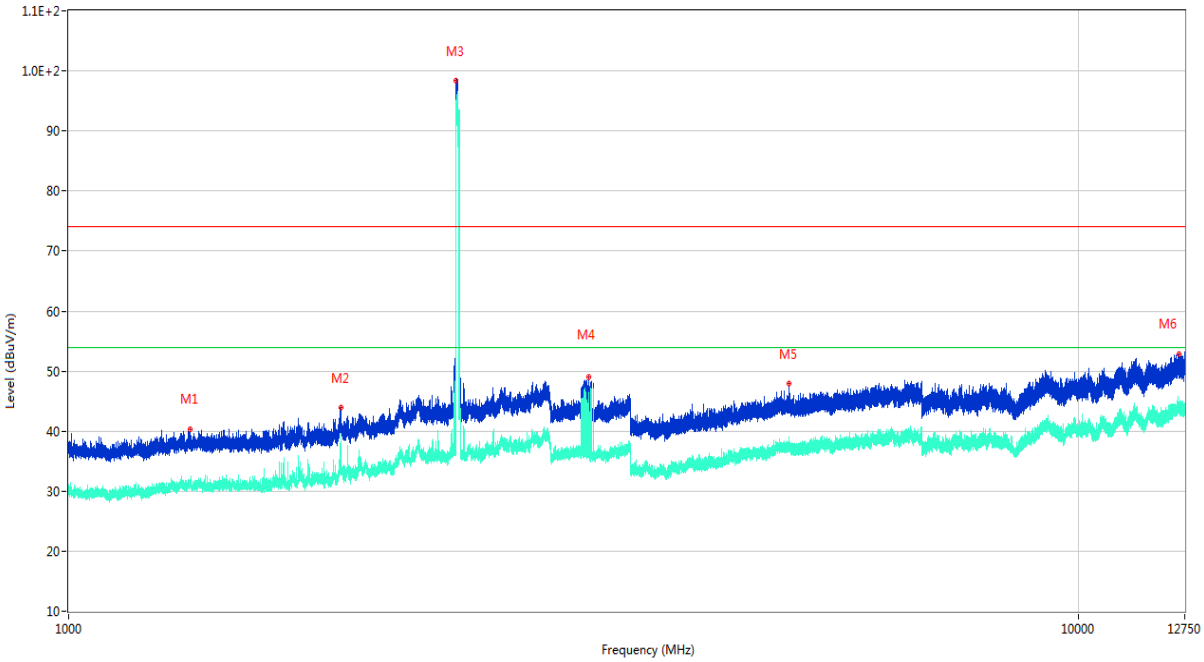
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	40.667	24.54	-26.69	29.5	4.96	Peak	276.00	100	Vertical	Pass
2	58.608	18.51	-26.39	29.5	10.99	Peak	118.00	100	Vertical	Pass
3	122.369	21.88	-28.06	33.0	11.12	Peak	53.00	200	Vertical	Pass
4	126.491	20.08	-27.57	33.0	12.92	Peak	93.00	200	Vertical	Pass
5	216.921	16.82	-28.91	35.5	18.68	Peak	103.00	100	Vertical	Pass
6	907.631	30.08	-10.55	35.5	5.42	Peak	168.00	100	Vertical	Pass

Equipment Information						
Equipment Name	Supplier	Model	Serial No.	Cal. Date	Cal. Due	Use
Frequency 30MHz-1GHz						
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2023.09.05	2024.09.04	☒
Amplifier (30MHz-1GHz)	COM-MV	ZT30-1000M	B2018054558	2023.12.05	2024.12.04	☒
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	9168-01162	2023.08.04	2024.08.03	☒
Anechoic Chamber（10m）	EMC Electronic Co., Ltd	20.10*11.60*7.35m	130	2021.08.15	2024.08.14	☒
Description	Supplier	Name	Version	/		Use
Test Software	BALUN	BL410-E	V22.930	/		☒

Sample No.	S01	Temperature	24.2℃
Humidity	56%RH	Pressure	101kPa
Test Engineer	Huang Xinghong	Test Date	2024.03.05

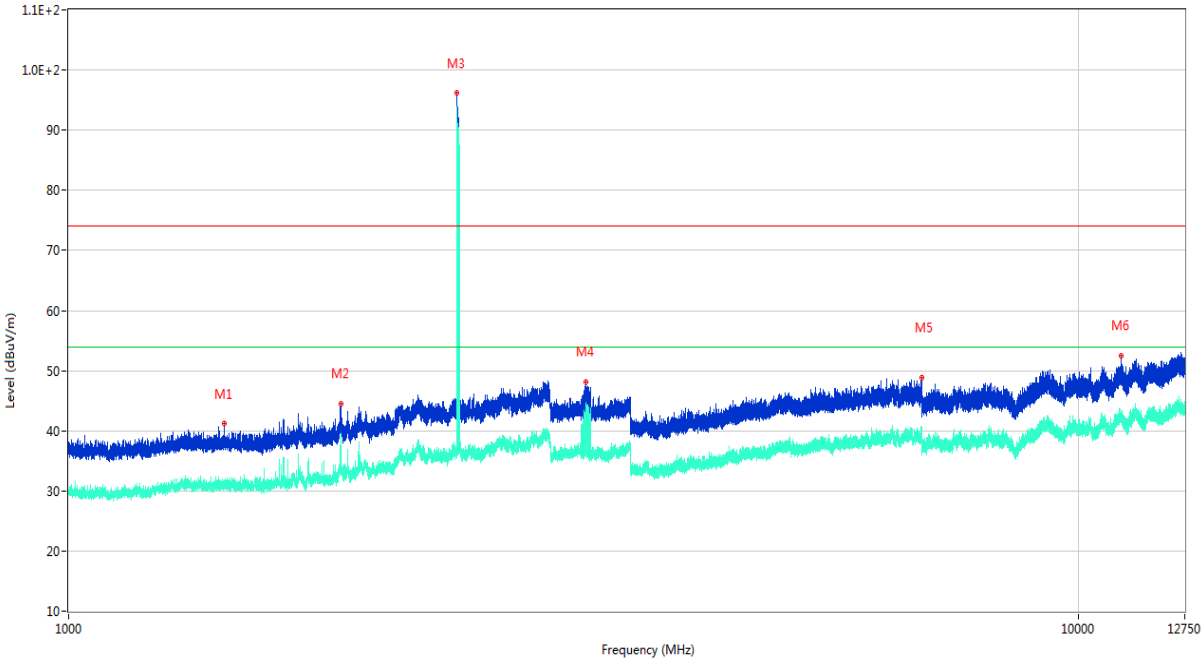
The Data and Plots (Above 1 GHz)

ANT-H



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1318.900	40.34	-15.04	74.0	33.66	Peak	129.20	100	Horizontal	Pass
1**	1318.900	31.01	-15.04	54.0	22.99	AV	129.20	100	Horizontal	Pass
2	1859.300	43.95	-12.96	74.0	30.05	Peak	282.00	200	Horizontal	Pass
2**	1859.300	38.60	-12.96	54.0	15.40	AV	282.00	200	Horizontal	Pass
3	2420.500	98.31	-9.27	74.0	-24.31	Peak	359.00	100	Horizontal	N/A
3**	2420.500	36.25	-9.27	54.0	17.75	AV	359.00	100	Horizontal	N/A
4	3275.800	49.09	-7.58	74.0	24.91	Peak	309.50	100	Horizontal	Pass
4**	3275.800	44.96	-7.58	54.0	9.04	AV	309.50	100	Horizontal	Pass
5	5167.800	47.88	-2.35	74.0	26.12	Peak	48.90	200	Horizontal	Pass
5**	5167.800	38.61	-2.35	54.0	15.39	AV	48.90	200	Horizontal	Pass
6	12584.688	52.84	21.92	74.0	21.16	Peak	2.70	100	Horizontal	Pass
6**	12584.688	44.71	21.92	54.0	9.29	AV	2.70	100	Horizontal	Pass

ANT-V



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1424.900	41.14	-15.26	74.0	32.86	Peak	0.80	200	Vertical	Pass
1**	1424.900	31.63	-15.26	54.0	22.37	AV	0.80	200	Vertical	Pass
2	1859.300	44.56	-12.96	74.0	29.44	Peak	30.80	100	Vertical	Pass
2**	1859.300	38.03	-12.96	54.0	15.97	AV	30.80	100	Vertical	Pass
3	2424.600	96.21	-9.69	74.0	-22.21	Peak	4.50	100	Vertical	N/A
3**	2424.600	90.13	-9.69	54.0	-36.13	AV	4.50	100	Vertical	N/A
4	3255.600	48.16	-7.88	74.0	25.84	Peak	244.00	100	Vertical	Pass
4**	3255.600	40.46	-7.88	54.0	13.54	AV	244.00	100	Vertical	Pass
5	6995.000	48.88	-1.41	74.0	25.12	Peak	49.00	100	Vertical	Pass
5**	6995.000	41.40	-1.41	54.0	12.60	AV	49.00	100	Vertical	Pass
6	11038.513	52.55	21.12	74.0	21.45	Peak	290.20	200	Vertical	Pass
6**	11038.513	42.10	21.12	54.0	11.90	AV	290.20	200	Vertical	Pass

Equipment Information						
Equipment Name	Supplier	Model	Serial No.	Cal. Date	Cal. Due	Use
Frequency Above 1 GHz						
EMI Receiver	Keysight	N9038A	MY53220118	2023.09.05	2024.09.04	☒
EMI Receiver	R&S	FSV-40	101544	2023.12.27	2024.12.26	☒
Amplifier (1-12GHz)	COM-MV	DLNAB-1000-12000-002	18080279	2023.12.05	2024.12.04	☒
Amplifier（0.8-21GHz）	Mini-Circuits	ZVA-213-S+	619201336	2023.12.05	2024.12.04	☒
Amplifier (18-40GHz)	COM-MV	KA_LNA18-40G-01	18050001	2021.07.02	2024.07.01	☒
Test Antenna-Horn	SCHWARZBECK	BBHA 9120D	1148	2022.04.12	2025.04.11	☒
Test Antenna-Horn	A-INFOMW	LB-180400KF	J211060273	2021.07.02	2024.07.01	☒
Anechoic Chamber（#4）	ChangNing	9m*6m*6m	101	2023.03.04	2026.03.03	☒
Description	Supplier	Name	Version	/		Use
Test Software	BALUN	BL410-E	V22.930	/		☒

A.4 Frequency Stability

Note 1: Because the 85%(4.25V) and 115% (5.75V) of the rated supply voltage value exceeds the cut-off voltage upper(4.9V) and lower(5.1V) limit of the manufacturer, the cut-off voltage of EUT is test here.
Note 2: The operating temperature range of the EUT is -30°C to 50°C.

Sample No.	S01	Temperature	22.5℃
Humidity	46%RH	Pressure	101kPa
Test Engineer	Xi Zifeng	Test Date	2024.01.02

OPERATING FREQUENCY:	13560000 Hz
REFERENCE VOLTAGE:	5 V
DEVIATION LIMIT:	±0.01%

VOLTAGE (%)	Test Conditions		Frequency (Hz)	Deviation (%)	Verdict
	Power (VDC)	Temperature (°C)			
100	5	-20	13560500	0.003687	Pass
100		-10	13560500	0.003687	Pass
100		0	13560500	0.003687	Pass
100		+10	13560500	0.003687	Pass
100		+20	13560500	0.003687	Pass
100		+25	13560600	0.004425	Pass
100		+30	13560600	0.004425	Pass
100		+40	13560500	0.003687	Pass
100		+50	13560500	0.003687	Pass
Max(85, End Point)	4.9	+20	13560500	0.003687	Pass
Min(115, End Point)	5.1	+20	13560600	0.004425	Pass

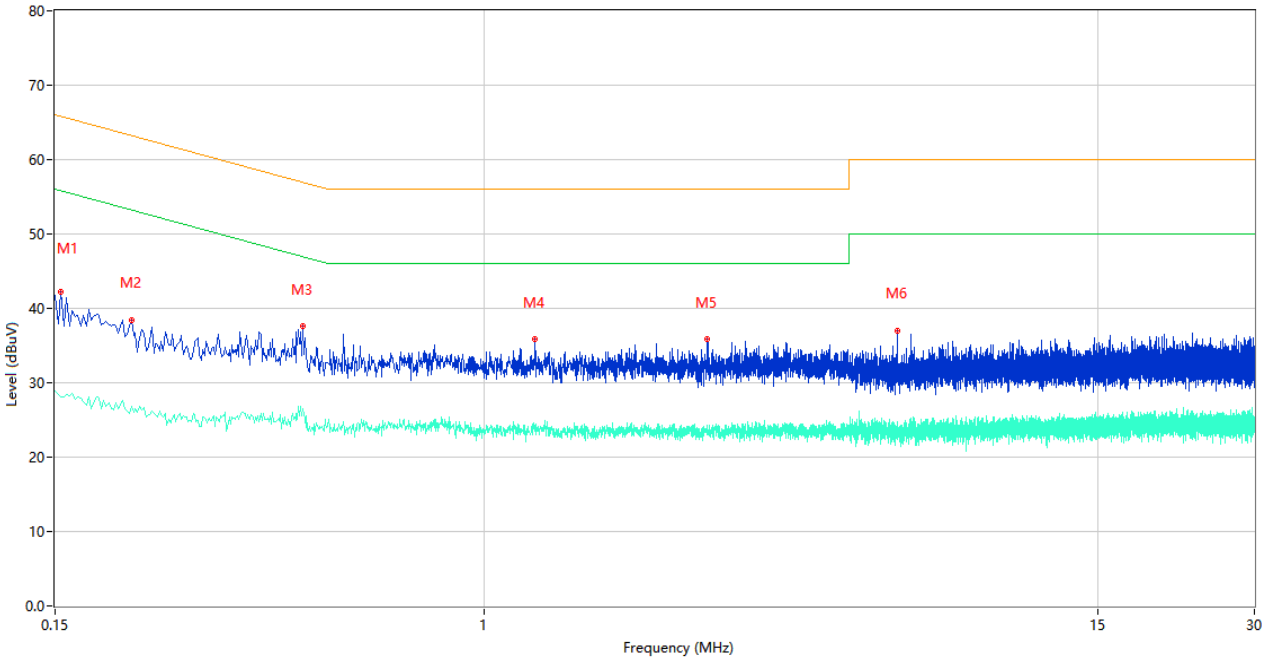
Equipment Information						
Equipment Name	Supplier	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2023.09.05	2024.09.04	☒
Test Antenna-Loop	SCHWARZBECK	FMZB 1519	1519-037	2021.04.16	2024.04.15	☒
Temperature Chamber	AHK	NTH64-40A	1310	2023.12.05	2024.12.05	☒
DC Power Supply	ROHDE&SCHWARZ	HMP2020	018141664	2023.05.15	2024.05.14	☒
Anechoic Chamber（10M）	EMC TECHNOLOGY LTD	20.1m*11.6m*7.35m	130	2021.08.15	2024.08.14	☒
Description	Supplier	Name	Version	/		Use
Test Software	/	/	/	/		☒

A.5 Conducted Emissions

Note: Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. So, The configuration 120 VAC, 60 Hz and 240 VAC, 50 Hz were tested respectively, but only the worst configuration (120 VAC, 60 Hz) shown here.

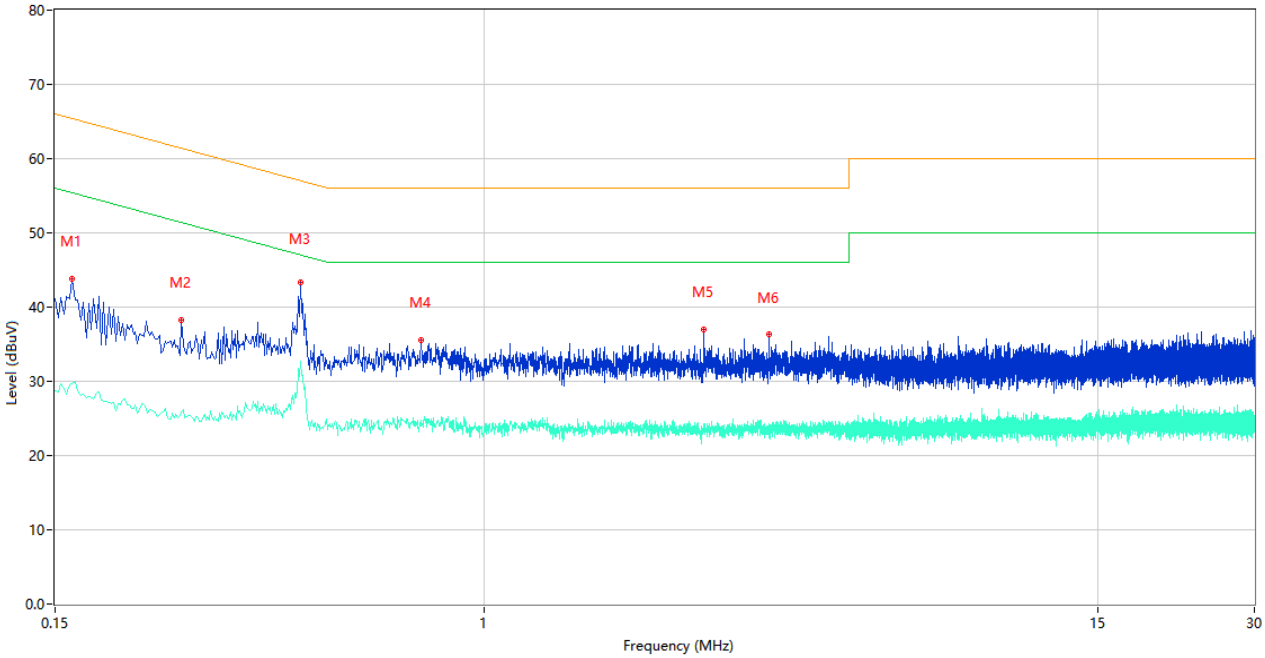
Sample No.	S02	Temperature	20.8℃
Humidity	47%RH	Pressure	101kPa
Test Engineer	Yang Yang	Test Date	2024.01.04

1) AC Ports - L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.154	42.24	9.78	65.78	23.54	Peak	L	Pass
1**	0.154	28.10	9.78	55.78	27.68	AV	L	Pass
2	0.210	38.39	9.77	63.21	24.82	Peak	L	Pass
2**	0.210	26.84	9.77	53.21	26.37	AV	L	Pass
3	0.448	37.59	10.05	56.91	19.32	Peak	L	Pass
3**	0.448	26.54	10.05	46.91	20.37	AV	L	Pass
4	1.250	35.85	10.45	56.00	20.15	Peak	L	Pass
4**	1.250	23.43	10.45	46.00	22.57	AV	L	Pass
5	2.670	35.84	10.13	56.00	20.16	Peak	L	Pass
5**	2.670	23.75	10.13	46.00	22.25	AV	L	Pass
6	6.190	37.06	10.27	60.00	22.94	Peak	L	Pass
6**	6.190	23.50	10.27	50.00	26.50	AV	L	Pass

2) AC Ports - N Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.162	43.86	9.78	65.36	21.50	Peak	N	Pass
1**	0.162	29.76	9.78	55.36	25.60	AV	N	Pass
2	0.262	38.32	9.76	61.37	23.05	Peak	N	Pass
2**	0.262	25.93	9.76	51.37	25.44	AV	N	Pass
3	0.444	43.38	10.09	56.99	13.61	Peak	N	Pass
3**	0.444	32.72	10.09	46.99	14.27	AV	N	Pass
4	0.756	35.61	10.22	56.00	20.39	Peak	N	Pass
4**	0.756	24.02	10.22	46.00	21.98	AV	N	Pass
5	2.630	37.05	10.03	56.00	18.95	Peak	N	Pass
5**	2.630	23.50	10.03	46.00	22.50	AV	N	Pass
6	3.510	36.33	10.11	56.00	19.67	Peak	N	Pass
6**	3.510	24.24	10.11	46.00	21.76	AV	N	Pass

Equipment Information						
Equipment Name	Supplier	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9010B	MY57110309	2023.09.05	2024.09.04	☒
LISN	SCHWARZBECK	NSLK 8127	8127-687	2023.05.16	2024.05.15	☒
Shielded Room	YiHeng Electronic Co., Ltd	3.5m*3.1m*2.8m	112	2022.02.19	2025.02.18	☒
Description	Supplier	Name	Version	/		Use
Test Software	BALUN	BL410-E	V22.930	/		☒

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ23C1352-AE-2.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ23C1352-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ23C1352-AI.PDF”.

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--END OF REPORT--