

TEST REPORT

Applicant: Jiangsu Niu Electric Technology Co., Ltd.

Address: No.387.ChangtingRd,WEZ,Wujin,Changzhou,Jiang
su Province.China

Equipment Type: Bluetooth Module

Model Name: C22Q

Brand Name: NIU

FCC ID: 2AZ6G-C22Q

Test Standard: 47 CFR Part 15 Subpart B
ANSI C63.4-2014

Sample Arrival Date: Feb. 05, 2025

Test Date: Feb. 21, 2025

Date of Issue: Mar. 25, 2025

ISSUED BY:

Shanghai Tejet Communications Technology Co., Ltd. Testing Center

Tested by: Chai Yong

Chai Yong

Checked by: Huang Chengkun

Huang Chengkun

Approved by: Chen Zidong
(Technical Director)

Chen Zidong

Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Mar. 25, 2025</u>	<u>Initial Issue</u>

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shanghai Tejet Communications Technology Co., Ltd. Testing Center
Address	1st to 2nd floors, Building 1, No. 222 Xuanlan Road, Xuanqiao Town, Pudong New District, Shanghai, China

1.2 Test Location

Name	Shanghai Tejet Communications Technology Co., Ltd. Testing Center
Location	1st to 2nd floors, Building 1, No. 222 Xuanlan Road, Xuanqiao Town, Pudong New District, Shanghai, China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1352.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Jiangsu Niu Electric Technology Co., Ltd.
Address	No.387.ChangtingRd,WEZ,Wujin,Changzhou,Jiangsu Province.China

2.2 Manufacturer Information

Manufacturer	Jiangsu Niu Electric Technology Co., Ltd.
Address	No.387.ChangtingRd,WEZ,Wujin,Changzhou,Jiangsu Province.China

2.3 General Description for Equipment under Test (EUT)

Equipment Type	Bluetooth Module
Model Name Under Test	C22Q
Series Model Name	N/A
Description of Model Name Differentiation	N/A
Hardware Version	0.6
Software Version	C22QQV08
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Ancillary Equipment

Note: Note applicable.

2.5 Technical Information

Network and wireless connectivity	Bluetooth
Classification of equipment	Class B
Highest frequency generated or used in the device or on which the device operates (MHz)	2483.5 MHz

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15 Subpart B	Unintentional Radiators
2	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

3.2 Verdict

No.	Description	FCC Rule	Test Verdict	Remark
1	Radiated Emission	15.109	Pass	--
2	Conducted Emission, AC Ports	15.107	Pass	--

3.3 Decision Rule

- ☐ No Need
- ☒ Use General conformity decision rule (Consider uncertainty or not ☒ No ☐ Yes)
- ☐ Use Special Conformity Decision Rule (Consider uncertainty or not ☐ No ☐ Yes)

3.4 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 (150 kHz-30 MHz)-AMN	2.6 dB
Radiated emissions (30 MHz-1 GHz)-966#1	4.2 dB
Radiated emissions (1 GHz-18 GHz) -966#1	5.3 dB

4 GENERAL TEST CONFIGURATIONS

4.1 Test Enclosure List

Description	Manufacturer	Model	Serial No.	Length	Description	Use
Laptop	Lenovo	N/A	N/A	N/A	N/A	☒

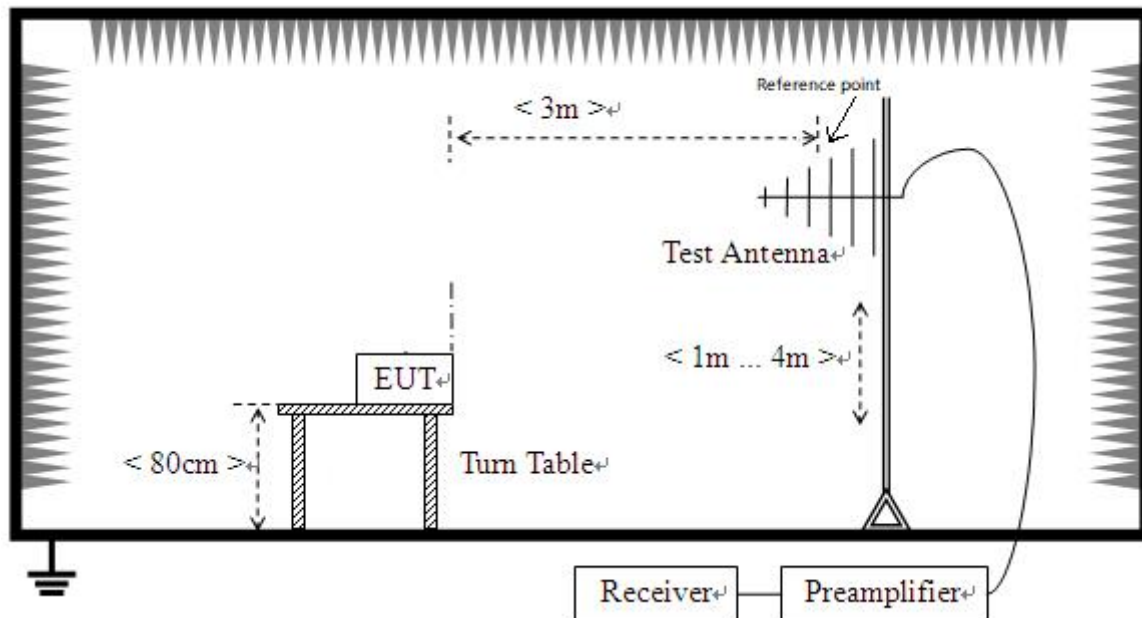
4.2 Test Configurations

All test modes of EUT are listed in the table below.

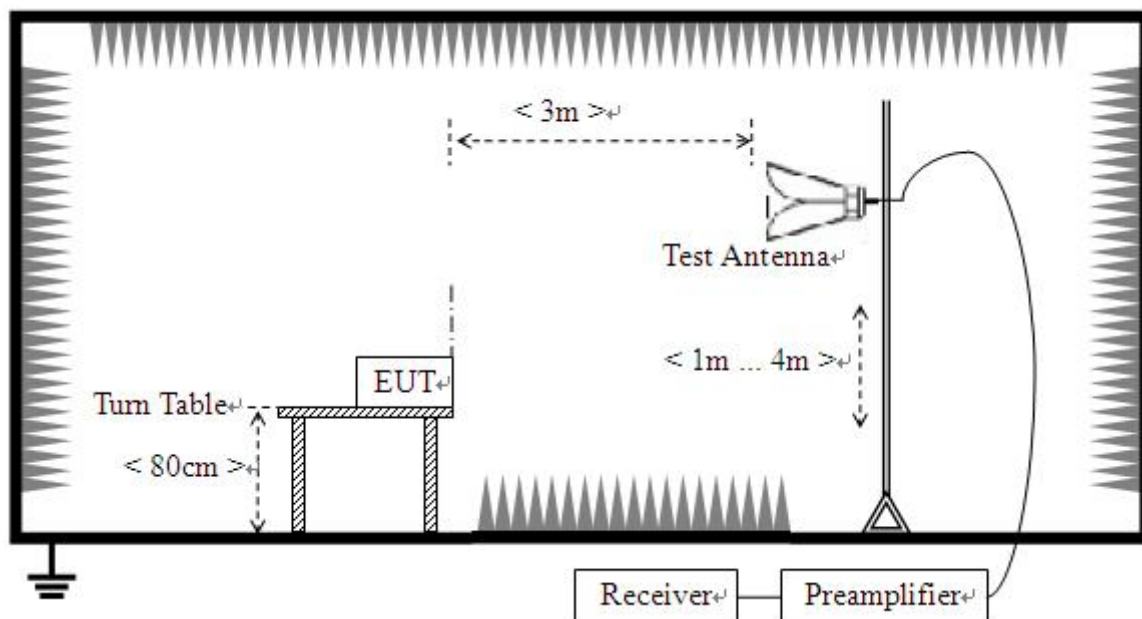
Test Mode Configuration	Description
Mode 1	<u>The Full System Test Mode</u> EUT + Laptop

4.3 Test Setups

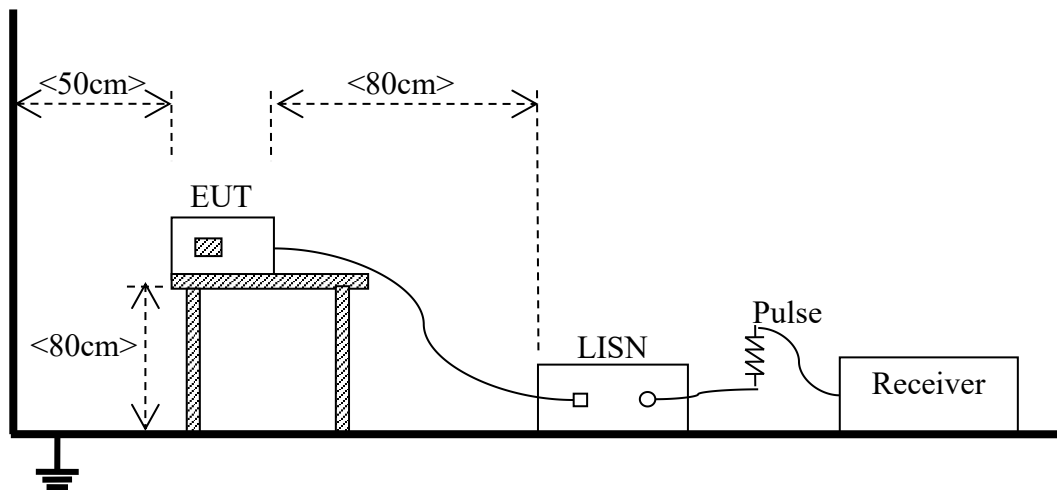
Test Setup 1



Radiated Emission (30 MHz-1 GHz)



Radiated Emission (above 1 GHz)

Test Setup 2

Conducted emission, AC ports

5 TEST ITEMS

5.1 Emission Tests

5.1.1 Radiated emission

5.1.1.1 Limit

Frequency range (MHz)	Class B (at 3 m)		Class A (at 3 m)
	Field Strength ($\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)	Field Strength (dB $\mu\text{V/m}$)
30 - 88	100	40	49.5
88 - 216	150	43.5	54
216 - 960	200	46	56.9
Above 960	500	54	60

Note:

- 1) Field Strength (dB $\mu\text{V/m}$) = $20 \cdot \log [\text{Field Strength } (\mu\text{V/m})]$.
- 2) In the emission tables above, the tighter limit applies at the band edges.
- 3) The limits using ANSI C63.4-2014.
- 4) For 30-1000 MHz, the CISPR quasi-peak is employed.

For above 1000 MHz, according to the requirements of FCC 15.35, unless otherwise specified, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

Frequency range (GHz)	Class B (at 3 m)			Class A (at 3 m)	
	Field Strength ($\mu\text{V/m}$)	Field Strength Average (dB $\mu\text{V/m}$)	Field Strength Peak (dB $\mu\text{V/m}$)	Field Strength Average (dB $\mu\text{V/m}$)	Field Strength Peak (dB $\mu\text{V/m}$)
1 - F_M	500	54	74	60	80

Note 1: The highest measurement frequency, F_M , in GHz, shall be determined as next Table.

Note 2: Average Class A limit at 3m L_{3m} is determined by the following conversion formula:

$$L_{3m} = L_{10m} + 20 \cdot \log(d_{10m}/d_{3m})$$
Where:
 L_{3m} is Average Class A limit at 3m;
 L_{10m} is Average Class A limit at 10m;
 d_{10m} is Measurement distance in 10m;
 d_{3m} is Measurement distance in 3m.
For this case: $L_{3m} = 49.5 + 20 \cdot \log(10/3) = 60$ (dB $\mu\text{V/m}$).

Highest internal frequency (F_X)	Highest measurement frequency (F_M)
$F_X \leq 108 \text{ MHz}$	1 GHz
$108 \text{ MHz} \leq F_X \leq 500 \text{ MHz}$	2 GHz
$500 \text{ MHz} \leq F_X \leq 1 \text{ GHz}$	5 GHz
$F_X \geq 1 \text{ GHz}$	$5 * F_X$ or 40 GHz, whichever is lower.
Note: F_X is Highest frequency generated or used in the device or on which the device operates or tunes.	

5.1.1.2 Test setup

Please refer to 4.2 section description of test setup of test setup 1. The photo of test setup please refer to ANNEX B.

5.1.1.3 Test procedure

1. The test employing the methods of measurement described in the publication referenced in Section 3(b) (ANSI C63.4);
2. All Radiated Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.
3. An initial pre-scan was performed in the chamber using the EMI Receiver in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bi-Log antenna with 2 orthogonal polarities.
4. The measurement frequency range is from 30 MHz to the 5th harmonic of the maximum frequency of the EUT internal source. 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.
5. Use the following spectrum analyzer settings:
 Span = wide enough to fully capture the emission being measured
 RBW = 1 MHz for $f \geq 1 \text{ GHz}$, 100 kHz for $f < 1 \text{ GHz}$
 VBW $\geq$ RBW
 Sweep = auto
 Detector function = peak for $f < 1 \text{ GHz}$, peak & RMS Average for $f \geq 1 \text{ GHz}$
 Trace = max hold

5.1.1.4 Test result and test equipment list

Please refer to ANNEX A.1.

Note:

1. Results (dB μ V/m) = Reading (dB μ V/m) + 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

5.1.2 Conducted emission

5.1.2.1 Limit

Frequency range (MHz)	Class A		Class B	
	Quasi-peak (dB μ V)	Average (dB μ V)	Quasi-peak (dB μ V)	Average (dB μ V)
0.15 - 0.50	79	66	66 to 56	56 to 46
0.50 - 5	73	60	56	46
5 - 30	73	60	60	50

Note:

- 1) The lower limit shall apply at the band edges.
- 2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50 MHz.
- 3) The limit using ANSI C63.4.

5.1.2.2 Test setup

Please refer to 4.2 section description of test setup of test setup 2. The photo of test setup please refer to ANNEX B.

5.1.2.3 Test procedure

1. The test employing the methods of measurement described in the publication referenced in Section 3(b) (ANSI C63.4);
2. The EUT is connected to the power mains through a LISN which provides 50 Ω /50 μ H of coupling impedance for the measuring instrument. The test frequency range is from 150 kHz to 30 MHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels that are 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.
3. Use the following spectrum analyzer settings:
 RBW = 9 kHz
 VBW $\geq$ RBW
 Sweep = 10ms
 Detector function = Peak & Average
 Trace = max hold

5.1.2.4 Test result and test equipment list

Please refer to ANNEX A.2.

Note:

1. Results (dB μ V) = Reading (dB μ V) + 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 RESULTS AND TEST EQUIPMENT LIST

A.1 Radiated emission

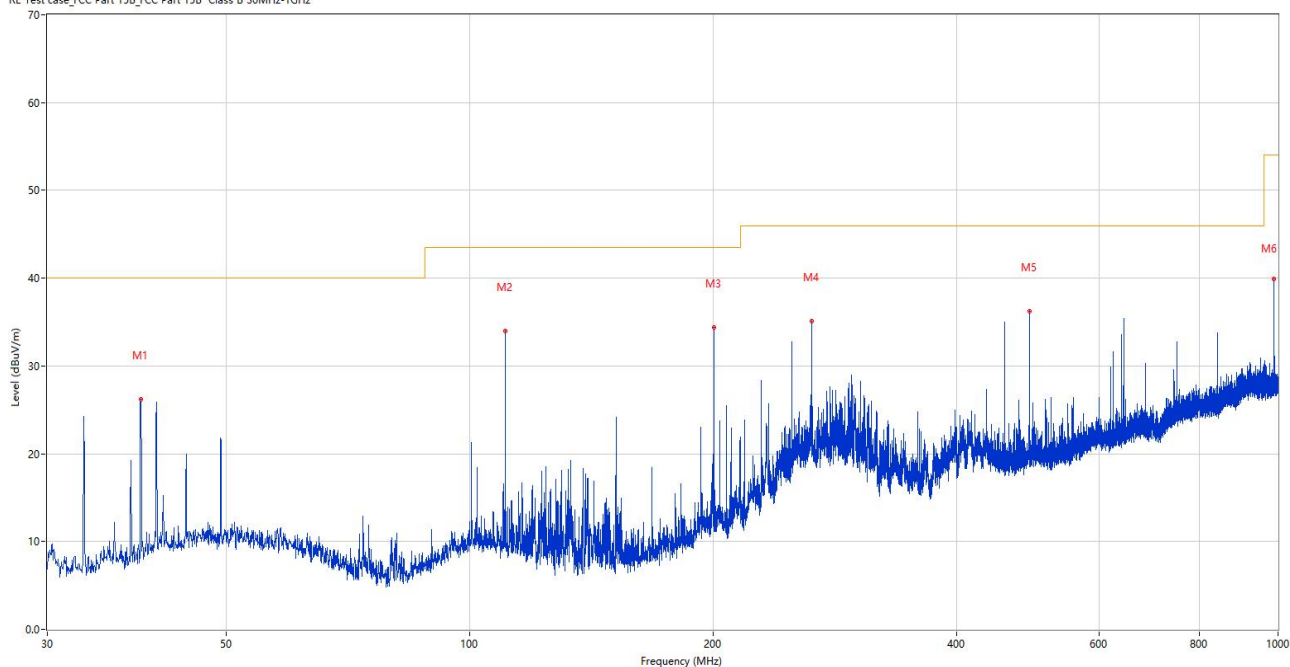
Note 1: Measurements shall be made with a quasi-peak measuring receiver in the frequency range 30 MHz to 1000 MHz. To reduce the testing time, a peak measuring receiver may be used instead of a quasi-peak measuring receiver. In case of dispute, measurement with a quasi-peak measuring receiver will take precedence.

Sample No.	S03	Temperature	21.5°C
Humidity	46%RH	Test Voltage	DC 5V From PC
Test Engineer	Hao Longda	Test Date	2025.02.21

Test Mode 1

A.1.1 Test Antenna Vertical, 30 MHz – 1 GHz

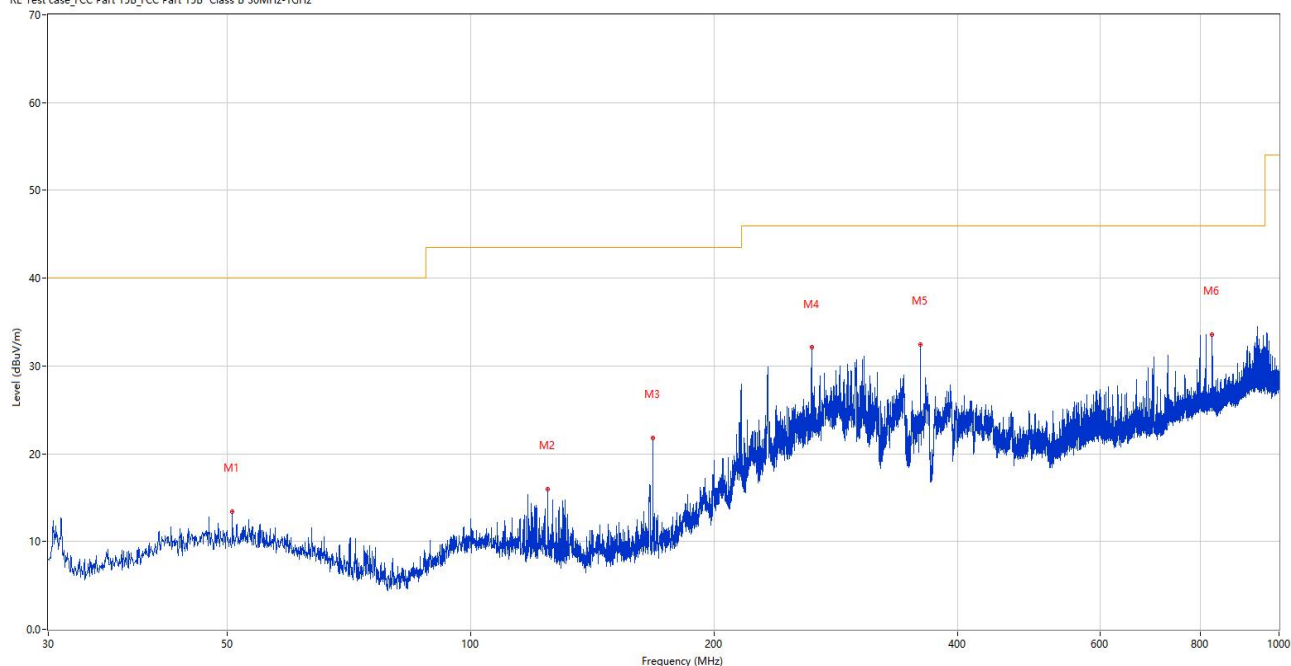
RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	39.166	26.23	-27.48	40.0	13.77	Peak	226.00	100	Vertical	Pass
2	110.656	33.94	-27.53	43.5	9.56	Peak	226.00	100	Vertical	Pass
3	200.477	34.38	-26.66	43.5	9.12	Peak	226.00	100	Vertical	Pass
4	264.692	35.10	-24.90	46.0	10.90	Peak	226.00	100	Vertical	Pass
5	492.544	36.22	-18.67	46.0	9.78	Peak	226.00	100	Vertical	Pass
6	987.438	39.94	-9.00	54.0	14.06	Peak	226.00	100	Vertical	Pass

A.1.2 Test Antenna Horizontal, 30 MHz – 1 GHz

RE Test case_FCC Part 15B_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	50.709	13.42	-25.69	40.0	26.58	Peak	144.00	100	Horizontal	Pass
2	124.478	15.97	-29.42	43.5	27.53	Peak	360.00	200	Horizontal	Pass
3	168.031	21.84	-29.22	43.5	21.66	Peak	82.00	200	Horizontal	Pass
4	264.013	32.12	-24.93	46.0	13.88	Peak	101.00	100	Horizontal	Pass
5	360.042	32.46	-22.52	46.0	13.54	Peak	178.00	100	Horizontal	Pass
6	825.594	33.59	-11.66	46.0	12.41	Peak	0.00	200	Horizontal	Pass

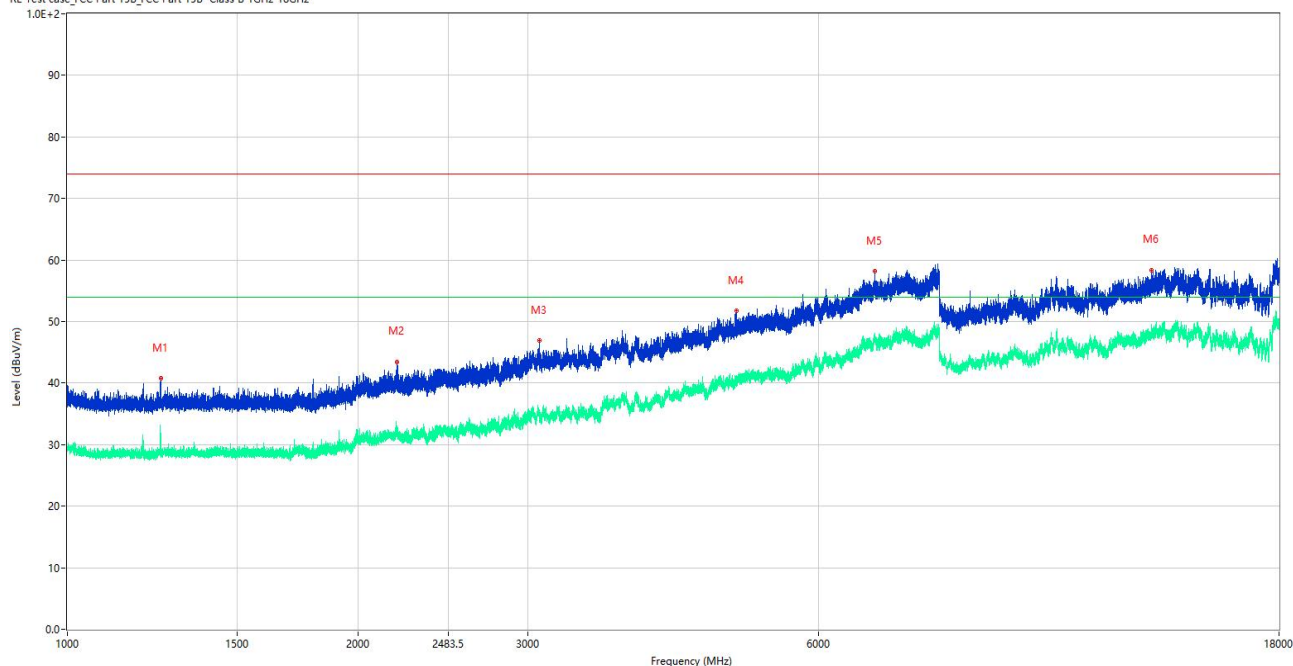
Equipment Information						
Equipment Name	Manufacturer	Model	Equipment No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9038A	BH-EMC-L127	2025.02.12	2026.02.11	☒
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9163	BH-EMC-L132	2024.03.11	2027.03.10	☒
Anechoic Chamber	YiHeng	9m*6m*6m	BH-EMC-L001	2024.04.18	2027.04.17	☒
Description	Manufacturer	Name	Version	/		Use
Test Software	BALUN	BL410-E	V21.919	/		☒

Sample No.	S03	Temperature	21.5°C
Humidity	46%RH	Test Voltage	DC 5V From PC
Test Engineer	Hao Longda	Test Date	2025.02.21

Test Mode 1

A.1.3 Test Antenna Vertical, 1 GHz – 18 GHz

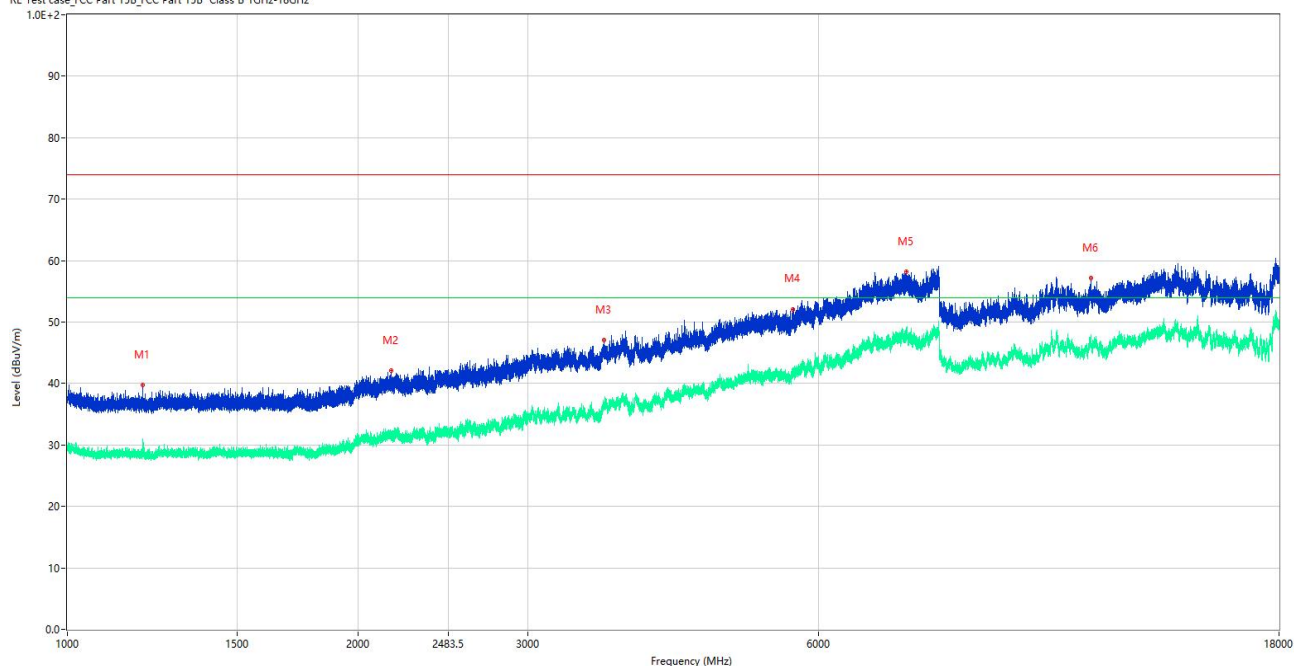
RE Test case_FCC Part 15B_FCC Part 15B Class B 1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1249.800	40.76	-15.91	74.0	33.24	Peak	315.00	100	Vertical	Pass
1**	1249.800	29.09	-15.91	54.0	24.91	AV	315.00	100	Vertical	Pass
2	2197.300	43.45	-12.74	74.0	30.55	Peak	360.00	100	Vertical	Pass
2**	2197.300	31.91	-12.74	54.0	22.09	AV	360.00	100	Vertical	Pass
3	3083.000	46.97	-6.80	74.0	27.03	Peak	158.00	100	Vertical	Pass
3**	3083.000	34.27	-6.80	54.0	19.73	AV	158.00	100	Vertical	Pass
4	4937.500	51.70	-1.23	74.0	22.30	Peak	183.00	100	Vertical	Pass
4**	4937.500	39.82	-1.23	54.0	14.18	AV	183.00	100	Vertical	Pass
5	6861.750	58.20	4.75	74.0	15.80	Peak	155.00	100	Vertical	Pass
5**	6861.750	46.77	4.75	54.0	7.23	AV	155.00	100	Vertical	Pass
6	13287.000	58.34	8.15	74.0	15.66	Peak	266.00	100	Vertical	Pass
6**	13287.000	47.89	8.15	54.0	6.11	AV	266.00	100	Vertical	Pass

A.1.4 Test Antenna Horizontal, 1 GHz – 18 GHz

RE Test case_FCC Part 15B_FCC Part 15B Class B 1GHz-18GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1197.300	39.71	-16.00	74.0	34.29	Peak	314.00	100	Horizontal	Pass
1**	1197.300	28.53	-16.00	54.0	25.47	AV	314.00	100	Horizontal	Pass
2	2164.400	42.13	-12.88	74.0	31.87	Peak	99.00	100	Horizontal	Pass
2**	2164.400	31.80	-12.88	54.0	22.20	AV	99.00	100	Horizontal	Pass
3	3599.750	47.08	-4.66	74.0	26.92	Peak	360.00	100	Horizontal	Pass
3**	3599.750	36.25	-4.66	54.0	17.75	AV	360.00	100	Horizontal	Pass
4	5641.750	52.09	-0.27	74.0	21.91	Peak	269.00	100	Horizontal	Pass
4**	5641.750	41.74	-0.27	54.0	12.26	AV	269.00	100	Horizontal	Pass
5	7396.000	58.12	6.22	74.0	15.88	Peak	55.00	100	Horizontal	Pass
5**	7396.000	47.32	6.22	54.0	6.68	AV	55.00	100	Horizontal	Pass
6	11488.000	57.18	3.82	74.0	16.82	Peak	0.00	100	Horizontal	Pass
6**	11488.000	46.23	3.82	54.0	7.77	AV	0.00	100	Horizontal	Pass

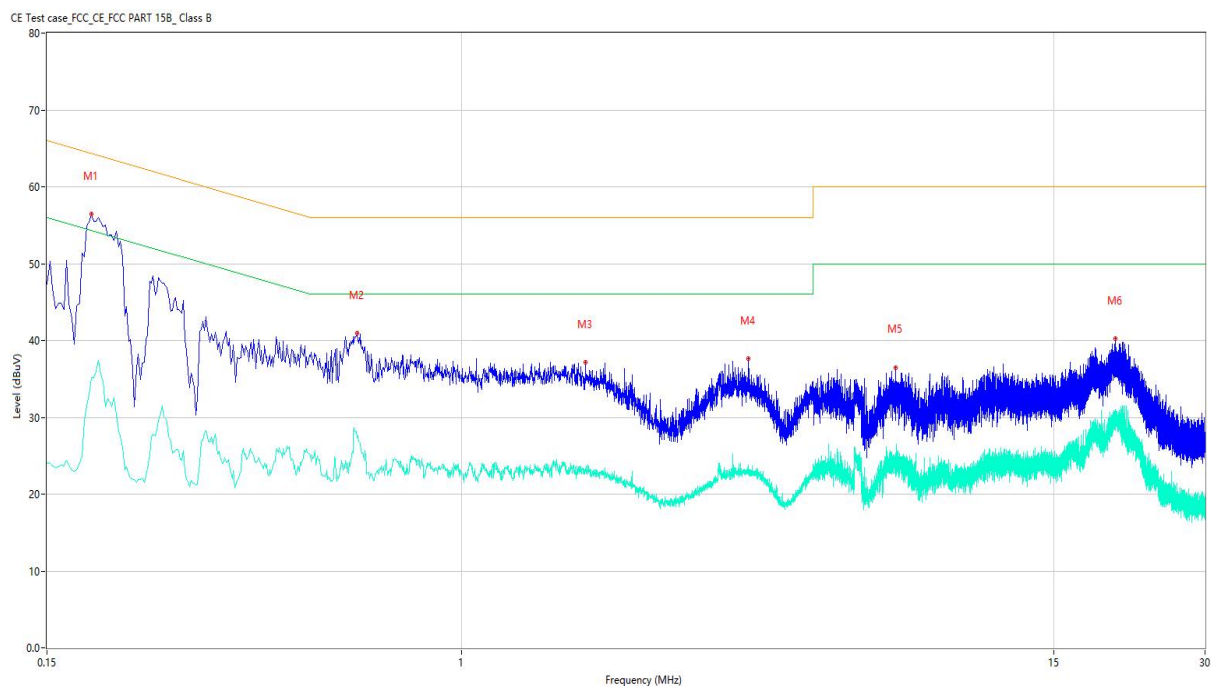
Equipment Information						
Equipment Name	Manufacturer	Model	Equipment No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9038A	BH-EMC-L127	2025.02.12	2026.02.11	☒
Test Antenna-Horn	SCHWARZB ECK	BBHA 9120D	BH-EMC-L111	2024.03.11	2027.03.10	☒
Anechoic Chamber	YiHeng	9m*6m*6m	BH-EMC-L001	2024.04.18	2027.04.17	☒
Description	Manufacturer	Name	Version	/		Use
Test Software	BALUN	BL410-E	V21.919	/		☒

A.2 Conducted emission

Sample No.	S03	Temperature	22.1°C
Humidity	42%RH	Test Voltage	DC 5V Form PC
Test Engineer	Tong Yingying	Test Date	2025.02.21

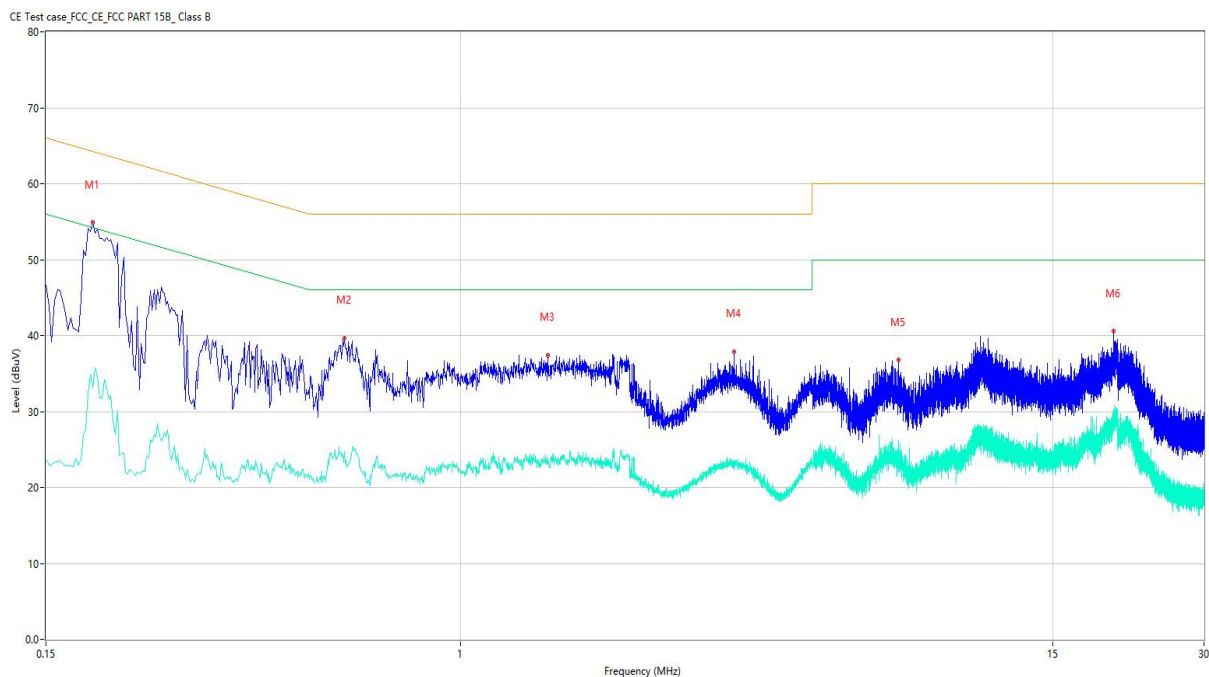
Test Mode 1

A.2.1 AC ports - L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.184	56.47	9.75	64.30	7.83	Peak	L	Pass
1**	0.184	35.17	9.75	54.30	19.13	AV	L	Pass
2	0.620	40.96	9.73	56.00	15.04	Peak	L	Pass
2**	0.620	27.34	9.73	46.00	18.66	AV	L	Pass
3	1.762	37.13	9.69	56.00	18.87	Peak	L	Pass
3**	1.762	23.19	9.69	46.00	22.81	AV	L	Pass
4	3.718	37.63	9.66	56.00	18.37	Peak	L	Pass
4**	3.718	23.78	9.66	46.00	22.22	AV	L	Pass
5	7.278	36.50	9.57	60.00	23.50	Peak	L	Pass
5**	7.278	24.83	9.57	50.00	25.17	AV	L	Pass
6	19.934	40.24	8.93	60.00	19.76	Peak	L	Pass
6**	19.934	31.05	8.93	50.00	18.95	AV	L	Pass

A.2.2 AC ports - N Phase



No.	Frequency (MHz)	Results (dBUV)	Factor (dB)	Limit (dBUV)	Margin (dB)	Detector	Line	Verdict
1	0.186	54.93	9.74	64.21	9.28	Peak	N	Pass
1**	0.186	33.11	9.74	54.21	21.10	AV	N	Pass
2	0.588	39.69	9.84	56.00	16.31	Peak	N	Pass
2**	0.588	24.71	9.84	46.00	21.29	AV	N	Pass
3	1.492	37.43	9.87	56.00	18.57	Peak	N	Pass
3**	1.492	23.31	9.87	46.00	22.69	AV	N	Pass
4	3.496	37.91	9.84	56.00	18.09	Peak	N	Pass
4**	3.496	23.28	9.84	46.00	22.72	AV	N	Pass
5	7.402	36.82	9.79	60.00	23.18	Peak	N	Pass
5**	7.402	26.24	9.79	50.00	23.76	AV	N	Pass
6	19.848	40.54	9.14	60.00	19.46	Peak	N	Pass
6**	19.848	28.91	9.14	50.00	21.09	AV	N	Pass

Equipment Information						
Equipment Name	Manufacturer	Model	Equipment No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9038A	TJEMC144	2024.04.06	2025.04.05	☒
LISN	SCHWARZBECK	NSLK 8127	BH-EMC-L011	2025.02.11	2026.02.10	☒
10dB Limiter	SCHWARZBECK	VTSD 9561-F	BH-EMC-L014	2025.02.11	2026.02.10	☒
Shielded Room	YiHeng	4.1m*4.0m*3.2m	BH-EMC-L006	2024.02.22	2027.02.21	☒
Description	Manufacturer	Name	Version	/		Use
Test Software	BALUN	BL410-E	V21.919	/		☒

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SH2520075-AE.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SH2520075-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SH2520075-AI.PDF”.

Statement

1. The Testing Center guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
2. For the report with Accreditation Symbol, the items marked with "☆" are not within the accredited scope.
3. This report is invalid if it is altered, without the signature of the testing and approval personnel, or without the test report stamp.
4. The test data and results are only valid for the tested samples provided by the customer.
5. This report shall not be partially reproduced without the written permission of the Testing Center.
6. Any objection shall be raised to the Testing Center within 30 days after receiving the report.

--END OF REPORT--