

TEST REPORT

Applicant: Shenzhen Honq Technology Co., Ltd
Address: 203, No.10, gongyehou street, Songgang street,
Bao'an District, Shenzhen P.R. China
Equipment Type: LTE module
Model Name: HQ308
Brand Name: baixiaonuanyang
FCC ID: 2BNH282071806220916
Test Standard: 47 CFR Part 15 Subpart B
ANSI C63.4-2014
Sample Arrival Date: Dec. 30, 2024
Test Date: Jan. 03, 2025 - Jan. 06, 2025
Date of Issue: Feb. 19, 2025

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Li Junfeng**Checked by:** Liu Zhenxiang**Approved by:** Tolan Tu
(Testing Director)

Revision History

Version	Issue Date	Revisions
<u>Rev. 01</u>	<u>Feb. 19, 2025</u>	<u>Initial Issue</u>

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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	Shenzhen Hong Technology Co., Ltd
Address	203, No.10, gongyehou street, Songgang street, Bao'an District, Shenzhen P.R. China

2.2 Manufacturer Information

Manufacturer	N/A
Address	N/A

2.3 General Description for Equipment under Test (EUT)

EUT Name	LTE module
Model Name Under Test	HQ308
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	V1.01
Software Version	V11.0.01
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Ancillary Equipment

Note: Not applicable.

2.5 Technical Information

Network and Wireless connectivity	4G Network FDD LTE Band 2/4/5/12/13/66
Classification of equipment	Class B

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 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 (30 MHz-1 GHz)-966#2	4.4 dB
Radiated emissions (1 GHz-18 GHz)-966#2	5.0 dB

4 GENERAL TEST CONFIGURATIONS

4.1 Test Enclosure List

Description	Manufacturer	Model	Serial No.	Length	Description	Use
Circuit board	N/A	N/A	N/A	N/A	N/A	☒
Antenna	N/A	N/A	N/A	N/A	N/A	☒
Cable	N/A	N/A	N/A	N/A	N/A	☒
Adapter	N/A	N/A	N/A	N/A	N/A	☒

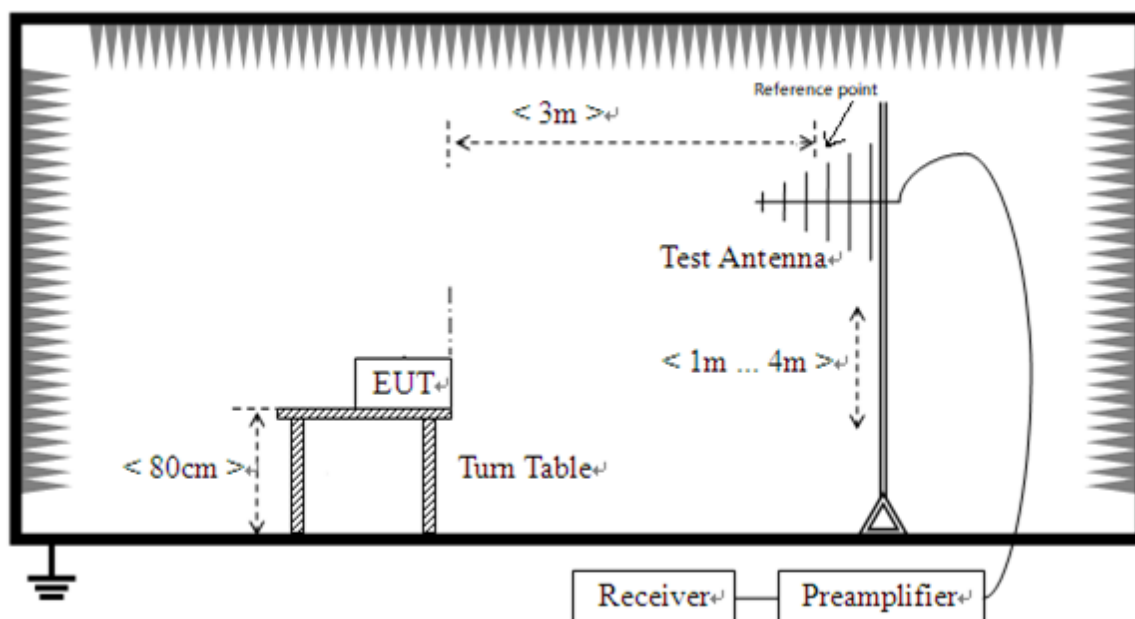
4.2 Test Configurations

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

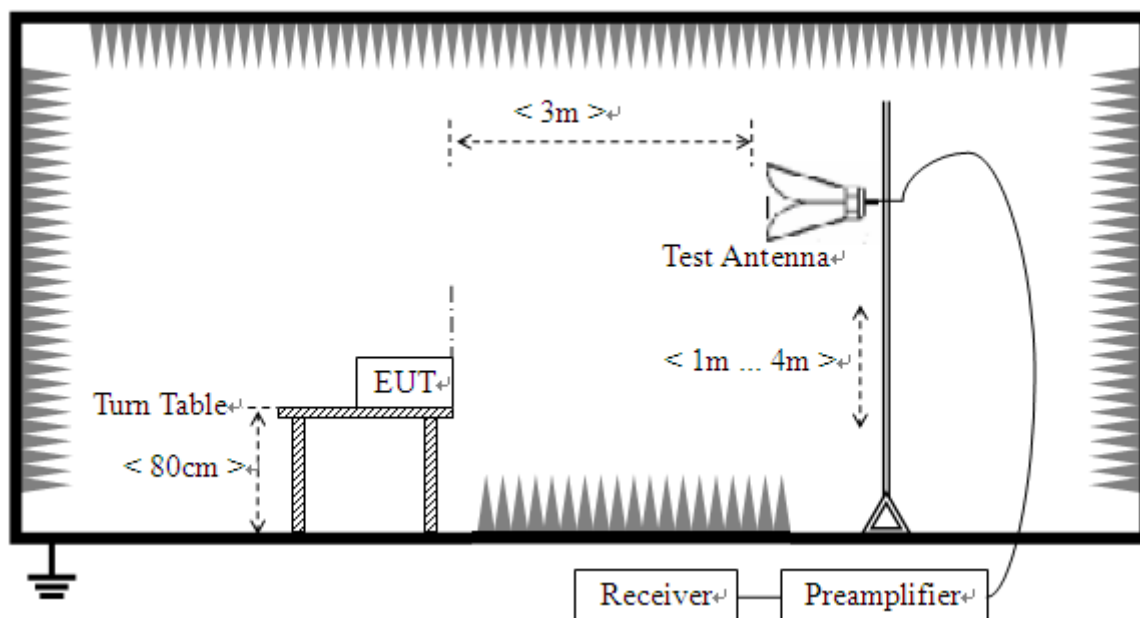
Test Mode Configuration	Description
Mode 1	<u>The Normal Working Test Mode</u> EUT + Adapter + Cable + Circuit board + Antenna

4.3 Test Setups

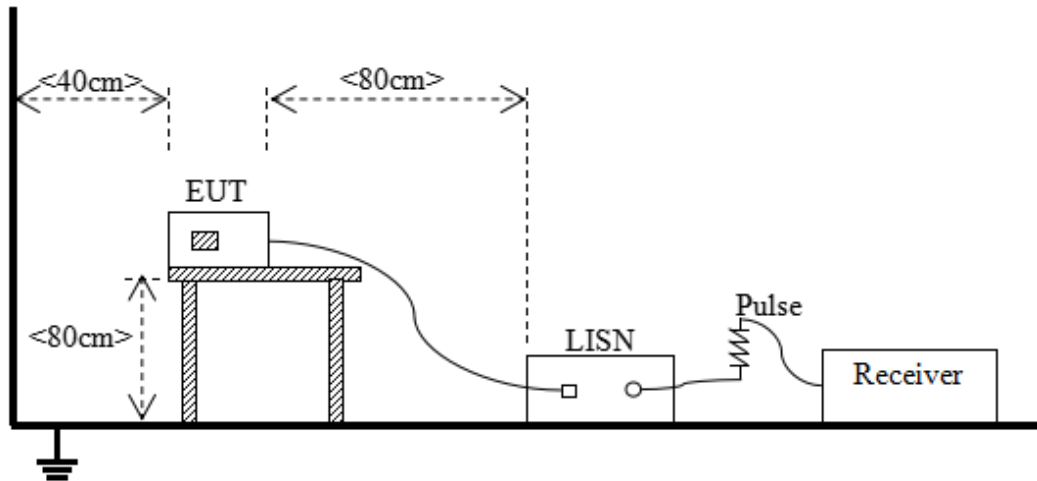
Test Setup 1



Radiated Emission (30 MHz-1 GHz)



Radiated Emission (above 1 GHz)

Test Setup 2

Conducted Emissions, 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) For 30 MHz to 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

Refer to 4.3 section (test setup 1) for radiated emission test, the photo of test setup please refer to ANNEX B.

5.1.1.3 Test Procedure

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.

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.

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.

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) + 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, AC Ports

5.1.2.1 Test Limit

Frequency range (MHz)	Class A	
	Quasi-peak (dB μ V)	Average (dB μ V)
0.15 - 0.50	79	66
0.50 - 30	73	60

Frequency range (MHz)	Class B	
	Quasi-peak (dB μ V)	Average (dB μ V)
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	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.

5.1.2.2 Test Setup

Refer to 4.3 section test (test setup 2) for conducted emission, the photo of test setup please refer to ANNEX B.

5.1.2.3 Test Procedure

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.

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.

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

A.1 Radiated Emission

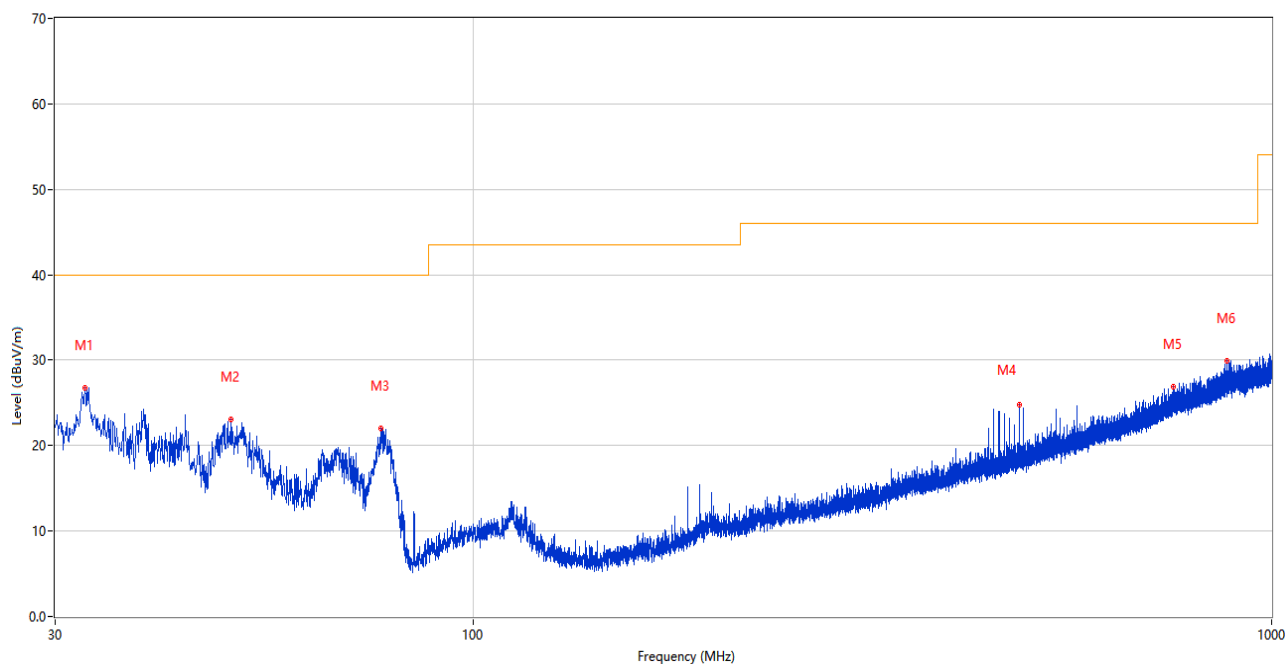
Note 1: The symbol of “--” in the table which means not application.

Note 2: For the test data above 1 GHz, according the ANSI C63.4-2014, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Sample No.	S10	Temperature	22.7℃
Humidity	39%RH	Pressure	101kPa
Test Engineer	He Shichang	Test Date	2025.01.04

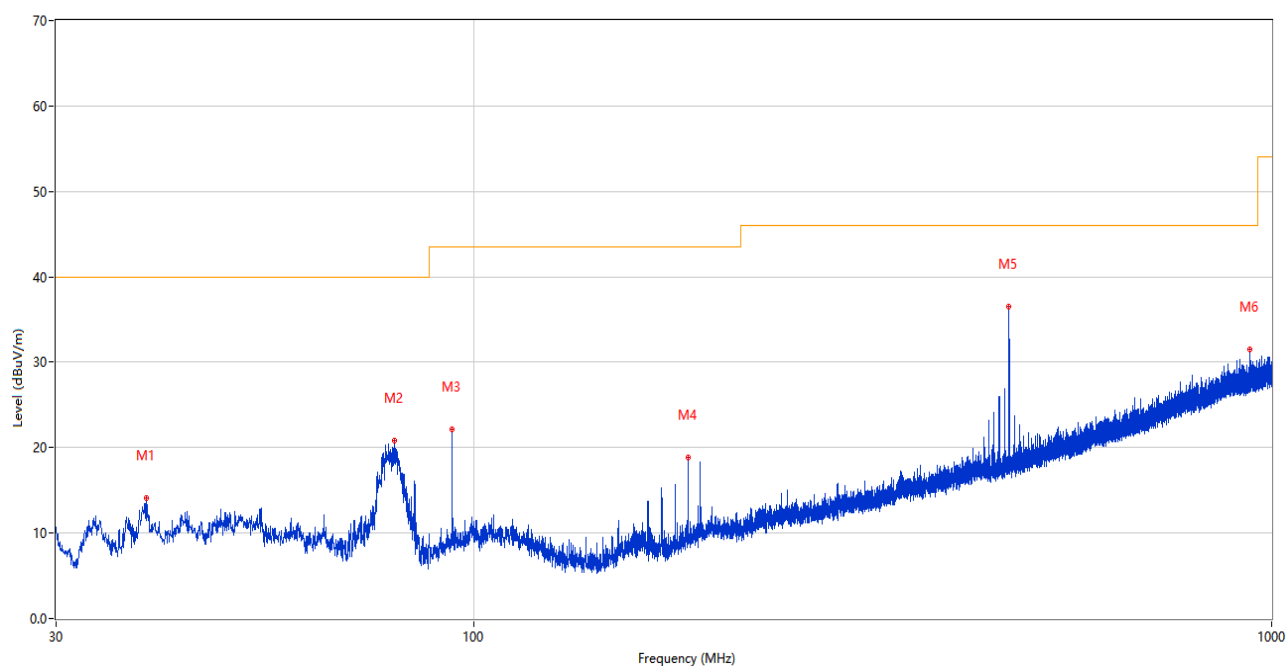
Test Mode 1

1) Test Antenna Vertical, 30 MHz – 1 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	32.716	26.79	-28.74	40.0	13.21	Peak	78.00	100	Vertical	Pass
2	49.837	23.12	-25.62	40.0	16.88	Peak	183.00	100	Vertical	Pass
3	76.705	22.07	-30.94	40.0	17.93	Peak	311.00	100	Vertical	Pass
4	482.747	24.78	-19.15	46.0	21.22	Peak	174.00	100	Vertical	Pass
5	753.329	26.95	-12.72	46.0	19.05	Peak	97.00	100	Vertical	Pass
6	877.974	29.94	-10.30	46.0	16.06	Peak	125.00	100	Vertical	Pass

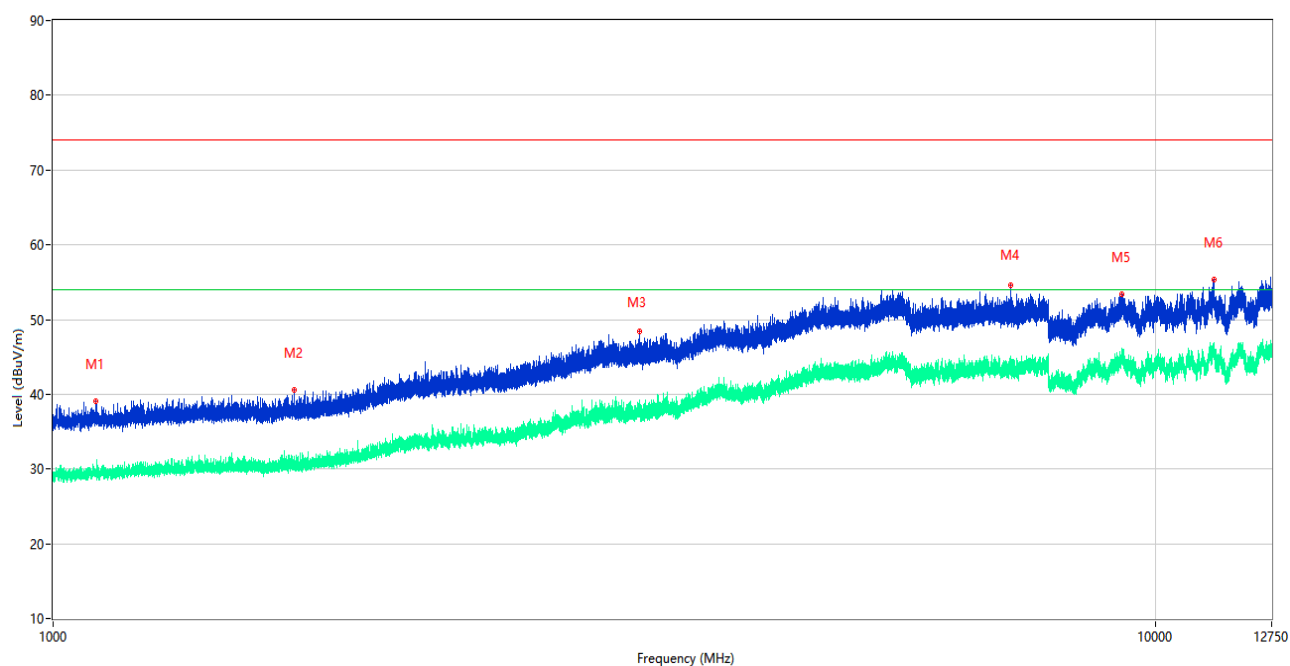
2) Test Antenna Horizontal, 30 MHz – 1 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	38.924	14.15	-26.82	40.0	25.85	Peak	176.00	200	Horizontal	Pass
2	79.567	20.83	-30.96	40.0	19.17	Peak	335.00	200	Horizontal	Pass
3	94.068	22.12	-27.53	43.5	21.38	Peak	92.00	200	Horizontal	Pass
4	185.685	18.90	-27.71	43.5	24.60	Peak	90.00	100	Horizontal	Pass
5	468.974	36.55	-19.41	46.0	9.45	Peak	72.00	200	Horizontal	Pass
6	937.726	31.44	-9.42	46.0	14.56	Peak	176.00	200	Horizontal	Pass

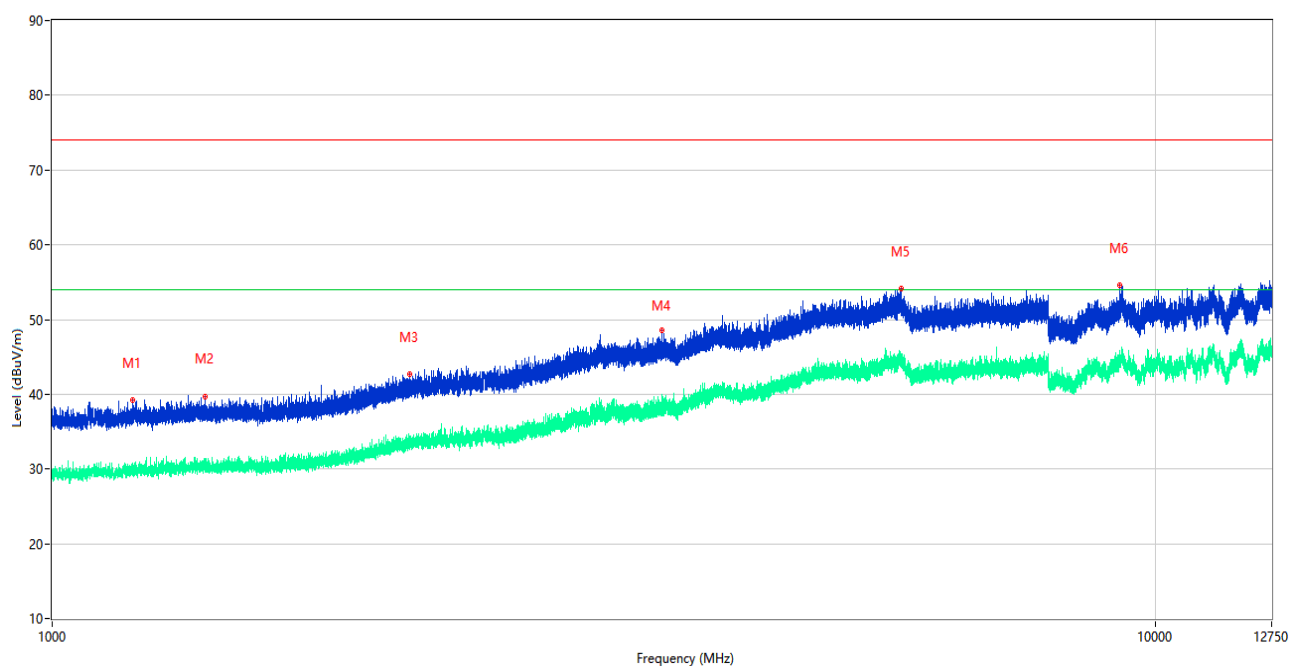
Equipment Information						
Equipment Name	Supplier	Model	Serial No.	Cal. Date	Cal. Due	Use
Frequency Below 1 GHz						
EMI Receiver	Keysight	N9038A	MY55330120	2024.08.01	2025.07.31	☒
Amplifier (30-1GHz)	COM-MV	ZT30-1000M	B2017119081	2024.11.28	2025.11.27	☒
Test Antenna- Bi-Log	SCHWARZB ECK	VULB 9168	9168-00867	2022.04.12	2025.04.11	☒
Anechoic Chamber (#2)	YiHeng	9m*6m*6m	142	2024.07.21	2027.07.20	☒
Description	Supplier	Name	Version	/		Use
Test Software	BALUN	BL410-E	V22.930	/		☒

3) Test Antenna Vertical, 1 GHz – 12.75 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1093.080	39.08	-15.81	74.0	34.92	Peak	353.00	100	Vertical	Pass
1**	1093.080	29.72	-15.81	54.0	24.28	AV	353.00	100	Vertical	Pass
2	1655.330	40.61	-15.47	74.0	33.39	Peak	360.00	100	Vertical	Pass
2**	1655.330	30.10	-15.47	54.0	23.90	AV	360.00	100	Vertical	Pass
3	3403.310	48.40	-5.24	74.0	25.60	Peak	143.00	100	Vertical	Pass
3**	3403.310	38.11	-5.24	54.0	15.89	AV	143.00	100	Vertical	Pass
4	7391.920	54.57	0.08	74.0	19.43	Peak	91.00	100	Vertical	Pass
4**	7391.920	43.23	0.08	54.0	10.77	AV	91.00	100	Vertical	Pass
5	9321.213	53.43	2.18	74.0	20.57	Peak	260.00	100	Vertical	Pass
5**	9321.213	45.27	2.18	54.0	8.73	AV	260.00	100	Vertical	Pass
6	11304.337	55.33	2.28	74.0	18.67	Peak	106.00	100	Vertical	Pass
6**	11304.337	45.85	2.28	54.0	8.15	AV	106.00	100	Vertical	Pass

4) Test Antenna Horizontal, 1 GHz – 6 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1183.950	39.25	-15.87	74.0	34.75	Peak	310.00	100	Horizontal	Pass
1**	1183.950	29.31	-15.87	54.0	24.69	AV	310.00	100	Horizontal	Pass
2	1375.960	39.73	-15.46	74.0	34.27	Peak	0.00	100	Horizontal	Pass
2**	1375.960	30.51	-15.46	54.0	23.49	AV	0.00	100	Horizontal	Pass
3	2106.950	42.70	-12.49	74.0	31.30	Peak	183.00	100	Horizontal	Pass
3**	2106.950	33.36	-12.49	54.0	20.64	AV	183.00	100	Horizontal	Pass
4	3573.610	48.60	-4.63	74.0	25.40	Peak	254.00	100	Horizontal	Pass
4**	3573.610	37.67	-4.63	54.0	16.33	AV	254.00	100	Horizontal	Pass
5	5886.240	54.18	2.23	74.0	19.82	Peak	42.00	100	Horizontal	Pass
5**	5886.240	44.64	2.23	54.0	9.36	AV	42.00	100	Horizontal	Pass
6	9289.862	54.52	2.05	74.0	19.48	Peak	49.00	100	Horizontal	Pass
6**	9289.862	43.96	2.05	54.0	10.04	AV	49.00	100	Horizontal	Pass

Equipment Information						
Equipment Name	Supplier	Model	Serial No.	Cal. Date	Cal. Due	Use
Frequency Above 1 GHz						
EMI Receiver	Keysight	N9038A	MY55330120	2024.08.01	2025.07.31	☒
Amplifier (1-12GHz)	Advanced Microwave	WLA652A	1740103	2024.11.28	2025.11.27	☒
Amplifier (0.8-21GHz)	Mini-Circuits	ZVA-213-S+	225321316	2024.11.28	2025.11.27	☒
Test Antenna- Horn	SCHWARZB ECK	BBHA 9120D	01917	2022.06.09	2025.06.08	☒
Anechoic Chamber (#2)	YiHeng	9m*6m*6m	142	2024.07.21	2027.07.20	☒
Description	Supplier	Name	Version	/		Use
Test Software	BALUN	BL410-E	V22.930	/		☒

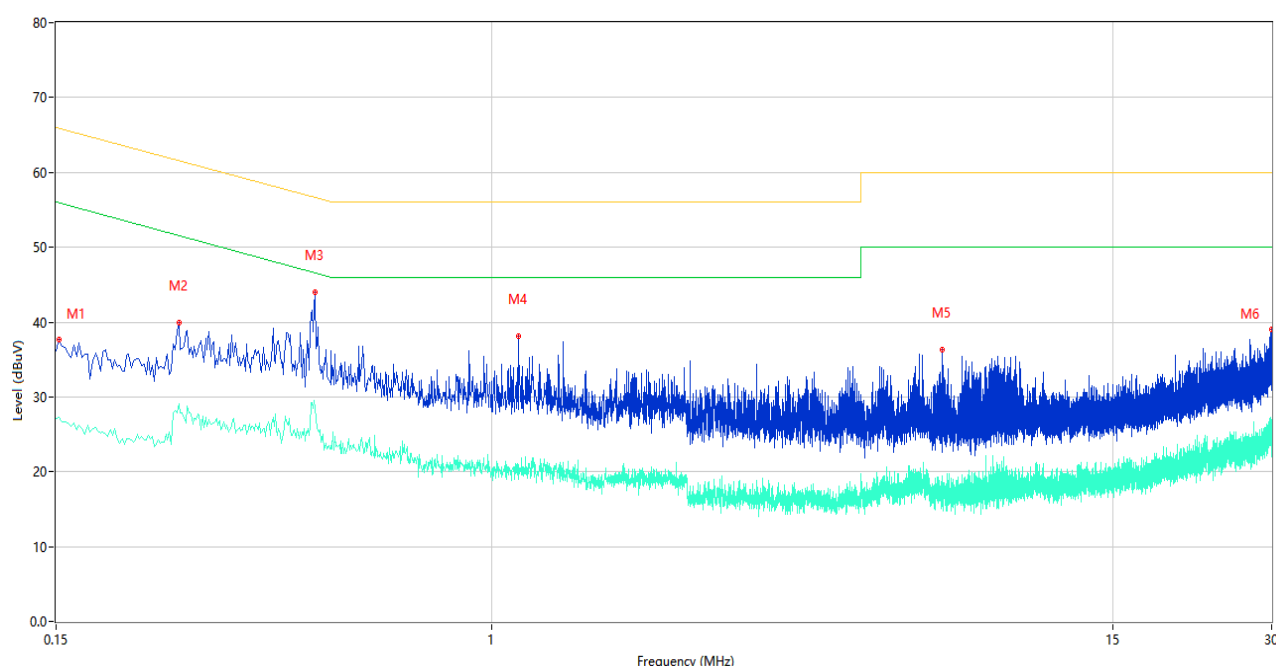
A.2 Conducted Emission, AC Ports

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.	S10	Temperature	22.2℃
Humidity	42%RH	Pressure	101kPa
Test Engineer	Yangyang	Test Date	2025.01.04

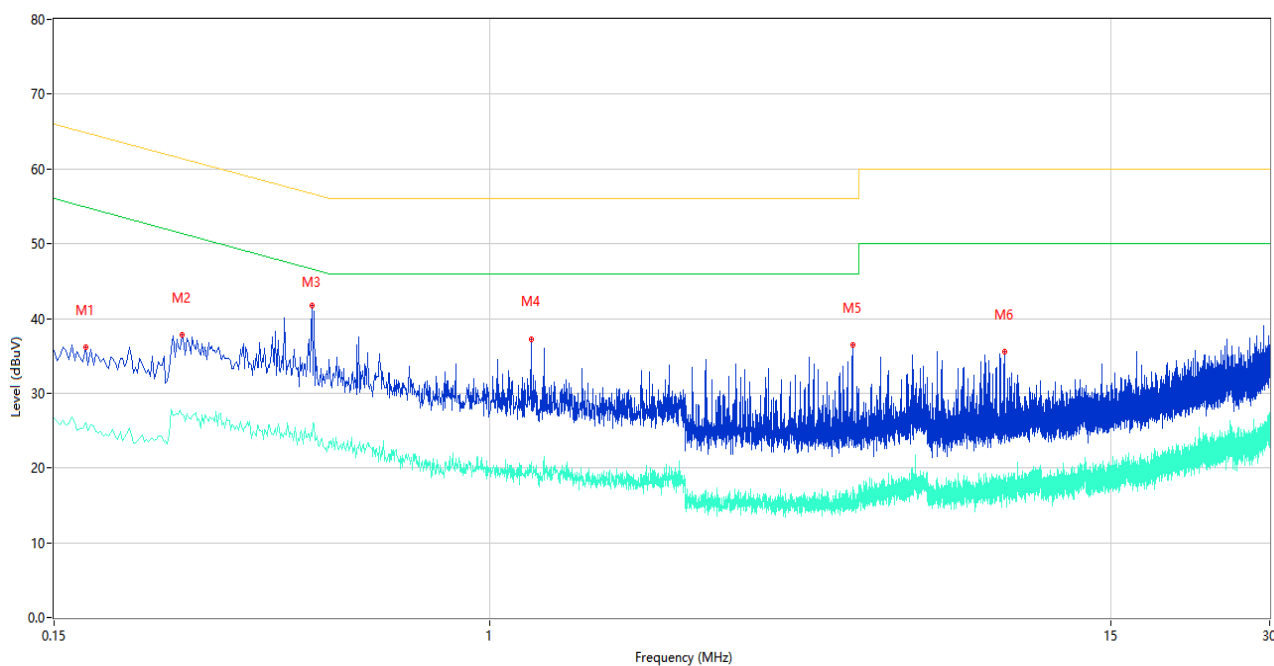
Test Mode 1

1) AC Ports - L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.152	37.63	10.12	65.89	28.26	Peak	L	Pass
1**	0.152	27.26	10.12	55.89	28.63	AV	L	Pass
2	0.256	39.88	10.03	61.56	21.68	Peak	L	Pass
2**	0.256	29.05	10.03	51.56	22.51	AV	L	Pass
3	0.464	44.01	10.48	56.62	12.61	Peak	L	Pass
3**	0.464	28.61	10.48	46.62	18.01	AV	L	Pass
4	1.126	38.06	10.42	56.00	17.94	Peak	L	Pass
4**	1.126	20.89	10.42	46.00	25.11	AV	L	Pass
5	7.128	36.35	11.36	60.00	23.65	Peak	L	Pass
5**	7.128	18.63	11.36	50.00	31.37	AV	L	Pass
6	29.976	39.06	17.40	60.00	20.94	Peak	L	Pass
6**	29.976	26.30	17.40	50.00	23.70	AV	L	Pass

2) AC Ports - N Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.172	36.19	10.06	64.86	28.67	Peak	N	Pass
1**	0.172	26.04	10.06	54.86	28.82	AV	N	Pass
2	0.262	37.78	10.03	61.37	23.59	Peak	N	Pass
2**	0.262	27.14	10.03	51.37	24.23	AV	N	Pass
3	0.462	41.80	10.49	56.66	14.86	Peak	N	Pass
3**	0.462	24.22	10.49	46.66	22.44	AV	N	Pass
4	1.200	37.28	10.76	56.00	18.72	Peak	N	Pass
4**	1.200	20.84	10.76	46.00	25.16	AV	N	Pass
5	4.886	36.41	11.26	56.00	19.59	Peak	N	Pass
5**	4.886	17.41	11.26	46.00	28.59	AV	N	Pass
6	9.438	35.54	12.09	60.00	24.46	Peak	N	Pass
6**	9.438	18.68	12.09	50.00	31.32	AV	N	Pass

Equipment Information						
Equipment Name	Supplier	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	KEYSIGHT	N9010B	MY57110309	2024.08.01	2025.07.31	☒
LISN	SCHWARZB ECK	NSLK 8127	8127-687	2024.05.09	2025.05.08	☒
ISN	TESEQ	ISN T800	34449	2024.11.06	2025.11.05	☐
ISN	TESEQ	ISN T8-Cat6	53561	2024.04.24	2025.04.23	☐
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-SZ24C1239-AE.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ24C1239-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ24C1239-AI.PDF”.

Statement

1. The laboratory 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. The report without China inspection body and laboratory Mandatory Approval (CMA) mark has no effect of proving to the society.
3. For the report with CNAS mark or A2LA mark, the items marked with "☆" are not within the accredited scope.
4. This report is invalid if it is altered, without the signature of the testing and approval personnel, or without the "inspection and testing dedicated stamp" or test report stamp.
5. The test data and results are only valid for the tested samples provided by the customer.
6. This report shall not be partially reproduced without the written permission of the laboratory.
7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--