TEST REPORT

Applicant:	Nice North America LLC
Address:	5919 Sea Otter Place, Suite 100, Carlsbad, CA 92010 USA
Equipment Type:	Tilt Sensor
Model Name:	2GIG-TILT100-345
Brand Name:	2GIG
FCC ID:	EF400254
Test Standard:	47 CFR Part 15 Subpart B ICES-003 (Issue 7,October 15, 2020) ANSI C63.4-2014
Sample Arrival Date:	Feb. 25, 2025
Test Date:	Feb. 25, 2025
Date of Issue:	Mar. 24, 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 Content
Rev. 01	Mar. 18, 2025	Initial Issue
Rev. 02	Mar. 24, 2025	Added antenna annotations for internal photos.

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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. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Nice North America LLC
Address	5919 Sea Otter Place, Suite 100, Carlsbad, CA 92010 USA

2.2 Manufacturer Information

Manufacturer	Nice North America LLC
Address	5919 Sea Otter Place, Suite 100, Carlsbad, CA 92010 USA

2.3 General Description for Equipment under Test (EUT)

EUT Name	Tilt Sensor
Model Name Under Test	2GIG-TILT100-345
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	X2
Software Version	X1
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Ancillary Equipment

Ancillary Equipment 1	Battery	
	Brand Name	N/A
	Model No.	CR2450
	Serial No.	N/A
	Capacity	600 mAh
	Rated Voltage	3 V
	Limit Charge Voltage	N/A

2.5 Technical Information

Network and Wireless connectivity	345MHz
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	ICES-003 (Issue 7,October 15, 2020)	Information Technology Equipment (Including Digital Apparatus)
3	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	ISED Rule	Test Verdict	Remark
1	Radiated Emission	15.109	ICES-003, 3.2.2	Pass	--
2	Conducted Emission, AC Ports	15.107	ICES-003, 3.2.1	N/A	Note 1
Note 1: The EUT has no AC Port, so this test item is not applicable.					

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
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

Note: Not applicable.

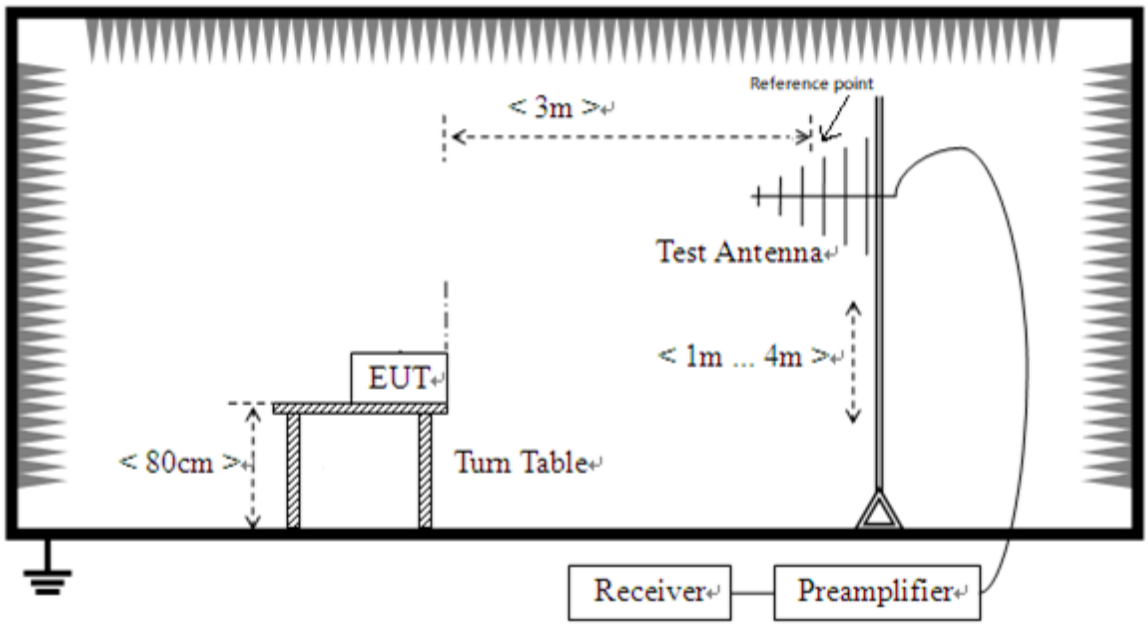
4.2 Test Configurations

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

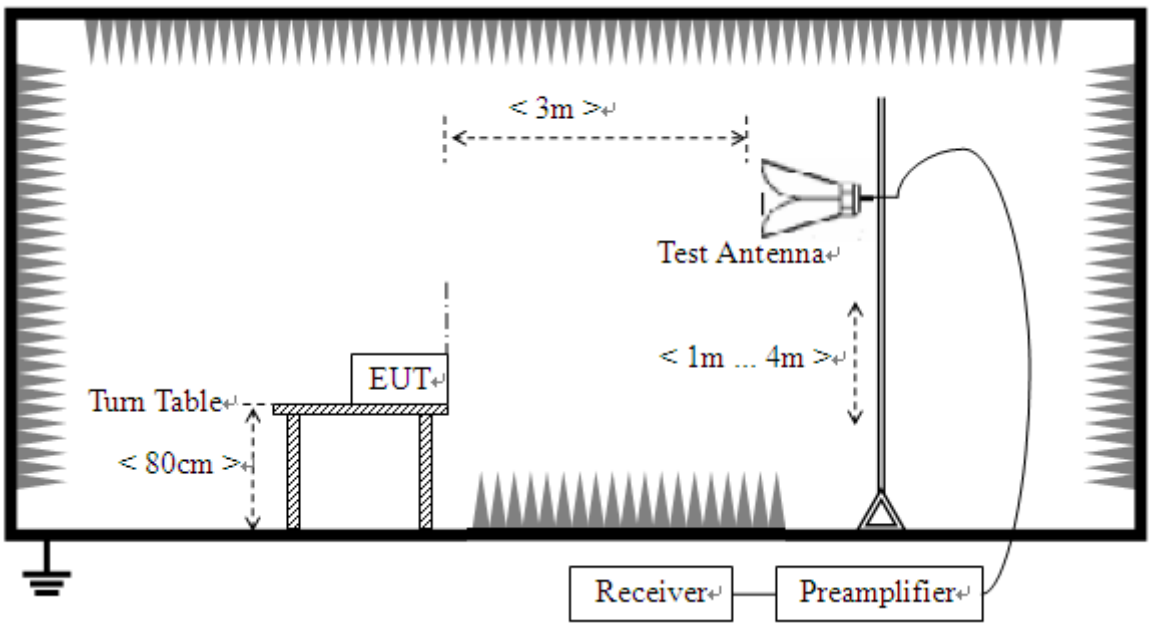
Test Mode Configuration	Description
Mode 1	The Working Test Mode EUT + Battery

4.3 Test Setups

Test Setup 1

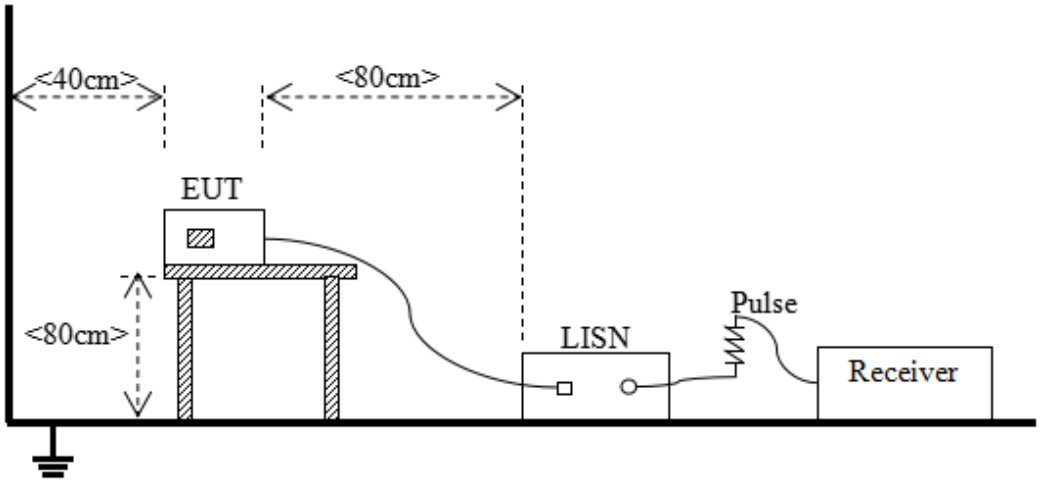


Radiated Emission (30 MHz-1 GHz)



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

FCC:

Frequency range (MHz)	Class B (at 3 m)		Class A (at 3 m)
	Field Strength (μV/m)	Field Strength (dBμV/m)	Field Strength (dBμV/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 (dBμV/m) = 20*log [Field Strength (μV/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 (μV/m)	Field Strength Average (dBμV/m)	Field Strength Peak (dBμV/m)	Field Strength Average (dBμV/m)	Field Strength Peak (dBμV/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: $L_{3m} = L_{10m} + 20*\log(d_{10m}/d_{3m})$ 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*log(10/3)=60 (dBμV/m).					

Highest internal frequency (F_X)	Highest measurement frequency (F_M)
$F_X \leq$ 108 MHz	1 GHz
108 MHz $\leq F_X \leq$ 500 MHz	2 GHz
500 MHz $\leq F_X \leq$ 1 GHz	5 GHz
$F_X \geq$ 1 GHz	5 *F_X

Highest internal frequency (F_X)	Highest measurement frequency (F_M)
	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.	

IC:

Frequency range (MHz)	Class A (3 m)	Class B (3 m)
	Quasi-peak (dBμV/m)	Quasi-peak (dBμV/m)
30 - 88	50.0	40.0
88 - 216	54.0	43.5
216 - 230	56.9	46.0
230 - 960	57.0	47.0
960 - 1000	60.0	54.0
Note: The more stringent limit applies at transition frequencies.		

Frequency range (GHz)	Class A (3 m)		Class B (3 m)	
	Average (dBμV/m)	Peak (dBμV/m)	Average (dBμV/m)	Peak (dBμV/m)
1 - F_M	60	80	54	74
Note: 1. The highest measurement frequency, F_M, in GHz, shall be determined as next Table. 2. The measurement bandwidth shall be 1 MHz or greater. 3. These limit levels apply for a measurement distance of 3 m. If using a different measurement distance, the measured levels shall be extrapolated to the 3 m limit distance using a factor of 20 dB per decade of distance. The measurement distance shall place the measurement antenna in the far field of the ITE or digital apparatus under test. 4. The test site shall have been validated at the distance used for radiated emission measurements on the ITE or digital apparatus under test.				

Highest internal frequency (F_X)	Highest measurement frequency (F_M)
$F_X \leq 108$ MHz	1GHz
108 MHz $\leq F_X \leq$ 500 MHz	2GHz
500 MHz $\leq F_X \leq$ 1 GHz	5GHz
$F_X \geq$ 1 GHz	5 *F_X up to a maximum of 40 GHz
Note: F_X is the highest fundamental frequency generated and/or used in the ITE or digital apparatus under test.	

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

The test employing the methods of measurement described in the publication referenced in ICES-003 Section 3(b) (ANSI C63.4) and ANSI C63.4;

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 ≥ 1 GHz, 100 kHz for f < 1 GHz

VBW ≥ RBW

Sweep = auto

Detector function = peak for f <1 GHz, peak & RMS Average for f ≥ 1 GHz

Trace = max hold

5.1.1.4 Test Result and Test Equipment List

Please refer to ANNEX A.1.

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

5.1.2 Conducted Emission, AC Ports

5.1.2.1 Test Limit

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

Frequency range (MHz)	Class B	
	Quasi-peak (dBμV)	Average (dBμV)
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.
3) The limit using ANSI C63.4.

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 test employing the methods of measurement described in the publication referenced in Section 3(b) (ANSI C63.4);

The EUT is connected to the power mains through a LISN which provides 50 Ω/50 μH 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 ≥ 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 (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 RESULTS

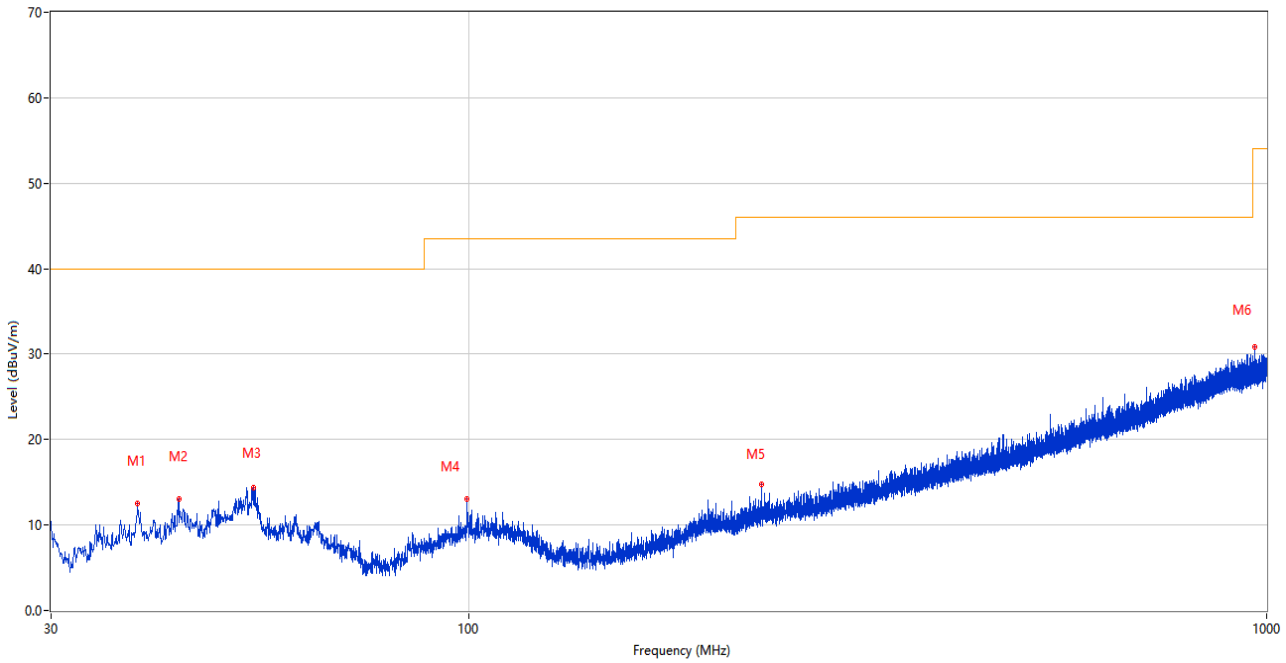
A.1 Radiated Emission

Note 1: 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.	S01	Temperature	22.7℃
Humidity	41%RH	Pressure	101kPa
Test Engineer	He Shichang	Test Date	2025.02.25

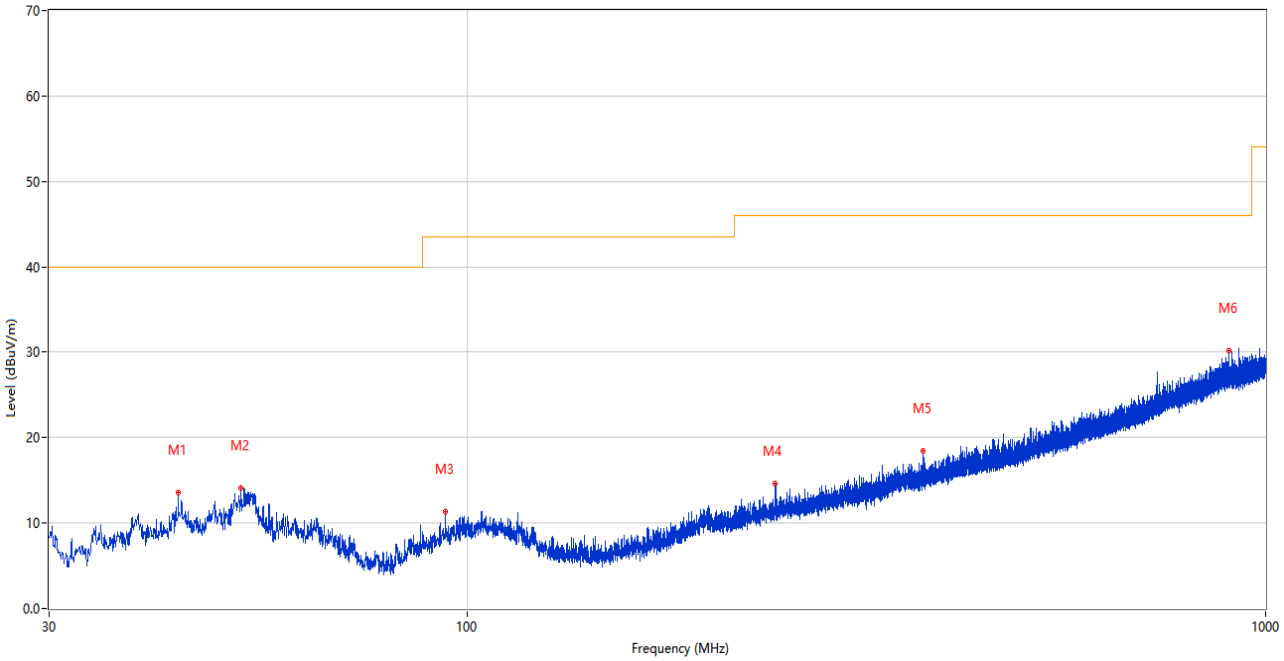
Test Mode 1

1) Test Antenna Vertical, 30 MHz – 1 GHz (FCC)



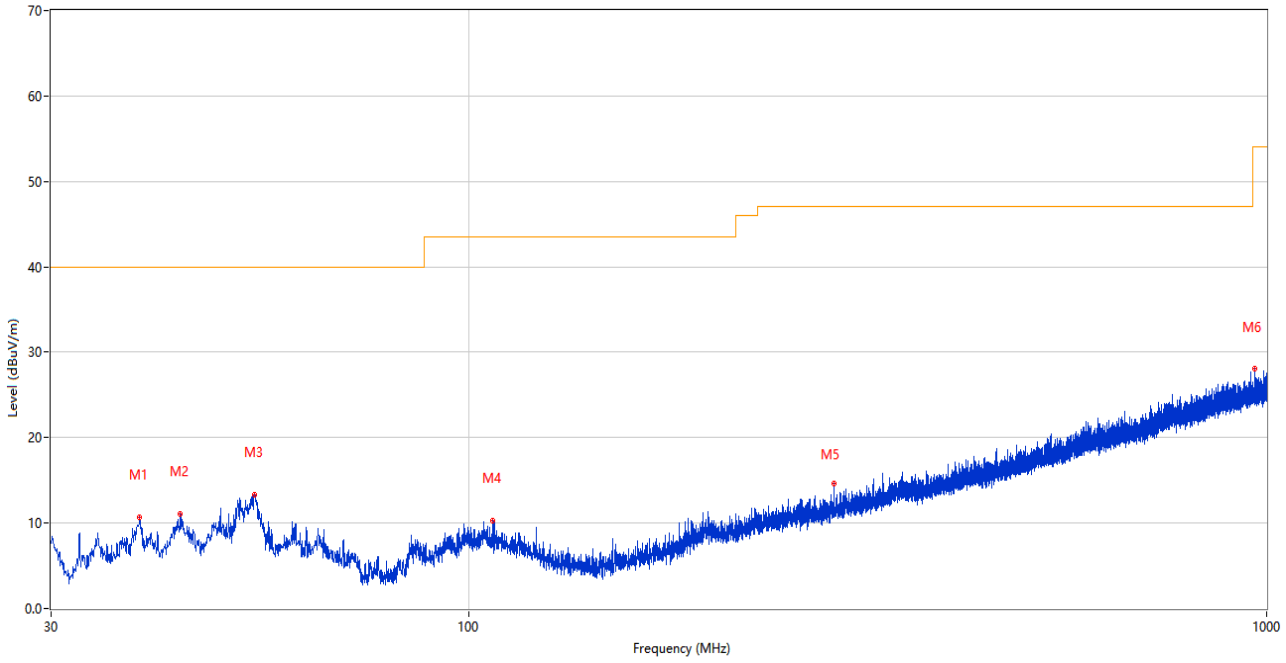
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	38.487	12.49	-25.87	40.0	27.51	Peak	139.00	100	Vertical	Pass
2	43.386	13.01	-25.28	40.0	26.99	Peak	359.00	200	Vertical	Pass
3	53.862	14.41	-25.07	40.0	25.59	Peak	354.00	200	Vertical	Pass
4	99.598	13.03	-26.69	43.5	30.47	Peak	98.00	100	Vertical	Pass
5	233.118	14.75	-25.43	46.0	31.25	Peak	110.00	100	Vertical	Pass
6	967.263	30.89	-9.07	54.0	23.11	Peak	214.00	200	Vertical	Pass

2) Test Antenna Horizontal, 30 MHz – 1 GHz (FCC)



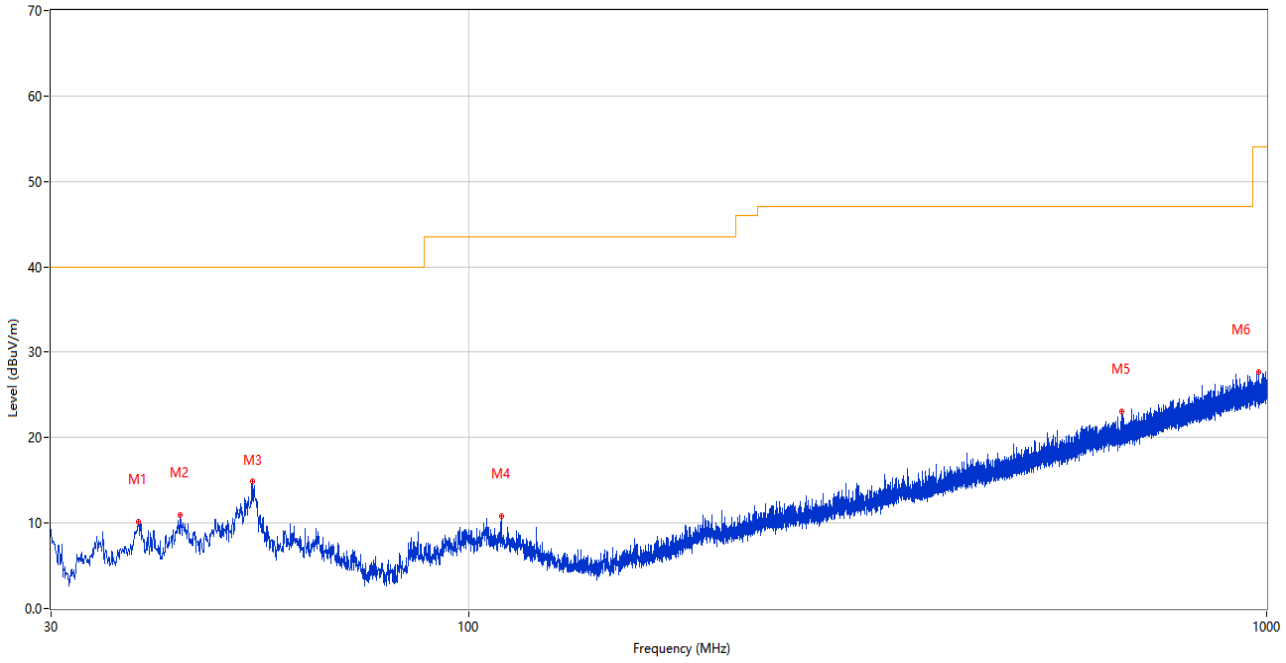
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	43.532	13.60	-25.22	40.0	26.40	Peak	90.00	200	Horizontal	Pass
2	52.164	14.13	-24.93	40.0	25.87	Peak	241.00	200	Horizontal	Pass
3	93.971	11.32	-27.52	43.5	32.18	Peak	25.00	200	Horizontal	Pass
4	243.497	14.69	-25.26	46.0	31.31	Peak	285.00	200	Horizontal	Pass
5	372.507	18.41	-21.86	46.0	27.59	Peak	302.00	100	Horizontal	Pass
6	900.721	30.25	-9.83	46.0	15.75	Peak	122.00	100	Horizontal	Pass

3) Test Antenna Vertical, 30 MHz – 1 GHz (IC)



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	38.730	10.73	-26.22	40.0	29.27	Peak	238.00	100	Vertical	Pass
2	43.580	11.12	-25.20	40.0	28.88	Peak	256.00	200	Vertical	Pass
3	54.008	13.35	-25.37	40.0	26.65	Peak	272.00	100	Vertical	Pass
4	107.260	10.30	-26.50	43.5	33.20	Peak	188.00	100	Vertical	Pass
5	287.147	14.57	-23.84	47.0	32.43	Peak	256.00	100	Vertical	Pass
6	965.226	28.08	-9.05	54.0	25.92	Peak	170.00	100	Vertical	Pass

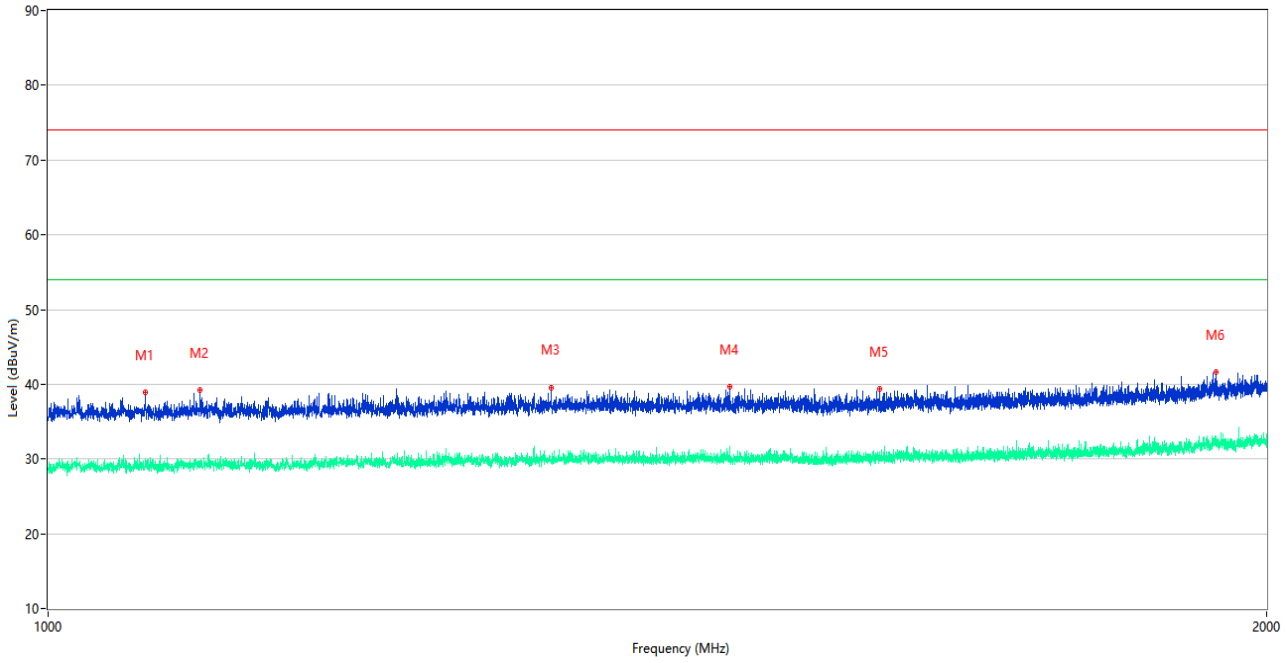
4) Test Antenna Horizontal, 30 MHz – 1 GHz (IC)



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	38.584	10.13	-25.78	40.0	29.87	Peak	114.00	100	Horizontal	Pass
2	43.532	10.95	-25.22	40.0	29.05	Peak	10.00	200	Horizontal	Pass
3	53.620	14.88	-25.15	40.0	25.12	Peak	348.00	200	Horizontal	Pass
4	109.880	10.79	-26.76	43.5	32.71	Peak	280.00	100	Horizontal	Pass
5	659.287	23.02	-14.92	47.0	23.98	Peak	289.00	200	Horizontal	Pass
6	977.836	27.65	-8.74	54.0	26.35	Peak	242.00	200	Horizontal	Pass

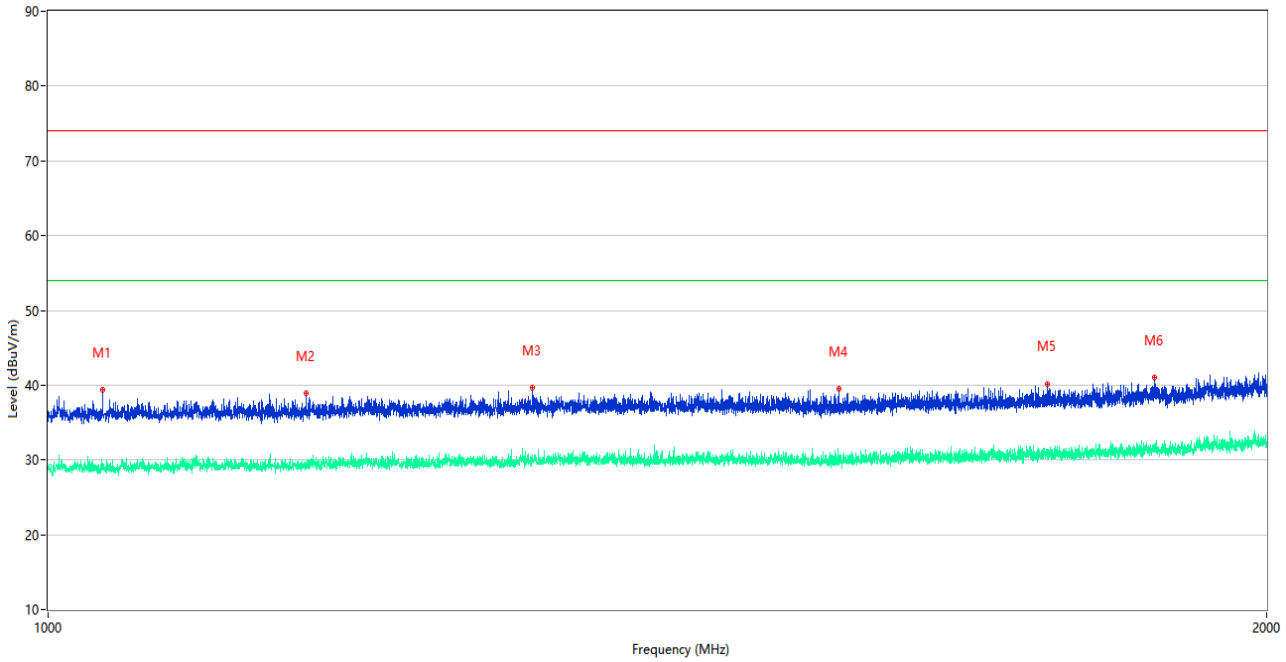
Equipment Information						
Equipment Name	Supplier	Model	Serial No.	Cal. Date	Cal. Due	Use
Frequency Below 1 GHz						
EMI Receiver	Keysight	N9038A	MY55330120	2024.08.01	2025.07.31	☒
Amplifier (30-1GHz)	COM-MV	ZT30-1000M	B2017119081	2024.11.28	2025.11.27	☒
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	9168-00867	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	/		☒

5) Test Antenna Vertical, 1 GHz – 2 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1056.680	38.97	-15.92	74.0	35.03	Peak	329.00	100	Vertical	Pass
1**	1056.680	28.99	-15.92	54.0	25.01	AV	329.00	100	Vertical	Pass
2	1090.480	39.17	-15.82	74.0	34.83	Peak	244.00	100	Vertical	Pass
2**	1090.480	29.73	-15.82	54.0	24.27	AV	244.00	100	Vertical	Pass
3	1331.240	39.60	-15.67	74.0	34.40	Peak	263.00	100	Vertical	Pass
3**	1331.240	29.85	-15.67	54.0	24.15	AV	263.00	100	Vertical	Pass
4	1473.330	39.65	-15.65	74.0	34.35	Peak	220.00	100	Vertical	Pass
4**	1473.330	29.97	-15.65	54.0	24.03	AV	220.00	100	Vertical	Pass
5	1604.760	39.37	-15.59	74.0	34.63	Peak	168.00	100	Vertical	Pass
5**	1604.760	30.96	-15.59	54.0	23.04	AV	168.00	100	Vertical	Pass
6	1942.760	41.67	-13.56	74.0	32.33	Peak	301.00	100	Vertical	Pass
6**	1942.760	33.06	-13.56	54.0	20.94	AV	301.00	100	Vertical	Pass

6) Test Antenna Horizontal, 1 GHz – 2 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	1031.460	39.41	-15.73	74.0	34.59	Peak	100.00	100	Horizontal	Pass
1**	1031.460	29.28	-15.73	54.0	24.72	AV	100.00	100	Horizontal	Pass
2	1157.950	38.90	-15.71	74.0	35.10	Peak	176.00	100	Horizontal	Pass
2**	1157.950	29.39	-15.71	54.0	24.61	AV	176.00	100	Horizontal	Pass
3	1317.460	39.66	-15.53	74.0	34.34	Peak	124.00	100	Horizontal	Pass
3**	1317.460	29.67	-15.53	54.0	24.33	AV	124.00	100	Horizontal	Pass
4	1567.710	39.57	-15.67	74.0	34.43	Peak	72.00	100	Horizontal	Pass
4**	1567.710	29.94	-15.67	54.0	24.06	AV	72.00	100	Horizontal	Pass
5	1765.700	40.20	-15.05	74.0	33.80	Peak	276.00	100	Horizontal	Pass
5**	1765.700	30.26	-15.05	54.0	23.74	AV	276.00	100	Horizontal	Pass
6	1876.070	41.03	-14.21	74.0	32.97	Peak	115.00	100	Horizontal	Pass
6**	1876.070	31.98	-14.21	54.0	22.02	AV	115.00	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	SCHWARZBECK	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: Not applicable.

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ2520841-AE.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ2520841-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ2520841-AI.PDF”.

Statement

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--END OF REPORT--