TEST REPORT

APPLICANT	:	NiceRF Wireless Technology LTD.
PRODUCT NAME	:	Wireless Module
MODEL NAME	:	RF4463Pro-433
BRAND NAME	:	G-NiceRF
STANDARD(S)	:	ICES-003
RECEIPT DATE	:	2024-11-29
TEST DATE	:	2024-12-04
ISSUE DATE	:	2024-12-26

Edited by: Chen Bilian

Chen Bilian(Rapporteur)

Approved by: Xiao Xiong

Xiao Xiong(Supervisor)

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MORLAB

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Change History		
Version	Date	Reason for change
1.0	2024-12-26	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	NiceRF Wireless Technology LTD.
Applicant Address:	309-314, Bldg A,Hongdu business building, Xin'an street, Zone 43, Baoan Dist, Shenzhen 518101, China
Manufacturer:	NiceRF Wireless Technology LTD.
Manufacturer Address:	309-314, Bldg A,Hongdu business building, Xin'an street, Zone 43, Baoan Dist, Shenzhen 518101, China

1.2. Equipment Under Test (EUT) Description

Product Name:	Wireless Module
EUT No.:	1#
Hardware Version:	V1.0
Software Version:	V1.0
Frequency Range:	433.5MHz

Note:

1. This test report derived from the FCC test report (Report No. : SZ20030282E01, model name: RF4463Pro-433-FCC). For CE, the test results in this report still refer to the test results of the FCC test report.
2. For a more detailed description, please refer to specification or user's manual supplied by the applicant and/or manufacturer.

2. Test Results

2.1. Applied Reference Documents

The objective of the report is to perform testing according to ICES-003:

No.	Identity	Document Title
1	ICES-003, Issue 7 October 2020	Information Technology Equipment (Including Digital Apparatus) – Limits and methods of measurement

Test detailed items/section required by IC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result	Method Determination Remark
1	ICES-003 3.2.1, Class B	Conducted Emission	2020.04.09	Huang Zhiye	PASS[Note 4]	No deviation
2	ICES-003 3.2.2, Class B	Radiated Emission	2024.12.04	Yuan Zihong	PASS	No deviation

Note 1: The tests were performed according to the method of measurements prescribed in ANSI C63.4-2014.

Note 2: Additions to, deviation, or exclusions from the method shall be judged in the “method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

Note 3: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

Note 4: The test results of these test items in this report refer to the test report (Report No.: SZ20030282E01).

2.2. EUT Setup and Operating Conditions

Test Item	
Radiated Emission	
Mode 2 :	EUT + 433MHz Idle + Battery + Working Mode
Conducted Emission	
Mode 1 :	EUT + Adapter + 433MHz Idle + Working Mode

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

Temperature (°C):	15 - 35
Relative Humidity (%):	30 - 60
Atmospheric Pressure (kPa):	86 - 106

3. ICES-003 Requirements

3.1. Conducted Emission

3.1.1. Requirement

According to ICES-003 section 3.2.1, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz 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)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

Note:

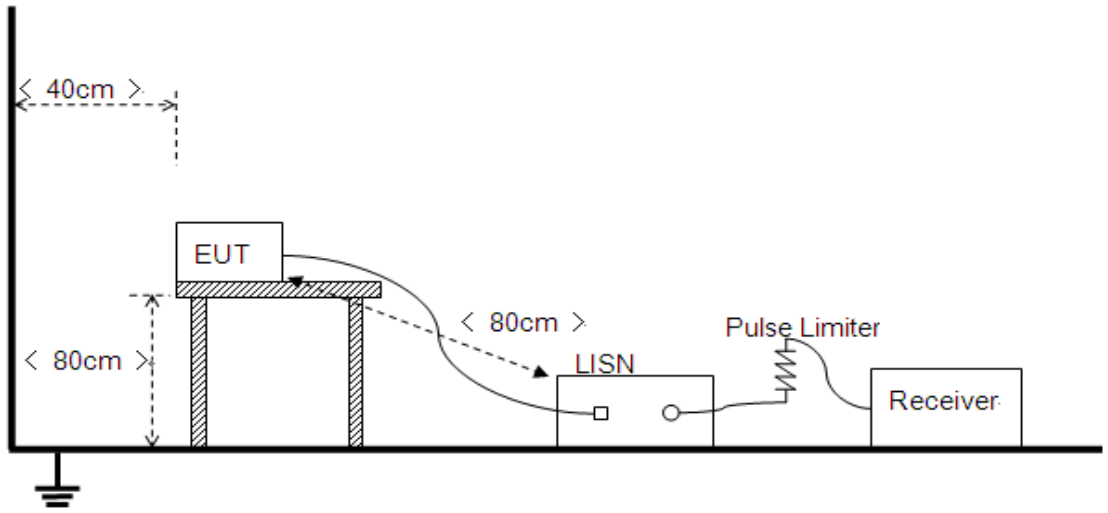
a) The limit subjects to the Class B digital device.

b) The lower limit shall apply at the band edges.

c) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

3.1.2. Test Setup

Please refer to Annex A for the photographs of the Test Configuration.



The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

The power strip or extension cord has been investigated to make sure that the LISN integrity in maintained with respect to the impedance characteristics as prescribed in ANSI C63.4-2014 at Clause 4.3.

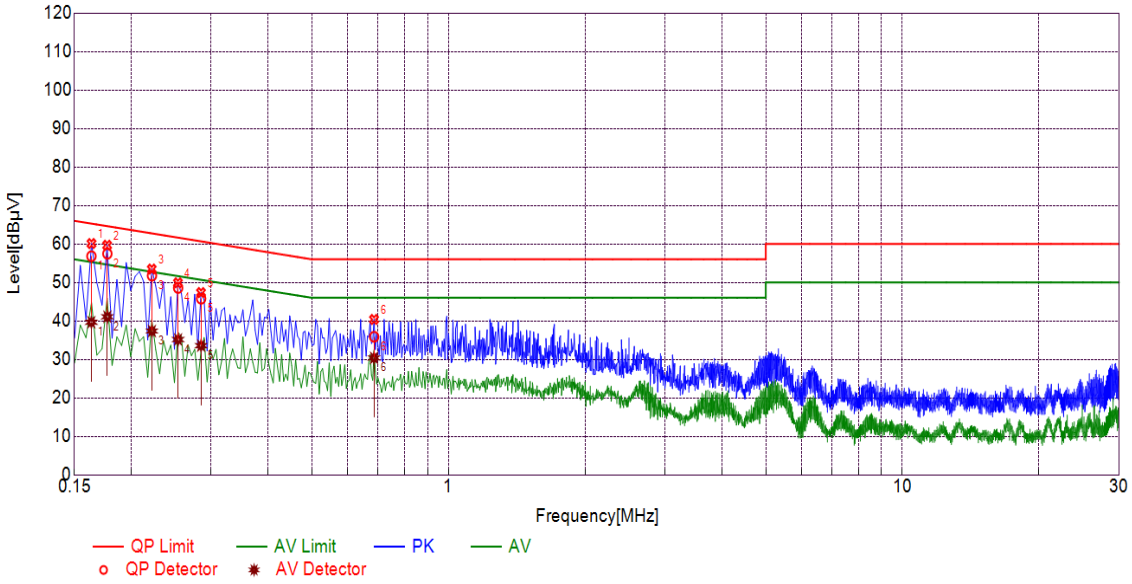
3.1.3. Test Result

Set RBW=9 kHz, VBW=30 kHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; 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. All test modes are considered, refer to recorded points and plots below.

The measurement results are obtained as below:
$E\ [dB\mu V] = U_R[dB\mu V] + L_{Cable\ loss}\ [dB] + A_{Factor}\ [dB]$
U_R: Receiver Reading
A_{Factor}: Voltage Division Factor of LISN
$L_{Cable\ loss}$: Correction Factor Contains Pulse Limiter and Cable

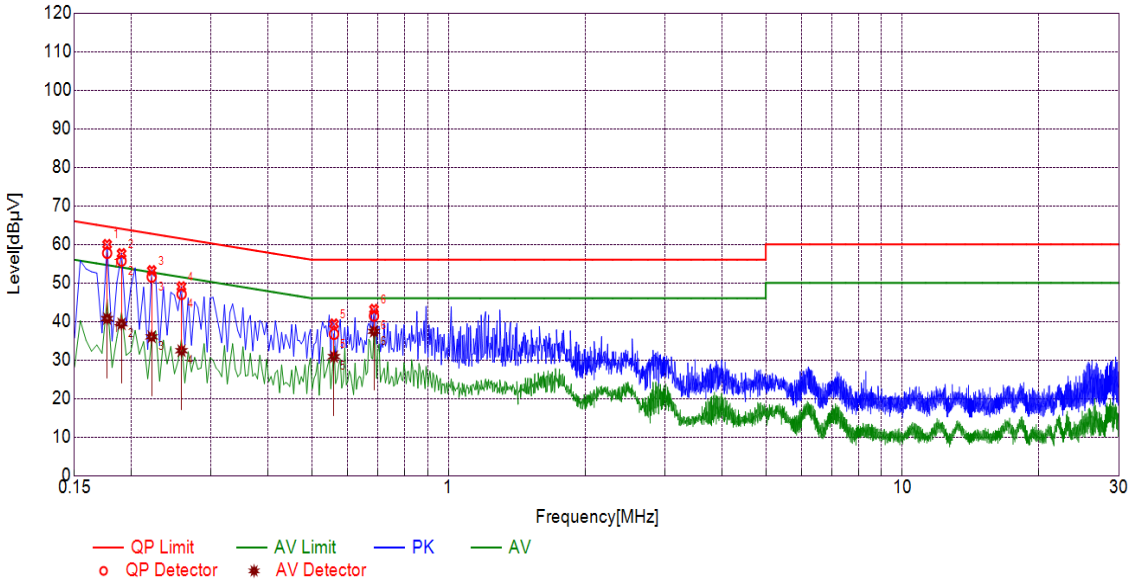
During the test, the total correction Factor $L_{Cable\ loss}$ and A_{Factor} were built in test software.

A. Test Plot and Suspicious Points:



(Plot A:L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quasi-peak	Average	Quasi-peak	Average		
1	0.1634	56.81	39.66	65.29	55.29	Line	PASS
2	0.1772	57.47	41.08	64.62	54.62		PASS
3	0.2222	51.76	37.37	62.74	52.74		PASS
4	0.2537	48.57	35.15	61.64	51.64		PASS
5	0.2851	45.78	33.57	60.67	50.67		PASS
6	0.6856	35.89	30.38	56.00	46.00		PASS



(Plot B: N Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quasi-peak	Average	Quasi-peak	Average		
1	0.1770	57.72	40.74	64.62	54.62	Neutral	PASS
2	0.1904	55.71	39.37	64.02	54.02		PASS
3	0.2219	51.55	36.02	62.75	52.75		PASS
4	0.2582	47.07	32.42	61.49	51.49		PASS
5	0.5594	36.72	30.88	56.00	46.00		PASS
6	0.6853	41.41	37.44	56.00	46.00		PASS

3.2. Radiated Emission

3.2.1. Requirement

According to ICES-003 3.2.2, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency range (MHz)	Class B Radiated Limit (dBμV/m)
	Quasi-Peak
30 – 88	40.0
88 – 216	43.5
216-230	46.0
230– 960	47.0
960 – 1000	54.0

3.2.2. Frequency range of measurement

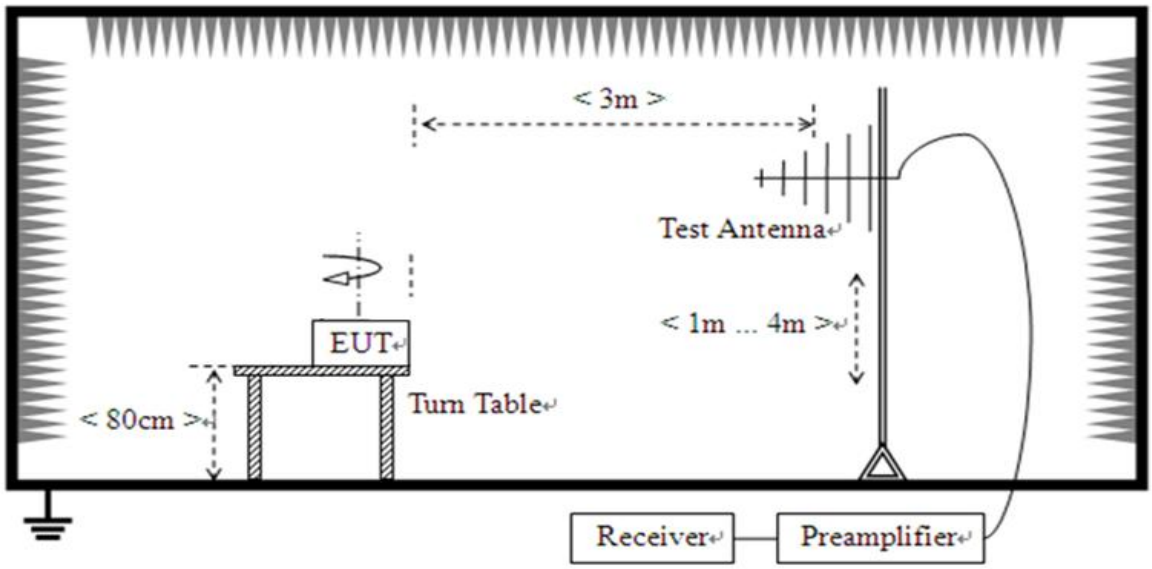
According to ICES-003 3.2.2, Radiated emissions from an ITE shall be measured from the lowest frequency generated, or used, in the device or 30 MHz, whichever is higher, up to the frequency determined in accordance with Table 3:

Table 3 — Frequency Range of Measurement

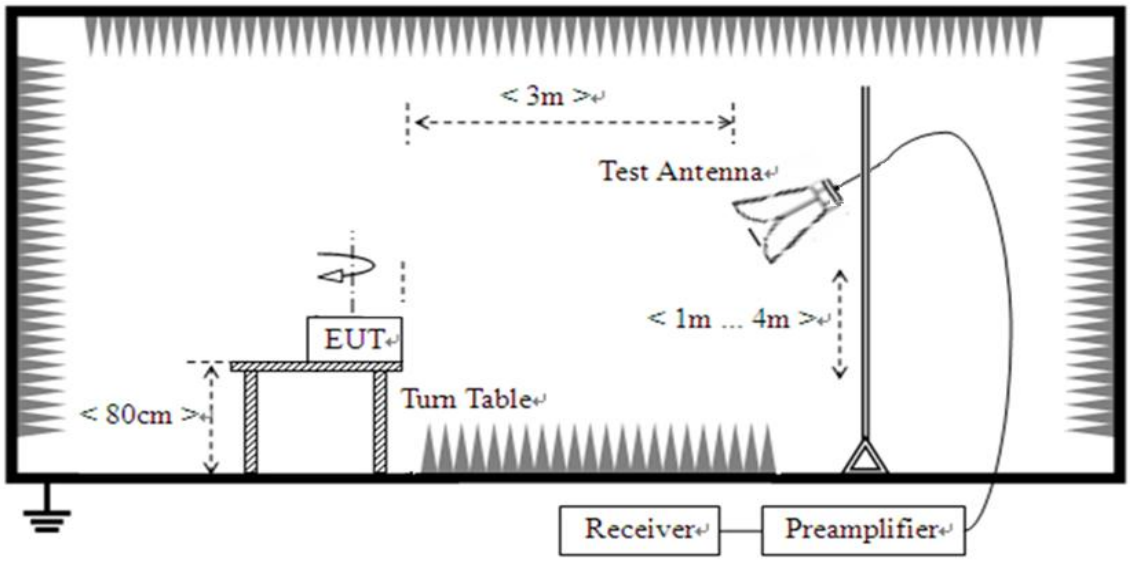
Highest Frequency Generated or Used in Device	Upper Frequency of Radiated Measurement
Below 1.705 MHz	No radiated testing required
1.705 MHz - 108 MHz	1 GHz
108 MHz - 500 MHz	2 GHz
500 MHz - 1 GHz	5 GHz
Above 1 GHz	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

3.2.3. Test Setup

1) For radiated emissions from 30MHz to 1GHz



2) For radiated emissions above 1GHz



The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of

the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

For the test Antenna:

In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz)are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested. For measurements above 1 GHz, keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

For measurements below 1GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video bandwidth is set to 3MHz for peak measurements and as applicable for average measurements.

3.2.4. Test Result

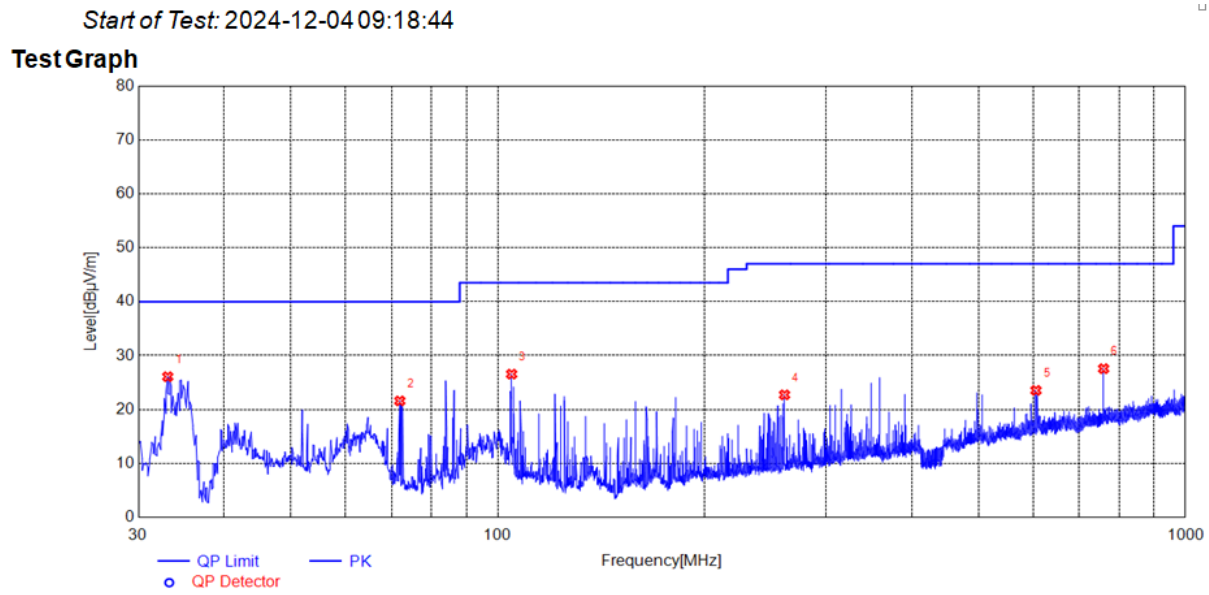
The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All test modes are considered, refer to recorded points and plots below.

The amplitude of emissions which are attenuated more than 20 dB below the permissible value need not be reported.

The measurement results are obtained as below:
$E\ [dB\mu V/m] = U_R\ [dB\mu V] + A_T[dB] + A_{Factor}\ [dB]$; $A_T = L_{Cable\ loss}\ [dB] - G_{preamp}\ [dB]$
A_T: Total correction Factor except Antenna
U_R: Receiver Reading
G_{preamp}: Preamplifier Gain
A_{Factor}: Antenna Factor at 3m

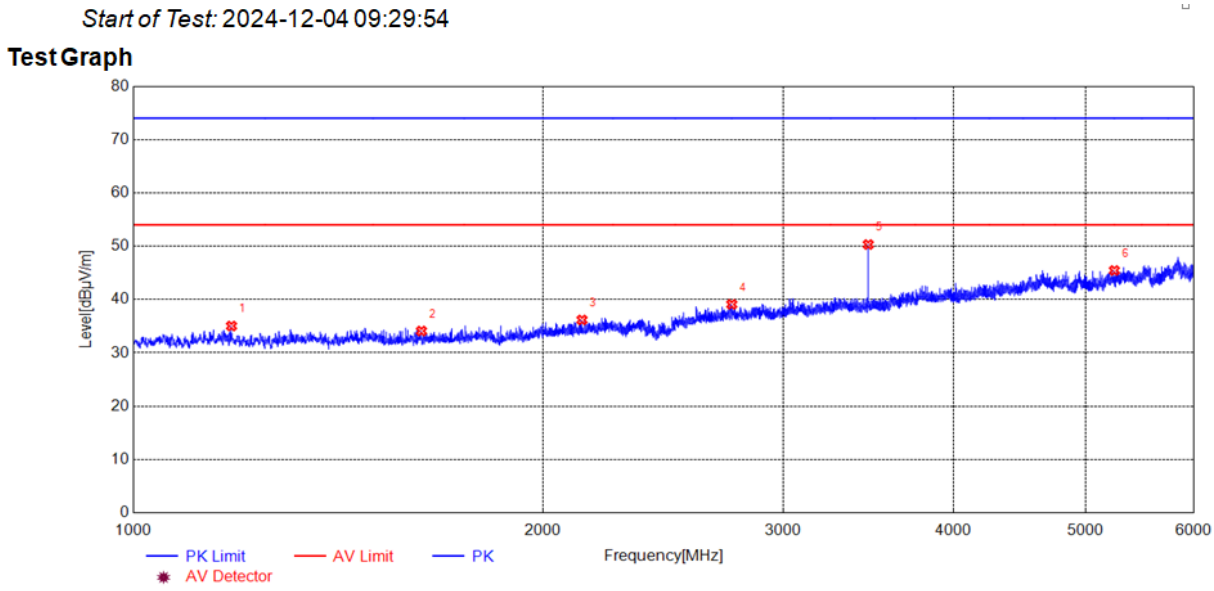
During the test, the total correction Factor A_T and A_{Factor} were built in test software.

Note: 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.



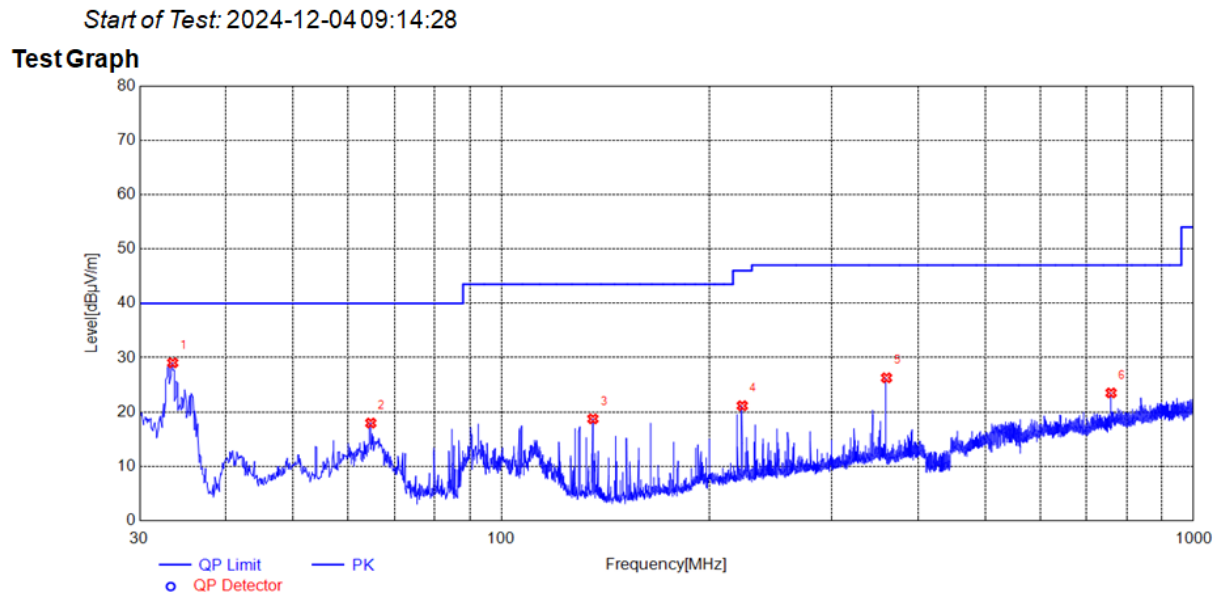
(Plot A: ANT-Vertical, 30MHz - 1GHz)

No.	Fre. MHz	Pk dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	33.1043	26.08	N.A	N.A	N.A	40.00	N.A	V	PASS
2	72.0052	21.59	N.A	N.A	N.A	40.00	N.A	V	PASS
3	104.6975	26.56	N.A	N.A	N.A	43.50	N.A	V	PASS
4	261.0771	22.72	N.A	N.A	N.A	47.00	N.A	V	PASS
5	606.0436	23.54	N.A	N.A	N.A	47.00	N.A	V	PASS
6	759.9980	27.57	N.A	N.A	N.A	47.00	N.A	V	PASS



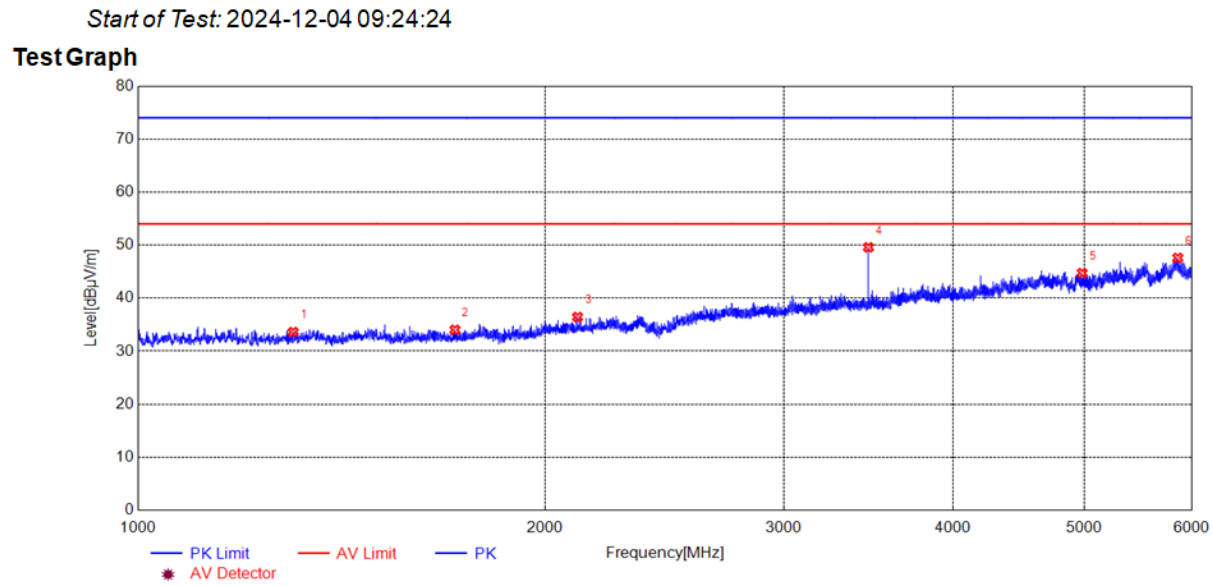
(Plot B: ANT-Vertical, 1GHz - 6GHz)

No.	Fre. MHz	Pk dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	1181.0000	35.03	N.A	N.A	74.00	N.A	54.00	V	PASS
2	1628.0000	34.10	N.A	N.A	74.00	N.A	54.00	V	PASS
3	2135.5000	36.18	N.A	N.A	74.00	N.A	54.00	V	PASS
4	2750.5000	39.09	N.A	N.A	74.00	N.A	54.00	V	PASS
5	3464.0000	50.32	N.A	N.A	74.00	N.A	54.00	V	PASS
6	5250.5000	45.45	N.A	N.A	74.00	N.A	54.00	V	PASS



(Plot C: ANT- Horizontal, 30MHz - 1GHz)

No.	Fre. MHz	Pk dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	33.4923	29.05	N.A	N.A	N.A	40.00	N.A	H	PASS
2	64.7295	17.97	N.A	N.A	N.A	40.00	N.A	H	PASS
3	135.5466	18.74	N.A	N.A	N.A	43.50	N.A	H	PASS
4	222.7583	21.15	N.A	N.A	N.A	46.00	N.A	H	PASS
5	360.0270	26.29	N.A	N.A	N.A	47.00	N.A	H	PASS
6	759.9980	23.51	N.A	N.A	N.A	47.00	N.A	H	PASS



(Plot D: ANT- Horizontal, 1GHz - 6GHz)

No.	Fre. MHz	Pk dBµV/m	QP dBµV/m	AV dBµV/m	Limit-PK dBµV/m	Limit-QP dBµV/m	Limit-AV dBµV/m	ANT	Verdict
1	1302.5000	33.62	N.A	N.A	74.00	N.A	54.00	H	PASS
2	1715.0000	34.04	N.A	N.A	74.00	N.A	54.00	H	PASS
3	2112.5000	36.44	N.A	N.A	74.00	N.A	54.00	H	PASS
4	3464.5000	49.59	N.A	N.A	74.00	N.A	54.00	H	PASS
5	4983.0000	44.73	N.A	N.A	74.00	N.A	54.00	H	PASS
6	5863.0000	47.60	N.A	N.A	74.00	N.A	54.00	H	PASS

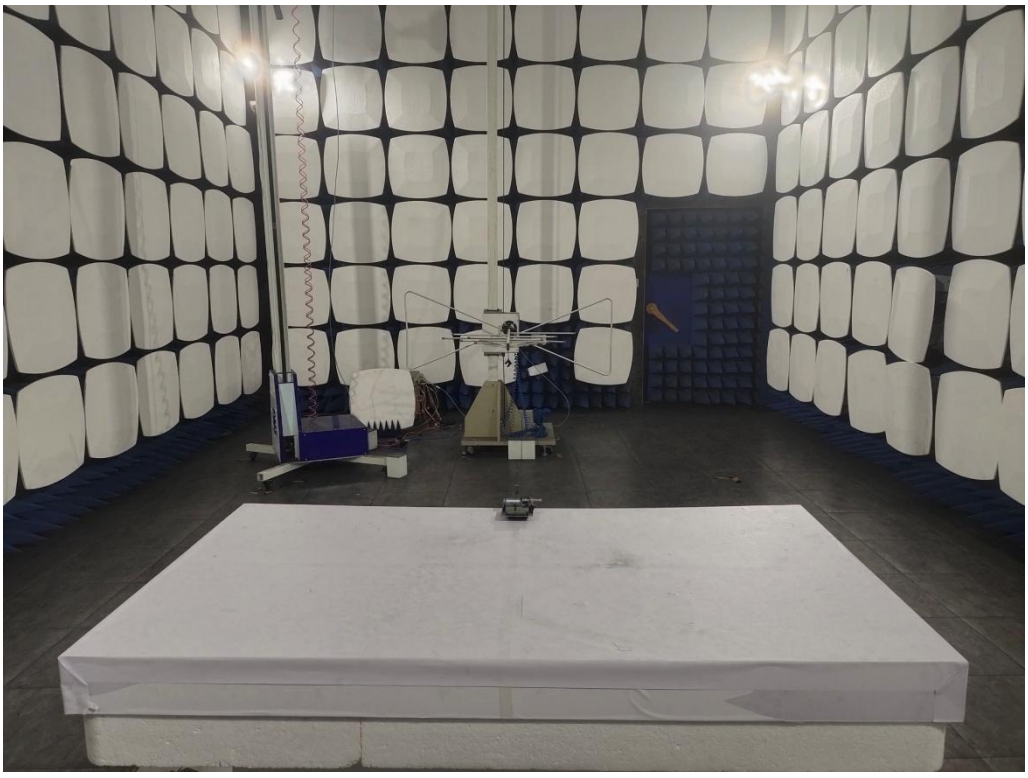
Annex A Photographs of Test Setup

1. Conducted Emission

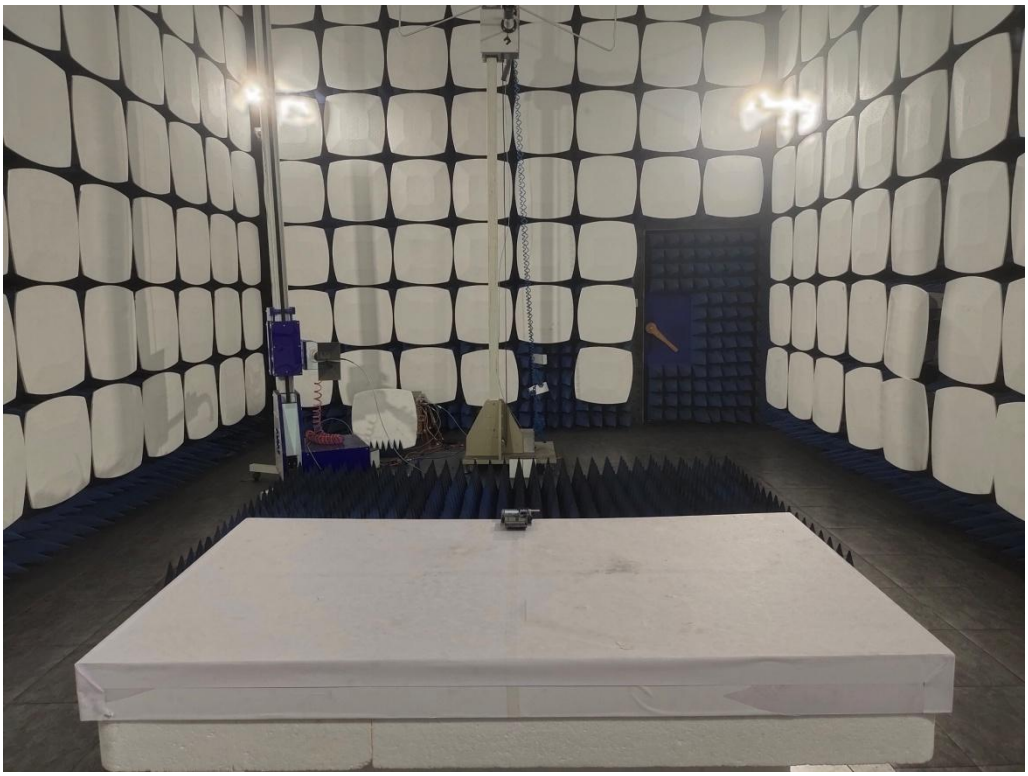




2. Radiated Emission(30MHz-1GHz)



3. Radiated Emission(above 1GHz)



Annex B Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	9kHz-150kHz	±3.3dB
	150kHz-30MHz	±2.8dB

Uncertainty of Radiated Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	30MHz-200MHz	±5.06dB
	200MHz-1000MHz	±5.04dB
	1GHz-6GHz	±5.18dB
	6GHz-18GHz	±5.48dB

Annex C Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Accreditation Certificate

Accredited Testing Laboratory:	The IC registration number is 7183A. (Shenzhen Morlab Communications Technology Co., Ltd.)

4. Test Software Utilized

Model	Version Number	Producer
TS+ -[JS32-RE]	Version 2.5.0.6	Tonscend
TS+ -[JS32-CE]	Version 2.5.0.0	Tonscend

5. Test Equipments Utilized

Description	Model	Serial No.	Manufacturer	Cal. Date	Due. Date
Bi-Log Antenna	VULB 9163	9163-519	SCHWARZBECK	2024/6/22	2025/6/21
Horn Antenna	BBHA 9120D	01774	SCHWARZBECK	2024/6/22	2025/6/21
Receiver	N9038A	MY56400093	KEYSIGHT	2024/1/25	2025/1/24
Preamplifier	S020180L3203	61171/61172	LUCIX CORP.	2024/5/30	2025/5/29
Preamplifier	S10M100L3802	46732	LUCIX CORP.	2024/5/30	2025/5/29
RF Coaxial Cable	PE330	MRE001	Pasternack	N/A	N/A
RF Coaxial Cable	CLU18	MRE002	Pasternack	N/A	N/A
RF Coaxial Cable	CLU18	MRE003	Pasternack	N/A	N/A
RF Coaxial Cable	BNC	MRE04	Qualwave	N/A	N/A
Receiver	ESPI	101052	R&S	2024/6/3	2025/6/2
LISN	NSLK 8127	8127449	Schwarzbeck	2024/2/2	2025/2/1
10dB Pulse Limiter	VTSD 9561-F	VTSD 9561 F-B #206	SCHWARZBECK	2024/5/30	2025/5/29
System Simulator	CMW500	152038	R&S	2024/9/11	2025/9/10

6. Ancillary Equipment Utilized

Description	Model	Serial No.	Manufacturer
Battery	AAA	N/A	NANFU
Adapter	SM-333D	N/A	N/A

END OF REPORT