TEST REPORT

APPLICANT	:	XINFENG 2D (FUJIAN)Material Technology Company LTD
PRODUCT NAME	:	Air Purification Device
MODEL NAME	:	4E11314G01
BRAND NAME	:	N/A
FCC ID	:	2A2HR-4E11314G01
STANDARD(S)	:	47 CFR Part 15 Subpart B
RECEIPT DATE	:	2021-06-28
TEST DATE	:	2021-06-29
ISSUE DATE	:	2021-07-12

Edited by: Yaming Luo

Yaming Luo

Approved by: Qijie Xiao

Qijie Xiao

Kehu-Morlab Test Laboratory

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DIRECTORY

Change History		
Version	**Date**	**Reason for change**
1.0	2021-07-12	First edition

1.Technical Information

Note: Provided by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	XINFENG 2D (FUJIAN)Material Technology Company LTD
Applicant Address:	Longcangcunqianyuan No.243 Road,Dongyuan,Taiwanese investment Zone,Quanzhou,Fujian
Manufacturer :	XINFENG 2D (FUJIAN)Material Technology Company LTD
Manufacturer Address :	Longcangcunqianyuan No.243 Road,Dongyuan,Taiwanese investment Zone,Quanzhou,Fujian

1.2. Equipment Under Test (EUT) Description

EUT Type:	Air Purification Device	
Serial No:	(N/A, marked #1 by test site)	
Model Name:	4E11314G01	
Hardware Version:	N/A	
Software Version:	N/A	
Auxiliary Equipment	**Voltage Driver**	
	Part Number:	SMT-024-150VWSW
	AC Input:	110-277VAC,50/60Hz,1.8A
	DC Output	24VDC,6.25A,150W max

Note:

1. 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 47 CFR Part 15 Subpart B:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart B	Radio Frequency Devices

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

No.	Section	Description	Test Date	Test Engineer	Result	Method determination /Remark
1	15.107	Conducted Emission	2021.06.29	Qijie Xiao	PASS	No deviation
2	15.109	Radiated Emission	2021.06.29	Qijie Xiao	PASS	No deviation

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

2.2. EUT Setup and Operating Conditions

Frequency range was investigated: Conducted emission test: from 150kHz to 30MHz; Radiated emission test: from 30MHz to 1000MHz.

Test Item	
Radiated Emission	
Mode 1 :	EUT ON
Conducted Emission	
Mode 1 :	EUT ON

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. 47 CFR Part 15 Subpart B Requirements

3.1. Conducted Emission

3.1.1. Requirement

According to FCC section 15.107, except for a Class A digital device 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 or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms 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:

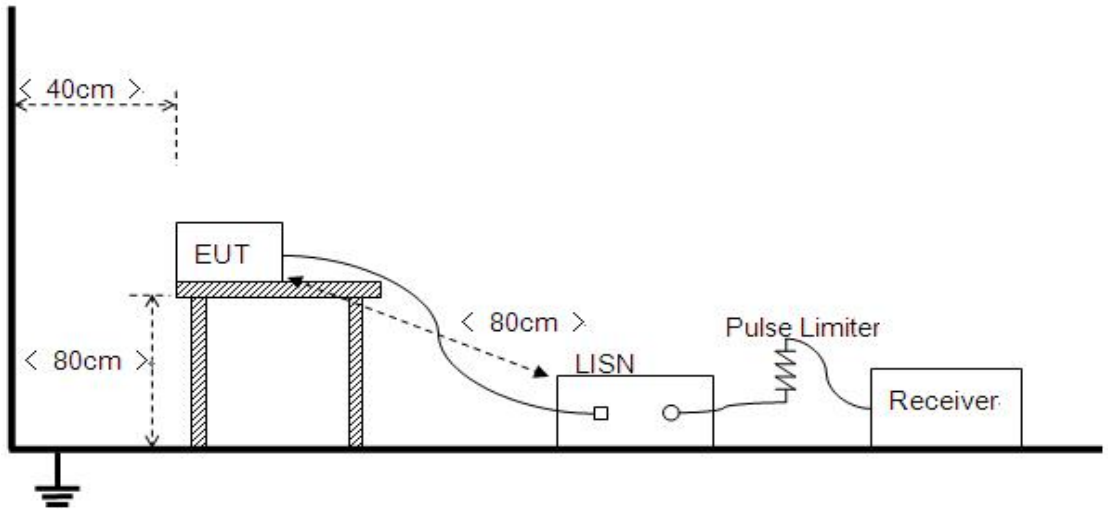
a) The limit subjects to the Class B digital device.

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.

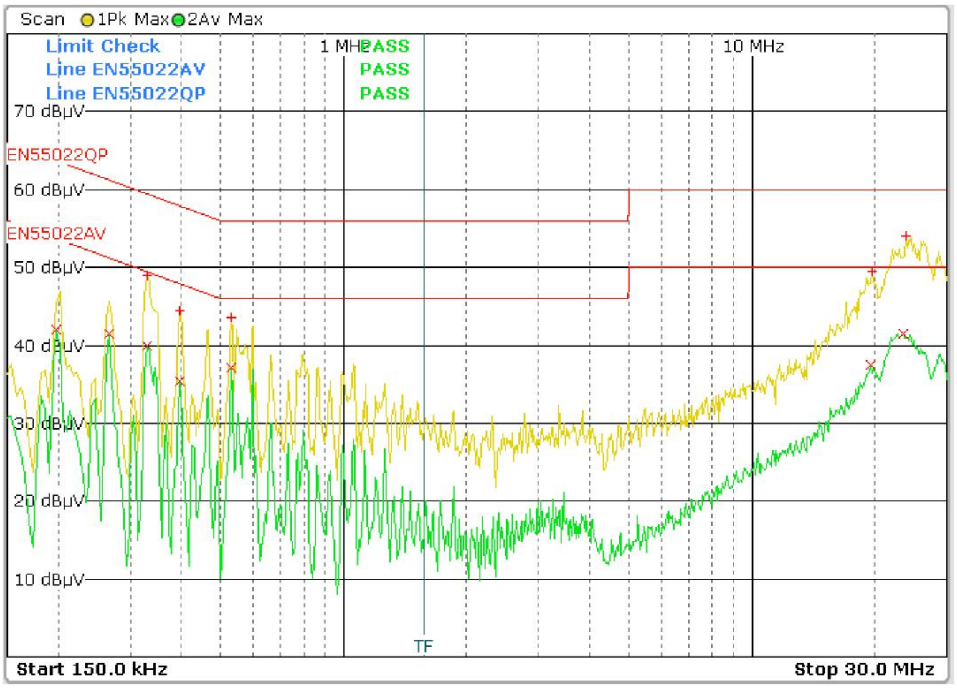
Measurement bandwidth (RBW) for 150kHzto 30 MHz: 9 kHz.

3.1.3. Test Results

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.

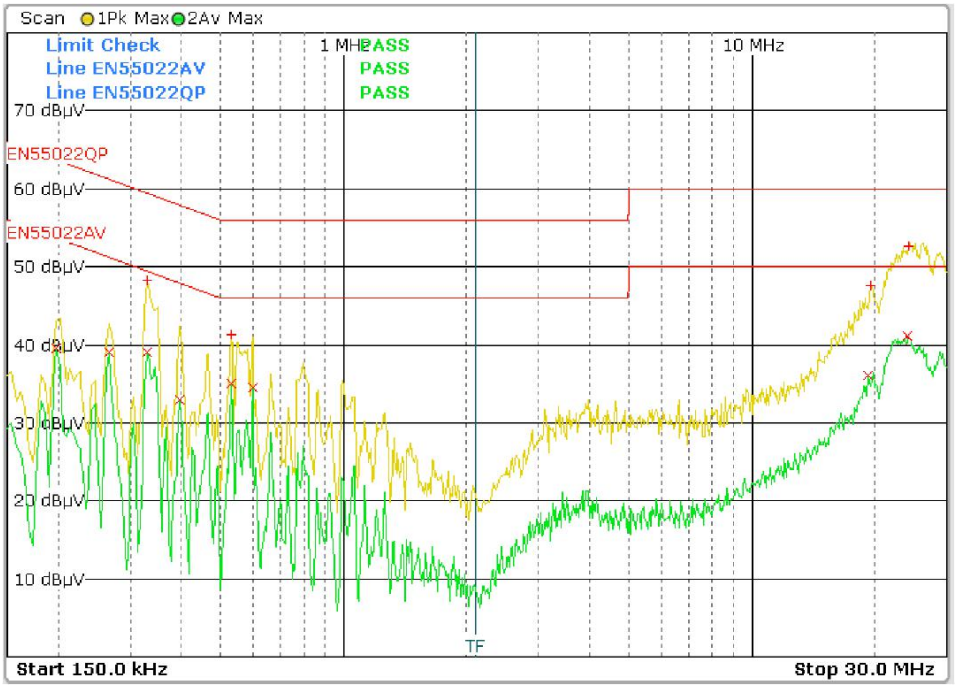
A. Test Plot and Suspicious Points:

Test Mode 1:



(Plot A: L Phase)

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)	Line	Verdict
0.198000	---	41.95	53.69	11.74	10.2	L1	PASS
0.266000	---	41.43	51.24	9.81	10.2	L1	PASS
0.330000	---	39.83	49.45	9.62	10.2	L1	PASS
0.330000	48.96	---	59.45	10.49	10.2	L1	PASS
0.398000	---	35.38	47.90	12.52	10.2	L1	PASS
0.398000	44.43	---	57.90	13.47	10.2	L1	PASS
0.530000	---	37.17	46.00	8.83	10.2	L1	PASS
0.530000	43.59	---	56.00	12.41	10.2	L1	PASS
0.198000	---	37.43	50.00	12.57	10.3	L1	PASS
0.266000	49.49	---	60.00	10.51	10.3	L1	PASS
0.330000	---	41.55	50.00	8.45	10.4	L1	PASS
0.330000	54.10	---	60.00	5.90	10.4	L1	PASS



(Plot B: N Phase)

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Corr. (dB)	Line	Verdict
0.198000	---	39.61	53.69	14.08	10.2	N	PASS
0.266000	---	38.96	51.24	12.28	10.2	N	PASS
0.330000	---	38.96	49.45	10.49	10.2	N	PASS
0.330000	48.23	---	59.45	11.22	10.2	N	PASS
0.398000	---	32.94	47.90	14.96	10.2	N	PASS
0.530000	---	35.07	46.00	10.93	10.2	N	PASS
0.530000	41.27	---	56.00	14.73	10.2	N	PASS
0.598000	---	34.46	46.00	11.54	10.2	N	PASS
19.282000	---	36.00	50.00	14.00	10.3	N	PASS
19.546000	47.62	---	60.00	12.38	10.3	N	PASS
24.114000	---	41.10	50.00	8.90	10.5	N	PASS
24.138000	52.58	---	60.00	7.42	10.5	N	PASS

3.2. Radiated Emission

3.2.1. Requirement

According to FCC section 15.109 (a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency range (MHz)	Field Strength Limitation at 3m Measurement Distance	
	(μV/m)	(dBμV/m)
30.0 - 88.0	100	40
88.0 - 216.0	150	43.5
216.0 - 960.0	200	46
Above 960.0	500	53.9

Note:

1) The tighter limit shall apply at the boundary between two frequency range.
2) Limitation expressed in dBμV/m is calculated by 20log Emission Level(μV/m).

3.2.2. Frequency range of measurement

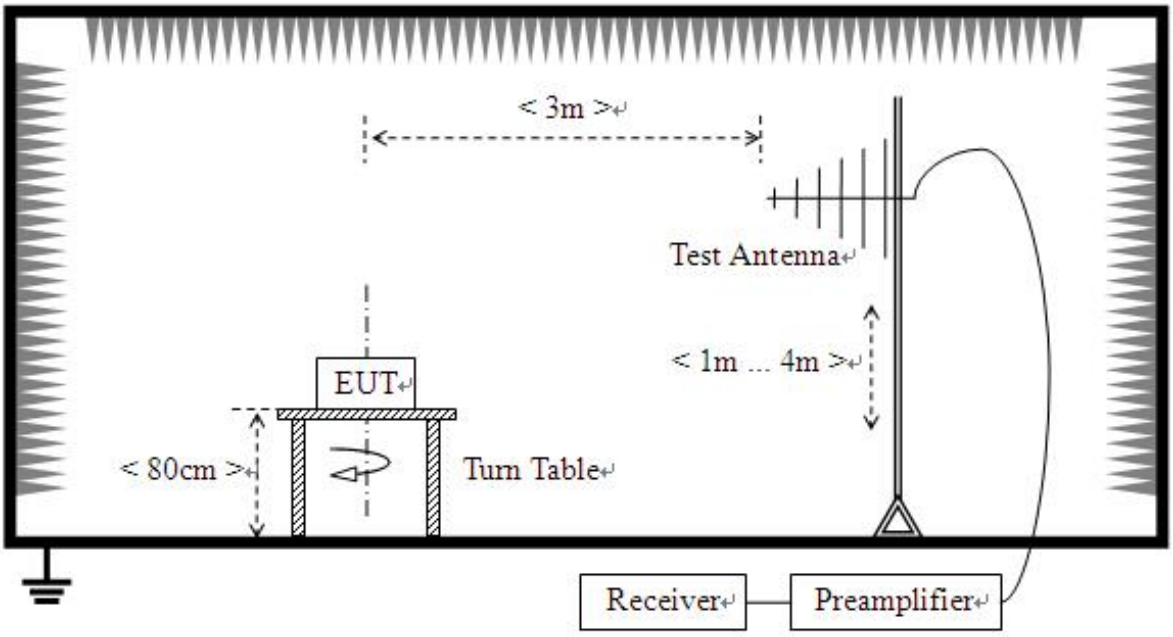
According to 15.33(b)(1), the frequency range of radiated measurement for the EUT is listed in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30.
1.705–108	1000.
108–500	2000.
500–1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

The frequency range from 30MHz to 1000MHz is investigated.

3.2.3. Test Setup

For radiated emissions from 30MHz to 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) 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.

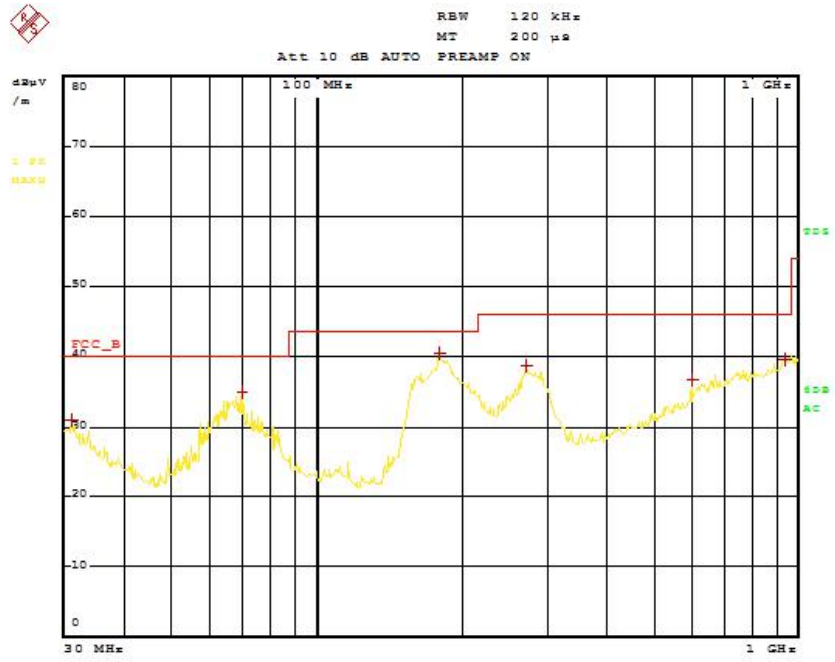
Note:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasipeak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency

above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

3.2.4. Test Results

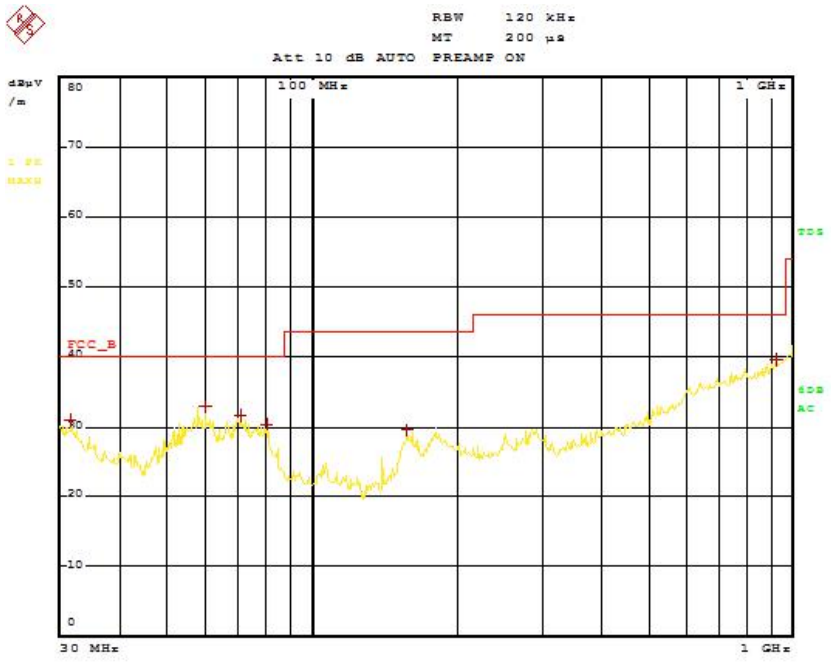
The maximum radiated emission is searched using PK, QP detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests. All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

Test Mode 1:



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

Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Corr. (dB/m)	Pol	Verdict
30.960000	31.07	40.00	8.92	15.1	H	PASS
69.920000	34.95	10.00	5.04	12.6	H	PASS
180.680000	40.47	43.50	3.02	15.7	H	PASS
273.400000	38.66	46.00	7.33	20.6	H	PASS
602.880000	36.66	46.00	9.34	24.5	H	PASS
939.800000	39.61	46.00	6.38	26.8	H	PASS



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

Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Corr. (dB/m)	Pol	Verdict
31.400000	30.98	39.99	9.01	12.9	V	PASS
60.200000	32.86	39.99	7.13	12.5	V	PASS
70.880000	31.56	39.99	8.43	11.3	V	PASS
80.560000	30.26	39.99	9.73	17.6	V	PASS
157.680000	29.58	43.49	13.91	24.5	V	PASS
928.160000	39.62	45.99	6.37	26.8	V	PASS

Annex A 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))	150kHz-30MHz	±2.61dB

Uncertainty of Radiated Emission Measurement

Measuring Uncertainty for a Level of Confidence of 95%(U=2Uc(y))	30MHz-200MHz	±3.66dB
	200MHz-1000MHz	±3.87dB

Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Kehu-Morlab Test Laboratory
Laboratory Address:	Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free Trade Zone (Fujian) , P. R.China
Telephone:	+86 592 5612050
Facsimile:	+86 592 5612095

2. Identification of the Responsible Testing Location

Name:	Kehu-Morlab Test Laboratory
Address:	Unit 101, No.1732 Gangzhong Road, Xiamen Area, Pilot Free Trade Zone (Fujian) , P. R. China

3. Accreditation Certificate

Accredited Testing Laboratory:	The FCC designation number is CN1249. (Kehu-Morlab Test Laboratory)

4. Test Equipment Utilized

List of Software Used

No.	Model	Version Number	Producer	Test Item
1	EMC 32	V10.00.00	R&S	RE
2	EMC 32	V10.20.01	R&S	CE

Conducted Emission Test Equipments

No.	Equipment Name	Serial No.	Model No.	Manufacturer	Cal.Due Date
1	EMI Receiver	102174	ESR3	R&S	2022.03.15
2	LISN	101338	ENV432	R&S	2022.03.09

Radiated Test Equipments

No.	Equipment Name	Serial No.	Model No.	Manufacturer	Cal.Due Date
1	Anechoic Chamber	N/A	9m*6m*6m	ETS-Lindgren	2022.07.20
2	Receiver	101799	ESR7	R&S	2022.03.15
3	Linear Log Periodic Broad Band Antenna	949	VULB 9163	Schwarzbeck	2021.09.24

Annex C FCC Statements

Information to Users

According to the FCC Part 15.19,15.21,and 15.105 rules, for this EUT, the instructions or operation manual furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

FCC Caution

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

NOTE 2:Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Annex D Matters needing attention

1. The report is invalid without the seal of the testing unit.
2. The report is invalid without the signature of the author and signing person.
3. The altered report is invalid.
4. If you have any objection to the test report, please raise it to the testing unit within 15 days from the date of receiving the report.
5. "P" means "test results meet requirements", "F" means "test results do not meet requirements", "N/A" means "requirements do not apply to the product", "/" means "not tested".
6. "*" means that the project is not recognized by CNAS/CMA.(This description only applies to CNAS/CMA seal).

END OF REPORT