



# TEST REPORT

REPORT NUMBER: I23W00008-EMC

ON

**Type of Equipment:** Multimedia Control System

**Type of Designation:** IN9.0-OS

**Brand Name:**  HAVAL NOBO

**Manufacturer:** NOBO AUTOMOTIVE TECHNOLOGIES CO., LTD.

**FCC ID:** 2A7V5-IN90-OS-1

ACCORDING TO

Subpart B, PART 15, RADIO FREQUENCY DEVICES, ANSI C63.4-2014

Chongqing Academy of Information and Communications Technology

*Month date, year*

March 24, 2023

*Signature*



**Xiang Luoyong**

**Director**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of Chongqing Academy of Information and Communications Technology.



Report No.: I23W00008-EMC

Revision Version

Report Number	Revision	Date	Memo
I23W00008-EMC	00	2023-3-24	Initial creation of test report

**Chongqing Academy of Information and Communication Technology**

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## 1. Test Laboratory

### 1.1. Testing Location

Name:	Chongqing Academy of Information and Communications Technology
FCC Registration Number:	CN1239
Address:	Building C, Technology Innovation Center, No.8, Yuma Road, Chayuan New Area, Nan'an District, Chongqing, People's Republic of China
Postal Code:	401336
Telephone:	0086-23-88069965
Fax:	0086-23-88608777

### 1.2. Testing Environment

Normal Temperature:	18.0-19.1°C
Relative Humidity:	55-58%

### 1.3. Project data

Testing Start Date:	2023-03-21
Testing End Date:	2023-03-24

### 1.4. Signature



2023-03-24

**Li Quan**  
(Prepared this test report)

**Date**

2023-03-24

**Xiao Yu**  
(Reviewed this test report)

**Date**

2023-03-24

**Xiang Luoyong** Director of the  
laboratory (Approved this test report)

**Date**

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## 2. Client Information

### 2.1. Applicant Information

Company Name:	NOBO AUTOMOTIVE TECHNOLOGIES CO., LTD.
Address /Post:	No. 668, Caihong Road, Zhangjiagang Economic and Technological Development Zone, Suzhou, Jiangsu, P.R. China
City:	Suzhou, Jiangsu
Country:	China
Telephone:	0512-80616208
Fax:	N/A
Email:	douwenjuan@noboauto.com
Contact Person:	Wenjuan Dou

### 2.2. Manufacturer Information


Company Name:	NOBO AUTOMOTIVE TECHNOLOGIES CO., LTD.
Address /Post:	No. 668, Caihong Road, Zhangjiagang Economic and Technological Development Zone, Suzhou, Jiangsu, P.R. China
City:	Suzhou, Jiangsu
Country:	China
Telephone:	0512-80616208
Fax:	N/A
Email:	douwenjuan@noboauto.com
Contact Person:	Wenjuan Dou

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### 3. Equipment under Test (EUT) and Ancillary Equipment (AE)

#### 3.1. About EUT

EUT Description	Multimedia Control System
Model name	IN9.0-OS
Brand name	 Haval NOBO
Wi-Fi Frequency Band:	Wi-Fi 2.4G: 802.11b/g/n; Wi-Fi 5G U-NII-1/Wi-Fi 5G U-NII-3: 802.11a/n/ac
BT Frequency Band:	BR, EDR, BLE

Note: Photographs of EUT are shown in ANNEX B of this test report.

#### 3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
S1	B3N4MCAXS0221224 5117	AA	AA	2023-03-14

\*EUT ID: is used to identify the test sample in the lab internally.

#### 3.3. Internal Identification of AE used during the test

AE ID*	Description	Model
EA01	Main Screen	N/A
ED01	Screen	N/A
ED02	Screen	N/A
ED03	Screen	N/A
EE01	Screen Cable	N/A
EE02	Screen Cable	N/A
EE03	Screen Cable	N/A
EE04	HUD Cable	N/A
EV02	Screen Cable	N/A

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EG01	HUD	N/A
EJ01	Shark fin antenna	N/A
EM03	Ethernet wire cable (1000M)	N/A
EL01	Ethernet wire cable (100M)	N/A
UA01	USB 3.0 Cable	N/A
UB01	USB 2.0 Cable	N/A
EC01	Power Line	N/A
EQ01	Horn load	N/A
ER01	Horn	N/A
UV02	Cable	N/A
AE1	Notebook	N/A
AE2	DC Battery	N/A
AE3	DC Battery	N/A
AE4	U-disk	N/A
AE5	U-disk	N/A

\*AE ID: is used to identify the test sample in the lab internally.

## 4. Reference Documents

### 4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC CFR Part 15, Subpart B	RADIO FREQUENCY DEVICES	October 01, 2021
ANSI C63.4	METHOD OF MEASUREMENT OF RADIO-NOISE EMISSIONS FROM LOW-VOLTAGE ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE RANGE OF 9 KHZ TO 40 GHZ	2014



## 5. Test Equipment Utilized

No.	Equipment	Model	SN	HW Version	SW Version	Manufacture	Cal.Due Date
1	Test Receiver	ESU26	100367	1	4.43 SP3	R&S	2023-06-29
2	Trilog Antenna	VULB9163	01392	--	--	Schwarzbeck	2024-05-04
3	Double Ridged Guide Antenna	HF907	100357	--	--	R&S	2025-03-25
4	Signal Generator	SMB 100A	105563	--	--	R&S	2023-06-29
5	GNSS signal generator	GSS7000	257904	--	--	spirent	2023-06-29

### Test software

No.	Name	version	SN	Manufacture
1	EMC32	V 8.51.00	N/A	R&S

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## 6. Test Results

### 6.1. Summary of Test Results

FCC Rules	Name of Test	Result
15.109	Radiated Emission	Pass
15.107	AC Conducted Emission	N/A
15.111	Antenna Power Conduction Limits for Receivers	Pass

Note:

N/A means not applicable.

The IN9.0-OS, manufactured by NOBO AUTOMOTIVE TECHNOLOGIES CO., LTD. is a new product for testing.

There are many configurations in this project. According to " Model Declaration Letter", S1 (Main supply) design covers all complete product functions and complete components. So we mainly tested the sample S1 (Main supply). In the report, the test data of the worst mode of the sample S1 are recorded.

Please refer to the " Model Declaration Letter" document for sample configuration information. Sample S1 (Main supply) corresponds to the "Full Testing sample" in the document.

Chongqing Academy of Information and Communications Technology has verified that the compliance of the tested device specified in section 4 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 1 of this test report.

In accordance with the requirements of standard FCC Part 15.203, conducted emission is not applicable.

## 7. Test Results

### 7.1. Radiated Emission

<b>Specifications:</b>	15.109
<b>Date of Tests</b>	2023-03-21~2023-03-24
<b>Test conditions:</b>	Ambient Temperature:18.0-19.1°C Relative Humidity:55-58% Air pressure:97.6- 98.7kPa
<b>Operation Mode</b>	30MHz-18GHz frequency range: Mode 1: Full system_100M_LAN Mode Mode 2: Full system_1000M_LAN Mode Mode 3: GNSS receiver (GPS+GLONASS+Galileo+BDS) Mode Mode 4: FM Mode Mode 5: AM Mode
<b>Test Results:</b>	Pass

#### Limit Level Construction (Except for Class A digital devices):

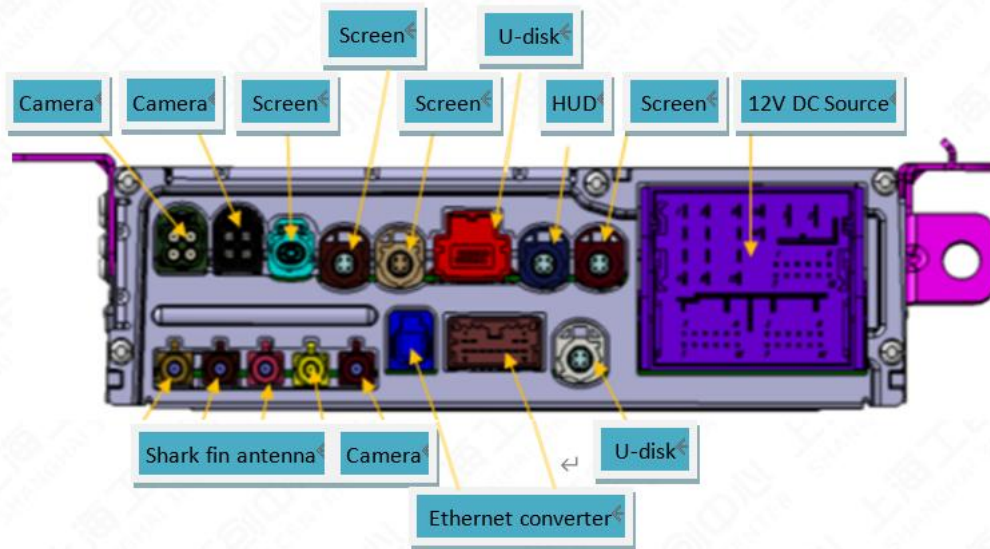
Frequency Range (MHz)	Quasi-Peak (dBuV/m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Frequency Range (MHz)	Peak (dBuV/m)	Average (dBuV/m)
Above 1000	74	54

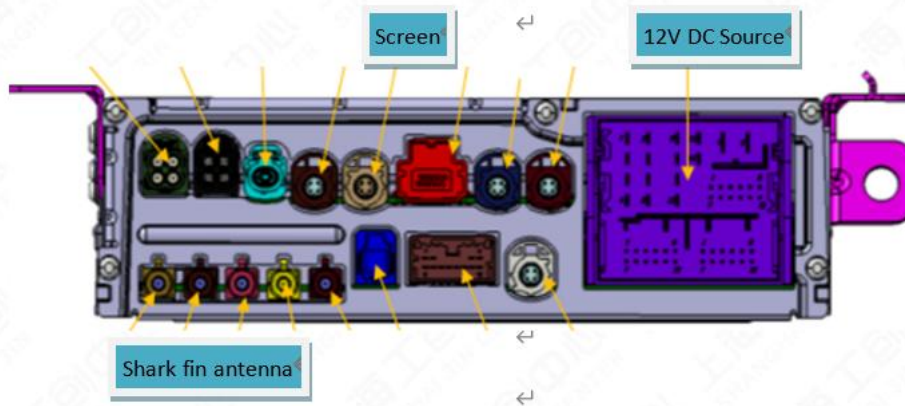
#### EUT Setup:

## Chongqing Academy of Information and Communication Technology

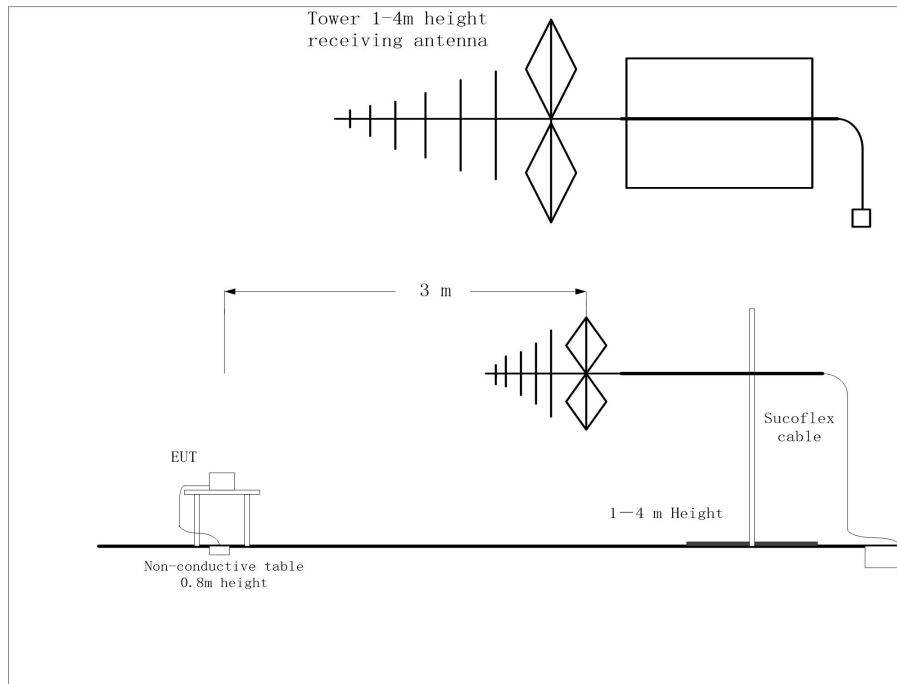
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Mode 1~2



Mode 3~5



**Test Method:**

For 30-1000MHz, the EUT was placed on the top of a rotating 0.8-m table above the ground at a semi-anechoic chamber. The distance between the EUT and the received antenna was 3 meters. The table was rotated 360 degree and the received antenna mounted on a variable-height antenna tower was varied from 1m to 4m to find the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement. Tested in accordance with the procedures of ANSI C63.4-2014, section 8.3.

For 1000-18000MHz, the maximal emission value was acquired by adjusting the antenna height, and the table was rotated 360 degrees to determine the maximum value of the field strength.

**Test Result:**

A “reference path loss” is established and Corr is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

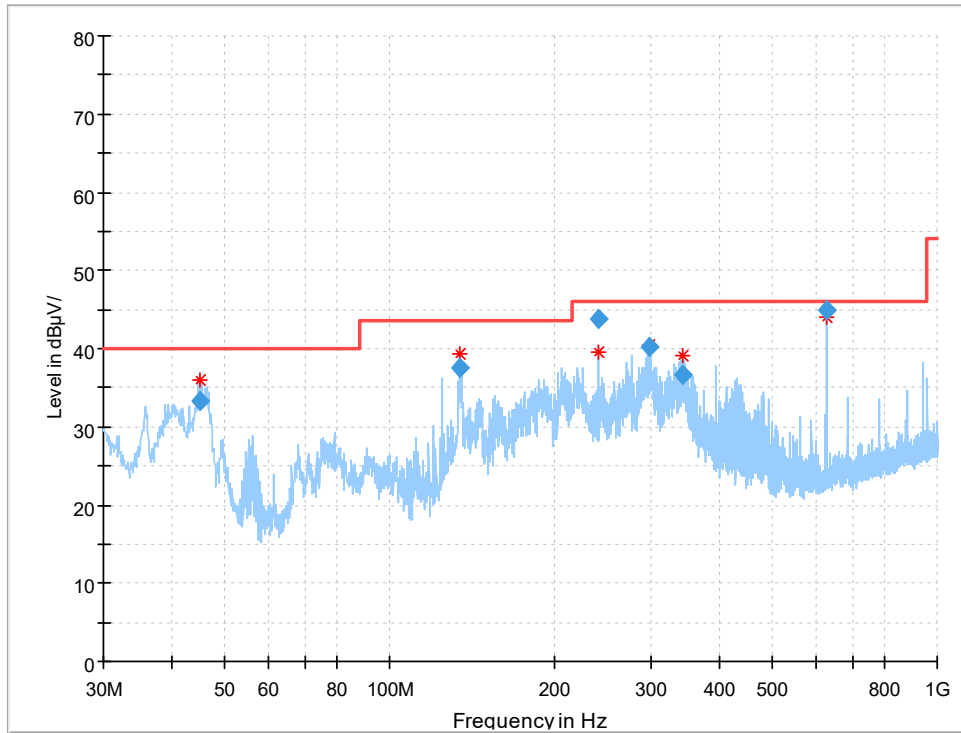
$$\text{Corr (dB/m)} = \text{Cable loss (dB)} + \text{Antenna Gain(dB/m)} - \text{Preamplifier gain (dB)}$$

$$\text{Result (dB}\mu\text{V/m)} = \text{PMea (dB}\mu\text{V)} + \text{Corr (dB/m)}$$

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**Test Data**



RE 30MHz-1GHz S1 Sample (Main supply) \_ Mode 2

**Final\_Result**

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
45.169760	33.27	40.00	6.73	5000	120.000	100.0	V	310.0	-11.9
133.951200	37.64	43.50	5.86	5000	120.000	200.0	H	170.0	-16.2
240.003200	43.86	46.00	2.14	5000	120.000	200.0	H	1.0	-11.2
297.625520	40.17	46.00	5.83	5000	120.000	100.0	H	234.0	-10.2
344.006440	36.73	46.00	9.27	5000	120.000	100.0	H	51.0	-8.8
628.157080	44.88	46.00	1.12	5000	120.000	100.0	V	1.0	-3.0

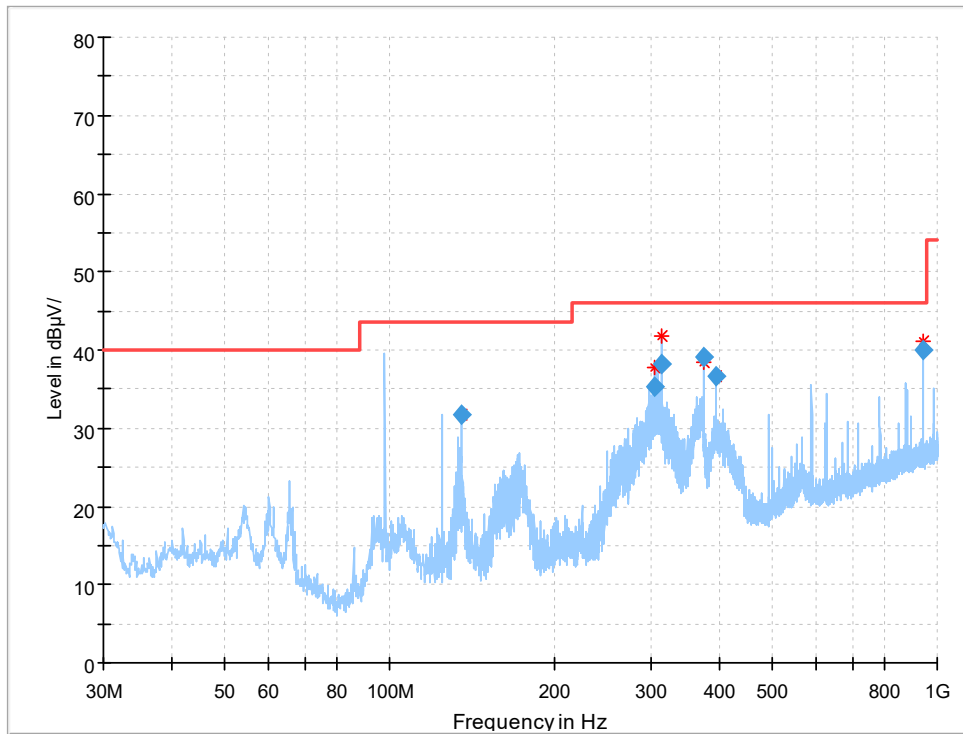
Corr.(dB)=Cable loss-Antenna Factor

Test result=Test receiver value-Corr.(dB)

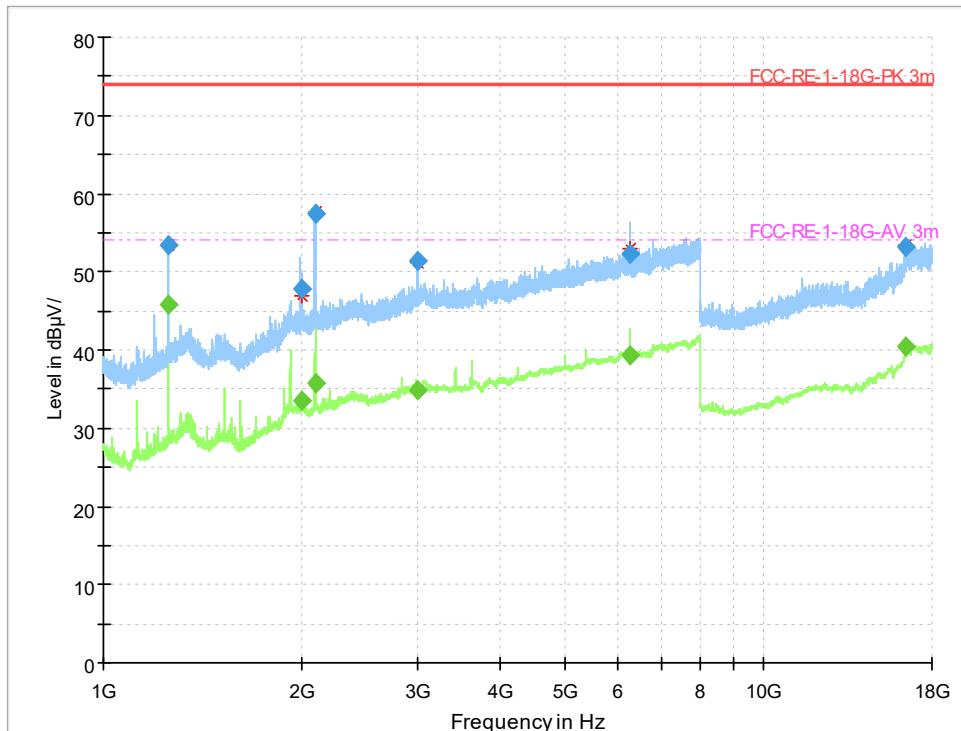
Horizontal and vertical polarity is all have been tested, the result of them is synthesized in the above data diagram.

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RE 30MHz-1GHz S1 Sample (Main supply) \_ Mode 4



RE 1GHz-18GHz S1 Sample (Main supply) \_ Mode 2-H

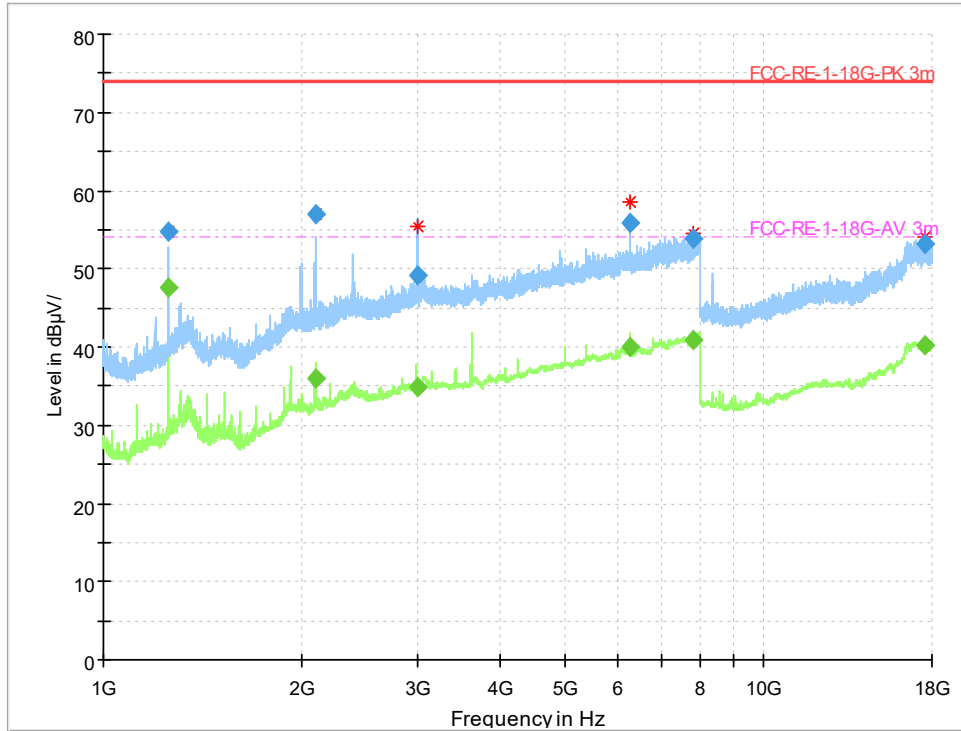
### Final\_Result 1

Frequency (MHz)	MaxPeak (dBµV/)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1256.28875	53.47	---	74.00	20.53	500.0	1000.000	105.0	H	279.0	1.8
1256.28875	---	45.70	54.00	8.30	500.0	1000.000	105.0	H	279.0	1.8
1993.32000	---	33.41	54.00	20.59	500.0	1000.000	185.0	H	231.0	6.5
1993.32000	47.72	---	74.00	26.28	500.0	1000.000	185.0	H	231.0	6.5
2093.51500	57.39	---	74.00	16.61	500.0	1000.000	100.0	H	48.0	6.6
2093.51500	---	35.79	54.00	18.21	500.0	1000.000	100.0	H	48.0	6.6
2998.24375	51.29	---	74.00	22.71	500.0	1000.000	103.0	H	221.0	11.3
2998.24375	---	34.97	54.00	19.03	500.0	1000.000	103.0	H	221.0	11.3
6277.49375	---	39.42	54.00	14.58	500.0	1000.000	103.0	H	316.0	18.0
6277.49375	52.22	---	74.00	21.78	500.0	1000.000	103.0	H	316.0	18.0
16463.40250	53.19	---	74.00	20.81	500.0	1000.000	185.0	H	129.0	21.4
16463.40250	---	40.34	54.00	13.66	500.0	1000.000	185.0	H	129.0	21.4

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RE 1GHz-18GHz S1 Sample (Main supply) \_ Mode 2-V

### Final\_Result 2

Frequency (MHz)	MaxPeak (dBµV/)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1256.32625	---	47.54	54.00	6.46	500.0	1000.000	100.0	V	255.0	1.8
1256.32625	54.81	---	74.00	19.19	500.0	1000.000	100.0	V	255.0	1.8
2092.92000	57.02	---	74.00	16.98	500.0	1000.000	115.0	V	283.0	6.6
2092.92000	---	36.02	54.00	17.98	500.0	1000.000	115.0	V	283.0	6.6
2996.84000	49.24	---	74.00	24.76	500.0	1000.000	102.0	V	255.0	11.2
2996.84000	---	34.86	54.00	19.14	500.0	1000.000	102.0	V	255.0	11.2
6277.96000	55.95	---	74.00	18.05	500.0	1000.000	200.0	V	330.0	18.0
6277.96000	---	40.07	54.00	13.93	500.0	1000.000	200.0	V	330.0	18.0
7807.30125	---	40.79	54.00	13.21	500.0	1000.000	215.0	V	330.0	20.7
7807.30125	53.84	---	74.00	20.16	500.0	1000.000	215.0	V	330.0	20.7
17549.21125	53.17	---	74.00	20.83	500.0	1000.000	102.0	V	358.0	21.9
17549.21125	---	40.29	54.00	13.71	500.0	1000.000	102.0	V	358.0	21.9

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### 7.2. Conducted Emission

In accordance with the requirements of standard FCC Part 15.203, conducted emission is not applicable.

### 7.3. Antenna Power Conduction Limits for Receiver

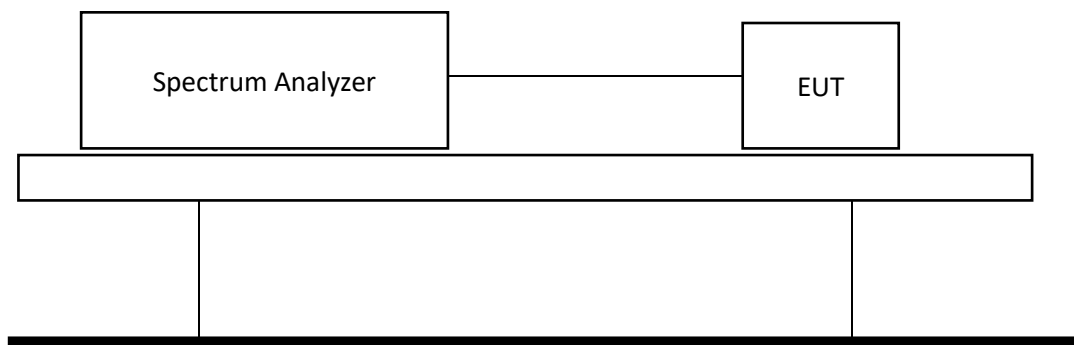
<b>Specifications:</b>	15.111
<b>Date of Tests</b>	2023-03-21~2023-03-24
<b>Test conditions:</b>	Ambient Temperature:18.0-19.1°C Relative Humidity:55-58% Air pressure:97.6- 98.7kPa
<b>Operation Mode</b>	Mode 6: FM Mode (Direct connection) +UV02
<b>Test Results:</b>	Pass

#### Limit Level Construction:

Standard	Limit (dBm)
FCC 47 Part 15.111(a)	< 2nW (-57dBm)

Frequency Range (MHz)	RBW/VBW	Sweep Time (s)
0.009-30	9kHz/30kHz	AUTO
30-1000	120kHz/300kHz	AUTO
Above 1G	1MHz/3MHz	AUTO

#### EUT Setup:



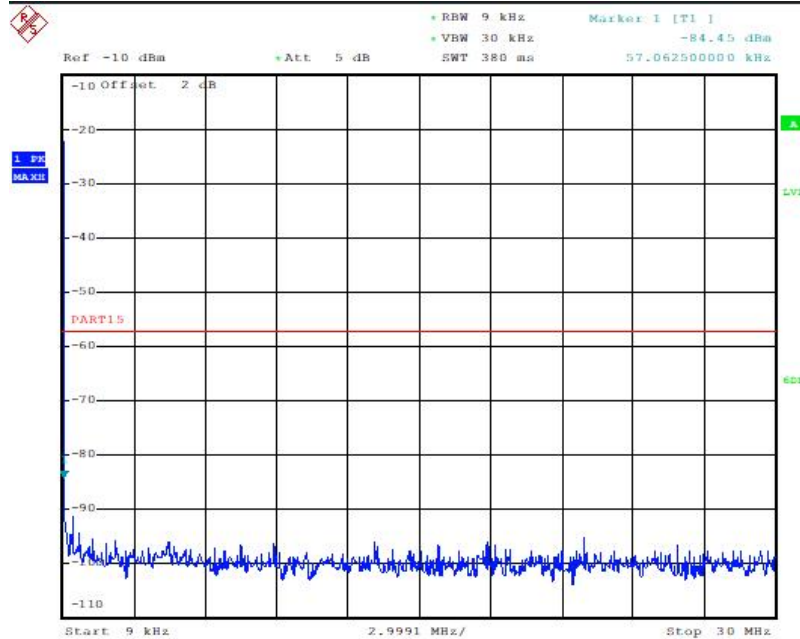
#### Test Method:

- The measurement is according to FCC Part 15.111(a).
- The FM port of the EUT is directly connected to the spectrum analyzer (ESCI) through a dedicated 75 Ω to 50 Ω cable (UV02), the cable attenuation is 2Db, The path loss was compensated to the results for each measurement.
- The test was conducted in a shielding chamber.

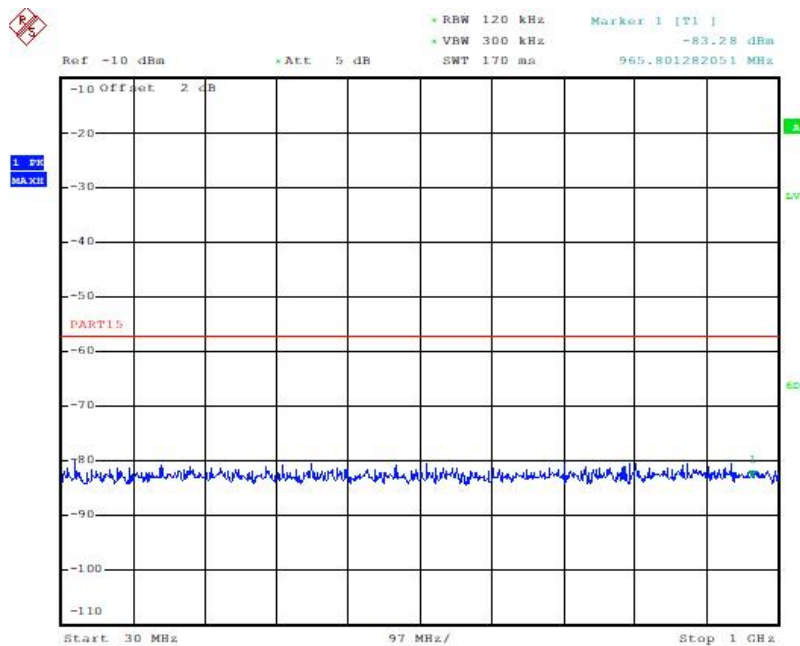
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Test Result:



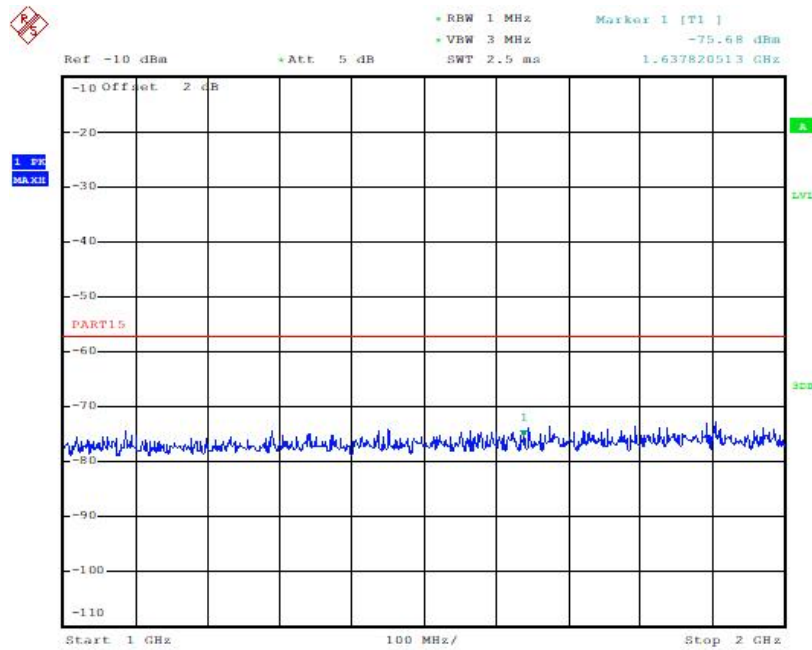
9kHz-30MHz S1 Sample (Main supply) \_ Mode 6



30MHz-1GHz S1 Sample (Main supply) \_ Mode 6

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1GHz-2GHz S1 Sample (Main supply) \_ Mode 6

### Annex A EUT Photos

See the document "I23W00008-External Photos".

See the document "I23W00008-Internal Photos".

Test photo See the in document "I23W00008\_EMC Test Setup Photos".



Report No.: I23W00008-EMC

## **ANNEX B Deviations from Prescribed Test Methods**

No deviation from Prescribed Test Methods.

**\*\*\*END OF REPORT\*\*\***

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