Industrial Internet Innovation Center (Shanghai) Co.,Ltd.

EMC TEST REPORT

PRODUCT	Sub Monitor
BRAND	SUNMI
MODEL	NPF10
APPLICANT	Shanghai Sunmi Technology Co.,Ltd.
FCC ID	2AH25NPF10
ISSUE DATE	January 3, 2025
STANDARD(S)	FCC Part 15, Subpart B, ANSI C63.4-2014, ICES-003 Issue 7.

Prepared by: ***Li Liukai*** **Reviewed by:** ***Qin Yabin*** **Approved by:** ***Zhang Min***

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1 Summary of Test Report

1.1 Test Standard (s)

No.	Test Standard(s)	Title
1	FCC Part 15, Subpart B	Radio frequency devices
2	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
3	ICES-003	Information Technology Equipment (Including Digital Apparatus)-Limits and Methods of Measurement
NOTE: According to customer requirements, test and report using the latest version of the standard.		

1.2 Summary of Test Results

No.	Item(s)	FCC Standard(s)	IC Standard(s)	Verdicts for Single Item	Detaied Results
1	Radiated Emission	15.109(a)	3.2.2	Pass	See section 6.1
2	AC Conducted Emission	15.107(a)	3.2.1	Pass	See section 6.2
NOTE: The NPF10, manufactured by Shanghai Sunmi Technology Co.,Ltd. is a new product for testing. Industrial Internet Innovation Center (Shanghai) Co., Ltd. only performed test cases which identified with Pass/Fail/Inc result in section 1.3. Industrial Internet Innovation Center (Shanghai) Co., Ltd. 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.					

2 General Information of The Laboratory

2.1 Testing Laboratory

Lab Name	Industrial Internet Innovation Center (Shanghai) Co.,Ltd.
Address	Building 4, No. 766, Jingang Road, Pudong, Shanghai, China
Telephone	021-68866880
FCC Registration No.	708870
FCC Designation No.	CN1364
IC designation No.	10766A
CAB identifier	CN0067

2.2 Laboratory Environmental Requirements

Temperature	15℃~35℃
Relative Humidity	25%RH~75%RH
Atmospheric Pressure	86kPa~106kPa
Supply Voltage	120V/60Hz

2.3 Project Information

Project Manager	Gao Hongning
Test Date	December 06, 2024 to December 23, 2024

3 General Information of The Customer

3.1 Applicant

Company	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
Telephone	8618501703215

3.2 Manufacturer

Company	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
Telephone	8618501703215

3.3 Factory

Company	N/A
Address	N/A

4 General Information of The Product

4.1 Product Description for Equipment under Test (EUT)

Product	Sub Monitor
Model	NPF10
Date of Receipt	December 04, 2024
EUT ID*	S03aa
SN/IMEI	ZE01D4B1J0027
Supported Radio Technology and Bands	NFC
Hardware Version	USBLCD_MB3_V1.0.A
Software Version	T113-ROM1.1.5-UBOOT1.1.3-FW1.1.5-APP1.1.5-RES1.1.0
Power Rating	DC 5V form USB
NOTE1: EUT ID is the internal identification code of the laboratory. NOTE2: Photographs of EUT are shown in ANNEX A of this test report. NOTE3: Samples in the test report are provided by the customer. The test results are only applicable to the samples received by the laboratory.	

4.2 Description for Auxiliary Equipment (AE)

AE ID*	Description	Model	SN/Remark
UB01	Screen cable	N/A	N/A
CA01	Adapter	CYZS36-240150	Jiangsu Chenyang Electron Co., Ltd. INPUT: 100-240V~50/60Hz 1.5A OUTPUT: 24V 1.5A
UA01	AC Cable	N/A	N/A
EA01	Wireless data POS System	T5711	VC04245W20004
EB01	Function Cradle	NDZA0	N/A
AE1	Scanning Box	NS011	N/A
AE2	Notebook PC	Matebook 13	N/A
AE3	Mouse	MS111-P	CN-011D3V-71581-19J-1A64
AE4	LAN Cable	N/A	N/A
AE5	Cash Box	NC020	N/A
AE6	Telephone	HA8000(28) P/T S	N/A

NOTE: *AE ID is the internal identification code of the laboratory.

5 Test Configuration Information

5.1 Laboratory Environmental Conditions

5.1.1 Permanent Facilities

Semi-anechoic chamber SAC3-1 (9 m*8m*6.2m) & SAC3-2 (9.8m*6.7m*6.7m)	
Shielding effectiveness	0.014MHz ~1MHz, >60dB; 1MHz~1000MHz, >90dB.
Electrical insulation	> 2MΩ
Ground system resistance	< 4Ω
Normalised site attenuation (NSA)	< ± 4 dB, 3m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio (SVSWR)	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

Shielded room	
Shielding effectiveness	0.014MHz~1MHz, >60dB; 1MHz~1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4Ω

5.2 Decision of final test mode

The EUT was tested in conjunction with the accessories in Section 4.2. We tested all of the following test modes and selected the worst mode from the test results and recorded them in the report.

The test configuration modes are as the following:

Test Item	Test setup and operating modes
Radiated emission	30MHz-18GHz frequency range: Mode 1: Fullsystem mode+ S03aa+ UB01+ CA01+ UA01+ EA01+ EB01+ AE
AC Conducted emission	Mode 1: Fullsystem mode+ S03aa+ UB01+ CA01+ UA01+ EA01+ EB01+ AE

5.3 EUT System Operation

1. Connect the EUT with AE.
2. Setup the EUT according to the standard.
3. Start testing and monitoring the function.
4. Fullsystem mode: The EUT is connected to the Function Cradle via a screen cable. The Wireless data POS System is placed on the Function Cradle, and The Wireless data POS System plays 1kHz+Color bar video. The Function Cradle is connected with mouse, Scanning Box, Cash Box and Telephone. The Notebook PC establishes data connection with The Wireless data POS System through LAN cable.

5.4 EUT Connection Diagram of Test System

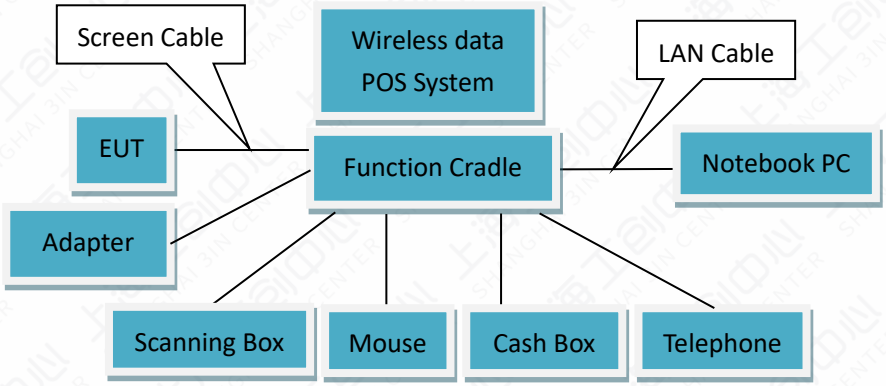

Figure 5.4-1 Mode 1

5.5 Test Equipment Utilized

No.	Name	Model	S/N	SW Version	HW Version	Manufacturer	Cal. Date	Cal. Interval
1	Test Receiver	ESCI	101235	V5.1-24-3	00	R&S	2023-12-19 2024-12-13	1 year
2	Test Receiver	ESR7	102399	1.4	00	R&S	2024-06-07	1 year
3	Test Receiver	FSW43	101943	1.12	00	R&S	2024-08-21	1 year
4	Trilog Antenna	VULB9162	00426	N/A	N/A	Schwarzbeck	2024-08-02	1 year
5	Double Ridged Guide Antenna	ETS-3117	00135885	N/A	N/A	ETS	2024-03-26	1 year
6	2-Line V-Network	ENV216	101380	N/A	N/A	R&S	2023-12-19 2024-12-13	1 year
7	EMI Test Software	EMC32 V10.35.02	N/A	V10.35.02	N/A	R&S	N/A	N/A
8	EMI Test Software	EMC32 V10.60.20	N/A	V10.60.20	N/A	R&S	N/A	N/A

No.	Name	Model	S/N	SW Version	HW Version	Manufacturer	Cal. Date	Cal. Interval
9	Preamplifier	SCU08F1	8320024	N/A	N/A	R&S	2024-10-09	1 year
10	Preamplifier	SCU18	10155	N/A	N/A	R&S	2024-10-09	1 year

5.6 Measurement Uncertainty

Item (s)	Uncertainty
Radiated Emission 30MHz-1000MHz	4.92 dB
Radiated Emission 1000MHz-18000MHz	5.66 dB
Conducted Emission	3.52 dB
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of *k*=2.	

6 Test Results

6.1 Radiated Emission

6.1.1 Method of Measurement

a. For 30MHz -1000MHz, the EUT was placed on the top of a rotating 0.8m 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.

b. For 1000MHz -18000MHz, the EUT was placed on the top of a 0.8m table above the ground at a 3m fully anechoic chamber. The maximal emission value was acquired by adjusting the antenna height, The table was rotated 360 degrees to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement

6.1.2 EUT Connection Diagram of Test System

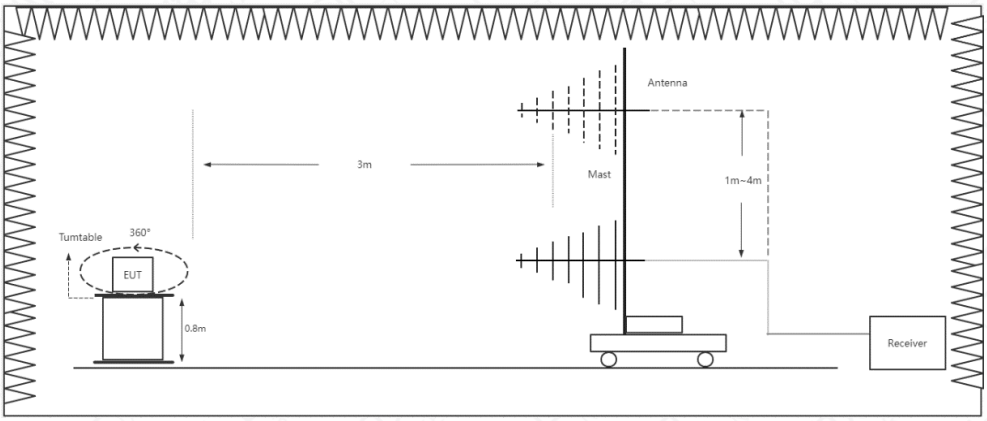

Figure 6.1.2-1 RE 30MHz-1GHz Connection Diagram

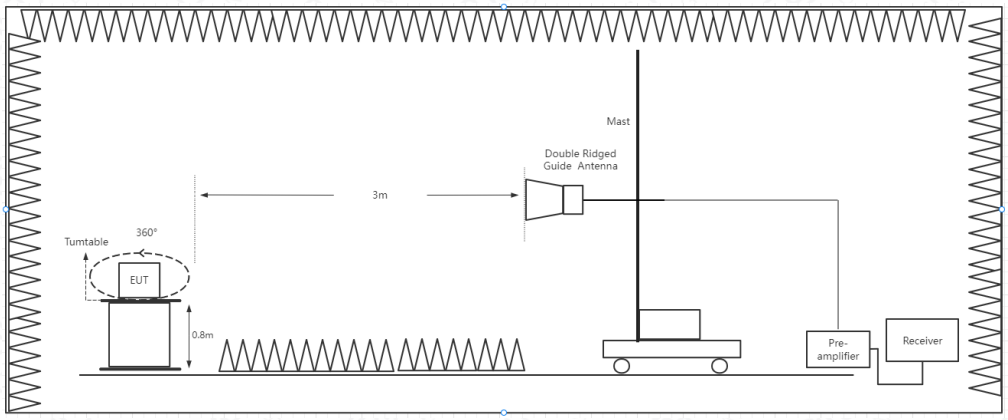

Figure 6.1.2-2 RE Above 1GHz Connection Diagram

6.1.3 Test Condition

Frequency Range (MHz)	RBW/VBW	Sweep Time (s)
30-1000	120kHz/300kHz	AUTO
1000-18000	1MHz/3MHz	AUTO

6.1.4 Limit/Criterion

Frequency Range (MHz)	Quasi-Peak (dBμV/m)	Peak (dBμV/m)	Average (dBμV/m)
30-88	40	N/A	N/A
88-216	43.5	N/A	N/A
216-960	46	N/A	N/A
Above 960	54	N/A	N/A
Above 1000	N/A	74	54

6.1.5 Test environmental conditions

Temperature	18.6℃
Relative Humidity	38.3%RH
Atmospheric Pressure	101.8 kPa

6.1.6 Test Results

Mode	Frequency (MHz)	Test Results	Verdicts
Mode 1: Fullsystem mode+ S03aa+ UB01+ CA01+ UA01+ EA01+ EB01+ AE	30-1000	See Annex A.1-1	Pass
Mode 1: Fullsystem mode+ S03aa+ UB01+ CA01+ UA01+ EA01+ EB01+ AE	1000-18000	See Annex A.1-2 &A.1-3	Pass
NOTE Abbreviations used in this clause: Pass—P; Fail—F; Not applicable—N/A			

6.2 Conducted Emission

6.2.1 Method of Measurement

The EUT was placed on a 0.8m height table with EUT being connected to the power mains through a line impedance stabilization network (LISN). Both lines of the power mains connected to the EUT were checked for maximum conducted interference. The frequency range from 150 kHz to 30 MHz was searched.

6.2.2 EUT Connection Diagram of Test System

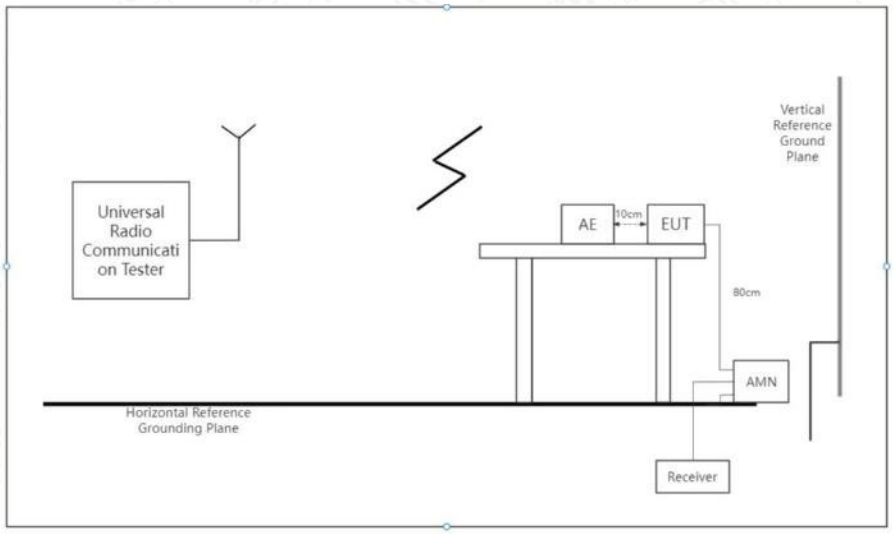

Figure 6.2.2-1 CE Connection Diagram

6.2.3 Test Condition

Test Condition in Charging Mode

Voltage (V)	Frequency (Hz)	RBW	Sweep Time (s)
120	60	9 kHz	AUTO

6.2.4 Limit

Frequency Range (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency		

6.2.5 Testing environmental conditions

Temperature	22.5℃
Relative Humidity	39.6%RH
Atmospheric Pressure	101.9kPa

6.2.6 Test Results

Mode	Frequency (MHz)	Test Results	Verdicts
Mode 1: Fullsystem mode+ S03aa+ UB01+ CA01+ UA01+ EA01+ EB01+ AE	0.15-30	See Annex A.2-1	Pass
NOTE Abbreviations used in this clause: Pass—P; Fail—F; Not applicable—N/A			

Annex A: Measurement Data

A.1 Radiated Emission

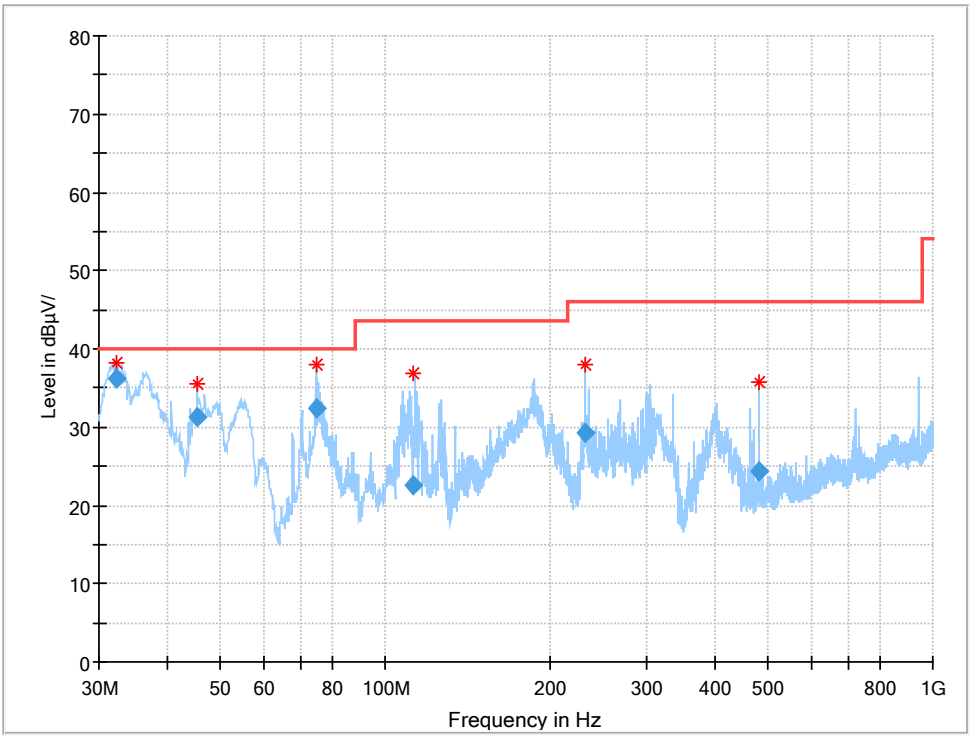

Figure A.1-1 Mode 1 (30M-1GHz)

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
32.192800	36.23	40.00	3.77	100.0	V	93.0	-15.7
45.423080	31.32	40.00	8.68	100.0	V	199.0	-11.5
75.022640	32.39	40.00	7.61	100.0	V	35.0	-17.3
112.619960	22.48	43.50	21.02	100.0	H	82.0	-13.8
231.740920	29.35	46.00	16.65	200.0	H	303.0	-11.7
479.983720	24.35	46.00	21.65	200.0	H	71.0	-5.4

Note:

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

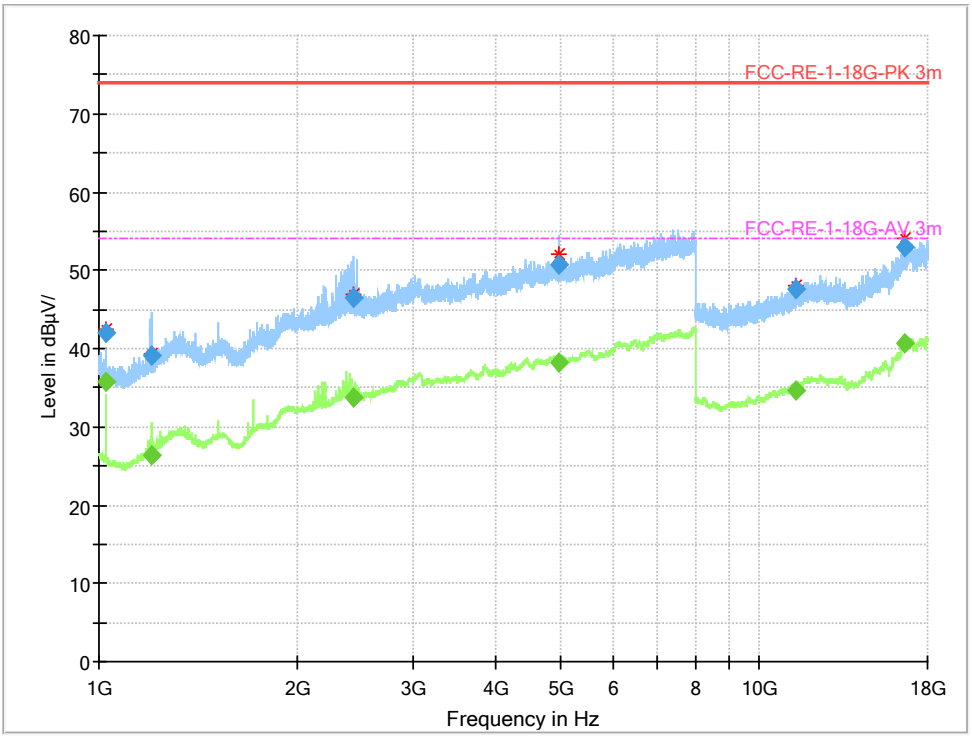

Figure A.1-2 Mode 1 (1GHz-18GHz)-H

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1026.022500	---	35.73	54.00	18.27	185.0	H	276.0	-0.5
1026.022500	42.05	---	74.00	31.95	185.0	H	276.0	-0.5
1202.145000	39.03	---	74.00	34.97	115.0	H	225.0	0.5
1202.145000	---	26.38	54.00	27.62	115.0	H	225.0	0.5
2426.455000	---	33.75	54.00	20.25	115.0	H	225.0	8.8
2426.455000	46.57	---	74.00	27.43	115.0	H	225.0	8.8
4977.962500	50.72	---	74.00	23.28	115.0	H	276.0	15.4
4977.962500	---	38.26	54.00	15.74	115.0	H	276.0	15.4
11399.965000	47.52	---	74.00	26.48	210.0	H	275.0	12.7
11399.965000	---	34.69	54.00	19.31	210.0	H	275.0	12.7
16575.148750	52.86	---	74.00	21.14	203.0	H	130.0	21.7
16575.148750	---	40.61	54.00	13.39	203.0	H	130.0	21.7

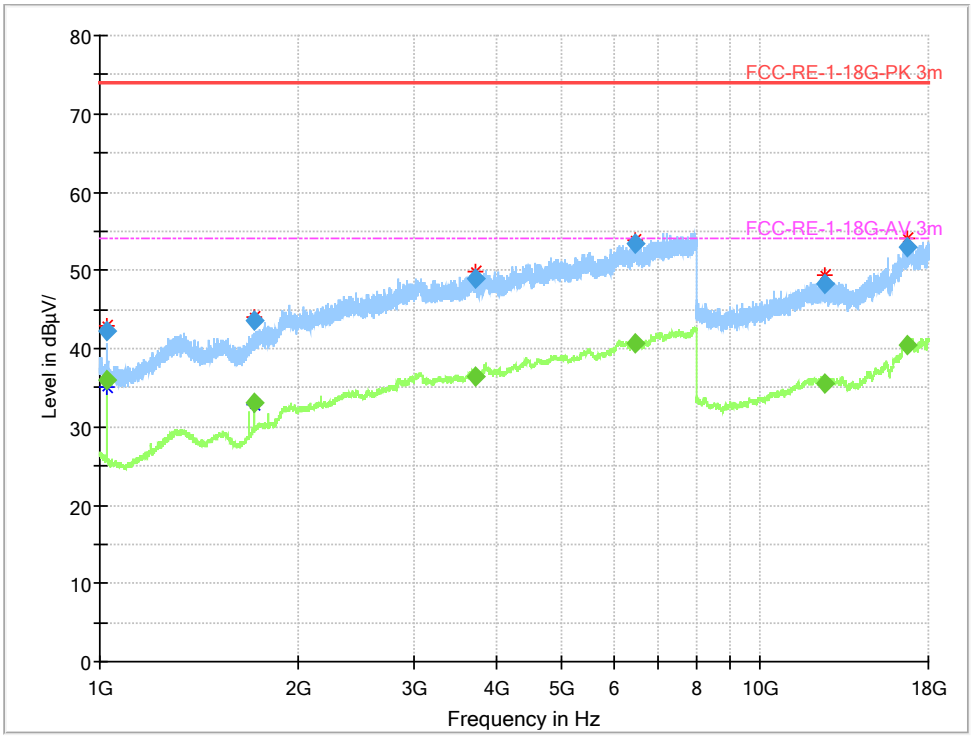

Figure A.1-3 Mode 1 (1GHz-18GHz)-V

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1025.962500	42.22	---	74.00	31.78	185.0	V	284.0	-0.5
1025.962500	---	36.08	54.00	17.92	185.0	V	284.0	-0.5
1710.041250	---	32.98	54.00	21.02	100.0	V	182.0	3.6
1710.041250	43.63	---	74.00	30.37	100.0	V	182.0	3.6
3710.455000	---	36.45	54.00	17.55	115.0	V	358.0	12.6
3710.455000	49.03	---	74.00	24.97	115.0	V	358.0	12.6
6488.866250	---	40.70	54.00	13.30	215.0	V	126.0	18.8
6488.866250	53.32	---	74.00	20.68	215.0	V	126.0	18.8
12513.010000	48.33	---	74.00	25.67	185.0	V	359.0	15.4
12513.010000	---	35.60	54.00	18.40	185.0	V	359.0	15.4
16765.915000	---	40.43	54.00	13.57	115.0	V	23.0	21.9
16765.915000	52.91	---	74.00	21.09	115.0	V	23.0	21.9

A.2 Conducted Emission

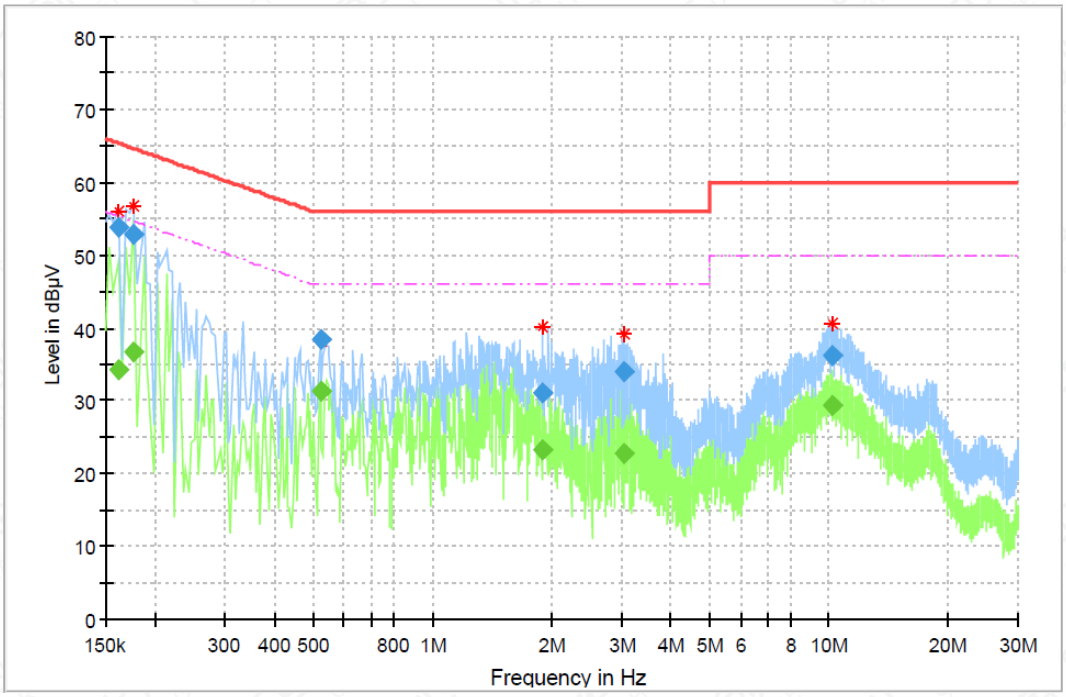

Figure A.2-1 Mode 1 (150kHz-30MHz)

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.161194	53.94	---	65.40	11.47	15000.0	9.000	L1	ON	10.0
0.161194	---	34.33	55.40	21.08	15000.0	9.000	L1	ON	10.0
0.176119	---	36.72	54.67	17.95	15000.0	9.000	N	ON	9.9
0.176119	52.84	---	64.67	11.83	15000.0	9.000	N	ON	9.9
0.523125	---	31.37	46.00	14.63	15000.0	9.000	N	ON	9.8
0.523125	38.51	---	56.00	17.49	15000.0	9.000	N	ON	9.8
1.899956	---	23.15	46.00	22.85	15000.0	9.000	N	ON	9.8
1.899956	31.07	---	56.00	24.93	15000.0	9.000	N	ON	9.8
3.034256	---	22.68	46.00	23.32	15000.0	9.000	N	ON	9.7
3.034256	34.05	---	56.00	21.95	15000.0	9.000	N	ON	9.7
10.228106	36.09	---	60.00	23.91	15000.0	9.000	L1	ON	9.8
10.228106	---	29.40	50.00	20.60	15000.0	9.000	L1	ON	9.8

Note: L1 and N line is all have been tested, the result of them is synthesized in the above data diagram.

Annex B: Revised History

Version	Revised Content
V0	Initial

Annex C: Accreditation Certificate

Accredited Laboratory

A2LA has accredited

INDUSTRIAL INTERNET INNOVATION CENTER (SHANGHAI) CO., LTD.

Shanghai, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 20th day of September 2023.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2025

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.