

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

EMC TEST REPORT

PRODUCT	Separate Monitor
BRAND	SUNMI
MODEL	NP710
APPLICANT	Shanghai Sunmi Technology Co.,Ltd.
FCC ID	2AH25NP7
ISSUE DATE	March 20, 2024
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	Detailed 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 NP710 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°C~35°C
Relative Humidity	25%RH~75%RH
Atmospheric Pressure	86kPa~106kPa
Supply Voltage	120V/60Hz

2.3 Project Information

Project Manager	Gao Hongning
Test Date	February 27, 2024 to March 07, 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	+86 17302160204

3.2 Manufacturer

Company	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505,No.388,Song Hu Road,Yang Pu District,Shanghai,China
Telephone	+86 17302160204

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	Separate Monitor
Model	NP710
Date of Receipt	January 31, 2024
EUT ID*	S08aa
SN/IMEI	ZB02D41P10030
Supported Radio Technology and Bands	NFC
Hardware Version	USBLCD_MB2_V2.0
Software Version	1.0.12
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
CA02	Adapter	CYZS36-240150	Jiangsu Chenyang Electron Co., Ltd. 24V,1.5A
UA02	AC Cable	N/A	N/A
EA01	POS System	F3510	With Fingerprint function
EB01	POS System	F3510	Without Fingerprint function
AE1	Notebook PC	DELL Latitude E6510	N/A
AE2	LAN Cable	N/A	N/A
AE3	Keyboard	KB212-B	CN-0Y88XT-65890-12I-005Q-A00
AE4	Mouse	MS111-P	CN-011D3V-71581-19J-1A64
AE5	Earphone	N/A	N/A
AE6	Micro SD card	Kingston SDC4/4GB 77	N/A
AE7	Cash Box	NC020	N/A
AE8	Telephone	HA8000(28) P/T S	N/A

AE9	U disk	Kingston DTSE9 64GB	N/A
AE10	U disk	Kingston DTSE9 64GB	N/A
AE9	U disk	Kingston DTSE9 16GB	N/A
AE10	U disk	Baize 2GB	N/A
AE11	OTG conversion cable	N/A	N/A
AE12	USB adapter cable	N/A	N/A
AE13	USB adapter cable	N/A	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: Working mode (Full system) + CA02+ UA02+ EA01+ AE Mode 2: Working mode (Full system) + CA02+ UA02+ EB01+ AE
AC Conducted emission	Mode 1: Working mode (Full system) + CA02+ UA02+ EA01+ AE Mode 2: Working mode (Full system) + CA02+ UA02+ EB01+ AE
Note:	

1. All test modes are performed, only the worst cases test data are recorded in this report.
2. The worst case of radiated emission for 30MHz-1GHz is Mode 2 and for 1GHz -18GHz is Mode 2.
3. The worst case for conducted emission is mode 1.

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. Working mode (Full system): The EUT is plugged into the POS System and powered by a power adapter that connects all accessories to the POS System. The computer establishes a pin connection with the POS System through the network cable. File transfer between SD card and POS System. The POS System simultaneously plays video from the USB flash drive.

5.4 EUT Connection Diagram of Test System

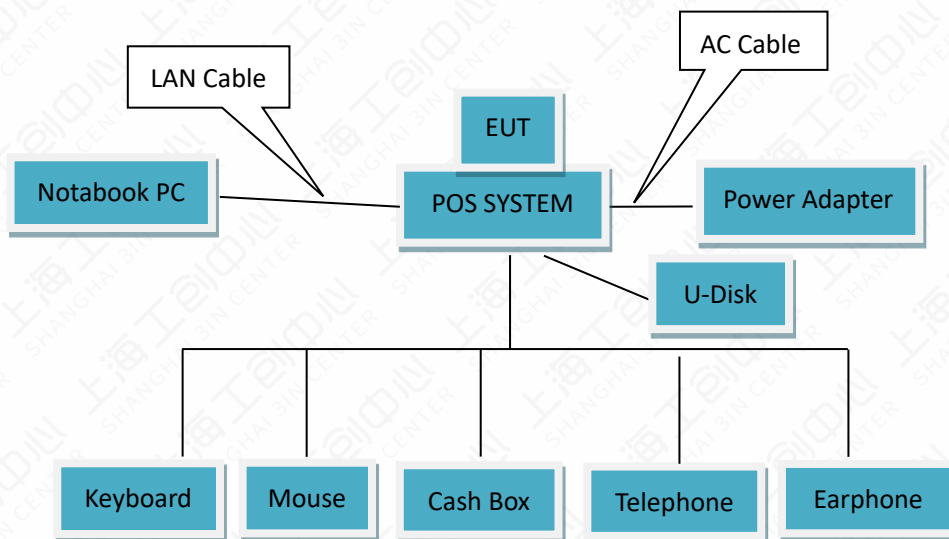


Figure 5.4-1 Mode 1-2

5.5 Test Equipment Utilized

No.	Name	Model	S/N	SW Version	HW Version	Manuf acturer	Cal. Date	Cal. Interval
1	Test Receiver	ESCI	101235	V5.1-24-3	00	R&S	2023-12-19	1 year
2	Test Receiver	ESR7	102399	1.4	00	R&S	2023-06-23	1 year

No.	Name	Model	S/N	SW Version	HW Version	Manuf acturer	Cal. Date	Cal. Interval
3	Test Receiver	FSW43	101943	1.12	00	R&S	2023-08-31	1 year
4	Trilog Antenna	VULB9162	00426	N/A	N/A	Schwar zbeck	2023-07-18	1 year
5	Double Ridged Guide Antenna	ETS-3117	0013588 5	N/A	N/A	ETS	2023-03-23	2 years
6	2-Line V-Network	ENV216	101380	N/A	N/A	R&S	2023-12-19	1 year
7	EMI Test Software	EMC32 V10.35.02	N/A	N/A	N/A	R&S	N/A	N/A
8	EMI Test Software	EMC32 V10.60.20	N/A	N/A	N/A	R&S	N/A	N/A

5.6 Measurement Uncertainty

Item (s)	Uncertainty
Radiated Emission 30MHz-1000MHz	4.86 dB
Radiated Emission 1000MHz-18000MHz	5.58 dB
Conducted Emission	3.30 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

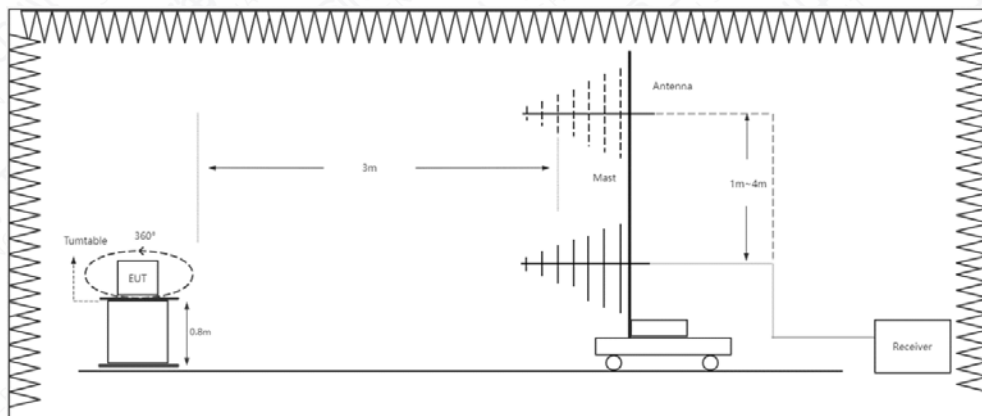


Figure 6.1.2-1 RE 30MHz-1GHz Connection Diagram

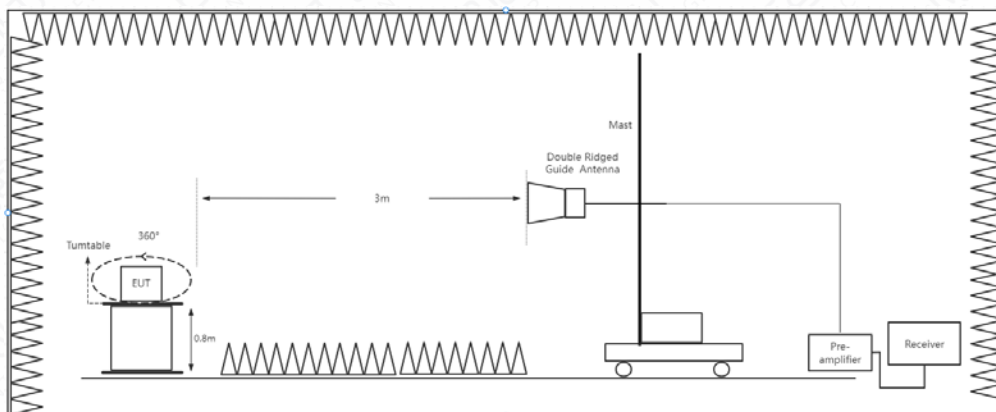


Figure 6.1.2-2 RE Above 1GHz Connection Diagram

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 (dB μ V/m)	Peak (dB μ V/m)	Average (dB μ V/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	20.8 $^{\circ}$ C
Relative Humidity	43.7%RH
Atmospheric Pressure	100.7 kPa

6.1.6 Test Results

Mode	Frequency (MHz)	Test Results	Verdicts
Mode 2: Working mode (Full system) + CA02+ UA02+ EB01+ AE	30-1000	See Annex A.1-1	Pass
Mode 2: Working mode (Full system) + CA02+ UA02+ 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

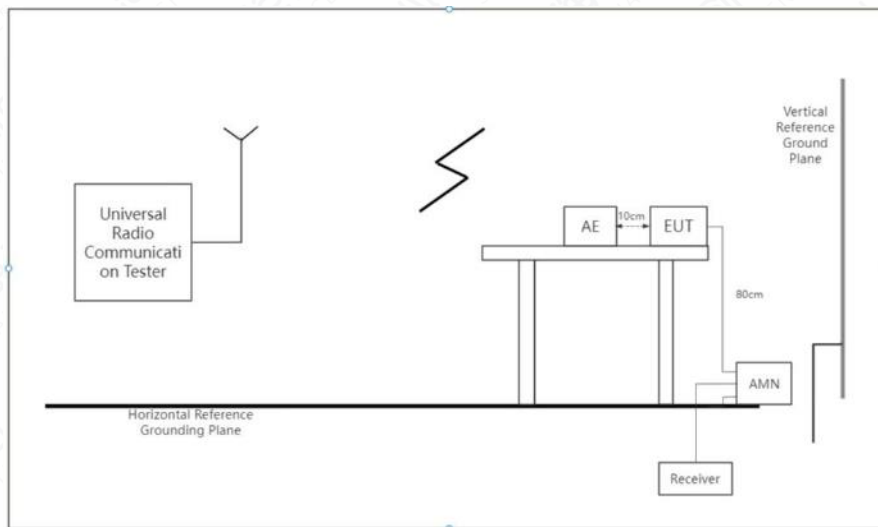


Figure 6.2.2-1 CE Connection Diagram

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 (dB μ V)	
	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	19.7°C
Relative Humidity	39.3%RH
Atmospheric Pressure	101.6kPa

6.2.6 Test Results

Mode	Frequency (MHz)	Test Results	Verdicts
Mode 1: Working mode (Full system) + CA02+ UA02+ EA01+ 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

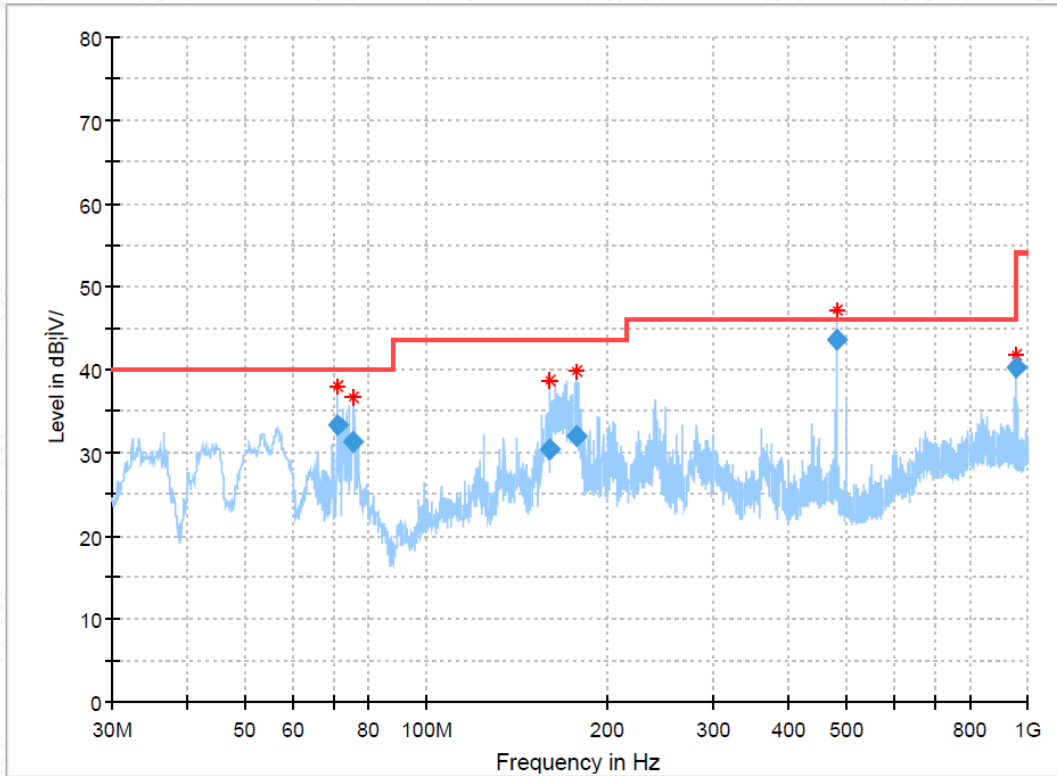


Figure A.1-1 Mode 2 (30M-1GHz)

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
71.281760	33.39	40.00	6.61	200.0	H	121.0	-16.3
75.739200	31.39	40.00	8.61	100.0	V	298.0	-17.6
160.065840	30.38	43.50	13.12	100.0	V	287.0	-15.8
177.630120	31.97	43.50	11.53	200.0	H	285.0	-14.8
480.000160	43.50	46.00	2.50	100.0	H	222.0	-5.3
959.988600	40.26	46.00	5.74	200.0	H	226.0	2.3

Note:

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

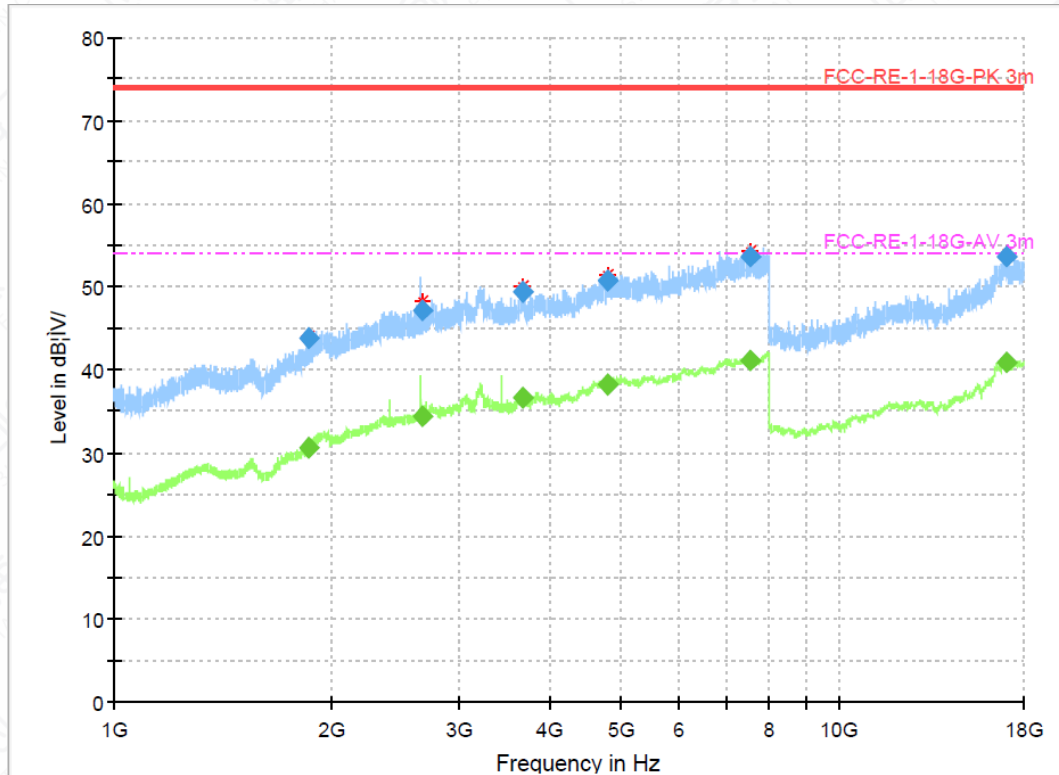


Figure A.1-2 Mode 2 (1GHz-18GHz)-H

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1856.640000	---	30.68	54.00	23.32	115.0	H	6.0	5.6
1856.640000	43.74	---	74.00	30.26	115.0	H	6.0	5.6
2657.578750	---	34.34	54.00	19.66	115.0	H	22.0	9.7
2657.578750	47.21	---	74.00	26.79	115.0	H	22.0	9.7
3668.876250	49.44	---	74.00	24.56	215.0	H	183.0	12.7
3668.876250	---	36.61	54.00	17.39	215.0	H	183.0	12.7
4795.450000	---	38.13	54.00	15.87	115.0	H	359.0	15.3
4795.450000	50.71	---	74.00	23.29	115.0	H	359.0	15.3
7552.571250	53.53	---	74.00	20.47	115.0	H	307.0	20.7
7552.571250	---	41.08	54.00	12.92	115.0	H	307.0	20.7
16993.572500	---	40.93	54.00	13.07	215.0	H	268.0	21.9
16993.572500	53.58	---	74.00	20.42	215.0	H	268.0	21.9

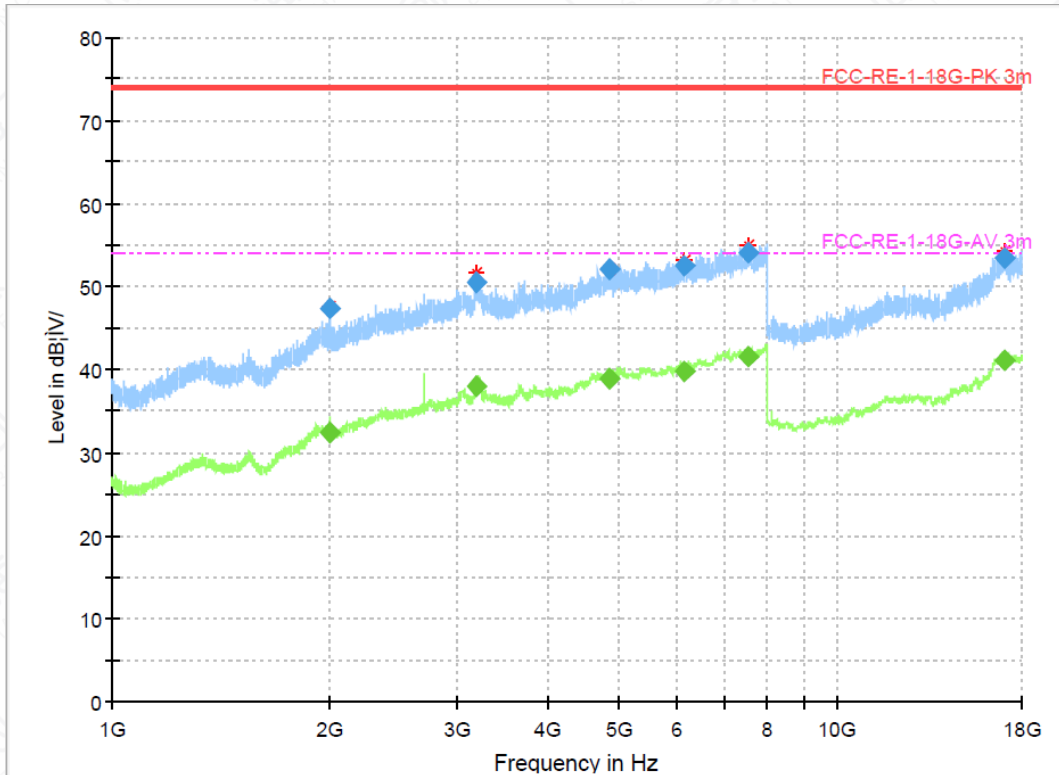


Figure A.1-3 Mode 2 (1GHz-18GHz)-V

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1993.977500	---	32.40	54.00	21.60	100.0	V	0.0	6.4
1993.977500	47.32	---	74.00	26.68	100.0	V	0.0	6.4
3188.667500	---	37.92	54.00	16.08	112.0	V	85.0	14.0
3188.667500	50.43	---	74.00	23.57	112.0	V	85.0	14.0
4853.511250	51.97	---	74.00	22.03	215.0	V	16.0	15.5
4853.511250	---	38.81	54.00	15.19	215.0	V	16.0	15.5
6159.338750	---	39.87	54.00	14.13	115.0	V	340.0	18.2
6159.338750	52.54	---	74.00	21.46	115.0	V	340.0	18.2
7565.437500	54.15	---	74.00	19.85	115.0	V	340.0	20.8
7565.437500	---	41.54	54.00	12.46	115.0	V	340.0	20.8
17068.916250	---	41.17	54.00	12.83	215.0	V	170.0	21.9
17068.916250	53.45	---	74.00	20.55	215.0	V	170.0	21.9

A.2 Conducted Emission

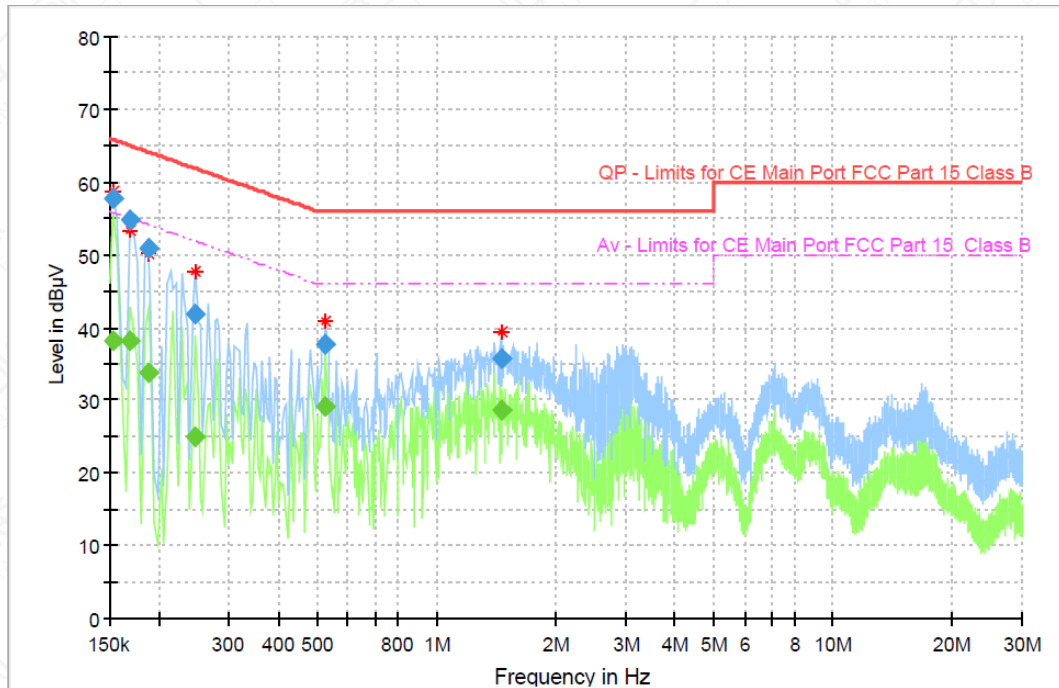


Figure A.2-1 Mode 1 (150kHz-30MHz)

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.153731	---	38.13	55.80	17.67	15000.0	9.000	L1	ON	9.6
0.153731	57.63	---	65.80	8.17	15000.0	9.000	L1	ON	9.6
0.168656	---	38.13	55.03	16.90	15000.0	9.000	L1	ON	9.6
0.168656	54.72	---	65.03	10.30	15000.0	9.000	L1	ON	9.6
0.187313	---	33.86	54.16	20.30	15000.0	9.000	L1	ON	9.6
0.187313	50.89	---	64.16	13.27	15000.0	9.000	L1	ON	9.6
0.247013	---	25.07	51.86	26.79	15000.0	9.000	L1	ON	9.6
0.247013	41.75	---	61.86	20.10	15000.0	9.000	L1	ON	9.6
0.526856	---	29.10	46.00	16.90	15000.0	9.000	L1	ON	9.6
0.526856	37.66	---	56.00	18.34	15000.0	9.000	L1	ON	9.6
1.455938	---	28.74	46.00	17.26	15000.0	9.000	L1	ON	9.6
1.455938	35.66	---	56.00	20.34	15000.0	9.000	L1	ON	9.6

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
010	Initial

Annex C: Accreditation Certificate

The certificate features a decorative orange and blue wavy border on the left and right sides. At the top center, it displays the logos for ILAC-MRA and A2LA. Below the logos, the text reads: "Accredited Laboratory", "A2LA has accredited", "INDUSTRIAL INTERNET INNOVATION CENTER (SHANGHAI) CO., LTD.", "Shanghai, People's Republic of China", and "for technical competence in the field of Electrical Testing". A paragraph of text states: "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)." To the left of this text is a gold seal with the text "CORPORATE SEAL 1978" and "A2LA". To the right is a signature and the text: "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". At the bottom, it says: "For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation."