



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

EMC TEST REPORT

PRODUCT	Smart POS System
BRAND	SUNMI
MODEL	T6F10
APPLICANT	Shanghai Sunmi Technology Co.,Ltd.
FCC ID	2AH25T6F10NA
ISSUE DATE	August 27, 2024
STANDARD(S)	FCC Part 15, Subpart B, ANSI C63.4-2014, ICES-003 Issue 7.

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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 T6F10, 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	July 19, 2024 to August 09, 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	18826519551

3.2 Manufacturer

Company	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505, No.388 Song Hu Road, Yang Pu District, Shanghai, China
Telephone	18826519551

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	Smart POS System
Model	T6F10
Date of Receipt	S05aa: July 16, 2024 S09aa: August 07, 2024
EUT ID*	S05aa & S09aa
SN/IMEI	868393070000286/868393070002282 868393070001557/868393070003553
Supported Radio Technology and Bands	WCDMA Band II/IV/V LTE Band 2/4/5/7/12/13/14/17/25/26/30/38/41/66/71 BT 5.0 BR/EDR/BLE WLAN 802.11b,g,n WLAN 802.11a,n,ac GPS/Galileo NFC
Hardware Version	V1.0(NA)
Software Version	V3.0.0
Power Rating	DC 7.7V form battery, DC 5V form adapter
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
CA01	Adapter	TPA-141A050200UU01	Shenzhen Tianyin Electronics Co., Ltd. INPUT: 100-240V~50/60Hz 0.3A OUTPUT: 5V 2A
CB01	Adapter	UC13US	Jiangsu Chenyang Electron Co., Ltd. INPUT: 100-240V~50/60Hz 0.3A OUTPUT: 5V 2A
CC01	Adapter	TPA-23A050200UU01	Shenzhen Tianyin Electronics Co., Ltd. INPUT: 100-240V~50/60Hz 0.35A OUTPUT: 5V 2A
UA02	AC Cable	N/A	N/A
BA10	Battery	HPPA	Guangdong Highpower New Energy Technology Co., Ltd.
AE1	Notebook PC	DELL Latitude E6510	N/A
AE2	Desktop PC	OptiPlex 790 DT	X8RP1 A01 APCC

AE3	LAN Cable	N/A	N/A
AE4	VGA Cable	N/A	N/A
AE5	RS232 Cable	N/A	N/A
AE6	Keyboard	KB212-B	CN-0Y88XT-65890-12I-005Q-A00
AE7	Mouse	MS111-P	CN-011D3V-71581-19J-1A64
AE8	Monitor	Dell E1709Wc	N/A
AE9	Micro SD card	Kingston SDC4/4GB 77	N/A
AE10	Earphone	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: LTE Band 2 receiver mode+ Back Camera+ CA01+ UA02+ S05aa Mode 2: LTE Band 2 receiver mode+ Front Camera+ CA01+ UA02+ S05aa Mode 3: WCDMA BAND IV receiver mode+ Front Camera+ CB01+ UA02+ S05aa Mode 4: LTE Band 5 receiver mode+ Front Camera+ CC01+ UA02+ S05aa Mode 5: Full system+ Data Link mode+ UA02+ S05aa Mode 6: GNSS mode+ CB01+ UA02+ S05aa Mode 7: Print mode+ CB01+ UA02+ S09aa Mode 8: Scan mode+ CB01+ UA02+ S09aa
AC Conducted emission	Mode 1: LTE Band 2 receiver mode+ Back Camera+ CA01+ UA02+ S05aa Mode 2: LTE Band 2 receiver mode+ Front Camera+ CA01+ UA02+ S05aa Mode 3: WCDMA BAND IV receiver mode+ Front Camera+ CB01+ UA02+ S05aa Mode 4: LTE Band 5 receiver mode+ Front Camera+ CC01+ UA02+ S05aa Mode 5: Full system+ Data Link mode+ UA02+ S05aa Mode 9: GNSS mode+ CA01+ UA02+ S05aa Mode 10: Print mode+ CA01+ UA02+ S09aa Mode 11: Scan mode+ CA01+ UA02+ S09aa
Note: 1. All test modes are performed, only the worst cases test data are recorded in this report. 2. After laboratory verification, WCDMA BAND IV/LTE Band 2/5 is the worst mode among all receiving modes of 3G/4G and is recorded in the report. 3. The worst case of radiated emission for 30MHz-1GHz is Mode 7 and for 1GHz -18GHz is Mode 5. 4. The worst case for conducted emission is mode 10.	

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. Data Link mode means data application transferred mode between EUT, SD Card and PC.
5. GNSS mode: EUT and GNSS simulator (SMBV100A) connection is established.

5.4 EUT Connection Diagram of Test System

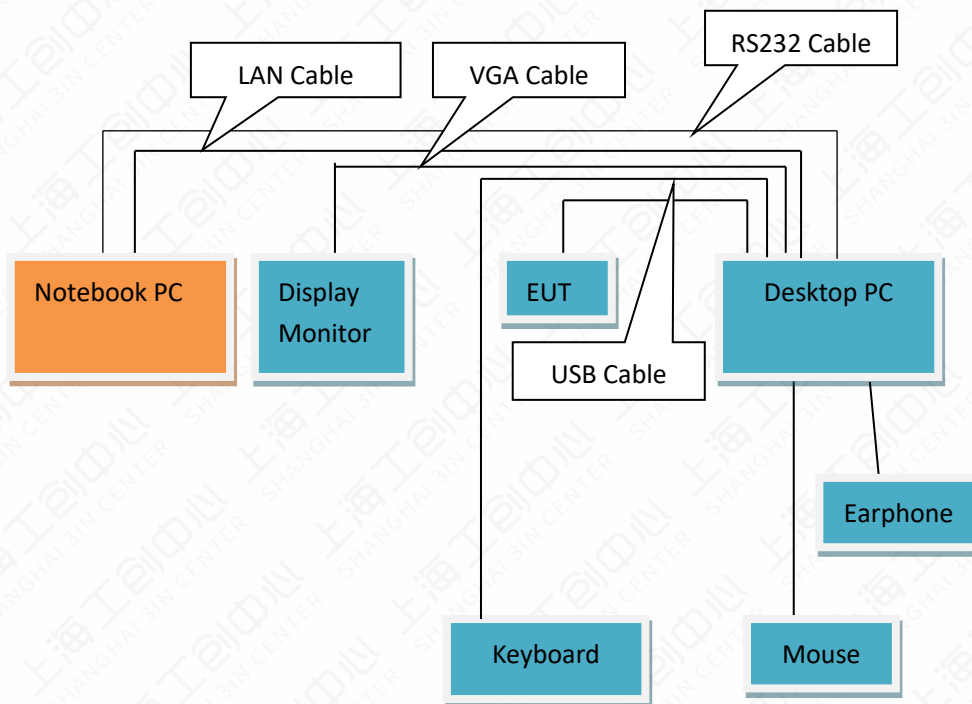


Figure 5.4-1 Mode 5

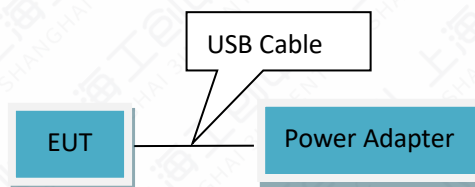


Figure 5.4-2 Mode 1-4,6-11

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	2024-06-07	1 year
3	Test Receiver	FSW43	101943	1.12	00	R&S	2023-08-31	1 year
4	Trilog Antenna	VULB9162	00426	N/A	N/A	Schwarzbeck	2024-07-17	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	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
9	Universal Radio Communication Tester	CMW500	104178	V3.7.20	1206.0600.00	R&S	2023-10-17	1 year
10	Vector signal generator	SMBV100A	257904	N/A	N/A	R&S	2023-12-19	1 year
11	Preamplifier	SCU08F1	8320024	N/A	N/A	R&S	2023-10-16	1 year
12	Preamplifier	SCU18	10155	N/A	N/A	R&S	2023-10-16	1 year

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

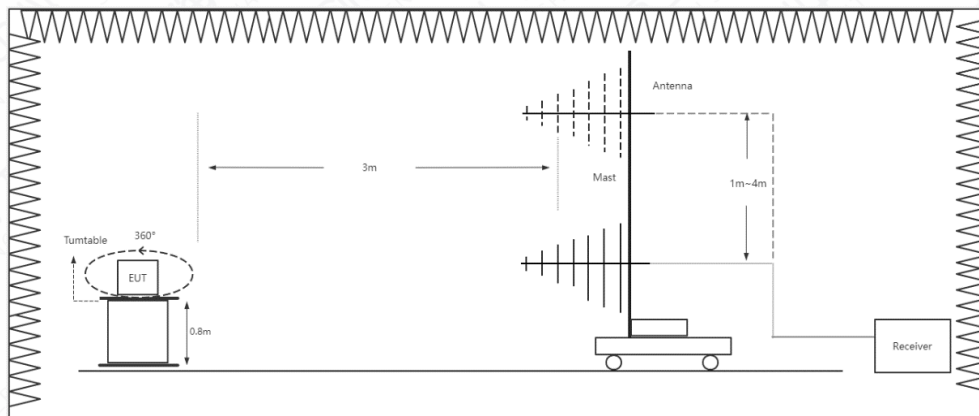


Figure 6.1.2-1 RE 30MHz-1GHz Connection Diagram

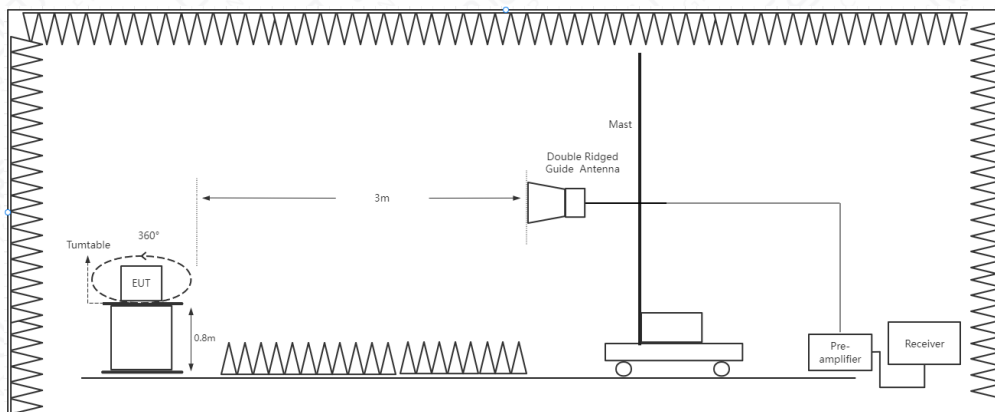


Figure 6.1.2-2 RE Above 1GHz Connection Diagram

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	20.0°C
Relative Humidity	61.2%RH
Atmospheric Pressure	100.4 kPa

6.1.6 Test Results

Mode	Frequency (MHz)	Test Results	Verdicts
Mode 7: Print mode+ CB01+ UA02+ S09aa	30-1000	See Annex A.1-1	Pass
Mode 5: Full system+ Data Link mode+ UA02+ S05aa	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

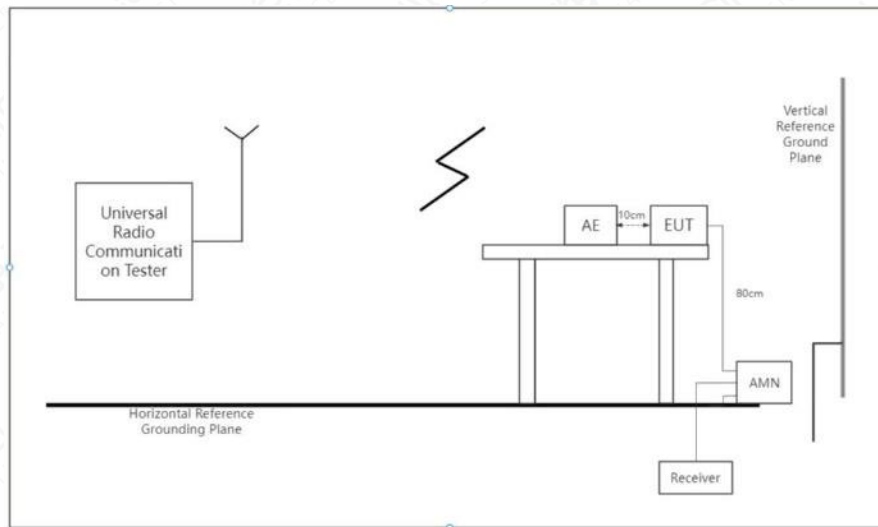


Figure 6.2.2-1 CE Connection Diagram

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	25.3°C
Relative Humidity	56.7%RH
Atmospheric Pressure	100.5kPa

6.2.6 Test Results

Mode	Frequency (MHz)	Test Results	Verdicts
Mode 10: Print mode+ CA01+ UA02+ S09aa	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

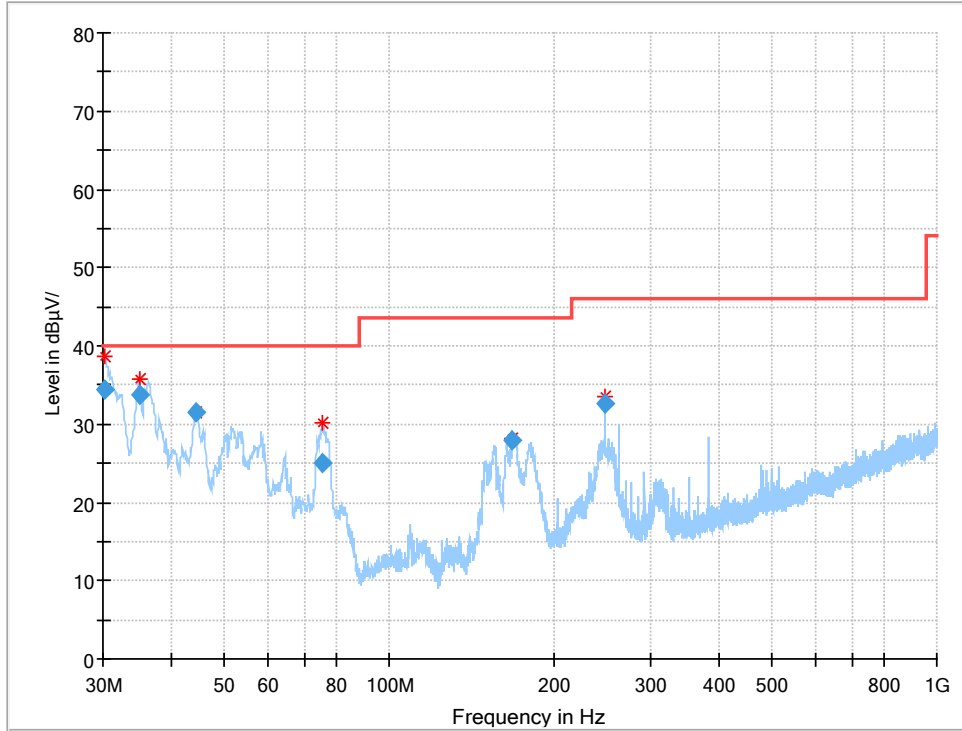


Figure A.1-1 Mode 7 (30M-1GHz)

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.132779	34.45	40.00	5.55	100.0	V	277.0	-16.2
35.157560	33.79	40.00	6.21	100.0	V	162.0	-14.9
44.497600	31.48	40.00	8.52	100.0	V	277.0	-11.6
75.388080	24.93	40.00	15.07	100.0	V	255.0	-17.5
167.798360	27.93	43.50	15.57	100.0	V	10.0	-15.5
247.498000	32.61	46.00	13.39	100.0	H	150.0	-10.7

Note:

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

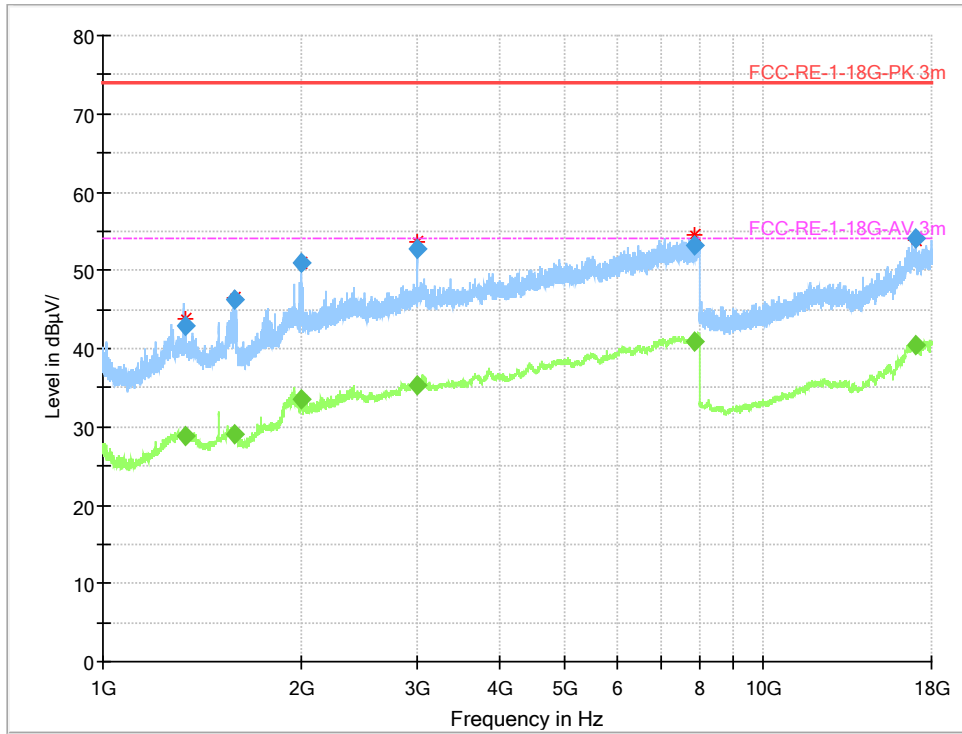


Figure A.1-2 Mode 5 (1GHz-18GHz)-H

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1330.208750	42.96	---	74.00	31.04	115.0	H	108.0	3.1
1330.208750	---	28.85	54.00	25.15	115.0	H	108.0	3.1
1585.262500	---	29.07	54.00	24.93	100.0	H	354.0	2.0
1585.262500	46.23	---	74.00	27.77	100.0	H	354.0	2.0
1999.421250	---	33.46	54.00	20.54	100.0	H	165.0	6.5
1999.421250	50.88	---	74.00	23.12	100.0	H	165.0	6.5
2987.078750	52.81	---	74.00	21.19	215.0	H	127.0	11.2
2987.078750	---	35.23	54.00	18.77	215.0	H	127.0	11.2
7868.373750	53.29	---	74.00	20.71	215.0	H	271.0	20.8
7868.373750	---	40.82	54.00	13.18	215.0	H	271.0	20.8
17047.887500	54.12	---	74.00	19.88	115.0	H	0.0	21.8
17047.887500	---	40.44	54.00	13.56	115.0	H	0.0	21.8

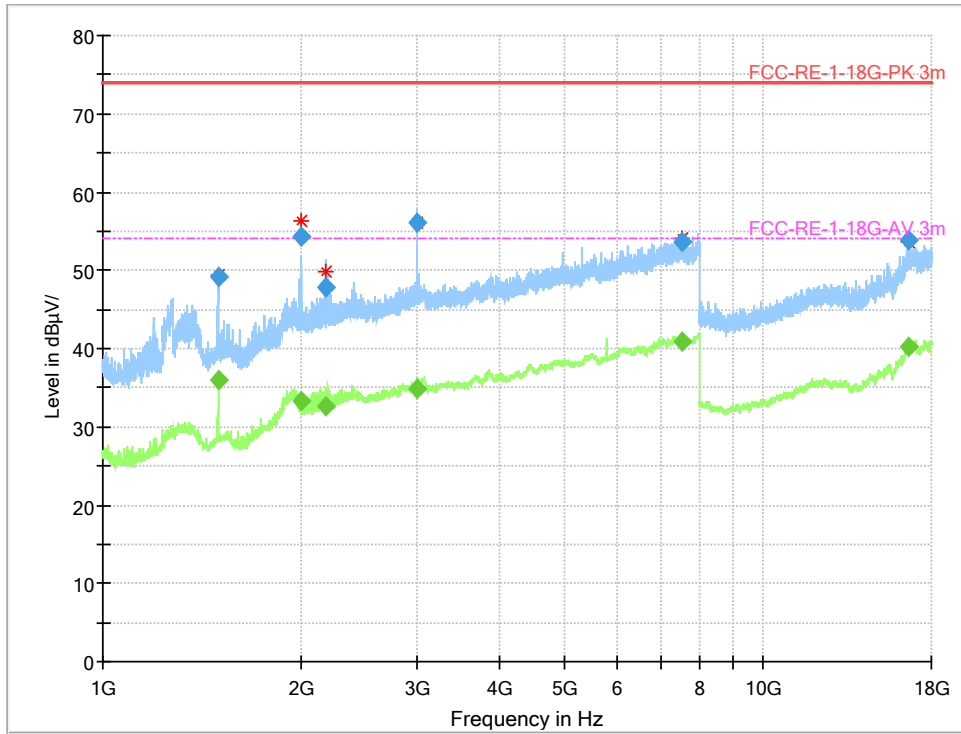


Figure A.1-3 Mode 5 (1GHz-18GHz)-V

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1496.923750	49.15	---	74.00	24.85	100.0	V	239.0	2.7
1496.923750	---	36.00	54.00	18.00	100.0	V	239.0	2.7
1993.652500	54.26	---	74.00	19.74	100.0	V	14.0	6.5
1993.652500	---	33.34	54.00	20.66	100.0	V	14.0	6.5
2177.342500	---	32.70	54.00	21.30	100.0	V	239.0	7.2
2177.342500	47.83	---	74.00	26.17	100.0	V	239.0	7.2
2986.842500	56.02	---	74.00	17.98	100.0	V	182.0	11.2
2986.842500	---	34.96	54.00	19.04	100.0	V	182.0	11.2
7529.713750	53.57	---	74.00	20.43	103.0	V	180.0	20.9
7529.713750	---	40.86	54.00	13.14	103.0	V	180.0	20.9
16603.487500	---	40.33	54.00	13.67	202.0	V	90.0	21.8
16603.487500	53.89	---	74.00	20.11	202.0	V	90.0	21.8

A.2 Conducted Emission

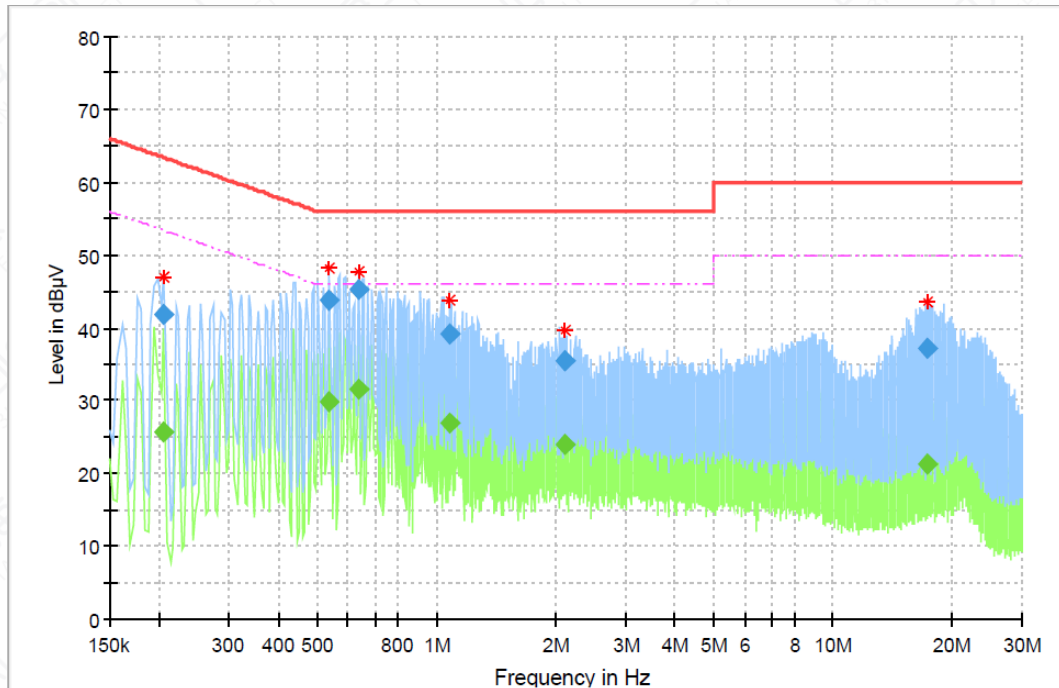


Figure A.2-1 Mode 10 (150kHz-30MHz)

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.205969	---	25.72	53.37	27.64	15000.0	9.000	L1	ON	9.6
0.205969	41.90	---	63.37	21.46	15000.0	9.000	L1	ON	9.6
0.538050	---	29.79	46.00	16.21	15000.0	9.000	N	ON	9.6
0.538050	43.91	---	56.00	12.09	15000.0	9.000	N	ON	9.6
0.638794	45.19	---	56.00	10.81	15000.0	9.000	N	ON	9.6
0.638794	---	31.48	46.00	14.52	15000.0	9.000	N	ON	9.6
1.079081	39.26	---	56.00	16.74	15000.0	9.000	L1	ON	9.6
1.079081	---	26.94	46.00	19.06	15000.0	9.000	L1	ON	9.6
2.108906	---	24.09	46.00	21.91	15000.0	9.000	L1	ON	9.6
2.108906	35.38	---	56.00	20.62	15000.0	9.000	L1	ON	9.6
17.254050	---	21.41	50.00	28.59	15000.0	9.000	L1	ON	10.0
17.254050	37.17	---	60.00	22.83	15000.0	9.000	L1	ON	10.0

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.