TEST REPORT

Report Number: C21T00091-SRD03-V01

Applicant	Shanghai Sunmi Technology Co.,Ltd.
Product Name	Smart POS system
Model Name	T6900
Brand Name	SUNMI
FCC ID	2AH25T6900

Industrial Internet Innovation Center (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in FCC Part15, ANSI C63.10, KDB 558074.

Prepared by	范宇航	Reviewed by	王长青
Approved by		Issue Date	2022-01-11

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

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Test Laboratory:
Industrial Internet Innovation Center (Shanghai) Co., Ltd.
Add: Building 4, No. 766 Jingang Rd, Pudong, Shanghai, China
Tel: +86 21 68866880

Revision Version

Report Number	Revision	Date	Memo
C21T00091-SRD03-V00	00	2022-01-05	Initial creation of test report
C21T00091-SRD03-V01	01	2022-01-11	Update the number of the original report in 5.2.

CONTENTS

1. Test Laboratory

1.1. Testing Location

Company Name	Industrial Internet Innovation Center (Shanghai) Co., Ltd.
Address	Building 4, No. 766 Jingang Rd, Pudong, Shanghai, China
FCC Registration No.	CN1177

1.2. Testing Environment

Normal Temperature	15℃~35℃
Relative Humidity	30%RH~60%RH
Supply Voltage	120V/60Hz

1.3. Project Information

Project Leader	Wang Wenwen
Testing Start Date	2021-09-15
Testing End Date	2022-01-05

2. Client Information

2.1. Applicant Information

Company Name	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China
Telephone	+86 18501703215

2.2. Manufacturer Information

Company Name	Shanghai Sunmi Technology Co.,Ltd.
Address	Room 505, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China
Telephone	+86 18501703215

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

3.1. About EUT

Product Name	Smart POS system
Model name	T6900
Supported Radio Technology and Bands	GSM850/GSM900/GSM1800/GSM1900 WCDMA Band I/V/VIII LTE Band FDD1/3/5/7/8/20 TDD38/40/41 BT 4.2 WLAN 802.11b,g,n WLAN 802.11a,n NFC GPS
Hardware Version	B1691_MAIN_PCB_V1.1
Software Version	V1.0.2
WLAN Frequency	2412MHz-2462MHz
WLAN Channel	Ch1-11
WLAN type of modulation	802.11b: DSSS 802.11g/n: OFDM
FCC ID	2AH25T6900
Extreme Temperature	0℃~45℃
Nominal Voltage	7.60V
Extreme High Voltage	8.70V
Extreme Low Voltage	6.80V

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of Receipt
N07	N/A	B1691_MAIN_PCB_V1.1	V1.0.2	2021-09-10
N09	N/A	B1691_MAIN_PCB_V1.1	V1.0.2	2021-11-11

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

3.3. Internal Identification of AE used during the test

AE ID*	Description	Model	SN/Remark
AE1	RF cable	N/A	N/A

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

4. Reference Documents

4.1. Reference Documents for testing

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

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz.	2020
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices	2013
KDB 558074 D01	Guidance for Performing Compliance Measurements on Frequency Hopping Spread Spectrum systems (DSS) Operating Under §15.247	2019

4.2. Reference Information from client

Information of the test sample provided by the client.

5. Test Summary

5.1. Summary of Test Results

Measurement Items	Sub-clause of Part15C	Verdict
Maximum Peak Output Power	15.247(b)	N/A
Peak Power Spectral Density	15.247(e)	N/A
Occupied 6dB Bandwidth	15.247(a)	N/A
99% Occupied Bandwidth	N/A	N/A
Band Edges Compliance	15.247(d)	Pass
Transmitter Spurious Emission-Conducted	15.247(d)	N/A
Transmitter Spurious Emission-Radiated	15.247/15.205/15.209	Pass

Note: All the test data for each data were verified, but only the worst case was reported.

Test Conditions

Tnom	Normal Temperature
Tmin	Low Temperature
Tmax	High Temperature
Vnom	Normal Voltage
Vmin	Low Voltage
Vmax	High Voltage
Hnom	Norm Humidity
Anom	Norm Air Pressure

For this report, all the test case listed above are tested under Normal Temperature and Normal Voltage, and also under norm humidity, the specific conditions as following:

Temperature	Tnom	25℃
Voltage	Vnom	7.60 V
Humidity	Hnom	48%
Air Pressure	Anom	1010hPa

5.2. Statements

The T6900, manufactured by Shanghai Sunmi Technology Co., Ltd.. is a variant product for testing.

This project is a variant project based on the original report I19D00121-SRD03-V00, we tested the worst mode of the original report, and the test data of the worst mode was recorded in the report. The main difference of EUT is as below：

	Product NO.	The difference with initial certified product
Mainly Supply	N07	1. Add a back up CPU(model:MT8765V/WA) 2. Add a back up 27.12MHz Crystal for NFC(model:SX20Y027120BA1T) 3. Add a back up PCB supplier ZHIHAO 4. Change mcu from MH1902 BGA121 to MH1902T BGA121 5. Add a back up NFC chip FM17660 6. Add a back up LCD(model:LMFBH055100970) 7. Add a back up Camera (model:LH-XC-5035COM-B1691-V9.0) 8. Add a back up NFC antenna(model:SH19038IB100-6) 9. back up memory
Secondary Supply	N09	1. Add a back up CPU(model:MT8765V/WA) 2. Add a back up 27.12MHz Crystal for NFC(model:SX20Y027120BA1T) 3. Add a back up PCB supplier ZHIHAO 4. Change mcu from MH1902 BGA121 to MH1902T BGA121 5. Add a back up LCD(model:LMFBH055100970) 6. Add a back up Camera (model:LH-XC-5035COM-B1691-V9.0) 7. Add a back up NFC antenna(model:SH19038IB100-6) 8. back up memory

Industrial Internet Innovation Center (Shanghai) Co., Ltd. only performed test cases which identified with Pass/Fail/Inc result in section 5.1.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. has verified that the compliance of the tested device specified in section 3 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 4 of this test report.

6. Measurement Results

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (6.9 meters×10.9 meters×5.4 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
VSWR	Between 0 and 6 dB, from 1GHz to 18GHz
Site Attenuation Deviation	Between -4 and 4 dB,30MHz to 1GHz
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

6.1Transmitter Spurious Emission-Radiated

6.1.1 Measurement Limit:

Standard	Limit
FCC 47 Part 15.247,15.205,15.209	20dB below peak output power

In addition, radiated emissions which fall in the restricted bands, as defined in 25.205(a), must also comply with the radiated emission limits specified in 15.209(a)(see 15.205(c)).
The measurement is according to ANSI C63.10 clause 11.11 and 11.12.

6.1.2 Limit in restricted band:

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30~88	100	40
88~216	150	43.5
216~960	200	46
Above 960	500	54

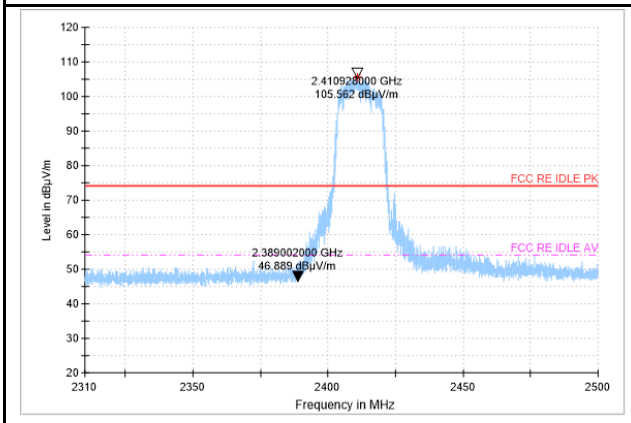
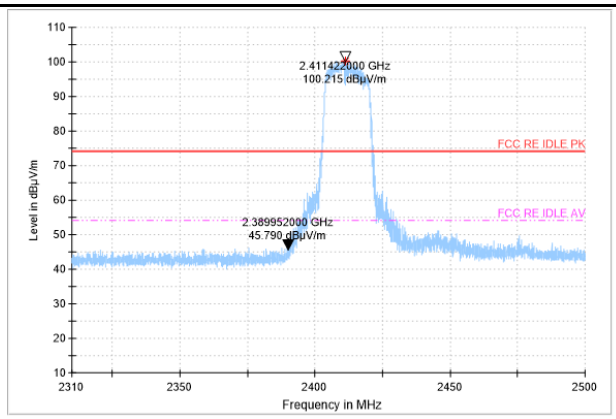
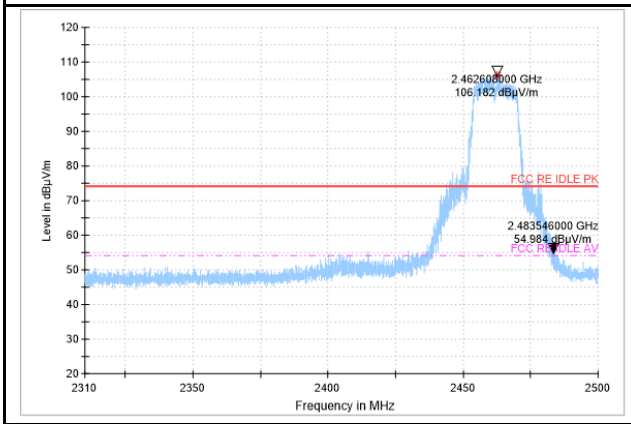
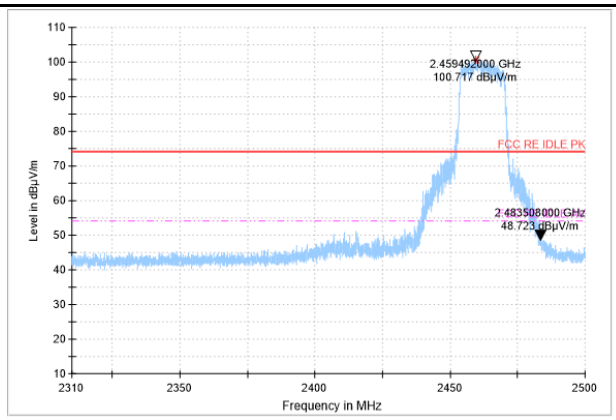
6.1.3 Test procedures

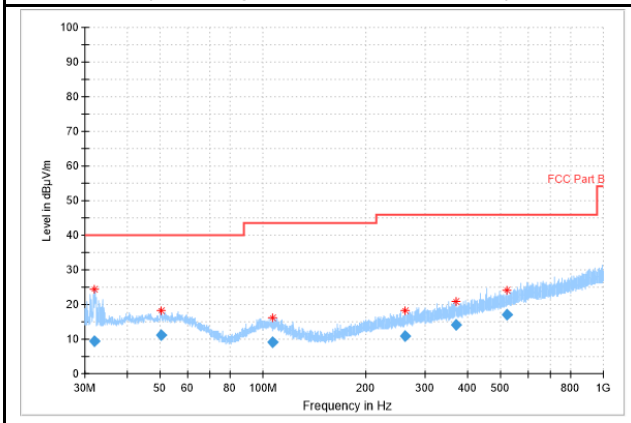
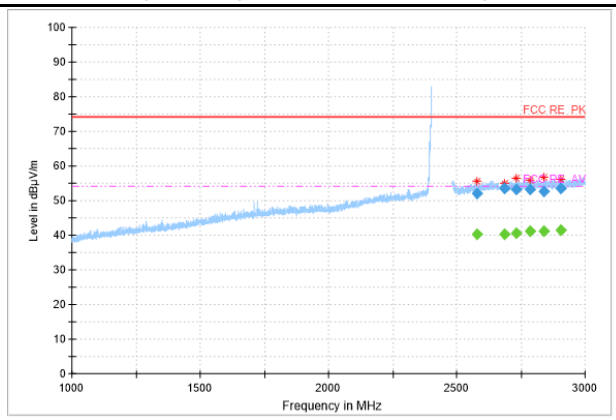
Portable, small, lightweight, or modular devices that may be handheld, worn on the body, or placed on a table during operation shall be positioned on a nonconducting platform, the top of which is 80 cm above the reference ground plane. The preferred area occupied by the EUT arrangement is 1 m by 1.5 m, but it may be larger or smaller to accommodate various sized EUTs. For testing purposes, ceiling- and wall-mounted devices also shall be positioned on a tabletop (see also ANSI C63.4-2013 section 6.3.4 and 6.3.5). In making any tests involving handheld, body-worn, or ceiling-mounted equipment, it is essential to recognize that the measured levels may be dependent on the orientation (attitude) of the three orthogonal axes of the EUT. Thus, exploratory tests as specified in 8.3.1 shall be carried out for various axes orientations to determine the attitude having maximum or near-maximum emission level.

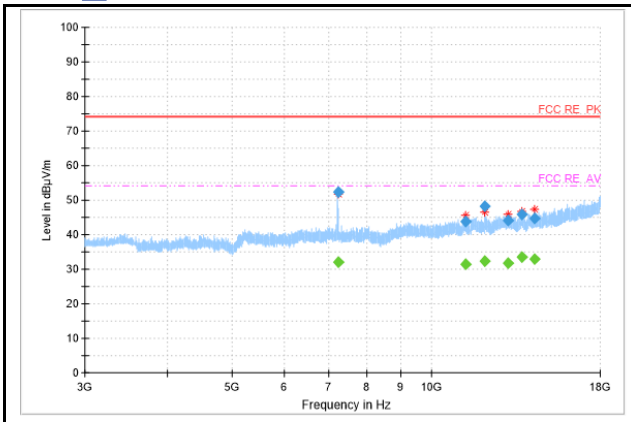
The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During testing, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emission from the EUT. This maximization process was repeated with the EUT positioned in each of its three rthogonal orientations.

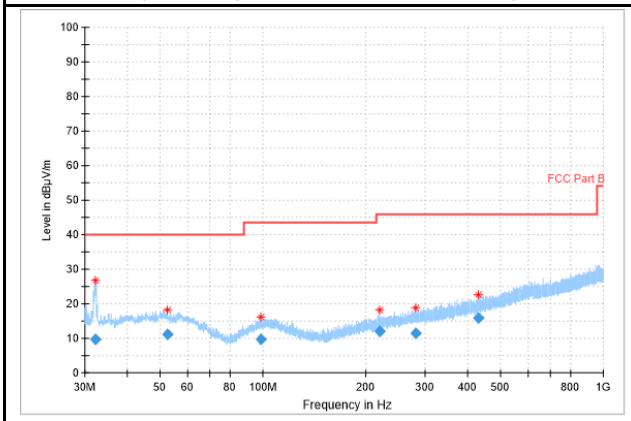
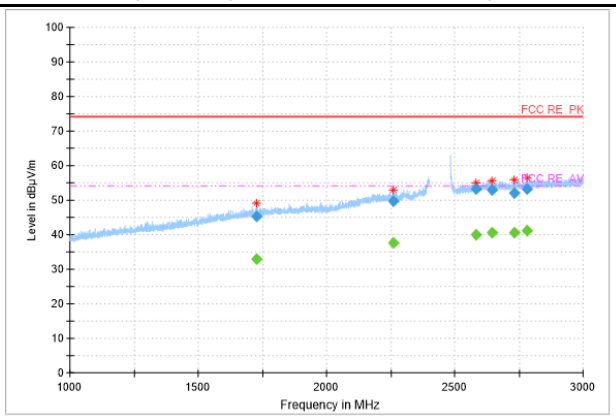
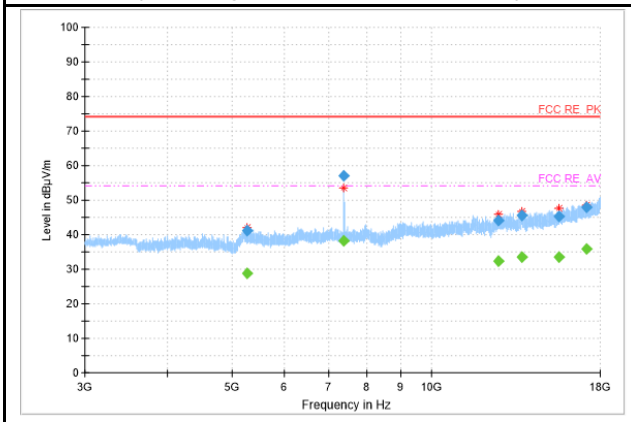
Frequency of emission (MHz)	RBW/VBW	Sweep Times (s)
30~1000	100KHz/300KHz	5
1000~4000	1MHz/3MHz	15
4000~18000	1MHz/3MHz	40
18000~26500	1MHz/3MHz	20

N07 Mainly Supply

Bandedge: 802.11g, low channel	
Peak detector	AV detector
	
Bandedge: 802.11g, high channel	
Peak detector	AV detector
	

Radiated Spurious Emission (802.11g, Ch1,30MHz~1GHz)	Radiated Spurious Emission (802.11g, Ch1,1GHz~3GHz)
	
Radiated Spurious Emission (802.11g, Ch1, 3GHz~18GHz)	/

	/

Radiated Spurious Emission (802.11g, Ch11,30MHz~1GHz)	Radiated Spurious Emission (802.11g, Ch11,1GHz~3GHz)
	
Radiated Spurious Emission (802.11g, Ch11, 3GHz~18GHz)	/
	/

Note:

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

P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

ARpi = Cable loss + Antenna Factor -Preamplifier gain

Result = P_{Mea} + Cable loss + Antenna Gain-Preamplifier gain = P_{Mea} + ARpi .

Ch1 30MHz~1GHz

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
32.0	9.45	-14.3	23.75	V
50.1	11.28	-11.9	23.18	H
106.6	9.14	-13.2	22.34	V
261.9	10.95	-11.6	22.55	V
369.8	14.14	-8.8	22.94	V
519.7	17.11	-5.7	22.81	V

Ch1 1GHz~3GHz

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
2576.7	51.97	15.3	36.67	V
2687.9	53.43	15.9	37.53	V
2733.2	53.24	16.1	37.14	H
2785.2	53.17	16.5	36.67	V
2838.9	52.79	16.6	36.19	V
2905.8	53.66	16.7	36.96	V

Ch1 3GHz~18GHz

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
7227.9	52.4	-2.1	54.5	H
11263.8	43.72	1.6	42.12	H
12056.6	48.37	2	46.37	V
13083.0	44.1	3.7	40.4	V
13719.5	45.77	4.1	41.67	H
14316.8	44.77	5.4	39.37	H

Ch11 30MHz~1GHz

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
32.3	9.82	-14.2	24.02	V
52.5	11.15	-12	23.15	H
98.3	9.56	-13.7	23.26	H
220.9	12.06	-12.5	24.56	V

280.4	11.41	-10.9	22.31	H
430.5	15.76	-7.7	23.46	V

Ch11 1GHz~3GHz

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
1729.0	45.19	7.9	37.29	H
2258.8	49.64	12.9	36.74	H
2582.0	53.1	15.4	37.7	H
2644.8	52.89	15.8	37.09	V
2732.2	52.08	16.1	35.98	H
2781.5	53.26	16.5	36.76	H

Ch11 3GHz~18GHz

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
5270.7	41.19	-2	43.19	H
7385.7	56.93	-2.2	59.13	H
12638.1	43.98	2.8	41.18	H
13720.5	45.48	4.1	41.38	H
15610.6	45.43	6.5	38.93	H
17146.9	47.95	9.2	38.75	H

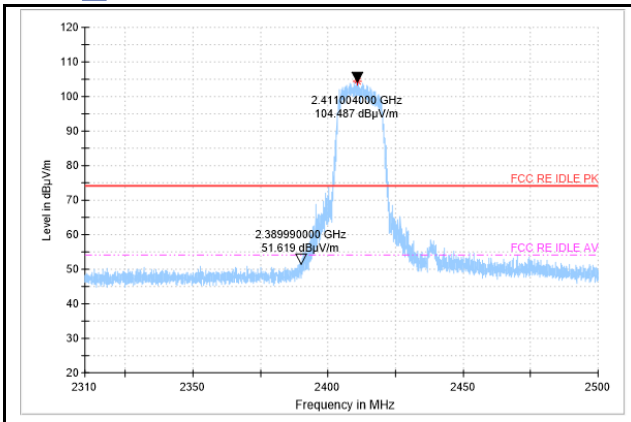
Ch11 3GHz~18GHz(Average)

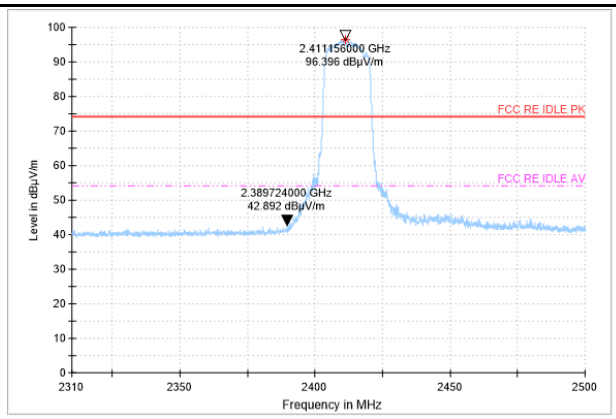
Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
7385.7	38.3	-2.2	40.5	H

Note: Only the worst case is written in the report.

N09 Secondary Supply

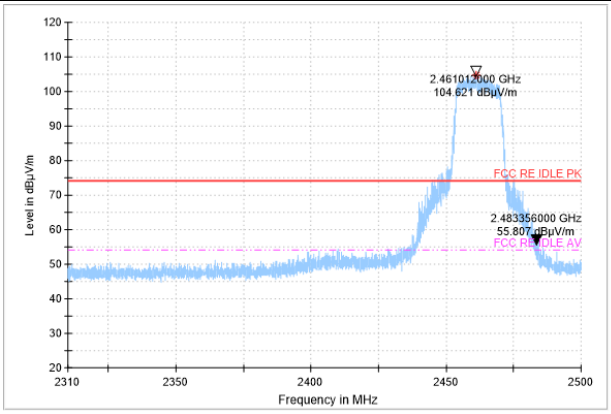
Bandedge: 802.11g, low channel	
Peak detector	AV detector

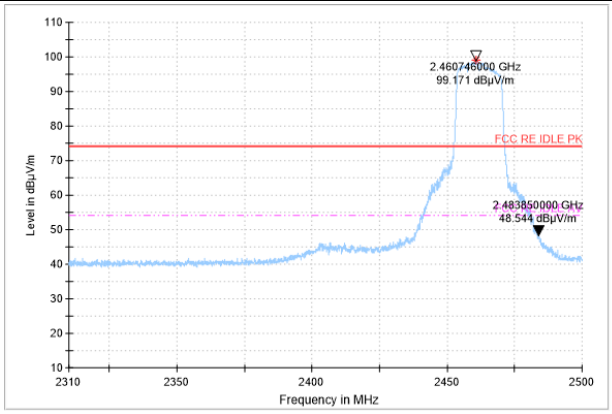




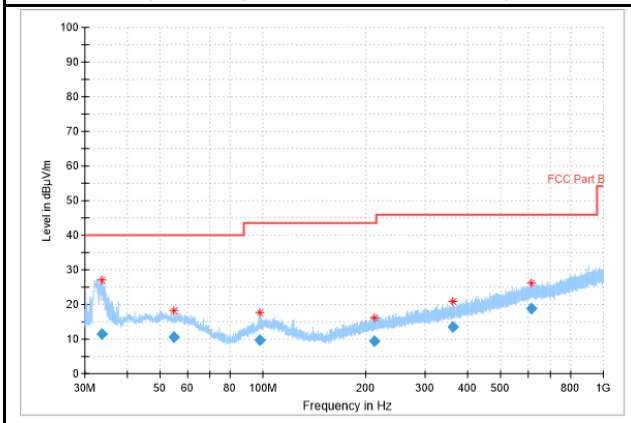
Bandedge: 802.11g, high channel

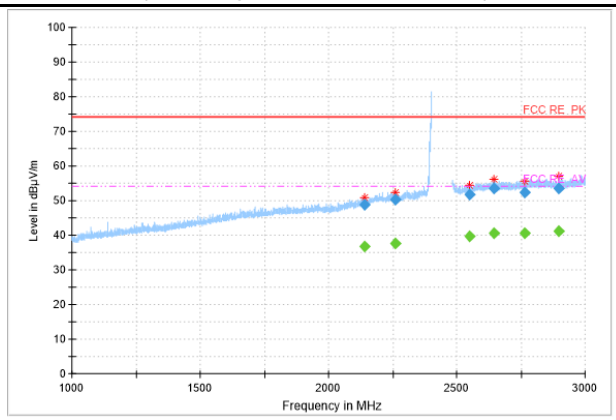
Peak detector	AV detector



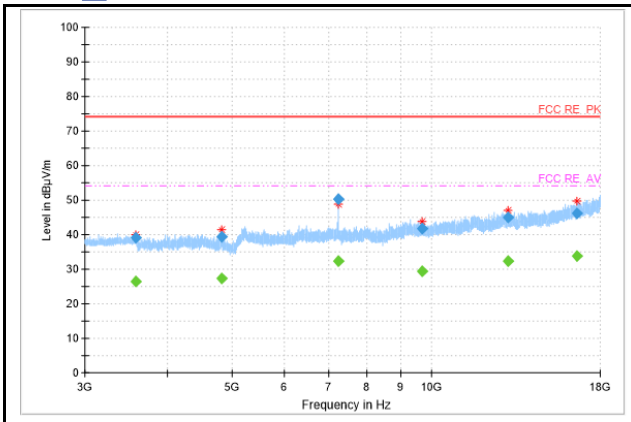


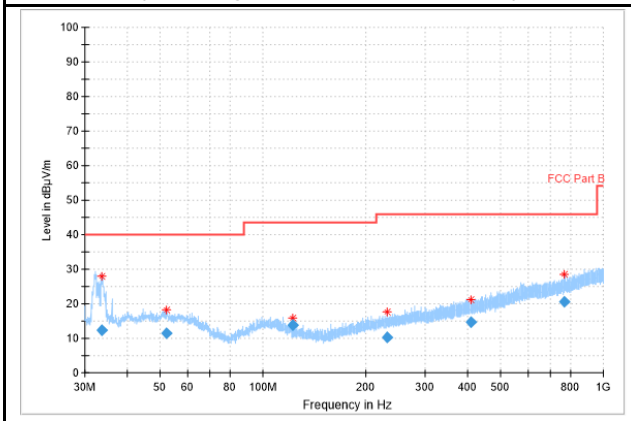
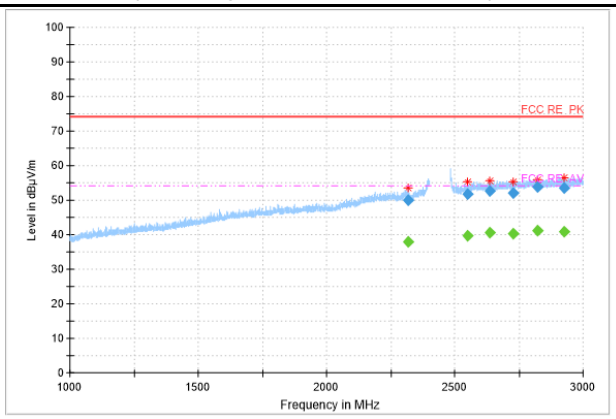
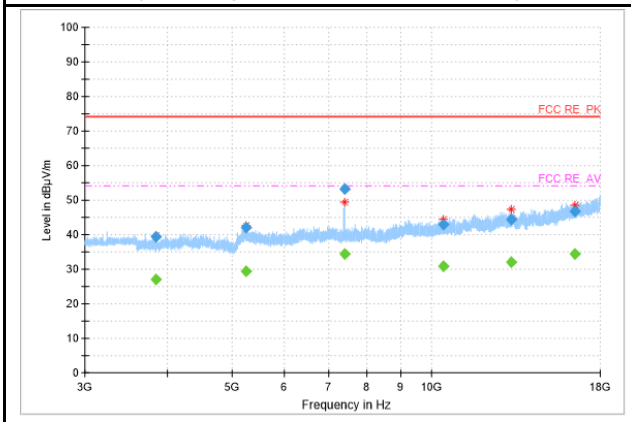
Radiated Spurious Emission (802.11g, Ch1,30MHz~1GHz)	Radiated Spurious Emission (802.11g, Ch1,1GHz~3GHz)





Radiated Spurious Emission (802.11g, Ch1, 3GHz~18GHz)	/

	/

Radiated Spurious Emission (802.11g, Ch11,30MHz~1GHz)	Radiated Spurious Emission (802.11g, Ch11,1GHz~3GHz)
	
Radiated Spurious Emission (802.11g, Ch11, 3GHz~18GHz)	/
	/

Note:

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

P_{Mea} is the field strength recorded from the instrument.

The measurement results are obtained as described below:

ARpi = Cable loss + Antenna Factor -Preamplifier gain

Result = P_{Mea} + Cable loss + Antenna Gain-Preamplifier gain = P_{Mea} + ARpi .

802.11g

Ch1 30MHz~1GHz

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
33.7	11.49	-14.1	25.59	V
55.0	10.49	-12.1	22.59	V
98.3	9.79	-13.7	23.49	H
212.8	9.36	-13.1	22.46	V
361.5	13.61	-9.2	22.81	H
616.0	18.95	-3	21.95	V

Ch1 1GHz~3GHz

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
2138.7	48.81	11.8	37.01	H
2260.8	50.23	12.9	37.33	V
2549.3	51.81	15.1	36.71	H
2645.2	53.51	15.8	37.71	H
2762.8	52.45	16.3	36.15	H
2896.5	53.54	16.7	36.84	V

Ch1 3GHz~18GHz

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
3586.5	39.09	-7	46.09	H
4822.6	39.55	-4.8	44.35	H
7240.5	50.18	-2.2	52.38	V
9672.3	41.79	-0.6	42.39	V
13041.9	44.95	3.6	41.35	H
16628.3	46.16	8.4	37.76	H

Ch11 30MHz~1GHz

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
33.6	12.21	-14.1	26.31	V
52.2	11.43	-12	23.43	H
122.7	13.81	-15.3	29.11	V

231.5	10.31	-12.5	22.81	H
406.7	14.63	-7.9	22.53	V
766.5	20.5	-1.9	22.4	H

Ch11 1GHz~3GHz

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
2317.4	50.02	13.3	36.72	V
2549.2	51.84	15.1	36.74	H
2637.9	52.59	15.8	36.79	V
2725.5	51.97	16.1	35.87	V
2821.4	53.95	16.6	37.35	H
2927.3	53.62	16.8	36.82	V

Ch11 3GHz~18GHz

Frequency (MHz)	Result (dBμV/m)	ARpl (dB)	PMea (dBμV/m)	Polarity
3835.5	39.52	-6.2	45.72	V
5262.6	41.99	-1.9	43.89	V
7393.5	53.1	-2.2	55.3	V
10449.5	43.01	0.8	42.21	V
13204.1	44.29	3.6	40.69	H
16504.2	46.77	8.3	38.47	V

Note: Only the worst case is written in the report.

7. Test Equipment List

7.1. Radiated Emission Test System

Item	Equipment Name	Type	Serial Number	Manufacturer	Cal. Date	Cal. interval
1	Universal Radio Communication Tester	CMU200	123123	R&S	2021-05-10	1 year
2	EMI Test Receiver	ESU40	100307	R&S	2021-05-10	1 year
3	TRILOG Broadband Antenna	VULB9163	VULB9163-515	Schwarzbeck	2020-02-28	2 years
4	Double- ridged Waveguide Antenna	ETS-3117	00135890	ETS	2020-02-28	2 years
5	2-Line V-Network	ENV216	101380	R&S	2021-05-10	1 year
6	EMI Test Software	EMC32 V 9.15.00	N/A	R&S	N/A	N/A

ClAnechoic chamber

Fully anechoic chamber by ETS.

Annex A: Measurement Uncertainty

Measurement uncertainty for all the testing in this report are within the limit specified in 3IN documents . The detailed measurement uncertainty is defined in 3IN documents.

Measurement Items	Range	Confidence Level	Calculated Uncertainty
Peak Output Power-Conducted	2412MHz-2462MHz	95%	0.544dB
Peak Power Spectral Density	2412MHz-2462MHz	95%	0.502dB
Conducted Emission	30MHz-2GHz	95%	0.90dB
Conducted Emission	2GHz-3.6GHz	95%	0.88dB
Conducted Emission	3.6GHz-8GHz	95%	0.96dB
Conducted Emission	8GHz-20GHz	95%	0.94dB
Conducted Emission	20GHz-22GHz	95%	0.88dB
Conducted Emission	22GHz-26GHz	95%	0.86dB
Transmitter Spurious Emission-Radiated	9KHz-30MHz	95%	5.66dB
Transmitter Spurious Emission-Radiated	30MHz-1000MHz	95%	4.98dB
Transmitter Spurious Emission-Radiated	1000MHz -18000MHz	95%	5.06dB
Transmitter Spurious Emission-Radiated	18000MHz -40000MHz	95%	5.20dB

Annex B: 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 12th day of April 2021.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2023

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

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