

FCC REPORT

Applicant: Shanghai Sunmi Technology Co.,Ltd.
Address of Applicant: Room 505, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China

Equipment Under Test (EUT)

Product Name: Wireless data POS System
Model No.: W5920
Trade mark: SUNMI
FCC ID: 2AH25V1S
Applicable standards: FCC CFR Title 47 Part 15 Subpart B
Date of sample receipt: 06 Jun., 2017
Date of Test: 06 Jun., to 12 Jul., 2017
Date of report issued: 12 Jul., 2017
Test Result: Pass *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2 Version

Version No.	Date	Description
00	12 Jul., 2017	Original

Tested by:

YT Yang

Date:

12 Jul., 2017

Test Engineer

Reviewed by:

Ryan Lee

Date:

12 Jul., 2017

Project Engineer

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4 Test Summary

Test Item	Section in CFR 47	Result
Conducted Emission	Part 15.107	Pass
Radiated Emission	Part 15.109	Pass

Pass: The EUT complies with the essential requirements in the standard.

5 General Information

5.1 Client Information

Applicant:	Shanghai Sunmi Technology Co.,Ltd.
Address of Applicant:	Room 505, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China
Manufacturer	Shanghai Sunmi Technology Co.,Ltd.
Address of Manufacturer:	Room 505, KIC Plaza, No.388 Song Hu Road, Yang Pu District, Shanghai, China
Factory:	Shenzhen Starworks Technology Co.,LTD.
Address of Factory:	Basicom Industry Park, Baolong Avenue 3rd Road, Longgang District, Shenzhen City, Guangdong Province, P.R.China

5.2 General Description of E.U.T.

Product Name:	Wireless data POS System
Model No.:	W5920
Power supply:	Rechargeable Li-ion Battery DC3.6V-5200mAh
AC adapter :	Model: TPA-46050200UU Input: AC100-240V 50/60Hz 0.3A Output: DC 5.0V, 2A

5.3 Test Mode

Operating mode	Detail description
PC mode	Keep the EUT in Downloading mode(Worst case)
Charging+Recording mode	Keep the EUT in Charging+Recording mode
Charging+Playing mode	Keep the EUT in Charging+Playing mode
FM mode	Keep the EUT in FM receiver mode
GPS mode	Keep the EUT in GPS receiver mode

The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

5.4 Measurement Uncertainty

Items	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 30MHz)	2.14 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	4.24 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	4.35 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	4.44 dB (k=2)
Radiated Emission (18GHz ~ 26.5GHz)	4.56 dB (k=2)

5.5 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
DELL	PC	OPTIPLEX745	N/A	DoC
DELL	MONITOR	E178FPC	N/A	DoC
DELL	KEYBOARD	SK-8115	N/A	DoC
DELL	MOUSE	MOC5UO	N/A	DoC
HP	Printer	CB495A	05257893	DoC
MERCURY	Wireless router	MW150R	12922104015	FCC ID
NAKAMICHI	Bluetooth earphone	T8	N/A	FCC ID

5.6 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Registration No.: 817957**
 Shenzhen Zhongjian Nanfang Testing Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in out files. Registration 817957, February 27, 2012.
- **IC - Registration No.: 10106A-1**
 The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.
- **CNAS - Registration No.: CNAS L6048**
 Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

5.7 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
 Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China
 Website: <http://www.ccis-cb.com>
 Tel: +86-755-23118282
 Fax: +86-755-23116366
 Email: info@ccis-cb.com

5.8 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	3m SAC	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	08-23-2014	08-22-2017
2	BiConiLog Antenna	SCHWARZBECK	VULB9163	CCIS0005	02-25-2017	02-24-2018
3	Horn Antenna	SCHWARZBECK	BBHA9120D	CCIS0006	02-25-2017	02-24-2018
4	Pre-amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	02-25-2017	02-24-2018
5	Pre-amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	02-25-2017	02-24-2018
6	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP30	CCIS0023	02-25-2017	02-24-2018
7	EMI Test Receiver	Rohde & Schwarz	ESRP7	CCIS0167	02-25-2017	02-24-2018
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	N/A	N/A	CCIS0018	02-25-2017	02-24-2018
10	Coaxial Cable	N/A	N/A	CCIS0020	02-25-2017	02-24-2018

Conducted Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	08-23-2014	08-22-2017
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	02-25-2017	02-24-2018
3	LISN	CHASE	MN2050D	CCIS0074	02-25-2017	02-24-2018
4	Coaxial Cable	CCIS	N/A	CCIS0086	02-25-2017	02-24-2018
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

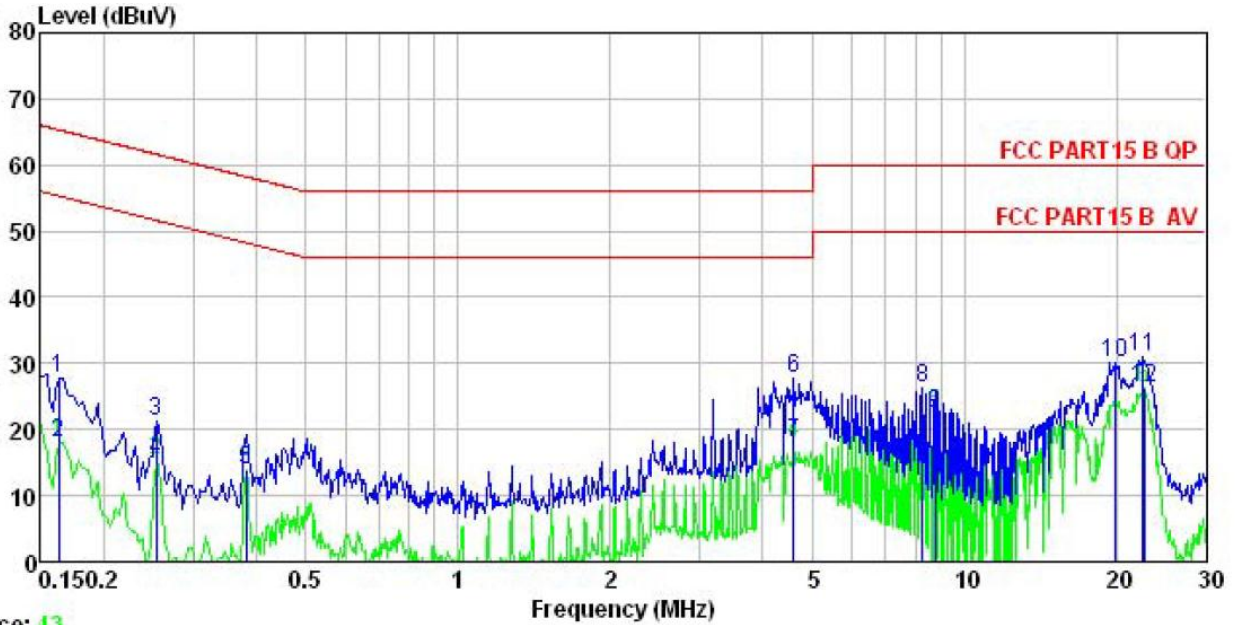
6 Test results and Measurement Data

6.1 Conducted Emission

Test Requirement:	FCC Part 15 B Section 15.107					
Test Method:	ANSI C63.4:2014					
Test Frequency Range:	150kHz to 30MHz					
Class / Severity:	Class B					
Receiver setup:	RBW=9kHz, VBW=30kHz					
Limit:	Frequency range (MHz)	Limit (dB μ V)				
		Quasi-peak		Average		
	0.15-0.5	66 to 56*		56 to 46*		
	0.5-5	56		46		
	0.5-30	60		50		
* Decreases with the logarithm of the frequency.						
Test setup:	<p>Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>					
Test procedure	<ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement. 					
Test environment:	Temp.:	23 °C	Humid.:	56%	Press.:	101kPa
Test Instruments:	Refer to section 5.7 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Pass					

Measurement data:

Line:



Trace: 43

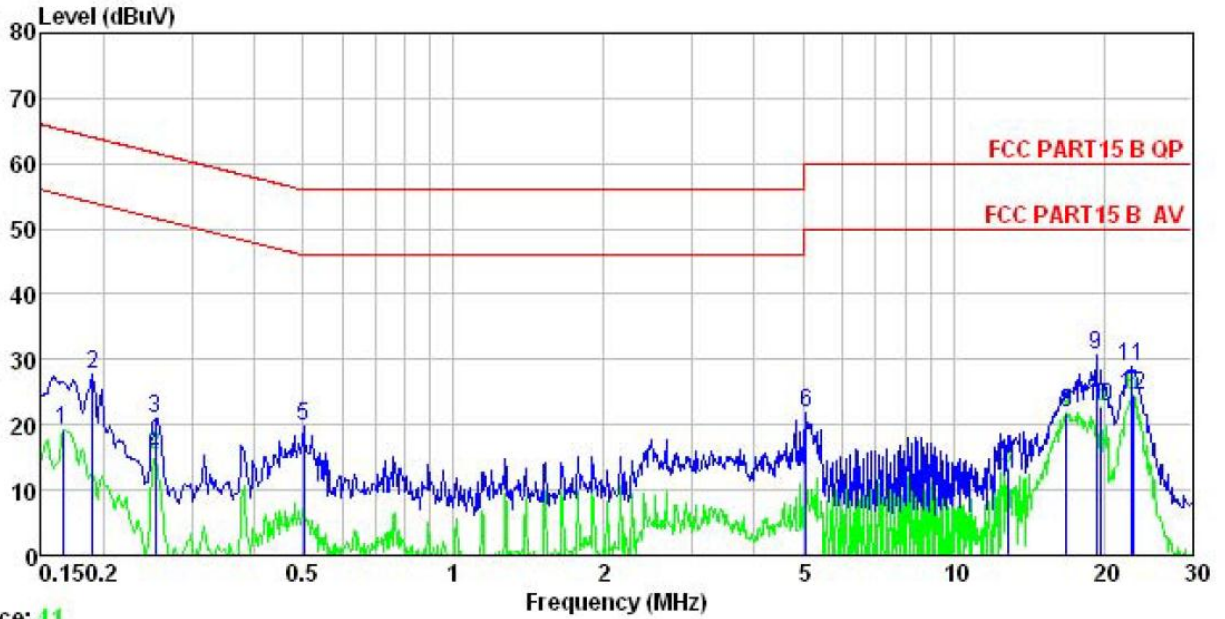
Site : CCIS Shielding Room
 Condition : FCC PART15 B QP LISN LINE
 EUT : Smart POS system
 Model : W5920
 Test Mode : PC mode
 Power Rating : AC 120/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: Yaro
 Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.162	17.62	-0.55	10.77	27.84	65.34	-37.50	QP
2	0.162	7.85	-0.55	10.77	18.07	65.34	-47.27	Peak
3	0.253	11.07	-0.51	10.75	21.31	61.64	-40.33	QP
4	0.253	5.25	-0.51	10.75	15.49	61.64	-46.15	Peak
5	0.381	3.64	-0.50	10.72	13.86	58.25	-44.39	Peak
6	4.598	17.17	-0.23	10.86	27.80	56.00	-28.20	QP
7	4.598	7.32	-0.23	10.86	17.95	56.00	-38.05	Peak
8	8.279	15.49	0.06	10.86	26.41	60.00	-33.59	QP
9	8.776	11.33	0.08	10.89	22.30	60.00	-37.70	Peak
10	19.950	19.67	-0.47	10.93	30.13	60.00	-29.87	QP
11	22.535	20.83	-0.59	10.89	31.13	60.00	-28.87	QP
12	22.655	16.00	-0.59	10.89	26.30	60.00	-33.70	Peak

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

Neutral:



Trace: 41

Site : CCIS Shielding Room
 Condition : FCC PART15 B QP LISN NEUTRAL
 EUT : Smart POS system
 Model : W5920
 Test Mode : PC mode
 Power Rating : AC 120/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: Yaro
 Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.166	8.84	-0.37	10.77	19.24	55.16	-35.92	Average
2	0.190	17.46	-0.35	10.76	27.87	64.02	-36.15	QP
3	0.253	10.67	-0.33	10.75	21.09	61.64	-40.55	QP
4	0.253	4.99	-0.33	10.75	15.41	51.64	-36.23	Average
5	0.502	9.22	-0.30	10.76	19.68	56.00	-36.32	QP
6	5.085	11.14	-0.19	10.85	21.80	60.00	-38.20	QP
7	12.852	2.52	-0.06	10.91	13.37	50.00	-36.63	Average
8	16.839	11.42	-0.38	10.91	21.95	50.00	-28.05	Average
9	19.326	20.27	-0.47	10.92	30.72	60.00	-29.28	QP
10	19.740	12.40	-0.48	10.93	22.85	50.00	-27.15	Average
11	22.775	18.81	-0.64	10.89	29.06	60.00	-30.94	QP
12	22.896	14.25	-0.65	10.89	24.49	50.00	-25.51	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

6.2 Radiated Emission

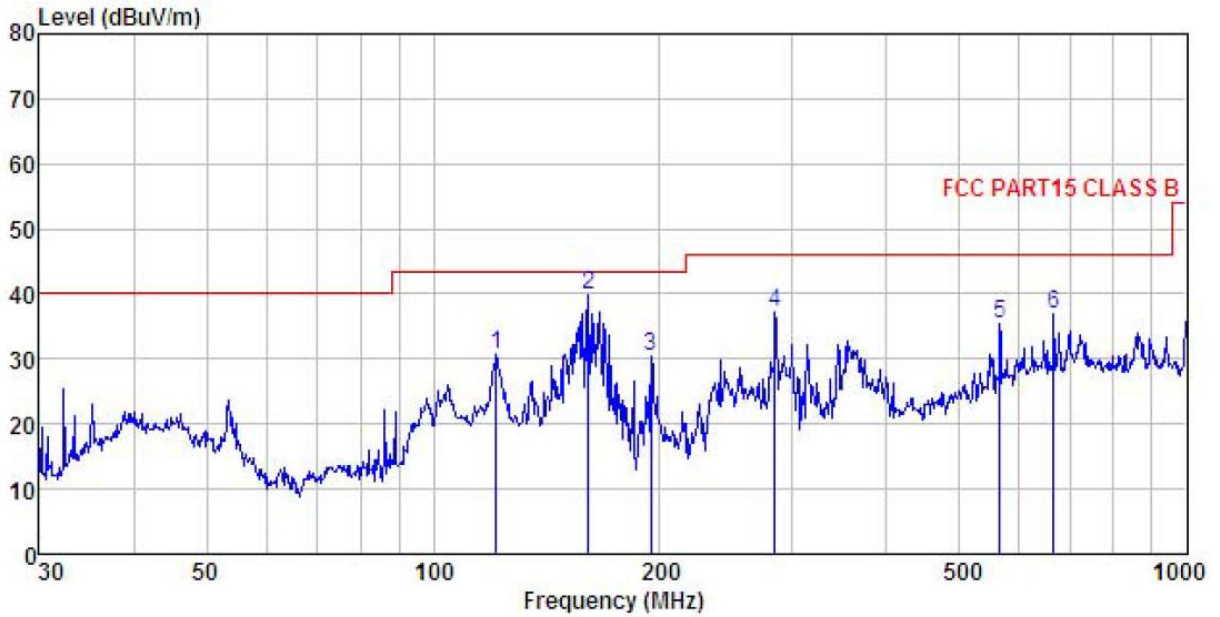
Test Requirement:	FCC Part 15 B Section 15.109				
Test Method:	ANSI C63.4:2014				
Test Frequency Range:	30MHz to 26000MHz				
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak RMS	1MHz 1MHz	3MHz 3MHz	Peak Value Average Value
Limit:	Frequency	Limit (dBuV/m @3m)			Remark
	30MHz-88MHz	40.0			Quasi-peak Value
	88MHz-216MHz	43.5			Quasi-peak Value
	216MHz-960MHz	46.0			Quasi-peak Value
	960MHz-1GHz	54.0			Quasi-peak Value
	Above 1GHz	54.0			Average Value
		74.0			Peak Value
Test setup:	Below 1GHz				
	Above 1GHz				

Test Procedure:	<ol style="list-style-type: none"> 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test environment:	Temp.: 25 °C Humid.: 55% Press.: 1 01kPa
Test Instruments:	Refer to section 5.7 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	All of the observed value above 6GHz were the noise floor , which were no recorded

Measurement Data:

Below 1GHz

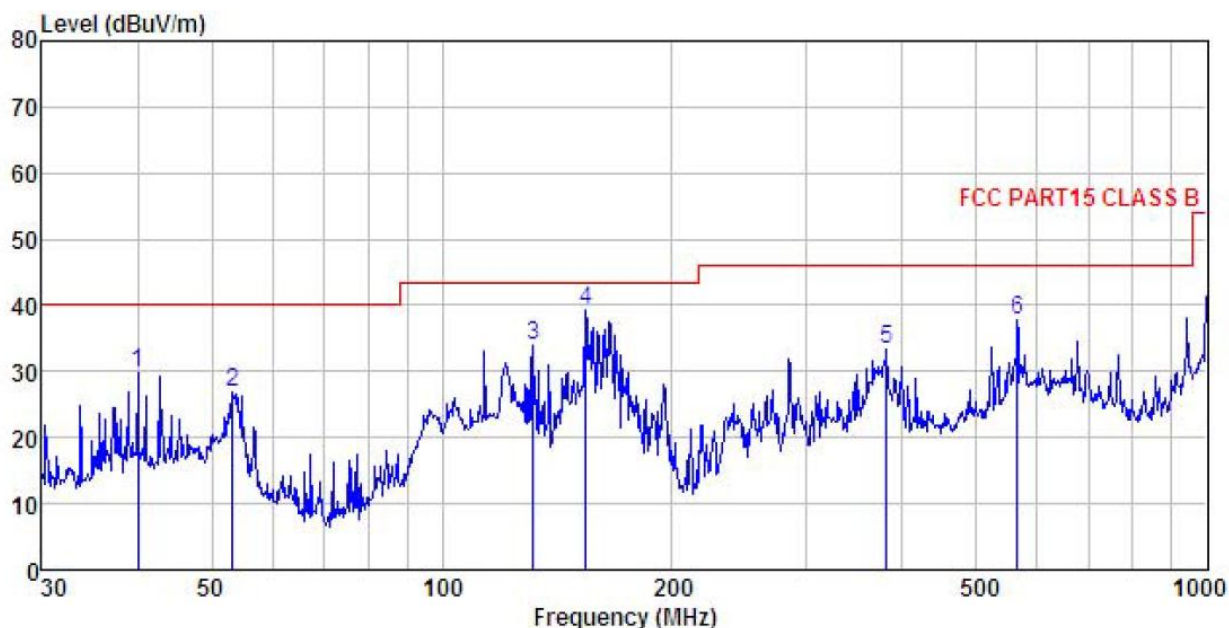
Horizontal:



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) HORIZONTAL
 EUT : Smart POS system
 Model : W5920
 Test mode : PC mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55% 101KPa
 Test Engineer: Yaro
 REMARK : PC - POS

	Freq	ReadAntenna		Cable Preamp		Level	Limit	Over	Remark
		Level	Factor	Loss	Factor				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	121.123	46.14	11.86	2.18	29.38	30.80	43.50	-12.70	QP
2	160.909	56.52	9.89	2.60	29.12	39.89	43.50	-3.61	QP
3	194.453	46.58	9.93	2.83	28.87	30.47	43.50	-13.03	QP
4	283.979	50.54	12.24	2.90	28.48	37.20	46.00	-8.80	QP
5	564.639	42.35	18.21	3.90	29.05	35.41	46.00	-10.59	QP
6	665.804	42.90	18.92	3.96	28.74	37.04	46.00	-8.96	QP

Vertical:

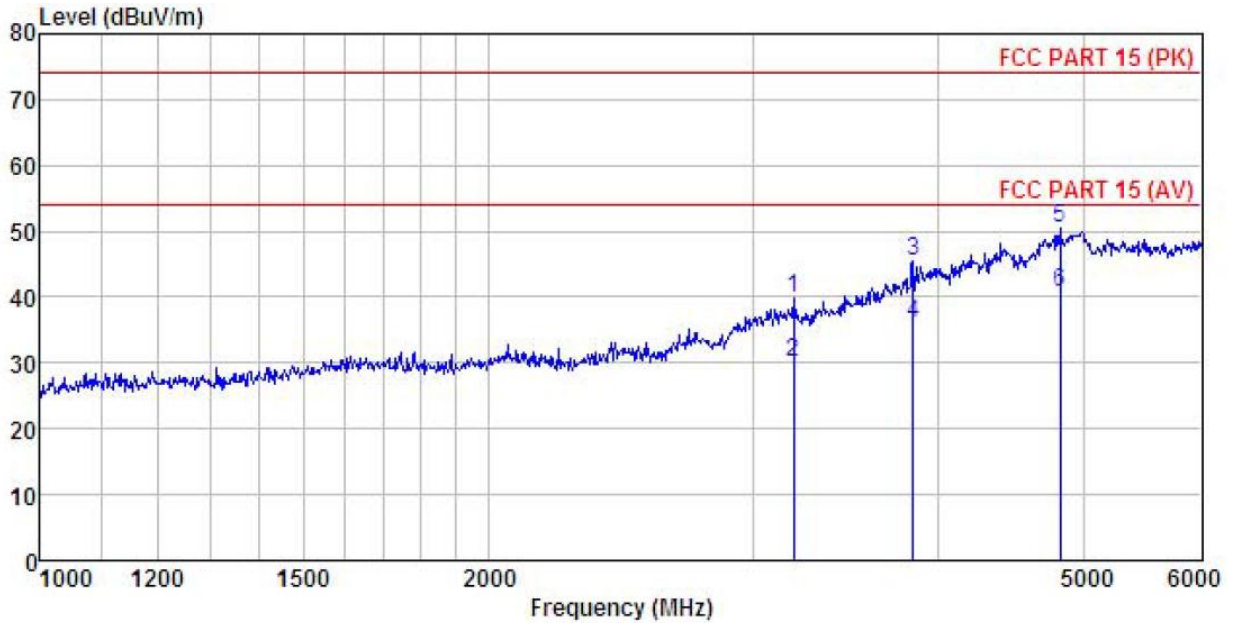


Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163(30M3G) VERTICAL
 EUT : Smart POS system
 Model : W5920
 Test mode : PC mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55% 101KPa
 Test Engineer: Yaro
 REMARK : PC - POS

	ReadAntenna	Cable	Preamp	Limit	Over				
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	39.994	41.51	16.90	1.21	29.90	29.72	40.00	-10.28	QP
2	53.318	42.06	13.27	1.32	29.81	26.84	40.00	-13.16	QP
3	131.758	48.85	12.19	2.30	29.32	34.02	43.50	-9.48	QP
4	154.279	55.52	10.30	2.55	29.18	39.19	43.50	-4.31	QP
5	381.249	43.65	15.28	3.09	28.70	33.32	46.00	-12.68	QP
6	564.639	44.75	18.21	3.90	29.05	37.81	46.00	-8.19	QP

Above 1GHz

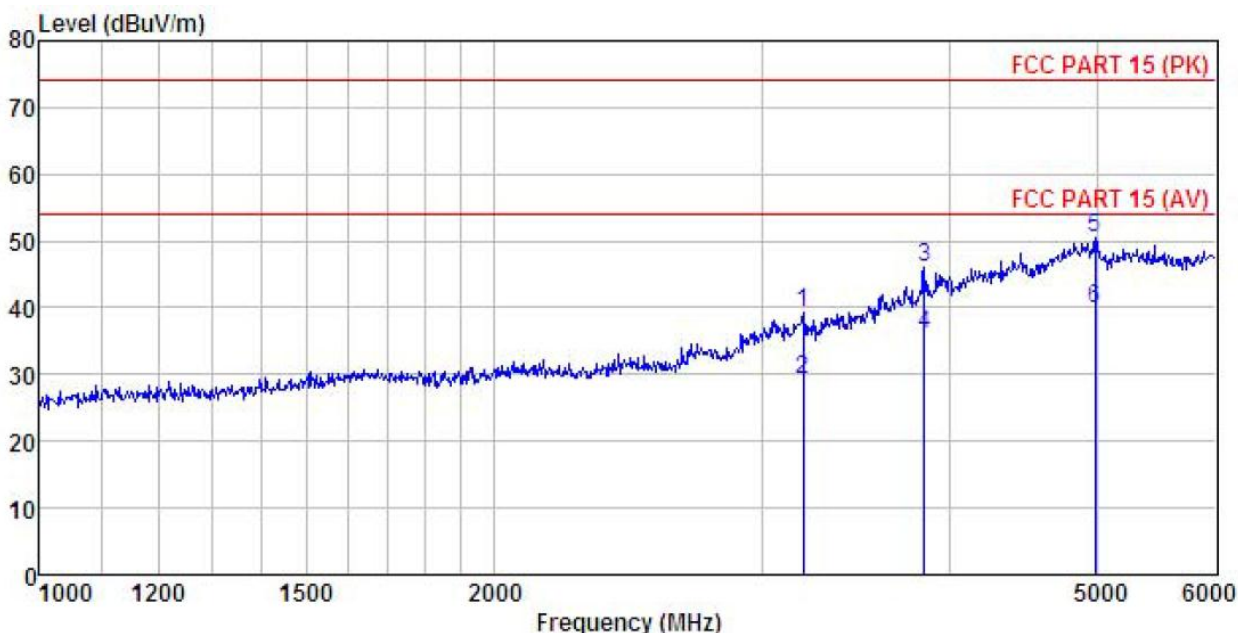
Horizontal:



Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) HORIZONTAL
 EUT : Smart POS system
 Model : W5920
 Test mode : PC mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55% 101KPa
 Test Engineer: Yaro
 REMARK :

	Read	Antenna	Cable	Preamp	Limit	Over			
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark		
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	3199.044	49.40	26.51	5.42	41.41	39.92	74.00	-34.08	Peak
2	3199.044	39.69	26.51	5.42	41.41	30.21	54.00	-23.79	Average
3	3847.421	50.32	30.96	6.09	41.79	45.58	74.00	-28.42	Peak
4	3847.421	40.71	30.96	6.09	41.79	35.97	54.00	-18.03	Average
5	4821.884	49.29	36.06	6.81	41.82	50.34	74.00	-23.66	Peak
6	4821.884	39.83	36.06	6.81	41.82	40.88	54.00	-13.12	Average

Vertical:



Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m BBHA9120(1G18) VERTICAL
 EUT : Smart POS system
 Model : W5920
 Test mode : PC mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55% 101KPa
 Test Engineer: Yaro
 REMARK :

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3199.044	48.66	26.51	5.42	41.41	39.18	74.00	-34.82	Peak
2	3199.044	38.73	26.51	5.42	41.41	29.25	54.00	-24.75	Average
3	3847.421	50.77	30.96	6.09	41.79	46.03	74.00	-27.97	Peak
4	3847.421	40.84	30.96	6.09	41.79	36.10	54.00	-17.90	Average
5	4988.864	48.54	36.84	6.93	41.88	50.43	74.00	-23.57	Peak
6	4988.864	37.92	36.84	6.93	41.88	39.81	54.00	-14.19	Average