Test Report

FCC ID: 2AKBV-S1

Date of issue: Oct. 13, 2016

Sample Description:	remote control
Model(s):	S1
Applicant:	POS International Limited
Address:	office 3A,12/F, Kaiser centre, No.18 centre street, Sai ying pun HK
Date of Test:	Sep. 24, 2015 to Oct. 13, 2015

Shenzhen Microtest Co., Ltd.
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Test Result Certification	
Applicant's name:	**POS International Limited**
Address:	office 3A, 12/F, Kaiser centre, No.18 centre street, Sai ying pun HK
Manufacture's Name:	**SHENZHEN AIDAXIN ELECTRONIC TECHNOLOGY CO., LTD**
Address:	2nd FLOOR, BLDG 24, XITIAN 3RD INDUSTRIAL ZONE, GONGMING, GUANGMING, SHENZHEN
Product name:	remote control
Trademark:	**N/A**
Model name:	S1
Standards:	FCC Part 15.249
Test Procedure:	ANSI C63.10-2013

This device described above has been tested by Shenzhen Toby Technology Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Tested By : David Chen

David Chen Oct, 13. 2016

Reviewed By : Leon Chen

Leon Chen Oct, 13. 2016

Approved By : Ares Liu

Ares Liu Oct, 13. 2016

SUMMARY OF TEST RESULT

Item	FCC Part No.	Description of Test	Result
1	15.203	Antenna requirement	Pass
2	15.207	AC power line conducted emission	Pass
3	15.215	20dB bandwidth	Pass
4	15.249(a), 15.249(d)	Field strength of fundamental, field strength of harmonics, emissions radiated outside of the specified frequency bands	Pass

1. General description

1.1 Feature of equipment under test (EUT)

Product name:	remote control
Model name:	S1
Tx frequency range:	2423MHz
Modulation Type:	GFSK
Power Source:	DC 3.7V by Li-on battery
Antenna Designation:	PCBA antenna (Antenna Gain: 0dBi)

1.2 EUT operation mode

During testing, EUT is set up to transmit continuously.

1.3 Test conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 20ºC~30ºC
- Humidity: 30%~70%
- Atmospheric pressure: 98kPa~101kPa

1.4 Ancillary equipment list

Equipment	Model	S/N	Manufacturer
/	/	/	/

1.5 Measurement uncertainty

Measurement Uncertainty for a Level of Confidence of 95 %, U=2xUc(y)

RF frequency	1 x 10-7
RF power, conducted	± 1 dB
Conducted emission(150kHz~30MHz)	± 2.5 dB
Radiated emission(30MHz~1GHz)	± 4.2 dB
Radiated emission (above 1GHz)	± 4.3 dB
Temperature	±1 degree
Humidity	± 5 %

2. Testing site

Test Site	Shenzhen Toby Technology Co., Ltd.
Test Site Location	1 A/F., Bldg.6, Yusheng Industrial Zone The National Road No.107 Xixiang Section 467, Shenzhen, Guangdong, China
FCC Registration No.:	811562
CNAS Registration No.:	CNAS L5813

3. List of test equipment

For AC power line conducted emission:

Equipment	Manufacturer	Model	Serial No.	Calibration Due
LISN	R&S	ENV216	101313	2016.12.06
LISN	SCHWARZBECK	NNLK 8129	8129245	2016.12.25
Pulse Limiter	SCHWARZBECK	VTSD 9561F	9716	2016.12.25
Test Cable	N/A	N/A	C01	2016.12.06
EMI Test Receiver	R&S	ESCI	101160	2016.12.06

For Radiated emission:

Equipment	Manufacturer	Model	Serial No.	Calibration Due
Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9160	3058	2016.12.11
Horn Antenna	Schwarzbeck	BBHA 9120D	631	2016.12.05
Horn Antenna	Schwarzbeck	BBHA 9170	373	2016.12.05
Test Cable	United Microwave	57793	1m	2016.12.05
Test Cable	United Microwave	A30A30-5006	10m	2016.12.05
Microwave Pre_amplifier	Agilent	8449B	3008A01714	2016.12.05
Pre-Amplifier	Anritsu	MH648A	M09961	2016.12.05
EMI Test Receiver	R&S	ESPI-7	101318	2016.12.05
Spctrum analyzer	Agient	E4470B	MY41441082	2017.06.01

For RF conducted emission:

Equipment	Manufacturer	Model	Serial No.	Calibration Due
Spctrum analyzer	Agient	E4470B	MY41441082	2017.06.01

Note: the calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

4. Test Result

4.1 Antenna requirement

4.1.1 Requirement defined in FCC 15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

4.1.2 EUT antenna description

The antenna of EUT is a PCBA antenna, the maximum gain of the antenna is 0dBi. So the antenna meets the requirement of this part.

4.2 20dB emission bandwidth

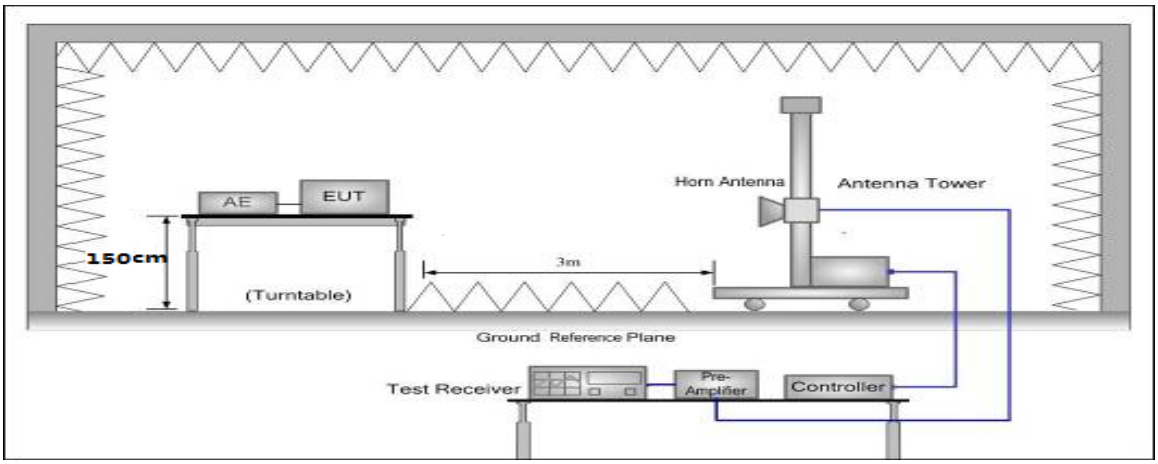
4.2.1 Test method

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on the test channel
RBW ≥ 1% of the 20 dB bandwidth
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

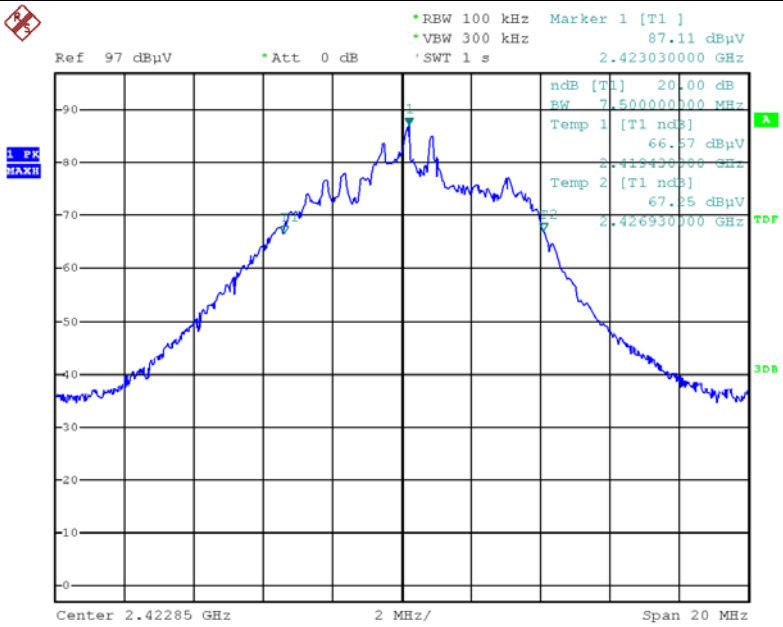
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

4.2.2 Test Setup



4.2.2 Test result

Frequency (MHz)	20dB emission bandwidth (MHz)
2423	7.5



4.3 Conducted emission

4.3.1 Limit

Frequency (MHz)	Limit	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Note: Decreases with the logarithm of the frequency from 0.15MHz to 0.5MHz.

4.3.2 Test method

1. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.

2. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

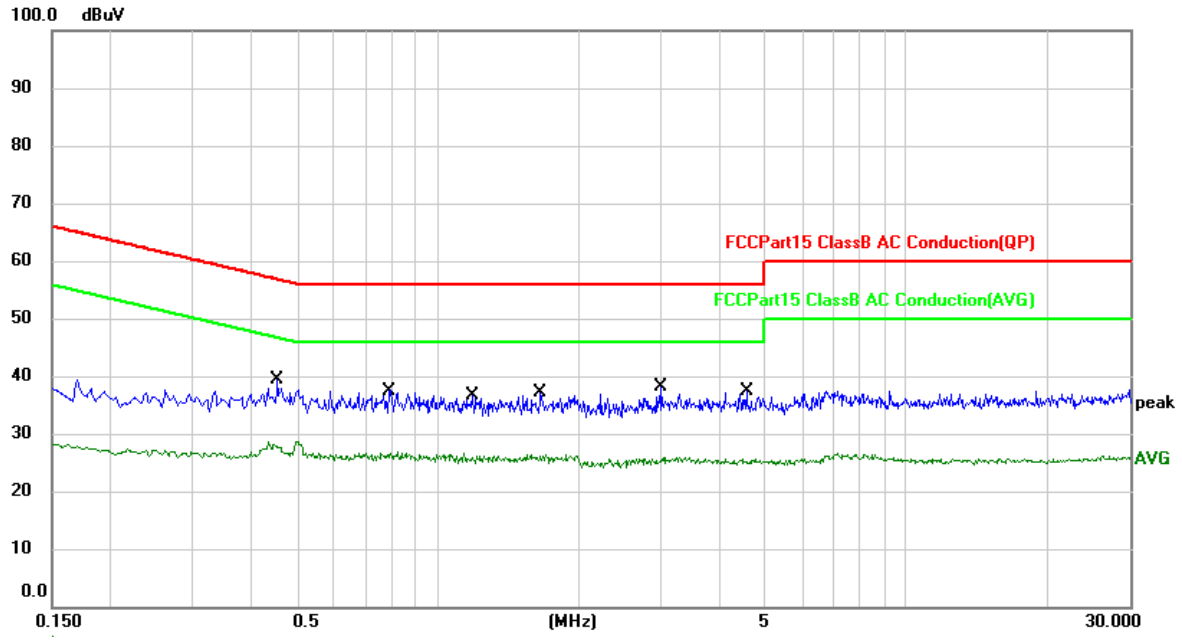
3. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

4. LISN is at least 80 cm from nearest part of EUT chassis.

5. The resolution bandwidth of EMI test receiver is set at 9 kHz.

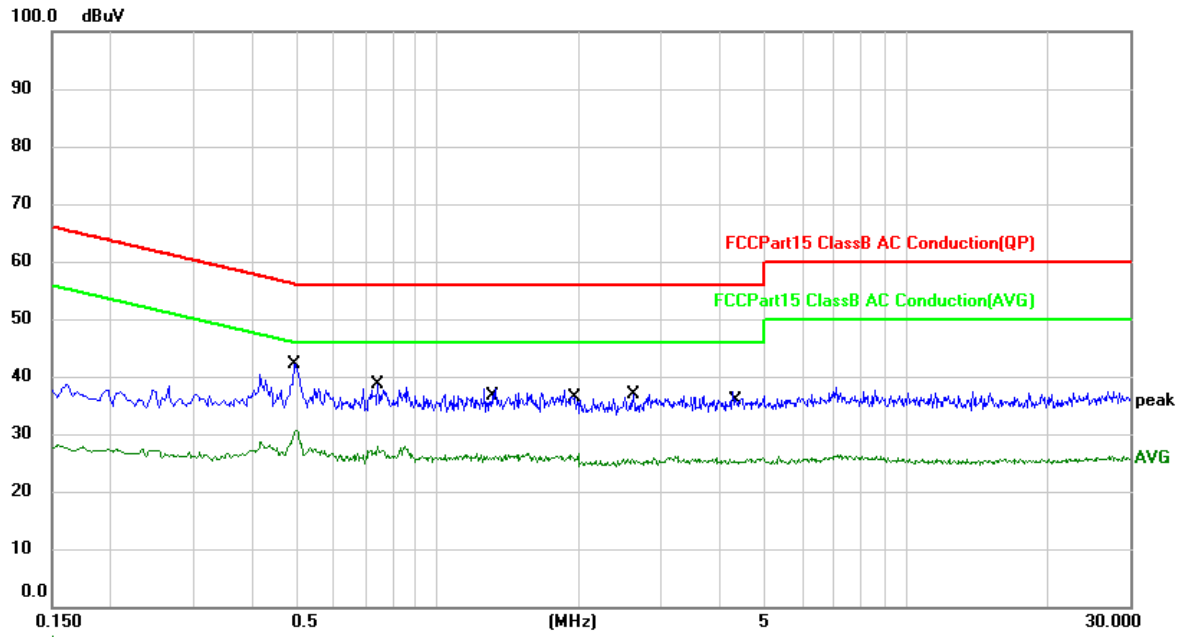
4.3.3 Test Result

Temperature:	23℃	Relative Humidity:	57%
Pressure:	101kPa	Polarization:	L
Test voltage:	AC 120V/60Hz	Test mode:	Transmitting



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4566	-1.35	30.02	28.67	56.75	-28.08	QP	
2		0.4566	-4.35	30.02	25.67	46.75	-21.08	AVG	
3		0.7810	-1.88	30.02	28.14	56.00	-27.86	QP	
4	*	0.7810	-4.56	30.02	25.46	46.00	-20.54	AVG	
5		1.1920	-1.79	30.02	28.23	56.00	-27.77	QP	
6		1.1920	-4.73	30.02	25.29	46.00	-20.71	AVG	
7		1.6607	-1.88	30.02	28.14	56.00	-27.86	QP	
8		1.6607	-4.67	30.02	25.35	46.00	-20.65	AVG	
9		2.9911	-0.72	30.04	29.32	56.00	-26.68	QP	
10		2.9911	-5.43	30.04	24.61	46.00	-21.39	AVG	
11		4.5781	-1.01	30.04	29.03	56.00	-26.97	QP	
12		4.5781	-5.62	30.04	24.42	46.00	-21.58	AVG	

Temperature:	23℃	Relative Humidity:	57%
Pressure:	101kPa	Polarization:	N
Test voltage:	AC 120V/60Hz	Test mode:	Transmitting



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4956	-0.85	30.02	29.17	56.07	-26.90	QP	
2	*	0.4956	-4.06	30.02	25.96	46.07	-20.11	AVG	
3		0.7526	-1.79	30.02	28.23	56.00	-27.77	QP	
4		0.7526	-4.69	30.02	25.33	46.00	-20.67	AVG	
5		1.2948	-1.88	30.02	28.14	56.00	-27.86	QP	
6		1.2948	-4.71	30.02	25.31	46.00	-20.69	AVG	
7		1.9284	-1.61	30.02	28.41	56.00	-27.59	QP	
8		1.9284	-4.62	30.02	25.40	46.00	-20.60	AVG	
9		2.6447	-1.11	30.03	28.92	56.00	-27.08	QP	
10		2.6447	-5.62	30.03	24.41	46.00	-21.59	AVG	
11		4.3174	-0.90	30.04	29.14	56.00	-26.86	QP	
12		4.3174	-5.56	30.04	24.48	46.00	-21.52	AVG	

4.4 Field strength of fundamental, field strength of harmonics, emissions radiated outside of the specified frequency bands

4.4.1 Limit

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency (MHz)	Field strength of fundamental mV/m	Field strength of harmonics dBμV/m	Detector	Measurement distance
2400-2483.5	50	500	AV	3m

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Frequency (MHz)	Field strength μV/m	Field strength dBμV/m	Detector	Measurement distance
30-88	100	40	QP	3m
88-216	150	43.5	QP	
216-960	200	46	QP	
960-1000	500	46	QP	
Above 1000	500	54	AV	
Above 1000	5000	74	PK	

4.4.2 Test method

1. The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range blew 1GHz, and 1.5m above ground plane for test frequency range above 1GHz.

2. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.

3. Use the following spectrum analyzer settings:

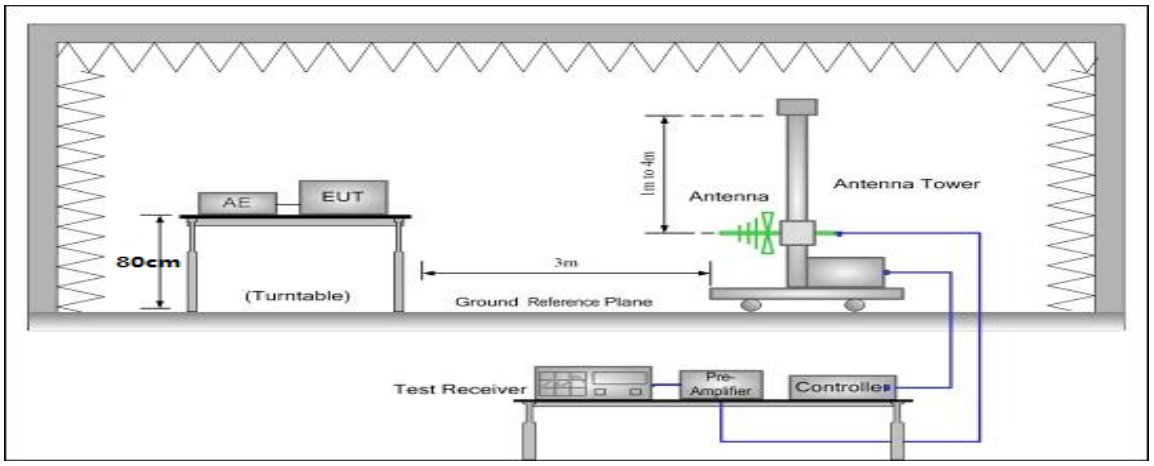
Span = wide enough to fully capture the emission being measured, RBW = 1 MHz for f ≥ 1GHz, 100 kHz for f < 1 GHz, VBW ≥ RBW, Sweep = auto, Detector function = peak, Trace = max hold

4. Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

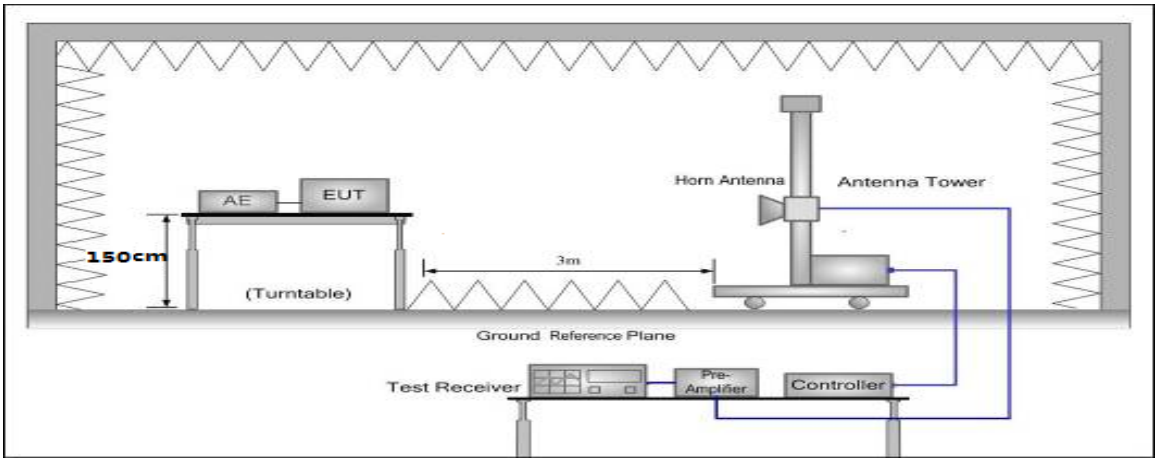
5. Set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209.

4.4.3 Test Setup

Blew 1GHz:



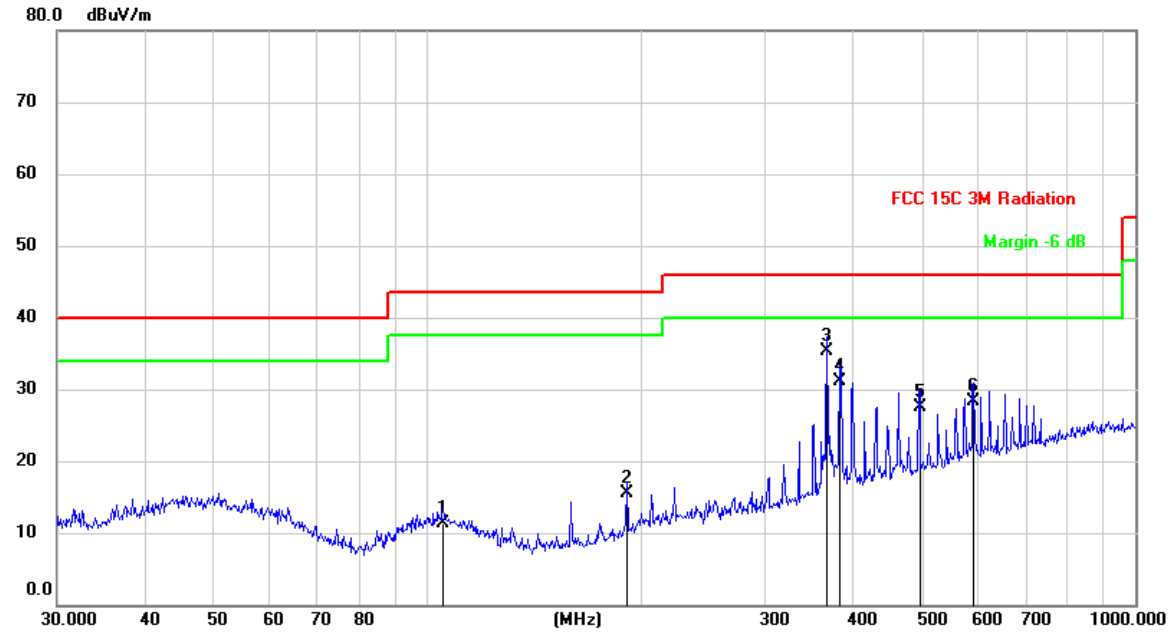
Above 1GHz:



4.4.4 Test Result

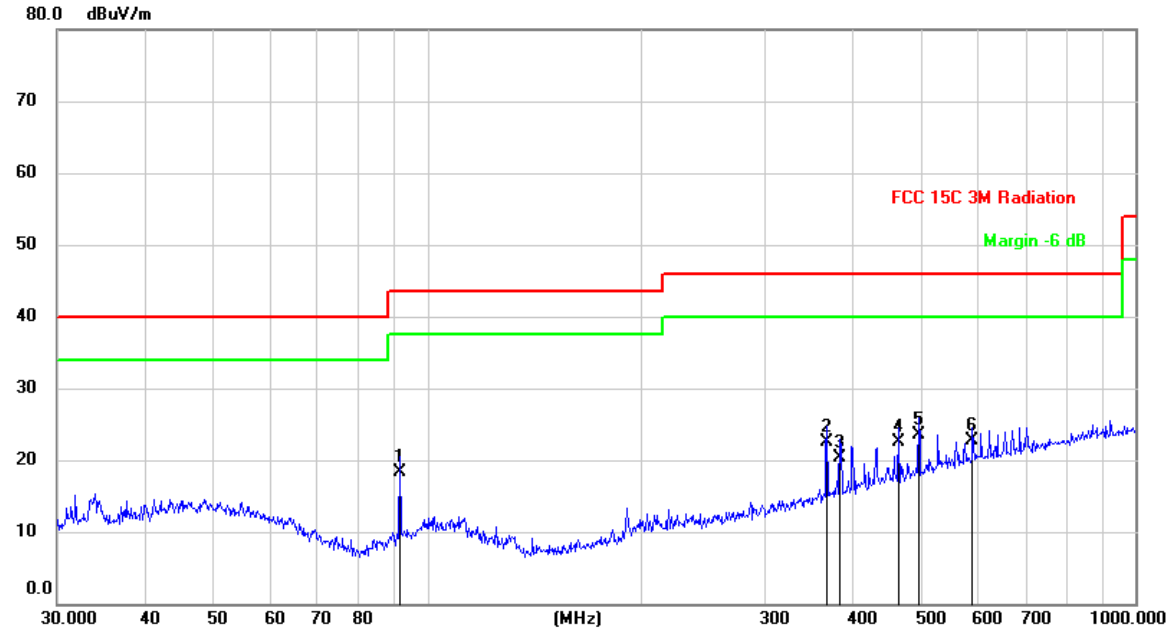
30MHz ~ 1GHz

Temperature:	26℃	Relative Humidity:	51%
Pressure:	101kPa	Polarization:	Horizontal
Test voltage:	/	Test mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		105.2716	25.15	-13.85	11.30	43.50	-32.20	QP			
2		191.7450	30.22	-14.62	15.60	43.50	-27.90	QP			
3	*	366.8231	45.32	-9.92	35.40	46.00	-10.60	QP			
4		382.5879	40.76	-9.56	31.20	46.00	-14.80	QP			
5		495.9344	35.15	-7.55	27.60	46.00	-18.40	QP			
6		590.9737	34.06	-5.66	28.40	46.00	-17.60	QP			

Temperature:	26℃	Relative Humidity:	51%
Pressure:	101kPa	Polarization:	Vertical
Test voltage:	/	Test mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		91.4949	33.43	-15.13	18.30	43.50	-25.20	QP			
2		366.8231	32.52	-9.92	22.60	46.00	-23.40	QP			
3		382.5878	29.96	-9.56	20.40	46.00	-25.60	QP			
4		462.3455	30.61	-8.11	22.50	46.00	-23.50	QP			
5	*	494.1984	31.18	-7.58	23.60	46.00	-22.40	QP			
6		588.9051	28.39	-5.69	22.70	46.00	-23.30	QP			

1GHz~25GHz

Frequency	Antenna Polarization	Reading level	Correct Factor	Measurement	Limits	Detector		Result
(MHz)	H / V	dBμV/m	dB	dBμV/m	dBμV/m			
2423	H	87.91	17.50	105.41	114	PK	Fundamental	Pass
2423	H	66.06	17.50	83.56	94	AV		
2423	V	74.35	17.50	91.85	114	PK		
2423	V	53.41	17.50	70.91	94	AV		
2400	H	45.14	/	45.14	74	PK	Spurious	
2400	V	46.03	/	46.03	74	PK		
2483.5	H	46.78	/	46.78	74	PK		
2483.5	V	46.35	/	46.35	74	PK		
4846	H	49.45	/	49.45	74	PK	harmonics	
4846	V	48.66	/	48.66	74	PK		

Note:

1. Correct Factor = 20×log(Emission Bandwidth / RBW) = 20×log(7.5/1) = 17.50.
2. Measurement = Reading level + Correct Factor.
3. For fundamental frequency, RBW = 1MHz, VBW = 3MHz, Peak detector is for PK value, RMS detector is for AV value.
4. Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
5. If the PK measured values lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.

----END OF REPORT----