

TEST REPORT FOR CERTIFICATION
On Behalf of

MONITOR AUDIO LTD.

Wireless Transmitter

Model Number: WT-1

FCC ID : O7VMA232015

Prepared for : MONITOR AUDIO LTD.

Unit 2, 24 Brook Road Rayleigh Essex. England SS6 7XJ United
Kingdom

Prepared By :EST Technology Co., Ltd.

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Report Number: ESTE-R1501001

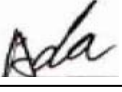
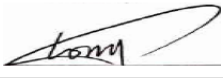
Date of Test : Nov 10,2014~ Dec 30, 2014

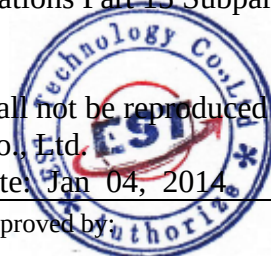
Date of Report : Jan 04, 2015

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Test Report Verification

Applicant:	MONITOR AUDIO LTD.		
Address:	Unit 2, 24 Brook Road Rayleigh Essex. England SS6 7XJ United Kingdom		
Manufacturer	MONITOR AUDIO LTD.		
Address:	Unit 2, 24 Brook Road Rayleigh Essex. England SS6 7XJ United Kingdom		
E.U.T:	Wireless Transmitter		
Model Number:	WT-1 Note: "WT-1", only TX		
Power Supply:	DC 5V From Adapter Input AC 100-240V;50/60Hz		
Test Voltage:	DC 5V From Adapter Input AC 120V/60Hz		
Trade Name:	Monitor Audio	Serial No.:	-----
Date of Receipt:	Nov 10, 2014	Date of Test:	Nov 10,2014~ Dec 30, 2014
Test Specification:	FCC Rules and Regulations Part 15 Subpart C:2014 ANSI C63.10:2013		
Test Result:	The device described above is tested by EST Technology Co., Ltd.. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart C requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd. Date: Jan 04, 2014		
Prepared by:	Tested by:	Approved by:	
			
Ada / Assistant	Tony.Tang/ Engineer	IcemanHu / Manager	
Other Aspects:	None.		
Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested			
This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.			



1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product Name	: Wireless Transmitter
Model Number	: WT-1
FCC ID	: O7VMA232015
Operation frequency	: 2406-2475 MHz
Number of channel	: 24
Antenna	: Integrated antenna, 0 dBi gain
Modulation	: GFSK
Power Supply	: DC 5V From Adapter Input AC 120V/60Hz
Sample Type	: Prototype production

2. SUMMARY OF TEST

2.1. Summary of test result

Description of Test Item	Standard	Results
Power Line Conducted Emissions	FCC Part 15C: 15.207 ANSI C63.10-2013	PASS
Radiated Emission Test	FCC Part 15C: 15.209 FCC Part 15C: 15.249 ANSI C63.10-2013	PASS
20 dB Bandwidth Test	FCC Part 15: 15.249 ANSI C63.10-2013	PASS
Band Edge Compliance Test	FCC Part 15: 15.215 ANSI C63.10-2013	PASS
Antenna requirement	FCC Part 15: 15.203	PASS
N/A is an abbreviation for Not Applicable.		

2.2. Test Facilities

EMC Lab : Certificated by CNAL, CHINA
 Registration No.: L5288
 Date of registration: Nov 23, 2014

 Certificated by FCC, USA
 Registration No.: 989591
 Date of registration: November 20, 2013

 Certificated by Industry Canada
 Registration No.: 9405A-1
 Date of registration: January 03, 2013

 Certificated by VCCI, Japan
 Registration No.: R-3663 & C-4103
 Date of registration: July 25, 2011

 Certificated by TUV Rheinland, Germany
 Registration No.: UA 50195514 0001
 Date of registration: January 07, 2011

 Certificated by TUV/PS, Shenzhen
 Registration No.: SCN1017
 Date of registration: January 27, 2011

 Certificated by Intertek ETL SEMKO
 Registration No.: 2011-RTL-L1-18
 Date of registration: April 28, 2011

 Certificated by Siemic, Inc.
 Registration No.: SLCN021
 Date of registration: November 8, 2011

 Certificated by Nemko, Hong Kong
 Registration No.: 175193
 Date of registration: May 4, 2011

Name of Firm : EST Technology Co., Ltd.

Site Location : San Tun Management Zone, Houjie District, Dongguan,
Guangdong, China

2.3. Assistant equipment used for test

2.3.1. Adapter

Model:	BI05A-050020-I1
Input:	AC 100-240V; 50/60Hz 0.3A
Output:	5V/0.2A

2.4. Block Diagram



(EUT: Wireless Transmitter)

2.5. Test mode

The test software was used to control EUT work in Continuous TX mode, and select test channel, wireless mode

Mode	Channel	Frequency
TX	Low	2406MHz
	Middle	2442MHz
	High	2475MHz

2.6. Channel List for GFSK

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2406	2	2409
3	2412	4	2415
5	2418	6	2421
7	2424	8	2427
9	2430	10	2433
11	2436	12	2439
13	2442	14	2445
15	2448	16	2451
17	2454	18	2457
19	2460	20	2463
21	2466	22	2469
23	2472	24	2475

2.7. Test Equipment

2.7.1. For conducted emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESHS30	832354	June,28,14	1 Year
Artificial Mains Networ	Rohde & Schwarz	ENV216	101260	June,28,14	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	101100	June,28,14	1 Year

2.7.2. For radiated emission test(30-1000MHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESVS10	100004	June,28,14	1 Year
Spectrum Analyzer	Agilent	E4411B	MY50140697	June,28,14	1 Year
Bilog Antenna	Teseq	CBL 6111D	27090	June,28,14	1 Year
Signal Amplifier	Agilent	310N	187037	June,28,14	1 Year

2.7.3. For radiated emission test(above 1GHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna	SCHWARZB ECK	BBHA 9120 D	BBHA9120D1 002	June,28,1 4	1 Year
Signal Amplifier	SCHWARZB ECK	BBV9718	9718-212	June,28,1 4	1 Year
Spectrum Analyzer	Agilent	E4408B	MY44211139	June,28,1 4	1 Year
RF Cable	Hubersuhner	RG 214/U	513423	June,28,1 4	1 Year

3. CONDUCTED EMISSION TEST

3.1. Limit

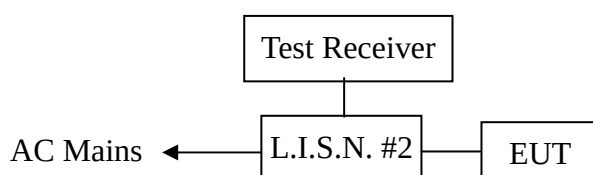
Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3.2. Block Diagram of Test Setup

Block diagram of connection between the EUT and simulators



3.3. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Please refer the block diagram of the test setup and photographs. Power on the PC and let it work normally, we use a keyboard test soft ware, let EUT working in test mode, then test it. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to RSS-210, ISSUE 8 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESHS30) is set at 10kHz.

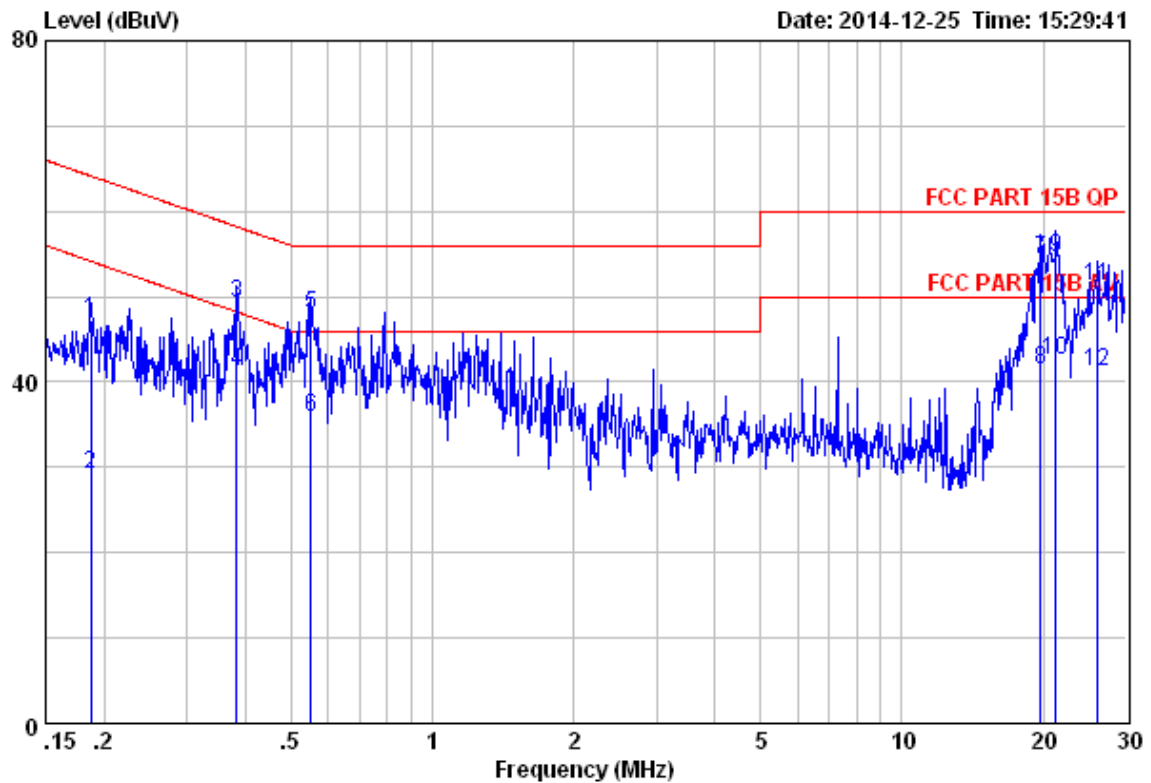
The frequency range from 150kHz to 30MHz is checked.

The test result are reported on Section 3.4.

3.4. Test Result

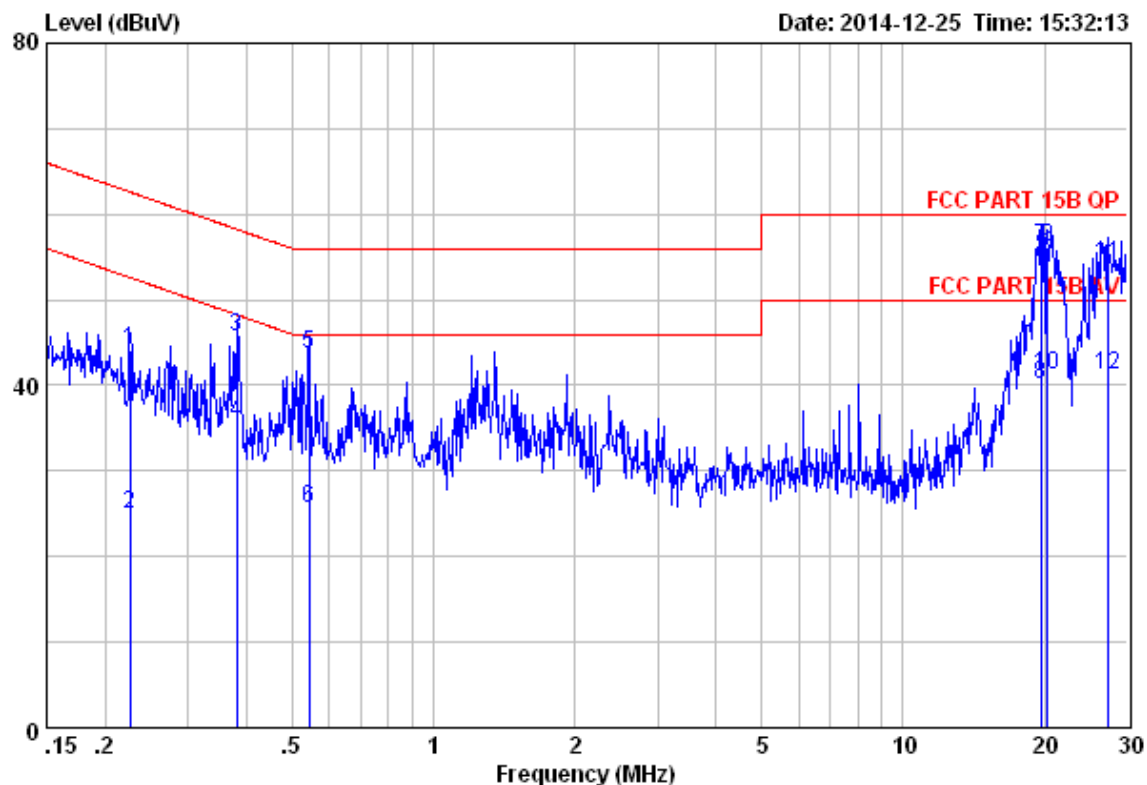
0.15MHz—30MHz Conducted emissison Test result	
EUT: Wireless Transmitter	M/N: WT-1
Power: DC 5V From Adapter Input AC 120V/60Hz	
Test date: 2014-12-25 Test site: 844 Chamber Tested by: Tony.Tang	
Test mode: Tx	
Pass	

3.5. Test Data



Site no. : EST Conduction Shielded RoomData no. : 136
 Limit : FCC PART 15B QP LINE Phase : LINE
 Env. / Ins. : Temp:25.3'C Humi:58% Press:101.50kPa
 Engineer : Dick
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX Mode

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.19	9.61	9.80	27.74	47.15	64.15	17.00	QP
2	0.19	9.61	9.80	9.74	29.15	54.15	25.00	Average
3	0.38	9.61	9.82	29.75	49.18	58.21	9.03	QP
4	0.38	9.61	9.82	21.75	41.18	48.21	7.03	Average
5	0.55	9.60	9.82	28.49	47.91	56.00	8.09	QP
6	0.55	9.60	9.82	16.49	35.91	46.00	10.09	Average
7	19.74	9.67	9.95	34.72	54.34	60.00	5.66	QP
8	19.74	9.67	9.95	21.72	41.34	50.00	8.66	Average
9	21.26	9.68	9.98	35.00	54.66	60.00	5.34	QP
10	21.26	9.68	9.98	23.00	42.66	50.00	7.34	Average
11	26.14	9.68	10.03	31.51	51.22	60.00	8.78	QP
12	26.14	9.68	10.03	21.51	41.22	50.00	8.78	Average



Site no. : EST Conduction Shielded RoomData no. : 138
 Limit : FCC PART 15B QP LINE Phase : NEUTRAL
 Env. / Ins. : Temp:25.3'C Humi:58% Press:101.50kPa
 Engineer : Dick
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX Mode

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.23	9.60	9.80	24.63	44.03	62.61	18.58	QP
2	0.23	9.60	9.80	5.63	25.03	52.61	27.58	Average
3	0.38	9.59	9.82	26.26	45.67	58.25	12.58	QP
4	0.38	9.59	9.82	16.26	35.67	48.25	12.58	Average
5	0.54	9.60	9.82	24.31	43.73	56.00	12.27	QP
6	0.54	9.60	9.82	6.31	25.73	46.00	20.27	Average
7	19.64	9.87	9.96	36.27	56.10	60.00	3.90	QP
8	19.64	9.87	9.96	20.27	40.10	50.00	9.90	Average
9	20.27	9.86	9.98	36.39	56.23	60.00	3.77	QP
10	20.27	9.86	9.98	21.39	41.23	50.00	8.77	Average
11	27.27	9.82	10.05	34.32	54.19	60.00	5.81	QP
12	27.27	9.82	10.05	21.32	41.19	50.00	8.81	Average

4. RADIATED EMISSIONS

4.1. Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

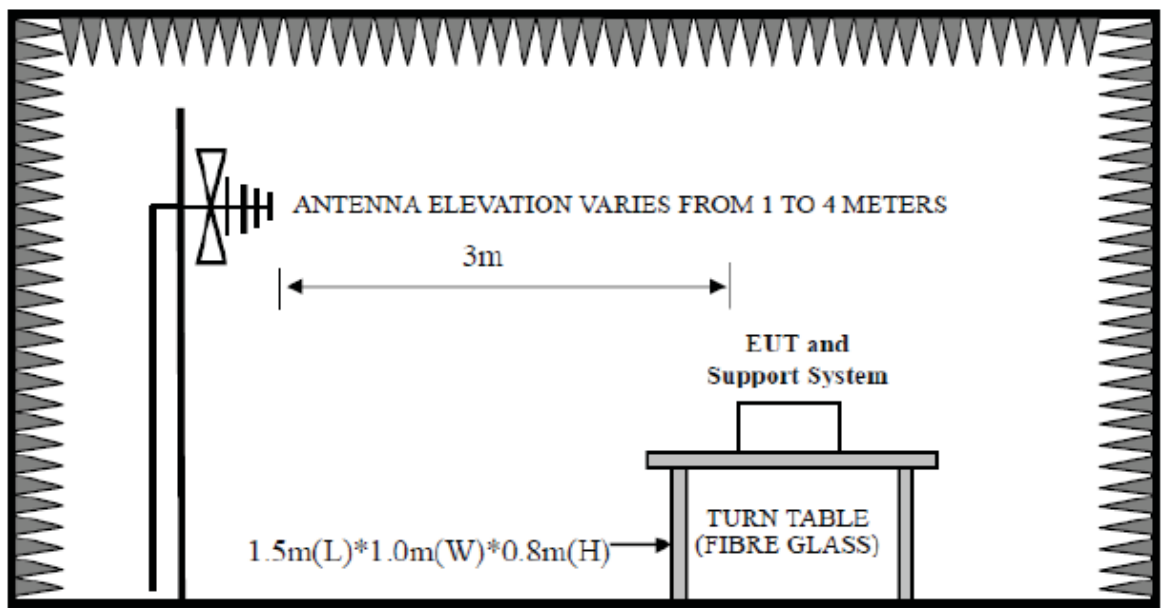
Remark : (1) Emission level $\text{dB}\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$

(2) The smaller limit shall apply at the cross point between two frequency bands.

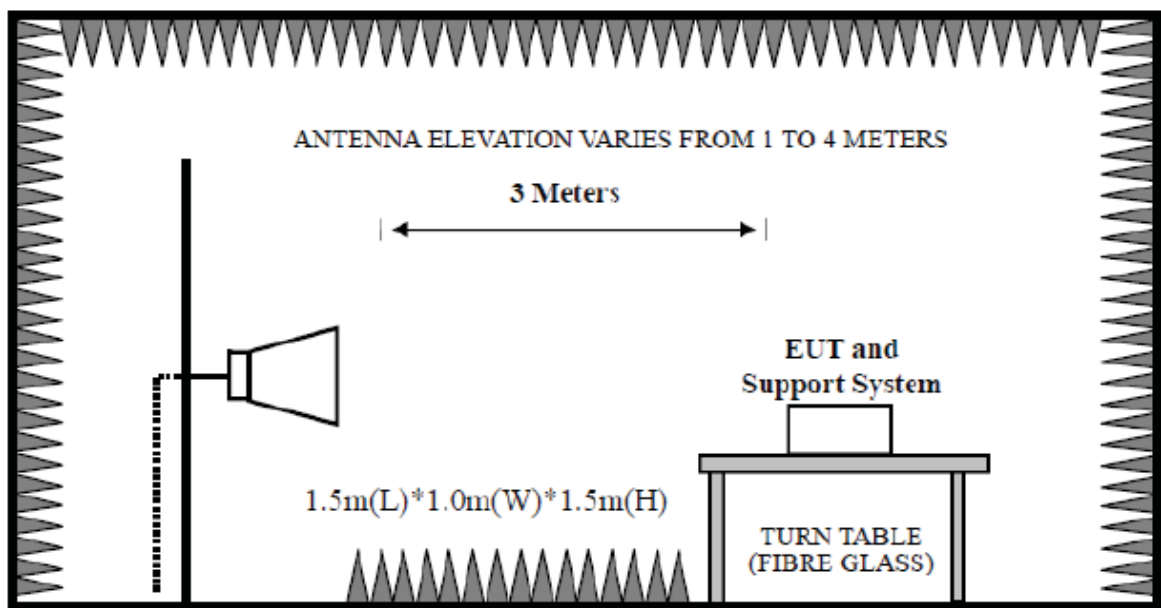
(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system

4.2. Block Diagram of Test setup

30~1000MHz



Above 1GHz



4.3. Test Procedure

EUT was placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

The bandwidth of the EMI test receiver (R&S FSU) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 1MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz

PEAK detector, 1MHz/1MHz for PAEK measurement,

PEAK detector, 1MHz/10Hz for Average measurement

The frequency range from 30MHz to 10th harmonic (25GHz) are checked.

4.4. Test Result

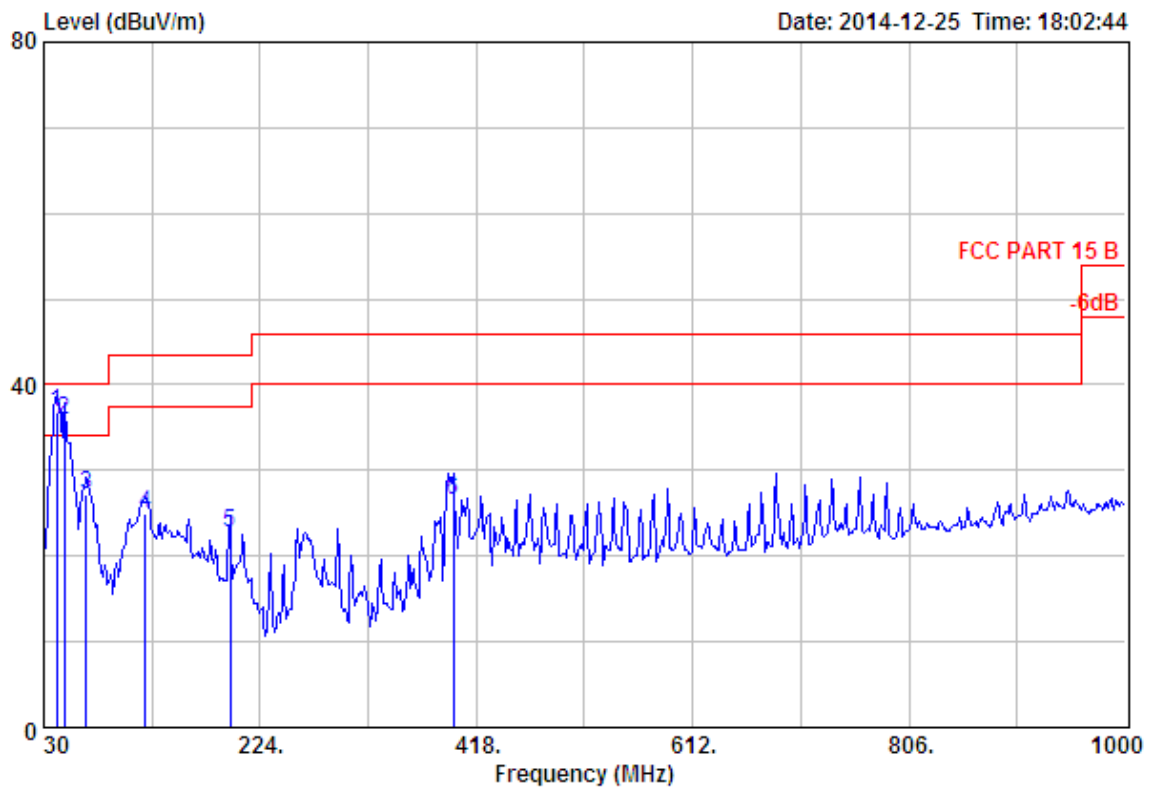
30MHz—25GHz Radiated emissison Test result	
EUT: Wireless Transmitter	M/N: WT-1
Power: DC 5V From Adapter Input AC 120V/60Hz	
Test date: 2014-11-20~2014-12-25 Test site: 3m Chamber Tested by: Tony Tang	
Test mode: Tx	
Pass	

Note: 1、 For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

2、 The frequency 2406MHz 、2442MHz and 2475MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.

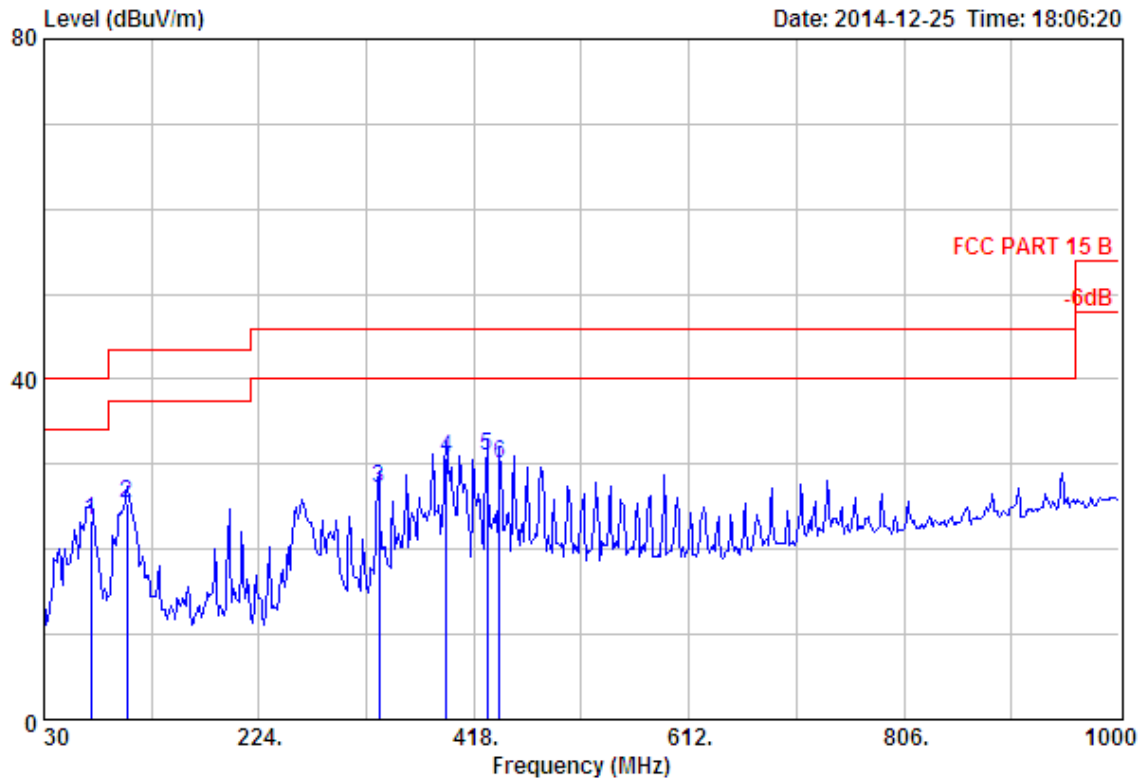
4.5. Test Data

30 MHz – 1000 MHz



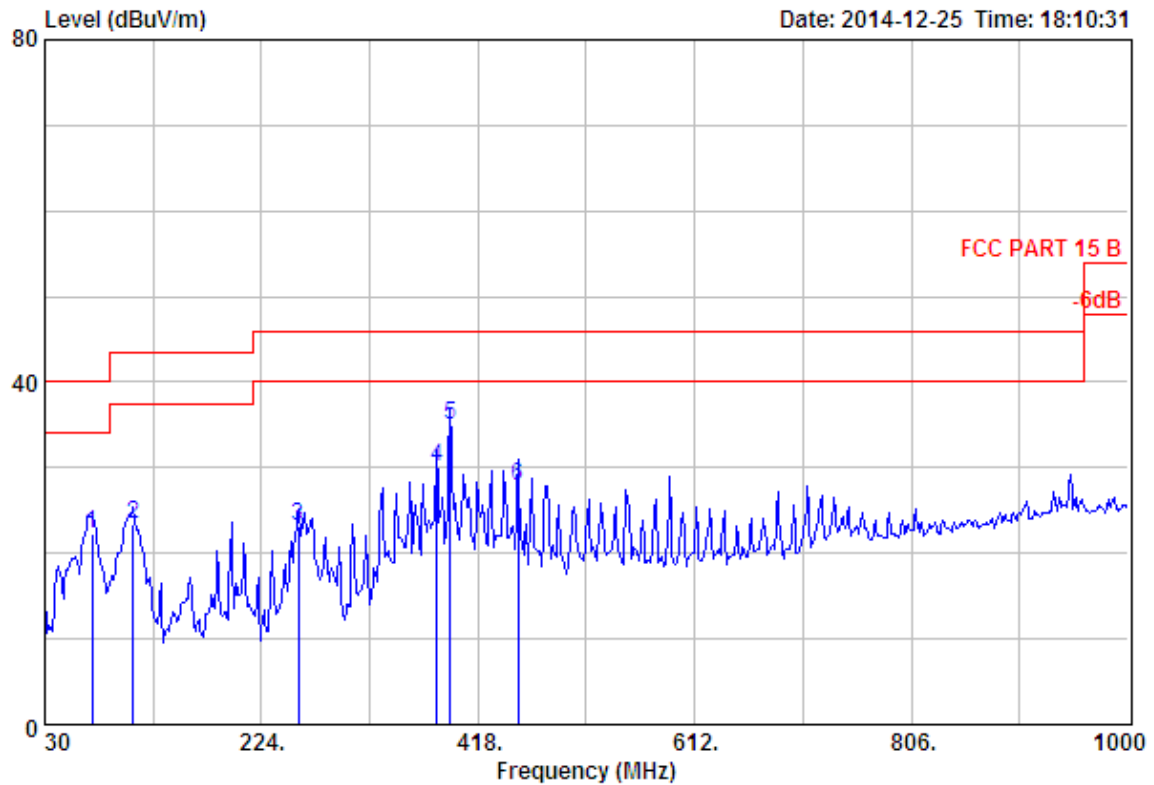
Site no. : 3m Chamber Data no. : 98
 Dis. / Ant. : 3m 27137 Ant. pol. : VERTICAL
 Limit : FCC PART 15 B
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2406MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	41.64	11.75	0.85	24.16	36.76	40.00	3.24	QP
2	48.43	8.37	0.98	26.49	35.84	40.00	4.16	QP
3	67.83	5.39	1.13	20.65	27.17	40.00	12.83	QP
4	121.18	11.20	1.40	12.34	24.94	43.50	18.56	QP
5	196.84	7.72	1.81	13.13	22.66	43.50	20.84	QP
6	397.63	15.96	2.68	7.98	26.62	46.00	19.38	QP



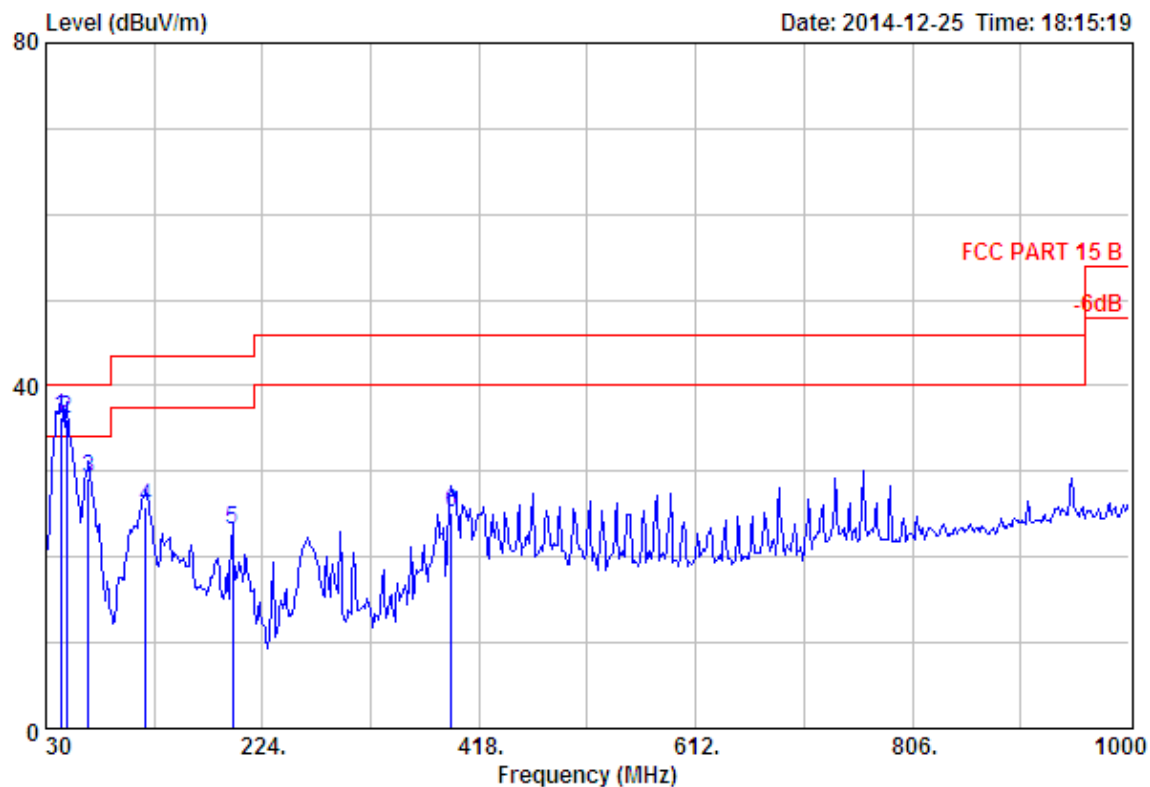
Site no. : 3m Chamber Data no. : 99
 Dis. / Ant. : 3m 27137 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 B
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2406MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	72.68	6.12	1.13	16.19	23.44	40.00	16.56	QP
2	104.69	9.95	1.44	14.12	25.51	43.50	17.99	QP
3	332.64	13.93	2.48	10.87	27.28	46.00	18.72	QP
4	392.78	15.73	2.58	12.38	30.69	46.00	15.31	QP
5	429.64	16.06	2.86	12.12	31.04	46.00	14.96	QP
6	441.28	16.27	2.90	10.90	30.07	46.00	15.93	QP



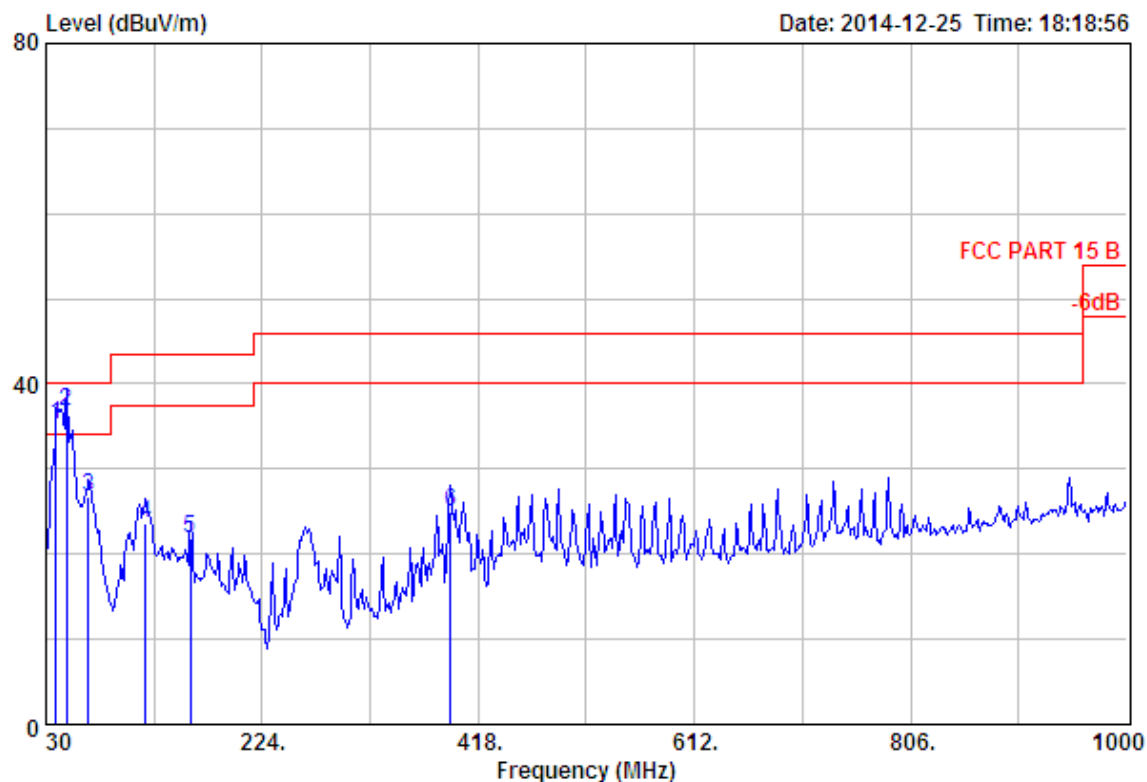
Site no. : 3m Chamber Data no. : 100
 Dis. / Ant. : 3m 27137 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 B
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2442MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	72.68	6.12	1.13	15.10	22.35	40.00	17.65	QP
2	109.54	10.44	1.40	11.52	23.36	43.50	20.14	QP
3	256.98	12.63	2.17	8.34	23.14	46.00	22.86	QP
4	381.14	15.06	2.67	12.32	30.05	46.00	15.95	QP
5	392.78	15.73	2.58	16.57	34.88	46.00	11.12	QP
6	453.89	16.62	2.98	8.29	27.89	46.00	18.11	QP



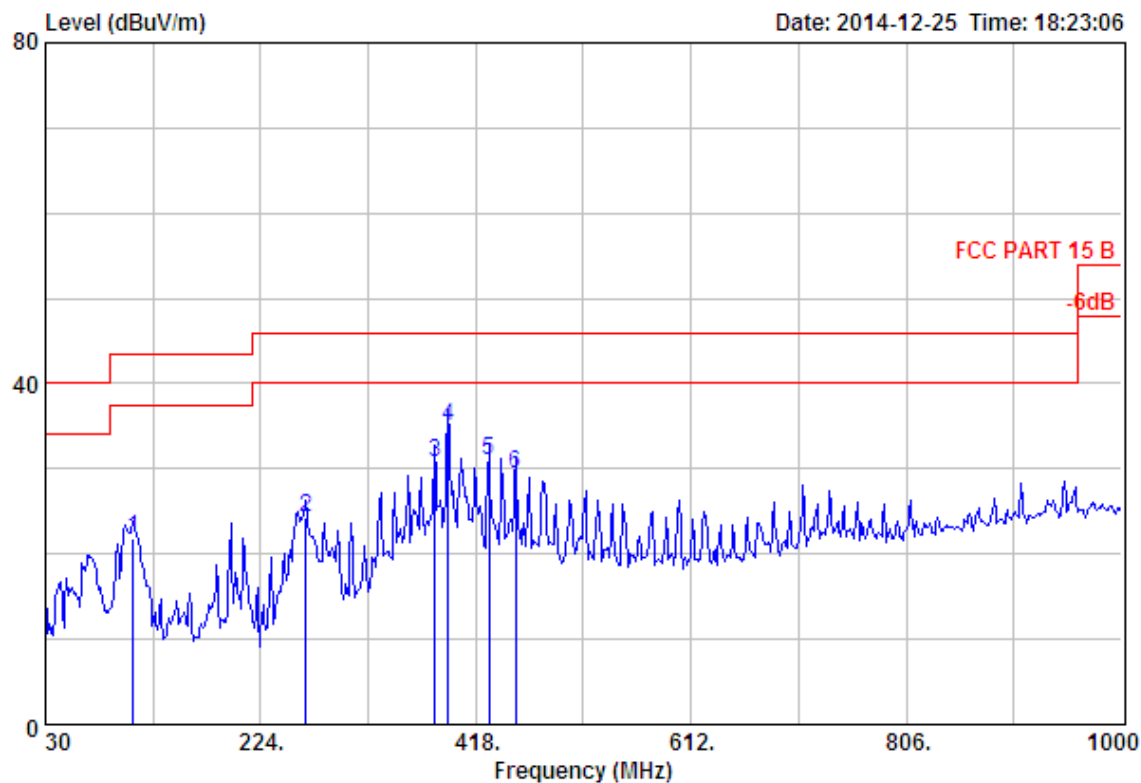
Site no. : 3m Chamber Data no. : 101
 Dis. / Ant. : 3m 27137 Ant. pol. : VERTICAL
 Limit : FCC PART 15 B
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2442MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	43.58	10.52	0.84	24.96	36.32	40.00	3.68	QP
2	48.43	8.37	0.98	26.72	36.07	40.00	3.93	QP
3	67.83	5.39	1.13	22.70	29.22	40.00	10.78	QP
4	119.24	11.11	1.42	13.23	25.76	43.50	17.74	QP
5	196.84	7.72	1.81	13.59	23.12	43.50	20.38	QP
6	392.78	15.73	2.58	6.95	25.26	46.00	20.74	QP



Site no. : 3m Chamber Data no. : 102
 Dis. / Ant. : 3m 27137 Ant. pol. : VERTICAL
 Limit : FCC PART 15 B
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2475MHz

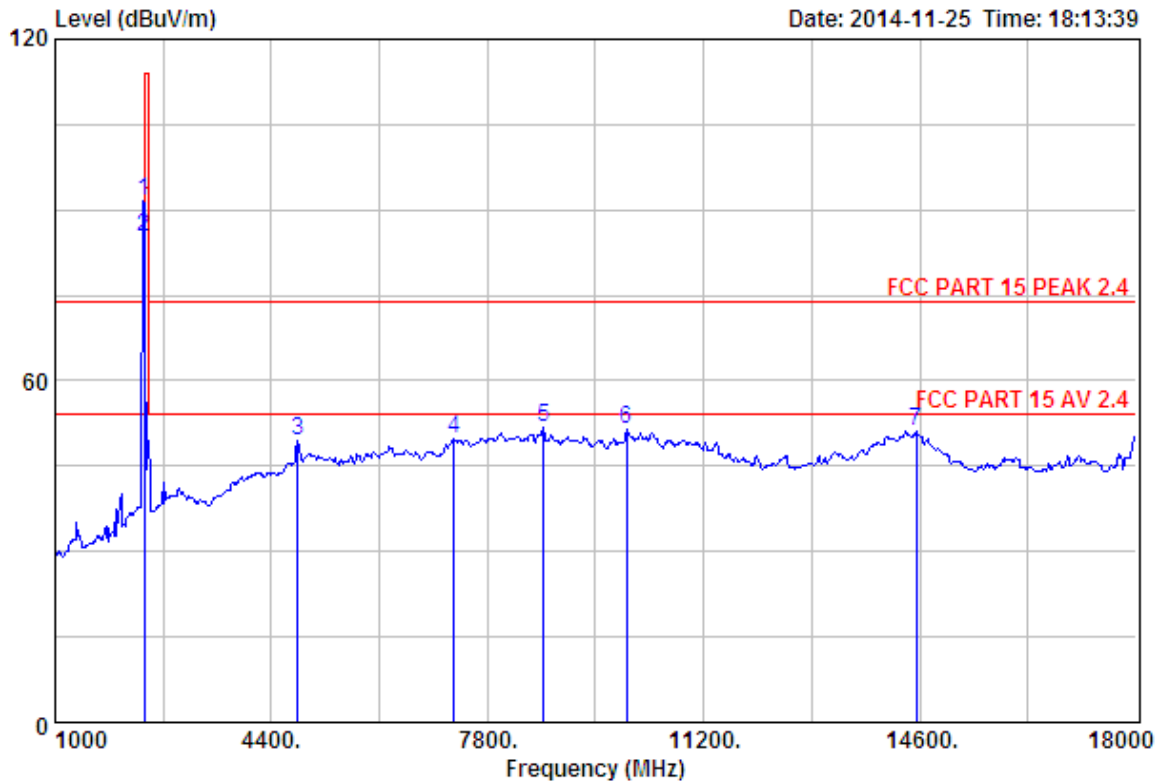
	Freq.	Ant.	Cable		Emission			
	(MHz)	Factor	Loss	Reading	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	38.73	13.48	0.79	20.83	35.10	40.00	4.90	QP
2	48.43	8.37	0.98	27.50	36.85	40.00	3.15	QP
3	67.83	5.39	1.13	20.21	26.73	40.00	13.27	QP
4	119.24	11.11	1.42	11.05	23.58	43.50	19.92	QP
5	159.98	10.36	1.71	9.73	21.80	43.50	21.70	QP
6	392.78	15.73	2.58	6.75	25.06	46.00	20.94	QP



Site no. : 3m Chamber Data no. : 103
 Dis. / Ant. : 3m 27137 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 B
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2475MHz

	Freq.	Ant.	Cable		Emission			
	(MHz)	Factor	Loss	Reading	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	109.54	10.44	1.40	9.93	21.77	43.50	21.73	QP
2	264.74	12.94	2.28	8.98	24.20	46.00	21.80	QP
3	381.14	15.06	2.67	12.93	30.66	46.00	15.34	QP
4	392.78	15.73	2.58	16.61	34.92	46.00	11.08	QP
5	429.64	16.06	2.86	11.95	30.87	46.00	15.13	QP
6	453.89	16.62	2.98	9.92	29.52	46.00	16.48	QP

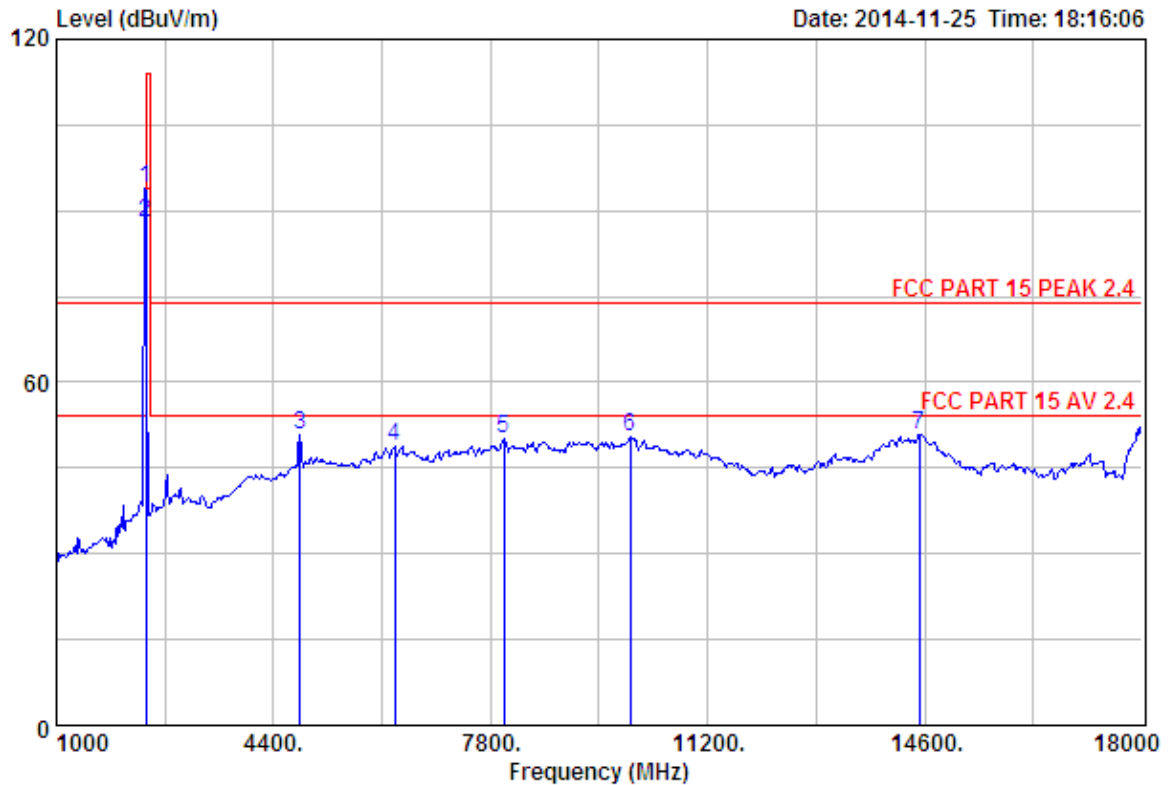
1000-18000MHz



Site no. : 3m Chamber Data no. : 24
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2406MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2406.00	27.61	6.64	34.18	91.54	91.61	114.00	22.39	Peak
2	2406.00	27.61	6.64	34.18	85.12	85.19	94.00	8.81	Average
3	4812.00	31.25	11.77	31.81	38.38	49.59	74.00	24.41	Peak
4	7273.00	36.54	11.56	32.04	33.78	49.84	74.00	24.16	Peak
5	8684.00	37.32	11.45	32.43	35.45	51.79	74.00	22.21	Peak
6	9993.00	38.12	11.59	31.78	33.42	51.35	74.00	22.65	Peak
7	14549.00	41.77	10.92	33.26	31.68	51.11	74.00	22.89	Peak

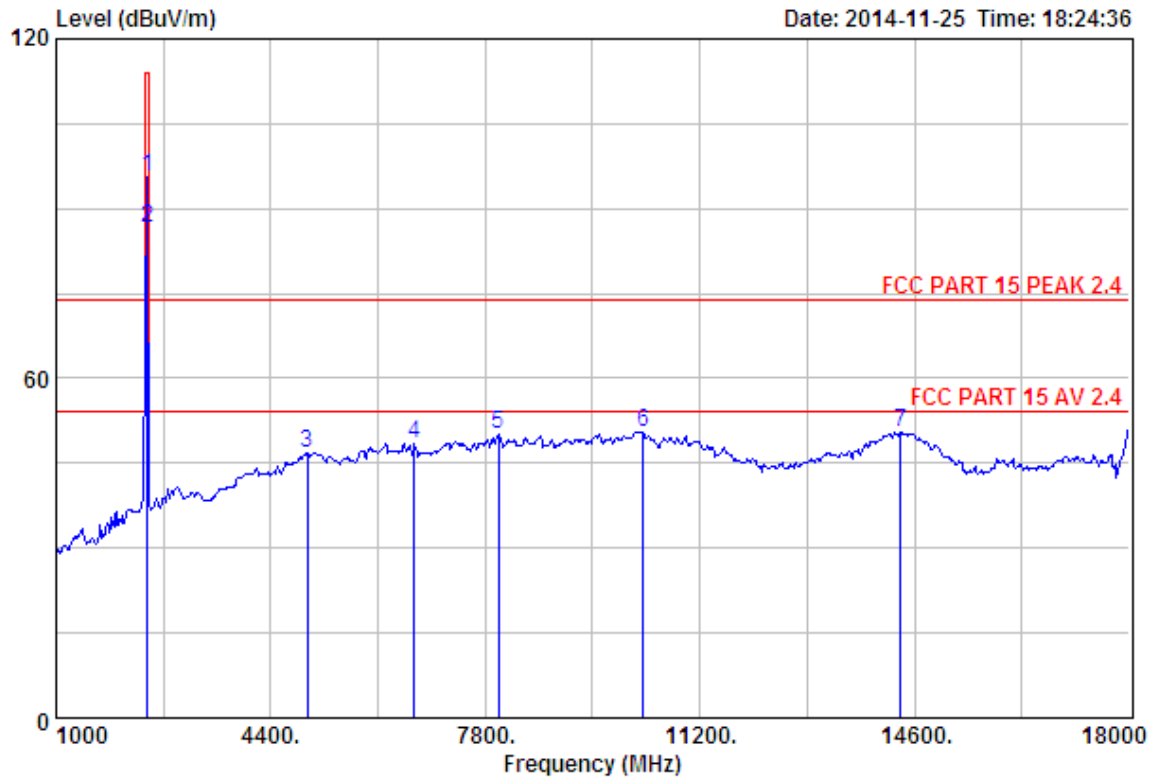
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 25
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2406MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2406.00	27.61	6.64	34.18	94.00	94.07	114.00	19.93	Peak
2	2406.00	27.61	6.64	34.18	87.76	87.83	94.00	6.17	Average
3	4812.00	31.25	11.77	31.81	39.53	50.74	74.00	23.26	Peak
4	6304.00	33.61	12.19	31.92	34.87	48.75	74.00	25.25	Peak
5	8004.00	37.01	11.40	31.22	32.90	50.09	74.00	23.91	Peak
6	9993.00	38.12	11.59	31.78	32.50	50.43	74.00	23.57	Peak
7	14515.00	41.89	10.93	33.14	31.18	50.86	74.00	23.14	Peak

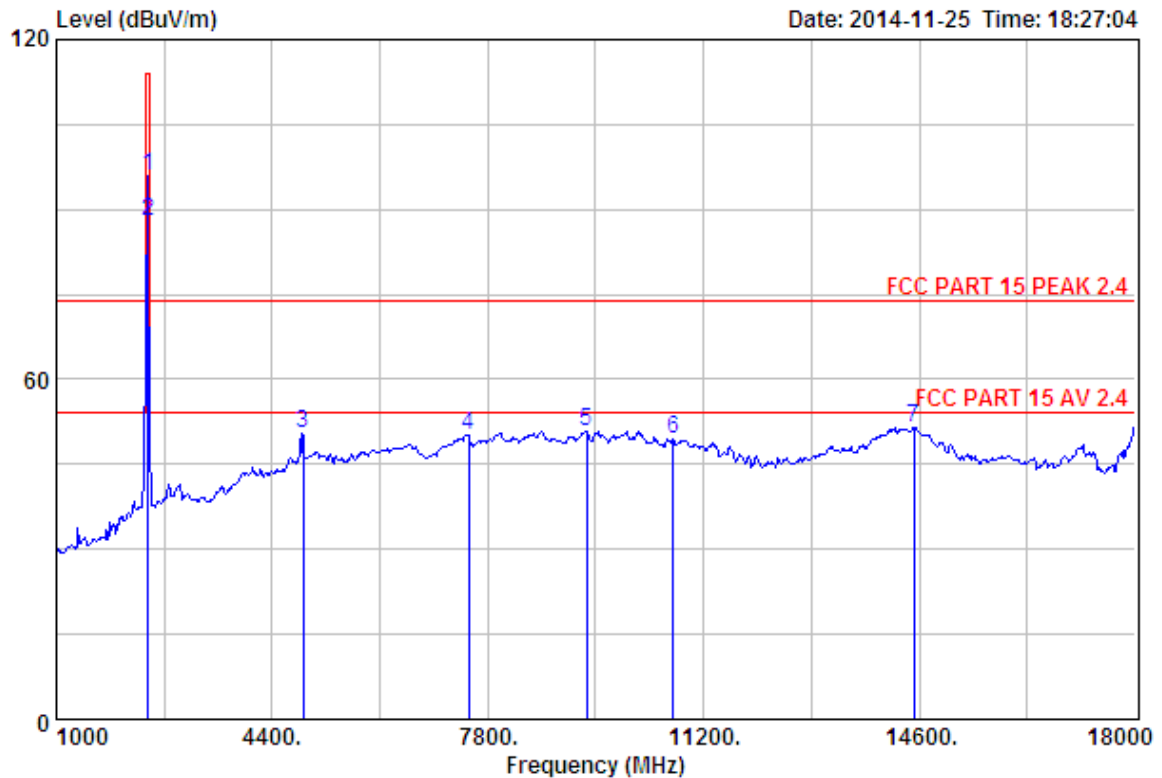
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 28
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2442MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2442.00	27.60	6.67	34.12	95.59	95.74	114.00	18.26	Peak
2	2442.00	27.60	6.67	34.12	86.45	86.60	94.00	7.40	Average
3	4978.00	31.52	12.52	31.99	34.83	46.88	74.00	27.12	Peak
4	6678.00	34.49	11.97	32.22	34.30	48.54	74.00	25.46	Peak
5	8004.00	37.01	11.40	31.22	32.84	50.03	74.00	23.97	Peak
6	10299.00	38.62	11.42	32.34	32.94	50.64	74.00	23.36	Peak
7	14379.00	41.77	10.92	32.88	30.71	50.52	74.00	23.48	Peak

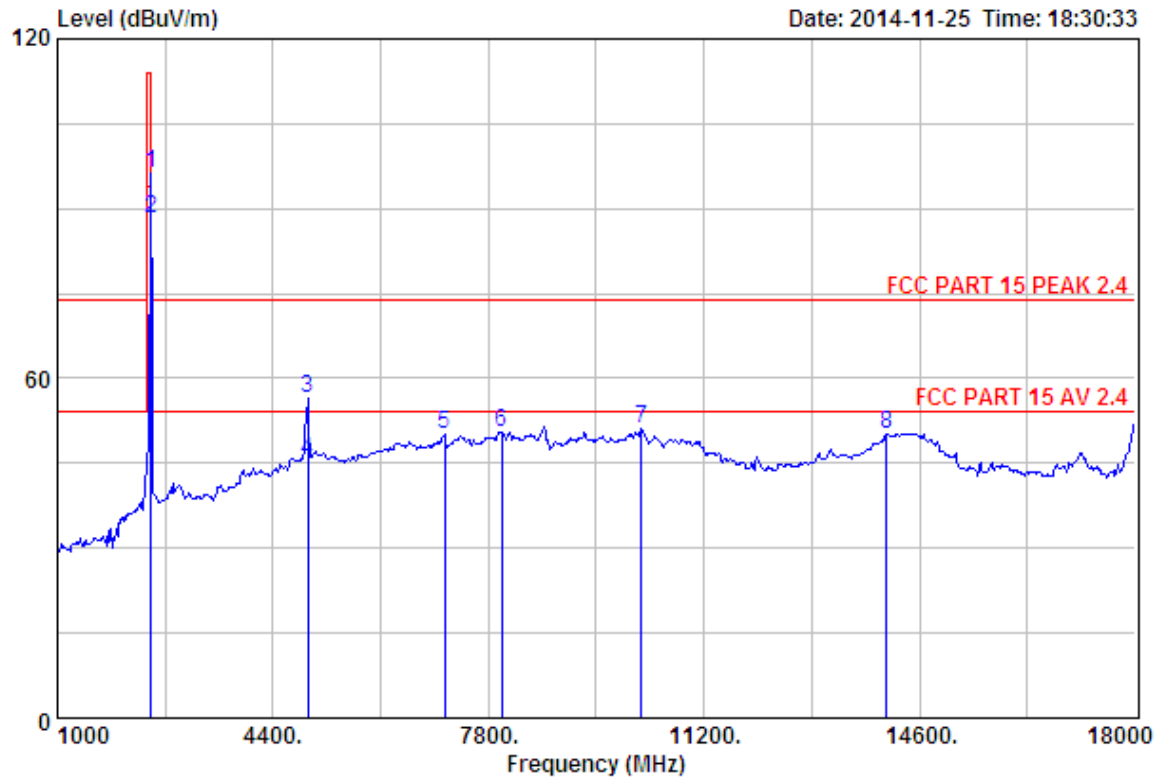
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 29
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2442MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2442.00	27.60	6.67	34.12	95.93	96.08	114.00	17.92	Peak
2	2442.00	27.60	6.67	34.12	87.87	88.02	94.00	5.98	Average
3	4884.00	31.37	12.07	31.90	39.00	50.54	74.00	23.46	Peak
4	7494.00	36.48	11.62	31.87	34.07	50.30	74.00	23.70	Peak
5	9364.00	38.02	11.64	32.06	33.34	50.94	74.00	23.06	Peak
6	10724.00	39.22	11.30	33.14	32.22	49.60	74.00	24.40	Peak
7	14515.00	41.89	10.93	33.14	31.76	51.44	74.00	22.56	Peak

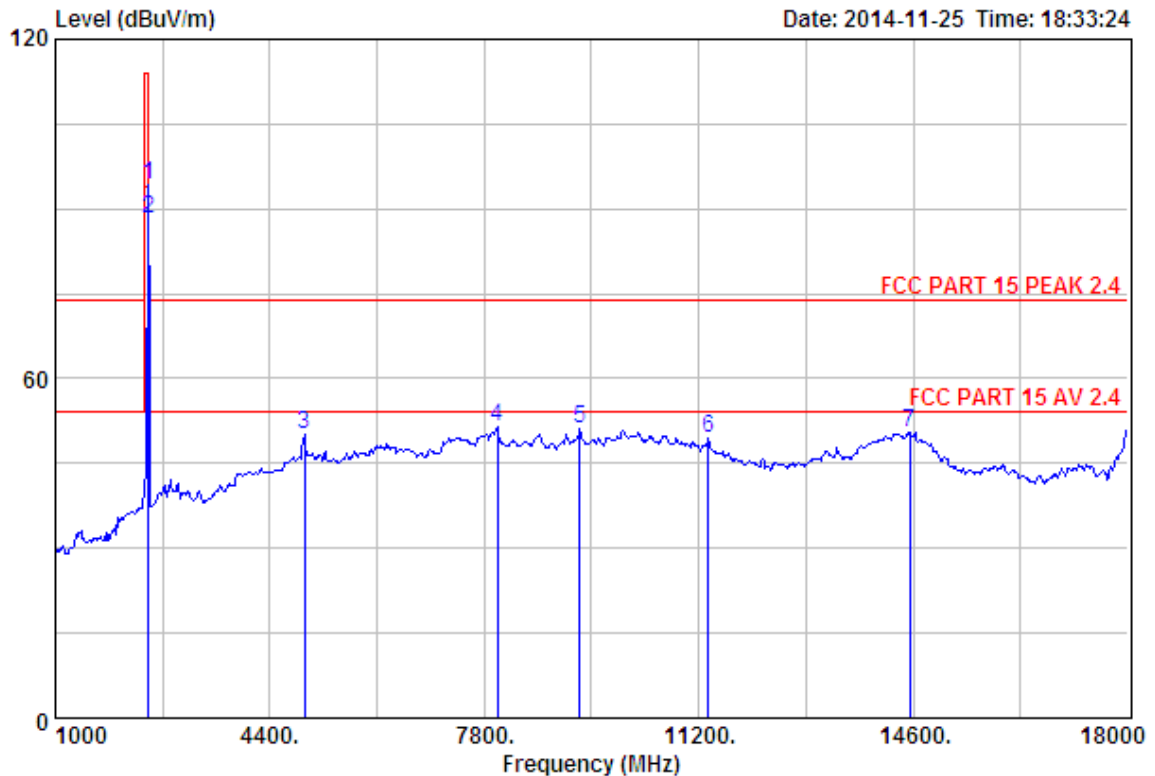
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 30
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2475MHz

		Ant.	Cable	Amp	Emission				
	Freq.	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	2475.00	27.58	6.71	34.06	96.12	96.35	114.00	17.65	Peak
2	2475.00	27.58	6.71	34.06	88.14	88.37	94.00	5.63	Average
3	4950.00	31.47	12.37	31.96	44.67	56.55	74.00	17.45	Peak
4	4950.00	31.47	12.37	31.96	33.44	45.32	54.00	8.68	Average
5	7103.00	35.99	11.51	32.31	35.06	50.25	74.00	23.75	Peak
6	8004.00	37.01	11.40	31.22	33.42	50.61	74.00	23.39	Peak
7	10214.00	38.48	11.47	32.17	33.27	51.05	74.00	22.95	Peak
8	14073.00	41.52	10.90	33.75	31.58	50.25	74.00	23.75	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

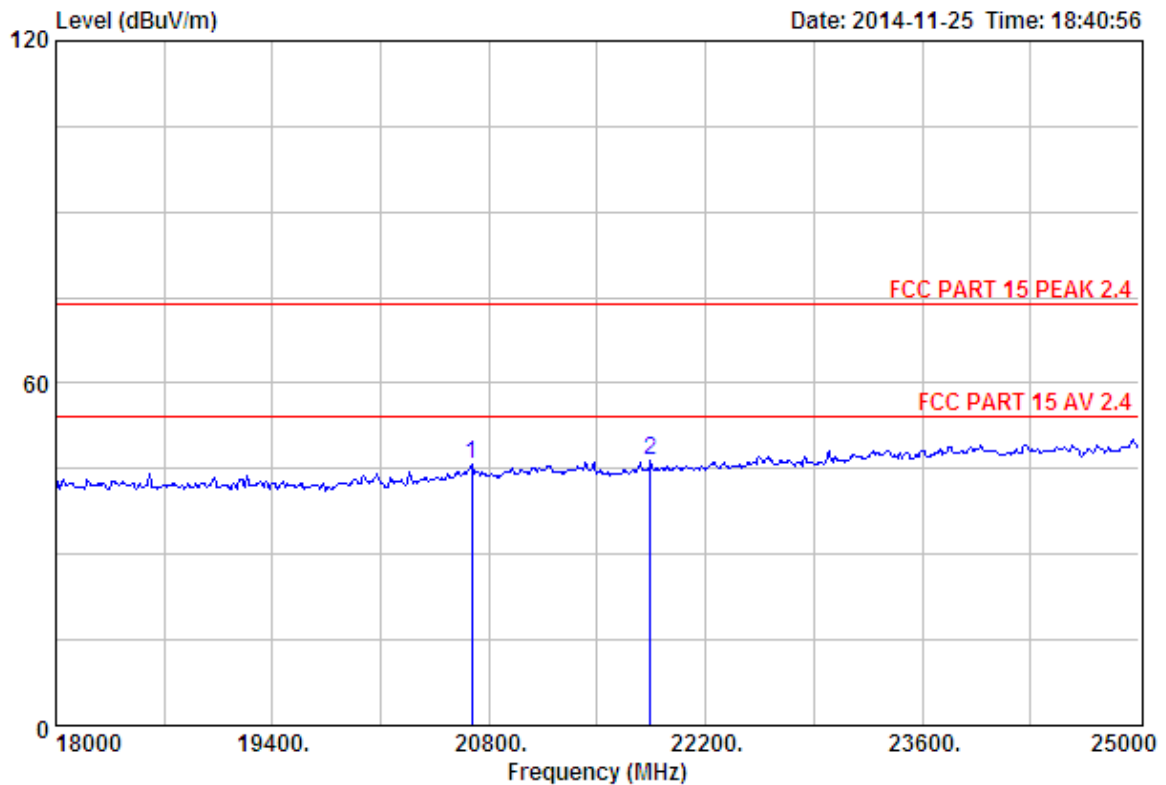


Site no. : 3m Chamber Data no. : 31
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2475MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2475.00	27.58	6.71	34.06	93.94	94.17	114.00	19.83	Peak
2	2475.00	27.58	6.71	34.06	87.92	88.15	94.00	5.85	Average
3	4950.00	31.47	12.37	31.96	38.33	50.21	74.00	23.79	Peak
4	8004.00	37.01	11.40	31.22	34.18	51.37	74.00	22.63	Peak
5	9313.00	37.94	11.62	32.15	33.69	51.10	74.00	22.90	Peak
6	11353.00	39.29	11.03	34.32	33.58	49.58	74.00	24.42	Peak
7	14549.00	41.77	10.92	33.26	30.98	50.41	74.00	23.59	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

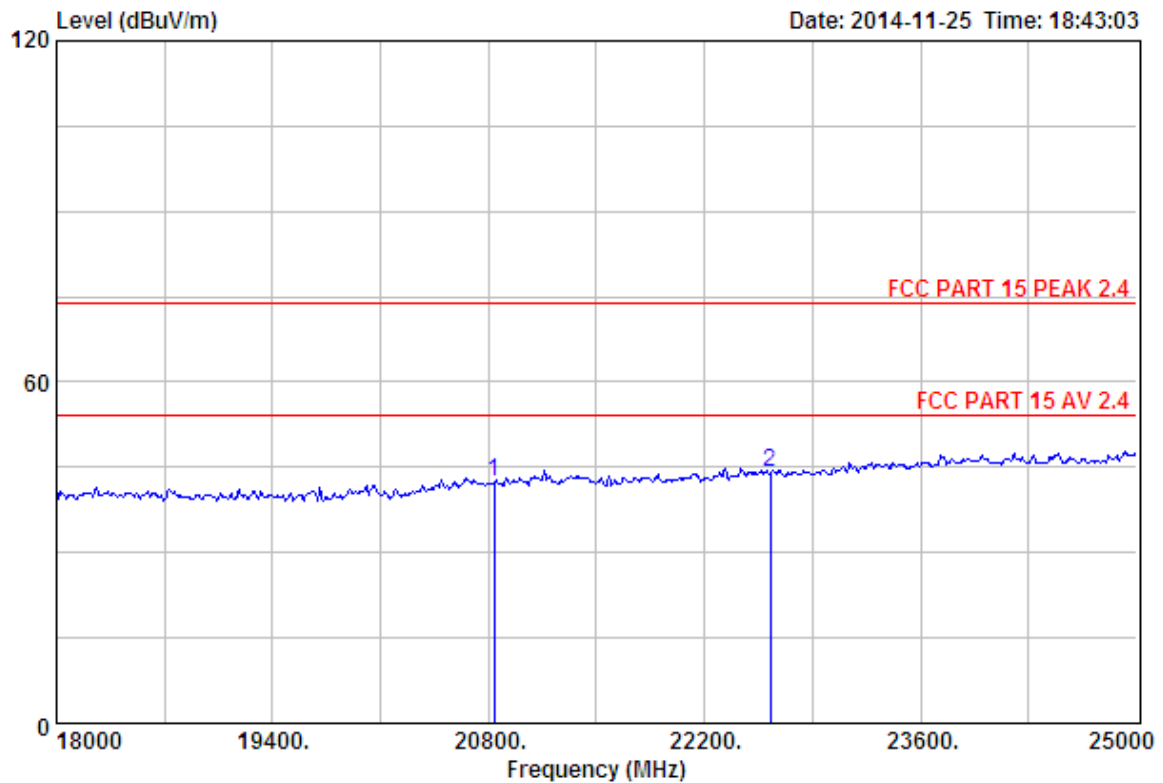
18000MHz-25000MHz



Site no. : 3m Chamber Data no. : 34
 Dis. / Ant. : 3m ANT ABVOE 18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2406MHz

		Ant.	Cable	Amp	Emission				
Freq.	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1 20688.00	46.11	19.99	36.07	15.84	45.87	74.00	28.13	Peak	
2 21843.00	45.79	20.49	35.03	15.24	46.49	74.00	27.51	Peak	

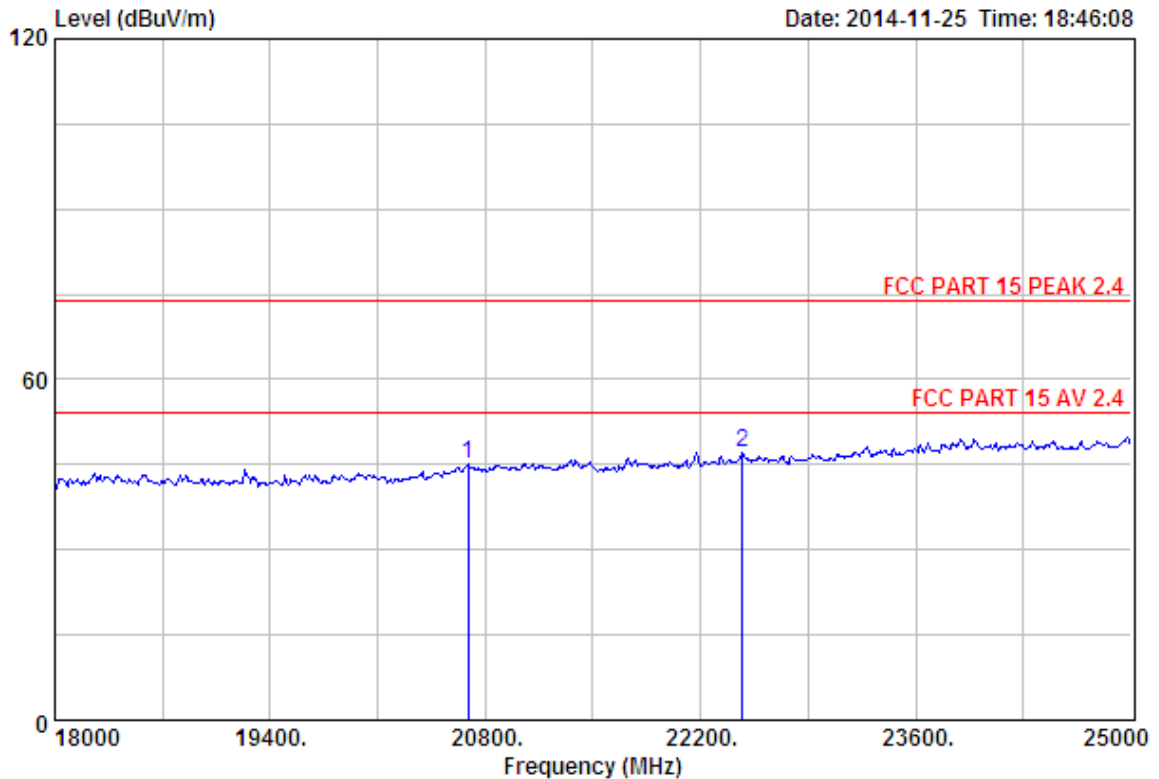
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 35
 Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WI-1
 Test Mode : TX 2406MHz

		Ant.	Cable	Amp	Emission				
	Freq.	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	20835.00	46.20	20.06	35.96	12.11	42.41	74.00	31.59	Peak
2	22627.00	45.75	20.93	34.24	11.62	44.06	74.00	29.94	Peak

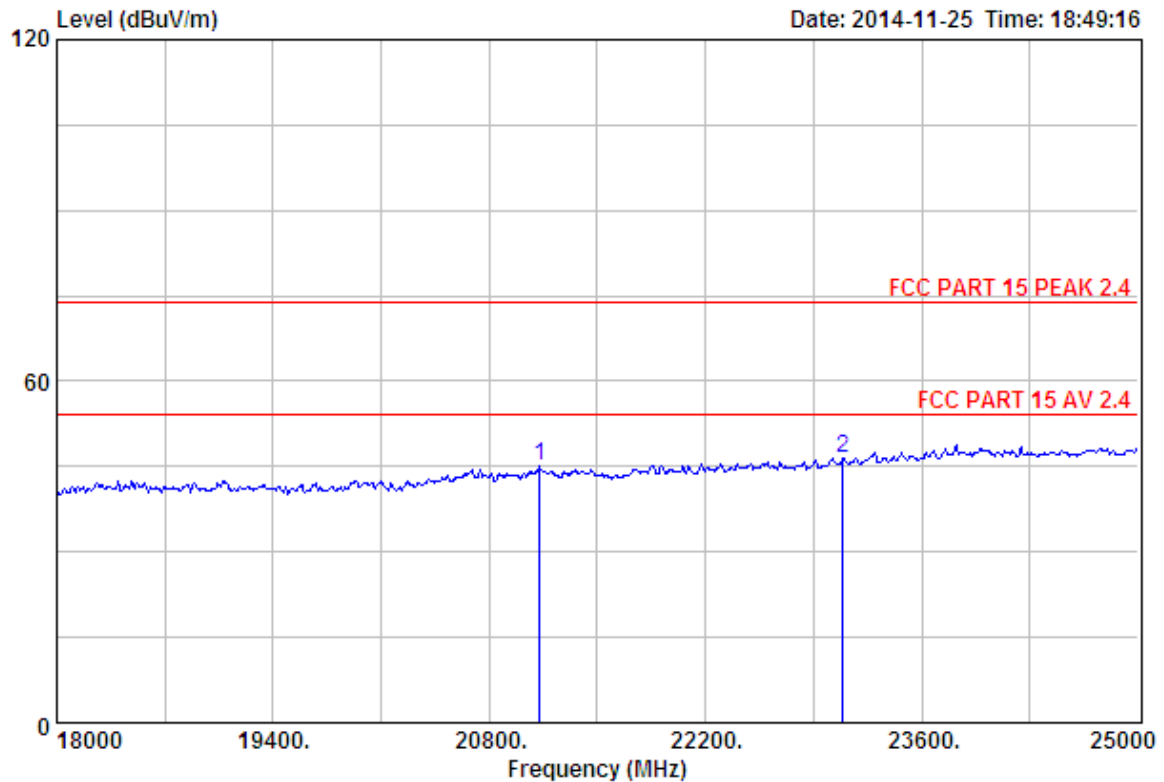
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 36
 Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2442MHz

	Ant.	Cable	Amp		Emission				
Freq.	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1 20688.00	46.11	19.99	36.07	15.11	45.14	74.00	28.86	Peak	
2 22473.00	45.79	20.84	34.40	14.95	47.18	74.00	26.82	Peak	

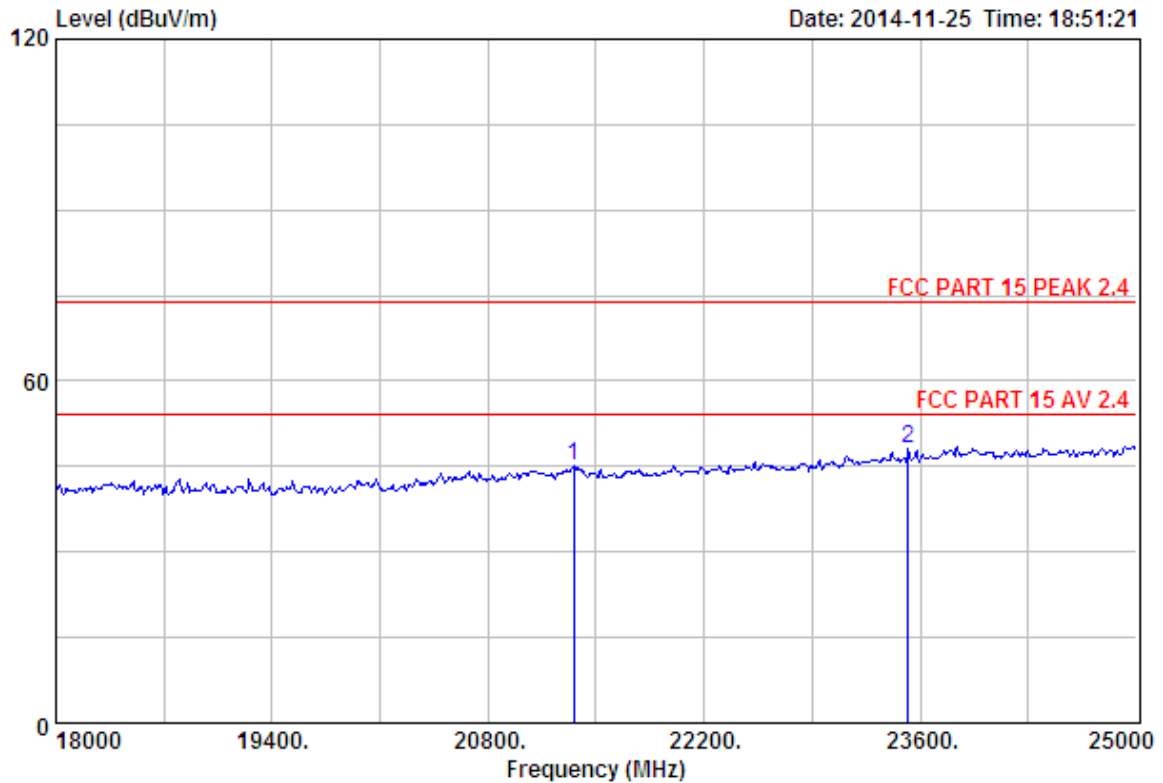
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 37
 Dis. / Ant. : 3m ANT ABVOE 18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2442MHz

Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission		Limits (dBuV/m)	Margin (dB)	Remark
					Level				
1 21129.00	46.22	20.19	35.69	14.34	45.06		74.00	28.94	Peak
2 23089.00	45.62	21.22	33.74	13.47	46.57		74.00	27.43	Peak

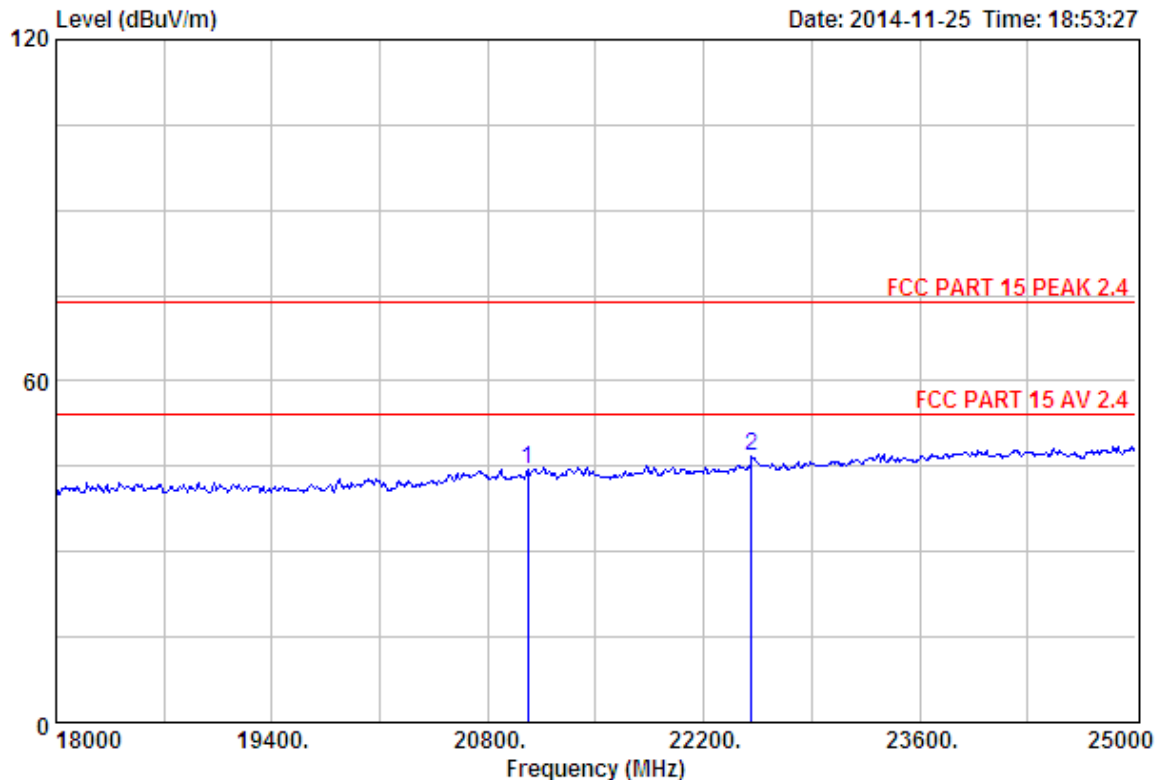
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 38
 Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2475MHz

		Ant.	Cable	Amp	Emission				
	Freq.	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	21353.00	46.09	20.28	35.49	14.31	45.19	74.00	28.81	Peak
2	23523.00	45.70	21.62	33.30	14.11	48.13	74.00	25.87	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 39
 Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2475MHz

		Ant.	Cable	Amp	Emission				
	Freq.	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	21059.00	46.26	20.16	35.76	13.79	44.45	74.00	29.55	Peak
2	22508.00	45.80	20.86	34.38	14.36	46.64	74.00	27.36	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

5. 20 DB BANDWIDTH

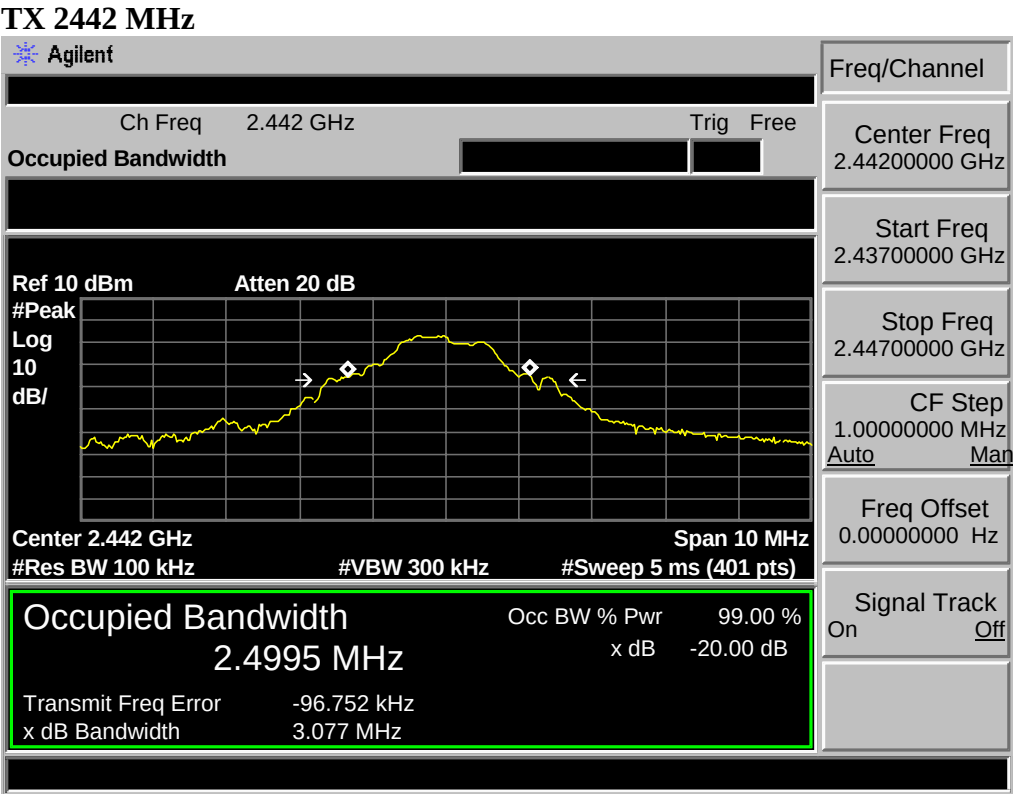
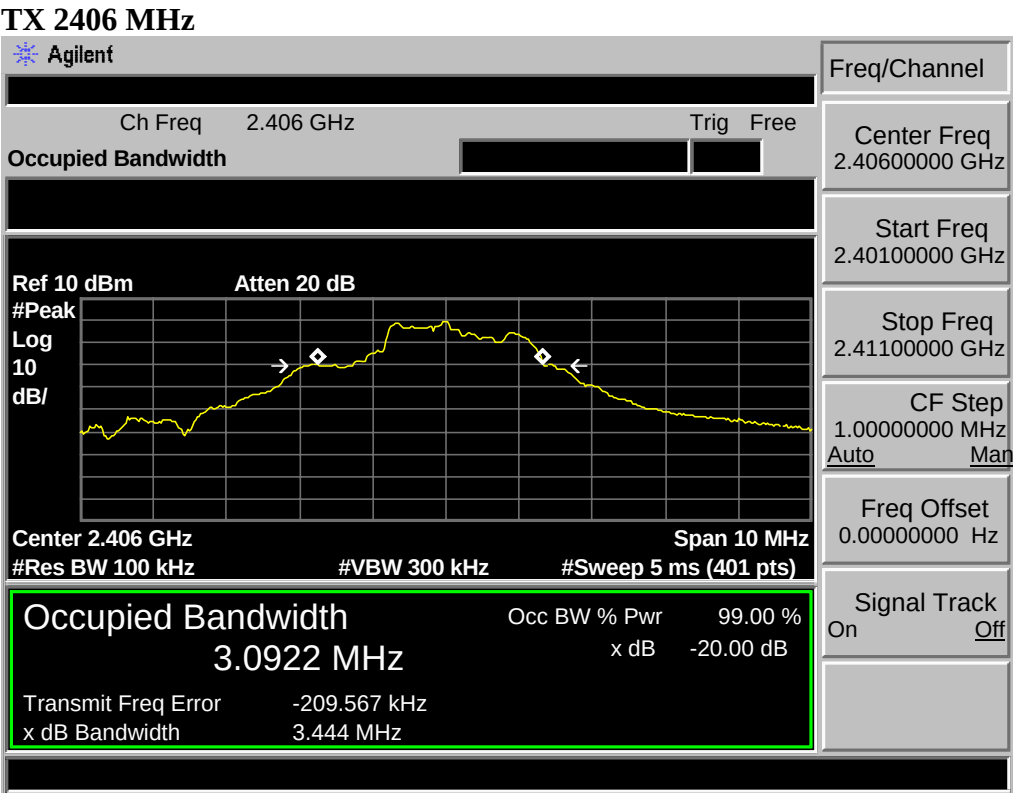
5.1. Test Procedure

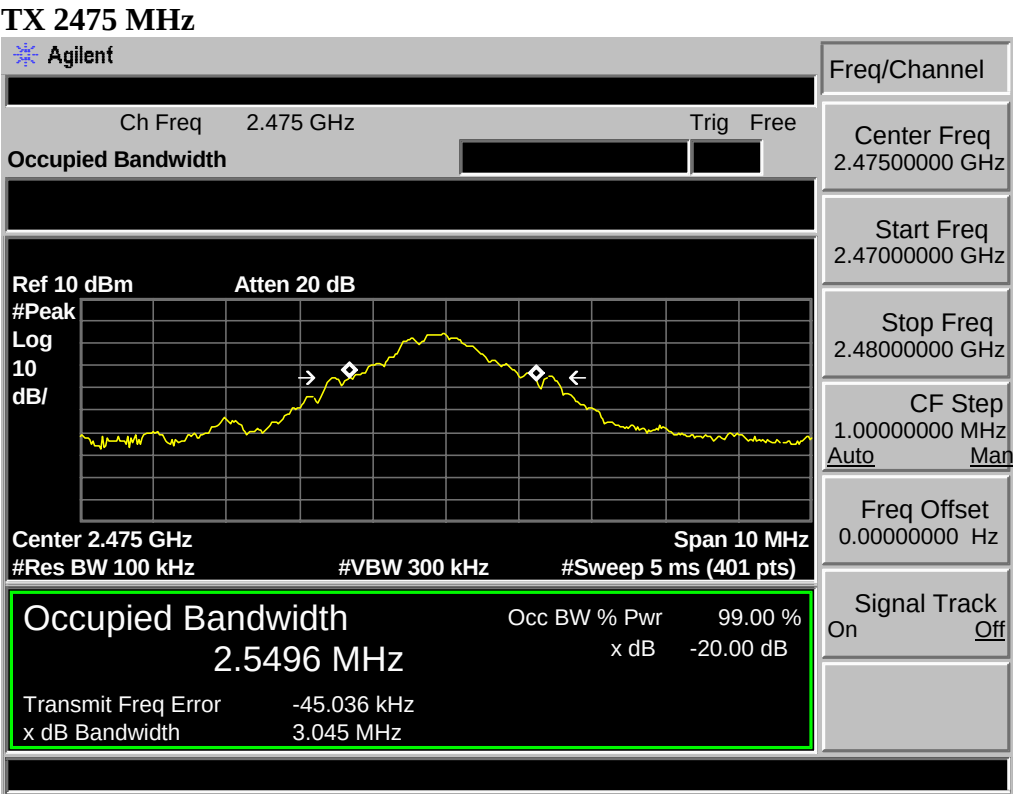
The transmitter output was coupled to a spectrum analyzer via a antenna. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

5.2. Test Result

EUT: Wireless Transmitter				
M/N: WT-1				
Test date: 2014-12-26		Test site: RF site		Tested by: Tony Tang
Mode	Freq (MHz)	20dB Bandwidth (MHz)	Limit (kHz)	Conclusion
TX	2406	3.444	/	PASS
	2442	3.077	/	PASS
	2475	3.045	/	PASS

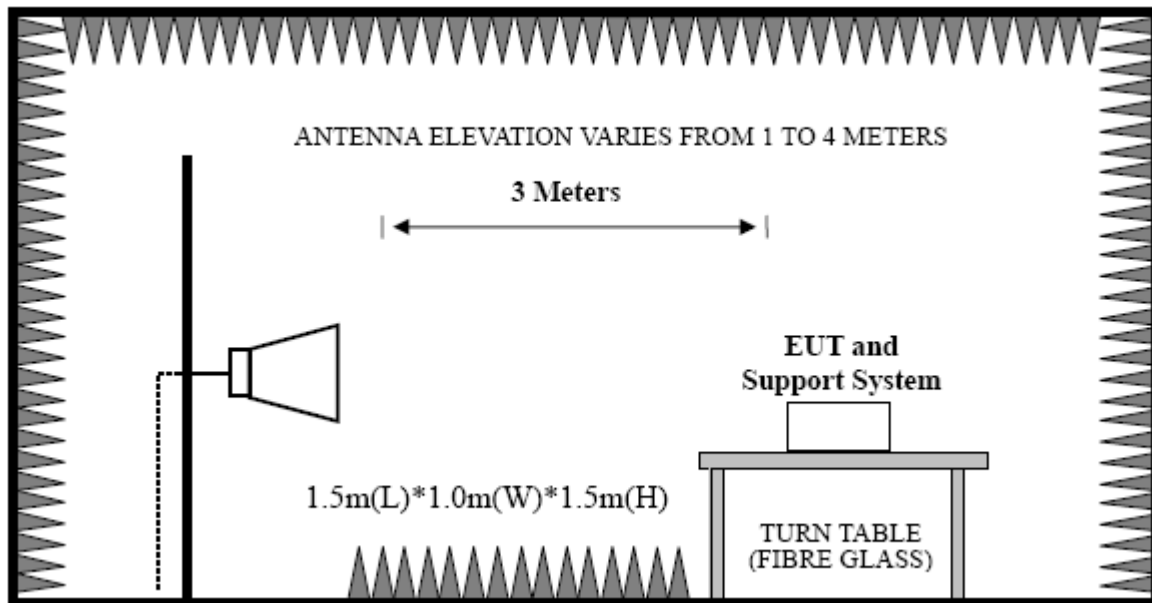
5.3. Test Data





6. BAND EDGE COMPLIANCE

6.1. Block Diagram of Test setup



6.2. Test Procedure

EUT was placed on a turn table, which is 1.5 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of emissions

Peak : RBW = 1MHz, VBW = 1MHz, Detector=PEAK detector, Sweep time = auto.

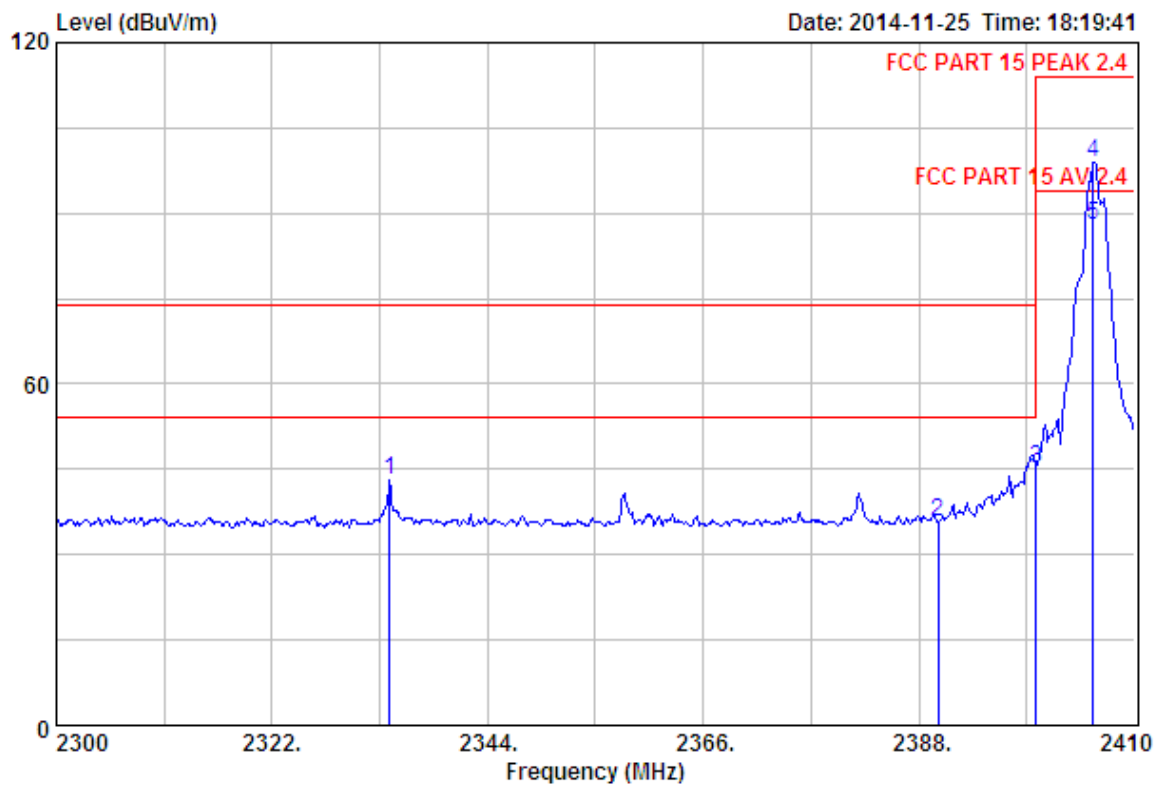
AV : RBW = 1MHz, VBW = 10Hz, Detector=PEAK detector, Sweep time = auto .

6.3. Test Result

EUT: Wireless Transmitter	M/N: WT-1
Power: DC 5V From Adapter Input AC 120V/60Hz	
Test date: 2014-11-25 Test site: 3m Chamber Tested by: Tony Tang	
Test mode: Tx Mode	
Pass	

Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

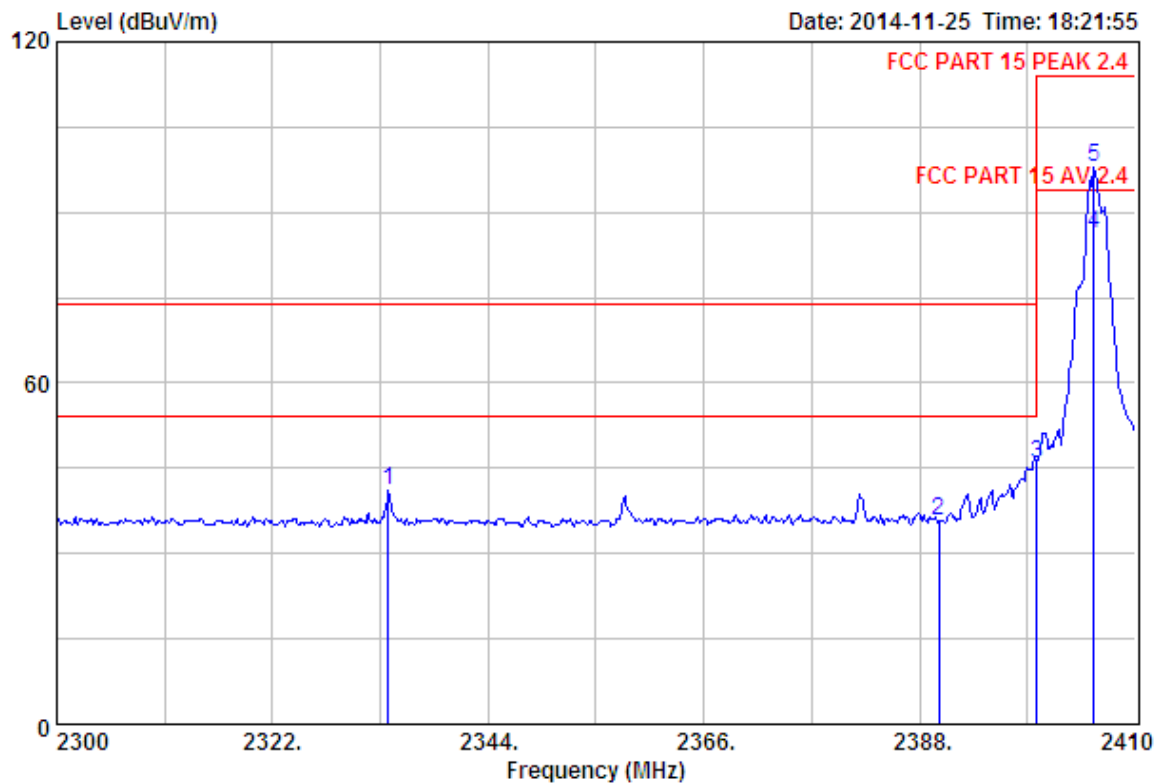
6.4. Test Data



Site no. : 3m Chamber Data no. : 26
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2406MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2333.99	27.73	6.54	34.23	43.09	43.13	74.00	30.87	Peak
2	2390.00	27.64	6.62	34.19	35.55	35.62	74.00	38.38	Peak
3	2400.00	27.61	6.62	34.18	45.22	45.27	74.00	28.73	Peak
4	2405.82	27.61	6.64	34.18	98.97	99.04	114.00	14.96	Peak
5	2405.82	27.61	6.64	34.18	87.90	87.97	94.00	6.03	Average

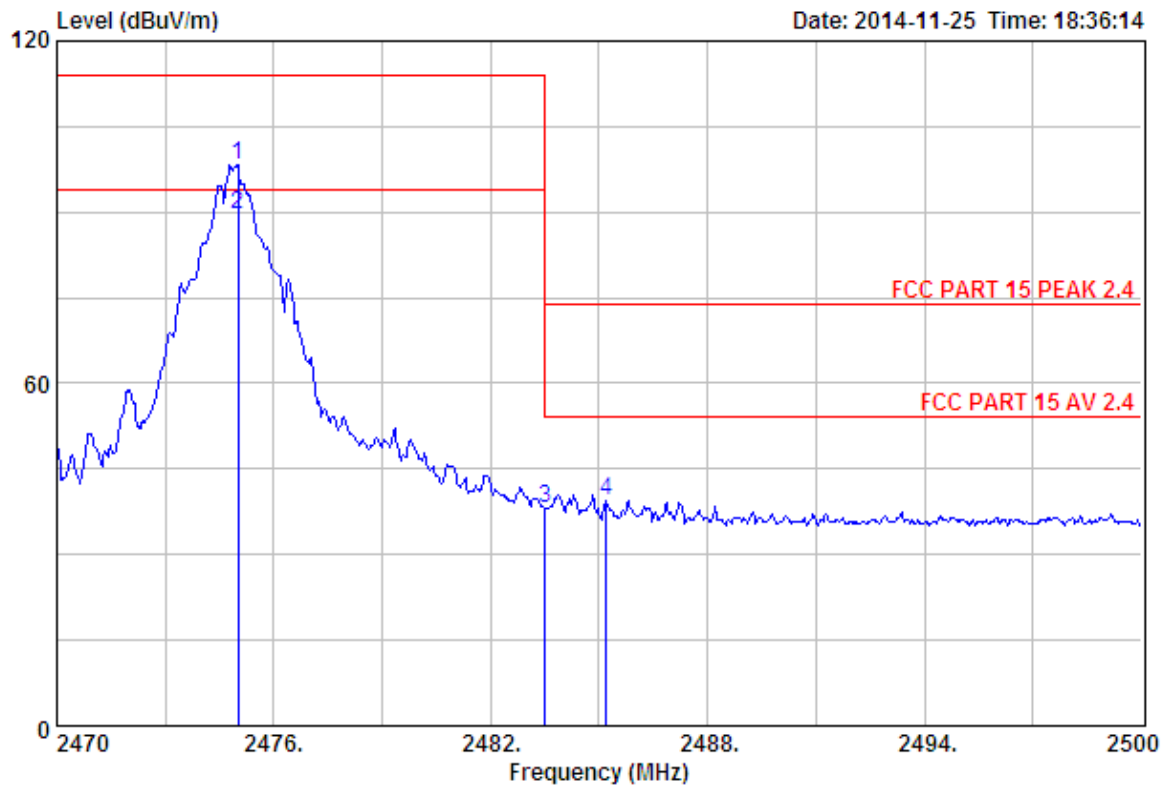
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 27
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2406MHz

	Freq.	Ant.	Cable	Amp	Emission				
	(MHz)	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	2333.77	27.73	6.54	34.23	41.08	41.12	74.00	32.88	Peak
2	2390.00	27.64	6.62	34.19	35.60	35.67	74.00	38.33	Peak
3	2400.00	27.61	6.62	34.18	45.67	45.72	74.00	28.28	Peak
4	2405.82	27.61	6.64	34.18	86.18	86.25	94.00	7.75	Average
5	2405.82	27.61	6.64	34.18	97.97	98.04	114.00	15.96	Peak

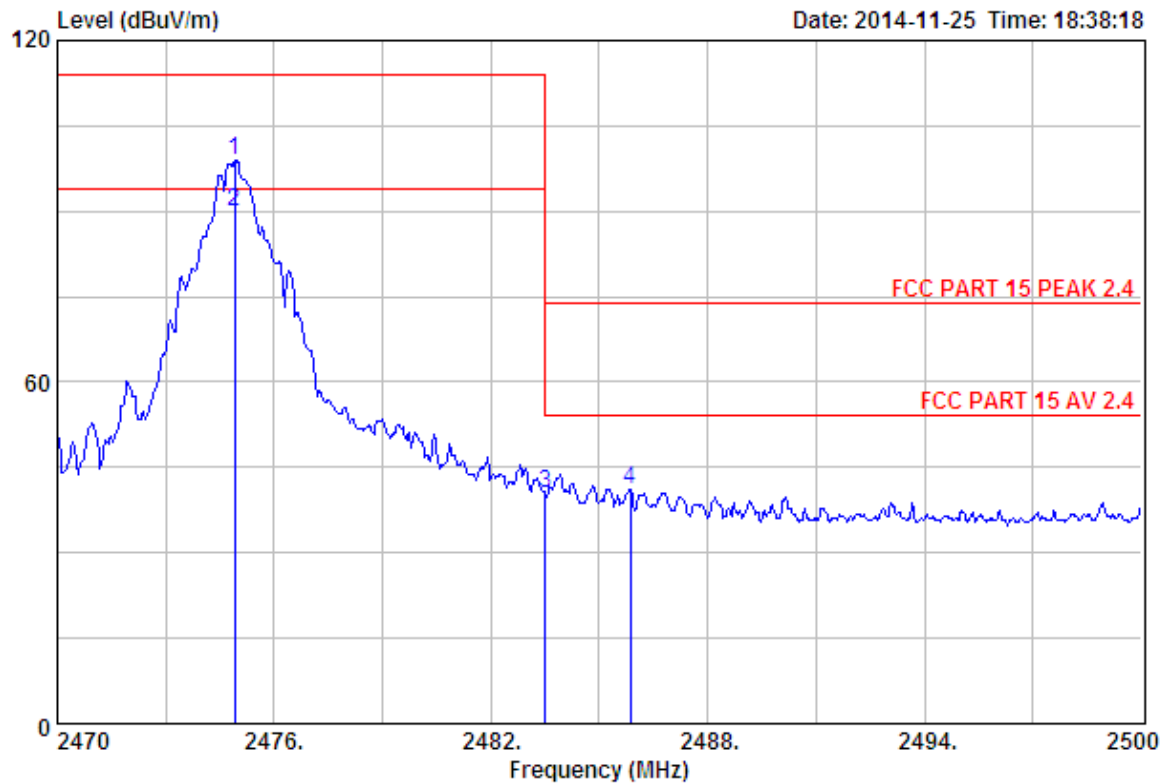
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 32
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2475MHz

	Freq.	Ant.	Cable	Amp	Emission				
	(MHz)	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	2475.01	27.58	6.71	34.06	98.08	98.31	114.00	15.69	Peak
2	2475.01	27.58	6.71	34.06	89.22	89.45	94.00	4.55	Average
3	2483.50	27.58	6.71	34.03	37.82	38.08	74.00	35.92	Peak
4	2485.21	27.58	6.71	34.03	39.29	39.55	74.00	34.45	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 33
 Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : Temp:25.6';Humi:56%;Press:101.52kPa
 Engineer : Tony
 EUT : Wireless Transmitter
 Power : DC 5V From Adapter Input AC 120V/60Hz
 M/N : WT-1
 Test Mode : TX 2475MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2474.92	27.58	6.71	34.06	98.68	98.91	114.00	15.09	Peak
2	2474.92	27.58	6.71	34.06	89.78	90.01	94.00	3.99	Average
3	2483.50	27.58	6.71	34.03	40.20	40.46	74.00	33.54	Peak
4	2485.87	27.58	6.71	34.03	40.96	41.22	74.00	32.78	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

7. ANTENNA REQUIREMENTS

7.1. Limit

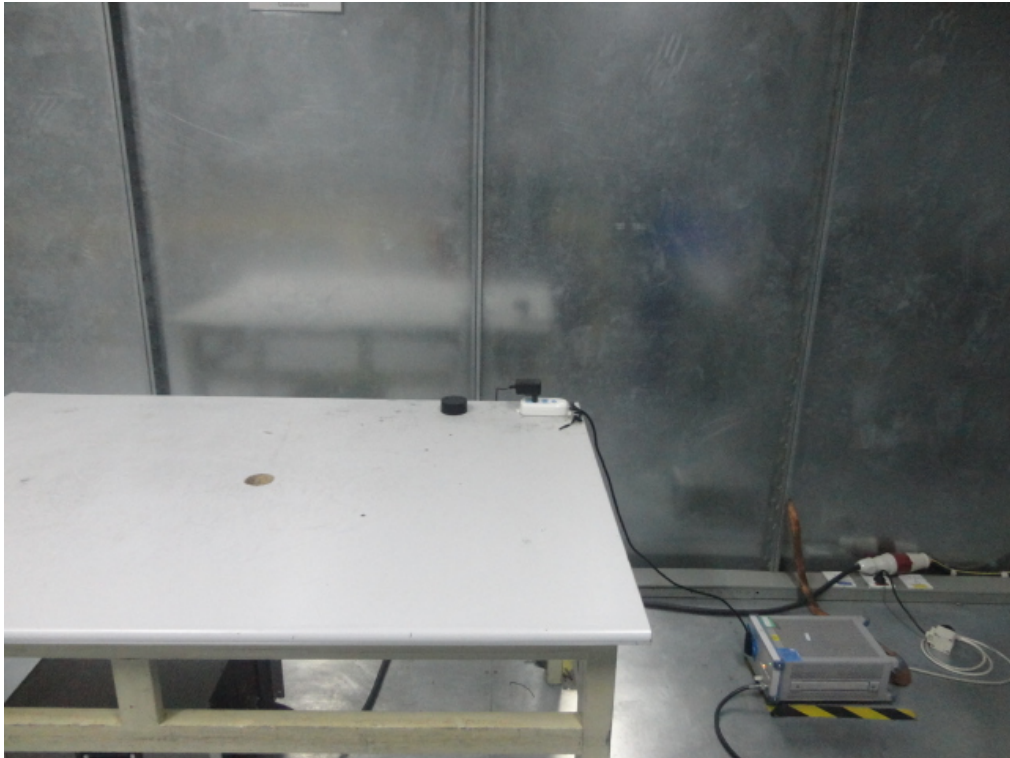
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.249 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

7.2. Result

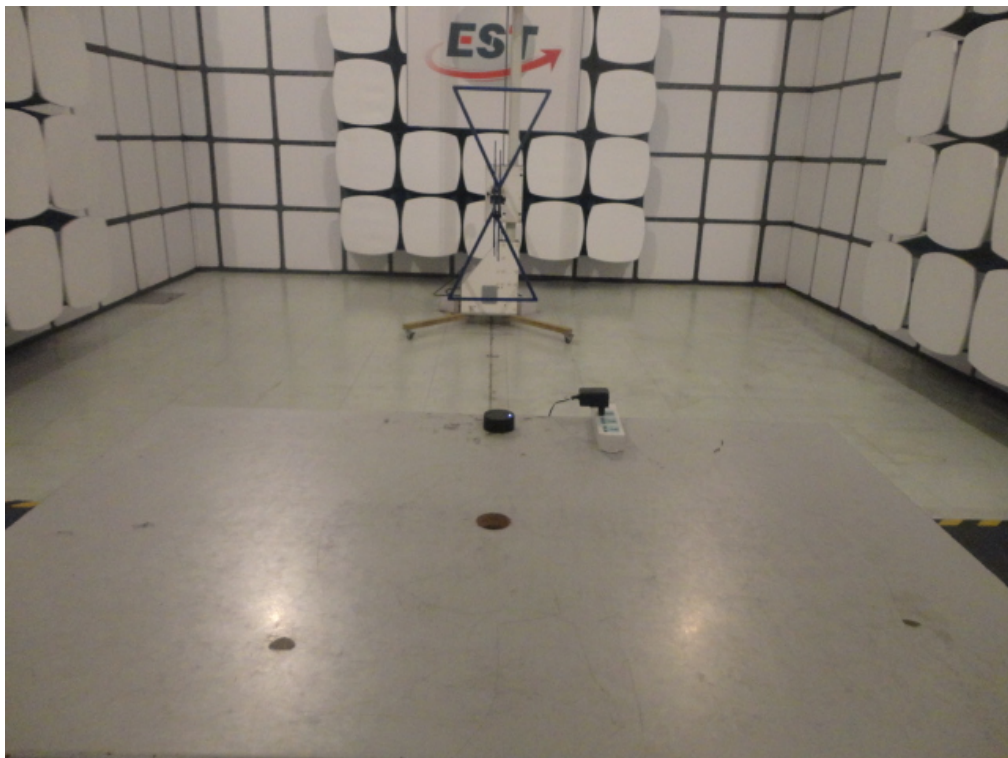
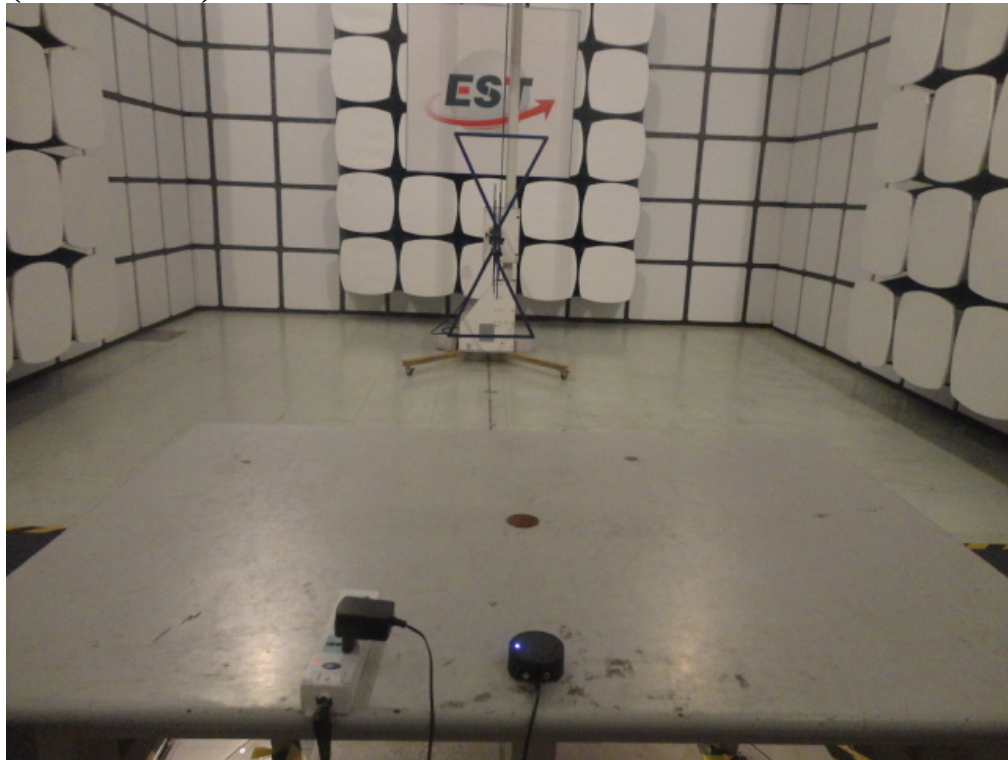
The antennas used for this product are integral Patch Antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 0dBi.

8. TESTSETUP PHOTO

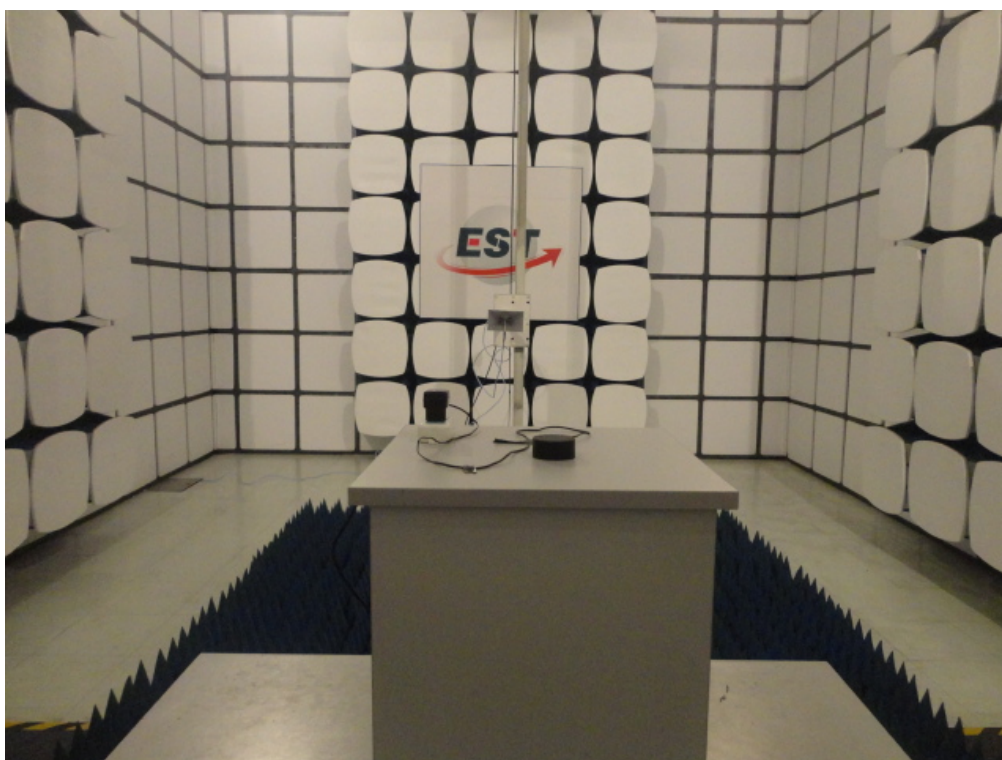
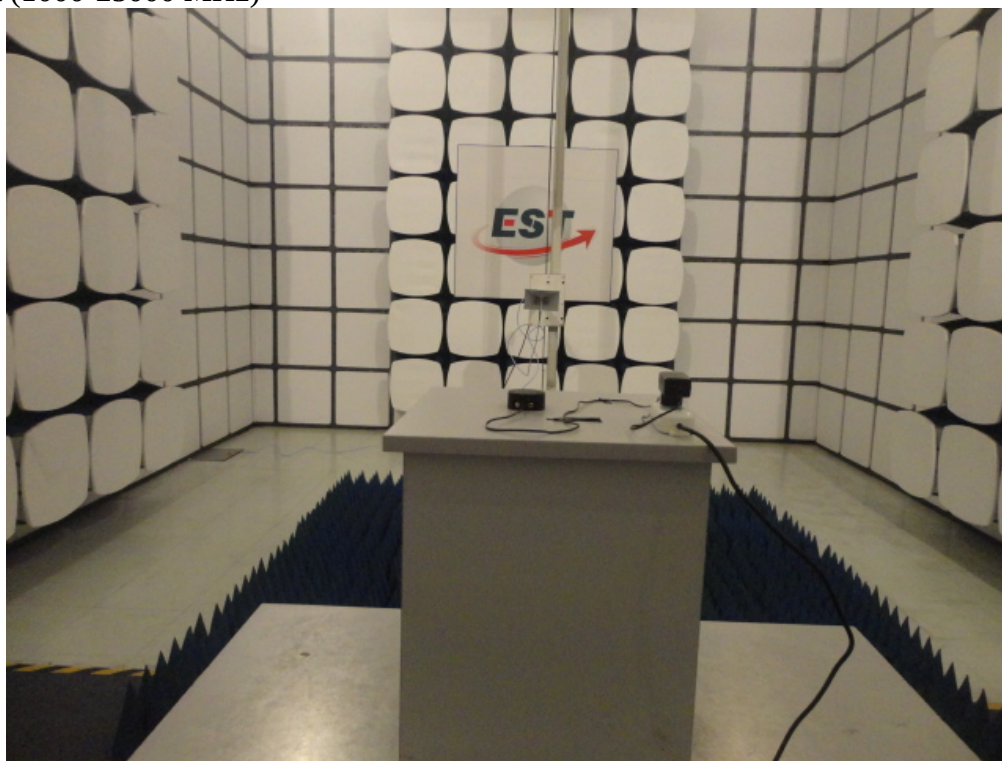
Conducted Test



Radiated Test (30-1000 MHz)



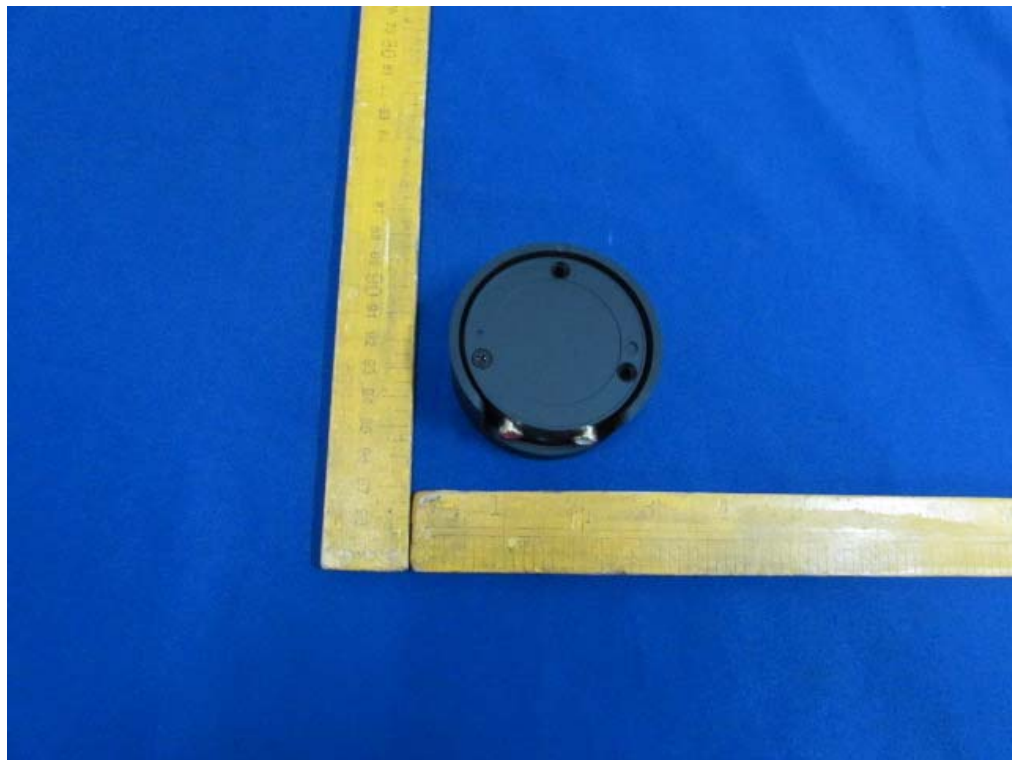
Radiated Test (1000-25000 MHz)



Photos of EUT

External Photos

M/N: WT-1

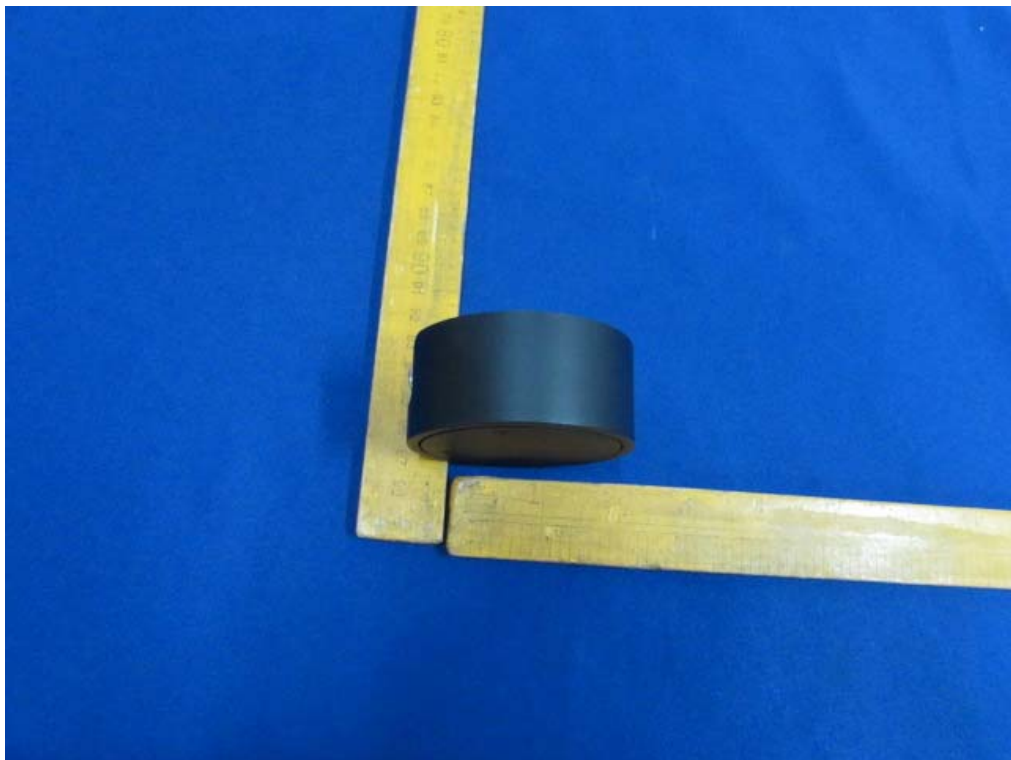
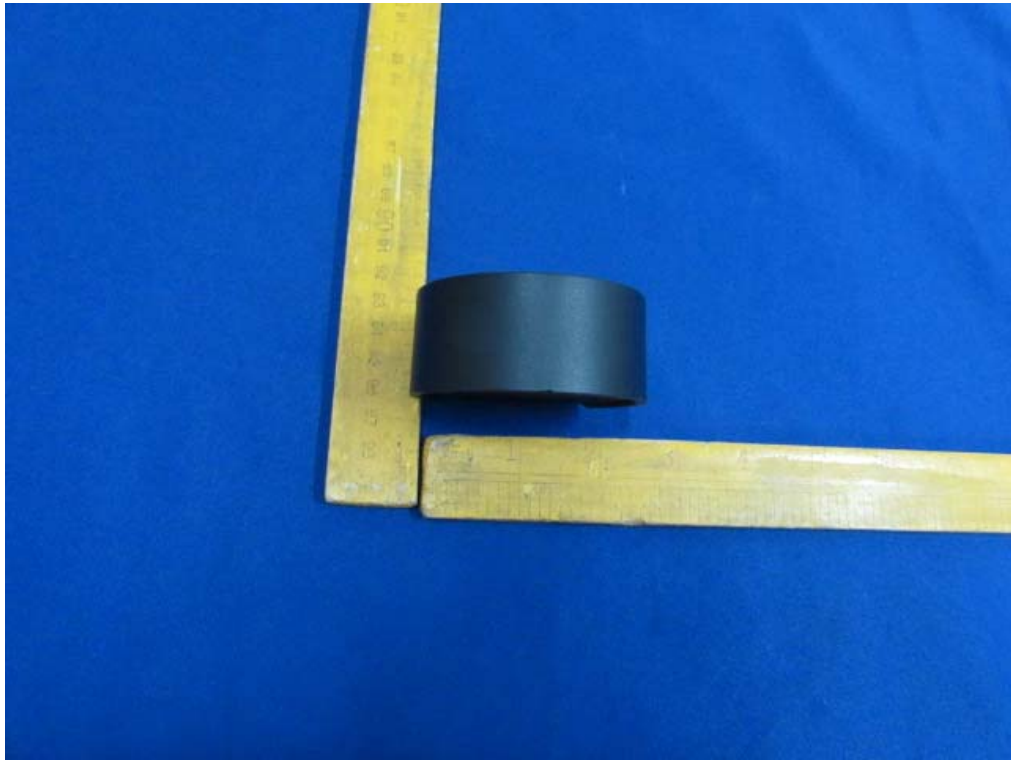


External Photos
M/N:WT-1



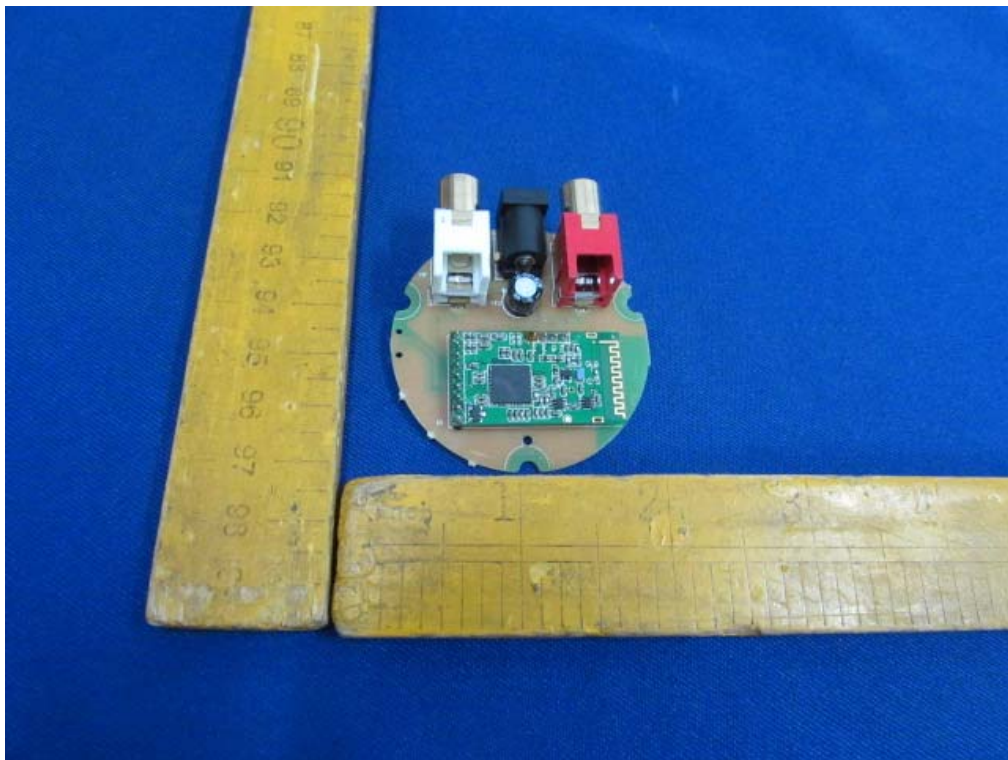
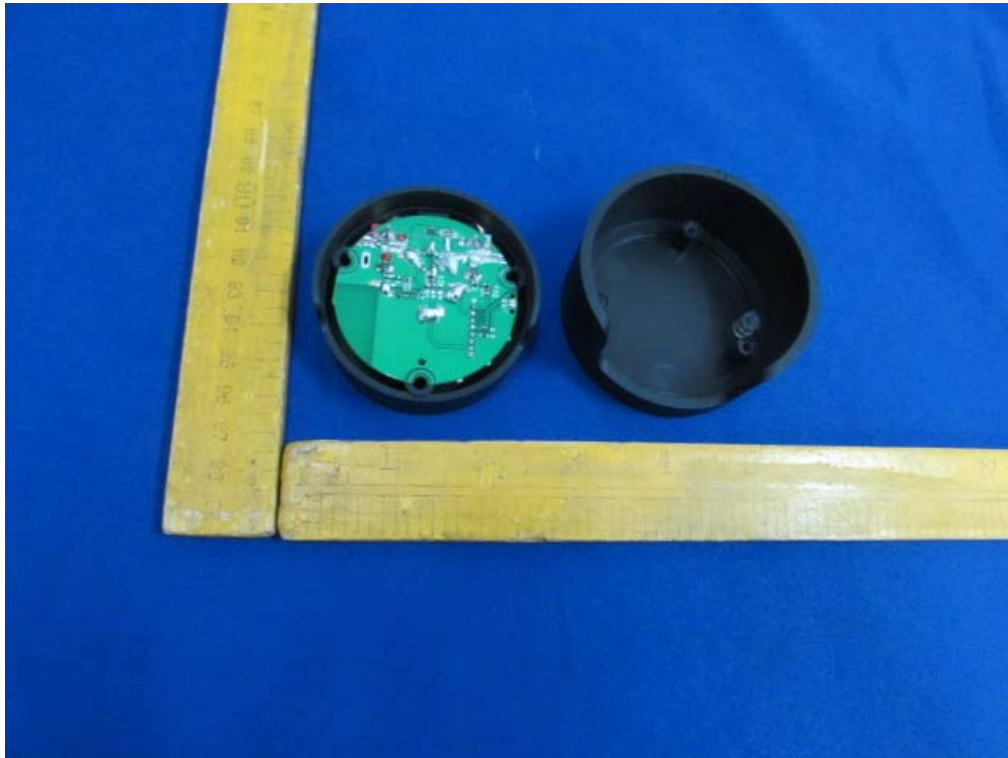
External Photos

M/N: WT-1

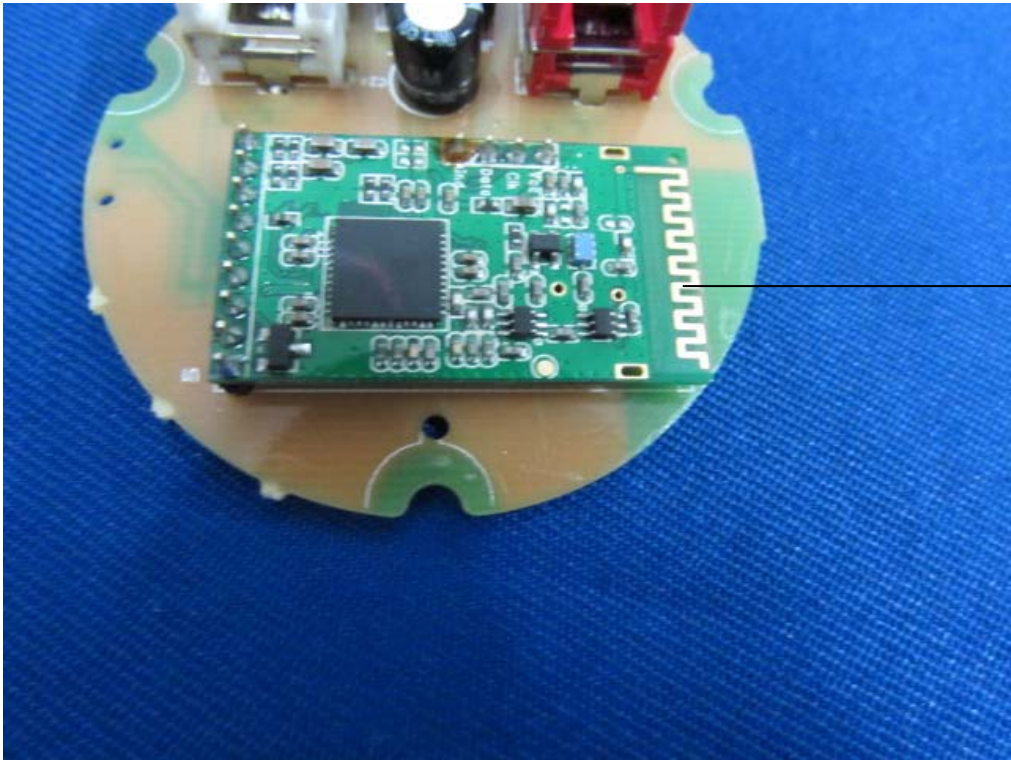


Internal Photos

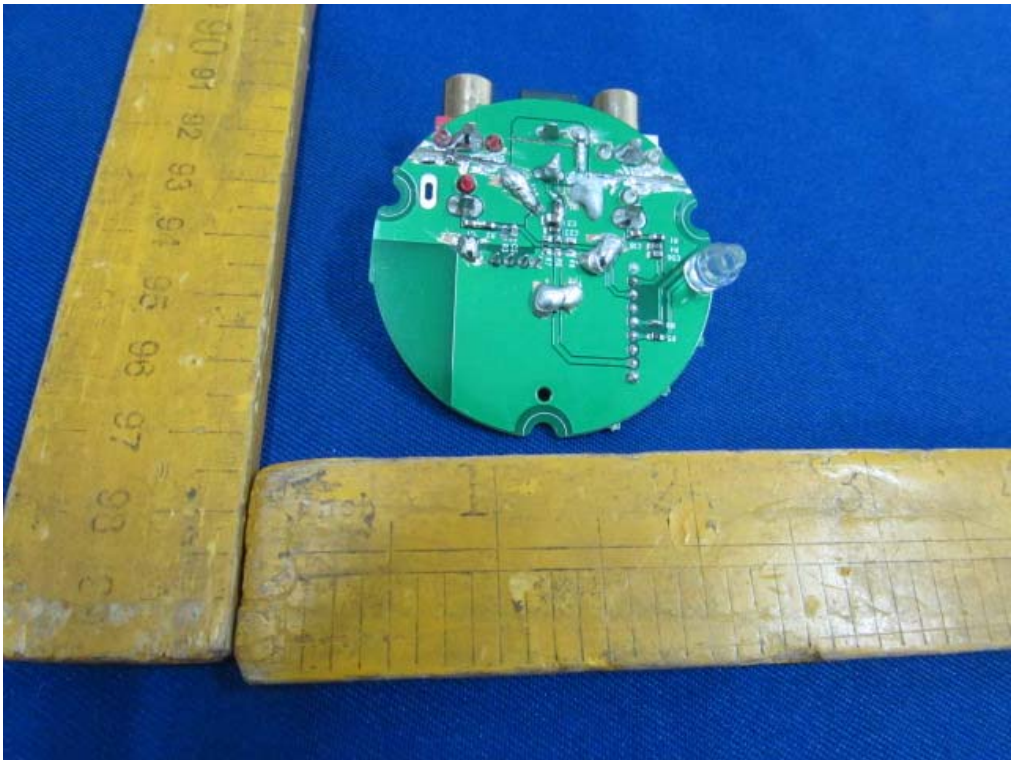
M/N: WT-1



Internal Photos
M/N: WT-1



TX
Antenna



Adapter Photos

