FCC TEST REPORT

FCC ID	: PB4-XMTAP
Applicant	: Imation Corp.
Address	: 1 Imation Way, Oakdale, MN 55128-3421 USA
Manufacturer	: Imation Corp.
Address	: 1 Imation Way, Oakdale, MN 55128-3421 USA

Equipment Under Test (EUT) :

Product Name	: AirPlay Wireless Hi-Fi Speaker
Model No.	: IPU-TAP
Brand Name	: XtremeMac
Rules	: FCC CFR47 Part 15 Section 15.247&15.209:2010

Date of Test	: July 20 ~ July 31, 2012
Date of Issue	: Aug.1, 2012
Test Result	: PASS*

Remark:

* The sample detailed above has been tested to the requirements of FCC rules mentioned above.

The test results have been reviewed against the directives above and found to meet their essential requirements.

Prepared By:

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Compiled by:

Olic huang / Project Engineer

Approved by:

Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Operation Mode	Result
Radiated Spurious Emissions (9KHz to 25GHz)	15.205(a) 15.109&15.209(a)	1-6	Complies
Conduction Emission	15.107&15.207(a)	7	Complies
6dB Bandwidth	15.247(a)(2)	1-6	Complies
Maximum Peak Output Power	15.247(b)(3),(4)	1-6	Complies
Power spectral density	15.247(e)	1-6	Complies
Band edge compliance	15.247(d)	1, 6	Complies
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	1-6	Complies

Operation mode	Description of Operation mode
1	Continuous transmitting on lower channel,B-mode,1Mbps
2	Continuous transmitting on middle channel,B-mode,1Mbps
3	Continuous transmitting on upper channel,B-mode,1Mbps
4	Continuous transmitting on lower channel,G-mode,6Mbps
5	Continuous transmitting on middle channel,G-mode,6Mbps
6	Continuous transmitting on upper channel,G-mode,6Mbps
7	Normal working

Note :Table of Parameters of Text Software Setting

During channel & power tests,the software provided by the customer was used to set the operating channels as well as the output power level. The RF output power set is the power expected by the manufacturer and is going to be fixed on the firmware of the final product .

Test software Version	WIFI Test(Power)		
Frequency (MHz)	2412 MHz	2437 MHz	2462 MHz
IEEE 802.11B	1	1	1
IEEE 802.11G	1	1	1

3 Contents

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4 General Information

4.1 General Description of E.U.T.

Product Name	: AirPlay Wireless Hi-Fi Speaker
Model No.	: IPU-TAP
Model Difference	: N/A
Operation Frequency	: 2412MHz ~ 2462MHz
Antenna Gain	: 1.856dBi
Declaration Power	: B mode:16.50 dBm. G mode:15.00 dBm.
Type of modulation	: DSSS and OFDM(802.11 B/G)
Note	: All the modulation modes were tested, all the test data deeply conform to the rules and the data of the worst mode (DSSS) are recorded in the following pages.

4.2 Details of E.U.T.

Technical Data	: Adapter input: 100-240VAC, 50-60Hz, 1.2A Adapter output: 18VDC, 2500mA.
AC-DC Adapter	: Model:Y48DE-180-2500
Note	:

4.3 Description of Support Units

The EUT has been tested as an independent unit.

4.4 Rules Applicable for Testing

The customer requested FCC tests for a AirPlay Wireless Hi-Fi Speaker. The rules used were FCC CFR47 Part 15 Section 15.207, Section 15.209 , Section 15.247, Section 1.1307.

4.5 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: IC7760A**

  Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A, July 12, 2012.

- **FCC – Registration No.: 880581**

  Waltek Services(Shenzhen) 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 our files. Registration 880581, May 26, 2011.

4.6 Test Location

All the tests were performed at:
Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd.,Songgang Street, Baoan District, Shenzhen, China

4.7 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 4.74 dB (Horn antenna 1000M~25000MHz)
Conducted Spurious Emissions test	± 2.2 dB

5 Equipment Used during Test

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Uncertainty
EMC Analyzer	Agilent/ E7405A	MY45114943	W2008001	9k-26.5GHz	July 30, 2012	July 29, 2013	±1dB
Active Loop Antenna	Beijing Dazhi / ZN30900A	-	-	9KHz-30MHz	July 30, 2012	July 29, 2013	±1dB
Trilog Broadband Antenne	SCHWARZBECK MESS-ELEKTROM/ VULB9163	336	W2008002	30-3000 MHz	July 30, 2012	July 29, 2013	±1dB
Broad-band Horn Antenna	SCHWARZBECK MESS-ELEKTROM/ BBHA 9120D(1201)	667	W2008003	1-18GHz	July 30, 2012	July 29, 2013	f < 10 GHz : ±1dB 10GHz < f < 18 GHz : ±1.5dB
Broadband Preamplifier	SCHWARZBECK MESS-ELEKTROM/ BBV 9718	9718-148	W2008004	0.5-18GHz	July 30, 2012	July 29, 2013	±1.2dB
Broad-band Horn Antenna	SCHWARZBECK MESS-ELEKTROM/ BBHA 9170	399	W2008005	15-26.5GHz	July 30, 2012	July 29, 2013	±1.5dB
Broadband Preamplifier	SCHWARZBECK MESS-ELEKTROM/ BBV 9719	9719-254	W2008006	18-26.5GHz	July 30, 2012	July 29, 2013	±1.2dB
10m Coaxial Cable with N-male Connectors	SCHWARZBECK MESS-ELEKTROM/ AK 9515 H	-	-	-	July 30, 2012	July 29, 2013	-
10m 50 Ohm Coaxial Cable	SCHWARZBECK MESS-ELEKTROM/ AK 9513	-	-	-	July 30, 2012	July 29, 2013	-
Positioning Controller	C&C LAB/ CC-C-IF	-	-	-	July 30, 2012	July 29, 2013	-
Color Monitor	SUNSPO/ SP-14C	-	-	-	July 30, 2012	July 29, 2013	-
Test Receiver	ROHDE&SCHWARZ/ ESPI	101155	W2005001	9k-3GHz	July 30, 2012	July 29, 2013	±1dB
Two-Line V-Network	ROHDE&SCHWARZ/ ENV216	100115	W2005002	50Ω/50μH	July 30, 2012	July 29, 2013	±10%
RF Generator	TESEQ GmbH/ NSGC43070	25781	W2008008	Fraq-range : 9K-1GHz RF voltage : -60 dBm-+10dBm	July 30, 2012	July 29, 2013	Power_freq distinguish0.1 Hz RFeletricity distinguish 0.1B

6 Conduction Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.107&15.207
Test Method:	ANSI C63.4:2003
Test Result:	Passed
Frequency Range:	150kHz to 30MHz
Class:	Class B
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz 56 dBμV between 0.5MHz & 5MHz 60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

6.1 E.U.T. Operation

Operating Environment:

Temperature: 25.5 °C

Humidity: 51 % RH

Atmospheric Pressure: 1012 mbar

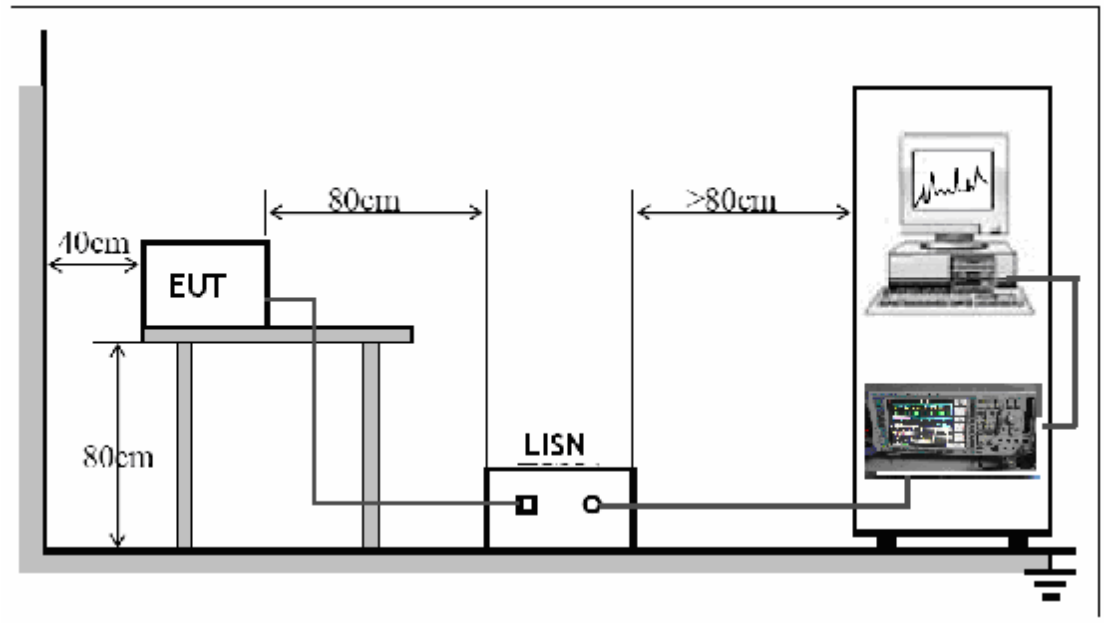
EUT Operation:

The pre-test was performed in operation mode 7 in normal working mode, so the worst data was shown as follow.The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC Part15.207 limits.



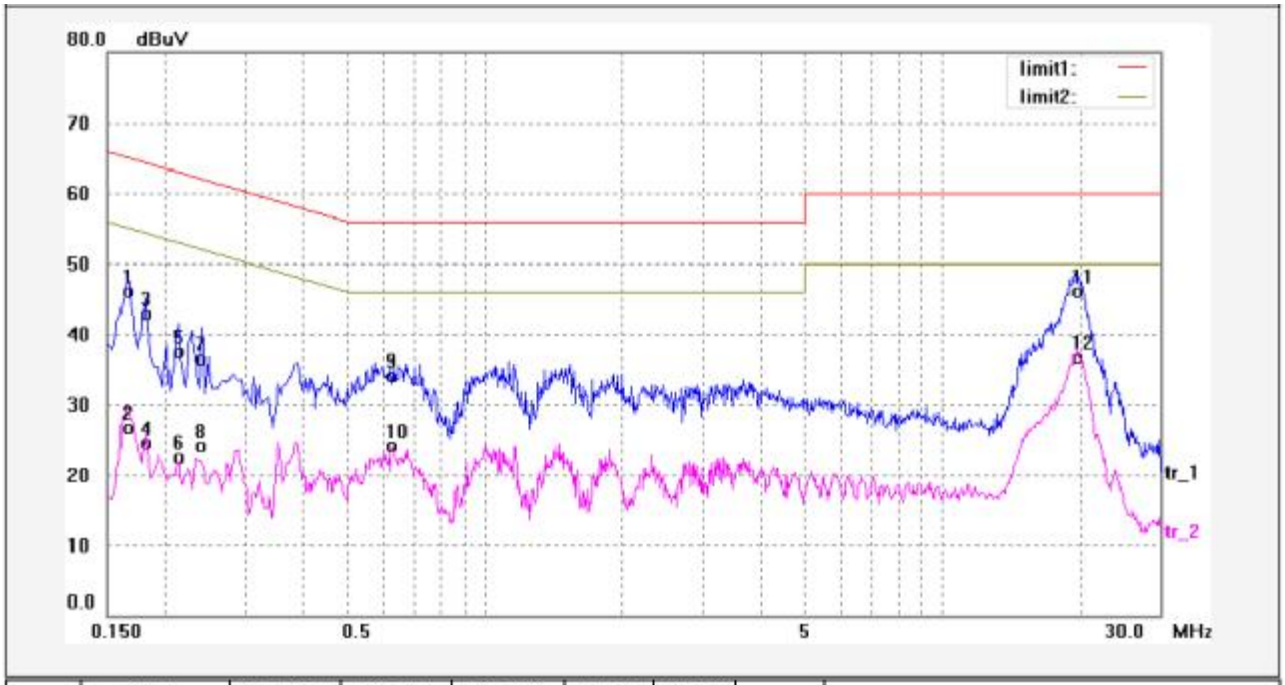
The EUT was placed on the test table in shielding room

6.3 Conducted Emission Test Result

An initial pre-scan was performed on the live and neutral lines.

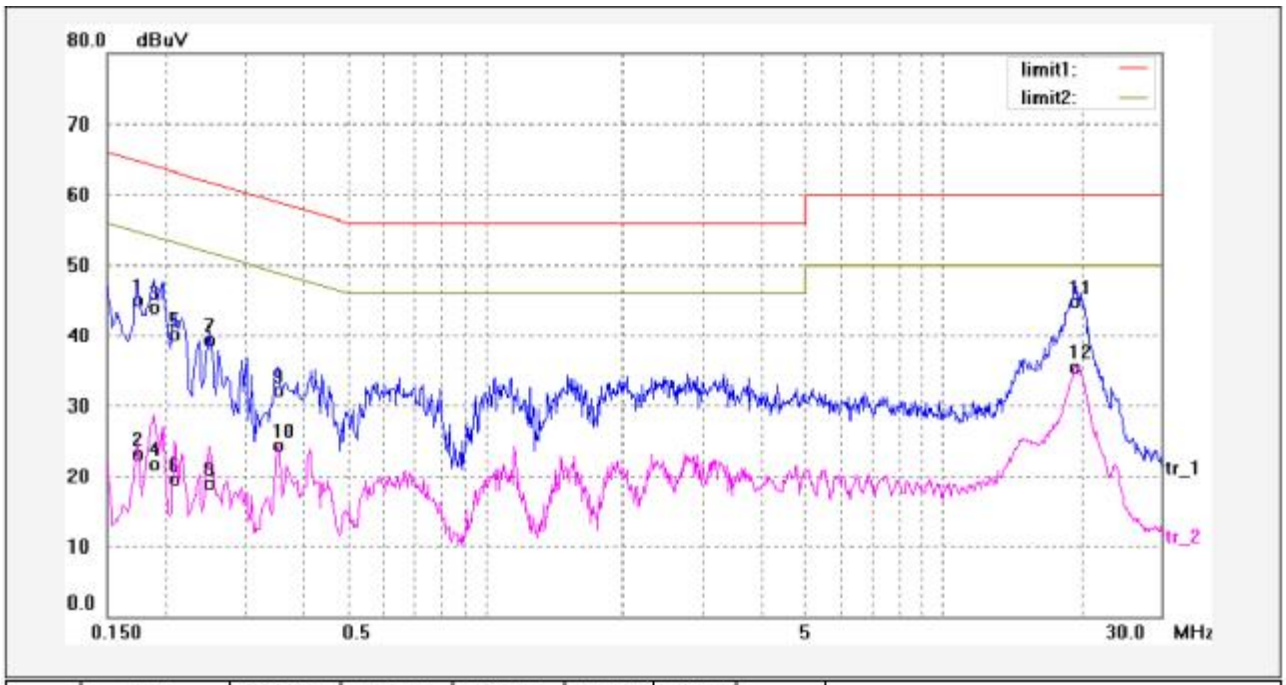
Working Mode: Normal Working

Live Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1660	34.97	10.35	45.32	65.15	-19.83	QP	
2	0.1660	15.54	10.35	25.89	55.15	-29.26	AVG	
3	0.1819	31.73	10.35	42.08	64.39	-22.31	QP	
4	0.1819	13.39	10.35	23.74	54.39	-30.65	AVG	
5	0.2140	26.30	10.35	36.65	63.04	-26.39	QP	
6	0.2140	11.41	10.35	21.76	53.04	-31.28	AVG	
7	0.2420	25.29	10.35	35.64	62.02	-26.38	QP	
8	0.2420	12.94	10.35	23.29	52.02	-28.73	AVG	
9	0.6305	22.91	10.36	33.27	56.00	-22.73	QP	
10	0.6305	13.03	10.36	23.39	46.00	-22.61	AVG	
11	19.4780	34.76	10.45	45.21	60.00	-14.79	QP	
12	19.4780	25.49	10.45	35.94	50.00	-14.06	AVG	

Neutral Line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1740	33.75	10.35	44.10	64.76	-20.66	QP	
2	0.1740	12.03	10.35	22.38	54.76	-32.38	AVG	
3	0.1900	32.67	10.35	43.02	64.03	-21.01	QP	
4	0.1900	10.62	10.35	20.97	54.03	-33.06	AVG	
5	0.2100	28.90	10.35	39.25	63.20	-23.95	QP	
6	0.2100	8.37	10.35	18.72	53.20	-34.48	AVG	
7	0.2500	28.15	10.35	38.50	61.75	-23.25	QP	
8	0.2500	7.74	10.35	18.09	51.75	-33.66	AVG	
9	0.3540	21.01	10.35	31.36	58.87	-27.51	QP	
10	0.3540	13.18	10.35	23.53	48.87	-25.34	AVG	
11	19.5300	33.43	10.45	43.88	60.00	-16.12	QP	
12	19.5300	24.28	10.45	34.73	50.00	-15.27	AVG	

7 Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.109&15.209& 15.247

Test Method: ANSI C63.4:2003

Test Result: PASS

Frequency Range: 9KHz to 25GHz

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

Test mode: operation mode 1~7

7.1 EUT Operation :

Operating Environment:

Temperature: 25.5 °C

Humidity: 51 % RH

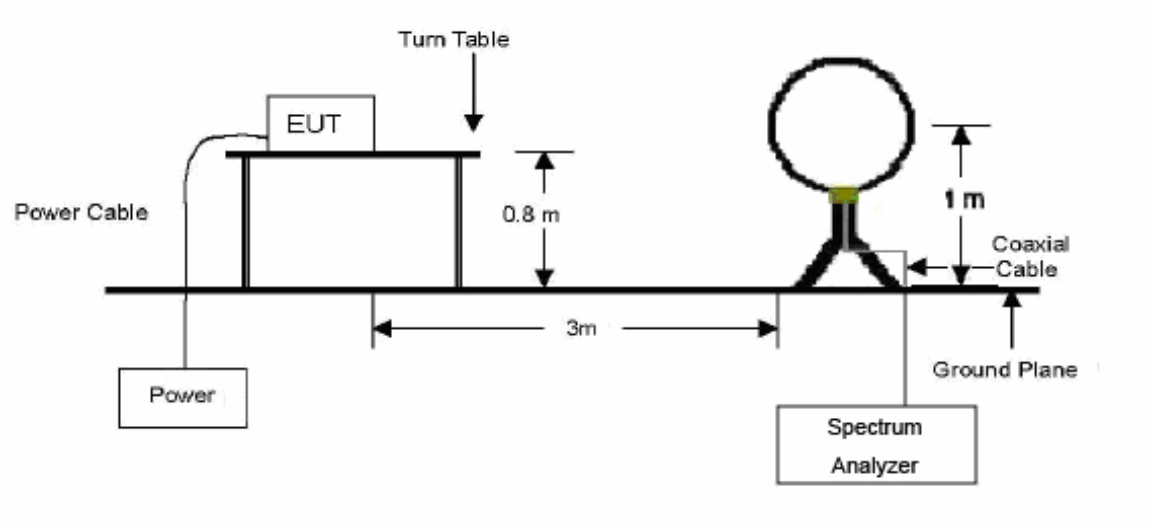
Atmospheric Pressure: 1012 mbar

7.2 Test Setup

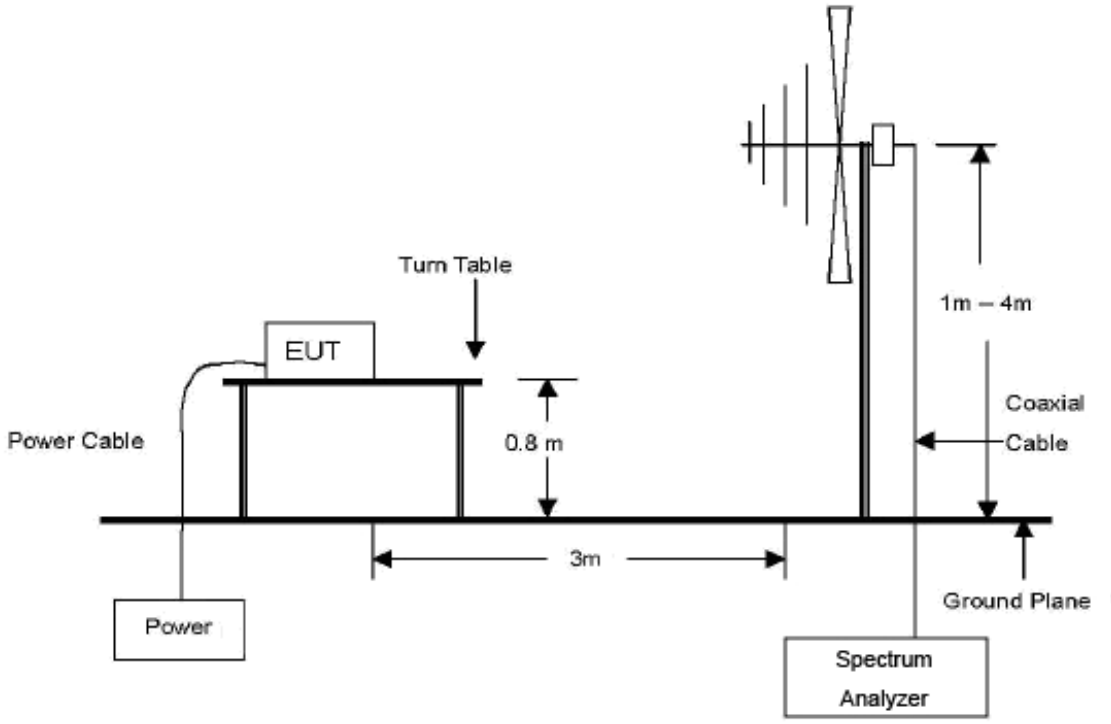
The radiated emission tests were performed in the 3m Semi-Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2003.

According to blockdiagram,the lowest oscillator generated in the device is 14.7456MHz Crystal, so the emission was tested from the lowest frequency.

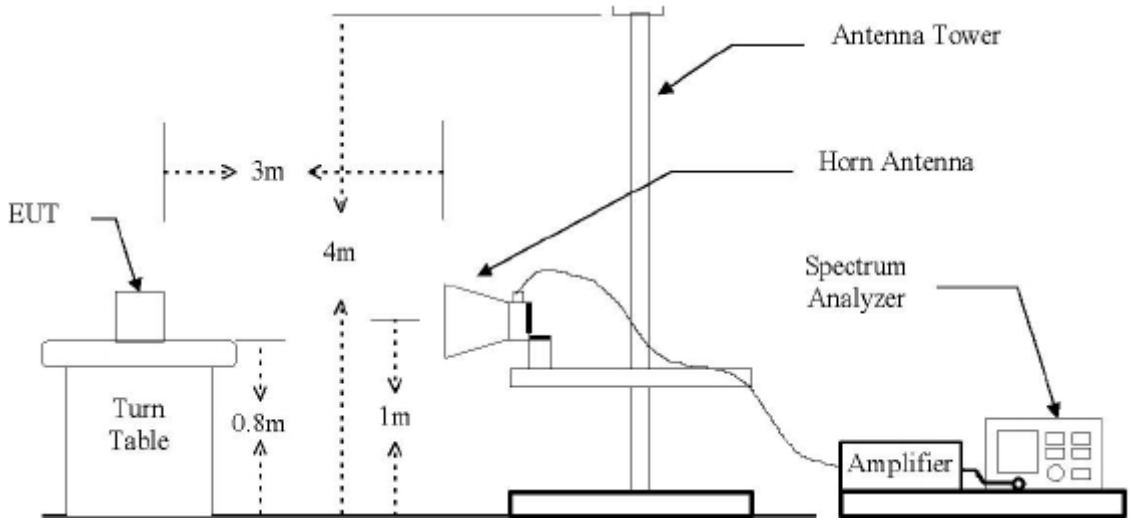
The diagram below shows the test setup that is utilized to make the measurements for emission Below 30 MHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz Emissions.



7.3 Spectrum Analyzer Setup

According to FCC Part15 Rules, the system was tested from 9KHz to 25000MHz.

Below 30MHz

Start Frequency	9KHz
Stop Frequency	30MHz
Sweep Speed	Auto
IF Bandwidth	10KHz
Video Bandwidth	10KHz
Resolution Bandwidth	10KHz

30MHz ~ 1GHz

Start Frequency	30 MHz
Stop Frequency	1000MHz
Sweep Speed	Auto
IF Bandwidth	120 KHz
Video Bandwidth	100KHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	100KHz

Above 1GHz

Start Frequency	1000 MHz
Stop Frequency	25000MHz
Sweep Speed	Auto
IF Bandwidth	120 KHz
Video Bandwidth	3MHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	1MHz

7.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning.,the worst condition was tested putting the eut in X axis,so the worst data were shown as follow.

And all the modes was tested in the report.Only the worst case is shown in the report.

7.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Limit

7.6 Summary of Test Results

According to the data in this section, the EUT complied with the FCC CFR47 Part 15 Section 15.209 & 15.247 rules.

Test mode: continuously recevie mode

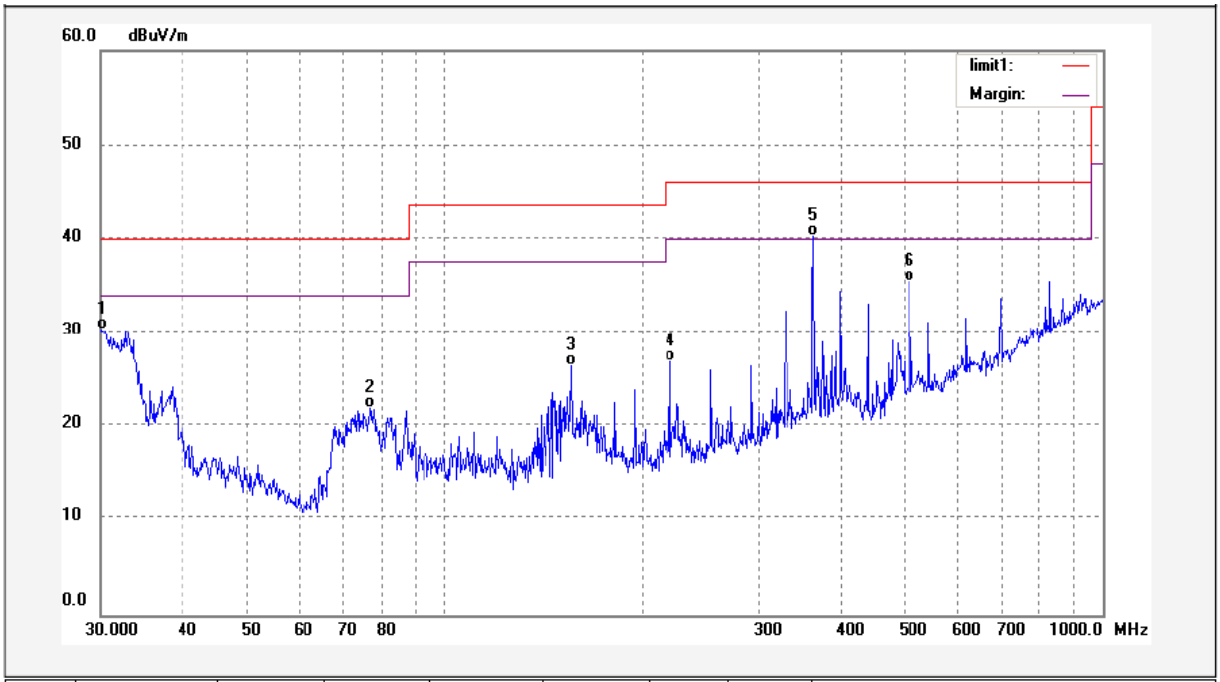
Remark: As pre-tests have shown,the emissions in the frequency range below 1GHz are not depending on the used antenna or the antenna cable length and also not on the transmitter operation mode or frequency.Therefore the emissions in this frequency range were measured only with the internal antenna,in B/G-mode in transmit in the middle of the assigned frequency range(operation mode 1 and 4).

Remark: The emissions below 30MHz are more than 20dB below the limit, the data do not show in the report.

Test Frequency : 30MHz ~ 1000MHz

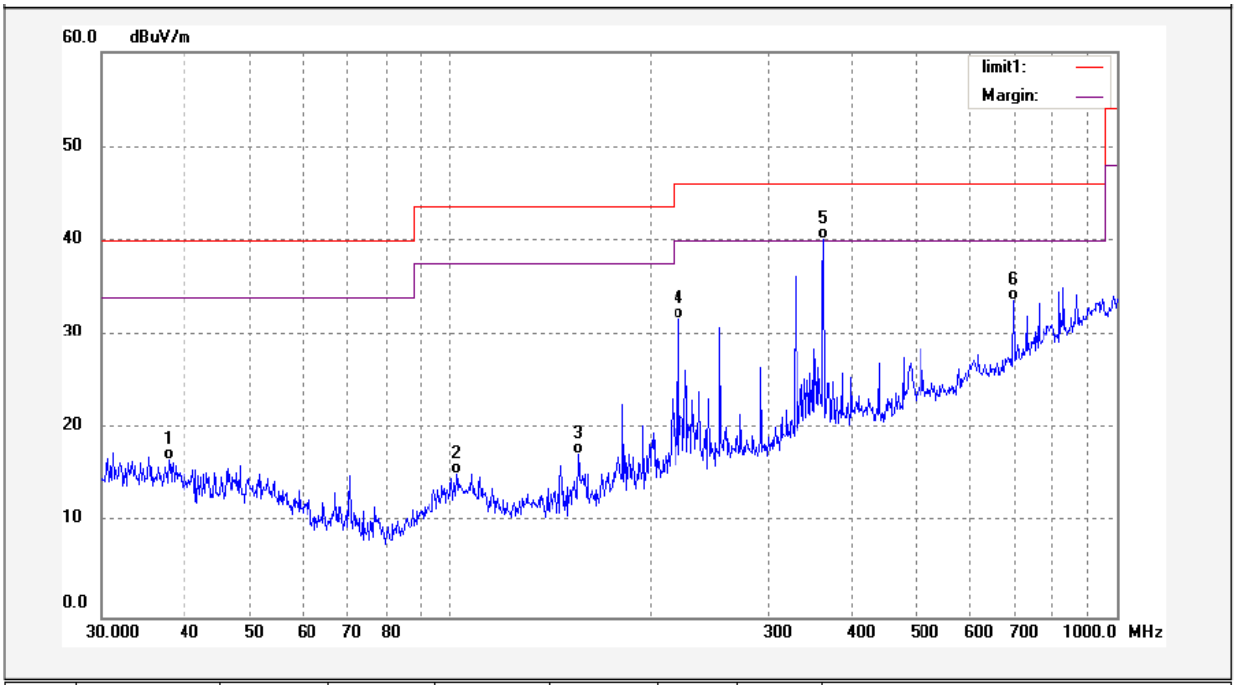
Mode:operation mode 1(the worst data)

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	30.0000	14.24	16.15	30.39	40.00	-9.61	QP	
2	76.9256	12.81	9.17	21.98	40.00	-18.02	QP	
3	155.8771	15.61	10.91	26.52	43.50	-16.98	QP	
4	219.9500	10.74	16.13	26.87	46.00	-19.13	QP	
5	363.5231	19.63	20.69	40.32	46.00	-5.68	QP	
6	509.3559	11.89	23.64	35.53	46.00	-10.47	QP	

Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	37.8297	-0.02	16.68	16.66	40.00	-23.34	QP	
2	102.2518	1.10	14.11	15.21	43.50	-28.29	QP	
3	155.8771	6.42	10.91	17.33	43.50	-26.17	QP	
4	219.9500	15.54	16.13	31.67	46.00	-14.33	QP	
5	363.5231	19.38	20.69	40.07	46.00	-5.93	QP	
6	698.8035	7.42	26.30	33.72	46.00	-12.28	QP	

Test Frequency: Above 1GHz radiation test data:

The emissions which are more than 20dB below the limit do not show in the report.

Mode:operation mode 1

The below are the Fundamentals and Harmonics which are the higher emissions recorded.

Frequency (MHz)	Detector	Antenna Polarization	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
2412	AV	Vertical	102.35		(Fund.)	1.1	10
4824	AV	Vertical	45.32	54	-8.68	1.1	70
7236	AV	Vertical	47.24	54	-6.76	1.1	150
9648	AV	Vertical	45.21	54	-8.79	1.2	110
12060	AV	Vertical		54	<-20dB		
14472	AV	Vertical		54	<-20dB		
16884	AV	Vertical		54	<-20dB		
19296	AV	Vertical		54	<-20dB		
21708	AV	Vertical		54	<-20dB		
24120	AV	Vertical		54	<-20dB		
2412	AV	Horizontal	96.98		(Fund.)	1.1	120
4824	AV	Horizontal	44.21	54	-9.79	1.3	170
7236	AV	Horizontal	40.35	54	-13.65	1.2	110
9648	AV	Horizontal	39.54	54	-14.46	1.4	140
12060	AV	Horizontal		54	<-20dB		
14472	AV	Horizonta		54	<-20dB		
16884	AV	Horizontal		54	<-20dB		
19296	AV	Horizontal		54	<-20dB		
21708	AV	Horizontal		54	<-20dB		
24120	AV	Horizontal		54	<-20dB		
2412	PK	Vertical	111.64		(Fund.)	1.1	35
4824	PK	Vertical	57.23	74	-16.77	1.2	105
7236	PK	Vertical	59.64	74	-14.36	1.1	135
9648	PK	Vertical	56.21	74	-17.79	1.1	210
12060	PK	Vertical		74	<-20dB		
14472	PK	Vertical		74	<-20dB		
16884	PK	Vertical		74	<-20dB		
19296	PK	Vertical		74	<-20dB		
21708	PK	Vertical		74	<-20dB		
24120	PK	Vertical		74	<-20dB		

2412	PK	Horizontal	105.12		(Fund.)	1.1	105
4824	PK	Horizontal	43.21	74	-30.79	1.2	110
7236	PK	Horizontal	10.25	74	-63.75	1.1	110
9648	PK	Horizontal	43.25	74	-30.75	1.2	20
12060	PK	Horizontal		74	<-20dB		
14472	PK	Horizontal		74	<-20dB		
16884	PK	Horizontal		74	<-20dB		
19296	PK	Horizontal		74	<-20dB		
21708	PK	Horizontal		74	<-20dB		
24120	PK	Horizontal		74	<-20dB		

Mode:operation mode 2

The below are the Fundamentals and Harmonics which are the higher emissions recorded.

Frequency (MHz)	Detector	Antenna Polarization	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
2442	AV	Vertical	102.68		(Fund.)	1.1	40
4884	AV	Vertical	47.52	54	-6.48	1.0	120
7326	AV	Vertical	45.21	54	-8.79	1.1	120
9768	AV	Vertical	42.02	54	-11.98	1.0	70
12210	AV	Vertical		54	<-20dB		
14652	AV	Vertical		54	<-20dB		
17094	AV	Vertical		54	<-20dB		
19536	AV	Vertical		54	<-20dB		
21978	AV	Vertical		54	<-20dB		
24420	AV	Vertical		54	<-20dB		
2442	AV	Horizontal	97.81		(Fund.)	1.2	110
4884	AV	Horizontal	43.24	54	-10.76	1.1	150
7326	AV	Horizontal	44.15	54	-9.85	1.1	20
9768	AV	Horizontal	37.15	54	-16.85	1.1	160
12210	AV	Horizontal		54	<-20dB		
14652	AV	Horizontal		54	<-20dB		
17094	AV	Horizontal		54	<-20dB		
19536	AV	Horizontal		54	<-20dB		
21978	AV	Horizontal		54	<-20dB		
24420	AV	Horizontal		54	<-20dB		
2442	PK	Vertical	113.95		(Fund.)	1.1	50

4884	PK	Vertical	60.25	74	-13.75	1.1	120
7326	PK	Vertical	57.15	74	-16.85	1.1	140
9768	PK	Vertical	57.21	74	-16.79	1.1	120
12210	PK	Vertical		74	<-20dB		
14652	PK	Vertical		74	<-20dB		
17094	PK	Vertical		74	<-20dB		
19536	PK	Vertical		74	<-20dB		
21978	PK	Vertical		74	<-20dB		
24420	PK	Vertical		74	<-20dB		
2442	PK	Horizontal	107.52		(Fund.)	1.2	20
4884	PK	Horizontal	57.21	74	-16.79	1.3	130
7326	PK	Horizontal	56.54	74	-17.46	1.2	140
9768	PK	Horizontal	52.11	74	-21.89	1.2	120
12210	PK	Horizontal		74	<-20dB		
14652	PK	Horizontal		74	<-20dB		
17094	PK	Horizontal		74	<-20dB		
19536	PK	Horizontal		74	<-20dB		
21978	PK	Horizontal		74	<-20dB		
24420	PK	Horizontal		74	<-20dB		

Mode:operation mode 3

The below are the Fundamentals and Harmonics which are the higher emissions recorded.

Frequency (MHz)	Detector	Antenna Polarization	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
2462	AV	Vertical	104.02		(Fund.)	1.1	190
4924	AV	Vertical	46.32	54	-7.68	1.0	20
7386	AV	Vertical	43.15	54	-10.85	1.2	120
9848	AV	Vertical	45.58	54	-8.42	1.1	130
12310	AV	Vertical		54	<-20dB		
14772	AV	Vertical		54	<-20dB		
17234	AV	Vertical		54	<-20dB		
19696	AV	Vertical		54	<-20dB		
22158	AV	Vertical		54	<-20dB		
24620	AV	Vertical		54	<-20dB		
2462	AV	Horizontal	97.85		(Fund.)	1.2	130

4924	AV	Horizontal	40.98	54	-13.02	1.2	210
7386	AV	Horizontal	41.56	54	-12.44	1.2	150
9848	AV	Horizontal	42.81	54	-11.19	1.3	220
12310	AV	Horizontal		54	<-20dB		
14772	AV	Horizontal		54	<-20dB		
17234	AV	Horizontal		54	<-20dB		
19696	AV	Horizontal		54	<-20dB		
22158	AV	Horizontal		54	<-20dB		
24620	AV	Horizontal		54	<-20dB		
2462	PK	Vertical	112.95		(Fund.)	1.3	230
4924	PK	Vertical	61.23	74	-12.77	1.2	20
7386	PK	Vertical	56.48	74	-17.52	1.2	150
9848	PK	Vertical	57.25	74	-16.75	1.2	170
12310	PK	Vertical		74	<-20dB		
14772	PK	Vertical		74	<-20dB		
17234	PK	Vertical		74	<-20dB		
19696	PK	Vertical		74	<-20dB		
22158	PK	Vertical		74	<-20dB		
24620	PK	Vertical		74	<-20dB		
2462	PK	Horizontal	109.65		(Fund.)	1.3	20
4924	PK	Horizontal	55.66	74	-18.34	1.1	140
7386	PK	Horizontal	54.25	74	-19.75	1.4	120
9848	PK	Horizontal	54.16	74	-19.84	1.0	230
12310	PK	Horizontal		74	<-20dB		
14772	PK	Horizontal		74	<-20dB		
17234	PK	Horizontal		74	<-20dB		
19696	PK	Horizontal		74	<-20dB		
22158	PK	Horizontal		74	<-20dB		
24620	PK	Horizontal		74	<-20dB		

Mode:operation mode 4

The below are the Fundamentals and Harmonics which are the higher emissions recorded.

Frequency (MHz)	Detector	Antenna Polarization	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
2412	AV	Vertical	101.66		(Fund.)	1.2	10
4824	AV	Vertical	46.16	54	-7.84	1.1	70
7236	AV	Vertical	48.76	54	-5.24	1.1	15
9648	AV	Vertical	44.29	54	-9.71	1.4	110
12060	AV	Vertical		54	<-20dB		
14472	AV	Vertical		54	<-20dB		
16884	AV	Vertical		54	<-20dB		
19296	AV	Vertical		54	<-20dB		
21708	AV	Vertical		54	<-20dB		
24120	AV	Vertical		54	<-20dB		
2412	AV	Horizontal	96.54		(Fund.)	1.1	45
4824	AV	Horizontal	43.52	54	-10.48	1.2	170
7236	AV	Horizontal	40.81	54	-13.19	1.2	110
9648	AV	Horizontal	39.33	54	-14.67	1.1	140
12060	AV	Horizontal		54	<-20dB		
14472	AV	Horizonta		54	<-20dB		
16884	AV	Horizontal		54	<-20dB		
19296	AV	Horizontal		54	<-20dB		
21708	AV	Horizontal		54	<-20dB		
24120	AV	Horizontal		54	<-20dB		
2412	PK	Vertical	112.12		(Fund.)	1.1	10
4824	PK	Vertical	57.27	74	-16.73	1.1	105
7236	PK	Vertical	59.58	74	5884	1.2	135
9648	PK	Vertical	56.69	74	-17.31	1.1	210
12060	PK	Vertical		74	<-20dB		
14472	PK	Vertical		74	<-20dB		
16884	PK	Vertical		74	<-20dB		
19296	PK	Vertical		74	<-20dB		
21708	PK	Vertical		74	<-20dB		
24120	PK	Vertical		74	<-20dB		
2412	PK	Horizontal	104.21		(Fund.)	1.4	105
4824	PK	Horizontal	43.77	74	-30.23	1.3	145
7236	PK	Horizontal	40.65	74	-33.35	1.4	115
9648	PK	Horizontal	43.51	74	-30.49	1.2	10

12060	PK	Horizontal		74	<-20dB		
14472	PK	Horizontal		74	<-20dB		
16884	PK	Horizontal		74	<-20dB		
19296	PK	Horizontal		74	<-20dB		
21708	PK	Horizontal		74	<-20dB		
24120	PK	Horizontal		74	<-20dB		

Mode:operation mode 5

The below are the Fundamentals and Harmonics which are the higher emissions recorded.

Frequency (MHz)	Detector	Antenna Polarization	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
2442	AV	Vertical	101.31		(Fund.)	1.1	40
4884	AV	Vertical	47.65	54	-6.35	1.2	115
7326	AV	Vertical	45.16	54	-8.84	1.2	120
9768	AV	Vertical	42.29	54	-11.71	1.3	20
12210	AV	Vertical		54	<-20dB		
14652	AV	Vertical		54	<-20dB		
17094	AV	Vertical		54	<-20dB		
19536	AV	Vertical		54	<-20dB		
21978	AV	Vertical		54	<-20dB		
24420	AV	Vertical		54	<-20dB		
2442	AV	Horizontal	96.41		(Fund.)	1.2	185
4884	AV	Horizontal	43.01	54	-10.99	1.1	150
7326	AV	Horizontal	43.52	54	-10.48	1.2	325
9768	AV	Horizontal	37.18	54	-16.82	1.3	160
12210	AV	Horizontal		54	<-20dB		
14652	AV	Horizontal		54	<-20dB		
17094	AV	Horizontal		54	<-20dB		
19536	AV	Horizontal		54	<-20dB		
21978	AV	Horizontal		54	<-20dB		
24420	AV	Horizontal		54	<-20dB		
2442	PK	Vertical	112.61		(Fund.)	1.1	80
4884	PK	Vertical	59.38	74	-14.62	1.1	110
7326	PK	Vertical	56.37	74	-17.63	1.4	141
9768	PK	Vertical	56.39	74	-17.61	1.2	190
12210	PK	Vertical		74	<-20dB		
14652	PK	Vertical		74	<-20dB		
17094	PK	Vertical		74	<-20dB		

19536	PK	Vertical		74	<-20dB		
21978	PK	Vertical		74	<-20dB		
24420	PK	Vertical		74	<-20dB		
2442	PK	Horizontal	106.18		(Fund.)	1.2	50
4884	PK	Horizontal	56.44	74	-17.56	1.5	130
7326	PK	Horizontal	55.09	74	-18.91	1.1	160
9768	PK	Horizontal	51.91	74	-22.09	1.2	110
12210	PK	Horizontal		74	<-20dB		
14652	PK	Horizontal		74	<-20dB		
17094	PK	Horizontal		74	<-20dB		
19536	PK	Horizontal		74	<-20dB		
21978	PK	Horizontal		74	<-20dB		
24420	PK	Horizontal		74	<-20dB		

Mode:operation mode 6

The below are the Fundamentals and Harmonics which are the higher emissions recorded.

Frequency (MHz)	Detector	Antenna Polarization	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Turntable Angle (°)
2462	AV	Vertical	103.29		(Fund.)	1.1	190
4924	AV	Vertical	45.17	54	-8.83	1.1	20
7386	AV	Vertical	42.61	54	-11.39	1.2	150
9848	AV	Vertical	44.18	54	-9.82	1.3	130
12310	AV	Vertical		54	<-20dB		
14772	AV	Vertical		54	<-20dB		
17234	AV	Vertical		54	<-20dB		
19696	AV	Vertical		54	<-20dB		
22158	AV	Vertical		54	<-20dB		
24620	AV	Vertical		54	<-20dB		
2462	AV	Horizontal	96.88		(Fund.)	1.3	180
4924	AV	Horizontal	39.25	54	-14.75	1.2	210
7386	AV	Horizontal	40.17	54	-13.83	1.1	170
9848	AV	Horizontal	41.66	54	-12.34	1.2	220
12310	AV	Horizontal		54	<-20dB		
14772	AV	Horizontal		54	<-20dB		
17234	AV	Horizontal		54	<-20dB		
19696	AV	Horizontal		54	<-20dB		
22158	AV	Horizontal		54	<-20dB		
24620	AV	Horizontal		54	<-20dB		

2462	PK	Vertical	111.08		(Fund.)	1.2	230
4924	PK	Vertical	60.25	74	-13.75	1.1	55
7386	PK	Vertical	55.73	74	-18.27	1.2	105
9848	PK	Vertical	56.37	74	-17.63	1.2	170
12310	PK	Vertical		74	<-20dB		
14772	PK	Vertical		74	<-20dB		
17234	PK	Vertical		74	<-20dB		
19696	PK	Vertical		74	<-20dB		
22158	PK	Vertical		74	<-20dB		
24620	PK	Vertical		74	<-20dB		
2462	PK	Horizontal	108.11		(Fund.)	1.3	235
4924	PK	Horizontal	54.63	74	-19.37	1.1	145
7386	PK	Horizontal	53.29	74	-20.71	1.4	195
9848	PK	Horizontal	53.18	74	-20.82	1.5	235
12310	PK	Horizontal		74	<-20dB		
14772	PK	Horizontal		74	<-20dB		
17234	PK	Horizontal		74	<-20dB		
19696	PK	Horizontal		74	<-20dB		
22158	PK	Horizontal		74	<-20dB		
24620	PK	Horizontal		74	<-20dB		

8 Band Edge Measurement

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	KDB Publication No. 558074
Measurement Distance:	3m
Detector:	For Peak value: RBW = 1MHz VBW =3MHz; Sweep = auto Detector function = peak Trace = max hold For Average value: RBW = 1MHz VBW=10Hz; Sweep = auto Detector function = Average Trace = max hold

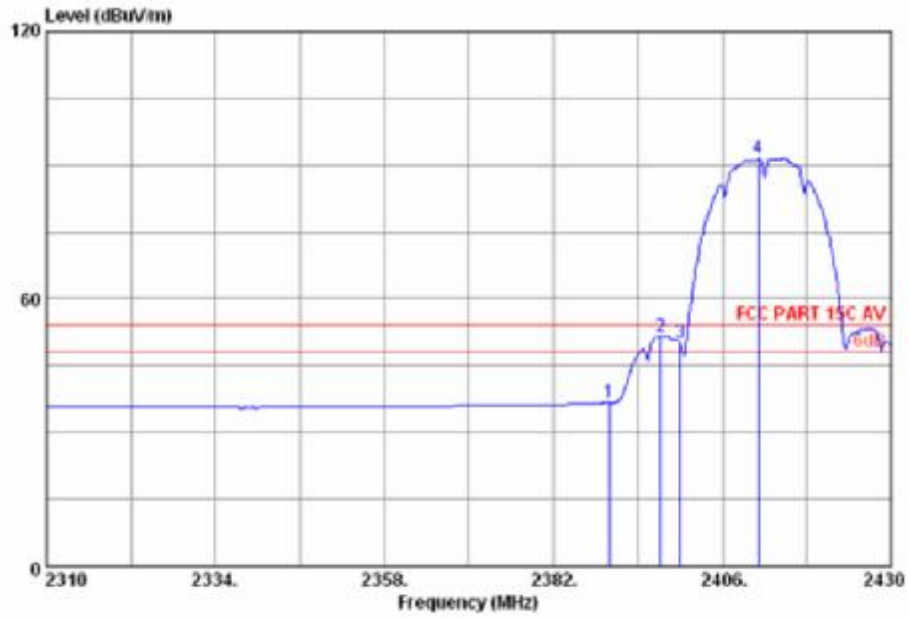
8.1 Test Produce

1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

8.2 Test Results:

Mode:Operation mode 1 **Antenna Polarization:Horizontal**

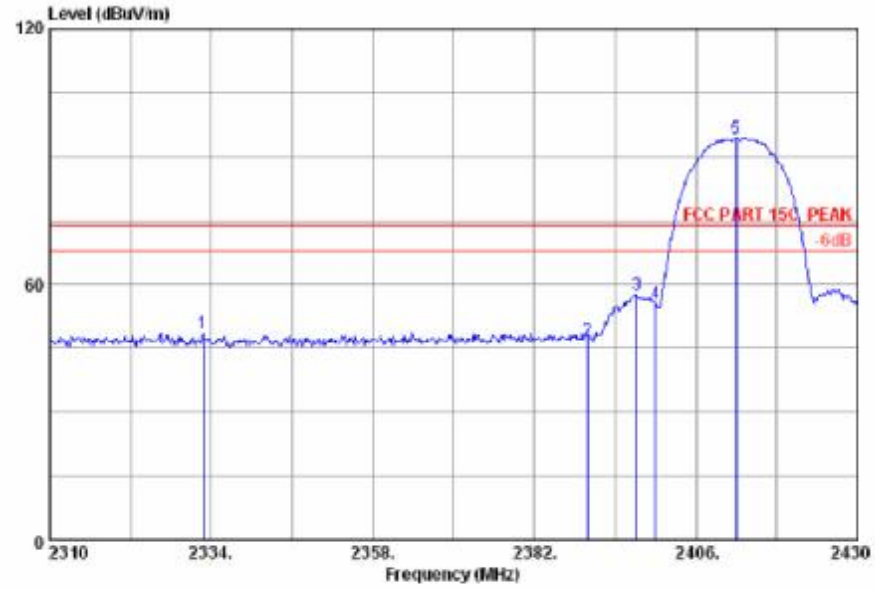
Detector: Average



	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	2390.000	29.44	7.39	36.62	36.40	36.61	54.00	17.39	Average
2	2397.240	29.44	7.39	36.62	51.41	51.62	54.00	2.38	Average
3	2400.000	29.44	7.43	36.62	49.72	49.97	54.00	4.03	Average
4	2411.160	29.45	7.43	36.62	91.19	91.45	54.00	-37.45	Average

Mode:Operation mode 1 **Antenna Polarization:Horizontal**

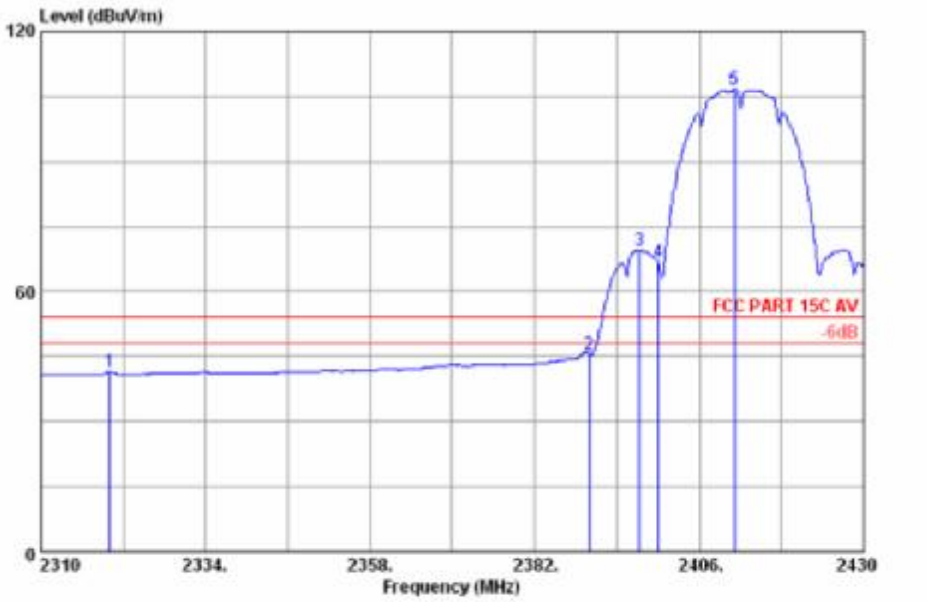
Detector: Peak



	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	2332.800	29.40	7.27	36.63	48.55	48.59	74.00	25.41	Peak
2	2390.000	29.44	7.39	36.62	46.55	46.76	74.00	27.24	Peak
3	2397.240	29.44	7.39	36.62	57.44	57.65	74.00	16.35	Peak
4	2400.000	29.44	7.43	36.62	55.13	55.38	74.00	18.62	Peak
5	2412.000	29.45	7.43	36.62	94.02	94.28	74.00	-20.28	Peak

Mode:Operation mode 1 **Antenna Polarization:Vertical**

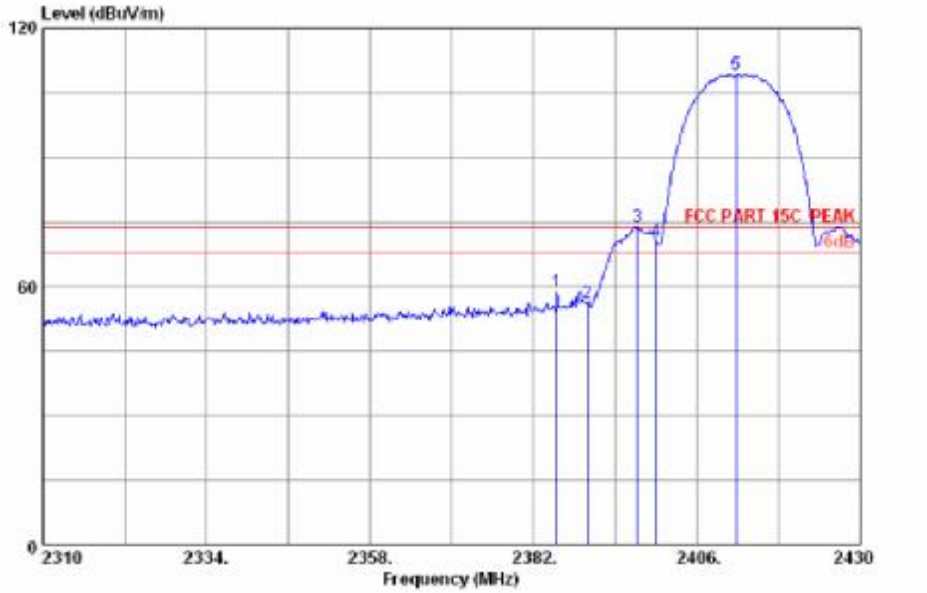
Detector: Average



	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	2319.960	29.40	7.27	36.63	41.45	41.49	54.00	12.51	Average
2	2390.000	29.44	7.39	36.62	45.30	45.51	54.00	8.49	Average
3	2397.240	29.44	7.39	36.62	69.39	69.60	54.00	-15.60	Average
4	2400.000	29.44	7.43	36.62	66.63	66.88	54.00	-12.88	Average
5	2411.160	29.45	7.43	36.62	106.36	106.62	54.00	-52.62	Average

Mode:Operation mode 1 **Antenna Polarization:Vertical**

Detector: Peak



	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	2385.360	29.43	7.39	36.62	58.76	58.96	74.00	15.04	Peak
2	2390.000	29.44	7.39	36.62	55.98	56.19	74.00	17.81	Peak
3	2397.240	29.44	7.39	36.62	73.52	73.73	74.00	0.27	Peak
4	2400.000	29.44	7.43	36.62	70.31	70.56	74.00	3.44	Peak
5	2411.760	29.45	7.43	36.62	109.10	109.36	74.00	-35.36	Peak

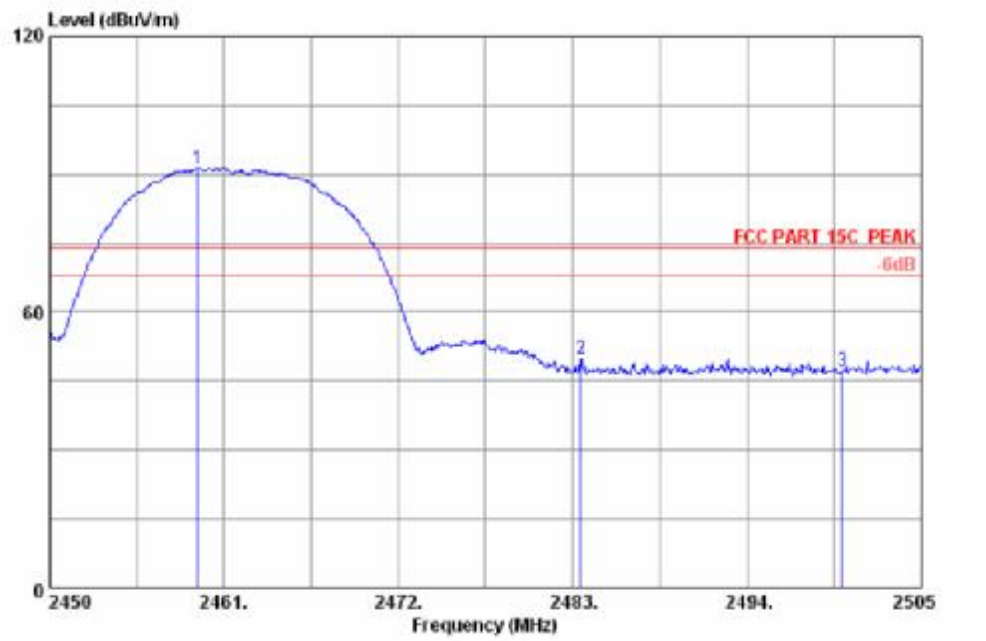
Mode:Operation mode 3 **Antenna Polarization:Horizontal**

Detector: Average

	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	2459.240	29.48	7.54	36.61	88.27	88.68	54.00	-34.68	Average
2	2483.500	29.49	7.58	36.60	35.88	36.35	54.00	17.65	Average
3	2500.000	29.50	7.62	36.60	36.01	36.53	54.00	17.47	Average

Mode:Operation mode 3 **Antenna Polarization:Horizontal**

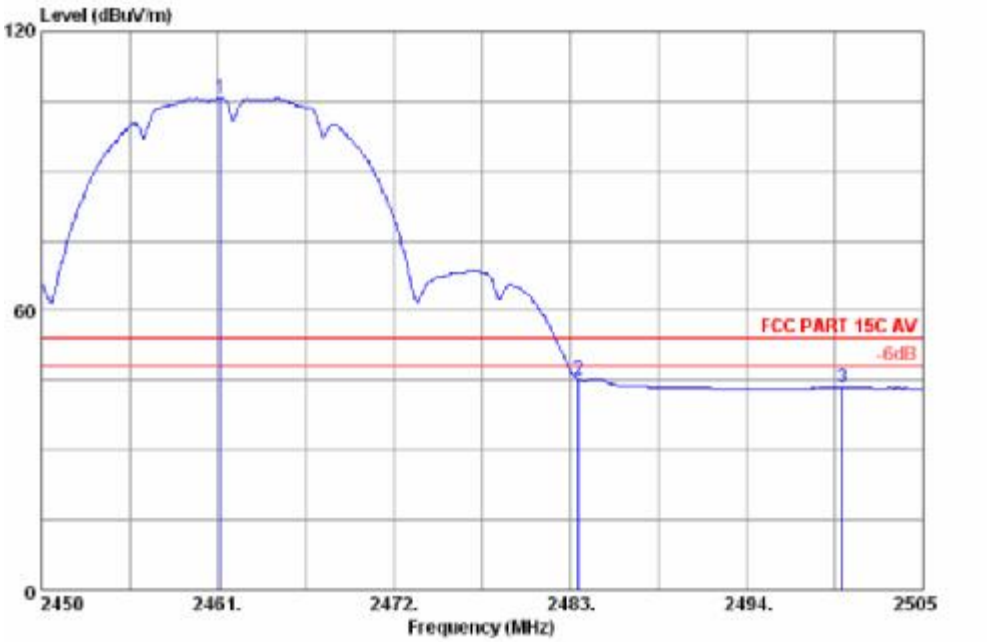
Detector: Peak



	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	2459.350	29.48	7.54	36.61	90.82	91.23	74.00	-17.23	Peak
2	2483.500	29.49	7.58	36.60	49.23	49.70	74.00	24.30	Peak
3	2500.000	29.50	7.62	36.60	46.72	47.24	74.00	26.76	Peak

Mode:Operation mode 3 **Antenna Polarization:Vertical**

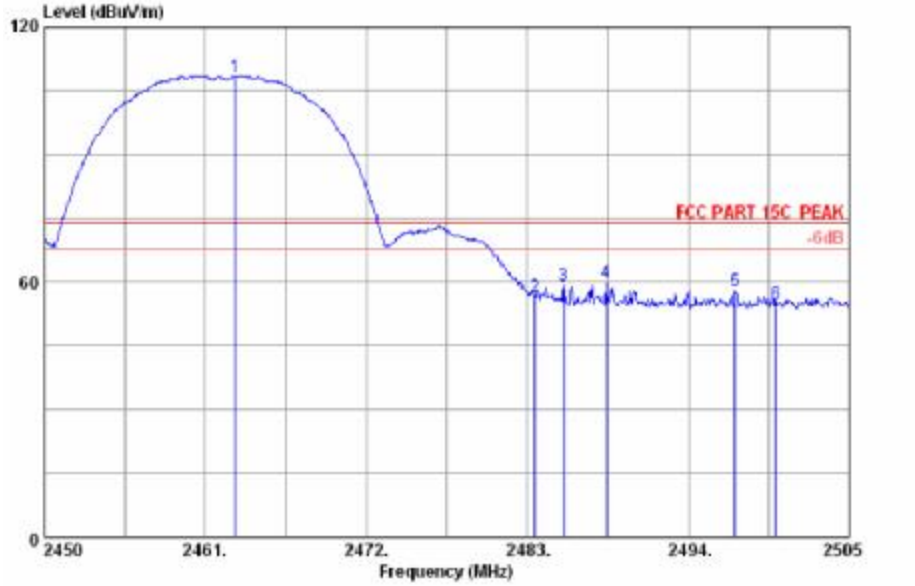
Detector: Average



	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	2461.165	29.48	7.54	36.61	105.27	105.68	54.00	-51.68	Average
2	2483.500	29.49	7.58	36.60	44.73	45.20	54.00	8.80	Average
3	2500.000	29.50	7.62	36.60	42.82	43.34	54.00	10.66	Average

Mode:Operation mode 3 **Antenna Polarization:Vertical**

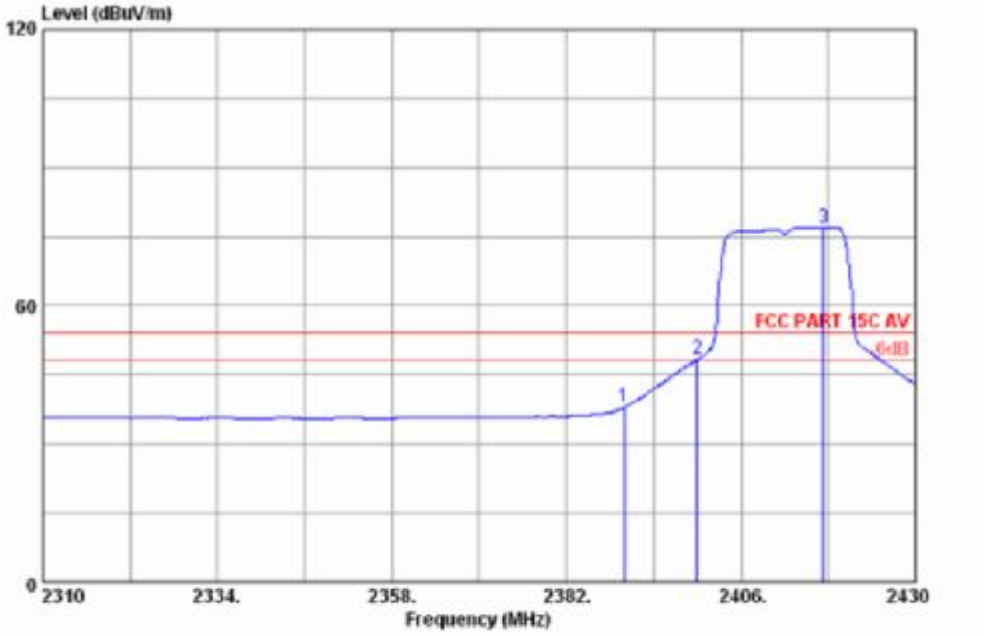
Detector: Peak



	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	2463.035	29.48	7.54	36.61	108.06	108.47	74.00	-34.47	Peak
2	2483.500	29.49	7.58	36.60	56.03	56.50	74.00	17.50	Peak
3	2485.475	29.49	7.58	36.60	59.85	59.32	74.00	14.68	Peak
4	2488.390	29.50	7.58	36.60	59.52	60.00	74.00	14.00	Peak
5	2497.190	29.50	7.58	36.60	57.36	57.84	74.00	16.16	Peak
6	2500.000	29.50	7.62	36.60	54.44	54.96	74.00	19.04	Peak

Mode:Operation mode 4 **Antenna Polarization:Horizontal**

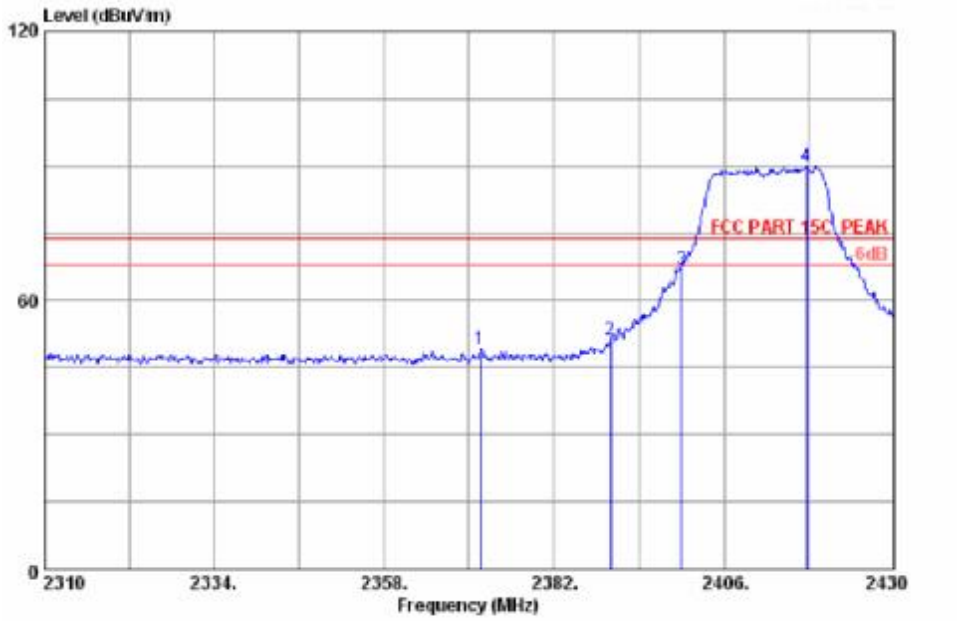
Detector: Average



	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	2390.000	29.44	7.39	36.62	37.77	37.98	54.00	16.02	Average
2	2400.000	29.44	7.43	36.62	48.14	48.39	54.00	5.61	Average
3	2417.400	29.45	7.43	36.61	76.64	76.91	54.00	-22.91	Average

Mode:Operation mode 4 **Antenna Polarization:Horizontal**

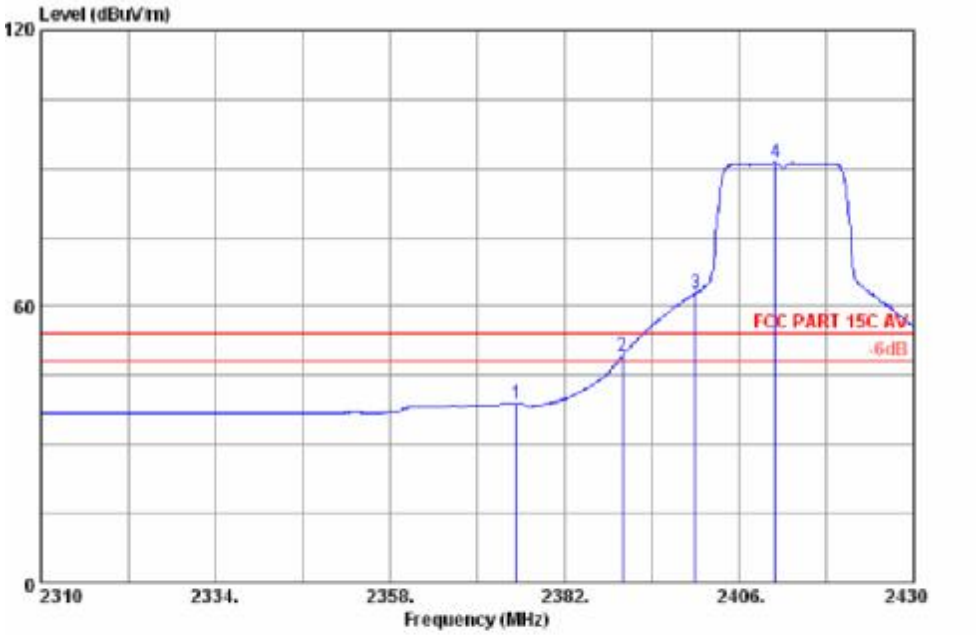
Detector: Peak



	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	2371.560	29.43	7.35	36.62	49.07	49.23	74.00	24.77	Peak
2	2390.000	29.44	7.39	36.62	50.99	51.20	74.00	22.80	Peak
3	2400.000	29.44	7.43	36.62	66.45	66.70	74.00	7.30	Peak
4	2417.640	29.45	7.43	36.61	89.62	89.89	74.00	-15.89	Peak

Mode:Operation mode 4 **Antenna Polarization:Vertical**

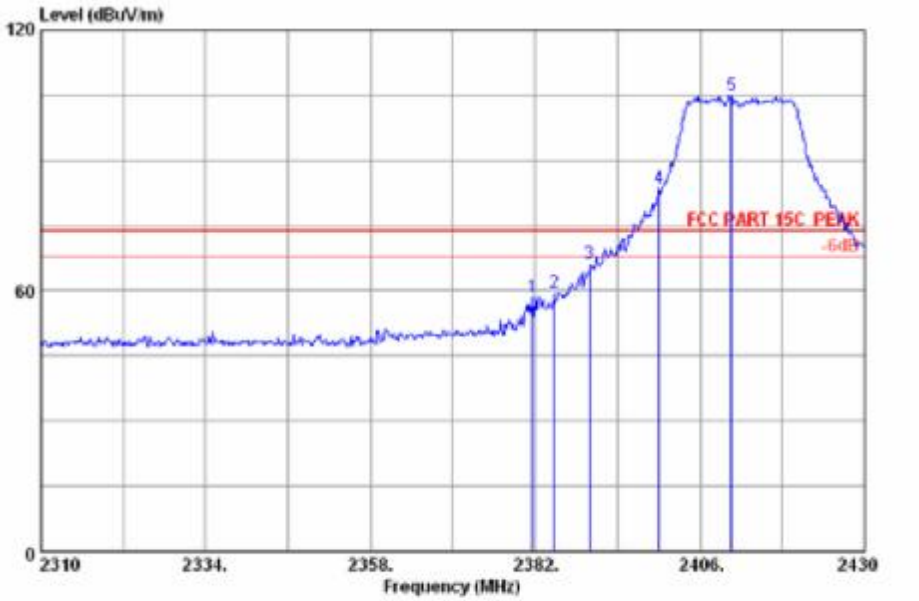
Detector: Average



	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	2375.400	29.43	7.35	36.62	38.71	38.87	54.00	15.13	Average
2	2390.000	29.44	7.39	36.62	49.06	49.27	54.00	4.73	Average
3	2400.000	29.44	7.43	36.62	62.66	62.91	54.00	-8.91	Average
4	2411.040	29.45	7.43	36.62	90.87	91.13	54.00	-37.13	Average

Mode:Operation mode 4 **Antenna Polarization:Vertical**

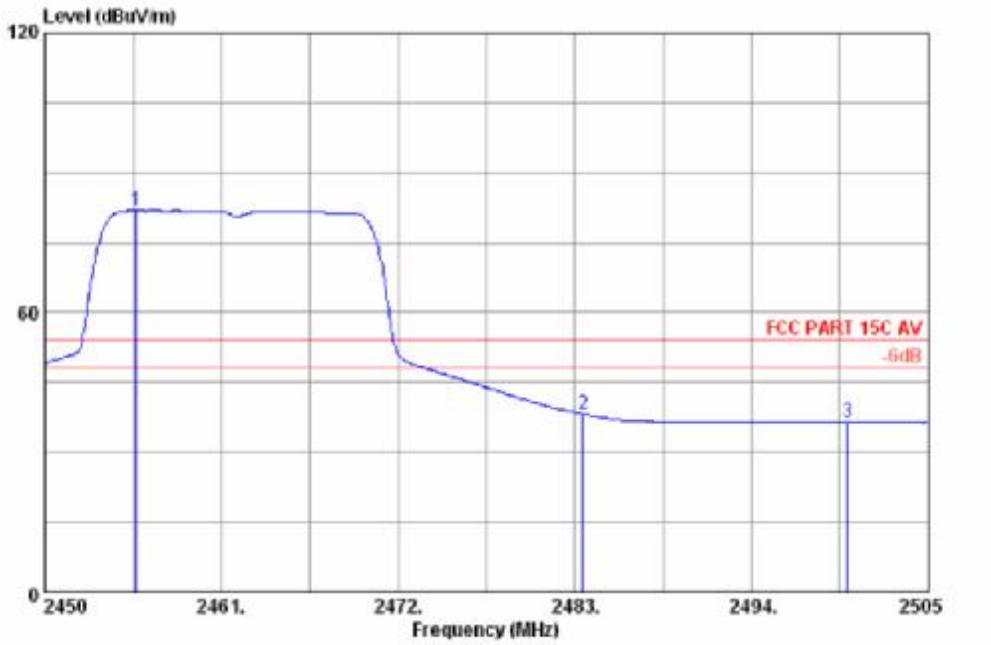
Detector: Peak



	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	2381.640	29.43	7.39	36.62	58.24	58.44	74.00	15.56	Peak
2	2384.760	29.43	7.39	36.62	59.22	59.42	74.00	14.58	Peak
3	2390.000	29.44	7.39	36.62	66.05	66.26	74.00	7.74	Peak
4	2400.000	29.44	7.43	36.62	83.29	83.54	74.00	-9.54	Peak
5	2410.560	29.45	7.43	36.62	104.76	105.02	74.00	-31.02	Peak

Mode:Operation mode 6 **Antenna Polarization:Horizontal**

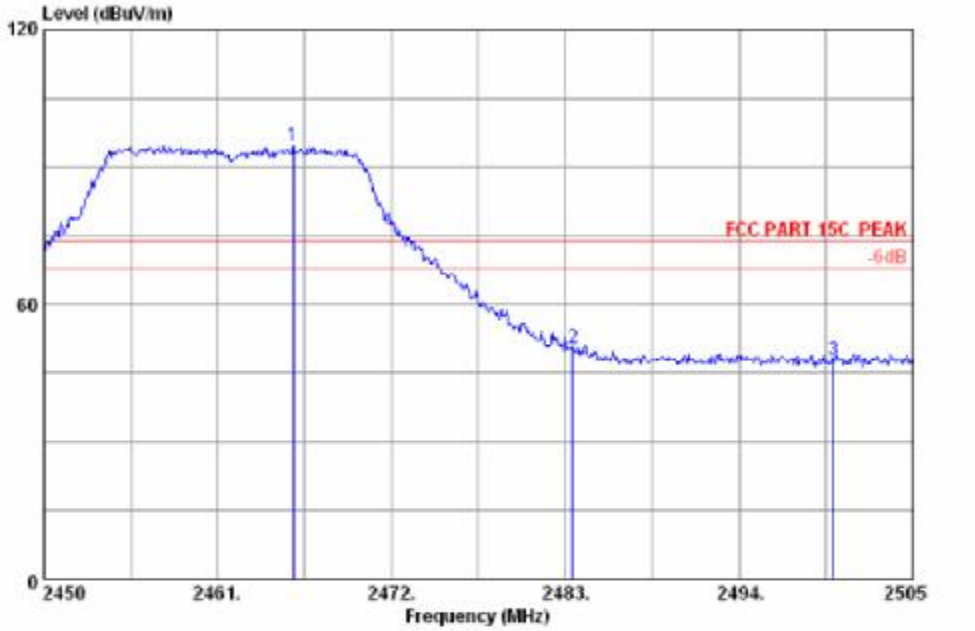
Detector: Average



	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	2455.665	29.48	7.50	36.61	81.47	81.84	54.00	-27.84	Average
2	2483.500	29.49	7.58	36.60	37.75	38.22	54.00	15.78	Average
3	2500.000	29.50	7.62	36.60	35.95	36.47	54.00	17.53	Average

Mode:Operation mode 6 **Antenna Polarization:Horizontal**

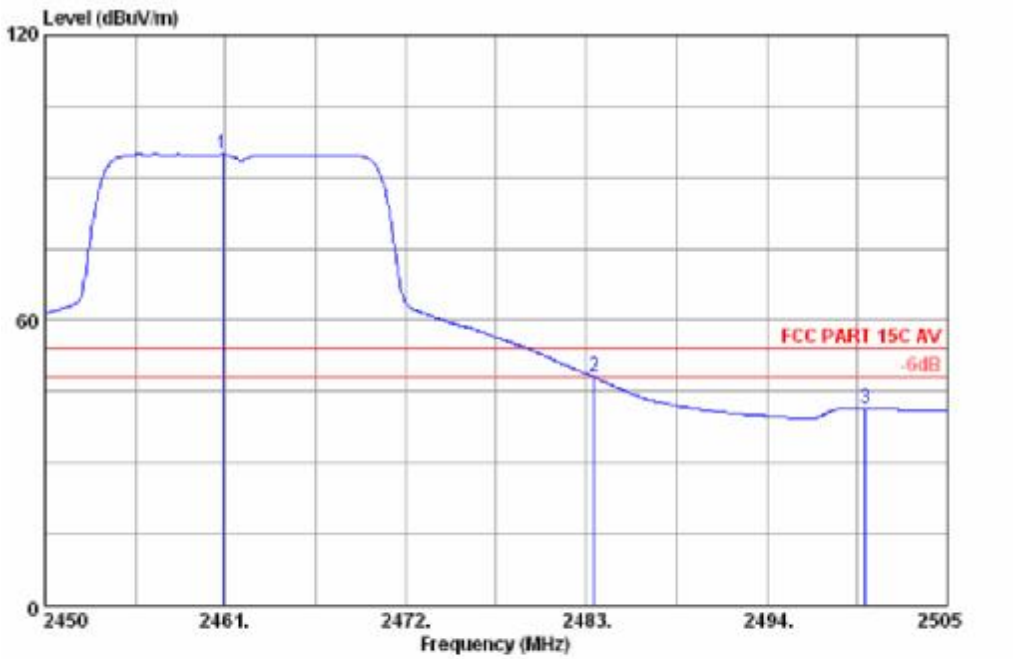
Detector: Peak



	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	2465.785	29.48	7.54	36.61	94.30	94.71	74.00	-20.71	Peak
2	2483.500	29.49	7.58	36.60	50.03	50.50	74.00	23.50	Peak
3	2500.000	29.50	7.62	36.60	47.29	47.81	74.00	26.19	Peak

Mode:Operation mode 6 **Antenna Polarization:Vertical**

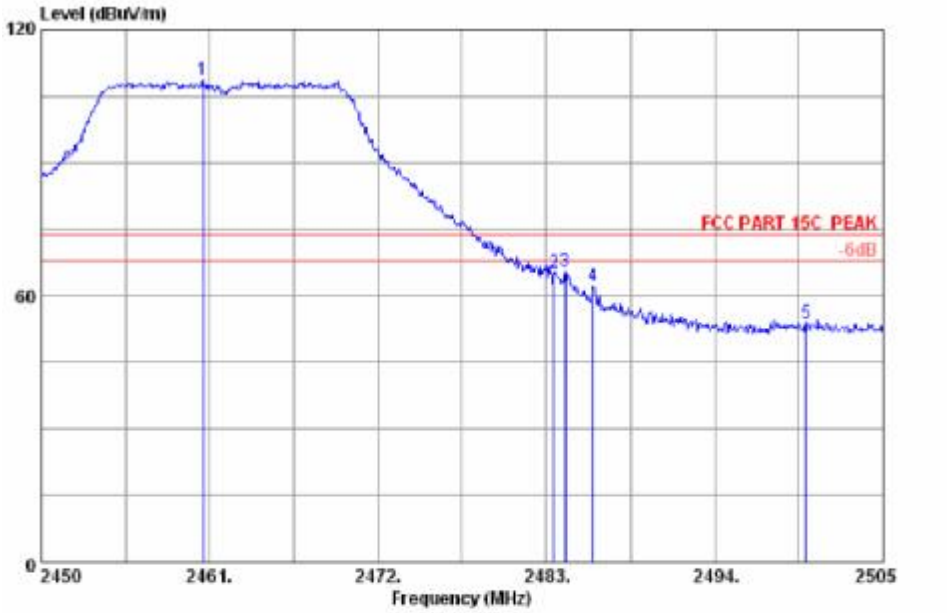
Detector: Average



	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	2460.835	29.48	7.54	36.61	94.38	94.79	54.00	-40.79	Average
2	2483.500	29.49	7.58	36.60	47.65	48.12	54.00	5.88	Average
3	2500.000	29.50	7.62	36.60	40.97	41.49	54.00	12.51	Average

Mode:Operation mode 6 **Antenna Polarization:Vertical**

Detector: Peak



	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	2460.560	29.48	7.54	36.61	108.38	108.79	74.00	-34.79	Peak
2	2483.500	29.49	7.58	36.60	64.73	65.20	74.00	8.80	Peak
3	2484.210	29.49	7.58	36.60	64.88	65.35	74.00	8.65	Peak
4	2486.025	29.49	7.58	36.60	61.68	62.15	74.00	11.85	Peak
5	2500.000	29.50	7.62	36.60	53.38	53.90	74.00	20.10	Peak

9 6 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB Publication No. 558074

9.1 Test Procedure:

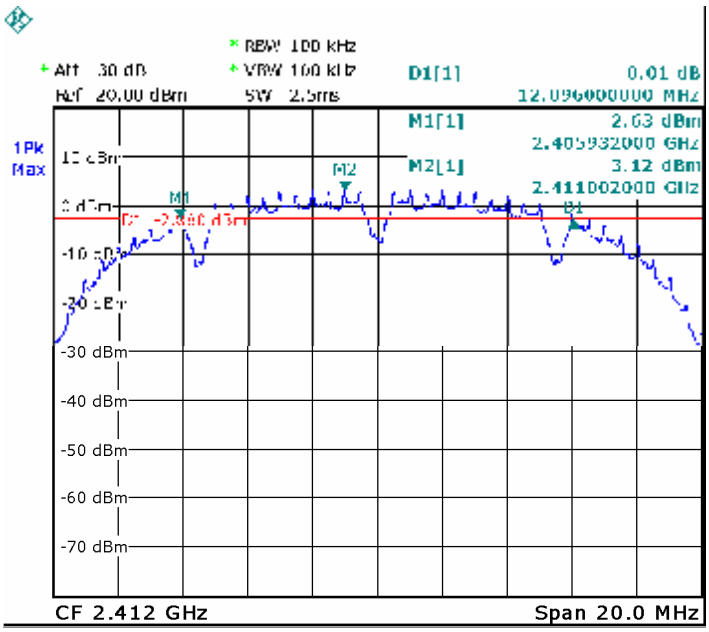
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

2. Set the spectrum analyzer: RBW = 100kHz, VBW = 100kHz

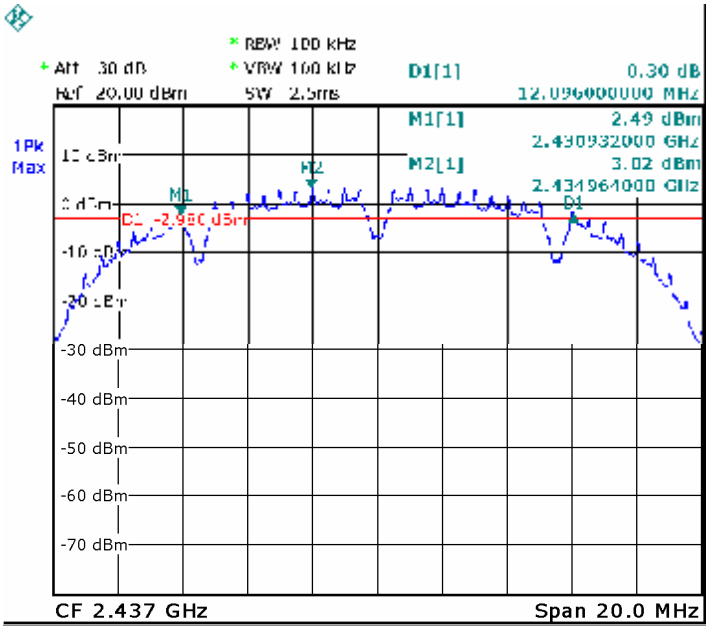
9.2 Test Result

Test result plots as follow:

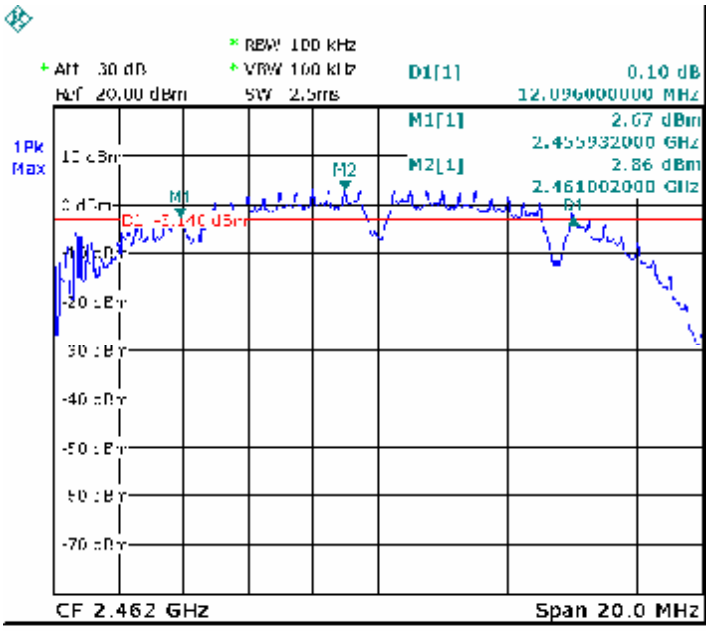
Mode:Operation mode 1



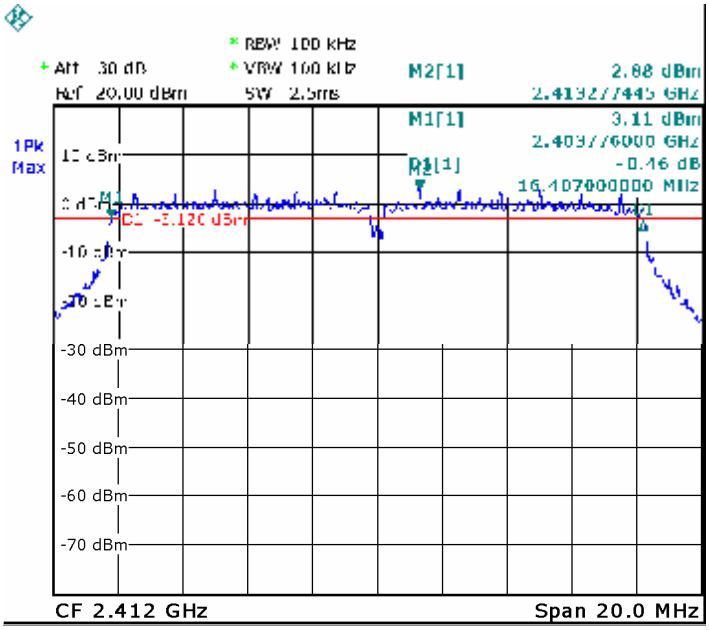
Mode:Operation mode 2



Mode:Operation mode 3

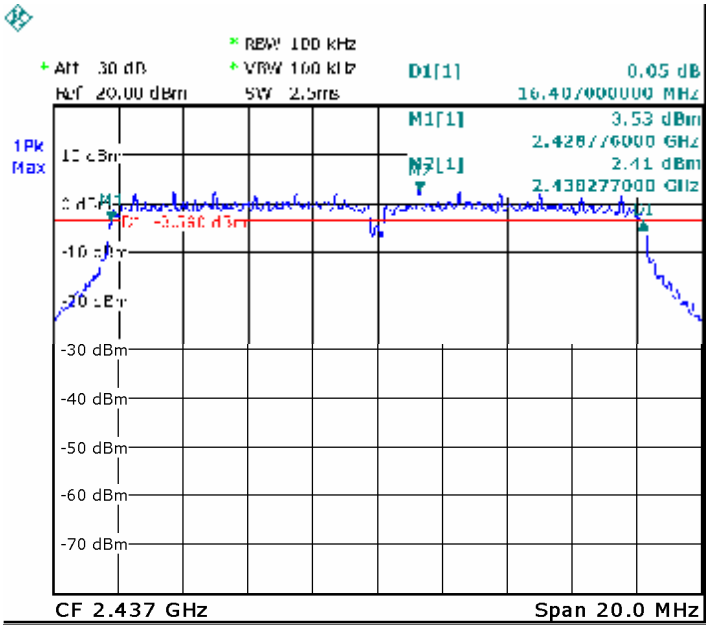


Mode:Operation mode 4



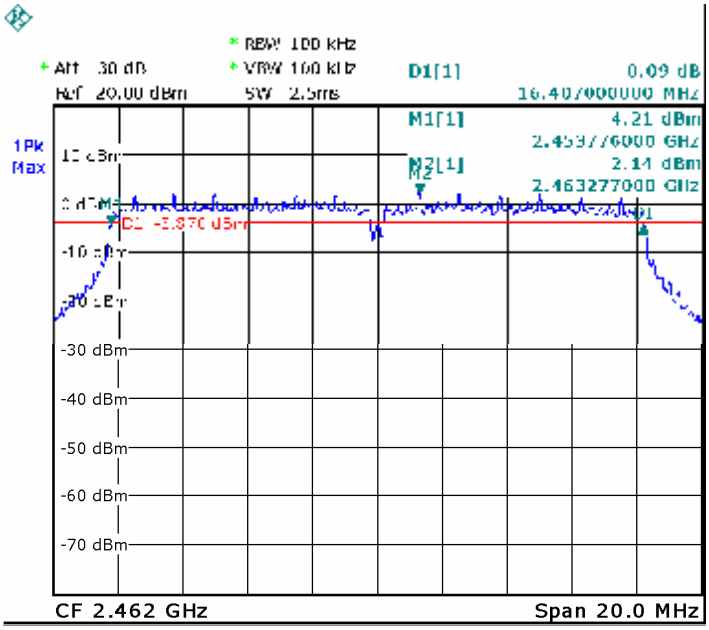
Date: 31.JUL.2012 14:16:34

Mode:Operation mode 5



Date: 31.JUL.2012 14:48:11

Mode:Operation mode 6



10 Maximum Peak Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB Publication No. 558074

10.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 3 MHz. VBW = 10 MHz. Sweep = auto; Detector Function = Peak.

3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

10.2 Test Results:

Operation mode	Output Power (dBm)	Antenna gain (dBi)	Limit (dBm)
1	16.23	1.856	30
2	16.35	1.856	30
3	16.36	1.856	30
4	15.03	1.856	30
5	15.32	1.856	30
6	14.98	1.856	30

11 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB Publication No. 558074

11.1 Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 3kHz. VBW = 30kHz , Span = 1.5MHz. Sweep = 500s; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

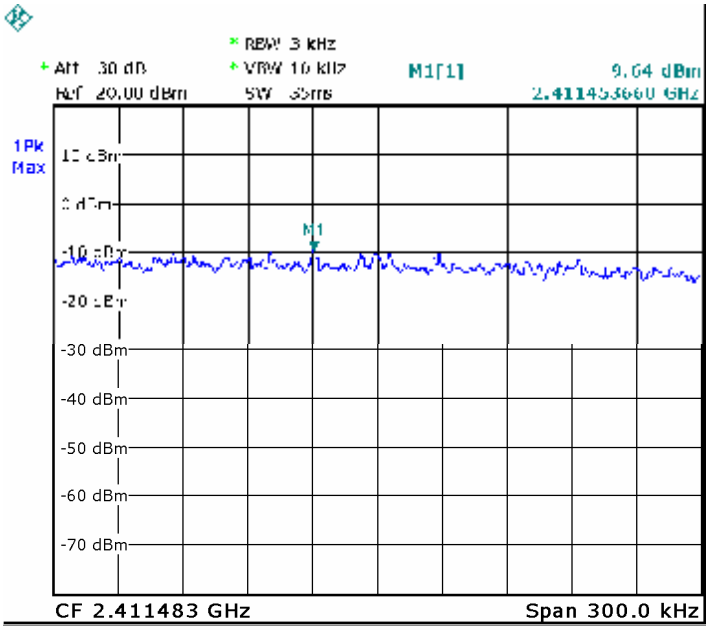
11.2 Test Result:

Operation mode	Test value (dBm per 3KHz)	Antenna gain (dBi)	Limit (dBm per 3KHz)
1	-9.64	1.856	8
2	-10.25	1.856	8
3	-10.75	1.856	8
4	-9.18	1.856	8
5	-9.66	1.856	8
6	-9.72	1.856	8

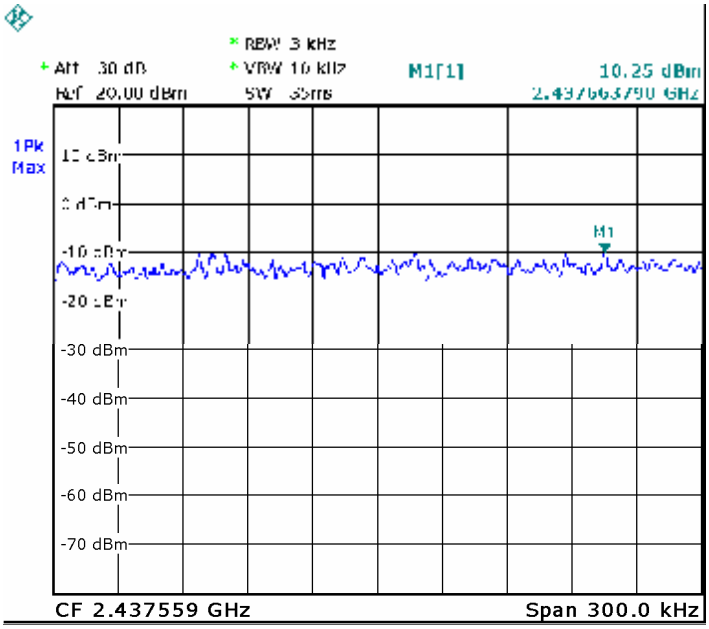
11.3 Test Plots:

The test plots as following:

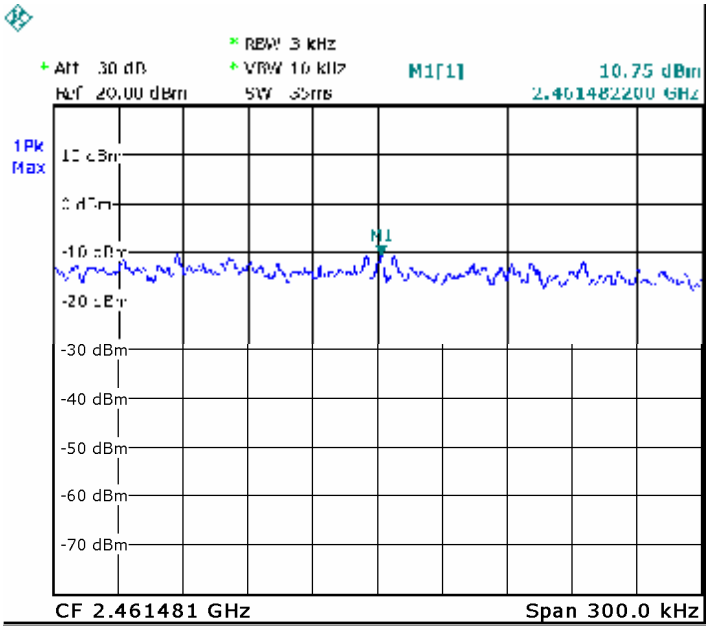
Mode:Operation mode 1



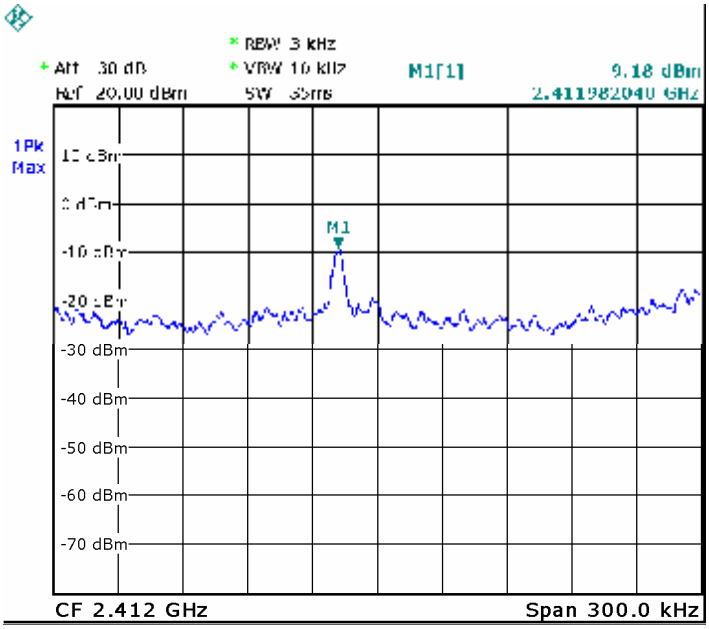
Mode:Operation mode 2



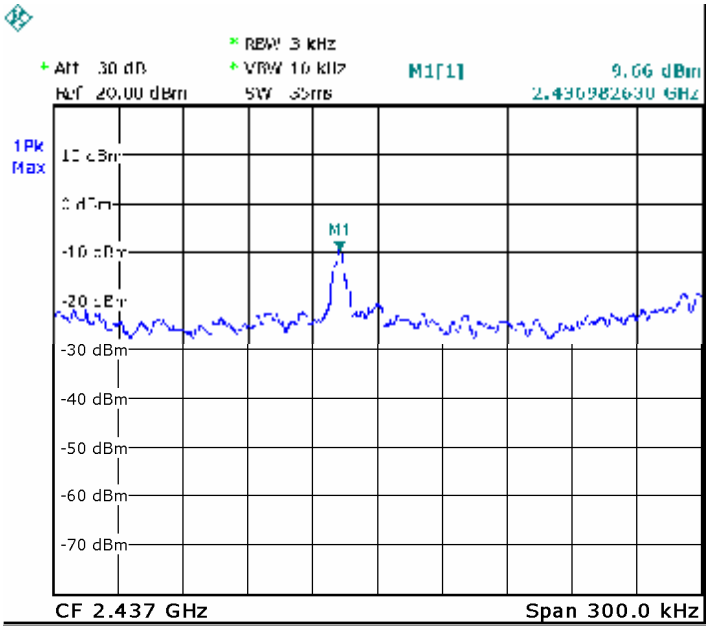
Mode:Operation mode 3



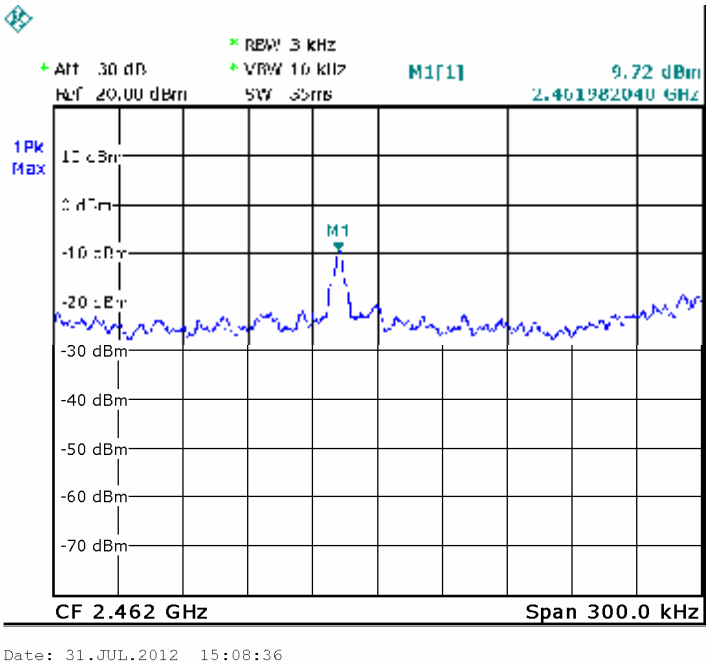
Mode:Operation mode 4



Mode:Operation mode 5



Mode:Operation mode 6



12 Antenna Requirement

According to the FCC Part 15 Paragraph 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.

13 RF Exposure

Test Requirement: FCC Part 1.1307

Test Mode: The EUT work in test mode(Tx).

13.1 Requiments:

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

13.2 The procedures / limit

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

13.3 MPE Calculation Method

$$E\ (V/m) = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd\ (W/m^2) = \frac{E^2}{377}$$

E = Electric field (V/m)
P = Peak RF output power (W)
G = EUT Antenna numeric gain (numeric)
d = Separation distance between radiator and human body (m)
The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

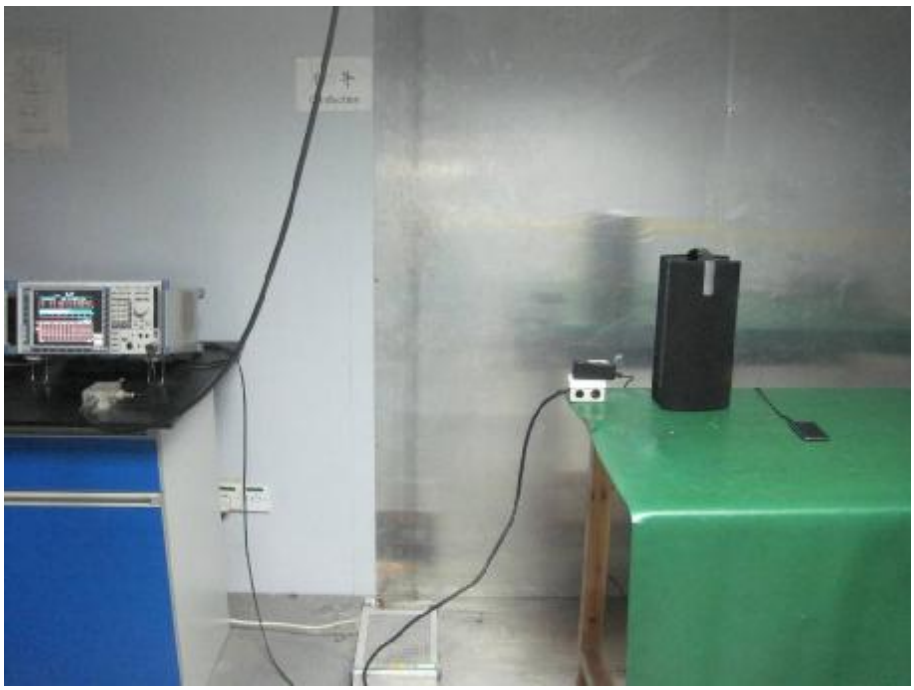
From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

Operation mode	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)	Test Result
1	1.856	1.533	16.36	43.25	0.013	1	Complies
4	1.856	1.533	15.32	34.04	0.010	1	Complies

Remark: the test was the operation mode 1 and 4 .

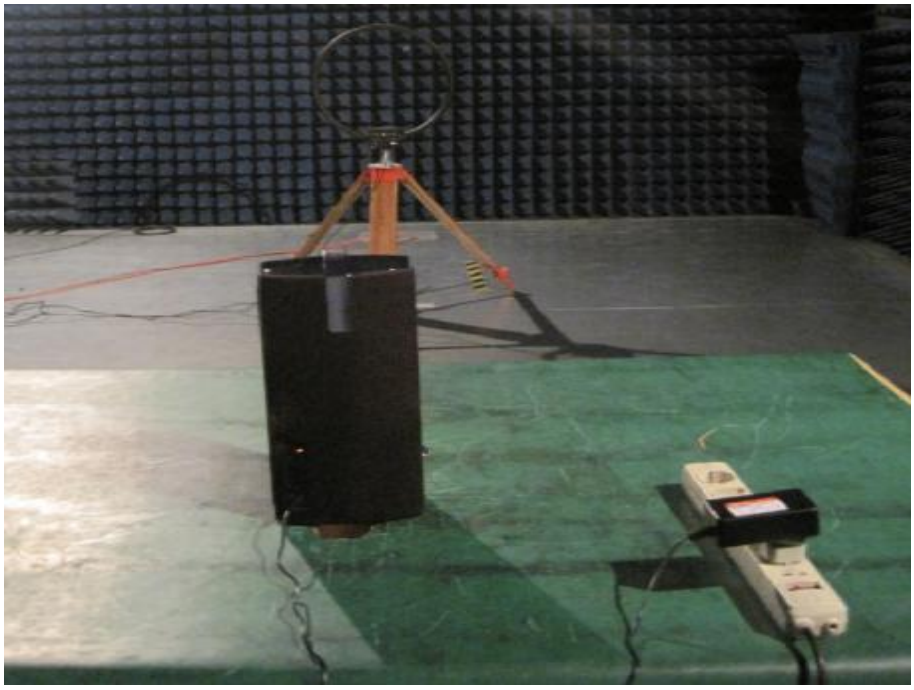
14 Photographs – Test Setup

14.1 Conduction Emission Test Setup

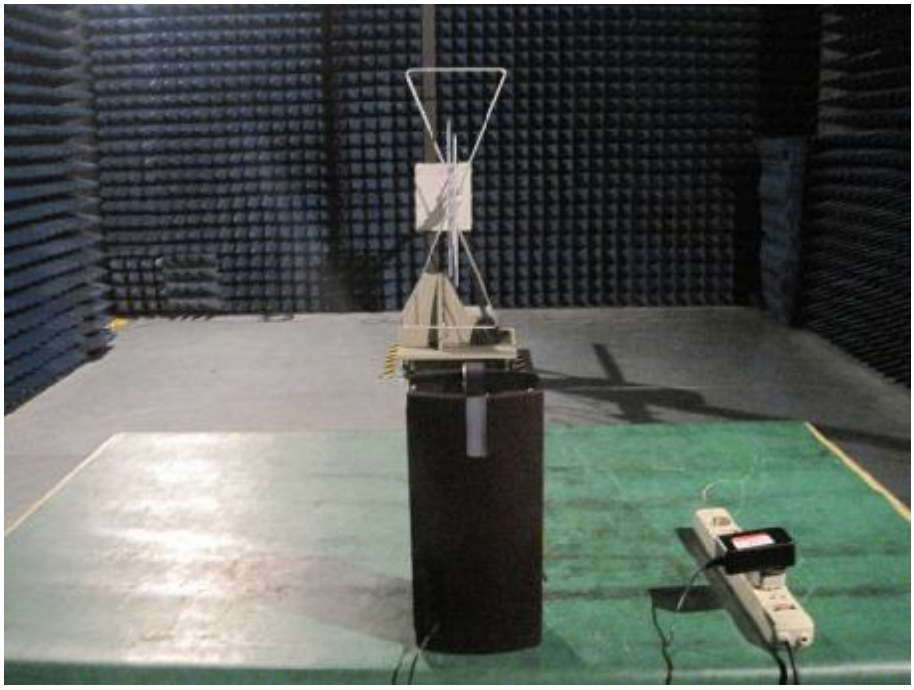


14.2 Radiation Emission Test Setup

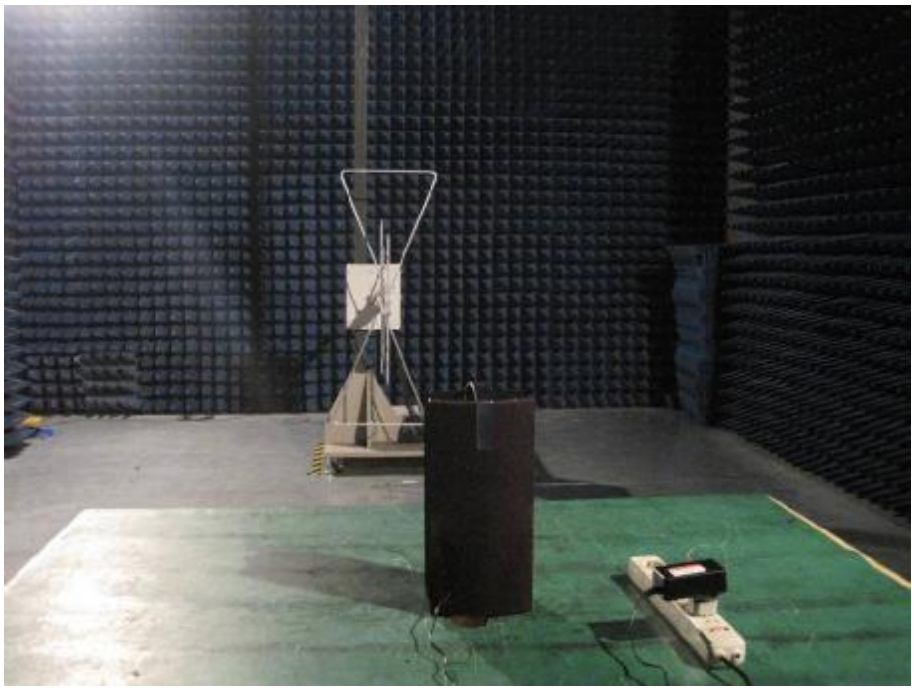
Test frequency below 30MHz



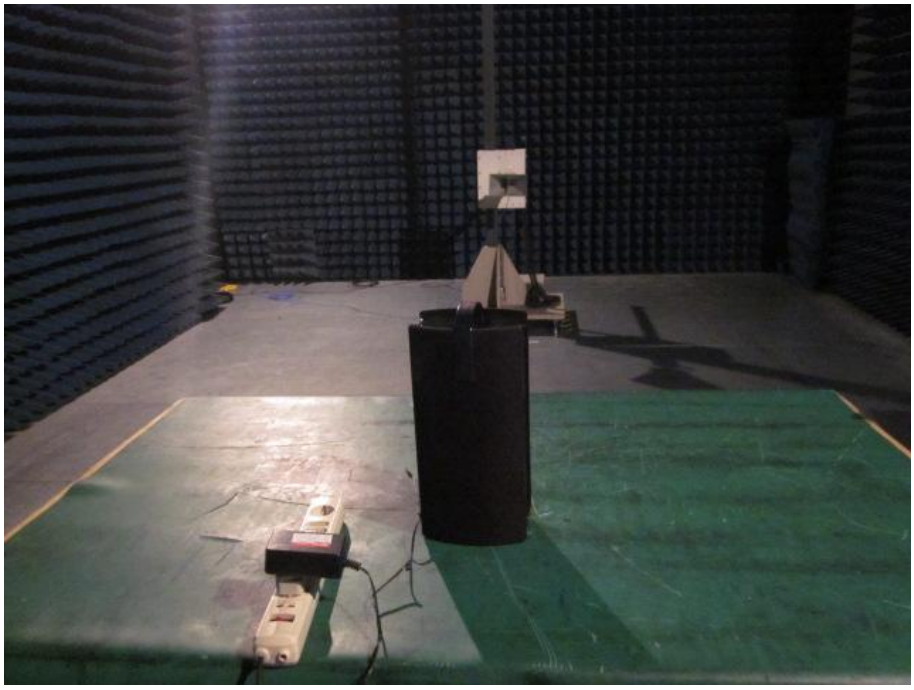
Test frequency from 30MHz to 1GHz for Normal Work mode



Test frequency from 30MHz to 1GHz for RF test mode



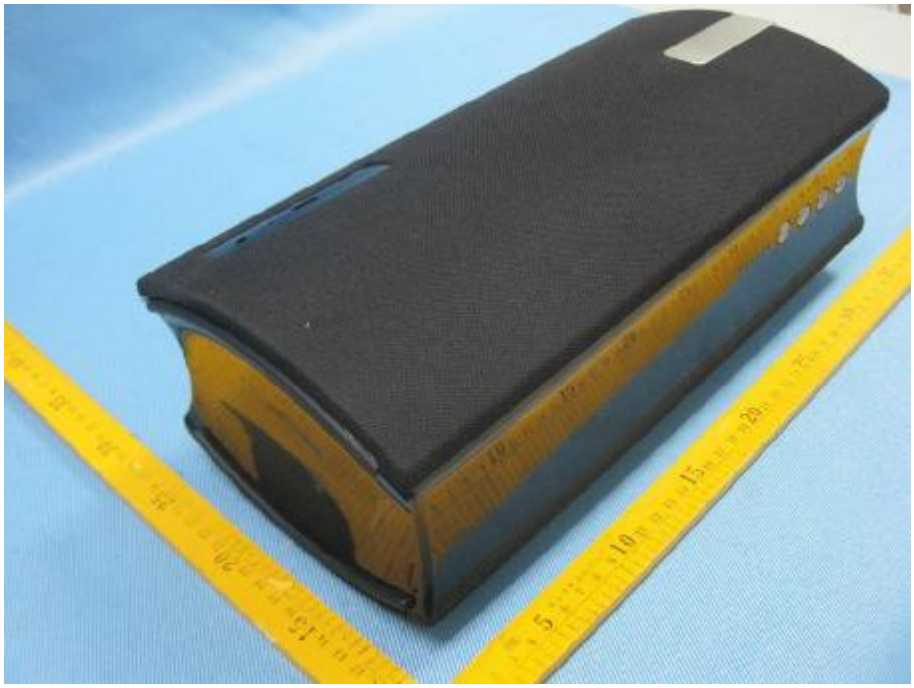
Test frequency above 1GHz



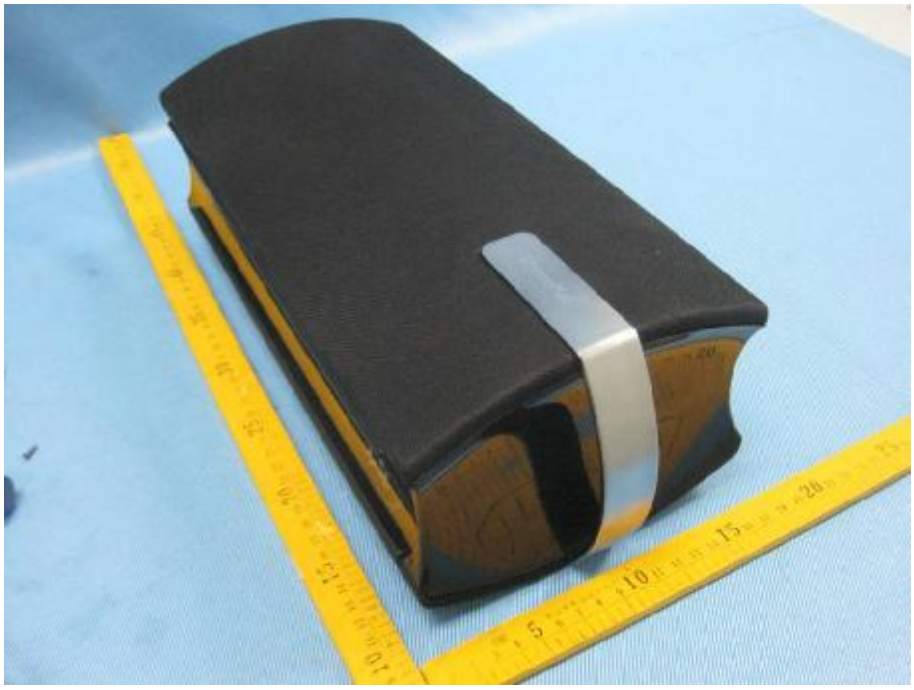
15 Photographs - Constructional Details

15.1 EUT – Appearance View(1)

15.2 EUT – Appearance View(2)



15.3 EUT – Appearance View(3)



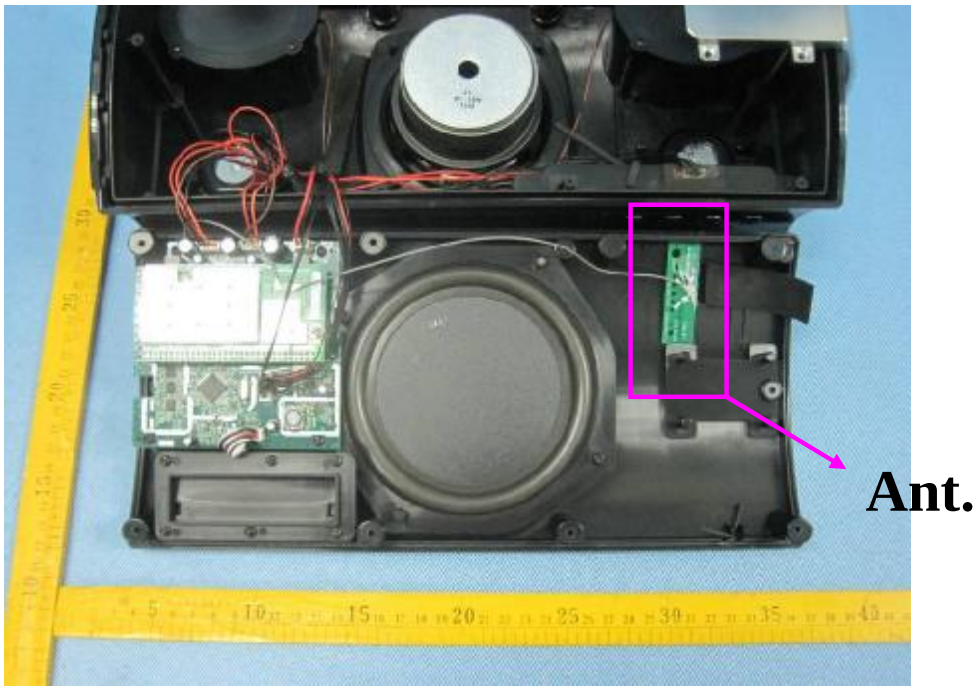
15.4 EUT – Appearance View(4)

15.5 EUT – Appearance View(5)

15.6 EUT – Appearance View(6)

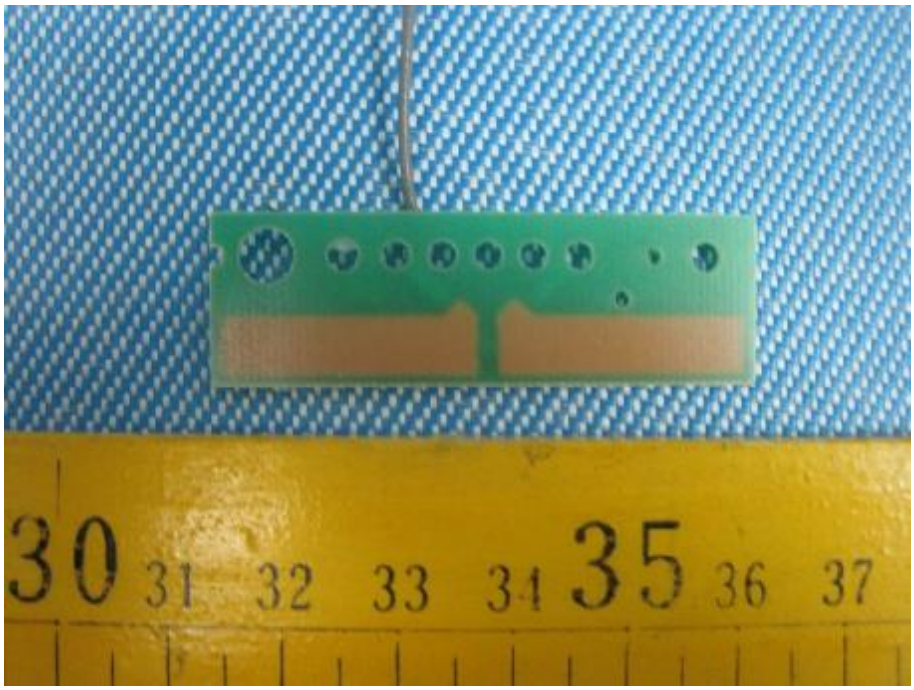
15.7 EUT-Open View(1)

15.8 EUT-Open View(2)



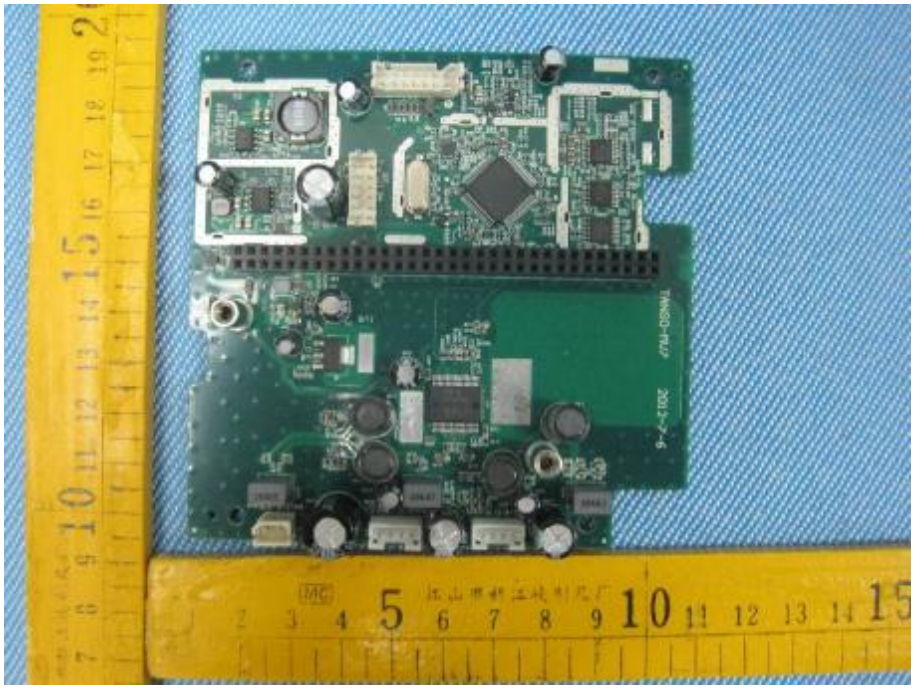
15.9 EUT-Ant. View(1)

15.10 EUT-Ant. View(2)

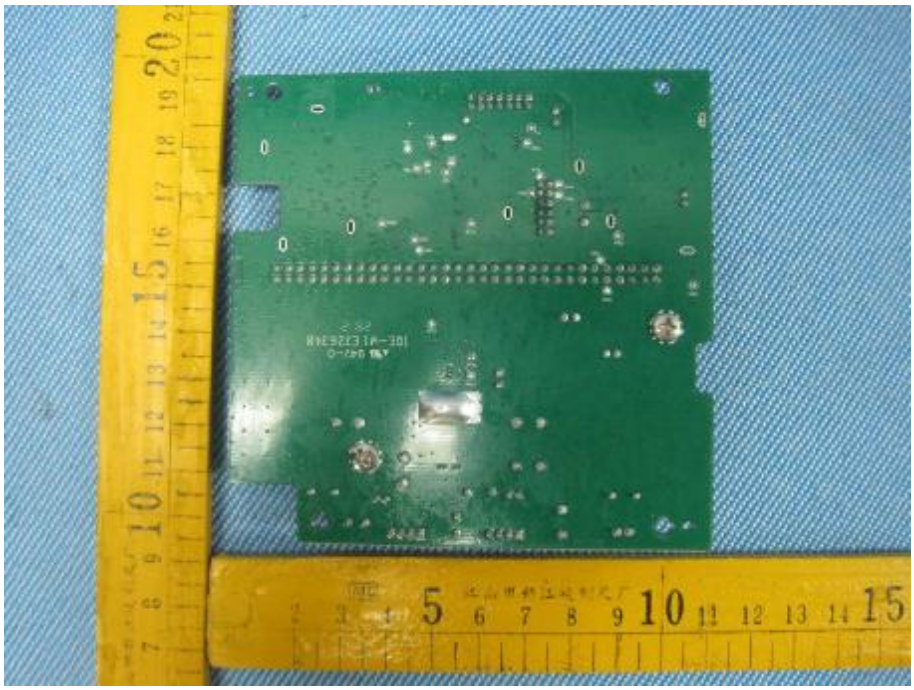


15.11 EUT-PCB1 Front View(1)

15.12 EUT-PCB1 Front View(2)



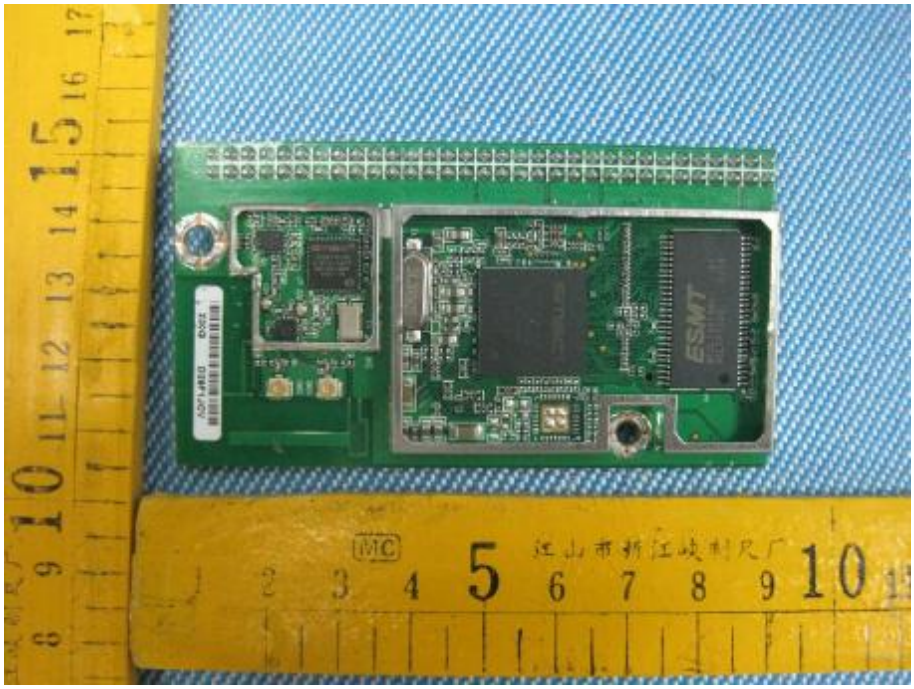
15.13 EUT-PCB1 Back View



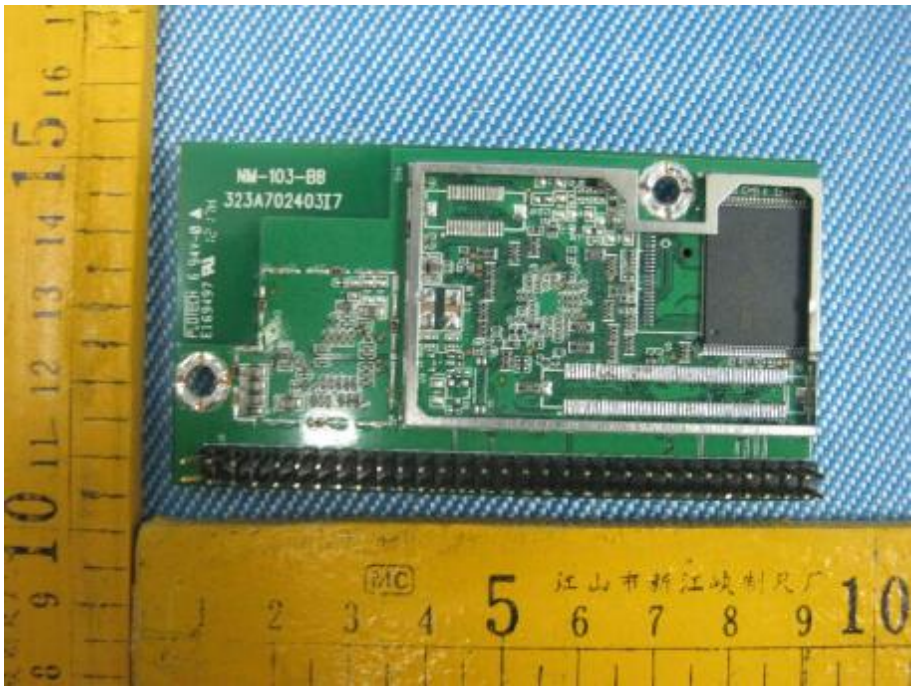
15.14 EUT-PCB2 Front View

15.15 EUT-PCB2 Back View

15.16 EUT-PCB2 Front Cover Open View



15.17 EUT-PCB2 Back Cover Open View



15.18 Adapter -View

15.19 Adapter -View

16 FCC Label

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Proposed Label Location on EUT

EUT Back View/ proposed FCC Label Location