

# FCC

## Test Report

Product Name	Plug-in AirPlay speaker
Model No	JBL SoundFly Air
FCC ID.	APISNDFAIRLO

Applicant	Harman International Industries, Incorporated
Address	8500 Balboa Blvd, Northridge, CA 91329, UNITED STATES

Date of Receipt	May 14, 2012
Issue Date	May 28, 2012
Report No.	125269R-RFUSP42V01
Report Version	V1.0



The test results relate only to the samples tested.

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This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

# Test Report Certification

Issue Date: May 28, 2012

Report No.: 125269R-RFUSP42V01


**Accredited by NIST (NVLAP)**

NVLAP Lab Code: 200533-0

Product Name	Plug-in AirPlay speaker
Applicant	Harman International Industries, Incorporated
Address	8500 Balboa Blvd, Northridge, CA 91329, UNITED STATES
Manufacturer	Harman International Industries, Incorporated
Model No.	JBL SoundFly Air
FCC ID.	APISNDFAIRLO
EUT Rated Voltage	AC 100-240V, 50-60Hz
EUT Test Voltage	AC 120V/60Hz
Trade Name	Harman International Industries, Incorporated
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2010 FCC KDB 558074, ANSI C63.4: 2003
Test Result	Complied

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# TABLE OF CONTENTS

Description	Page
<b>1. GENERAL INFORMATION .....</b>	<b>5</b>
1.1. EUT Description.....	5
1.2. Operational Description .....	7
1.3. Tested System Details.....	8
1.4. Configuration of Tested System .....	8
1.5. EUT Exercise Software .....	9
1.6. Test Facility .....	10
<b>2. Conducted Emission.....</b>	<b>11</b>
2.1. Test Equipment.....	11
2.2. Test Setup .....	11
2.3. Limits .....	12
2.4. Test Procedure .....	12
2.5. Uncertainty .....	12
2.6. Test Result of Conducted Emission.....	13
<b>3. Peak Power Output .....</b>	<b>15</b>
3.1. Test Equipment.....	15
3.2. Test Setup .....	15
3.3. Limits .....	15
3.4. Test Procedure .....	15
3.5. Uncertainty .....	15
3.6. Test Result of Peak Power Output.....	16
<b>4. Radiated Emission.....</b>	<b>18</b>
4.1. Test Equipment.....	18
4.2. Test Setup .....	19
4.3. Limits .....	20
4.4. Test Procedure .....	21
4.5. Uncertainty .....	21
4.6. Test Result of Radiated Emission.....	22
<b>5. RF antenna conducted test.....</b>	<b>30</b>
5.1. Test Equipment.....	30
5.2. Test Setup .....	30
5.3. Limits .....	30
5.4. Test Procedure .....	30
5.5. Uncertainty .....	31
5.6. Test Result of RF antenna conducted test.....	32
<b>6. Band Edge .....</b>	<b>44</b>
6.1. Test Equipment.....	44
6.2. Test Setup .....	45
6.3. Limits .....	45
6.4. Test Procedure .....	46
6.5. Uncertainty .....	46
6.6. Test Result of Band Edge .....	47

<b>7.</b>	<b>Occupied Bandwidth.....</b>	<b>55</b>
7.1.	Test Equipment.....	55
7.2.	Test Setup .....	55
7.3.	Limits .....	55
7.4.	Test Procedure .....	55
7.5.	Uncertainty .....	55
7.6.	Test Result of Occupied Bandwidth .....	56
<b>8.</b>	<b>Power Density .....</b>	<b>62</b>
8.1.	Test Equipment.....	62
8.2.	Test Setup .....	62
8.3.	Limits .....	62
8.4.	Test Procedure .....	62
8.5.	Uncertainty .....	62
8.6.	Test Result of Power Density .....	63
<b>9.</b>	<b>EMI Reduction Method During Compliance Testing .....</b>	<b>69</b>
Attachment 1:	EUT Test Photographs	
Attachment 2:	EUT Detailed Photographs	

## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	Plug-in AirPlay speaker
Trade Name	Harman International Industries, Incorporated
Model No.	JBL SoundFly Air
FCC ID.	APISNDFAIRLO
Frequency Range	2412-2462MHz for 802.11b/g
Number of Channels	802.11b/g: 11
Data Speed	802.11b: 1-11Mbps, 802.11g: 6-54Mbps
Type of Modulation	802.11b:DSSS (DBPSK, DQPSK, CCK) 802.11g:OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna Type	PIFA
Antenna Gain	Refer to the table "Antenna List"
Channel Control	Auto

#### Antenna List

No.	Manufacturer	Model No.	Peak Gain
1	LITE-ON	3010000238I7	3.81 dBi for 2.4GHz

Note: The antenna of EUT is conform to FCC 15.203.

## 802.11b/g Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2412 MHz	Channel 02:	2417 MHz	Channel 03:	2422 MHz	Channel 04:	2427 MHz
Channel 05:	2432 MHz	Channel 06:	2437 MHz	Channel 07:	2442 MHz	Channel 08:	2447 MHz
Channel 09:	2452 MHz	Channel 10:	2457 MHz	Channel 11:	2462 MHz		

## Note:

1. The EUT is a Plug-in AirPlay speaker with a built-in 2.4GHz WLAN transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report.  
(802.11b is 1Mbps 、 802.11g is 6Mbps)
4. These tests are conducted on a sample for the purpose of demonstrating compliance of 802.11b/g transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices.

Test Mode:	Mode 1: Transmit (802.11b 1Mbps)
	Mode 2: Transmit (802.11g 6Mbps)

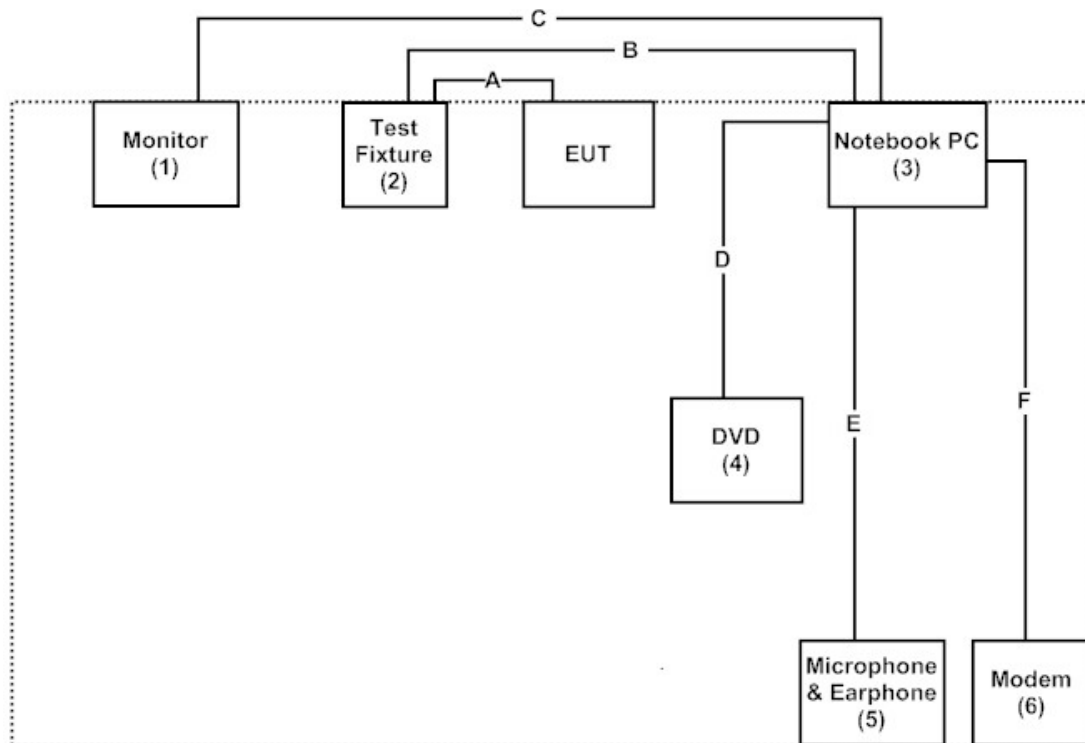
### 1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1 Monitor	LG	W2261VT	907YHZK07373	DoC	Non-Shielded, 1.8m
2 Test Fixture	LITE-ON	N/A	N/A	N/A	N/A
3 Notebook PC	DELL	PPT	N/A	DoC	Non-Shielded, 0.8m
4 DVD	DELL	PDO1S	N/A	N/A	N/A
5 Microphone & Earphone	PCHOME	N/A	N/A	N/A	N/A
6 Modem	ACEEX	DM-1414	0102027558	IFAXDM1414	Non-Shielded, 1.8m

Signal Cable Type	Signal cable Description
A Signal Cable	Non-Shielded, 0.15m
B USB Cable	Non-Shielded, 1.5m
C D-SUB Cable	Shielded, 1.8m, with two ferrite cores bonded.
D DVD Cable	Non-Shielded, 0.5m
E Microphone & Earphone Cable	Non-Shielded, 1.2m
F Modem Cable	Non-Shielded, 1.0m

### 1.4. Configuration of Tested System



## **1.5. EUT Exercise Software**

- (1) Setup the EUT as shown in section 1.4.
- (2) Execute command on the notebook.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Start the continuous transmission.
- (5) Verify that the EUT works properly.



## 1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from

Quietek Corporation's Web Site: <http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site:

<http://www.quietek.com/>

Site Description: File on  
Federal Communications Commission  
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Columbia, MD 21046  
Registration Number: 92195

Accreditation on NVLAP  
NVLAP Lab Code: 200533-0

Site Name: Quietek Corporation  
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FCC Accreditation Number: TW1014

## 2. Conducted Emission

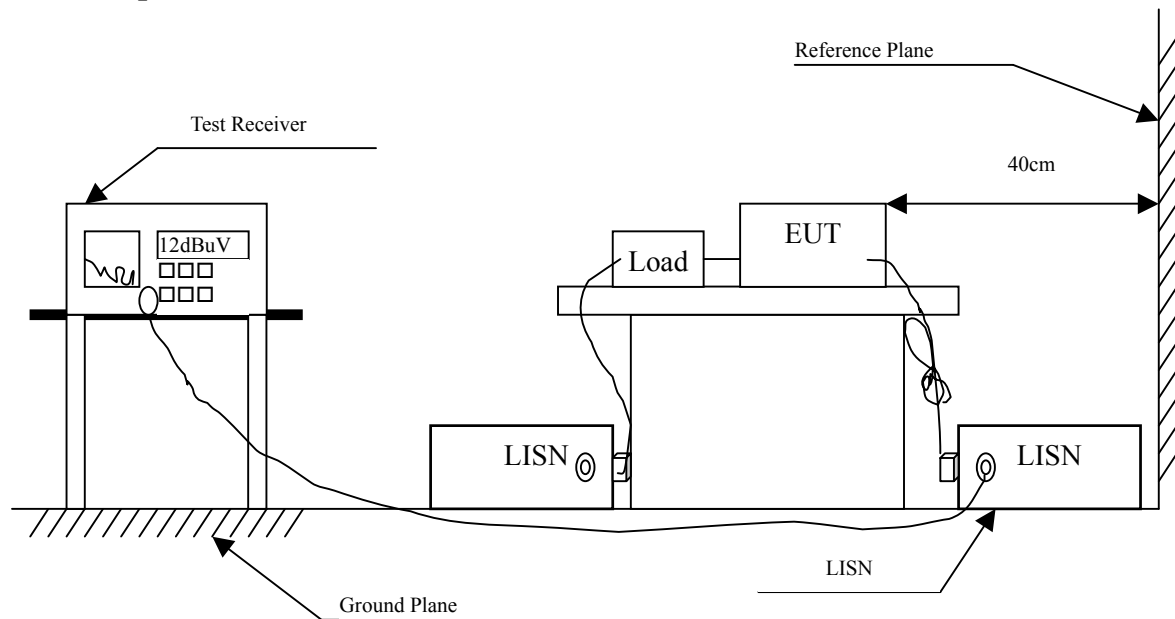
### 2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2012	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2012	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2012	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2012	
5	No.1 Shielded Room			N/A	

Note: All instruments are calibrated every one year.

### 2.2. Test Setup



### 2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBUV) Limit		
Frequency MHz	Limits	
	QP	AVG
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

### 2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

### 2.5. Uncertainty

± 2.26 dB

## 2.6. Test Result of Conducted Emission

Product : Plug-in AirPlay speaker  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>Line 1</b>					
<b>Quasi-Peak</b>					
0.170	9.707	31.540	41.247	-24.182	65.429
0.310	9.640	24.170	33.810	-27.619	61.429
0.392	9.640	32.630	42.270	-16.816	59.086
0.459	9.640	36.160	45.800	-11.371	57.171
2.931	9.690	22.990	32.680	-23.320	56.000
11.392	9.800	24.840	34.640	-25.360	60.000
<b>Average</b>					
0.170	9.707	23.490	33.197	-22.232	55.429
0.310	9.640	20.690	30.330	-21.099	51.429
0.392	9.640	29.290	38.930	-10.156	49.086
0.459	9.640	28.820	38.460	-8.711	47.171
2.931	9.690	11.920	21.610	-24.390	46.000
11.392	9.800	18.310	28.110	-21.890	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : Plug-in AirPlay speaker  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBuV
	dB	dBuV	dBuV		
<b>Line 2</b>					
<b>Quasi-Peak</b>					
0.154	9.727	35.870	45.597	-20.289	65.886
0.392	9.650	33.490	43.140	-15.946	59.086
0.463	9.650	36.080	45.730	-11.327	57.057
0.666	9.650	21.230	30.880	-25.120	56.000
1.388	9.690	24.410	34.100	-21.900	56.000
9.478	9.830	24.470	34.300	-25.700	60.000
<b>Average</b>					
0.154	9.727	28.760	38.487	-17.399	55.886
0.392	9.650	29.930	39.580	-9.506	49.086
0.463	9.650	29.540	39.190	-7.867	47.057
0.666	9.650	13.450	23.100	-22.900	46.000
1.388	9.690	16.920	26.610	-19.390	46.000
9.478	9.830	17.250	27.080	-22.920	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. “ ” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

### 3. Peak Power Output

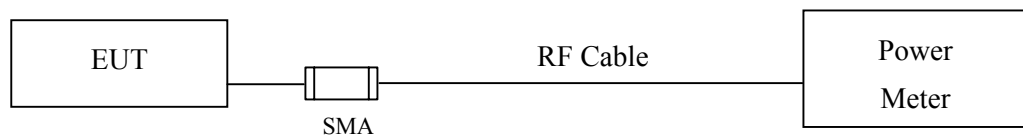
#### 3.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2012
X	Power Sensor	Anritsu	MA2411B/0738448	Jun, 2011

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with "X" are used to measure the final test results.

#### 3.2. Test Setup



#### 3.3. Limits

The maximum peak power shall be less 1 Watt.

#### 3.4. Test Procedure

The EUT was tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

#### 3.5. Uncertainty

$\pm 1.27$  dB

### 3.6. Test Result of Peak Power Output

Product : Plug-in AirPlay speaker  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)

#### COM 1

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11	1		
		Measurement Level (dBm)						
01	2412	16.64	--	--	--	19.29	<30dBm	Pass
06	2437	16.88	16.53	16.37	16.12	19.51	<30dBm	Pass
11	2462	16.96	--	--	--	19.36	<30dBm	Pass

Note: Peak Power Output Value =Reading value on peak power meter + cable loss

#### COM 2

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)				Peak Power	Required Limit	Result
		1	2	5.5	11	1		
		Measurement Level (dBm)						
01	2412	16.83	--	--	--	19.36	<30dBm	Pass
06	2437	17.04	17.01	16.98	16.95	19.52	<30dBm	Pass
11	2462	16.98	--	--	--	19.43	<30dBm	Pass

Note: Peak Power Output Value =Reading value on peak power meter + cable loss

Product : Plug-in AirPlay speaker  
 Test Item : Peak Power Output Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)

## COM 1

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54	6		
		Measurement Level (dBm)										
01	2412	15.32	--	--	--	--	--	--	--	24.03	<30dBm	Pass
06	2437	15.65	15.19	14.81	14.52	14.38	13.85	13.52	13.27	24.01	<30dBm	Pass
11	2462	15.63	--	--	--	--	--	--	--	24.07	<30dBm	Pass

Note: Peak Power Output Value =Reading value on peak power meter + cable loss

## COM 2

Channel No	Frequency (MHz)	Average Power For different Data Rate (Mbps)								Peak Power	Required Limit	Result
		6	9	12	18	24	36	48	54	6		
		Measurement Level (dBm)										
01	2412	15.73	--	--	--	--	--	--	--	24.24	<30dBm	Pass
06	2437	15.71	15.69	15.66	15.64	15.61	15.59	15.55	15.51	24.03	<30dBm	Pass
11	2462	15.64	--	--	--	--	--	--	--	24.18	<30dBm	Pass

Note: Peak Power Output Value =Reading value on peak power meter + cable loss



## 4. Radiated Emission

### 4.1. Test Equipment

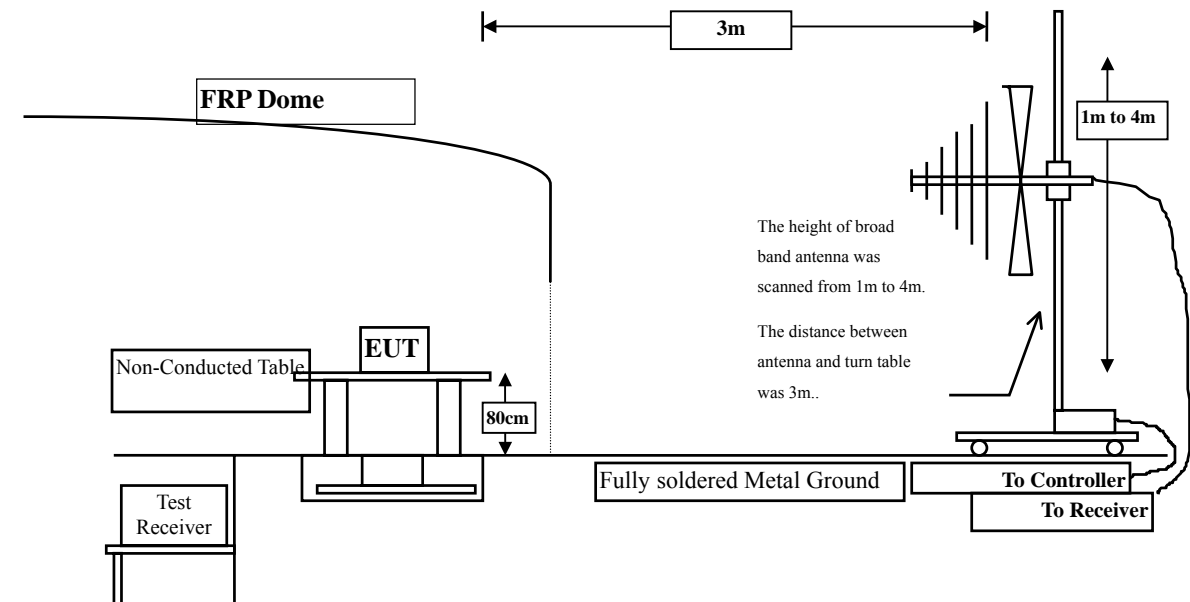
The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2011
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2011
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2011
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2011
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2012
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2011
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2012
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

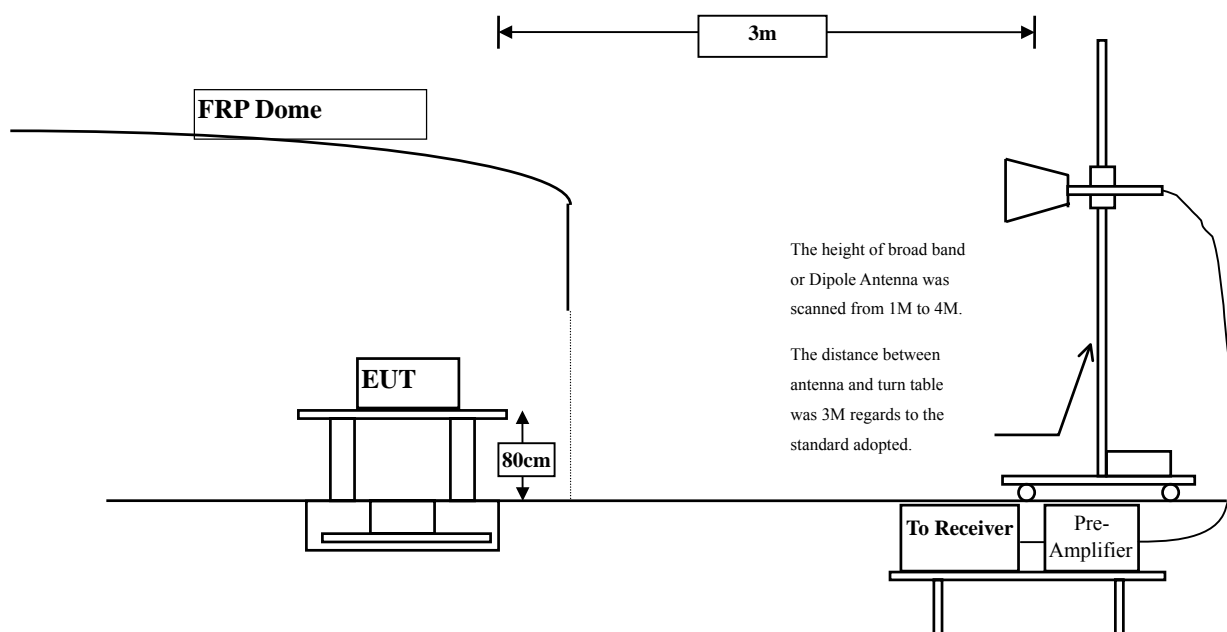
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
  2. The test instruments marked with “X” are used to measure the final test results.

## 4.2. Test Setup

### Radiated Emission Below 1GHz



### Radiated Emission Above 1GHz



### 4.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209(a) Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks: E field strength (dBuV/m) = 20 log E field strength (uV/m)

#### **4.4. Test Procedure**

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2003 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The frequency range from 30MHz to 10th harmonics is checked.

#### **4.5. Uncertainty**

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

#### 4.6. Test Result of Radiated Emission

Product : Plug-in AirPlay speaker  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

##### Horizontal

##### Peak Detector:

4824.000	0.428	42.250	42.679	-31.321	74.000
7236.000	7.177	39.400	46.577	-27.423	74.000
9648.000	8.019	40.980	49.000	-25.000	74.000

##### Average Detector:

--

##### Vertical

##### Peak Detector:

4824.000	0.836	41.810	42.647	-31.353	74.000
7236.000	7.676	39.240	46.916	-27.084	74.000
9648.000	8.556	39.940	48.497	-25.503	74.000

##### Average Detector:

--

##### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Plug-in AirPlay speaker  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4874.000	0.076	41.730	41.807	-32.193	74.000
7311.000	7.512	38.620	46.132	-27.868	74.000
9748.000	7.630	39.050	46.680	-27.320	74.000
<b>Average Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
4874.000	0.532	41.620	42.152	-31.848	74.000
7311.000	8.089	38.270	46.359	-27.641	74.000
9748.000	8.266	39.190	47.457	-26.543	74.000
<b>Average Detector:</b>					
--					

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Plug-in AirPlay speaker  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

#### Horizontal

##### Peak Detector:

4924.000	0.191	40.880	41.071	-32.929	74.000
7386.000	8.373	38.330	46.704	-27.296	74.000
9848.000	7.964	39.660	47.624	-26.376	74.000

##### Average Detector:

--

#### Vertical

##### Peak Detector:

4924.000	0.805	40.970	41.775	-32.225	74.000
7386.000	9.180	39.030	48.210	-25.790	74.000
9848.000	8.801	39.590	48.391	-25.609	74.000

##### Average Detector:

--

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Plug-in AirPlay speaker  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

#### Horizontal

##### Peak Detector:

4824.000	0.428	42.120	42.549	-31.451	74.000
7236.000	7.177	39.570	46.747	-27.253	74.000
9648.000	8.019	41.390	49.410	-24.590	74.000

##### Average Detector:

--

#### Vertical

##### Peak Detector:

4824.000	0.836	42.220	43.057	-30.943	74.000
7236.000	7.676	39.520	47.196	-26.804	74.000
9648.000	8.556	40.170	48.727	-25.273	74.000

##### Average Detector:

--

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Product : Plug-in AirPlay speaker  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m

#### Horizontal

##### Peak Detector:

4874.000	0.076	42.390	42.467	-31.533	74.000
7311.000	7.512	39.110	46.622	-27.378	74.000
9748.000	7.630	39.480	47.110	-26.890	74.000

##### Average Detector:

--

##### Peak Detector:

4874.000	0.532	41.450	41.982	-32.018	74.000
7311.000	8.089	38.920	47.009	-26.991	74.000
9748.000	8.266	39.660	47.927	-26.073	74.000

##### Average Detector:

--

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Plug-in AirPlay speaker  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m

#### Horizontal

##### Peak Detector:

4924.000	0.191	42.260	42.451	-31.549	74.000
7386.000	8.373	38.620	46.994	-27.006	74.000
9848.000	7.964	40.290	48.254	-25.746	74.000

##### Average Detector:

--

#### Vertical

##### Peak Detector:

4924.000	0.805	40.880	41.685	-32.315	74.000
7386.000	9.180	38.720	47.900	-26.100	74.000
9848.000	8.801	39.840	48.641	-25.359	74.000

##### Average Detector:

--

#### Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Plug-in AirPlay speaker  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)(2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
105.509	-7.706	44.428	36.723	-6.777	43.500
479.182	1.897	40.864	42.761	-3.239	46.000
608.902	3.820	35.951	39.771	-6.229	46.000
744.431	3.900	37.215	41.115	-4.885	46.000
788.962	6.202	35.713	41.915	-4.085	46.000
959.341	6.645	33.955	40.600	-5.400	46.000
<b>Vertical</b>					
140.359	-5.529	43.301	37.771	-5.729	43.500
479.182	-3.410	42.973	39.563	-6.437	46.000
608.902	2.143	36.165	38.307	-7.693	46.000
788.962	2.711	38.900	41.611	-4.389	46.000
879.960	1.223	37.639	38.862	-7.138	46.000
924.491	3.159	35.432	38.591	-7.409	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Plug-in AirPlay speaker  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)(2437 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
<b>Horizontal</b>					
223.613	-10.078	48.993	38.916	-7.084	46.000
479.182	1.897	40.560	42.457	-3.543	46.000
558.563	2.351	39.261	41.612	-4.388	46.000
788.962	6.202	35.130	41.332	-4.668	46.000
879.960	6.658	36.023	42.681	-3.319	46.000
959.341	6.645	36.235	42.880	-3.120	46.000
<b>Vertical</b>					
159.721	-5.127	40.290	35.163	-8.337	43.500
382.375	0.431	35.799	36.231	-9.769	46.000
479.182	-3.410	43.750	40.340	-5.660	46.000
608.902	2.143	35.845	37.987	-8.013	46.000
788.962	2.711	38.999	41.710	-4.290	46.000
924.491	3.159	35.541	38.700	-7.300	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

## 5. RF antenna conducted test

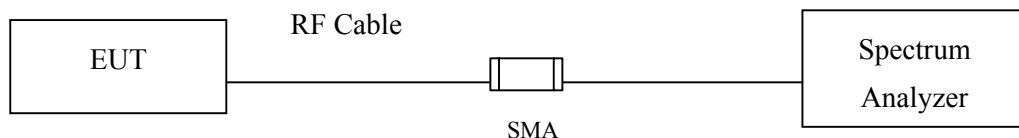
### 5.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2011
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2011
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2012

Note: 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.  
2. The test instruments marked with "X" are used to measure the final test results.

### 5.2. Test Setup

#### RF antenna Conducted Measurement:



### 5.3. Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. 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)).

### 5.4. Test Procedure

The EUT was tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

## 5.5. Uncertainty

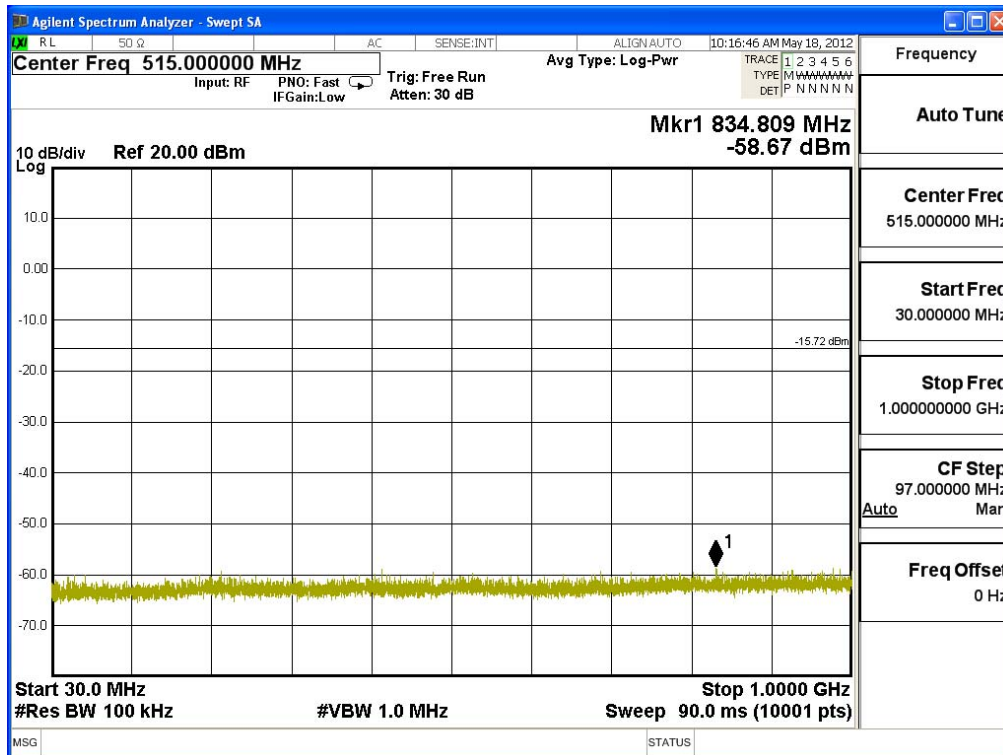
The measurement uncertainty

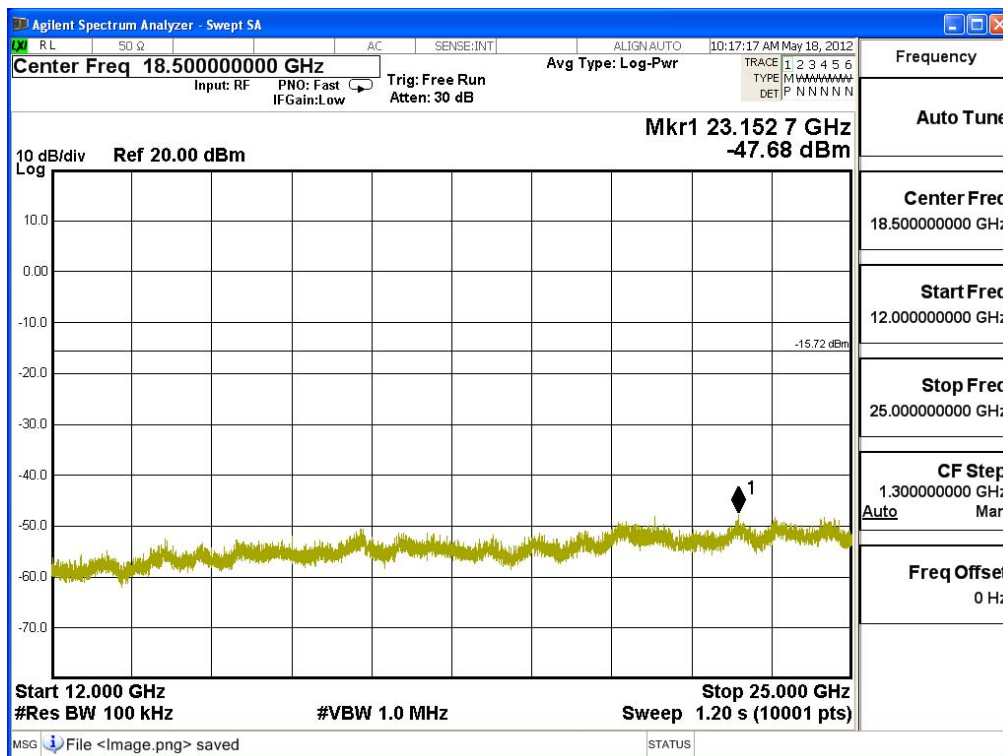
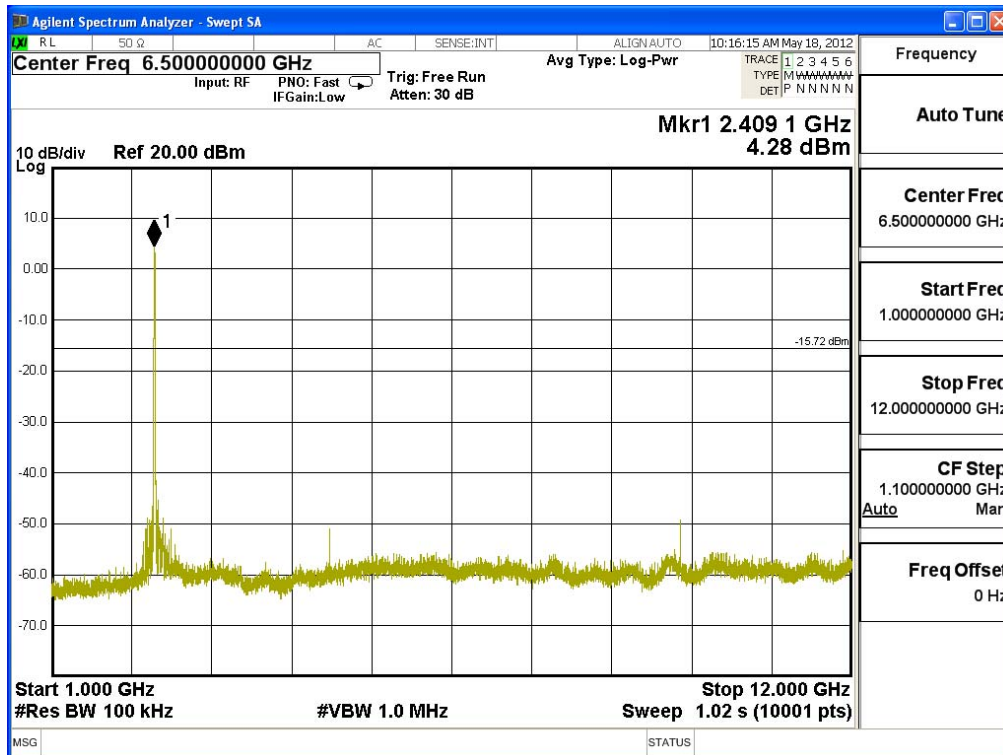
Conducted is defined as  $\pm 1.27\text{dB}$

## 5.6. Test Result of RF antenna conducted test

Product : Plug-in AirPlay speaker  
 Test Item : RF antenna conducted test  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)

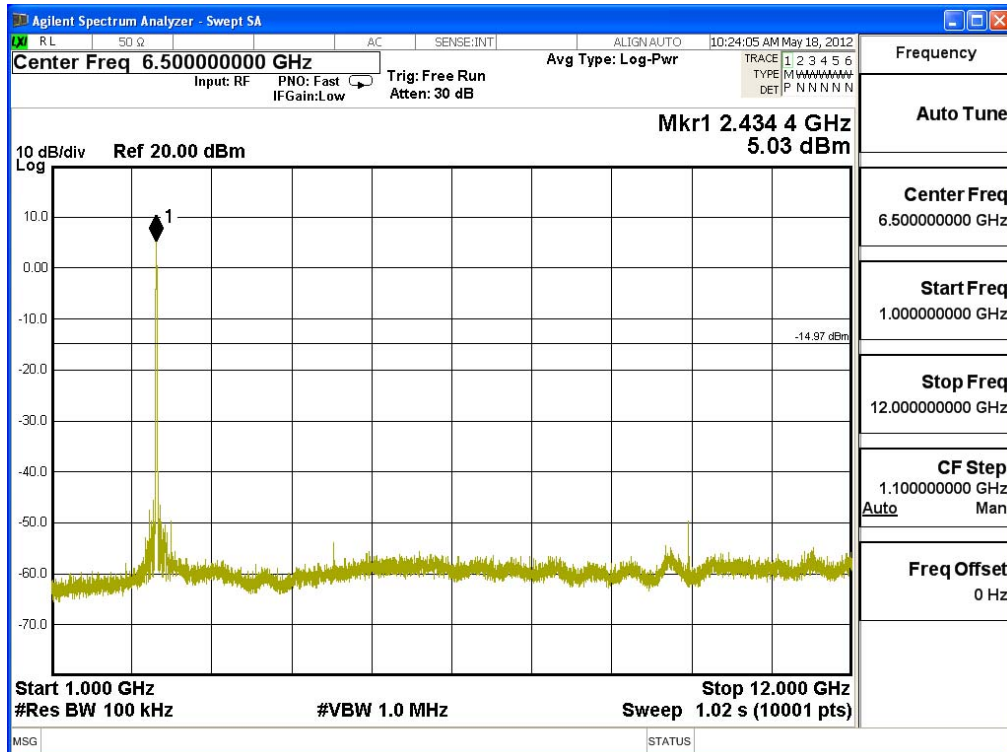
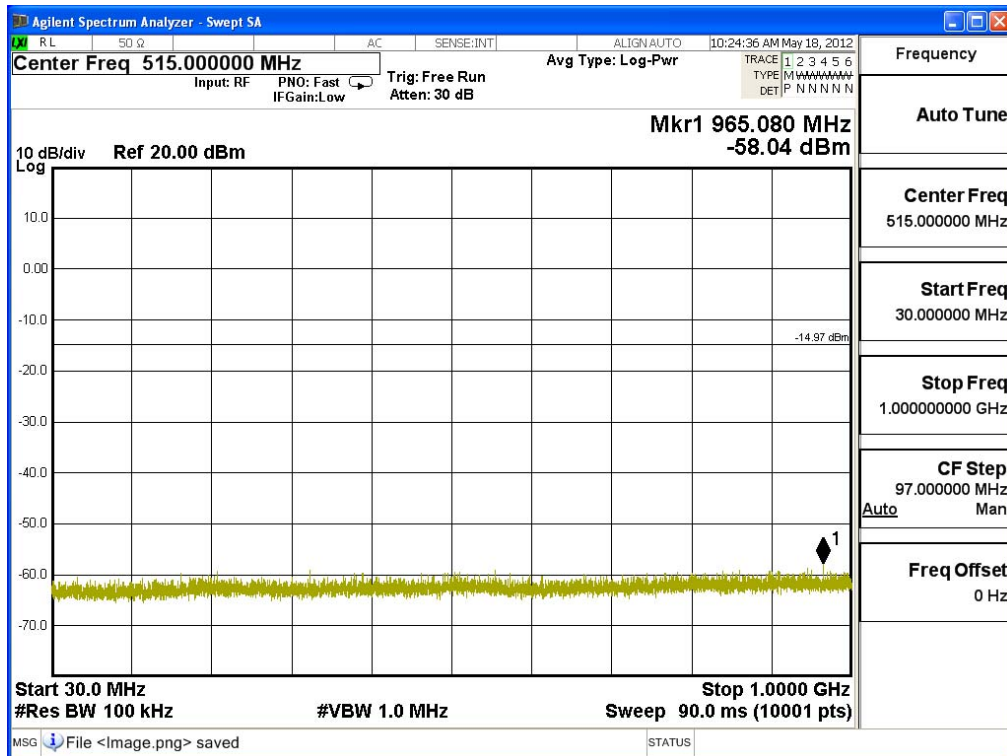
### Channel 01 (2412MHz)

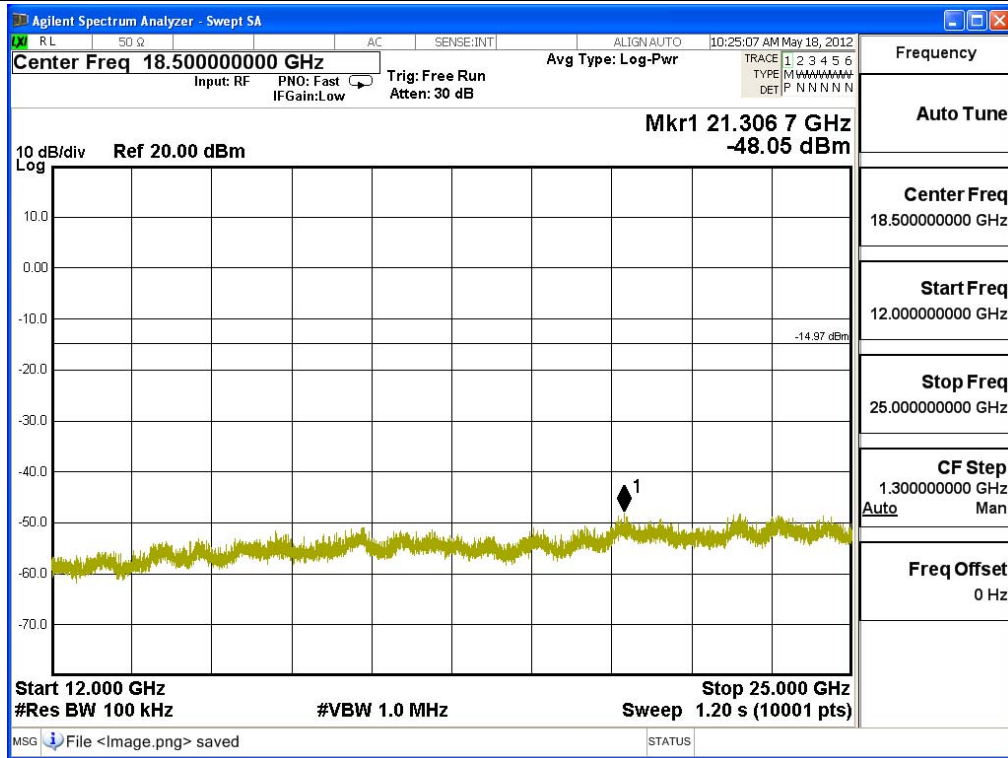




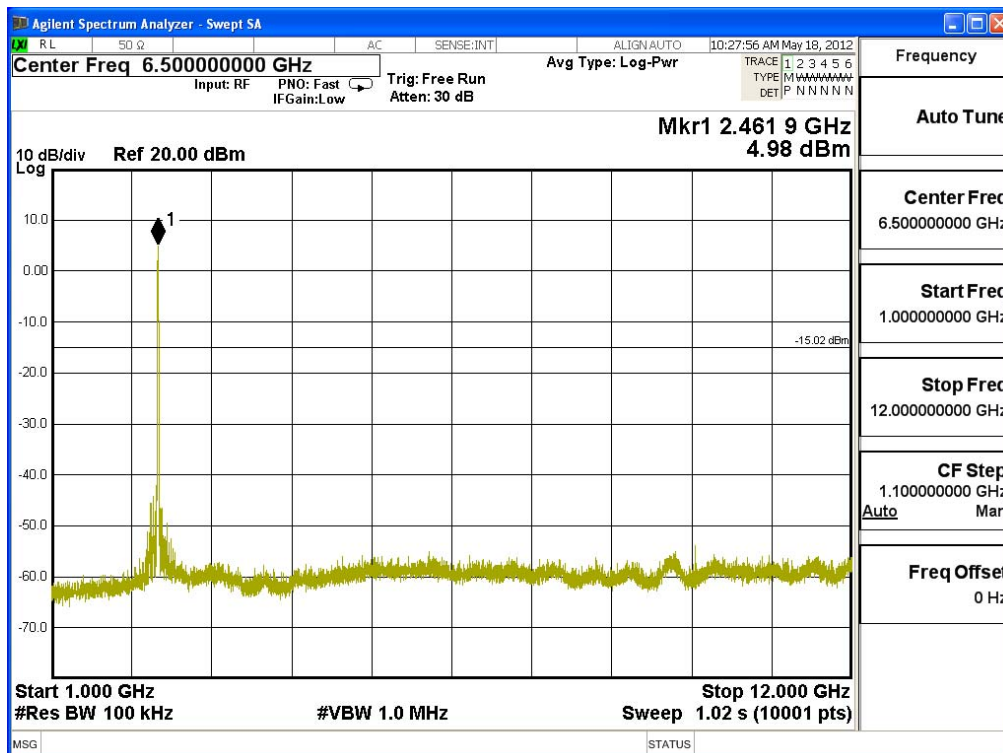
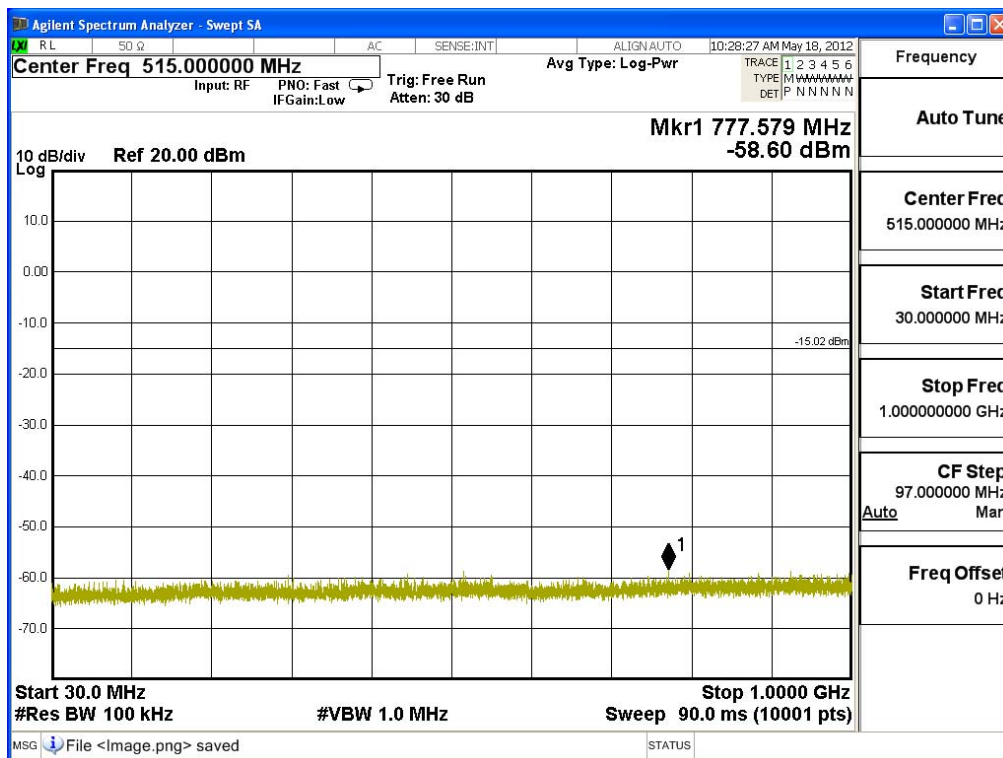


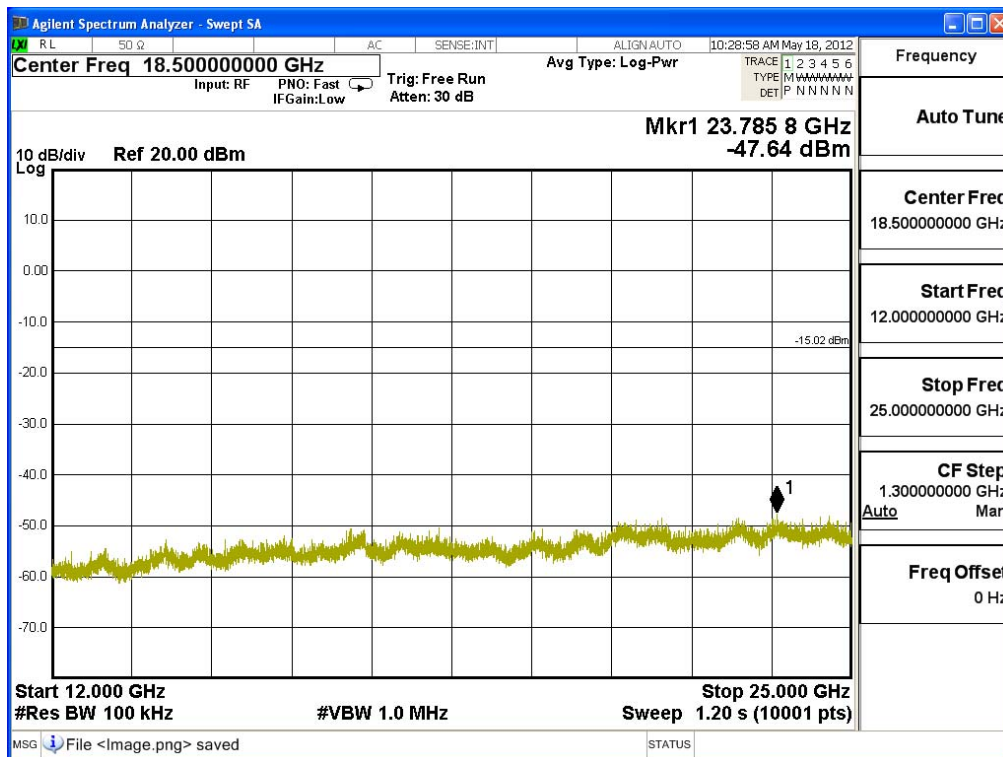
### Channel 06 (2437MHz)





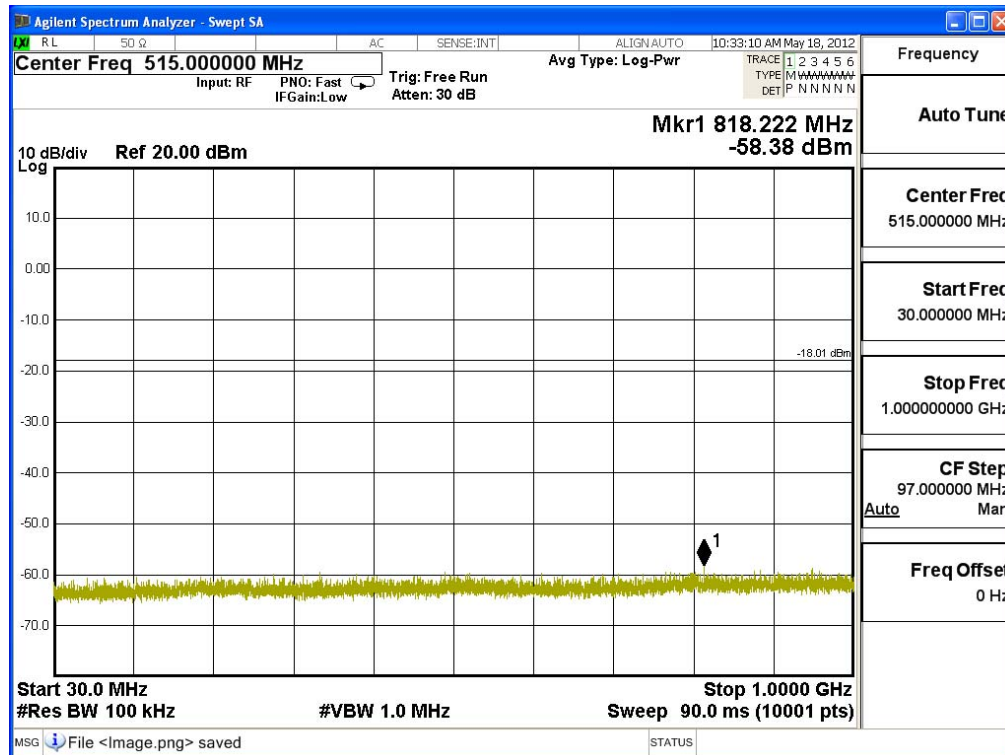
### Channel 11 (2462MHz)

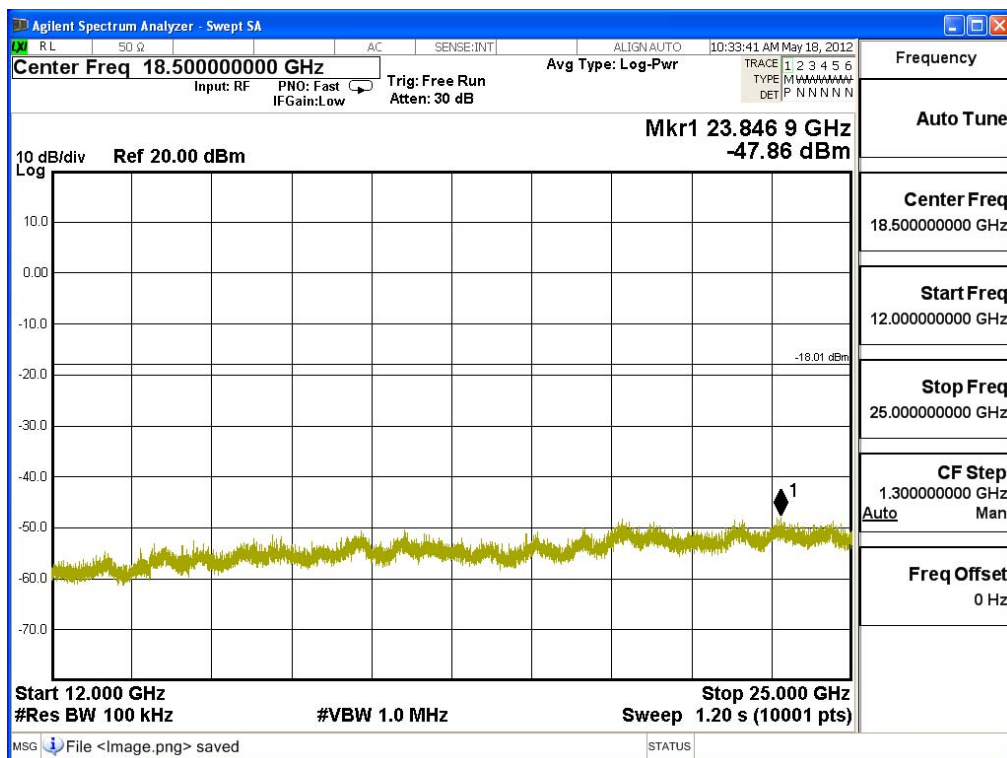
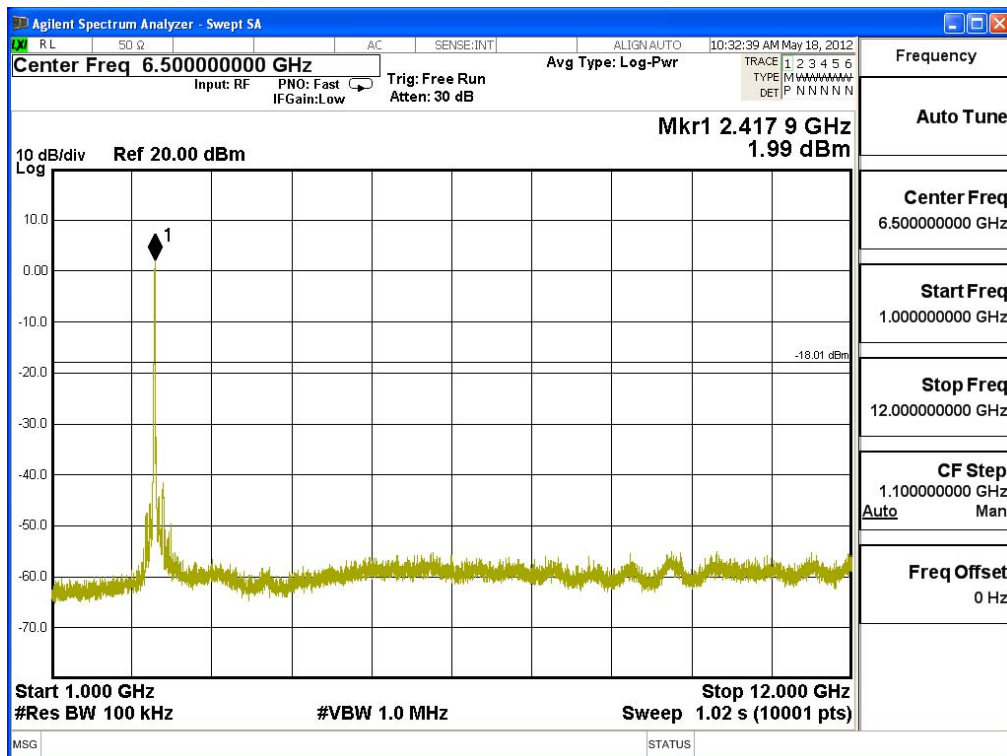




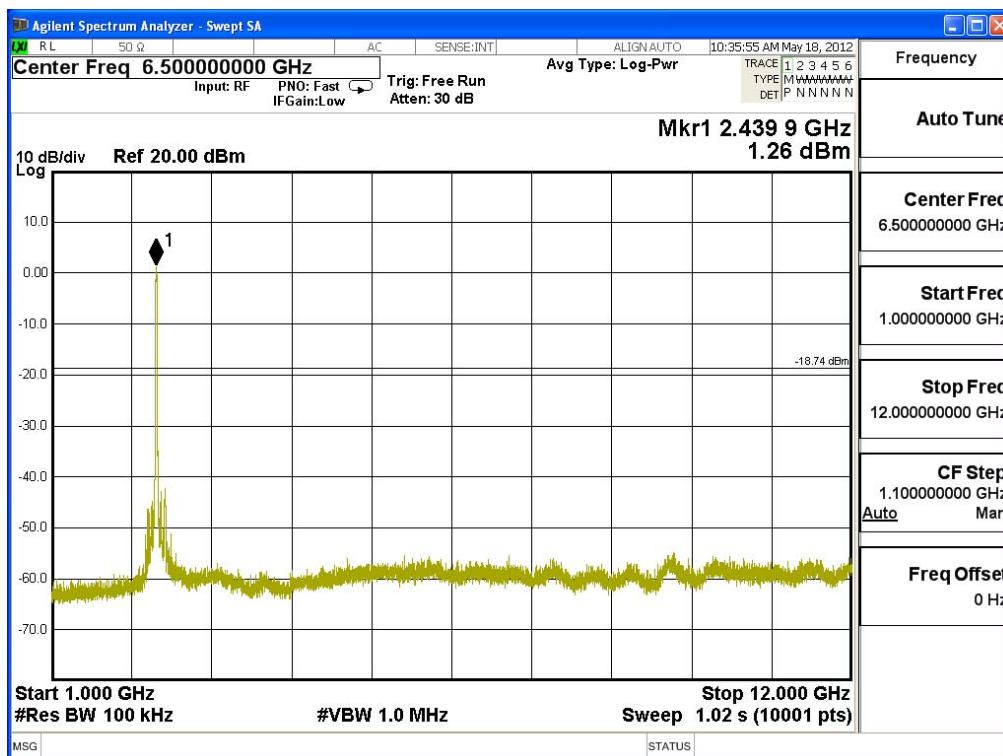
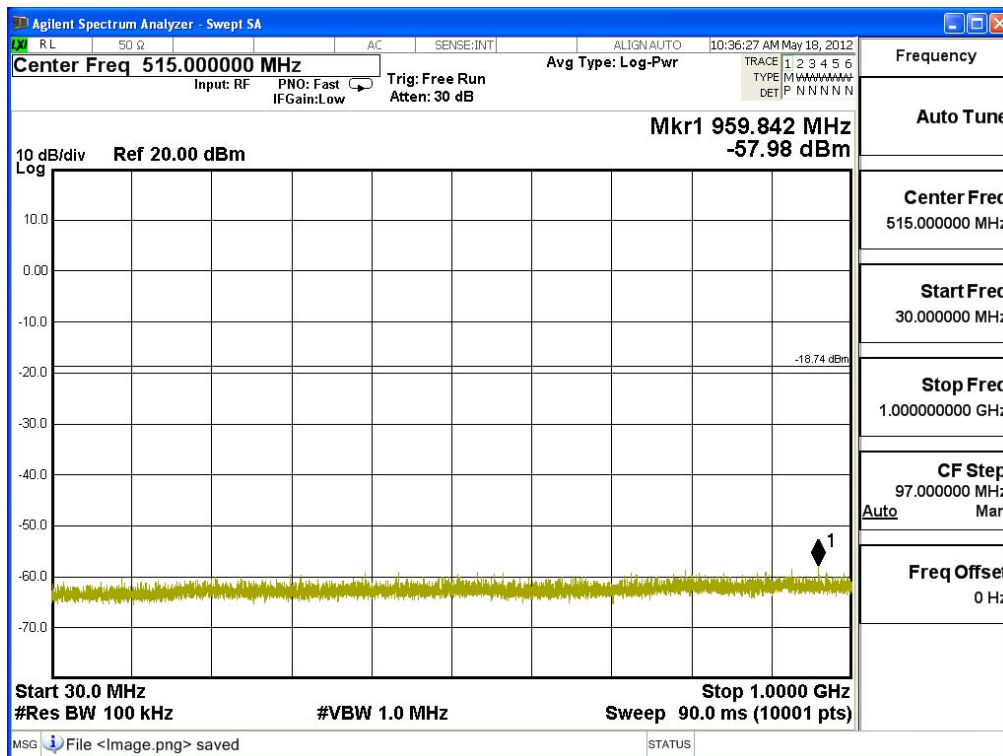
Product : Plug-in AirPlay speaker  
 Test Item : RF Antenna Conducted Spurious  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)

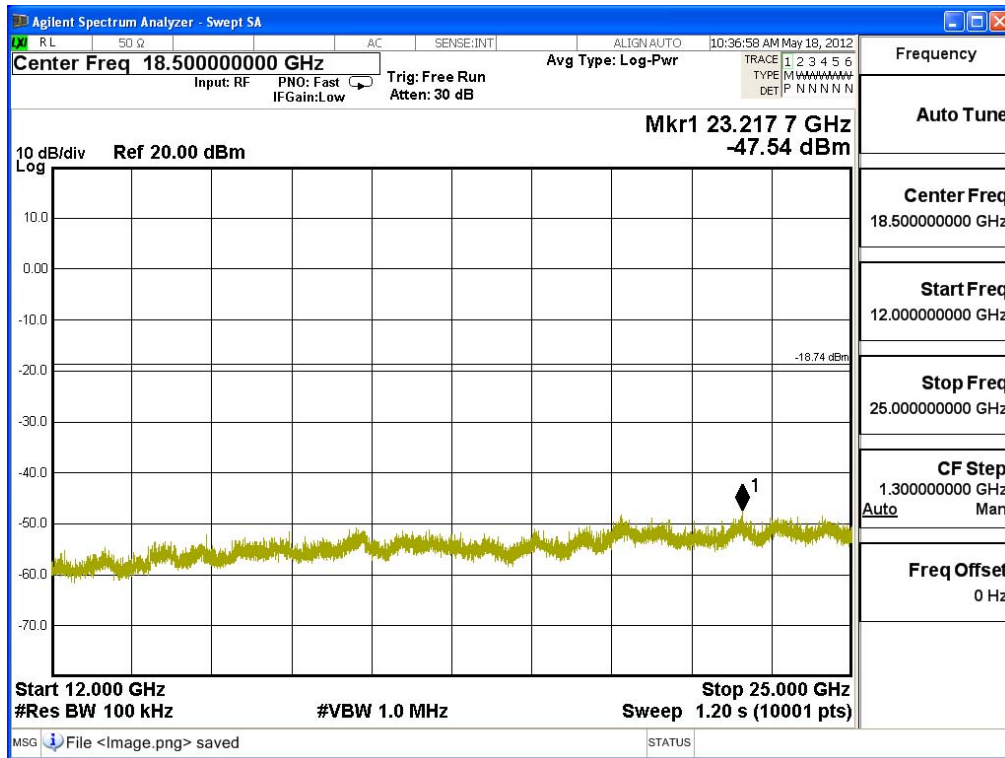
Channel 01 (2412MHz)





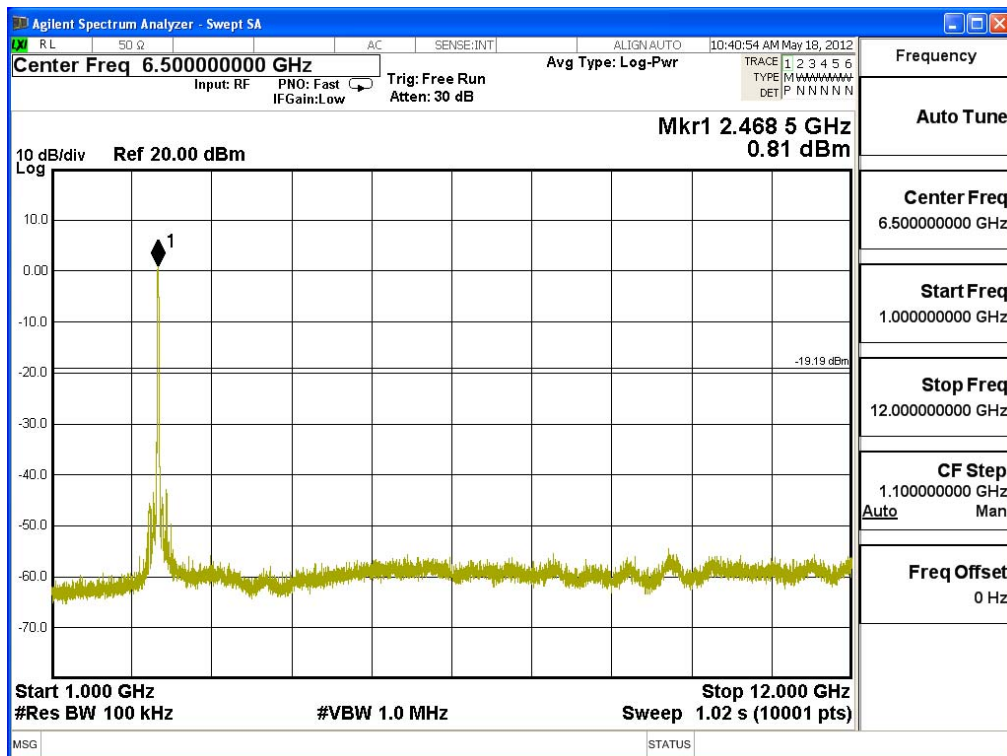
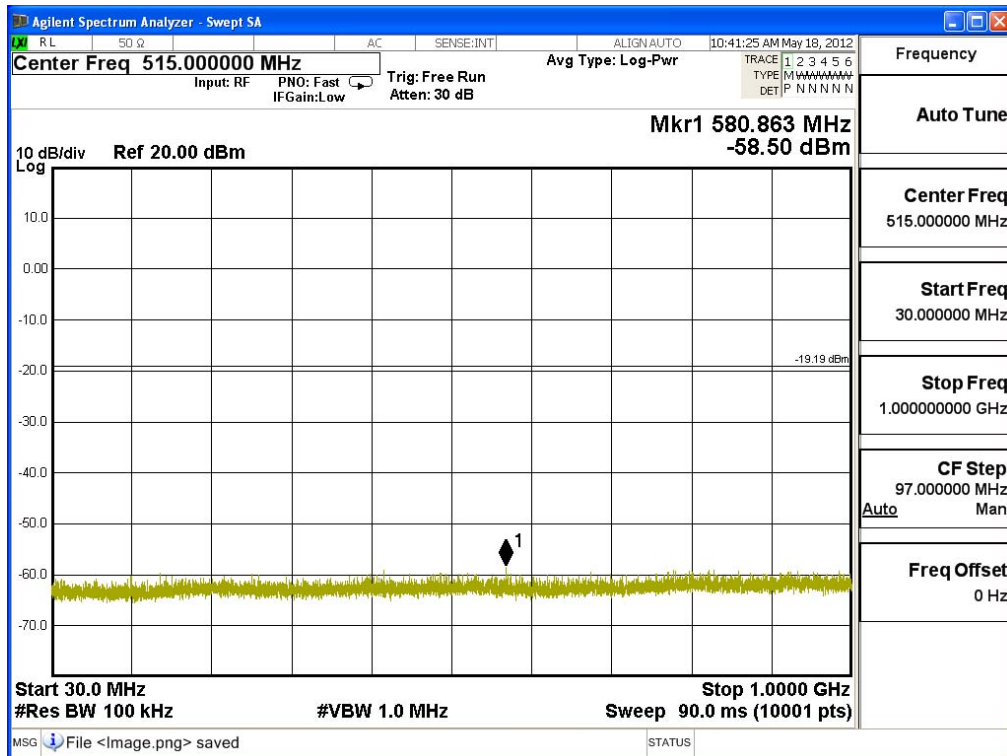
### Channel 06 (2437MHz)

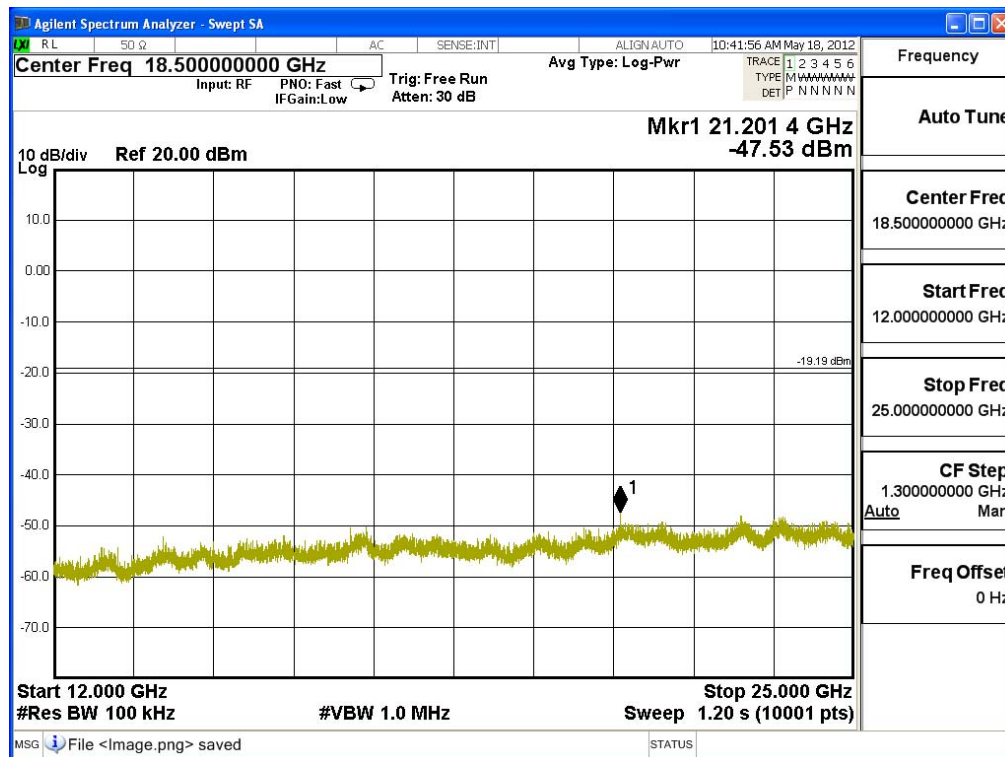






### Channel 11 (2462MHz)





## 6. Band Edge

### 6.1. Test Equipment

#### RF Conducted Measurement

The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2011
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2011
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2012

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

#### RF Radiated Measurement:

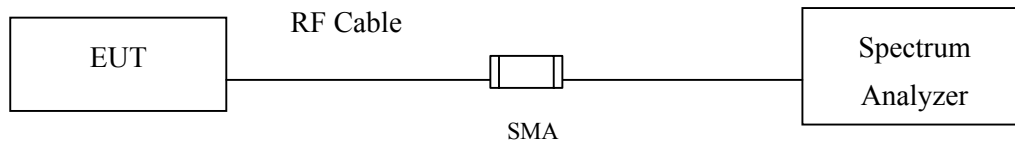
The following test equipments are used during the band edge tests:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2011
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2011
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2011
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2011
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2012
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2011
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2012
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

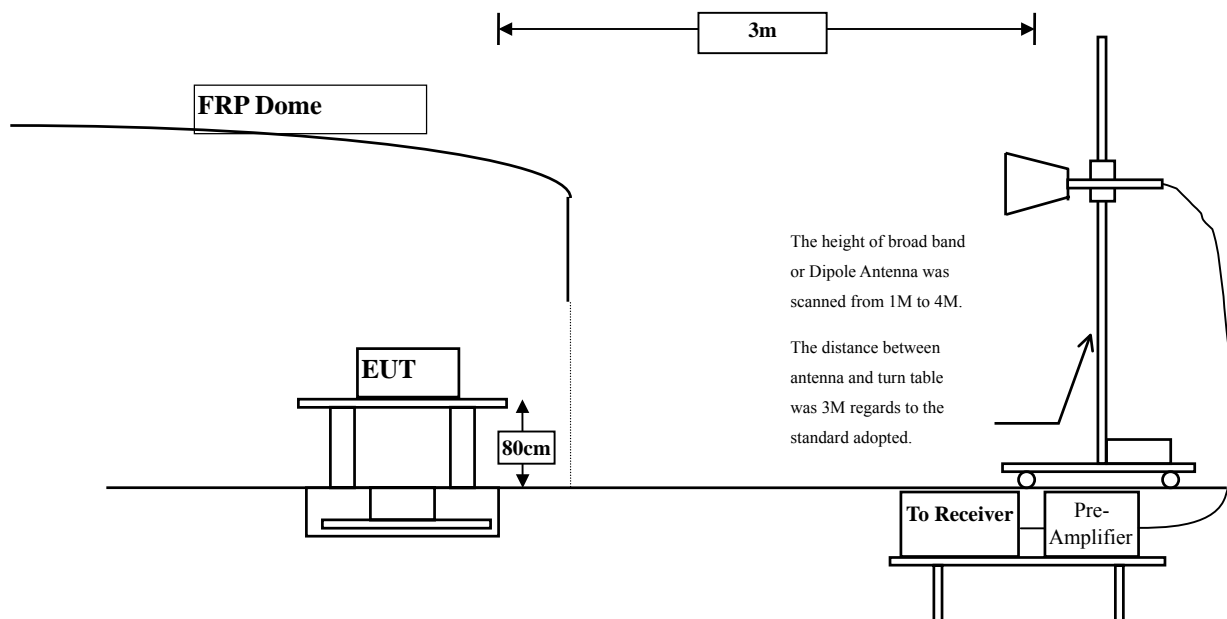
- Note:
1. All instruments are calibrated every one year.
  2. The test instruments marked by “X” are used to measure the final test results.

## 6.2. Test Setup

### RF Conducted Measurement:



### RF Radiated Measurement:



## 6.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

#### **6.4. Test Procedure**

The EUT was setup according to ANSI C63.4, 2003 and tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2003 on radiated measurement.

#### **6.5. Uncertainty**

$\pm 3.9$  dB above 1GHz

$\pm 3.8$  dB below 1GHz

## 6.6. Test Result of Band Edge

Product : Plug-in AirPlay speaker  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)

### RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2387.505	31.738	26.628	58.365	74.000	54.000	Pass
01 (Peak)	2390.000	31.739	24.894	56.633	74.000	54.000	Pass
01 (Peak)	2412.854	31.775	70.691	102.465	--	--	--
01 (Average)	2386.108	31.736	15.579	47.315	74.000	54.000	Pass
01 (Average)	2390.000	31.739	14.867	46.606	74.000	54.000	Pass
01 (Average)	2411.058	31.770	67.035	98.805	--	--	--

Figure Channel 01: Horizontal (Peak)

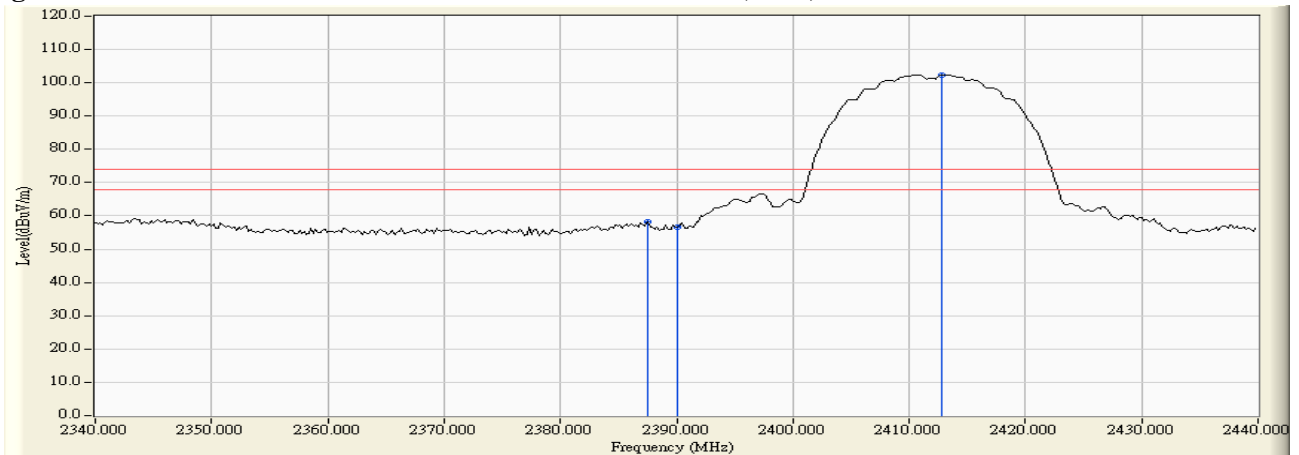
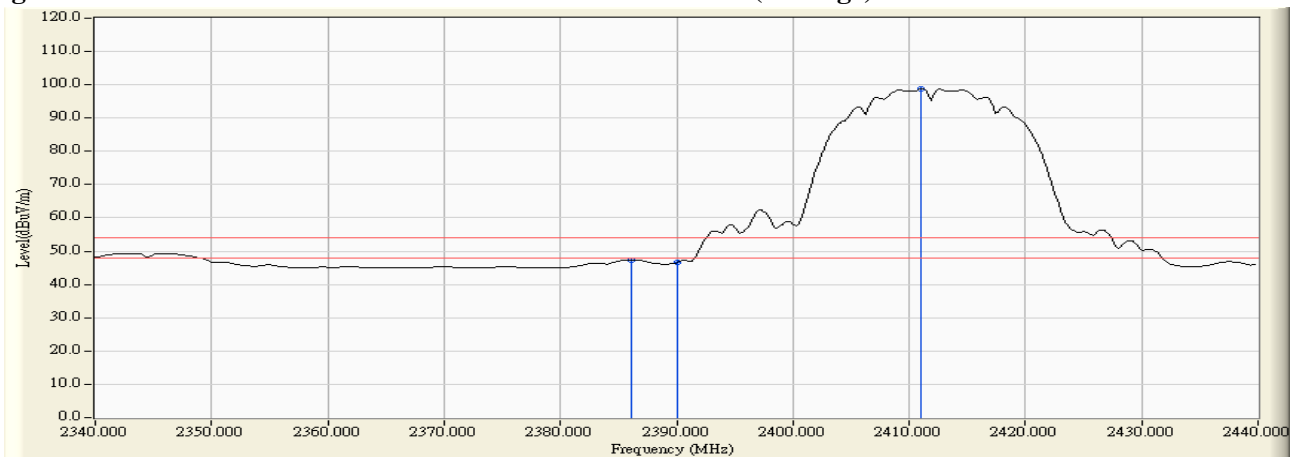


Figure Channel 01: Horizontal (Average)



Note:

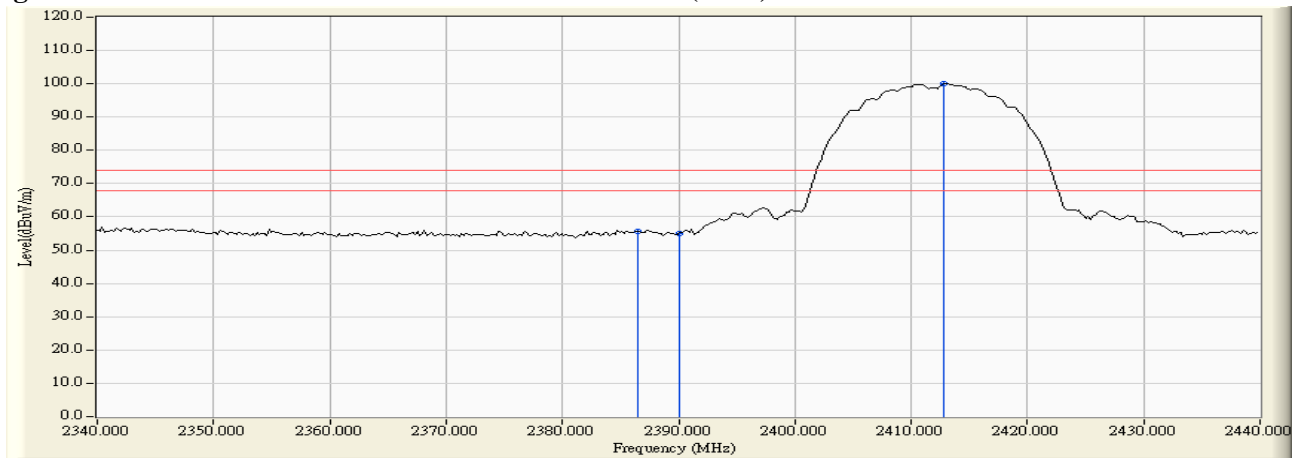
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Plug-in AirPlay speaker  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)

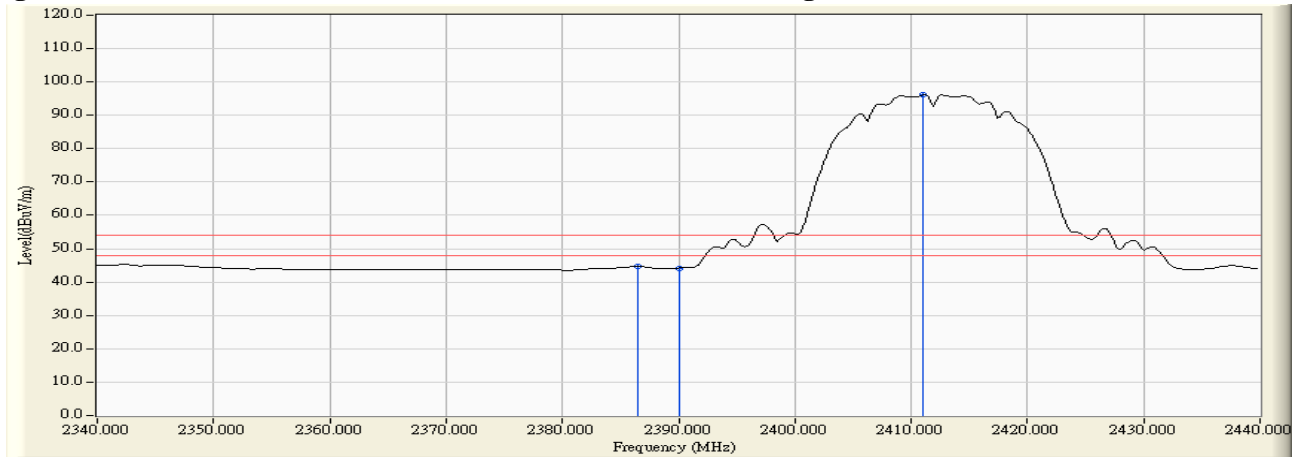
**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2386.507	30.291	25.525	55.816	74.000	54.000	Pass
01 (Peak)	2390.000	30.267	24.832	55.099	74.000	54.000	Pass
01 (Peak)	2412.854	30.254	69.703	99.956	--	--	--
01 (Average)	2386.507	30.291	14.373	44.664	74.000	54.000	Pass
01 (Average)	2390.000	30.267	13.931	44.198	74.000	54.000	Pass
01 (Average)	2411.058	30.245	65.978	96.223	--	--	--

**Figure Channel 01: Vertical (Peak)**



**Figure Channel 01: Vertical (Average)**



Note:

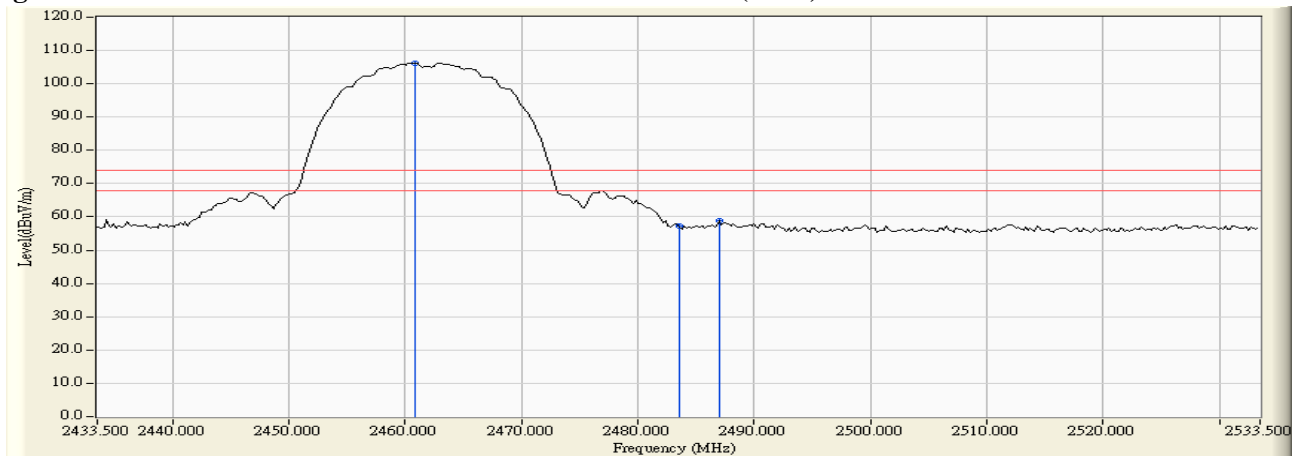
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Plug-in AirPlay speaker  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)

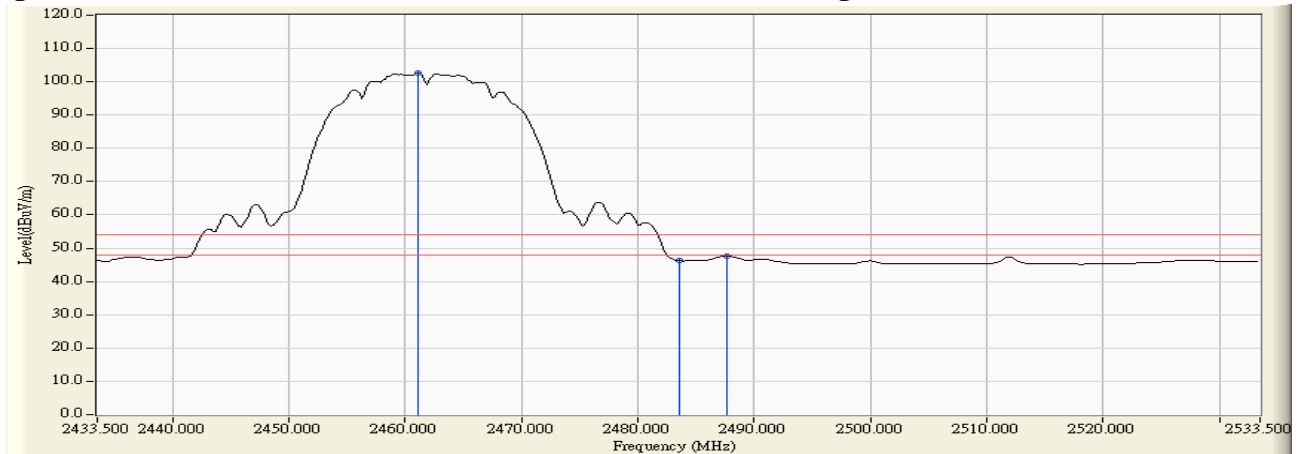
**RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2460.845	31.890	74.345	106.234	--	--	--
11 (Peak)	2483.500	31.951	25.242	57.192	74.000	54.000	Pass
11 (Peak)	2486.993	31.959	26.787	58.746	74.000	54.000	Pass
11 (Average)	2461.045	31.890	70.693	102.583	--	--	--
11 (Average)	2483.500	31.951	14.273	46.223	74.000	54.000	Pass
11 (Average)	2487.592	31.961	15.635	47.596	74.000	54.000	Pass

**Figure Channel 11: Horizontal (Peak)**



**Figure Channel 11: Horizontal (Average)**



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

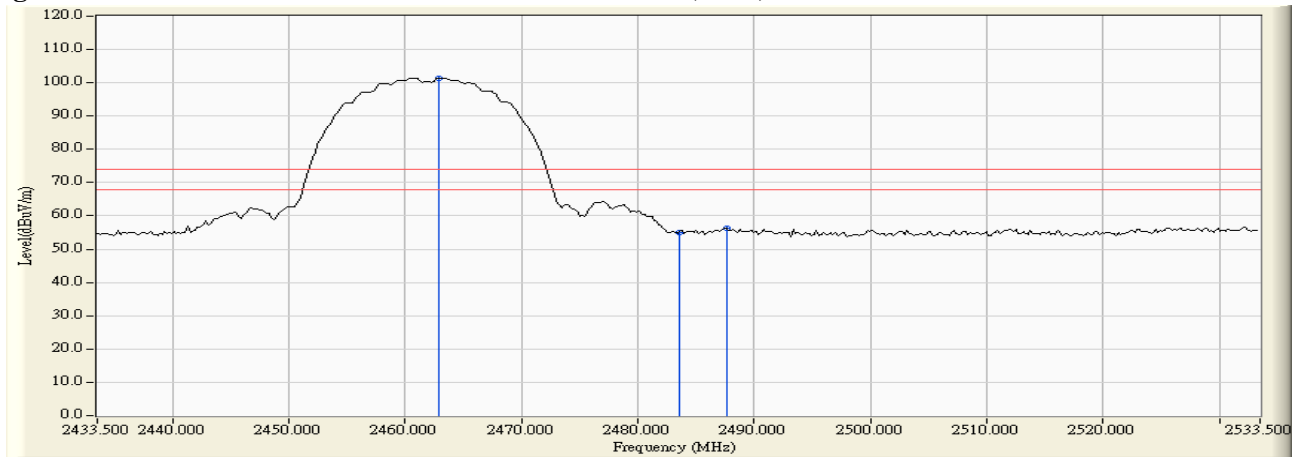


Product : Plug-in AirPlay speaker  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps)

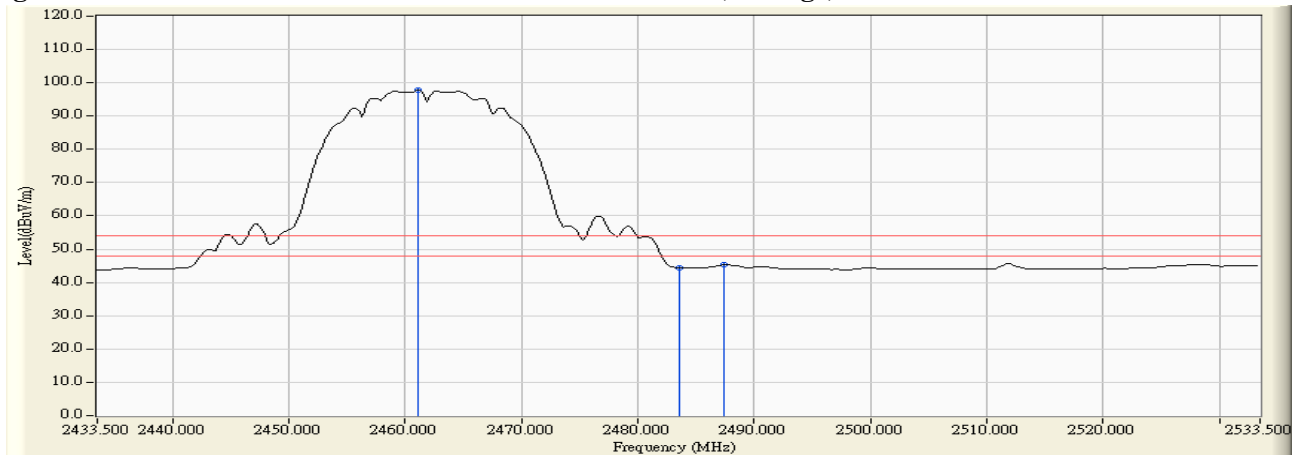
**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2462.841	30.485	70.904	101.388	--	--	--
11 (Peak)	2483.500	30.586	24.525	55.110	74.000	54.000	Pass
11 (Peak)	2487.592	30.605	25.589	56.194	74.000	54.000	Pass
11 (Average)	2461.045	30.476	67.272	97.748	--	--	--
11 (Average)	2483.500	30.586	13.826	44.411	74.000	54.000	Pass
11 (Average)	2487.392	30.603	14.625	45.229	74.000	54.000	Pass

**Figure Channel 11: Vertical (Peak)**



**Figure Channel 11: Vertical (Average)**



Note:

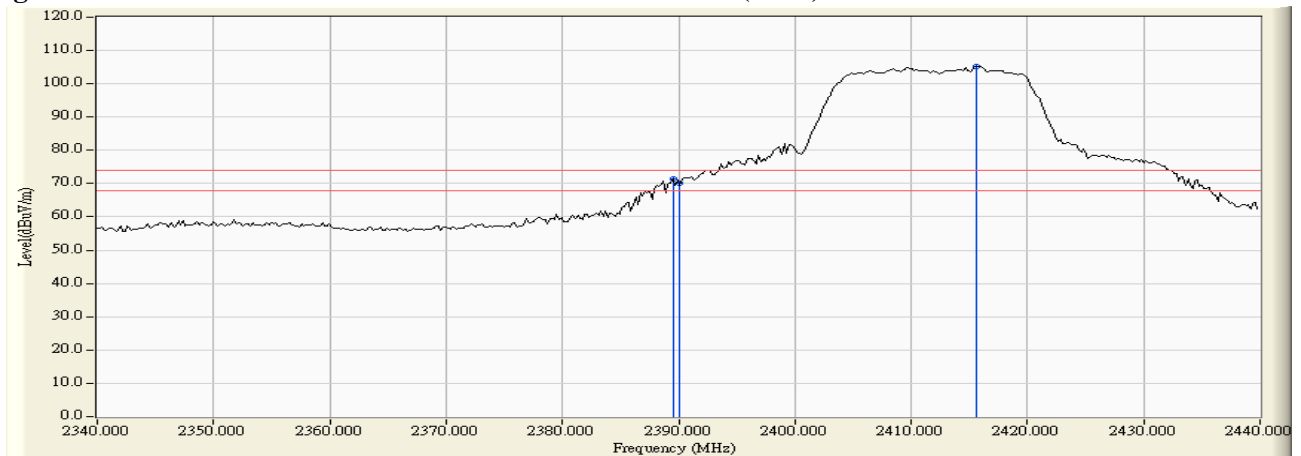
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Plug-in AirPlay speaker  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)

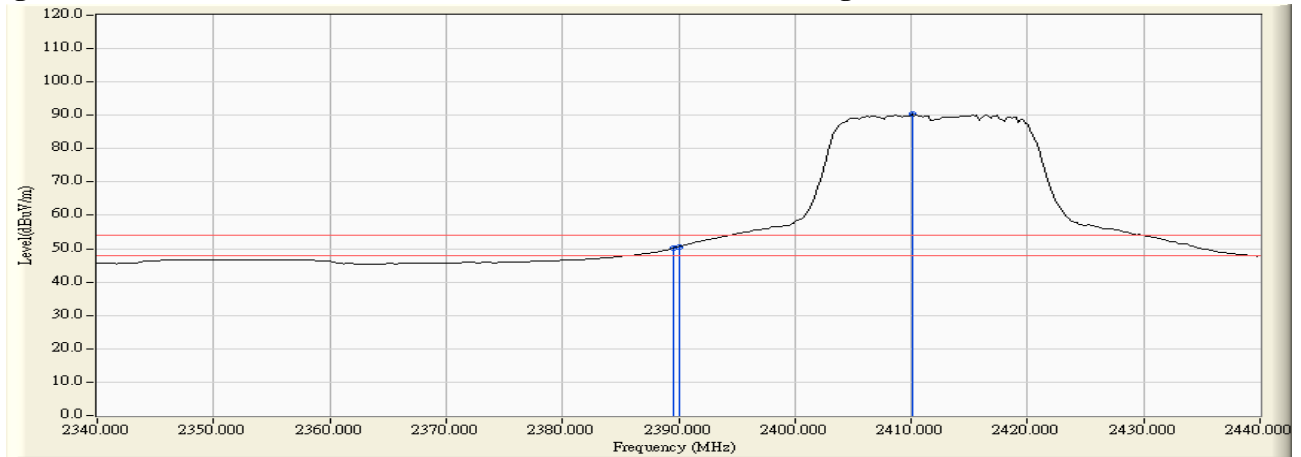
**RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2389.501	31.739	39.692	71.430	74.000	54.000	Pass
01 (Peak)	2390.000	31.739	38.480	70.219	74.000	54.000	Pass
01 (Peak)	2415.649	31.781	73.411	105.192	--	--	--
01 (Average)	2389.501	31.739	18.326	50.064	74.000	54.000	Pass
01 (Average)	2390.000	31.739	18.821	50.560	74.000	54.000	Pass
01 (Average)	2410.060	31.768	58.535	90.303	--	--	--

**Figure Channel 01: Horizontal (Peak)**



**Figure Channel 01: Horizontal (Average)**



Note:

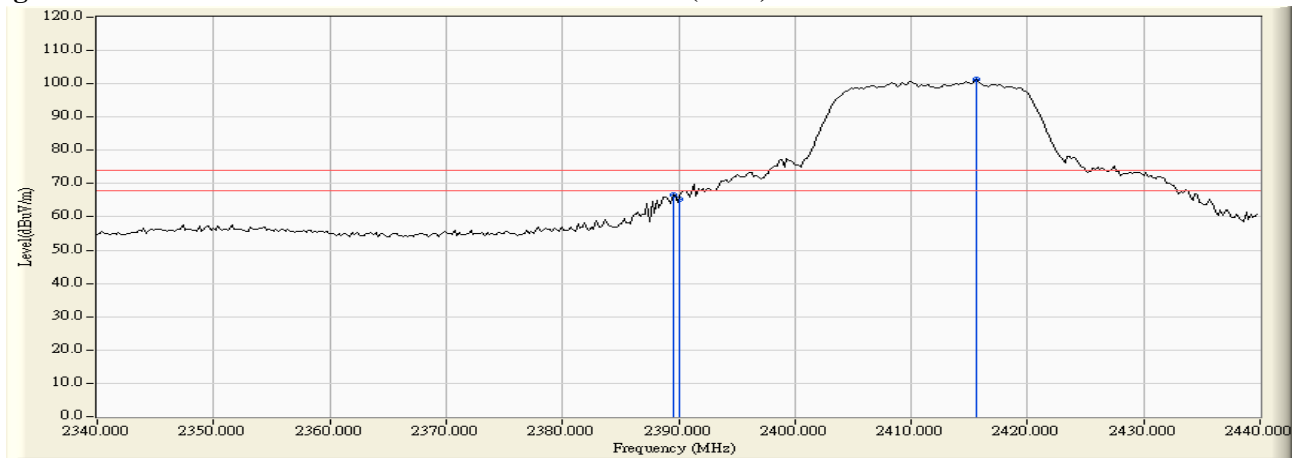
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Plug-in AirPlay speaker  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)

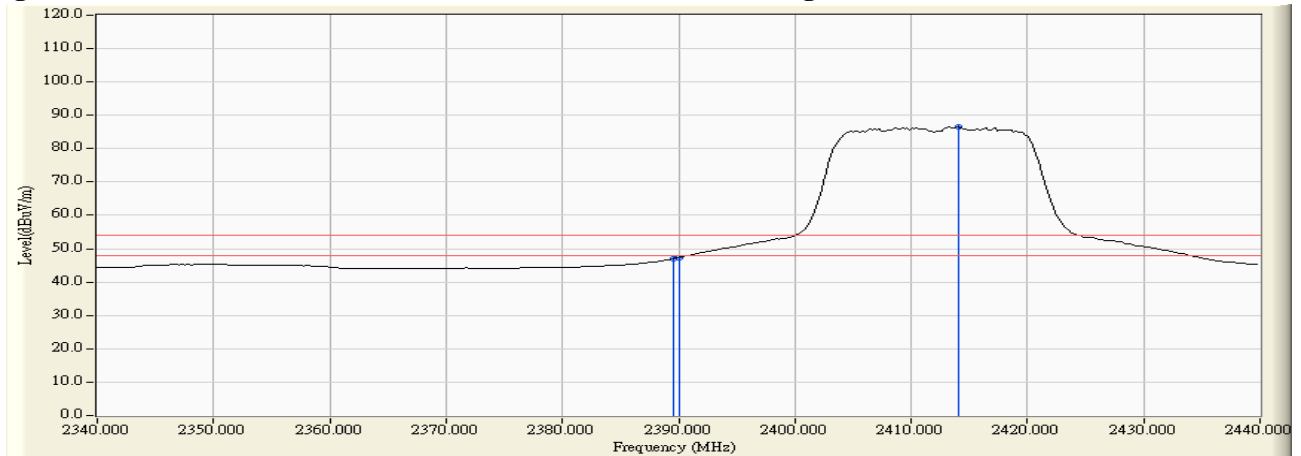
**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2389.501	30.271	36.170	66.440	74.000	54.000	Pass
01 (Peak)	2390.000	30.267	34.979	65.246	74.000	54.000	Pass
01 (Peak)	2415.649	30.265	71.035	101.300	--	--	--
01 (Average)	2389.501	30.271	16.733	47.003	74.000	54.000	Pass
01 (Average)	2390.000	30.267	17.125	47.392	74.000	54.000	Pass
01 (Average)	2414.052	30.258	56.204	86.462	--	--	--

**Figure Channel 01: Vertical (Peak)**



**Figure Channel 01: Vertical (Average)**



Note:

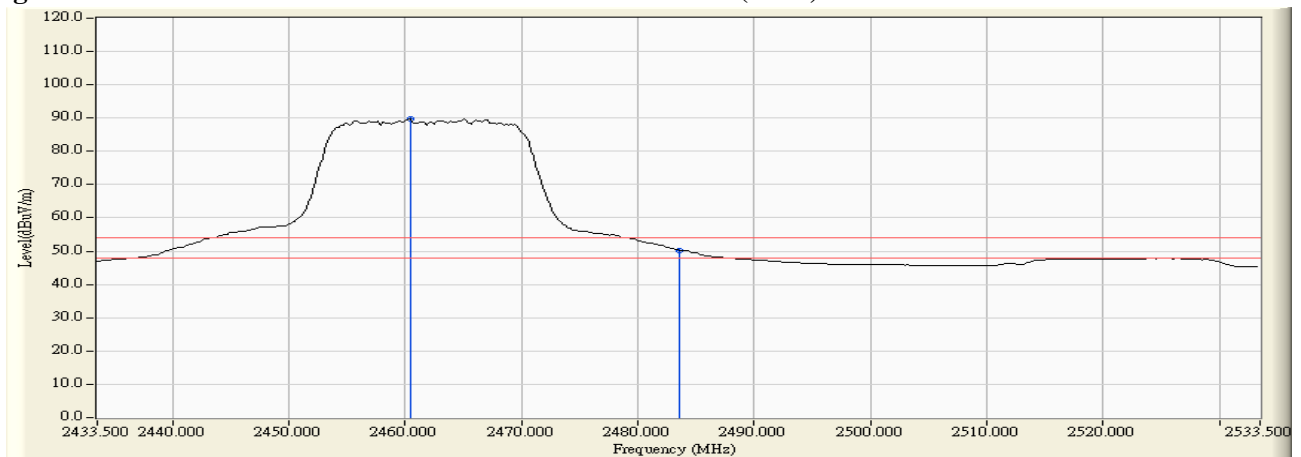
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Plug-in AirPlay speaker  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)

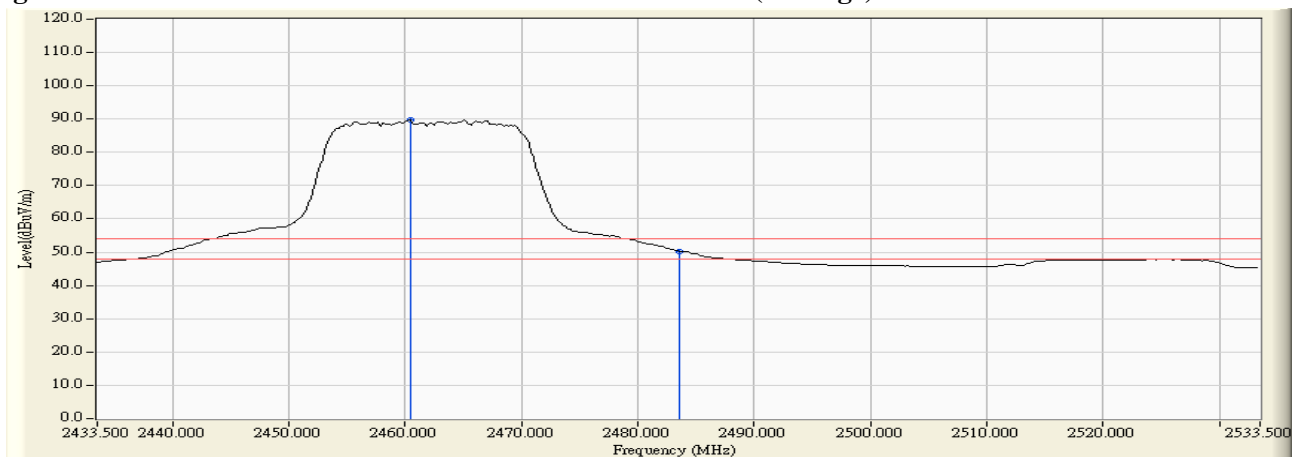
**RF Radiated Measurement (Horizontal):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2465.636	31.902	72.615	104.517	--	--	--
11 (Peak)	2483.500	31.951	37.944	69.894	74.000	54.000	Pass
11 (Average)	2460.446	31.889	57.955	89.843	--	--	--
11 (Average)	2483.500	31.951	18.355	50.305	74.000	54.000	Pass

**Figure Channel 11: Horizontal (Peak)**



**Figure Channel 11: Horizontal (Average)**



Note:

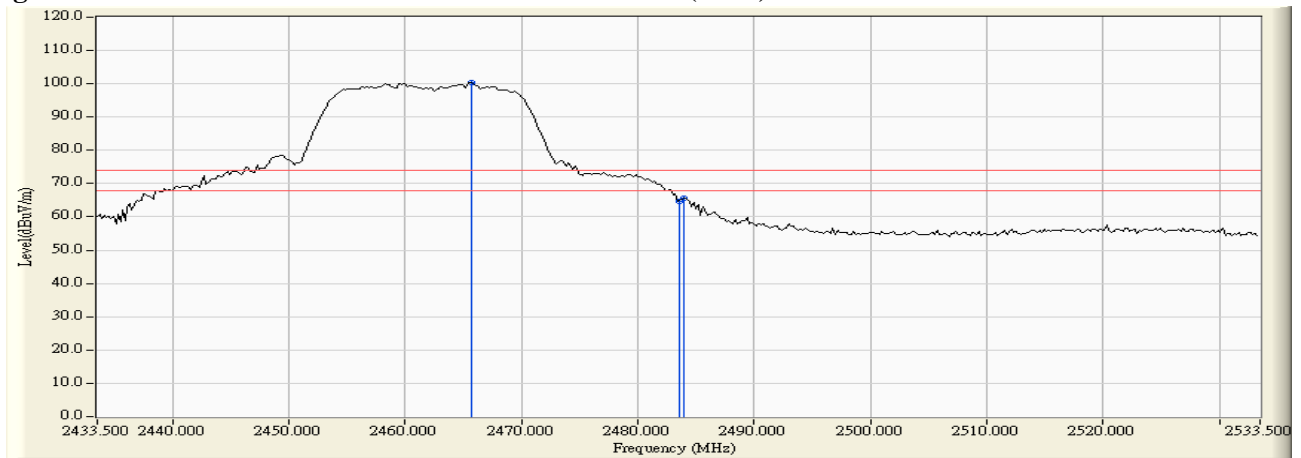
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average etection.

Product : Plug-in AirPlay speaker  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps)

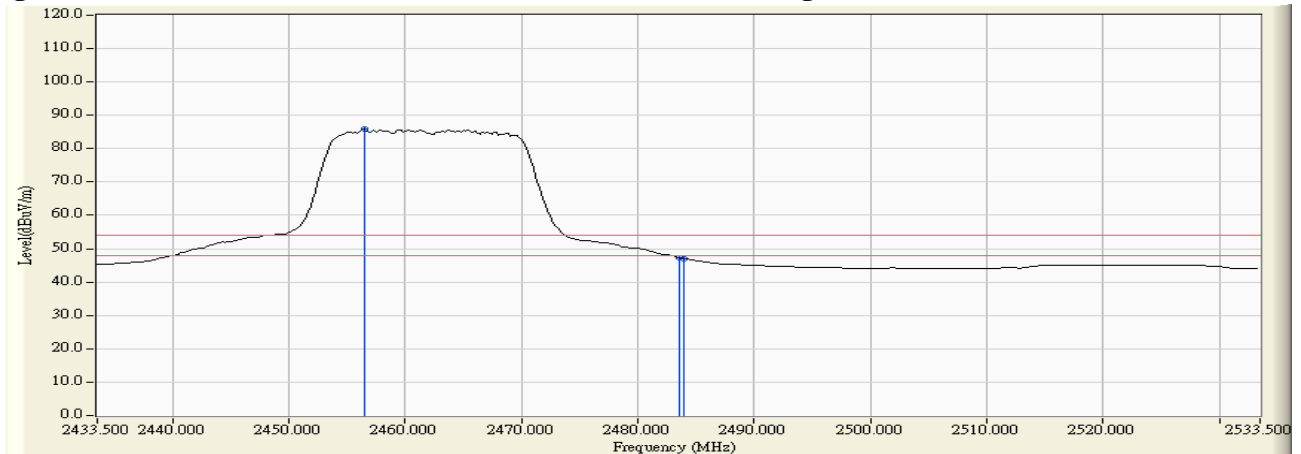
**RF Radiated Measurement (Vertical):**

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
11 (Peak)	2465.636	30.498	69.983	100.481	--	--	--
11 (Peak)	2483.500	30.586	34.237	64.822	74.000	54.000	Pass
11 (Peak)	2483.999	30.587	35.144	65.731	74.000	54.000	Pass
11 (Average)	2456.454	30.454	55.406	85.860	--	--	--
11 (Average)	2483.500	30.586	16.779	47.364	74.000	54.000	Pass
11 (Average)	2483.999	30.587	16.477	47.064	74.000	54.000	Pass

**Figure Channel 11: Vertical (Peak)**



**Figure Channel 11: Vertical (Average)**



Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ \* ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.

## 7. Occupied Bandwidth

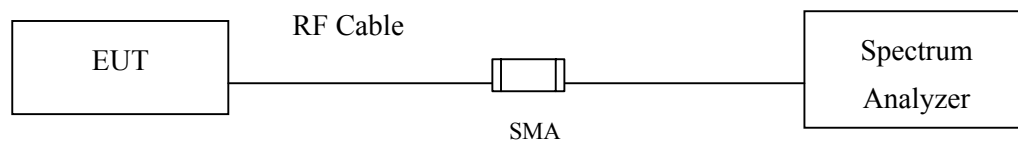
### 7.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2011
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2011
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2012

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

### 7.2. Test Setup



### 7.3. Limits

The minimum bandwidth shall be at least 500 kHz.

### 7.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003; tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 1-5% of the emission bandwidth, VBW $\geq$ 3\*RBW

### 7.5. Uncertainty

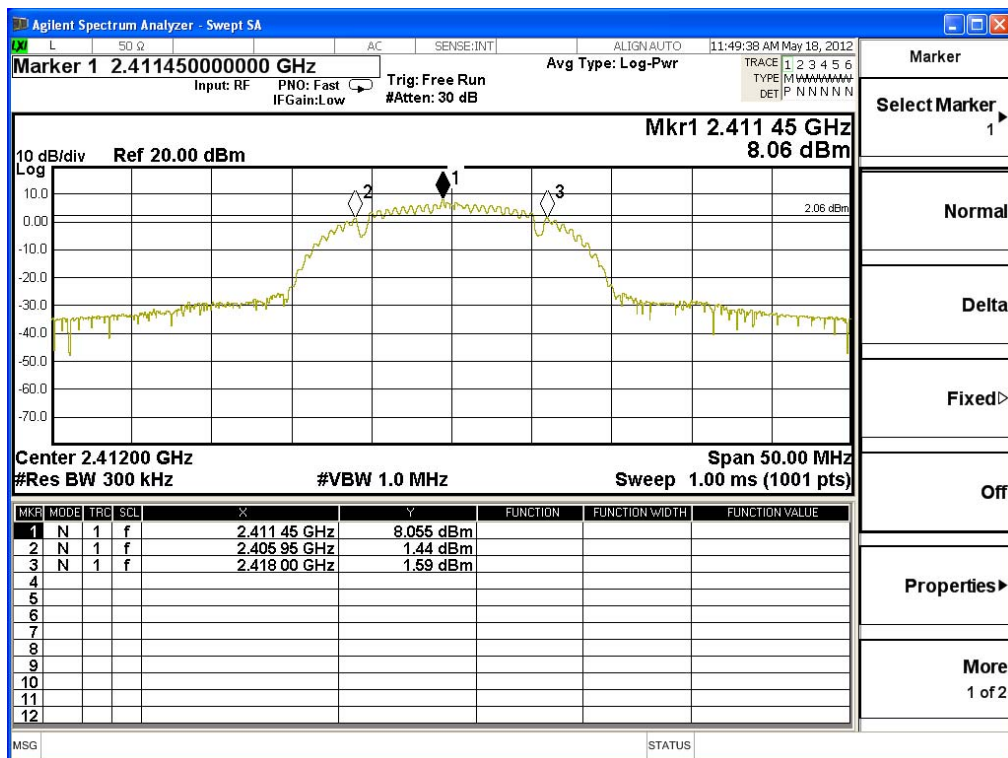
$\pm 150\text{Hz}$

## 7.6. Test Result of Occupied Bandwidth

Product : Plug-in AirPlay speaker  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	2412	12050	>500	Pass

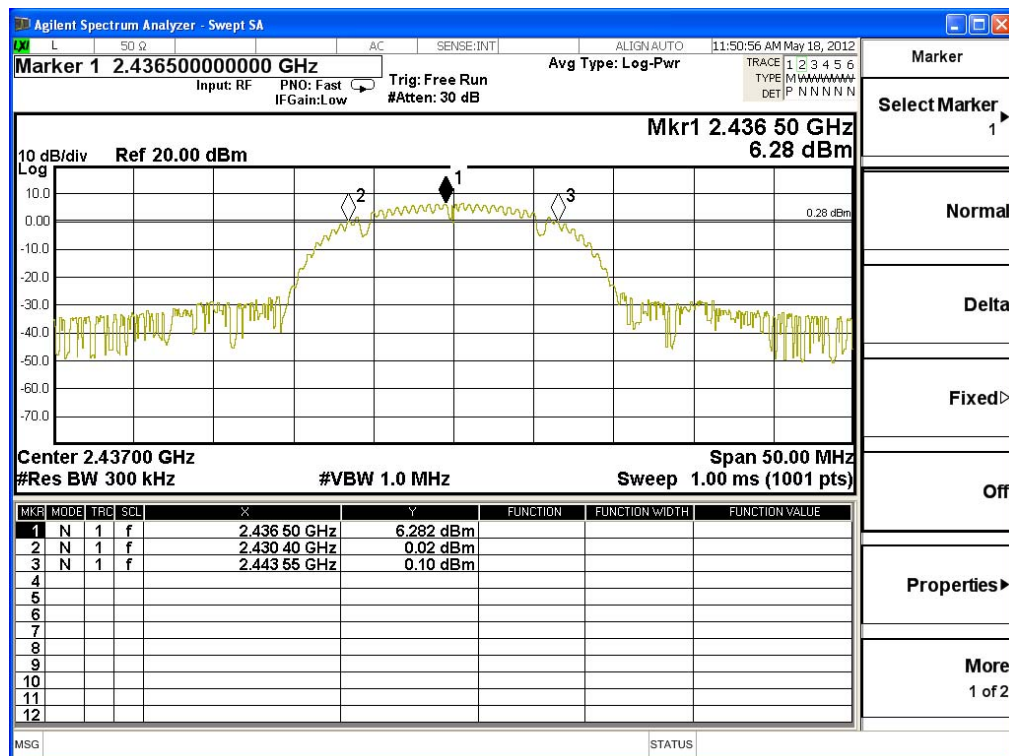
Figure Channel 1:



Product : Plug-in AirPlay speaker  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	2437	13150	>500	Pass

Figure Channel 6:

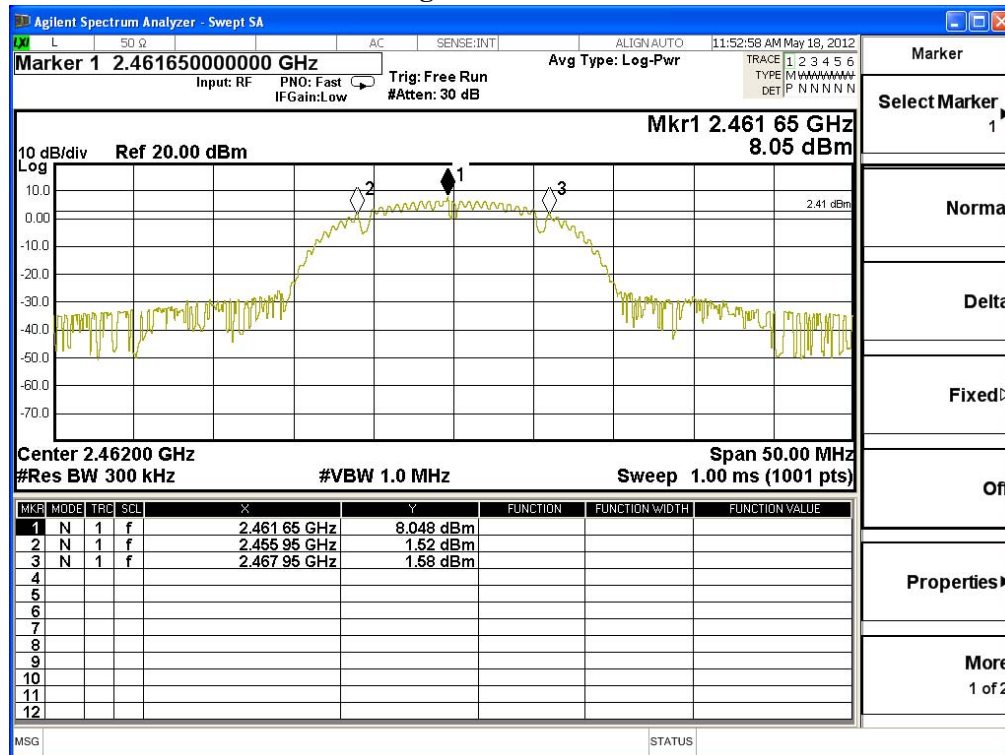




Product : Plug-in AirPlay speaker  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11	2462	12000	>500	Pass

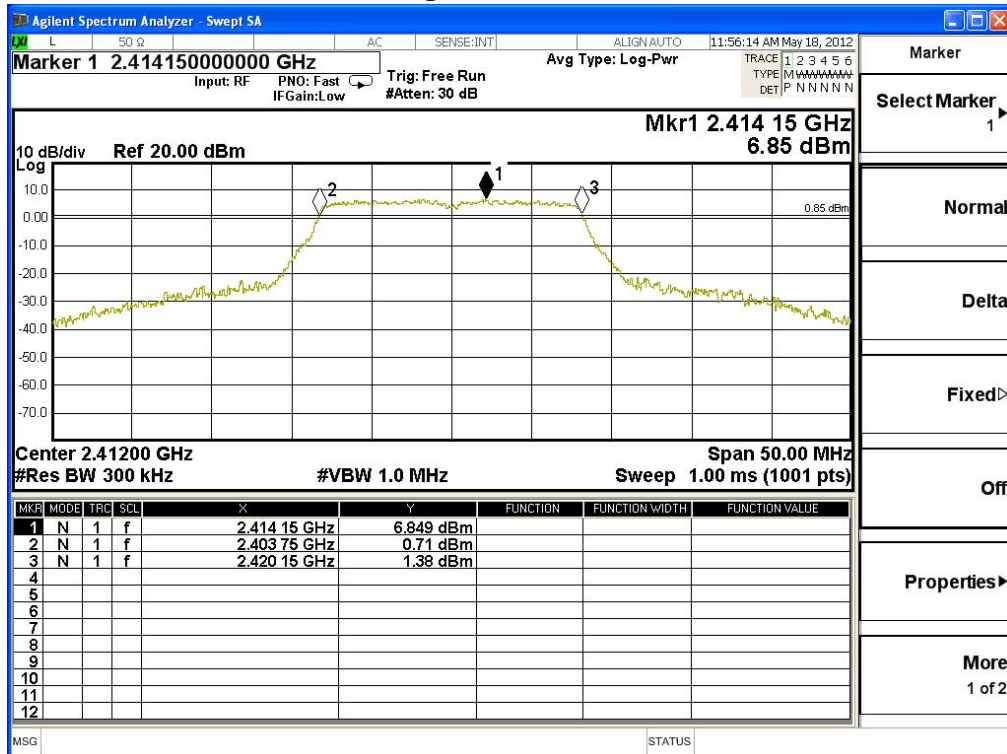
Figure Channel 11:



Product : Plug-in AirPlay speaker  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
1	2412	16400	>500	Pass

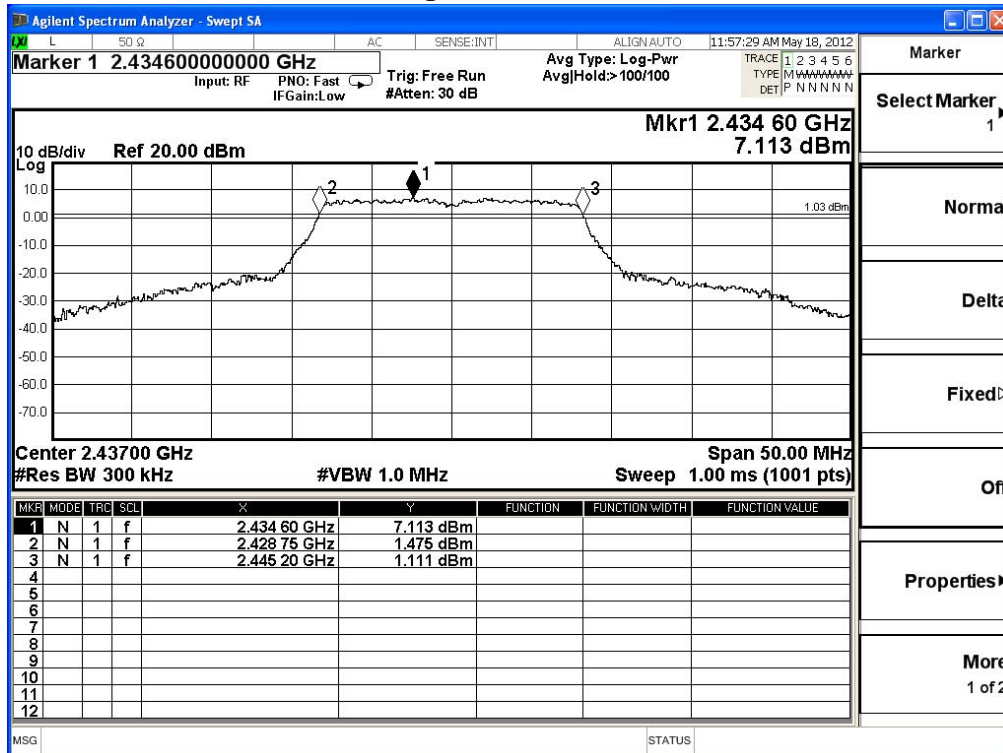
Figure Channel 1:



Product : Plug-in AirPlay speaker  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
6	2437	16450	>500	Pass

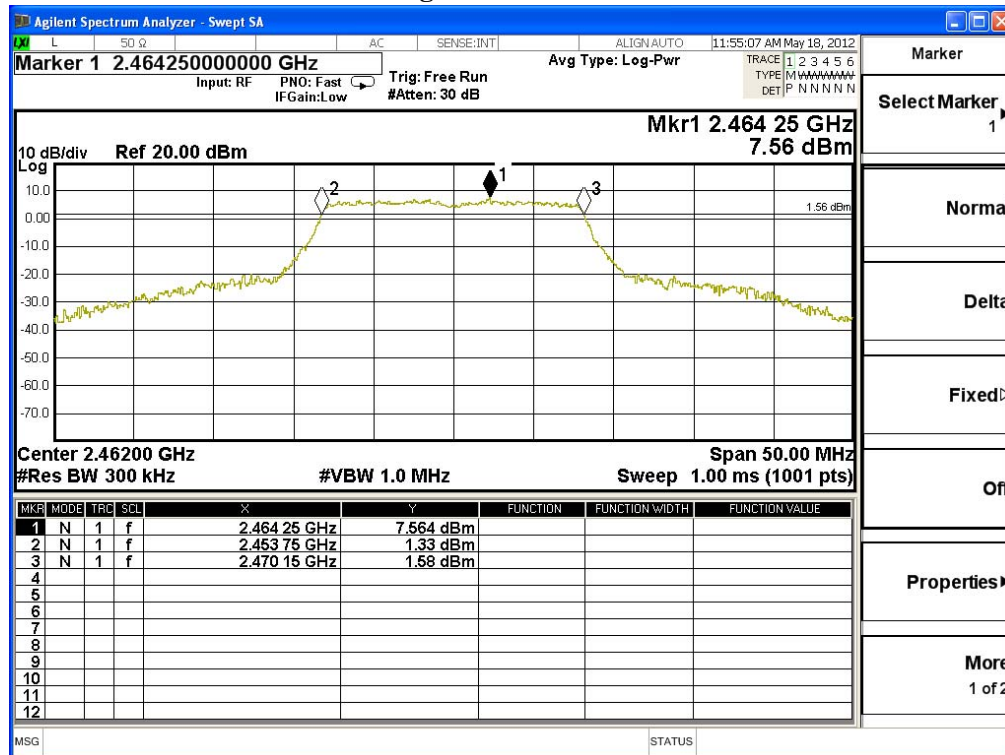
Figure Channel 6:



Product : Plug-in AirPlay speaker  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
11	2462	16400	>500	Pass

Figure Channel 11:



## 8. Power Density

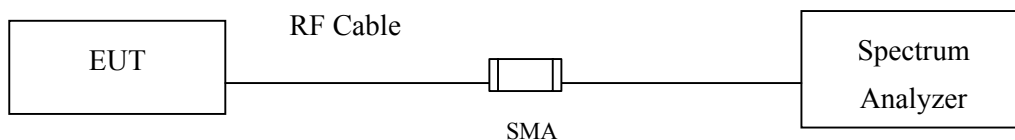
### 8.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2011
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2011
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2012

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with "X" are used to measure the final test results.

### 8.2. Test Setup



### 8.3. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

### 8.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2003; tested according to DTS test procedure of Jan. 2012 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW= 100 kHz, VBW $\geq$ 300KHz, SPAN to 5-30 % greater than the EBW,

Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3\text{ kHz}/100\text{ kHz}) = -15.2\text{ dB}$ .

### 8.5. Uncertainty

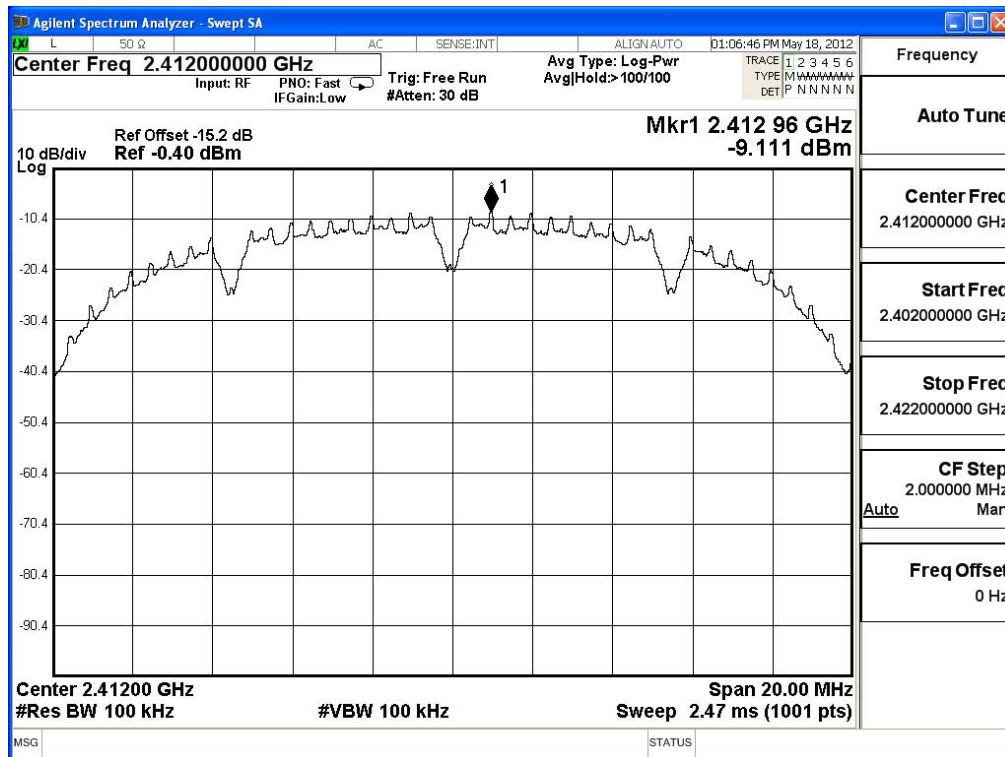
$\pm 1.27\text{ dB}$

## 8.6. Test Result of Power Density

Product : Plug-in AirPlay speaker  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2412MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	-9.111	< 8dBm	Pass

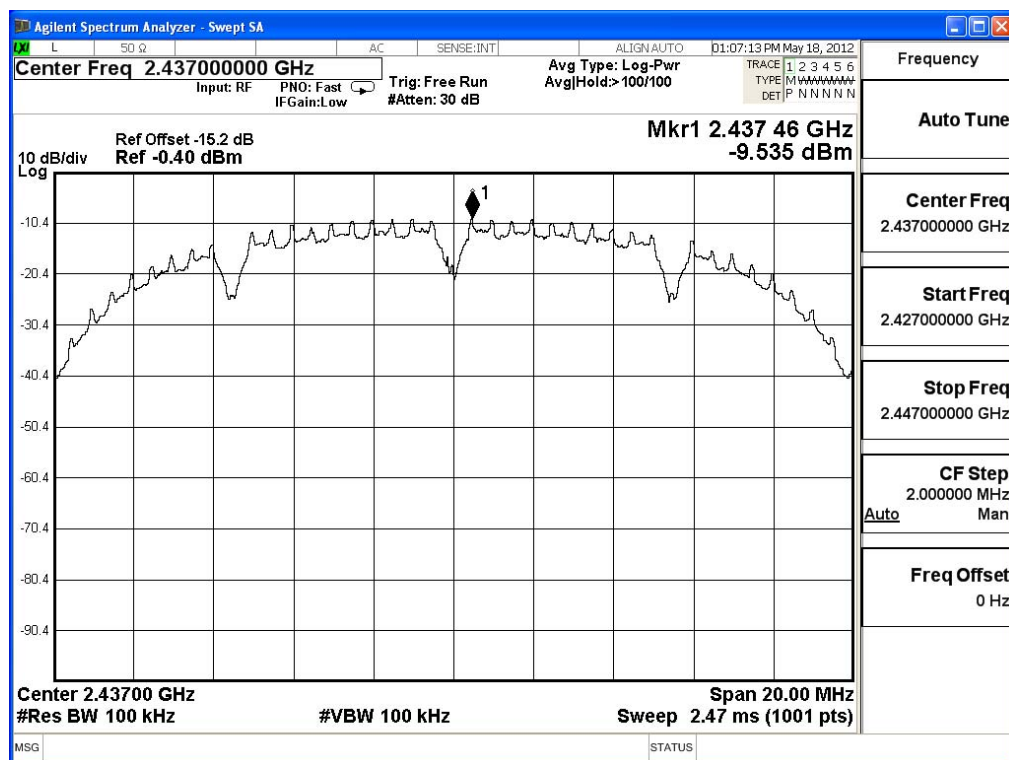
Figure Channel 1:



Product : Plug-in AirPlay speaker  
 Test Item : Power Density Data  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
6	2437	-9.535	< 8dBm	Pass

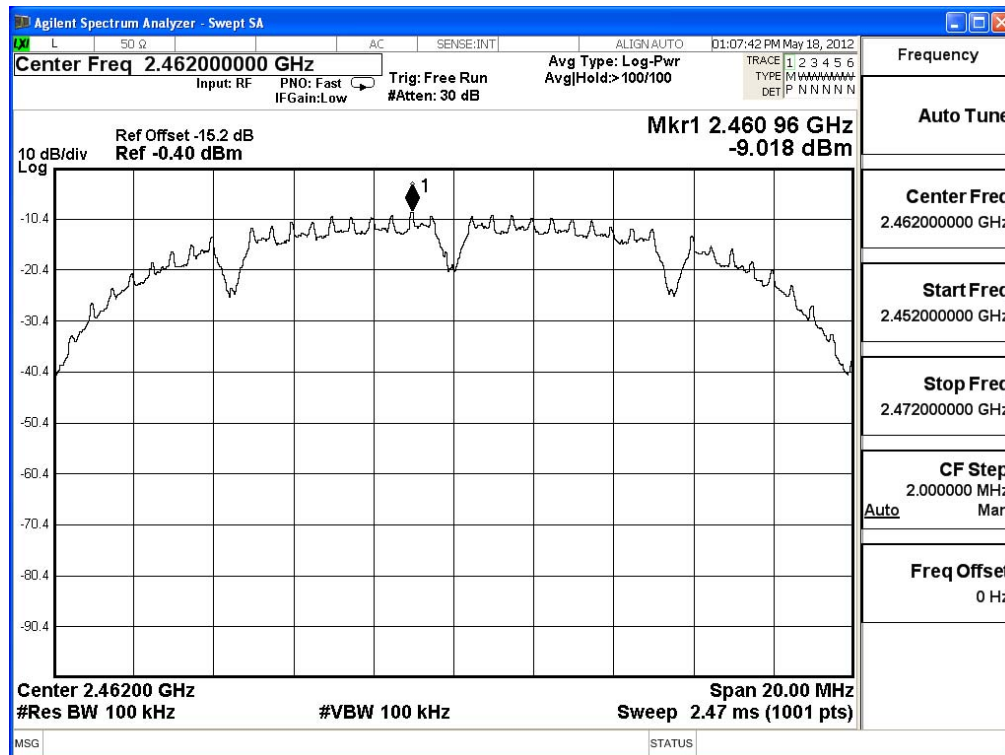
Figure Channel 6:



Product : Plug-in AirPlay speaker  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (802.11b 1Mbps) (2462MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
11	2462	-9.018	< 8dBm	Pass

Figure Channel 11:

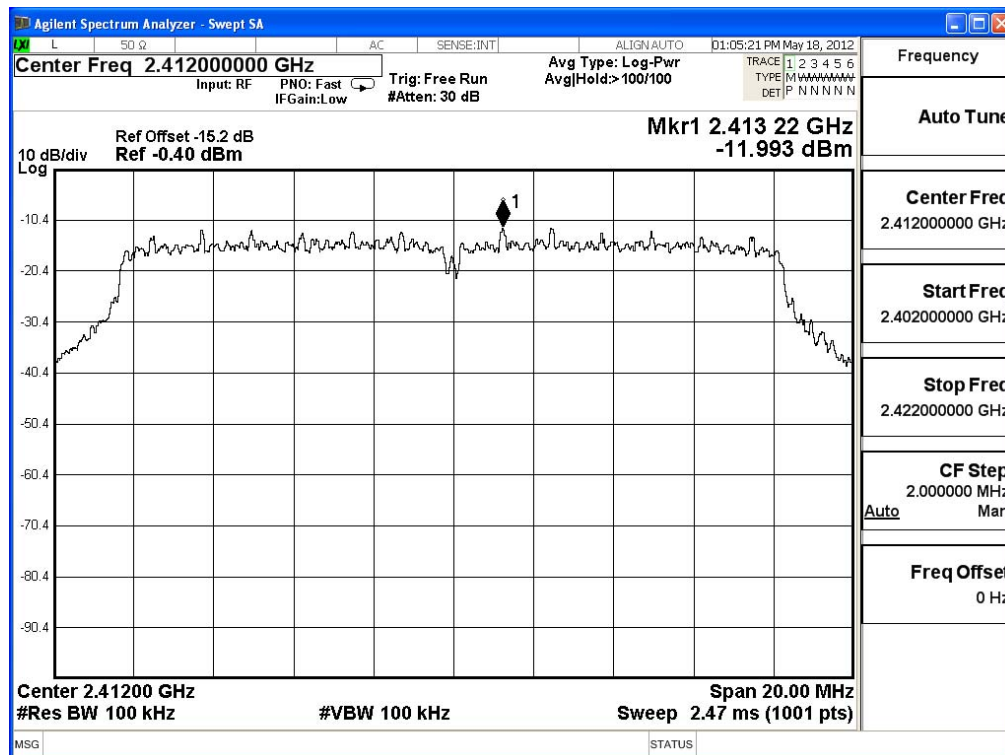




Product : Plug-in AirPlay speaker  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2412MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	-11.993	< 8dBm	Pass

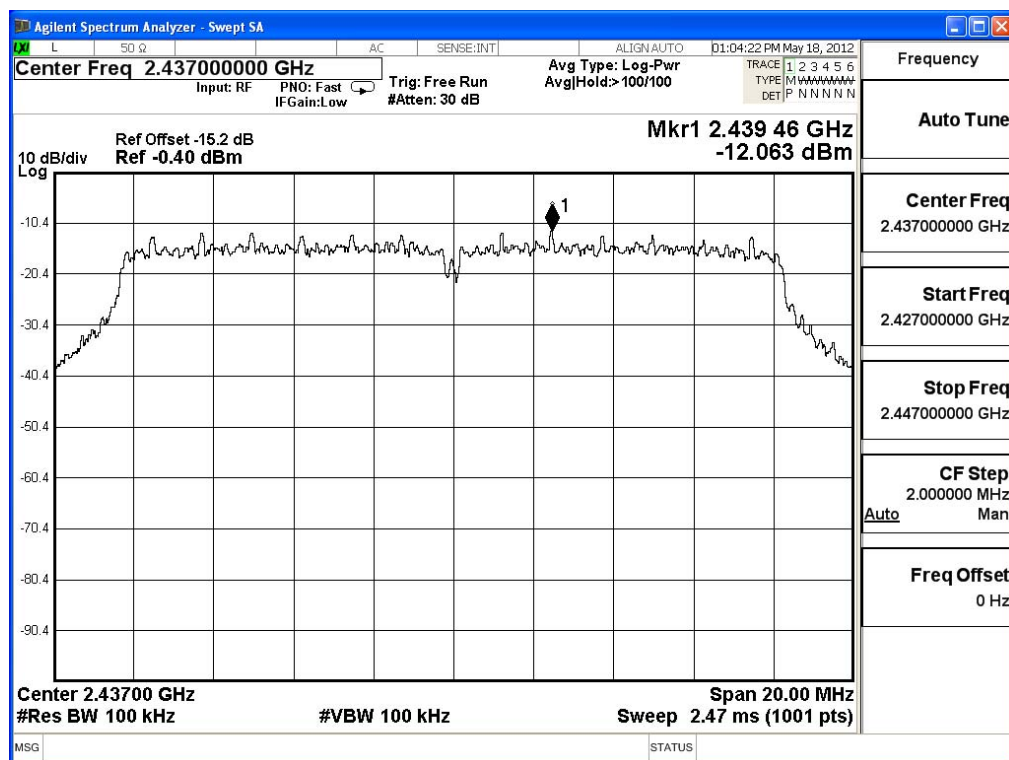
Figure Channel 1:



Product : Plug-in AirPlay speaker  
 Test Item : Power Density Data  
 Test Site : No.3OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2437MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
6	2437	-12.063	< 8dBm	Pass

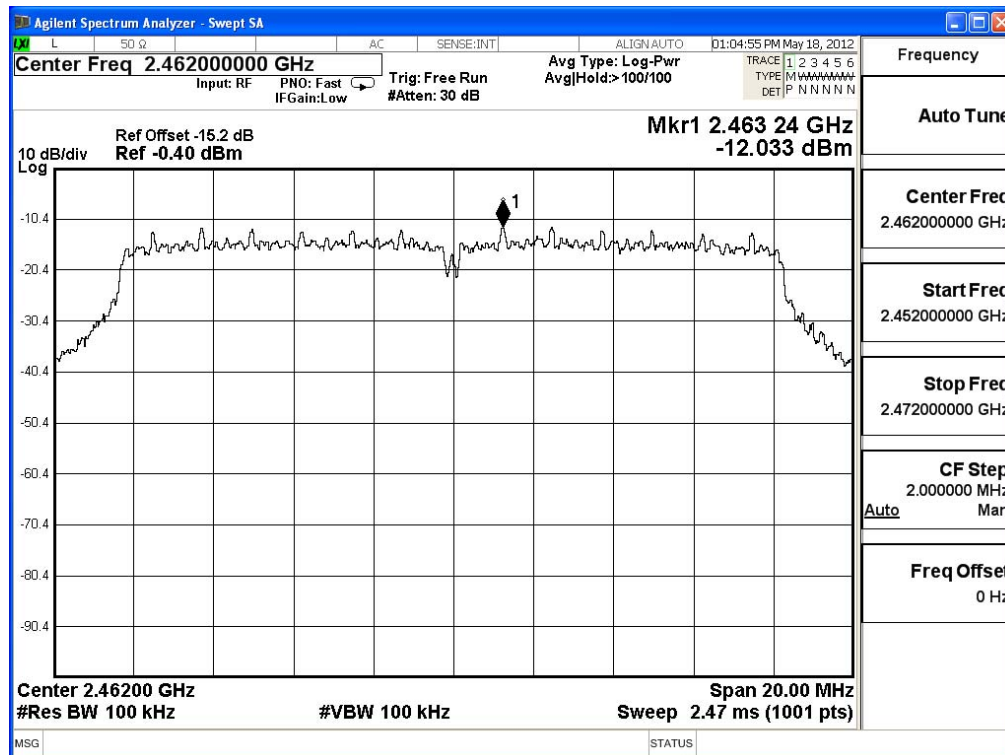
Figure Channel 6:



Product : Plug-in AirPlay speaker  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 2: Transmit (802.11g 6Mbps) (2462MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
11	2462	-12.033	< 8dBm	Pass

Figure Channel 11:



## **9. EMI Reduction Method During Compliance Testing**

No modification was made during testing.

## Attachment 1: EUT Test Photographs

## Attachment 2: EUT Detailed Photographs