

FCC Test Report

Product Name	Wi Stereo Digital Wireless Audio Receiver
Model No	Wi-ALP55_RX , Wi-ASP55_RX
FCC ID.	XZ3-ALP55-R

Applicant	Jangus Music, Inc.
Address	8001 Irvine Center Drive, 4th Floor, Suite 400 Irvine, CA, 92618

Date of Receipt	Aug. 02, 2013
Issue Date	Oct. 18, 2013
Report No.	138122R-RFUSP42V01
Report Version	V1.0



The test results relate only to the samples tested.

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Test Report Certification

Issue Date: Oct. 18, 2013

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Product Name	Wi Stereo Digital Wireless Audio Receiver
Applicant	Jangus Music, Inc.
Address	8001 Irvine Center Drive, 4th Floor, Suite 400 Irvine, CA, 92618
Manufacturer	Jangus Music, Inc.
Model No.	Wi-ALP55_RX , Wi-ASP55_RX
EUT Rated Voltage	DC 3.7V
EUT Test Voltage	AC 120V/60Hz
Trade Name	Wi Digital Systems
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2012 ANSI C63.4: 2003, ANSI C63.10: 2009, FCC KDB 558074
Test Result	Complied

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Tested By :

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(Engineer / Andy Lin)

Approved By :

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(Manager / Vincent Lin)

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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Wi Stereo Digital Wireless Audio Receiver
Trade Name	Wi Digital Systems
Model No.	Wi-ALP55_RX , Wi-ASP55_RX
FCC ID.	XZ3-ALP55-R
Frequency Range	2405 – 2477MHz
Number of Channels	37CH
Channel Separation	2MHz
Type of Modulation	$\pi/4$ DQPSK (Differential Quadrature Phase Shift Keying)
Antenna Type	Printed on PCB
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto
Contain Module	AVNERA/AV7300

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	TATUNG	N/A	Printed on PCB	-0.39dBi for 2.4 GHz

Note: The antenna of EUT is conform to FCC 15.203

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 02:	2405 MHz	Channel 12:	2425 MHz	Channel 22:	2445 MHz	Channel 32:	2465 MHz
Channel 03:	2407 MHz	Channel 13:	2427 MHz	Channel 23:	2447 MHz	Channel 33:	2467 MHz
Channel 04:	2409 MHz	Channel 14:	2429 MHz	Channel 24:	2449 MHz	Channel 34:	2469 MHz
Channel 05:	2411 MHz	Channel 15:	2431 MHz	Channel 25:	2451 MHz	Channel 35:	2471 MHz
Channel 06:	2413 MHz	Channel 16:	2433 MHz	Channel 26:	2453 MHz	Channel 36:	2473 MHz
Channel 07:	2415 MHz	Channel 17:	2435 MHz	Channel 27:	2455 MHz	Channel 37:	2475 MHz
Channel 08:	2417 MHz	Channel 18:	2437 MHz	Channel 28:	2457 MHz	Channel 38:	2477 MHz
Channel 09:	2419 MHz	Channel 19:	2439 MHz	Channel 29:	2459 MHz		
Channel 10:	2421 MHz	Channel 20:	2441 MHz	Channel 30:	2461 MHz		
Channel 11:	2423 MHz	Channel 21:	2443 MHz	Channel 31:	2463 MHz		

Note:

1. The EUT is a Wi Stereo Digital Wireless Audio Receiver with a built-in 2.4GHz transceiver.
2. The Hardware is identical for two models, and the difference of two model is shown as below:

Model Number	Wi-ALP55_RX	Wi-ASP55_RX
Color	Black	Blue
Description	Pocket Portable 2.4GHz Stereo Digital Wireless Audio System for Music Instruments, live performance and Audio Monitoring with USB 2.0 Audio Interface for MAC, PC, iPad®, Windows Surface® and TabletPC. <ul style="list-style-type: none"> • Electric Acoustic, Lead & Bass Guitars (Passive and Active) • Electric Violins & Upright Bass • Electronic Wind Instruments • Electronic Drums & Percussions • Digital Pianos, Keyboards & Synths • Guitar Foot Pedals and Multi Effects • Amplifiers and Powered Monitors • Mixers and Live Sound Systems • DJ Gear & Multitrack Recorders • Professional Studio Monitor Headphones • In-Ear Professional Personal Monitors • Any device with headphone jack • MAC, PC, iPad and Windows Surface • Stereo Line Level Applications • Performance Monitoring and Audio Listening Applications • VoIP Audio Applications 	Pocket Portable 2.4GHz Stereo Digital Wireless Audio System for Vocals, Live performance, Video Cameras, Smartphones, and Audio Monitoring with USB 2.0 Audio Interface for iPad®, MAC, PC , Windows Surface® & TabletPC. <ul style="list-style-type: none"> • Earset & Headset Mono Microphones • Stereo & Mono Lavalier Microphones • Shotgun Microphones • Singing, Spoken Word, Vocals and Ambient Miking • Video Camera, DSLR and Handheld Recorders Miking • iPhone, Smartphones and Tablets Miking • Stringed, Brass & Acoustic Instruments Miking • MIC Level Applications • Stereo Line Level Applications • MAC, PC, iPad, Windows Surface Miking Applications • Performance Monitoring and Audio Listening Applications • VoIP Audio Applications

3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. These tests are conducted on a sample for the purpose of demonstrating compliance of 2.4GHz transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices
5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode:	Mode 1: Transmit
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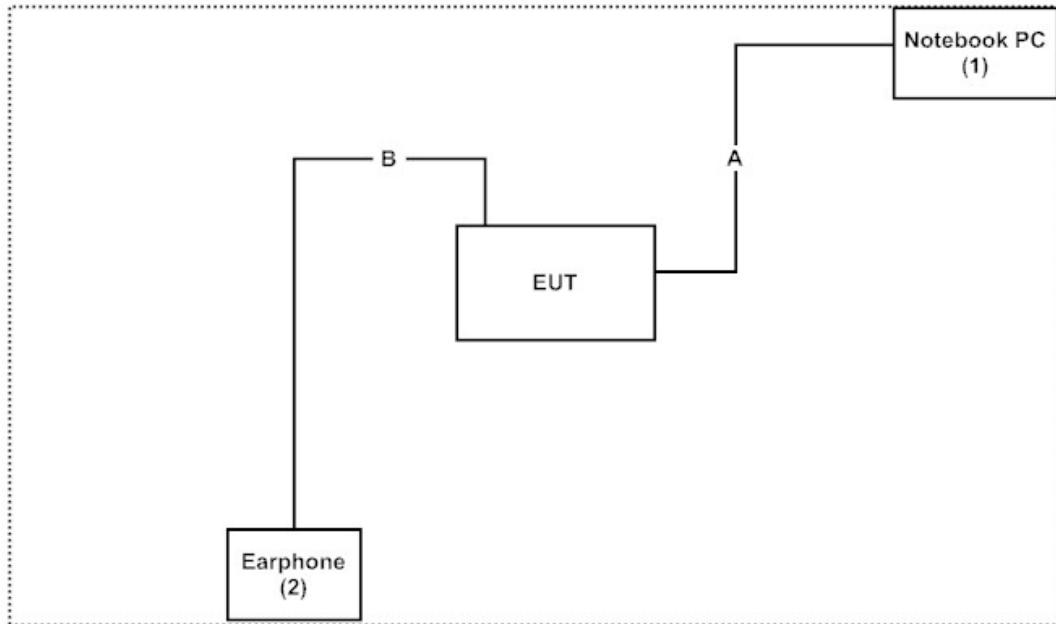
1.3. Tested System Details

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.	Power Cord
1 Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
2 Earphone	Dr.AV	CD-806B	N/A	N/A

Signal Cable Type		Signal cable Description
A	USB Cable	Non-Shielded, 1m
B	Earphone Cable	Non-Shielded, 1.2m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4.
- (2) Execute “VM4G debug.exe (V.1.1.5.35)” on the Notebook PC.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press “OK” to start the continuous Transmit.
- (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/>

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E-Mail : service@quietek.com

FCC Accreditation Number: TW1014

2. Conducted Emission

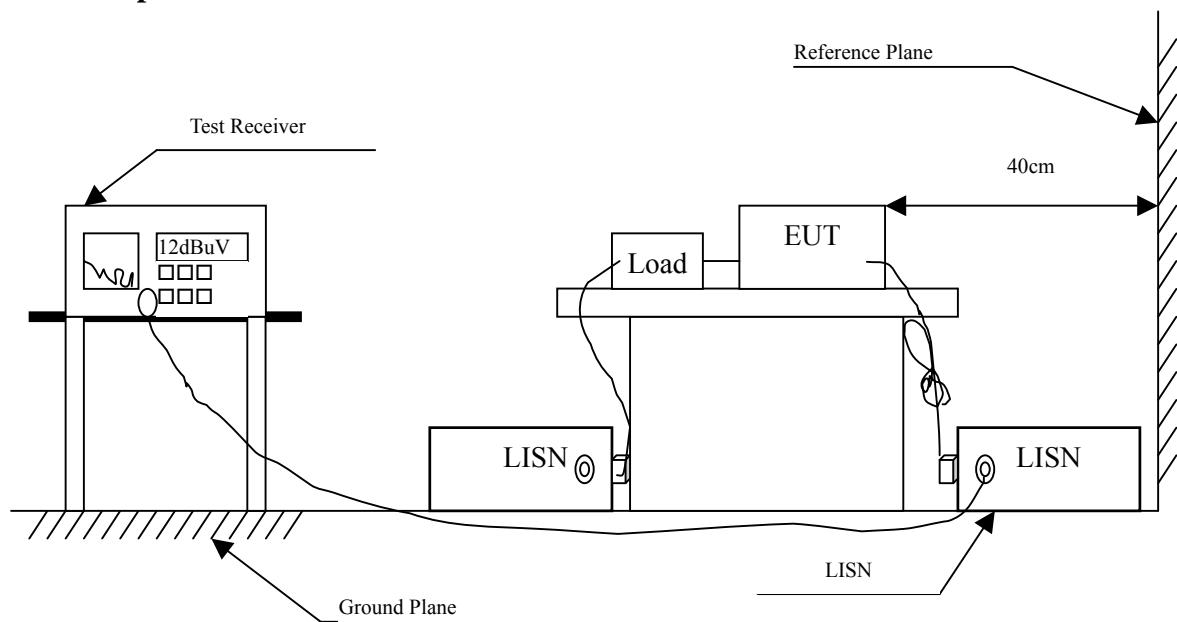
2.1. Test Equipment

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, 2013	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2013	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2013	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2013	
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 C63.10: 2009 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 : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 1: Transmit

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 1					
Quasi-Peak					
0.181	9.724	40.960	50.684	-14.430	65.114
0.240	9.680	35.010	44.690	-18.739	63.429
0.302	9.650	28.510	38.160	-23.497	61.657
0.361	9.650	22.000	31.650	-28.321	59.971
1.880	9.680	19.230	28.910	-27.090	56.000
3.888	9.700	22.940	32.640	-23.360	56.000
Average					
0.181	9.724	31.760	41.484	-13.630	55.114
0.240	9.680	27.740	37.420	-16.009	53.429
0.302	9.650	10.270	19.920	-31.737	51.657
0.361	9.650	15.190	24.840	-25.131	49.971
1.880	9.680	16.240	25.920	-20.080	46.000
3.888	9.700	17.180	26.880	-19.120	46.000

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 : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 1: Transmit

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV	dB	dBuV
Line 2					
Quasi-Peak					
0.181	9.732	40.920	50.652	-14.462	65.114
0.244	9.689	35.340	45.029	-18.285	63.314
0.298	9.660	24.020	33.680	-28.091	61.771
0.353	9.655	10.950	20.605	-39.595	60.200
3.822	9.700	26.010	35.710	-20.290	56.000
15.466	10.000	8.840	18.840	-41.160	60.000
Average					
0.181	9.732	32.030	41.762	-13.352	55.114
0.244	9.689	26.810	36.499	-16.815	53.314
0.298	9.660	19.500	29.160	-22.611	51.771
0.353	9.655	3.310	12.965	-37.235	50.200
3.822	9.700	19.630	29.330	-16.670	46.000
15.466	10.000	3.060	13.060	-36.940	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

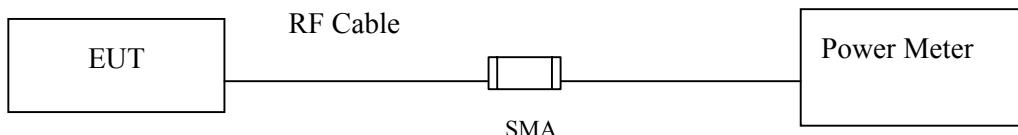
3.1. Test Equipment

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X Power Meter	Anritsu	ML2495A/6K00003357	May, 2013
X Power Sensor	Anritsu	MA2411B/0738448	Jun, 2013

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

3.2. Test Setup

Conducted Measurement



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 KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 9.1.3 PKPM1 Peak power meter method.

3.5. Uncertainty

± 1.27 dB

3.6. Test Result of Peak Power Output

Product : Wi Stereo Digital Wireless Audio Receiver
Test Item : Peak Power Output Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
02	2405	4.21	<30dBm	Pass
20	2441	3.63	<30dBm	Pass
38	2477	3.01	<30dBm	Pass

4. Radiated Emission

4.1. Test Equipment

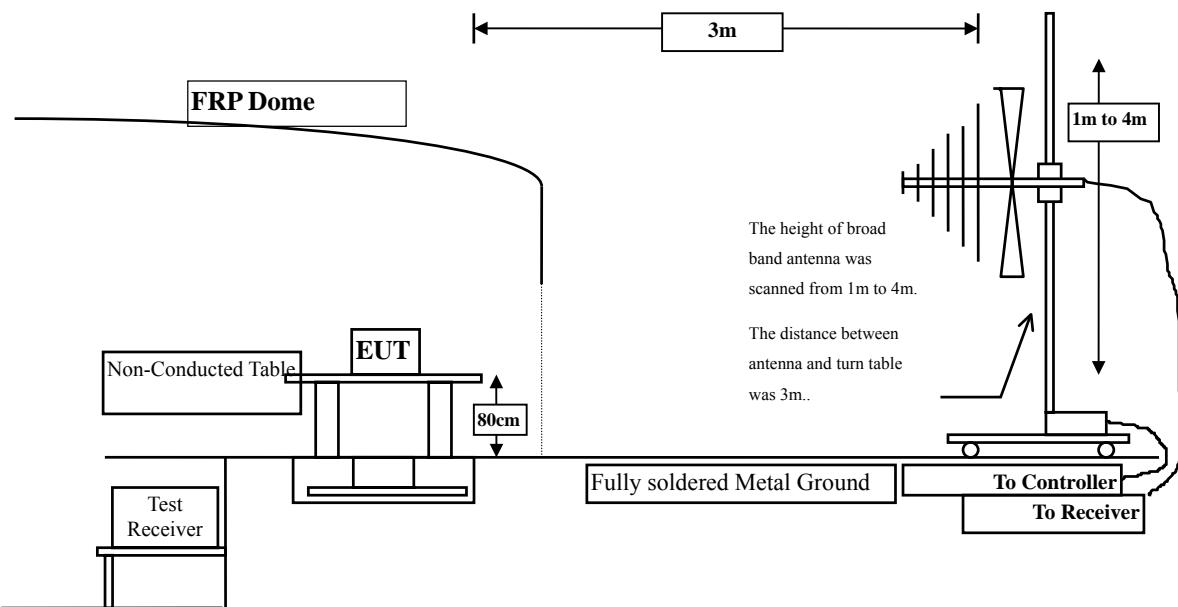
The following test equipment are used during the radiated emission test:

Test Site	Equipment		Manufacturer	Model No./Serial No.	Last Cal.
<input checked="" type="checkbox"/> Site # 3	X	Loop Antenna	Teseq	HLA6120 / 26739	Jul., 2013
	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2013
	X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2013
	X	Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2013
	X	Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar, 2013
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2013
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2013
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2013
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

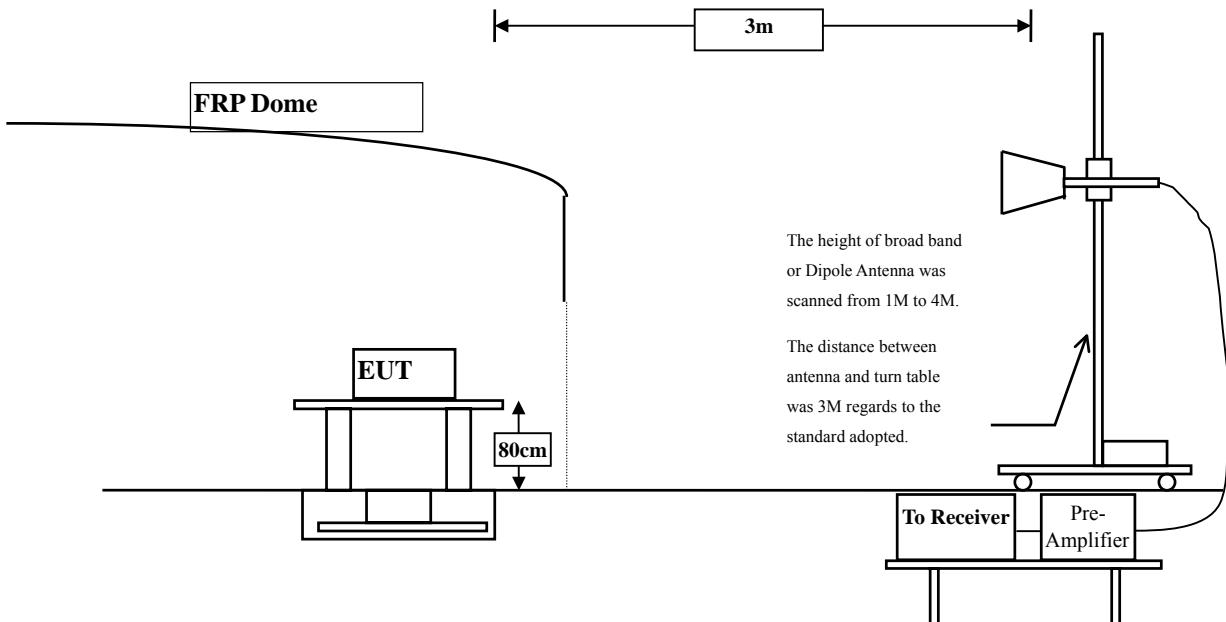
Note: 1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with "X" are used to measure the final test results.

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	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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

4.4. Test Procedure

The EUT was setup according to ANSI C63.10, 2009 and tested according to DTS test procedure of 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 C63.10:2009 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~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 measurement frequency range from 9KHz - 10th Harmonic of fundamental was investigated.

4.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

4.6. Test Result of Radiated Emission

Product : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2405MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4810.000	2.532	55.890	58.422	-15.578	74.000
7215.000	9.411	42.150	51.561	-22.439	74.000
9620.000	10.282	39.680	49.962	-24.038	74.000
Average Detector:					
4810.000	2.532	48.360	50.892	-3.108	54.000
Vertical					
Peak Detector:					
4810.000	2.927	53.570	56.497	-17.503	74.000
7215.000	9.895	43.260	53.155	-20.845	74.000
9620.000	10.760	40.150	50.910	-23.090	74.000
Average Detector:					
4810.000	2.927	34.590	37.517	-16.483	54.000

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 : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4882.000	2.025	55.590	57.615	-16.385	74.000
7323.000	9.762	42.150	51.911	-22.089	74.000
9764.000	9.682	39.150	48.831	-25.169	74.000
Average Detector:					
4882.000	2.488	48.550	51.038	-2.962	54.000
Vertical					
Peak Detector:					
4882.000	2.488	54.150	56.638	-17.362	74.000
7323.000	10.375	43.230	53.604	-20.396	74.000
9764.000	10.315	40.250	50.565	-23.435	74.000
Average Detector:					
4882.000	2.488	35.050	37.538	-16.462	54.000

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 : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2477MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector:					
4954.000	2.522	55.980	58.503	-15.497	74.000
7431.000	10.520	42.660	53.180	-20.820	74.000
9908.000	10.187	39.650	49.837	-24.163	74.000
Average Detector:					
4954.000	2.522	47.550	50.073	-3.927	54.000
Vertical					
Peak Detector:					
4954.000	3.305	53.250	56.555	-17.445	74.000
7431.000	11.222	42.510	53.731	-20.269	74.000
9908.000	11.240	40.140	51.380	-22.620	74.000
Average Detector:					
4954.000	3.305	35.010	38.315	-15.685	54.000

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 : Wi Stereo Digital Wireless Audio Receiver
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
	dB				
Horizontal					
165.800	-9.915	40.384	30.469	-13.031	43.500
299.660	-4.751	32.807	28.056	-17.944	46.000
433.520	0.841	32.920	33.761	-12.239	46.000
563.500	1.950	33.273	35.223	-10.777	46.000
763.320	5.113	29.971	35.084	-10.916	46.000
901.060	5.878	28.837	34.715	-11.285	46.000
Vertical					
113.420	-3.709	34.439	30.730	-12.770	43.500
231.760	-6.457	39.729	33.272	-12.728	46.000
365.620	0.282	32.597	32.879	-13.121	46.000
499.480	-0.199	32.171	31.971	-14.029	46.000
631.400	-1.454	30.337	28.883	-17.117	46.000
749.740	2.023	31.606	33.629	-12.371	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.
8. No emission found between lowest internal used/generated frequency to 30MHz.

5. RF antenna conducted test

5.1. Test Equipment

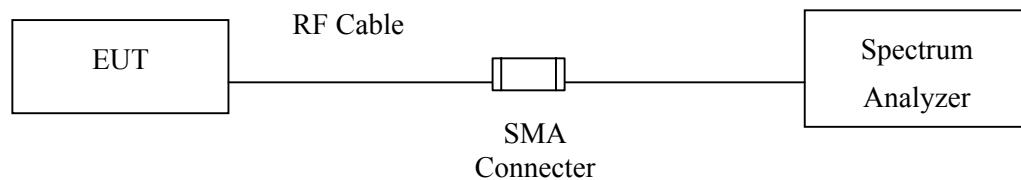
Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2013
Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2013
X Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr.,2013

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 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

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

5.5. Uncertainty

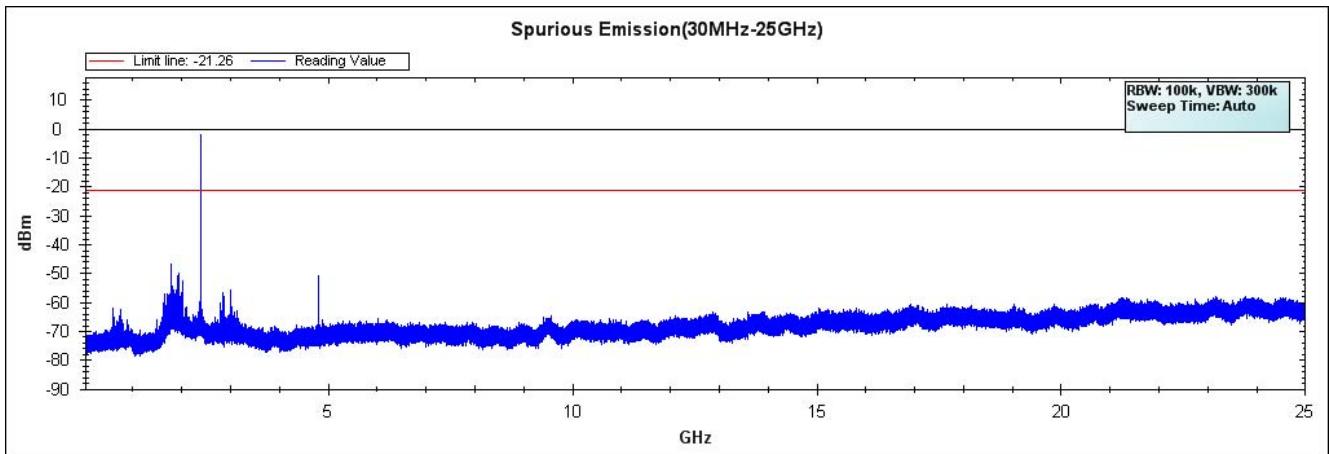
The measurement uncertainty

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

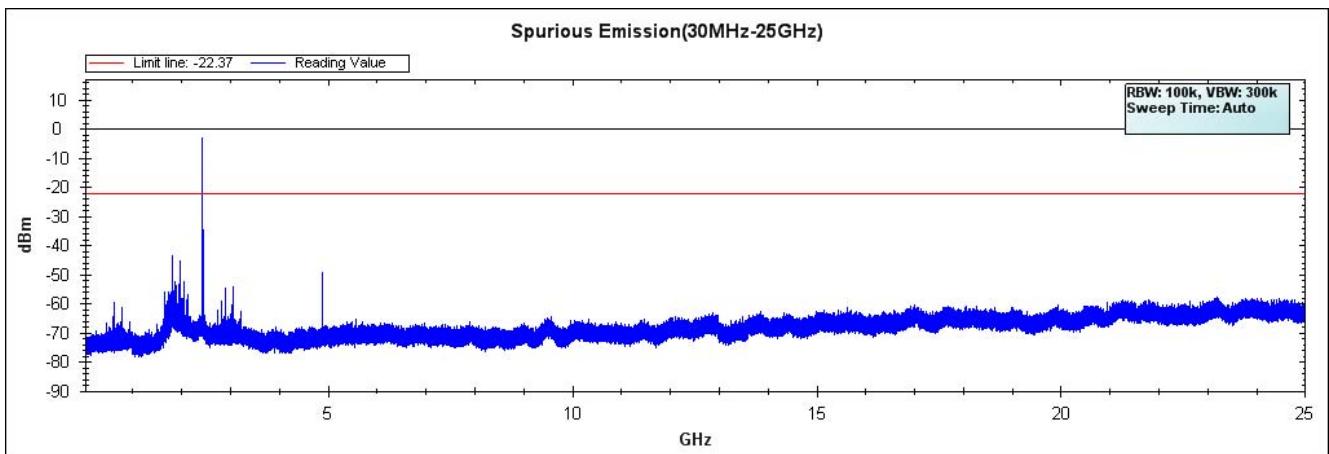
5.6. Test Result of RF antenna conducted test

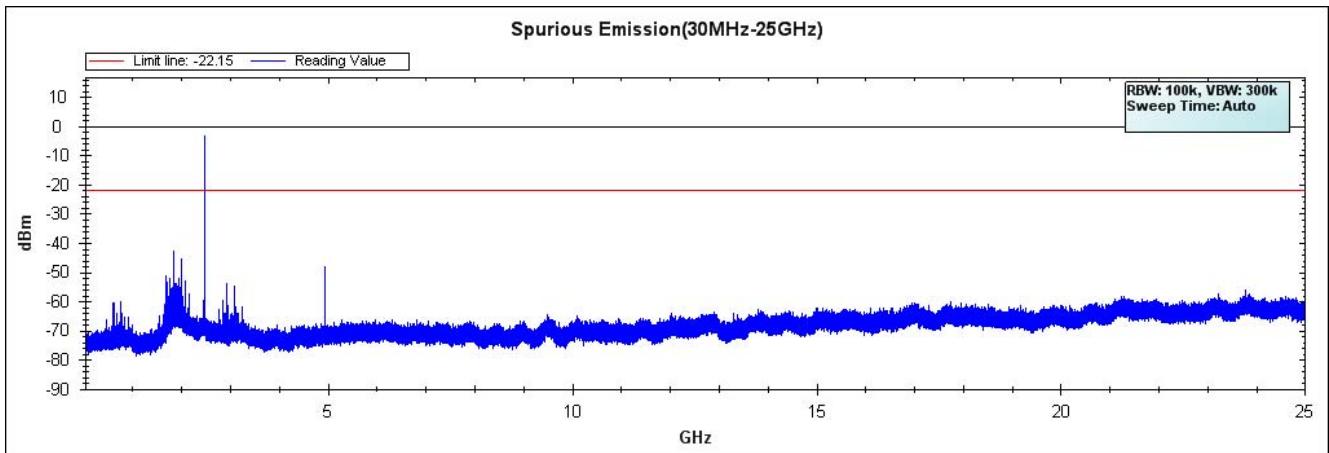
Product : Wi Stereo Digital Wireless Audio Receiver
Test Item : RF antenna conducted test
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit

Channel 02 (2405MHz) 30M-25GHz



Channel 20 (2441MHz) 30M-25GHz



Channel 38 (2477MHz) 30M-25GHz

6. Band Edge

6.1. Test Equipment

RF Radiated Measurement:

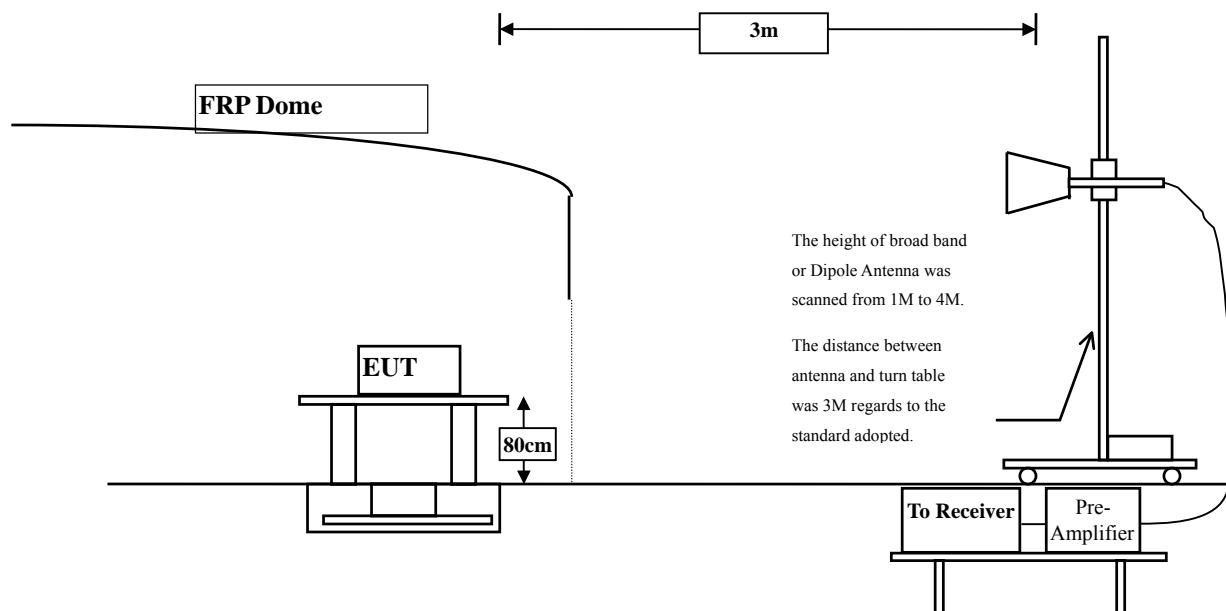
The following test equipments are used during the band edge tests:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
<input checked="" type="checkbox"/> Site # 3	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	X Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2013
	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2013
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2013
	X Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2013
	Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar, 2013
	X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2013
	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2013
	X Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2013
	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 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 C63.10, 2009 and tested according to DTS test procedure of 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 C63.10:2009 on radiated measurement.

6.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

6.6. Test Result of Band Edge

Product : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit

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
02 (Peak)	2390.000	33.739	23.127	56.866	74.00	54.00	Pass
02 (Peak)	2405.200	33.760	54.534	88.294	--	--	--
02 (Average)	2390.000	33.739	12.152	45.891	74.00	54.00	Pass
02 (Average)	2405.000	33.759	51.547	85.306	--	--	--

Figure Channel 02:

Horizontal (Peak)

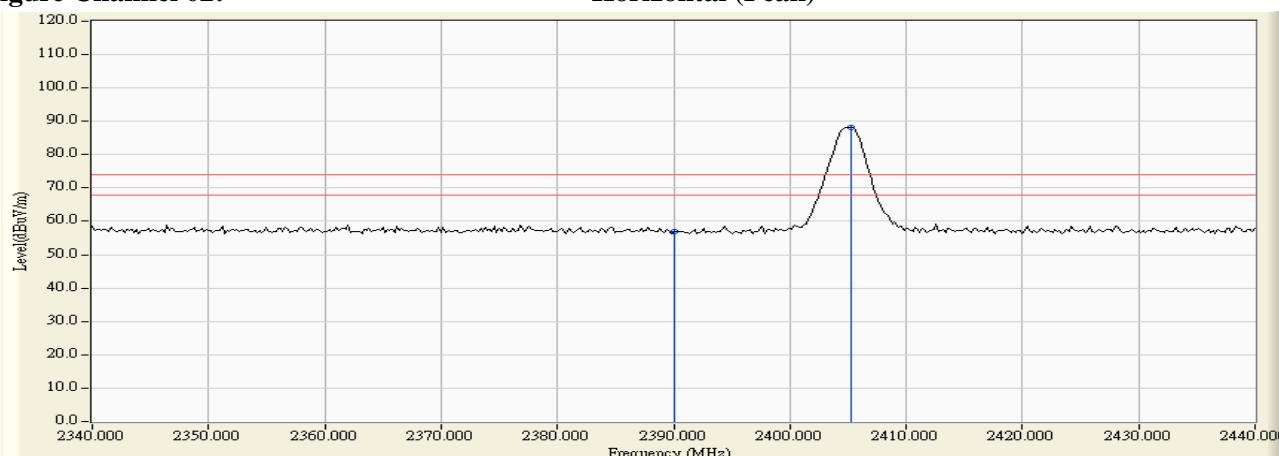
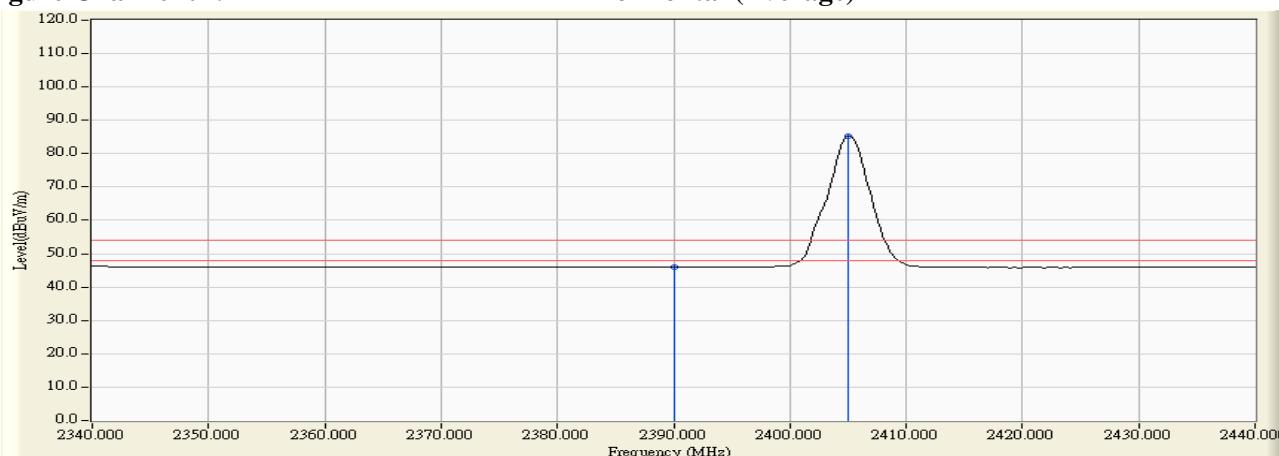


Figure Channel 02:

Horizontal (Average)



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

Product : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit

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
02 (Peak)	2389.400	32.271	24.655	56.926	74.00	54.00	Pass
02 (Peak)	2390.000	32.267	23.928	56.195	74.00	54.00	Pass
02 (Peak)	2405.000	32.242	46.885	79.127	--	--	--
02 (Average)	2390.000	33.739	12.152	45.891	74.00	54.00	Pass
02 (Average)	2405.000	33.759	51.547	85.306	--	--	--

Figure Channel 02:

Vertical (Peak)

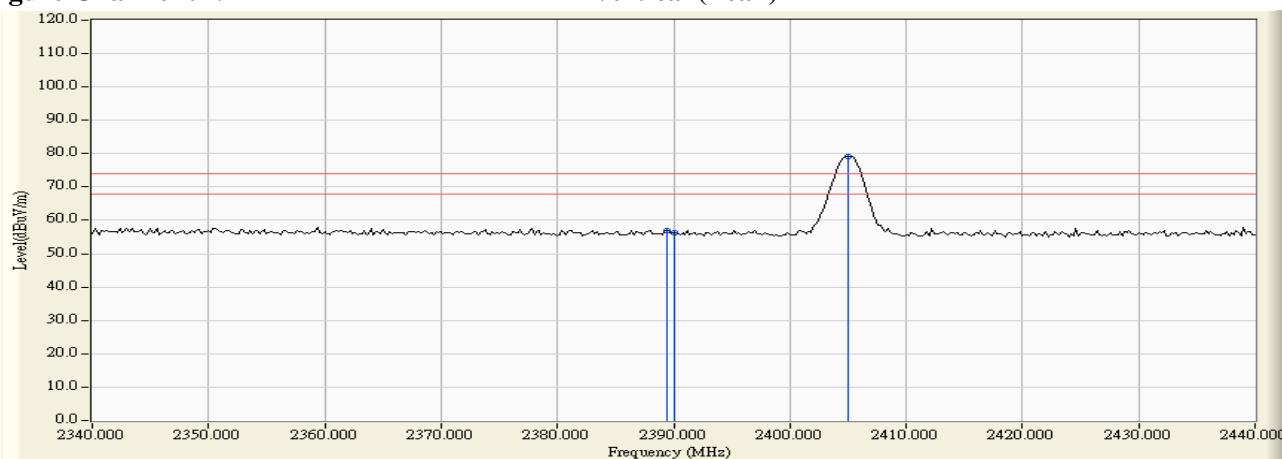
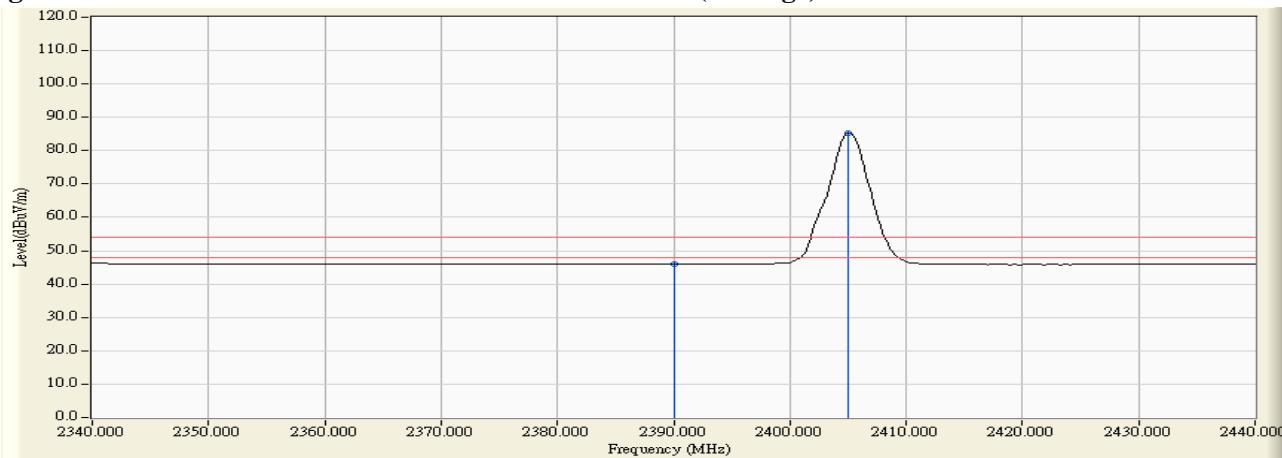


Figure Channel 02:

Vertical (Average)



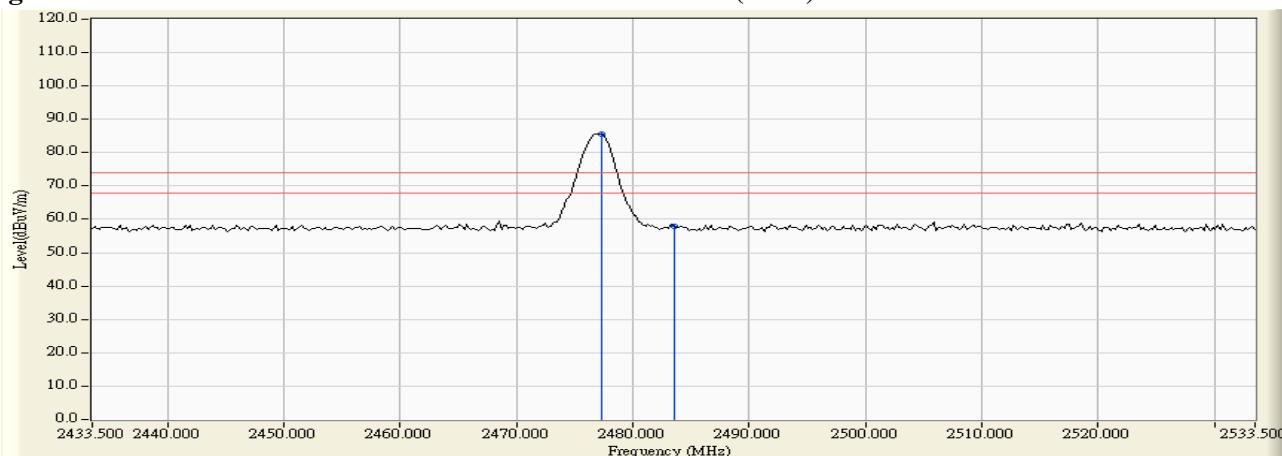
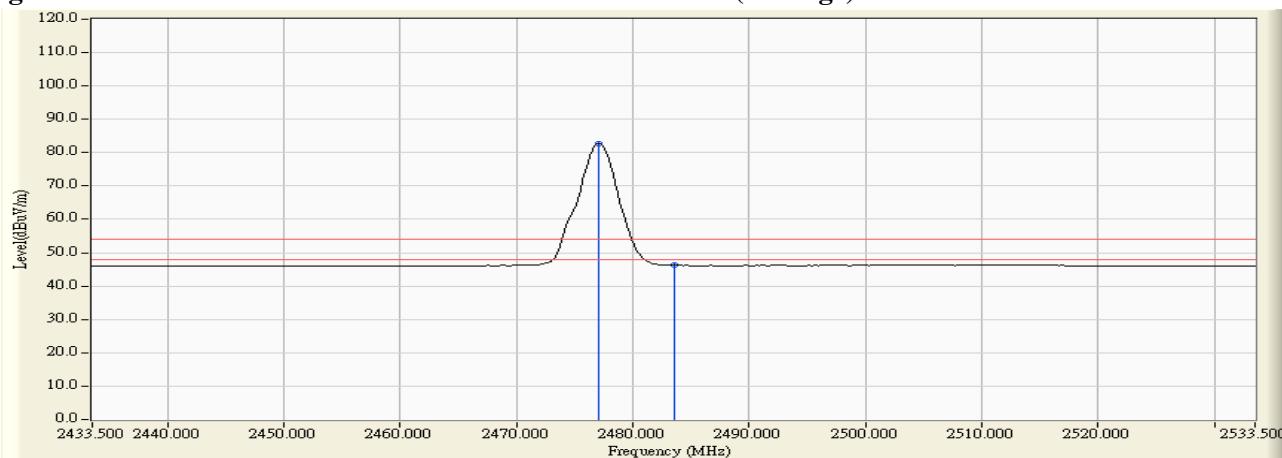
Note:

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 : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit

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
38 (Peak)	2477.300	33.933	51.720	85.653	--	--	--
38 (Peak)	2483.500	33.951	23.985	57.935	74.00	54.00	Pass
38 (Average)	2477.100	33.933	48.837	82.770	--	--	--
38 (Average)	2483.500	33.951	12.272	46.222	74.00	54.00	Pass

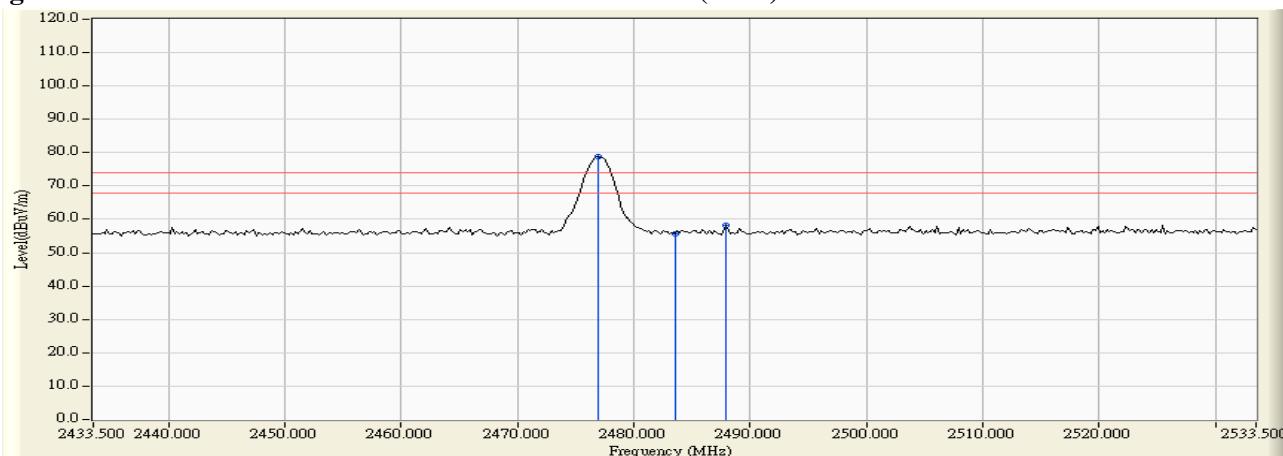
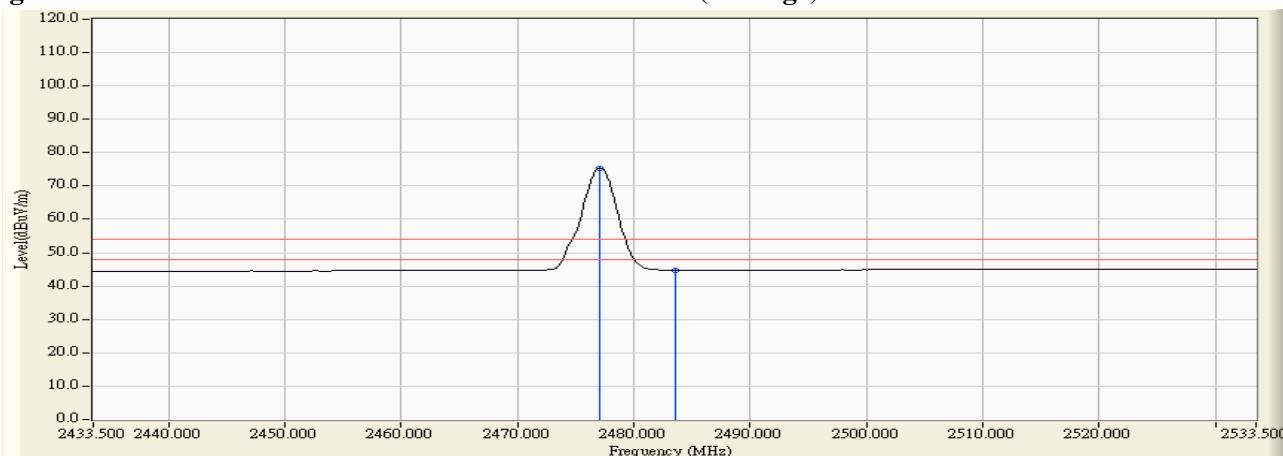
Figure Channel 38:**Horizontal (Peak)****Figure Channel 38:****Horizontal (Average)**

- 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 : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit-

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
38 (Peak)	2476.900	32.553	46.120	78.673	--	--	--
38 (Peak)	2483.500	32.586	23.090	55.675	74.00	54.00	Pass
38 (Peak)	2487.900	32.607	25.696	58.302	74.00	54.00	Pass
38 (Average)	2477.100	32.554	42.849	75.403	--	--	--
38 (Average)	2483.500	32.586	12.187	44.772	74.00	54.00	Pass

Figure Channel 38:**Vertical (Peak)****Figure Channel 38:****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.

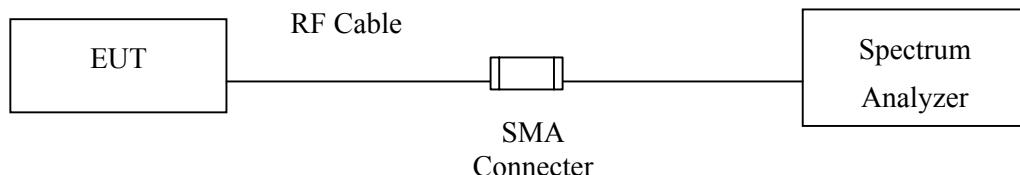
7. Occupied Bandwidth

7.1. Test Equipment

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2013
Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2013
X Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr.,2013

Note: 1. All instruments are calibrated every one year.
2. The test instruments marked by "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 C63.10, 2009; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

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

7.5. Uncertainty

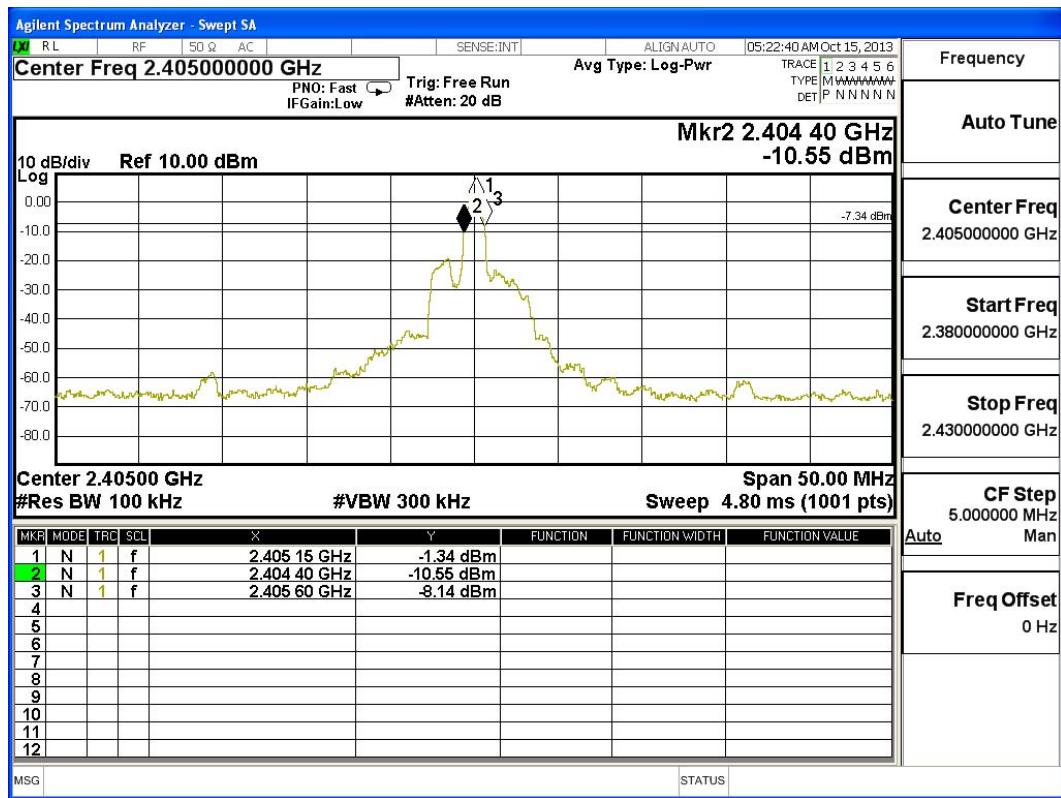
$\pm 150\text{Hz}$

7.6. Test Result of Occupied Bandwidth

Product : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2405MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
02	2405	1200	>500	Pass

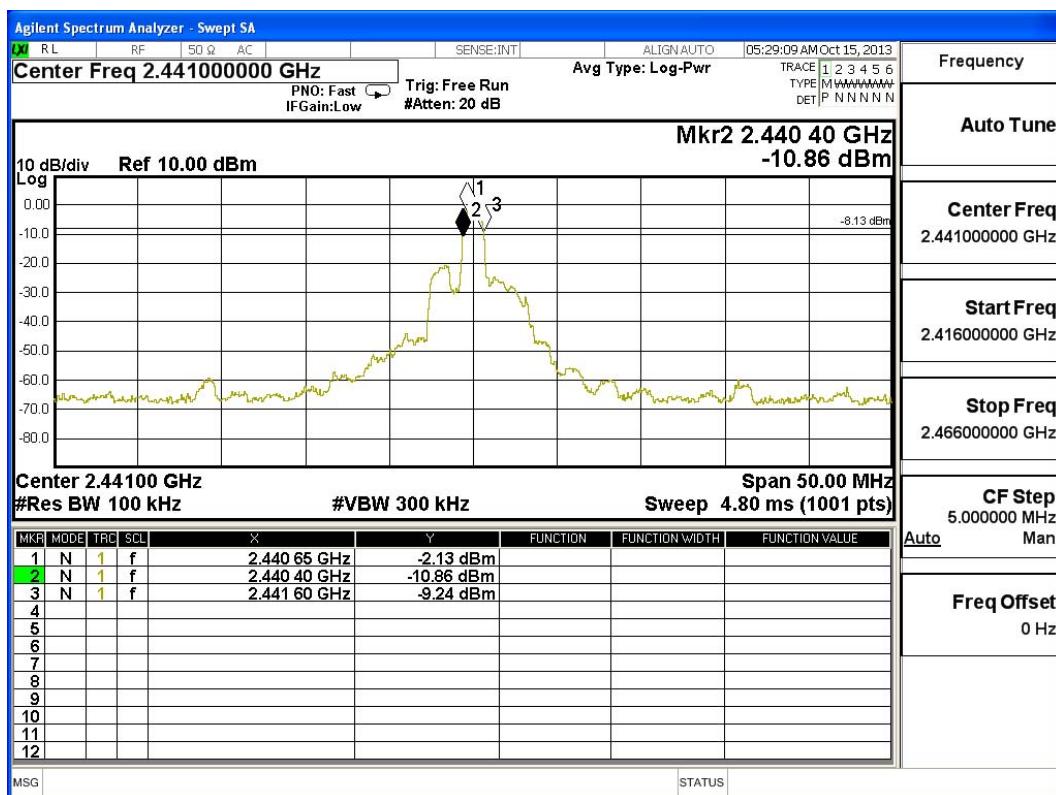
Figure Channel 02:



Product : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2441MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
20	2441	1200	>500	Pass

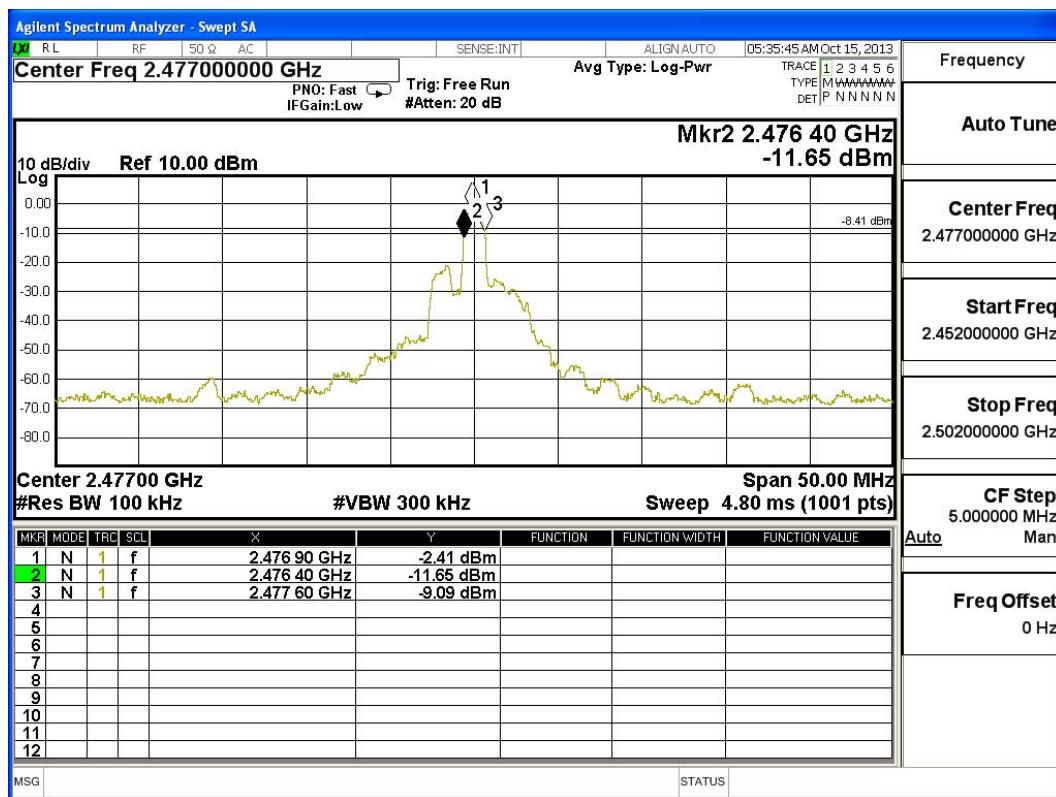
Figure Channel 20:



Product : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Occupied Bandwidth Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2477MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
38	2477	1200	>500	Pass

Figure Channel 38:



8. Power Density

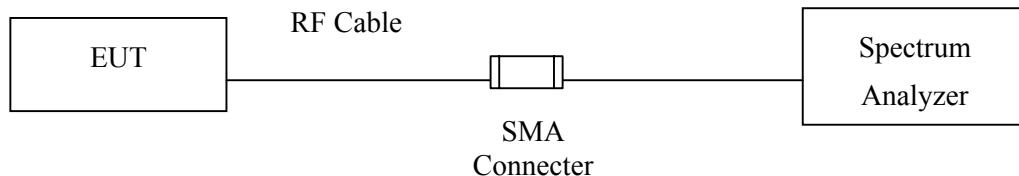
8.1. Test Equipment

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2013
Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2013
X Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr.,2013

Note: 1. All equipments are calibrated every one year.

1. The test instruments marked by "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 C63.10, 2009; tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

The maximum power spectral density using KDB 558074 section 10.2 PKPSD (peak PSD) method.

8.5. Uncertainty

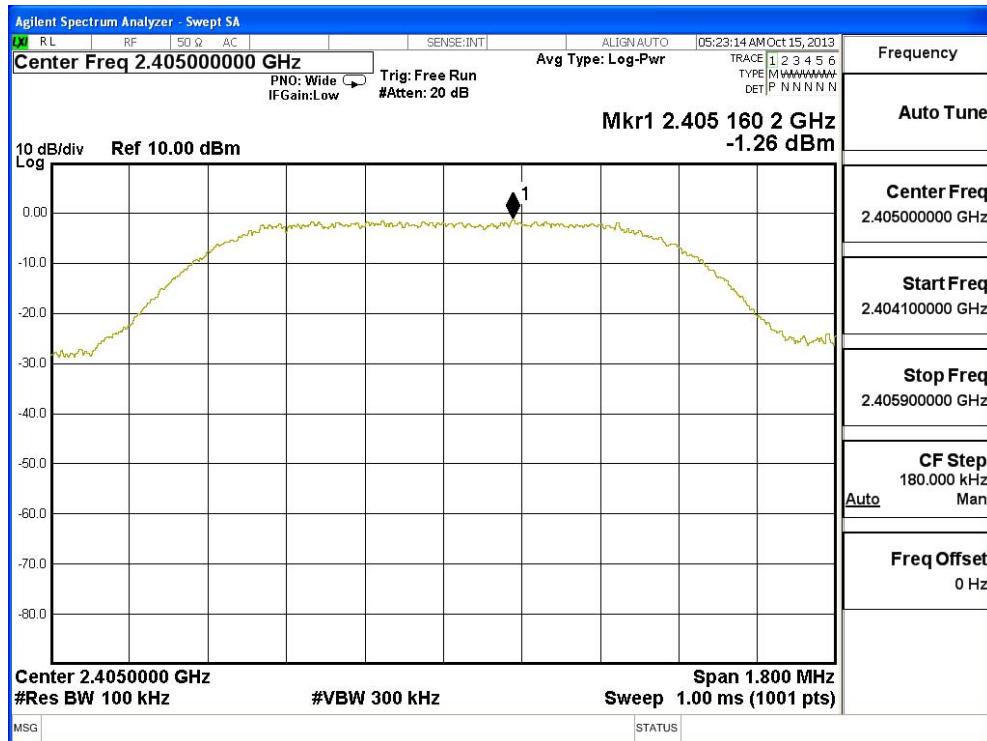
± 1.27 dB

8.6. Test Result of Power Density

Product : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Power Density Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2405MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
02	2405	-1.260	< 8dBm	Pass

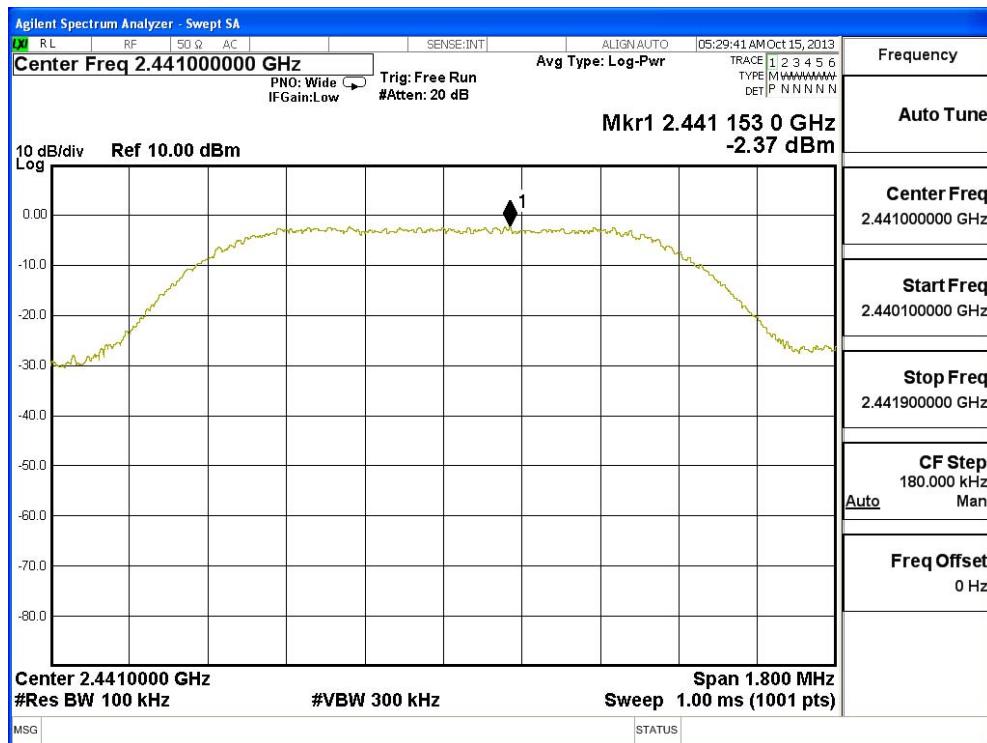
Figure Channel 02:



Product : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Power Density Data
 Test Site : No.3OATS
 Test Mode : Mode 1: Transmit (2441MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
20	2441	-2.370	< 8dBm	Pass

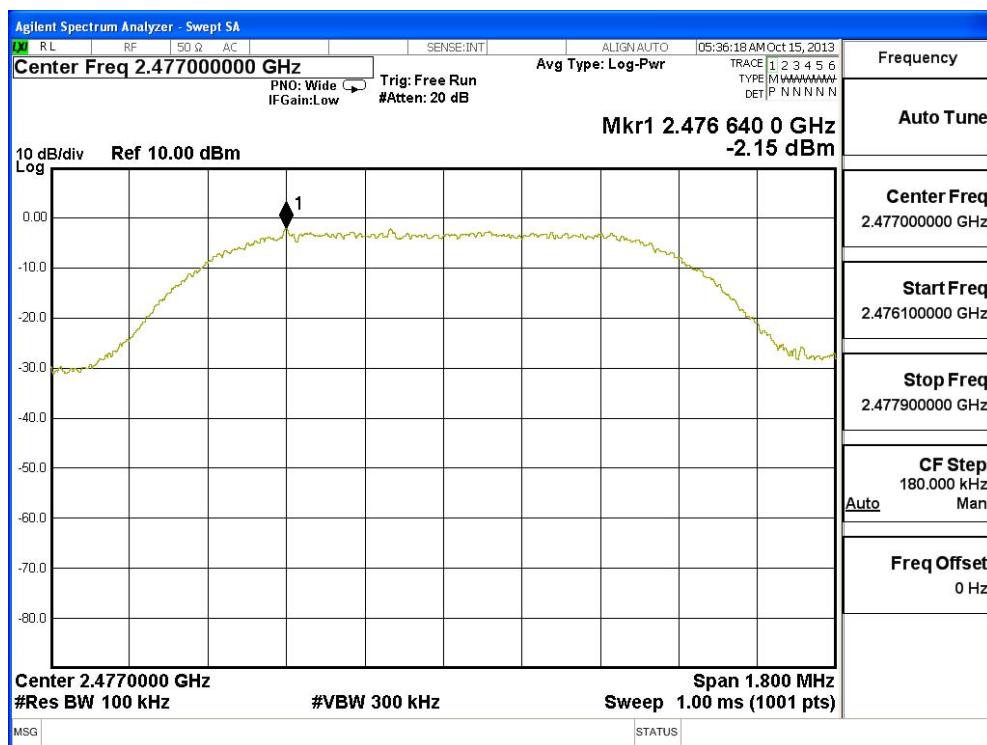
Figure Channel 20:



Product : Wi Stereo Digital Wireless Audio Receiver
 Test Item : Power Density Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2477MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
38	2477	-2.150	< 8dBm	Pass

Figure Channel 38



9. EMI Reduction Method During Compliance Testing

No modification was made during testing.