FCC Test Report

Product Name	Wi Stereo Digital Wireless Audio Transmitter
Model No	Wi-ALP55_TX, Wi-ASP55_TX
FCC ID.	XZ3-ALP55-T

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. 21, 2013
Report No.	138121R-RFUSP42V01
Report Version	V1.0

Testing Laboratory
0914

The test results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.
This report must not be used to claim product endorsement by TAF or any agency of the U.S. Government

Test Report Certification

Issue Date: Oct. 21, 2013
Report No.: 138121R-RFUSP42V01

Product Name	Wi Stereo Digital Wireless Audio Transmitter
Applicant	Jangus Music, Inc.
Address	8001 Irvine Center Drive, 4th Floor, Suite 400 Irvine, CA, 92618
Manufacturer	Jangus Music, Inc.
Model No.	Wi-ALP55_TX, Wi-ASP55_TX
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
Test Result	Complied

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Tested By : Andy Lin
(Engineer / Andy Lin)

Approved By :
(Manager / Vincent Lin)

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Wi Stereo Digital Wireless Audio Transmitter
Trade Name	Wi Digital Systems
Model No.	Wi-ALP55_TX, Wi-ASP55_TX
FCC ID.	XZ3-ALP55-T
Frequency Range	2405~2477MHz
Channel Separation	2MHz
Channel Number	37
Type of Modulation	π/4 DQPSK (Differential Quadrature Phase Shift Keying)
Antenna Type	Printed on PCB
Antenna Gain	Refer to the table “Antenna List”
Channel Control	Auto

Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	TATUNG	N/A	-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 Transmitter. 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_TX	Wi-ASP55_TX
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.	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.
	• 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	• 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

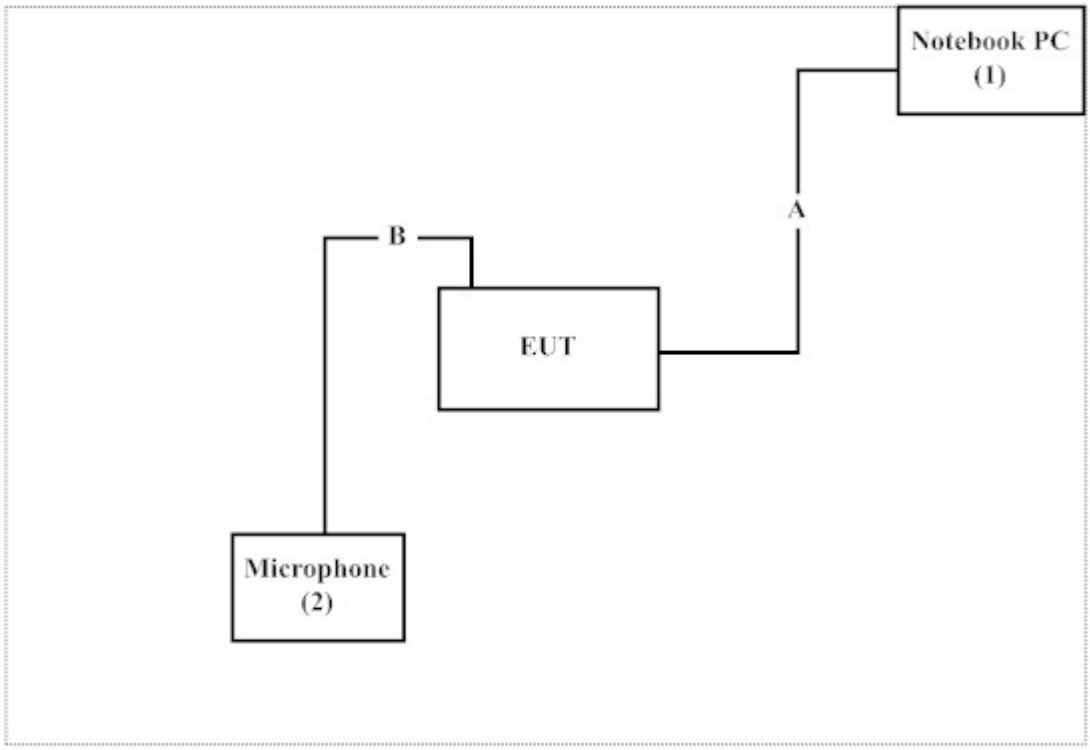
1.3. Tested System Details

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	Microphone	TENGDA	Dm-401	N/A	N/A

Signal Cable Type		Signal cable Description
A	USB Cable	Non-Shielded, 1.0m
B	Microphone & 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 “VM4Gdebug v1.1.5.35” on the Notebook PC.

(3) Configure the test mode, the test channel to start the continuous transmit

(4) 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://tw.quietek.com/tw/emc/accreditations/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
FCC Engineering Laboratory
7435 Oakland Mills Road
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Registration Number: 92195

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Linkou Dist. New Taipei City 24451,
Taiwan, R.O.C.
TEL: 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

FCC Accreditation Number: TW1014

2. Conducted Emission

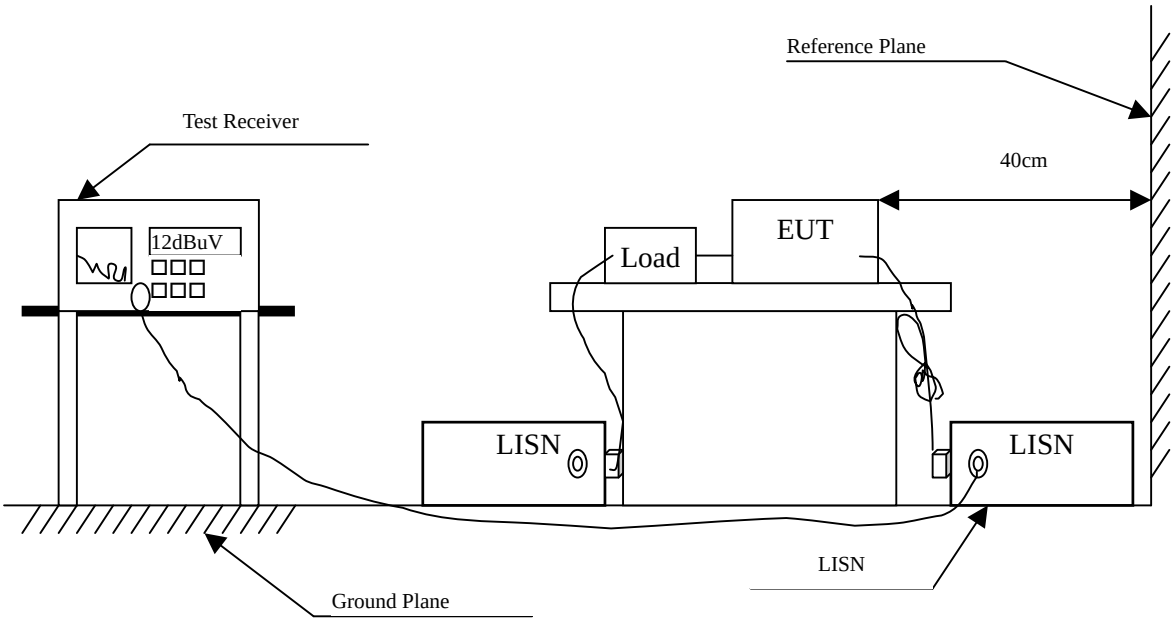
2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2013	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2013	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2013	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2013	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2013	
	No.1 Shielded Room				

Note:

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

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 Transmitter
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					
0.150	9.830	40.440	50.270	-15.730	66.000
0.193	9.830	39.180	49.010	-15.761	64.771
0.291	9.830	35.550	45.380	-16.591	61.971
0.521	9.830	31.530	41.360	-14.640	56.000
2.045	9.840	32.030	41.870	-14.130	56.000
7.982	9.941	26.920	36.861	-23.139	60.000
Average					
0.150	9.830	19.850	29.680	-26.320	56.000
0.193	9.830	21.040	30.870	-23.901	54.771
0.291	9.830	22.010	31.840	-20.131	51.971
0.521	9.830	20.620	30.450	-15.550	46.000
2.045	9.840	20.490	30.330	-15.670	46.000
7.982	9.941	16.320	26.261	-23.739	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 : Wi Stereo Digital Wireless Audio Transmitter
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					
0.189	9.830	36.030	45.860	-19.026	64.886
0.263	9.830	28.040	37.870	-24.901	62.771
0.447	9.840	31.220	41.060	-16.454	57.514
0.814	9.850	28.750	38.600	-17.400	56.000
1.220	9.850	28.770	38.620	-17.380	56.000
2.056	9.860	30.760	40.620	-15.380	56.000
Average					
0.189	9.830	18.120	27.950	-26.936	54.886
0.263	9.830	8.460	18.290	-34.481	52.771
0.447	9.840	14.250	24.090	-23.424	47.514
0.814	9.850	10.770	20.620	-25.380	46.000
1.220	9.850	10.260	20.110	-25.890	46.000
2.056	9.860	17.660	27.520	-18.480	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

3. Peak Power Output

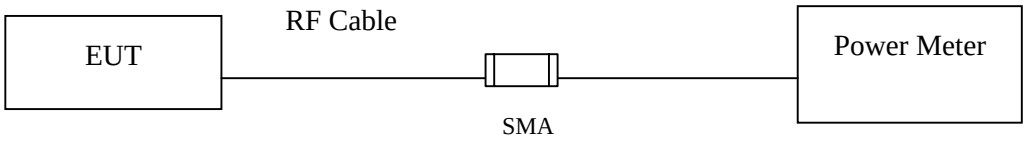
3.1. Test Equipment

	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 Transmitter
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	3.63	<30dBm	Pass
20	2441	2.99	<30dBm	Pass
38	2477	2.38	<30dBm	Pass

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

4. Radiated Emission

4.1. Test Equipment

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

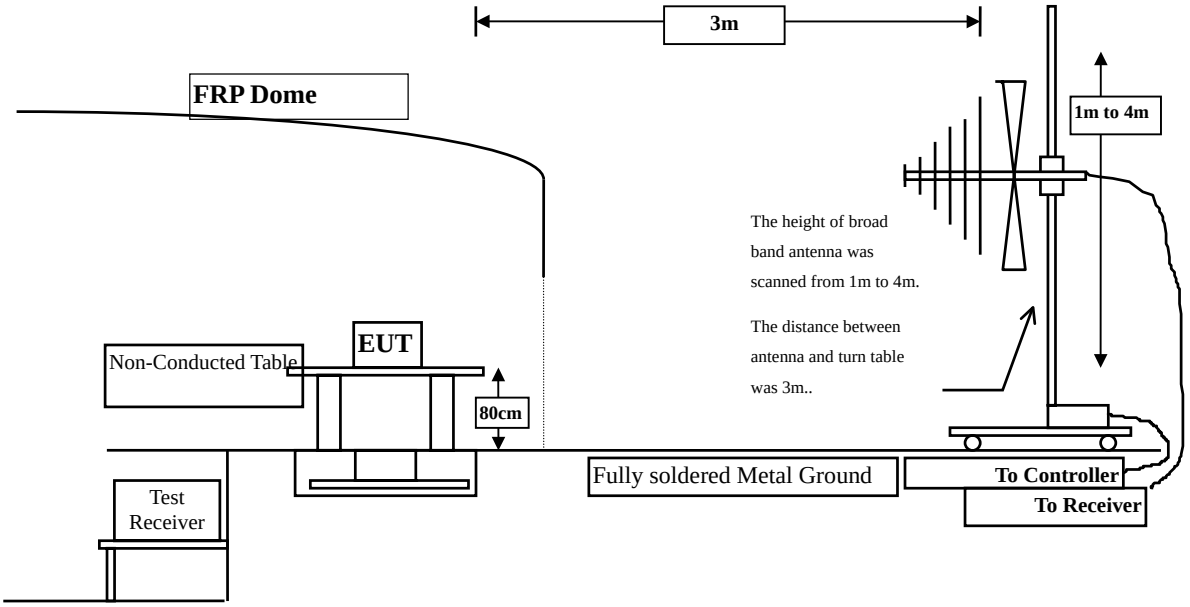
Test Site	Equipment		Manufacturer	Model No./Serial No.	Last Cal.
☒Site # 3	X	Loop Antenna	Teseq	HLA6120 / 26739	Jul., 2013
	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2013
	X	Pre-Amplifier	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.

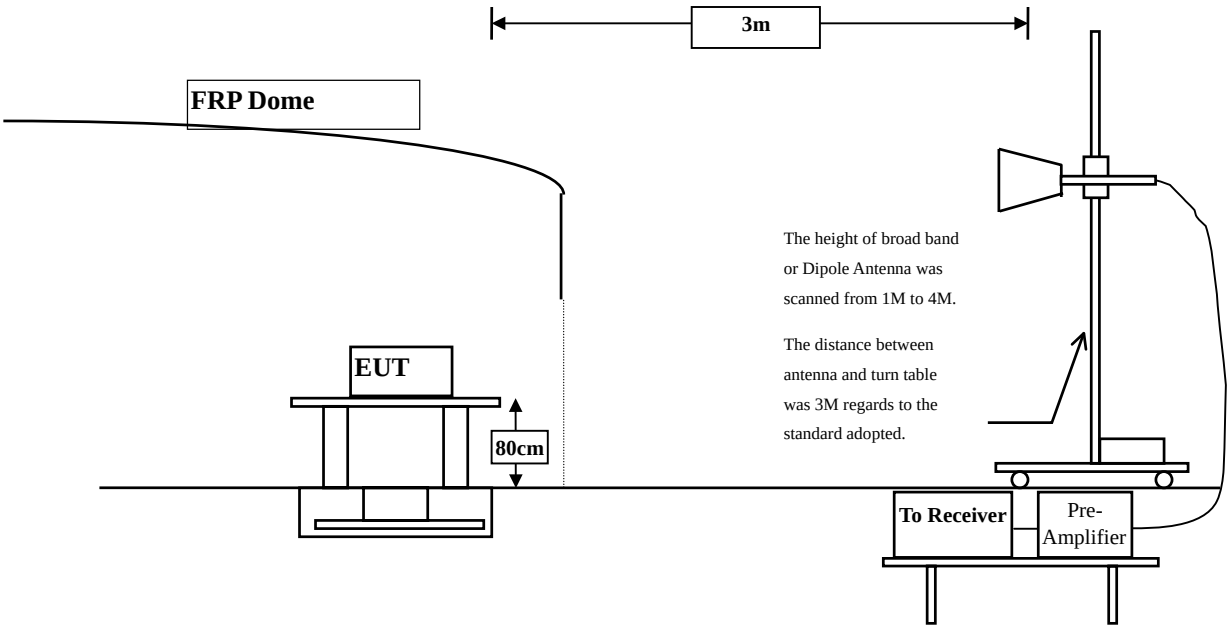
2. The test instruments marked with “X” are used to measure the final test results.

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 form 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 Transmitter
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2405MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4810.000	3.323	43.210	46.533	-27.467	74.000
7215.000	10.289	37.520	47.810	-26.190	74.000
9620.000	13.595	36.360	49.956	-24.044	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4810.000	6.591	43.860	50.451	-23.549	74.000
7215.000	11.151	40.300	51.452	-22.548	74.000
9620.000	14.014	36.630	50.645	-23.355	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 : Wi Stereo Digital Wireless Audio Transmitter
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2441MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4882.000	3.001	42.320	45.321	-28.679	74.000
7323.000	11.846	36.770	48.617	-25.383	74.000
9764.000	12.563	37.540	50.103	-23.897	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4882.000	5.713	41.960	47.674	-26.326	74.000
7323.000	12.727	38.650	51.378	-22.622	74.000
9764.000	13.028	36.990	50.018	-23.982	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 : Wi Stereo Digital Wireless Audio Transmitter
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2477MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4954.000	2.777	41.240	44.017	-29.983	74.000
7431.000	12.481	36.160	48.641	-25.359	74.000
9908.000	13.389	37.410	50.799	-23.201	74.000
Average Detector:					
--					
Vertical					
Peak Detector:					
4954.000	5.552	40.360	45.912	-28.088	74.000
7431.000	13.412	37.570	50.983	-23.017	74.000
9908.000	13.968	37.700	51.668	-22.332	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 : Wi Stereo Digital Wireless Audio Transmitter
Test Item : General Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit (2441MHz)

Frequency	Correct Factor	Reading Level	Measurement Level	Margin	Limit
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
262.800	-5.013	24.849	19.836	-26.164	46.000
344.280	-2.591	25.527	22.937	-23.063	46.000
460.680	1.589	24.511	26.100	-19.900	46.000
544.100	3.512	25.621	29.133	-16.867	46.000
615.880	3.215	28.372	31.587	-14.413	46.000
829.280	6.344	24.578	30.922	-15.078	46.000
Vertical					
99.840	-0.021	24.975	24.954	-18.546	43.500
458.740	-3.887	25.609	21.722	-24.278	46.000
615.880	-1.905	24.795	22.890	-23.110	46.000
755.560	3.281	24.224	27.505	-18.495	46.000
827.340	3.162	23.571	26.733	-19.267	46.000
967.020	8.071	22.921	30.992	-23.008	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.
8. No emission found between lowest internal used/generated frequency to 30MHz.

5. RF antenna conducted test

5.1. Test Equipment

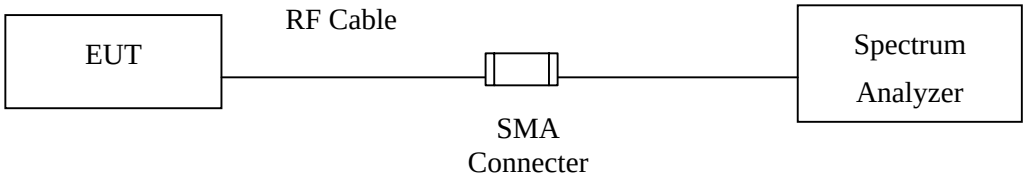
	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2013
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2013
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2013

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

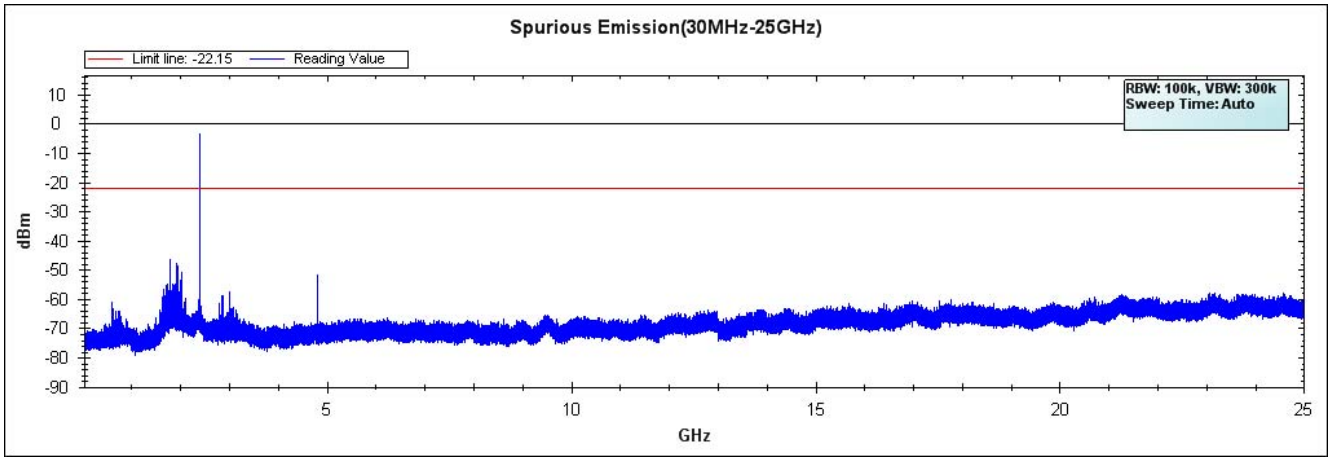
The measurement uncertainty

Conducted is defined as ± 1.27dB

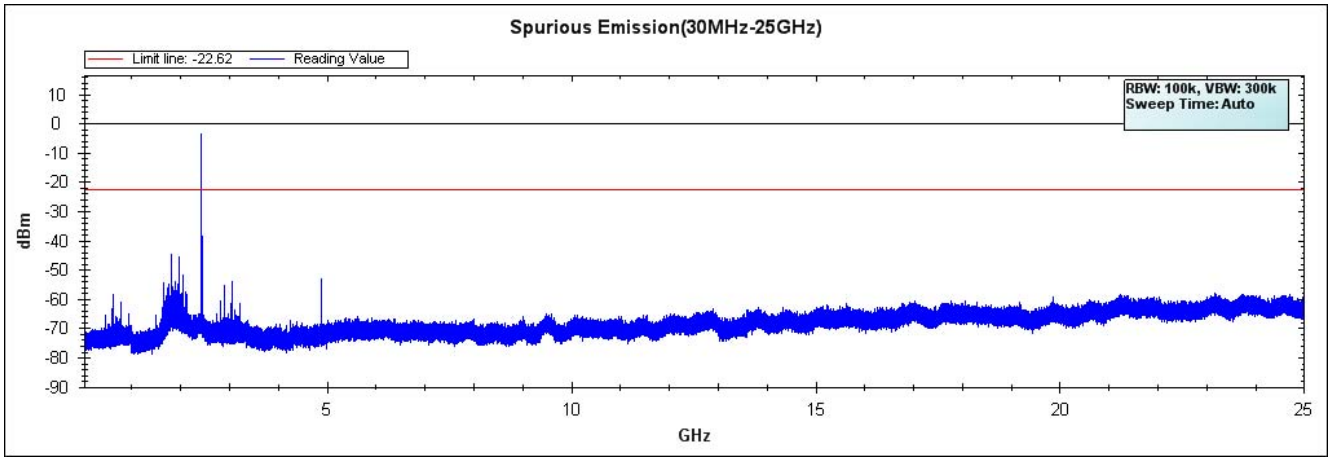
5.6. Test Result of RF antenna conducted test

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

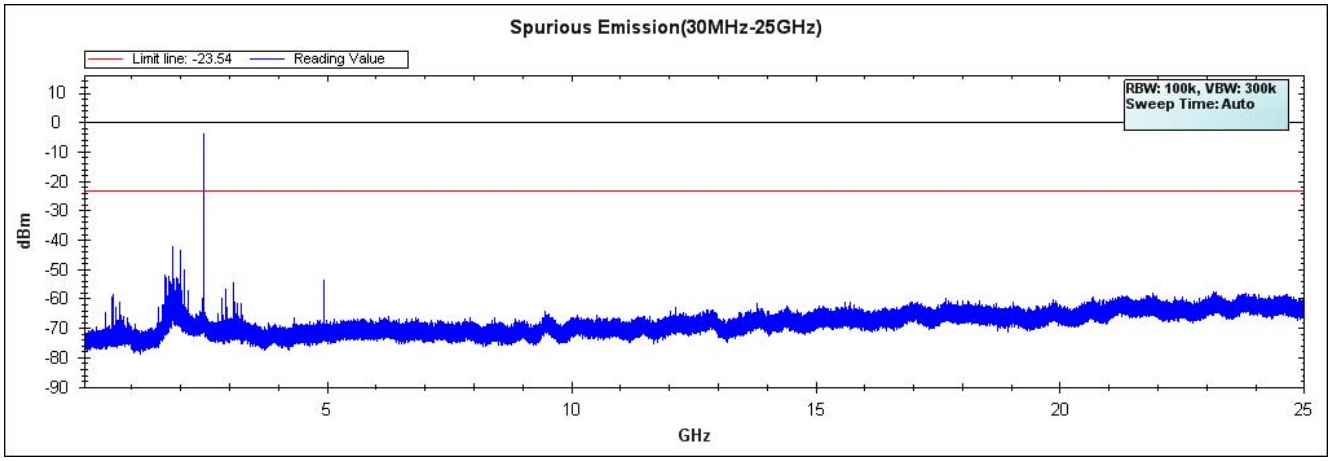
Channel 02(2405MHz)



Channel 20(2441MHz)



Channel 38(2477MHz)



6. Band Edge

6.1. Test Equipment

RF Radiated Measurement:

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

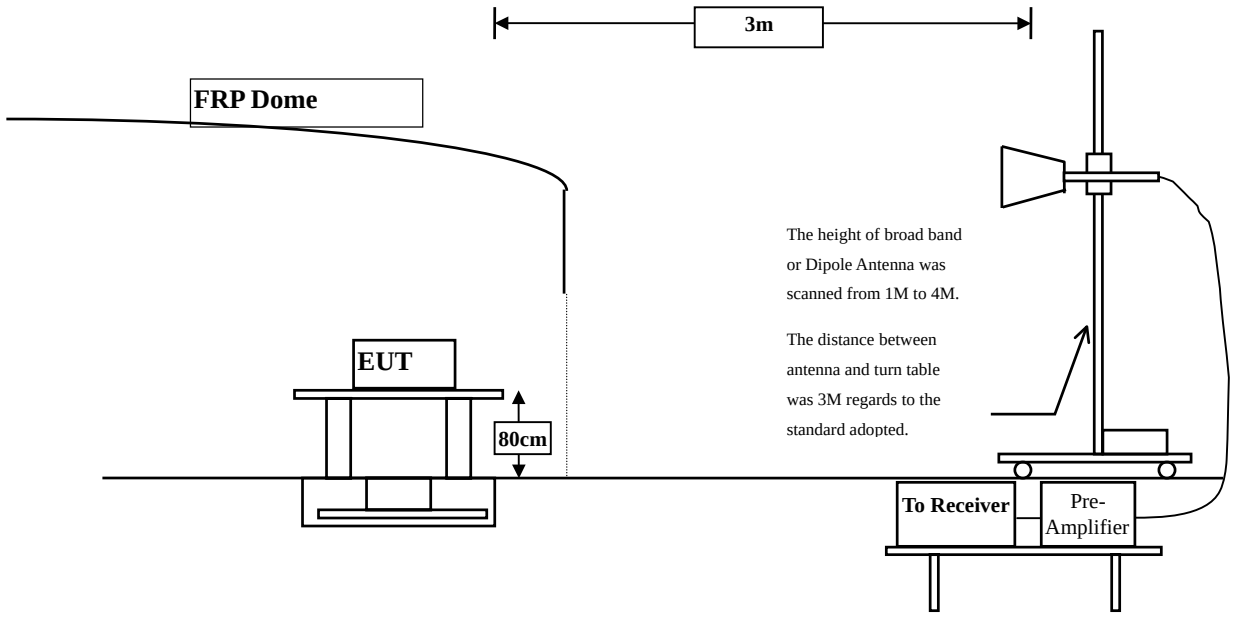
Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2013
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2013
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2013
		Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2013
	X	Pre-Amplifier	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

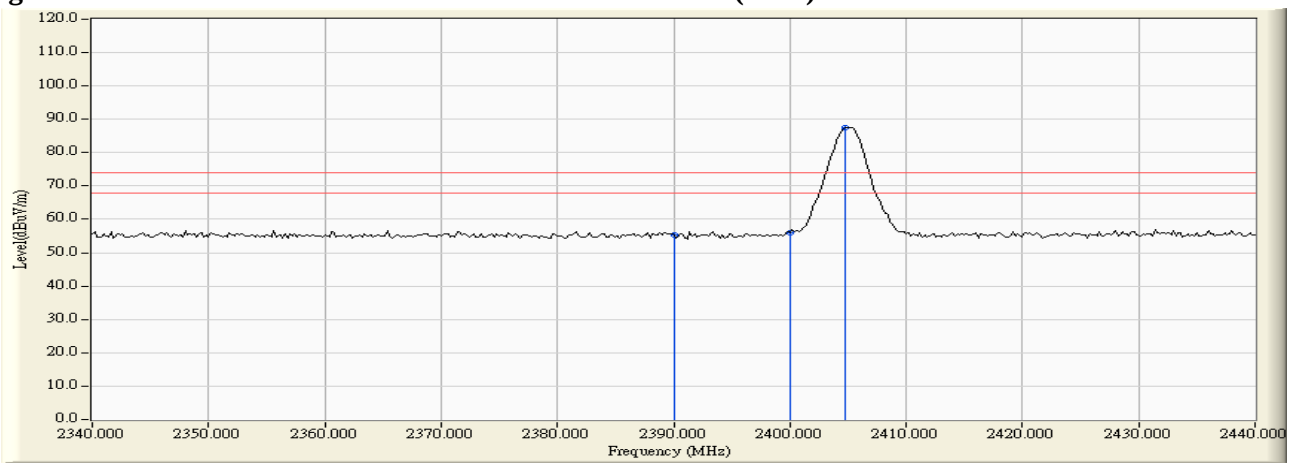
6.6. Test Result of Band Edge

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

RF Radiated Measurement (Horizontal):

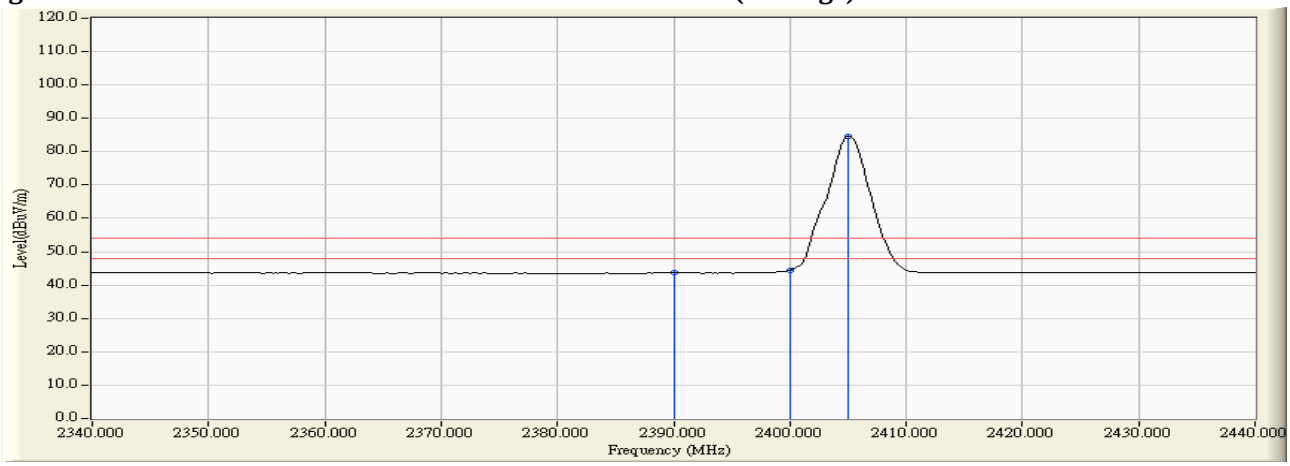
Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Result
02 (Peak)	2390.000	31.509	23.891	55.400	-18.600	74.000	Pass
02 (Peak)	2400.000	31.561	24.464	56.025	-17.975	74.000	Pass
02 (Peak)	2404.800	31.592	55.958	87.549	--	--	Pass
02 (Average)	2390.000	31.509	12.104	43.613	-10.387	54.000	Pass
02 (Average)	2400.000	31.561	12.832	44.393	-9.607	54.000	Pass
02 (Average)	2405.000	31.593	52.937	84.530	--	--	Pass

Figure Channel 02: Horizontal (Peak)



Note: RBW=1MHz, VBW=1MHz, Sweep=500ms

Figure Channel 02: Horizontal (Average)



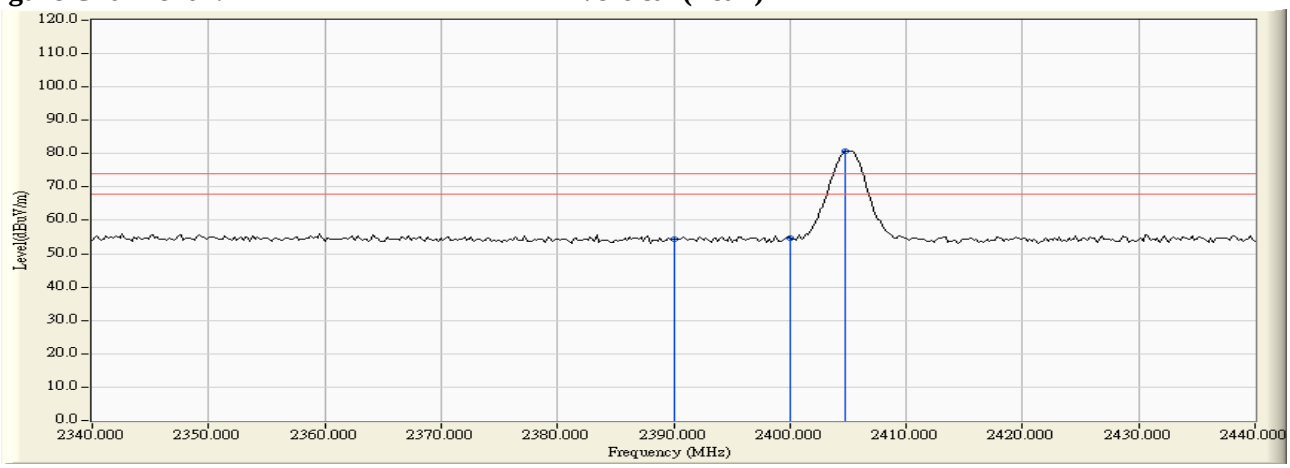
Note: RBW=1MHz, VBW=1MHz, Sweep=500ms

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

RF Radiated Measurement (Vertical):

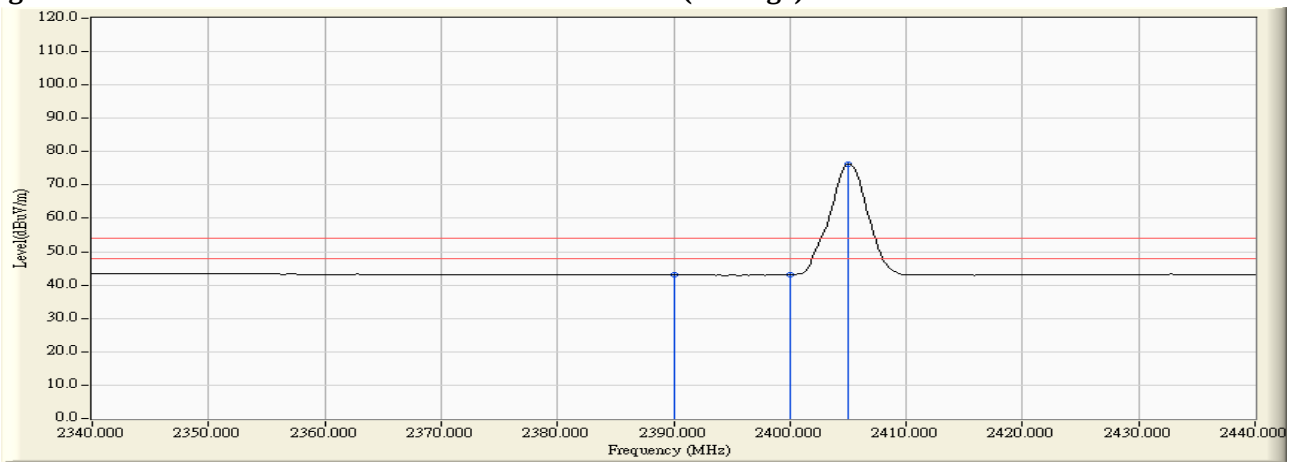
Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Result
02 (Peak)	2390.000	30.915	23.499	54.414	-19.586	74.000	Pass
02 (Peak)	2400.000	30.912	23.653	54.565	-19.435	74.000	Pass
02 (Peak)	2404.800	30.926	49.772	80.697	--	--	Pass
02 (Average)	2390.000	30.915	12.093	43.008	-10.992	54.000	Pass
02 (Average)	2400.000	30.912	12.124	43.036	-10.964	54.000	Pass
02 (Average)	2405.000	30.926	45.219	76.145	--	--	Pass

Figure Channel 02: Vertical (Peak)



Note: RBW=1MHz, VBW=1MHz, Sweep=500ms

Figure Channel 02: Vertical (Average)



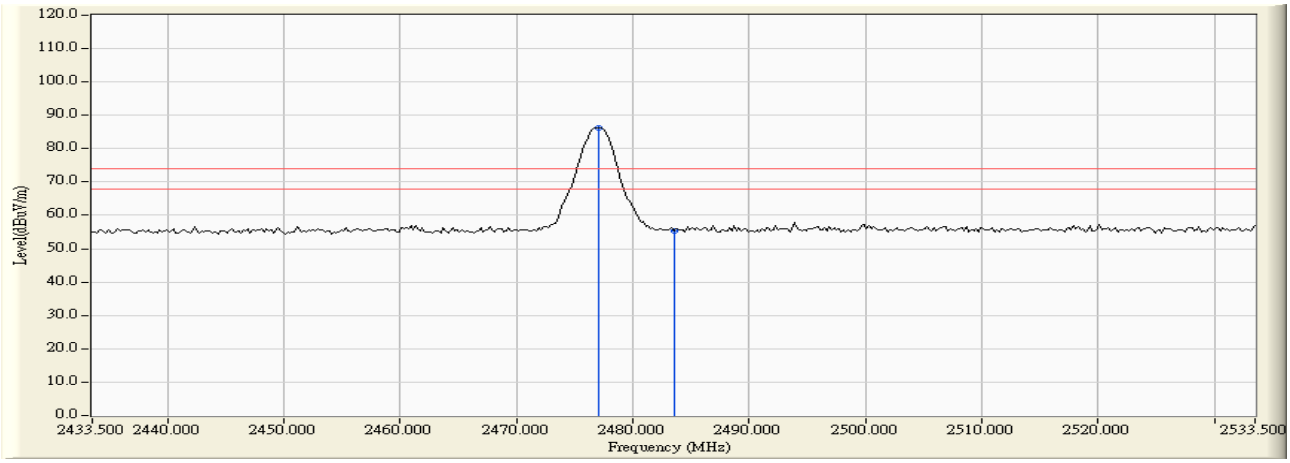
Note: RBW=1MHz, VBW=1MHz, Sweep=500ms

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

RF Radiated Measurement (Horizontal):

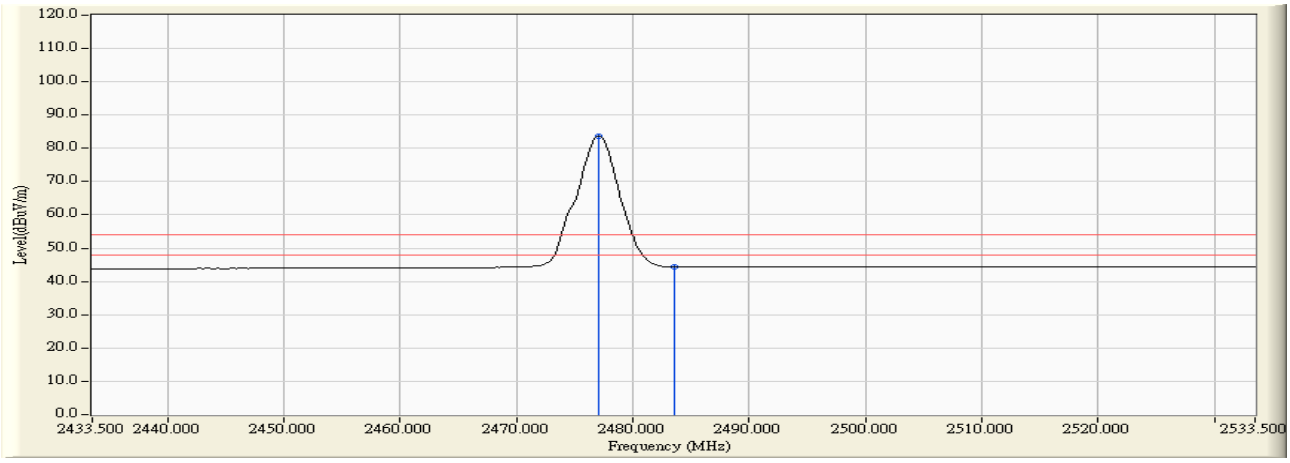
Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Result
38 (Peak)	2477.100	32.134	54.242	86.376	--	--	Pass
38 (Peak)	2483.500	32.182	23.273	55.455	-18.545	74.000	Pass
38 (Average)	2477.100	32.134	51.387	83.521	--	--	Pass
38 (Average)	2483.500	32.182	12.221	44.403	-9.597	54.000	Pass

Figure Channel 38: Horizontal (Peak)



Note: RBW=1MHz, VBW=1MHz, Sweep=500ms

Figure Channel 38: Horizontal (Average)



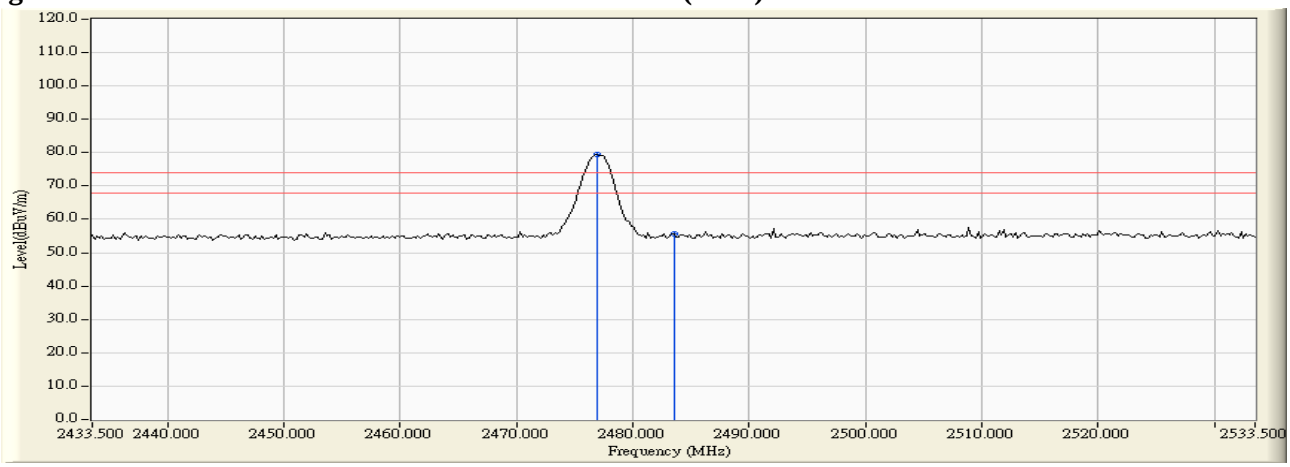
Note: RBW=1MHz, VBW=1MHz, Sweep=500ms

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

RF Radiated Measurement (Vertical):

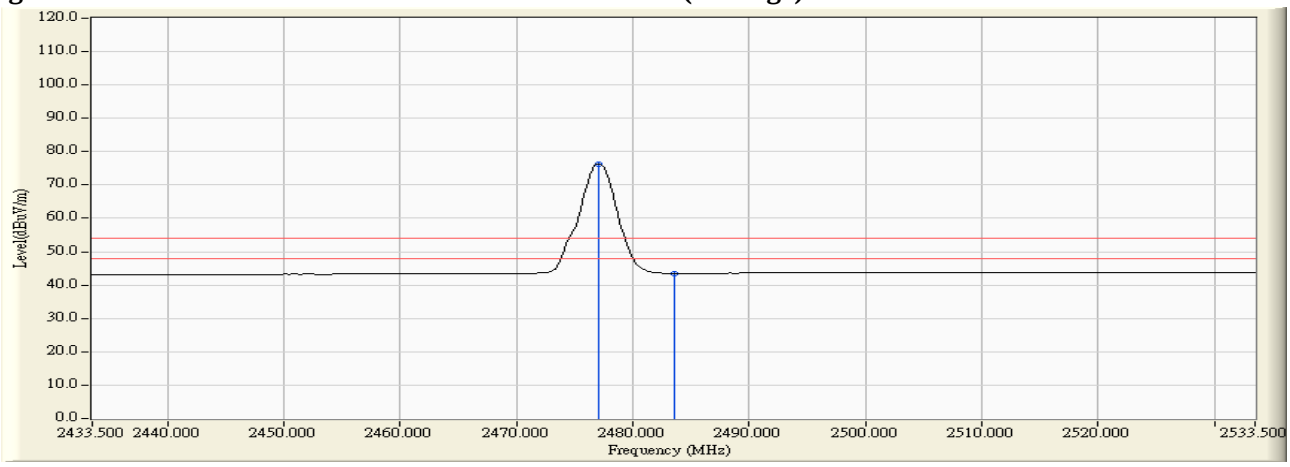
Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Result
38 (Peak)	2476.900	31.391	47.963	79.354	--	--	Pass
38 (Peak)	2483.500	31.435	24.117	55.552	-18.448	74.000	Pass
38 (Average)	2477.100	31.392	44.983	76.375	--	--	Pass
38 (Average)	2483.500	31.435	12.121	43.556	-10.444	54.000	Pass

Figure Channel 38: Vertical (Peak)



Note: RBW=1MHz, VBW=1MHz, Sweep=500ms

Figure Channel 38: Vertical (Average)



Note: RBW=1MHz, VBW=1MHz, Sweep=500ms

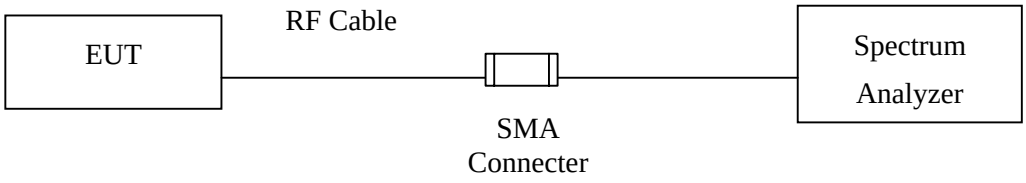
7. Occupied Bandwidth

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.

7.5. Uncertainty

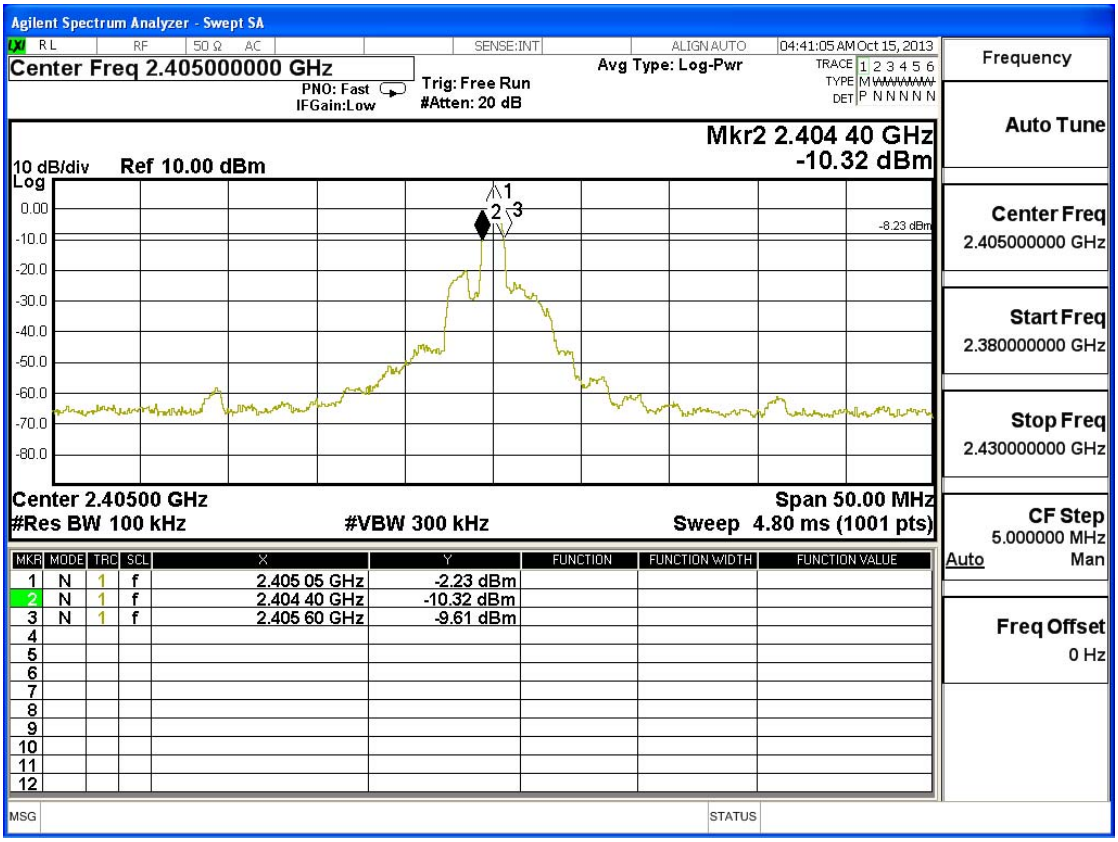
± 150Hz

7.6. Test Result of Occupied Bandwidth

Product : Wi Stereo Digital Wireless Audio Transmitter
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	2405.00	1200	>500	Pass

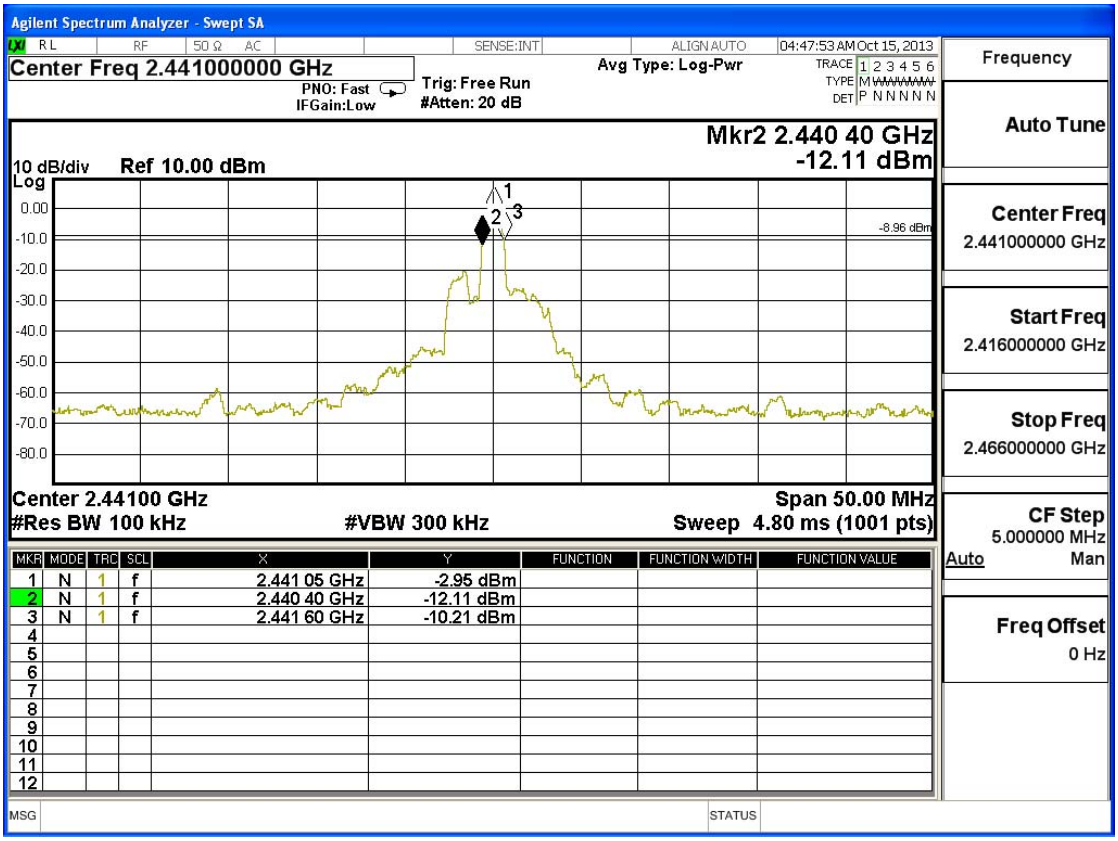
Figure Channel 02:



Product : Wi Stereo Digital Wireless Audio Transmitter
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	2441.00	1200	>500	Pass

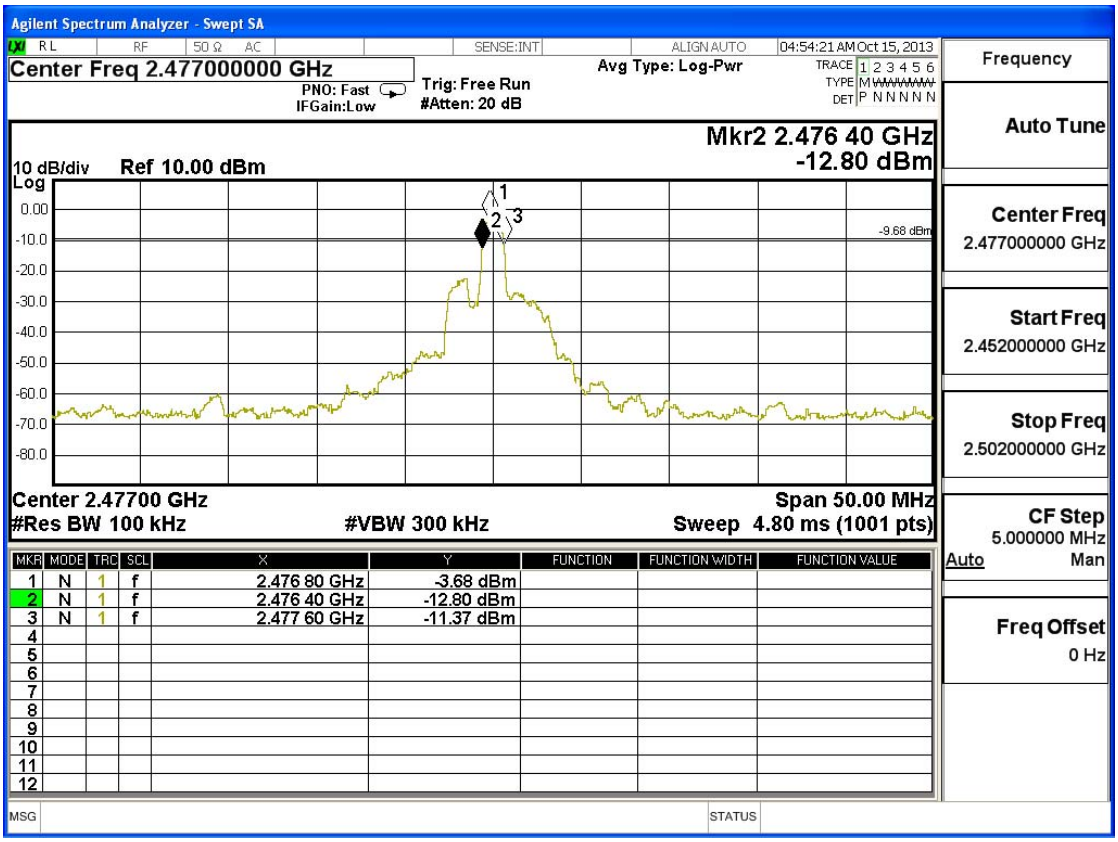
Figure Channel 20:



Product : Wi Stereo Digital Wireless Audio Transmitter
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	2477.00	1200	>500	Pass

Figure Channel 38:



8. Power Density

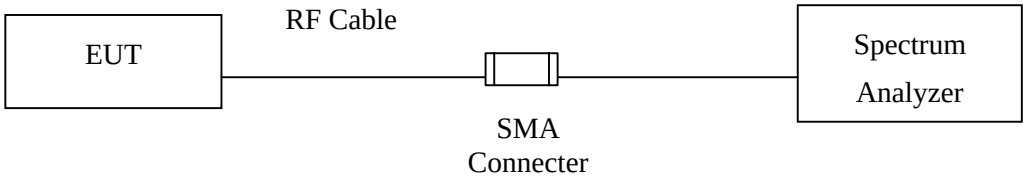
8.1. Test Equipment

	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

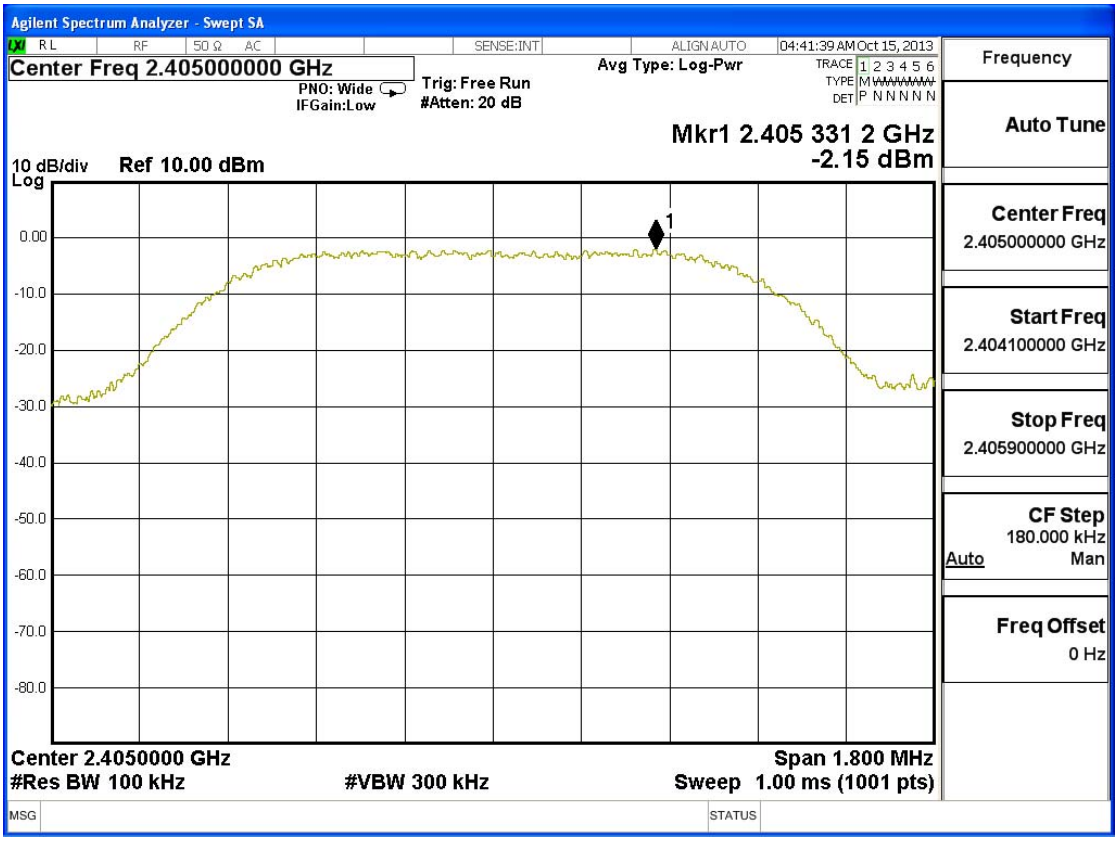
± 1.27 dB

8.6. Test Result of Power Density

Product : Wi Stereo Digital Wireless Audio Transmitter
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	2405.00	-2.150	< 8dBm	Pass

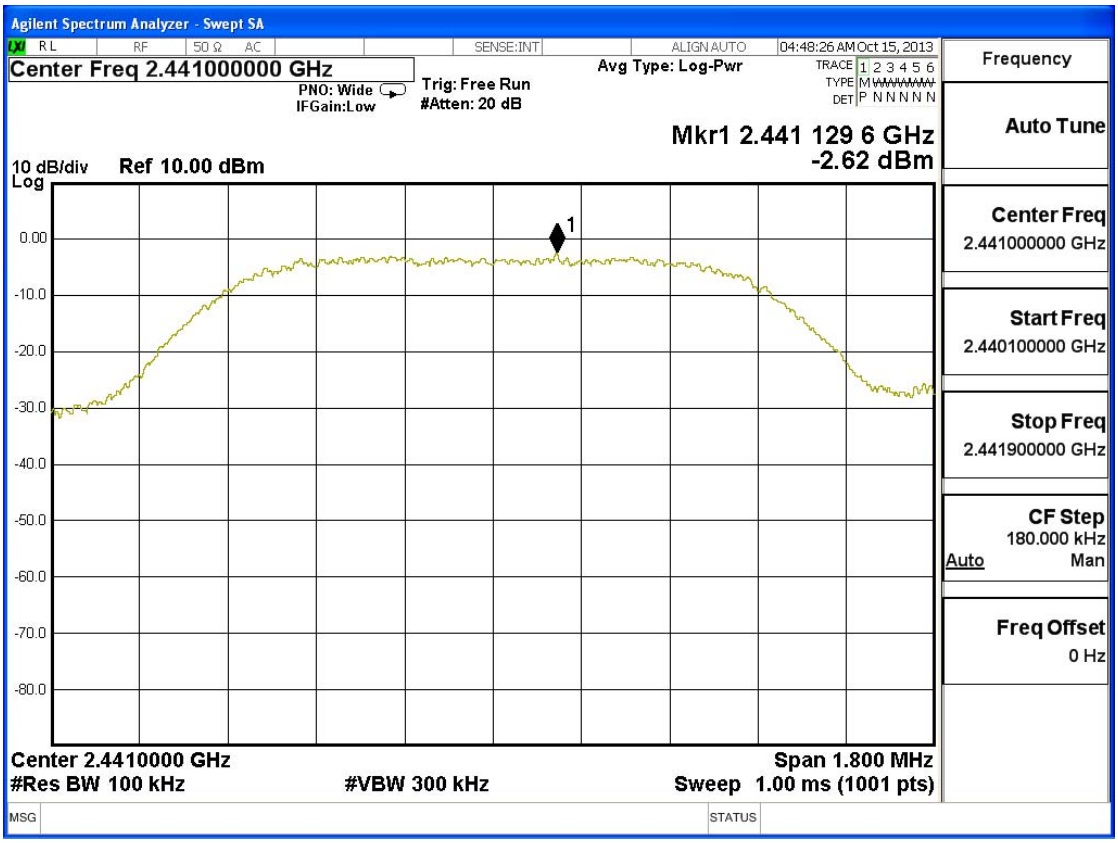
Figure Channel 01:



Product : Wi Stereo Digital Wireless Audio Transmitter
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	2441.00	-2.620	< 8dBm	Pass

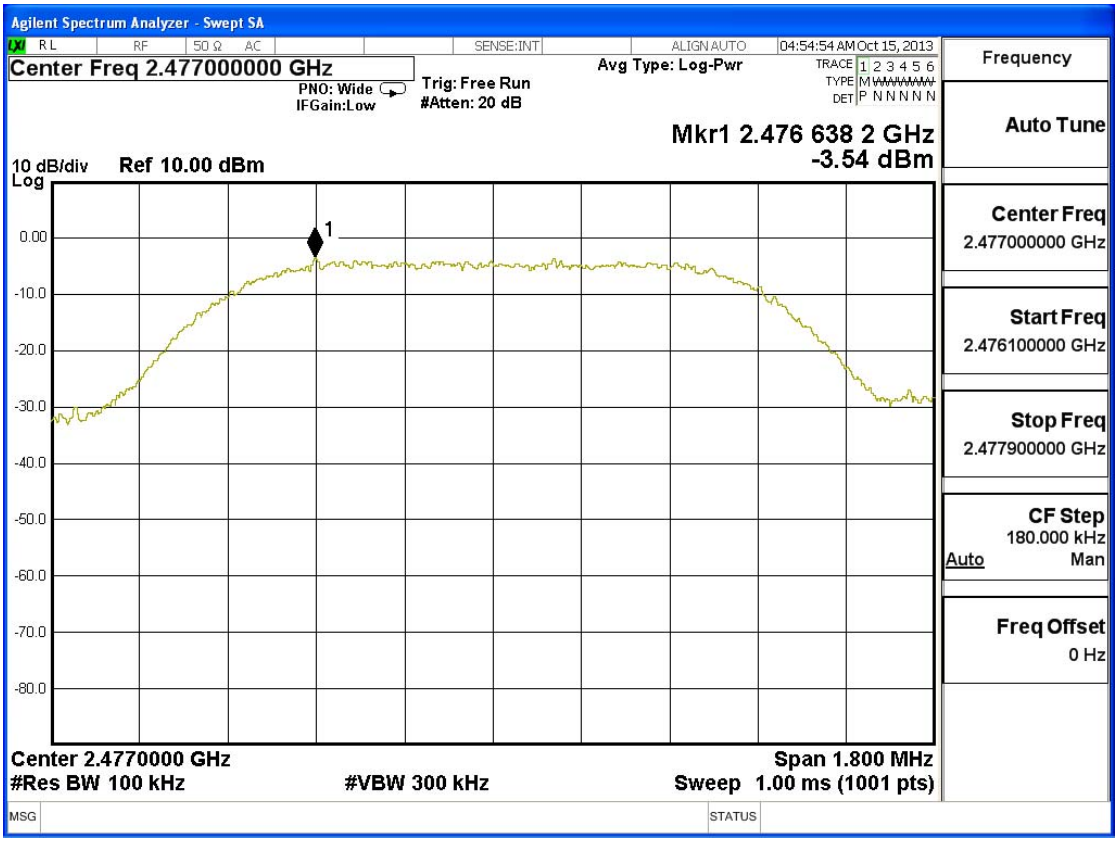
Figure Channel 20:



Product : Wi Stereo Digital Wireless Audio Transmitter
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	2477.00	-3.540	< 8dBm	Pass

Figure Channel 38:



9. EMI Reduction Method During Compliance Testing

No modification was made during testing.