



Test Report

Product Name	Professional Stereo Digital Wireless Audio Dongles (Transmitter)
Model No.	JM-WAL35-T1, KEN4-T1, JM-WAL45-T1, KEN5-T1
FCC ID.	BJM-KEN4-T

Applicant	TATUNG CO.
Address	22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.

Date of Receipt	June 24, 2009
Issued Date	July 10, 2009
Report No.	096373R-RFUSP44V01
Report Version	V1.0

The Test Results relate only to the samples tested.

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Test Report Certification

Issued Date: July 10, 2009

Report No. : 096373R-RFUSP44V01



Product Name	Professional Stereo Digital Wireless Audio Dongles (Transmitter)	
Applicant	TATUNG CO.	
Address	22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C.	
Manufacturer	TATUNG CO.	
Model No.	JM-WAL35-T1, KEN4-T1, JM-WAL45-T1, KEN5-T1	
FCC ID.	BJM-KEN4-T	
Rated Voltage	AC 120V/60Hz	
Working Voltage	DC 3.7V (Power by Battery)	
Trade Name	JANGUS, TATUNG	
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2008	 <small>NVLAP Lab Code: 200533-0</small>
	ANSI C63.4: 2003	
Test Result	Complied	

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Documented By : Jinn Chen
 (Adm. Assistant / Jinn Chen)



Tested By : Molin Huang
 (Engineer / Molin Huang)



Approved By : Vincent Lin
 (Manager / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Professional Stereo Digital Wireless Audio Dongles (Transmitter)
Trade Name	JANGUS, TATUNG
FCC ID.	BJM-KEN4-T
Model No.	JM-WAL35-T1, KEN4-T1, JM-WAL45-T1, KEN5-T1
Frequency Range	2405 – 2477MHz
Type of Modulation	$\pi/4$ DQPSK (Differential Quadrature Phase Shift Keying)
Number of Channels	37
Channel Control	Auto
Antenna Type	Printer on PCB
Antenna Gain	Refer to the table “Antenna List”
USB Cable	Shielded, 0.2m

Antenna List

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

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 2:	2405 MHz	Channel 3:	2407 MHz	Channel 4:	2409 MHz
Channel 5:	2411 MHz	Channel 6:	2413 MHz	Channel 7:	2415 MHz
Channel 8:	2417 MHz	Channel 9:	2419 MHz	Channel 10:	2421 MHz
Channel 11:	2423 MHz	Channel 12:	2425 MHz	Channel 13:	2427 MHz
Channel 14:	2429 MHz	Channel 15:	2431 MHz	Channel 16:	2433 MHz
Channel 17:	2435 MHz	Channel 18:	2437 MHz	Channel 19:	2439 MHz
Channel 20:	2441 MHz	Channel 21:	2443 MHz	Channel 22:	2445 MHz
Channel 23:	2447 MHz	Channel 24:	2449 MHz	Channel 25:	2451 MHz
Channel 26:	2453 MHz	Channel 27:	2455 MHz	Channel 28:	2457 MHz
Channel 29:	2459 MHz	Channel 30:	2461 MHz	Channel 31:	2463 MHz
Channel 32:	2465 MHz	Channel 33:	2467 MHz	Channel 34:	2469 MHz
Channel 35:	2471 MHz	Channel 36:	2473 MHz	Channel 37:	2475 MHz
Channel 38:	2477 MHz				

Note:

1. The EUT is a Professional Stereo Digital Wireless Audio Dongles (Transmitter) with a built-in 2.4GHz transceiver
2. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. The EUT is including four models The different of each model is shown as below:

Model Number	Description
JM-WAL35-T1	Brand: JANGUS Color: Black With Microphone Function
KEN4-T1	Brand: TATUNG Color: Black With Microphone Function
JM-WAL45-T1	Brand: JANGUS Color: Blue Without Microphone Function
KEN5-T1	Brand: TATUNG Color: Blue Without Microphone Function

5. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

EMI Test Mode	Mode 1: Transmit
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1.2. Operation Description

The EUT is a Professional Stereo Digital Wireless Audio Dongles (Transmitter) with a built-in 2.4GHz transceiver. The EUT operation frequency is 2.405GHz-2.477GHz. The signals modulated by $\pi/4$ DQPSK (Differential Quadrature Phase Shift Keying) are transmitted from the Printer on PCB Antenna of the EUT.

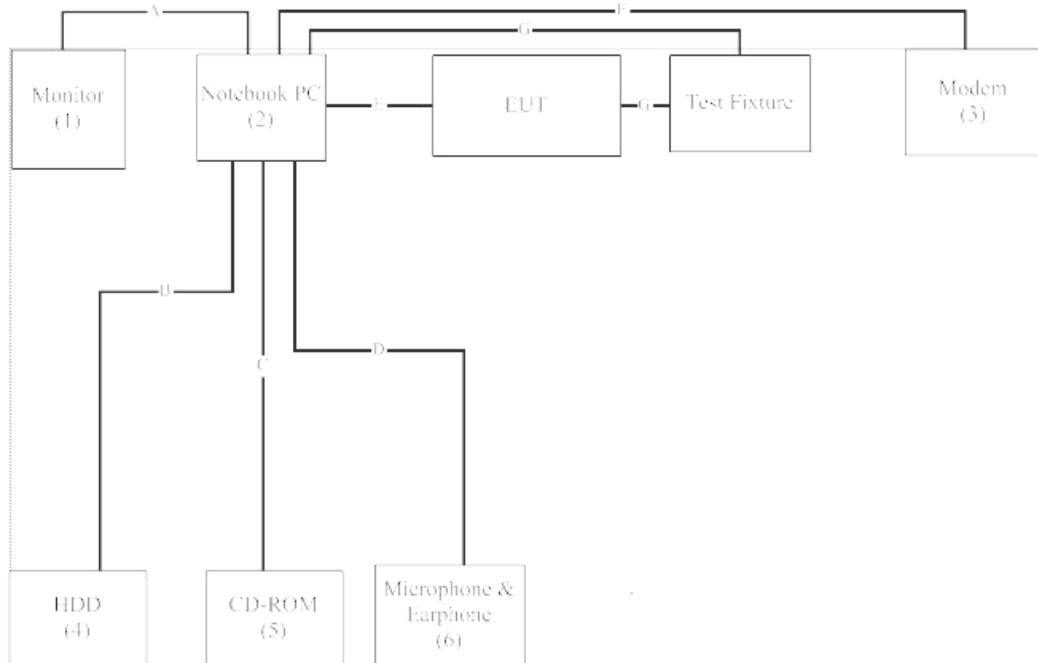
1.3. Tested System Details

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. Monitor	Dell	2407WFPb	CN-0FC255-46633-638-1MD S	Non-Shielded, 1.8m
2. Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
3. Modem	ACEEX	DM-1414	0102027536	Non-Shielded, 1.8m
4. COMBO HDD	TeraSys	F12-UF	A0100215-64b0006	N/A
5. CD-ROM	Dell	N/A	N/A	N/A
6. Microphone & Earphone	PCHOME	N/A	N/A	N/A
7. Test fixture	N/A	N/A	N/A	N/A

Signal Cable Type	Signal Cable Description
A. VGA Cable	Non-Shielded, 1.6m, with one ferrite core bonded
B. 1394 Cable	Non-Shielded, 1.8m
C. USB	Non-Shielded, 1.6m
D. Microphone & Earphone Cable	Non-Shielded, 1.6m
E. Earphone Cable	Non-Shielded, 1.6m
F. RS-232	Non-Shielded, 1.8m, with one ferrite core bonded
G. USB Cable	Non-Shielded, 1.8m
H. Control Cable	Non-Shielded, 0.1m

1.4. Configuration of Test System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in section 1.4.
- (2) Connect the EUT to a notebook via a USB.
- (3) Execute “AMD2 Debug.exe (V1.37.001)” on the notebook.
- (4) Setup the test channel.
- (5) Press “Apply” to start the continuous receiver.
- (6) Verify that the EUT works correctly.

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/modules/myalbum/>
 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
 Columbia, MD 21046
 Registration Number: 92195



Accreditation on NVLAP
 NVLAP Lab Code: 200533-0



Site Name: Quietek Corporation

Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,
 Lin-Kou Shiang, Taipei,
 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

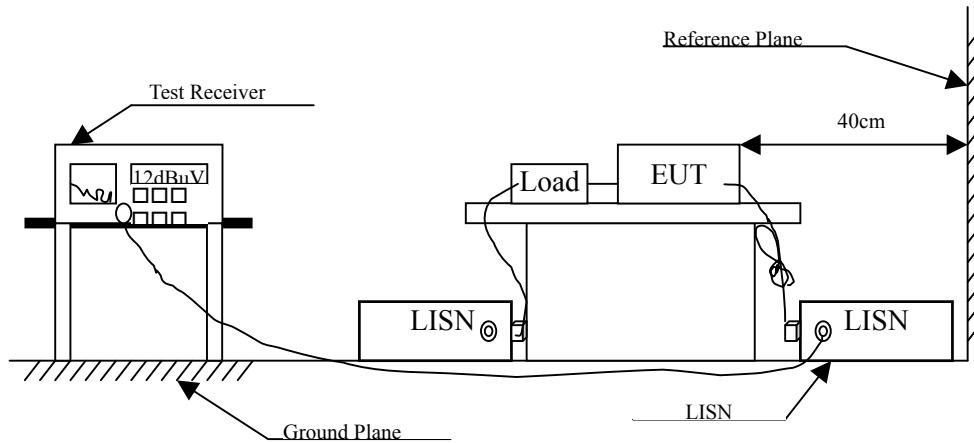
2.1. Test Equipment

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, 2009	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2009	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2009	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2009	
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	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

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 investigated 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 : Professional Stereo Digital Wireless Audio Dongles (Transmitter)
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
LINE 1					
Quasi-Peak					
0.181	9.724	46.860	56.584	-8.530	65.114
0.302	9.650	32.690	42.340	-19.317	61.657
0.791	9.650	19.500	29.150	-26.850	56.000
2.005	9.680	23.850	33.530	-22.470	56.000
3.951	9.700	28.620	38.320	-17.680	56.000
15.736	10.000	22.820	32.820	-27.180	60.000
Average					
0.181	9.724	40.900	50.624	-4.490	55.114
0.302	9.650	26.990	36.640	-15.017	51.657
0.791	9.650	13.370	23.020	-22.980	46.000
2.005	9.680	21.100	30.780	-15.220	46.000
3.951	9.700	19.410	29.110	-16.890	46.000
15.736	10.000	18.290	28.290	-21.710	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 : Professional Stereo Digital Wireless Audio Dongles (Transmitter)
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
LINE 2					
Quasi-Peak					
0.185	9.727	43.760	53.488	-11.512	65.000
0.302	9.660	31.340	41.000	-20.657	61.657
0.783	9.670	19.720	29.390	-26.610	56.000
2.369	9.680	22.740	32.420	-23.580	56.000
4.130	9.700	29.710	39.410	-16.590	56.000
15.603	10.000	30.700	40.700	-19.300	60.000
Average					
0.185	9.727	37.960	47.688	-7.312	55.000
0.302	9.660	25.560	35.220	-16.437	51.657
0.783	9.670	12.050	21.720	-24.280	46.000
2.369	9.680	19.990	29.670	-16.330	46.000
4.130	9.700	20.970	30.670	-15.330	46.000
15.603	10.000	28.840	38.840	-11.160	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. Radiated Emission

3.1. Test Equipment

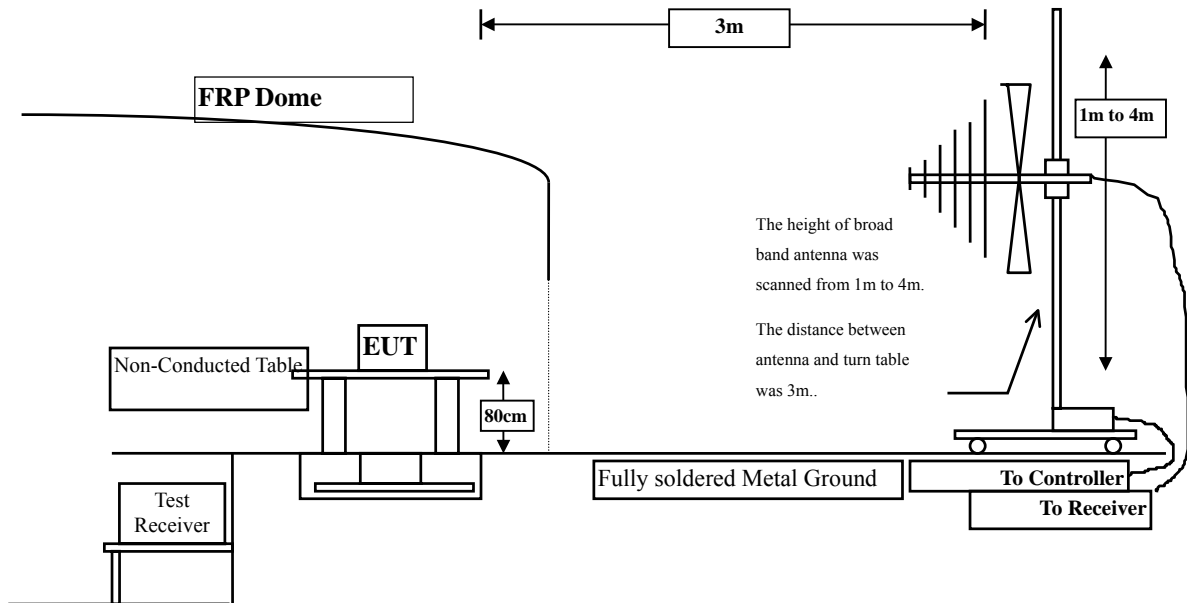
The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	
☒ Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2008
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2008
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2009
	X	Pre-Amplifier	AGILENT	8447D/2944A09549	Sep., 2008
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2008
	X	Spectrum Analyzer	Advantest	R3162/91700283	Oct., 2008
	X	Coaxial Cable	Quietek	QTK-CABLE/ CAB5	Feb., 2009
	X	Controller	Quietek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

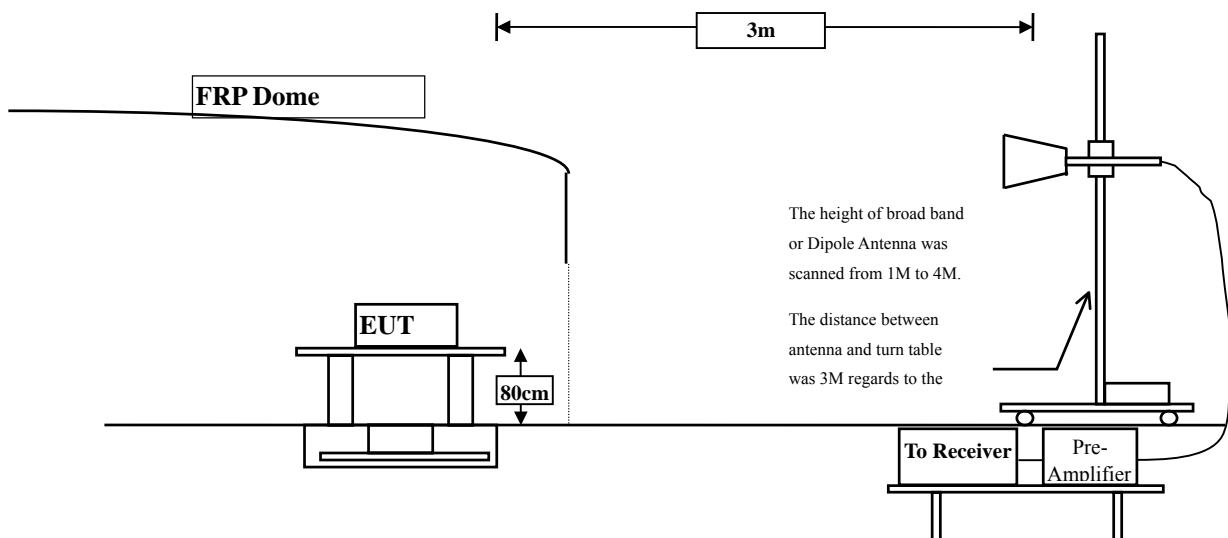
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with “X” are used to measure the final test results.

3.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.3. Limits

➤ Fundamental and Harmonics Emission Limits

FCC Part 15 Subpart C Paragraph 15.249 Limits				
Frequency MHz	Field Strength of Fundamental		Field Strength of Harmonics	
	(mV/m @3m)	(dBuV/m @3m)	(uV/m @3m)	(dBuV/m @3m)
902-928	50	94	500	54
2400-2483.5	50	94	500	54
5725-5875	50	94	500	54

- Remarks :
1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
 2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB 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 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 :
1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 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 can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be 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 on the Final Measurement.

The measurement frequency range from 30MHz - 10th Harmonic of fundamental was investigated.

3.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

3.6. Test Result of Radiated Emission

Product : Professional Stereo Digital Wireless Audio Dongles (Transmitter)
 Test Item : Fundamental Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2405 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector					
Channel 02					
2405.000	2.973	94.040	97.014	-16.986	114.000
Average Detector					
Channel 02					
2405.000	2.973	90.020	92.994	-1.006	94.000
Vertical					
Peak Detector					
Channel 02					
2405.000	1.969	89.210	91.179	-22.821	114.000
Average Detector					
Channel 02					
--					

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.

Product : Professional Stereo Digital Wireless Audio Dongles (Transmitter)
 Test Item : Fundamental Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2441 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Peak Detector					
Channel 20					
2441.000	2.976	92.940	95.915	-18.085	114.000
Average Detector					
Channel 20					
2441.000	2.976	89.940	92.915	-1.085	94.000
Vertical					
Peak Detector					
Channel 20					
2441.000	2.180	88.770	90.950	-23.050	114.000
Average Detector					
Channel 20					
--					

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.

Product : Professional Stereo Digital Wireless Audio Dongles (Transmitter)
 Test Item : Fundamental Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2477 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal Peak Detector					
Channel 38					
2477.000	3.072	93.310	96.383	-17.617	114.000
Average Detector					
Channel 38					
2477.000	3.072	89.750	92.823	-1.177	94.000
Vertical Peak Detector					
Channel 38					
2477.000	2.509	89.310	91.820	-22.180	114.000
Average Detector					
Channel 38					
--					

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.

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

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Peak Limit dBuV/m
Horizontal					
Peak Detector:					
4810.000	9.607	39.430	49.036	-24.964	74.000
7215.000	14.334	45.520	59.855	-14.145	74.000
9620.000	19.708	35.850	55.559	-18.441	74.000
Average Detector					
7215.000	14.334	37.790	52.125	-1.875	54.000
9620.000	19.708	22.860	42.569	-11.431	54.000
Vertical					
Peak Detector:					
4810.000	8.347	40.660	49.006	-24.994	74.000
7215.000	15.419	43.380	58.799	-15.201	74.000
9620.000	18.918	35.600	54.519	-19.481	74.000
Average Detector					
7215.000	15.419	36.070	51.489	-2.511	54.000
9620.000	18.918	23.150	42.069	-11.931	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz ◦
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:10Hz; Span:20MHz ◦
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Professional Stereo Digital Wireless Audio Dongles (Transmitter)
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2441 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Peak Limit dBuV/m
Horizontal					
Peak Detector:					
4882.000	9.489	39.680	49.169	-24.831	74.000
7323.000	14.568	39.730	54.298	-19.702	74.000
9764.000	20.055	36.780	56.835	-17.165	74.000
Average Detector					
7323.000	14.568	32.170	46.738	-7.262	54.000
9764.000	20.055	23.140	43.195	-10.805	54.000
Vertical					
Peak Detector:					
4882.000	8.979	41.090	50.069	-23.931	74.000
7323.000	15.262	39.740	55.002	-18.998	74.000
9764.000	19.255	36.050	55.305	-18.695	74.000
Average Detector					
7323.000	15.262	31.020	46.282	-7.718	54.000
9764.000	19.255	23.030	42.285	-11.715	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz ◦
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:10Hz; Span:20MHz ◦
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Professional Stereo Digital Wireless Audio Dongles (Transmitter)
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2477 MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Peak Limit dBuV/m
Horizontal					
Peak Detector:					
4954.000	9.430	40.360	49.790	-24.210	74.000
7431.000	14.977	37.000	51.976	-22.024	74.000
9908.000	19.759	36.710	56.469	-17.531	74.000
Average Detector					
9908.000	19.759	23.240	42.999	-11.001	54.000
Vertical					
Peak Detector:					
4954.000	9.666	42.410	52.076	-21.924	74.000
7431.000	15.361	38.080	53.441	-20.559	74.000
9908.000	18.909	36.890	55.799	-18.201	74.000
Average Detector					
9908.000	18.909	23.300	42.209	-11.791	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz ◦
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:10Hz; Span:20MHz ◦
4. Emission Level = Reading Level + Correct Factor.
5. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
6. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Professional Stereo Digital Wireless Audio Dongles (Transmitter)
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2441 MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBuV/m
	dB	dBuV	dBuV/m		
Horizontal					
388.900	-2.298	24.851	22.553	-23.447	46.000
530.520	1.347	23.539	24.886	-21.114	46.000
672.140	1.840	26.420	28.260	-17.740	46.000
745.860	2.793	24.115	26.909	-19.091	46.000
829.280	6.015	21.384	27.399	-18.601	46.000
934.040	6.116	21.864	27.980	-18.020	46.000
Vertical					
388.900	-3.678	23.855	20.177	-25.823	46.000
511.120	-0.769	21.097	20.328	-25.672	46.000
693.480	1.721	21.105	22.826	-23.174	46.000
767.200	2.102	22.208	24.310	-21.690	46.000
846.740	2.210	22.123	24.333	-21.667	46.000
934.040	5.296	23.288	28.584	-17.416	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. “█” means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

4. Band Edge

4.1. Test Equipment

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

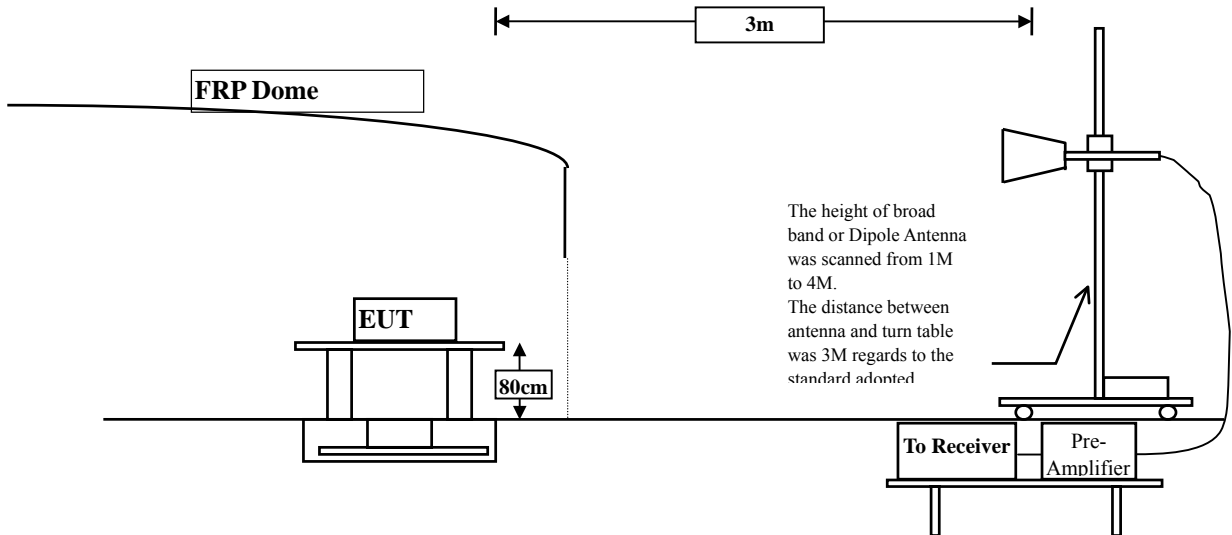
Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X Test Receiver	R & S	ESI 26 / 838786/004	May, 2009
X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2009
X Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2009
X Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2009
X Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2009
X Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 2009
X Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2009
X Pre-Amplifier	HP	8449B / 3008A01123	July, 2009
OATS No.3			

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

4.2. Test Setup

RF Radiated Measurement:

Above 1GHz



4.3. Limit

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 50 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)).

4.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 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 can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2003 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30)is 120 kHz, above 1GHz are 1 MHz.

4.5. Uncertainty

Conducted is ± 1.27 dB

Radiated is ± 3.9 dB.

4.6. Test Result of Band Edge

Product : Professional Stereo Digital Wireless Audio Dongles (Transmitter)
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2405 MHz)

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)	2388.900	2.936	40.540	43.476	74.000	54.000	Pass
02(Peak)	2400.000	2.965	54.334	57.300	74.000	54.000	Pass
02(Average)	2400.000	2.965	34.387	37.353	74.000	54.000	Pass

Figure Channel 02: Horizontal (Peak)

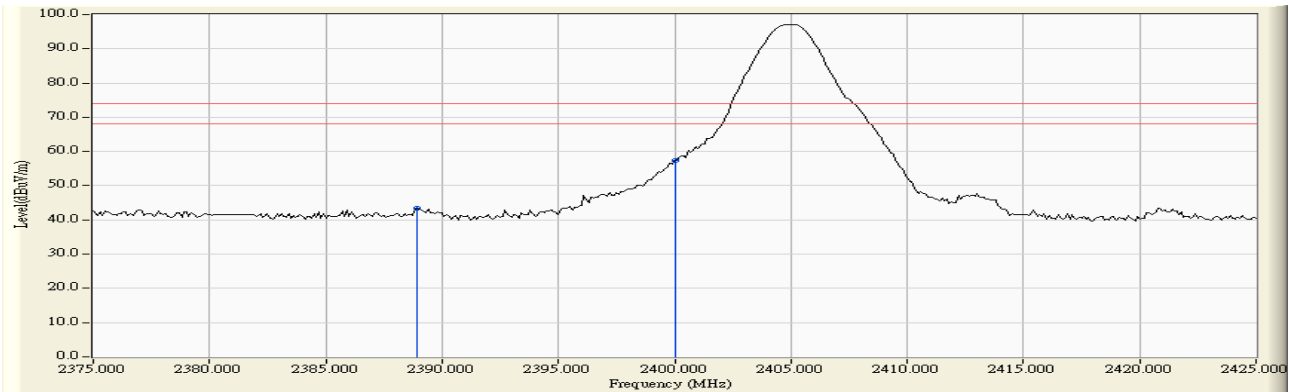
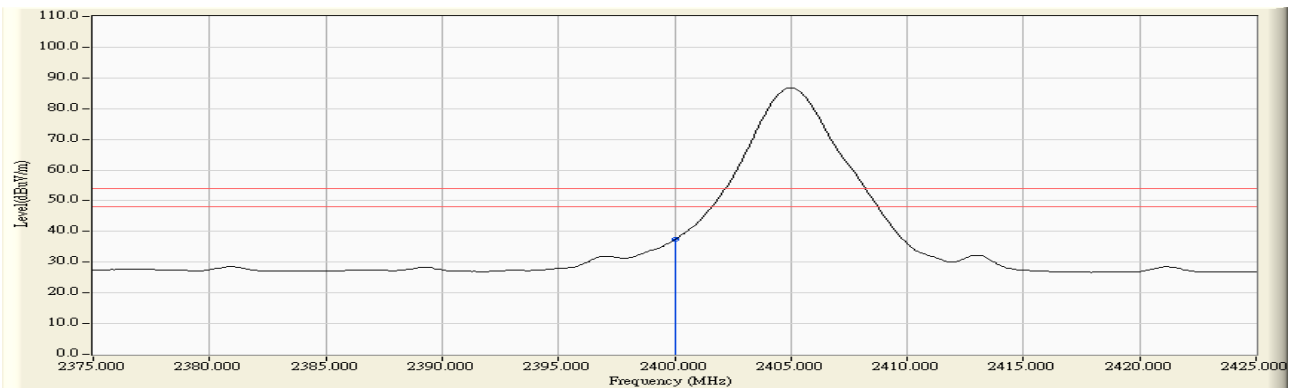


Figure Channel 02: Horizontal (Average)



Note:

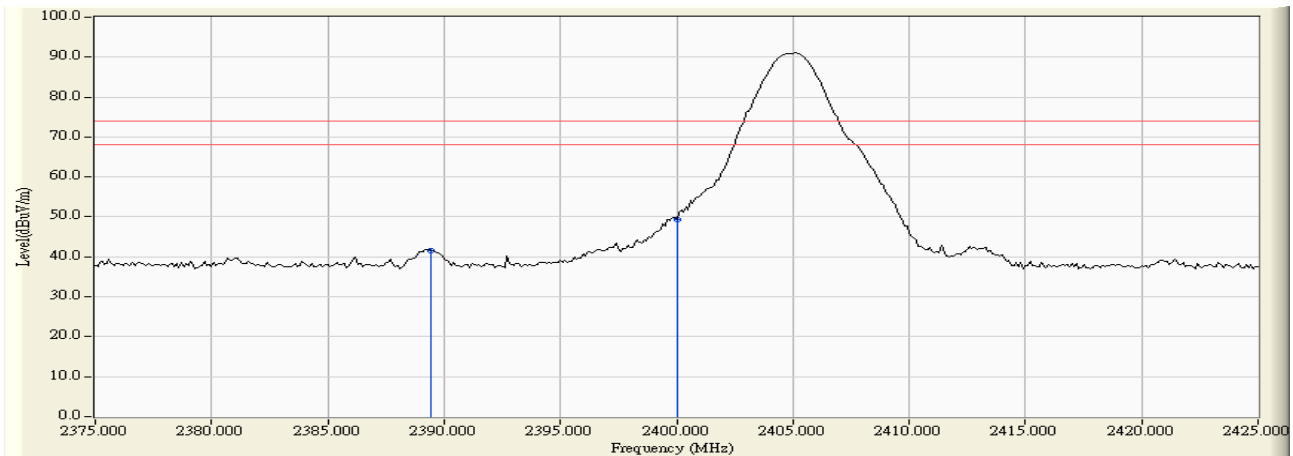
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading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

Product : Professional Stereo Digital Wireless Audio Dongles (Transmitter)
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2405 MHz)

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	1.932	39.648	41.580	74.000	54.000	Pass
02(Peak)	2400.000	1.949	47.447	49.397	74.000	54.000	Pass
02(Average)	--	--	--	--	74.000	54.000	Pass

Figure Channel 02: Vertical (Peak)



Note:

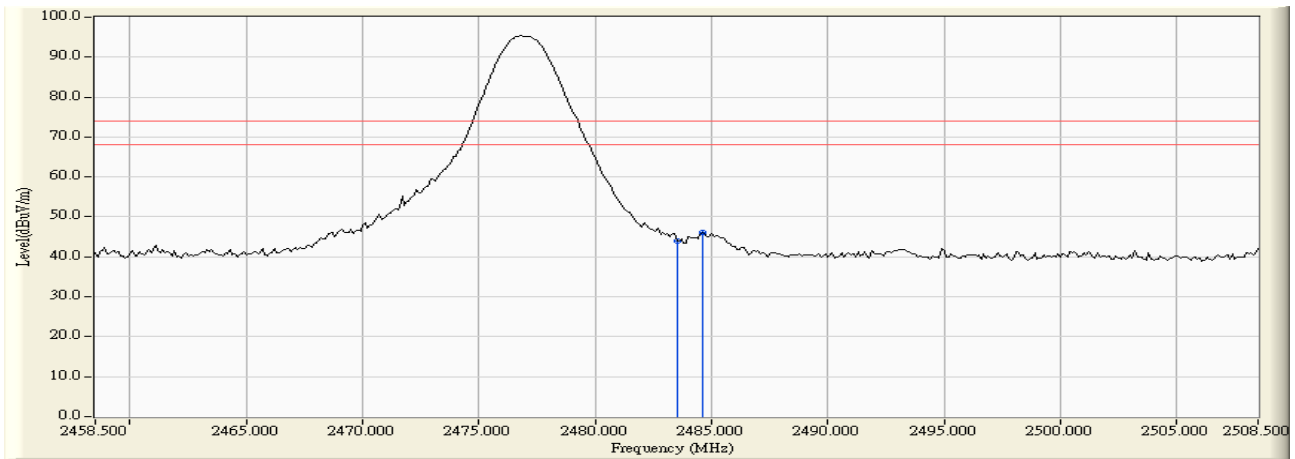
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading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

Product : Professional Stereo Digital Wireless Audio Dongles (Transmitter)
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2477 MHz)

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)	2483.500	3.077	40.997	44.074	74.000	54.000	Pass
38(Peak)	2484.600	3.077	43.161	46.238	74.000	54.000	Pass
38(Average)	--	--	--	--	74.000	54.000	Pass

Figure Channel 38: Horizontal (Peak)



Note:

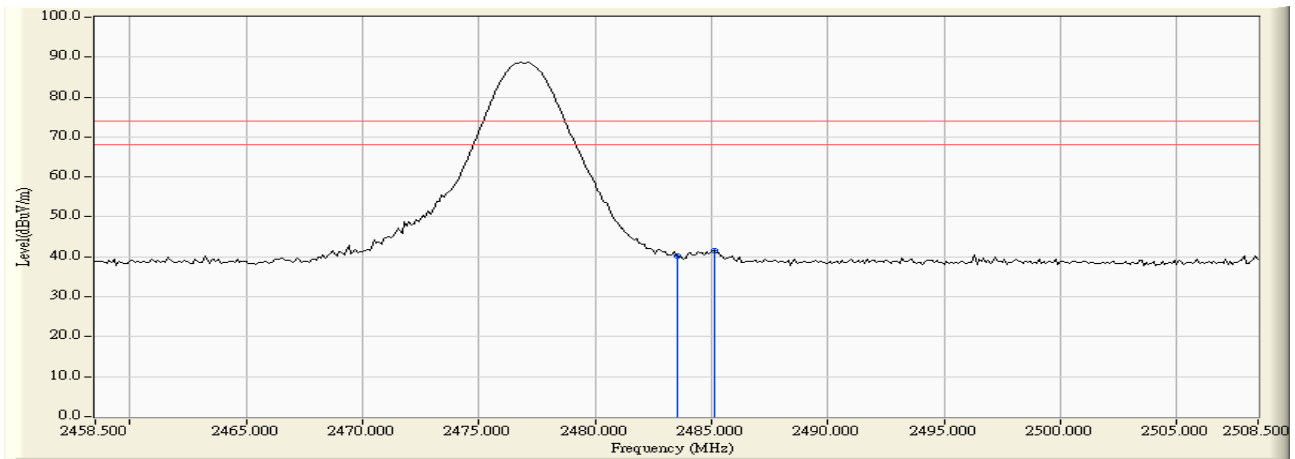
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading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

Product : Professional Stereo Digital Wireless Audio Dongles (Transmitter)
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit (2477 MHz)

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)	2483.500	2.554	37.570	40.123	74.000	54.000	Pass
38(Peak)	2485.100	2.562	39.004	41.567	74.000	54.000	Pass
38(Average)	--	--	--	--	74.000	54.000	Pass

Figure Channel 38: Vertical (Peak)



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.

5. EMI Reduction Method During Compliance Testing

No modification was made during testing.