



Test Report

| | |
|--------------|---|
| Product Name | Professional Stereo Digital Wireless Audio Dongles (Receiver) |
| Model No. | JM-WAL35-R1, KEN4-R1, JM-WAL45-R1, KEN5-R1 |
| FCC ID. | BJM-KEN4-R |

| | |
|-----------|--|
| 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 09, 2009 |
| Report No. | 096375R-RFUSP44V01 |
| Report Version | V1.0 |

The Test Results relate only to the samples tested.

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Test Report Certification

Issued Date: July 09, 2009

Report No. : 096375R-RFUSP44V01



| | | |
|---------------------|---|--|
| Product Name | Professional Stereo Digital Wireless Audio Dongles (Receiver) | |
| Applicant | TATUNG CO. | |
| Address | 22, Chungshan N. Rd., 3rd Sec. Taipei, Taiwan, 104, R.O.C. | |
| Manufacturer | TATUNG CO. | |
| Model No. | JM-WAL35-R1, KEN4-R1, JM-WAL45-R1, KEN5-R1 | |
| FCC ID. | BJM-KEN4-R | |
| 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 : Anita Chou
 (Senior Engineering Adm. Specialist / Anita Chou)



Tested By : Molin Huang
 (Engineer / Molin Huang)



Approved By : Vincent Lin
 (Manager / Vincent Lin)

Testing Laboratory
0914

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1. GENERAL INFORMATION

1.1. EUT Description

| | |
|---------------------|---|
| Product Name | Professional Stereo Digital Wireless Audio Dongles (Receiver) |
| Trade Name | JANGUS, TATUNG |
| FCC ID. | BJM-KEN4-R |
| Model No. | JM-WAL35-R1, KEN4-R1, JM-WAL45-R1, KEN5-R1 |
| 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” |
| Power and USB Cable | Shielded, 0.2m |

Antenna List

| No. | Manufacturer | Part No. | Antenna Type | Peak Gain |
|-----|--------------|----------|----------------|-----------------------|
| 1 | TATUNG | N/A | Printer on PCB | -1.32 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 (Receiver) 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-R1 | Brand: JANGUS Color: Black With Microphone Function |
| KEN4-R1 | Brand: TATUNG Color: Black With Microphone Function |
| JM-WAL45-R1 | Brand: JANGUS Color: Blue Without Microphone Function |
| KEN5-R1 | 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: Transmitter |
|---------------|---------------------|

1.2. Operation Description

The EUT is a Professional Stereo Digital Wireless Audio Dongles (Receiver) 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 "RED" Antenna of the EUT.

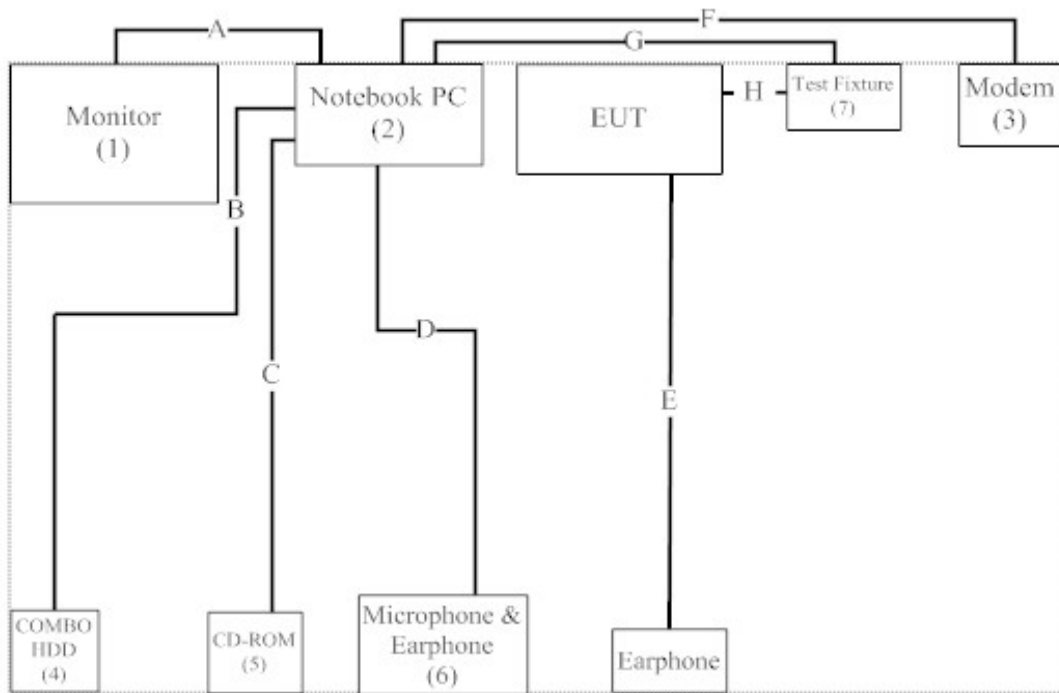
1.3. Tested System Details

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-0FC255-46633-638-1MDS | 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 | Non-Shielded, 1.8m |
| 5. CD-ROM | DELL | N/A | N/A | N/A |
| 6. Microphone & Earphone | PCHOME | N/A | N/A | N/A |
| 7. Test Fixture | TATUNG | 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 Cable | Non-shielded, 1.6m |
| D. Microphone Cable | Non-shielded, 1.6m |
| E. Earphone Cable | Non-shielded, 1.6m |
| F. RS-232 Cable | Non-shielded, 1.8m, with one ferrite core bonded. |
| G. USB Cable | Non-shielded, 1.8m |
| H. Control Line 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 transmitter.
- (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



Testing Laboratory
0914

2. Conducted Emission

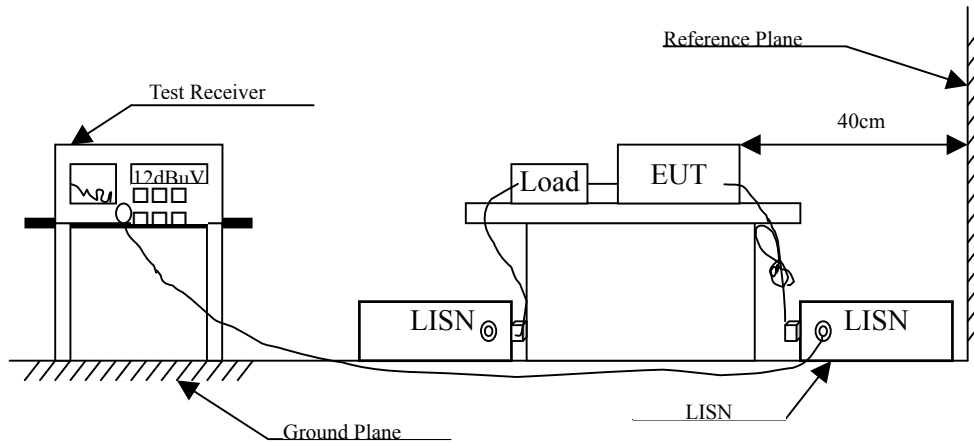
2.1. Test Equipment

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 (Receiver)
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 1: Transmitter (2441MHz)

| Frequency MHz | Correct Factor dB | Reading Level dBuV | Measurement Level dBuV | Margin dB | Limit dBuV |
|-------------------|-------------------------|--------------------------|------------------------------|--------------|---------------|
| LINE 1 | | | | | |
| Quasi-Peak | | | | | |
| 0.177 | 9.730 | 40.420 | 50.149 | -15.080 | 65.229 |
| 0.302 | 9.650 | 29.730 | 39.380 | -22.277 | 61.657 |
| 0.779 | 9.650 | 18.780 | 28.430 | -27.570 | 56.000 |
| 2.181 | 9.680 | 25.980 | 35.660 | -20.340 | 56.000 |
| 4.119 | 9.700 | 32.950 | 42.650 | -13.350 | 56.000 |
| 15.759 | 10.000 | 29.860 | 39.860 | -20.140 | 60.000 |
| Average | | | | | |
| 0.177 | 9.730 | 34.870 | 44.599 | -10.630 | 55.229 |
| 0.302 | 9.650 | 24.950 | 34.600 | -17.057 | 51.657 |
| 0.779 | 9.650 | 10.460 | 20.110 | -25.890 | 46.000 |
| 2.181 | 9.680 | 23.490 | 33.170 | -12.830 | 46.000 |
| 4.119 | 9.700 | 22.090 | 31.790 | -14.210 | 46.000 |
| 15.759 | 10.000 | 28.950 | 38.950 | -11.050 | 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 (Receiver)
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 1: Transmitter (2441MHz)

| Frequency | Correct | Reading | Measurement | Margin | Limit |
|-------------------|---------|---------|-------------|---------|--------|
| MHz | Factor | Level | Level | dB | dBuV |
| | dB | dBuV | dBuV | | |
| LINE 2 | | | | | |
| Quasi-Peak | | | | | |
| 0.177 | 9.736 | 40.160 | 49.896 | -15.333 | 65.229 |
| 0.302 | 9.660 | 29.530 | 39.190 | -22.467 | 61.657 |
| 0.697 | 9.650 | 19.720 | 29.370 | -26.630 | 56.000 |
| 2.181 | 9.680 | 25.120 | 34.800 | -21.200 | 56.000 |
| 4.119 | 9.700 | 32.060 | 41.760 | -14.240 | 56.000 |
| 15.326 | 10.000 | 31.140 | 41.140 | -18.860 | 60.000 |
| Average | | | | | |
| 0.177 | 9.736 | 34.600 | 44.336 | -10.893 | 55.229 |
| 0.302 | 9.660 | 24.150 | 33.810 | -17.847 | 51.657 |
| 0.697 | 9.650 | 10.630 | 20.280 | -25.720 | 46.000 |
| 2.181 | 9.680 | 22.210 | 31.890 | -14.110 | 46.000 |
| 4.119 | 9.700 | 22.370 | 32.070 | -13.930 | 46.000 |
| 15.326 | 10.000 | 30.690 | 40.690 | -9.310 | 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

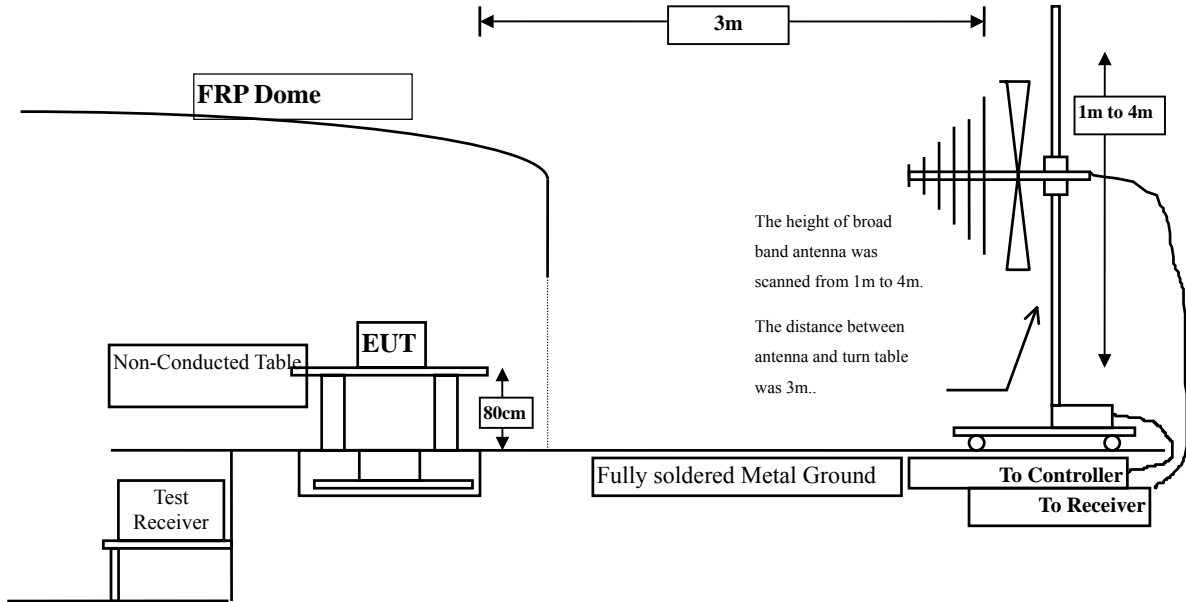
The following test equipment are used during the radiated emission test:

| 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 |

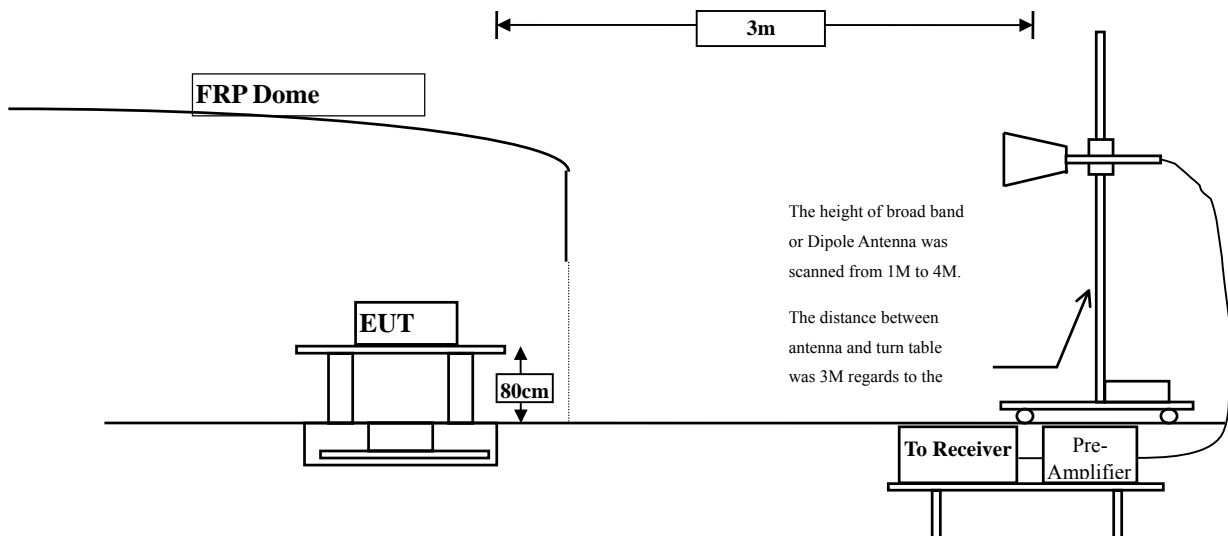
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
 2. The test instruments marked with “X” are used to measure the final test results.

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 form 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 (Receiver)
 Test Item : Fundamental Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (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 | 93.959 | 96.933 | -17.067 | 114.000 |
| Average Detector | | | | | |
| Channel 02 | | | | | |
| 2405.000 | 2.973 | 89.040 | 92.014 | -1.986 | 94.000 |
| Vertical | | | | | |
| Peak Detector | | | | | |
| Channel 02 | | | | | |
| 2405.000 | 1.969 | 93.598 | 95.567 | -18.433 | 114.000 |
| Average Detector | | | | | |
| Channel 02 | | | | | |
| 2405.000 | 1.969 | 87.910 | 89.879 | -4.121 | 94.000 |

Note:

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

Product : Professional Stereo Digital Wireless Audio Dongles (Receiver)
 Test Item : Fundamental Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (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 | 91.275 | 94.250 | -19.750 | 114.000 |
| Average Detector | | | | | |
| Channel 20 | | | | | |
| 2441.000 | 2.976 | 88.560 | 91.535 | -2.465 | 94.000 |
| Vertical | | | | | |
| Peak Detector | | | | | |
| Channel 20 | | | | | |
| 2441.000 | 2.180 | 91.040 | 93.220 | -20.780 | 114.000 |
| Average Detector | | | | | |
| Channel 20 | | | | | |
| 2441.000 | 2.180 | 88.810 | 90.990 | -3.010 | 94.000 |

Note:

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

Product : Professional Stereo Digital Wireless Audio Dongles (Receiver)
 Test Item : Fundamental Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (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 | 93.307 | 96.380 | -17.620 | 114.000 |
| Average Detector | | | | | |
| Channel 38 | | | | | |
| 2477.000 | 3.072 | 87.690 | 90.763 | -3.237 | 94.000 |
| Vertical | | | | | |
| Peak Detector | | | | | |
| Channel 38 | | | | | |
| 2477.000 | 2.509 | 91.824 | 94.334 | -19.666 | 114.000 |
| Average Detector | | | | | |
| Channel 38 | | | | | |
| 2477.000 | 2.509 | 88.950 | 91.460 | -2.540 | 94.000 |

Note:

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

Product : Professional Stereo Digital Wireless Audio Dongles (Receiver)
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (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 | 9.507 | 40.620 | 50.126 | -23.874 | 74.000 |
| 7215.000 | 14.084 | 50.630 | 64.715 | -9.285 | 74.000 |
| 9620.000 | 19.564 | 38.060 | 57.624 | -16.376 | 74.000 |
| Average Detector | | | | | |
| 7215.000 | 14.084 | 38.610 | 52.695 | -1.305 | 54.000 |
| 9620.000 | 19.564 | 24.460 | 44.024 | -9.976 | 54.000 |
| Vertical | | | | | |
| Peak Detector: | | | | | |
| 4810.000 | 8.247 | 41.560 | 49.806 | -24.194 | 74.000 |
| 7215.000 | 15.169 | 45.740 | 60.909 | -13.091 | 74.000 |
| 9620.000 | 18.774 | 38.230 | 57.004 | -16.996 | 74.000 |
| Average Detector | | | | | |
| 7215.000 | 15.169 | 36.960 | 52.129 | -1.871 | 54.000 |
| 9620.000 | 18.774 | 24.430 | 43.204 | -10.796 | 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 (Receiver)
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (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 | 9.399 | 41.310 | 50.709 | -23.291 | 74.000 |
| 7323.000 | 14.328 | 45.290 | 59.618 | -14.382 | 74.000 |
| 9764.000 | 19.925 | 39.210 | 59.135 | -14.865 | 74.000 |
| Average Detector | | | | | |
| 7323.000 | 14.328 | 37.610 | 51.938 | -2.062 | 54.000 |
| 9764.000 | 19.925 | 25.450 | 45.375 | -8.625 | 54.000 |
| Vertical | | | | | |
| Peak Detector: | | | | | |
| 4882.000 | 8.889 | 41.920 | 50.809 | -23.191 | 74.000 |
| 7323.000 | 15.022 | 41.160 | 56.182 | -17.818 | 74.000 |
| 9764.000 | 19.125 | 38.100 | 57.225 | -16.775 | 74.000 |
| Average Detector | | | | | |
| 7323.000 | 15.022 | 36.960 | 51.982 | -2.018 | 54.000 |
| 9764.000 | 19.125 | 27.530 | 46.655 | -7.345 | 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 (Receiver)
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (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 | 9.349 | 41.380 | 50.728 | -23.272 | 74.000 |
| 7431.000 | 14.737 | 41.140 | 55.876 | -18.124 | 74.000 |
| 9908.000 | 19.640 | 39.080 | 58.720 | -15.280 | 74.000 |
| Average Detector | | | | | |
| 7431.000 | 14.737 | 31.810 | 46.546 | -7.454 | 54.000 |
| 9908.000 | 19.640 | 27.350 | 46.990 | -7.010 | 54.000 |
| Vertical | | | | | |
| Peak Detector: | | | | | |
| 4954.000 | 9.666 | 42.040 | 51.706 | -22.294 | 74.000 |
| 7431.000 | 15.361 | 40.260 | 55.621 | -18.379 | 74.000 |
| 9908.000 | 18.909 | 39.270 | 58.179 | -15.821 | 74.000 |
| Average Detector | | | | | |
| 7431.000 | 15.361 | 30.300 | 45.661 | -8.339 | 54.000 |
| 9908.000 | 18.909 | 26.800 | 45.709 | -8.291 | 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 (Receiver)
 Test Item : General Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (2441 MHz)

| Frequency | Correct | Reading | Measurement | Margin | Limit |
|-------------------|---------|---------|-------------|---------|--------|
| | Factor | Level | Level | | |
| MHz | dB | dBuV | dBuV/m | dB | dBuV/m |
| Horizontal | | | | | |
| 288.020 | -5.106 | 33.249 | 28.143 | -17.857 | 46.000 |
| 383.080 | -1.799 | 28.187 | 26.388 | -19.612 | 46.000 |
| 544.100 | 2.992 | 25.807 | 28.799 | -17.201 | 46.000 |
| 699.300 | 2.422 | 24.915 | 27.337 | -18.663 | 46.000 |
| 819.580 | 5.509 | 23.635 | 29.144 | -16.856 | 46.000 |
| 932.100 | 6.430 | 22.905 | 29.335 | -16.665 | 46.000 |
| Vertical | | | | | |
| 258.920 | -7.898 | 36.044 | 28.146 | -17.854 | 46.000 |
| 503.360 | -1.350 | 27.570 | 26.220 | -19.780 | 46.000 |
| 565.440 | -5.893 | 27.850 | 21.957 | -24.043 | 46.000 |
| 722.580 | -0.608 | 27.404 | 26.796 | -19.204 | 46.000 |
| 840.920 | 2.570 | 22.390 | 24.960 | -21.040 | 46.000 |
| 965.080 | 7.397 | 23.984 | 31.381 | -22.619 | 54.000 |

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:

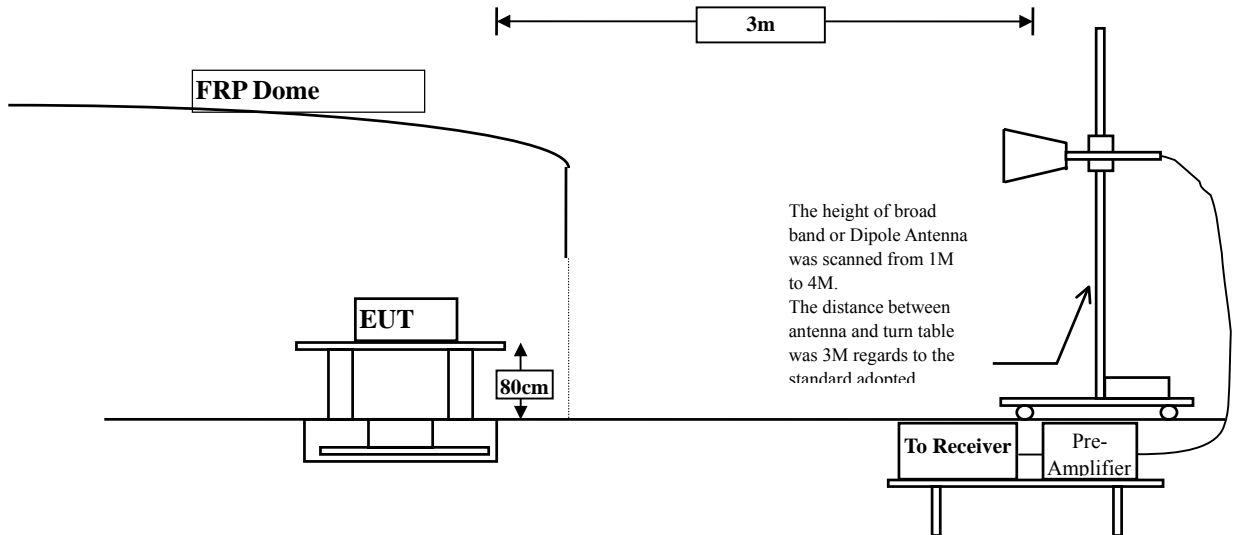
| Equipment | Manufacturer | Model No./Serial No. | Last Cal. |
|---------------------|--------------|----------------------|------------|
| X Test Receiver | R & S | ESI 26 / 838786/004 | May, 2009 |
| X Spectrum Analyzer | Agilent | E4407B / US39440758 | May, 2009 |
| X Bilog Antenna | SCHAFFNER | 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 (Receiver)
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (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) | 2389.400 | 2.937 | 39.742 | 42.680 | 74.000 | 54.000 | Pass |
| 02(Peak) | 2400.000 | 2.965 | 52.868 | 55.834 | 74.000 | 54.000 | Pass |
| 02(Average) | 2400.000 | 2.965 | 41.801 | 44.767 | 74.000 | 54.000 | Pass |

Figure Channel 02: Horizontal (Peak)

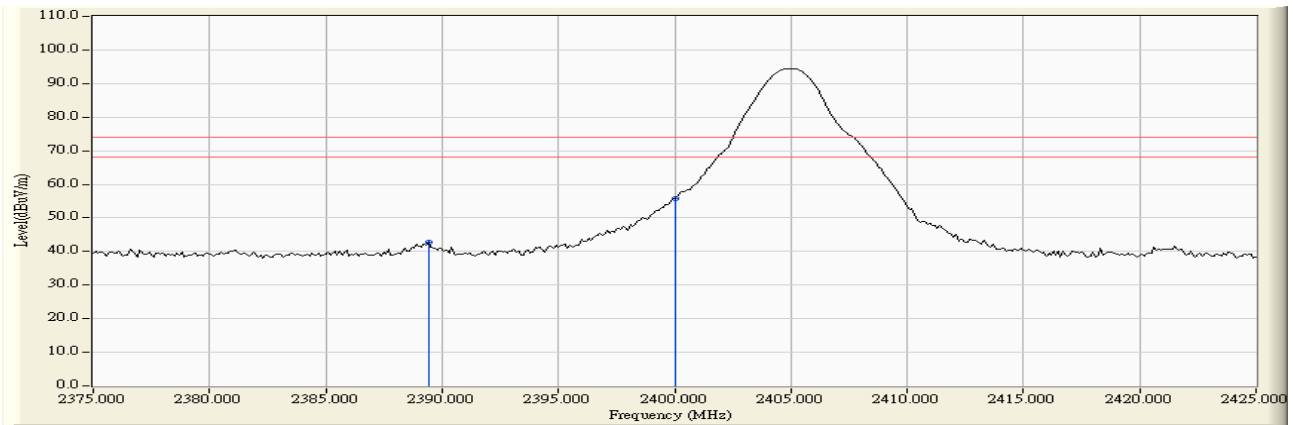
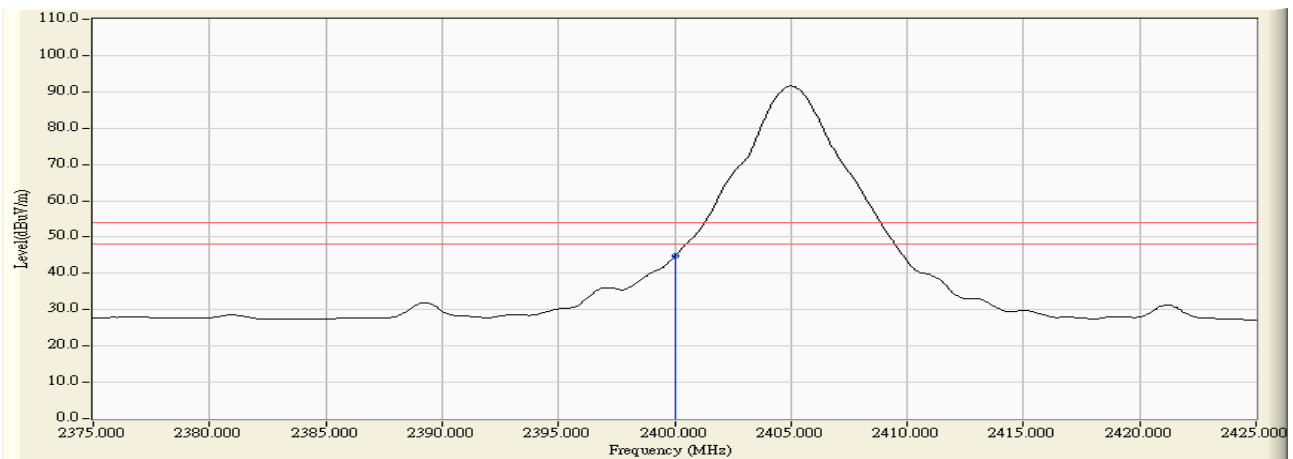


Figure Channel 02: Horizontal (Average)



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 (Receiver)
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (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) | 2389.200 | 1.932 | 42.207 | 44.139 | 74.000 | 54.000 | Pass |
| 02(Peak) | 2400.000 | 1.949 | 55.334 | 57.284 | 74.000 | 54.000 | Pass |
| 02(Average) | 2400.000 | 1.949 | 43.632 | 45.582 | 74.000 | 54.000 | Pass |

Figure Channel 02: Vertical (Peak)

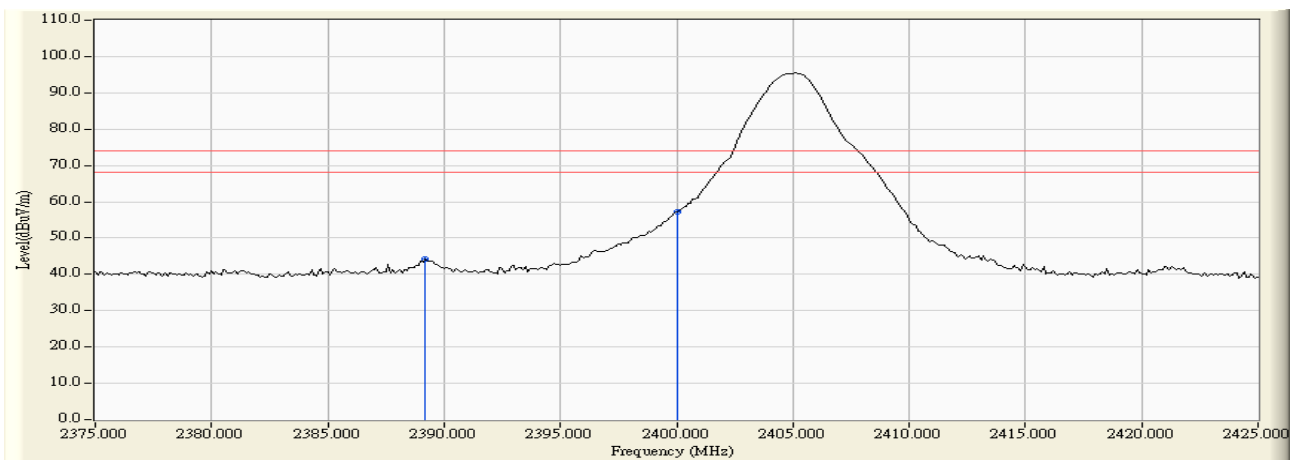
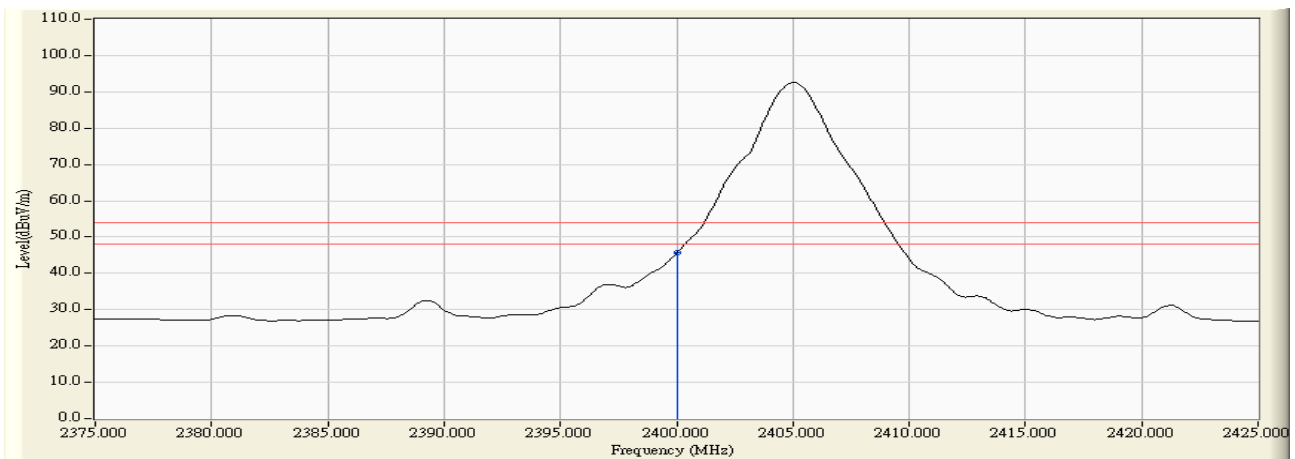


Figure Channel 02: Vertical (Average)



Note:

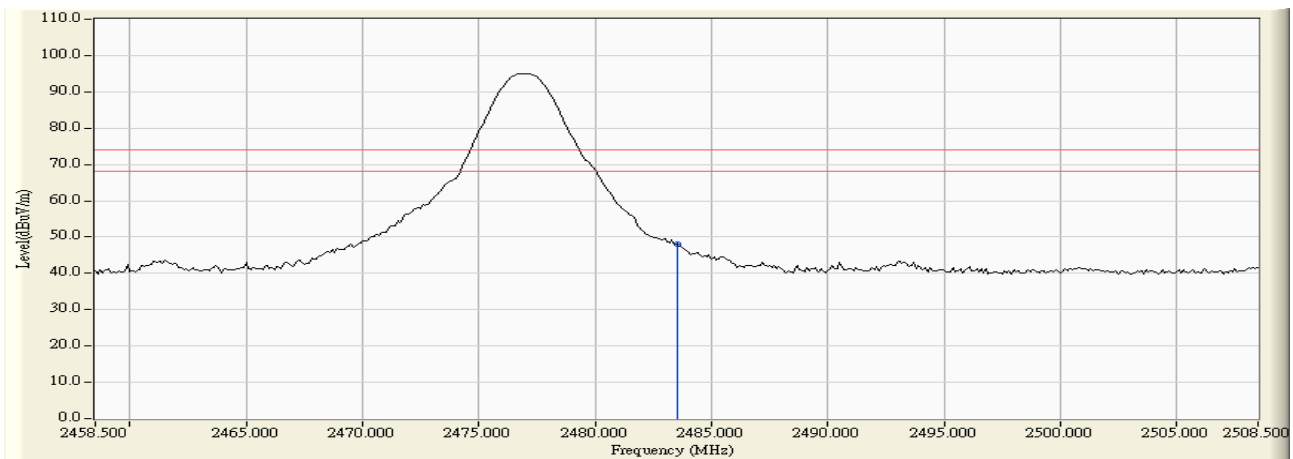
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading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

Product : Professional Stereo Digital Wireless Audio Dongles (Receiver)
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (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 | 44.872 | 47.949 | 74.000 | 54.000 | Pass |
| 38(Average) | -- | -- | -- | -- | 74.000 | 54.000 | Pass |

Figure Channel 38: Horizontal (Peak)



Note:

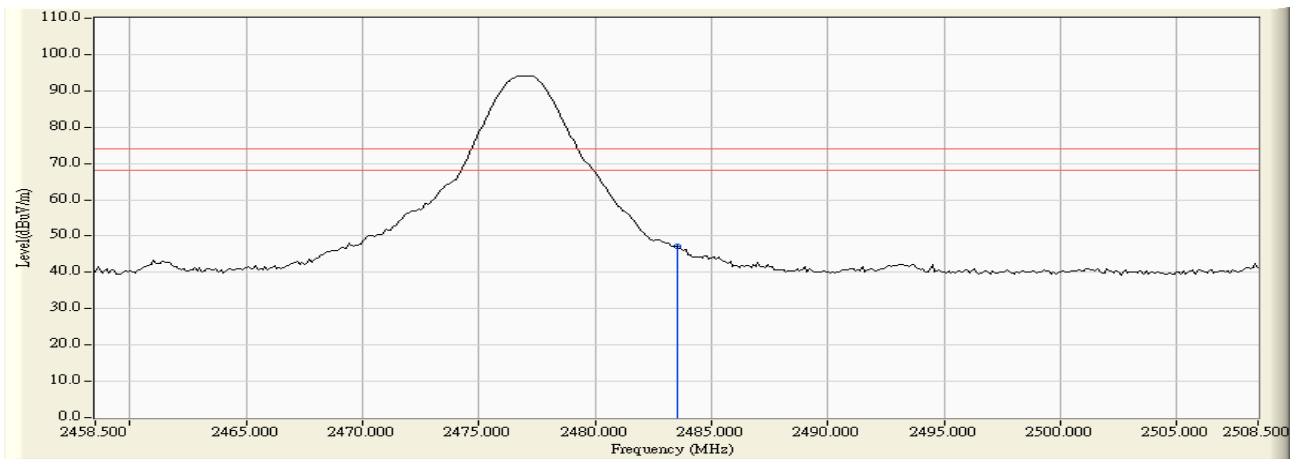
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading 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 (Receiver)
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (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 | 44.696 | 47.249 | 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.