



## Test Report

Product Name	Wireless Headset
Model No.	HS-W1 headset
FCC ID	MSQ-HSW1HEADSET

Applicant	ASUSTeK COMPUTER INC.
Address	No. 15, Li-Te Rd., Peitou, Taipei, Taiwan, R.O.C.

Date of Receipt	Oct. 24, 2011
Issued Date	Nov. 11, 2011
Report No.	11A351R-RFUSP44V01
Report Version	V1.0

The test results relate only to the samples tested.

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# Test Report Certification

Issued Date: Nov. 11, 2011

Report No.: 11A351R-RFUSP44V01




Product Name	Wireless Headset	
Applicant	ASUSTeK COMPUTER INC.	
Address	No. 15, Li-Te Rd., Peitou, Taipei, Taiwan, R.O.C.	
Manufacturer	Merry Electronics (Shenzhen) CO., LTD.	
Model No.	HS-W1 headset	
EUT Rated Voltage	DC 5V (Power by USB)	
EUT Test Voltage	AC 120V/ 60Hz	
Trade Name	ASUS	
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2010 ANSI C63.4: 2009	 NVLAP Lab Code: 200533-0
Test Result	Complied	

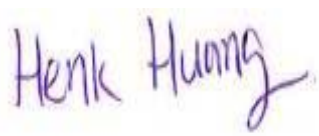
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Documented By :   
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 ( Adm. Specialist / Joanne Lin )



Tested By :   
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 ( Engineer / Henk Huang )



Testing Laboratory  
0914

Approved By :   
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 ( Manager / Vincent Lin )

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	Wireless Headset
Trade Name	ASUS
Model No.	HS-W1 headset
FCC ID	MSQ-HSW1HEADSET
Frequency Range	2404~2476MHz
Channel Control	Auto
Channel Separation	3MHz
Antenna Type	Monopole
Channel Number	25
Type of Modulation	GFSK
USB Cable	Shielded, 1m

#### Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	Merry Electronics (Shenzhen) CO., LTD.	N/A	1.09 dBi for 2.4 GHz

Note: The antenna of EUT is conform to FCC 15.203

#### Frequency of Each Channel

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 01:	2404 MHz	Channel 02:	2407 MHz	Channel 03:	2410 MHz	Channel 04:	2413 MHz
Channel 05:	2416 MHz	Channel 06:	2419 MHz	Channel 07:	2422MHz	Channel 08:	2425 MHz
Channel 09:	2428 MHz	Channel 10:	2431 MHz	Channel 11:	2434MHz	Channel 12:	2437 MHz
Channel 13:	2440 MHz	Channel 14:	2443 MHz	Channel 15:	2446 MHz	Channel 16:	2449 MHz
Channel 17:	2452 MHz	Channel 18:	2455 MHz	Channel 19:	2458 MHz	Channel 20:	2461 MHz
Channel 21:	2464 MHz	Channel 22:	2467 MHz	Channel 23:	2470 MHz	Channel 24:	2473 MHz
Channel 25:	2476 MHz						

Note:

1. The EUT is a Wireless Headset with a built-in 2.4GHz transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249 for spread spectrum devices.

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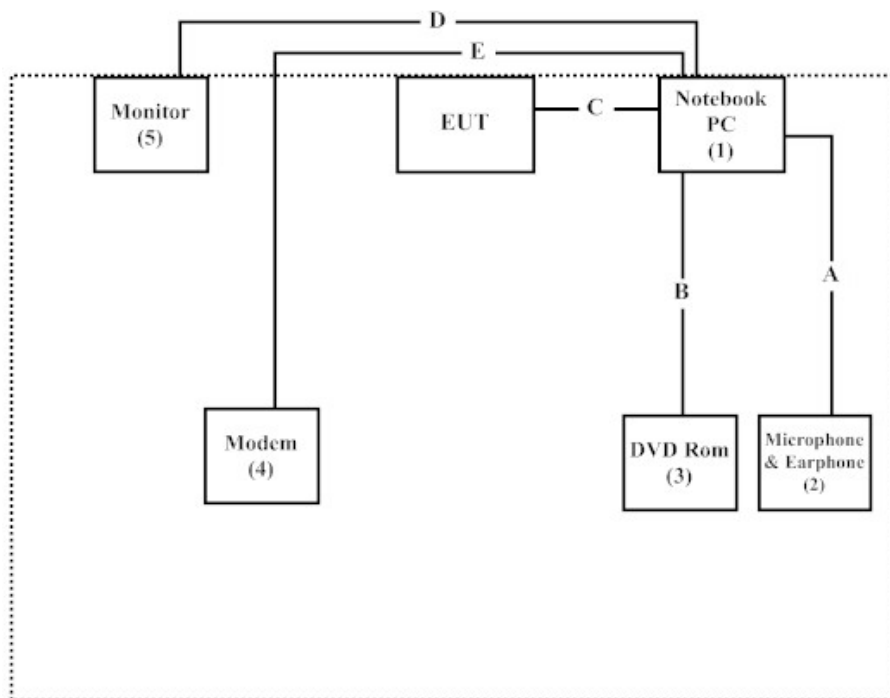
### 1.3. Tested System Details

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

	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
2	Microphone & Earphone	Ergotech	ET-E201	N/A	N/A
3	DVD Rom	N/A	N/A	N/A	N/A
4	Modem	ACEEX	DM-1414	0102027558	Non-Shielded, 1.8m
5	Monitor	LG	W2261VT	907YHPB07296	Non-Shielded, 1.8m

	Signal Cable Type	Signal cable Description
A	Microphone & Earphone Cable	Non-Shielded, 1.6m
B	USB Cable	Non-Shielded, 0.45m
C	USB Cable	Non-Shielded, 1m
D	VGA Cable	Non-Shielded, 1.6m, with one ferrite core bonded.
E	Modem Cable	Non-Shielded, 1.5m

### 1.4. Configuration of Test System



## 1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4.
- (2) Execute “hypertm.exe” program on the Notebook.
- (3) Configure the test mode and the test channel
- (4) Start the continuous Transmit.
- (5) Verify that the EUT works properly.

**1.6. Test Facility**

Ambient conditions in the laboratory:

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

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation’s Web Site : <http://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



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 Taiwan, R.O.C

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 E-Mail : [service@quietek.com](mailto:service@quietek.com)

FCC Accreditation Number: TW1014



**2. Conducted Emission**

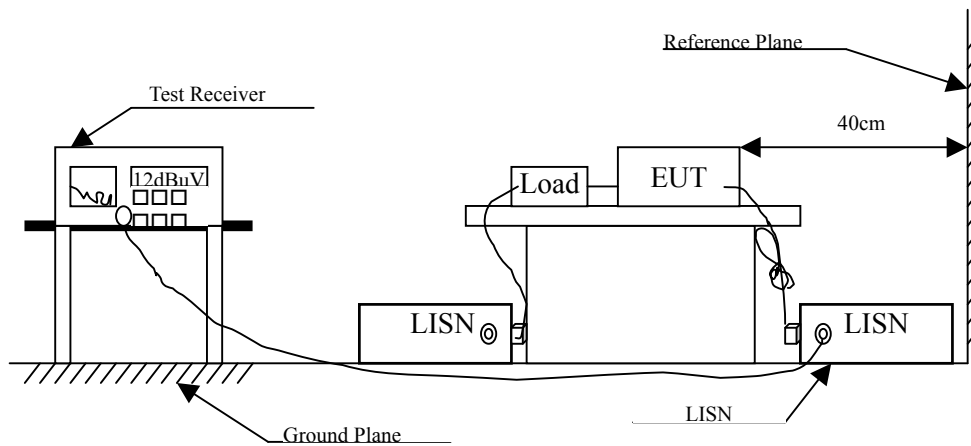
**2.1. Test Equipment**

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2011	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2011	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2011	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2011	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2011	
	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**

<b>FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit</b>		
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: 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 : Wireless Headset  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmit

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>Line 1</b>					
<b>Quasi-Peak</b>					
0.224	9.680	10.660	20.340	-43.546	63.886
0.459	9.650	16.900	26.550	-30.621	57.171
0.685	9.650	21.020	30.670	-25.330	56.000
2.681	9.700	12.860	22.560	-33.440	56.000
8.548	9.790	16.940	26.730	-33.270	60.000
19.533	9.930	21.840	31.770	-28.230	60.000
<b>Average</b>					
0.224	9.680	-4.530	5.150	-48.736	53.886
0.459	9.650	8.500	18.150	-29.021	47.171
0.685	9.650	9.390	19.040	-26.960	46.000
2.681	9.700	-0.020	9.680	-36.320	46.000
8.548	9.790	1.930	11.720	-38.280	50.000
19.533	9.930	18.090	28.020	-21.980	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 : Wireless Headset  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmit

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>Line 2</b>					
<b>Quasi-Peak</b>					
0.166	9.720	21.740	31.460	-34.083	65.543
0.252	9.666	18.940	28.606	-34.480	63.086
0.408	9.650	16.980	26.630	-31.999	58.629
0.689	9.650	21.960	31.610	-24.390	56.000
2.853	9.700	14.940	24.640	-31.360	56.000
22.134	10.140	20.260	30.400	-29.600	60.000
<b>Average</b>					
0.166	9.720	19.840	29.560	-25.983	55.543
0.252	9.666	16.850	26.516	-26.570	53.086
0.408	9.650	7.880	17.530	-31.099	48.629
0.689	9.650	11.520	21.170	-24.830	46.000
2.853	9.700	14.930	24.630	-21.370	46.000
22.134	10.140	11.980	22.120	-27.880	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

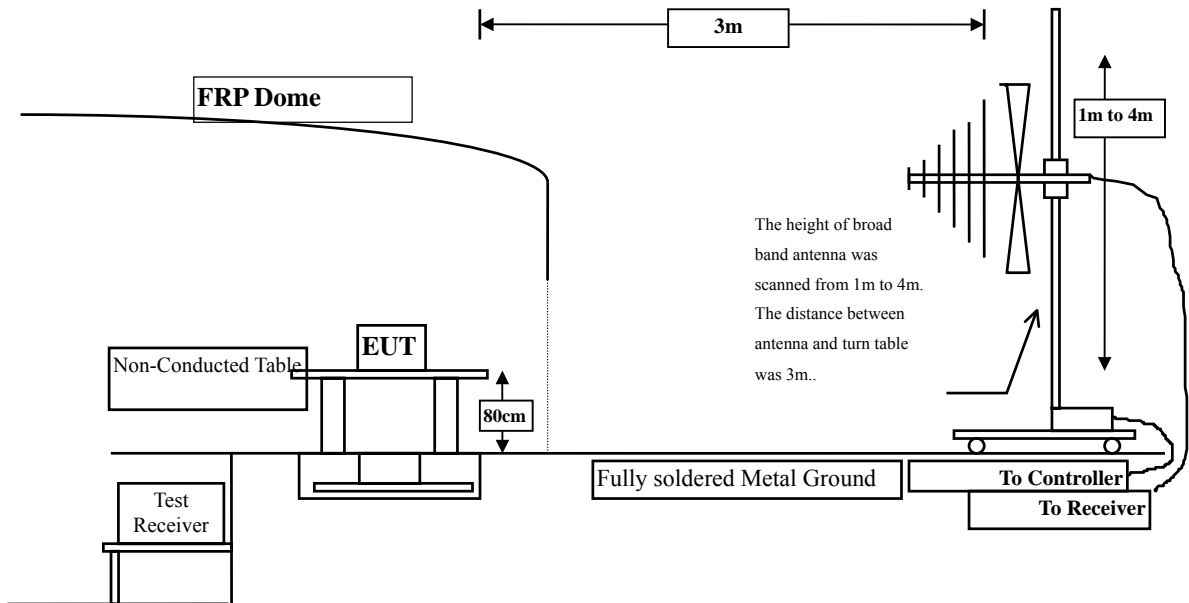
The following test equipment are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2011
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2011
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2011
	X	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2011
	X	Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2011
	X	Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar, 2011
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2011
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2011
	X	Coaxial Cable	Quietek	QTK-CABLE/ CAB5	Feb., 2011
	X	Controller	Quietek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

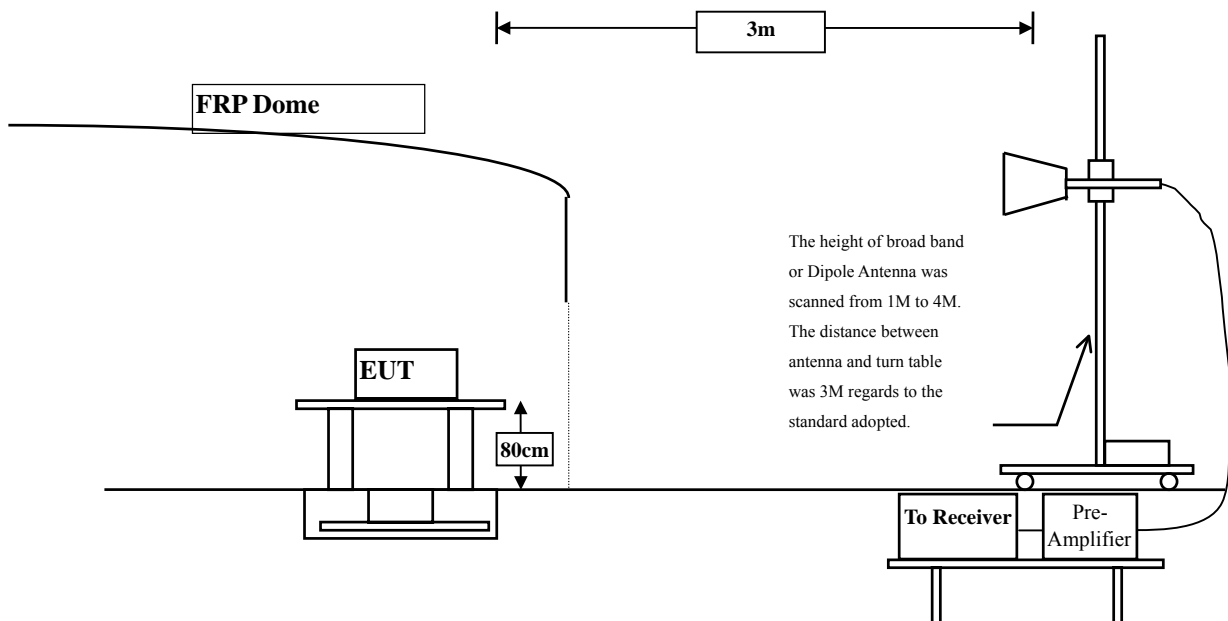
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
  2. The test instruments marked with "X" are used to measure the final test results.

### 3.2. Test Setup

#### Radiated Emission Below 1GHz



#### Radiated Emission Above 1GHz



### 3.3. Limits

➤ **Fundamental and Harmonics Emission Limits**

<b>FCC Part 15 Subpart C Paragraph 15.249 Limits</b>				
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.

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

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

### 3.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested compliance to FCC 47CFR 15.249 requirements.

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

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4: 2009 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 : Wireless Headset  
 Test Item : Fundamental Radiated Emission  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmit- X-Axis

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
2404.000	31.586	66.670	98.256	-15.744	114.000
2440.000	31.852	66.260	98.112	-15.888	114.000
2476.000	32.125	66.420	98.545	-15.455	114.000
<b>Average Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
2404.000	30.923	65.560	96.483	-17.517	114.000
2440.000	31.139	64.880	96.019	-17.981	114.000
2476.000	31.384	65.590	96.975	-17.025	114.000
<b>Average Detector:</b>					
--					

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.
3. 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.



**Average Detector:**

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Correct Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Average Detector:</b>					
2404	98.256	-8.322	89.934	-4.066	94.000
2440	98.112	-8.322	89.790	-4.210	94.000
2476	98.545	-8.322	90.223	-3.777	94.000
<b>Vertical</b>					
<b>Average Detector:</b>					
2404	96.483	-8.322	88.161	-5.839	94.000
2440	96.019	-8.322	87.697	-6.303	94.000
2476	96.975	-8.322	88.653	-5.347	94.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : Wireless Headset  
 Test Item : Fundamental Radiated Emission  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmit- Y-Axis

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
2404.000	31.586	67.730	99.316	-14.684	114.000
2440.000	31.852	67.870	99.722	-14.278	114.000
2476.000	32.125	68.190	100.315	-13.685	114.000
<b>Average Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
2404.000	30.923	65.250	96.173	-17.827	114.000
2440.000	31.139	66.720	97.859	-16.141	114.000
2476.000	31.384	66.530	97.915	-16.085	114.000
<b>Average Detector:</b>					
--					

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.
3. 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.

**Average Detector:**

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Correct Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Average Detector:</b>					
2404	99.316	-8.322	90.994	-3.006	94.000
2440	99.722	-8.322	91.400	-2.600	94.000
2476	100.315	-8.322	91.993	-2.007	94.000
<b>Vertical</b>					
<b>Average Detector:</b>					
2404	96.173	-8.322	87.851	-6.149	94.000
2440	97.859	-8.322	89.537	-4.463	94.000
2476	97.915	-8.322	89.593	-4.407	94.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : Wireless Headset  
 Test Item : Fundamental Radiated Emission  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmit- Z-Axis

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
2404.000	31.586	68.520	100.106	-13.894	114.000
2440.000	31.852	68.610	100.462	-13.538	114.000
2476.000	32.125	68.480	100.605	-13.395	114.000
<b>Average Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
2404.000	30.923	61.640	92.563	-21.437	114.000
2440.000	31.139	60.570	91.709	-22.291	114.000
2476.000	31.384	61.750	93.135	-20.865	114.000
<b>Average Detector:</b>					
--					

Note:

1. Measurement Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.
3. 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.

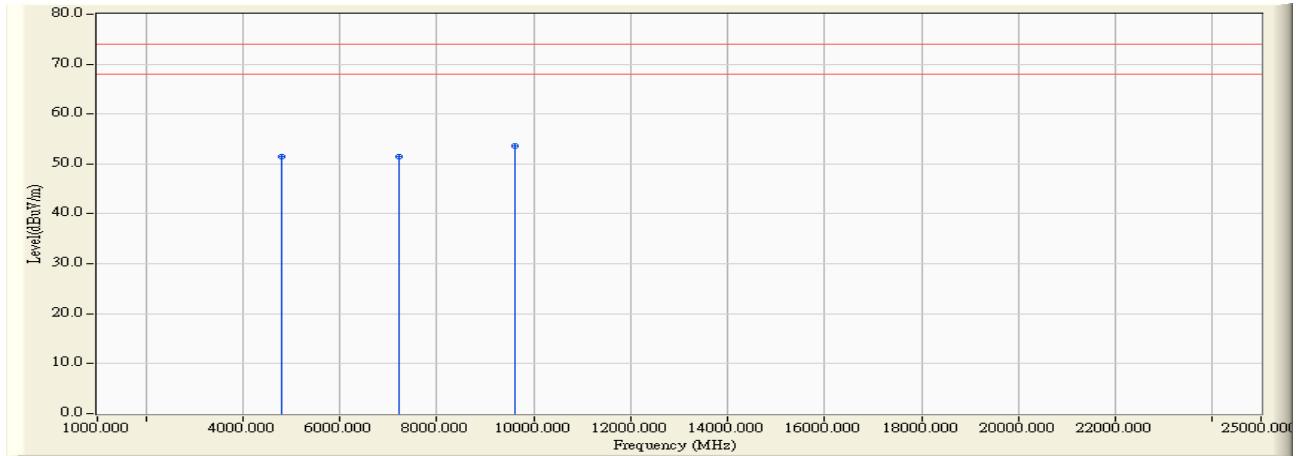
**Average Detector:**

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Correct Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Average Detector:</b>					
2404	100.106	-8.322	91.784	-2.216	94.000
2440	100.462	-8.322	92.140	-1.860	94.000
2476	100.605	-8.322	92.283	-1.717	94.000
<b>Vertical</b>					
<b>Average Detector:</b>					
2404	92.563	-8.322	84.241	-9.759	94.000
2440	91.709	-8.322	83.387	-10.613	94.000
2476	93.135	-8.322	84.813	-9.187	94.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : Wireless Headset  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2404MHz) -Z-Axis



Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4808.000	3.331	48.160	51.491	-22.509	74.000
7212.000	10.240	41.130	51.369	-22.631	74.000
9616.000	13.633	40.000	53.632	-20.368	74.000

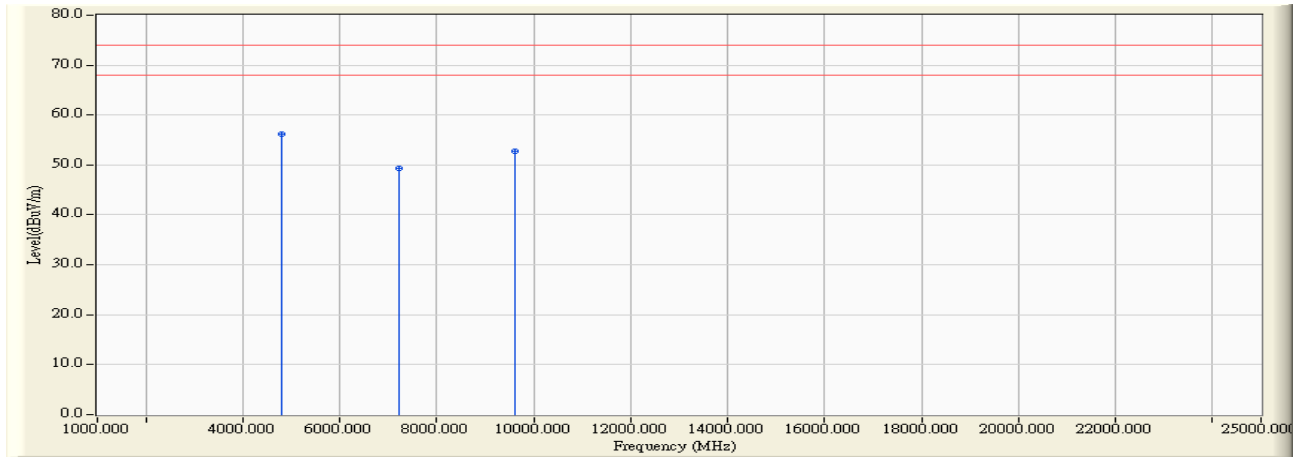
**Average Detector:**

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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 : Wireless Headset  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2404MHz) -Z-Axis



Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
4808.000	6.615	49.540	56.155	-17.845	74.000
7212.000	11.104	38.160	49.263	-24.737	74.000
9616.000	14.045	38.790	52.834	-21.166	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.

**Average Detector:**

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Correct Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Average Detector:</b>					
4808	56.155	-8.322	47.833	-6.167	54.000

**Vertical**
**Average Detector:**

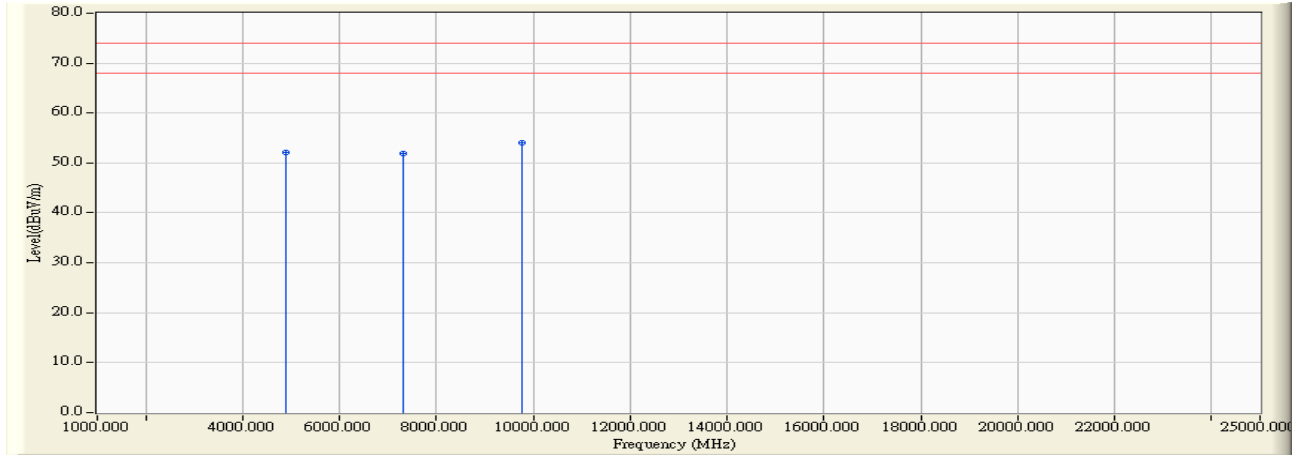
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Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.



Product : Wireless Headset  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2440 MHz) -Z-Axis



Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
4880.000	3.010	49.140	52.150	-21.850	74.000
7320.000	11.833	40.060	51.894	-22.106	74.000
9760.000	12.580	41.420	54.001	-19.999	74.000

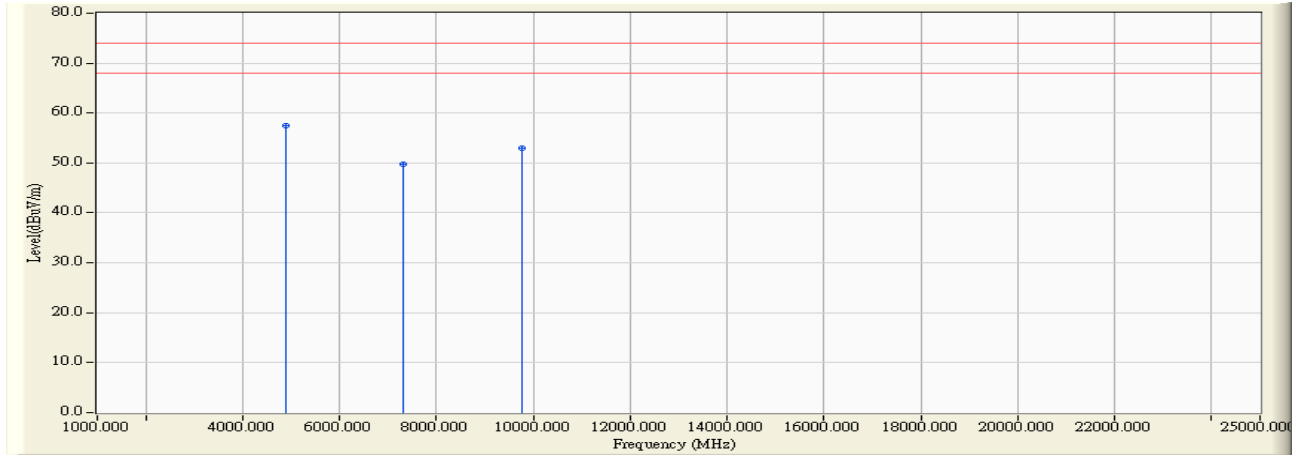
**Average Detector:**

--

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 : Wireless Headset  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2440MHz) -Z-Axis



Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
4880.000	5.738	51.820	57.558	-16.442	74.000
7320.000	12.703	37.140	49.843	-24.157	74.000
9760.000	13.052	39.890	52.942	-21.058	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.

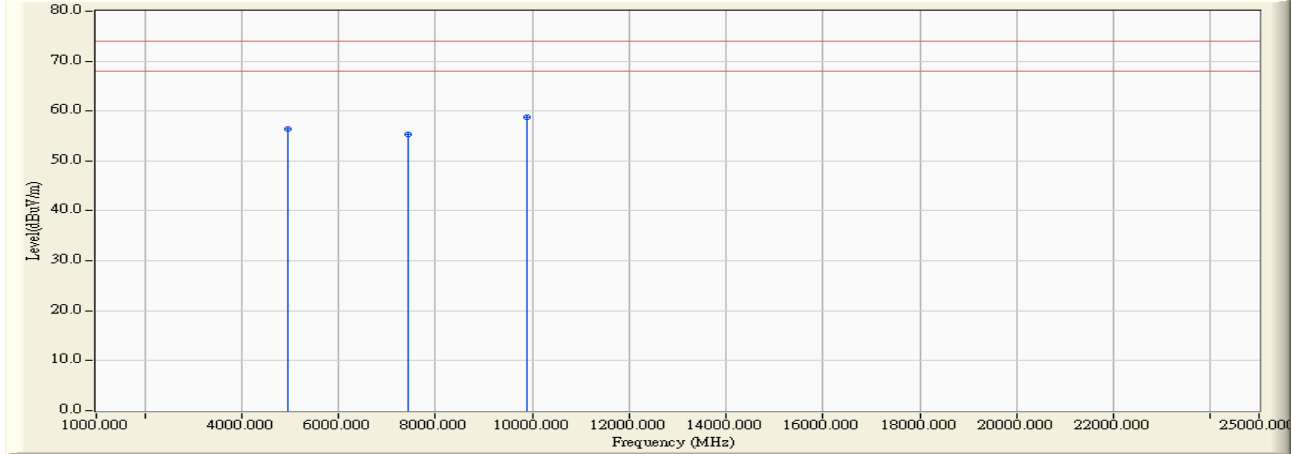
**Average Detector:**

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Correct Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Average Detector:</b>					
9760	54.001	-8.322	45.679	-8.321	54.000
<b>Vertical</b>					
<b>Average Detector:</b>					
4880	57.558	-8.322	49.236	-4.764	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : Wireless Headset  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2476 MHz) -Z-Axis



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

**Peak Detector:**

4952.000	0.503	55.910	56.413	-17.587	74.000
7428.000	8.508	46.860	55.368	-18.632	74.000
9904.000	8.175	50.580	58.754	-15.246	74.000

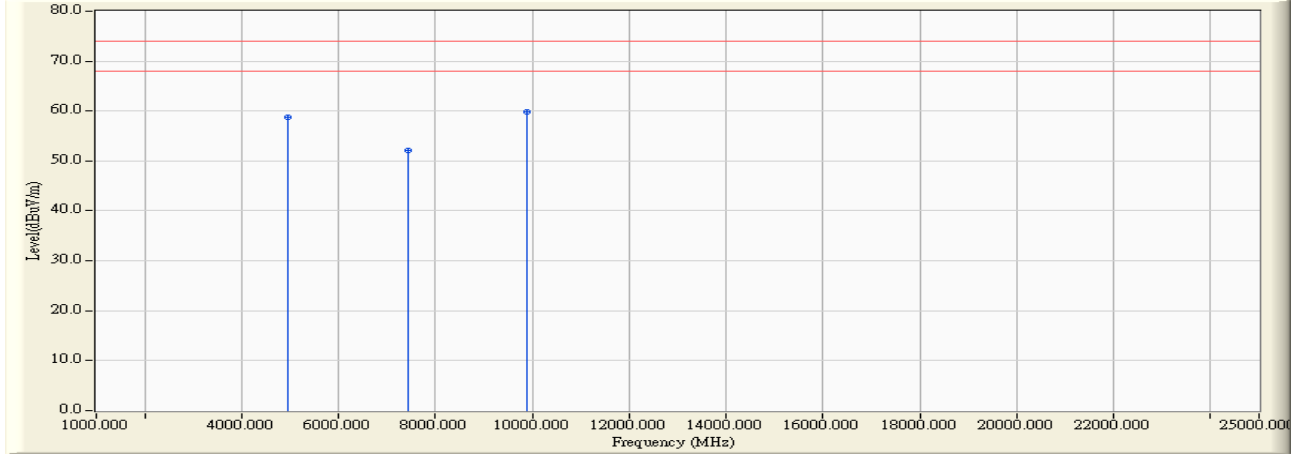
**Average Detector:**

--

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 : Wireless Headset  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2476MHz) -Z-Axis



Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Vertical</b>					
<b>Peak Detector:</b>					
4952.000	1.275	57.560	58.834	-15.166	74.000
7428.000	9.224	42.930	52.154	-21.846	74.000
9904.000	9.221	50.620	59.840	-14.160	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.

**Average Detector:**

Frequency MHz	Peak Measurement dBuV/m	Duty Cycle Correct Factor dB	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
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**Horizontal**
**Average Detector:**

4952	56.413	-8.322	48.091	-5.909	54.000
7428	55.368	-8.322	47.046	-6.954	54.000
9904	58.754	-8.322	50.432	-3.568	54.000

**Vertical**
**Average Detector:**

4952	58.834	-8.322	50.512	-3.488	54.000
9904	59.84	-8.322	51.518	-2.482	54.000

Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

Product : Wireless Headset  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2404 MHz) -Z-Axis

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
526.640	3.112	30.274	33.386	-12.614	46.000
608.120	3.925	26.038	29.963	-16.037	46.000
664.380	1.882	32.752	34.634	-11.366	46.000
763.320	5.113	27.855	32.968	-13.032	46.000
821.520	7.116	28.173	35.289	-10.711	46.000
961.200	6.810	28.895	35.705	-18.295	54.000
<b>Vertical</b>					
563.500	-2.460	40.233	37.773	-8.227	46.000
687.660	2.292	30.275	32.567	-13.433	46.000
734.220	-0.855	36.569	35.715	-10.285	46.000
829.280	2.376	26.257	28.633	-17.367	46.000
922.400	3.200	24.312	27.512	-18.488	46.000
961.200	3.310	30.419	33.729	-20.271	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.

#### 4. Band Edge

##### 4.1. Test Equipment

###### RF Conducted Measurement

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

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

Note:

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

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

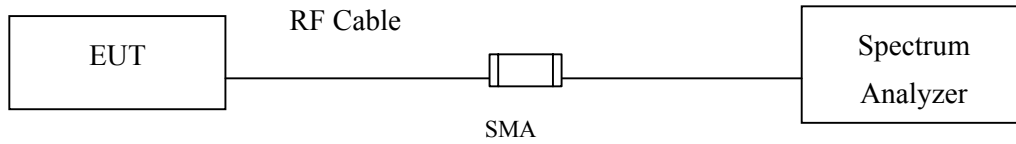
Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2011
	X Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2011
	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2011
	X Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2011
	X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2011
	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2011
	X Coaxial Cable	Quietek	QTK-CABLE/ CAB5	Feb., 2011
	X Controller	Quietek	QTK-CONTROLLER/ CTRL3	N/A
	X Coaxial Switch	Anritsu	MP59B/6200265729	N/A

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

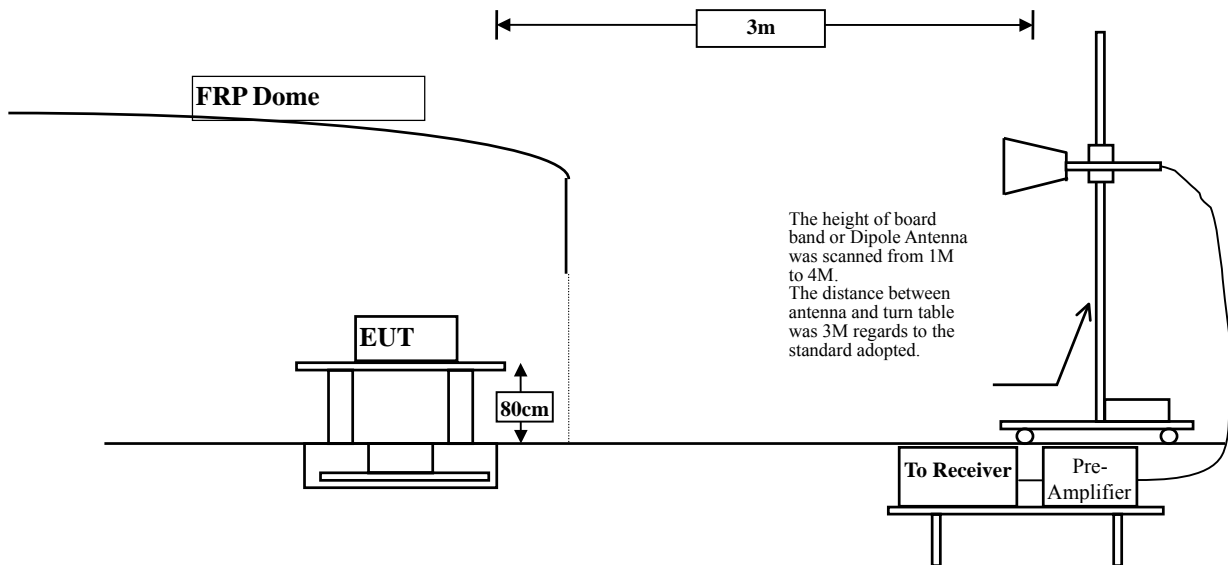


## 4.2. Test Setup

### RF Conducted Measurement



### RF Radiated Measurement:



### 4.3. 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 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: 2009 on radiated measurement.

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

### 4.5. Uncertainty

Conducted is  $\pm 1.27$  dB

Radiated is  $\pm 3.9$  dB

#### 4.6. Test Result of Band Edge

Product : Wireless Headset  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit - Channel 01

##### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Reading Level [dBuV]	Correction Factor [dB/m]	Emission Level [dBuV/m]	Detector
Horizontal	2404	31.586	68.52	100.106	Peak
Vertical	2404	30.923	61.64	92.563	Peak

Note: 1: Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

##### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiqment Limit (dBuV/m)	Detector
Horizontal	2400	100.106	42.7	57.406	74.000	Peak
Vertical	2400	92.563	42.7	49.863	74.000	Peak

Note:

The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

##### Average Detector:

Frequency MHz	Peak Measurement dB $\mu$ V/m	Duty Cycle Factor dB	Measurement Level dB $\mu$ V/m	Margin dB	Limit dB $\mu$ V/m	Result Pass
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##### Horizontal

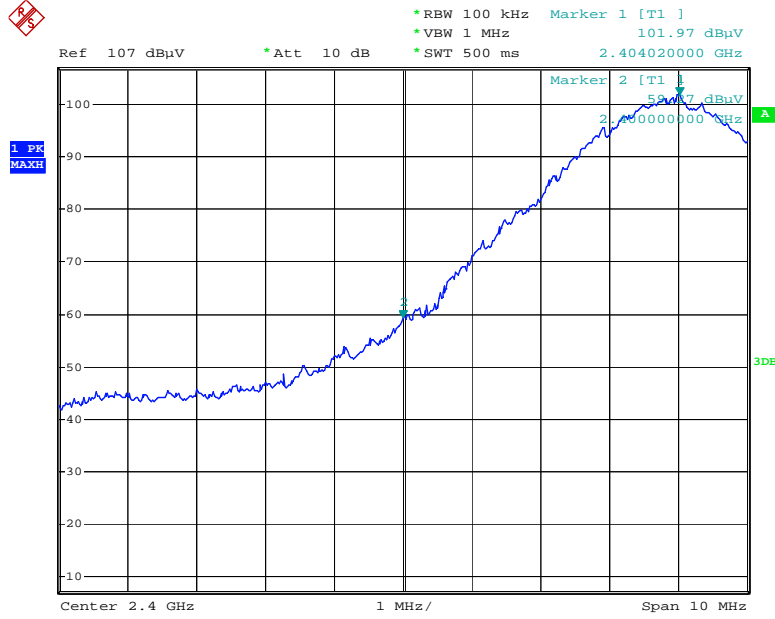
##### Average Detector:

2400	57.406	-8.322	49.084	-4.916	54.000	Pass
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Note:

1. AVG Measurement=Peak Measurement + Duty Cycle Correct Factor
2. The Duty Cycle is refer to section 5.

### Peak Detector of conducted Band Edge Delta



5190B-2

Date: 5.NOV.2011 08:57:05

Product : Wireless Headset  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit - Channel 25

**Fundamental Filed Strength**

Antenna Pole	Frequency [MHz]	Reading Level [dBuV]	Correction Factor [dB/m]	Emission Level [dBuV/m]	Detector
Horizontal	2476	32.125	68.48	100.605	Peak
Vertical	2476	31.384	61.75	93.135	Peak

Note: 1: Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz

Average detector: RBW=1MHz, VBW=10Hz

**Band Edge Test Data**

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Requiment Limit (dBuV/m)	Detector
Horizontal	2483.5	100.605	48.82	51.785	74.000	Peak
Vertical	2483.5	93.135	48.82	44.315	74.000	Peak

Note:

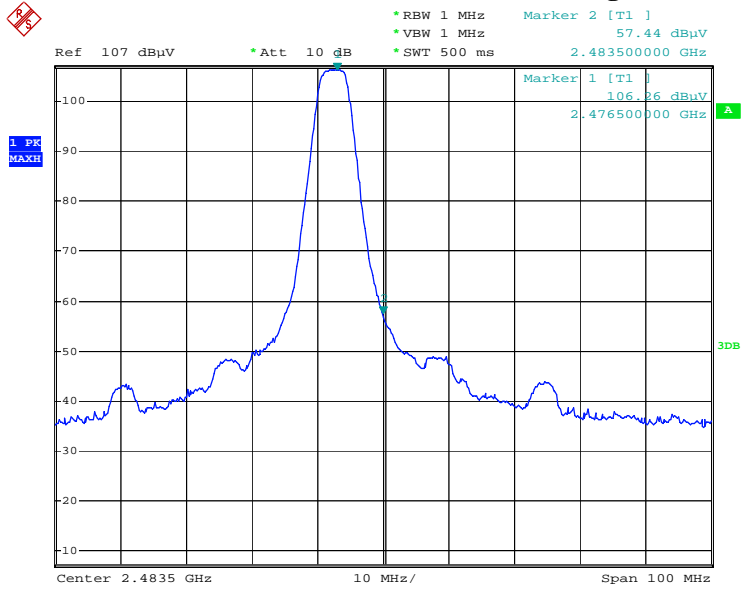
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength = F -  $\Delta$

F = Fundamental field Strength (Peak or Average)

$\Delta$  = Conducted Band Edge Delta (Peak or Average)

### Peak Detector of conducted Band Edge Delta



5190B-2

Date: 5.NOV.2011 08:58:57

## 5. Duty Cycle

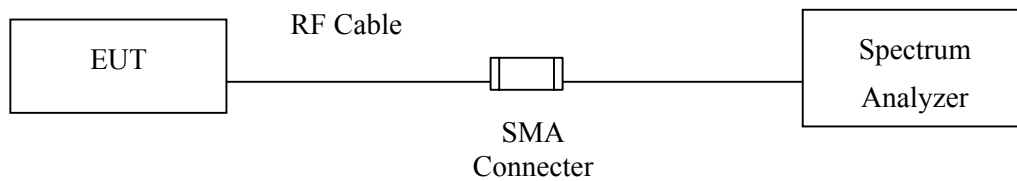
### 5.1. Test Equipment

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

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

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

### 5.2. Test Setup

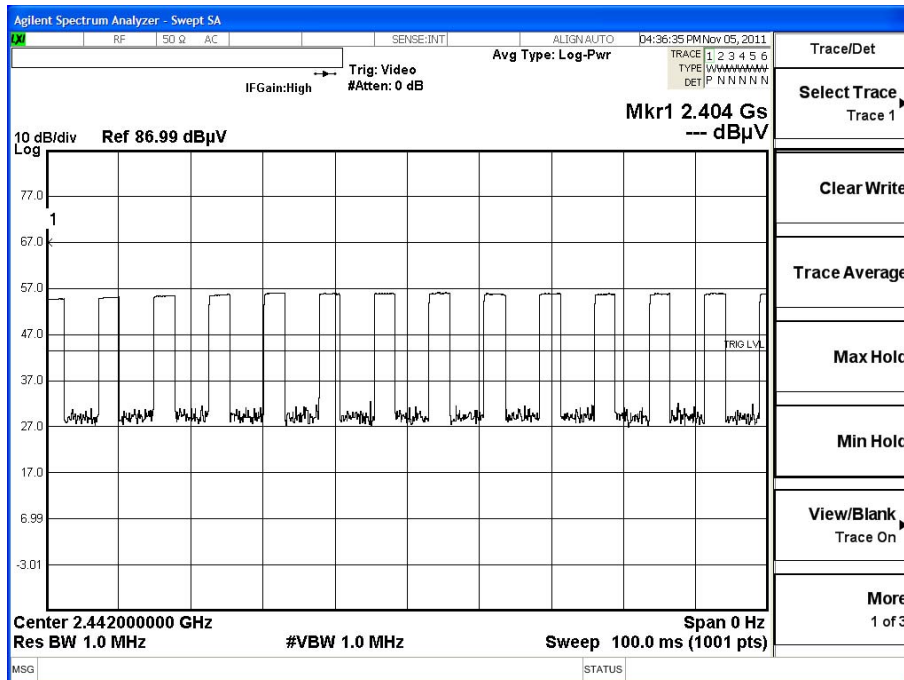
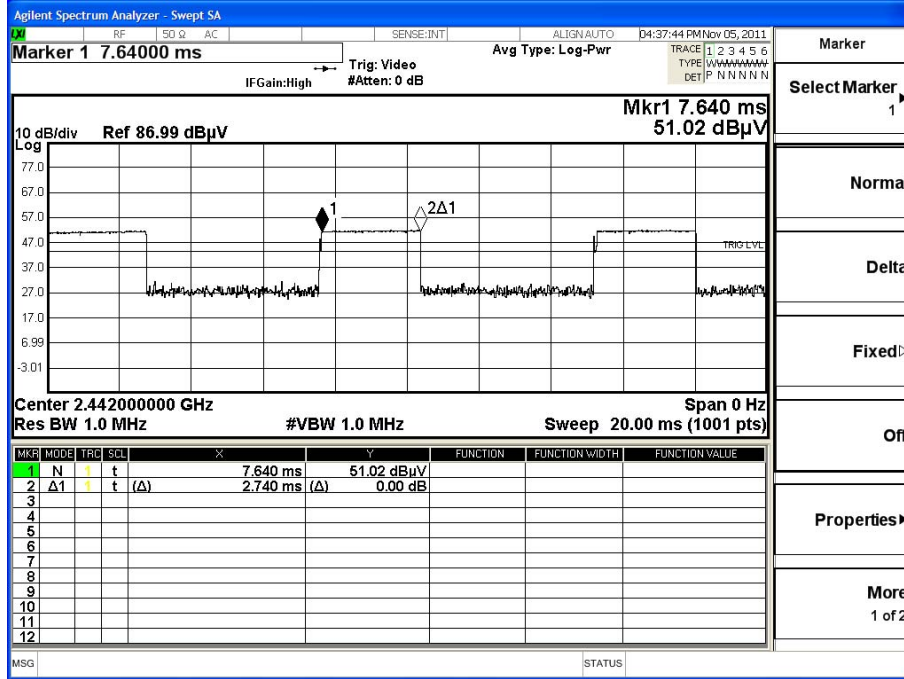


### 5.3. Uncertainty

$\pm 150\text{Hz}$

### 5.4. Test Result of Duty Cycle

Product : Wireless Headset  
 Test Item : Duty Cycle Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit





Time on of 100ms= 2.74ms\*14=38.36ms

Duty Cycle= 38.36ms / 100ms= 0.3836

Duty Cycle correction factor= 20 LOG 0.3836= -8.322 dB

<b>Duty Cycle correction factor</b>	<b>-8.322</b>	<b>dB</b>
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## 6. EMI Reduction Method During Compliance Testing

No modification was made during testing.