Test Report

Industry Canada RSS-Gen Issue 2/RSS-210 Issue 7
FCC Part15 Subpart C

Product Name	:	2.4GHz RF and BT headphone
Model No.	:	PX5 RX
FCC ID	:	XGB-TB2180
IC	:	3879A-2180

Applicant	:	Voyetra Turtle Beach
Address	:	150 Clearbrook Rd, Suite 162, EImsford, New York 10523

Date of Receipt	:	Dec. 28, 2010
Test Date	:	Dec. 28, 2010 ~ Jan. 17, 2011
Issued Date	:	Jan. 18, 2011
Report No.	:	10CS045R-RF-US-P06V01
Report Version	:	V1.0

Test Report Certification

Issued Date : Jan. 18, 2010
Report No. : 10CS045R-RF-US-P06V01

QuieTek

Product Name	:	2.4GHz RF and BT headphone
Applicant	:	Voyetra Turtle Beach
Address	:	150 Clearbrook Rd, Suite 162, Elmsford, New York 10523
Manufacturer	:	Weifang Goertek Electronics Co.,Ltd
Address	:	Dongfang North Road Hi-tech Industry Development District, Weifang Shandong
Model No.	:	PX5 RX
FCC ID	:	XGB-TB2180
IC	:	3879A-2180
EUT Voltage	:	DC: 3V
Trade Name	:	EAR FORCE
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart C: 2008 ANSI C63.4: 2009 RSS-Gen Issue 2/RSS-210 Issue 7
Test Result	:	Complied
Performed Location	:	Suzhou EMC Laboratory No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., Suzhou, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098 FCC Registration Number: 800392, IC Lab Code: 4075B

Documented By : Alice Ni

(Engineering ADM: Alice Ni)

Reviewed By : Robin Wu

(Engineering Supervisor: Robin Wu)

Approved By : Marlin Chen

(Engineering Manager: Marlin Chen)

Laboratory Information

We, **QuieTek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	**:**	**BSMI, NCC, TAF**
Germany	**:**	**TUV Rheinland**
Norway	**:**	**Nemko, DNV**
USA	**:**	**FCC, NVLAP**
Japan	**:**	**VCCI**

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : http://www.quietek.com/tw/ctg/cts/accreditations.htm
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

NVLAP Lab Code : 200347-0

Testing Laboratory 1313

LinKou Testing Laboratory :
No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen, Lin-Kou Shiang, Taipei, Taiwan, R.O.C.
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NVLAP Lab Code: 200533-0

Testing Laboratory 0914

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NVLAP Lab Code : 200743-0

Testing Laboratory 1596

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1. General Information

1.1. EUT Description

Product Name	2.4GHz RF and BT headphone
Brand Name	EAR FORCE
Model No.	PX5 RX
Working Voltage	DC: 3V
Frequency Range	2404 - 2476 MHz
Channel Number	73
Type of Modulation	GFSK
Data Rate	4Mbit/s
Channel Control	Auto
Antenna Type	PIFA
Antenna Gain	1.08dBi

Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2404 MHz	01	2405 MHz	02	2406 MHz	03	2407 MHz
04	2408 MHz	05	2409 MHz	06	2410 MHz	07	2411 MHz
08	2412 MHz	09	2413 MHz	10	2414 MHz	11	2415 MHz
12	2416 MHz	13	2417 MHz	14	2418 MHz	15	2419 MHz
16	2420 MHz	17	2421 MHz	18	2422 MHz	19	2423 MHz
20	2424 MHz	21	2425 MHz	22	2426 MHz	23	2427 MHz
24	2428 MHz	25	2429 MHz	26	2430 MHz	27	2431 MHz
28	2432 MHz	29	2433 MHz	30	2434 MHz	31	2435 MHz
32	2436 MHz	33	2437 MHz	34	2438 MHz	35	2439 MHz
36	2440 MHz	37	2441 MHz	38	2442 MHz	39	2443 MHz
40	2444 MHz	41	2445 MHz	42	2446 MHz	43	2447 MHz
44	2448 MHz	45	2449 MHz	46	2450 MHz	47	2451 MHz
48	2452 MHz	49	2453 MHz	50	2454 MHz	51	2455 MHz
52	2456 MHz	53	2457 MHz	54	2458 MHz	55	2459 MHz
56	2460 MHz	57	2461 MHz	58	2462 MHz	59	2463 MHz
60	2464 MHz	61	2465 MHz	62	2466 MHz	63	2467 MHz
64	2468 MHz	65	2469 MHz	66	2470 MHz	67	2471 MHz
68	2472 MHz	69	2473 MHz	70	2474 MHz	71	2475 MHz
72	2476 MHz	N/A	N/A	N/A	N/A	N/A	N/A

Typical Working Frequency of Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
34	2438 MHz	22	2426 MHz	32	2436 MHz	60	2464 MHz
52	2456 MHz	70	2474 MHz	62	2466 MHz	12	2416 MHz
18	2422 MHz	24	2428 MHz	58	2462 MHz	10	2414 MHz
06	2410 MHz	46	2450 MHz	20	2424 MHz	38	2442 MHz
50	2454 MHz	40	2444 MHz	08	2412 MHz	16	2420 MHz
00	2404 MHz	44	2448 MHz	36	2440 MHz	26	2430 MHz
28	2432 MHz	54	2458 MHz	56	2460 MHz	30	2434 MHz
04	2408 MHz	48	2452 MHz	66	2470 MHz	64	2468 MHz
72	2476 MHz	68	2472 MHz	01	2405 MHz	14	2418 MHz
02	2406 MHz	42	2446 MHz	N/A	N/A	N/A	N/A

1.2. Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmit
Mode 2: Receive

Note:

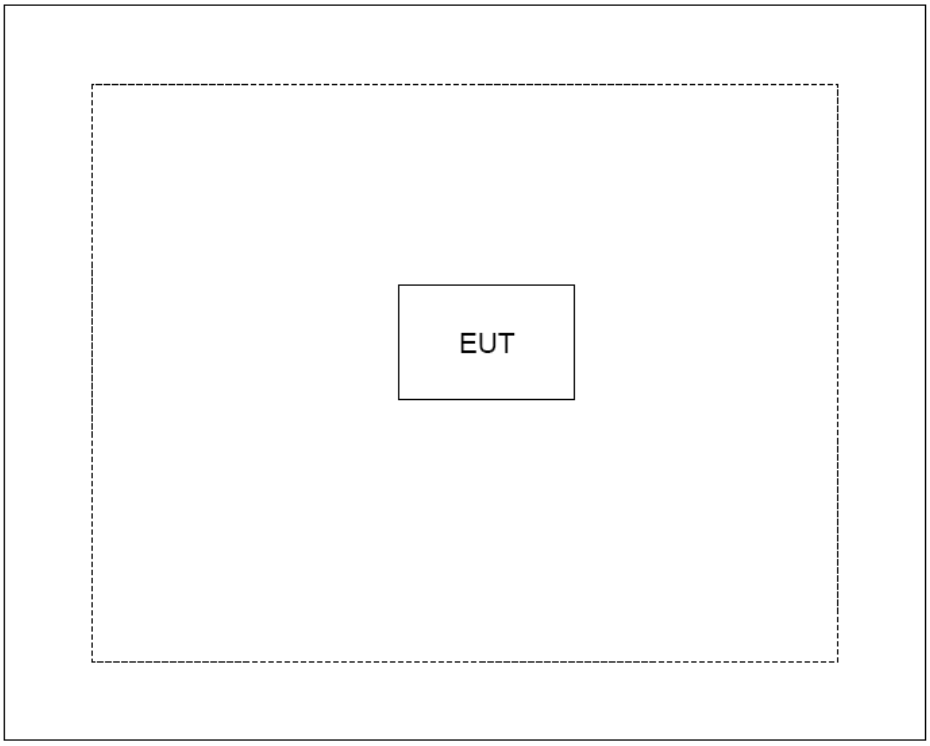
1. Regards to the frequency band operation: the lowest、middle and highest frequency of channel were selected to perform the test, then shown on this report.

1.3. Tested System Details

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

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	N/A	N/A	N/A	N/A	N/A

1.4. Configuration of Tested System

<table>
<tr><td colspan="2">Connection Diagram</td></tr>
<tr><td colspan="2">
</td></tr>
<tr><td>Signal Cable Type</td><td>Signal cable Description</td></tr>
</table>

1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	Open the software “PX5 Interface Software_v1.2_20100103.exe” provided by applicant, Select the channel and test.

2. Technical Test

2.1. Summary of Test Result

☒ No deviations from the test standards

☐ Deviations from the test standards as below description:

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.207 RSS-Gen Issue 2 June 2007 Section 7.2.2	N/A	N/A
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.209 and 15.249 RSS-210 Issue 7 June 2007 Section 2.7 Table 2 , Table 3 and Section A2.9(a),(b)	Yes	No
Band-edge Compliance of RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.215(c)	Yes	No
99% Occupied Bandwidth	RSS-Gen Issue 2 June 2007 Section 4.6.1	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

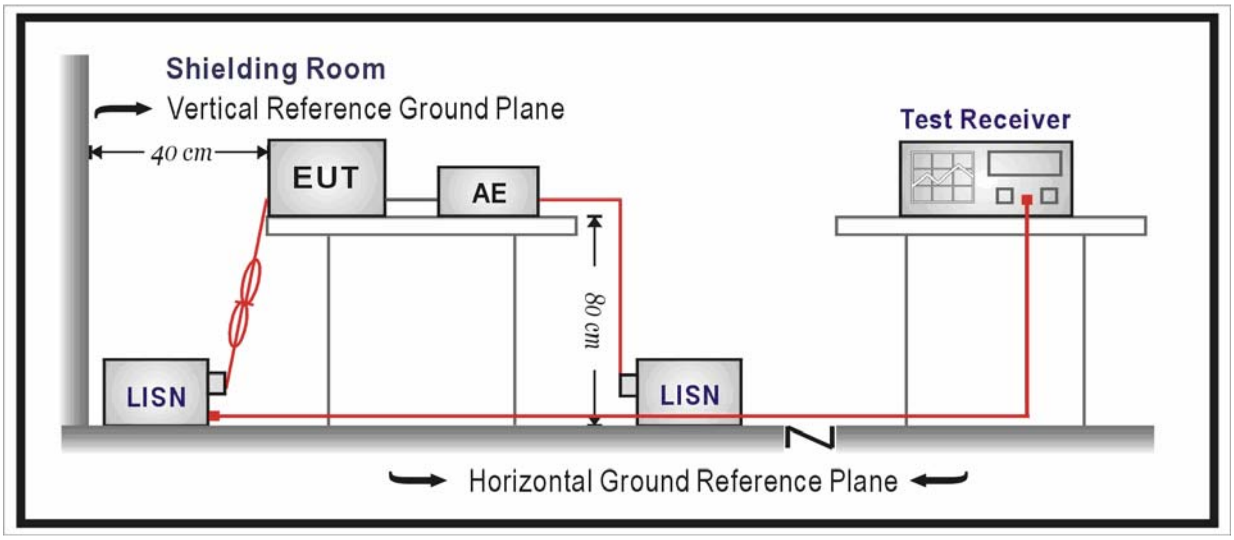
3.1. Test Equipment

Conducted Emission / TR-1

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100726	2011.04.23
Two-Line V-Network	R&S	ENV216	100043	2011.06.18
Two-Line V-Network	R&S	ENV216	100044	2011.09.07
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2011.05.05
50ohm Termination	SHX	TF2	07081401	2011.09.27
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2012.01.14

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

3.6. Test Result

The EUT rely on battery-powered, so this test item needn't perform.

4. Radiated Emission

4.1. Test Equipment

Radiated Emission / AC-2

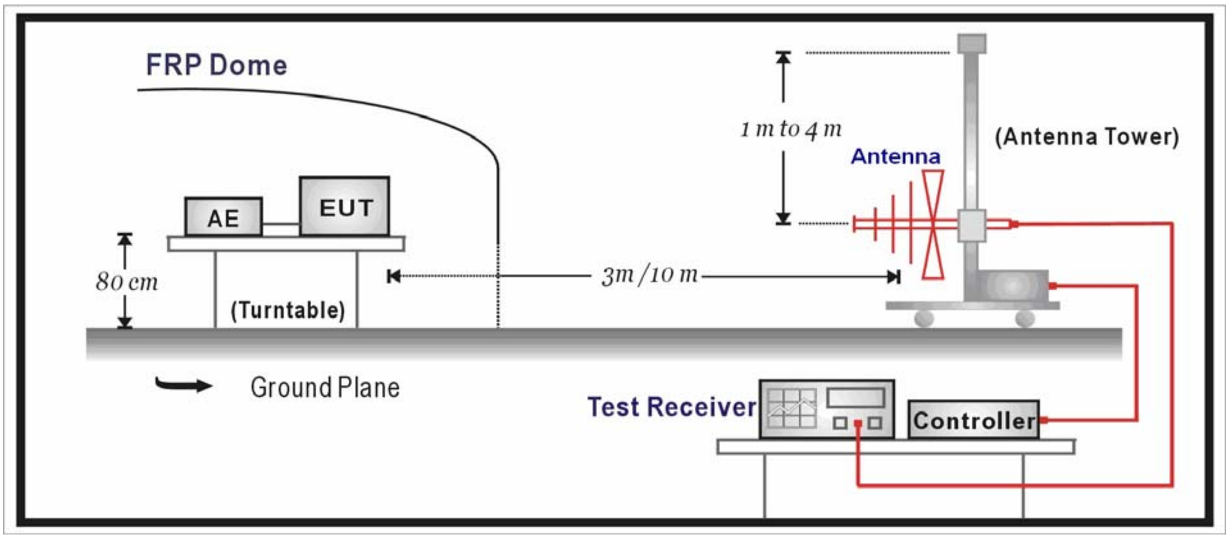
Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100573	2011.04.23
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2011.10.18
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2011.05.05
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2012.01.14

☒Radiated Emission / AC-5

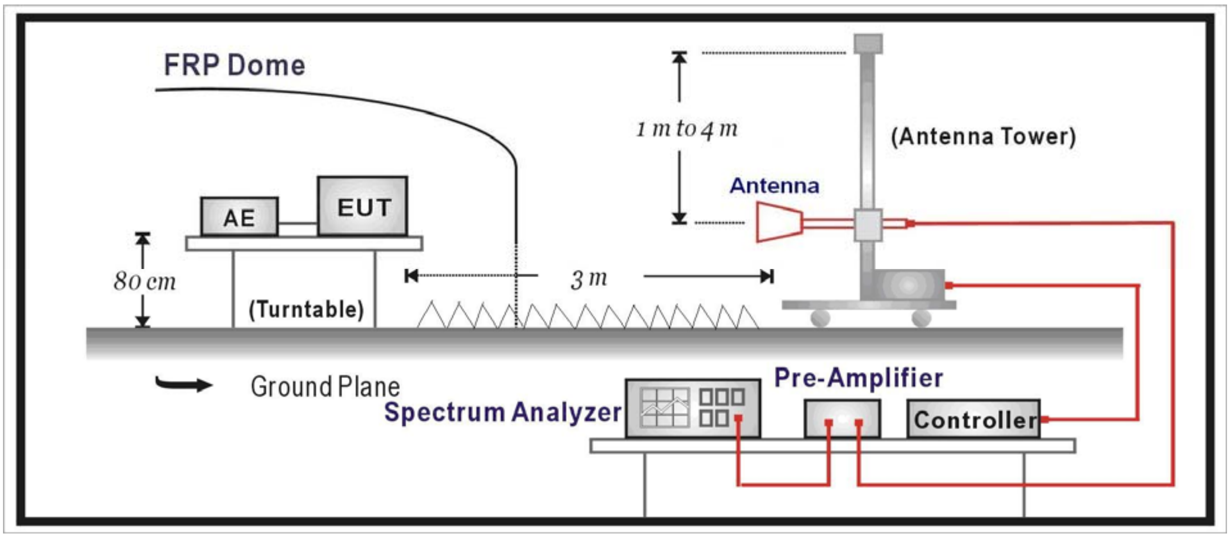
Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2012.04.23
EMI Test Receiver	R&S	ESCI	100573	2012.04.23
Preamplifier	Quietek	AP-025C	CHM-0511006	2012.05.05
Preamplifier	Quietek	AP-180C	CHM-0602013	2012.05.05
Bilog Type Antenna	Schaffner	CBL6112B	2932	2011.10.18
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2011.06.11
High-Pass Filter	Wainwright	WHKX2.8/18G-12SS	SN1	2011.03.03
Band Reject Filter	Wainwright	WRCG2400/2485-2375 /2510-60/11SS	SN9	2011.03.03
High-Pass Filter	Wainwright	WHKX7.0/18G-8SS	SN16	2011.03.03
Low-Pass Filter	Wainwright	WLKS4500-9SS	SN2	2011.03.03
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2011.05.05
Temperature/Humidity Meter	zhicheng	ZC1-2	AC5-TH	2012.01.14

4.2. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 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.

Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m)

FCC Part 15 Subpart C Paragraph 15.249		
Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902-928(MHz)	50	500
2400-2483.5(MHz)	50	500
5725-5875(MHz)	50	500
24.0-24.25(GHz)	250	2500

4.4. Test Procedure

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2009 on radiated measurement.

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

The frequency range from 30MHz to 10th harmonic is checked.

Note: When doing emission measurement above 1GHz, the horn antenna will be bended down a little (as horn antenna has the narrow beamwidth) in order to keeping the antenna in the “cone of radiation” of EUT. The 3dB beamwidth is 60~10 degrees for H-plane and 90~10 degrees for E-plane.

4.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB

below 1G is defined as ± 3.8 dB

4.6. Test Result

All of the test result shown indicates the worst case, and spectrum analyzer parameters setting as shown below:
Peak detector: RBW = 1MHz, VBW = 3MHz, sweep time = 200ms;
Average detector = Peak detector - 20*Log(1/Duty Cycle)

Fundamental Radiated Emission

Product	:	2.4GHz RF and BT headphone
Test Item	:	Fundamental Radiated Emission
Test Site	:	AC-5
Test Mode	:	Mode 1: Transmit

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
2404	H	104.1	-5.9	98.2	114	-15.8	PK
	V	101.0	-5.9	95.1	114	-18.9	PK
2441	H	103.5	-5.9	97.6	114	-16.4	PK
	V	99.2	-5.9	93.3	114	-20.7	PK
2476	H	100.5	-5.8	94.7	114	-19.3	PK
	V	97.6	-5.8	91.8	114	-22.2	PK

Note: Measure Level = Reading Level + Factor.

Frequency (MHz)	Antenna	Peak Measure (dBuV/m)	Duty Cycle Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
2404	H	98.2	-20	78.2	94	-15.8	AV
	V	95.1	-20	75.1	94	-18.9	AV
2441	H	97.6	-20	77.6	94	-16.4	AV
	V	93.3	-20	73.3	94	-20.7	AV
2476	H	94.7	-20	74.7	94	-19.3	AV
	V	91.8	-20	71.8	94	-22.2	AV

Note:1. Measure Level = Peak Measure + Duty Cycle Correct Factor.
2. If Duty Cycle is smaller than -20dB,based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

Harmonic Radiated Emission

Product	:	2.4GHz RF and BT headphone
Test Item	:	Harmonic Radiated Emission
Test Site	:	AC-5
Test Mode	:	Mode 1: Transmit (2404MHz)

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4804	H	54.0	0.4	54.4	74	-19.6	PK
4804	V	65.3	0.4	65.7	74	-8.3	PK
7212	H	47.1	7.3	54.4	74	-19.6	PK
7212	V	45.1	7.3	52.4	74	-21.6	PK
9616	H	43.4	8.4	51.8	74	-22.2	PK
9616	V	44.9	8.4	53.3	74	-20.7	PK

Note: Measure Level = Reading Level + Factor.

Frequency (MHz)	Antenna	Peak Measure (dBuV/m)	Duty Cycle Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4804	H	54.4	-20	34.4	54	-19.6	AV
4804	V	65.7	-20	45.7	54	-8.3	AV
7212	H	54.4	-20	34.4	54	-19.6	AV
7212	V	52.4	-20	32.4	54	-21.6	AV
9616	H	51.8	-20	31.8	54	-22.2	AV
9616	V	53.3	-20	33.3	54	-20.7	AV

Note:1. Measure Level = Peak Measure + Duty Cycle Correct Factor.

2. If Duty Cycle is smaller than -20dB,based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

Product	:	2.4GHz RF and BT headphone
Test Item	:	Harmonic Radiated Emission
Test Site	:	AC-5
Test Mode	:	Mode 1: Transmit (2441MHz)

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4882	H	63.4	0.2	63.6	74	-10.4	PK
4882	V	63.6	0.2	63.8	74	-10.2	PK
7323	H	47.3	6.7	54.0	74	-20.0	PK
7323	V	49.4	6.7	56.1	74	-17.9	PK
9764	H	43.4	9.3	52.7	74	-21.3	PK
9764	V	46.2	9.3	55.5	74	-18.5	PK

Note: Measure Level = Reading Level + Factor.

Frequency (MHz)	Antenna	Peak Measure (dBuV/m)	Duty Cycle Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4882	H	63.6	-20	43.6	54	-10.4	AV
4882	V	63.8	-20	43.8	54	-10.2	AV
7323	H	54.0	-20	34.0	54	-20.0	AV
7323	V	56.1	-20	36.1	54	-17.9	AV
9764	H	52.7	-20	32.7	54	-21.3	AV
9764	V	55.5	-20	35.5	54	-18.5	AV

Note:1. Measure Level = Peak Measure + Duty Cycle Correct Factor.

2. If Duty Cycle is smaller than -20dB,based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

Product	:	2.4GHz RF and BT headphone
Test Item	:	Harmonic Radiated Emission
Test Site	:	AC-5
Test Mode	:	Mode 1: Transmit (2476MHz)

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4952	H	62.3	0.6	62.9	74	-11.1	PK
4952	V	61.2	0.6	61.8	74	-12.2	PK
7428	H	47.7	6.7	54.4	74	-19.6	PK
7428	V	45.2	6.7	51.9	74	-22.1	PK
9904	H	42.9	10.3	53.2	74	-20.8	PK
9904	V	43.0	10.1	53.1	74	-20.9	PK

Note: Measure Level = Reading Level + Factor.

Frequency (MHz)	Antenna	Peak Measure (dBuV/m)	Duty Cycle Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4952	H	62.9	-20	42.9	54	-11.1	AV
4952	V	61.8	-20	41.8	54	-12.2	AV
7428	H	54.4	-20	34.4	54	-19.6	AV
7428	V	51.9	-20	31.9	54	-22.1	AV
9904	H	53.2	-20	33.2	54	-20.8	AV
9904	V	53.1	-20	33.1	54	-20.9	AV

Note:1. Measure Level = Peak Measure + Duty Cycle Correct Factor.

2. If Duty Cycle is smaller than -20dB,based on FCC part15 the duty cycle correction factor is -20dB for calculating average emission.

General Radiated Emission

Product	:	2.4GHz RF and BT headphone
Test Item	:	General Radiated Emission
Test Site	:	AC-2
Test Mode	:	Mode 1: Transmit (2441MHz)

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
416.6	H	4.7	17.9	22.6	46	-23.4	QP
416.6	V	11.5	17.9	29.4	46	-16.6	QP
528.3	H	4.6	19.2	23.8	46	-22.2	QP
528.3	V	11.2	19.2	30.4	46	-15.6	QP

Note: 1. Measure Level = Reading Level + Factor.
2. The general radiated emission limits in Section 15.209 is the lesser attenuation than the fundamental attenuated 50 dB.

5. Band-edge Compliance of RF Conducted Emissions

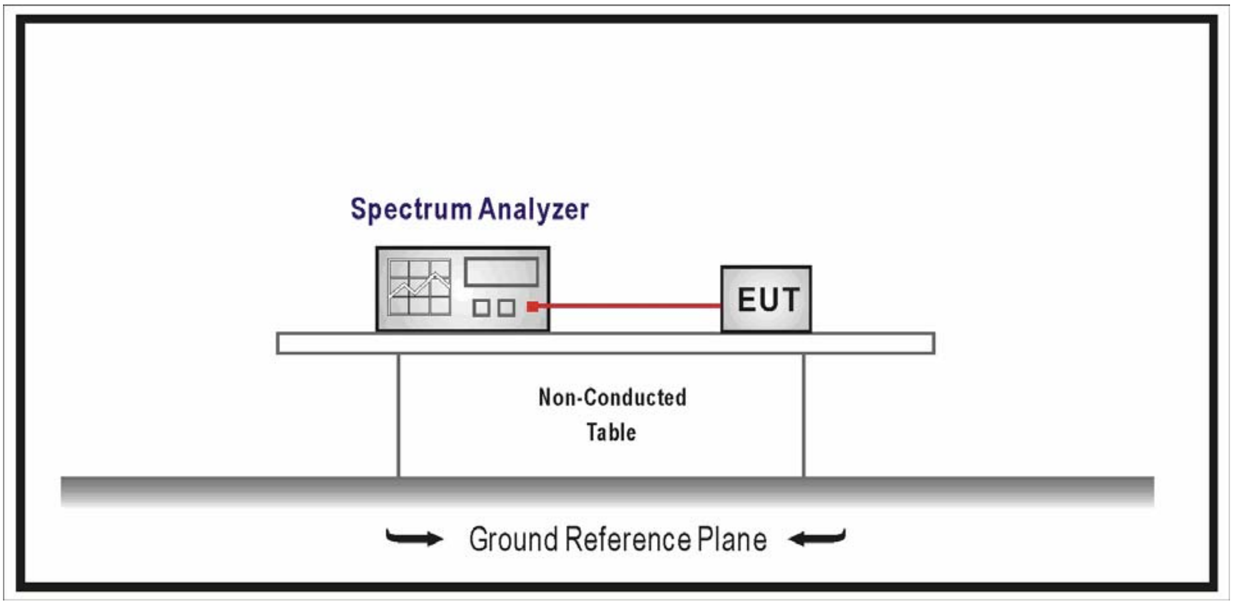
5.1. Test Equipment

Band-edge Compliance of RF Conducted Emissions / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2011.04.30
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2011.05.04

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup



5.3. Limit

- Intentional radiators operating under the alternative provisions to the general emission limits as contained in 15.217 through 15.257 and in Subpart E of FCC part 15, must be designed to ensure that 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.
- In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz

bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) of FCC part 15 is not required.

5.4. Test Procedure

Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation.
RBW ≧ 1% of the span
VBW ≧ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Allow the trace to stabilize. Set the marker on the emission at the bandedge, or on the highest modulation prouduct outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. The marker-delta value now displayed must comply with the limit specified in this Section.
Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit.

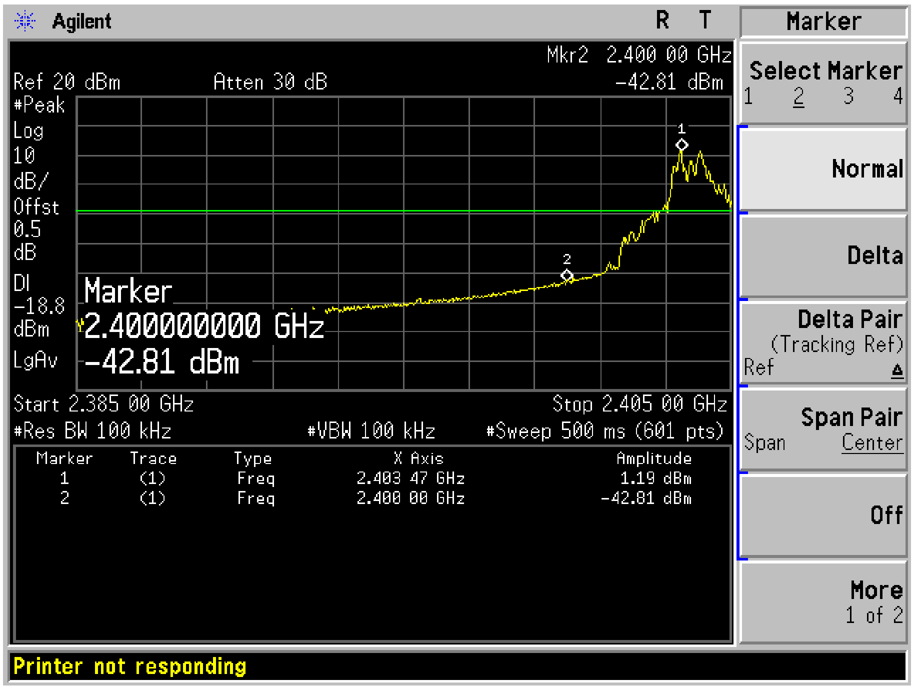
5.5. Uncertainty

The measurement uncertainty is defined as ± 1.0 dB

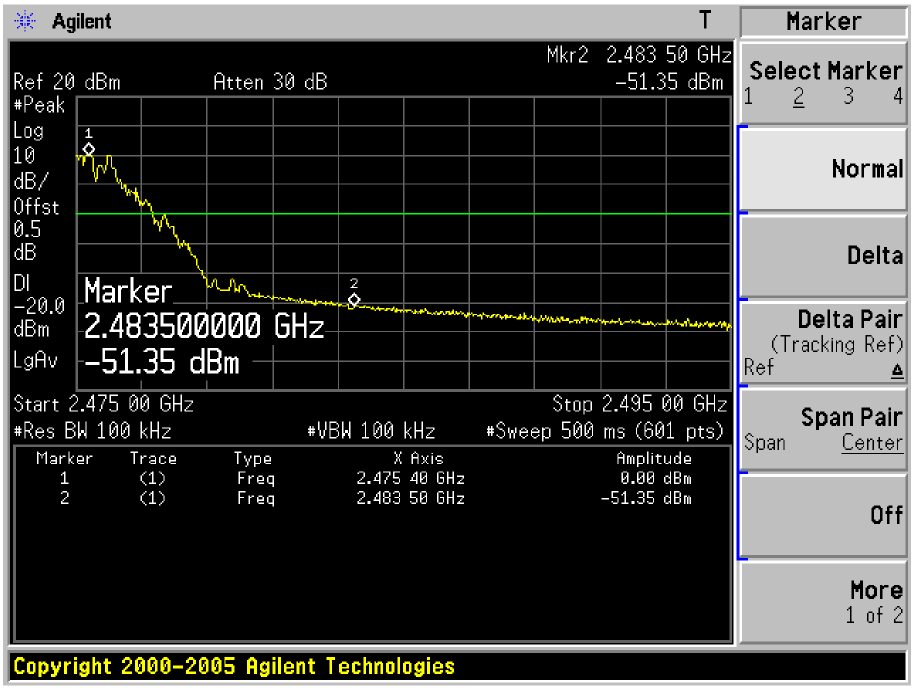
5.6. Test Result

Product	:	2.4GHz RF and BT headphone
Test Item	:	Band-edge Compliance of RF Conducted Emissions
Test Mode	:	Mode 1: Transmit

Channel 00 (2404MHz)



Channel 72 (2476MHz)



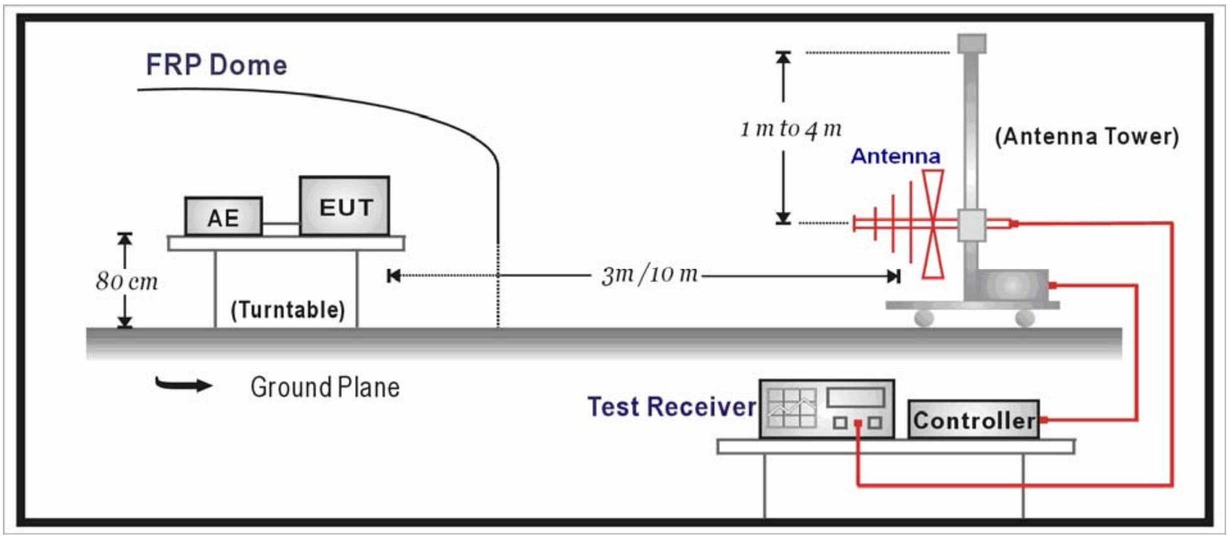
6. Receiver Spurious Emission for RSS-GEN

6.1. Test Specification

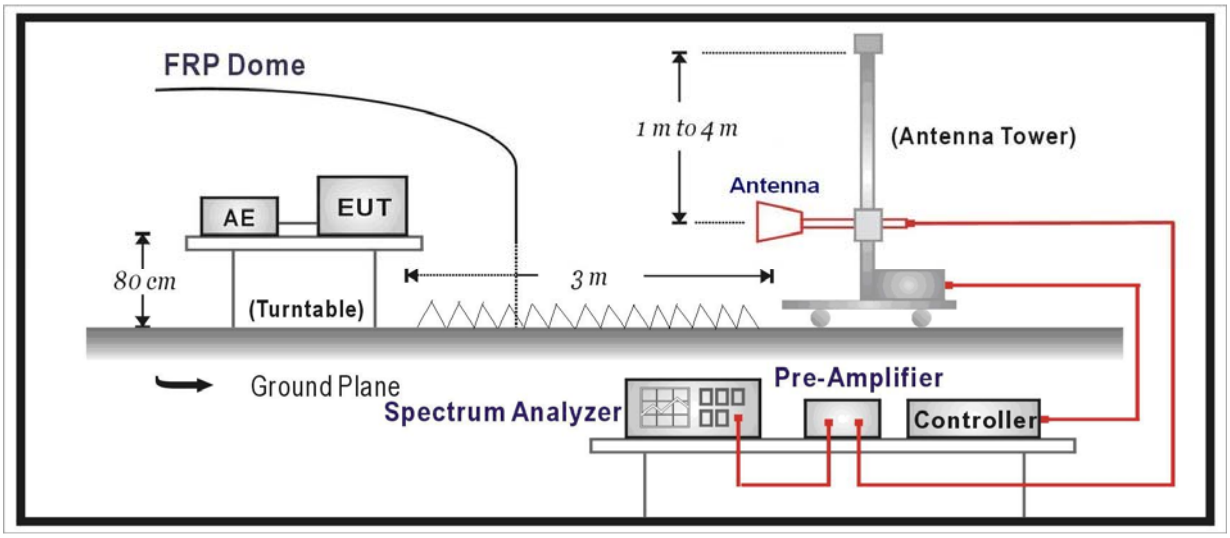
According to EMC Standard: FCC Part 15 Subpart B Class B, ANSI C63.4 or RSS-GEN

6.2. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.3. Limit

FCC Part 15 Subpart B Paragraph 15.109 & RSS-GEN		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 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.

Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m)

6.4. 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 10 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 on radiated measurement.

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 - 108	1000
108 - 500	2000

500 - 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

On any frequency or frequencies below or equal to 1000 MHz, the radiated limits shown are based on measuring equipment employing a quasi-peak detector function and above 1000 MHz, the radiated limits shown are based measuring equipment employing an average detector function.

When average radiated emission measurement are included emission measurement Above 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

For class A, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and above 1GHz.

For class B, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and 3 meters for above 1GHz.

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

Note: When measurement above 1GHz, the horn antenna will bend down a little (as horn antenna have the narrow beamwidth) in order to find the maximum emission of EUT.

6.5. Deviation from Test Standard

No deviation.

6.6. Test Result

All of the test result shown indicates the worst case, and spectrum analyzer parameters setting as shown below:
Peak detector: RBW = 1MHz, VBW = 3MHz, sweep time = 200ms;
Average detector: RBW = 1MHz, VBW = 10Hz, sweep time = auto.
Measure Level = Reading Level + Cable Loss + Antenna Factor - Preamplifier Gain

Mode 2: Receive

CH (MHz)	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
2404	H	112.2	6.7	12.4	19.1	43.5	-24.4	QP
	V	112.2	3.4	12.4	15.8	43.5	-27.7	QP
	H	317.2	5.9	15.0	20.9	46	-25.1	QP
	V	317.2	3.7	15.0	18.7	46	-27.3	QP
	H	2861.5	40.0	-5.0	35.0	54(Note)	-19.0	PK
	V	2861.5	41.2	-5.0	36.2	54(Note)	-17.8	PK
2441	H	128.9	6.7	12.5	19.2	43.5	-24.3	QP
	V	128.9	4.4	12.5	16.9	43.5	-26.6	QP
	H	439.8	6.7	17.5	24.2	46	-21.8	QP
	V	439.8	5.2	17.5	22.7	46	-23.3	QP
	H	3643.5	41.3	-3.4	37.9	54(Note)	-16.1	PK
	V	3643.5	41.3	-3.4	37.9	54(Note)	-16.1	PK
2476	H	293.8	6.7	14.0	20.7	46	-25.3	QP
	V	293.8	3.9	14.0	17.9	46	-28.1	QP
	H	499.7	6.6	18.8	25.4	46	-20.6	QP
	V	499.7	3.3	18.8	22.1	46	-23.9	QP
	H	5411.5	39.2	0.9	40.1	54(Note)	-13.9	PK
	V	5411.5	40.0	0.9	40.9	54(Note)	-13.1	PK

Note : This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

7. 99% Occupied Bandwidth

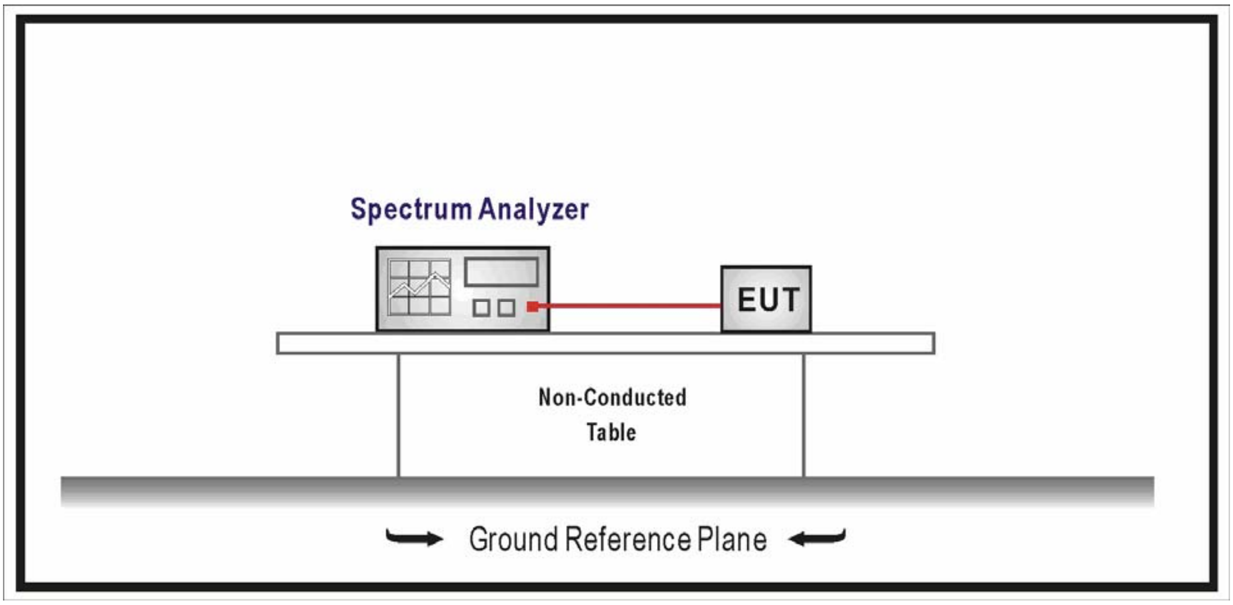
7.1. Test Equipment

99% Occupied Bandwidth / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2011.04.30
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2011.05.04

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

7.2. Test Setup



7.3. Limit

N/A

7.4. Test Procedure

Use the following spectrum analyzer settings:

Span = capture all products of the modulation process, including the emission skirts

RBW = as close to 1% of the selected span as is possible without being below 1%

VBW = 3 times RBW

Sweep = auto

Detector function = sampling

The trace data points are recoved and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

The span between the two recordeded frequencies is the occupied bandwidth.

7.5. Uncertainty

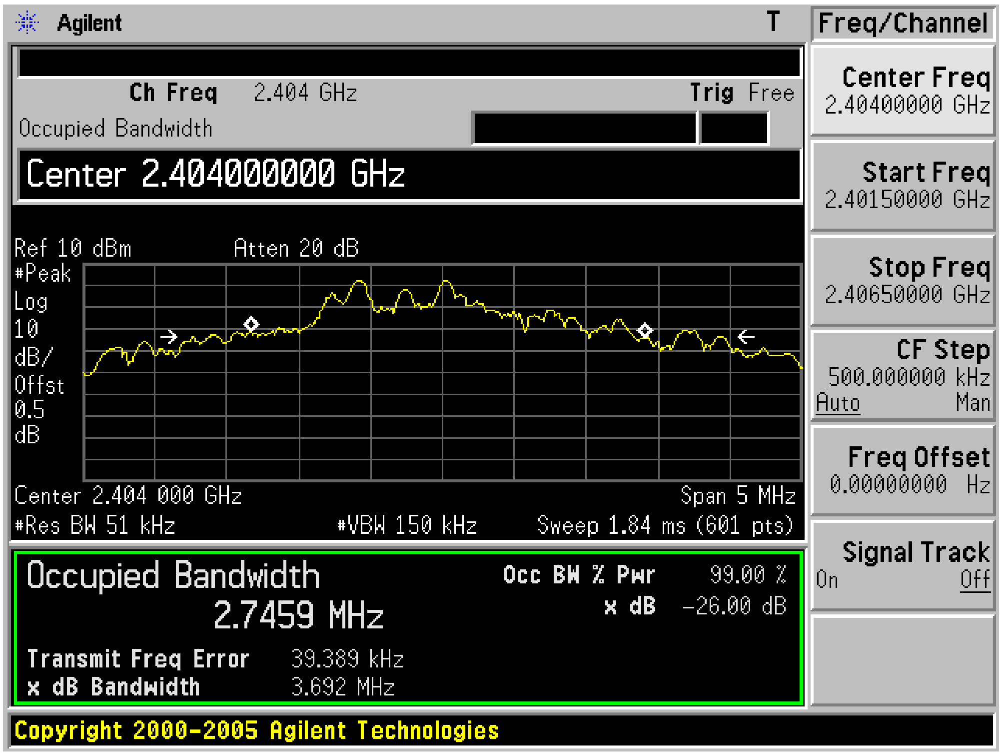
The measurement uncertainty is defined as ± 1 kHz

7.6. Test Result

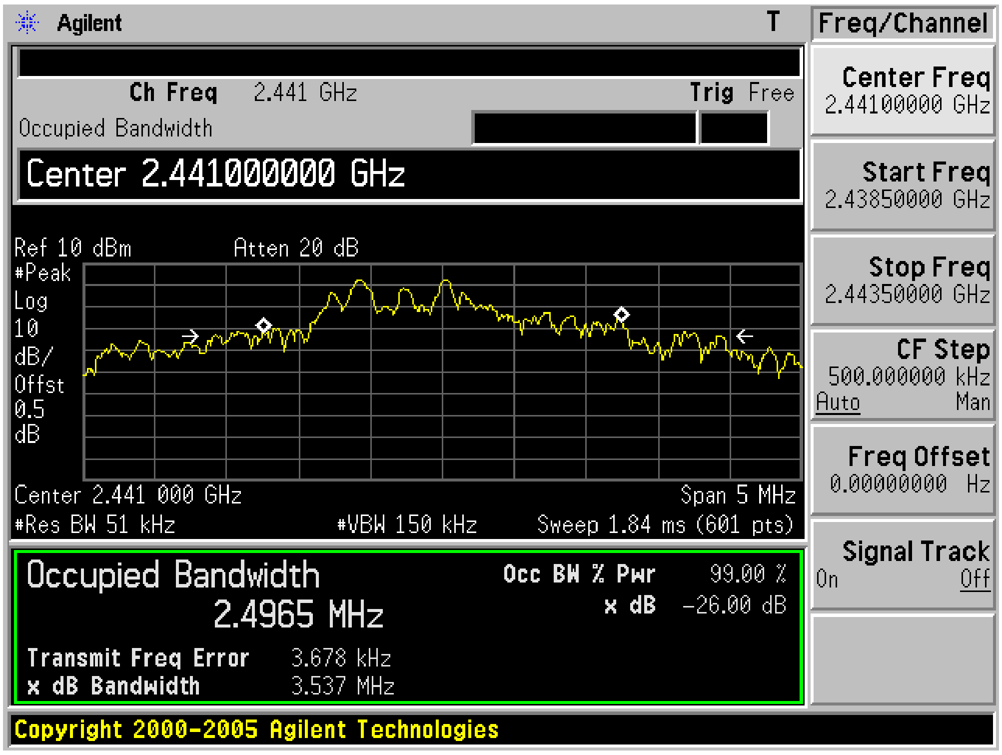
Product	:	2.4GHz RF and BT headphone
Test Item	:	99% Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit

Channel No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Limit (kHz)	Result
00	2404	2.7459	N/A	Pass
36	2440	2.4965	N/A	Pass
76	2480	2.5227	N/A	Pass

Channel 00 (2404MHz)



Channel 37 (2441MHz)



Channel 72 (2476MHz)