



CONFORMANCE TEST REPORT FOR FCC 47 CFR, Part 15 Subpart C

Report No.: 06-09-MAS-158-01

Client: IATEC LIMITED
Product: 2.4G 5.1_stereo Wireless Headphone
Model: WLHY-311
FCC ID: UN2-WLH311
Manufacturer/supplier: Kenling Electronic Co.,Ltd.
Date test item received: 2006/09/25
Date test campaign completed: 2006/11/06
Date of issue: 2006/11/10




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Total number of pages of this test report: 27 pages

Total number of pages of photos: External photos 2 pages

Internal photos 4 pages

Setup photos 3 pages

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Client : IATEC LIMITED (Representative Office)
Address : 5F, No. 23, Long Jiang Rd., 104, Taipei, Taiwan, R.O.C.
Manufacturer : Kenling Electronic Co.,Ltd.
Address : Dong Guan Chang An Zen Tian Industrial park
EUT : 2.4G 5.1_stereo Wireless Headphone
Trade name : YAMASYC (WLHY-311) ; LTB (WLHL-311)
Model No. : WLHY-311
Comment issues : (1) The report also apply to model: WLHL-311
(2) The multiple listing recognized without test basis is according to information supplied by manufacturer. A detail documentation of the above models must be verified by legal right organization for the EMC characteristic with relation to the subject model.
Power Source : Adapter Model No.: KSAB0500100W1US
Input: 100-240Vac, 50/60Hz, 0.18A
Output: DC +5V, 1.0A
Regulations applied : FCC 47 CFR, Part 15 Subpart C (2006)

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- ③ Filing: FCC, Industry Canada, VCCI
- ④ MRA: Australia, Hong Kong, New Zealand, Singapore, USA, Japan, Korea, China, APLAC through CNLA
- ⑤ FCC Registration Number: 90588, 91094, 91095



NVLAP Lab Code 200133-0

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1. GENERAL INFORMATION

1.1 Product Description

- a) Type of EUT : 2.4G 5.1_stereo Wireless Headphone
b) Model No. : WLHY-311
c) Serial No. : ----
d) FCC ID : UN2-WLH311
e) Working Frequency :
CH 1: 2405.376 MHz CH 5: 2446.336 MHz
CH 2: 2415.616 MHz CH 6: 2456.576 MHz
CH 3: 2425.856 MHz CH 7: 2466.816 MHz
CH 4: 2436.096 MHz CH 8: 2477.056 MHz
f) Power Supply : Adapter Model No.: KSAB0500100W1US
Input: 100-240Vac, 50/60Hz, 0.18A
Output: DC +5V, 1.0A

1.2 Characteristics of Device:

The EUT is a Wireless Headphone transmitter and operat at 2.4 GHz with GFSK modulation.

1.3 Test Methodology

Radiated testing were performed according to the procedures in chapter 13 of ANSI C63.4.

The device under test was operated continuously in its normal operating mode for the purpose of the measurements. In order to secure the continuous operation of the device under test, rewiring in the circuit was done by the manufacturer so as to affect its intended operation.

The receiving antenna was varied from 1 to 4 meters and the wooden turntable was rotated through 360 degrees to obtain the highest reading on the field strength meter or on the display of the spectrum analyzer. And also, each emission was to be maximized by changing the orientation of the device under test. The hand-held or body-worn devices rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relatives to the limit.

1.4 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data are located inside the Building at No.8, Lane 29, Wen-ming Road, Lo-shan Tsun, Kweishan Hsiang, Taoyuan, Taiwan, R.O.C.

This site has been accreditation as a FCC filing site.

2. DEFINITION AND LIMITS

2.1 Definition

Intentional radiator:

A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.25
0.495 - 0.505 **	16.69475 - 16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425 - 16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475 - 156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Remark “**”: Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

2.3 Limitation

(1) Conducted Emission Limits:

For an intentional radiator, which is designed to be connected to the public utility (AC) power line, the conducted limit is the following:

Frequency MHz	Quasi Peak dB μ V	Average dB μ V
0.15 - 0.5	66-56*	56-46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

*Decreases with the logarithm of the frequency.

(2) Radiated Emission Limits:

According to §15.249, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Frequency Band (MHz)	Field strength of Fundamental (mV/m)	Field strength of Harmonics (uV/m)
902 – 928	50	500
2400 – 2483.5	50	500
5725 – 5875	50	500
24.0 – 24.25 GHz	250	2500

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated limits in 15.209, as following table(whichever is the lesser attenuation):

Other Frequencies (MHz)	Field Strength of Fundamental	
	$\mu\text{V}/\text{meter}$	$\text{dB}\mu\text{V}/\text{meter}$
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

(3) Occupied Bandwidth Requirement:

According to § 15.215(c) 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 this part, must be designed to ensure that the 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.

(4) Antenna Requirement:

According to §15.203 An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

2.4 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.5 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

3. RADIATED EMISSION MEASUREMENT

3.1 Applicable Standard

For periodic operation intentional radiator, the radiated emission shall comply with § 15.249 and 15.209.

The occupied bandwidth requirement shall comply with § 15.215 (c).

The antenna requirement shall comply with § 15.203.

3.2 Measurement Procedure

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 1 GHz respectively. Turn on EUT and make sure that it is in normal function.
2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a semi-anechoic chamber to determine the accurate frequencies of higher emissions and then each selected frequency is precisely measured. As the same purpose, for emission measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.
3. For emission measured below and above 1 GHz, set the spectrum analyzer on a 120 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.
5. Repeat step 4 until all frequencies that need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.
7. Check the frequencies of highest emission with varying the placement of cables (if any) associated with EUT to obtain the worse case and record the result.

Figure 1: Frequencies measured below 1 GHz configuration

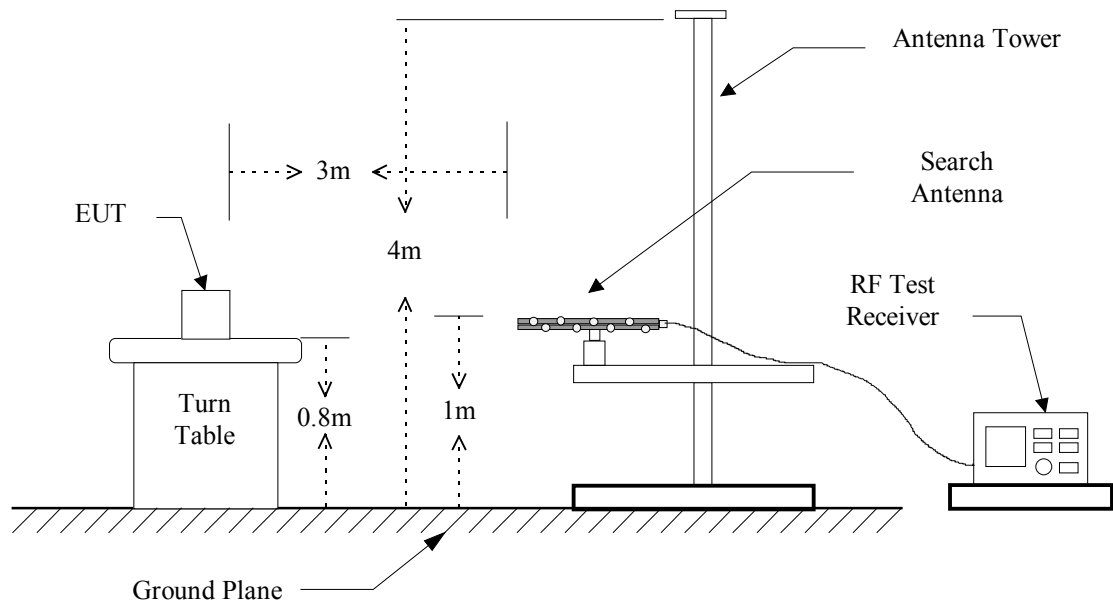
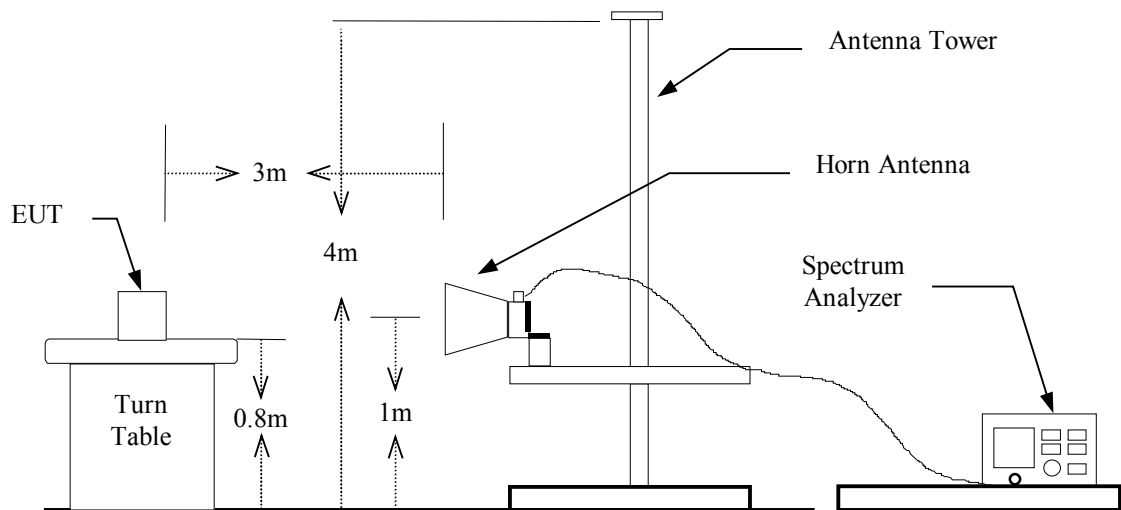


Figure 2: Frequencies measured above 1 GHz configuration



3.3 Test Data

3.3.1

Operated mode : Channel 1

Test Date : Nov. 06, 2006 Temperature : 20 °C Humidity : 60 %

Frequency (MHz)	Ant Pol H / V	Reading (dBuV)		Correct Factor (dB)	Duty Factor (dB)	Result @3m (dBuV/m)			Limit @3m (dBuV/m)			Margins (dB)
		Peak	AVG			Peak	QP	AVG	Peak	QP	AVG	
Fundamental												
2405.219	H	106.5	91.5	-6.8	N/A	99.7	----	84.7	114.0	----	94.0	-9.3
2405.219	V	113.4	96.6	-6.8	N/A	106.6	----	89.8	114.0	----	94.0	-4.2
Harmonic												
4810.438	H	----	----	0.6	N/A	----	----	----	74.0	----	54.0	----
4810.438	V	----	----	0.6	N/A	----	----	----	74.0	----	54.0	----
7215.657	H	----	----	2.2	N/A	----	----	----	74.0	----	54.0	----
7215.657	V	----	----	2.2	N/A	----	----	----	74.0	----	54.0	----
9620.876	H	----	----	2.6	N/A	----	----	----	74.0	----	54.0	----
9620.876	V	----	----	2.6	N/A	----	----	----	74.0	----	54.0	----
12026.095	H	----	----	1.1	N/A	----	----	----	74.0	----	54.0	----
12026.095	V	----	----	1.1	N/A	----	----	----	74.0	----	54.0	----
14431.314	H	----	----	6.0	N/A	----	----	----	74.0	----	54.0	----
14431.314	V	----	----	6.0	N/A	----	----	----	74.0	----	54.0	----
16836.533	H	----	----	3.2	N/A	----	----	----	74.0	----	54.0	----
16836.533	V	----	----	3.2	N/A	----	----	----	74.0	----	54.0	----
19241.752	H	----	----	11.2	N/A	----	----	----	74.0	----	54.0	----
19241.752	V	----	----	11.2	N/A	----	----	----	74.0	----	54.0	----
21646.971	H	----	----	10.5	N/A	----	----	----	74.0	----	54.0	----
21646.971	V	----	----	10.5	N/A	----	----	----	74.0	----	54.0	----
24052.190	H	----	----	9.9	N/A	----	----	----	74.0	----	54.0	----
24052.190	V	----	----	9.9	N/A	----	----	----	74.0	----	54.0	----

Note:

1. Limit on the field strength of fundamental (Average)
 $50\text{mV/m} = 20 / \log(50000) = 94.0 \text{ dB } \mu \text{ V/m}$
2. Limit on the field strength of Harmonics (Average)
 $500 \mu \text{ V/m} = 20 / \log(500) = 54.0 \text{ dB } \mu \text{ V/m}$
3. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.
4. If the data table appeared symbol of “****” means the value is too low to be measured.
5. The system amplitude accuracy of the measurement made during the radiated emission tests was $\pm 4.2\text{dB}$.

3.3.2Operated mode : Channel 4Test Date : Nov. 06, 2006 Temperature : 20 °C Humidity : 60 %

Frequency (MHz)	Ant Pol H / V	Reading (dBuV)		Correct Factor (dB)	Duty Factor (dB)	Result @3m (dBuV/m)			Limit @3m (dBuV/m)			Margins (dB)
		Peak	AVG			Peak	QP	AVG	Peak	QP	AVG	
Fundamental												
2435.996	H	100.1	92.0	-6.6	N/A	93.5	----	85.4	114.0	----	94.0	-8.6
2435.996	V	112.3	97.1	-6.6	N/A	105.7	----	90.5	114.0	----	94.0	-3.5
Harmonic												
4810.438	H	----	----	0.6	N/A	----	----	----	74.0	----	54.0	----
4810.438	V	----	----	0.6	N/A	----	----	----	74.0	----	54.0	----
7215.657	H	----	----	2.2	N/A	----	----	----	74.0	----	54.0	----
7215.657	V	----	----	2.2	N/A	----	----	----	74.0	----	54.0	----
9620.876	H	----	----	2.6	N/A	----	----	----	74.0	----	54.0	----
9620.876	V	----	----	2.6	N/A	----	----	----	74.0	----	54.0	----
12026.095	H	----	----	1.1	N/A	----	----	----	74.0	----	54.0	----
12026.095	V	----	----	1.1	N/A	----	----	----	74.0	----	54.0	----
14431.314	H	----	----	6.0	N/A	----	----	----	74.0	----	54.0	----
14431.314	V	----	----	6.0	N/A	----	----	----	74.0	----	54.0	----
16836.533	H	----	----	3.2	N/A	----	----	----	74.0	----	54.0	----
16836.533	V	----	----	3.2	N/A	----	----	----	74.0	----	54.0	----
19241.752	H	----	----	11.2	N/A	----	----	----	74.0	----	54.0	----
19241.752	V	----	----	11.2	N/A	----	----	----	74.0	----	54.0	----
21646.971	H	----	----	10.5	N/A	----	----	----	74.0	----	54.0	----
21646.971	V	----	----	10.5	N/A	----	----	----	74.0	----	54.0	----
24052.190	H	----	----	9.9	N/A	----	----	----	74.0	----	54.0	----
24052.190	V	----	----	9.9	N/A	----	----	----	74.0	----	54.0	----

Note:

1. Limit on the field strength of fundamental (Average)
 $50\text{mV/m} = 20 / \log(50000) = 94.0 \text{ dB } \mu\text{V/m}$
2. Limit on the field strength of Harmonics (Average)
 $500 \mu\text{V/m} = 20 / \log(500) = 54.0 \text{ dB } \mu\text{V/m}$
3. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.
4. If the data table appeared symbol of “****” means the value is too low to be measured.
5. The system amplitude accuracy of the measurement made during the radiated emission tests was $\pm 4.2\text{dB}$.

3.3.3Operated mode : Channel 8Test Date : Nov. 06, 2006 Temperature : 20 °C Humidity : 60 %

Frequency (MHz)	Ant Pol H / V	Reading (dBuV)		Correct Factor (dB)	Duty Factor (dB)	Result @3m (dBuV/m)			Limit @3m (dBuV/m)			Margins (dB)
		Peak	AVG			Peak	QP	AVG	Peak	QP	AVG	
Fundamental												
2476.431	H	102.3	92.1	-6.8	N/A	95.5	----	85.3	114.0	----	94.0	-8.7
2476.431	V	110.9	96.3	-6.8	N/A	104.1	----	89.5	114.0	----	94.0	-4.5
Harmonic												
4810.438	H	----	----	0.6	N/A	----	----	----	74.0	----	54.0	----
4810.438	V	58.5	41.2	0.6	N/A	59.1	----	41.8	74.0	----	54.0	-12.2
7215.657	H	----	----	2.2	N/A	----	----	----	74.0	----	54.0	----
7215.657	V	55.4	39.2	2.2	N/A	57.6	----	41.4	74.0	----	54.0	-12.6
9620.876	H	----	----	2.6	N/A	----	----	----	74.0	----	54.0	----
9620.876	V	----	----	2.6	N/A	----	----	----	74.0	----	54.0	----
12026.095	H	----	----	1.1	N/A	----	----	----	74.0	----	54.0	----
12026.095	V	----	----	1.1	N/A	----	----	----	74.0	----	54.0	----
14431.314	H	----	----	6.0	N/A	----	----	----	74.0	----	54.0	----
14431.314	V	----	----	6.0	N/A	----	----	----	74.0	----	54.0	----
16836.533	H	----	----	3.2	N/A	----	----	----	74.0	----	54.0	----
16836.533	V	----	----	3.2	N/A	----	----	----	74.0	----	54.0	----
19241.752	H	----	----	11.2	N/A	----	----	----	74.0	----	54.0	----
19241.752	V	----	----	11.2	N/A	----	----	----	74.0	----	54.0	----
21646.971	H	----	----	10.5	N/A	----	----	----	74.0	----	54.0	----
21646.971	V	----	----	10.5	N/A	----	----	----	74.0	----	54.0	----
24052.190	H	----	----	9.9	N/A	----	----	----	74.0	----	54.0	----
24052.190	V	----	----	9.9	N/A	----	----	----	74.0	----	54.0	----

Note:

1. Limit on the field strength of fundamental (Average)
 $50\text{mV/m} = 20 / \log(50000) = 94.0 \text{ dB } \mu\text{V/m}$
2. Limit on the field strength of Harmonics (Average)
 $500 \mu\text{V/m} = 20 / \log(500) = 54.0 \text{ dB } \mu\text{V/m}$
3. The radiation emissions have been measured to beyond the tenth harmonic of the fundamental frequency and show the significant frequencies, other means the value is too low to be detected.
4. If the data table appeared symbol of “****” means the value is too low to be measured.
5. The system amplitude accuracy of the measurement made during the radiated emission tests was $\pm 4.2\text{dB}$.

3.3.2 Data 2: Other emissions**3.3.2.1**

EUT : Wireless headphone	Model :	Status : TX CH LOW	
Condition : Horizontal	Date : 2006/10/12	Temp. : 20°C	Humi. : 60%

	Freq (MHz)	QP Level (dBuV)	Factor (dB/m)	QP Result (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dB)
1	208.838	19.3	13.3	32.6	43.5	-10.9
2	254.940	24.1	14.9	39.0	46.0	-7.0
3	331.303	16.3	17.5	33.8	46.0	-12.2
4	356.573	17.7	18.1	35.8	46.0	-10.2
5	380.866	18.1	18.9	37.0	46.0	-9.0
6	405.170	17.9	19.3	37.2	46.0	-8.8

EUT : Wireless headphone	Model :	Status : TX CH LOW	
Condition : Vertical	Date : 2006/10/12	Temp. : 20°C	Humi. : 60%

	Freq (MHz)	QP Level (dBuV)	Factor (dB/m)	QP Result (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dB)
1	241.884	21.5	14.5	36.0	46.0	-10.0
2	247.715	23.6	14.7	38.3	46.0	-7.7
3	255.491	23.0	14.9	37.9	46.0	-8.1
4	381.844	16.8	18.9	35.7	46.0	-10.3
5	405.170	17.1	19.3	36.4	46.0	-9.6
6	430.441	12.3	20.1	32.4	46.0	-13.6

Note :

1. Place of Measurement: Measuring site of the ETC.
2. Remark “***” means that the emissions level is too low to be measured.
3. Remark “#” means the noise was low, so record the peak value.
4. Item “Margin” referred to Q.P. limit while there is only peak result.

3.3.2.2

EUT : Wireless headphone	Model :	Status : TX CH MID
Condition : Horizontal	Date : 2006/10/12	Temp. : 20°C
		Humi. : 60%

	Freq (MHz)	QP Level (dBuV)	Factor (dB/m)	QP Result (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dB)
1	160.240	13.8	14.8	28.6	43.5	-14.9
2	208.838	19.4	13.3	32.7	43.5	-10.8
3	248.803	25.2	14.8	40.0	46.0	-6.0
4	381.844	18.4	18.9	37.3	46.0	-8.7
5	405.170	16.2	19.3	35.5	46.0	-10.5
6	430.441	10.5	20.1	30.6	46.0	-15.4

EUT : Wireless headphone	Model :	Status : TX CH MID
Condition : Vertical	Date : 2006/10/12	Temp. : 20°C
		Humi. : 60%

	Freq (MHz)	QP Level (dBuV)	Factor (dB/m)	QP Result (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dB)
1	33.888	14.3	13.1	27.4	40.0	-12.6
2	160.240	14.6	14.8	29.4	43.5	-14.1
3	247.715	15.8	14.7	30.5	46.0	-15.5
4	255.491	15.8	14.9	30.7	46.0	-15.3
5	626.774	7.5	24.0	31.5	46.0	-14.5
6	700.641	5.7	25.6	31.3	46.0	-14.7

Note :

1. Place of Measurement: Measuring site of the ETC.
2. Remark “***” means that the emissions level is too low to be measured.
3. Remark “#” means the noise was low, so record the peak value.
4. Item “Margin” referred to Q.P. limit while there is only peak result.

3.3.2.3

EUT : Wireless headphone	Model :	Status : TX CH HIGH	
Condition : Horizontal	Date : 2006/10/12	Temp. : 20°C	Humi. : 60%

	Freq (MHz)	QP Level (dBuV)	Factor (dB/m)	QP Result (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dB)
1	160.240	13.6	14.8	28.4	43.5	-15.1
2	208.838	19.2	13.3	32.5	43.5	-11.0
3	234.798	22.9	14.8	37.7	46.0	-8.3
4	241.805	22.8	14.8	37.6	46.0	-8.4
5	248.804	22.9	14.8	37.7	46.0	-8.3
6	381.844	19.9	18.9	38.8	46.0	-7.2

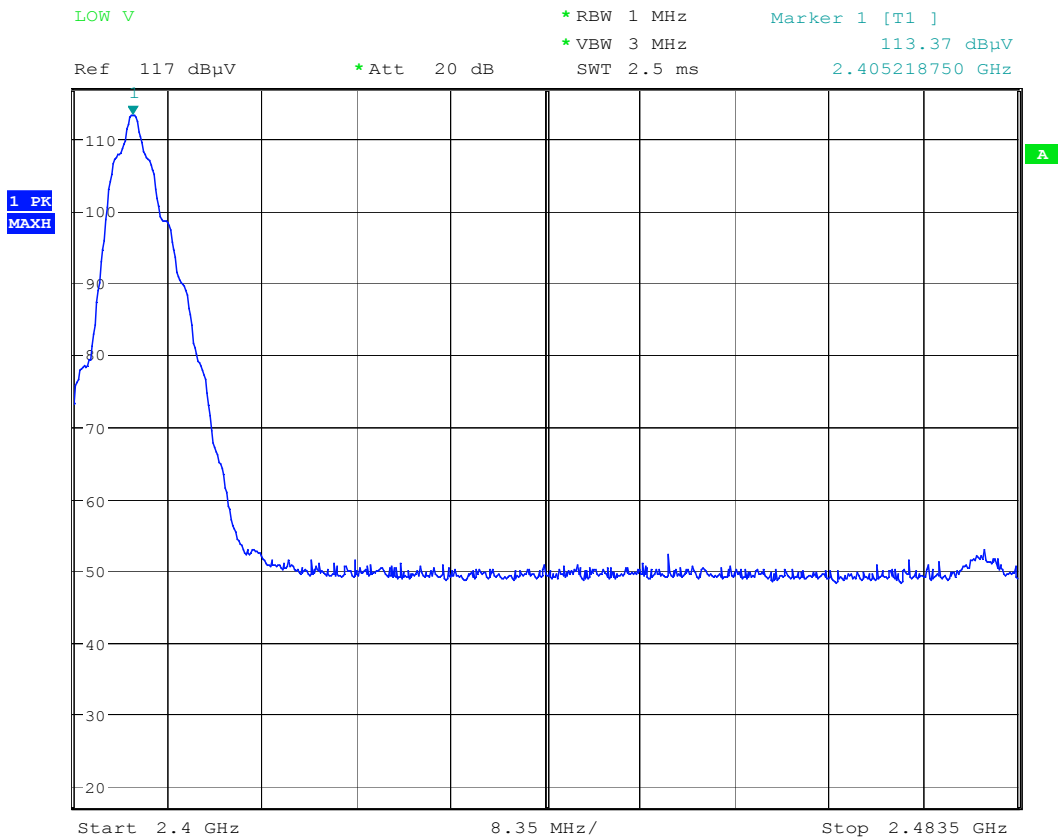
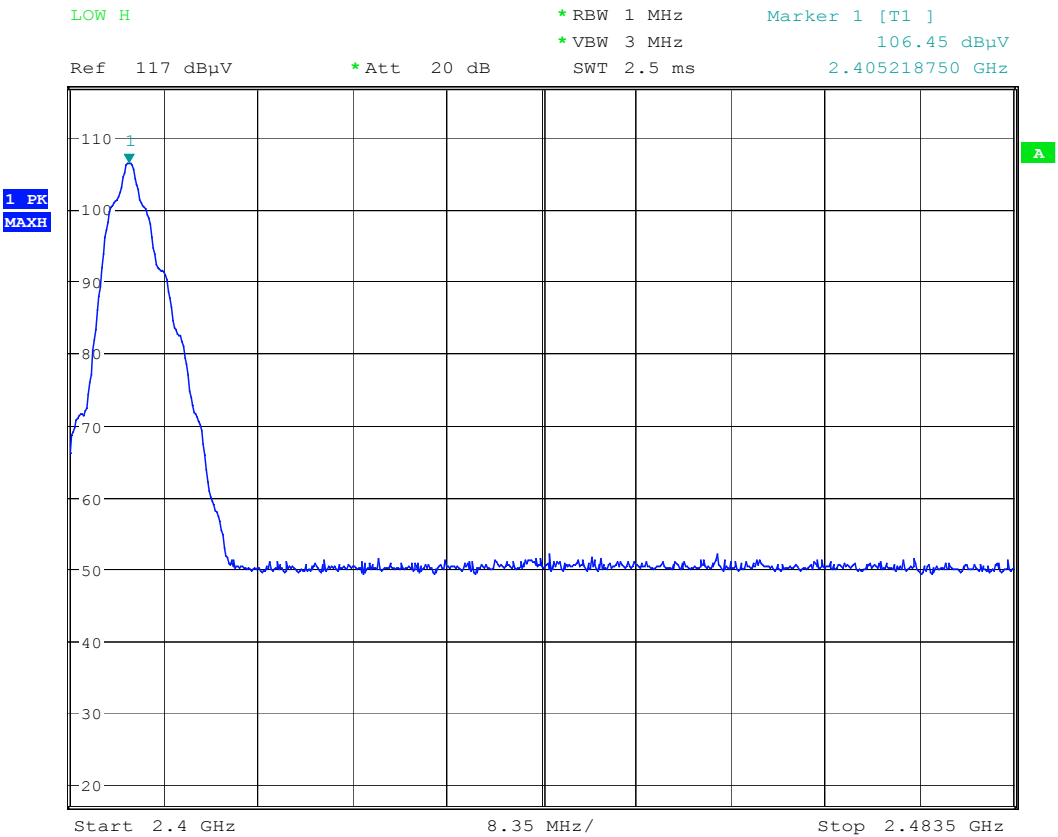
EUT : Wireless headphone	Model :	Status : TX CH HIGH	
Condition : Vertical	Date : 2006/10/12	Temp. : 20°C	Humi. : 60%

	Freq (MHz)	QP Level (dBuV)	Factor (dB/m)	QP Result (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dB)
1	33.888	13.6	13.1	26.7	40.0	-13.3
2	160.240	14.4	14.8	29.2	43.5	-14.3
3	241.884	16.8	14.5	31.3	46.0	-14.7
4	381.844	13.1	18.9	32.0	46.0	-14.0
5	626.774	8.3	24.0	32.3	46.0	-13.7
6	652.044	8.1	24.6	32.7	46.0	-13.3

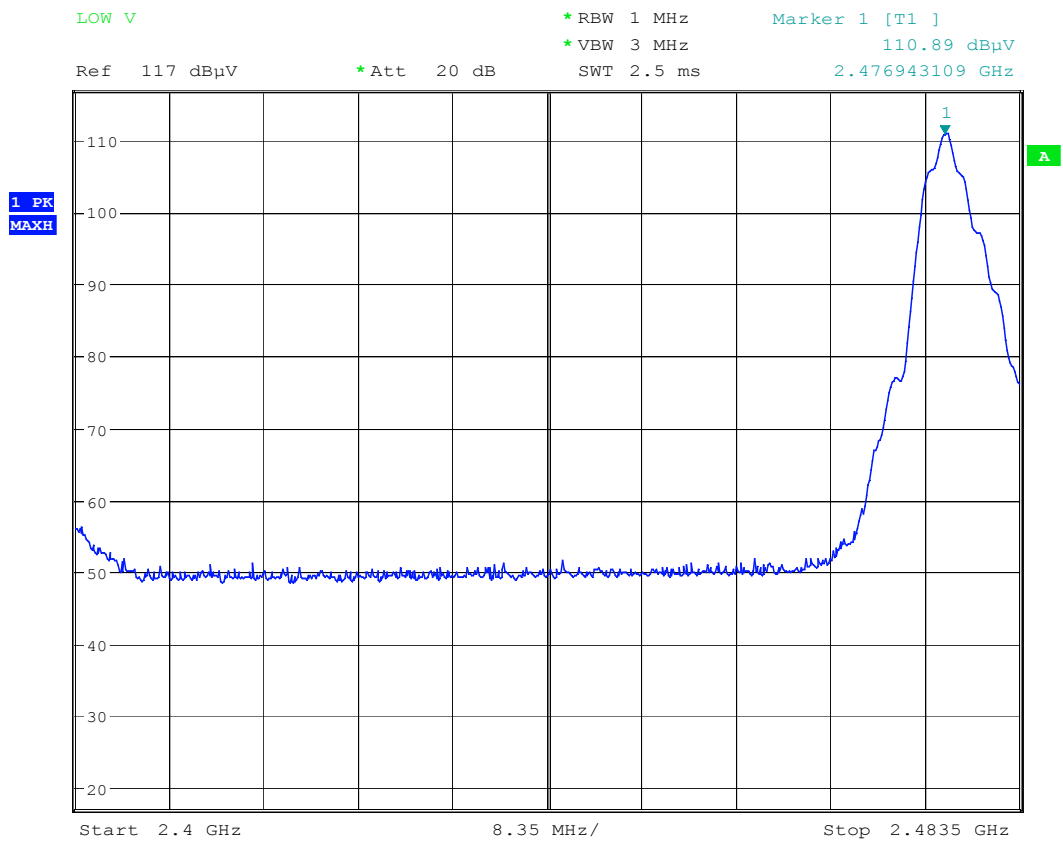
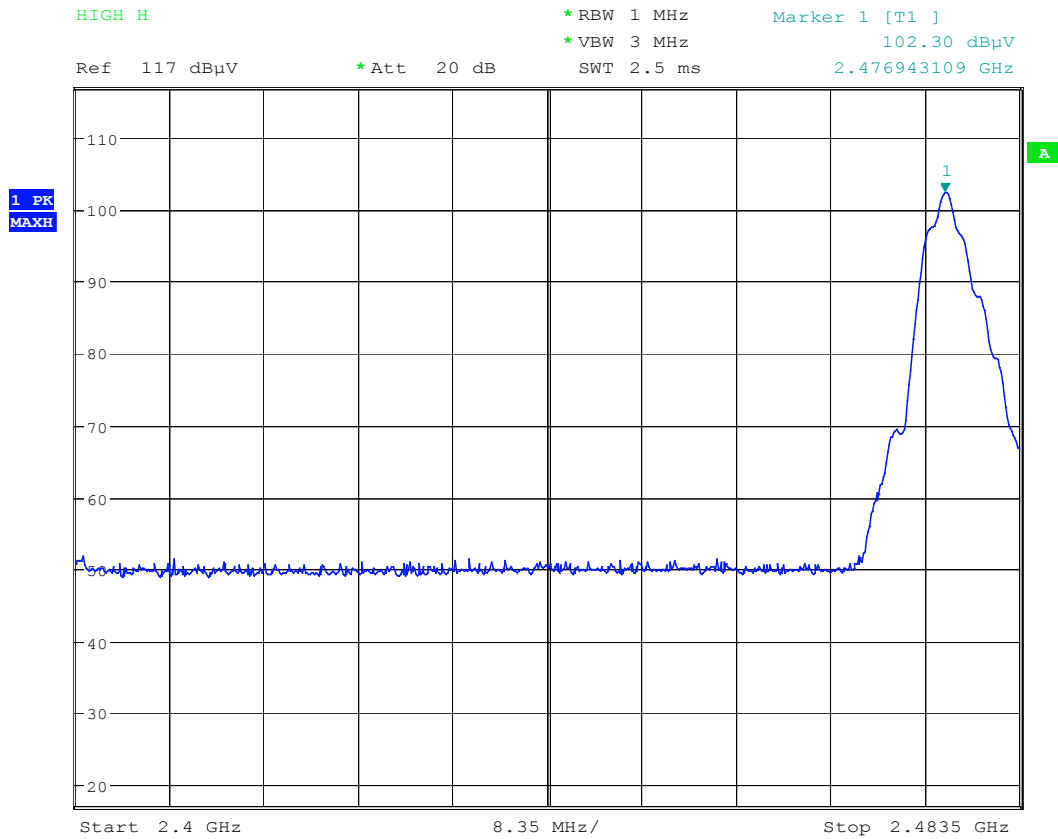
Note :

1. Place of Measurement: Measuring site of the ETC.
2. Remark “***” means that the emissions level is too low to be measured.
3. Remark “#” means the noise was low, so record the peak value.
4. Item “Margin” referred to Q.P. limit while there is only peak result.

BANDEDGE COMPLIANCE MEASUREMENT (Channel 1)



BANDEDGE COMPLIANCE MEASUREMENT (Channel 8)



3.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$\text{RESULT} = \text{READING} + \text{CORR. FACTOR}$$

where CORR. FACTOR = Antenna FACTOR + Cable FACTOR

3.5 Radiated Test Equipment

The following instrument are used for radiated emissions measurement:

Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
EMI Test Receiver	HP	8546A	13054404-001	Dec. 12, 2006
BiLog Antenna	Schaffner	CBL 6112B	2927	Jun. 11, 2007
Horn Antenna	EMCO	3115	9107-3729	Jun. 06, 2007
Hom Antenna	EMCO	3116	----	Jul. 23, 2007
PRE-Amplifier	Agilent	8449B	----	Sep. 17, 2007
Spectrum Analyzer	Rohde & Schwarz	FSU46	13040904-001	Oct. 31, 2007
Spectrum Analyzer	Agilent	8564EC	----	Sep. 22, 2007

Note: The standards used to perform this calibration are traceable to NML/ROC, NIST/USA and NPL.

3.6 Measuring Instrument Setup

Measuring instrument setup in measured frequency band when specified detector function is used:

Frequency Band (MHz)	Instrument	Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi-Peak	120 kHz	N/A
	Spectrum Analyzer	Peak	100 kHz	100 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
	Spectrum Analyzer	Average	1 MHz	Auto

3.7 Antenna Requirement

The antenna of EUT is a external antenna and use an non-standard antenna jack.



4. CONDUCTED EMISSION MEASUREMENT

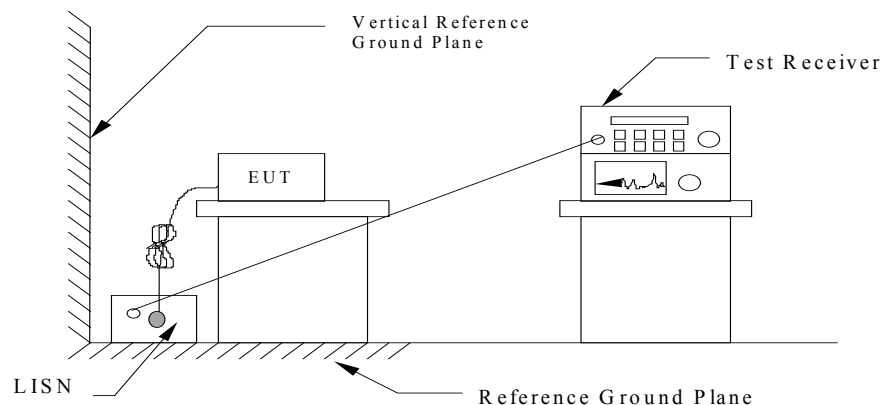
5.1 Standard Applicable

For unintentional and intentional device, Line Conducted Emission Limits are in accordance to § 15.107(a) and § 15.207(a) respectively. Both Limits are identical specification.

5.2 Measurement Procedure

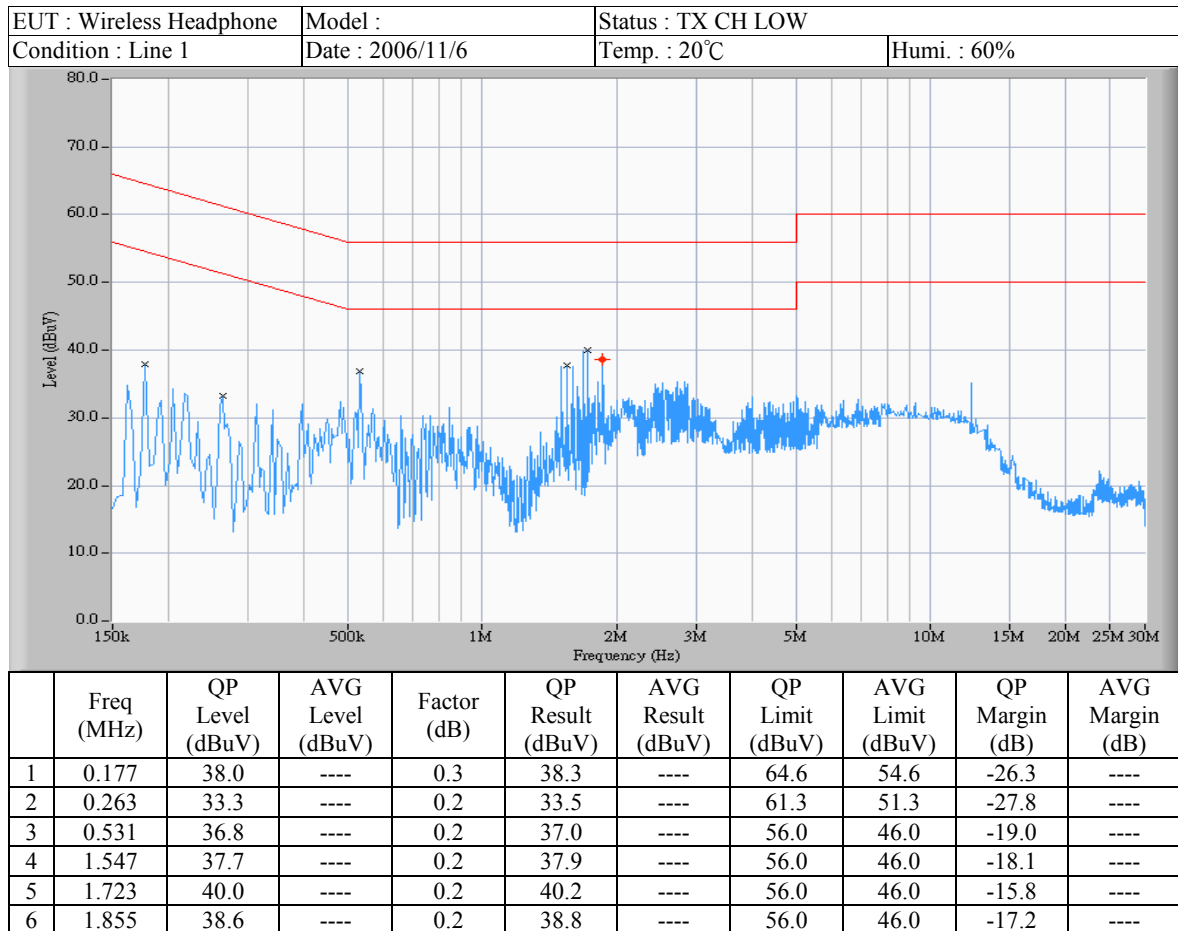
1. Setup the configuration per figure 3.
2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.
3. Record the 6 highest emissions relative to the limit.
4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.
5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.
6. Repeat all above procedures on measuring each operation mode of EUT.

Figure 3 : Conducted emissions measurement configuration



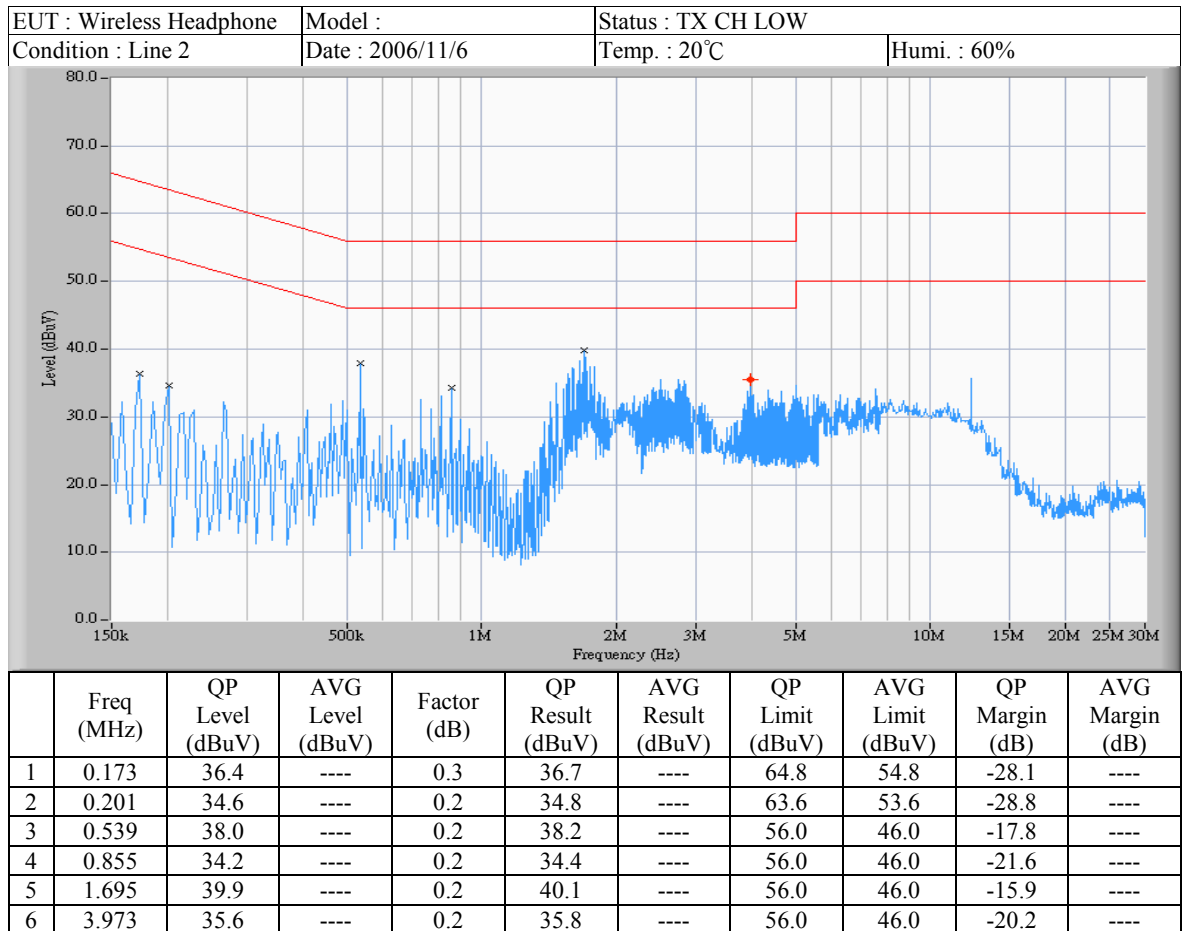
5.3 Conducted Emission Data

5.3.1



Note:

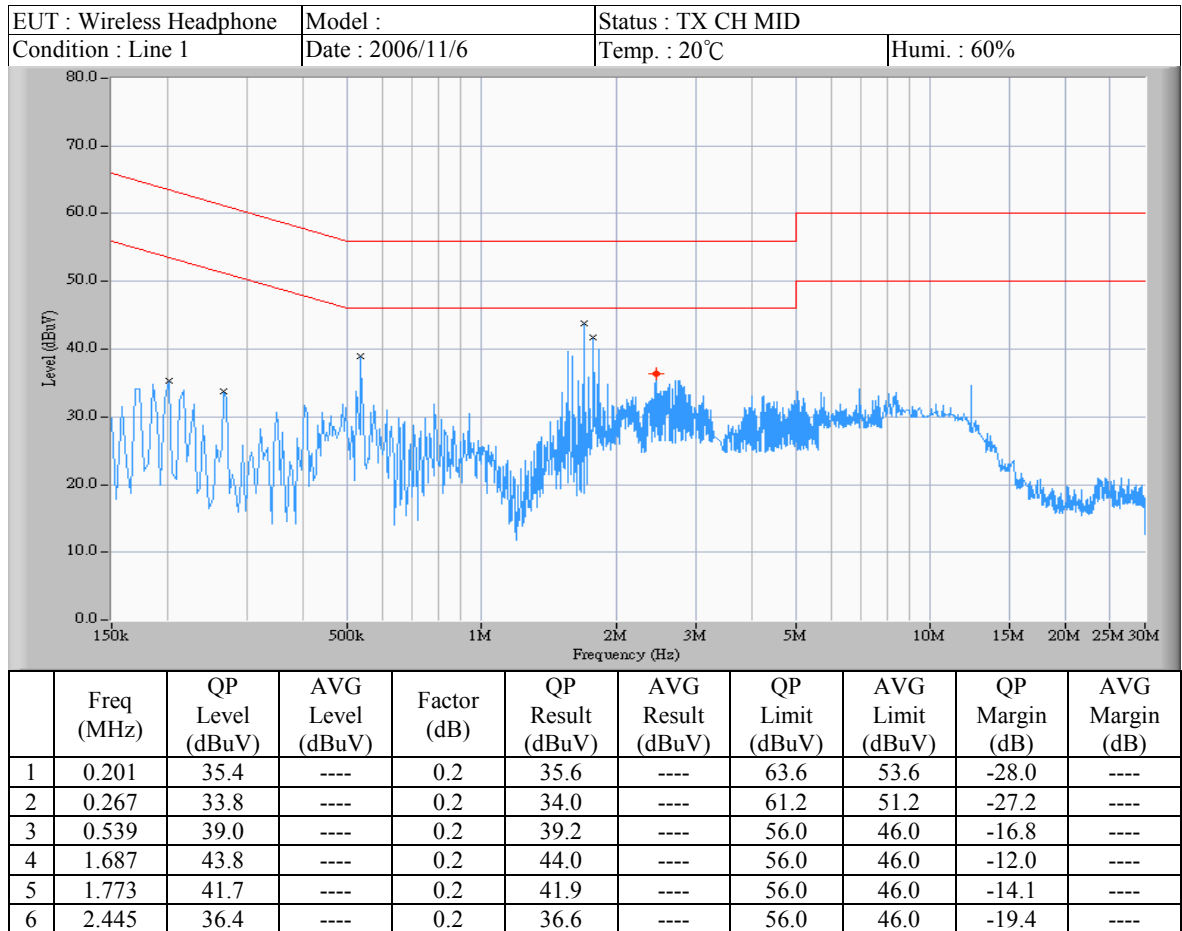
1. “***” means the value was too low to be measured.
2. If the data table appeared symbol of “----” means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
3. “#” means the noise was too low, so record the peak value.
4. The estimated measurement uncertainty of the result measurement is $\pm 2.5\text{dB}$.



Note:

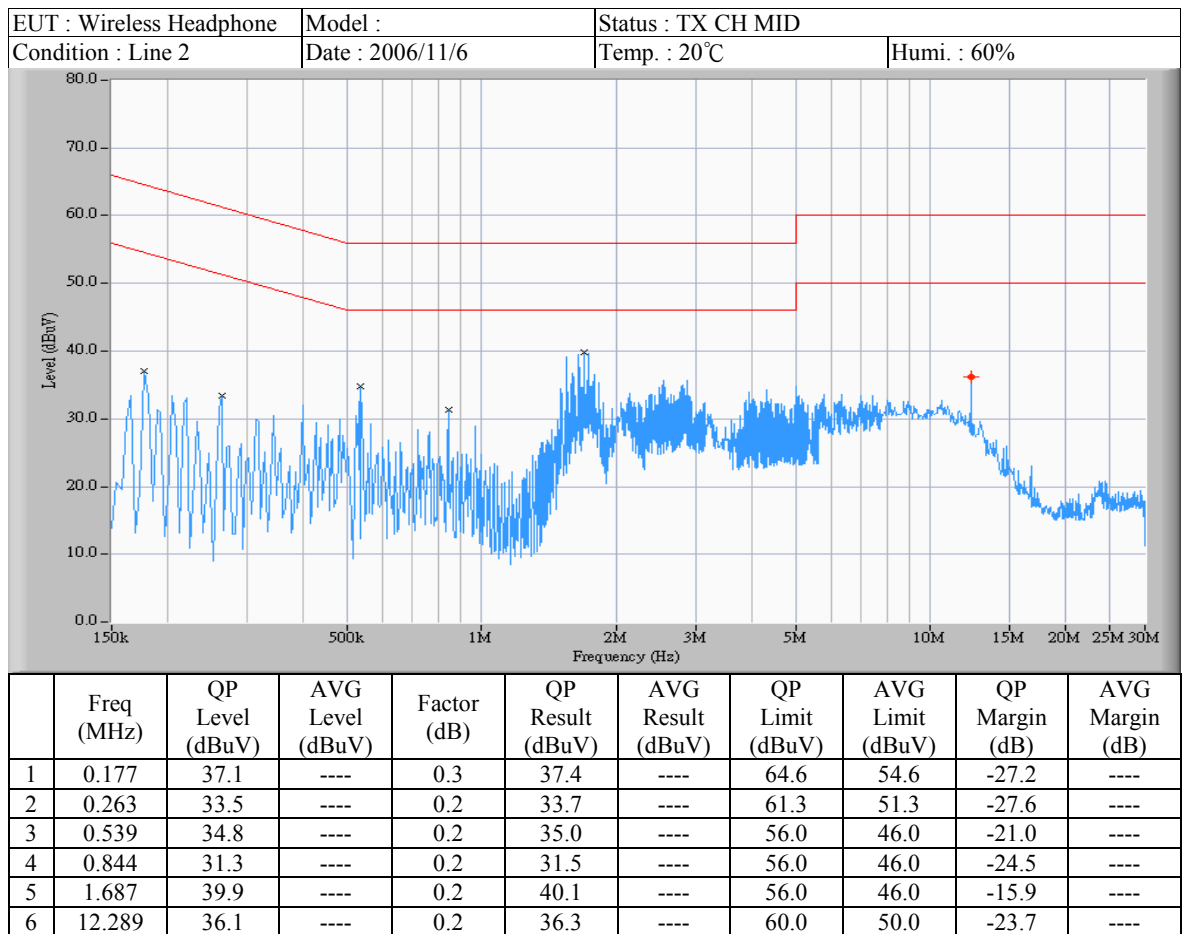
1. “***” means the value was too low to be measured.
2. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
3. “#” means the noise was too low, so record the peak value.
4. The estimated measurement uncertainty of the result measurement is ± 2.5 dB.

5.3.2



Note:

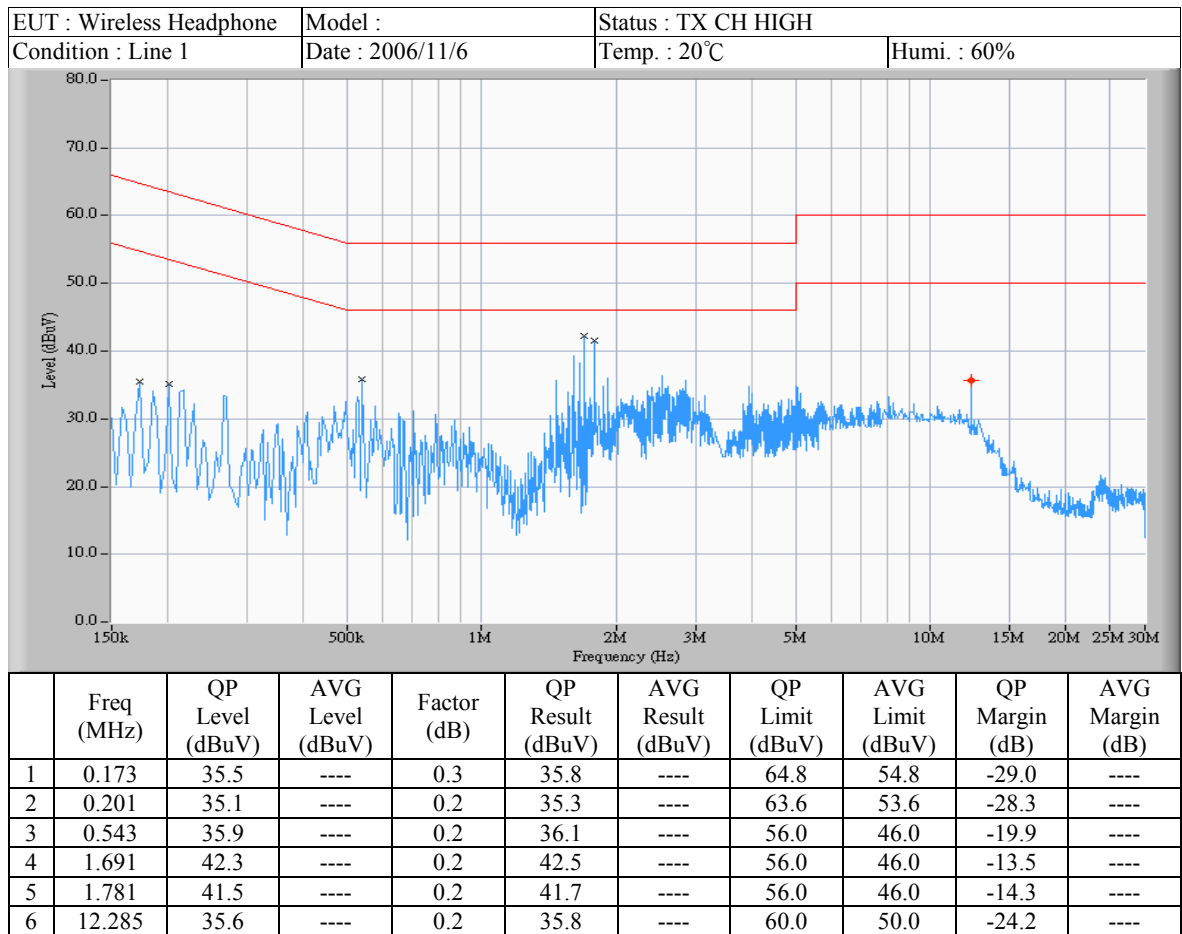
1. “***” means the value was too low to be measured.
2. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
3. “#” means the noise was too low, so record the peak value.
4. The estimated measurement uncertainty of the result measurement is $\pm 2.5\text{dB}$.



Note:

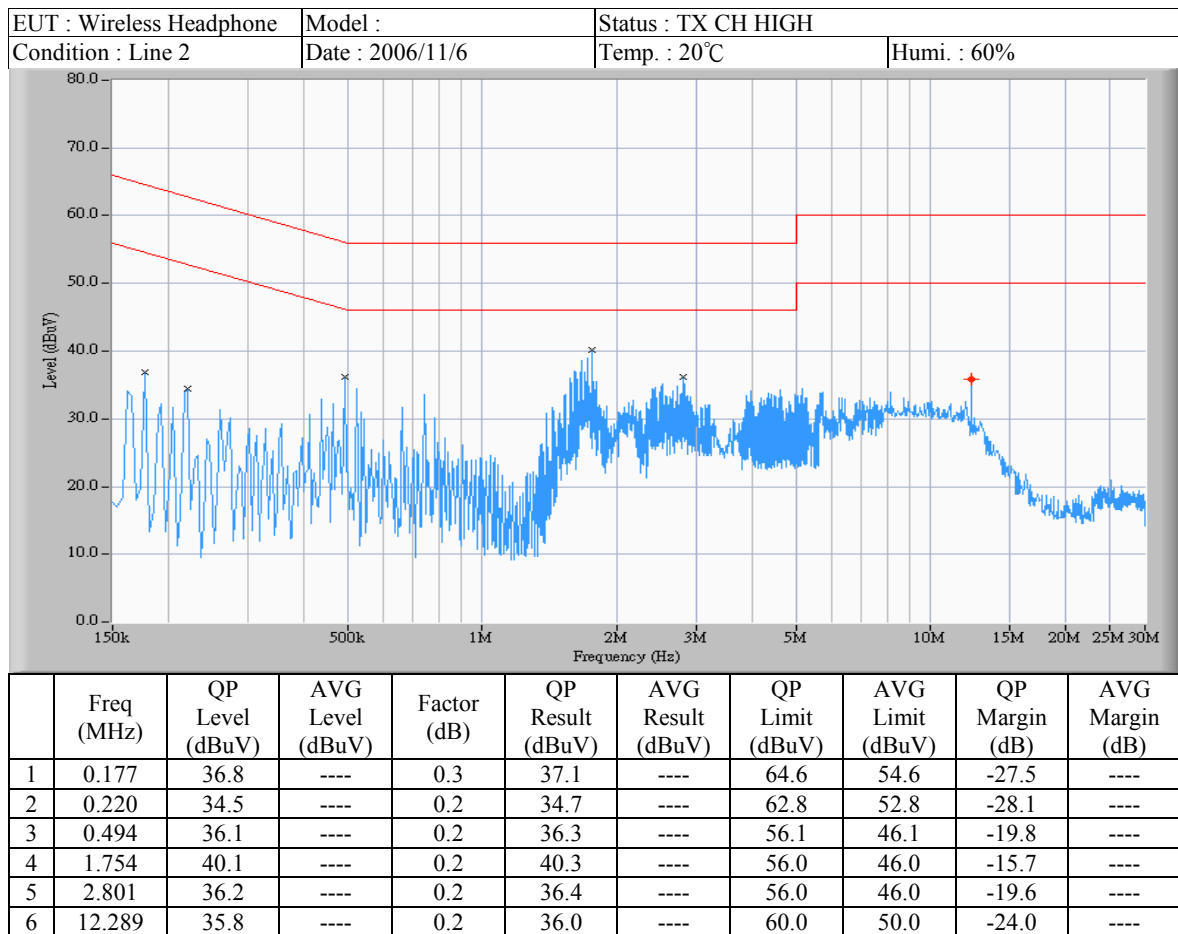
1. “***” means the value was too low to be measured.
2. If the data table appeared symbol of “----” means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
3. “#” means the noise was too low, so record the peak value.
4. The estimated measurement uncertainty of the result measurement is ± 2.5 dB.

5.3.3



Note:

1. “***” means the value was too low to be measured.
2. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
3. “#” means the noise was too low, so record the peak value.
4. The estimated measurement uncertainty of the result measurement is $\pm 2.5\text{dB}$.



Note:

1. “***” means the value was too low to be measured.
2. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
3. “#” means the noise was too low, so record the peak value.
4. The estimated measurement uncertainty of the result measurement is $\pm 2.5\text{dB}$.

5.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

$$\textbf{RESULT} = \textbf{READING} + \textbf{LISN FACTOR (Included Cable Loss)}$$

5.5 Conducted Measurement Equipment

The following test equipment are used during the conducted test.

Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
Test Receiver	R&S	ESCS30	13054409-001	May 19, 2007
LISN	TELEMETER	NNB-2/16Z	13057708-001	Mar. 30, 2007