

# **Ke Mei Ou Laboratory Co., Ltd.**

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## **FCC TEST REPORT**

Under  
FCC 15 Subpart C, Paragraph 15.239

Prepared For :

### **MERKURY INNOVATIONS LLC**

180 Maiden Lane 28th Floor New York, NY,10038 USA

**FCC ID: YCI-MHW160**

**EUT: Wireless Headphone (Base)**

**Model: M-HW160**

April 23, 2010

**Report Type:** Original Report

**Test Engineer:** Jacky Huang

**Test Date:** April 15, 2010



**Review By:** \_\_\_\_\_  
Apollo Liu / Manager

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**TABLE OF CONTENTS**

<b>1. General Information .....</b>	<b>3</b>
1. 1 Notes.....	3
1. 2 Testing Laboratory.....	3
1. 3 Details of Applicant.....	3
1. 4 Application Details .....	3
1. 5 Test Item .....	3
1. 6 Test Standards.....	3
<b>2. Technical Test.....</b>	<b>4</b>
2. 1 Summary of Test Results.....	4
2. 2 Antenna Requirement .....	4
<b>3. EUT Modifications .....</b>	<b>4</b>
<b>4. Conducted Power Line Test .....</b>	<b>5</b>
4. 1 Test Equipment .....	5
4. 2 Test Procedure .....	5
4. 3 Test Setup .....	5
4. 4 Configuration of the EUT .....	6
4. 5 EUT Operating Condition.....	7
4. 6 Conducted Power Line Emission Limits .....	7
4. 7 Conducted Power Line Test Result.....	7
<b>5. Radiated Emission Test .....</b>	<b>8</b>
5. 1 Test Equipment .....	8
5. 2 Test Procedure .....	8
5. 3 Radiated Test Setup .....	8
5. 4 Configuration of the EUT .....	9
5. 5 EUT Operating Condition.....	9
5. 6 Radiated Emission Limit .....	9
5. 7 Radiated Emission Test Result.....	10
<b>6. Band Edge .....</b>	<b>11</b>
6. 1 Test Equipment .....	11
6. 2 Test Procedure .....	11
6. 3 Radiated Test Setup .....	11
6. 4 Configuration of The EUT.....	12
6. 5 EUT Operating Condition.....	12
6. 6 Band Edge FCC 15.239 Limit .....	12
6. 7 Band Edge Test Result.....	12
<b>7. Photos of Testing .....</b>	<b>14</b>
7. 1 EUT Test Photographs .....	14
7. 2 EUT Detailed Photographs .....	15
<b>8. FCC ID Label.....</b>	<b>19</b>
<b>9. Test Equipment.....</b>	<b>20</b>

## 1. General Information

### 1. 1 Notes

The test results of this report relate exclusively to the test item specified in 1.5. The KMO Lab does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the KMO Lab.

### 1. 2 Testing Laboratory

SinTek Laboratory Co., Ltd.  
Site on File with the Federal Communications Commission – United States  
Registration Number: 963441

Site Listed with Industry Canada of Ottawa, Canada  
Registration Number: 7353A-1

### 1. 3 Details of Applicant

Name : MERKURY INNOVATIONS LLC  
Address : 180 Maiden Lane 28th Floor New York, NY,10038 USA  
Contact : N/A  
Tel : N/A  
Fax : N/A

### 1. 4 Application Details

Date of Receipt of Application: : March 22, 2010  
Date of Receipt of Test Item: : March 22, 2010  
Date of Test : April 15~April 23, 2010

### 1. 5 Test Item

Manufacturer	Same Applicant
Address	Same Applicant
Trade Name	MERKURY INNOVATIONS
Model No.	M-HW160, M-HW680, M-HW960, M-HW210
Description	Wireless Headphone (Base)

### Additional Information

Frequency	: 88.1MHz~107.9MHz
Maximum Range	: N/A
Number of Channels	: N/A
Transmitter Antenna	: The transmitter's antenna is on PCB layout
Power Supply	: DC 3V
Current Consumption	: N/A

### 1. 6 Test Standards

FCC 15 Subpart C, Paragraph 15.239

Note: All radiated measurements were made in all three orthogonal planes. The values reported are the maximum values.

## 2. Technical Test

### 2. 1 Summary of Test Results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.203	Antenna Requirement	PASS	Complies
FCC Part 15, Paragraph 15.207	Conducted Test	N/A	Complies
FCC Part 15 Subpart C Paragraph 15.239 Limit	Field Strength of Fundamental	PASS	Complies
FCC Part 15, Subpart C Paragraph 15.239 Limit & Paragraph 15.209	Radiated Test	PASS	Complies
FCC Part 15 Subpart C Paragraph 15.239 Limit	Measured Bandwidth	PASS	Complies.

### 2. 2 Antenna Requirement

According to Section 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 transmitter's antenna is on PCB layout which is a copper trace on PCB, this is permanently attached antenna and meets the requirements of this section.

## 3. EUT Modifications

No modification by test lab.

## 4. Conducted Power Line Test

### 4. 1 Test Equipment

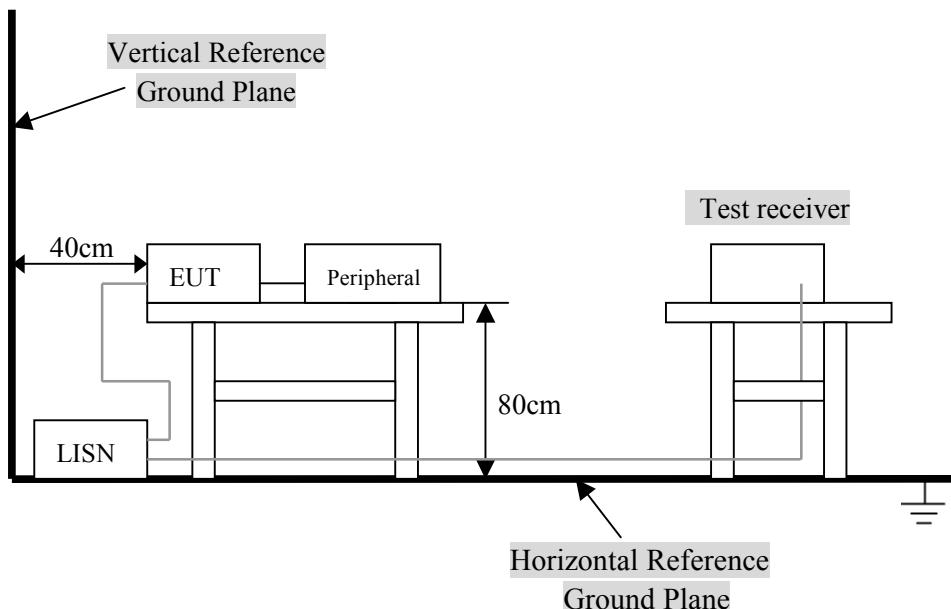
Please refer to Section 9 this report.

### 4. 2 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.

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission., the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4:2003 on conducted measurement. Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

### 4. 3 Test Setup



For the actual test configuration, Please refer to the related items – Photos of Testing.

#### 4. 4 Configuration of the EUT

The EUT was configured according to ANSI C63.4-2003. EUT was used DC3V. The operation frequency is from 88.1MHz~107.9MHz. Enable the signal transmitted from the external antenna from EUT to receiver. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

Note:

- 1) Below 1GHz, the channel low, middle, high were pre-tested, The channel middle, worst case one, was chosen for conducted and radiated emission test.
- 2) Above 1GHz, the channel low, middle, high were tested individually.

Test with a iPod Player / Notebook as the sound source for the EUT.

#### A. EUT

Device	Manufacturer	Model #	FCC ID
Wireless Headphone (Base)	MERKURY INNOVATIONS LLC	M-HW160	YCI-MHW160

#### B. Internal Devices

Device	Manufacturer	Model #	FCC ID
N/A			

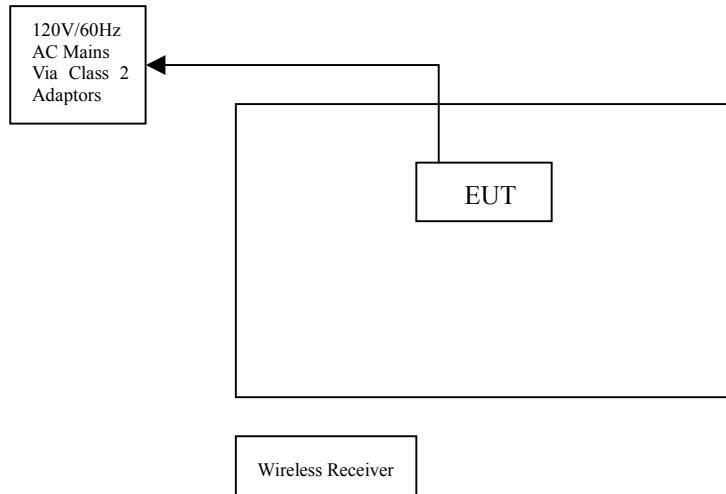
#### C. Peripherals

Device	Manufacturer	Model # Serial #	FCC ID/ DoC	Cable
Printer	HP	HP930C	DoC	1.5m unshielded power cord 1.2m unshielded data cable.
Modem	GVC	N/A	DoC	1.5m unshielded power cord 1.2m unshielded data cable.
Notebook	DELL	PP10L	DoC	1.5m unshielded power cord
PC	Dell	2400n	DoC	1.5m unshielded power cord

#### 4. 5 EUT Operating Condition

Operating condition is according to ANSI C63.4 - 2003.

- A. Setup the EUT and simulators as shown on follow.
- B. Enable RF signal and confirm EUT active.
- C. Modulate output capacity of EUT up to specification.



#### 4. 6 Conducted Power Line Emission Limits

FCC Part 15 Paragraph 15.207 (dBuV)		
Frequency Range (MHz)	Class A QP/AV	Class B QP/AV
0.15 – 0.5	79/66	66-56/56-46
0.5 – 5.0	73/60	56/46
5.0 - 30	73/60	60/50

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

#### 4. 7 Conducted Power Line Test Result

Owing to the DC operation of EUT, this test item is not performed.

## 5. Radiated Emission Test

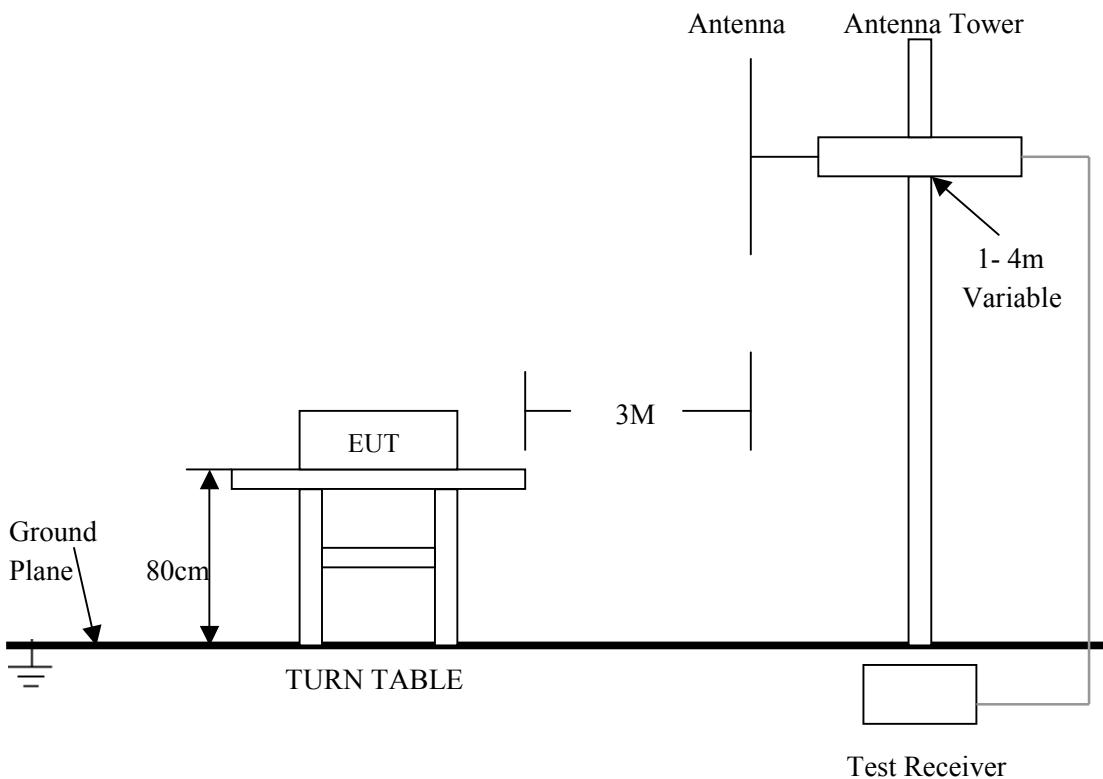
### 5. 1 Test Equipment

Please refer to Section 9 this report.

### 5. 2 Test Procedure

1. The EUT was tested according to ANSI C63.4 - 2003.
2. The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
3. The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with resolution bandwidth of 120 KHz. All readings are above 1 GHz , peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.
4. The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
5. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
6. The antenna polarization: Vertical polarization and Horizontal polarization.

### 5. 3 Radiated Test Setup



For the actual test configuration, please refer to the related items – Photos of Testing.

## 5. 4 Configuration of the EUT

Same as section 4.4 of this report

## 5. 5 EUT Operating Condition

Same as section 4.5 of this report.

## 5. 6 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below :

### A. FCC Part 15 Subpart C Paragraph 15.239 Limit

Fundamental Frequency (MHz)	Field Strength of Fundamental (3m)	
	Peak (dBuV/m)	Average (dBuV/m)
88 to 108	67.96	47.96

- Note:**
- (1) RF Voltage (dBuV) =  $20 \log_{10}$  RF Voltage (uV)
  - (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.
  - (3) The emission limit in this paragraph is based on measurement instrumentation employing an average detector. Measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

### B. Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency (MHz)	Distance (m)	Field Strength (dBuV/m)
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
ABOVE 960	3	54.0

- Note:**
- (1) RF Voltage (dBuV) =  $20 \log_{10}$  RF Voltage (uV)
  - (2) In the Above Table, the tighter limit applies at the band edges.
  - (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

## 5. 7 Radiated Emission Test Result

### A. Fundamental Radiated Emission Data - FCC 15.239

Product : Wireless Headphone (Base) Test Mode : CH1  
 Test Item : Fundamental Radiated Emission Data Temperature : 25 °C  
 Test Voltage : DC 3V Humidity : 56%RH  
 Test Result : **PASS**

#### CH Low

Freq. (MHz)	Emission (dBuV/m) Peak Detector	HORIZ / VERT	Limits (dBuV/m) Peak / Average	Margin (dB)
88.100	46.46	HORIZ	67.96 / 47.96	-21.50
88.100	35.78	VERT	67.96 / 47.96	-32.18

#### CH Middle

Freq. (MHz)	Emission (dBuV/m) Peak Detector	HORIZ / VERT	Limits (dBuV/m) Peak / Average	Margin (dB)
98.100	45.44	HORIZ	67.96 / 47.96	-22.52
98.100	34.93	VERT	67.96 / 47.96	-33.03

#### CH High

Freq. (MHz)	Emission (dBuV/m) Peak Detector	HORIZ / VERT	Limits (dBuV/m) Peak / Average	Margin (dB)
107.900	43.03	HORIZ	67.96 / 47.96	-24.93
107.900	33.87	VERT	67.96 / 47.96	-34.09

- Note:**
- (1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
  - (2) Emission Level = Reading Level + Probe Factor + Cable Loss.
  - (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.

### B. General Radiated Emission Data

Product : **Wireless Headphone** Test Mode : CH1  
 Test Item : Fundamental Radiated Emission Data Temperature : 25 °C  
 Test Voltage : DC 5V (Power by Adapter) Humidity : 56%RH  
 Test Result : **PASS**

#### CH Low

Freq. (MHz)	Emission (dBuV/m) QP Detector	HORIZ / VERT	Limits (dBuV/m)	Margin (dB)
215.760	42.16	HORZ	43.5	-1.34
39.960	35.64	VERT	40.0	-4.36
323.640	38.95	HORZ	46.0	-7.05
215.760	38.33	VERT	43.5	-5.17
431.480	35.96	HORZ	46.0	-10.04
431.480	44.02	VERT	46.0	-1.98

- Note:**
- (1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
  - (2) Emission Level = Reading Level + Probe Factor + Cable Loss.

## 6. Band Edge

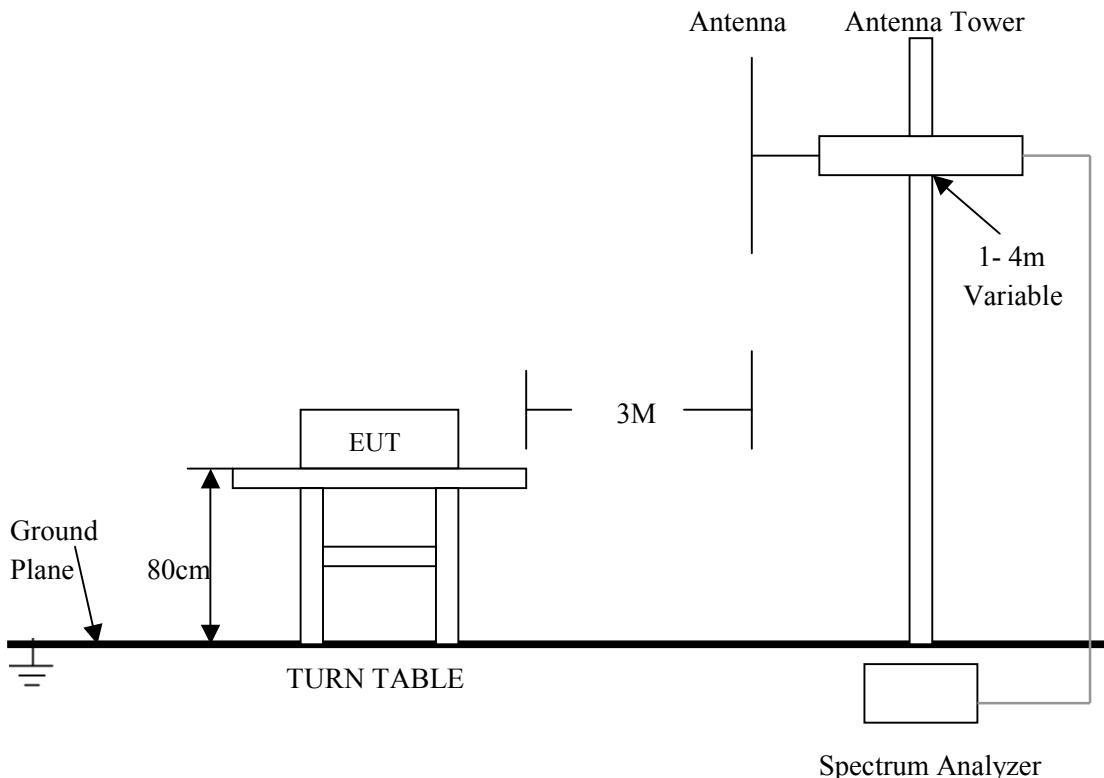
### 6. 1 Test Equipment

Please refer to Section 9 this report.

### 6. 2 Test Procedure

1. The EUT was tested according to ANSI C63.4 - 2003.
2. The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.

### 6. 3 Radiated Test Setup



For the actual test configuration , please refer to the related items – Photos of Testing

## 6.4 Configuration of The EUT

Same as section 4 . 4 of this report

## 6.5 EUT Operating Condition

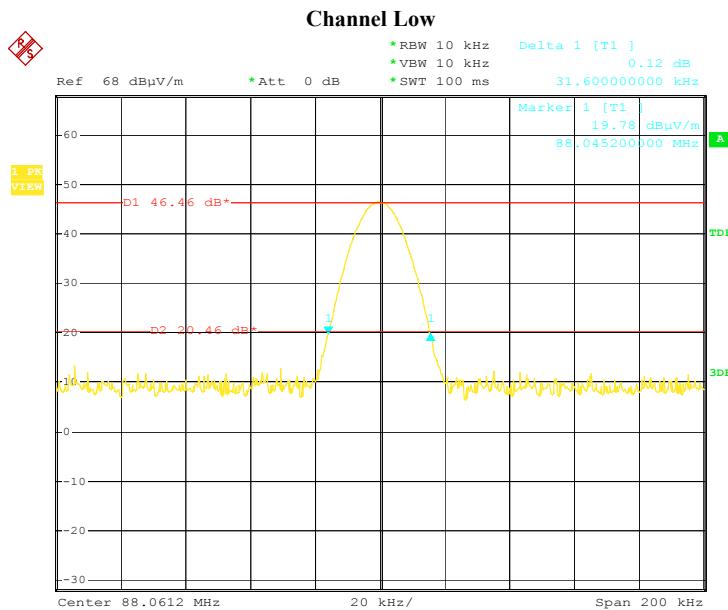
Same as section 4 . 5 of this report.

## 6.6 Band Edge FCC 15.239 Limit

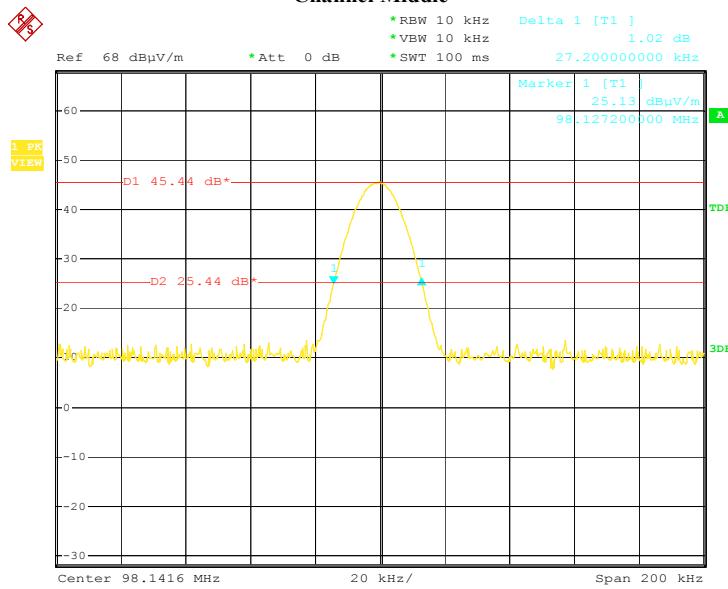
Emission from the intentional radiator shall be confined within a bands 200kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88 to 108 MHz.

## 6.7 Band Edge Test Result

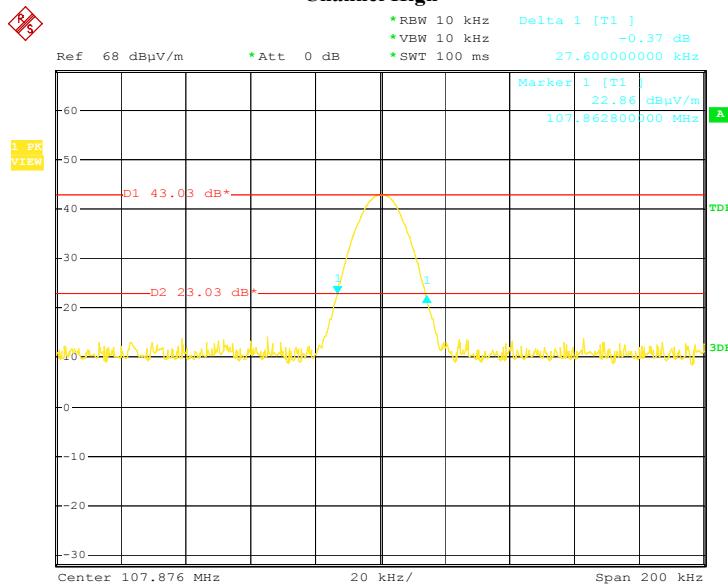
Product	: Wireless Headphone (Base)	Test Mode	: Channel 1
Test Item	: Band Edge Data	Temperature	: 25 °C
Test Voltage	: DC 3V	Humidity	: 56%RH
Test Result	: <b>PASS</b>		



Date: 16.APR.2010 17:07:51

**Channel Middle**

Date: 16.APR.2010 17:17:44

**Channel High**

Date: 16.APR.2010 18:01:03

- Note:**
- (1) The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.
  - (2) The average measurement was not performed when the peak measured data under the limit of average detection.

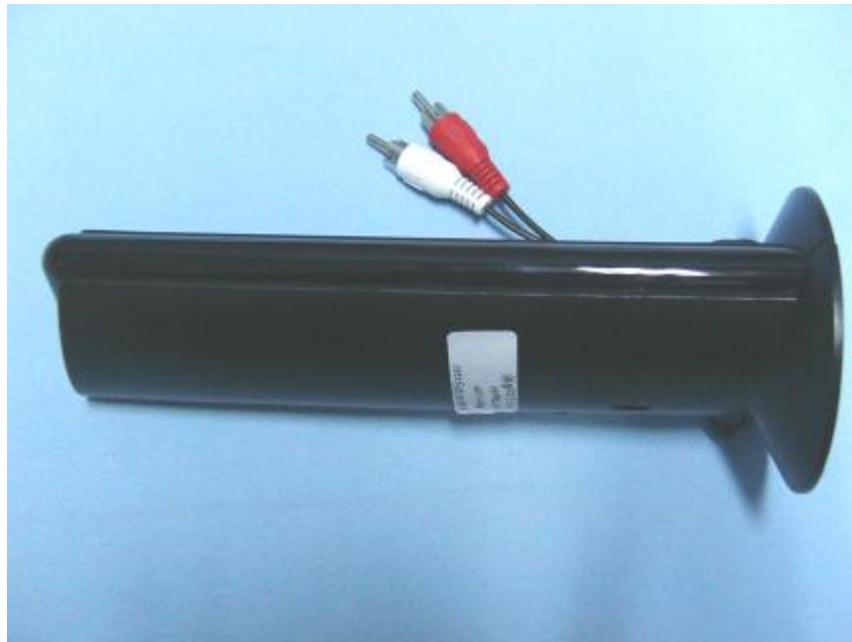
## 7. Photos of Testing

### 7. 1 EUT Test Photographs



## 7.2 EUT Detailed Photographs

EUT top view  
M-HW160



M-HW210



M-HW680



M-HW960



EUT bottom view

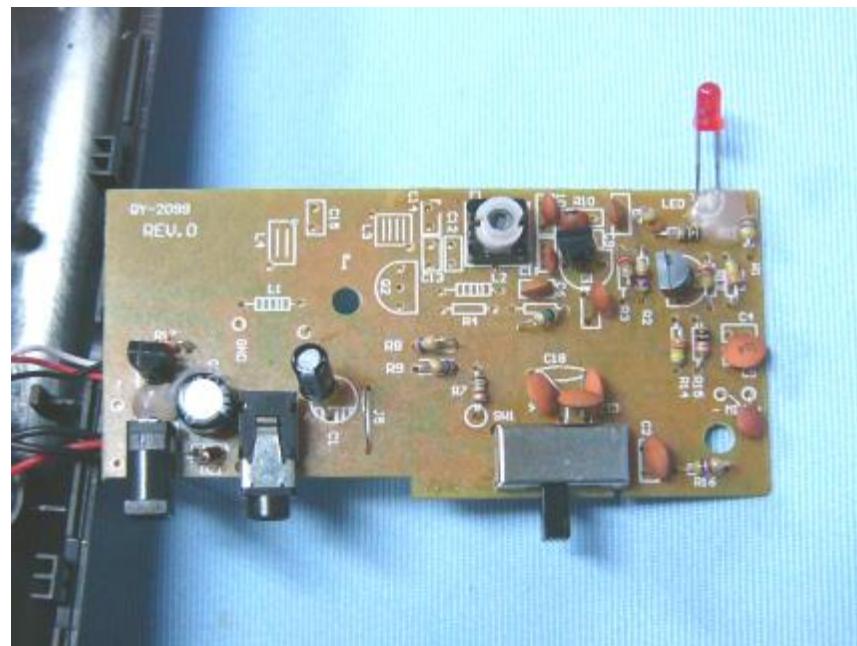
M-HW160



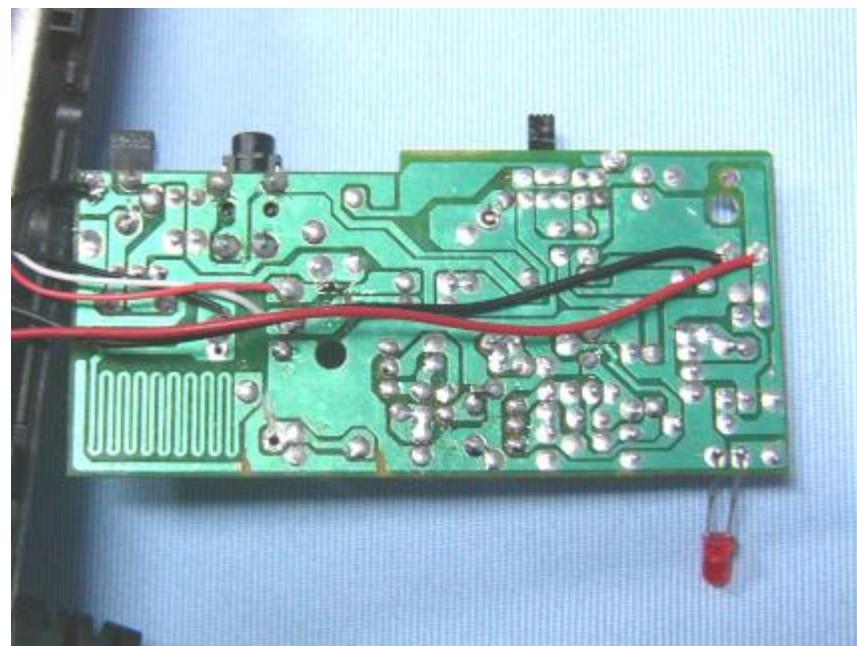
EUT inside whole view



Main&RF board component side



Main&RF board solder side



## 8. FCC ID Label

FCC ID: YCI-MHW160

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.

The Label must not be a stick-on paper label. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

### Proposed Label Location on EUT

EUT Bottom View/Proposed FCC ID Label Location



## 9. Test Equipment

The following test equipments were used during the radiated & conducted emission test:

Equipment/ Facilities	Manufacturer	Model #	Serial No.	Due Date
Turntable	SinTek	N/A	N/A	NCR
Antenna Tower	SinTek	N/A	N/A	NCR
OATS	SinTek	N/A	N/A	Oct. 9, 2010
Bilog Antenna	SCHAFFNER	CBL6111C	2775	June 12, 2010
Pre-Amplifier	HP	8449B	3008B00965	June 12, 2010
Horn Antenna	EMCO	3115	9602-4659	June 12, 2010
Horn Antenna	Rohde & Schwarz	AT4560	SB3435/03	May 4, 2010
EMI Test Receiver	Rohde & Schwarz	ESPI7	100013	July 09, 2010
Spectrum Analyzer	Rohde & Schwarz	FSP40	100273	Sep.18, 2010
Signal Generator	FLUKE	PM5418+Y/C	LO747012	Feb.10, 2011
Loop Antenna	Rohde & Schwarz	HFH2-Z2	872096/16	Jan. 30, 2011
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	9161-4079	Sep.18, 2010
Trilog-Super Broadband Antenna	SCHWARZBECK	VULB9161	9161-4080	Sep.18, 2010
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-564	Sep.18, 2010
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-565	Sep.18, 2010
AMN	Rohde & Schwarz	ESH3-Z5	100196	Oct. 23, 2010
AMN	Rohde & Schwarz	ESH3-Z5	100197	Oct. 23, 2010
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	N/A	N/A
KMO Shielded Room	KMO	KMO-001	N/A	N/A
Coaxial Cable with N-Connectors	SCHWARZBECK	AK9515H	95549	Sep.18, 2010
Radio Communication Test Set	Rohde & Schwarz	CMS 54	846621/024	Feb.10, 2011
Modulation Analyzer	Hewlett-Packard	8901B	2303A00362	Feb.10, 2011
SOHO Telephone Switching System	IKE	2000-108C	N/A	Feb.10, 2011
Temperature Chamber	TABAI	PSL-4GTW	N/A	Feb.10, 2011