# APPLICATION FOR CERTIFICATION On Behalf of

Beautiful Enterprise Co., Ltd

Digital Wireless Stereo Headphones

Model Number: RF-WHP01

Prepared for: Beautiful Enterprise Co., Ltd

26th Floor, Beautiful Group Tower, 77 Connaught Road

Central, Hong Kong

Prepared By: Audix Technology (Shenzhen) Co., Ltd.

No. 6, Ke Feng Rd., 52 Block,

Shenzhen Science & Industrial Park, Nantou, Shenzhen, Guangdong, China

Tel: (0755) 26639496

Report Number : ACS-F08154

Date of Test : Feb.28 ~ Mar.18, 2008

Date of Report : Mar.24, 2008

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#### FCC ID: UZZRFWHP01RX

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#### TEST REPORT CERTIFICATION

Applicant Beautiful Enterprise Co., Ltd.

Manufacturer Shen Zhen Synchron Electronics Co., Ltd.

**EUT Description** Digital Wireless Stereo Headphones

> (A) MODEL NO. : RF-WHP01

(B) SERIAL NO. : N/A

(C) POWER SUPPLY: DC 2.4V

Test Procedure Used:

FCC Rules and Regulations Part 15 Subpart C 2007

The device described above is tested by AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both radiated and conducted emissions.

The test results are contained in this test report and AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these tests. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX TECHNOLOGY (SHENZHEN) CO., LTD.

Date of Test: Feb.28 - Mar.18, 2008

Yoyo Wang Prepared by:

YoYo Wang / Assistant

Reviewer: Iceman Hu / Supervi

图 信華科技(深圳)有限公司 **AUDIX** 

Audix Technology (Shenzhen) Co., Ltd.

EMC 部門報告專用章

Stamp only for EMC Dept. Report

u 3/1-8 Signature:

Approved & Authorized Signer: Ken Lu / Deputy Manager

# 1. SUMMARY OF STANDARDS AND RESULTS

# 1.1.Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION					
Description of Test Item	Standard	Results			
	FCC Part 15: 15.207				
Conducted Emission Test	ANSI C63.4: 2003 KDB58074	PASS			
	FCC Part 15: 15.209				
Radiated Emission Test	ANSI C63.4: 2003	PASS			
	KDB58074				
6dB Bandwidth Test	FCC Part 15: 15.247	PASS			
	KDB58074				
Output Power Test	FCC Part 15: 15.247	PASS			
Output Tower Test	KDB58074	17155			
Band Edge Compliance Test	FCC Part 15: 15.247	PASS			
Band Edge Comphanice Test	KDB58074	1735			
Power Spectral Density Test	FCC Part 15: 15.247	PASS			
Fower Spectral Delisity Test	KDB58074	I ASS			
MPE ESTIMATION	FCC Part 2: 2.1093	PASS			
Antenna requirement	FCC Part 15: 15.203	PASS			

# 2. GENERAL INFORMATION

# 2.1.Description of Device (EUT)

Product name	:	Digital Wireless Stereo Headphones
Model Number	:	RF-WHP01
Operation frequency	:	2.405GHz2.477GHz ISM Band
Channel Number	:	37
Channel frequency	:	F = 2405 + 2(K-1) $K=1,2,37$
Modulation Technology	:	PI/4 DQPSK Modulation
Output power	:	0.51dBm(Maximum measured)
Antenna Assembly Gain	:	2dBi (maximum)
Applicant	:	Beautiful Enterprise Co., Ltd  26th Floor, Beautiful Group Tower, 77 Connaught Road Central, Hong Kong
Manufacturer	:	Shen Zhen Synchron Electronics Co., Ltd.  No.9 Mei Li Road, Xia Mei Lin, Fu Tian Area, ShenZhen,
		China.
Power Adapter	:	M/N: PLR-050100 US Cable: Unshielded, Detectable, 2.0m
Date of Test	:	Feb.28 ~ Mar.18, 2008
Date of Receipt	:	Feb.26, 2008
Sample Type	:	Prototype production

Note: This product is a Digital Wireless Stereo Headphones with two parts, one is the headphone, the other is the docking station. It can transmit and receive by each other. In this report we test the part of headphone.

# 2.2.Tested Supporting System Details

#### **2.2.1.NOTEBOOK**

M/N : PP09S S/N : N/A Manufacturer : DELL

Power Adaptor : Manufacturer: DELL,

M/N: LA65NS1-00

Cable: Unshielded, Detachabled,

4.0m

(Bond one ferrite core)

Test software : AWAflash v1.58

2.2.2.USB Cable: Unshielded, Detachable, 1.5m

# 2.3. Test Facility

Site Description Name of Firm

: Audix Technology (Shenzhen) Co., Ltd. No. 6, Ke Feng Rd., 52 Block, Shenzhen

Science & Industrial Park, Nantou, Shenzhen, Guangdong, China

3m Anechoic Chamber : Jun.13, 2006 File on

Federal Communication Commission

Registration Number: 90454

3m & 10m Anechoic Chamber : Jan.31, 2007 File on

Federal Communication Commission

Registration Number: 794232

EMC Lab. : Accredited by DATech, German

Registration Number: DAT-P-091/99-01

Feb. 02, 2004

Accredited by NVLAP, USA NVLAP Code: 200372-0

Apr.01, 2007

# 2.4. Measurement Uncertainty

No.	Item	Uncertainty
1.	Uncertainty for Conducted Emission Test	1.22dB
2.	Uncertainty for Radiated Emission Test<1GHz	4.62dB
3.	Uncertainty for Radiated Emission Test>1GHz	4.79dB
4.	Uncertainty for Frequency measure	$0.42*10^{-6}$
5.	Uncertainty for conducted power measure	0.112

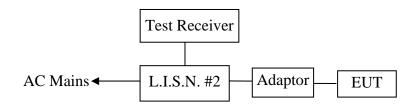
# 3. POWER LINE CONDUCTED EMISSION TEST

# 3.1.Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS10	838693/001	Dec.19, 07	1 Year
2	L.I.S.N.#2	Kyoritsu	KNW-407	8-1636-1	May 11, 07	1 Year
3.	Terminator	Hubersuhner	50Ω	No. 1	May 11, 07	1 Year
4.	RF Cable	MIYAZAKI	5D-2W	LISN Cable 1#	Jan.09, 08	1/2 Year
5	Coaxial Switch	Anritsu	MP59B	M55367	Jan.09, 08	1/2 Year
6	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100340	Jan.09, 08	1/2 Year

# 3.2.Block Diagram of Test Setup

#### 3.2.1.Block diagram of connection between the EUT and simulators



(EUT: Digital Wireless Stereo Headphones)

#### 3.3. Power Line Conducted Emission Test Limits

	Maximum RF Line Voltage			
Frequency	Quasi-Peak Level	Average Level		
	$dB(\mu V)$	dB(µV)		
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*		
500kHz ~ 5MHz	56	46		
5MHz ~ 30MHz	60	50		

Notes: 1. \* Decreasing linearly with logarithm of frequency.

# 3.4. Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

### 3.4.1.Digital Wireless Stereo Headphones (EUT)

Model Number : RF-WHP01

Serial Number : N/A

Manufacturer : Shen Zhen Synchron Electronics Co., Ltd.

<sup>2.</sup> The lower limit shall apply at the transition frequencies.

# 3.5. Operating Condition of EUT

- 3.5.1. Setup the EUT and simulator as shown as Section 3.2.
- 3.5.2. Turn on the power of all equipment.
- 3.5.3.Let the EUT worked in test mode (Charging) and measured it.
- 3.5.4. The other peripheral devices were driven and operated in turn during all testing.

#### 3.6. Test Procedure

The EUT is connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). This provides a 50 ohm coupling impedance for the EUT. Please refer the block diagram of the test setup and photographs. Power on the PC and let it work normally, we use a keyboard test soft ware, let EUT working in test mode, then test it. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4: 2003 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESHS10) is set at 10kHz.

The frequency range from 150kHz to 30MHz is checked.

The test result are reported on Section 3.7.,

#### 3.7. Power Line Conducted Emission Test Results

**PASS.** (All emissions not reported below are too low against the prescribed limits.)

The EUT with the following test modes was tested and selected (mode 1) to read Q.P values and average values, all the test results are listed in next pages.

EUT: Digital Wireless Stereo Headphones Model No.: RF-WHP01

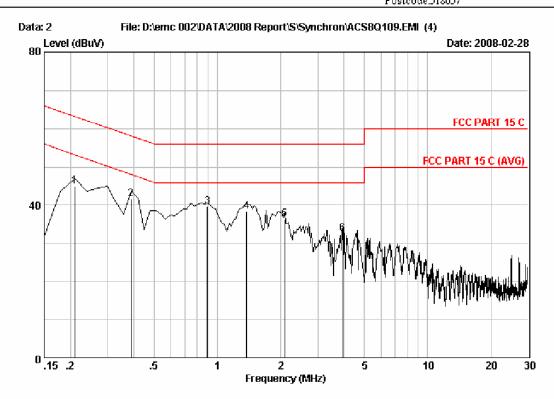
Test Date: Feb.28, 2008 Temperature: 23°C Humidity: 54%

The details of test modes are as follows:

No.	Test Mode	Reference Test Data No.		
		VA	VB	
1.	Charging	# 2	# 1	



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Data no :2

Engineer Jamy

Site no :AUDIX No.1 Conduction
Dis./Ant. :— KNW407 VA (1#)
Limit :FCC PART 15 C
Env./Ins. :Temp:23' Humi:54% ESHS10 Engir
EUT :Digital Wireless Stereo Headphones
Power Rating :DC 5V From adaptor AC 120V/60Hz
Test Mode :Charging
M/N

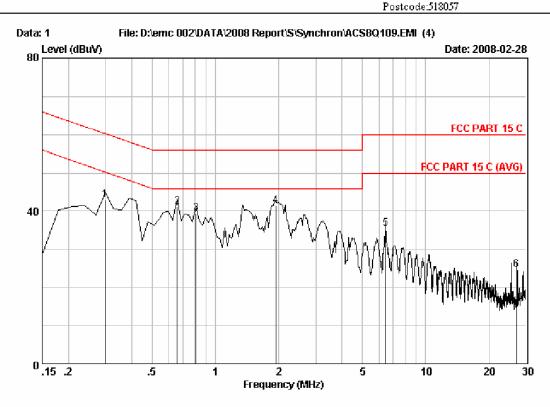
:RF-WHP01 M/NMemo  $: \\ Headphones$ 

Мо	Freq (MHz)	LISM Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1 2 3	0.21	0.15	10.15	34.68	44.98	63.22	18.24	QP
	0.39	0.09	10.14	31.50	41.73	58.09	16.36	QP
	0.90	0.04	10.15	29.40	39.59	56.00	16.41	QP
<b>4</b>	1.37	0.0 <b>4</b>	10.15	28.16	38.35	56.00	17.65	QP
5	2.09	0.05	10.15	26.20	36.40	56.00	19.60	QP
6	3.94	0.09	10.18	22.20	32.47	56.00	23.53	QP

1.Emission Level=LISN Factor+Cable Loss+Reading. Remarks: 2. If the average limit is met when useing a quasi-peak detector the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary



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Data no :1

Engineer Jamy

Site no :AUDIX No.1 Conduction
Dis./Ant. :— KNW407 VB (1#)
Limit :FCC PART 15 C
Env./Ins. :Temp:23' Humi:54% ESHS10 Engir
EUT :Digital Wireless Stereo Headphones
Power Rating :DC 5V From adaptor AC 120V/60Hz
Test Mode :Charging
M/N

M/N:RF-WHP01  ${\tt Memo}$ :Headphones

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.30	0.12	10.15	32.75	43.02	60.26	17.24	QP
2	0.66	0.04	10.14	31.06	41.24	56.00	14.76	QP
3	0.81	0.04	10.14	29.32	39.50	56.00	16.50	QP
<b>4</b>	1.94	0.05	10.15	31.34	41.54	56.00	14.46	QP
5	6.45	0.12	10.21	25.11	35.44	60.00	24.56	QP
6	27.02	0.58	10.28	13.78	24.64	60.00	35.36	QP

1.Emission Level=LISN Factor+Cable Loss+Reading. Remarks: 2. If the average limit is met when useing a quasi-peak detector the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary

# 4. RADIATED EMISSION TEST

# 4.1.Test Equipment

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

4.1.1.For Anechoic Chamber

Frequency rang: 30~1000MHz

	11040000 10000000							
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval		
1.	3#Chamber	AUDIX	N/A	N/A	Dec.20, 07	1/2 Year		
2.	EMI Spectrum	Agilent	E7403A	MY42000106	May 11, 07	1 Year		
3.	Test Receiver	Rohde & Schwarz	ESVS20	830350/005	Dec.19, 07	1 Year		
4.	Amplifier	HP	8447D	2944A04738	Jan.09, 08	1/2 Year		
5.	Bilog Antenna	Schaffner	CBL6111C	2598	Feb.21, 08	1 Year		
6.	RF Cable	MIYAZAKI	5D-2W	3# Chamber No.1	Jan.09, 08	1/2 Year		
7.	RF Cable	MIYAZAKI	5D-2W	3# Chamber No.2	Jan.09, 08	1/2 Year		
8.	RF Cable	FUJIKURAw	RG-55/U	3# Chamber No.3	Jan.09, 08	1/2 Year		
9.	RF Cable	FUJIKURA	RG-55/U	3# Chamber No.4	Jan.09, 08	1/2 Year		
10.	Coaxial Switch	Anritsu	MP59B	M73989	Jan.09, 08	1/2 Year		

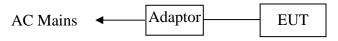
Frequency rang: above 1000MHz

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4446A	MY41440292	May 11, 07	1 Year
2.	Amp	HP	8449B	3008A00863	May 11, 07	1 Year
3.	Antenna	EMCO	3115	9607-4877	Jan. 23, 07	1.5 Year
4	Antenna	EMCO	3116	00060088	May 28, 07	1 Year
5.	HF Cable	Hubersuhne	Sucoflex104	-	May 11, 07	1 Year

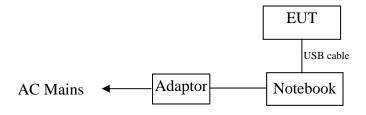
# 4.2.Block Diagram of Test Setup

# $4.2.1. Block \ diagram \ of \ connection \ between \ the \ EUT \ and \ simulators$

Test Mode: Charging Mode



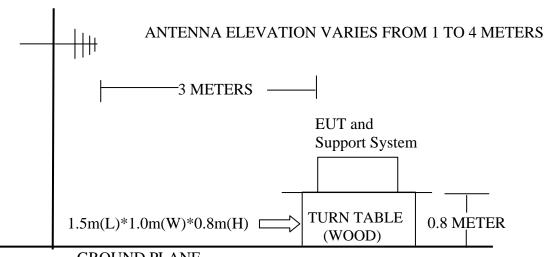
Test Mode: TX Mode



(EUT: Digital Wireless Stereo Headphones)

#### 4.2.2.In Anechoic Chamber

#### ANTENNA TOWER



**GROUND PLANE** 

### 4.3. Radiated Emission Limit

FREQUENCY	DISTANCE	FIELD STREN	NGTHS LIMIT	
MHz	Meters	μV/m	$dB(\mu V)/m$	
30 ~ 88	3	100	40.0	
88 ~ 216	3	150	43.5	
216 ~ 960	3	200	46.0	
960 ~ 1000	3	500	54.0	
Above 1000	3	74.0 dB(μV)/m (Peak)		
		54.0 dB(μV	/)/m (Average)	

(1) Emission level  $dB\mu V = 20 \log Emission level \mu V/m$ 

- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

# 4.4.EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.4.1.Digital Wireless Stereo Headphones (EUT)

Model Number RF-WHP01

Serial Number N/A

Shen Zhen Synchron Electronics Co., Ltd. Manufacturer

4.4.2.Support Equipment As Tested Supporting System Detail, in Section 2.2.

# 4.5. Operating Condition of EUT

- 4.5.1. Setup the EUT and simulator as shown as Section 4.2.
- 4.5.2. Turn on the power of all equipment.
- 4.5.3. Notebook run test software to control EUT work in Tx Mode
- 4.5.4. The other peripheral devices were driven and operated in turn during all testing.

#### 4.6.Test Procedure

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it work normally, we use a keyboard test soft ware, let EUT working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.

The bandwidth of the EMI test receiver (R&S ESVS20) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the VBW is set at 1MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW 10Hz VBW for average emission above 1GHz

The frequency range from 30MHz to 10<sup>th</sup> harmonic are checked.

The test modes (TX / Charging) are tested in Anechoic Chamber and all the scanning waveforms are reported with antenna in horizontal and vertical polarization on Section 4.7.

Three EUT position(X,Y,Z) were checked, and worse case was happened in Y position, so Y position was chose for final measurements.

#### 4.7. Radiated Emission Test Results

#### PASS.

The frequency range from 30MHz to 1000MHz and above 1GHz. is investigated. Please see the following pages.

All measurements for radiated emissions within the restricted bands were performed using a Quasi-Peak detector with 120kHz RBW below 1GHz and a Peak and Average detector with 1MHz RBW above 1GHz,

All measurements for radiated emissions within the restricted bands were performed using a Quasi-Peak detector with 300kHz VBW below 1GHz and a Peak detector with 1MHz VBW above 1GHz, A average detector with 10Hz VBW above 1GHz

The radiated emissions from 18GHz to 25 GHz were Peak measured and complied with average limits, so the average level was deemed to meet average limits.

Test Date: Mar.12~18, 2008 Temperature: 24°C Humidity: 56%

The details of test modes are as follows:

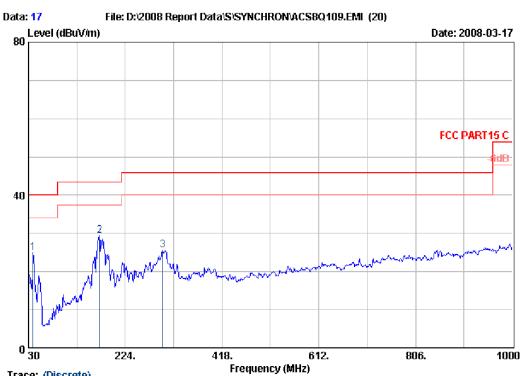
Test	Frequency	Test Mode	Reference T	est Data No.					
Mode	(MHz)	rest wrode	Horizontal	Vertical					
1.	30~1000	Charging	#17	#18					
2.	30~1000	Tx Mode	#16	#15					
3.	Tx 2405MHz		#64(P), #65(Av)	#66(P), #67(Av)					
4.	1000~18000	Tx 2441MHz	#70(P), #71(Av)	#68(P), #69(Av)					
5.		Tx 2477MHz	#72(P), #73(Av)	#74(P), #75(Av)					
6.		Tx 2405MHz	#166	#167					
7.	18000~25000	Tx 2441MHz	#169	#168					
8.		Tx 2477MHz	#170	#171					
Note:	Note: "P" means "peak", "Av" means "average"								

### Frequency: 30MHz~1GHz



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Trace: (Discrete)

: 3# Chamber Radiation Data no. : 17

Dis. / Ant. : 3m 2598 Ant. pol. : HORIZONTAL

Limit : FCC PART15 C

Env. / Ins. : 24\*C/56% ESVS20 Engineer : Jamy

: Digital Wireless Stereo Headphones Power Rating : DC 5V From Adapter AC 120V/60Hz

Test Mode : Charging M/N: RF-WHPO1 Memo : Headphones

	Freq.		Cable Loss (dB)	Reading (dBuV)		Limits (dBuV/m)	_	Remark
1		14.82	0.73	9.43	24.98	40.00	15.02	QP
2		9.84	1.30	18.31	29.45	43.50	14.05	QP
3		13.78	1.60	10.30	25.68	46.00	20.32	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.

2. The emission levels that are 20dB below the official limit are not reported.



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Frequency (MHz)

#### Trace: (Discrete)

Site no. : 3# Chamber Radiation Data no. : 18
Dis. / Ant. : 3m 2598 Ant. pol. : VERTICAL

Limit : FCC PART15 C

Env. / Ins. : 24\*C/56% ESVS20 Engineer : Jamy

EUT : Digital Wireless Stereo Headphones
Power Rating : DC 5V From Adapter AC 120V/60Hz

Test Mode : Charging M/N : RF-WHP01 Memo : Headphones

	Freq.	Ant. Factor (dB/m)	Cable Loss (dB)	_	Emission Level (dBuV/m)		_	Remark
1		19.80	0.68	13.12	33.60	40.00	6.40	QP
2		9.45	1.27	21.84	32.56	43.50	10.94	QP
3		13.78	1.60	14.51	29.89	46.00	16.11	QP

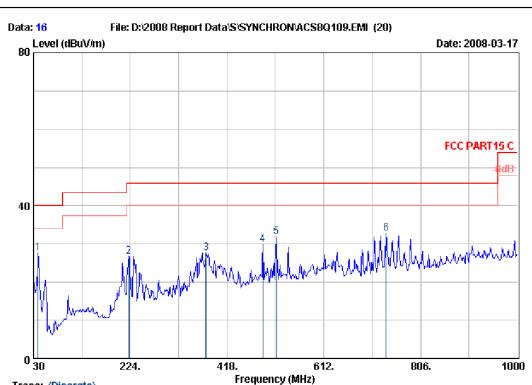
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.

2. The emission levels that are 20dB below the official limit are not reported.



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Trace: (Discrete)

Site no. : 3# Chamber Radiation Data no. : 16

Dis. / Ant. : 3m 2598 Ant. pol. : HORIZONTAL

Limit : FCC PART15 C

Env. / Ins. : 24\*C/56% ESVS20 Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating : DC 2.4V
Test Mode : TX
M/N : RF-WHP01
Memo : Headphones

	Freq.	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	38.73	14.82	0.73	11.99	27.54	40.00	12.46	QP
2	221.09	10.38	1.42	15.03	26.83	46.00	19.17	QP
3	376.29	15.74	1.78	10.19	27.71	46.00	18.29	QP
4	489.78	18.10	1.90	9.97	29.97	46.00	16.03	QP
5	516.94	18.34	2.18	11.33	31.85	46.00	14.15	QP
6	737.13	21.74	2.53	8.42	32.69	46.00	13.31	QP

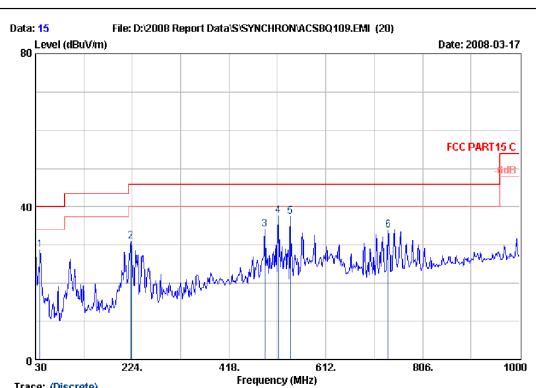
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.

2. The emission levels that are 20dB below the official limit are not reported.



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#### Trace: (Discrete)

Site no. : 3# Chamber Radiation Data no. : 15 Ant. pol. : VERTICAL Dis. / Ant. : 3m 2598

Limit : FCC PART15 C

Env. / Ins. : 24\*C/56% ESVS20 Engineer : Jamy

: Digital Wireless Stereo Headphones EHT

Power Rating : DC 2.4V Test Mode : TX : RF-WHPO1 M/NMemo : Headphones

	Freq.	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	38.73	14.82	0.73	13.11	28.66	40.00	11.34	QP
2	221.09	10.38	1.42	19.09	30.89	46.00	15.11	QP
3	489.78	18.10	1.90	14.17	34.17	46.00	11.83	QP
4	516.94	18.34	2.18	17.17	37.69	46.00	8.31	QP
5	541.19	18.88	2.09	16.53	37.50	46.00	8.50	QP
6	737.13	21.74	2.53	9.60	33.87	46.00	12.13	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.

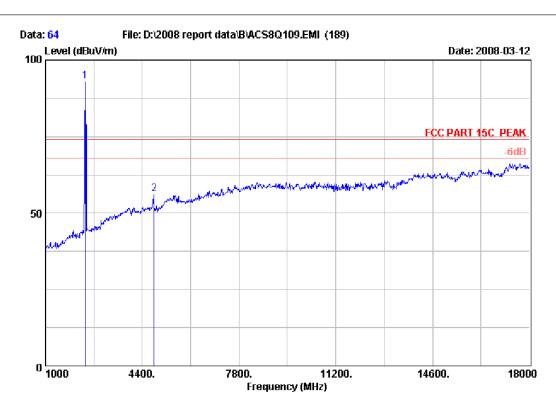
2. The emission levels that are 20dB below the official limit are not reported.

### Frequency: 1GHz~18GHz



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: RF Chamber Site no. Data no. : 64

Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : HORIZONTAL

Limit : FCC PART 15C PEAK Env. / Ins. : 23\*C/54% Engineer : Jamy

: Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH2:2405MHz : RF-WHPO1 M/NMemo : Headphones

		Ant.	Cable	$\mathbf{Amp}$	Emission				
	Freq.	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	2405.00	29.03	6.73	35.18	92.41	92.99	74.00	-18.99	Peak
2	4808.00	33.98	10.54	34.50	46.28	56.30	74.00	17.70	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

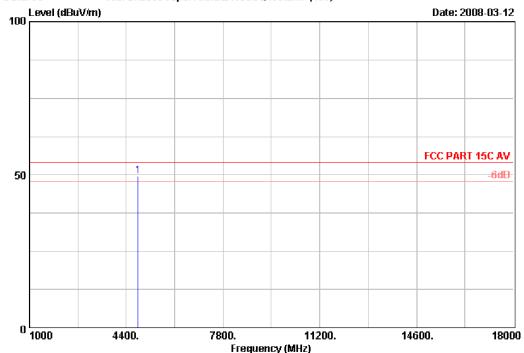
2. The emission levels that are 20dB below the official limit are not reported.



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File: D:\2008 report data\B\AC\$8Q109.EMI (189) Data: 65



Site no. : RF Chamber

Data no. : 65 Ant. pol. : HORIZONTAL Dis. / Ant. : 3m 3115 FACTOR

: FCC PART 15C AV

Env. / Ins. : 23\*C/54% Engineer : Jamy

: Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH2:2405MHz : RF-WHP01 : Headphones M/NMemo

		Ant.	Cable	Amp		Emission			
	Freq.	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	4808.00	33.98	10.54	34.50	39.45	49.47	54.00	4.53	Average

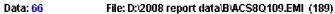
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

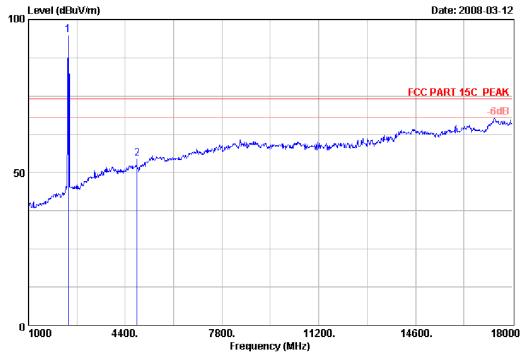
2. The emission levels that are 20dB below the official  $\,$ limit are not reported.



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Site no. : RF Chamber Data no. : 66
Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : VERTICAL

Limit : FCC PART 15C PEAK

Env. / Ins. : 23\*C/54% Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH2:2405MHz M/N : RF-WHP01
Memo : Headphones

		Ant.	Cable	Amp	Emission				
	Freq.	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	2405.00	29.03	6.73	35.18	94.34	94.92	74.00	-20.92	Peak
2	4808.00	33.98	10.54	34.50	44.65	54.67	74.00	19.33	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

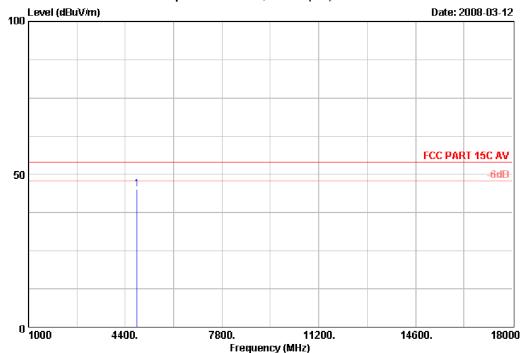
The emission levels that are 20dB below the official limit are not reported.



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Data: 67 File: D:\2008 report data\B\AC\$8Q109.EMI (189)



Site no. : RF Chamber Data no. : 67
Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : VERTICAL

Limit : FCC PART 15C AV

Env. / Ins. : 23 \* C/54% Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH2:2405MHz
M/N : RF-WHP01
Memo : Headphones

		Ant.	Cable	$\mathbf{Amp}$		Emission			
	Freq.	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	4808.00	33.98	10.54	34.50	35.16	45.18	54.00	8.82	Average

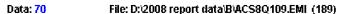
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

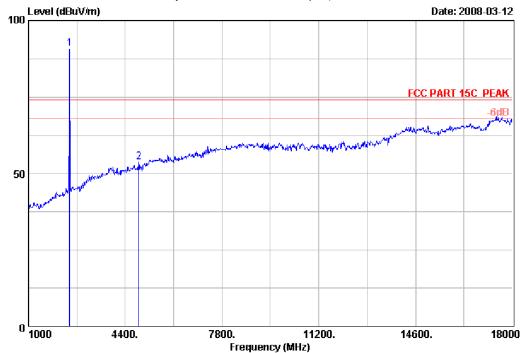
The emission levels that are 20dB below the official limit are not reported.



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Site no. : RF Chamber

Data no. : 70 Ant. pol. : HORIZONTAL Dis. / Ant. : 3m 3115 FACTOR

: FCC PART 15C PEAK Limit

Env. / Ins. : 23\*C/54% Engineer : Jamy

: Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH20:2441MHz

: RF-WHP01 : Headphones M/NMemo

		Ant.	Cable	Amp		Emission		
	Freq. (MHz)				-	Level (dBuV/m)	Margin (dB)	Remark
<b>1</b> 2	2441.00 4880.00						-16.71 20.19	Peak Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

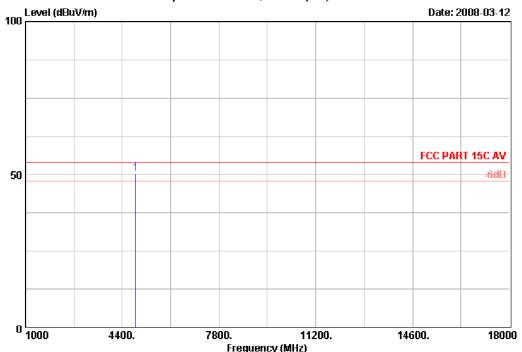
2. The emission levels that are 20dB below the official limit are not reported.



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Site no. : RF Chamber Data no. : 71

Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : HORIZONTAL

Limit : FCC PART 15C AV

Env. / Ins. : 23\*C/54% Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH20:2441MHz

M/N : RF-WHPO1 Memo : Headphones

Ant. Cable Amp Emission

Freq. Factor Loss Factor Reading Level Limits Margin Remark

 $(\mathtt{MHz}) \qquad (\mathtt{dB/m}) \qquad (\mathtt{dB}) \qquad (\mathtt{dB}) \qquad (\mathtt{dBuV}) \qquad (\mathtt{dBuV/m}) \qquad (\mathtt{dBuV/m}) \qquad (\mathtt{dB}) \qquad \qquad$ 

1 4880.00 34.16 10.56 34.48 40.10 50.34 54.00 3.66 Average

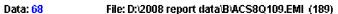
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

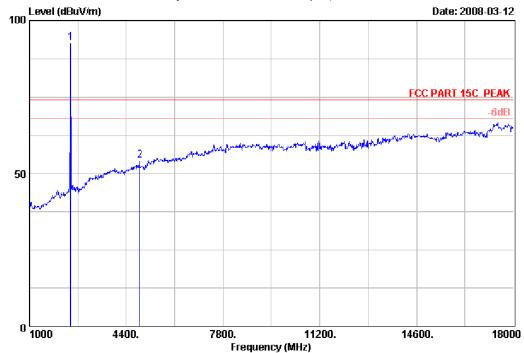
2. The emission levels that are 20dB below the official limit are not reported.



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Site no. : RF Chamber Data no. : 68
Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : VERTICAL

Limit : FCC PART 15C PEAK

Env. / Ins. : 23 \* C/54% Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH20:2441MHz M/N : RF-WHP01

Memo : Kr-whrol
Headphones

	Freq.	Factor	Cable Loss (dB)	Factor	Reading	Emission Level (dBuV/m)	Margin (dB)	Remark
<b>1</b> 2	2441.00 4880.00					92.73 54.44	 -18.73 19.56	Peak Peak

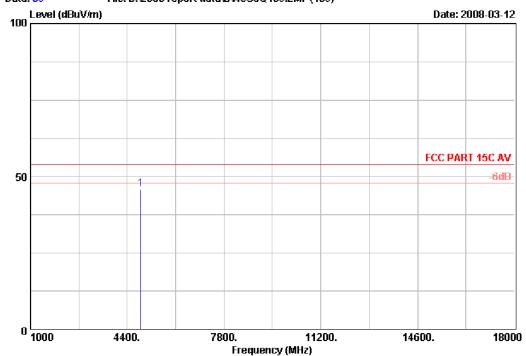
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.



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Data: 69 File: D:\2008 report data\B\ACS8Q109.EMI (189)



Site no. : RF Chamber Data no. : 69
Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : VERTICAL

Limit : FCC PART 15C AV

Env. / Ins. : 23\*C/54% Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH20:2441MHz

M/N : RF-WHP01 Memo : Headphones

Ant. Cable Amp Emission
Freq. Factor Loss Factor Reading Level Limits Margin Remark
(MHz) (dB/m) (dB) (dB) (dBuV/ (dBuV/m) (dBuV/m) (dB)

1 4880.00 34.16 10.56 34.48 35.63 45.87 54.00 8.13 Average

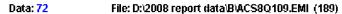
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

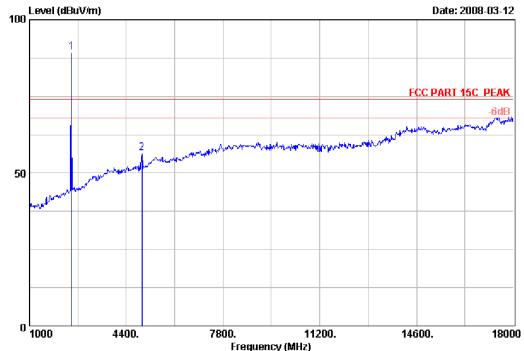
2. The emission levels that are 20dB below the official limit are not reported.



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Site no. : RF Chamber Data no. : 72

Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : HORIZONTAL

Limit : FCC PART 15C PEAK

Env. / Ins. : 23 \* C/54% Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH38:2477MHz M/N : RF-WHP01

M/N : RF-WHPO1 Memo : Headphones

	Freq.	Factor	Factor	Reading	Emission Level (dBuV/m)	Limits	_	Remark
<b>1</b> 2	2477.00 4952.00		 		89.29 56.51		-15.29 17.49	Peak Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

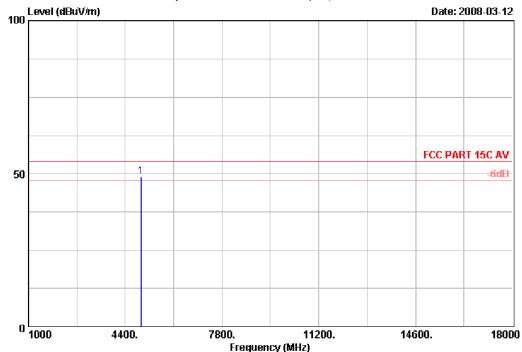
The emission levels that are 20dB below the official limit are not reported.



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File: D:\2008 report data\B\AC\$8Q109.EMI (189) Data: 73



Site no. : RF Chamber

Data no. : 73 Ant. pol. : HORIZONTAL Dis. / Ant. : 3m 3115 FACTOR

: FCC PART 15C AV

Env. / Ins. : 23\*C/54% Engineer : Jamy

: Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH38:2477MHz

: RF-WHP01 : Headphones M/NMemo

		Ant.	Cable	Amp	1	Emission			
	-				-		Limits (dBuV/m)	-	Remark
1	4952.00	34.34	10.58	34.46	38.56	49.02	54.00	4.98	Average

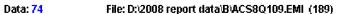
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

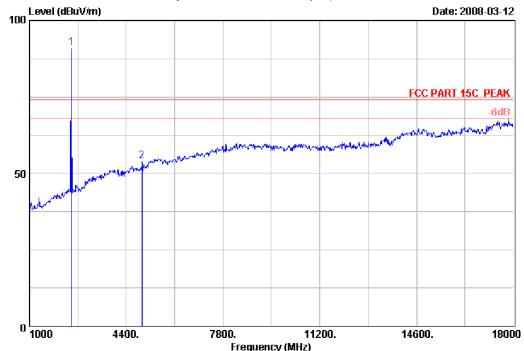
2. The emission levels that are 20dB below the official  $% \left( 1\right) =\left( 1\right) +\left( 1\right) +\left($ limit are not reported.



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Site no. : RF Chamber Data no. : 74
Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : VERTICAL

Limit : FCC PART 15C PEAK

Env. / Ins. : 23\*C/54% Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH38:2477MHz

M/N : RF-WHP01 Memo : Headphones

		Ant.	Cable	$\mathbf{Amp}$		Emission			
	Freq. (MHz)				_	Level (dBuV/m)		Margin (dB)	Remark
	2477.00		6 87	 35 16	 an 27	 01 17	74 00	 -17 17	Peak
2	4952.00					54.06		19.94	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

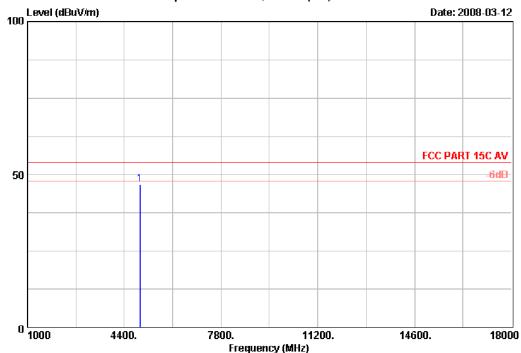
2. The emission levels that are 20dB below the official limit are not reported.



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Site no. : RF Chamber Data no. : 75
Dis. / Ant. : 3m 3115 FACTOR Ant. pol. : VERTICAL

Limit : FCC PART 15C AV

Env. / Ins. : 23\*C/54% Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH38:2477MHz

M/N : RF-WHP01 Memo : Headphones

		Ant.	Cable	Amp		Emission			
	Freq.	Factor	Loss	Factor	Reading	Level	Limits	Margin	Remark
	(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	4952.00	34.34	10.58	34.46	36.25	46.71	54.00	7.29	Average

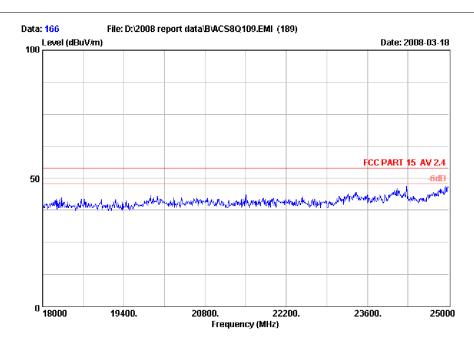
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.

The emission levels that are 20dB below the official limit are not reported.

### Frequency: 18GHz~25GHz



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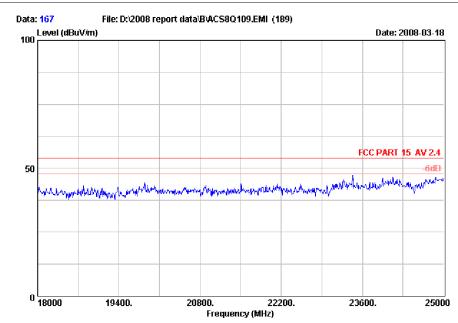
Site no. : RF Chamber Data no. : 166
Dis. / Ant. : 3m Ant. pol. : HORIZONTAL

Limit : FCC PART 15 AV 2.4

Env. / Ins. : 23\*C/54% Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V
Test Mode : TX CH2:2405MHz
M/N : RF-WHP01
Memo : Headphones



Site no. : RF Chamber Data no. : 167
Dis. / Ant. : 3m Ant. pol. : VERTICAL
Limit : FCC PART 15 AV 2.4

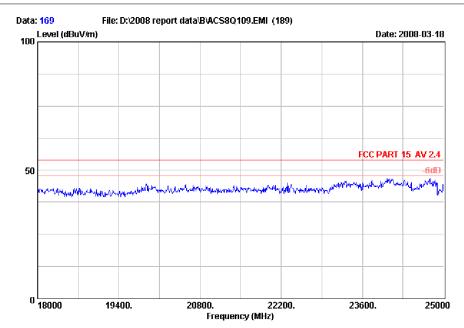
Env. / Ins. : 23\*C/54% Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V
Test Mode : TX CH2:2405MHz
M/N : RF-WHP01
Memo : Headphones



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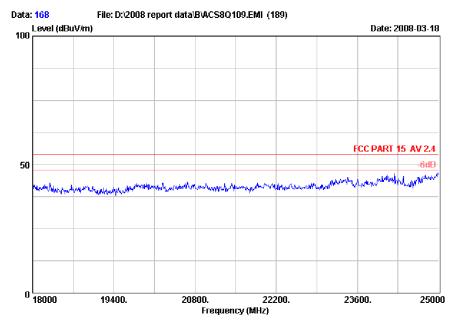
Site no. : RF Chamber Data no. : 169 Dis. / Ant. : 3m Ant. pol. : HORIZONTAL

Limit : FCC PART 15 AV 2.4

Env. / Ins. : 23\*C/54% Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V Test Mode : TX CH20:2441MHz : RF-WHPO1 M/NMemo : Headphones



: RF Chamber Data no. : 168 Ant. pol. : VERTICAL Site no. Dis. / Ant. : 3m

: FCC PART 15 AV 2.4 Limit

Env. / Ins. : 23\*C/54% Engineer : Jamy

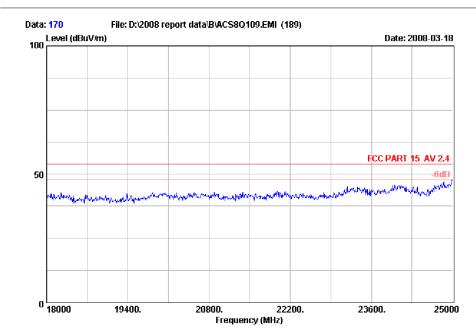
EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH20:2441MHz : RF-WHPO1 M/N Memo : Headphones



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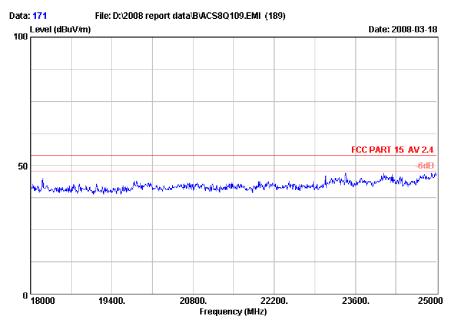
Site no. : RF Chamber Data no. : 170 Dis. / Ant. : 3m Ant. pol. : HORIZONTAL

Limit : FCC PART 15 AV 2.4

Env. / Ins. : 23\*C/54% Engineer : Jamy

: Digital Wireless Stereo Headphones

Power Rating: DC 2.4V Test Mode : TX CH38:2477MHz : RF-WHPO1 M/NMemo : Headphones



: RF Chamber Data no. : 171 Ant. pol. : VERTICAL Site no. Dis. / Ant. : 3m

: FCC PART 15 AV 2.4 Limit

Env. / Ins. : 23\*C/54% Engineer : Jamy

EUT : Digital Wireless Stereo Headphones

Power Rating: DC 2.4V

Test Mode : TX CH38:2477MHz : RF-WHPO1 M/N Memo : Headphones

# 5. 6dB Bandwidth Test

# 5.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum	Agilent	E4407B	MY41440292	May 11, 07	1 Year
2	Amp	HP	8449B	3008A00863	May 11, 07	1 Year
3	Antenna	EMCO	3115	9607-4877	Jan. 23, 07	1.5 Year
4	HF Cable	Hubersuhne	Sucoflex104	-	May 11, 07	1 Year

# 5.2.Test Information

EUT:	Digital Wireless Stereo Headphones					
M/N:	RF-WHP01					
Test Date:	Mar.18, 2008					
Ambient Temperature:	23°C					
Relative Humidity:	60%					
Test standard:	FCC PART 15C: 15.247					
Test mode:	TX					
Test Frequency:	CH2: 2405MHz CH20: 2441MHz CH38: 2477MHz					
Tested By:	Jamy					

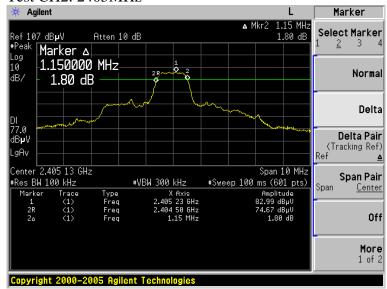
### 5.3.Test Procedure

The transmitter output was connected to a spectrum analyzer via a Attenuator . The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 100 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

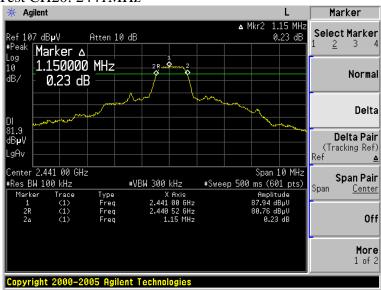
# 5.4. Test Results

СН	6dB Bandwidth (MHz)	Limit	Conclusion
2	1.15	>500	PASS
20	1.15	>500	PASS
38	1.13	>500	PASS

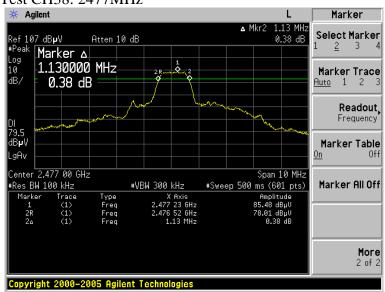
Test CH2: 2405MHz



#### Test CH20: 2441MHz



#### Test CH38: 2477MHz



#### 6. OUTPUT POWER TEST

### 6.1.Test Equipment

Item	Equipment	Manufacture	Model No.	Serial No.	Last Cal.	Cal.
		r				Interval
1.	SpectrumAnalyzer	Agilent	E4446A	US44300459	May,11, 07	1 Year
2	Horn Antenna	EMCO	3115	9607-4877	Jan, 23, 07	1.5 Year
3	Horn Antenna	EMCO	3115	9510-4580	May,11, 07	1.5 Year
4	Signal Generator	HP	83732B	6K00003262	May,11, 07	1Year
5	RF Cable	Hubersuhner	SUCOFLEX	182769/4	May,11,07	1Year
6	RF Cable	Hubersuhner	SUCOFLEX	182768/4	May,11, 07	1Year
7	RF Cable	Hubersuhner	SUCOFLEX	182771/4	May,11, 07	1Year
8	Amplifier	HP	8449B	3008A00863	May,11, 07	1Year

#### 6.2. Test Information

EUT:	Digital Wireless Stereo Headphones
M/N:	RF-WHP01
Test Date:	Mar.14, 2008
Ambient Temperature:	23℃
Relative Humidity:	60%
Test standard:	FCC PART 15C: 15.247
Test mode:	TX
Test Frequency:	CH2: 2405MHz CH20: 2441MHz CH38: 2477MHz
Tested By:	Jamy

#### 6.3. Test Procedure

- (1). The EUT was placed on a 0.8m high table in the chamber and turned on in continuously transmitting mode.
- (2). The maximum fundamental emission at 3m distance was measured and recorded with receive antenna in both vertical and horizontal by rotating the turntable and by lowering the receive antenna.
- (3). The EUT was then removed and replaced with a substitution antenna in the same position and the substitution antenna must have the same polarization with the receive antenna.
- (4). A signal which have the same frequency obtained in step 2 was fed to the substitution, the receive antenna was raised and lowered to obtain a maximum reading at the test receiver, the level of the signal generator was adjusted until the measured field strength level in step 2 was obtained, recorded the level of the signal generator.
- (5). Repeated step 4 with both antenna polarizations
- (6). The radiated power is equal to the power supplied by the signal generator and corrections due to the gain of the substitution antenna and the cable loss between the signal generator and the substitution antenna.

### 6.4. Test Results

СН	Freq (MHz)	Ant Pol.	Electric Field Strength ( dBuV/m)	SG Reading (dBm)	Tx Cable Loss (dB)	Tx Ant. Gain (dBi)	Result EIRP (dBm)	Limit EIRP (dBm)	Margin (dB)
Low	2405	Н	92.99	-6.7	6.06	9.25	-3.51	30	33.51
Low	2405	V	94.92	-3.78	6.06	9.25	-0.59	30	30.59
Mid	2441	Н	90.71	-8.64	6.08	9.30	-5.42	30	35.42
IVIIU	2441	V	92.73	-5.81	6.08	9.30	-2.59	30	32.59
Ціа	2477	Н	89.29	-9.1	6.15	9.33	-5.92	30	35.92
Hig	2477	V	91.17	-7.04	6.15	9.33	-3.86	30	33.86

Result = SG Reading – Tx Cable Loss + Tx Antenna Gain

Rx-Antenna: Horn Antenna Tx-Antenna: Horn Antenna

## 7. BANDEDGE COMPLIANCE TEST

# 7.1.Test Equipment

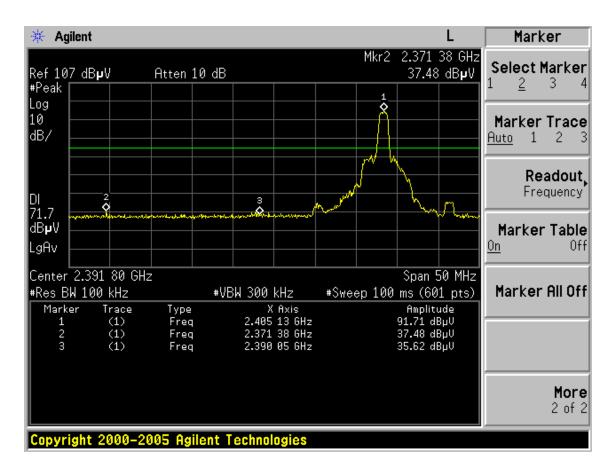
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum	Agilent	E4407B	MY41440292	May 11, 07	1 Year
2.	Amp	HP	8449B	3008A00863	May 11, 07	1 Year
3.	Antenna	EMCO	3115	9607-4877	Jan. 23, 07	1.5 Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May 11, 07	1 Year

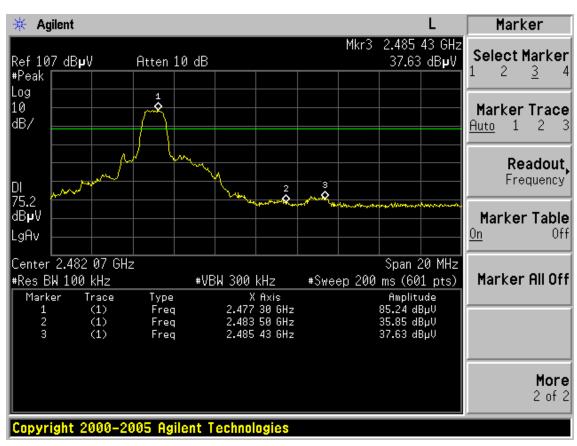
## 7.2.Test Information

EUT:	Digital Wireless Stereo Headphones
M/N:	RF-WHP01
Test Date:	Mar.14, 2008
Ambient Temperature:	23℃
Relative Humidity:	60%
Test standard:	FCC PART 15C: 15.247
Test mode:	TX
Test Frequency:	CH2: 2405MHz CH38: 2477MHz
Test By:	Jamy

### 7.3.Test Results

Pass (The EUT was tested and all the test results are listed in following page.)





# 8. POWER SPECTRAL DENSITY TEST

## 8.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	SpectrumAn	Agilent	E4446A	US44300459	May,11, 07	1 Year
	alyzer					
2	Horn	EMCO	3115	9607-4877	Jan, 23, 07	1.5 Year
	Antenna					
3	Horn	EMCO	3115	9510-4580	May,11, 07	1.5 Year
	Antenna					
4	Signal	HP	83732B	6K00003262	May,11, 07	1Year
	Generator					
5	RF Cable	Hubersuhner	SUCOFLEX	182769/4	May,11,07	1Year
6	RF Cable	Hubersuhner	SUCOFLEX	182768/4	May,11, 07	1Year
7	RF Cable	Hubersuhner	SUCOFLEX	182771/4	May,11, 07	1Year
8	Amplifier	HP	8449B	3008A00863	May,11, 07	1Year

#### 8.2.Test Information

EUT:	Digital Wireless Stereo Headphones
M/N:	RF-WHP01
Test Date:	Mar.14, 2008
Ambient Temperature:	23℃
Relative Humidity:	60%
Test standard:	FCC PART 15C: 15.247
Test mode:	TX
Test Frequency:	CH2: 2405MHz CH20: 2441MHz CH38: 2477MHz
Test By:	Jamy

#### 8.3.Test Procedure

The transmitter output was coupled to a spectrum analyzer via a horn antenna in anechoic chamber. The maximum power density level at 3m was measured by spectrum analyzer with 3 kHz RBW and 30kHz VBW, sweep time=span/3kHz. Record this level with test antenna in horizontal and vertical polarization. Use substitution measurements as clause 6.3 to measured out the power density.

### 8.4.Test Results

СН	Freq (MHz)	Ant Pol.	Power density at 3m ( dBm/3kHz)	SG Reading (dBm)	Tx Cable Loss (dB)	Tx Ant. Gain (dBi)	Result EIRP (dBm/3kHz)	EIRP	Margin (dB)
Low	2405	Н	-30.45	-22.54	6.06	9.25	-19.35	8	27.35
Low	2405	V	-27.40	-19.60	6.06	9.25	-16.41	8	24.41
Mid	2441	Н	-34.56	-26.78	6.08	9.30	-23.56	8	31.56
Mila	2441	V	-31.30	-23.67	6.08	9.30	-20.45	8	28.45
Ціа	2477	Н	-36.59	-28.71	6.15	9.33	-25.53	8	33.53
Hig	2477	V	-34.08	-26.96	6.15	9.33	-23.78	8	31.78

Result = SG Reading – Tx Cable Loss + Tx Antenna Gain

Rx-Antenna: Horn Antenna Tx-Antenna: Horn Antenna

## 9. MPE ESTIMATION

# 9.1.Limit for General Population / Uncontrolled Exposures

Frequency	Power density (mW/cm²)	Averaging time (minutes)
300MHz~1.5GHz	F/1500	30
1.5GHz~100GHz	1.0	30

Frequency (MHz)	Power density (mW/cm²)	Averaging time (minutes)
2405	1.0	30
2441	1.0	30
2477	1.0	30

Note: F = Frequency in MHz

## 9.2. Estimation Result

Channel	Frequency(MHz)	Peak output	antenna	antenna gain
		power(dBm)	gain(dBi)	(Linear)
2	2405	-0.59	2	1.58
20	2441	-2.59	2	1.58
38	2477	-3.86	2	1.58

Channel	Frequency(MHz)	Peak output power to antenna	
		(mW)	$20 \text{cm}(\text{mW/cm}^2)$
2	2405	0.87	0.00027
20	2441	0.55	0.00017
38	2477	0.41	0.00013

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## 10. ANTENNA REQUIREMENT

#### 10.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

#### 10.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used for this product is PCB Antenna (see EUT photo) that no antenna other than that furnished by the responsible party shall be used with the device, The maximum peak gain of this antenna is only 2dBi.

## 11.DEVIATION TO TEST SPECIFICATIONS

[ NONE]

# 12.PHOTOGRAPH

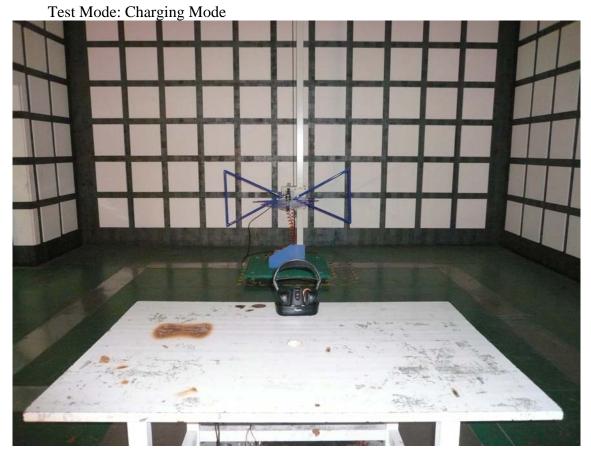
## 12.1.Photos of Power Line Conducted Emission Test

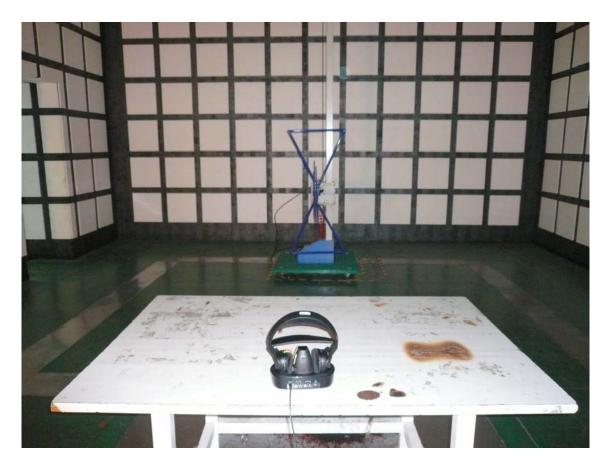


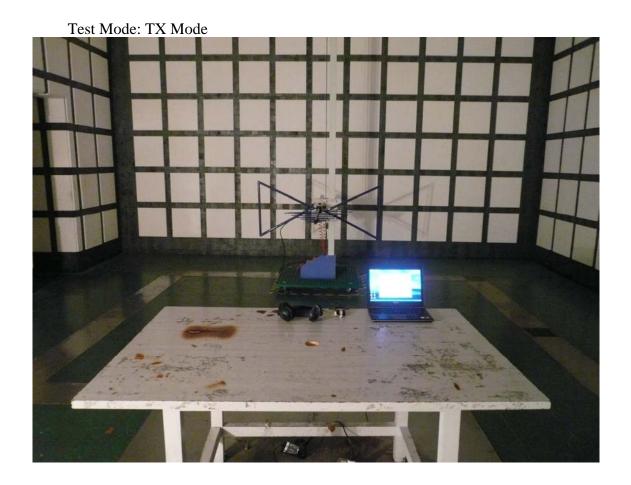


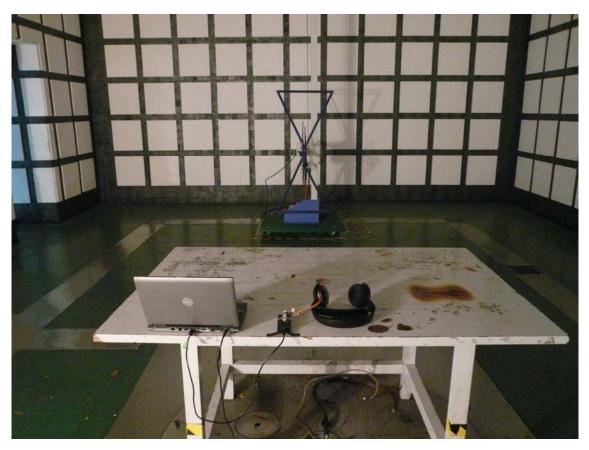
# 12.2.Photos of Radiated Emission Test

30-1000MHz









Above 1000MHz







