

## APPLICATION FOR CERTIFICATION

On Behalf of

Harmonix Music Systems, Inc.

P9 PS Gretsch Wireless Guitar

Model Number: PSGTS4

FCC ID: VFRPSGTS4

Prepared for : Harmonix Music Systems, Inc.  
675 Massachusetts Avenue, 6<sup>th</sup> Floor, Cambridge, MA  
02139 US

Prepared By : Audix Technology (Shenzhen) Co., Ltd.  
No. 6, Ke Feng Rd., 52 Block,  
Shenzhen Science & Industrial Park,  
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Tel: (0755) 26639496

Report Number : ACS-F09097  
Date of Test : May.21~25, 2009  
Date of Report : May.27, 2009

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## TEST REPORT CERTIFICATION

Applicant : Harmonix Music Systems, Inc.  
Manufacturer : Contel Electronics Technology Co., Ltd.  
EUT Description : P9 PS Gretsch Wireless Guitar  
FCC ID : VFRPSGTS4

(A) MODEL NO. : PSGTS4

(B) SERIAL NO. : N/A

(C) POWER SUPPLY : DC 4.5V

(D) TEST VOLTAGE : DC 4.5V

Test Procedure Used:

FCC Rules and Regulations Part 15 Subpart C 2008

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:

May.21~ 25, 2009

Prepared by:

  
Selina Liu / Assistant

Reviewer:

  
Jamy Yu / Senior Engineer



Approved & Authorized Signer:

Ken Lu / 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
Power Line Conducted Emission Test	FCC Part 15: 15.207 ANSI C63.4: 2003 DA 00-705	N/A
Radiated Emission Test	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.4: 2003 DA 00-705	PASS
Carrier Frequency Separation Test	FCC Part 15: 15.247(a)(1) DA 00-705	PASS
20dB Bandwidth Test	FCC Part 15: 15.215 DA 00-705	PASS
Number Of Hopping Frequency Test	FCC Part 15: 15.247(a)(1)(iii) DA 00-705	PASS
Dwell Time Test	FCC Part 15: 15.247(a)(1)(iii) DA 00-705	PASS
Maximum Peak Output Power Test	FCC Part 15: 15.247(b)(1) DA 00-705	PASS
Band Edge Compliance Test	FCC Part 15: 15.247(d) DA 00-705	PASS
Antenna requirement	FCC Part 15: 15.203	PASS
N/A is an abbreviation for Not Applicable.		

## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

Description	:	P9 PS Gretsch Wireless Guitar
Model Number	:	PSGTS4
FCC ID	:	VFRPSGTS4
Operation frequency	:	2.408GHz-----2.476GHz ISM Band
Operation Channel	:	16Channels
Modulation Technology		GFSK
Output power	:	0.71dBm(maximum measured)
Antenna Assembly Gain	:	Integrated PCB antenna with 0dBi gain (maximum)
Power Supply	:	DC 4.5V (Note: New batteries were used for all test)
Applicant	:	Harmonix Music Systems, Inc. 675 Massachusetts Avenue, 6 <sup>th</sup> Floor, Cambridge, MA 02139 US
Manufacturer	:	Contel Electronics Technology Co., Ltd. 13/F, Dawning BLDG, 12 KejiNan Rd., SHIP, Shenzhen, China
Date of Test	:	May.21~25, 2009
Date of Receipt	:	May.20, 2009
Sample Type	:	Prototype production

## 2.2. 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 : Mar.31, 2009 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, 2009

Accredited by NVLAP, USA  
NVLAP Code: 200372-0  
Apr. 01, 2009

## 2.3. Measurement Uncertainty

( 95% confidence levels, k=2 )

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.88dB	
Uncertainty for Radiation Emission test in 3m chamber(30MHz to 1GHz)	3.86dB	Polarize: V
	4.3dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber(1GHz to 25GHz)	2.78dB	Polarize: H
	2.82dB	Polarize: V
Uncertainty for radio frequency	$1 \times 10^{-9}$	
Uncertainty for conducted RF Power	0.34dB	
Uncertainty for temperature	0.2°C	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	

### **3. POWER LINE CONDUCTED EMISSION TEST**

According to Paragraph (f) of FCC Part 15 section 15.207, Tests to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

## 4. RADIATED EMISSION TEST

### 4.1. Test Equipment

Frequency rang: 30~1000MHz

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber	AUDIX	N/A	N/A	Dec.05, 08	1/2 Year
2.	EMI Spectrum	Agilent	E4407B	MY41440292	May.08, 09	1 Year
3.	Test Receiver	Rohde & Schwarz	ESVS10	834468/011	May.08, 09	1 Year
4.	Amplifier	HP	8447D	2648A04738	May.08, 09	1/2 Year
5.	Bilog Antenna	Schaffner	CBL6111C	2598	Nov.10, 08	1 Year
6.	RF Cable	JINGCHENG	JBY400	3# Chamber No.1	May.08, 09	1/2 Year
7.	RF Cable	JINGCHENG	JBY400	3# Chamber No.2	May.08, 09	1/2 Year
8.	RF Cable	JINGCHENG	JBY400	3# Chamber No.3	May.08, 09	1/2 Year
9.	RF Cable	JINGCHENG	JBY400	3# Chamber No.4	May.08, 09	1/2 Year
10.	Coaxial Switch	Anritsu	MP59B	M73989	May.08, 09	1/2 Year

Frequency rang: above 1000MHz

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E4446A	US44300459	May.08, 09	1 Year
2.	Horn Antenna	EMCO	3115	9607-4877	May.27, 08	1.5 Year
3.	Horn Antenna	EMCO	3116	00060088	May.27, 08	1 Year
4.	Amplifier	Agilent	8449B	3008A02495	Nov.24, 08	1 Year
5.	RF Cable	Hubersuhner	SUCOFLEX102	28620/2	May.08, 09	1 Year
6.	RF Cable	Hubersuhner	SUCOFLEX102	271471/4	May.08, 09	1 Year
7.	RF Cable	Hubersuhner	SUCOFLEX102	29086/2	May.08, 09	1 Year

### 4.2. Block Diagram of Test Setup

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

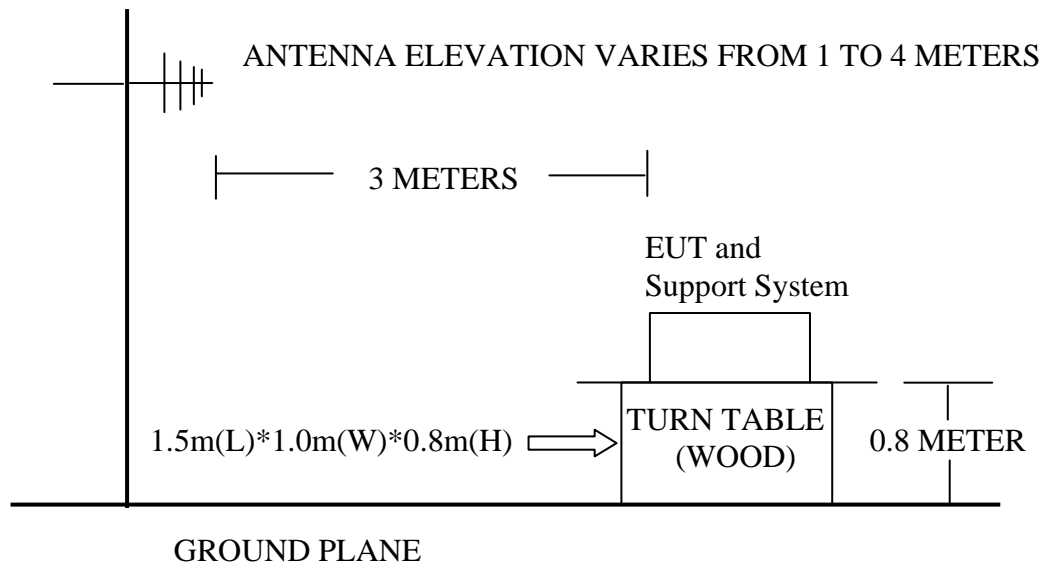
EUT

*(EUT: P9 PS Gretsch Wireless Guitar)*



## 4.2.2. In Anechoic Chamber

## ANTENNA TOWER



## 4.3. Radiated Emission Limit

## 4.3.1.15.209 limits

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
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 960MHz	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

- Remark :
- (1) Emission level  $\text{dB}\mu\text{V} = 20 \log \text{Emission level } \mu\text{V}/\text{m}$
  - (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.

## 4.3.2. 15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 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	2690 - 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	( <sup>2</sup> )

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

## 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.P9 PS Gretsch Wireless Guitar (EUT)

Model Number : PSGTS4  
Serial Number : N/A

## 4.5.Operating Condition of EUT

4.5.1.Setup the EUT as shown in Section 4.2..

4.5.2.Let the EUT worked in test modes (TX Mode) and test it.

## 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 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.

This test was performed with EUT in X, Y, Z position, and the worse case was found when EUT in X position as test photo indicated.

The bandwidth of the EMI test receiver (R&S ESVS10) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 1MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz

The frequency range from 30MHz to 10<sup>th</sup> harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

#### 4.7.Radiated Emission Test Results

**PASS.**

All the emissions from 30MHz to 25 GHz are comply with 15.209 limits

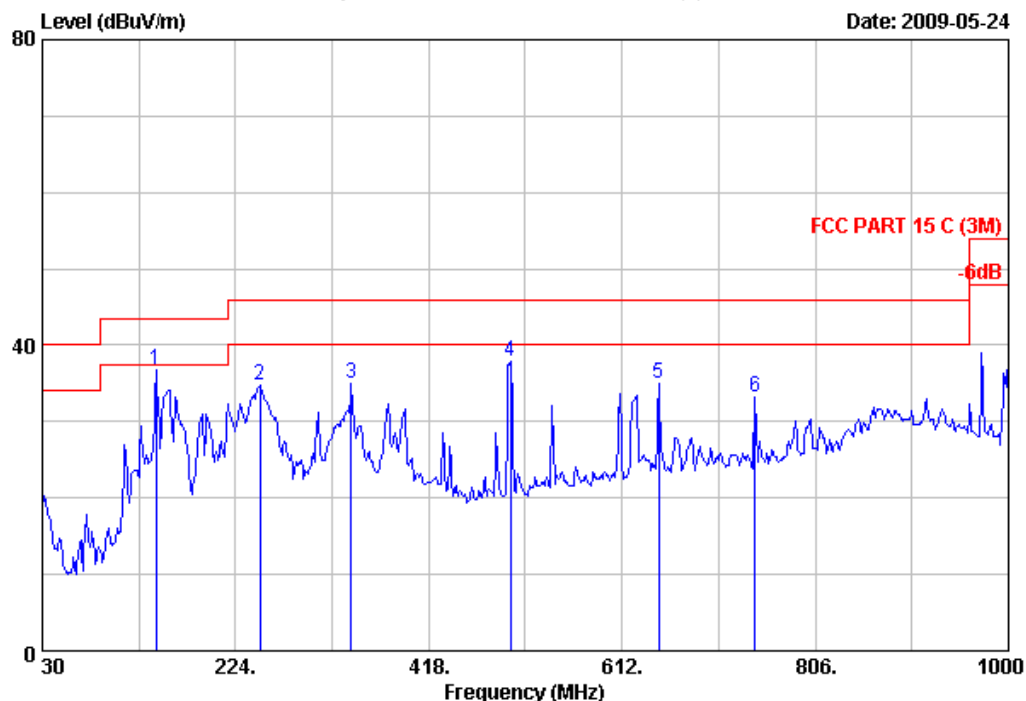
Test Frequency: 30MHz-1000MHz



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Data: 1 File: D:\2009 Report Data\C\contel\ACS9Q728.EM6 (6)

Date: 2009-05-24



Site no. : 3m Chamber Data no. : 1  
Dis. / Ant. : 3m CBL6111C Ant. pol. : HORIZONTAL  
Limit : FCC PART 15 C (3M)  
Env. / Ins. : 24°C/56% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power Rating : DC 4.5V  
Test Mode : Tx Mode  
M/N:PSGTS4

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	144.460	11.78	0.94	51.59	36.83	43.50	6.67	QP
2	248.250	12.44	1.55	47.79	34.73	46.00	11.27	QP
3	340.400	14.71	1.78	45.75	35.08	46.00	10.92	QP
4	500.450	18.04	2.15	45.77	37.84	46.00	8.16	QP
5	648.860	19.98	2.57	40.44	34.89	46.00	11.11	QP
6	745.860	21.47	2.81	36.83	33.19	46.00	12.81	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. The emission levels that are 20dB below the official limit are not reported.

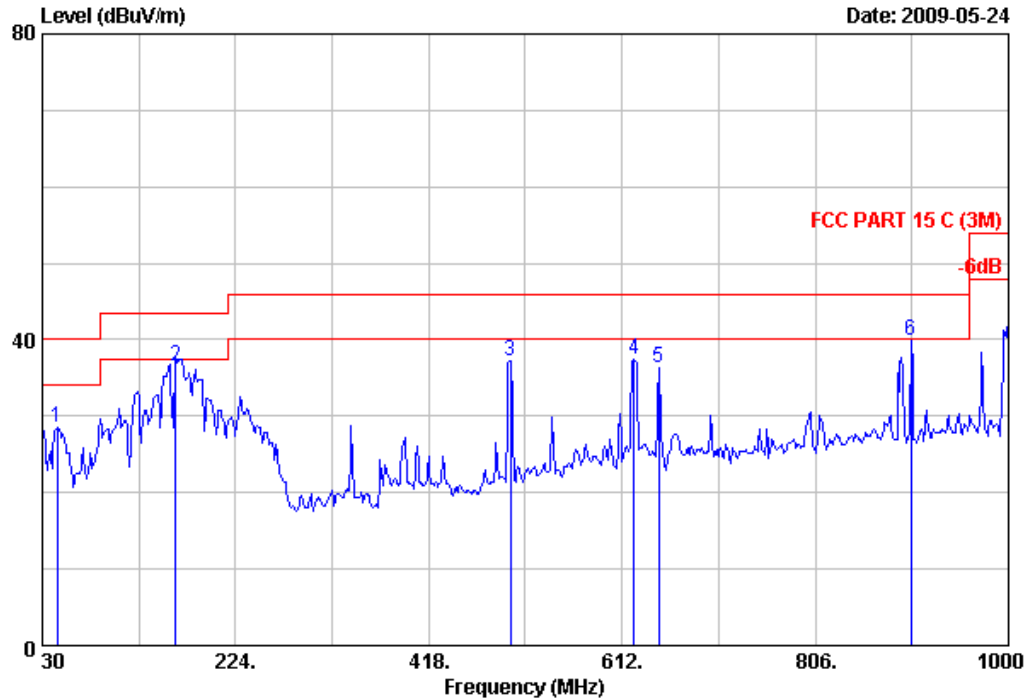


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Data: 2

File: D:\2009 Report Data\C\contel\ACS9Q728.EM6 (6)

Date: 2009-05-24



Site no. : 3m Chamber Data no. : 2  
Dis. / Ant. : 3m CBL6111C Ant. pol. : VERTICAL  
Limit : FCC PART 15 C (3M)  
Env. / Ins. : 24°C/56% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power Rating : DC 4.5V  
Test Mode : Tx Mode  
M/N:PSGTS4

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	44.550	11.71	0.38	44.38	28.58	40.00	11.42	QP
2	163.860	10.66	1.02	52.27	36.56	43.50	6.94	QP
3	500.450	18.04	2.15	45.12	37.19	46.00	8.81	QP
4	623.640	19.85	2.52	43.21	37.44	46.00	8.56	QP
5	648.860	19.98	2.57	41.88	36.33	46.00	9.67	QP
6	902.030	22.67	3.27	41.32	39.79	46.00	6.21	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.  
2. The emission levels that are 20dB below the official limit are not reported.

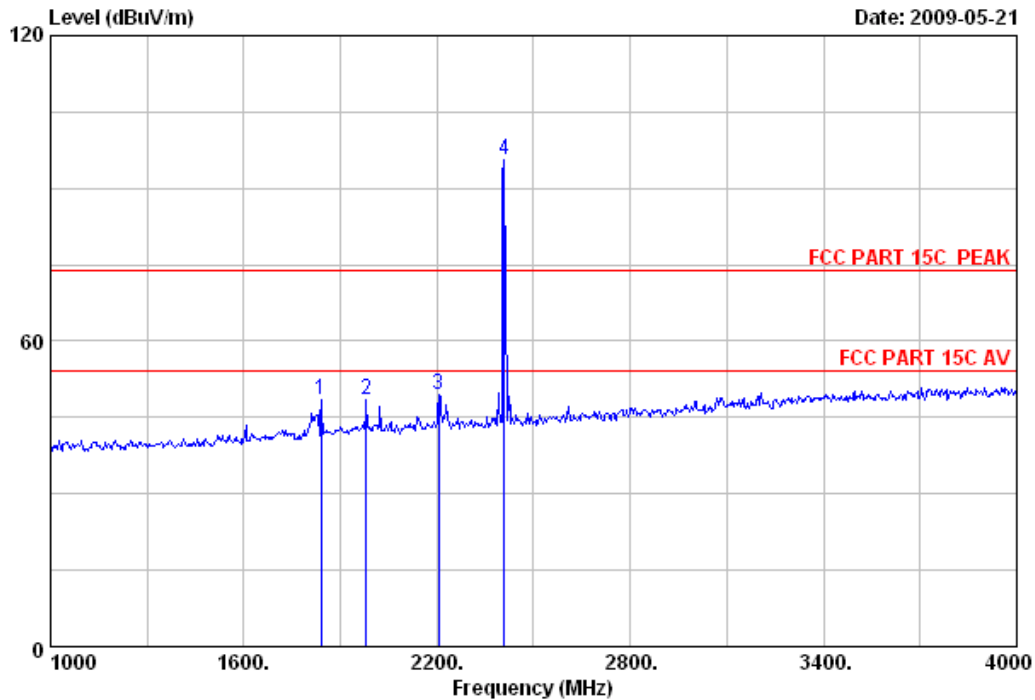
Test Frequency: 1GHz-18GHz



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Data: 2 File: E:\2009 report data\H\harmonix\ACS90728.EM6 (30)

Date: 2009-05-21



Site no. : 3m Chamber Data no. : 2  
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL  
Limit : FCC PART 15C PEAK  
Env. / Ins. : 25°C/49% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power : DC 4.5V  
Test mode : Tx 2408MHz  
M/N : PSGTS4

		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	1840.000	27.23	5.86	35.37	50.70	48.42	74.00	25.58	Peak
2	1981.000	27.83	6.16	35.23	49.81	48.57	74.00	25.43	Peak
3	2206.000	28.19	6.51	35.16	49.77	49.31	74.00	24.69	Peak
4	2408.000	28.48	6.73	35.12	95.59	95.68	74.00	-21.68	Peak

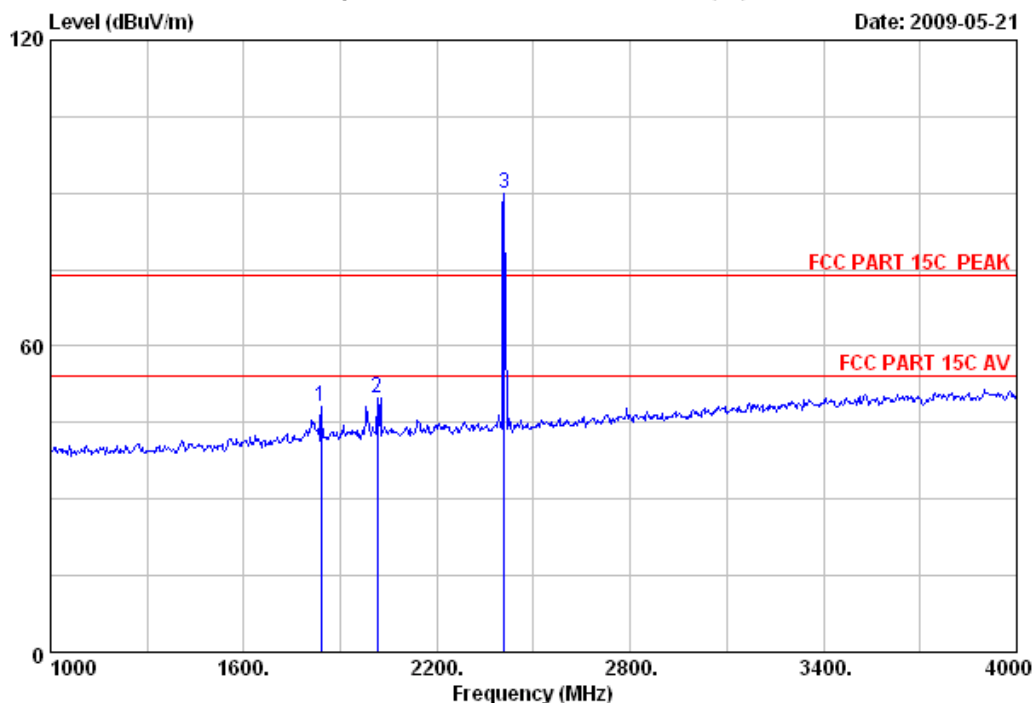
## Remarks:

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. : 3m Chamber Data no. : 1  
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL  
Limit : FCC PART 15C PEAK  
Env. / Ins. : 25°C/49% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power : DC 4.5V  
Test mode : Tx 2408MHz  
M/N : PSGTS4

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	1840.000	27.23	5.86	35.37	50.39	48.11	74.00	25.89	Peak
2	2014.000	27.92	6.23	35.19	50.74	49.70	74.00	24.30	Peak
3	2408.000	28.48	6.73	35.12	89.83	89.92	74.00	-15.92	Peak

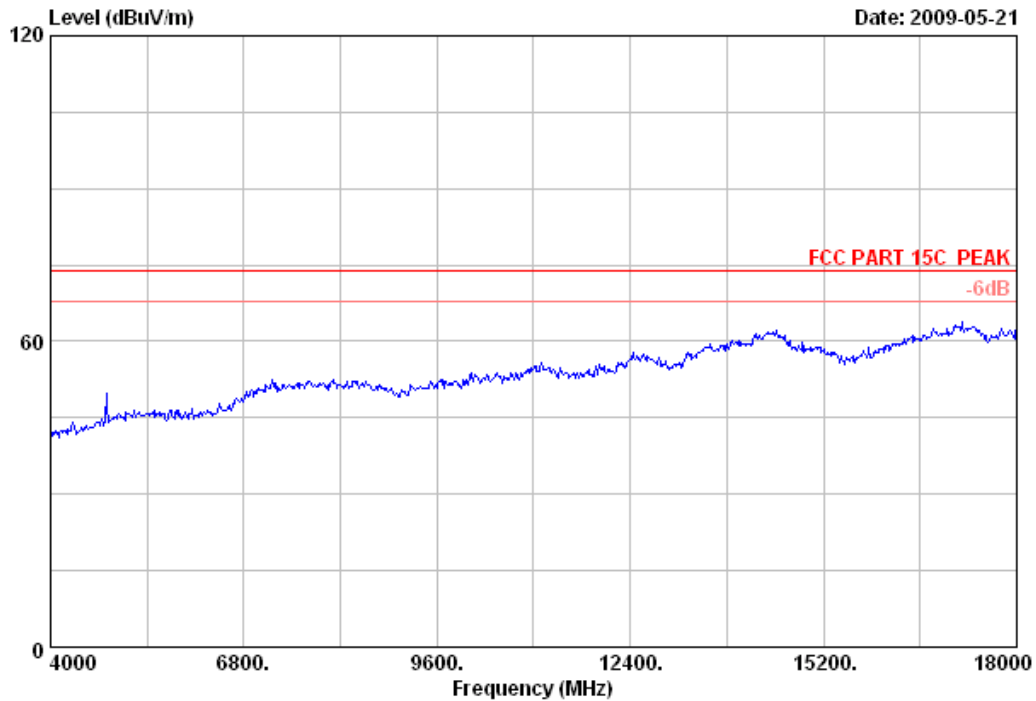
Remarks:

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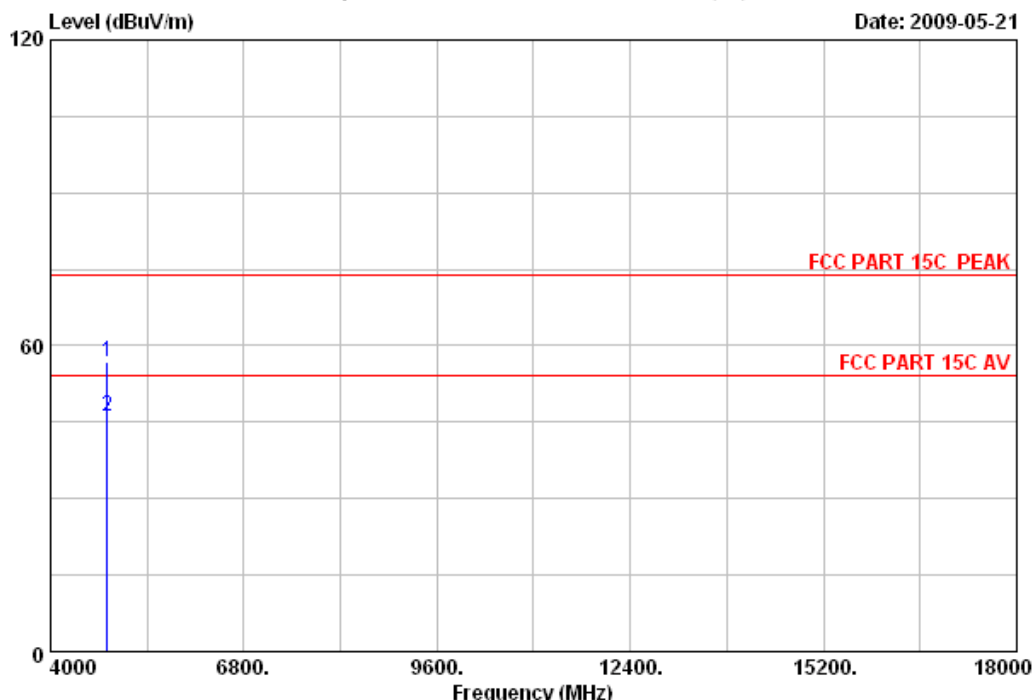
Site no.	: 3m Chamber	Data no.	: 3
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2408MHz		
M/N	: PSGTS4		





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Site no. : 3m Chamber Data no. : 4  
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL  
Limit : FCC PART 15C PEAK  
Env. / Ins. : 25°C/49% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power : DC 4.5V  
Test mode : Tx 2408MHz  
M/N : PSGTS4

		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	4816.000	34.36	10.54	34.59	46.64	56.95	74.00	17.05	Peak
2	4816.000	34.36	10.54	34.59	35.69	46.00	54.00	8.00	Average

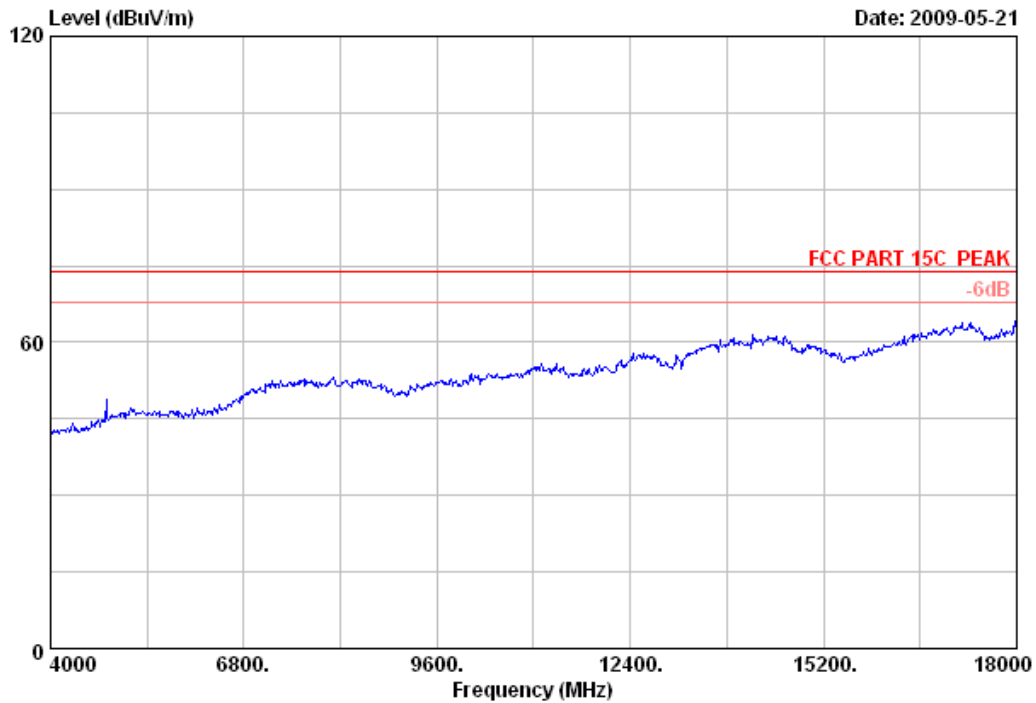
Remarks:

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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Data: 5 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)

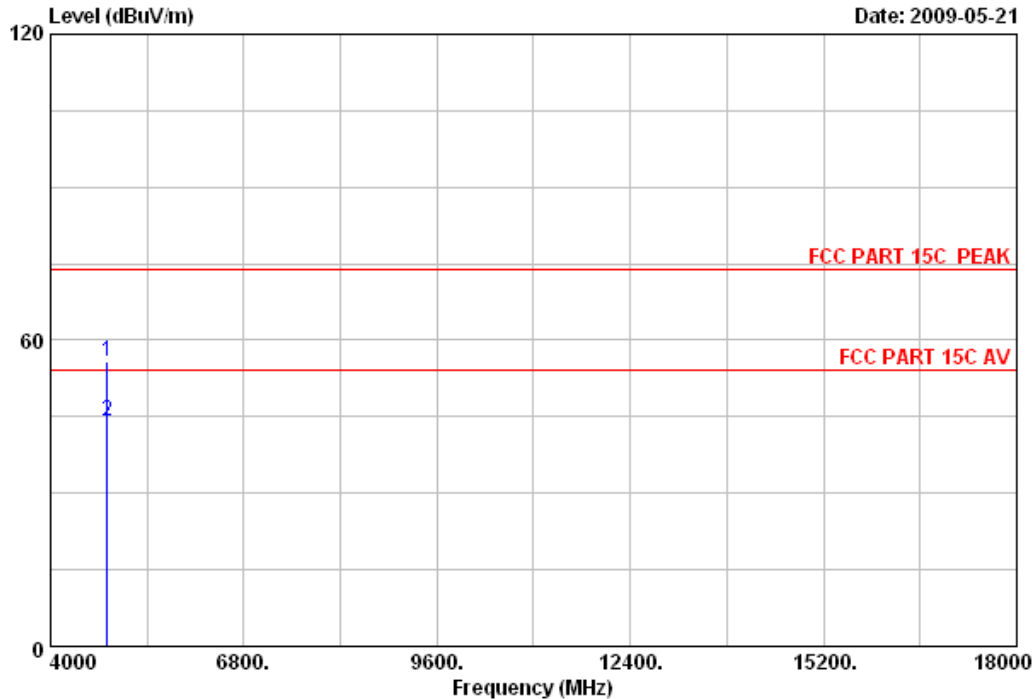


Site no.	: 3m Chamber	Data no.	: 5
Dis. / Ant.	: 3m 3115	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2408MHz		
M/N	: PSGTS4		



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Data: 6 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 6
Dis. / Ant.	: 3m 3115	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2408MHz		
M/N	: PSGTS4		

	Freq.	Ant.	Cable	Amp.		Emission			
	(MHz)	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)	
1	4816.000	34.36	10.54	34.59	45.64	55.95	74.00	18.05	Peak
2	4816.000	34.36	10.54	34.59	33.98	44.29	54.00	9.71	Average

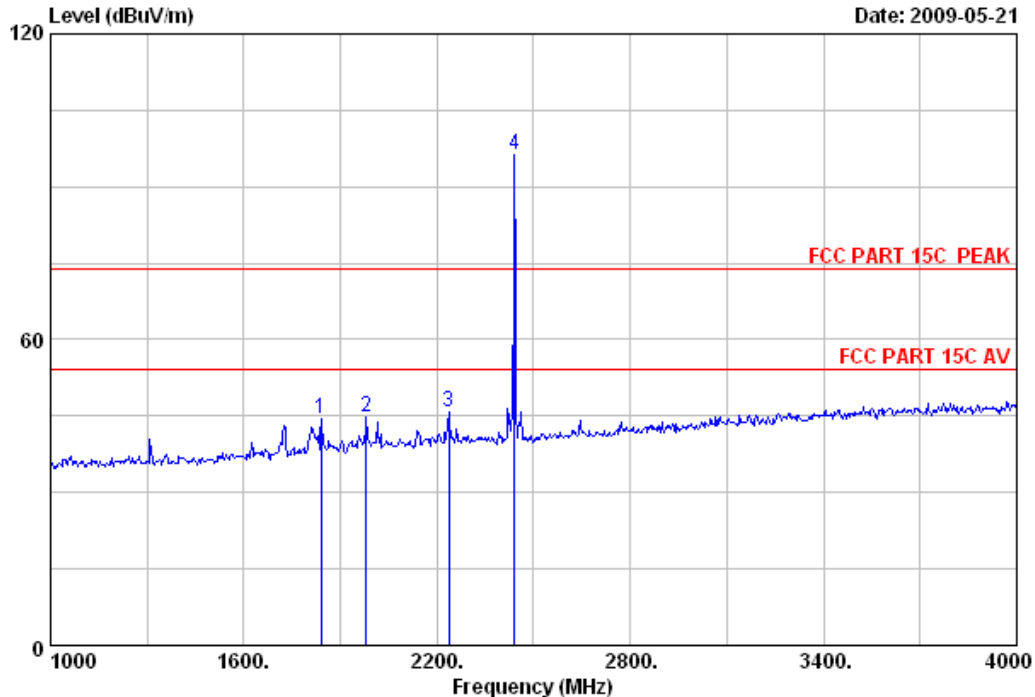
Remarks:

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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Data: 7 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 7
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2440MHz		
M/N	: PSGTS4		

	Freq.	Ant.	Cable	Amp.	Reading	Emission			
	(MHz)	Factor	loss	Factor	(dbuv)	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dB)		(dBuV/m)	(dBuV/m)	(dB)	
1	1840.000	27.23	5.86	35.37	46.75	44.47	74.00	29.53	Peak
2	1981.000	27.83	6.16	35.23	45.92	44.68	74.00	29.32	Peak
3	2236.000	28.24	6.53	35.15	46.33	45.95	74.00	28.05	Peak
4	2440.000	28.53	6.80	35.11	96.10	96.32	74.00	-22.32	Peak

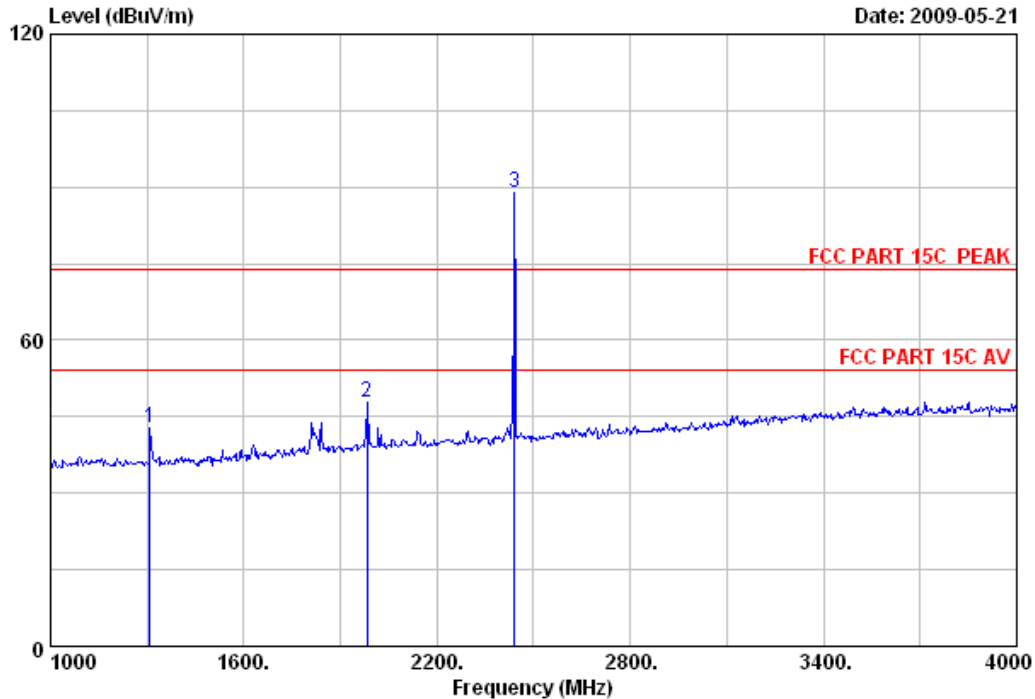
Remarks:

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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Data: 8 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no. : 3m Chamber Data no. : 8  
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL  
Limit : FCC PART 15C PEAK  
Env. / Ins. : 25°C/49% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power : DC 4.5V  
Test mode : Tx 2440MHz  
M/N : PSGTS4

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	1309.000	25.63	4.95	35.96	48.19	42.81	74.00	31.19	Peak
2	1984.000	27.83	6.16	35.20	48.89	47.68	74.00	26.32	Peak
3	2440.000	28.53	6.80	35.11	88.64	88.86	74.00	-14.86	Peak

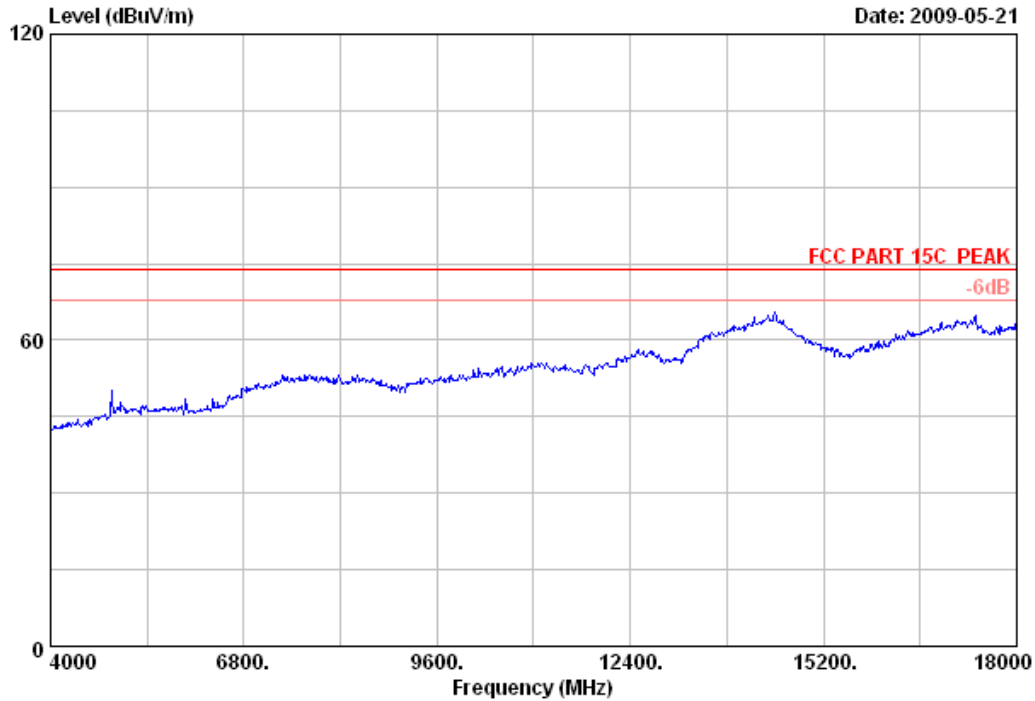
Remarks:

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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Data: 11 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)

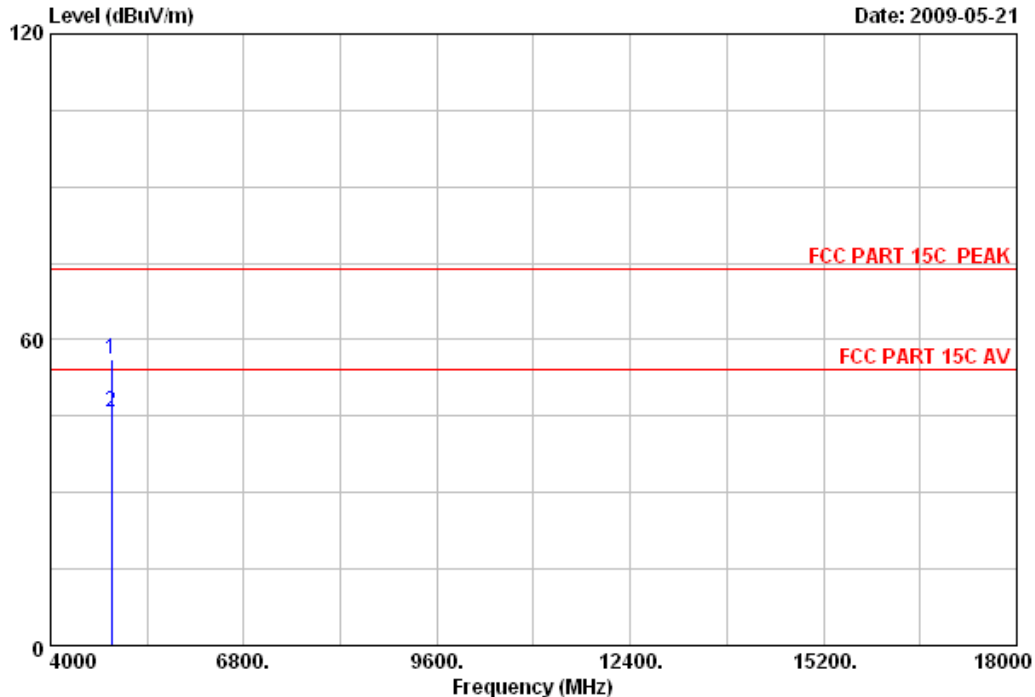


Site no.	: 3m Chamber	Data no.	: 11
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2440MHz		
M/N	: PSGTS4		



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Data: 12 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 12
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2440MHz		
M/N	: PSGTS4		

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	4880.000	34.78	10.56	34.58	45.51	56.27	74.00	17.73	Peak
2	4880.000	34.78	10.56	34.58	35.08	45.84	54.00	8.16	Average

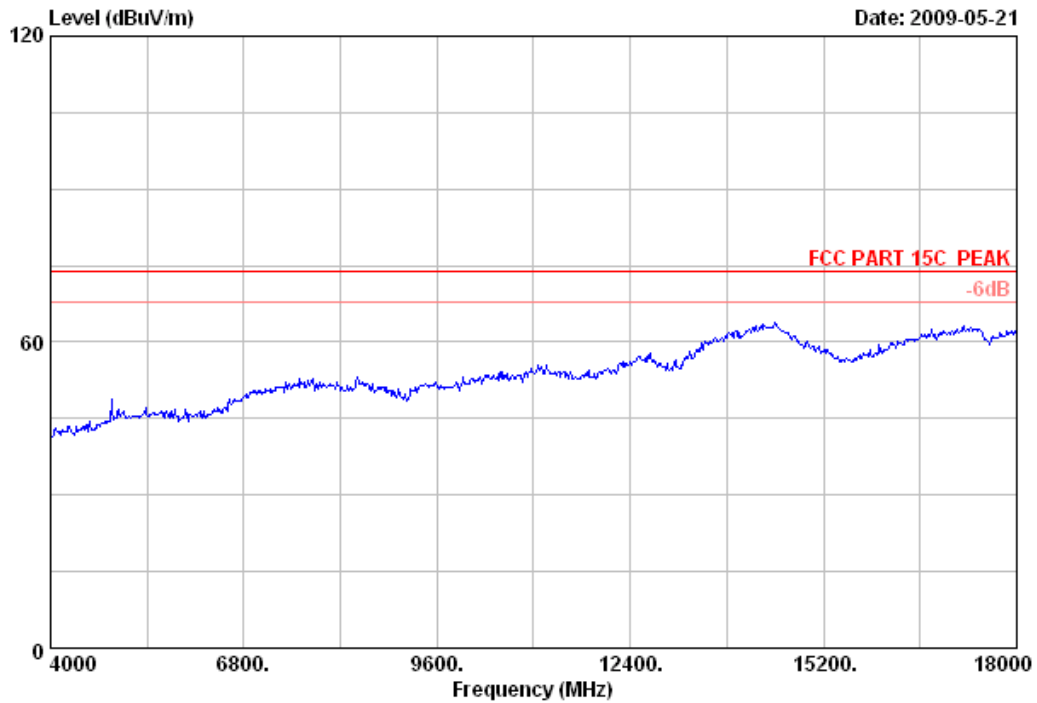
Remarks:

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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Data: 9 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 9
Dis. / Ant.	: 3m 3115	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2440MHz		
M/N	: PSGTS4		



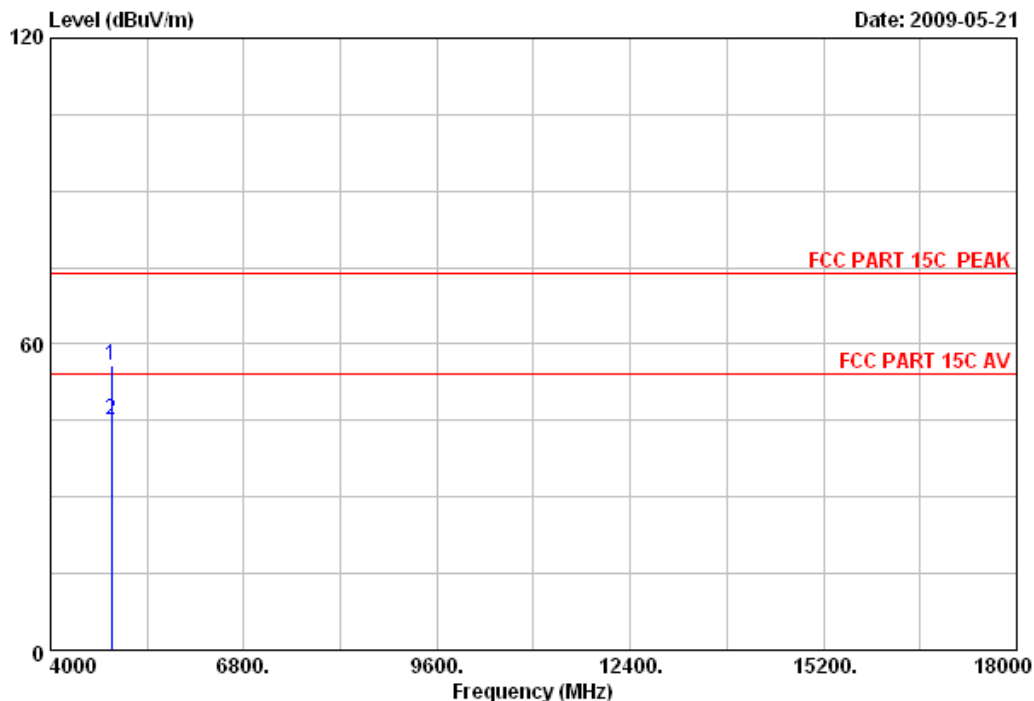


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Data: 10

File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)

Date: 2009-05-21



Site no.	: 3m Chamber	Data no.	: 10
Dis. / Ant.	: 3m 3115	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2440MHz		
M/N	: PSGTS4		

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	4880.000	34.78	10.56	34.58	44.91	55.67	74.00	18.33	Peak
2	4880.000	34.78	10.56	34.58	34.25	45.01	54.00	8.99	Average

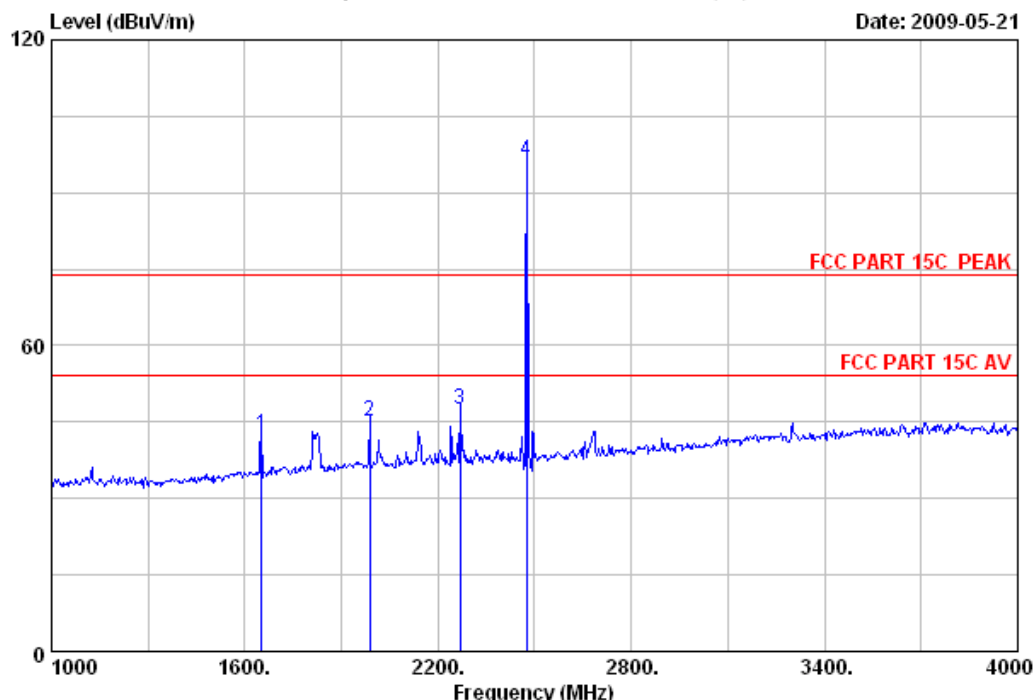
## Remarks:

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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Data: 13 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 13
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2476MHz		
M/N	: PSGTS4		

	Freq.	Ant.	Cable	Amp.	Reading	Emission			
	(MHz)	Factor	loss	Factor	(dbuv)	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dB)		(dBuV/m)	(dBuV/m)	(dB)	
1	1651.000	26.50	5.53	35.57	45.87	42.33	74.00	31.67	Peak
2	1987.000	27.83	6.16	35.20	46.18	44.97	74.00	29.03	Peak
3	2269.000	28.29	6.58	35.14	47.86	47.59	74.00	26.41	Peak
4	2476.000	28.58	6.87	35.10	95.88	96.23	74.00	-22.23	Peak

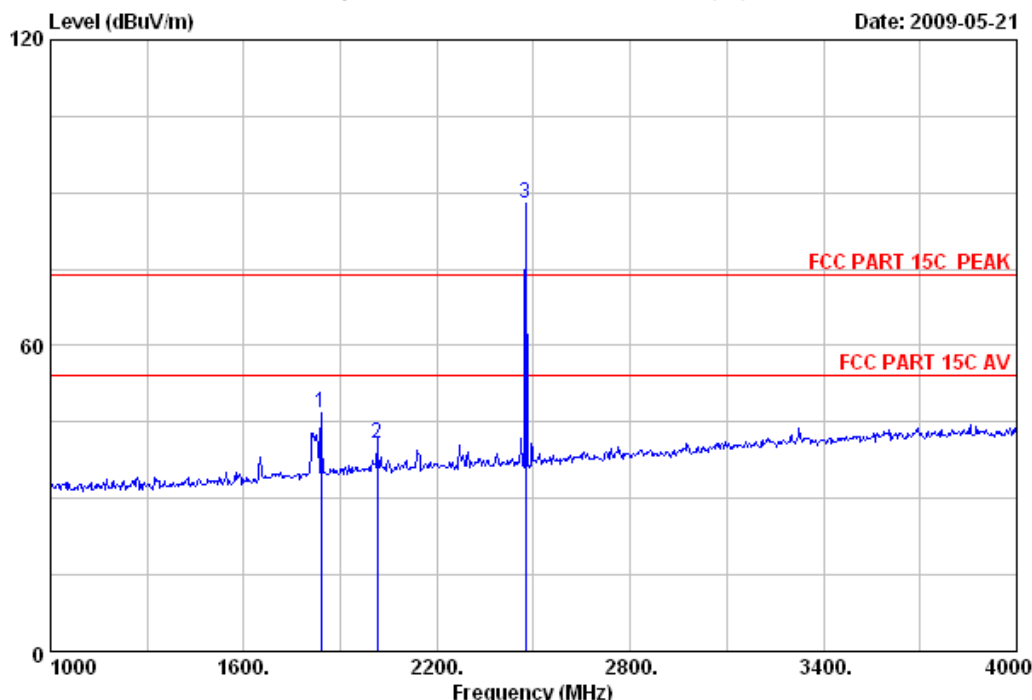
Remarks:

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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Data: 14 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 14
Dis. / Ant.	: 3m 3115	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2476MHz		
M/N	: PSGTS4		

	Freq.	Ant.	Cable	Amp.		Emission			
	(MHz)	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)	
1	1840.000	27.23	5.86	35.37	49.13	46.85	74.00	27.15	Peak
2	2014.000	27.92	6.23	35.19	41.93	40.89	74.00	33.11	Peak
3	2476.000	28.58	6.87	35.10	87.53	87.88	74.00	-13.88	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.

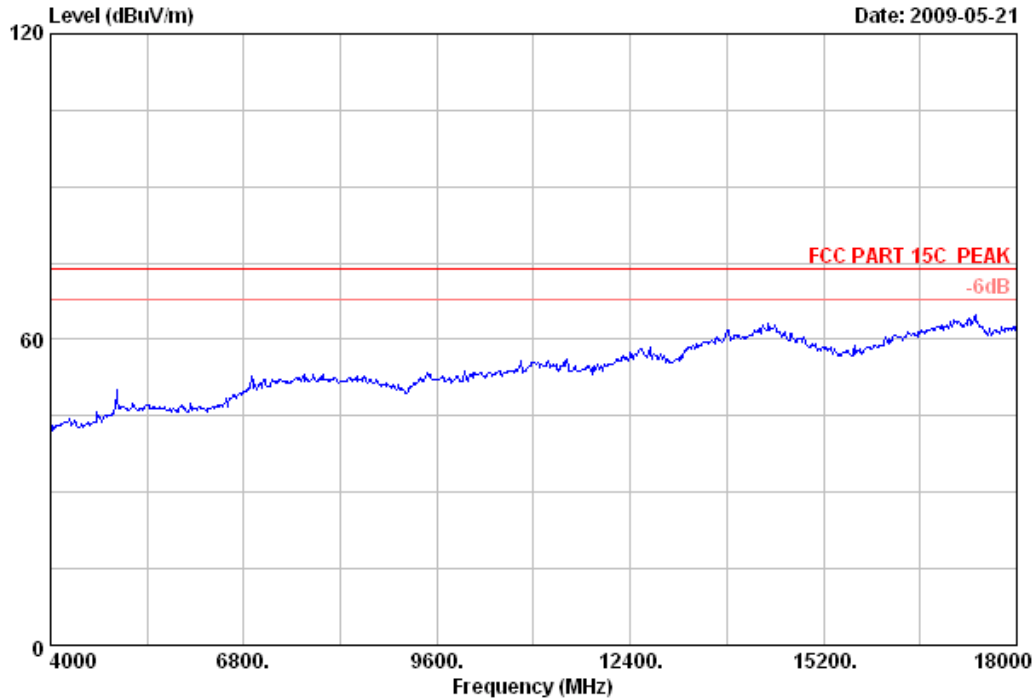


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Data: 17

File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)

Date: 2009-05-21

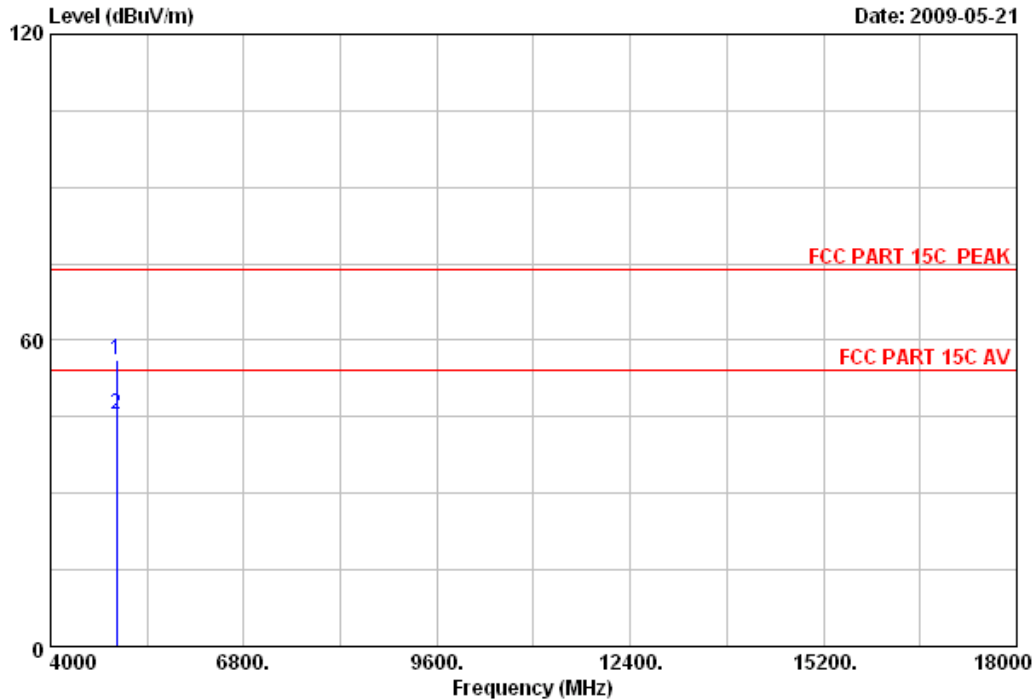


Site no.	: 3m Chamber	Data no.	: 17
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2476MHz		
M/N	: PSGTS4		



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Data: 18 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 18
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2476MHz		
M/N	: PSGTS4		

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	4952.000	35.19	10.58	34.56	44.91	56.12	74.00	17.88	Peak
2	4952.000	35.19	10.58	34.56	34.24	45.45	54.00	8.55	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.

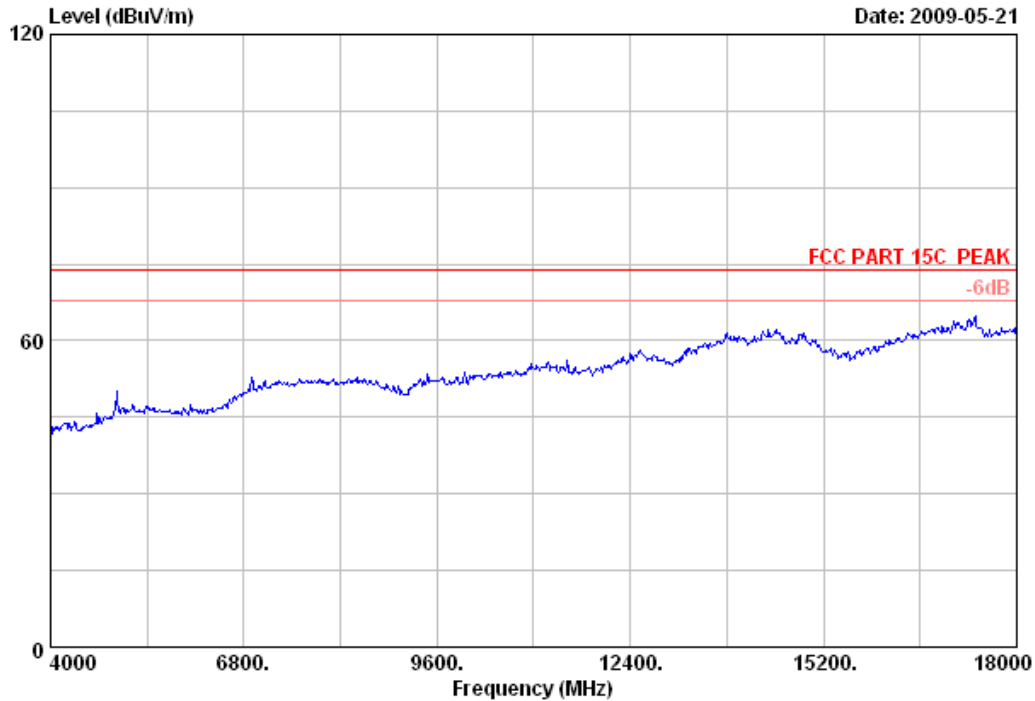


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Data: 15

File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)

Date: 2009-05-21

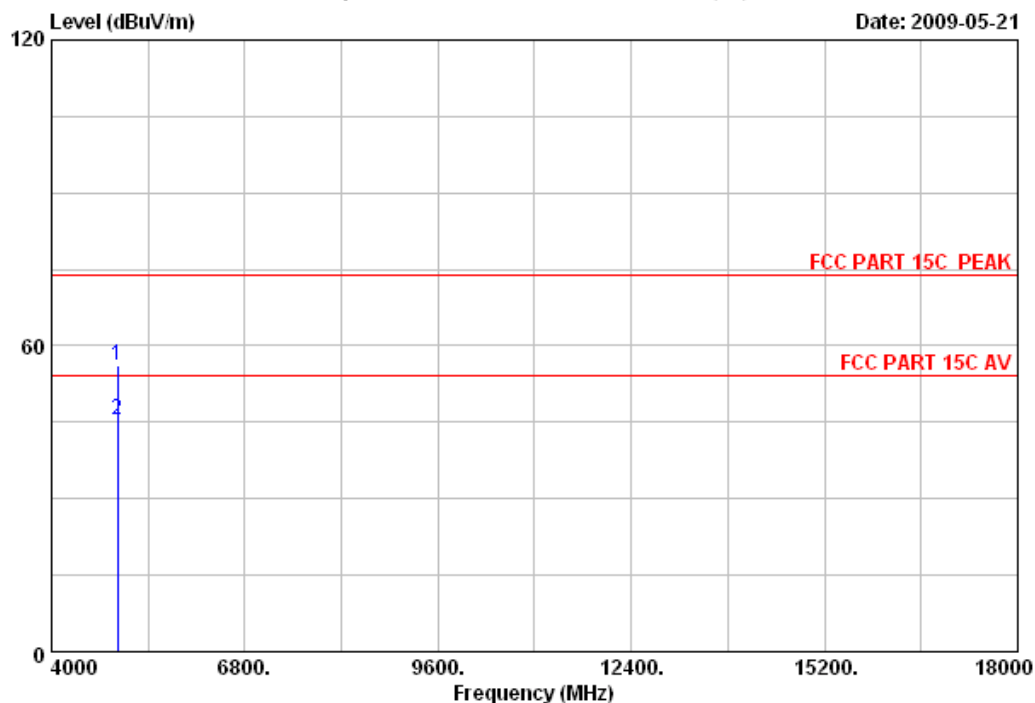


Site no.	: 3m Chamber	Data no.	: 15
Dis. / Ant.	: 3m 3115	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2476MHz		
M/N	: PSGTS4		



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Data: 16 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 16
Dis. / Ant.	: 3m 3115	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2476MHz		
M/N	: PSGTS4		

	Freq.	Ant.	Cable	Amp.		Emission			
	(MHz)	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)	
1	4952.000	35.19	10.58	34.56	44.91	56.12	74.00	17.88	Peak
2	4952.000	35.19	10.58	34.56	34.15	45.36	54.00	8.64	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.

## 5. CARRIER FREQUENCY SEPARATION TEST

### 5.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4446A	US44300459	May.08, 09	1 Year

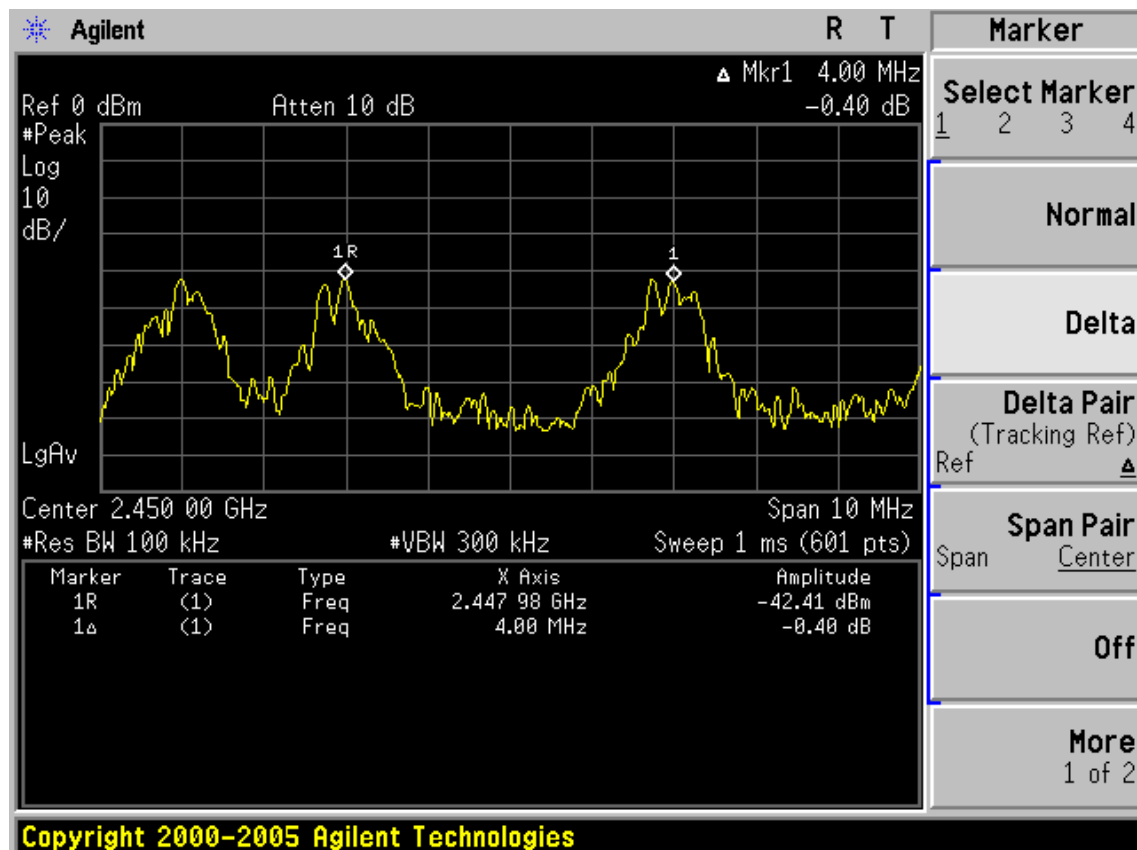
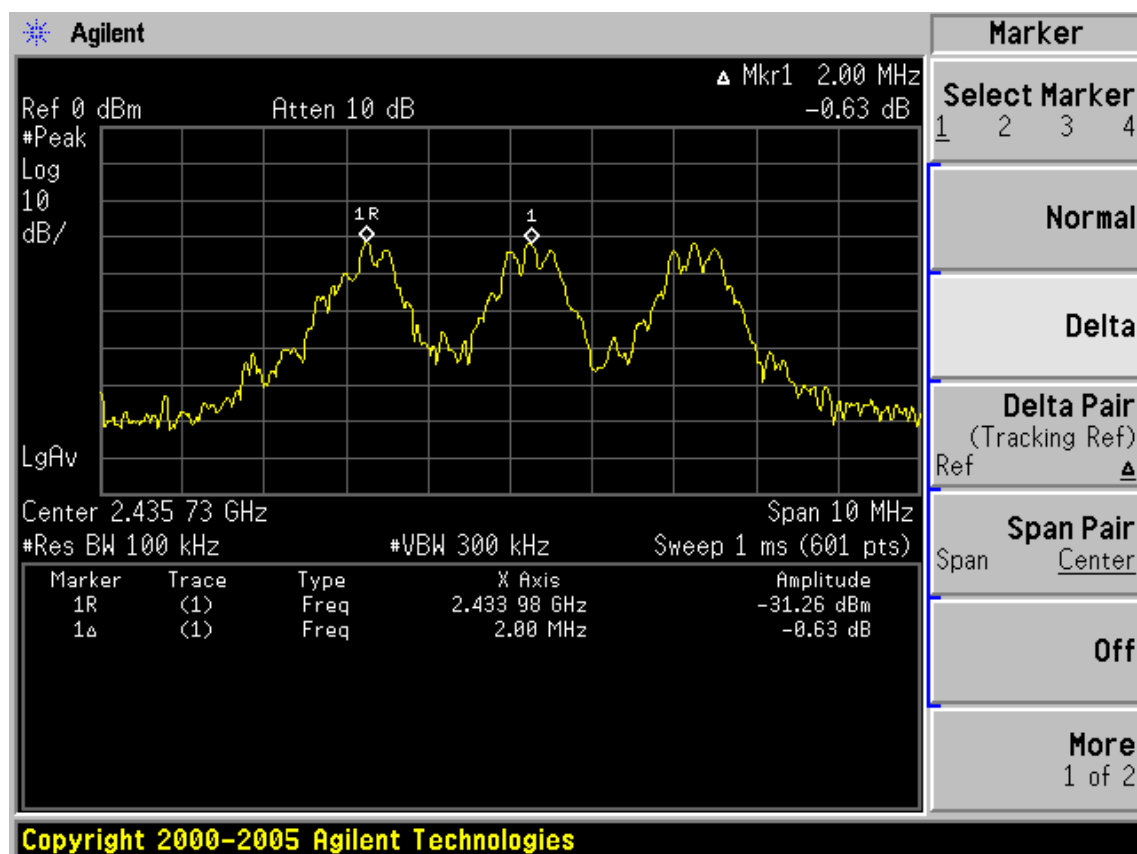
### 5.2. Limit

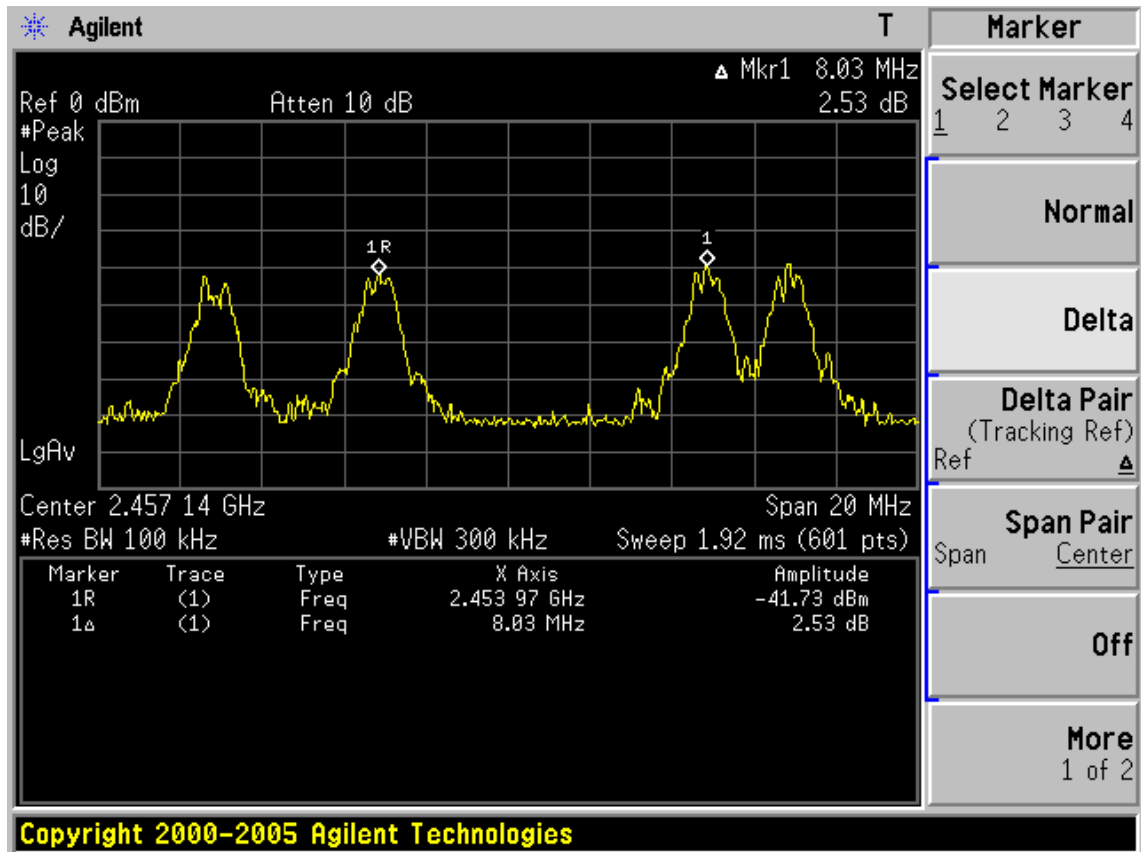
Frequency hopping systems shall have hopping channel carrier frequency separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

### 5.3. Test Results.

CH	Channel separation	Conclusion
Low	2.00MHz	PASS
Mid	4.00MHz	PASS
High	8.03.MHz	PASS







## 6. 20 DB BANDWIDTH TEST

### 6.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4446A	US44300459	May,08, 09	1 Year
2	Attenuator	Agilent	8491B	MY39262165	May,08, 09	1 Year
3	RF Cable	Hubersuhner	SUCOFLEX 102	28618/2	May,08, 09	1 Year

### 6.2.Test Procedure

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.

### 6.3.Test Results

CH	20dB Bandwidth (MHz)	Limit (kHz)	Conclusion
(Low)	1.23	---	PASS
(Mid)	1.22	---	PASS
(High)	1.27	---	PASS

Agilent R T

Test Frequency: 2.406 MHz

Ref 0 dBm Atten 10 dB

#Peak Log 10 dB/

DI -53.3 dBm LgAv

V1 S2

Center 2.407 92 GHz Span 10 MHz

#Res BW 100 kHz #VBW 300 kHz Sweep 13.4 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.407 92 GHz	-33.26 dBm
2R	(1)	Freq	2.407 30 GHz	-54.51 dBm
2Δ	(1)	Freq	1.23 MHz	-0.02 dB

Agilent R T

Test Frequency: 2.43992 GHz

Ref 0 dBm Atten 10 dB

▲ Mkr2 1.22 MHz 0.55 dB

#Peak Log 10 dB/

DI -53.6 dBm LgAv

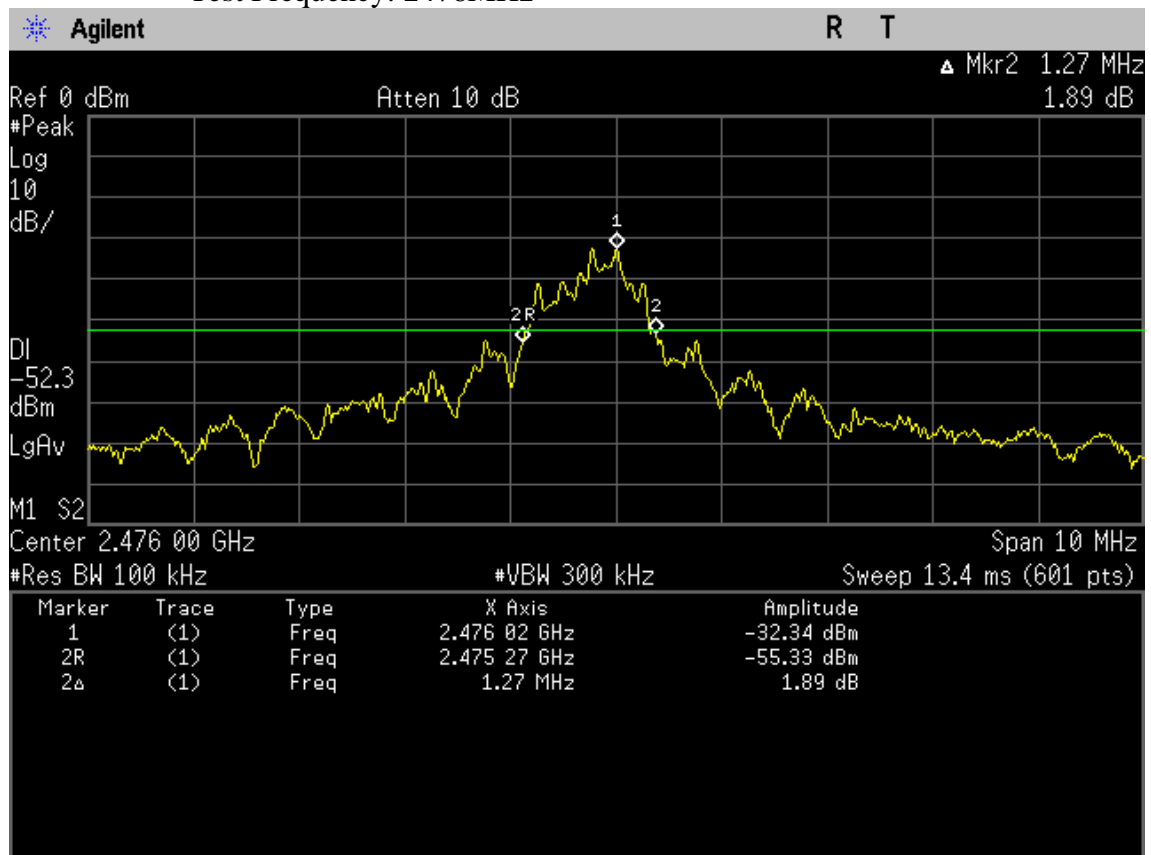
V1 S2

Center 2.439 92 GHz Span 10 MHz

#Res BW 100 kHz #VBW 300 kHz Sweep 13.4 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.439 92 GHz	-33.58 dBm
2R	(1)	Freq	2.439 30 GHz	-54.19 dBm
2Δ	(1)	Freq	1.22 MHz	0.55 dB

Test Frequency: 2476MHz



## 7. NUMBER OF HOPPING FREQUENCY TEST

### 7.1. Test Equipment

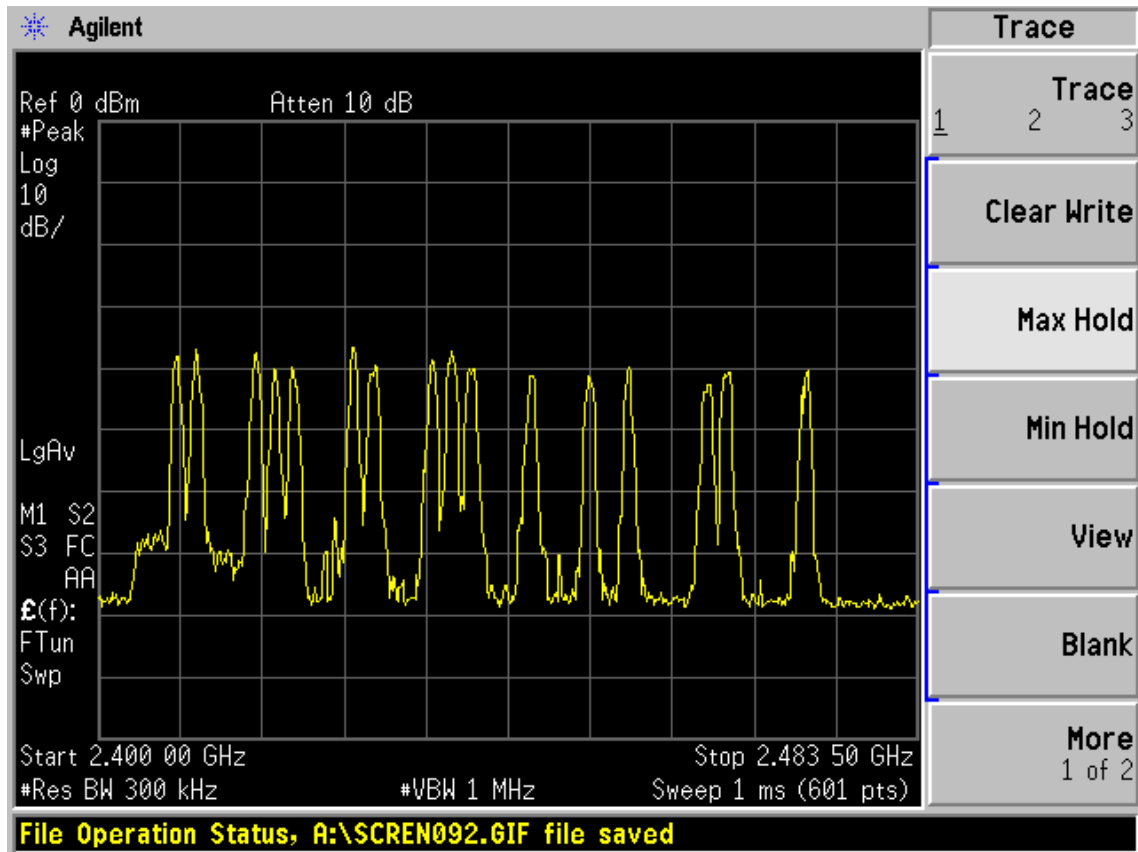
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4446A	US44300459	May.08, 09	1 Year
2	Attenuator	Agilent	8491B	MY39262165	May,08, 09	1 Year
3	RF Cable	Hubersuhner	SUCOFLEX 102	28618/2	May,08, 09	1Year

### 7.2. Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

### 7.3. Test Results

Number of channel	Limit	Conclusion
16	$\geq 15$	PASS



## 8. DWELL TIME

### 8.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4446A	US44300459	May.08, 09	1 Year
2	Attenuator	Agilent	8491B	MY39262165	May,08, 09	1 Year
3	RF Cable	Hubersuhner	SUCOFLEX 102	28618/2	May,08, 09	1 Year

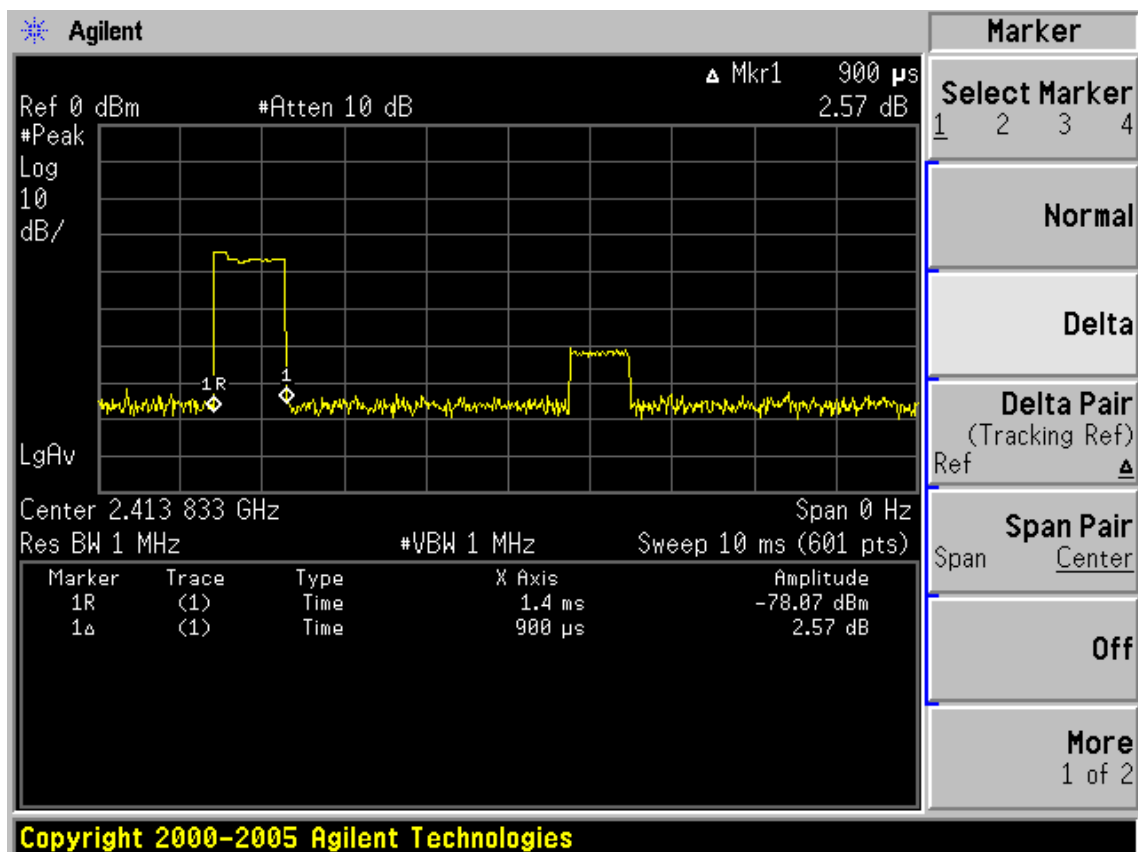
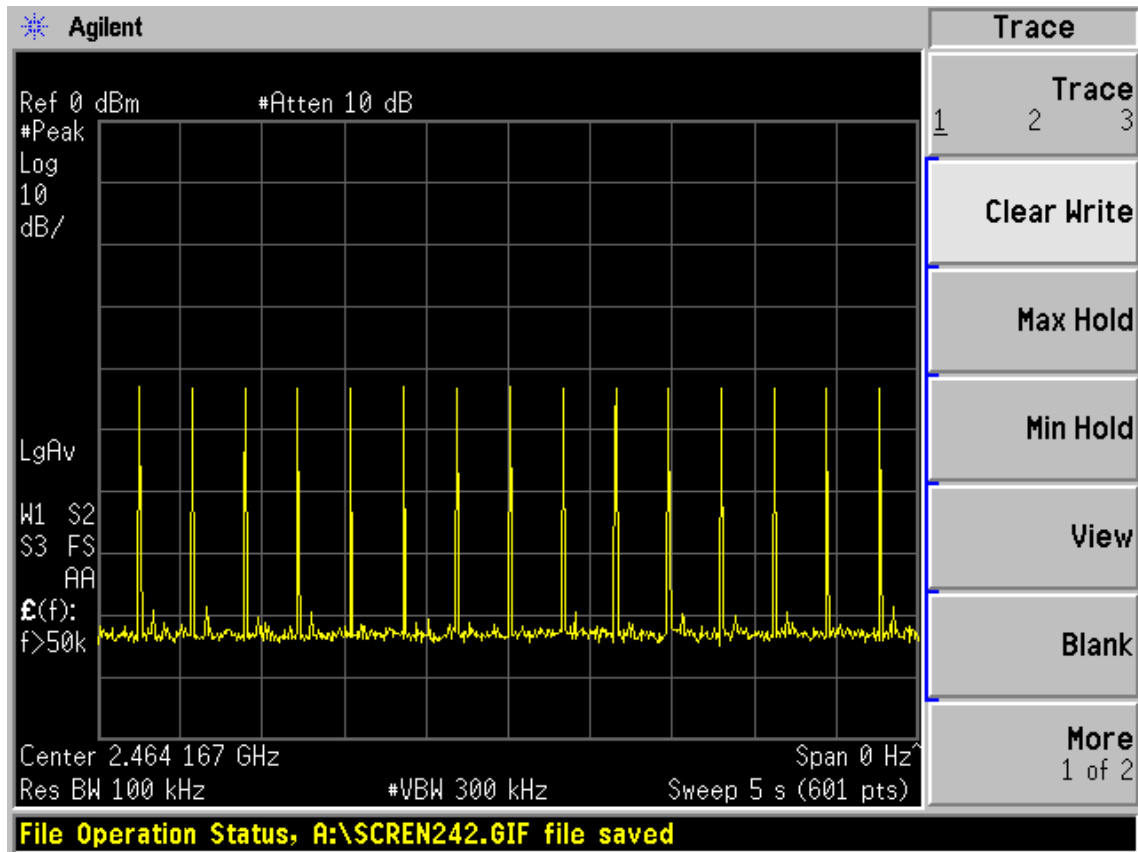
### 8.2. Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

### 8.3. Test Results

dwel time	Limit	Conclusion
$15\text{hops}/5\text{s} \times 0.4 \times 16\text{channels} \times 0.9\text{ms} = 17.28\text{ ms}$	<400ms	PASS





## 9. MAXIMUM PEAK OUTPUT POWER TEST

### 9.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E4446A	US44300459	May.08, 09	1 Year
2.	Horn Antenna	EMCO	3115	9607-4877	May. 27, 08	1.5 Year
3.	Horn Antenna	EMCO	3115	9510-4580	May.10, 08	1.5 Year
4.	Signal Generator	HP	83732B	VS3449051	May,08, 09	1 Year
5.	Amplifier	Agilent	8449B	3008A02495	Nov.24.08	1 Year
6.	RF Cable	Hubersuhner	SUCOFLEX 102	28620/2	May,08, 09	1 Year
7.	RF Cable	Hubersuhner	SUCOFLEX 102	271471/4	May,08, 09	1 Year
8.	RF Cable	Hubersuhner	SUCOFLEX 102	29086/2	May,08, 09	1 Year
9.	RF Cable	Hubersuhner	SUCOFLEX 102	271473/4	May,08, 09	1 Year
10.	RF Cable	Hubersuhner	SUCOFLEX 102	29091/2	May,08, 09	1 Year

### 9.2. Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

### 9.3. 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.

## 9.4. Test Results

EUT: P9 PS Gretsch Wireless Guitar					M/N: PSGTS4				
Power: DC 4.5V									
Test Date: 2009/05/22			Test site: RF Chamber			Engineer: Sunny-lu			
Ambient Temperature: 25℃			Relative Humidity: 56%						
Test mode: TX Mode									
CH	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	2408	H	95.68	-2.57	6.06	9.25	0.62	20.97	20.35
	2408	V	89.92	-3.30	6.06	9.25	-0.11	20.97	21.08
Mid	2440	H	96.32	-2.58	6.08	9.30	0.64	20.97	20.33
	2440	V	88.86	-3.34	6.08	9.30	-0.12	20.97	21.09
Hig	2476	H	96.23	-2.47	6.15	9.33	0.71	20.97	20.26
	2476	V	87.88	-3.33	6.15	9.33	-0.15	20.97	21.12
Result = SG Reading – Tx Cable Loss + Tx Antenna Gain –EUT Antenna gain (0dBi)									

## 10.BAND EDGE COMPLIANCE TEST

### 10.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4446A	US44300459	May.08, 09	1 Year
2	Horn Antenna	EMCO	3115	9607-4877	May, 27, 08	1.5 Year
3	Amplifier	Agilent	8449B	3008A02495	Nov.24.08	1 Year
4	RF Cable	Hubersuhner	SUCOFLEX 102	28620/2	May.08, 09	1 Year
5	RF Cable	Hubersuhner	SUCOFLEX 102	271471/4	May.08, 09	1 Year
6	RF Cable	Hubersuhner	SUCOFLEX 102	29086/2	May.08, 09	1 Year

### 10.2.Limit

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

### 10.3.Test Produce

1. The EUT is placed on a turntable, which is 0.8m above the ground plane and worked at highest radiated power.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upperband-edges of the emission:
  - (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
  - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

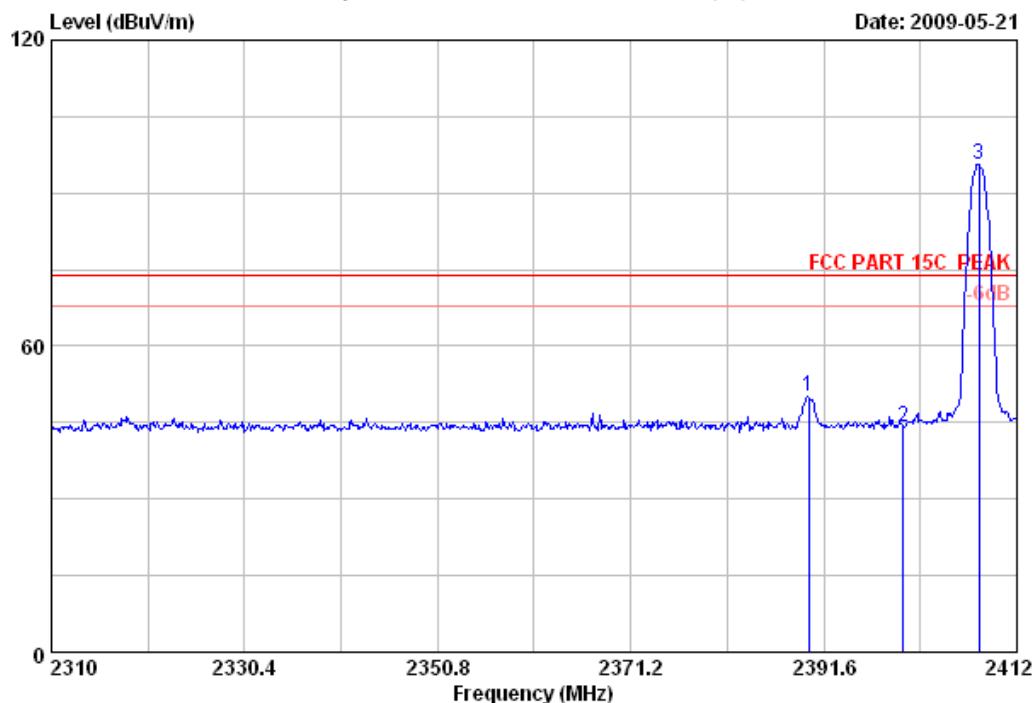
### 10.4.Test Results

Pass (The testing data was attached in the next pages.)



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Data: 21 File: E:\2009 report data\H\harmonix\ACS90728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 21
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2408MHz		
M/N	: PSGTS4		

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	28.46	6.71	35.12	50.01	50.06	74.00	23.94	Peak
2	2400.000	28.46	6.73	35.12	44.06	44.13	74.00	29.87	Peak
3	2408.000	28.48	6.73	35.12	95.52	95.61	74.00	-21.61	Peak

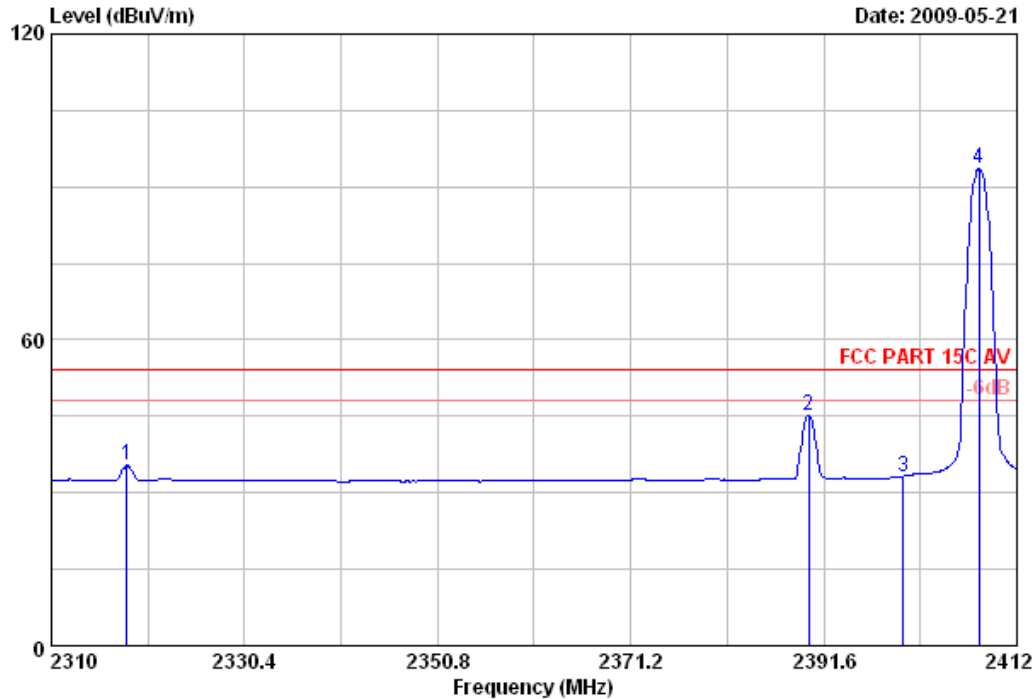
Remarks:

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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Data: 22 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 22
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C AV		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2408MHz		
M/N	: PSGTS4		

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2317.956	28.36	6.65	35.13	35.43	35.31	54.00	18.69	Average
2	2390.000	28.46	6.71	35.12	45.04	45.09	54.00	8.91	Average
3	2400.000	28.46	6.73	35.12	33.13	33.20	54.00	20.80	Average
4	2408.000	28.48	6.73	35.12	93.49	93.58	54.00	-39.58	Average

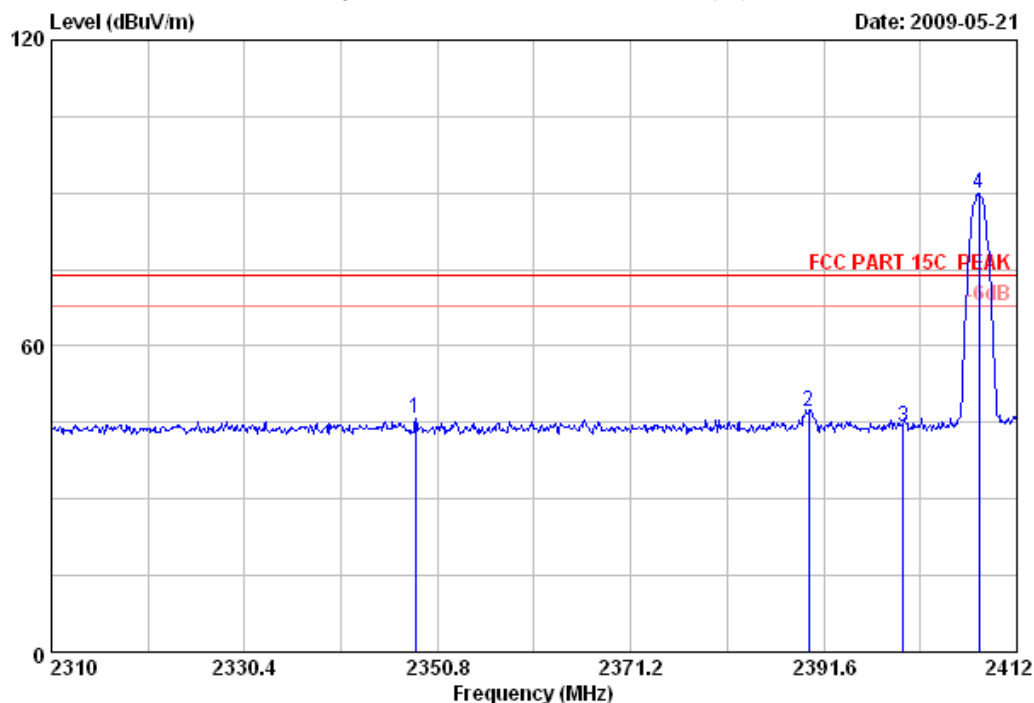
Remarks:

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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Data: 19 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no. : 3m Chamber Data no. : 19  
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL  
Limit : FCC PART 15C PEAK  
Env. / Ins. : 25°C/49% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power : DC 4.5V  
Test mode : Tx 2408MHz  
M/N : PSGTS4

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2348.454	28.38	6.67	35.13	45.76	45.68	74.00	28.32	Peak
2	2390.000	28.46	6.71	35.12	47.02	47.07	74.00	26.93	Peak
3	2400.000	28.46	6.73	35.12	44.08	44.15	74.00	29.85	Peak
4	2408.000	28.48	6.73	35.12	89.71	89.80	74.00	-15.80	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.

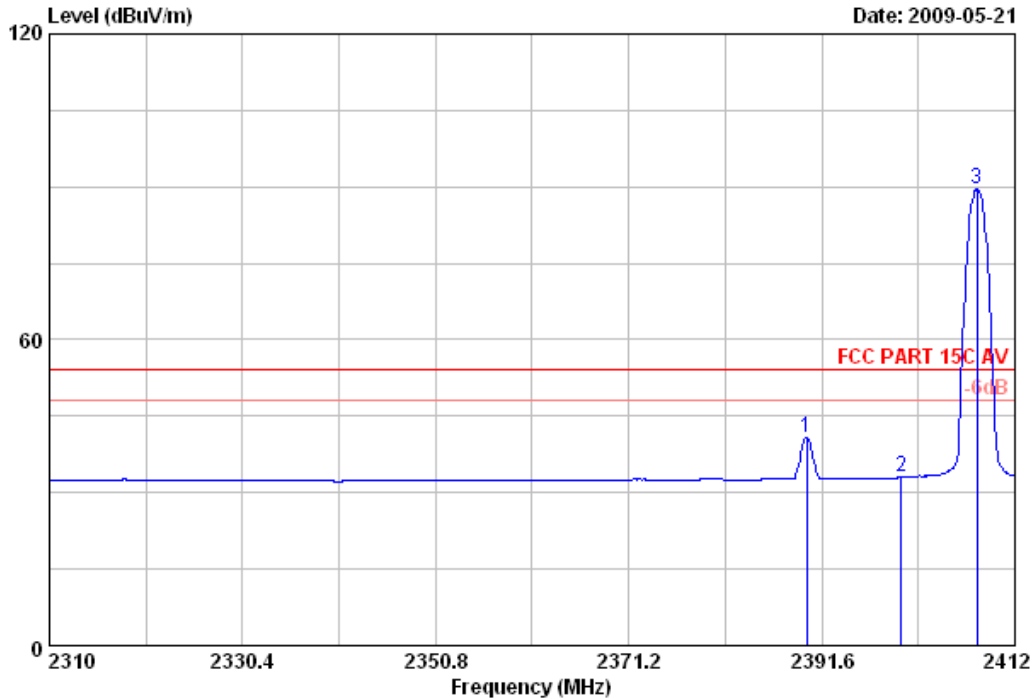


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Data: 20

File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)

Date: 2009-05-21



Site no. : 3m Chamber Data no. : 20  
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL  
Limit : FCC PART 15C AV  
Env. / Ins. : 25°C/49% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power : DC 4.5V  
Test mode : Tx 2408MHz  
M/N : PSGTS4

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	28.46	6.71	35.12	40.59	40.64	54.00	13.36	Average
2	2400.000	28.46	6.73	35.12	32.91	32.98	54.00	21.02	Average
3	2408.000	28.48	6.73	35.12	89.49	89.58	54.00	-35.58	Average

## Remarks:

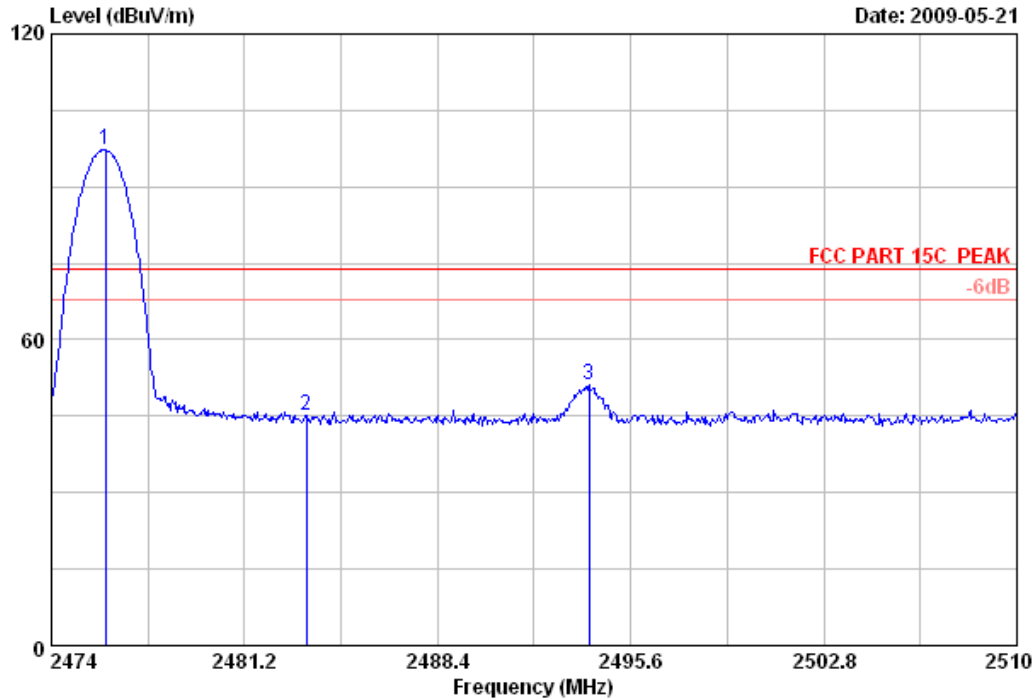
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.





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Data: 23 File: E:\2009 report data\H\harmonix\ACS90728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 23
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2476MHz		
M/N	: PSGTS4		

	Freq.	Ant.	Cable	Amp.		Emission			
	(MHz)	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dB)	(dbuv)	(dBuV/m)	(dBuV/m)	(dB)	
1	2476.000	28.58	6.87	35.10	96.81	97.16	74.00	-23.16	Peak
2	2483.500	28.58	6.87	35.10	44.79	45.14	74.00	28.86	Peak
3	2494.052	28.60	6.91	35.10	50.87	51.28	74.00	22.72	Peak

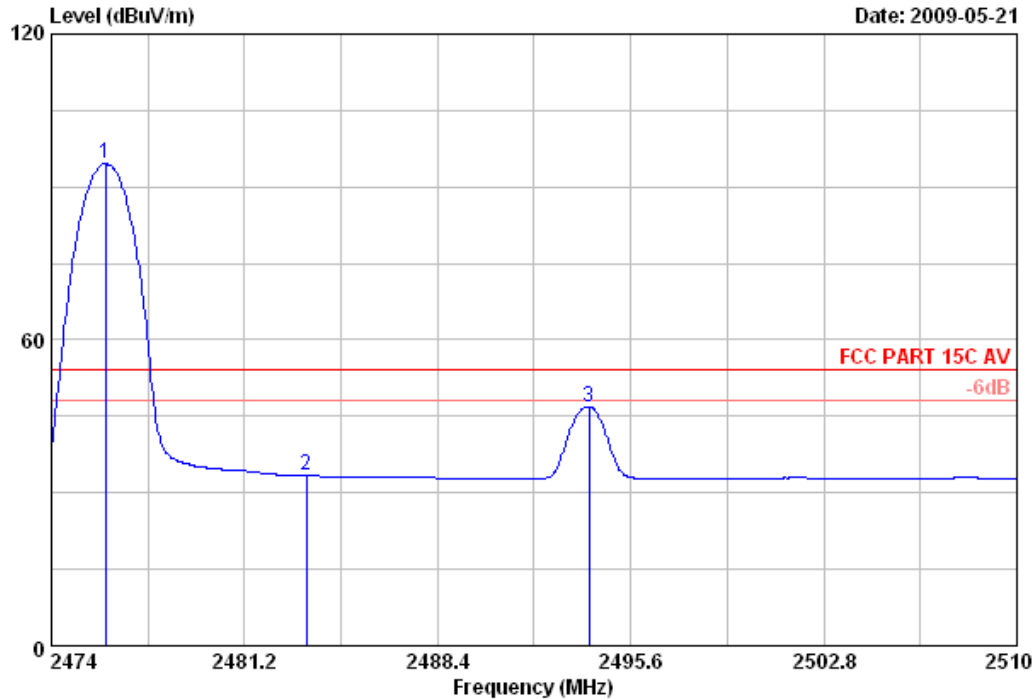
Remarks:

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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Data: 24 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 24
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C AV		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2476MHz		
M/N	: PSGTS4		

	Freq.	Ant.	Cable	Amp.	Reading	Emission			
	(MHz)	Factor	loss	Factor	(dbuv)	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dB)		(dBuV/m)	(dBuV/m)	(dB)	
1	2476.000	28.58	6.87	35.10	94.15	94.50	54.00	-40.50	Average
2	2483.500	28.58	6.87	35.10	33.02	33.37	54.00	20.63	Average
3	2494.052	28.60	6.91	35.10	46.43	46.84	54.00	7.16	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.

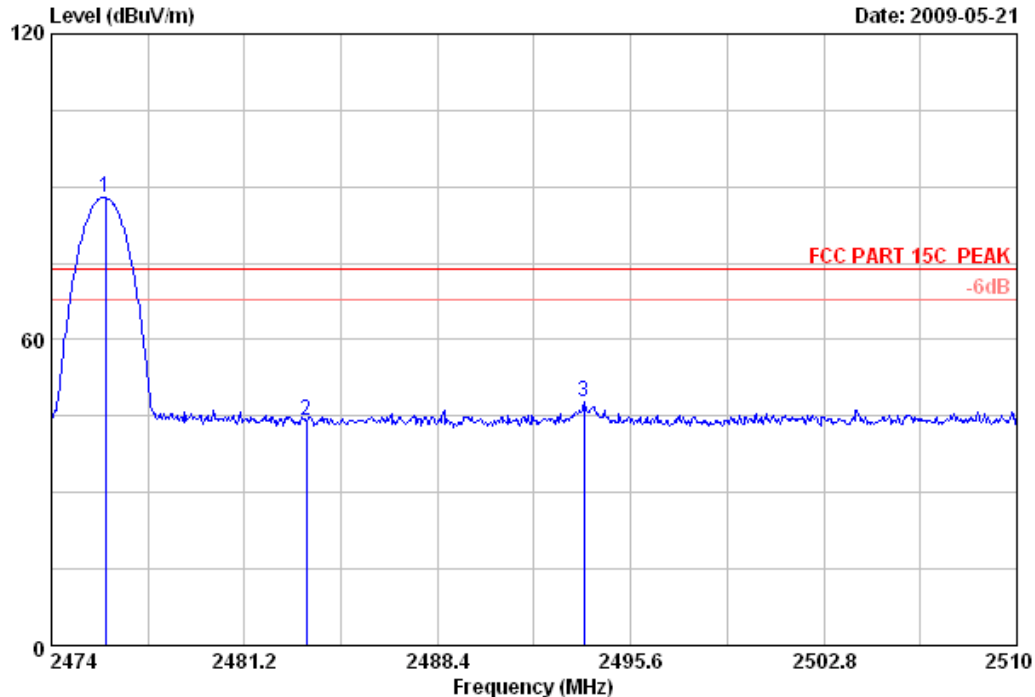


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Data: 25

File: E:\2009 report data\H\harmonix\ACS90728.EM6 (30)

Date: 2009-05-21



Site no. : 3m Chamber Data no. : 25  
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL  
Limit : FCC PART 15C PEAK  
Env. / Ins. : 25°C/49% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power : DC 4.5V  
Test mode : Tx 2476MHz  
M/N : PSGTS4

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2476.000	28.58	6.87	35.10	87.52	87.87	74.00	-13.87	Peak
2	2483.500	28.58	6.87	35.10	43.90	44.25	74.00	29.75	Peak
3	2493.872	28.60	6.91	35.10	47.37	47.78	74.00	26.22	Peak

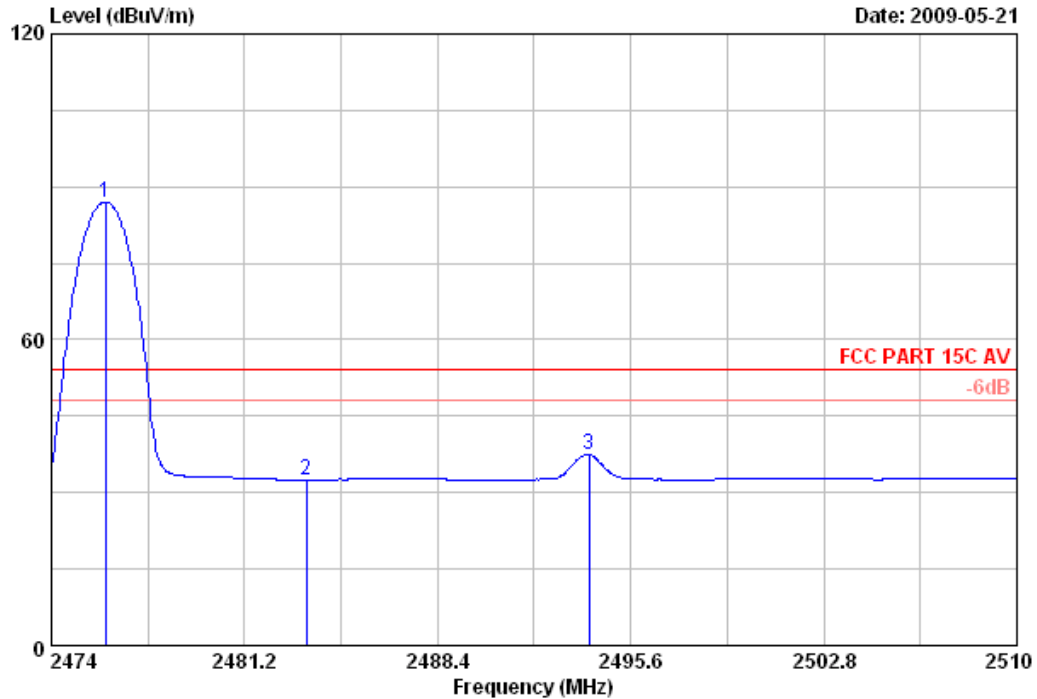
## Remarks:

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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Data: 26 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no.	: 3m Chamber	Data no.	: 26
Dis. / Ant.	: 3m 3115	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C AV		
Env. / Ins.	: 25°C/49%	Engineer	: Sunny-lu
EUT	: P9 PS Gretsch Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2476MHz		
M/N	: PSGTS4		

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2476.000	28.58	6.87	35.10	86.64	86.99	54.00	-32.99	Average
2	2483.500	28.58	6.87	35.10	32.16	32.51	54.00	21.49	Average
3	2494.052	28.60	6.91	35.10	36.98	37.39	54.00	16.61	Average

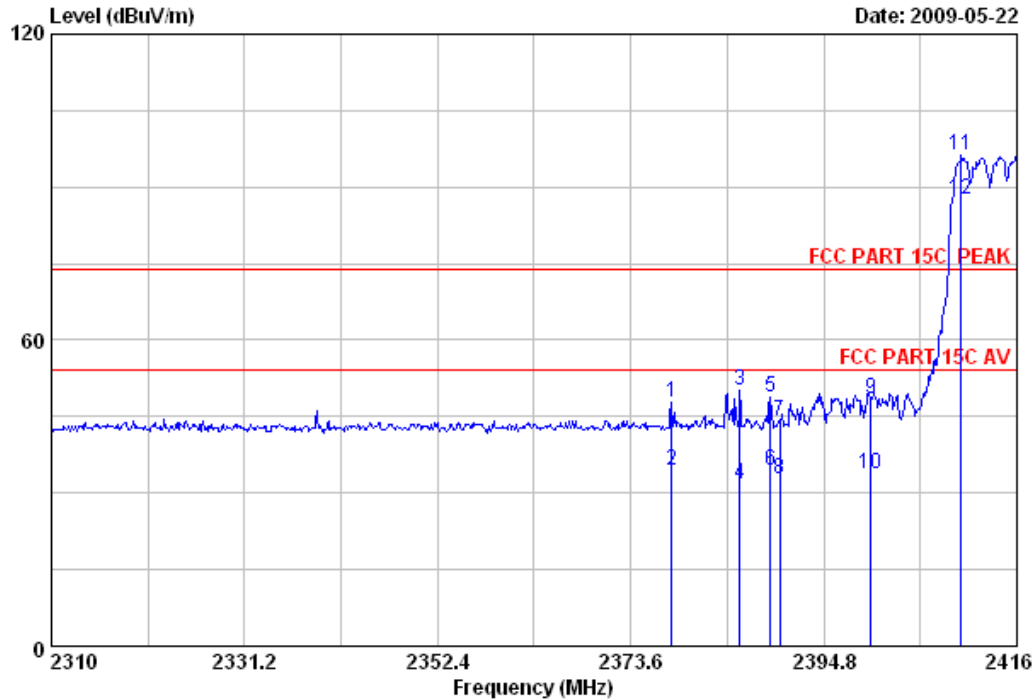
Remarks:

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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Data: 28 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no. : 3m Chamber Data no. : 28  
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL  
Limit : FCC PART 15C PEAK  
Env. / Ins. : 25°C/49% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power : DC 4.5V  
Test mode : Hopping on  
M/N : PSGTS4

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2378.052	28.43	6.71	35.12	47.77	47.79	74.00	26.21	Peak
2	2378.052	28.43	6.71	35.12	34.26	34.28	54.00	19.72	Average
3	2385.578	28.46	6.71	35.12	49.99	50.04	74.00	23.96	Peak
4	2385.578	28.46	6.71	35.12	31.63	31.68	54.00	22.32	Average
5	2388.970	28.46	6.71	35.12	48.59	48.64	74.00	25.36	Peak
6	2388.970	28.46	6.71	35.12	34.35	34.40	54.00	19.60	Average
7	2390.000	28.46	6.71	35.12	44.08	44.13	74.00	29.87	Peak
8	2390.000	28.46	6.71	35.12	32.65	32.70	54.00	21.30	Average
9	2400.000	28.46	6.73	35.12	48.36	48.43	74.00	25.57	Peak
10	2400.000	28.46	6.73	35.12	33.64	33.71	54.00	20.29	Average
11	2409.852	28.48	6.73	35.12	96.13	96.22	74.00	-22.22	Peak
12	2409.852	28.48	6.73	35.12	87.65	87.74	54.00	-33.74	Average

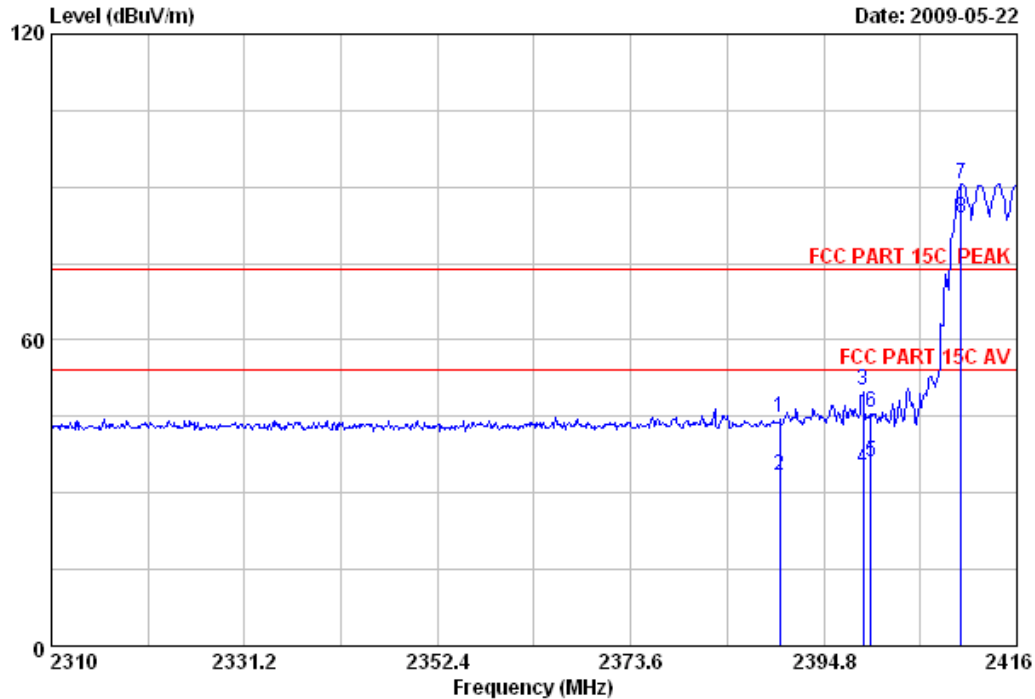
Remarks:

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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Data: 27 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)



Site no. : 3m Chamber Data no. : 27  
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL  
Limit : FCC PART 15C PEAK  
Env. / Ins. : 25°C/49% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power : DC 4.5V  
Test mode : Hopping on  
M/N : PSGTS4

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	28.46	6.71	35.12	44.65	44.70	74.00	29.30	Peak
2	2390.000	28.46	6.71	35.12	33.28	33.33	54.00	20.67	Average
3	2399.100	28.46	6.73	35.12	50.15	50.22	74.00	23.78	Peak
4	2399.100	28.46	6.73	35.12	34.68	34.75	54.00	19.25	Average
5	2400.000	28.46	6.73	35.12	36.16	36.23	54.00	17.77	Average
6	2400.000	28.46	6.73	35.12	45.85	45.92	74.00	28.08	Peak
7	2409.880	28.48	6.73	35.12	90.34	90.43	74.00	-16.43	Peak
8	2409.880	28.48	6.73	35.12	83.67	83.76	54.00	-29.76	Average

Remarks:

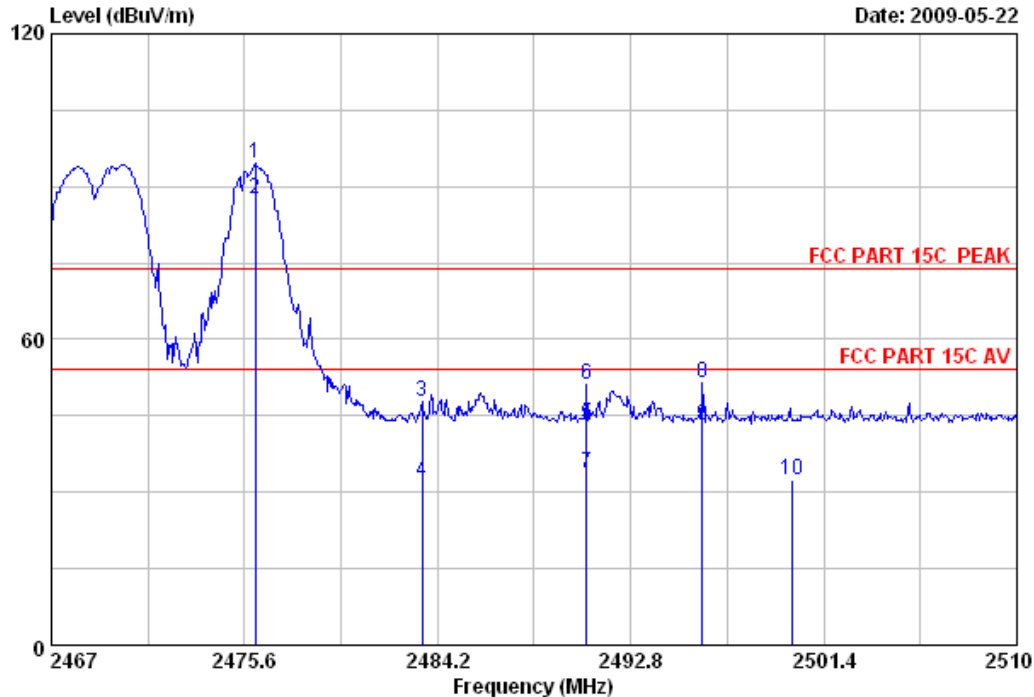
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



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Data: 29 File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)

Date: 2009-05-22



Site no. : 3m Chamber Data no. : 29  
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL  
Limit : FCC PART 15C PEAK  
Env. / Ins. : 25°C/49% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power : DC 4.5V  
Test mode : Hopping on  
M/N : PSGTS4

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2476.100	28.58	6.87	35.10	94.29	94.64	74.00	-20.64	Peak
2	2476.100	28.58	6.87	35.10	87.34	87.69	54.00	-33.69	Average
3	2483.500	28.58	6.87	35.10	47.33	47.68	74.00	26.32	Peak
4	2483.500	28.58	6.87	35.10	31.77	32.12	54.00	21.88	Average
5	2490.850	28.60	6.91	35.10	43.12	43.53	54.00	10.47	Average
6	2490.850	28.60	6.91	35.10	50.58	50.99	74.00	23.01	Peak
7	2490.850	28.60	6.91	35.10	33.22	33.63	54.00	20.37	Average
8	2496.000	28.60	6.91	35.10	50.91	51.32	74.00	22.68	Peak
9	2496.000	28.60	6.91	35.10	42.68	43.09	54.00	10.91	Average
10	2500.000	28.60	6.91	35.10	32.11	32.52	54.00	21.48	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.

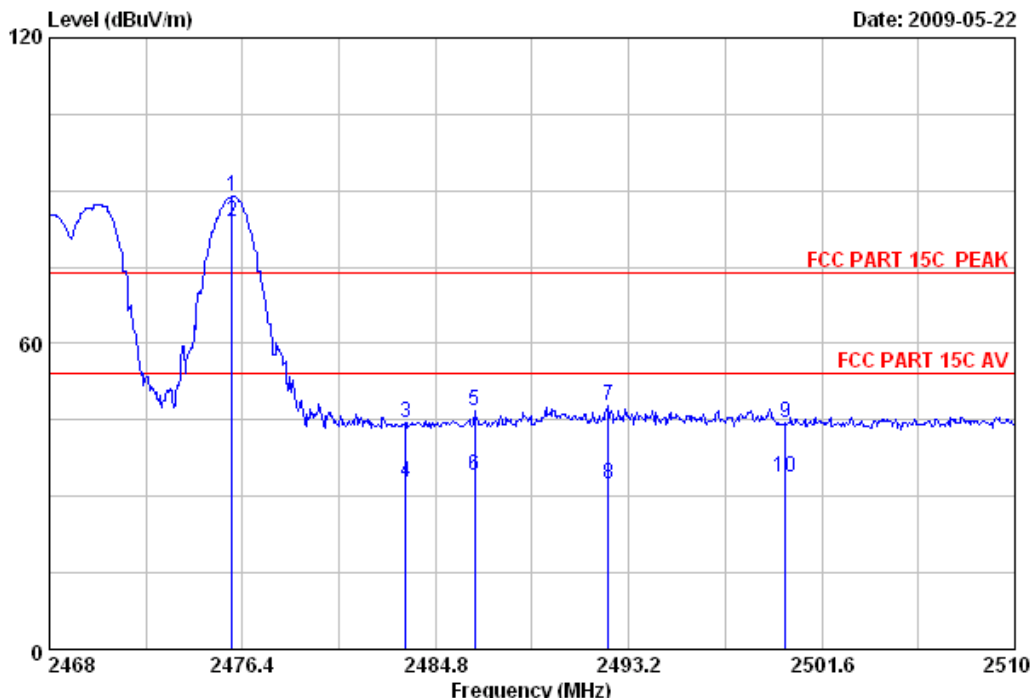


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Data: 30

File: E:\2009 report data\H\harmonix\ACS9Q728.EM6 (30)

Date: 2009-05-22



Site no. : 3m Chamber Data no. : 30  
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL  
Limit : FCC PART 15C PEAK  
Env. / Ins. : 25°C/49% Engineer : Sunny-lu  
EUT : P9 PS Gretsch Wireless Guitar  
Power : DC 4.5V  
Test mode : Hopping on  
M/N : PSGTS4

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dbuv)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2475.935	28.58	6.87	35.10	88.48	88.83	74.00	-14.83	Peak
2	2475.935	28.58	6.87	35.10	83.69	84.04	54.00	-30.04	Average
3	2483.500	28.58	6.87	35.10	44.19	44.54	74.00	29.46	Peak
4	2483.500	28.58	6.87	35.10	32.56	32.91	54.00	21.09	Average
5	2486.510	28.58	6.87	35.10	46.52	46.87	74.00	27.13	Peak
6	2486.510	28.58	6.87	35.10	33.61	33.96	54.00	20.04	Average
7	2492.315	28.60	6.91	35.10	47.41	47.82	74.00	26.18	Peak
8	2492.315	28.60	6.91	35.10	31.86	32.27	54.00	21.73	Average
9	2500.000	28.60	6.91	35.10	43.99	44.40	74.00	29.60	Peak
10	2500.000	28.60	6.91	35.10	33.23	33.64	54.00	20.36	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.



## **11. 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 a PCB integral antenna 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 0dBi.

## **12.DEVIATION TO TEST SPECIFICATIONS**

[ NONE]