

APPLICATION FOR CERTIFICATION

On Behalf of

Harmonix Music Systems, Inc.

P9 Wii Hofner Wireless Guitar

Model Number: NWGTS3

FCC ID: VFRNWGTS3

Prepared for : Harmonix Music Systems, Inc.
675 Massachusetts Avenue, 6th 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-F09115
Date of Test : May.19~24, 2009
Date of Report : Jun.05, 2009

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TEST REPORT CERTIFICATION

Applicant : Harmonix Music Systems, Inc.
Manufacturer : Early Light International Co., Ltd.
EUT Description : P9 Wii Hofner Wireless Guitar
FCC ID : VFRNWGTS3
(A) MODEL NO. : NWGTS3
(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.

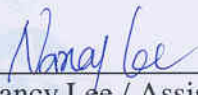
The test results are contained in this test report and AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these tests. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

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.19~ 24, 2009

Prepared by:


Nancy Lee / 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 Wii Hofner Wireless Guitar |
| Model Number | : NWGTS3 |
| FCC ID | : VFRNWGTS3 |
| Operation frequency | : 2.408GHz-----2.476GHz |
| Operation Channel | : 16 Channels |
| Modulation Technology | GFSK |
| Output power | : 0.76dBm (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 th Floor, Cambridge, MA 02139 US |
| Manufacturer | : Early Light International Co., Ltd. Early Light International Centre, No.9 Ka Fu Close, Sheung Shui, N.T., Hong Kong |
| Date of Test | : May.19~24, 2009 |
| Date of Receipt | : May.18, 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 | 1×10^{-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 | 1.5Year |
| 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

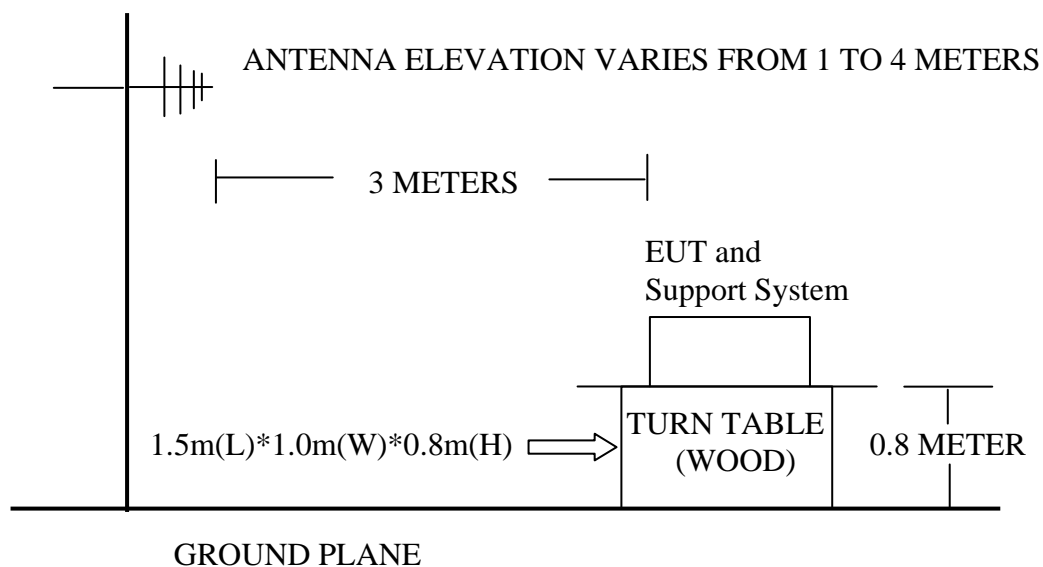
4.2.1. Block diagram of connection between the EUT and simulators

EUT

(EUT: P9 Wii Hofner 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 1000 | 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 |
| ¹ 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 | (²) |

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 Wii Hofner Wireless Guitar (EUT)

Model Number : NWGTS2
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 10th 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

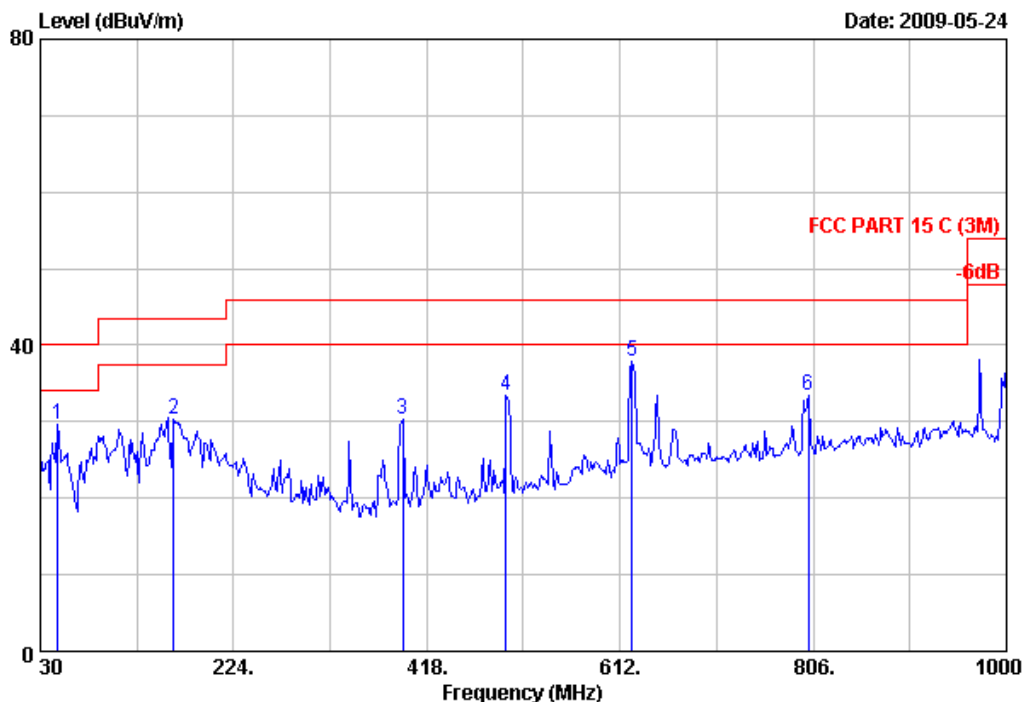


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Data: 1

File: D:\2009 Report Data\H\Harmonix\ACS9Q695.EM6 (6)

Date: 2009-05-24



Site no. : 3m Chamber Data no. : 1
Dis. / Ant. : 3m CBL6111C Ant. pol. : VERTICAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 24°C/56% Engineer : Sunny-lu
EUT : P9 Wii Hofner Wireless Guitar M/N:NWGT3
Power Rating : DC 4.5V
Test Mode : Tx Mode

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 47.460 | 10.43 | 0.42 | 46.68 | 29.65 | 40.00 | 10.35 | QP |
| 2 | 163.860 | 10.66 | 1.02 | 46.00 | 30.29 | 43.50 | 13.21 | QP |
| 3 | 393.750 | 16.00 | 1.97 | 39.87 | 30.28 | 46.00 | 15.72 | QP |
| 4 | 497.540 | 17.99 | 2.18 | 41.39 | 33.45 | 46.00 | 12.55 | QP |
| 5 | 623.640 | 19.85 | 2.52 | 43.68 | 37.91 | 46.00 | 8.09 | QP |
| 6 | 801.150 | 21.73 | 3.00 | 36.55 | 33.48 | 46.00 | 12.52 | QP |

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

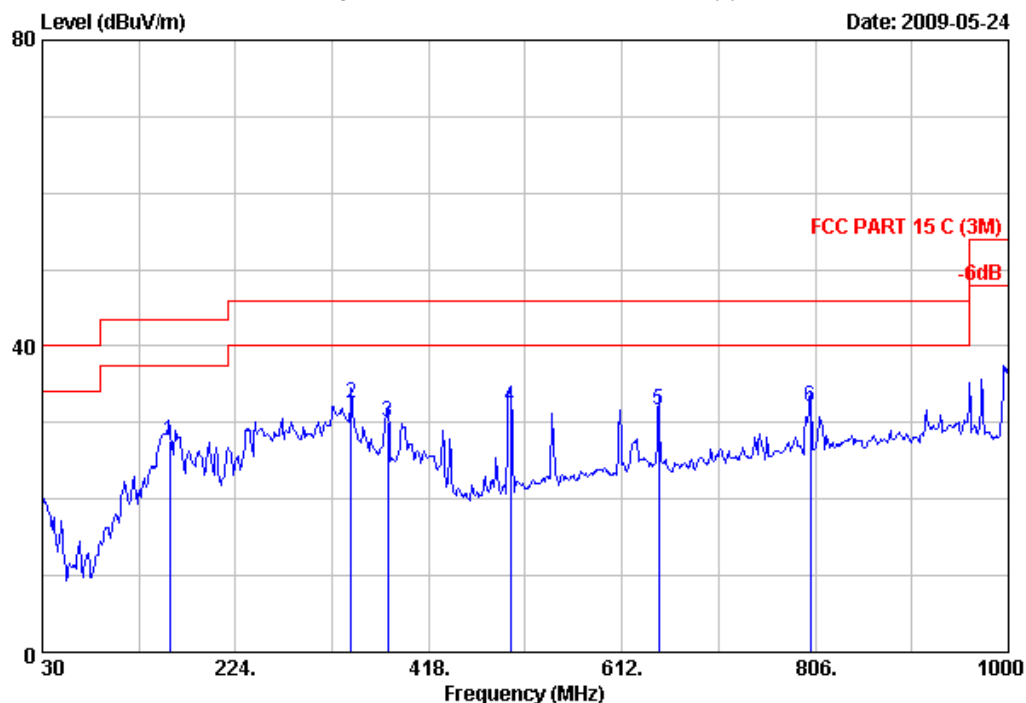


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Data: 2

File: D:\2009 Report Data\H\Harmonix\ACS9Q695.EM6 (6)

Date: 2009-05-24



Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m CBL6111C Ant. pol. : HORIZONTAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 24°C/56% Engineer : Sunny-lu
EUT : P9 Wii Hofner Wireless Guitar M/N:NWGTS3
Power Rating : DC 4.5V
Test Mode : Tx Mode

| | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 158.040 | 11.07 | 0.97 | 43.09 | 27.71 | 43.50 | 15.79 | QP |
| 2 | 340.400 | 14.71 | 1.78 | 43.14 | 32.47 | 46.00 | 13.53 | QP |
| 3 | 377.260 | 15.57 | 1.85 | 40.12 | 30.11 | 46.00 | 15.89 | QP |
| 4 | 500.450 | 18.04 | 2.15 | 40.11 | 32.18 | 46.00 | 13.82 | QP |
| 5 | 648.860 | 19.98 | 2.57 | 37.23 | 31.68 | 46.00 | 14.32 | QP |
| 6 | 801.150 | 21.73 | 3.00 | 35.11 | 32.04 | 46.00 | 13.96 | QP |

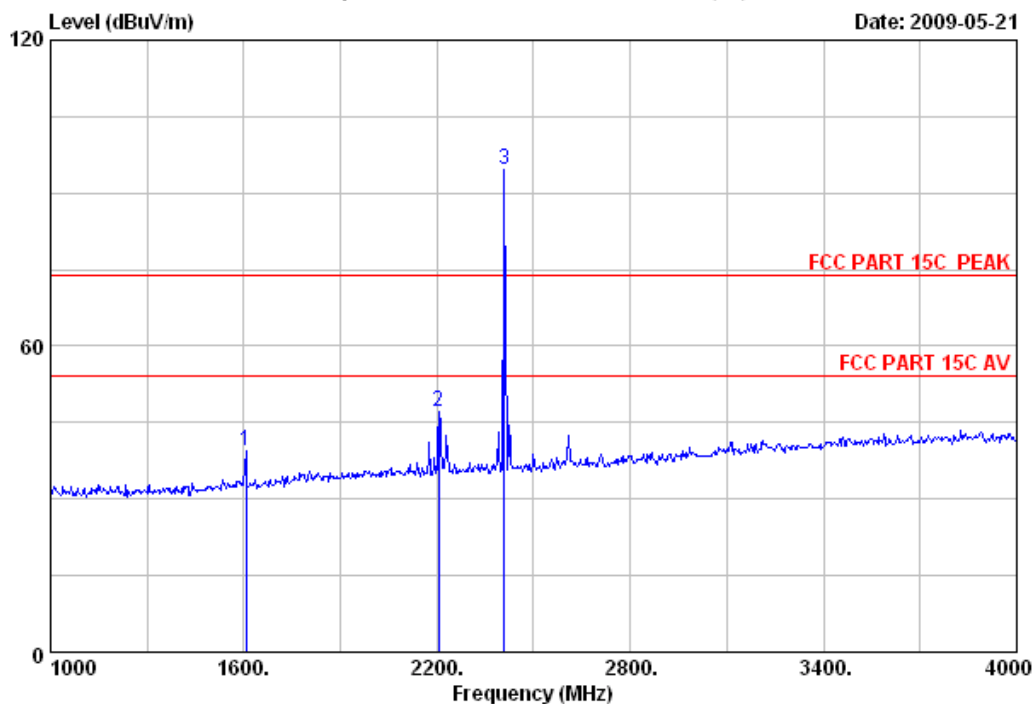
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Test Frequency: 1GHz-4GHz



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Data: 1 File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)



| | | | |
|-------------|---------------------------------|-----------|--------------|
| Site no. | : 3m Chamber | Data no. | : 1 |
| Dis. / Ant. | : 3m 3115 | Ant. pol. | : HORIZONTAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 25°C/49% | Engineer | : Paul Tian |
| EUT | : P9 Wii Hofner Wireless Guitar | | |
| Power | : DC 4.5V | | |
| Test mode | : Tx 2408MHz | | |
| M/N | : NWGTS3 | | |

| | 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 | 1606.000 | 26.37 | 5.46 | 35.62 | 43.39 | 39.60 | 74.00 | 34.40 | Peak |
| 2 | 2206.000 | 28.19 | 6.51 | 35.16 | 47.51 | 47.05 | 74.00 | 26.95 | Peak |
| 3 | 2408.000 | 28.48 | 6.73 | 35.12 | 94.52 | 94.61 | 74.00 | -20.61 | Peak |

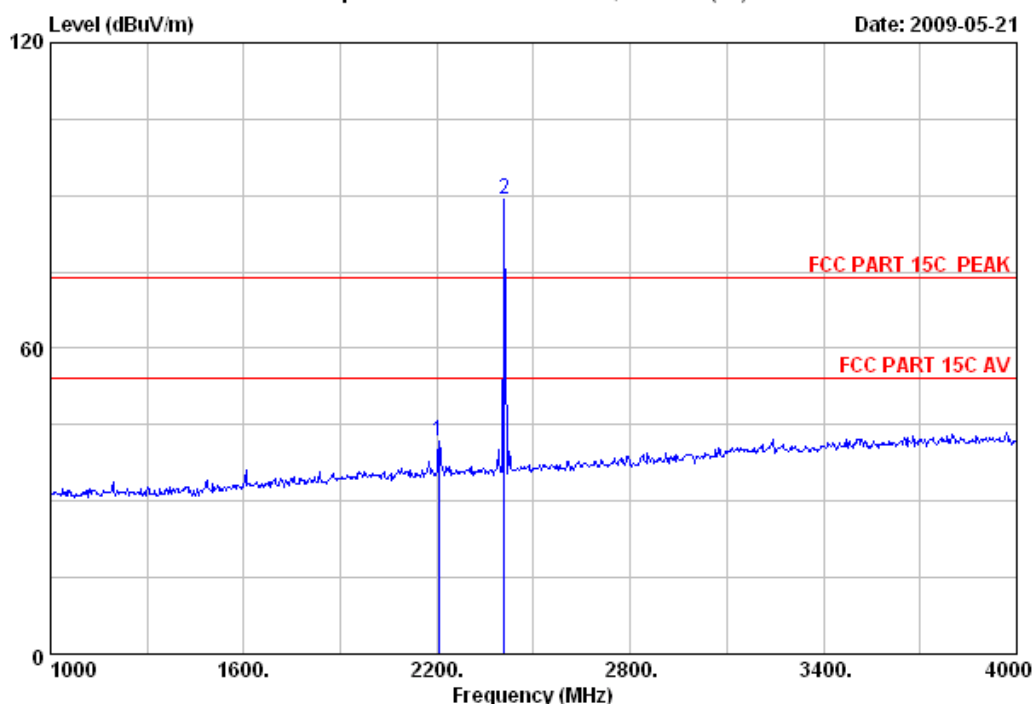
Remarks:

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: 2 File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)



Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2408MHz
M/N : NWGTS3

| | | 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 | 2206.000 | 28.19 | 6.51 | 35.16 | 42.17 | 41.71 | 74.00 | 32.29 | Peak |
| 2 | 2408.000 | 28.48 | 6.73 | 35.12 | 89.17 | 89.26 | 74.00 | -15.26 | Peak |

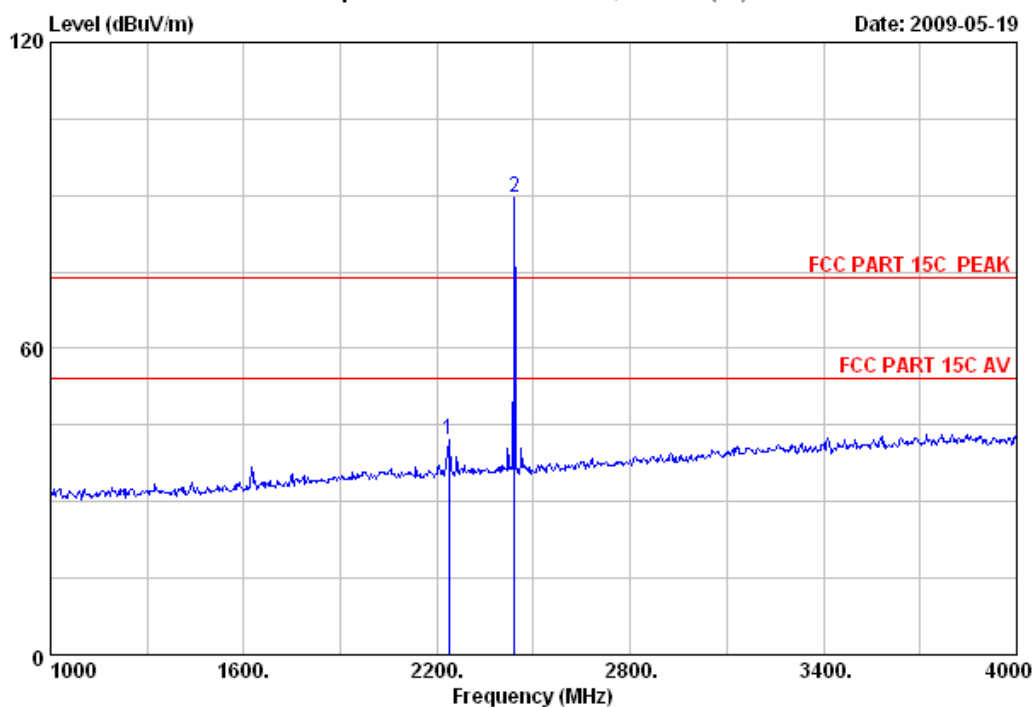
Remarks:

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: 7 File: E:\2009 report data\H\harmonix\ACS9Q695.EM6 (30)



Site no. : 3m Chamber Data no. : 7
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2440MHz
M/N : NWGTS3

| | 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 | 2236.000 | 28.24 | 6.53 | 35.15 | 42.59 | 42.21 | 74.00 | 31.79 | Peak |
| 2 | 2440.000 | 28.53 | 6.80 | 35.11 | 89.32 | 89.54 | 74.00 | -15.54 | Peak |

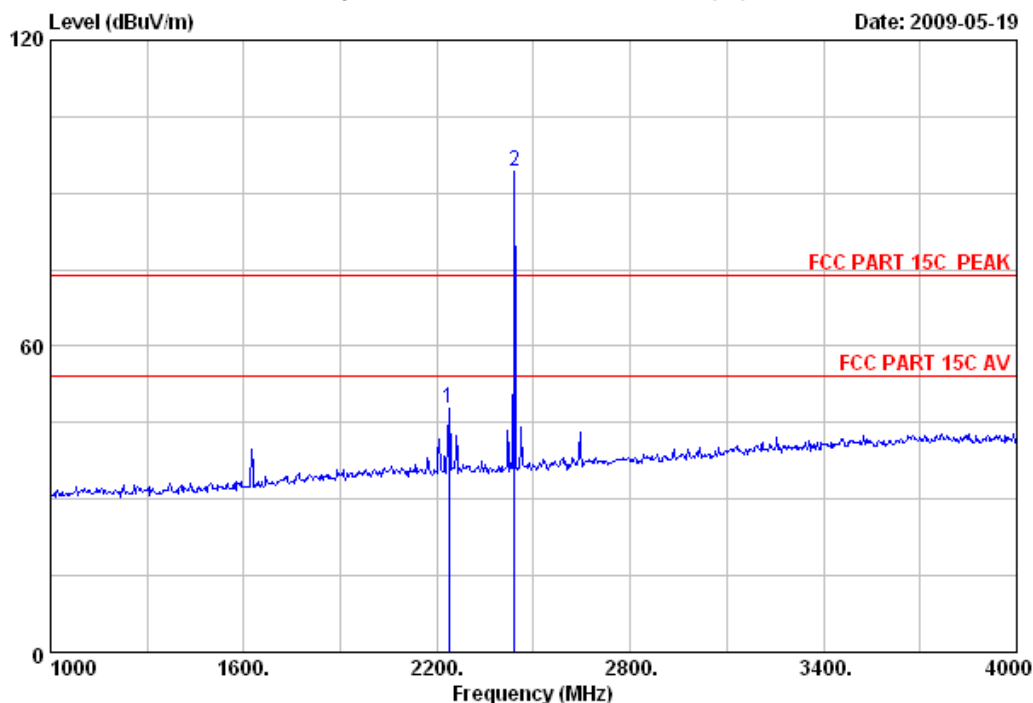
Remarks:

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\ACS9Q695.EM6 (30)



Site no. : 3m Chamber Data no. : 8
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2440MHz
M/N : NWGTS3

| | | 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 | 2236.000 | 28.24 | 6.53 | 35.15 | 48.21 | 47.83 | 74.00 | 26.17 | Peak |
| 2 | 2440.000 | 28.53 | 6.80 | 35.11 | 94.09 | 94.31 | 74.00 | -20.31 | Peak |

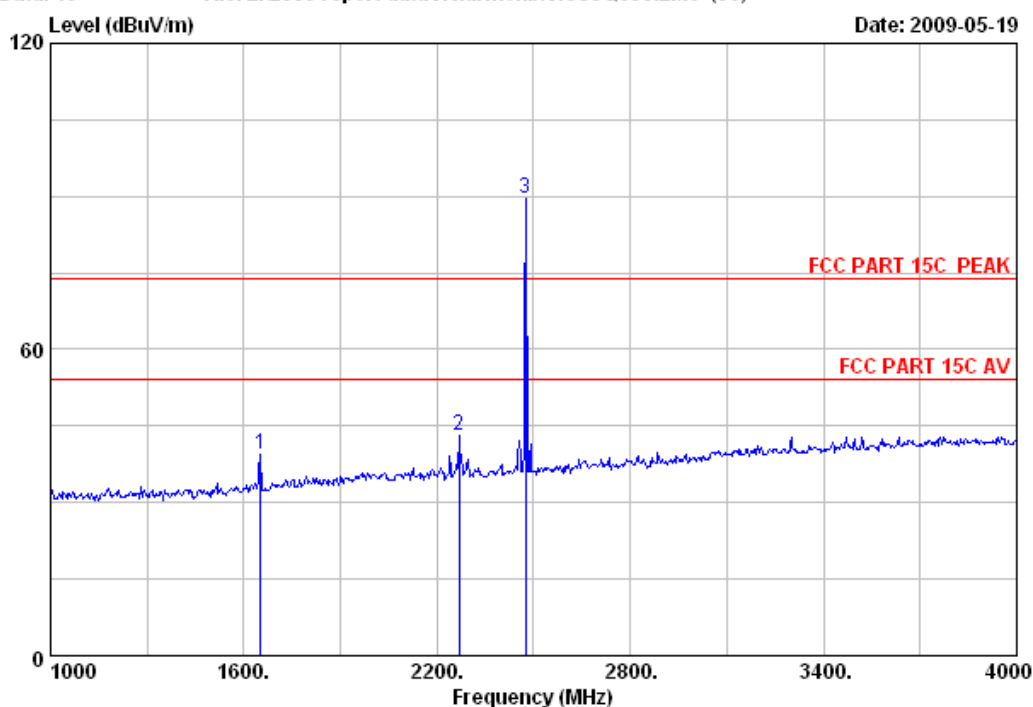
Remarks:

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: 13 File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)



Site no. : 3m Chamber Data no. : 13
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2476MHz
M/N : NWGTS3

| | | 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 1651.000 | 26.50 | 5.53 | 35.57 | 42.87 | 39.33 | 74.00 | 34.67 | Peak | |
| 2 2269.000 | 28.29 | 6.58 | 35.14 | 43.24 | 42.97 | 74.00 | 31.03 | Peak | |
| 3 2476.000 | 28.58 | 6.87 | 35.10 | 89.11 | 89.46 | 74.00 | -15.46 | Peak | |

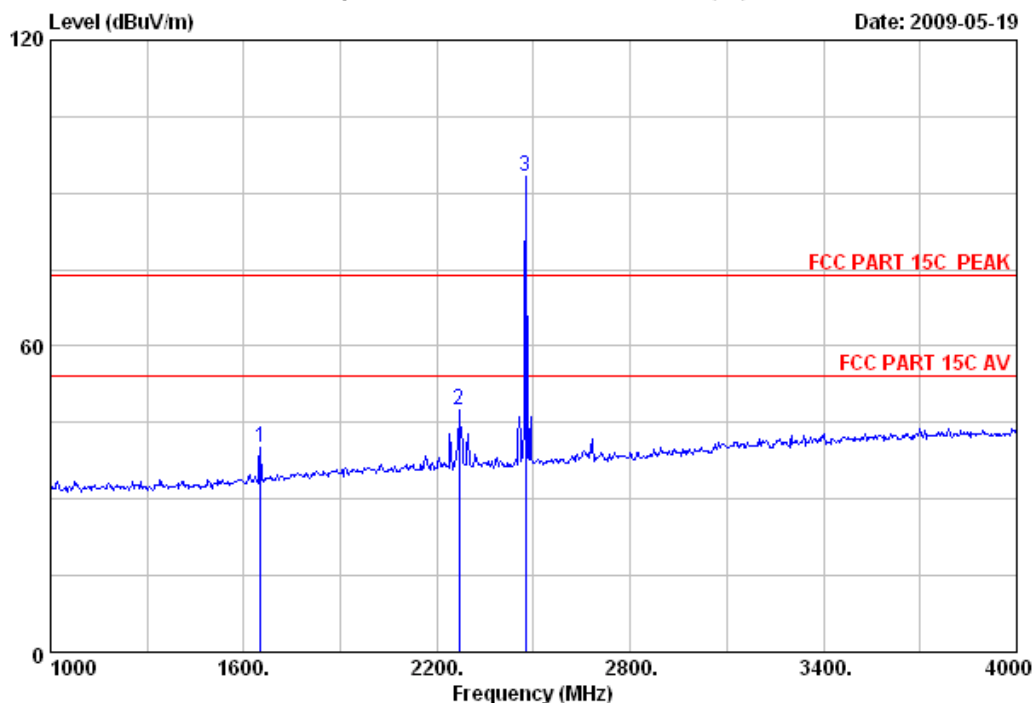
Remarks:

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\ACS90695.EM6 (30)



Site no. : 3m Chamber Data no. : 14
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2476MHz
M/N : NWGTS3

| | 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 | 1651.000 | 26.50 | 5.53 | 35.57 | 43.82 | 40.28 | 74.00 | 33.72 | Peak |
| 2 | 2269.000 | 28.29 | 6.58 | 35.14 | 47.70 | 47.43 | 74.00 | 26.57 | Peak |
| 3 | 2476.000 | 28.58 | 6.87 | 35.10 | 93.07 | 93.42 | 74.00 | -19.42 | Peak |

Remarks:

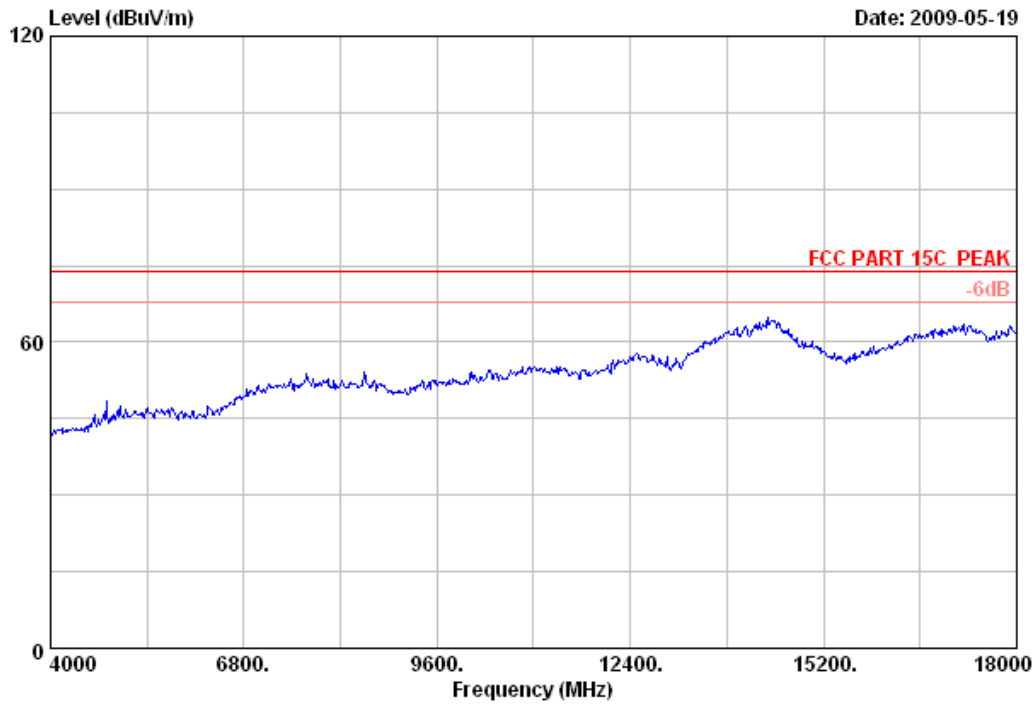
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Test Frequency: 4GHz-18GHz



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Data: 3 File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)

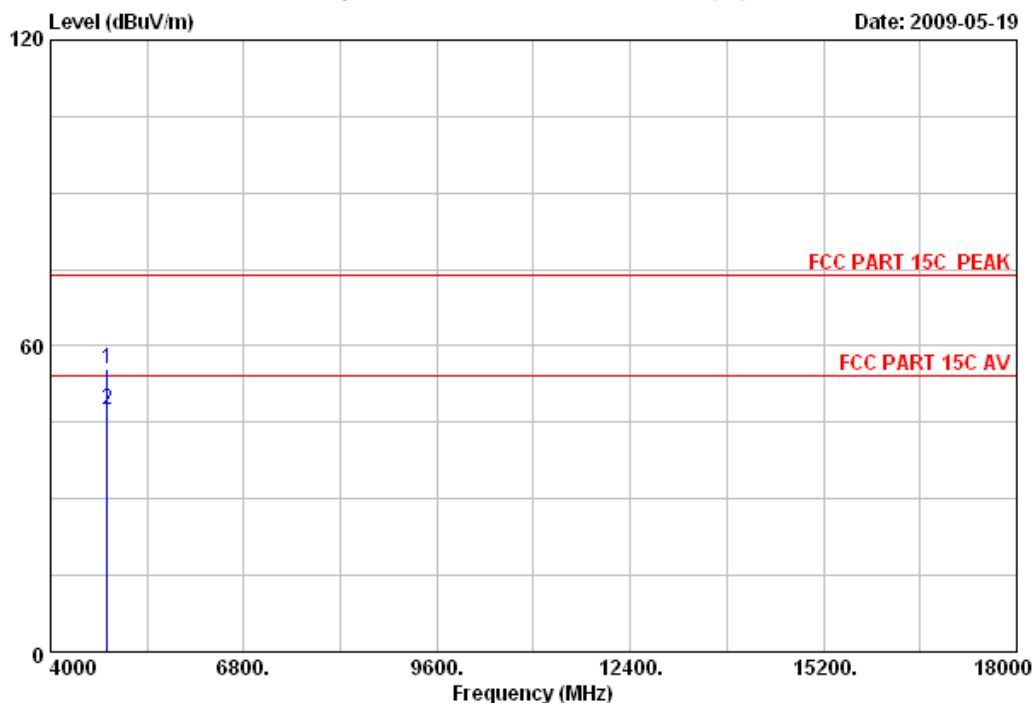


| | | | |
|-------------|---------------------------------|-----------|-------------|
| Site no. | : 3m Chamber | Data no. | : 3 |
| Dis. / Ant. | : 3m 3115 | Ant. pol. | : VERTICAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 25°C/49% | Engineer | : Paul Tian |
| EUT | : P9 Wii Hofner Wireless Guitar | | |
| Power | : DC 4.5V | | |
| Test mode | : Tx 2408MHz | | |
| M/N | : NWGTS3 | | |



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Data: 4 File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)



| | | | |
|-------------|---------------------------------|-----------|-------------|
| Site no. | : 3m Chamber | Data no. | : 4 |
| Dis. / Ant. | : 3m 3115 | Ant. pol. | : VERTICAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 25°C/49% | Engineer | : Paul Tian |
| EUT | : P9 Wii Hofner Wireless Guitar | | |
| Power | : DC 4.5V | | |
| Test mode | : Tx 2408MHz | | |
| M/N | : NWGTS3 | | |

| | 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 | 4816.000 | 34.36 | 10.54 | 34.59 | 45.04 | 55.35 | 74.00 | 18.65 | Peak |
| 2 | 4816.000 | 34.36 | 10.54 | 34.59 | 37.18 | 47.49 | 54.00 | 6.51 | Average |

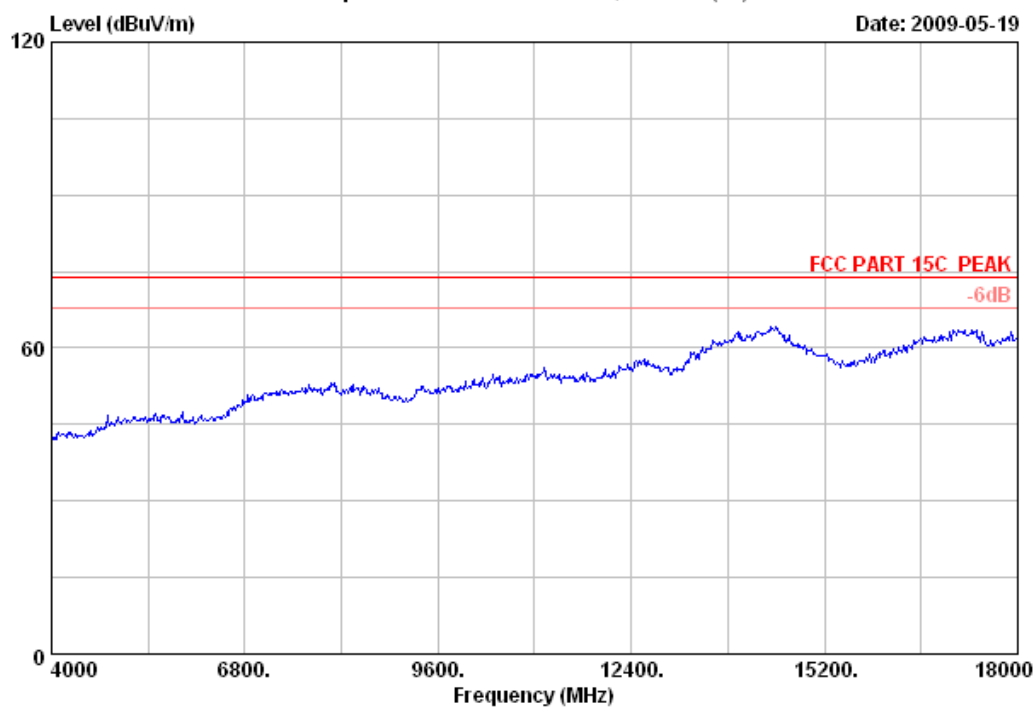
Remarks:

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\ACS9Q695.EM6 (30)

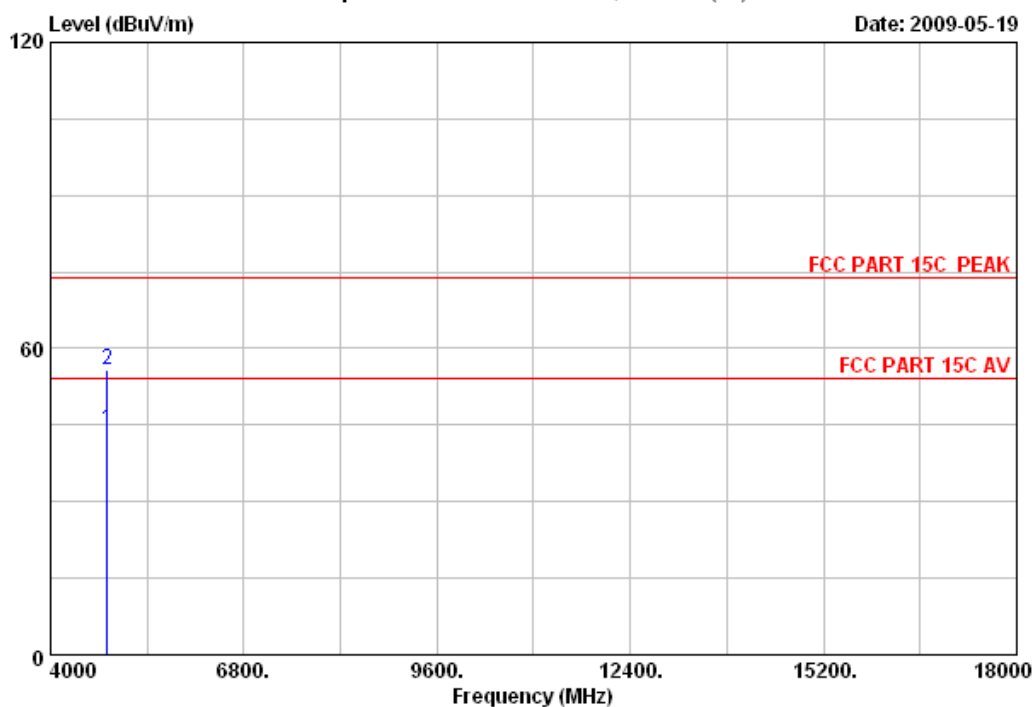


| | | | |
|-------------|---------------------------------|-----------|--------------|
| Site no. | : 3m Chamber | Data no. | : 5 |
| Dis. / Ant. | : 3m 3115 | Ant. pol. | : HORIZONTAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 25°C/49% | Engineer | : Paul Tian |
| EUT | : P9 Wii Hofner Wireless Guitar | | |
| Power | : DC 4.5V | | |
| Test mode | : Tx 2408MHz | | |
| M/N | : NWGTS3 | | |



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Data: 6 File: E:\2009 report data\H\harmonix\ACS9Q695.EM6 (30)



Site no. : 3m Chamber Data no. : 6
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2408MHz
M/N : NWGTS3

| | 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 | 4816.000 | 34.36 | 10.54 | 34.59 | 33.73 | 44.04 | 54.00 | 9.96 | Average |
| 2 | 4816.000 | 34.36 | 10.54 | 34.59 | 45.54 | 55.85 | 74.00 | 18.15 | Peak |

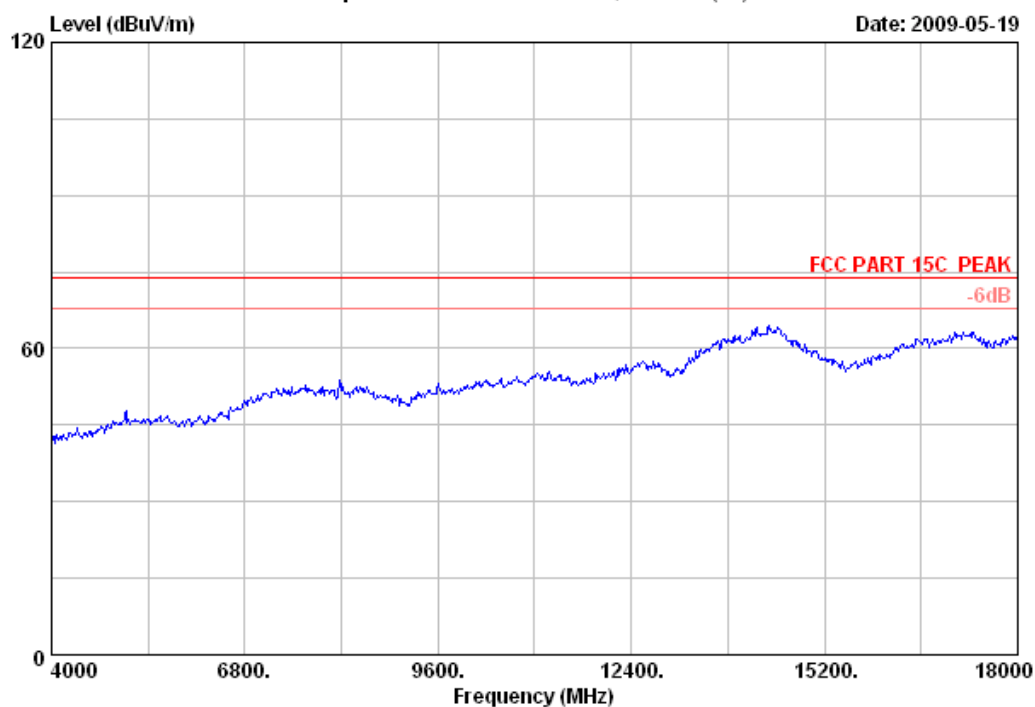
Remarks:

- 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: 9 File: E:\2009 report data\H\harmonix\ACS9Q695.EM6 (30)



| | | | |
|-------------|---------------------------------|-----------|--------------|
| Site no. | : 3m Chamber | Data no. | : 9 |
| Dis. / Ant. | : 3m 3115 | Ant. pol. | : HORIZONTAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 25°C/49% | Engineer | : Paul Tian |
| EUT | : P9 Wii Hofner Wireless Guitar | | |
| Power | : DC 4.5V | | |
| Test mode | : Tx 2440MHz | | |
| M/N | : NWGTS3 | | |

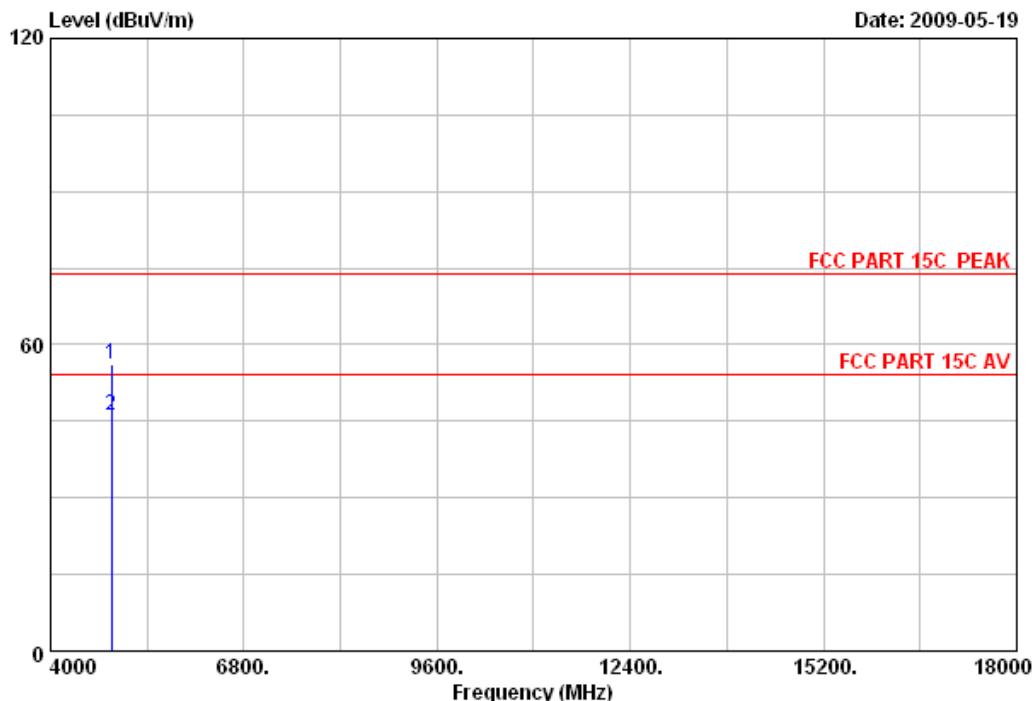


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Data: 10

File: E:\2009 report data\H\harmonix\ACS9Q695.EM6 (30)

Date: 2009-05-19



| | | | |
|-------------|---------------------------------|-----------|--------------|
| Site no. | : 3m Chamber | Data no. | : 10 |
| Dis. / Ant. | : 3m 3115 | Ant. pol. | : HORIZONTAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 25°C/49% | Engineer | : Paul Tian |
| EUT | : P9 Wii Hofner Wireless Guitar | | |
| Power | : DC 4.5V | | |
| Test mode | : Tx 2440MHz | | |
| M/N | : NWGTS3 | | |

| | 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 | 45.26 | 56.02 | 74.00 | 17.98 | Peak |
| 2 | 4880.000 | 34.78 | 10.56 | 34.58 | 35.24 | 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.

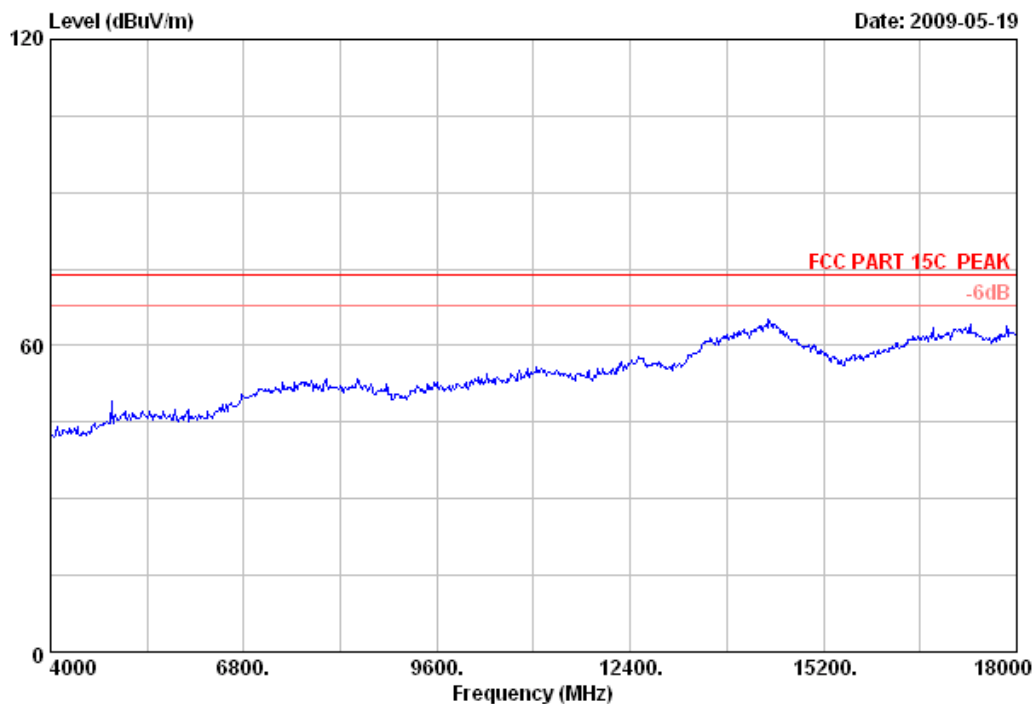


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Data: 11

File: E:\2009 report data\H\harmonix\ACS9Q695.EM6 (30)

Date: 2009-05-19

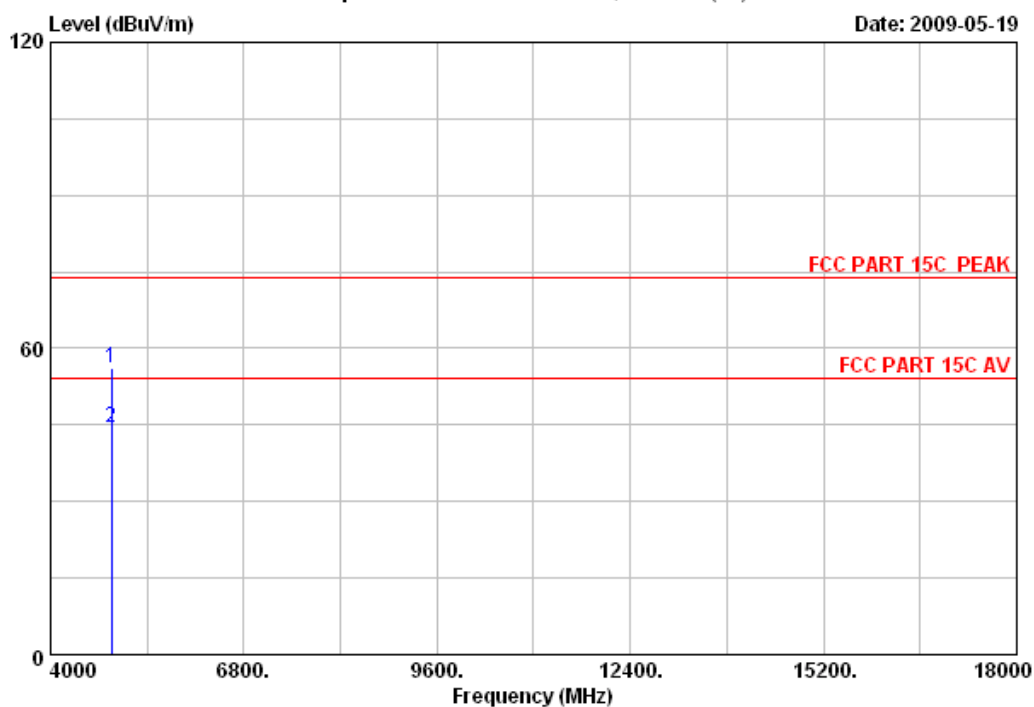


| | | | |
|-------------|---------------------------------|-----------|-------------|
| Site no. | : 3m Chamber | Data no. | : 11 |
| Dis. / Ant. | : 3m 3115 | Ant. pol. | : VERTICAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 25°C/49% | Engineer | : Paul Tian |
| EUT | : P9 Wii Hofner Wireless Guitar | | |
| Power | : DC 4.5V | | |
| Test mode | : Tx 2440MHz | | |
| M/N | : NWGTS3 | | |



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Data: 12 File: E:\2009 report data\H\harmonix\ACS9Q695.EM6 (30)



Site no. : 3m Chamber Data no. : 12
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2440MHz
M/N : NWGTS3

| | | 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 | 4880.000 | 34.78 | 10.56 | 34.58 | 45.32 | 56.08 | 74.00 | 17.92 | Peak |
| 2 | 4880.000 | 34.78 | 10.56 | 34.58 | 33.69 | 44.45 | 54.00 | 9.55 | 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.

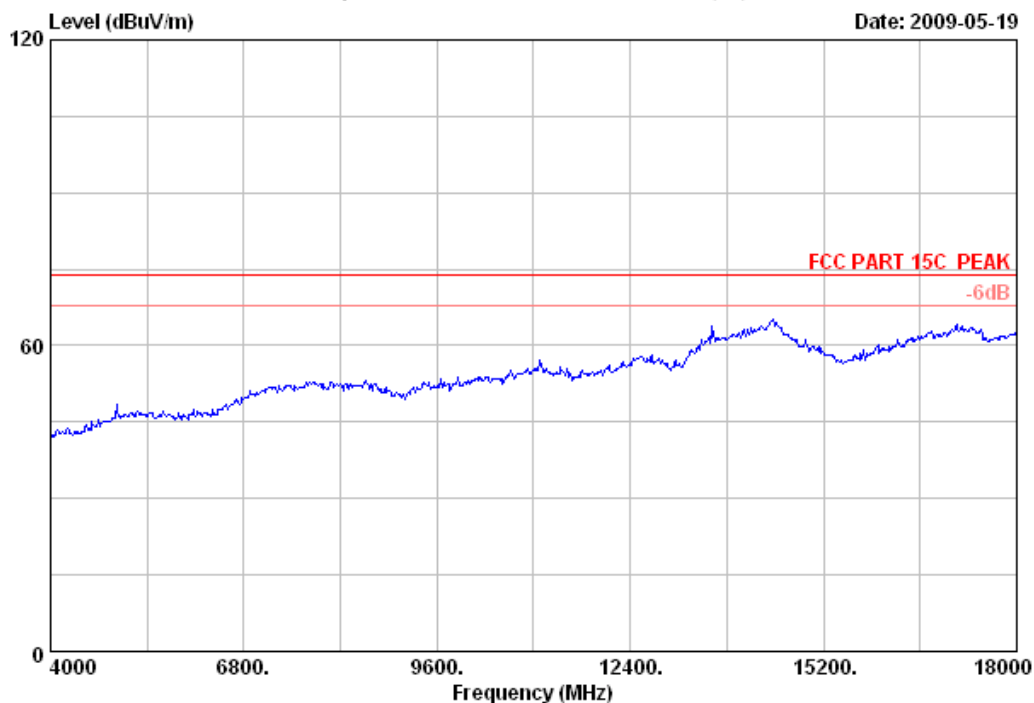


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Data: 15

File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)

Date: 2009-05-19



| | | | |
|-------------|---------------------------------|-----------|--------------|
| Site no. | : 3m Chamber | Data no. | : 15 |
| Dis. / Ant. | : 3m 3115 | Ant. pol. | : HORIZONTAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 25°C/49% | Engineer | : Paul Tian |
| EUT | : P9 Wii Hofner Wireless Guitar | | |
| Power | : DC 4.5V | | |
| Test mode | : Tx 2476MHz | | |
| M/N | : NWGTS3 | | |

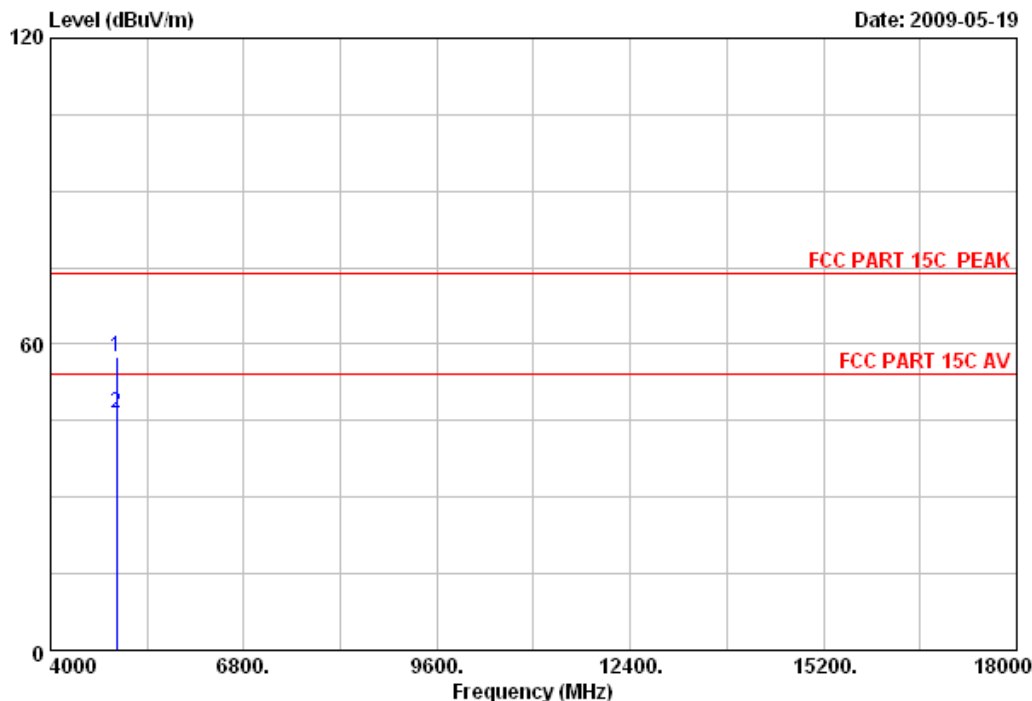


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Data: 16

File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)

Date: 2009-05-19



| | | | |
|-------------|---------------------------------|-----------|--------------|
| Site no. | : 3m Chamber | Data no. | : 16 |
| Dis. / Ant. | : 3m 3115 | Ant. pol. | : HORIZONTAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 25°C/49% | Engineer | : Paul Tian |
| EUT | : P9 Wii Hofner Wireless Guitar | | |
| Power | : DC 4.5V | | |
| Test mode | : Tx 2476MHz | | |
| M/N | : NWGTS3 | | |

| | 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 | 46.34 | 57.55 | 74.00 | 16.45 | Peak |
| 2 | 4952.000 | 35.19 | 10.58 | 34.56 | 35.25 | 46.46 | 54.00 | 7.54 | 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.

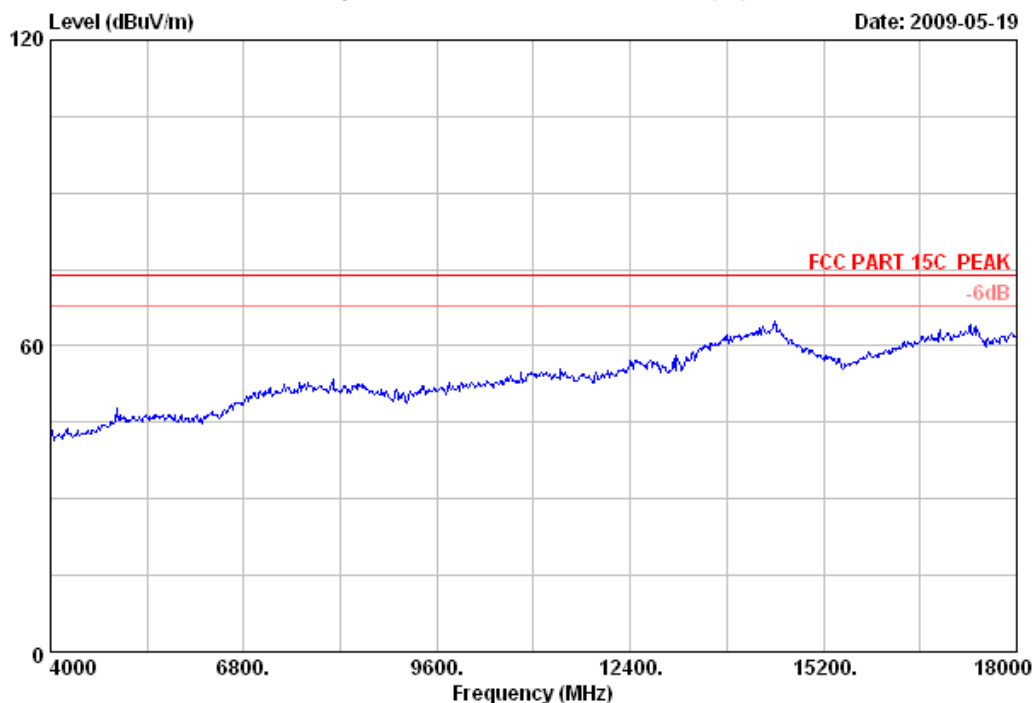


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Data: 17

File: E:\2009 report data\H\harmonix\ACS9Q695.EM6 (30)

Date: 2009-05-19



| | | | |
|-------------|---------------------------------|-----------|-------------|
| Site no. | : 3m Chamber | Data no. | : 17 |
| Dis. / Ant. | : 3m 3115 | Ant. pol. | : VERTICAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 25°C/49% | Engineer | : Paul Tian |
| EUT | : P9 Wii Hofner Wireless Guitar | | |
| Power | : DC 4.5V | | |
| Test mode | : Tx 2476MHz | | |
| M/N | : NWGTS3 | | |

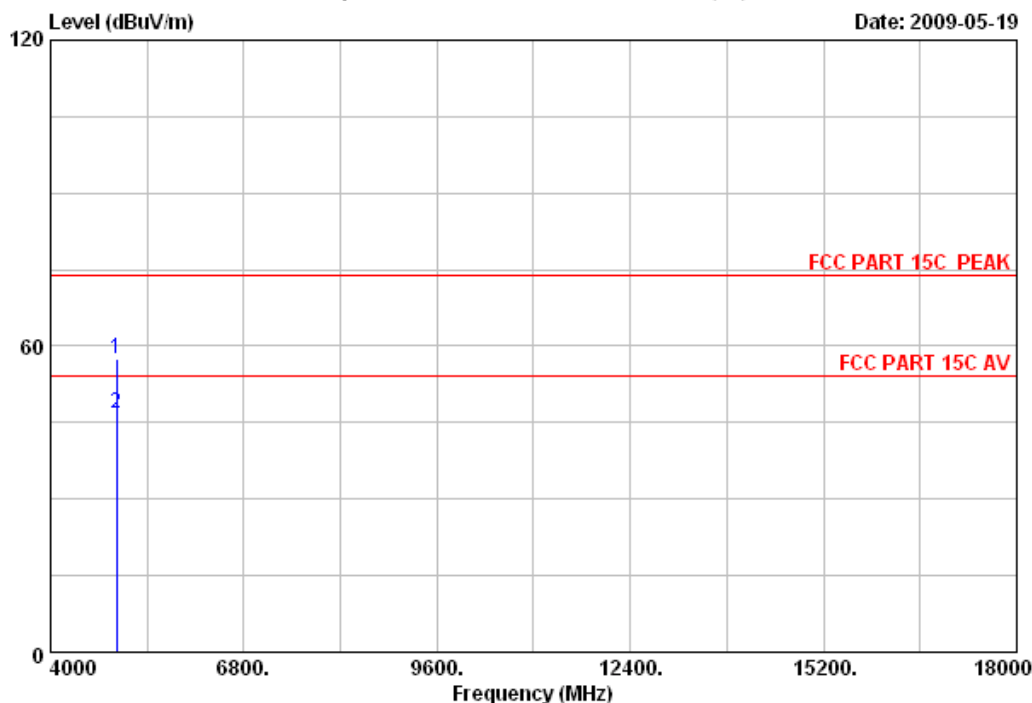


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Data: 18

File: E:\2009 report data\H\harmonix\ACS9Q695.EM6 (30)

Date: 2009-05-19



Site no. : 3m Chamber Data no. : 18
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2476MHz
M/N : NWGTS3

| | 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 | 46.32 | 57.53 | 74.00 | 16.47 | Peak |
| 2 | 4952.000 | 35.19 | 10.58 | 34.56 | 35.67 | 46.88 | 54.00 | 7.12 | 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

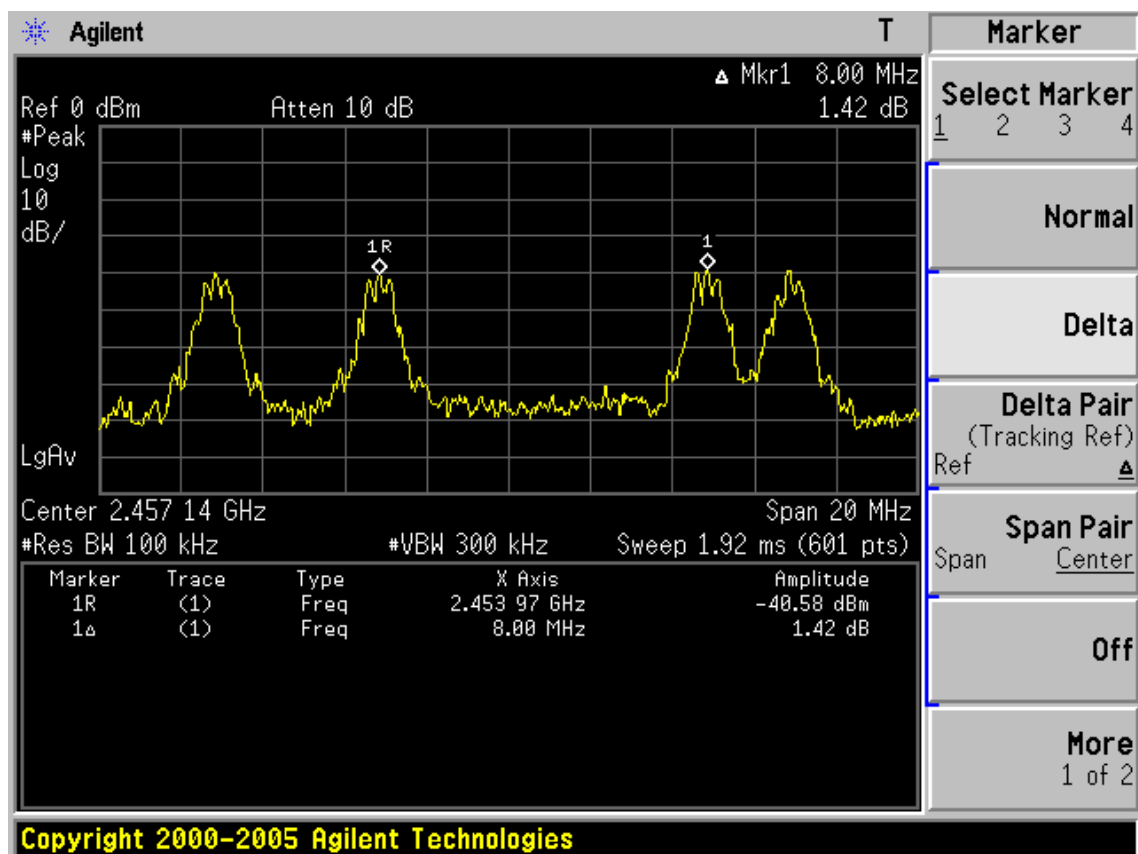
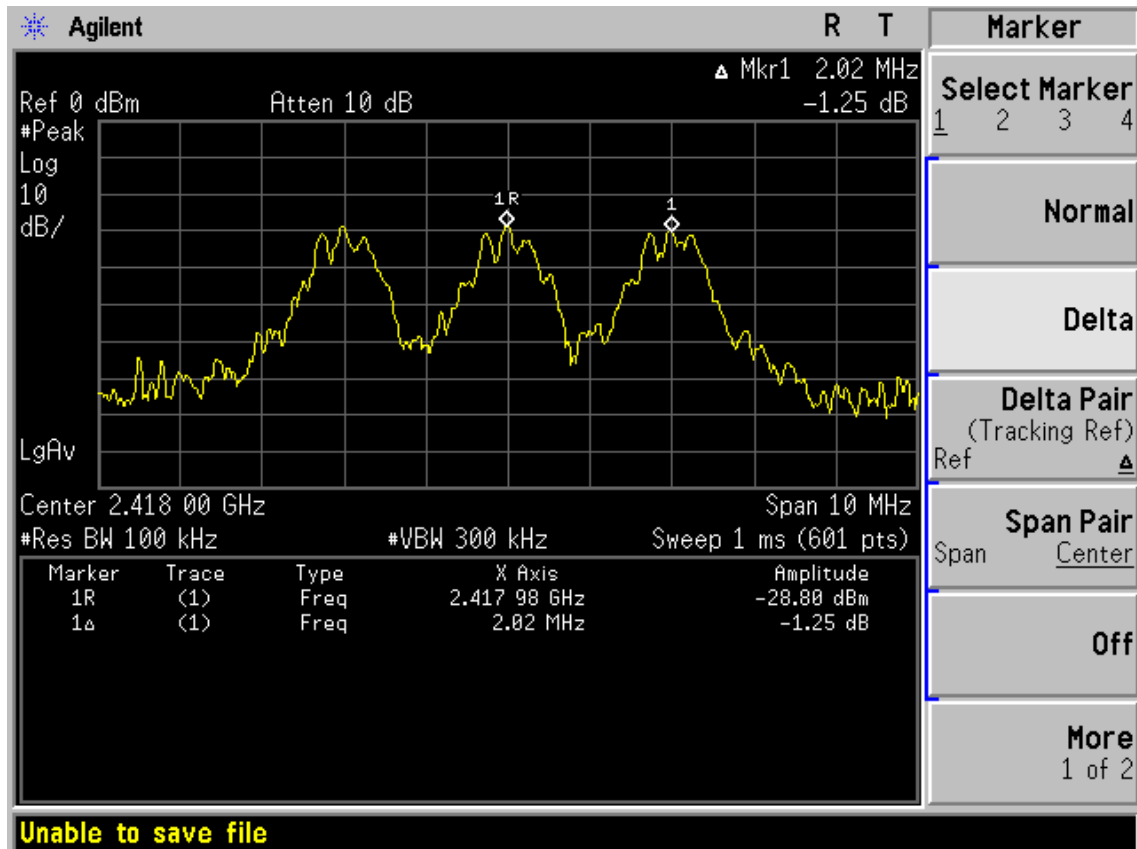
| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-------------------|--------------|-----------|------------|------------|---------------|
| 1. | Spectrum Analyzer | Agilent | E4446A | US44300459 | May,08, 09 | 1 Year |

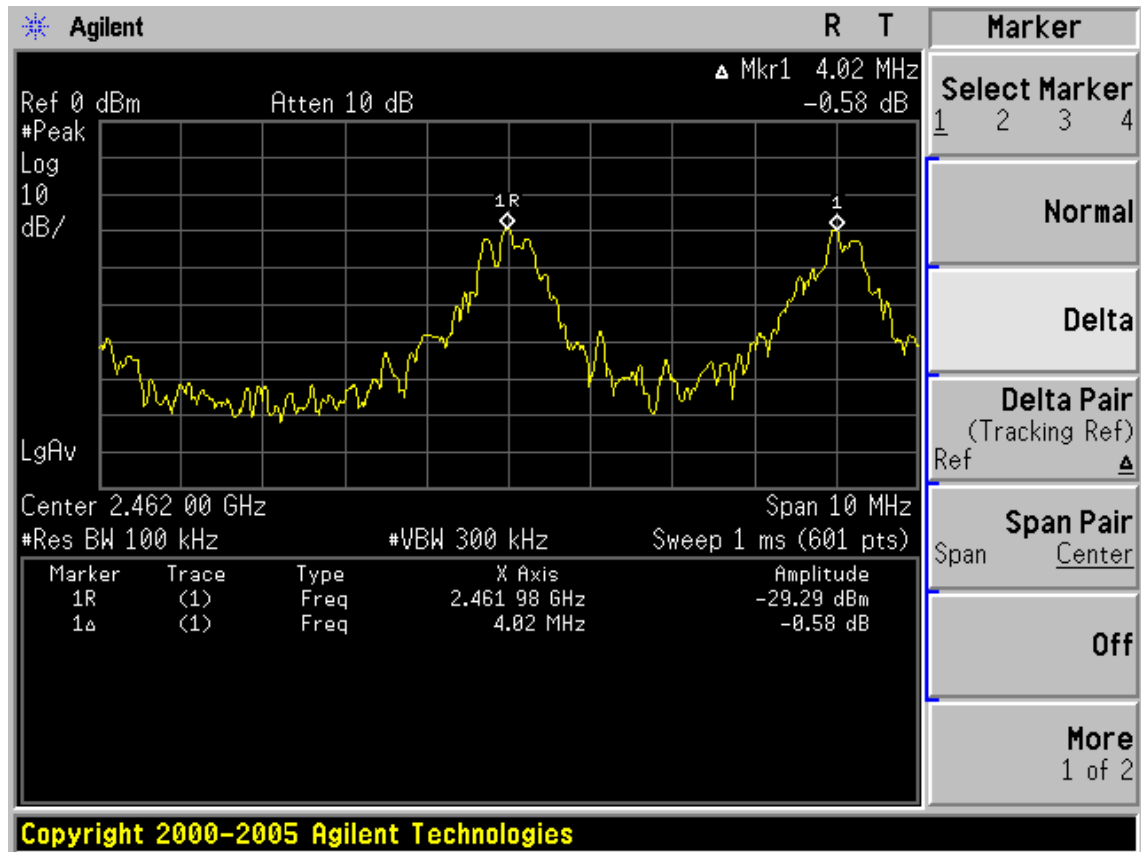
5.2. Limit

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 (Pass)

| CH | Channel separation | Conclusion |
|------|--------------------|------------|
| Low | 2.02MHz | PASS |
| Mid | 8.00MHz | PASS |
| High | 4.02MHz | 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 |

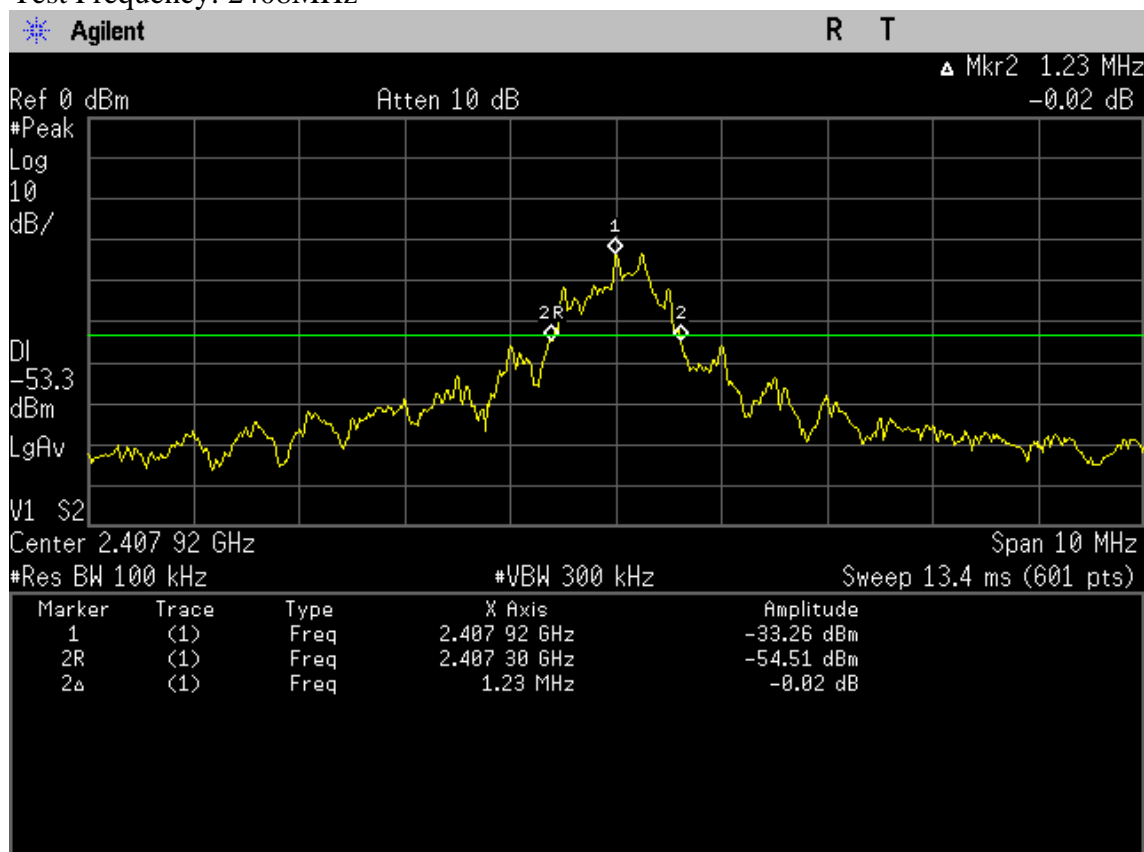
6.2. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of 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.

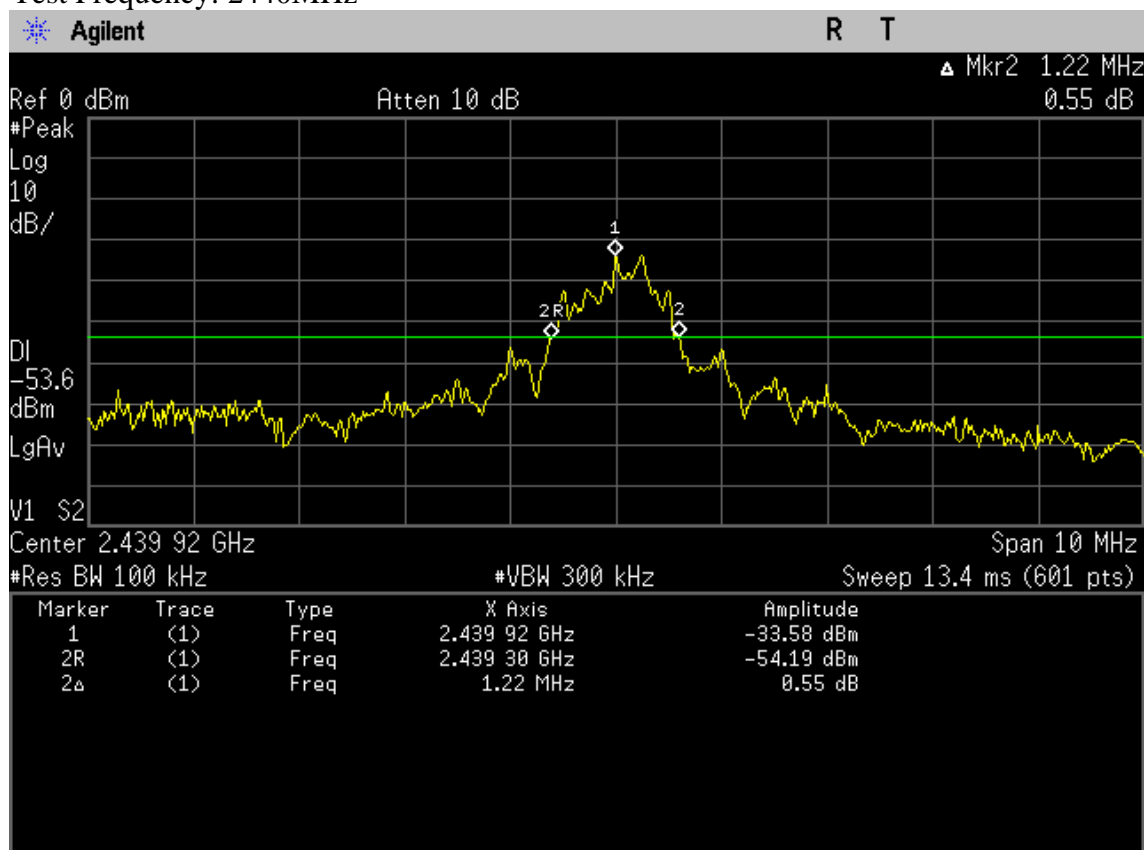
6.3. Test Results

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

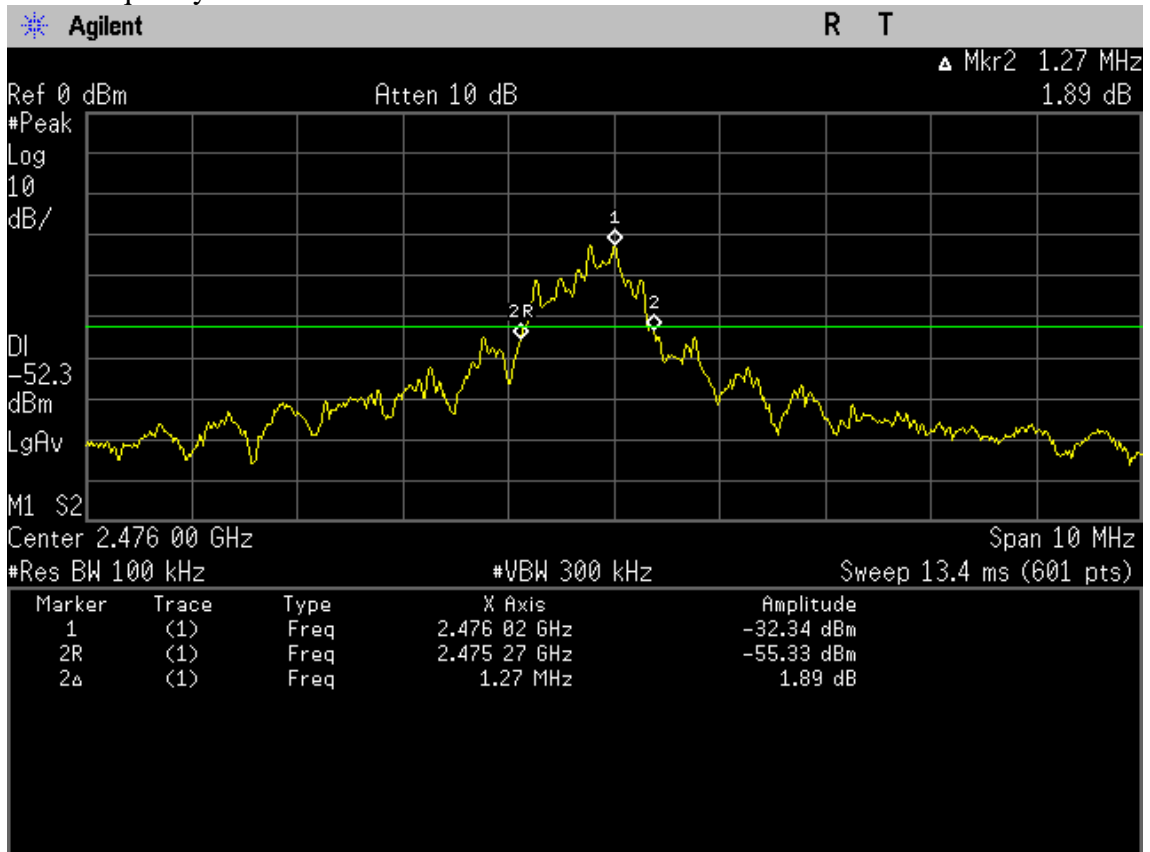
Test Frequency: 2408MHz



Test Frequency: 2440MHz



Test Frequency: 2476MHz



7. NUMBER OF HOPPING FREQUENCY TEST

7.1. Test Equipment

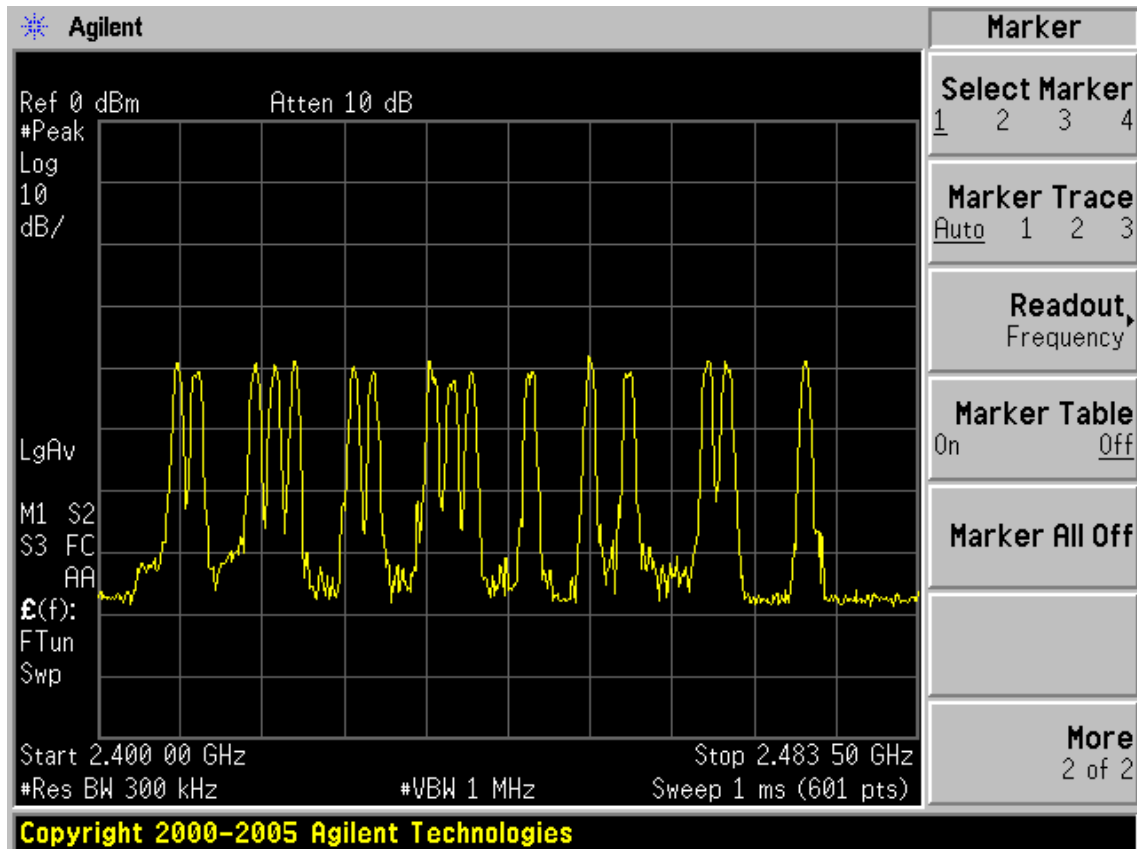
| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-------------------|--------------|-----------------|------------|------------|---------------|
| 1 | Spectrum Analyzer | Agilent | E4446A | US44300459 | May,08, 09 | 1 Year |
| 2 | Attenuator | Agilent |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

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 | ≥ 15 | PASS |



8. DWELL TIME

8.1. Test Equipment

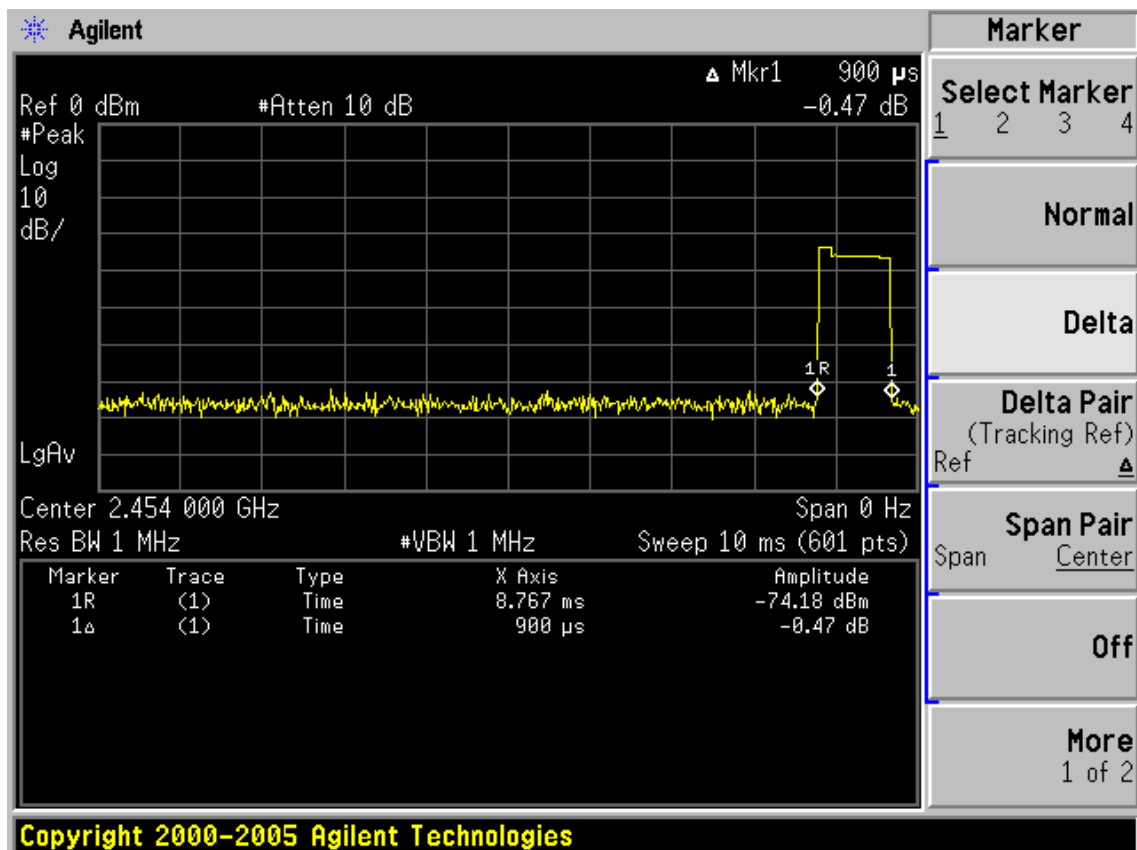
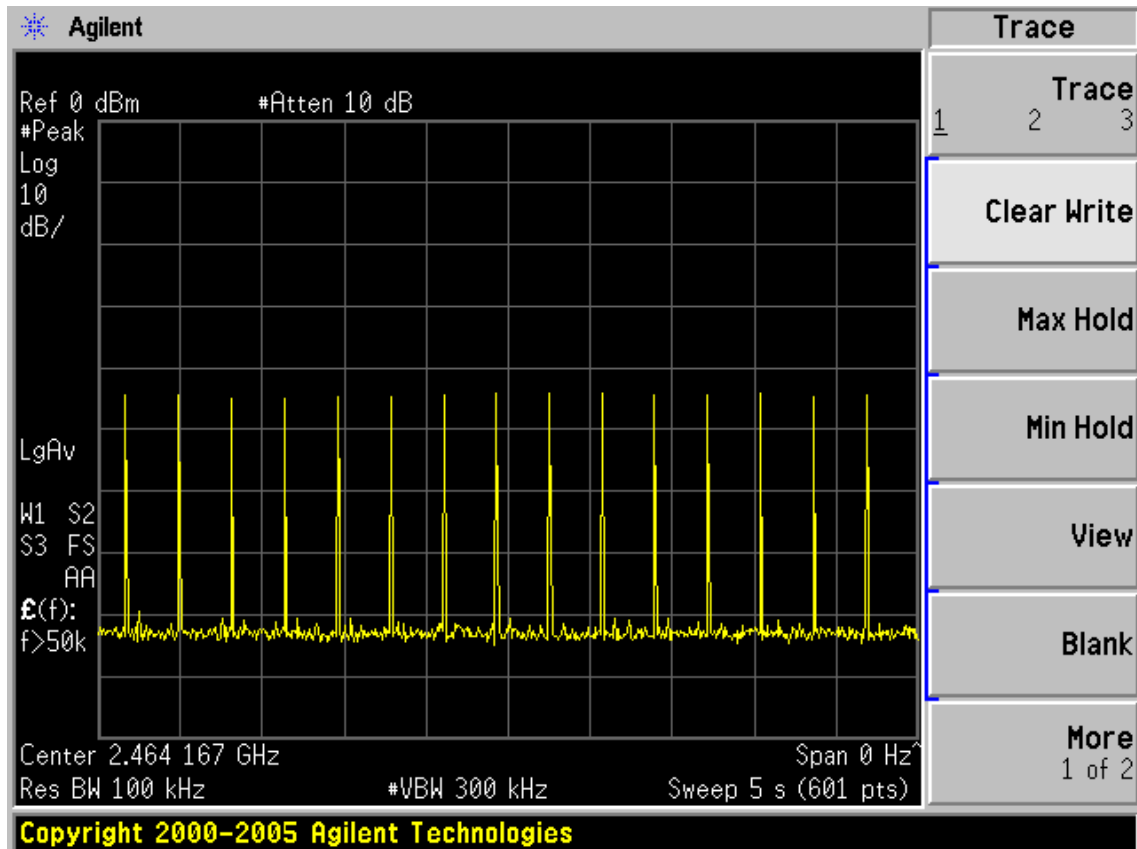
| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|-------------------|--------------|-----------------|------------|------------|---------------|
| 1 | Spectrum Analyzer | Agilent | E4446A | US44300459 | May,08, 09 | 1 Year |
| 2 | Attenuator | Agilent | 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 |
|---|--------|------------|
| $15\text{hops}/5\text{s} \times 0.4 \times 16\text{chanel s} \times 0.9\text{ms} = 17.28\text{ ms}$ | <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, 09 | 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 Wii Hofner Wireless Guitar | | | | | M/N: NWGTS3 | | | | |
| Power: DC 4.5V | | | | | | | | | |
| Test Date: 2009/05/21 | | | 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 (dBm) | Limit (dBm) | Margin (dB) |
| Low | 2408 | H | 94.61 | -2.43 | 6.06 | 9.25 | 0.76 | 20.97 | 20.21 |
| | 2408 | V | 89.26 | -8.08 | 6.06 | 9.25 | -4.89 | 20.97 | 25.86 |
| Mid | 2440 | H | 94.31 | -2.54 | 6.08 | 9.30 | 0.68 | 20.97 | 20.29 |
| | 2440 | V | 89.54 | -8.34 | 6.08 | 9.30 | -5.12 | 20.97 | 26.09 |
| Hig | 2476 | H | 93.42 | -2.57 | 6.15 | 9.33 | 0.61 | 20.97 | 20.36 |
| | 2476 | V | 89.46 | -7.80 | 6.15 | 9.33 | -4.62 | 20.97 | 25.59 |
| 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, PK detector, Sweep=AUTO

10.4.Test Results

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

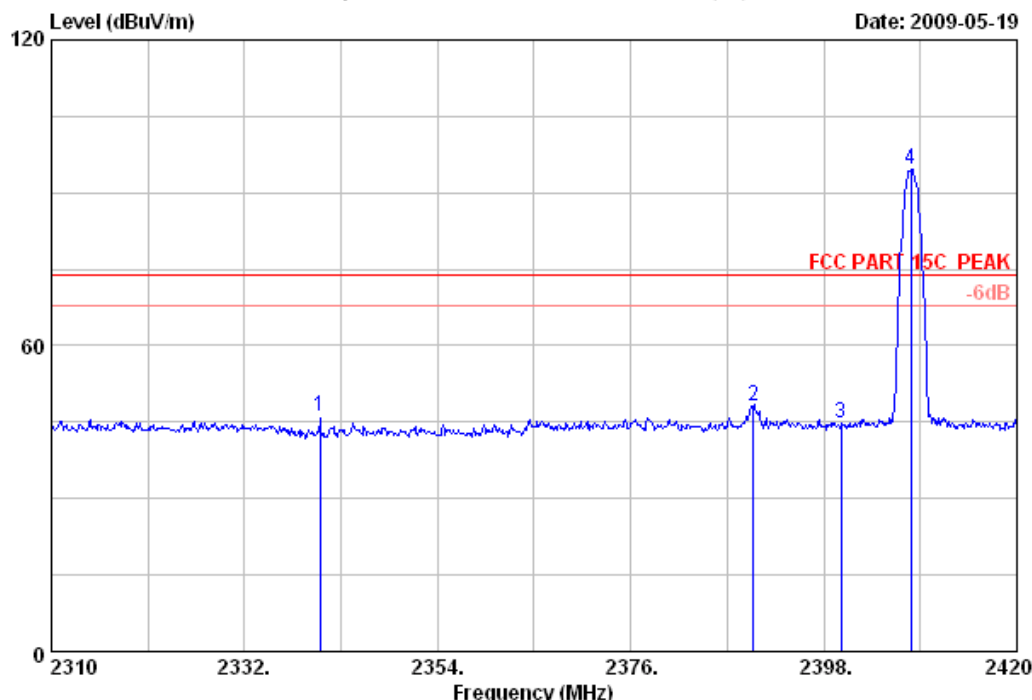


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Postcode:518057

Data: 19

File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)

Date: 2009-05-19



Site no. : 3m Chamber Data no. : 19
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2408MHz
M/N : NWGTS3

| | 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 | 2340.580 | 28.38 | 6.67 | 35.13 | 46.17 | 46.09 | 74.00 | 27.91 | Peak |
| 2 | 2390.000 | 28.46 | 6.71 | 35.12 | 47.98 | 48.03 | 74.00 | 25.97 | Peak |
| 3 | 2400.000 | 28.46 | 6.73 | 35.12 | 44.56 | 44.63 | 74.00 | 29.37 | Peak |
| 4 | 2407.900 | 28.48 | 6.73 | 35.12 | 94.42 | 94.51 | 74.00 | -20.51 | Peak |

Remarks:

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

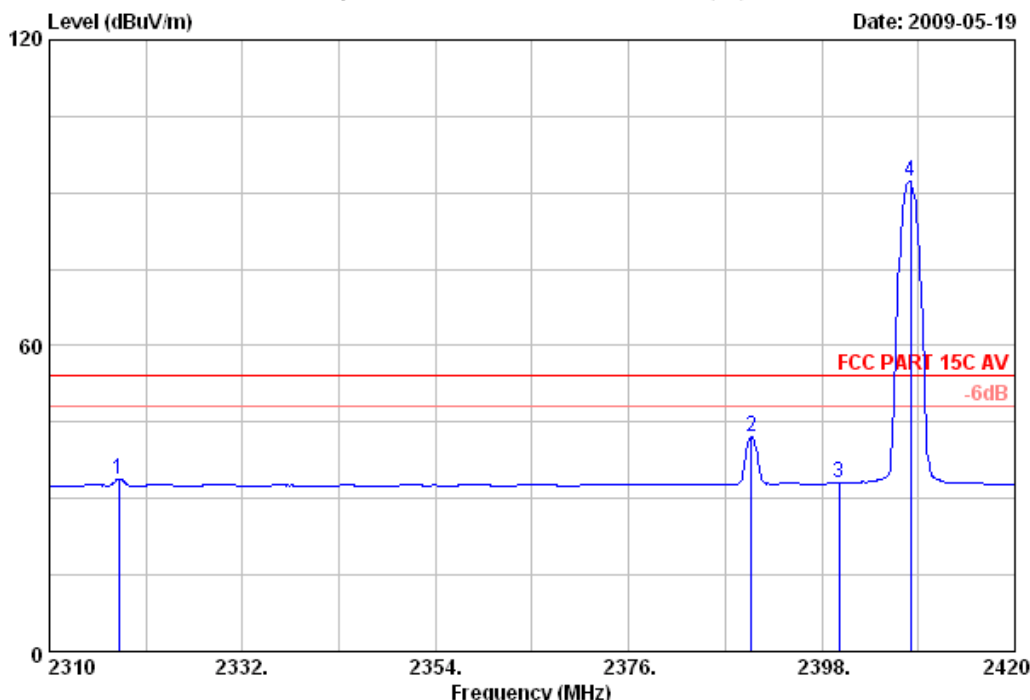


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Data: 20

File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)

Date: 2009-05-19



Site no. : 3m Chamber Data no. : 20
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C AV
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2408MHz
M/N : NWGTS3

| | 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 | 2317.920 | 28.36 | 6.65 | 35.13 | 33.94 | 33.82 | 54.00 | 20.18 | Average |
| 2 | 2390.000 | 28.46 | 6.71 | 35.12 | 42.01 | 42.06 | 54.00 | 11.94 | Average |
| 3 | 2400.000 | 28.46 | 6.73 | 35.12 | 32.98 | 33.05 | 54.00 | 20.95 | Average |
| 4 | 2408.120 | 28.48 | 6.73 | 35.12 | 92.01 | 92.10 | 54.00 | -38.10 | Average |

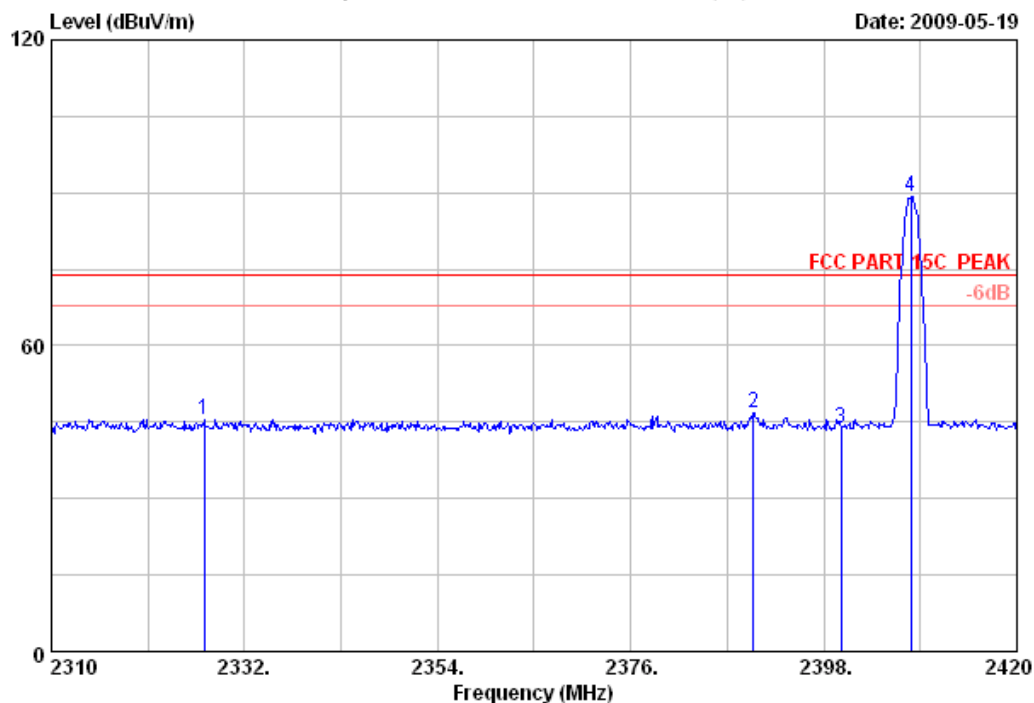
Remarks:

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: 21 File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)



Site no. : 3m Chamber Data no. : 21
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2408MHz
M/N : NWGTS3

| | 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 | 2327.380 | 28.36 | 6.65 | 35.13 | 45.61 | 45.49 | 74.00 | 28.51 | Peak |
| 2 | 2390.000 | 28.46 | 6.71 | 35.12 | 46.66 | 46.71 | 74.00 | 27.29 | Peak |
| 3 | 2400.000 | 28.46 | 6.73 | 35.12 | 43.71 | 43.78 | 74.00 | 30.22 | Peak |
| 4 | 2407.900 | 28.48 | 6.73 | 35.12 | 89.09 | 89.18 | 74.00 | -15.18 | Peak |

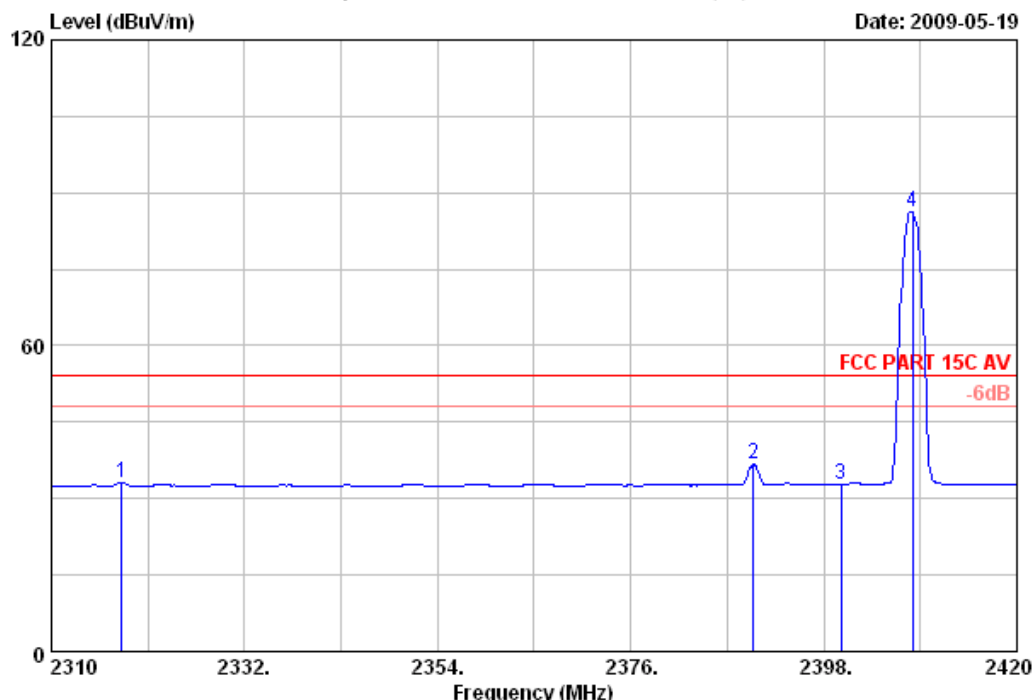
Remarks:

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\ACS90695.EM6 (30)



| | | | |
|-------------|---------------------------------|-----------|-------------|
| Site no. | : 3m Chamber | Data no. | : 22 |
| Dis. / Ant. | : 3m 3115 | Ant. pol. | : VERTICAL |
| Limit | : FCC PART 15C AV | | |
| Env. / Ins. | : 25°C/49% | Engineer | : Paul Tian |
| EUT | : P9 Wii Hofner Wireless Guitar | | |
| Power | : DC 4.5V | | |
| Test mode | : Tx 2408MHz | | |
| M/N | : NWGTS3 | | |

| | 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 | 2318.030 | 28.36 | 6.65 | 35.13 | 33.22 | 33.10 | 54.00 | 20.90 | Average |
| 2 | 2390.000 | 28.46 | 6.71 | 35.12 | 36.66 | 36.71 | 54.00 | 17.29 | Average |
| 3 | 2400.000 | 28.46 | 6.73 | 35.12 | 32.84 | 32.91 | 54.00 | 21.09 | Average |
| 4 | 2408.120 | 28.48 | 6.73 | 35.12 | 86.25 | 86.34 | 54.00 | -32.34 | 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.

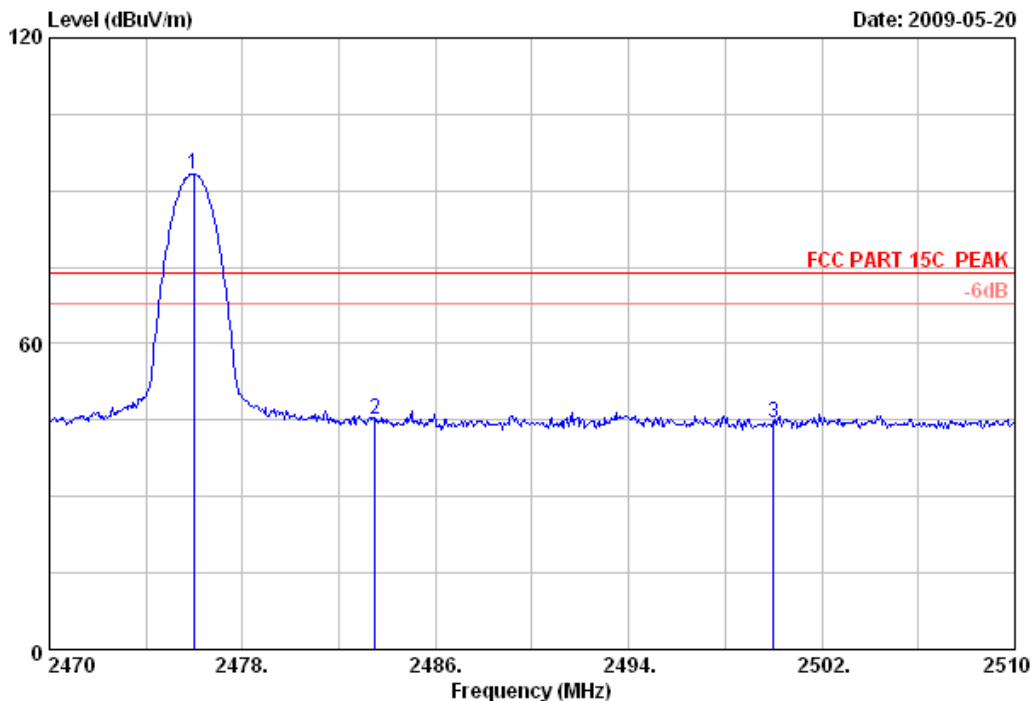


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Data: 23

File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)

Date: 2009-05-20



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 : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2476MHz
M/N : NWGTS3

| | 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 | 2475.964 | 28.58 | 6.87 | 35.10 | 92.90 | 93.25 | 74.00 | -19.25 | Peak |
| 2 | 2483.500 | 28.58 | 6.87 | 35.10 | 44.92 | 45.27 | 74.00 | 28.73 | Peak |
| 3 | 2500.000 | 28.60 | 6.91 | 35.10 | 44.12 | 44.53 | 74.00 | 29.47 | Peak |

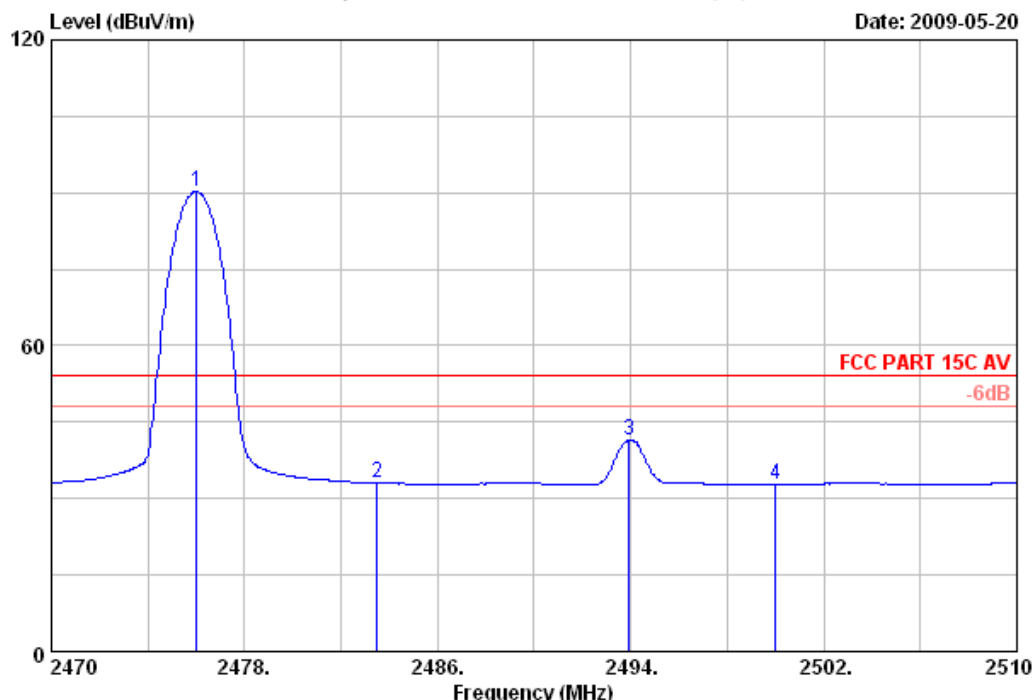
Remarks:

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\ACS90695.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 : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2476MHz
M/N : NWGTS3

| | 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 | 2476.006 | 28.58 | 6.87 | 35.10 | 89.84 | 90.19 | 54.00 | -36.19 | Average |
| 2 | 2483.500 | 28.58 | 6.87 | 35.10 | 32.75 | 33.10 | 54.00 | 20.90 | Average |
| 3 | 2493.940 | 28.60 | 6.91 | 35.10 | 41.04 | 41.45 | 54.00 | 12.55 | Average |
| 4 | 2500.000 | 28.60 | 6.91 | 35.10 | 32.31 | 32.72 | 54.00 | 21.28 | 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.

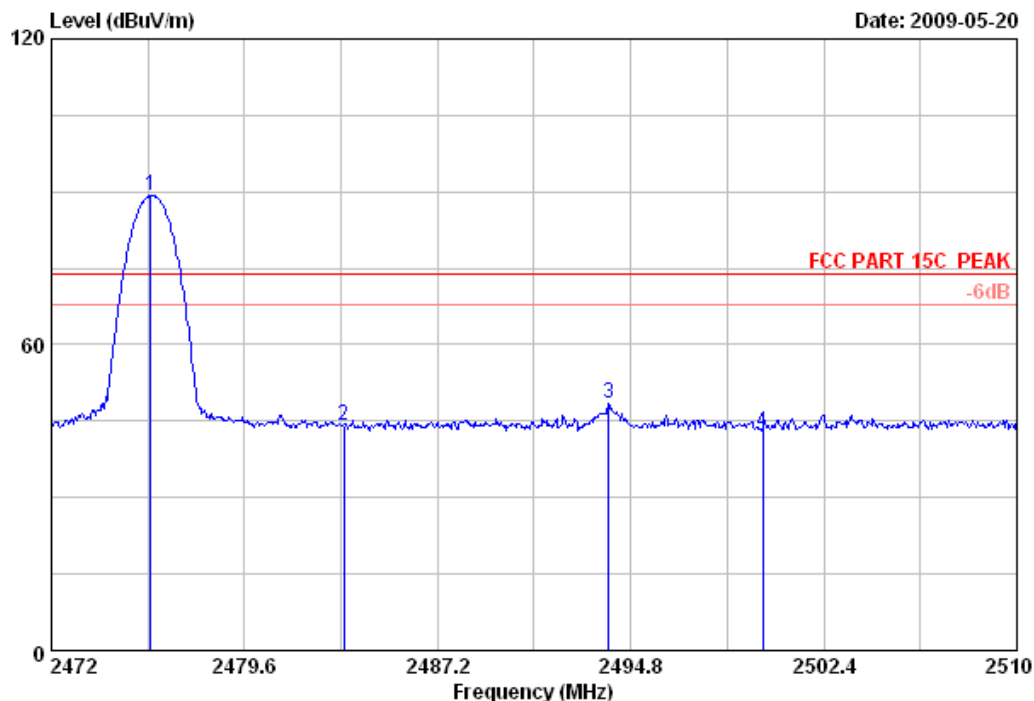


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Data: 25

File: E:\2009 report data\H\harmonix\ACS9Q695.EM6 (30)

Date: 2009-05-20



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 : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2476MHz
M/N : NWGTS3

| | 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 | 2475.920 | 28.58 | 6.87 | 35.10 | 88.87 | 89.22 | 74.00 | -15.22 | Peak |
| 2 | 2483.500 | 28.58 | 6.87 | 35.10 | 43.69 | 44.04 | 74.00 | 29.96 | Peak |
| 3 | 2493.920 | 28.60 | 6.91 | 35.10 | 48.22 | 48.63 | 74.00 | 25.37 | Peak |
| 4 | 2500.000 | 28.60 | 6.91 | 35.10 | 42.54 | 42.95 | 74.00 | 31.05 | 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.

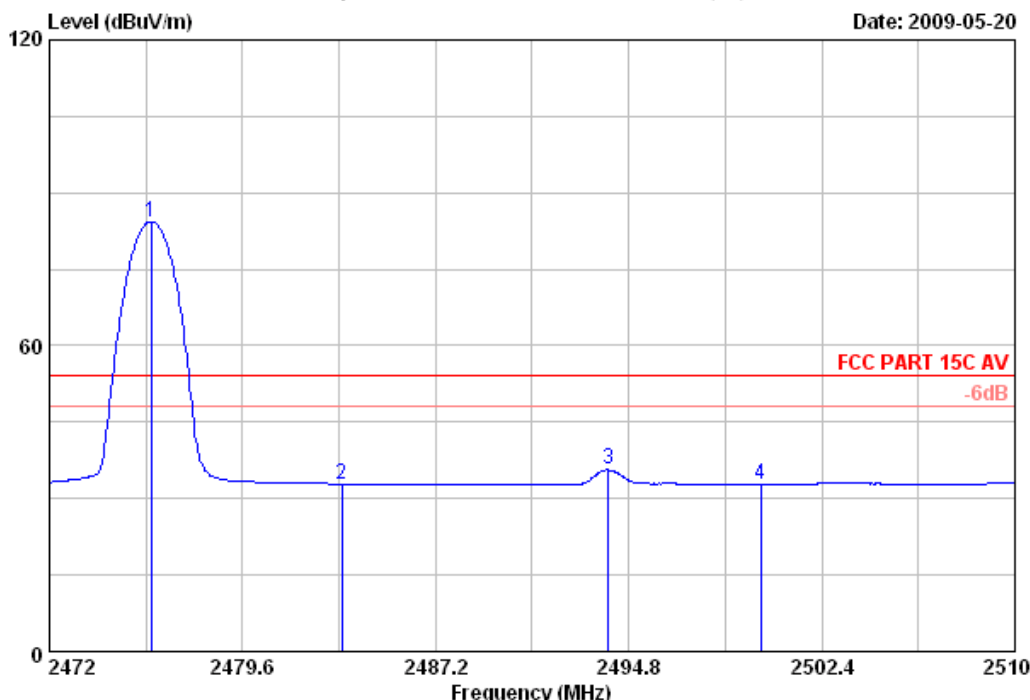


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Data: 26

File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)

Date: 2009-05-20



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 : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2476MHz
M/N : NWGTS3

| | 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 | 83.98 | 84.33 | 54.00 | -30.33 | Average |
| 2 | 2483.500 | 28.58 | 6.87 | 35.10 | 32.51 | 32.86 | 54.00 | 21.14 | Average |
| 3 | 2494.000 | 28.60 | 6.91 | 35.10 | 35.20 | 35.61 | 54.00 | 18.39 | Average |
| 4 | 2500.000 | 28.60 | 6.91 | 35.10 | 32.28 | 32.69 | 54.00 | 21.31 | Average |

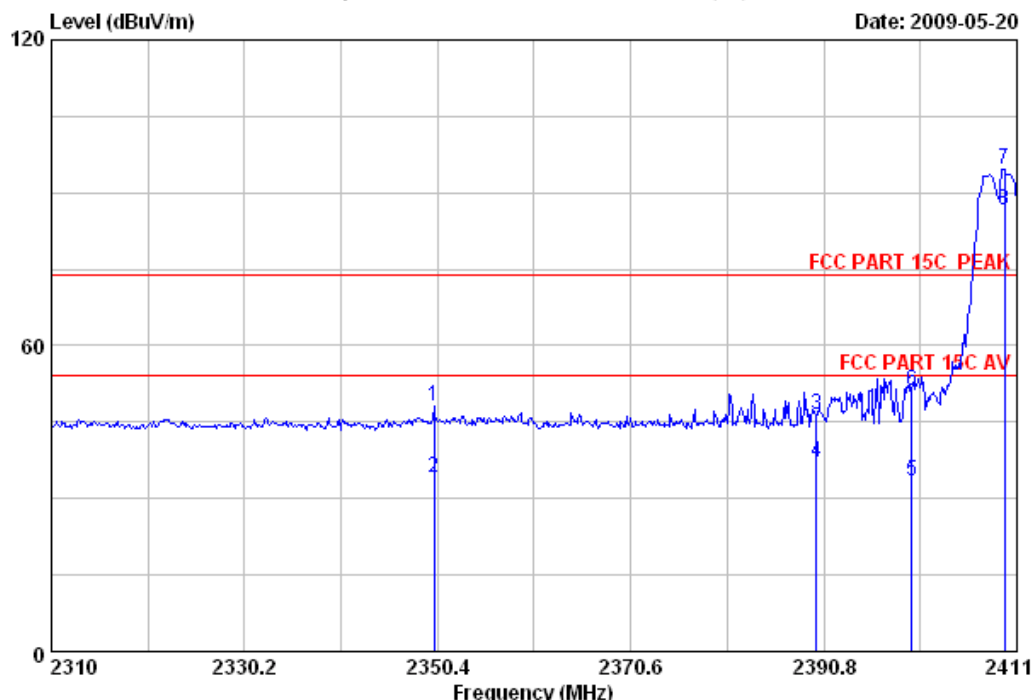
Remarks:

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\ACS90695.EM6 (30)



Site no. : 3m Chamber Data no. : 27
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx Hopping
M/N : NWGTS3

| | 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 | 2350.020 | 28.38 | 6.67 | 35.13 | 48.22 | 48.14 | 74.00 | 25.86 | Peak |
| 2 | 2350.020 | 28.38 | 6.67 | 35.13 | 34.06 | 33.98 | 54.00 | 20.02 | Average |
| 3 | 2390.000 | 28.46 | 6.71 | 35.12 | 46.36 | 46.41 | 74.00 | 27.59 | Peak |
| 4 | 2390.000 | 28.46 | 6.71 | 35.12 | 37.12 | 37.17 | 54.00 | 16.83 | Average |
| 5 | 2400.000 | 28.46 | 6.73 | 35.12 | 33.27 | 33.34 | 54.00 | 20.66 | Average |
| 6 | 2400.000 | 28.46 | 6.73 | 35.12 | 50.97 | 51.04 | 74.00 | 22.96 | Peak |
| 7 | 2409.705 | 28.48 | 6.73 | 35.12 | 94.45 | 94.54 | 74.00 | -20.54 | Peak |
| 8 | 2409.705 | 28.48 | 6.73 | 35.12 | 86.49 | 86.58 | 54.00 | -32.58 | Average |

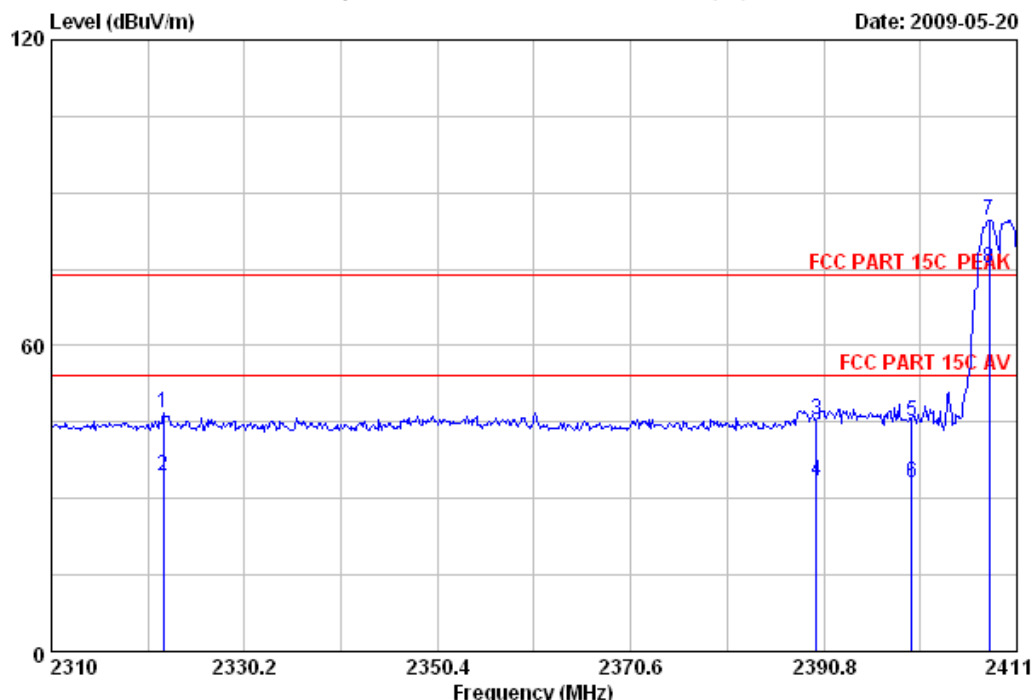
Remarks:

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: 28 File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)



Site no. : 3m Chamber Data no. : 28
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25°C/49% Engineer : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx Hopping
M/N : NWGTS3

| | 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 | 2321.730 | 28.36 | 6.65 | 35.13 | 47.04 | 46.92 | 74.00 | 27.08 | Peak |
| 2 | 2321.730 | 28.36 | 6.65 | 35.13 | 34.42 | 34.30 | 54.00 | 19.70 | Average |
| 3 | 2390.000 | 28.46 | 6.71 | 35.12 | 45.46 | 45.51 | 74.00 | 28.49 | Peak |
| 4 | 2390.000 | 28.46 | 6.71 | 35.12 | 33.30 | 33.35 | 54.00 | 20.65 | Average |
| 5 | 2400.000 | 28.46 | 6.73 | 35.12 | 45.22 | 45.29 | 74.00 | 28.71 | Peak |
| 6 | 2400.000 | 28.46 | 6.73 | 35.12 | 33.15 | 33.22 | 54.00 | 20.78 | Average |
| 7 | 2408.095 | 28.48 | 6.73 | 35.12 | 84.47 | 84.56 | 74.00 | -10.56 | Peak |
| 8 | 2408.095 | 28.48 | 6.73 | 35.12 | 75.06 | 75.15 | 54.00 | -21.15 | 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.

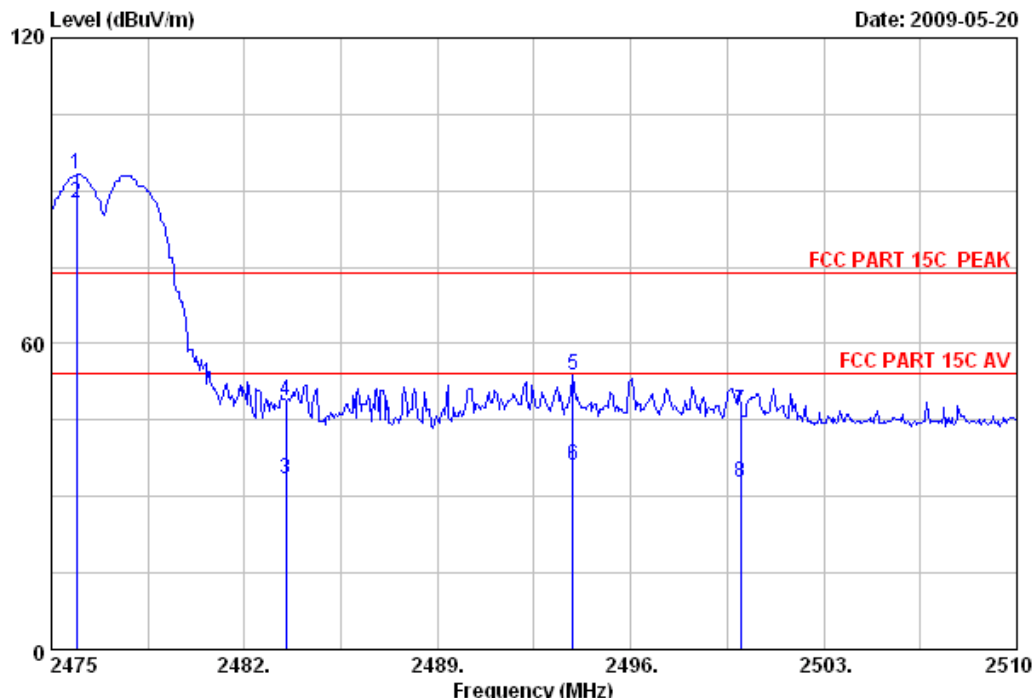


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Data: 29

File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)

Date: 2009-05-20



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 : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx Hopping
M/N : NWGTS3

| | 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 | 2475.910 | 28.58 | 6.87 | 35.10 | 92.81 | 93.16 | 74.00 | -19.16 | Peak |
| 2 | 2475.910 | 28.58 | 6.87 | 35.10 | 87.36 | 87.71 | 54.00 | -33.71 | Average |
| 3 | 2483.500 | 28.58 | 6.87 | 35.10 | 33.10 | 33.45 | 54.00 | 20.55 | Average |
| 4 | 2483.500 | 28.58 | 6.87 | 35.10 | 48.45 | 48.80 | 74.00 | 25.20 | Peak |
| 5 | 2493.910 | 28.60 | 6.91 | 35.10 | 53.51 | 53.92 | 74.00 | 20.08 | Peak |
| 6 | 2493.910 | 28.60 | 6.91 | 35.10 | 35.63 | 36.04 | 54.00 | 17.96 | Average |
| 7 | 2500.000 | 28.60 | 6.91 | 35.10 | 46.40 | 46.81 | 74.00 | 27.19 | Peak |
| 8 | 2500.000 | 28.60 | 6.91 | 35.10 | 32.51 | 32.92 | 54.00 | 21.08 | 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.

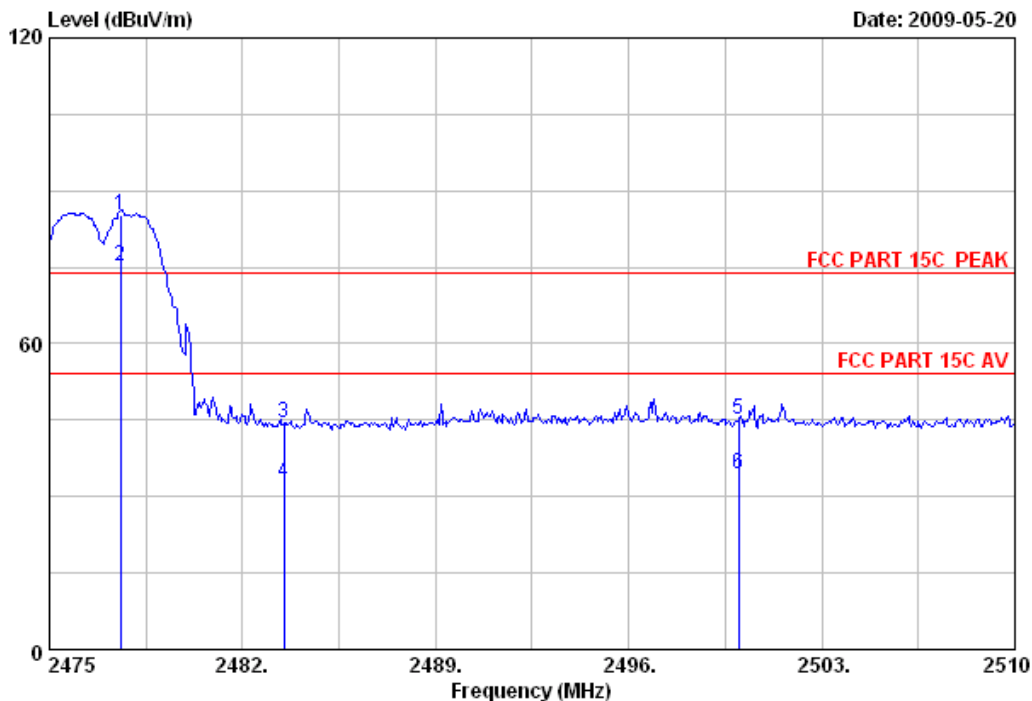


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Data: 30

File: E:\2009 report data\H\harmonix\ACS90695.EM6 (30)

Date: 2009-05-20



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 : Paul Tian
EUT : P9 Wii Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx Hopping
M/N : NWGTS3

| | 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 | 2477.575 | 28.58 | 6.87 | 35.10 | 84.87 | 85.22 | 74.00 | -11.22 | Peak |
| 2 | 2477.575 | 28.58 | 6.87 | 35.10 | 74.87 | 75.22 | 54.00 | -21.22 | Average |
| 3 | 2483.500 | 28.58 | 6.87 | 35.10 | 44.18 | 44.53 | 74.00 | 29.47 | Peak |
| 4 | 2483.500 | 28.58 | 6.87 | 35.10 | 32.57 | 32.92 | 54.00 | 21.08 | Average |
| 5 | 2500.000 | 28.60 | 6.91 | 35.10 | 44.60 | 45.01 | 74.00 | 28.99 | Peak |
| 6 | 2500.000 | 28.60 | 6.91 | 35.10 | 34.08 | 34.49 | 54.00 | 19.51 | 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

11.1 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.

11.2 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]