APPLICATION FOR CERTIFICATION

On Behalf of

Harmonix Music Systems, Inc.

P9 XBox Hofner Wireless Guitar

Model Number: XBGTS3

FCC ID: VFRXBGTS3

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,
Nantou, Shenzhen, Guangdong, China

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Report Number	:	ACS-F09112
Date of Test	:	May.24~26, 2009
Date of Report	:	Jun.04, 2009

TABLE OF CONTENTS

TEST REPORT CERTIFICATION

Applicant	:	Harmonix Music Systems, Inc.
Manufacturer	:	Early Light International Co., Ltd.
EUT Description	:	P9 XBox Hofner Wireless Guitar
FCC ID	:	VFRXBGTS3

(A) MODEL NO. : XBGTS3
(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.24~ 26, 2009

Prepared by: Edie Huang
Edie Huang / Assistant

Reviewer: Jamy Yu
Jamy Yu / Senior Engineer

AUDIX® 信華科技(深圳)有限公司
Audix Technology (Shenzhen) Co., Ltd.
EMC 部門報告專用章
Stamp only for EMC Dept. Report
Signature: Ken Lu 6/4/09

Approved & Authorized Signer: Ken Lu
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 XBox Hofner Wireless Guitar
Model Number	:	XBGTS3
FCC ID	:	VFRXBGTS3
Operation frequency	:	2.402GHz-----2.482GHz
Operation Channel	:	41 Channels
Modulation Technology		GMSK
Output power	:	1.98dBm (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, 6th 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.24~26, 2009
Date of Receipt	:	May.21, 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℃	
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

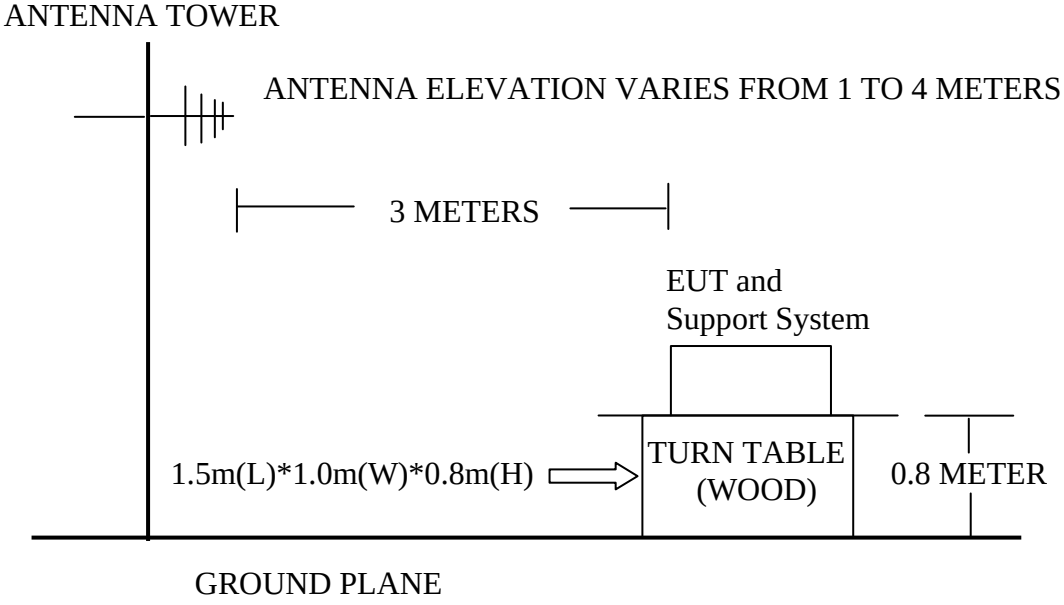
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E4446A	US44300459	May.08, 09	1 Year
2.	Horn Antenna	EMCO	3115	9607-4877	May.27, 08	1.5 Year
3.	Horn Antenna	EMCO	3116	00060088	May.27, 08	1.5Year
4	Amplifier	Agilent	8449B	3008A02495	Nov.24, 08	1 Year
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: P9 XBox Hofner Wireless Guitar)

4.2.2.In Anechoic Chamber



4.3.Radiated Emission Limit

4.3.1. 15.209 limits

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

Remark： (1) Emission level dBμV = 20 log Emission level μV/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 XBox Hofner Wireless Guitar (EUT)

Model Number : XBGTS3
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^{th} 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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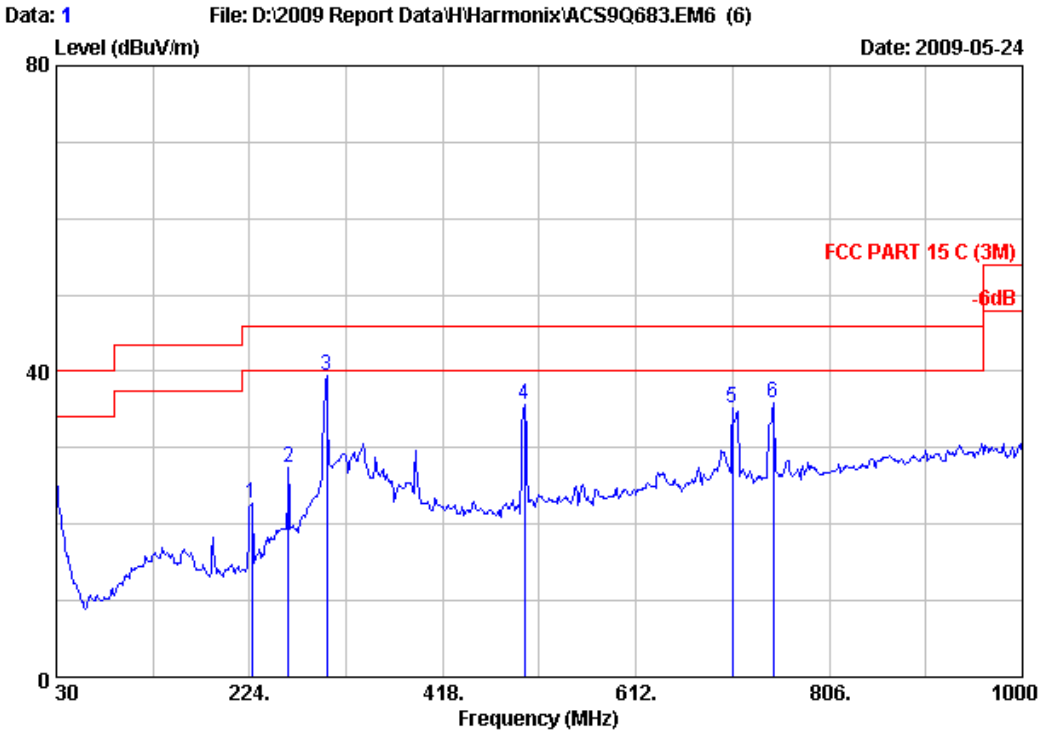

Site no. : 3m Chamber Data no. : 1
Dis. / Ant. : 3m CBL6111C Ant. pol. : HORIZONTAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 24*C/56% Engineer : Sunny-lu
EUT : P9 XBOX Hofner Wireless Guitar
Power Rating : DC 4.5V
Test Mode : Tx Mode
M/N:XBGTS3

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	225.940	10.55	1.24	38.10	22.76	46.00	23.24	QP
2	262.800	13.73	1.41	39.30	27.45	46.00	18.55	QP
3	301.600	13.66	1.59	51.17	39.55	46.00	6.45	QP
4	500.450	18.04	2.15	43.48	35.55	46.00	10.45	QP
5	709.000	20.53	2.79	39.82	35.14	46.00	10.86	QP
6	749.740	21.53	2.84	39.46	35.92	46.00	10.08	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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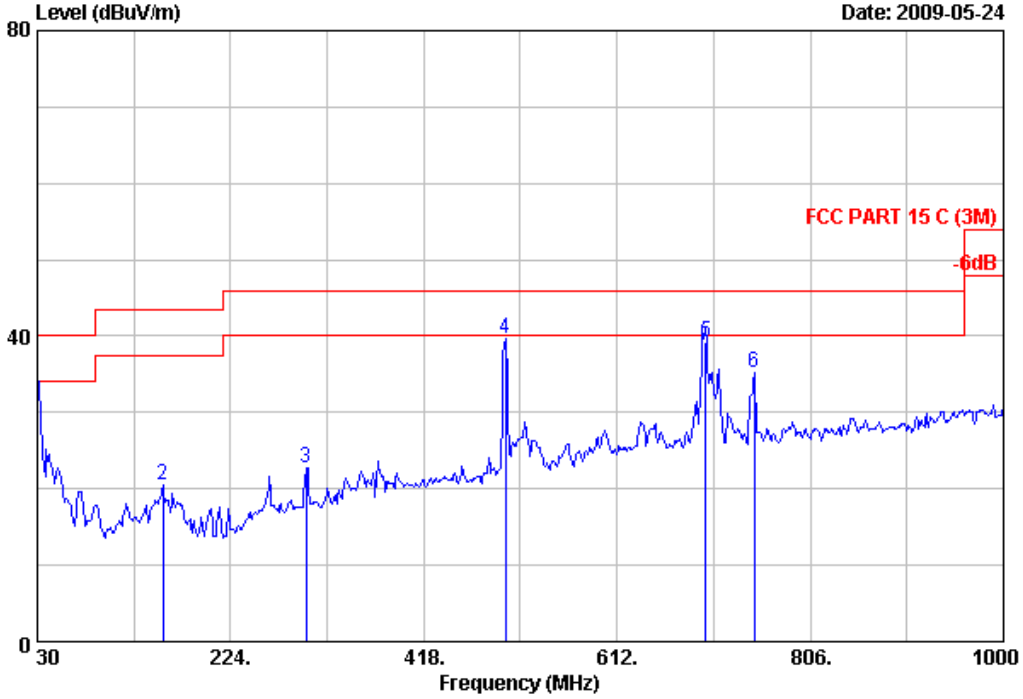
Data: 2 File: D:\2009 Report Data\H\Harmonix\ACS9Q683.EM6 (6)



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 XBOX Hofner Wireless Guitar
Power Rating : DC 4.5V
Test Mode : Tx Mode
M/N:XBGTS3

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	30.000	19.86	0.28	41.58	33.78	40.00	6.22	QP
2	156.100	11.18	0.98	35.72	20.45	43.50	23.05	QP
3	299.660	13.64	1.59	34.43	22.80	46.00	23.20	QP
4	500.450	18.04	2.15	47.53	39.60	46.00	6.40	QP
5	701.240	20.58	2.69	44.02	39.27	46.00	6.73	QP
6	749.740	21.53	2.84	38.75	35.21	46.00	10.79	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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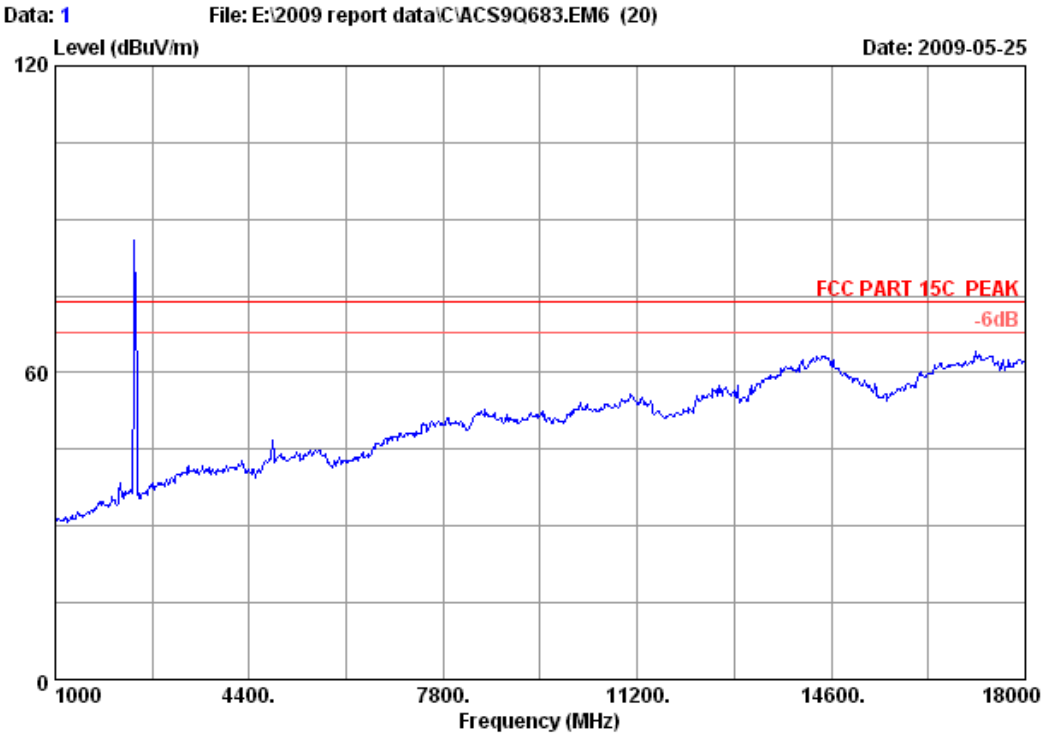


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Site no.      : 3m Chamber                Data no.   : 1
Dis. / Ant.   : 3m   3115                 Ant. pol.  : VERTICAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 25*C/55%                  Engineer   : Sunny
EUT           : P9 XBOX Hofner Wireless Guitar
Power         : DC 4.5V
Test mode     : Tx  2402MHz
M/N           : XBGTS3
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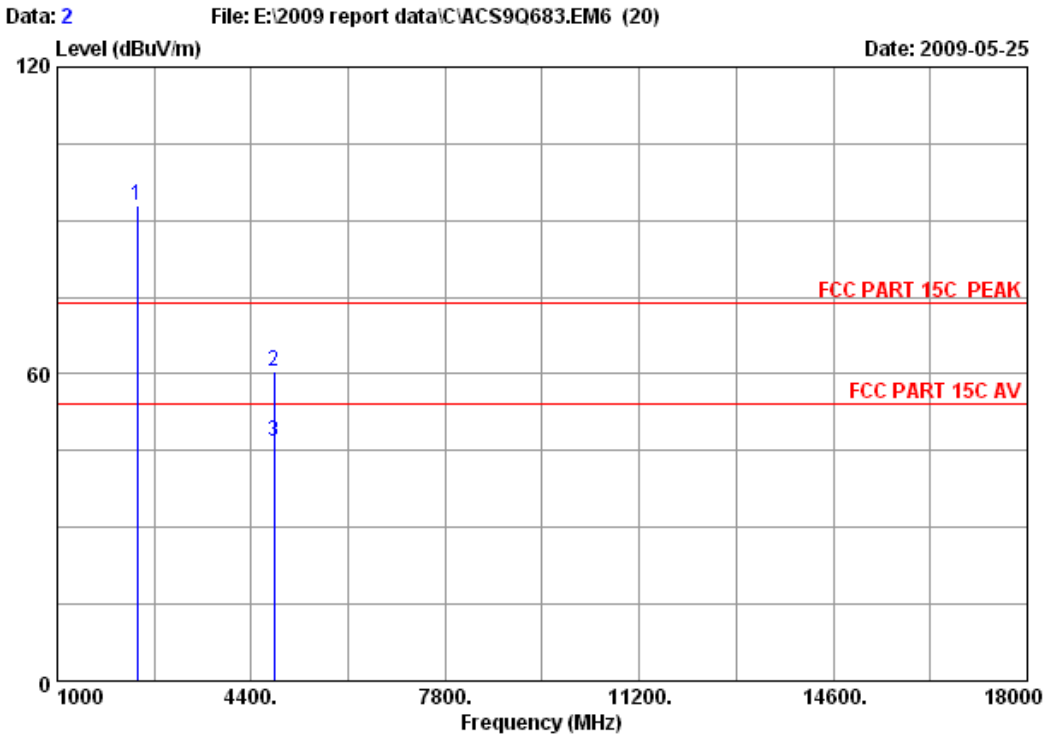

Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer : Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2402MHz
M/N : XBGTS3

	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	2402.000	28.46	6.73	35.12	93.01	93.08	74.00	-19.08	Peak
2	4804.000	34.36	10.53	34.60	50.36	60.65	74.00	13.35	Peak
3	4804.000	34.36	10.53	34.60	36.58	46.87	54.00	7.13	Average

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

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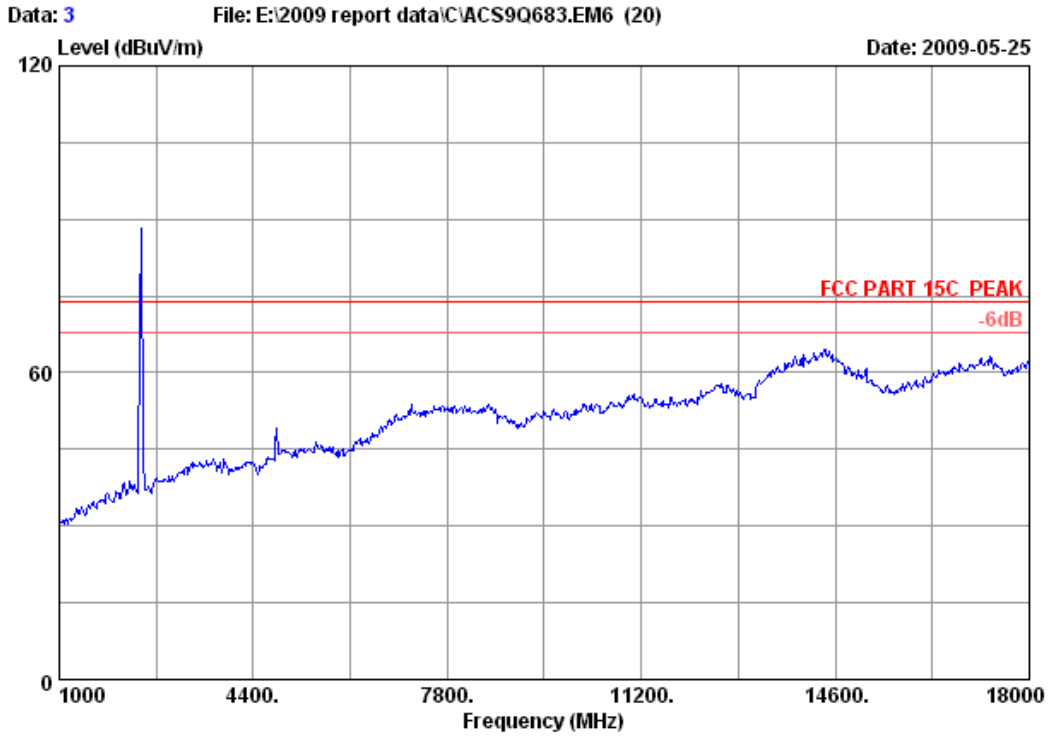


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Site no.      : 3m Chamber              Data no.   : 3
Dis. / Ant.   : 3m   3115               Ant. pol.  : HORIZONTAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 25*C/55%                Engineer   : Sunny
EUT           : P9 XBOX Hofner Wireless Guitar
Power         : DC 4.5V
Test mode     : Tx  2402MHz
M/N           : XBGTS3
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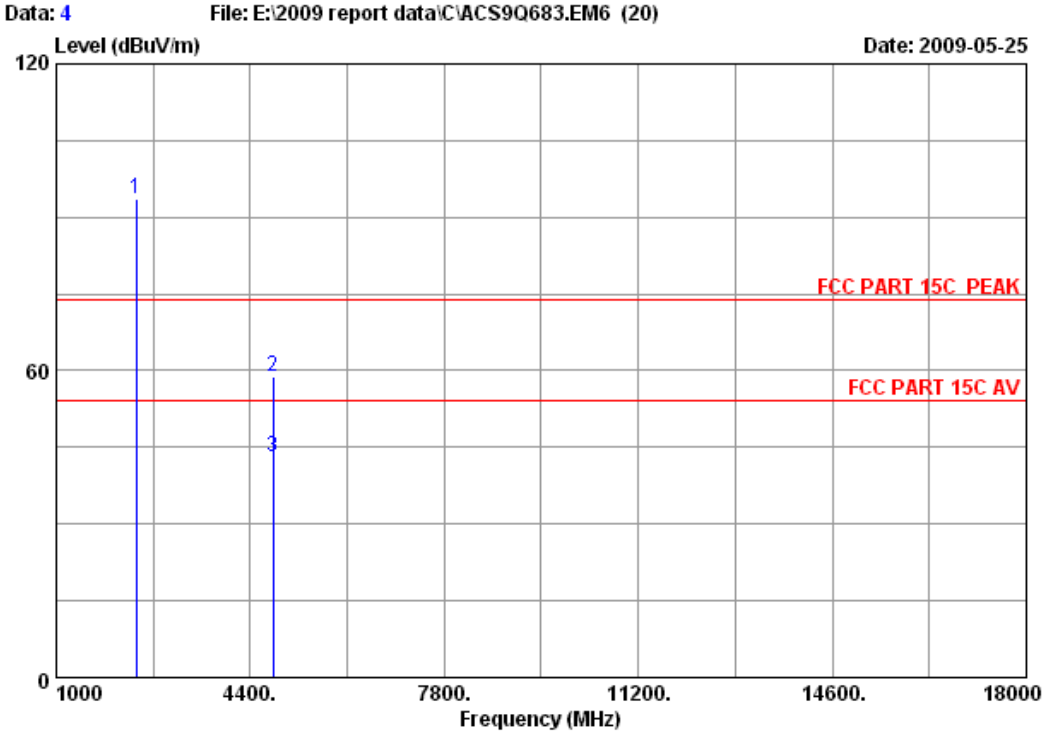

Site no. : 3m Chamber Data no. : 4
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer : Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2402MHz
M/N : XBGTS3

	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	2402.000	28.46	6.73	35.12	93.47	93.54	74.00	-19.54	Peak
2	4804.000	34.36	10.53	34.60	48.67	58.96	74.00	15.04	Peak
3	4804.000	34.36	10.53	34.60	32.67	42.96	54.00	11.04	Average

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

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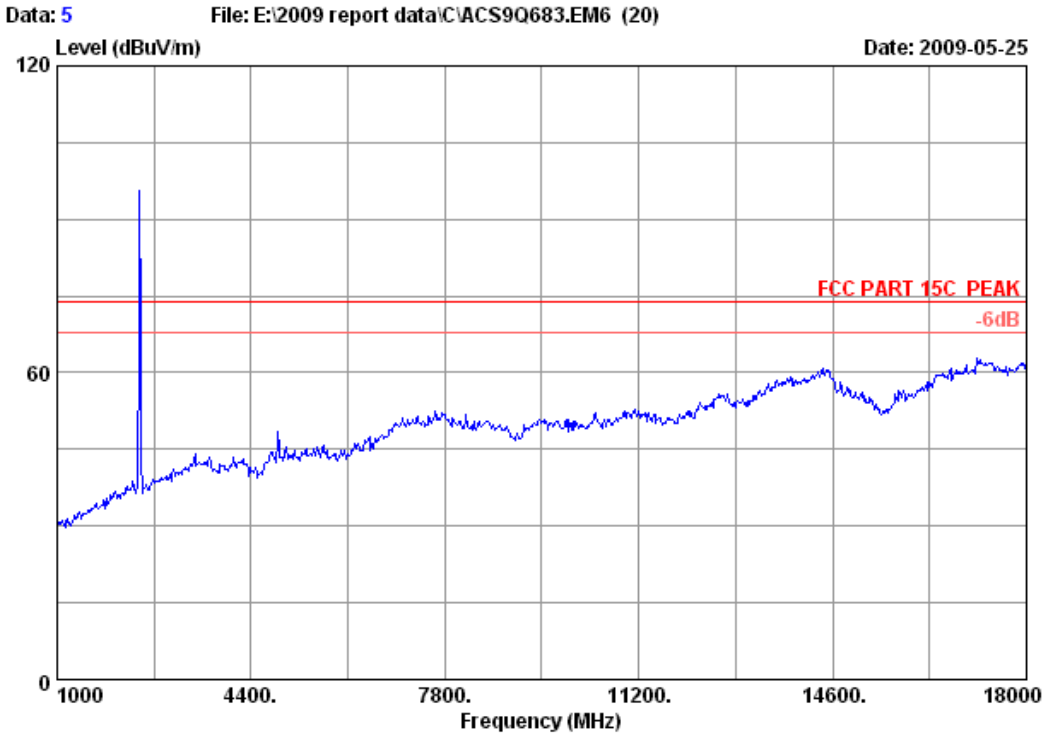

Site no.	: 3m Chamber	Data no.	: 5
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25*C/55%	Engineer	: Sunny
EUT	: P9 XBOX Hofner Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2442MHz		
M/N	: XBGTS3		

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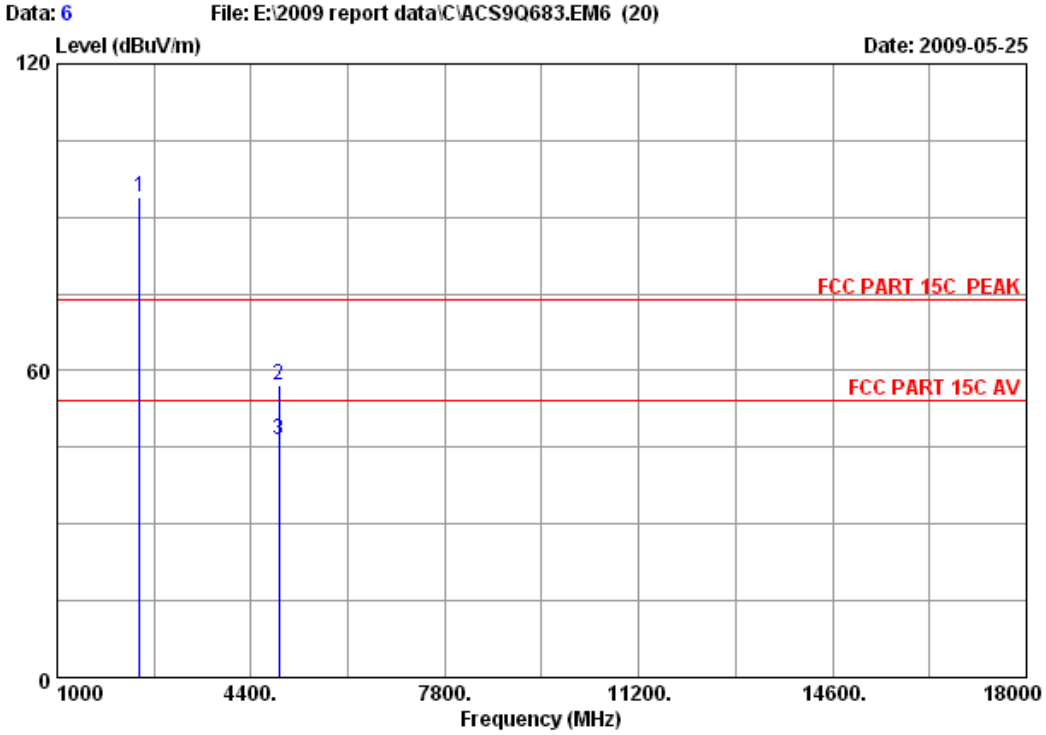

Site no. : 3m Chamber Data no. : 6
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer : Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2442MHz
M/N : XBGTS3

	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	2442.000	28.53	6.80	35.11	93.65	93.87	74.00	-19.87	Peak
2	4884.000	34.78	10.57	34.58	46.35	57.12	74.00	16.88	Peak
3	4884.000	34.78	10.57	34.58	35.69	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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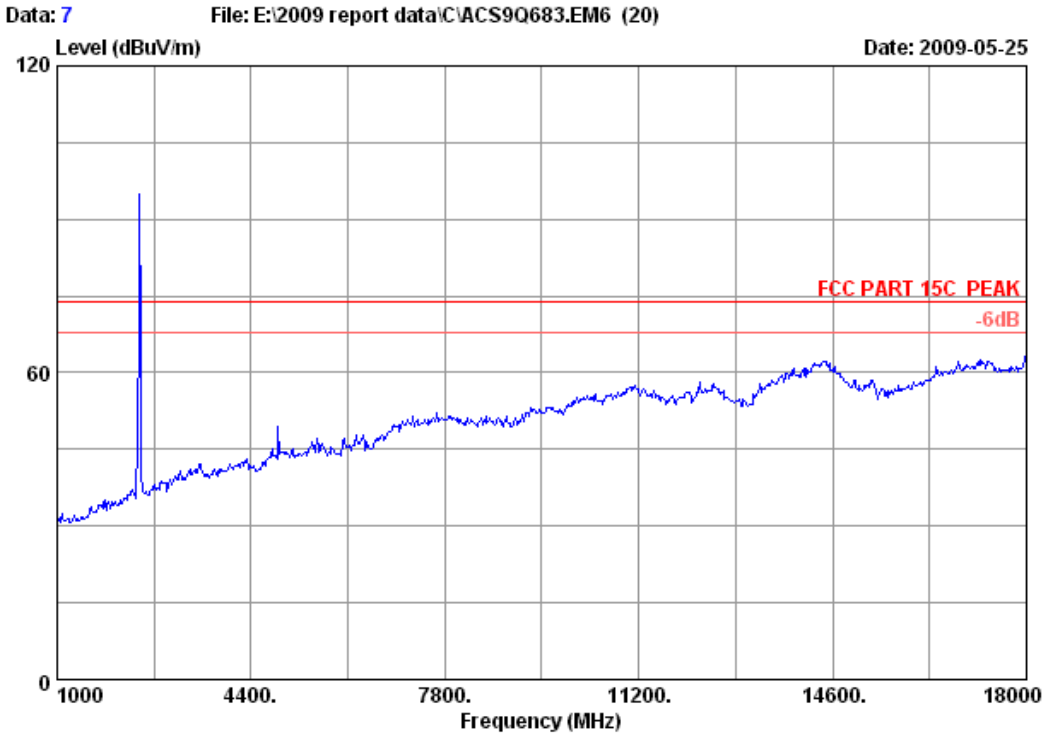

Site no.	: 3m Chamber	Data no.	: 7
Dis. / Ant.	: 3m 3115	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25*C/55%	Engineer	: Sunny
EUT	: P9 XBOX Hofner Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2442MHz		
M/N	: XBGTS3		

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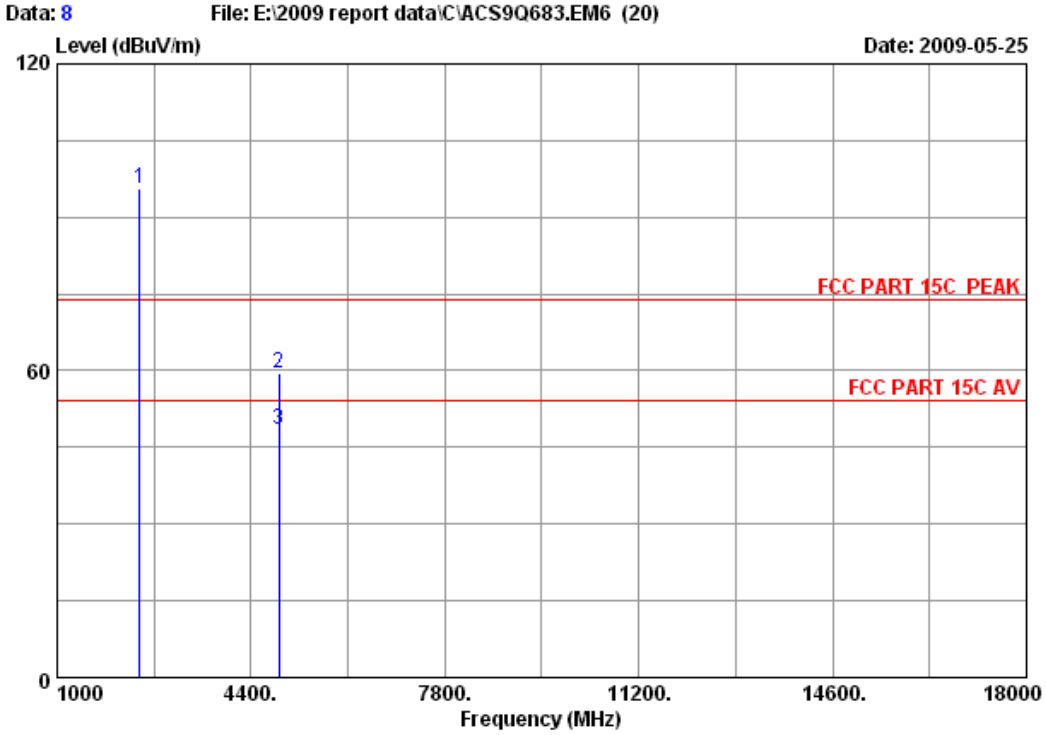

Site no. : 3m Chamber Data no. : 8
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer : Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2442MHz
M/N : XBGTS3

	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	2442.000	28.53	6.80	35.11	95.36	95.58	74.00	-21.58	Peak
2	4884.000	34.78	10.57	34.58	48.69	59.46	74.00	14.54	Peak
3	4884.000	34.78	10.57	34.58	37.54	48.31	54.00	5.69	Average

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

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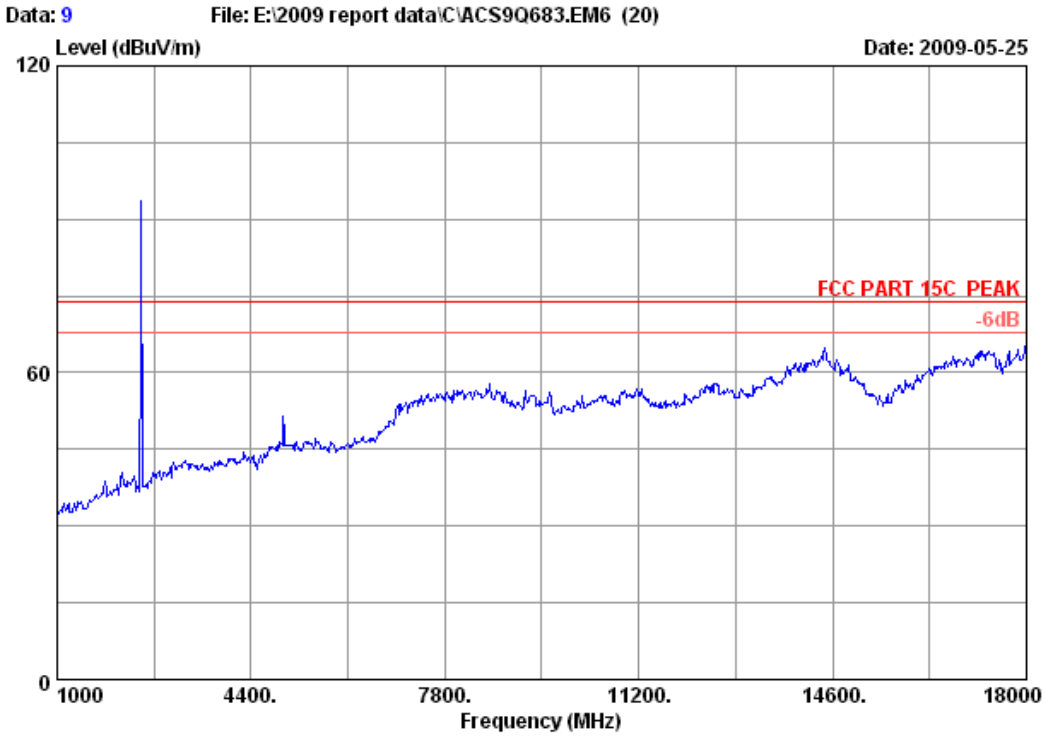

Site no.	: 3m Chamber	Data no.	: 9
Dis. / Ant.	: 3m 3115	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25*C/55%	Engineer	: Sunny
EUT	: P9 XBOX Hofner Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2482MHz		
M/N	: XBGTS3		

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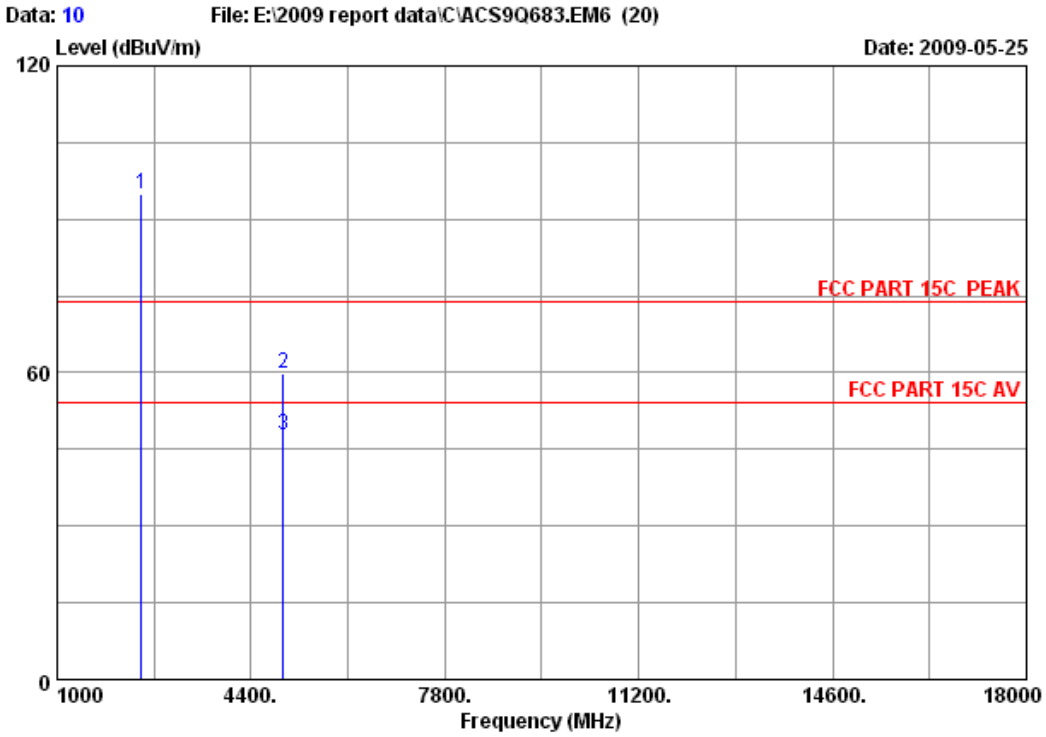

Site no. : 3m Chamber Data no. : 10
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer : Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2482MHz
M/N : XBGTS3

	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	2482.000	28.58	6.87	35.10	94.68	95.03	74.00	-21.03	Peak
2	4964.000	35.29	10.59	34.56	48.67	59.99	74.00	14.01	Peak
3	4964.000	35.29	10.59	34.56	36.58	47.90	54.00	6.10	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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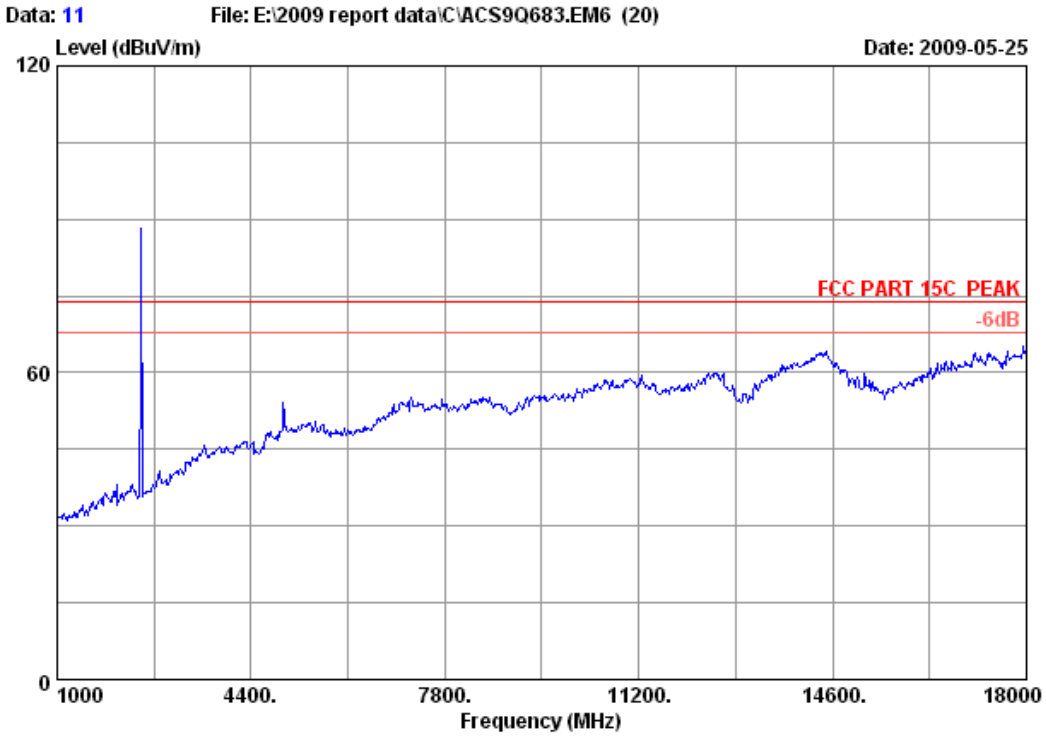
Postcode:518057



Site no.	: 3m Chamber	Data no.	: 11
Dis. / Ant.	: 3m 3115	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 25*C/55%	Engineer	: Sunny
EUT	: P9 XBOX Hofner Wireless Guitar		
Power	: DC 4.5V		
Test mode	: Tx 2482MHz		
M/N	: XBGTS3		

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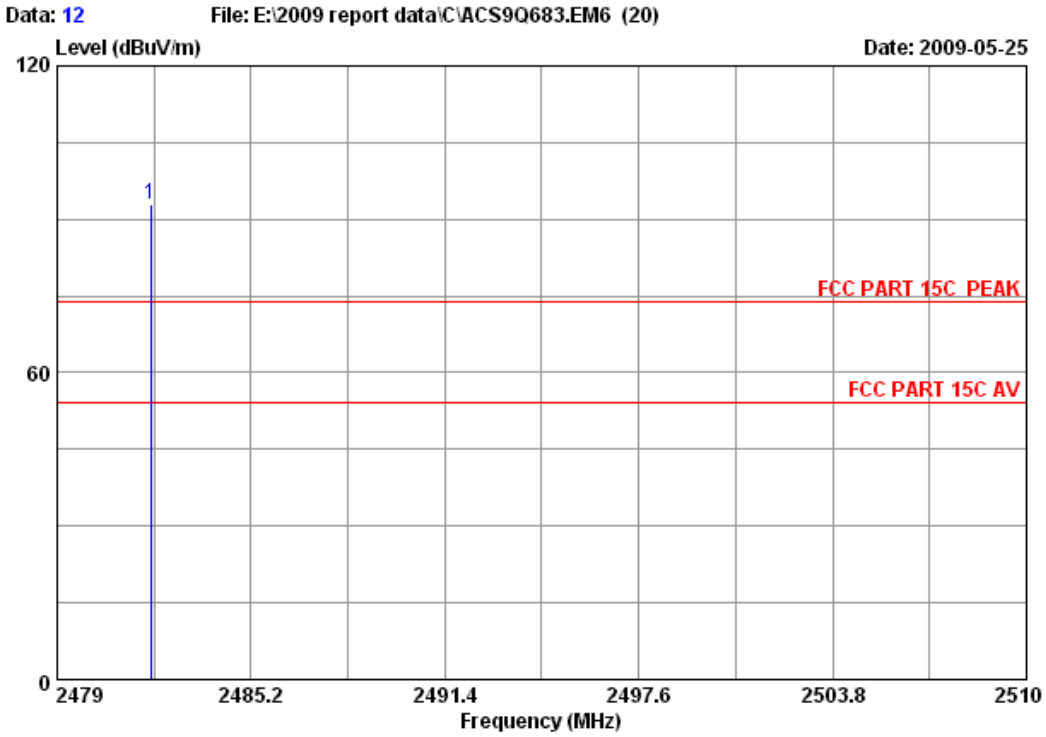


Site no. : 3m Chamber Data no. : 12
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer : Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2402MHz
M/N : XBGTS3

	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	2482.000	28.58	6.87	35.10	92.45	92.80	74.00	-18.80	Peak
2	4964.000	35.29	10.59	34.56	50.80	62.12	74.00	11.88	Peak
3	4964.000	35.29	10.59	34.56	36.26	47.58	54.00	6.42	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

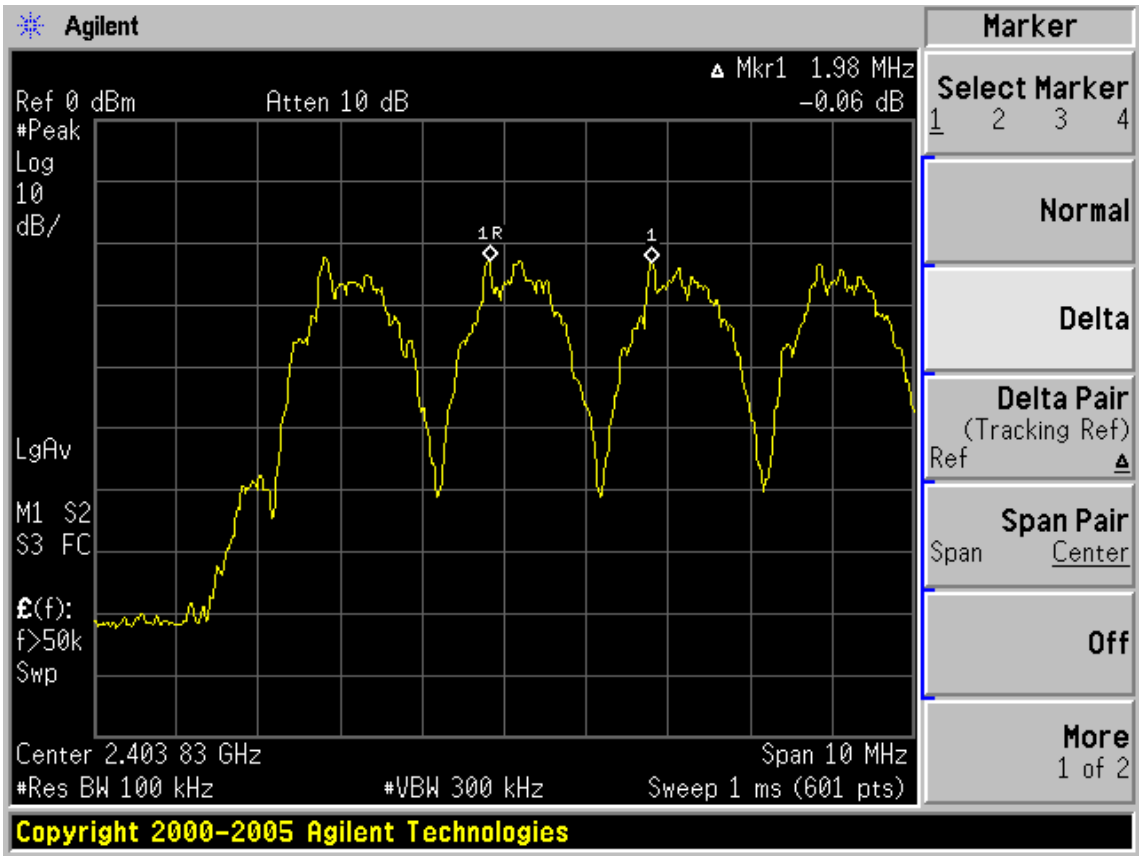
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	E4446A	US44300459	May,08, 09	1 Year

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

Channel separation	Conclusion
1.98MHz	PASS


Agilent
Marker
Mkr1 1.98 MHz
Ref 0 dBm
Atten 10 dB
-0.06 dB
#Peak
Log
10
dB/
1R
1
LgAv
M1 S2
S3 FC
£(f):
f>50k
Swp
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
Center 2.403 83 GHz
Span 10 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 1 ms (601 pts)
Copyright 2000-2005 Agilent Technologies

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	1Year

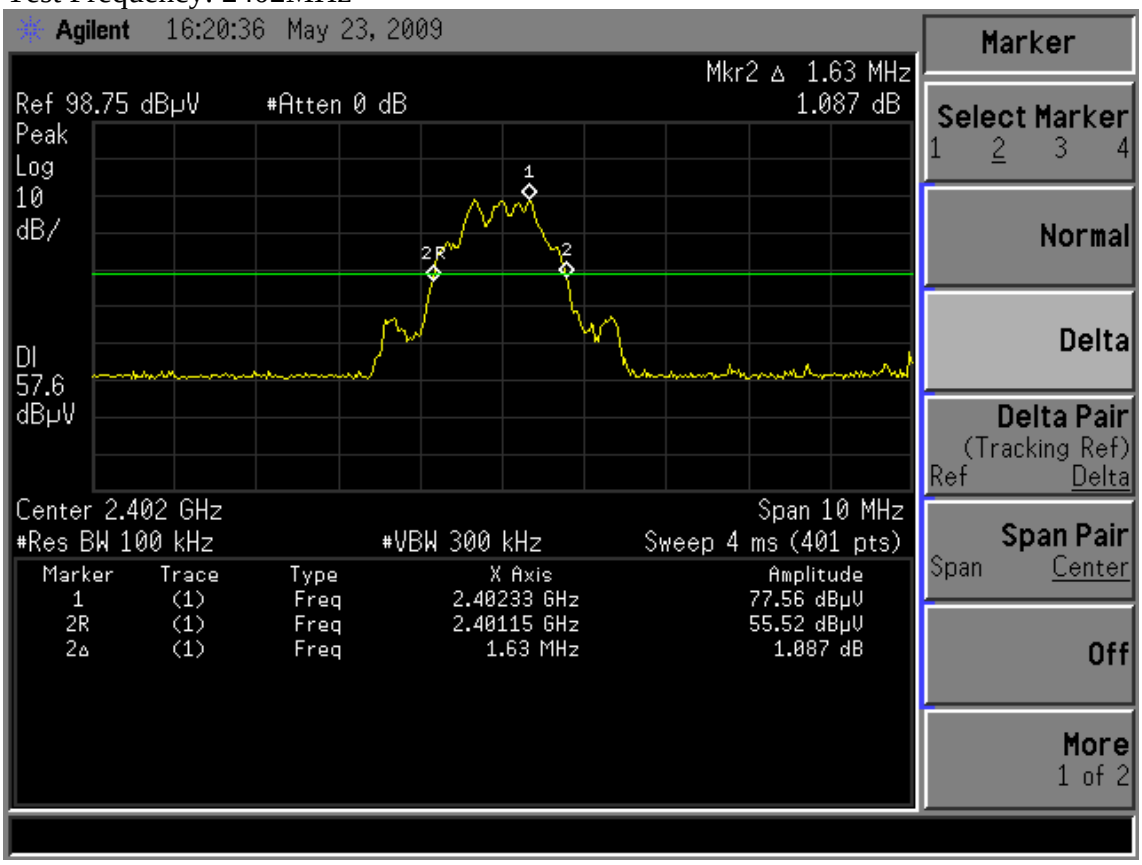
6.2. Limit

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.

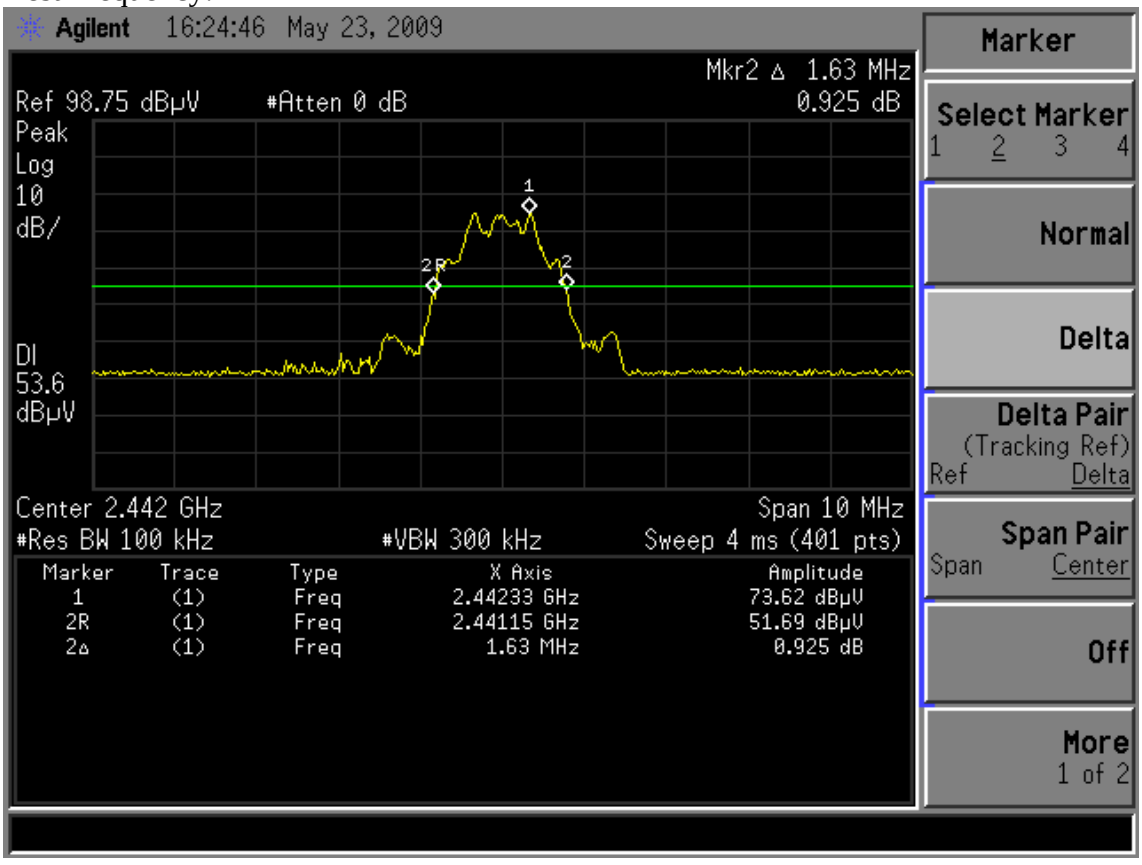
6.3. Test Results

CH	20dB Bandwidth (MHz)	Limit (MHz)	Conclusion
(Low)	1.63	---	PASS
(Mid)	1.63	---	PASS
(High)	1.53	---	PASS

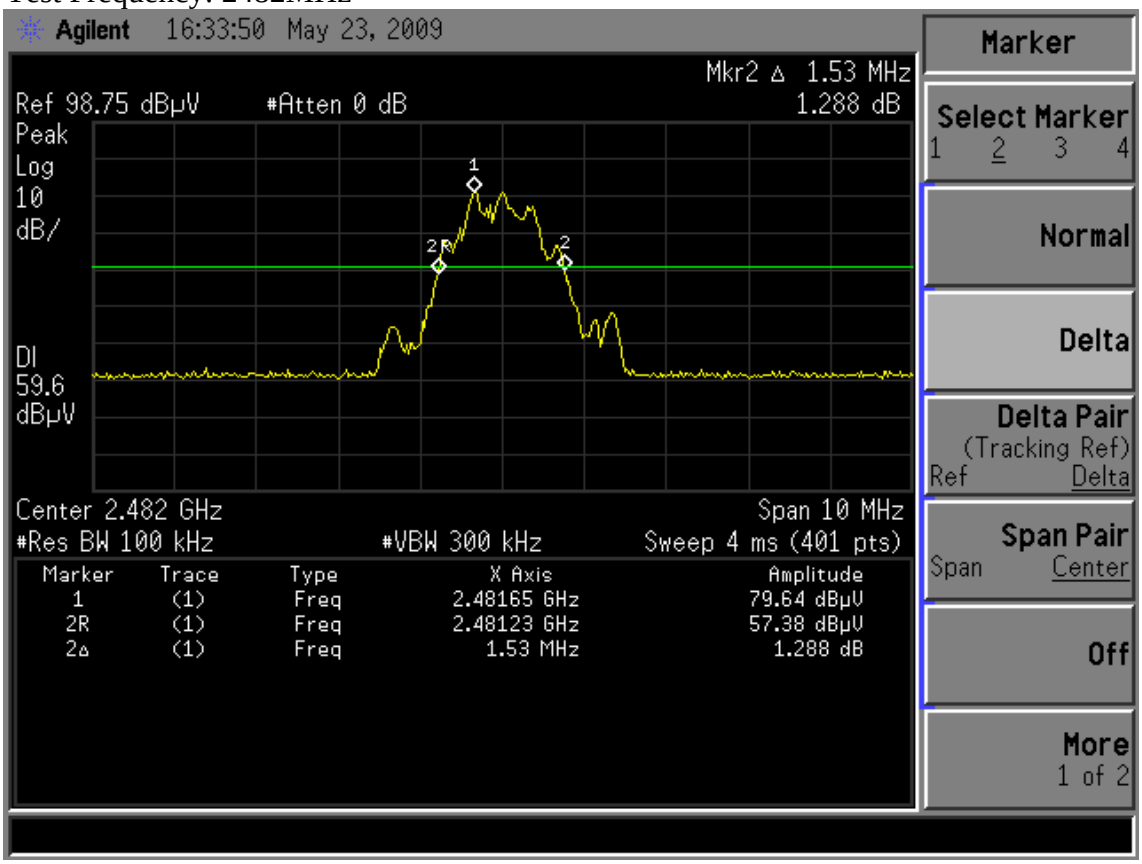
Test Frequency: 2402MHz



Test Frequency: 2442MHz



Test Frequency: 2482MHz



7. NUMBER OF HOPPING FREQUENCY TEST

7.1.Test Equipment

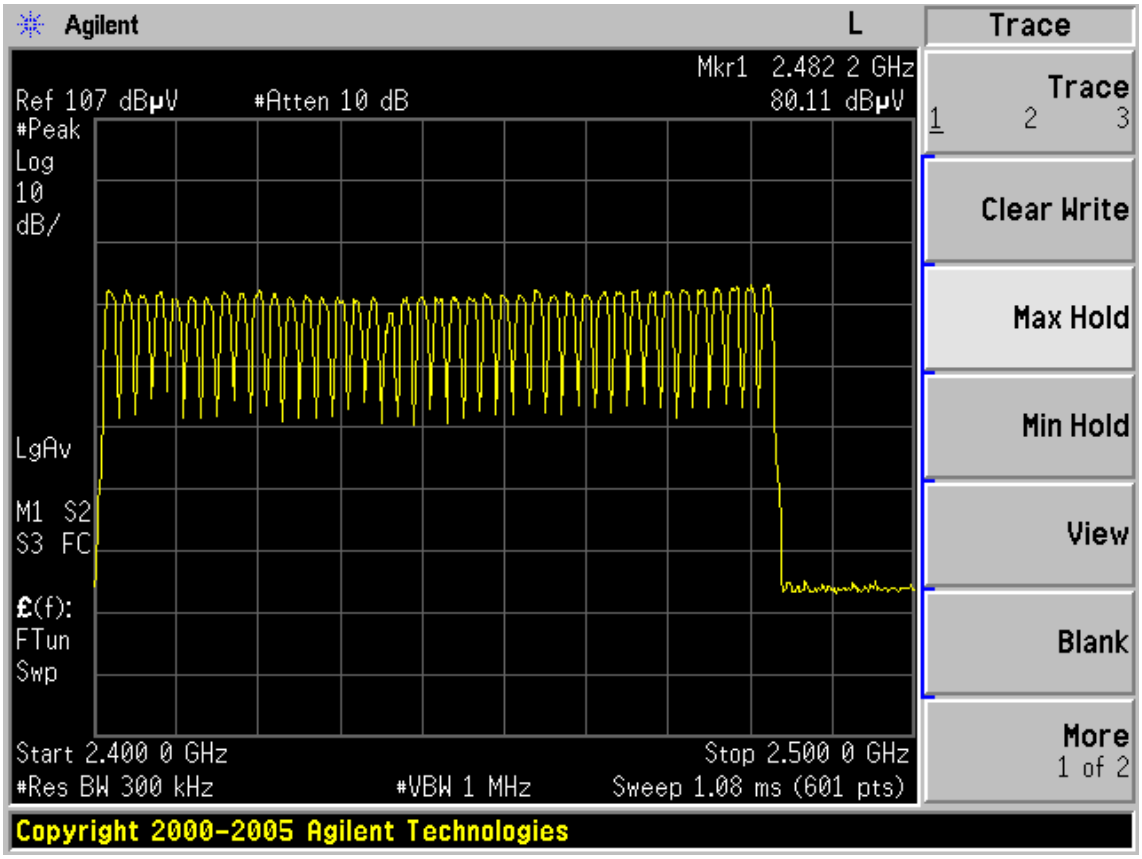
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4446A	US44300459	May,08, 09	1 Year
2	Attenuator	Agilent	8491B	MY39262165	May,08, 09	1 Year
3	RF Cable	Hubersuhner	SUCOFLEX 102	28618/2	May,08, 09	1Year

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
41	>=15	PASS


Agilent
L
Trace
Mkr1 2.482 2 GHz
Ref 107 dBµV
#Atten 10 dB
80.11 dBµV
#Peak
Log
10
dB/
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Start 2.400 0 GHz
Stop 2.500 0 GHz
#Res BW 300 kHz
#VBW 1 MHz
Sweep 1.08 ms (601 pts)
Copyright 2000-2005 Agilent Technologies

8. DWELL TIME

8.1.Test Equipment

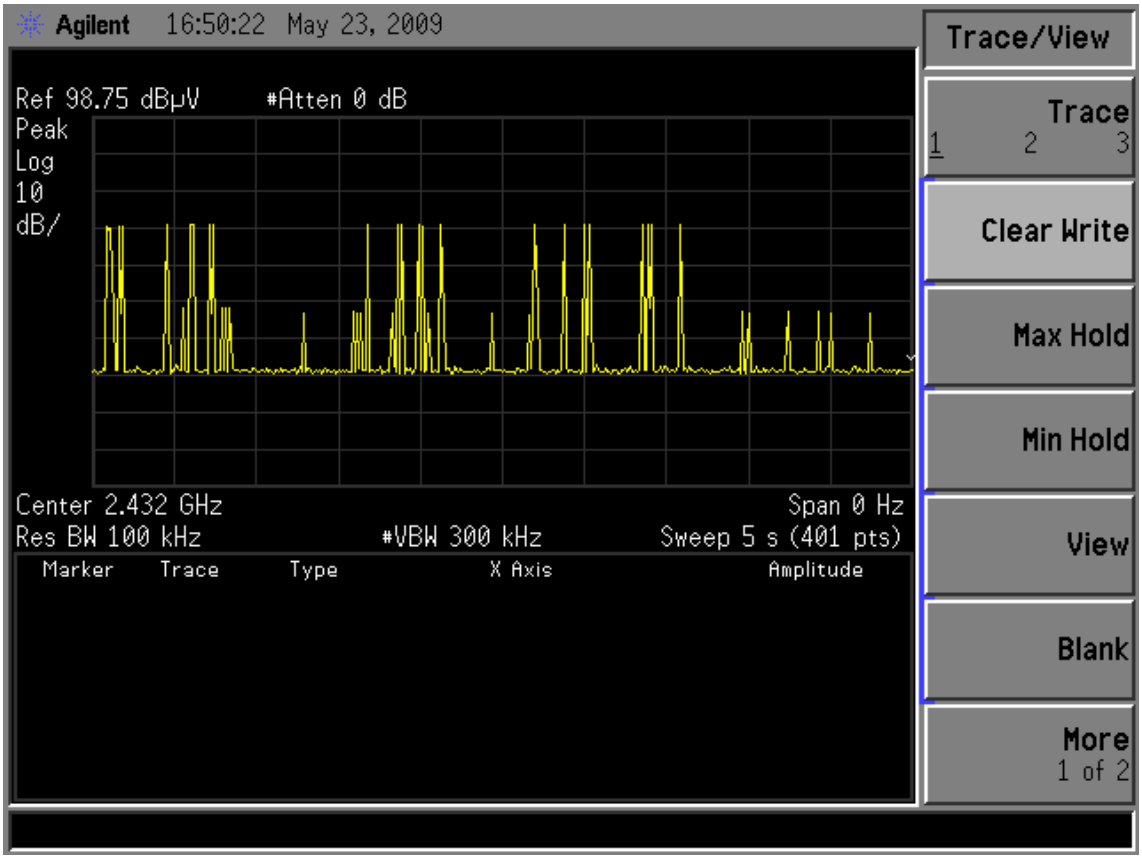
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4446A	US44300459	May,08, 09	1 Year
2	Attenuator	Agilent	8491B	MY39262165	May,08, 09	1 Year
3	RF Cable	Hubersuhner	SUCOFLEX 102	28618/2	May,08, 09	1Year

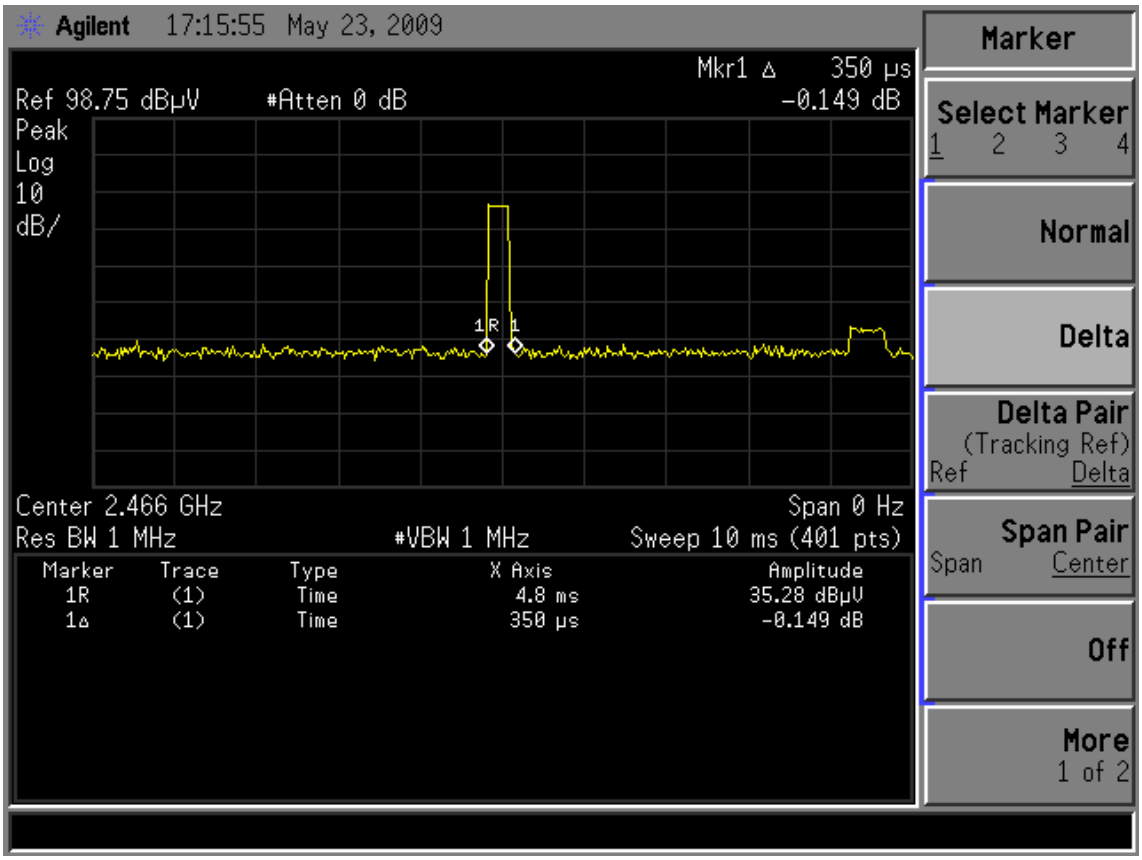
8.2.Limit

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

dwell time	Limit	Conclusion
23hops/5s*0.4*41chanels*0.35ms=26.40 ms	<400ms	PASS


Agilent 16:50:22 May 23, 2009
Ref 98.75 dBµV
#Atten 0 dB
Peak
Log
10
dB/
Center 2.432 GHz
Span 0 Hz
Res BW 100 kHz
#VBW 300 kHz
Sweep 5 s (401 pts)
Marker Trace Type X Axis Amplitude
Trace/View
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2


Agilent 17:15:55 May 23, 2009
Mkr1 Δ 350 µs
Ref 98.75 dBµV
#Atten 0 dB
-0.149 dB
Peak
Log
10
dB/
1R 1
Center 2.466 GHz
Span 0 Hz
Res BW 1 MHz
#VBW 1 MHz
Sweep 10 ms (401 pts)
Marker Trace Type X Axis Amplitude
1R (1) Time 4.8 ms 35.28 dBµV
1Δ (1) Time 350 µs -0.149 dB
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

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 XBox Hofner Wireless Guitar				M/N: XBGTS3					
Power: DC 4.5V									
Test Date: 2009/05/26			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	2402	H	93.54	-3.00	6.06	9.25	0.19	20.97	20.78
	2402	V	93.08	-3.42	6.06	9.25	-0.23	20.97	21.20
Mid	2442	H	93.87	-3.08	6.08	9.30	0.14	20.97	20.83
	2442	V	95.58	-1.39	6.08	9.30	1.83	20.97	19.14
Hig	2482	H	92.80	-3.11	6.18	9.35	0.06	20.97	20.91
	2482	V	95.03	-1.19	6.18	9.35	1.98	20.97	18.99
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

For emissions that are up to two bandwidths(1.5MHz) away（2390-2370MHz and 2483.5MHz to 2486.5MHz）from the band-edge use below produce:

1. Choose a spectrum analyzer span that encompasses both the peak of the fundamental emission and the band-edge emission under investigation. Set the analyzer RBW to 100KHz and with a video bandwidth 300KHz. Record the peak levels of the fundamental emission and the relevant band-edge emission, Observe the stored trace and measure the amplitude delta between the peak of the fundamental and the peak of the band-edge emission. This is not a field strength measurement, it is only a relative measurement to determine the amount by which the emission drops at the band edge relative to the highest fundamental emission level.
2. Subtract the delta measured in step (1) from the maximum field strengths measured in clause 4 .The resultant field strengths are then used to determine band-edge compliance as required by Section 15.205

For emissions above two bandwidths away from the band-edge use below 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

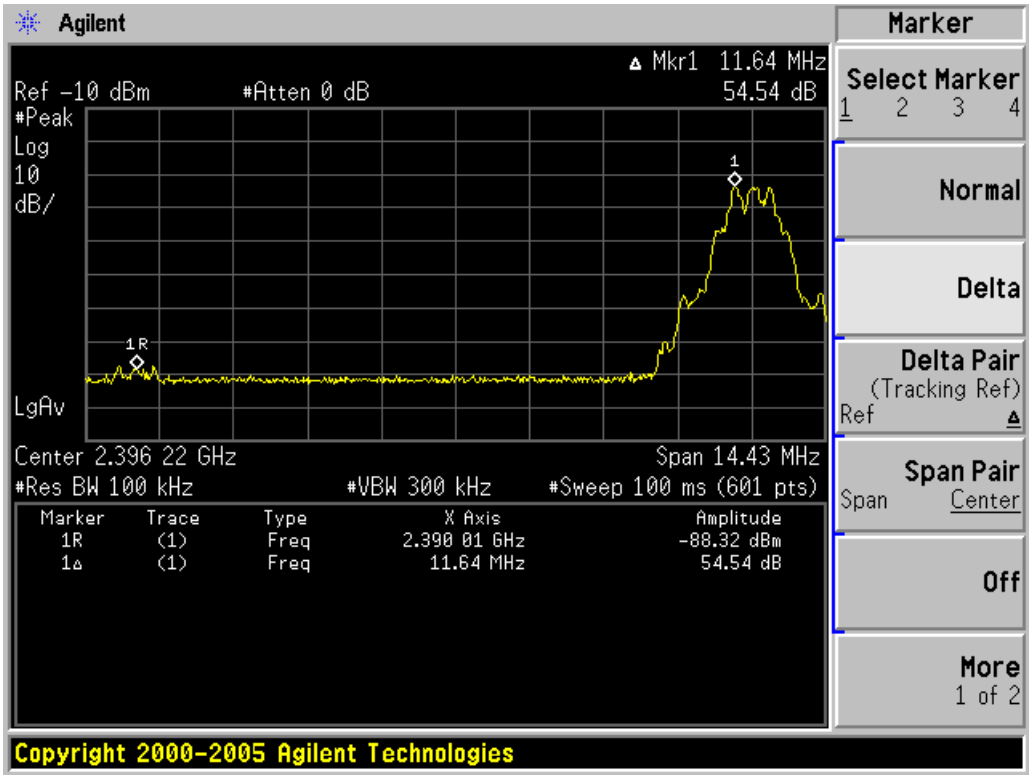
10.4.Test Results

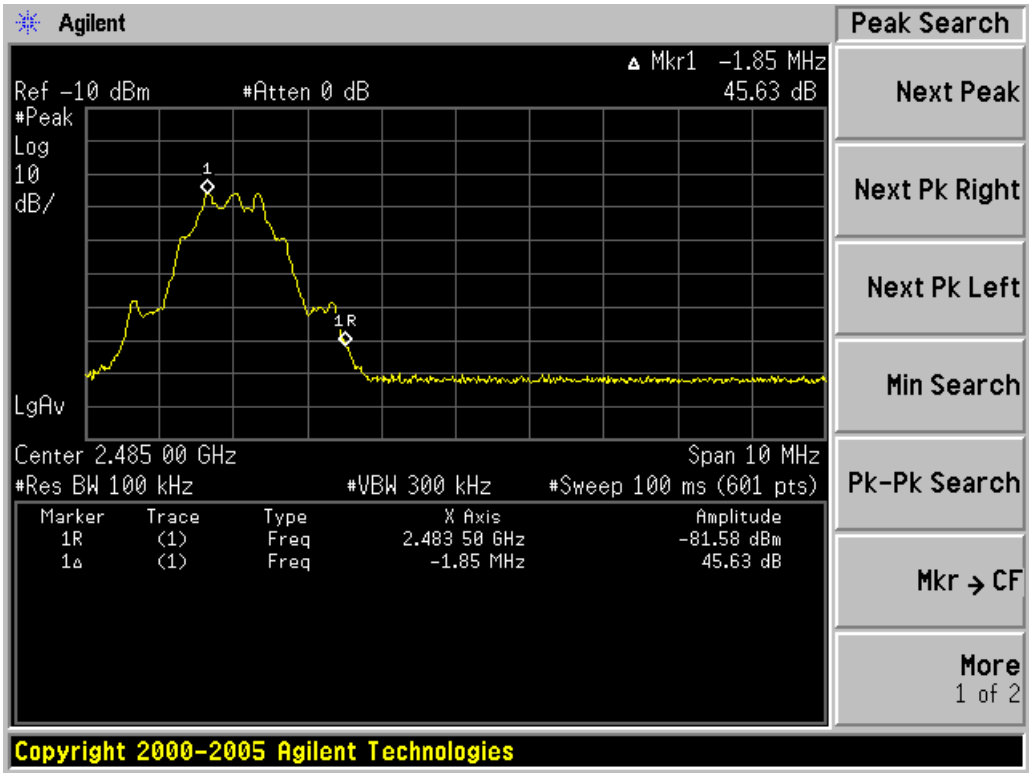
Pass (The testing data was attached in the next pages.)
All the PK levels comply with average limit, so the average levels were deemed to comply with average limit.

Emissions in two bandwidths away from the band-edge

CH	Frequency (MHz)	Maximum PK Fundamental level (dBuV/m)	Marker delta (dB) (Note2)	band edge level (dBuV/m)	PK Limit (dBuV/m)	Margin (dB)
Low 2402MHz	2390	95.35	54.54	40.81	74	33.19
High 2482MHz	2483.5	95.57	45.63	49.94	74	24.06
Note1: Because calculate with maximum PK fundamental level, the result will comply with average limit,so all the other levels and average levels were deemed to comply with FCC requirements. Note 2:The data comes from next page marker delta test result.						

Band edge marker delta-plot:





For emissions above two bandwidths away from the band-edge

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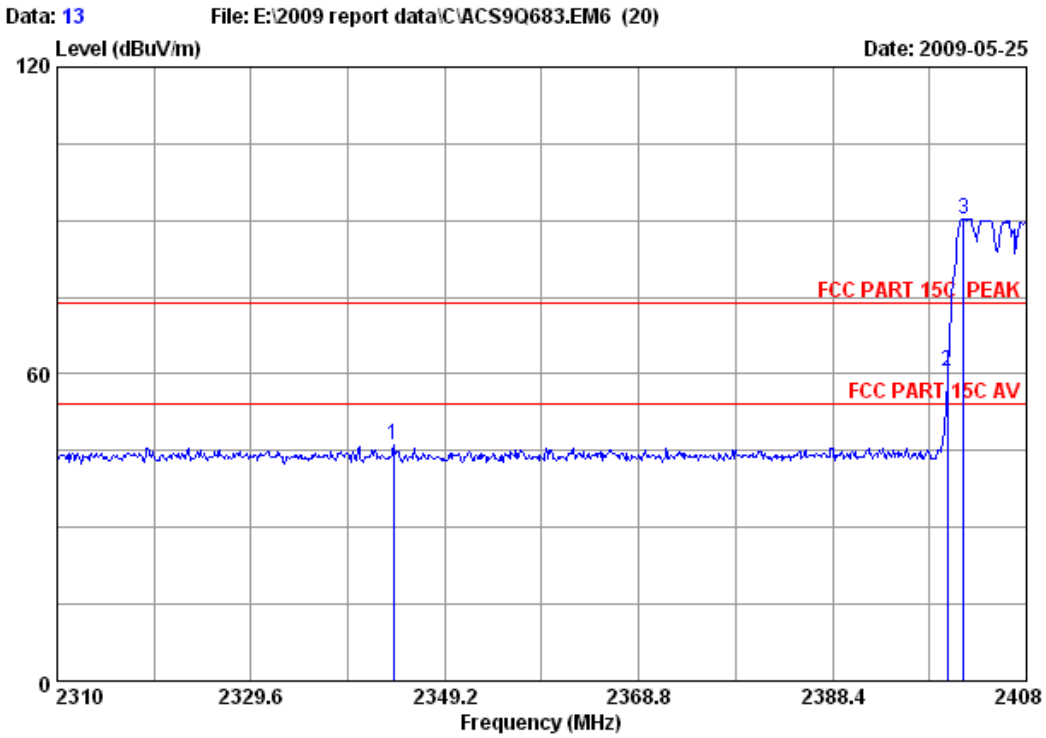

Site no. : 3m Chamber Data no. : 13
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer :Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx Hopping on
XBGTS3

	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	2344.006	28.38	6.67	35.13	46.31	46.23	74.00	27.77	Peak
2	2400.000	28.46	6.73	35.12	60.42	60.49	74.00	13.51	Peak
3	2401.630	28.46	6.73	35.12	90.28	90.35	74.00	-16.35	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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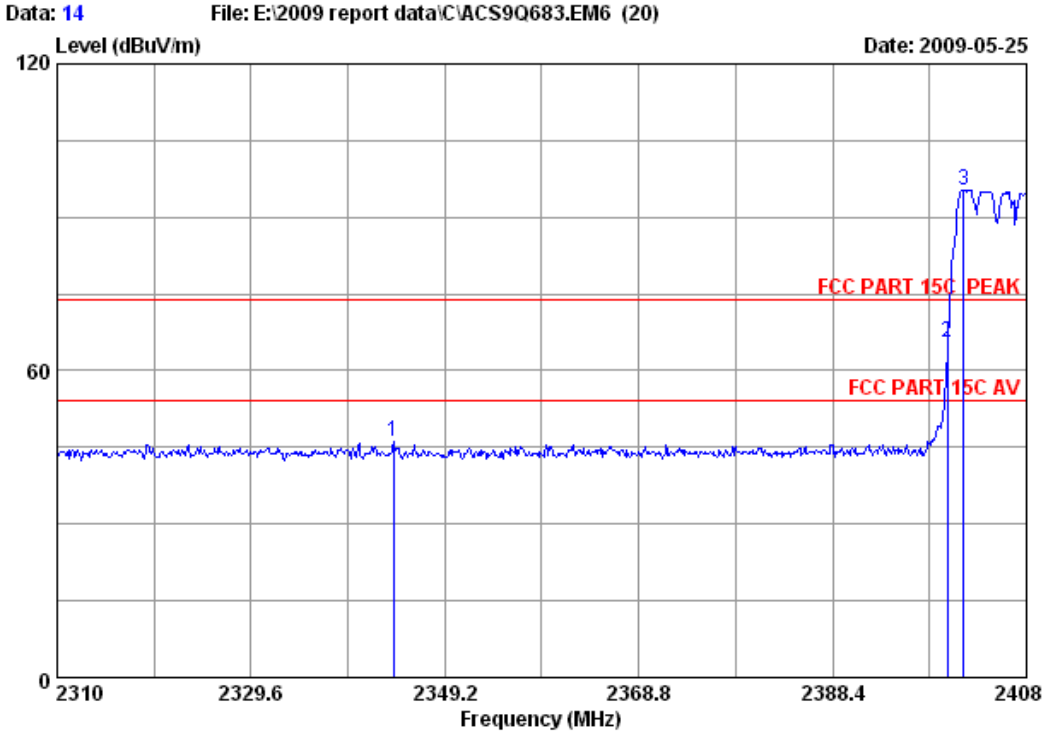

Site no. : 3m Chamber Data no. : 14
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer :Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx Hopping on
XBGTS3

	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	2344.006	28.38	6.67	35.13	46.31	46.23	74.00	27.77	Peak
2	2400.000	28.46	6.73	35.12	65.42	65.49	74.00	8.51	Peak
3	2401.630	28.46	6.73	35.12	95.28	95.35	74.00	-21.35	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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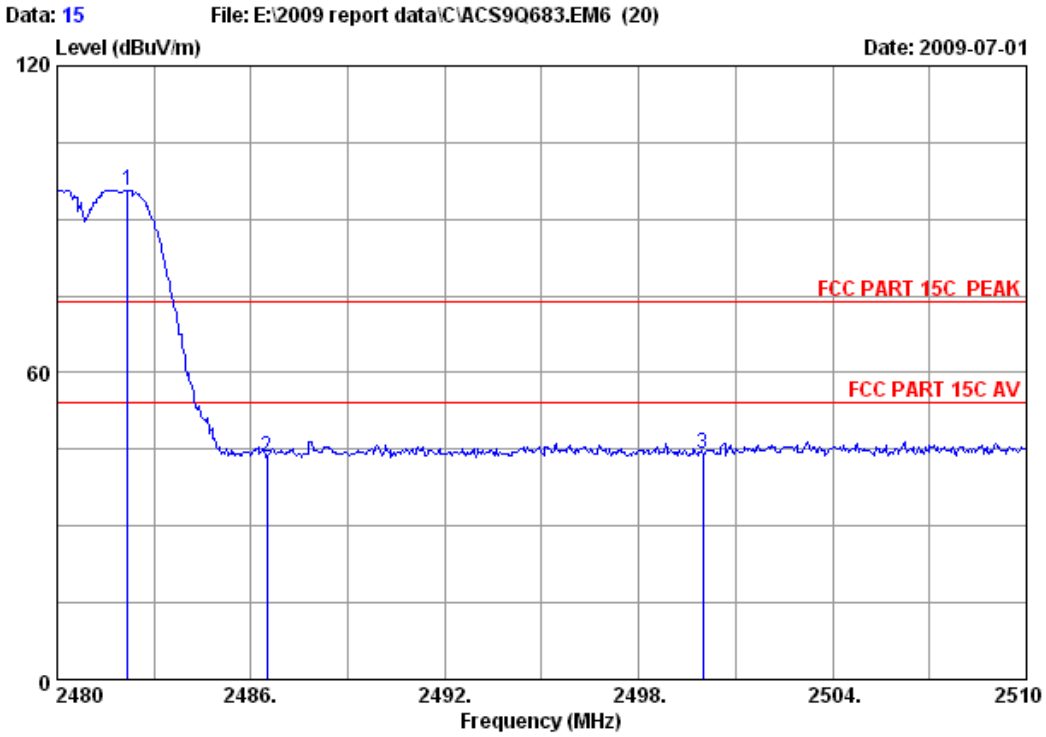

Site no. : 3m Chamber Data no. : 15
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer :Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx Hopping on
XBGTS3

	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	2482.182	28.58	6.87	35.10	95.22	95.57	74.00	-21.57	Peak
2	2486.500	28.58	6.87	35.10	43.07	43.42	74.00	30.58	Peak
3	2500.000	28.60	6.91	35.10	43.83	44.24	74.00	29.76	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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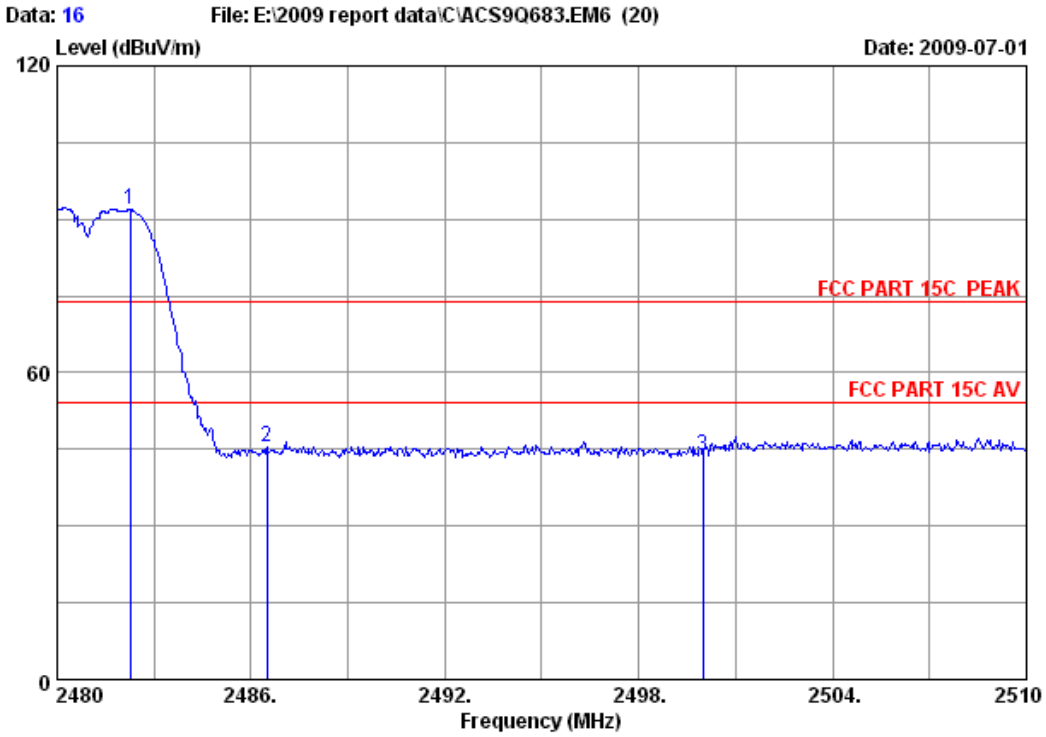

Site no. : 3m Chamber Data no. : 16
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer :Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx Hopping on
XBGTS3

	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	2482.250	28.58	6.87	35.10	91.49	91.84	74.00	-17.84	Peak
2	2486.500	28.58	6.87	35.10	45.23	45.58	74.00	28.42	Peak
3	2500.000	28.60	6.91	35.10	43.49	43.90	74.00	30.10	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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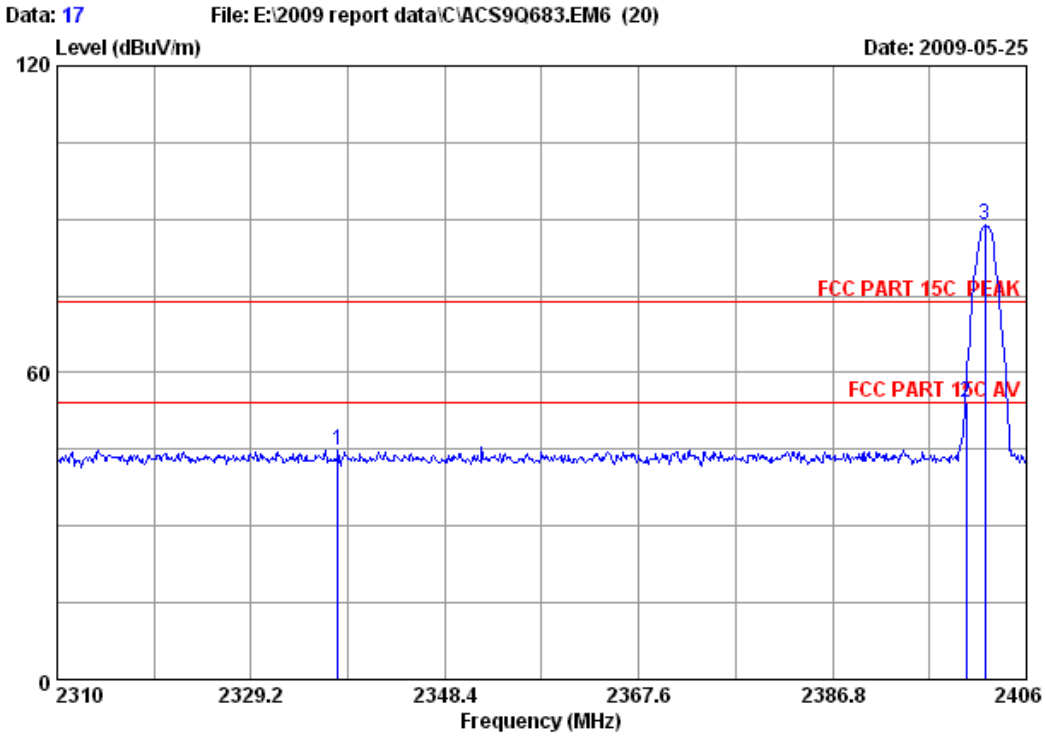

Site no. : 3m Chamber Data no. : 17
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer :Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2402MHz
XBGTS3

	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	2337.840	28.38	6.67	35.13	44.73	44.65	74.00	29.35	Peak
2	2400.000	28.46	6.73	35.12	54.19	54.26	74.00	19.74	Peak
3	2401.872	28.46	6.73	35.12	88.70	88.77	74.00	-14.77	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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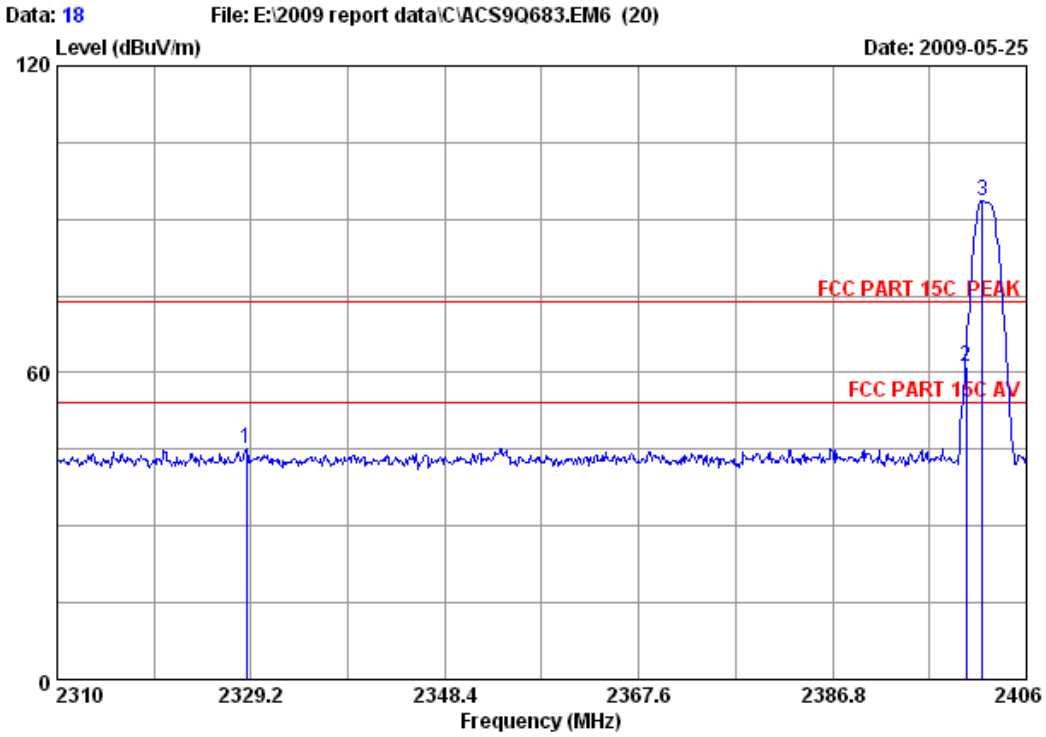

Site no. : 3m Chamber Data no. : 18
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer :Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2402MHz
XBGTS3

	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	2328.720	28.36	6.65	35.13	45.26	45.14	74.00	28.86	Peak
2	2400.000	28.46	6.73	35.12	61.19	61.26	74.00	12.74	Peak
3	2401.680	28.46	6.73	35.12	93.66	93.73	74.00	-19.73	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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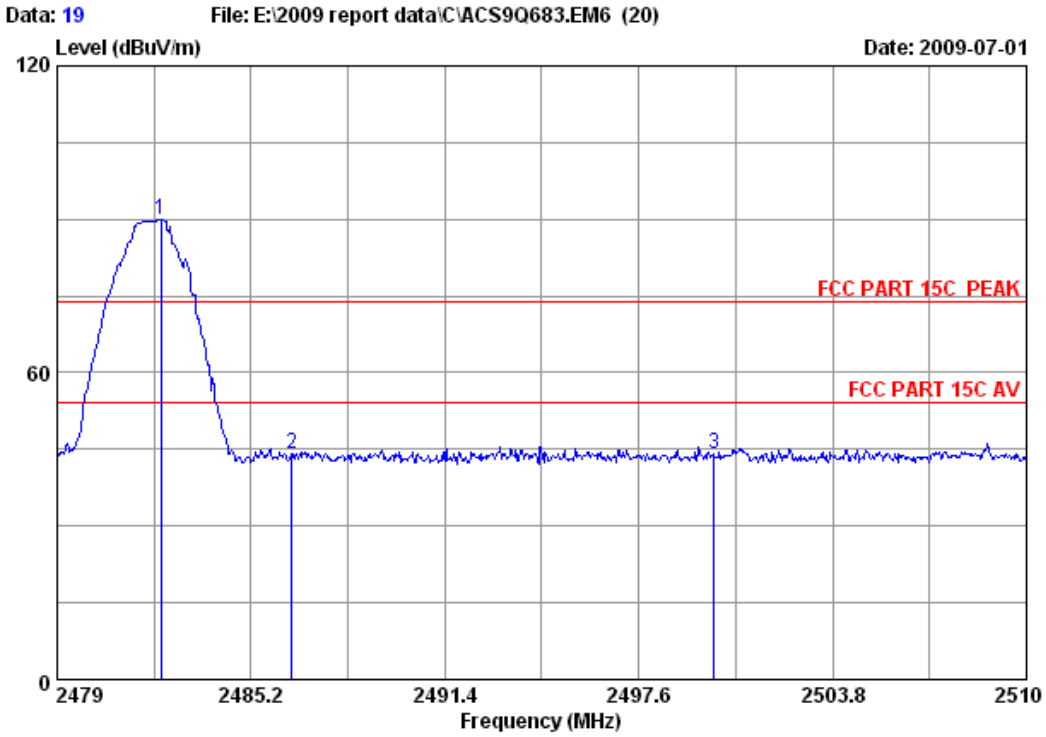

Site no. : 3m Chamber Data no. : 19
Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer :Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2482MHz
XBGTS3

	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	2482.317	28.58	6.87	35.10	89.60	89.95	74.00	-15.95	Peak
2	2486.500	28.58	6.87	35.10	43.91	44.26	74.00	29.74	Peak
3	2500.000	28.60	6.91	35.10	43.58	43.99	74.00	30.01	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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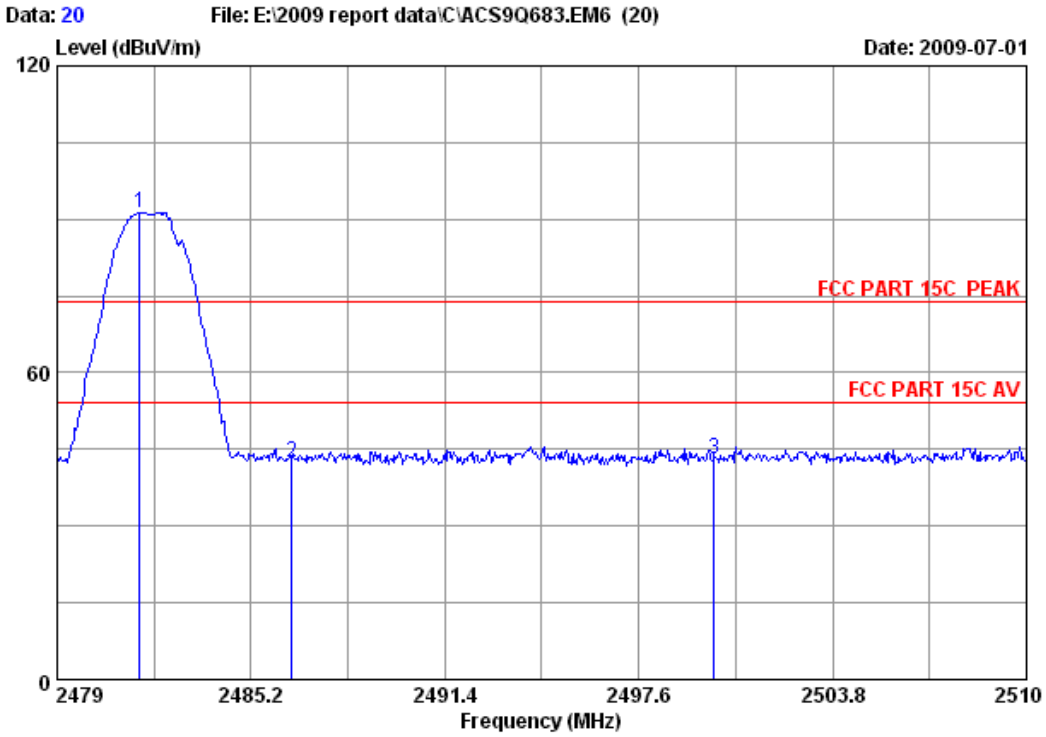

Site no. : 3m Chamber Data no. : 20
Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 25*C/55% Engineer :Sunny
EUT : P9 XBOX Hofner Wireless Guitar
Power : DC 4.5V
Test mode : Tx 2482MHz
XBGTS3

	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	2481.635	28.58	6.87	35.10	91.05	91.40	74.00	-17.40	Peak
2	2486.500	28.58	6.87	35.10	42.11	42.46	74.00	31.54	Peak
3	2500.000	28.60	6.91	35.10	42.59	43.00	74.00	31.00	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.

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]