

APPLICATION FOR CERTIFICATION
On Behalf of

Activision Publishing, Inc.

Wireless Guitar Controller for Xbox 360

Model Number: 96150805

FCC ID: XLU96150805

Prepared for : Activision Publishing, Inc.
3100 Ocean Park Blvd., Santa Monica, CA 90405, U.S.A.

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Ke Feng Rd., 52 Block,
Shenzhen Science & Industrial Park,
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Report Number : ACS-F10219
Date of Test : Aug.01~06, 2010
Date of Report : Aug.12, 2010

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TEST REPORT CERTIFICATION

Applicant : Activision Publishing, Inc.
 Manufacturer : Berway Technology Ltd.
 EUT Description : Wireless Guitar Controller for Xbox 360
 MODEL NO. : 96150805
 FCC ID : XLU96150805
 POWER SUPPLY : DC 3V
 TEST VOLTAGE : DC 3V

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 for radiated and conducted emissions.

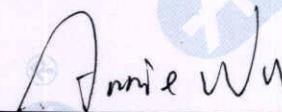
The test results are contained in this test report and Audix Technology (Shenzhen) Co., Ltd. is assumed full responsibility for the accuracy and completeness of tests. Also, this report shows that EUT is technically compliant with FCC requirements.

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 :

Aug.01~06, 2010

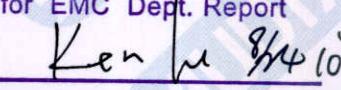
Prepared by :


Annie Wu / Supervisor

Reviewer :


Jamy Yu / Supervisor

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 C63.10 :2009	N/A
Radiated Emission Test	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.10 :2009	PASS
Carrier Frequency Separation Test	FCC Part 15: 15.247(a)(1) ANSI C63.10 :2009	PASS
20dB Bandwidth Test	FCC Part 15: 15.215 ANSI C63.10 :2009	PASS
Number Of Hopping Frequency Test	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10 :2009	PASS
Dwell Time Test	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10 :2009	PASS
Maximum Peak Output Power Test	FCC Part 15: 15.247(b)(1)\ ANSI C63.10 :2009	PASS
Band Edge Compliance Test	FCC Part 15: 15.247(d) ANSI C63.10 :2009	PASS
N/A is an abbreviation for Not Applicable.		

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product name : Wireless Guitar Controller for Xbox 360

Model Number : 96150805

FCC ID : XLU96150805

Operation frequency : 2402MHz~2482MHz

Modulation : GMSK

Power Supply : DC 3V
(Note: Batteries were full charged for all the test.)

Applicant : Activision Publishing, Inc.
3100 Ocean Park Blvd., Santa Monica, CA 90405, U.S.A.

Manufacturer : Berway Technology Ltd.
Unit 1301-03, No.88, Kwai Cheong Road, Kwai Chung,
N.T. Hong Kong

Date of Test : Aug.01~06, 2010

Date of Receipt : Jul.29, 2010

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

: Dec. 30, 2009 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, 2010

2.3. Test Uncertainty (95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Radiation Emission test in 3m chamber	3.82 dB (Polarize: V)
	4.32 dB (Polarize: H)
Uncertainty for Radiated Spurious Emission test in RF chamber	2.70 dB (Bilog antenna 30M~1000MHz)
	2.27 dB (Horn antenna 1000M~25000MHz)
Uncertainty for Temperature and humidity test	2%
	1°C
Uncertainty for Bandwidth test	1x10 ⁻⁹
Uncertainty for DC power test	0.038 %
Uncertainty for test site temperature and humidity	0.6°C
	3%

3. POWER LINE CONDUCTED EMISSION TEST

According to Paragraph (c) 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.05,09	1 Year
2	EMI Spectrum	Agilent	E4407B	MY41440292	May.08, 10	1 Year
3	Test Receiver	Rohde & Schwarz	ESVS10	834468/011	May.08, 10	1 Year
4	Amplifier	HP	8447D	2648A04738	May.08, 10	1 Year
5	Bilog Antenna	Schaffner	CBL6111C	2598	Dec.14, 09	1 Year
6	RF Cable	MIYAZAKI	8D-FB	3# Chamber No.1	May.08, 10	1 Year
7	Coaxial Switch	Anritsu	MP59B	M73989	May.08, 10	1 Year

Frequency rang: above 1000MHz

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4446A	US44300459	May.08, 10	1 Year
2	Horn Antenna	EMCO	3115	9607-4877	Nov.25, 09	1.5 Year
3	Horn Antenna	EMCO	3116	00060089	Nov.25, 09	1.5 Year
4	Amplifier	Agilent	8449B	3008A00863	May.08, 10	1 Year
5	RF Cable	Hubersuhner	SUCOFLEX102	28620/2	May.08, 10	1 Year
6	RF Cable	Hubersuhner	SUCOFLEX102	29091/2	May.08, 10	1 Year

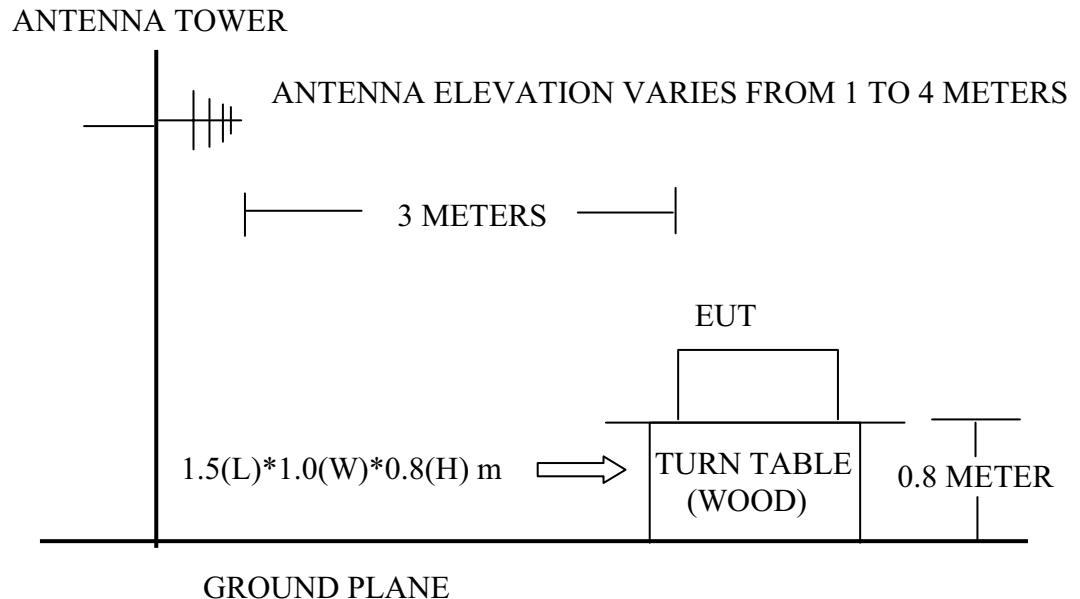
4.2. Block Diagram of Test Setup

4.2.1. Block Diagram of connection between EUT and simulators



(EUT: Wireless Guitar Controller for Xbox 360)

4.2.2. Anechoic Chamber Setup Diagram



4.3. Radiated Emission Limit Standard: FCC 15.209

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

Remark :

- (1) Emission level $dB\mu$ V = $20 \log$ Emission level μ V/m
- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.
- (4) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

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.

4.5. Operating Condition of EUT

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

4.5.2. Turned on the power of all equipment.

4.5.3. Let the EUT worked in test mode (Tx Mode) and tested it.

4.6. Test Procedure

The 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. The 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 is set on Test. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10-2009 on radiated emission Test.

This test was performed with EUT in X, Y, Z position, and the worse case was found when EUT in X position as the 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 RBW is set at 1MHz and VBW is set at 3MHz for peak emissions measurement above 1GHz

This device is pulse modulated, a duty cycle factor was used to calculate average level based measured peak level.

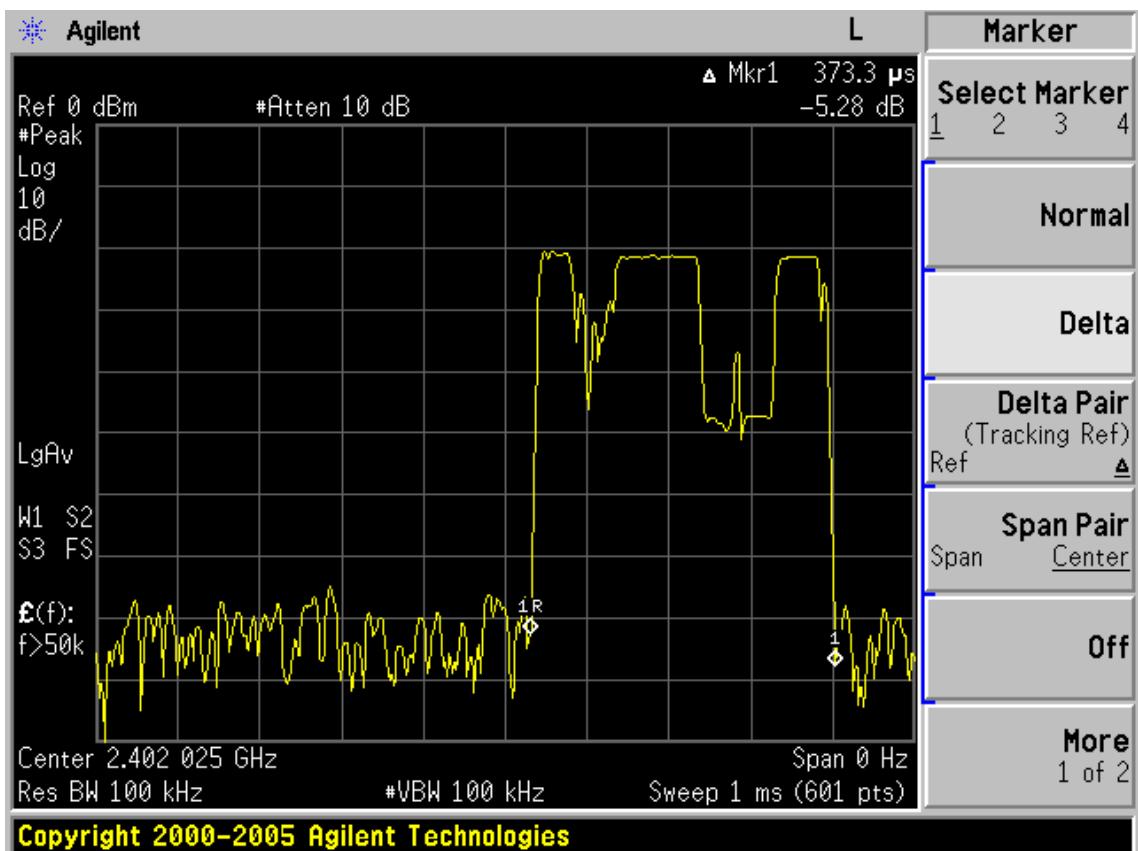
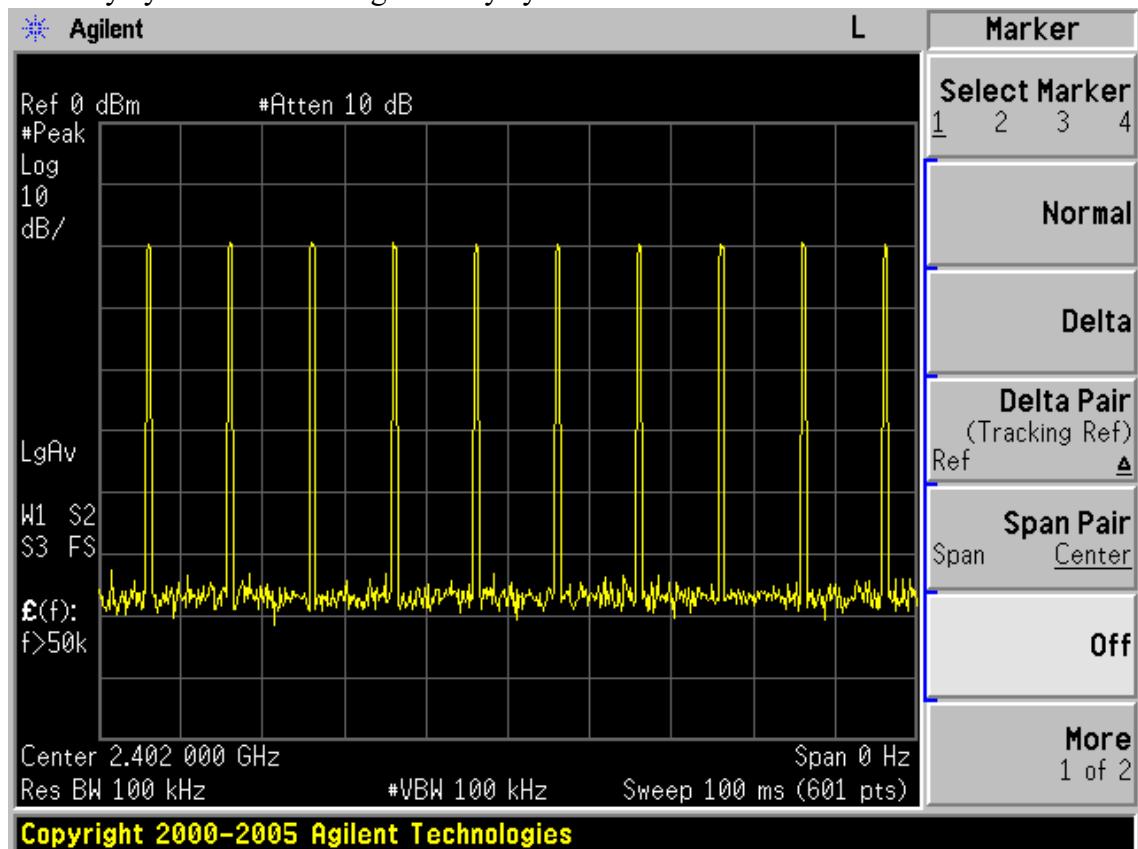
The frequency range from 30MHz to 10th harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

4.7. Radiated Emission Test Results

PASS

All the emissions from 30MHz to 25GHz were comply with the 15.209 Limit.

Note: The duty cycle factor for calculate average level is 28.56dB, and average limit is 20dB below peak limit, so if peak measured level comply with peak limit, the average level was deemed to comply with average limit.

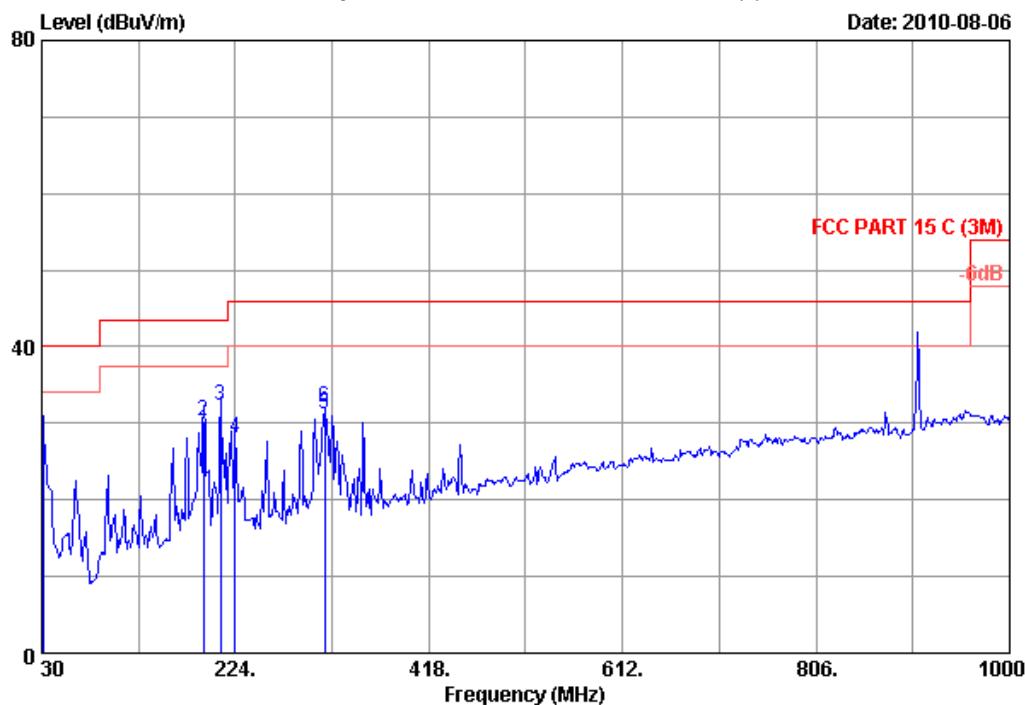
Duty cycle: $0.3733\text{ms} * 10 / 100\text{ms} * 100\% = 3.733\%$ Duty cycle factor = $20\log (1/\text{duty cycle}) = 28.56$ 

Radiated spurious emissions from 30MHz to 1GHz test result



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Data: 1 File: D:\2010 Report Data\1\Mad Catz\ACS10QH182.EM6 (6)



Site no. : 3m Chamber Data no. : 1
 Dis. / Ant. : 3m 2010 CBL6111C Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 C (3M)
 Env. / Ins. : 24°C/56% Engineer : Leo-Li
 EUT : Wireless Guitar Controller for Xbox 360
 Power : DC 3V
 Test mode : Tx
 M/N : 96150805

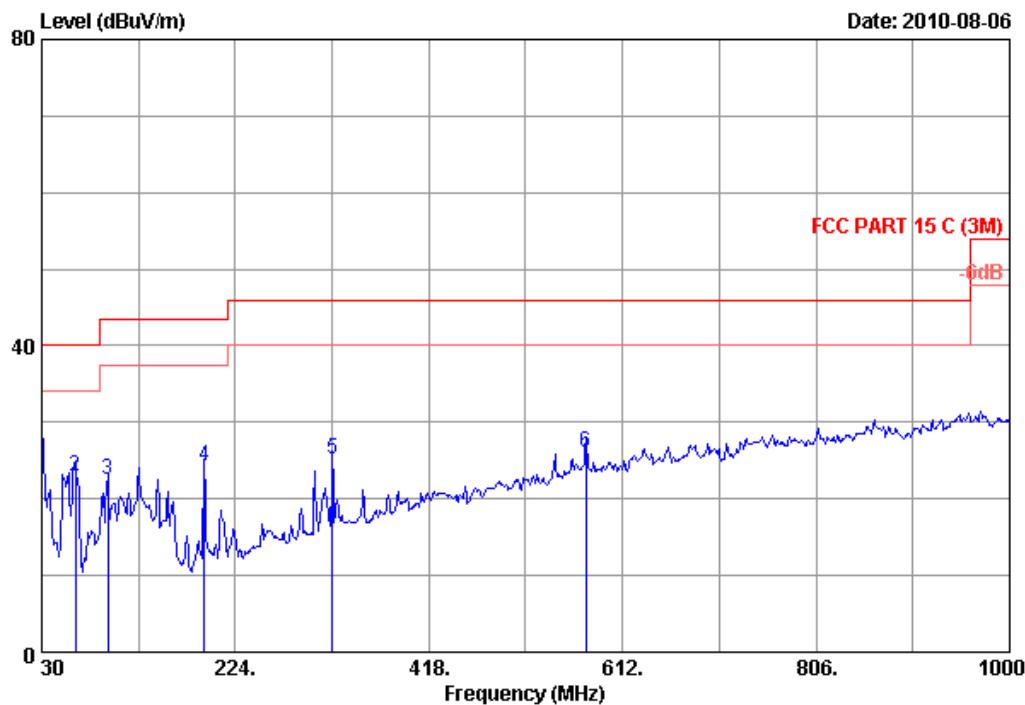
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Emission				
				Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	30.970	19.44	0.62	10.00	30.06	40.00	9.94	QP
2	191.990	9.52	1.63	19.13	30.28	43.50	13.22	QP
3	209.450	10.10	1.81	20.44	32.35	43.50	11.15	QP
4	224.000	10.52	1.94	15.69	28.15	46.00	17.85	QP
5	313.240	14.06	2.54	14.49	31.09	46.00	14.91	QP
6	313.240	14.06	2.54	15.49	32.09	46.00	13.91	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:\2010 Report Data\MMad Catz\ACS10QH182.EM6 (6)



Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 2010 CBL6111C Ant. pol. : VERTICAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 24°C/56% Engineer : Leo-Li
EUT : Wireless Guitar Controller for Xbox 360
Power : DC 3V
Test mode : Tx
M/N : 96150805

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Emission					Remark
				Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark	
1	30.000	20.00	0.61	6.59	27.20	40.00	12.80	QP	
2	63.950	6.00	0.88	16.02	22.90	40.00	17.10	QP	
3	95.960	9.84	1.09	11.52	22.45	43.50	21.05	QP	
4	192.960	9.58	1.64	13.04	24.26	43.50	19.24	QP	
5	321.000	14.22	2.57	8.49	25.28	46.00	20.72	QP	
6	575.140	19.65	3.98	2.55	26.18	46.00	19.82	QP	

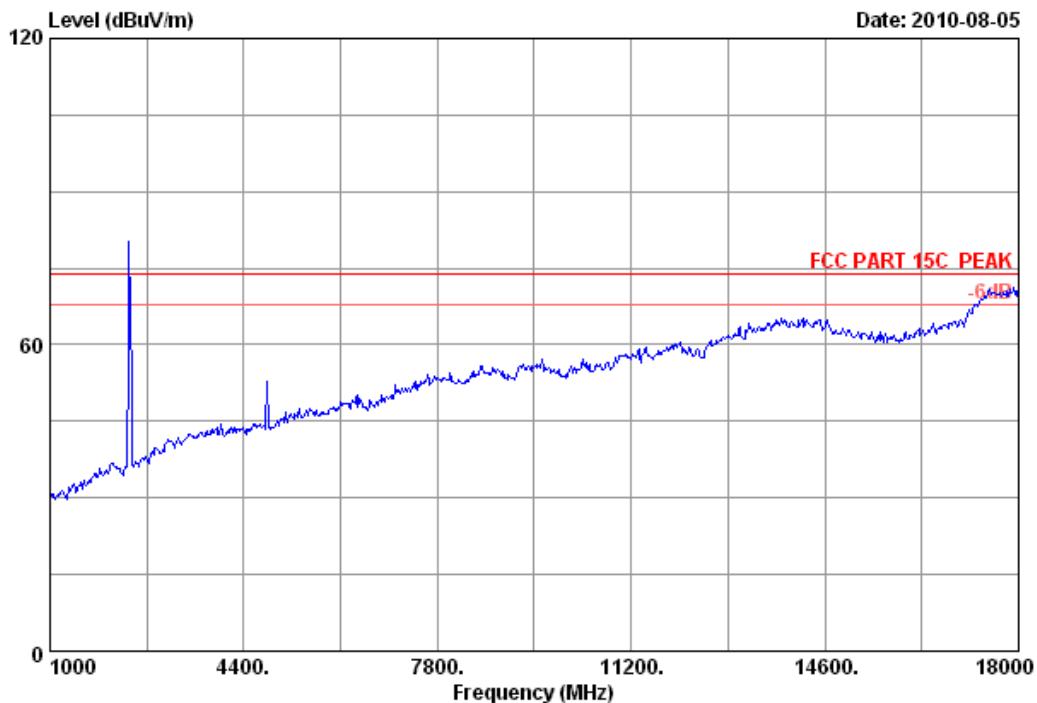
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Radiated emissions from 1GHz to 18GHz test result



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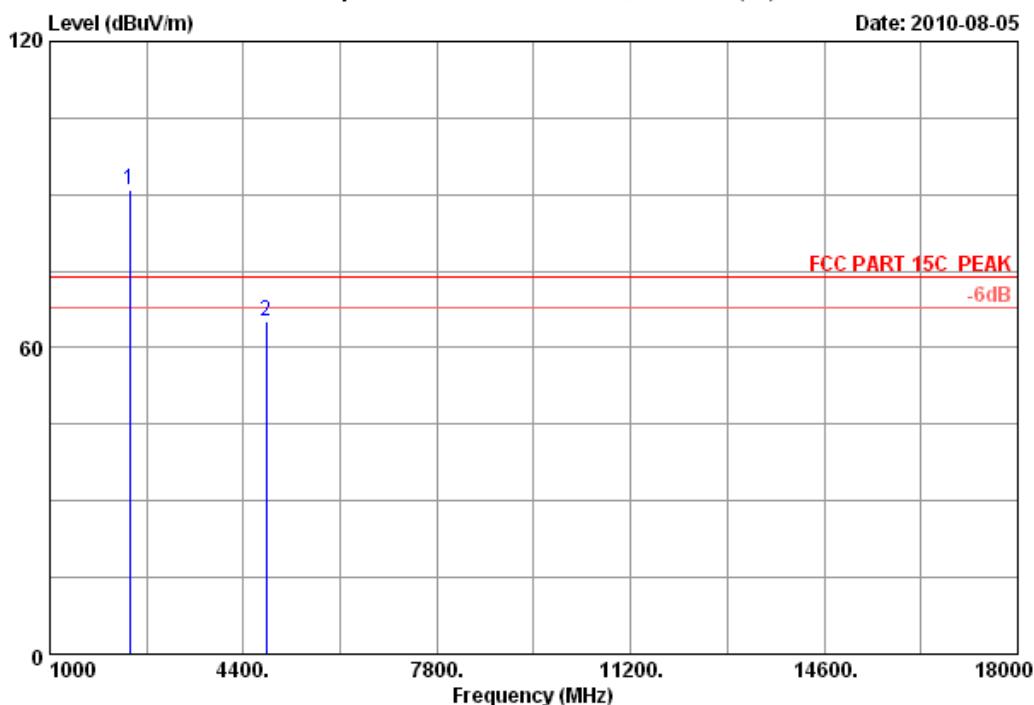


Site no.	:	RF Chamber	Data no. :	1
Dis. / Ant.	:	3m 3115(0911)	Ant. pol. :	VERTICAL
Limit	:	FCC PART 15C PEAK		
Env. / Ins.	:	23°C/54%	Engineer :	Paul Tian
EUT	:	Wireless Guitar Controller for Xbox 360		
Power	:	DC 3V		
Test mode	:	Tx 2402MHz		
M/N	:	96150805		



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Data: 2 File: E:\2010 report data\A\Activision\ACS10QH182.EM6 (16)



Site no. : RF Chamber Data no. : 2
Dis. / Ant. : 3m 3115(0911) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23°C/54% Engineer : Paul Tian
EUT : Wireless Guitar Controller for Xbox 360
Power : DC 3V
Test mode : Tx 2402MHz
M/N : 96150805

Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission			
				Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1 2402.000	29.44	7.43	36.62	90.63	90.88	74.00	-16.88 Peak
2 4804.000	34.30	10.62	35.10	55.28	65.10	74.00	8.90 Peak

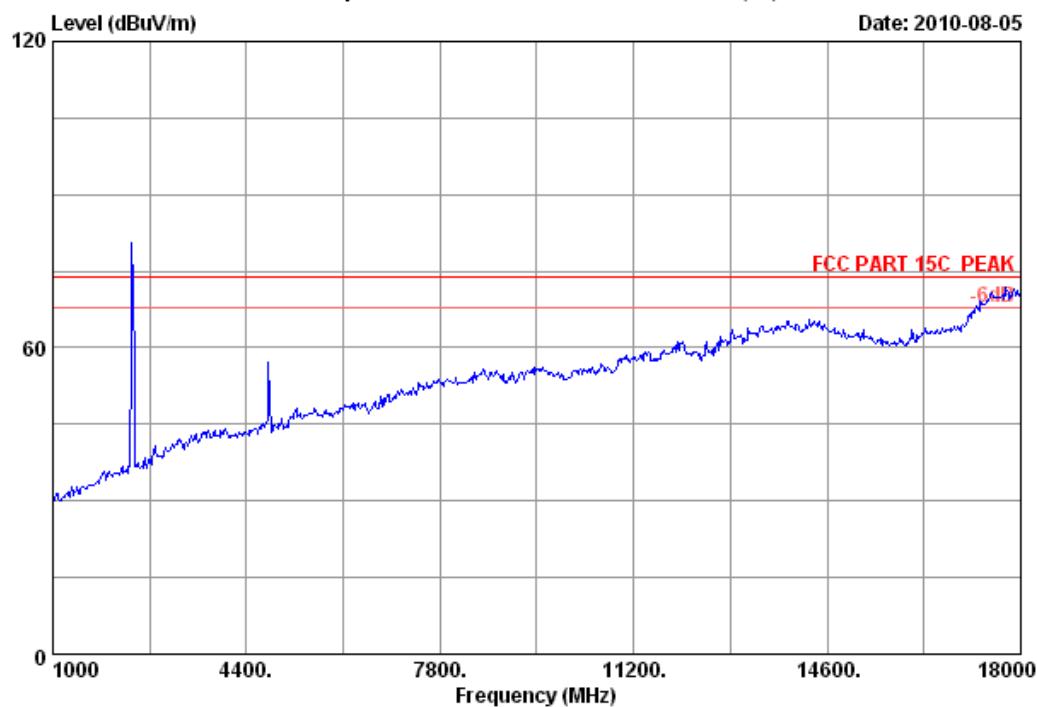
Remarks:

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



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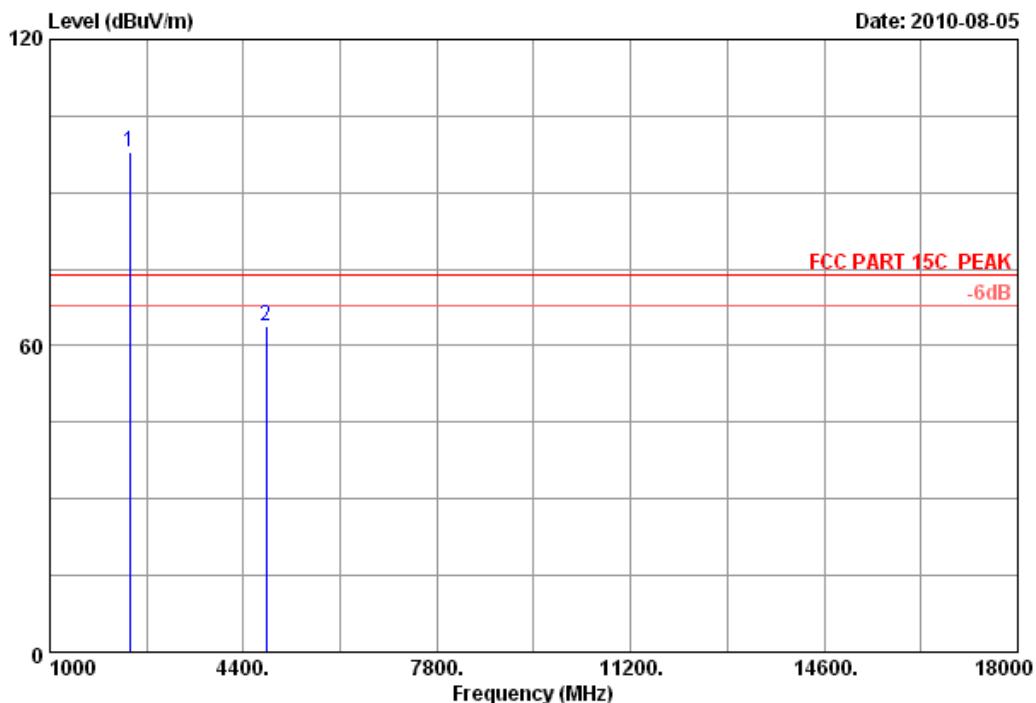


Site no.	: RF Chamber	Data no. :	3
Dis. / Ant.	: 3m 3115(0911)	Ant. pol. :	HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23°C/54%	Engineer :	Paul Tian
EUT	: Wireless Guitar Controller for Xbox 360		
Power	: DC 3V		
Test mode	: Tx 2402MHz		
M/N	: 96150805		



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Data: 4 File: E:\2010 report data\A\Activision\ACS10QH182.EM6 (16)



Site no. : RF Chamber Data no. : 4
Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23°C/54% Engineer : Paul Tian
EUT : Wireless Guitar Controller for Xbox 360
Power : DC 3V
Test mode : Tx 2402MHz
M/N : 96150805

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

1	2402.000	29.44	7.43	36.62	97.66	97.91	74.00	-23.91	Peak
2	4804.000	34.30	10.62	35.10	54.18	64.00	74.00	10.00	Peak

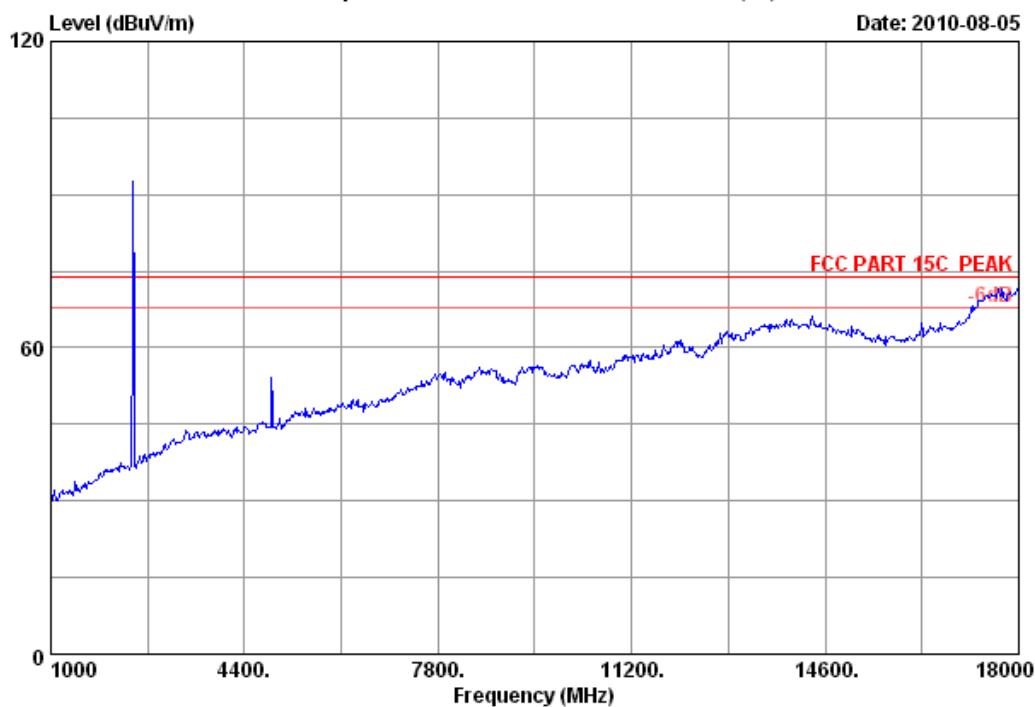
Remarks:

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



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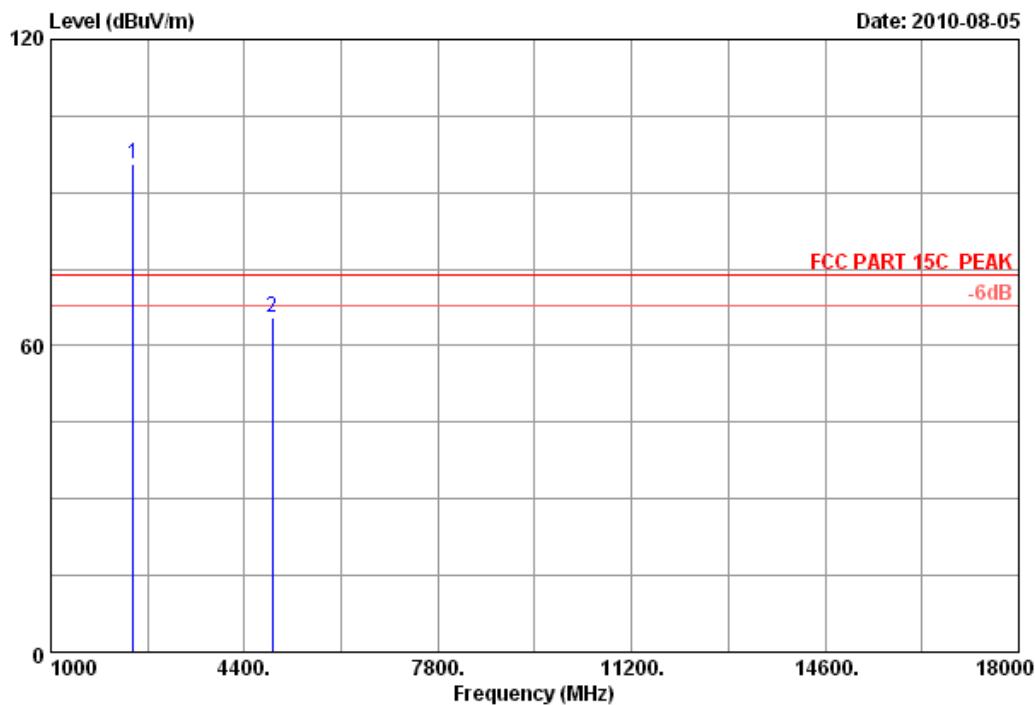


Site no.	: RF Chamber	Data no. :	7
Dis. / Ant.	: 3m 3115(0911)	Ant. pol. :	HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23°C/54%	Engineer :	Paul Tian
EUT	: Wireless Guitar Controller for Xbox 360		
Power	: DC 3V		
Test mode	: Tx 2442MHz		
M/N	: 96150805		



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Site no. : RF Chamber Data no. : 8
Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23°C/54% Engineer : Paul Tian
EUT : Wireless Guitar Controller for Xbox 360
Power : DC 3V
Test mode : Tx 2442MHz
M/N : 96150805

Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission				
				Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2442.000	29.47	7.50	36.61	95.28	95.64	74.00	-21.64	Peak
2 4884.000	34.41	10.71	35.03	55.47	65.56	74.00	8.44	Peak

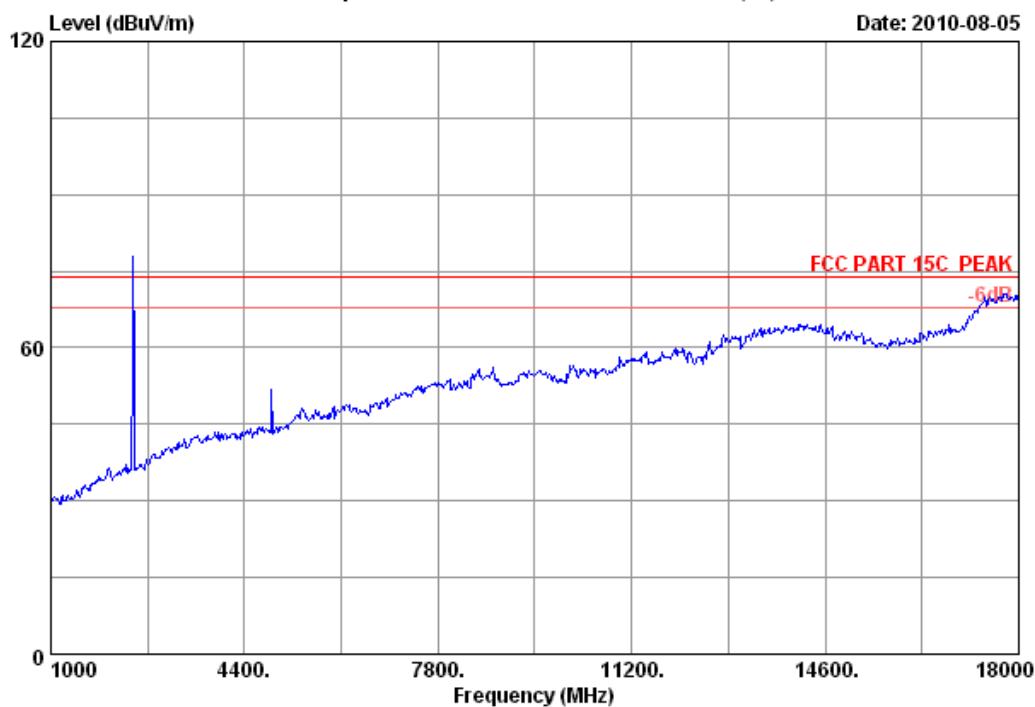
Remarks:

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



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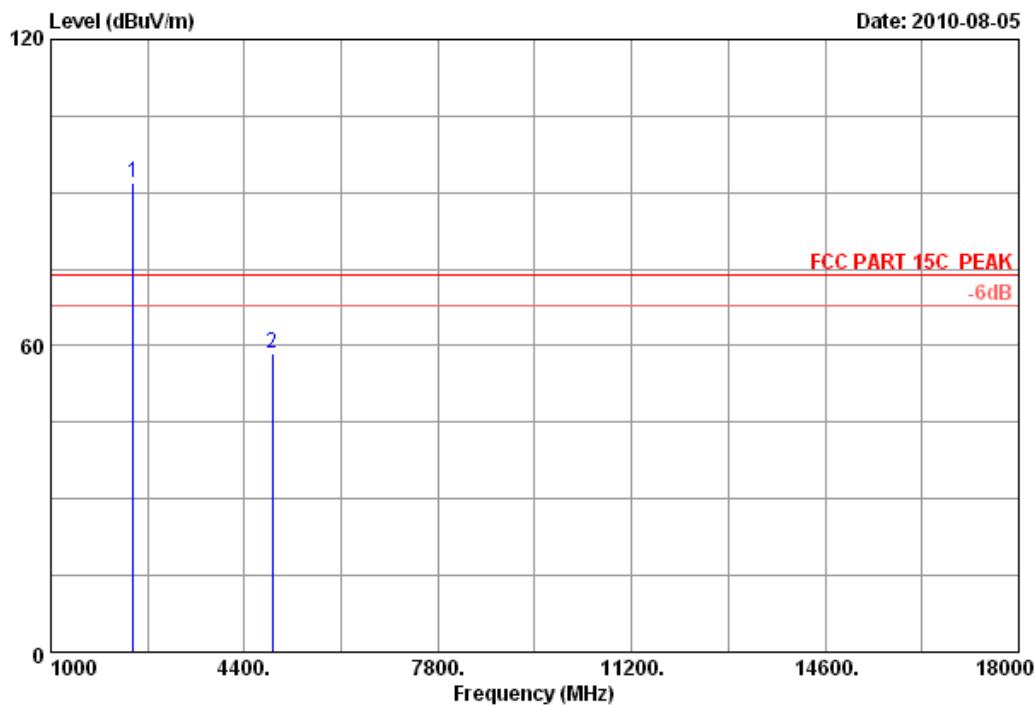


Site no.	: RF Chamber	Data no. :	9
Dis. / Ant.	: 3m 3115(0911)	Ant. pol. :	VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23°C/54%	Engineer :	Paul Tian
EUT	: Wireless Guitar Controller for Xbox 360		
Power	: DC 3V		
Test mode	: Tx 2442MHz		
M/N	: 96150805		



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Data: 10 File: E:\2010 report data\A\Activision\ACS10QH182.EM6 (16)



Site no. : RF Chamber Data no. : 10
Dis. / Ant. : 3m 3115(0911) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23°C/54% Engineer : Paul Tian
EUT : Wireless Guitar Controller for Xbox 360
Power : DC 3V
Test mode : Tx 2442MHz
M/N : 96150805

Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission				
				Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2442.000	29.47	7.50	36.61	91.54	91.90	74.00	-17.90	Peak
2 4884.000	34.41	10.71	35.03	48.36	58.45	74.00	15.55	Peak

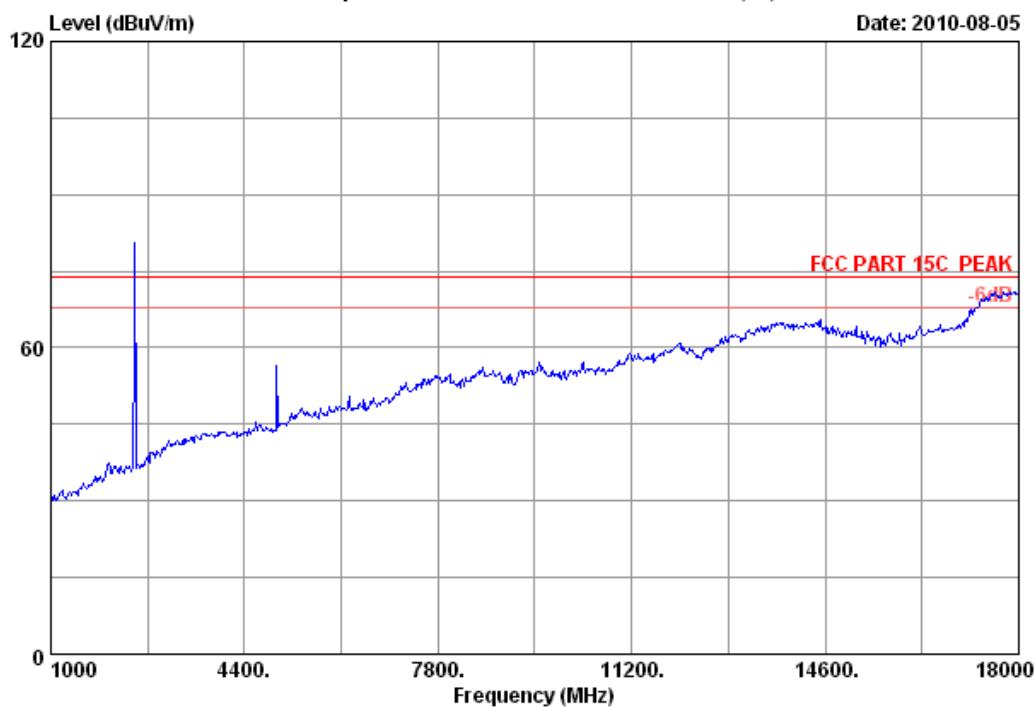
Remarks:

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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Postcode: 518057

Data: 11 File: E:\2010 report data\A\Activision\ACS10QH182.EM6 (16)

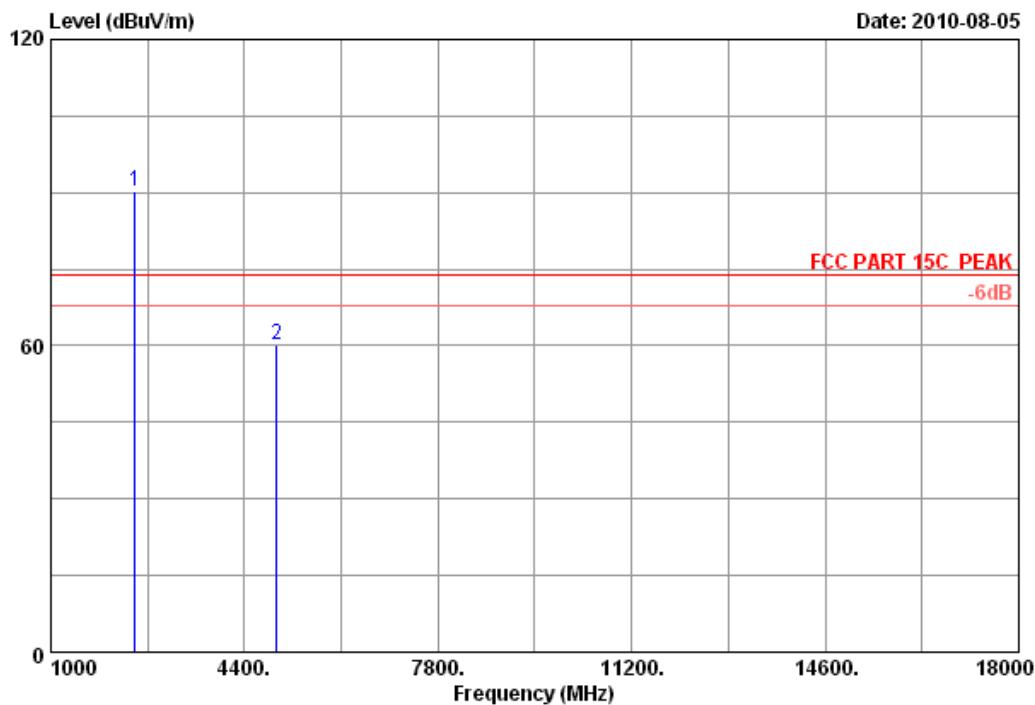


Site no.	: RF Chamber	Data no. :	11
Dis. / Ant.	: 3m 3115(0911)	Ant. pol. :	VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23°C/54%	Engineer :	Paul Tian
EUT	: Wireless Guitar Controller for Xbox 360		
Power	: DC 3V		
Test mode	: Tx 2482MHz		
M/N	: 96150805		



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Data: 12 File: E:\2010 report data\A\Activision\ACS10QH182.EM6 (16)



Site no. : RF Chamber Data no. : 12
Dis. / Ant. : 3m 3115(0911) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23°C/54% Engineer : Paul Tian
EUT : Wireless Guitar Controller for Xbox 360
Power : DC 3V
Test mode : Tx 2482MHz
M/N : 96150805

Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission			
				Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1 2482.000	29.49	7.58	36.60	89.80	90.27	74.00	-16.27 Peak
2 4964.000	34.54	10.80	34.95	49.73	60.12	74.00	13.88 Peak

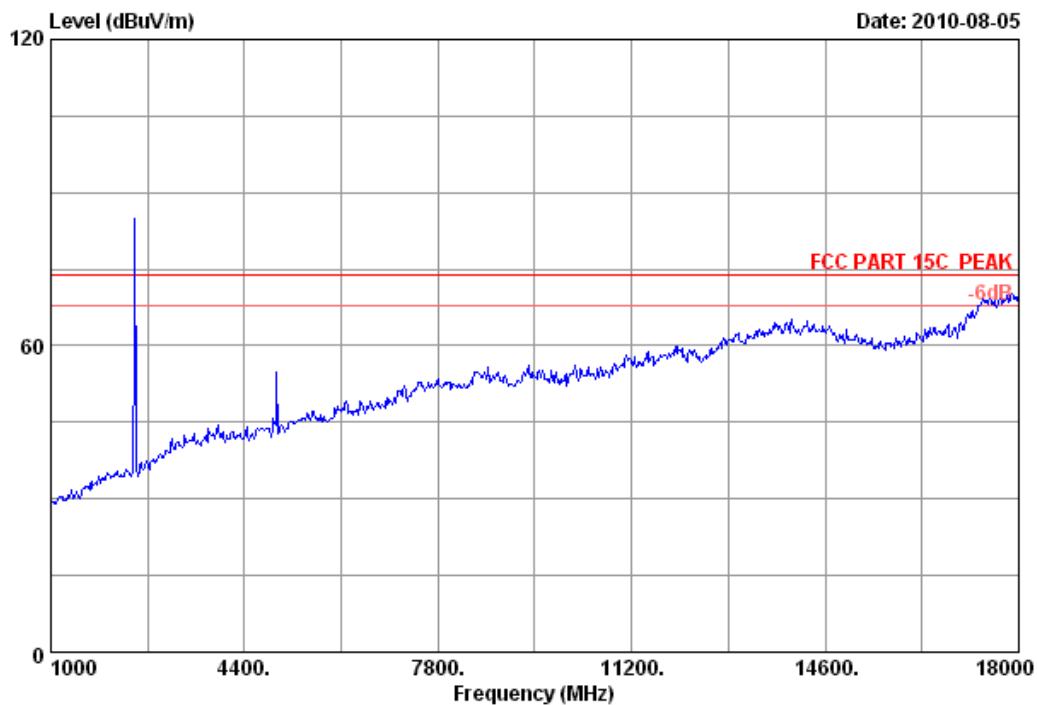
Remarks:

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



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Data: 13 File: E:\2010 report data\A\Activision\ACS10QH182.EM6 (16)

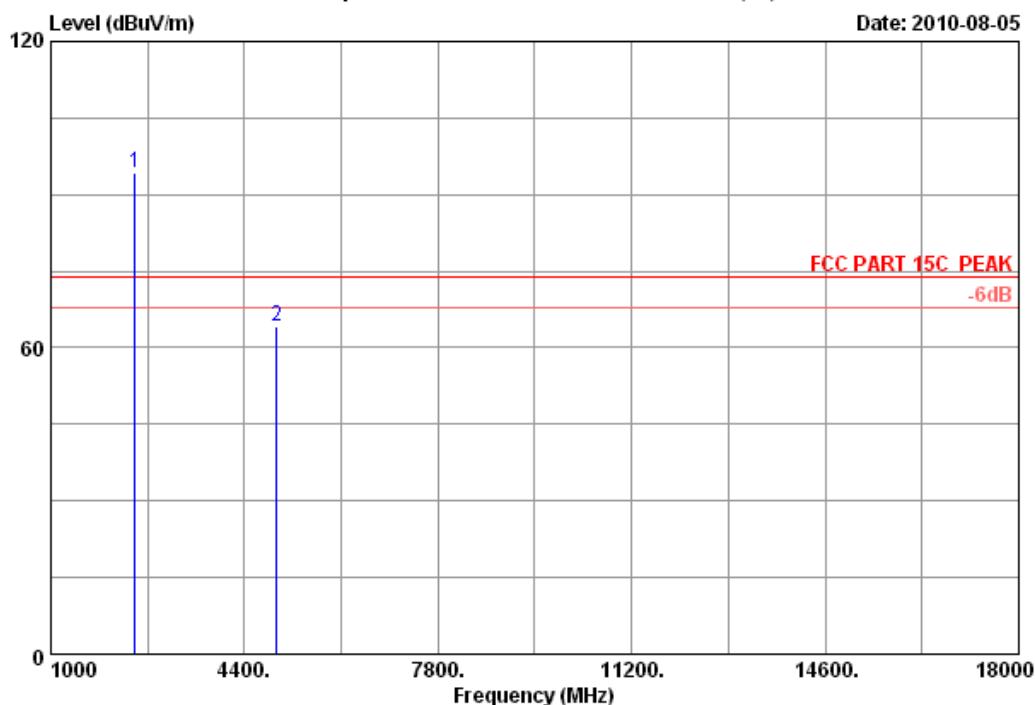


Site no.	: RF Chamber	Data no. :	13
Dis. / Ant.	: 3m 3115(0911)	Ant. pol. :	HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23°C/54%	Engineer :	Paul Tian
EUT	: Wireless Guitar Controller for Xbox 360		
Power	: DC 3V		
Test mode	: Tx 2482MHz		
M/N	: 96150805		



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Data: 14 File: E:\2010 report data\A\Activision\ACS10QH182.EM6 (16)



Site no. : RF Chamber Data no. : 14
Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23°C/54% Engineer : Paul Tian
EUT : Wireless Guitar Controller for Xbox 360
Power : DC 3V
Test mode : Tx 2482MHz
M/N : 96150805

Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Emission			
				Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1 2482.000	29.49	7.58	36.60	93.66	94.13	74.00	-20.13 Peak
2 4964.000	34.54	10.80	34.95	53.65	64.04	74.00	9.96 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.

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, 10	1 Year

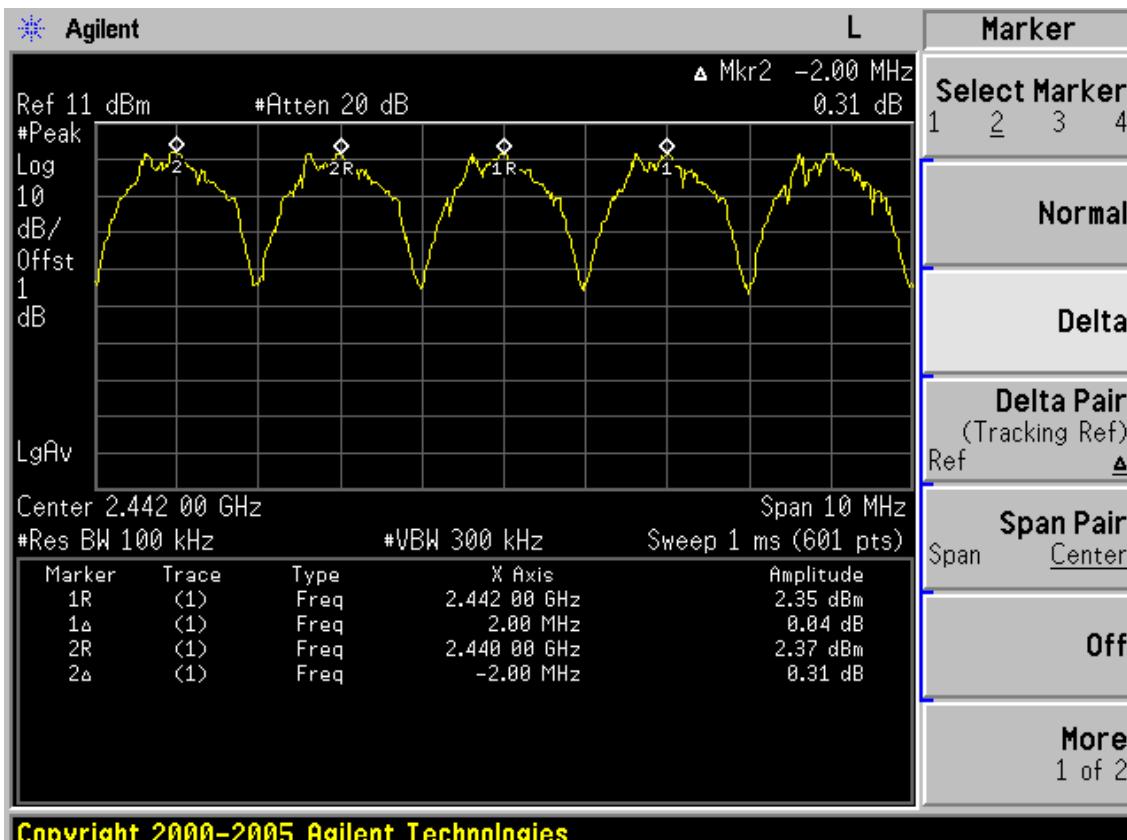
5.2. Limit

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. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

5.3. Test Results.

EUT: Wireless Guitar Controller for Xbox 360		
M/N: 96150805		
Test date:2010-08-01	Pressure:100.6 kpa	Humidity:53%
Tested by:Paul Tian	Test site: RF site	Temperature:25 °C

Channel separation	Conclusion
2.00MHz	PASS



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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.08,10	1 Year

6.2. Limit

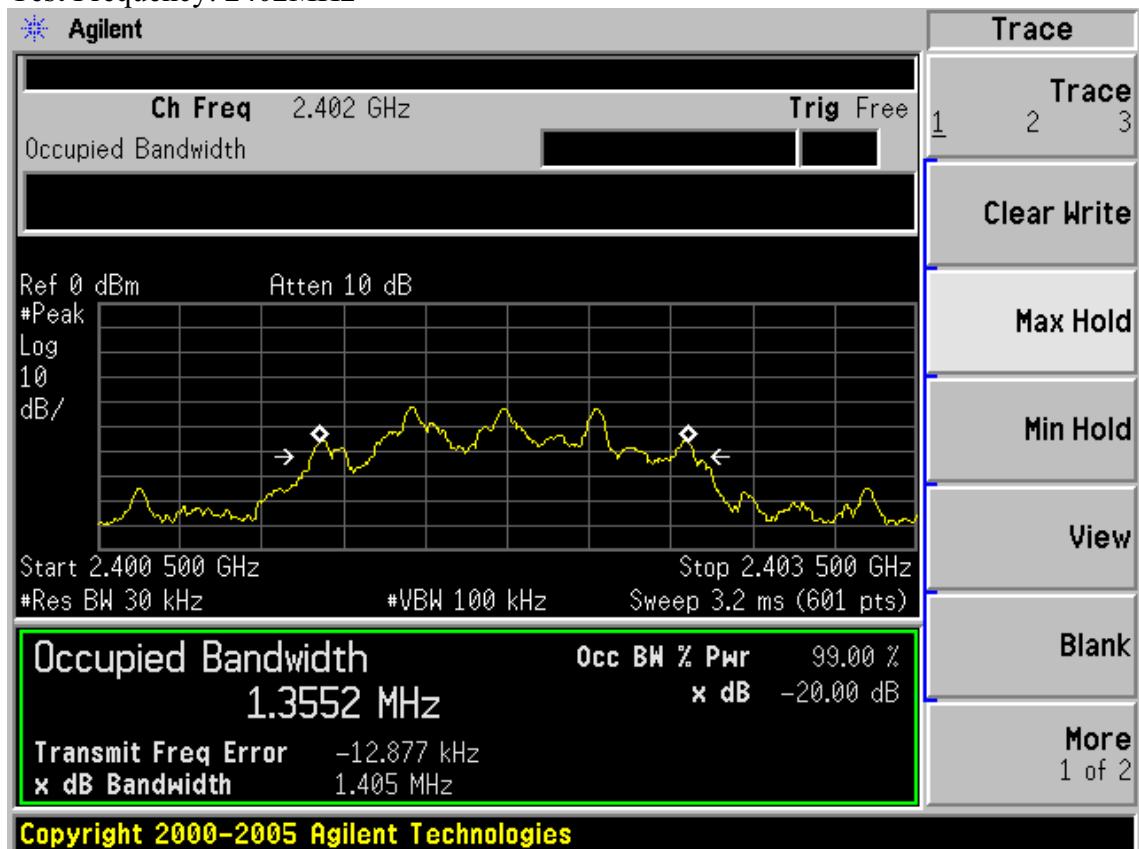
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific 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

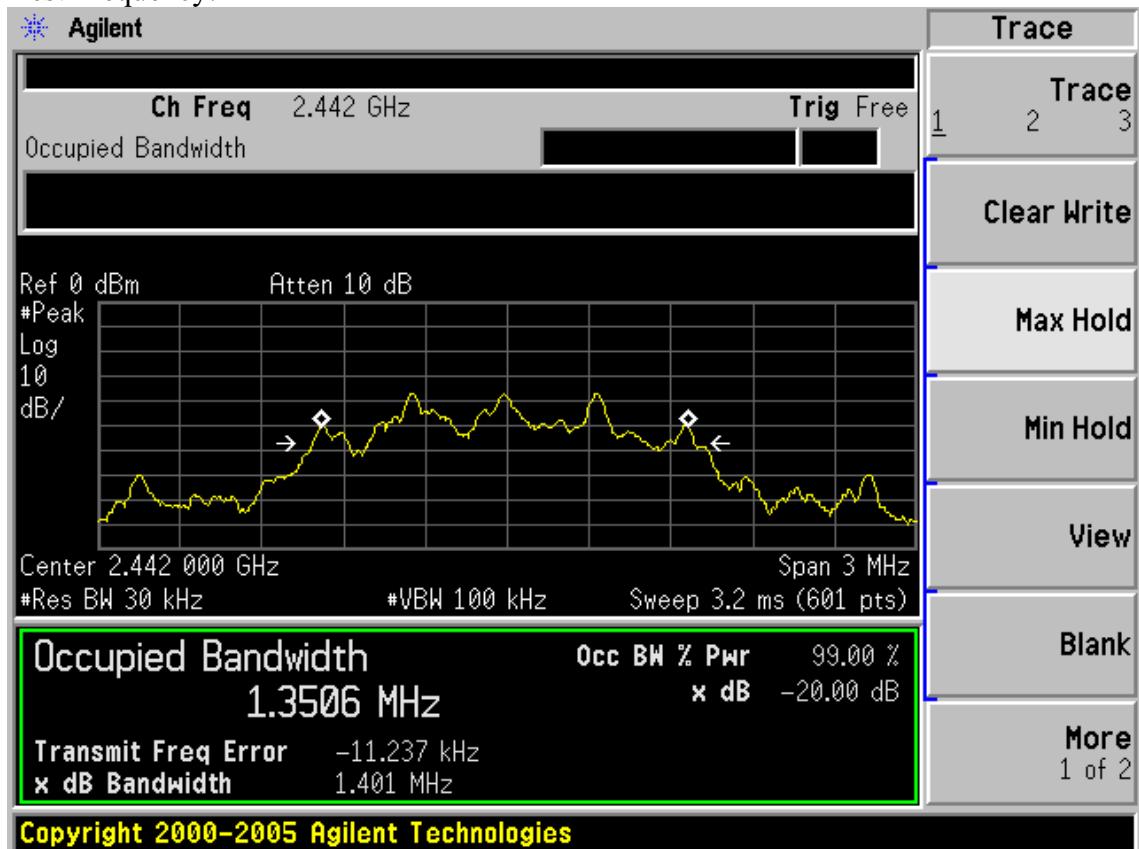
EUT: Wireless Guitar Controller for Xbox 360		
M/N: 96150805		
Test date:2010-08-01	Pressure:100.5 kpa	Humidity:56 %
Tested by:Paul Tian	Test site: RF site	Temperature : 25 °C

Frequency	-20dB bandwidth (KHz)	Limit (KHz)
2402	1405	N/A
2442	1401	N/A
2482	1403	N/A
Conclusion : PASS		

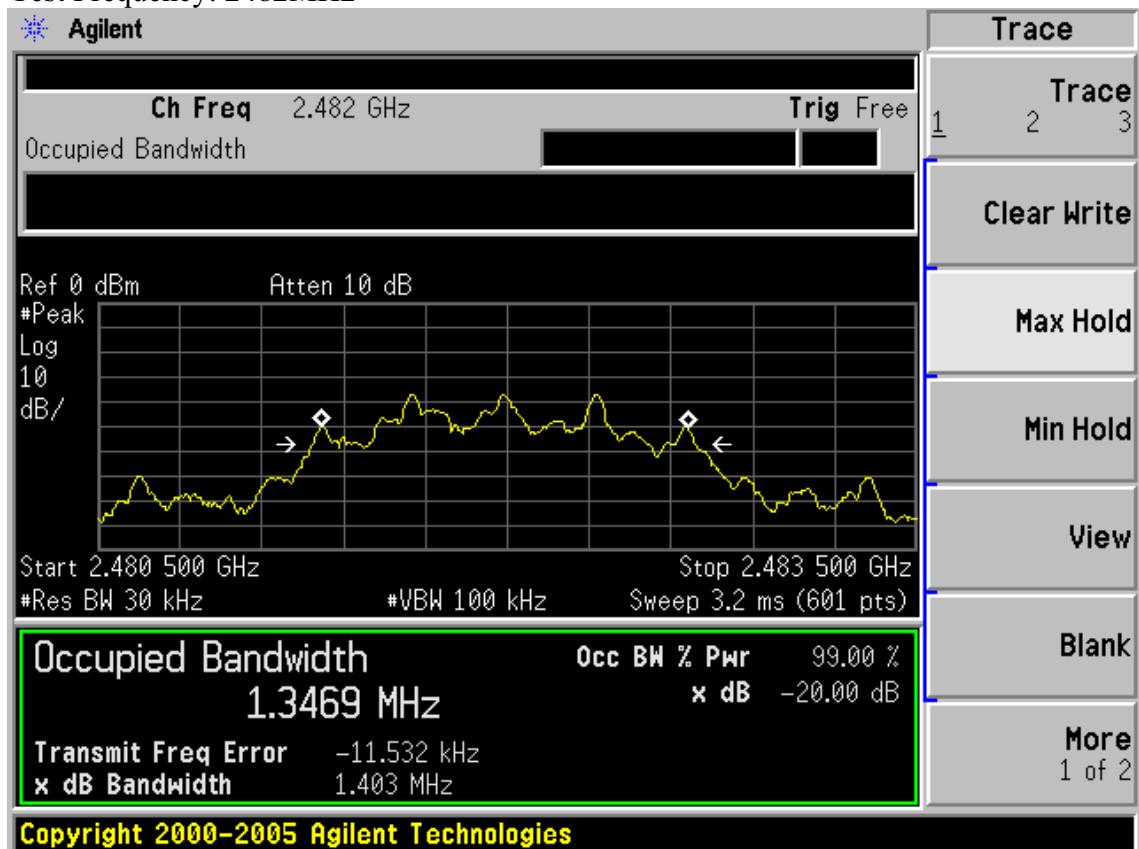
Test Frequency: 2402MHz



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, 10	1 Year

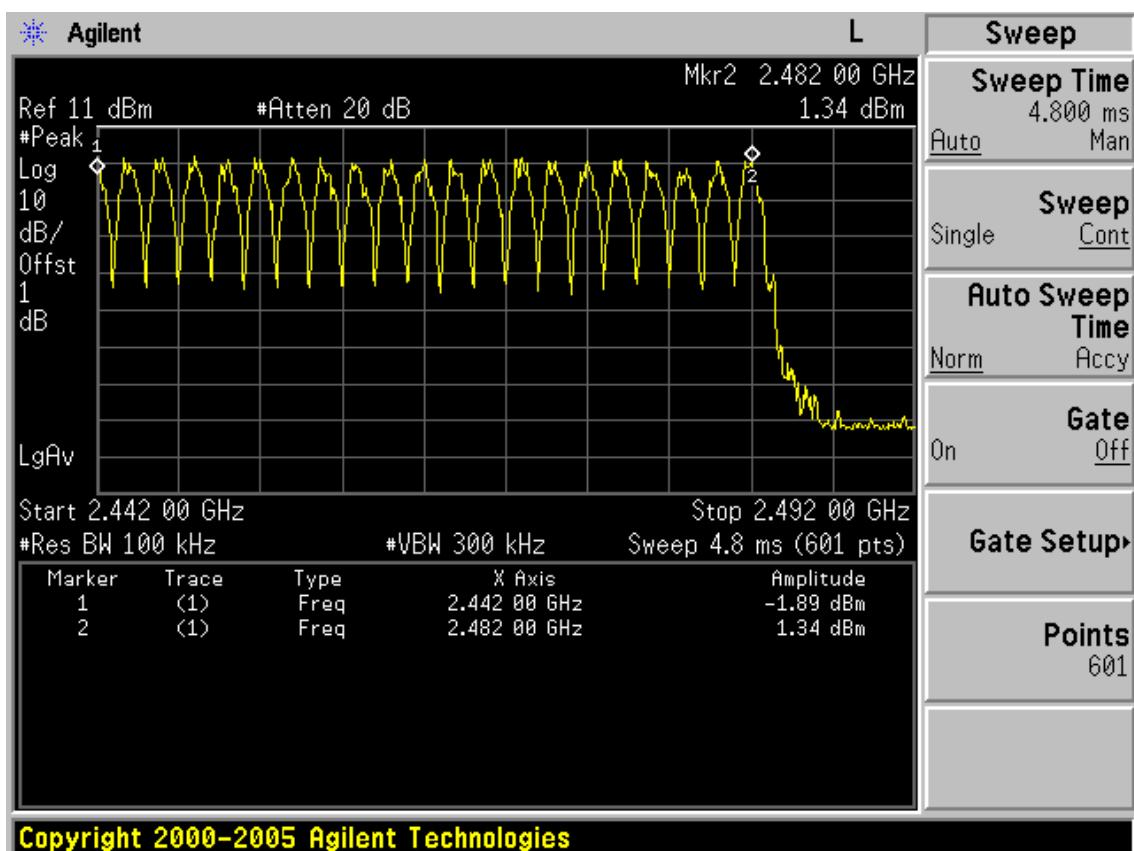
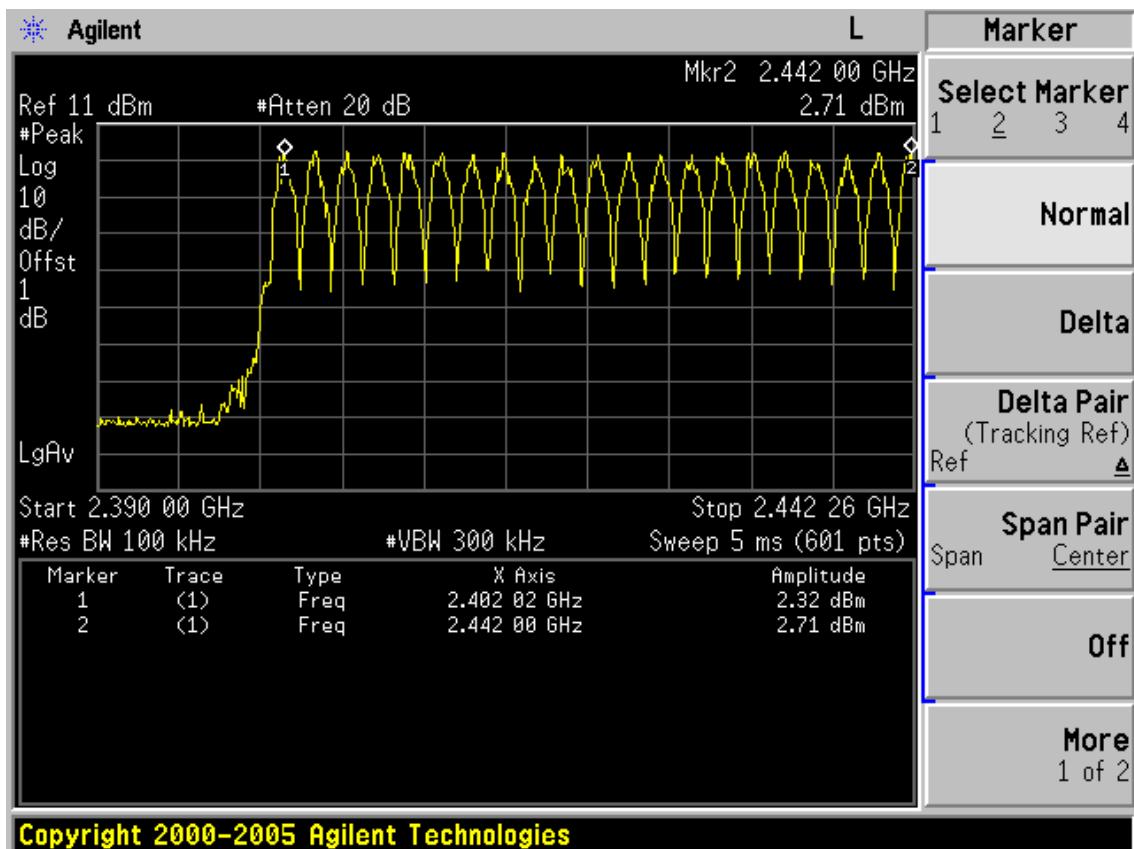
7.2. Limit

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

7.3. Test Results

EUT: Wireless Guitar Controller for Xbox 360		
M/N: 96150805		
Test date:2010-08-01	Pressure:100.6 kpa	Humidity:53%
Tested by:Paul Tian	Test site: RF site	Temperature:25 °C

Number of channel	Limit	Conclusion
41	≥ 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, 10	1 Year

8.2. Limit

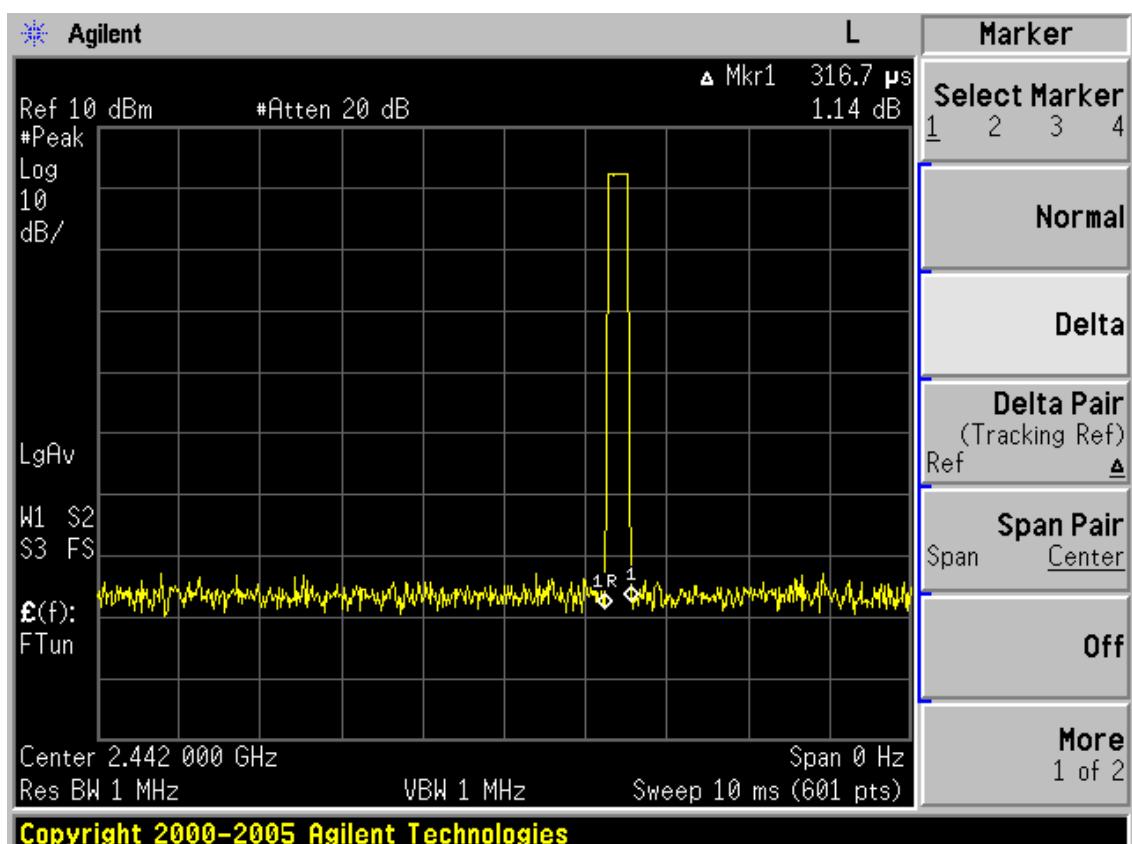
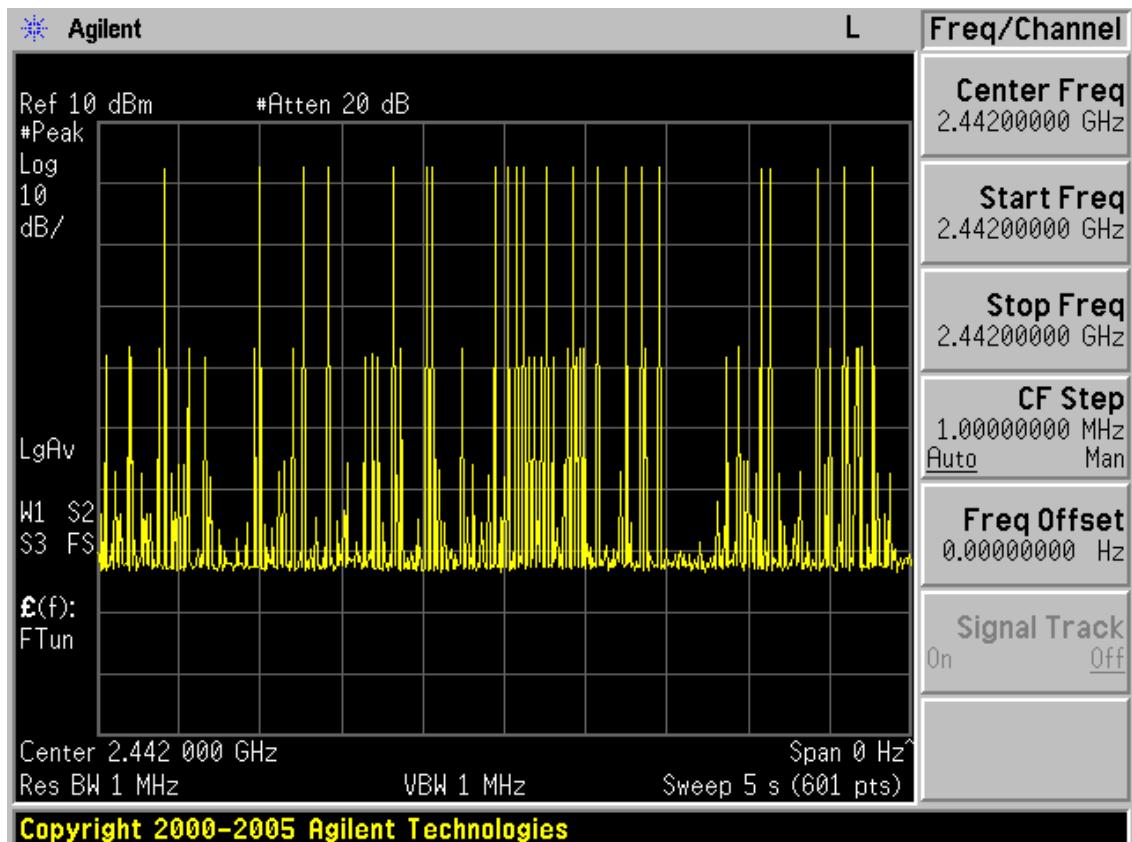
The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

8.3. Test Results

EUT: Wireless Guitar Controller for Xbox 360		
M/N: 96150805		
Test date:2010-08-01	Pressure:100.6 kpa	Humidity:53%
Tested by:Paul Tian	Test site: RF site	Temperature:25 °C

dwell time	Limit	Conclusion
22hops/5s*0.4*41channels*0.3167ms =22.85ms	<400ms	PASS

Note: All the lower levels were signal from receiver's, and should not be considered in here.



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, 10	1 Year
2.	Horn Antenna	EMCO	3115	9510-4580	Nov.19, 09	1.5 Year
3.	Horn Antenna	EMCO	3115	9607-4877	Nov. 25, 09	1.5 Year
4.	Signal Generator	HP	83732B	VS34490501	May.08, 10	1 Year
5.	Amplifier	Agilent	8491B	MY39262165	May.08, 10	1 Year
6.	RF Cable	Hubersuhner	SUCOFLEX 102	28620/2	May,08, 10	1 Year
7.	RF Cable	Hubersuhner	SUCOFLEX 102	271471/4	May,08, 10	1 Year
8.	RF Cable	Hubersuhner	SUCOFLEX 102	29086/2	May,08, 10	1 Year
9.	RF Cable	Hubersuhner	SUCOFLEX 102	271473/4	May,08, 10	1 Year
10.	RF Cable	Hubersuhner	SUCOFLEX 102	29091/2	May,08, 10	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 with 2MHz RBW (above 20dB bandwidth of device), 3MHz VBW, PK detector, 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: Wireless Guitar Controller for Xbox 360						
M/N: 96150805						
Test date:2010-08-02		Pressure:100.4 kpa			Humidity:55%	
Tested by: Paul Tian		Test site: RF site			Temperature:25 °C	

Frequency (MHz)	Test Antenna polarization	Maximum field strength (dBuV/m)	SG Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Result (dBm)
2402	H	97.91	-0.03	5.75	8.90	3.12
	V	90.88	-8.27	5.75	8.90	-5.12
2442	H	95.64	-1.91	5.77	8.91	1.23
	V	91.90	-7.37	5.77	8.91	-4.23
2482	H	94.13	-2.93	5.78	8.94	0.23
	V	90.27	-7.83	5.78	8.94	-4.67

Note: Result = SG level -Cable loss + Antenna Gain

Limit: 21dBm

Conclusion: PASS

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.08,10	1 Year
2.	Horn Antenna	EMCO	3115	9607-4877	Nov.25, 09	1.5 Year
3.	Amplifier	Agilent	8449B	3008A02495	May.08, 10	1 Year
4.	RF Cable	Hubersuhner	SUCOFLEX102	28620/2	May.08,10	1 Year
5.	RF Cable	Hubersuhner	SUCOFLEX102	28618/2	May.08,10	1 Year
6.	RF Cable	Hubersuhner	SUCOFLEX102	28610/2	May.08,10	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 upper band emissions that are up to two bandwidths(2MHz) away (2483.5MHz to 2485.5MHz) 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=1MHz ;VBW=3MHz, PK detector, Sweep=AUTO
 - (b) This device is pulse modulated, a duty cycle factor was used to calculate average level based measured peak level.

10.4. Test Results

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

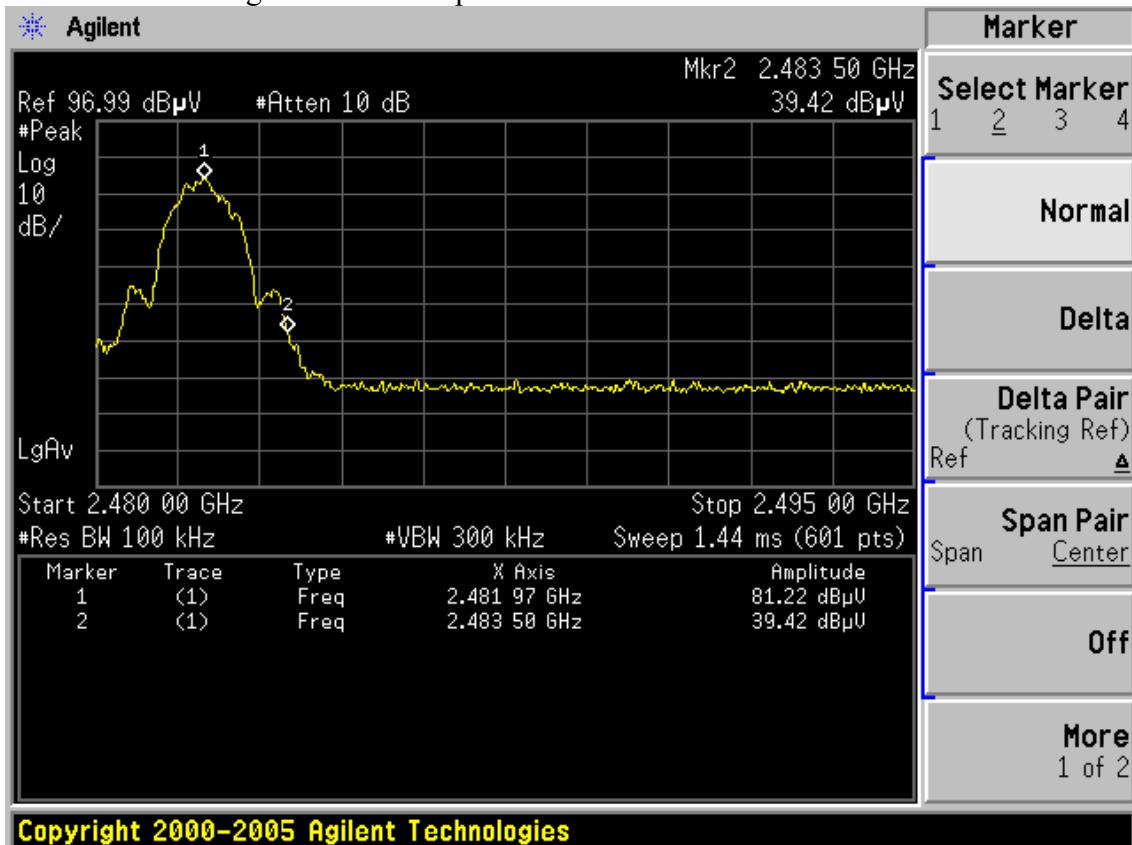
Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

Emissions in two bandwidths away from the band-edge

CH	Frequency (MHz)	Maximum PK Fundamental level (dBuV/m)	Marker delta (dB)	PK band edge level (dBuV/m)	PK Limit (dBuV/m)	Result
High 2482MHz	2483.5	94.13	41.80	52.33	74	PASS

Marker delta =81.22-39.42 = 41.80dB

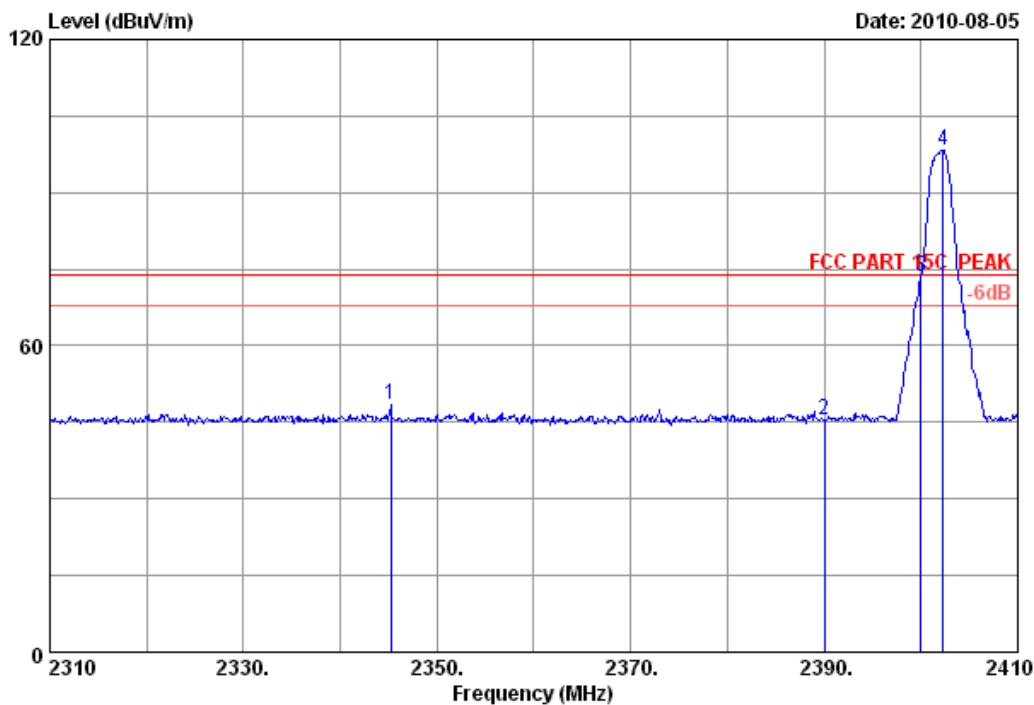
Band edge marker delta-plot:





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Data: 5 File: E:\2010 report data\A\Activision\ACS10QH182.EM6 (16)



Site no. : RF Chamber Data no. : 5
Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23°C/54% Engineer : Paul Tian
EUT : Wireless Guitar Controller for Xbox 360
Power : DC 3V
Test mode : Tx 2402MHz
M/N : 96150805

	Ant.	Cable	Amp.	Emission			
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)
1	2345.200	29.41	7.31	36.63	48.29	48.38	74.00 25.62 Peak
2	2390.000	29.44	7.39	36.62	45.11	45.32	74.00 28.68 Peak
3	2400.000	29.44	7.43	36.62	73.37	73.62	74.00 0.38 Peak
4	2402.300	29.44	7.43	36.62	98.03	98.28	74.00 -24.28 Peak

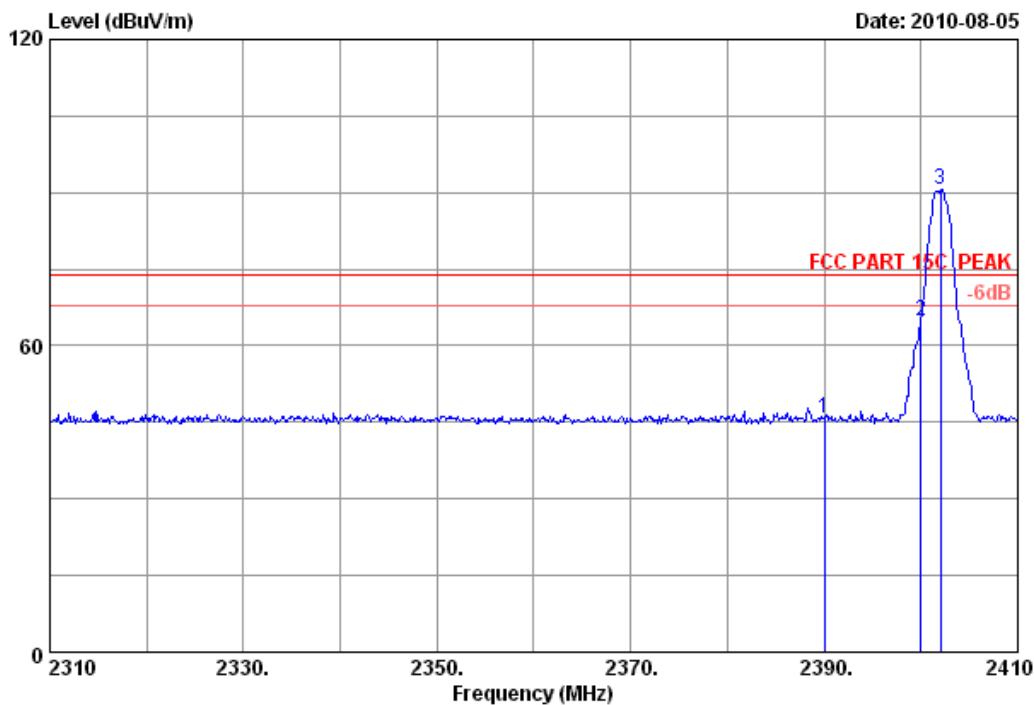
Remarks:

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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Postcode:518057

Data: 6 File: E:\2010 report data\A\Activision\ACS10QH182.EM6 (16)



Site no. : RF Chamber Data no. : 6
Dis. / Ant. : 3m 3115(0911) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23°C/54% Engineer : Paul Tian
EUT : Wireless Guitar Controller for Xbox 360
Power : DC 3V
Test mode : Tx 2402MHz
M/N : 96150805

	Ant.	Cable	Amp.	Emission			
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)
1	2390.000	29.44	7.39	36.62	45.58	45.79	74.00 28.21 Peak
2	2400.000	29.44	7.43	36.62	64.54	64.79	74.00 9.21 Peak
3	2402.000	29.44	7.43	36.62	90.29	90.54	74.00 -16.54 Peak

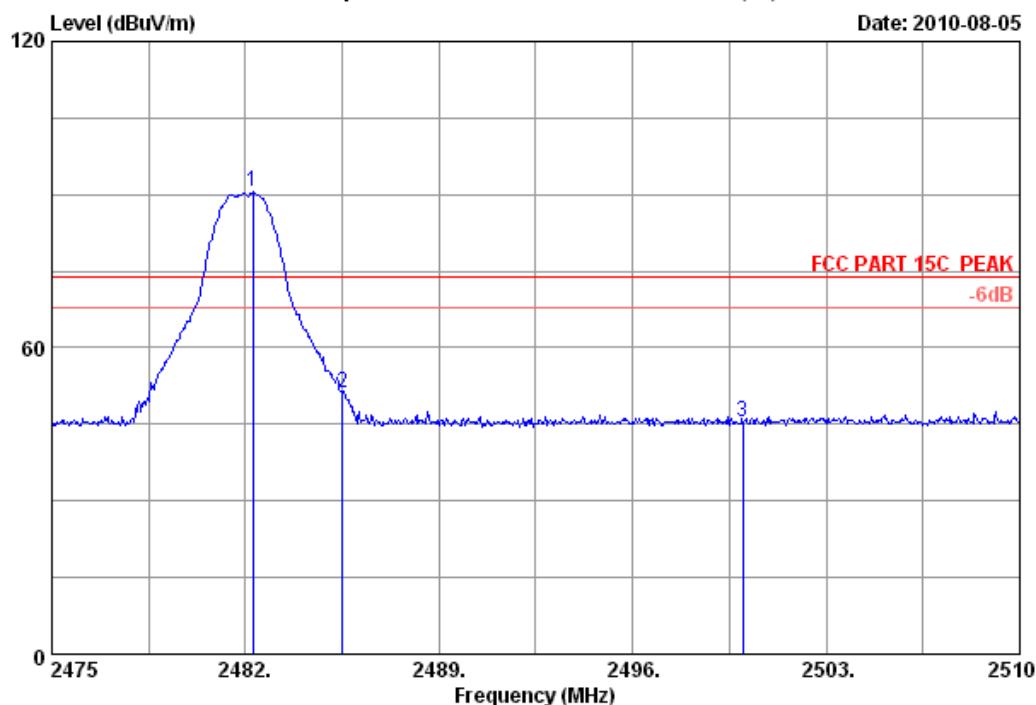
Remarks:

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: 16 File: E:\2010 report data\A\Activision\ACS10QH182.EM6 (17)



Site no. : 3m Chamber Data no. : 16
Dis. / Ant. : 3m 3115(0911) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23°C/54% Engineer : Paul Tian
EUT : Wireless Guitar Controller for Xbox 360
Power : DC 3V
Test mode : Tx 2482MHz
M/N : 96150805

	Ant.	Cable	Amp.	Emission			
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)
1	2482.280	29.49	7.58	36.60	89.95	90.42	74.00 -16.42 Peak
2	2485.500	29.49	7.58	36.60	50.51	50.98	74.00 23.02 Peak
3	2500.000	29.50	7.62	36.60	45.06	45.58	74.00 28.42 Peak

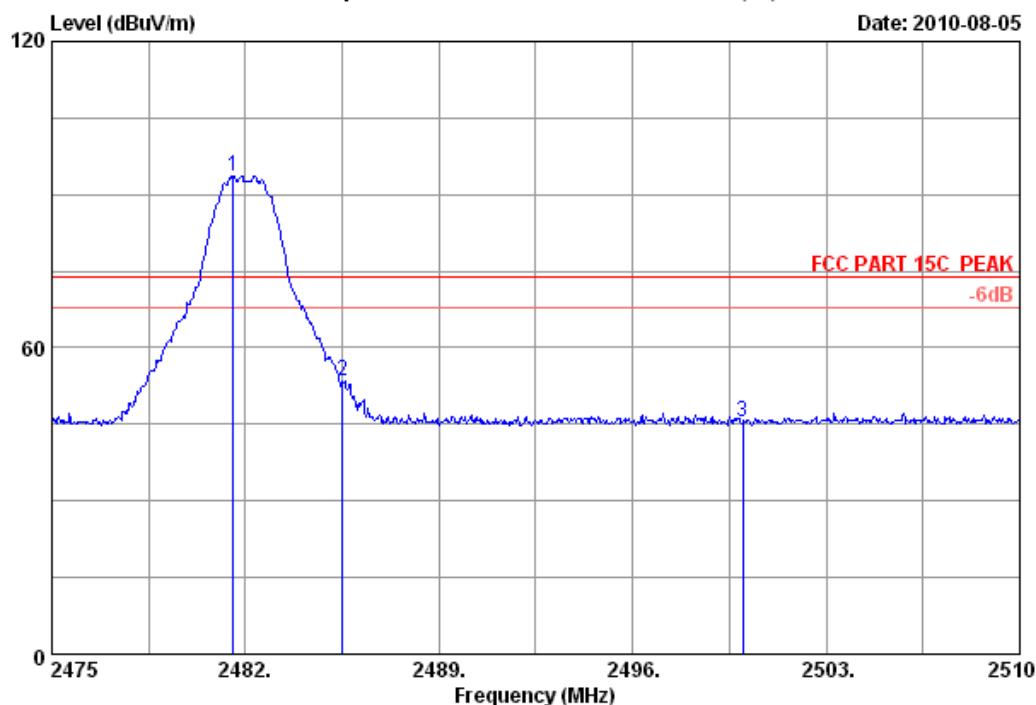
Remarks:

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



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Data: 15 File: E:\2010 report data\A\Activision\ACS10QH182.EM6 (17)



Site no. : 3m Chamber Data no. : 15
Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23°C/54% Engineer : Paul Tian
EUT : Wireless Guitar Controller for Xbox 360
Power : DC 3V
Test mode : Tx 2482MHz
M/N : 96150805

	Ant.	Cable	Amp.	Emission			
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)
1	2481.545	29.49	7.58	36.60	93.28	93.75	74.00 -19.75 Peak
2	2485.500	29.49	7.58	36.60	53.15	53.62	74.00 20.38 Peak
3	2500.000	29.50	7.62	36.60	44.89	45.41	74.00 28.59 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. DEVIATION TO TEST SPECIFICATIONS

[NONE]