

APPLICATION FOR CERTIFICATION
On Behalf of

Mad Catz, Inc.

Eclipse Wireless Litetouch Keyboard

Model Number: ECB43001

FCC ID: P25M043001C1011C

Prepared for : Mad Catz, Inc.
7480 Mission Valley Road, Suite 101, San Diego,
California, 92108

Prepared By : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Ke Feng Rd., 52 Block,
Shenzhen Science & Industrial Park,
Nantou, Shenzhen, Guangdong, China

Tel: (0755) 26639496

Report Number : ACS-F10039
Date of Test : Feb.10~11, 2010
Date of Report : Mar.01, 2010

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TEST REPORT CERTIFICATION

Applicant : Mad Catz, Inc.
 EUT Description : Eclipse Wireless Litetouch Keyboard
 MODEL NO. : ECB43001
 FCC ID : P25M043001C1011C
 POWER SUPPLY : DC 5V
 TEST VOLTAGE : DC 5V From Adapter Input AC 120V/60Hz

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 : Feb.10~ 11, 2010

Prepared by :

Edie Huang
Edie Huang / Assistant

Reviewer :

Jamy Yu
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 15C: 15.207 ANSI C63.10-2009	PASS
Radiated Emission Test	FCC Part 15C: 15.209 FCC Part 15C: 15.249 ANSI C63.10-2009	PASS
Band Edge Compliance Test	FCC Part 15: 15.249	PASS
20dB Bandwidth Test	FCC Part 15: 15.215	PASS

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product name : Eclipse Wireless Litetouch Keyboard

Model Number : ECB43001

FCC ID : P25M043001C1011C

Operation frequency : 2405MHz~2480MHz

Modulation : DSSS

Applicant : Mad Catz, Inc.
7480 Mission Valley Road, Suite 101, San Diego, California,
92108

Power Adapter : Manufacturer: Mass Power
M/N: SDF0500150A1BB
Cable: Shielded, Undeachable, 1.5m (with one core)

Date of Test : Feb.10~11, 2010

Date of Receipt : Jan.10, 2010

Sample Type : Prototype production

Note: This EUT has two parts, one is keyboard, another one is receiver, this report is only for keyboard

2.2. Tested Supporting System Details

2.2.1. Notebook

M/N : PP09S

S/N : N/A

Manufacturer : DELL

Power Adaptor : Manufacturer: DELL,
M/N: LA65NS1-00
Cable: Unshielded, Detachable, 4.0m
(Bond one ferrite core)

2.2.2. Eclipse Wireless Litetouch Keyboard (Dongle)

M/N : ECB43001

Manufacturer : Mad Catz, Inc.

2.3. Test Facility

Site Description	
Name of Firm	: Audix Technology (Shenzhen) Co., Ltd. No. 6, Ke Feng Rd., 52 Block, Shenzhen Science & Industrial Park, Nantou, Shenzhen, Guangdong, China
3m Anechoic Chamber	: 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, 2009

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

Test Item	Uncertainty
Uncertainty for Conduction emission test in No. 1 Conduction	2.40dB
Uncertainty for Radiation Emission test in 3m chamber	3.82 dB (Polarize: V)
	4.32 dB (Polarize: H)
Uncertainty for Temperature and humidity test	2%
	1°C
Uncertainty for Bandwidth test	1×10^{-9}
Uncertainty for DC power test	0.038 %
Uncertainty for test site temperature and humidity	0.6°C
	3%

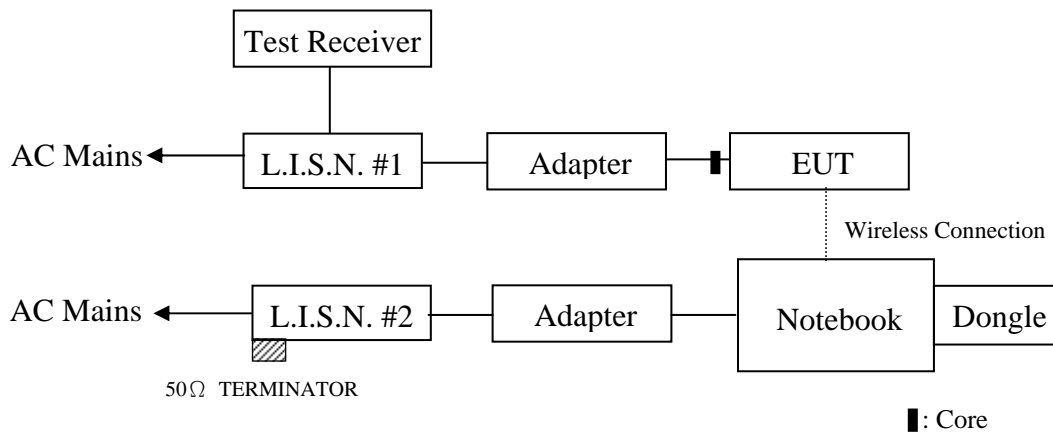
3. POWER LINE CONDUCTED EMISSION TEST

3.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	Rohde & Schwarz	ESHS20	836600/006	May.08, 09	1 Year
2	L.I.S.N.#1	Rohde & Schwarz	ESH2-Z5	834066/011	May.08, 09	1 Year
3	L.I.S.N.#2	Kyoritsu	KNW-407	8-1636-1	May.08, 09	1 Year
4	Terminator	Hubersuhner	50Ω	No. 1	May.08, 09	1 Year
5	RF Cable	Fujikura	3D-2W	LISN Cable 1#	May.08, 09	1Year
6	Coaxial Switch	Anritsu	MP59B	M55367	May.08, 09	1 Year
7	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100341	May.08, 09	1 Year

3.2. Block Diagram of Test Setup

3.2.1. Block diagram of connection between the EUT and Supporting System



(EUT: Eclipse Wireless Litetouch Keyboard)

3.3. Power Line Conducted Emission Test Limits

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

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

2. The lower limit shall apply at the transition frequencies.

3.4. Configuration of EUT on Test

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

3.4.1. Eclipse Wireless Litetouch Keyboard (EUT)

Model Number : ECB43001
Serial Number : N/A

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

3.5. Operating Condition of EUT

3.5.1. Setup the EUT and simulator as shown as Section 3.2.

3.5.2. Turned on the power of all equipment.

3.5.3. Let the EUT worked in test mode (Tx Mode) and measured it.

3.6. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). This provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs). Power on the Notebook and let it work normally, we use a test software, let EUT working in test mode, then test it. Both the sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2009 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESHS20) is set at 10kHz.

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

The test result are reported on Section 3.7.,

3.7. Power Line Conducted Emission Test Results

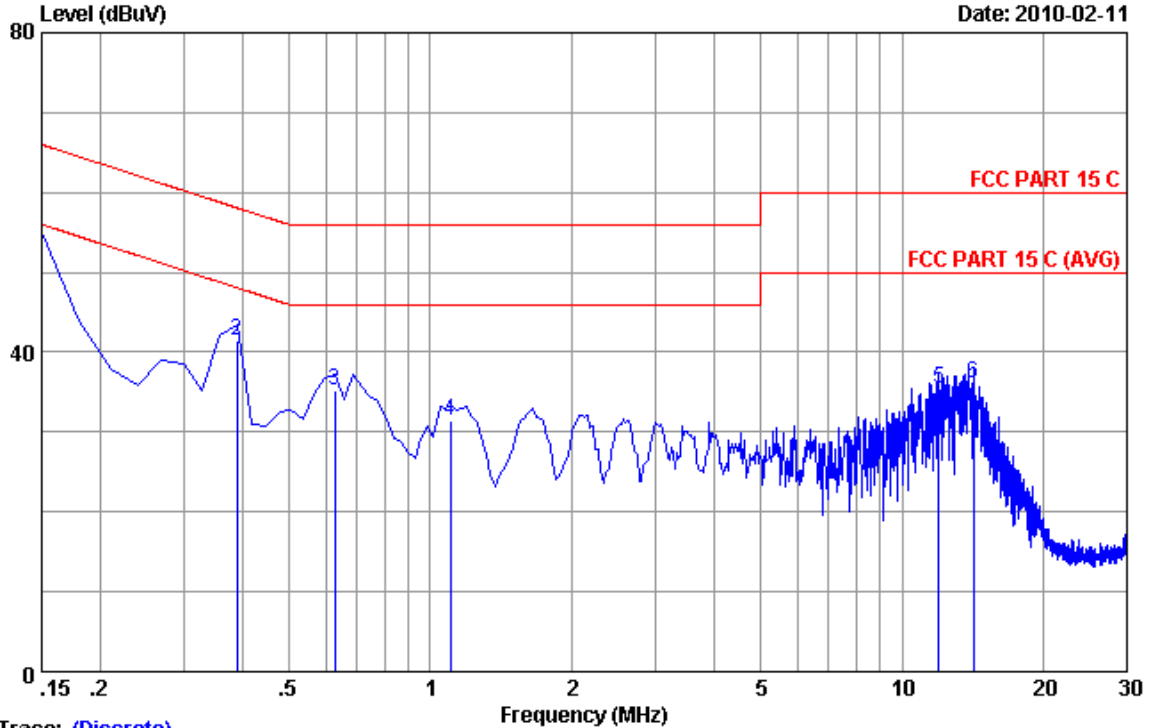
PASS. (All emissions not reported below are too low against the prescribed limits.)



NO.6 Ke Feng Road,Block 52,
Shenzhen Science&Industry Park
Nantou, Shenzhen,Guang dong, China.
Tel:+86-755-26639495
Fax:+86-755-26632877
Postcode:518057

Data: 1 File: D:\DATA\2010 test data\MMAD CATZ\ACS9QH357.EM6 (8)

Date: 2010-02-11



Trace: (Discrete)

Site no :Audix No.1 Conduction Data no :1
Dis./Ant. **: 2009 KNW-242C VA
Limit :FCC PART 15 C
Env./Ins. :Temp:23'C Humi:54% Engineer :Power Feng
EUT :Eclipse Wireless Litetouch Keyboard
Power Rating :DC 5V From Adapter Input AC 120V/60Hz
Test Mode :Tx Mode
ECB43001

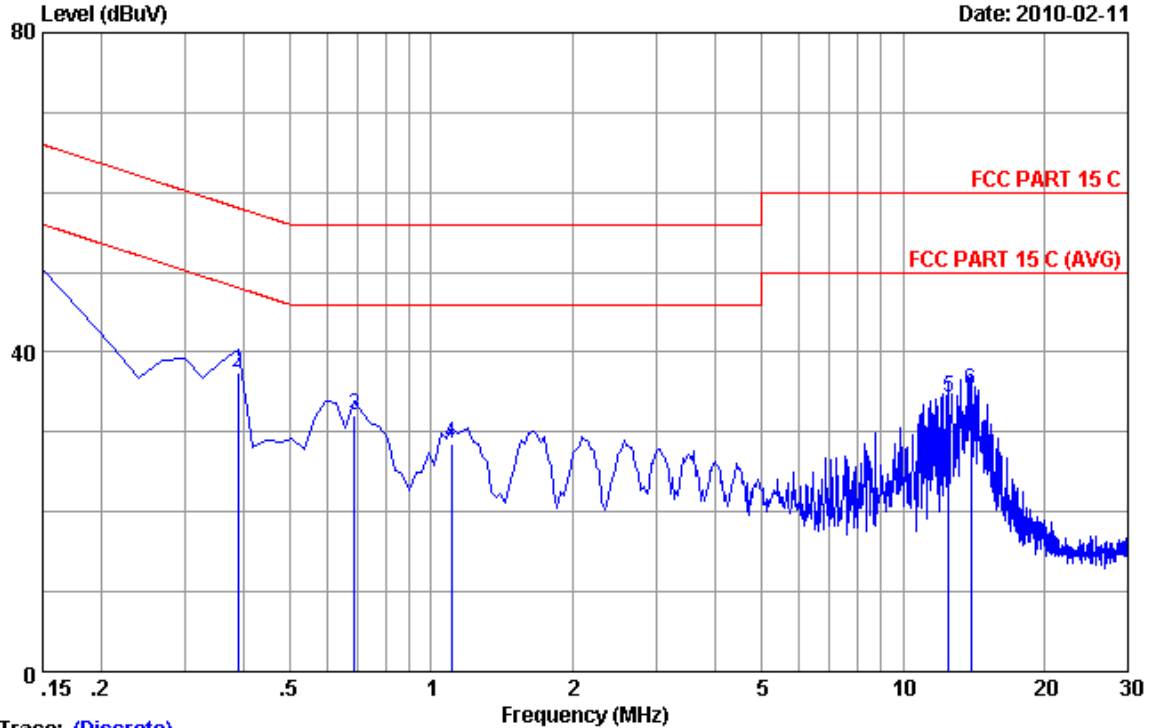
No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.15000	0.09	9.88	43.08	53.05	66.00	12.95	QP
2	0.38880	0.05	9.89	31.52	41.46	58.09	16.63	QP
3	0.62760	0.05	9.89	25.31	35.25	56.00	20.75	QP
4	1.105	0.07	9.89	21.55	31.51	56.00	24.49	QP
5	11.971	0.23	9.95	25.19	35.37	60.00	24.63	QP
6	14.209	0.27	9.97	25.92	36.16	60.00	23.84	QP

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



NO.6 Ke Feng Road,Block 52,
Shenzhen Science&Industry Park
Nantou, Shenzhen,Guang dong, China.
Tel:+86-755-26639495
Fax:+86-755-26632877
Postcode:518057

Data: 2 File: D:\DATA\2010 test data\MMAD CATZ\ACS9QH357.EM6 (8)



Trace: (Discrete)
 Site no :Audix No.1 Conduction Data no :2
 Dis./Ant. **: 2009 KNW-242C VB
 Limit :FCC PART 15 C
 Env./Ins. :Temp:23'C Humi:54% Engineer :Power Feng
 EUT :Eclipse Wireless Litetouch Keyboard
 Power Rating :DC 5V From Adapter Input AC 120V/60Hz
 Test Mode :Tx Mode
 ECB43001

No	Freq (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.15000	0.62	9.88	37.80	48.30	66.00	17.70	QP
2	0.38880	0.13	9.89	27.34	37.36	58.09	20.73	QP
3	0.68730	0.18	9.89	21.91	31.98	56.00	24.02	QP
4	1.105	0.27	9.89	18.33	28.49	56.00	27.51	QP
5	12.508	0.55	9.96	23.74	34.25	60.00	25.75	QP
6	13.941	0.57	9.97	24.78	35.32	60.00	24.68	QP

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

4. RADIATED EMISSION TEST

4.1. Test Equipment

Frequency rang: 30~1000MHz

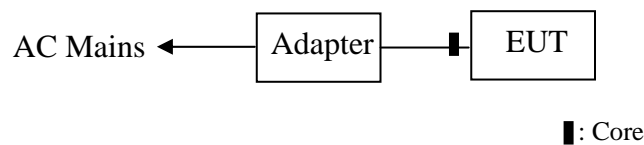
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	3#Chamber	AUDIX	N/A	N/A	Dec.05,09	1 Year
2	EMI Spectrum	Agilent	E4407B	MY41440292	May.08, 09	1 Year
3	Test Receiver	Rohde & Schwarz	ESVS10	834468/011	May.08, 09	1 Year
4	Amplifier	HP	8447D	2648A04738	May.08, 09	1 Year
5	Bilog Antenna	Schaffner	CBL6111C	2598	Dec.14, 09	1 Year
6	RF Cable	MIYAZAKI	8D-FB	3# Chamber No.1	May.08, 09	1 Year
7	Coaxial Switch	Anritsu	MP59B	M73989	May.08, 09	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, 09	1 Year
2	Horn Antenna	EMCO	3115	9607-4877	Nov.25, 09	1.5 Year
3	Horn Antenna	EMCO	3116	00060089	Dec.03, 09	1.5 Year
4	Amplifier	Agilent	8449B	3008A00863	May.08, 09	1 Year
5	RF Cable	Hubersuhner	SUCOFLEX102	28620/2	Nov.28, 09	1 Year
6	RF Cable	Hubersuhner	SUCOFLEX102	29091/2	Nov.28, 09	1 Year

4.2. Block Diagram of Test Setup

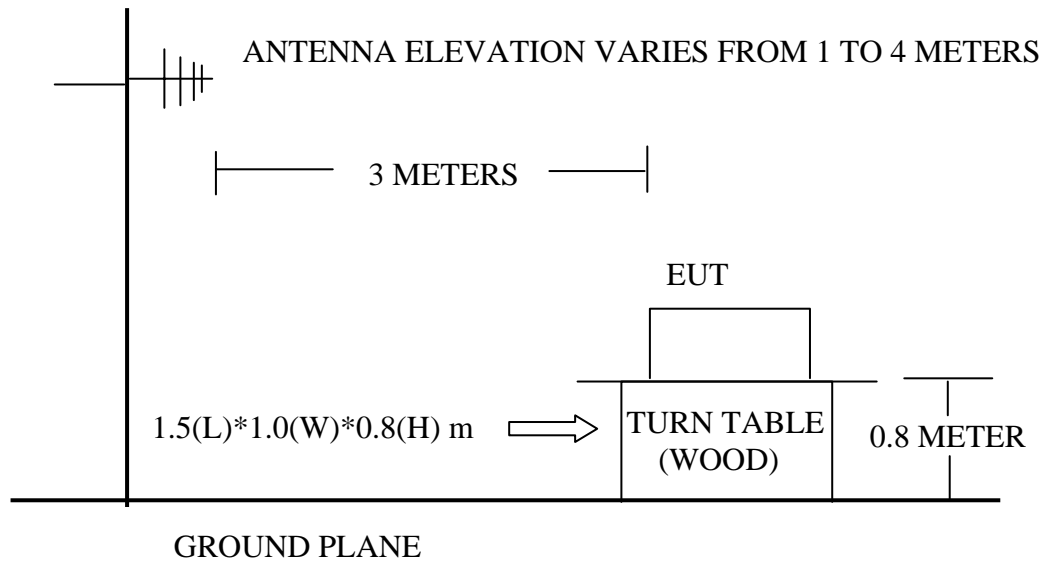
4.2.1. Block Diagram of connection between EUT and simulators



(EUT: Eclipse Wireless Litetouch Keyboard)

4.2.2. Anechoic Chamber Setup Diagram

ANTENNA TOWER



4.3. Radiated Emission Limit Standard: FCC 15.209 and 15.249

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 1000MHz	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	
Field Strength of Fundamental emission for 2.4GHz-2.4835GHz	3	94.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average) 114.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak)	
Field Strength of Harmonics	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 $\text{dB}\mu\text{V} = 20 \log$ 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) 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.

4.4.1. Eclipse Wireless Litetouch Keyboard (EUT)

Model Number : ECB43001

Serial Number : N/A

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

4.5. Operating Condition of EUT

4.5.1. Setup the EUT 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 VBW is set at 1MHz and RBW is set at 3MHz for peak emissions measurement 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

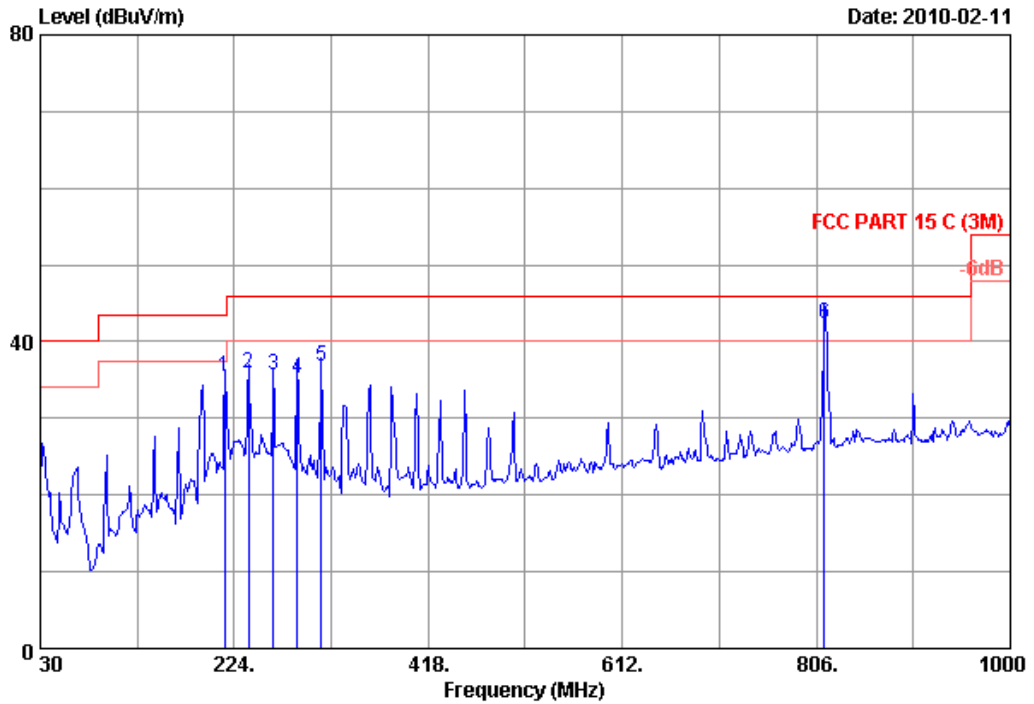
All the emissions from 30MHz to 25GHz were comply with the 15.209 and 15.249 Limit.

Test Frequency: 30MHz-1000MHz



No.6 Ke Feng Road,Block 52,
ShenZhen Science & Industry Park
Noutou,ShenZhen,GuangDong,China
Tel:+86-755-26639495-7
Fax:+86-755-26632877
Postcode:518057

Data: 4 File: D:\2010 Reput Data\M\ACS9QH357.EM6 (4)



Site no. : 3m chamber Data no. : 4
 Dis. / Ant. : 3m CBL6111C Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 C (3M)
 Env. / Ins. : 24°C/56% Engineer : Power Feng
 EUT : Eclipse Wireless Litetouch Keyboard
 Power Rating : DC 5V From Adapter Input AC 120V/60Hz
 Test Mode : Tx mode
 ECB43001

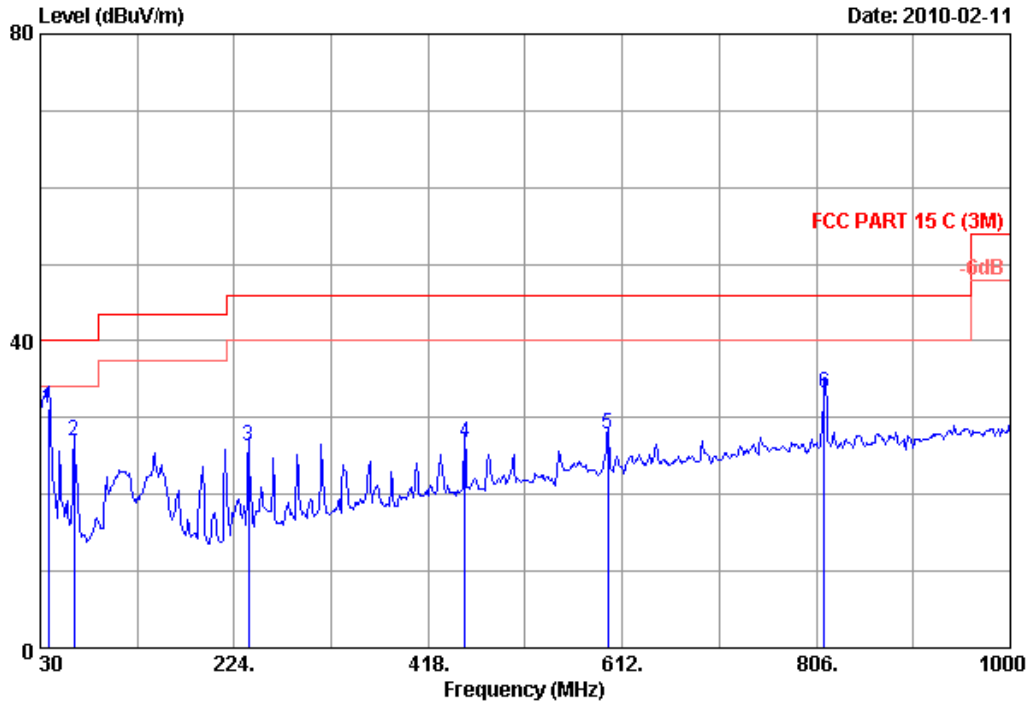
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	214.300	9.98	1.40	24.04	35.42	43.50	8.08	QP
2	238.550	11.55	1.56	22.86	35.97	46.00	10.03	QP
3	262.800	13.73	1.66	20.21	35.60	46.00	10.40	QP
4	287.050	13.34	1.71	20.16	35.21	46.00	10.79	QP
5	311.300	13.75	1.75	21.28	36.78	46.00	9.22	QP
6	813.700	21.88	3.07	17.50	42.45	46.00	3.55	QP

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



No.6 Ke Feng Road,Block 52,
ShenZhen Science & Industry Park
Noutou,ShenZhen,GuangDong,China
Tel:+86-755-26639495-7
Fax:+86-755-26632877
Postcode:518057

Data: 3 File: D:\2010 Reput Data\M\ACS9QH357.EM6 (4)



Site no. : 3m chamber Data no. : 3
Dis. / Ant. : 3m CBL6111C Ant. pol. : VERTICAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 24°C/56% Engineer : Power Feng
EUT : Eclipse Wireless Litetouch Keyboard
Power Rating : DC 5V From Adapter Input AC 120V/60Hz
Test Mode : Tx mode
ECB43001

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	37.760	15.46	0.57	15.11	31.14	40.00	8.86	QP
2	63.950	5.98	0.73	20.18	26.89	40.00	13.11	QP
3	238.550	11.55	1.56	13.23	26.34	46.00	19.66	QP
4	454.860	17.18	2.11	7.47	26.76	46.00	19.24	QP
5	597.450	19.46	2.48	5.85	27.79	46.00	18.21	QP
6	813.760	21.88	3.07	8.31	33.26	46.00	12.74	QP

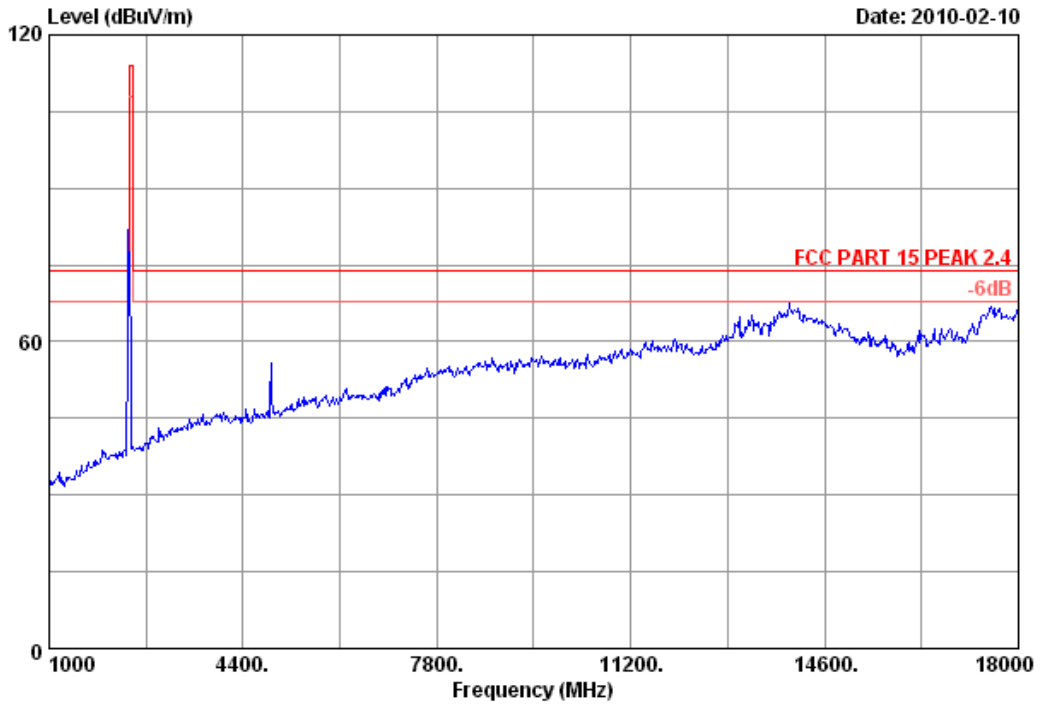
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Test Frequency: 1GHz-18GHz



No.6 Ke Feng Road,Block 52,
ShenZhen Science & Industry Park
Noutou,ShenZhen, GuangDong, China
Tel:+86-755-26639495-7
Fax:+86-755-26632877
Postcode:518057

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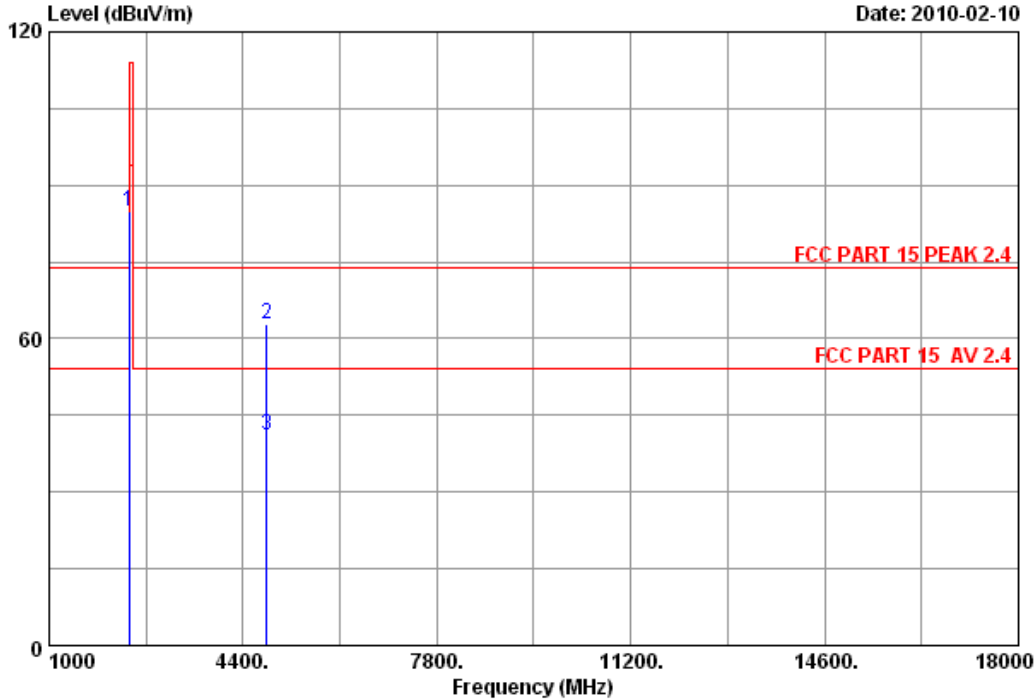


Site no.	: 3m Chamber	Data no.	: 1
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: VERTICAL
Limit	: FCC PART 15 PEAK 2.4		
Env. / Ins.	: 23°C/54%	Engineer	: Leo-Li
EUT	: Eclipse Wireless Litetouch Keyboard		
Power	: DC 5V From Adapter Input AC 120V/60Hz		
Test mode	: Tx 2405MHz		
M/N	: ECB43001		



No.6 Ke Feng Road,Block 52,
ShenZhen Science & Industry Park
Noutou,ShenZhen,GuangDong,China
Tel:+86-755-26639495-7
Fax:+86-755-26632877
Postcode:518057

Data: 2 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32)



Site no. : 3m Chamber Data no. : 2
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : 23*C/54% Engineer : Leo-Li
 EUT : Eclipse Wireless Litetouch Keyboard
 Power : DC 5V From Adapter Input AC 120V/60Hz
 Test mode : Tx 2405MHz
 M/N : ECB43001

	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	2405.000	29.45	8.72	35.95	82.56	84.78	114.00	29.22	Peak
2	4810.000	34.30	12.35	35.37	51.50	62.78	74.00	11.22	Peak
3	4810.000	34.30	12.35	35.37	29.95	41.23	54.00	12.77	Average

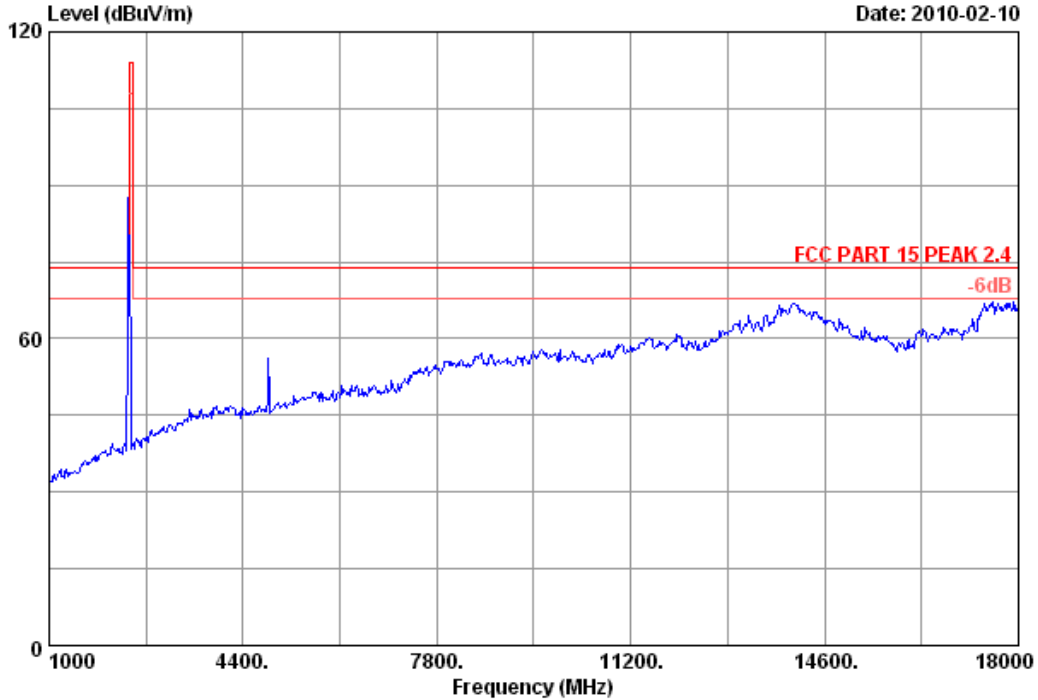
Remarks:

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



No.6 Ke Feng Road,Block 52,
ShenZhen Science & Industry Park
Noutou,ShenZhen,GuangDong,China
Tel:+86-755-26639495-7
Fax:+86-755-26632877
Postcode:518057

Data: 3 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32)

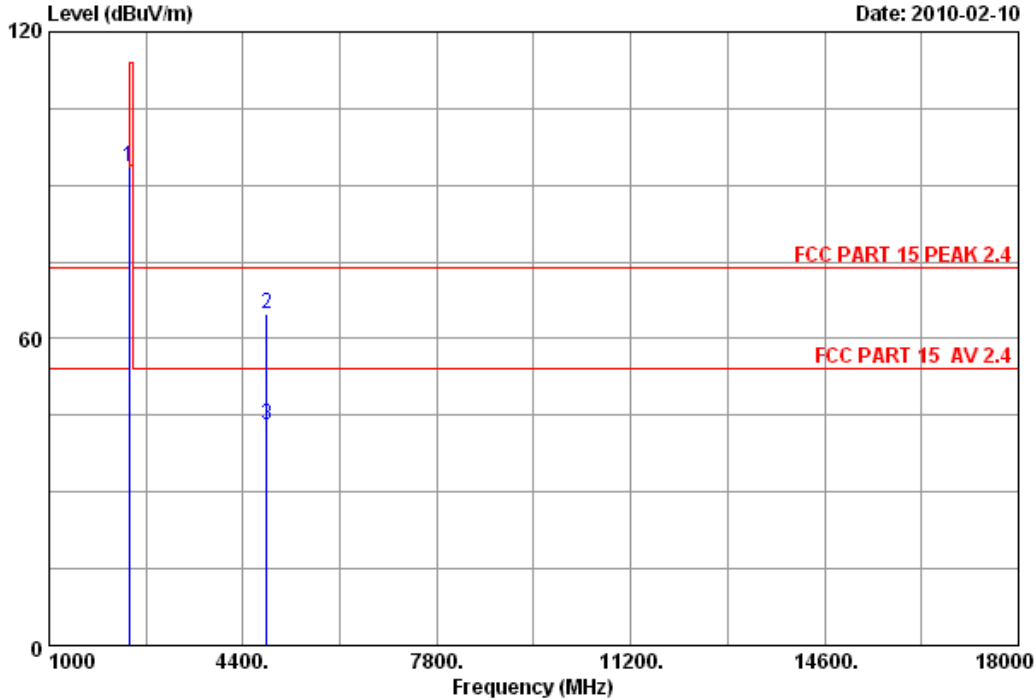


Site no.	: 3m Chamber	Data no.	: 3
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15 PEAK 2.4		
Env. / Ins.	: 23°C/54%	Engineer	: Leo-Li
EUT	: Eclipse Wireless Litetouch Keyboard		
Power	: DC 5V From Adapter Input AC 120V/60Hz		
Test mode	: Tx 2405MHz		
M/N	: ECB43001		



No.6 Ke Feng Road,Block 52,
ShenZhen Science & Industry Park
Noutou,ShenZhen,GuangDong,China
Tel:+86-755-26639495-7
Fax:+86-755-26632877
Postcode:518057

Data: 4 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32)



Site no. : 3m Chamber Data no. : 4
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : 23*C/54% Engineer : Leo-Li
 EUT : Eclipse Wireless Litetouch Keyboard
 Power : DC 5V From Adapter Input AC 120V/60Hz
 Test mode : Tx 2405MHz
 M/N : ECB43001

	Ant.	Cable	Amp.	Emission					
Freq.	Factor	loss	Factor	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1 2405.000	29.45	8.72	35.95	91.27	93.49	114.00	20.51	Peak	
2 4810.000	34.30	12.35	35.37	53.56	64.84	74.00	9.16	Peak	
3 4810.000	34.30	12.35	35.37	32.01	43.29	54.00	10.71	Average	

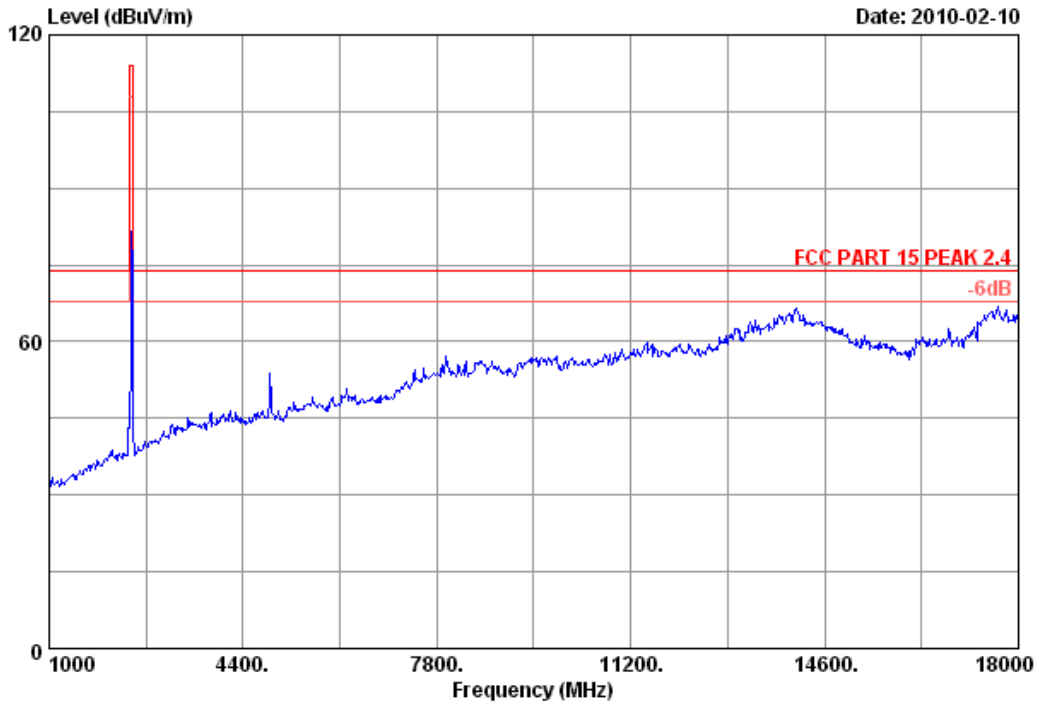
Remarks:

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



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Data: 5 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32)

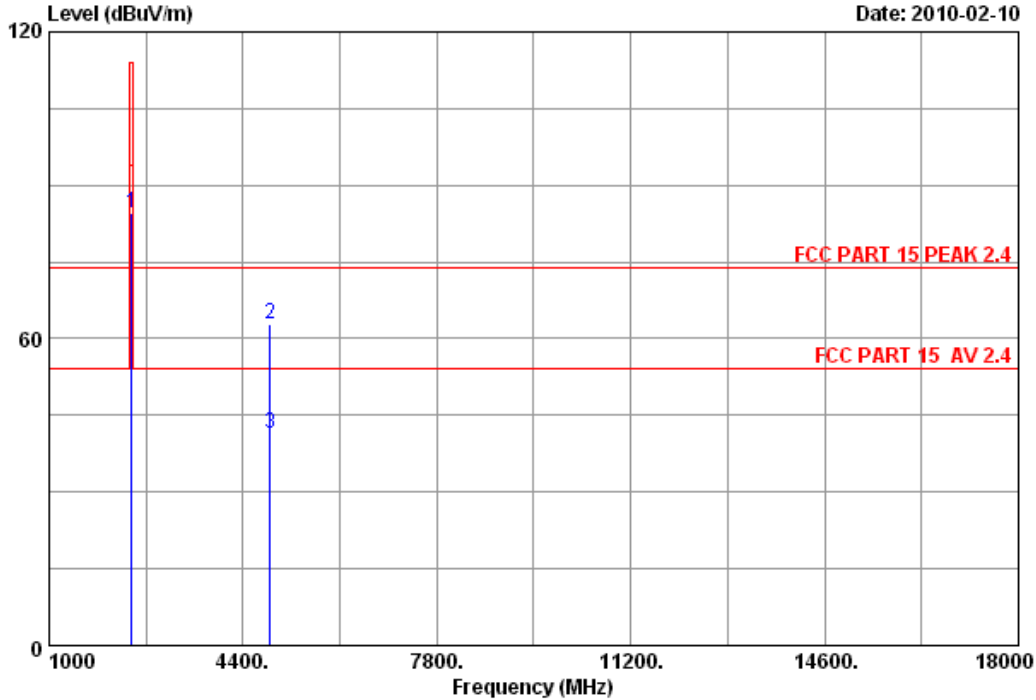


Site no.	: 3m Chamber	Data no.	: 5
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: VERTICAL
Limit	: FCC PART 15 PEAK 2.4		
Env. / Ins.	: 23°C/54%	Engineer	: Leo-Li
EUT	: Eclipse Wireless Litetouch Keyboard		
Power	: DC 5V From Adapter Input AC 120V/60Hz		
Test mode	: Tx 2440MHz		
M/N	: ECB43001		



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ShenZhen Science & Industry Park
Noutou,ShenZhen,GuangDong,China
Tel:+86-755-26639495-7
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Data: 6 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32)



Site no. : 3m Chamber Data no. : 6
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : 23*C/54% Engineer : Leo-Li
 EUT : Eclipse Wireless Litetouch Keyboard
 Power : DC 5V From Adapter Input AC 120V/60Hz
 Test mode : Tx 2440MHz
 M/N : ECB43001

	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	2440.000	29.47	8.48	36.06	82.77	84.66	114.00	29.34	Peak
2	4880.000	34.41	12.33	35.36	51.49	62.87	74.00	11.13	Peak
3	4880.000	34.41	12.44	35.36	29.93	41.42	54.00	12.58	Average

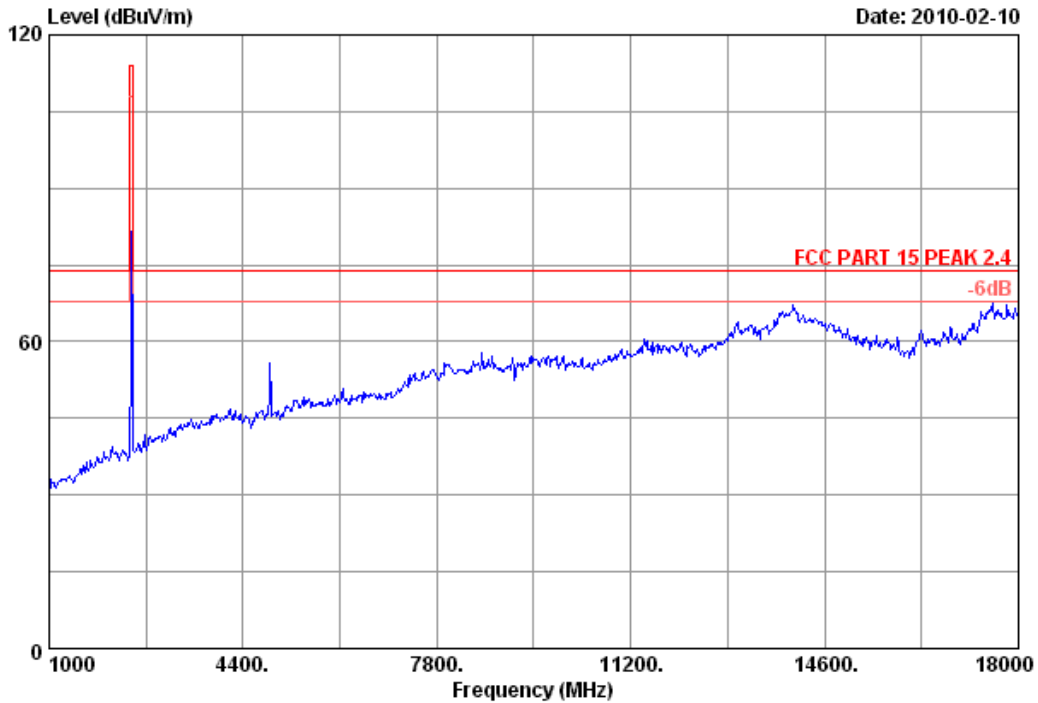
Remarks:

- 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: 7 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32)

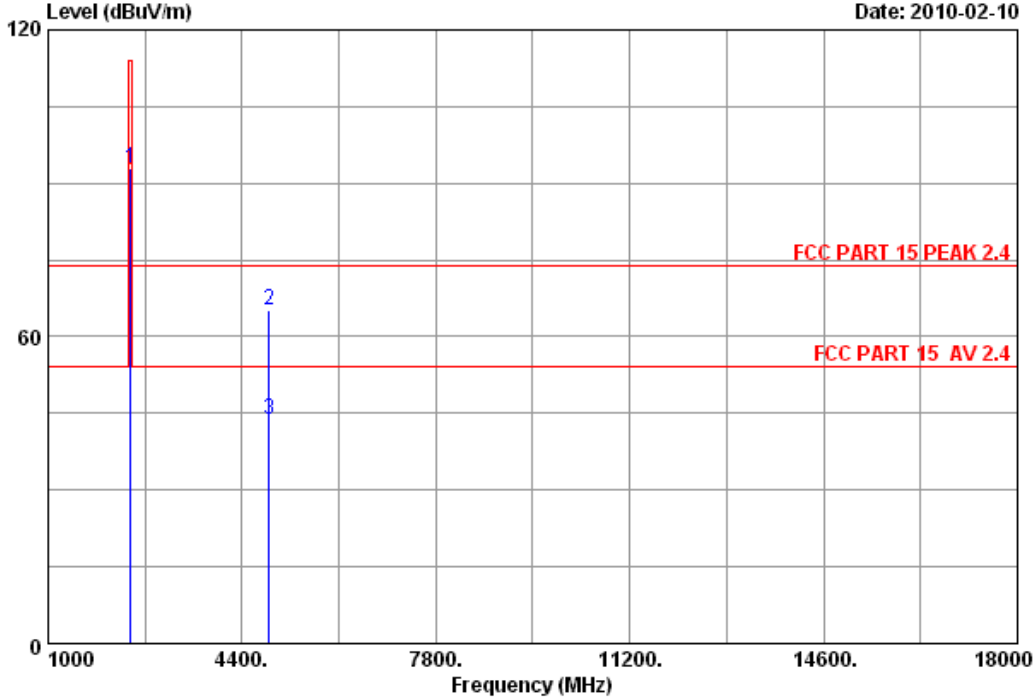


Site no. : 3m Chamber Data no. : 7
Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : 23°C/54% Engineer : Leo-Li
EUT : Eclipse Wireless Litetouch Keyboard
Power : DC 5V From Adapter Input AC 120V/60Hz
Test mode : Tx 2440MHz
M/N : ECB43001



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ShenZhen Science & Industry Park
Noutou,ShenZhen,GuangDong,China
Tel:+86-755-26639495-7
Fax:+86-755-26632877
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Data: 8 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32) Date: 2010-02-10



Site no. : 3m Chamber Data no. : 8
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : 23*C/54% Engineer : Leo-Li
 EUT : Eclipse Wireless Litetouch Keyboard
 Power : DC 5V From Adapter Input AC 120V/60Hz
 Test mode : Tx 2440MHz
 M/N : ECB43001

	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	2440.000	29.47	8.48	36.06	91.12	93.01	114.00	20.99	Peak
2	4880.000	34.41	12.33	35.36	53.88	65.26	74.00	8.74	Peak
3	4880.000	34.41	12.44	35.36	32.21	43.70	54.00	10.30	Average

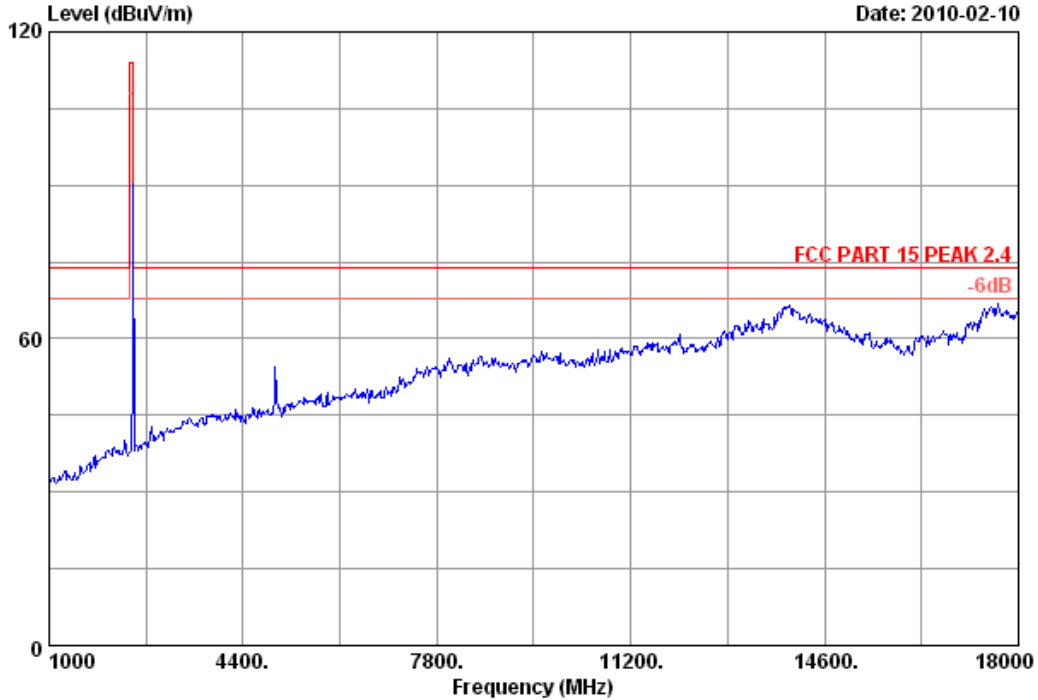
Remarks:

- 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\MMad Catz\ACS9QH357.EM6 (32)

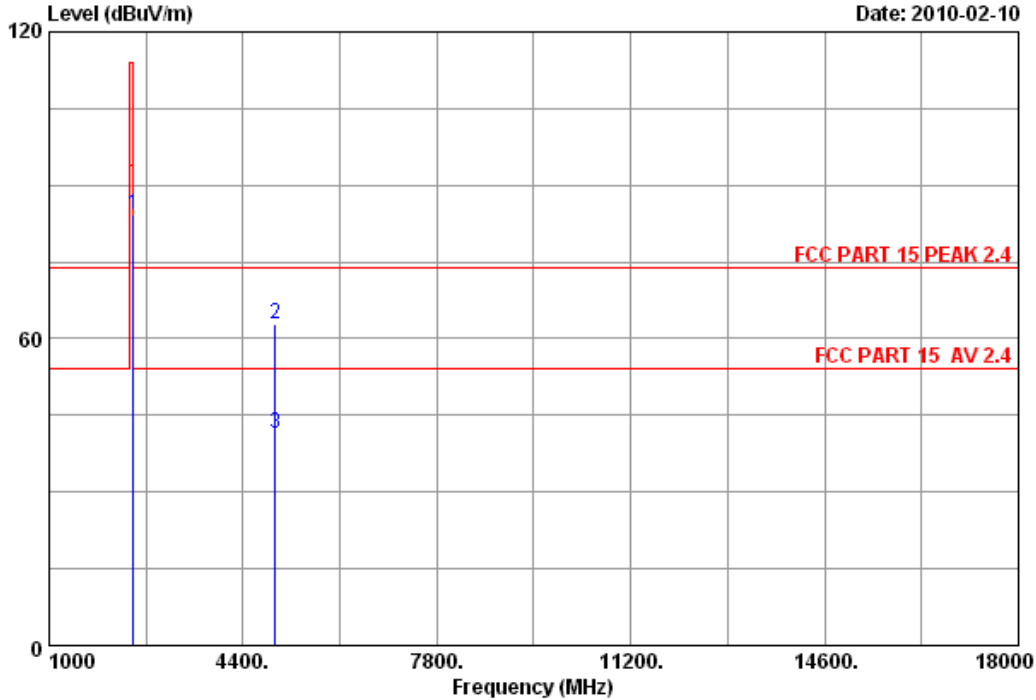


Site no.	: 3m Chamber	Data no.	: 9
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: VERTICAL
Limit	: FCC PART 15 PEAK 2.4		
Env. / Ins.	: 23°C/54%	Engineer	: Leo-Li
EUT	: Eclipse Wireless Litetouch Keyboard		
Power	: DC 5V From Adapter Input AC 120V/60Hz		
Test mode	: Tx 2480MHz		
M/N	: ECB43001		



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Data: 10 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32)



Site no. : 3m Chamber Data no. : 10
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : 23*C/54% Engineer : Leo-Li
 EUT : Eclipse Wireless Litetouch Keyboard
 Power : DC 5V From Adapter Input AC 120V/60Hz
 Test mode : Tx 2480MHz
 M/N : ECB43001

	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	29.49	8.94	35.97	81.71	84.17	114.00	29.83	Peak	
2	34.54	12.58	35.37	51.17	62.92	74.00	11.08	Peak	
3	34.54	12.53	35.37	29.61	41.31	54.00	12.69	Average	

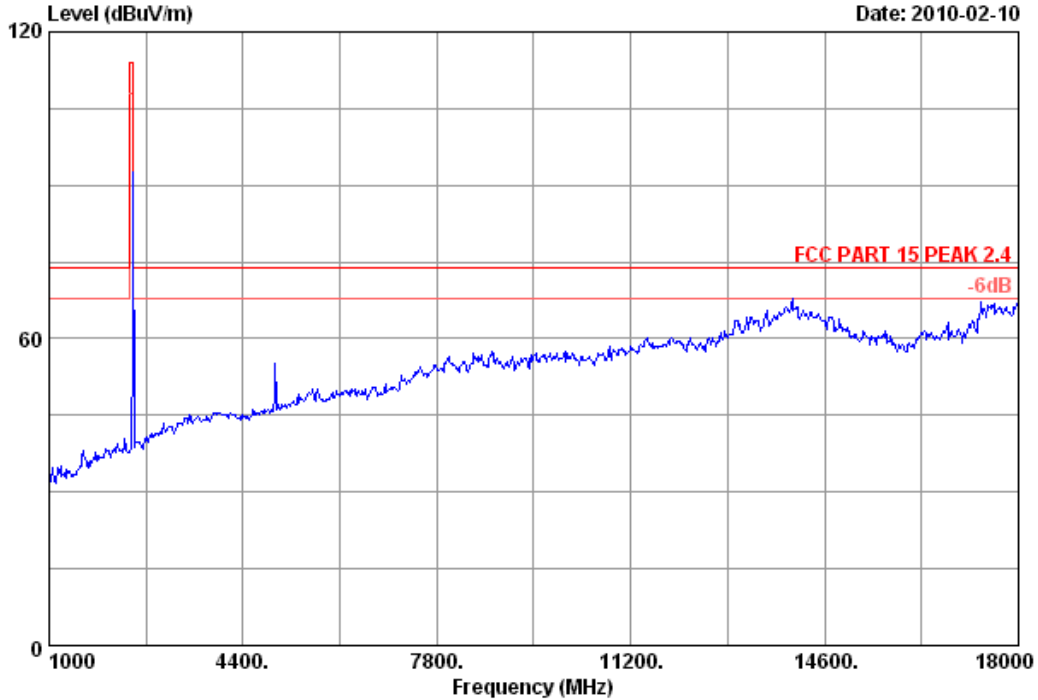
Remarks:

- 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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Noutou,ShenZhen,GuangDong,China
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Data: 11 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32)

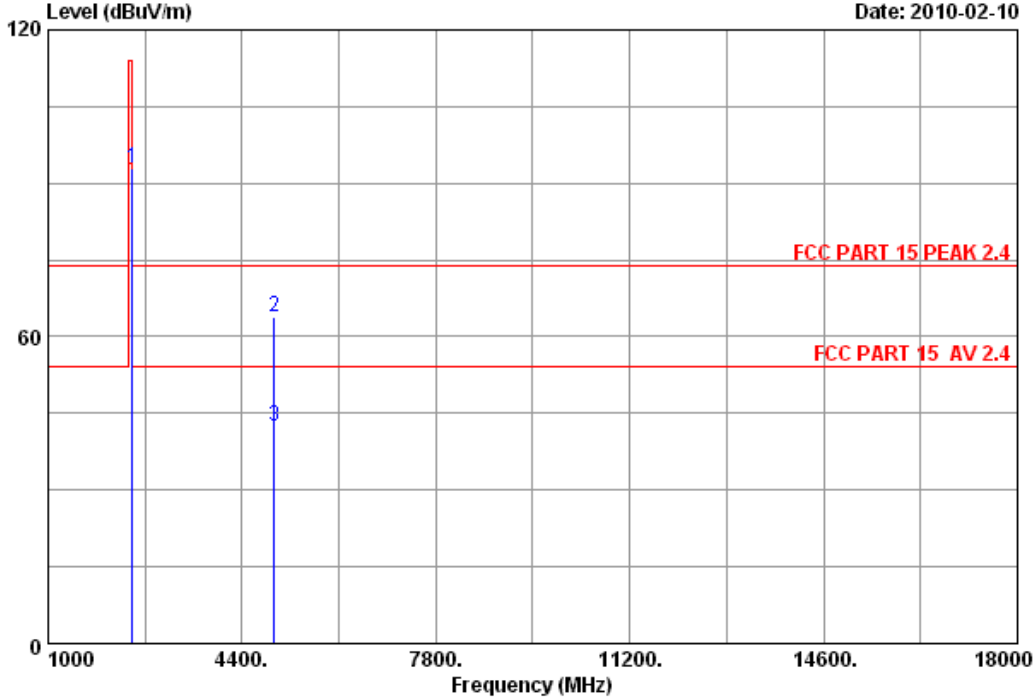


Site no.	: 3m Chamber	Data no.	: 11
Dis. / Ant.	: 3m 3115(0911)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15 PEAK 2.4		
Env. / Ins.	: 23°C/54%	Engineer	: Leo-Li
EUT	: Eclipse Wireless Litetouch Keyboard		
Power	: DC 5V From Adapter Input AC 120V/60Hz		
Test mode	: Tx 2480MHz		
M/N	: ECB43001		



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Tel:+86-755-26639495-7
Fax:+86-755-26632877
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Data: 12 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32) Date: 2010-02-10



Site no. : 3m Chamber Data no. : 12
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : 23*C/54% Engineer : Leo-Li
 EUT : Eclipse Wireless Litetouch Keyboard
 Power : DC 5V From Adapter Input AC 120V/60Hz
 Test mode : Tx 2480MHz
 M/N : ECB43001

	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	2480.000	29.49	8.94	35.97	90.55	93.01	114.00	20.99	Peak
2	4960.000	34.54	12.58	35.37	52.22	63.97	74.00	10.03	Peak
3	4960.000	34.54	12.53	35.37	30.66	42.36	54.00	11.64	Average

Remarks:

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

5. BAND EDGE COMPLIANCE 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
2.	Horn Antenna	EMCO	3115	9607-4877	Nov.25, 09	1.5 Year
3.	Amplifier	Agilent	8449B	3008A02495	May.08, 09	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

5.2. Limit

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in section 15.209, which is the lesser attenuation.

5.3. 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=1MHz ; VBW=3MHz, PK detector, Sweep=AUTO
 - (b) Average: RBW=1MHz ; VBW=10Hz, PK detector, Sweep=AUTO

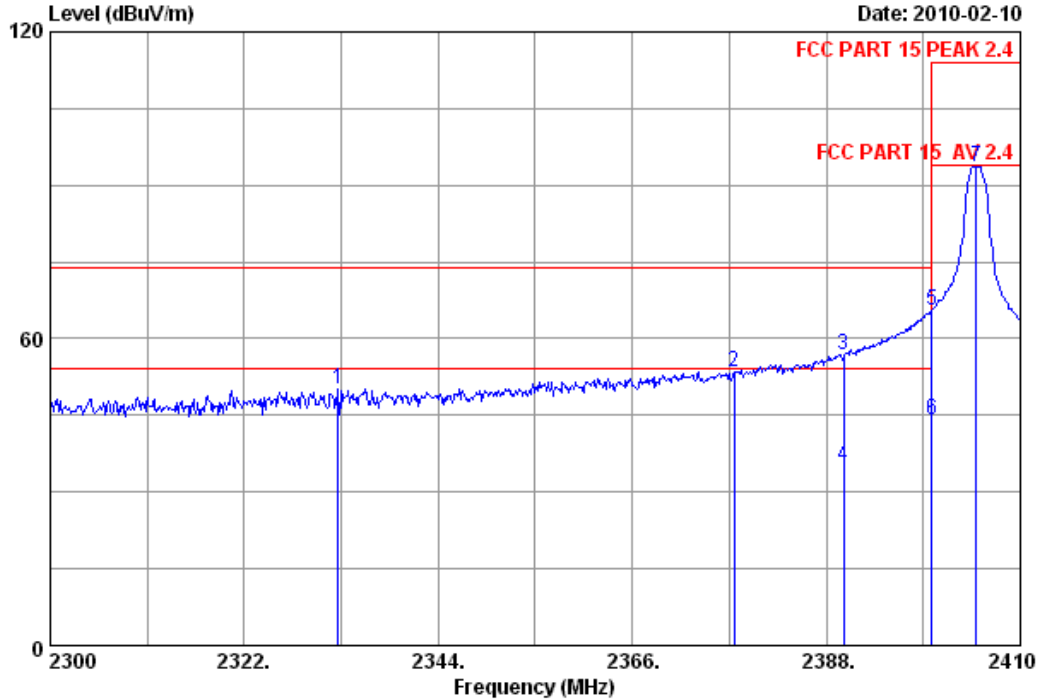
5.4. Test Results

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



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ShenZhen Science & Industry Park
Noutou, ShenZhen, Guangdong, China
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Fax:+86-755-26632877
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Data: 13 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32)



Site no. : 3m Chamber Data no. : 13
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : 23°C/54% Engineer : Leo-Li
 EUT : Eclipse Wireless Litetouch Keyboard
 Power : DC 5V From Adapter Input AC 120V/60Hz
 Test mode : Tx 2405MHz
 M/N : ECB43001

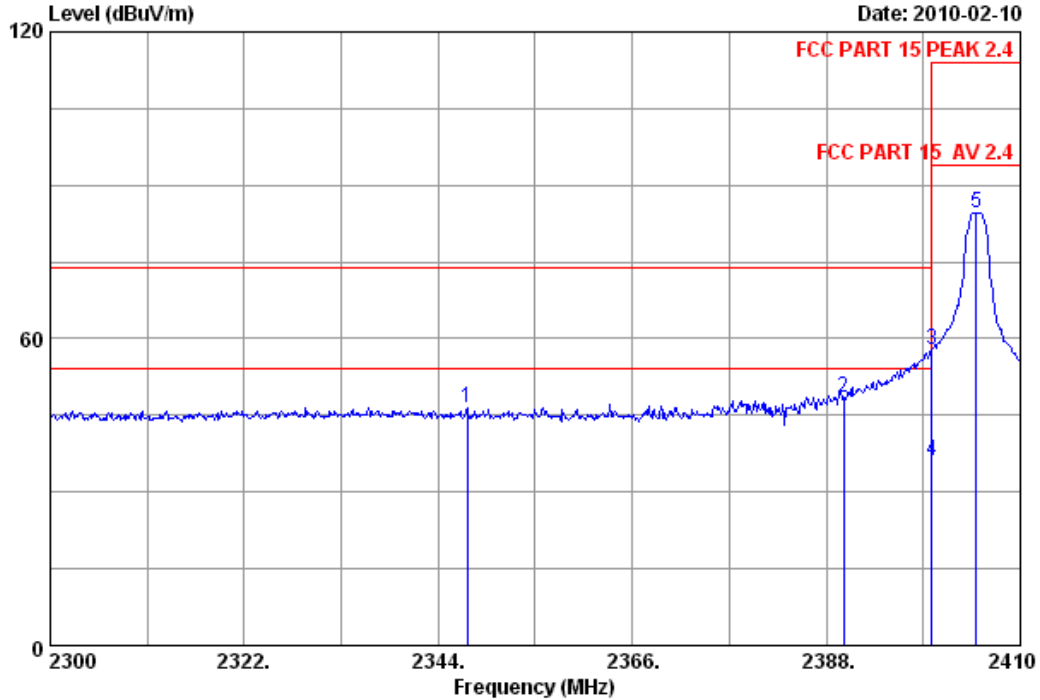
	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2332.670	29.40	7.61	36.06	49.13	50.08	74.00	23.92	Peak
2	2377.550	29.43	7.66	36.00	52.28	53.37	74.00	20.63	Peak
3	2390.000	29.44	7.66	36.09	55.69	56.70	74.00	17.30	Peak
4	2390.000	29.44	7.66	36.09	34.13	35.14	54.00	18.86	Average
5	2400.000	29.44	7.66	36.09	64.60	65.61	74.00	8.39	Peak
6	2400.000	29.44	7.66	36.09	43.04	44.05	54.00	9.95	Average
7	2405.000	29.45	7.66	35.95	92.31	93.47	114.00	20.53	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\MMad Catz\ACS9QH357.EM6 (32)



Site no. : 3m Chamber Data no. : 14
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : 23°C/54% Engineer : Leo-Li
 EUT : Eclipse Wireless Litetouch Keyboard
 Power : DC 5V From Adapter Input AC 120V/60Hz
 Test mode : Tx 2405MHz
 M/N : ECB43001

	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	2347.300	29.41	7.61	35.99	45.46	46.49	74.00	27.51	Peak
2	2390.000	29.44	7.66	36.09	47.61	48.62	74.00	25.38	Peak
3	2400.000	29.44	7.66	36.09	56.78	57.79	74.00	16.21	Peak
4	2400.000	29.44	7.66	36.09	35.22	36.23	54.00	17.77	Average
5	2405.000	29.45	7.66	35.95	83.37	84.53	114.00	29.47	Peak

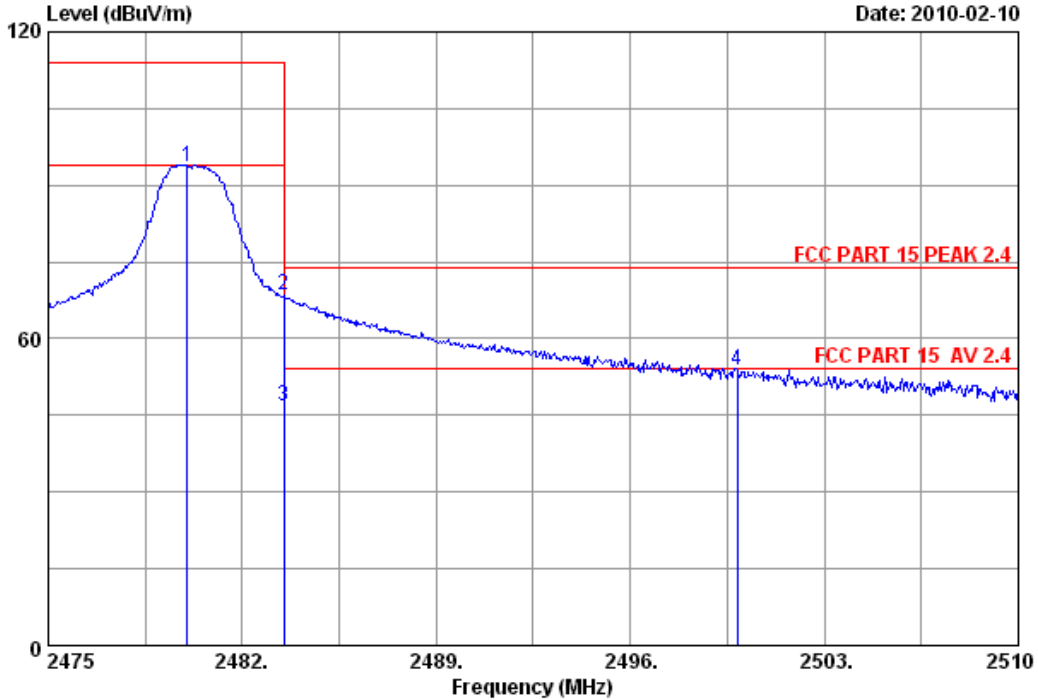
Remarks:

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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ShenZhen Science & Industry Park
Noutou, ShenZhen, Guangdong, China
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Fax:+86-755-26632877
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Data: 15 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32)



Site no. : 3m Chamber Data no. : 15
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : 23°C/54% Engineer : Leo-Li
 EUT : Eclipse Wireless Litetouch Keyboard
 Power : DC 5V From Adapter Input AC 120V/60Hz
 Test mode : Tx 2480MHz
 M/N : ECB43001

	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	2480.000	29.49	8.94	35.97	91.30	93.76	114.00	20.24	Peak
2	2483.500	29.49	8.94	35.97	65.99	68.45	74.00	5.55	Peak
3	2483.500	29.49	8.94	35.97	44.44	46.90	54.00	7.10	Average
4	2499.850	29.50	8.89	36.00	51.50	53.89	74.00	20.11	Peak

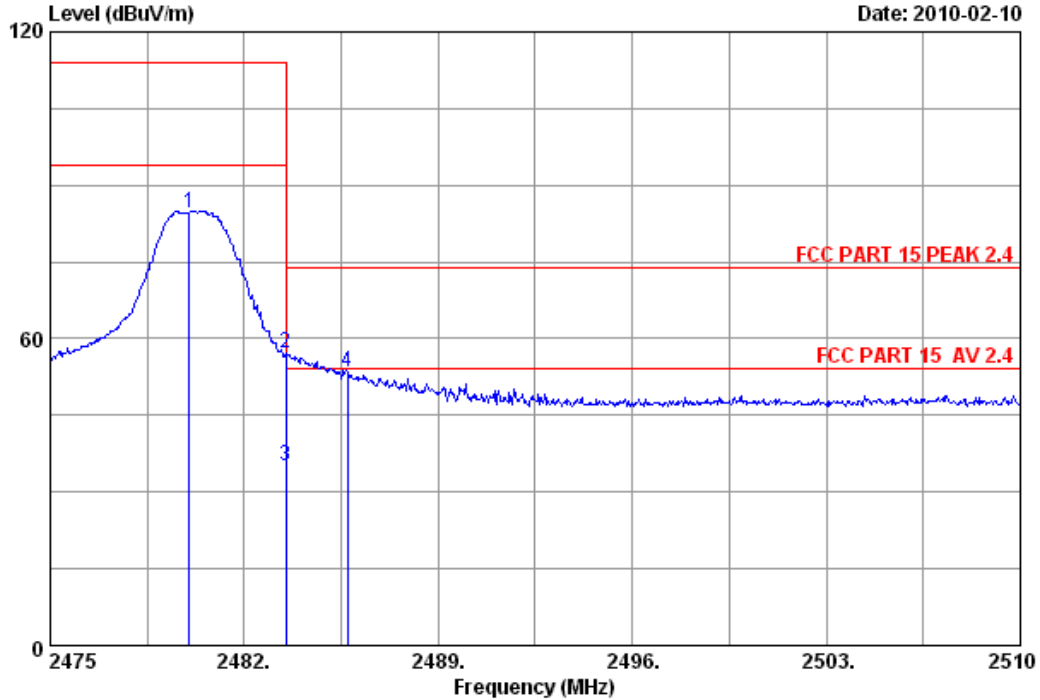
Remarks:

- 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: 16 File: E:\2009 report data\MMad Catz\ACS9QH357.EM6 (32)



Site no. : 3m Chamber Data no. : 16
 Dis. / Ant. : 3m 3115(0911) Ant. pol. : VERTICAL
 Limit : FCC PART 15 PEAK 2.4
 Env. / Ins. : 23°C/54% Engineer : Leo-Li
 EUT : Eclipse Wireless Litetouch Keyboard
 Power : DC 5V From Adapter Input AC 120V/60Hz
 Test mode : Tx 2480MHz
 M/N : ECB43001

	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	2480.000	29.49	8.94	35.97	82.15	84.61	114.00	29.39	Peak
2	2483.500	29.49	8.94	35.97	54.61	57.07	74.00	16.93	Peak
3	2483.500	29.49	8.94	35.97	32.79	35.25	54.00	18.75	Average
4	2485.710	29.49	8.94	35.97	51.17	53.63	74.00	20.37	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.

6. 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

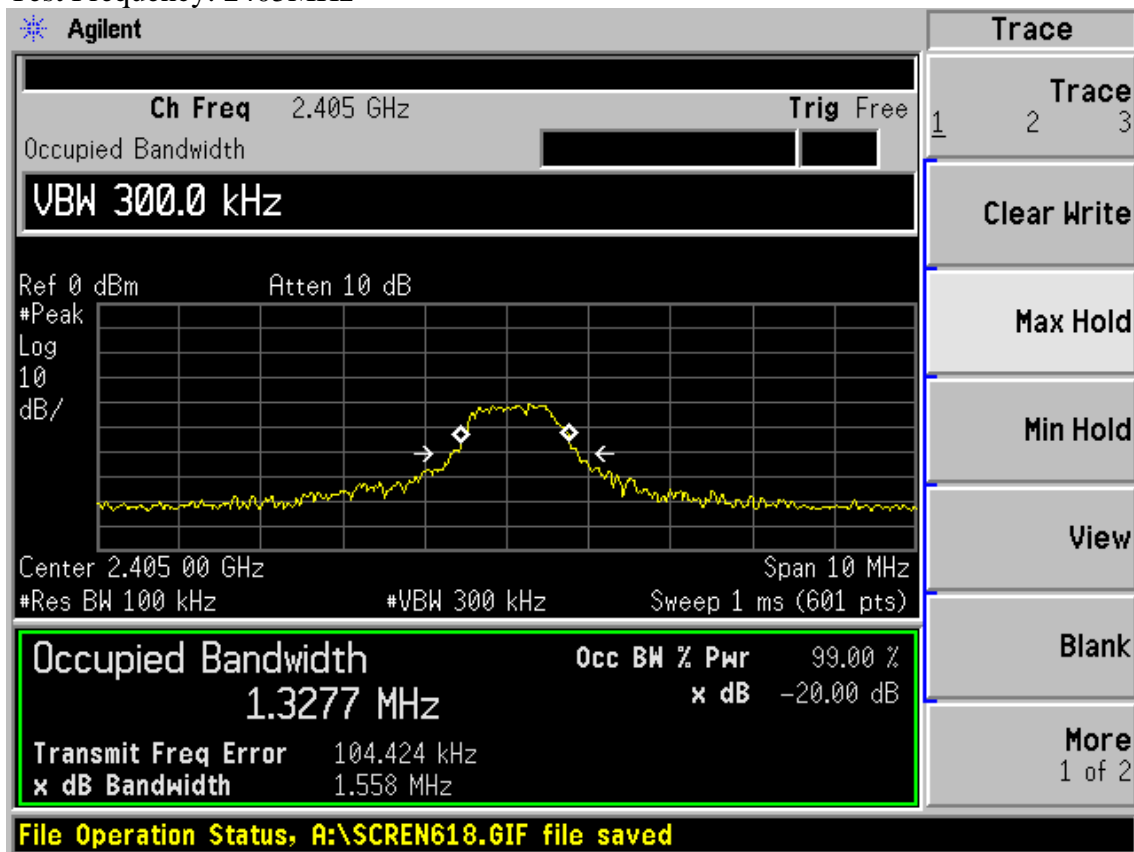
6.2. Limit

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.

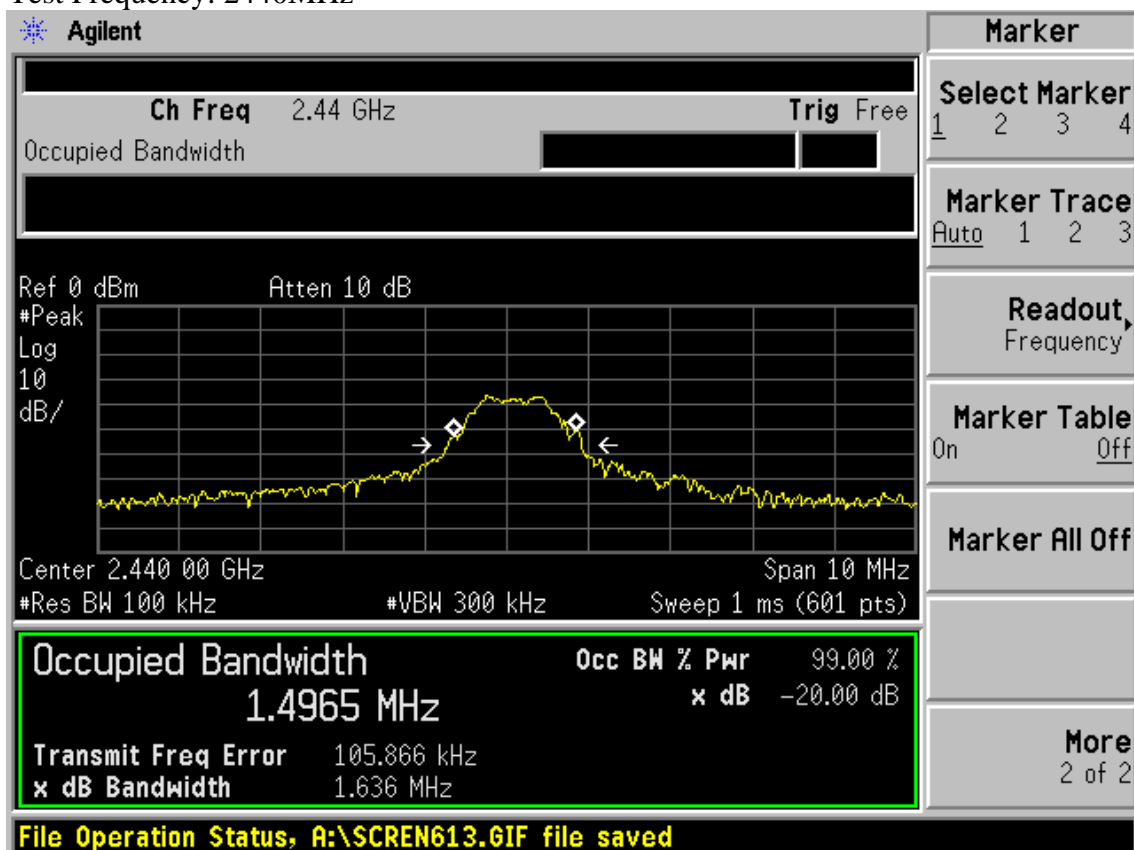
6.3. Test Results

CH	20dB Bandwidth (MHz)	Conclusion
(Low)	1.558	PASS
(Mid)	1.636	PASS
(High)	1.394	PASS

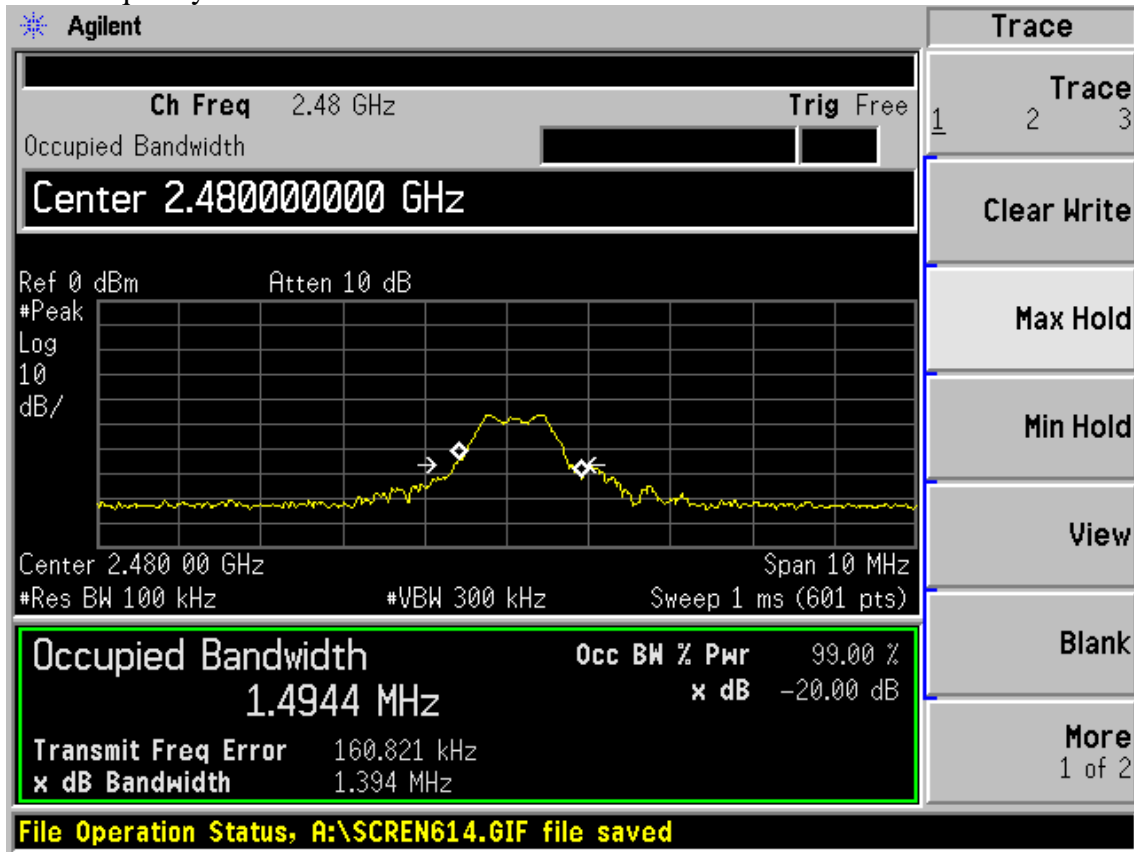
Test Frequency: 2405MHz



Test Frequency: 2440MHz



Test Frequency: 2480MHz



7. DEVIATION TO TEST SPECIFICATIONS

[NONE]