FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

Mad Catz Inc.

Mad Catz Micro C.T.R.L.R

Model No. : 32268

FCC ID: P25D232268A4813C

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

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-F14052
Date of Test : Dec.26, 2013~Jan.22, 2014
Date of Report : Mar.21, 2014

TABLE OF CONTENTS

TEST REPORT CERTIFICATION

Applicant	:	Mad Catz Inc.
Manufacturer	:	Mad Catz Inc.
EUT Description	:	Mad Catz Micro C.T.R.L.R
FCC ID	:	P25D232268A4813C

(A) MODEL NO. : 32268
(B) SERIAL NO. : N/A
(C) POWER SUPPLY : DC 3V
(D) TEST VOLTAGE : DC 3V

Tested for comply with:
FCC Rules and Regulations Part 15 Subpart C: 2012
Test procedure used:
ANSI C63.10:2009
ANSI C63.4:2009

The device described above is tested by AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. to confirm comply with all the FCC Part 15 Subpart C requirements. 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 and IC requirements. This report contains data that are not covered by the NVLAP accreditation.

This Report is made under FCC Part 2.1075. No modifications were required during testing to bring this product into compliance.

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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Dec.26, 2013~ Jan.22, 2014 Report of date: Mar.21, 2014

Prepared by : Julia Zhu
Julia Zhu / Assistant

Reviewed by :
Sunny Lu/ Assistant Manager

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: David Jin 3.24

Approved & Authorized Signer :
David Jin / 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.

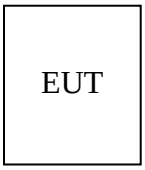
EMISSION		
Description of Test Item	**Standard**	**Results**
Power Line Conducted Emission Test	FCC Part 15: 15.207 ANSI C63.10:2009 ANSI C63.4:2009	PASS
Radiated Emission Test	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.10:2009 ANSI C63.4:2009	PASS
Conducted Spurious Emissions	FCC Part 15: 15.247(a)(1) ANSI C63.10:2009	PASS
Carrier Frequency Separation Test	FCC Part 15: 15.247(a)(1) ANSI C63.10:2009	PASS
6dB Bandwidth Test	FCC Part 15: 15.215 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
Power Spectral Density Test	FCC Part 15: 15.247(d) ANSI C63.10:2009	PASS

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product Name	: Mad Catz Micro C.T.R.L.R
Model Number	: 32268
FCC ID	: P25D232268A4813C
Radio	: Bluetooth V4.0
Operation Frequency	: 2402-2480MHz
Channel Number	: 40
Modulation Technology	: GFSK
Antenna Assembly Gain	: Integrated PCB Antenna, 0dBi PK gain
Applicant	: Mad Catz Inc. 7480 Mission Valley Road, Suite 101, San Diego, California, 92108, USA
Manufacturer	Mad Catz Inc. 7480 Mission Valley Road, Suite 101, San Diego, California, 92108, USA
Date of Test	: Dec.26, 2013~Jan.22, 2014
Date of Receipt	: Deb.25, 2013
Sample Type	: Prototype production

2.2. Block Diagram of connection between EUT and simulators



(EUT: Mad Catz Micro C.T.R.L.R)

2.3. Test information

The test software “bluesuite.exe” was used to control EUT work in Continuous TX mode, and select test channel.

Tested mode, channel, and data rate information			
Mode	data rate (Mbps)	Channel	Frequency (MHz)
Tx Mode GFSK modulation	1	Low :CH 0	2402
	1	Middle: CH19	2440
	1	High: CH39	2480
Note: New battery used during all test.			

2.4. 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 : Certificated by FCC, USA
Registration Number: 90454
Valid Date: Feb.22, 2015

3m & 10m Anechoic Chamber : Certificated by FCC, USA
Registration Number: 794232
Valid Date: Oct.31, 2015

EMC Lab. : Certificated by Industry Canada
Registration Number: IC 5183A-1
Valid Date: Jun.13, 2014

: Certificated by DAkkS, Germany
Registration No: D-PL-12151-01-00
Valid Date: Dec.15, 2016

: Accredited by NVLAP, USA
NVLAP Code: 200372-0
Valid Date: Mar.31, 2014

2.5. Measurement Uncertainty (95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Radiation Emission test in 3m chamber	3.22 dB(30~200MHz, Polarize: H)
	3.23 dB(30~200MHz, Polarize: V)
	3.49 dB(200M~1GHz, Polarize: H)
	3.39 dB(200M~1GHz, Polarize: V)
Uncertainty for Radiation Emission test in 3m chamber (1GHz-18GHz)	4.97 dB (1~6GHz, Distance: 3m)
	4.99 dB (6~18GHz, Distance: 3m)
Uncertainty for Radiated Spurious Emission test in RF chamber	3.57 dB
Uncertainty for Conduction Spurious emission test	2.00 dB
Uncertainty for Output power test	0.73 dB
Uncertainty for Bandwidth test	83 kHz
Uncertainty for DC power test	0.038 %
Uncertainty for test site temperature and humidity	0.6℃
	3%

3. POWER LINE CONDUCTED EMISSION MEASUREMENT

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 MEASUREMENT

4.1.Test Equipment

Frequency rang: 30~1000MHz

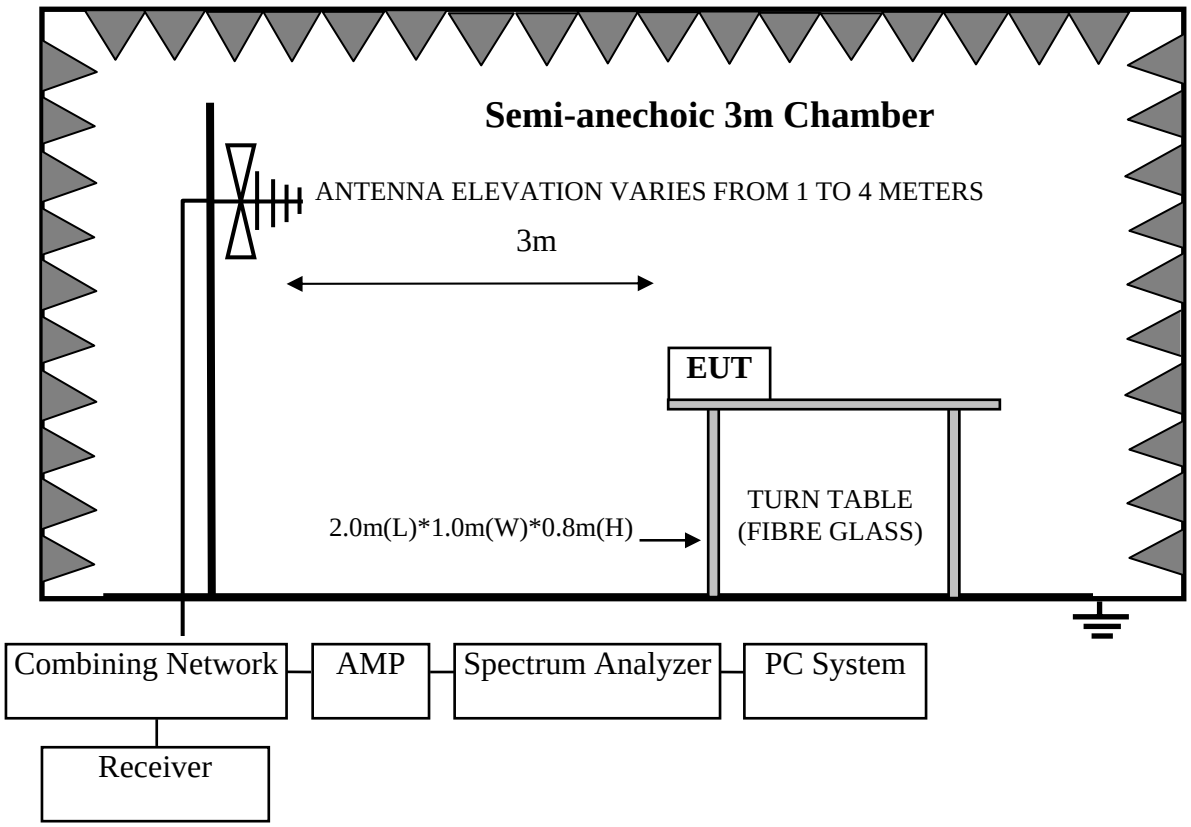
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	3#Chamber	AUDIX	N/A	N/A	Nov.24, 13	1 Year
2	EMI Spectrum	Agilent	E4407B	MY41440292	May.08, 13	1 Year
3	Test Receiver	Rohde & Schwarz	ESVS10	834468/011	May.08, 13	1 Year
4	Amplifier	HP	8447D	2648A04738	May.08, 13	1 Year
5	Bilog Antenna	TESEQ	CBL6112D	35375	May.30, 13	1 Year
6	RF Cable	MIYAZAKI	CFD400-NL	3# Chamber No.1	May.08, 13	1 Year
7	Coaxial Switch	Anritsu	MP59B	M74389	May.08, 13	1 Year
8	MPEG2 Measurement Generator	ROHDE&SCHWARZ	DVG	100319	Dec.11, 13	1 Year
9	TV Transmitter	ROHDE&SCHWARZ	SFQ	100521	May.08, 13	1 Year
10	Signal Generator	HP	8648A	3625U00573	May.08, 13	1 Year
11	Pattern Generator	Philiphs	PM5418	LO625020	May.08, 13	1 Year

Frequency rang: above 1000MHz

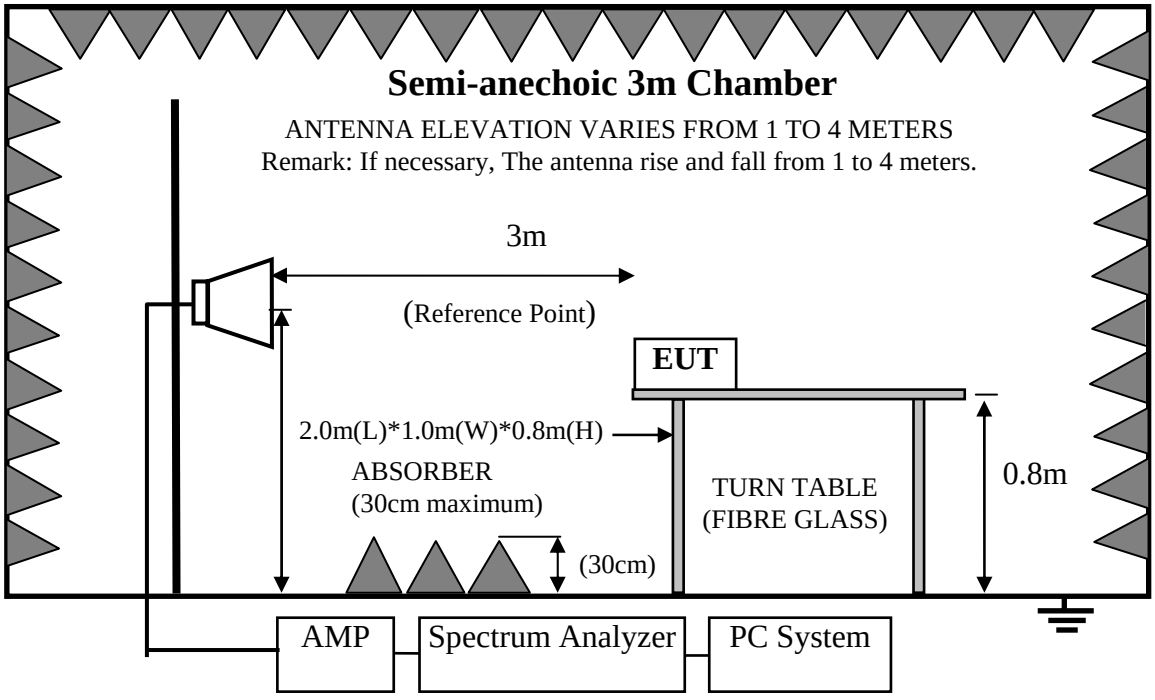
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4407B	MY41440292	May.08, 13	1 Year
2	Horn Antenna	EMCO	3115	9510-4580	May.28,13	1 Year
3	Amplifier	Agilent	8449B	3008A00863	May.08, 13	1 Year
4	RF Cable	Hubersuhner	SUCOFLEX106	77980/6	May.08, 13	1 Year
5	RF Cable	Hubersuhner	SUCOFLEX106	77977/6	May.08, 13	1 Year
6	Horn Antenna	EMCO	3116	00060089	Aug.28, 13	1 Year

4.2.Block Diagram of Test Setup

For frequency range 30MHz-1000MHz



For frequency range 1GHz-25GHz



4.3.Radiated Emission Limit Standard: FCC 15.209

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 1000MHz	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) 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. Mad Catz Micro C.T.R.L.R (EUT)

Model Number : 32268
Serial Number : N/A

4.5.Operating Condition of EUT

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

4.5.2. Turned on the power of all equipment.

4.5.3. Let EUT work in Tx mode.

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 calculated average level based measured peak level.

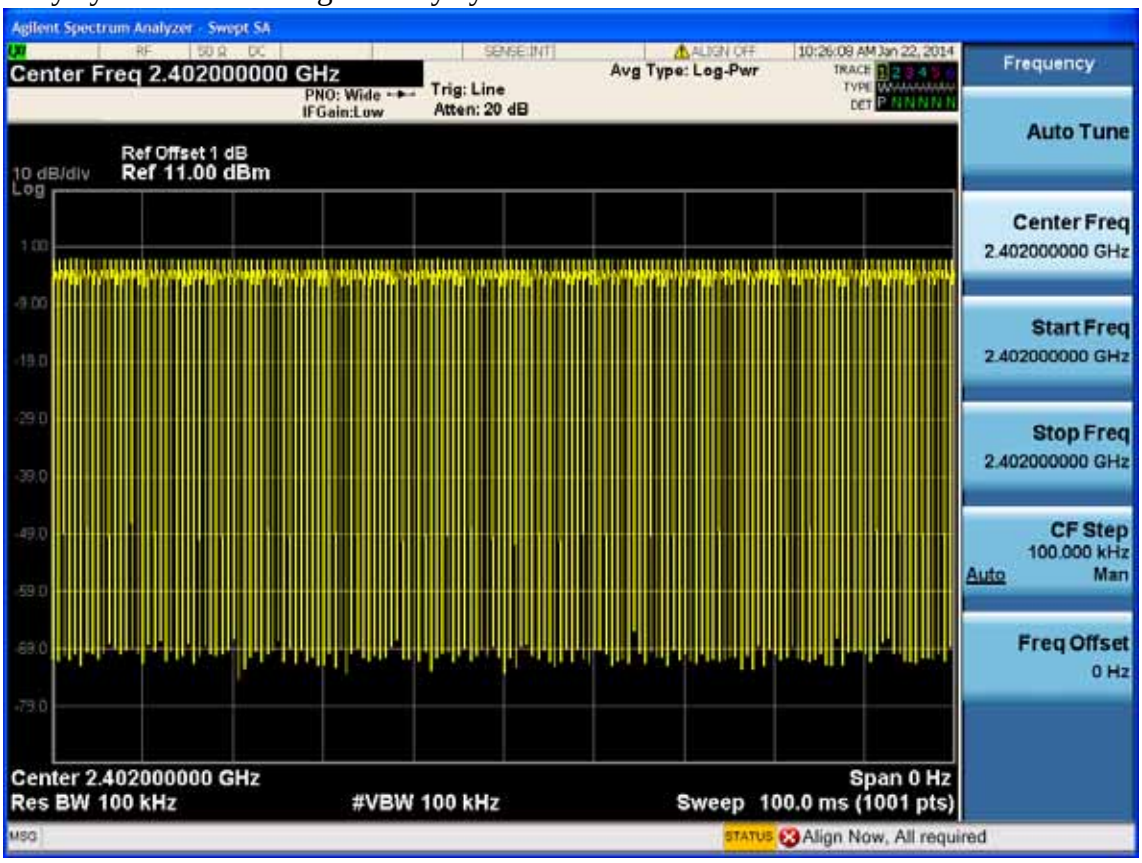
The frequency range from 30MHz to 10th harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

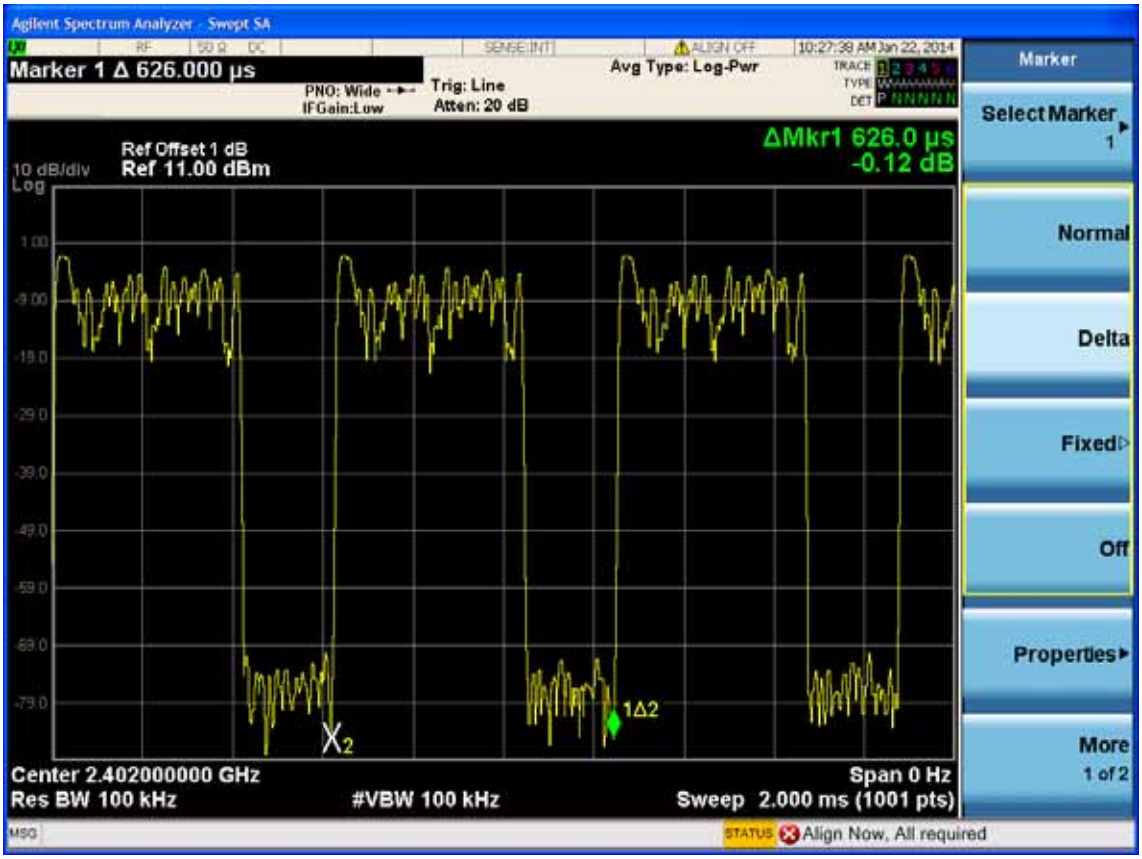
4.7. Radiated Emission Test Results

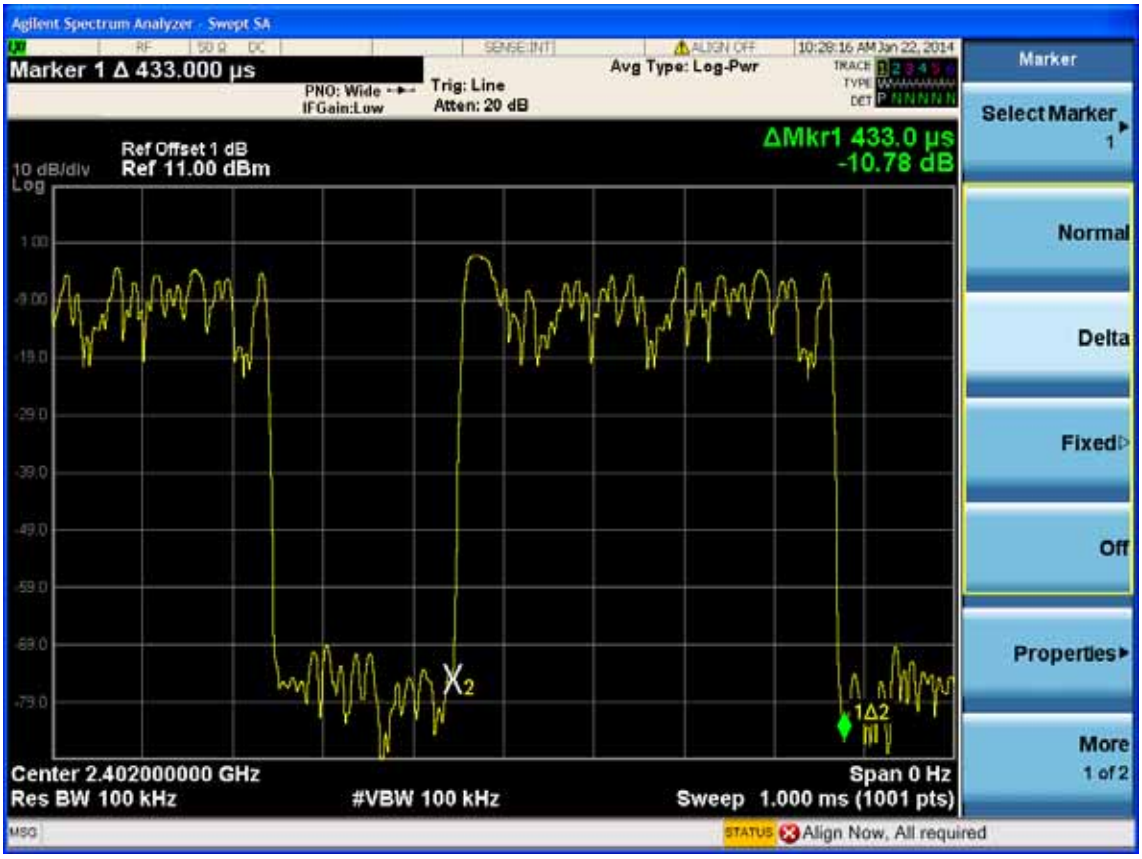
PASS.

All the emissions from 30MHz to 25GHz were comply with the 15.209 Limit.
Note: The duty cycle factor for calculate average level is 3.20dB, and average limit is 20dB below peak limit, so if peak measured level comply with average limit, the average level was deemed to comply with average limit.

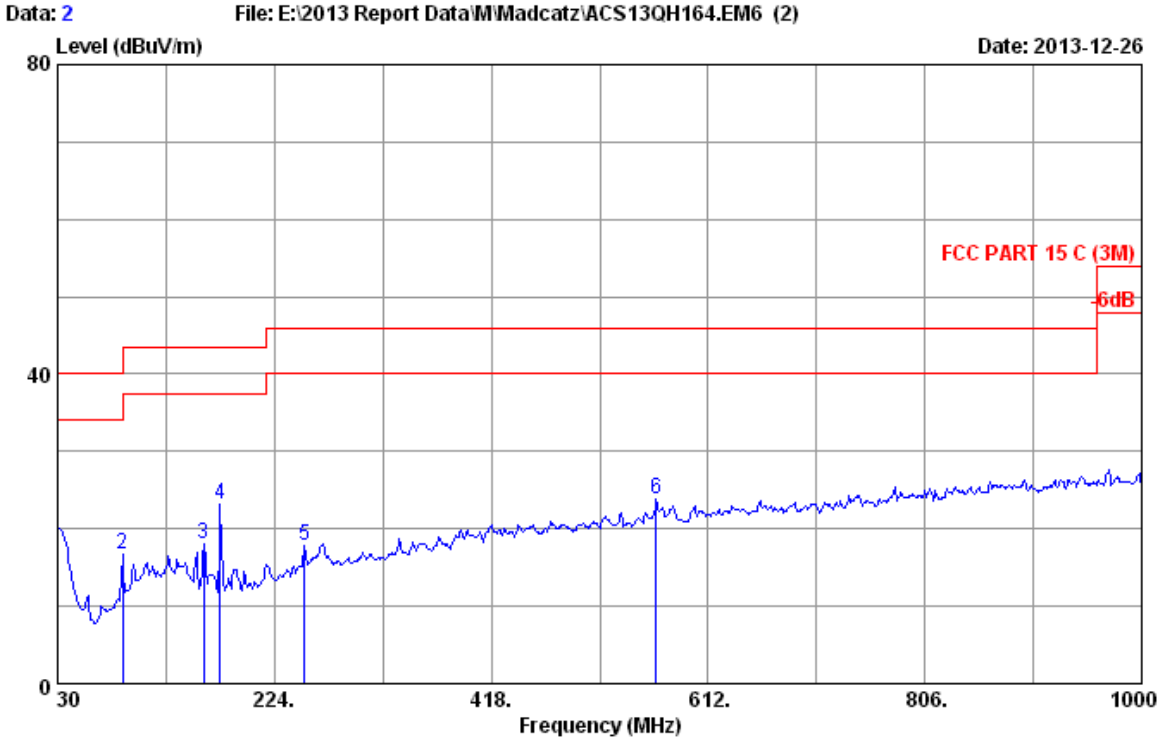
Duty cycle: 433μs /626μs *100% = 69.17%
Duty cycle factor = 20log（1/duty cycle）= 3.20






Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 433.000 µs
PNO: Wide
IFGain:Low
Trig: Line
Atten: 20 dB
Avg Type: Log-Pwr
10:28:16 AM Jan 22, 2014
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
ΔMkr1 433.0 µs
-10.78 dB
Center 2.402000000 GHz
Res BW 100 kHz
#VBW 100 kHz
Span 0 Hz
Sweep 1.000 ms (1001 pts)
Marker
Select Marker
1
Normal
Delta
Fixed
Off
Properties
More
1 of 2
Align Now, All required

Frequency: 30MHz~1GHz

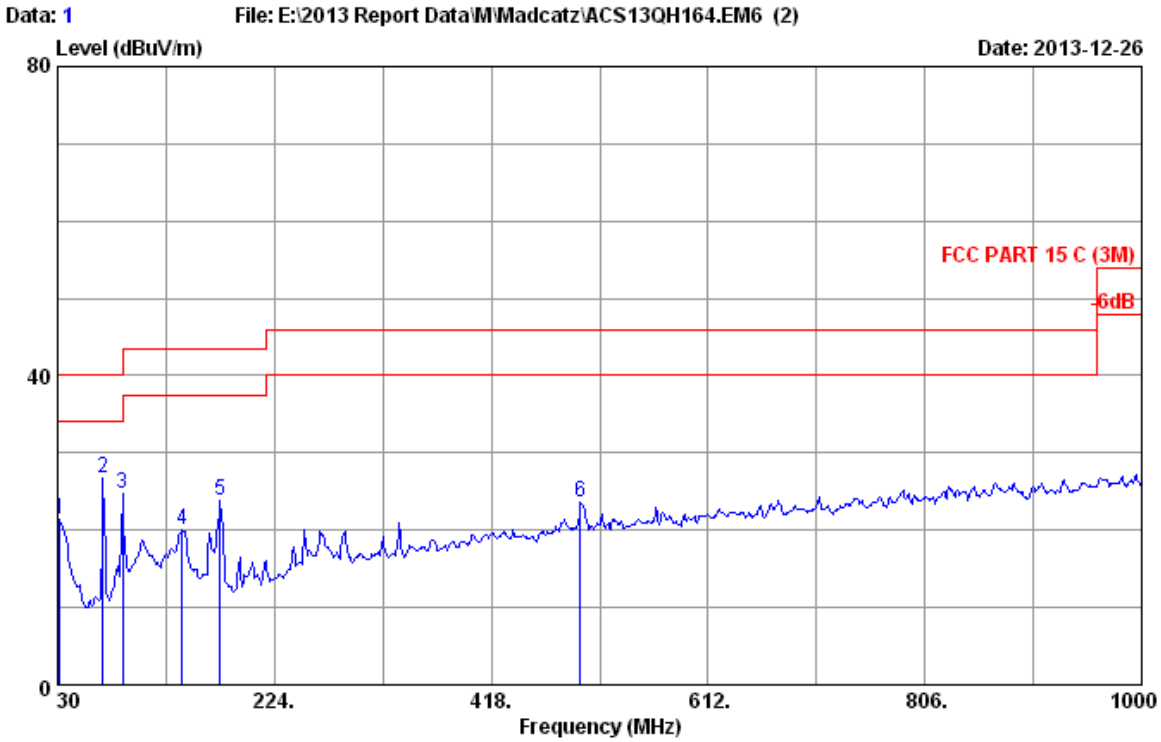


Site no. : 3m Chamber
Dis. / Ant. : 3m 2013 CBL6112D 35375
Limit : FCC PART 15 C (3M)
Env. / Ins. : 24*C/65%
EUT : Mad Catz Micro C.T.R.L.R
Power rating : DC 3V
Test Mode : Tx Mode
M/N:32268

Data no. : 2
Ant. pol. : HORIZONTAL
Engineer : Eric

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	30.000	20.10	0.83	0.79	20.14	40.00	21.44	QP
2	88.200	9.04	1.36	6.31	16.71	43.50	26.79	QP
3	160.950	10.75	1.64	5.71	18.10	43.50	25.40	QP
4	175.500	9.92	1.70	11.48	23.10	43.50	20.40	QP
5	251.160	13.16	1.98	2.67	17.81	46.00	28.19	QP
6	565.440	18.81	2.94	2.00	23.75	46.00	22.25	QP

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



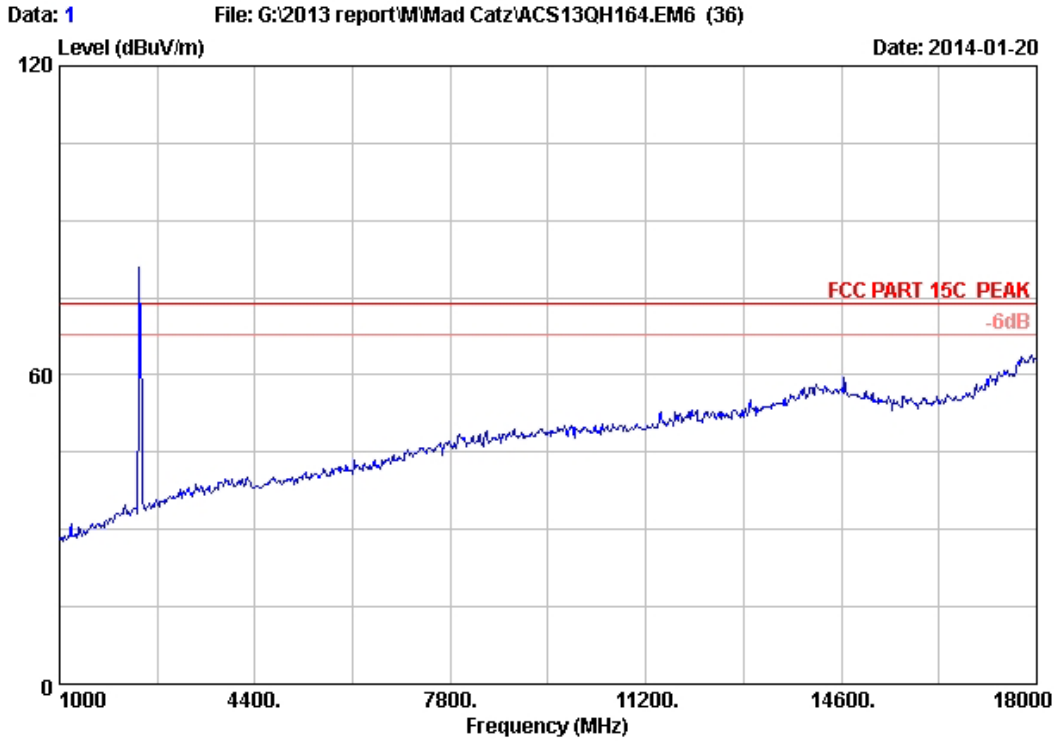
Site no. : 3m Chamber
Dis. / Ant. : 3m 2013 CBL6112D 35375
Limit : FCC PART 15 C (3M)
Env. / Ins. : 24*C/65%
EUT : Mad Catz Micro C.T.R.L.R
Power rating : DC 3V
Test Mode : Tx Mode
M/N:32268

Data no. : 1
Ant. pol. : VERTICAL
Engineer : Eric

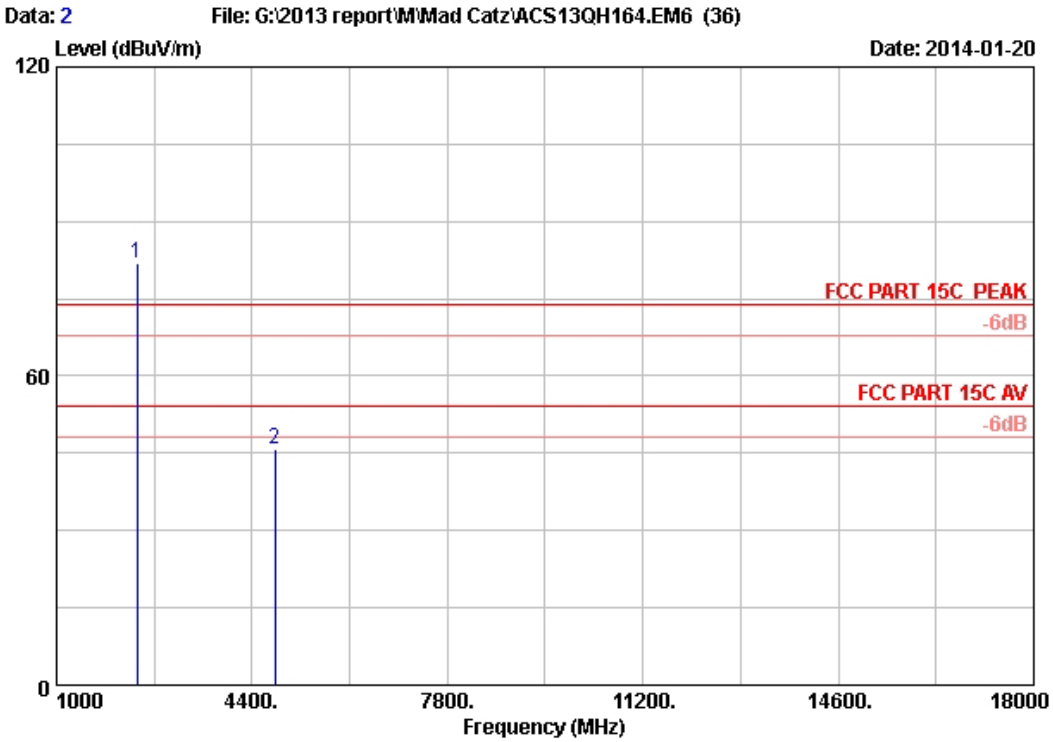
No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	31.940	18.84	0.86	1.61	21.31	40.00	18.69	QP
2	70.740	6.84	1.28	18.62	26.74	40.00	13.26	QP
3	88.200	9.04	1.36	14.39	24.79	43.50	18.71	QP
4	141.550	11.89	1.57	6.64	20.10	43.50	23.40	QP
5	175.500	9.92	1.70	12.23	23.85	43.50	19.65	QP
6	497.540	17.95	2.74	2.92	23.61	46.00	22.39	QP

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

Frequency: 1GHz~18GHz



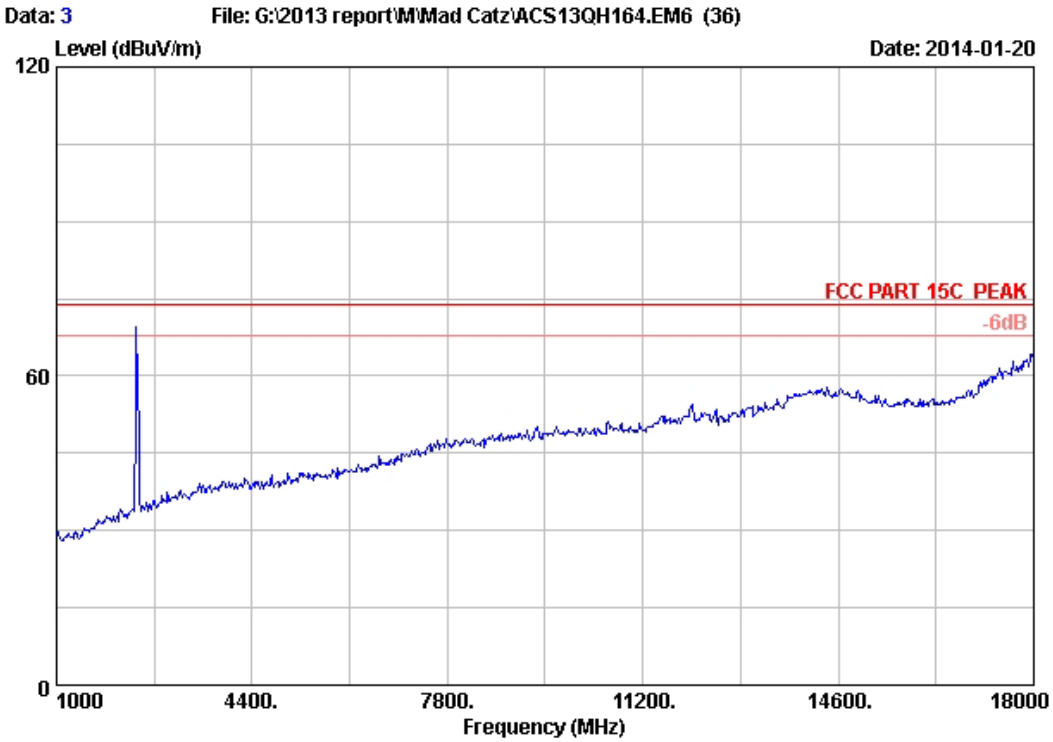
Site no.	: 3m Chamber	Data no.	: 1
Dis. / Ant.	: 3m 2013 3115 (4580)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23*C/54%	Engineer	: Leo-Li
EUT	: Mad Catz Micro C.T.R.L.R		
Power supply	: DC3V		
Test mode	: GFSK 2402 Tx Mode		
M/N	: 32268		



Site no. : 3m Chamber Data no. : 2
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Mad Catz Micro C.T.R.L.R
Power supply : DC3V
Test mode : GFSK 2402 Tx Mode
M/N : 32268

	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	28.18	5.80	35.70	83.58	81.86	74.00	-7.86	Peak
2	4804.000	32.85	8.56	35.70	39.97	45.68	74.00	28.32	Peak

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

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Site no.      : 3m Chamber                Data no.   : 3
Dis. / Ant.   : 3m   2013 3115 (4580)     Ant. pol.  : VERTICAL
Limit         : FCC PART 15C  PEAK
Env. / Ins.   : 23*C/54%                  Engineer   : Leo-Li
EUT           : Mad Catz Micro C.T.R.L.R
Power supply  : DC3V
Test mode     : GFSK 2402 Tx Mode
M/N           : 32268
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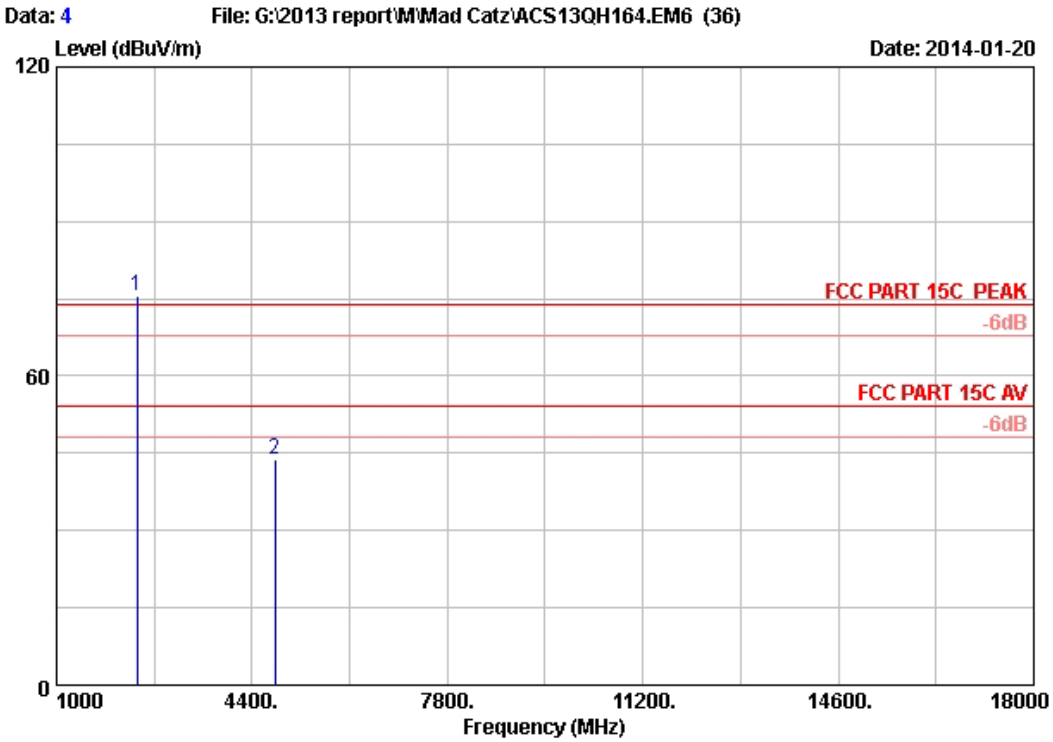
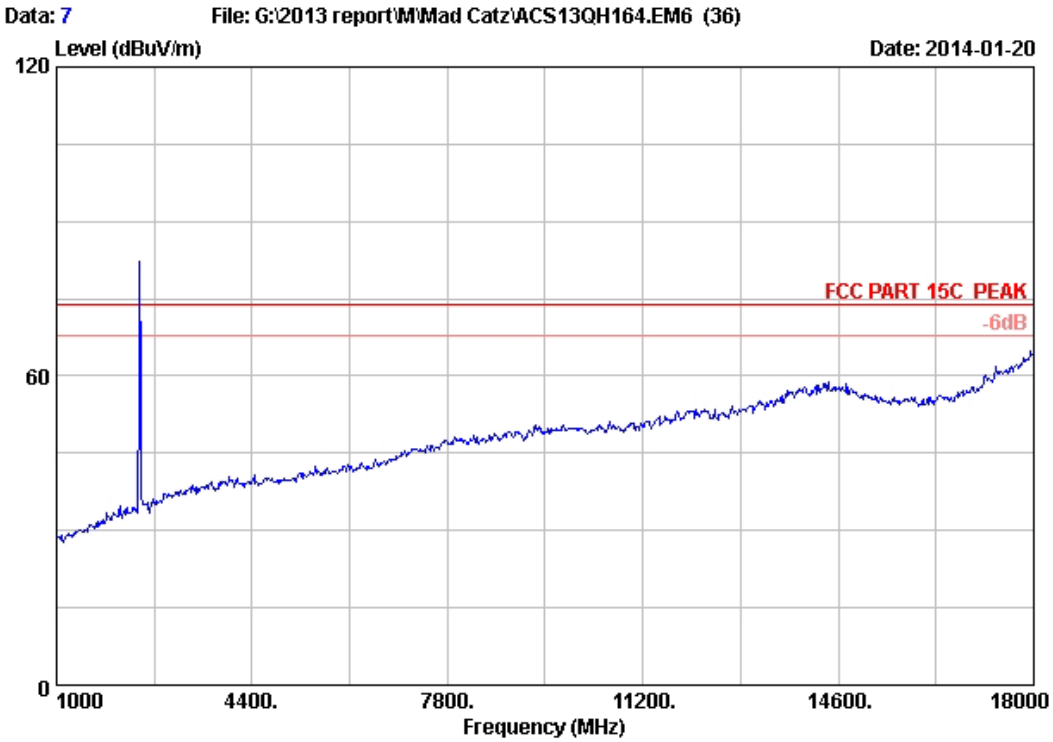


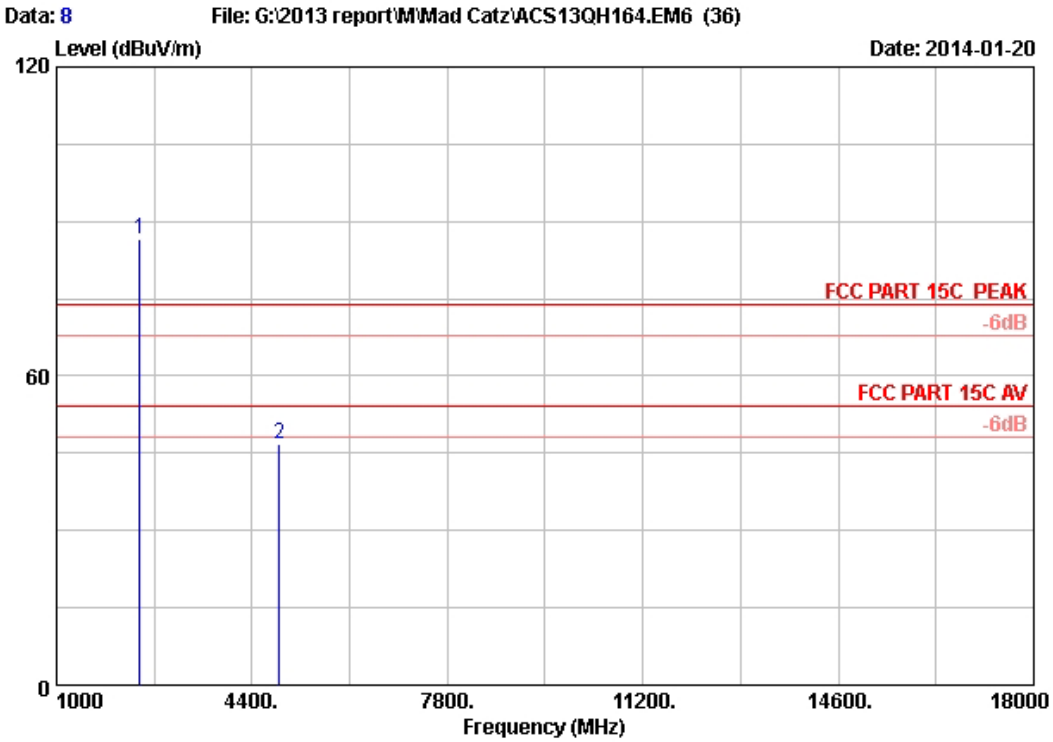
Site no. : 3m Chamber Data no. : 4
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Mad Catz Micro C.T.R.L.R
Power supply : DC3V
Test mode : GFSK 2402 Tx Mode
M/N : 32268

	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	28.18	5.80	35.70	77.11	75.39	74.00	-1.39	Peak
2	4804.000	32.85	8.56	35.70	38.06	43.77	74.00	30.23	Peak

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



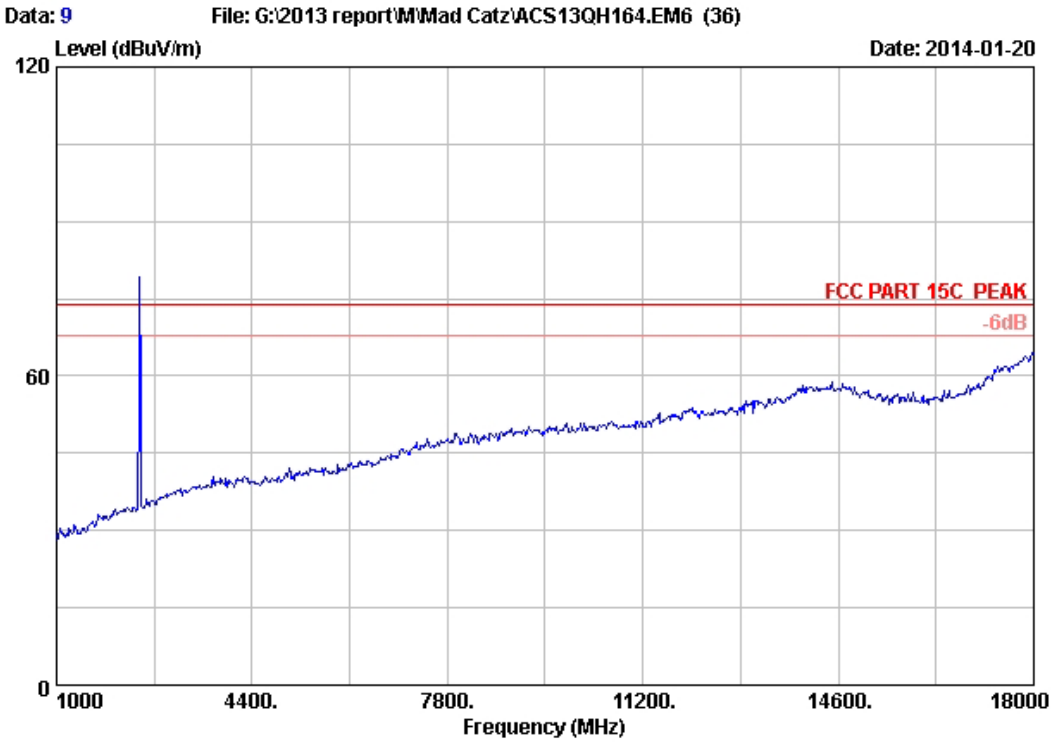
Site no.	: 3m Chamber	Data no.	: 7
Dis. / Ant.	: 3m 2013 3115 (4580)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23*C/54%	Engineer	: Leo-Li
EUT	: Mad Catz Micro C.T.R.L.R		
Power supply	: DC3V		
Test mode	: GFSK 2440 Tx Mode		
M/N	: 32268		



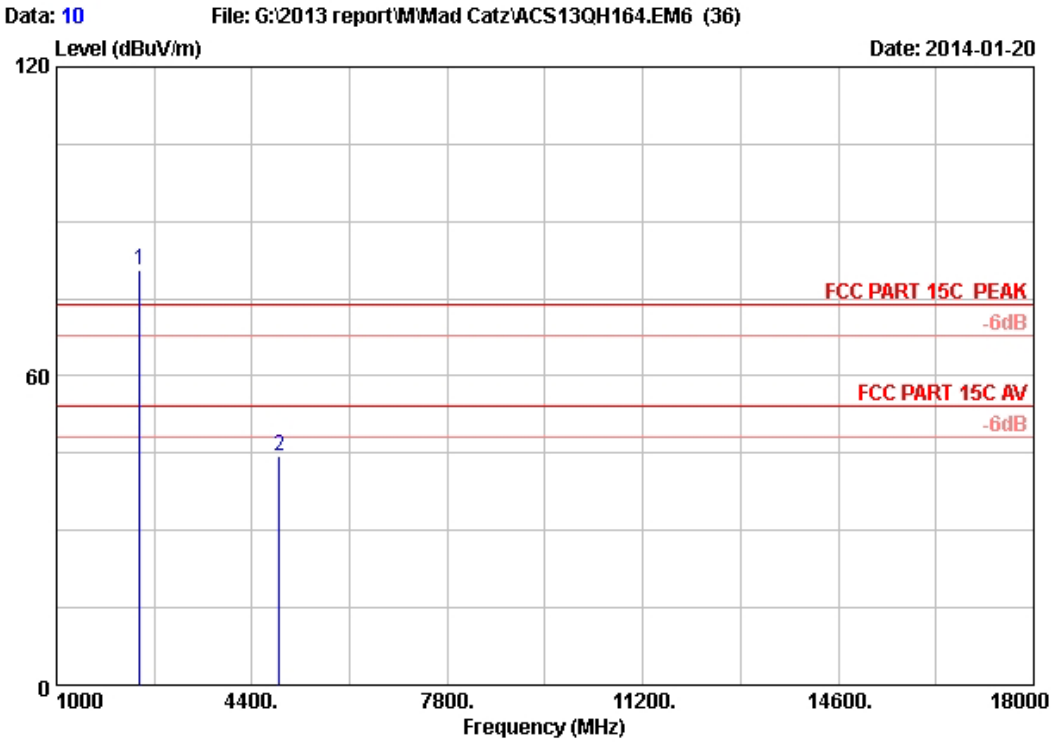
Site no. : 3m Chamber Data no. : 8
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Mad Catz Micro C.T.R.L.R
Power supply : DC3V
Test mode : GFSK 2440 Tx Mode
M/N : 32268

	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	28.27	5.86	35.70	88.05	86.48	74.00	-12.48	Peak
2	4880.000	32.98	8.64	35.70	41.03	46.95	74.00	27.05	Peak

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



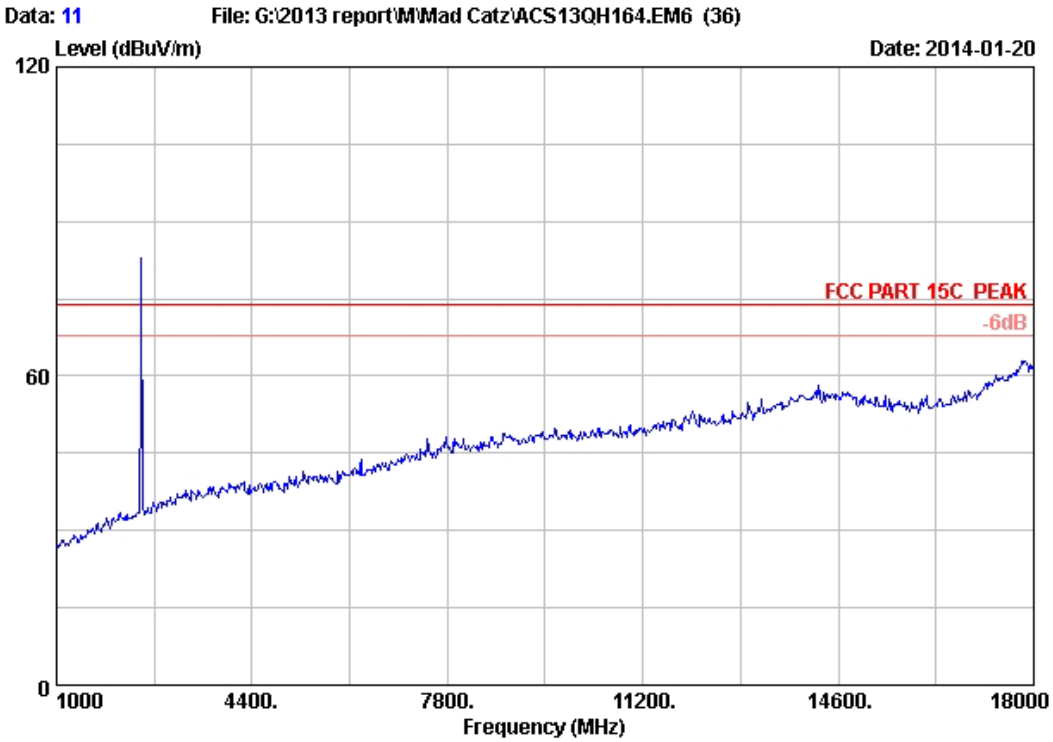
Site no.	: 3m Chamber	Data no.	: 9
Dis. / Ant.	: 3m 2013 3115 (4580)	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23*C/54%	Engineer	: Leo-Li
EUT	: Mad Catz Micro C.T.R.L.R		
Power supply	: DC3V		
Test mode	: GFSK 2440 Tx Mode		
M/N	: 32268		



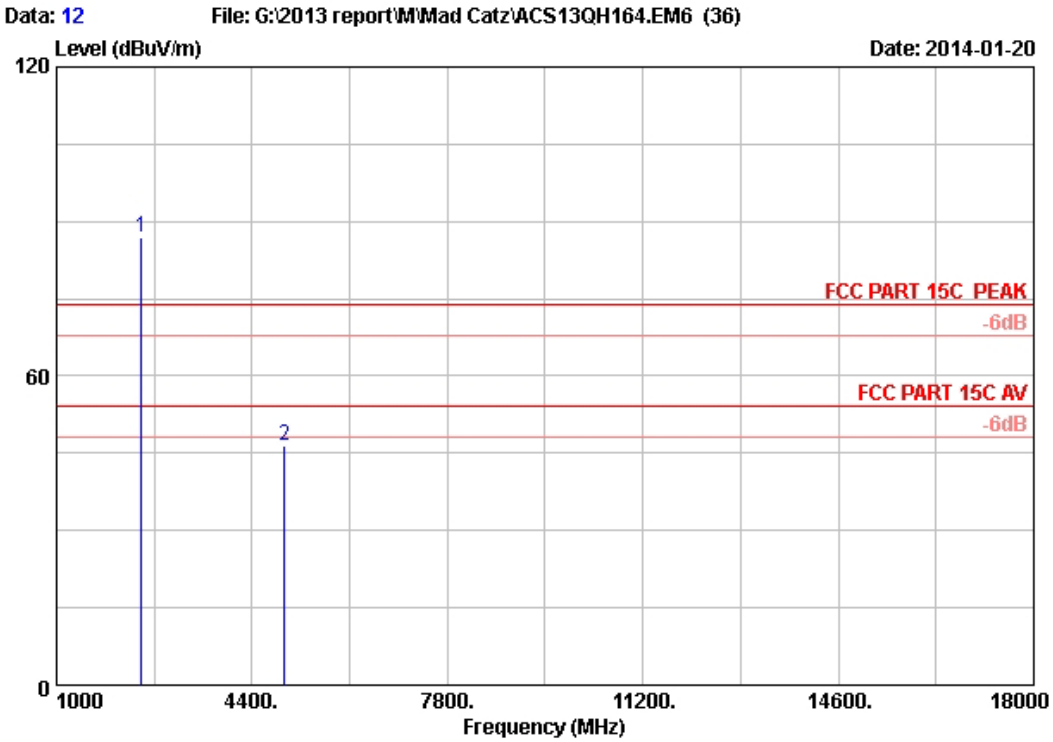
Site no. : 3m Chamber Data no. : 10
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Mad Catz Micro C.T.R.L.R
Power supply : DC3V
Test mode : GFSK 2440 Tx Mode
M/N : 32268

	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	28.27	5.86	35.70	82.01	80.44	74.00	-6.44	Peak
2	4880.000	32.98	8.64	35.70	38.67	44.59	74.00	29.41	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.



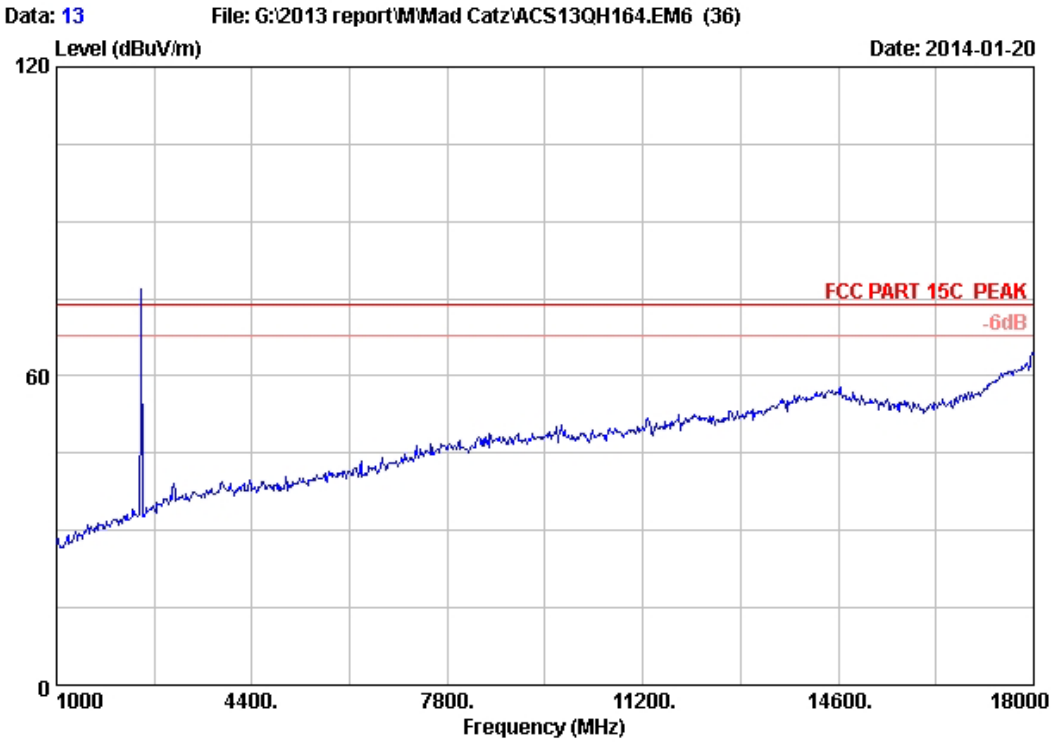
Site no.	: 3m Chamber	Data no.	: 11
Dis. / Ant.	: 3m 2013 3115 (4580)	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23*C/54%	Engineer	: Leo-Li
EUT	: Mad Catz Micro C.T.R.L.R		
Power supply	: DC3V		
Test mode	: GFSK 2480 Tx Mode		
M/N	: 32268		



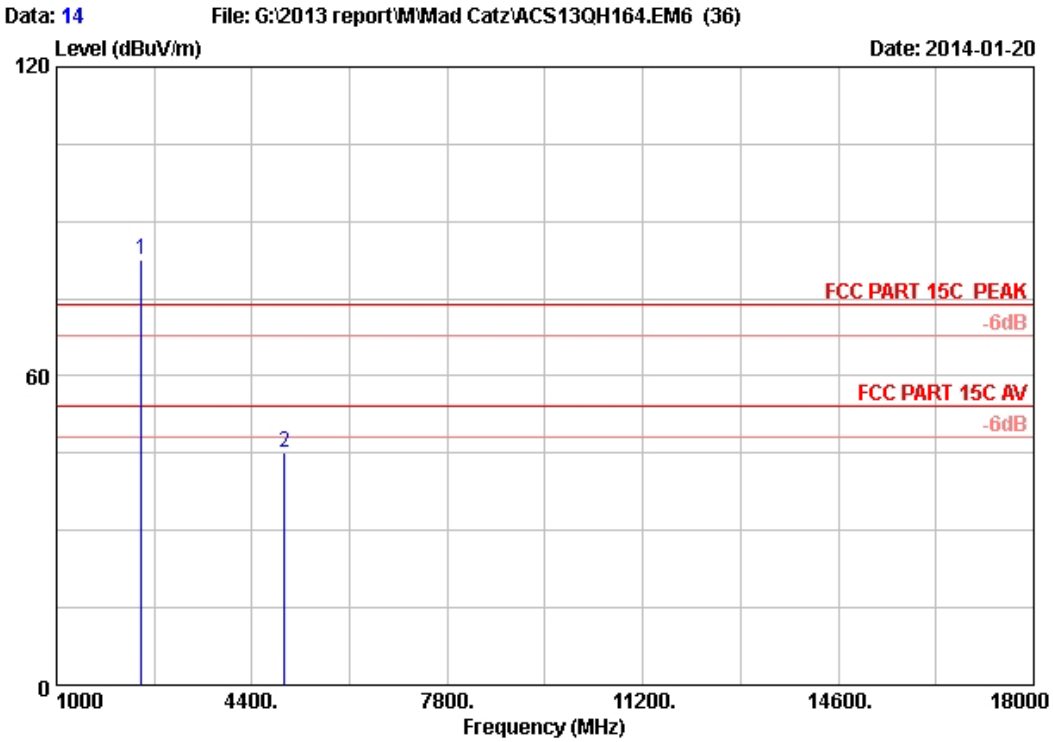
Site no. : 3m Chamber Data no. : 12
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Mad Catz Micro C.T.R.L.R
Power supply : DC3V
Test mode : GFSK 2480 Tx Mode
M/N : 32268

	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	28.36	5.91	35.70	88.36	86.93	74.00	-12.93	Peak
2	4960.000	33.13	8.72	35.70	40.26	46.41	74.00	27.59	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.



Site no.	: 3m Chamber	Data no.	: 13
Dis. / Ant.	: 3m 2013 3115 (4580)	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23*C/54%	Engineer	: Leo-Li
EUT	: Mad Catz Micro C.T.R.L.R		
Power supply	: DC3V		
Test mode	: GFSK 2480 Tx Mode		
M/N	: 32268		



Site no. : 3m Chamber Data no. : 14
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Mad Catz Micro C.T.R.L.R
Power supply : DC3V
Test mode : GFSK 2480 Tx Mode
M/N : 32268

	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	28.36	5.91	35.70	84.06	82.63	74.00	-8.63	Peak
2	4960.000	33.13	8.72	35.70	38.97	45.12	74.00	28.88	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.

5. CONDUCTED SPURIOUS EMISSIONS

5.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9030A	MY51380221	Oct.31, 13	1 Year
2.	Attenuator	Agilent	8491B	MY39262165	May.08,13	1 Year
3.	RF Cable	Hubersuhner	SUCOFLEX102	28618/2	May.08,13	1 Year

5.2. Limit

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

5.3. Test Procedure

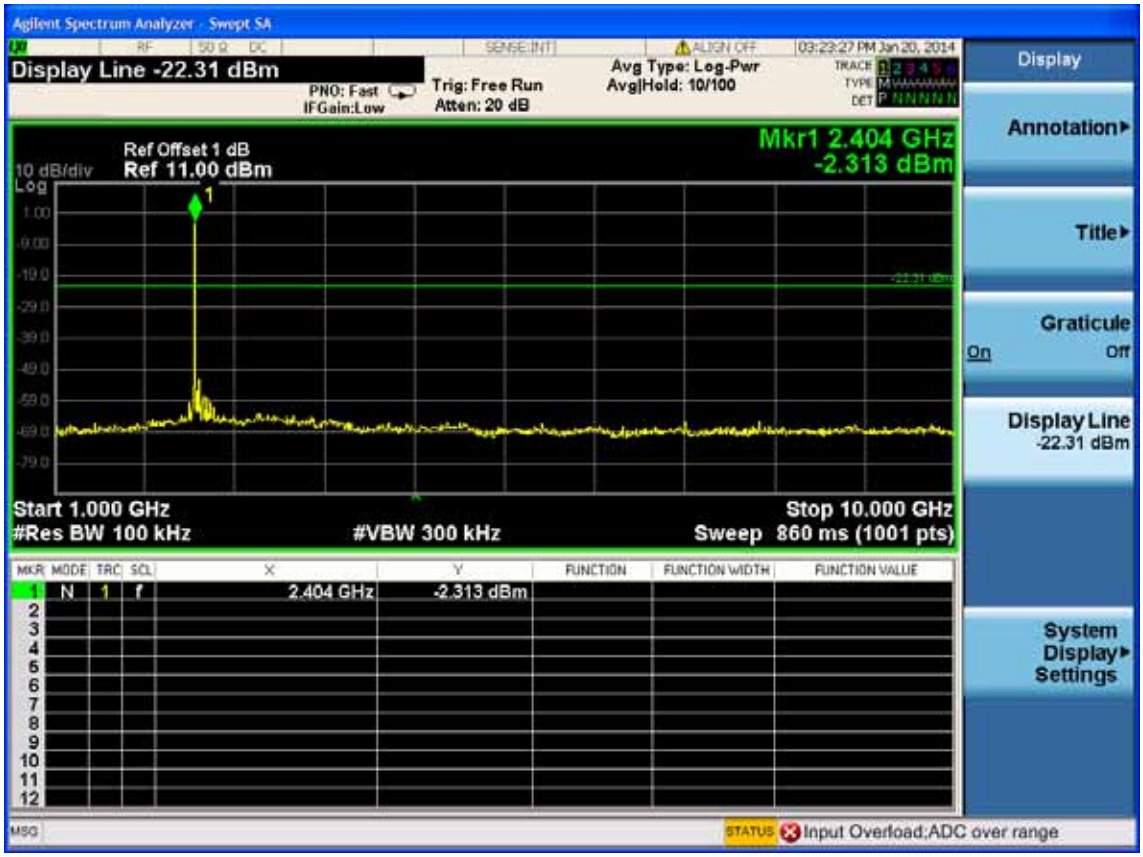
The transmitter output was connected to a spectrum analyzer, The resolution bandwidth is set to 100 kHz, The video bandwidth is set to 300 kHz and measure all the emissions detected.

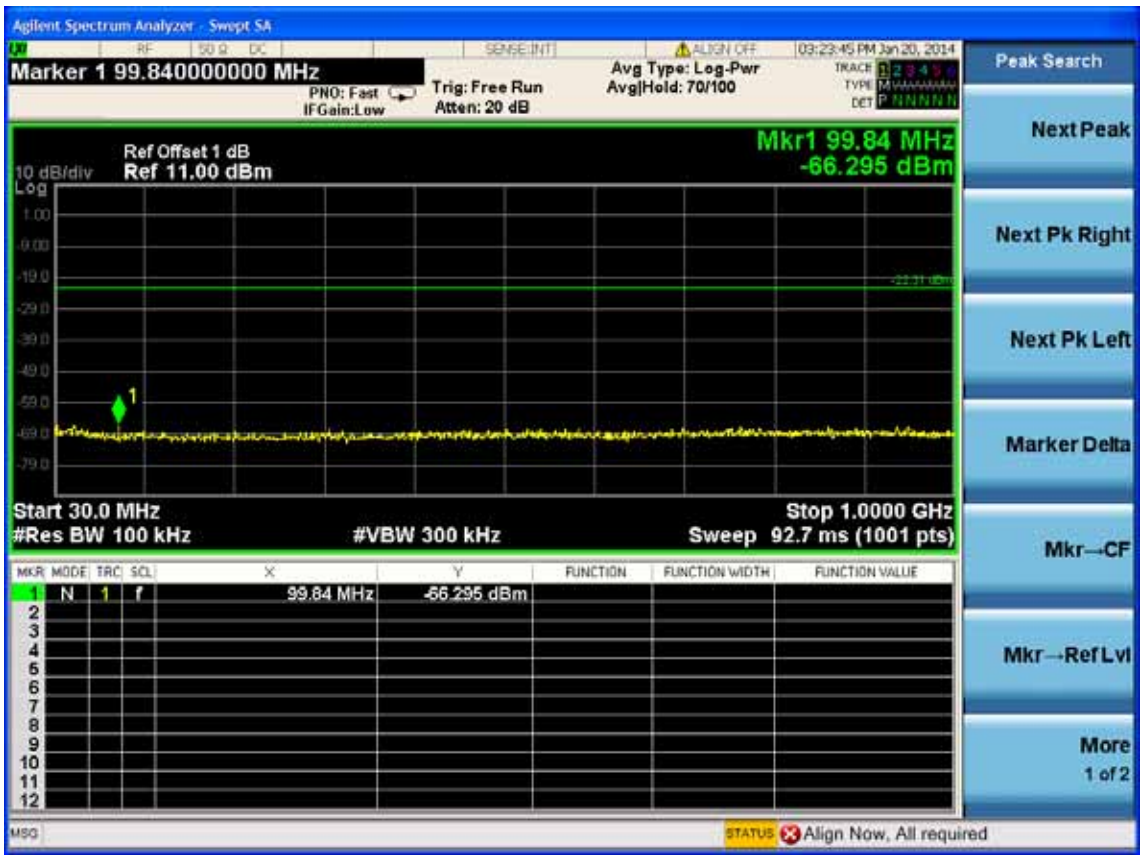
5.4. Test result

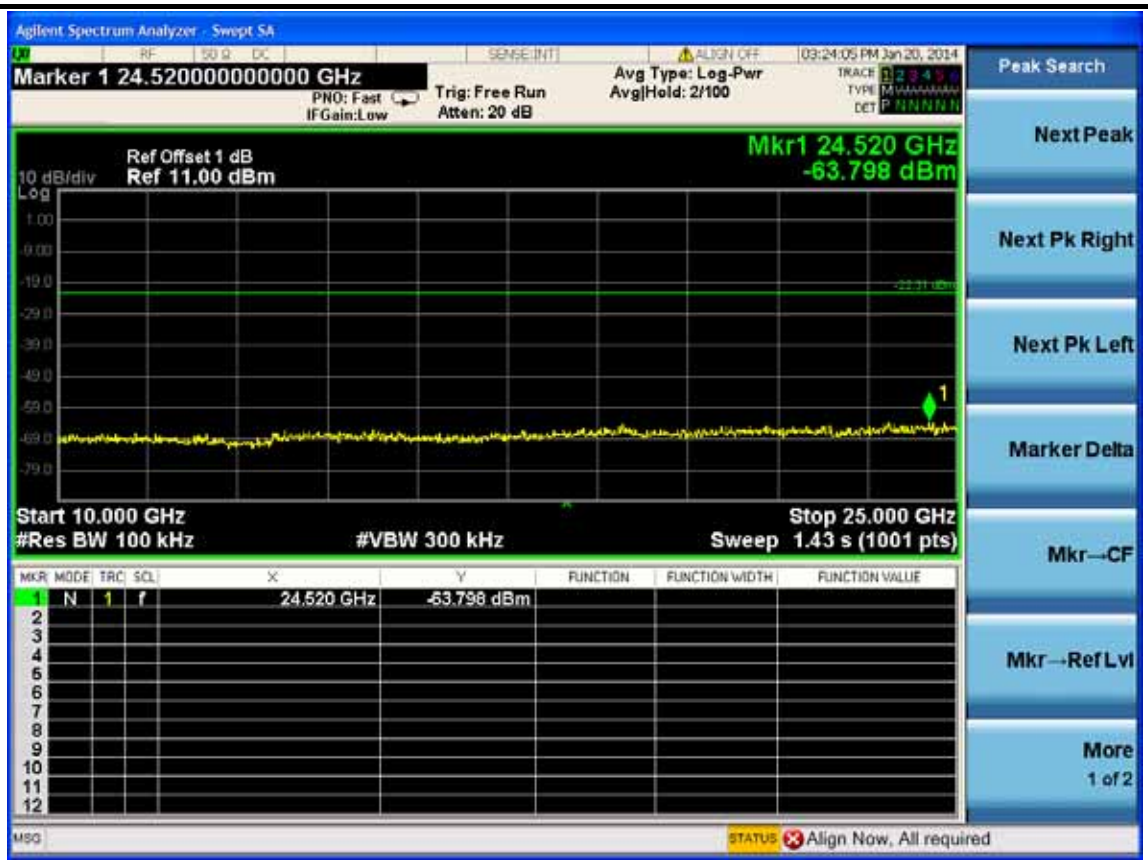
PASS (The testing data was attached in the next pages.)

GFSK

2402MHz

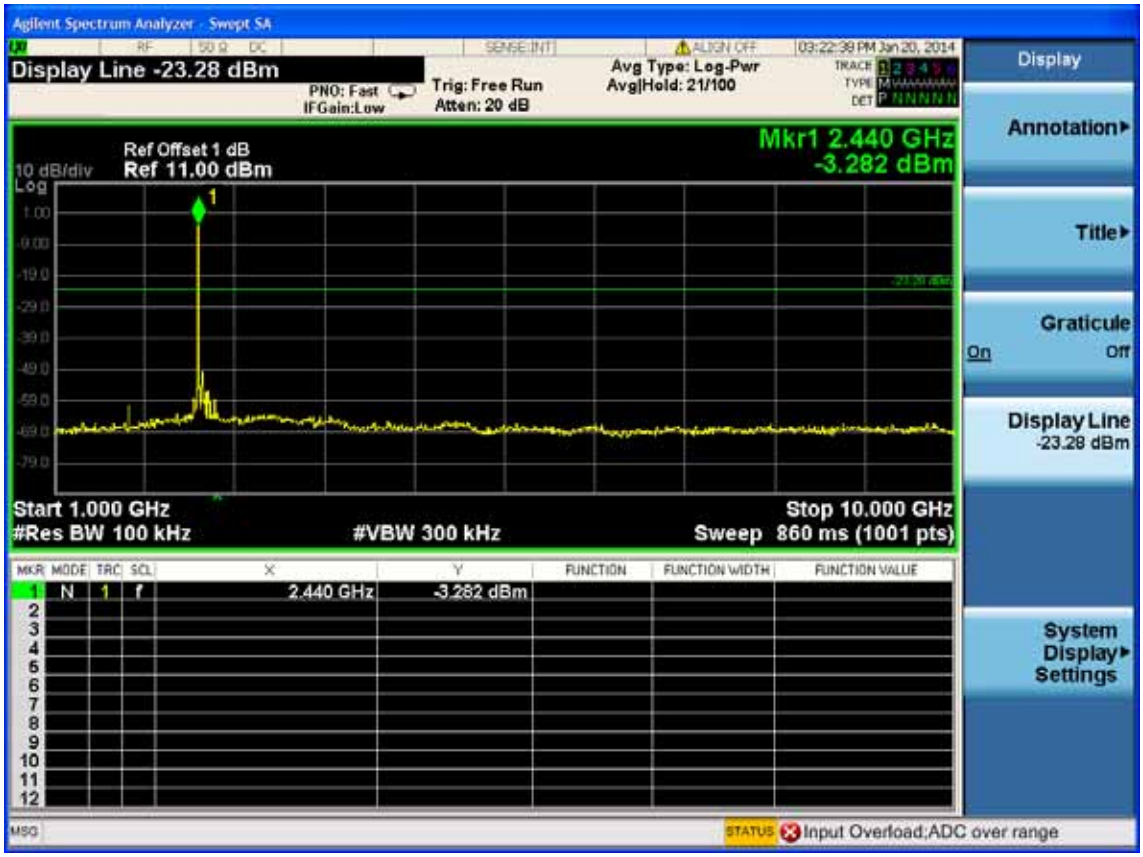


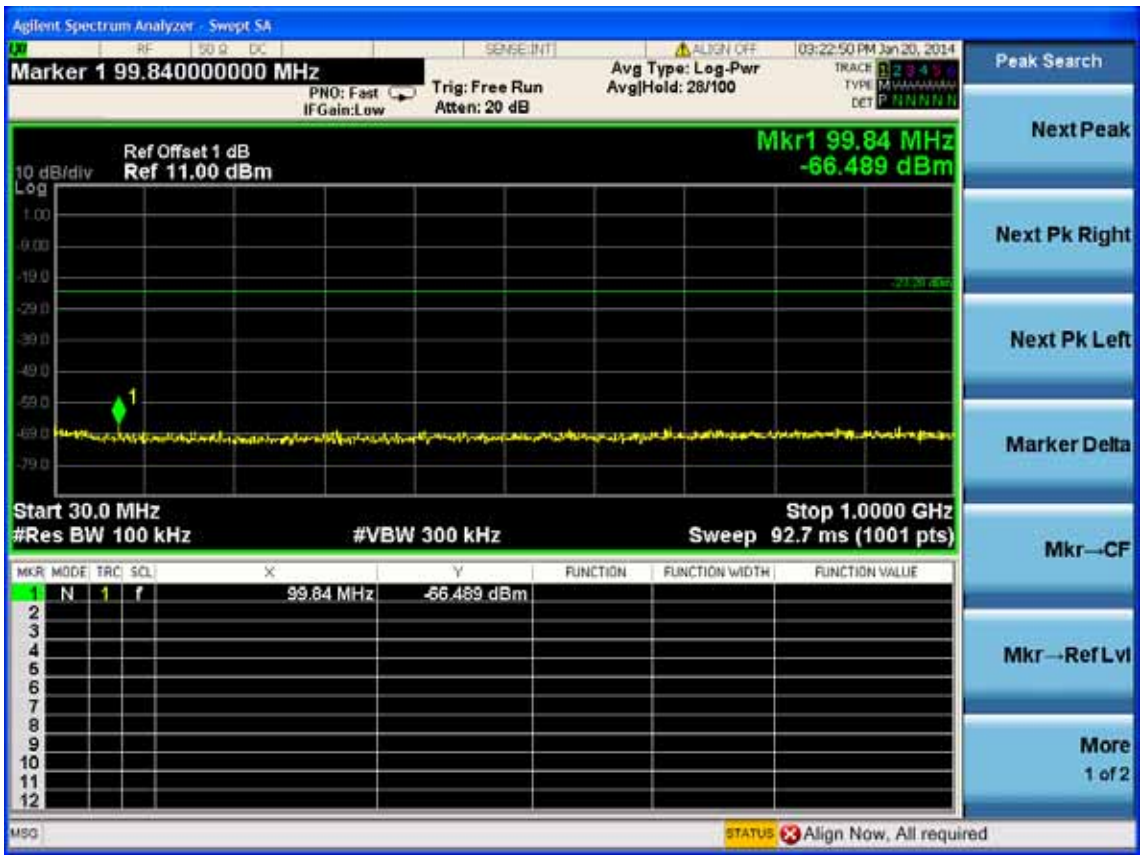


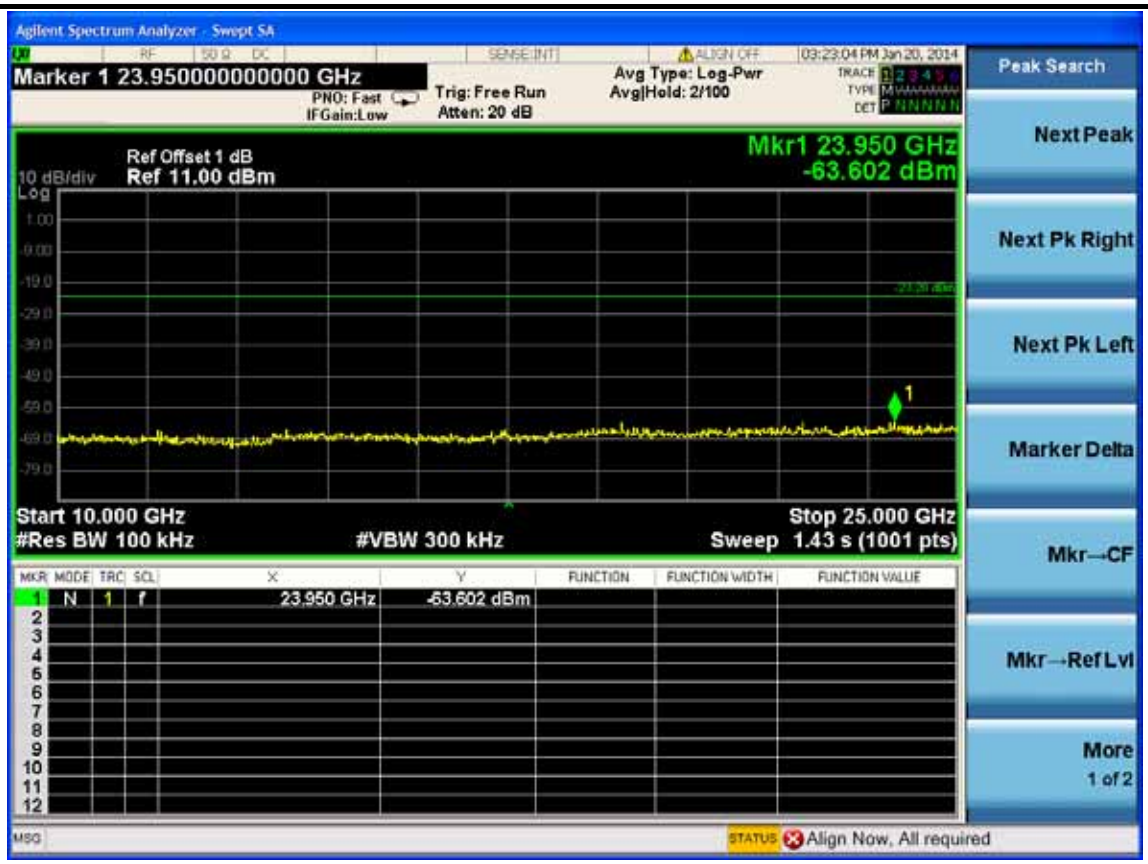

Agilent Spectrum Analyzer - Swept SA
Marker 1 24.520000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 2/100
03:24:05 PM Jan 20, 2014
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 24.520 GHz
-63.798 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.520 GHz -63.798 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required


Agilent Spectrum Analyzer - Swept SA
Display Line -22.14 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:25:09 PM Jan 20, 2014
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr4 2.402 055 GHz
-2.144 dBm
Start 2.31000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.40500 GHz
Sweep 9.13 ms (1001 pts)
1 N 1 f 2.390 000 GHz -62.142 dBm
2 N 1 f 2.400 000 GHz -49.224 dBm
3 N 1 f 2.354 270 GHz -56.567 dBm
4 N 1 f 2.402 055 GHz -2.144 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-22.14 dBm
System
Display
Settings
Align Now, All required

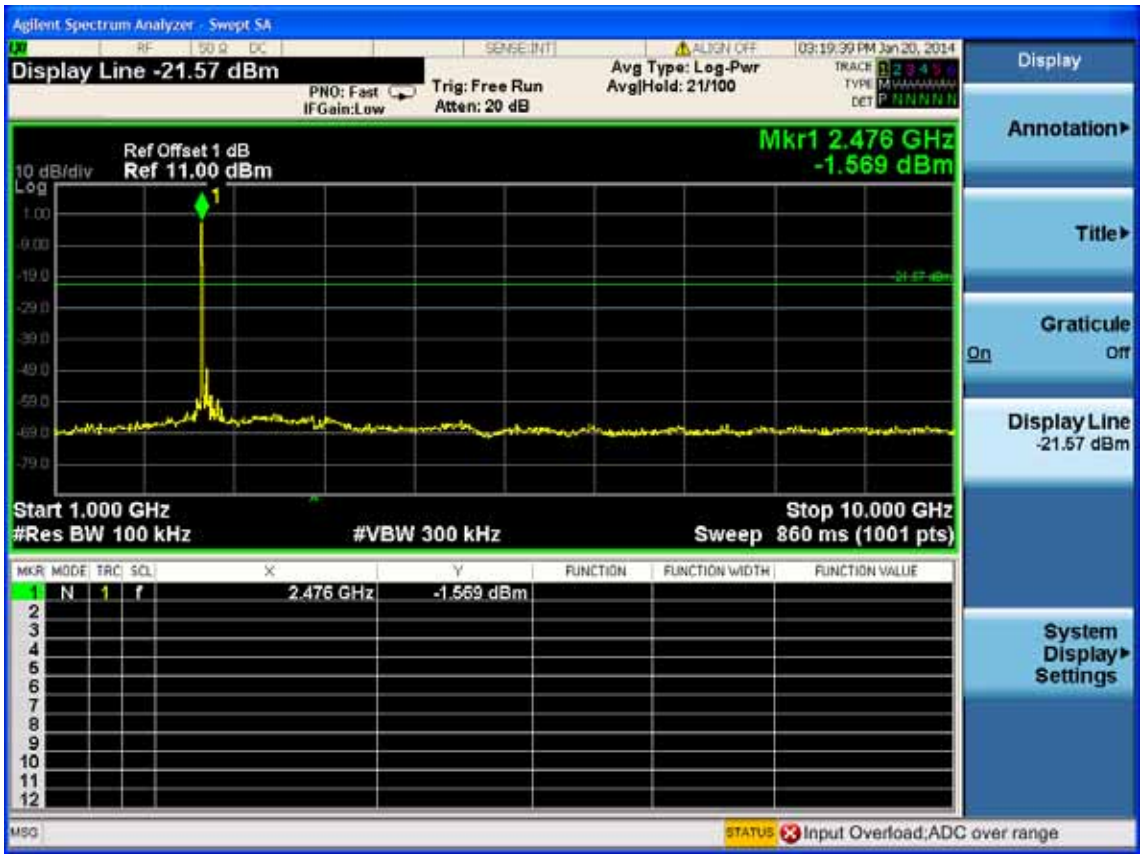
2440MHz

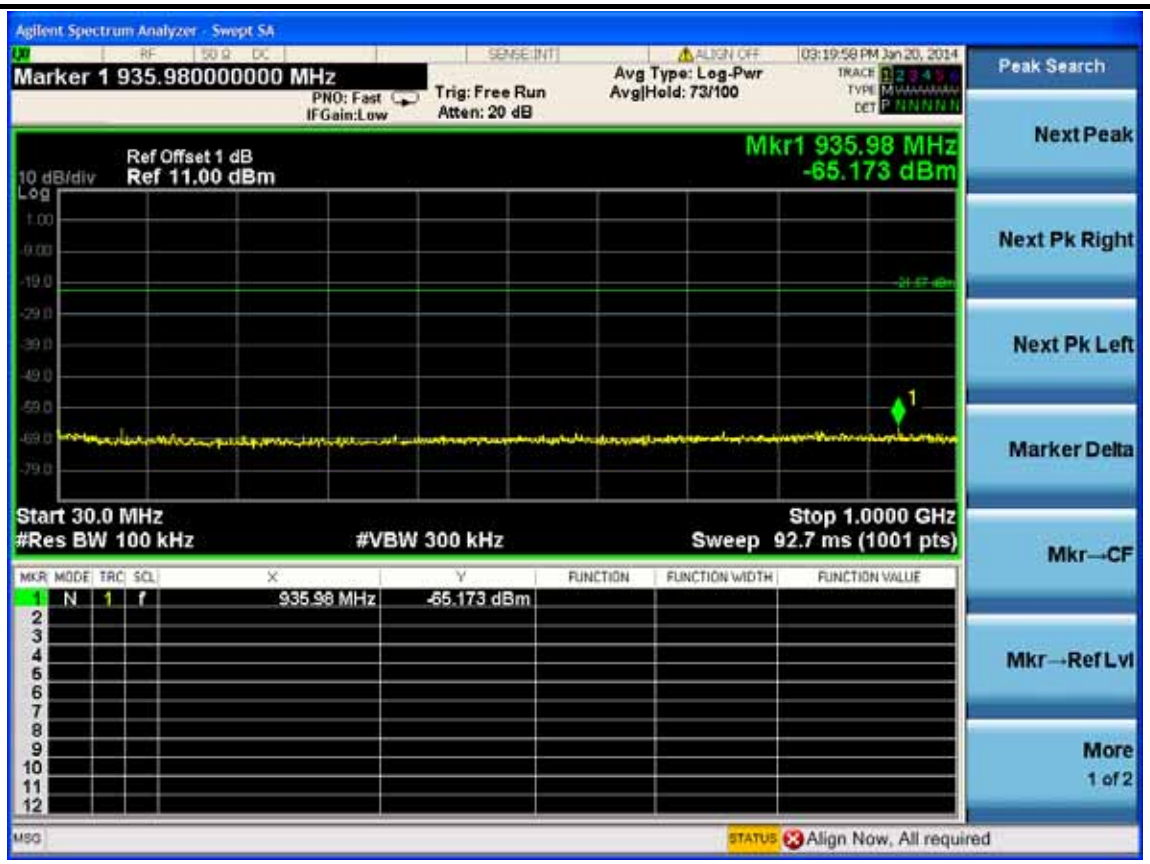

Agilent Spectrum Analyzer - Swept SA
Display Line -23.28 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 21/100
03:22:39 PM Jan 20, 2014
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 2.440 GHz
-3.282 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
1 N 1 f 2.440 GHz -3.282 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-23.28 dBm
System
Display
Settings
Input Overload;ADC over range

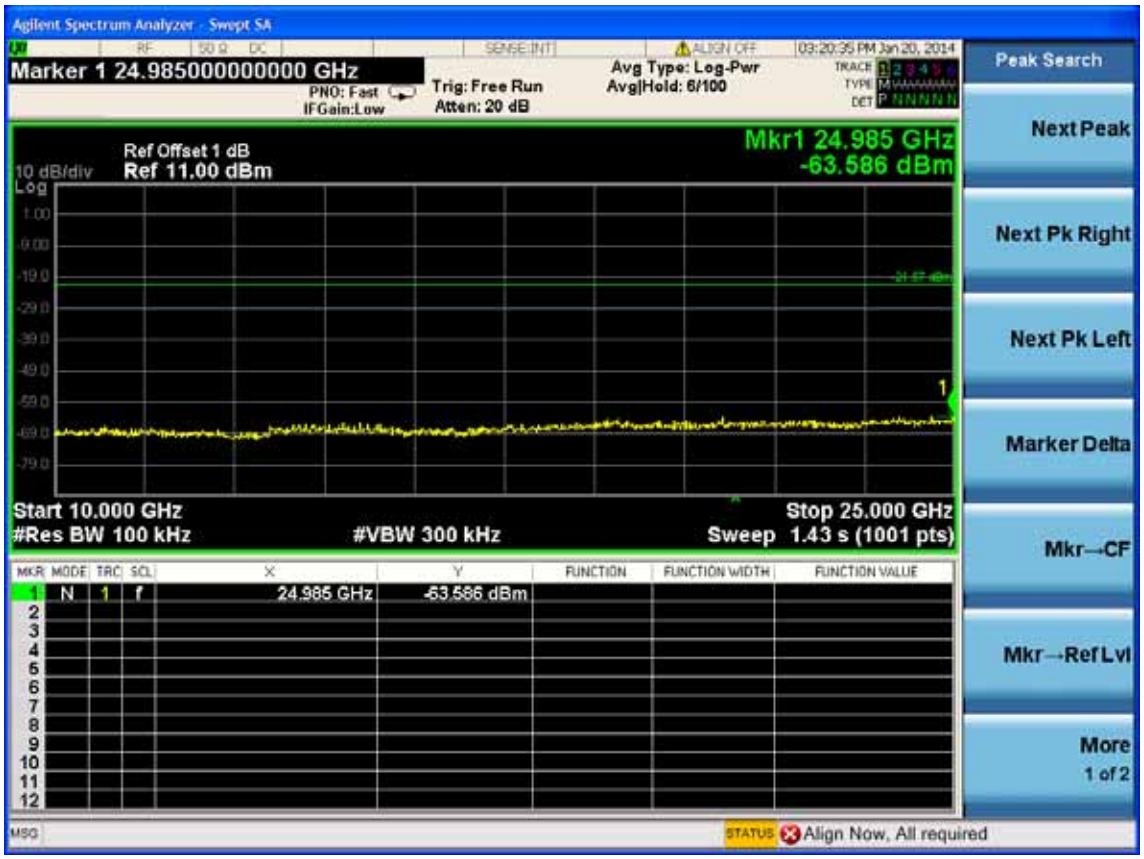

Agilent Spectrum Analyzer - Swept SA
Marker 1 99.840000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 28/100
03:22:50 PM Jan 20, 2014
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 99.84 MHz
-66.489 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
1 N 1 f 99.84 MHz -66.489 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required

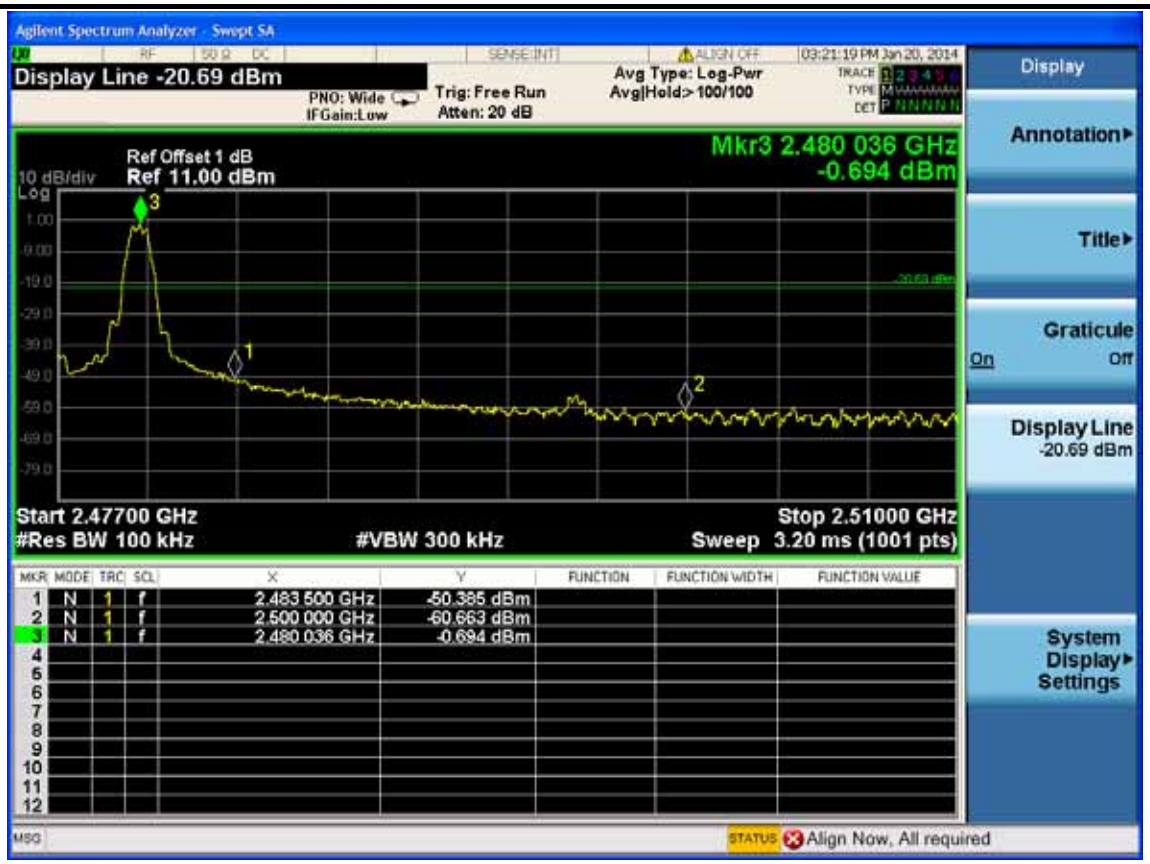

Agilent Spectrum Analyzer - Swept SA
Marker 1 23.950000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 2/100
03:23:04 PM Jan 20, 2014
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 23.950 GHz
-63.602 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 23.950 GHz -63.602 dBm
MSG
STATUS Align Now, All required

2480MHz


Agilent Spectrum Analyzer - Swept SA
Display Line -21.57 dBm
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 21/100
03:19:39 PM Jan 20, 2014
Display
Annotation
Title
Graticule
On Off
Display Line
-21.57 dBm
System
Display
Settings
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 2.476 GHz
-1.569 dBm
Start 1.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 10.000 GHz
Sweep 860 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.476 GHz -1.569 dBm
MSG
STATUS Input Overload;ADC over range


Agilent Spectrum Analyzer - Swept SA
Marker 1 935.980000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 73/100
03:19:58 PM Jan 20, 2014
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 935.98 MHz
-65.173 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.0000 GHz
Sweep 92.7 ms (1001 pts)
1 N 1 f 935.98 MHz -65.173 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required


Agilent Spectrum Analyzer - Swept SA
Marker 1 24.985000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 6/100
03:20:35 PM Jan 20, 2014
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 24.985 GHz
-63.586 dBm
Start 10.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.000 GHz
Sweep 1.43 s (1001 pts)
1 N 1 f 24.985 GHz -63.586 dBm
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Align Now, All required


Agilent Spectrum Analyzer - Swept SA
Display Line -20.69 dBm
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
03:21:19 PM Jan 20, 2014
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr3 2.480 036 GHz
-0.694 dBm
Start 2.47700 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.51000 GHz
Sweep 3.20 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 2.483 500 GHz -50.385 dBm
2 N 1 f 2.500 000 GHz -60.663 dBm
3 N 1 f 2.480 036 GHz -0.694 dBm
Display
Annotation
Title
Graticule
On Off
Display Line
-20.69 dBm
System
Display
Settings
MSG
STATUS
Align Now, All required

6. 6dB BANDWIDTH TEST

6.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9030A	MY51380221	Oct.31, 13	1 Year
2.	Horn Antenna	EMCO	3115	9510-4580	May.28,13	1 Year
3.	HF Cable	Hubersuhner	Sucoflex104	-	May.08, 13	1 Year

6.2.Limit

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

6.3.Test Procedure

The transmitter output was connected to a spectrum analyzer, The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

6.4.Test Results

EUT: Mad Catz Micro C.T.R.L.R		
M/N: 32268		
Test date: 2014-01-21	Pressure: 102.2±1.0kpa	Humidity: 50.1 ±3.0%
Tested by: Eric_Lv	Test site: RF site	Temperature: 22.1±0.6℃

Cable loss: 1.0 dB		Attenuator loss: 20 dB	
Test Mode	CH (MHz)	6 dB bandwidth (kHz)	Limit (KHz)
GFSK	2402	687.4	≧500KHz
	2440	678.8	≧500KHz
	2480	689.2	≧500KHz
Conclusion：PASS			

GFSK

Test Frequency: 2402MHz

Test Frequency: 2440MHz

Test Frequency: 2480MHz

7. MAXIMUM PEAK OUTPUT POWER TEST

7.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Meter	Anritsu	ML2487A	6K00002472	May.08, 13	1Year
2.	Power Sensor	Anritsu	MA2491A	033005	May.08, 13	1Year

7.2.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.

7.3.Test Procedure

Connected the EUT's antenna port to Power Sensor, and use power meter to test peak output power.

7.4.Test Results

EUT: Mad Catz Micro C.T.R.L.R		
M/N: 32268		
Test date:2014-01-21	Pressure: 102.7±1.0kpa	Humidity: 53.9 ±3.0%
Tested by: Eric_Lv	Test site: RF site	Temperature: 21.8±0.6℃

Cable loss: 1.0 dB		Attenuator loss: 20 dB	
Test Mode	Frequency (MHz)	Peak output Power （dBm）	Limit (dBm)
GFSK	2402	-1.718	30
	2440	-1.565	30
	2480	-0.290	30
Conclusion: PASS			

8. BAND EDGE COMPLIANCE TEST

8.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9030A	MY51380221	Oct.31, 13	1 Year
2.	Amp	HP	8449B	3008A08495	May.08, 13	1 Year
3.	Horn Antenna	EMCO	3115	9510-4580	May.28,13	1 Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 13	1 Year

8.2. 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.

8.3. 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

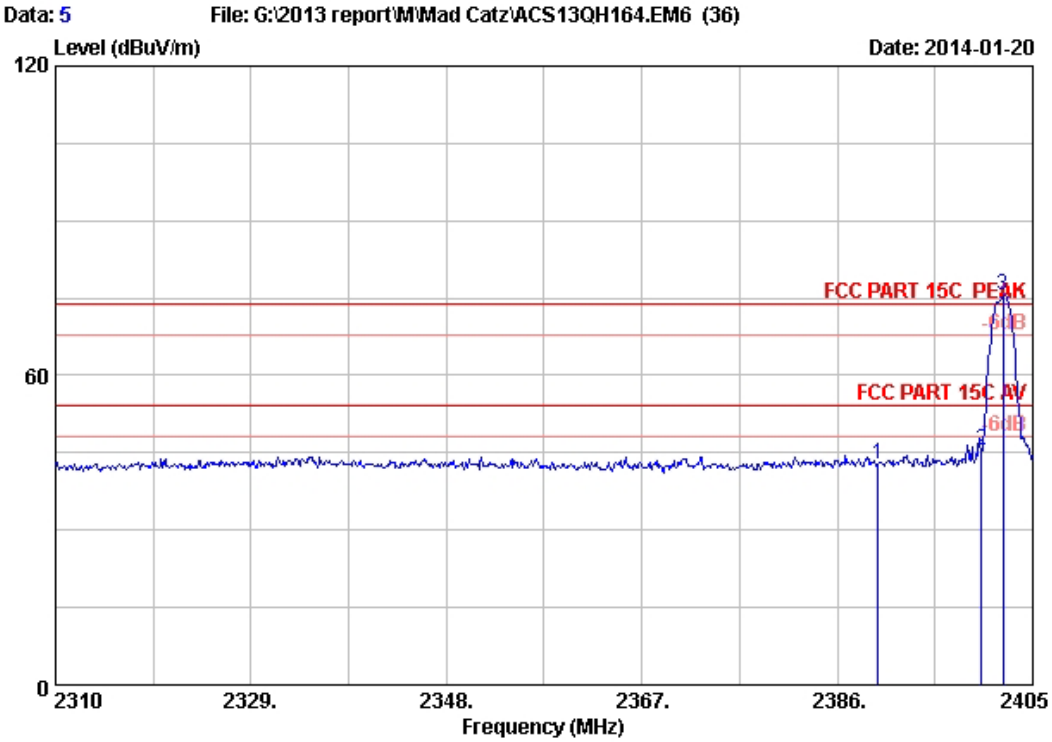
For emissions above two bandwidths away from the band-edge use below produce:

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

8.4. Test Results

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

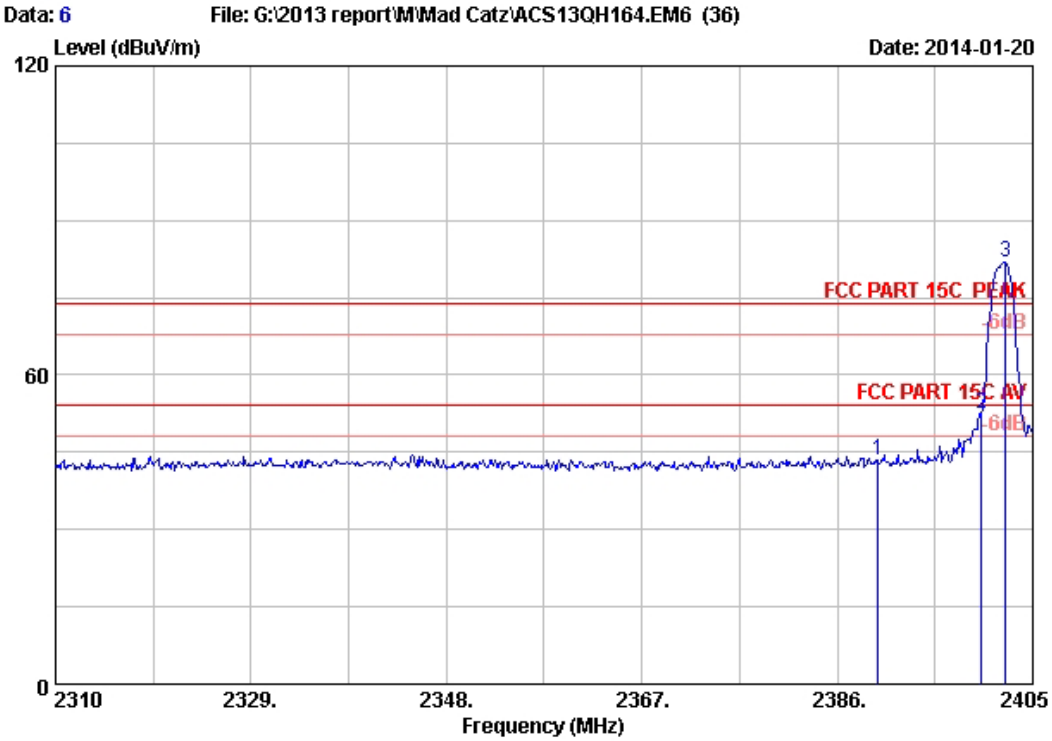
Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.



Site no. : 3m Chamber Data no. : 5
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Mad Catz Micro C.T.R.L.R
Power supply : DC3V
Test mode : GFSK 2402 Tx Mode
M/N : 32268

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	28.16	5.78	35.70	44.71	42.95	74.00	31.05	Peak
2	2400.000	28.18	5.80	35.70	47.10	45.38	74.00	28.62	Peak
3	2402.150	28.18	5.80	35.70	77.11	75.39	74.00	-1.39	Peak

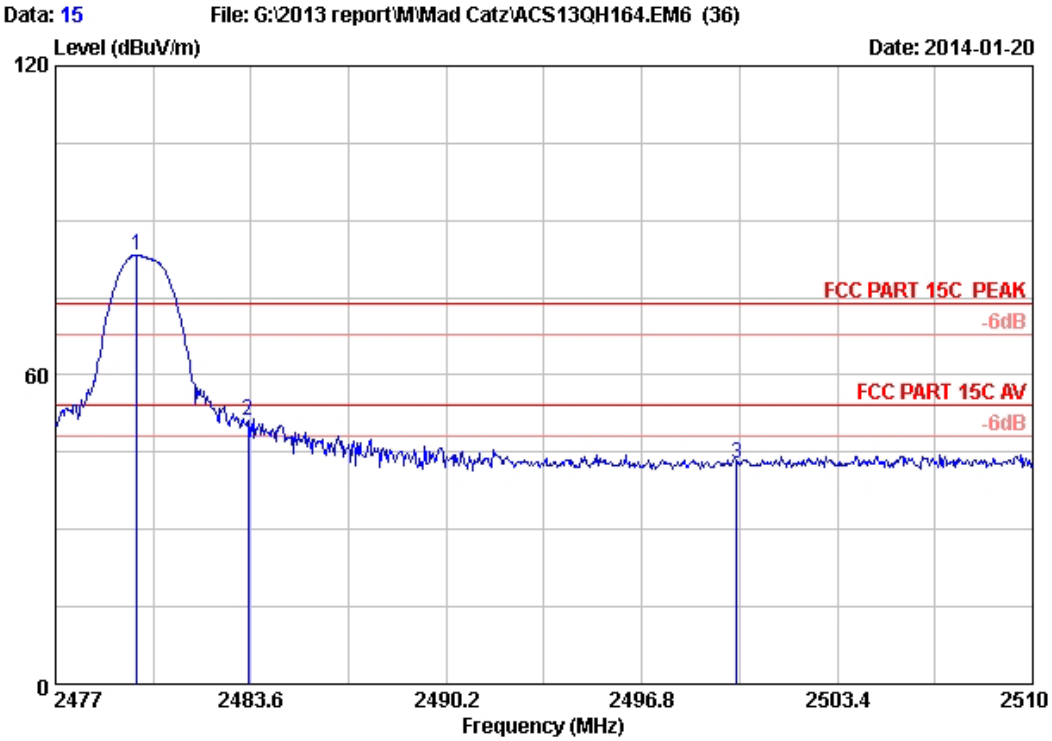
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 6
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Mad Catz Micro C.T.R.L.R
Power supply : DC3V
Test mode : GFSK 2402 Tx Mode
M/N : 32268

	Freq. (MHz)	Ant. Factor (dB/m)	Cable loss (dB)	Amp. Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2390.000	28.16	5.78	35.70	45.28	43.52	74.00	30.48	Peak
2	2400.000	28.18	5.80	35.70	54.09	52.37	74.00	21.63	Peak
3	2402.340	28.19	5.80	35.70	83.58	81.87	74.00	-7.87	Peak

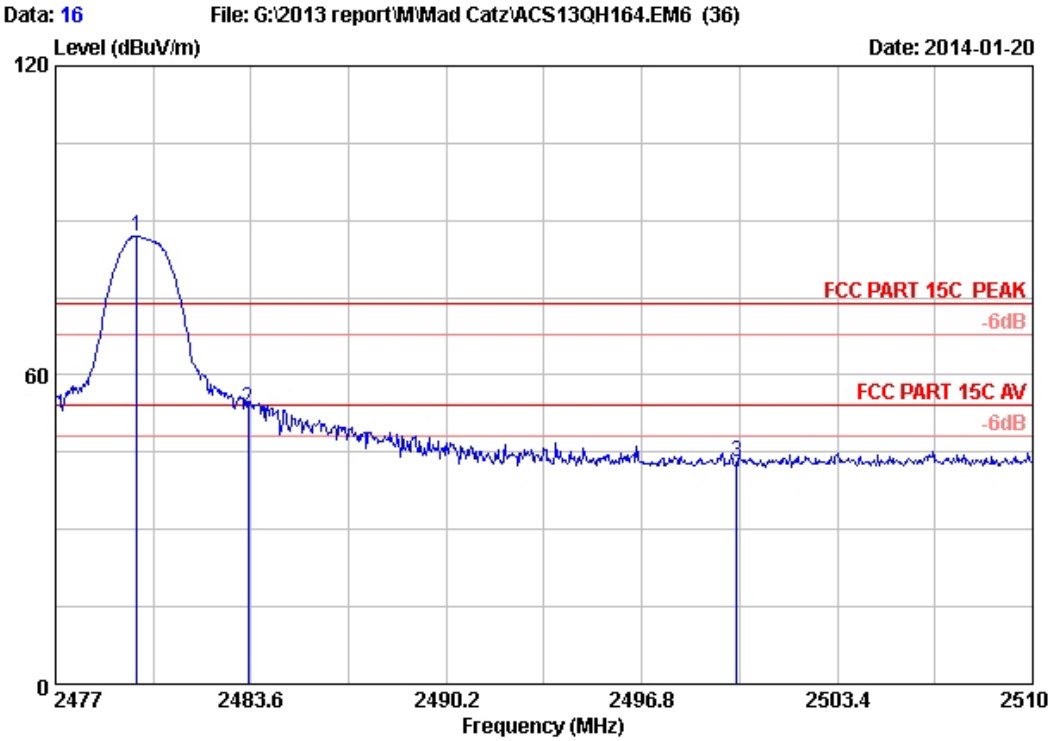
Remarks:
1. Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 3m Chamber Data no. : 15
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Mad Catz Micro C.T.R.L.R
Power supply : DC3V
Test mode : GFSK 2480 Tx Mode
M/N : 32268

	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	2479.739	28.36	5.91	35.70	84.75	83.32	74.00	-9.32	Peak
2	2483.500	28.36	5.92	35.70	52.72	51.30	74.00	22.70	Peak
3	2500.000	28.40	5.94	35.70	44.27	42.91	74.00	31.09	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.



Site no. : 3m Chamber Data no. : 16
Dis. / Ant. : 3m 2013 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 23*C/54% Engineer : Leo-Li
EUT : Mad Catz Micro C.T.R.L.R
Power supply : DC3V
Test mode : GFSK 2480 Tx Mode
M/N : 32268

	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	2479.739	28.36	5.91	35.70	88.35	86.92	74.00	-12.92	Peak
2	2483.500	28.36	5.92	35.70	55.04	53.62	74.00	20.38	Peak
3	2500.000	28.40	5.94	35.70	44.32	42.96	74.00	31.04	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.

9. POWER SPECTRAL DENSITY TEST

9.1.Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	Agilent	N9030A	MY51380221	Oct.31, 13	1Year
2.	Amp	HP	8449B	3008A08495	May.08, 13	1 Year
3.	Horn Antenna	EMCO	3115	9510-4580	May.28,13	1 Year
4.	HF Cable	Hubersuhne	Sucoflex104	-	May.08, 13	1 Year

9.2.Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

9.3.Test Procedure

1. Connected the EUT's antenna port to spectrum analyzer device by 20dB attenuator.

2. Set the test frequency as center frequency, Set RBW=3KHz,VBW=10KHz,Span large enough capture the entire frequency, Read out maximum peak level frequency

3. Set the span to 1.5 times of the DTS Bandwidth Detector= Peak; Sweep time= Auto Couple; Trace Mode= Max hold.

4. Allow trace to fully stabilize use the peak marker function to determine the maximum amplitude level within the RBW.

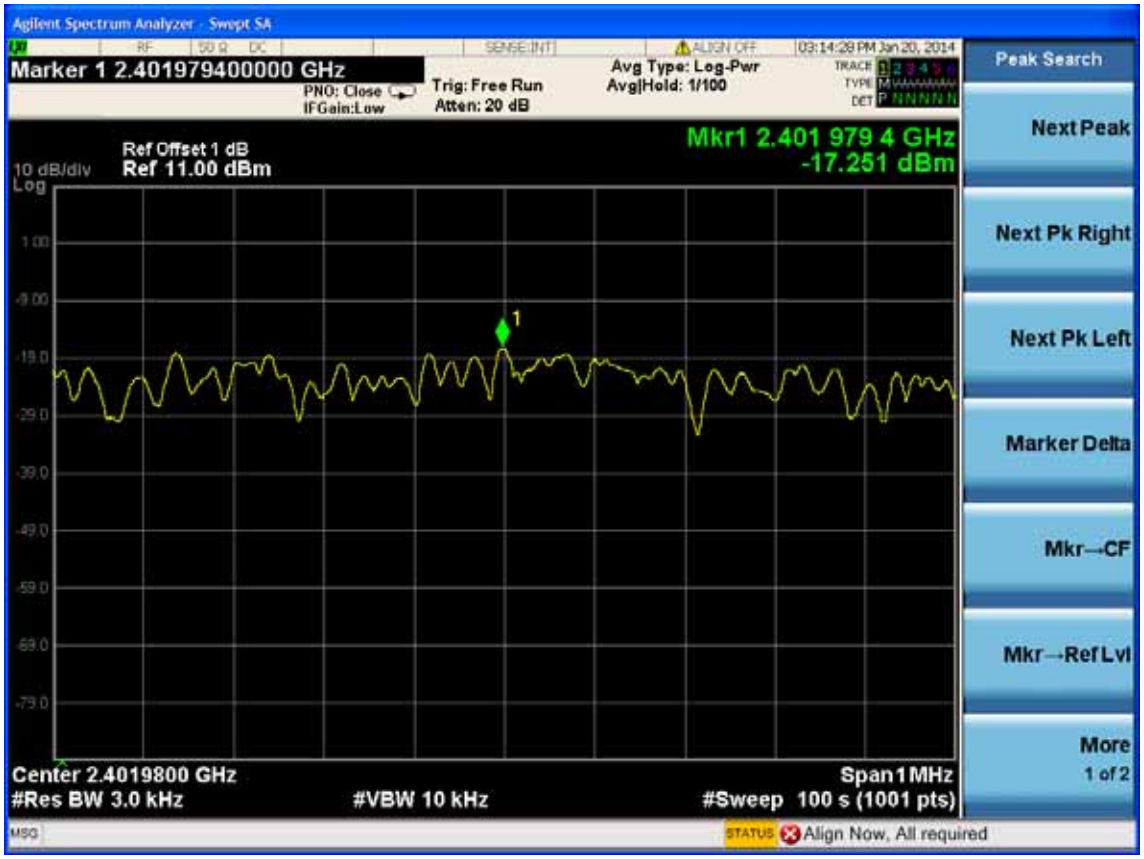
Note: The cable loss and attenuator loss were offset into measure device as an amplitude

9.4.Test Results

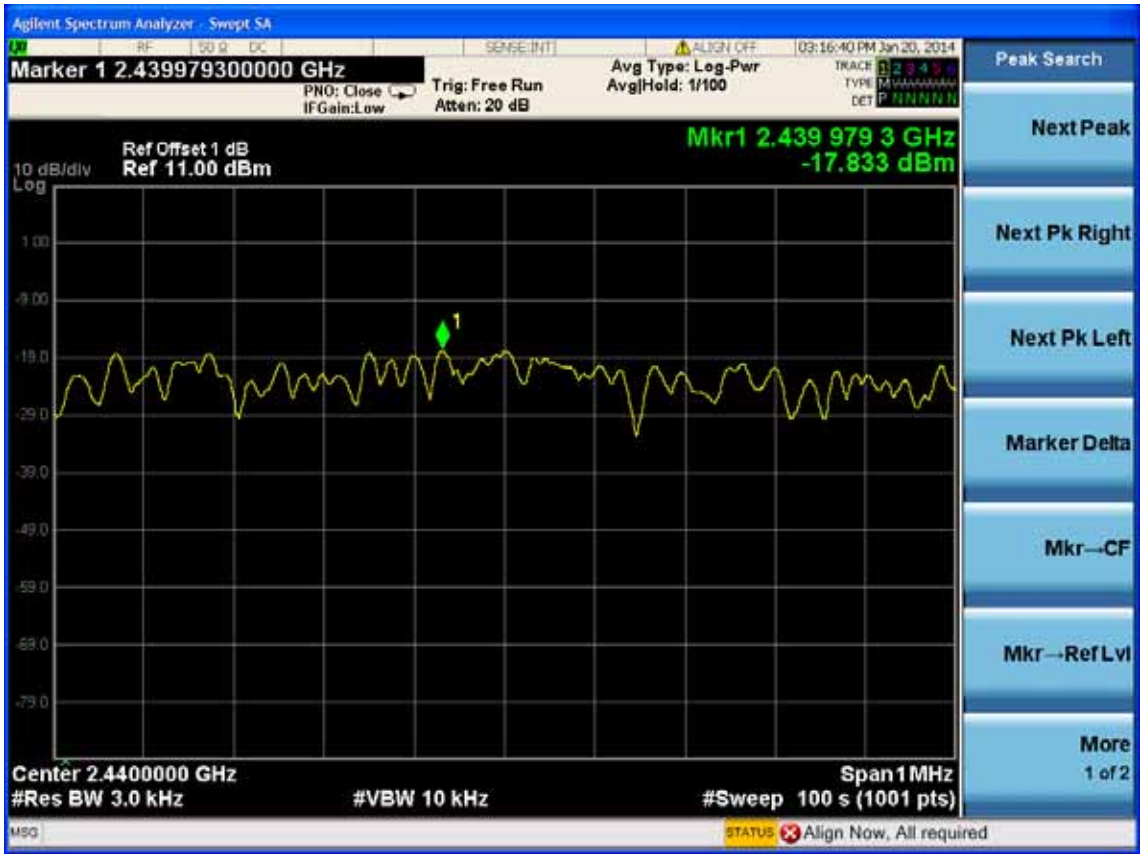
EUT: Mad Catz Micro C.T.R.L.R		
M/N: 32268		
Test date: 2014-01-21	Pressure: 101.8±1.0kpa	Humidity: 52.7 ±3.0%
Tested by: Eric_ Lv	Test site: RF site	Temperature: 22.3±0.6℃

Cable loss: 1 dB			
Test Mode	CH (MHz)	Power density（dBm/3KHz）	Limit (dBm/3KHz)
GFSK	2402	-17.251	8
	2440	-17.833	8
	2480	-16.334	8
Conclusion：PASS			

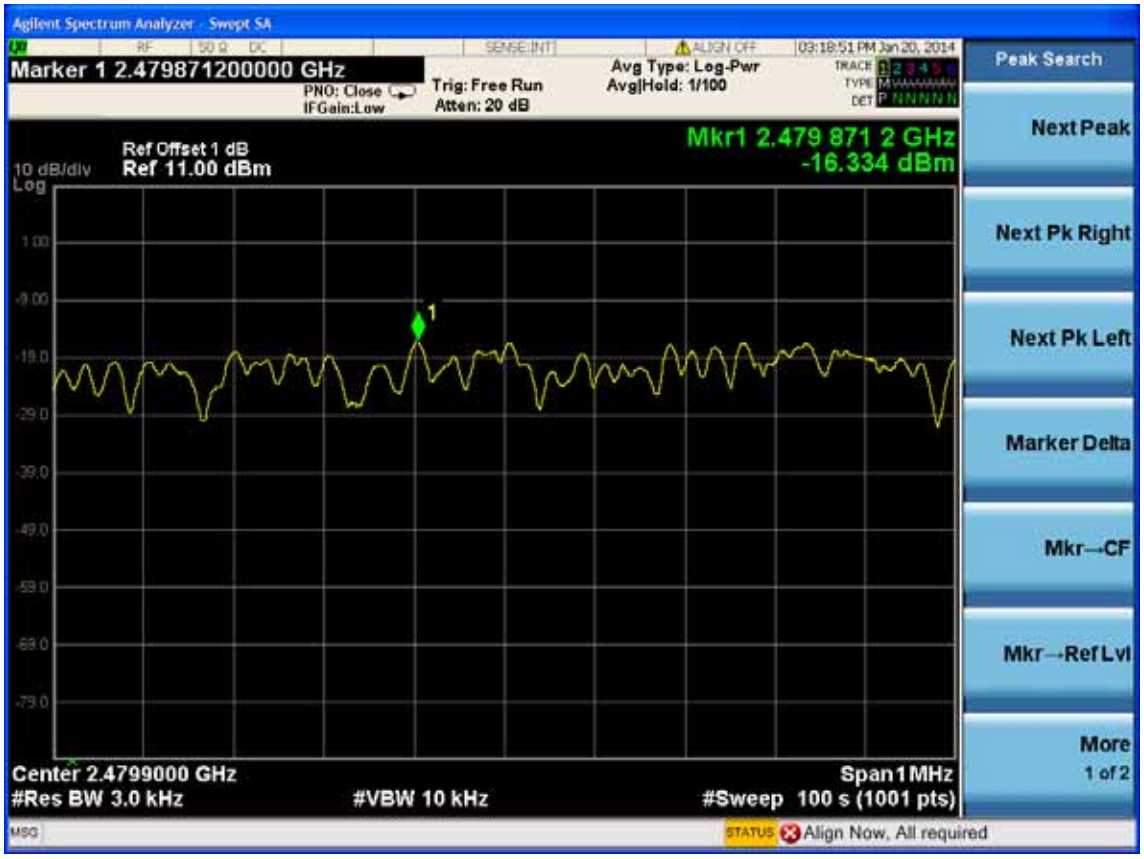
2402MHz



2440MHz



2480MHz


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.479871200000 GHz
PNO: Close
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 1/100
03:18:51 PM Jan 20, 2014
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 2.479 871 2 GHz
-16.334 dBm
Center 2.4799000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 1 MHz
#Sweep 100 s (1001 pts)
Align Now, All required

10. DEVIATION TO TEST SPECIFICATIONS

[NONE]