



FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

PlayJam Ltd

Bluetooth HID Controller

Model Number: PJGS2358

FCC ID: 2AATXBWPJ2358

Prepared for : PlayJam Ltd
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Date of Report : Aug.20, 2013

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TEST REPORT CERTIFICATION

Applicant : PlayJam Ltd
Manufacturer : Berway Technology Ltd
EUT Description : Bluetooth HID Controller
FCC ID : 2AATXBWPJ2358
(A) MODEL NO. : PJGS2358
(B) Brand Name : N/A
(C) POWER SUPPLY : DC 5V
(D) TEST VOLTAGE : DC 5V From Adapter Input AC 120V/60Hz

Tested for comply with:
FCC Rules and Regulations Part 15 Subpart C: 2012
Test procedure used:
ANSI C63.10: 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 : May.31~Jun.20, 2013 Report of date: Aug.20, 2013

Prepared by : Sherry Zhuo Reviewed by : Sunny Lu
Sherry Zhuo / Assistant Sunny Lu / Assistant Manager

Approved & Authorized Signer :

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 820

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 | PASS |
| Radiated Emission Test | FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.10 :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 |
| 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)

| | |
|-----------------------|---|
| EUT name | : Bluetooth HID Controller |
| Model Number | : PJGS2358 |
| Adapter | : Manufacture: DongGuan Yingna Electronic Technology Co., Ltd , M/N: PSEA050150U USB2 |
| USB Cable | : Unshielded, Detachable, 1.0m |
| Radio | Bluetooth V2.1+EDR |
| Operation frequency | Bluetooth 2402-2480MHz |
| Channel Number | Bluetooth: 79 channels |
| Modulation Technology | GFSK, $\pi/4$ DQPSK, 8-DPSK Note: $\pi/4$ DQPSK modulation is same type modulation with 8-DPSK, and according exploratory test, 8-DPSK will have worse emissions, so the final test were only performed with GFSK and 8-DPSK modulation. |
| Antenna Type | : Integrated PCB Antenna, 1.3dBi PK gain |
| Applicant | : PlayJam Ltd 30th Floor, Centre Point Tower, 103 New Oxford Street, London, WC1A 1DD |
| Manufacturer | : Berway Technology Ltd Unit 1301-03, 13/F., No.88 Kwai Cheong Road, Kwai Chung, N.T., Hong Kong |
| Date of Test | : May.31~Jun.20, 2013 |
| Date of Receipt | May.20, 2013 |
| Sample Type | : Prototype production |

2.2. Test information

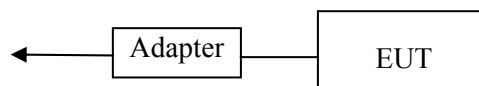
The test software “bluesuite.exe” was used to control EUT work in Continuous TX mode, and select test channel.

| 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: CH39 | 2441 |
| | 1 | High: CH78 | 2480 |
| Tx Mode 8-DPSK modulation | 3 | Low :CH 0 | 2402 |
| | 3 | Middle: CH39 | 2441 |
| | 3 | High: CH78 | 2480 |
| Note: $\pi/4$ DQPSK modulation is same type modulation with 8-DPSK, and according exploratory test, 8-DPSK will have worse emissions, so the final test were only performed with GFSK and 8-DPSK modulation. | | | |

2.3. Tested Supporting System Details

| No. | Description | ACS No. | Manufacturer | Model | Serial Number | Approved type |
|-----|-------------|---|--------------|-----------------|---------------|--|
| 1. | GameStick | -- | -- | ARM Cortex A9X2 | -- | <input type="checkbox"/> FCC DoC <input type="checkbox"/> BSMI ID |
| | | USB Cable: Unshielded, Detachable, 1.0m | | | | |

2.4. Block Diagram of Test Setup



(EUT: Bluetooth HID Controller)

2.5. 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-12151-01-01
Valid Date: Feb.01, 2014

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

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

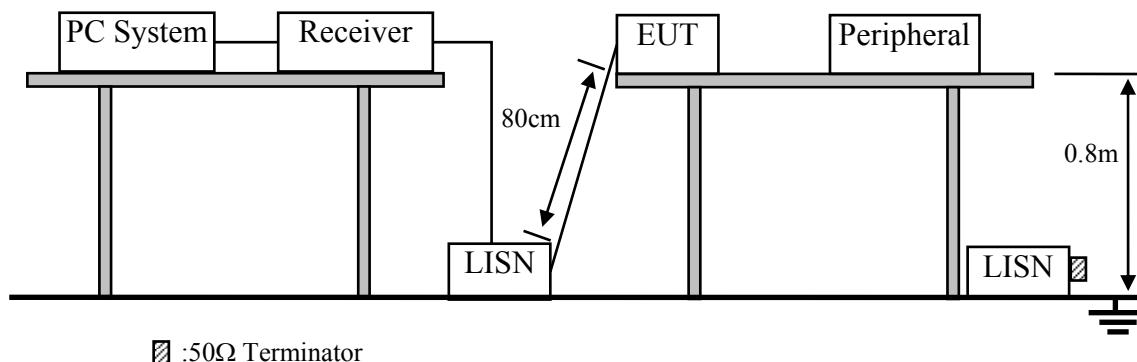
| Test Item | Uncertainty |
|---|---------------------------------|
| Uncertainty for Conduction emission test in No. 1 Conduction | 3.08 dB(9KHz to 150KHz) |
| | 3.10 dB (150KHz to 30MHz) |
| Uncertainty for Radiation Emission test in 3m chamber | 3.22 dB(30~200MHz, Polarize: H) |
| | 3.23 dB(30~200MHz, 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) | 5.04 dB (1~6GHz, Distance: 3m) |
| | 5.06 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°C |
| | 3% |

3. POWER LINE CONDUCTED EMISSION MEASUREMENT

3.1. Test Equipment

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|----------------|-----------------|-----------|------------|------------|---------------|
| 1. | Test Receiver | Rohde & Schwarz | ESHS10 | 838693/001 | Oct.31, 12 | 1 Year |
| 2. | L.I.S.N.#1 | Rohde & Schwarz | ESH2-Z5 | 834066/011 | Oct.31, 12 | 1 Year |
| 3. | L.I.S.N.#3 | Kyoritsu | KNW-242C | 8-1920-1 | May.08, 13 | 1 Year |
| 4. | Terminator | Hubersuhner | 50Ω | No.1 | May.08, 13 | 1 Year |
| 5. | Terminator | Hubersuhner | 50Ω | No.2 | May.08, 13 | 1 Year |
| 6. | RF Cable | Fujikura | 3D-2W | No.1 | May.08, 13 | 1Year |
| 7. | Coaxial Switch | Anritsu | MP59B | M50564 | May.08, 13 | 1 Year |
| 8. | Pulse Limiter | Rohde & Schwarz | ESH3-Z2 | 100341 | May.08, 13 | 1 Year |

3.2. Block Diagram of Test Setup



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. Bluetooth HID Controller (EUT)

Model Number : PJGS2358

Serial Number : N/A

3.5. Operating Condition of EUT

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

3.5.2. Turn on the power of all equipment.

3.5.3. Let the EUT work in test mode (TX Mode & Idle Mode) and measure it.

3.6. Test Procedure

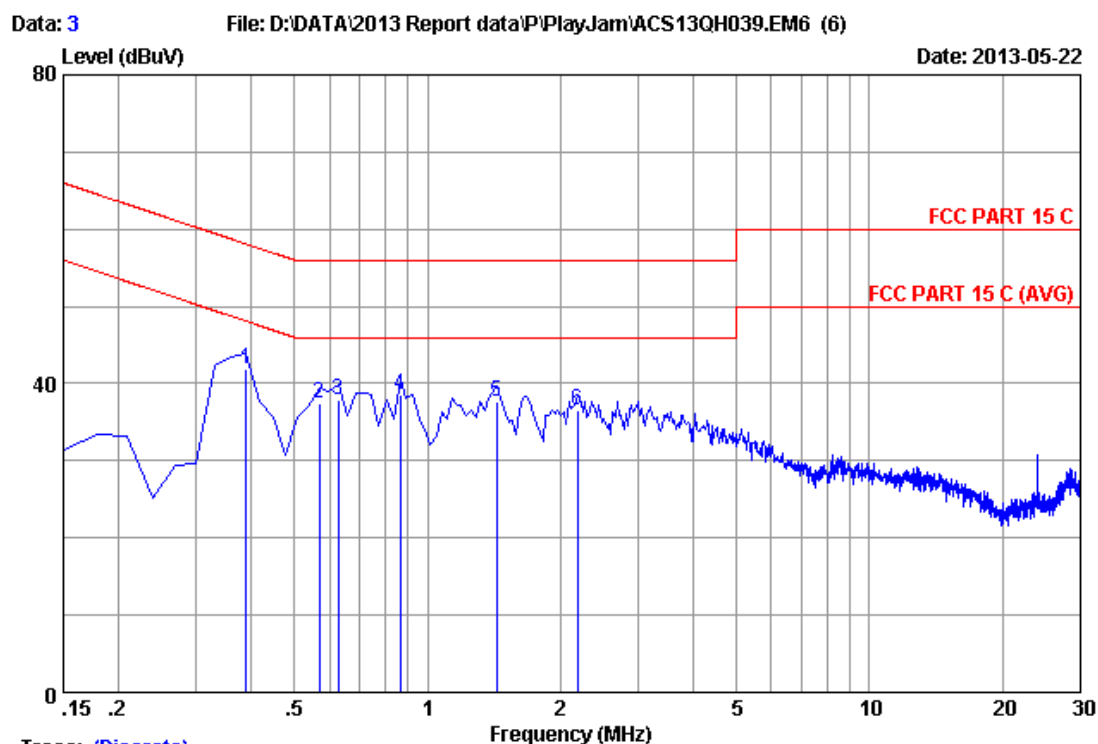
The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4-2009 on conducted Emission test.

The bandwidth of test receiver (R&S TEST RECEIVER ESHS10) is set at 9 kHz.

The frequency range from 150kHz to 30MHz is checked. The test result are reported on Section 3.7.

3.7. Conducted Emission at Mains Terminals Test Results

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

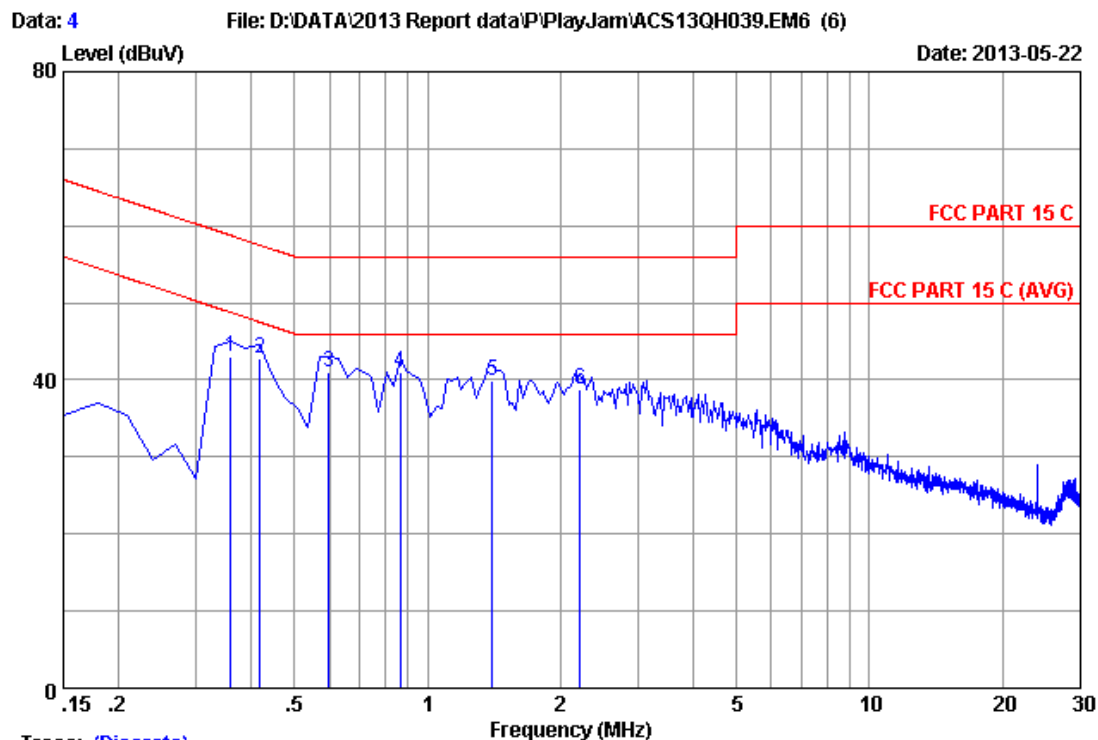


Trace: (Discrete)

Site no :1#conduction Data No :3
Dis./Ant. :** 2012 ESH2-Z5 LINE
Limit :FCC PART 15 C
Env./Ins. :23.5°C/65% Engineer :Alan_Chen
EUT :Bluetooth HID Controller
Power Rating :DC 5V From Adapter Input AC 120V/60Hz
Test Mode :Tx Mode
M/N:PJGS2358

| No | Freq (MHz) | LISN Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV) | Limits (dBuV) | Margin (dB) | Remark |
|----|---------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|--------|
| 1 | 0.38880 | 0.19 | 0.00 | 41.79 | 41.98 | 58.09 | 16.11 | QP |
| 2 | 0.56790 | 0.19 | 0.00 | 37.25 | 37.44 | 56.00 | 18.56 | QP |
| 3 | 0.62760 | 0.20 | 0.00 | 37.65 | 37.85 | 56.00 | 18.15 | QP |
| 4 | 0.86640 | 0.21 | 0.00 | 38.32 | 38.53 | 56.00 | 17.47 | QP |
| 5 | 1.434 | 0.22 | 0.00 | 37.48 | 37.70 | 56.00 | 18.30 | QP |
| 6 | 2.180 | 0.24 | 0.00 | 36.24 | 36.48 | 56.00 | 19.52 | 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.


Trace: (Discrete)

Site no :1#conduction Data No :4
 Dis./Ant. : ** 2012 ESH2-Z5 NEUTRAL
 Limit :FCC PART 15 C
 Env./Ins. :23.5°C/65% Engineer :Alan_Chen
 EUT :Bluetooth HID Controller
 Power Rating :DC 5V From Adapter Input AC 120V/60Hz
 Test Mode :Tx Mode
 M/N:PJGS2358

| No | Freq (MHz) | LISN Factor (dB) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV) | Limits (dBuV) | Margin (dB) | Remark |
|----|---------------|------------------------|-----------------------|-------------------|-----------------------------|------------------|----------------|--------|
| 1 | 0.35895 | 0.22 | 0.00 | 42.89 | 43.11 | 58.75 | 15.64 | QP |
| 2 | 0.41800 | 0.23 | 0.00 | 42.60 | 42.83 | 57.49 | 14.66 | QP |
| 3 | 0.59775 | 0.24 | 0.00 | 40.87 | 41.11 | 56.00 | 14.89 | QP |
| 4 | 0.86640 | 0.24 | 0.00 | 40.86 | 41.10 | 56.00 | 14.90 | QP |
| 5 | 1.404 | 0.26 | 0.00 | 39.56 | 39.82 | 56.00 | 16.18 | QP |
| 6 | 2.210 | 0.29 | 0.00 | 38.56 | 38.85 | 56.00 | 17.15 | 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 MEASUREMENT

4.1. Test Equipment

Frequency rang: 30~1000MHz

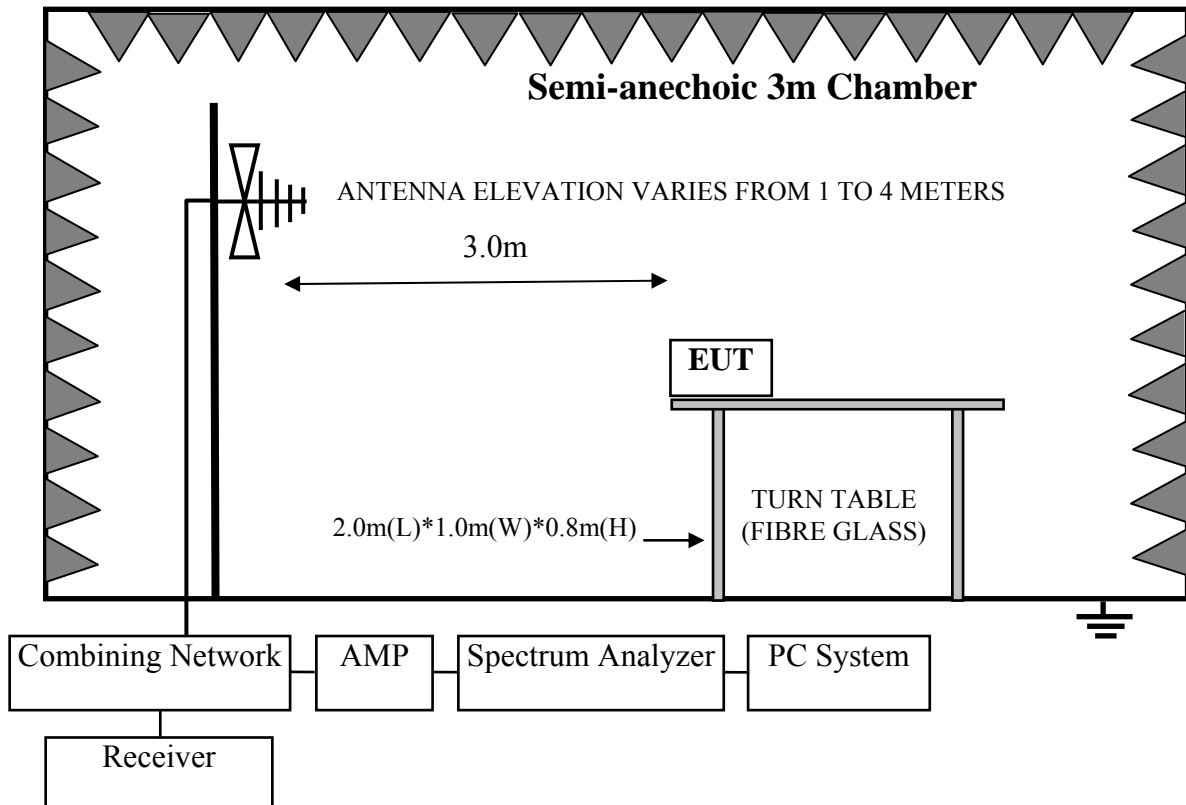
| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|----------------|-----------------|---------------|-----------------|------------|---------------|
| 1 | 3#Chamber | AUDIX | N/A | N/A | Nov.24,12 | 1 Year |
| 2 | EMI Spectrum | Agilent | E4407B | MY41440292 | 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 | Schaffner | CBL6111C | 2598 | Mar.14,13 | 1 Year |
| 6 | RF Cable | MIYAZAKI | CFD400-N L | 3# Chamber No.1 | May.08, 13 | 1 Year |
| 7 | Coaxial Switch | Anritsu | MP59B | M74389 | May.08, 13 | 1 Year |

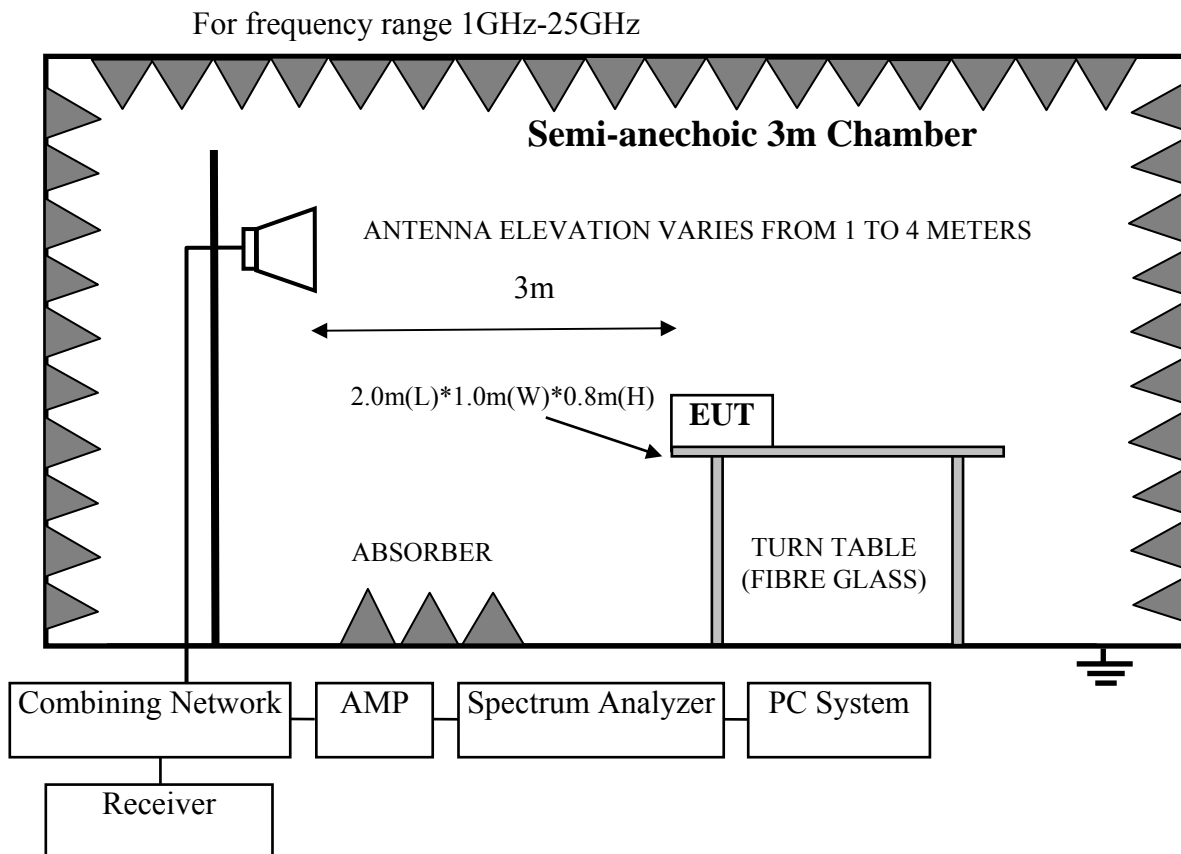
4.1.1. For frequency range 1GHz~25GHz (In 3m Anechoic Chamber)

| 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 | 9607-4877 | Aug.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 | 00060088 | June.05,13 | 1 Year |

4.2. Block Diagram of Test Setup

For frequency range 30MHz-1000MHz





4.3. Radiated Emission Limit Standard: FCC 15.209

| 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) | |

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. Bluetooth HID Controller (EUT)

Model Number : PJGS2358
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 an 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

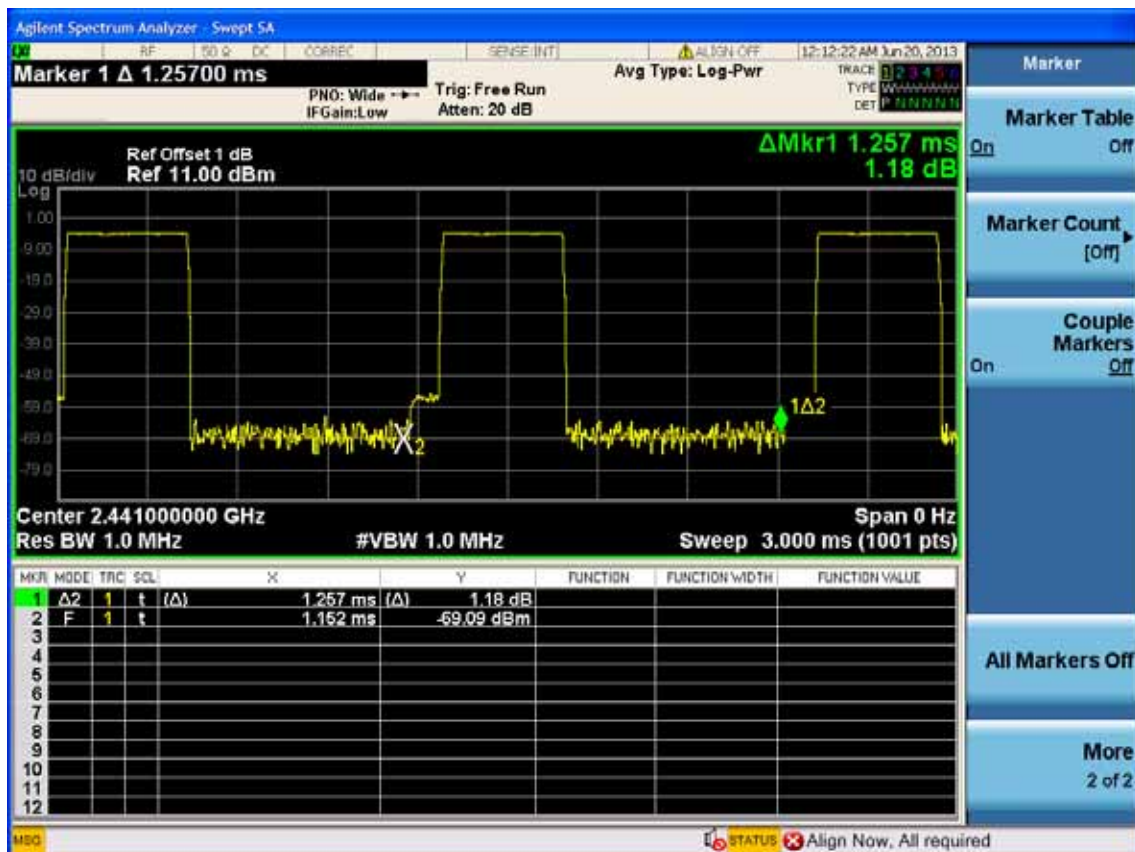
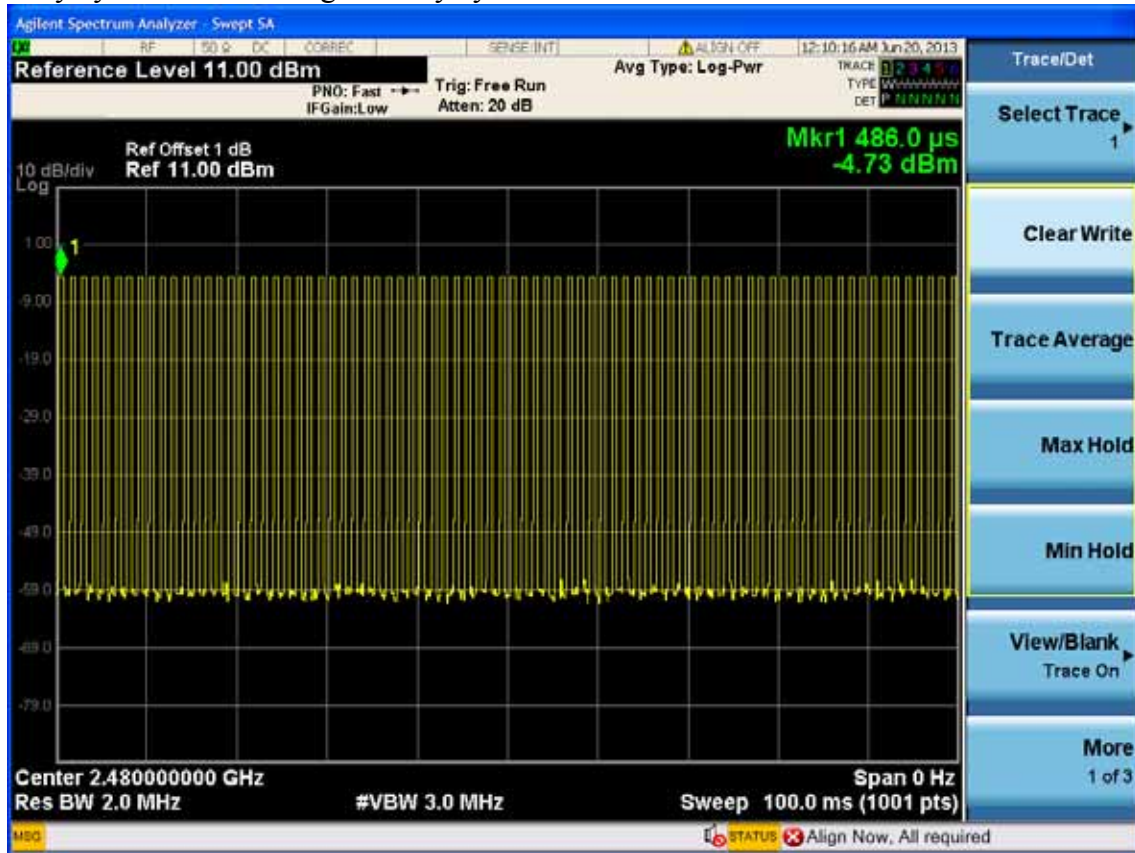
PASS.

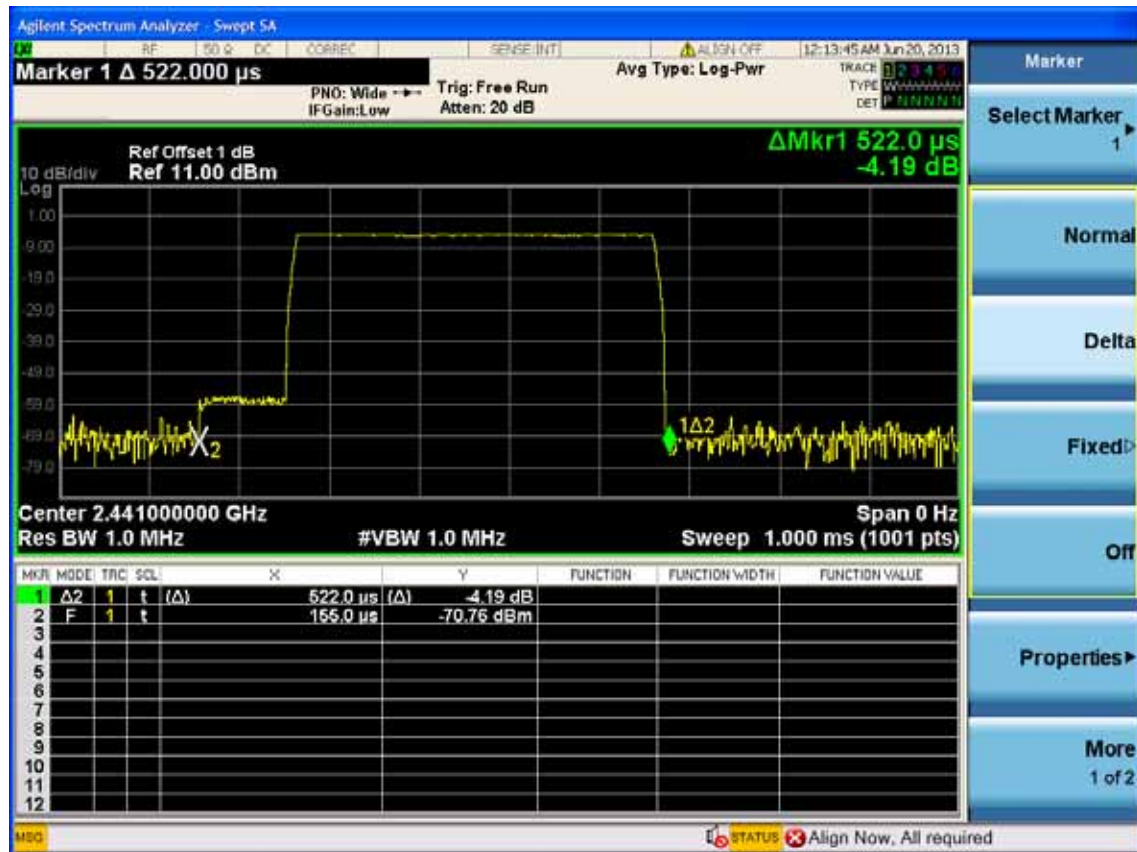
All the emissions from 30MHz to 25GHz were comply with the 15.209 Limit.

Note: The duty cycle factor for calculate average level is 7.63dB, 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: $0.522 \text{ ms} / 1.257 \text{ ms} * 100\% = 41.53\%$

Duty cycle factor = $20 \log (1/\text{duty cycle}) = 7.63$



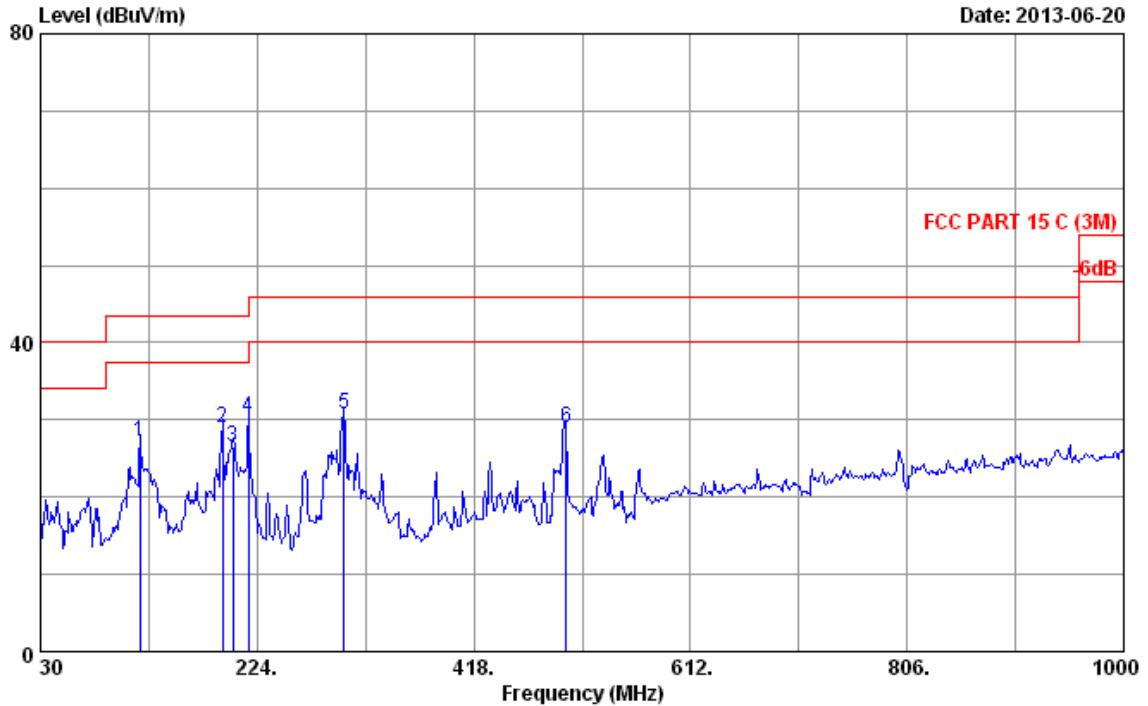


Frequency: 30MHz~1GHz

Data: 2

File: E:\2013 Report Data\P\PlayJam\ACS13Qh039.EM6 (6)

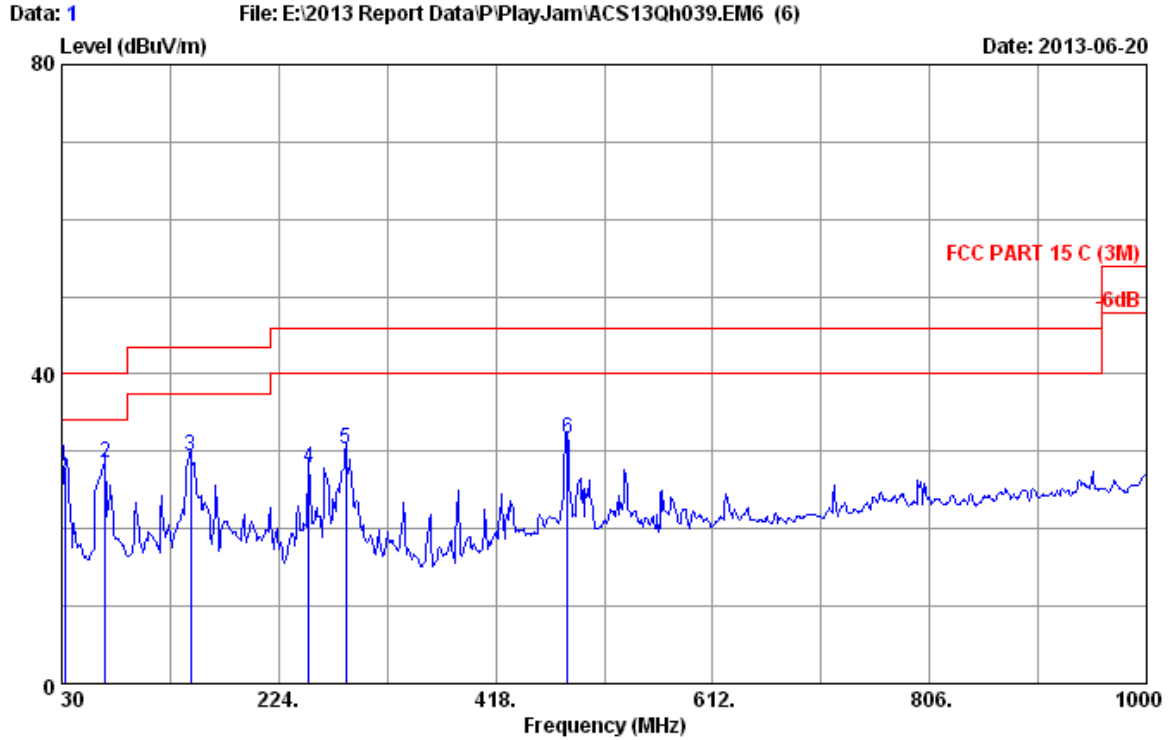
Date: 2013-06-20



Site no. : 3m Chamber Data no. : 2
 Dis. / Ant. : 3m 2013 CBL6111C 2598 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 C (3M)
 Env. / Ins. : 24°C/65% Engineer : Leo_Li
 EUT : Bluetooth HID Controller
 Power rating : DC 5V From Adapter Input AC 120V/60Hz
 Test Mode : Tx Mode
 M/N:PJGS2358

| No. | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 119.240 | 12.10 | 1.48 | 13.52 | 27.10 | 43.50 | 16.40 | QP |
| 2 | 192.960 | 9.45 | 1.76 | 17.81 | 29.02 | 43.50 | 14.48 | QP |
| 3 | 202.660 | 10.05 | 1.80 | 14.75 | 26.60 | 43.50 | 16.90 | QP |
| 4 | 216.240 | 10.05 | 1.85 | 18.32 | 30.22 | 46.00 | 15.78 | QP |
| 5 | 301.600 | 13.63 | 2.17 | 14.88 | 30.68 | 46.00 | 15.32 | QP |
| 6 | 500.450 | 18.31 | 2.75 | 7.81 | 28.87 | 46.00 | 17.13 | 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 Data no. : 1
Dis. / Ant. : 3m 2013 CBL6111C 2598 Ant. pol. : VERTICAL
Limit : FCC PART 15 C (3M)
Env. / Ins. : 24°C/65% Engineer : Leo_Li
EUT : Bluetooth HID Controller
Power rating : DC 5V From Adapter Input AC 120V/60Hz
Test Mode : Tx Mode
M/N:PJGS2358

| No. | Freq. (MHz) | Ant. Factor (dB/m) | Cable Loss (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|-----|----------------|--------------------------|-----------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 32.910 | 18.31 | 0.88 | 8.90 | 28.09 | 40.00 | 11.91 | QP |
| 2 | 68.800 | 6.56 | 1.27 | 20.75 | 28.58 | 40.00 | 11.42 | QP |
| 3 | 145.430 | 12.10 | 1.58 | 15.69 | 29.37 | 43.50 | 14.13 | QP |
| 4 | 251.160 | 12.82 | 1.98 | 13.15 | 27.95 | 46.00 | 18.05 | QP |
| 5 | 284.140 | 13.28 | 2.11 | 14.89 | 30.28 | 46.00 | 15.72 | QP |
| 6 | 482.020 | 17.78 | 2.70 | 11.11 | 31.59 | 46.00 | 14.41 | QP |

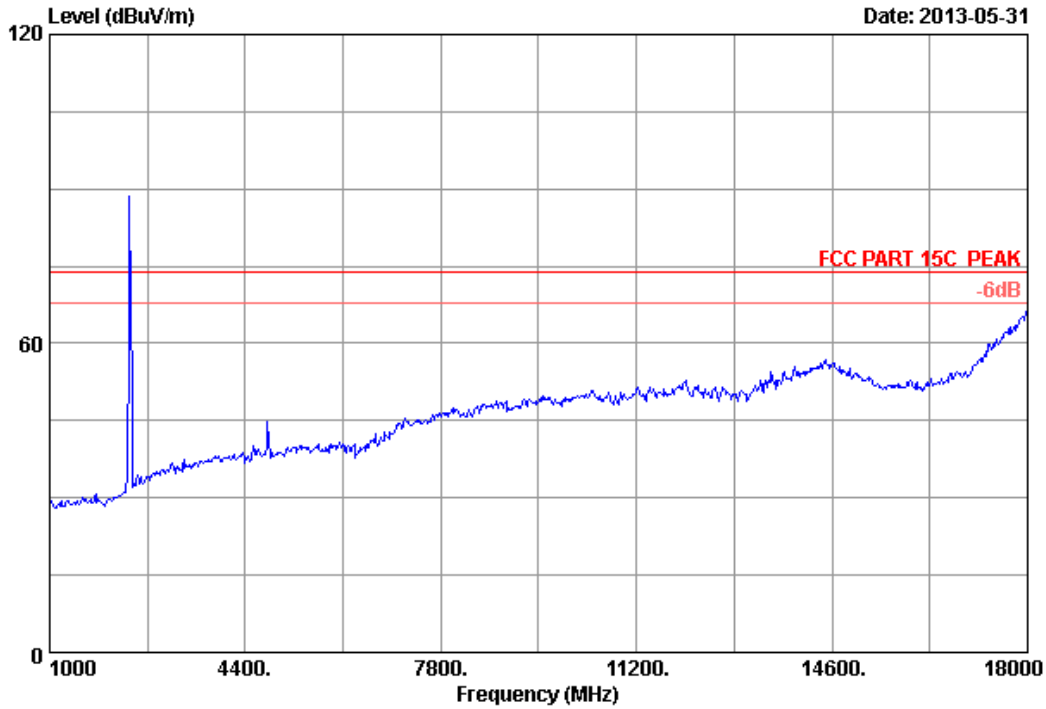
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Frequency: 1GHz~18GHz GFSK

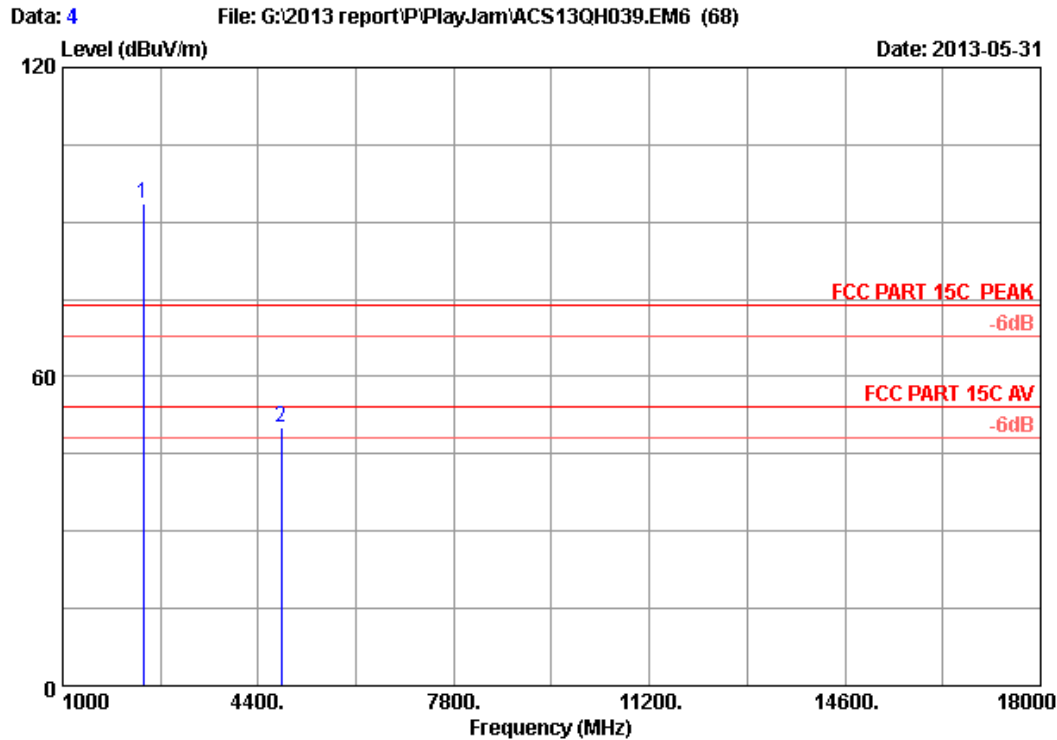
Data: 3

File: G:\2013 report\PI\PlayJam\ACS13QH039.EM6 (68)

Date: 2013-05-31



Site no. : 3m Chamber Data no. : 3
Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
EUT : Bluetooth HID Controller
Power supply : DC 5V From Adapter Input AC120V/60Hz
Test mode : Tx Mode GFSK 2402MHz
M/N : PJGS2358
:

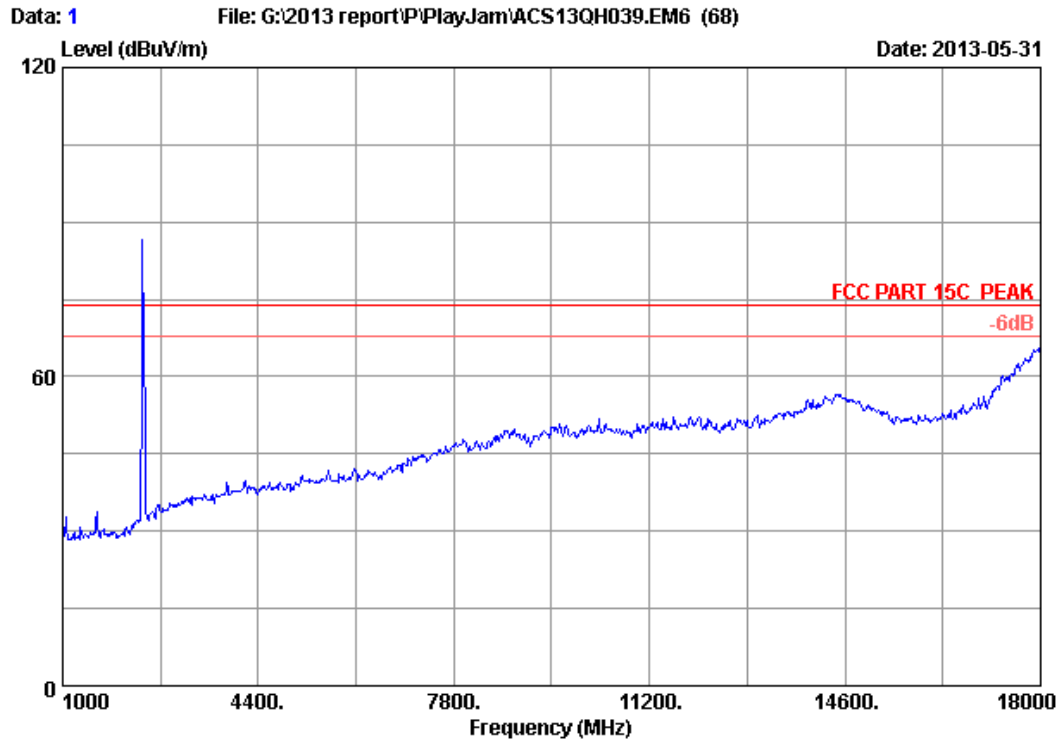


Site no. : 3m Chamber Data no. : 4
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode GFSK 2402MHz
 M/N : PJGS2358
 :

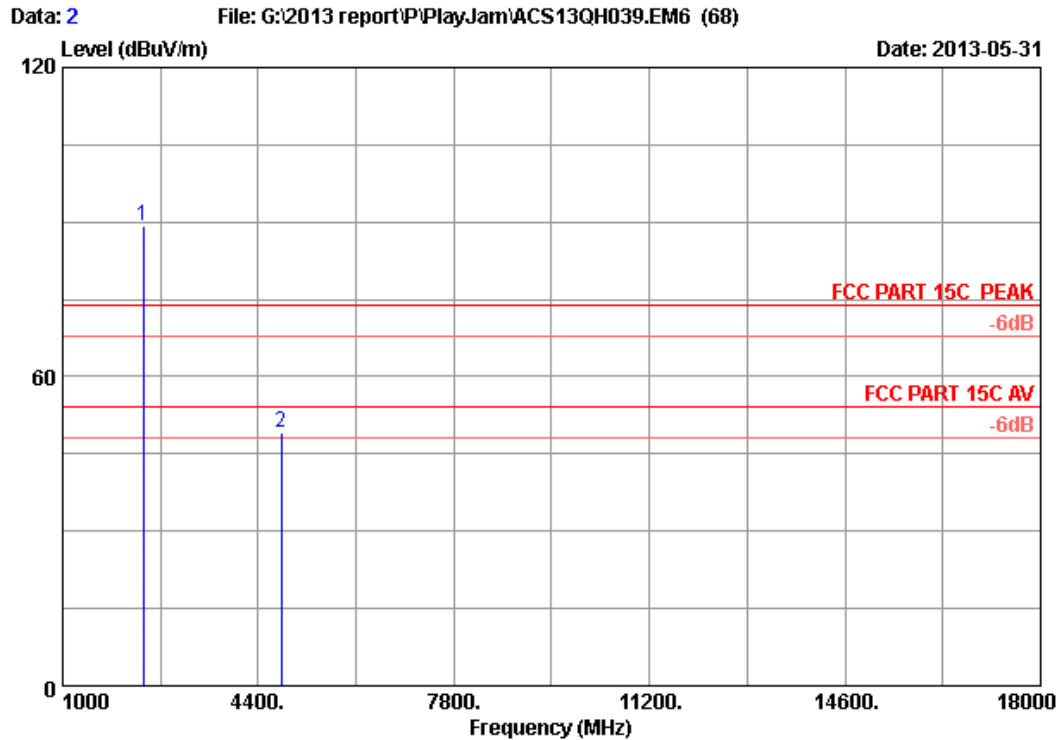
| | Freq. (MHz) | Ant. Factor (dB/m) | Cable loss (dB) | Amp. Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------------|--------------------------|-----------------------|------------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2402.000 | 26.77 | 6.02 | 35.92 | 96.80 | 93.67 | 74.00 | -19.67 | Peak |
| 2 | 4804.000 | 32.47 | 8.67 | 35.72 | 44.87 | 50.29 | 74.00 | 23.71 | Peak |

Remarks:

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



Site no. : 3m Chamber Data no. : 1
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode GFSK 2402MHz
 M/N : PJGS2358
 :

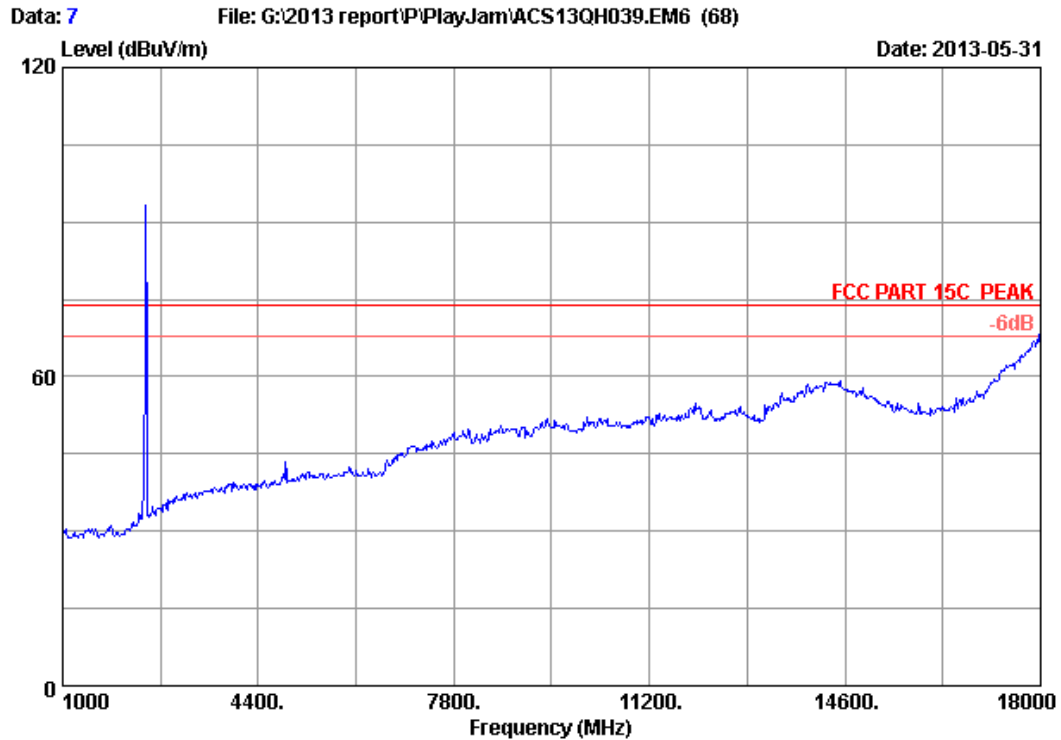


Site no. : 3m Chamber Data no. : 2
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode GFSK 2402MHz
 M/N : PJGS2358
 :

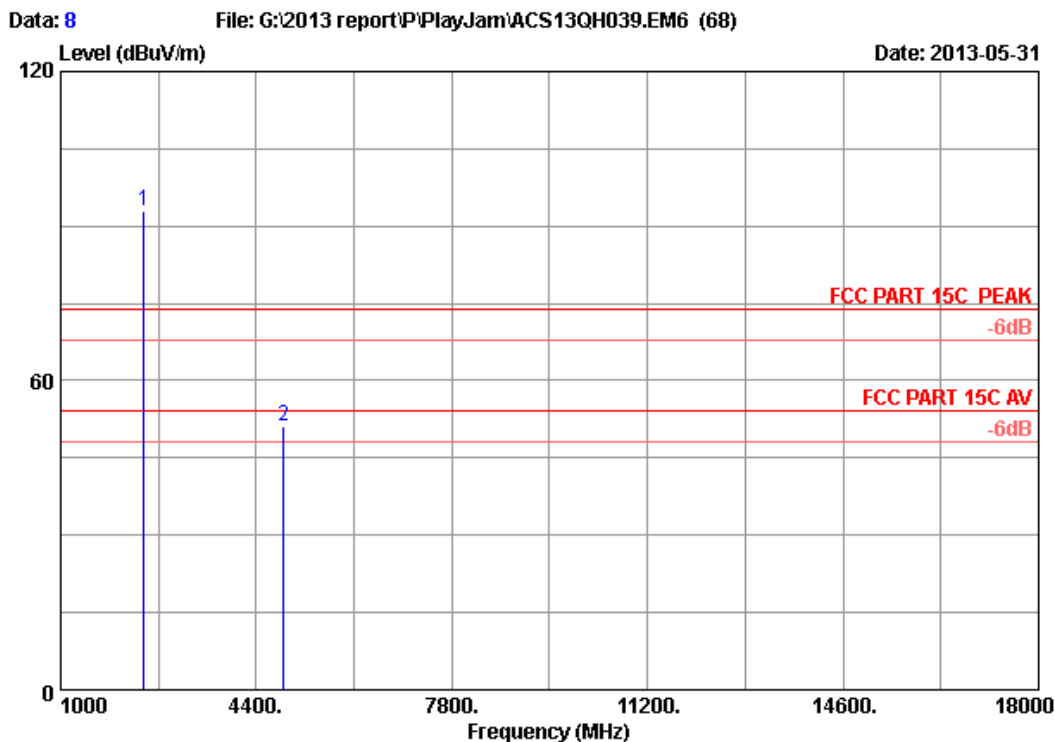
| | Freq. (MHz) | Ant. Factor (dB/m) | Cable loss (dB) | Amp. Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------------|--------------------------|-----------------------|------------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2402.000 | 26.77 | 6.02 | 35.92 | 92.53 | 89.40 | 74.00 | -15.40 | Peak |
| 2 | 4804.000 | 32.47 | 8.67 | 35.72 | 43.72 | 49.14 | 74.00 | 24.86 | Peak |

Remarks:

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



Site no. : 3m Chamber Data no. : 7
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode GFSK 2441MHz
 M/N : PJGS2358
 :

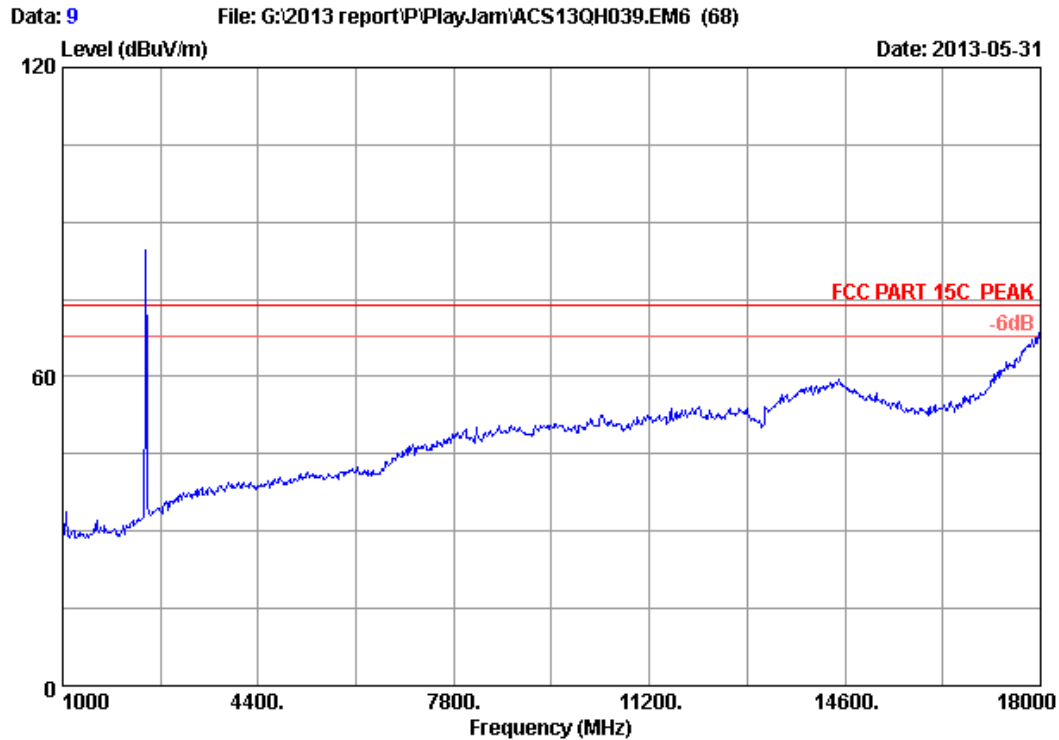


Site no. : 3m Chamber Data no. : 8
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode GFSK 2441MHz
 M/N : PJGS2358
 :

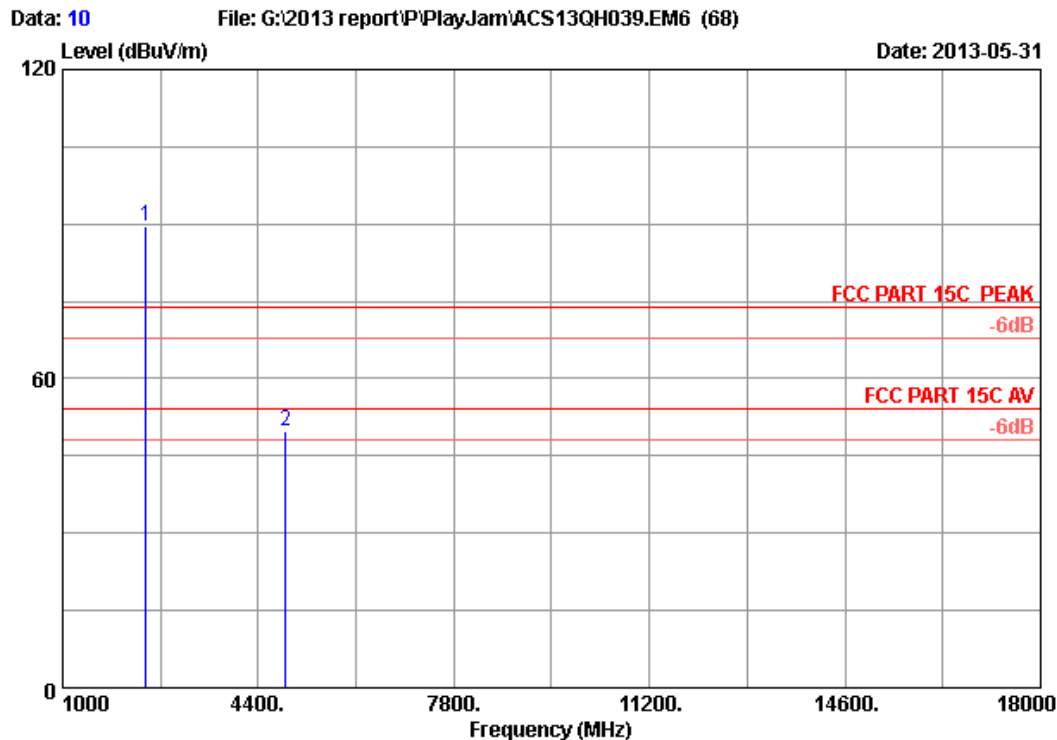
| | Freq. (MHz) | Ant. Factor (dB/m) | Cable loss (dB) | Amp. Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------------|--------------------------|-----------------------|------------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2441.000 | 27.02 | 6.09 | 35.92 | 95.72 | 92.91 | 74.00 | -18.91 | Peak |
| 2 | 4882.000 | 32.64 | 8.74 | 35.69 | 45.37 | 51.06 | 74.00 | 22.94 | Peak |

Remarks:

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



Site no. : 3m Chamber Data no. : 9
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode GFSK 2441MHz
 M/N : PJGS2358
 :

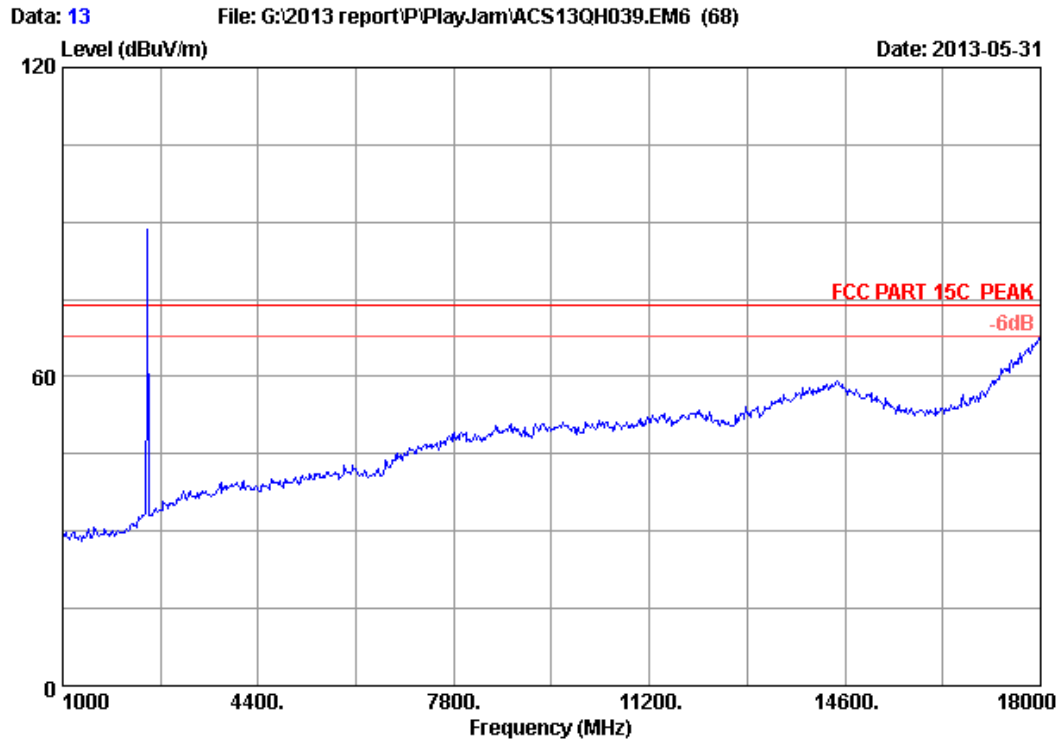


Site no. : 3m Chamber Data no. : 10
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode GFSK 2441MHz
 M/N : PJGS2358
 :

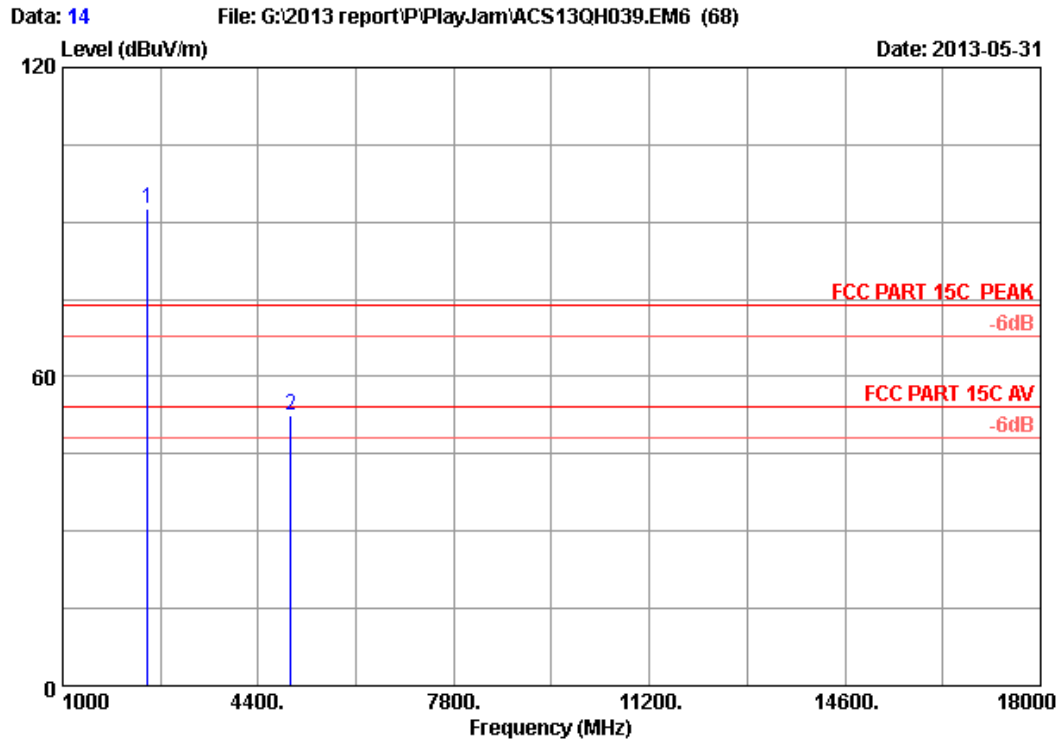
| | Freq. (MHz) | Ant. Factor (dB/m) | Cable loss (dB) | Amp. Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------------|--------------------------|-----------------------|------------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2441.000 | 27.02 | 6.09 | 35.92 | 92.47 | 89.66 | 74.00 | -15.66 | Peak |
| 2 | 4882.000 | 32.64 | 8.74 | 35.69 | 44.04 | 49.73 | 74.00 | 24.27 | Peak |

Remarks:

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



| | | | |
|--------------|--|-----------|--------------|
| Site no. | : 3m Chamber | Data no. | : 13 |
| Dis. / Ant. | : 3m 2012 3115 (4580) | Ant. pol. | : HORIZONTAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 24.2°C/56% | Engineer | : Tony_Yan |
| EUT | : Bluetooth HID Controller | | |
| Power supply | : DC 5V From Adapter Input AC120V/60Hz | | |
| Test mode | : Tx Mode GFSK 2480MHz | | |
| M/N | : PJGS2358 | | |
| | : | | |

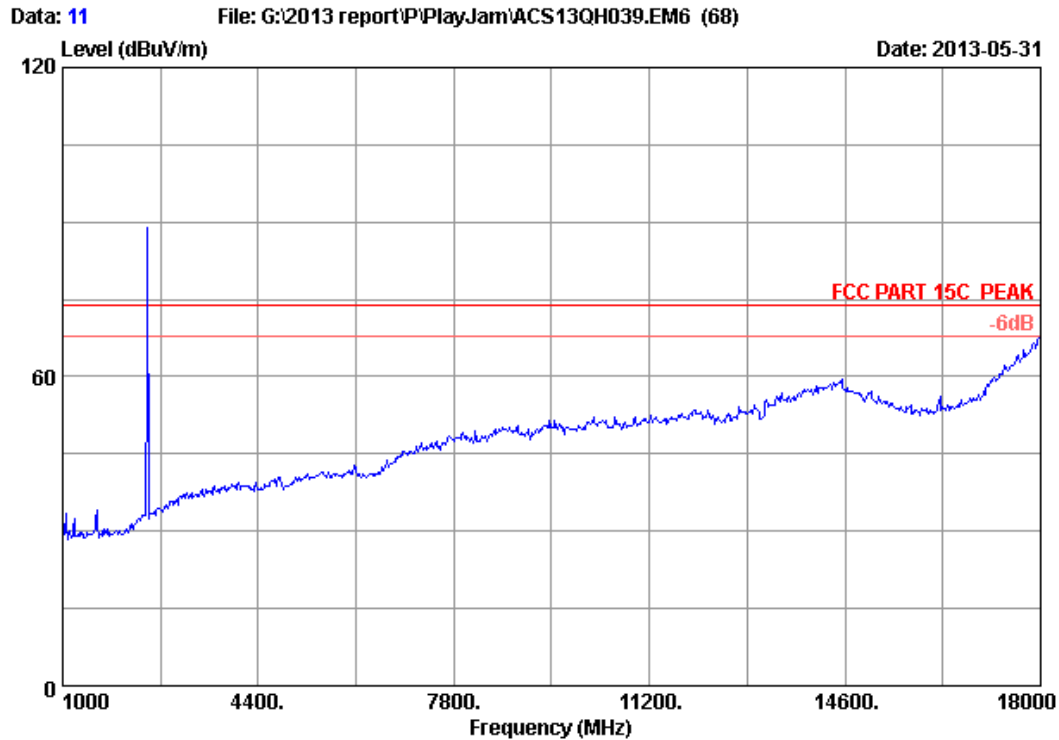


Site no. : 3m Chamber Data no. : 14
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode GFSK 2480MHz
 M/N : PJGS2358
 :

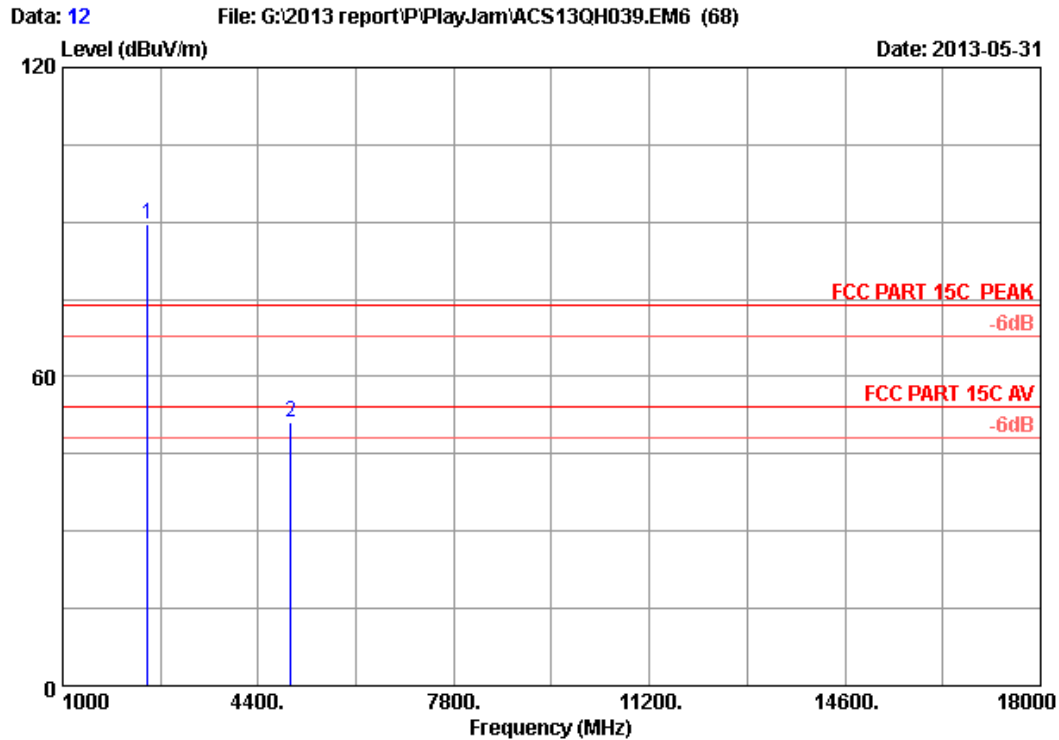
| | Freq. (MHz) | Ant. Factor (dB/m) | Cable loss (dB) | Amp. Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------------|--------------------------|-----------------------|------------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2480.000 | 27.27 | 6.15 | 35.92 | 95.23 | 92.73 | 74.00 | -18.73 | Peak |
| 2 | 4960.000 | 32.81 | 8.81 | 35.66 | 46.66 | 52.62 | 74.00 | 21.38 | Peak |

Remarks:

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



Site no. : 3m Chamber Data no. : 11
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode GFSK 2480MHz
 M/N : PJGS2358
 :



Site no. : 3m Chamber Data no. : 12
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode GFSK 2480MHz
 M/N : PJGS2358
 :

| | 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 | 27.27 | 6.15 | 35.92 | 92.04 | 89.54 | 74.00 | -15.54 | Peak |
| 2 | 4960.000 | 32.81 | 8.81 | 35.66 | 45.06 | 51.02 | 74.00 | 22.98 | Peak |

Remarks:

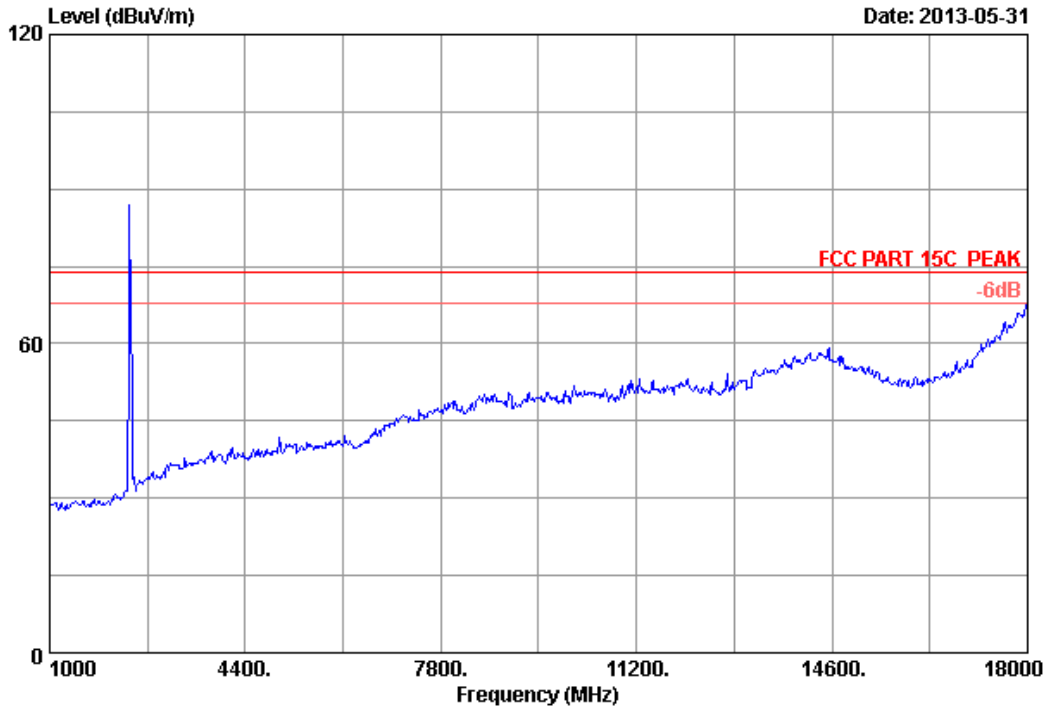
- Emission Level= Antenna Factor + Cable Loss -Amp Factor + Reading.
- The emission levels that are 20dB below the official limit are not reported.

8DPSK

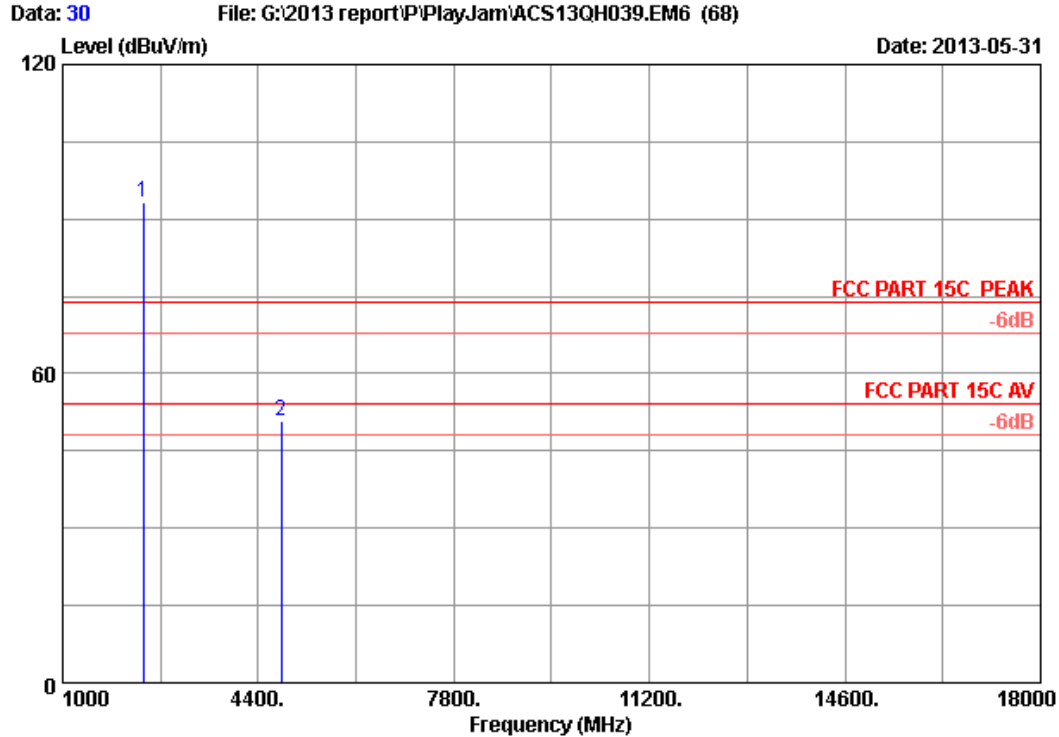
Data: 29

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Date: 2013-05-31



Site no. : 3m Chamber Data no. : 29
Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
EUT : Bluetooth HID Controller
Power supply : DC 5V From Adapter Input AC120V/60Hz
Test mode : Tx Mode 8DPSK 2402MHz
M/N : PJGS2358
:

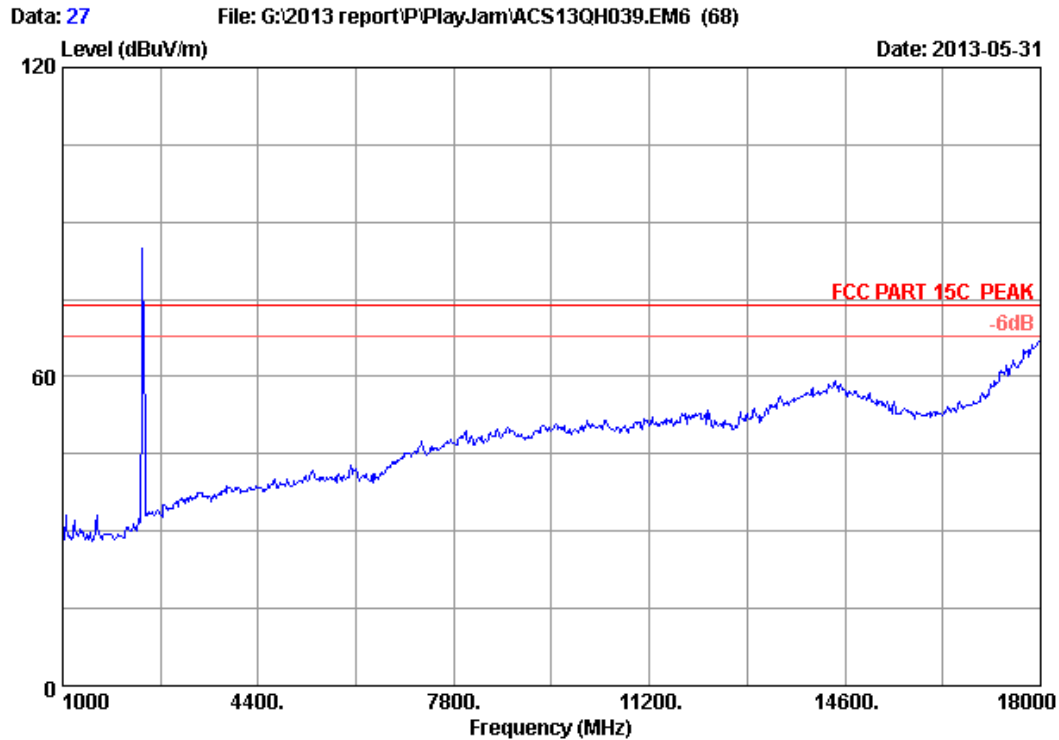


Site no. : 3m Chamber Data no. : 30
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode 8DPSK 2402MHz
 M/N : PJGS2358
 :

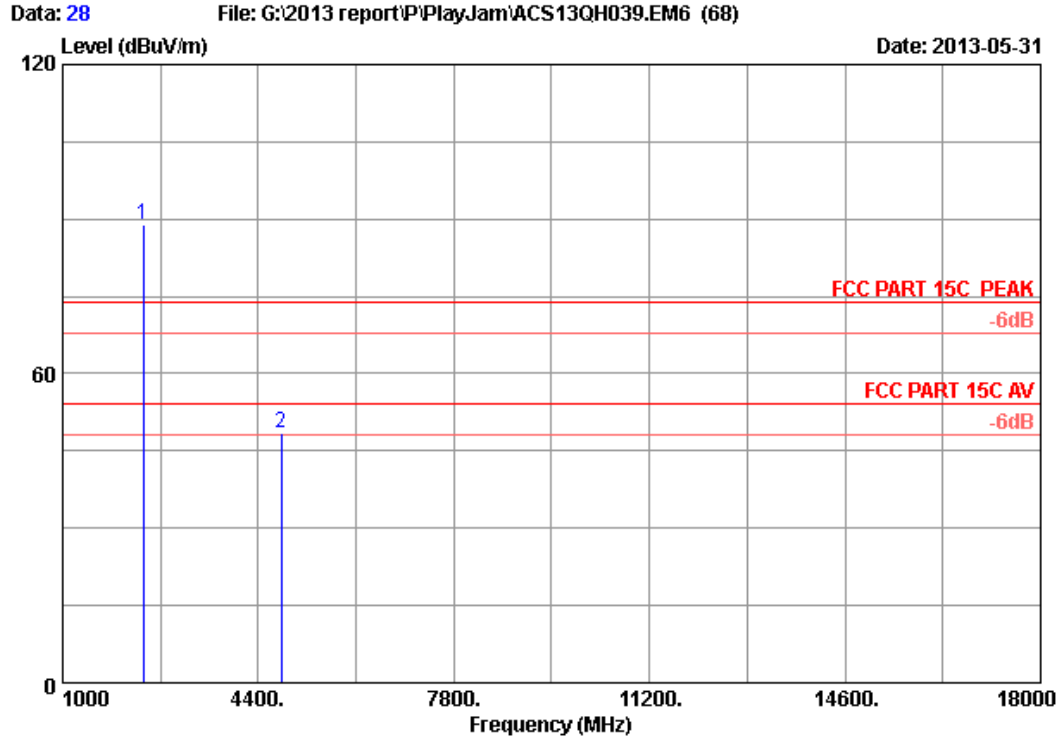
| | Freq. (MHz) | Ant. Factor (dB/m) | Cable loss (dB) | Amp. Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------------|--------------------------|-----------------------|------------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2402.000 | 26.77 | 6.02 | 35.92 | 96.38 | 93.25 | 74.00 | -19.25 | Peak |
| 2 | 4804.000 | 32.47 | 8.67 | 35.72 | 45.46 | 50.88 | 74.00 | 23.12 | Peak |

Remarks:

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



Site no. : 3m Chamber Data no. : 27
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode 8DPSK 2402MHz
 M/N : PJGS2358
 :

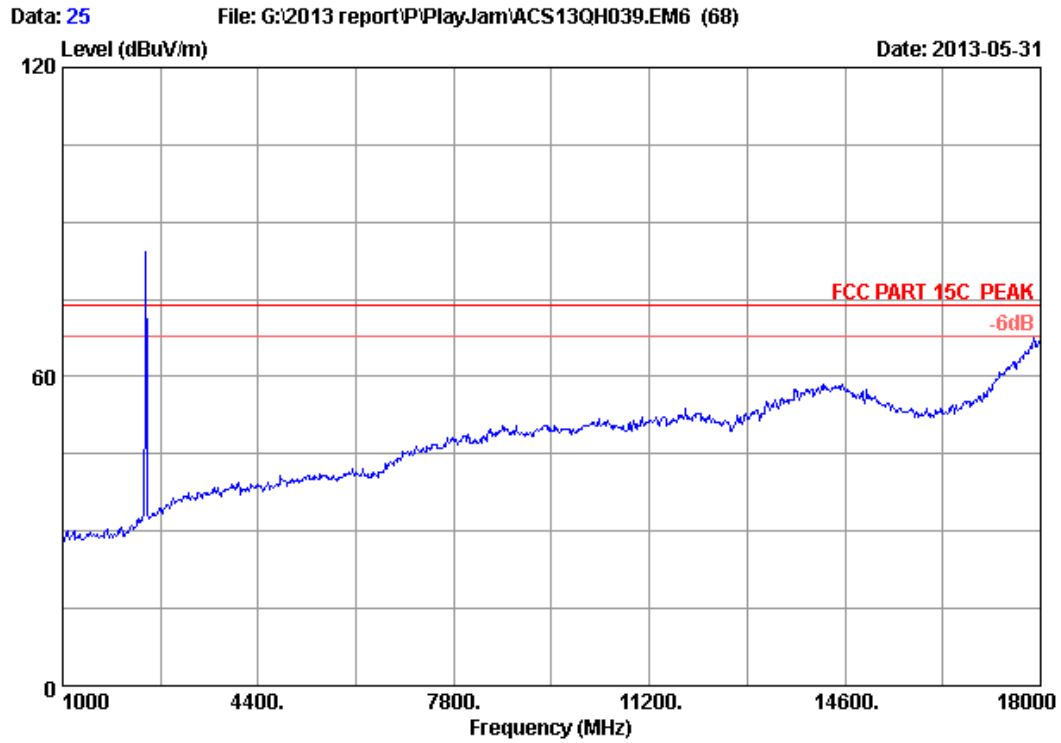


Site no. : 3m Chamber Data no. : 28
Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
EUT : Bluetooth HID Controller
Power supply : DC 5V From Adapter Input AC120V/60Hz
Test mode : Tx Mode 8DPSK 2402MHz
M/N : PJGS2358
:

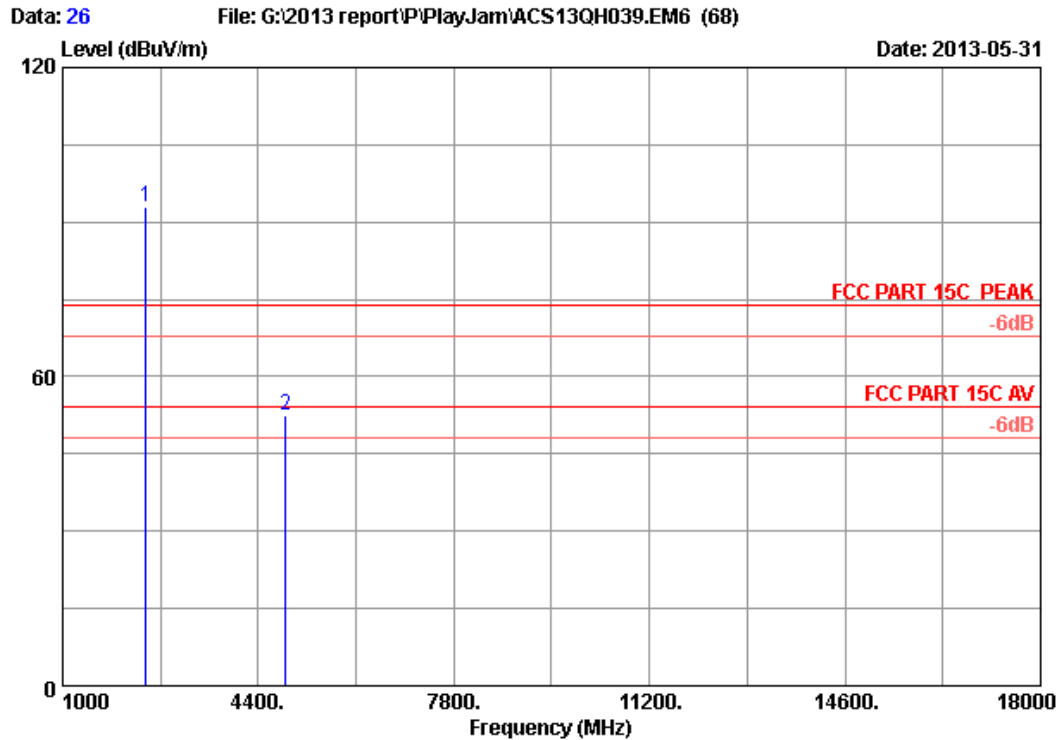
| | Freq. (MHz) | Ant. Factor (dB/m) | Cable loss (dB) | Amp. Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------------|--------------------------|-----------------------|------------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2402.000 | 26.77 | 6.02 | 35.92 | 92.13 | 89.00 | 74.00 | -15.00 | Peak |
| 2 | 4804.000 | 32.47 | 8.67 | 35.72 | 43.12 | 48.54 | 74.00 | 25.46 | Peak |

Remarks:

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



| | | | |
|--------------|--|-----------|--------------|
| Site no. | : 3m Chamber | Data no. | : 25 |
| Dis. / Ant. | : 3m 2012 3115 (4580) | Ant. pol. | : HORIZONTAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 24.2°C/56% | Engineer | : Tony_Yan |
| EUT | : Bluetooth HID Controller | | |
| Power supply | : DC 5V From Adapter Input AC120V/60Hz | | |
| Test mode | : Tx Mode 8DPSK 2441MHz | | |
| M/N | : PJGS2358 | | |
| | : | | |

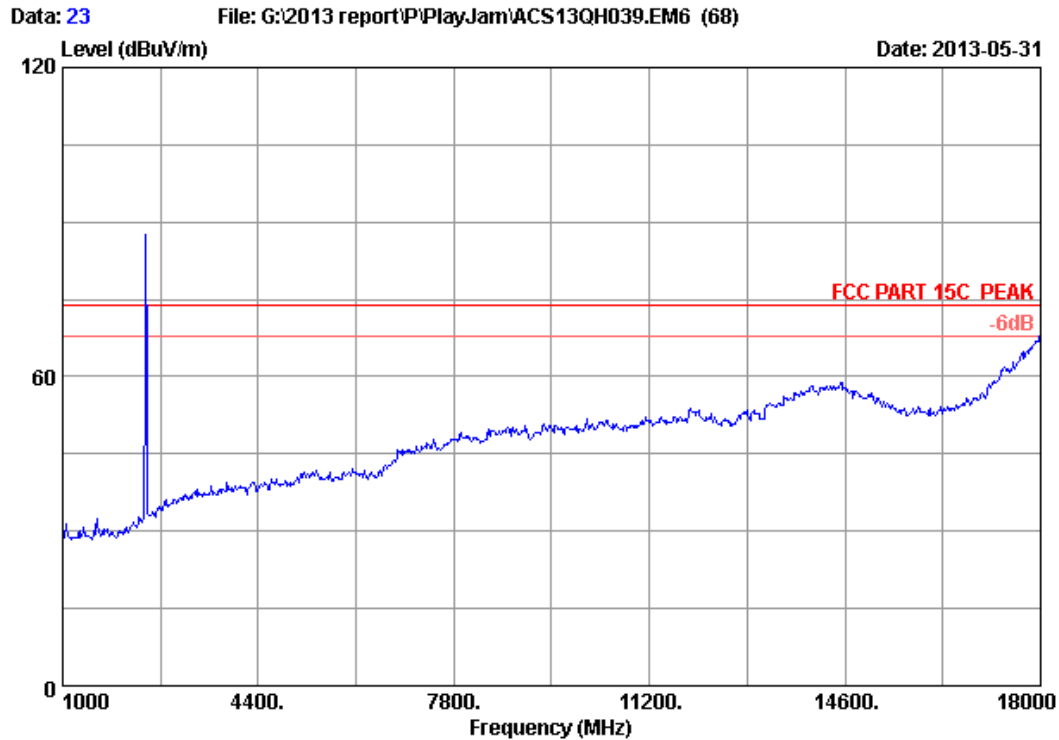


Site no. : 3m Chamber Data no. : 26
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode 8DPSK 2441MHz
 M/N : PJGS2358
 :

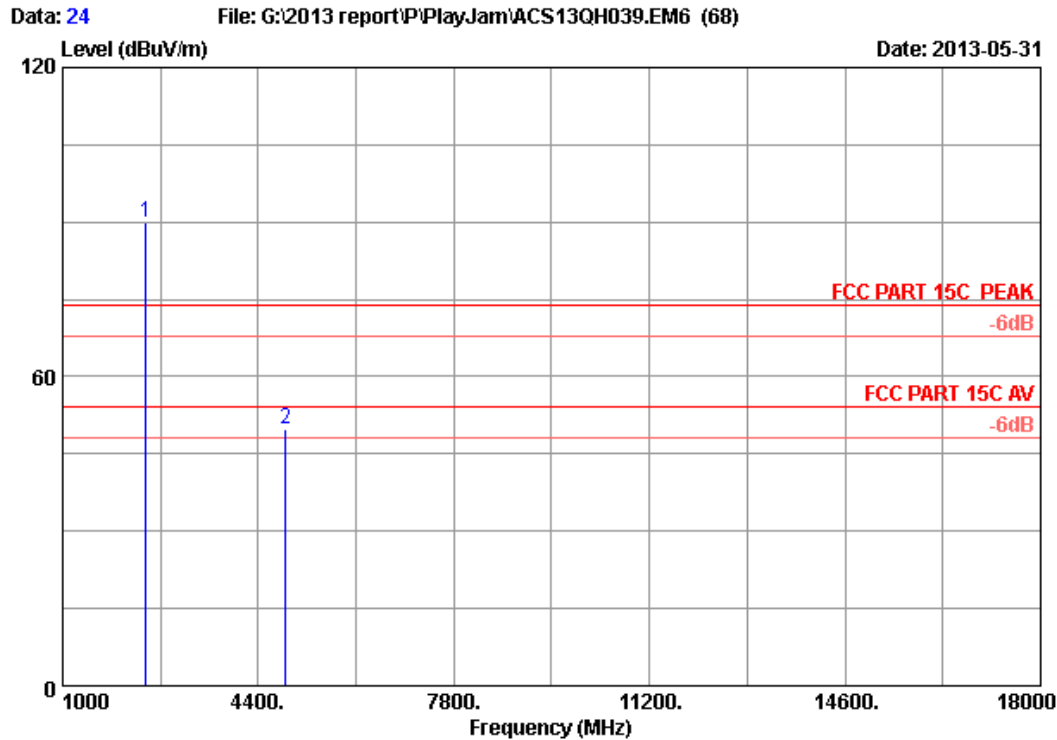
| | Freq. (MHz) | Ant. Factor (dB/m) | Cable loss (dB) | Amp. Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------------|--------------------------|-----------------------|------------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2441.000 | 27.02 | 6.09 | 35.92 | 95.84 | 93.03 | 74.00 | -19.03 | Peak |
| 2 | 4882.000 | 32.64 | 8.74 | 35.69 | 46.68 | 52.37 | 74.00 | 21.63 | Peak |

Remarks:

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



Site no. : 3m Chamber Data no. : 23
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode 8DPSK 2441MHz
 M/N : PJGS2358
 :

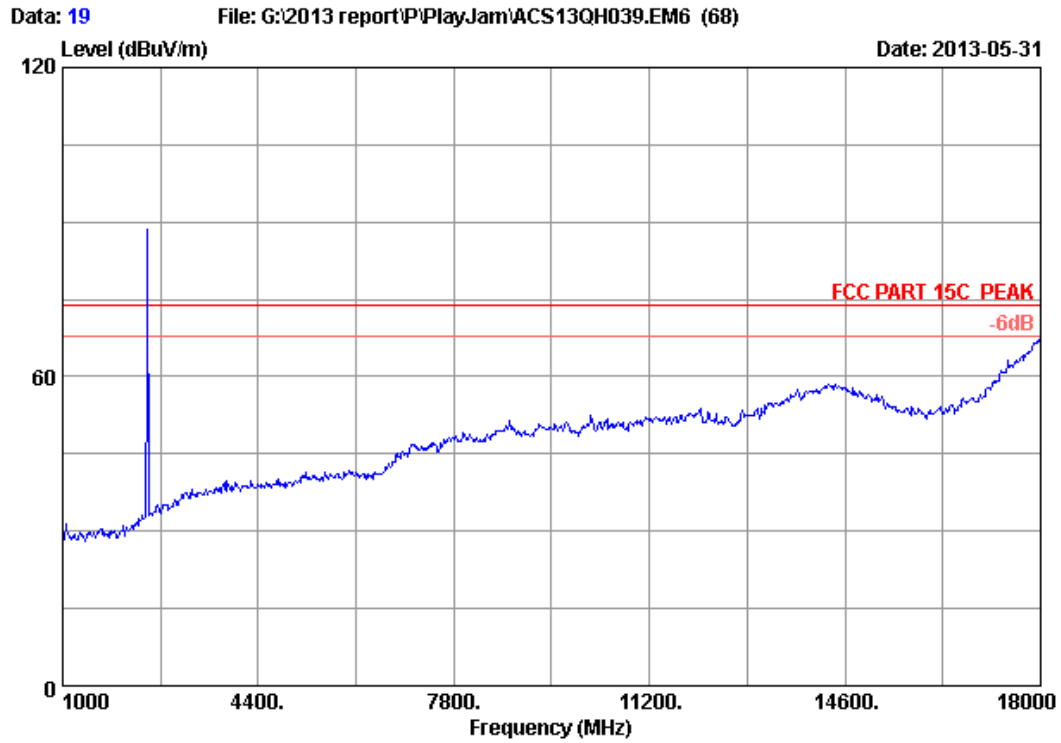


Site no. : 3m Chamber Data no. : 24
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode 8DPSK 2441MHz
 M/N : PJGS2358
 :

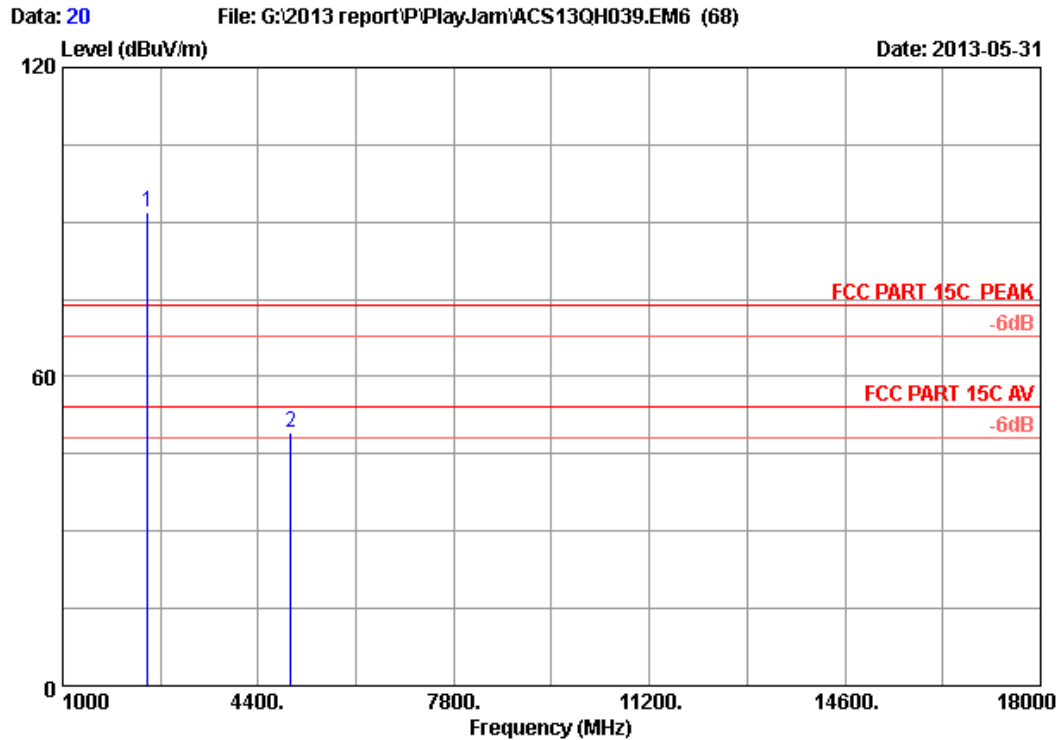
| | Freq. (MHz) | Ant. Factor (dB/m) | Cable loss (dB) | Amp. Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------------|--------------------------|-----------------------|------------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2441.000 | 27.02 | 6.09 | 35.92 | 92.68 | 89.87 | 74.00 | -15.87 | Peak |
| 2 | 4882.000 | 32.64 | 8.74 | 35.69 | 44.26 | 49.95 | 74.00 | 24.05 | Peak |

Remarks:

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



| | | | |
|--------------|--|-----------|--------------|
| Site no. | : 3m Chamber | Data no. | : 19 |
| Dis. / Ant. | : 3m 2012 3115 (4580) | Ant. pol. | : HORIZONTAL |
| Limit | : FCC PART 15C PEAK | | |
| Env. / Ins. | : 24.2°C/56% | Engineer | : Tony_Yan |
| EUT | : Bluetooth HID Controller | | |
| Power supply | : DC 5V From Adapter Input AC120V/60Hz | | |
| Test mode | : Tx Mode 8DPSK 2480MHz | | |
| M/N | : PJGS2358 | | |
| | : | | |

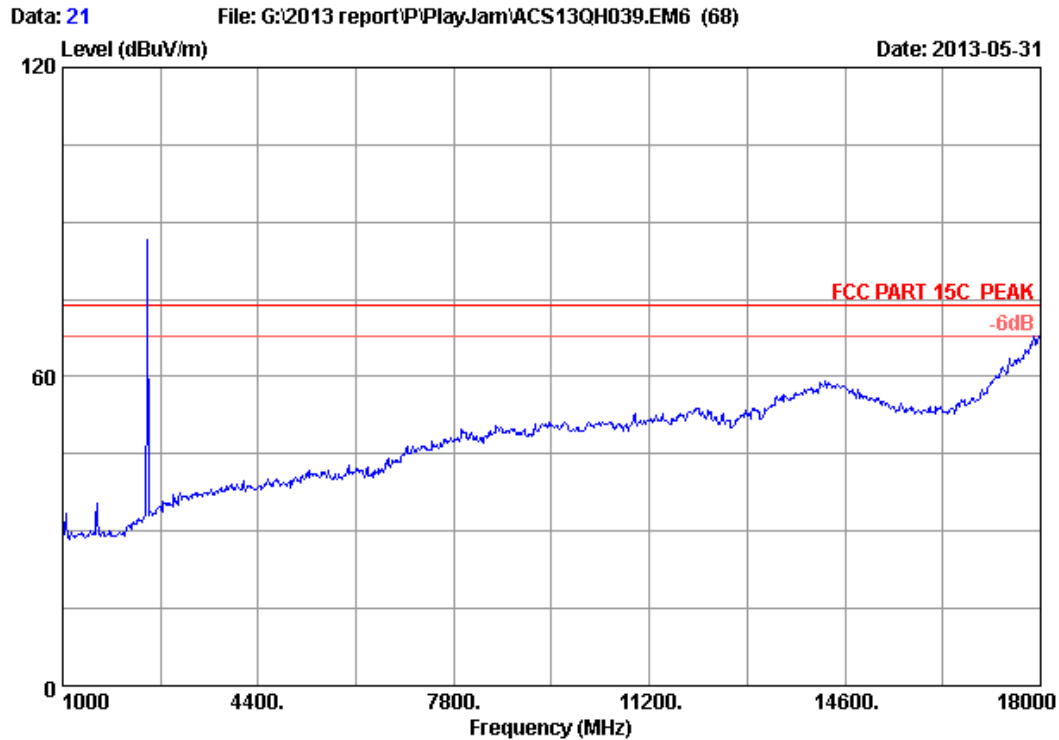


Site no. : 3m Chamber Data no. : 20
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode 8DPSK 2480MHz
 M/N : PJGS2358
 :

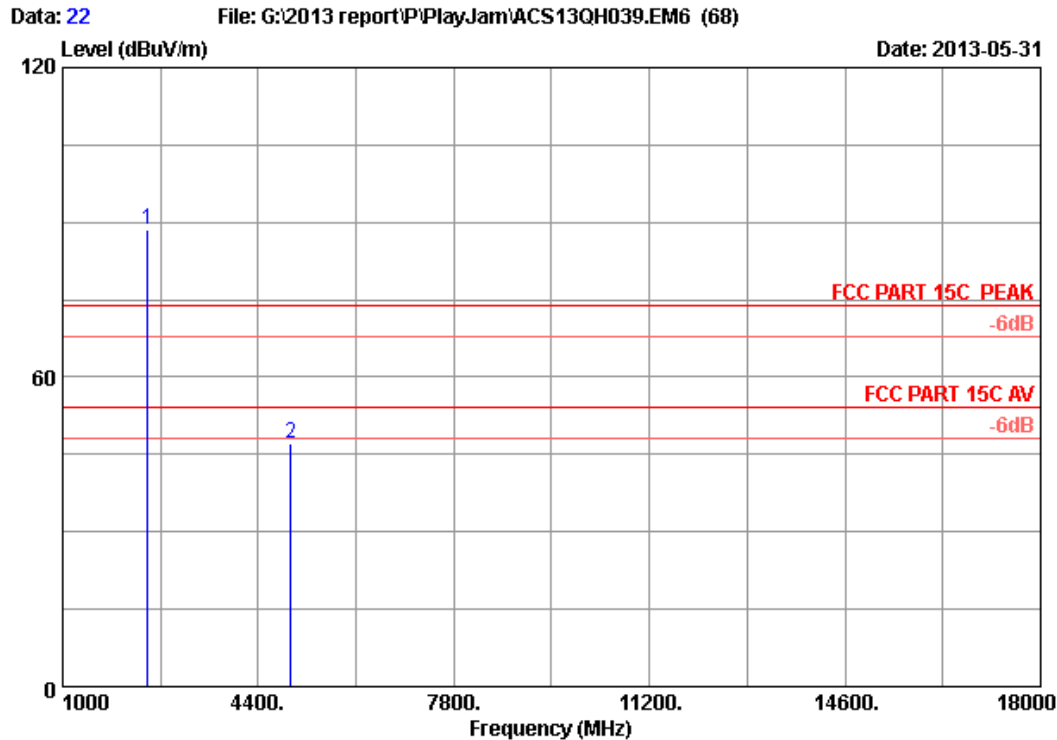
| | Freq. (MHz) | Ant. Factor (dB/m) | Cable loss (dB) | Amp. Factor (dB) | Reading (dBuV) | Emission Level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Remark |
|---|----------------|--------------------------|-----------------------|------------------------|-------------------|-------------------------------|--------------------|----------------|--------|
| 1 | 2480.000 | 27.27 | 6.15 | 35.92 | 94.55 | 92.05 | 74.00 | -18.05 | Peak |
| 2 | 4960.000 | 32.81 | 8.81 | 35.66 | 43.31 | 49.27 | 74.00 | 24.73 | Peak |

Remarks:

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



Site no. : 3m Chamber Data no. : 21
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode 8DPSK 2480MHz
 M/N : PJGS2358
 :



Site no. : 3m Chamber Data no. : 22
 Dis. / Ant. : 3m 2012 3115 (4580) Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 24.2°C/56% Engineer : Tony_Yan
 EUT : Bluetooth HID Controller
 Power supply : DC 5V From Adapter Input AC120V/60Hz
 Test mode : Tx Mode 8DPSK 2480MHz
 M/N : PJGS2358
 :

| | 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 | 27.27 | 6.15 | 35.92 | 91.24 | 88.74 | 74.00 | -14.74 | Peak |
| 2 | 4960.000 | 32.81 | 8.81 | 35.66 | 41.03 | 46.99 | 74.00 | 27.01 | Peak |

Remarks:

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

5. CONDUCTED SPURIOUS EMISSIONS

5.1. Test Equipment

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|---------------------|--------------|-------------|------------|------------|---------------|
| 1. | PXA Signal Analyzer | Agilent | N9030A | MY51380221 | Oct.31, 12 | 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 is 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.

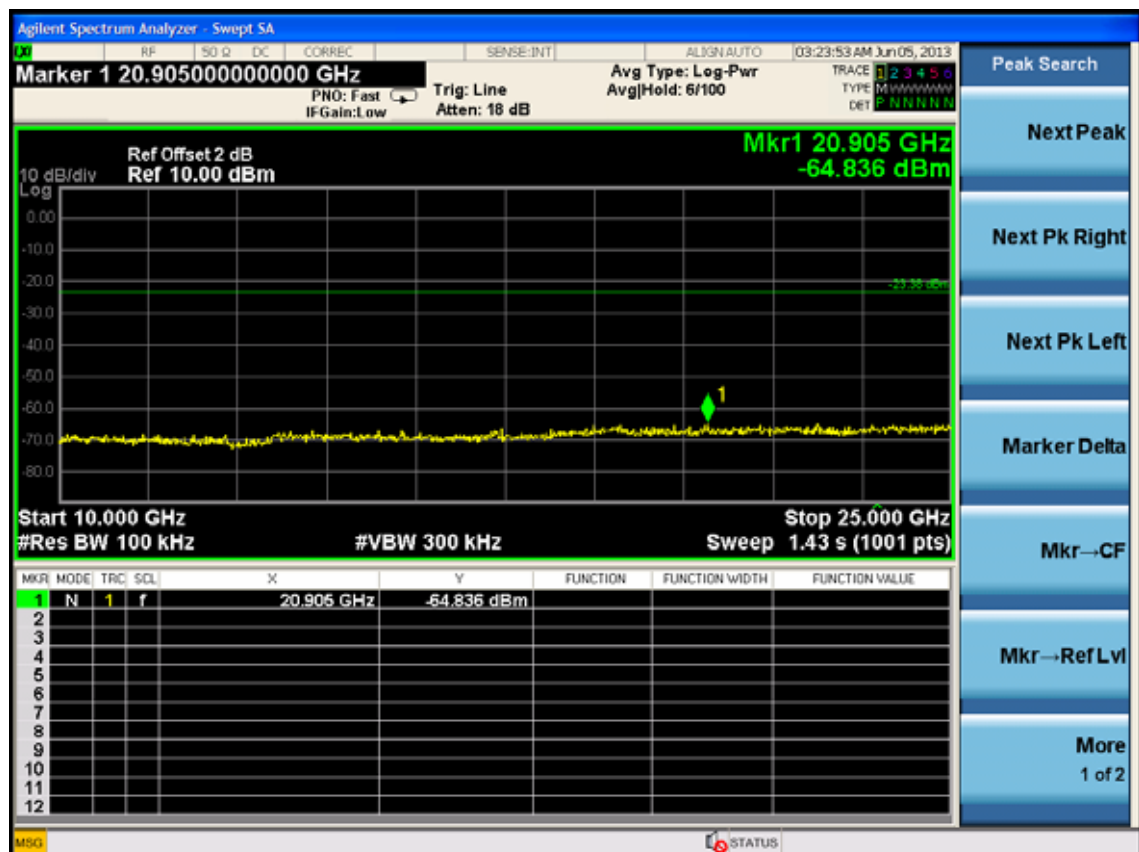
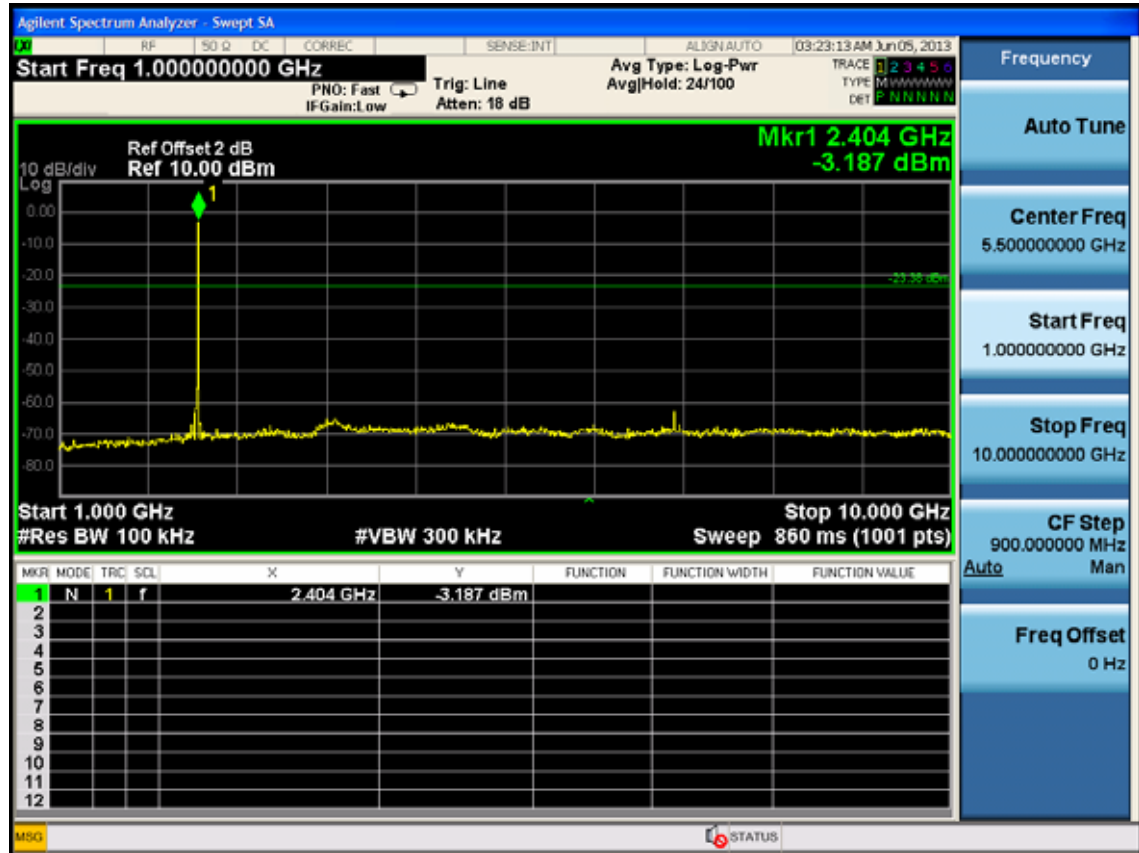
5.4. Test result

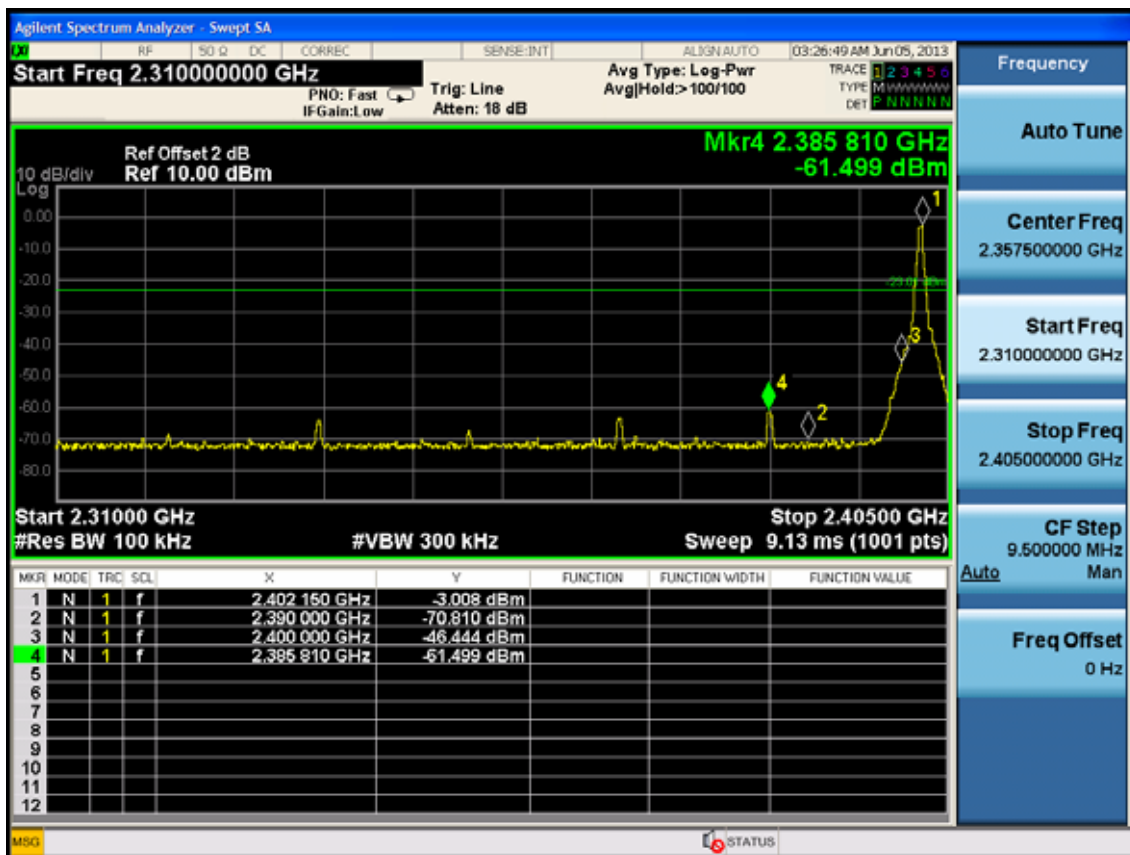
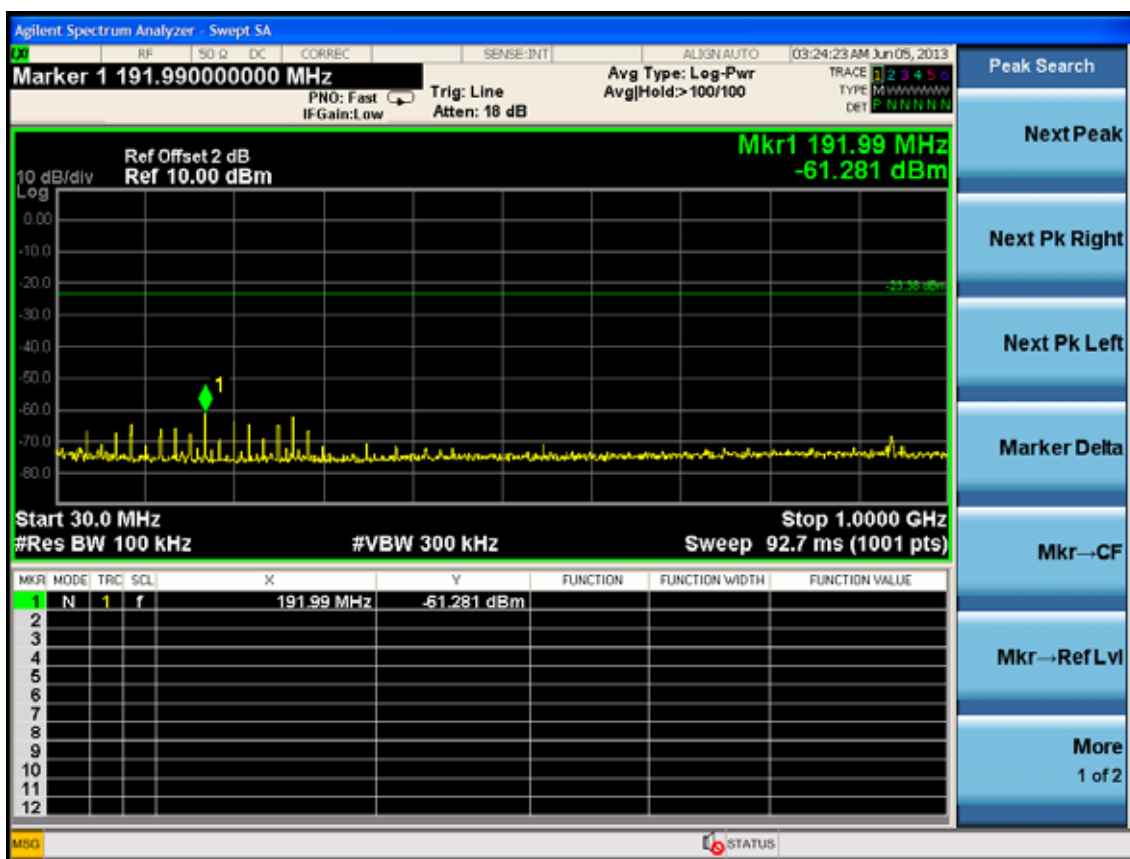
PASS (The testing data was attached in the next pages.)

Hopping Off

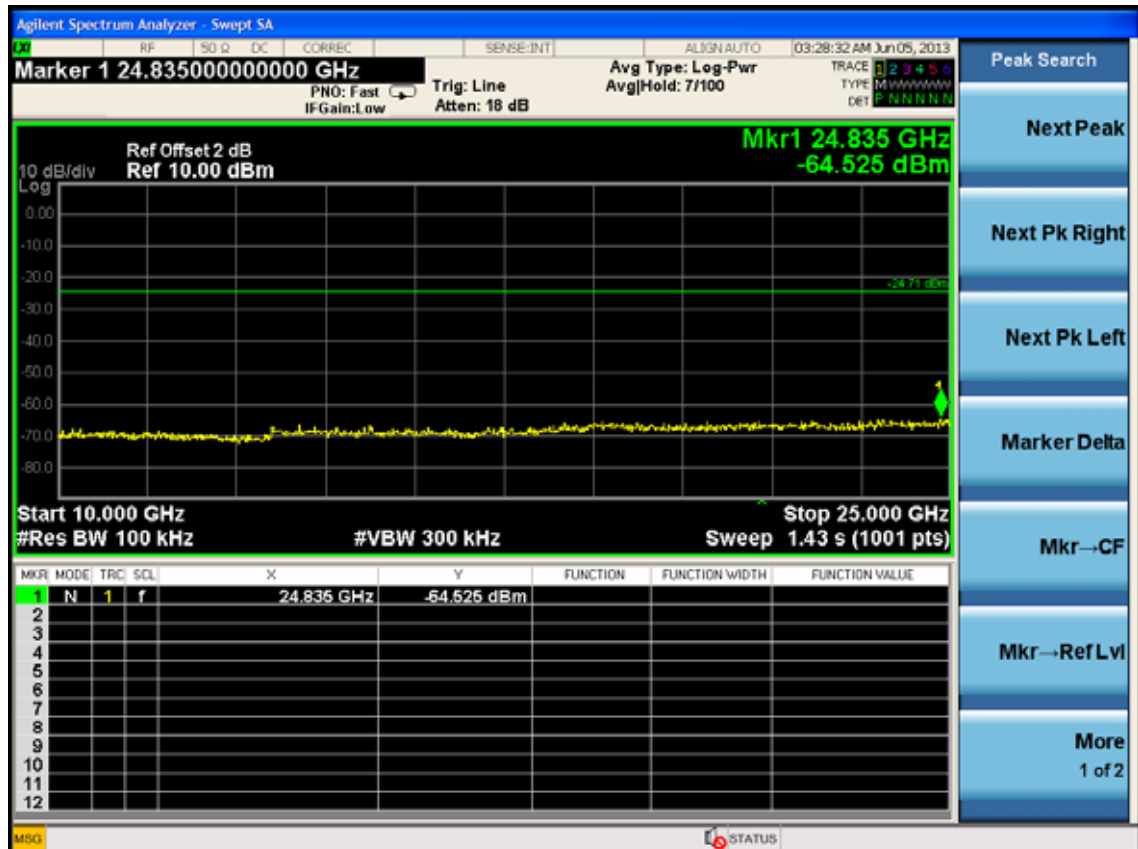
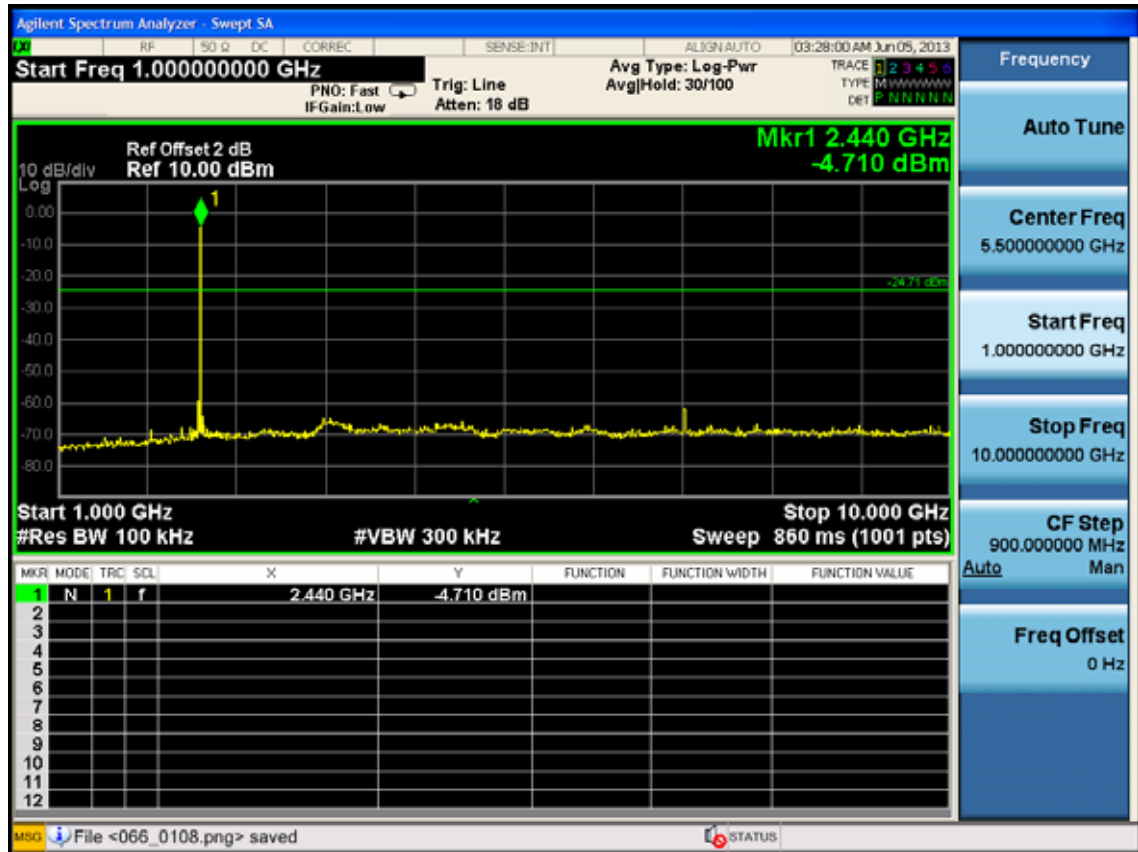
GFSK

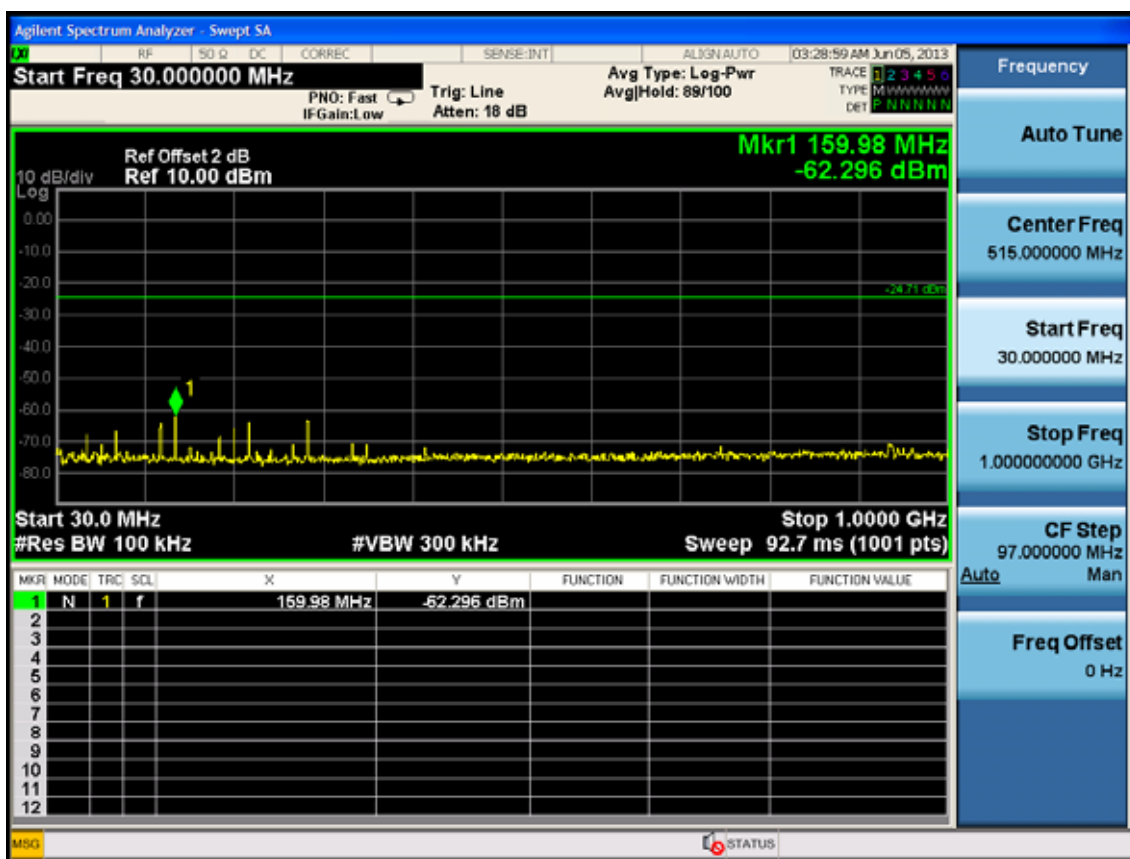
2402MHz



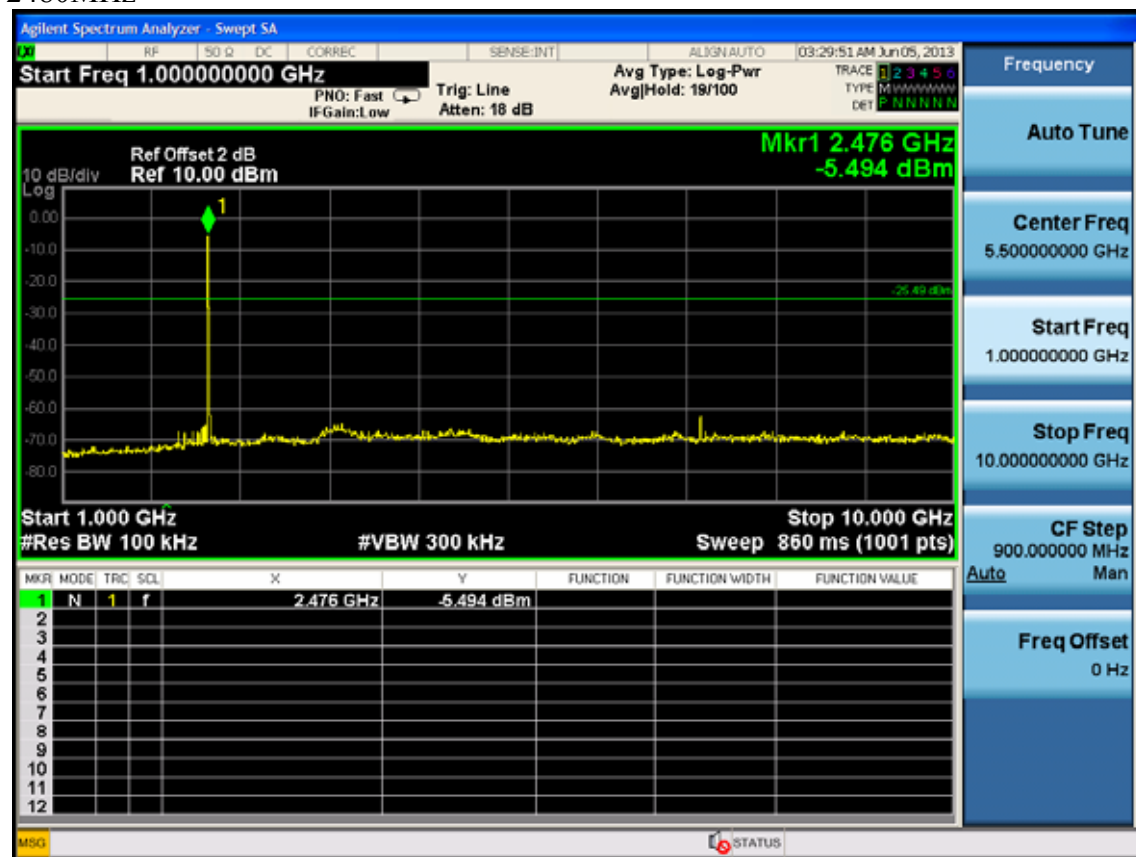


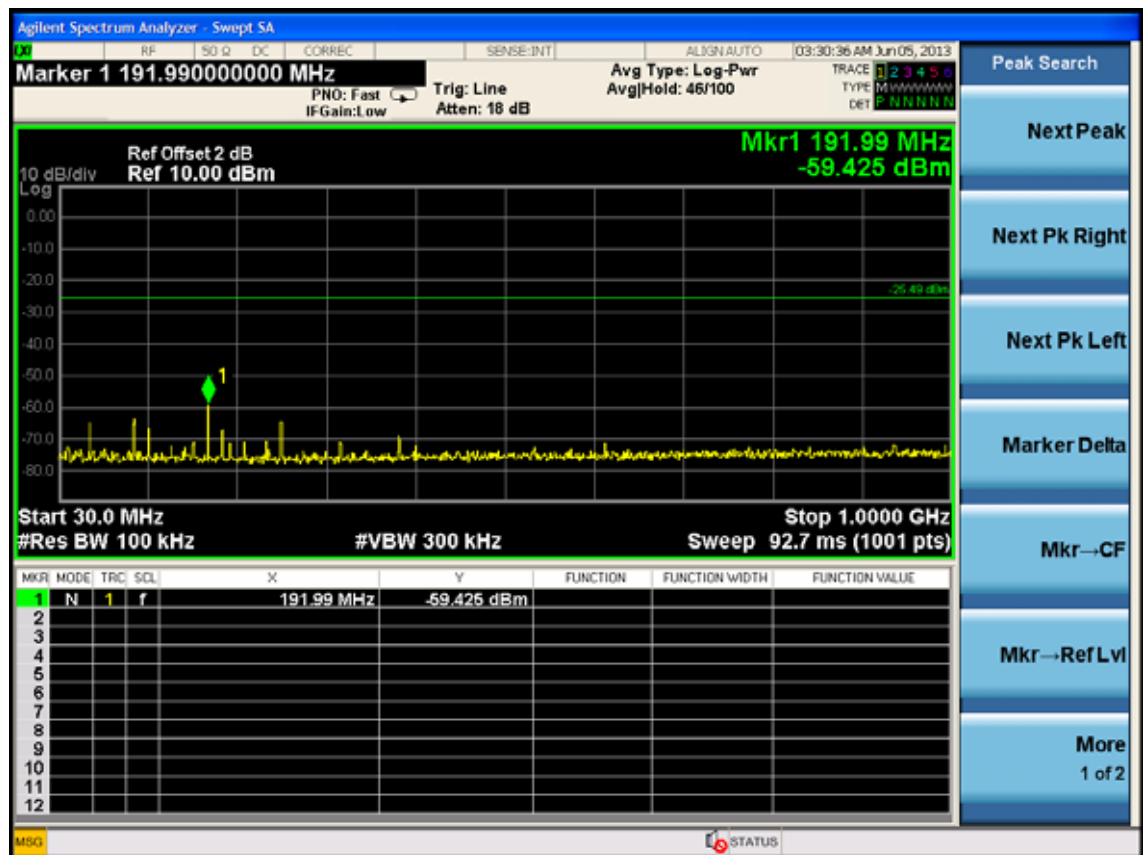
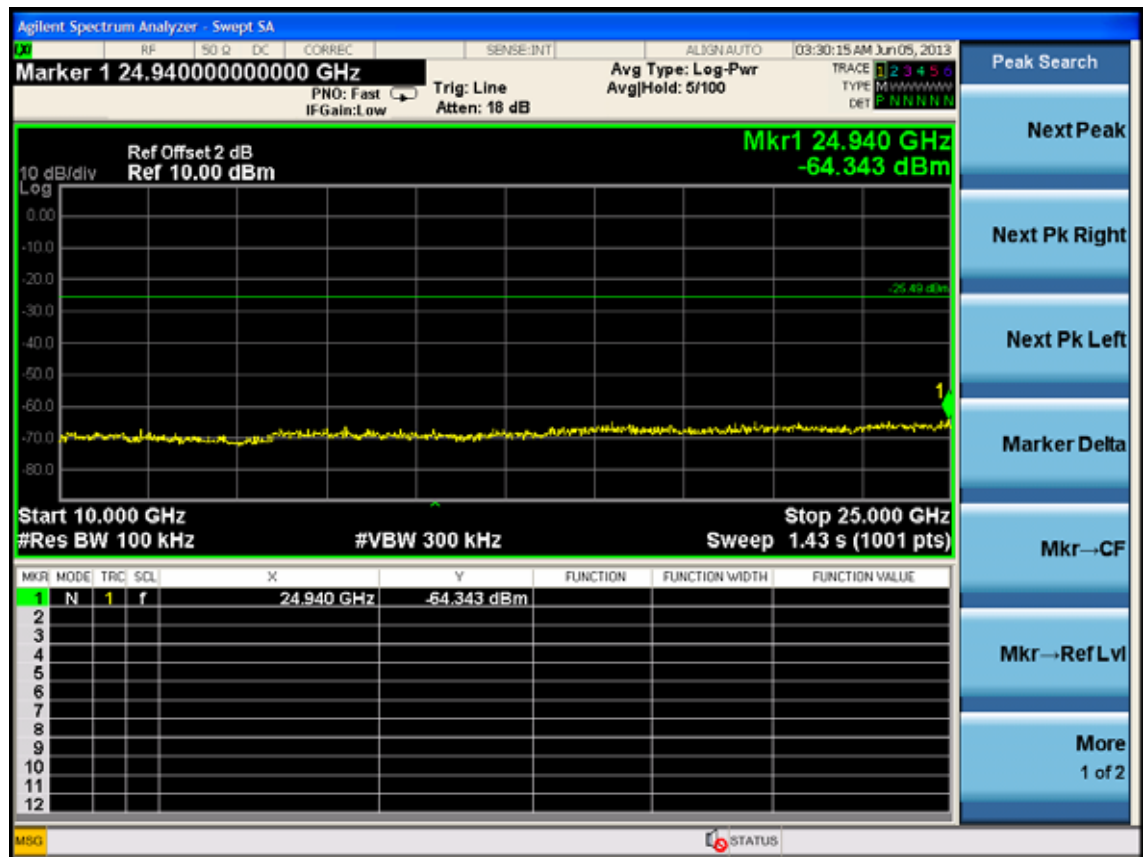
2441MHz

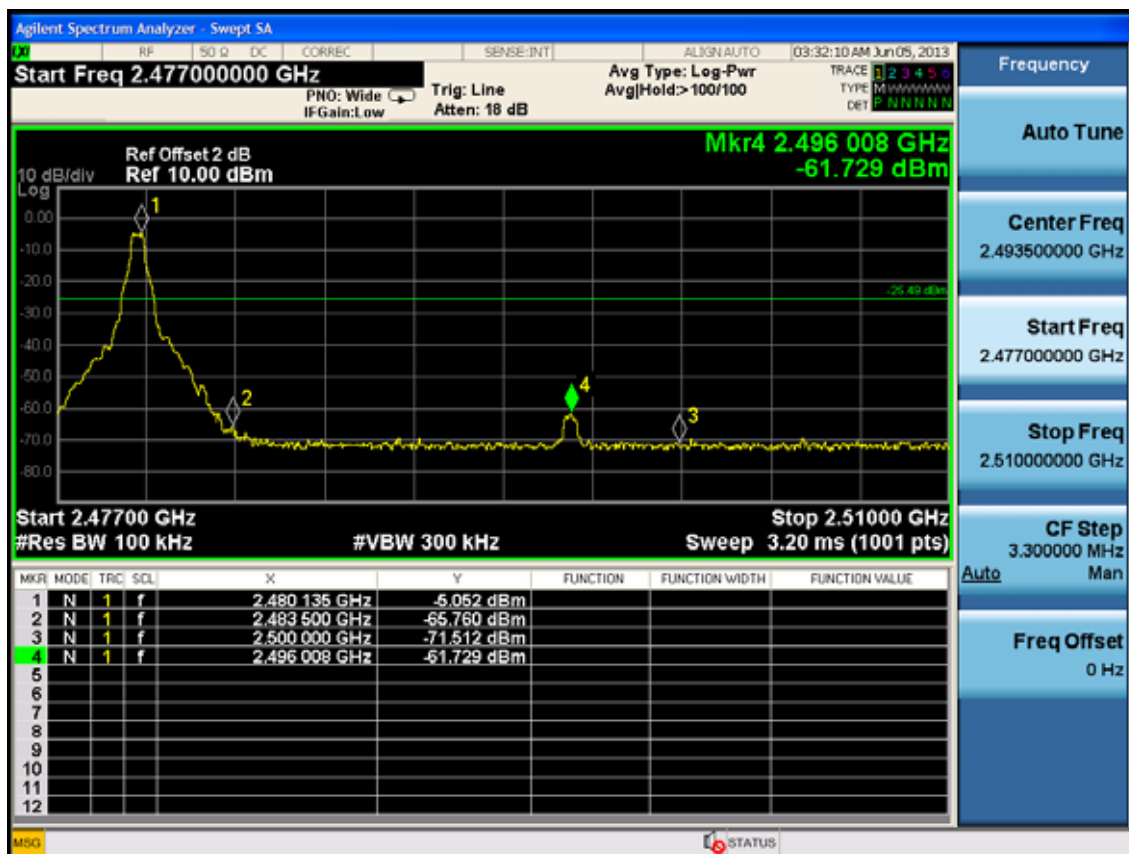




2480MHz







8-DPSK

2402MHz

