

## FCCID – Test report

Report Number : **60/790.14.025.03** Date of Issue: November 19, 2014

Model : Hercules Universal DJ

Product Type : Wireless DJ Controller

Applicant : GUILLEMOT CORPORATION S,A.

Address : Place Du Granier– B.P.97143. 35571 CHANTEPIE CEDEX, FRANCE

Production Facility : --

Address : --

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : 65

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Hong Kong

## 2. Details about the Test Laboratory

### Details about the Test Laboratory

#### Test site 1

Company name: TÜV SÜD HONG KONG LTD.  
3/F, West Wing, Lakeside 2,  
10 Science Park West Avenue,  
Science Park, Shatin  
HK.

Telephone: 852 2776 1323

Fax: 852 2776 1372

#### Test site 2

Company name: Shenzhen Academy of Metrology and Quality Inspection  
No.4 TongFa Road, Xili TownNanshan District, Shenzhen, China  
Test Firm FCC Registration number:994606

National Digital Electronic Product Test  
No.4 TongFa Road, Xili TownNanshan District, Shenzhen, China  
IC Assigned Code: 11177A

### 3. Description of the Equipment Under Test

#### Description of the Equipment Under Test

|                            |                              |
|----------------------------|------------------------------|
| Product:                   | Wireless DJ Controller       |
| Model no.:                 | Hercules Universal DJ        |
| Serial number:             | NIL                          |
| Options and accessories:   | NIL                          |
| FCC ID:                    | NAM5061920                   |
| Rated Voltage:             | 5VDC(Powered by PC USB port) |
| Rated Current:             | NIL                          |
| Rated Power:               | NIL                          |
| Frequency:                 | 2402-2480MHz                 |
| RF Transmission Frequency: | 2402-2480MHz                 |
| Antenna gain:              | 0 dBi                        |
| No. of Operated Channel:   | 79                           |
| Modulation:                | GFSK / $\pi/4$ DQPSK / 8DPSK |

#### 4. Summary of Test Standards

| Test Standards                                                |                                                                        |
|---------------------------------------------------------------|------------------------------------------------------------------------|
| FCC Part 15 Subpart C, Intentional Radiators, 10-1-12 Edition | PART 15 – RADIO FREQUENCY DEVICES<br>Subpart C – Intentional Radiators |

#### 5. Mode of Operation

All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

| Test Mode                        |
|----------------------------------|
| Mode 1: GFSK for 1Mbps Link Mode |
| Mode 2: 8DPSK for 3MbpsLink Mode |
| --                               |

Note1:By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “X axis” position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

Note 2: After pre-test, the emission of  $\pi/4$ -DQPSK mode is no worse than 8DPSK mode.

#### 6. Assistant Equipment Used in Test

| Assistant Equipment | Brand  | Model  |
|---------------------|--------|--------|
| Notebook            | Lenovo | B490   |
| speaker             | --     | K20403 |

## 7. Summary of Test Standards and Results

| Emission Tests                          |       |           |                                     |                          |                          |
|-----------------------------------------|-------|-----------|-------------------------------------|--------------------------|--------------------------|
| Test Condition                          | Pages | Test site | Test Result                         |                          |                          |
|                                         |       |           | Pass                                | Fail                     | N/A                      |
| Maximum Conducted Output Power          | 9     | Site 2    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Conducted Emission Measurement          | 11    | Site 2    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Radiated Interference Measurement       | 15    | Site 2    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20dB RF Bandwidth                       | 20    | Site 2    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Carrier Frequency Separation            | 23    | Site 2    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Number of Hopping                       | 25    | Site 2    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Time of Occupancy (Dwell Time)          | 27    | Site 2    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
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| Band Edge Measurement                   | 42    | Site 2    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Antenna Requirement                     | 48    | Site 2    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## 8. General Remarks

### Remarks

This submittal(s) (test report) is intended for FCC ID: NAM5061920complies with the FCC Part 15, Subpart C Rules.

All the configurations of the product were tested and only the worst test results are listed in the report.

### SUMMARY:

All tests according to the regulations cited on page 7 were

■ - Performed

□ - Not Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

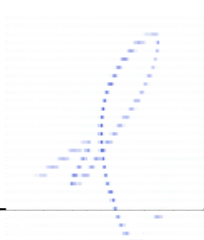
Sample Received Date: November 3, 2014

Testing Start Date: November 6, 2014

Testing End Date: November 19, 2014

- TÜV SÜD HONG KONG LTD. -

Reviewed by:



Edmond FUNG



1 by:



CHAN Kwong Ngai

Report Number: **60/790.14.025.03**

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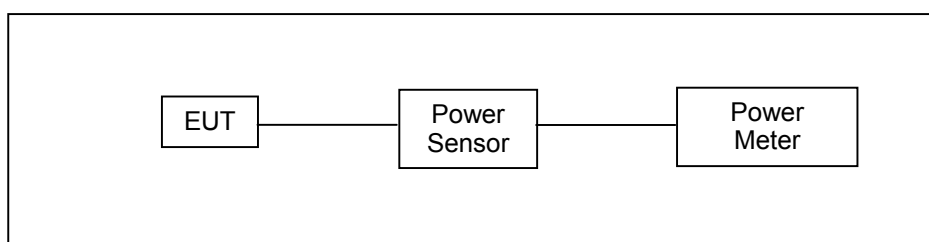
Rev. no.: 2.1

## 9. Test Results

### 8.1 Maximum Conducted Output Power Measurement Limit

For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels < 1 watt.

#### Test Setup



#### Test Instruments

| Equipment                                 | Manufacturer | Model Number | Serial Number  | Cal. Date  | Remark |
|-------------------------------------------|--------------|--------------|----------------|------------|--------|
| Power Sensor                              | Agilent      | U2021XA      | MY53180015     | 05/24/2014 | (1)    |
| USB Modular Simultaneous Data Acquisition | Agilent      | U2531A       | TW53353509     | N.C.R.     |        |
| 0.5M RF Cable                             | Agilent      | --           | S02-140409-052 | 06/22/2014 | (1)    |

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

#### Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor. The maximum peak output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the power sensor, for prevent the power sensor input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

The antenna port of the EUT was connected to the input of a power sensor. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

## Test Result

| Model Number    | Hercules Universal DJ          |            |       |            |
|-----------------|--------------------------------|------------|-------|------------|
| Test Item       | Maximum Conducted Output Power |            |       |            |
| Test Mode       | Mode 1: GFSK Link Mode         |            |       |            |
| Date of Test    | 2014-11-06                     |            |       |            |
| Frequency (MHz) | Packet Type                    | Peak Power |       | Limit (mW) |
|                 |                                | (dBm)      | (mW)  |            |
| 2402            | DH1                            | 2.93       | 1.963 | <1000      |
|                 | DH3                            | 2.87       | 1.936 |            |
|                 | DH5                            | 2.91       | 1.954 |            |
| 2441            | DH1                            | 4.98       | 3.148 |            |
|                 | DH3                            | 4.75       | 2.985 |            |
|                 | DH5                            | 4.46       | 2.792 |            |
| 2480            | DH1                            | 4.03       | 2.529 |            |
|                 | DH3                            | 3.99       | 2.506 |            |
|                 | DH5                            | 3.78       | 2.388 |            |

| Model Number    | Hercules Universal DJ          |            |       |            |
|-----------------|--------------------------------|------------|-------|------------|
| Test Item       | Maximum Conducted Output Power |            |       |            |
| Test Mode       | Mode 2: 8DPSK Link Mode        |            |       |            |
| Date of Test    | 2014-11-06                     |            |       |            |
| Frequency (MHz) | Packet Type                    | Peak Power |       | Limit (mW) |
|                 |                                | (dBm)      | (mW)  |            |
| 2402            | DH1                            | 1.00       | 1.259 | <1000      |
|                 | DH3                            | 1.21       | 1.321 |            |
|                 | DH5                            | 1.05       | 1.274 |            |
| 2441            | DH1                            | 3.40       | 2.188 |            |
|                 | DH3                            | 3.60       | 2.291 |            |
|                 | DH5                            | 3.09       | 2.037 |            |
| 2480            | DH1                            | 2.36       | 1.722 |            |
|                 | DH3                            | 2.16       | 1.644 |            |
|                 | DH5                            | 2.44       | 1.754 |            |

Note: The relevant measured result has the offset with cable loss already.

## 8.2 Conducted Emission Measurement

### Limit

| Frequency (MHz) | Quasi-peak | Average  |
|-----------------|------------|----------|
| 0.15 - 0.5      | 66 to 56   | 56 to 46 |
| 0.50 - 5.0      | 56         | 46       |
| 5.0 - 30.0      | 60         | 50       |

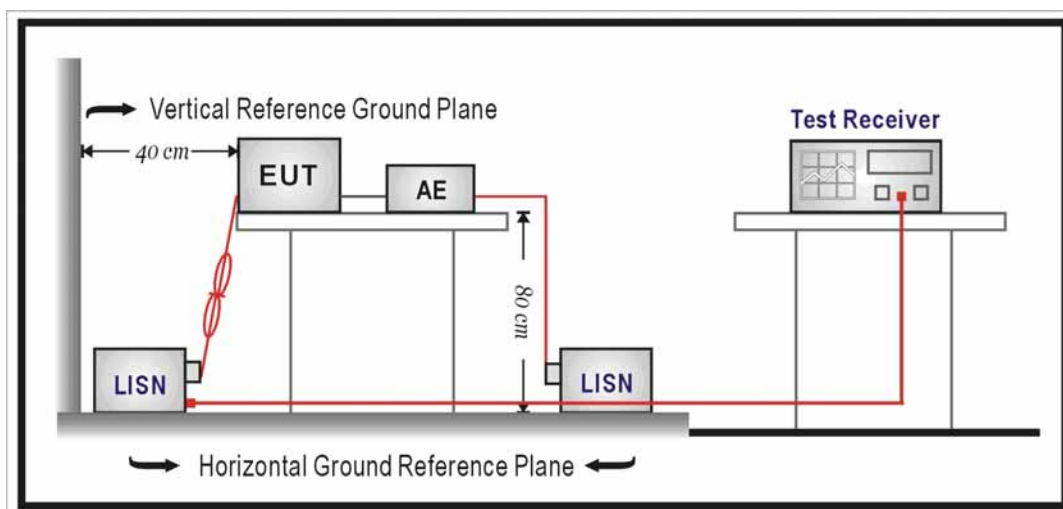
### Test Instruments

| Describe      | Manufacturer | Model Number | Serial Number | Cal. Date  | Remark |
|---------------|--------------|--------------|---------------|------------|--------|
| Test Receiver | R&S          | ESCI30       | SB3319        | 01/20/2014 | (1)    |
| LISN          | R&S          | ENV216       | SB4357        | 01/20/2014 | (1)    |
| 4.5M RF Cable | R&S          | --           | 436922        | 01/20/2014 | (1)    |

Remark: (1)Calibration period 1 year. (2)Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### Test Setup



## Test Procedure

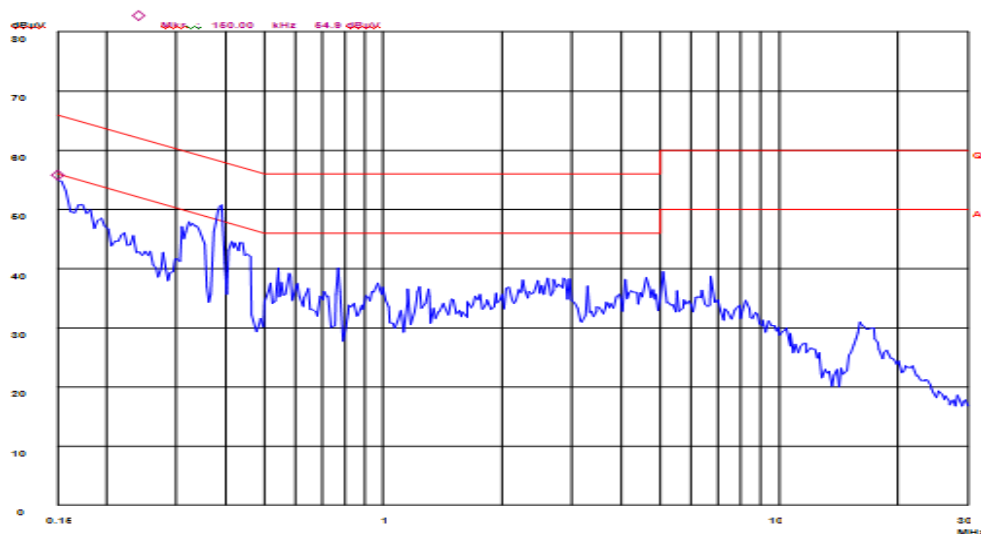
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

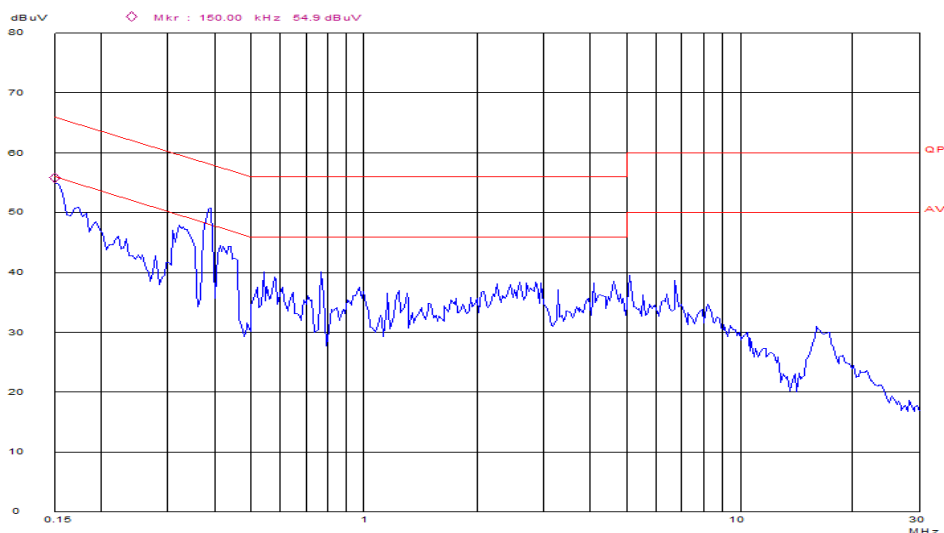
## Test Result

|                  |                       |                      |              |
|------------------|-----------------------|----------------------|--------------|
| Standard:        | FCC Part 15C          | Line:                | L            |
| Test item:       | Conducted Emission    | Power:               | DC 5V        |
| Model Number:    | Hercules Universal DJ | Temp.(°C)/Hum.(%RH): | 24(°C)/57%RH |
| Mode:            | Mode 1                | Date:                | 2014/11/08   |
| Description:Line |                       |                      |              |



|      | Frequency<br>(MHz) | Quasi-Peak                  |                  | Average                     |                  |
|------|--------------------|-----------------------------|------------------|-----------------------------|------------------|
|      |                    | Emission<br>Level<br>(dBμV) | Limits<br>(dBμV) | Emission<br>Level<br>(dBμV) | Limits<br>(dBμV) |
| Line | 0.154              | 47.6                        | 65.8             | 41.2                        | 55.8             |
|      | 0.410              | 47.2                        | 57.6             | 43.0                        | 47.6             |
|      | 0.722              | 37.8                        | 56.0             | 31.9                        | 46.0             |
|      | /                  | /                           | /                | /                           | /                |
|      | /                  | /                           | /                | /                           | /                |
|      | /                  | /                           | /                | /                           | /                |

|                      |                       |                      |              |
|----------------------|-----------------------|----------------------|--------------|
| Standard:            | FCC Part 15C          | Line:                | N            |
| Test item:           | Conducted Emission    | Power:               | AC 120V/60Hz |
| Model Number:        | Hercules Universal DJ | Temp.(°C)/Hum.(%RH): | 24(°C)/57%RH |
| Mode:                | Mode 1                | Date:                | 2014/11/08   |
| Description: Neutral |                       |                      |              |



|         | Frequency<br>(MHz) | Quasi-Peak                  |                  | Average                     |                  |
|---------|--------------------|-----------------------------|------------------|-----------------------------|------------------|
|         |                    | Emission<br>Level<br>(dBµV) | Limits<br>(dBµV) | Emission<br>Level<br>(dBµV) | Limits<br>(dBµV) |
| Neutral | 0.162              | 47.3                        | 65.4             | 40.8                        | 55.4             |
|         | 0.242              | 44.1                        | 62.0             | 37.1                        | 52.0             |
|         | 0.410              | 47.2                        | 57.6             | 43.0                        | 47.6             |
|         | /                  | /                           | /                | /                           | /                |
|         | /                  | /                           | /                | /                           | /                |
|         | /                  | /                           | /                | /                           | /                |

## 8.3 Radiated Interference Measurement Limit

According to §15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength ( $\mu\text{V/m}$ at meter) | Measurement Distance (meters) |
|-----------------|--------------------------------------------|-------------------------------|
| 0.009 – 0.490   | 2400 / F (kHz)                             | 300                           |
| 0.490 – 1.705   | 24000 / F (kHz)                            | 30                            |
| 1.705 – 30.0    | 30                                         | 30                            |
| 30 - 88         | 100**                                      | 3                             |
| 88-216          | 150**                                      | 3                             |
| 216-960         | 200**                                      | 3                             |
| Above 960       | 500                                        | 3                             |

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequencybands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

## Test Instruments

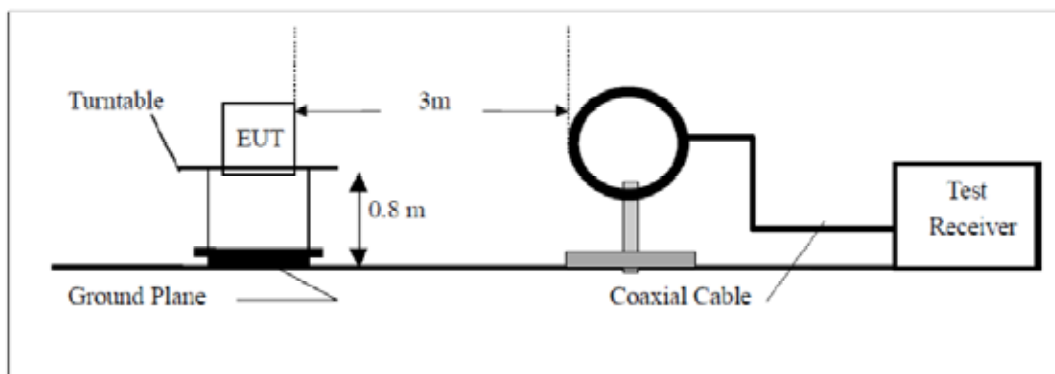
| 3 Meter Chamber            |                    |              |                 |            |        |
|----------------------------|--------------------|--------------|-----------------|------------|--------|
| Equipment                  | Manufacturer       | Model Number | Serial Number   | Cal. Date  | Remark |
| EMI Test Receiver          | R&S                | ESU40        | SB8501/09       | 05/16/2014 | (1)    |
| Bilog Antenna              | SCHWARZBECK        | VULB9163     | SB8501/04       | 01/20/2014 | (1)    |
| Horn Antenna               | R&S                | HF906        | SB3435          | 01/20/2014 | (1)    |
| 3-dimensional loop antenna | SCHWARZBECK        | HXYZ9170     | 9124            | 01/20/2014 | (1)    |
| Amplifier(1-18GHz)         | R&S                | --           | SB3435/01       | 01/20/2014 | (1)    |
| Amplifier(18-40GHz)        | R&S                | --           | SB3435/02       | 01/20/2014 | (1)    |
| Horn Antenna               | Amplifier Research | AT4560       | SB5392/02       | 05/16/2014 | (1)    |
| RF cable(0.4m)             | Woken              | /            | S02-1404-09-065 | 05/11/2014 | (1)    |
| RF cable(3.5m)             | Woken              | /            | S02-1404-09-047 | 05/11/2014 | (1)    |
| RF cable(1.2m)             | Woken              | /            | S02-1404-09-052 | 05/11/2014 | (1)    |
| 3m Semi-anechoic chamber   | Albatross Projects | 9X6X6        | SB3450/01       | 10/12/2014 | (1)    |

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

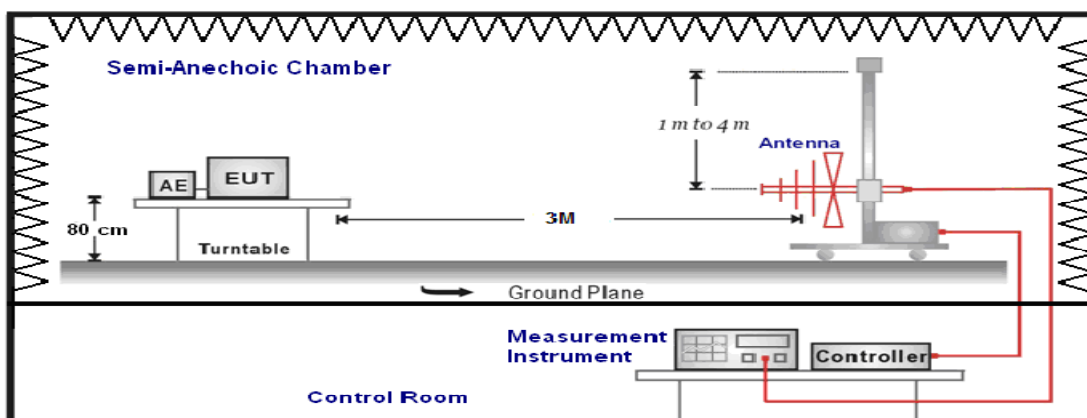
NOTE: N.C.R. = No Calibration Request.

## Setup

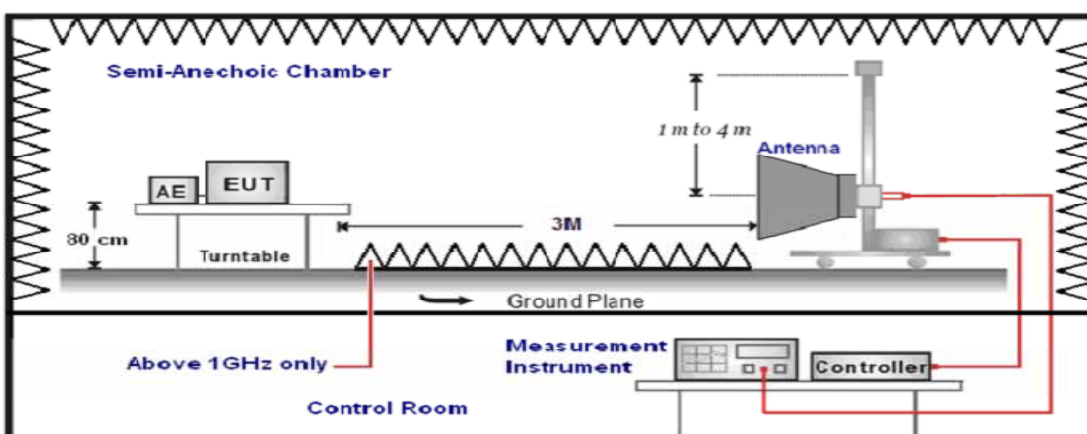
9KHz-30MHz



30MHz-1GHz



Above 1GHz



## Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurement spectrum range from 9kHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (model VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts per meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro volts per meter (dBuV/m).

The actual field intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

$$(1) \text{ Amplitude (dBuV/m) = FI (dBuV) + AF (dBuV) + CL (dBuV) - Gain (dB)}$$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

$$(2) \text{ Actual Amplitude (dBuV/m) = Amplitude (dBuV) - Dis(dB)}$$

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30dBm

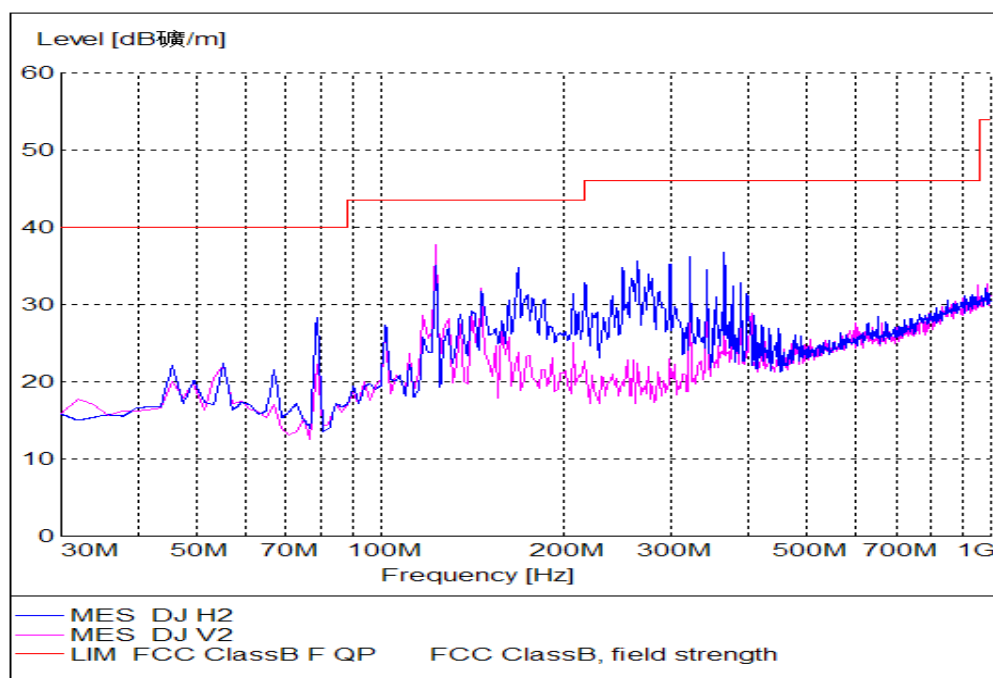
(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

Data of measurement within this frequency range without mark in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

# Test Result

## Below 1GHz

|               |                       |                      |              |
|---------------|-----------------------|----------------------|--------------|
| Standard:     | FCC Part 15C          | Test Distance:       | 3m           |
| Test item:    | Radiated Emission     | Power:               | 5V DC        |
| Model Number: | Hercules Universal DJ | Temp.(°C)/Hum.(%RH): | 23(°C)/50%RH |
| Mode:         | Mode 1                | Date:                | 2014/11/10   |



| Frequency (MHz) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Ant.Polar. H / V |
|-----------------|-----------------------|-----------------|----------------|-------------|--------|------------------|
| --              | --                    | --              | --             | --          | QP     | H                |
| --              | --                    | --              | --             | --          | QP     | H                |
| --              | --                    | --              | --             | --          | QP     | H                |
| --              | --                    | --              | --             | --          | QP     | H                |
| --              | --                    | --              | --             | --          | QP     | H                |
| --              | --                    | --              | --             | --          | QP     | H                |
| --              | --                    | --              | --             | --          | QP     | V                |
| --              | --                    | --              | --             | --          | QP     | V                |
| --              | --                    | --              | --             | --          | QP     | V                |
| --              | --                    | --              | --             | --          | QP     | V                |
| --              | --                    | --              | --             | --          | QP     | V                |

Note: No emission found between lowest internal used/generated frequencies to 30MHz (9 kHz~30MHz).

**1GHz-25GHz**

| Standard:       |                | FCC Part 15C          |                 | Test Distance:       |             | 3m           |                  |
|-----------------|----------------|-----------------------|-----------------|----------------------|-------------|--------------|------------------|
| Test item:      |                | Radiated Emission     |                 | Power:               |             | 5V DC        |                  |
| Model Number:   |                | Hercules Universal DJ |                 | Temp.(°C)/Hum.(%RH): |             | 23(°C)/50%RH |                  |
| Mode:           |                | Mode 1                |                 | Date:                |             | 2014/11/10   |                  |
| Frequency:      |                | 2402 MHz              |                 | Test By:             |             |              |                  |
| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m)       | Margin (dB) | Remark       | Ant.Polar. H / V |
| 4804            | 41.6           | -5.4                  | 36.2            | 74.0                 | 37.8        | peak         | H                |
| 4804            | 33.5           | -5.4                  | 28.1            | 54.0                 | 25.9        | Average      | H                |
| 7206            | --             | -2.7                  | --              | 74.0                 | --          | peak         | H                |
| 7206            | --             | -2.7                  | --              | 54.0                 | --          | Average      | H                |
| 4804            | 40.8           | -5.4                  | 35.4            | 74.0                 | 38.6        | peak         | V                |
| 4804            | 32.6           | -5.4                  | 27.2            | 54.0                 | 26.8        | Average      | V                |
| 7206            | --             | -2.7                  | --              | 74.0                 | --          | peak         | V                |
| 7206            | --             | -2.7                  | --              | 54.0                 | --          | Average      | V                |

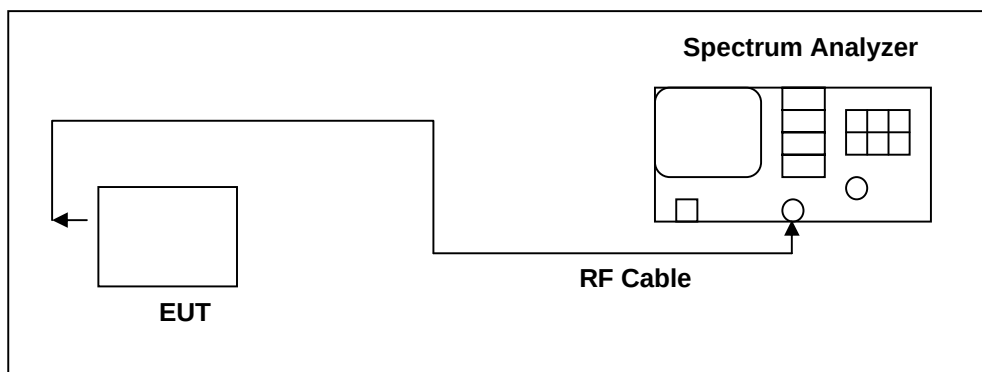
| Standard:       |                | FCC Part 15C          |                 | Test Distance:       |             | 3m           |                  |
|-----------------|----------------|-----------------------|-----------------|----------------------|-------------|--------------|------------------|
| Test item:      |                | Radiated Emission     |                 | Power:               |             | 5V DC        |                  |
| Model Number:   |                | Hercules Universal DJ |                 | Temp.(°C)/Hum.(%RH): |             | 23(°C)/50%RH |                  |
| Mode:           |                | Mode 1                |                 | Date:                |             | 2014/11/10   |                  |
| Frequency:      |                | 2441 MHz              |                 | Test By:             |             |              |                  |
| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m)       | Margin (dB) | Remark       | Ant.Polar. H / V |
| 4882            | 42.3           | -5.4                  | 36.9            | 74.0                 | 37.1        | peak         | H                |
| 4882            | 31.8           | -5.4                  | 26.4            | 54.0                 | 27.6        | Average      | H                |
| 7323            | --             | -2.5                  | --              | 74.0                 | --          | peak         | H                |
| 7323            | --             | -2.5                  | --              | 54.0                 | --          | Average      | H                |
| 4882            | 42.3           | -5.4                  | 36.9            | 74.0                 | 37.1        | peak         | V                |
| 4882            | 34.4           | -5.4                  | 29.0            | 54.0                 | 25.0        | Average      | V                |
| 7323            | --             | -2.5                  | --              | 74.0                 | --          | peak         | V                |
| 7323            | --             | -2.5                  | --              | 54.0                 | --          | Average      | V                |

| Standard:       |                | FCC Part 15C          |                 | Test Distance:       |             | 3m           |                  |
|-----------------|----------------|-----------------------|-----------------|----------------------|-------------|--------------|------------------|
| Test item:      |                | Radiated Emission     |                 | Power:               |             | 5V DC        |                  |
| Model Number:   |                | Hercules Universal DJ |                 | Temp.(°C)/Hum.(%RH): |             | 23(°C)/50%RH |                  |
| Mode:           |                | Mode 1                |                 | Date:                |             | 2014/11/10   |                  |
| Frequency:      |                | 2480 MHz              |                 | Test By:             |             |              |                  |
| Frequency (MHz) | Reading (dBuV) | Correct Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m)       | Margin (dB) | Remark       | Ant.Polar. H / V |
| 4960            | 43.9           | -5.4                  | 38.5            | 74.0                 | 35.5        | peak         | H                |
| 4960            | 30.9           | -5.4                  | 25.5            | 54.0                 | 28.5        | Average      | H                |
| 7440            | --             | -2.1                  | --              | 74.0                 | --          | peak         | H                |
| 7440            | --             | -2.1                  | --              | 54.0                 | --          | Average      | H                |
| 4960            | 44.5           | -5.4                  | 39.1            | 74.0                 | 34.9        | peak         | V                |
| 4960            | 32.6           | -5.4                  | 27.2            | 54.0                 | 26.8        | Average      | V                |
| 7440            | --             | -2.1                  | --              | 74.0                 | --          | peak         | V                |
| 7440            | --             | -2.1                  | --              | 54.0                 | --          | Average      | V                |

## 8.4 20dB Bandwidth & 99% OBW Measurement Limit

N/A

### Test Setup



### Test Instruments

| Equipment         | Manufacturer | Model Number | Serial Number | Cal. Date  | Remark |
|-------------------|--------------|--------------|---------------|------------|--------|
| Spectrum Analyzer | Agilent      | E4445A       | MY46181814    | 11/12/2014 | (1)    |

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### Test Procedure

#### 20dB RF Bandwidth

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

1. Span = approx. 2 to 3 times the 20dB bandwidth, centered on a hopping frequency
2. RBW  $\geq$  1% of the 20dB span
3. VBW  $\geq$  RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

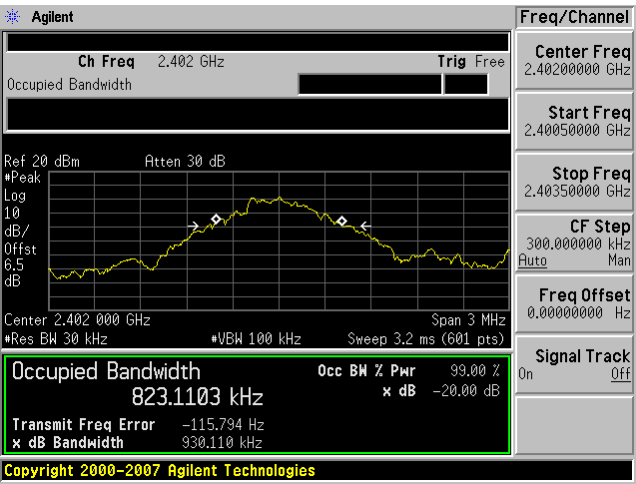
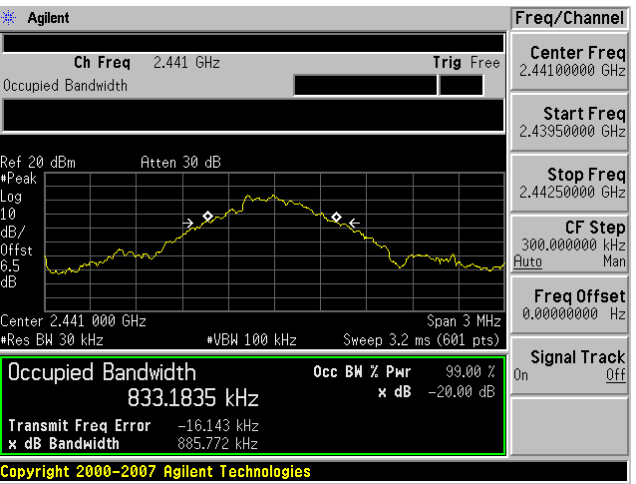
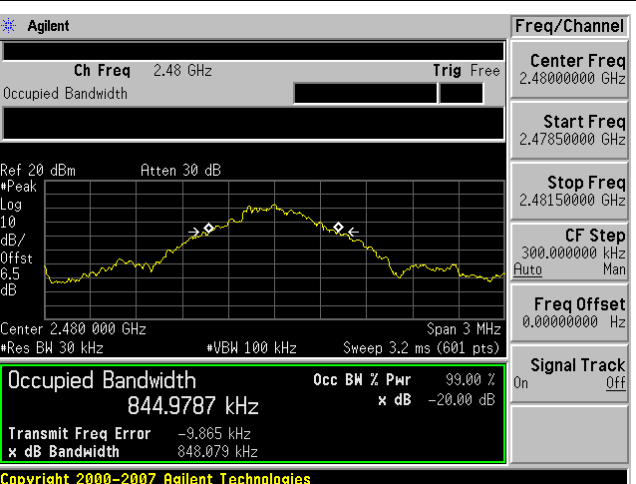
The trace was allowed to stabilize. The EUT was transmitting at its maximum data rate. The marker-to-peak function was used to set the marker to the peak of the emission. The marker-delta function was used to measure 20dB down on one side of the emission. The marker-delta function and marker was moved to the other side of the emission until it was even with the reference marker. The marker-delta reading at this point was the 20dB bandwidth of the emission.

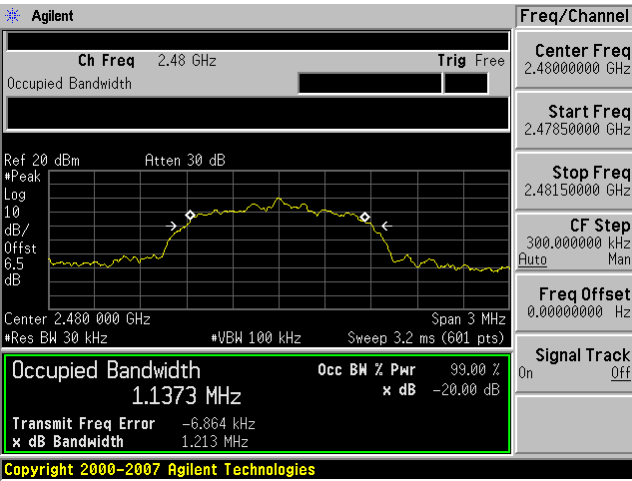
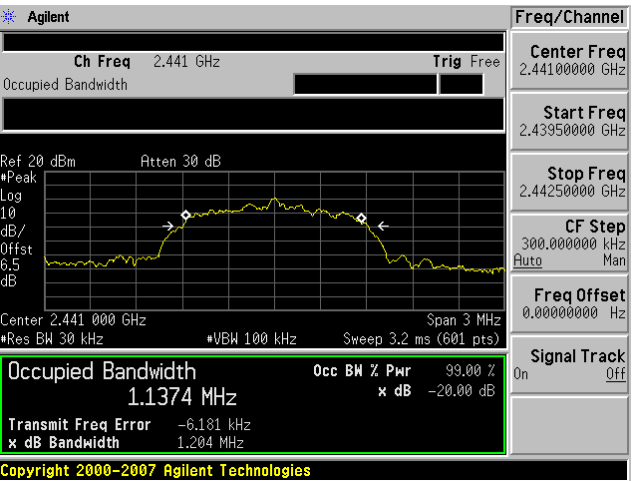
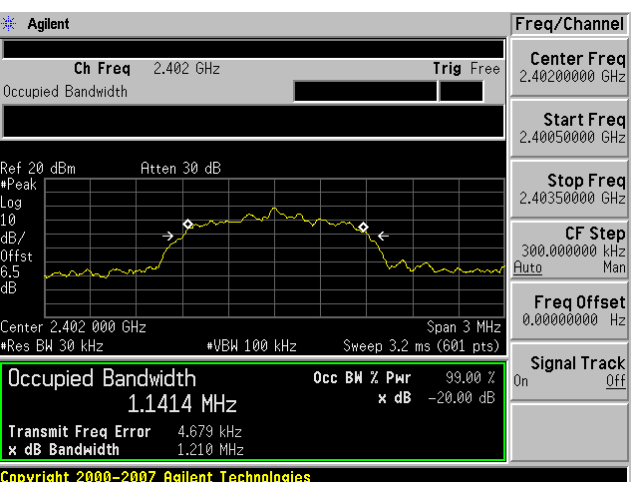
## Test Result

| Model Number    | Hercules Universal DJ   |               |             |
|-----------------|-------------------------|---------------|-------------|
| Test Item       | 20dB Bandwidth& 99% OBW |               |             |
| Test Mode       | Mode 1: GFSK Link Mode  |               |             |
| Date of Test    | 2014/11/11              | Test Site     | TE02        |
| Frequency (MHz) | 20dB Bandwidth (MHz)    | 99% OBW (MHz) | Limit (MHz) |
| 2402            | 0.930                   | 0.823         | ----        |
| 2441            | 0.886                   | 0.833         | ----        |
| 2480            | 0.848                   | 0.845         | ----        |

| Model Number    | Hercules Universal DJ   |               |             |
|-----------------|-------------------------|---------------|-------------|
| Test Item       | 20dB Bandwidth& 99% OBW |               |             |
| Test Mode       | Mode 2: 8DPSK Link Mode |               |             |
| Date of Test    | 2014/11/11              | Test Site     | TE02        |
| Frequency (MHz) | 20dB Bandwidth (MHz)    | 99% OBW (MHz) | Limit (MHz) |
| 2402            | 1.213                   | 1.1373        | ----        |
| 2441            | 1.204                   | 1.1374        | ----        |
| 2480            | 1.210                   | 1.1414        | ----        |

# Test Graphs

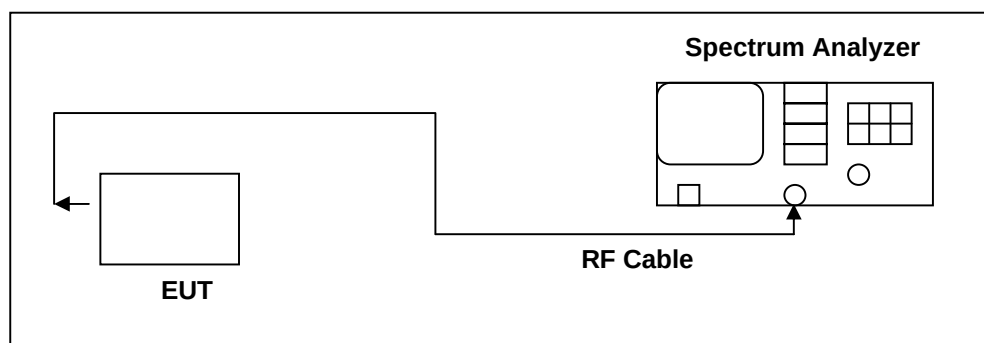
| Mode 1: GFSK Link Mode |                                                                                      |
|------------------------|--------------------------------------------------------------------------------------|
| 2402                   |    |
| 2441                   |   |
| 2480                   |  |

| Mode 2: 8DPSK Link Mode |                                                                                      |
|-------------------------|--------------------------------------------------------------------------------------|
| 2402                    |    |
| 2441                    |   |
| 2480                    |  |

## 8.5 Carrier Frequency Separation Measurement Limit

Title 47 of the CFR, Part 15 Subpart (c) 15.247(a)(1)(i) requires the measurement of the bandwidth of the transmission between the -20 dB points on the transmitted spectrum. The results of this test determine the limits for channel spacing. The channel spacing shall be a minimum of 25 kHz or the 20 dB bandwidth.

### Test Setup



### Test Instruments

| Equipment         | Manufacturer | Model Number | Serial Number | Cal. Date  | Remark |
|-------------------|--------------|--------------|---------------|------------|--------|
| Spectrum Analyzer | Agilent      | E4445A       | MY46181814    | 11/12/2014 | (1)    |

Remark: (1)Calibration period 1 year. (2)Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth transmitter of the V6 had its hopping function enabled. The following spectrum analyzer settings were used:

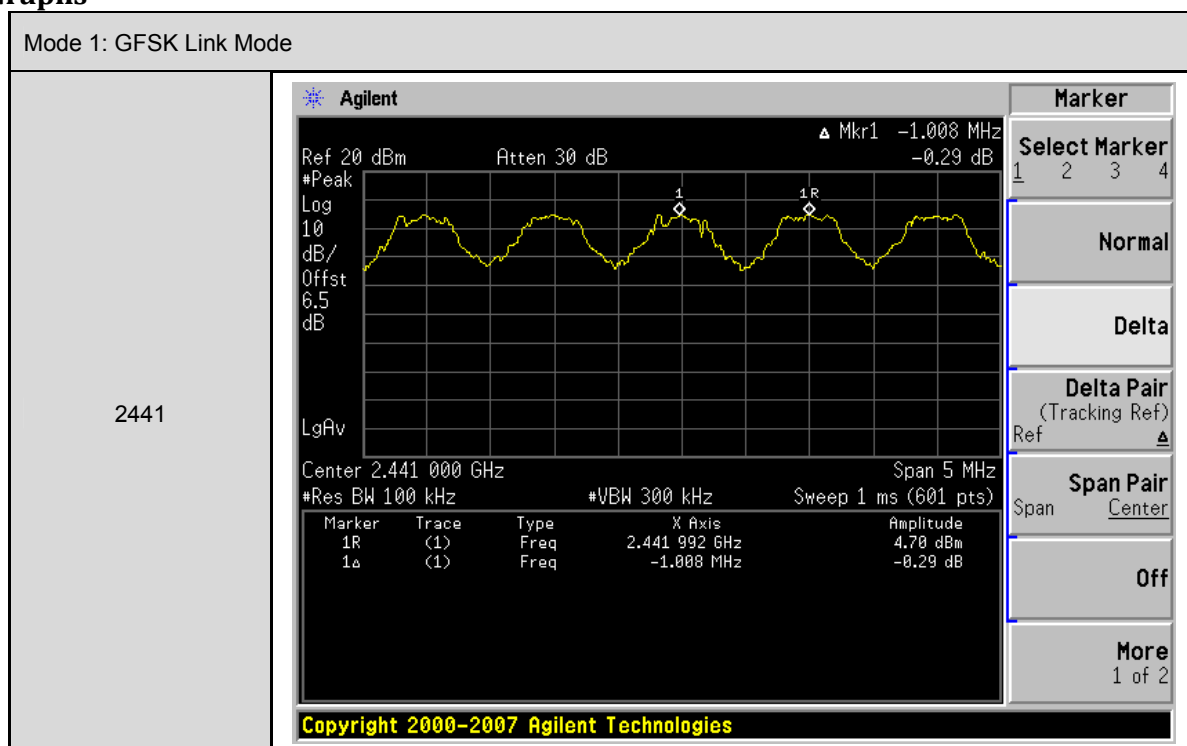
1. Span = wide enough to capture the peaks of two adjacent channels
2. Resolution (or IF) Bandwidth (RBW)  $\geq$  1% of the span
3. Video (or Average) Bandwidth (VBW)  $\geq$  RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

The trace was allowed to stabilize. The marker-delta function was used to determine the separation between the peaks of the adjacent channels.

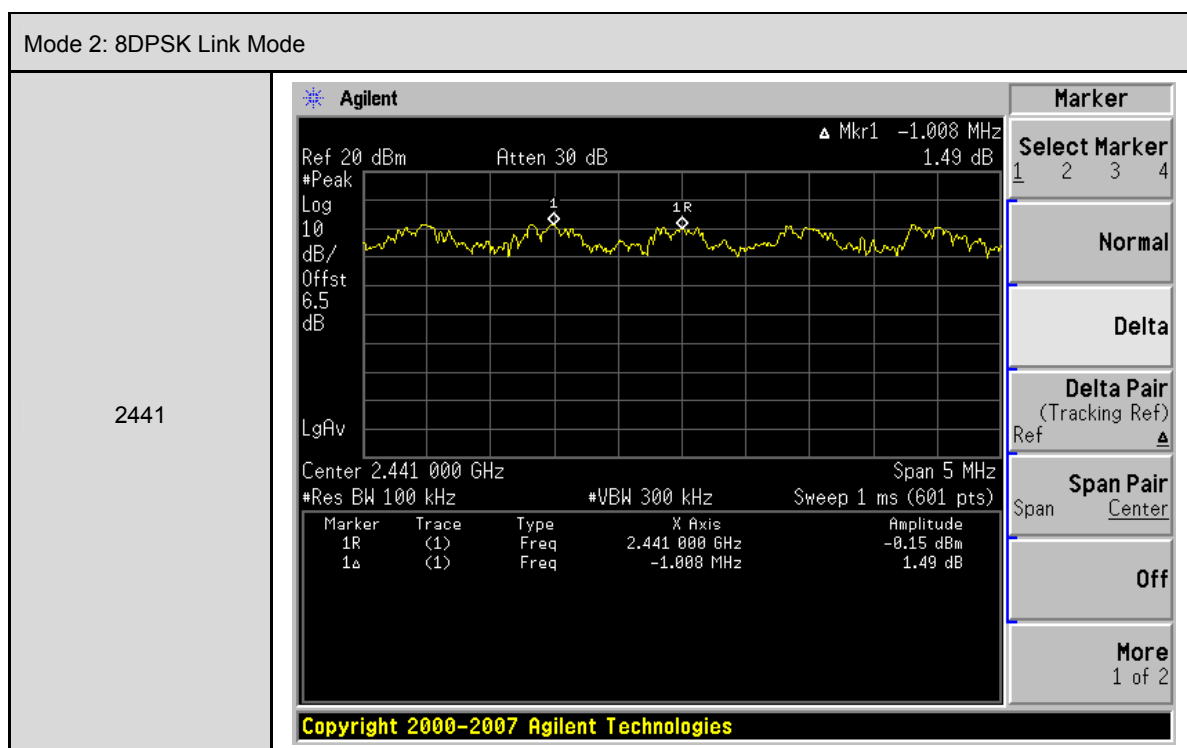
## Test Result

|                 |                              |             |      |
|-----------------|------------------------------|-------------|------|
| Model Number    | Hercules Universal DJ        |             |      |
| Test Item       | Carrier Frequency Separation |             |      |
| Test Mode       | Mode 1: GFSK Link Mode       |             |      |
| Date of Test    | 2014/11/12                   | Test Site   | TE02 |
| Frequency (MHz) | Measurement (MHz)            | Limit (MHz) |      |
| 2441            | 1.008                        | >0.563      |      |

## Test Graphs



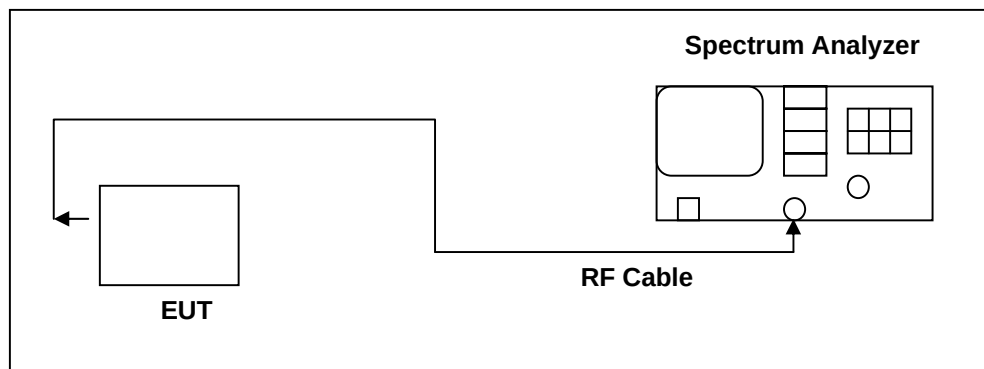
|                 |                              |             |      |
|-----------------|------------------------------|-------------|------|
| Model Number    | Hercules Universal DJ        |             |      |
| Test Item       | Carrier Frequency Separation |             |      |
| Test Mode       | Mode 2: 8DPSK Link Mode      |             |      |
| Date of Test    | 2014/11/12                   | Test Site   | TE02 |
| Frequency (MHz) | Measurement (MHz)            | Limit (MHz) |      |
| 2441            | 1.008                        | >0.761      |      |



## 8.6 Number of Hopping Measurement Limit

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

### Test Setup



### Test Instruments

| Equipment         | Manufacturer | Model Number | Serial Number | Cal. Date  | Remark |
|-------------------|--------------|--------------|---------------|------------|--------|
| Spectrum Analyzer | Agilent      | E4445A       | MY46181814    | 11/12/2014 | (1)    |

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth frequency hopping function of the EUT was enabled. The spectrum analyzer used the following settings:

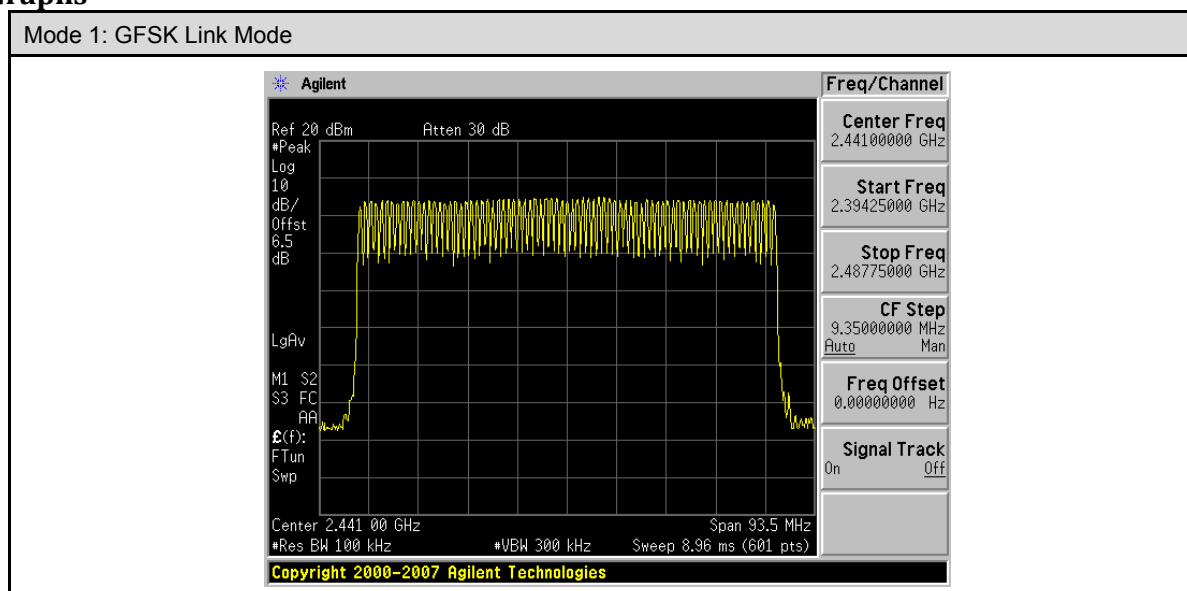
1. Span = the frequency band of operation
2. RBW  $\geq$  1% of the span
3. VBW  $\geq$  RBW
4. Sweep = auto
5. Detector function = peak
6. Trace = max hold

The trace was allowed to stabilize.

## Test Result

|                      |                        |           |            |
|----------------------|------------------------|-----------|------------|
| Model Number         | Hercules Universal DJ  |           |            |
| Test Item            | Number of Hopping      |           |            |
| Test Mode            | Mode 1: GFSK Link Mode |           |            |
| Date of Test         | 2014/11/12             | Test Site | TE02       |
| FrequencyRange (MHz) | Measurement (ch)       |           | Limit (ch) |
| 2402 - 2480          | 79                     |           | > 15       |

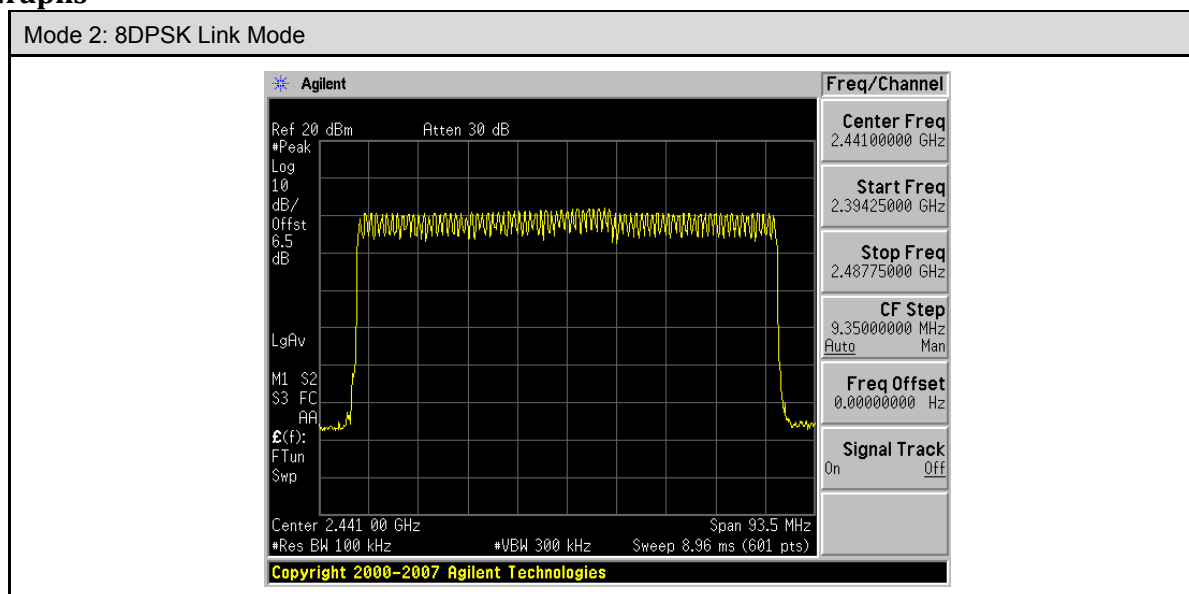
## Test Graphs



## Test Result

|                       |                         |                  |            |
|-----------------------|-------------------------|------------------|------------|
| Model Number          | Hercules Universal DJ   |                  |            |
| Test Item             | Number of Hopping       |                  |            |
| Test Mode             | Mode 2: 8DPSK Link Mode |                  |            |
| Date of Test          | 2014/11/12              | Test Site        | TE02       |
| Frequency Range (MHz) |                         | Measurement (ch) | Limit (ch) |
| 2402 - 2480           |                         | 79               | > 15       |

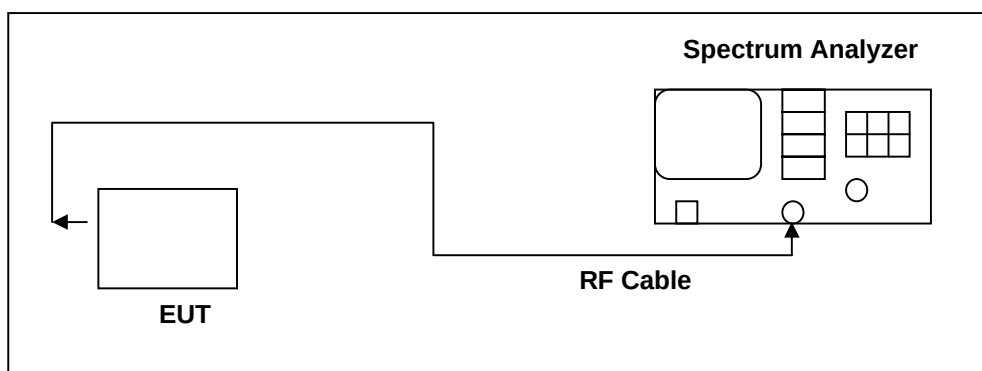
## Test Graphs



## 8.7 Time of Occupancy (Dwell Time) Measurement Limit

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

### Test Setup



### Test Instruments

| Equipment         | Manufacturer | Model Number | Serial Number | Cal. Date  | Remark |
|-------------------|--------------|--------------|---------------|------------|--------|
| Spectrum Analyzer | Agilent      | E4445A       | MY46181814    | 11/12/2014 | (1)    |

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

### Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The RF output port of the Equipment-Under-Test is directly coupled to the input of the EMC analyzer through a specialized RF connector and a 10dB passive attenuator. A fully charged battery was used for the supply voltage. The Bluetooth hopping function of the EUT was enabled. The following spectrum analyzer settings were used:

1. Span = zero span, centered on a hopping channel
2. RBW = 1 MHz
3. VBW  $\geq$  RBW
4. Sweep = as necessary to capture the entire dwell time per hopping channel
5. Detector function = peak
6. Trace = max hold

The marker-delta function was used to determine the dwell time.

## Test Result

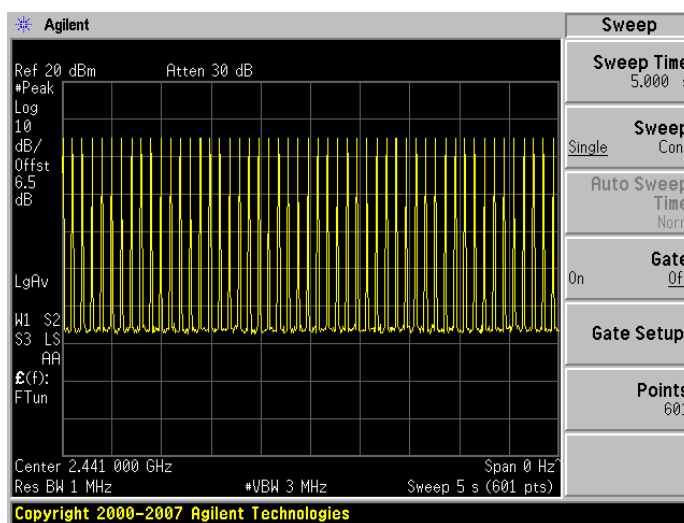
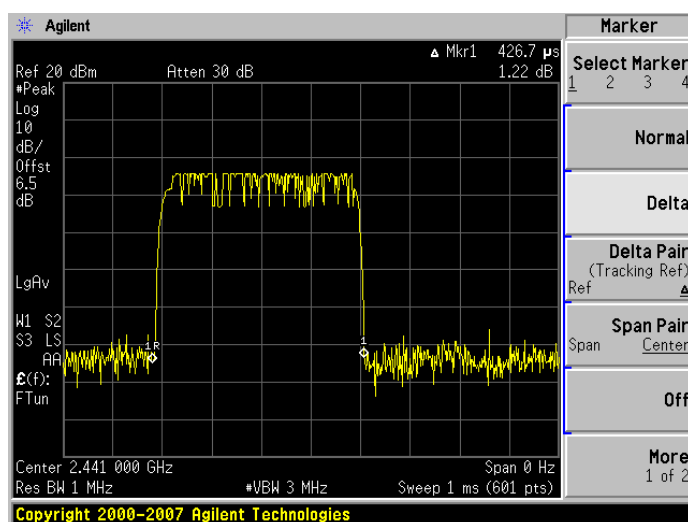
|                              |                                |           |      |
|------------------------------|--------------------------------|-----------|------|
| Model Number                 | Hercules Universal DJ          |           |      |
| Test Item                    | Time of Occupancy (Dwell Time) |           |      |
| Test Mode                    | Mode 1: GFSK Link Mode         |           |      |
| Date of Test                 | 2014/11/13                     | Test Site | TE02 |
| DH1                          |                                |           |      |
| Length of per burst(ms)      | 0.427                          |           |      |
| Number of burst in 5 seconds | 51                             |           |      |
| Cycle Calculate              | 79CH * 0.4 = 31.6 (sec)        |           |      |
| Dwell Times                  | 31.6/5*51*0.427 =137.631       |           |      |
| LIMIT(msec)                  | < = 400                        |           |      |
| DH3                          |                                |           |      |
| Length of per burst(ms)      | 1.6                            |           |      |
| Number of burst in 5 seconds | 26                             |           |      |
| Cycle Calculate              | 79CH * 0.4 = 31.6 (sec)        |           |      |
| Dwell Times                  | 31.6/5*26*1.600 =262.912       |           |      |
| LIMIT(msec)                  | < = 400                        |           |      |
| DH5                          |                                |           |      |
| Length of per burst(ms)      | 2.94                           |           |      |
| Number of burst in 5 seconds | 17                             |           |      |
| Cycle Calculate              | 79CH * 0.4 = 31.6 (sec)        |           |      |
| Dwell Times                  | 31.6/5*17*2.94 =315.874        |           |      |
| LIMIT(msec)                  | < = 400                        |           |      |

|                              |                                |           |      |
|------------------------------|--------------------------------|-----------|------|
| Model Number                 | Hercules Universal DJ          |           |      |
| Test Item                    | Time of Occupancy (Dwell Time) |           |      |
| Test Mode                    | Mode 2: 8DPSK Link Mode        |           |      |
| Date of Test                 | 2014/11/13                     | Test Site | TE02 |
| 3-DH1                        |                                |           |      |
| Length of per burst(ms)      | 0.443                          |           |      |
| Number of burst in 5 seconds | 51                             |           |      |
| Cycle Calculate              | 79CH * 0.4 = 31.6 (sec)        |           |      |
| Dwell Times                  | 31.6/5*51*0.443 =142.788       |           |      |
| LIMIT(msec)                  | < = 400                        |           |      |
| 3-DH3                        |                                |           |      |
| Length of per burst(ms)      | 1.700                          |           |      |
| Number of burst in 5 seconds | 25                             |           |      |
| Cycle Calculate              | 79CH * 0.4 = 31.6 (sec)        |           |      |
| Dwell Times                  | 31.6/5*25*1.700 =268.600       |           |      |
| LIMIT(msec)                  | < = 400                        |           |      |
| 3-DH5                        |                                |           |      |
| Length of per burst(ms)      | 2.975                          |           |      |
| Number of burst in 5 seconds | 17                             |           |      |
| Cycle Calculate              | 79CH * 0.4 = 31.6 (sec)        |           |      |
| Dwell Times                  | 31.6/5*17*2.975 =319.634       |           |      |
| LIMIT(msec)                  | < = 400                        |           |      |

## Test Graphs

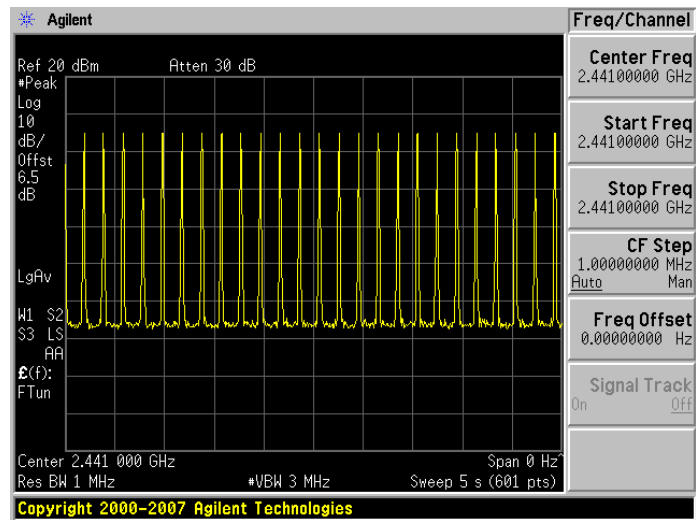
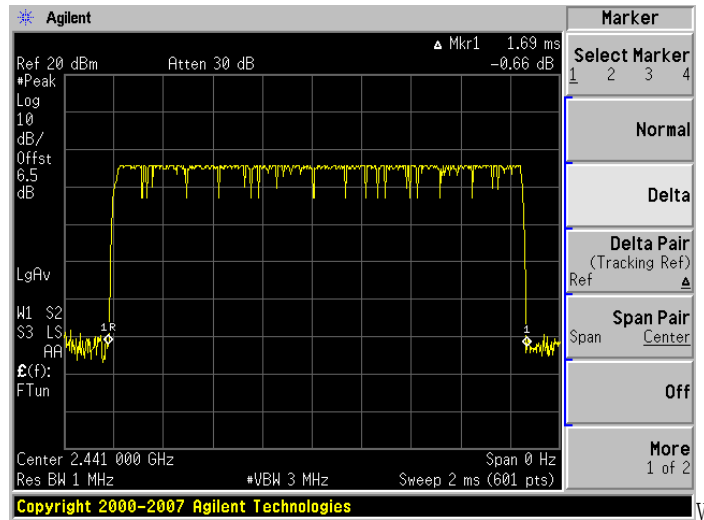
Mode 1: GFSK Link Mode

DH1



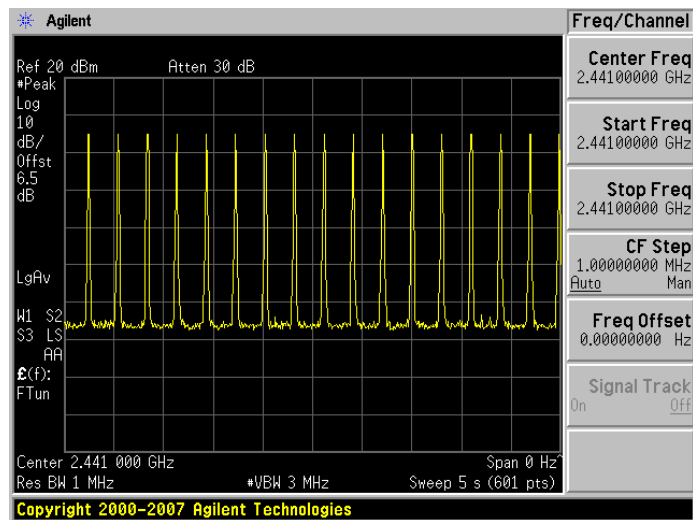
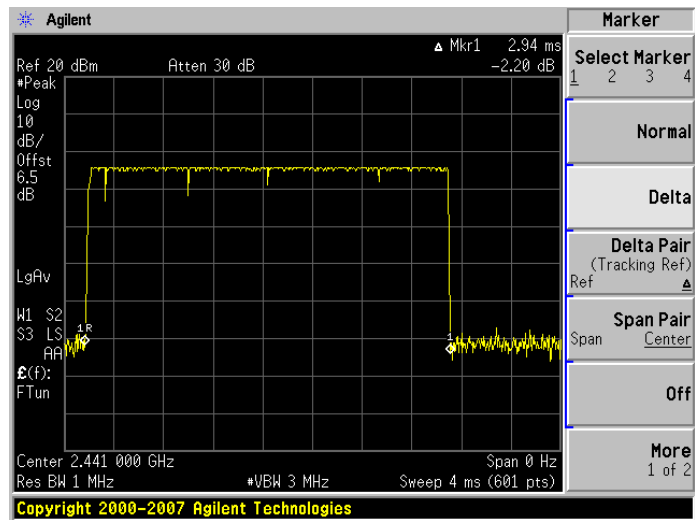
Mode 1: GFSK Link Mode

DH3



Mode 1: GFSK Link Mode

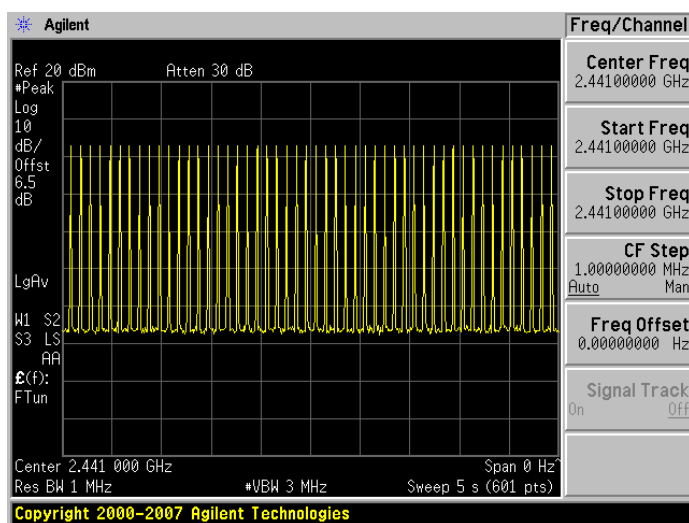
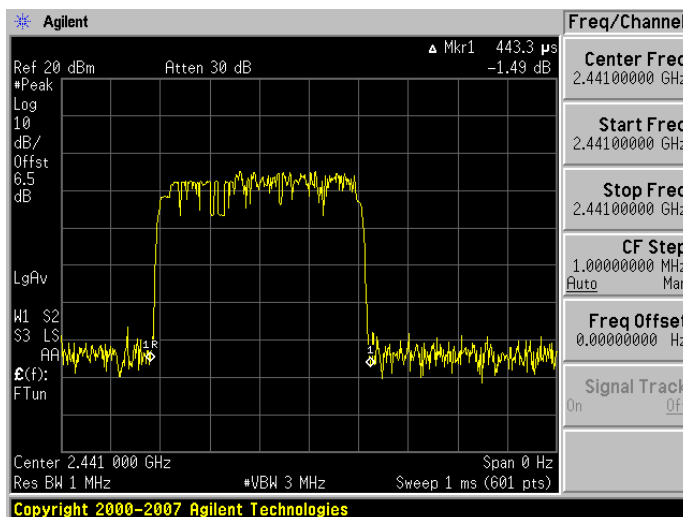
DH5



## Test Graphs

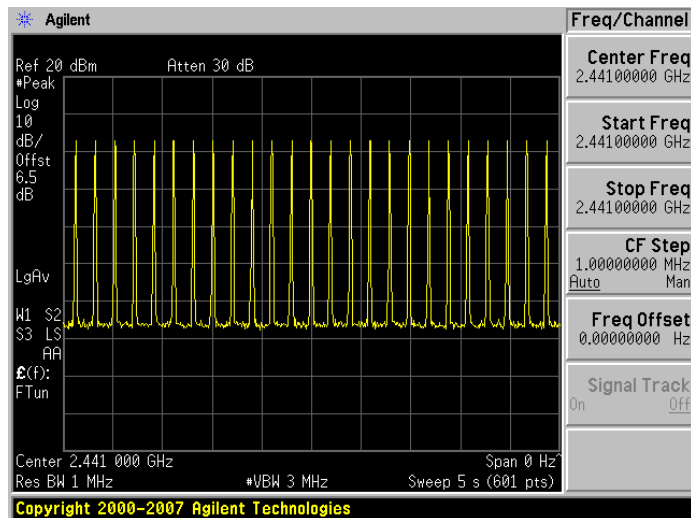
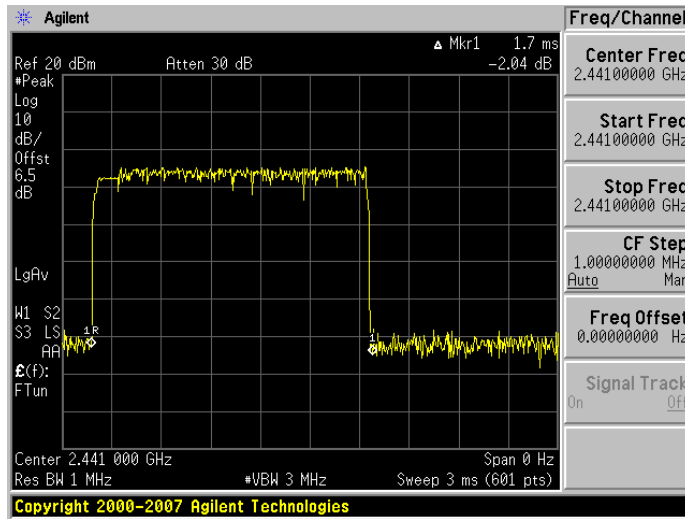
Mode 2: 8DPSK Link Mode

3-DH1



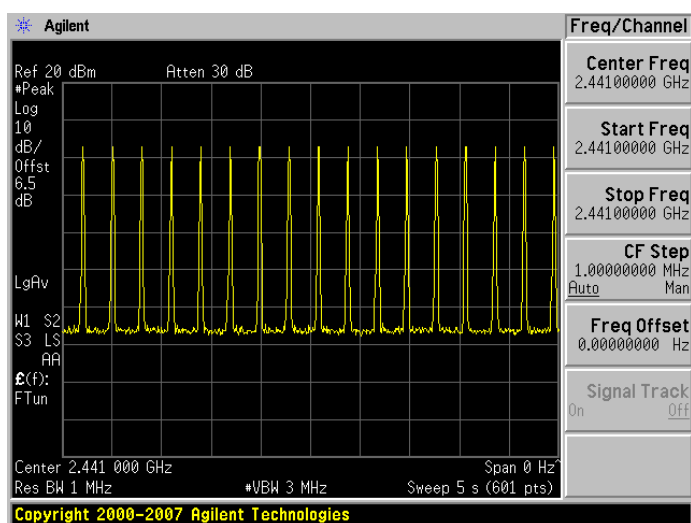
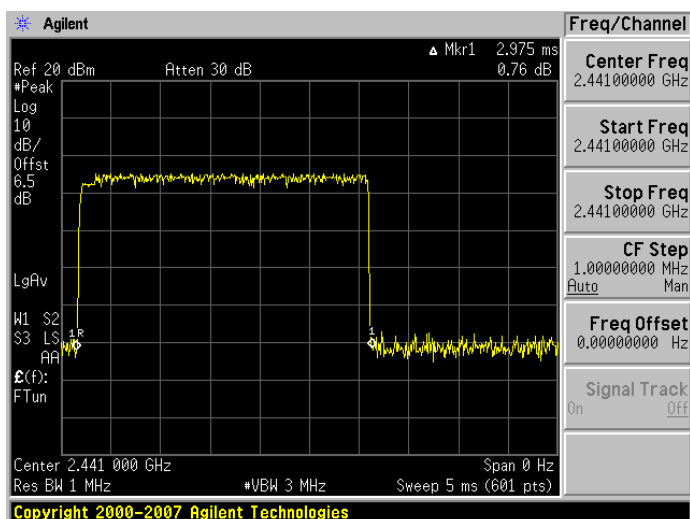
Mode 2: 8DPSK Link Mode

3-DH3



Mode 2: 8DPSK Link Mode

3-DH5

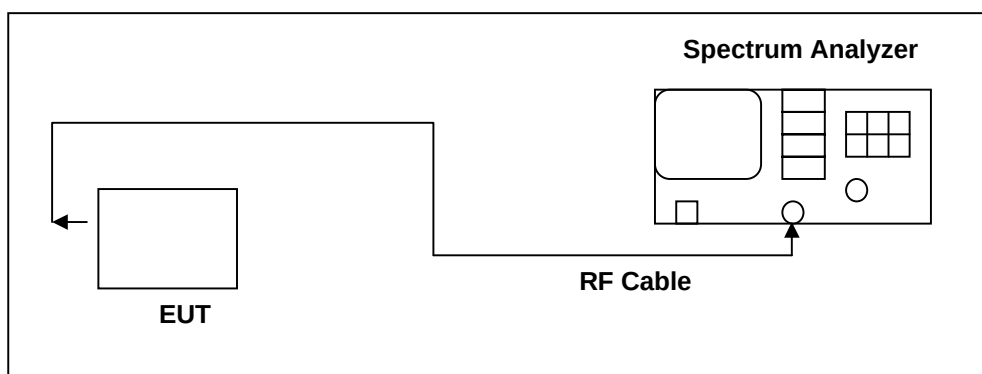


## 8.8 Out of Band Conducted Emissions Measurement

### Limit

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

### Test Setup



### Test Instruments

| Equipment         | Manufacturer | Model Number | Serial Number | Cal. Date  | Remark |
|-------------------|--------------|--------------|---------------|------------|--------|
| Spectrum Analyzer | Agilent      | N9020A       | MY53420615    | 05/12/2014 | (1)    |
| Spectrum Analyzer | Agilent      | E4445A       | MY46181814    | 11/12/2014 | (1)    |

Remark: (1)Calibration period 1 year. (2)Calibration period 2 years.

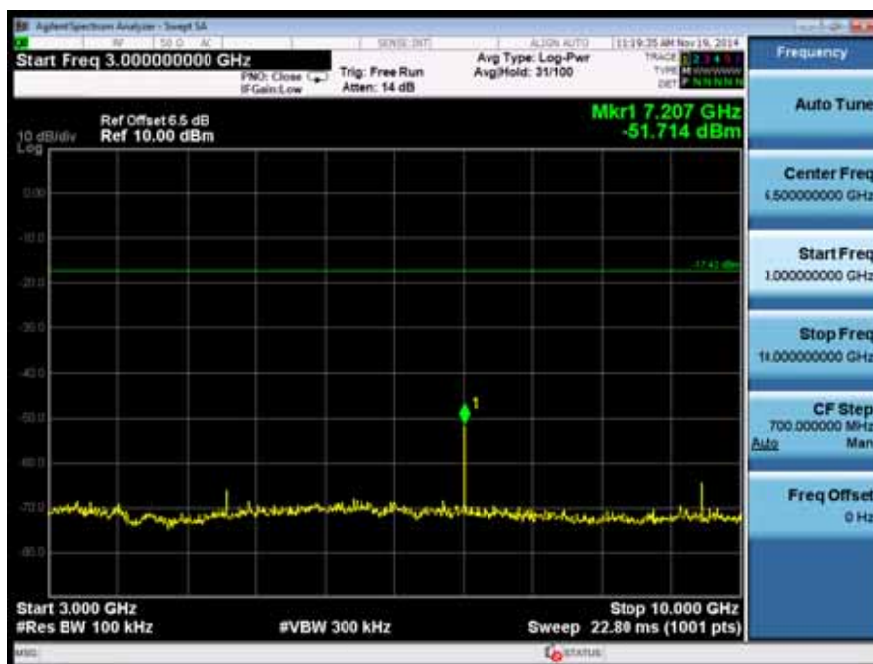
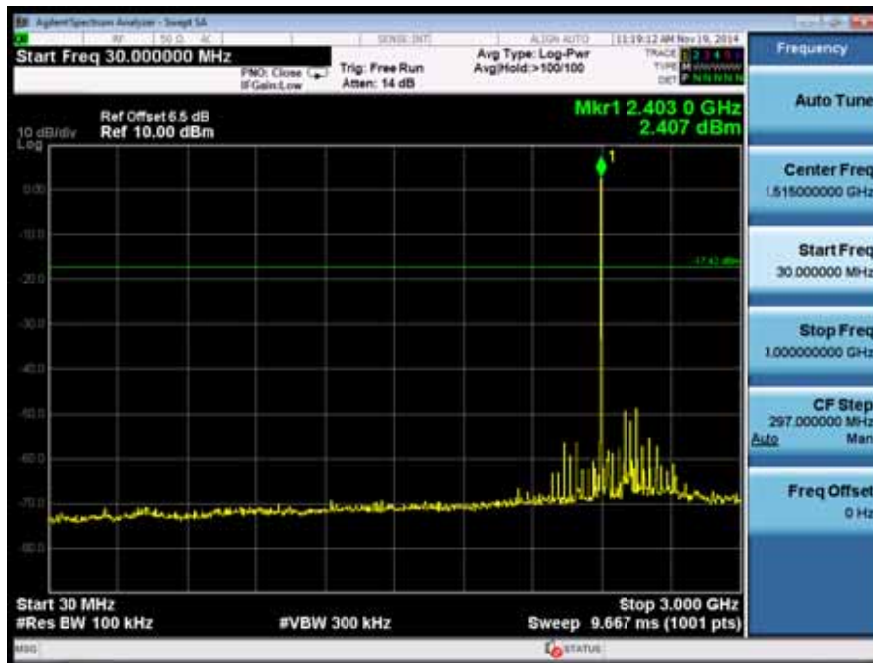
NOTE: N.C.R. = No Calibration Request.

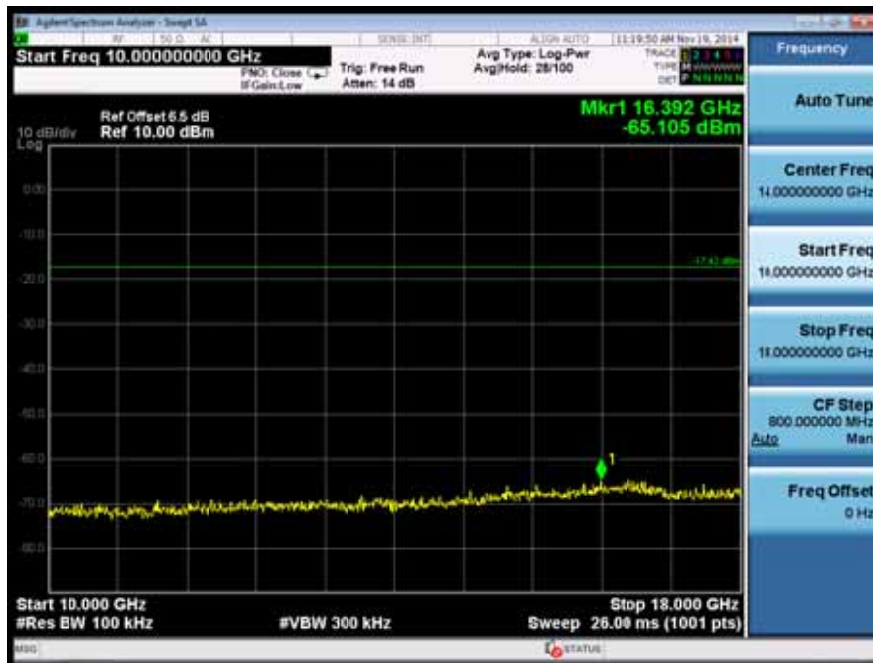
### Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band. The test was performed at 3 channels (Channel 0, 39, 78)







Agilent

Ref 10 dBm Atten 20 dB Mkr1 2.440 993 GHz 4.68 dBm

\*Peak Log 10 dB/ Offst 6.5 dB

LgAv

M1 S2 S3 FC AA

£(f): f>50k Swp

Center 2.441 000 GHz Span 2 MHz

\*Res BW 100 kHz #VBW 100 kHz Sweep 1 ms (601 pts)

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Freq/Channel

Center Freq 2.44100000 GHz

Start Freq 2.44000000 GHz

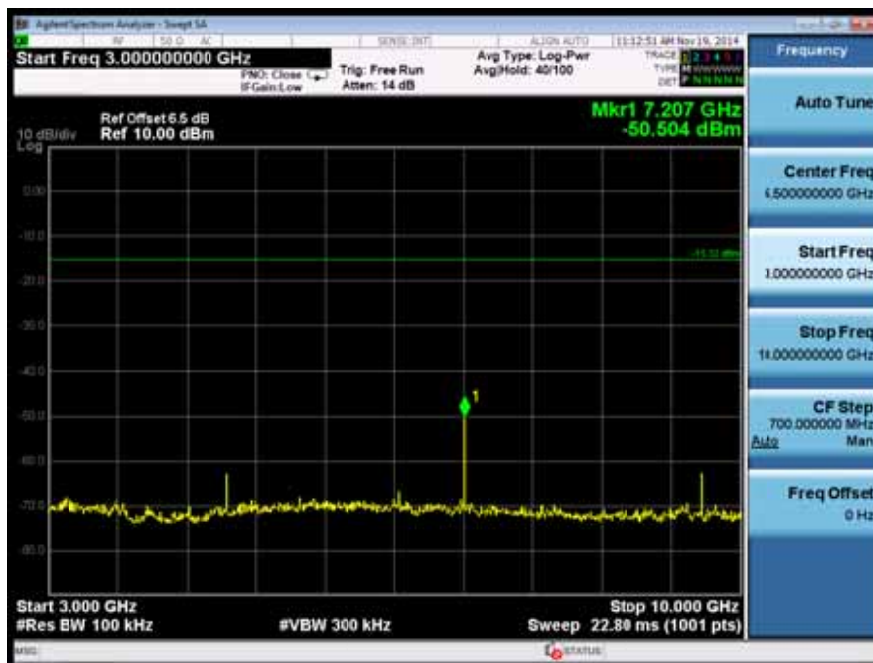
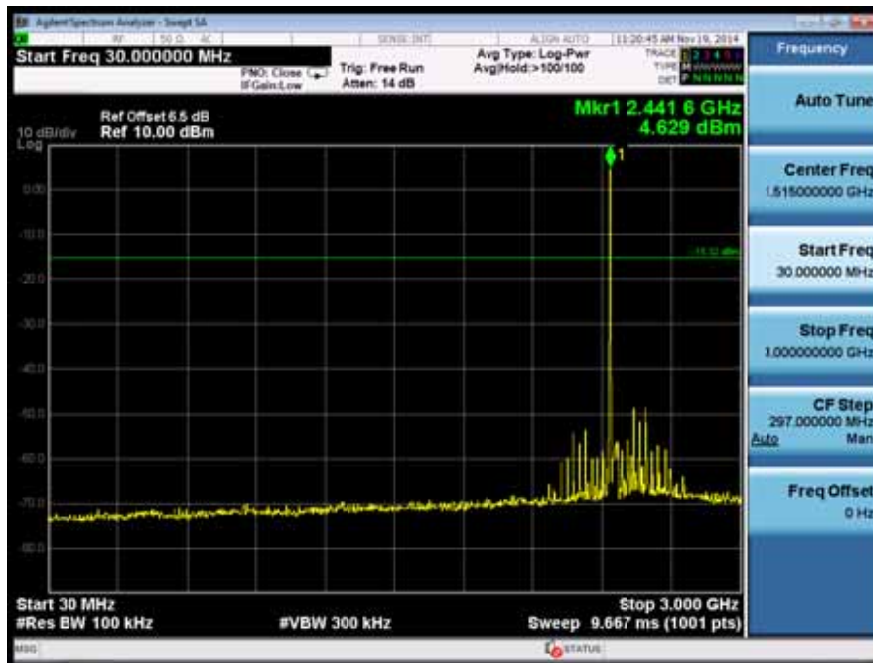
Stop Freq 2.44200000 GHz

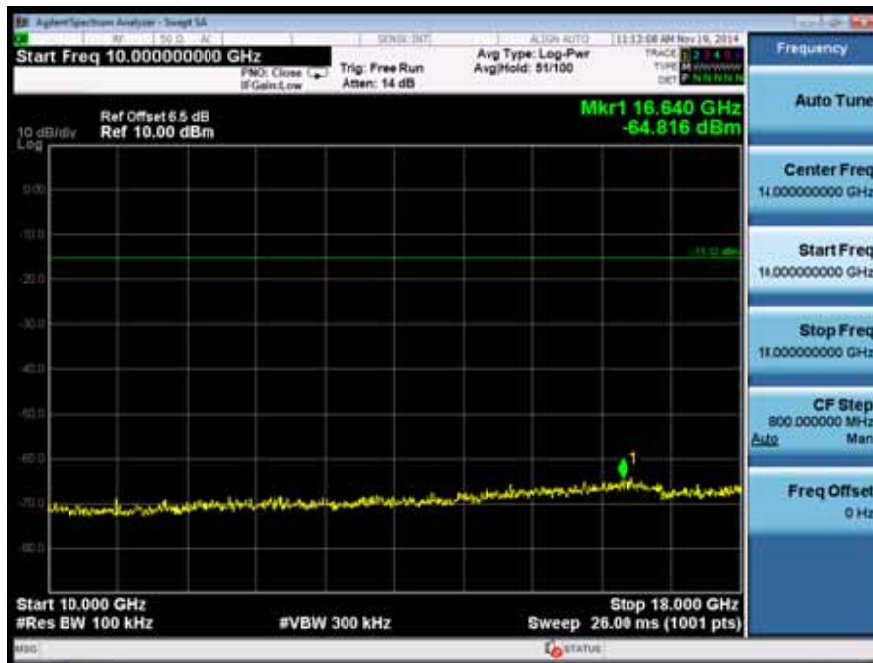
CF Step 200.000000 kHz Auto

Freq Offset 0.00000000 Hz

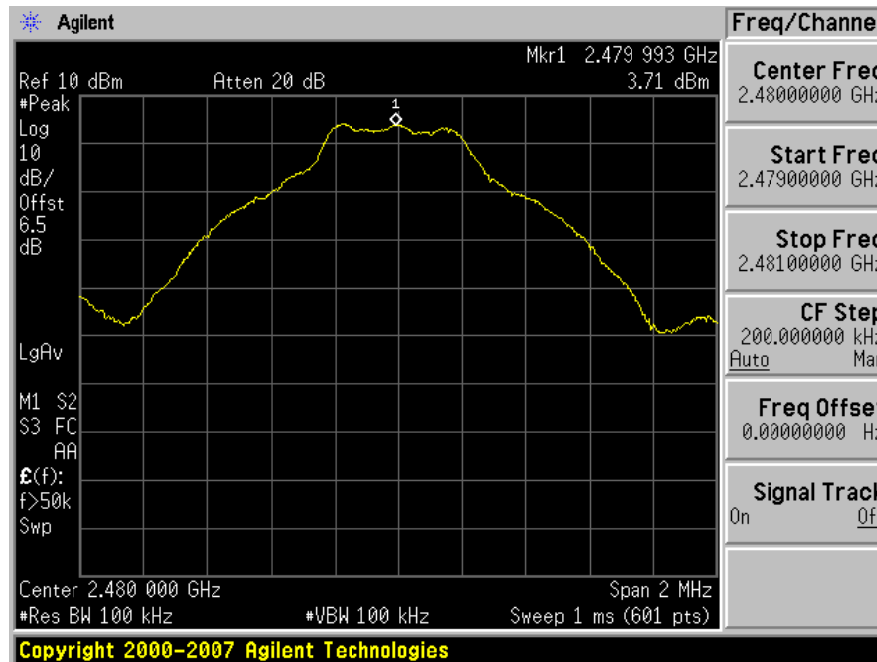
Signal Track On

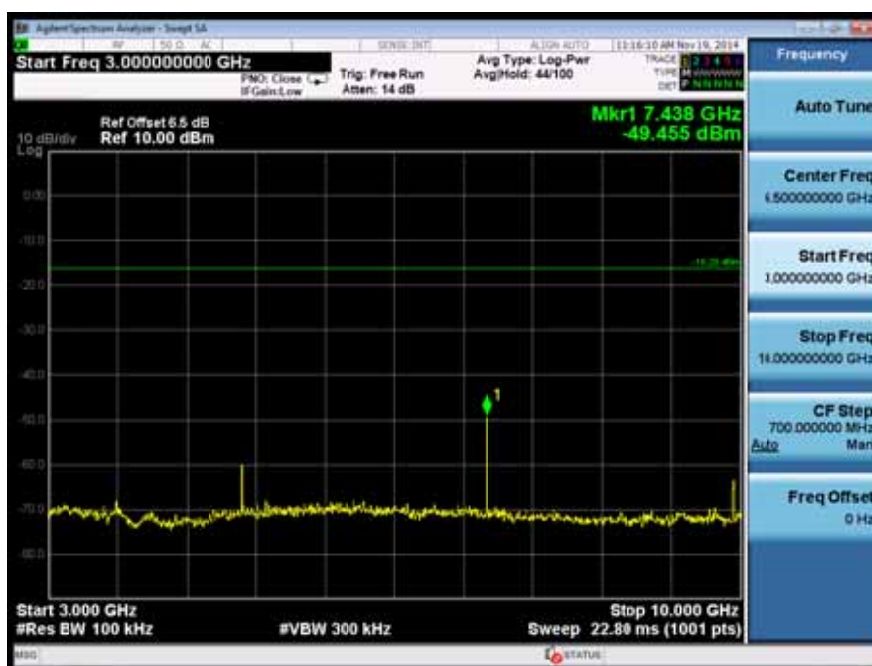
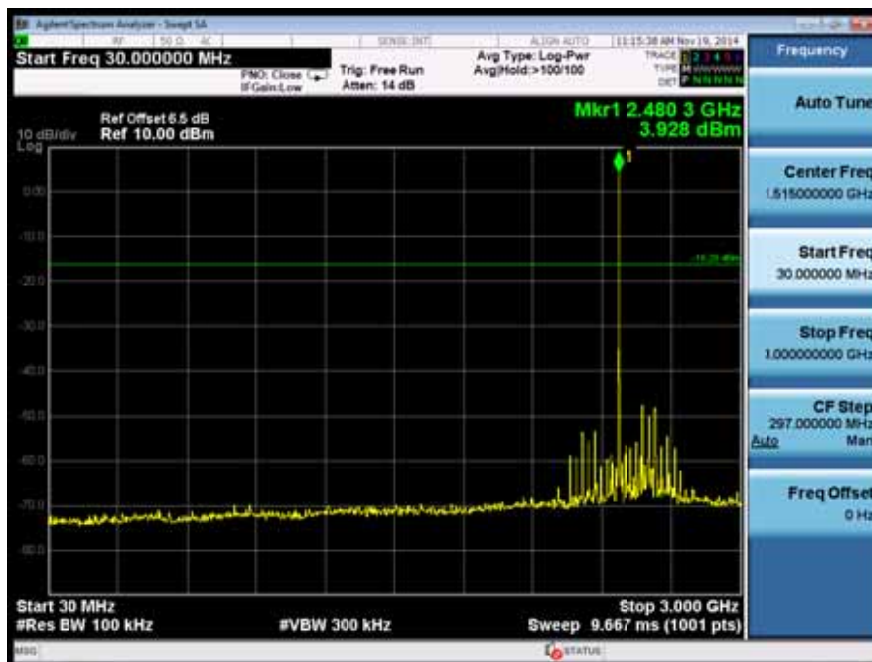






High channel: 2480MHz

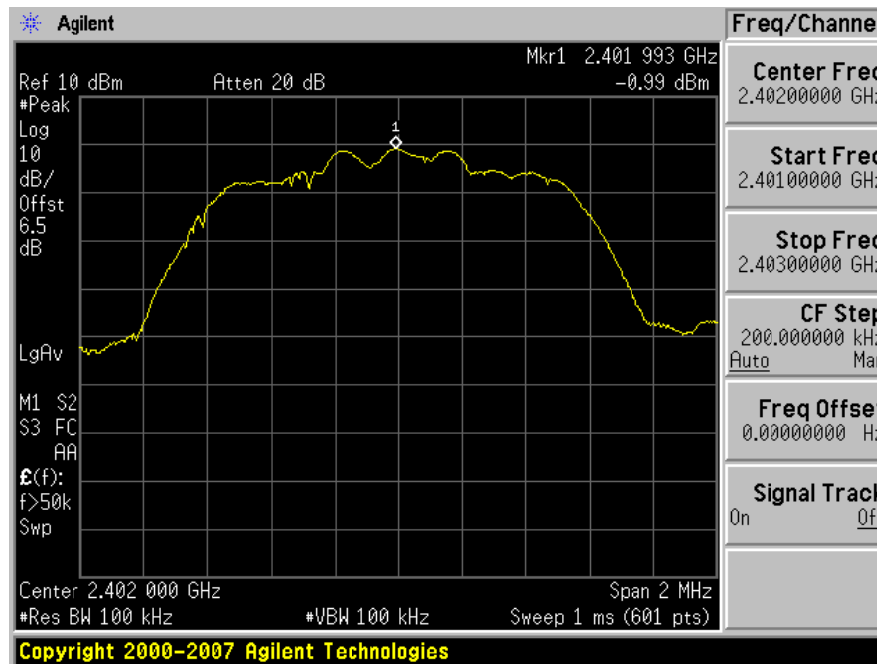






## Mode2:8DPSK Link Mode

Low channel: 2402MHz

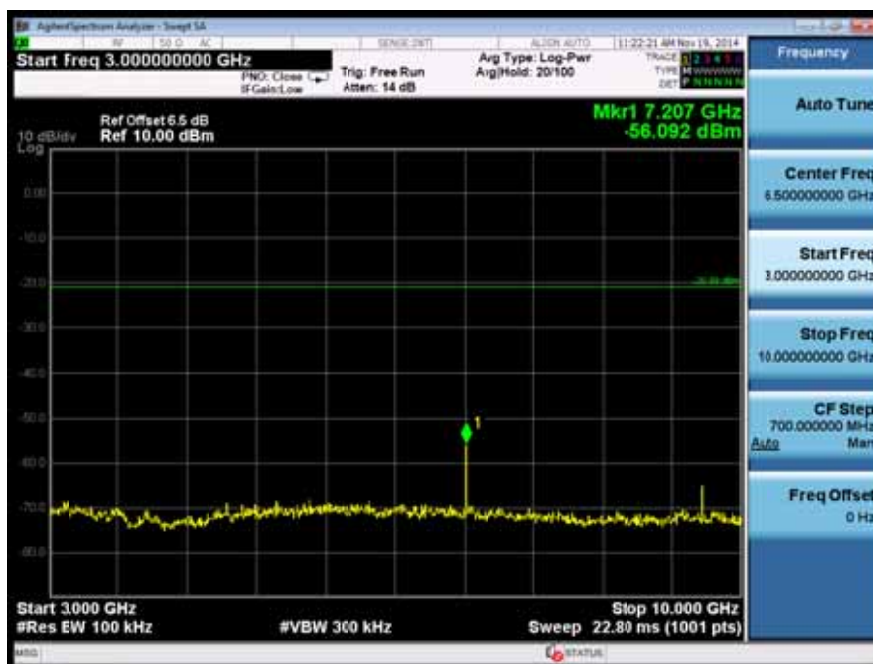
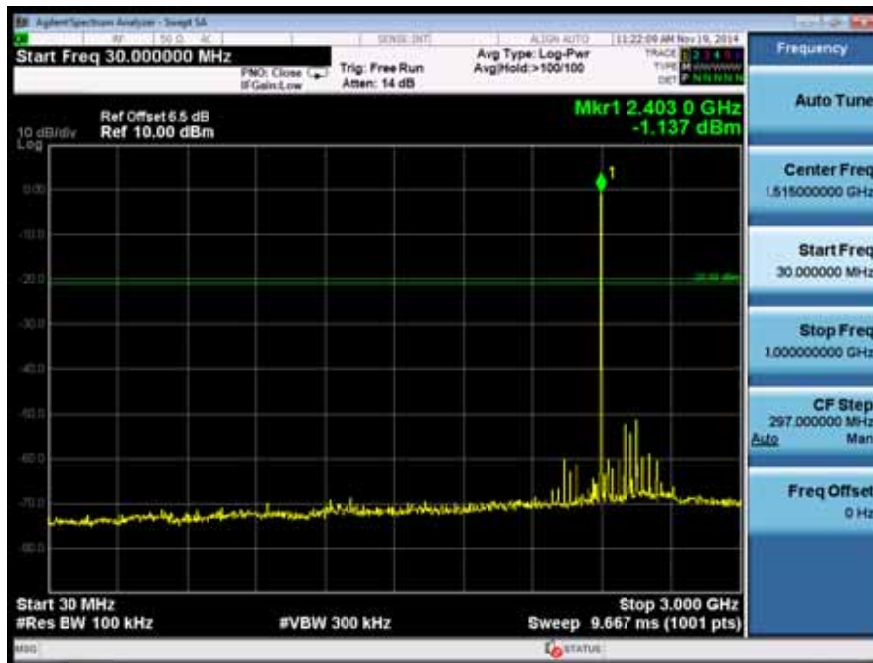


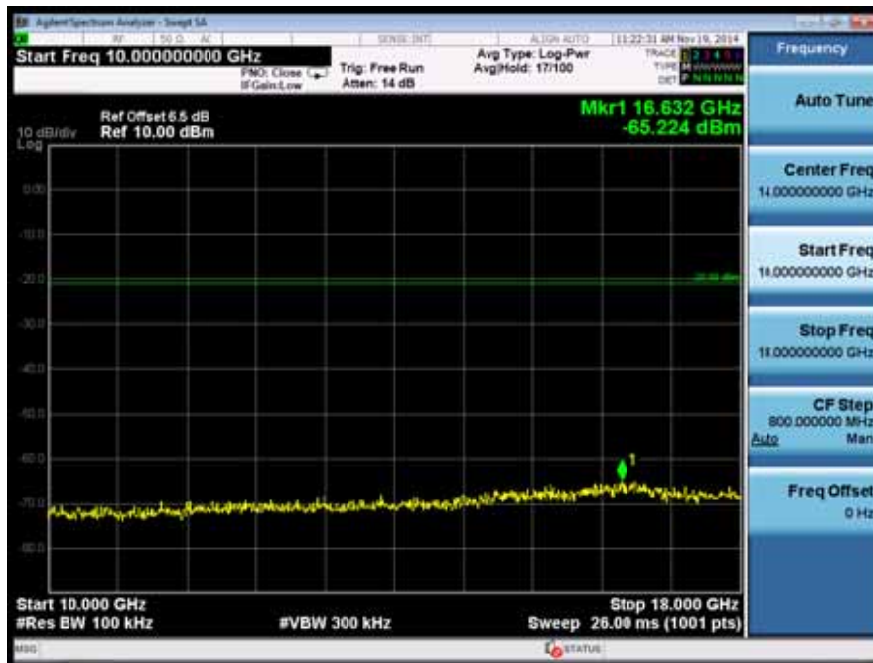
Report Number: **60/790.14.025.03**

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Tel: +852-2776 1323 Fax: +852-2776 1206

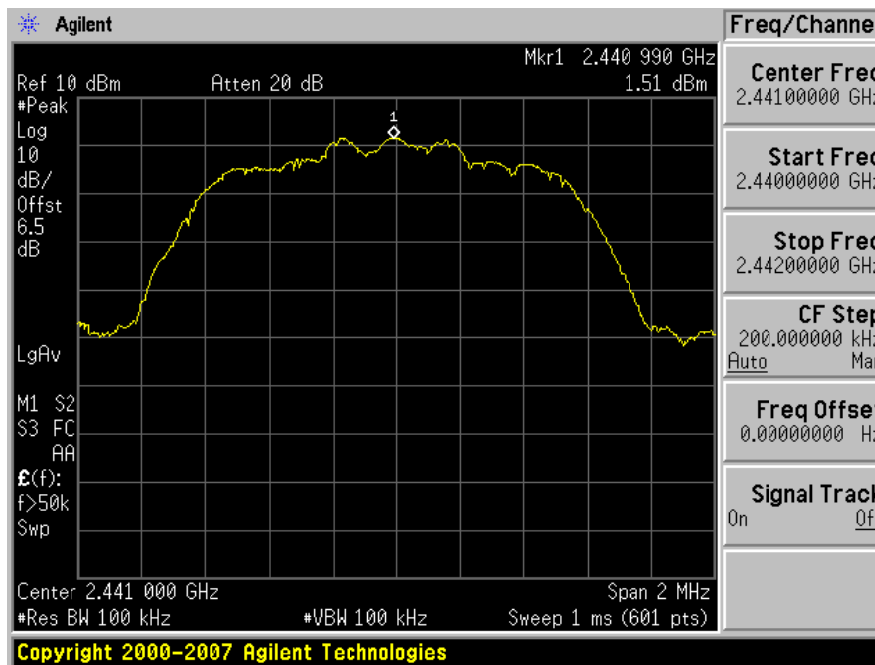
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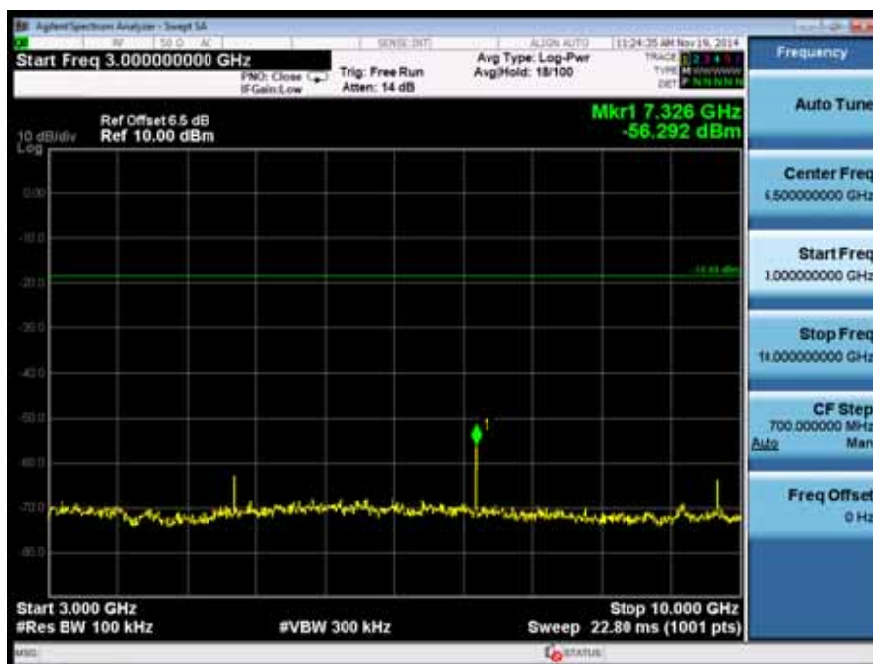
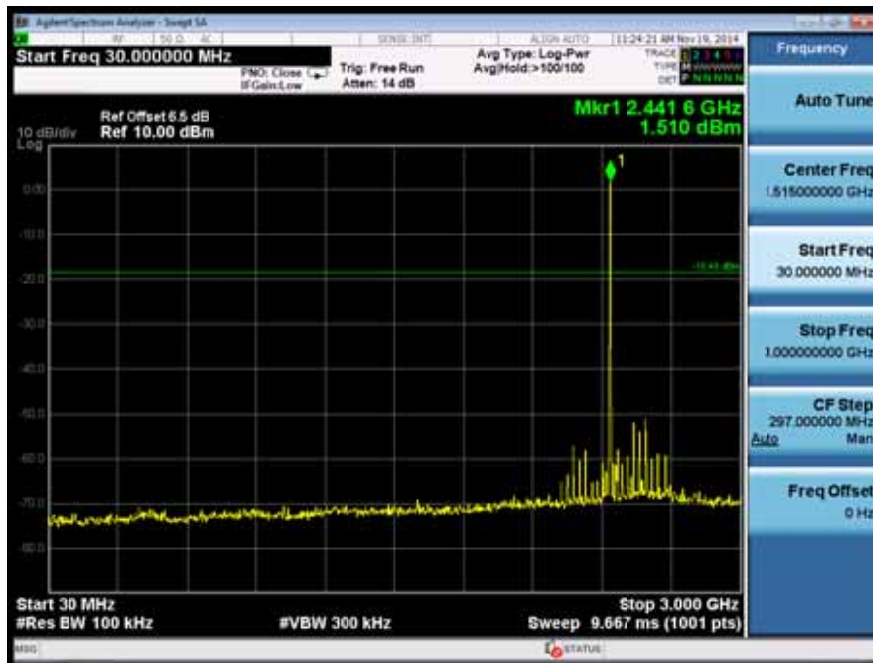
Rev. no.: 2.1

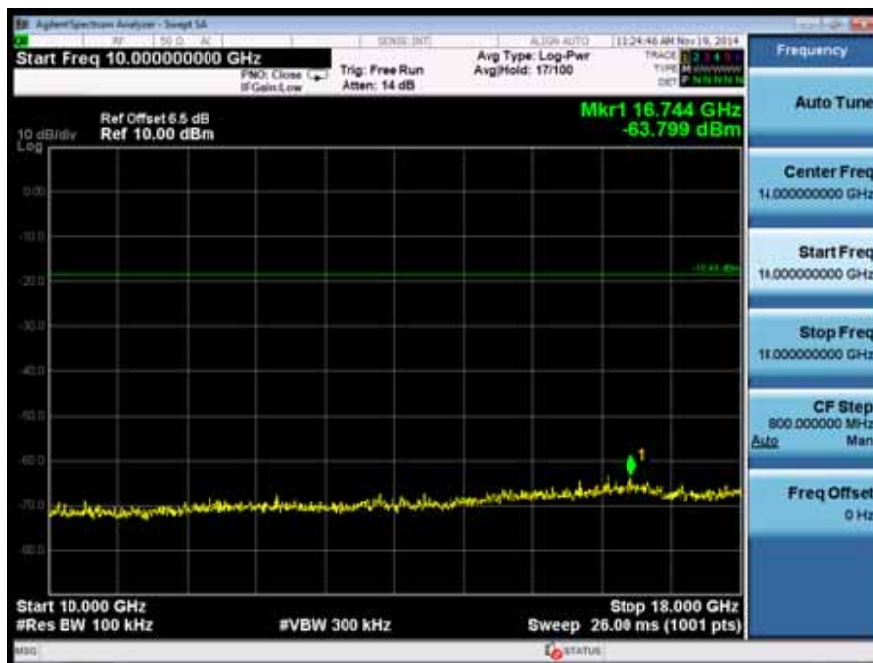




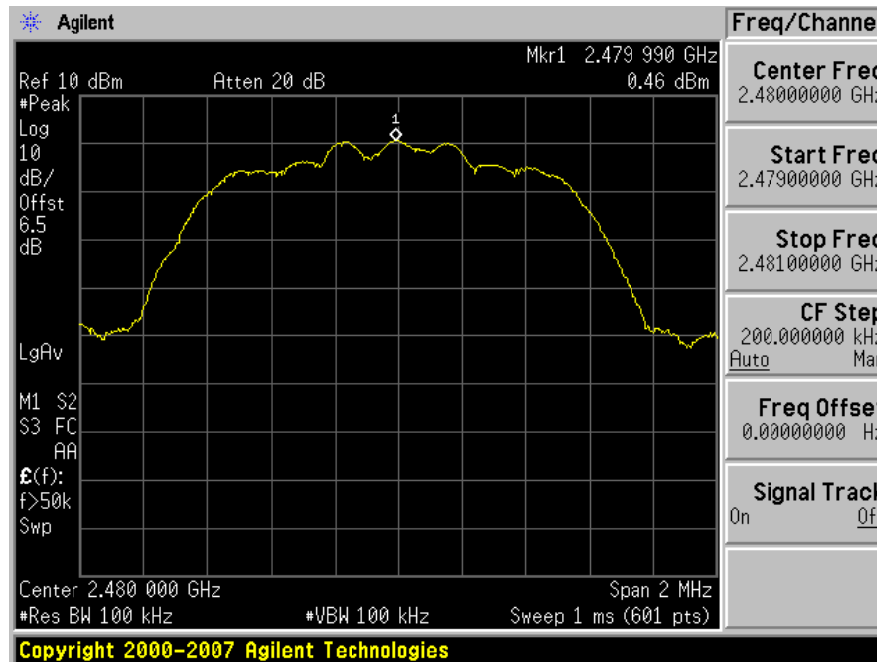
Middle channel: 2441MHz







High channel: 2480MHz

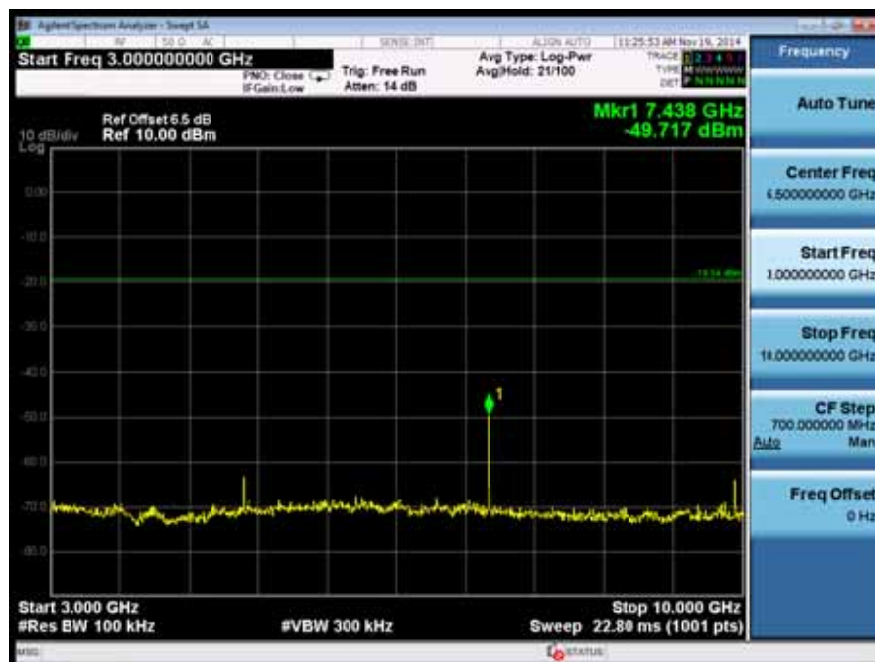
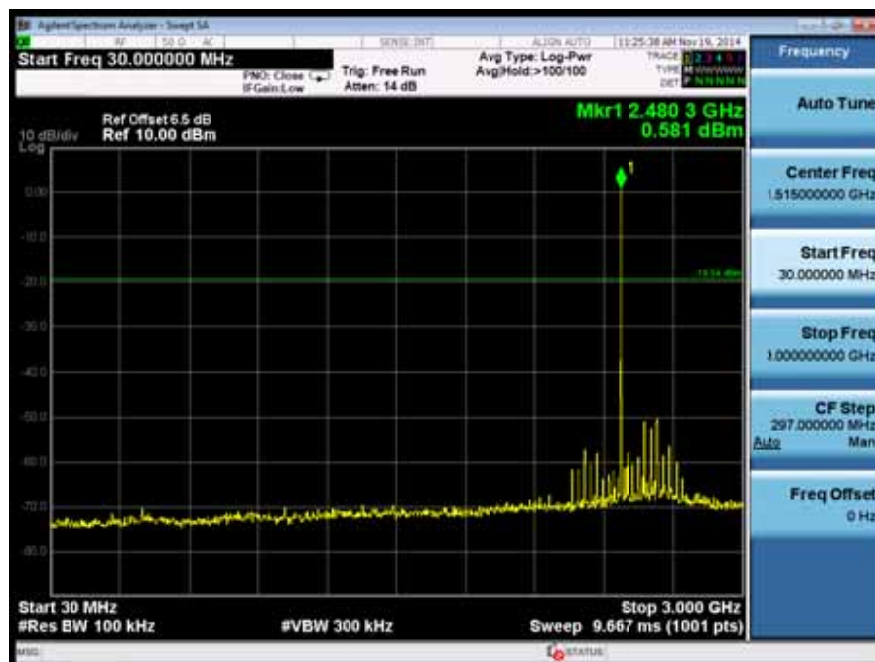


Report Number: **60/790.14.025.03**

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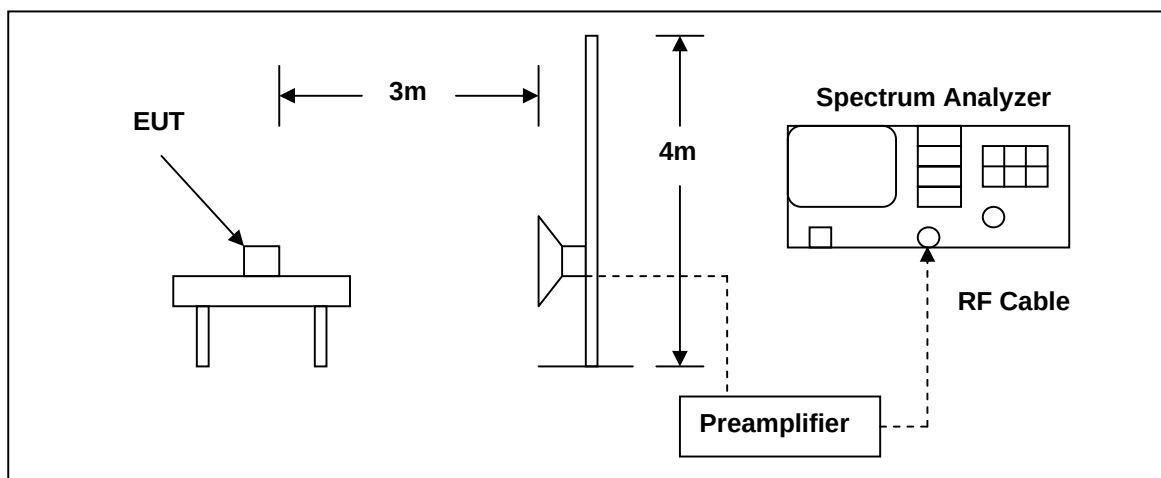


## 8.9 Band Edges Measurement

### Limit

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

### Test Setup



### Test Instruments

| Equipment                | Manufacturer       | Model Number | Serial Number   | Cal. Date  | Remark |
|--------------------------|--------------------|--------------|-----------------|------------|--------|
| EMI Test Receiver        | R&S                | ESU40        | SB8501/09       | 05/16/2014 | (1)    |
| Bilog Antenna            | Schwarzbeck        | Schwarzbeck  | SB8501/04       | 01/20/2014 | (1)    |
| Horn Antenna             | R&S                | HF906        | SB3435          | 01/20/2014 | (1)    |
| Amplifier(1-18GHz)       | R&S                | --           | SB3435/01       | 01/20/2014 | (1)    |
| Amplifier(18-40GHz)      | R&S                | --           | SB3435/02       | 01/20/2014 | (1)    |
| Horn Antenna             | Amplifier Research | AT4560       | SB5392/02       | 05/16/2014 | (1)    |
| RF cable(0.4m)           | Woken              | /            | S02-1404-09-065 | 05/11/2014 | (1)    |
| RF cable(3.5m)           | Woken              | /            | S02-1404-09-047 | 05/11/2014 | (1)    |
| RF cable(1.2m)           | Woken              | /            | S02-1404-09-052 | 05/11/2014 | (1)    |
| 3m Semi-anechoic chamber | Albatross Projects | 9X6X6        | SB3450/01       | 10/12/2014 | (1)    |

Remark: (1)Calibration period 1 year. (2)Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

Report Number: **60/790.14.025.03**

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Rev. no.: 2.1

## Test Procedure

Testing must be done according to this procedure, FCC Public Notice DA 00-705 - Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems. This is the only method recognized by the FCC. The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

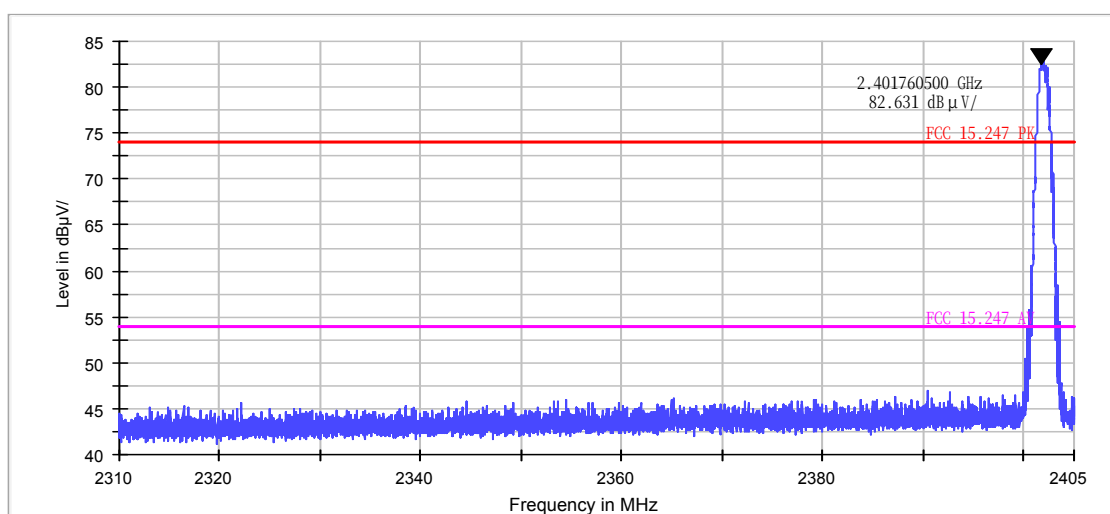
The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

For measurements the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

## Test Result

|               |                       |                      |              |
|---------------|-----------------------|----------------------|--------------|
| Standard:     | FCC Part 15C          | Test Distance:       | 3m           |
| Test item:    | Radiated Emission     | Power:               | 5V DC        |
| Model Number: | Hercules Universal DJ | Temp.(°C)/Hum.(%RH): | 25(°C)/58%RH |
| Mode:         | Mode 1                | Date:                | 2014/11/16   |
| Frequency:    | 2402 MHz              | Test By:             |              |
| Ant.Polar.:   | Horizontal            |                      |              |

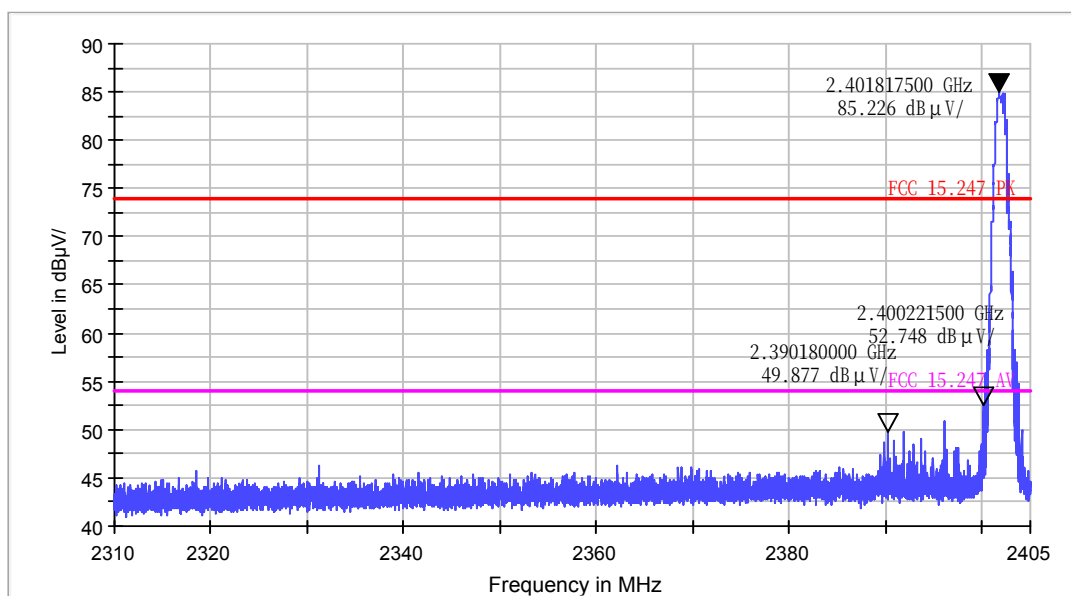
FCC Electric Field Strength 2.4GHz Bandedge-PK



| Channel | Frequency (MHz) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark  | Ant.Polar. H / V |
|---------|-----------------|-----------------|----------------|-------------|---------|------------------|
| 2402MHz | 2390            | 32.6            | 74.00          | 41.4        | peak    | H                |
|         | 2390            | 21.4            | 54.00          | 32.6        | Average | H                |

|               |                       |                      |              |
|---------------|-----------------------|----------------------|--------------|
| Standard:     | FCC Part 15C          | Test Distance:       | 3m           |
| Test item:    | Radiated Emission     | Power:               | 5V DC        |
| Model Number: | Hercules Universal DJ | Temp.(°C)/Hum.(%RH): | 25(°C)/58%RH |
| Mode:         | Mode 1                | Date:                | 2014/11/16   |
| Frequency:    | 2402 MHz              | Test By:             |              |
| Ant.Polar.:   | Vertical              |                      |              |

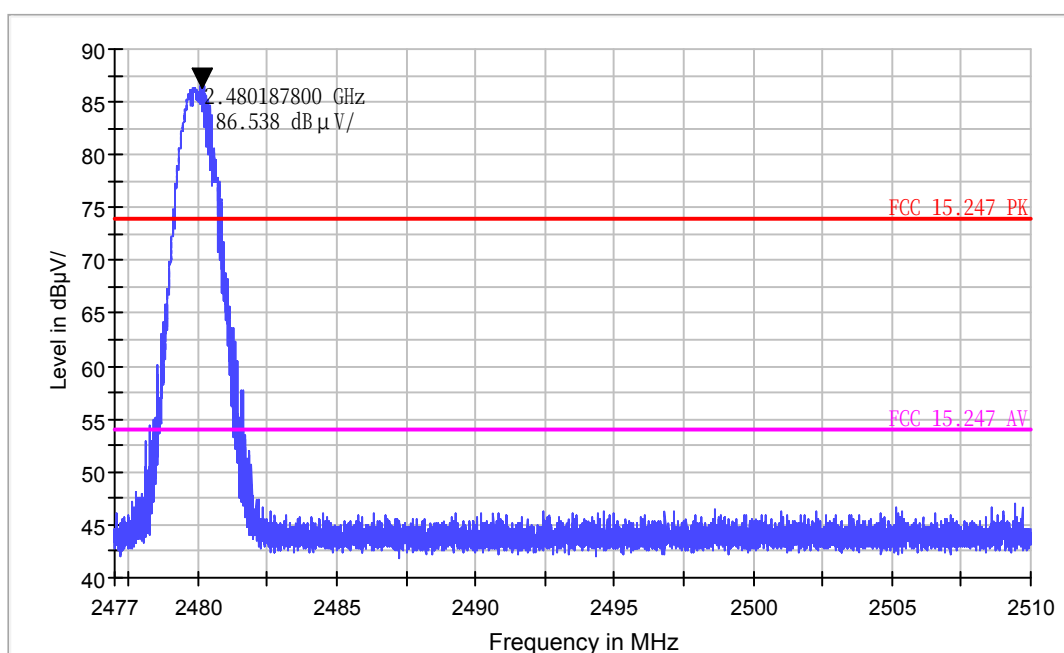
FCC Electric Field Strength 2.4GHz Bandedge-PK



| Channel | Frequency (MHz) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark  | Ant.Polar. H / V |
|---------|-----------------|-----------------|----------------|-------------|---------|------------------|
| 2402MHz | 2390            | 49.9            | 74.00          | 24.1        | peak    | V                |
|         | 2390            | 35.1            | 54.00          | 18.9        | Average | V                |

|               |                       |                      |              |
|---------------|-----------------------|----------------------|--------------|
| Standard:     | FCC Part 15C          | Test Distance:       | 3m           |
| Test item:    | Radiated Emission     | Power:               | 5V DC        |
| Model Number: | Hercules Universal DJ | Temp.(°C)/Hum.(%RH): | 25(°C)/58%RH |
| Mode:         | Mode 1                | Date:                | 2014/11/16   |
| Frequency:    | 2480 MHz              | Test By:             |              |
| Ant.Polar.:   | Horizontal            |                      |              |

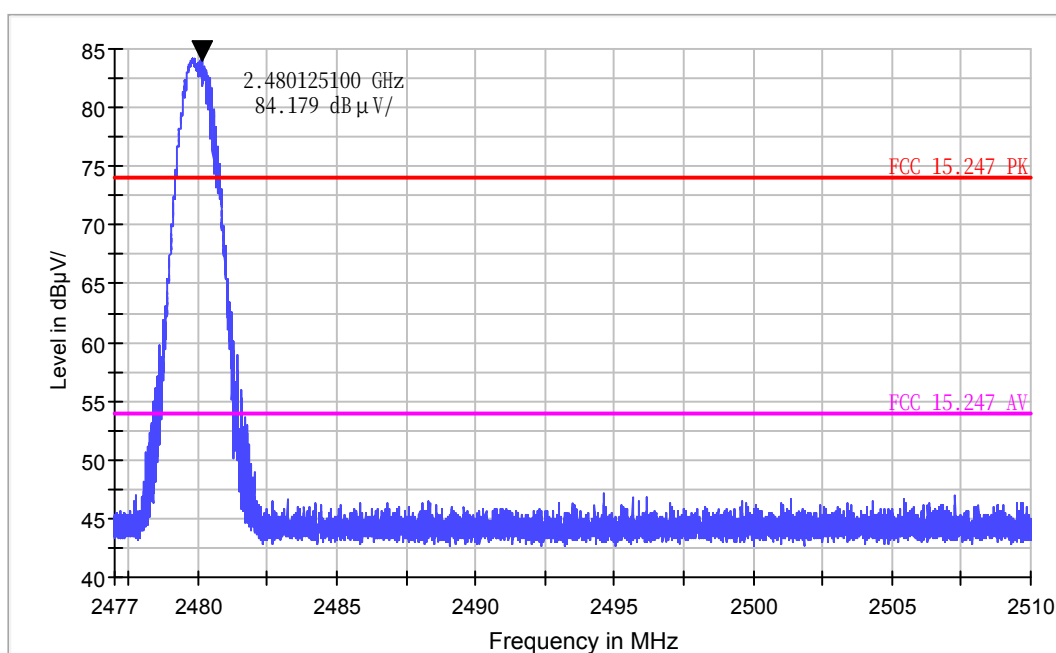
FCC Electric Field Strength 2.4GHz Bandedge-PK



| Channel | Frequency (MHz) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark  | Ant.Polar. H / V |
|---------|-----------------|-----------------|----------------|-------------|---------|------------------|
| 2480MHz | 2483.5          | 36.6            | 74.00          | 37.4        | peak    | H                |
|         | 2483.5          | 25.8            | 54.00          | 28.2        | Average | H                |

|               |                       |                      |              |
|---------------|-----------------------|----------------------|--------------|
| Standard:     | FCC Part 15C          | Test Distance:       | 3m           |
| Test item:    | Radiated Emission     | Power:               | 5V DC        |
| Model Number: | Hercules Universal DJ | Temp.(°C)/Hum.(%RH): | 25(°C)/58%RH |
| Mode:         | Mode 1                | Date:                | 2014/11/16   |
| Frequency:    | 2480 MHz              | Test By:             |              |
| Ant.Polar.:   | Vertical              |                      |              |

FCC Electric Field Strength 2.4GHz Bandedge-PK



| Channel | Frequency (MHz) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark  | Ant.Polar. H / V |
|---------|-----------------|-----------------|----------------|-------------|---------|------------------|
| 2480MHz | 2483.5          | 37.1            | 74.00          | 36.9        | peak    | V                |
|         | 2483.5          | 29.9            | 54.00          | 24.1        | Average | V                |

## 8.10 Antenna Measurement Limit

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

## Antenna Connector Construction

The antenna used in this product is an integrated PCB monopole antenna. And the maximum Gain of this antenna is 0.0 dBi.