



**FCC 47 CFR PART 15 SUBPART C  
INDUSTRY CANADA RSS-247 ISSUE 1**

**CERTIFICATION TEST REPORT**

**FOR**

**TABLET DEVICE**

**MODEL NUMBER: A1550**

**FCC ID: BCGA1550**

**IC: 579C-A1550**

**REPORT NUMBER: 14U19187-E1, REVISION B**

**ISSUE DATE: JUNE 01, 2015**

*Prepared for*

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**NVLAP LAB CODE 200065-0**

Revision History

| <u>Rev.</u> | <u>Issue Date</u> | <u>Revisions</u>                                 | <u>Revised By</u> |
|-------------|-------------------|--|-------------------|
| --          | 04/21/2015        | Initial Issue                                    | T. Chan           |
| A           | 05/18/2015        | Revised report to address TCB's questions        | T. Chu            |
| B           | 06/01/2015        | Revised report to RSS-247 standard and Section 2 | T. Chu            |

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** APPLE  
1 INFINITE LOOP  
CUPERTINO, CA 95014, U.S.A.

**EUT DESCRIPTION:** TABLET DEVICE

**MODEL:** A1550

**SERIAL NUMBER:** F4KPC009GJK2 (CONDUCTED); F4KP604KGJK5 (RADIATED);

**DATE TESTED:** FEBRUARY 17, 2015 – MARCH 12, 2015

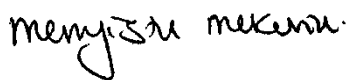
| APPLICABLE STANDARDS            |              |
|---------------------------------|--------------|
| STANDARD                        | TEST RESULTS |
| CFR 47 Part 15 Subpart C        | Pass         |
| INDUSTRY CANADA RSS-247 Issue 1 | Pass         |
| INDUSTRY CANADA RSS-GEN Issue 4 | Pass         |

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For  
UL Verification Services Inc. By:

Tested By:



MENGISTU MEKURIA  
EMC SUPERVISOR  
UL Verification Services Inc.

TRI PHAM  
EMC ENGINEER  
UL Verification Services Inc.

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 4, and RSS-247 Issue 1, and ANSI C63.10-2009 for FCC test and ANSI C63.10-2013 with deviation of measurement height of 0.8m rather than 1.5m for IC test.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

| 47173 Benicia Street               | 47266 Benicia Street                          |
|------------------------------------|---|
| <input type="checkbox"/> Chamber A | <input type="checkbox"/> Chamber D            |
| <input type="checkbox"/> Chamber B | <input checked="" type="checkbox"/> Chamber E |
| <input type="checkbox"/> Chamber C | <input checked="" type="checkbox"/> Chamber F |
|                                    | <input type="checkbox"/> Chamber G            |
|                                    | <input type="checkbox"/> Chamber H            |

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER                             | UNCERTAINTY |
|---------------------------------------|-------------|
| Conducted Disturbance, 0.15 to 30 MHz | ±3.52 dB    |
| Radiated Disturbance, 30 to 1000 MHz  | ±4.94 dB    |

Uncertainty figures are valid to a confidence level of 95%.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a tablet with multimedia functions (music, application support, and video), Cellular GSM/GPRS/EGPRS/CDMA2000 1xRTT/1x Advanced/EVDO Rev.A/EVDO Rev.B /WCDMA /HSPA+/DC-HSDPA/LTE FDD & Carrier Aggregation/TDD/TD-SCDMA radio, IEEE 802.11a/b/g/n/ac radio, and Bluetooth radio. The rechargeable battery is not user accessible.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

| Frequency Range (MHz) | Mode          | Antenna B Output Power (dBm) | Antenna B Output Power (mW) | Antenna D Output Power (dBm) | Antenna D Output Power (mW) |
|-----------------------|---------------|------------------------------|-----------------------------|------------------------------|-----------------------------|
| 2402 - 2480           | Basic GFSK    | 10.62                        | 11.53                       | 7.95                         | 6.24                        |
| 2402 - 2480           | DQPSK         | 10.08                        | 10.19                       | 9.05                         | 8.04                        |
| 2402 - 2480           | Enhanced 8PSK | 10.14                        | 10.33                       | 9.41                         | 8.73                        |

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

| Frequency Band (GHz) | Antenna Gain |           |
|----------------------|--------------|-----------|
|                      | Antenna B    | Antenna D |
| 2.4                  | -1.00        | 2.50      |

### 5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 12H33.



## 5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The following configurations were investigated and EUT powered by AC/DC adapter was the worst-case scenario. AC power line and below 1G radiated tests were conducted on configuration 1.

| Configuration | Descriptions                               |
|---------------|--|
| 1             | EUT powered by AC/DC adapter via USB cable |
| 2             | EUT powered by host PC via USB cable       |

The fundamental of the EUT was investigated in three orthogonal orientations X/Y/Z, it was determined that X-flatbed orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X-flatbed orientation.

EUT supports BT/BLE operation on antenna B or antenna D, testing was performed on both antenna B and antenna D.

Worst-case data rates were:

GFSK mode: DH5  
8PSK mode: 3-DH5

DQPSK mode has been verified to have lower power than 8PSK.

For the co-located test, no other emissions were found after have been investigated from the conducted measurement with all different combination frequencies between BT & 5GHz bands.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Support Equipment List |              |           |                        |        |
|------------------------|--------------|-----------|------------------------|--------|
| Description            | Manufacturer | Model     | Serial Number          | FCC ID |
| Laptop AC/DC adapter   | Lenovo       | 92P1160   | 11S92P1160Z1ZBGH798B12 | NA     |
| Laptop                 | Lenovo       | 7659      | L3-AL664 08/03         | NA     |
| Earphone               | Apple        | NA        | NA                     | NA     |
| EUT AC/DC adapter      | Apple        | MD836LL/A | NA                     | NA     |

### I/O CABLES (CONDUCTED TEST)

| I/O Cable List |         |                      |                |             |                  |                      |
|----------------|---------|----------------------|----------------|-------------|------------------|----------------------|
| Cable No       | Port    | # of identical ports | Connector Type | Cable Type  | Cable Length (m) | Remarks              |
| 1              | Antenna | 1                    | SMA            | Un-Shielded | 0.2              | To spectrum Analyzer |
| 2              | USB     | 1                    | USB            | Shielded    | 1                | N/A                  |

### I/O CABLES (RADIATED ABOVE 1 GHZ)

| I/O Cable List |      |                      |                |            |                  |         |
|----------------|------|----------------------|----------------|------------|------------------|---------|
| Cable No       | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| None used      |      |                      |                |            |                  |         |

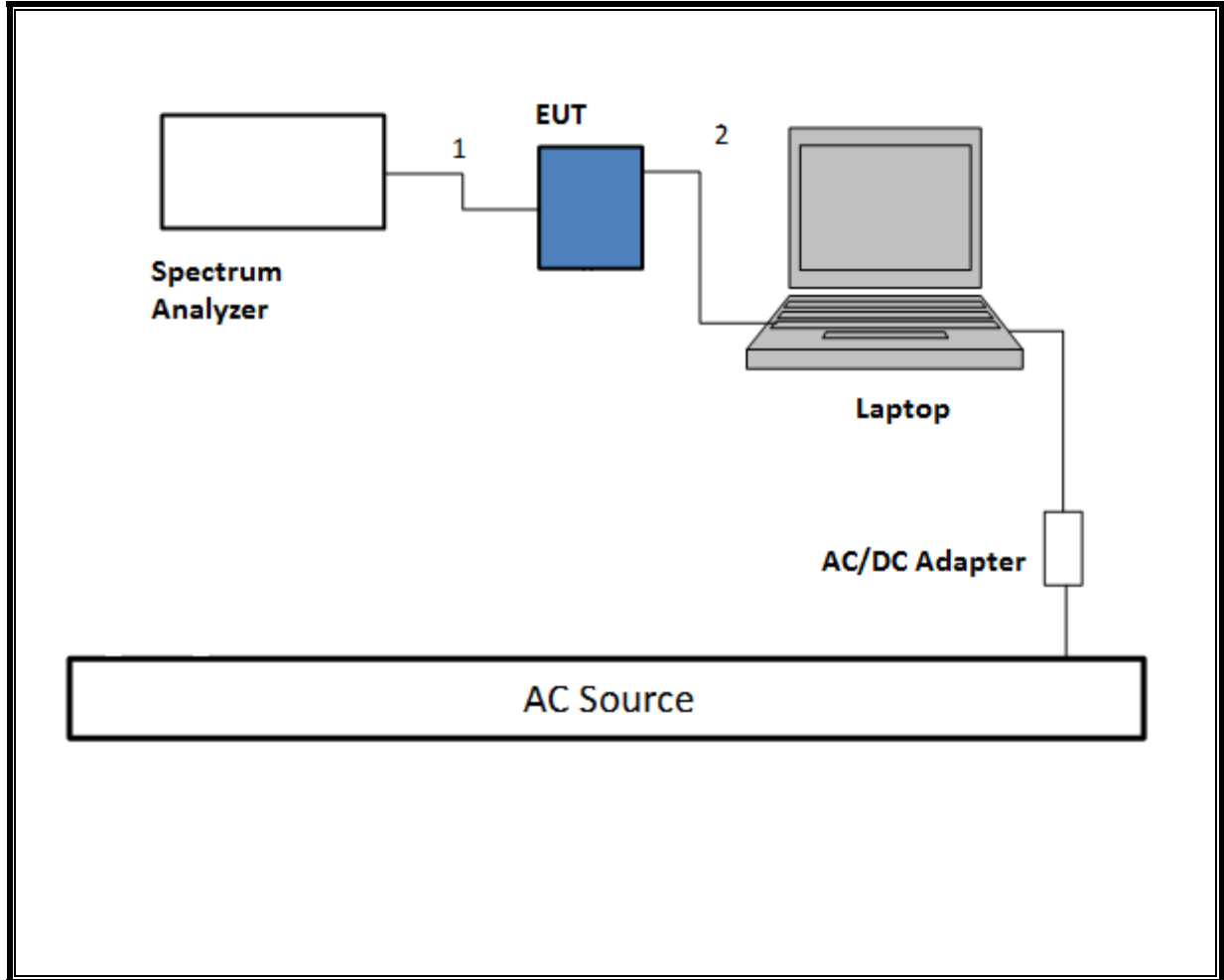
### I/O CABLES (AC POWER CONDUCTED TEST and below 1 GHZ)

| I/O Cable List |       |                      |                |             |                  |         |
|----------------|-------|----------------------|----------------|-------------|------------------|---------|
| Cable No       | Port  | # of identical ports | Connector Type | Cable Type  | Cable Length (m) | Remarks |
| 1              | AC    | 1                    | US115          | Un-Shielded | 0.8              | NA      |
| 2              | DC    | 1                    | lightning      | Un-Shielded | 1                | NA      |
| 3              | Audio | 1                    | Jack           | Un-Shielded | 0.5              | NA      |

**TEST SETUP- CONDUCTED PORT**

The EUT was tested connected to a host Laptop via USB cable adapter and spectrum analyzer to antenna port. Test software exercised the EUT.

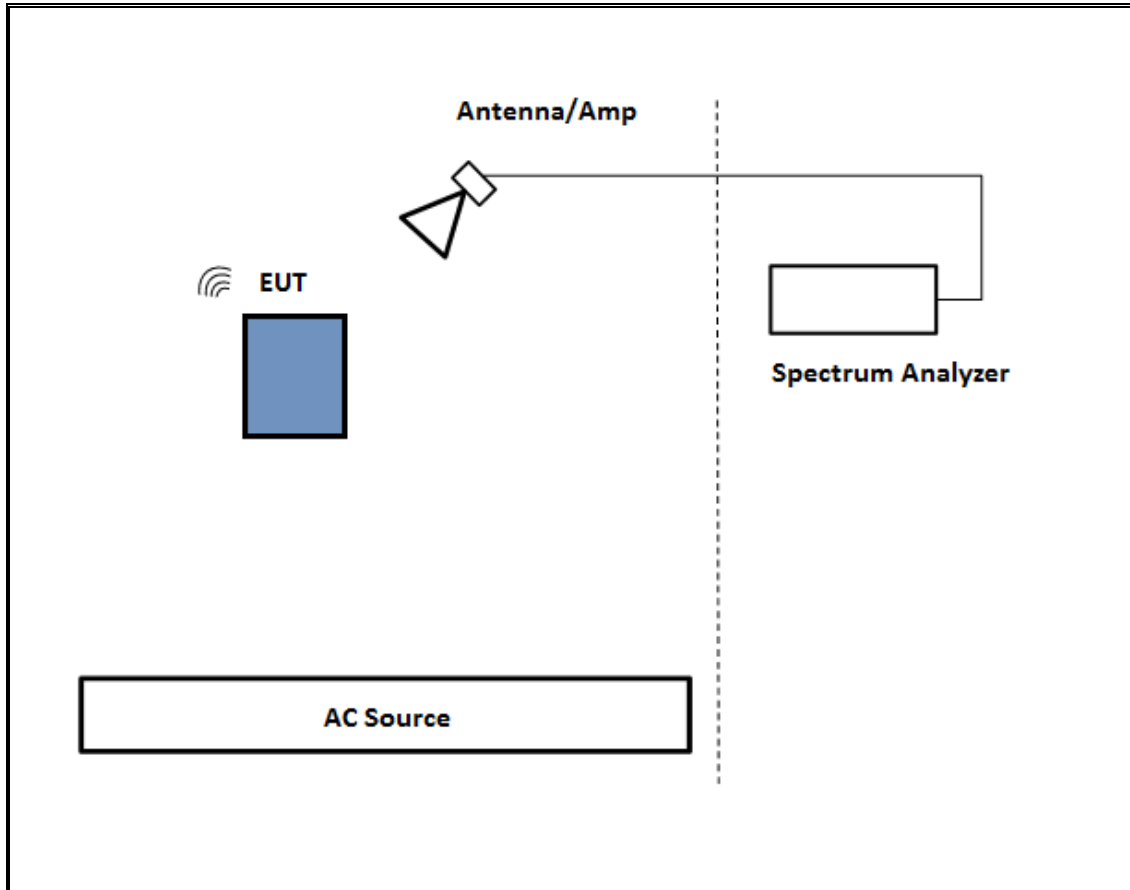
**SETUP DIAGRAM**



**TEST SETUP- RADIATED-ABOVE 1 GHZ**

The EUT was tested battery powered. Test software exercised the EUT.

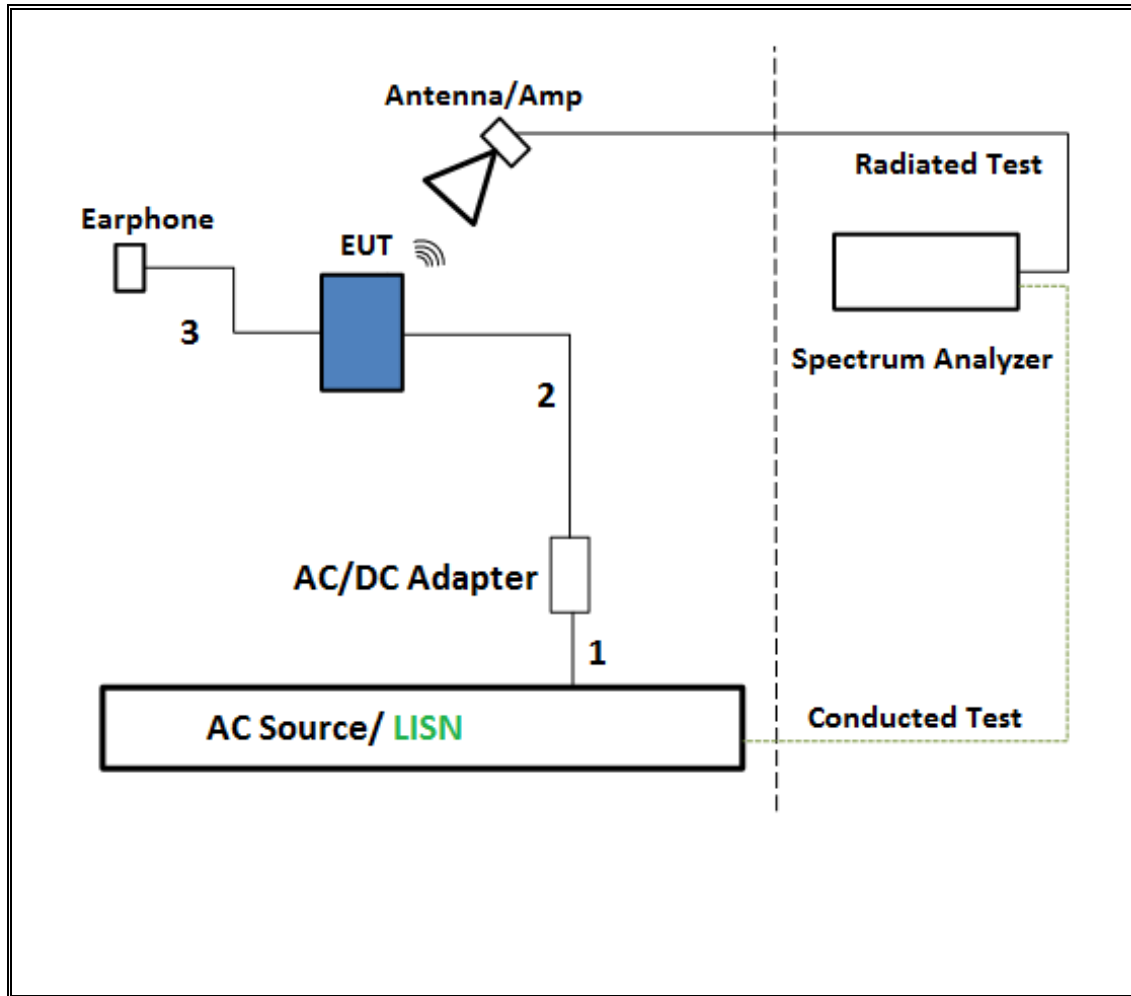
**SETUP DIAGRAM**



**TEST SETUP- BELOW 1GHZ & AC LINE CONDUCTED TESTS**

The EUT was tested with earphone connected and powered by AC adapter. Test software exercised the EUT.

**SETUP DIAGRAM**



## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| Test Equipment List                                |                 |                        |                              |            |
|--|-----------------|------------------------|------------------------------|------------|
| Description  | Manufacturer    | Model                  | Asset                        | Cal Due    |
| Antenna, Horn 1-18GHz                              | ETS Lindgren    | 3117                   | 00143449                     | 2/10/2016  |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz        | Sunol Sciences  | JB3                    | A022813-1                    | 1/14/2016  |
| Amplifier, 1 - 18GHz                               | Miteq           | AFS42-00101800-25-S-42 | 1782158                      | 1/26/2016  |
| Amplifier, 10KHz to 1GHz, 32dB                     | Sonoma          | 310N                   | 323561                       | 5/28/2015  |
| Spectrum Analyzer, PXA, 3Hz to 44GHz               | Agilent         | N9030A                 | US51350187                   | 5/2/2015   |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz        | Sunol Sciences  | JB1                    | A121003                      | 2/13/2016  |
| Amplifier, 10KHz to 1GHz, 32dB                     | Sonoma          | 310N                   | 185623                       | 6/7/2015   |
| Spectrum Analyzer, PXA, 3Hz to 44GHz               | Agilent         | N9030A                 | MY51380911                   | 2/20/2016  |
| Power Meter, P-series single channel               | Agilent         | N1911A                 | GB45100212                   | 10/9/2015  |
| Power Sensor, P - series, 50MHz to 18GHz, Wideband | Agilent         | N1921A                 | MY53260010                   | 7/12/2015  |
| Antenna, Horn 18 to 26.5GHz                        | ARA             | MWH-1826               | 1049                         | 12/17/2015 |
| Spectrum Analyzer, 40 GHz                          | Agilent         | 8564E                  | 3943A01643                   | 8/6/2015   |
| Amplifier, 1 to 26.5GHz, 23.5dB Gain minimum       | Agilent         | 8449B                  | 3008A01114                   | 10/4/2015  |
| AC Line Conducted                                  |                 |                        |                              |            |
| EMI Test Receiver 9KHz-7GHz                        | Rohde & Schwarz | ESCI7                  | 100935                       | 9/16/2015  |
| LISN for Conducted Emissions CISPR-16              | FCC             | 50/250-25-2            | 114                          | 1/16/2016  |
| Power Cable, Line Conducted Emissions ANSI 63.4    | UL              | PG1                    | N/A                          | 7/28/2015  |
| UL SOFTWARE  |                 |                        |                              |            |
| Radiated Software                                  | UL              | UL EMC                 | Ver 9.5, July 22, 2014       |            |
| Conducted Software                                 | UL              | UL EMC                 | Ver 2.1.2, February 23, 2015 |            |
| AC Line Conducted Software                         | UL              | UL EMC                 | Ver 9.5, February 26, 2015   |            |

## 7. ON TIME AND DUTY CYCLE

### LIMITS

None; for reporting purposes only.

### PROCEDURE

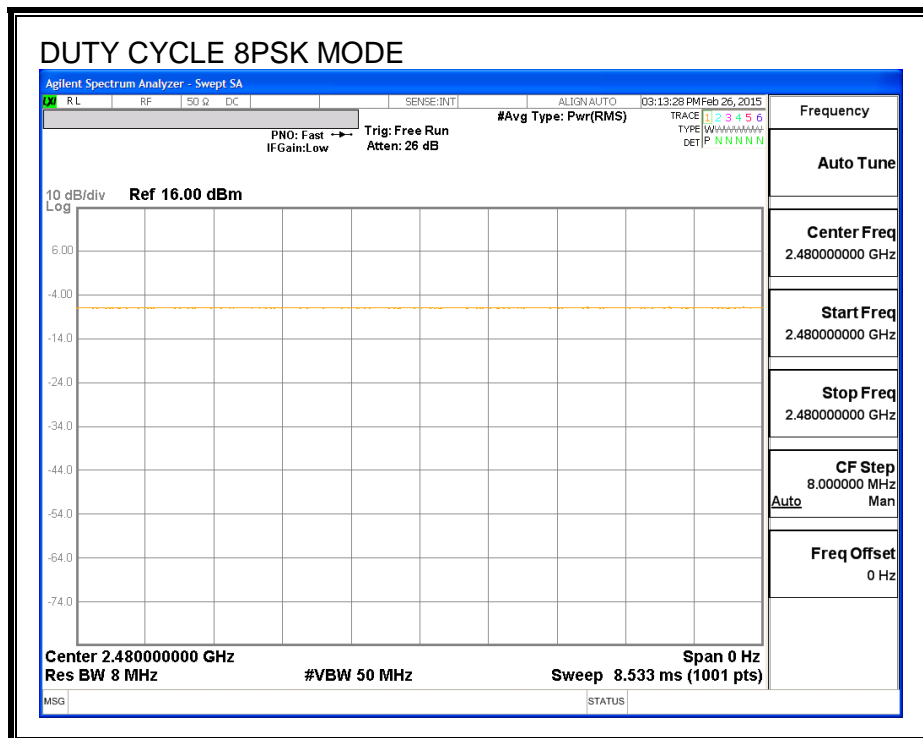
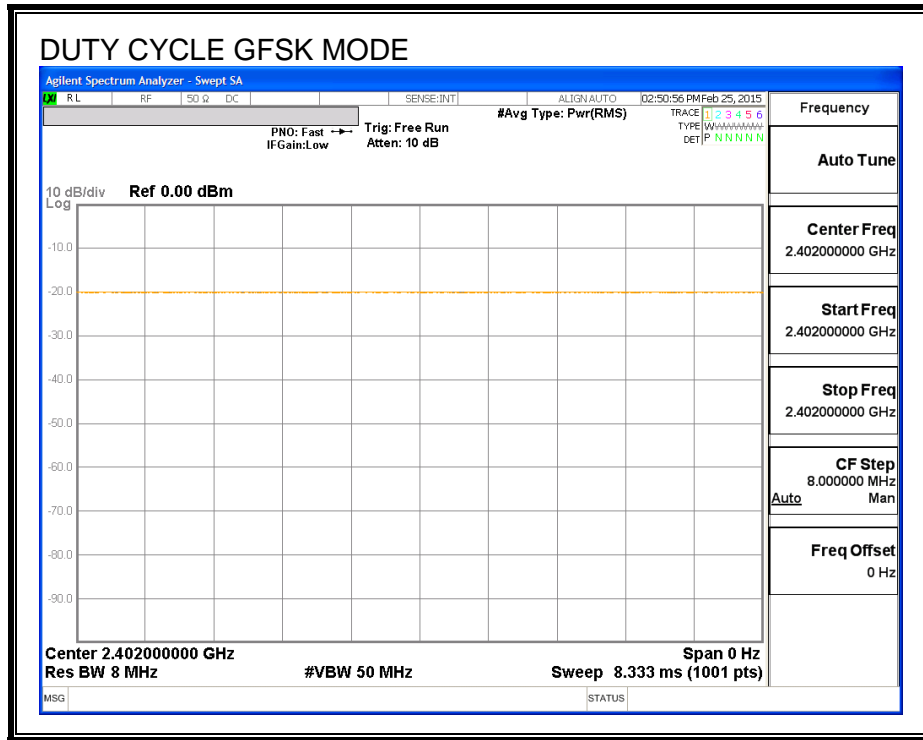
KDB 558074 Zero-Span Spectrum Analyzer Method.

### ON TIME AND DUTY CYCLE RESULTS

| Mode           | ON Time<br>B<br>(msec) | Period<br>(msec) | Duty Cycle<br>x<br>(linear) | Duty<br>Cycle<br>(%) | Duty Cycle<br>Correction Factor<br>(dB) | 1/B<br>Minimum VBW<br>(kHz) |
|----------------|------------------------|------------------|-----------------------------|----------------------|---|-----------------------------|
| Bluetooth GFSK | 1.000                  | 1.000            | 1.000                       | 100.00%              | 0.00                                    | 0.010                       |
| Bluetooth 8PSK | 1.000                  | 1.000            | 1.000                       | 100.00%              | 0.00                                    | 0.010                       |

**DUTY CYCLE PLOTS**

**HOPPING OFF**





## 8. ANTENNA PORT TEST RESULTS

### 8.1. BASIC DATA RATE GFSK MODULATION (ANTENNA B)

#### 8.1.1. 20 dB AND 99% BANDWIDTH

##### LIMIT

None; for reporting purposes only.

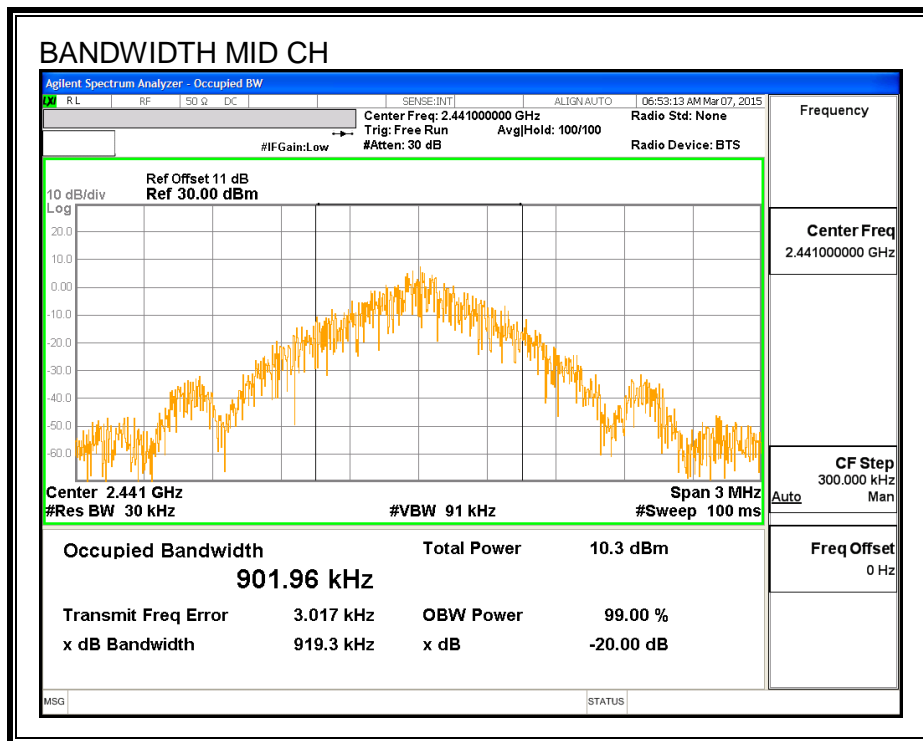
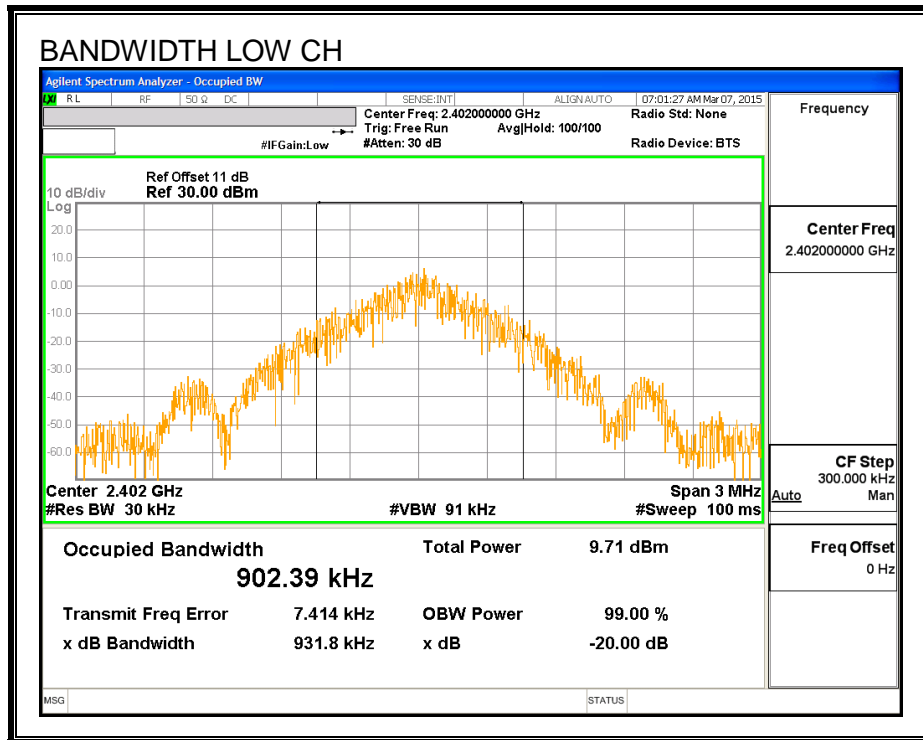
##### TEST PROCEDURE

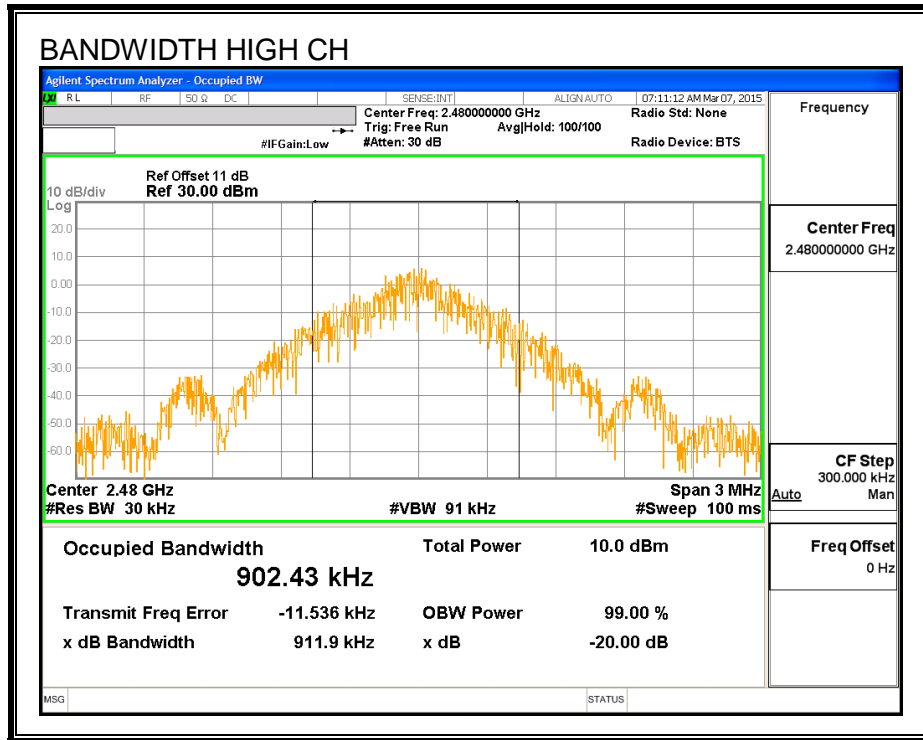
The transmitter output is connected to a spectrum analyzer. The RBW is set to  $\geq 1\%$  of the 20 dB bandwidth. The VBW is set to  $\geq$  RBW. The sweep time is coupled.

##### RESULTS

| Channel | Frequency (MHz) | 20 dB Bandwidth (kHz) | 99% Bandwidth (kHz) |
|---------|-----------------|-----------------------|---------------------|
| Low     | 2402            | 931.8                 | 902.39              |
| Middle  | 2441            | 919.3                 | 901.96              |
| High    | 2480            | 911.9                 | 902.43              |

**20 dB AND 99% BANDWIDTH**





## 8.1.2. HOPPING FREQUENCY SEPARATION

### LIMIT

FCC §15.247 (a) (1)

IC RSS-247 (5.1) (2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

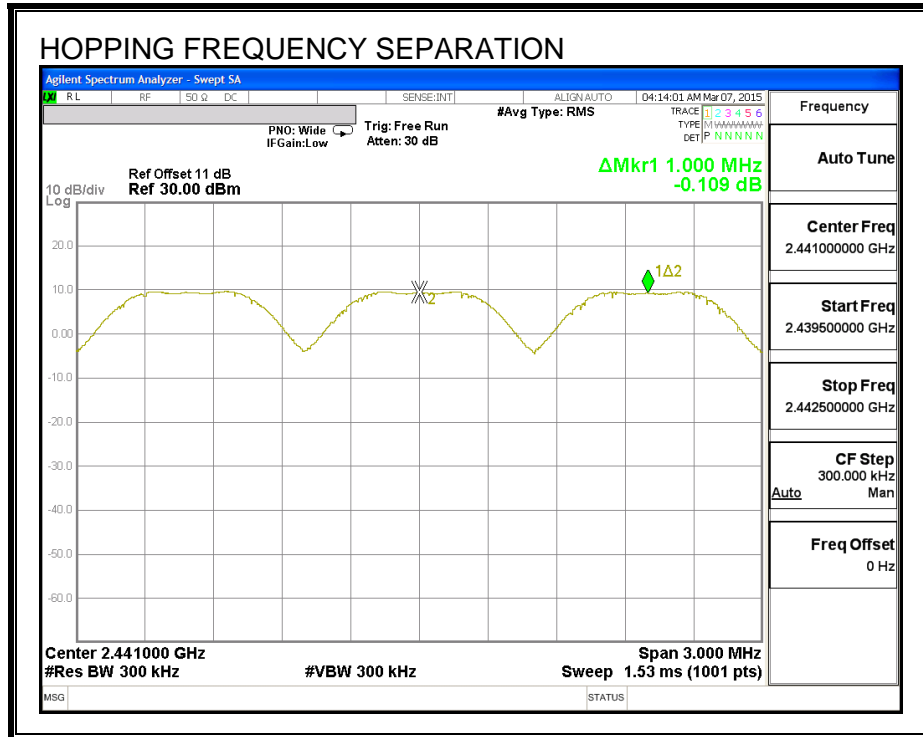
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

### TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

### RESULTS

**HOPPING FREQUENCY SEPARATION**



### **8.1.3. NUMBER OF HOPPING CHANNELS**

#### **LIMIT**

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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

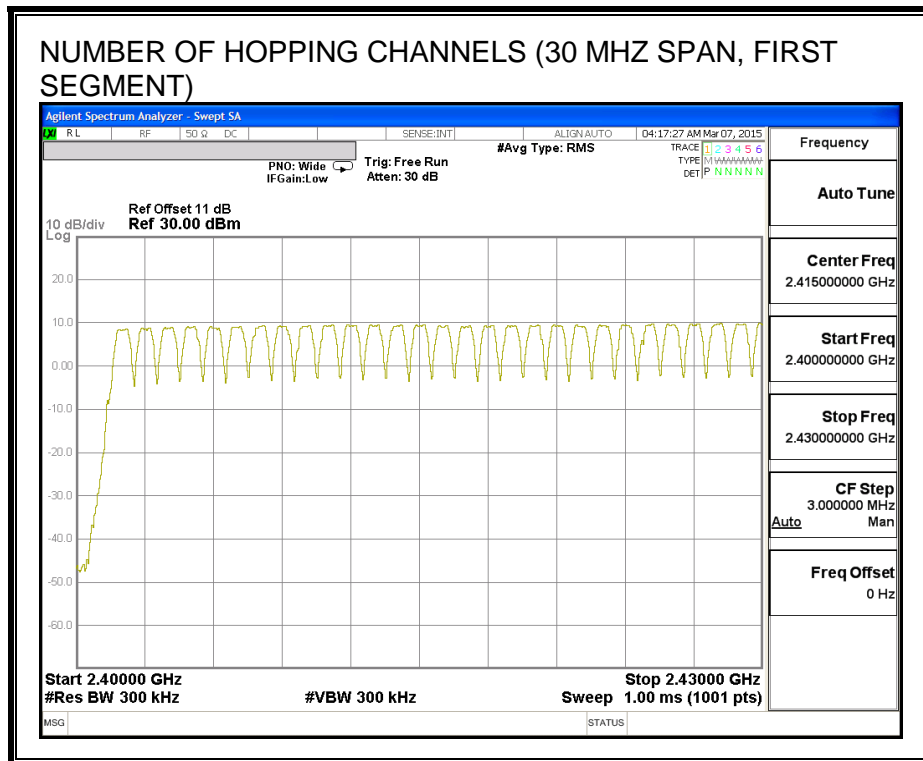
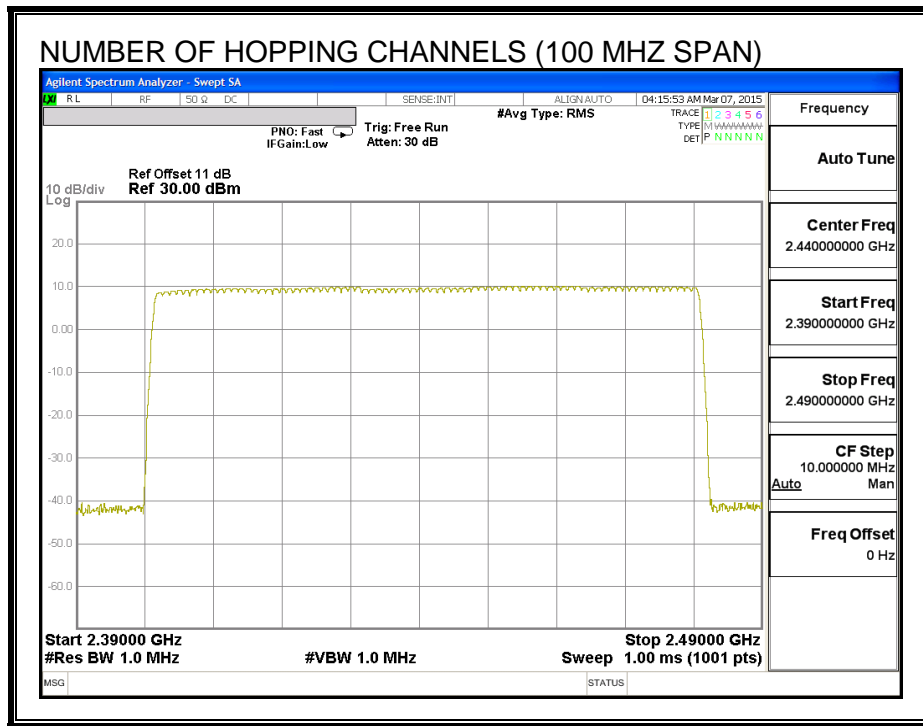
#### **TEST PROCEDURE**

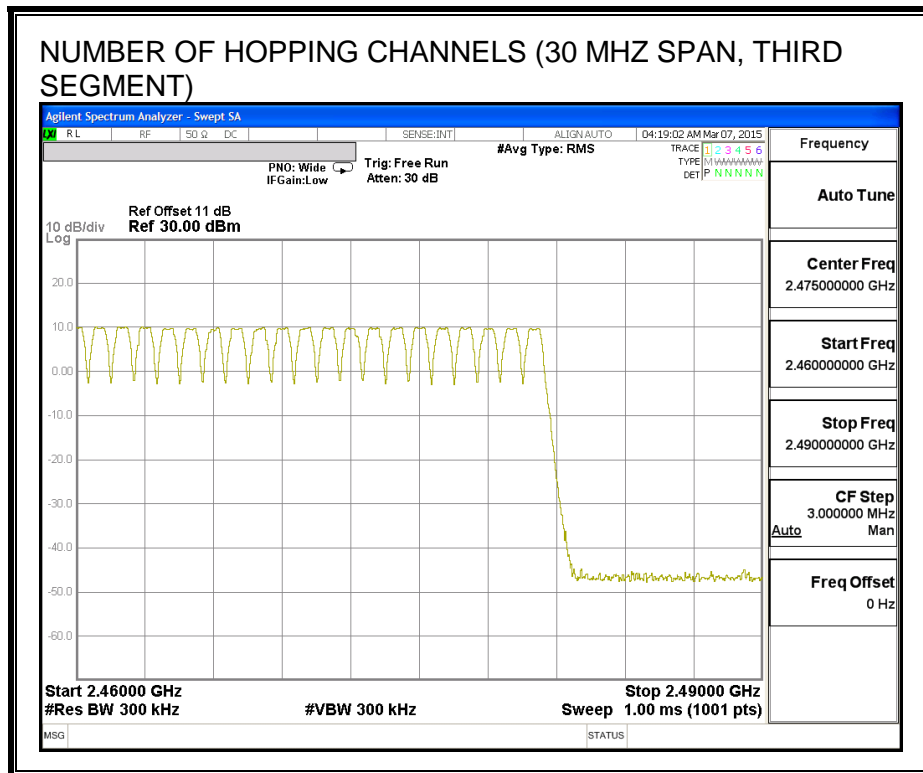
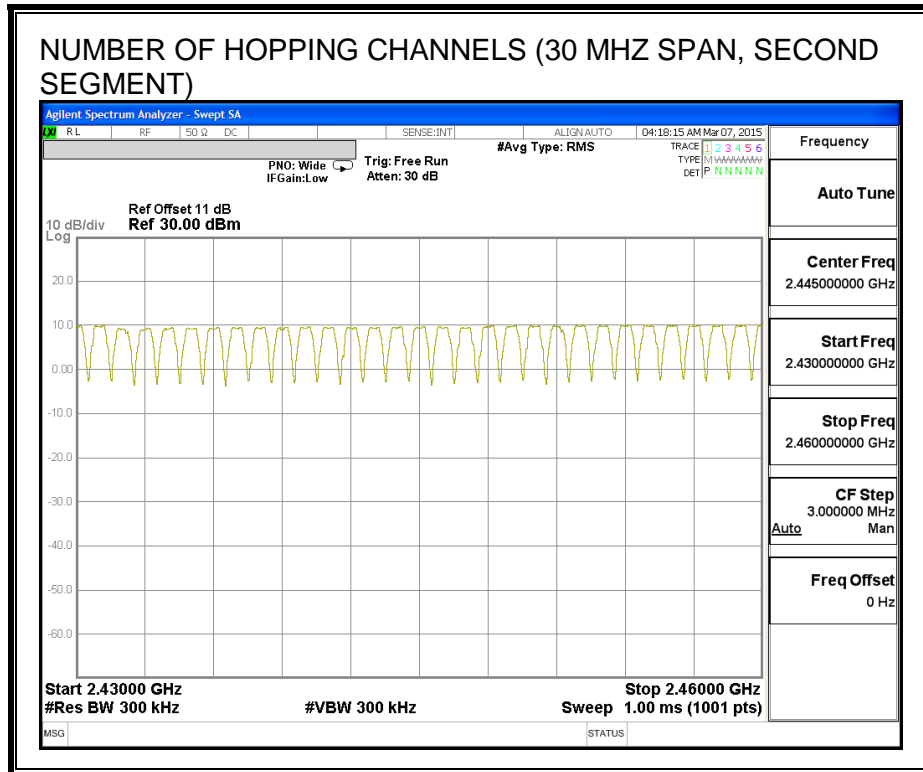
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

#### **RESULTS**

Normal Mode: 79 Channels observed.

**NUMBER OF HOPPING CHANNELS**







### 8.1.4. AVERAGE TIME OF OCCUPANCY

#### LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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 PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

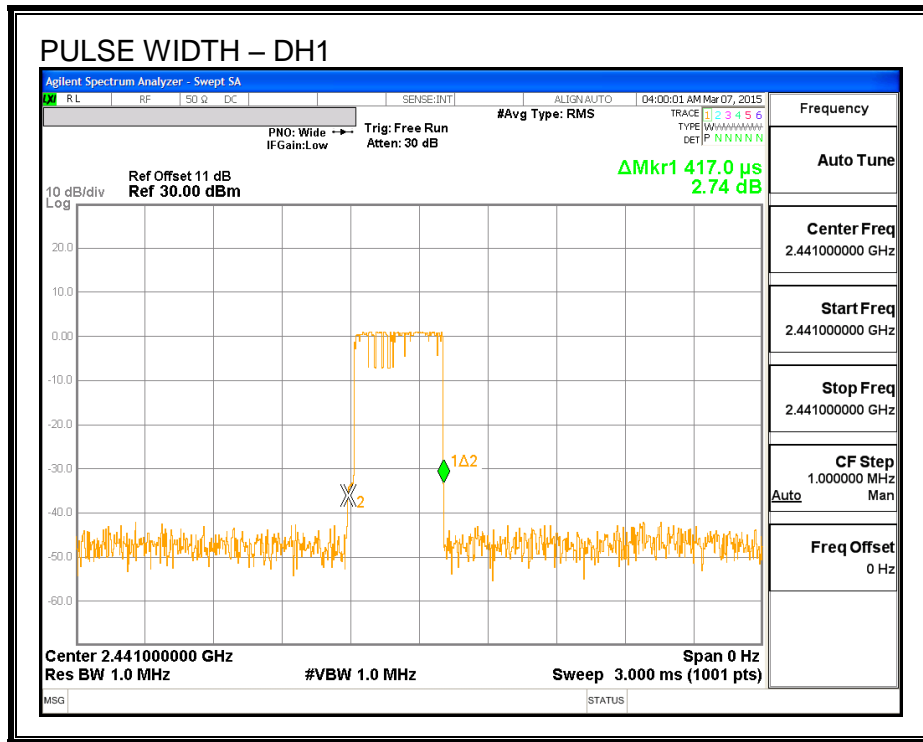
The average time of occupancy in the specified 31.6 second period (79 channels \* 0.4 s) is equal to 10 \* (# of pulses in 3.16 s) \* pulse width.

For AFH mode, the average time of occupancy in the specified 8 second period (20 channels \* 0.4 seconds) is equal to 10 \* (# of pulses in 0.8 s) \* pulse width.

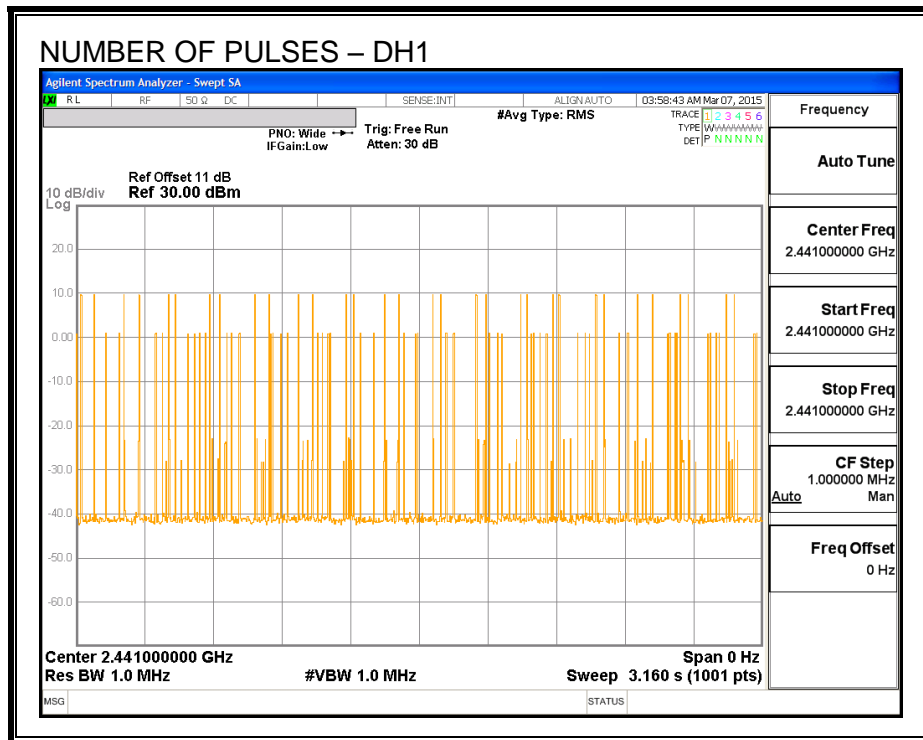
#### RESULTS

| DH Packet        | Pulse Width (msec) | Number of Pulses in 3.16 seconds | Average Time of Occupancy (sec) | Limit (sec) | Margin (sec) |
|------------------|--------------------|----------------------------------|---------------------------------|-------------|--------------|
| GFSK Normal Mode |                    |                                  |                                 |             |              |
| DH1              | 0.417              | 32                               | 0.133                           | 0.4         | -0.267       |
| DH3              | 1.675              | 18                               | 0.302                           | 0.4         | -0.099       |
| DH5              | 2.93               | 11                               | 0.322                           | 0.4         | -0.078       |

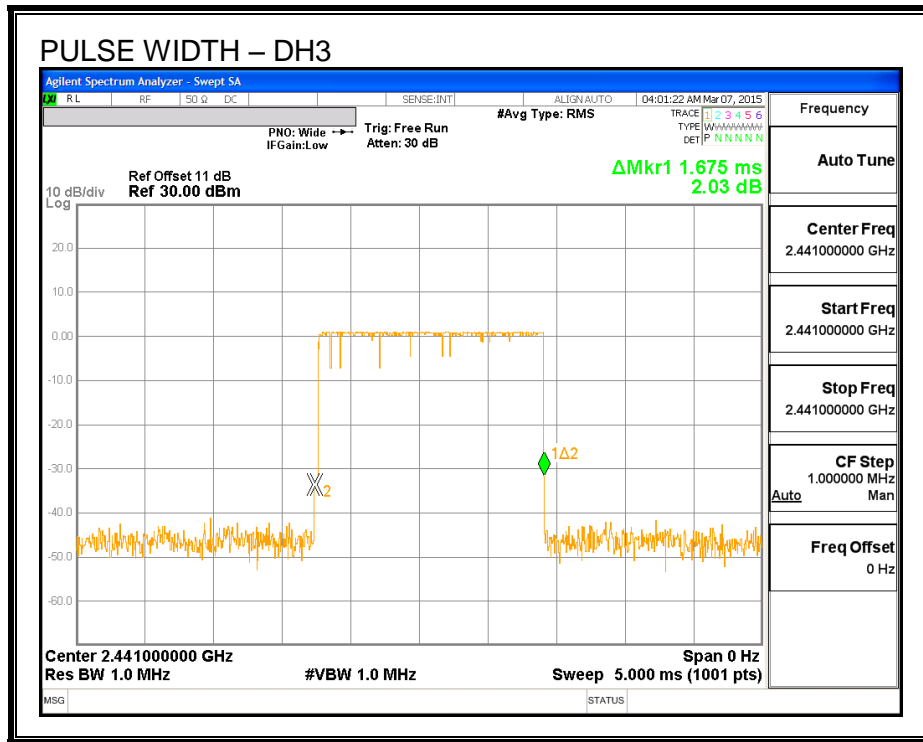
**PULSE WIDTH - DH1**



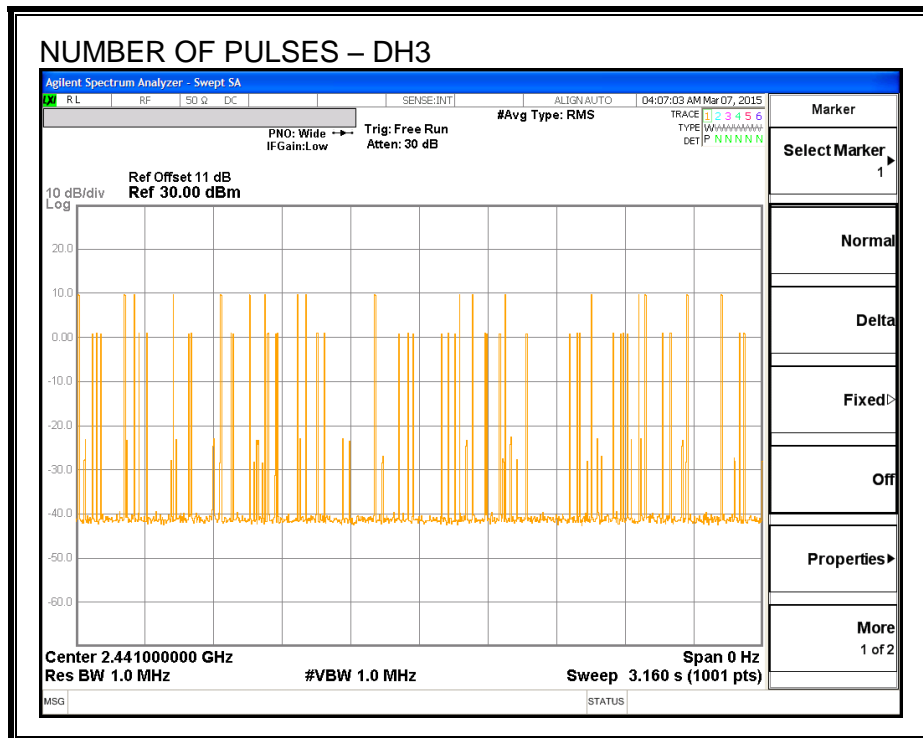
**NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - DH1**



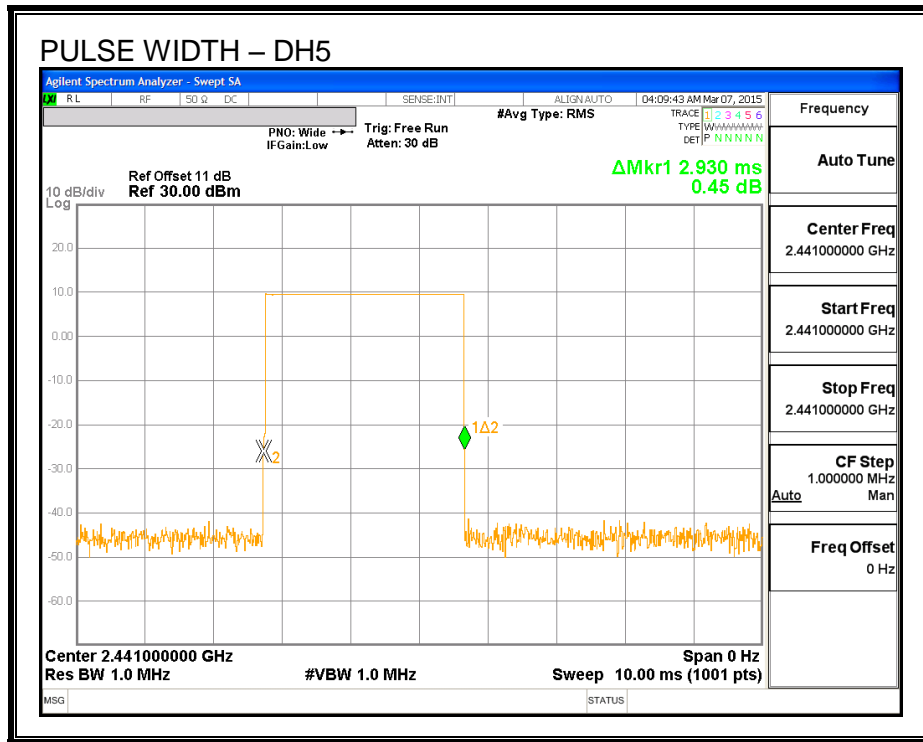
**PULSE WIDTH – DH3**



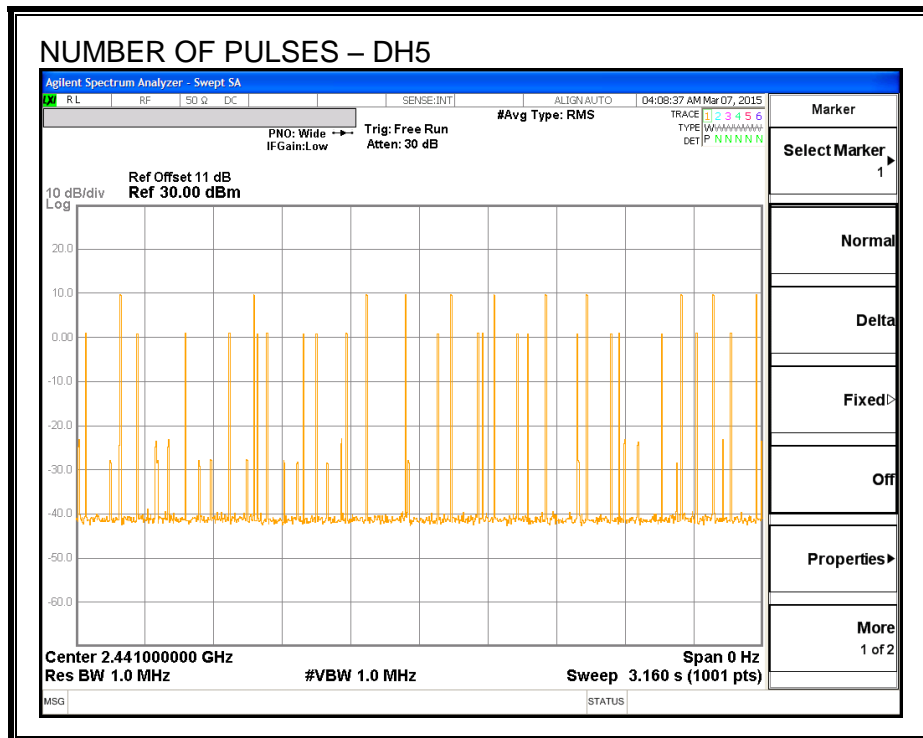
**NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3**



**PULSE WIDTH – DH5**



**NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5**



### 8.1.5. OUTPUT POWER

#### LIMIT

§15.247 (b) (1)

RSS-247 (5.4) (2)

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

#### TEST PROCEDURE

The transmitter output is connected to a wideband peak and average power meter.

#### RESULTS

| Channel | Frequency (MHz) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|---------|-----------------|--------------------|-------------|-------------|
| Low     | 2402            | 10.27              | 30          | -19.73      |
| Middle  | 2441            | 10.62              | 30          | -19.38      |
| High    | 2480            | 10.34              | 30          | -19.66      |

### 8.1.6. AVERAGE POWER

#### LIMIT

None; for reporting purposes only.

#### TEST PROCEDURE

The transmitter output is connected to a power meter.

#### RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Average Power<br/>(dBm)</b> |
|----------------|----------------------------|--------------------------------|
| Low            | 2402                       | 10.07                          |
| Middle         | 2441                       | 10.51                          |
| High           | 2480                       | 10.24                          |

## **8.1.7. CONDUCTED SPURIOUS EMISSIONS**

### **LIMITS**

FCC §15.247 (d)

IC RSS-247 (5.5)

Limit = -20 dBc

### **TEST PROCEDURE**

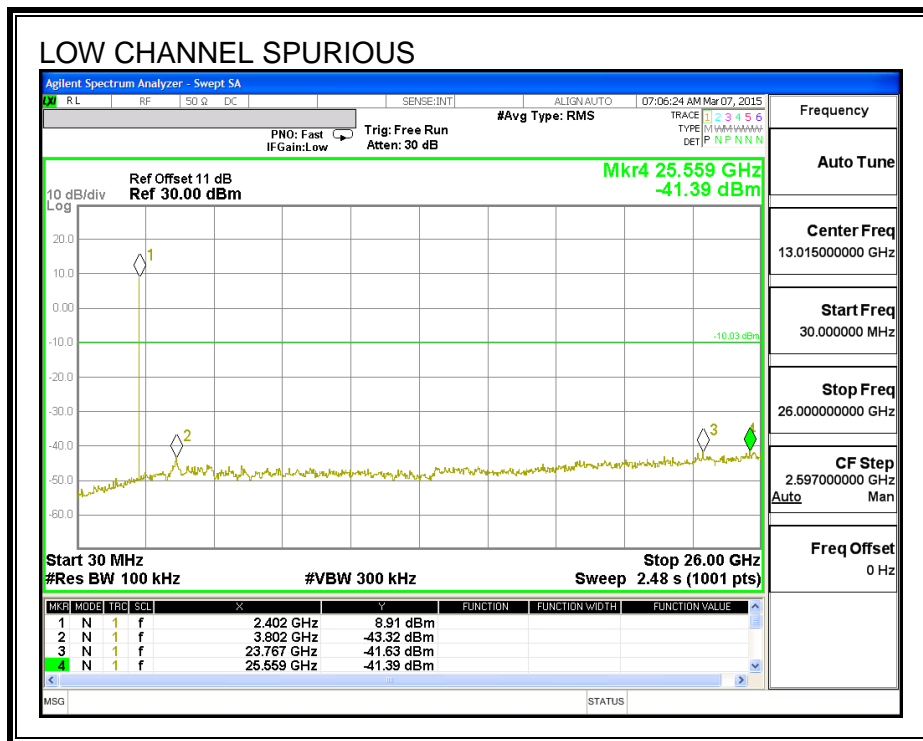
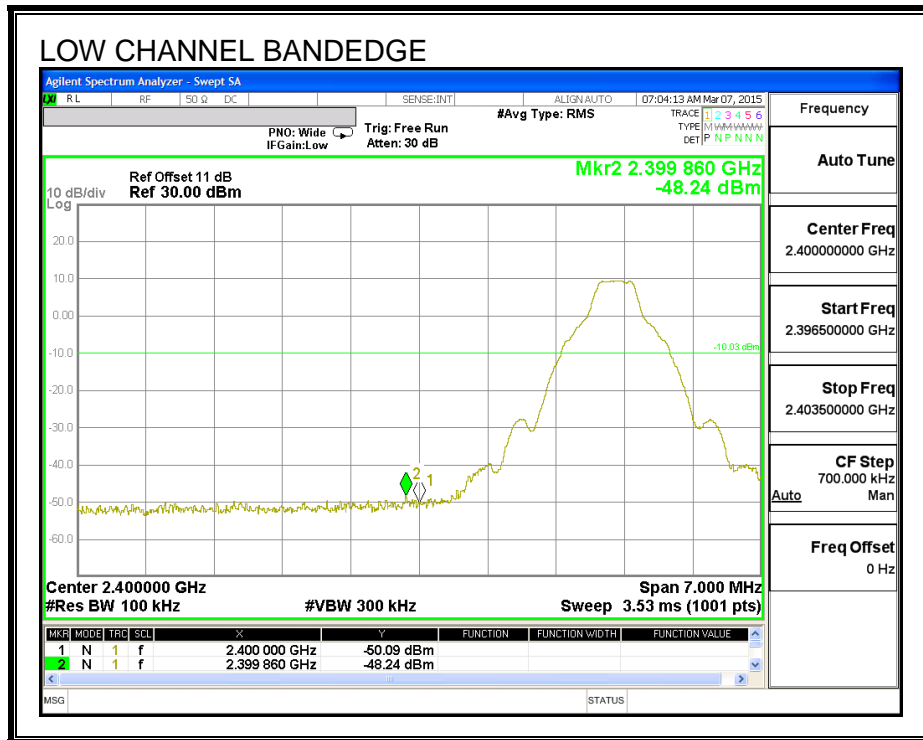
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

### **RESULTS**

**SPURIOUS EMISSIONS, LOW CHANNEL**

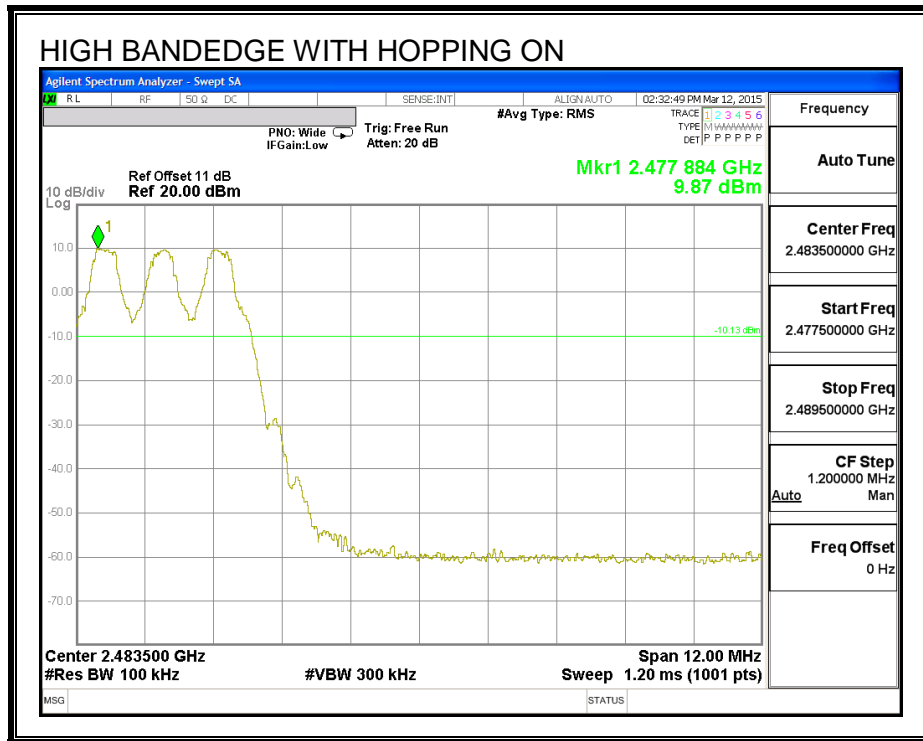
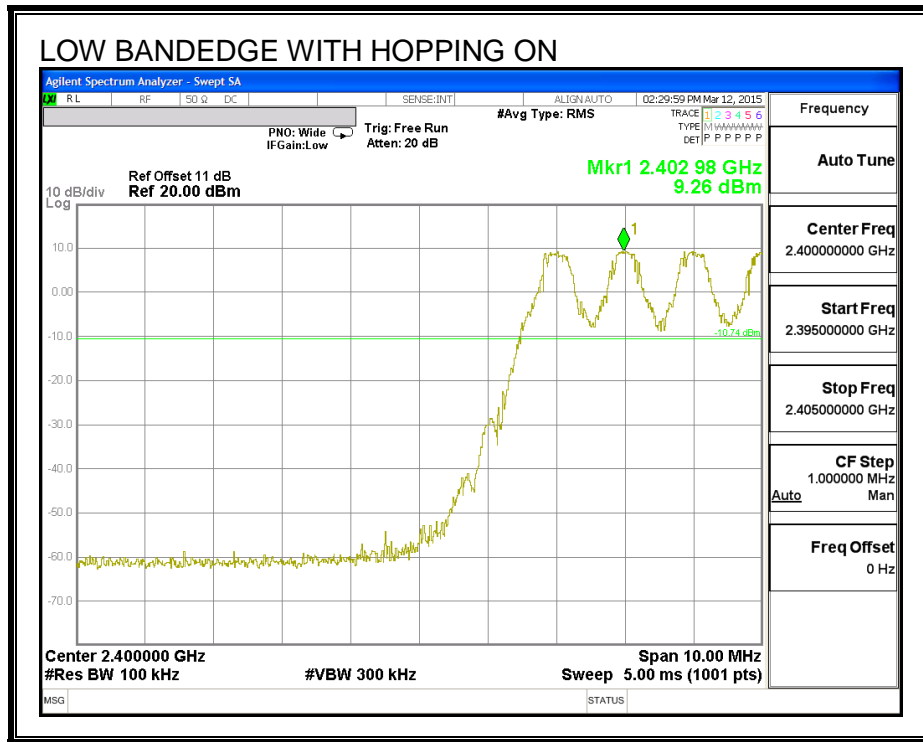








**SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON**



## 8.2. BASIC DATA RATE GFSK MODULATION (ANTENNA D)

### 8.2.1. 20 dB AND 99% BANDWIDTH

#### LIMIT

None; for reporting purposes only.

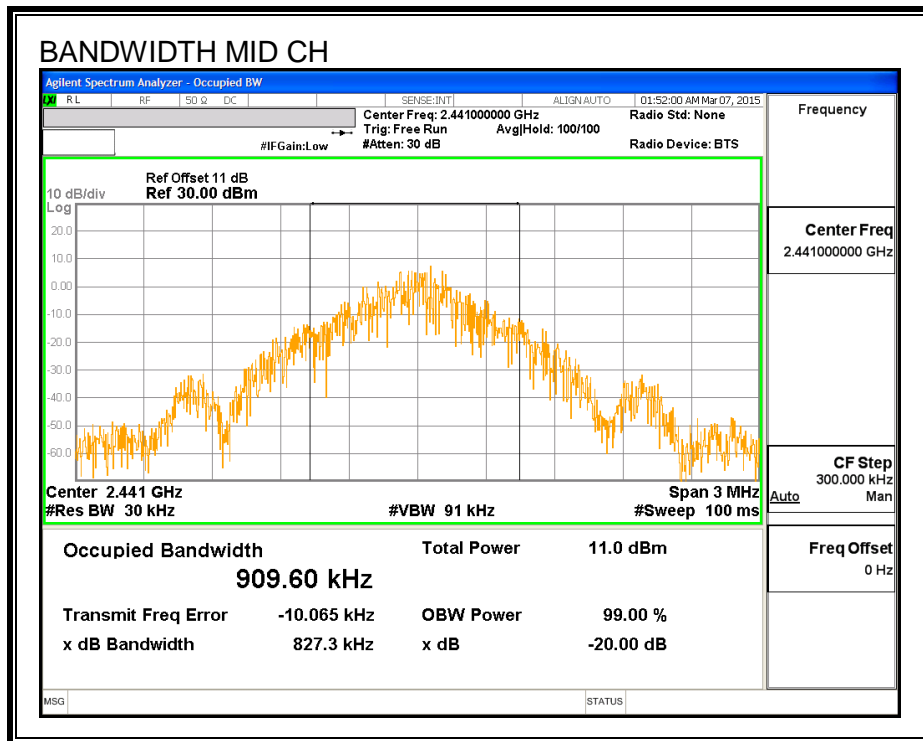
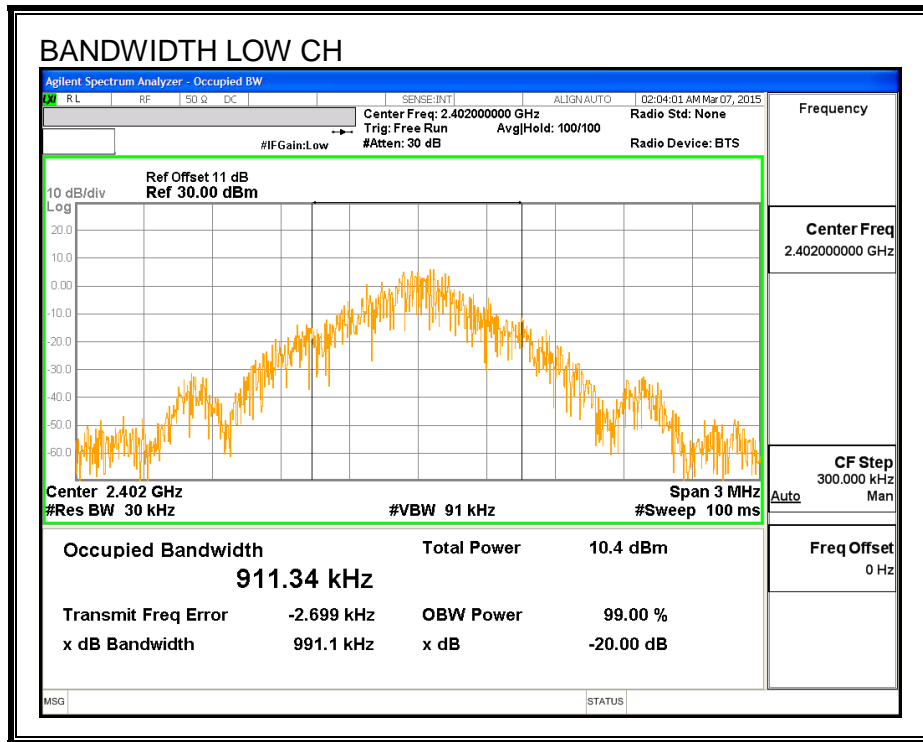
#### TEST PROCEDURE

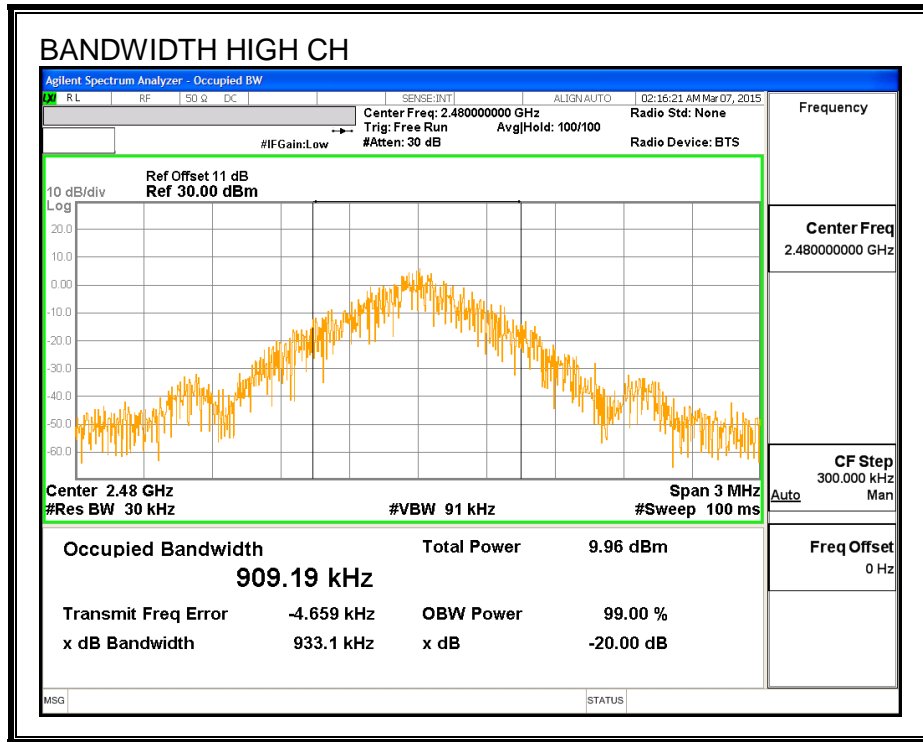
The transmitter output is connected to a spectrum analyzer. The RBW is set to  $\geq 1\%$  of the 20 dB bandwidth. The VBW is set to  $\geq$  RBW. The sweep time is coupled.

#### RESULTS

| Channel | Frequency<br>(MHz) | 20 dB Bandwidth<br>(kHz) | 99% Bandwidth<br>(kHz) |
|---------|--------------------|--------------------------|------------------------|
| Low     | 2402               | 991.1                    | 911.34                 |
| Middle  | 2441               | 827.3                    | 909.6                  |
| High    | 2480               | 933.1                    | 909.19                 |

**20 dB AND 99% BANDWIDTH**





## 8.2.2. HOPPING FREQUENCY SEPARATION

### LIMIT

FCC §15.247 (a) (1)

IC RSS-247 (5.1) (2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

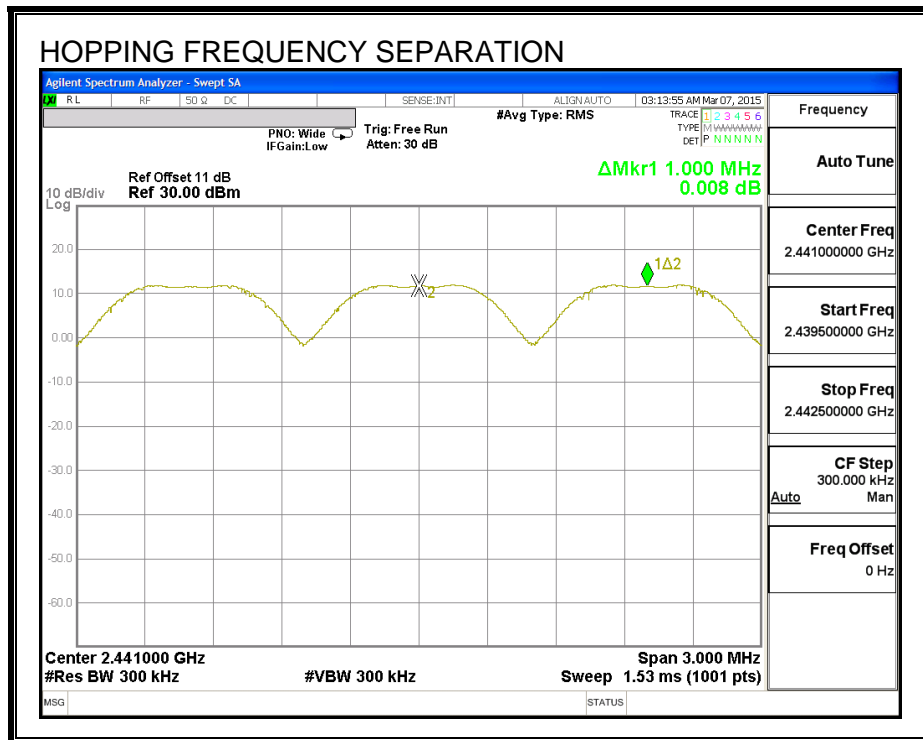
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

### TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

### RESULTS

**HOPPING FREQUENCY SEPARATION**





### **8.2.3. NUMBER OF HOPPING CHANNELS**

#### **LIMIT**

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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

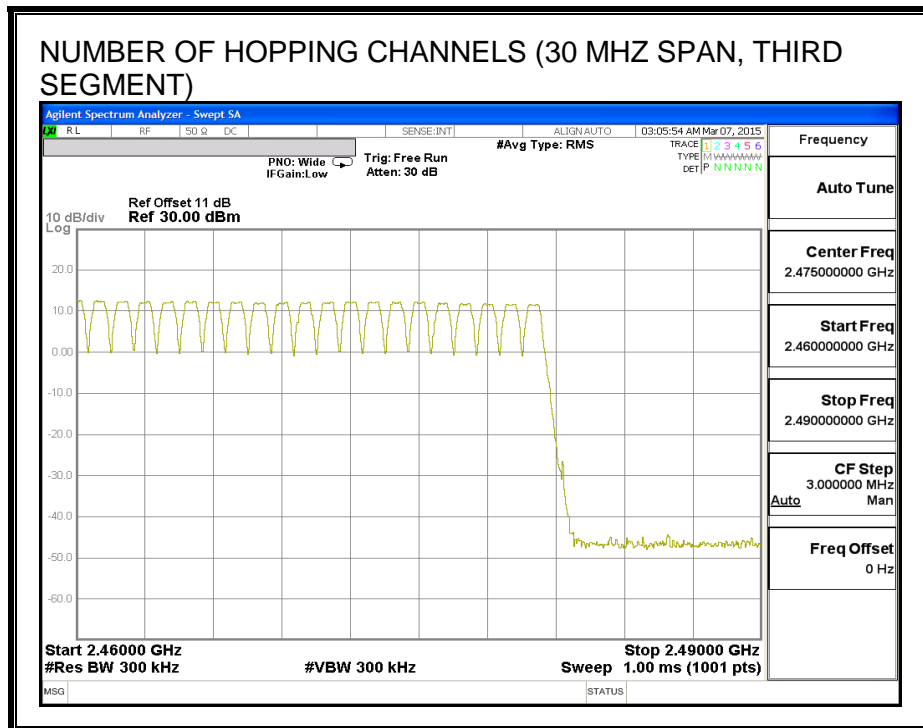
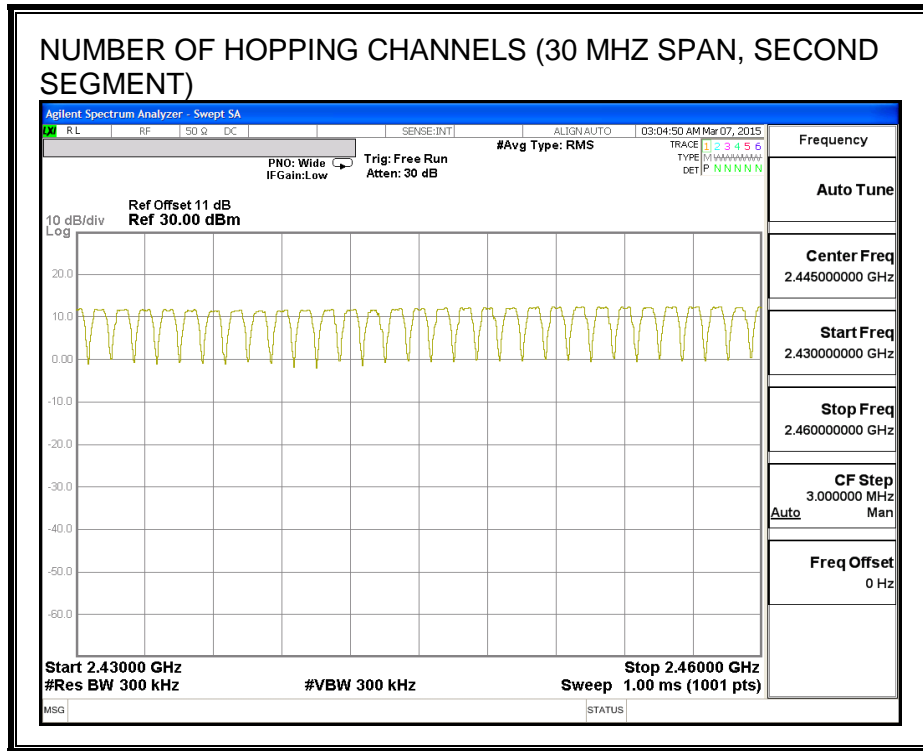
#### **TEST PROCEDURE**

The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

#### **RESULTS**

Normal Mode: 79 Channels observed.





## 8.2.4. AVERAGE TIME OF OCCUPANCY

### LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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 PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channels \* 0.4 s) is equal to 10 \* (# of pulses in 3.16 s) \* pulse width.

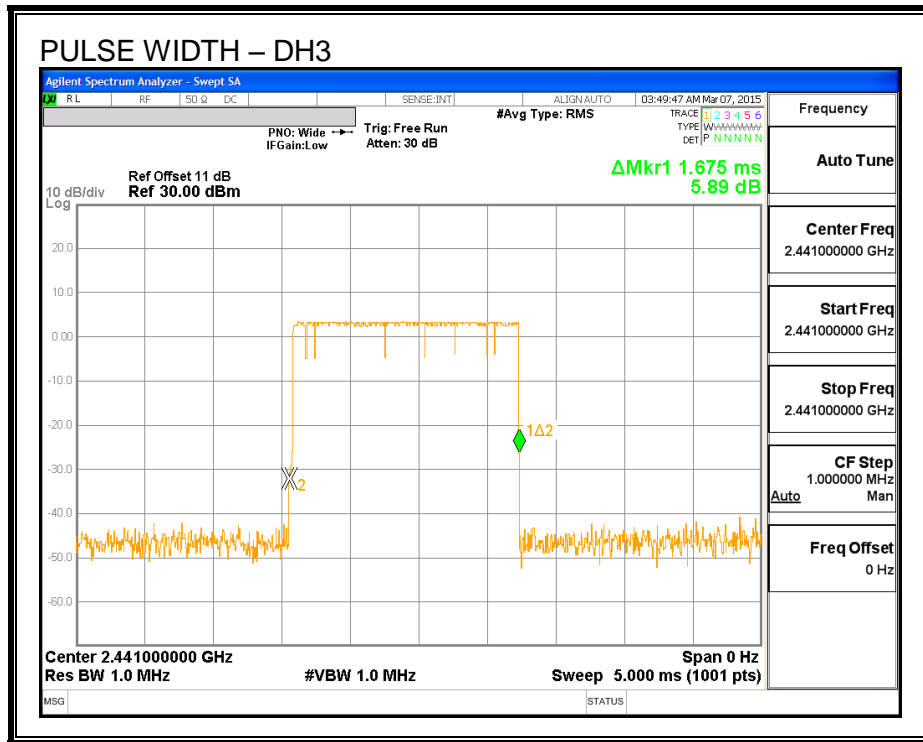
For AFH mode, the average time of occupancy in the specified 8 second period (20 channels \* 0.4 seconds) is equal to 10 \* (# of pulses in 0.8 s) \* pulse width.

### RESULTS

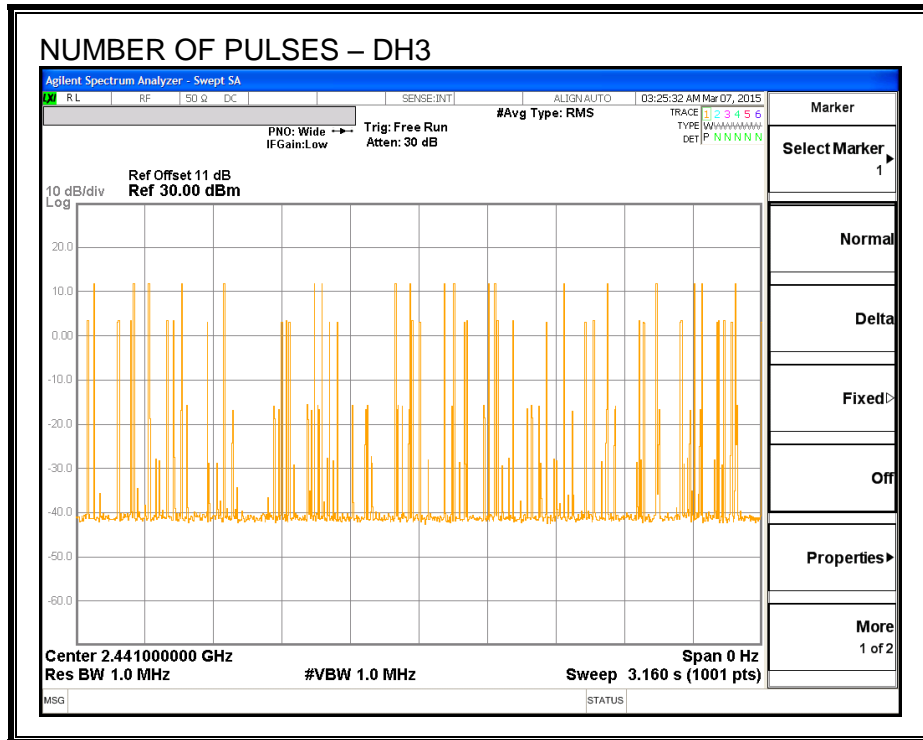
| DH Packet        | Pulse Width (msec) | Number of Pulses in 3.16 seconds | Average Time of Occupancy (sec) | Limit (sec) | Margin (sec) |
|------------------|--------------------|----------------------------------|---------------------------------|-------------|--------------|
| GFSK Normal Mode |                    |                                  |                                 |             |              |
| DH1              | 0.42               | 32                               | 0.134                           | 0.4         | -0.266       |
| DH3              | 1.675              | 19                               | 0.318                           | 0.4         | -0.082       |
| DH5              | 2.92               | 11                               | 0.321                           | 0.4         | -0.079       |



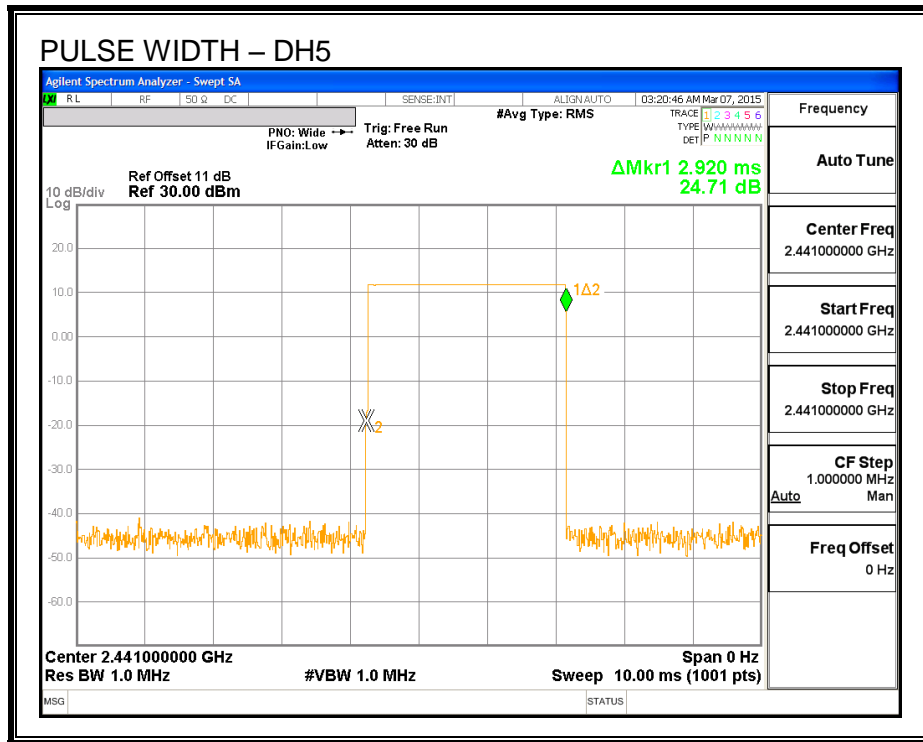
**PULSE WIDTH – DH3**



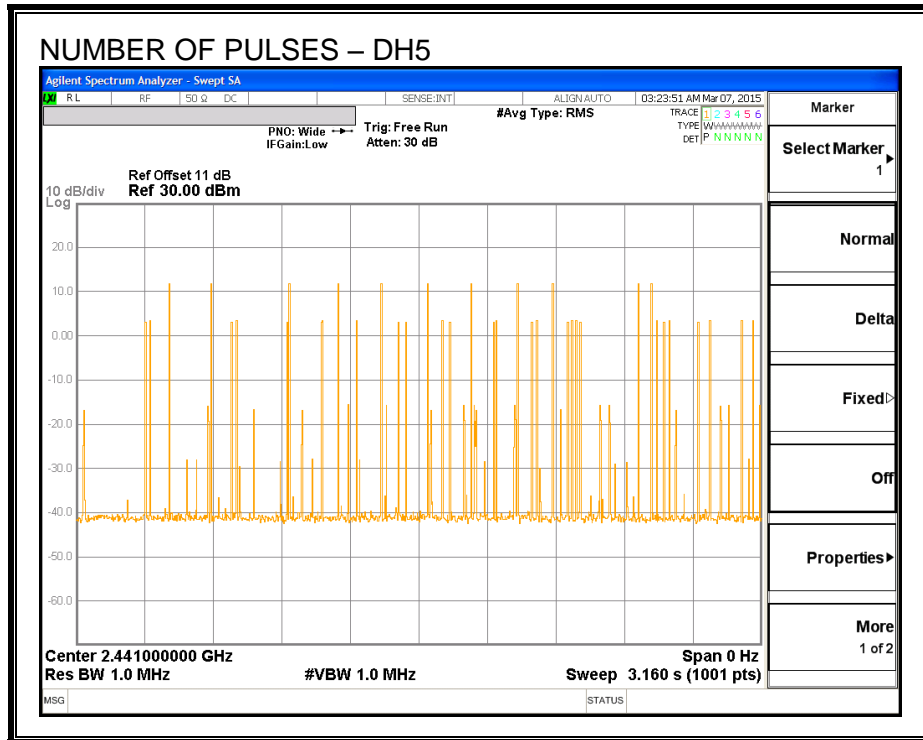
**NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH3**



**PULSE WIDTH – DH5**



**NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – DH5**



## 8.2.5. OUTPUT POWER

### LIMIT

§15.247 (b) (1)

RSS-247 (5.4) (2)

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

### TEST PROCEDURE

The transmitter output is connected to a wideband peak and average power meter.

### RESULTS

| Channel | Frequency (MHz) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|---------|-----------------|--------------------|-------------|-------------|
| Low     | 2402            | 7.92               | 30          | -22.08      |
| Middle  | 2441            | 7.95               | 30          | -22.05      |
| High    | 2480            | 7.93               | 30          | -22.07      |



## 8.2.6. AVERAGE POWER

### LIMIT

None; for reporting purposes only.

### TEST PROCEDURE

The transmitter output is connected to a power meter.

### RESULTS

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Average Power<br/>(dBm)</b> |
|----------------|----------------------------|--------------------------------|
| Low            | 2402                       | 7.84                           |
| Middle         | 2441                       | 7.85                           |
| High           | 2480                       | 7.84                           |

## **8.2.7. CONDUCTED SPURIOUS EMISSIONS**

### **LIMITS**

FCC §15.247 (d)

IC RSS-247 (5.5)

Limit = -20 dBc

### **TEST PROCEDURE**

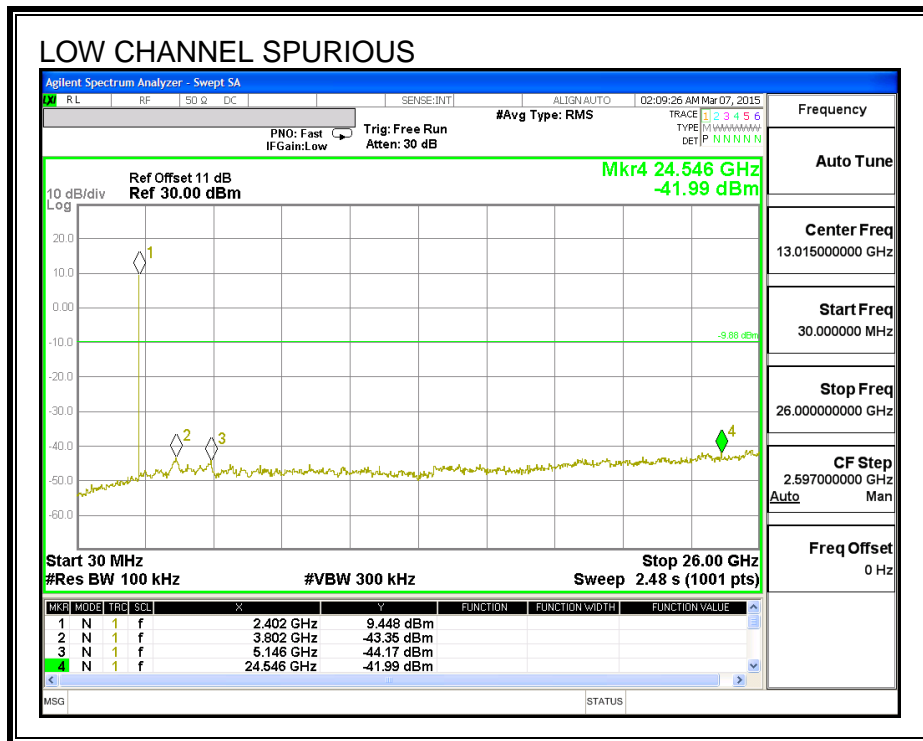
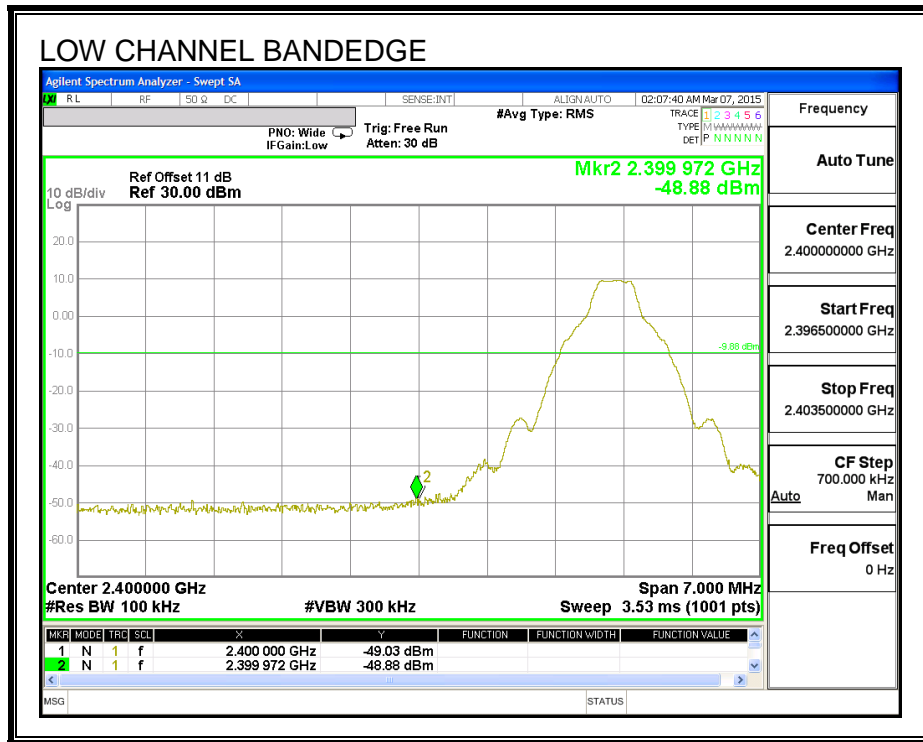
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

### **RESULTS**

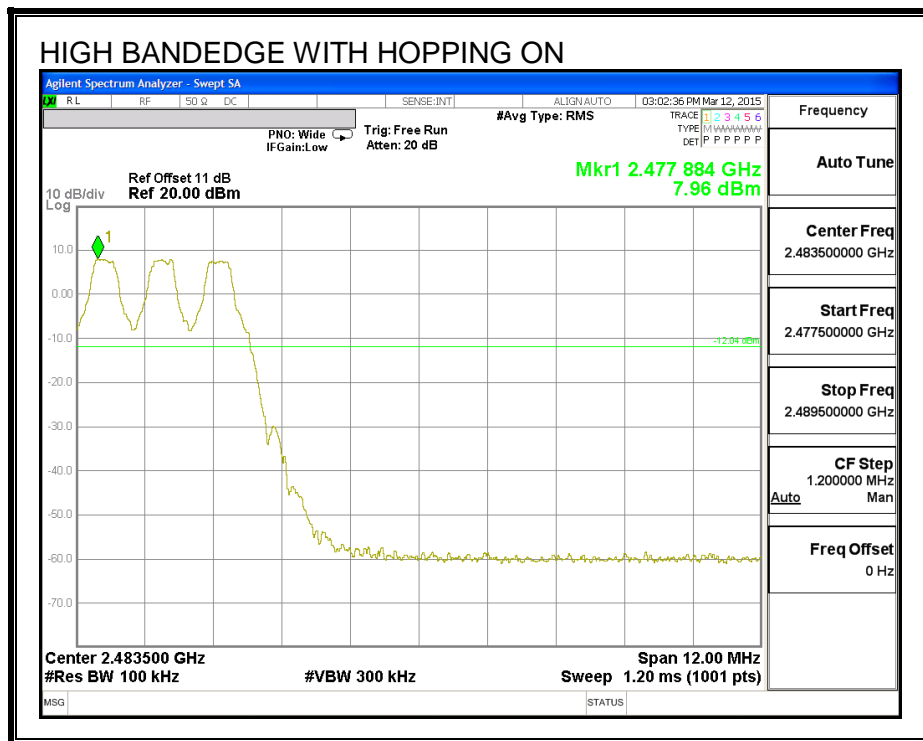
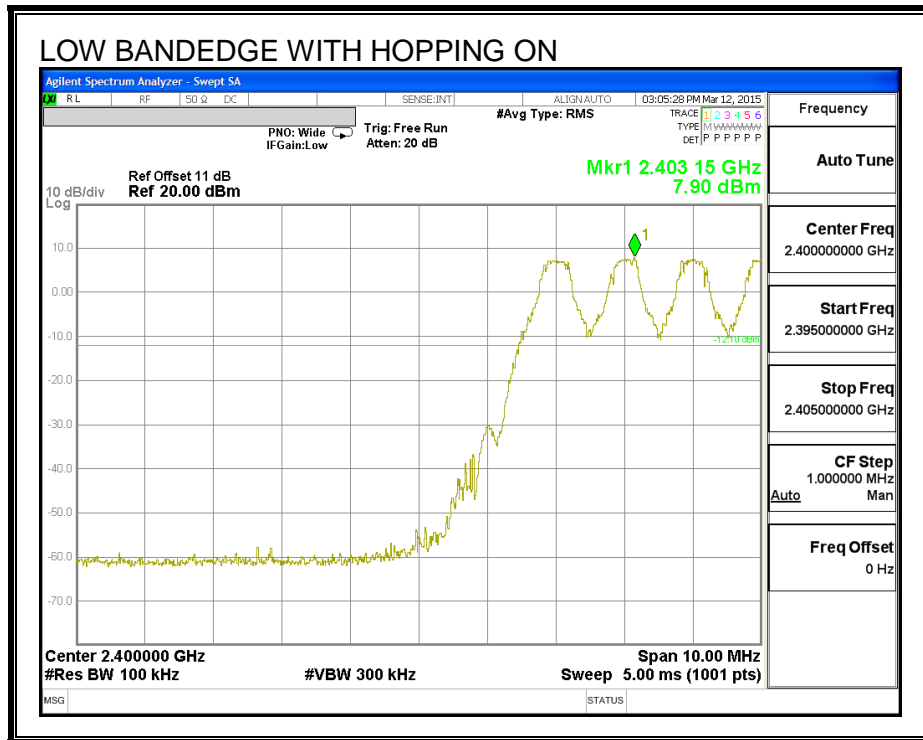
**SPURIOUS EMISSIONS, LOW CHANNEL**







**SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON**



### 8.3. ENHANCED DATA RATE QPSK MODULATION (ANTENNA B)

#### 8.3.1. OUTPUT POWER

##### LIMIT

§15.247 (b) (1)

RSS-247 (5.4) (2)

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

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

##### TEST PROCEDURE

The transmitter output is connected to a wideband peak and average power meter.

##### RESULTS

| Channel | Frequency (MHz) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|---------|-----------------|--------------------|-------------|-------------|
| Low     | 2402            | 10.04              | 21          | -10.93      |
| Middle  | 2441            | 10.08              | 21          | -10.89      |
| High    | 2480            | 10.05              | 21          | -10.92      |

### 8.3.2. AVERAGE POWER

#### LIMIT

None; for reporting purposes only.

#### TEST PROCEDURE

The transmitter output is connected to a power meter.

#### RESULTS

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Average Power<br/>(dBm)</b> |
|----------------|----------------------------|--------------------------------|
| Low            | 2402                       | 7.98                           |
| Middle         | 2441                       | 8.10                           |
| High           | 2480                       | 8.02                           |



## 8.4. ENHANCED DATA RATE QPSK MODULATION (ANTENNA D)

### 8.4.1. OUTPUT POWER

#### LIMIT

§15.247 (b) (1)

RSS-247 (5.4) (2)

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

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

#### TEST PROCEDURE

The transmitter output is connected to a wideband peak and average power meter.

#### RESULTS

| Channel | Frequency (MHz) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|---------|-----------------|--------------------|-------------|-------------|
| Low     | 2402            | 8.58               | 21          | -12.39      |
| Middle  | 2441            | 9.05               | 21          | -11.92      |
| High    | 2480            | 9.02               | 21          | -11.95      |

### 8.4.2. AVERAGE POWER

#### LIMIT

None; for reporting purposes only.

#### TEST PROCEDURE

The transmitter output is connected to a power meter.

#### RESULTS

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Average Power<br/>(dBm)</b> |
|----------------|----------------------------|--------------------------------|
| Low            | 2402                       | 6.66                           |
| Middle         | 2441                       | 6.95                           |
| High           | 2480                       | 6.94                           |

## 8.5. ENHANCED DATA RATE 8PSK MODULATION (ANTENNA B)

### 8.5.1. 20 dB AND 99% BANDWIDTH

#### LIMIT

None; for reporting purposes only.

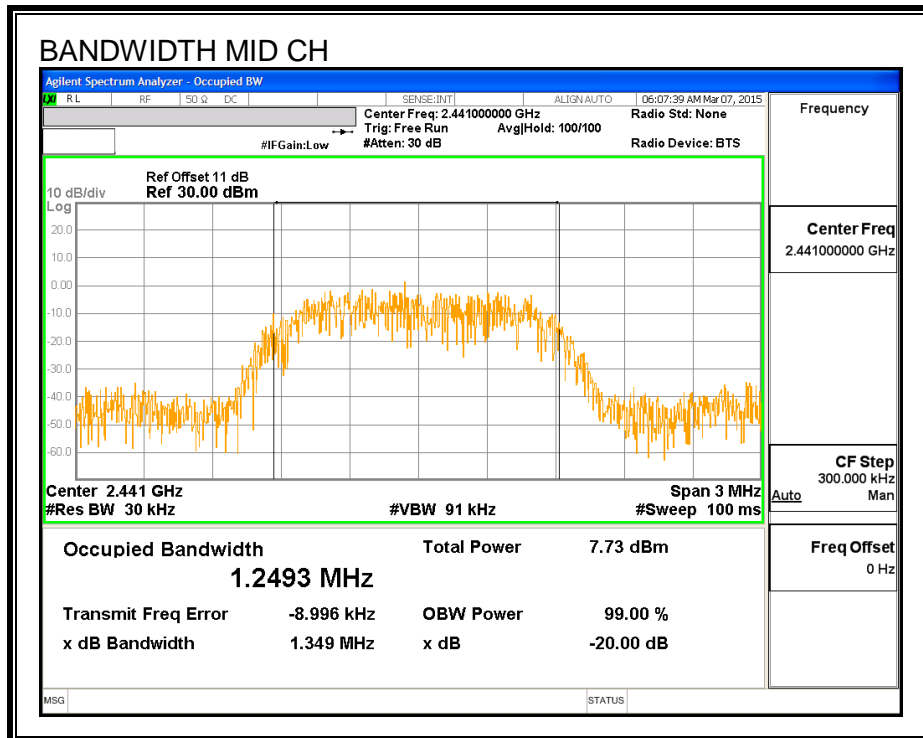
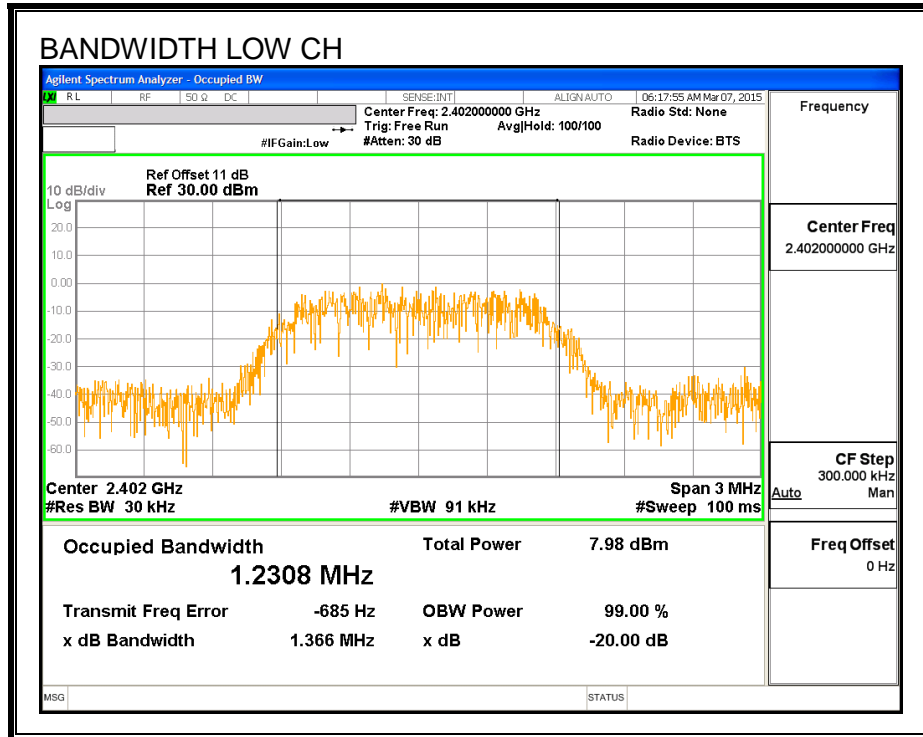
#### TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to  $\geq 1\%$  of the 20 dB bandwidth. The VBW is set to  $\geq$  RBW. The sweep time is coupled.

#### RESULTS

| Channel | Frequency (MHz) | 20 dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|-----------------------|---------------------|
| Low     | 2402            | 1.366                 | 1.2308              |
| Middle  | 2441            | 1.349                 | 1.2493              |
| High    | 2480            | 1.350                 | 1.2509              |

**20 dB AND 99% BANDWIDTH**





## 8.5.2. HOPPING FREQUENCY SEPARATION

### LIMIT

FCC §15.247 (a) (1)

IC RSS-247 (5.1) (2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

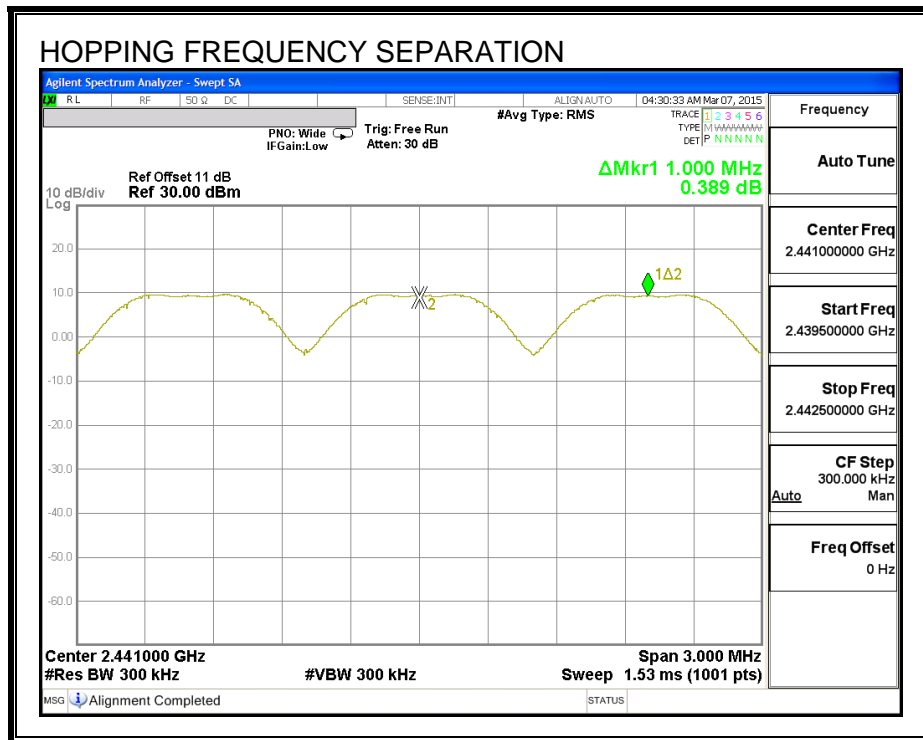
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

### TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

### RESULTS

**HOPPING FREQUENCY SEPARATION**



### **8.5.3. NUMBER OF HOPPING CHANNELS**

#### **LIMIT**

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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

#### **TEST PROCEDURE**

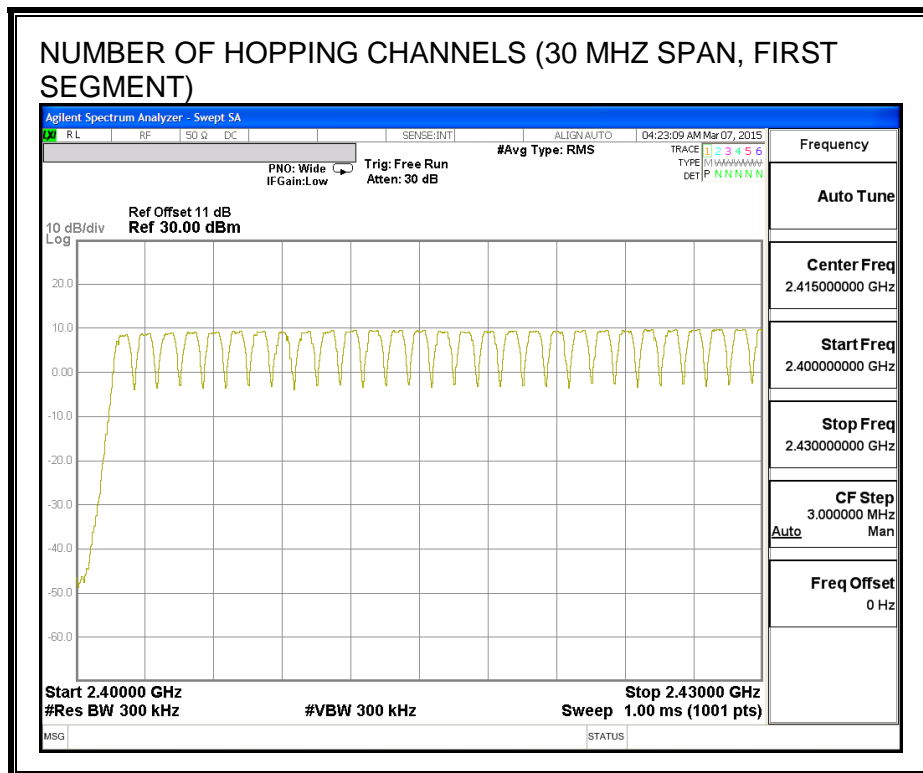
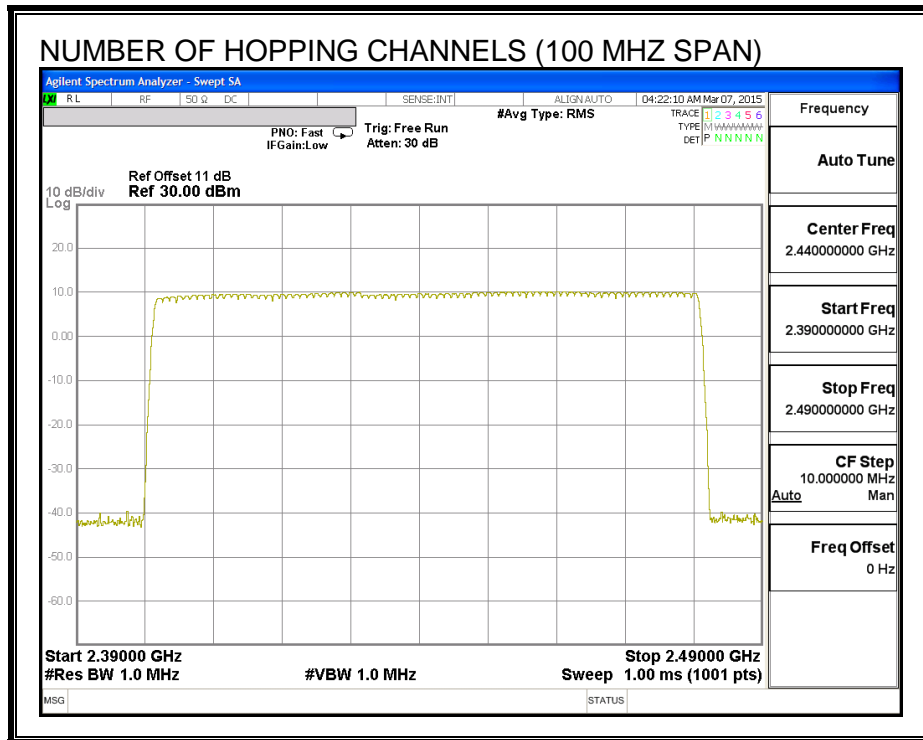
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

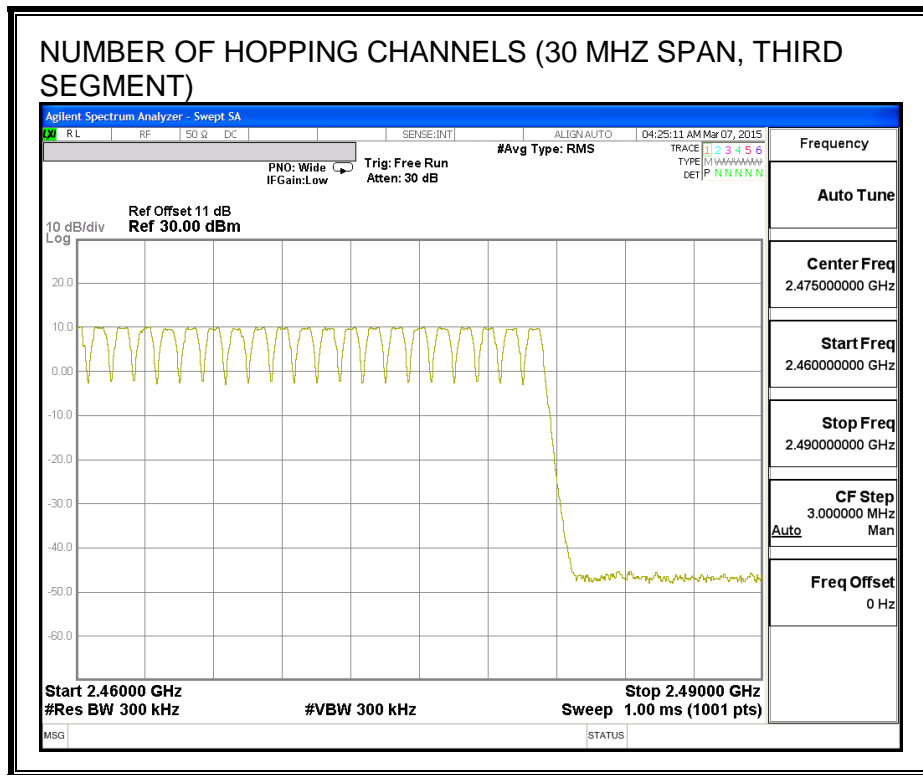
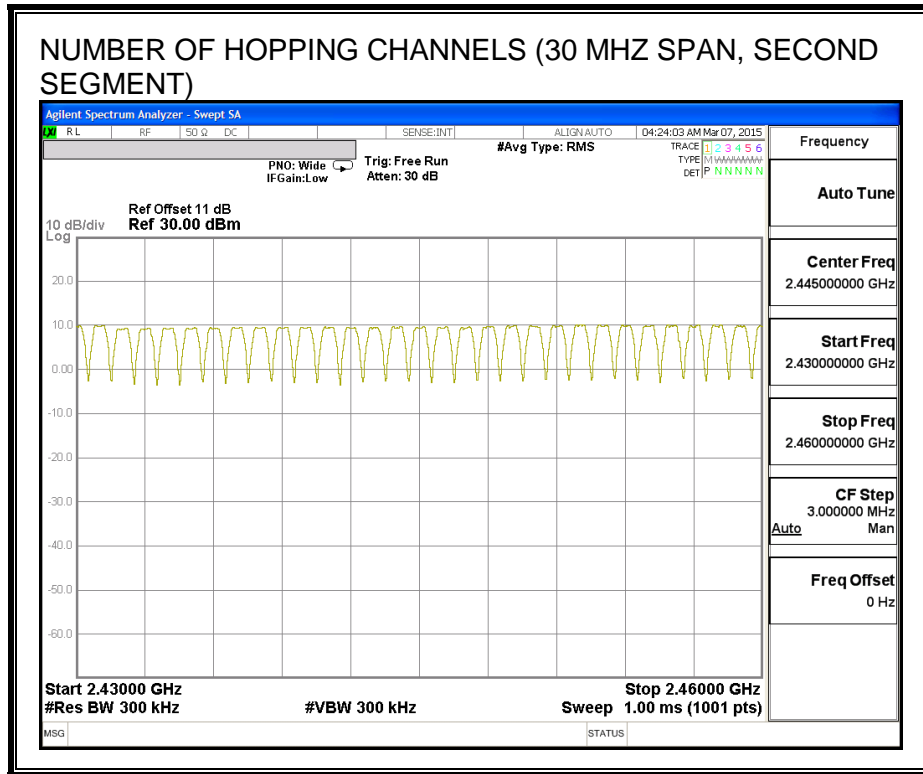
#### **RESULTS**

Normal Mode: 79 Channels observed.



**NUMBER OF HOPPING CHANNELS**





### 8.5.4. AVERAGE TIME OF OCCUPANCY

#### LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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 PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

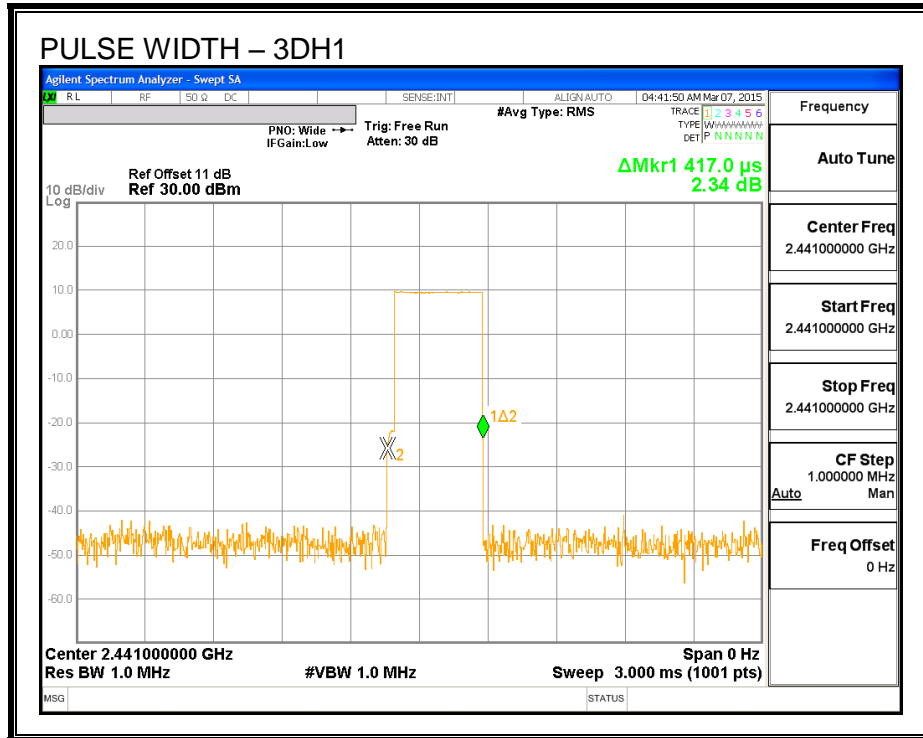
The average time of occupancy in the specified 31.6 second period (79 channels \* 0.4 s) is equal to 10 \* (# of pulses in 3.16 s) \* pulse width.

#### RESULTS

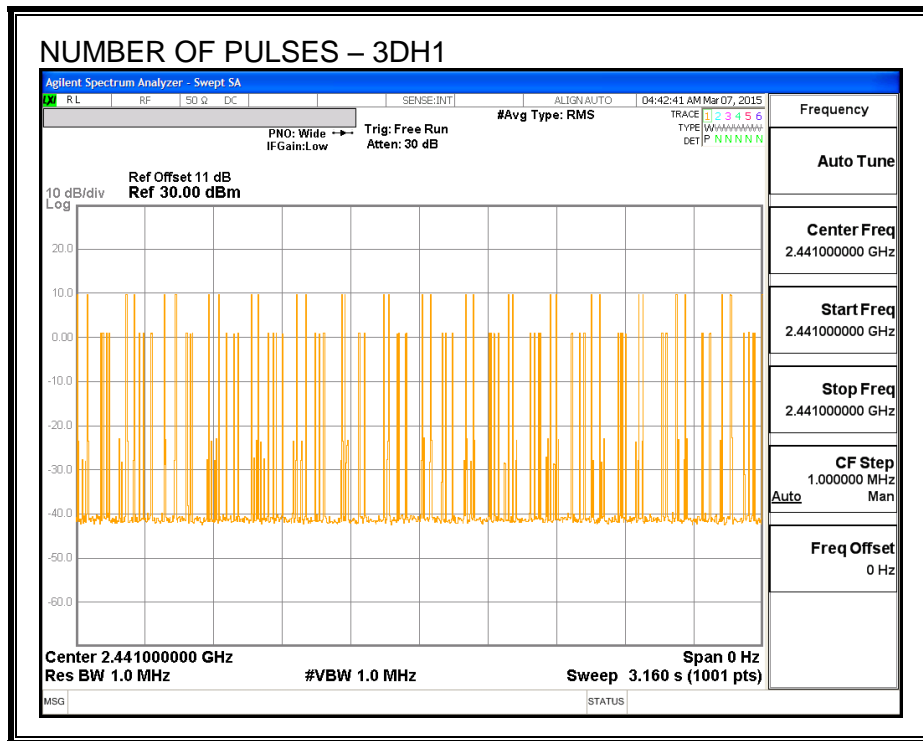
##### 8PSK (EDR) Mode

| DH Packet | Pulse Width (msec) | Number of Pulses in 3.16 seconds | Average Time of (sec) | Limit (sec) | Margin (sec) |
|-----------|--------------------|----------------------------------|-----------------------|-------------|--------------|
| 3DH1      | 0.417              | 32                               | 0.133                 | 0.4         | -0.267       |
| 3DH3      | 1.675              | 18                               | 0.302                 | 0.4         | -0.099       |
| 3DH5      | 2.92               | 11                               | 0.321                 | 0.4         | -0.079       |

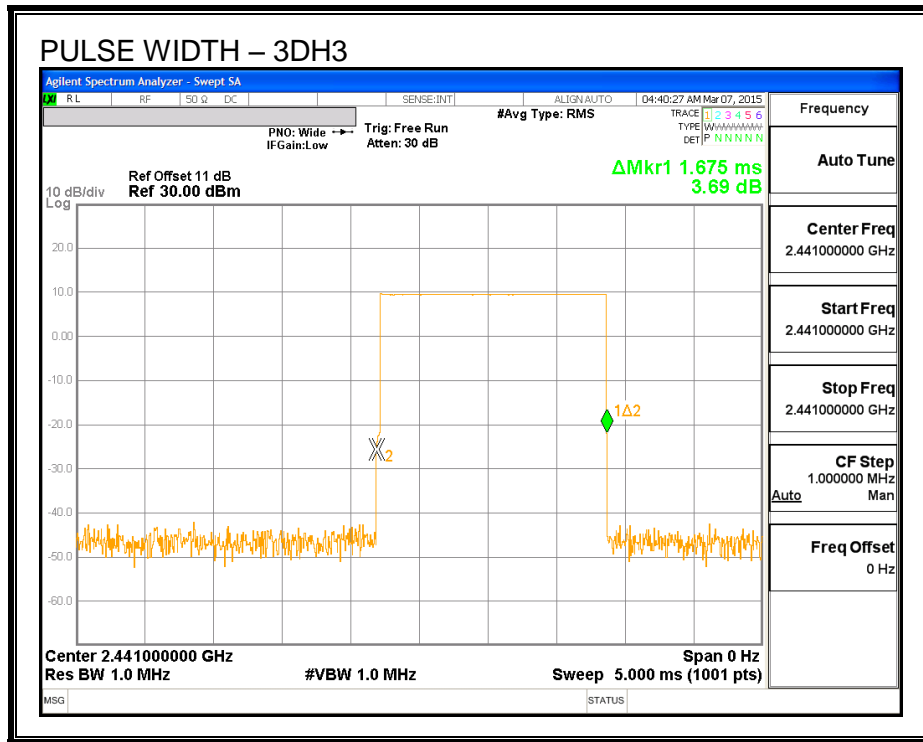
**PULSE WIDTH - 3DH1**



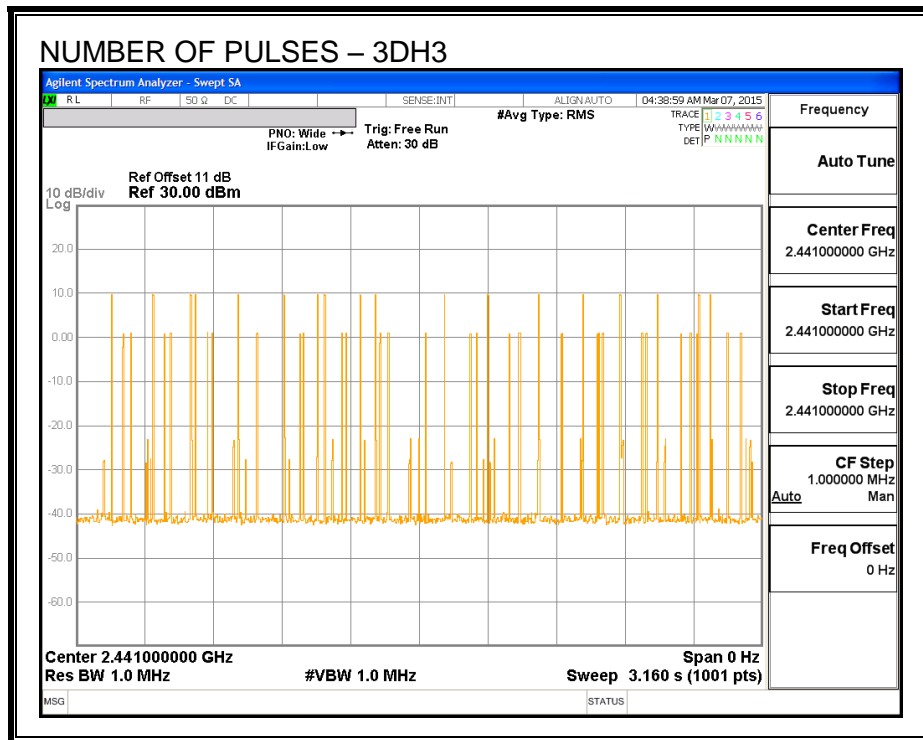
**NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3DH1**



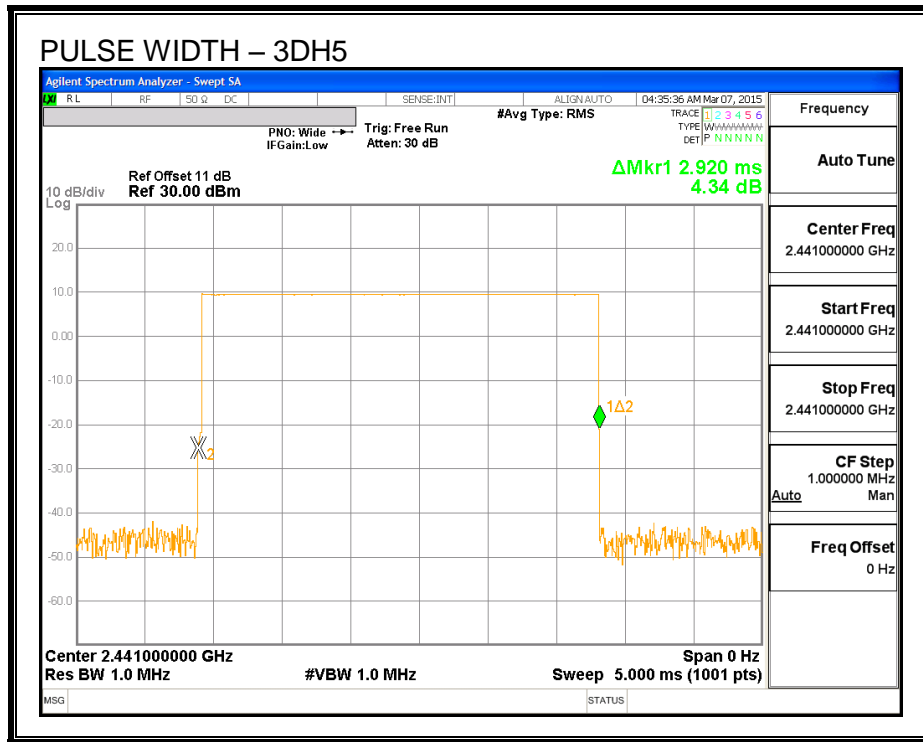
**PULSE WIDTH – 3DH3**



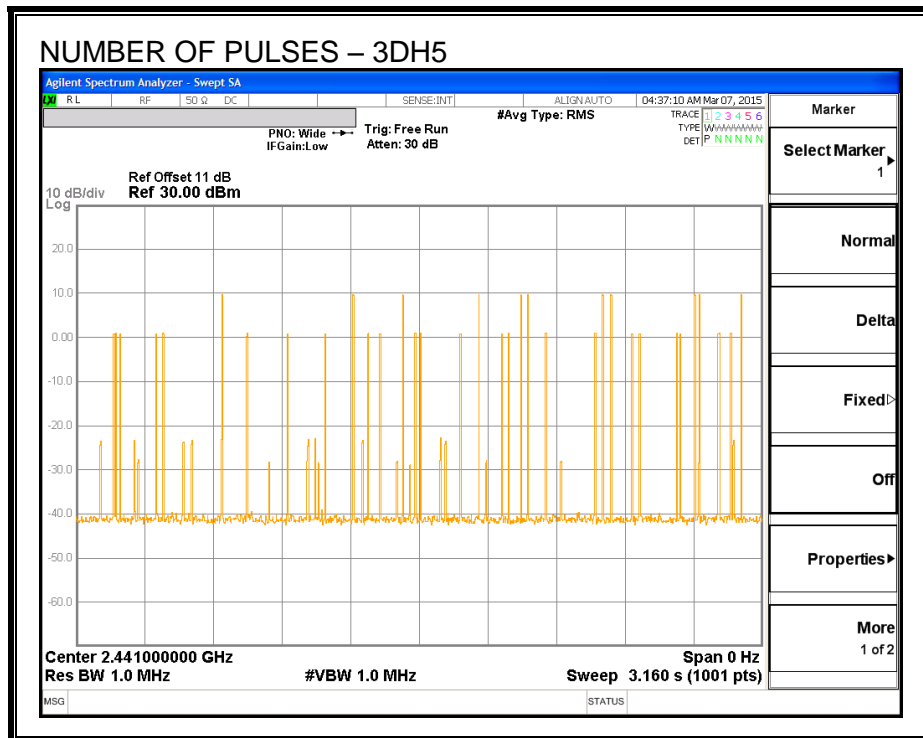
**NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3DH3**



**PULSE WIDTH – 3DH5**



**NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3DH5**



## 8.5.5. OUTPUT POWER

### LIMIT

§15.247 (b) (1)

RSS-247 (5.4) (2)

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

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

### TEST PROCEDURE

The transmitter output is connected to a wideband peak and average power meter.

### RESULTS

| Channel | Frequency (MHz) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|---------|-----------------|--------------------|-------------|-------------|
| Low     | 2402            | 10.08              | 21          | -10.89      |
| Middle  | 2441            | 10.14              | 21          | -10.83      |
| High    | 2480            | 10.13              | 21          | -10.84      |

### 8.5.6. AVERAGE POWER

#### LIMIT

None; for reporting purposes only.

#### TEST PROCEDURE

The transmitter output is connected to a power meter.

#### RESULTS

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Average Power<br/>(dBm)</b> |
|----------------|----------------------------|--------------------------------|
| Low            | 2402                       | 8.01                           |
| Middle         | 2441                       | 8.14                           |
| High           | 2480                       | 8.13                           |



## **8.5.7. CONDUCTED SPURIOUS EMISSIONS**

### **LIMITS**

FCC §15.247 (d)

IC RSS-247 (5.5)

Limit = -20 dBc

### **TEST PROCEDURE**

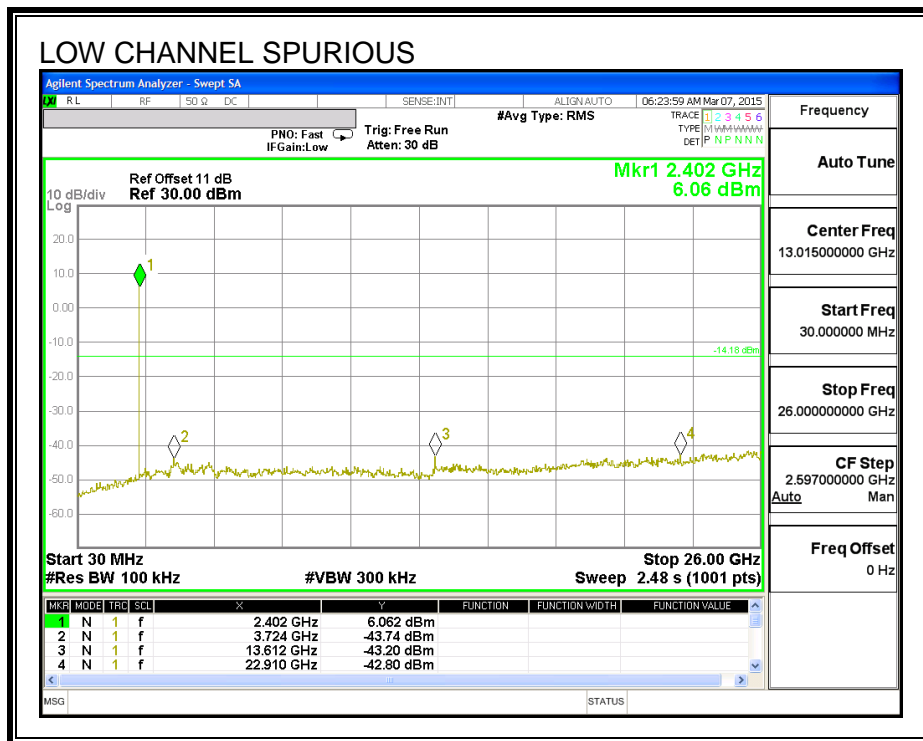
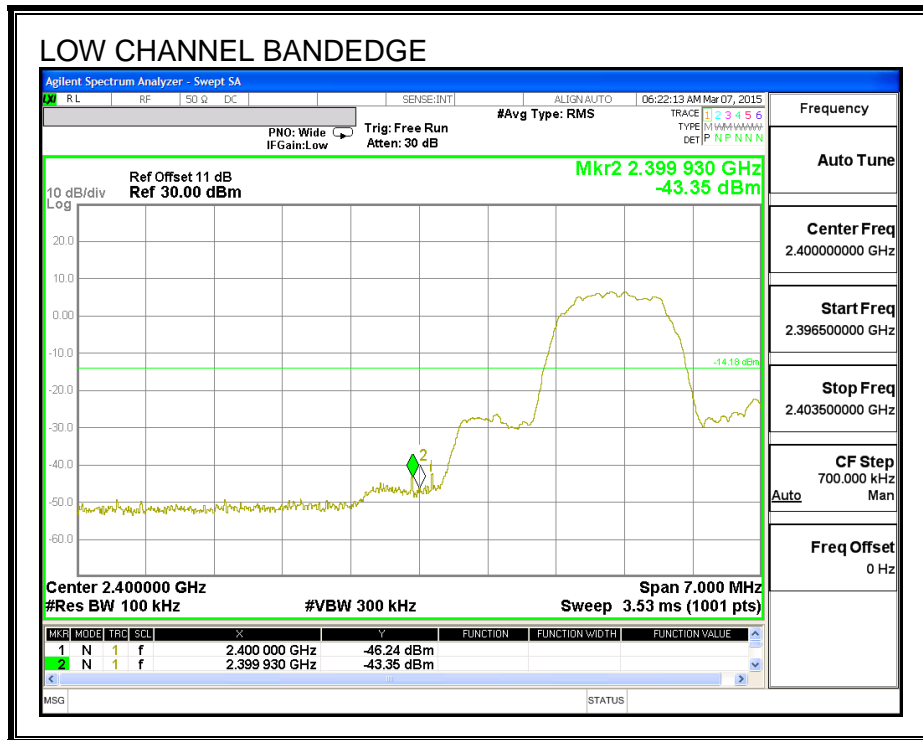
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

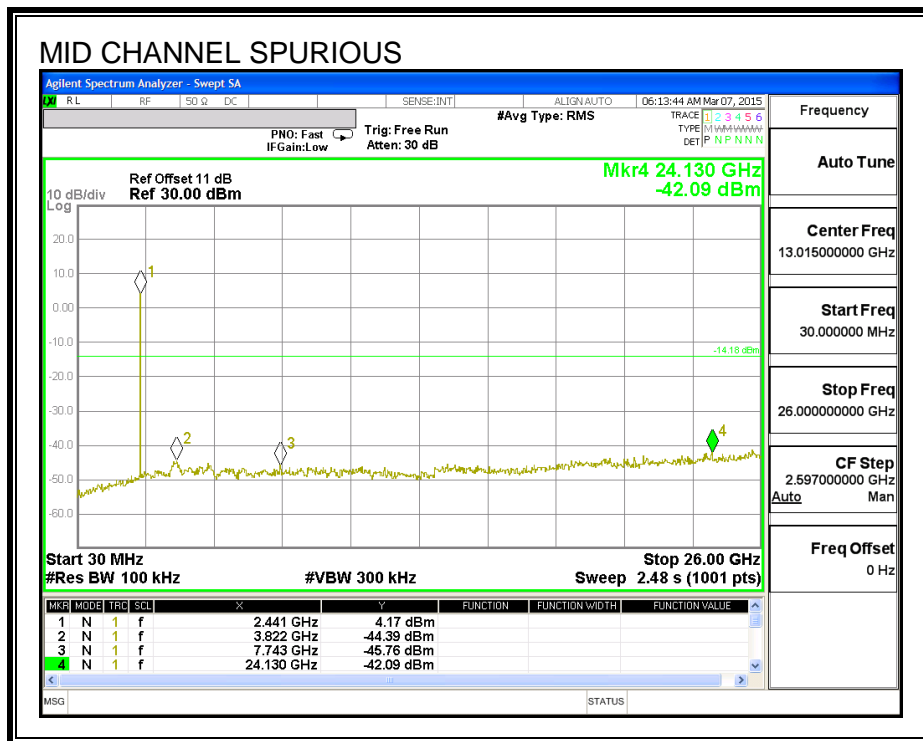
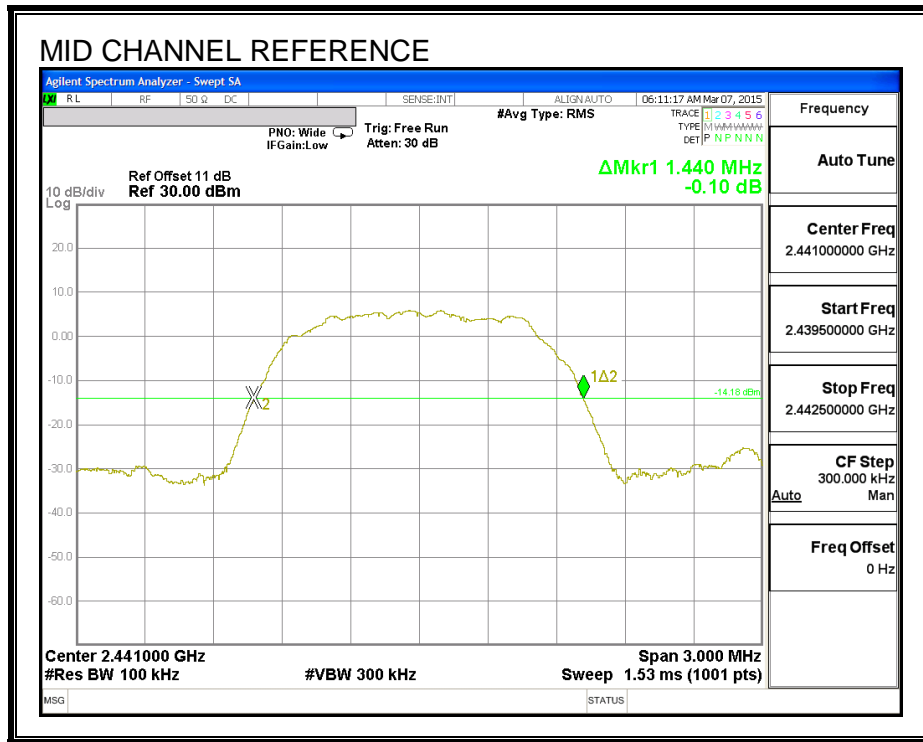
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

### **RESULTS**

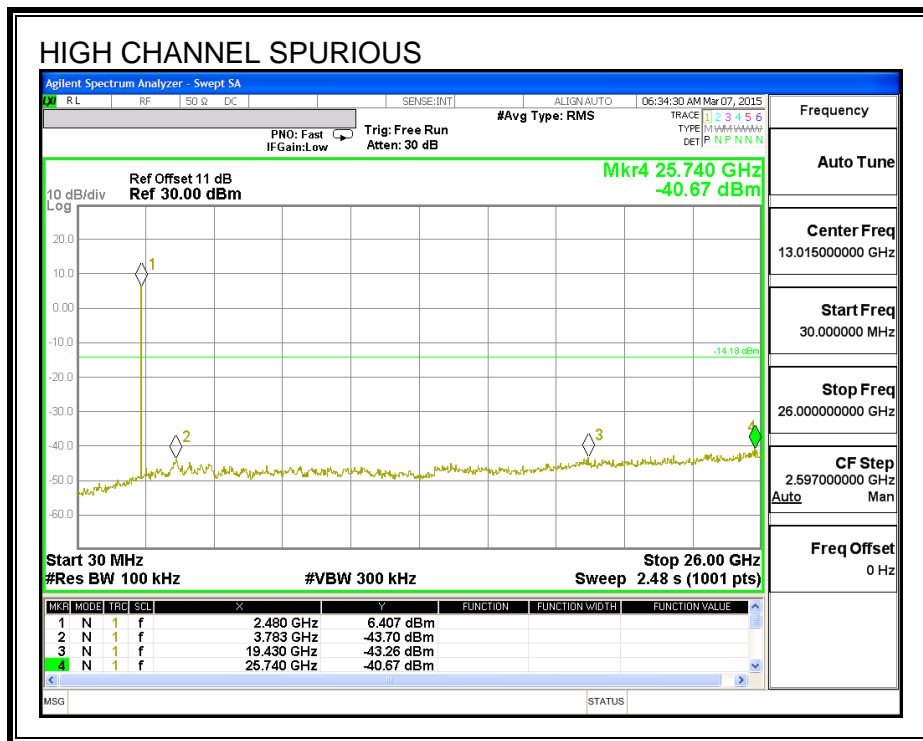
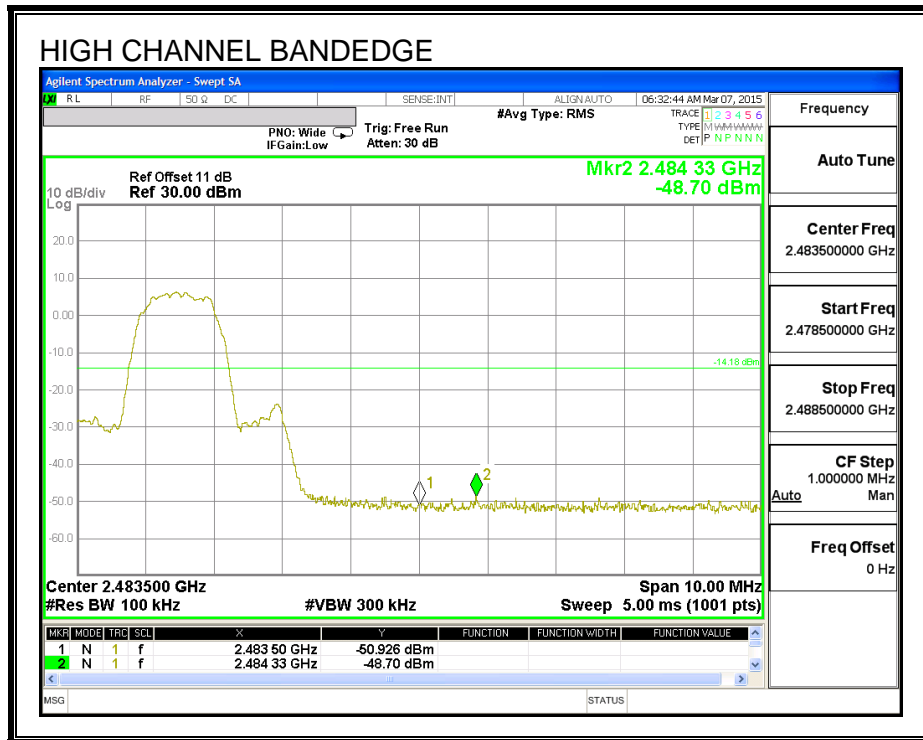
**SPURIOUS EMISSIONS, LOW CHANNEL**



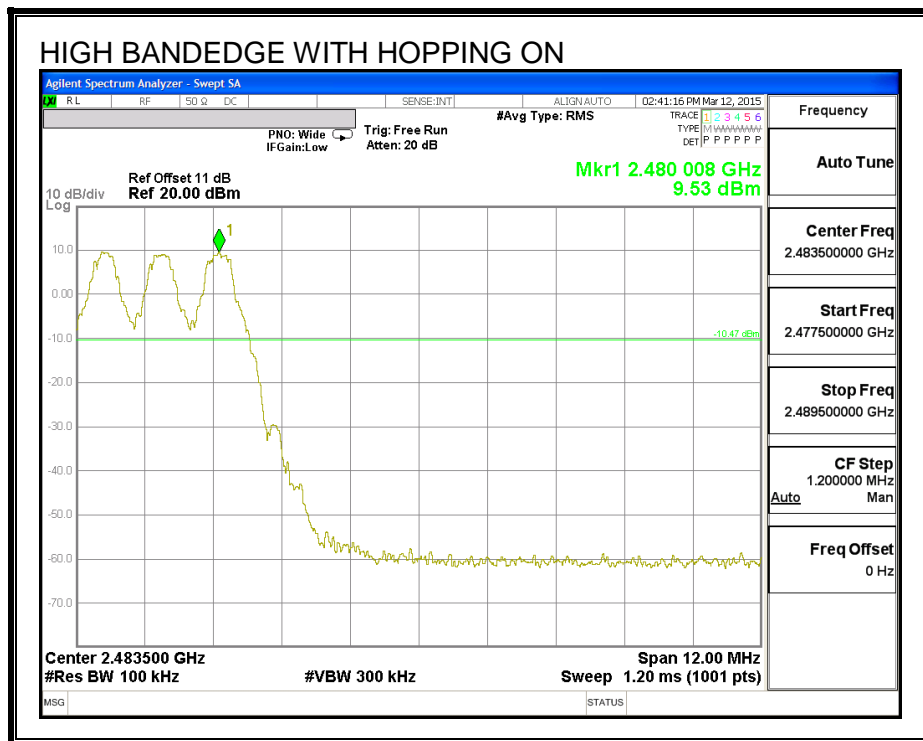
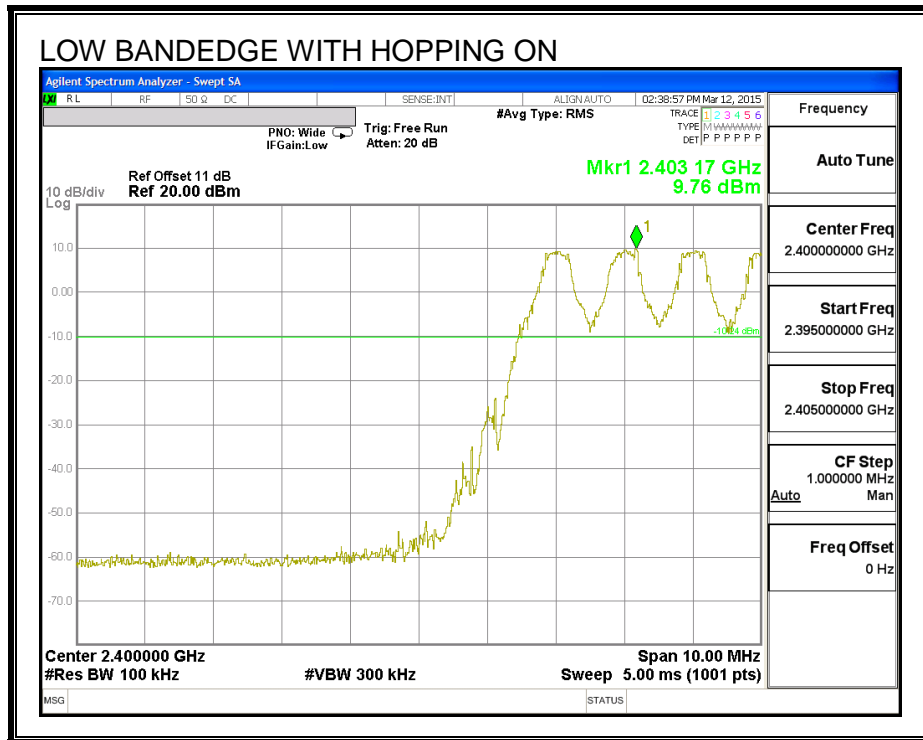
**SPURIOUS EMISSIONS, MID CHANNEL**



**SPURIOUS EMISSIONS, HIGH CHANNEL**



**SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON**



## 8.6. ENHANCED DATA RATE 8PSK MODULATION (ANTENNA D)

### 8.6.1. 20 dB AND 99% BANDWIDTH

#### LIMIT

None; for reporting purposes only.

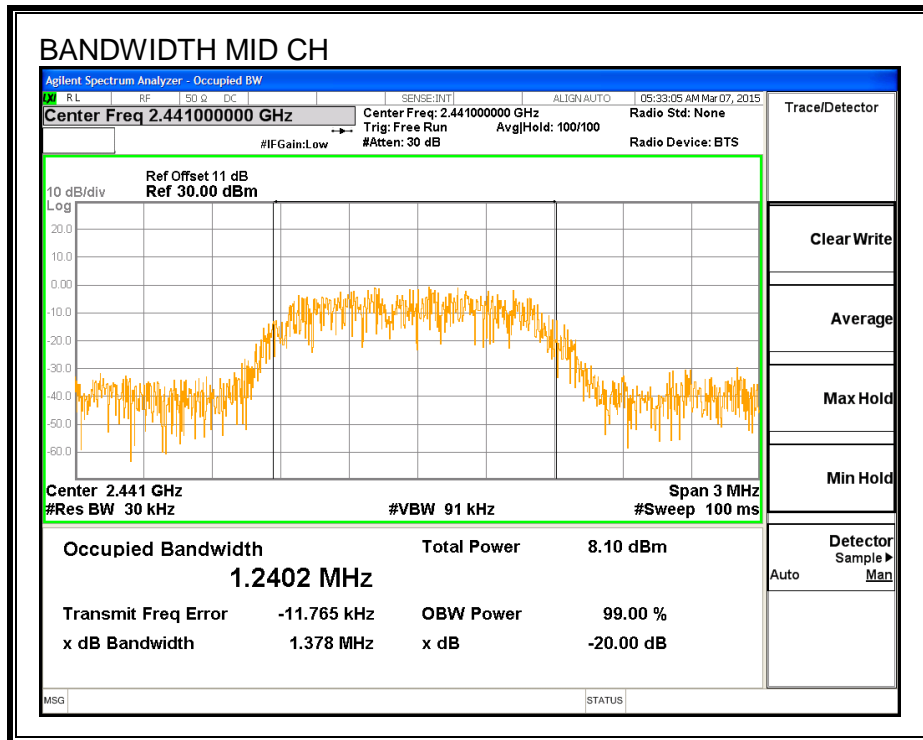
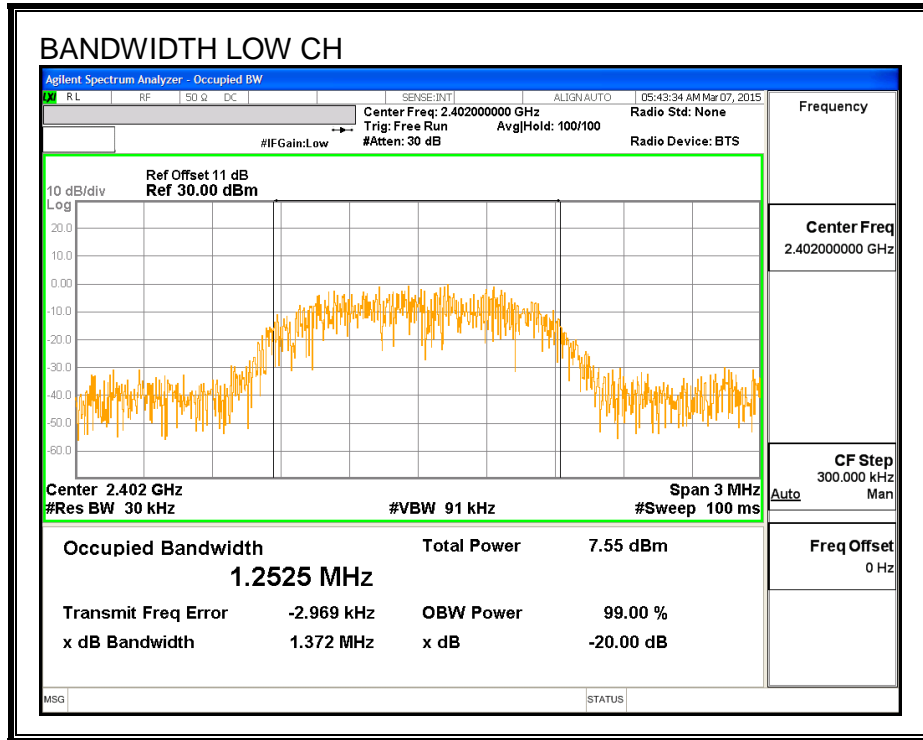
#### TEST PROCEDURE

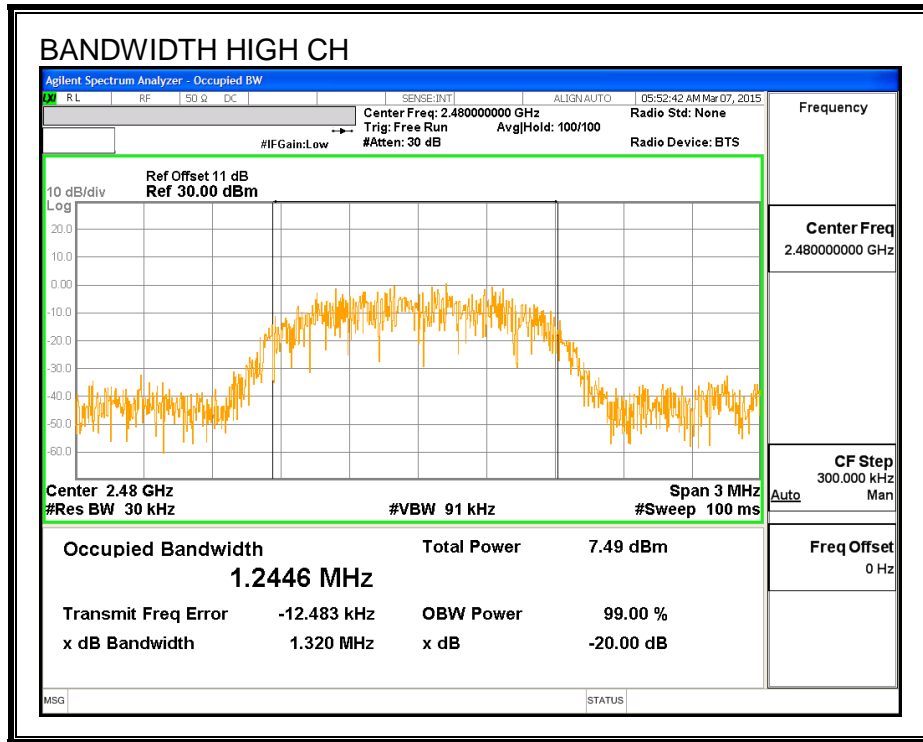
The transmitter output is connected to a spectrum analyzer. The RBW is set to  $\geq 1\%$  of the 20 dB bandwidth. The VBW is set to  $\geq$  RBW. The sweep time is coupled.

#### RESULTS

| Channel | Frequency (MHz) | 20 dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|-----------------------|---------------------|
| Low     | 2402            | 1.372                 | 1.2525              |
| Middle  | 2441            | 1.378                 | 1.2402              |
| High    | 2480            | 1.32                  | 1.2446              |

**20 dB AND 99% BANDWIDTH**







## 8.6.2. HOPPING FREQUENCY SEPARATION

### LIMIT

FCC §15.247 (a) (1)

IC RSS-247 (5.1) (2)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

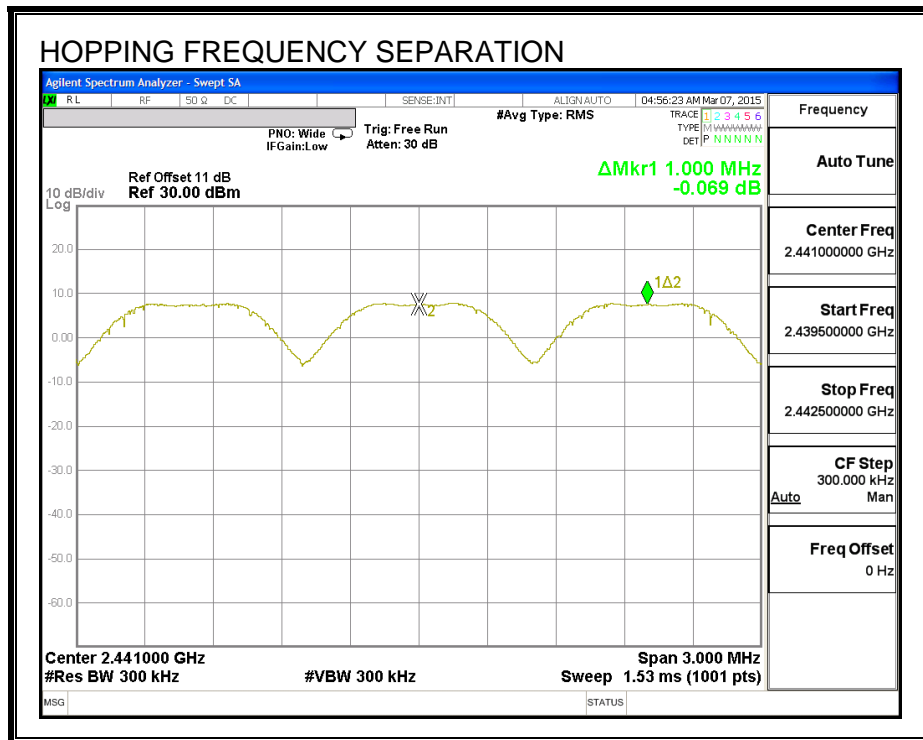
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than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

### TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

### RESULTS

**HOPPING FREQUENCY SEPARATION**



### **8.6.3. NUMBER OF HOPPING CHANNELS**

#### **LIMIT**

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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

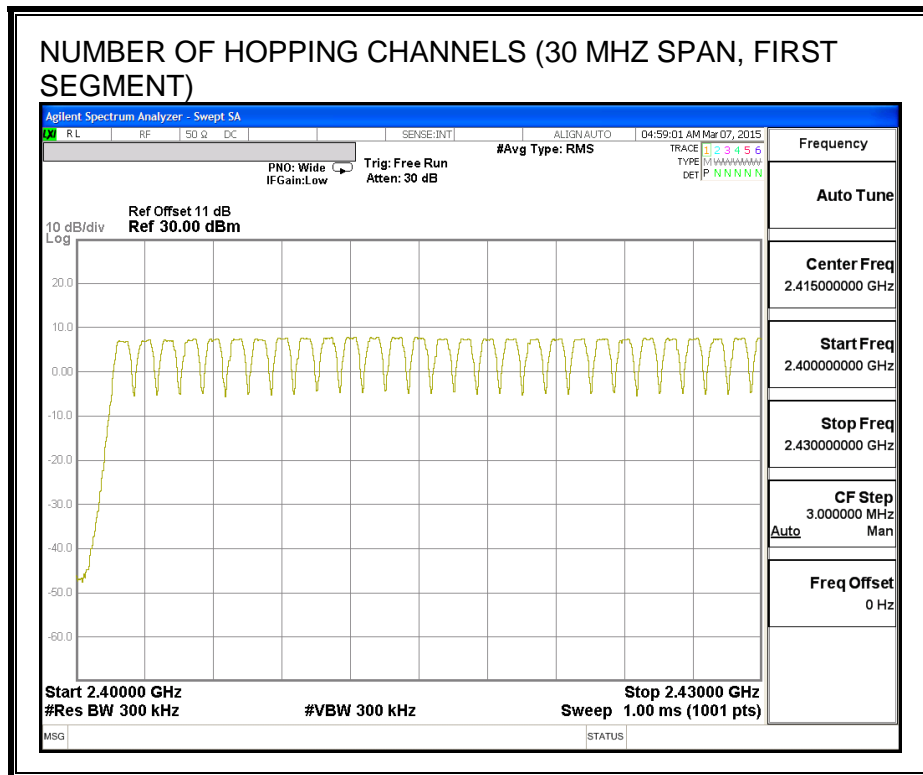
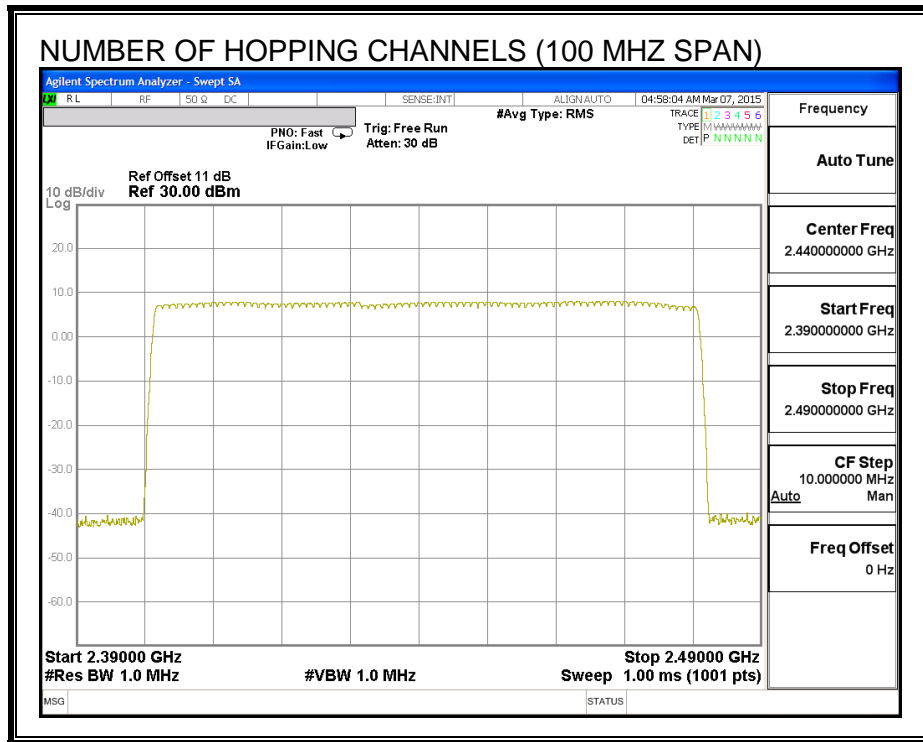
#### **TEST PROCEDURE**

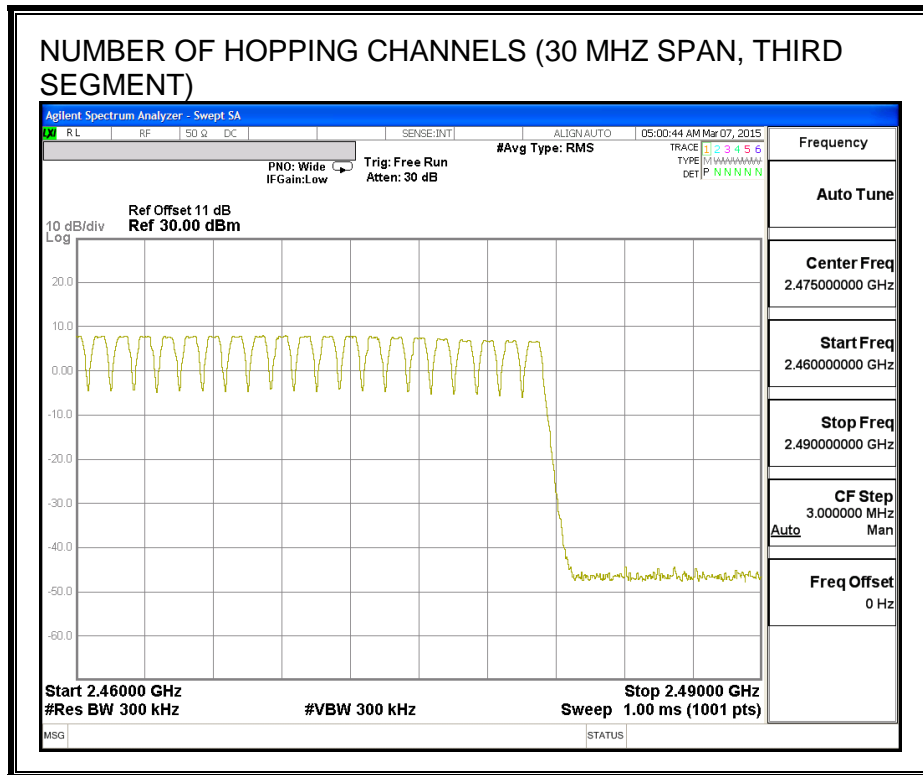
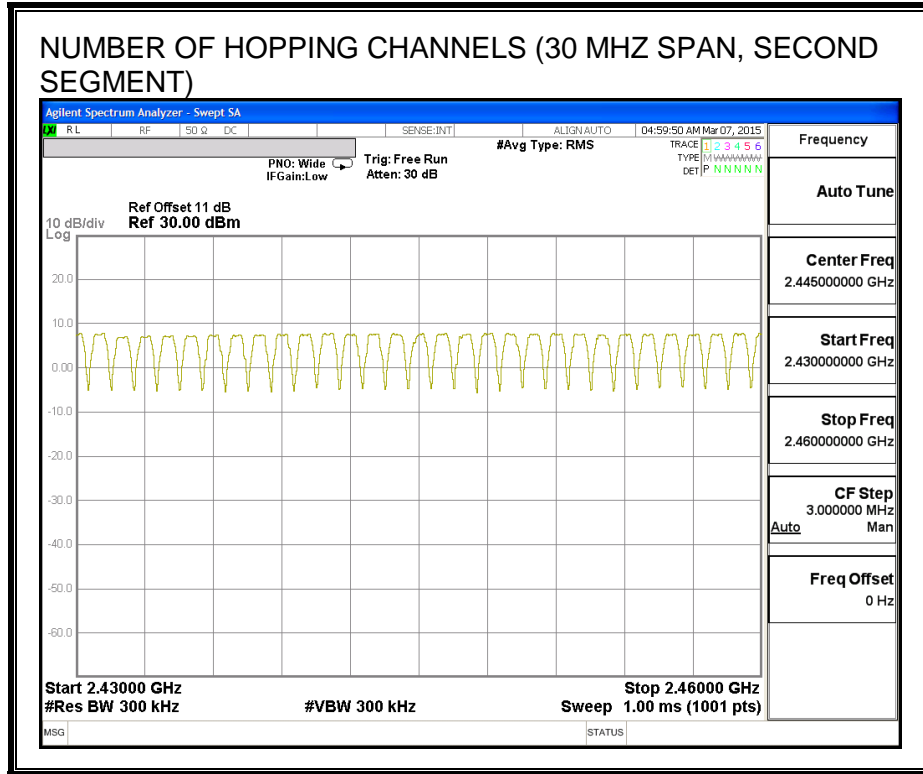
The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

#### **RESULTS**

Normal Mode: 79 Channels observed.

**NUMBER OF HOPPING CHANNELS**





### 8.6.4. AVERAGE TIME OF OCCUPANCY

#### LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-247 (5.1) (4)

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 PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

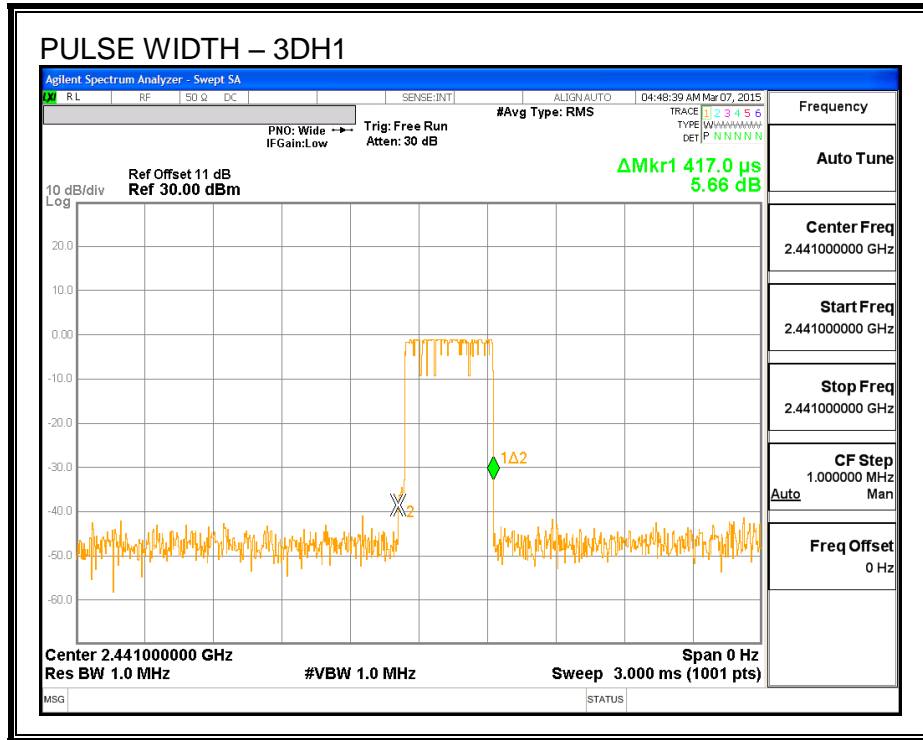
The average time of occupancy in the specified 31.6 second period (79 channels \* 0.4 s) is equal to 10 \* (# of pulses in 3.16 s) \* pulse width.

#### RESULTS

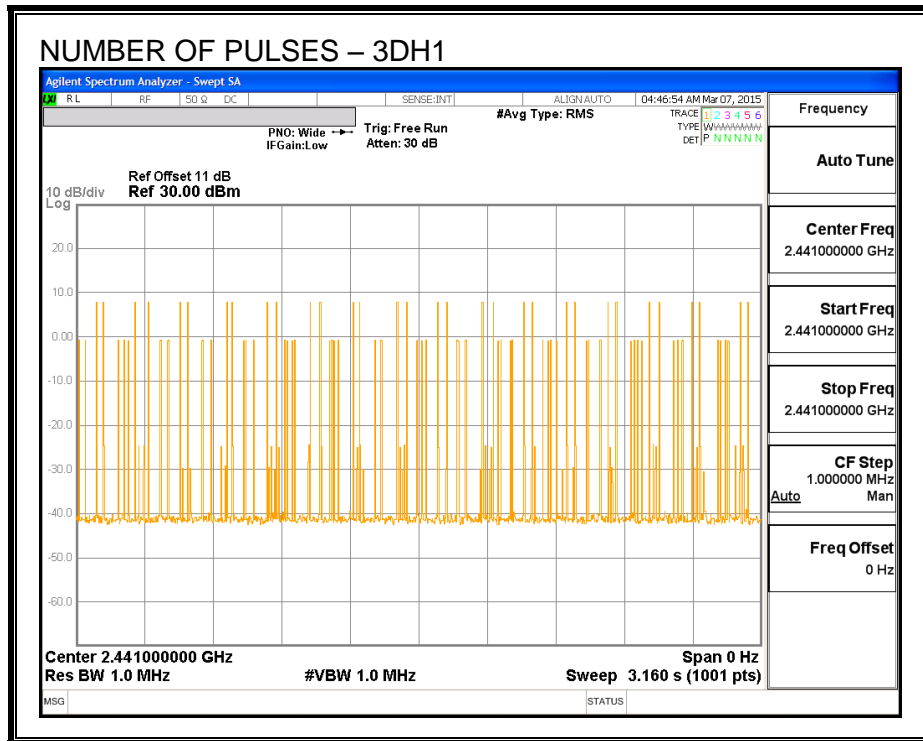
##### 8PSK (EDR) Mode

| DH Packet | Pulse Width (msec) | Number of Pulses in 3.16 seconds | Average Time of (sec) | Limit (sec) | Margin (sec) |
|-----------|--------------------|----------------------------------|-----------------------|-------------|--------------|
| 3DH1      | 0.417              | 32                               | 0.133                 | 0.4         | -0.267       |
| 3DH3      | 1.67               | 18                               | 0.301                 | 0.4         | -0.099       |
| 3DH5      | 2.92               | 11                               | 0.321                 | 0.4         | -0.079       |

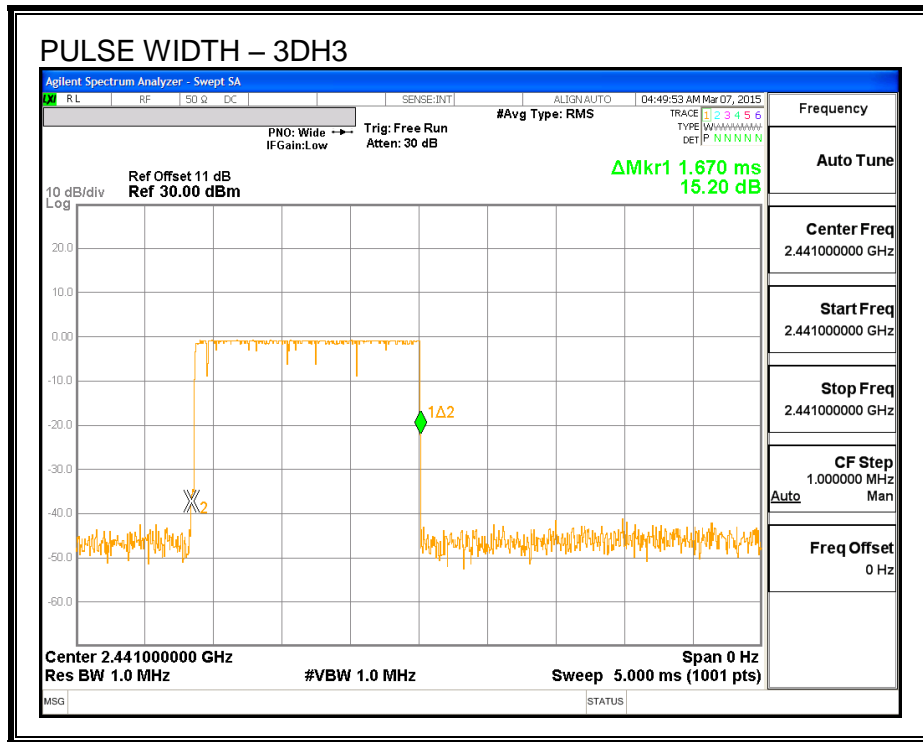
**PULSE WIDTH - 3DH1**



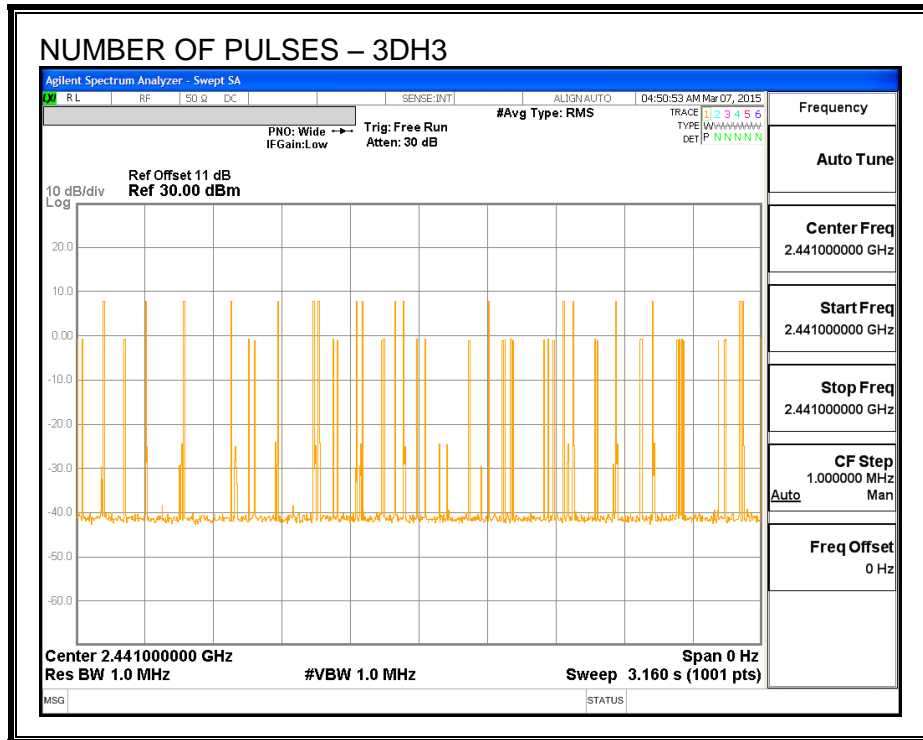
**NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD - 3DH1**



**PULSE WIDTH – 3DH3**

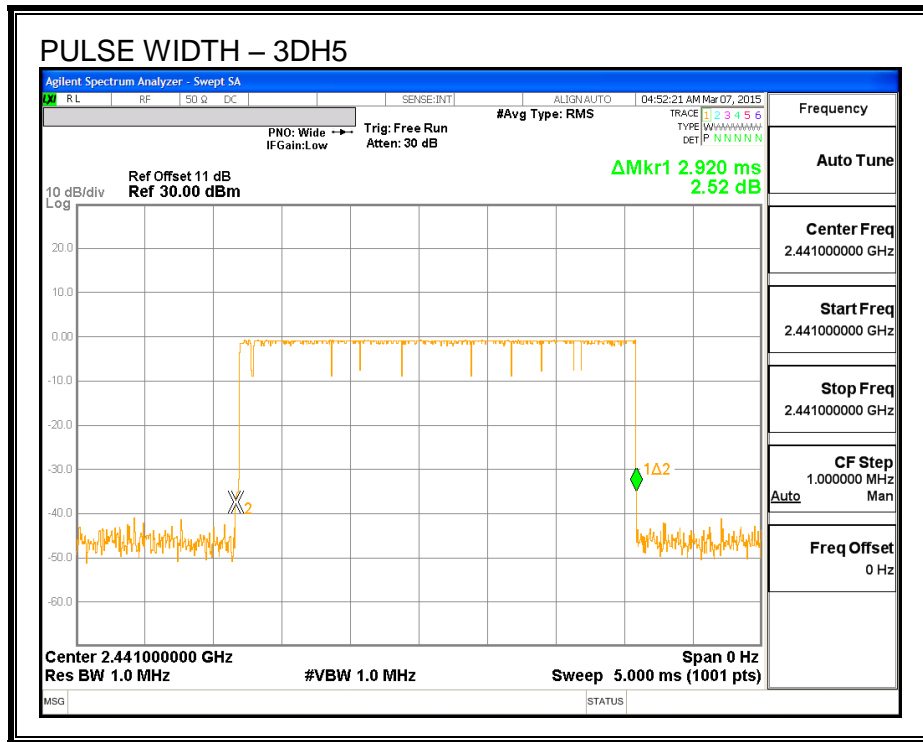


**NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3DH3**

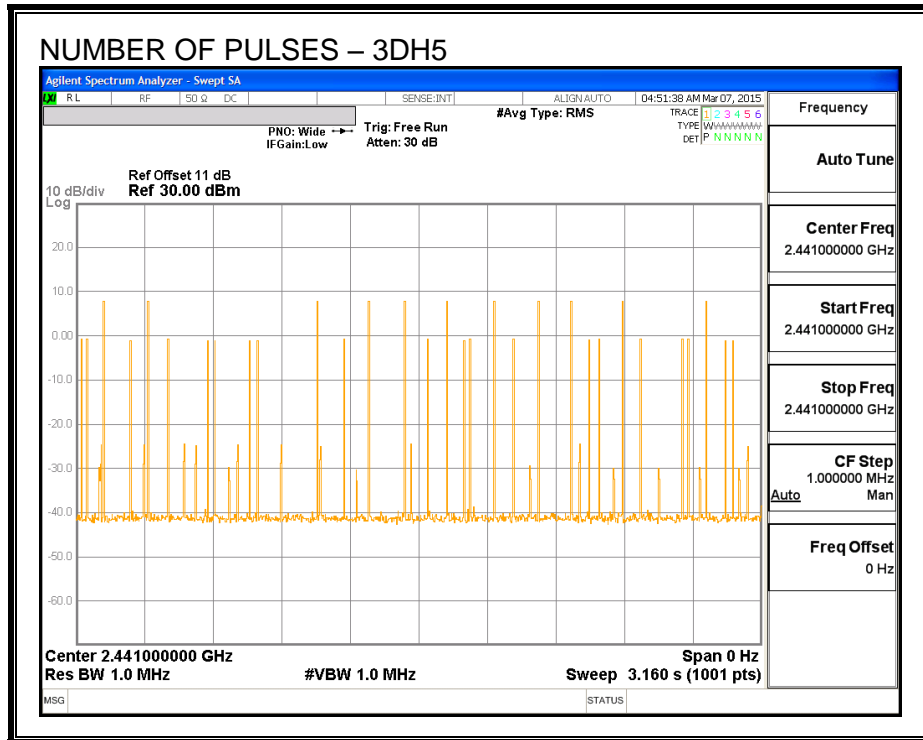




**PULSE WIDTH – 3DH5**



**NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD – 3DH5**



### 8.6.5. OUTPUT POWER

#### LIMIT

§15.247 (b) (1)

RSS-247 (5.4) (2)

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm.

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

#### TEST PROCEDURE

The transmitter output is connected to a wideband peak and average power meter.

#### RESULTS

| Channel | Frequency (MHz) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|---------|-----------------|--------------------|-------------|-------------|
| Low     | 2402            | 8.90               | 21          | -12.07      |
| Middle  | 2441            | 9.41               | 21          | -11.56      |
| High    | 2480            | 9.40               | 21          | -11.57      |

### 8.6.6. AVERAGE POWER

#### LIMIT

None; for reporting purposes only.

#### TEST PROCEDURE

The transmitter output is connected to a power meter.

#### RESULTS

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Average Power<br/>(dBm)</b> |
|----------------|----------------------------|--------------------------------|
| Low            | 2402                       | 6.83                           |
| Middle         | 2441                       | 6.99                           |
| High           | 2480                       | 6.98                           |

## **8.6.7. CONDUCTED SPURIOUS EMISSIONS**

### **LIMITS**

FCC §15.247 (d)

IC RSS-247 (5.5)

Limit = -20 dBc

### **TEST PROCEDURE**

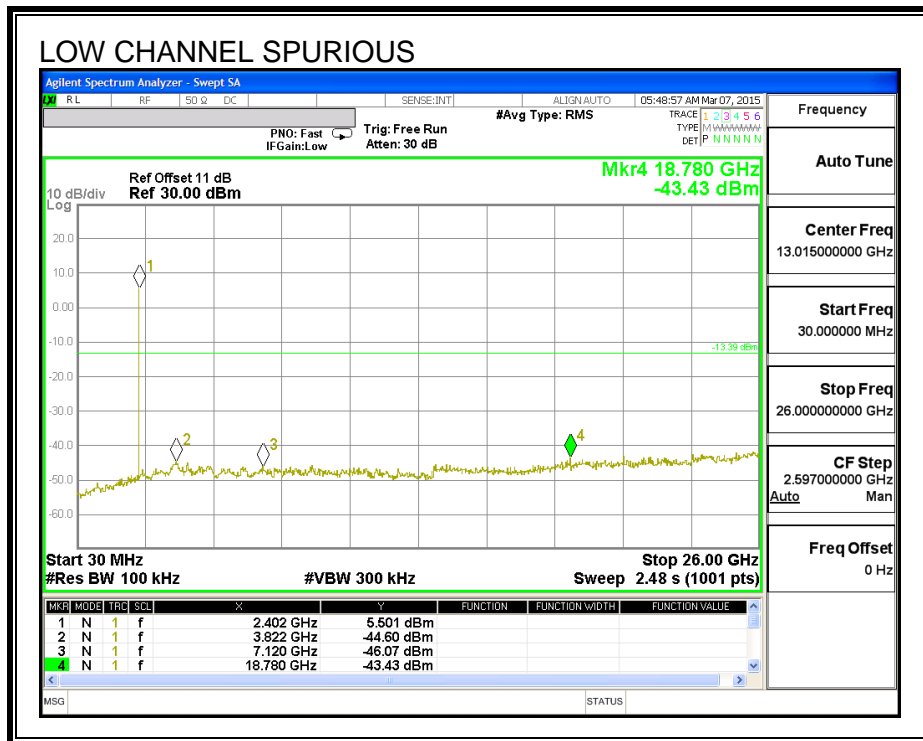
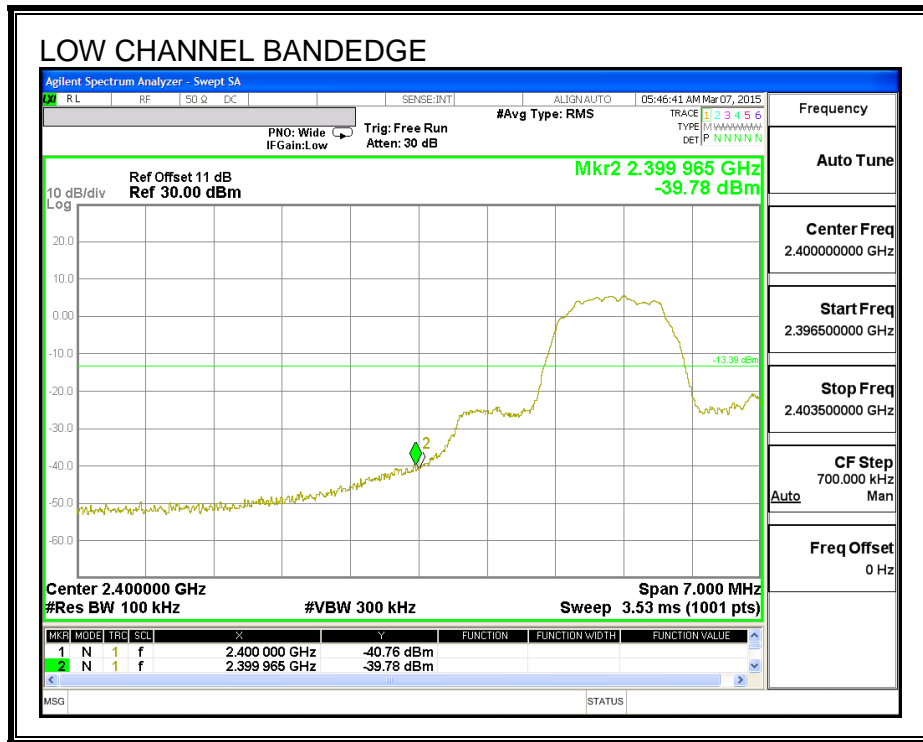
The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

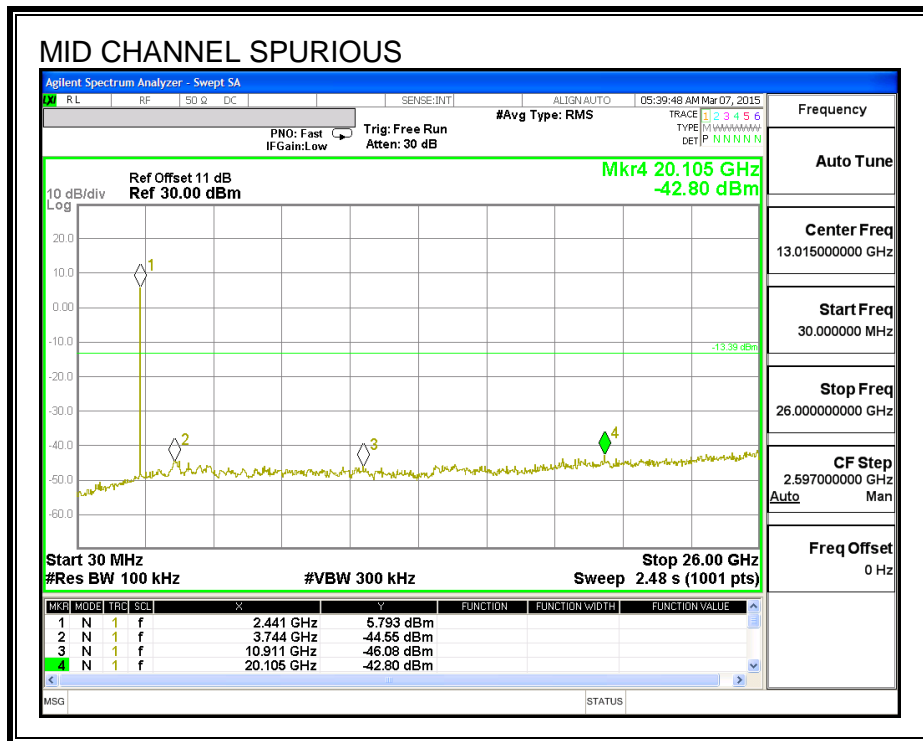
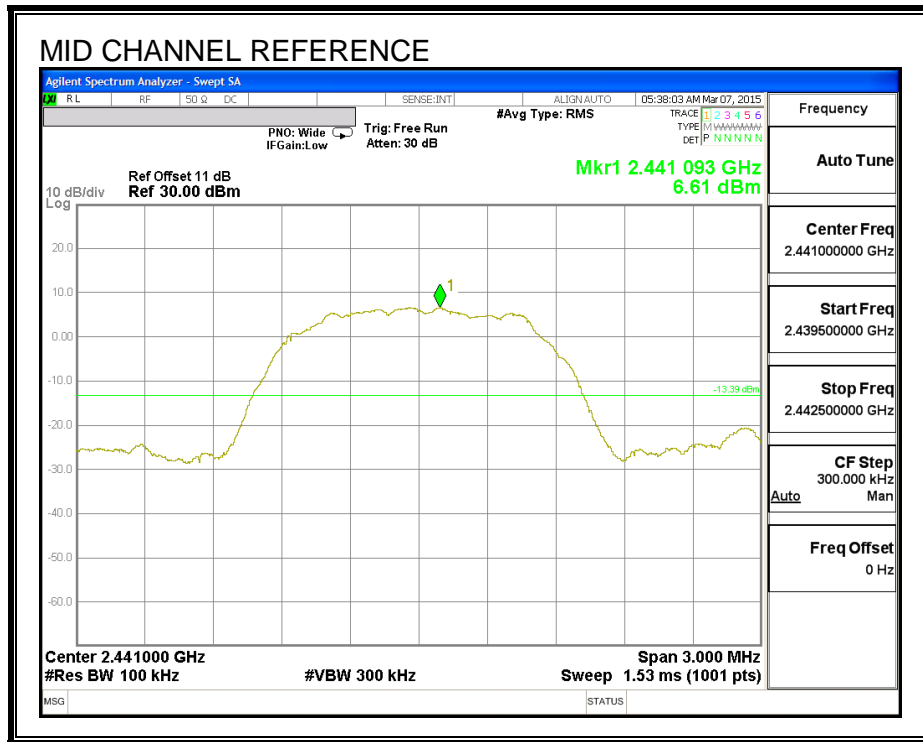
The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

### **RESULTS**

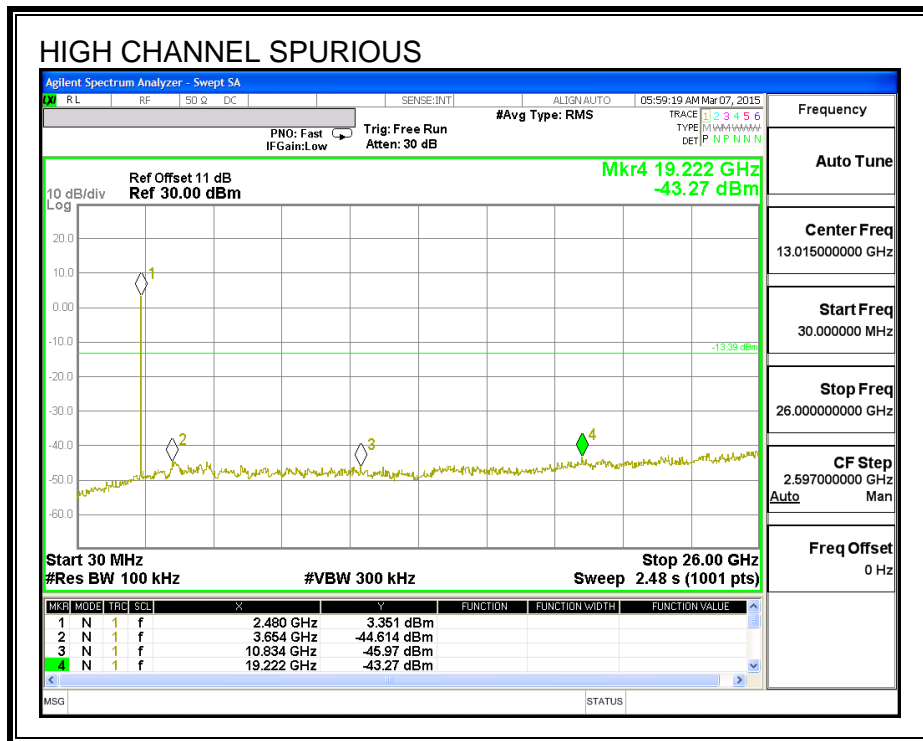
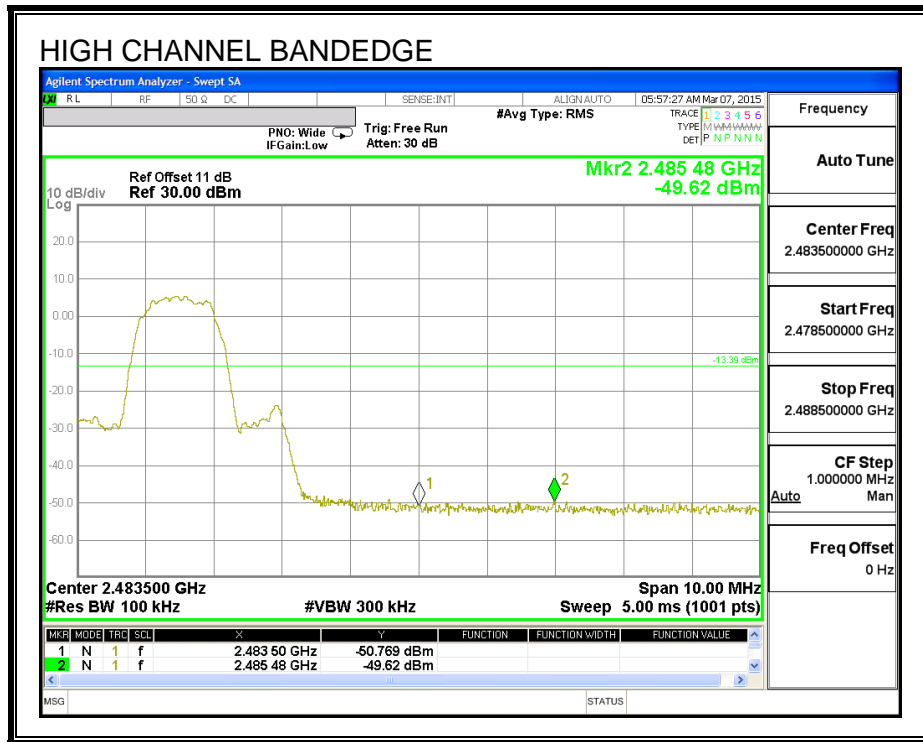
**SPURIOUS EMISSIONS, LOW CHANNEL**



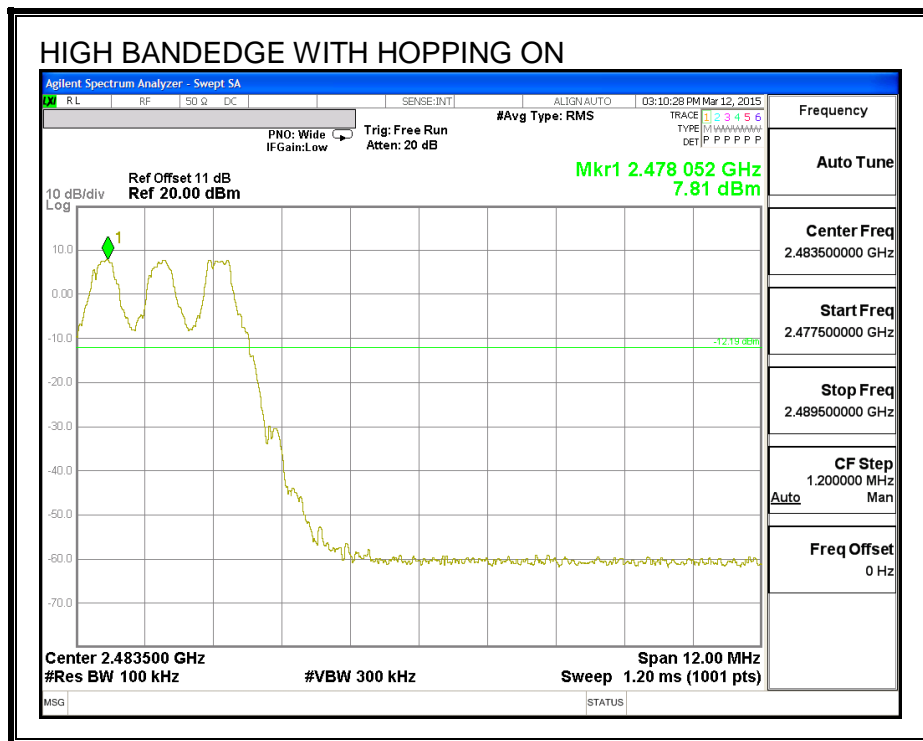
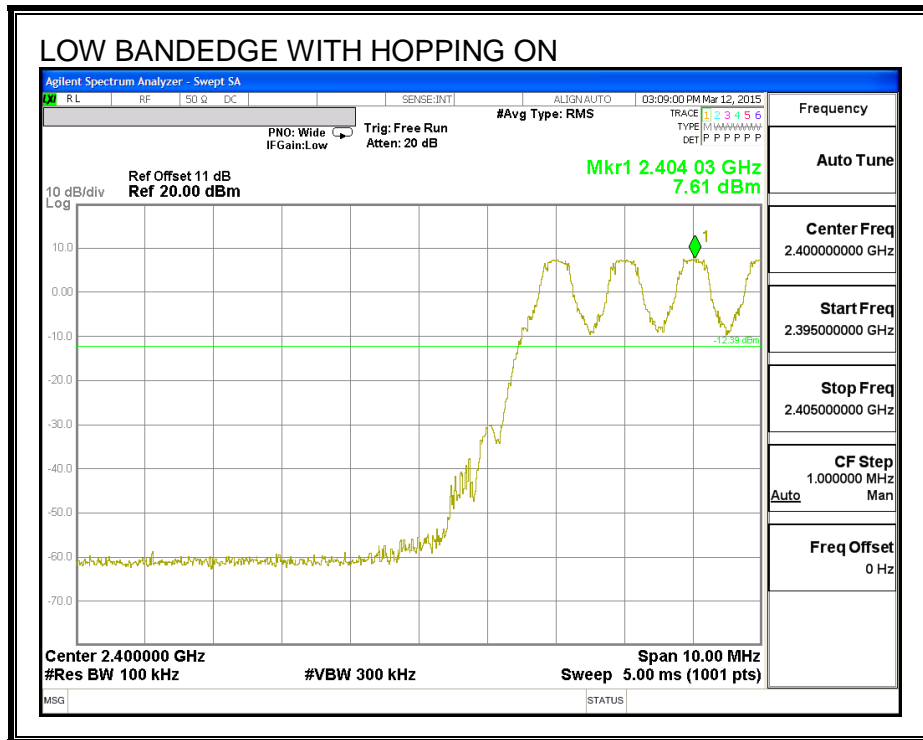
**SPURIOUS EMISSIONS, MID CHANNEL**



**SPURIOUS EMISSIONS, HIGH CHANNEL**



**SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON**





## 10. RADIATED TEST RESULTS

### 10.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §15.205 and §15.209

IC RSS-GEN, Section 8.9 and 8.10.

| Frequency Range (MHz) | Field Strength Limit (uV/m) at 3 m | Field Strength Limit (dBuV/m) at 3 m |
|-----------------------|------------------------------------|--------------------------------------|
| 30 - 88               | 100                                | 40                                   |
| 88 - 216              | 150                                | 43.5                                 |
| 216 - 960             | 200                                | 46                                   |
| Above 960             | 500                                | 54                                   |

#### TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

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, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements.

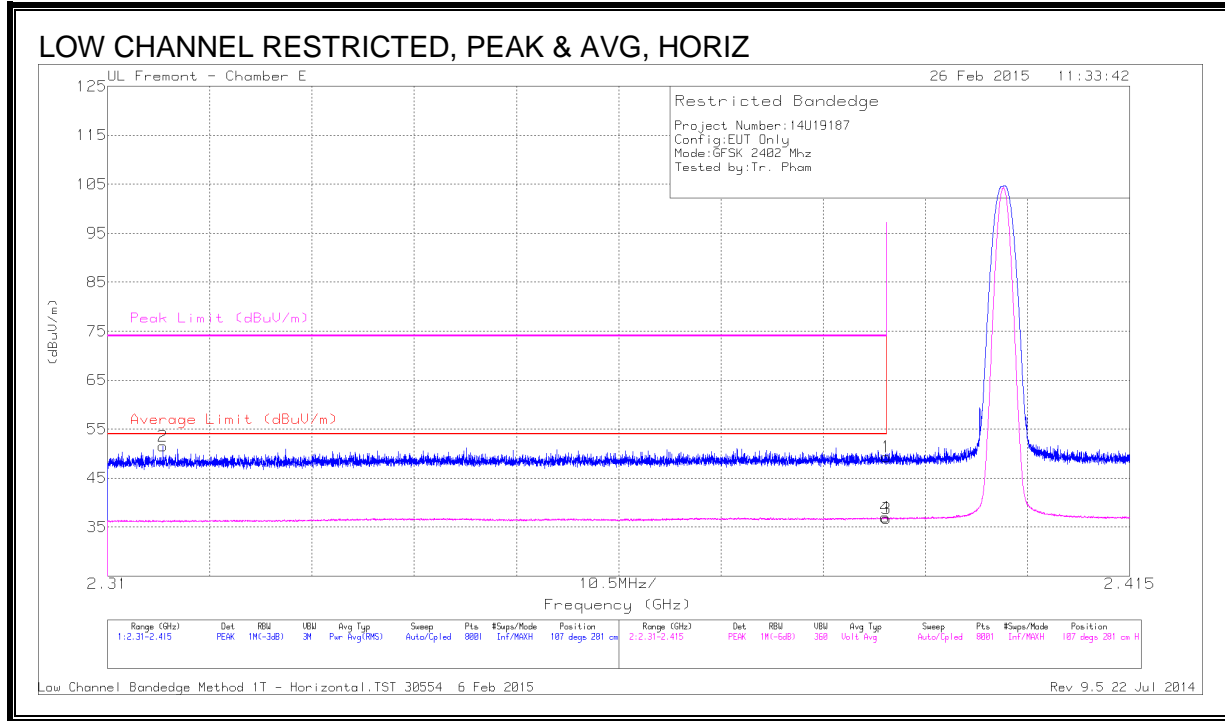
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

### 10.1. ANTENNA B TRANSMITTER ABOVE 1 GHz

#### 10.1.1. BASIC DATA RATE GFSK MODULATION

#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



#### DATA

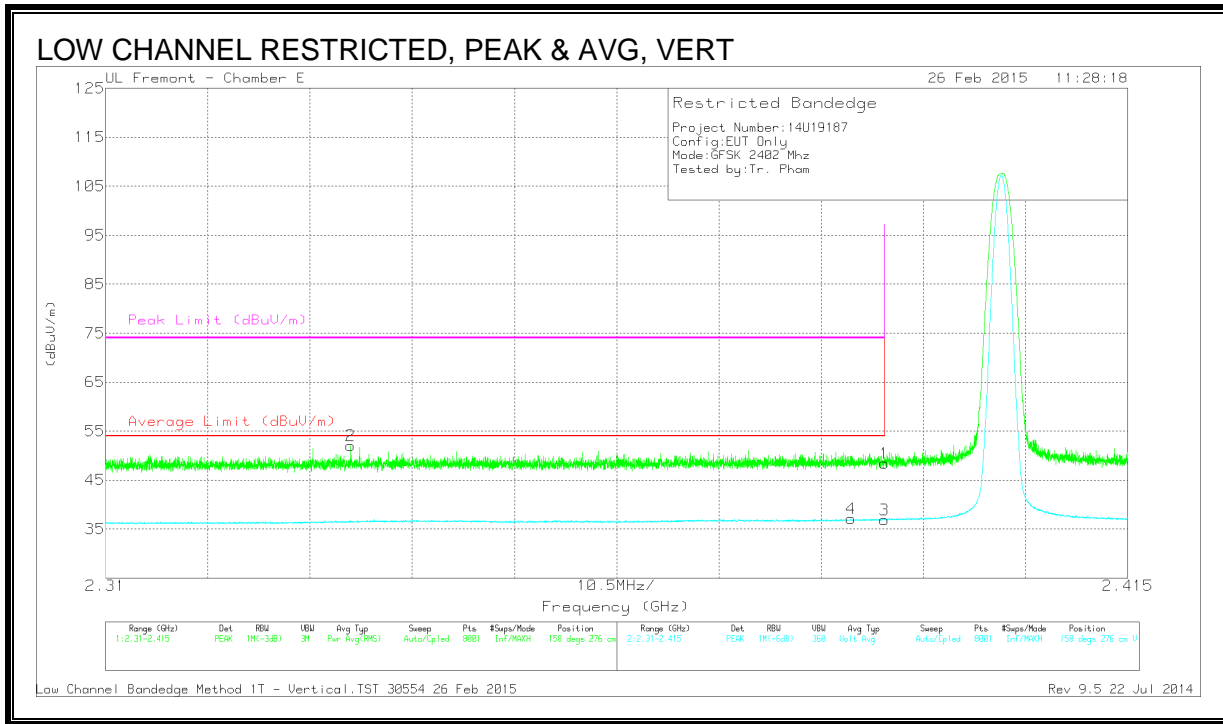
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/Fitr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|-----------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 2      | * 2.316         | 44.65                | PK   | 31.9           | -25                   | 0            | 51.55                      | -                      | -           | 74                  | -22.45         | 107            | 281         | H        |
| 1      | * 2.39          | 41.96                | PK   | 32.1           | -24.7                 | 0            | 49.36                      | -                      | -           | 74                  | -24.64         | 107            | 281         | H        |
| 3      | * 2.39          | 29.4                 | VB1T | 32.1           | -24.7                 | 0            | 36.8                       | 54                     | -17.2       | -                   | -              | 107            | 281         | H        |
| 4      | * 2.39          | 29.58                | VB1T | 32.1           | -24.7                 | 0            | 36.98                      | 54                     | -17.02      | -                   | -              | 107            | 281         | H        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



**DATA**

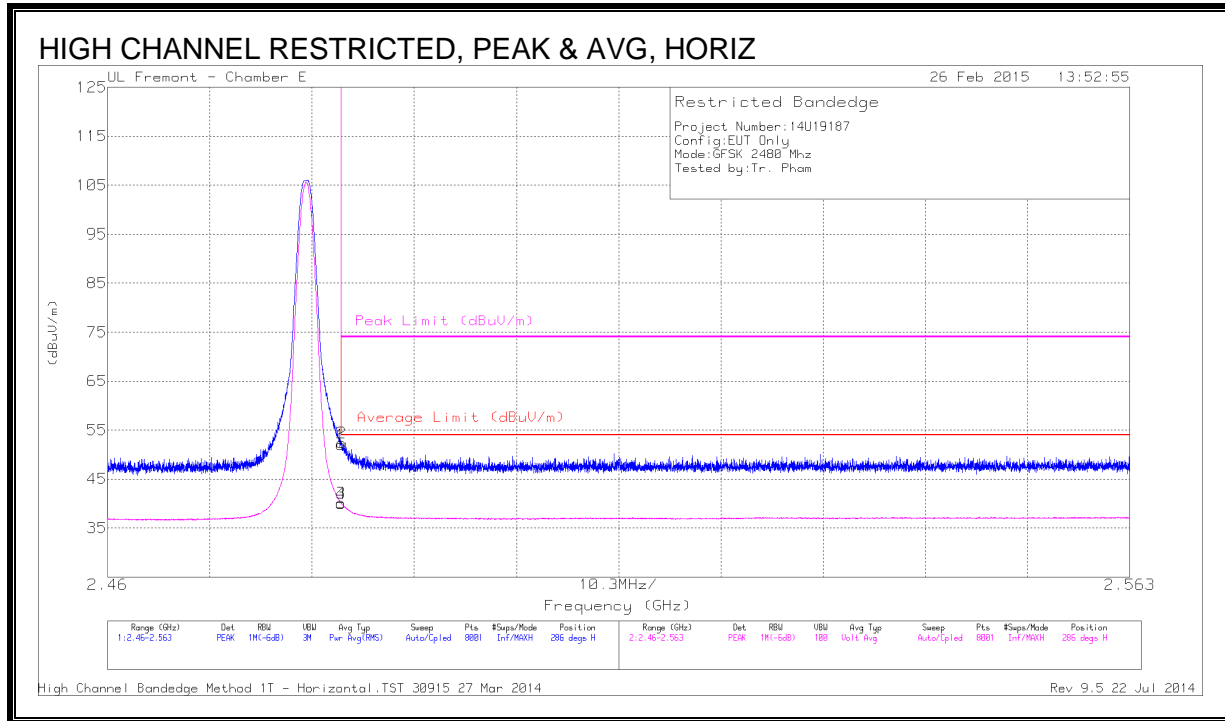
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.39          | 41.05                | PK   | 32.1           | -24.7                  | 48.45                      | -                      | -           | 74                  | -25.55         | 158            | 276         | V        |
| 2      | * 2.335         | 44.79                | PK   | 32             | -24.8                  | 51.99                      | -                      | -           | 74                  | -22.01         | 158            | 276         | V        |
| 3      | * 2.39          | 29.49                | VB1T | 32.1           | -24.7                  | 36.89                      | 54                     | -17.11      | -                   | -              | 158            | 276         | V        |
| 4      | * 2.387         | 29.79                | VB1T | 32             | -24.7                  | 37.09                      | 54                     | -16.91      | -                   | -              | 158            | 276         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



**DATA**

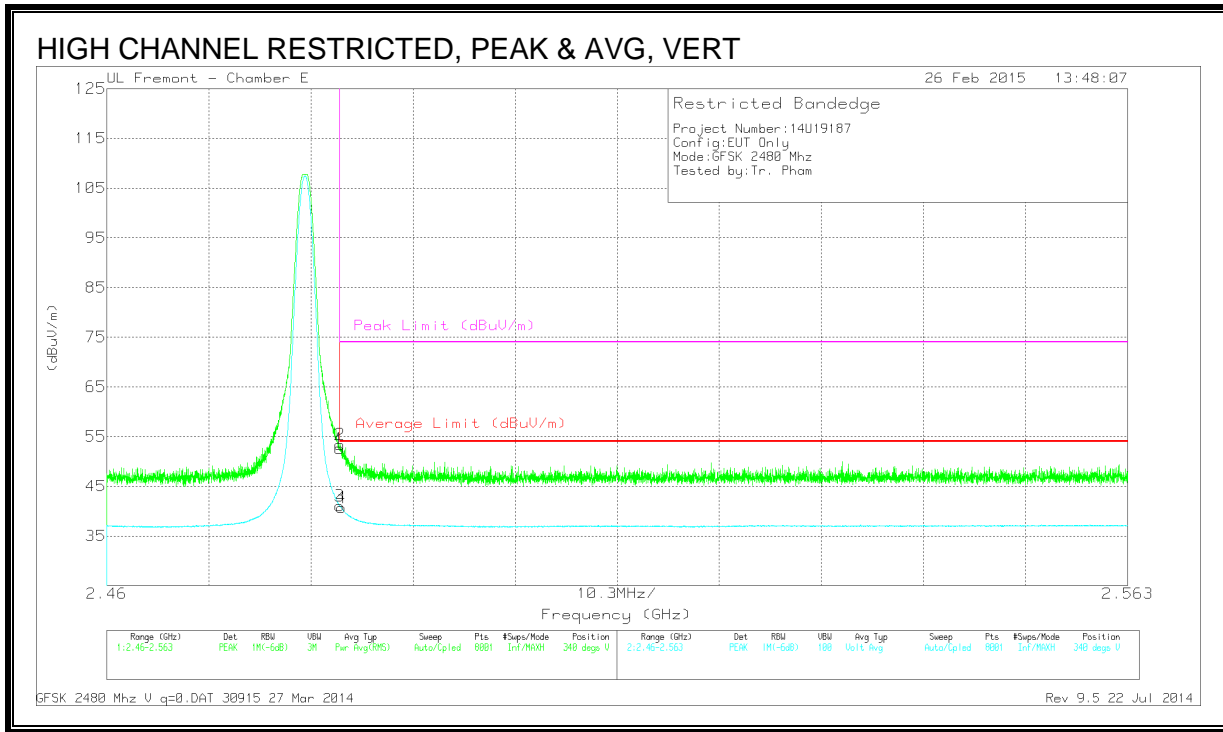
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cb/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|-----------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.484         | 44.16                | PK   | 32.2           | -24.3                 | 52.06                      | -                      | -           | 74                  | -21.94         | 286            | 266         | H        |
| 2      | * 2.484         | 44.55                | PK   | 32.2           | -24.3                 | 52.45                      | -                      | -           | 74                  | -21.55         | 286            | 266         | H        |
| 3      | * 2.484         | 32.2                 | VB1T | 32.2           | -24.3                 | 40.1                       | 54                     | -13.9       | -                   | -              | 286            | 266         | H        |
| 4      | * 2.484         | 32.13                | VB1T | 32.2           | -24.3                 | 40.03                      | 54                     | -13.97      | -                   | -              | 286            | 266         | H        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



**DATA**

**Trace Markers**

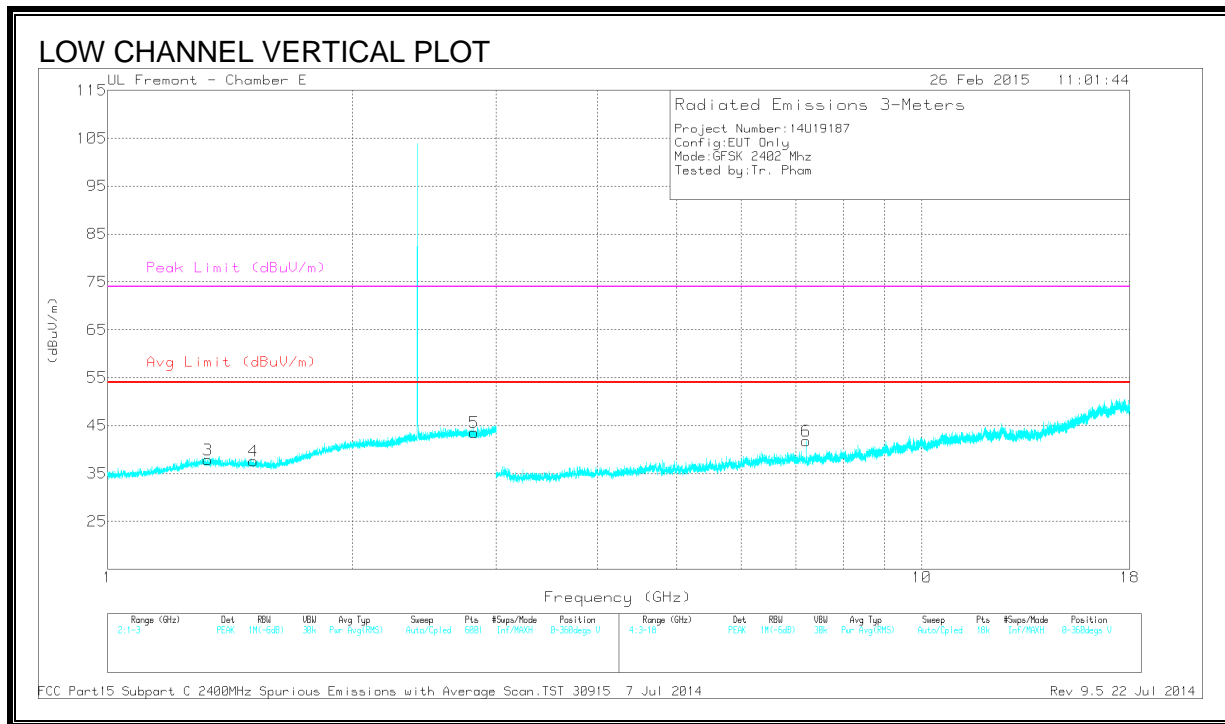
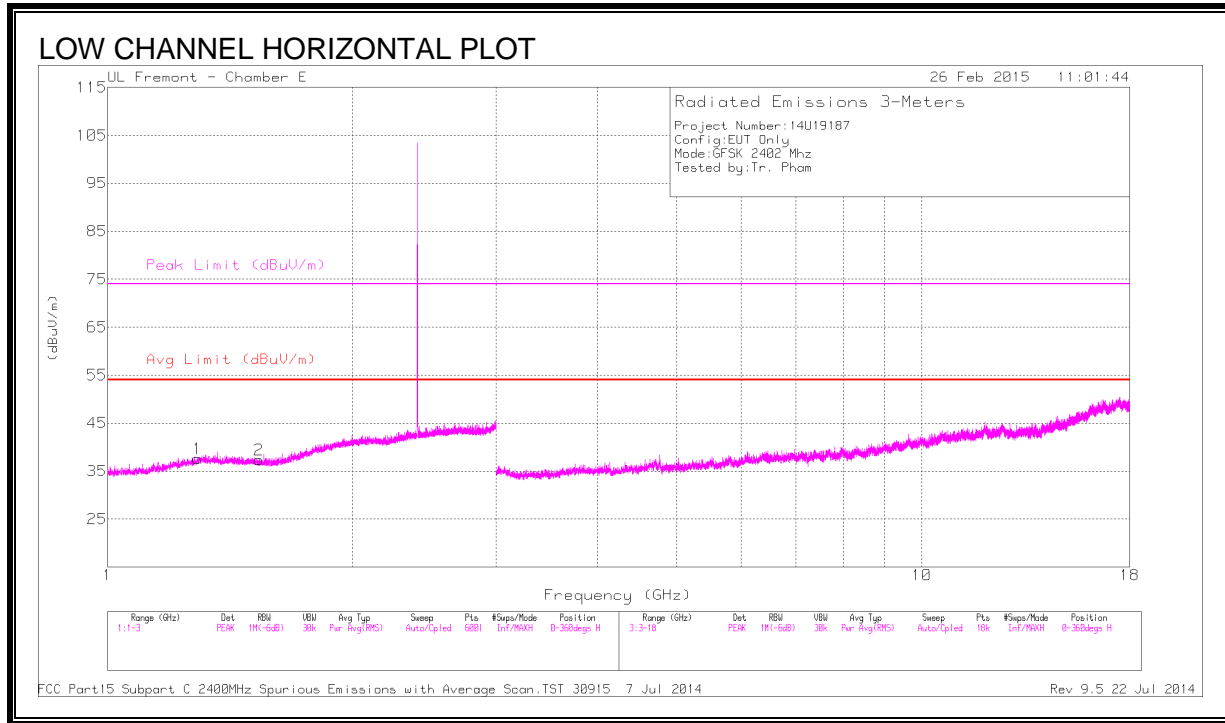
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cb/ Ftr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|----------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.484         | 44.7                 | PK   | 32.2           | -24.3                | 52.6                       | -                      | -           | 74                  | -21.4          | 340            | 262         | V        |
| 2      | * 2.484         | 45.51                | PK   | 32.2           | -24.3                | 53.41                      | -                      | -           | 74                  | -20.59         | 340            | 262         | V        |
| 3      | * 2.484         | 33.16                | VB1T | 32.2           | -24.3                | 41.06                      | 54                     | -12.94      | -                   | -              | 340            | 262         | V        |
| 4      | * 2.484         | 32.82                | VB1T | 32.2           | -24.3                | 40.72                      | 54                     | -13.28      | -                   | -              | 340            | 262         | V        |

\* - indicates frequency MHz in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**HARMONICS AND SPURIOUS EMISSIONS**



**DATA**

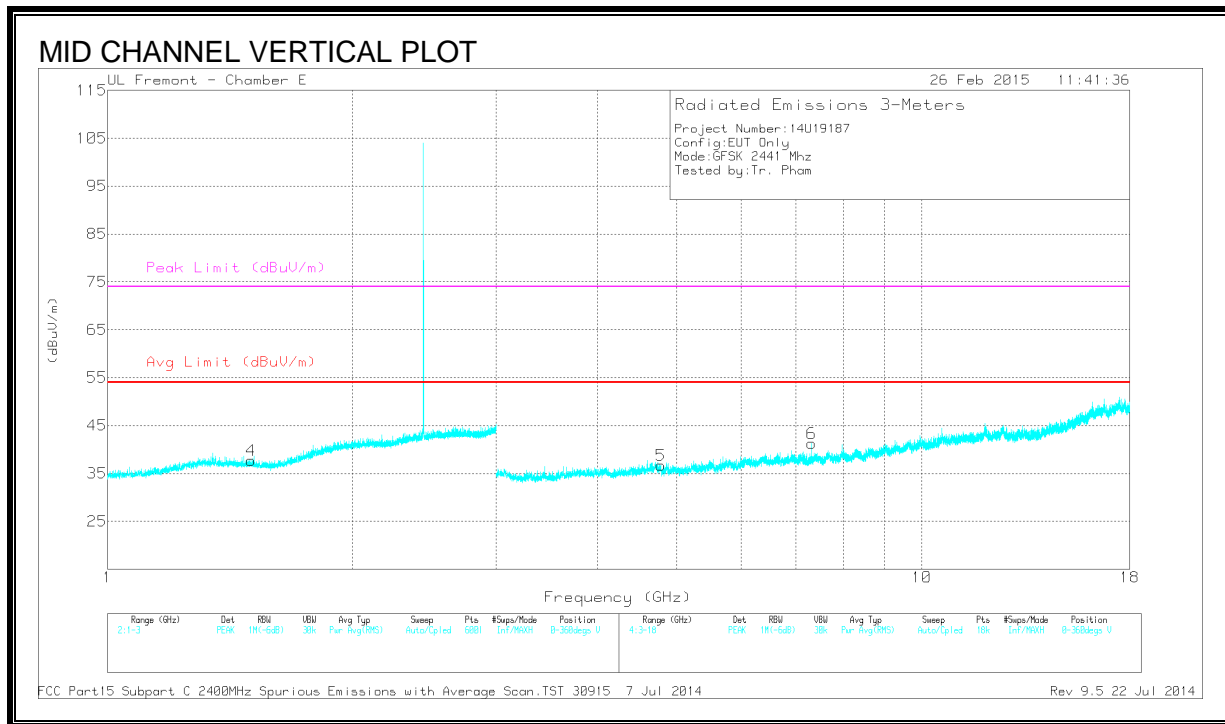
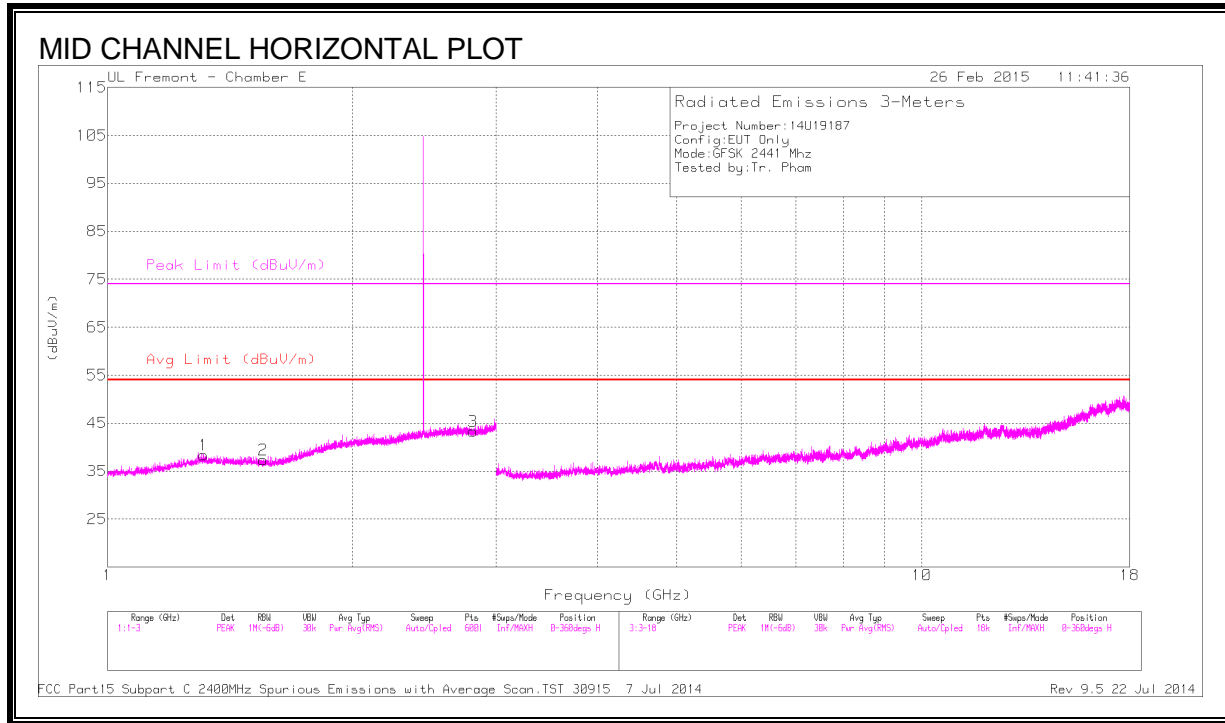
| Markers | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---------|-----------------|----------------------|------|----------------|------------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1       | * 1.291         | 44.08                | PK3  | 28.9           | -27                    | 45.98                      | -                  | -           | 74                  | -28.02         | 360            | 101         | H        |
|         | * 1.291         | 31.12                | VB10 | 28.9           | -27                    | 33.02                      | 54                 | -20.98      | -                   | -              | 360            | 101         | H        |
| 2       | * 1.535         | 44.14                | PK3  | 28.1           | -26.4                  | 45.84                      | -                  | -           | 74                  | -28.16         | 360            | 101         | H        |
|         | * 1.534         | 30.95                | VB10 | 28.1           | -26.4                  | 32.65                      | 54                 | -21.35      | -                   | -              | 360            | 101         | H        |
| 3       | * 1.329         | 43.91                | PK3  | 28.9           | -26.8                  | 46.01                      | -                  | -           | 74                  | -27.99         | 360            | 101         | V        |
|         | * 1.328         | 31.01                | VB10 | 28.9           | -26.8                  | 33.11                      | 54                 | -20.89      | -                   | -              | 360            | 101         | V        |
| 4       | * 1.509         | 43.95                | PK3  | 28.2           | -26.3                  | 45.85                      | -                  | -           | 74                  | -28.15         | 360            | 101         | V        |
|         | * 1.511         | 31.03                | VB10 | 28.2           | -26.3                  | 32.93                      | 54                 | -21.07      | -                   | -              | 360            | 101         | V        |
| 5       | * 2.818         | 44.13                | PK3  | 32.4           | -24.1                  | 52.43                      | -                  | -           | 74                  | -21.57         | 360            | 101         | V        |
|         | * 2.819         | 30.55                | VB10 | 32.4           | -24.1                  | 38.85                      | 54                 | -15.15      | -                   | -              | 360            | 101         | V        |
| 6       | 7.205           | 41.85                | PK3  | 35.5           | -28.4                  | 48.95                      | -                  | -           | -                   | -              | 152            | 172         | V        |
|         | 7.206           | 32.47                | VB10 | 35.5           | -28.4                  | 39.57                      | -                  | -           | -                   | -              | 152            | 172         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

**HARMONICS AND SPURIOUS EMISSIONS**





**DATA**

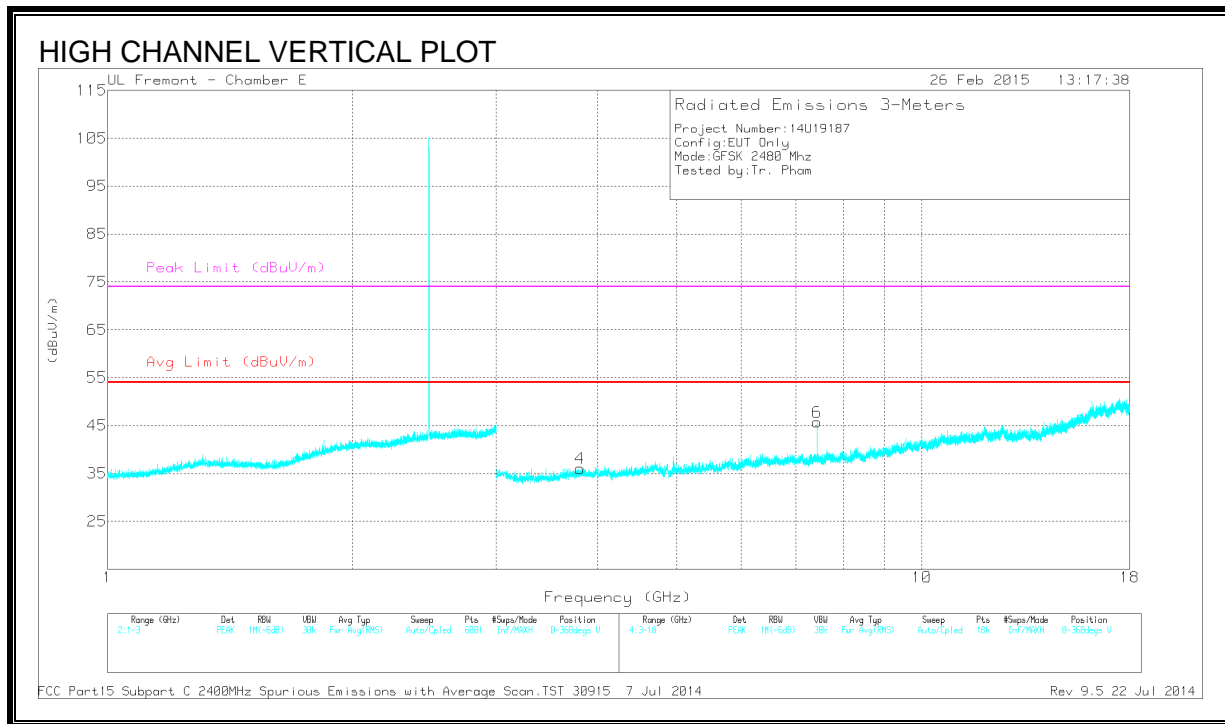
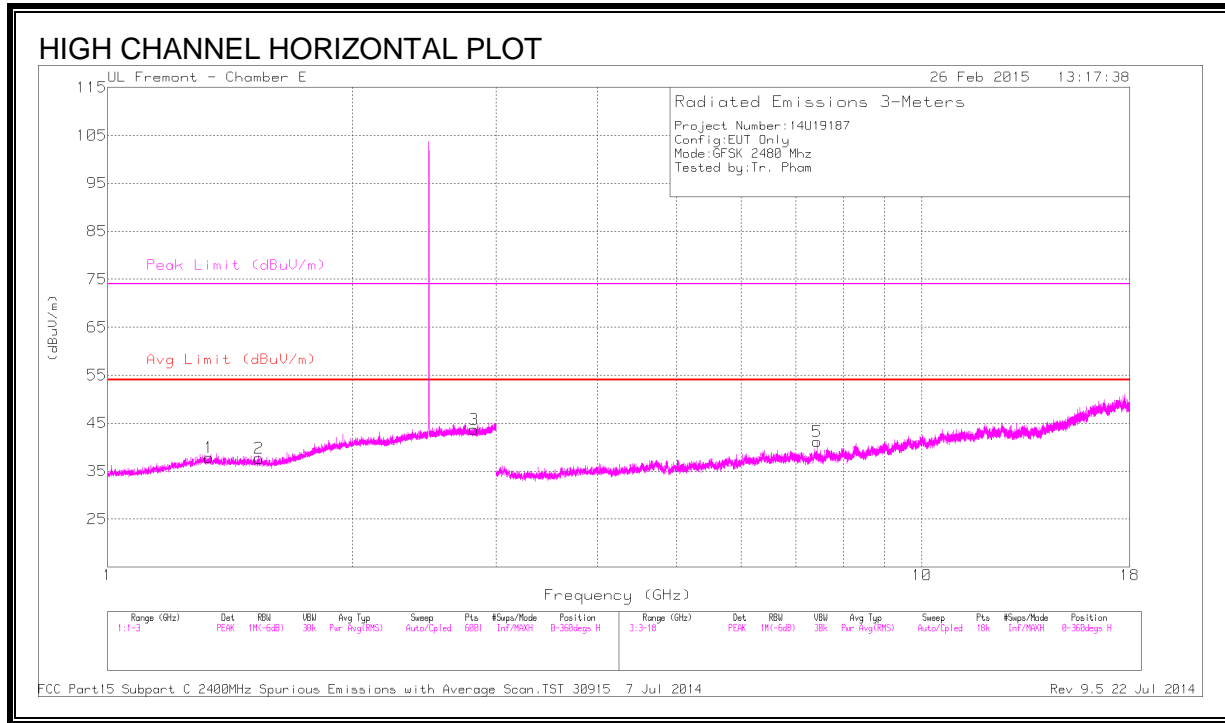
| Markers | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/ Filt/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---------|-----------------|----------------------|------|----------------|------------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1       | * 1.311         | 45.25                | PK3  | 29             | -26.9                  | 47.35                      | -                  | -           | 74                  | -26.65         | 0              | 101         | H        |
|         | * 1.312         | 31.18                | VB10 | 29             | -26.9                  | 33.28                      | 54                 | -20.72      | -                   | -              | 0              | 101         | H        |
| 4       | * 1.551         | 44.22                | PK3  | 28.1           | -26.4                  | 45.92                      | -                  | -           | 74                  | -28.08         | 0              | 101         | H        |
|         | * 1.551         | 30.92                | VB10 | 28.1           | -26.4                  | 32.62                      | 54                 | -21.38      | -                   | -              | 0              | 101         | H        |
| 3       | * 2.809         | 43.49                | PK3  | 32.4           | -24.1                  | 51.79                      | -                  | -           | 74                  | -22.21         | 0              | 101         | H        |
|         | * 2.81          | 30.52                | VB10 | 32.4           | -24.1                  | 38.82                      | 54                 | -15.18      | -                   | -              | 0              | 101         | H        |
| 2       | * 1.5           | 43.76                | PK3  | 28.2           | -26.2                  | 45.76                      | -                  | -           | 74                  | -28.24         | 0              | 101         | V        |
|         | * 1.502         | 30.9                 | VB10 | 28.2           | -26.3                  | 32.8                       | 54                 | -21.2       | -                   | -              | 0              | 101         | V        |
| 5       | * 4.778         | 41.59                | PK3  | 34.1           | -31.1                  | 44.59                      | -                  | -           | 74                  | -29.41         | 0              | 101         | V        |
|         | * 4.778         | 29.15                | VB10 | 34.1           | -31.1                  | 32.15                      | 54                 | -21.85      | -                   | -              | 0              | 101         | V        |
| 6       | * 7.324         | 42.33                | PK3  | 35.5           | -27.6                  | 50.23                      | -                  | -           | 74                  | -23.77         | 35             | 158         | V        |
|         | * 7.323         | 33.32                | VB10 | 35.5           | -27.6                  | 41.22                      | 54                 | -12.78      | -                   | -              | 35             | 158         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

**HARMONICS AND SPURIOUS EMISSIONS**



**DATA**

| Markers | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/ Fitr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---------|-----------------|----------------------|------|----------------|------------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1       | * 1.335         | 44.82                | PK3  | 28.8           | -26.8                  | 46.82                      | -                  | -           | 74                  | -27.18         | 0              | 101         | H        |
|         | * 1.331         | 30.87                | VB10 | 28.9           | -26.8                  | 32.97                      | 54                 | -21.03      | -                   | -              | 0              | 101         | H        |
| 2       | * 1.534         | 43.99                | PK3  | 28.1           | -26.4                  | 45.69                      | -                  | -           | 74                  | -28.31         | 0              | 101         | H        |
|         | * 1.535         | 30.8                 | VB10 | 28.1           | -26.4                  | 32.5                       | 54                 | -21.5       | -                   | -              | 0              | 101         | H        |
| 3       | * 2.819         | 43.6                 | PK3  | 32.4           | -24.1                  | 51.9                       | -                  | -           | 74                  | -22.1          | 0              | 101         | H        |
|         | * 2.817         | 30.45                | VB10 | 32.4           | -24.1                  | 38.75                      | 54                 | -15.25      | -                   | -              | 0              | 101         | H        |
| 5       | * 7.44          | 42.78                | PK3  | 35.6           | -28.2                  | 50.18                      | -                  | -           | 74                  | -23.82         | 152            | 246         | H        |
|         | * 7.44          | 33.59                | VB10 | 35.6           | -28.2                  | 40.99                      | 54                 | -13.01      | -                   | -              | 152            | 246         | H        |
| 4       | * 3.803         | 41.55                | PK3  | 33.5           | -31.2                  | 43.85                      | -                  | -           | 74                  | -30.15         | 152            | 246         | V        |
|         | * 3.806         | 28.8                 | VB10 | 33.5           | -31.2                  | 31.1                       | 54                 | -22.9       | -                   | -              | 152            | 246         | V        |
| 6       | * 7.44          | 44.94                | PK3  | 35.6           | -28.2                  | 52.34                      | -                  | -           | 74                  | -21.66         | 243            | 177         | V        |
|         | * 7.44          | 37.66                | VB10 | 35.6           | -28.2                  | 45.06                      | 54                 | -8.94       | -                   | -              | 243            | 177         | V        |

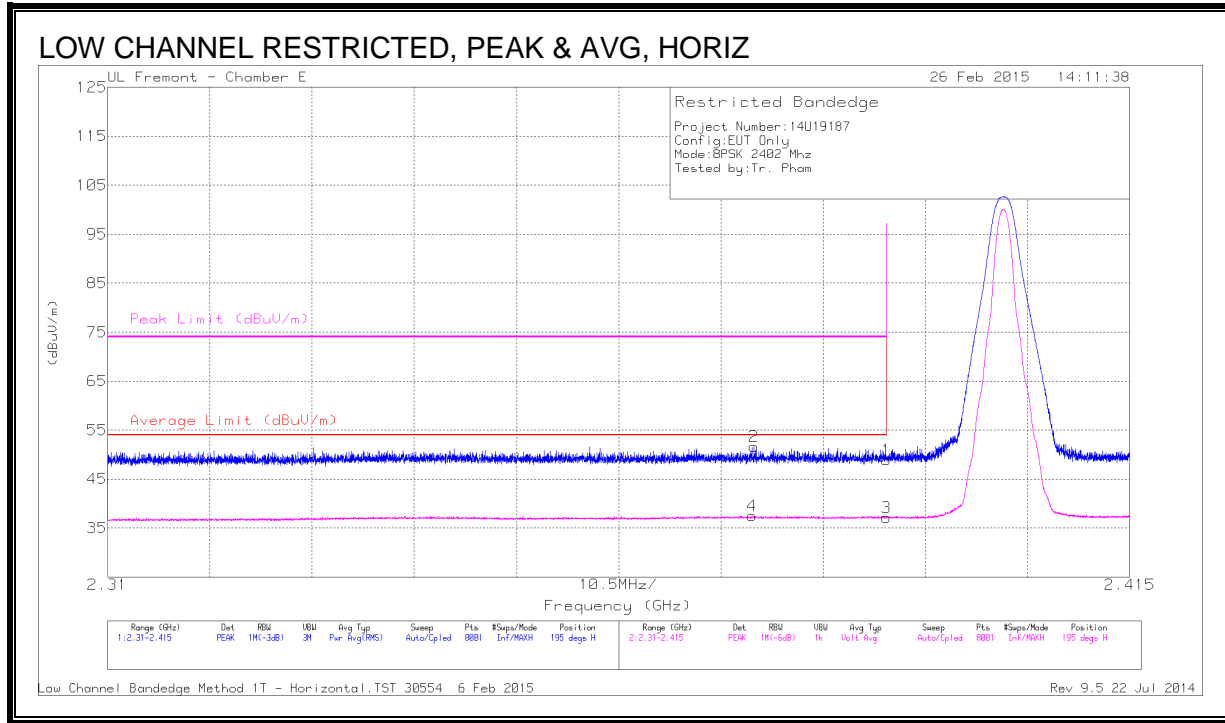
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

### 10.1.2. ENHANCED DATA RATE 8PSK MODULATION

#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



#### DATA

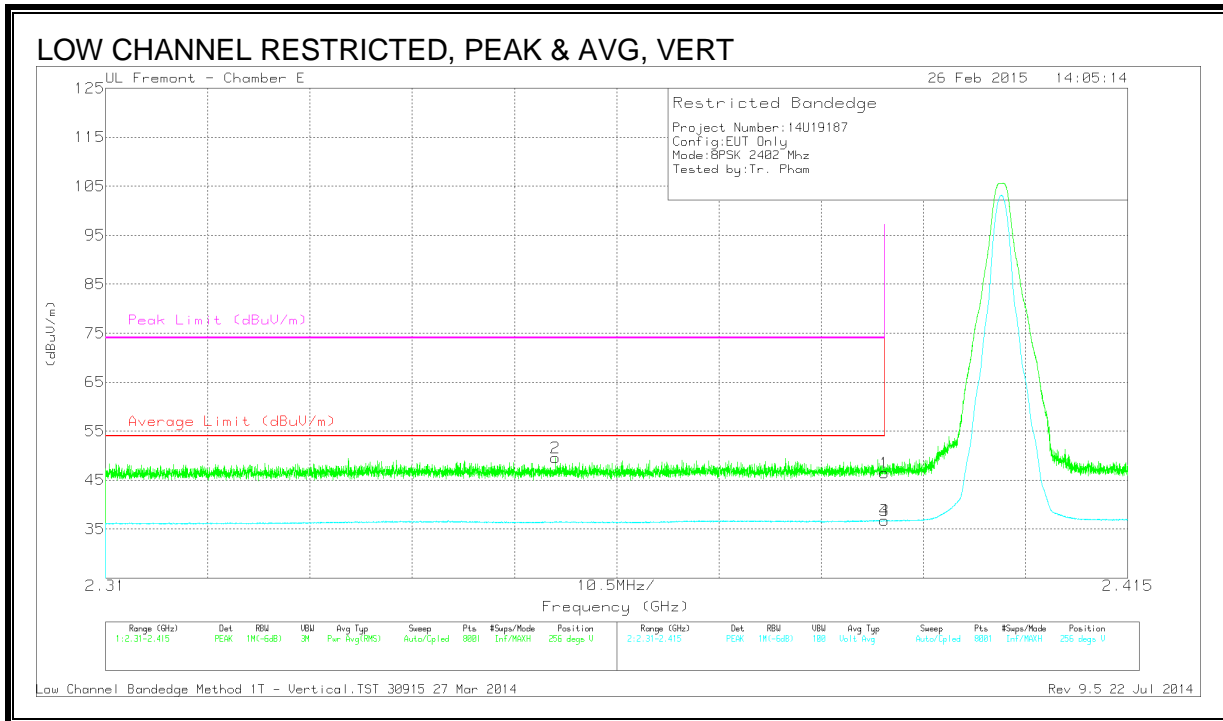
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/Fitr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|-----------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.39          | 41.51                | PK   | 32.1           | -24.7                 | 0            | 48.91                      | -                      | -           | 74                  | -25.09         | 195            | 283         | H        |
| 2      | * 2.376         | 44.21                | PK   | 32             | -24.6                 | 0            | 51.61                      | -                      | -           | 74                  | -22.39         | 195            | 283         | H        |
| 3      | * 2.39          | 29.69                | VB1T | 32.1           | -24.7                 | 0            | 37.09                      | 54                     | -16.91      | -                   | -              | 195            | 283         | H        |
| 4      | * 2.376         | 30.13                | VB1T | 32             | -24.6                 | 0            | 37.53                      | 54                     | -16.47      | -                   | -              | 195            | 283         | H        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



**DATA**

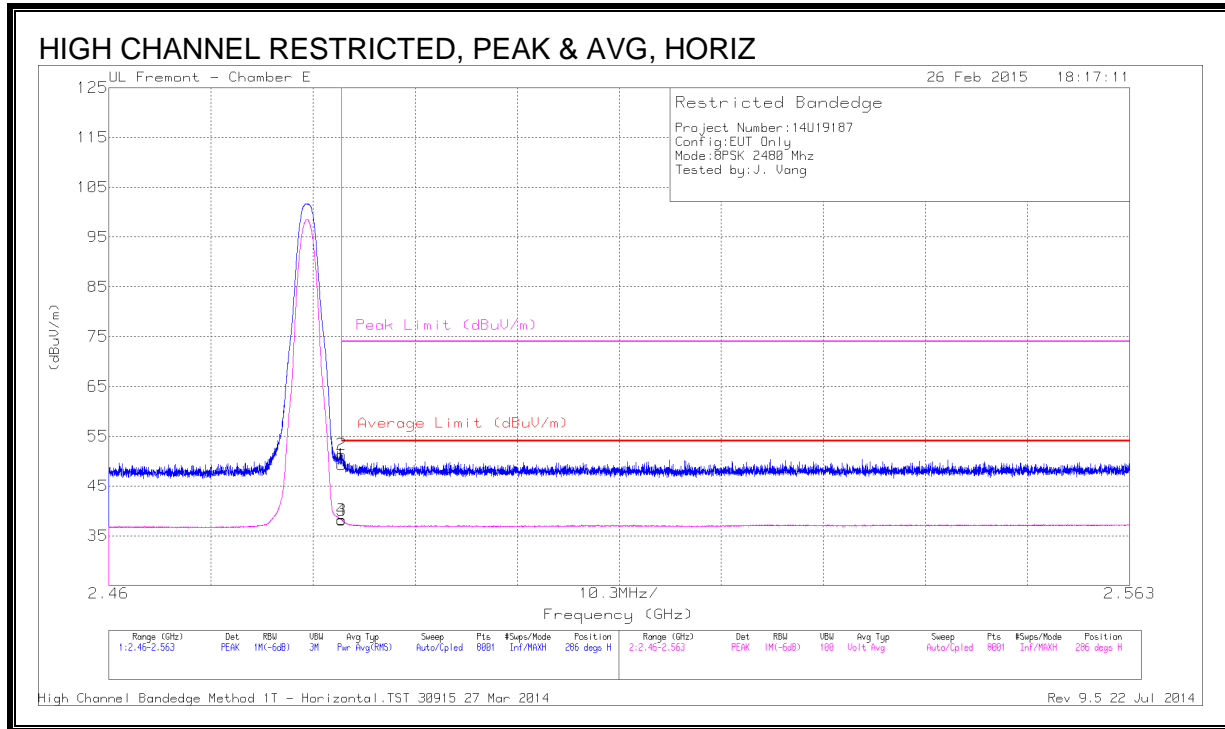
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.39          | 39                   | PK   | 32.1           | -24.7                  | 46.4                       | -                      | -           | 74                  | -27.6          | 256            | 276         | V        |
| 2      | * 2.356         | 42.2                 | PK   | 32             | -24.7                  | 49.5                       | -                      | -           | 74                  | -24.5          | 256            | 276         | V        |
| 3      | * 2.39          | 29.37                | VB1T | 32.1           | -24.7                  | 36.77                      | 54                     | -17.23      | -                   | -              | 256            | 276         | V        |
| 4      | * 2.39          | 29.39                | VB1T | 32.1           | -24.7                  | 36.79                      | 54                     | -17.21      | -                   | -              | 256            | 276         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



**DATA**

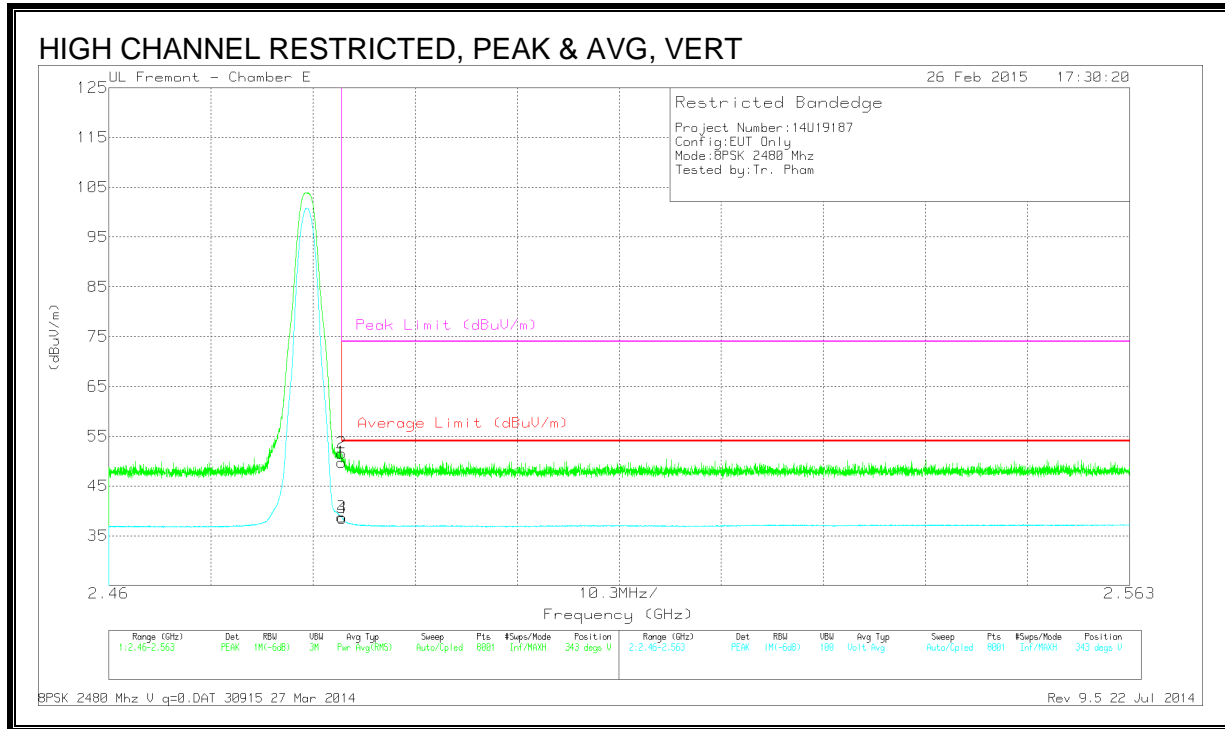
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarit y |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|-----------|
| 1      | * 2.484         | 41.4                 | PK   | 32.2           | -24.3                  | 49.3                       | -                      | -           | 74                  | -24.7          | 286            | 265         | H         |
| 2      | * 2.484         | 43.45                | PK   | 32.2           | -24.3                  | 51.35                      | -                      | -           | 74                  | -22.65         | 286            | 265         | H         |
| 3      | * 2.484         | 30.26                | VB1T | 32.2           | -24.3                  | 38.16                      | 54                     | -15.84      | -                   | -              | 286            | 265         | H         |
| 4      | * 2.484         | 30.3                 | VB1T | 32.2           | -24.3                  | 38.2                       | 54                     | -15.8       | -                   | -              | 286            | 265         | H         |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



**DATA**

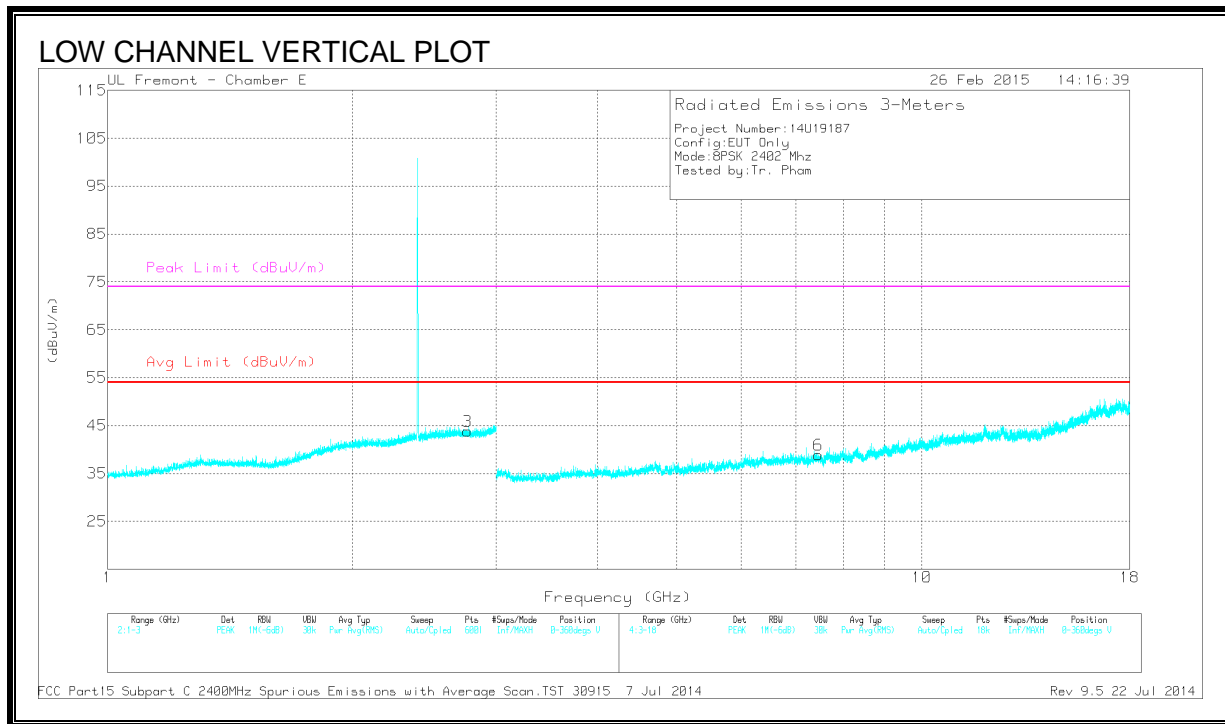
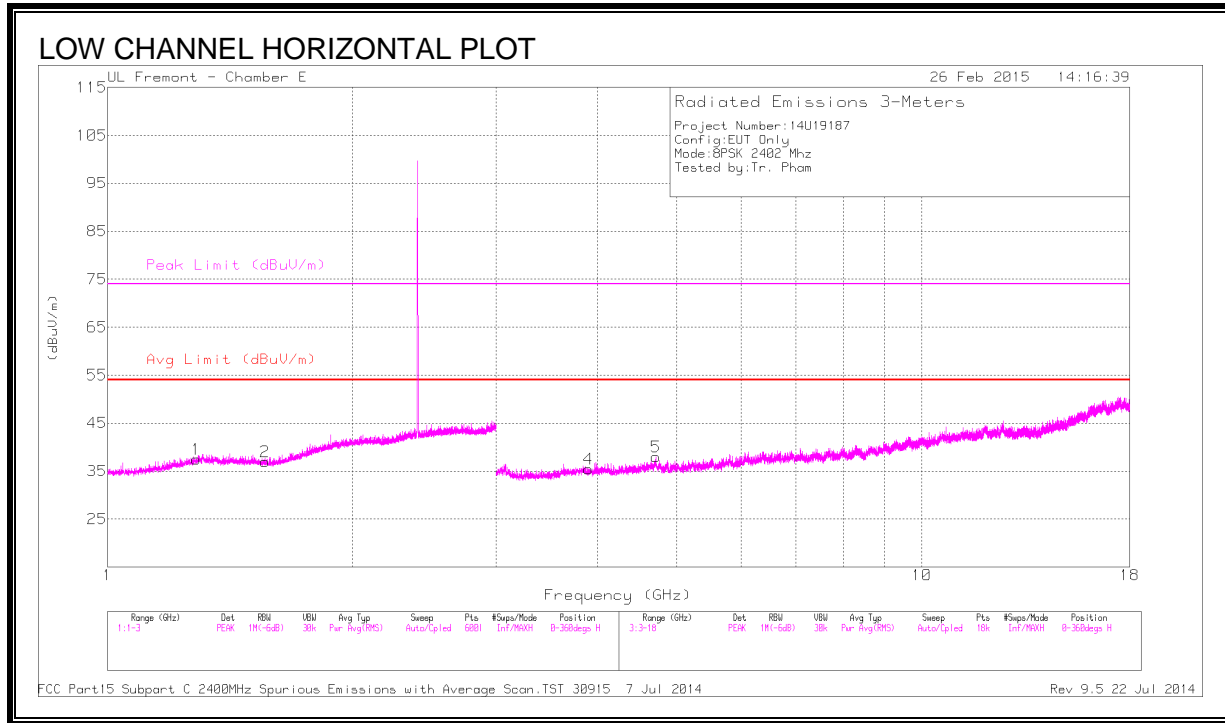
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.484         | 41.88                | PK   | 32.2           | -24.3                  | 49.78                      | -                      | -           | 74                  | -24.22         | 343            | 268         | V        |
| 2      | * 2.484         | 43.71                | PK   | 32.2           | -24.3                  | 51.61                      | -                      | -           | 74                  | -22.39         | 343            | 268         | V        |
| 3      | * 2.484         | 30.84                | VB1T | 32.2           | -24.3                  | 38.74                      | 54                     | -15.26      | -                   | -              | 343            | 268         | V        |
| 4      | * 2.484         | 30.66                | VB1T | 32.2           | -24.3                  | 38.56                      | 54                     | -15.44      | -                   | -              | 343            | 268         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**HARMONICS AND SPURIOUS EMISSIONS**





**DATA**

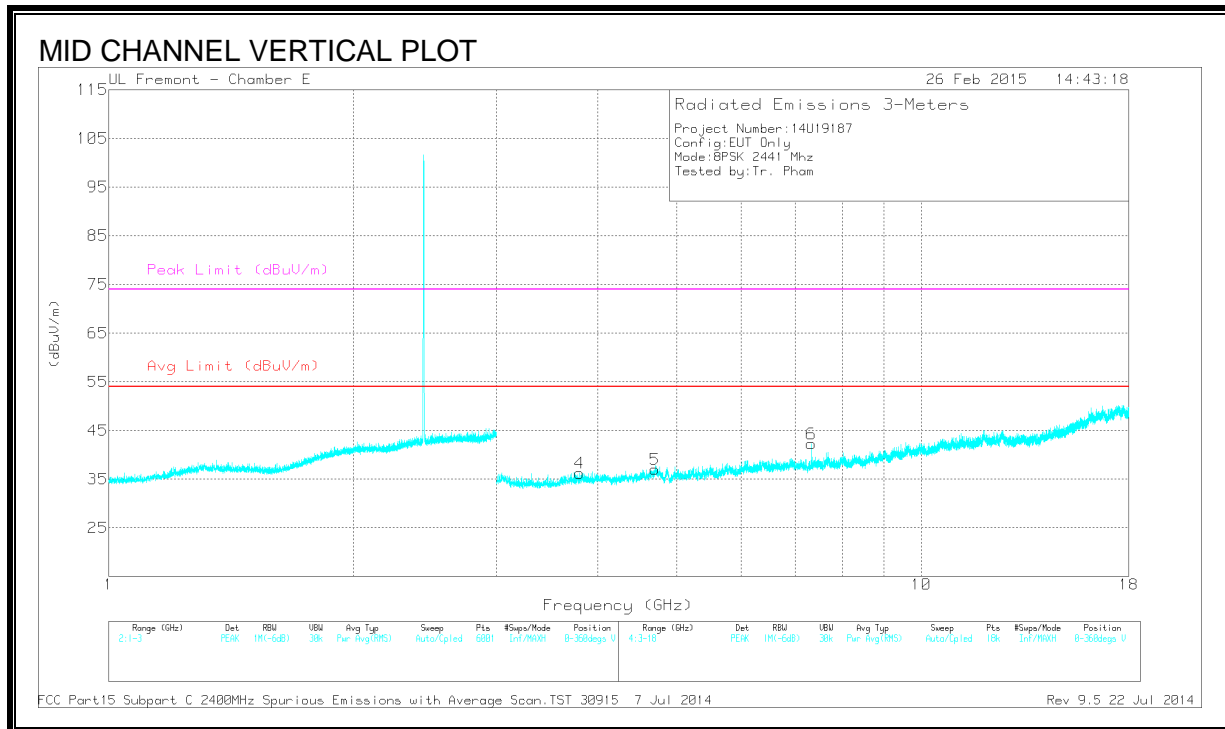
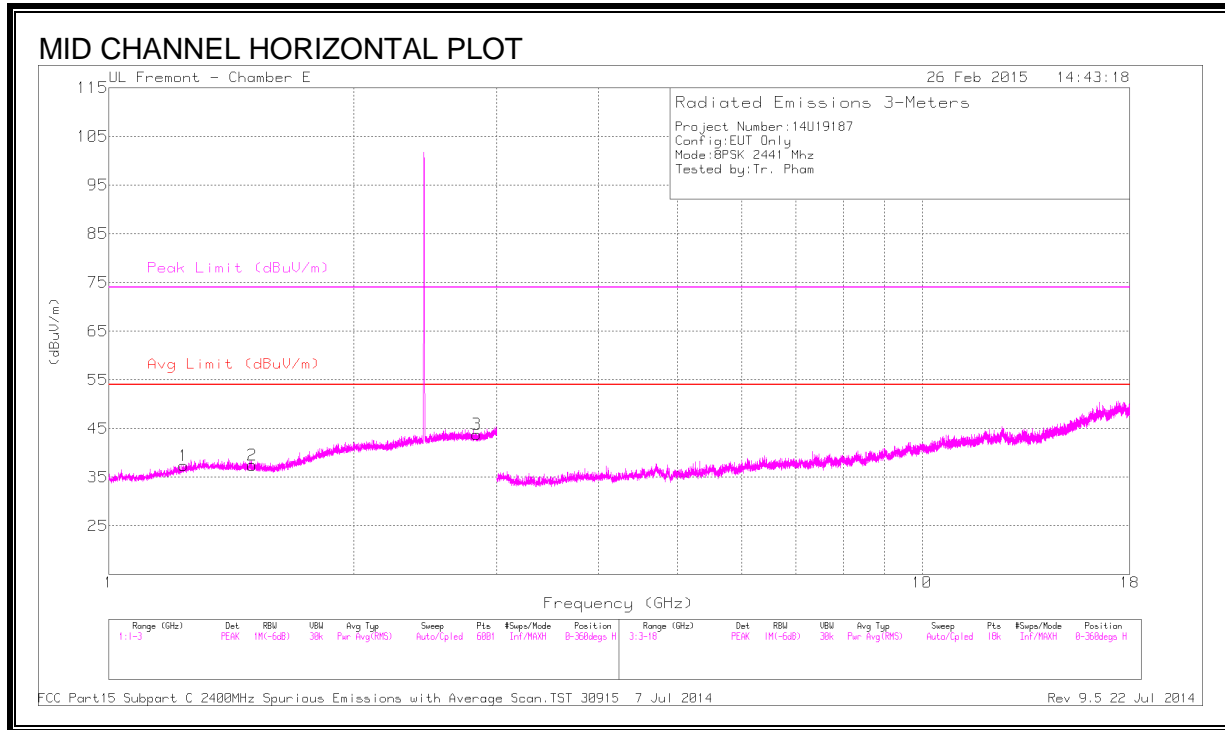
| Markers | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/ Filt/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---------|-----------------|----------------------|------|----------------|------------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1       | * 1.286         | 44.67                | PK3  | 28.9           | -27.1                  | 46.47                      | -                  | -           | 74                  | -27.53         | 360            | 101         | H        |
|         | * 1.286         | 31.02                | VB10 | 28.9           | -27                    | 32.92                      | 54                 | -21.08      | -                   | -              | 360            | 101         | H        |
| 2       | * 1.562         | 43.51                | PK3  | 28             | -26.4                  | 45.11                      | -                  | -           | 74                  | -28.89         | 360            | 101         | H        |
|         | * 1.561         | 30.91                | VB10 | 28             | -26.4                  | 32.51                      | 54                 | -21.49      | -                   | -              | 360            | 101         | H        |
| 3       | * 2.766         | 44.55                | PK3  | 32.4           | -24                    | 52.95                      | -                  | -           | 74                  | -21.05         | 360            | 101         | V        |
|         | * 2.766         | 30.53                | VB10 | 32.4           | -24                    | 38.93                      | 54                 | -15.07      | -                   | -              | 360            | 101         | V        |
| 4       | * 3.894         | 41.55                | PK3  | 33.5           | -31.7                  | 43.35                      | -                  | -           | 74                  | -30.65         | 360            | 101         | H        |
|         | * 3.892         | 29.17                | VB10 | 33.5           | -31.7                  | 30.97                      | 54                 | -23.03      | -                   | -              | 360            | 101         | H        |
| 5       | * 4.718         | 42.24                | PK3  | 34.2           | -30.7                  | 45.74                      | -                  | -           | 74                  | -28.26         | 360            | 101         | H        |
|         | * 4.719         | 29.3                 | VB10 | 34.2           | -30.7                  | 32.8                       | 54                 | -21.2       | -                   | -              | 360            | 101         | H        |
| 6       | * 7.461         | 39.28                | PK3  | 35.6           | -28.5                  | 46.38                      | -                  | -           | 74                  | -27.62         | 360            | 101         | V        |
|         | * 7.463         | 26.84                | VB10 | 35.6           | -28.5                  | 33.94                      | 54                 | -20.06      | -                   | -              | 360            | 101         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

**HARMONICS AND SPURIOUS EMISSIONS**



**DATA**

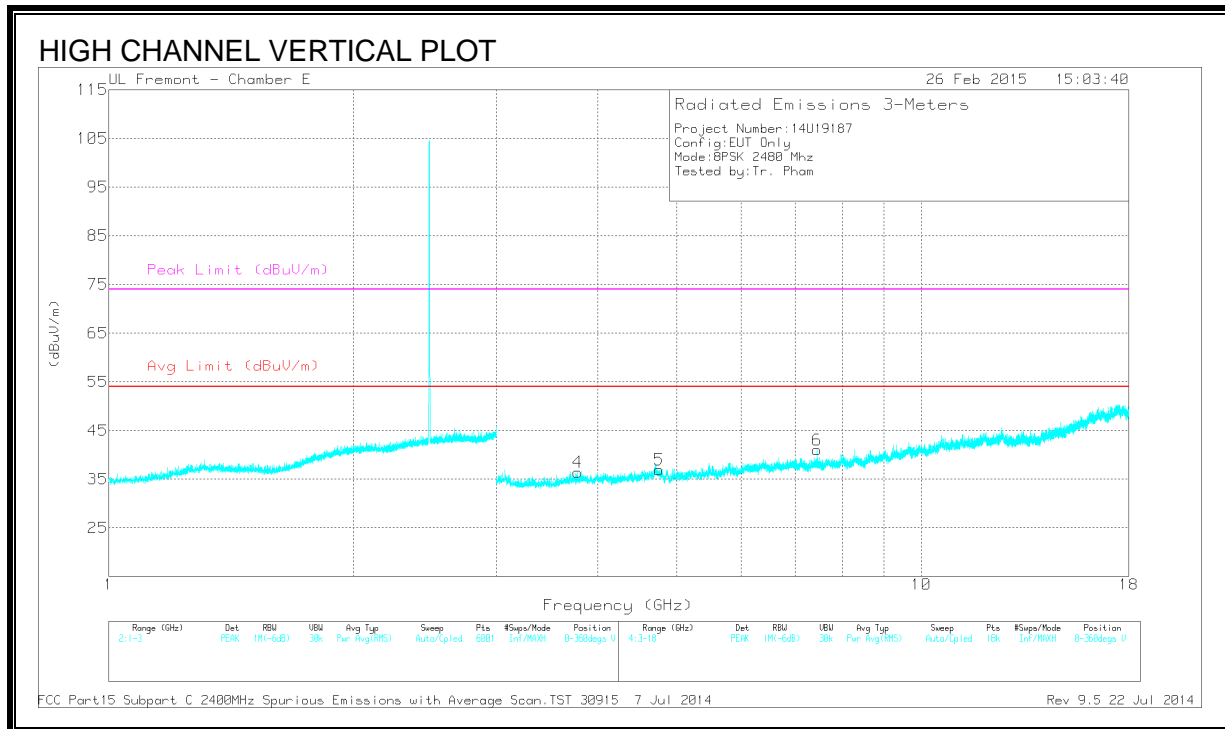
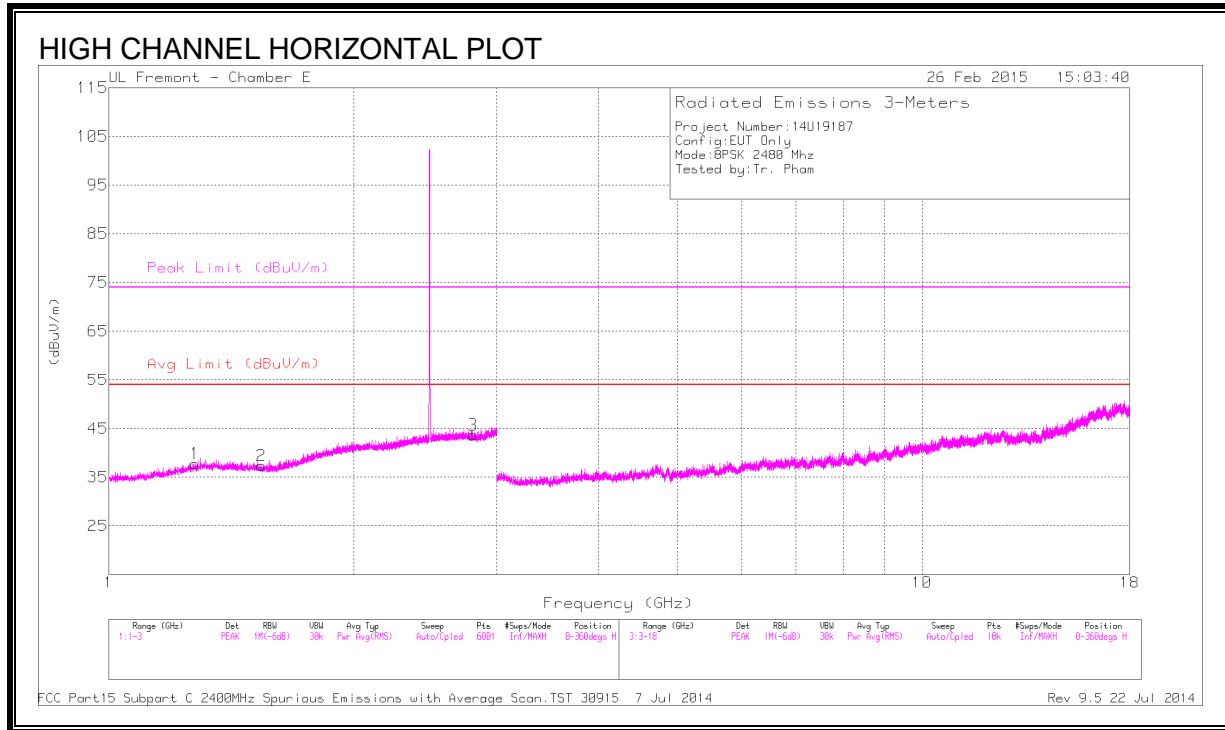
| Markers | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/ Filt/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---------|-----------------|----------------------|------|----------------|------------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1       | * 1.234         | 44.62                | PK3  | 28.4           | -27.3                  | 45.72                      | -                  | -           | 74                  | -28.28         | 360            | 100         | H        |
|         | * 1.237         | 31.16                | VB10 | 28.4           | -27.3                  | 32.26                      | 54                 | -21.74      | -                   | -              | 360            | 100         | H        |
| 2       | * 1.499         | 43.88                | PK3  | 28.2           | -26.2                  | 45.88                      | -                  | -           | 74                  | -28.12         | 360            | 100         | H        |
|         | * 1.502         | 30.92                | VB10 | 28.2           | -26.3                  | 32.82                      | 54                 | -21.18      | -                   | -              | 360            | 100         | H        |
| 3       | * 2.837         | 43.35                | PK3  | 32.4           | -24.2                  | 51.55                      | -                  | -           | 74                  | -22.45         | 360            | 100         | H        |
|         | * 2.836         | 30.52                | VB10 | 32.4           | -24.2                  | 38.72                      | 54                 | -15.28      | -                   | -              | 360            | 100         | H        |
| 4       | * 3.798         | 40.98                | PK3  | 33.5           | -31.3                  | 43.18                      | -                  | -           | 74                  | -30.82         | 360            | 100         | V        |
|         | * 3.796         | 28.81                | VB10 | 33.5           | -31.3                  | 31.01                      | 54                 | -22.99      | -                   | -              | 360            | 100         | V        |
| 5       | * 4.699         | 40.89                | PK3  | 34.2           | -30.3                  | 44.79                      | -                  | -           | 74                  | -29.21         | 360            | 100         | V        |
|         | * 4.7           | 28.72                | VB10 | 34.2           | -30.3                  | 32.62                      | 54                 | -21.38      | -                   | -              | 360            | 100         | V        |
| 6       | * 7.323         | 42.85                | PK3  | 35.5           | -27.6                  | 50.75                      | -                  | -           | 74                  | -23.25         | 264            | 196         | V        |
|         | * 7.323         | 32.72                | VB10 | 35.5           | -27.6                  | 40.62                      | 54                 | -13.38      | -                   | -              | 264            | 196         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

**HARMONICS AND SPURIOUS EMISSIONS**



**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/ Fitr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 1.277         | 43.9                 | PK3  | 28.8           | -27.1                  | 45.6                       | -                  | -           | 74                  | -28.4          | 360            | 101         | H        |
|        | * 1.276         | 31.02                | VB10 | 28.8           | -27.1                  | 32.72                      | 54                 | -21.28      | -                   | -              | 360            | 101         | H        |
| 2      | * 1.54          | 43.61                | PK3  | 28.1           | -26.3                  | 45.41                      | -                  | -           | 74                  | -28.59         | 360            | 101         | H        |
|        | * 1.539         | 30.86                | VB10 | 28.1           | -26.3                  | 32.66                      | 54                 | -21.34      | -                   | -              | 360            | 101         | H        |
| 3      | * 2.806         | 43.3                 | PK3  | 32.4           | -24.1                  | 51.6                       | -                  | -           | 74                  | -22.4          | 360            | 101         | H        |
|        | * 2.807         | 30.49                | VB10 | 32.4           | -24.1                  | 38.79                      | 54                 | -15.21      | -                   | -              | 360            | 101         | H        |
| 4      | * 3.778         | 41.37                | PK3  | 33.4           | -31.2                  | 43.57                      | -                  | -           | 74                  | -30.43         | 360            | 101         | V        |
|        | * 3.776         | 28.82                | VB10 | 33.4           | -31.1                  | 31.12                      | 54                 | -22.88      | -                   | -              | 360            | 101         | V        |
| 5      | * 4.761         | 42.71                | PK3  | 34.1           | -31                    | 45.81                      | -                  | -           | 74                  | -28.19         | 360            | 101         | V        |
|        | * 4.761         | 30.14                | VB10 | 34.1           | -31                    | 33.24                      | 54                 | -20.76      | -                   | -              | 360            | 101         | V        |
| 6      | * 7.44          | 39.93                | PK3  | 35.6           | -28.2                  | 47.33                      | -                  | -           | 74                  | -26.67         | 360            | 101         | V        |
|        | * 7.44          | 27.44                | VB10 | 35.6           | -28.2                  | 34.84                      | 54                 | -19.16      | -                   | -              | 360            | 101         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

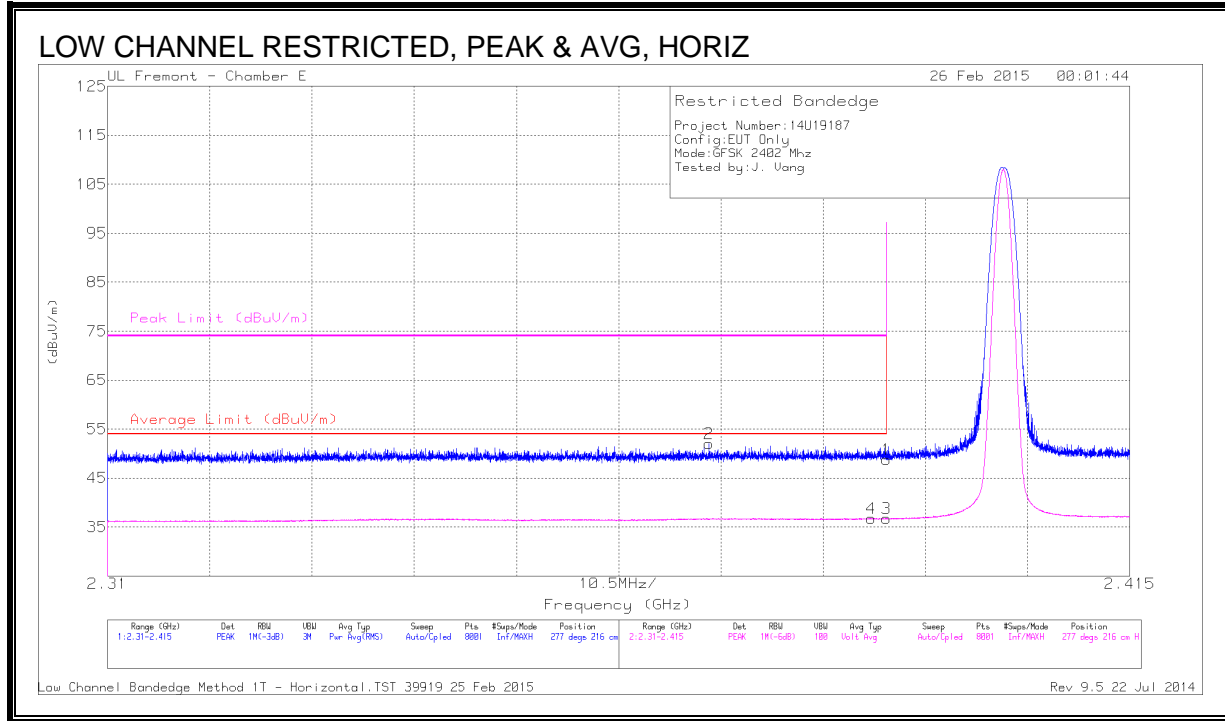
PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

## 10.2. ANTENNA D TRANSMITTER ABOVE 1 GHz

### 10.2.1. BASIC DATA RATE GFSK MODULATION

#### RESTRICTED BANDEGE (LOW CHANNEL, HORIZONTAL)



#### DATA

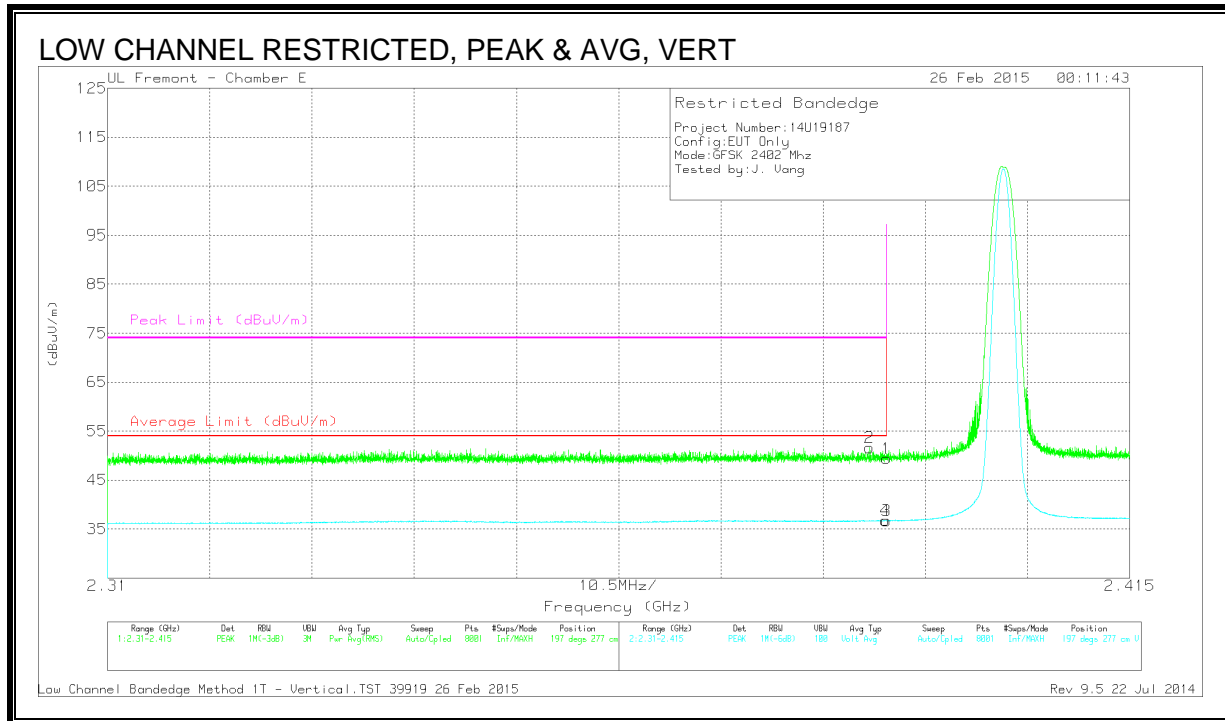
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/F ltr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 2      | * 2.372         | 44.66                | PK   | 32             | -24.6                  | 52.06                      | -                      | -           | 74                  | -21.94         | 277            | 216         | H        |
| 4      | * 2.388         | 29.39                | VB1T | 32.1           | -24.7                  | 36.79                      | 54                     | -17.21      | -                   | -              | 277            | 216         | H        |
| 1      | * 2.39          | 41.4                 | PK   | 32.1           | -24.7                  | 48.8                       | -                      | -           | 74                  | -25.2          | 277            | 216         | H        |
| 3      | * 2.39          | 29.35                | VB1T | 32.1           | -24.7                  | 36.75                      | 54                     | -17.25      | -                   | -              | 277            | 216         | H        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**RESTRICTED BANDEGE (LOW CHANNEL, VERTICAL)**



**DATA**

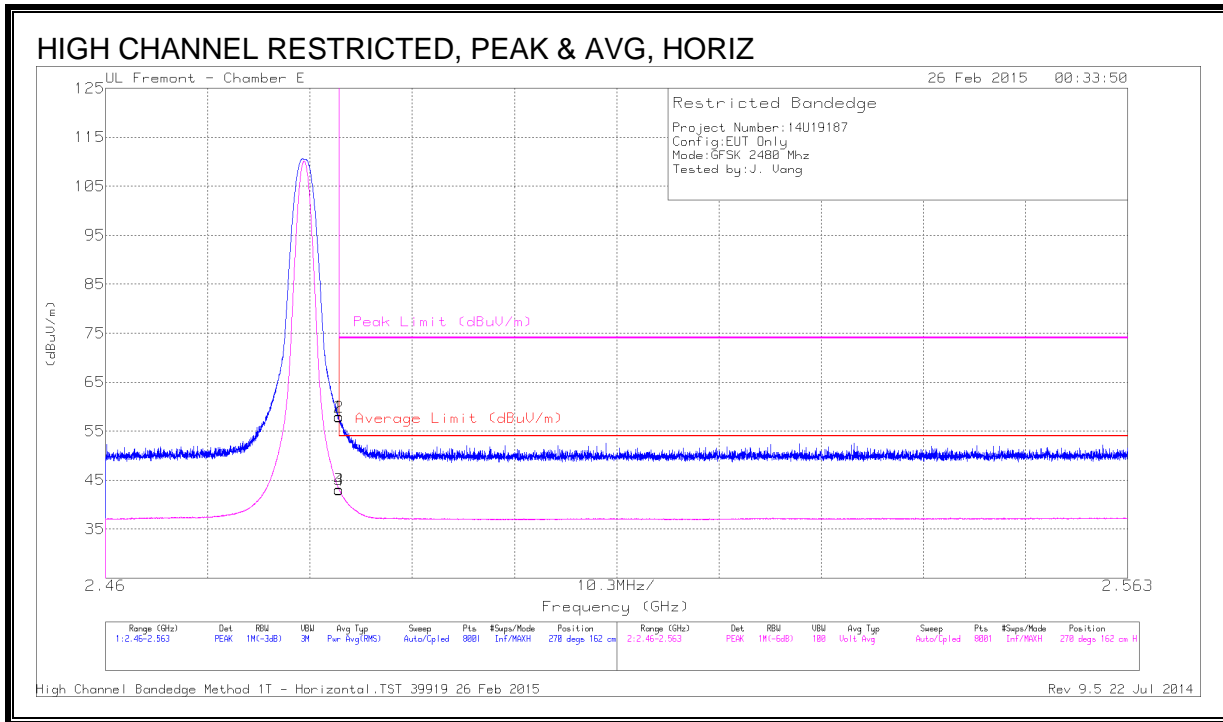
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AFT346 (dB/m) | Amp/Cb/ Fitr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|-----------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 2      | * 2.388         | 44.2                 | PK   | 32.1          | -24.7                 | 51.6                       | -                      | -           | 74                  | -22.4          | 197            | 277         | V        |
| 1      | * 2.39          | 42.05                | PK   | 32.1          | -24.7                 | 49.45                      | -                      | -           | 74                  | -24.55         | 197            | 277         | V        |
| 3      | * 2.39          | 29.3                 | VB1T | 32.1          | -24.7                 | 36.7                       | 54                     | -17.3       | -                   | -              | 197            | 277         | V        |
| 4      | * 2.39          | 29.4                 | VB1T | 32.1          | -24.7                 | 36.8                       | 54                     | -17.2       | -                   | -              | 197            | 277         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**RESTRICTED BANDEGE (HIGH CHANNEL, HORIZONTAL)**



**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/FI tr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.484         | 50.09                | PK   | 32.2           | -24.3                  | 57.99                      | -                      | -           | 74                  | -16.01         | 270            | 162         | H        |
| 2      | * 2.484         | 49.91                | PK   | 32.2           | -24.3                  | 57.81                      | -                      | -           | 74                  | -16.19         | 270            | 162         | H        |
| 3      | * 2.484         | 35.21                | VB1T | 32.2           | -24.3                  | 43.11                      | 54                     | -10.89      | -                   | -              | 270            | 162         | H        |
| 4      | * 2.484         | 35.06                | VB1T | 32.2           | -24.3                  | 42.96                      | 54                     | -11.04      | -                   | -              | 270            | 162         | H        |

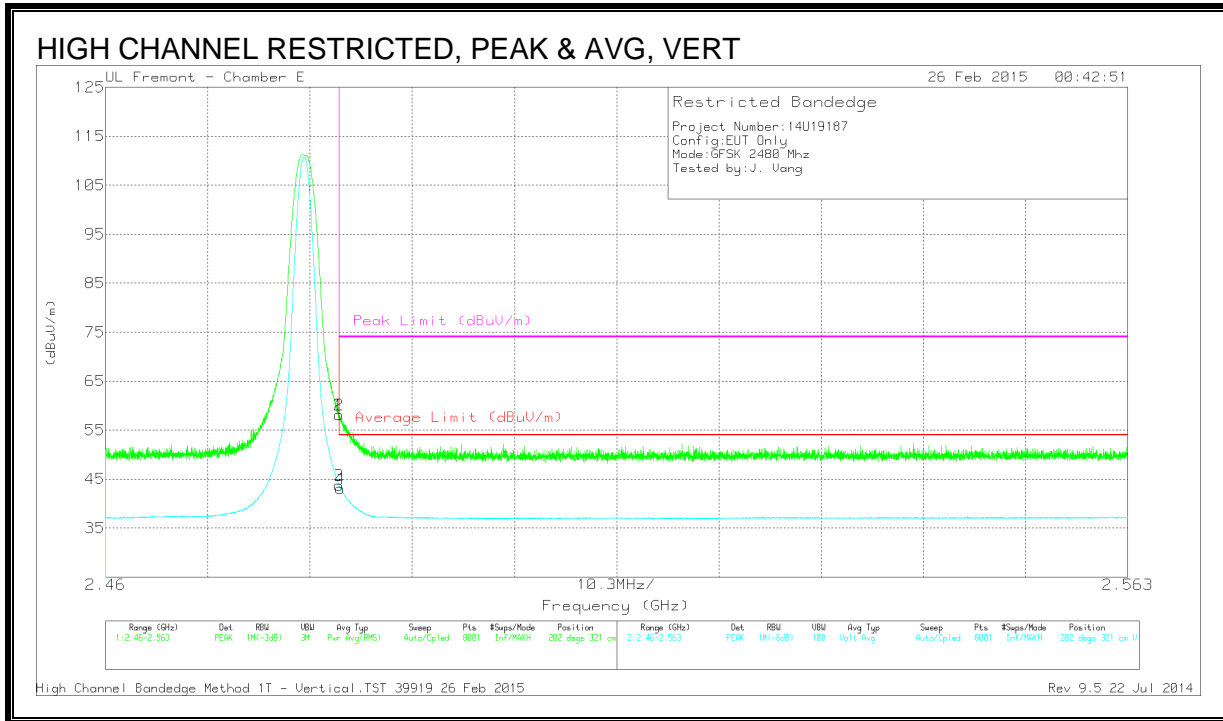
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet



**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



**DATA**

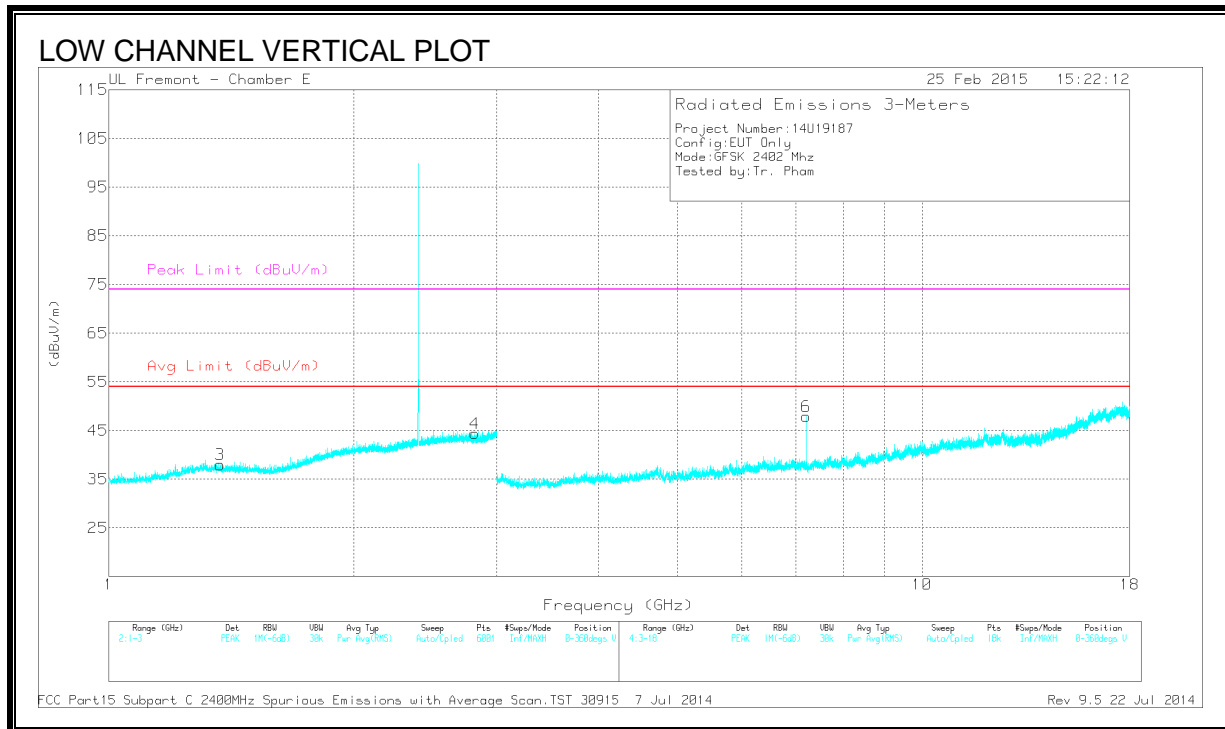
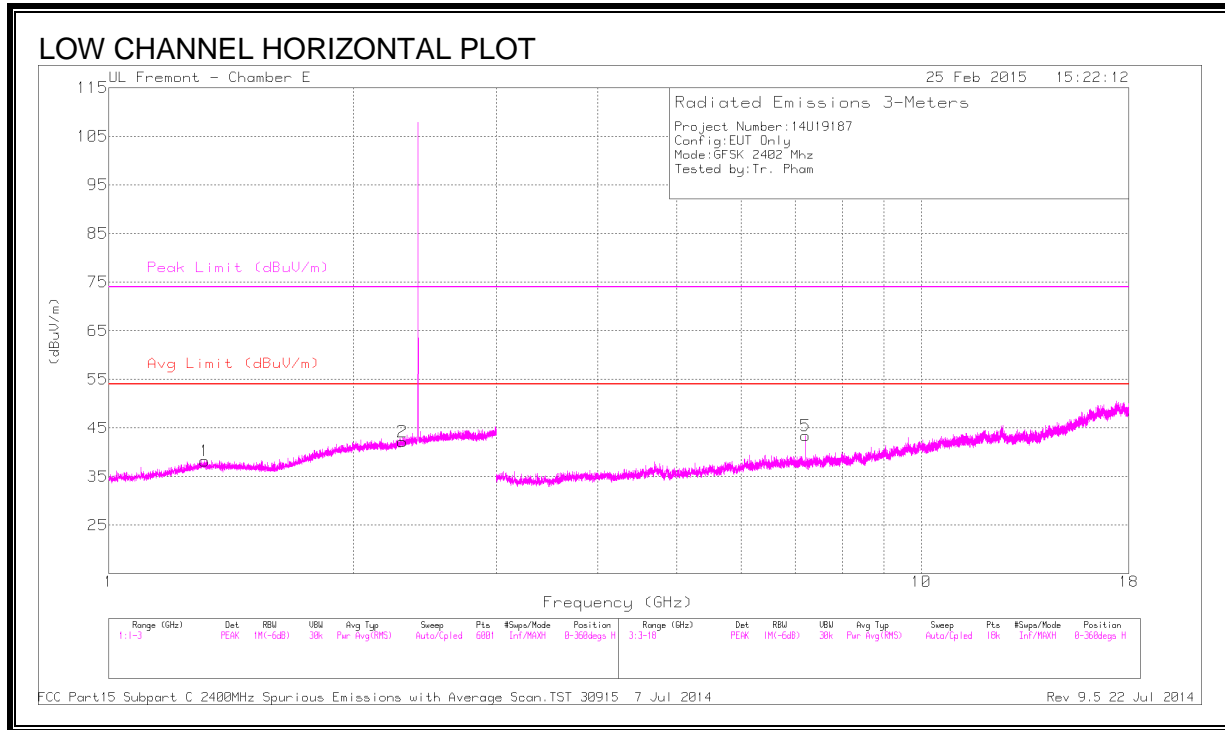
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/F ltr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.484         | 50.25                | PK   | 32.2           | -24.3                  | 58.15                      | -                      | -           | 74                  | -15.85         | 202            | 321         | V        |
| 2      | * 2.484         | 50.2                 | PK   | 32.2           | -24.3                  | 58.1                       | -                      | -           | 74                  | -15.9          | 202            | 321         | V        |
| 3      | * 2.484         | 35.86                | VB1T | 32.2           | -24.3                  | 43.76                      | 54                     | -10.24      | -                   | -              | 202            | 321         | V        |
| 4      | * 2.484         | 35.21                | VB1T | 32.2           | -24.3                  | 43.11                      | 54                     | -10.89      | -                   | -              | 202            | 321         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**HARMONICS AND SPURIOUS EMISSIONS**



**DATA**

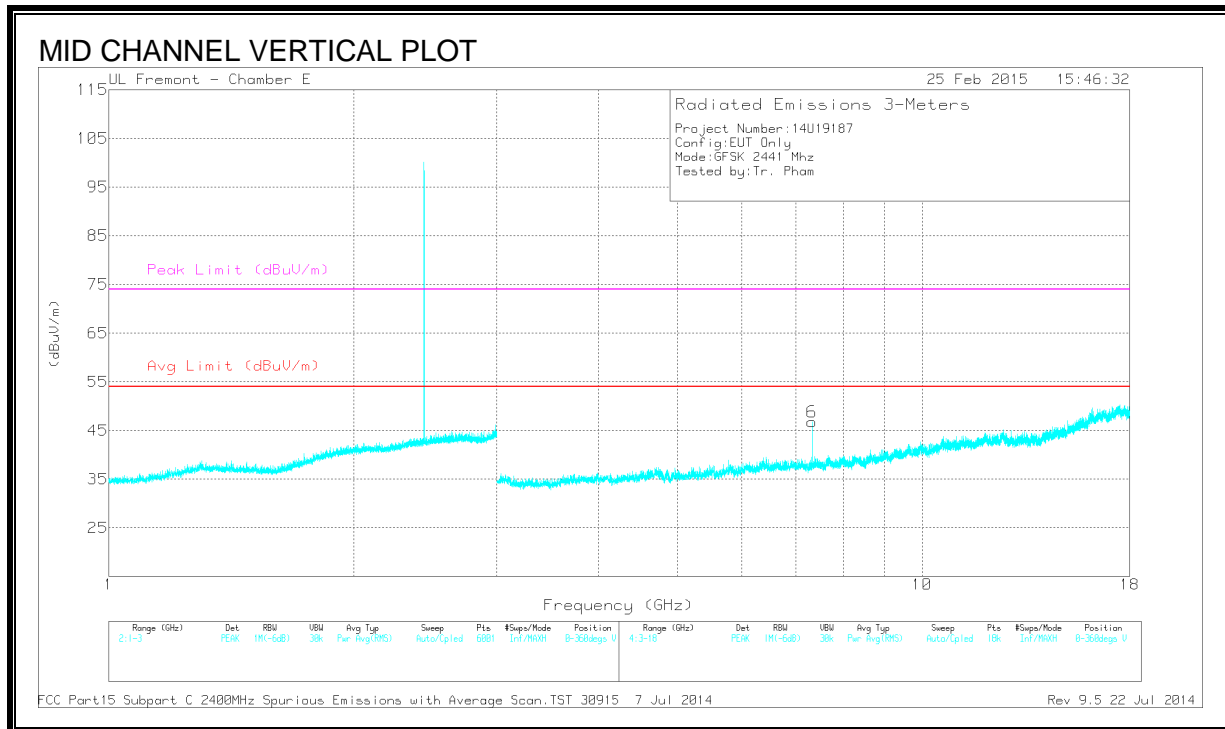
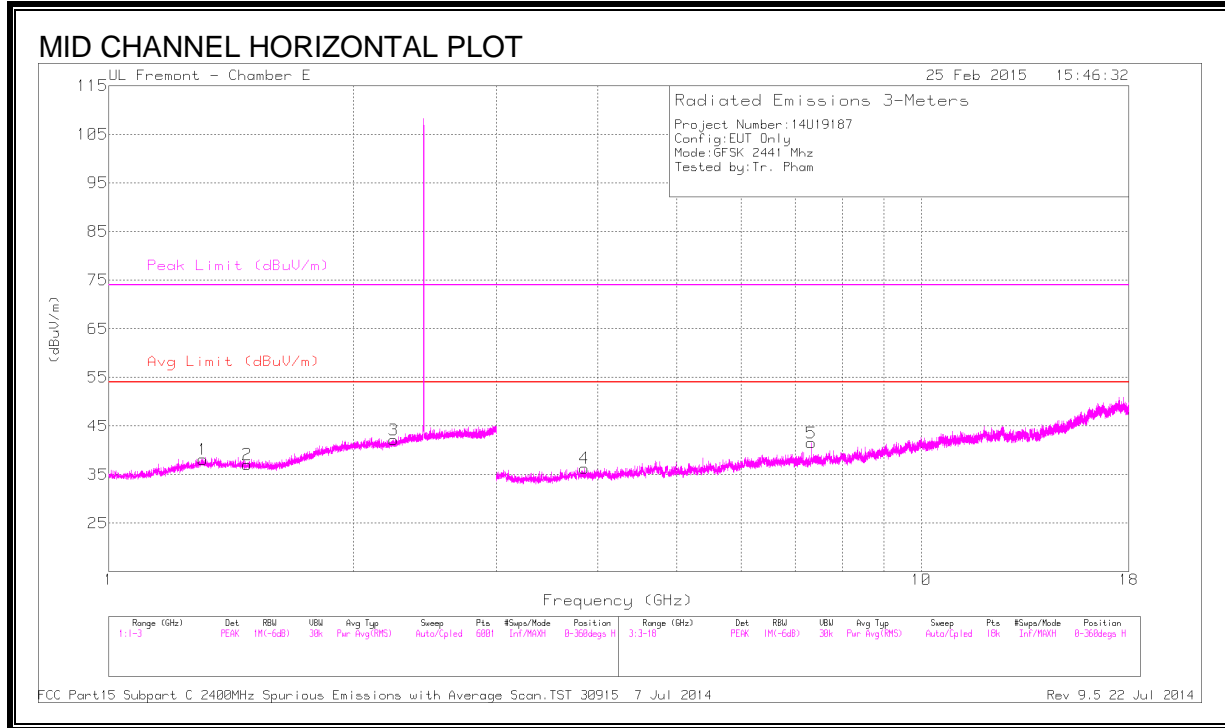
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/ Fitr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 1.314         | 44.32                | PK3  | 28.9           | -26.9                  | 46.32                      | -                  | -           | 74                  | -27.68         | 360            | 200         | H        |
|        | * 1.314         | 31                   | VB10 | 29             | -26.9                  | 33.1                       | 54                 | -20.9       | -                   | -              | 360            | 200         | H        |
| 2      | * 2.299         | 43.94                | PK3  | 31.9           | -25.1                  | 50.74                      | -                  | -           | 74                  | -23.26         | 360            | 200         | H        |
|        | * 2.299         | 30.73                | VB10 | 31.9           | -25.1                  | 37.53                      | 54                 | -16.47      | -                   | -              | 360            | 200         | H        |
| 3      | * 1.37          | 44.14                | PK3  | 28.7           | -26.6                  | 46.24                      | -                  | -           | 74                  | -27.76         | 360            | 200         | V        |
|        | * 1.37          | 30.85                | VB10 | 28.7           | -26.6                  | 32.95                      | 54                 | -21.05      | -                   | -              | 360            | 200         | V        |
| 4      | * 2.819         | 43.59                | PK3  | 32.4           | -24.1                  | 51.89                      | -                  | -           | 74                  | -22.11         | 360            | 200         | V        |
|        | * 2.821         | 30.45                | VB10 | 32.4           | -24.1                  | 38.75                      | 54                 | -15.25      | -                   | -              | 360            | 200         | V        |
| 5      | 7.206           | 43.79                | PK3  | 35.5           | -28.4                  | 50.89                      | -                  | -           | -                   | -              | 331            | 216         | H        |
| 6      | 7.207           | 45.66                | PK3  | 35.5           | -28.4                  | 52.76                      | -                  | -           | -                   | -              | 227            | 183         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

**HARMONICS AND SPURIOUS EMISSIONS**



**DATA**

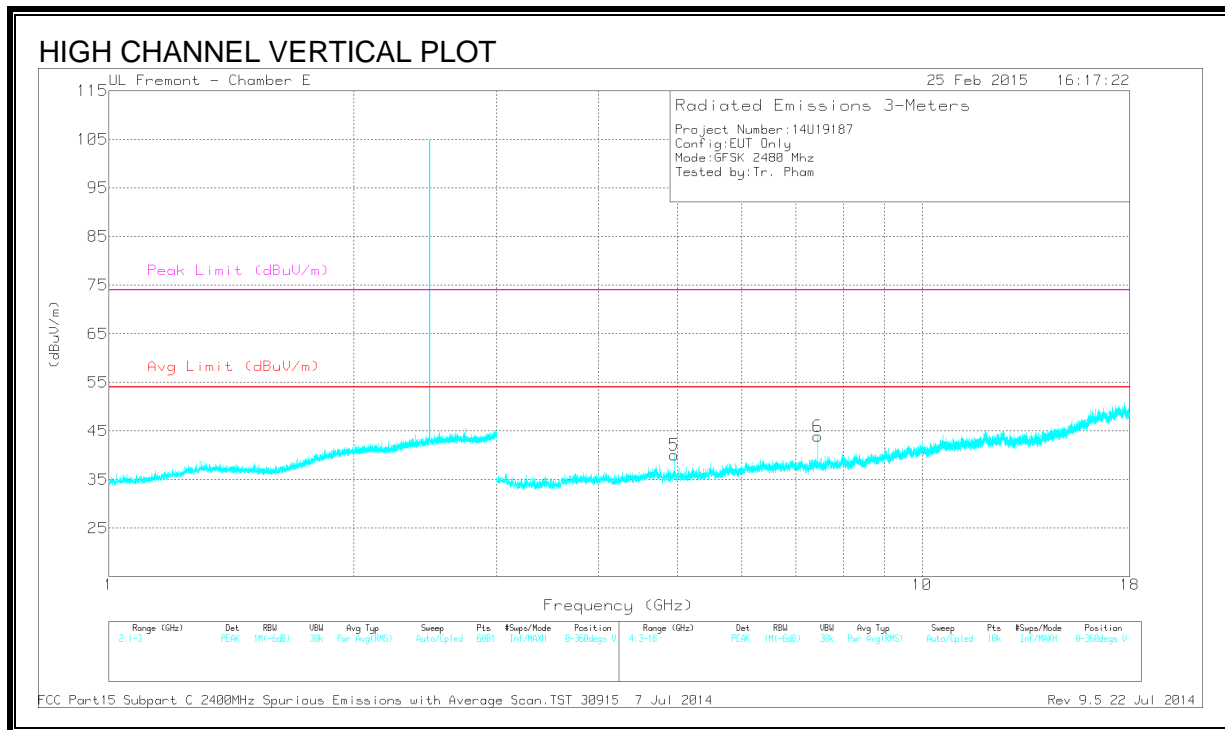
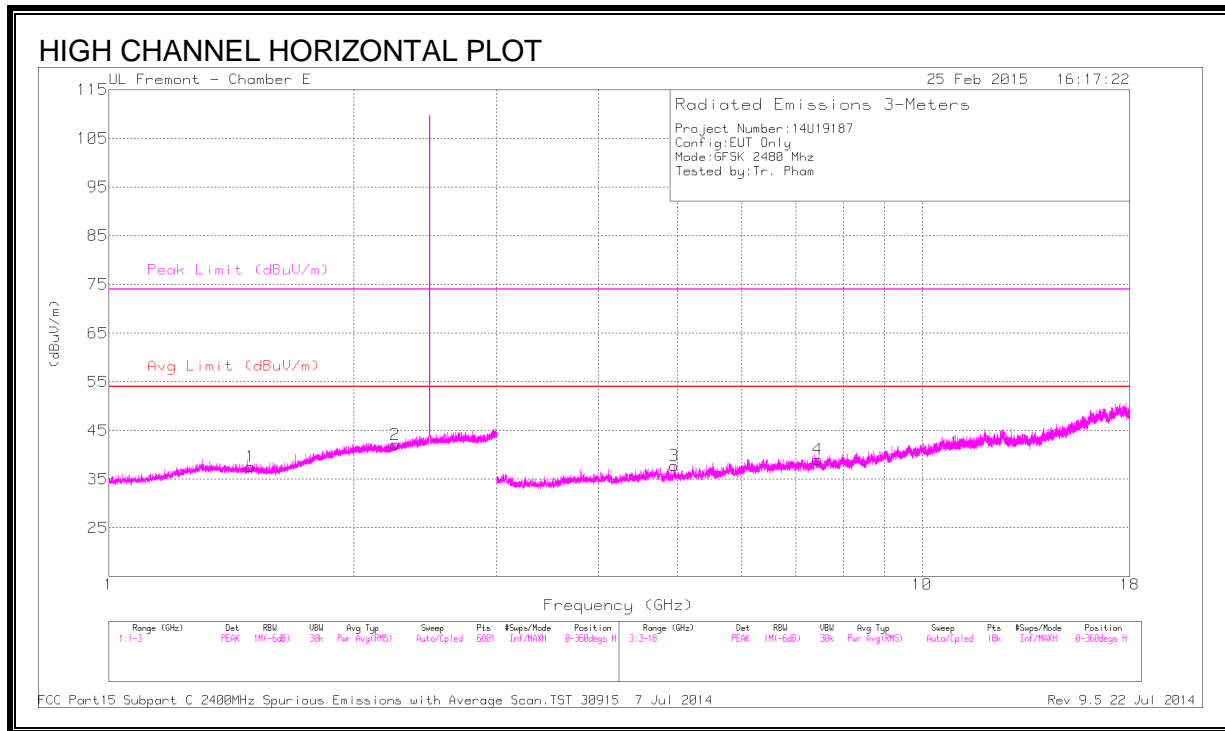
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/ Fitr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 1.306         | 44.06                | PK3  | 29             | -26.9                  | 46.16                      | -                  | -           | 74                  | -27.84         | 360            | 100         | H        |
|        | * 1.306         | 31.03                | VB10 | 29             | -26.9                  | 33.13                      | 54                 | -20.87      | -                   | -              | 360            | 100         | H        |
| 2      | * 1.48          | 43.87                | PK3  | 28.3           | -26.3                  | 45.87                      | -                  | -           | 74                  | -28.13         | 360            | 100         | H        |
|        | * 1.481         | 30.78                | VB10 | 28.3           | -26.3                  | 32.78                      | 54                 | -21.22      | -                   | -              | 360            | 100         | H        |
| 3      | * 2.243         | 43.86                | PK3  | 31.6           | -25.2                  | 50.26                      | -                  | -           | 74                  | -23.74         | 360            | 100         | H        |
|        | * 2.242         | 30.68                | VB10 | 31.6           | -25.2                  | 37.08                      | 54                 | -16.92      | -                   | -              | 360            | 100         | H        |
| 4      | * 3.848         | 42.05                | PK3  | 33.5           | -31.3                  | 44.25                      | -                  | -           | 74                  | -29.75         | 360            | 100         | H        |
|        | * 3.849         | 29.04                | VB10 | 33.5           | -31.4                  | 31.14                      | 54                 | -22.86      | -                   | -              | 360            | 100         | H        |
| 5      | * 7.322         | 42.02                | PK3  | 35.5           | -27.6                  | 49.92                      | -                  | -           | 74                  | -24.08         | 329            | 240         | H        |
|        | * 7.323         | 31.12                | VB10 | 35.5           | -27.6                  | 39.02                      | 54                 | -14.98      | -                   | -              | 329            | 240         | H        |
| 6      | * 7.322         | 44.91                | PK3  | 35.5           | -27.6                  | 52.81                      | -                  | -           | 74                  | -21.19         | 276            | 234         | V        |
|        | * 7.323         | 37.81                | VB10 | 35.5           | -27.6                  | 45.71                      | 54                 | -8.29       | -                   | -              | 276            | 234         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

**HARMONICS AND SPURIOUS EMISSIONS**



**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/ Fitr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 1.494         | 43.67                | PK3  | 28.2           | -26.2                  | 45.67                      | -                  | -           | 74                  | -28.33         | 360            | 100         | H        |
|        | * 1.492         | 30.79                | VB10 | 28.2           | -26.2                  | 32.79                      | 54                 | -21.21      | -                   | -              | 360            | 100         | H        |
| 2      | * 2.248         | 43.92                | PK3  | 31.6           | -25.2                  | 50.32                      | -                  | -           | 74                  | -23.68         | 360            | 100         | H        |
|        | * 2.248         | 30.7                 | VB10 | 31.6           | -25.2                  | 37.1                       | 54                 | -16.9       | -                   | -              | 360            | 100         | H        |
| 3      | * 4.961         | 42.3                 | PK3  | 34.1           | -30.2                  | 46.2                       | -                  | -           | 74                  | -27.8          | 129            | 200         | H        |
|        | * 4.96          | 31.62                | VB10 | 34.1           | -30.2                  | 35.52                      | 54                 | -18.48      | -                   | -              | 129            | 200         | H        |
| 4      | * 7.441         | 39.93                | PK3  | 35.6           | -28.2                  | 47.33                      | -                  | -           | 74                  | -26.67         | 233            | 117         | H        |
|        | * 7.44          | 28.23                | VB10 | 35.6           | -28.2                  | 35.63                      | 54                 | -18.37      | -                   | -              | 233            | 117         | H        |
| 5      | * 4.96          | 43.39                | PK3  | 34.1           | -30.2                  | 47.29                      | -                  | -           | 74                  | -26.71         | 298            | 189         | V        |
|        | * 4.96          | 34.65                | VB10 | 34.1           | -30.2                  | 38.55                      | 54                 | -15.45      | -                   | -              | 298            | 189         | V        |
| 6      | * 7.44          | 42.78                | PK3  | 35.6           | -28.2                  | 50.18                      | -                  | -           | 74                  | -23.82         | 244            | 214         | V        |
|        | * 7.44          | 33.96                | VB10 | 35.6           | -28.2                  | 41.36                      | 54                 | -12.64      | -                   | -              | 244            | 214         | V        |

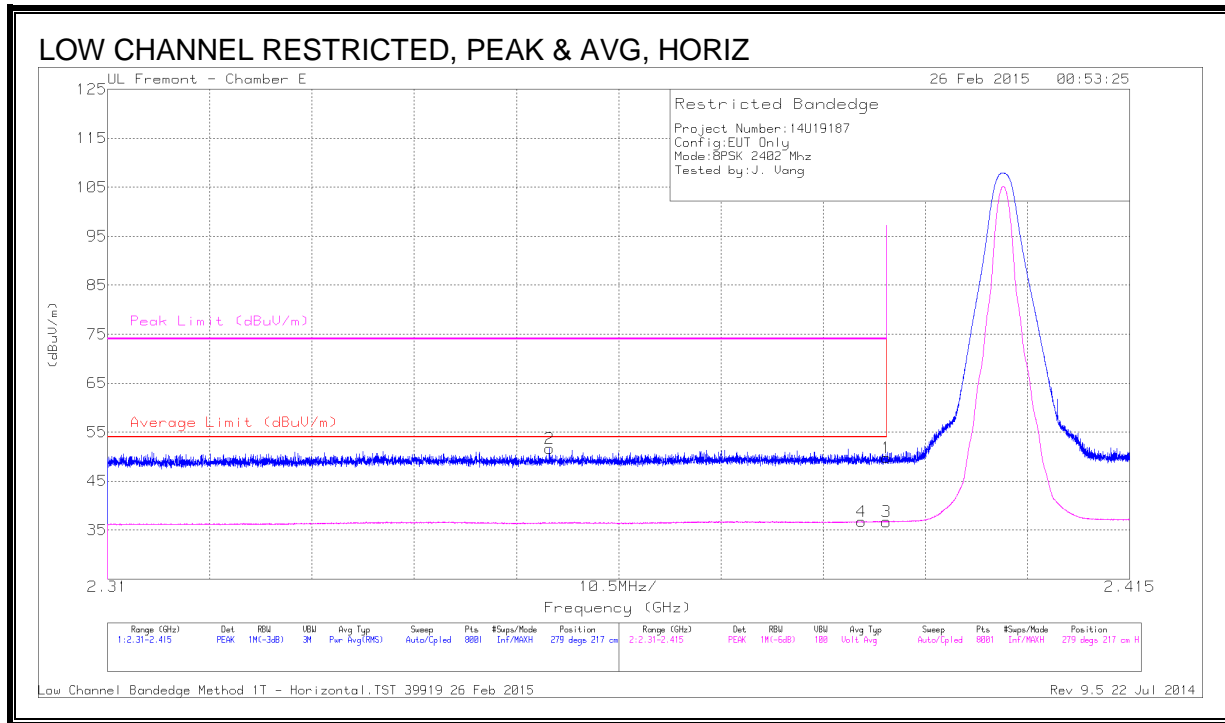
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

### 10.2.2. ENHANCED DATA RATE 8PSK MODULATION

#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



#### DATA

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/FI tr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 2      | * 2.355         | 44.36                | PK   | 32             | -24.7                  | 51.66                      | -                      | -           | 74                  | -22.34         | 279            | 217         | H        |
| 4      | * 2.387         | 29.39                | VB1T | 32.1           | -24.7                  | 36.79                      | 54                     | -17.21      | -                   | -              | 279            | 217         | H        |
| 1      | * 2.39          | 42.43                | PK   | 32.1           | -24.7                  | 49.83                      | -                      | -           | 74                  | -24.17         | 279            | 217         | H        |
| 3      | * 2.39          | 29.3                 | VB1T | 32.1           | -24.7                  | 36.7                       | 54                     | -17.3       | -                   | -              | 279            | 217         | H        |

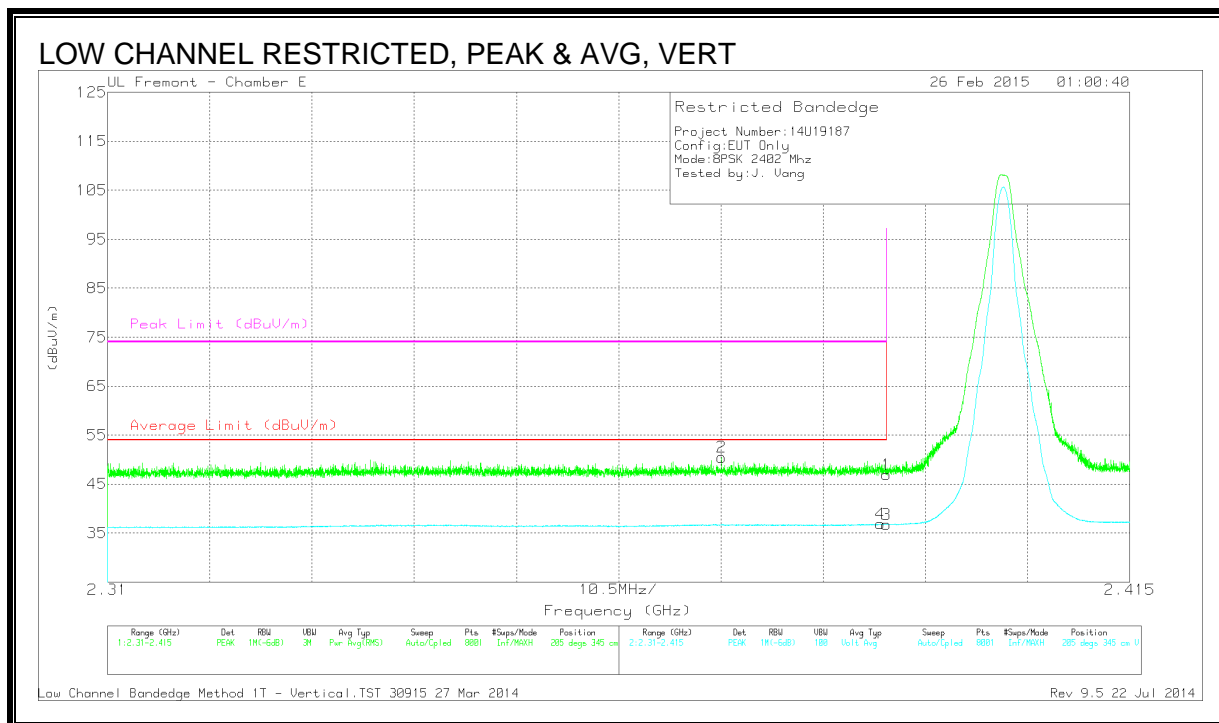
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet



**RESTRICTED BANDEGE (LOW CHANNEL, VERTICAL)**



**DATA**

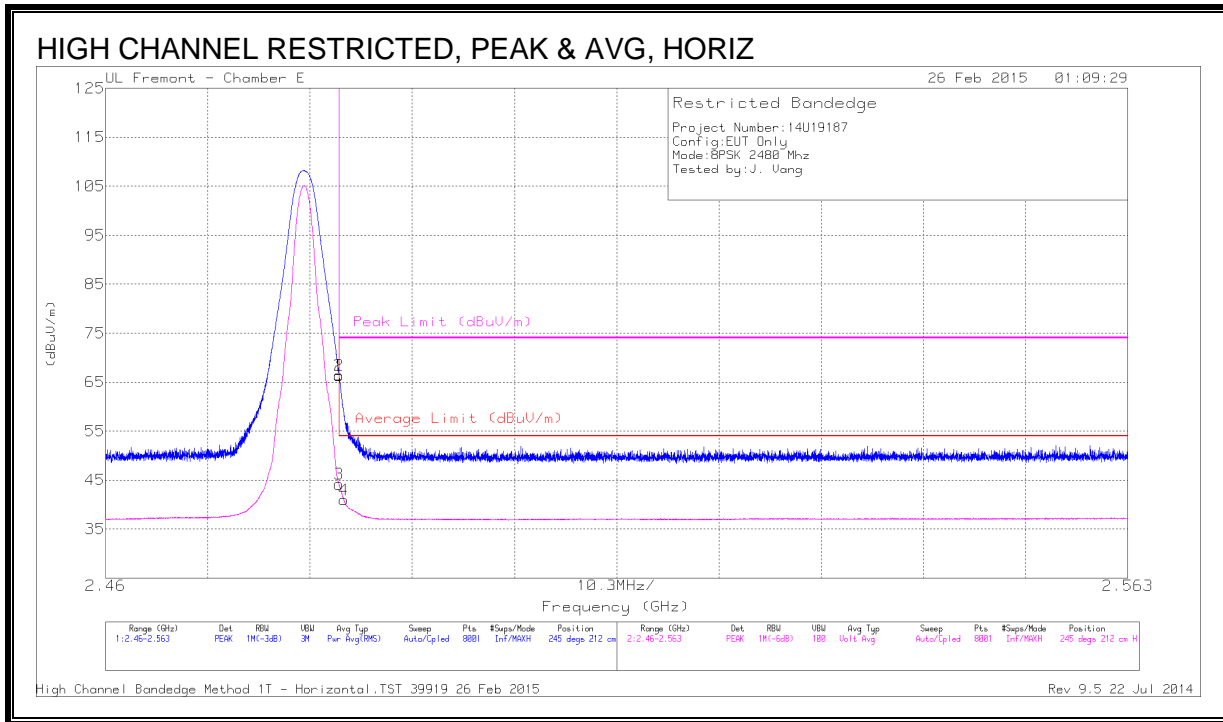
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/FI tr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 2      | * 2.373         | 43.08                | PK   | 32             | -24.6                  | 50.48                      | -                      | -           | 74                  | -23.52         | 205            | 345         | V        |
| 4      | * 2.389         | 29.43                | VB1T | 32.1           | -24.7                  | 36.83                      | 54                     | -17.17      | -                   | -              | 205            | 345         | V        |
| 1      | * 2.39          | 39.59                | PK   | 32.1           | -24.7                  | 46.99                      | -                      | -           | 74                  | -27.01         | 205            | 345         | V        |
| 3      | * 2.39          | 29.41                | VB1T | 32.1           | -24.7                  | 36.81                      | 54                     | -17.19      | -                   | -              | 205            | 345         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



**DATA**

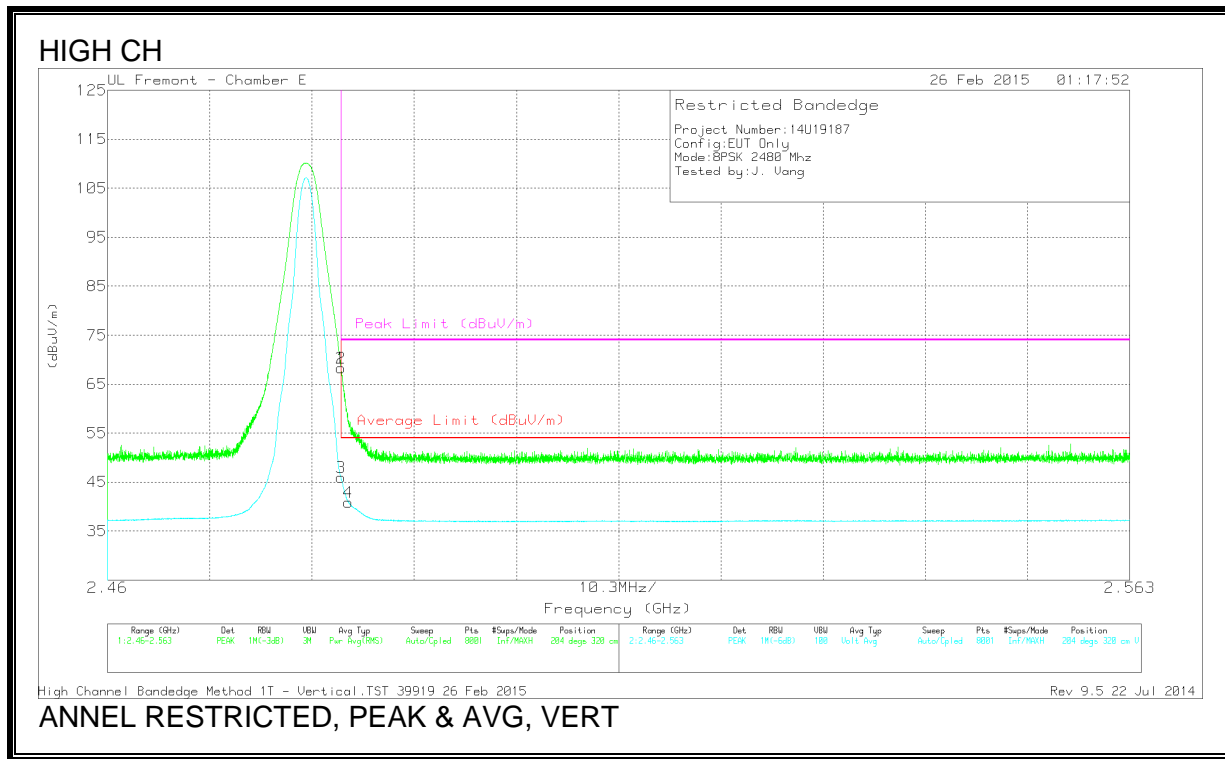
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/FI tr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.484         | 58.4                 | PK   | 32.2           | -24.3                  | 66.3                       | -                      | -           | 74                  | -7.7           | 245            | 212         | H        |
| 2      | * 2.484         | 58.57                | PK   | 32.2           | -24.3                  | 66.47                      | -                      | -           | 74                  | -7.53          | 245            | 212         | H        |
| 3      | * 2.484         | 36.25                | VB1T | 32.2           | -24.3                  | 44.15                      | 54                     | -9.85       | -                   | -              | 245            | 212         | H        |
| 4      | * 2.484         | 33.1                 | VB1T | 32.2           | -24.3                  | 41                         | 54                     | -13         | -                   | -              | 245            | 212         | H        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



**ANNEL RESTRICTED, PEAK & AVG, VERT**

**DATA**

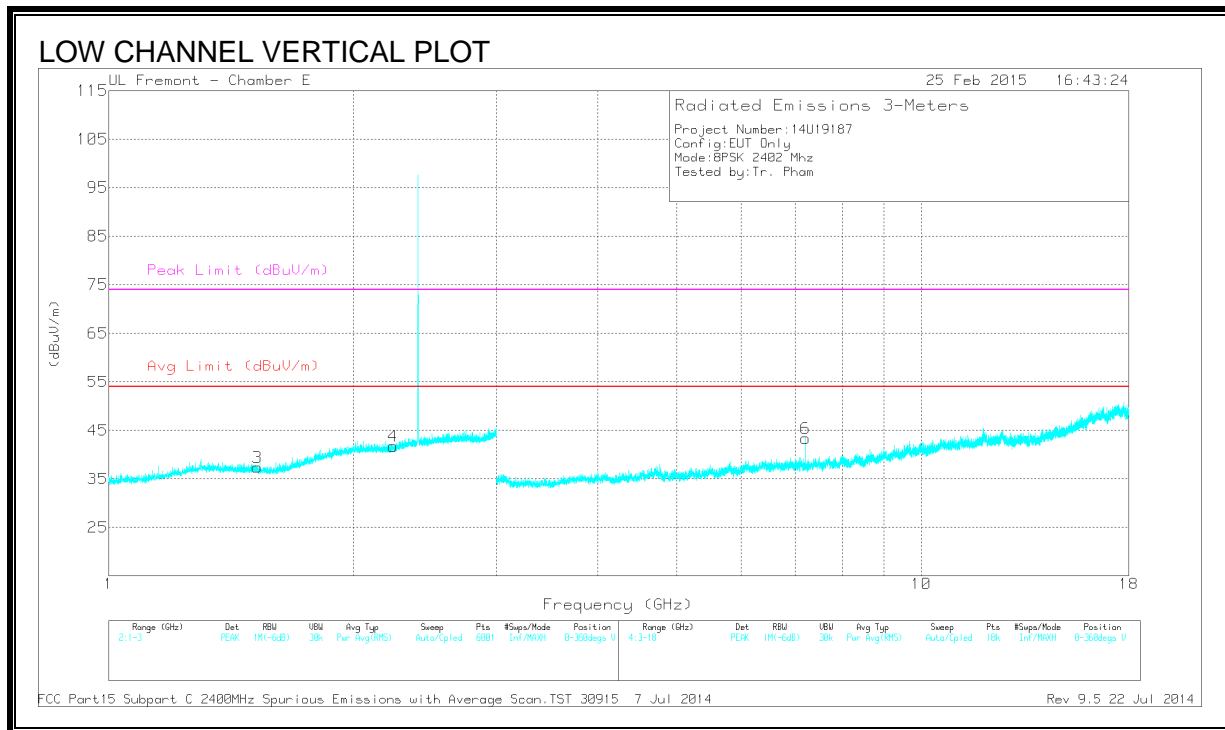
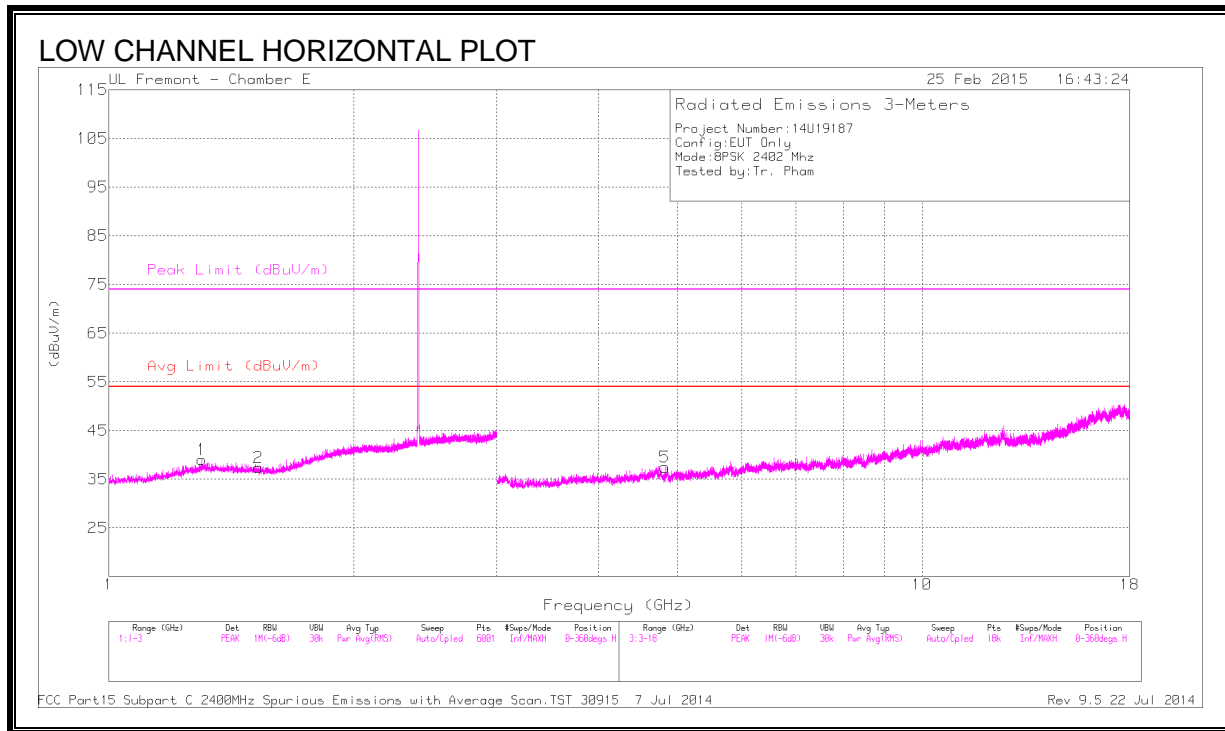
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AFT346 (dB/m) | Amp/Cbl/F ltr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.484         | 60.35                | PK   | 32.2          | -24.3                  | 68.25                      | -                      | -           | 74                  | -5.75          | 204            | 320         | V        |
| 2      | * 2.484         | 60.42                | PK   | 32.2          | -24.3                  | 68.32                      | -                      | -           | 74                  | -5.68          | 204            | 320         | V        |
| 3      | * 2.484         | 37.99                | VB1T | 32.2          | -24.3                  | 45.89                      | 54                     | -8.11       | -                   | -              | 204            | 320         | V        |
| 4      | * 2.484         | 32.98                | VB1T | 32.2          | -24.3                  | 40.88                      | 54                     | -13.12      | -                   | -              | 204            | 320         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

VB1T - FHSS Method: VB=1/Ton, Voltage Averaging Max Hold where: Ton is the duration of the packet

**HARMONICS AND SPURIOUS EMISSIONS**



**DATA**

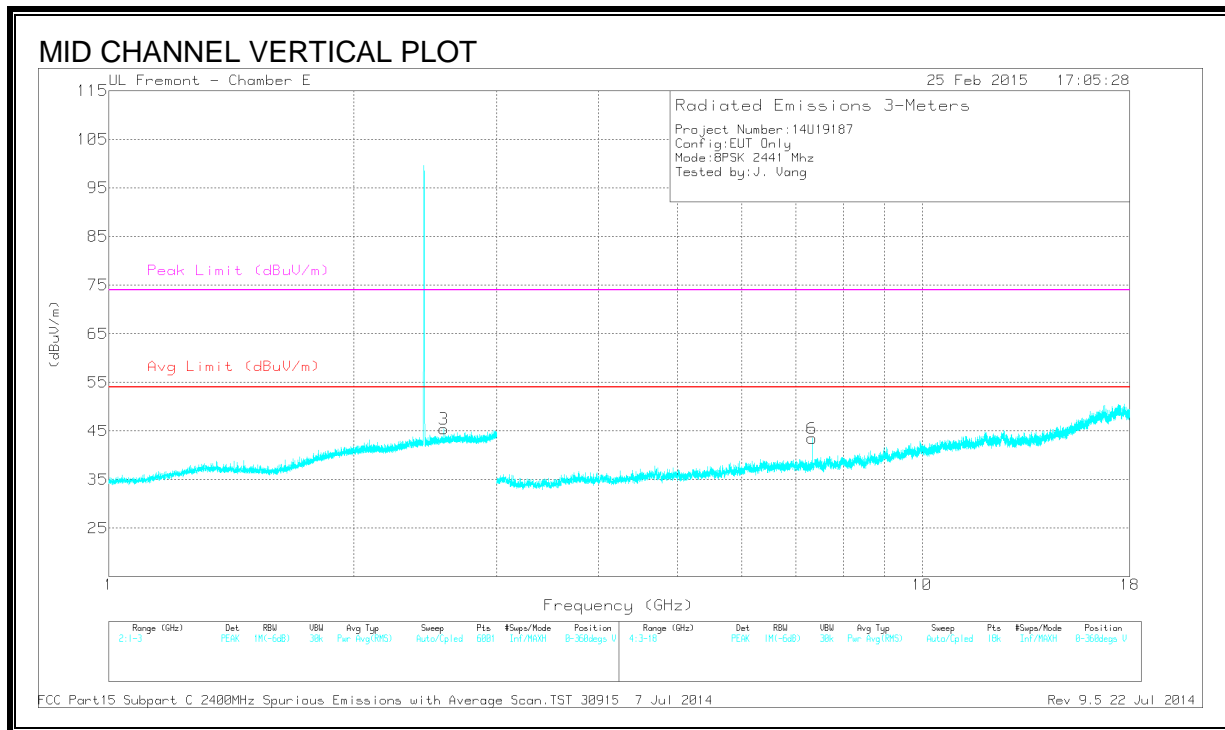
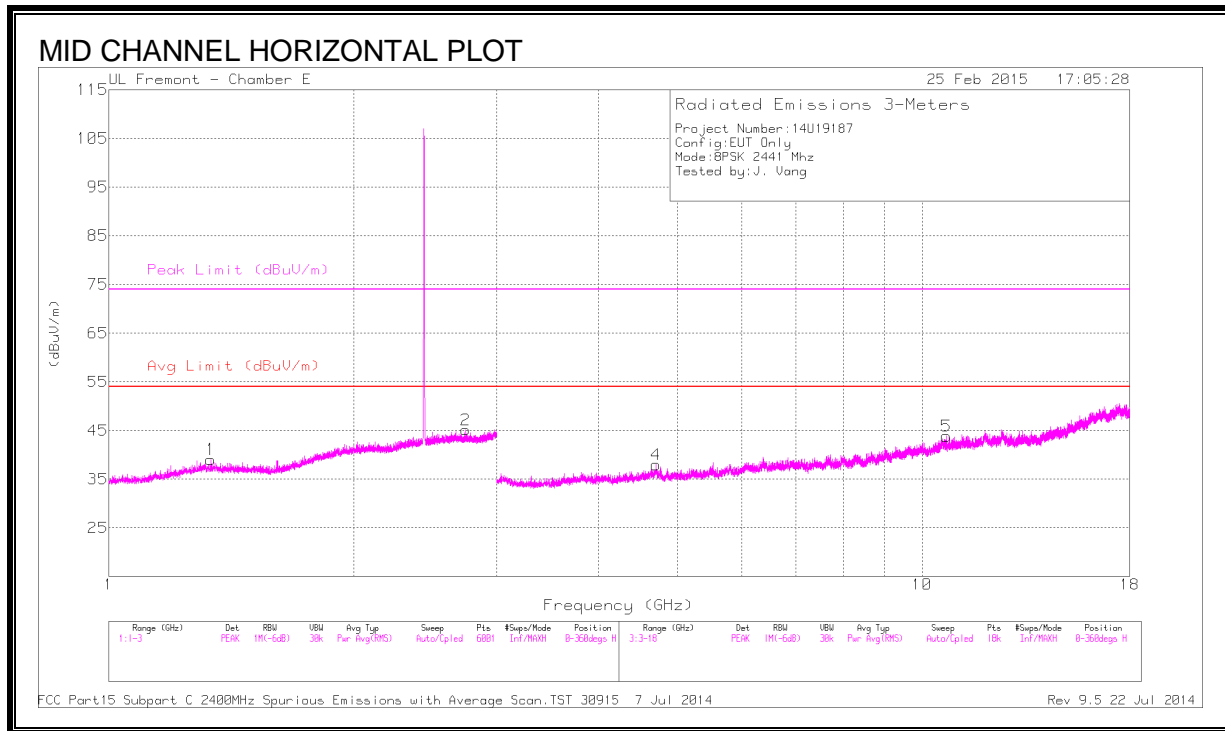
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 1.302         | 43.79                | PK3  | 29             | -27                    | 45.79                      | -                  | -           | 74                  | -28.21         | 360            | 101         | H        |
|        | * 1.301         | 31.06                | VB10 | 29             | -27                    | 33.06                      | 54                 | -20.94      | -                   | -              | 360            | 101         | H        |
| 2      | * 1.529         | 44.19                | PK3  | 28.1           | -26.4                  | 45.89                      | -                  | -           | 74                  | -28.11         | 360            | 101         | H        |
|        | * 1.528         | 30.84                | VB10 | 28.1           | -26.4                  | 32.54                      | 54                 | -21.46      | -                   | -              | 360            | 101         | H        |
| 3      | * 1.524         | 43.89                | PK3  | 28.1           | -26.3                  | 45.69                      | -                  | -           | 74                  | -28.31         | 360            | 101         | V        |
|        | * 1.523         | 30.9                 | VB10 | 28.1           | -26.3                  | 32.7                       | 54                 | -21.3       | -                   | -              | 360            | 101         | V        |
| 4      | * 2.24          | 44.02                | PK3  | 31.5           | -25.2                  | 50.32                      | -                  | -           | 74                  | -23.68         | 360            | 101         | V        |
|        | * 2.239         | 30.74                | VB10 | 31.5           | -25.2                  | 37.04                      | 54                 | -16.96      | -                   | -              | 360            | 101         | V        |
| 5      | * 4.829         | 41.96                | PK3  | 34.1           | -31.2                  | 44.86                      | -                  | -           | 74                  | -29.14         | 360            | 101         | H        |
|        | * 4.829         | 28.42                | VB10 | 34.1           | -31.2                  | 31.32                      | 54                 | -22.68      | -                   | -              | 360            | 101         | H        |
| 6      | 7.206           | 43.42                | PK3  | 35.5           | -28.4                  | 50.52                      | -                  | -           | -                   | -              | 238            | 200         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

**HARMONICS AND SPURIOUS EMISSIONS**



**DATA**

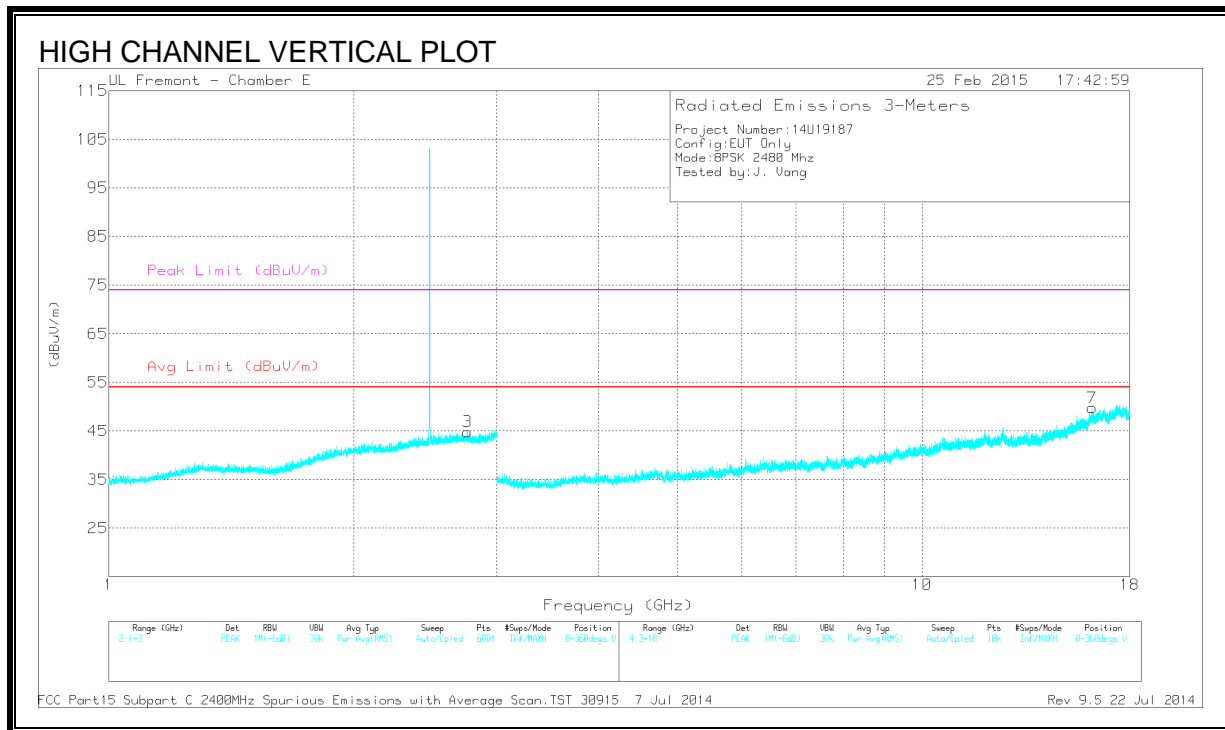
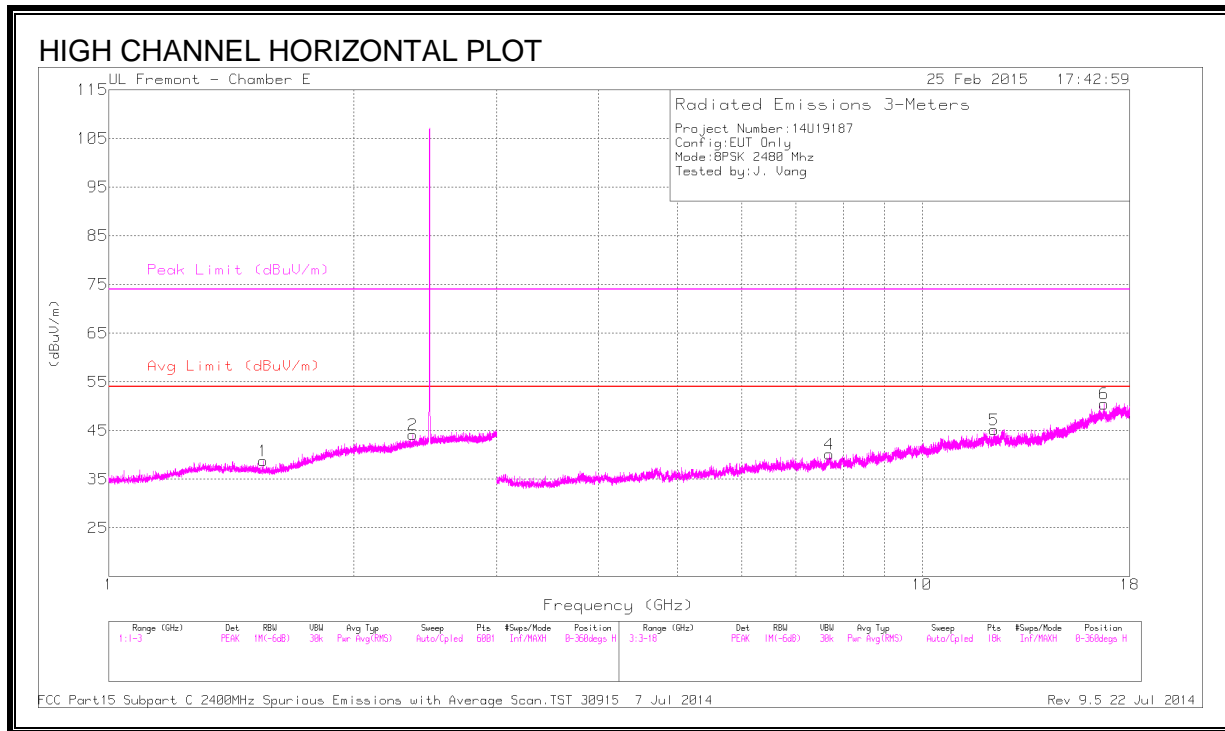
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/ Ftr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|-----------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 1.336         | 44.75                | PK3  | 28.8           | -26.8                 | 46.75                      | -                  | -           | 74                  | -27.25         | 184            | 308         | H        |
|        | * 1.333         | 30.84                | VB10 | 28.8           | -26.8                 | 32.84                      | 54                 | -21.16      | -                   | -              | 184            | 308         | H        |
| 2      | * 2.744         | 43.67                | PK3  | 32.4           | -23.8                 | 52.27                      | -                  | -           | 74                  | -21.73         | 78             | 160         | H        |
|        | * 2.754         | 30.45                | VB10 | 32.4           | -23.9                 | 38.95                      | 54                 | -15.05      | -                   | -              | 78             | 160         | H        |
| 4      | * 4.709         | 42.46                | PK3  | 34.2           | -30.5                 | 46.16                      | -                  | -           | 74                  | -27.84         | 42             | 101         | H        |
|        | * 4.71          | 29.39                | VB10 | 34.2           | -30.5                 | 33.09                      | 54                 | -20.91      | -                   | -              | 42             | 101         | H        |
| 5      | * 10.711        | 36.93                | PK3  | 37.9           | -23.6                 | 51.23                      | -                  | -           | 74                  | -22.77         | 9              | 319         | H        |
|        | * 10.709        | 23.9                 | VB10 | 37.9           | -23.6                 | 38.2                       | 54                 | -15.8       | -                   | -              | 9              | 319         | H        |
| 6      | * 7.323         | 43.22                | PK3  | 35.5           | -27.6                 | 51.12                      | -                  | -           | 74                  | -22.88         | 248            | 165         | V        |
|        | * 7.323         | 32.95                | VB10 | 35.5           | -27.6                 | 40.85                      | 54                 | -13.15      | -                   | -              | 248            | 165         | V        |
| 3      | 2.58            | 44.01                | PK3  | 32.3           | -24.2                 | 52.11                      | -                  | -           | -                   | -              | 248            | 165         | V        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

**HARMONICS AND SPURIOUS EMISSIONS**





**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T346 (dB/m) | Amp/Cbl/ Ftr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|-----------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 1.55          | 43.76                | PK3  | 28.1           | -26.4                 | 45.46                      | -                  | -           | 74                  | -28.54         | 207            | 355         | H        |
|        | * 1.551         | 30.89                | VB10 | 28.1           | -26.4                 | 32.59                      | 54                 | -21.41      | -                   | -              | 207            | 355         | H        |
| 2      | * 2.364         | 42.97                | PK3  | 32             | -24.7                 | 50.27                      | -                  | -           | 74                  | -23.73         | 260            | 102         | H        |
|        | * 2.366         | 30.54                | VB10 | 32             | -24.7                 | 37.84                      | 54                 | -16.16      | -                   | -              | 260            | 102         | H        |
| 3      | * 2.764         | 43.78                | PK3  | 32.4           | -24                   | 52.18                      | -                  | -           | 74                  | -21.82         | 118            | 212         | V        |
|        | * 2.764         | 30.49                | VB10 | 32.4           | -24                   | 38.89                      | 54                 | -15.11      | -                   | -              | 118            | 212         | V        |
| 4      | * 7.694         | 38.63                | PK3  | 35.8           | -26.5                 | 47.93                      | -                  | -           | 74                  | -26.07         | 281            | 236         | H        |
|        | * 7.695         | 25.52                | VB10 | 35.8           | -26.5                 | 34.82                      | 54                 | -19.18      | -                   | -              | 281            | 236         | H        |
| 5      | * 12.27         | 37.56                | PK3  | 38.8           | -23.8                 | 52.56                      | -                  | -           | 74                  | -21.44         | 141            | 262         | H        |
|        | * 12.268        | 24.31                | VB10 | 38.8           | -23.8                 | 39.31                      | 54                 | -14.69      | -                   | -              | 141            | 262         | H        |
| 7      | * 16.188        | 35.49                | PK3  | 40.9           | -20.5                 | 55.89                      | -                  | -           | 74                  | -18.11         | 279            | 260         | V        |
|        | * 16.187        | 23.16                | VB10 | 40.9           | -20.6                 | 43.46                      | 54                 | -10.54      | -                   | -              | 279            | 260         | V        |
| 6      | 16.736          | 35.53                | PK3  | 41.1           | -19.6                 | 57.03                      | -                  | -           | -                   | -              | 279            | 260         | H        |

\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

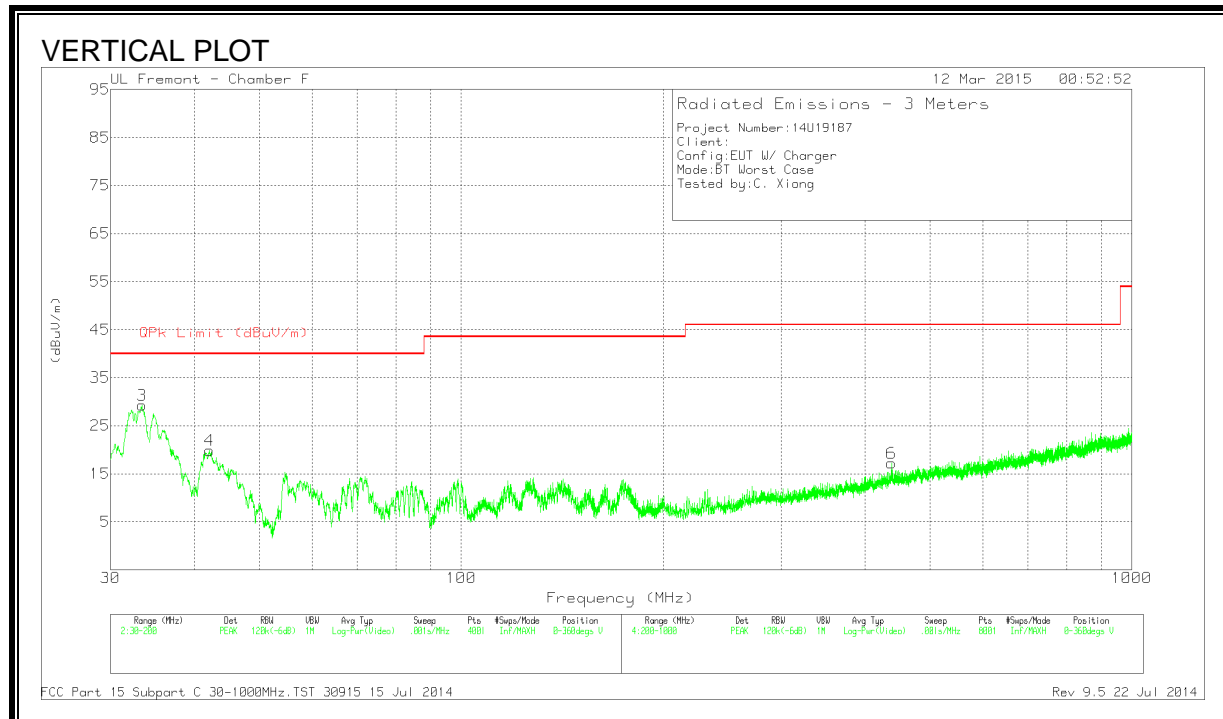
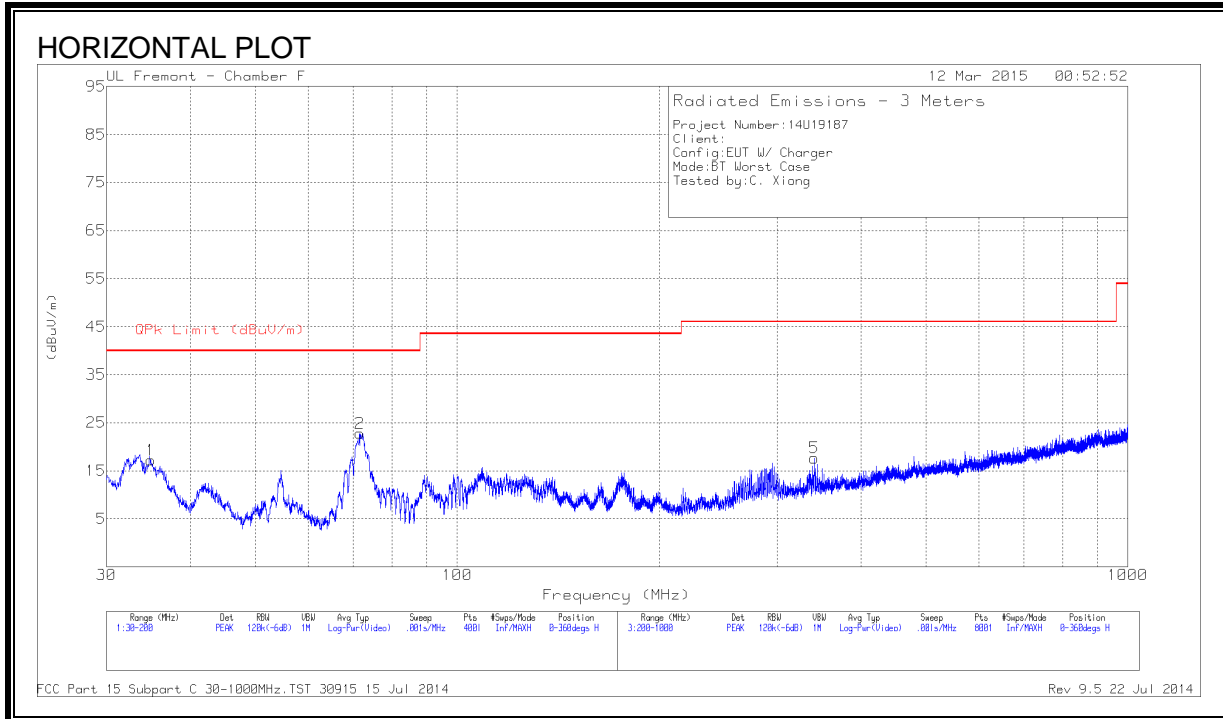
PK3 - FHSS Method: Maximum Peak

VB10Hz - FHSS Method: 10Hz Video Bandwidth

### 10.3. WORST-CASE BELOW 1 GHz

#### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)

#### ANTENNA B

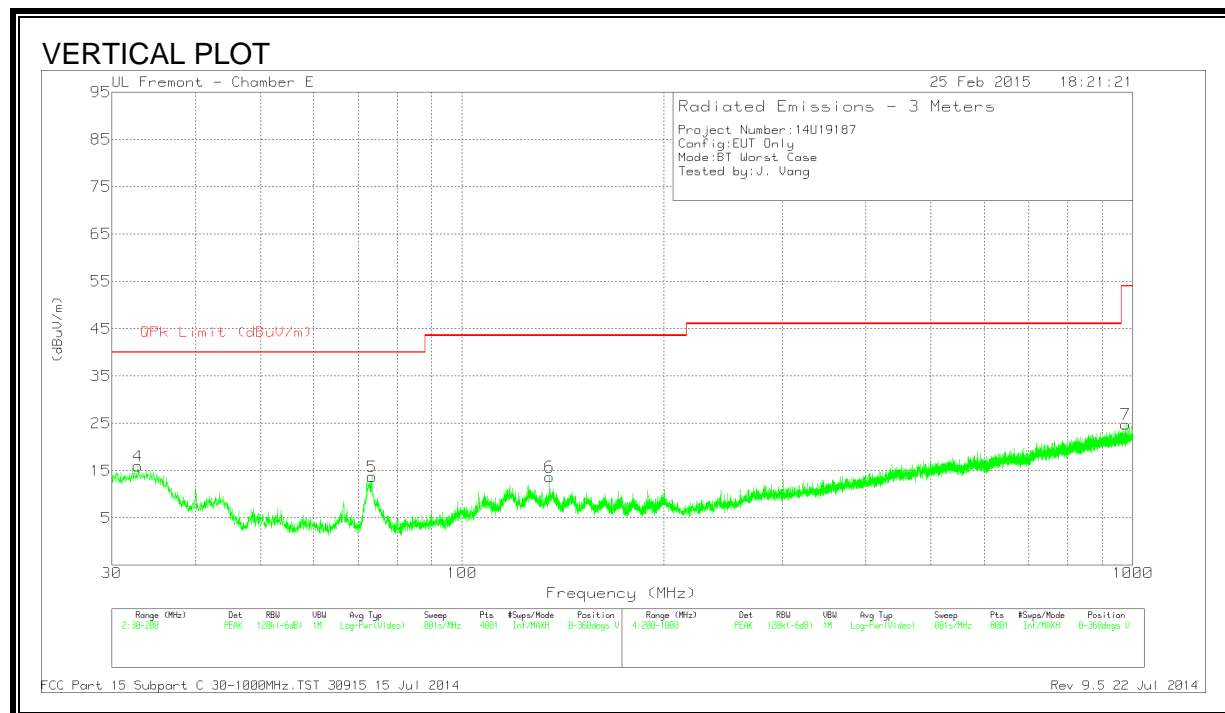
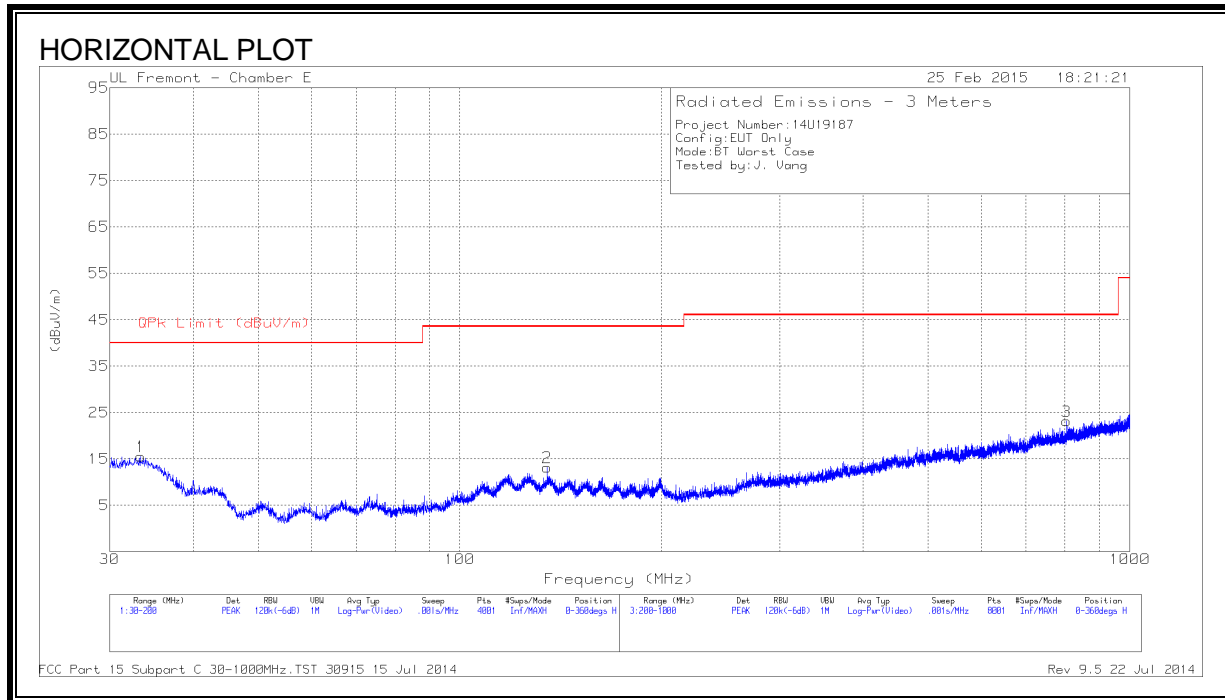


**DATA**

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AF T122 (dB/m) | Amp/Cbl (dB) | Corrected Reading (dBuV/m) | QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|--------------|----------------------------|--------------------|-------------|----------------|-------------|----------|
| 1      | 34.93           | 31.68                | PK  | 17.4           | -31.8        | 17.28                      | 40                 | -22.72      | 0-360          | 201         | H        |
| 2      | 71.65           | 45.94                | PK  | 8.4            | -31.5        | 22.84                      | 40                 | -17.16      | 0-360          | 201         | H        |
| 3      | 33.4            | 42.34                | PK  | 18.8           | -31.9        | 29.24                      | 40                 | -10.76      | 0-360          | 100         | V        |
| 4      | 42.1125         | 39.03                | PK  | 12.6           | -31.8        | 19.83                      | 40                 | -20.17      | 0-360          | 100         | V        |
| 5      | 340.7           | 33.47                | PK  | 14.1           | -29.9        | 17.67                      | 46.02              | -28.35      | 0-360          | 99          | H        |
| 6      | 438.1           | 30.01                | PK  | 16.7           | -29.5        | 17.21                      | 46.02              | -28.81      | 0-360          | 201         | V        |

PK - Peak detector

**ANTENNA D**



**DATA**

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AF T408 (dB/m) | Amp/Cbl (dB) | Corrected Reading (dBuV/m) | QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|--------------|----------------------------|--------------------|-------------|----------------|-------------|----------|
| 2      | * 134.975       | 30.98                | PK  | 13.3           | -31.1        | 13.18                      | 43.52              | -30.34      | 0-360          | 301         | H        |
| 5      | * 73.3075       | 36.74                | PK  | 8.5            | -31.5        | 13.74                      | 40                 | -26.26      | 0-360          | 100         | V        |
| 6      | * 135.0175      | 31.51                | PK  | 13.3           | -31.1        | 13.71                      | 43.52              | -29.81      | 0-360          | 100         | V        |
| 7      | * 976           | 29.61                | PK  | 22.5           | -27.3        | 24.81                      | 53.97              | -29.16      | 0-360          | 301         | V        |
| 4      | 32.8475         | 28.28                | PK  | 19.5           | -31.8        | 15.98                      | 40                 | -24.02      | 0-360          | 100         | V        |
| 1      | 33.3575         | 28.25                | PK  | 19.1           | -31.8        | 15.55                      | 40                 | -24.45      | 0-360          | 201         | H        |
| 3      | 805             | 30.73                | PK  | 21.1           | -28.7        | 23.13                      | 46.02              | -22.89      | 0-360          | 99          | H        |

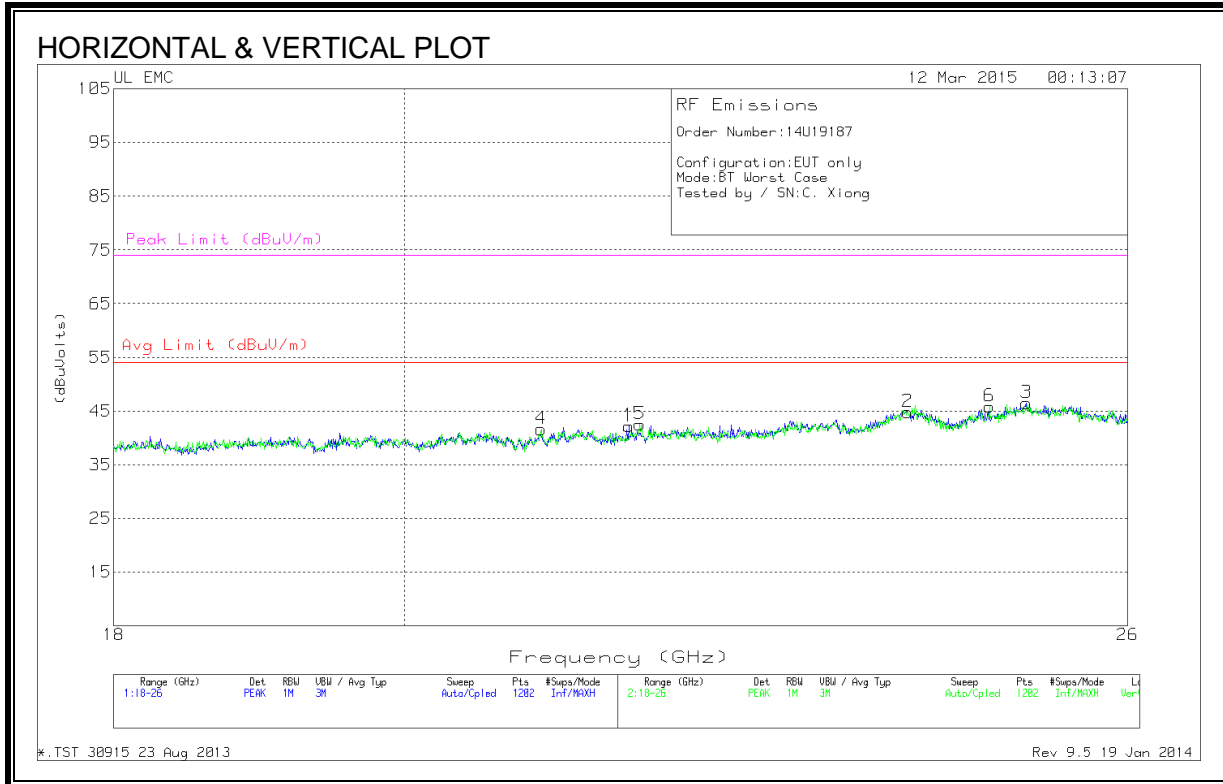
\* - indicates frequency in CFR 47, Part 15 and Industry Canada RSS-Restricted Band.

PK - Peak detector

### 10.4. WORST-CASE ABOVE 18 GHz

#### SPURIOUS EMISSIONS 18000 TO 26000 MHz (WORST-CASE CONFIGURATION)

#### ANTENNA B

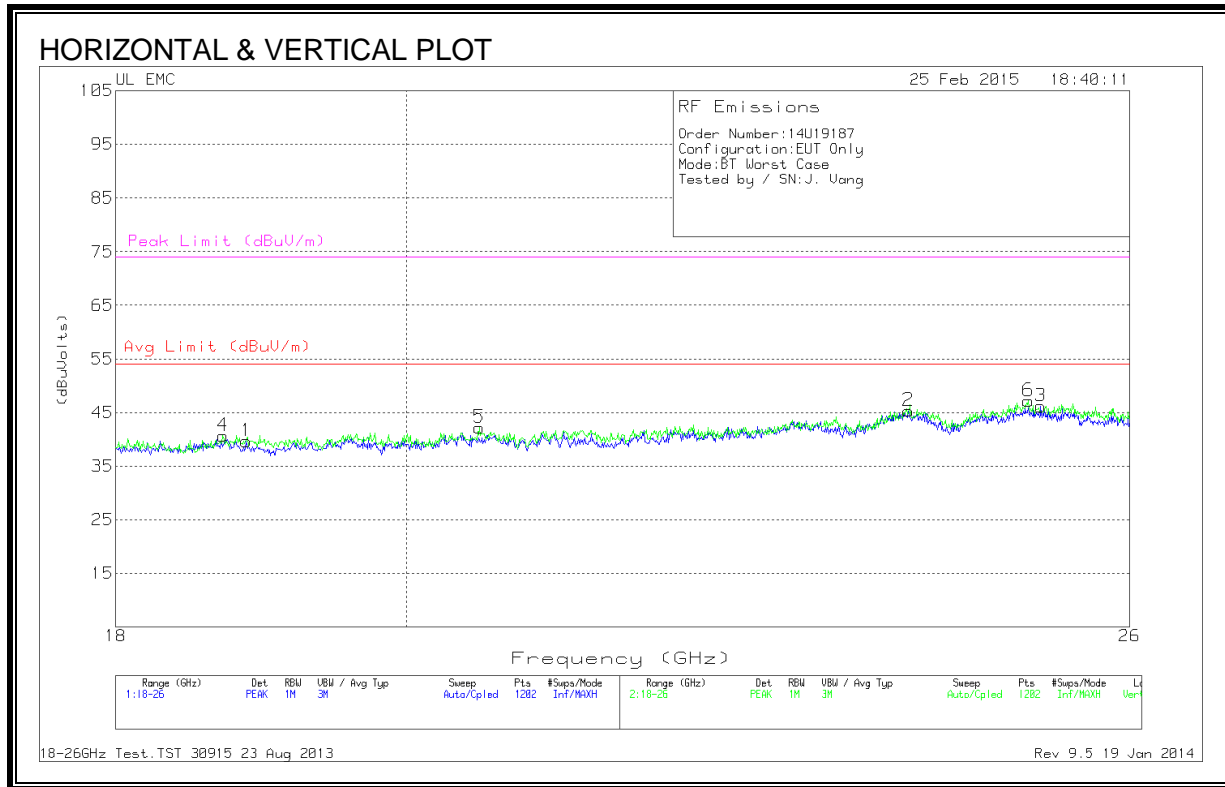


#### DATA

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | T89 AF (dB/m) | Amp/Cbl (dB) | Dist Corr (dB) | Corrected Reading (dBuVolts) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) |
|--------|-----------------|----------------------|-----|---------------|--------------|----------------|------------------------------|--------------------|-------------|---------------------|----------------|
| 1      | 21.697          | 41.77                | PK  | 33.6          | -23.7        | -9.5           | 42.16                        | 54                 | -11.83      | 74                  | -31.83         |
| 2      | 24.005          | 42.83                | PK  | 34.2          | -22.7        | -9.5           | 44.83                        | 54                 | -9.16       | 74                  | -29.16         |
| 3      | 25.061          | 44.1                 | PK  | 34.5          | -22.6        | -9.5           | 46.5                         | 54                 | -7.5        | 74                  | -27.5          |
| 4      | 21.017          | 41.57                | PK  | 33.3          | -23.7        | -9.5           | 41.66                        | 54                 | -12.33      | 74                  | -32.33         |
| 5      | 21.784          | 41.5                 | PK  | 33.6          | -23.1        | -9.5           | 42.5                         | 54                 | -11.5       | 74                  | -31.5          |
| 6      | 24.728          | 43.63                | PK  | 34.5          | -22.8        | -9.5           | 45.83                        | 54                 | -8.16       | 74                  | -28.16         |

PK - Peak detector

**ANTENNA D**



**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | T89 AF (dB/m) | Amp/Cbl (dB) | Dist Corr (dB) | Corrected Reading (dBuVolts) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) |
|--------|-----------------|----------------------|-----|---------------|--------------|----------------|------------------------------|--------------------|-------------|---------------------|----------------|
| 1      | 18.873          | 40.87                | PK  | 32.8          | -24.5        | -9.5           | 39.6                         | 54                 | -14.3       | 74                  | -34.3          |
| 2      | 23.995          | 43.33                | PK  | 34.2          | -22.7        | -9.5           | 45.3                         | 54                 | -8.6        | 74                  | -28.6          |
| 3      | 25.174          | 44.07                | PK  | 34.5          | -22.9        | -9.5           | 46.1                         | 54                 | -7.8        | 74                  | -27.8          |
| 4      | 18.713          | 41.67                | PK  | 32.7          | -24.2        | -9.5           | 40.6                         | 54                 | -13.3       | 74                  | -33.3          |
| 5      | 20.538          | 42.47                | PK  | 33            | -23.8        | -9.5           | 42.1                         | 54                 | -11.8       | 74                  | -31.8          |
| 6      | 25.061          | 44.77                | PK  | 34.5          | -22.6        | -9.5           | 47.1                         | 54                 | -6.8        | 74                  | -26.8          |

PK - Peak detector

## 11. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

| Frequency of emission (MHz) | Conducted limit (dBµV) |           |
|-----------------------------|------------------------|-----------|
|                             | Quasi-peak             | Average   |
| 0.15-0.5                    | 66 to 56*              | 56 to 46* |
| 0.5-5                       | 56                     | 46        |
| 5-30                        | 60                     | 50        |

\*Decreases with the logarithm of the frequency.

### TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

### RESULTS



**6 WORST EMISSIONS**

**Line-L1 .15 - 30MHz**

**Trace Markers**

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | T24 IL L1 (dB) | LC Cables 1&3 (dB) | Corrected Reading dBuV | CISPR 22 Class B QP | Margin to Limit (dB) | CISPR 22 Class B Avg | Margin to Limit (dB) |
|--------|-----------------|----------------------|-----|----------------|--------------------|------------------------|---------------------|----------------------|----------------------|----------------------|
| 1      | .204            | 37.73                | PK  | .9             | 0                  | 38.63                  | 63.4                | -24.77               | -                    | -                    |
| 2      | .204            | 30.63                | Av  | .9             | 0                  | 31.53                  | -                   | -                    | 53.4                 | -21.87               |
| 3      | .582            | 42.55                | PK  | .3             | 0                  | 42.85                  | 56                  | -13.15               | -                    | -                    |
| 4      | .582            | 29.04                | Av  | .3             | 0                  | 29.34                  | -                   | -                    | 46                   | -16.66               |
| 5      | 1.7475          | 31.67                | PK  | .2             | .1                 | 31.97                  | 56                  | -24.03               | -                    | -                    |
| 6      | 1.7475          | 19.27                | Av  | .2             | .1                 | 19.57                  | -                   | -                    | 46                   | -26.43               |
| 7      | 9.15            | 28.87                | PK  | .2             | .2                 | 29.27                  | 60                  | -30.73               | -                    | -                    |
| 8      | 9.15            | 18.52                | Av  | .2             | .2                 | 18.92                  | -                   | -                    | 50                   | -31.08               |

**Line-L2 .15 - 30MHz**

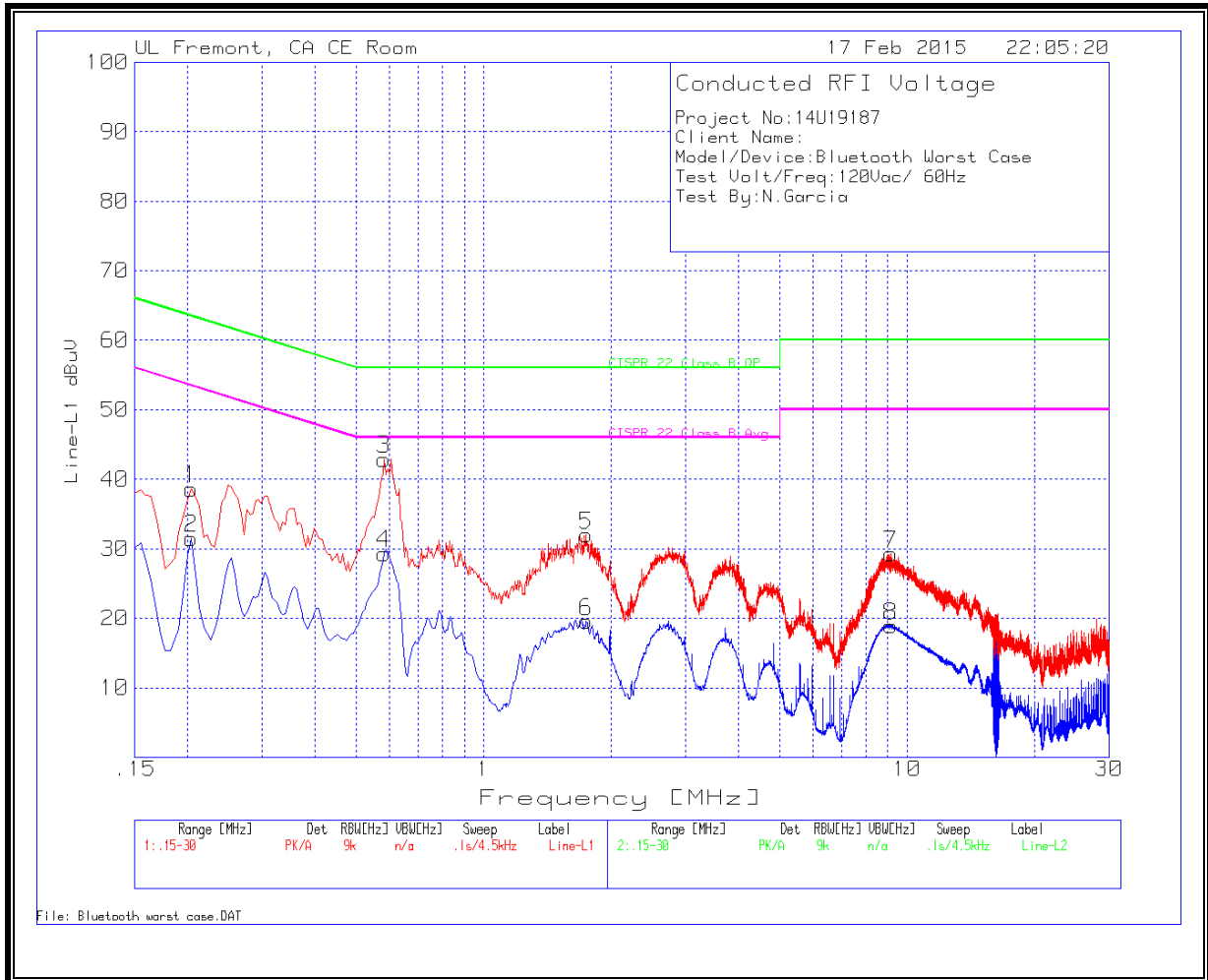
**Trace Markers**

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | T24 IL L2 (dB) | LC Cables 2&3 (dB) | Corrected Reading dBuV | CISPR 22 Class B QP | Margin to Limit (dB) | CISPR 22 Class B Avg | Margin to Limit (dB) |
|--------|-----------------|----------------------|-----|----------------|--------------------|------------------------|---------------------|----------------------|----------------------|----------------------|
| 9      | .204            | 36.84                | PK  | 1              | 0                  | 37.84                  | 63.4                | -25.56               | -                    | -                    |
| 10     | .204            | 28.7                 | Av  | 1              | 0                  | 29.7                   | -                   | -                    | 53.4                 | -23.7                |
| 11     | .591            | 38.33                | PK  | .3             | 0                  | 38.63                  | 56                  | -17.37               | -                    | -                    |
| 12     | .591            | 24.25                | Av  | .3             | 0                  | 24.55                  | -                   | -                    | 46                   | -21.45               |
| 13     | 1.5765          | 28.79                | PK  | .2             | .1                 | 29.09                  | 56                  | -26.91               | -                    | -                    |
| 14     | 1.5765          | 10.93                | Av  | .2             | .1                 | 11.23                  | -                   | -                    | 46                   | -34.77               |
| 15     | 9.1815          | 30.56                | PK  | .2             | .2                 | 30.96                  | 60                  | -29.04               | -                    | -                    |
| 16     | 9.1815          | 19.85                | Av  | .2             | .2                 | 20.25                  | -                   | -                    | 50                   | -29.75               |

PK - Peak detector

Av - average detection

**LINE 1 RESULTS**



**LINE 2 RESULTS**

