



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

BLUETOOTH LOW ENERGY  
CERTIFICATION TEST REPORT

FOR

HEALTH MONITORING DEVICE

MODEL NUMBER: 848766

FCC ID: 2AB8ZND6  
IC: 1000X-ND6

REPORT NUMBER: 15U20766-E1V3

ISSUE DATE: DECEMBER 11, 2015

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NVLAP®

NVLAP LAB CODE 200065-0

Revision History

| Rev. | Issue Date | Revisions                 | Revised By |
|------|------------|---------------------------|------------|
| V1   | 10/27/2015 | Initial Issue             | C. PANG    |
| V2   | 12/04/2015 | Address TCB's Questions   | C. PANG    |
| V3   | 12/11/2015 | Removed conducted results | D.Weaver   |

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** INTEL CORPORATION  
2200 MISSION COLLEGE BOULEVARD  
SANTA CLARA, CA 95052, U.S.A.

**EUT DESCRIPTION:** HEALTH MONITORING DEVICE

**MODEL:** 848766

**SERIAL NUMBER:** VT0123FZ53200HG (CONDUCTED)  
VT0123FZ53200HU (RADIATED)

**DATE TESTED:** SEPTEMBER 09 -10, 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:



CHIN PANG  
EMC SENIOR ENGINEER  
UL VERIFICATION SERVICES INC.

Tested By:



CHRIS XIONG  
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, ANSI C63.10-2013, RSS-GEN Issue 4, and RSS-247 Issue 1.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

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 type="checkbox"/> Chamber E            |
| <input type="checkbox"/> Chamber C | <input checked="" type="checkbox"/> Chamber F |
|                                    | <input type="checkbox"/> Chamber G            |
|                                    | <input checked="" 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:

$$\begin{aligned}\text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ \text{Cable Loss (dB)} - \text{Preamp Gain (dB)} & \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m}\end{aligned}$$

## 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   |
| Radiated Disturbance, 1 to 6 GHz      | ± 3.86 dB   |
| Radiated Disturbance, 6 to 18 GHz     | ± 4.23 dB   |
| Radiated Disturbance, 18 to 26 GHz    | ± 5.30 dB   |
| Radiated Disturbance, 26 to 40 GHz    | ± 5.23 dB   |

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a Wearable Device with BLE. It is battery operated and is not functional while charging.

### 5.2. MAXIMUM OUTPUT POWER

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

| Frequency Range (MHz) | Mode | Output Power (dBm) | Output Power (mW) |
|-----------------------|------|--------------------|-------------------|
| 2402 - 2480           | BLE  | 4.03               | 2.53              |

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PCB Trace antenna, with a maximum gain of 0 dBi.

### 5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 1.12.0x1.

The test utility software used during testing was Vortex Control Panel, ver. 3.2.7.

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

Worst-case data rates as provided by the client were:

Based on the baseline scan, the worst-case data rates were:

BLE: 1 Mbps.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Support Equipment List |              |             |                      |        |
|------------------------|--------------|-------------|----------------------|--------|
| Description            | Manufacturer | Model       | Serial Number        | FCC ID |
| Laptop                 | Lenovo       | Yoga 2 11   | YB04499042           | N/A    |
| AC Adapter             | Lenovo       | ADLX45NCC3A | 11S45N0297ZSH443G0XE | N/A    |
| Test Board             | INTEL        | N/A         | N/A                  | N/A    |

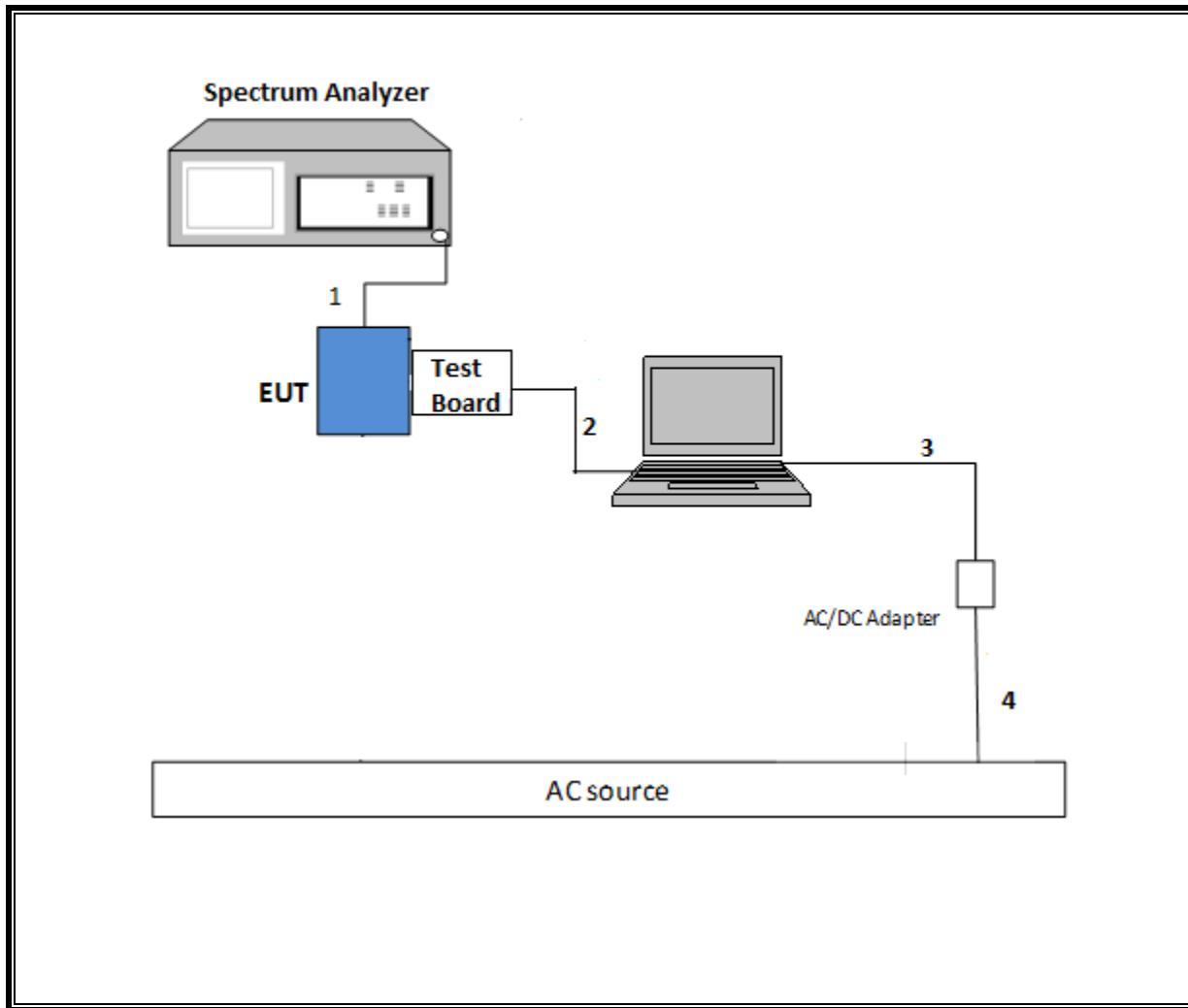
### I/O CABLES

| I/O Cable List |         |                      |                |             |                  |                      |
|----------------|---------|----------------------|----------------|-------------|------------------|----------------------|
| Cable No       | Port    | # of identical ports | Connector Type | Cable Type  | Cable Length (m) | Remarks              |
| 1              | Antenna | 1                    | SMA            | un-shielded | 0.045            | To Spectrum Analyzer |
| 2              | USB     | 1                    | USB            | shielded    | 1.85             | Test board to Laptop |
| 3              | DC      | 1                    | DC             | un-shielded | 1                | N/A                  |
| 4              | AC      | 1                    | 3-Prong        | un-shielded | 1.8              | N/A                  |

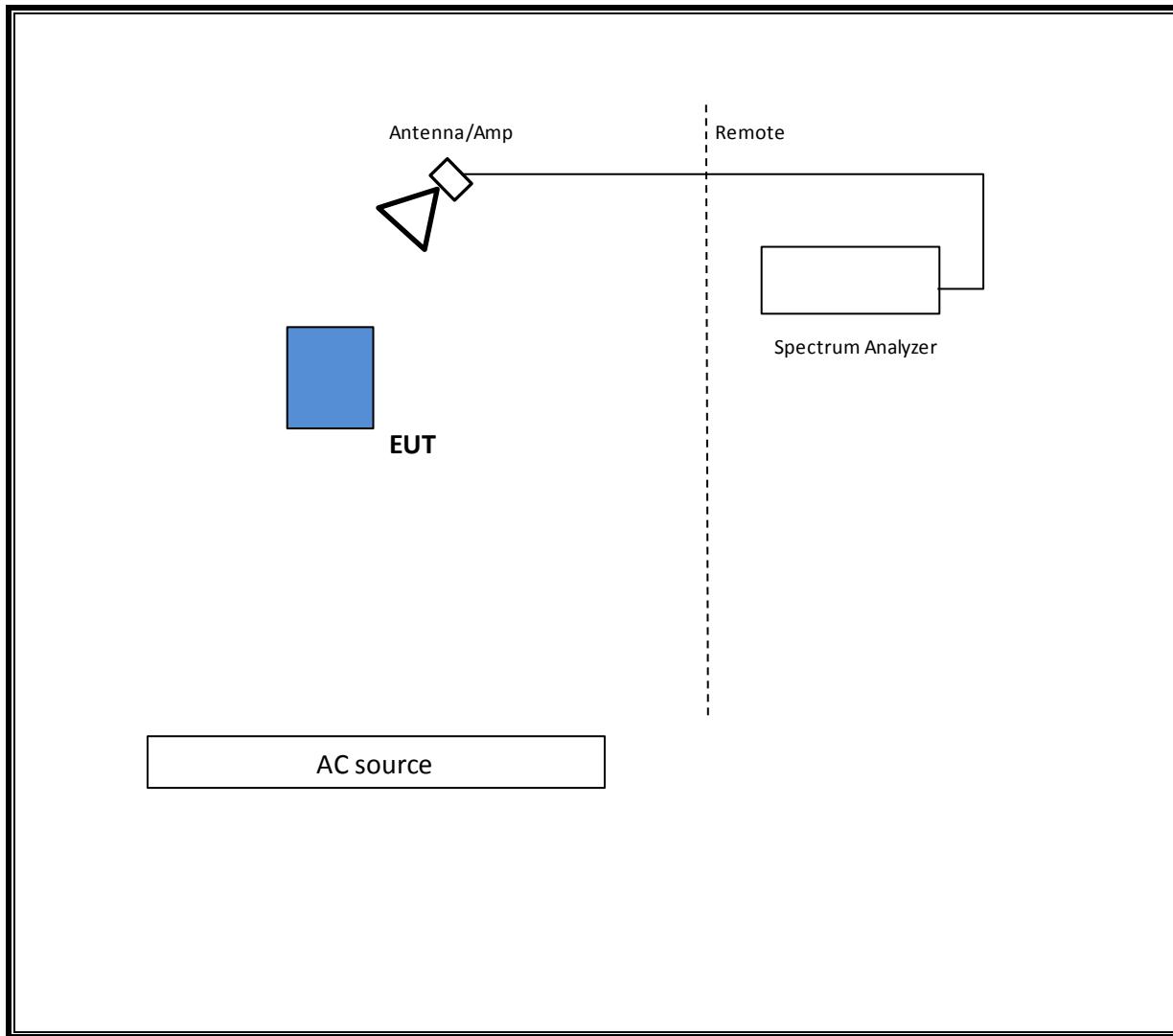
### TEST SETUP

The EUT is a standalone device. Test software exercised the radio card.

**SETUP DIAGRAM FOR CONDUCTED TESTS**



**SETUP DIAGRAM FOR RADIATED TESTS**



## 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                  | T No.                    | Cal Due |
| Spectrum Analyzer, PXA,3Hz to 44GHz          | Agilent         | N9030A                 | 341                      | 2/20/16 |
| Antenna, Horn 1-18GHz                        | ETS Lindgren    | 3117                   | 120                      | 3/26/16 |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz  | Sunol Sciences  | JB1                    | 122                      | 2/13/16 |
| Amplifier, 10KHz to 1GHz,                    | Sonoma          | 310N                   | 173                      | 6/9/16  |
| Amplifier, 1 - 18GHz                         | Miteq           | AFS42-00101800-25-S-42 | 742                      | 1/31/16 |
| Amplifier, 1 to 26.5GHz, 23.5dB Gain minimum | Keysight        | 8449B                  | 404                      | 6/29/16 |
| Antenna, Horn 18 to 26.5GHz                  | ARA             | MWH-1826               | 39                       | 1/29/16 |
| Spectrum Analyzer, PXA,3Hz to 44GHz          | Agilent         | N9030A                 | 342                      | 6/29/16 |
| EMI Test Receiver, 9kHz to 7GHz              | Rhode & Schwarz | ESCI 7                 | 1124                     | 9/30/15 |
| LISN, 30MHz                                  | FCC             | 50/250-25-2            | 24                       | 1/16/16 |
| Antenna, Active Loop 9kHz-30MHz              | ETS Lindgren    | 6502                   | 757                      | 5/21/16 |
| Spectrum Analyzer, PXA,3Hz to 44GHz          | Agilent         | N9030A                 | 906                      | 6/11/16 |
| UL SOFTWARE                                  |                 |                        |                          |         |
| *Radiated Software                           | UL              | UL EMC                 | Ver 9.5, July 22, 2014   |         |
| *Conducted Software                          | UL              | UL EMC                 | Ver 3.4, August 28, 2015 |         |
| *AC Line Conducted Software                  | UL              | UL EMC                 | Ver 9.5, April 3, 2015   |         |

## 7. ANTENNA PORT TEST RESULTS

### 7.1. MEASUREMENT METHODS

6 dB BW: KDB 558074 D01 v03r03, Section 8.1.

Output Power: KDB 558074 D01 v03r03, Section 9.1.2.

Power Spectral Density: KDB 558074 D01 v03r03, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r03, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r03, Section 12.1.

Band-edge: KDB 558074 D01 v03r03, Section 12.1

## 7.2. ON TIME AND DUTY CYCLE RESULTS

### LIMITS

None; for reporting purposes only.

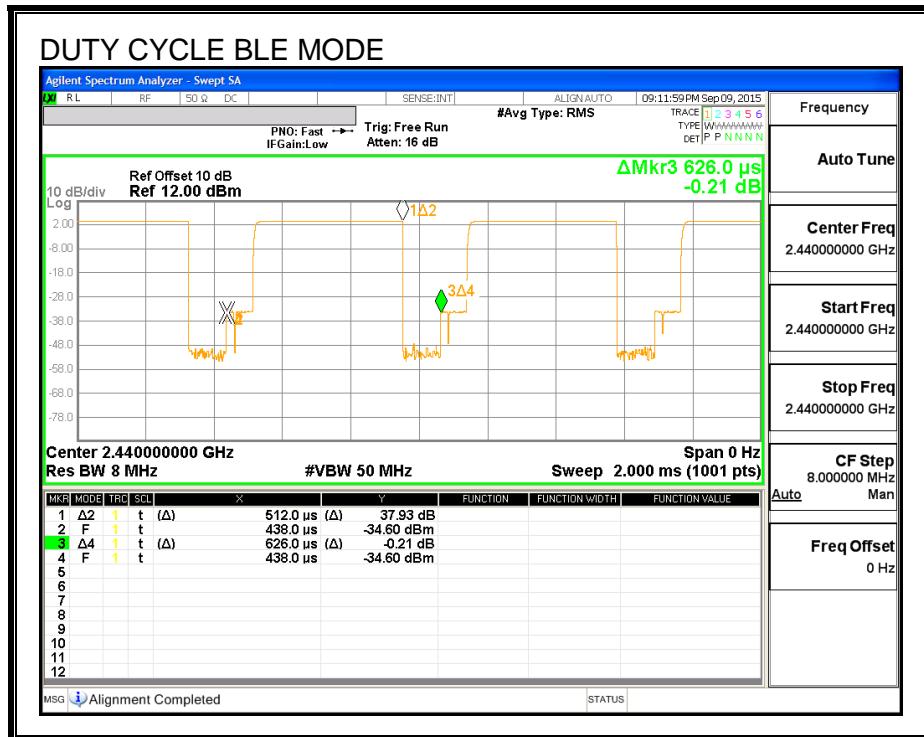
### PROCEDURE

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) |
|------|------------------------|------------------|-----------------------------|----------------------|---|-----------------------------|
| BLE  | 0.512                  | 0.626            | 0.818                       | 81.79%               | 0.87                                    | 1.953                       |

### DUTY CYCLE PLOTS



### 7.3. 6 dB BANDWIDTH

#### LIMITS

FCC §15.247 (a) (2)

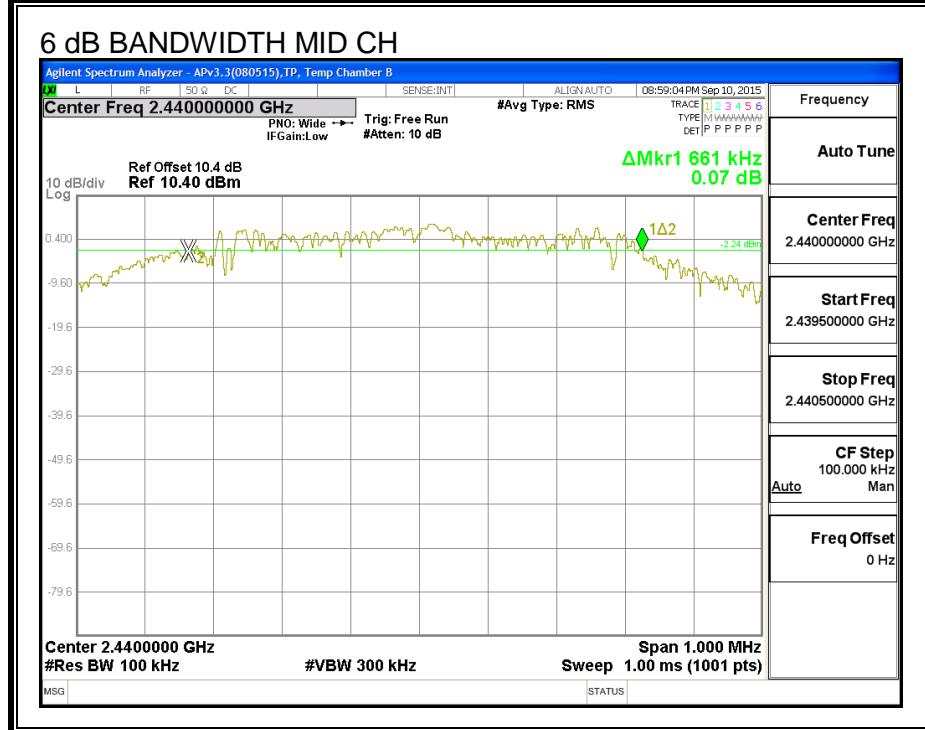
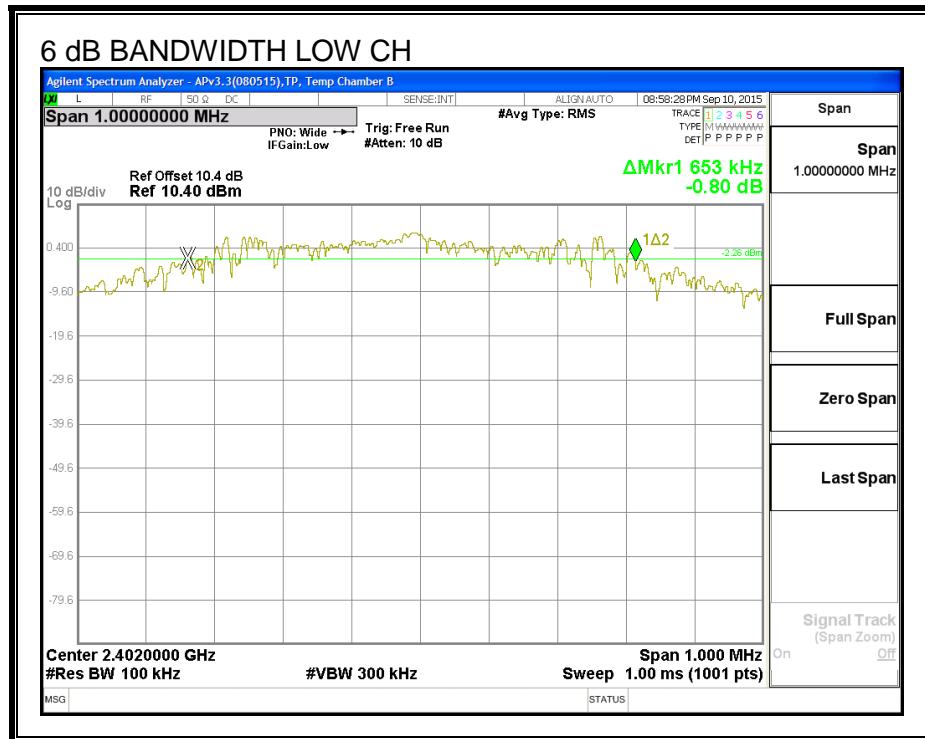
IC RSS-247 (5.2) (1)

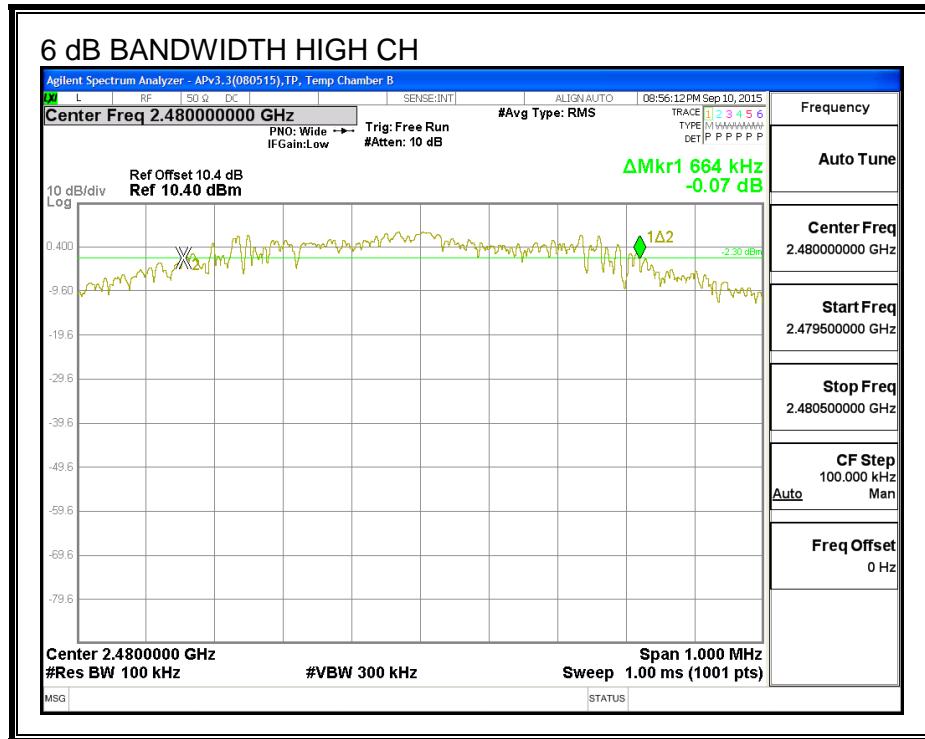
The minimum 6 dB bandwidth shall be at least 500 kHz.

#### RESULTS

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|----------------------|---------------------|
| Low     | 2402            | 0.653                | 0.5                 |
| Middle  | 2440            | 0.661                | 0.5                 |
| High    | 2480            | 0.664                | 0.5                 |

## 6 dB BANDWIDTH





## 7.4. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

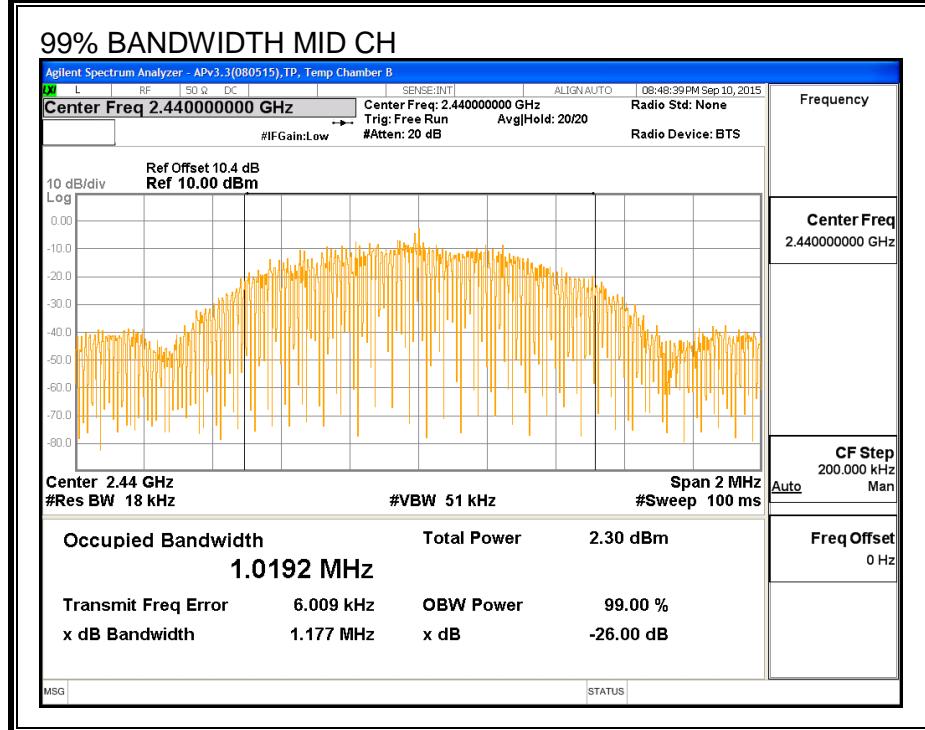
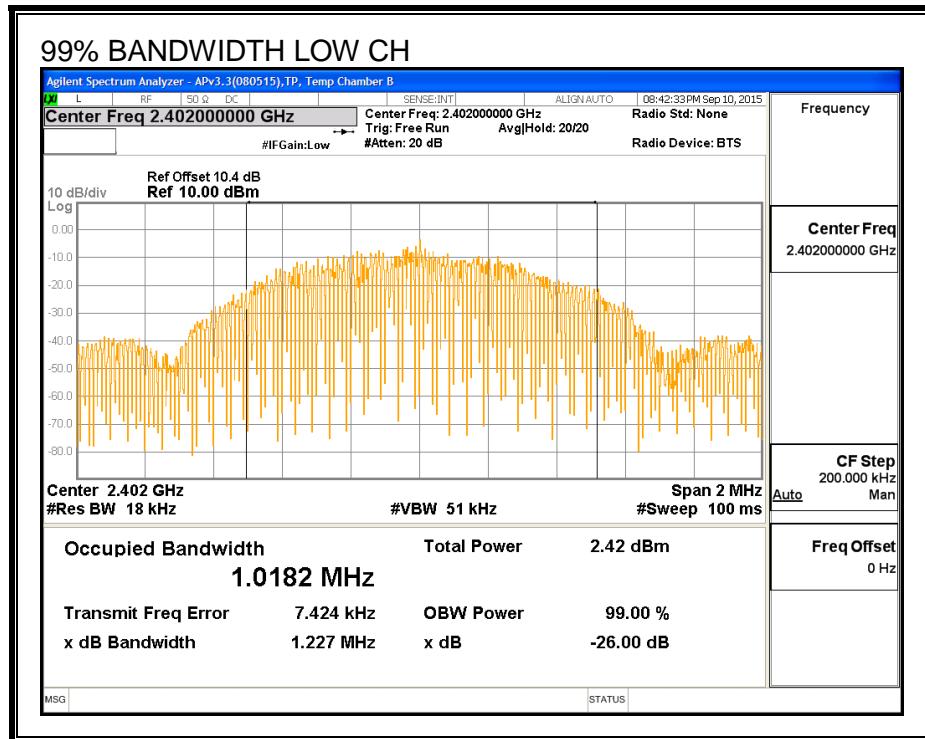
### TEST PROCEDURE

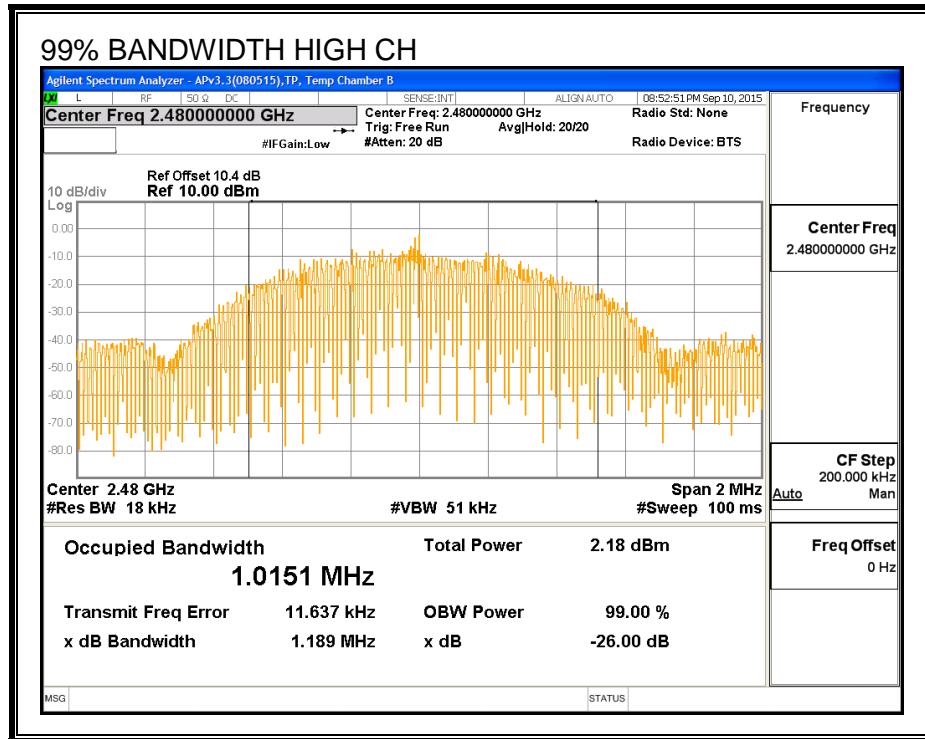
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

### RESULTS

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low     | 2402            | 1.0182              |
| Middle  | 2440            | 1.0192              |
| High    | 2480            | 1.0151              |

**99% BANDWIDTH**





## 7.5. OUTPUT POWER

### LIMITS

FCC §15.247 (b)

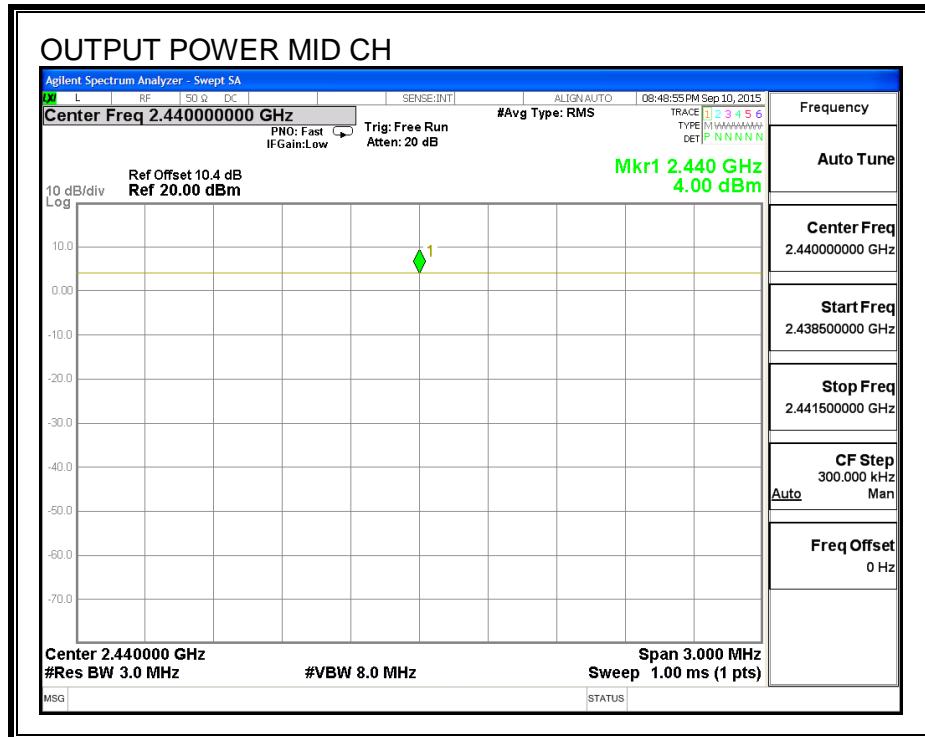
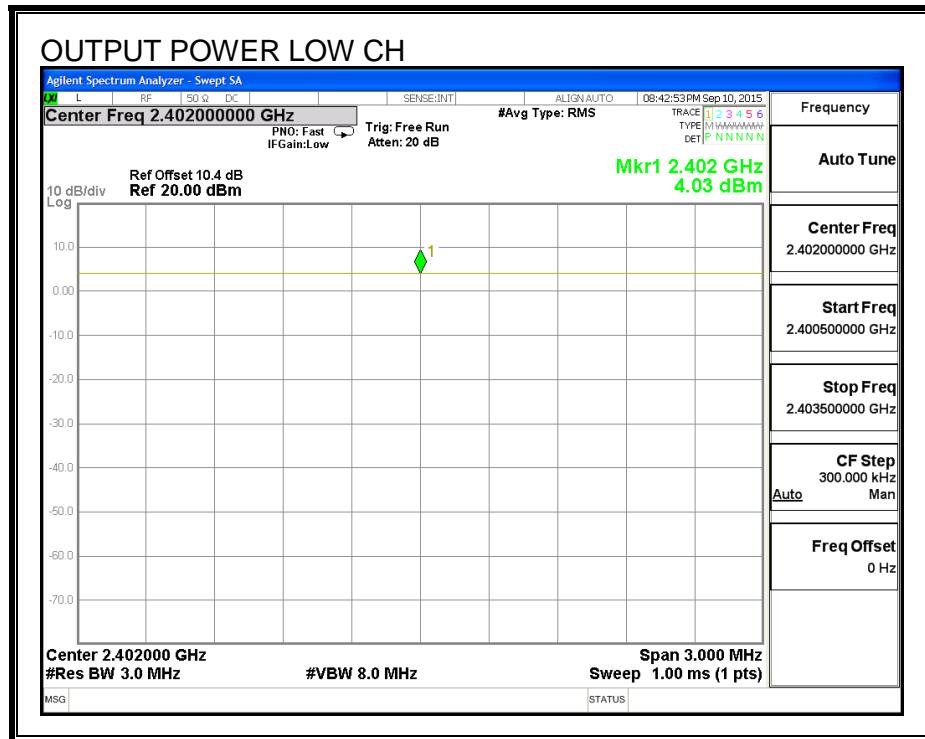
IC RSS-247 (5.4) (4)

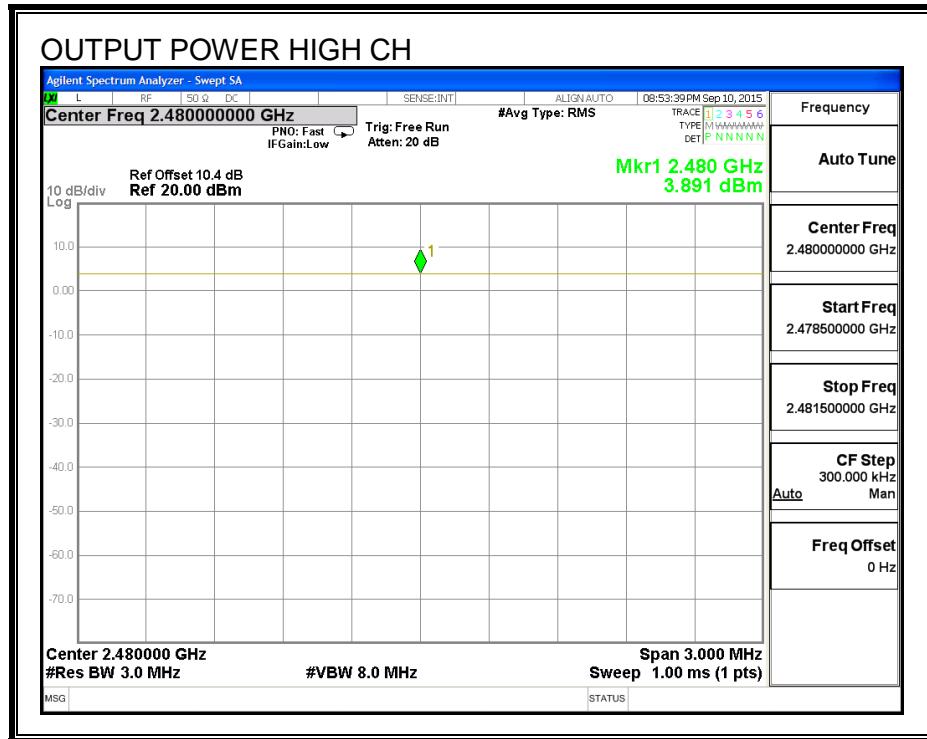
The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

### RESULTS

| Channel | Frequency<br>(MHz) | Peak Power<br>Reading<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) |
|---------|--------------------|--------------------------------|----------------|----------------|
| Low     | 2402               | 4.03                           | 30             | -25.970        |
| Middle  | 2440               | 4.00                           | 30             | -26.000        |
| High    | 2480               | 3.89                           | 30             | -26.109        |

## OUTPUT POWER





## 7.6. AVERAGE POWER

### LIMITS

None; for reporting purposes only.

### RESULTS

The cable assembly insertion loss of 10.4 dB (including 10 dB pad and 0.4dB cable) was entered as an offset in the power meter to allow for direct reading of power.

| Channel | Frequency (MHz) | AV power (dBm) |
|---------|-----------------|----------------|
| Low     | 2402            | 3.89           |
| Middle  | 2440            | 3.94           |
| High    | 2480            | 3.85           |

## 7.7. POWER SPECTRAL DENSITY

### LIMITS

FCC §15.247 (e)

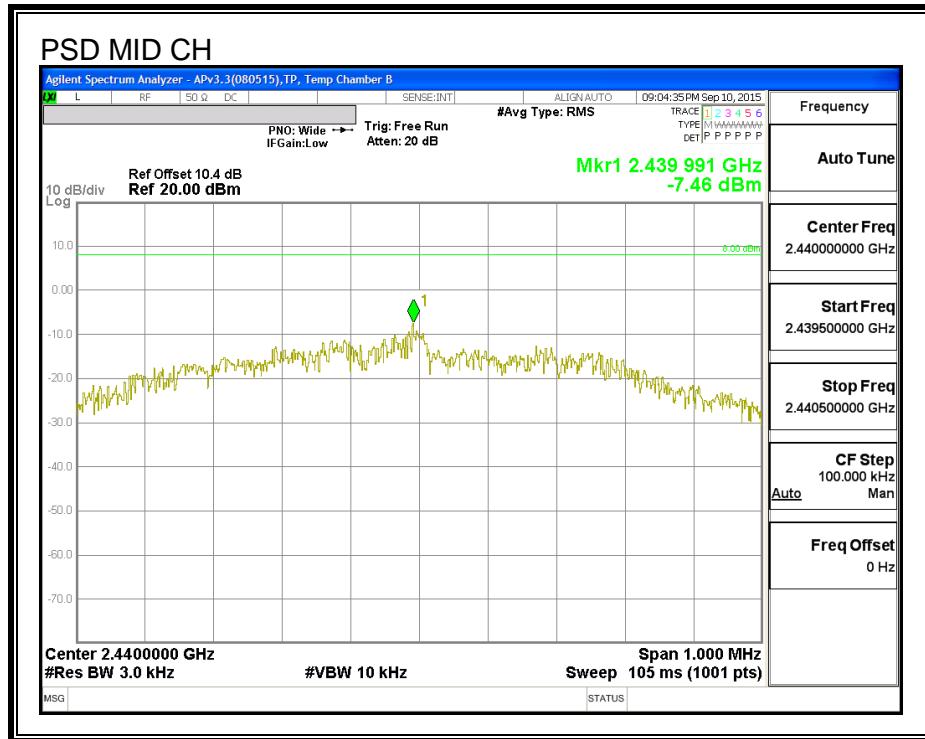
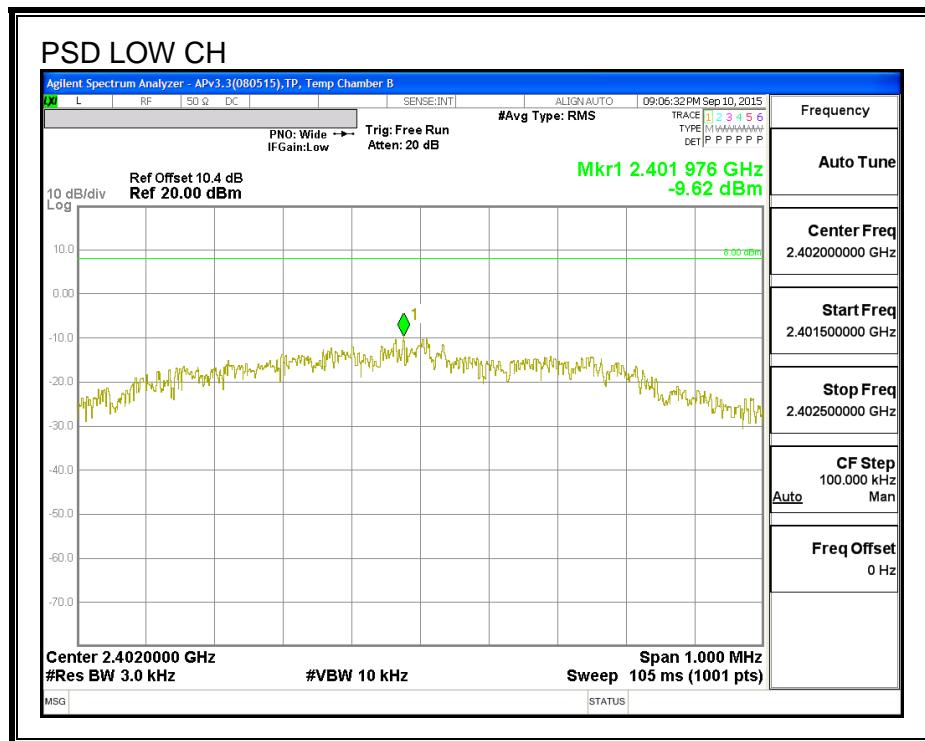
IC RSS-247 (5.2) (2)

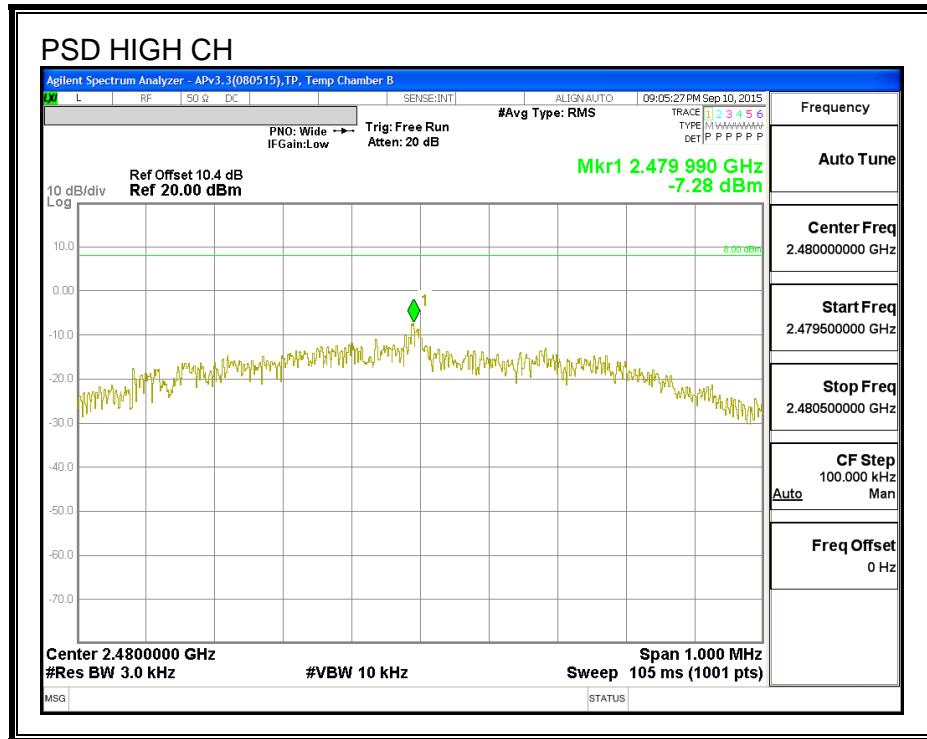
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### RESULTS

| Channel | Frequency (MHz) | PSD (dBm) | Limit (dBm) | Margin (dB) |
|---------|-----------------|-----------|-------------|-------------|
| Low     | 2402            | -9.62     | 8           | -17.62      |
| Middle  | 2440            | -7.46     | 8           | -15.46      |
| High    | 2480            | -7.28     | 8           | -15.28      |

## POWER SPECTRAL DENSITY





## 7.8. CONDUCTED SPURIOUS EMISSIONS

### LIMITS

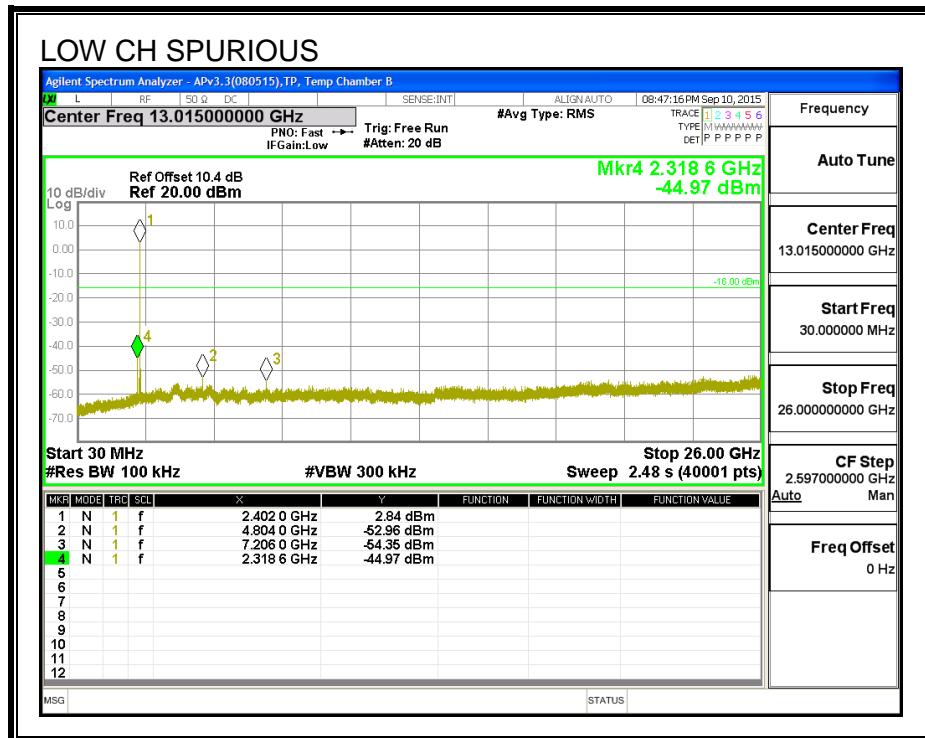
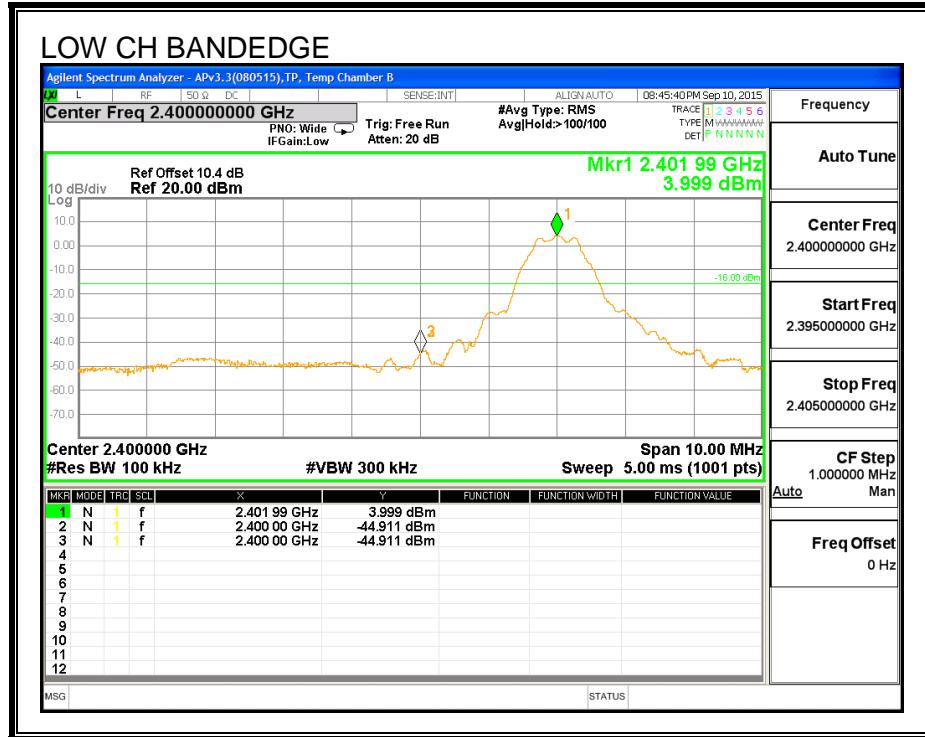
FCC §15.247 (d)

IC RSS-247 (5.5)

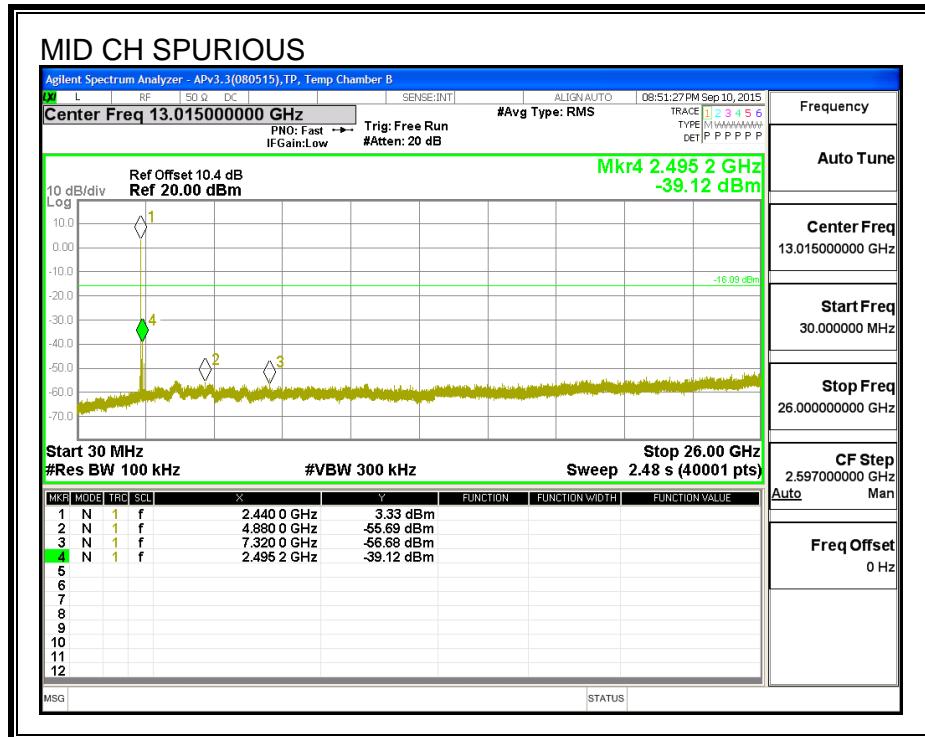
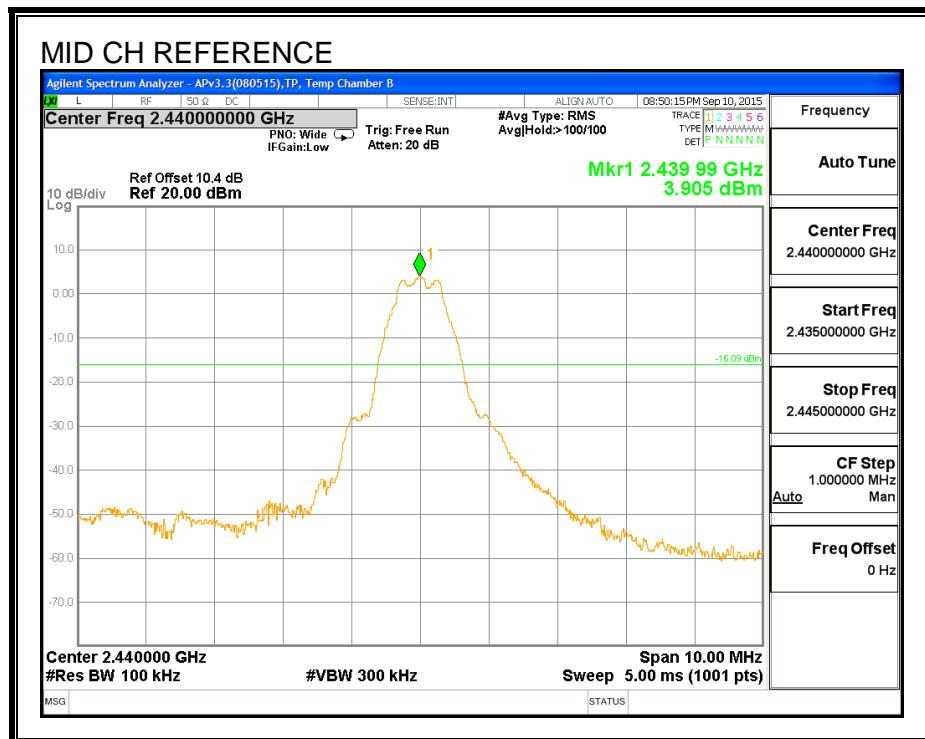
Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

## RESULTS

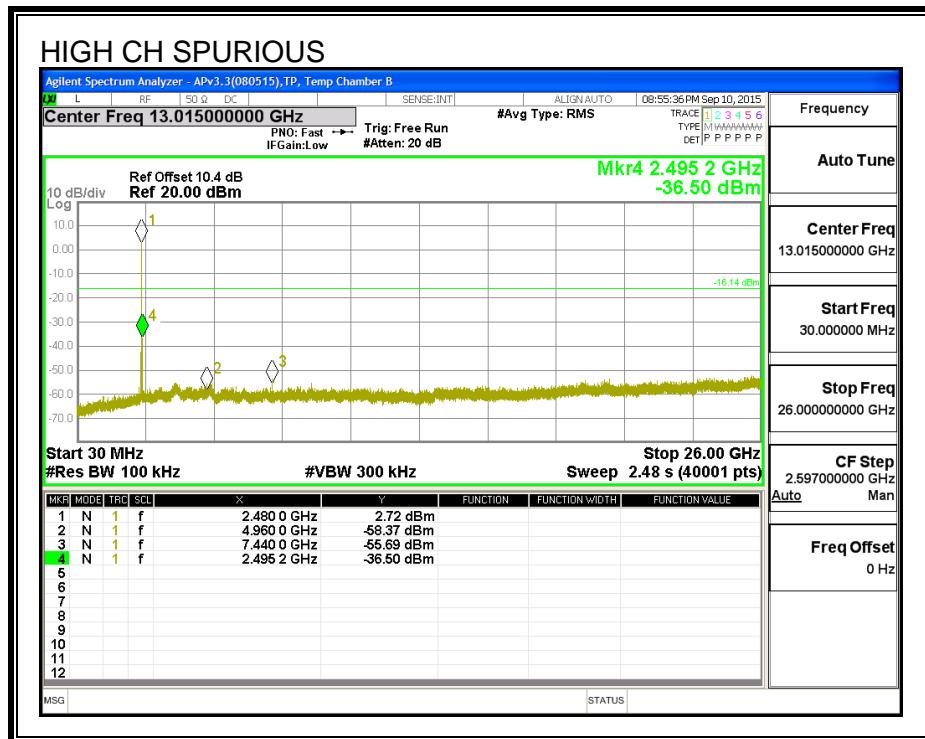
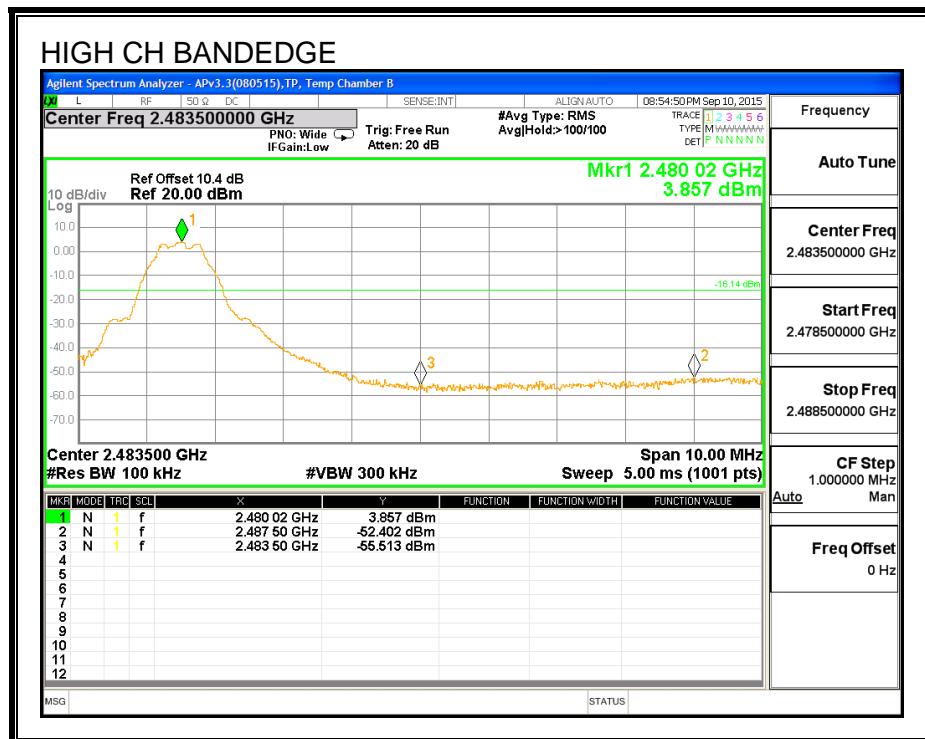
### SPURIOUS EMISSIONS, LOW CHANNEL



**SPURIOUS EMISSIONS, MID CHANNEL**



**SPURIOUS EMISSIONS, HIGH CHANNEL**



## 8. RADIATED TEST RESULTS

### 8.1. 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 for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. 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.

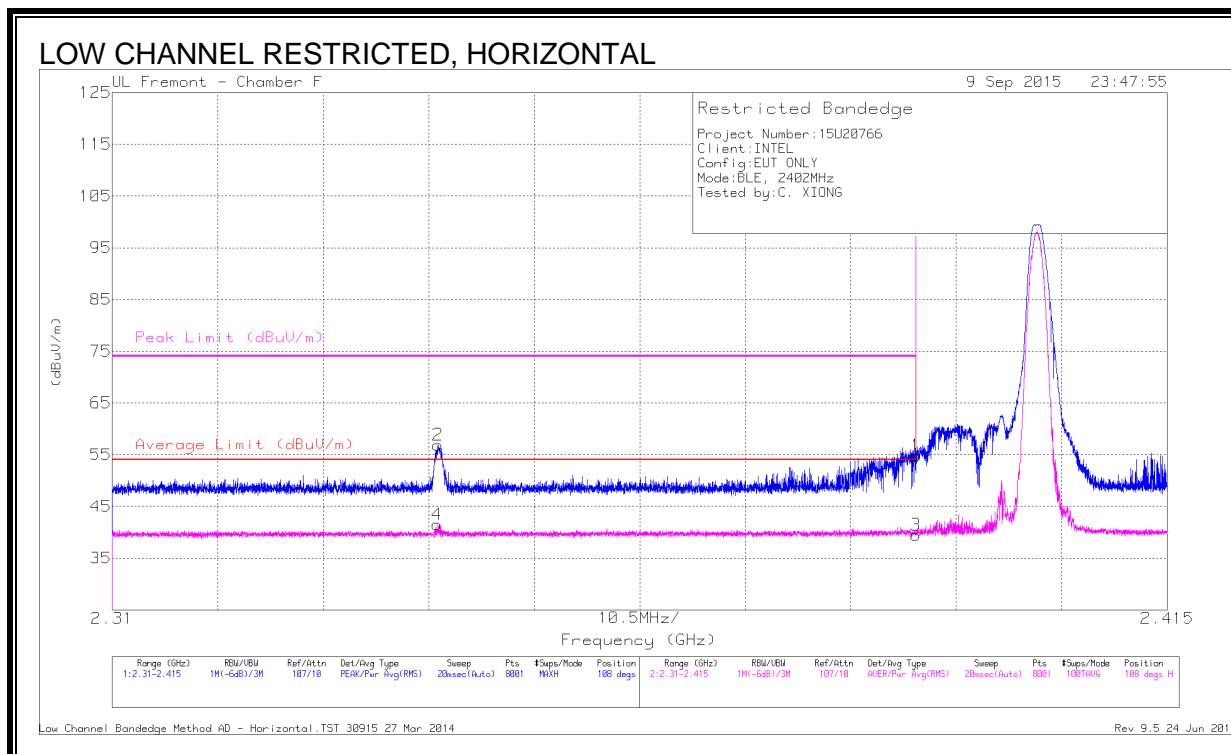
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 3MHz video bandwidth with average detector for average measurements.

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.

## 8.2. TRANSMITTER ABOVE 1 GHz

### RESTRICTED BANDEDGE (LOW CHANNEL)



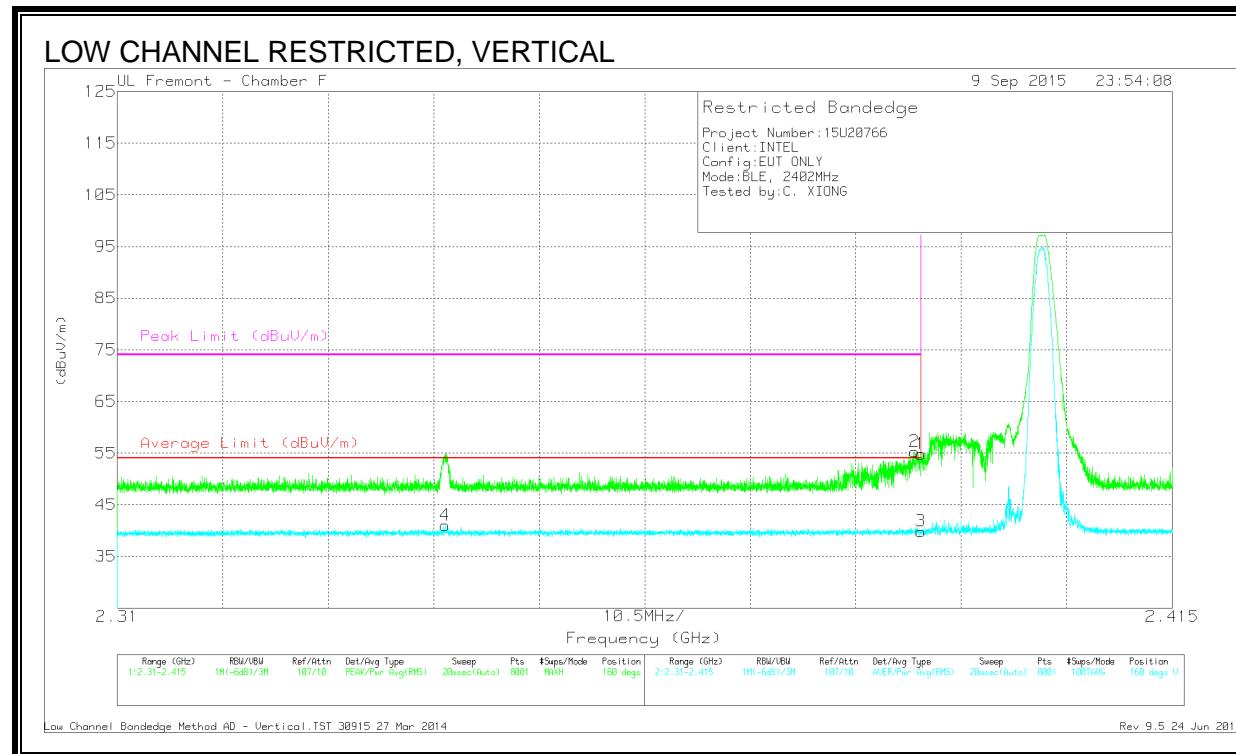
### DATA

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cbl/Flt r/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          | 43.93                | Pk  | 31.9           | -21                    | 0            | 54.83                      | -                      | -           | 74                  | -19.17         | 108            | 272         | H        |
| 2      | * 2.342         | 46.17                | Pk  | 31.8           | -21.1                  | 0            | 56.87                      | -                      | -           | 74                  | -17.13         | 108            | 272         | H        |
| 3      | * 2.39          | 27.69                | RMS | 31.9           | -21                    | .87          | 39.46                      | 54                     | -14.54      | -                   | -              | 108            | 272         | H        |
| 4      | * 2.342         | 29.94                | RMS | 31.8           | -21.1                  | .87          | 41.51                      | 54                     | -12.49      | -                   | -              | 108            | 272         | H        |

\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection



## DATA

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cb/Filt r/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          | 43.96                | Pk  | 31.9           | -21                    | 0            | 54.86                      | -                      | -           | 74                  | -19.14         | 160            | 345         | V        |
| 2      | * 2.389         | 44.4                 | Pk  | 31.9           | -21                    | 0            | 55.3                       | -                      | -           | 74                  | -18.7          | 160            | 345         | V        |
| 3      | * 2.39          | 28.1                 | RMS | 31.9           | -21                    | .87          | 39.87                      | 54                     | -14.13      | -                   | -              | 160            | 345         | V        |
| 4      | * 2.343         | 29.36                | RMS | 31.9           | -21.1                  | .87          | 41.03                      | 54                     | -12.97      | -                   | -              | 160            | 345         | V        |

\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

**RESTRICTED BANDEDGE (HIGH CHANNEL)**



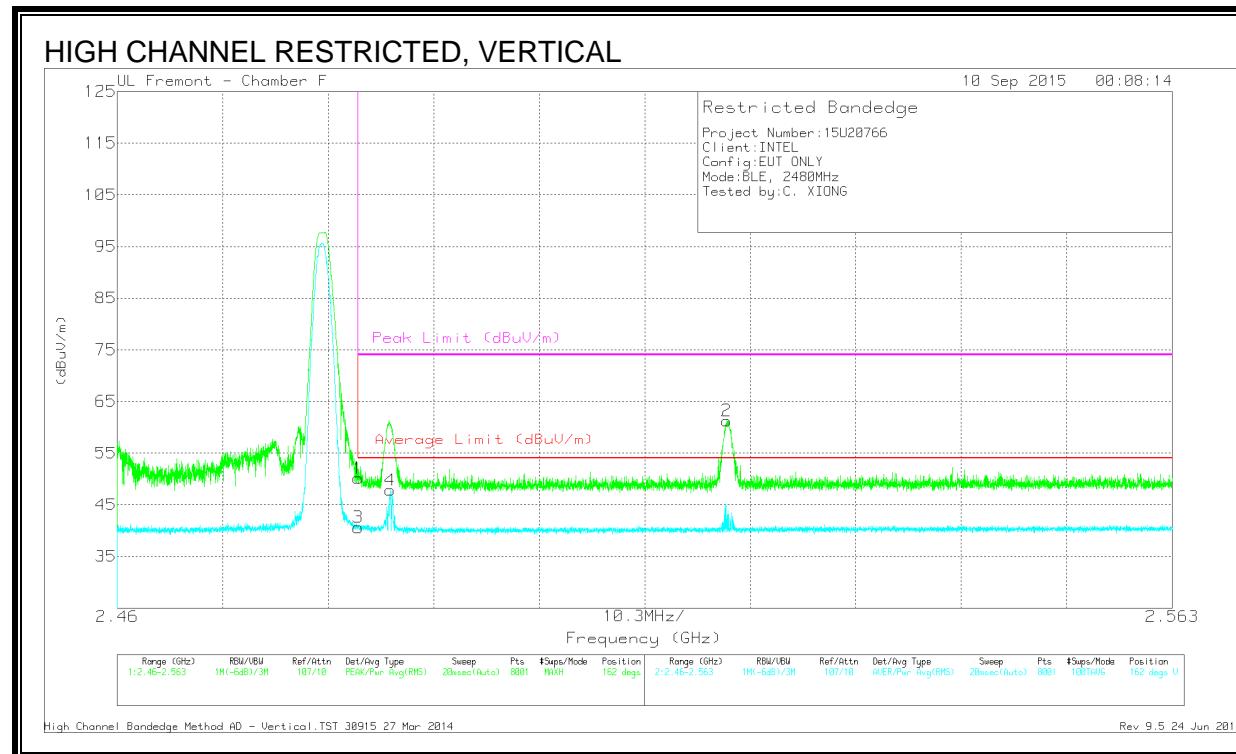
**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cbl/Flt r/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      | * 2.484         | 42.52                | Pk  | 32.2           | -21.1                  | 0            | 53.62                      | -                      | -           | 74                  | -20.38         | 118            | 311         | H        |
| 2      | * 2.486         | 52.22                | Pk  | 32.2           | -21.1                  | 0            | 63.32                      | -                      | -           | 74                  | -10.68         | 118            | 311         | H        |
| 3      | * 2.484         | 29.1                 | RMS | 32.2           | -21.1                  | .87          | 41.07                      | 54                     | -12.93      | -                   | -              | 118            | 311         | H        |
| 4      | * 2.486         | 39.18                | RMS | 32.2           | -21.1                  | .87          | 51.15                      | 54                     | -2.85       | -                   | -              | 118            | 311         | H        |

\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection



## DATA

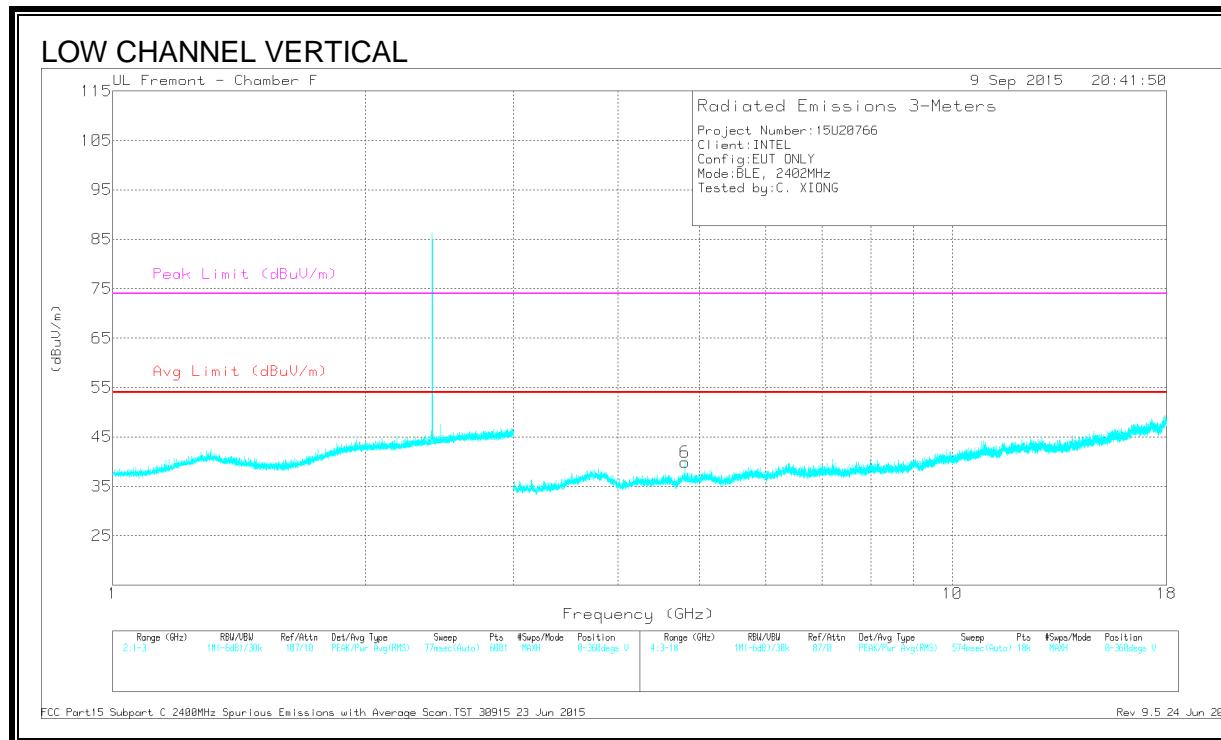
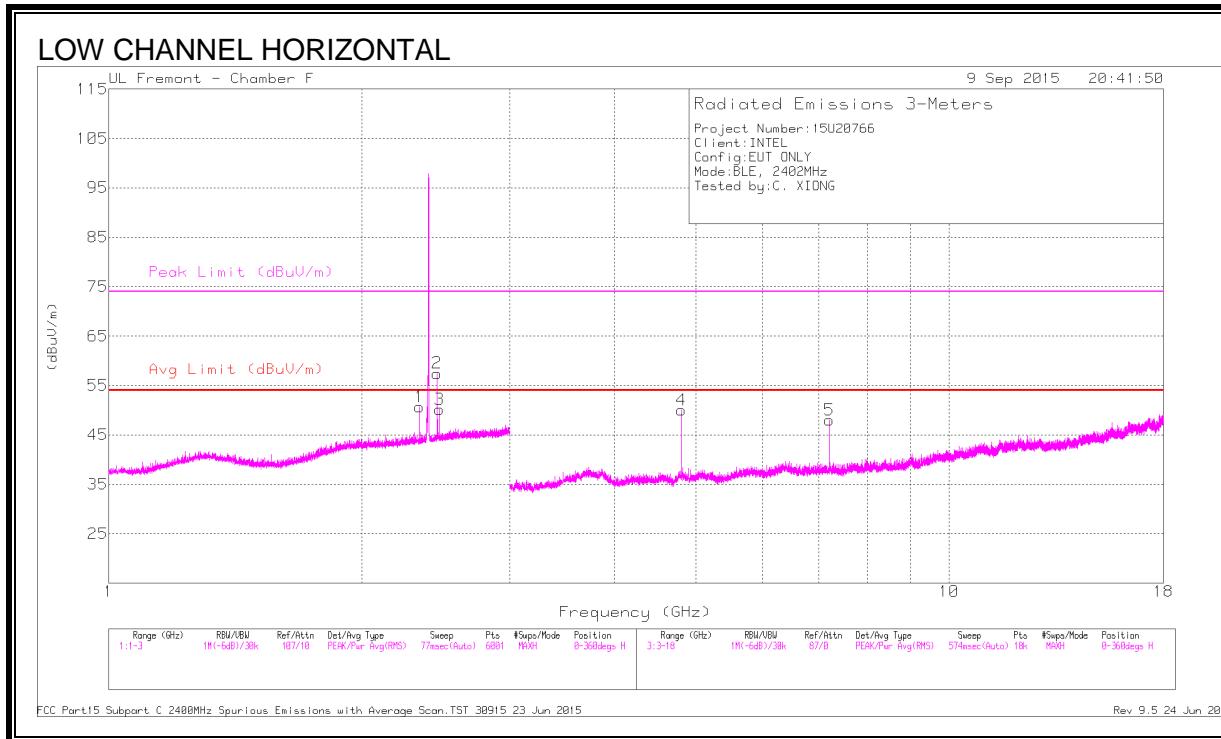
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cb/Filt r/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|------------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.484         | 39.05                | Pk  | 32.2           | -21.1                  | 0            | 50.15                      | -                      | -           | 74                  | -23.85         | 162            | 395         | V        |
| 2      | 2.519           | 50.07                | Pk  | 32.3           | -21.1                  | 0            | 61.27                      | -                      | -           | 74                  | -12.73         | 162            | 395         | V        |
| 3      | * 2.484         | 28.64                | RMS | 32.2           | -21.1                  | .87          | 40.61                      | 54                     | -13.39      | -                   | -              | 162            | 395         | V        |
| 4      | * 2.487         | 35.87                | RMS | 32.2           | -21.1                  | .87          | 47.84                      | 54                     | -6.16       | -                   | -              | 162            | 395         | V        |

\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

## HARMONICS AND SPURIOUS EMISSIONS



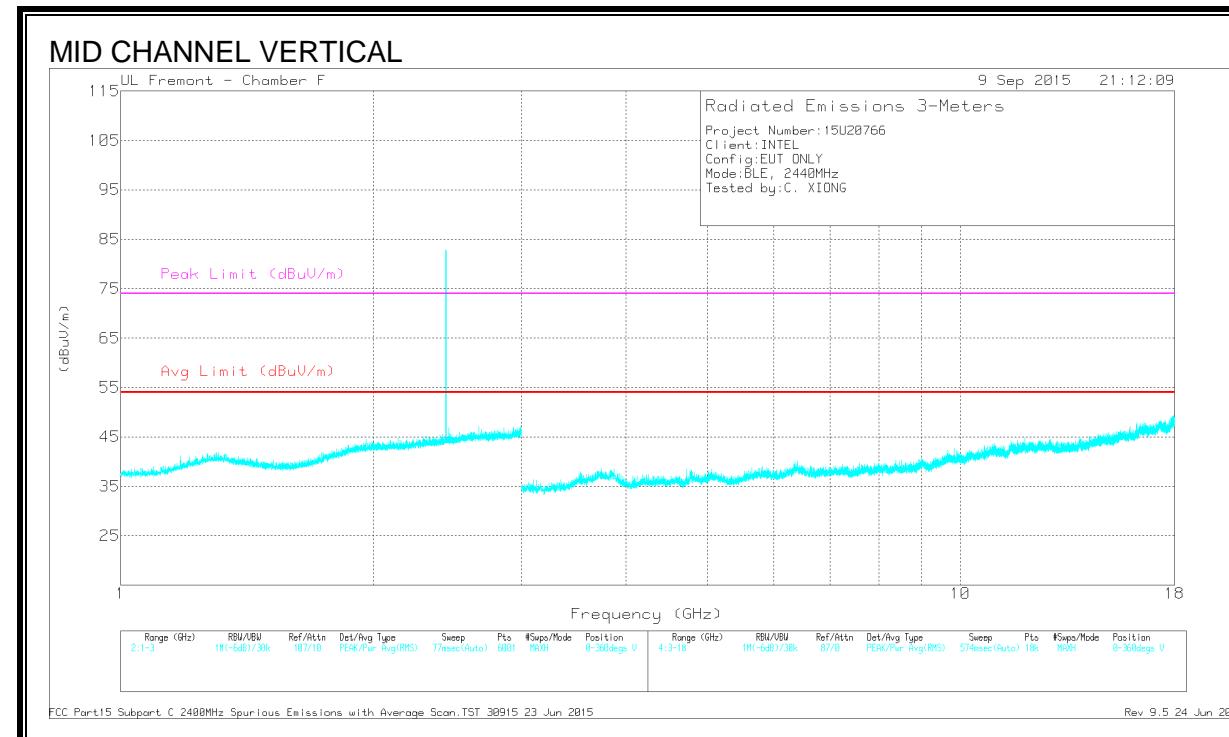
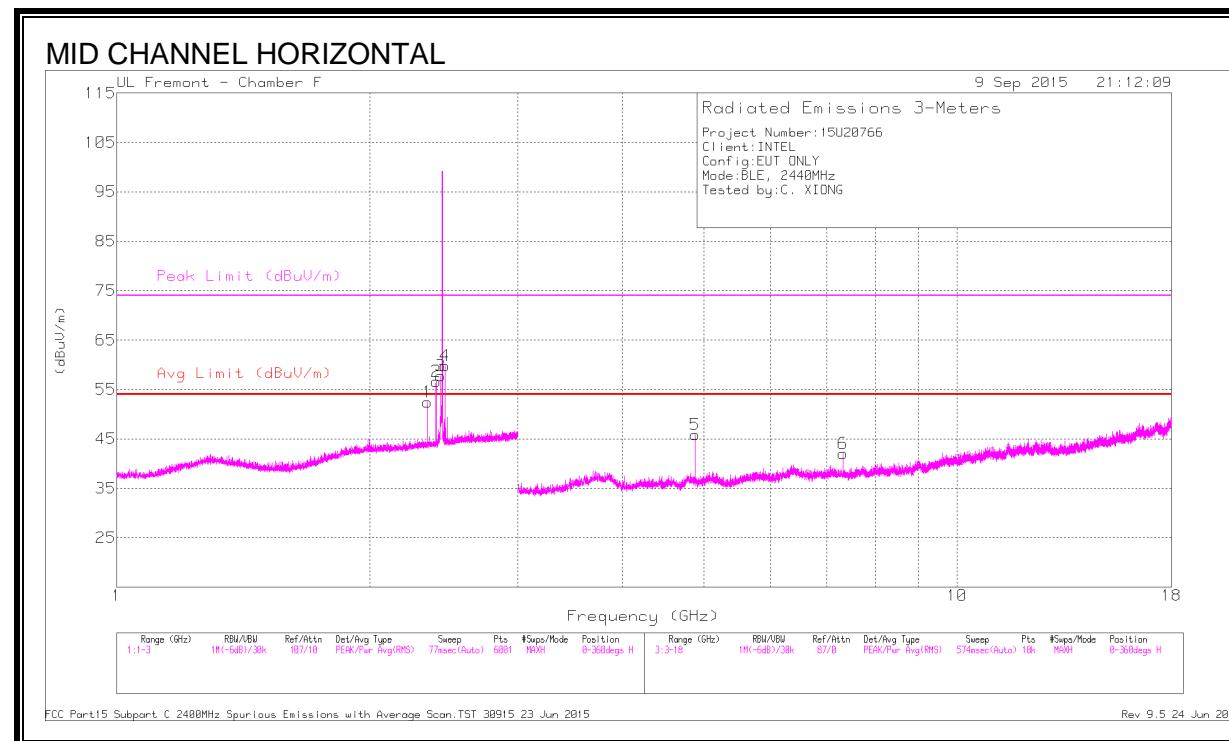
**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T120 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|-----------------------|--------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.343         | 46.91                | PK2  | 31.9           | -21.1                 | 0            | 57.71                      | -                  | -           | 74                  | -16.29         | 200            | 267         | H        |
|        | * 2.343         | 30.9                 | MAv1 | 31.9           | -21.1                 | .87          | 42.57                      | 54                 | -11.43      | -                   | -              | 200            | 267         | H        |
| 4      | * 4.804         | 45.89                | PK2  | 34.1           | -27.7                 | 0            | 52.29                      | -                  | -           | 74                  | -21.71         | 217            | 102         | H        |
|        | * 4.804         | 39.5                 | MAv1 | 34.1           | -27.7                 | .87          | 46.77                      | 54                 | -7.23       | -                   | -              | 217            | 102         | H        |
| 6      | * 4.805         | 40.85                | PK2  | 34.1           | -27.7                 | 0            | 47.25                      | -                  | -           | 74                  | -26.75         | 109            | 354         | V        |
|        | * 4.804         | 30.56                | MAv1 | 34.1           | -27.7                 | .87          | 37.83                      | 54                 | -16.17      | -                   | -              | 109            | 354         | V        |
| 2      | 2.459           | 46.47                | Pk2  | 32.1           | -21.1                 | 0            | 57.47                      | -                  | -           | 74                  | -16.53         | 0-360          | 201         | H        |
| 3      | 2.475           | 39.03                | PK2  | 32.2           | -21.1                 | 0            | 50.13                      | -                  | -           | 74                  | -23.87         | 0-360          | 101         | H        |
| 5      | 7.205           | 38.96                | PK2  | 35.6           | -26.6                 | 0            | 47.96                      | -                  | -           | 74                  | -26.04         | 0-360          | 100         | H        |

\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average



**DATA**

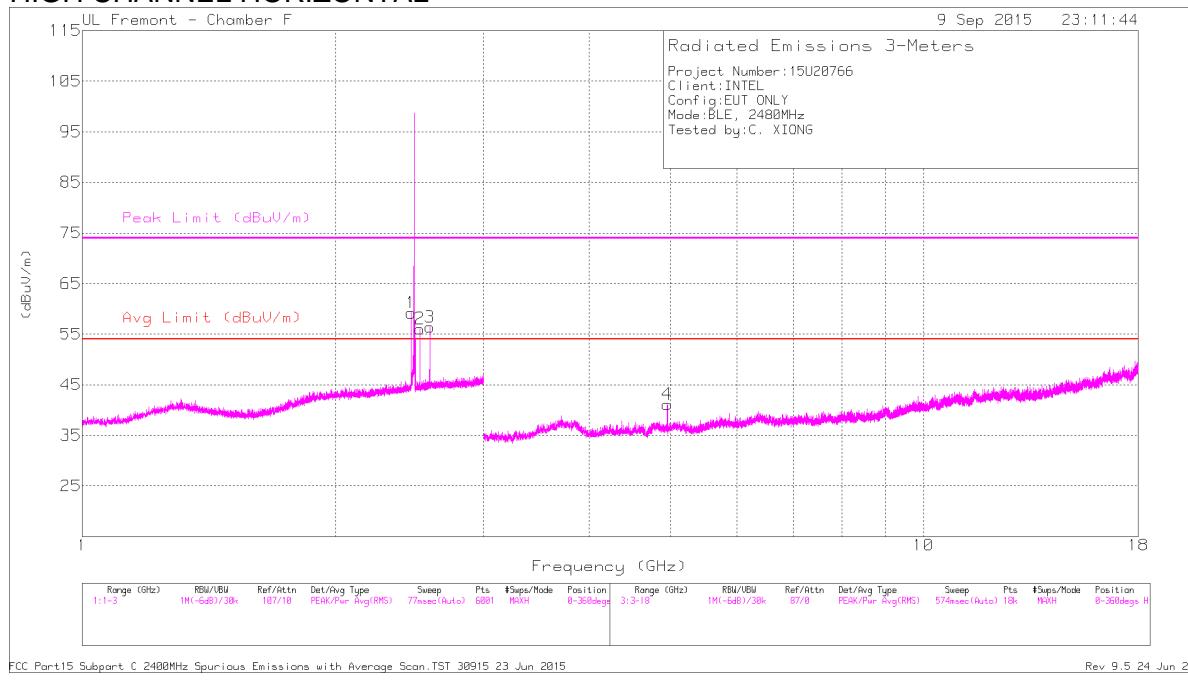
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T120 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|-----------------------|--------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.343         | 47.81                | PK2  | 31.9           | -21.1                 | 0            | 58.61                      | -                  | -           | 74                  | -15.39         | 356            | 123         | H        |
|        | * 2.343         | 31.14                | MAv1 | 31.9           | -21.1                 | .87          | 42.81                      | 54                 | -11.19      | -                   | -              | 356            | 123         | H        |
| 5      | * 4.88          | 42.81                | PK2  | 34.1           | -27.9                 | 0            | 49.01                      | -                  | -           | 74                  | -24.99         | 45             | 101         | H        |
|        | * 4.88          | 35.1                 | MAv1 | 34.1           | -27.9                 | .87          | 42.17                      | 54                 | -11.83      | -                   | -              | 45             | 101         | H        |
| 6      | * 7.32          | 40.54                | PK2  | 35.7           | -26.6                 | 0            | 49.64                      | -                  | -           | 74                  | -24.36         | 59             | 108         | H        |
|        | * 7.32          | 30.11                | MAv1 | 35.7           | -26.6                 | .87          | 40.08                      | 54                 | -13.92      | -                   | -              | 59             | 108         | H        |
| 2      | 2.399           | 45.77                | Pk   | 31.9           | -21                   | 0            | 56.67                      | -                  | -           | 74                  | -17.33         | 0-360          | 100         | H        |
| 3      | 2.428           | 46.79                | Pk   | 32             | -21                   | 0            | 57.79                      | -                  | -           | 74                  | -16.21         | 0-360          | 100         | H        |
| 4      | 2.459           | 48.78                | Pk   | 32.1           | -21.1                 | 0            | 59.78                      | -                  | -           | 74                  | -14.22         | 0-360          | 100         | H        |

\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

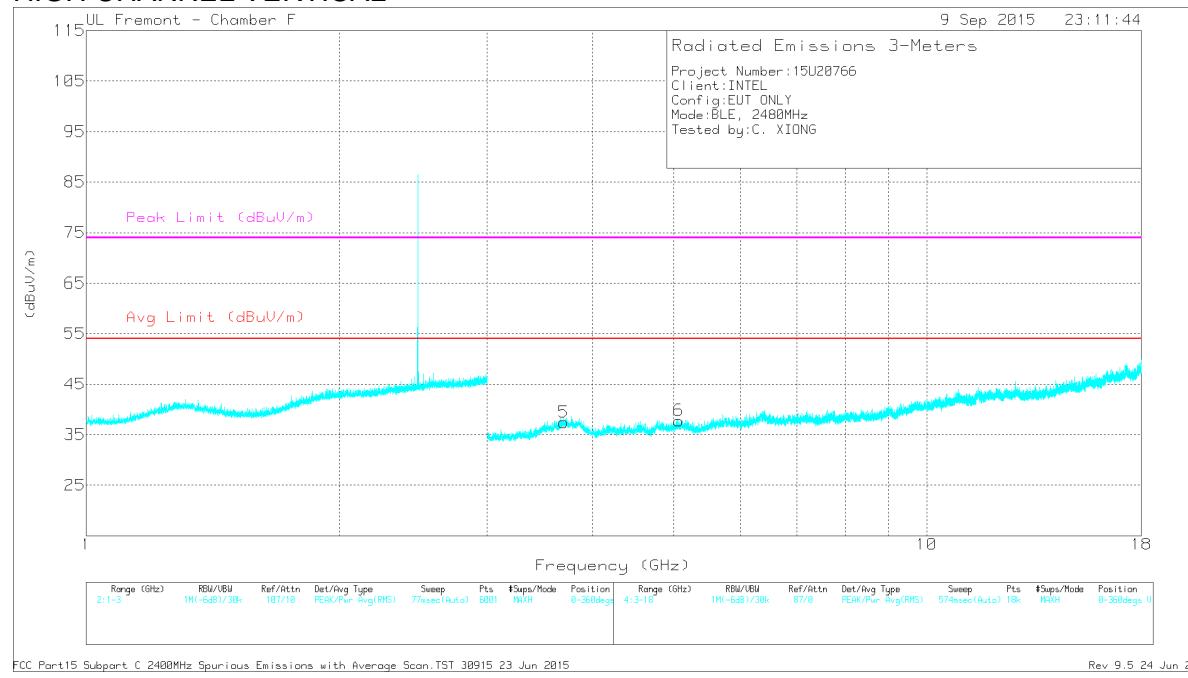
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

## HIGH CHANNEL HORIZONTAL



## HIGH CHANNEL VERTICAL



**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T120 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|-----------------------|--------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 4      | * 4.96          | 42.01                | PK2  | 34.1           | -28.7                 | 0            | 47.41                      | -                  | -           | 74                  | -26.59         | 47             | 121         | H        |
|        | * 4.96          | 32.96                | MAv1 | 34.1           | -28.7                 | .87          | 39.23                      | 54                 | -14.77      | -                   | -              | 47             | 121         | H        |
| 5      | * 3.691         | 40.75                | PK2  | 34.7           | -29.5                 | 0            | 45.95                      | -                  | -           | 74                  | -28.05         | 93             | 259         | V        |
|        | * 3.69          | 29.15                | MAv1 | 34.7           | -29.5                 | .87          | 35.22                      | 54                 | -18.78      | -                   | -              | 93             | 259         | V        |
| 6      | * 5.06          | 39.64                | PK2  | 34.2           | -28.1                 | 0            | 45.74                      | -                  | -           | 74                  | -28.26         | 150            | 343         | V        |
|        | * 5.056         | 28.22                | MAv1 | 34.2           | -28.2                 | .87          | 35.09                      | 54                 | -18.91      | -                   | -              | 150            | 343         | V        |
| 1      | 2.459           | 48.22                | Pk2  | 32.1           | -21.1                 | 0            | 59.22                      | -                  | -           | 74                  | -14.78         | 0-360          | 100         | H        |
| 2      | 2.519           | 44.87                | PK2  | 32.3           | -21.1                 | 0            | 56.07                      | -                  | -           | 74                  | -17.93         | 0-360          | 100         | H        |
| 3      | 2.588           | 44.78                | PK2  | 32.6           | -21                   | 0            | 56.38                      | -                  | -           | 74                  | -17.62         | 0-360          | 201         | H        |

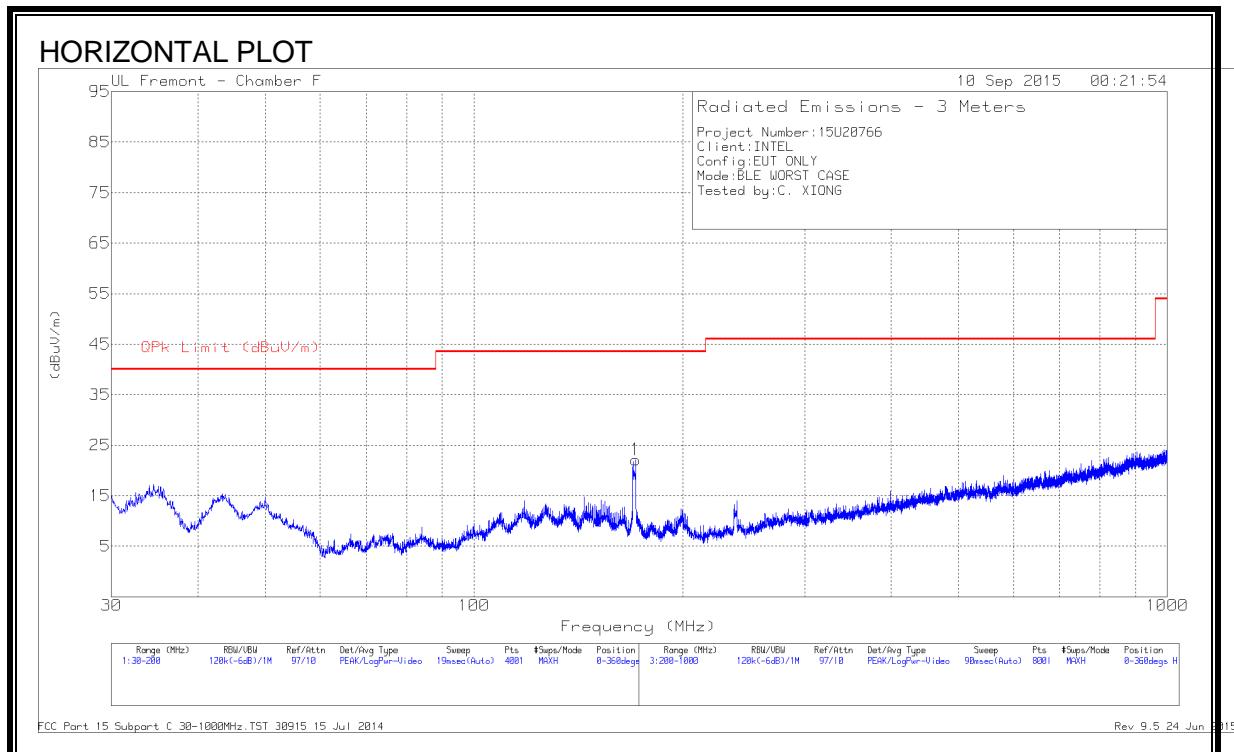
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

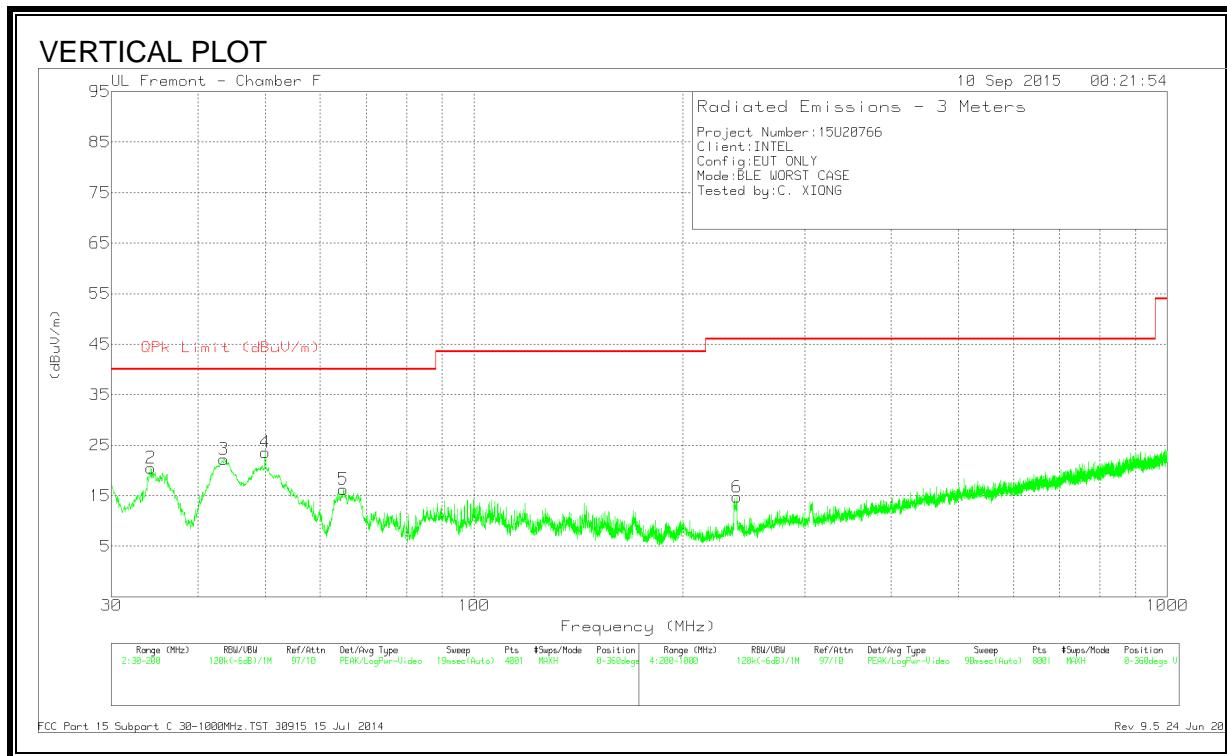
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

### 8.3. WORST-CASE BELOW 1 GHz

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





**DATA**

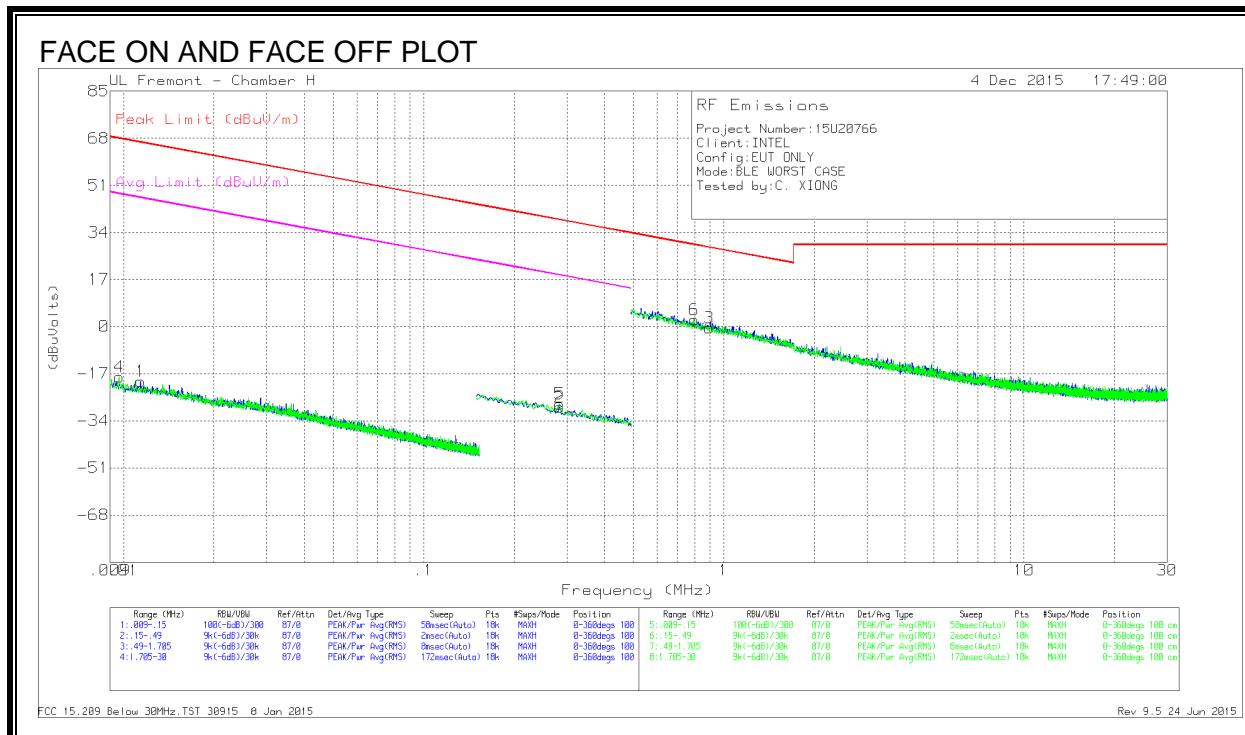
| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AF T122 (dB/m) | Amp/Cbl (dB) | Dc Corr (dB) | Corrected Reading (dBuV/m) | QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|--------------|--------------|----------------------------|--------------------|-------------|----------------|-------------|----------|
| 1      | * 171.0575      | 41.02                | Pk  | 11.8           | -30.7        | 0            | 22.12                      | 43.52              | -21.4       | 0-360          | 103         | H        |
| 2      | 34.2075         | 34.08                | Pk  | 18.2           | -31.8        | 0            | 20.48                      | 40                 | -19.52      | 0-360          | 100         | V        |
| 3      | 43.6            | 42.44                | Pk  | 11.5           | -31.7        | 0            | 22.24                      | 40                 | -17.76      | 0-360          | 100         | V        |
| 4      | 50.0175         | 47.01                | Pk  | 8.3            | -31.7        | 0            | 23.61                      | 40                 | -16.39      | 0-360          | 100         | V        |
| 5      | 64.85           | 39.99                | Pk  | 7.9            | -31.6        | 0            | 16.29                      | 40                 | -23.71      | 0-360          | 100         | V        |
| 6      | 239.5           | 33.44                | Pk  | 11.6           | -30.3        | 0            | 14.74                      | 46.02              | -31.28      | 0-360          | 301         | V        |

\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

## 8.4. WORST CASE BELOW 30MHz

### SPURIOUS EMISSIONS 0.15 TO 30 MHz (WORST-CASE CONFIGURATION)



### DATA

#### FACE ON

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dB/m) | Cbl (dB) | Dist Corr 300m | Corrected Reading (dBuVolts) | Peak Limit (dBuV/m) | Margin (dB) | Avg Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|---------------------|----------|----------------|------------------------------|---------------------|-------------|--------------------|-------------|----------------|
| 1      | .01139          | 41.97                | Pk  | 18.2                | .1       | -80            | -19.73                       | 66.47               | -86.2       | 46.47              | -66.2       | 0-360          |
| 2      | .28371          | 40.65                | Pk  | 10.2                | .1       | -80            | -29.05                       | 38.55               | -67.6       | 18.55              | -47.6       | 0-360          |
| 3      | .89471          | 29.17                | Pk  | 10.2                | .2       | -40            | -.43                         | 28.57               | -29         | -                  | -           | 0-360          |

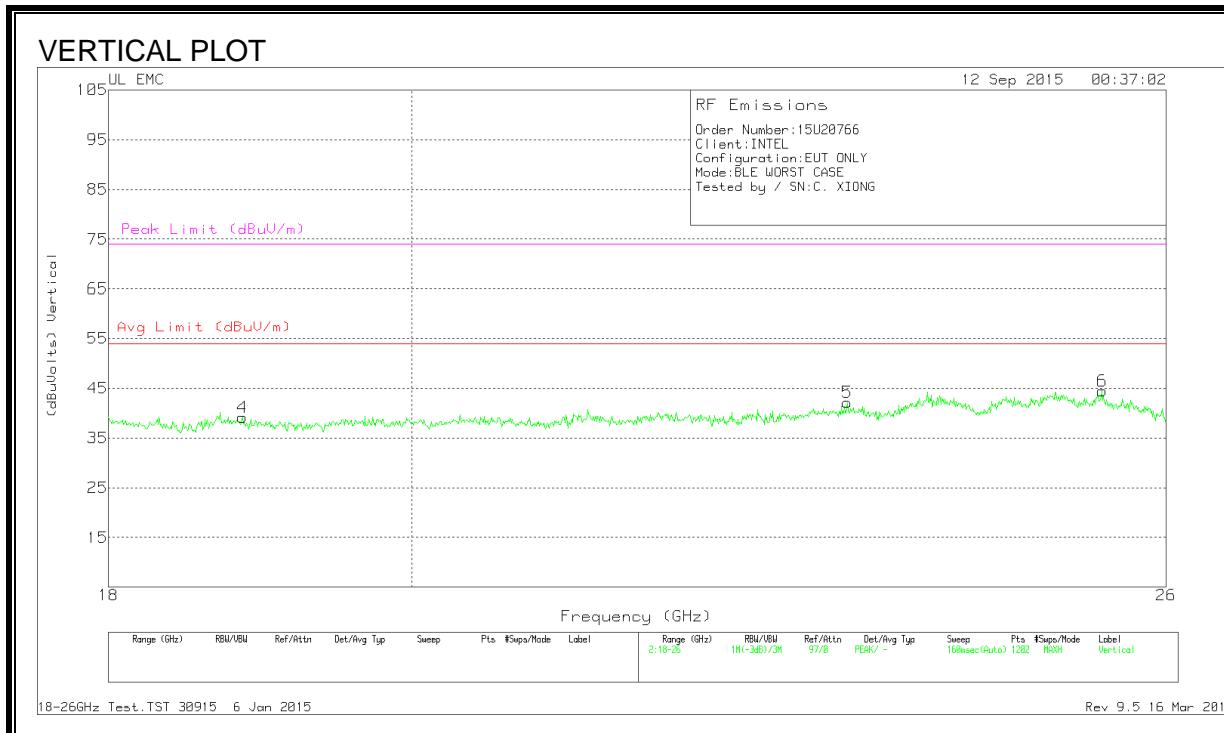
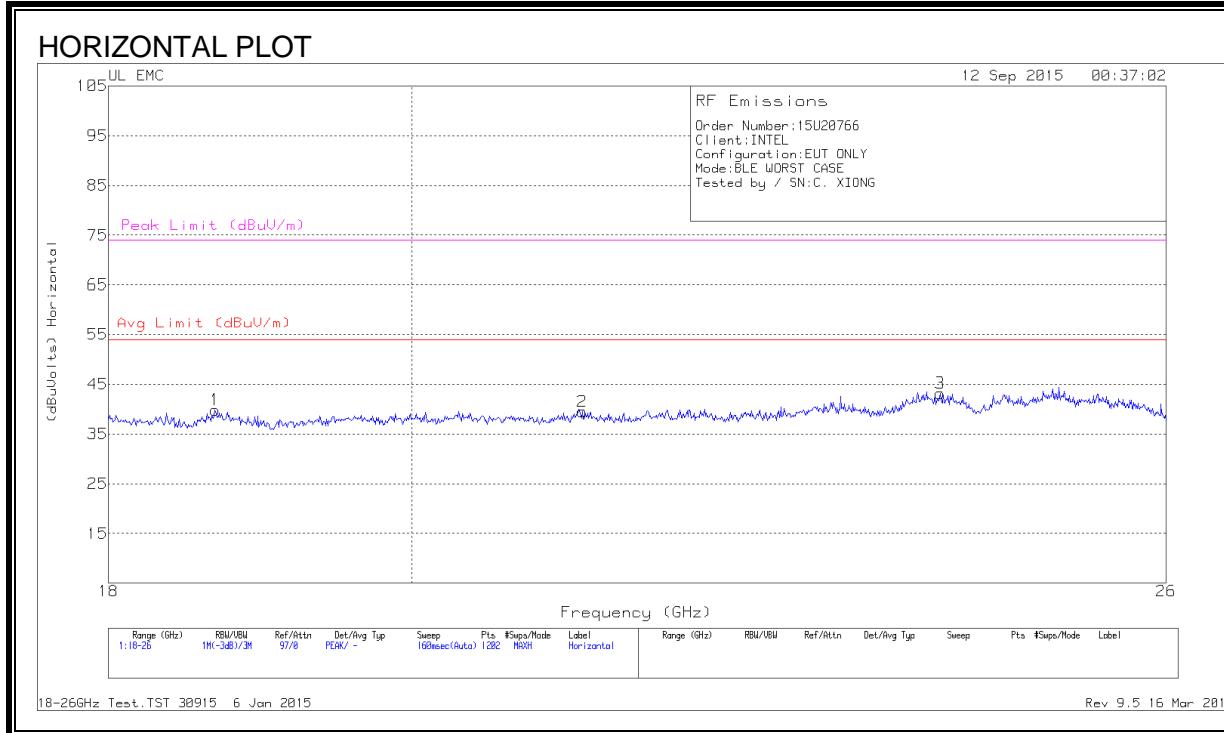
#### FACE OFF

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dB/m) | Cbl (dB) | Dist Corr 300m | Corrected Reading (dBuVolts) | Peak Limit (dBuV/m) | Margin (dB) | Avg Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|---------------------|----------|----------------|------------------------------|---------------------|-------------|--------------------|-------------|----------------|
| 4      | .00969          | 42.65                | Pk  | 19.1                | .1       | -80            | -18.15                       | 67.88               | -86.03      | 47.88              | -66.03      | 0-360          |
| 5      | .28367          | 41.73                | Pk  | 10.2                | .1       | -80            | -27.97                       | 38.55               | -66.52      | 18.55              | -46.52      | 0-360          |
| 6      | .79639          | 32.11                | Pk  | 10.2                | .1       | -40            | 2.41                         | 29.58               | -27.17      | -                  | -           | 0-360          |

Pk - Peak detector

## 8.5. WORST-CASE 18 to 26 GHz

### SPURIOUS EMISSIONS 18 to 26 GHz (WORST-CASE CONFIGURATION)



**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      | 18.679          | 41.43                | Pk  | 32.5          | -24.6        | -9.5           | 39.83                        | 54                 | -14.17      | 74                  | -34.17         |
| 2      | 21.224          | 40.9                 | Pk  | 33.1          | -25          | -9.5           | 39.50                        | 54                 | -14.50      | 74                  | -34.50         |
| 3      | 24.035          | 43.67                | Pk  | 33.3          | -24.3        | -9.5           | 43.17                        | 54                 | -10.83      | 74                  | -30.83         |
| 4      | 18.859          | 41.37                | Pk  | 32.4          | -25.1        | -9.5           | 39.17                        | 54                 | -14.83      | 74                  | -34.83         |
| 5      | 23.269          | 42.87                | Pk  | 33.5          | -24.7        | -9.5           | 42.17                        | 54                 | -11.83      | 74                  | -31.83         |
| 6      | 25.427          | 44.5                 | Pk  | 33.8          | -24.3        | -9.5           | 44.50                        | 54                 | -9.50       | 74                  | -29.50         |

Pk - Peak detector