**FCC 47 CFR PART 15 SUBPART E**

# CERTIFICATION TEST REPORT
# CLASS II PERMISSIVE CHANGE

**FOR**

**TABLET DEVICE**

**MODEL NUMBER: A1490**

**FCC ID: BCGA1490**

**REPORT NUMBER: 15U21850-E10V2**

**ISSUE DATE: DECEMBER 02, 2015**

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NVLAP LAB CODE 200065-0

## Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 11/16/2015 | Initial Issue | M. Mekuria |
| V2 | 12/02/2015 | Revised report to address TCB's questions | T. Chu |


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# TABLE OF CONTENTS

**1. ATTESTATION OF TEST RESULTS ..... 5**

**2. TEST METHODOLOGY ..... 6**

**3. FACILITIES AND ACCREDITATION ..... 6**

**4. CALIBRATION AND UNCERTAINTY ..... 7**

*4.1. MEASURING INSTRUMENT CALIBRATION ..... 7*

*4.2. SAMPLE CALCULATION ..... 7*

*4.3. MEASUREMENT UNCERTAINTY ..... 7*

**5. EQUIPMENT UNDER TEST ..... 8**

*5.1. DESCRIPTION OF EUT ..... 8*

*5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE ..... 8*

*5.3. MAXIMUM OUTPUT POWER ..... 8*

*5.4. DESCRIPTION OF AVAILABLE ANTENNAS ..... 8*

*5.5. SOFTWARE AND FIRMWARE ..... 8*

*5.6. WORST-CASE CONFIGURATION AND MODE ..... 9*

*5.7. DESCRIPTION OF TEST SETUP ..... 10*

**6. TEST AND MEASUREMENT EQUIPMENT ..... 17**

**7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS ..... 18**

*7.1. ON TIME AND DUTY CYCLE ..... 18*

*7.2. MEASUREMENT METHODS ..... 21*

**8. ANTENNA PORT TEST RESULTS ..... 22**

*8.1. 802.11a MODE 1TX MODE IN THE 5.8 GHz BAND ..... 22*

8.1.1. 6 dB BANDWIDTH ..... 22
8.1.2. 26 dB BANDWIDTH ..... 25
8.1.3. 99% BANDWIDTH ..... 28
8.1.4. AVERAGE POWER ..... 31
8.1.5. OUTPUT POWER ..... 32
8.1.6. PSD ..... 34

*8.2. 802.11n HT20 2Tx CDD MODE IN THE 5.8 GHz BAND ..... 37*

8.2.1. 6 dB BANDWIDTH ..... 37
8.2.2. 26 dB BANDWIDTH ..... 41
8.2.3. 99% BANDWIDTH ..... 45
8.2.4. AVERAGE POWER ..... 49
8.2.5. OUTPUT POWER ..... 50
8.2.6. PSD ..... 52

*8.3. 802.11n HT20 2Tx STBC MODE IN THE 5.8 GHz BAND ..... 57*

*8.4. 802.11n HT40 1TX MODE IN THE 5.8 GHz BAND ..... 58*

8.4.1. 6 dB BANDWIDTH ..... 58


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8.4.2. 26 dB BANDWIDTH ..... 60
8.4.3. 99% BANDWIDTH ..... 62
8.4.4. AVERAGE POWER ..... 64
8.4.5. OUTPUT POWER ..... 65
8.4.6. PSD ..... 67

*8.5. 802.11n HT40 2Tx CDD MODE IN THE 5.8 GHz BAND ..... 70*
8.5.1. 6 dB BANDWIDTH ..... 70
8.5.2. 26 dB BANDWIDTH ..... 73
8.5.3. 99% BANDWIDTH ..... 76
8.5.4. AVERAGE POWER ..... 79
8.5.5. OUTPUT POWER ..... 80
8.5.6. PSD ..... 82

*8.6. 802.11n HT40 2Tx STBC MODE IN THE 5.8 GHz BAND ..... 86*

**9. RADIATED TEST RESULTS ..... 87**

*9.1. LIMITS AND PROCEDURE ..... 87*

*9.2. 802.a 1Tx MODE IN THE 5.8 GHz BAND ..... 88*
9.2.1. CHAIN 0, RESTRICTED BANDEDGE, (LOW CHANNEL) ..... 88
9.2.2. CHAIN 1, RESTRICTED BANDEDGE ..... 98

*9.3. 802.11n HT20 2Tx CDD MODE IN THE 5.8 GHz BAND ..... 108*

*9.4. 802.11n HT40 1Tx MODE IN THE 5.8 GHz BAND ..... 118*
9.4.1. CHAIN 0, RESTRICTED BANDEDGE ..... 118
9.4.2. CHAIN 1, RESTRICTED BANDEDGE ..... 126

*9.5. 802.11n HT40 2Tx CDD MODE IN THE 5.8 GHz BAND ..... 134*

*9.6. WORST-CASE BELOW 1 GHz ..... 142*

*9.7. WORST-CASE ABOVE 18 GHz ..... 144*

**10. AC POWER LINE CONDUCTED EMISSIONS ..... 148**

*10.1. EUT POWERED BY AC ADAPTER ..... 149*

*10.2. EUT POWERED BY HOST PC VIA USB CABLE ..... 151*

**11. SETUP PHOTOS ..... 153**


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# 1. ATTESTATION OF TEST RESULTS

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

**EUT DESCRIPTION:** TABLET DEVICE

**MODEL:** A1490

**SERIAL NUMBER:** DLXL400DFPLY(Conducted), DLXL400QFPLY (Radiated)

**DATE TESTED:** OCTOBER 6, 2015 TO NOVEMBER 09, 2015

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| CFR 47 Part 15 Subpart E | 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.

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Tested By:

ERIC YU
EMC LAB ENGINEER
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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 14-30, FCC KDB 789033 D02 v01, ANSI C63.10-2013.

# 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 |
|---|---|
| ☐ Chamber A | ☒ Chamber D |
| ☐ Chamber B | ☐ Chamber E |
| ☐ Chamber C | ☐ Chamber F |
| | ☒ Chamber G |
| | ☐ 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.


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# 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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 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 |
| 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%.


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# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

The Apple iPad Model A1490 is a Tablet with cellular GSM/GPRS/EGPRS/WCDMA/HSPA+ DC-HSDPA/ CDMA 1xRTT/1x Advanced/EV-DO Rev 0, A, B/LTE/IEEE 802.11a/b/g/n (MIMO 2x2) and Bluetooth radio.

## 5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

Upgrade 5.8GHz band to new rule per KDB 789033 D02 v01.

## 5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

**5.8GHz Band**

| Frequency Range (MHz) | Mode | Output Power (dBm) | Output Power (mW) |
|---|---|---|---|
| 5745 - 5825 | 802.11a | 15.44 | 34.99 |
| 5745 - 5825 | 802.11n HT20 SISO | Covered by 802.11a SISO | |
| 5745 - 5825 | 802.11a 2TX CDD | Covered by 802.11n HT20 CDD 2TX | |
| 5745 - 5825 | 802.11n HT20 CDD 2TX | 18.42 | 69.50 |
| 5745 - 5825 | 802.11n HT20 STBC/SDM 2TX | Covered by 802.11n HT20 CDD 2TX | |
| 5755 - 5795 | 802.11n HT40 SISO | 15.50 | 35.48 |
| 5755 - 5795 | 802.11n HT40 CDD 2TX | 18.34 | 68.23 |
| 5755 - 5795 | 802.11n HT40 STBC/SDM 2TX | Covered by 802.11n HT40 CDD 2TX | |

## 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

| Frequency Band (GHz) | Antenna Gain | |
|---|---|---|
| | Chain 0 | Chain 1 |
| 5.8 | 2.68 | 3.76 |

## 5.5. SOFTWARE AND FIRMWARE

The test utility software used during testing was Broadcom WL Tool Version 6.25.86.


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## 5.6. WORST-CASE CONFIGURATION AND MODE

There are two vendors of the WiFi/Bluetooth radio modules: BOM #1, vender1 and BOM #2, vender 2, and they have the same mechanical outline, same on board antenna, matching circuit, antenna structure and same specification and baseline was performed on both venders to determine the worst case on conducted power and radiated emissions.

The fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that Z orientation was worst-case orientation for 5GHz; therefore, all final radiated testing was performed with the EUT in Z orientation for 5GHz.

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

802.11a mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS0

Worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was including headset, AC charger and the mode and channel with the highest output power.

For all modes with single chain, chain 0 was selected per the software provided by the client. Based on the client a preliminary investigation was performed on the two chains and chain 0 was found to be worst-case for the antenna port. The radiated emissions test was tested on both Chain 0 and 1.


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## 5.7. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Support Equipment List | | | | |
|---|---|---|---|---|
| Description | Manufacturer | Model | Serial Number | FCC ID |
| Laptop | Apple | MacBook Pro | 73043BDQAGU | N/A |
| Laptop AC/DC adapter | Apple | A1172 | MV7211FJAX4XA | N/A |
| Earphone | Apple | NA | NA | N/A |
| EUT AC/DC adapter | Apple | A1357 | W010A051 | N/A |

**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 |
| 3 | AC | 1 | AC | Un-shielded | 3 | 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 (RADAITED BELOW 1 GHZ)**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| Cable No | Port | # of identical | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | Headphones Jack | 1 | 3.5mm Audio | Shielded | 0.9 | N/A |
| 2 | AC | 1 | AC | Un-shielded | 3 | N/A |

**I/O CABLES (AC LINE CONDUCTED: AC/DC ADAPTER)**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| Cable No | Port | # of identical | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | Headphones Jack | 1 | 3.5mm Audio | Shielded | 0.9 | N/A |
| 2 | AC | 1 | AC | Un-shielded | 3 | N/A |


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**I/O CABLES (AC LINE CONDUCTED: LAPTOP CONFIGUARTION)**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| Cable No | Port | # of identical | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | Headphones Jack | 1 | 3.5mm Audio | Shielded | 0.9 | N/A |
| 2 | USB | 1 | USB | Shielded | 1 | N/A |
| 3 | AC | 1 | AC | Un-shielded | 3 | N/A |


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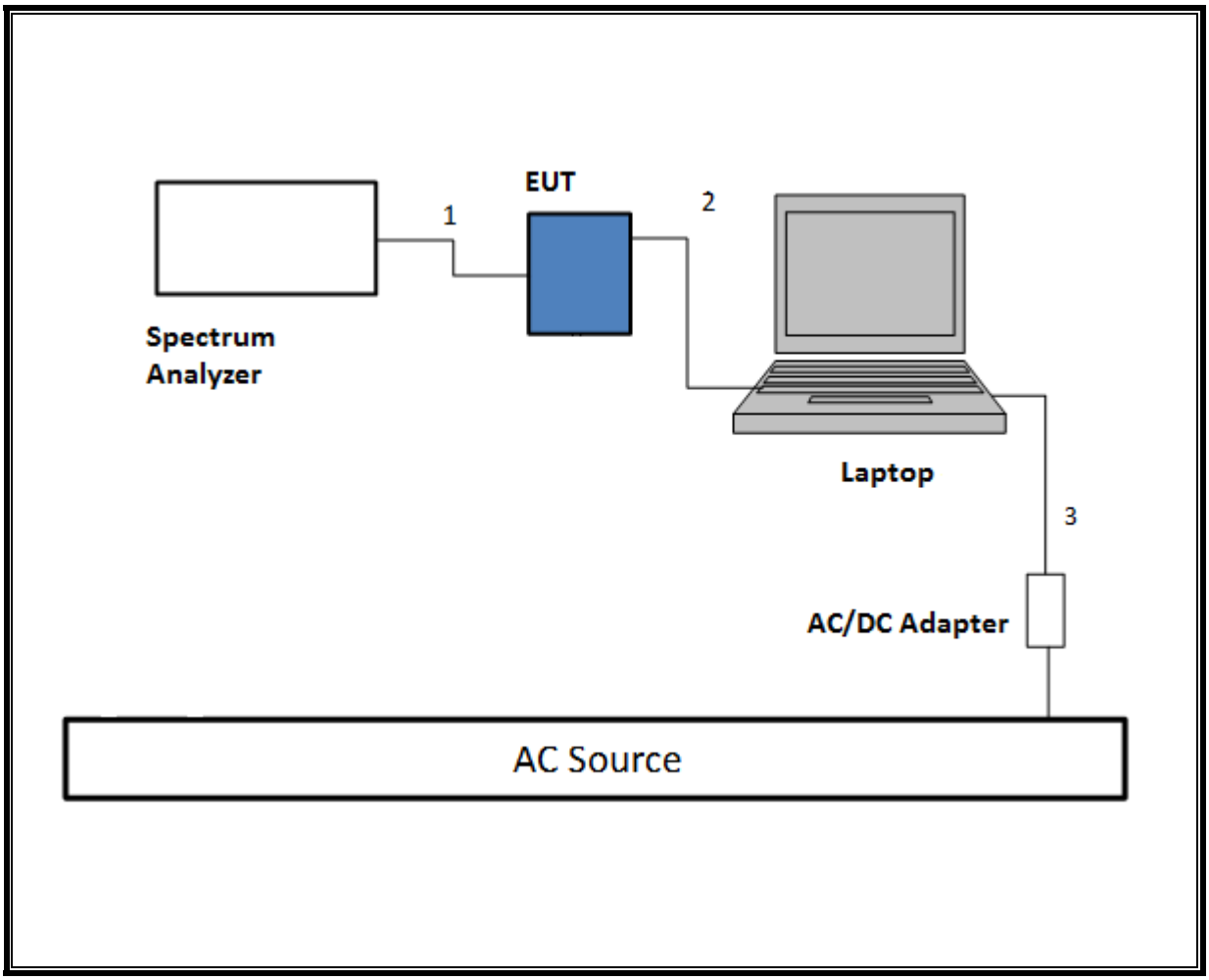
**TEST SETUP - CONDUCTED TESTS**

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**





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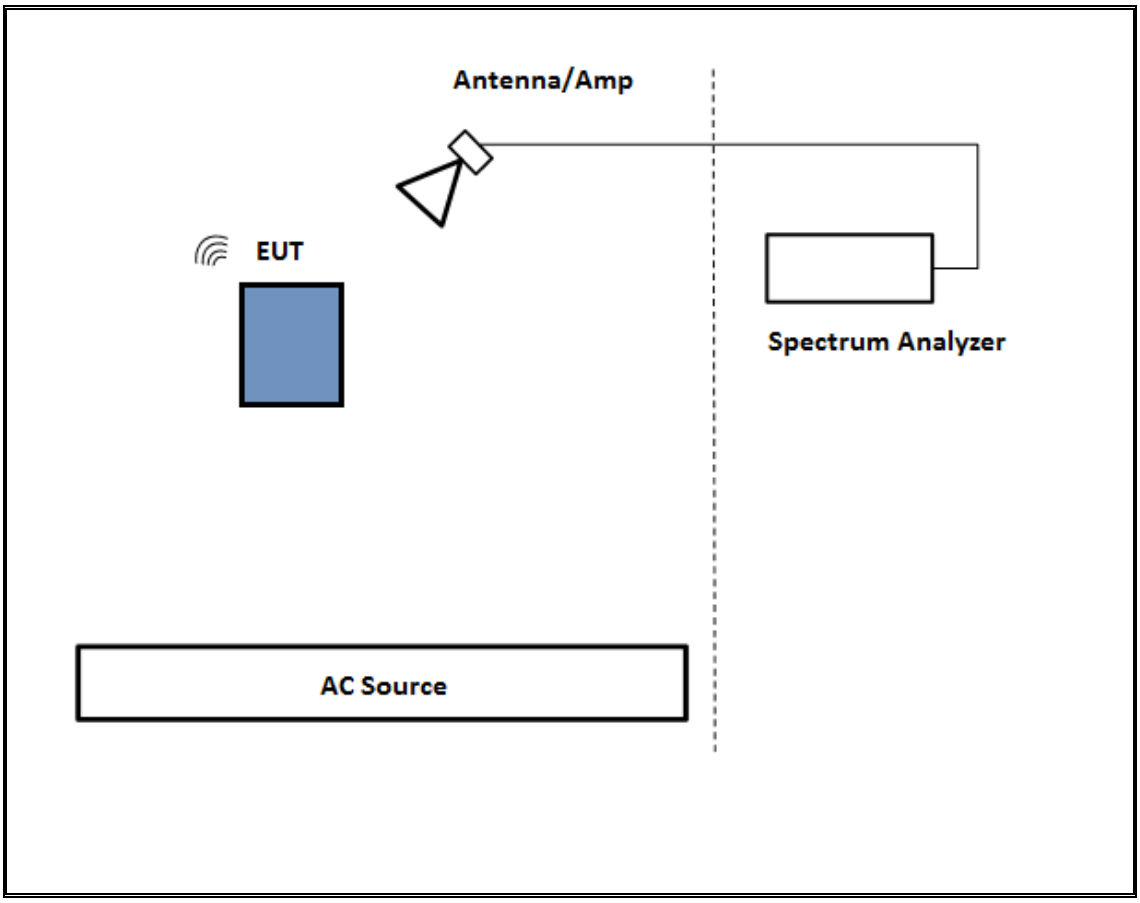
**TEST SETUP- RADIATED-ABOVE 1 GHZ**

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

**SETUP DIAGRAM**





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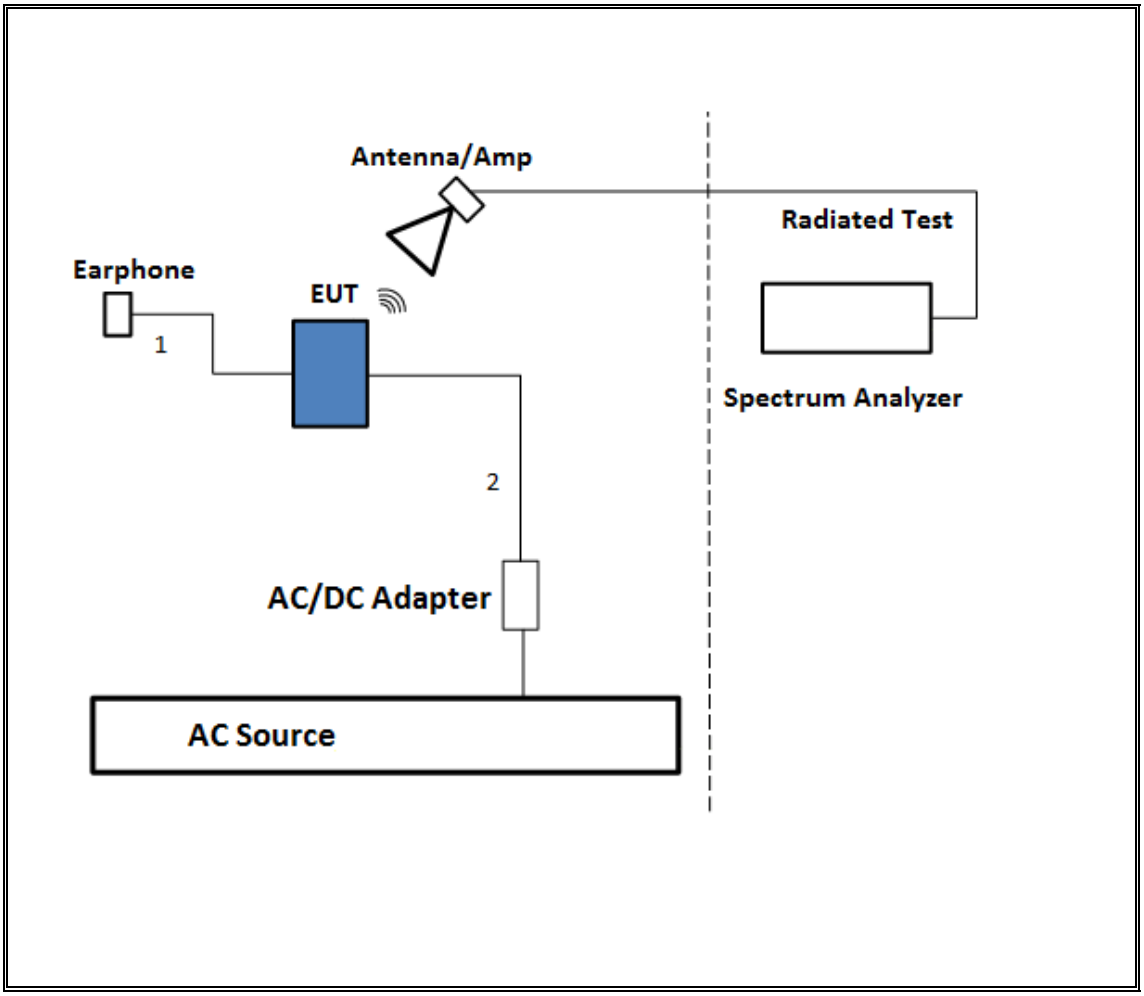
**TEST SETUP- BELOW 1GHz**

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

**SETUP DIAGRAM**





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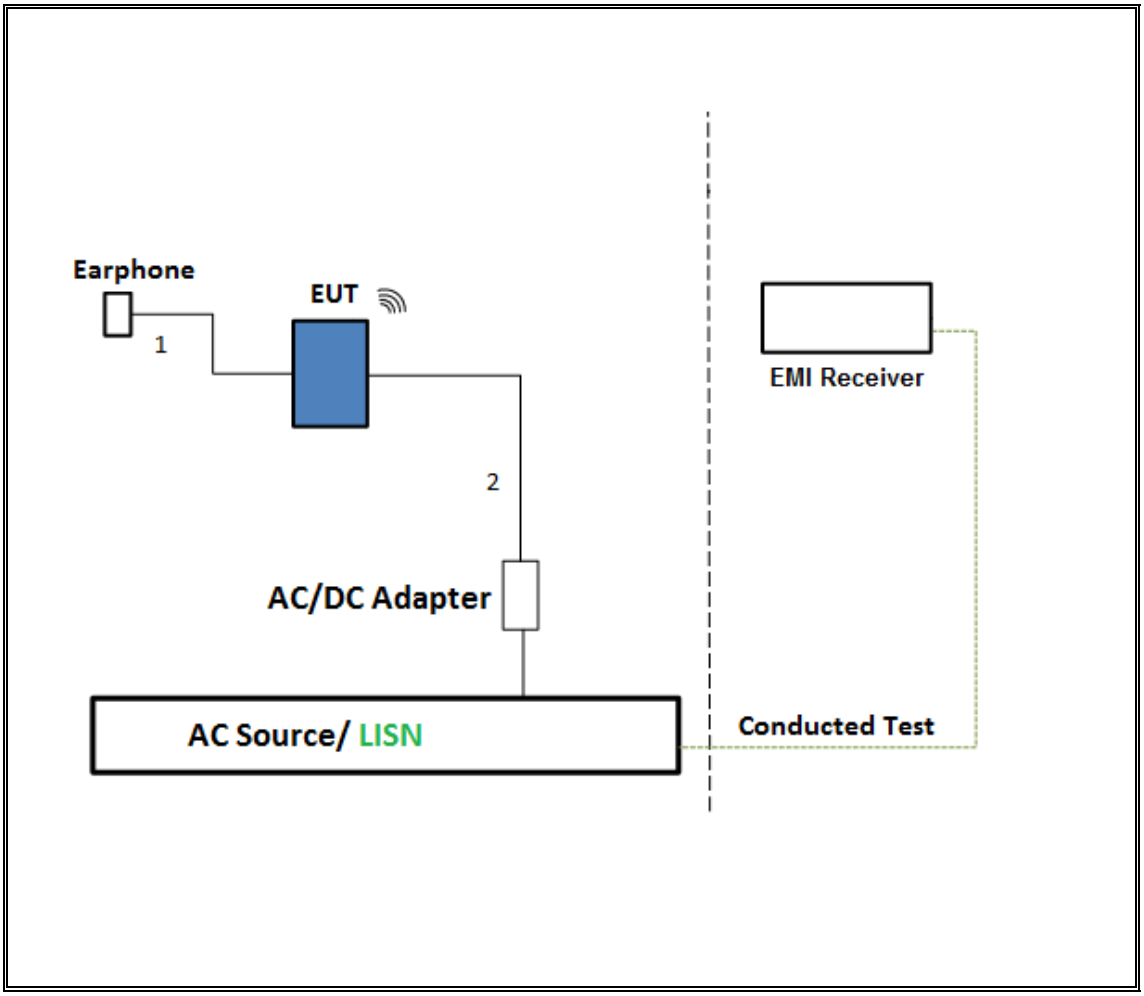
**TEST SETUP- AC LINE CONDUCTED: AC/DC ADAPTER**

The EUT was tested with earphone connected and powered by AC/DC adapter via USB cable. Test software exercised the EUT.

**SETUP DIAGRAM**





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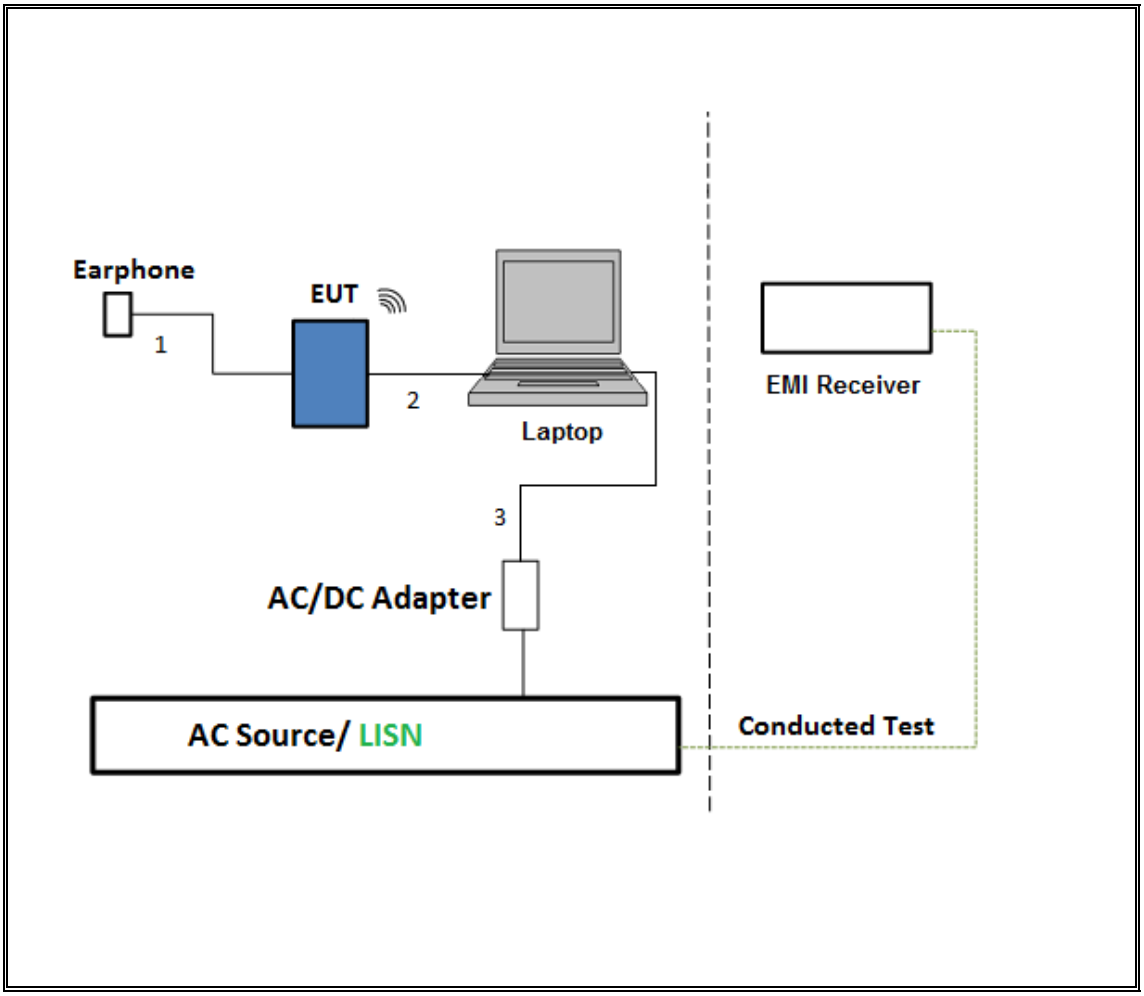
**TEST SETUP- AC LINE CONDUCTED: LAPTOP CONFIGURATION**

The EUT was tested with earphone connected and powered by host PC via USB cable. Test software exercised the EUT.

**SETUP DIAGRAM**





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# 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 | 00143448 | 2/10/2016 |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz | Sunol Sciences | JB3 | A022813-2 | 3/5/2016 |
| Amplifier, 1 - 18GHz | Miteq | AFS42-00101800-25-S-42 | 1782158 | 1/26/2016 |
| Amplifier, 10KHz to 1GHz, 32dB | Sonoma | 310N | 323562 | 5/7/2016 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz | Keysight | N9030A | MY52350675 | 11/12/2015 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz | Keysight | N9030A | MY54490254 | 12/10/2015 |
| Power Sensor, P - series, 50MHz to 18GHz, Wideband | Keysight | N1921A | MY55200002 | 3/6/2016 |
| Power Sensor, P - series, 50MHz to 18GHz, Wideband | Keysight | N1921A | MY55200004 | 5/6/2016 |
| Antenna, Horn 18 to 26.5GHz | ARA | MWH-1826 | 1049 | 12/17/2015 |
| Horn Antenna, 40GHz | ARA | MWH-2640/B | 1029 | 7/28/2016 |
| Spectrum Analyzer, 40 GHz | Agilent | 8564E | 3943A01643 | 8/6/2016 |
| Amplifier, 1 to 26.5GHz, 23.5dB Gain minimum | Keysight | 8449B | 3008A04710 | 6/29/2016 |
| Amplifier, 26 - 40GHz | Miteq | NSP4000-SP2 | 924343 | 4/7/2016 |
| AC Line Conducted | | | | |
| EMI Test Receiver 9Khz-7GHz | Rohde & Schwarz | ESCI7 | 100773 | 8/7/2016 |
| 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 | 7/28/2016 |
| **UL SOFTWARE** | | | | |
| *Radiated Software | UL | UL EMC | Ver 9.5, July 22, 2014 | |
| *Conducted Software | UL | UL EMC | Ver 2.2, March 31, 2015 | |
| *AC Line Conducted Software | UL | UL EMC | Ver 9.5, April 3, 2015 | |

Note: * indicates automation software version used in the compliance certification testing


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# 7. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

## 7.1. ON TIME AND DUTY CYCLE

**LIMITS**

None; for reporting purposes only.

**PROCEDURE**

KDB 789033 Zero-Span Spectrum Analyzer Method.

**RESULTS**

| Mode | ON Time B (msec) | Period (msec) | Duty Cycle x (linear) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) | 1/B Minimum VBW (kHz) |
|---|---|---|---|---|---|---|
| 802.11a 1TX | 2.064 | 2.094 | 0.986 | 98.57% | 0.00 | 0.010 |
| 802.11n HT20 CDD | 2.065 | 2.090 | 0.988 | 98.80% | 0.00 | 0.010 |
| 802.11n HT40 1TX | 0.932 | 0.960 | 0.971 | 97.12% | 0.13 | 1.073 |
| 802.11n HT40 CDD | 0.932 | 0.958 | 0.973 | 97.29% | 0.12 | 1.073 |


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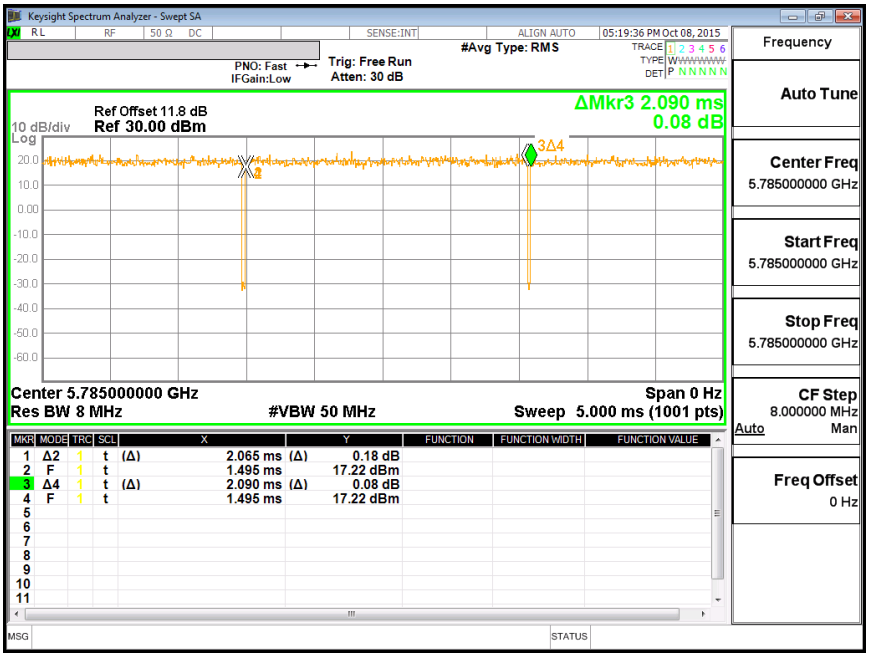
**DUTY CYCLE PLOTS**

DUTY CYCLE 802.11a MODE 1TX MODE

DUTY CYCLE 802.11n HT20 CDD MODE





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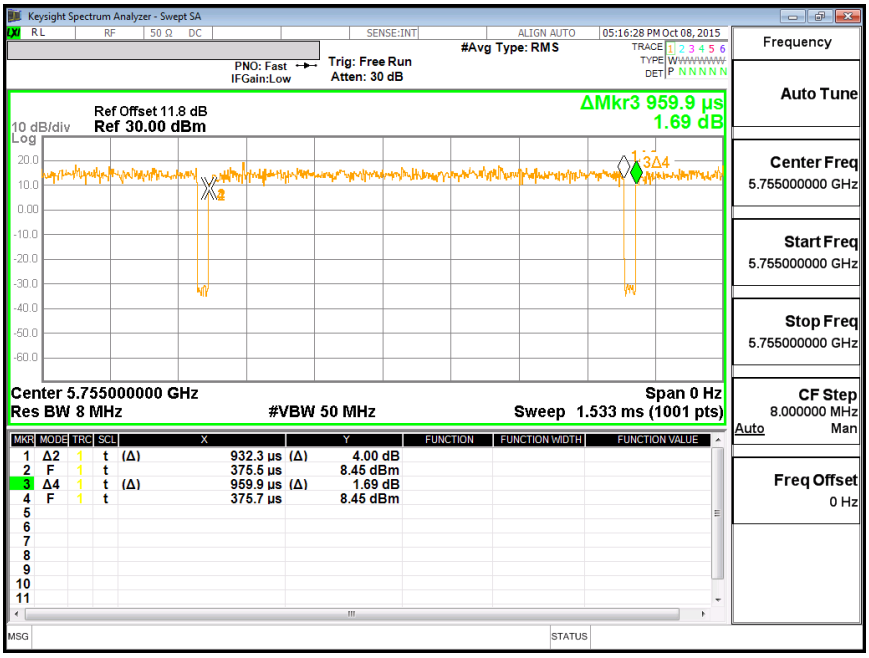
## DUTY CYCLE 802.11n HT40 1TX MODE




## DUTY CYCLE 802.11n HT40 CDD MODE

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## 7.2. MEASUREMENT METHODS

26 dB Emission BW & 6 dB Emission BW: KDB 789033 D02 v01, Section C.

99% Occupied BW: KDB 789033 D02 v01, Section D.

Conducted Output Power: KDB 789033 D02 v01, Section E.3.b (Method PM-G).

Power Spectral Density: KDB 789033 D02 v01, Section F.

Unwanted emissions in restricted bands: KDB 789033 D02 v01, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v01, Sections G.3, G.4, and G.5.


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# 8. ANTENNA PORT TEST RESULTS

## 8.1. 802.11a MODE 1TX MODE IN THE 5.8 GHz BAND

### 8.1.1. 6 dB BANDWIDTH

**LIMITS**

FCC §15.407 (e)

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

**RESULTS**

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---|---|---|---|
| Low | 5745 | 16.03 | 0.5 |
| Mid | 5785 | 16.30 | 0.5 |
| High | 5825 | 16.15 | 0.5 |


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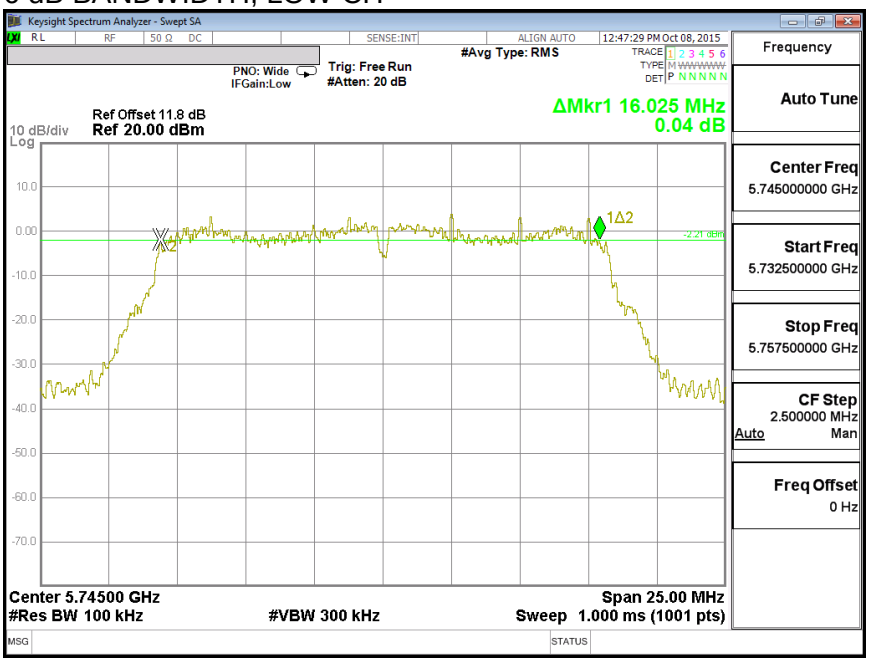
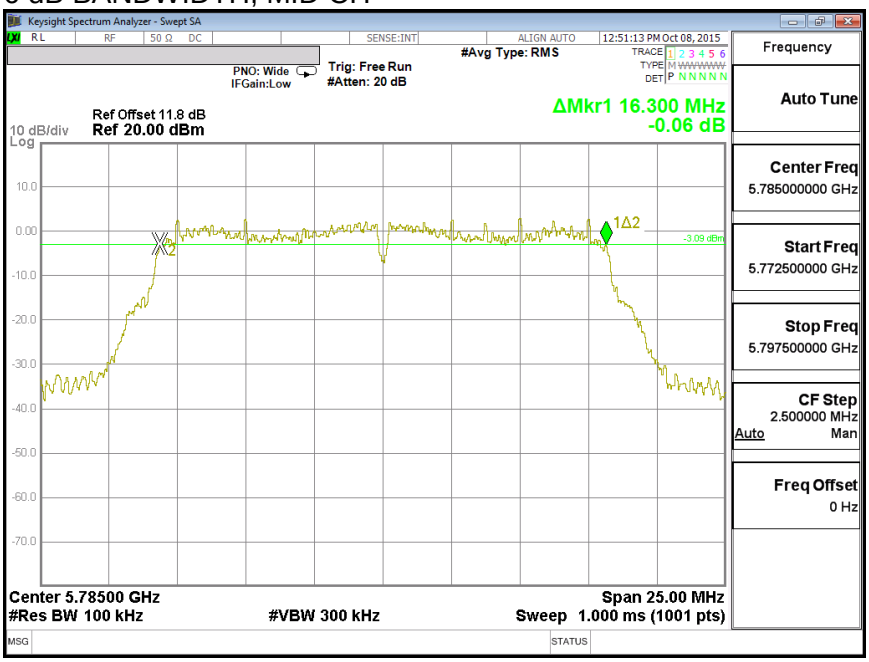
## 6 dB BANDWIDTH

6 dB BANDWIDTH, LOW CH




6 dB BANDWIDTH, MID CH





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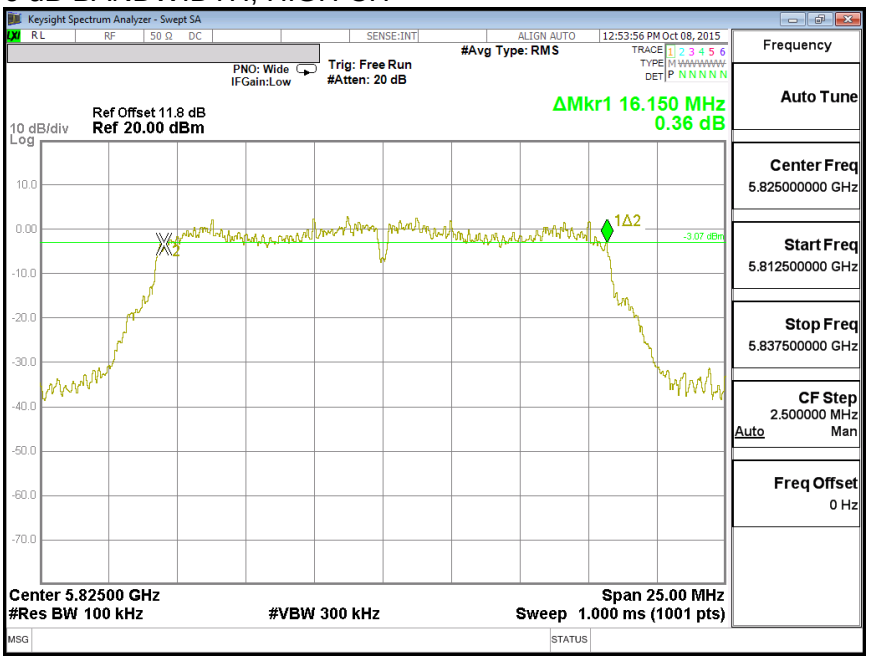
6 dB BANDWIDTH, HIGH CH





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### 8.1.2. 26 dB BANDWIDTH

**LIMITS**

None, for reporting purposes only

**RESULTS**

| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) |
|---|---|---|
| Low | 5745 | 19.43 |
| Mid | 5785 | 19.50 |
| High | 5825 | 19.45 |


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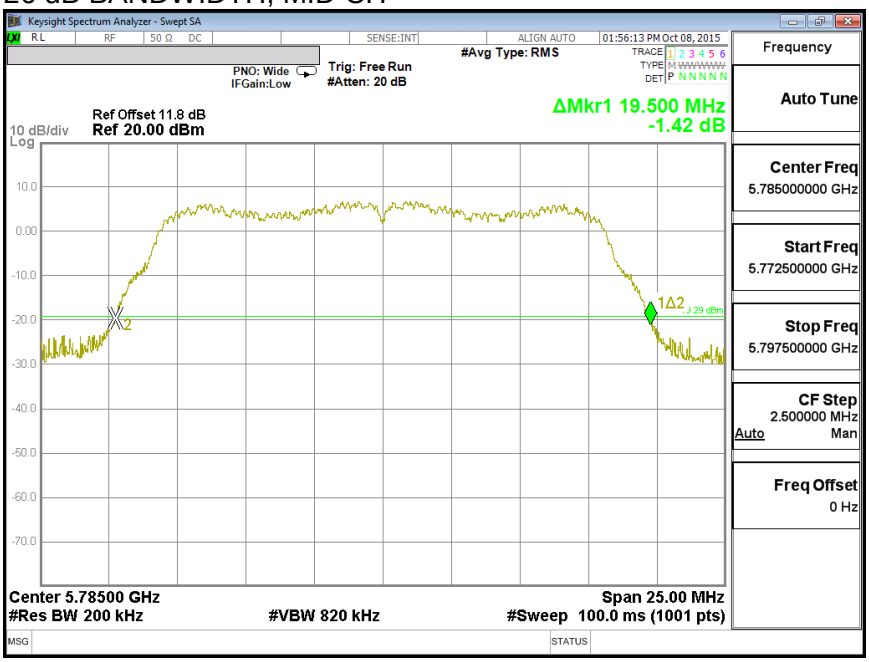
## 26 dB BANDWIDTH

26 dB BANDWIDTH, LOW CH

26 dB BANDWIDTH, MID CH





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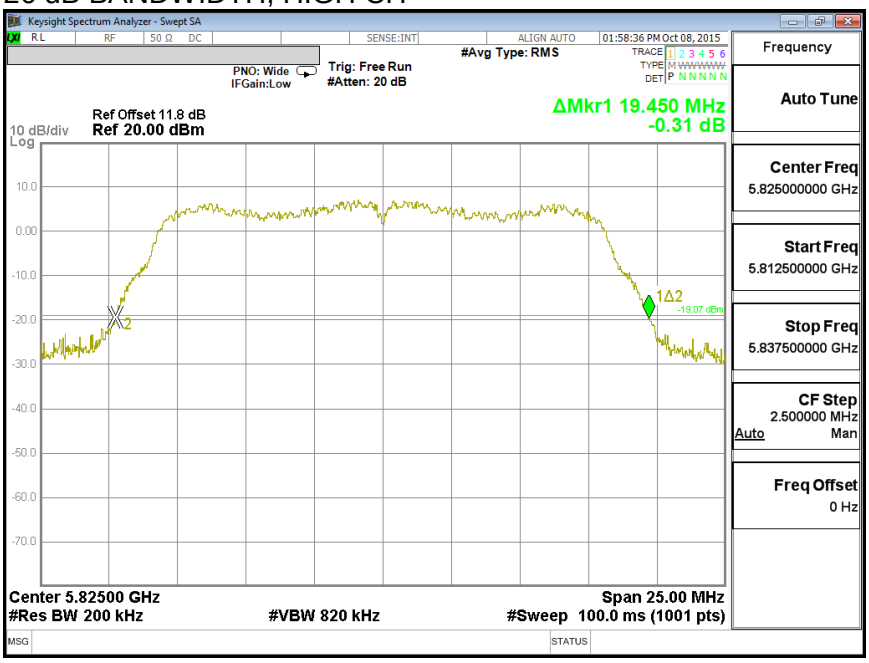
26 dB BANDWIDTH, HIGH CH





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### 8.1.3. 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

**RESULTS**

| Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|
| 5745 | 16.323 |
| 5785 | 16.314 |
| 5825 | 16.347 |


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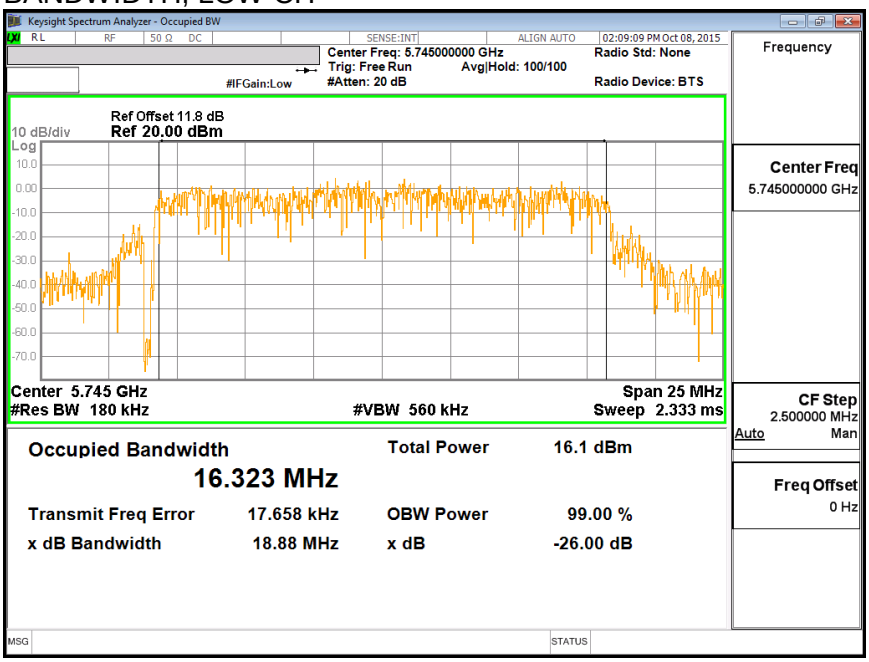
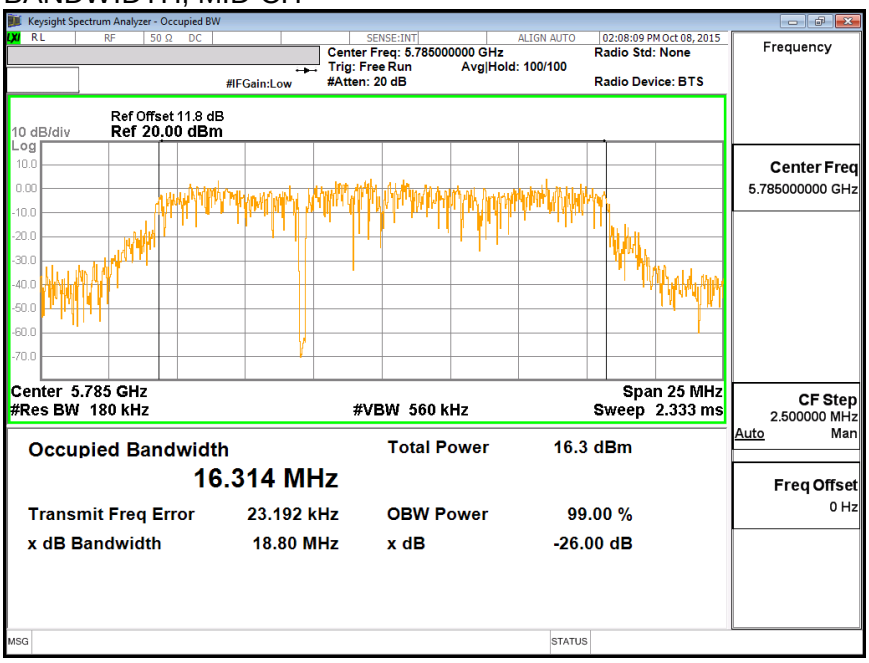
**99% BANDWIDTH**

BANDWIDTH, LOW CH




BANDWIDTH, MID CH





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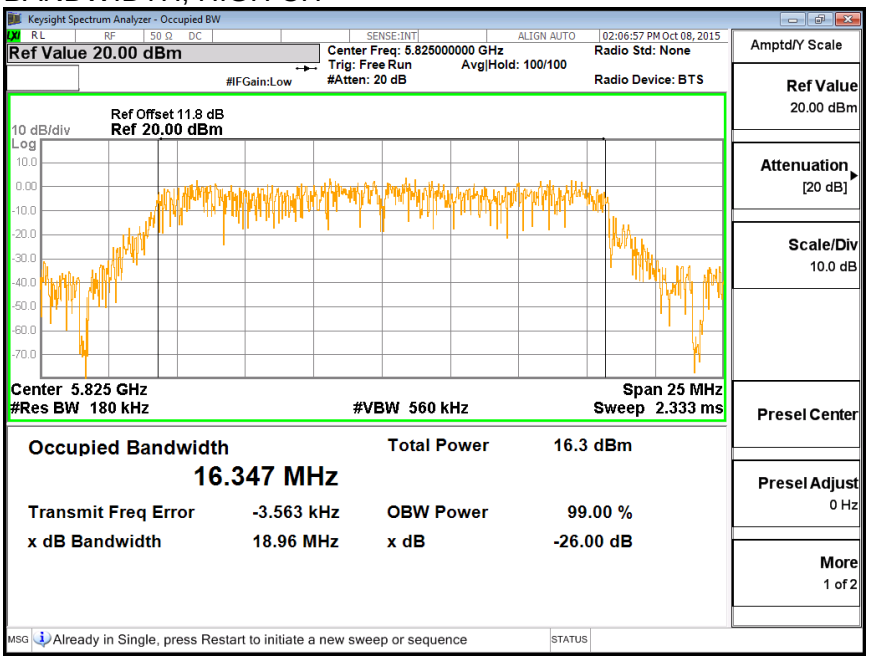
BANDWIDTH, HIGH CH





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### 8.1.4. AVERAGE POWER

**LIMITS**

None; for reporting purposes only.

**Test Procedure**

Measurements perform using a wideband gated RF power meter.

**RESULTS**

| Channel | Frequency (MHz) | Power (dBm) |
|---|---|---|
| Low | 5745 | 15.44 |
| Mid | 5785 | 15.42 |
| High | 5825 | 15.43 |


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### 8.1.5. OUTPUT POWER

**LIMITS**

FCC §15.407 (a) (3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**Test Procedure**

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

**DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.


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**RESULTS**

**Antenna Gain and Limit**

| Channel | Frequency (MHz) | Directional Gain for Power (dBi) | Power Limit (dBm) |
|---|---|---|---|
| Low | 5745 | 3.76 | 30.00 |
| Mid | 5785 | 3.76 | 30.00 |
| High | 5825 | 3.76 | 30.00 |

**Output Power Results**

| Channel | Frequency (MHz) | Chain 0 Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Power Margin (dB) |
|---|---|---|---|---|---|
| Low | 5745 | 15.44 | 15.44 | 30.00 | -14.56 |
| Mid | 5785 | 15.42 | 15.42 | 30.00 | -14.58 |
| High | 5825 | 15.43 | 15.43 | 30.00 | -14.57 |


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### 8.1.6. PSD

**LIMITS**

FCC §15.407 (a) (3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

**RESULTS**

**Antenna Gain and Limits**

| Channel | Frequency (MHz) | Directional Gain (dBi) | PSD Limit (dBm) |
|---|---|---|---|
| Low | 5745 | 3.76 | 30.00 |
| Mid | 5785 | 3.76 | 30.00 |
| High | 5825 | 3.76 | 30.00 |

| | | |
|---|---|---|
| Duty Cycle CF (dB) | 0.00 | Included in Calculations of Corr'd PSD |

**PSD Results**

| Channel | Frequency (MHz) | Chain 0 Meas PSD (dBm) | Total Corr'd PSD (dBm) | PSD Limit (dBm) | PSD Margin (dB) |
|---|---|---|---|---|---|
| Low | 5745 | 3.68 | 3.68 | 30.00 | -26.32 |
| Mid | 5785 | 3.41 | 3.41 | 30.00 | -26.59 |
| High | 5825 | 3.36 | 3.36 | 30.00 | -26.64 |


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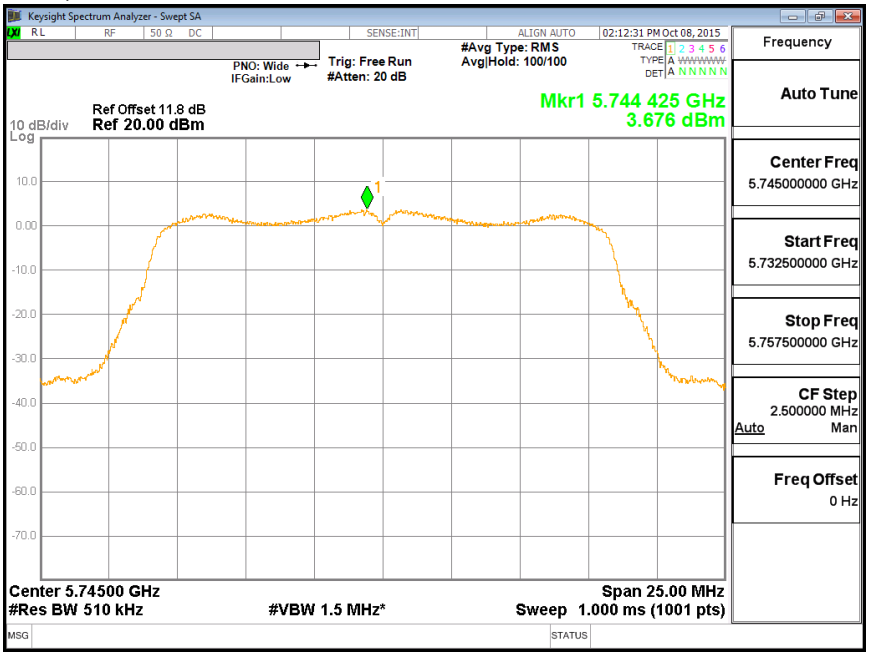
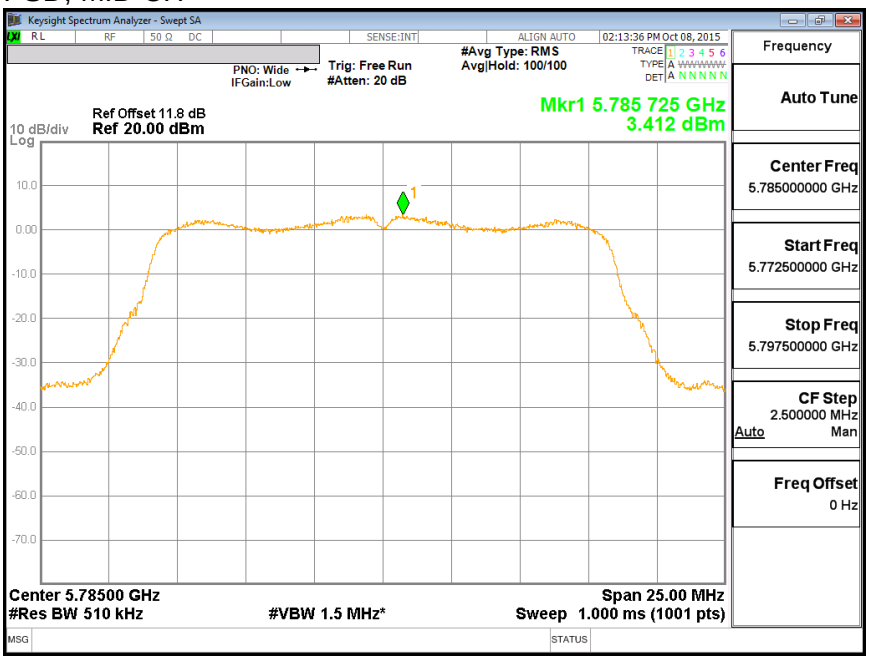
**PSD,**

PSD, LOW CH




PSD, MID CH





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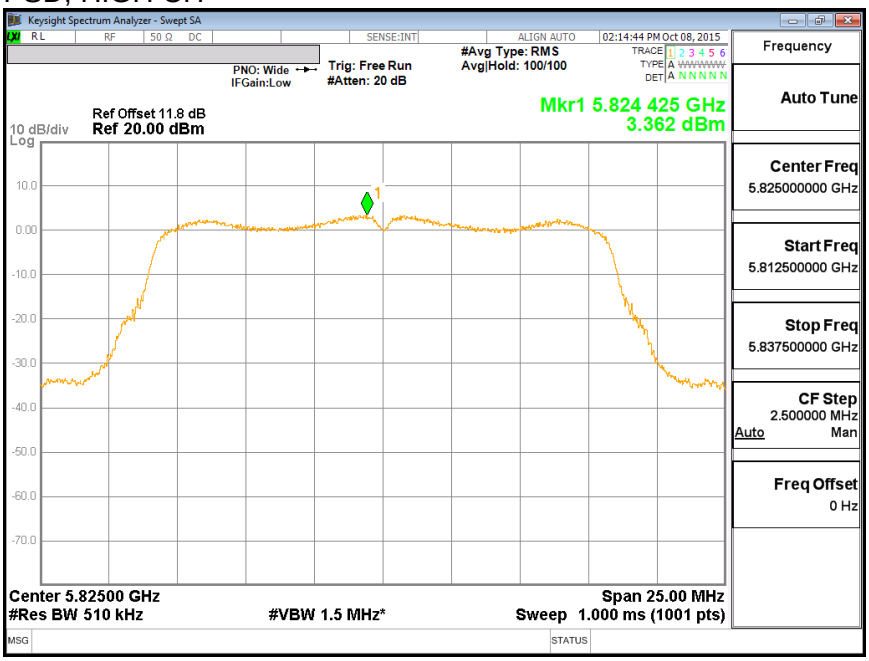
PSD, HIGH CH





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## 8.2. 802.11n HT20 2Tx CDD MODE IN THE 5.8 GHz BAND

### 8.2.1. 6 dB BANDWIDTH

**LIMITS**

FCC §15.407 (e)

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

**RESULTS**

| Channel | Frequency (MHz) | 6 dB BW Chain 0 (MHz) | 6 dB BW Chain 1 (MHz) | Minimum Limit (MHz) |
|---|---|---|---|---|
| Low | 5745 | 17.55 | 17.60 | 0.5 |
| Mid | 5785 | 17.60 | 17.58 | 0.5 |
| High | 5825 | 17.58 | 17.63 | 0.5 |


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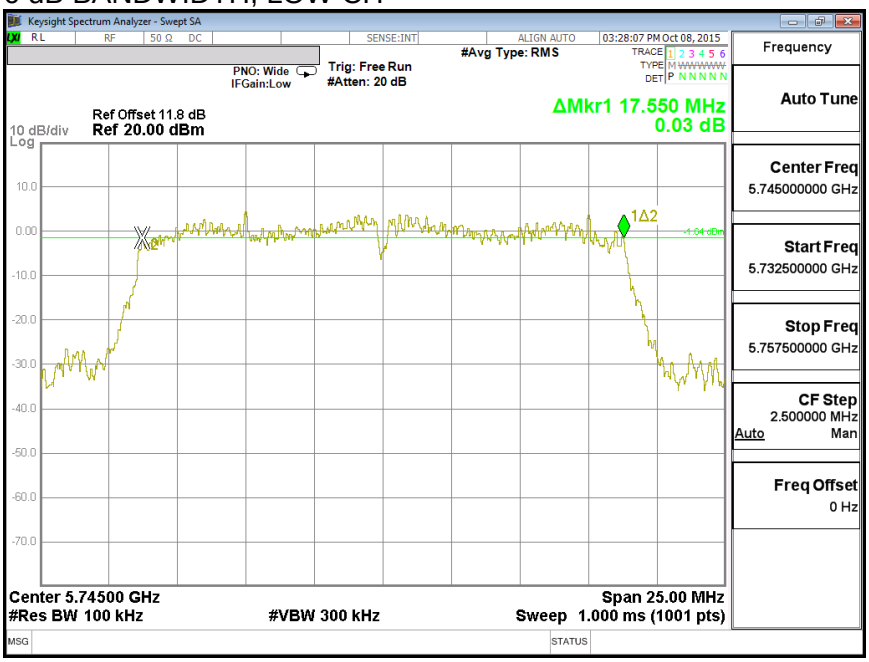
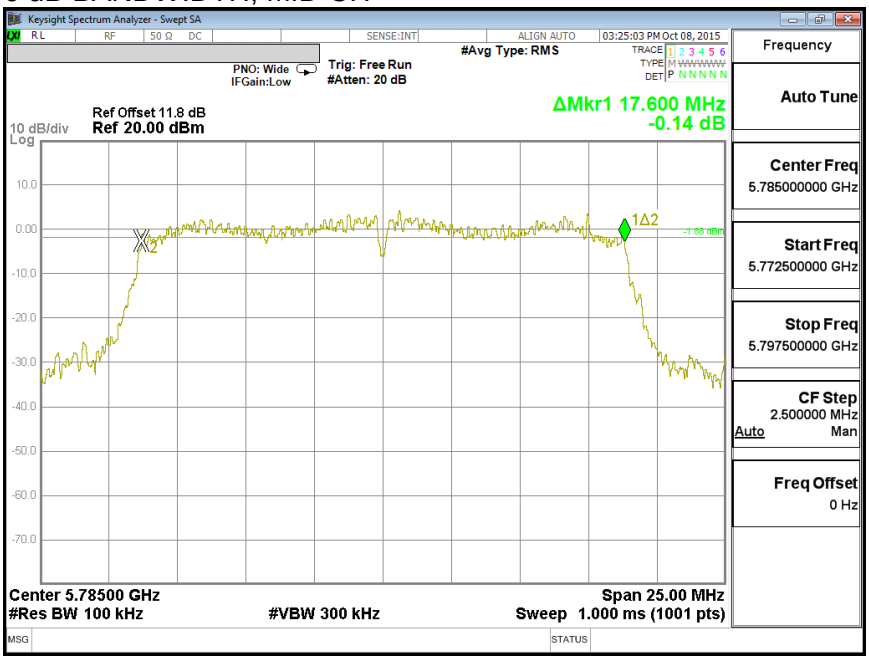
## 6 dB BANDWIDTH, CHAIN 0

6 dB BANDWIDTH, LOW CH




6 dB BANDWIDTH, MID CH





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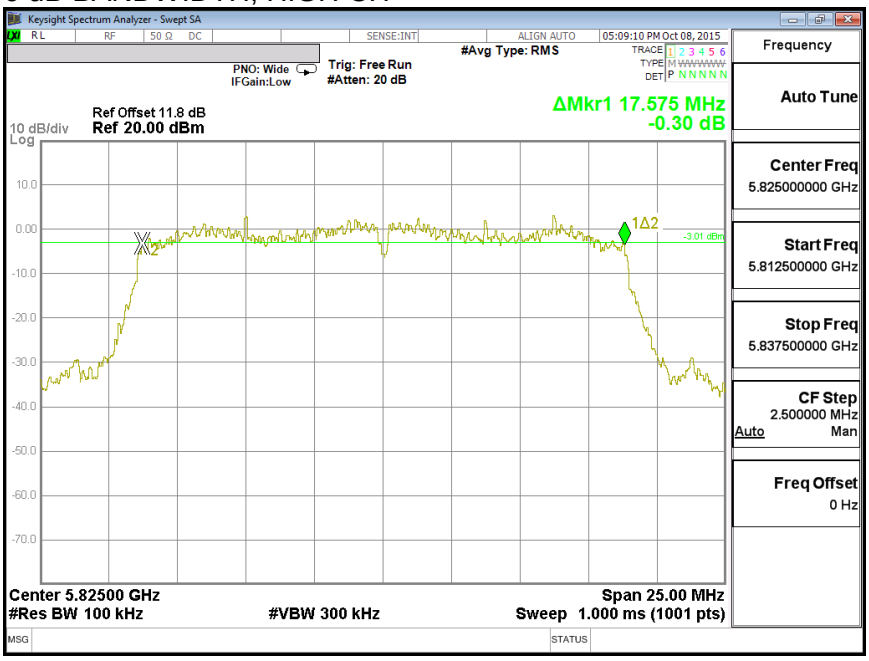
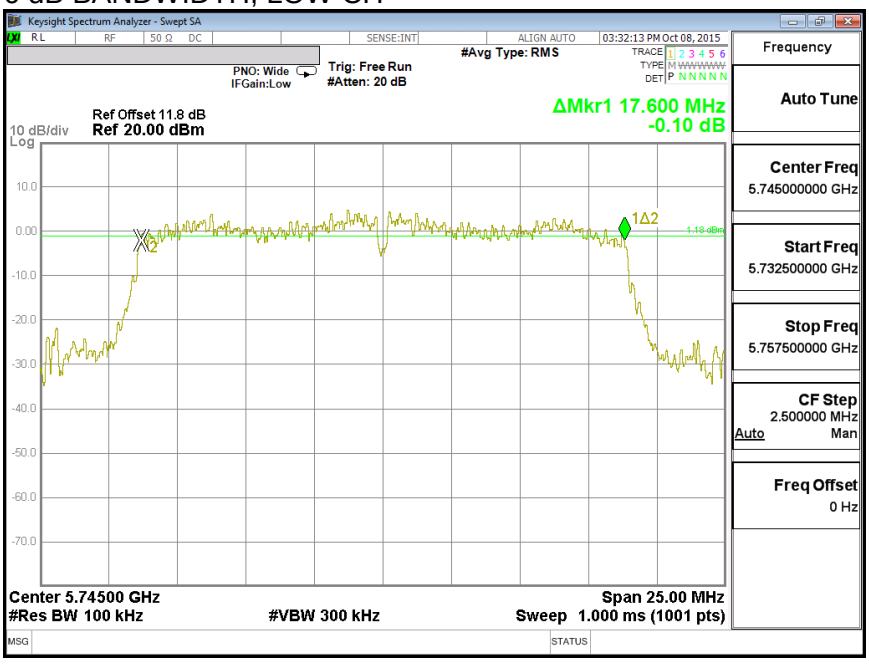
6 dB BANDWIDTH, HIGH CH




**6 dB BANDWIDTH, CHAIN 1**

6 dB BANDWIDTH, LOW CH





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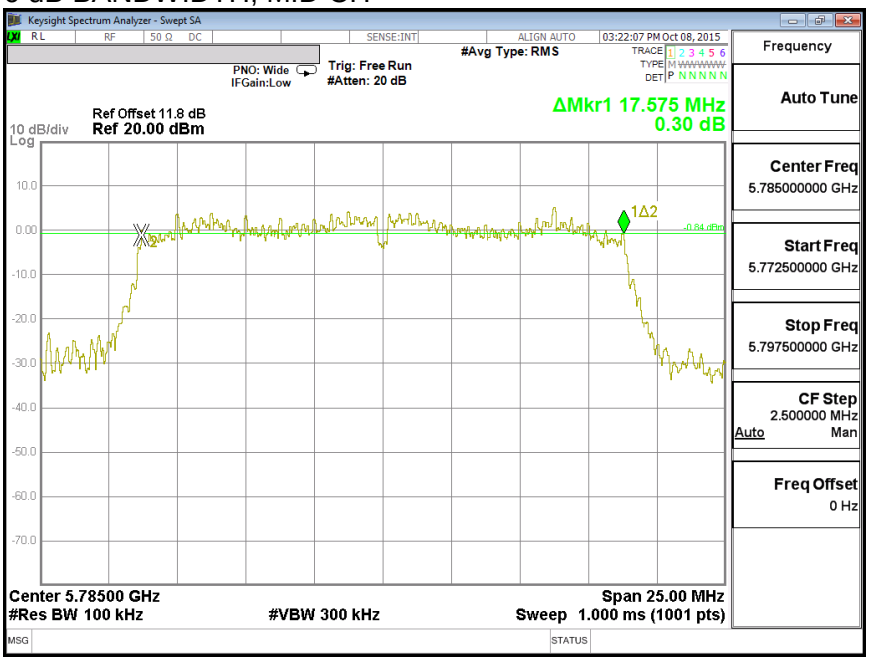
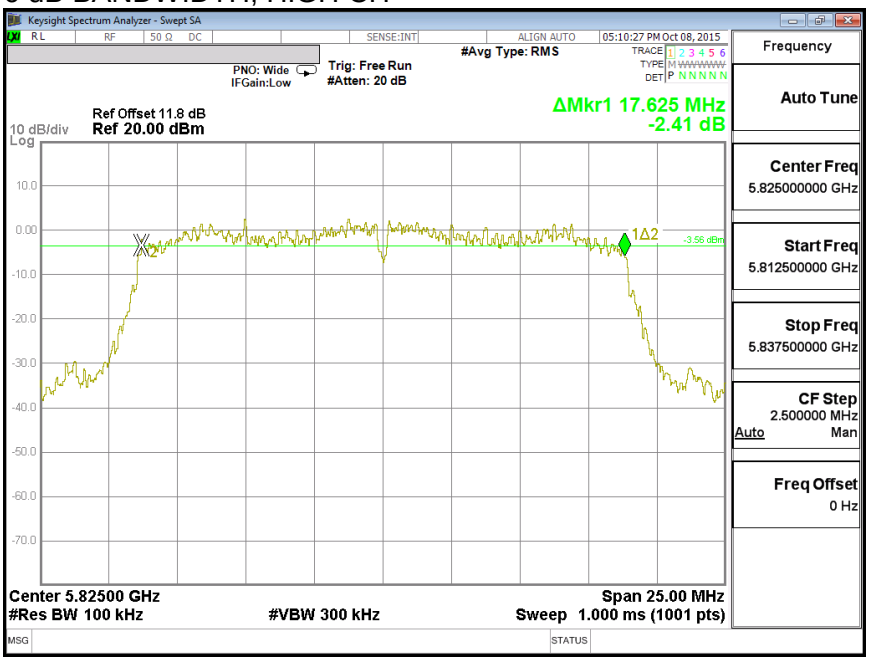
6 dB BANDWIDTH, MID CH




6 dB BANDWIDTH, HIGH CH





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### 8.2.2. 26 dB BANDWIDTH

**LIMITS**

None, for reporting purposes only.

**RESULTS**

| Channel | Frequency (MHz) | 26 dB BW Chain 0 (MHz) | 26 dB BW Chain 1 (MHz) |
|---|---|---|---|
| Low | 5745 | 19.68 | 19.63 |
| Mid | 5785 | 19.63 | 19.88 |
| High | 5825 | 19.83 | 19.68 |


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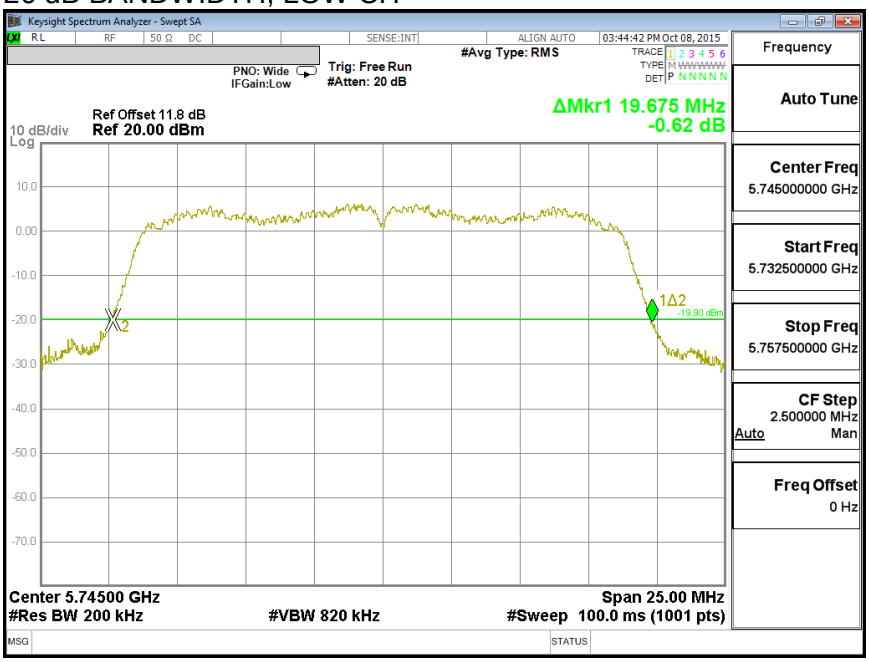
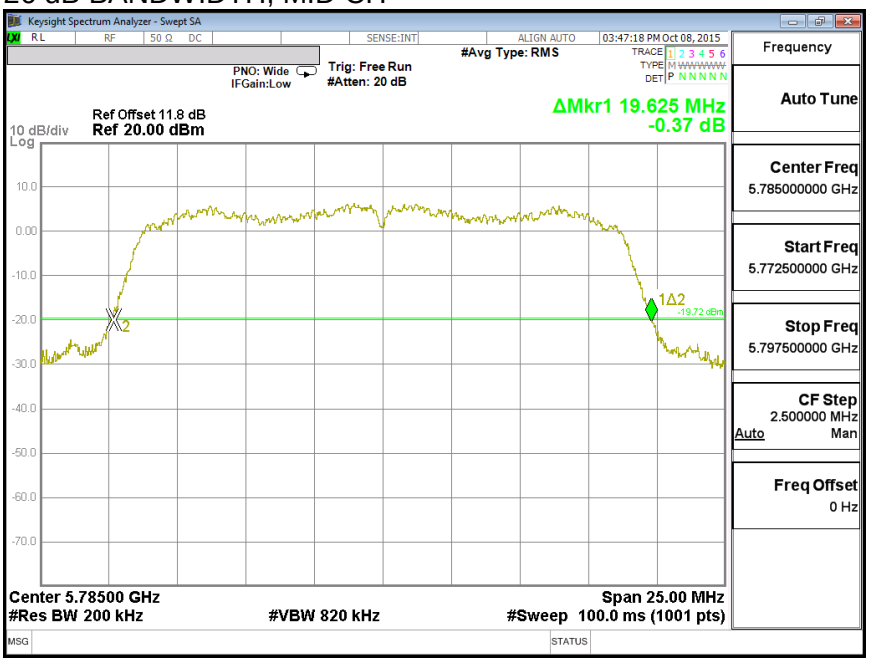
**26 dB BANDWIDTH, CHAIN 0**

26 dB BANDWIDTH, LOW CH




26 dB BANDWIDTH, MID CH





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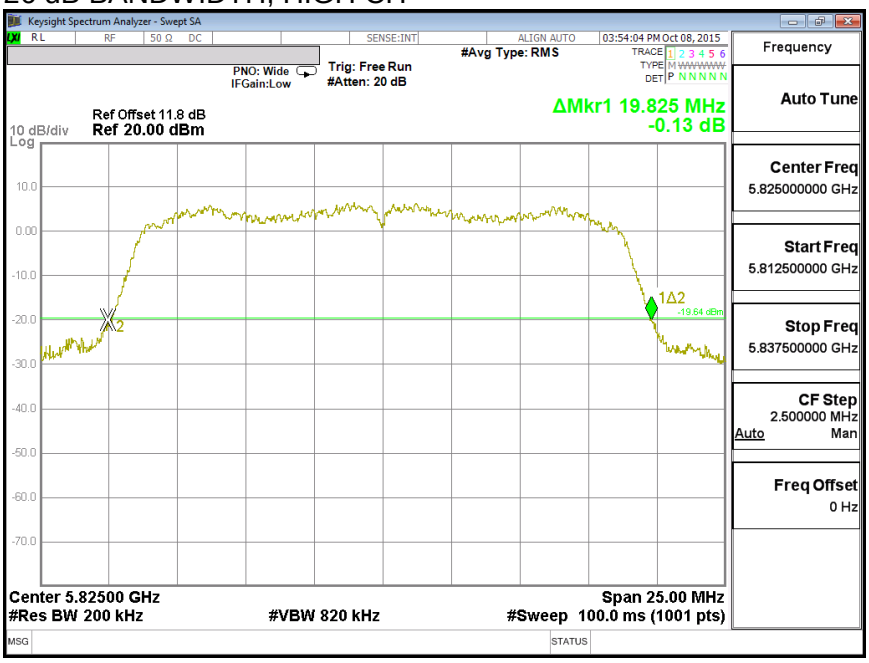
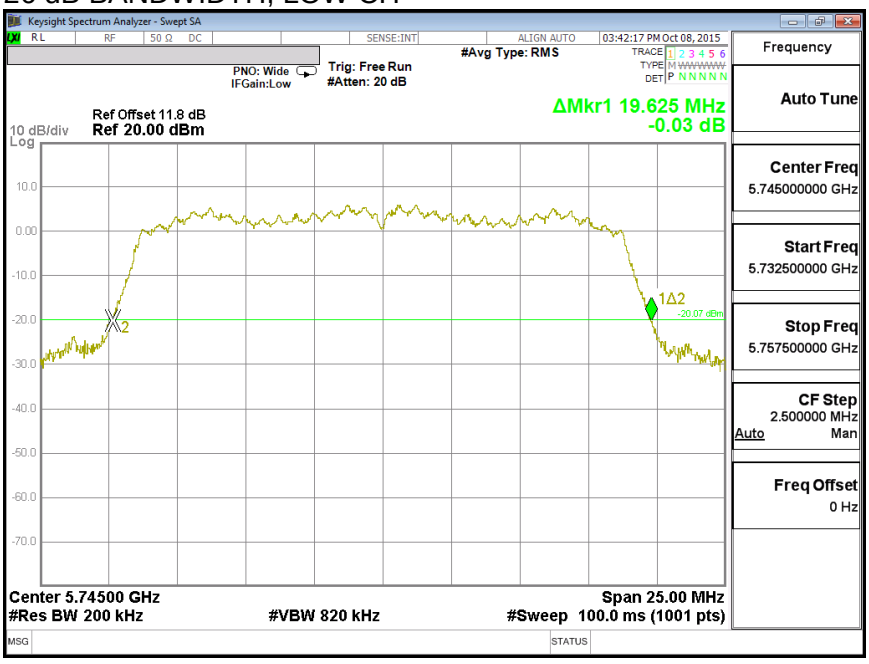
26 dB BANDWIDTH, HIGH CH




**26 dB BANDWIDTH, CHAIN 1**

26 dB BANDWIDTH, LOW CH





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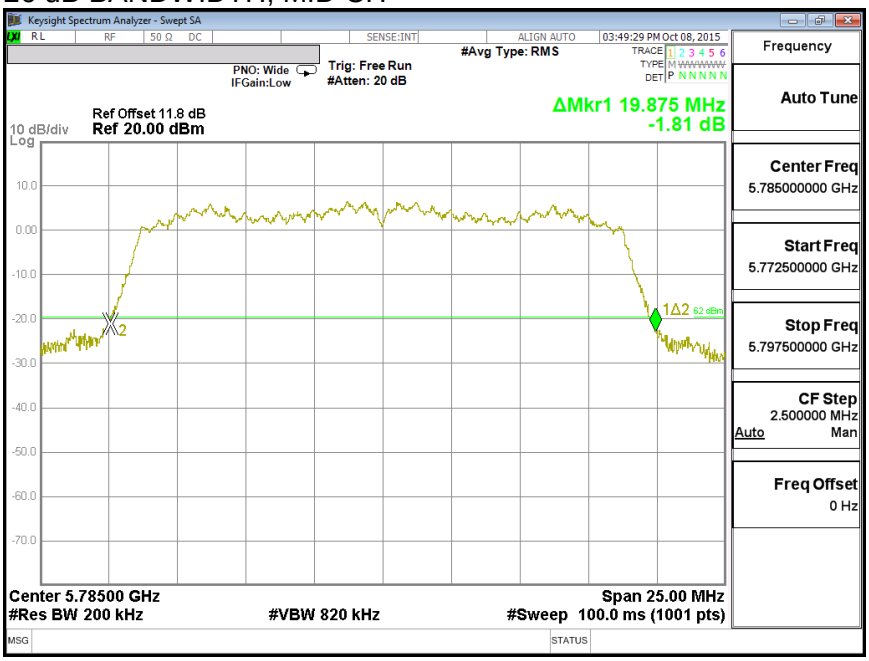
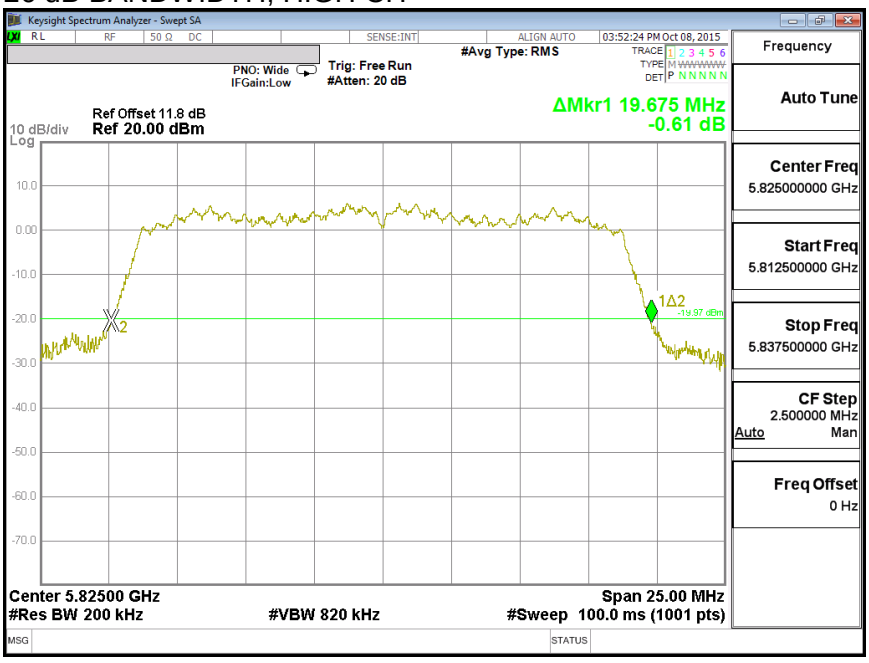
26 dB BANDWIDTH, MID CH




26 dB BANDWIDTH, HIGH CH





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### 8.2.3. 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

**RESULTS**

| Channel | Frequency (MHz) | 99% BW Chain 0 (MHz) | 99% BW Chain 1 (MHz) |
|---|---|---|---|
| Low | 5745 | 17.577 | 17.565 |
| Mid | 5785 | 17.583 | 17.476 |
| High | 5825 | 17.546 | 17.516 |


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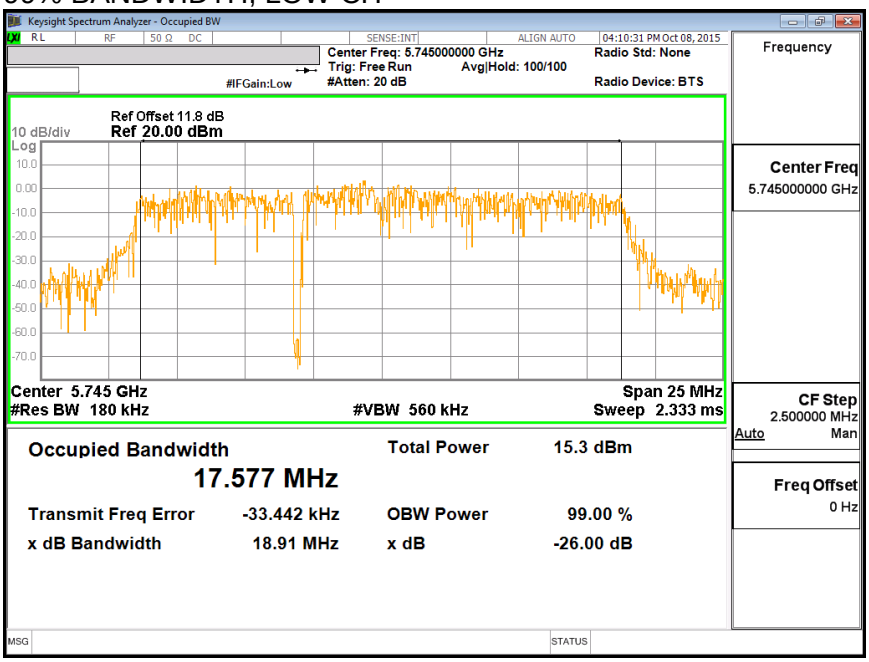
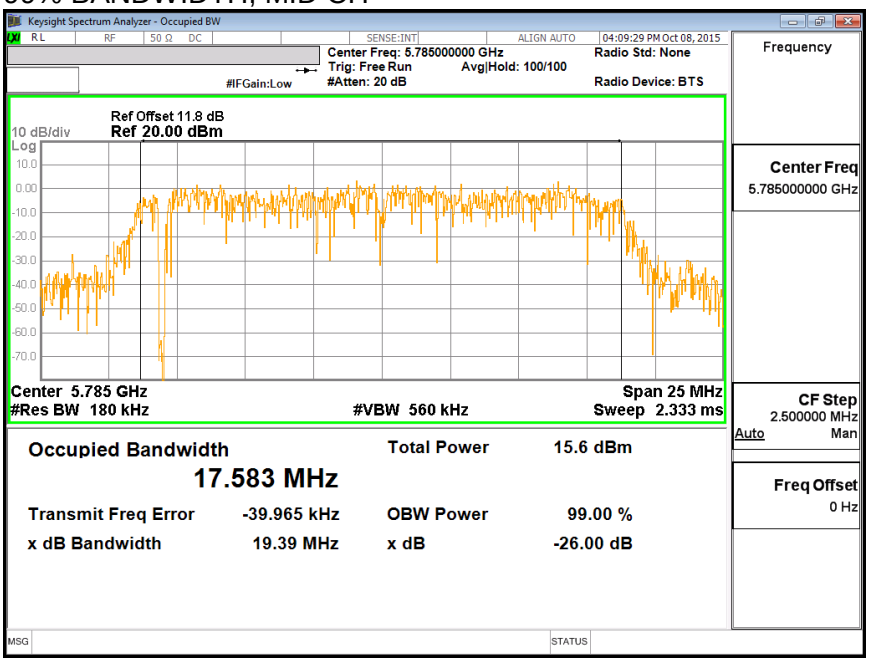
**99% BANDWIDTH, CHAIN 0**

99% BANDWIDTH, LOW CH




99% BANDWIDTH, MID CH





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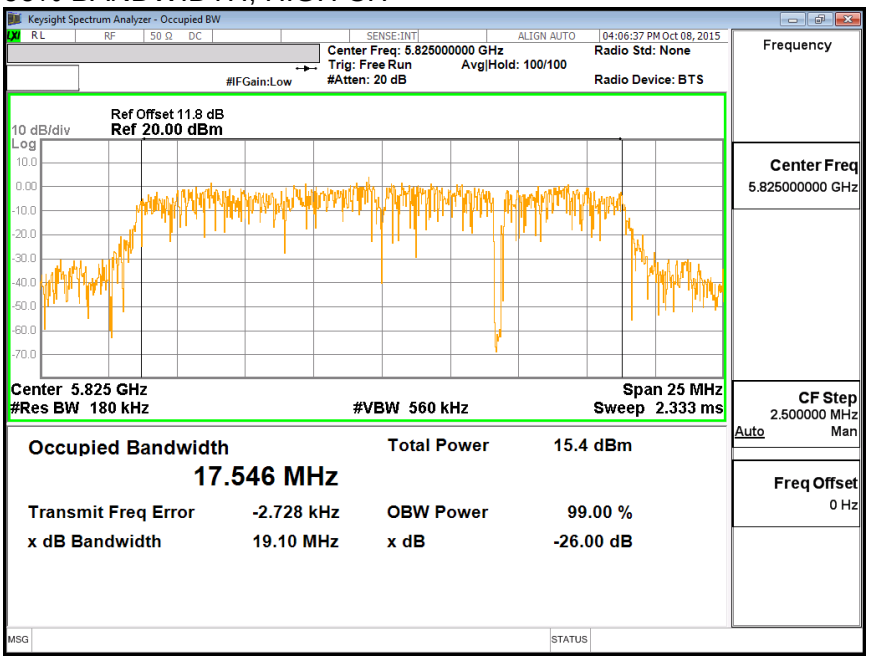
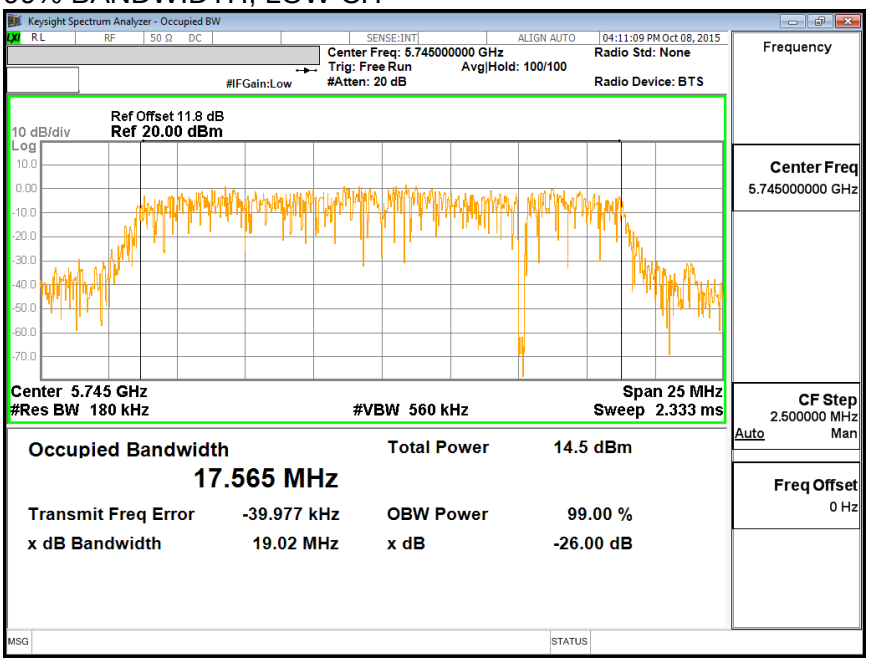
99% BANDWIDTH, HIGH CH




**99% BANDWIDTH, CHAIN 1**

99% BANDWIDTH, LOW CH





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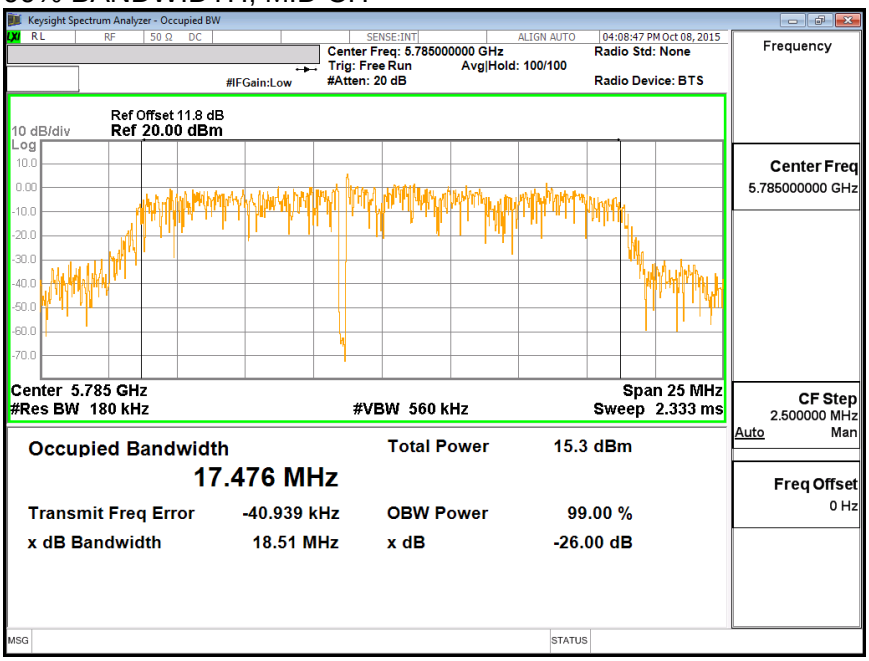
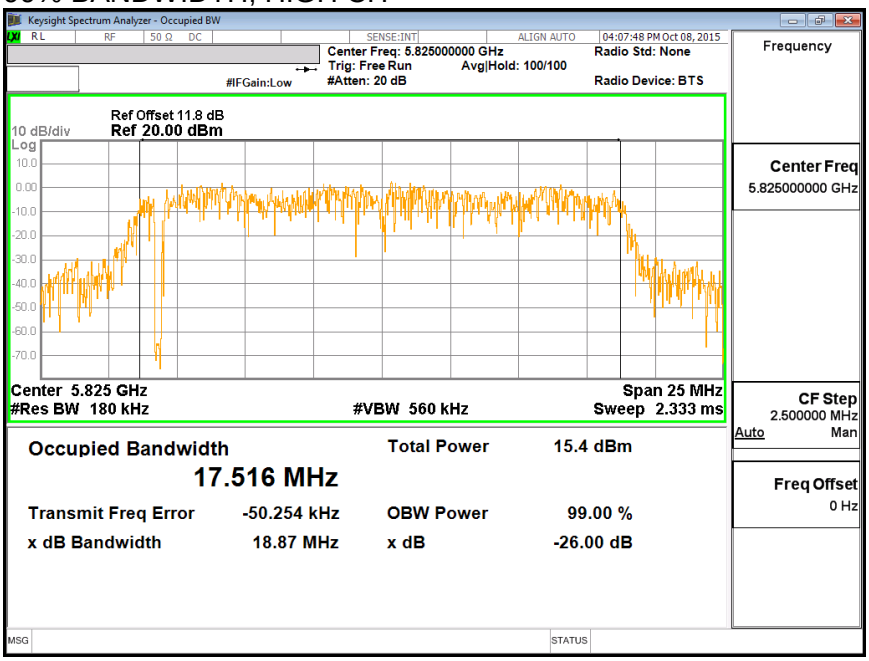
99% BANDWIDTH, MID CH




99% BANDWIDTH, HIGH CH





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### 8.2.4. AVERAGE POWER

**LIMITS**

None; for reporting purposes only.

**Test Procedure**

Measurements perform using a wideband gated RF power meter.

**RESULTS**

| Channel | Frequency (MHz) | Chain 0 Power (dBm) | Chain 1 Power (dBm) | Total Power (dBm) |
|---|---|---|---|---|
| Low | 5745 | 14.50 | 14.09 | 17.31 |
| Mid | 5785 | 15.50 | 15.32 | 18.42 |
| High | 5825 | 15.44 | 15.35 | 18.41 |


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### 8.2.5. OUTPUT POWER

**LIMITS**

FCC §15.407 (a) (3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**Test Procedure**

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

**DIRECTIONAL ANTENNA GAIN**

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

| Chain 0 Antenna Gain (dBi) | Chain 1 Antenna Gain (dBi) | Uncorrelated Chains Directional Gain (dBi) |
|---|---|---|
| 2.68 | 3.76 | 3.25 |


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**RESULTS**

**Antenna Gain and Limit**

| Channel | Frequency (MHz) | Directional Gain for Power (dBi) | Power Limit (dBm) |
|---|---|---|---|
| Low | 5745 | 3.25 | 30.00 |
| Mid | 5785 | 3.25 | 30.00 |
| High | 5825 | 3.25 | 30.00 |

**Output Power Results**

| Channel | Frequency (MHz) | Chain 0 Meas Power (dBm) | Chain 1 Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Power Margin (dB) |
|---|---|---|---|---|---|---|
| Low | 5745 | 14.50 | 14.09 | 17.31 | 30.00 | -12.69 |
| Mid | 5785 | 15.50 | 15.32 | 18.42 | 30.00 | -11.58 |
| High | 5825 | 15.44 | 15.35 | 18.41 | 30.00 | -11.59 |


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### 8.2.6. PSD

**LIMITS**

FCC §15.407 (a) (3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**DIRECTIONAL ANTENNA GAIN**

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

| Chain 0 Antenna Gain (dBi) | Chain 1 Antenna Gain (dBi) | Correlated Chains Directional Gain (dBi) |
|---|---|---|
| 2.68 | 3.76 | 6.25 |


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**RESULTS**

**Antenna Gain and Limits**

| Channel | Frequency (MHz) | Directional Gain (dBi) | PSD Limit (dBm) |
|---|---|---|---|
| Low | 5745 | 6.25 | 29.75 |
| Mid | 5785 | 6.25 | 29.75 |
| High | 5825 | 6.25 | 29.75 |

| | | |
|---|---|---|
| **Duty Cycle CF (dB)** | 0.00 | **Included in Calculations of Corr'd PSD** |

**PSD Results**

| Channel | Frequency (MHz) | Chain 0 Meas PSD (dBm) | Chain 1 Meas PSD (dBm) | Total Corr'd PSD (dBm) | PSD Limit (dBm) | PSD Margin (dB) |
|---|---|---|---|---|---|---|
| Low | 5745 | 1.72 | 1.48 | 4.61 | 29.75 | -25.14 |
| Mid | 5785 | 2.90 | 2.75 | 5.84 | 29.75 | -23.91 |
| High | 5825 | 2.75 | 3.00 | 5.88 | 29.75 | -23.87 |


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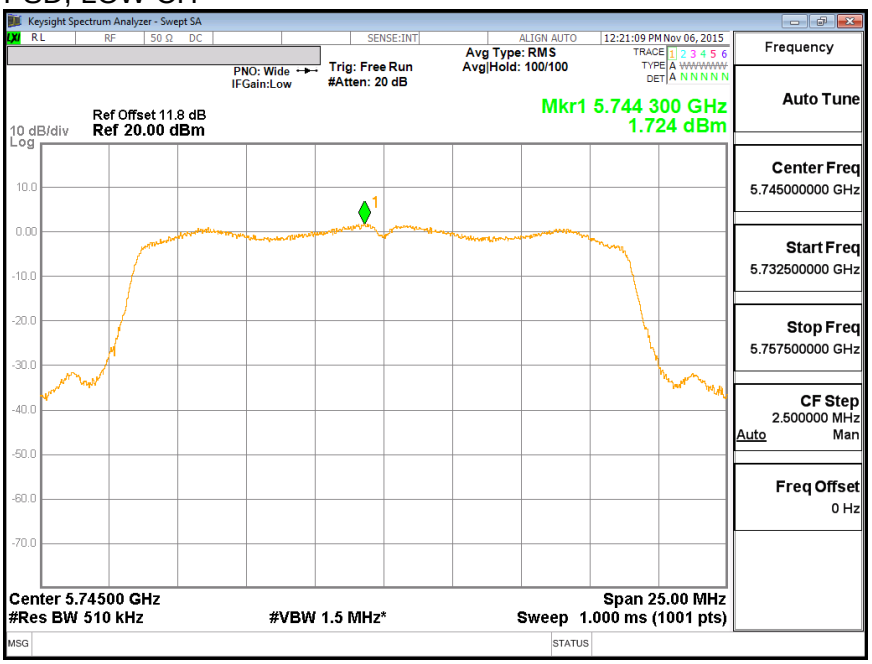
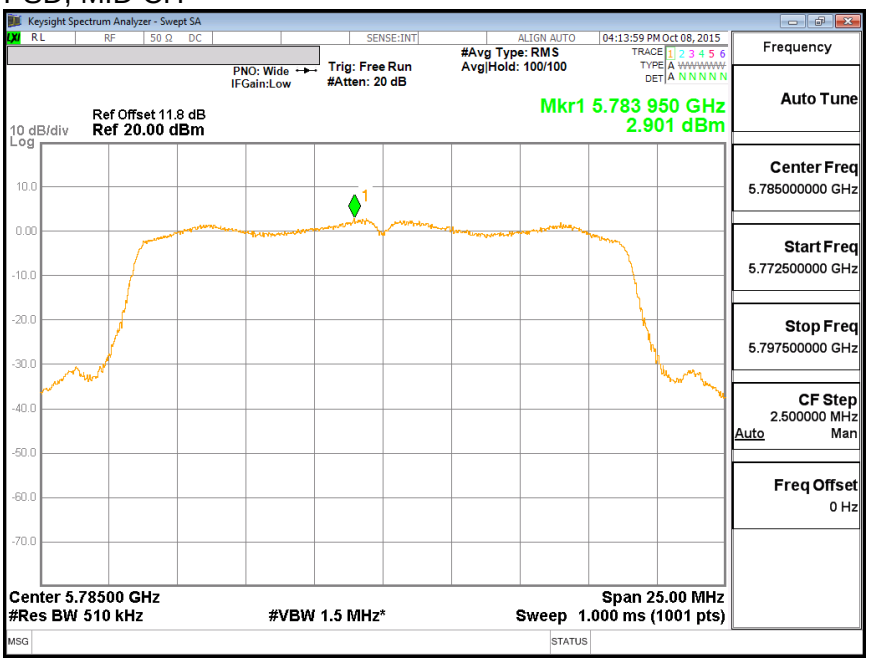
**PSD, CHAIN 0**

PSD, LOW CH




PSD, MID CH





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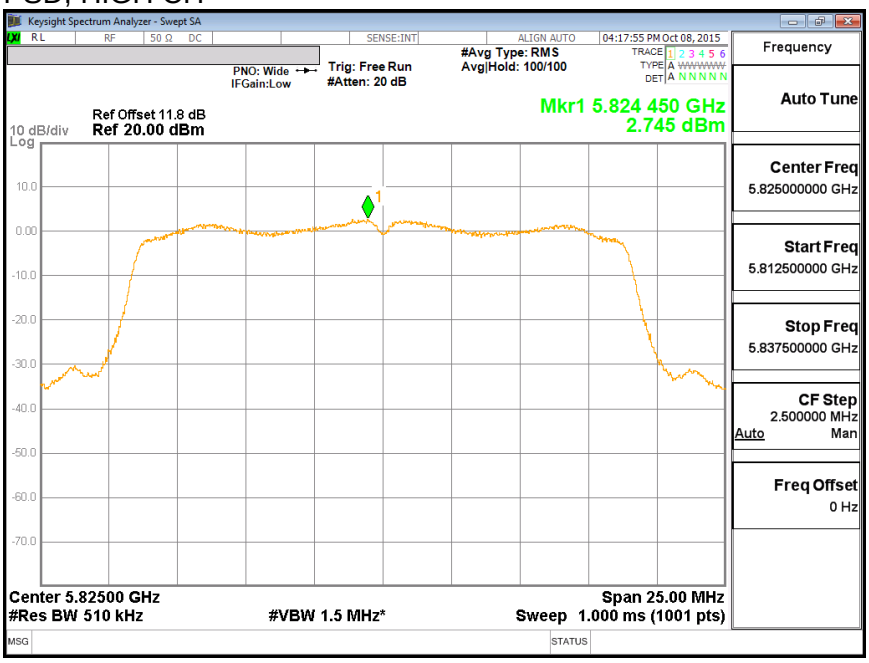
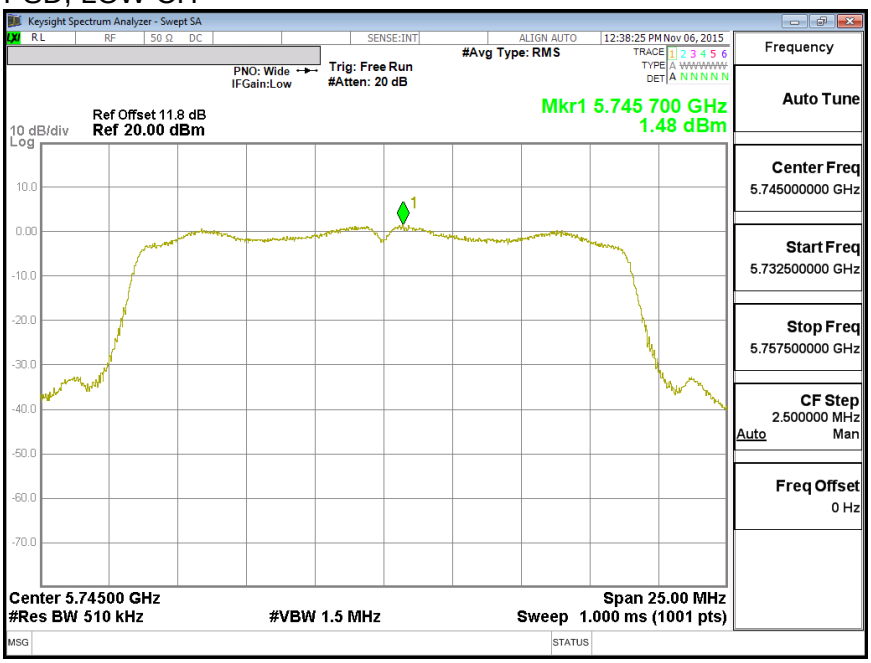
PSD, HIGH CH




**PSD, CHAIN 1**

PSD, LOW CH





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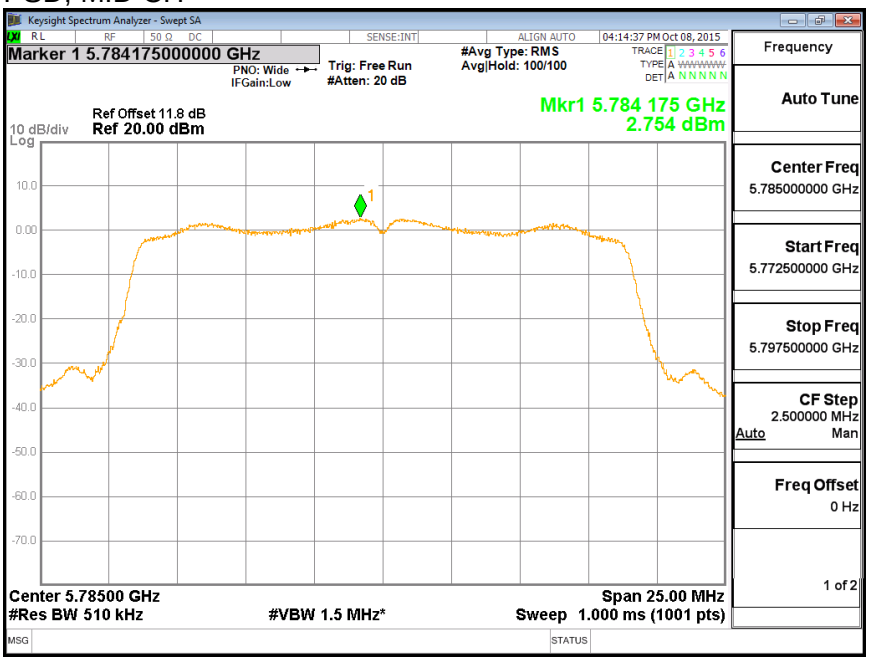
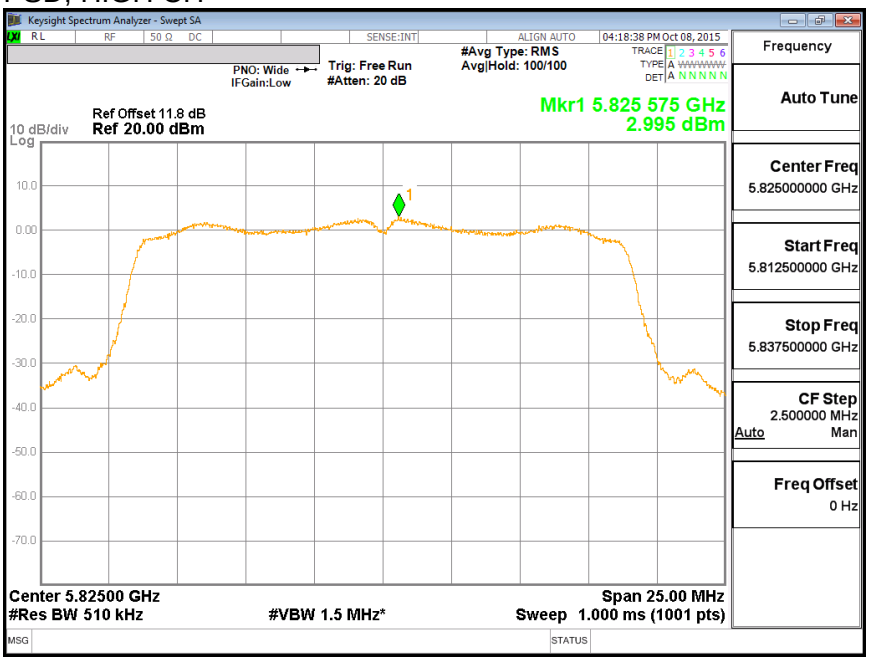
PSD, MID CH




PSD, HIGH CH





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## 8.3. 802.11n HT20 2Tx STBC MODE IN THE 5.8 GHz BAND

**Note:** Covered by 802.11n HT20 2Tx CDD MODE


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## 8.4. 802.11n HT40 1TX MODE IN THE 5.8 GHz BAND

### 8.4.1. 6 dB BANDWIDTH

**LIMITS**

FCC §15.407 (e)

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

**RESULTS**

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---|---|---|---|
| Low | 5755 | 35.64 | 0.5 |
| High | 5795 | 35.42 | 0.5 |


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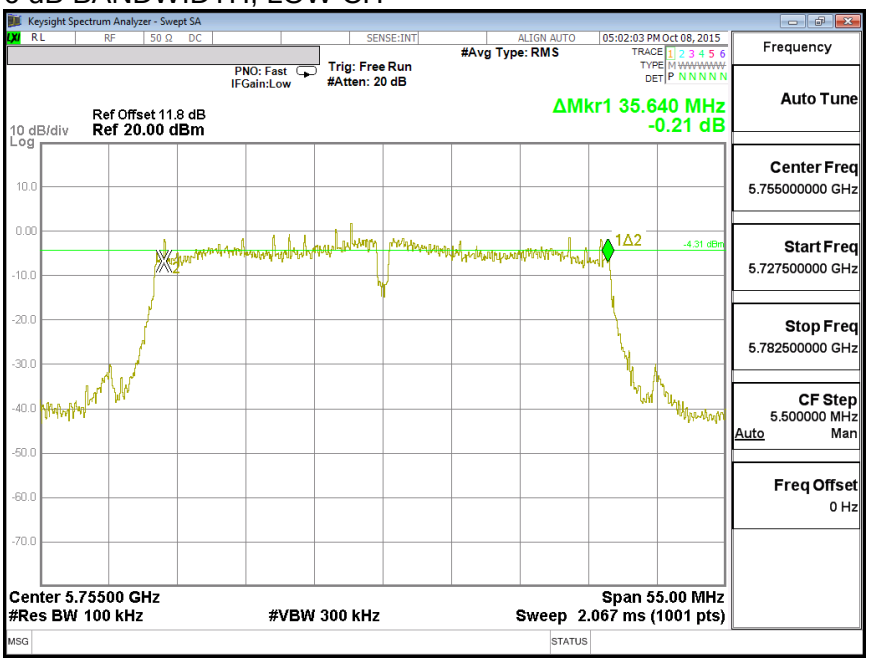
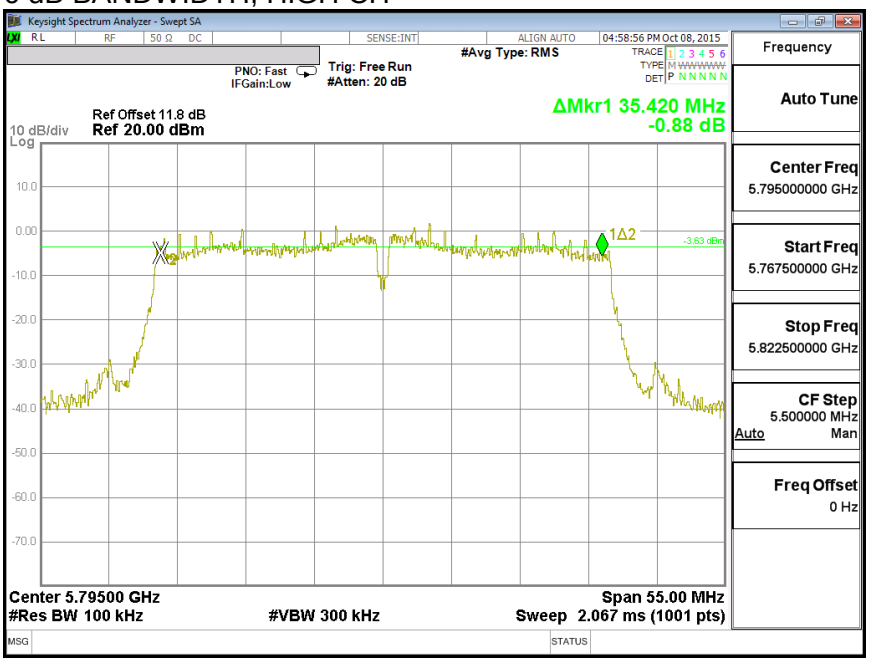
## 6 dB BANDWIDTH

6 dB BANDWIDTH, LOW CH




6 dB BANDWIDTH, HIGH CH





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### 8.4.2. 26 dB BANDWIDTH

**LIMITS**

None, for reporting purposes only.

**RESULTS**

| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) |
|---|---|---|
| Low | 5755 | 40.21 |
| High | 5795 | 40.04 |


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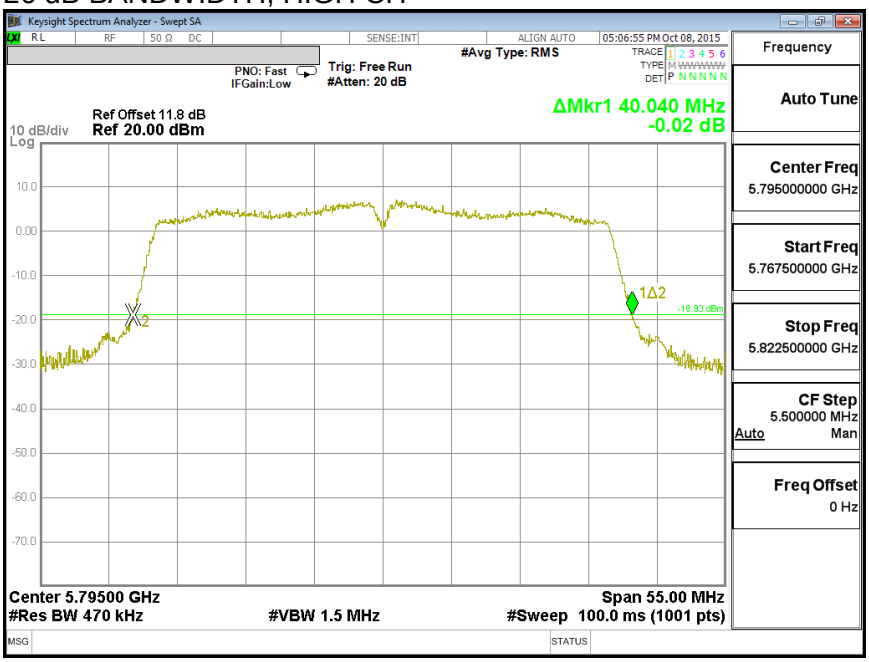
## 26 dB BANDWIDTH

26 dB BANDWIDTH, LOW CH

26 dB BANDWIDTH, HIGH CH





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### 8.4.3. 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

**RESULTS**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low | 5755 | 36.314 |
| High | 5795 | 36.291 |


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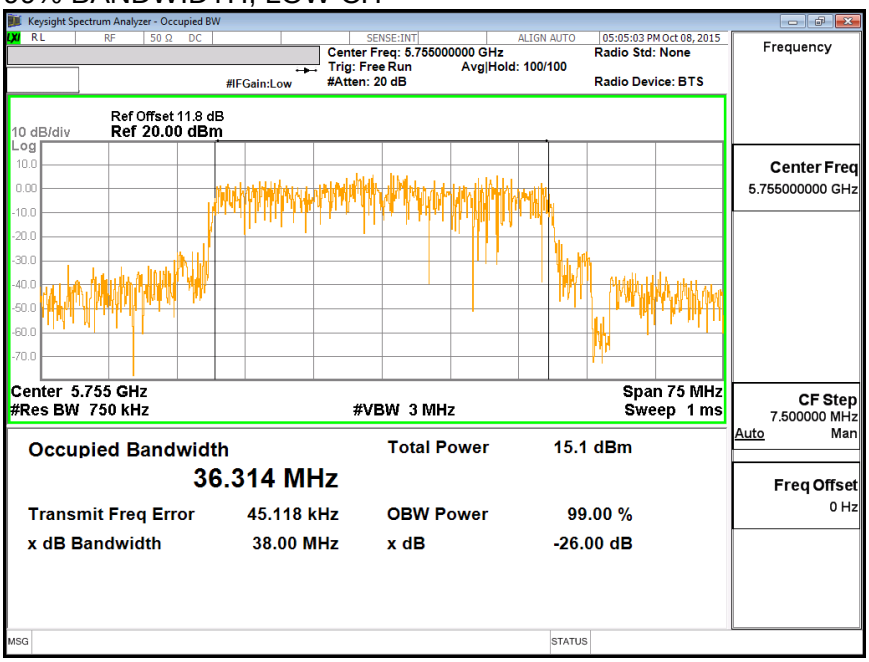
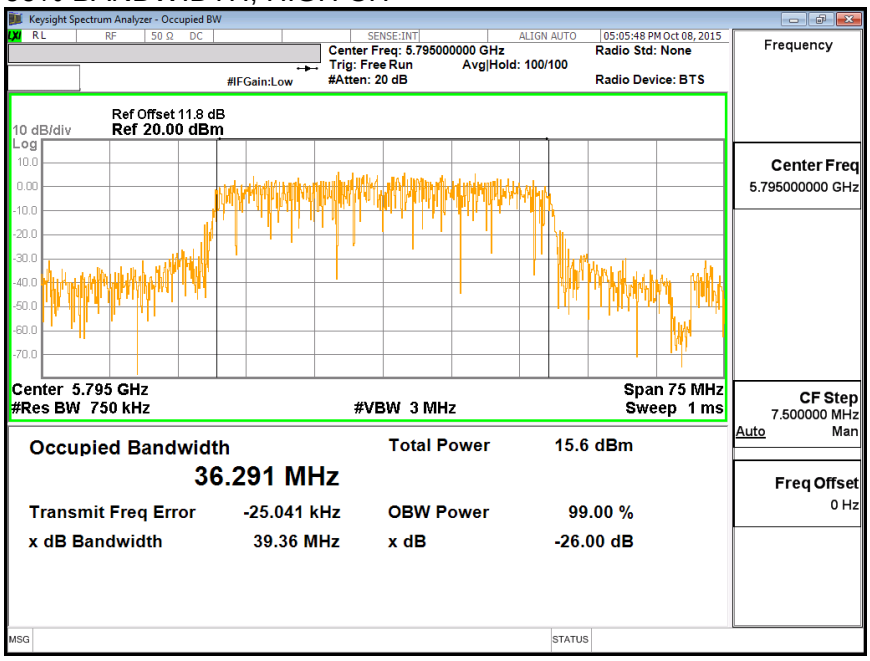
**99% BANDWIDTH**

99% BANDWIDTH, LOW CH




99% BANDWIDTH, HIGH CH





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### 8.4.4. AVERAGE POWER

**LIMITS**

None; for reporting purposes only.

**Test Procedure**

Measurements perform using a wideband gated RF power meter.

**RESULTS**

| Channel | Frequency (MHz) | Power (dBm) |
|---|---|---|
| Low | 5755 | 14.60 |
| High | 5795 | 15.50 |


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### 8.4.5. OUTPUT POWER

**LIMITS**

FCC §15.407 (a) (3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**Test Procedure**

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

**DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.


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**RESULTS**

**Antenna Gain and Limit**

| Channel | Frequency (MHz) | Directional Gain (dBi) | Power Limit (dBm) |
|---|---|---|---|
| Low | 5755 | 2.68 | 30.00 |
| High | 5795 | 2.68 | 30.00 |

**Output Power Results**

| Channel | Frequency (MHz) | Chain 0 Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Power Margin (dB) |
|---|---|---|---|---|---|
| Low | 5755 | 14.60 | 14.60 | 30.00 | -15.40 |
| High | 5795 | 15.50 | 15.50 | 30.00 | -14.50 |


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### 8.4.6. PSD

**LIMITS**

FCC §15.407 (a) (3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.


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**RESULTS**

**Antenna Gain and Limits**

| Channel | Frequency (MHz) | Directional Gain (dBi) | PSD Limit (dBm) |
|---|---|---|---|
| Low | 5755 | 2.68 | 30.00 |
| High | 5795 | 2.68 | 30.00 |

| | | |
|---|---|---|
| **Duty Cycle CF (dB)** | 0.13 | **Included in Calculations of Corr'd PSD** |

**PSD Results**

| Channel | Frequency (MHz) | Chain 0 Meas PSD (dBm) | Total Corr'd PSD (dBm) | PSD Limit (dBm) | PSD Margin (dB) |
|---|---|---|---|---|---|
| Low | 5755 | -0.57 | -0.44 | 30.00 | -30.44 |
| High | 5795 | 0.18 | 0.31 | 30.00 | -29.69 |


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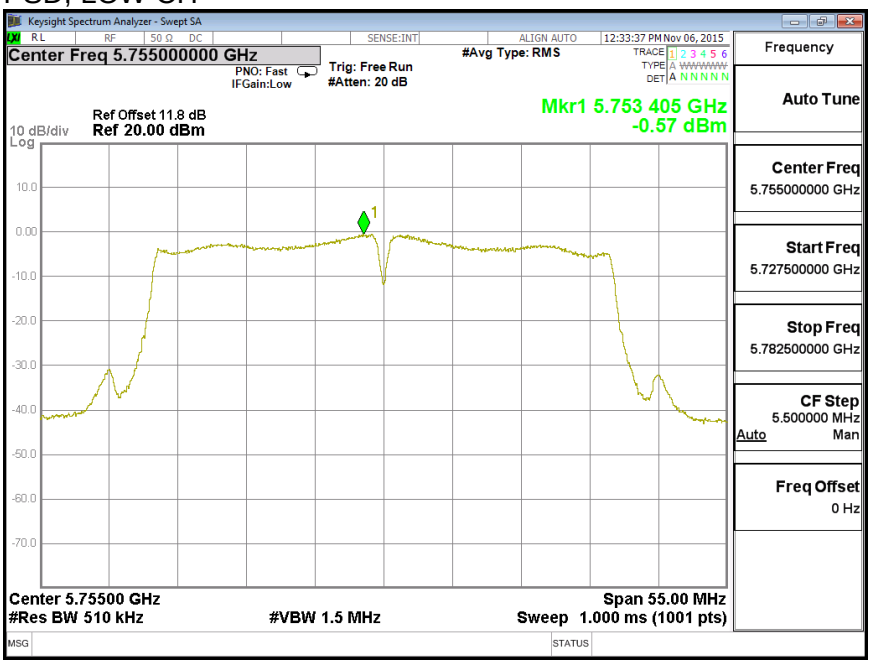
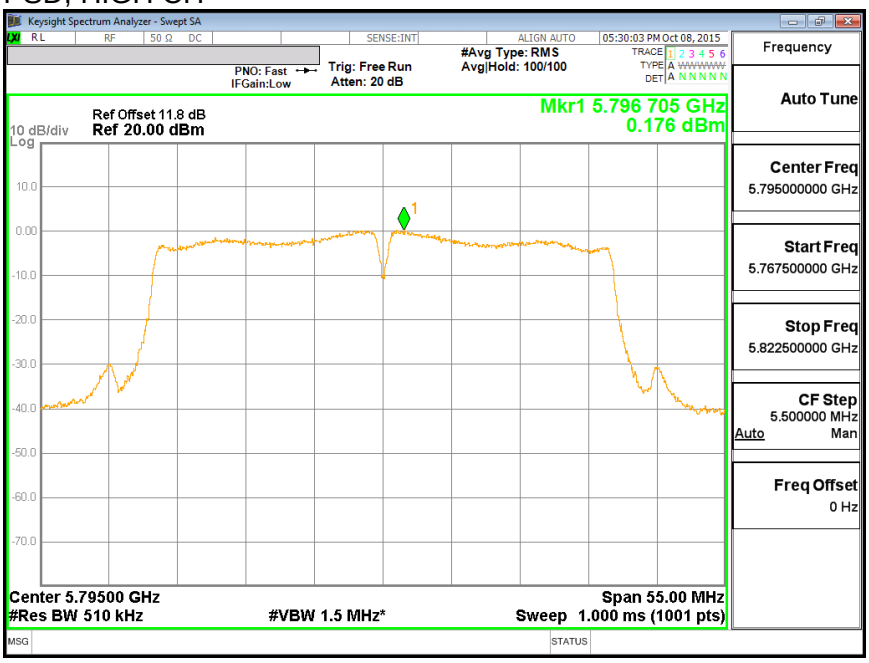
**PSD,**

PSD, LOW CH




PSD, HIGH CH





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## 8.5. 802.11n HT40 2Tx CDD MODE IN THE 5.8 GHz BAND

### 8.5.1. 6 dB BANDWIDTH

**LIMITS**

FCC §15.407 (e)

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

**RESULTS**

| Channel | Frequency (MHz) | 6 dB BW Chain 0 (MHz) | 6 dB BW Chain 1 (MHz) | Minimum Limit (MHz) |
|---|---|---|---|---|
| Low | 5755 | 36.25 | 36.30 | 0.5 |
| High | 5795 | 35.20 | 36.30 | 0.5 |


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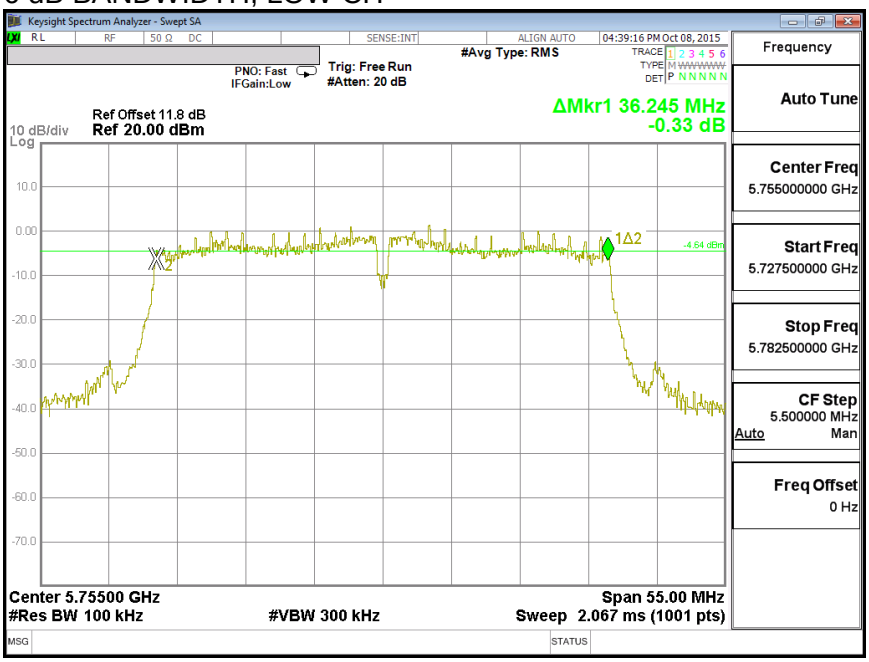
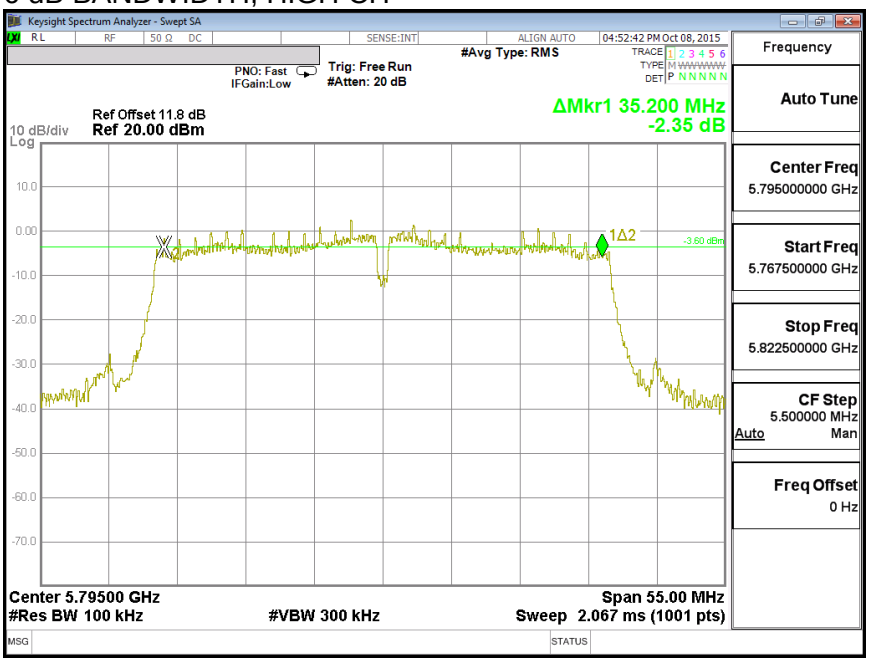
**6 dB BANDWIDTH, CHAIN 0**

6 dB BANDWIDTH, LOW CH




6 dB BANDWIDTH, HIGH CH





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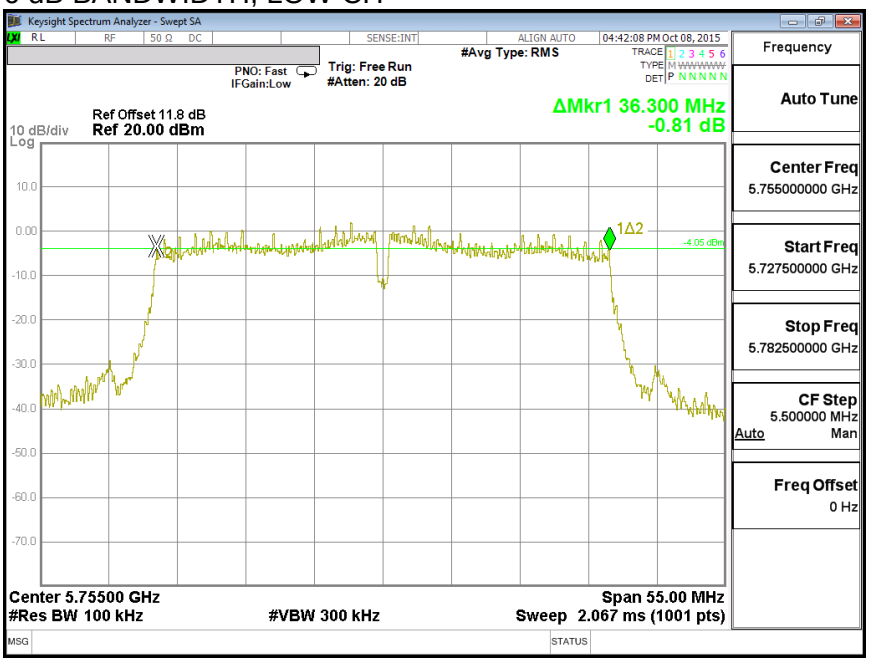
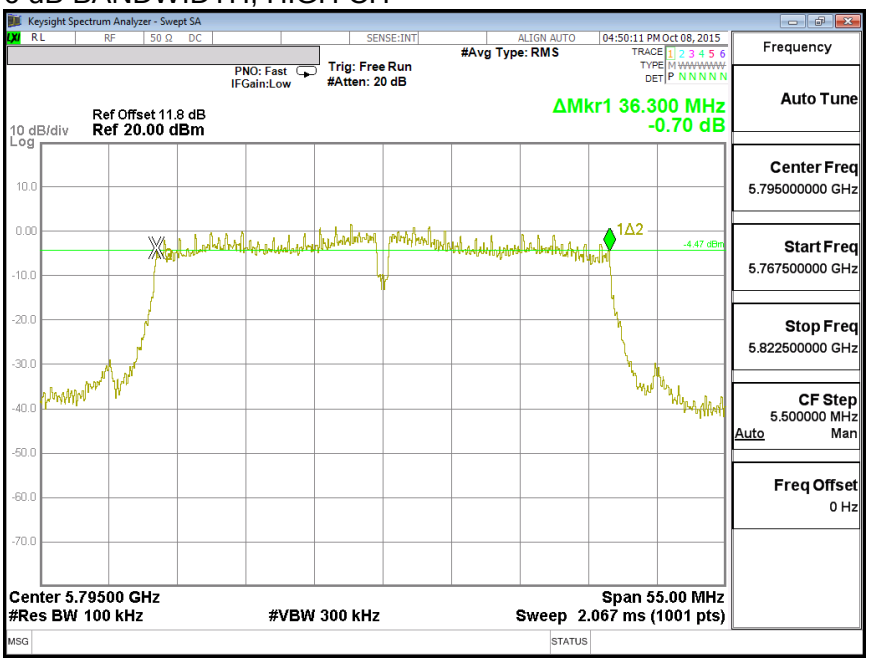
## 6 dB BANDWIDTH, CHAIN 1

6 dB BANDWIDTH, LOW CH




6 dB BANDWIDTH, HIGH CH





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### 8.5.2. 26 dB BANDWIDTH

**LIMITS**

None, for reporting purposes only.

**RESULTS**

| Channel | Frequency (MHz) | 26 dB BW Chain 0 (MHz) | 26 dB BW Chain 1 (MHz) |
|---|---|---|---|
| Low | 5755 | 40.48 | 39.82 |
| High | 5795 | 40.70 | 39.60 |


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**26 dB BANDWIDTH, CHAIN 0**

26 dB BANDWIDTH, LOW CH

26 dB BANDWIDTH, HIGH CH

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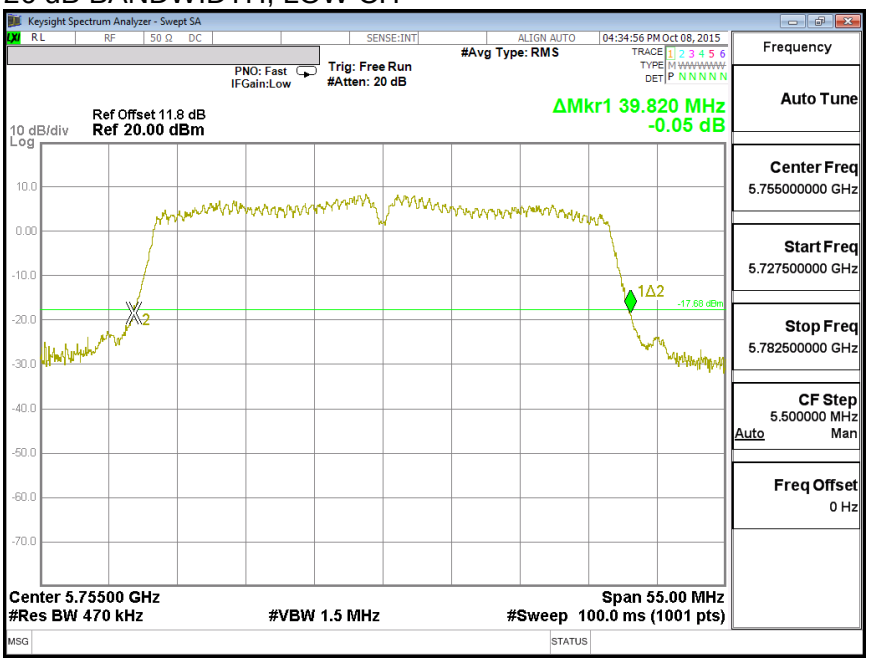
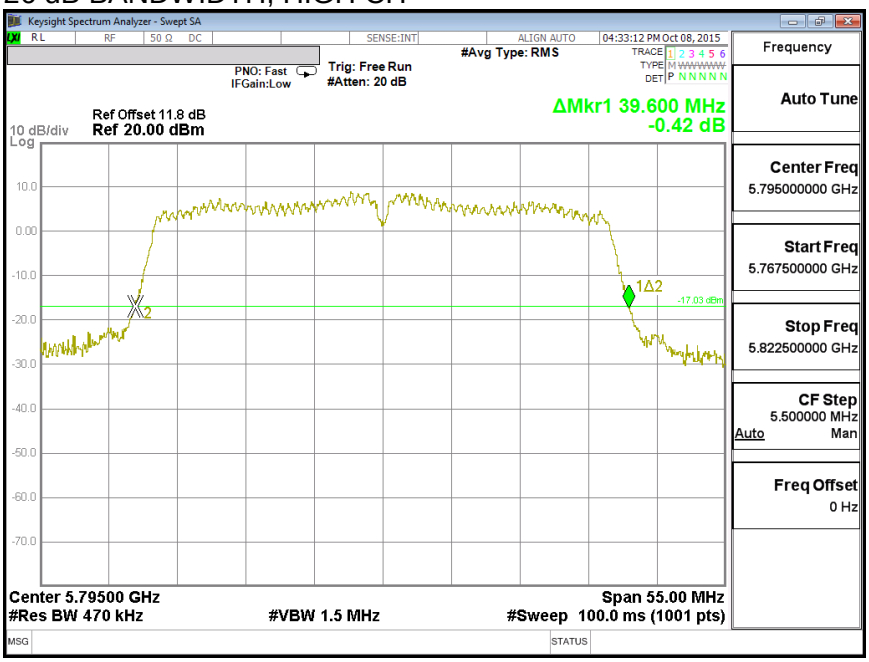
**26 dB BANDWIDTH, CHAIN 1**

26 dB BANDWIDTH, LOW CH




26 dB BANDWIDTH, HIGH CH





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### 8.5.3. 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

**RESULTS**

| Channel | Frequency (MHz) | 99% BW Chain 0 (MHz) | 99% BW Chain 1 (MHz) |
|---|---|---|---|
| Low | 5755 | 36.177 | 36.332 |
| High | 5795 | 36.423 | 36.332 |


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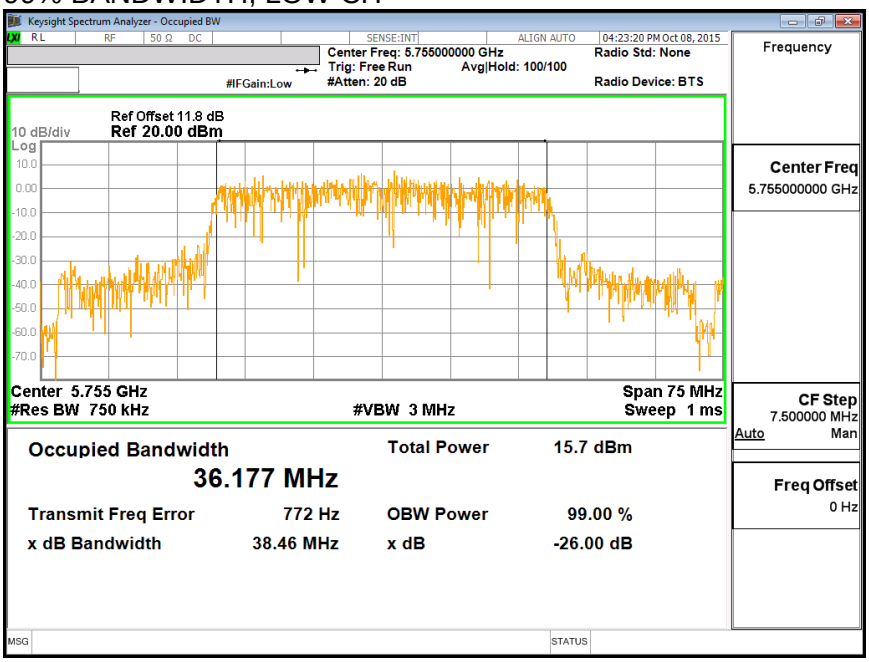
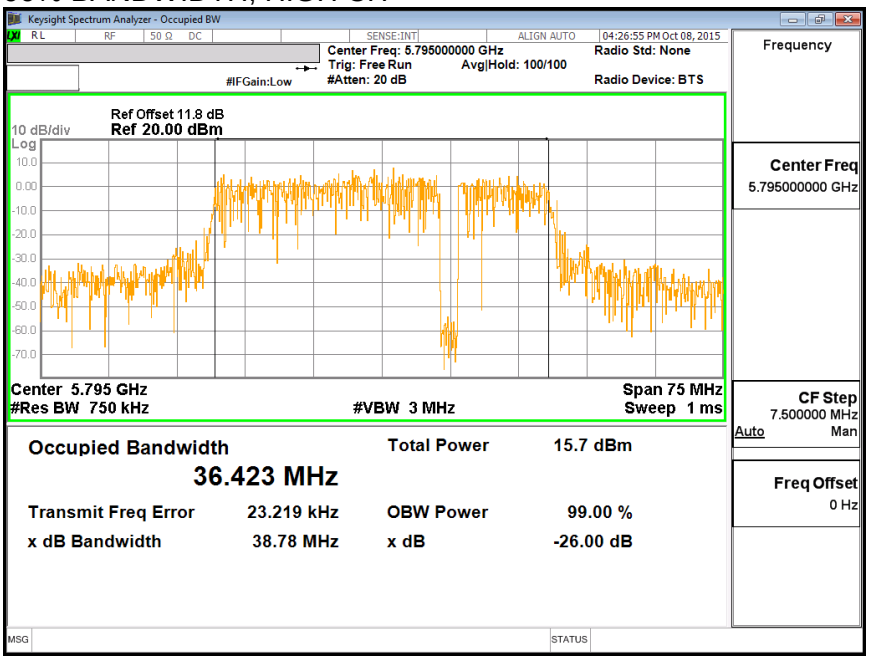
**99% BANDWIDTH, CHAIN 0**

99% BANDWIDTH, LOW CH




99% BANDWIDTH, HIGH CH





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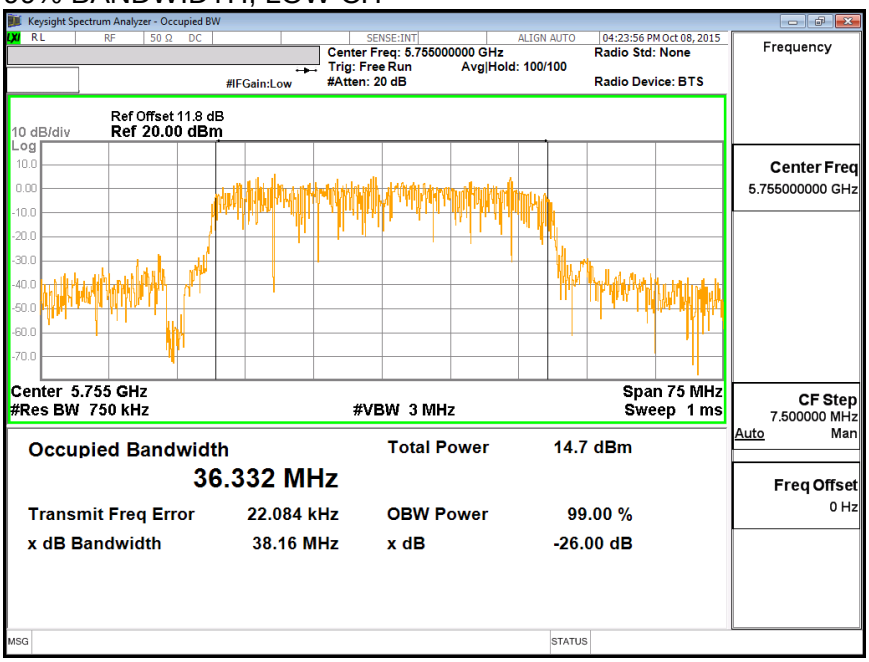
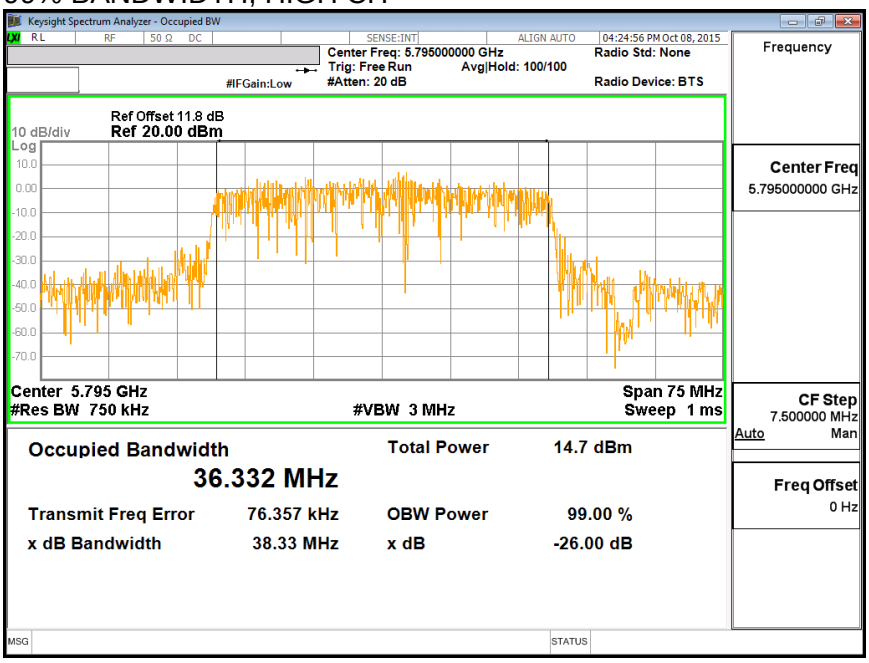
**99% BANDWIDTH, CHAIN 1**

99% BANDWIDTH, LOW CH




99% BANDWIDTH, HIGH CH





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### 8.5.4. AVERAGE POWER

**LIMITS**

None; for reporting purposes only.

**Test Procedure**

Measurements perform using a wideband gated RF power meter.

**RESULTS**

| Channel | Frequency (MHz) | Chain 0 Power (dBm) | Chain 1 Power (dBm) | Total Power (dBm) |
|---|---|---|---|---|
| Low | 5755 | 12.45 | 12.40 | 15.44 |
| High | 5795 | 15.50 | 15.15 | 18.34 |


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### 8.5.5. OUTPUT POWER

**LIMITS**

FCC §15.407 (a) (3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**Test Procedure**

Measurements perform using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

**DIRECTIONAL ANTENNA GAIN**

The TX chains are uncorrelated and the antenna gain is unequal among the chains. The directional gain is:

| Chain 0 Antenna Gain (dBi) | Chain 1 Antenna Gain (dBi) | Uncorrelated Chains Directional Gain (dBi) |
|---|---|---|
| 2.68 | 3.76 | 3.25 |


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**RESULTS**

**Antenna Gain and Limit**

| Channel | Frequency (MHz) | Directional Gain (dBi) | Power Limit (dBm) |
|---|---|---|---|
| Low | 5755 | 3.25 | 30.00 |
| High | 5795 | 3.25 | 30.00 |

**Output Power Results**

| Channel | Frequency (MHz) | Chain 0 Meas Power (dBm) | Chain 1 Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Power Margin (dB) |
|---|---|---|---|---|---|---|
| Low | 5755 | 12.45 | 12.40 | 15.44 | 30.00 | -14.56 |
| High | 5795 | 15.50 | 15.15 | 18.34 | 30.00 | -11.66 |


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### 8.5.6. PSD

**LIMITS**

FCC §15.407 (a) (3)

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**DIRECTIONAL ANTENNA GAIN**

The TX chains are correlated and the antenna gain is unequal among the chains. The directional gain is:

| Chain 0 Antenna Gain (dBi) | Chain 1 Antenna Gain (dBi) | Correlated Chains Directional Gain (dBi) |
|---|---|---|
| 2.68 | 3.76 | 6.25 |


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**RESULTS**

**Antenna Gain and Limit**

| Channel | Frequency (MHz) | Directional Gain (dBi) | PSD Limit (dBm) |
|---|---|---|---|
| Low | 5755 | 6.25 | 29.75 |
| High | 5795 | 6.25 | 29.75 |

| | | |
|---|---|---|
| **Duty Cycle CF (dB)** | 0.12 | **Included in Calculations of Corr'd PSD** |

**PSD Results**

| Channel | Frequency (MHz) | Chain 0 Meas PSD (dBm) | Chain 1 Meas PSD (dBm) | Total Corr'd PSD (dBm) | PSD Limit (dBm) | PSD Margin (dB) |
|---|---|---|---|---|---|---|
| Low | 5755 | -0.98 | -1.37 | 1.96 | 29.75 | -27.79 |
| High | 5795 | 0.52 | -0.70 | 3.09 | 29.75 | -26.66 |


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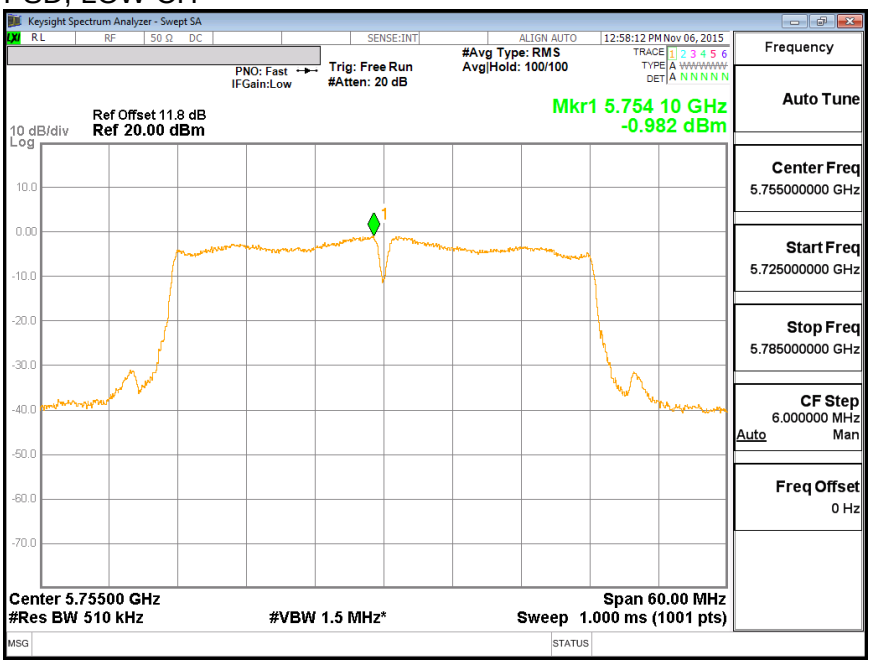
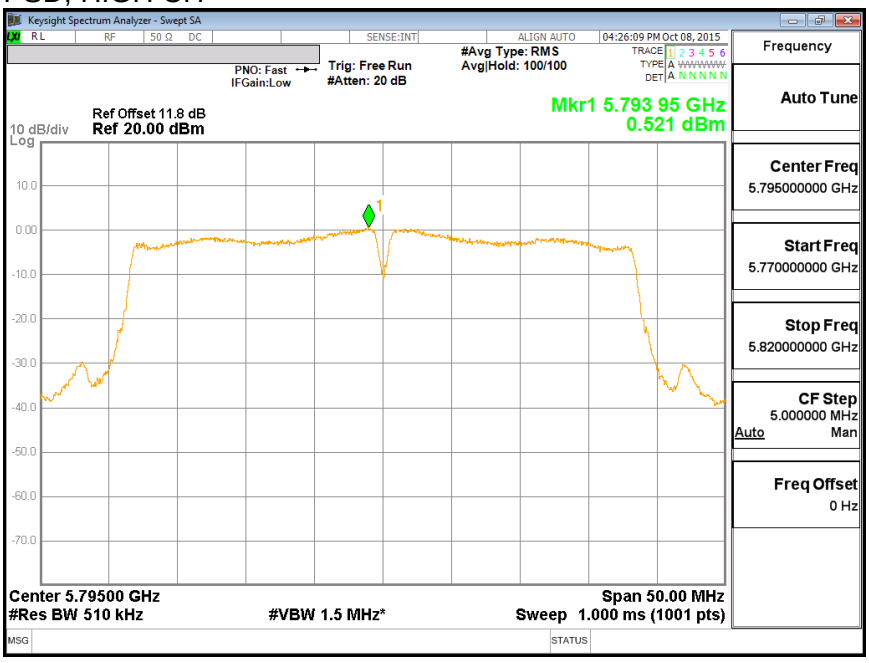
**PSD, CHAIN 0**

PSD, LOW CH




PSD, HIGH CH





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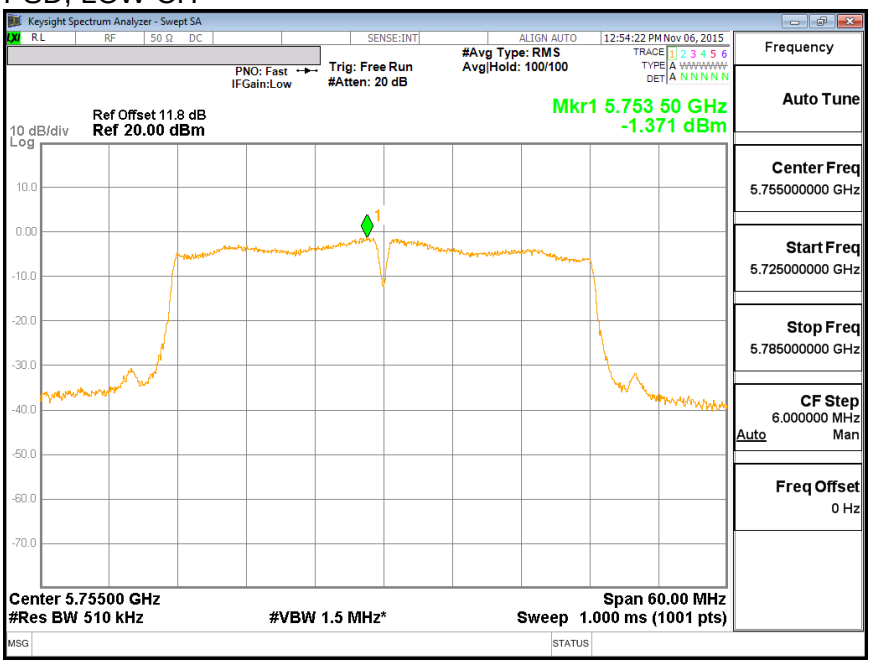
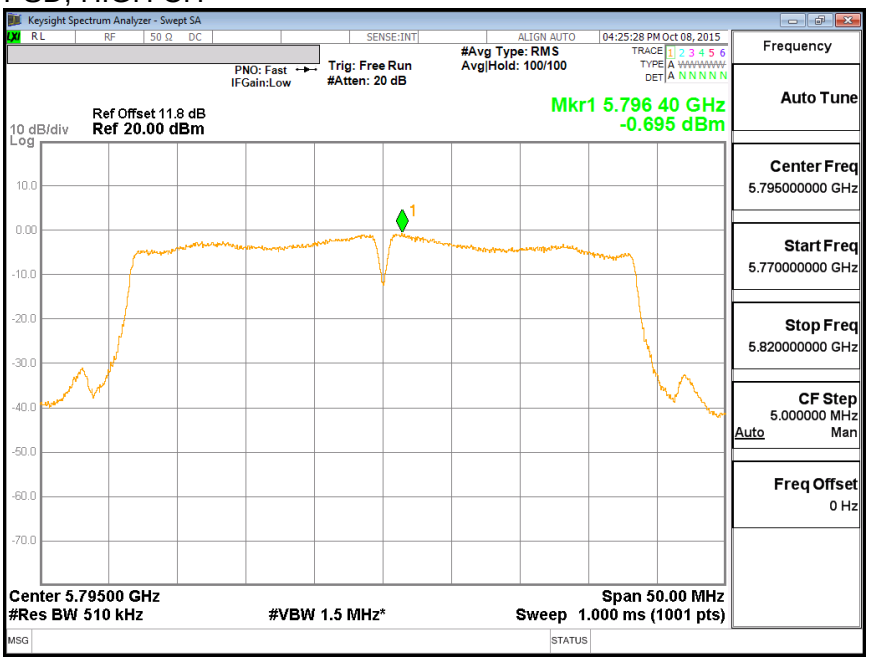
**PSD, CHAIN 1**

PSD, LOW CH




PSD, HIGH CH





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## 8.6. 802.11n HT40 2Tx STBC MODE IN THE 5.8 GHz BAND

**Note:** Covered by 802.11n HT40 2Tx CDD MODE


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# 9. RADIATED TEST RESULTS

## 9.1. LIMITS AND PROCEDURE

**LIMITS**

FCC §15.205 and §15.209

| 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; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

The spectrum from 30 MHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable 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.

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


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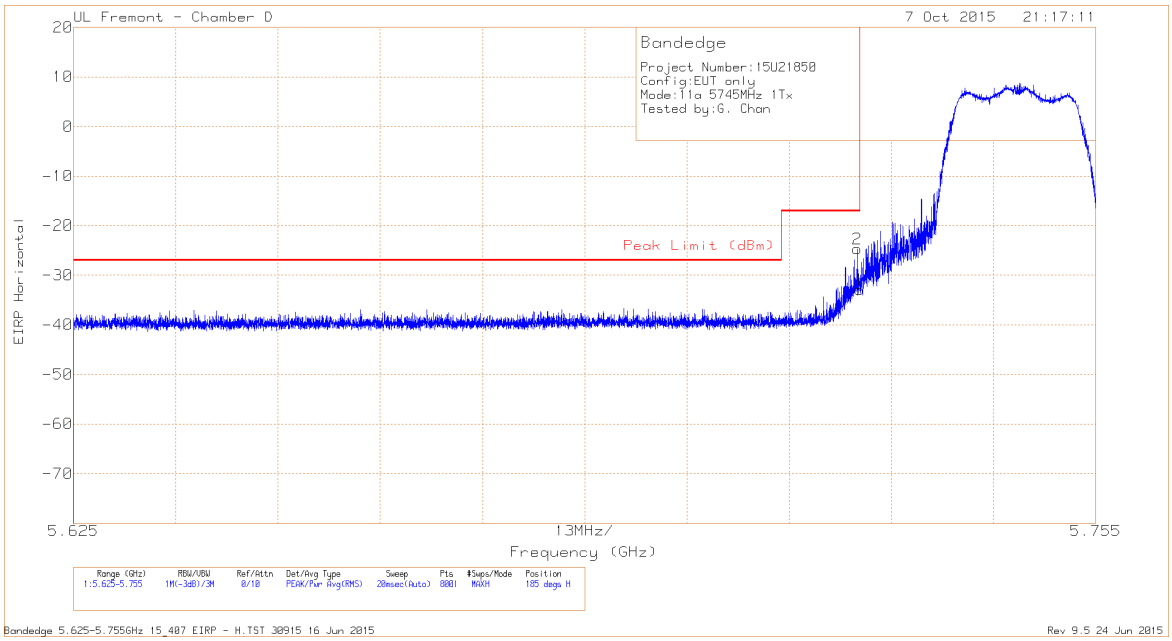
## 9.2. 802.a 1Tx MODE IN THE 5.8 GHz BAND

### 9.2.1. CHAIN 0, RESTRICTED BANDEDGE, (LOW CHANNEL)

LOW CHANNEL HORIZONTAL PLOT




**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.725 | -61.75 | Pk | 34.6 | -17.6 | 11.8 | -32.95 | -17 | -15.95 | 185 | 396 | H |
| 2 | 5.725 | -53.47 | Pk | 34.6 | -17.6 | 11.8 | -24.67 | -17 | -7.67 | 185 | 396 | H |

Pk - Peak detector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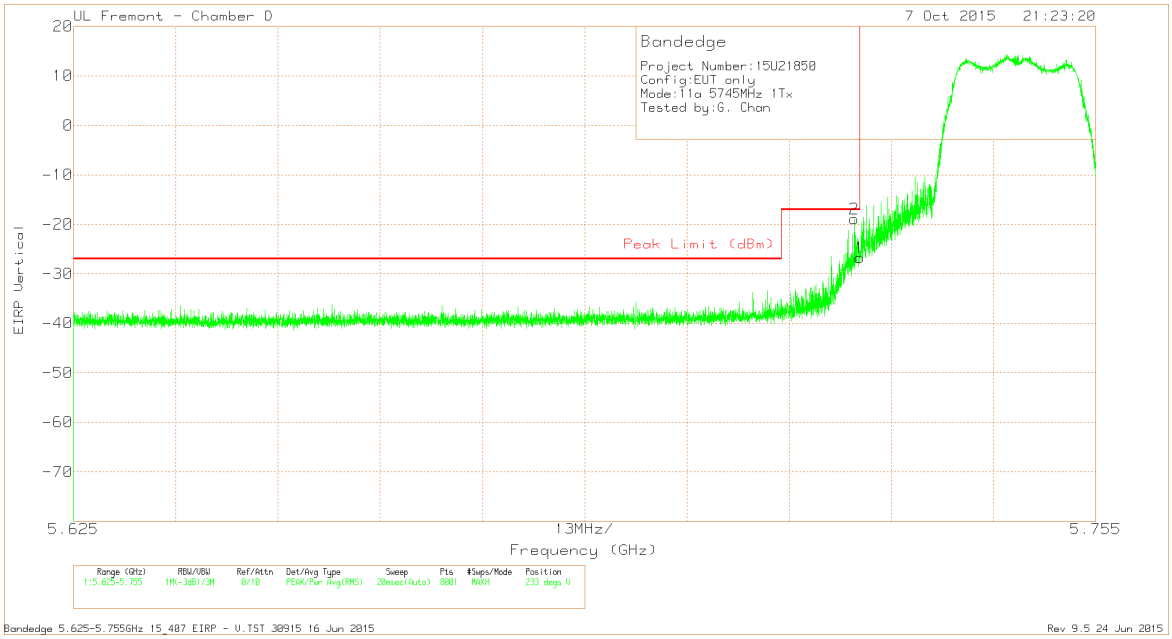
LOW CHANNEL VERTICAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 5.724 | -47.66 | Pk | 34.6 | -17.6 | 11.8 | -18.86 | -17 | -1.86 | 233 | 370 | V |
| 1 | 5.725 | -55.61 | Pk | 34.6 | -17.6 | 11.8 | -26.81 | -17 | -9.81 | 233 | 370 | V |

Pk - Peak detector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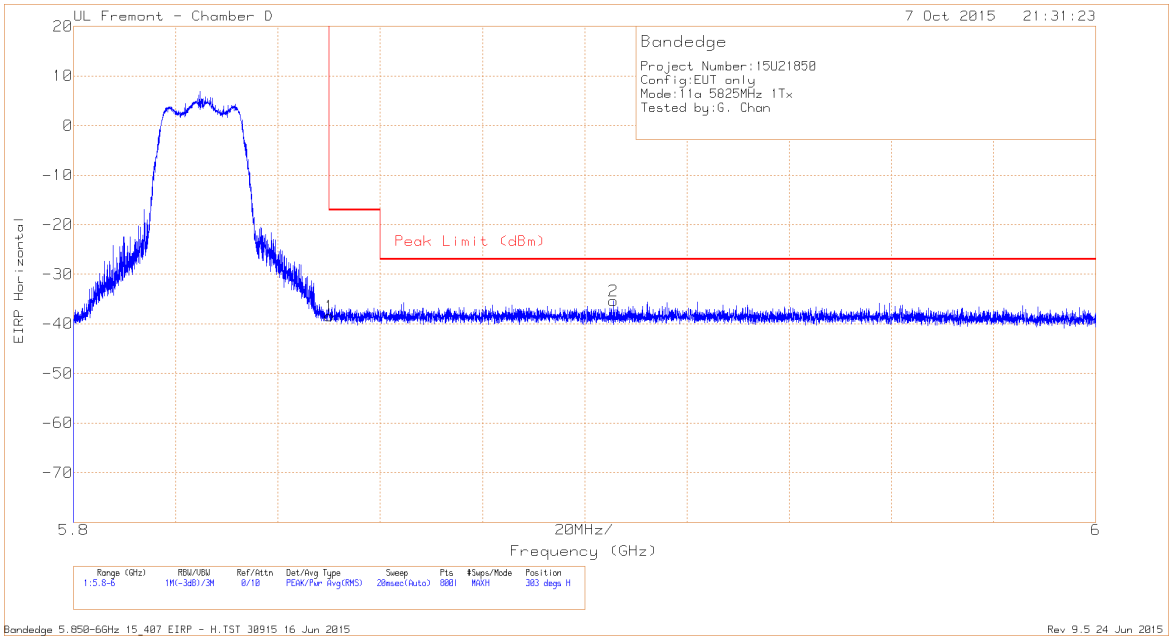
## RESTRICTED BANDEDGE, (HIGH CHANNEL)

HIGH CHANNEL HORIZONTAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.85 | -67.42 | Pk | 34.9 | -17.7 | 11.8 | -38.42 | -17 | -21.42 | 303 | 388 | H |
| 2 | 5.906 | -64.73 | Pk | 35.1 | -17.5 | 11.8 | -35.33 | -27 | -8.33 | 303 | 388 | H |

Pk - Peak detector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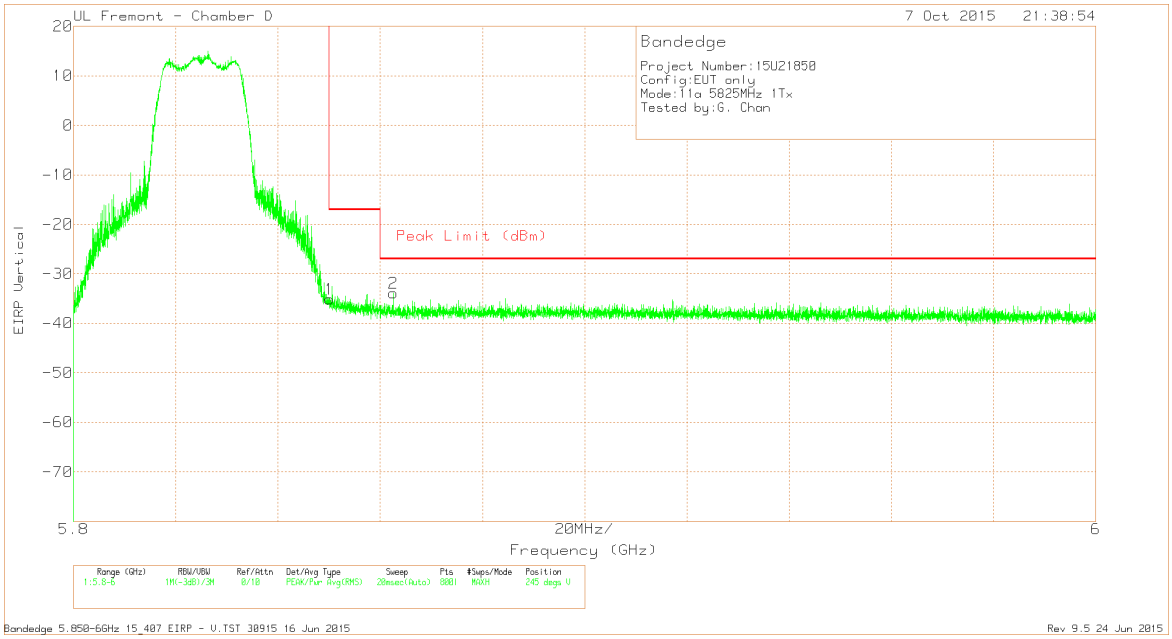
HIGH CHANNEL VERTICAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T344 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.85 | -64.1 | Pk | 34.9 | -17.7 | 11.8 | -35.1 | -17 | -18.1 | 245 | 126 | V |
| 2 | 5.863 | -63.11 | Pk | 35 | -17.6 | 11.8 | -33.91 | -27 | -6.91 | 245 | 126 | V |

Pk - Peak detector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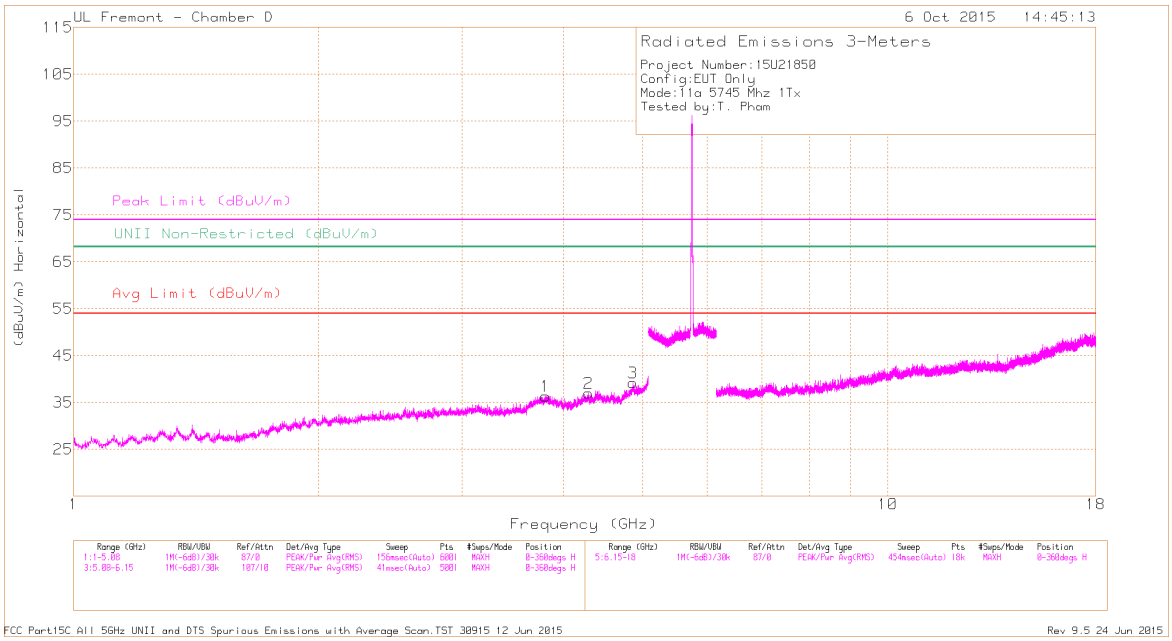
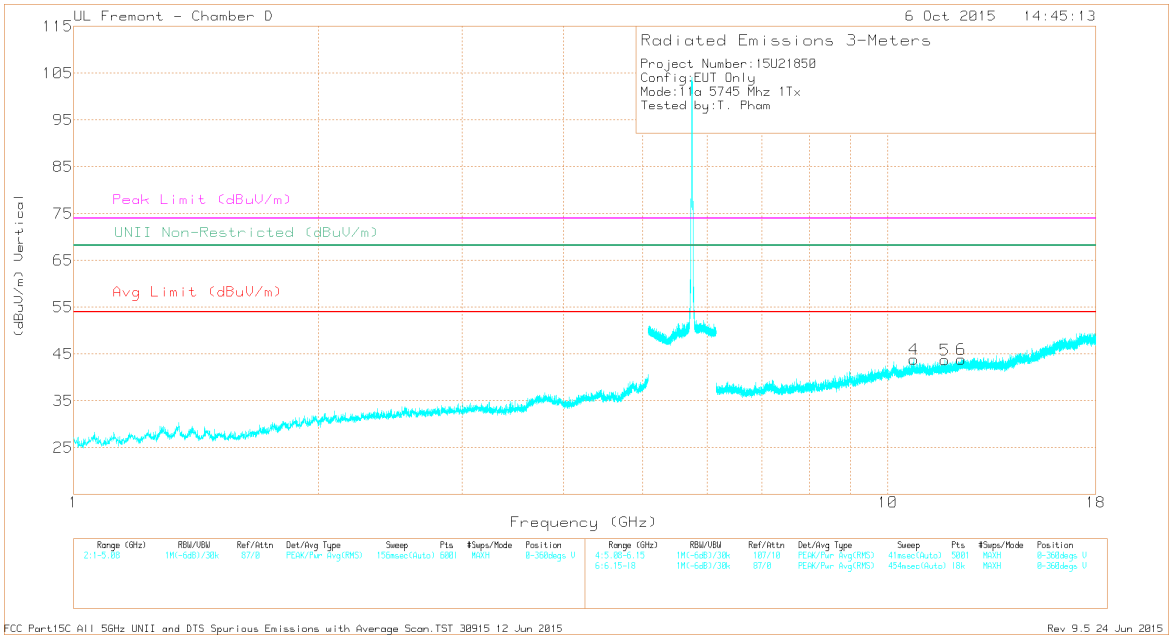
## LOW CHANNEL HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT




LOW CHANNEL VERTICAL PLOT





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## DATA

| Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * 3.799 | 39.19 | PK-U | 33.3 | -28.7 | 43.79 | - | - | 74 | -30.21 | - | - | 276 | 161 | H |
| * 3.8 | 27.39 | ADR | 33.3 | -28.7 | 31.99 | 54 | -22.01 | - | - | - | - | 276 | 161 | H |
| * 4.287 | 38.58 | PK-U | 33.6 | -28 | 44.18 | - | - | 74 | -29.82 | - | - | 259 | 150 | H |
| * 4.285 | 26.81 | ADR | 33.6 | -28 | 32.41 | 54 | -21.59 | - | - | - | - | 259 | 150 | H |
| * 4.861 | 37.82 | PK-U | 34.1 | -25.4 | 46.52 | - | - | 74 | -27.48 | - | - | 274 | 132 | H |
| * 4.862 | 25.83 | ADR | 34.1 | -25.4 | 34.53 | 54 | -19.47 | - | - | - | - | 274 | 132 | H |
| * 10.764 | 34.75 | PK-U | 37.9 | -20.9 | 51.75 | - | - | 74 | -22.25 | - | - | 285 | 157 | V |
| * 10.764 | 22.76 | ADR | 37.9 | -20.9 | 39.76 | 54 | -14.24 | - | - | - | - | 285 | 157 | V |
| * 11.747 | 34.44 | PK-U | 38.2 | -21.5 | 51.14 | - | - | 74 | -22.86 | - | - | 276 | 145 | V |
| * 11.748 | 23.13 | ADR | 38.2 | -21.5 | 39.83 | 54 | -14.17 | - | - | - | - | 276 | 145 | V |
| * 12.302 | 35.37 | PK-U | 39 | -22.1 | 52.27 | - | - | 74 | -21.73 | - | - | 256 | 166 | V |
| * 12.302 | 23.53 | ADR | 39 | -22.1 | 40.43 | 54 | -13.57 | - | - | - | - | 256 | 166 | V |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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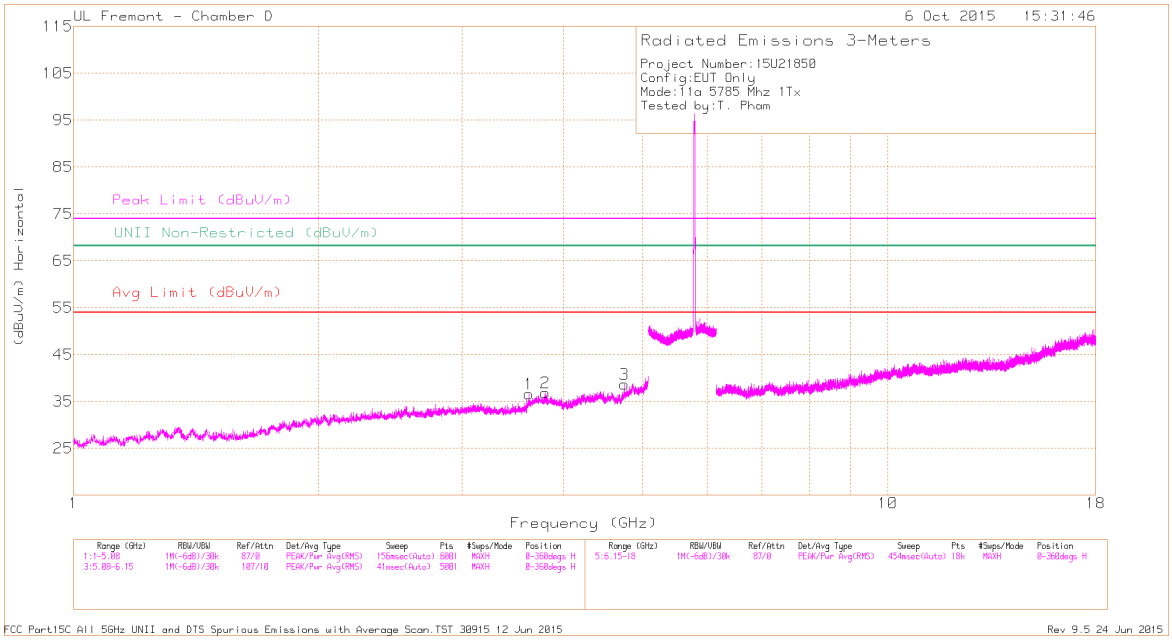
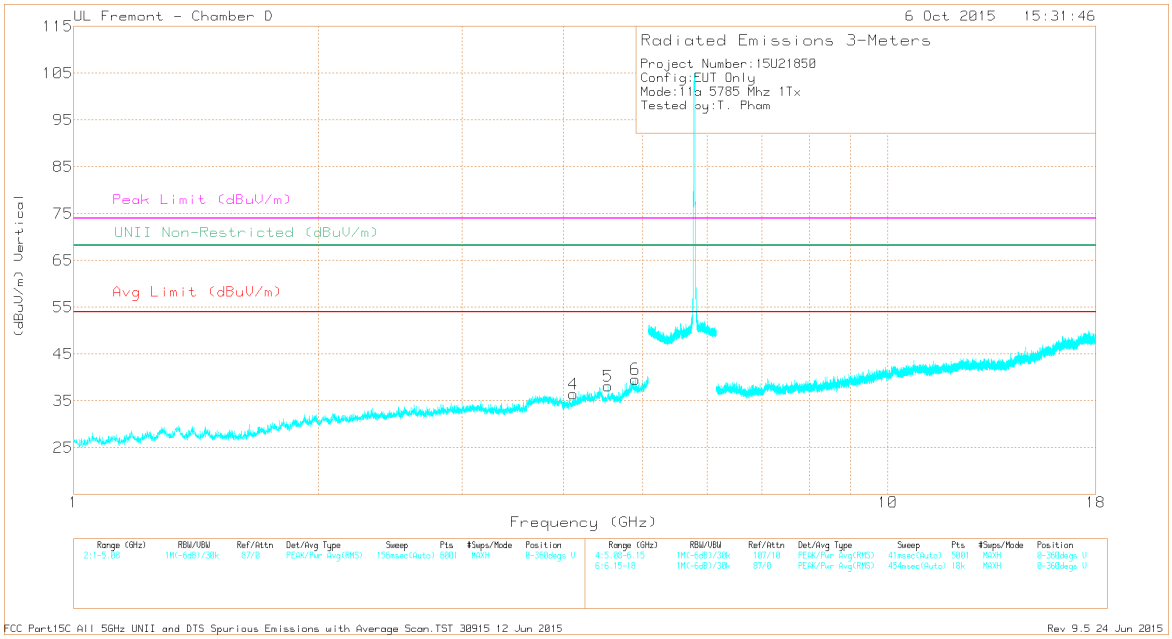
**MID CHANNEL HARMONICS AND SPURIOUS EMISSIONS**

MID CHANNEL HORIZONTAL PLOT




MID CHANNEL VERTICAL PLOT





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## DATA

| Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * 3.621 | 39 | PK-U | 33.1 | -29.2 | 42.9 | - | - | 74 | -31.1 | - | - | 208 | 178 | H |
| * 3.622 | 27.25 | ADR | 33.1 | -29.2 | 31.15 | 54 | -22.85 | - | - | - | - | 208 | 178 | H |
| * 3.795 | 39.39 | PK-U | 33.3 | -28.7 | 43.99 | - | - | 74 | -30.01 | - | - | 196 | 150 | H |
| * 3.795 | 27.34 | ADR | 33.3 | -28.7 | 31.94 | 54 | -22.06 | - | - | - | - | 196 | 150 | H |
| * 3.795 | 39.34 | PK-U | 33.3 | -28.7 | 43.94 | - | - | 74 | -30.06 | - | - | 204 | 159 | H |
| * 3.795 | 27.39 | ADR | 33.3 | -28.7 | 31.99 | 54 | -22.01 | - | - | - | - | 204 | 159 | H |
| * 4.743 | 39.01 | PK-U | 34.1 | -27.6 | 45.51 | - | - | 74 | -28.49 | - | - | 228 | 179 | H |
| * 4.744 | 27.45 | ADR | 34.1 | -27.6 | 33.95 | 54 | -20.05 | - | - | - | - | 228 | 179 | H |
| * 4.111 | 38.67 | PK-U | 33.4 | -28.7 | 43.37 | - | - | 74 | -30.63 | - | - | 187 | 197 | V |
| * 4.11 | 26.84 | ADR | 33.4 | -28.7 | 31.54 | 54 | -22.46 | - | - | - | - | 187 | 197 | V |
| * 4.532 | 38.67 | PK-U | 34 | -28.1 | 44.57 | - | - | 74 | -29.43 | - | - | 218 | 186 | V |
| * 4.533 | 26.99 | ADR | 34 | -28.1 | 32.89 | 54 | -21.11 | - | - | - | - | 218 | 186 | V |
| * 4.9 | 37.2 | PK-U | 34.1 | -26 | 45.3 | - | - | 74 | -28.7 | - | - | 228 | 204 | V |
| * 4.901 | 25.65 | ADR | 34.1 | -26 | 33.75 | 54 | -20.25 | - | - | - | - | 228 | 204 | V |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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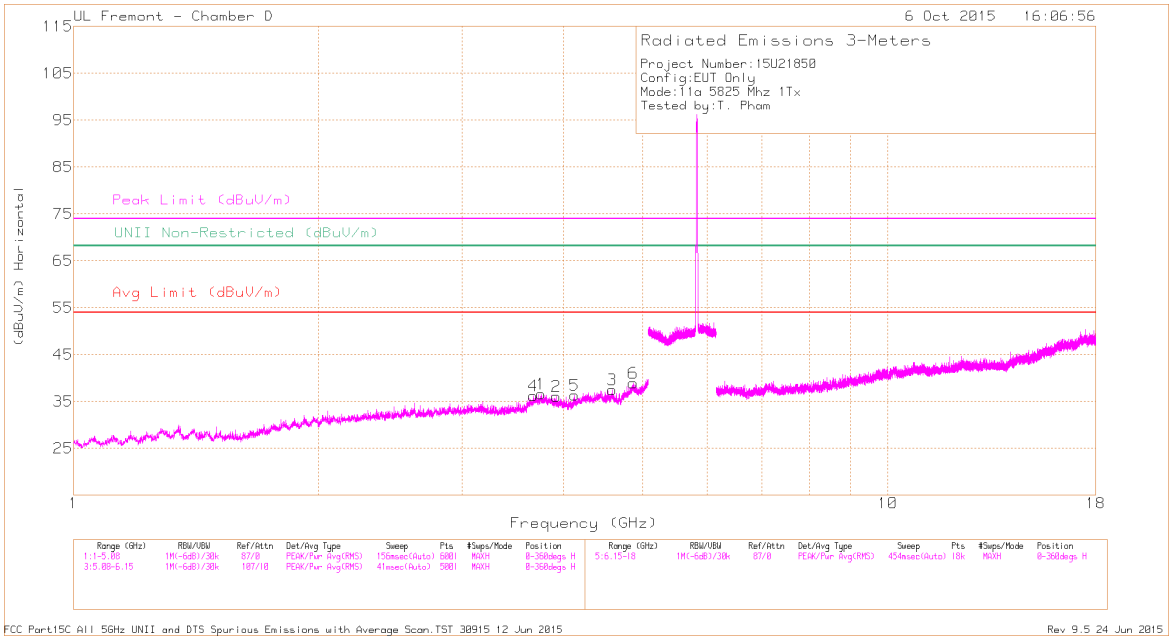
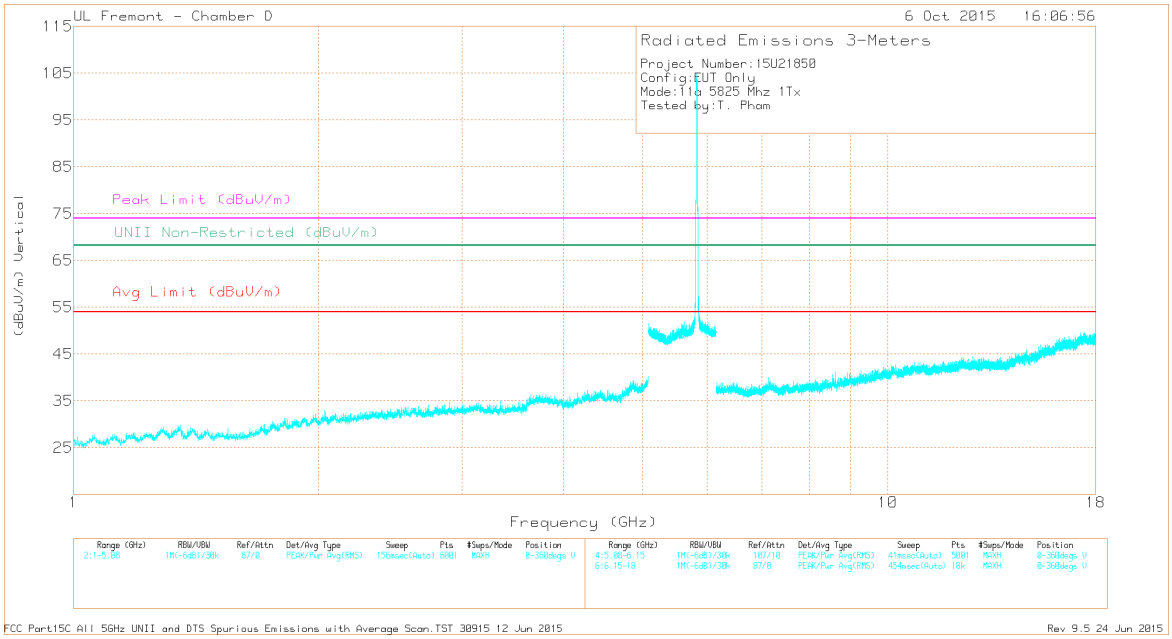
## HIGH CHANNEL HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL PLOT




HIGH CHANNEL VERTICAL PLOT





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## DATA

| Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * 3.75 | 38.97 | PK-U | 33.3 | -29 | 43.27 | - | - | 74 | -30.73 | - | - | 315 | 117 | H |
| * 3.75 | 27.2 | ADR | 33.3 | -29 | 31.5 | 54 | -22.5 | - | - | - | - | 315 | 117 | H |
| * 3.919 | 39.07 | PK-U | 33.4 | -28.7 | 43.77 | - | - | 74 | -30.23 | - | - | 306 | 147 | H |
| * 3.919 | 27.19 | ADR | 33.4 | -28.7 | 31.89 | 54 | -22.11 | - | - | - | - | 306 | 147 | H |
| * 4.586 | 38.26 | PK-U | 34.1 | -27.1 | 45.26 | - | - | 74 | -28.74 | - | - | 282 | 167 | H |
| * 4.587 | 26.73 | ADR | 34.1 | -27.1 | 33.73 | 54 | -20.27 | - | - | - | - | 282 | 167 | H |
| * 3.672 | 38.91 | PK-U | 33.1 | -29.2 | 42.81 | - | - | 74 | -31.19 | - | - | 293 | 177 | H |
| * 3.672 | 27.18 | ADR | 33.1 | -29.2 | 31.08 | 54 | -22.92 | - | - | - | - | 293 | 177 | H |
| * 4.122 | 38.86 | PK-U | 33.4 | -28.5 | 43.76 | - | - | 74 | -30.24 | - | - | 301 | 194 | H |
| * 4.122 | 26.91 | ADR | 33.4 | -28.5 | 31.81 | 54 | -22.19 | - | - | - | - | 301 | 194 | H |
| * 4.868 | 36.95 | PK-U | 34.1 | -25.2 | 45.85 | - | - | 74 | -28.15 | - | - | 305 | 218 | H |
| * 4.866 | 25.52 | ADR | 34.1 | -25.3 | 34.32 | 54 | -19.68 | - | - | - | - | 305 | 218 | H |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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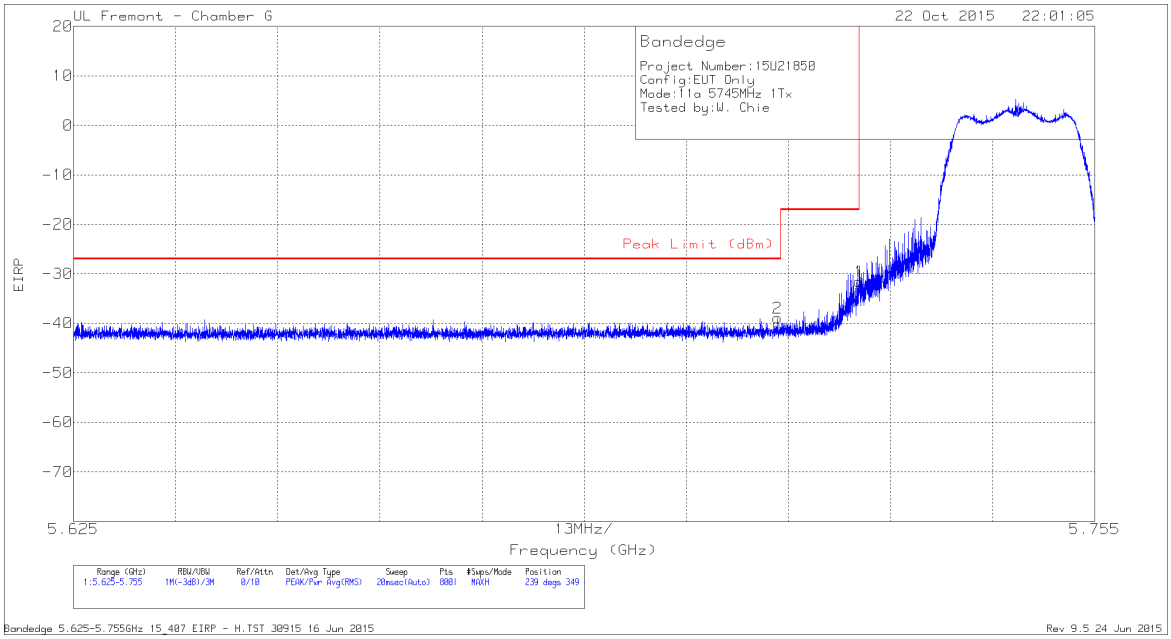
## 9.2.2. CHAIN 1, RESTRICTED BANDEDGE

**LOW CHANNEL**

LOW CHANNEL HORIZONTAL PLOT




**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T862 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 5.715 | -62.68 | Pk | 34.9 | -22.9 | 11.8 | -38.88 | -27 | -11.88 | 239 | 349 | H |
| 1 | 5.725 | -55.47 | Pk | 35 | -22.9 | 11.8 | -31.57 | -17 | -14.57 | 239 | 349 | H |

Pk - Peak detector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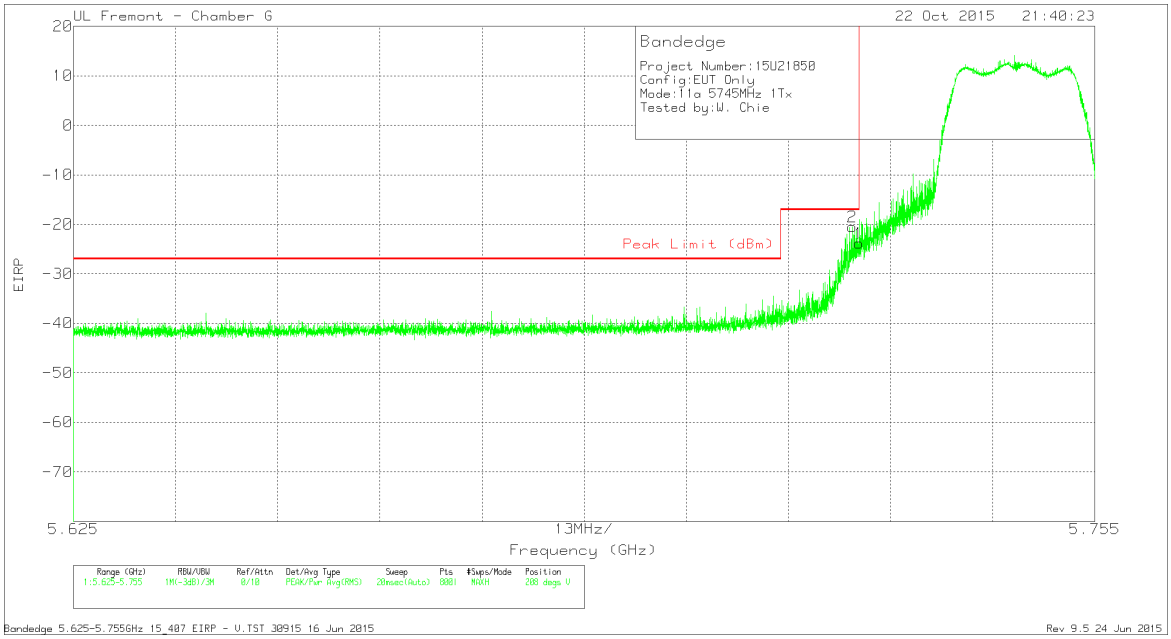
LOW CHANNEL VERTICAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T862 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 5.724 | -44.36 | Pk | 35 | -22.9 | 11.8 | -20.46 | -17 | -3.46 | 208 | 303 | V |
| 1 | 5.725 | -47.67 | Pk | 35 | -22.9 | 11.8 | -23.77 | -17 | -6.77 | 208 | 303 | V |

Pk - Peak detector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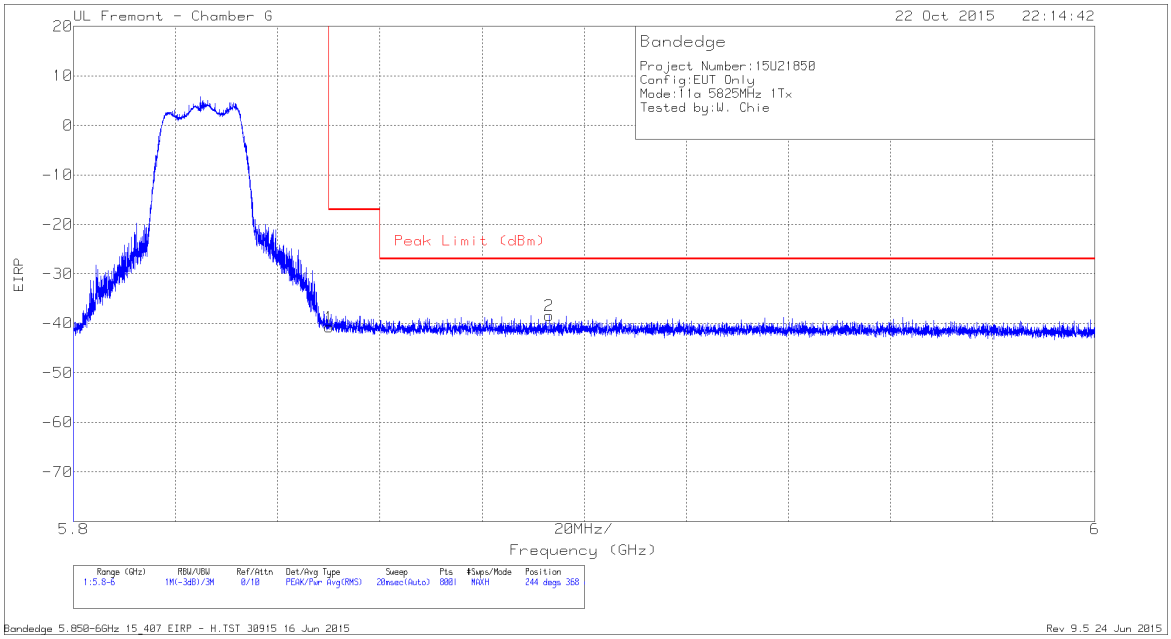
## RESTRICTED BANDEDGE, (HIGH CHANNEL)

HIGH CHANNEL HORIZONTAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T862 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.85 | -64.69 | Pk | 35.1 | -23 | 11.8 | -40.79 | -17 | -23.79 | 244 | 368 | H |
| 2 | 5.893 | -62.21 | Pk | 35.1 | -23.1 | 11.8 | -38.41 | -27 | -11.41 | 244 | 368 | H |

Pk - Peak detector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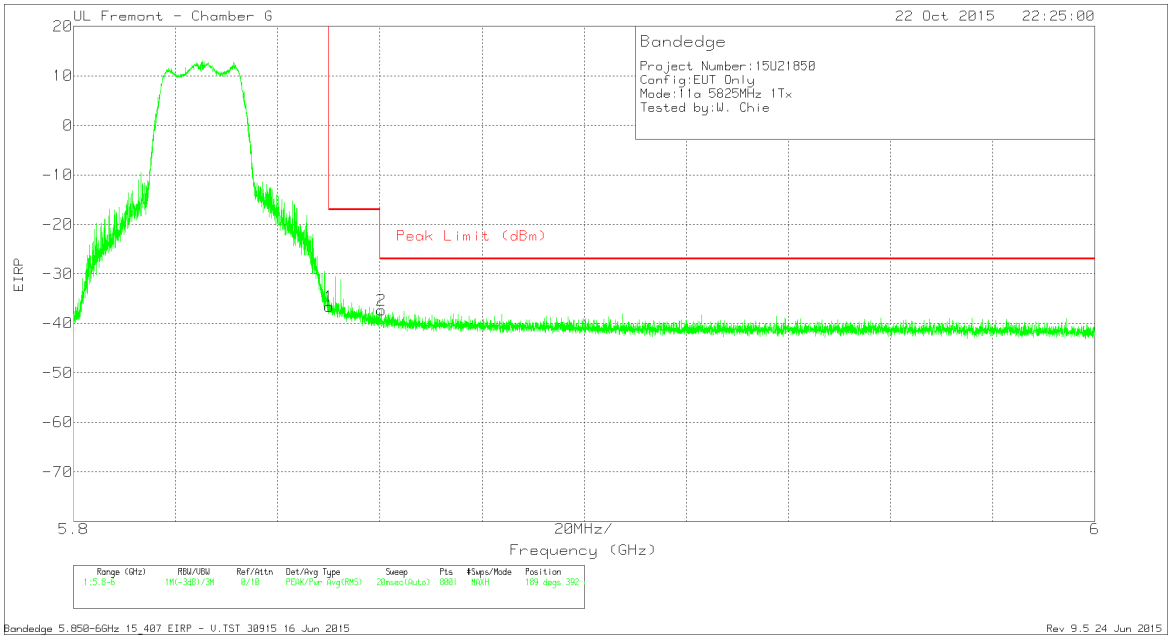
HIGH CHANNEL VERTICAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T862 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.85 | -60.46 | Pk | 35.1 | -23 | 11.8 | -36.56 | -17 | -19.56 | 189 | 392 | V |
| 2 | 5.86 | -61.1 | Pk | 35.1 | -23.1 | 11.8 | -37.3 | -27 | -10.3 | 189 | 392 | V |

Pk - Peak detector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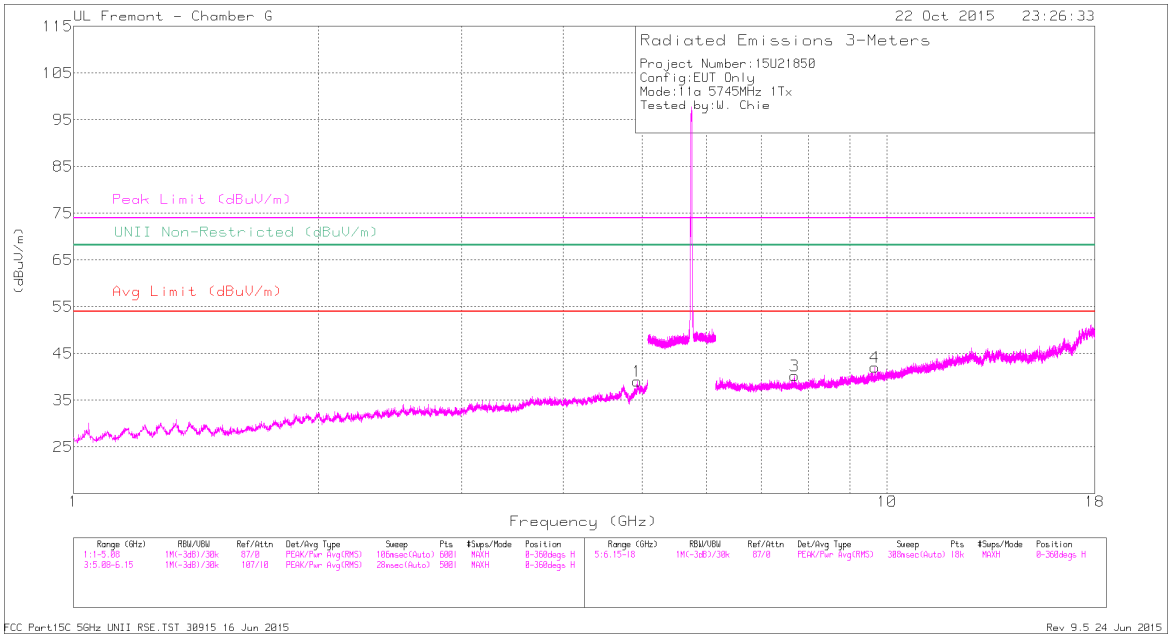
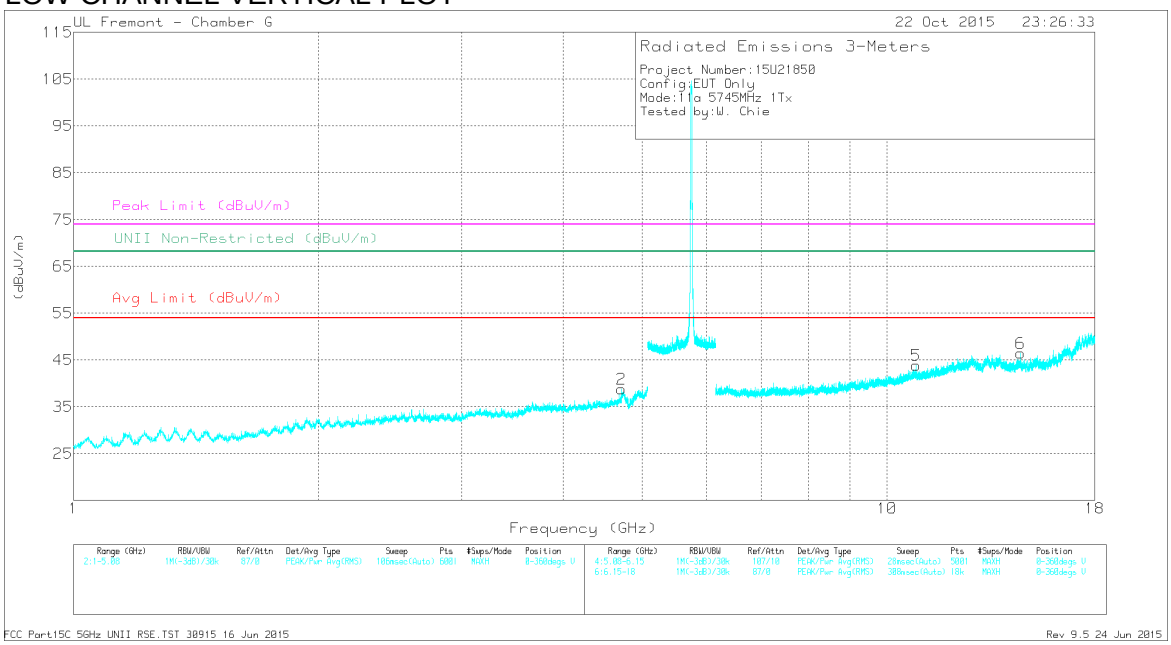
## LOW CHANNEL HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT




LOW CHANNEL VERTICAL PLOT





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## DATA

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T862 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 4.934 | 41.77 | PK-U | 34.1 | -31.2 | 44.67 | - | - | 74 | -29.33 | - | - | 13 | 340 | H |
| | * 4.934 | 30.23 | ADR | 34.1 | -31.2 | 33.13 | 54 | -20.87 | - | - | - | - | 13 | 340 | H |
| 2 | * 4.719 | 43.64 | PK-U | 33.9 | -31.9 | 45.64 | - | - | 74 | -28.36 | - | - | 219 | 384 | V |
| | * 4.72 | 32.22 | ADR | 33.9 | -31.9 | 34.22 | 54 | -19.78 | - | - | - | - | 219 | 384 | V |
| 3 | * 7.701 | 40.83 | PK-U | 35.6 | -30 | 46.43 | - | - | 74 | -27.57 | - | - | 100 | 125 | H |
| | * 7.702 | 28.82 | ADR | 35.6 | -30 | 34.42 | 54 | -19.58 | - | - | - | - | 100 | 125 | H |
| 5 | * 10.849 | 38.17 | PK-U | 38 | -26.3 | 49.87 | - | - | 74 | -24.13 | - | - | 195 | 250 | V |
| | * 10.845 | 26.23 | ADR | 38 | -26.3 | 37.93 | 54 | -16.07 | - | - | - | - | 195 | 250 | V |
| 4 | 9.662 | 39.5 | PK-U | 36.8 | -28.6 | 47.7 | - | - | - | - | 68.2 | -20.5 | 42 | 123 | H |
| 6 | 14.588 | 39.11 | PK-U | 39.9 | -26.5 | 52.51 | - | - | - | - | 68.2 | -15.69 | 158 | 233 | V |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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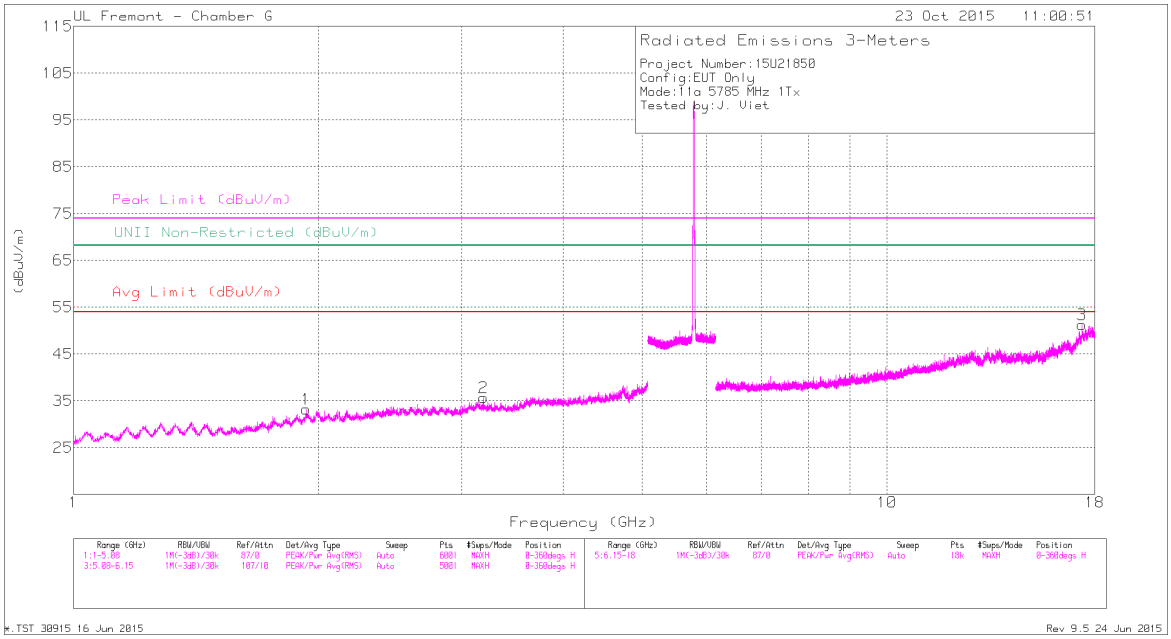
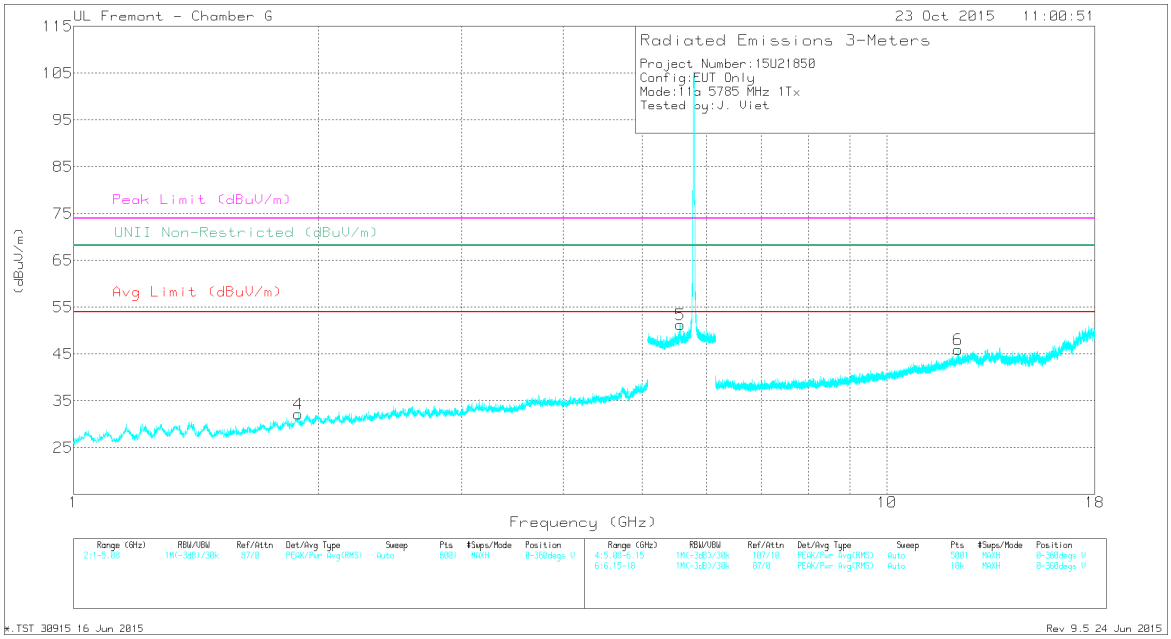
**MID CHANNEL HARMONICS AND SPURIOUS EMISSIONS**

MID CHANNEL HORIZONTAL PLOT




MID CHANNEL VERTICAL PLOT





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**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T862 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | * 12.215 | 37.86 | PK-U | 39 | -24.8 | 52.06 | - | - | 74 | -21.94 | - | - | 185 | 202 | V |
| | * 12.212 | 26.75 | ADR | 39 | -24.7 | 41.05 | 54 | -12.95 | - | - | - | - | 185 | 202 | V |
| 4 | 1.886 | 42.56 | PK-U | 30.8 | -34.6 | 38.76 | - | - | - | - | 68.2 | -29.44 | 360 | 301 | V |
| 1 | 1.932 | 42.78 | PK-U | 31 | -34.1 | 39.68 | - | - | - | - | 68.2 | -28.52 | 25 | 171 | H |
| 2 | 3.194 | 41.88 | PK-U | 33.1 | -33.6 | 41.38 | - | - | - | - | 68.2 | -26.82 | 276 | 281 | H |
| 5 | 5.571 | 46.8 | PK-U | 34.8 | -23 | 58.6 | - | - | - | - | 68.2 | -9.6 | 196 | 394 | V |
| 3 | 17.355 | 36.58 | PK-U | 41.4 | -21.1 | 56.88 | - | - | - | - | 68.2 | -11.32 | 221 | 208 | H |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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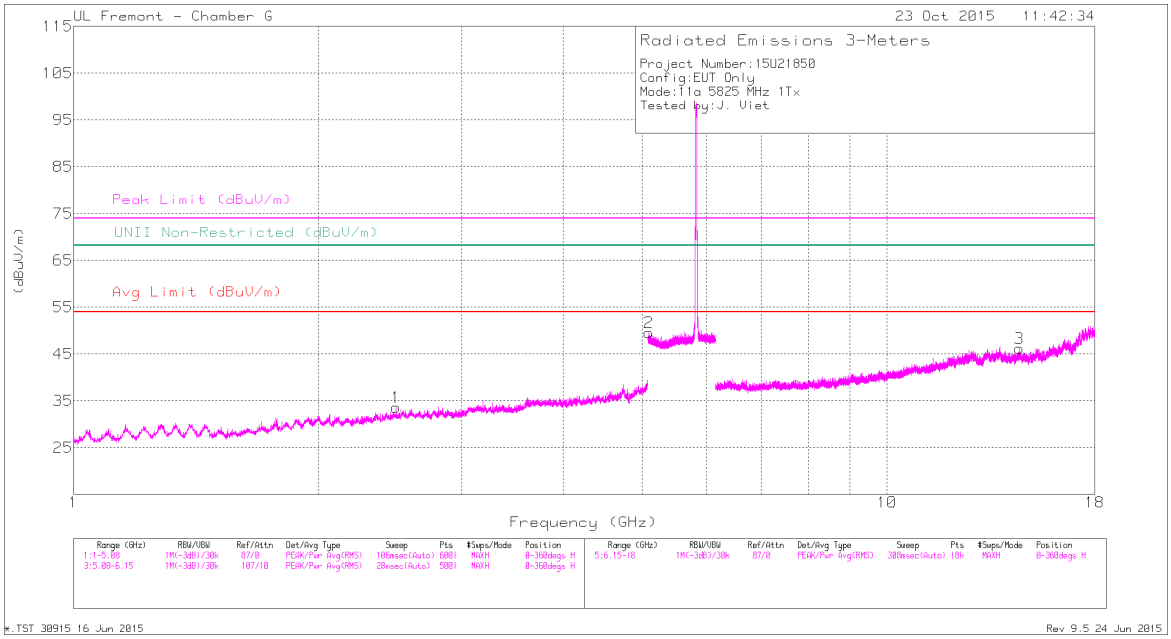
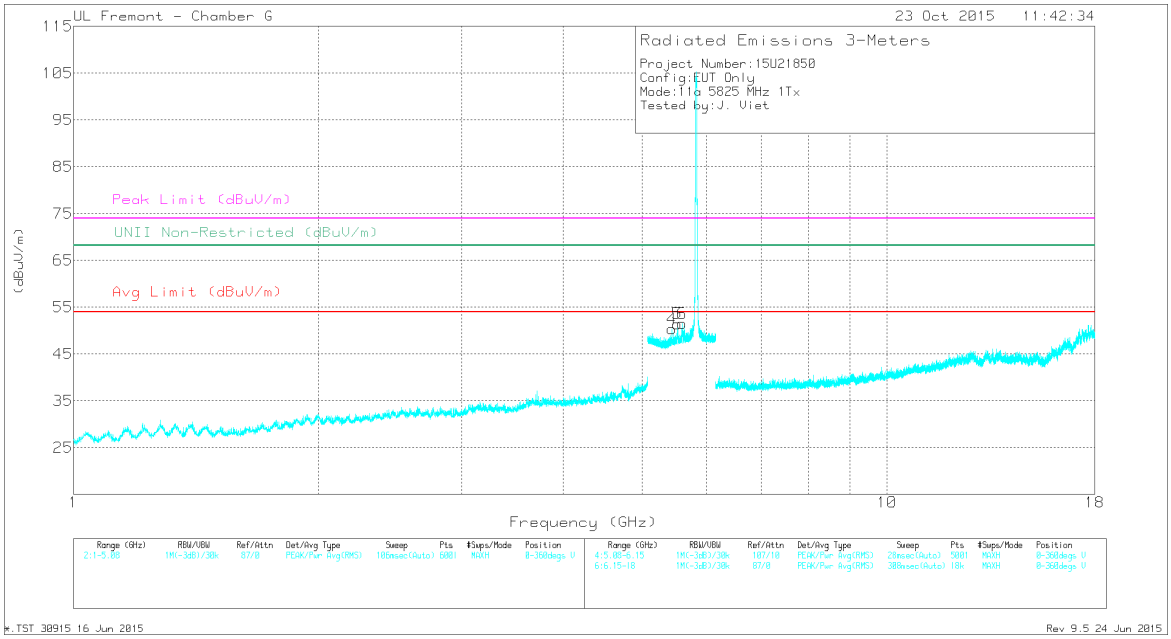
## HIGH CHANNEL HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL PLOT




HIGH CHANNEL VERTICAL PLOT





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**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T862 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.49 | 42.1 | PK-U | 32.3 | -34 | 40.4 | - | - | 74 | -33.6 | - | - | 360 | 202 | H |
| | * 2.489 | 30.58 | ADR | 32.3 | -34 | 28.88 | 54 | -25.12 | - | - | - | - | 360 | 202 | H |
| 2 | * 5.094 | 44.24 | PK-U | 34.2 | -23.2 | 55.24 | - | - | 74 | -18.76 | - | - | 63 | 181 | H |
| | * 5.094 | 32.68 | ADR | 34.2 | -23.2 | 43.68 | 54 | -10.32 | - | - | - | - | 63 | 181 | H |
| 4 | * 5.434 | 44.03 | PK-U | 34.5 | -22.9 | 55.63 | - | - | 74 | -18.37 | - | - | 223 | 301 | V |
| | * 5.437 | 32.45 | ADR | 34.5 | -22.9 | 44.05 | 54 | -9.95 | - | - | - | - | 223 | 301 | V |
| 5 | 5.526 | 47 | PK-U | 34.7 | -23 | 58.7 | - | - | - | - | 68.2 | -9.5 | 193 | 108 | V |
| 6 | 5.599 | 46.98 | PK-U | 34.9 | -23.1 | 58.78 | - | - | - | - | 68.2 | -9.42 | 196 | 270 | V |
| 3 | 14.549 | 39.59 | PK-U | 39.9 | -26.6 | 52.89 | - | - | - | - | 68.2 | -15.31 | 13 | 192 | H |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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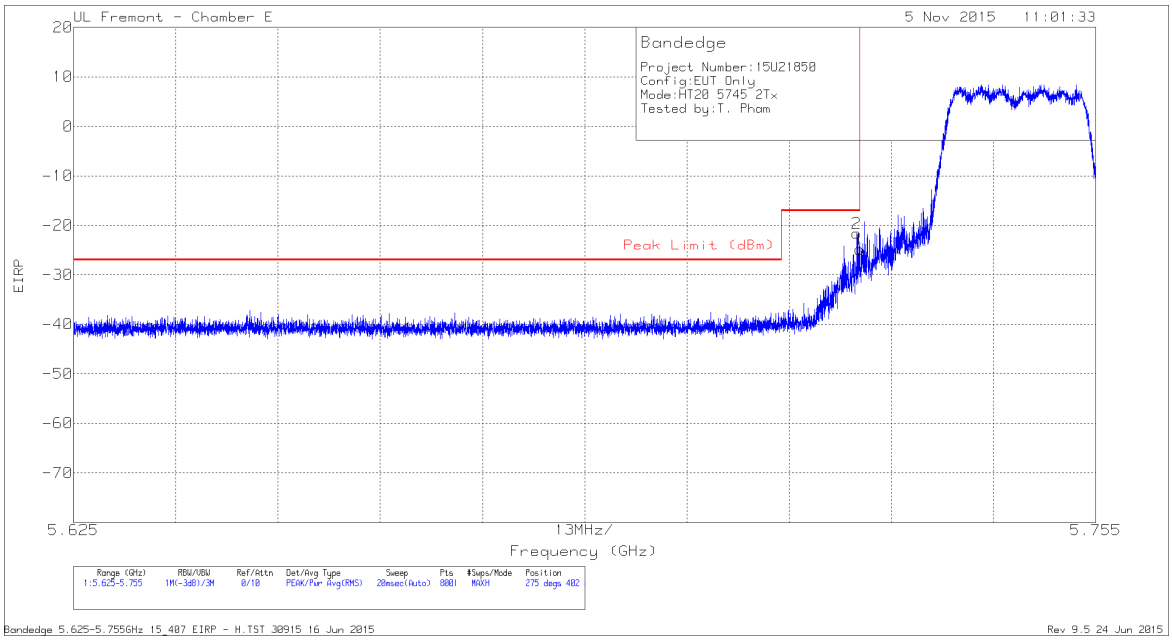
## 9.3. 802.11n HT20 2Tx CDD MODE IN THE 5.8 GHz BAND

**RESTRICTED BANDEDGE (LOW CHANNEL)**

LOW CHANNEL HORIZONTAL PLOT




**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T346 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.725 | -51.25 | Pk | 34.7 | -20.1 | 11.8 | -24.85 | -17 | -7.85 | 275 | 402 | H |
| 2 | 5.725 | -47.98 | Pk | 34.7 | -20.1 | 11.8 | -21.58 | -17 | -4.58 | 275 | 402 | H |

Pk - Peak detector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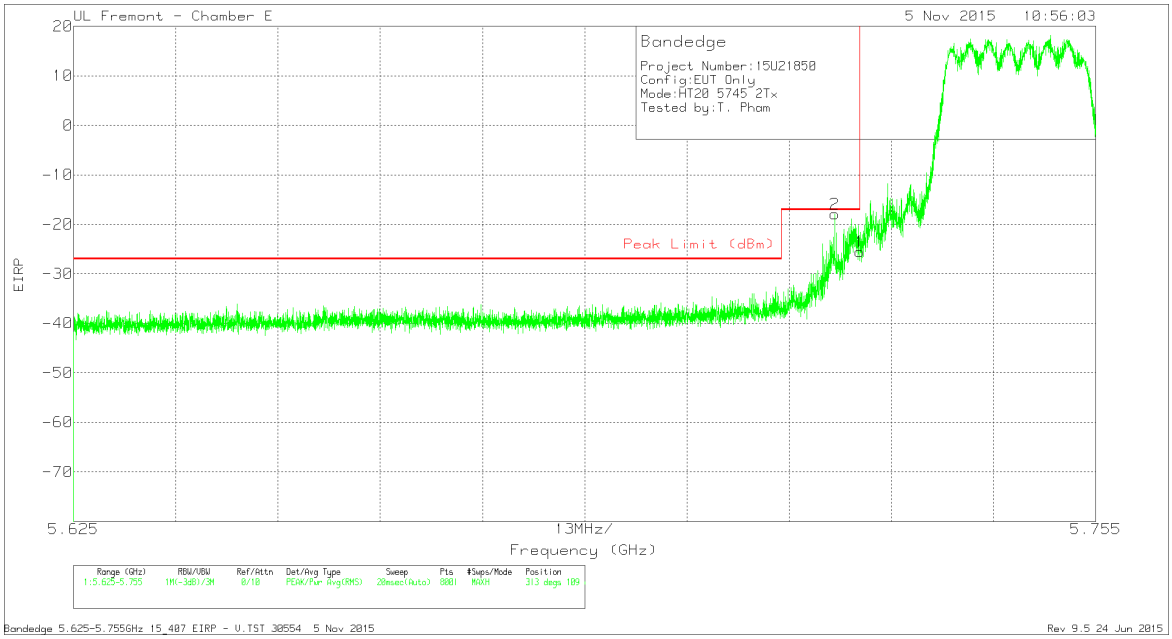
LOW CHANNEL VERTICAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T346 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 5.722 | -44.35 | Pk | 34.7 | -20.1 | 11.8 | -17.95 | -17 | -.95 | 313 | 109 | V |
| 1 | 5.725 | -51.95 | Pk | 34.7 | -20.1 | 11.8 | -25.55 | -17 | -8.55 | 313 | 109 | V |

Pk - Peak detector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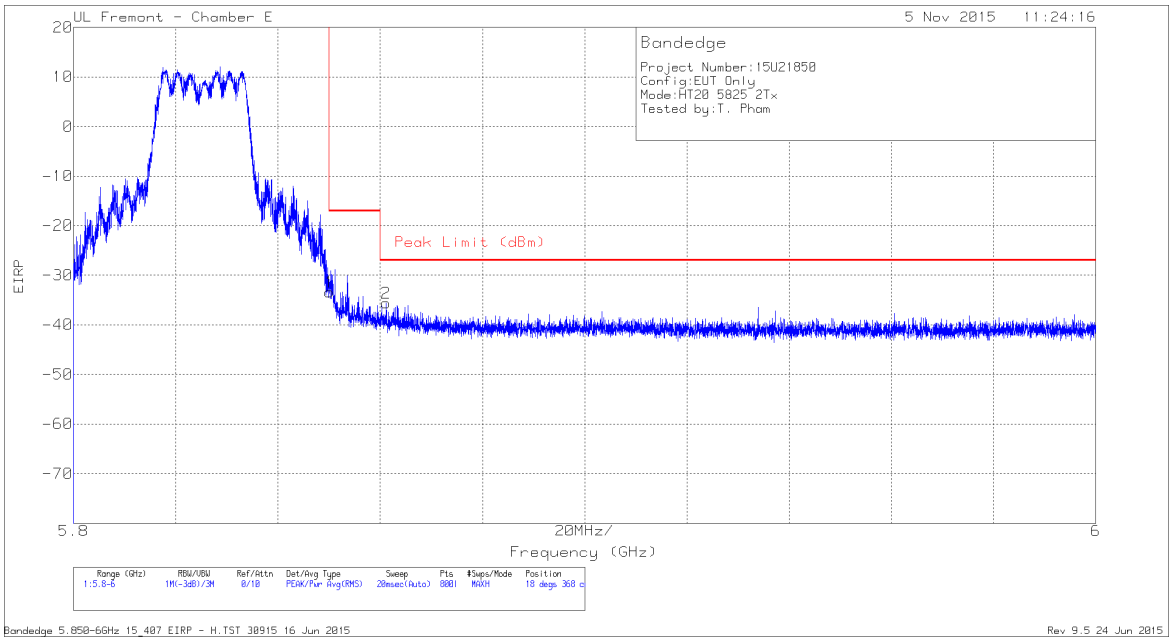
## RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL HORIZONTAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T346 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.85 | -59.82 | Pk | 34.9 | -20.3 | 11.8 | -33.42 | -17 | -16.42 | 18 | 368 | H |
| 2 | 5.861 | -61.86 | Pk | 34.9 | -20.4 | 11.8 | -35.56 | -27 | -8.56 | 18 | 368 | H |

Pk - Peak detector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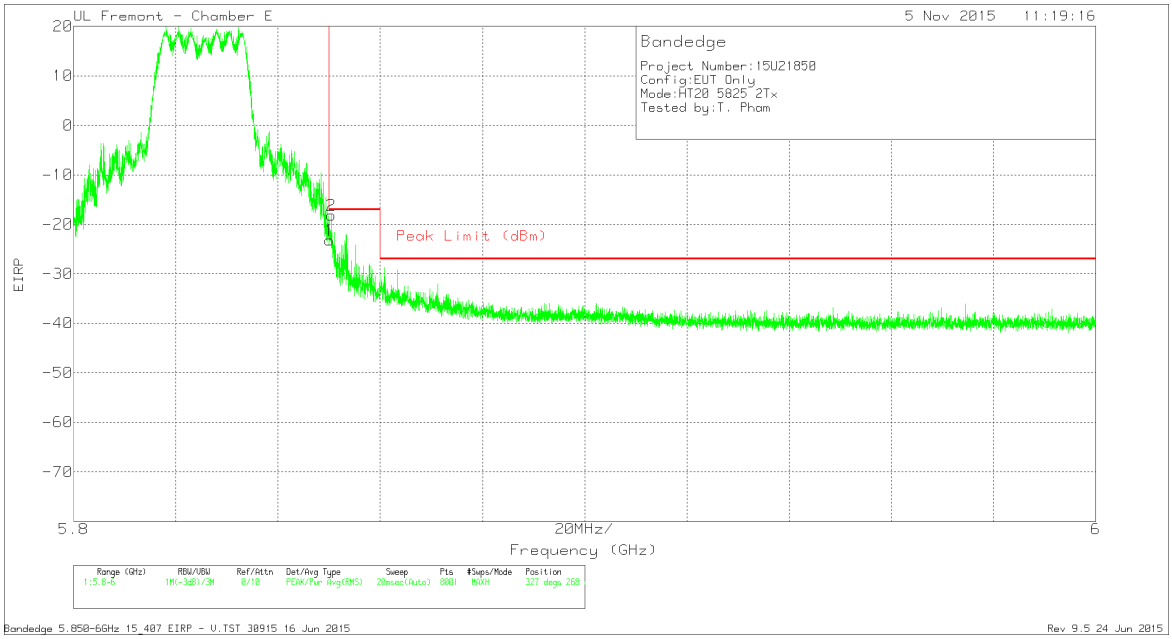
HIGH CHANNEL VERTICAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T346 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.85 | -49.58 | Pk | 34.9 | -20.3 | 11.8 | -23.18 | -17 | -6.18 | 327 | 268 | V |
| 2 | 5.85 | -44.56 | Pk | 34.9 | -20.3 | 11.8 | -18.16 | -17 | -1.16 | 327 | 268 | V |

Pk - Peak detector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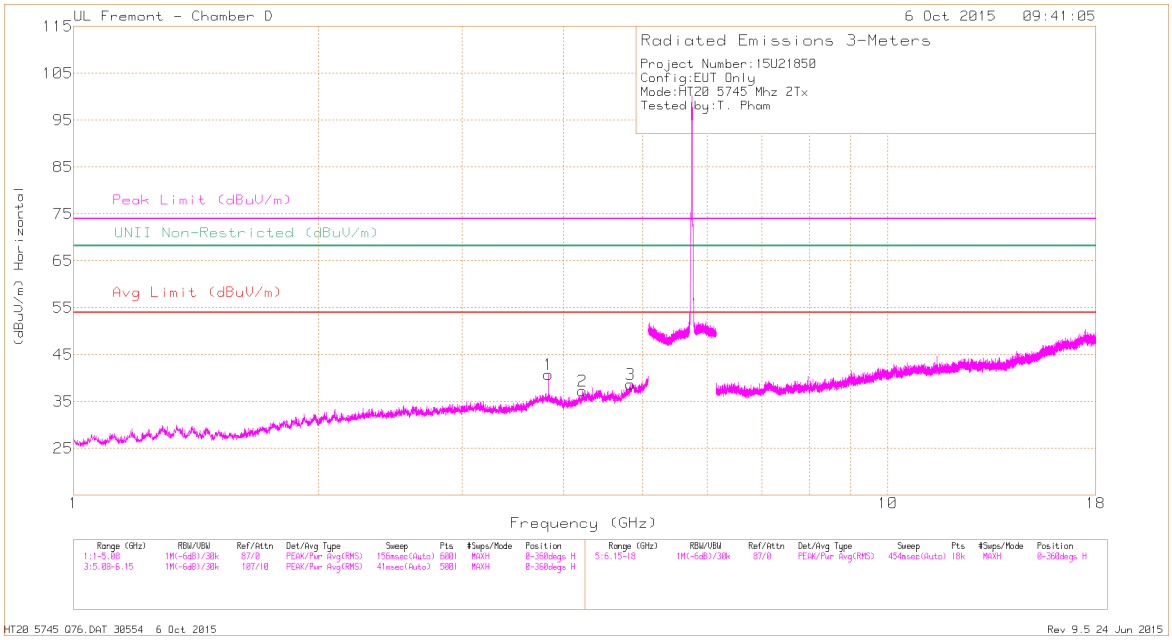
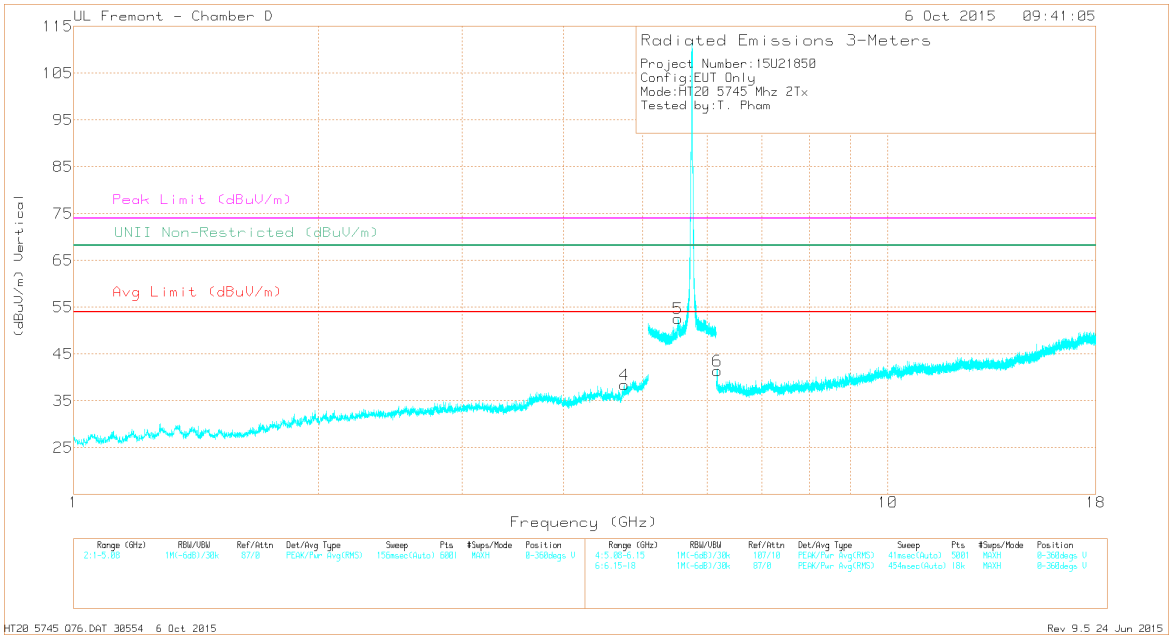
**LOW CHANNEL HARMONICS AND SPURIOUS EMISSIONS**

LOW CHANNEL HORIZONTAL PLOT




LOW CHANNEL VERTICAL PLOT





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**DATA**

| Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * 3.83 | 42.39 | PK-U | 33.4 | -28.8 | 46.99 | - | - | 74 | -27.01 | - | - | 11 | 114 | H |
| * 3.83 | 33.55 | ADR | 33.4 | -28.8 | 38.15 | 54 | -15.85 | - | - | - | - | 11 | 114 | H |
| * 4.218 | 38.02 | PK-U | 33.5 | -27.9 | 43.62 | - | - | 74 | -30.38 | - | - | 41 | 136 | H |
| * 4.217 | 26.66 | ADR | 33.5 | -27.9 | 32.26 | 54 | -21.74 | - | - | - | - | 41 | 136 | H |
| * 4.831 | 38.63 | PK-U | 34.1 | -26.8 | 45.93 | - | - | 74 | -28.07 | - | - | 68 | 158 | H |
| * 4.831 | 26.65 | ADR | 34.1 | -26.8 | 33.95 | 54 | -20.05 | - | - | - | - | 68 | 158 | H |
| * 4.746 | 39.33 | PK-U | 34.1 | -27.6 | 45.83 | - | - | 74 | -28.17 | - | - | 111 | 170 | V |
| * 4.746 | 27.64 | ADR | 34.1 | -27.6 | 34.14 | 54 | -19.86 | - | - | - | - | 111 | 170 | V |
| 5.521 | 42.11 | PK-U | 34.4 | -17.9 | 58.61 | - | - | - | - | 68.2 | -9.59 | 96 | 161 | V |
| 6.179 | 36.98 | PK-U | 35.5 | -26.4 | 46.08 | - | - | - | - | 68.2 | -22.12 | 103 | 184 | V |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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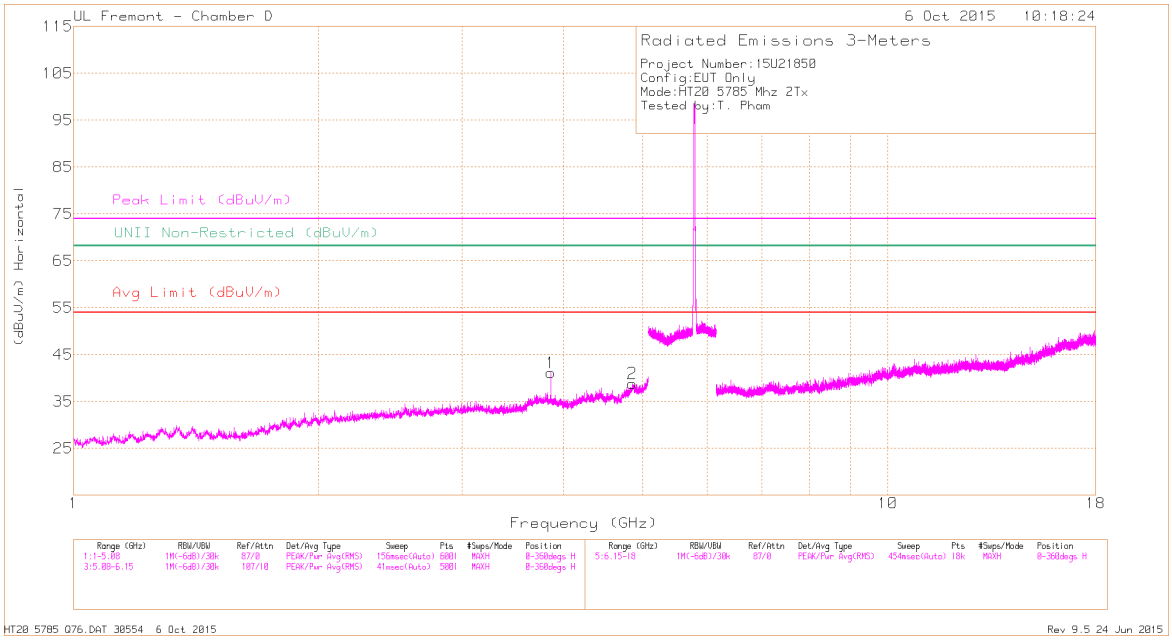
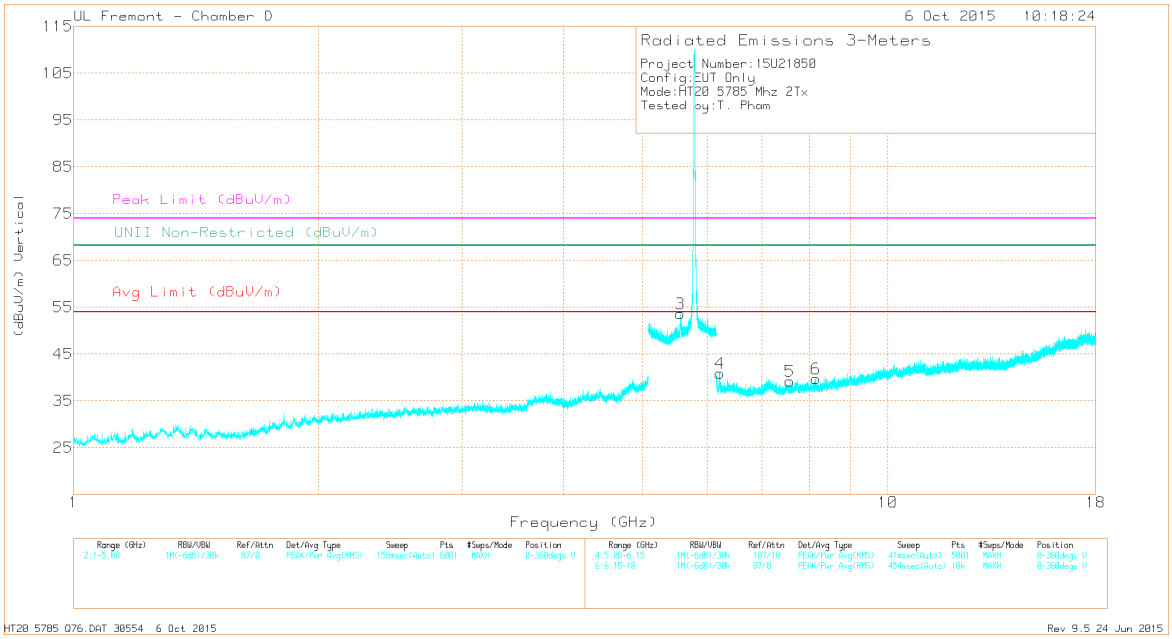
**MID CHANNEL HARMONICS AND SPURIOUS EMISSIONS**

MID CHANNEL HORIZONTAL PLOT




MID CHANNEL VERTICAL PLOT





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**DATA**

| Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * 3.857 | 42.56 | PK-U | 33.4 | -29 | 46.96 | - | - | 74 | -27.04 | - | - | 7 | 134 | H |
| * 3.857 | 35.06 | ADR | 33.4 | -29 | 39.46 | 54 | -14.54 | - | - | - | - | 7 | 134 | H |
| * 4.854 | 26.4 | ADR | 34.1 | -25.7 | 34.8 | 54 | -19.2 | - | - | - | - | 21 | 158 | H |
| * 4.855 | 37.94 | PK-U | 34.1 | -25.7 | 46.34 | - | - | 74 | -27.66 | - | - | 21 | 158 | H |
| * 7.574 | 36.44 | PK-U | 35.6 | -25.2 | 46.84 | - | - | 74 | -27.16 | - | - | 120 | 210 | V |
| * 7.574 | 24.71 | ADR | 35.6 | -25.2 | 35.11 | 54 | -18.89 | - | - | - | - | 120 | 210 | V |
| * 8.158 | 36.2 | PK-U | 35.6 | -24.1 | 47.7 | - | - | 74 | -26.3 | - | - | 107 | 201 | V |
| * 8.158 | 24.41 | ADR | 35.6 | -24.1 | 35.91 | 54 | -18.09 | - | - | - | - | 107 | 201 | V |
| 5.564 | 43.26 | PK-U | 34.4 | -18 | 59.66 | - | - | - | - | 68.2 | -8.54 | 45 | 138 | V |
| 6.214 | 38.06 | PK-U | 35.4 | -26.7 | 46.76 | - | - | - | - | 68.2 | -21.44 | 79 | 191 | V |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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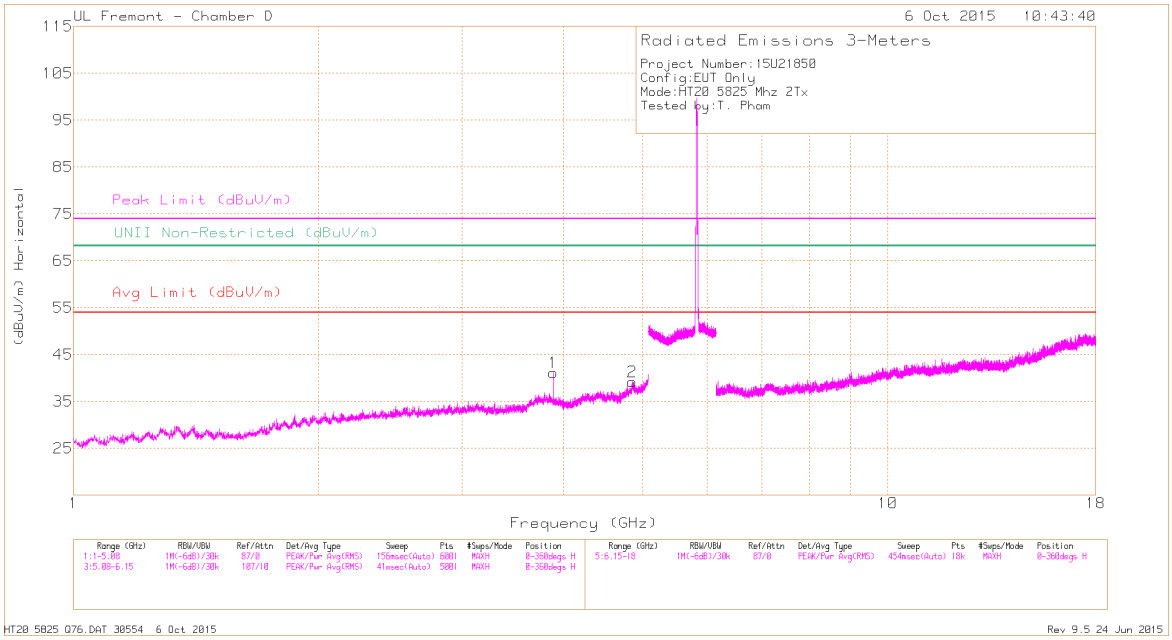
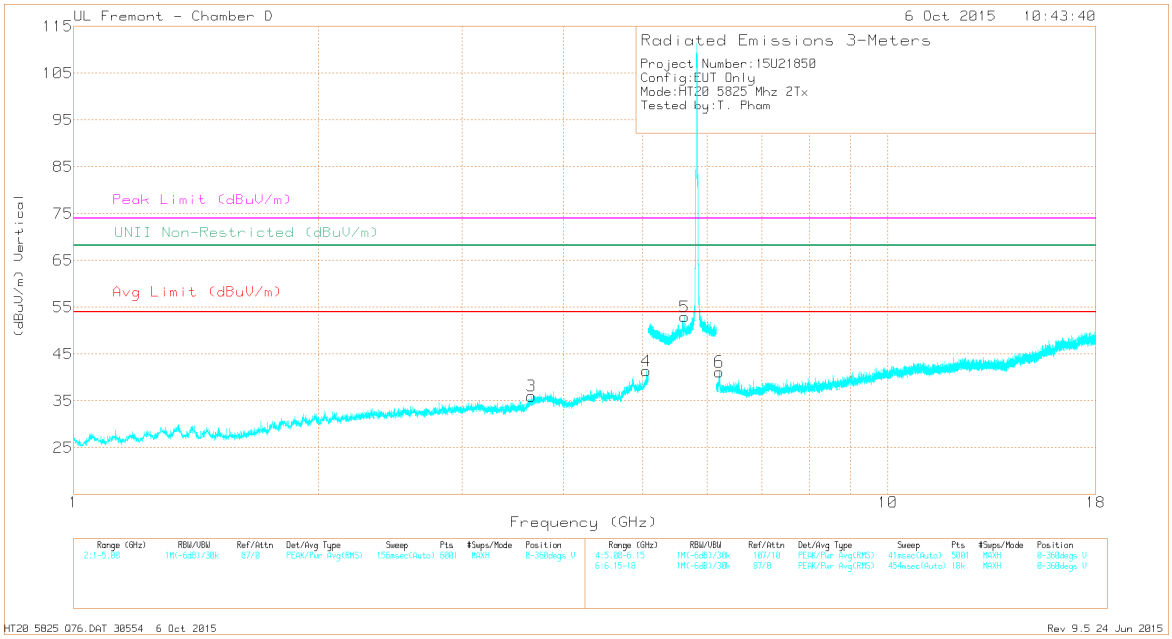
## HIGH CHANNEL HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL PLOT




HIGH CHANNEL VERTICAL PLOT





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**DATA**

| Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * 3.883 | 42.77 | PK-U | 33.4 | -29.1 | 47.07 | - | - | 74 | -26.93 | - | - | 345 | 102 | H |
| * 3.883 | 35.58 | ADR | 33.4 | -29.1 | 39.88 | 54 | -14.12 | - | - | - | - | 345 | 102 | H |
| * 4.853 | 38.48 | PK-U | 34.1 | -25.7 | 46.88 | - | - | 74 | -27.12 | - | - | 338 | 117 | H |
| * 4.854 | 26.81 | ADR | 34.1 | -25.7 | 35.21 | 54 | -18.79 | - | - | - | - | 338 | 117 | H |
| * 3.652 | 38.56 | PK-U | 33.1 | -29.2 | 42.46 | - | - | 74 | -31.54 | - | - | 312 | 109 | V |
| * 3.651 | 27.09 | ADR | 33.1 | -29.2 | 30.99 | 54 | -23.01 | - | - | - | - | 312 | 109 | V |
| * 5.048 | 40.91 | PK-U | 34.3 | -25.7 | 49.51 | - | - | 74 | -24.49 | - | - | 330 | 124 | V |
| * 5.048 | 30.15 | ADR | 34.3 | -25.7 | 38.75 | 54 | -15.25 | - | - | - | - | 330 | 124 | V |
| 6.206 | 40.66 | PK-U | 35.4 | -26.7 | 49.36 | - | - | - | - | 68.2 | -18.84 | 342 | 150 | V |
| 6.207 | 29.63 | ADR | 35.4 | -26.7 | 38.33 | - | - | - | - | - | - | 342 | 150 | V |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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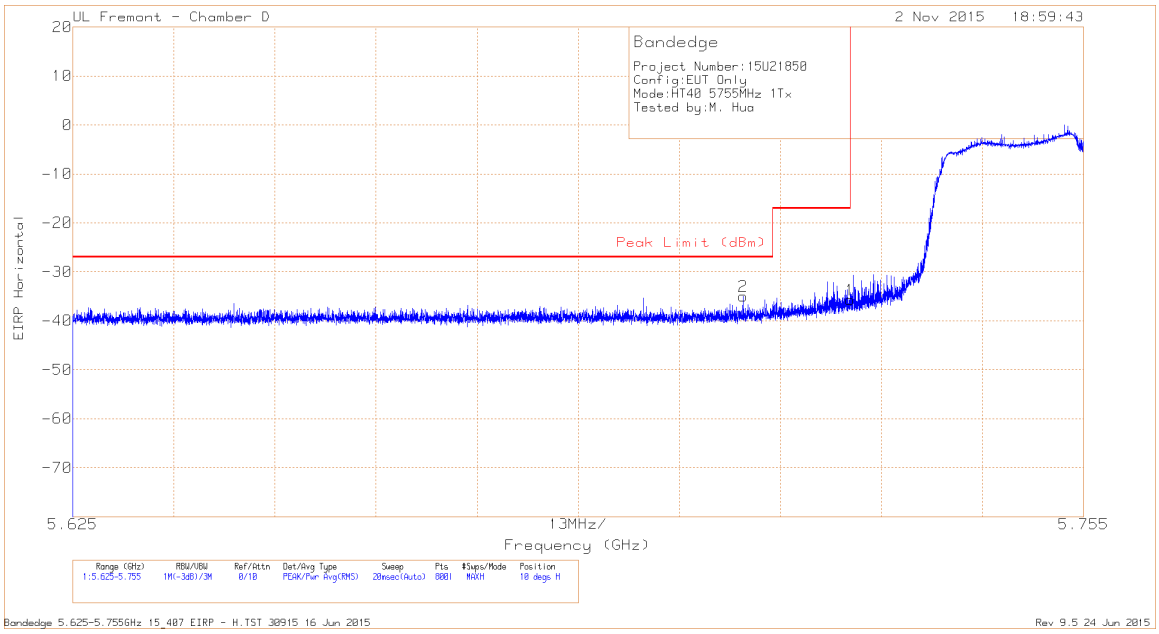
## 9.4. 802.11n HT40 1Tx MODE IN THE 5.8 GHz BAND

### 9.4.1. CHAIN 0, RESTRICTED BANDEDGE

**LOW CHANNEL**

LOW CHANNEL HORIZONTAL PLOT




**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T344 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 5.711 | -63.75 | Pk | 34.5 | -17.5 | 11.8 | -34.95 | -27 | -7.95 | 10 | 360 | H |
| 1 | 5.725 | -64.53 | Pk | 34.6 | -17.6 | 11.8 | -35.73 | -17 | -18.73 | 10 | 360 | H |

Pk - Peak detector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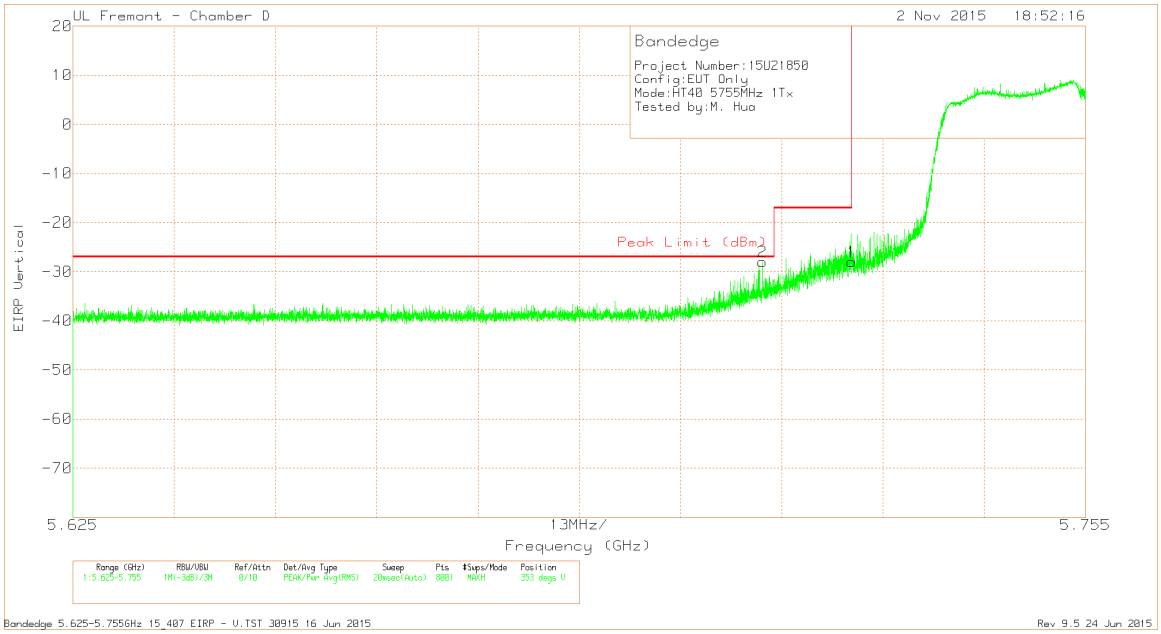
LOW CHANNEL VERTICAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 5.714 | -56.83 | Pk | 34.6 | -17.5 | 11.8 | -27.93 | -27 | -.93 | 353 | 286 | V |
| 1 | 5.725 | -56.73 | Pk | 34.6 | -17.6 | 11.8 | -27.93 | -17 | -10.93 | 353 | 286 | V |

Pk - Peak detector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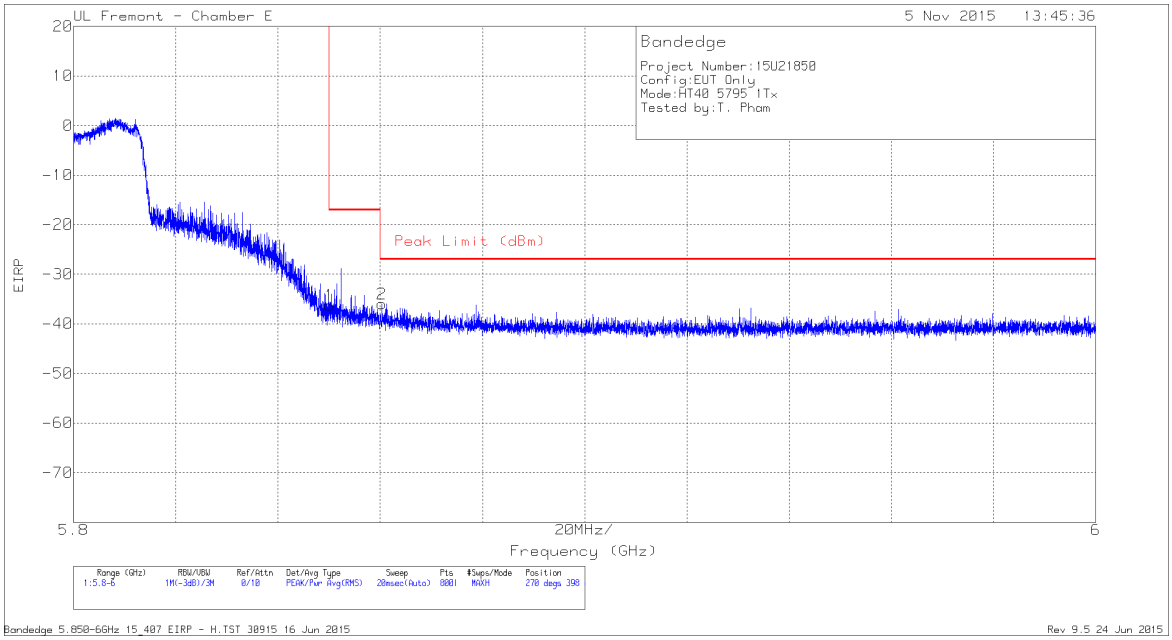
## RESTRICTED BANDEDGE, CHAIN 0 (HIGH CHANNEL)

HIGH CHANNEL HORIZONTAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T346 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.85 | -62.6 | Pk | 34.9 | -20.3 | 11.8 | -36.2 | -17 | -19.2 | 270 | 398 | H |
| 2 | 5.86 | -62.24 | Pk | 34.9 | -20.4 | 11.8 | -35.94 | -27 | -8.94 | 270 | 398 | H |

Pk - Peak detector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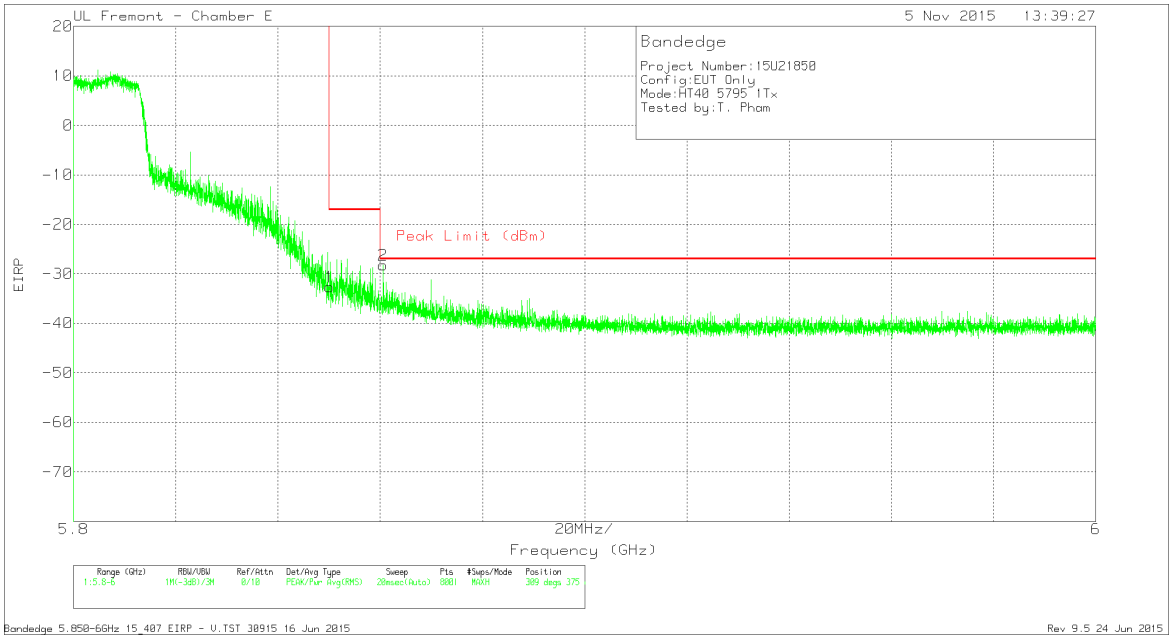
HIGH CHANNEL VERTICAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T346 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.85 | -59.1 | Pk | 34.9 | -20.3 | 11.8 | -32.7 | -17 | -15.7 | 309 | 375 | V |
| 2 | 5.861 | -54.53 | Pk | 34.9 | -20.4 | 11.8 | -28.23 | -27 | -1.23 | 309 | 375 | V |

Pk - Peak detector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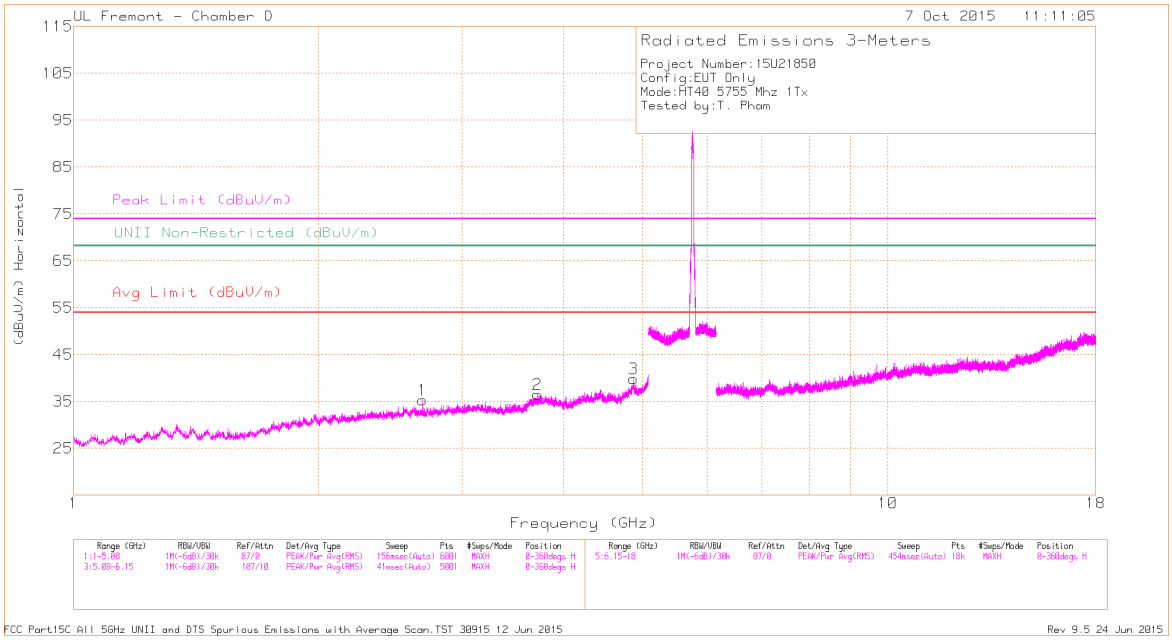
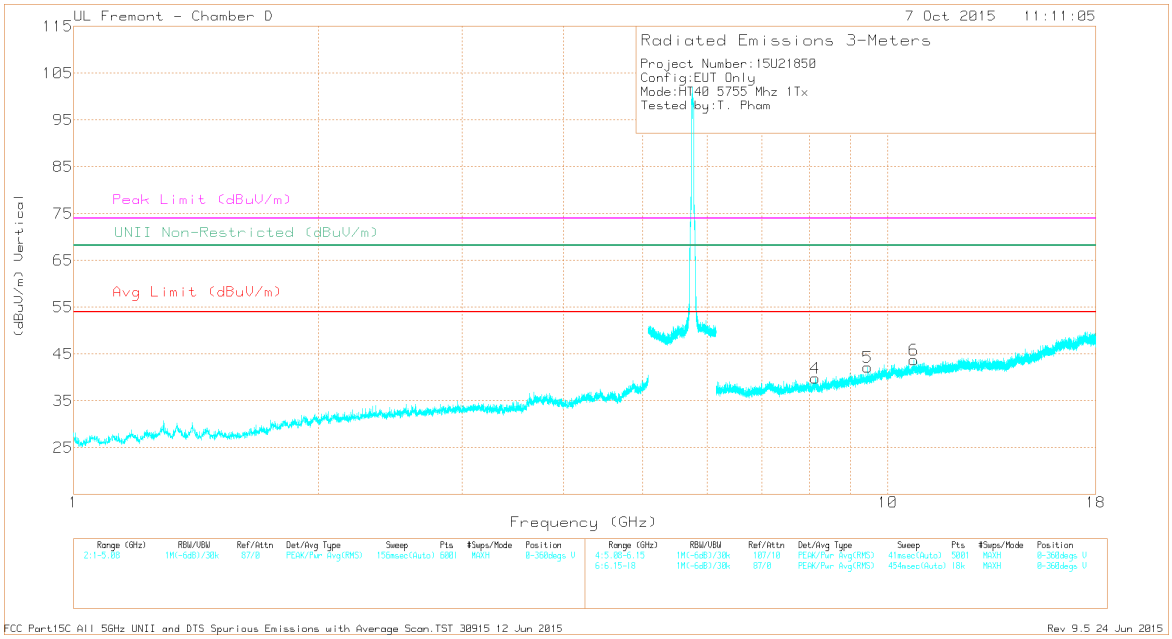
## LOW CHANNEL HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL PLOT




LOW CHANNEL VERTICAL PLOT





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## DATA

| Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (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) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * 2.684 | 40 | PK-U | 32.4 | -30.6 | 0 | 41.8 | - | - | 74 | -32.2 | - | - | 36 | 158 | H |
| * 2.686 | 28.23 | ADR | 32.4 | -30.6 | .13 | 30.16 | 54 | -23.84 | - | - | - | - | 36 | 158 | H |
| * 3.713 | 38.76 | PK-U | 33.2 | -29.3 | 0 | 42.66 | - | - | 74 | -31.34 | - | - | 158 | 147 | H |
| * 3.713 | 27.38 | ADR | 33.2 | -29.3 | .13 | 31.41 | 54 | -22.59 | - | - | - | - | 158 | 147 | H |
| * 4.868 | 37.15 | PK-U | 34.1 | -25.2 | 0 | 46.05 | - | - | 74 | -27.95 | - | - | 46 | 199 | H |
| * 4.868 | 25.67 | ADR | 34.1 | -25.2 | .13 | 34.70 | 54 | -19.30 | - | - | - | - | 46 | 199 | H |
| * 8.147 | 35.9 | PK-U | 35.6 | -23.8 | 0 | 47.7 | - | - | 74 | -26.3 | - | - | 82 | 236 | V |
| * 8.147 | 24.49 | ADR | 35.6 | -23.8 | .13 | 36.42 | 54 | -17.58 | - | - | - | - | 82 | 236 | V |
| * 9.442 | 34.43 | PK-U | 36.5 | -21.9 | 0 | 49.03 | - | - | 74 | -24.97 | - | - | 211 | 228 | V |
| * 9.444 | 23.19 | ADR | 36.5 | -21.8 | .13 | 38.02 | 54 | -15.98 | - | - | - | - | 211 | 228 | V |
| * 10.764 | 34.62 | PK-U | 37.9 | -20.9 | 0 | 51.62 | - | - | 74 | -22.38 | - | - | 65 | 174 | V |
| * 10.764 | 22.84 | ADR | 37.9 | -20.9 | .13 | 39.97 | 54 | -14.03 | - | - | - | - | 65 | 174 | V |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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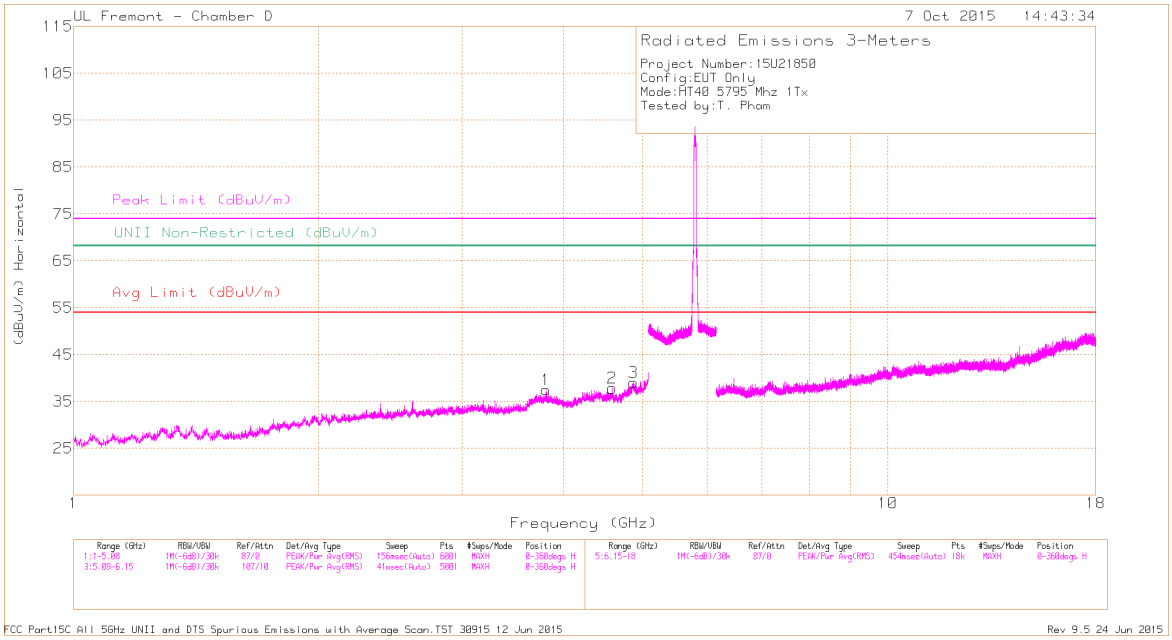
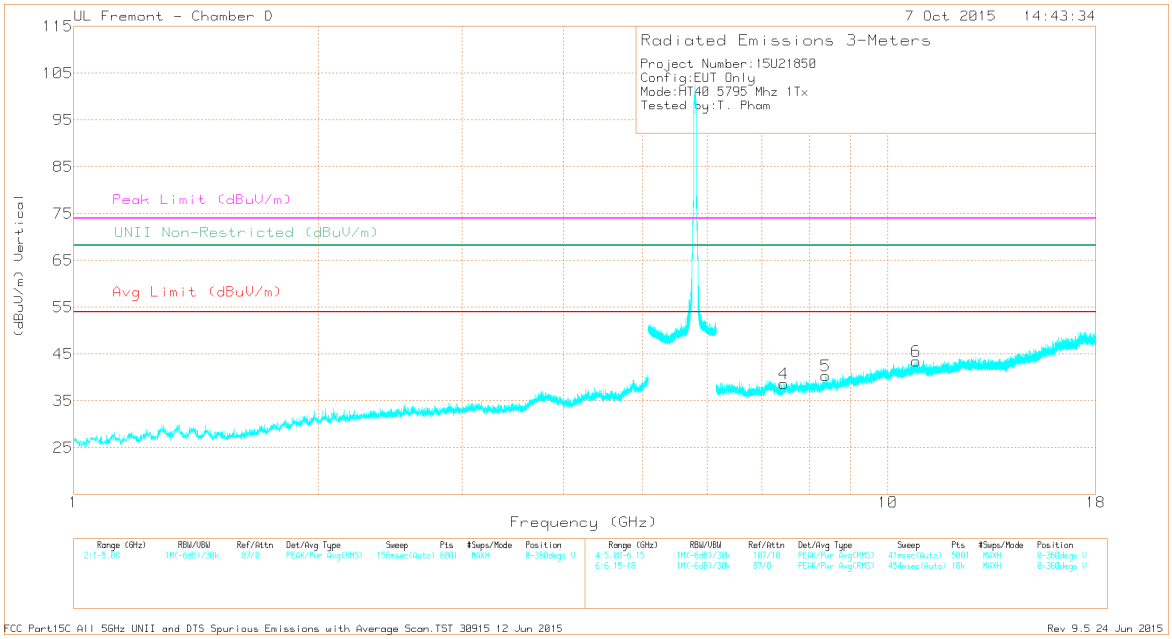
## HIGH CHANNEL HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL PLOT




HIGH CHANNEL VERTICAL PLOT





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## DATA

| Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (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) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * 3.805 | 38.62 | PK-U | 33.4 | -28.6 | 0 | 43.42 | - | - | 74 | -30.58 | - | - | 26 | 125 | H |
| * 3.804 | 27.45 | ADR | 33.4 | -28.6 | .13 | 32.38 | 54 | -21.62 | - | - | - | - | 26 | 125 | H |
| * 4.587 | 38.14 | PK-U | 34.1 | -27.1 | 0 | 45.14 | - | - | 74 | -28.86 | - | - | 65 | 144 | H |
| * 4.588 | 26.62 | ADR | 34.1 | -27.1 | .13 | 33.75 | 54 | -20.25 | - | - | - | - | 65 | 144 | H |
| * 4.871 | 37.48 | PK-U | 34.1 | -25.2 | 0 | 46.38 | - | - | 74 | -27.62 | - | - | 158 | 269 | H |
| * 4.871 | 25.31 | ADR | 34.1 | -25.2 | .13 | 34.34 | 54 | -19.66 | - | - | - | - | 158 | 269 | H |
| * 7.454 | 36.42 | PK-U | 35.5 | -24.9 | 0 | 47.02 | - | - | 74 | -26.98 | - | - | 78 | 228 | V |
| * 7.454 | 24.56 | ADR | 35.5 | -24.9 | .13 | 35.29 | 54 | -18.71 | - | - | - | - | 78 | 228 | V |
| * 8.393 | 36.36 | PK-U | 35.7 | -23.7 | 0 | 48.36 | - | - | 74 | -25.64 | - | - | 225 | 148 | V |
| * 8.394 | 24.42 | ADR | 35.7 | -23.8 | .13 | 36.45 | 54 | -17.55 | - | - | - | - | 225 | 148 | V |
| * 10.83 | 34.05 | PK-U | 38 | -21.2 | 0 | 50.85 | - | - | 74 | -23.15 | - | - | 36 | 159 | V |
| * 10.83 | 22.66 | ADR | 38 | -21.2 | .13 | 39.59 | 54 | -14.41 | - | - | - | - | 36 | 159 | V |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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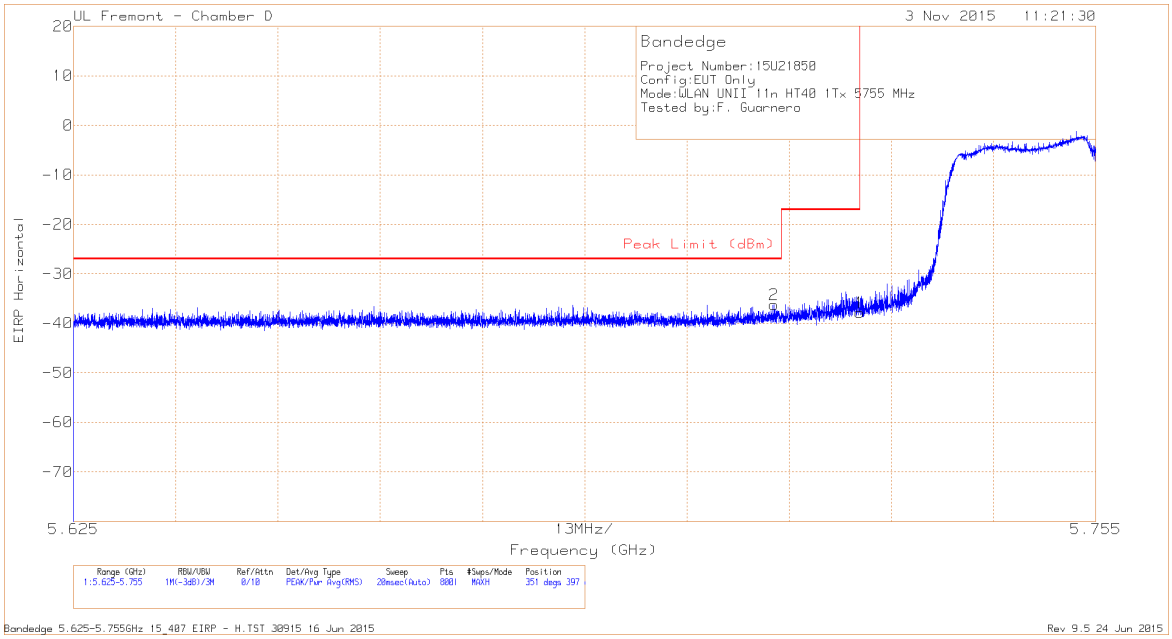
## 9.4.2. CHAIN 1, RESTRICTED BANDEDGE

**LOW CHANNEL**

LOW CHANNEL HORIZONTAL PLOT




**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 5.714 | -65.14 | Pk | 34.6 | -17.5 | 11.8 | -36.24 | -27 | -9.24 | 351 | 397 | H |
| 1 | 5.725 | -66.65 | Pk | 34.6 | -17.6 | 11.8 | -37.85 | -17 | -20.85 | 351 | 397 | H |

Pk - Peak detector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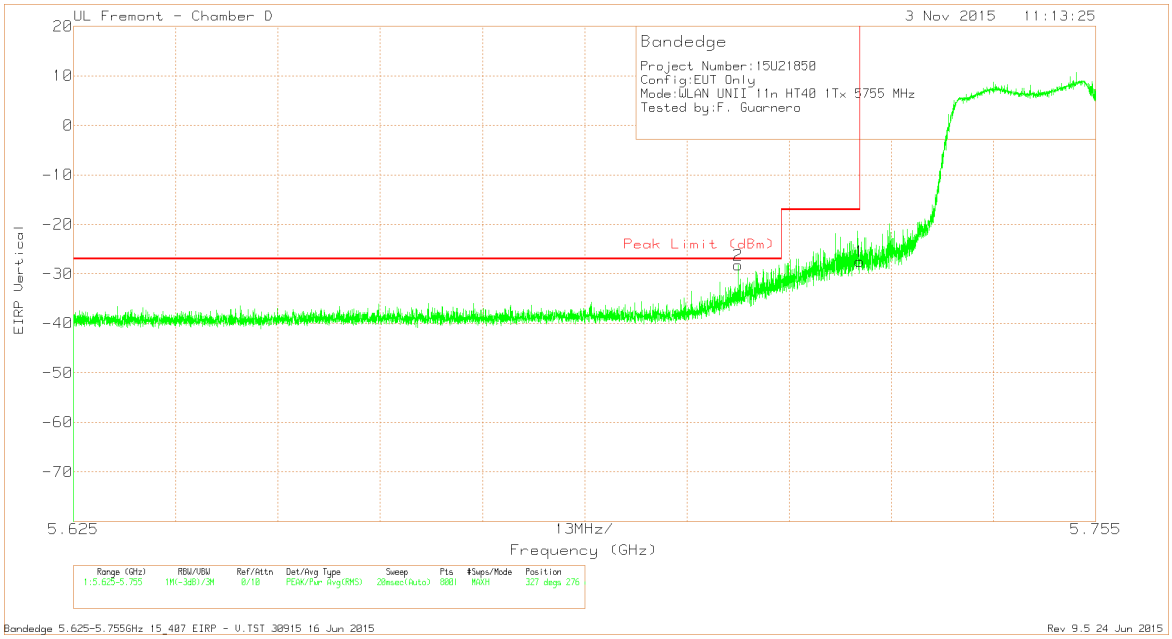
LOW CHANNEL VERTICAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 5.71 | -57 | Pk | 34.5 | -17.5 | 11.8 | -28.2 | -27 | -1.2 | 327 | 276 | V |
| 1 | 5.725 | -56.3 | Pk | 34.6 | -17.6 | 11.8 | -27.5 | -17 | -10.5 | 327 | 276 | V |

Pk - Peak detector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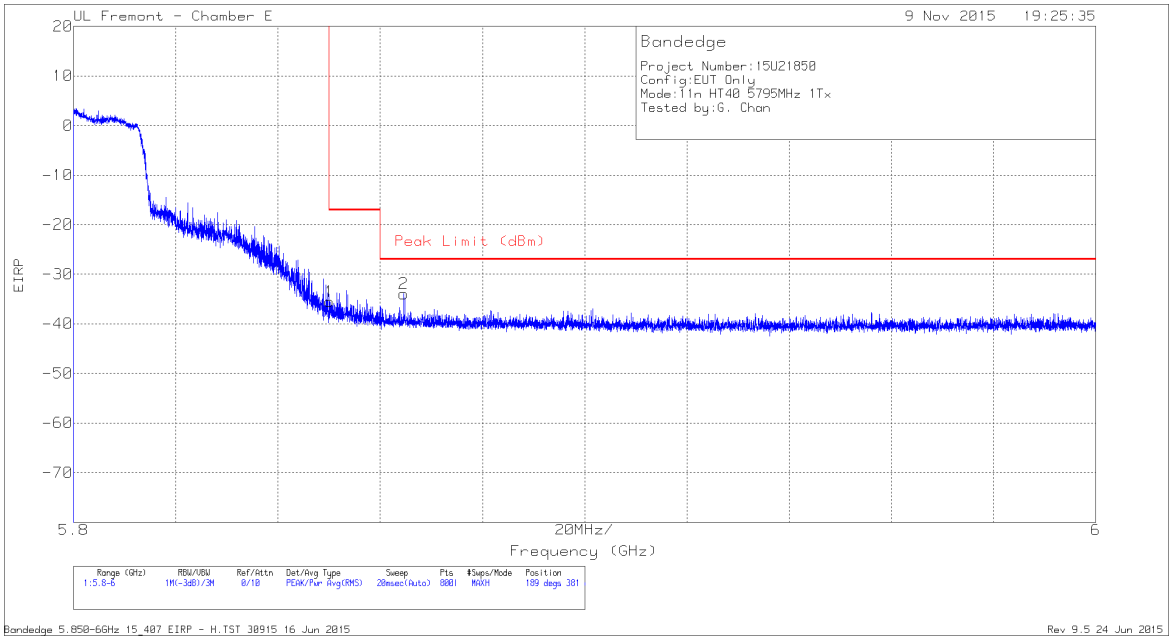
## RESTRICTED BANDEDGE, CHAIN 1 (HIGH CHANNEL)

HIGH CHANNEL HORIZONTAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T346 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.85 | -61.89 | Pk | 34.9 | -20.3 | 11.8 | -35.49 | -17 | -18.49 | 189 | 381 | H |
| 2 | 5.865 | -60.24 | Pk | 34.9 | -20.4 | 11.8 | -33.94 | -27 | -6.94 | 189 | 381 | H |

Pk - Peak detector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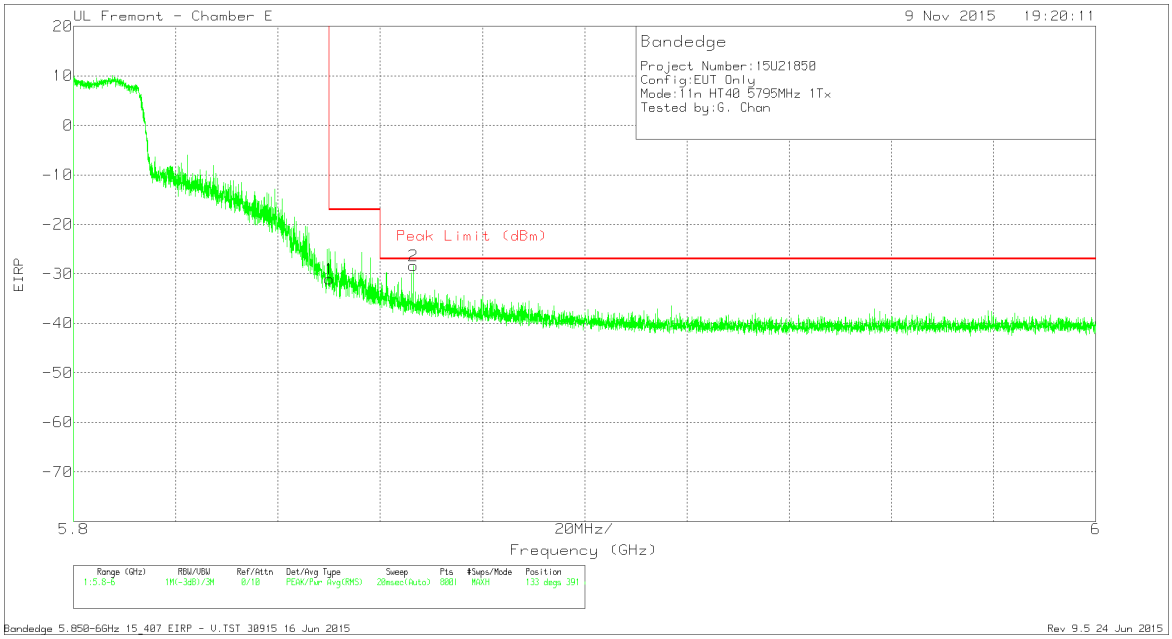
HIGH CHANNEL VERTICAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T346 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.85 | -57.43 | Pk | 34.9 | -20.3 | 11.8 | -31.03 | -17 | -14.03 | 133 | 391 | V |
| 2 | 5.867 | -54.69 | Pk | 34.9 | -20.4 | 11.8 | -28.39 | -27 | -1.39 | 133 | 391 | V |

Pk - Peak detector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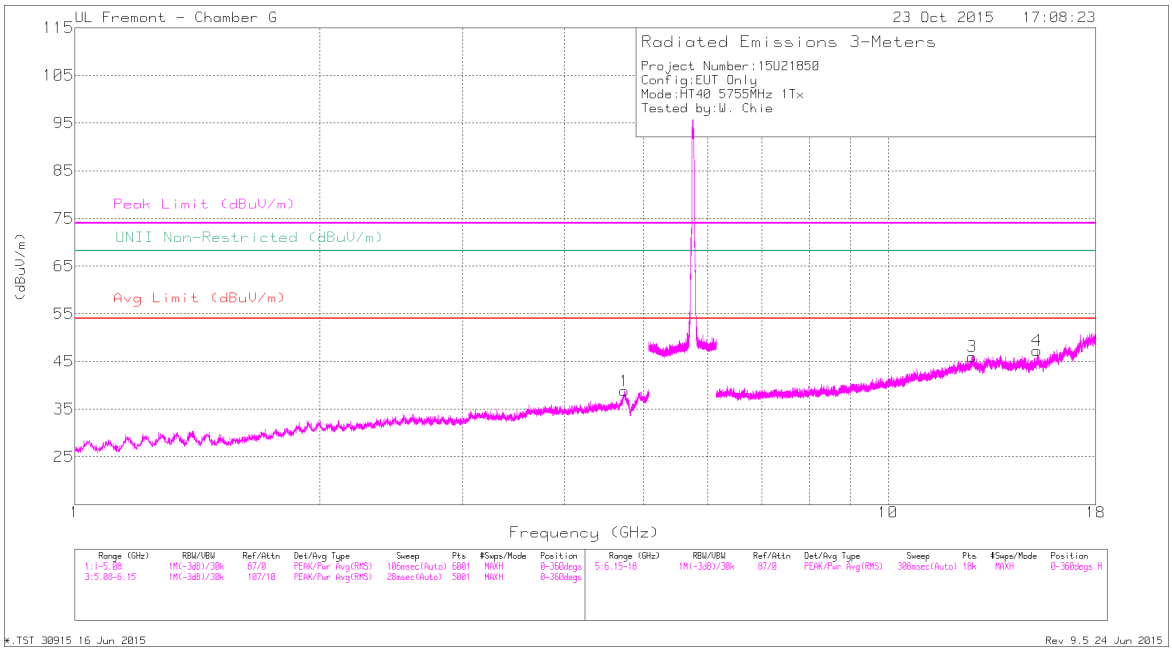
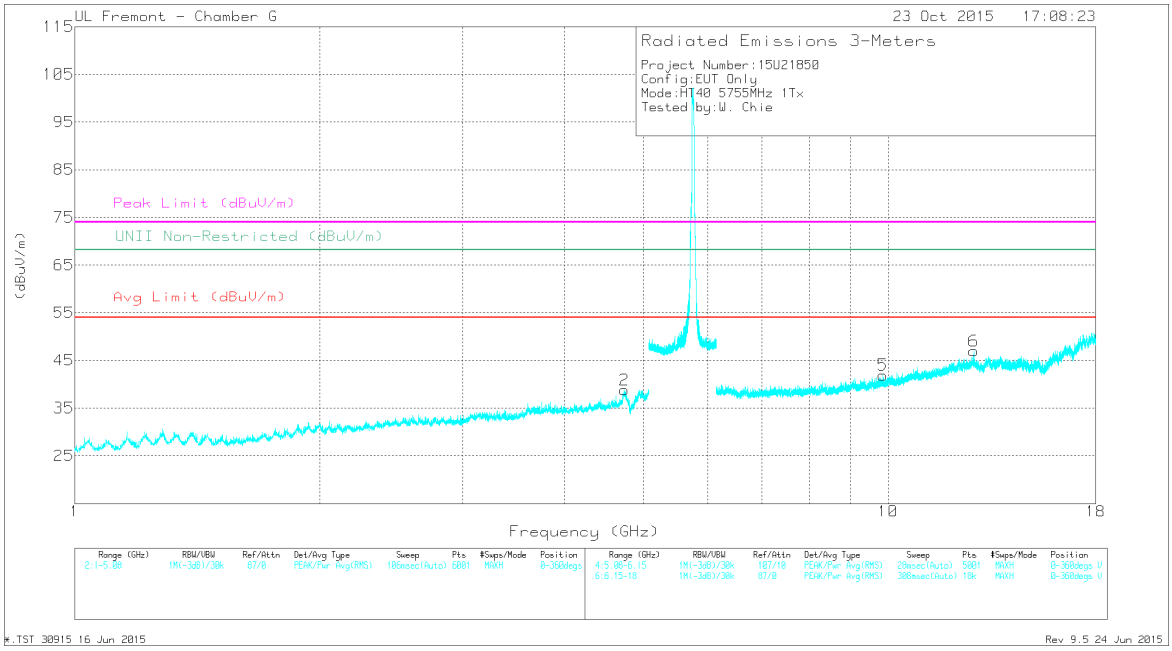
**LOW CHANNEL HARMONICS AND SPURIOUS EMISSIONS**

LOW CHANNEL HORIZONTAL PLOT




LOW CHANNEL VERTICAL PLOT





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## DATA

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T862 (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) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 4.739 | 44.15 | PK-U | 33.9 | -31.9 | 0 | 46.15 | - | - | 74 | -27.85 | - | - | 160 | 132 | H |
| | * 4.739 | 32.69 | ADR | 33.9 | -31.9 | .13 | 34.72 | 54 | -19.28 | - | - | - | - | 160 | 132 | H |
| 2 | * 4.739 | 45.54 | PK-U | 33.9 | -31.9 | 0 | 47.54 | - | - | 74 | -26.46 | - | - | 211 | 173 | V |
| | * 4.74 | 33.45 | ADR | 33.9 | -31.8 | .13 | 35.68 | 54 | -18.32 | - | - | - | - | 211 | 173 | V |
| 3 | * 12.69 | 37.33 | PK-U | 39.3 | -24.3 | 0 | 52.33 | - | - | 74 | -21.67 | - | - | 237 | 136 | H |
| | * 12.687 | 25.91 | ADR | 39.3 | -24.3 | .13 | 41.04 | 54 | -12.96 | - | - | - | - | 237 | 136 | H |
| 5 | 9.852 | 39.02 | PK-U | 36.9 | -27.9 | 0 | 48.02 | - | - | - | - | 68.2 | -20.18 | 229 | 169 | V |
| 6 | 12.747 | 37.4 | PK-U | 39.2 | -24.1 | 0 | 52.5 | - | - | - | - | 68.2 | -15.7 | 169 | 234 | V |
| 4 | 15.243 | 38.91 | PK-U | 39.8 | -25.7 | 0 | 53.01 | - | - | - | - | 68.2 | -15.19 | 176 | 145 | H |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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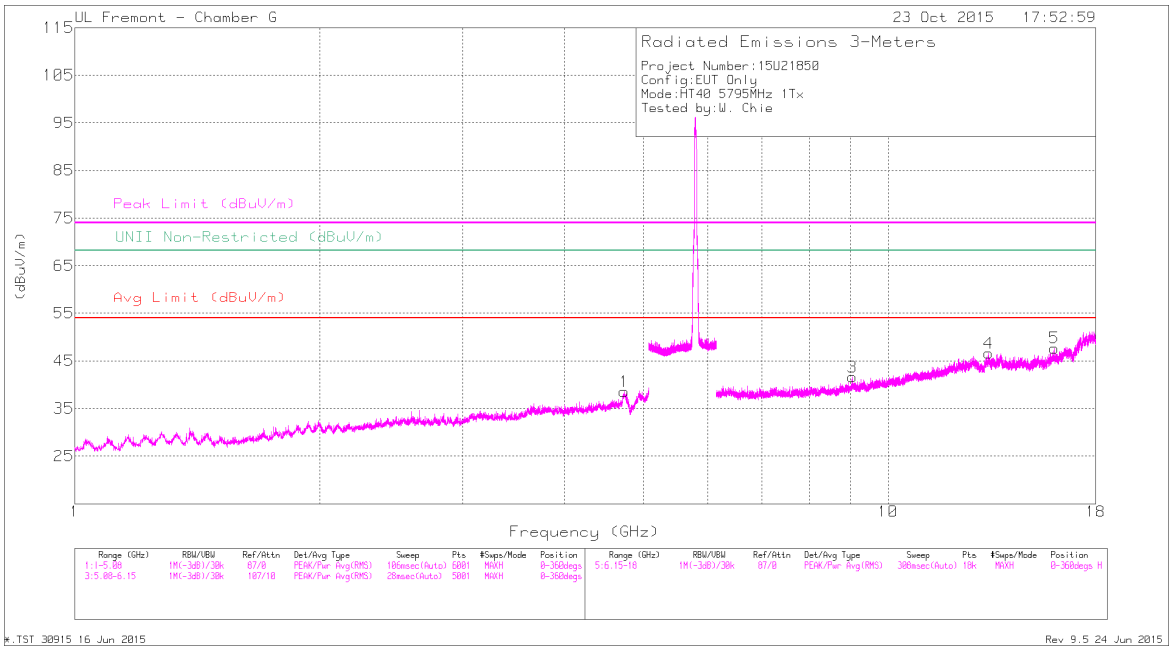
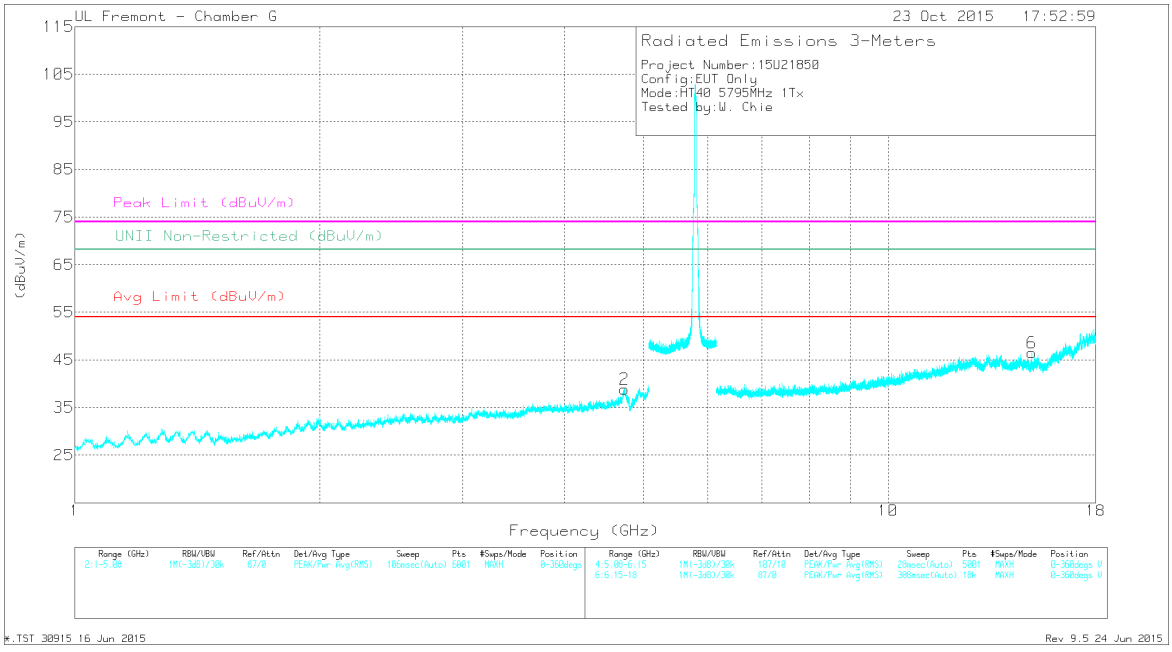
## HIGH CHANNEL HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL PLOT




HIGH CHANNEL VERTICAL PLOT





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## DATA

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T862 (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) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 4.736 | 44.17 | PK-U | 33.9 | -31.9 | 0 | 46.17 | - | - | 74 | -27.83 | - | - | 192 | 137 | H |
| | * 4.739 | 32.58 | ADR | 33.9 | -31.9 | .13 | 34.71 | 54 | -19.29 | - | - | - | - | 192 | 137 | H |
| 2 | * 4.741 | 45.47 | PK-U | 33.9 | -31.9 | 0 | 47.47 | - | - | 74 | -26.53 | - | - | 217 | 119 | V |
| | * 4.741 | 33.36 | ADR | 33.9 | -31.9 | .13 | 35.49 | 54 | -18.51 | - | - | - | - | 217 | 119 | V |
| 3 | * 9.046 | 40.02 | PK-U | 36.2 | -28.2 | 0 | 48.02 | - | - | 74 | -25.98 | - | - | 147 | 233 | H |
| | * 9.045 | 27.62 | ADR | 36.2 | -28.2 | .13 | 35.75 | 54 | -18.25 | - | - | - | - | 147 | 233 | H |
| 4 | * 13.291 | 37.76 | PK-U | 39.6 | -24.6 | 0 | 52.76 | - | - | 74 | -21.24 | - | - | 119 | 245 | H |
| | * 13.291 | 26.4 | ADR | 39.6 | -24.6 | .13 | 41.53 | 54 | -12.47 | - | - | - | - | 119 | 245 | H |
| 5 | * 16.001 | 38.57 | PK-U | 40.4 | -24.7 | 0 | 54.27 | - | - | 74 | -19.73 | - | - | 172 | 112 | H |
| | * 16 | 26.88 | ADR | 40.4 | -24.8 | .13 | 42.61 | 54 | -11.39 | - | - | - | - | 172 | 112 | H |
| 6 | 15.014 | 37.92 | PK-U | 39.7 | -26.2 | 0 | 51.42 | - | - | - | - | 68.2 | -16.78 | 125 | 237 | V |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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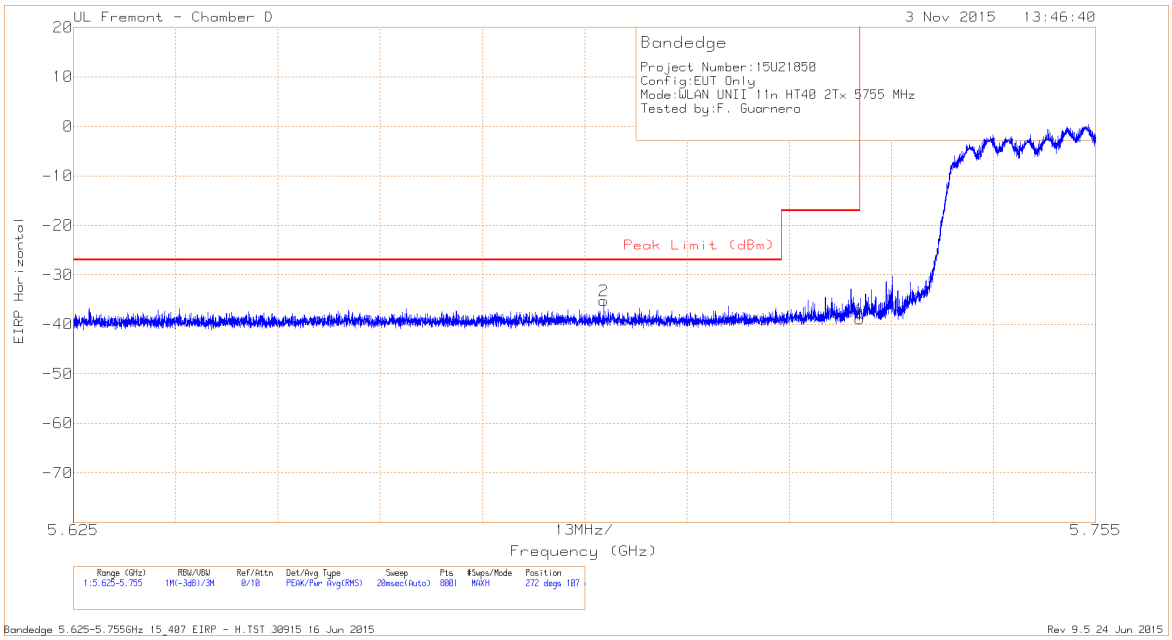
## 9.5. 802.11n HT40 2Tx CDD MODE IN THE 5.8 GHz BAND

**RESTRICTED BANDEDGE (LOW CHANNEL)**

LOW CHANNEL HORIZONTAL PLOT




**DATA**

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T344 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 5.692 | -64.19 | Pk | 34.5 | -17.3 | 11.8 | -35.19 | -27 | -8.19 | 272 | 107 | H |
| 1 | 5.725 | -67.74 | Pk | 34.6 | -17.6 | 11.8 | -38.94 | -17 | -21.94 | 272 | 107 | H |

Pk - Peak detector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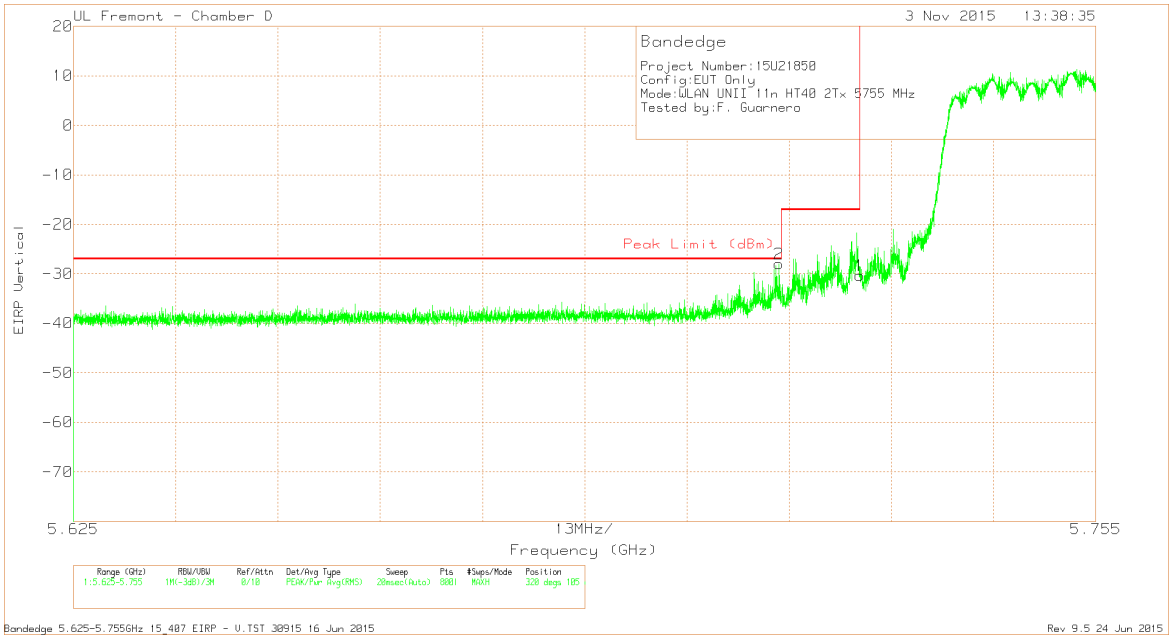
LOW CHANNEL VERTICAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T344 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 5.715 | -56.87 | Pk | 34.6 | -17.5 | 11.8 | -27.97 | -27 | -.97 | 320 | 105 | V |
| 1 | 5.725 | -59.15 | Pk | 34.6 | -17.6 | 11.8 | -30.35 | -17 | -13.35 | 320 | 105 | V |

Pk - Peak detector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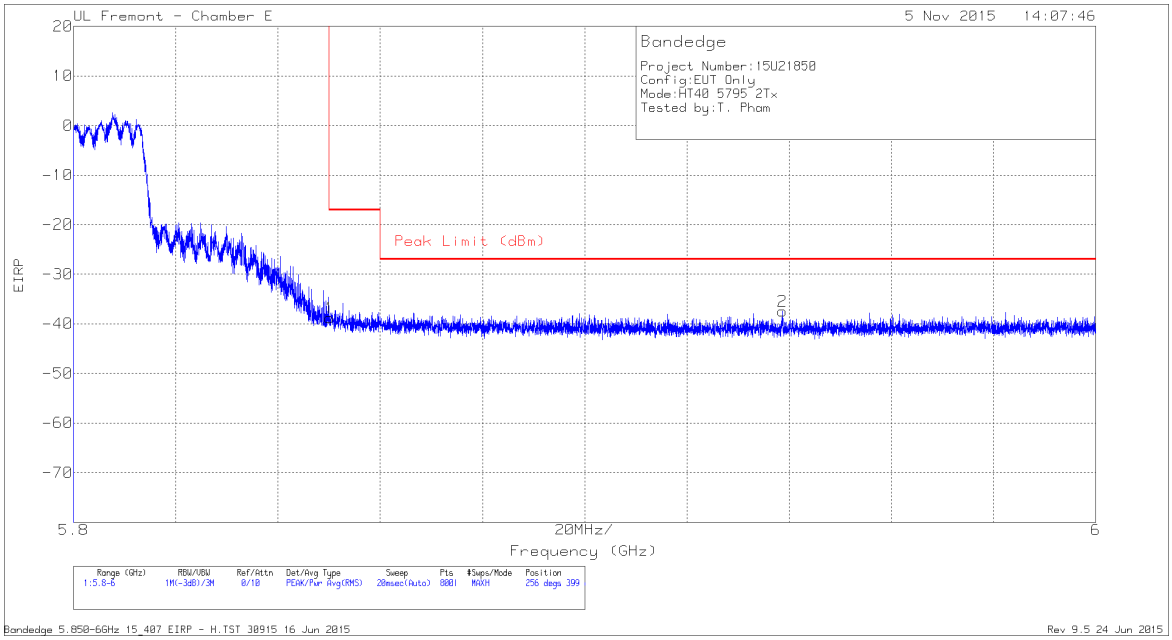
## RESTRICTED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL HORIZONTAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T346 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.85 | -65.14 | Pk | 34.9 | -20.3 | 11.8 | -38.74 | -17 | -21.74 | 256 | 399 | H |
| 2 | 5.939 | -63.97 | Pk | 35 | -20.3 | 11.8 | -37.47 | -27 | -10.47 | 256 | 399 | H |

Pk - Peak detector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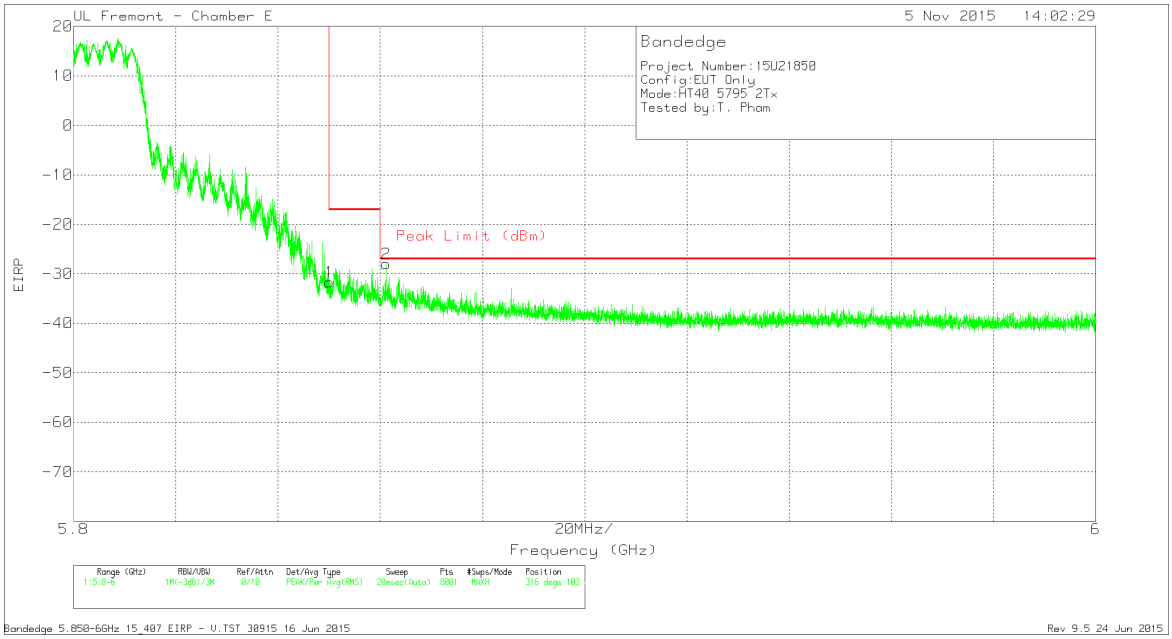
HIGH CHANNEL VERTICAL PLOT




## DATA

| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | AF T346 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.85 | -58.04 | Pk | 34.9 | -20.3 | 11.8 | -31.64 | -17 | -14.64 | 316 | 103 | V |
| 2 | 5.861 | -54.25 | Pk | 34.9 | -20.4 | 11.8 | -27.95 | -27 | -.95 | 316 | 103 | V |

Pk - Peak detector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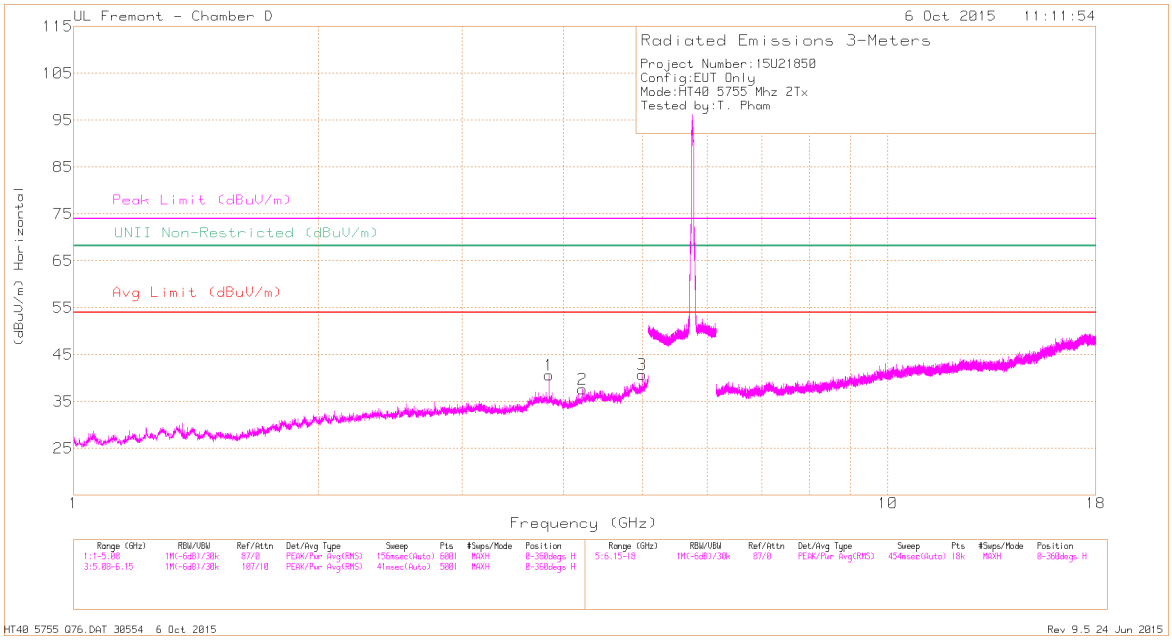
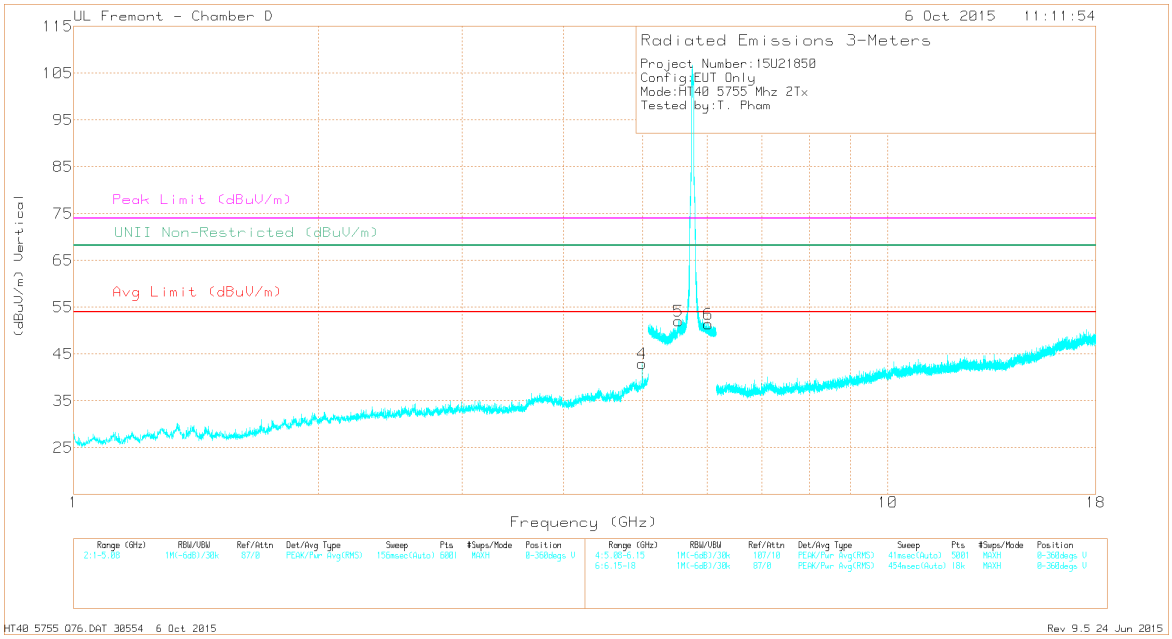
**LOW CHANNEL HARMONICS AND SPURIOUS EMISSIONS**

LOW CHANNEL HORIZONTAL PLOT




LOW CHANNEL VERTICAL PLOT





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**DATA**

| Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (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) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * 3.837 | 41.88 | PK-U | 33.4 | -28.8 | 0 | 46.48 | - | - | 74 | -27.52 | - | - | 349 | 124 | H |
| * 3.837 | 33.73 | ADR | 33.4 | -28.8 | .12 | 38.45 | 54 | -15.55 | - | - | - | - | 349 | 124 | H |
| * 4.219 | 38.97 | PK-U | 33.5 | -27.8 | 0 | 44.67 | - | - | 74 | -29.33 | - | - | 305 | 114 | H |
| * 4.218 | 26.41 | ADR | 33.5 | -27.9 | .12 | 32.13 | 54 | -21.87 | - | - | - | - | 305 | 114 | H |
| * 4.988 | 39.82 | PK-U | 34.2 | -26.9 | 0 | 47.12 | - | - | 74 | -26.88 | - | - | 321 | 129 | H |
| * 4.988 | 28.95 | ADR | 34.2 | -26.9 | .12 | 36.37 | 54 | -17.63 | - | - | - | - | 321 | 129 | H |
| * 4.987 | 43.07 | PK-U | 34.2 | -26.9 | 0 | 50.37 | - | - | 74 | -23.63 | - | - | 319 | 135 | V |
| * 4.988 | 33.56 | ADR | 34.2 | -26.9 | .12 | 40.98 | 54 | -13.02 | - | - | - | - | 319 | 135 | V |
| 5.533 | 42.63 | PK-U | 34.4 | -18 | 0 | 59.03 | - | - | - | - | 68.2 | -9.17 | 289 | 153 | V |
| 5.534 | 30.93 | ADR | 34.4 | -18 | .12 | 47.45 | - | - | - | - | - | - | 289 | 153 | V |
| 6.017 | 30.04 | ADR | 35.5 | -17.8 | .12 | 47.86 | - | - | - | - | - | - | 295 | 171 | V |
| 6.018 | 42.15 | PK-U | 35.5 | -17.8 | 0 | 59.85 | - | - | - | - | 68.2 | -8.35 | 295 | 171 | V |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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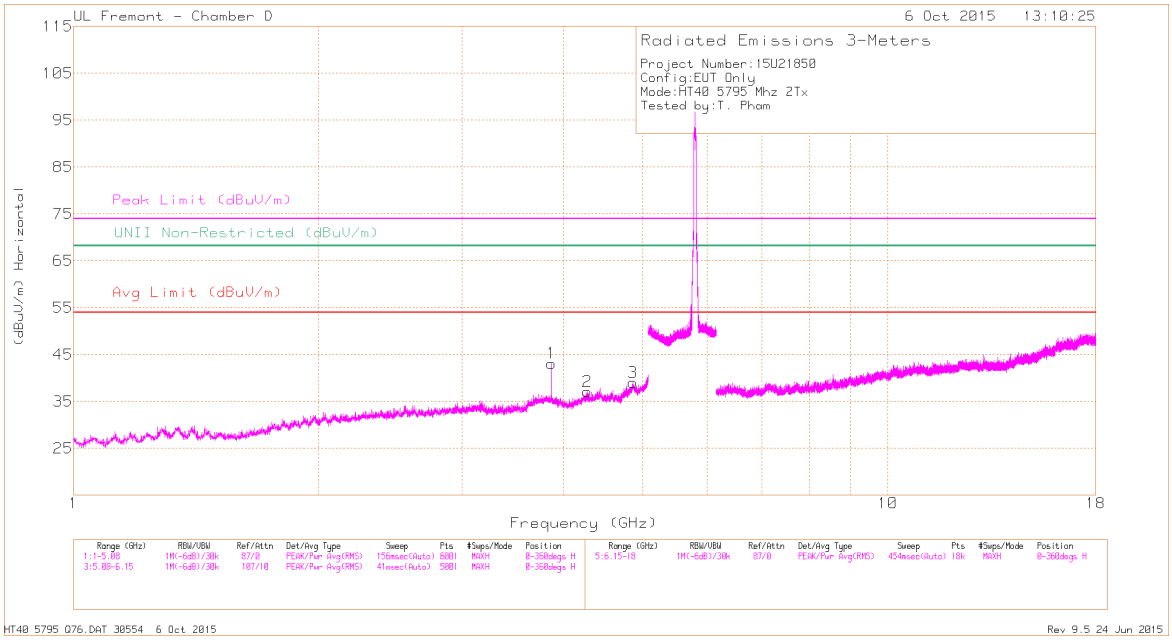
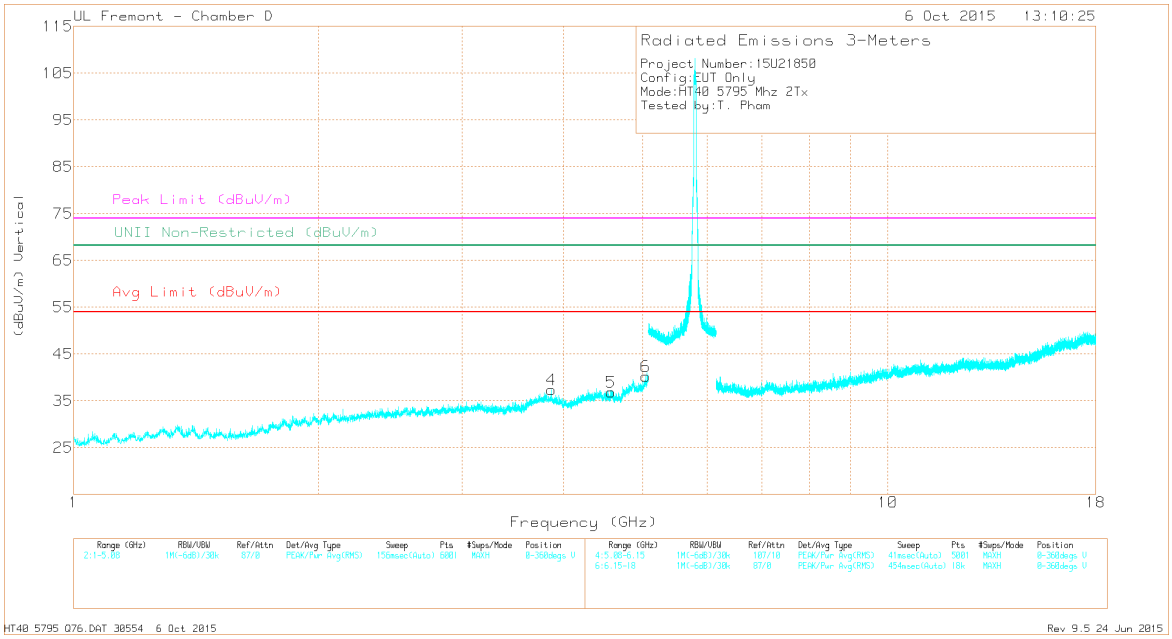
## HIGH CHANNEL HARMONICS AND SPURIOUS EMISSIONS

HIGH CHANNEL HORIZONTAL PLOT




HIGH CHANNEL VERTICAL PLOT





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**DATA**

| Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (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) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| * 3.863 | 43.22 | PK-U | 33.4 | -29 | 0 | 47.62 | - | - | 74 | -26.38 | - | - | 345 | 105 | H |
| * 3.863 | 35.84 | ADR | 33.4 | -29 | .12 | 40.36 | 54 | -13.64 | - | - | - | - | 345 | 105 | H |
| * 4.271 | 38.81 | PK-U | 33.5 | -27.8 | 0 | 44.51 | - | - | 74 | -29.49 | - | - | 0 | 131 | H |
| * 4.272 | 26.51 | ADR | 33.5 | -27.9 | .12 | 32.23 | 54 | -21.77 | - | - | - | - | 0 | 131 | H |
| * 4.862 | 37.71 | PK-U | 34.1 | -25.4 | 0 | 46.41 | - | - | 74 | -27.59 | - | - | 34 | 143 | H |
| * 4.861 | 25.83 | ADR | 34.1 | -25.4 | .12 | 34.65 | 54 | -19.35 | - | - | - | - | 34 | 143 | H |
| * 3.864 | 40.52 | PK-U | 33.4 | -29 | 0 | 44.92 | - | - | 74 | -29.08 | - | - | 86 | 158 | V |
| * 3.863 | 29.28 | ADR | 33.4 | -29 | .12 | 33.80 | 54 | -20.20 | - | - | - | - | 86 | 158 | V |
| * 4.575 | 38.52 | PK-U | 34.1 | -27.3 | 0 | 45.32 | - | - | 74 | -28.68 | - | - | 119 | 194 | V |
| * 4.575 | 26.92 | ADR | 34.1 | -27.3 | .12 | 33.84 | 54 | -20.16 | - | - | - | - | 119 | 194 | V |
| * 5.043 | 38.49 | PK-U | 34.3 | -25.6 | 0 | 47.19 | - | - | 74 | -26.81 | - | - | 109 | 173 | V |
| * 5.043 | 26.46 | ADR | 34.3 | -25.6 | .12 | 35.28 | 54 | -18.72 | - | - | - | - | 109 | 173 | V |

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average


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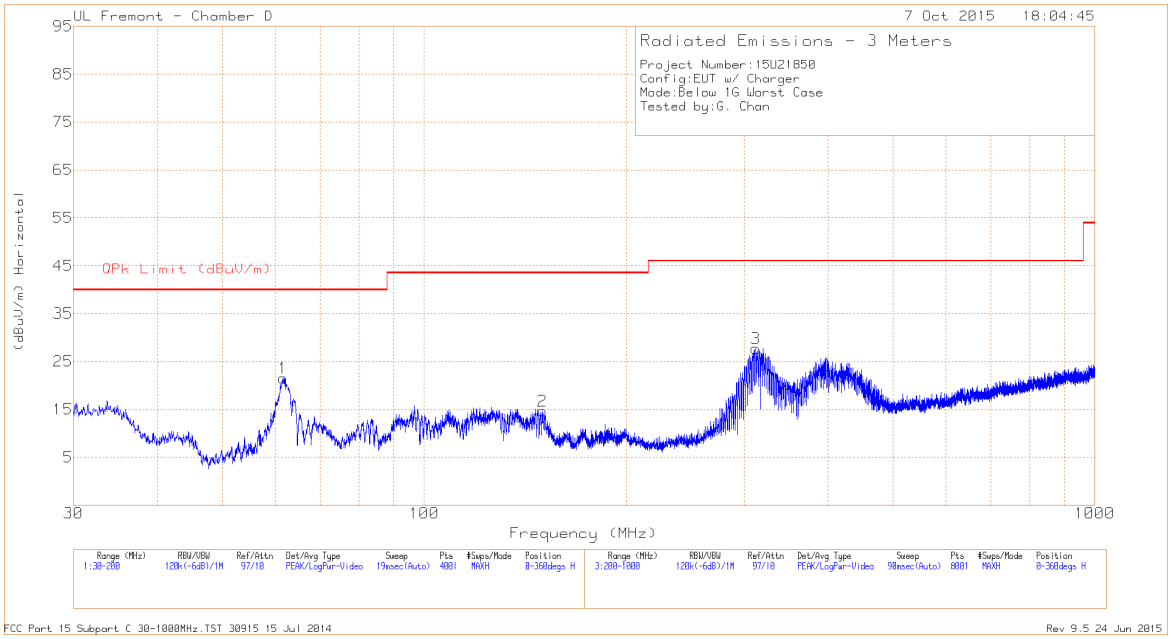
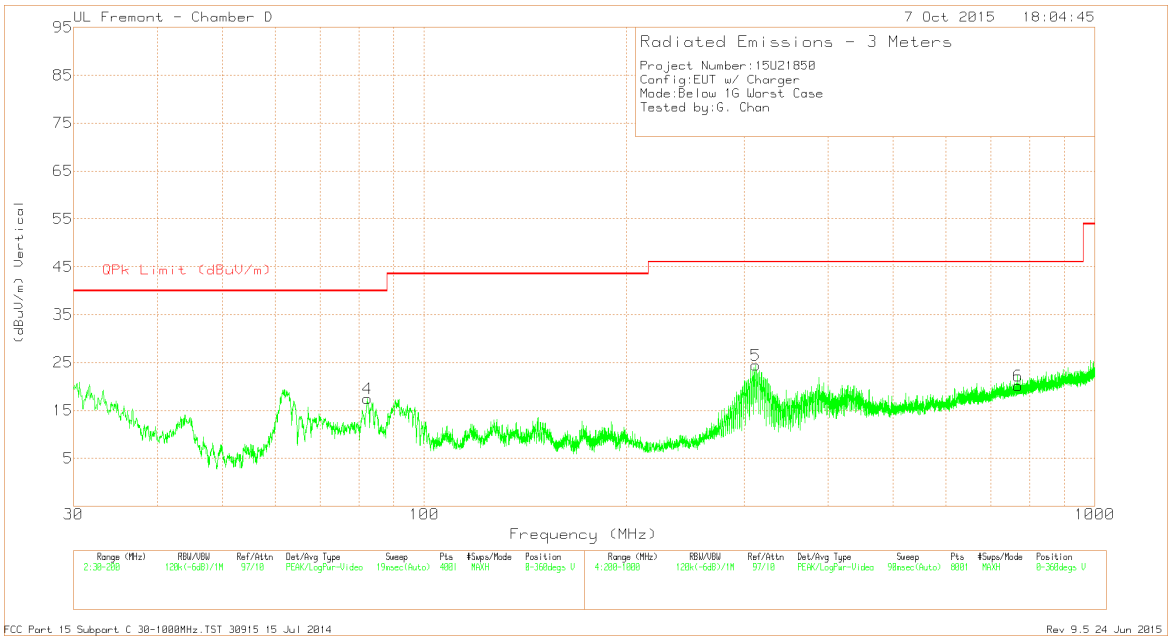
## 9.6. WORST-CASE BELOW 1 GHz

**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL & VERTICAL)**

HORIZONTAL PLOT




VERTICAL PLOT





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## HORIZONTAL AND VERTICAL DATA

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AF T407 (dB/m) | Amp/Cbl (dB) | Corrected Reading (dBuV/m) | QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 61.535 | 45.63 | Pk | 7.6 | -31.7 | 21.53 | 40 | -18.47 | 0-360 | 401 | H |
| 4 | 82.3175 | 41.45 | Pk | 7.5 | -31.5 | 17.45 | 40 | -22.55 | 0-360 | 100 | V |
| 2 | 150.19 | 33.64 | Pk | 12.2 | -31.1 | 14.74 | 43.52 | -28.78 | 0-360 | 301 | H |
| 3 | 312.1 | 44.64 | Pk | 13.5 | -30.4 | 27.74 | 46.02 | -18.28 | 0-360 | 100 | H |
| 5 | 312.3 | 41.38 | Pk | 13.5 | -30.4 | 24.48 | 46.02 | -21.54 | 0-360 | 100 | V |
| 6 | 768.4 | 28.56 | Pk | 20.7 | -29.1 | 20.16 | 46.02 | -25.86 | 0-360 | 201 | V |

Pk - Peak detector


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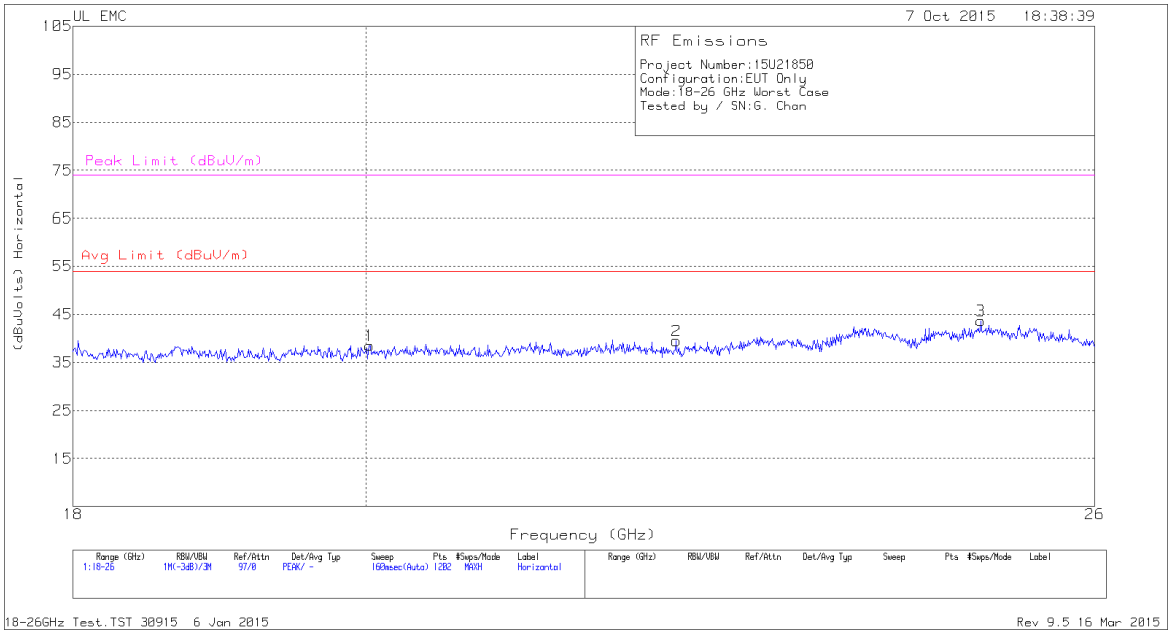
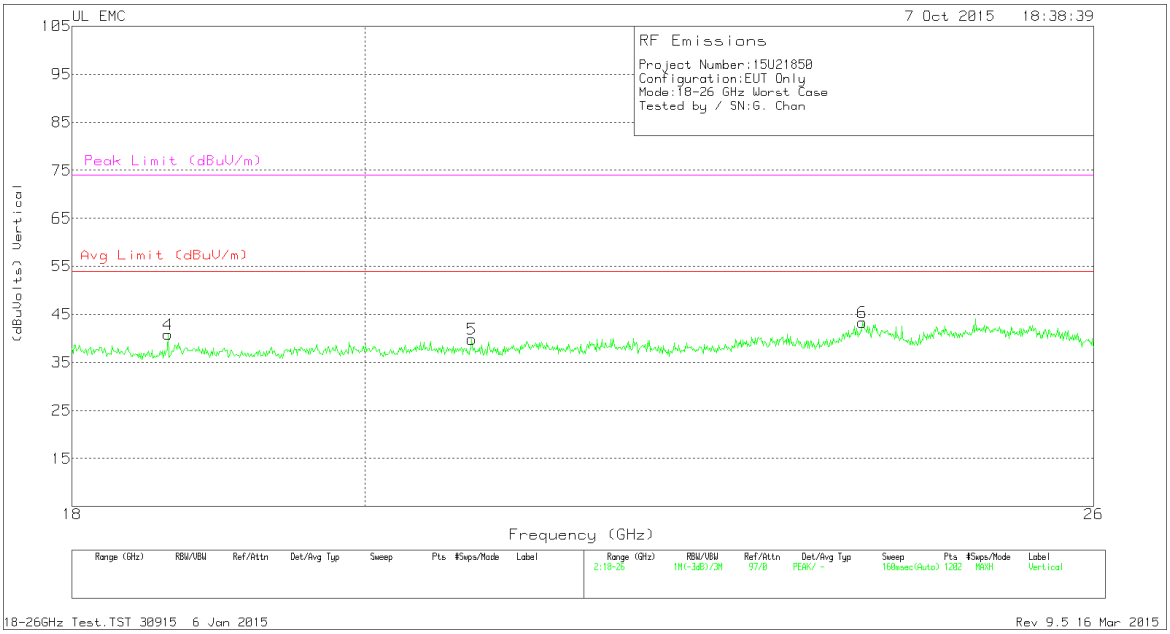
## 9.7. WORST-CASE ABOVE 18 GHz

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

HORIZONTAL PLOT




VERTICAL PLOT





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## HORIZONTAL AND VERTICAL 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 | 20.028 | 40.2 | Pk | 33 | -25.2 | -9.5 | 38.5 | 54 | -15.5 | 74 | -35.5 |
| 2 | 22.363 | 40.7 | Pk | 33 | -24.7 | -9.5 | 39.5 | 54 | -14.5 | 74 | -34.5 |
| 3 | 24.954 | 43.47 | Pk | 34.1 | -24.4 | -9.5 | 43.67 | 54 | -10.33 | 74 | -30.33 |
| 4 | 18.633 | 42.63 | Pk | 32.5 | -24.8 | -9.5 | 40.83 | 54 | -13.17 | 74 | -33.17 |
| 5 | 20.784 | 41.43 | Pk | 32.7 | -24.8 | -9.5 | 39.83 | 54 | -14.17 | 74 | -34.17 |
| 6 | 23.922 | 43.33 | Pk | 33.4 | -23.9 | -9.5 | 43.33 | 54 | -10.67 | 74 | -30.67 |

Pk - Peak detector


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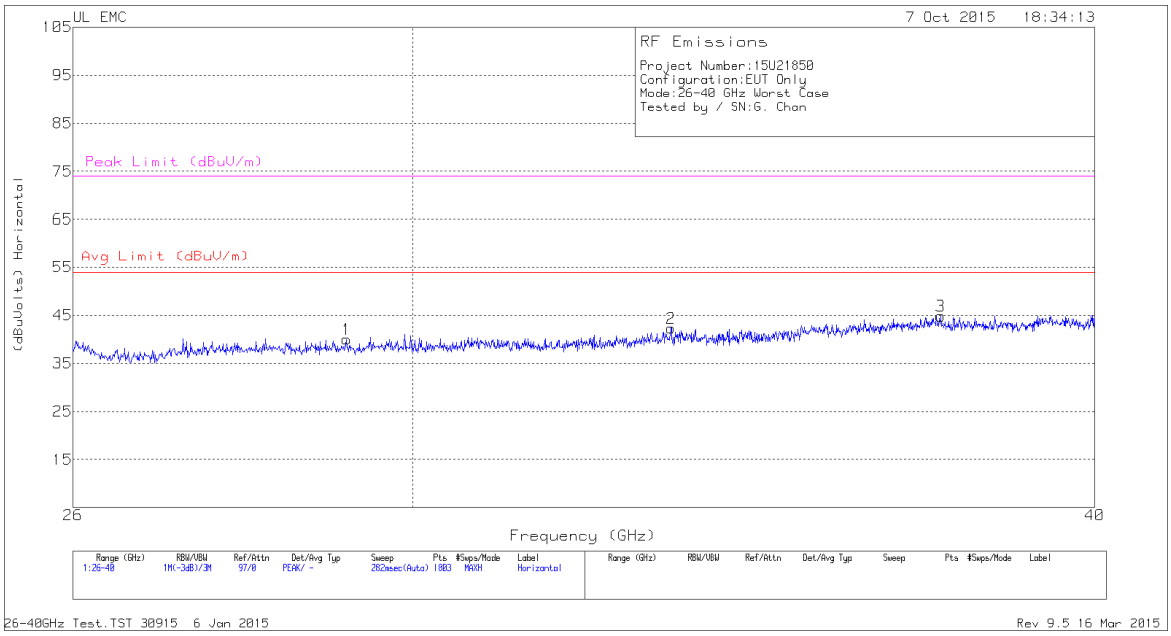
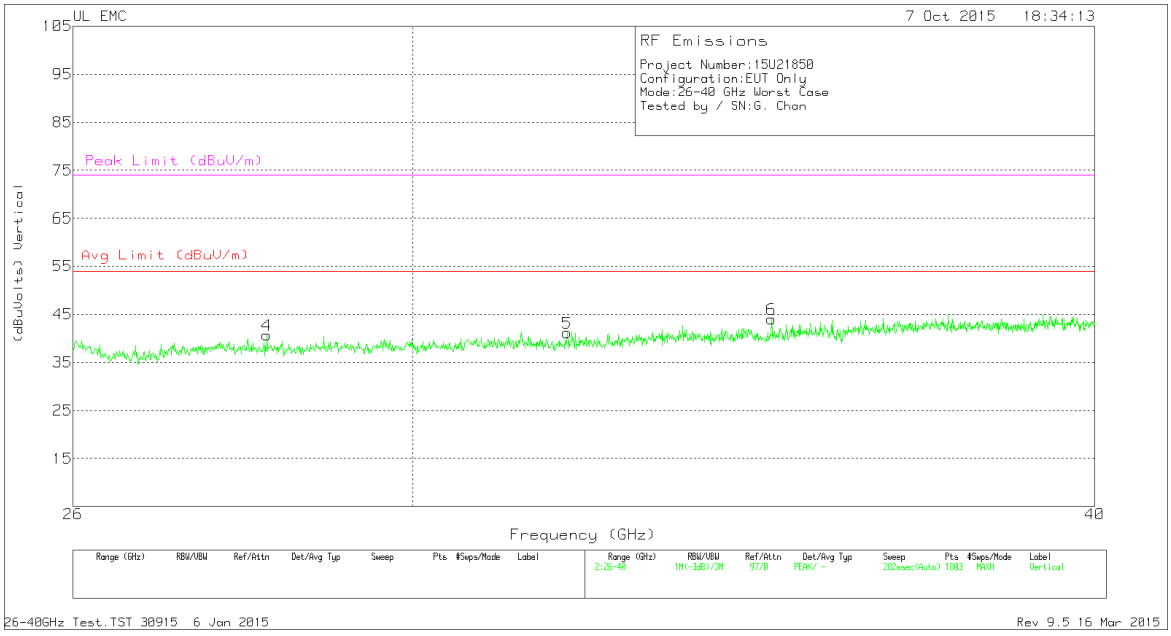
**SPURIOUS EMISSIONS 26000 TO 40000 MHz (WORST-CASE CONFIGURATION)**

HORIZONTAL PLOT




VERTICAL PLOT





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## HORIZONTAL AND VERTICAL DATA

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | T90 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 | 29.178 | 45.8 | Pk | 35.9 | -32.2 | -9.5 | 40 | 54 | -14 | 74 | -34 |
| 2 | 33.454 | 47.53 | Pk | 37.1 | -32.8 | -9.5 | 42.33 | 54 | -11.67 | 74 | -31.67 |
| 3 | 37.483 | 50.03 | Pk | 37.3 | -33 | -9.5 | 44.83 | 54 | -9.17 | 74 | -29.17 |
| 4 | 28.214 | 46.07 | Pk | 35.9 | -31.8 | -9.5 | 40.67 | 54 | -13.33 | 74 | -33.33 |
| 5 | 32.021 | 47.27 | Pk | 36.2 | -32.8 | -9.5 | 41.17 | 54 | -12.83 | 74 | -32.83 |
| 6 | 34.903 | 49.5 | Pk | 37.2 | -33.2 | -9.5 | 44 | 54 | -10 | 74 | -30 |

Pk - Peak detector


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# 10. AC POWER LINE CONDUCTED EMISSIONS

**LIMITS**

FCC §15.207 (a)

| 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 C63.10.

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**


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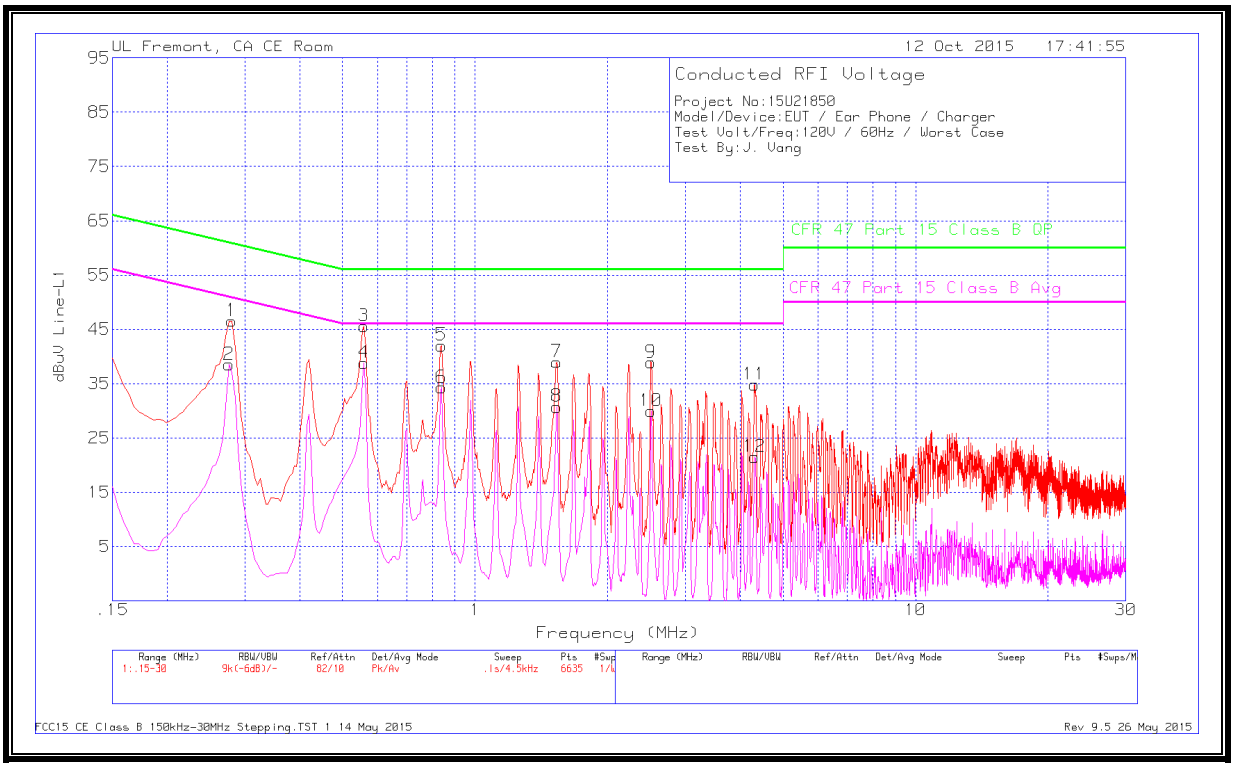
## 10.1. EUT POWERED BY AC ADAPTER

**LINE 1 RESULTS**




**WORST EMISSIONS**

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | T24 IL L1 | LC Cables 1&3 | Corrected Reading dBuV | CFR 47 Part 15 Class B QP | Margin (dB) | CFR 47 Part 15 Class B Avg | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .2805 | 45.95 | Pk | .6 | 0 | 46.55 | 60.8 | -14.25 | - | - |
| 2 | .276 | 37.92 | Av | .6 | 0 | 38.52 | - | - | 50.94 | -12.42 |
| 3 | .5595 | 45.31 | Pk | .3 | 0 | 45.61 | 56 | -10.39 | - | - |
| 4 | .5595 | 38.52 | Av | .3 | 0 | 38.82 | - | - | 46 | -7.18 |
| 5 | .8385 | 41.74 | Pk | .3 | 0 | 42.04 | 56 | -13.96 | - | - |
| 6 | .8385 | 33.98 | Av | .3 | 0 | 34.28 | - | - | 46 | -11.72 |
| 7 | 1.5315 | 38.68 | Pk | .2 | .1 | 38.98 | 56 | -17.02 | - | - |
| 8 | 1.5315 | 30.48 | Av | .2 | .1 | 30.78 | - | - | 46 | -15.22 |
| 9 | 2.508 | 38.6 | Pk | .2 | .1 | 38.9 | 56 | -17.1 | - | - |
| 10 | 2.508 | 29.68 | Av | .2 | .1 | 29.98 | - | - | 46 | -16.02 |
| 11 | 4.308 | 34.54 | Pk | .2 | .1 | 34.84 | 56 | -21.16 | - | - |
| 12 | 4.308 | 21.24 | Av | .2 | .1 | 21.54 | - | - | 46 | -24.46 |

Pk - Peak detector

Av - Average detection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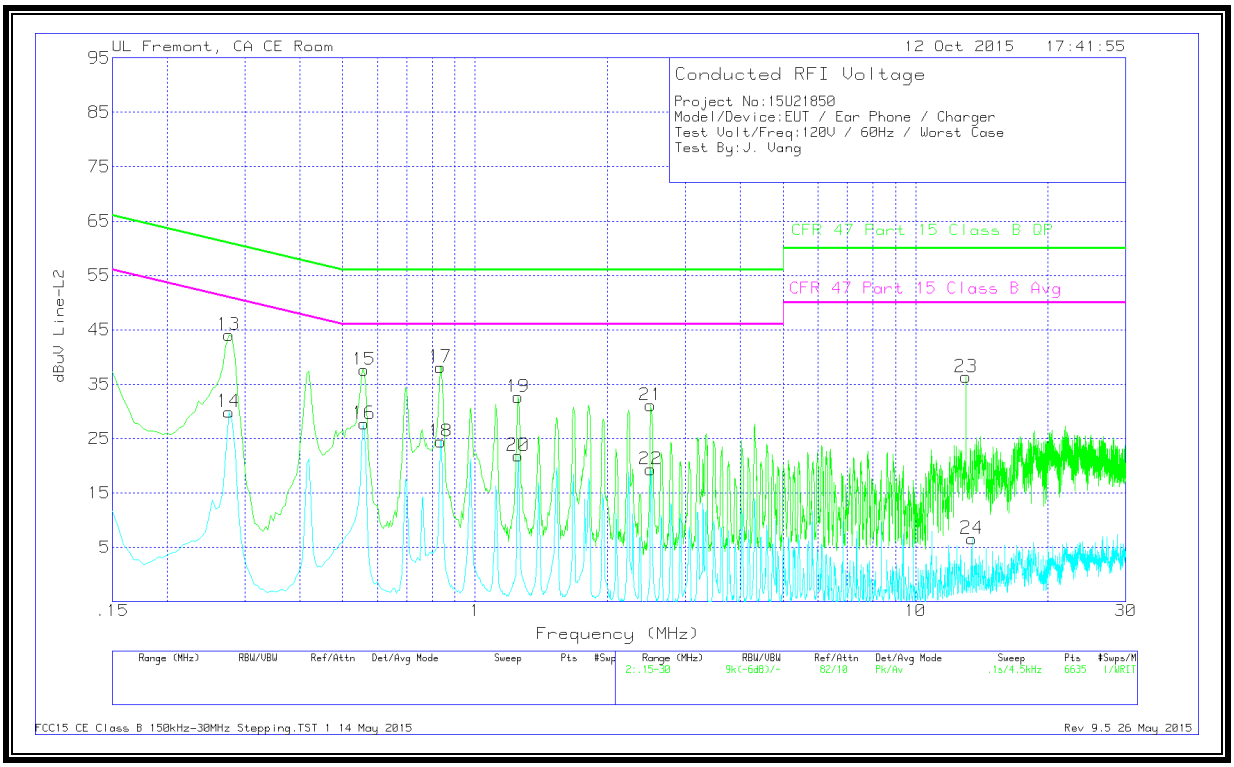
**LINE 2 RESULTS**




**WORST EMISSIONS**

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | T24 IL L2 | LC Cables 2&3 | Corrected Reading dBuV | CFR 47 Part 15 Class B QP | Margin (dB) | CFR 47 Part 15 Class B Avg | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 13 | .276 | 43.38 | Pk | .7 | 0 | 44.08 | 60.94 | -16.86 | - | - |
| 14 | .276 | 29.19 | Av | .7 | 0 | 29.89 | - | - | 50.94 | -21.05 |
| 15 | .5595 | 37.36 | Pk | .3 | 0 | 37.66 | 56 | -18.34 | - | - |
| 16 | .5595 | 27.44 | Av | .3 | 0 | 27.74 | - | - | 46 | -18.26 |
| 17 | .834 | 37.81 | Pk | .3 | 0 | 38.11 | 56 | -17.89 | - | - |
| 18 | .83625 | 24.15 | Av | .3 | 0 | 24.45 | - | - | 46 | -21.55 |
| 19 | 1.2525 | 32.47 | Pk | .2 | 0 | 32.67 | 56 | -23.33 | - | - |
| 20 | 1.2525 | 21.64 | Av | .2 | 0 | 21.84 | - | - | 46 | -24.16 |
| 21 | 2.5035 | 30.81 | Pk | .2 | .1 | 31.11 | 56 | -24.89 | - | - |
| 22 | 2.5035 | 19.06 | Av | .2 | .1 | 19.36 | - | - | 46 | -26.64 |
| 23 | 13.0155 | 35.94 | Pk | .2 | .2 | 36.34 | 60 | -23.66 | - | - |
| 24 | 13.4205 | 6.18 | Av | .2 | .2 | 6.58 | - | - | 50 | -43.42 |

Pk - Peak detector

Av - Average detection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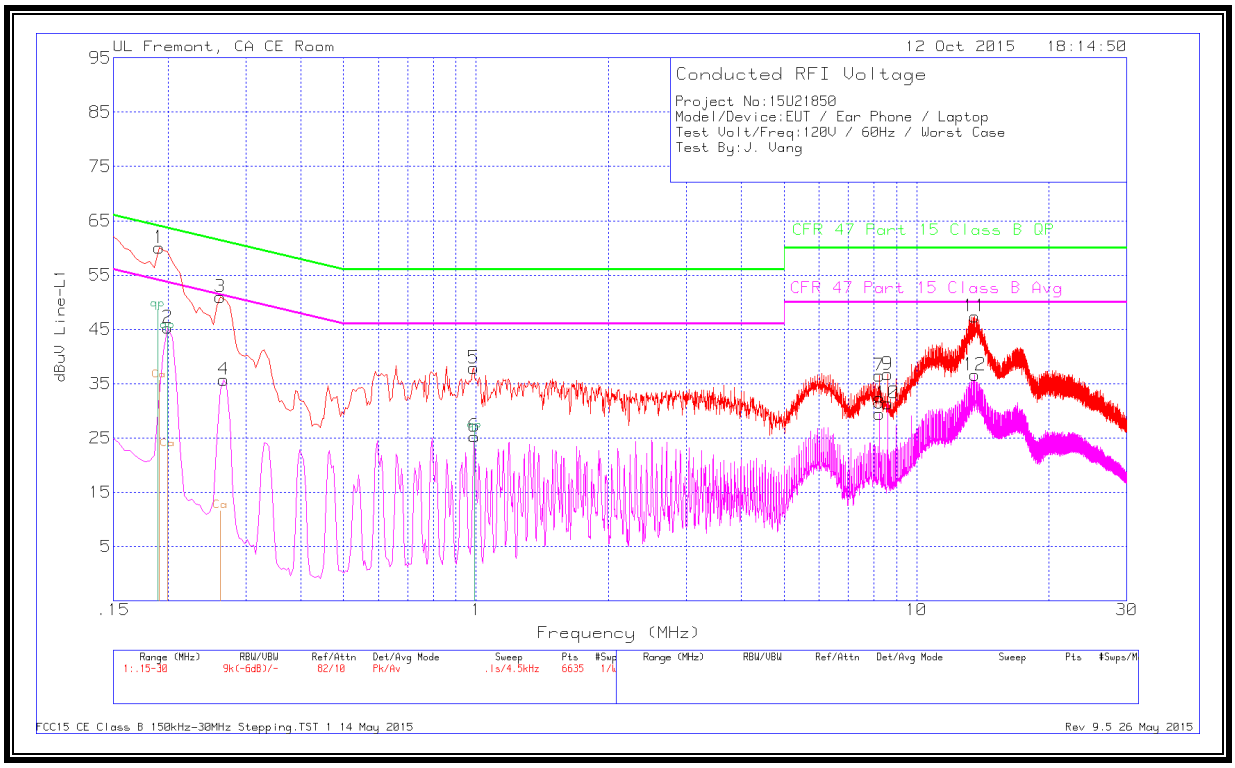
## 10.2. EUT POWERED BY HOST PC VIA USB CABLE

**LINE 1 RESULTS**




**WORST EMISSIONS**

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | T24 IL L1 | LC Cables 1&3 | Corrected Reading dBuV | CFR 47 Part 15 Class B QP | Margin (dB) | CFR 47 Part 15 Class B Avg | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .1905 | 59.02 | Pk | 1 | 0 | 60.02 | 64.01 | -3.99 | - | - |
| | .18938 | 47.7 | Qp | 1 | 0 | 48.7 | 64.06 | -15.36 | | |
| 2 | .1995 | 44.37 | Av | .9 | 0 | 45.27 | - | - | 53.63 | -8.36 |
| 3 | .2625 | 50.26 | Pk | .7 | 0 | 50.96 | 61.35 | -10.39 | - | - |
| 4 | .267 | 35.13 | Av | .6 | 0 | 35.73 | - | - | 51.21 | -15.48 |
| 5 | .987 | 37.57 | Pk | .3 | 0 | 37.87 | 56 | -18.13 | - | - |
| 6 | .9915 | 24.98 | Av | .3 | 0 | 25.28 | - | - | 46 | -20.72 |
| 7 | 8.2275 | 36.18 | Pk | .2 | .1 | 36.48 | 60 | -23.52 | - | - |
| 8 | 8.2275 | 29.14 | Av | .2 | .1 | 29.44 | - | - | 50 | -20.56 |
| 9 | 8.601 | 36.41 | Pk | .2 | .1 | 36.71 | 60 | -23.29 | - | - |
| 10 | 8.601 | 31.09 | Av | .2 | .1 | 31.39 | - | - | 50 | -18.61 |
| 11 | 13.56 | 46.96 | Pk | .2 | .2 | 47.36 | 60 | -12.64 | - | - |
| 12 | 13.56 | 36.18 | Av | .2 | .2 | 36.58 | - | - | 50 | -13.42 |

Pk - Peak detector
Av - Average detection

Qp - Quasi-Peak detector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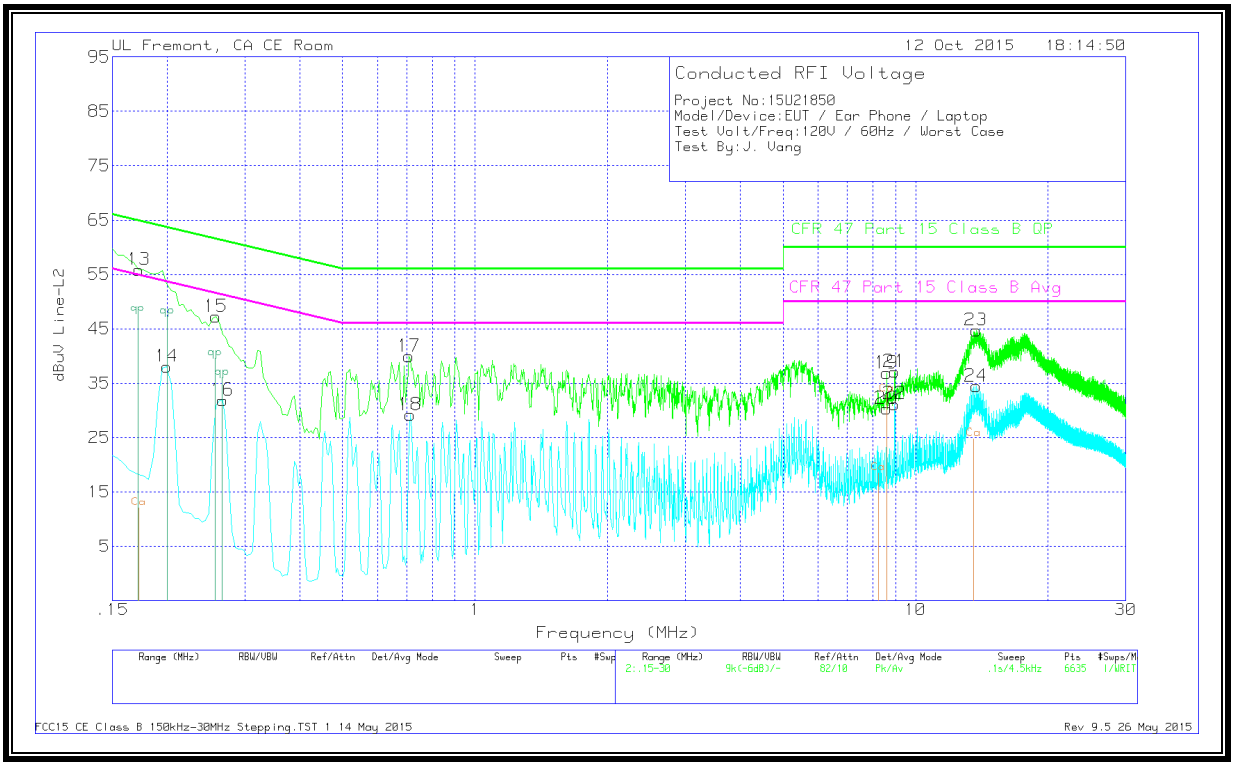
## LINE 2 RESULTS




## WORST EMISSIONS

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | T24 IL L2 | LC Cables 2&3 | Corrected Reading dBuV | CFR 47 Part 15 Class B QP | Margin (dB) | CFR 47 Part 15 Class B Avg | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 13 | .1725 | 54.65 | Pk | 1.2 | 0 | 55.85 | 64.84 | -8.99 | - | - |
| 14 | .1995 | 37.01 | Av | 1 | 0 | 38.01 | - | - | 53.63 | -15.62 |
| 15 | .258 | 46.51 | Pk | .7 | 0 | 47.21 | 61.5 | -14.29 | - | - |
| 16 | .267 | 31.14 | Av | .7 | 0 | 31.84 | - | - | 51.21 | -19.37 |
| 17 | .708 | 39.62 | Pk | .3 | 0 | 39.92 | 56 | -16.08 | - | - |
| 18 | .7125 | 28.87 | Av | .3 | 0 | 29.17 | - | - | 46 | -16.83 |
| 19 | 8.5965 | 36.55 | Pk | .2 | .1 | 36.85 | 60 | -23.15 | - | - |
| 20 | 8.592 | 30 | Av | .2 | .1 | 30.3 | - | - | 50 | -19.7 |
| 21 | 8.97 | 36.79 | Pk | .2 | .1 | 37.09 | 60 | -22.91 | - | - |
| 22 | 8.9655 | 30.86 | Av | .2 | .1 | 31.16 | - | - | 50 | -18.84 |
| 23 | 13.7265 | 44.3 | Pk | .2 | .2 | 44.7 | 60 | -15.3 | - | - |
| 24 | 13.7265 | 34.02 | Av | .2 | .2 | 34.42 | - | - | 50 | -15.58 |

Pk - Peak detector
Av - Average detection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