



# **CERTIFICATION TEST REPORT**

**Report Number. :** 12726913-E5V2

**Applicant :** Samsung Electronics Co., Ltd.  
129 Samsung-Ro, Yeongtong-Gu,  
Suwon-Si, Gyeonggi-Do, 16677, Korea

**Model :** SM-A705GM/DS

**FCC ID :** A3LSMA705GM

**EUT Description :** GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, ANT+,  
NFC and MST

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART E (EXCEPT DFS)

**Date Of Issue:**

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NVLAP Lab code: 200065-0

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## REPORT REVISION HISTORY

| Rev. | Issue Date | Revisions                    | Revised By |
|------|------------|------------------------------|------------|
| V1   | 3/29/2019  | Initial Issue                |            |
| V2   | 4/04/2019  | Added MST in EUT Description | K. Kedida  |

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Samsung Electronics Co., Ltd.  
129 Samsung-Ro, Yeongtong-Gu,  
Suwon-Si, Gyeonggi-Do, 16677, Korea

**EUT DESCRIPTION:** GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac,  
ANT+, NFC and MST

**MODEL:** SM-A705GM/DS

**SERIAL NUMBER:** Radiated (Original): R38M10NPF1Y, R38M10CSH8Z  
Conducted (Original): R38M10CT1JE  
Radiated (Spot Check): R38M208LZKY, R38M208LZMN

**DATE TESTED:** February 19 to March 08, 2019 (Original)  
March 13, 2019 (Spot Check)

| APPLICABLE STANDARDS                  |              |
|---------------------------------------|--------------|
| STANDARD                              | TEST RESULTS |
| CFR 47 Part 15 Subpart E (EXCEPT DFS) | Complies     |

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

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 the U.S. government.

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## 2. INTRODUCTION OF TEST DATA REUSE

### 2.1. INTRODUCTION

According to the manufacturer, FCC ID: A3LSMA705FN and FCC ID: A3LSMA705GM non-licensed and licensed radios are electrically identical. The FCC ID: A3LSMA705FN test data shall remain representative of FCC ID: A3LSMA705GM.

The applicant takes full responsibility that the test data as referenced in this section represents compliance for this FCC ID.

### 2.2. DIFFERENCES

The FCC ID: A3LSMA705FN, shares the same enclosure and circuit board as FCC ID: A3LSMA705GM. The UNII WLAN antennas and surrounding circuitry and layout are identical between two models.

After confirming through preliminary radiated emissions that the performance of the FCC ID: A3LSMA705FN remains representative of FCC ID: A3LSMA705GM. The test data of FCC ID: A3LSMA705FN being submitted for this application to cover UNII WLAN features.

### 2.3. SPOT CHECK VERIFICATION RESULTS SUMMARY

Spot check verification has been done on device A3LSMA705GM for radiated harmonic spurious and radiated band-edge. The data from the application has been verified through appropriate spot checks to demonstrate compliance for this device in accordance to FCC public KDB 484596 D01 as shown in the summary below.

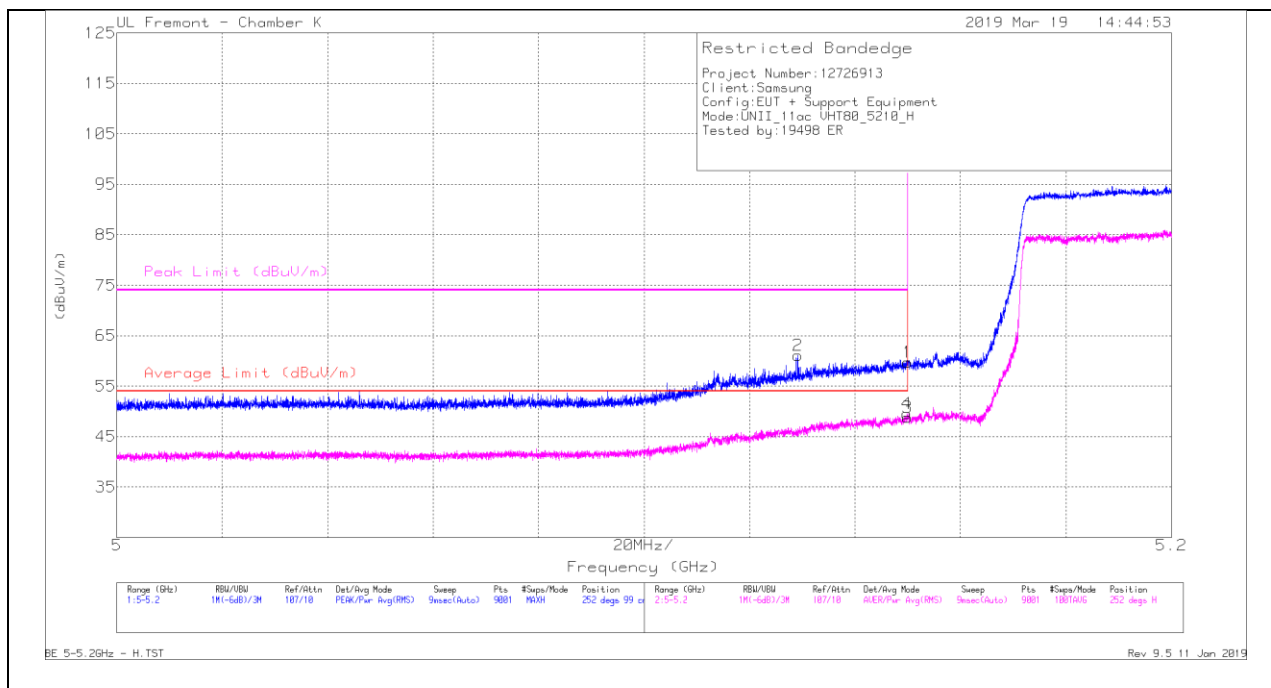
| A3LSMA705GM SPOT CHECK RESULTS |            |           |         |           |                |       |                  |       |            |       |
|--------------------------------|------------|-----------|---------|-----------|----------------|-------|------------------|-------|------------|-------|
| Technology                     | Mode       | Test Item | Channel | Measured  | Original model |       | Spot check model |       | Delta (dB) |       |
|                                |            |           |         |           | SM-A705FN/DS   |       | SM-A705GM/DS     |       |            |       |
|                                |            |           |         |           | A3LSMA705FN    |       | A3LSMA705GM      |       |            |       |
|                                |            |           |         | Frequency | Peak           | Ave   | Peak             | Ave   | Peak       | Ave   |
| DTS                            | 11ac VHT80 | RBE       | 42      | 5149 MHz  | 62.84          | 51.89 | 61.13            | 49.51 | -1.71      | -2.38 |
|                                | 11a        | RSE       | 165     | 5825MHz   | 54.42          | 46.85 | 52.27            | 44.6  | -2.15      | -2.25 |

Comparison of the models, upper deviation is within 3dB range and all tests are under FCC Technical Limits.

## SPOT CHECK DATA

### BANDEDGE (HIGH CHANNEL)

### HORIZONTAL RESULT



### Trace Markers

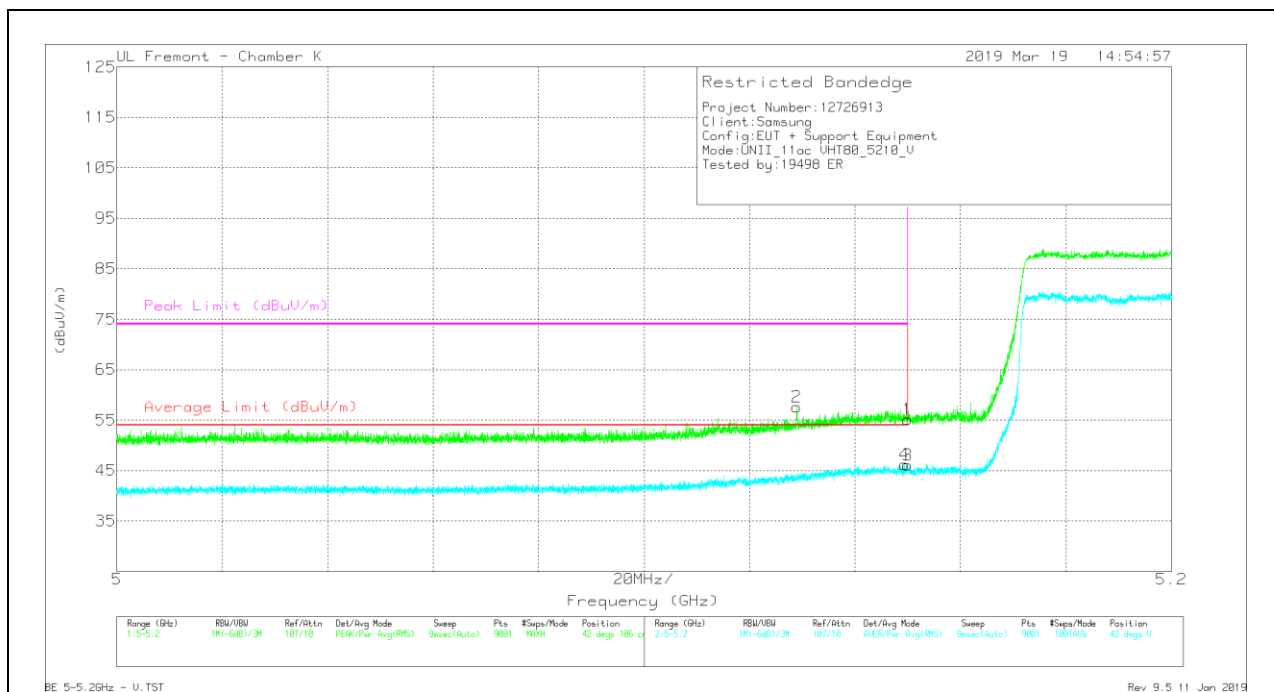
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AFT344 (dB/m) | Amp/CbI/Ftr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|---------------|----------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | *5.15           | 45.47                | Pk  | 34.4          | -20.1                | 0            | 59.77                      | -                      | -           | 74                  | -14.23         | 252            | 99          | H        |
| 2      | *5.129          | 46.93                | Pk  | 34.4          | -20.2                | 0            | 61.13                      | -                      | -           | 74                  | -12.87         | 252            | 99          | H        |
| 3      | *5.15           | 34.11                | RMS | 34.4          | -20.1                | .44          | 48.85                      | 54                     | -5.15       | -                   | -              | 252            | 99          | H        |
| 4      | *5.15           | 34.77                | RMS | 34.4          | -20.1                | .44          | 49.51                      | 54                     | -4.49       | -                   | -              | 252            | 99          | H        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

## VERTICAL RESULT



## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (dB/m) | Amp/Cb/Flr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|---------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 5.15          | 40.83                | Pk  | 34.4           | -20.1               | 0            | 55.13                      | -                      | -           | 74                  | -18.87         | 42             | 106         | V        |
| 2      | * 5.129         | 43.38                | Pk  | 34.4           | -20.2               | 0            | 57.58                      | -                      | -           | 74                  | -16.42         | 42             | 106         | V        |
| 3      | * 5.15          | 31.29                | RMS | 34.4           | -20.1               | .44          | 46.03                      | 54                     | -7.97       | -                   | -              | 42             | 106         | V        |
| 4      | * 5.149         | 31.44                | RMS | 34.4           | -20.1               | .44          | 46.18                      | 54                     | -7.82       | -                   | -              | 42             | 106         | V        |

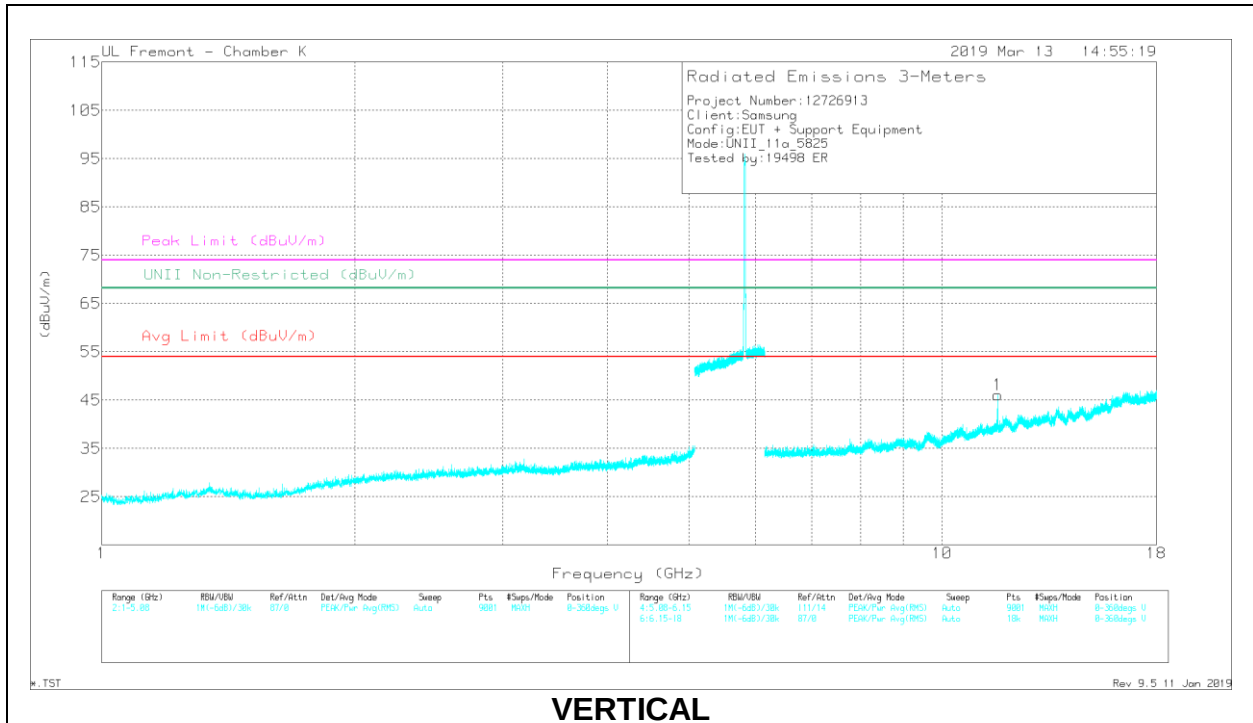
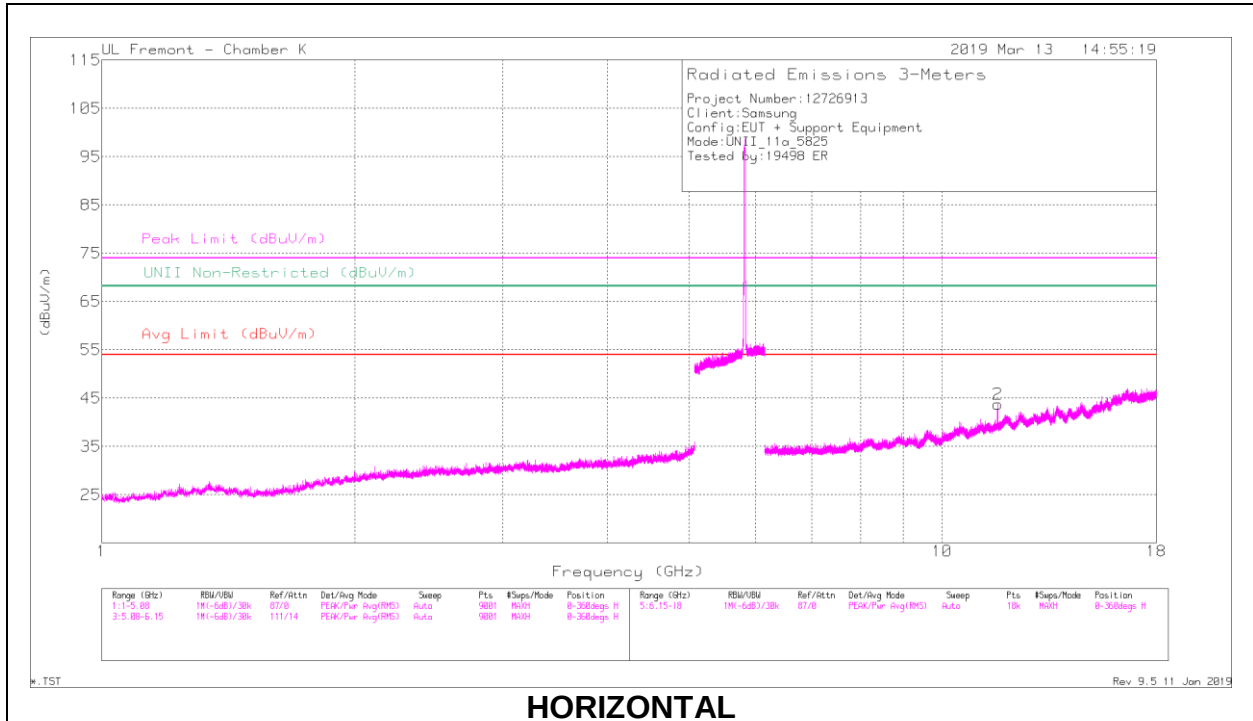
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

## HARMONICS AND SPURIOUS EMISSIONS

### HIGH CHANNEL RESULTS



## RADIATED EMISSIONS

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AF T344 (dB/m) | Amp/Cbl/Filt/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      | * 11.651        | 35.6                 | PK-U | 38.2           | -20.8                 | 0            | 53                         | -                  | -           | 74                  | -21            | -                            | -              | 11             | 119         | H        |
|        | * 11.65         | 25.17                | ADR  | 38.2           | -20.8                 | .09          | 42.66                      | 54                 | -11.34      | -                   | -              | -                            | -              | 11             | 119         | H        |
| 1      | * 11.65         | 34.87                | PK-U | 38.2           | -20.8                 | 0            | 52.27                      | -                  | -           | 74                  | -21.73         | -                            | -              | 285            | 117         | V        |
|        | * 11.65         | 27.11                | ADR  | 38.2           | -20.8                 | .09          | 44.6                       | 54                 | -9.4        | -                   | -              | -                            | -              | 285            | 117         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

## 2.4. REFERENCE DETAIL

Reference application that contains the reused reference data

| Equipment Class | Reference FCC ID | Type Grant/ Permissive Change | Reference Application | Folder Test/RF Exposure | Report Title/Section                |
|-----------------|------------------|-------------------------------|-----------------------|-------------------------|-------------------------------------|
| UNII            | A3LSMA705FN      | Grant                         | 12726900-E5           | Test                    | FCC Report UNII WLAN / All sections |

### 3. 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 905462 D02 v02/D03 v01r02/D06 v02, FCC KDB 789033 D02 v02r01, ANSI C63.10-2013, FCC 06-96.

### 4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, 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                              | 47658 Kato Rd                                                |
|--------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------------|
| <input checked="" type="checkbox"/> Chamber A (ISED:2324B-1) | <input type="checkbox"/> Chamber D (ISED:22541-1) | <input checked="" type="checkbox"/> Chamber I (ISED:2324A-5) |
| <input type="checkbox"/> Chamber B (ISED:2324B-2)            | <input type="checkbox"/> Chamber E (ISED:22541-2) | <input checked="" type="checkbox"/> Chamber J (ISED:2324A-6) |
| <input type="checkbox"/> Chamber C (ISED:2324B-3)            | <input type="checkbox"/> Chamber F (ISED:22541-3) | <input checked="" type="checkbox"/> Chamber K (ISED:2324A-1) |
|                                                              | <input type="checkbox"/> Chamber G (ISED:22541-4) | <input type="checkbox"/> Chamber L (ISED:2324A-3)            |
|                                                              | <input type="checkbox"/> Chamber H (ISED:22541-5) |                                                              |

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

## 5. CALIBRATION AND UNCERTAINTY

### 5.1. 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.

### 5.2. SAMPLE CALCULATION

#### **RADIATED EMISSIONS**

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

#### **MAINS CONDUCTED EMISSIONS**

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.  
 $36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$

### 5.3. MEASUREMENT UNCERTAINTY

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

| PARAMETER                                           | UNCERTAINTY |
|-----------------------------------------------------|-------------|
| Worst Case Conducted Disturbance, 9KHz to 0.15 MHz  | 3.84 dB     |
| Worst Case Conducted Disturbance, 0.15 to 30 MHz    | 3.65 dB     |
| Worst Case Radiated Disturbance, 9KHz to 30 MHz     | 2.52 dB     |
| Worst Case Radiated Disturbance, 30 to 1000 MHz     | 4.88 dB     |
| Worst Case Radiated Disturbance, 1000 to 18000 MHz  | 4.24 dB     |
| Worst Case Radiated Disturbance, 18000 to 26000 MHz | 4.37 dB     |
| Worst Case Radiated Disturbance, 26000 to 40000 MHz | 5.17 dB     |

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

## 6. EQUIPMENT UNDER TEST

### 6.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, ANT+, NFC and MST. The model SM-A705FN/DS was used for final testing and is representative of the results in this report.

### 6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

#### 5.2 GHz BAND

| Frequency Range (MHz)    | Mode           | Output Power (dBm) | Output Power (mW) |
|--------------------------|----------------|--------------------|-------------------|
| <b>5.2 GHz band, 1TX</b> |                |                    |                   |
| 5180-5240                | 802.11a        | 17.94              | 62.23             |
| 5180-5240                | 802.11n HT20   | 18.83              | 76.38             |
| 5190-5230                | 802.11n HT40   | 17.76              | 59.70             |
| 5210                     | 802.11ac VHT80 | 15.22              | 33.27             |

#### 5.3 GHz BAND

| Frequency Range (MHz)    | Mode           | Output Power (dBm) | Output Power (mW) |
|--------------------------|----------------|--------------------|-------------------|
| <b>5.3 GHz band, 1TX</b> |                |                    |                   |
| 5260 - 5320              | 802.11a        | 17.66              | 58.34             |
| 5260 - 5320              | 802.11n HT20   | 18.83              | 76.38             |
| 5270 - 5310              | 802.11n HT40   | 17.83              | 60.67             |
| 5290                     | 802.11ac VHT80 | 15.80              | 38.02             |

#### 5.6 GHz BAND

| Frequency Range (MHz)    | Mode           | Output Power (dBm) | Output Power (mW) |
|--------------------------|----------------|--------------------|-------------------|
| <b>5.6 GHz band, 1TX</b> |                |                    |                   |
| 5500-5720                | 802.11a        | 17.68              | 58.61             |
| 5500-5720                | 802.11n HT20   | 18.72              | 74.47             |
| 5510-5710                | 802.11n HT40   | 17.87              | 61.24             |
| 5530-5690                | 802.11ac VHT80 | 15.82              | 38.19             |

**5.8 GHz BAND**

| Frequency Range<br>(MHz) | Mode           | Output<br>Power<br>(dBm) | Output Power<br>(mW) |
|--------------------------|----------------|--------------------------|----------------------|
| <b>5.8 GHz band, 1TX</b> |                |                          |                      |
| 5745-5825                | 802.11a        | 17.79                    | 60.12                |
| 5745-5825                | 802.11n HT20   | 18.85                    | 76.74                |
| 5755-5795                | 802.11n HT40   | 17.60                    | 57.54                |
| 5775                     | 802.11ac VHT80 | 15.89                    | 38.82                |

### 6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of:

| Frequency (GHz) | Peak Antenna Gain (dBi) |
|-----------------|-------------------------|
| 5180-5240       | -5.92                   |
| 5260-5320       | -6.50                   |
| 5500-5720       | -5.92                   |
| 5745-5825       | -4.33                   |

### 6.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was A705FN.001

### 6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

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

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

802.11a mode: 6 Mbps  
802.11n HT20mode: MCS0  
802.11n HT40mode: MCS0  
802.11ac VHT80 mode: MCS0

## 6.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Support Equipment List |              |            |               |        |
|------------------------|--------------|------------|---------------|--------|
| Description            | Manufacturer | Model      | Serial Number | FCC ID |
| AC Adapter             | Samsung      | EP-TA50EWE | DW3J719AS/A-E | N/A    |
| Earphone               | Samsung      | N/A        | N/A           | 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                    | RF             | Shielded    | 0.2              | To spectrum Analyzer |
| 2              | USB     | 1                    | USB            | Un-shielded | 1                | EUT to AC Mains      |

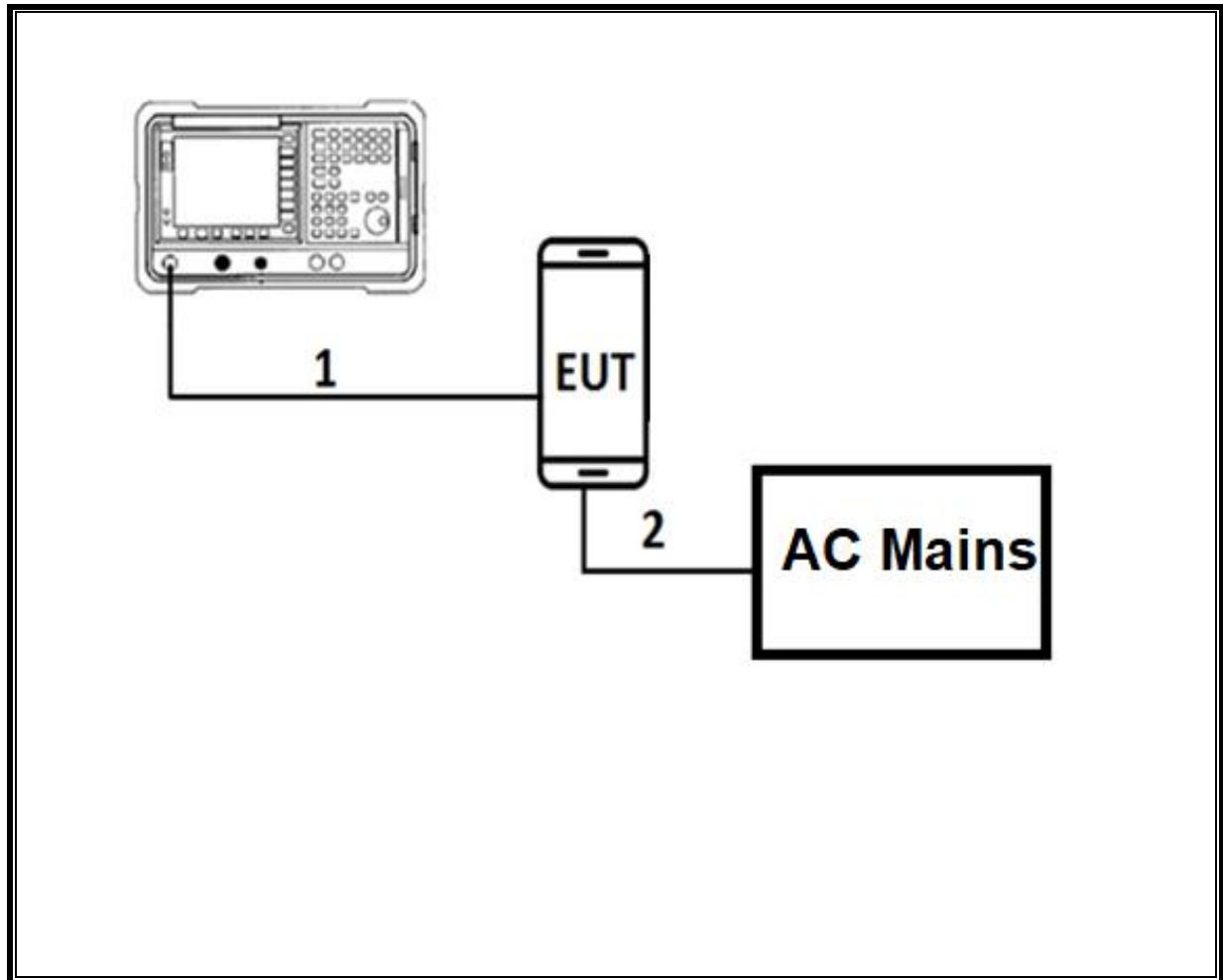
### I/O CABLES (RADIATED AND CONDUCTED EMISSIONS)

| I/O Cable List |          |                      |                |             |                  |         |
|----------------|----------|----------------------|----------------|-------------|------------------|---------|
| Cable No       | Port     | # of identical ports | Connector Type | Cable Type  | Cable Length (m) | Remarks |
| 1              | USB      | 1                    | USB            | Shielded    | 1                | N/A     |
| 2              | Earphone | 1                    | 3.5mm          | Un-shielded | 1                | N/A     |

### TEST SETUP

The EUT is a stand alone unit. Test software exercised the radio card.

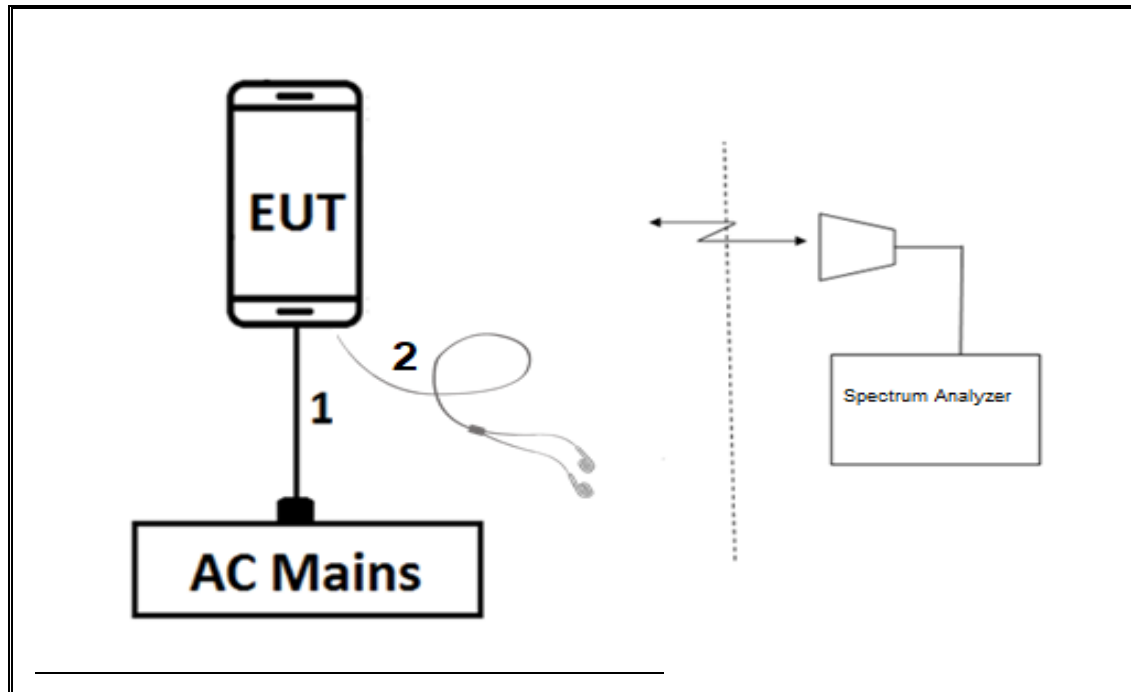
**CONDUCTED TEST SETUP DIAGRAM**



**TEST SETUP**

For conducted tests: the EUT was stand alone. The test software exercises the radio.

**RADIATED AND AC LINE CONDUCTED EMISSIONS SETUP DIAGRAM**



**TEST SETUP**

For radiated tests, the EUT is stand alone unit and the test software exercises the radio.

## 7. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 789033 D02 v02r01, Section II.B.

6 dB Emission BW: KDB 789033 D02 v02r01, Section II.C.2.

26 dB Emission BW: KDB 789033 D02 v02r01, Section II.C.1.

Conducted Output Power: KDB 789033 D02 v02r01, Sections II.E.3.b (Method PM-G) & II.E.2.b (Method SA-1).

Power Spectral Density: KDB 789033 D02 v02r01, Section II F

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4

Unwanted emissions: KDB 789033 D02 v02r01, Sections II.G.3 – II.G.6.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

## 8. 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                  | ID Num                   | Cal Due    | Last Cal   |
| Power Meter, P-series single channel             | Agilent (Keysight) Technologies | N1911A                 | T1271                    | 07/26/2019 | 07/26/2018 |
| Power Sensor, P-series, 50MHz to 18GHz, Wideband | Agilent (Keysight) Technologies | N1921A                 | T1224                    | 10/09/2019 | 10/09/2018 |
| Antenna, Active Loop 9kHz-30MHz                  | ETS-Lindgren                    | 6502                   | T757                     | 09/25/2019 | 09/25/2018 |
| Antenna, Horn 1-18GHz                            | ETS-Lindgren                    | 3117                   | T344                     | 04/30/2019 | 04/30/2018 |
| Amplifier, 1 to 18GHz, 35dB                      | AMOLICAL                        | AMP1G18-35             | T1569                    | 06/03/2019 | 06/03/2018 |
| Antenna, Horn 1-18GHz                            | ETS-Lindgren                    | 3117                   | T862                     | 05/25/2019 | 05/25/2018 |
| Antenna, Horn 1-18GHz                            | ETS Lindgren                    | 3117                   | AT0067                   | 03/06/2019 | 03/06/2018 |
| Amplifier, 1 to 18GHz                            | Amplical                        | AMP1G18-35             | T1571                    | 07/30/2019 | 07/30/2018 |
| Amplifier, 1 to 18GHz,                           | MITEQ                           | AFS42-00101800-25-S-42 | PRE018078                | 08/01/2019 | 08/01/2018 |
| EMI Test Receiver                                | Rohde & Schwarz                 | ESW44                  | PRE0179367               | 04/25/2019 | 04/25/2018 |
| EMI Test Receiver                                | Rohde & Schwarz                 | ESW44                  | PRE0179375               | 05/08/2019 | 05/08/2018 |
| EMI Test Receiver                                | Rohde&Schwarz                   | ESW44                  | PRE0179372               | 05/04/2019 | 05/04/2018 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz             | Agilent (Keysight) Technologies | N9030A                 | T908                     | 01/23/2020 | 01/23/2019 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz             | Agilent (Keysight) Technologies | N9030A                 | T341                     | 09/26/2019 | 09/26/2018 |
| Amplifier, 100kHz to 1GHz, 32 dB                 | Agilent (Keysight) Technologies | 8447D                  | T15                      | 10/20/2019 | 10/20/2018 |
| Hybrid Antenna, 30MHz to 3GHz                    | SunAR rf motion                 | JB3                    | PRE0181574               | 08/01/2019 | 08/01/2018 |
| Antenna, Horn 18 to 26.5GHz                      | ARA                             | MWH-1826/B             | T447                     | 06/16/2019 | 06/16/2018 |
| Pre-Amp, 1-26.5GHz                               | Agilent                         | 8449B                  | T404                     | 03/09/2019 | 03/09/2018 |
| Antenna Horn, 26 to 40GHz                        | ARA                             | MWH-2640               | T90                      | 03/11/2019 | 03/11/2018 |
| Pre-Amp 26-40GHz                                 | MITEQ                           | NSTTA2640-35-HG        | T1864                    | 03/09/2019 | 03/09/2018 |
| AC Line Conducted                                |                                 |                        |                          |            |            |
| EMI Receiver                                     | Rohde & Schwarz                 | ESR                    | T1436                    | 02/14/2020 | 02/14/2019 |
| LISN for Conducted Emissions CISPR-16            | FCC INC.                        | FCC LISN 50/250        | T1310                    | 06/15/2019 | 06/15/2018 |
| Test Software List                               |                                 |                        |                          |            |            |
| Radiated Software                                | UL                              | UL EMC                 | Ver 9.5, June 22, 2018   |            |            |
| Antenna Port Software                            | UL                              | UL RF                  | Ver 9.3.2, Jan. 07, 2019 |            |            |
| AC Line Conducted Software                       | UL                              | UL EMC                 | Ver 9.5, May 26, 2015    |            |            |

### NOTES:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

## 9. ANTENNA PORT TEST RESULTS

### 9.1. ON TIME AND DUTY CYCLE

#### LIMITS

None; for reporting purposes only.

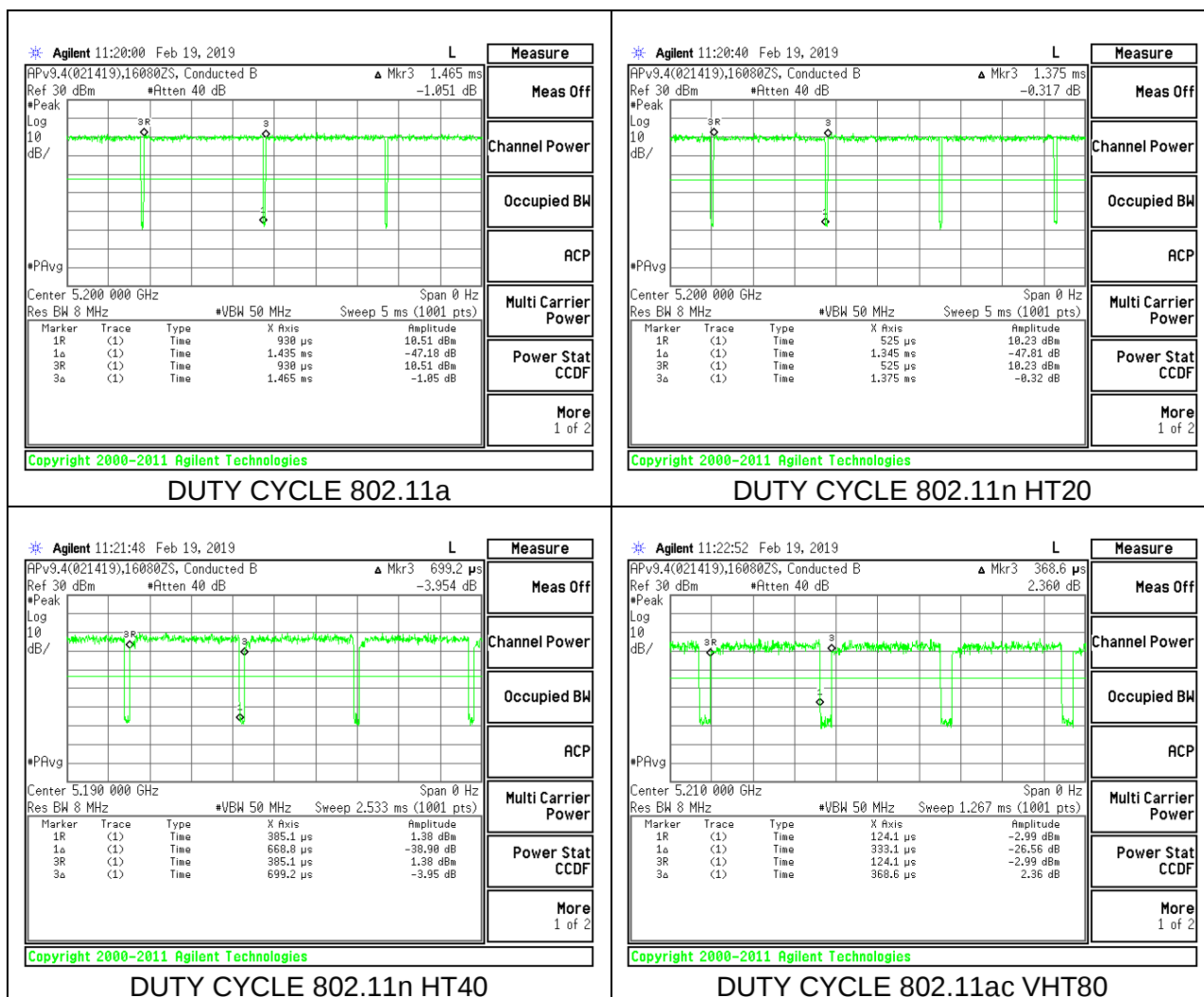
#### PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

#### ON TIME AND DUTY CYCLE RESULTS

| Mode           | ON Time<br>B<br>(msec) | Period<br>(msec) | Duty Cycle<br>x<br>(linear) | Duty<br>Cycle<br>(%) | Duty Cycle<br>Correction Factor<br>(dB) | 1/B<br>Minimum VBW<br>(kHz) |
|----------------|------------------------|------------------|-----------------------------|----------------------|-----------------------------------------|-----------------------------|
| 802.11a        | 1.435                  | 1.465            | 0.980                       | 97.95%               | 0.09                                    | 0.697                       |
| 802.11n HT20   | 1.345                  | 1.375            | 0.978                       | 97.82%               | 0.10                                    | 0.743                       |
| 802.11n HT40   | 0.669                  | 0.699            | 0.957                       | 95.65%               | 0.19                                    | 1.495                       |
| 802.11ac VHT80 | 0.333                  | 0.369            | 0.904                       | 90.37%               | 0.44                                    | 3.002                       |

# DUTY CYCLE PLOTS



## 9.2. 26 dB BANDWIDTH

### LIMITS

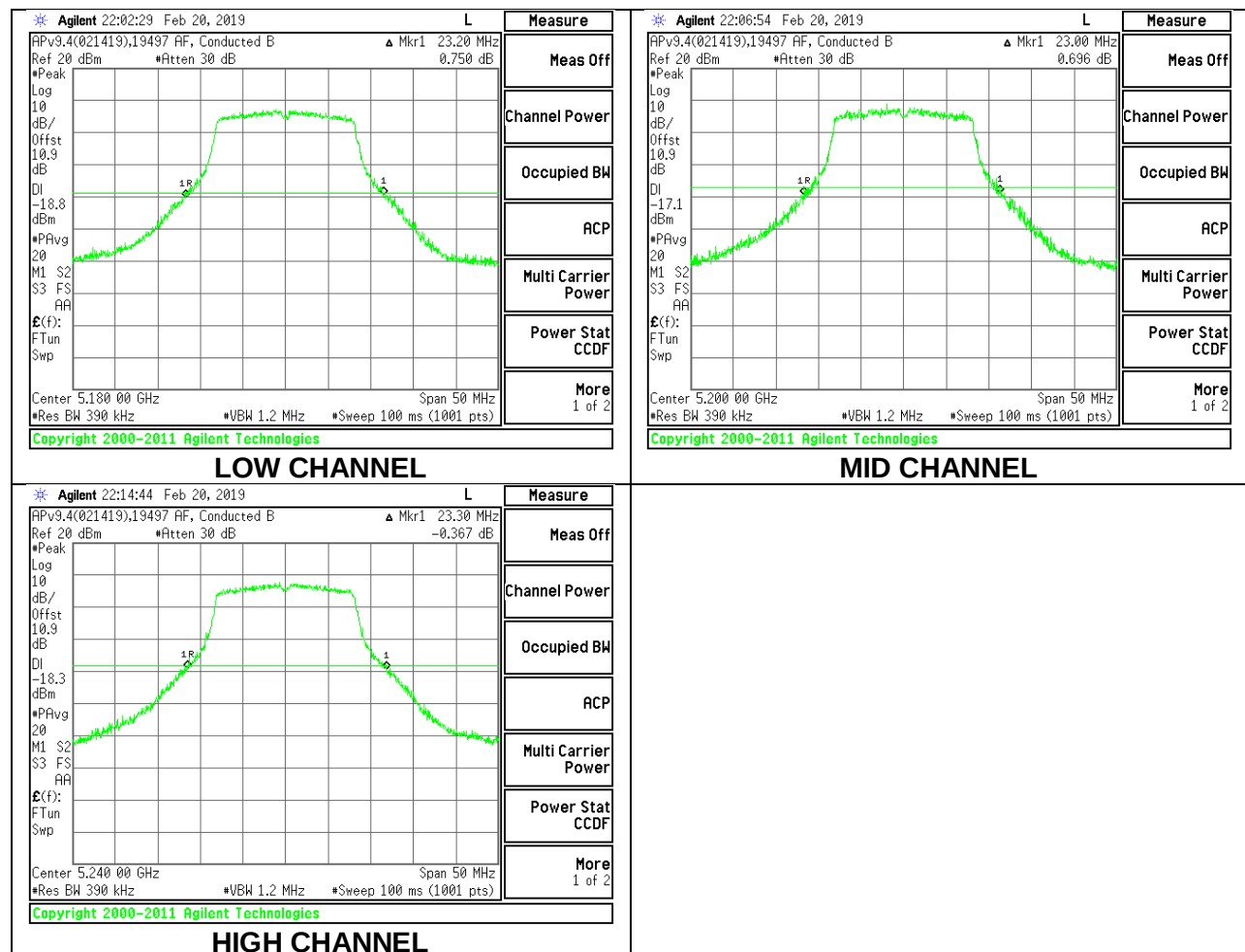
None; for reporting purposes only.

### RESULTS

#### 9.2.1. 802.11a MODE IN THE 5.2 GHz BAND

##### 1TX Antenna 1 MODE

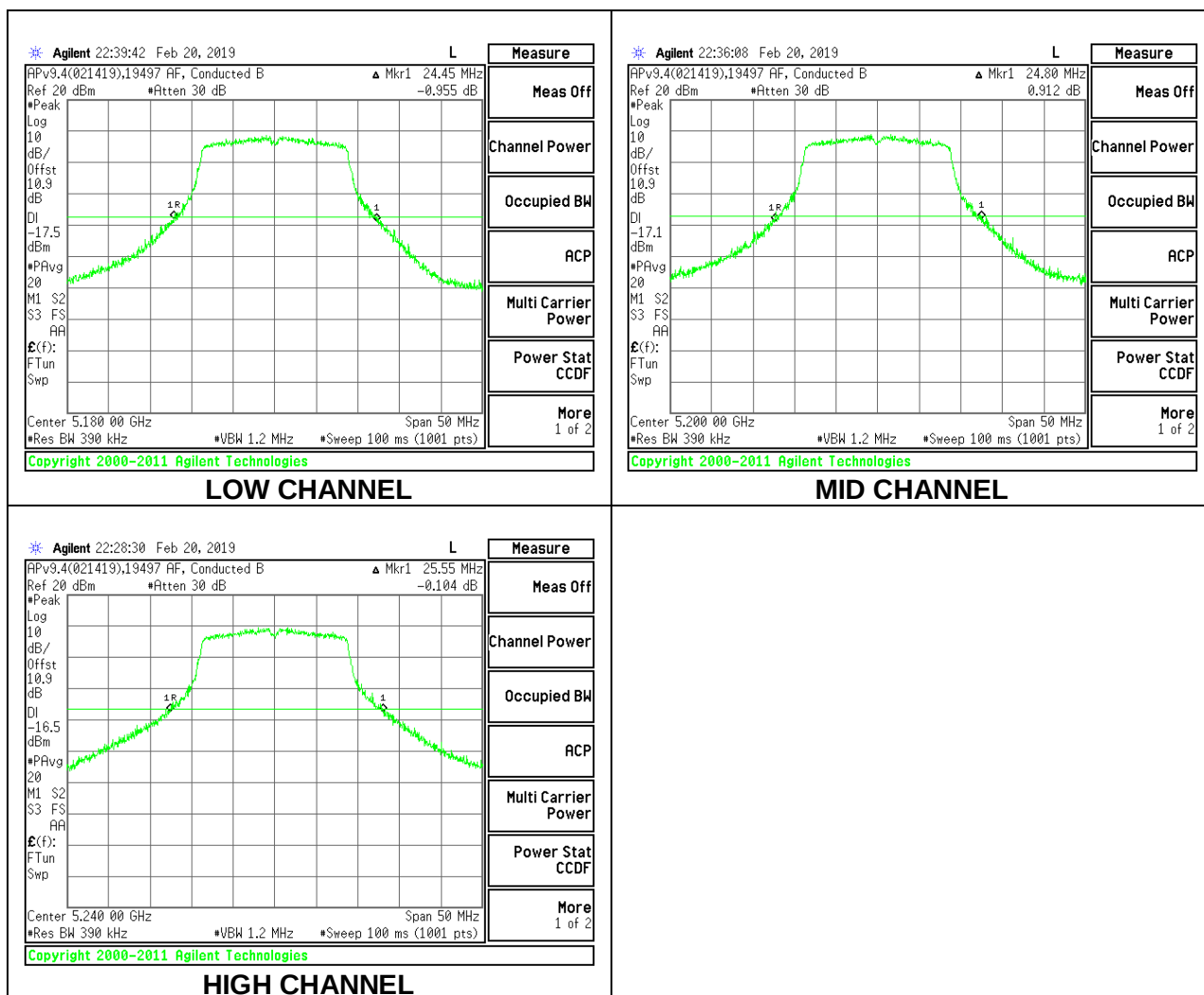
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Low     | 5180      | 23.20           |
| Mid     | 5200      | 23.00           |
| High    | 5240      | 23.30           |



## 9.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

### 1TX Antenna 1 MODE

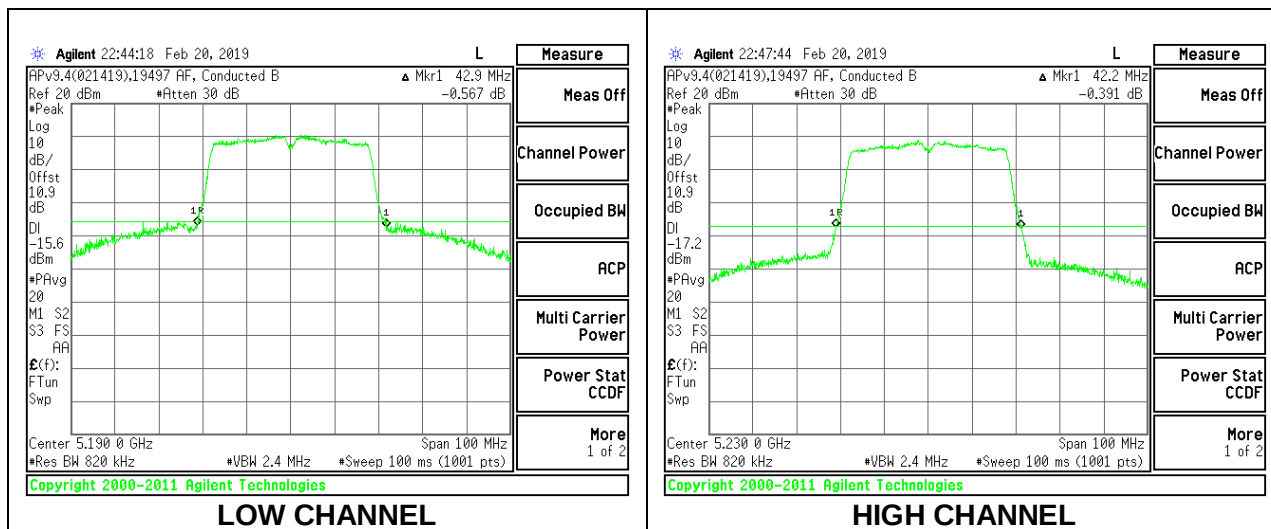
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Low     | 5180      | 24.45           |
| Mid     | 5200      | 24.80           |
| High    | 5240      | 25.55           |



### 9.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

#### 1TX Antenna 1 MODE

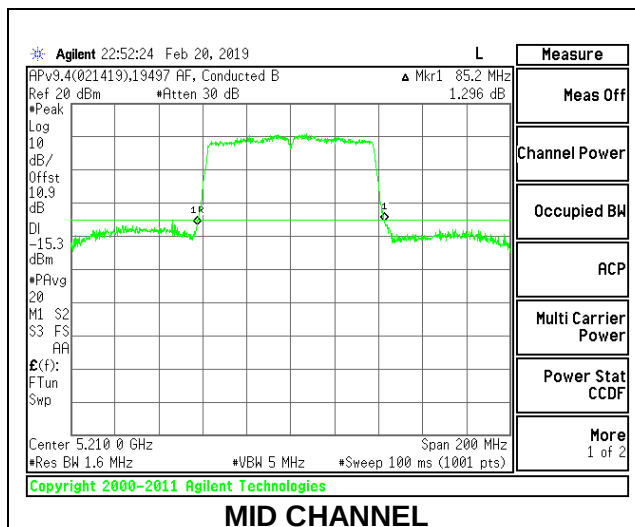
| Channel | Frequency | 26dB Bandwidth |
|---------|-----------|----------------|
|         | (MHz)     | (MHz)          |
| Low     | 5190      | 42.90          |
| High    | 5230      | 42.20          |



## 9.2.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

### 1TX Antenna 1 MODE

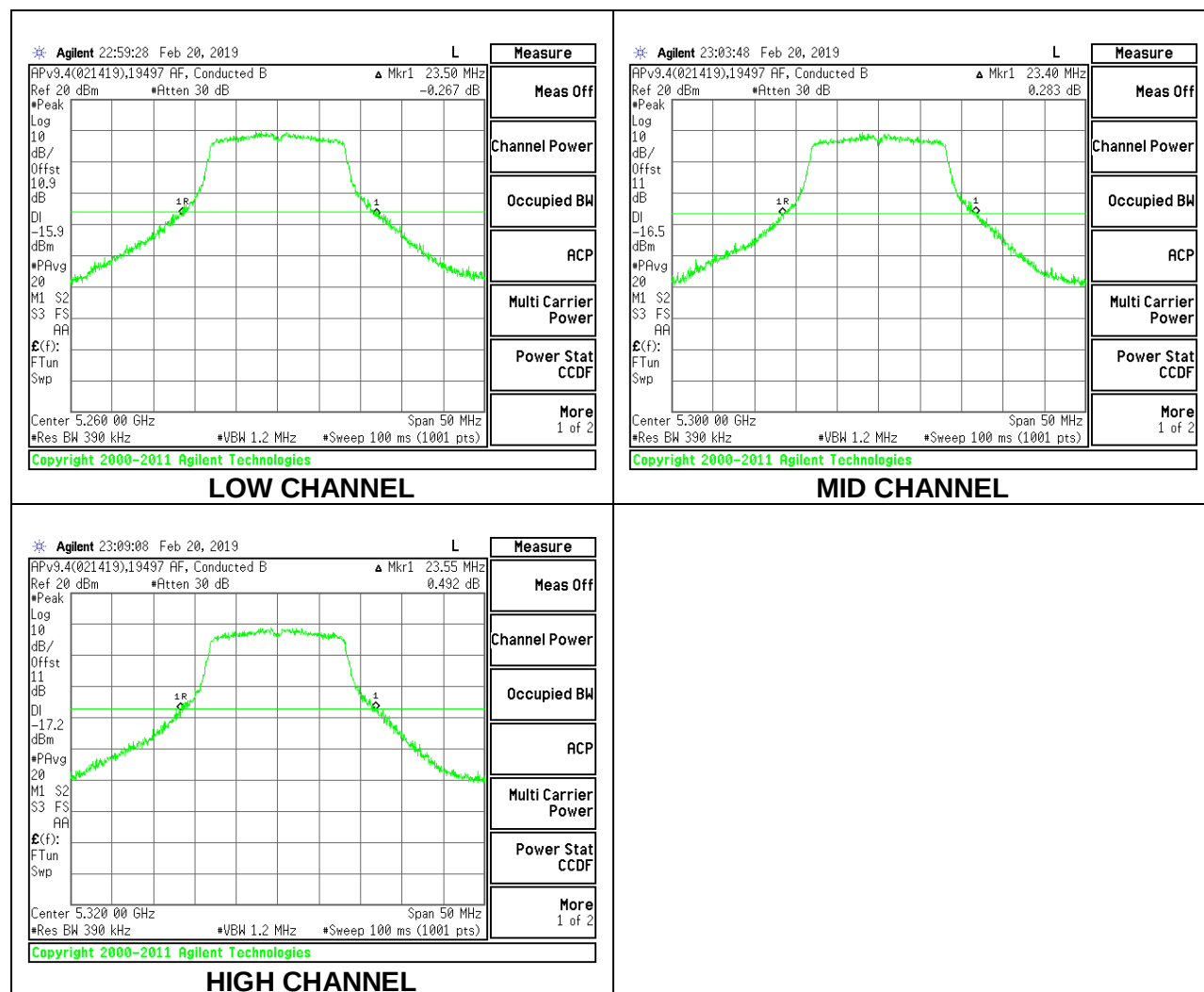
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Mid     | 5210      | 85.20           |



## 9.2.5. 802.11a MODE IN THE 5.3 GHz BAND

### 1TX Antenna 1 MODE

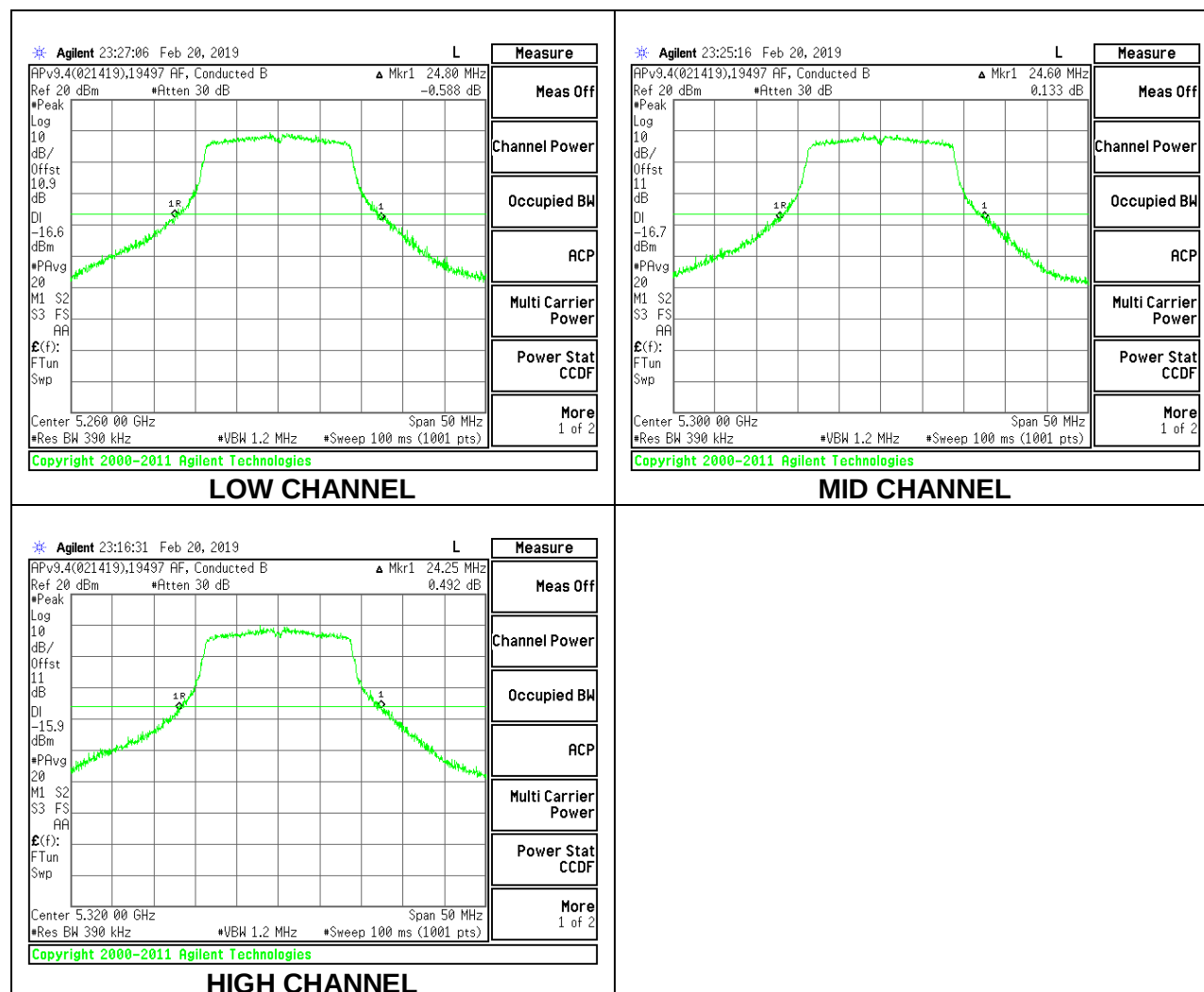
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Low     | 5260      | 23.50           |
| Mid     | 5300      | 23.40           |
| High    | 5320      | 23.55           |



## 9.2.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

### 1TX Antenna 1 MODE

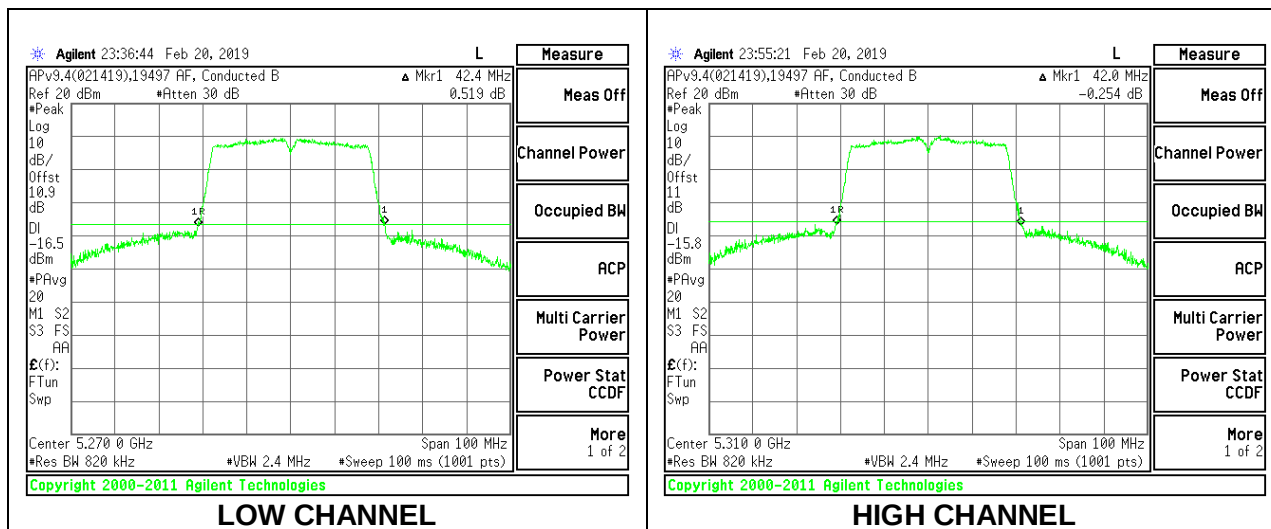
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Low     | 5260      | 24.80           |
| Mid     | 5300      | 24.60           |
| High    | 5320      | 24.25           |



## 9.2.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

### 1TX Antenna 1 MODE

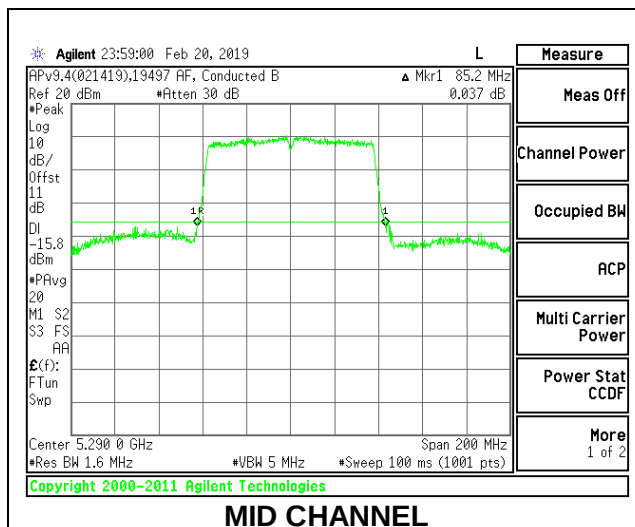
| Channel | Frequency | 26dB Bandwidth |
|---------|-----------|----------------|
|         | (MHz)     | (MHz)          |
| Low     | 5270      | 42.40          |
| High    | 5310      | 42.00          |



## 9.2.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

### 1TX Antenna 1 MODE

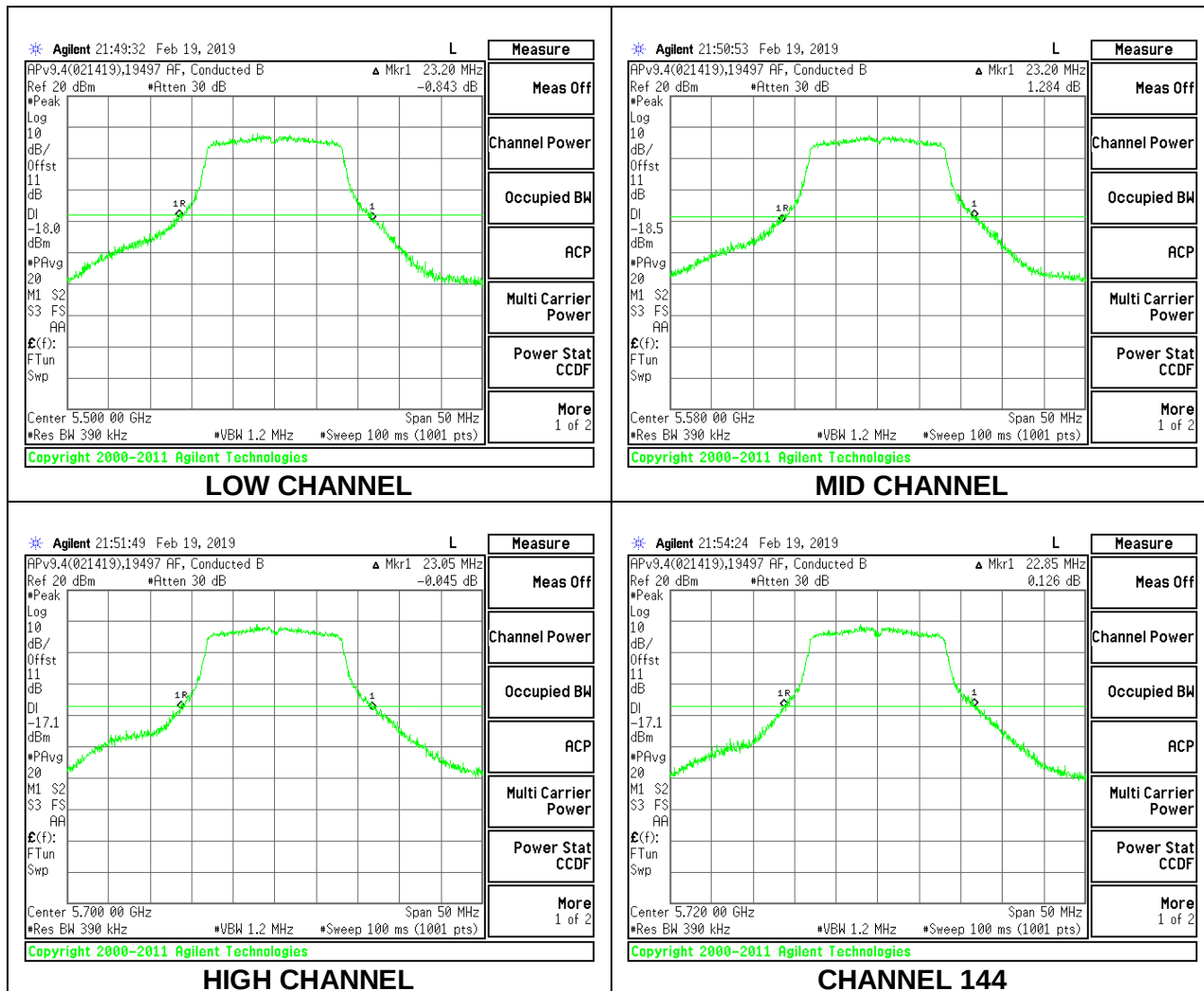
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Mid     | 5290      | 85.20           |



## 9.2.9. 802.11a MODE IN THE 5.6 GHz BAND

### 1TX Antenna 1 MODE

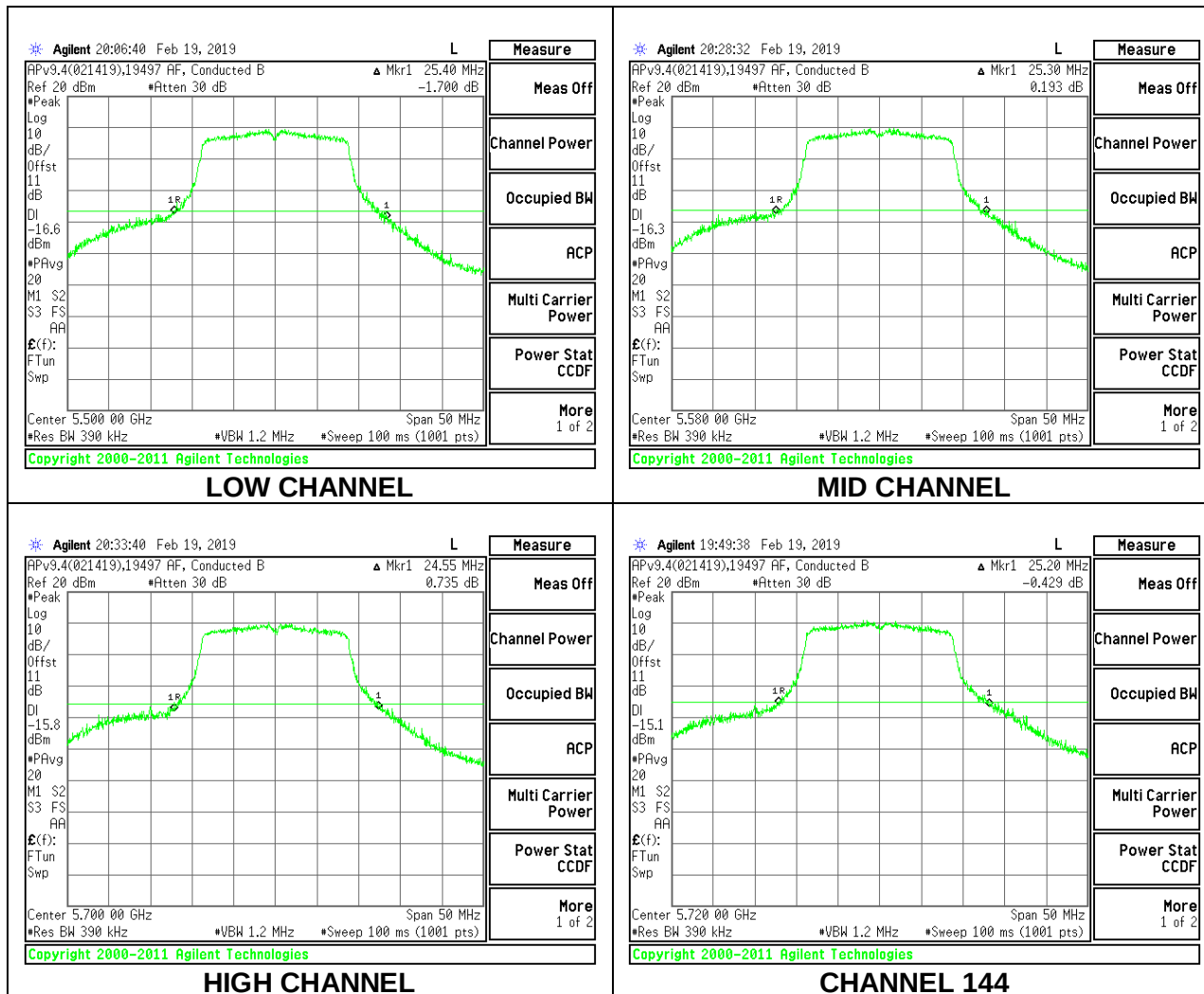
| Channel | Frequency<br>(MHz) | 26 dB Bandwidth<br>(MHz) |
|---------|--------------------|--------------------------|
| Low     | 5500               | 23.20                    |
| Mid     | 5580               | 23.20                    |
| High    | 5700               | 23.05                    |
| 144     | 5720               | 22.85                    |



## 9.2.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

### 1TX Antenna 1 MODE

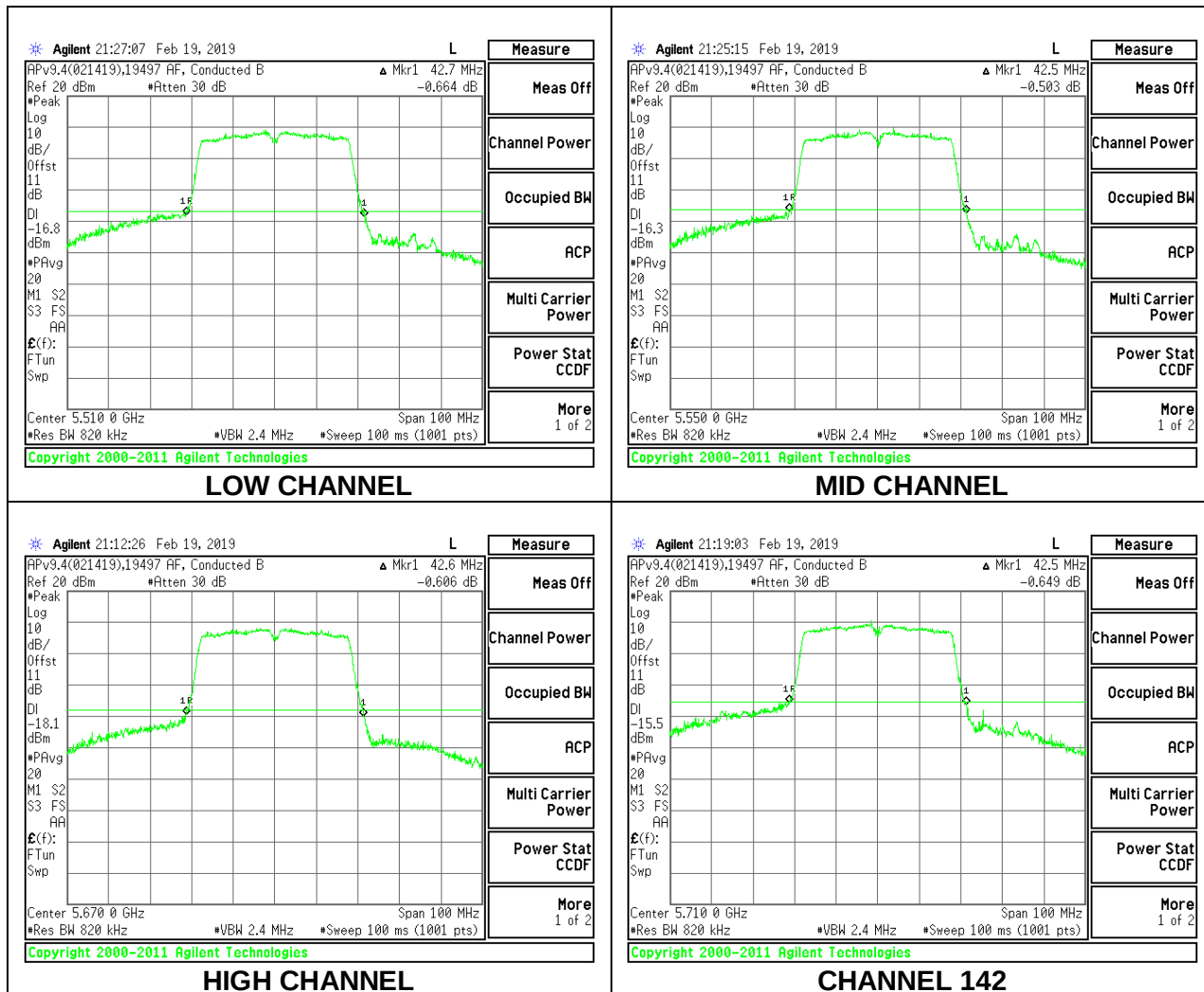
| Channel | Frequency<br>(MHz) | 26 dB Bandwidth<br>(MHz) |
|---------|--------------------|--------------------------|
| Low     | 5500               | 25.40                    |
| Mid     | 5580               | 25.30                    |
| High    | 5700               | 24.55                    |
| 144     | 5720               | 25.20                    |



## 9.2.11. 802.11n HT40 MODE IN THE 5.6 GHz BAND

### 1TX Antenna 1 MODE

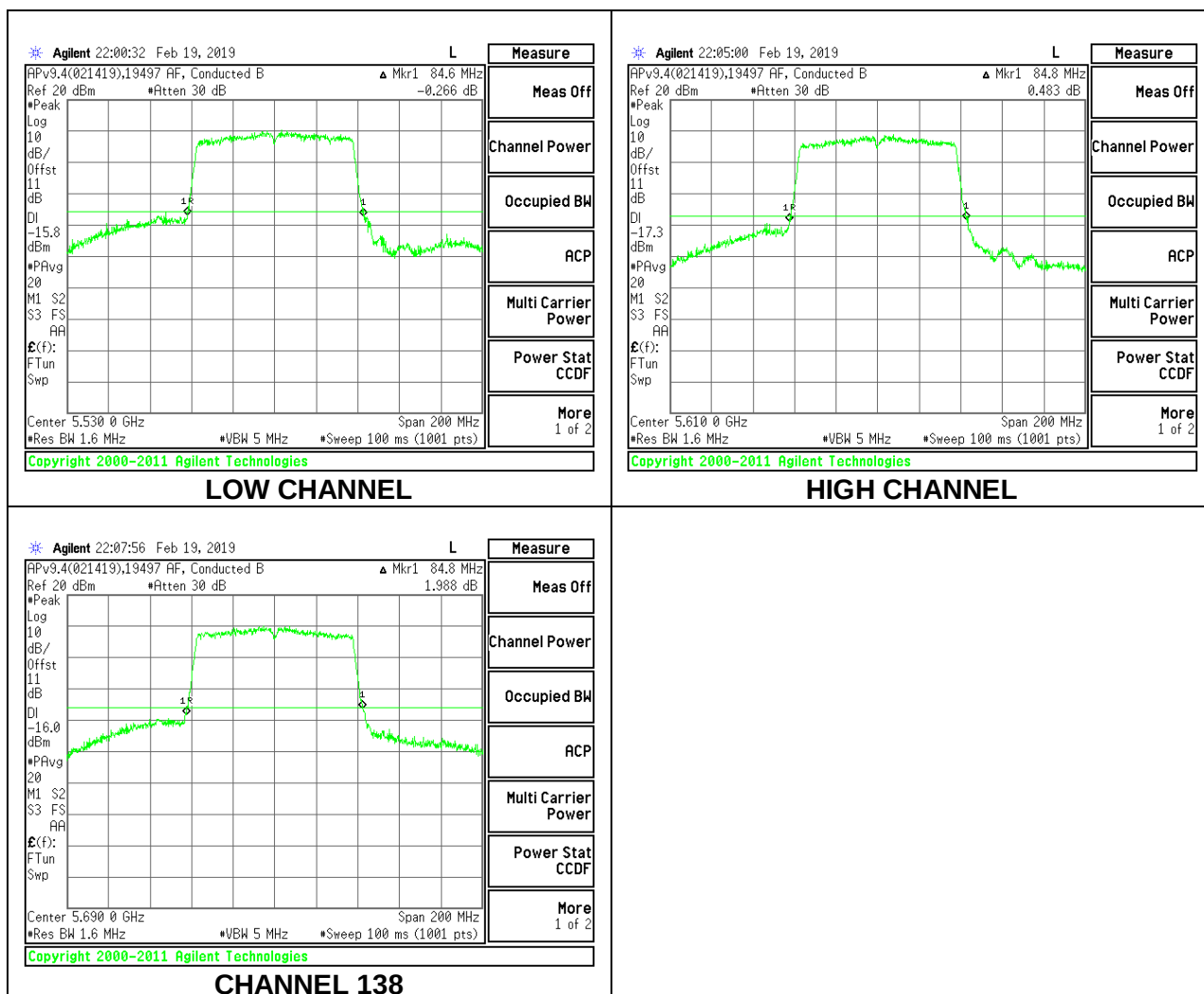
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Low     | 5510      | 42.70           |
| Mid     | 5550      | 42.50           |
| High    | 5670      | 42.60           |
| 142     | 5710      | 42.50           |



## 9.2.12. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

### 1TX Antenna 1 MODE

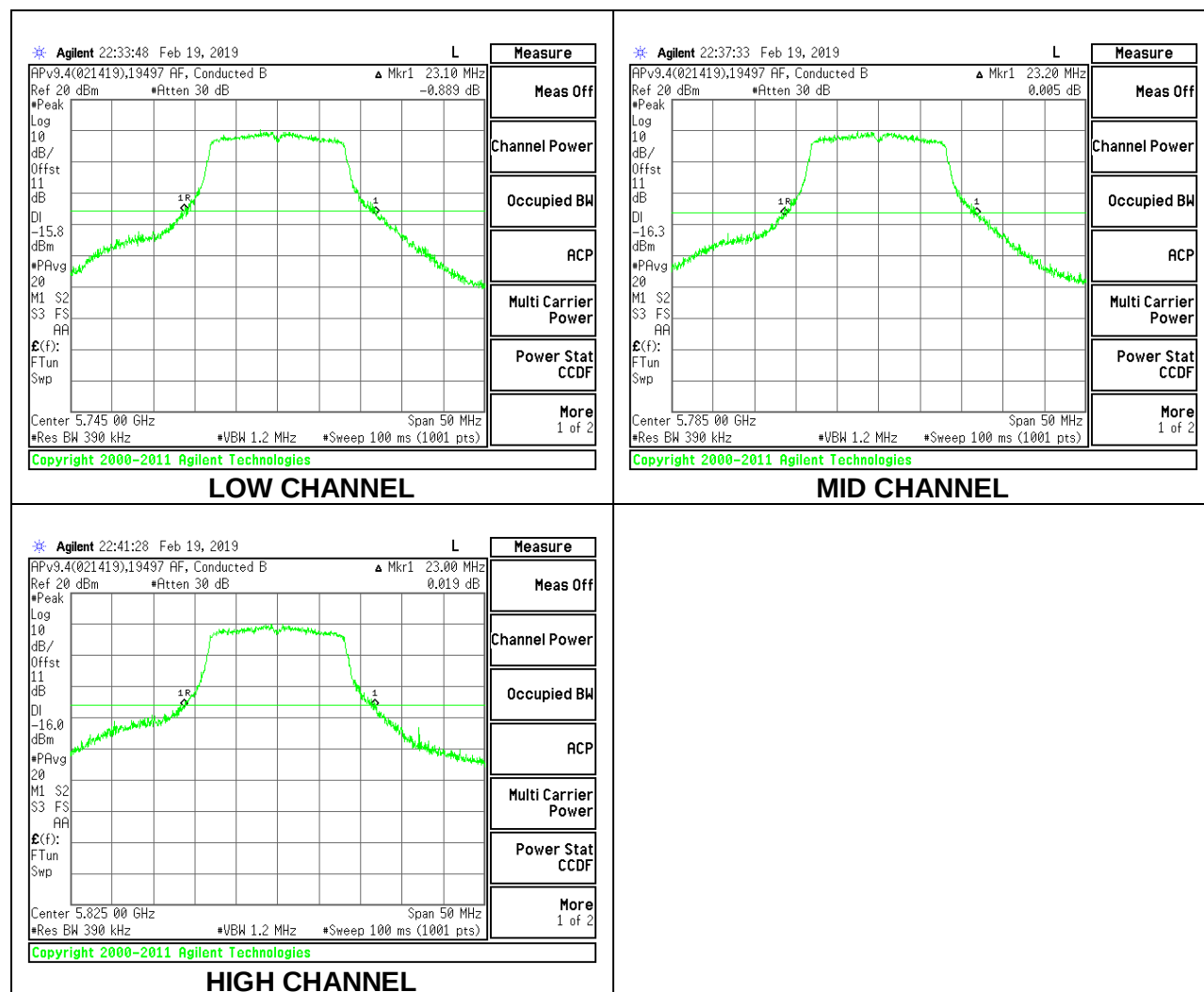
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Low     | 5530      | 84.60           |
| High    | 5610      | 84.80           |
| 138     | 5690      | 84.80           |



## 9.2.13. 802.11a MODE IN THE 5.8 GHz BAND

### 1TX Antenna 1 MODE

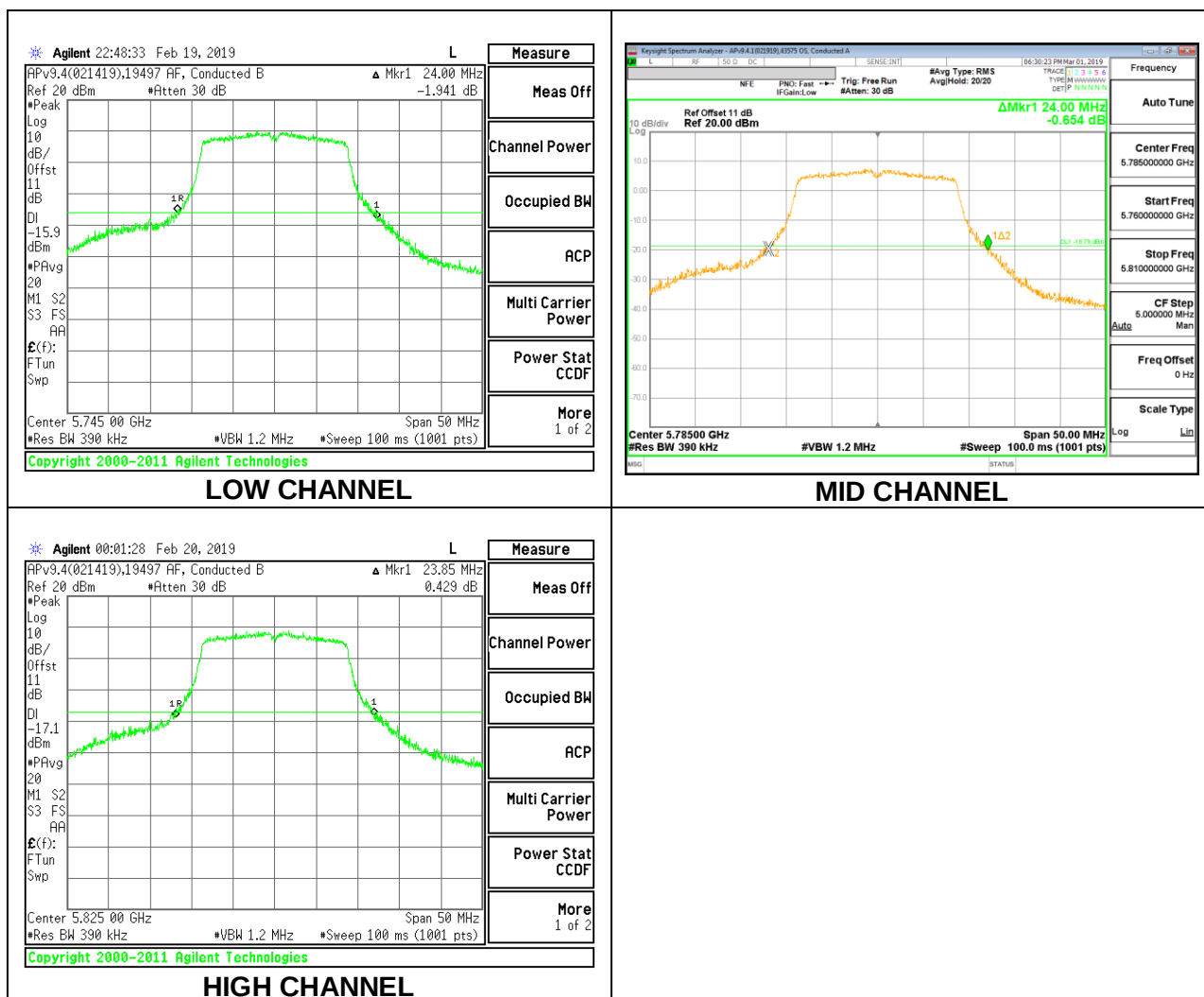
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Low     | 5745      | 23.10           |
| Mid     | 5785      | 23.20           |
| High    | 5825      | 23.00           |



## 9.2.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

### 1TX Antenna 1 MODE

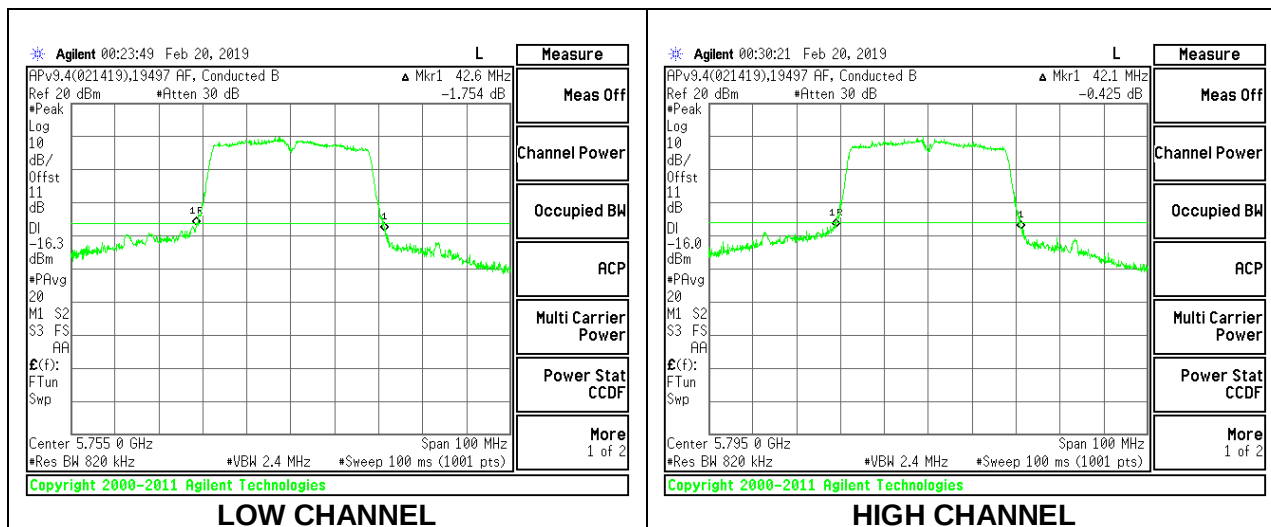
| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Low     | 5745      | 24.00           |
| Mid     | 5785      | 24.00           |
| High    | 5825      | 23.85           |



## 9.2.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

### 1TX Antenna 1 MODE

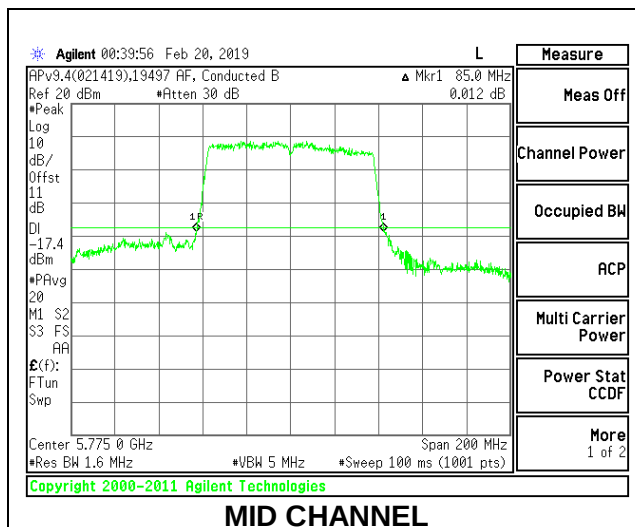
| Channel | Frequency | 26dB Bandwidth |
|---------|-----------|----------------|
|         | (MHz)     | (MHz)          |
| Low     | 5755      | 42.60          |
| High    | 5795      | 42.10          |



## 9.2.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

### 1TX Antenna 1 MODE

| Channel | Frequency | 26 dB Bandwidth |
|---------|-----------|-----------------|
|         | (MHz)     | (MHz)           |
| Mid     | 5775      | 85.00           |



---

### **9.3. 6 dB BANDWIDTH**

#### **LIMITS**

FCC §15.407 (e)

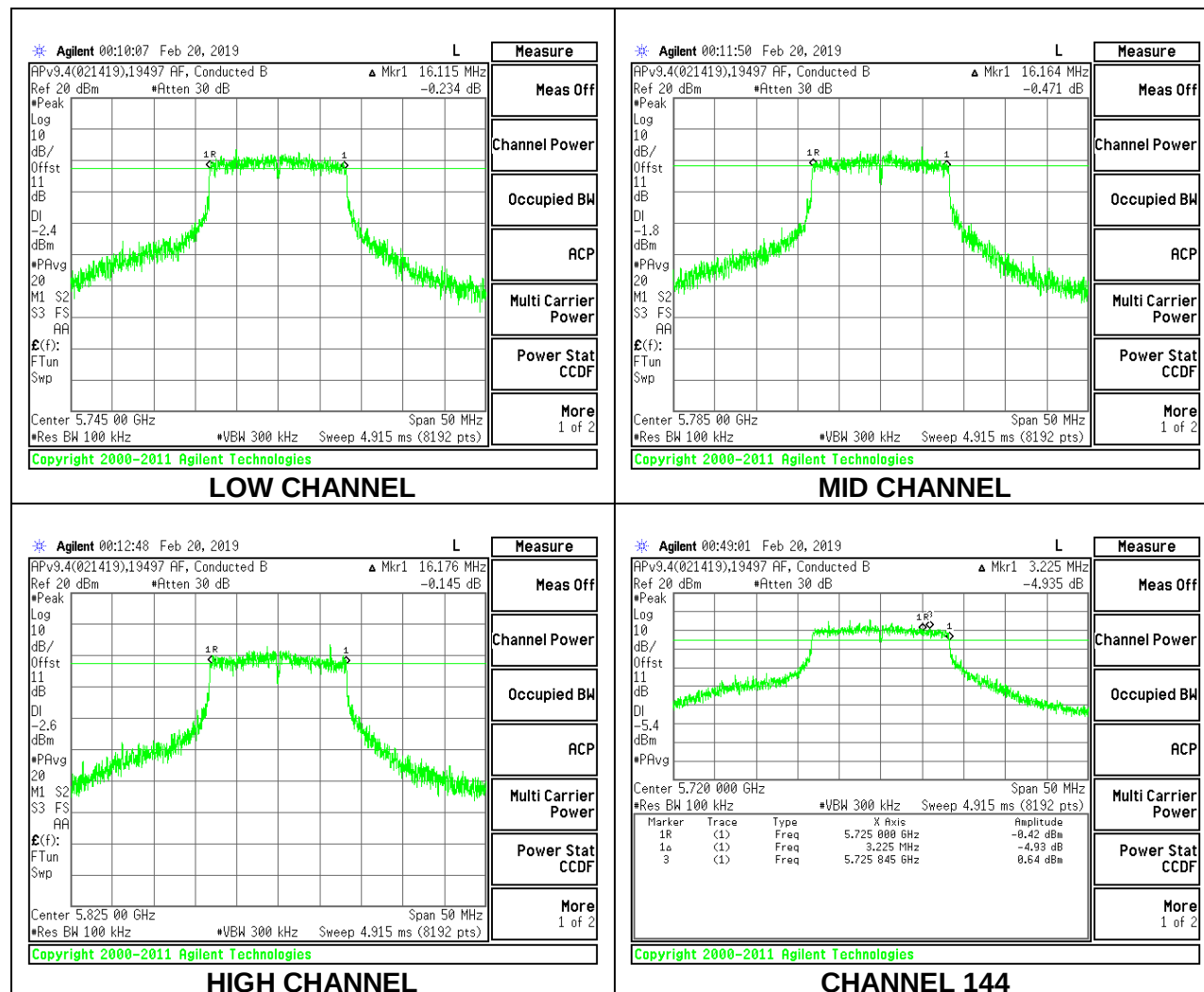
The minimum 6 dB bandwidth shall be at least 500 kHz.

#### **RESULTS**

### 9.3.1. 802.11a MODE IN THE 5.8 GHz BAND

#### 1TX Antenna 1 MODE

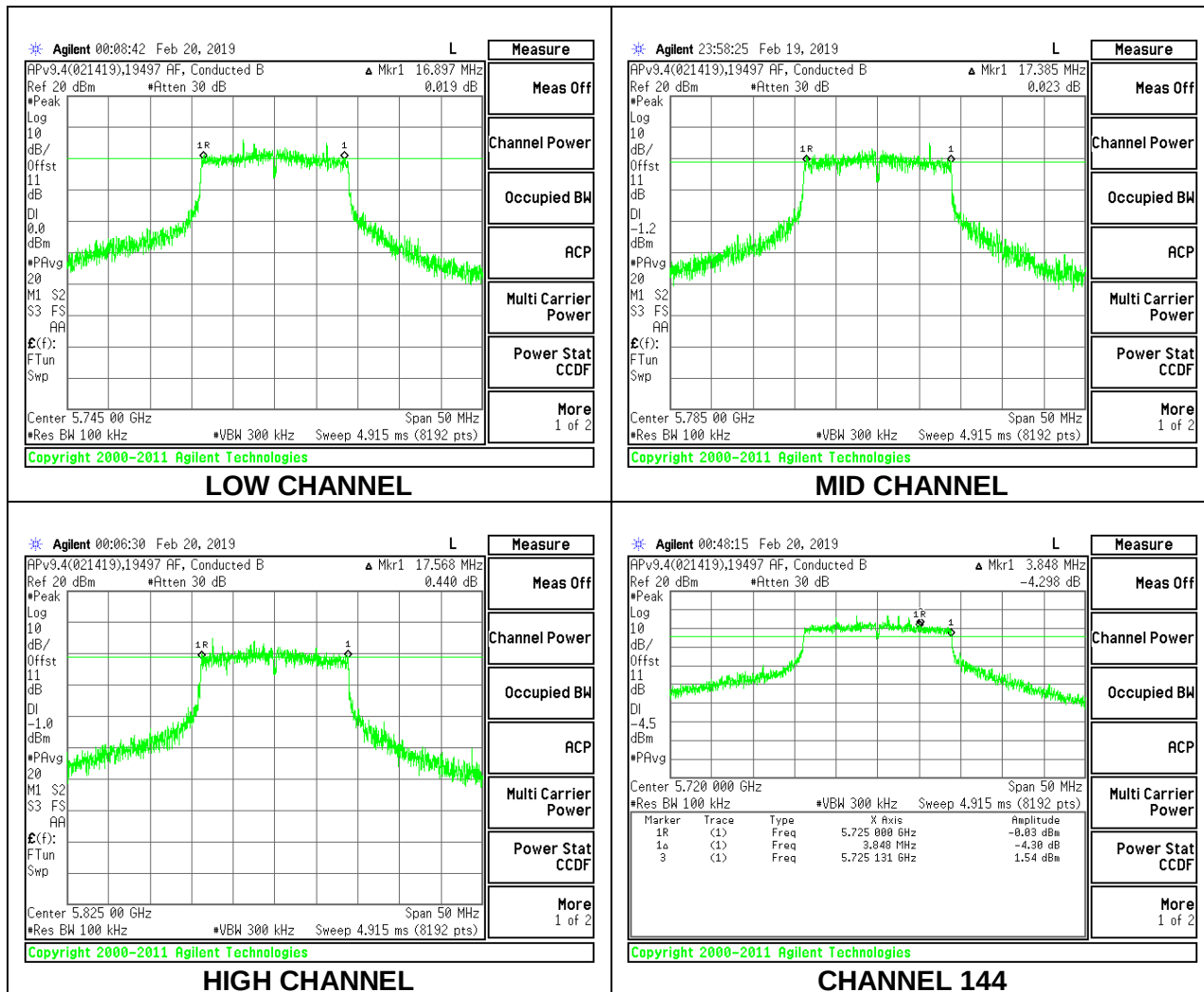
| Channel | Frequency<br>(MHz) | 6 dB Bandwidth<br>(MHz) | Minimum Limit<br>(MHz) |
|---------|--------------------|-------------------------|------------------------|
| Low     | 5745               | 16.1150                 | 0.5                    |
| Mid     | 5785               | 16.1640                 | 0.5                    |
| High    | 5825               | 16.1760                 | 0.5                    |
| 144     | 5720               | 3.2250                  | 0.5                    |



### 9.3.2. 802.11n HT20 MODE IN THE 5.8 GHz BAND

#### 1TX Antenna 1 MODE

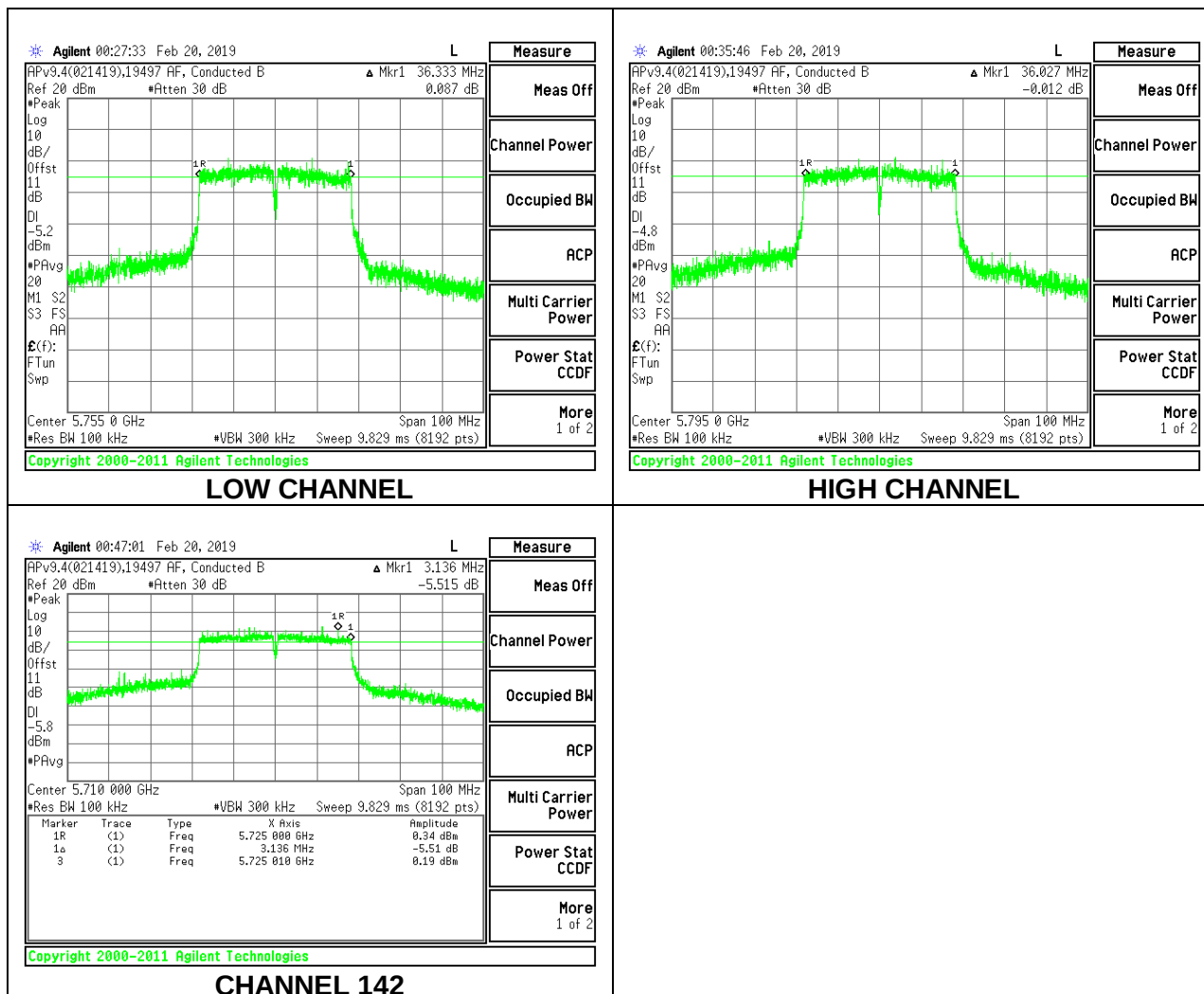
| Channel | Frequency<br>(MHz) | 6 dB Bandwidth<br>(MHz) | Minimum Limit<br>(MHz) |
|---------|--------------------|-------------------------|------------------------|
| Low     | 5745               | 16.8970                 | 0.5                    |
| Mid     | 5785               | 17.3850                 | 0.5                    |
| High    | 5825               | 17.5680                 | 0.5                    |
| 144     | 5720               | 3.8480                  | 0.5                    |



### 9.3.3. 802.11n HT40 MODE IN THE 5.8 GHz BAND

#### 1TX Antenna 1 MODE

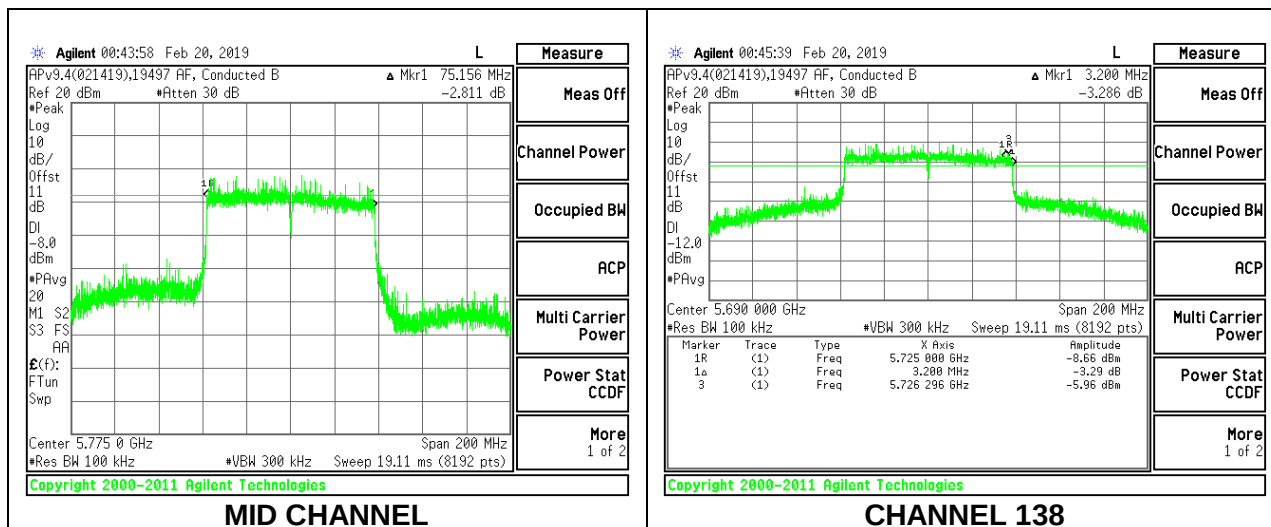
| Channel | Frequency | 6 dB Bandwidth | Minimum Limit |
|---------|-----------|----------------|---------------|
|         | (MHz)     | (MHz)          | (MHz)         |
| Low     | 5755      | 36.3330        | 0.5           |
| High    | 5795      | 36.0270        | 0.5           |
| 142     | 5710      | 3.1360         | 0.5           |



### 9.3.4. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

#### 1TX Antenna 1 MODE

| Channel | Frequency | 6 dB Bandwidth | Minimum Limit |
|---------|-----------|----------------|---------------|
|         | (MHz)     | (MHz)          | (MHz)         |
| Mid     | 5775      | 75.1560        | 0.5           |
| 138     | 5690      | 3.2000         | 0.5           |



## **9.4. OUTPUT POWER AND PSD**

### **LIMITS**

#### **FCC §15.407**

##### **Band 5.15–5.25 GHz**

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

##### **Bands 5.25-5.35 GHz and 5.47-5.725 GHz**

The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz 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.

##### **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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.

### **TEST PROCEDURE**

The measurement method used for output power is KDB 789033 D02 v02r01, Section II.E.3.b (Method PM-G) and for straddles channels KDB 789033 D02 v02r01, Section II.E.2.b (Method SA-1) was used.

The measurement method used for power spectral density is KDB 789033 D02 v02r01, Section F.

## **DIRECTIONAL ANTENNA GAIN**

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

## **RESULTS**

|        |                      |
|--------|----------------------|
| Tester | 19497 AF             |
| Date   | 2/26/2019 – 3/8/2019 |

### **9.4.1. 802.11a MODE IN THE 5.2 GHz BAND**

#### **1TX Antenna 1 MODE (FCC) MOBILE**

##### **Antenna Gain and Limits**

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/1MHz) |
|---------|--------------------|------------------------------|-------------------------|----------------------------|
| Low     | 5180               | -5.92                        | 24.00                   | 11.00                      |
| Mid     | 5200               | -5.92                        | 24.00                   | 11.00                      |
| High    | 5240               | -5.92                        | 24.00                   | 11.00                      |

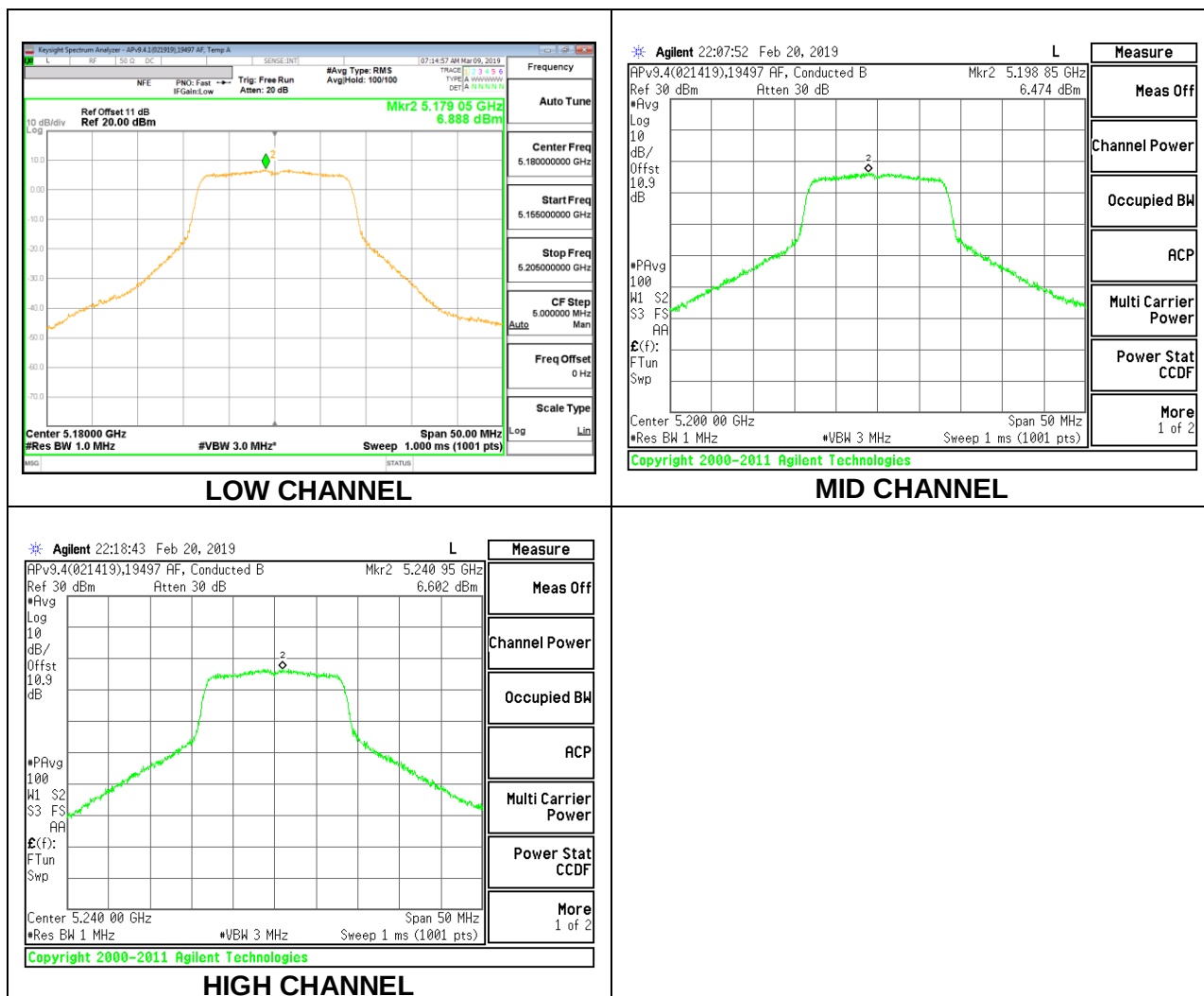
|                    |      |                                        |
|--------------------|------|----------------------------------------|
| Duty Cycle CF (dB) | 0.09 | Included in Calculations of Corr'd PSD |
|--------------------|------|----------------------------------------|

##### **Output Power Results**

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5180               | 17.65                  | 17.65                             | 24.00                   | -6.35                   |
| Mid     | 5200               | 17.94                  | 17.94                             | 24.00                   | -6.06                   |
| High    | 5240               | 17.71                  | 17.71                             | 24.00                   | -6.29                   |

##### **PSD Results**

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/1MHz) | Total<br>Corr'd<br>PSD<br>(dBm/1MHz) | PSD<br>Limit<br>(dBm/1MHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|---------------------------|--------------------------------------|----------------------------|-----------------------|
| Low     | 5180               | 6.888                     | 6.98                                 | 11.00                      | -4.02                 |
| Mid     | 5200               | 6.474                     | 6.56                                 | 11.00                      | -4.44                 |
| High    | 5240               | 6.602                     | 6.69                                 | 11.00                      | -4.31                 |



## 9.4.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

### 1TX Antenna 1 MODE (FCC) MOBILE

#### Antenna Gain and Limits

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/<br>1MHz) |
|---------|--------------------|------------------------------|-------------------------|--------------------------------|
| Low     | 5180               | -5.92                        | 24.00                   | 11.00                          |
| Mid     | 5200               | -5.92                        | 24.00                   | 11.00                          |
| High    | 5240               | -5.92                        | 24.00                   | 11.00                          |

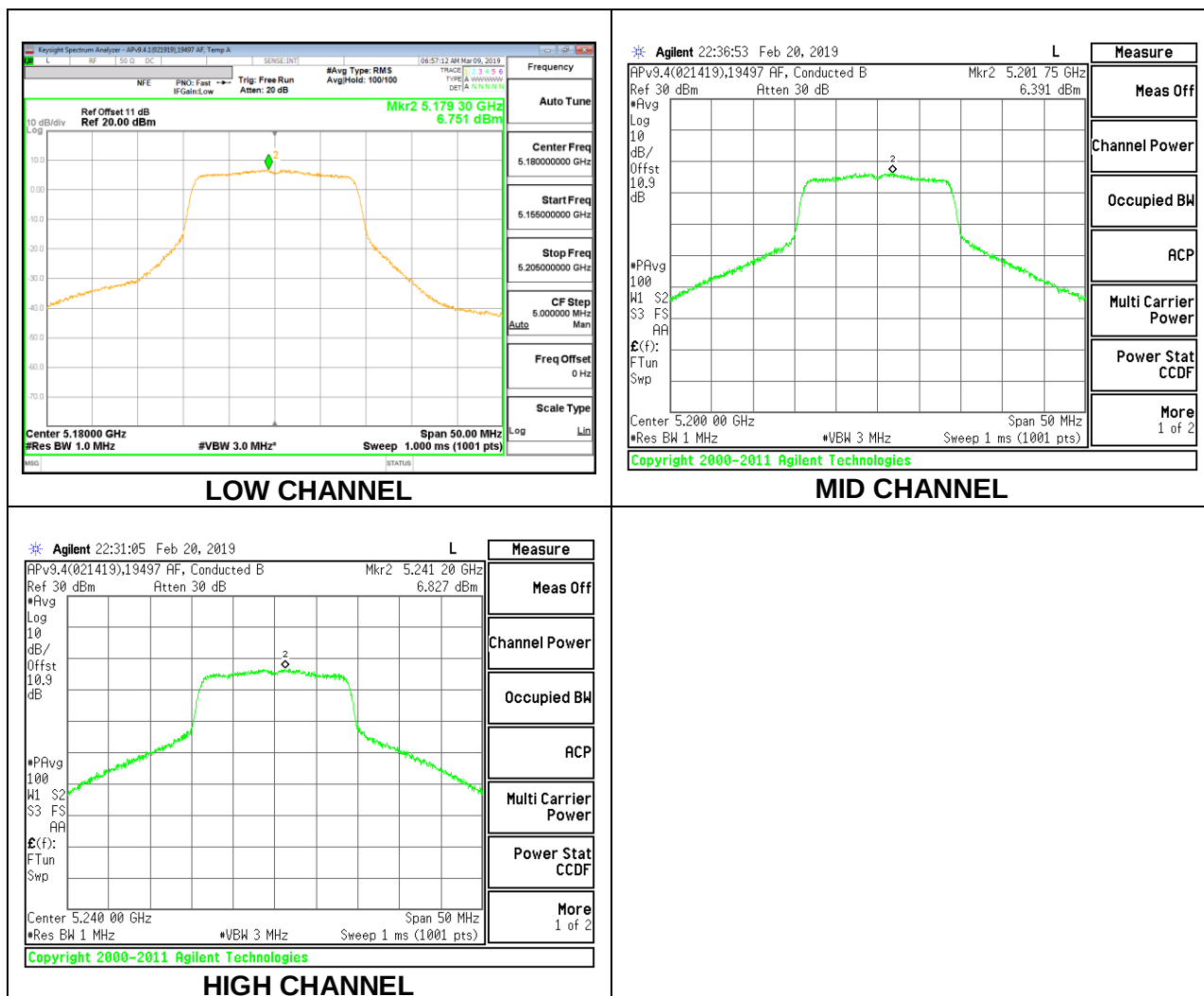
|                    |      |                                        |
|--------------------|------|----------------------------------------|
| Duty Cycle CF (dB) | 0.10 | Included in Calculations of Corr'd PSD |
|--------------------|------|----------------------------------------|

#### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5180               | 18.48                  | 18.48                             | 24.00                   | -5.52                   |
| Mid     | 5200               | 18.58                  | 18.58                             | 24.00                   | -5.42                   |
| High    | 5240               | 18.83                  | 18.83                             | 24.00                   | -5.17                   |

#### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/1MHz) | Total<br>Corr'd<br>PSD<br>(dBm/1MHz) | PSD<br>Limit<br>(dBm/<br>1MHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|---------------------------|--------------------------------------|--------------------------------|-----------------------|
| Low     | 5180               | 6.751                     | 6.85                                 | 11.00                          | -4.15                 |
| Mid     | 5200               | 6.391                     | 6.49                                 | 11.00                          | -4.51                 |
| High    | 5240               | 6.827                     | 6.93                                 | 11.00                          | -4.07                 |



### 9.4.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

#### 1TX Antenna 1 MODE (FCC) MOBILE

##### Antenna Gain and Limits

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>for Power<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/<br>1MHz) |
|---------|--------------------|-------------------------------------------|-------------------------|--------------------------------|
| Low     | 5190               | -5.92                                     | 24.00                   | 11.00                          |
| High    | 5230               | -5.92                                     | 24.00                   | 11.00                          |

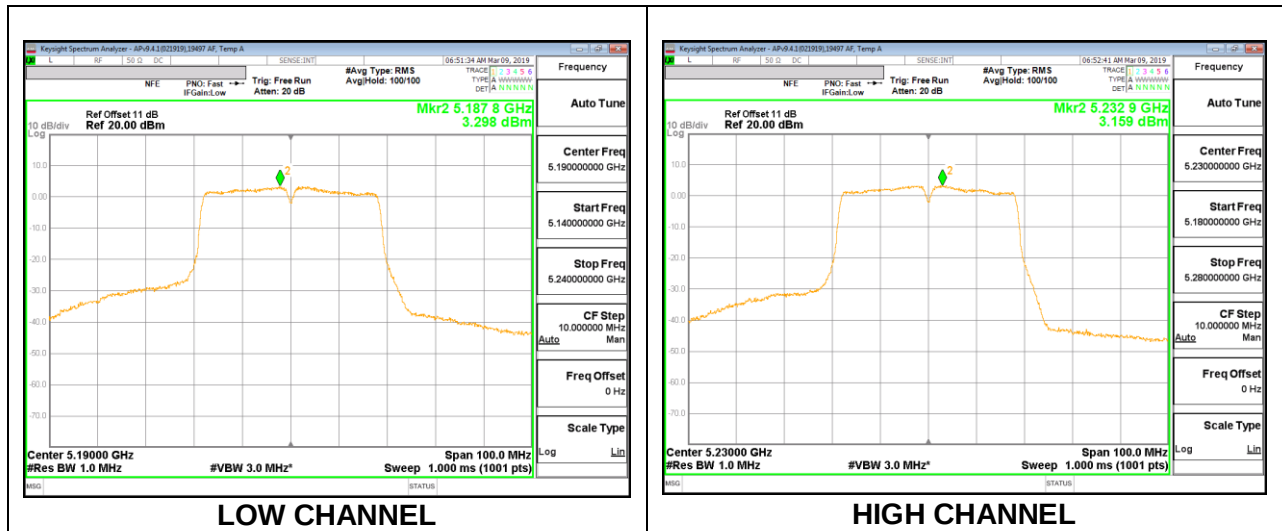
|                    |      |                                        |
|--------------------|------|----------------------------------------|
| Duty Cycle CF (dB) | 0.19 | Included in Calculations of Corr'd PSD |
|--------------------|------|----------------------------------------|

##### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5190               | 15.97                  | 15.97                             | 24.00                   | -8.03                   |
| High    | 5230               | 17.76                  | 17.76                             | 24.00                   | -6.24                   |

##### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/1MHz) | Total<br>Corr'd<br>PSD<br>(dBm/1MHz) | PSD<br>Limit<br>(dBm/<br>1MHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|---------------------------|--------------------------------------|--------------------------------|-----------------------|
| Low     | 5190               | 3.298                     | 3.49                                 | 11.00                          | -7.51                 |
| High    | 5230               | 3.159                     | 3.35                                 | 11.00                          | -7.65                 |



#### 9.4.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

##### 1TX Antenna 1 MODE (FCC) MOBILE

###### Antenna Gain and Limits

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/<br>1MHz) |
|---------|--------------------|------------------------------|-------------------------|--------------------------------|
| Mid     | 5210               | -5.92                        | 24.00                   | 11.00                          |

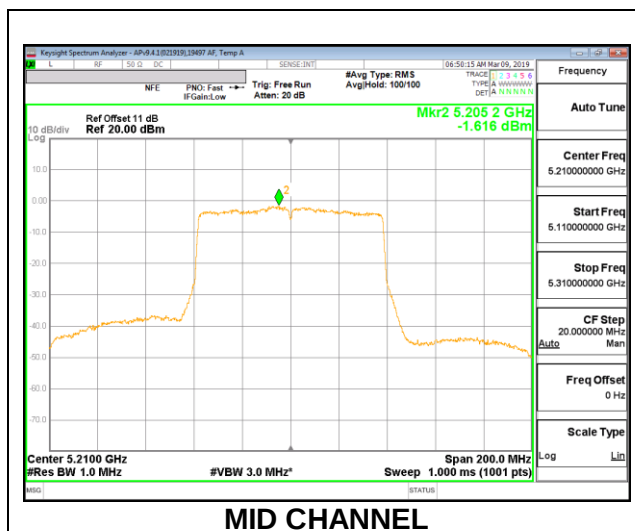
|                    |      |                                        |
|--------------------|------|----------------------------------------|
| Duty Cycle CF (dB) | 0.44 | Included in Calculations of Corr'd PSD |
|--------------------|------|----------------------------------------|

###### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Mid     | 5210               | 15.22                  | 15.22                             | 24.00                   | -8.78                   |

###### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/<br>1MHz) | Total<br>Corr'd<br>PSD<br>(dBm/<br>1MHz) | PSD<br>Limit<br>(dBm/<br>1MHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|-------------------------------|------------------------------------------|--------------------------------|-----------------------|
| Mid     | 5210               | -1.616                        | -1.18                                    | 11.00                          | -12.18                |



### 9.4.5. 802.11a MODE IN THE 5.3 GHz BAND

#### 1TX Antenna 1 MODE (FCC)

##### Bandwidth, Antenna Gain, and Limits

| Channel | Frequency<br>(MHz) | Min<br>26 dB<br>BW<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/1MHz) |
|---------|--------------------|-----------------------------|------------------------------|-------------------------|----------------------------|
| Low     | 5260               | 23.50                       | -6.50                        | 24.00                   | 11.00                      |
| Mid     | 5300               | 23.40                       | -6.50                        | 24.00                   | 11.00                      |
| High    | 5320               | 23.55                       | -6.50                        | 24.00                   | 11.00                      |

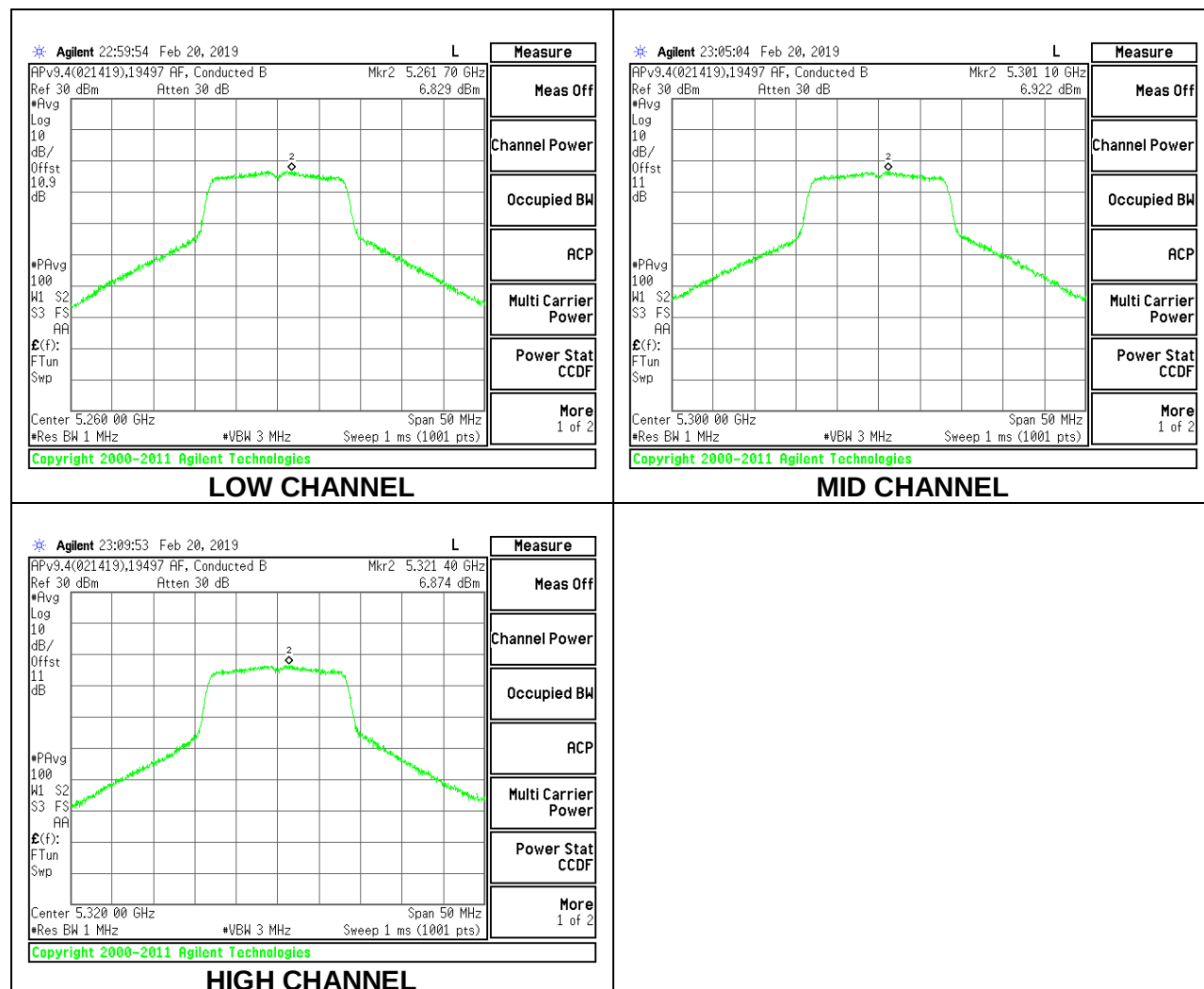
|                    |      |                                        |
|--------------------|------|----------------------------------------|
| Duty Cycle CF (dB) | 0.09 | Included in Calculations of Corr'd PSD |
|--------------------|------|----------------------------------------|

##### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5260               | 17.51                  | 17.51                             | 24.00                   | -6.49                   |
| Mid     | 5300               | 17.66                  | 17.66                             | 24.00                   | -6.34                   |
| High    | 5320               | 17.58                  | 17.58                             | 24.00                   | -6.42                   |

##### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/1MHz) | Total<br>Corr'd<br>PSD<br>(dBm/1MHz) | PSD<br>Limit<br>(dBm/1MHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|---------------------------|--------------------------------------|----------------------------|-----------------------|
| Low     | 5260               | 6.829                     | 6.92                                 | 11.00                      | -4.08                 |
| Mid     | 5300               | 6.922                     | 7.01                                 | 11.00                      | -3.99                 |
| High    | 5320               | 6.845                     | 6.94                                 | 11.00                      | -4.07                 |



## 9.4.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

### 1TX Antenna 1 MODE (FCC)

#### Bandwidth, Antenna Gain, and Limits

| Channel | Frequency<br>(MHz) | Min<br>26 dB<br>BW<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/1MHz) |
|---------|--------------------|-----------------------------|------------------------------|-------------------------|----------------------------|
| Low     | 5260               | 24.80                       | -6.50                        | 24.00                   | 11.00                      |
| Mid     | 5300               | 24.60                       | -6.50                        | 24.00                   | 11.00                      |
| High    | 5320               | 24.25                       | -6.50                        | 24.00                   | 11.00                      |

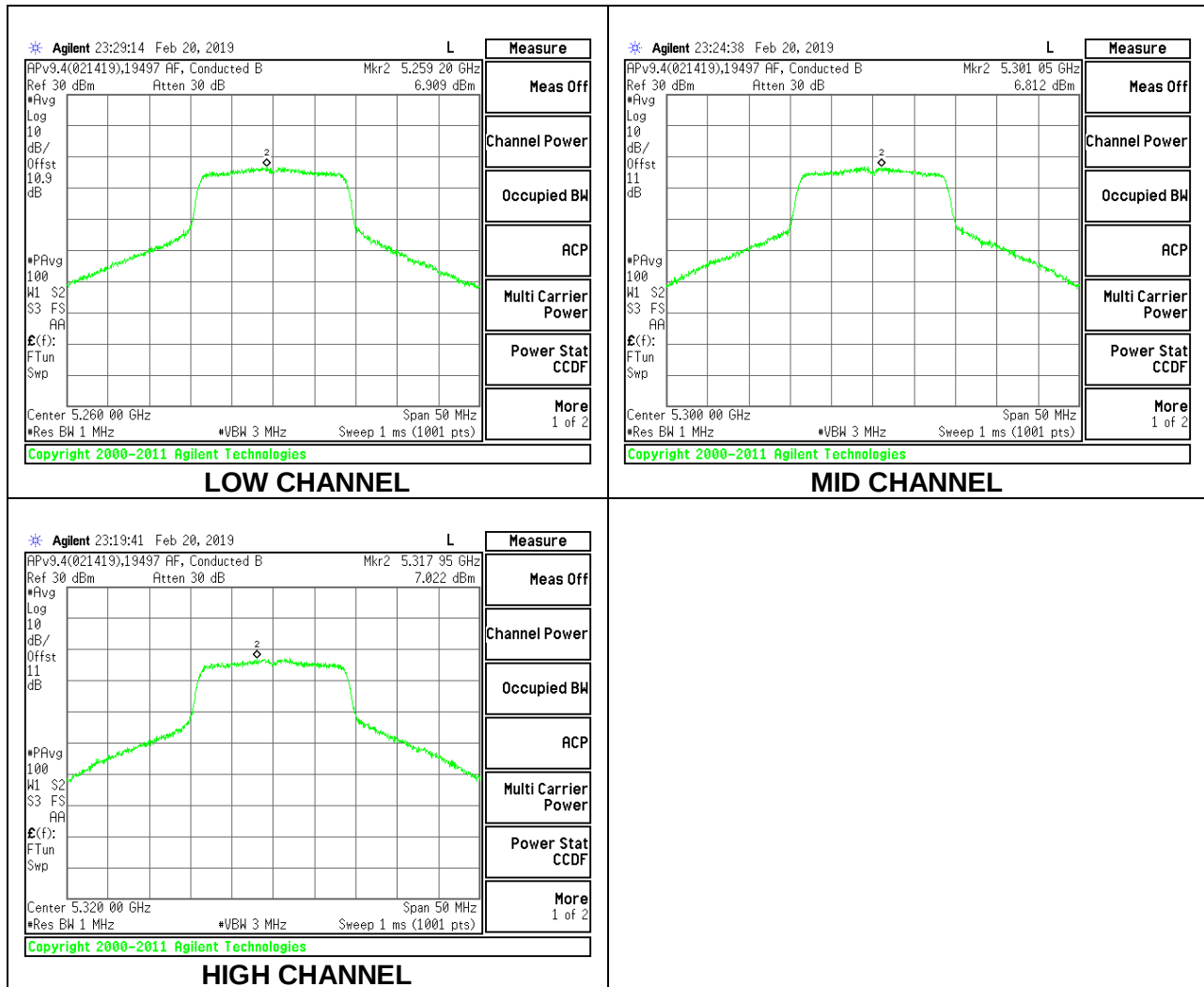
|                    |      |                                        |
|--------------------|------|----------------------------------------|
| Duty Cycle CF (dB) | 0.10 | Included in Calculations of Corr'd PSD |
|--------------------|------|----------------------------------------|

#### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5260               | 18.52                  | 18.52                             | 24.00                   | -5.48                   |
| Mid     | 5300               | 18.69                  | 18.69                             | 24.00                   | -5.31                   |
| High    | 5320               | 18.83                  | 18.83                             | 24.00                   | -5.17                   |

#### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/1MHz) | Total<br>Corr'd<br>PSD<br>(dBm/1MHz) | PSD<br>Limit<br>(dBm/1MHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|---------------------------|--------------------------------------|----------------------------|-----------------------|
| Low     | 5260               | 6.909                     | 7.01                                 | 11.00                      | -3.99                 |
| Mid     | 5300               | 6.812                     | 6.91                                 | 11.00                      | -4.09                 |
| High    | 5320               | 7.022                     | 7.12                                 | 11.00                      | -3.88                 |



## 9.4.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

### 1TX Antenna 1 MODE (FCC)

#### Bandwidth, Antenna Gain, and Limits

| Channel | Frequency<br>(MHz) | Min<br>26 dB<br>BW<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/1MHz) |
|---------|--------------------|-----------------------------|------------------------------|-------------------------|----------------------------|
| Low     | 5270               | 42.40                       | -6.50                        | 24.00                   | 11.00                      |
| High    | 5310               | 42.00                       | -6.50                        | 24.00                   | 11.00                      |

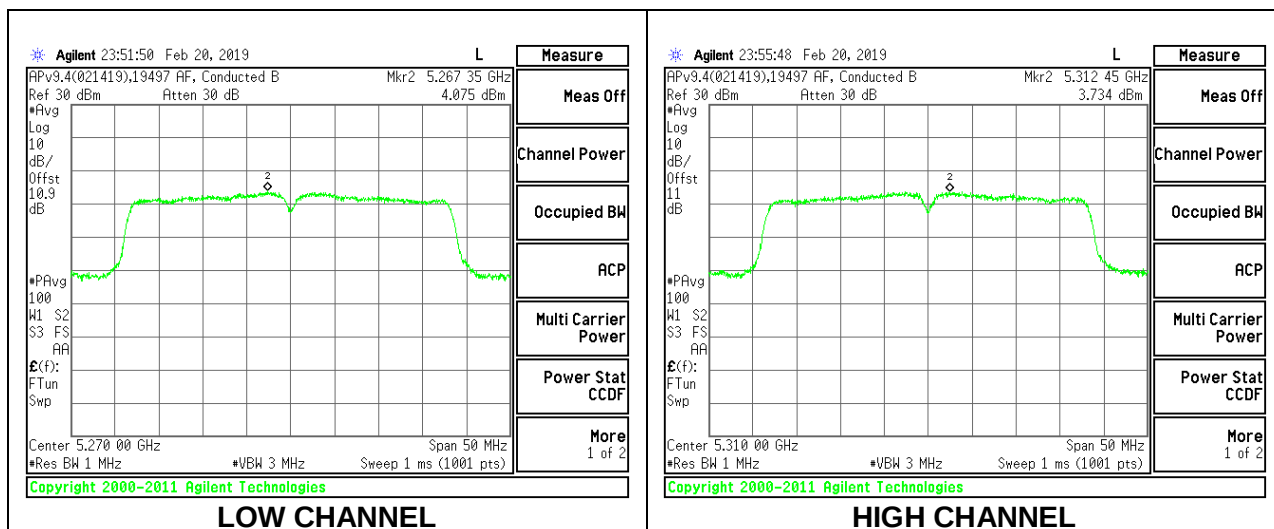
|                    |      |                                        |
|--------------------|------|----------------------------------------|
| Duty Cycle CF (dB) | 0.19 | Included in Calculations of Corr'd PSD |
|--------------------|------|----------------------------------------|

#### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5270               | 17.83                  | 17.83                             | 24.00                   | -6.17                   |
| High    | 5310               | 17.71                  | 17.71                             | 24.00                   | -6.29                   |

#### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/1MHz) | Total<br>Corr'd<br>PSD<br>(dBm/1MHz) | PSD<br>Limit<br>(dBm/1MHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|---------------------------|--------------------------------------|----------------------------|-----------------------|
| Low     | 5270               | 4.075                     | 4.27                                 | 11.00                      | -6.74                 |
| High    | 5310               | 3.734                     | 3.92                                 | 11.00                      | -7.08                 |



### 9.4.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

#### 1TX Antenna 1 MODE (FCC)

##### Bandwidth, Antenna Gain, and Limits

| Channel | Frequency<br>(MHz) | Min<br>26 dB<br>BW<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/1MHz) |
|---------|--------------------|-----------------------------|------------------------------|-------------------------|----------------------------|
| Mid     | 5290               | 85.20                       | -6.50                        | 24.00                   | 11.00                      |

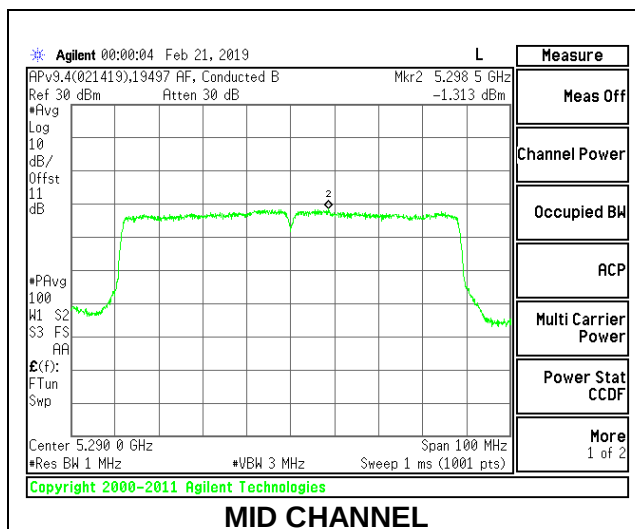
|                    |      |                                        |
|--------------------|------|----------------------------------------|
| Duty Cycle CF (dB) | 0.44 | Included in Calculations of Corr'd PSD |
|--------------------|------|----------------------------------------|

##### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Mid     | 5290               | 15.80                  | 15.80                             | 24.00                   | -8.20                   |

##### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/1MHz) | Total<br>Corr'd<br>PSD<br>(dBm/1MHz) | PSD<br>Limit<br>(dBm/1MHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|---------------------------|--------------------------------------|----------------------------|-----------------------|
| Mid     | 5290               | -1.313                    | -0.87                                | 11.00                      | -11.87                |



### 9.4.9. 802.11a MODE IN THE 5.6 GHz BAND

#### 1TX Antenna 1 MODE (FCC)

##### Bandwidth, Antenna Gain, and Limits

| Channel | Frequency<br>(MHz) | Min<br>26 dB<br>BW<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/<br>1MHz) |
|---------|--------------------|-----------------------------|------------------------------|-------------------------|--------------------------------|
| Low     | 5500               | 23.20                       | -5.92                        | 24.00                   | 11.00                          |
| Mid     | 5580               | 23.20                       | -5.92                        | 24.00                   | 11.00                          |
| High    | 5700               | 23.05                       | -5.92                        | 24.00                   | 11.00                          |
| 144     | 5720               | 22.85                       | -5.92                        | 24.00                   | 11.00                          |

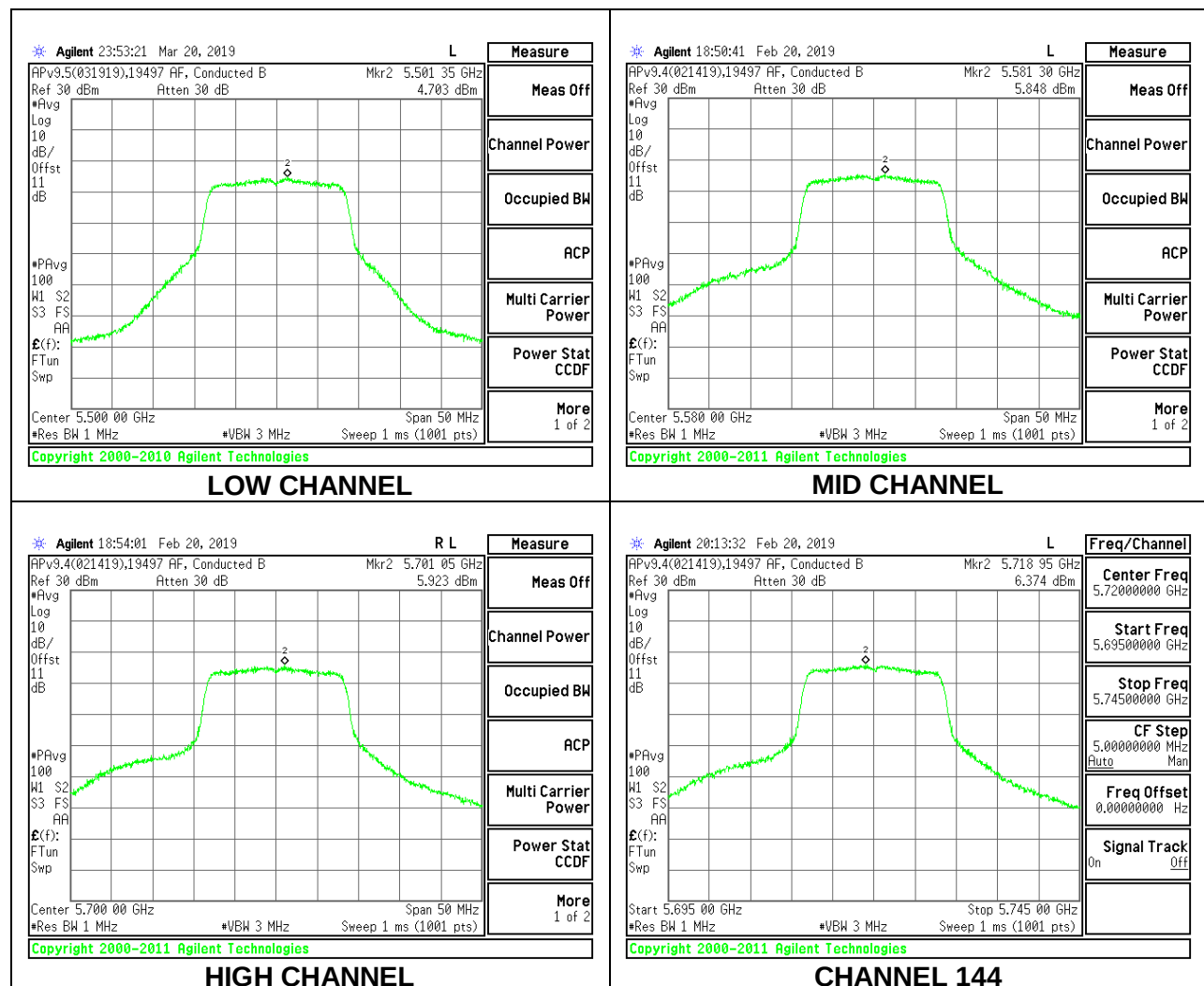
|                    |      |                                                |
|--------------------|------|------------------------------------------------|
| Duty Cycle CF (dB) | 0.09 | Included in Calculations of Corr'd Power & PSD |
|--------------------|------|------------------------------------------------|

##### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5500               | 14.75                  | 14.75                             | 24.00                   | -9.25                   |
| Mid     | 5580               | 17.45                  | 17.45                             | 24.00                   | -6.55                   |
| High    | 5700               | 17.68                  | 17.68                             | 24.00                   | -6.32                   |
| 144     | 5720               | 17.56                  | 17.56                             | 24.00                   | -6.44                   |

##### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/<br>1MHz) | Total<br>Corr'd<br>PSD<br>(dBm/<br>1MHz) | PSD<br>Limit<br>(dBm/<br>1MHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|-------------------------------|------------------------------------------|--------------------------------|-----------------------|
| Low     | 5500               | 4.703                         | 4.79                                     | 11.00                          | -6.21                 |
| Mid     | 5580               | 5.848                         | 5.94                                     | 11.00                          | -5.06                 |
| High    | 5700               | 5.923                         | 6.01                                     | 11.00                          | -4.99                 |
| 144     | 5720               | 6.374                         | 6.46                                     | 11.00                          | -4.54                 |



### 9.4.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

#### 1TX Antenna 1 MODE (FCC)

##### Bandwidth, Antenna Gain, and Limits

| Channel | Frequency<br>(MHz) | Min<br>26 dB<br>BW<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/<br>1MHz) |
|---------|--------------------|-----------------------------|------------------------------|-------------------------|--------------------------------|
| Low     | 5500               | 25.40                       | -5.92                        | 24.00                   | 11.00                          |
| Mid     | 5580               | 25.30                       | -5.92                        | 24.00                   | 11.00                          |
| High    | 5700               | 24.55                       | -5.92                        | 24.00                   | 11.00                          |
| 144     | 5720               | 25.20                       | -5.92                        | 24.00                   | 11.00                          |

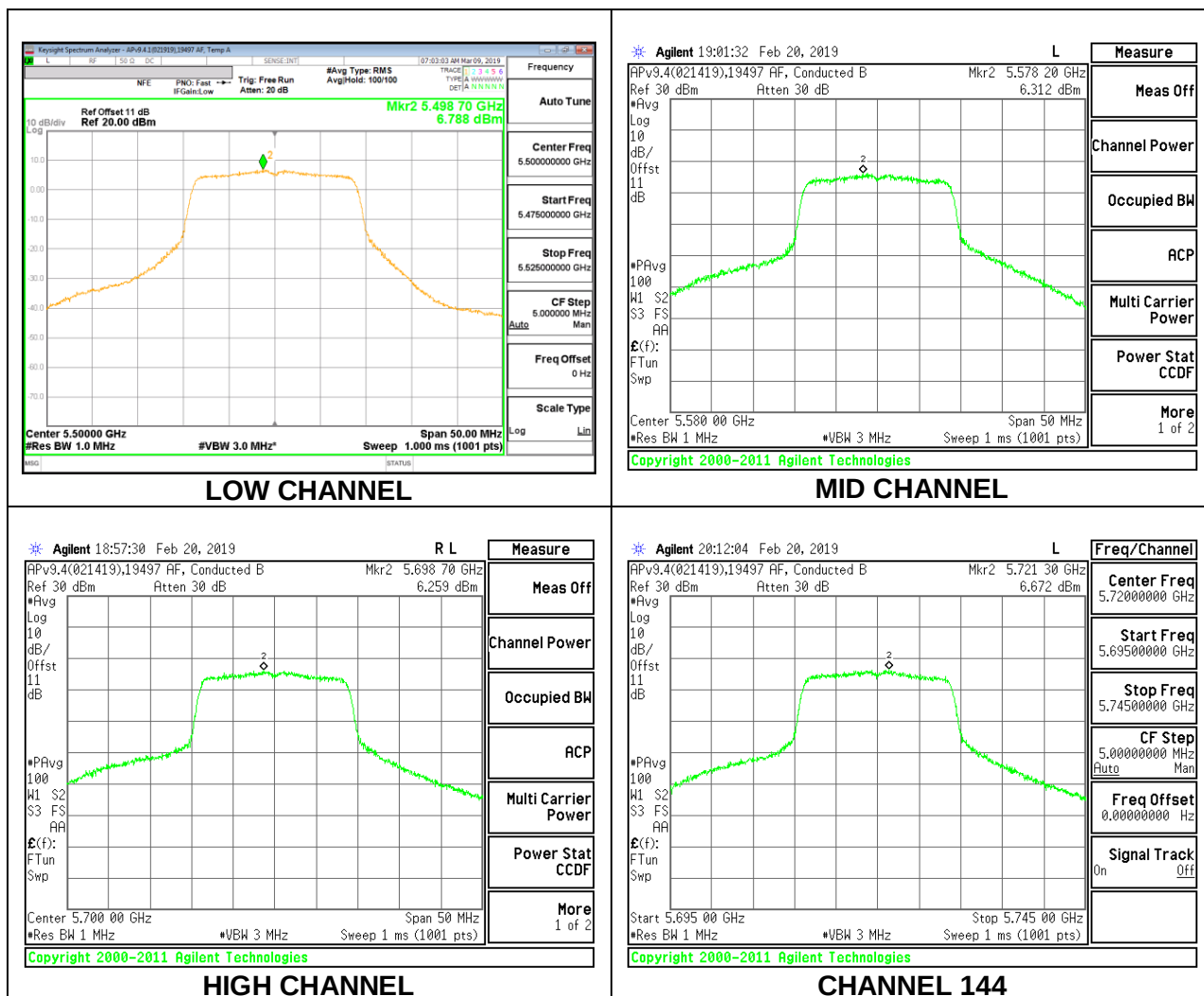
|                    |      |                                                |
|--------------------|------|------------------------------------------------|
| Duty Cycle CF (dB) | 0.10 | Included in Calculations of Corr'd Power & PSD |
|--------------------|------|------------------------------------------------|

##### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5500               | 18.66                  | 18.66                             | 24.00                   | -5.34                   |
| Mid     | 5580               | 18.46                  | 18.46                             | 24.00                   | -5.54                   |
| High    | 5700               | 18.69                  | 18.69                             | 24.00                   | -5.31                   |
| 144     | 5720               | 18.72                  | 18.72                             | 24.00                   | -5.28                   |

##### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/<br>1MHz) | Total<br>Corr'd<br>PSD<br>(dBm/<br>1MHz) | PSD<br>Limit<br>(dBm/<br>1MHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|-------------------------------|------------------------------------------|--------------------------------|-----------------------|
| Low     | 5500               | 6.788                         | 6.89                                     | 11.00                          | -4.11                 |
| Mid     | 5580               | 6.312                         | 6.41                                     | 11.00                          | -4.59                 |
| High    | 5700               | 6.259                         | 6.36                                     | 11.00                          | -4.64                 |
| 144     | 5720               | 6.672                         | 6.77                                     | 11.00                          | -4.23                 |



### 9.4.11. 802.11n HT40 MODE IN THE 5.6 GHz BAND

#### 1TX Antenna 1 MODE (FCC)

##### Bandwidth, Antenna Gain, and Limits

| Channel | Frequency<br>(MHz) | Min<br>26 dB<br>BW<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/<br>1MHz) |
|---------|--------------------|-----------------------------|------------------------------|-------------------------|--------------------------------|
| Low     | 5510               | 42.70                       | -5.92                        | 24.00                   | 11.00                          |
| Mid     | 5550               | 42.50                       | -5.92                        | 24.00                   | 11.00                          |
| High    | 5670               | 42.60                       | -5.92                        | 24.00                   | 11.00                          |
| 142     | 5710               | 42.50                       | -5.92                        | 24.00                   | 11.00                          |

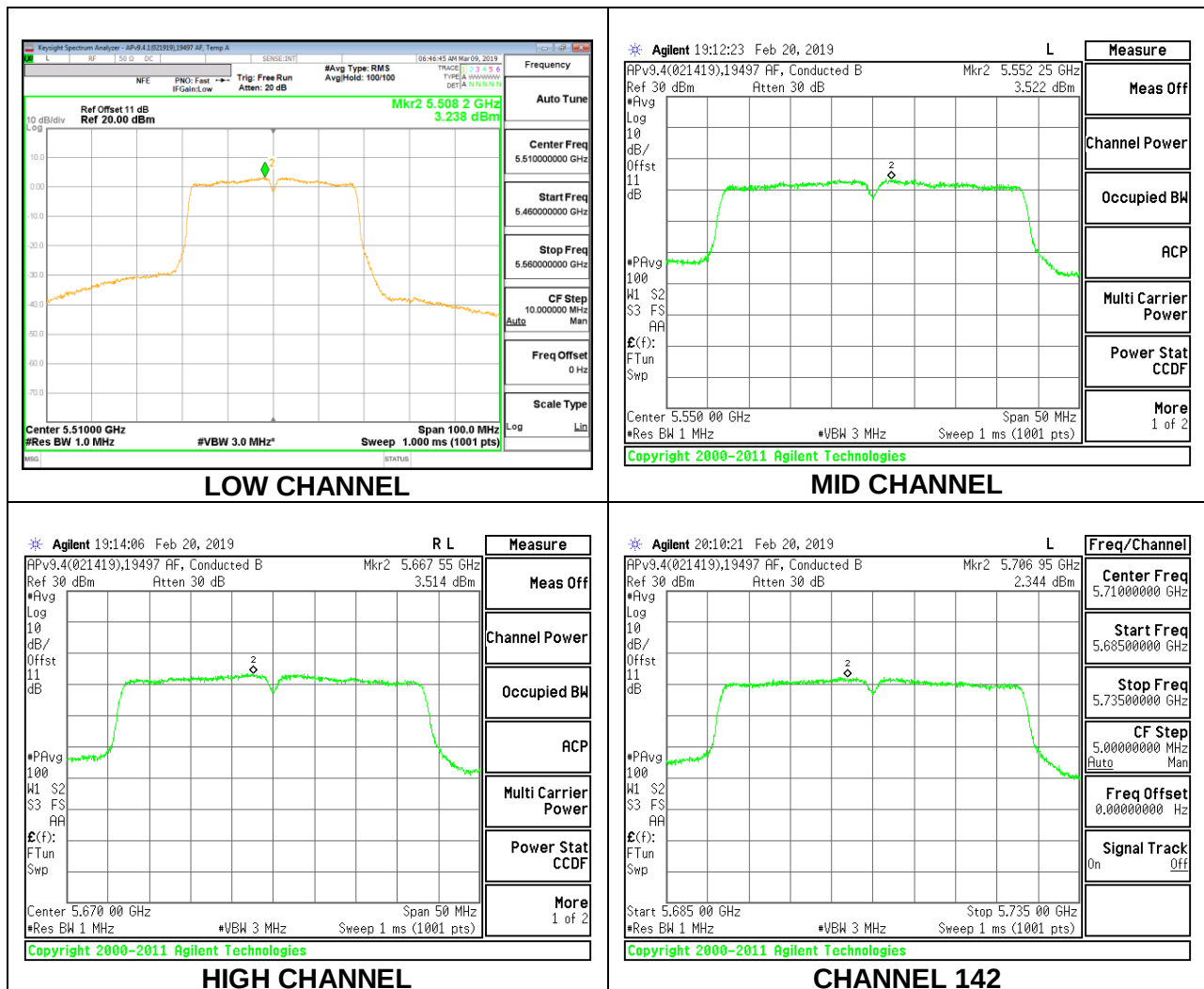
|                    |      |                                                |
|--------------------|------|------------------------------------------------|
| Duty Cycle CF (dB) | 0.19 | Included in Calculations of Corr'd Power & PSD |
|--------------------|------|------------------------------------------------|

##### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5510               | 15.98                  | 15.98                             | 24.00                   | -8.02                   |
| Mid     | 5550               | 17.80                  | 17.80                             | 24.00                   | -6.20                   |
| High    | 5670               | 17.87                  | 17.87                             | 24.00                   | -6.13                   |
| 142     | 5710               | 17.68                  | 17.68                             | 24.00                   | -6.32                   |

##### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/<br>1MHz) | Total<br>Corr'd<br>PSD<br>(dBm/<br>1MHz) | PSD<br>Limit<br>(dBm/<br>1MHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|-------------------------------|------------------------------------------|--------------------------------|-----------------------|
| Low     | 5510               | 3.238                         | 3.43                                     | 11.00                          | -7.57                 |
| Mid     | 5550               | 3.522                         | 3.71                                     | 11.00                          | -7.29                 |
| High    | 5670               | 3.514                         | 3.70                                     | 11.00                          | -7.30                 |
| 142     | 5710               | 2.344                         | 2.53                                     | 11.00                          | -8.47                 |



## 9.4.12. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

### 1TX Antenna 1 MODE (FCC)

#### Bandwidth, Antenna Gain, and Limits

| Channel | Frequency<br>(MHz) | Min<br>26 dB<br>BW<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/<br>1MHz) |
|---------|--------------------|-----------------------------|------------------------------|-------------------------|--------------------------------|
| Low     | 5530               | 84.60                       | -5.92                        | 24.00                   | 11.00                          |
| High    | 5610               | 84.80                       | -5.92                        | 24.00                   | 11.00                          |
| 138     | 5690               | 84.80                       | -5.92                        | 24.00                   | 11.00                          |

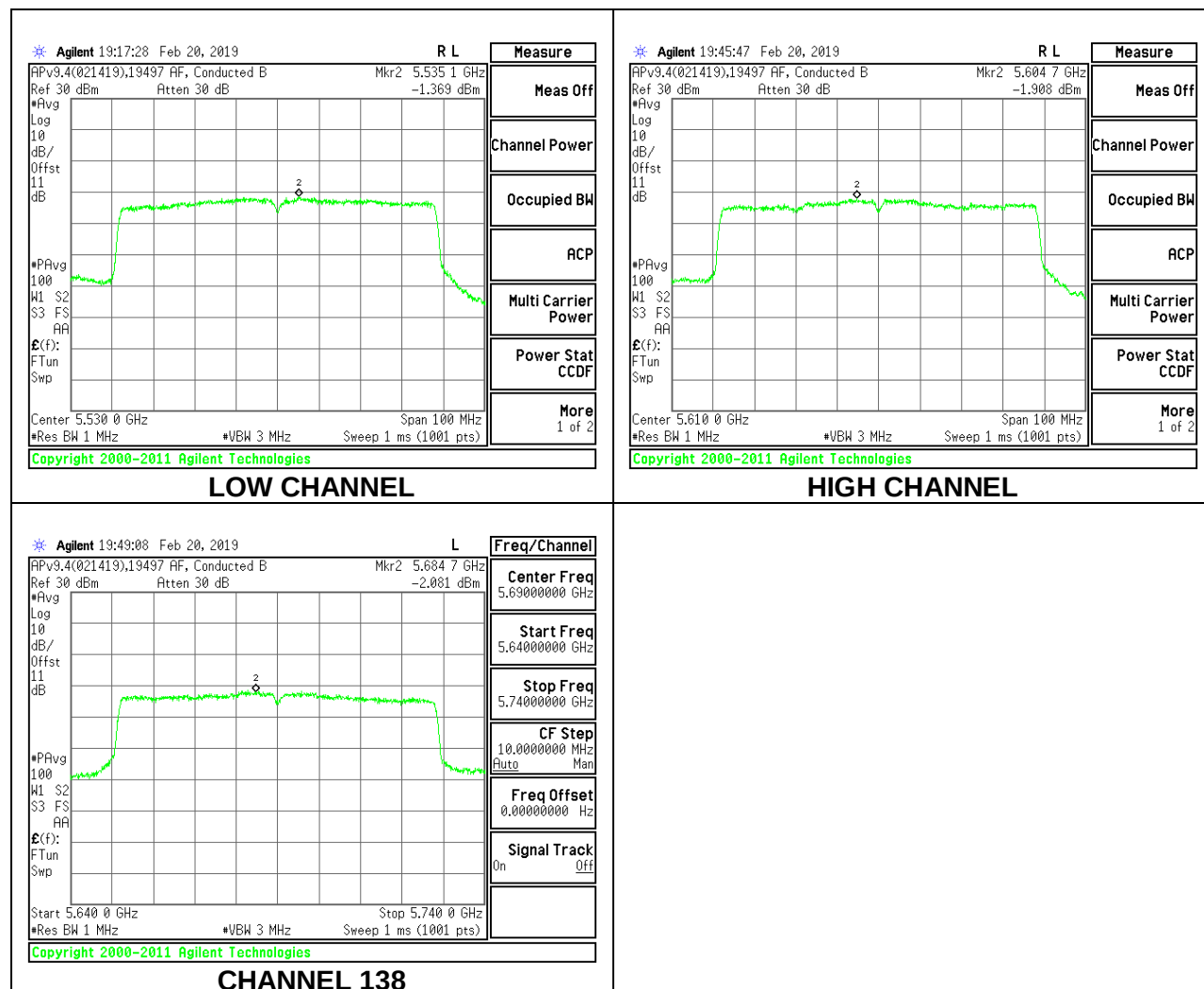
|                    |      |                                                |
|--------------------|------|------------------------------------------------|
| Duty Cycle CF (dB) | 0.44 | Included in Calculations of Corr'd Power & PSD |
|--------------------|------|------------------------------------------------|

#### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5530               | 15.51                  | 15.51                             | 24.00                   | -8.49                   |
| High    | 5610               | 15.82                  | 15.82                             | 24.00                   | -8.18                   |
| 138     | 5690               | 15.58                  | 15.58                             | 24.00                   | -8.42                   |

#### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/<br>1MHz) | Total<br>Corr'd<br>PSD<br>(dBm/<br>1MHz) | PSD<br>Limit<br>(dBm/<br>1MHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|-------------------------------|------------------------------------------|--------------------------------|-----------------------|
| Low     | 5530               | -1.369                        | -0.93                                    | 11.00                          | -11.93                |
| High    | 5610               | -1.908                        | -1.47                                    | 11.00                          | -12.47                |
| 138     | 5690               | -2.081                        | -1.64                                    | 11.00                          | -12.64                |



### 9.4.13. 802.11a MODE IN THE 5.8 GHz BAND

#### 1TX Antenna 1 MODE (FCC)

##### Antenna Gain and Limit

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/<br>500KHz) |
|---------|--------------------|------------------------------|-------------------------|----------------------------------|
| Low     | 5745               | -4.33                        | 30.00                   | 30.00                            |
| Mid     | 5785               | -4.33                        | 30.00                   | 30.00                            |
| High    | 5825               | -4.33                        | 30.00                   | 30.00                            |

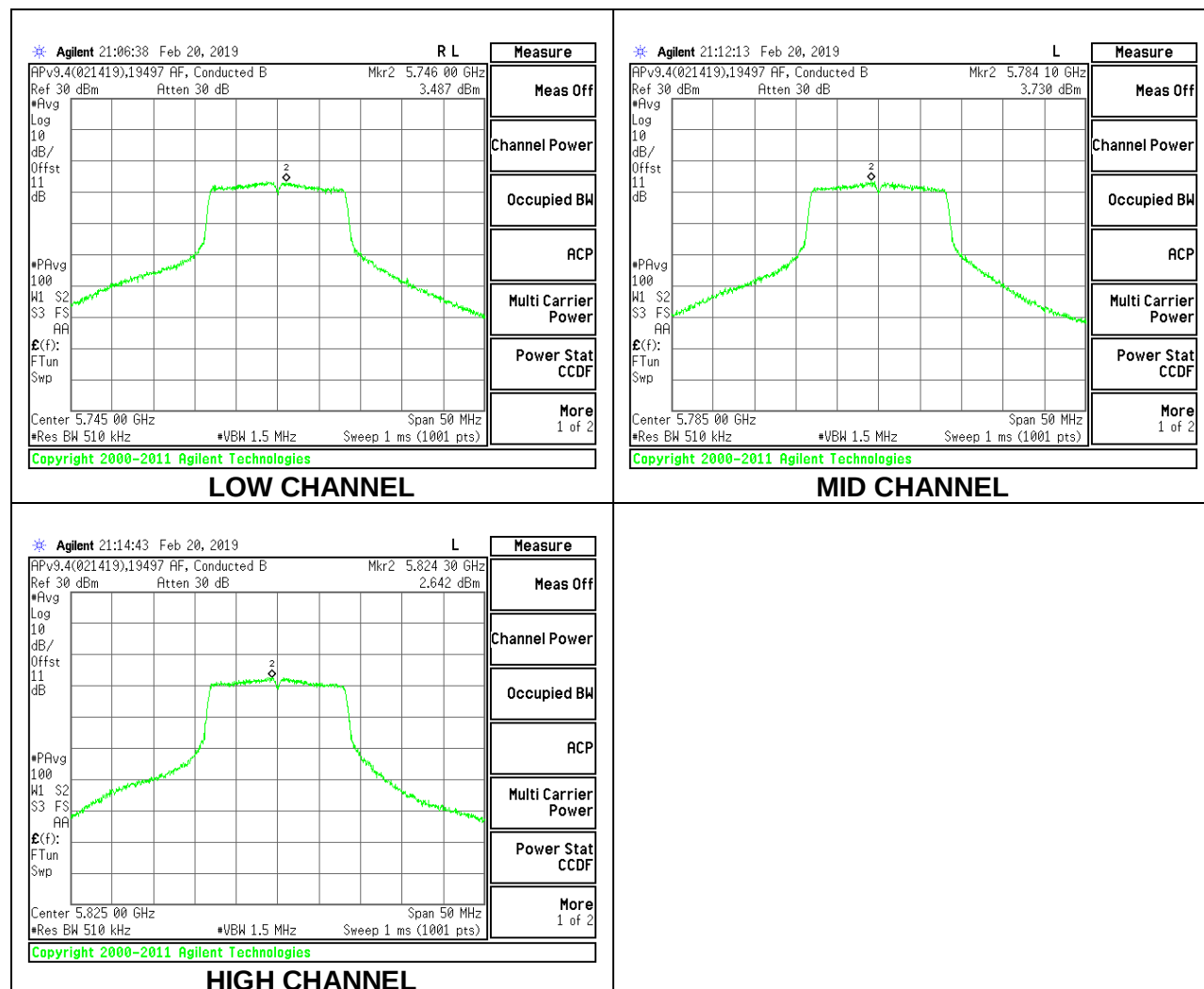
|                    |      |                                        |
|--------------------|------|----------------------------------------|
| Duty Cycle CF (dB) | 0.09 | Included in Calculations of Corr'd PSD |
|--------------------|------|----------------------------------------|

##### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5745               | 17.79                  | 17.79                             | 30.00                   | -12.21                  |
| Mid     | 5785               | 17.65                  | 17.65                             | 30.00                   | -12.35                  |
| High    | 5825               | 17.78                  | 17.78                             | 30.00                   | -12.22                  |

##### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/<br>500KHz) | Total<br>Corr'd<br>PSD<br>(dBm/<br>500KHz) | PSD<br>Limit<br>(dBm/<br>500KHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|---------------------------------|--------------------------------------------|----------------------------------|-----------------------|
| Low     | 5745               | 3.487                           | 3.577                                      | 30.00                            | -26.42                |
| Mid     | 5785               | 3.730                           | 3.820                                      | 30.00                            | -26.18                |
| High    | 5825               | 2.642                           | 2.732                                      | 30.00                            | -27.27                |



## 9.4.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

### 1TX Antenna 1 MODE (FCC)

#### Antenna Gain and Limit

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/<br>500KHz) |
|---------|--------------------|------------------------------|-------------------------|----------------------------------|
| Low     | 5745               | -4.33                        | 30.00                   | 30.00                            |
| Mid     | 5785               | -4.33                        | 30.00                   | 30.00                            |
| High    | 5825               | -4.33                        | 30.00                   | 30.00                            |

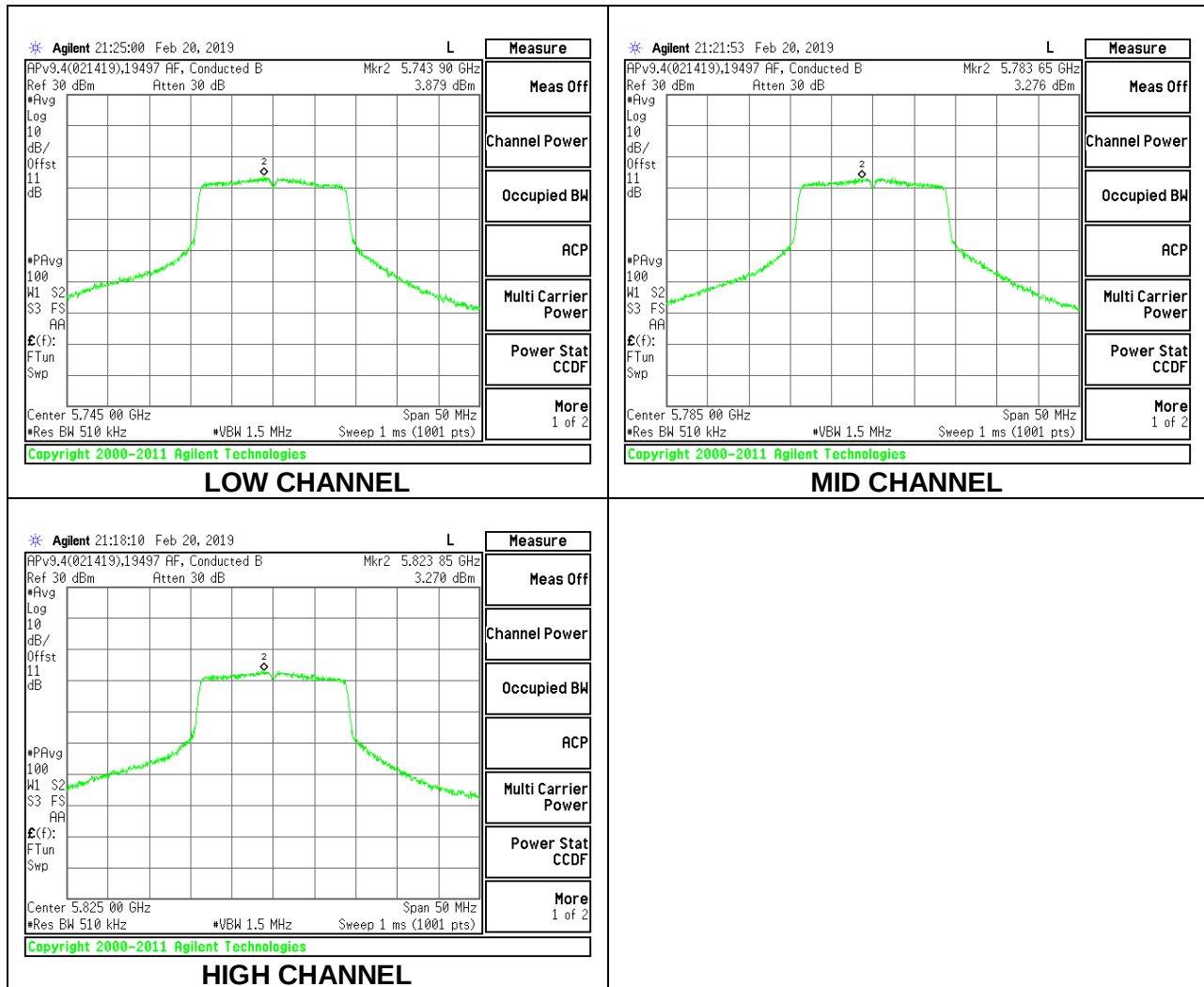
|                    |      |                                        |
|--------------------|------|----------------------------------------|
| Duty Cycle CF (dB) | 0.10 | Included in Calculations of Corr'd PSD |
|--------------------|------|----------------------------------------|

#### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5745               | 18.85                  | 18.85                             | 30.00                   | -11.15                  |
| Mid     | 5785               | 18.79                  | 18.79                             | 30.00                   | -11.21                  |
| High    | 5825               | 18.49                  | 18.49                             | 30.00                   | -11.51                  |

#### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/<br>500KHz) | Total<br>Corr'd<br>PSD<br>(dBm/<br>500KHz) | PSD<br>Limit<br>(dBm/<br>500KHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|---------------------------------|--------------------------------------------|----------------------------------|-----------------------|
| Low     | 5745               | 3.879                           | 3.979                                      | 30.00                            | -26.02                |
| Mid     | 5785               | 3.276                           | 3.376                                      | 30.00                            | -26.62                |
| High    | 5825               | 3.270                           | 3.370                                      | 30.00                            | -26.63                |



## 9.4.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

### 1TX Antenna 1 MODE (FCC)

#### Antenna Gain and Limit

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/<br>500KHz) |
|---------|--------------------|------------------------------|-------------------------|----------------------------------|
| Low     | 5755               | -4.33                        | 30.00                   | 30.00                            |
| High    | 5795               | -4.33                        | 30.00                   | 30.00                            |

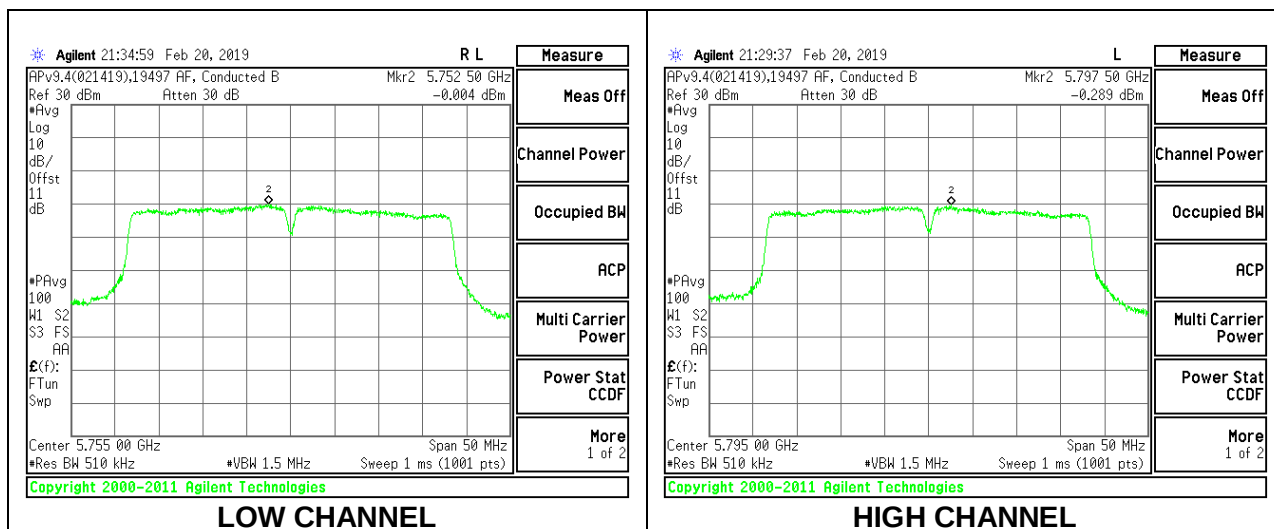
|                    |      |                                        |
|--------------------|------|----------------------------------------|
| Duty Cycle CF (dB) | 0.19 | Included in Calculations of Corr'd PSD |
|--------------------|------|----------------------------------------|

#### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Low     | 5755               | 17.51                  | 17.51                             | 30.00                   | -12.49                  |
| High    | 5795               | 17.60                  | 17.60                             | 30.00                   | -12.40                  |

#### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/<br>500KHz) | Total<br>Corr'd<br>PSD<br>(dBm/<br>500KHz) | PSD<br>Limit<br>(dBm/<br>500KHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|---------------------------------|--------------------------------------------|----------------------------------|-----------------------|
| Low     | 5755               | -0.004                          | 0.186                                      | 30.00                            | -29.81                |
| High    | 5795               | -0.289                          | -0.099                                     | 30.00                            | -30.10                |



## 9.4.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

### 1TX Antenna 1 MODE (FCC)

#### Antenna Gain and Limit

| Channel | Frequency<br>(MHz) | Directional<br>Gain<br>(dBi) | Power<br>Limit<br>(dBm) | PSD<br>Limit<br>(dBm/<br>1MHz) |
|---------|--------------------|------------------------------|-------------------------|--------------------------------|
| Mid     | 5775               | -4.33                        | 30.00                   | 30.00                          |

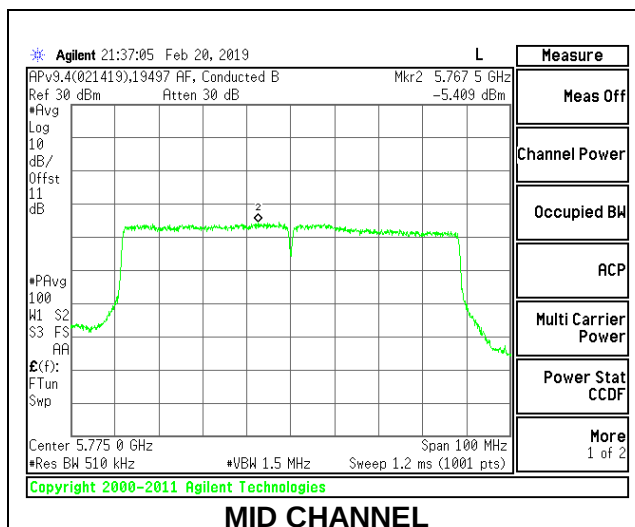
|                    |      |                                        |
|--------------------|------|----------------------------------------|
| Duty Cycle CF (dB) | 0.44 | Included in Calculations of Corr'd PSD |
|--------------------|------|----------------------------------------|

#### Output Power Results

| Channel | Frequency<br>(MHz) | Meas<br>Power<br>(dBm) | Total<br>Corr'd<br>Power<br>(dBm) | Power<br>Limit<br>(dBm) | Power<br>Margin<br>(dB) |
|---------|--------------------|------------------------|-----------------------------------|-------------------------|-------------------------|
| Mid     | 5775               | 15.89                  | 15.89                             | 30.00                   | -14.11                  |

#### PSD Results

| Channel | Frequency<br>(MHz) | Meas<br>PSD<br>(dBm/<br>500KHz) | Total<br>Corr'd<br>PSD<br>(dBm/<br>500KHz) | PSD<br>Limit<br>(dBm/<br>500KHz) | PSD<br>Margin<br>(dB) |
|---------|--------------------|---------------------------------|--------------------------------------------|----------------------------------|-----------------------|
| Mid     | 5775               | -5.409                          | -4.969                                     | 30.00                            | -34.97                |



## 10. RADIATED TEST RESULTS

### LIMITS

FCC §15.205 and §15.209 -Restricted bands

FCC §15.407(b)(1-3) -Un-Restricted bands

### After January 01, 2019 for Outside of the Restricted Bands Emissions

| 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 pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final 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 1GHz and 18GHz to 40 GHz is investigated with the transmitter set to transmit at the channel with highest output power as worst-case scenario. 1GHz to 18GHz was set to the lowest, middle, and highest channels in the 5 GHz bands.

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.

2D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.

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**KDB 414788 OFS and Chamber Correlation Justification**

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

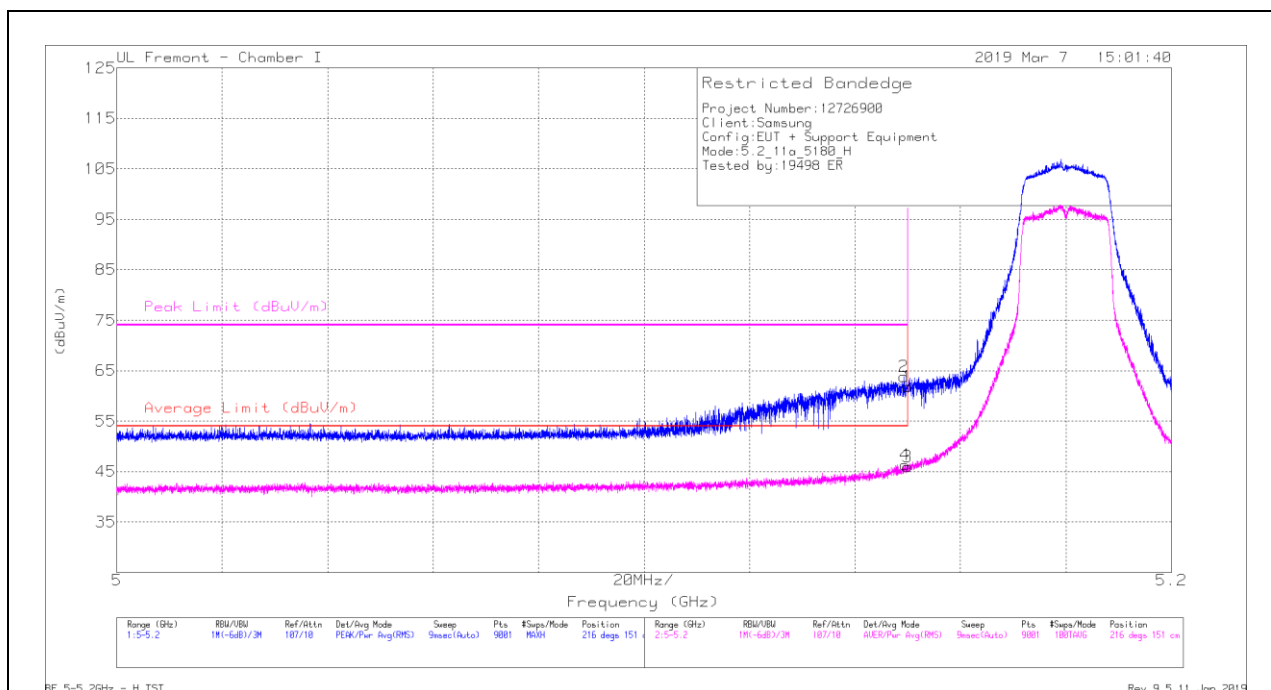
## 10.1. TRANSMITTER ABOVE 1 GHz

### 10.1.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND

#### 1TX Antenna 1 MODE

#### BANDEDGE (LOW CHANNEL)

#### HORIZONTAL RESULT



#### Trace Markers

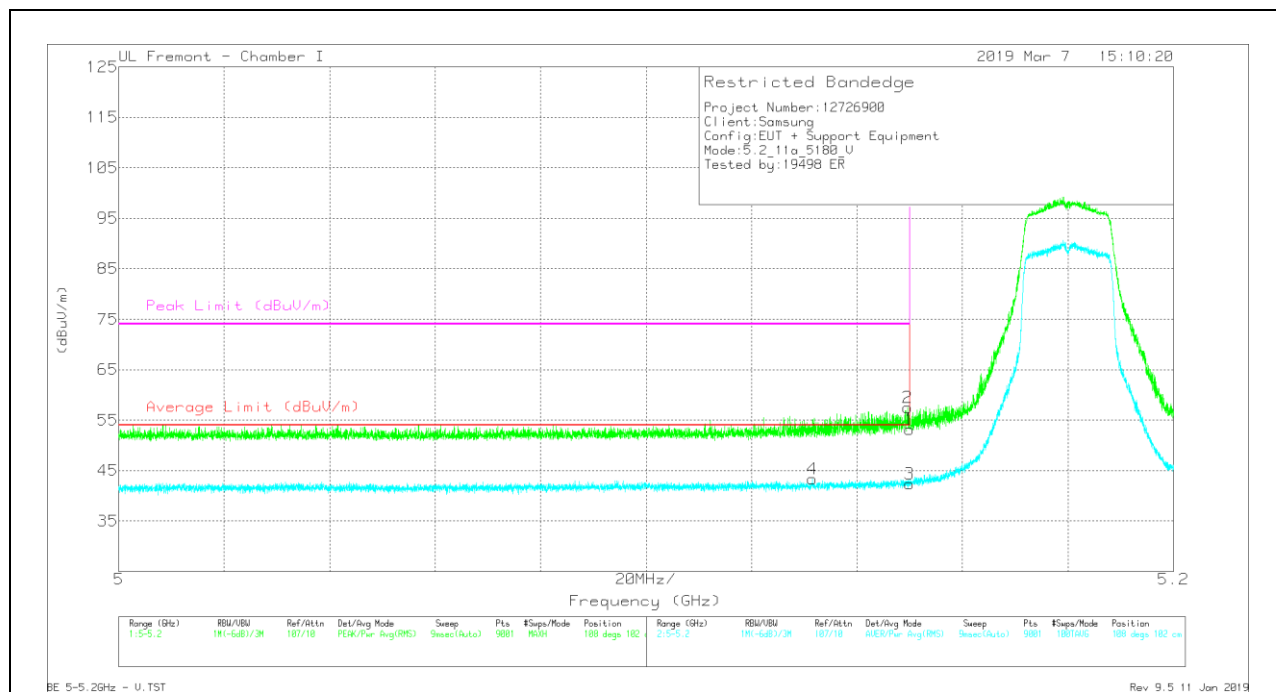
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T862 (dB/m) | Amp/Cbl/Ftr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|----------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 5.15          | 46.42                | Pk  | 34.4           | -19                  | 0            | 61.82                      | -                      | -           | 74                  | -12.18         | 216            | 151         | H        |
| 2      | * 5.149         | 48.39                | Pk  | 34.4           | -19                  | 0            | 63.79                      | -                      | -           | 74                  | -10.21         | 216            | 151         | H        |
| 3      | * 5.15          | 30.48                | RMS | 34.4           | -19                  | .09          | 45.97                      | 54                     | -8.03       | -                   | -              | 216            | 151         | H        |
| 4      | * 5.15          | 30.78                | RMS | 34.4           | -19                  | .09          | 46.27                      | 54                     | -7.73       | -                   | -              | 216            | 151         | H        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK - Peak detector

RMS - RMS detection

## VERTICAL RESULT



## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T862 (dB/m) | Amp/Cbl/Ftr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|----------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 5.15          | 37.73                | Pk  | 34.4           | -19                  | 0            | 53.13                      | -                      | -           | 74                  | -20.87         | 108            | 102         | V        |
| 2      | * 5.15          | 42.06                | Pk  | 34.4           | -19                  | 0            | 57.46                      | -                      | -           | 74                  | -16.54         | 108            | 102         | V        |
| 3      | * 5.15          | 26.83                | RMS | 34.4           | -19                  | .09          | 42.32                      | 54                     | -11.68      | -                   | -              | 108            | 102         | V        |
| 4      | * 5.132         | 27.93                | RMS | 34.3           | -19                  | .09          | 43.32                      | 54                     | -10.68      | -                   | -              | 108            | 102         | V        |

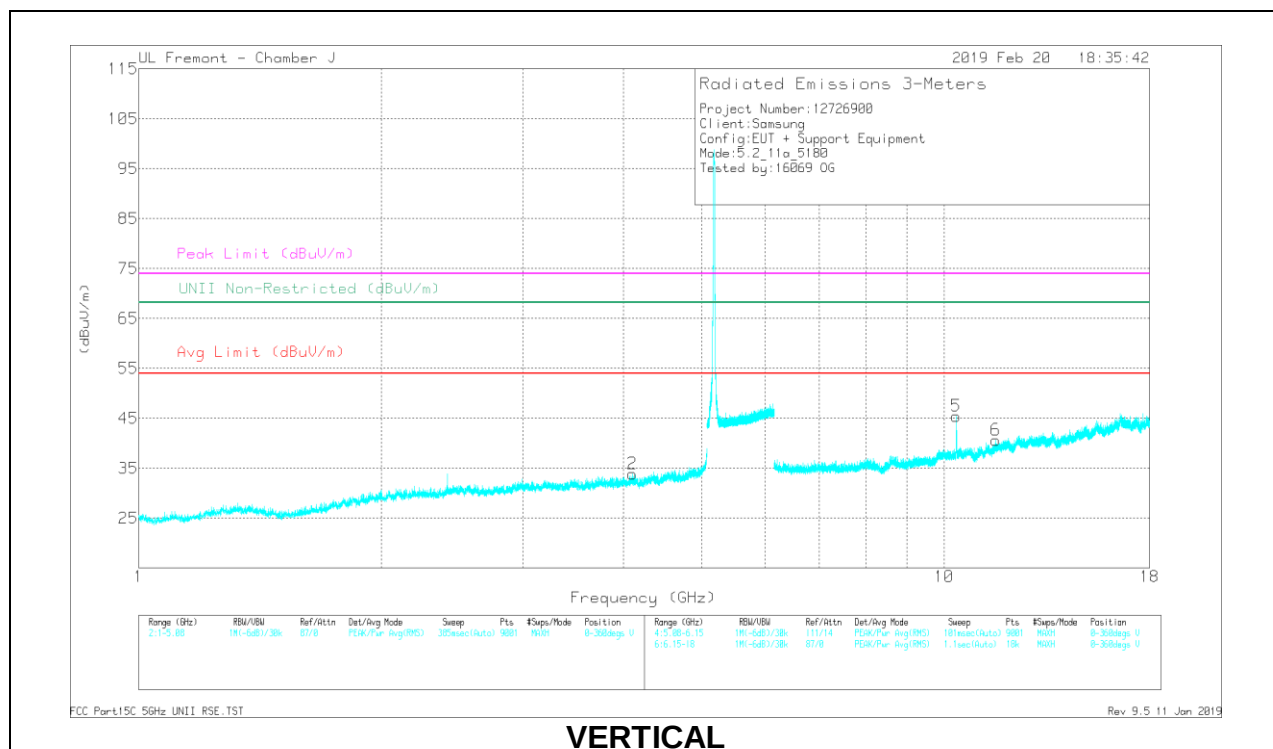
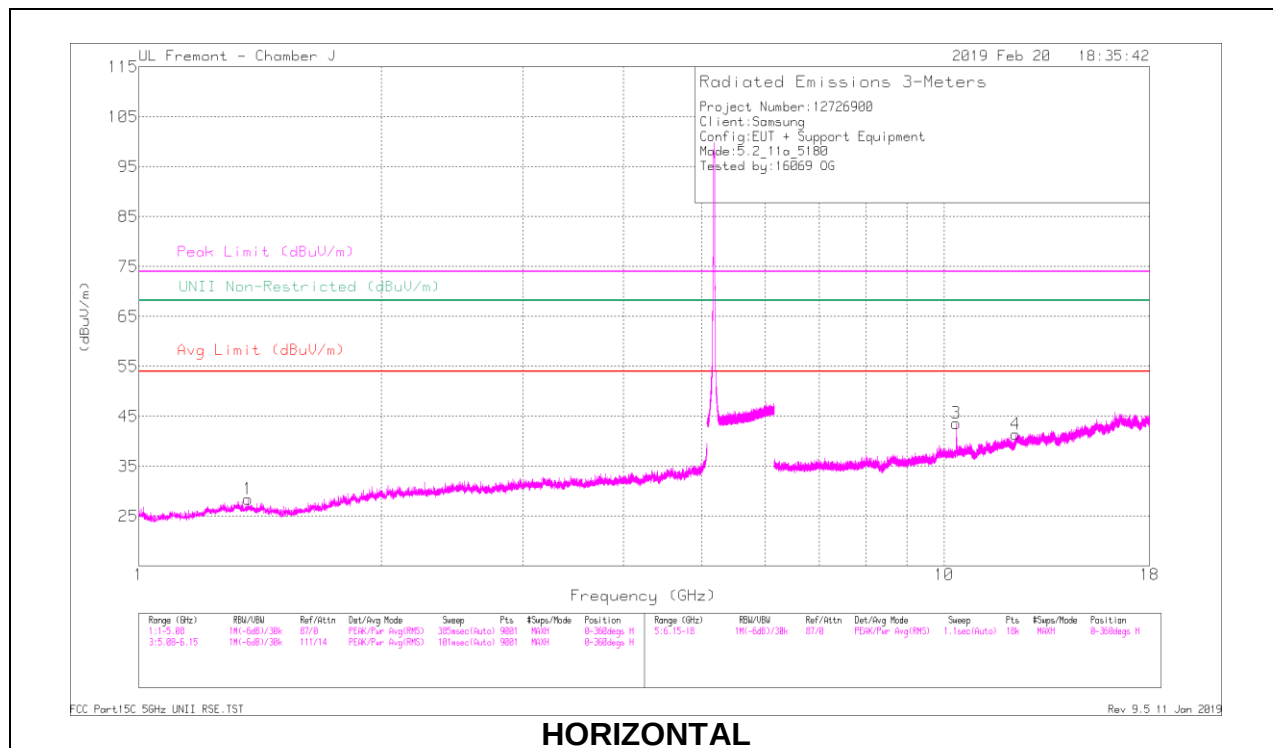
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

## HARMONICS AND SPURIOUS EMISSIONS

### LOW CHANNEL RESULTS



## RADIATED EMISSIONS

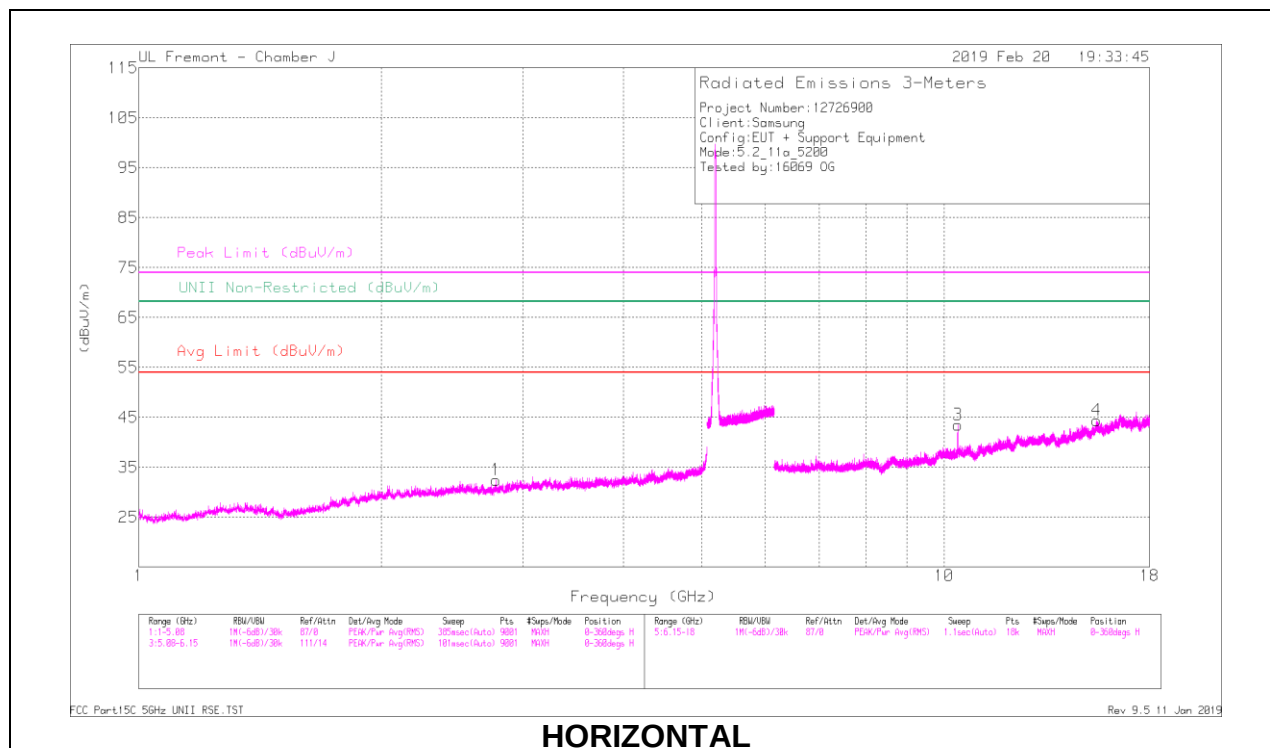
| Frequency (GHz) | Meas Reading (dBuV) | Det  | AF AT0067 (dBm) | Amp/CMB/Fit (Pad) (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|---------------------|------|-----------------|------------------------|--------------|----------------------------|--------------------|-------------|---------------------|----------------|------------------------------|----------------|----------------|-------------|----------|
| * 1.365         | 41.91               | PK-U | 29.2            | -35.9                  | 0            | 35.21                      | -                  | -           | 74                  | -38.79         | -                            | -              | 19             | 171         | H        |
| * 1.366         | 31.63               | ADR  | 29.2            | -35.9                  | .09          | 25.02                      | 54                 | -28.98      | -                   | -              | -                            | -              | 19             | 171         | H        |
| * 4.103         | 39.46               | PK-U | 33.6            | -32.1                  | 0            | 40.96                      | -                  | -           | 74                  | -33.04         | -                            | -              | 48             | 258         | V        |
| * 4.102         | 29.47               | ADR  | 33.6            | -32.1                  | .09          | 31.06                      | 54                 | -22.94      | -                   | -              | -                            | -              | 48             | 258         | V        |
| 10.36           | 34.78               | PK-U | 37.5            | -25.5                  | 0            | 46.78                      | -                  | -           | -                   | -              | 68.2                         | -21.42         | 48             | 104         | H        |
| * 12.281        | 32.35               | PK-U | 38.8            | -22.9                  | 0            | 48.25                      | -                  | -           | 74                  | -25.75         | -                            | -              | 4              | 309         | H        |
| * 12.284        | 22.54               | ADR  | 38.8            | -22.9                  | .09          | 38.53                      | 54                 | -15.47      | -                   | -              | -                            | -              | 4              | 309         | H        |
| 10.36           | 38.98               | PK-U | 37.5            | -25.5                  | 0            | 50.98                      | -                  | -           | -                   | -              | 68.2                         | -17.22         | 166            | 130         | V        |
| * 11.594        | 33.06               | PK-U | 38.4            | -23.4                  | 0            | 48.06                      | -                  | -           | 74                  | -25.94         | -                            | -              | 306            | 296         | V        |
| * 11.597        | 22.87               | ADR  | 38.4            | -23.4                  | .09          | 37.96                      | 54                 | -16.04      | -                   | -              | -                            | -              | 306            | 296         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

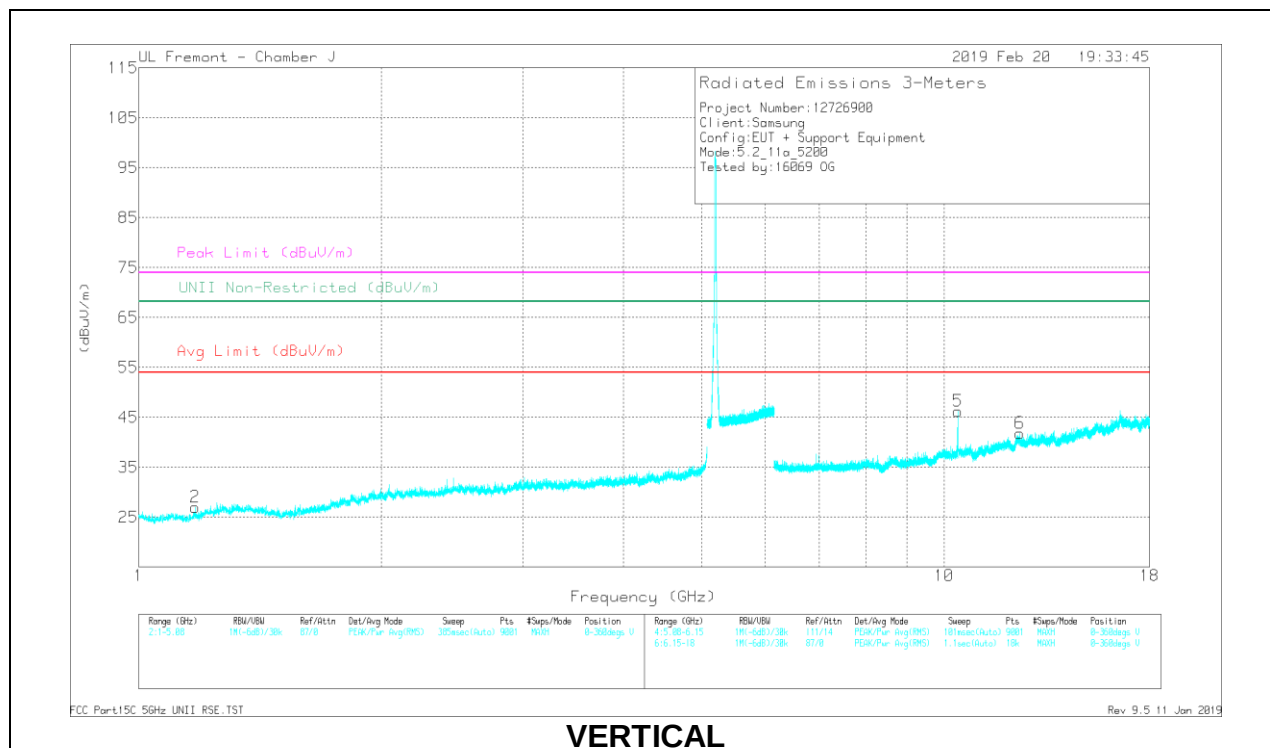
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

## MID CHANNEL RESULTS



## HORIZONTAL



## VERTICAL

## RADIATED EMISSIONS

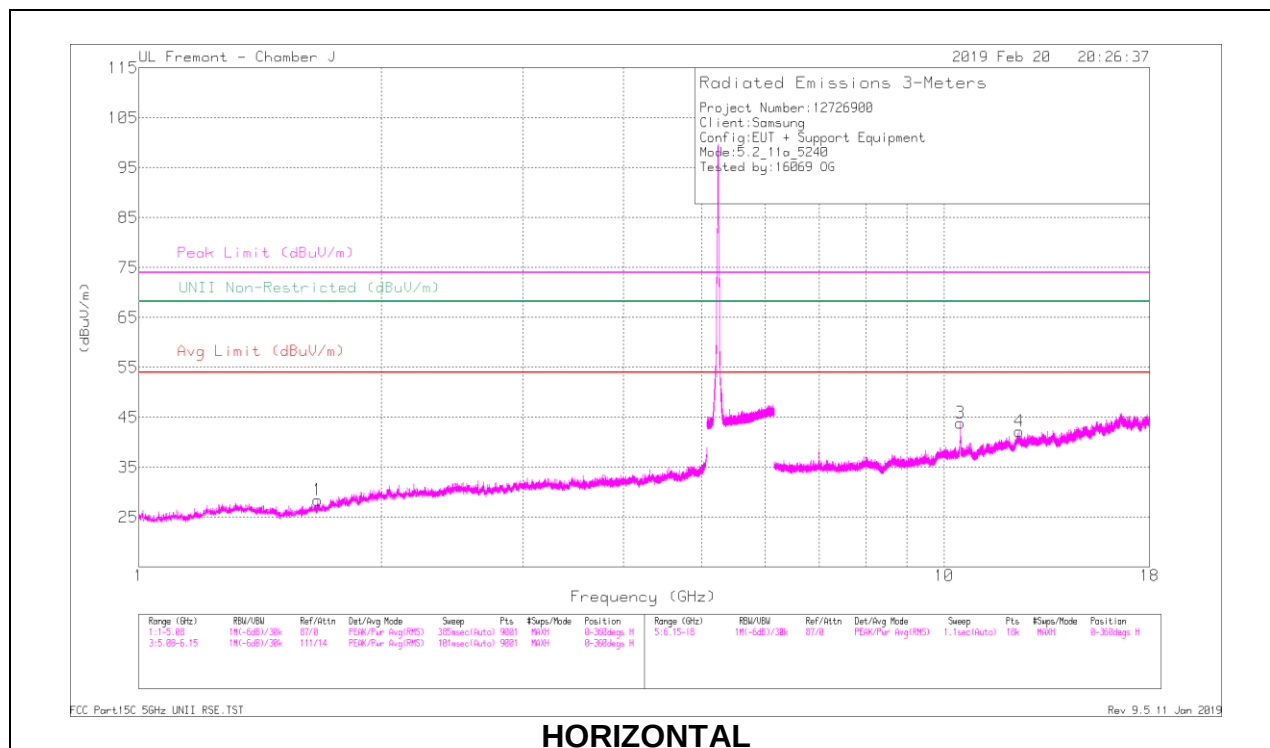
| Frequency (GHz) | Measr Reading (dBuV) | Det  | AF AT0067 (dBm) | AmpCalFidPa d (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|----------------------|------|-----------------|--------------------|--------------|----------------------------|--------------------|-------------|---------------------|----------------|------------------------------|----------------|----------------|-------------|----------|
| * 2.779         | 41.7                 | PK-U | 32.4            | -35                | 0            | 39.1                       | -                  | -           | 74                  | -34.9          | -                            | -              | 7              | 176         | H        |
| * 2.777         | 32                   | ADR  | 32.4            | -35                | .09          | 29.49                      | 54                 | -24.51      | -                   | -              | -                            | -              | 7              | 176         | H        |
| * 1.176         | 41.86                | PK-U | 27.9            | -35.8              | 0            | 33.96                      | -                  | -           | 74                  | -40.04         | -                            | -              | 227            | 250         | V        |
| * 1.174         | 31.47                | ADR  | 27.9            | -35.8              | .09          | 23.66                      | 54                 | -30.34      | -                   | -              | -                            | -              | 227            | 250         | V        |
| * 15.474        | 31.21                | PK-U | 40.1            | -20                | 0            | 51.31                      | -                  | -           | 74                  | -22.69         | -                            | -              | 115            | 146         | H        |
| * 15.471        | 20.91                | ADR  | 40.1            | -20                | .09          | 41.1                       | 54                 | -12.9       | -                   | -              | -                            | -              | 115            | 146         | H        |
| 10.399          | 33.65                | PK-U | 37.5            | -25.3              | 0            | 45.85                      | -                  | -           | -                   | -              | 68.2                         | -22.35         | 2              | 189         | H        |
| * 12.424        | 32.31                | PK-U | 38.9            | -22.8              | 0            | 48.41                      | -                  | -           | 74                  | -25.59         | -                            | -              | 136            | 252         | V        |
| * 12.425        | 22.05                | ADR  | 38.9            | -22.8              | .09          | 38.24                      | 54                 | -15.76      | -                   | -              | -                            | -              | 136            | 252         | V        |
| 10.4            | 33.93                | PK-U | 37.5            | -25.3              | 0            | 46.13                      | -                  | -           | -                   | -              | 68.2                         | -22.07         | 202            | 147         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

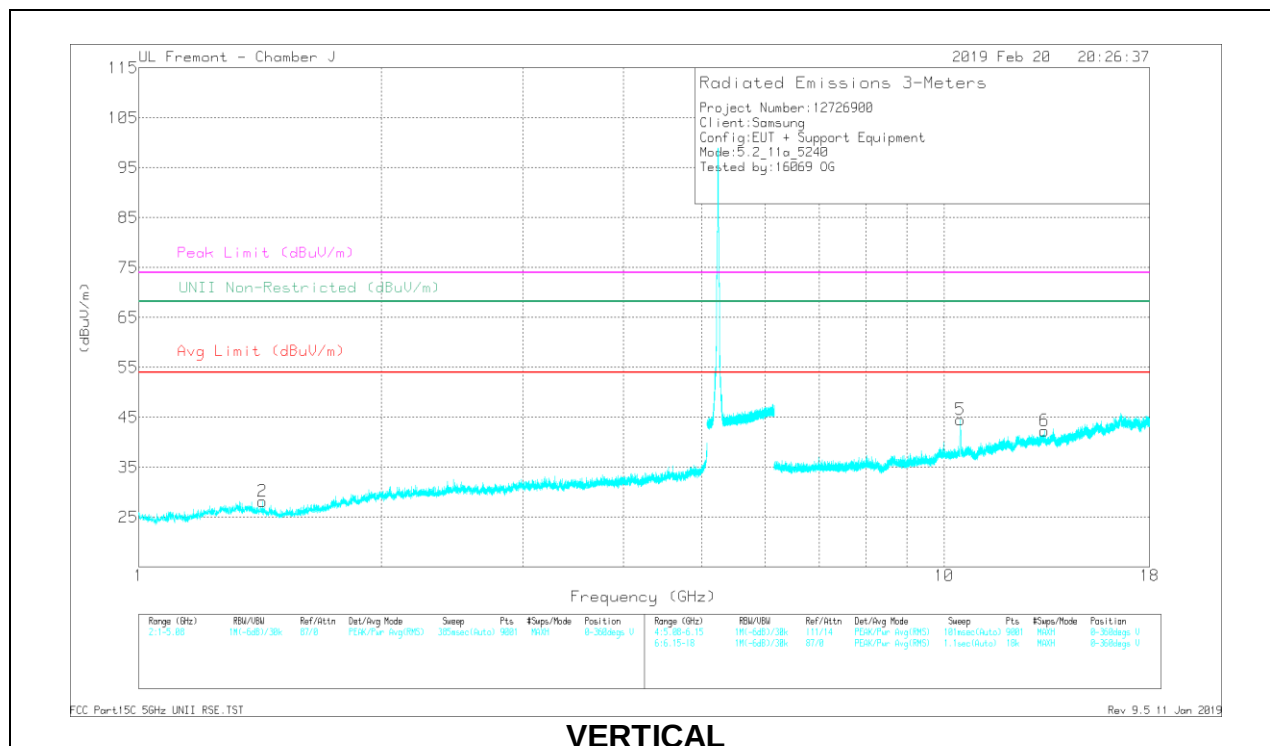
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

## HIGH CHANNEL RESULTS



## HORIZONTAL



## VERTICAL

## RADIATED EMISSIONS

| Frequency (GHz) | Meas Reading (dBuV) | Det  | AF AT0067 (dBm) | AmpCalFidPa d (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 |
|-----------------|---------------------|------|-----------------|--------------------|--------------|----------------------------|--------------------|-------------|---------------------|----------------|------------------------------|----------------|----------------|-------------|----------|
| * 1.666         | 42.18               | PK-U | 28.9            | -35.9              | 0            | 35.18                      | -                  | -           | 74                  | -38.82         | -                            | -              | 326            | 344         | H        |
| * 1.665         | 31.47               | ADR  | 28.9            | -35.9              | .09          | 24.56                      | 54                 | -29.44      | -                   | -              | -                            | -              | 326            | 344         | H        |
| * 1.425         | 42.19               | PK-U | 28.7            | -35.9              | 0            | 34.29                      | -                  | -           | 74                  | -39.01         | -                            | -              | 161            | 235         | V        |
| * 1.425         | 31.68               | ADR  | 28.7            | -35.9              | .09          | 24.57                      | 54                 | -29.43      | -                   | -              | -                            | -              | 161            | 235         | V        |
| * 12.391        | 32.65               | PK-U | 38.8            | -22.7              | 0            | 48.75                      | -                  | -           | 74                  | -25.25         | -                            | -              | 269            | 373         | H        |
| * 12.39         | 22.92               | ADR  | 38.8            | -22.7              | .09          | 39.11                      | 54                 | -14.89      | -                   | -              | -                            | -              | 269            | 373         | H        |
| 10.479          | 40.35               | PK-U | 37.5            | -25.3              | 0            | 52.55                      | -                  | -           | -                   | -              | 68.2                         | -15.65         | 165            | 106         | H        |
| * 13.334        | 31.42               | PK-U | 39              | -21.9              | 0            | 48.52                      | -                  | -           | 74                  | -25.48         | -                            | -              | 124            | 150         | V        |
| * 13.332        | 21.44               | ADR  | 39              | -21.8              | .09          | 38.73                      | 54                 | -15.27      | -                   | -              | -                            | -              | 124            | 150         | V        |
| 10.479          | 41.53               | PK-U | 37.5            | -25.3              | 0            | 54.03                      | -                  | -           | -                   | -              | 68.2                         | -14.17         | 179            | 109         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

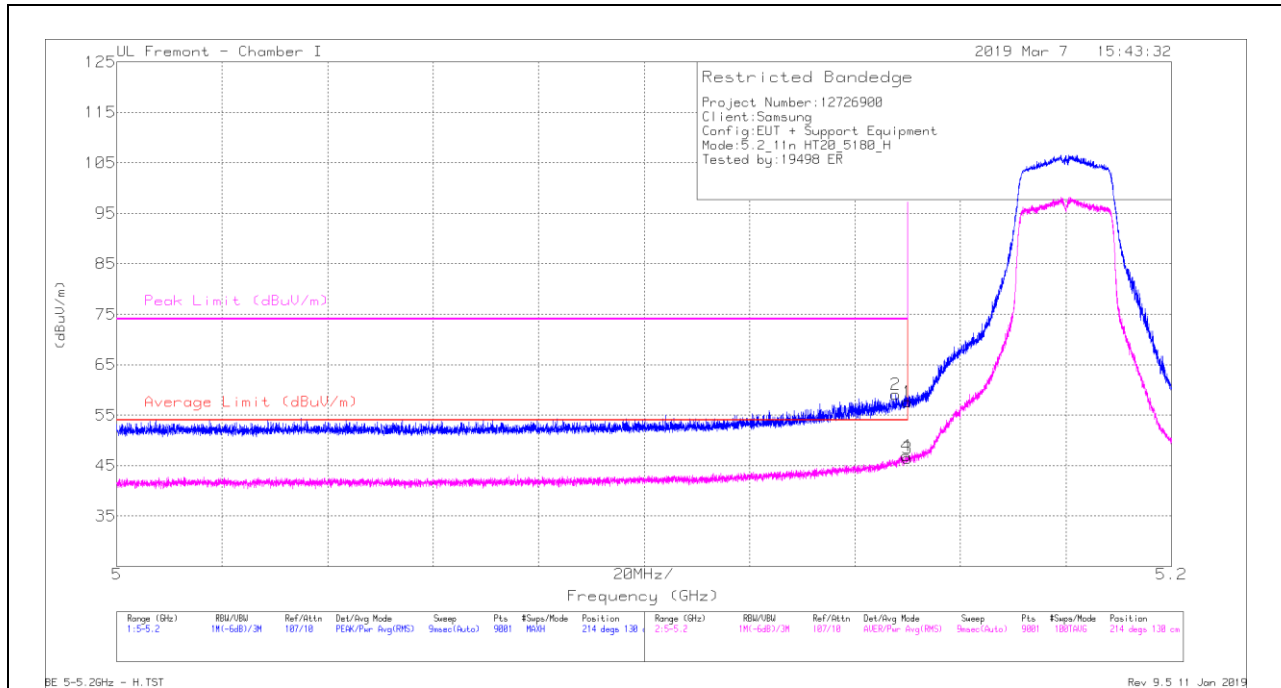
ADR - U-NII AD primary method, RMS average

## 10.1.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND

### 1TX Antenna 1 MODE

### BANDEDGE (LOW CHANNEL)

### HORIZONTAL RESULT



### Trace Markers

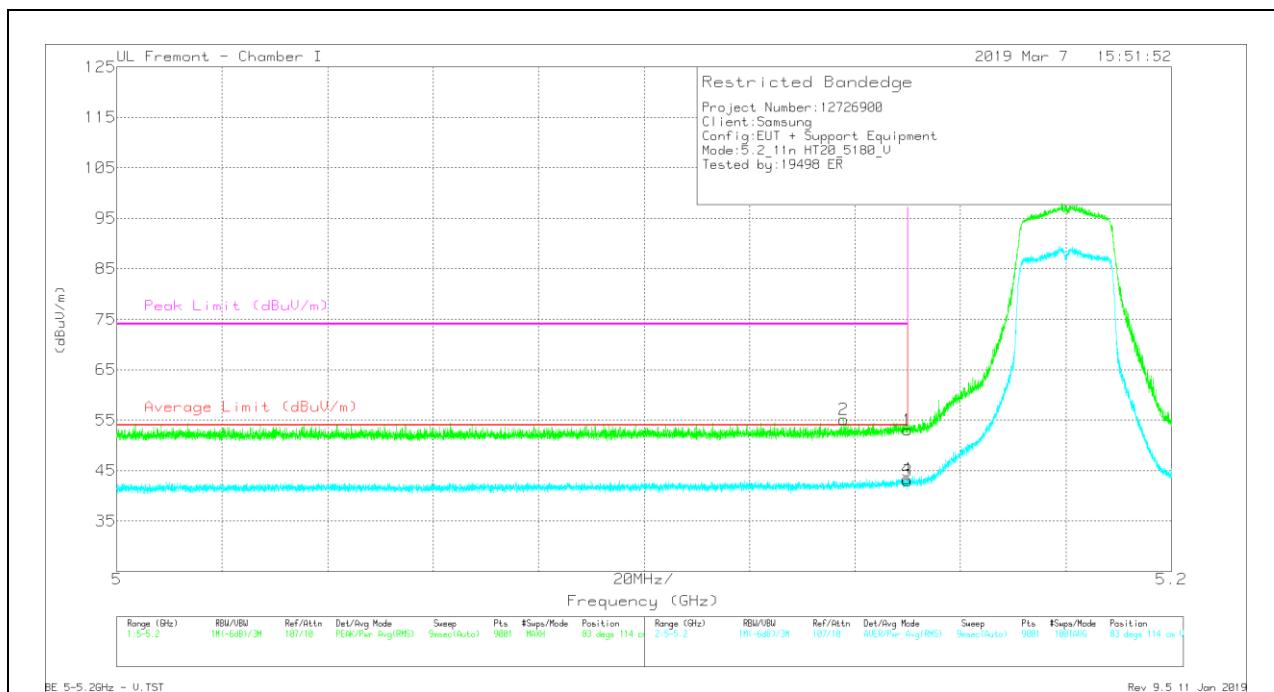
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T862 (dB/m) | Amp/Cb/Flr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|---------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | *5.15           | 42.2                 | Pk  | 34.4           | -19                 | 0            | 57.6                       | -                      | -           | 74                  | -16.4          | 214            | 130         | H        |
| 2      | *5.148          | 43.76                | Pk  | 34.4           | -19                 | 0            | 59.16                      | -                      | -           | 74                  | -14.84         | 214            | 130         | H        |
| 3      | *5.15           | 30.95                | RMS | 34.4           | -19                 | .1           | 46.45                      | 54                     | -7.55       | -                   | -              | 214            | 130         | H        |
| 4      | *5.15           | 31.41                | RMS | 34.4           | -19                 | .1           | 46.91                      | 54                     | -7.09       | -                   | -              | 214            | 130         | H        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

## VERTICAL RESULT



## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T862 (dB/m) | Amp/Cbl/Ftr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|----------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 5.15          | 37.63                | Pk  | 34.4           | -19                  | 0            | 53.03                      | -                      | -           | 74                  | -20.97         | 83             | 114         | V        |
| 2      | * 5.138         | 39.78                | Pk  | 34.4           | -19                  | 0            | 55.18                      | -                      | -           | 74                  | -18.82         | 83             | 114         | V        |
| 3      | * 5.15          | 27.49                | RMS | 34.4           | -19                  | .1           | 42.99                      | 54                     | -11.01      | -                   | -              | 83             | 114         | V        |
| 4      | * 5.15          | 27.86                | RMS | 34.4           | -19                  | .1           | 43.36                      | 54                     | -10.64      | -                   | -              | 83             | 114         | V        |

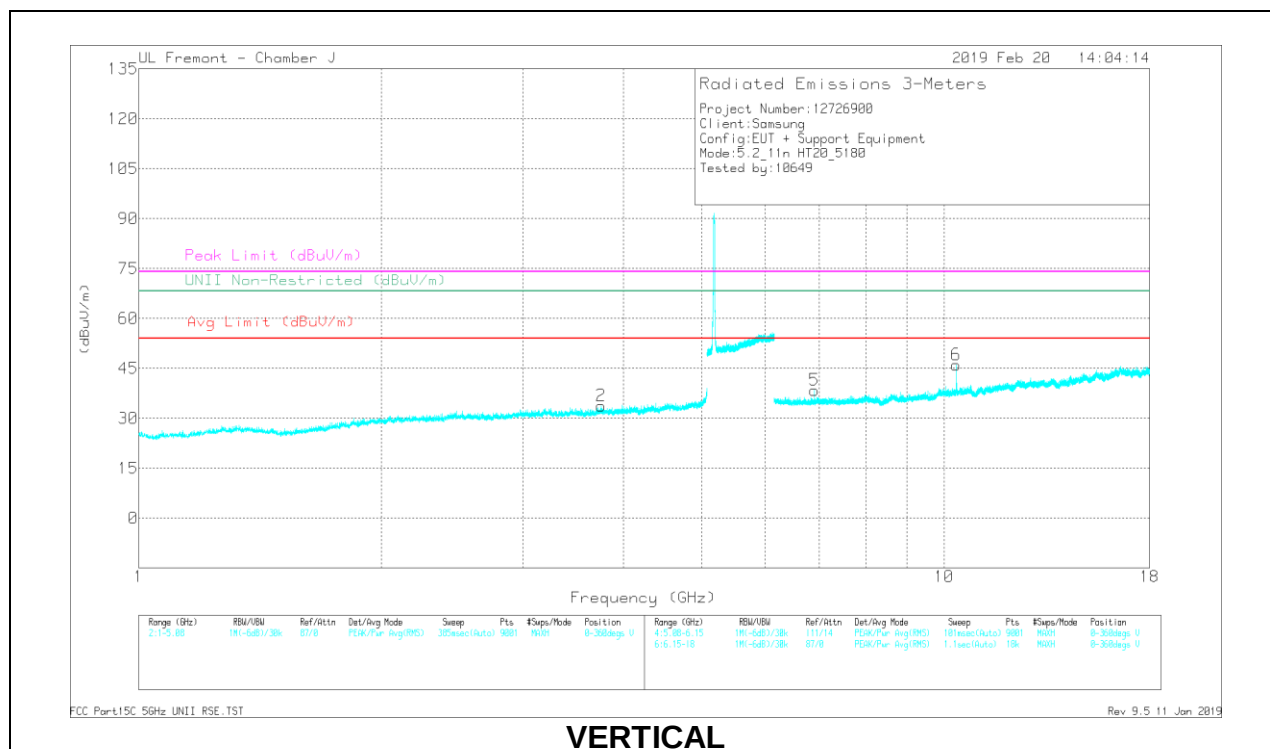
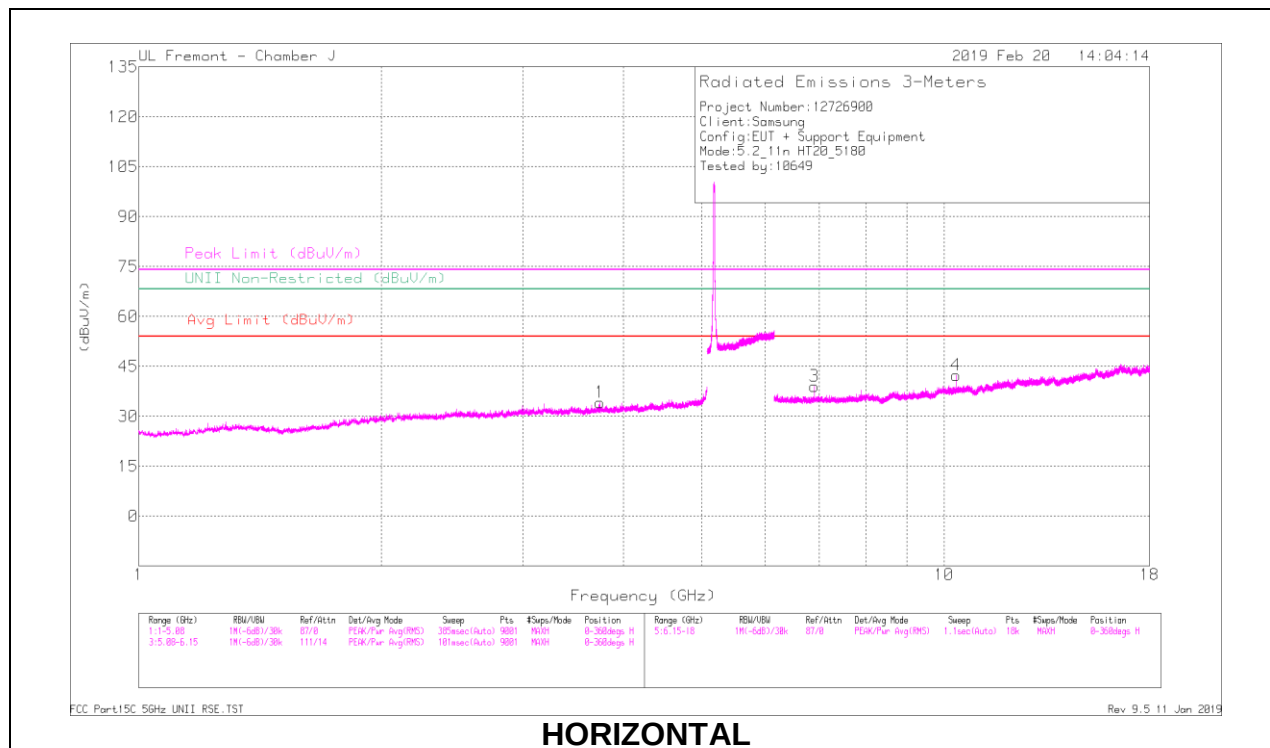
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

## HARMONICS AND SPURIOUS EMISSIONS

### LOW CHANNEL RESULTS



## RADIATED EMISSIONS

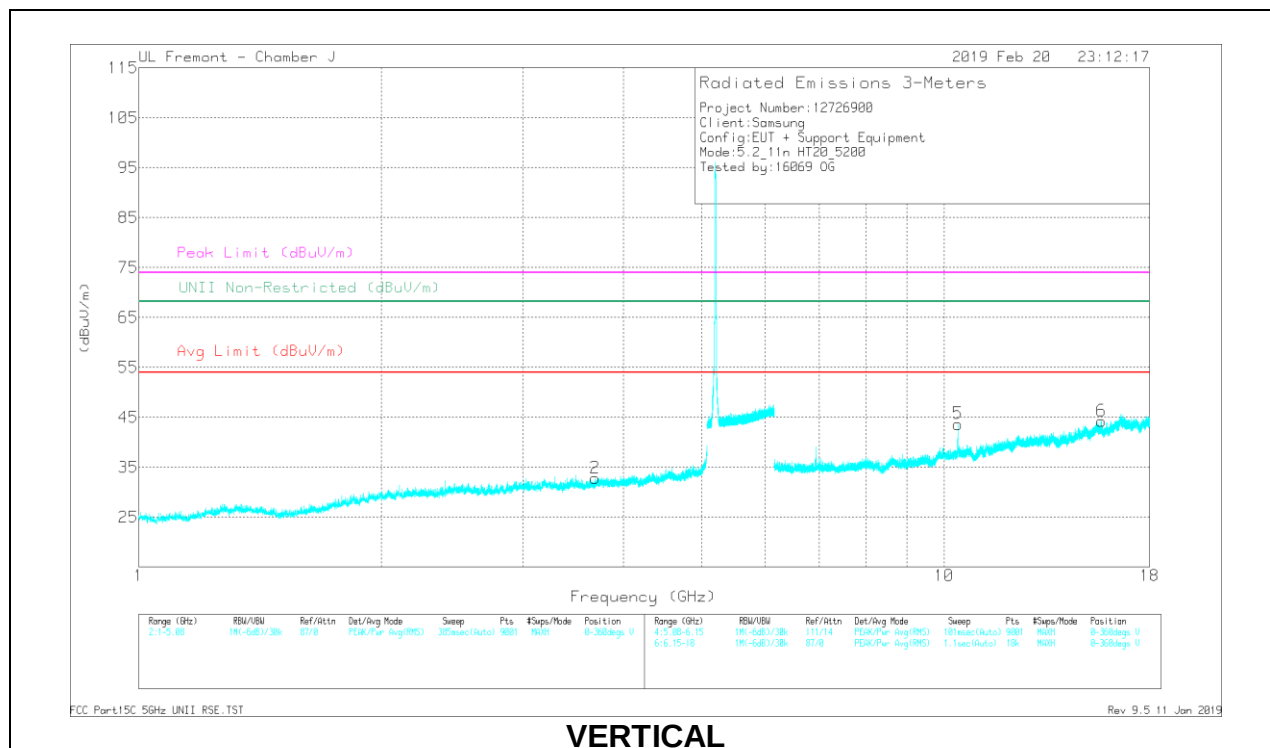
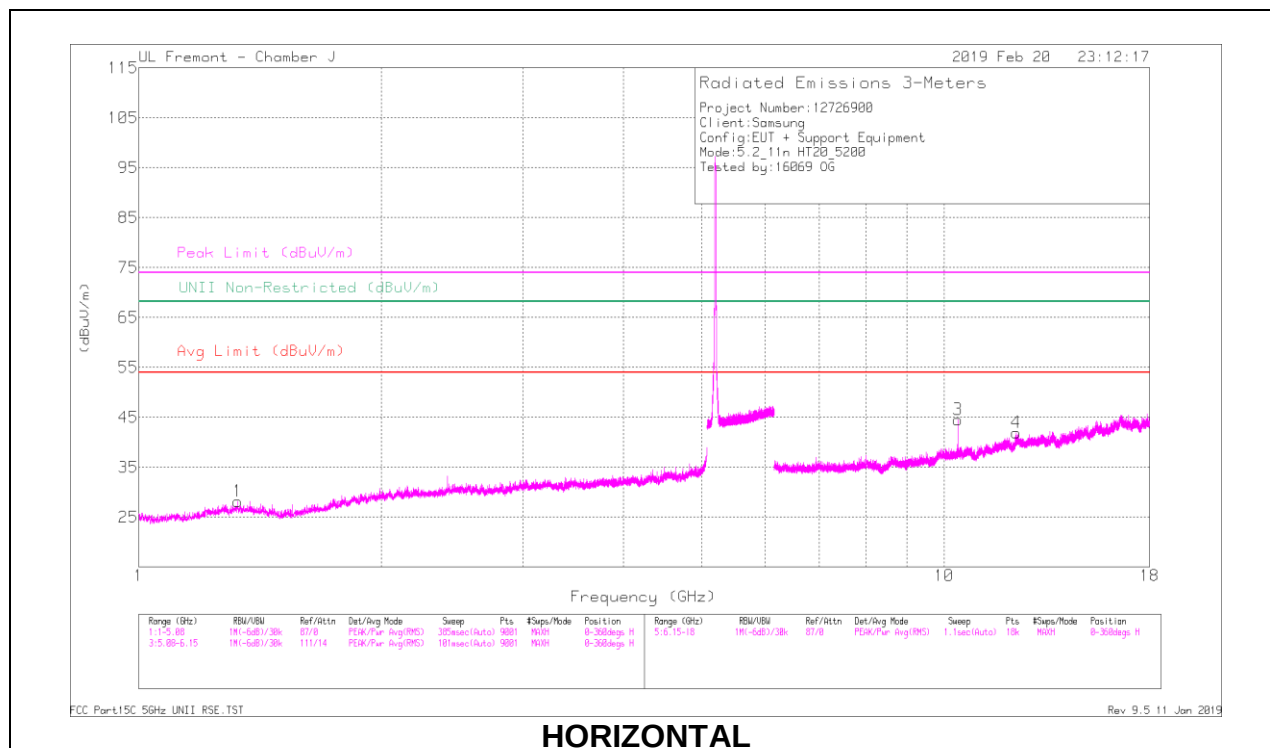
| Marker | Frequency (GHz) | Meas Reading (dBuV) | Det  | AF AT0067 (dBm) | AmpChfFit(Pa d (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|---------------------|------|-----------------|---------------------|--------------|----------------------------|--------------------|-------------|---------------------|----------------|------------------------------|----------------|----------------|-------------|----------|
| 1      | * 3.741         | 40.26               | PK-U | 33.4            | -33.2               | 0            | 40.46                      | -                  | -           | 74                  | -33.54         | -                            | -              | 314            | 130         | H        |
|        | * 3.739         | 29.99               | ADR  | 33.4            | -33.2               | .1           | 30.29                      | 54                 | -23.71      | -                   | -              | -                            | -              | 314            | 130         | H        |
| 2      | * 3.752         | 40.33               | PK-U | 33.4            | -33.1               | 0            | 40.63                      | -                  | -           | 74                  | -33.37         | -                            | -              | 283            | 276         | V        |
|        | * 3.75          | 30.36               | ADR  | 33.4            | -33.1               | .1           | 30.76                      | 54                 | -23.24      | -                   | -              | -                            | -              | 283            | 276         | V        |
| 3      | 6.907           | 37.01               | PK-U | 35.6            | -27.7               | 0            | 44.91                      | -                  | -           | -                   | -              | 68.2                         | -23.29         | 204            | 108         | H        |
| 4      | 10.36           | 36.36               | PK-U | 37.5            | -25.5               | 0            | 48.36                      | -                  | -           | -                   | -              | 68.2                         | -19.84         | 321            | 125         | H        |
| 5      | 6.907           | 36.76               | PK-U | 35.6            | -27.7               | 0            | 44.66                      | -                  | -           | -                   | -              | 68.2                         | -23.54         | 342            | 117         | V        |
| 6      | 10.36           | 38.92               | PK-U | 37.5            | -25.5               | 0            | 51.92                      | -                  | -           | -                   | -              | 68.2                         | -16.28         | 38             | 105         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

## MID CHANNEL RESULTS



## RADIATED EMISSIONS

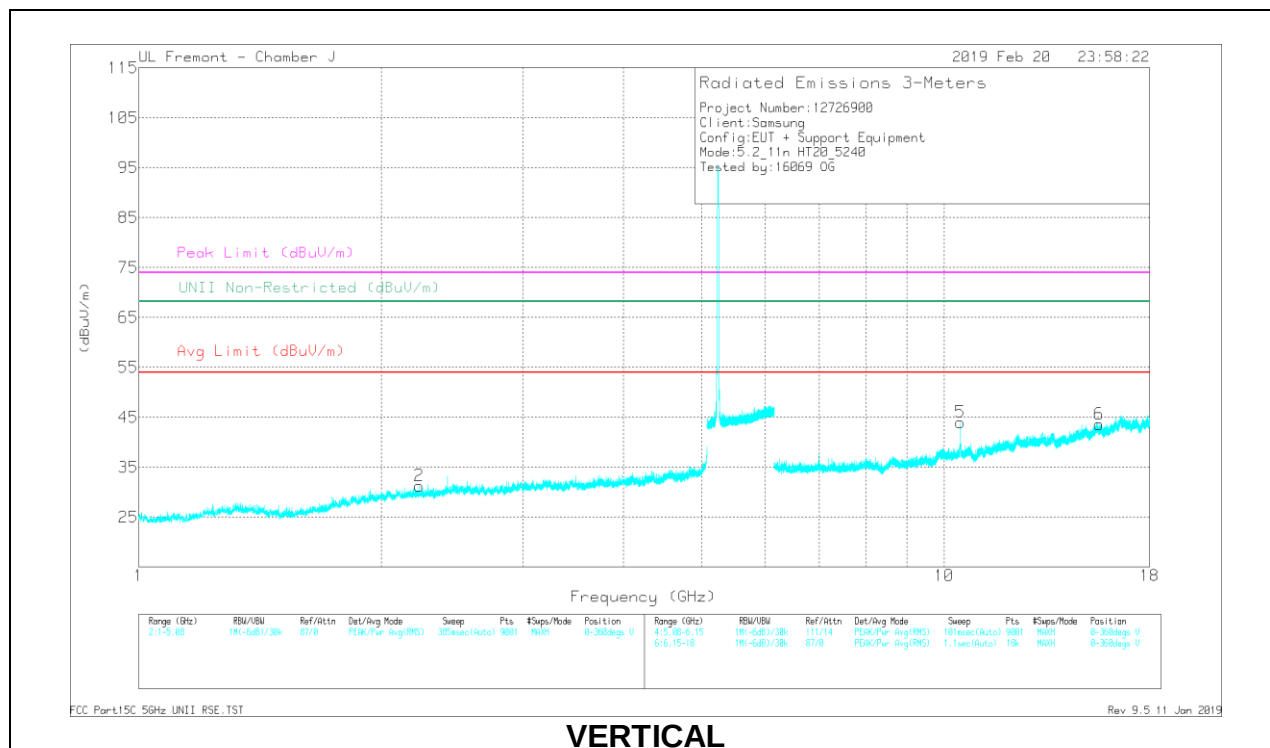
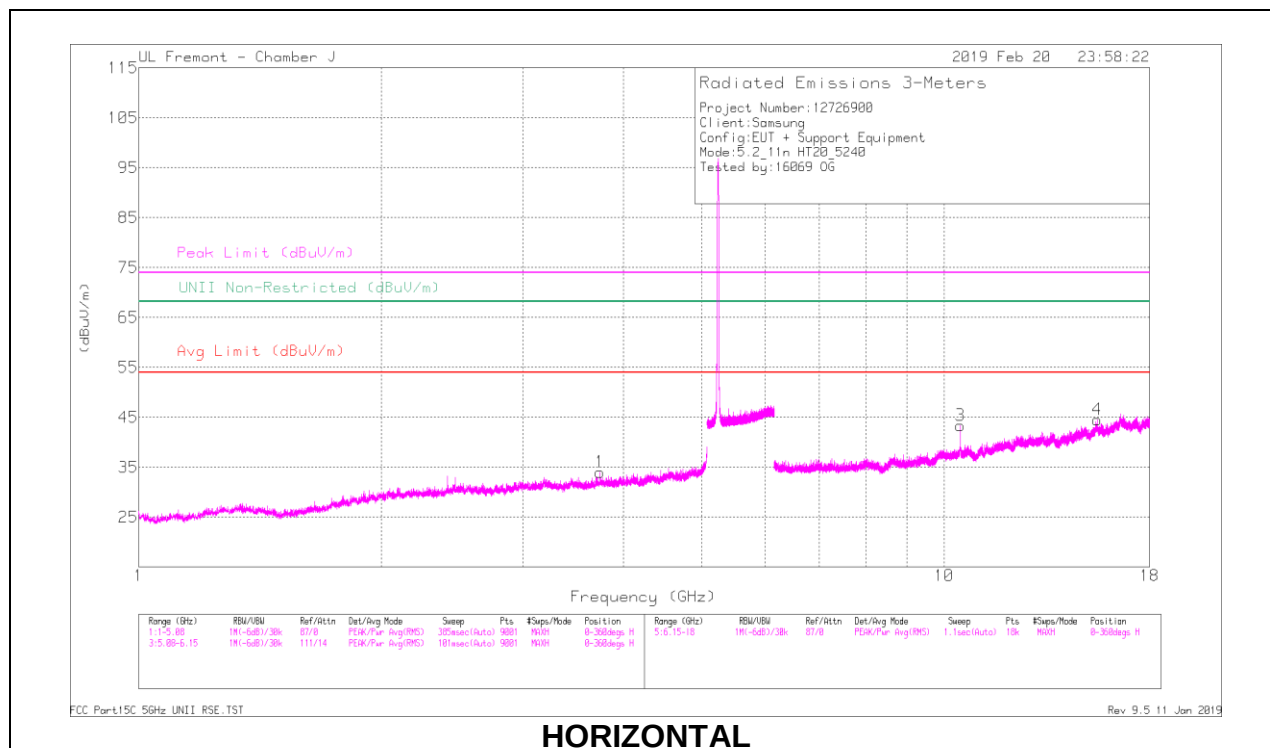
| Frequency (GHz) | Meas Reading (dBuV) | Det  | AF AT0067 (dBm) | AmpC2a12aPa d (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|---------------------|------|-----------------|--------------------|--------------|----------------------------|--------------------|-------------|---------------------|----------------|------------------------------|----------------|----------------|-------------|----------|
| * 1.326         | 41.98               | PK-U | 29.3            | -35.8              | 0            | 34.88                      | -                  | -           | 74                  | -39.12         | -                            | -              | 348            | 184         | H        |
| * 1.327         | 32.15               | ADR  | 29.3            | -35.8              | .1           | 25.75                      | 54                 | -28.25      | -                   | -              | -                            | -              | 348            | 184         | H        |
| * 3.69          | 40.72               | PK-U | 33.3            | -33.5              | 0            | 40.52                      | -                  | -           | 74                  | -33.48         | -                            | -              | 138            | 369         | V        |
| * 3.698         | 30.28               | ADR  | 33.2            | -33.5              | .1           | 30.08                      | 54                 | -23.92      | -                   | -              | -                            | -              | 138            | 369         | V        |
| * 12.301        | 32.68               | PK-U | 38.8            | -22.8              | 0            | 48.68                      | -                  | -           | 74                  | -25.32         | -                            | -              | 294            | 258         | H        |
| * 12.301        | 21.84               | ADR  | 38.8            | -22.8              | .1           | 37.94                      | 54                 | -16.06      | -                   | -              | -                            | -              | 294            | 258         | H        |
| 10.4            | 37.89               | PK-U | 37.5            | -25.3              | 0            | 50.09                      | -                  | -           | -                   | -              | 68.2                         | -18.11         | 329            | 106         | H        |
| * 15.698        | 31.55               | PK-U | 40.4            | -20.3              | 0            | 51.65                      | -                  | -           | 74                  | -22.35         | -                            | -              | 214            | 224         | V        |
| * 15.698        | 20.95               | ADR  | 40.4            | -20.3              | .1           | 41.15                      | 54                 | -12.85      | -                   | -              | -                            | -              | 214            | 224         | V        |
| 10.4            | 37.61               | PK-U | 37.5            | -25.3              | 0            | 49.61                      | -                  | -           | -                   | -              | 68.2                         | -18.39         | 156            | 111         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

## HIGH CHANNEL RESULTS



## RADIATED EMISSIONS

| Frequency (GHz) | Meas Reading (dBuV) | Det  | AF AT0067 (dBm) | AmpC2a12aPa d (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 |
|-----------------|---------------------|------|-----------------|--------------------|--------------|----------------------------|--------------------|-------------|---------------------|----------------|------------------------------|----------------|----------------|-------------|----------|
| * 3.74          | 40.55               | PK-U | 33.4            | -33.2              | 0            | 40.75                      | -                  | -           | 74                  | -33.25         | -                            | -              | 360            | 182         | H        |
| * 3.74          | 30.28               | ADR  | 33.4            | -33.2              | .1           | 30.58                      | 54                 | -23.42      | -                   | -              | -                            | -              | 360            | 182         | H        |
| * 2.23          | 41.95               | PK-U | 31.9            | -35.6              | 0            | 39.25                      | -                  | -           | 74                  | -35.74         | -                            | -              | 139            | 122         | V        |
| * 2.228         | 31.85               | ADR  | 31.9            | -35.6              | .1           | 28.25                      | 54                 | -25.75      | -                   | -              | -                            | -              | 139            | 122         | V        |
| * 15.496        | 31.77               | PK-U | 40.1            | -20                | 0            | 51.87                      | -                  | -           | 74                  | -22.13         | -                            | -              | 66             | 178         | H        |
| * 15.496        | 21.03               | ADR  | 40.1            | -20                | .1           | 41.23                      | 54                 | -12.77      | -                   | -              | -                            | -              | 66             | 178         | H        |
| 10.48           | 37.26               | PK-U | 37.5            | -25.3              | 0            | 49.46                      | -                  | -           | -                   | -              | 68.2                         | -18.74         | 330            | 109         | H        |
| * 15.571        | 32.33               | PK-U | 40.2            | -20.5              | 0            | 52.03                      | -                  | -           | 74                  | -21.97         | -                            | -              | 293            | 110         | V        |
| * 15.572        | 21.14               | ADR  | 40.2            | -20.5              | .1           | 40.94                      | 54                 | -13.06      | -                   | -              | -                            | -              | 293            | 110         | V        |
| 10.48           | 37.88               | PK-U | 37.5            | -25.3              | 0            | 50.08                      | -                  | -           | -                   | -              | 68.2                         | -18.12         | 26             | 122         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

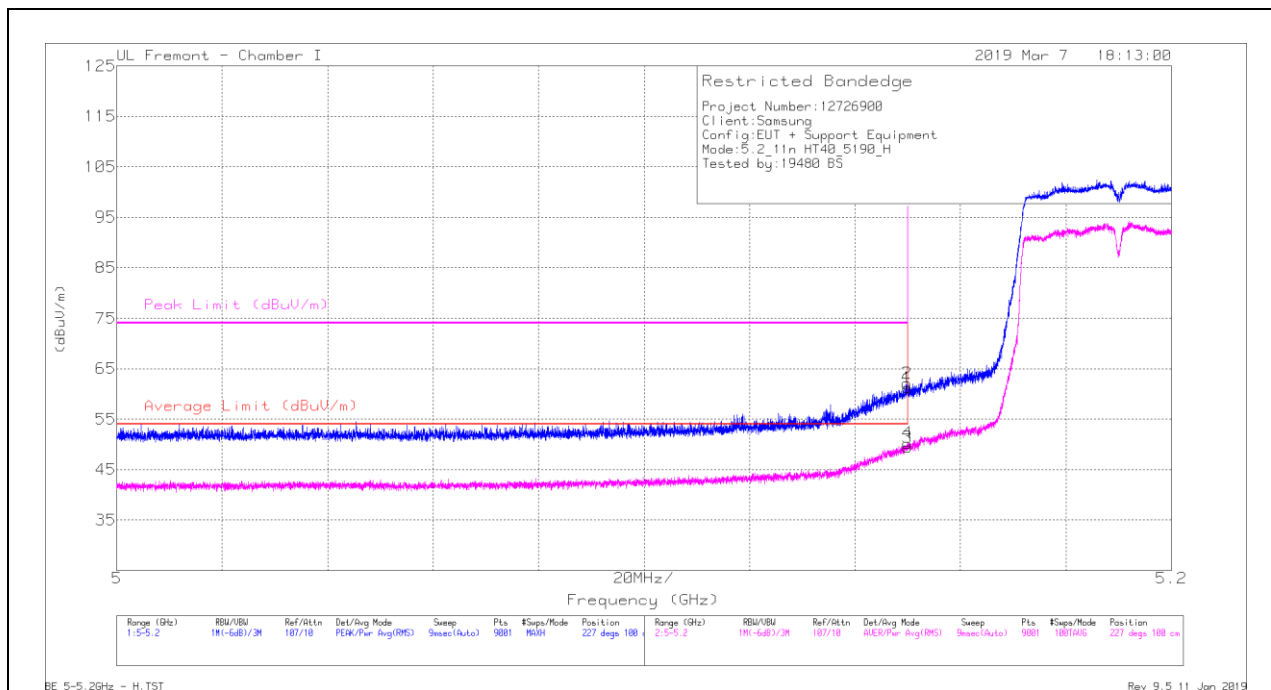
ADR - U-NII AD primary method, RMS average

## 10.1.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND

### 1TX Antenna 1 MODE

### BANDEDGE (LOW CHANNEL)

### HORIZONTAL RESULT



### Trace Markers

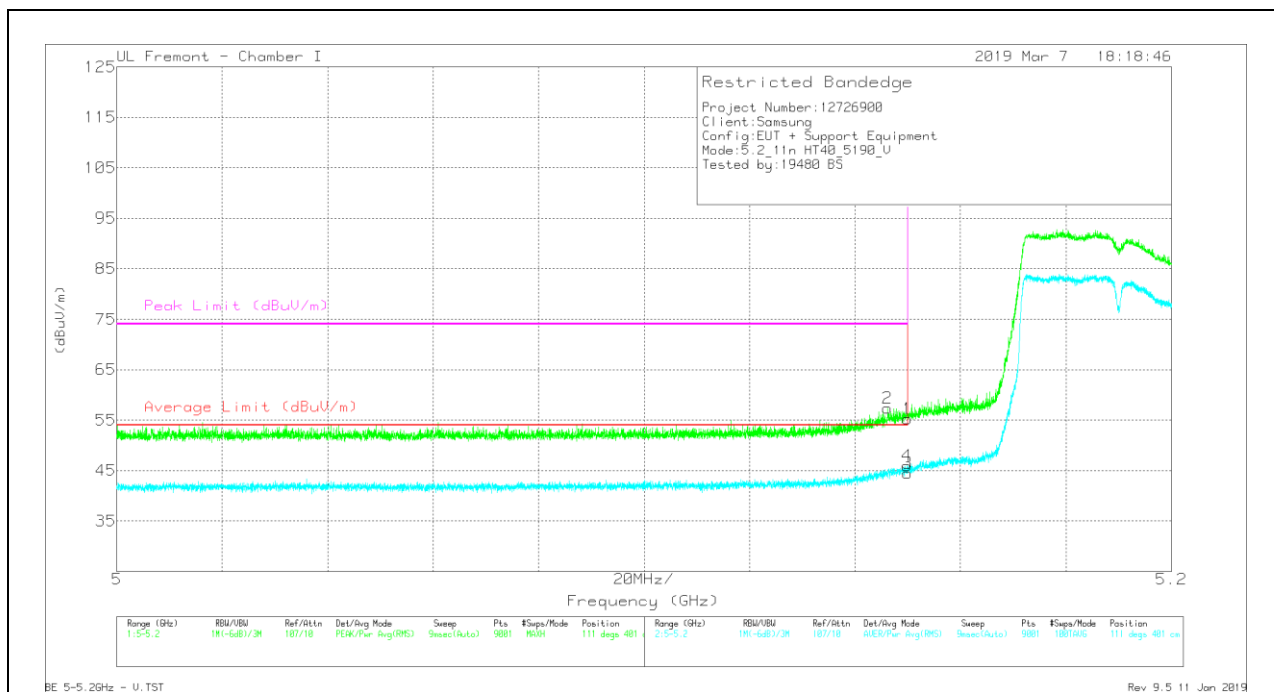
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T862 (dB/m) | Amp/Cb/Flr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|---------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | *5.15           | 45.87                | Pk  | 34.4           | -19                 | 0            | 61.27                      | -                      | -           | 74                  | -12.73         | 227            | 100         | H        |
| 2      | *5.15           | 46.68                | Pk  | 34.4           | -19                 | 0            | 62.08                      | -                      | -           | 74                  | -11.92         | 227            | 100         | H        |
| 3      | *5.15           | 33.8                 | RMS | 34.4           | -19                 | .19          | 49.39                      | 54                     | -4.61       | -                   | -              | 227            | 100         | H        |
| 4      | *5.15           | 34.64                | RMS | 34.4           | -19                 | .19          | 50.23                      | 54                     | -3.77       | -                   | -              | 227            | 100         | H        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

## VERTICAL RESULT



## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T862 (dB/m) | Amp/Cbl/Ftr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|----------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 5.15          | 39.84                | Pk  | 34.4           | -19                  | 0            | 55.24                      | -                      | -           | 74                  | -18.76         | 111            | 401         | V        |
| 2      | * 5.146         | 41.99                | Pk  | 34.4           | -19                  | 0            | 57.39                      | -                      | -           | 74                  | -16.61         | 111            | 401         | V        |
| 3      | * 5.15          | 28.82                | RMS | 34.4           | -19                  | .19          | 44.41                      | 54                     | -9.59       | -                   | -              | 111            | 401         | V        |
| 4      | * 5.15          | 30.32                | RMS | 34.4           | -19                  | .19          | 45.91                      | 54                     | -8.09       | -                   | -              | 111            | 401         | V        |

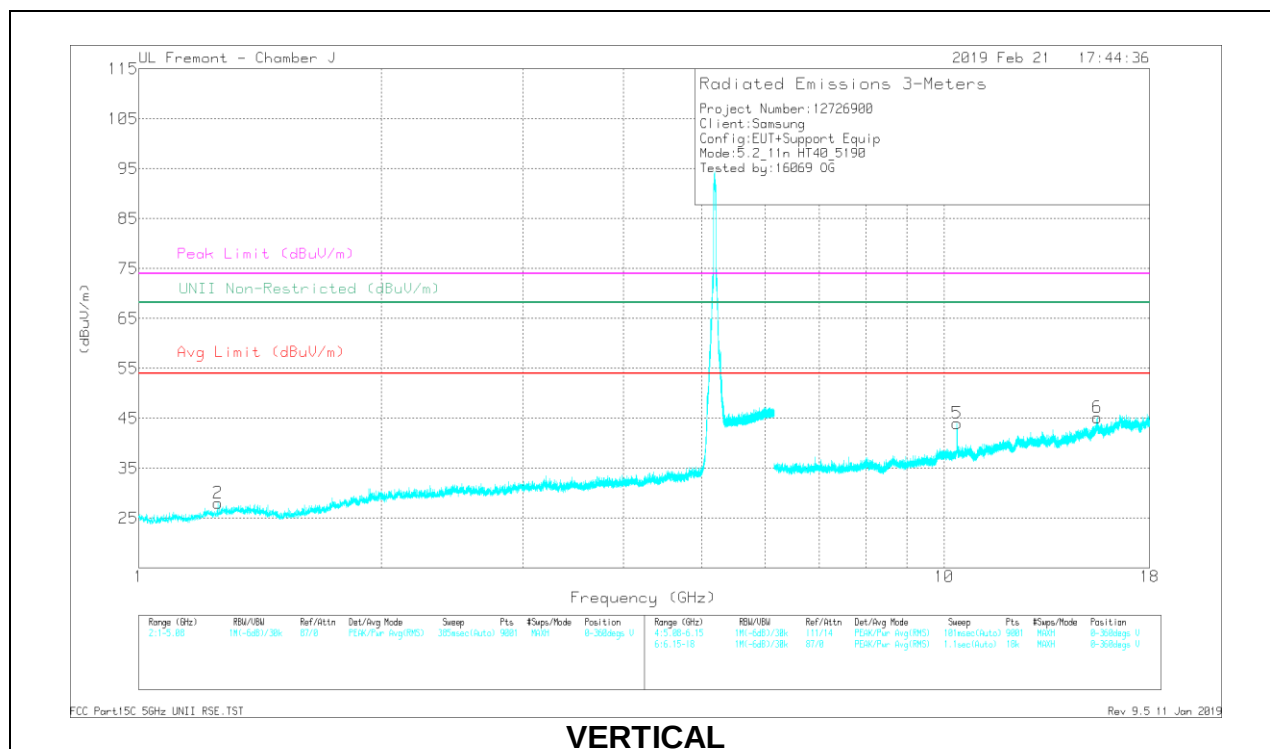
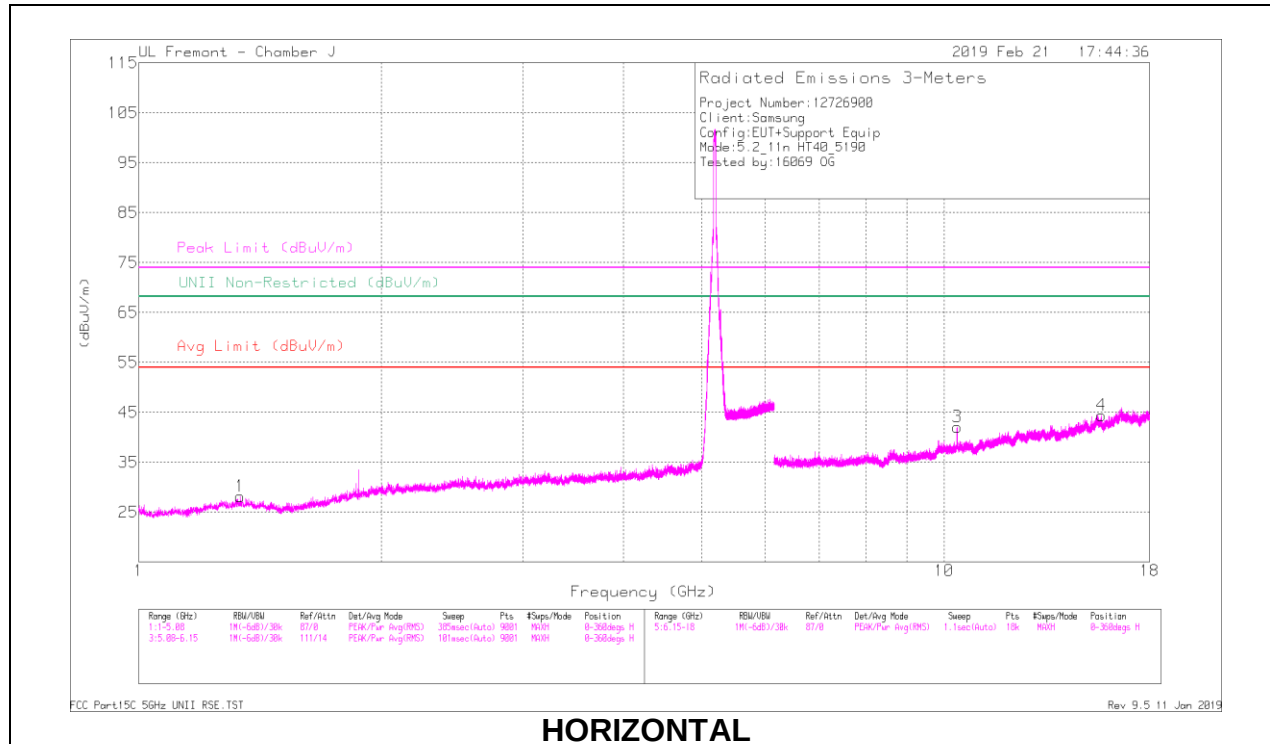
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

## HARMONICS AND SPURIOUS EMISSIONS

### LOW CHANNEL RESULTS



## RADIATED EMISSIONS

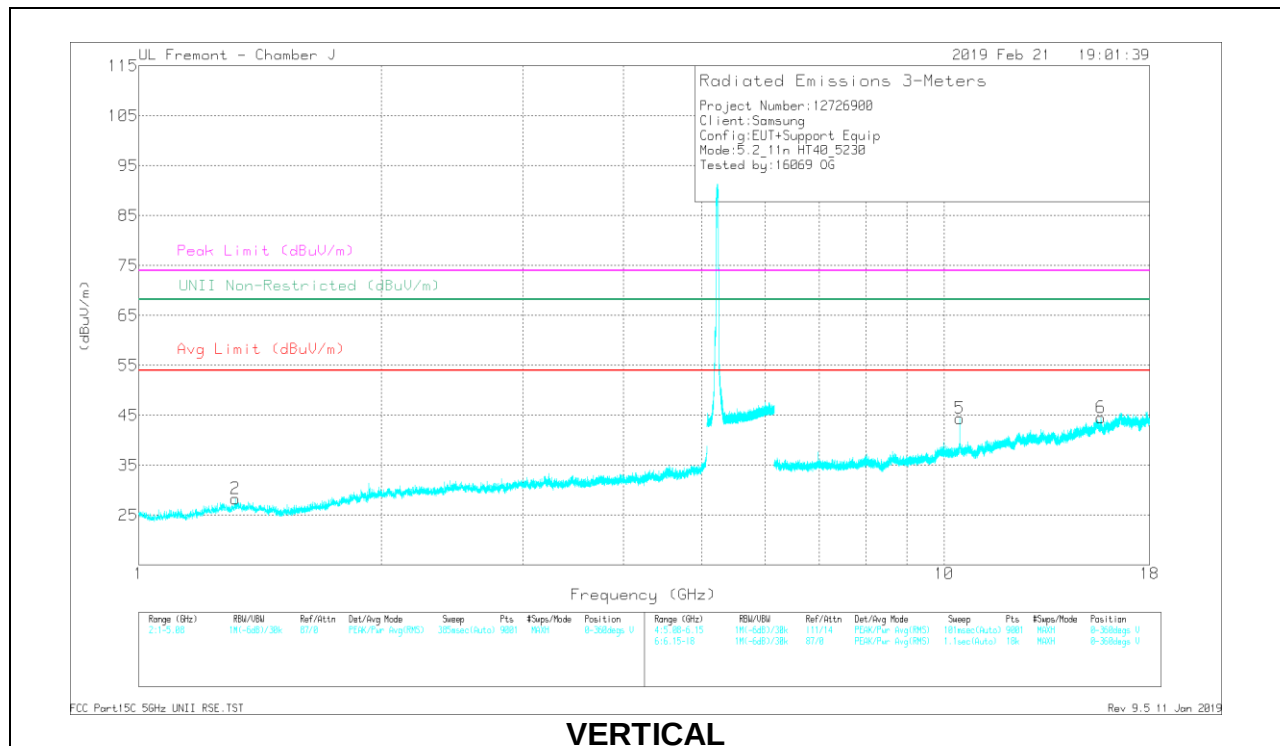
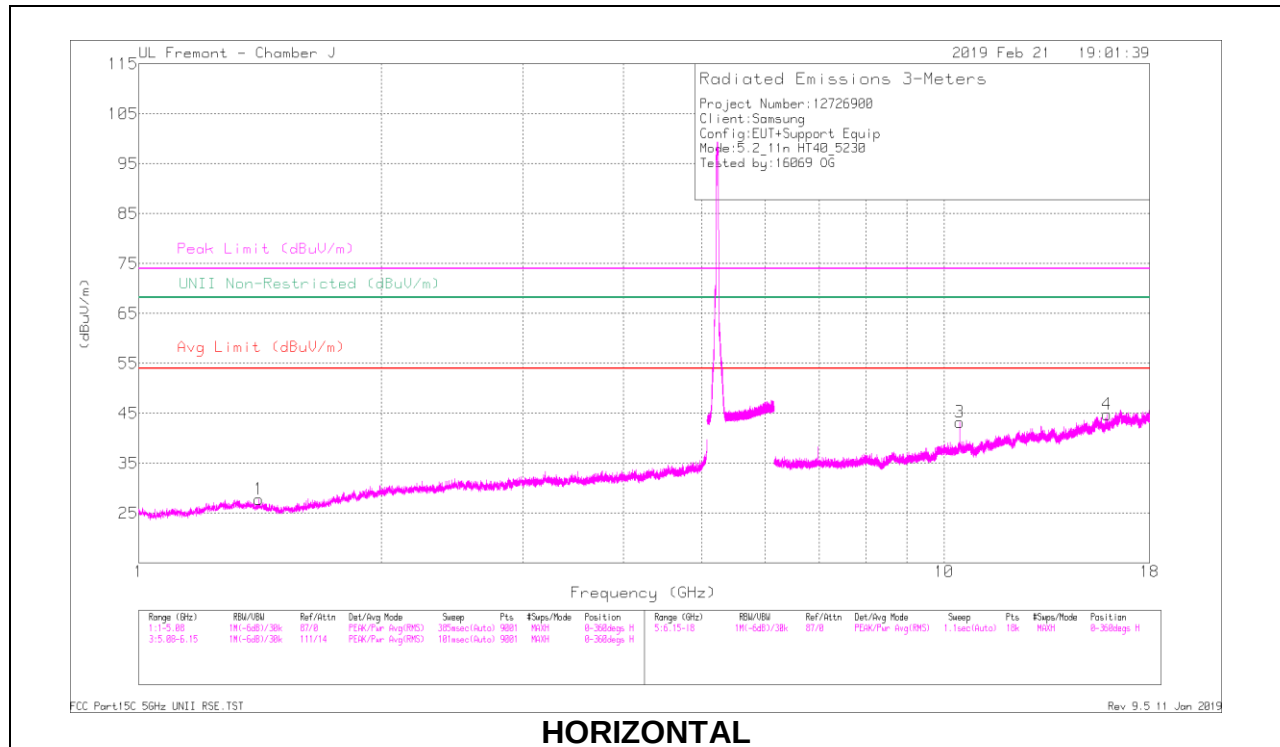
| Frequency (GHz) | Measr Reading (dBuV) | Det  | AF AT0067 (dBm) | AmpCal10Pa d (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|----------------------|------|-----------------|-------------------|--------------|----------------------------|--------------------|-------------|---------------------|----------------|------------------------------|----------------|----------------|-------------|----------|
| * 1.336         | 41.81                | PK-U | 29.3            | -35.8             | 0            | 35.31                      | -                  | -           | 74                  | -38.69         | -                            | -              | 334            | 305         | H        |
| * 1.339         | 31.13                | ADR  | 29.3            | -35.9             | .19          | 24.72                      | 54                 | -29.28      | -                   | -              | -                            | -              | 334            | 305         | H        |
| * 1.252         | 41.46                | PK-U | 29              | -35.8             | 0            | 34.66                      | -                  | -           | 74                  | -39.34         | -                            | -              | 136            | 277         | V        |
| * 1.253         | 31.55                | ADR  | 29              | -35.8             | .19          | 24.94                      | 54                 | -29.06      | -                   | -              | -                            | -              | 136            | 277         | V        |
| * 15.687        | 31.36                | PK-U | 40.3            | -20.4             | 0            | 51.26                      | -                  | -           | 74                  | -22.74         | -                            | -              | 67             | 199         | H        |
| * 15.685        | 21.55                | ADR  | 40.3            | -20.5             | .19          | 41.54                      | 54                 | -12.46      | -                   | -              | -                            | -              | 67             | 199         | H        |
| 10.38           | 36.51                | PK-U | 37.5            | -25.3             | 0            | 48.71                      | -                  | -           | -                   | -              | 68.2                         | -19.49         | 332            | 103         | H        |
| * 15.51         | 31.13                | PK-U | 40.2            | -20               | 0            | 51.33                      | -                  | -           | 74                  | -22.67         | -                            | -              | 329            | 239         | V        |
| * 15.51         | 21.18                | ADR  | 40.2            | -20               | .19          | 41.57                      | 54                 | -12.43      | -                   | -              | -                            | -              | 329            | 239         | V        |
| 10.39           | 37.46                | PK-U | 37.5            | -25.3             | 0            | 49.66                      | -                  | -           | -                   | -              | 68.2                         | -18.54         | 39             | 114         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

## HIGH CHANNEL RESULTS



## RADIATED EMISSIONS

| Frequency (GHz) | Meas Reading (dBuV) | Det  | AF AT0067 (dBm) | AmpC2a12aPa d (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 |
|-----------------|---------------------|------|-----------------|--------------------|--------------|----------------------------|--------------------|-------------|---------------------|----------------|------------------------------|----------------|----------------|-------------|----------|
| * 1.408         | 42.54               | PK-U | 28.9            | -35.9              | 0            | 35.54                      | -                  | -           | 74                  | -38.46         | -                            | -              | 110            | 371         | H        |
| * 1.411         | 31.8                | ADR  | 28.8            | -35.9              | .19          | 24.89                      | 54                 | -29.11      | -                   | -              | -                            | -              | 110            | 371         | H        |
| * 1.318         | 41.89               | PK-U | 29.3            | -35.9              | 0            | 35.29                      | -                  | -           | 74                  | -38.71         | -                            | -              | 345            | 208         | V        |
| * 1.317         | 31.61               | ADR  | 29.3            | -35.9              | .19          | 25.2                       | 54                 | -28.8       | -                   | -              | -                            | -              | 345            | 208         | V        |
| * 15.921        | 32.16               | PK-U | 40.4            | -19.8              | 0            | 52.76                      | -                  | -           | 74                  | -21.24         | -                            | -              | 218            | 309         | H        |
| * 15.925        | 20.53               | ADR  | 40.4            | -19.9              | .19          | 41.22                      | 54                 | -12.78      | -                   | -              | -                            | -              | 218            | 309         | H        |
| 10.46           | 35.85               | PK-U | 37.5            | -25.1              | 0            | 48.25                      | -                  | -           | -                   | -              | 68.2                         | -19.95         | 283            | 127         | H        |
| * 15.667        | 31.08               | PK-U | 40.3            | -20.3              | 0            | 51.08                      | -                  | -           | 74                  | -22.92         | -                            | -              | 230            | 225         | V        |
| * 15.664        | 21.05               | ADR  | 40.3            | -20.3              | .19          | 41.24                      | 54                 | -12.76      | -                   | -              | -                            | -              | 230            | 225         | V        |
| 10.46           | 35.94               | PK-U | 37.5            | -25.1              | 0            | 49.34                      | -                  | -           | -                   | -              | 68.2                         | -18.86         | 21             | 117         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK-U - U-NII: Maximum Peak

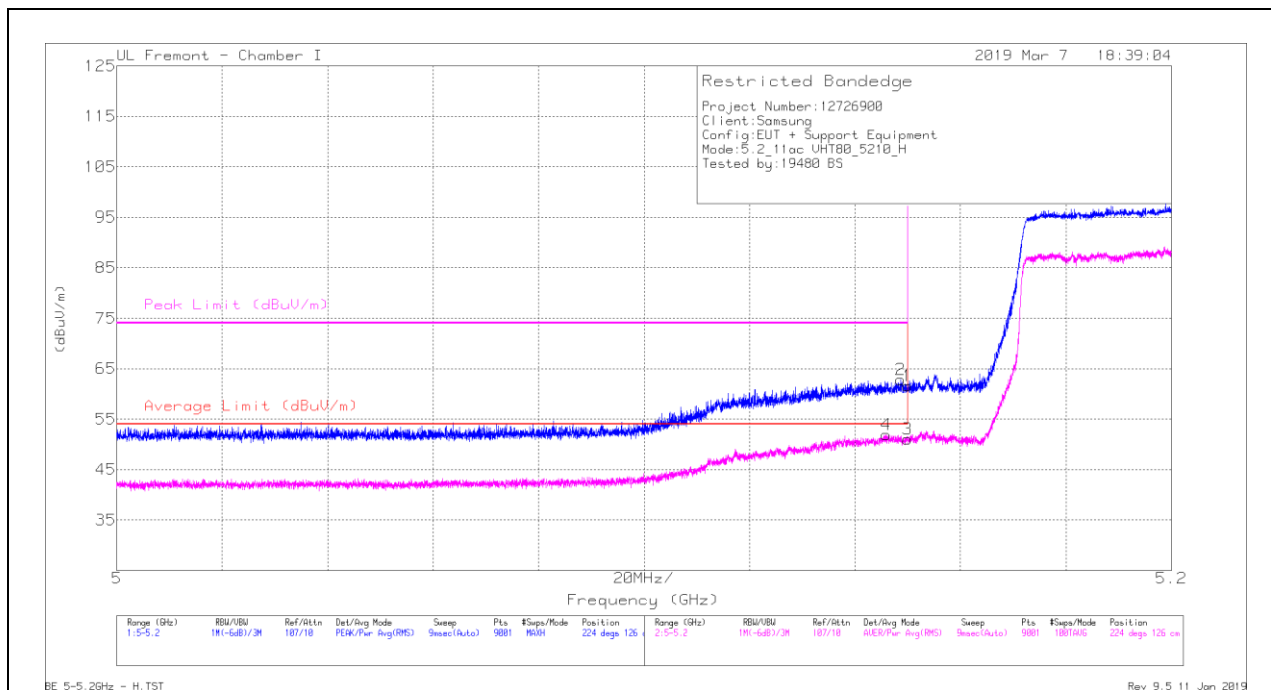
ADR - U-NII AD primary method, RMS average

## 10.1.4. TX ABOVE 1 GHz 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

### 1TX Antenna 1 MODE

### BANDEDGE (MID CHANNEL)

### HORIZONTAL RESULT



### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T862 (dB/m) | Amp/Cb/Ftr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|---------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | *5.15           | 46.17                | Pk  | 34.4           | -19                 | 0            | 61.57                      | -                      | -           | 74                  | -12.43         | 224            | 126         | H        |
| 2      | *5.149          | 47.44                | Pk  | 34.4           | -19                 | 0            | 62.84                      | -                      | -           | 74                  | -11.16         | 224            | 126         | H        |
| 3      | *5.15           | 35.22                | RMS | 34.4           | -19                 | .44          | 51.06                      | 54                     | -2.94       | -                   | -              | 224            | 126         | H        |
| 4      | *5.146          | 36.05                | RMS | 34.4           | -19                 | .44          | 51.89                      | 54                     | -2.11       | -                   | -              | 224            | 126         | H        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK - Peak detector

RMS - RMS detection