# CERTIFICATION TEST REPORT

**Report Number. :** 12371351-E4V2

| | | |
|---|---|---|
| **Applicant** | **:** | SONY MOBILE COMMUNICATIONS, INC.<br>4-12-3 HIGASHI-SHINAGAWA<br>SHINAGAWA-KU, TOKYO, 140-0002, JAPAN |
| **FCC ID** | **:** | PY7-26828G |
| **EUT Description** | **:** | GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac & NFC |
| **Test Standard(s)** | **:** | FCC 47 CFR PART 15 SUBPART C |

**Date Of Issue:**
July 24, 2018

**Prepared by:**
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP Lab code: 200065-0

# REPORT REVISION HISTORY

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 7/6/2018 | Initial Issue | |
| V2 | 7/24/2018 | Removed labels of “2TX Antenna 1 + Antenna 2. | Kiya Kedida |



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

# TABLE OF CONTENTS

**REPORT REVISION HISTORY ..... 2**

**TABLE OF CONTENTS ..... 3**

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

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

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

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

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

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

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

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

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

*5.2. MAXIMUM OUTPUT POWER ..... 8*

*5.3. DESCRIPTION OF AVAILABLE ANTENNAS ..... 8*

*5.4. SOFTWARE AND FIRMWARE ..... 8*

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

*5.6. DESCRIPTION OF TEST SETUP ..... 10*

**6. MEASUREMENT METHOD ..... 13**

**7. TEST AND MEASUREMENT EQUIPMENT ..... 14**

**8. ANTENNA PORT TEST RESULTS ..... 15**

*8.1. ON TIME AND DUTY CYCLE ..... 15*

*8.2. 99% BANDWIDTH ..... 17*

8.2.1. 802.11b MODE ..... 17

8.2.2. 802.11g MODE ..... 20

8.2.3. 802.11n HT20 MODE ..... 23

*8.3. 6 dB BANDWIDTH ..... 26*

8.3.1. 802.11b MODE ..... 26

8.3.2. 802.11g MODE ..... 29

8.3.3. 802.11n HT20 MODE ..... 32

*8.4. OUTPUT POWER ..... 35*

8.4.1. 802.11b MODE ..... 36

8.4.2. 802.11g MODE ..... 37

8.4.3. 802.11n HT20 MODE ..... 38

*8.5. POWER SPECTRAL DENSITY ..... 39*

8.5.1. 802.11b MODE ..... 39

8.5.2. 802.11g MODE ..... 42

8.5.3. 802.11n HT20 MODE ..... 45



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

*8.6. CONDUCTED SPURIOUS EMISSIONS ..... 48*
8.6.1. 802.11b MODE ..... 49
8.6.2. 802.11g MODE ..... 53
8.6.3. 802.11n HT20 MODE ..... 57

**9. RADIATED TEST RESULTS ..... 61**

*9.1. TRANSMITTER ABOVE 1 GHz ..... 62*
9.1.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND ..... 62
9.1.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND ..... 76
9.1.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND ..... 92

*9.2. Worst Case Below 30 MHz ..... 108*

*9.3. Worst Case Below 1 GHz ..... 109*

*9.4. Worst Case 18-26 GHz ..... 111*

**10. AC POWER LINE CONDUCTED EMISSIONS ..... 113**

10.1.1. AC Power Line Norm ..... 114

**11. SETUP PHOTOS ..... 116**



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SONY MOBILE COMMUNICATIONS, INC.
4-12-3 HIGASHI-SHINAGAWA,
SHINAGAWA-KU, TOKYO, 140-0002, JAPAN

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

**SERIAL NUMBER:** BH93004ED4, BH93008XD4 (Conducted),
BH93008MD4, BH93008QD4 (Radiated)

**DATE TESTED:** June 21 – July 2, 2018

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| CFR 47 Part 15 Subpart C | Complies |

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

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

Approved & Released For
UL Verification Services Inc. By:

Dan Coronia
CONSUMER TECHNOLOGY DIVISION
Operations Leader
UL Verification Services Inc.

Reviewed By:

Kiya Kedida
CONSUMER TECHNOLOGY DIVISION
Project Engineer
UL Verification Services Inc.

# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 558074 D01 v4, KDB 662911 D01 v02r01 and ANSI C63.10-2013.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and at 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. |
|---|---|---|
| ☐ Chamber A (ISED:2324B-1) | ☐ Chamber D (ISED:22541-1) | ☒ Chamber K (ISED: 2324A-1) |
| ☒ Chamber B (ISED:2324B-2) | ☐ Chamber E (ISED:22541-2) | ☒ Chamber L (ISED: 2324A-3) |
| ☐ Chamber C (ISED:2324B-3) | ☐ Chamber F (ISED:22541-3) | |
| | ☐ Chamber G (ISED:22541-4) | |
| | ☐ Chamber H (ISED:22541-5) | |

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through C are covered under ISED company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under ISED company address code 22541 with site numbers 22541 -1 through 22541-5, respectively.

ISED company address codes for chambers K through L are in process, and have yet to be determined.

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



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

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

## 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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

## 4.3. MEASUREMENT UNCERTAINTY

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

| PARAMETER | UNCERTAINTY |
|---|---|
| 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 | 3.15 dB |
| Worst Case Radiated Disturbance, 30 to 1000 MHz | 5.36 dB |
| Worst Case Radiated Disturbance, 1000 to 18000 MHz | 4.32 dB |
| Worst Case Radiated Disturbance, 18000 to 26000 MHz | 4.45 dB |
| Worst Case Radiated Disturbance, 26000 to 40000 MHz | 5.24 dB |

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



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

# 5. EQUIPMENT UNDER TEST

## 5.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac, & NFC.

## 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

| Frequency Range (MHz) | Mode | Output Power (dBm) | Output Power (mW) |
|---|---|---|---|
| **2Tx** | | | |
| 2412 - 2472 | 802.11b | 18.22 | 66.37 |
| 2412 - 2472 | 802.11g | 18.04 | 63.68 |
| 2412 - 2472 | 802.11n HT20 CDD | 17.96 | 62.52 |

## 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes Loop Antennas with maximum gain as below table:

| Frequency Band (GHz) | Chain 0 | Chain 1 |
|---|---|---|
| | Antenna Gain (dBi) | Antenna Gain (dBi) |
| 2.4 | -1.50 | -8.50 |

## 5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was s_atp_0_ 00436_A_12_16.
The test utility software used during testing was Tera Term Ver 4.79


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## 5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 30MHz, 1GHz, above 18GHz, and AC 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 Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.

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

802.11b mode: 1 Mbps
802.11g mode: 6 Mbps
802.11n HT20mode: MCS0

The simultaneous mode (SISO 2.4GHz Chain 0 and 5GHz chain 1) was checked and stand-alone (MIMO) 2.4 GHz / 5GHz remain the worst case.

NOTE: SISO mode is covered by MIMO mode due to same maximum tune-up limit (power).

## 5.6. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Support Equipment List | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| Laptop | Lenovo | 20B7S0A200 | PC015REW | N/A |
| Desktop | Lenovo | ThinkCentre | MJ00QA59 | N/A |
| AC Adapter | SONY | UCH20 | 3416W45305784 | N/A |
| DC Power Supply | Ametek | XT 15-4 | T463 | 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 Type C | Shielded | 1 | N/A |
| 3 | DC | 1 | DC | Shielded | 0.3 | N/A |

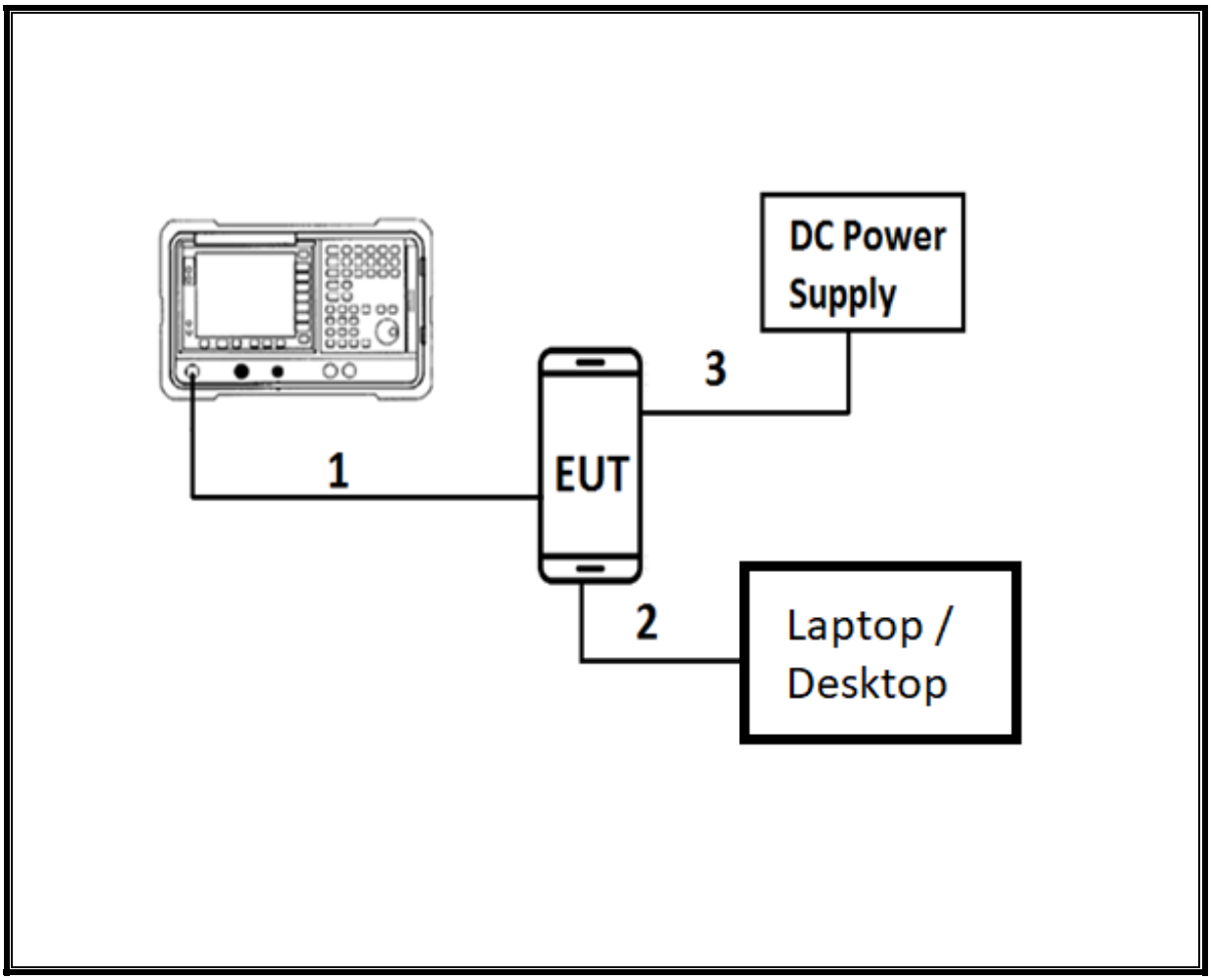
**I/O CABLES (RADIATED AND CONDUCTED EMISSIONS)**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No** | **Port** | **# of identical ports** | **Connector Type** | **Cable Type** | **Cable Length (m)** | **Remarks** |
| 1 | USB | 1 | USB Type C | Shielded | 3 | N/A |



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

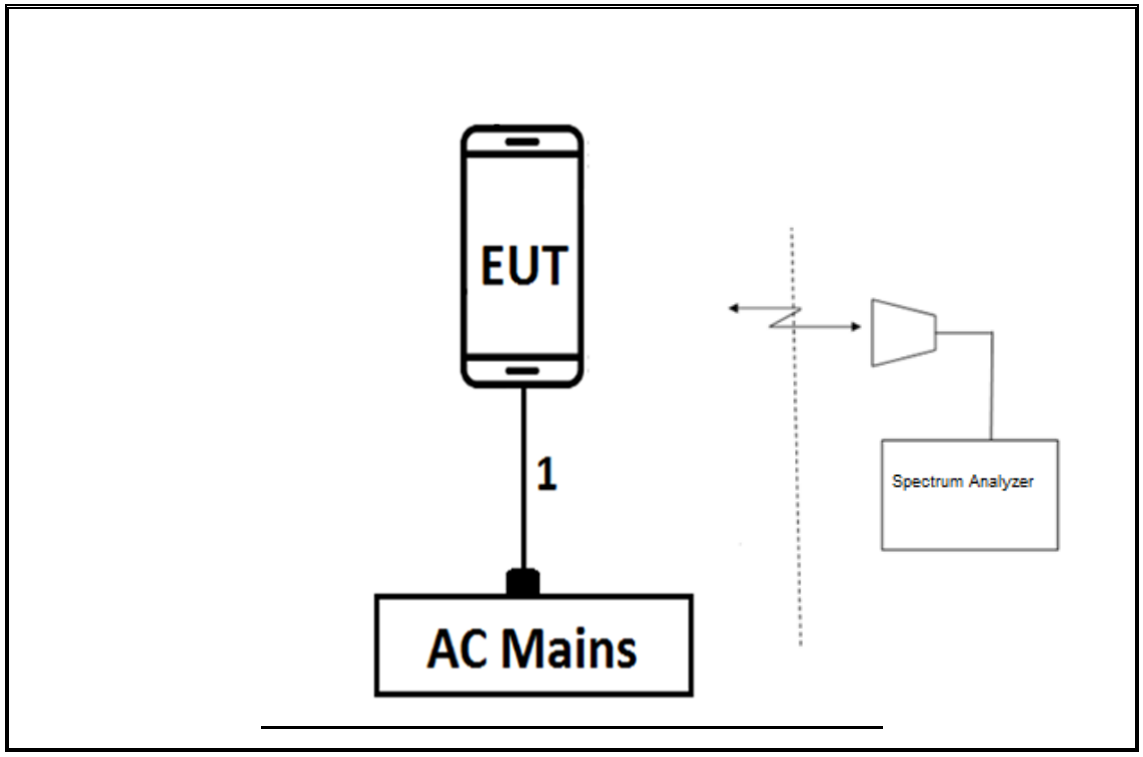
**CONDCUTED TEST SETUP DIAGRAM**




**TEST SETUP**

For conducted tests: the EUT was connected to a host laptop via an USB cable for parameter setting purpose such as channel, output power...etc. The test software exercises the radio.

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




**TEST SETUP**

For radiated tests: All support equipment were removed after the EUT programmed. The test software exercises the radio.

# 6. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 558074 D01 v04, Section 6.

6 dB BW: KDB 558074 D01 v04, Section 8.1.

99% BW: ANSI C63.10-2013, Section 6.9.3.

Output Power: KDB 558074 D01 v04, Section 9.2.3.2.

Power Spectral Density: KDB 558074 D01 v04, Section 10.3.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v04, Section 11.1 (b).

Out-of-band emissions in restricted bands: KDB 558074 D01 v04, Section 12.1.

Band-edge: KDB 558074 D01 v04, Section 12.1.

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



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

# 7. 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** |
| Amplifier | Hewlet Packard | 8447D | T64 | 06/25/2019 |
| Amplifier, 9KHz to 1GHz, 32dB | Sonoma Instrument | 310 | PRE0180089 | 06/21/2019 |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz | Sunol Sciences Corp. | JB3 | T407 | 05/10/2019 |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz w/4dB Pad | Sunol Sciences Corp. | JB3 | T477 | 07/07/2018 |
| Antenna, Horn 1-18GHz | ETS-Lindgren | 3117 | T344 | 04/30/2019 |
| Antenna, Horn 1-18GHz | ETS-Lindgren | 3117 | T4294 | 04/30/2019 |
| Amplifier, 1 to 18GHz, 35dB | AMPLICAL | AMP1G18-35 | T1569 | 06/03/2019 |
| RF Amplifier | MITEQ | AFS42-00101800-25-S-42 | T1568 | 06/21/2019 |
| Amplifier, 1 to 7.0GHz, 20.0dB Gain minimum, 6dB NF | AMPLICAL | AMP1G7-20-27 | T1563 | 06/03/2019 |
| Amplifier 1-8GHz 30dB gain | L3 Narda | AMF-4D-01000800-30-29P | 167495 | 06/22/2019 |
| EMI TEST RECEIVER | Rohde & Schwarz | ESW44 | PRE0179522 | 05/11/2019 |
| EMI TEST RECEIVER | Rohde & Schwarz | ESW44 | PRE0179367 | 04/25/2019 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz | Agilent (Keysight) Technologies | N9030A | T1113 | 12/21/2018 |
| Spectrum Analyzer, PSA, 3Hz to 44GHz | Agilent (Keysight) Technologies | N9030A | T146 | 07/18/2018 |
| Spectrum Analyzer, PSA, 3Hz to 44GHz | Agilent (Keysight) Technologies | N9030A | T1454 | 01/08/2019 |
| Power Meter, P-series single channel | Agilent (Keysight) Technologies | N1911A | T1271 | 07/17/2018 |
| Power Sensor, P-series, 50MHz to 18GHz, Wideband | Agilent (Keysight) Technologies | N1921A | T1225 | 04/10/2019 |
| Filter, HPF 3.0GHz | MICRO-TRONICS | HPM17543 | T1013 | 06/21/2019 |
| Filter, HPF 3.0GHz | MICRO-TRONICS | HPM17543 | T894 | 06/03/2019 |
| Antenna, Active Loop 9kHz-30MHz | Com-Power Corp. | AL-130R | T1866 | 10/10/2018 |
| 18 - 26.5 GHz Horn Antenna | Seavey Division | MWH-1826/B | T89 | 01/18/2019 |
| Pre-Amp 1-26.5 GHz | Agilent | 8449B | T404 | 03/09/2019 |
| EMI Reciever | Rohde & Schwarz | ESR | T1436 | 02/21/2019 |
| L.I.S.N. | FCC INC. | FCC LISN 50/250 | T1310 | 06/15/2019 |
| L.I.S.N. | FCC INC. | FCC LISN 50/250 | T24 | 03/06/2019 |
| Thermometer - Digital | Control Company | 14-650-118 | PRE0177862 | 02/22/2019 |

| UL AUTOMATION SOFTWARE | | | |
|---|---|---|---|
| Radiated Software | UL | UL EMC | Ver 9.5, June 22, 2018 |
| Antenna Port Software | UL | UL EMC | Ver 8.4, June 12, 2018 |

# 8. ANTENNA PORT TEST RESULTS

## 8.1. ON TIME AND DUTY CYCLE

**LIMITS**

None; for reporting purposes only.

**PROCEDURE**

KDB 789033 Zero-Span Spectrum Analyzer Method.

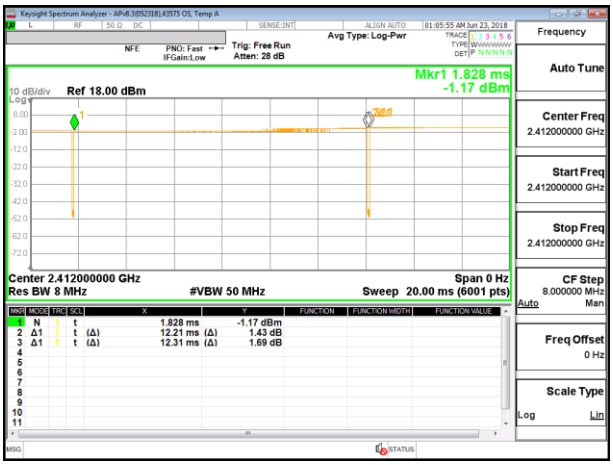
**ON TIME AND DUTY CYCLE RESULTS**

| Mode | ON Time B (msec) | Period (msec) | Duty Cycle x (linear) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) | 1/B Minimum VBW (kHz) |
|---|---|---|---|---|---|---|
| **2.4GHz Band** | | | | | | |
| 802.11b 1TX | 12.210 | 12.310 | 0.992 | 99.19% | 0.00 | 0.010 |
| 802.11g 1TX | 2.028 | 2.066 | 0.982 | 98.16% | 0.00 | 0.010 |
| 802.11n HT20 1TX | 2.508 | 2.566 | 0.977 | 97.74% | 0.10 | 0.399 |

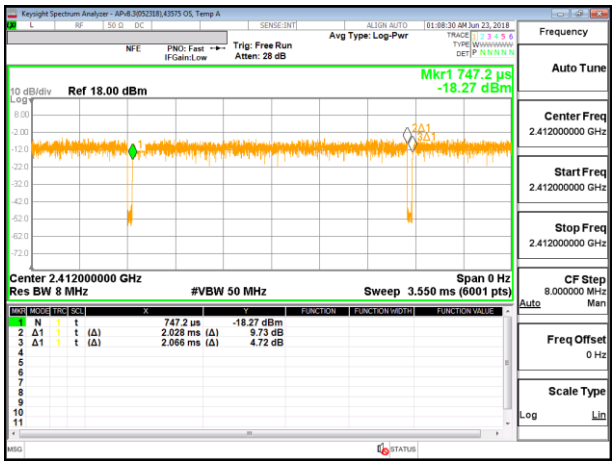


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## DUTY CYCLE PLOTS




**DUTY CYCLE 802.11b 1TX MODE**




**DUTY CYCLE 802.11g 1TX MODE**


**DUTY CYCLE 802.11n HT20 1TX MODE**

## 8.2. 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

**RESULTS**

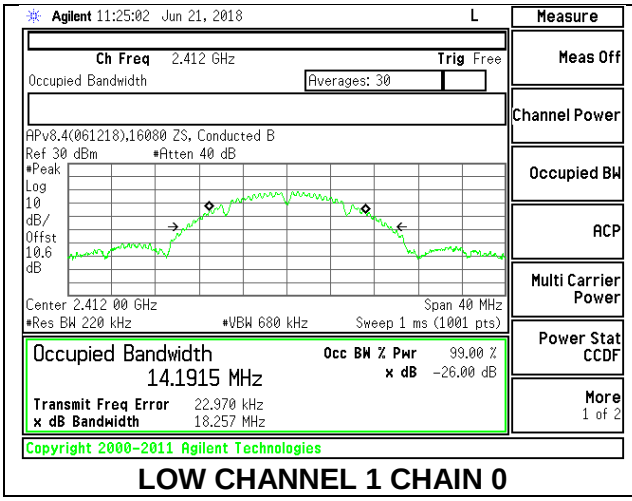
### 8.2.1. 802.11b MODE

| Channel | Frequency (MHz) | 99% Bandwidth Chain 0 (MHz) | 99% Bandwidth Chain 1 (MHz) |
|---|---|---|---|
| Low 1 | 2412 | 14.1915 | 13.7125 |
| Mid 6 | 2437 | 13.9187 | 13.7198 |
| High 11 | 2462 | 13.5039 | 13.6858 |
| High 12 | 2467 | 13.7821 | 13.8109 |
| High 13 | 2472 | 13.8932 | 13.6781 |
| **Worst** | | **14.1915** | **13.8109** |

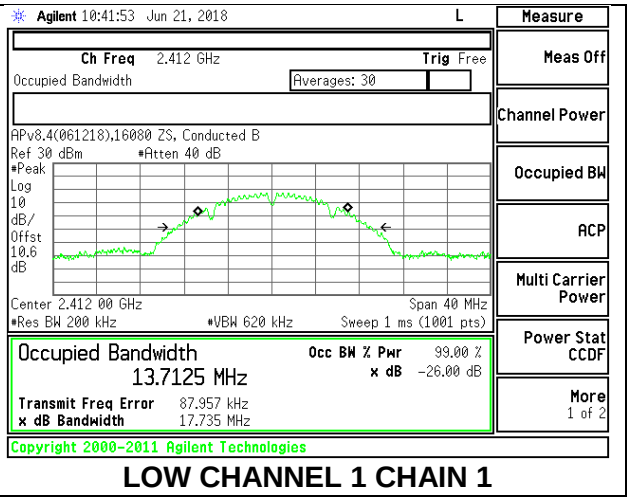


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## LOW CHANNEL 1

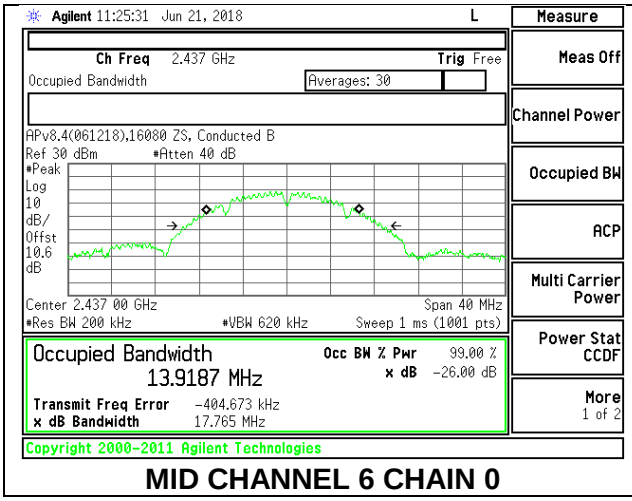



LOW CHANNEL 1 CHAIN 0

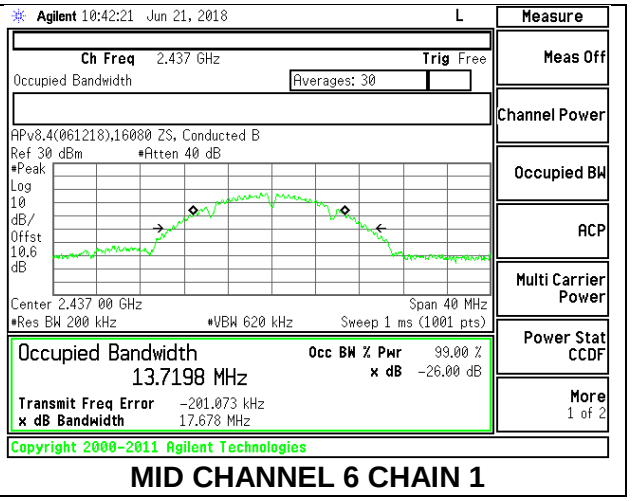



LOW CHANNEL 1 CHAIN 1

## MID CHANNEL 6

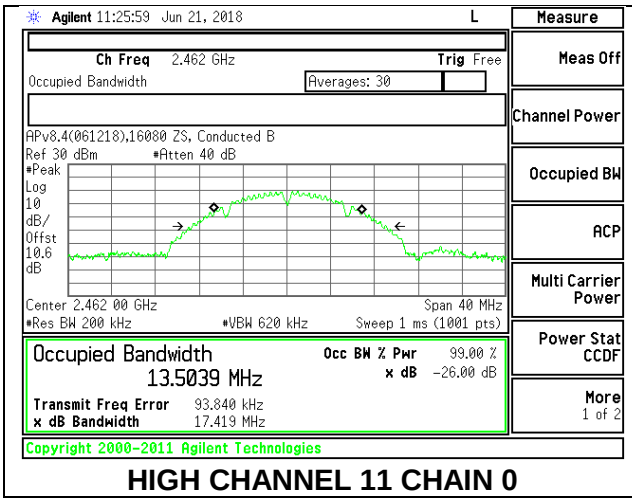



MID CHANNEL 6 CHAIN 0

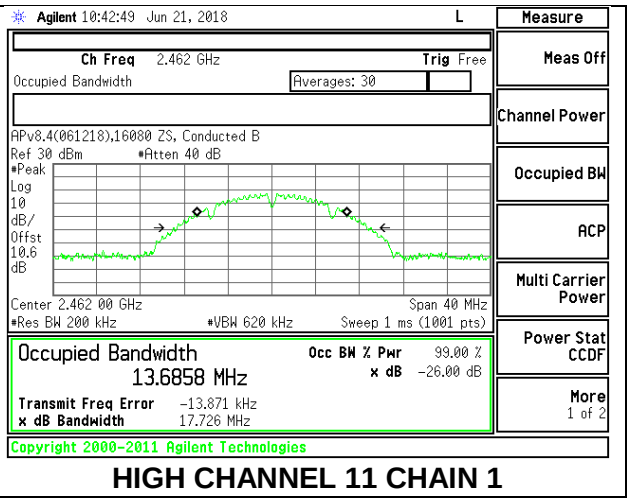



MID CHANNEL 6 CHAIN 1

## HIGH CHANNEL 11

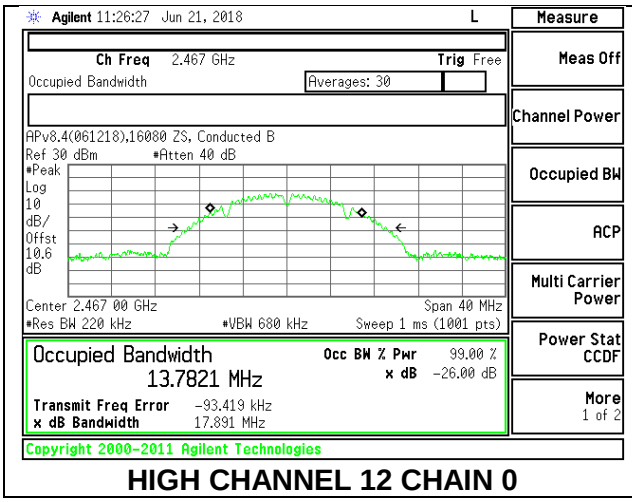



HIGH CHANNEL 11 CHAIN 0

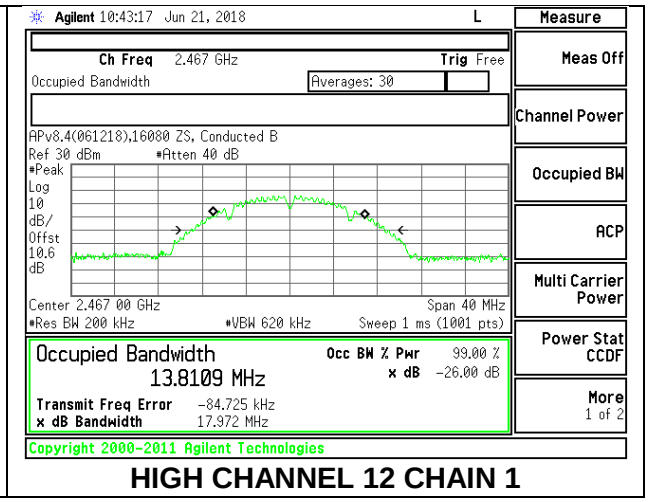



HIGH CHANNEL 11 CHAIN 1

## HIGH CHANNEL 12

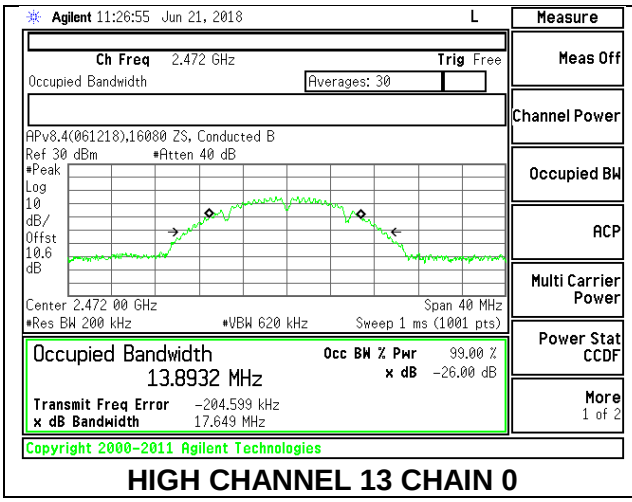



HIGH CHANNEL 12 CHAIN 0

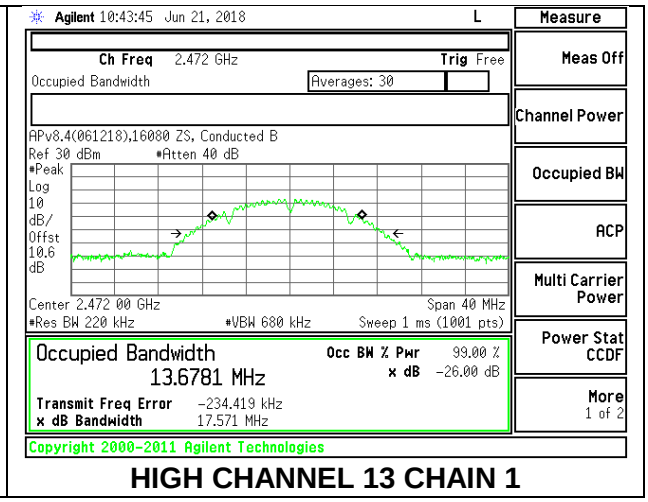



HIGH CHANNEL 12 CHAIN 1

## HIGH CHANNEL 13




HIGH CHANNEL 13 CHAIN 0

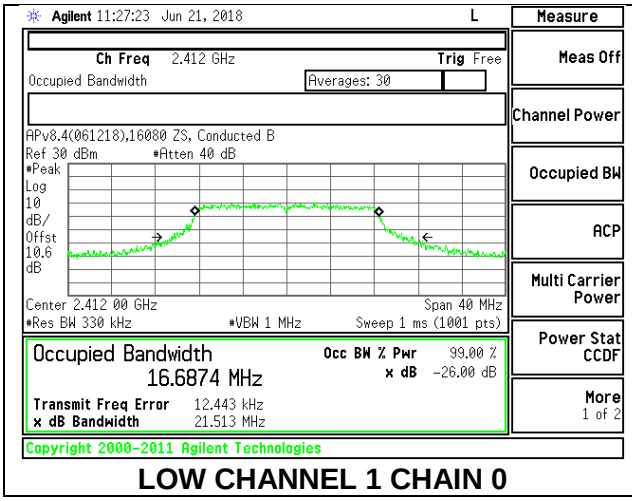



HIGH CHANNEL 13 CHAIN 1

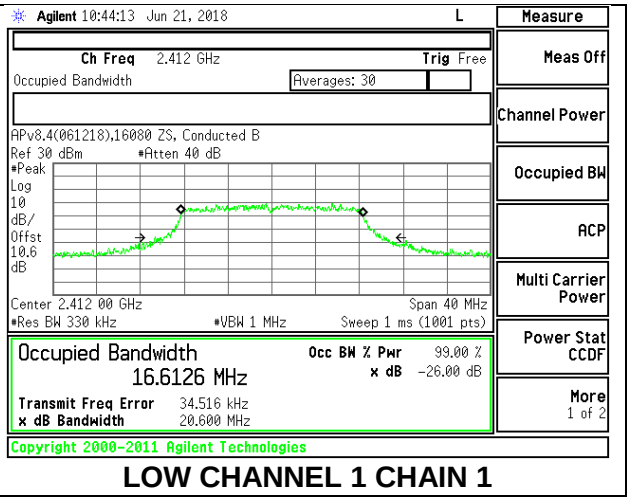
### 8.2.2. 802.11g MODE

| Channel | Frequency (MHz) | 99% Bandwidth Chain 0 (MHz) | 99% Bandwidth Chain 1 (MHz) |
|---|---|---|---|
| Low 1 | 2412 | 16.6874 | 16.6126 |
| Low 2 | 2417 | 16.6832 | 16.5999 |
| Mid 6 | 2437 | 16.6108 | 16.7126 |
| High 11 | 2462 | 16.4204 | 16.4359 |
| High 12 | 2467 | 16.5207 | 16.4523 |
| High 13 | 2472 | 16.5382 | 16.5945 |
| **Worst** | | **16.6874** | **16.7126** |

## LOW CHANNEL 1

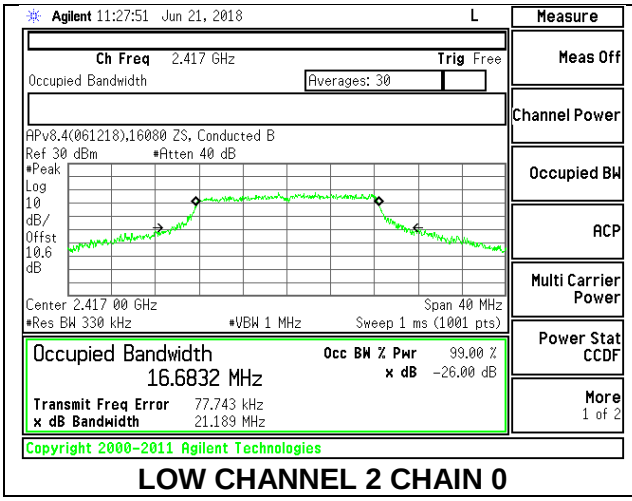



LOW CHANNEL 1 CHAIN 0

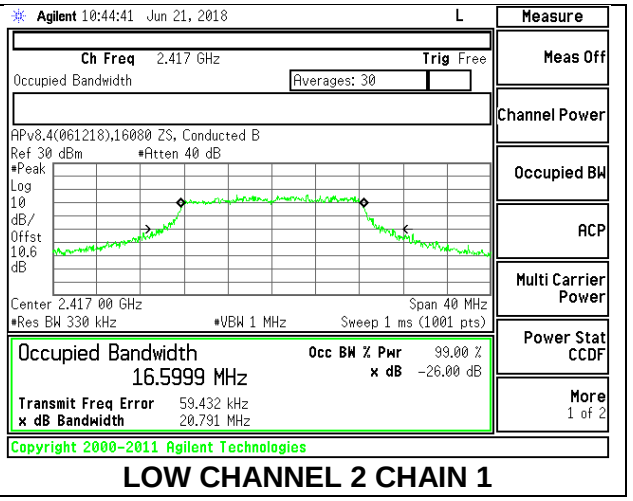



LOW CHANNEL 1 CHAIN 1

## LOW CHANNEL 2

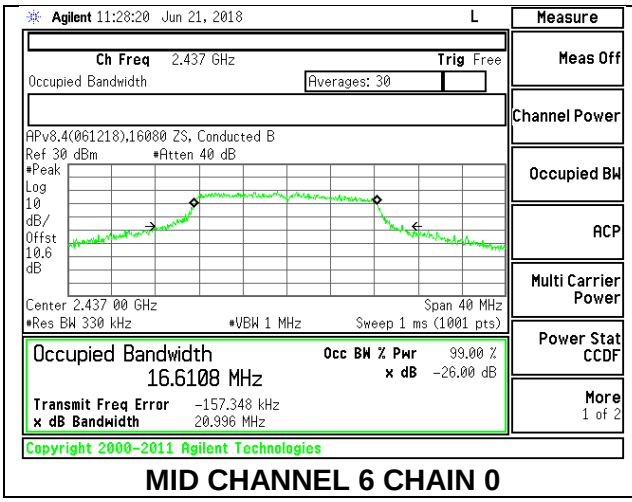



LOW CHANNEL 2 CHAIN 0

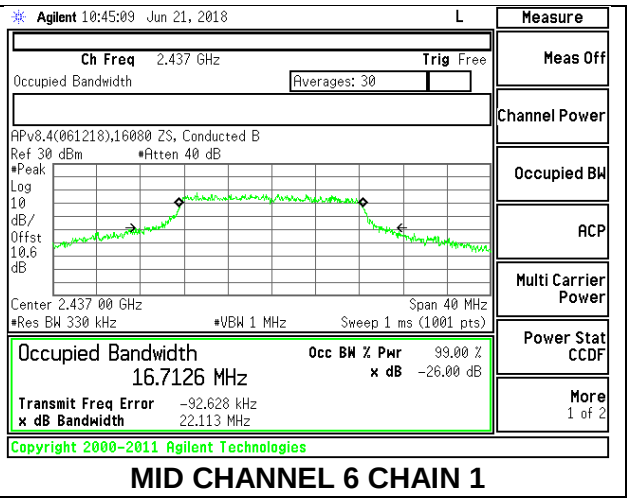



LOW CHANNEL 2 CHAIN 1

## MID CHANNEL 6

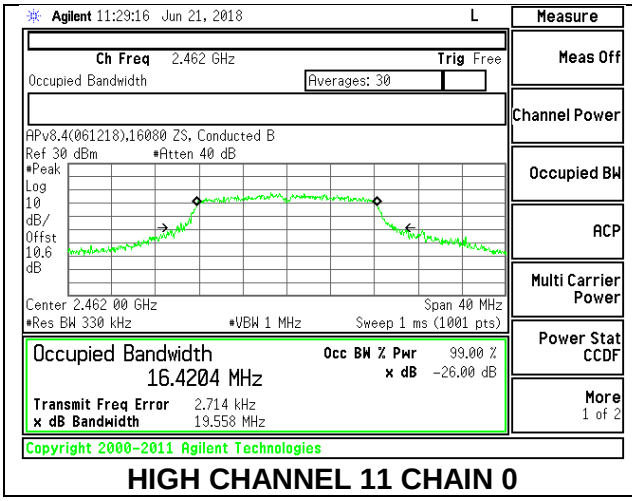



MID CHANNEL 6 CHAIN 0

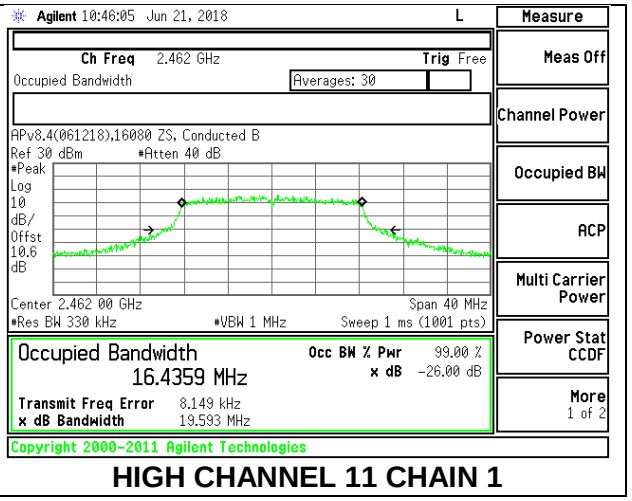



MID CHANNEL 6 CHAIN 1

## HIGH CHANNEL 11

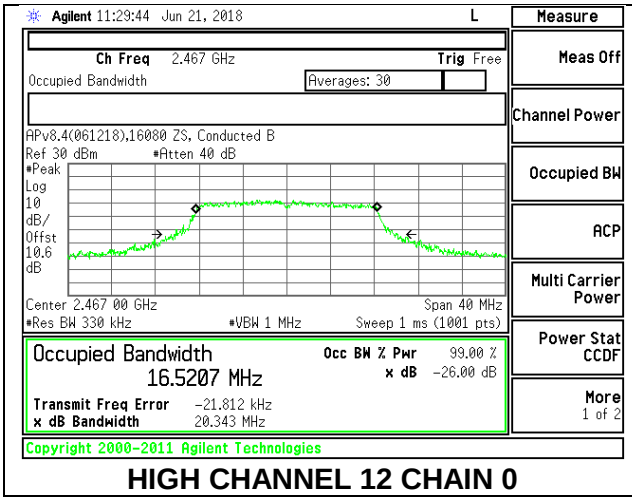



HIGH CHANNEL 11 CHAIN 0

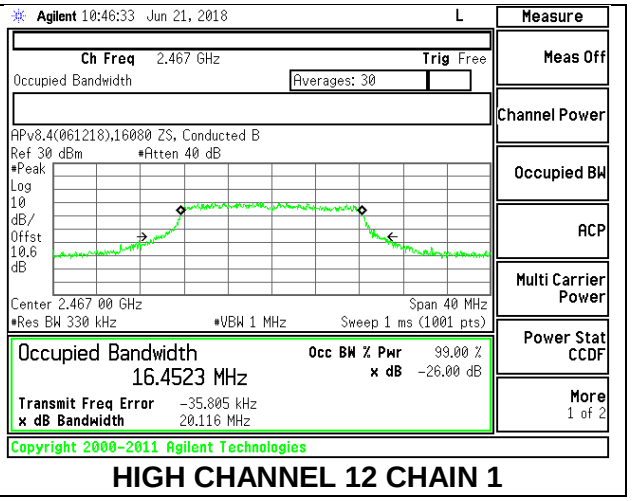



HIGH CHANNEL 11 CHAIN 1

## HIGH CHANNEL 12

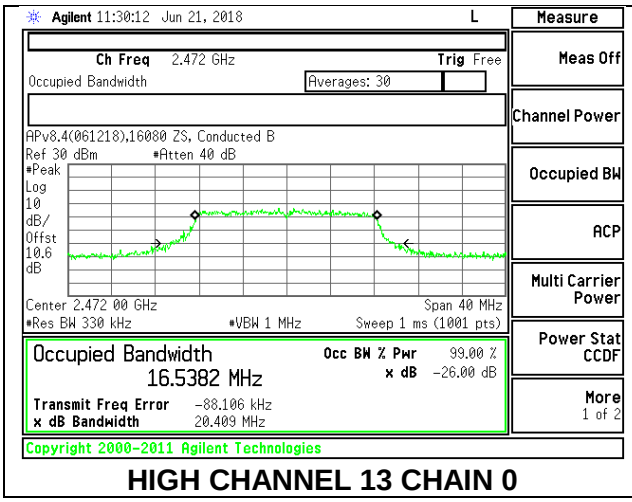



HIGH CHANNEL 12 CHAIN 0

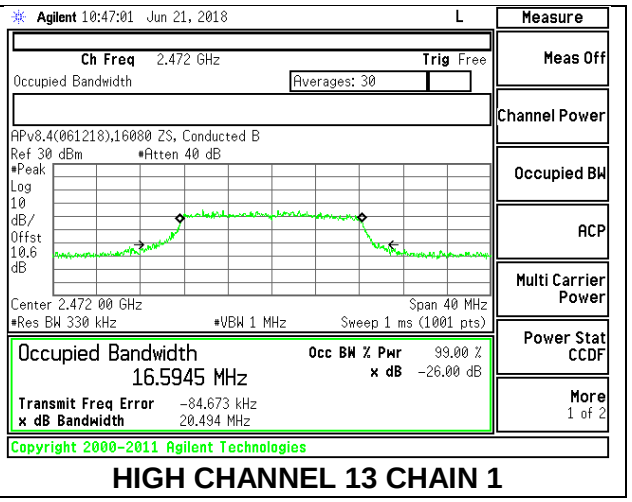



HIGH CHANNEL 12 CHAIN 1

## HIGH CHANNEL 13




HIGH CHANNEL 13 CHAIN 0




HIGH CHANNEL 13 CHAIN 1

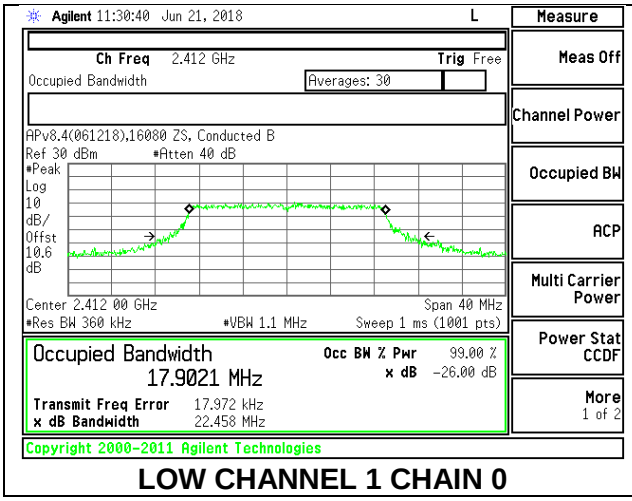
### 8.2.3. 802.11n HT20 MODE

| Channel | Frequency (MHz) | 99% Bandwidth Chain 0 (MHz) | 99% Bandwidth Chain 1 (MHz) |
|---|---|---|---|
| Low 1 | 2412 | 17.9021 | 17.7578 |
| Low 2 | 2417 | 17.8668 | 17.7784 |
| Mid 6 | 2437 | 17.8265 | 17.8385 |
| High 11 | 2462 | 17.6664 | 17.6765 |
| High 12 | 2467 | 17.7491 | 17.7143 |
| High 13 | 2472 | 17.7913 | 17.8595 |
| **Worst** | | **17.9021** | **17.8595** |

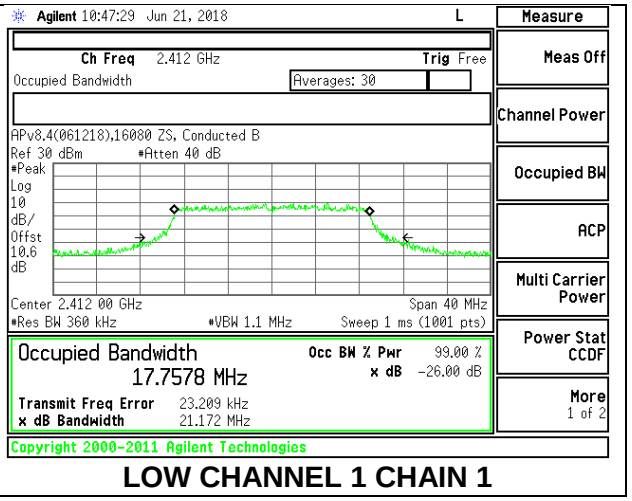


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## LOW CHANNEL 1

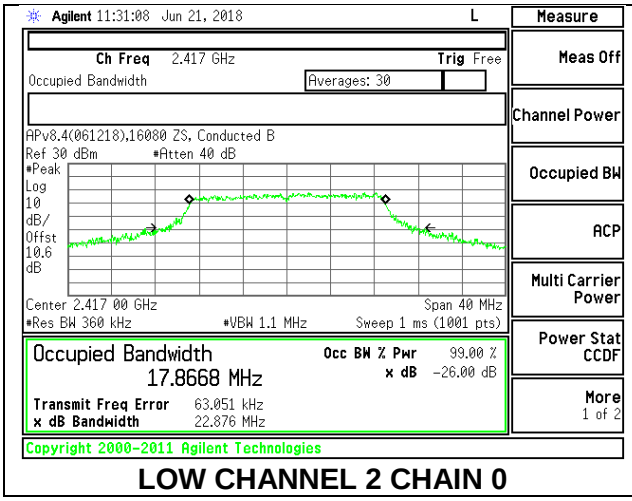



LOW CHANNEL 1 CHAIN 0

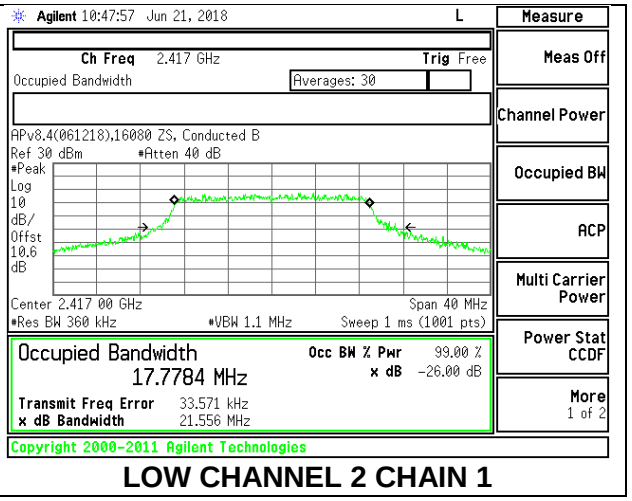



LOW CHANNEL 1 CHAIN 1

## LOW CHANNEL 2

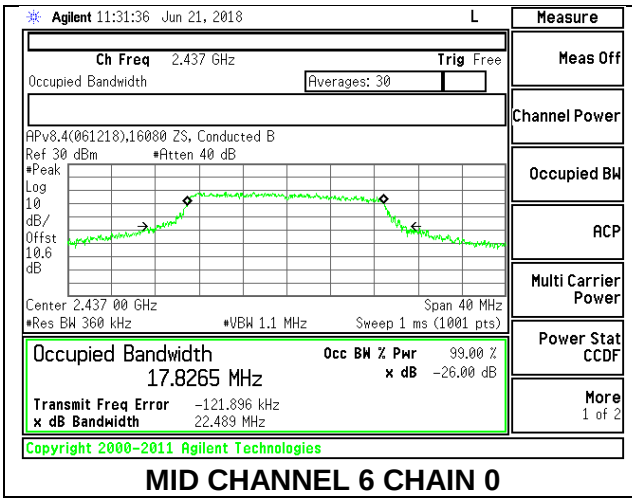



LOW CHANNEL 2 CHAIN 0

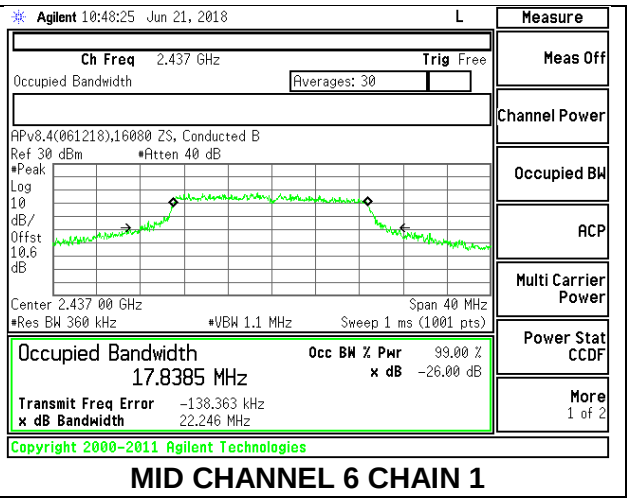



LOW CHANNEL 2 CHAIN 1

## MID CHANNEL 6

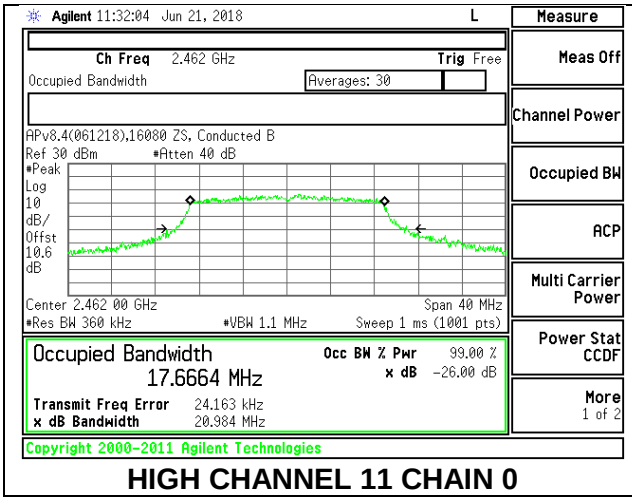



MID CHANNEL 6 CHAIN 0

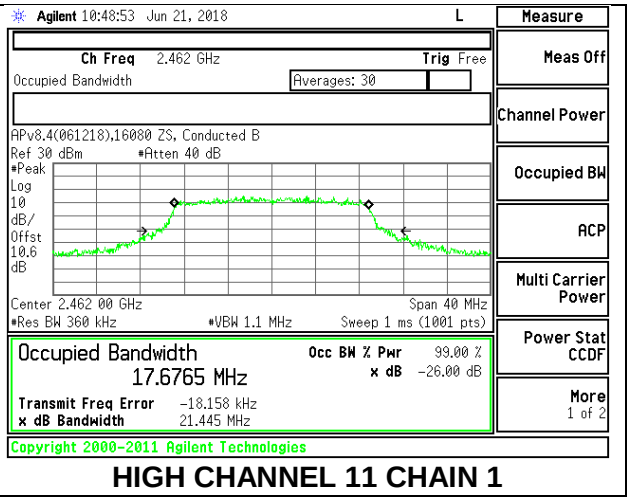



MID CHANNEL 6 CHAIN 1

## HIGH CHANNEL 11

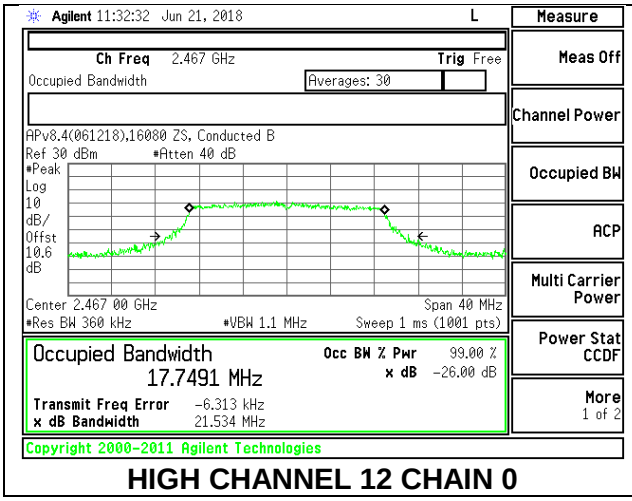



**HIGH CHANNEL 11 CHAIN 0**

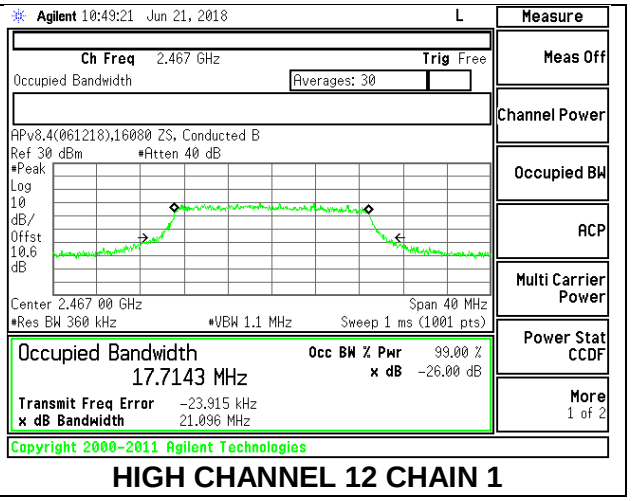



**HIGH CHANNEL 11 CHAIN 1**

## HIGH CHANNEL 12

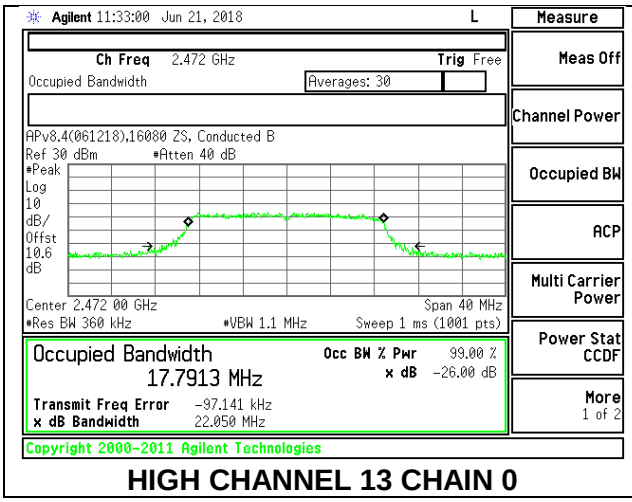



**HIGH CHANNEL 12 CHAIN 0**

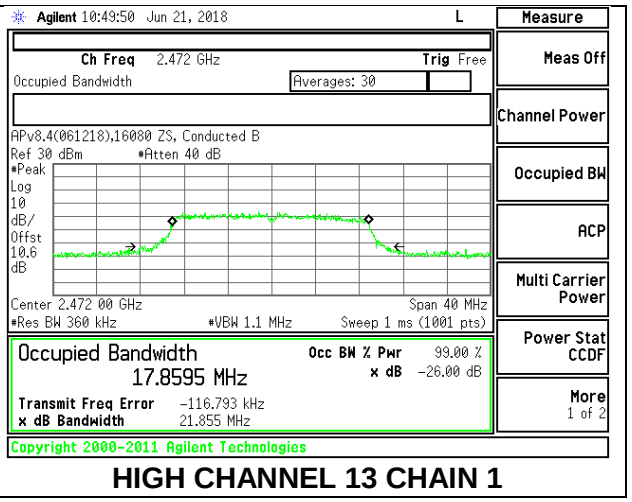



**HIGH CHANNEL 12 CHAIN 1**

## HIGH CHANNEL 13




**HIGH CHANNEL 13 CHAIN 0**




**HIGH CHANNEL 13 CHAIN 1**

## 8.3. 6 dB BANDWIDTH

**LIMITS**

FCC §15.247 (a) (2)

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

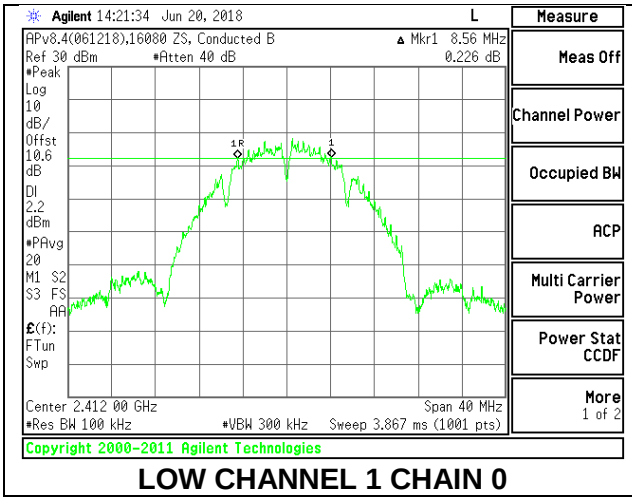
**RESULTS**

### 8.3.1. 802.11b MODE

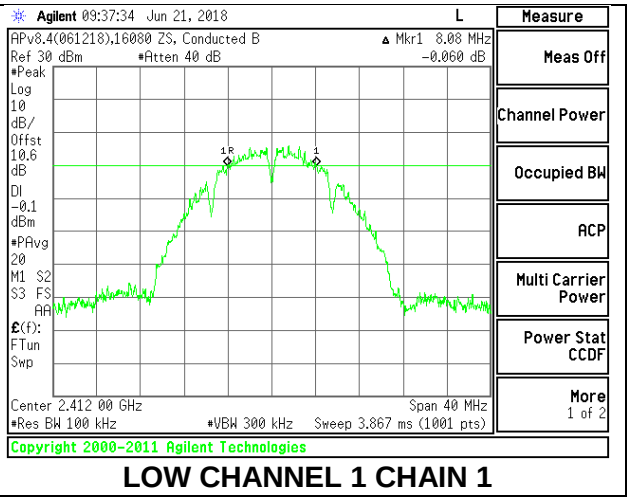
| Channel | Frequency (MHz) | 6 dB BW Chain 0 (MHz) | 6 dB BW Chain 1 (MHz) | Minimum Limit (MHz) |
|---|---|---|---|---|
| Low 1 | 2412 | 8.56 | 8.08 | 0.5 |
| Mid 6 | 2437 | **9.08** | 7.16 | 0.5 |
| High 11 | 2462 | 8.12 | 8.08 | 0.5 |
| High 12 | 2467 | 8.56 | **8.12** | 0.5 |
| High 13 | 2472 | 8.04 | 8.12 | 0.5 |


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## LOW CHANNEL 1

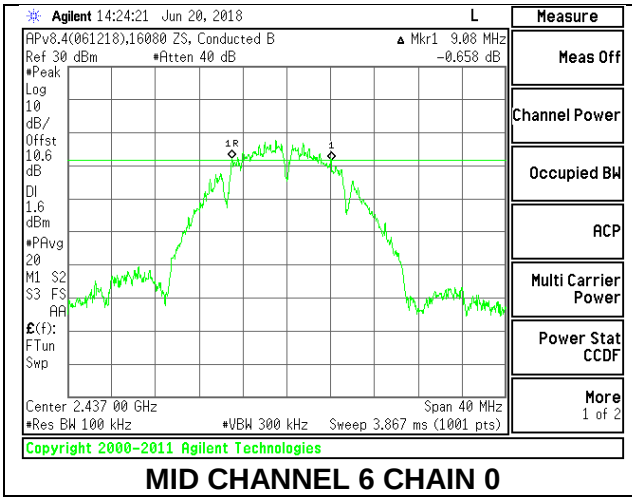



LOW CHANNEL 1 CHAIN 0

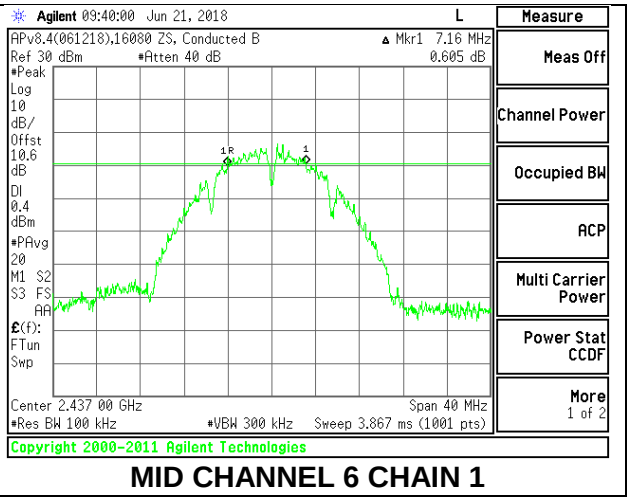



LOW CHANNEL 1 CHAIN 1

## MID CHANNEL 6

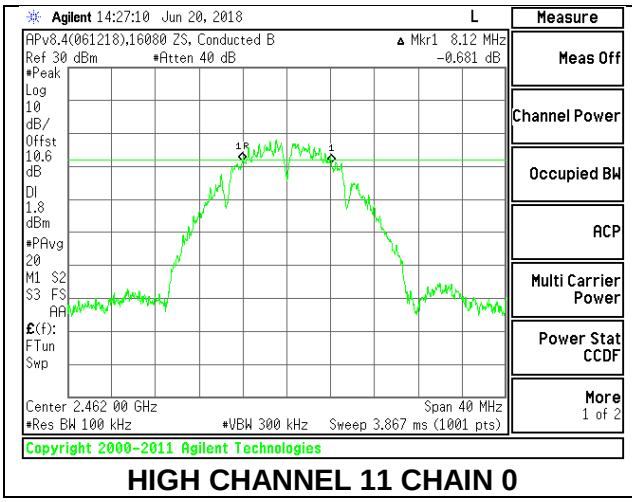



MID CHANNEL 6 CHAIN 0

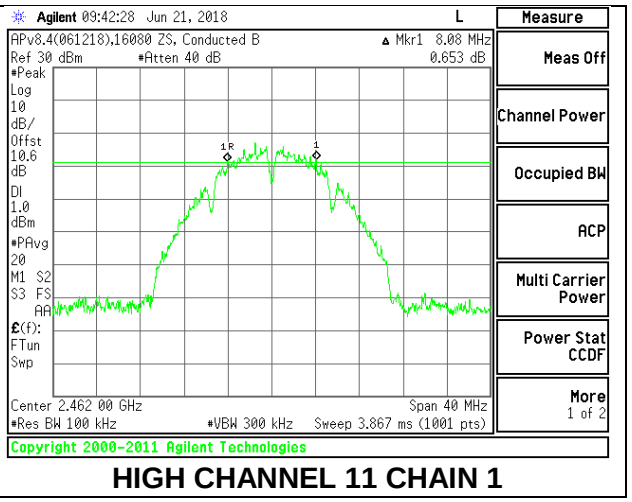



MID CHANNEL 6 CHAIN 1

## HIGH CHANNEL 11

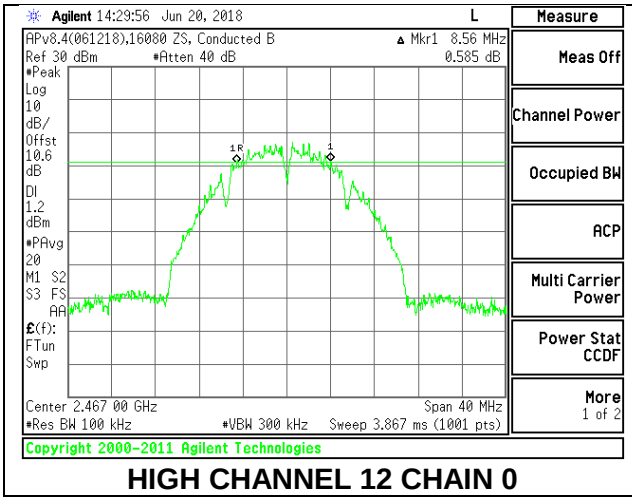



HIGH CHANNEL 11 CHAIN 0

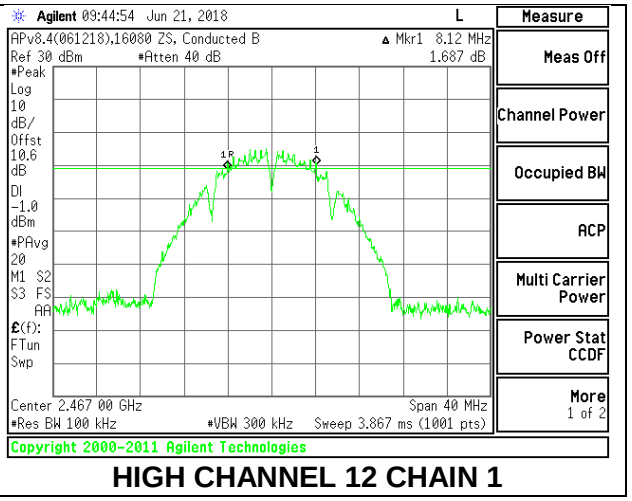



HIGH CHANNEL 11 CHAIN 1

## HIGH CHANNEL 12

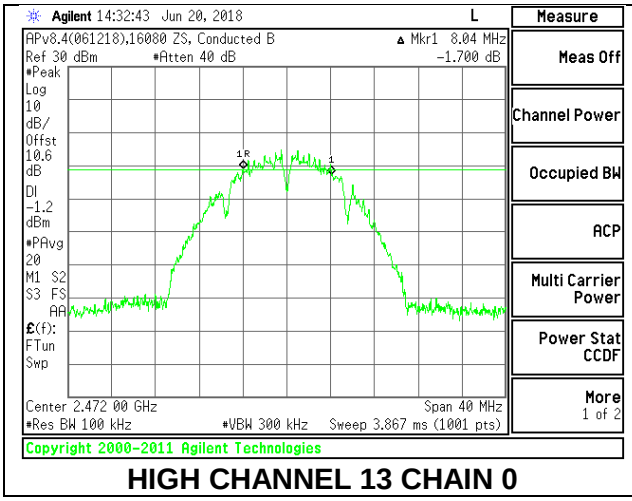



HIGH CHANNEL 12 CHAIN 0

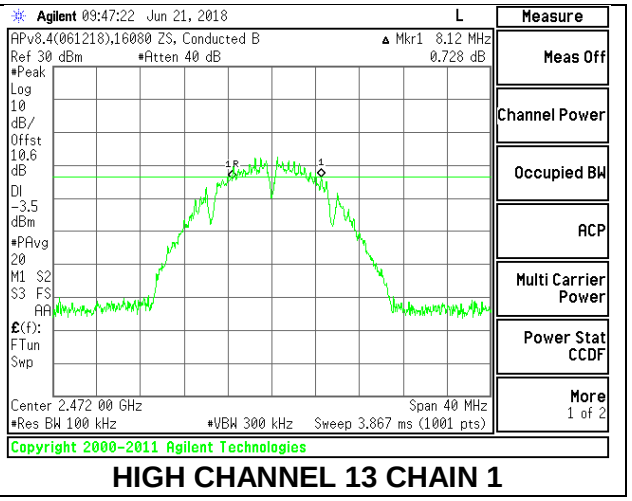



HIGH CHANNEL 12 CHAIN 1

## HIGH CHANNEL 13




HIGH CHANNEL 13 CHAIN 0

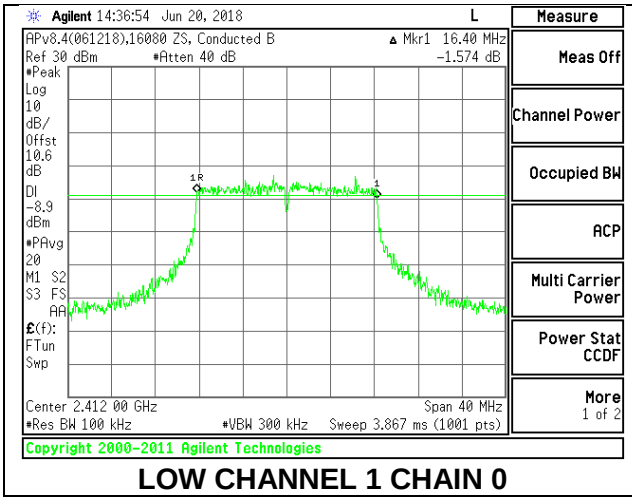



HIGH CHANNEL 13 CHAIN 1

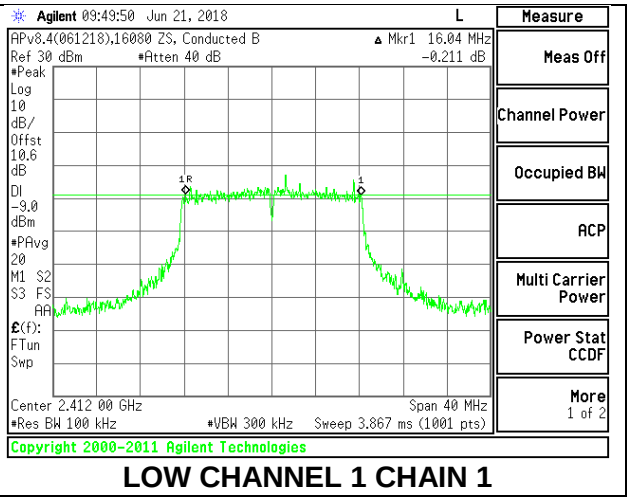
### 8.3.2. 802.11g MODE

| Channel | Frequency (MHz) | 6 dB BW Chain 0 (MHz) | 6 dB BW Chain 1 (MHz) | Minimum Limit (MHz) |
|---|---|---|---|---|
| Low 1 | 2412 | 16.40 | 16.04 | 0.5 |
| Low 2 | 2417 | **16.44** | **16.40** | 0.5 |
| Mid 6 | 2437 | 16.44 | 16.16 | 0.5 |
| High 11 | 2462 | 16.36 | 16.04 | 0.5 |
| High 12 | 2467 | 16.12 | 16.40 | 0.5 |
| High 13 | 2472 | 16.40 | 16.12 | 0.5 |

## LOW CHANNEL 1

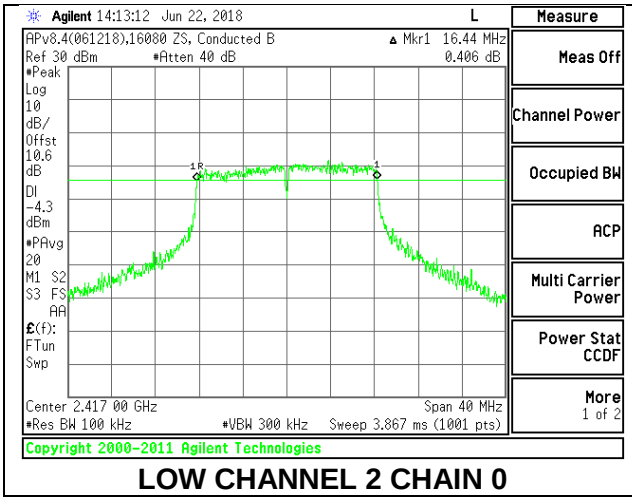



LOW CHANNEL 1 CHAIN 0

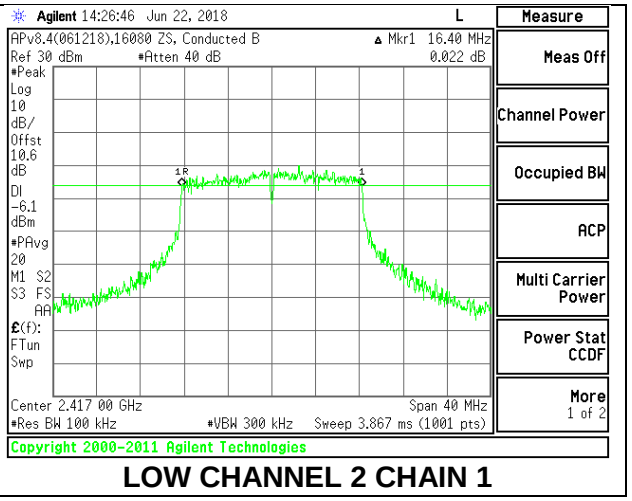



LOW CHANNEL 1 CHAIN 1

## LOW CHANNEL 2

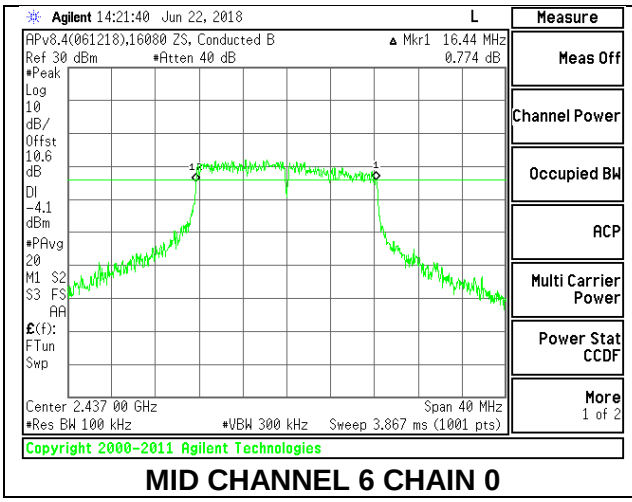



LOW CHANNEL 2 CHAIN 0

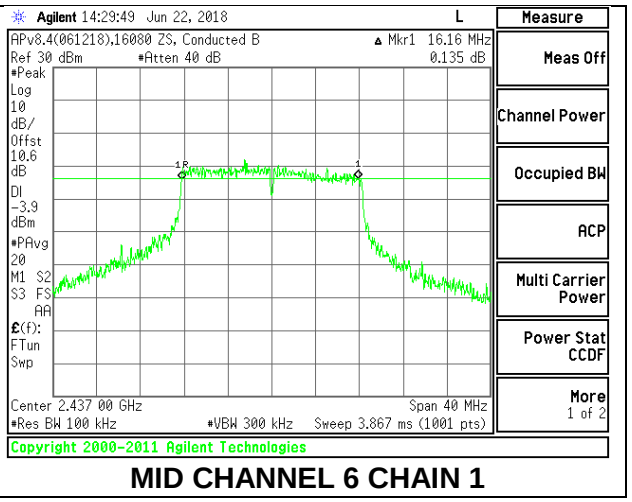



LOW CHANNEL 2 CHAIN 1

## MID CHANNEL 6

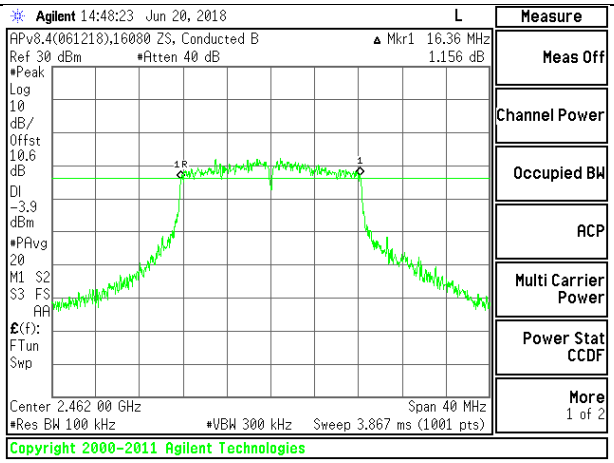



MID CHANNEL 6 CHAIN 0

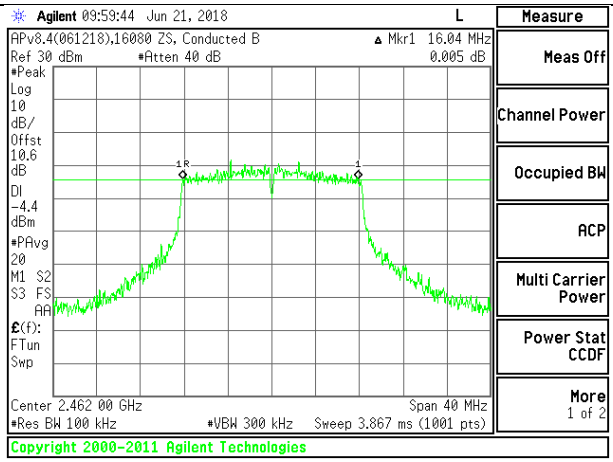



MID CHANNEL 6 CHAIN 1

## HIGH CHANNEL 11

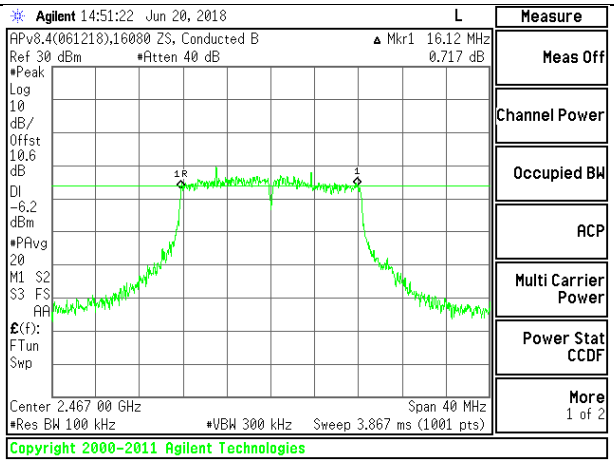



HIGH CHANNEL 11 CHAIN 0

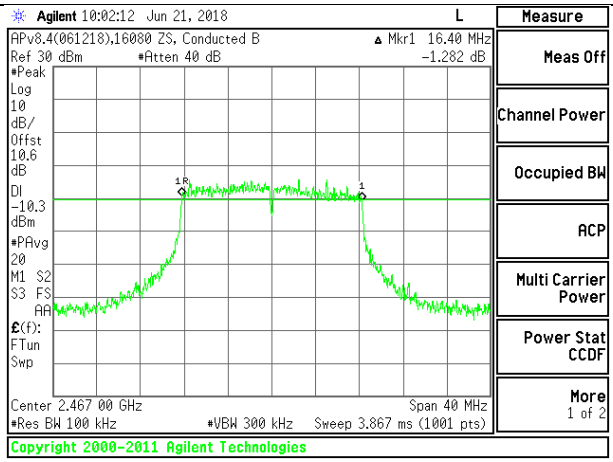



HIGH CHANNEL 11 CHAIN 1

## HIGH CHANNEL 12

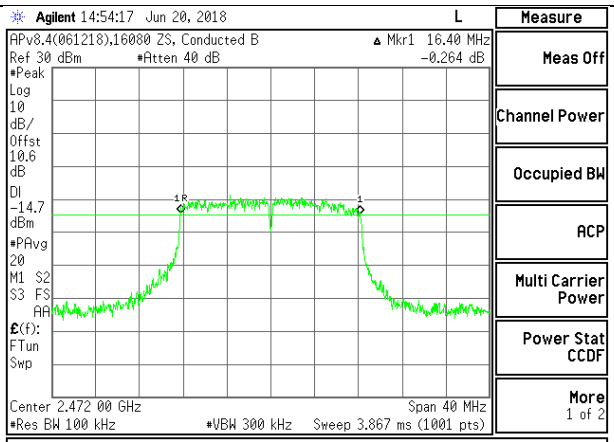



HIGH CHANNEL 12 CHAIN 0

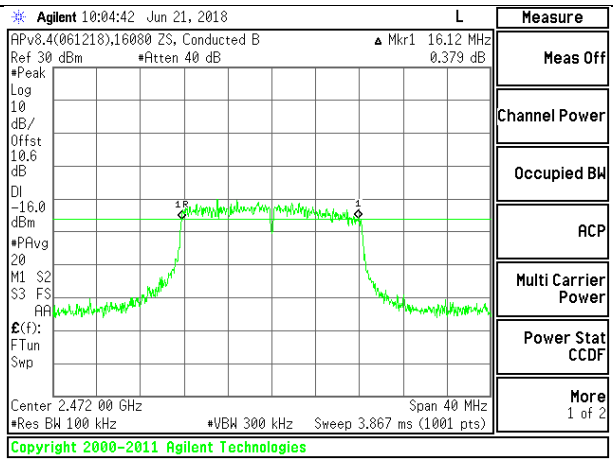



HIGH CHANNEL 12 CHAIN 1

## HIGH CHANNEL 13




HIGH CHANNEL 13 CHAIN 0



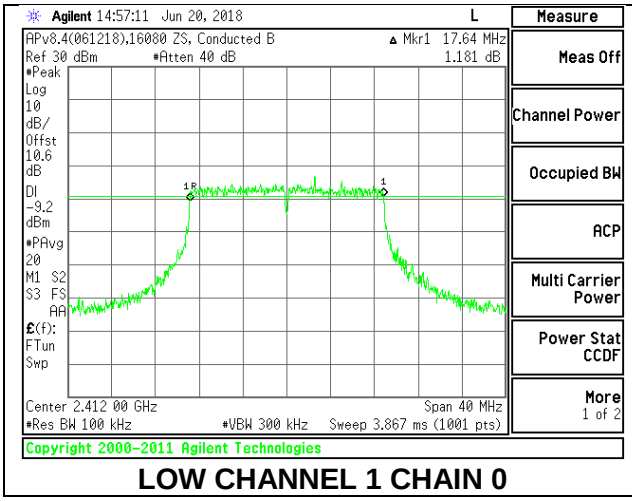

HIGH CHANNEL 13 CHAIN 1

### 8.3.3. 802.11n HT20 MODE

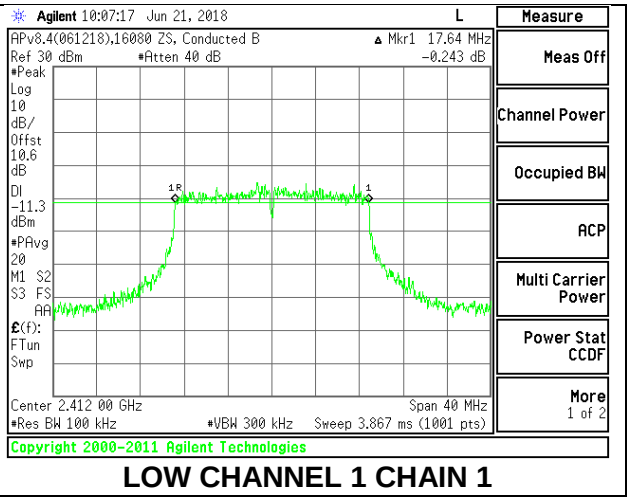
| Channel | Frequency (MHz) | 6 dB BW Chain 0 (MHz) | 6 dB BW Chain 1 (MHz) | Minimum Limit (MHz) |
|---|---|---|---|---|
| Low 1 | 2412 | 17.64 | **17.64** | 0.5 |
| Low 2 | 2417 | **17.72** | 17.64 | 0.5 |
| Mid 6 | 2437 | 17.64 | 17.24 | 0.5 |
| High 11 | 2462 | 17.12 | 17.60 | 0.5 |
| High 12 | 2467 | 17.72 | 17.64 | 0.5 |
| High 13 | 2472 | 17.68 | 17.28 | 0.5 |


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## LOW CHANNEL 1

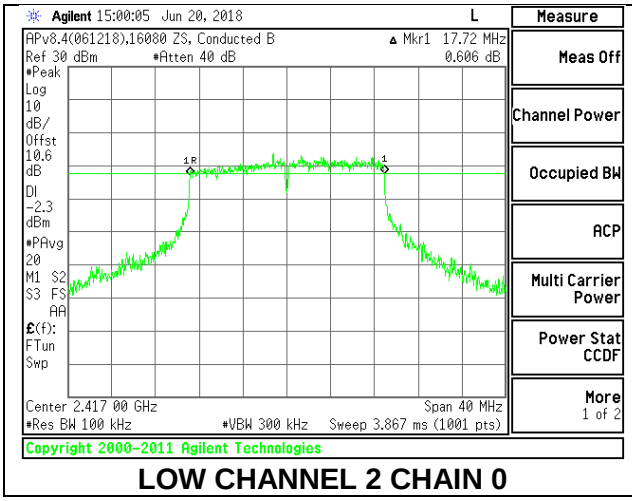



LOW CHANNEL 1 CHAIN 0

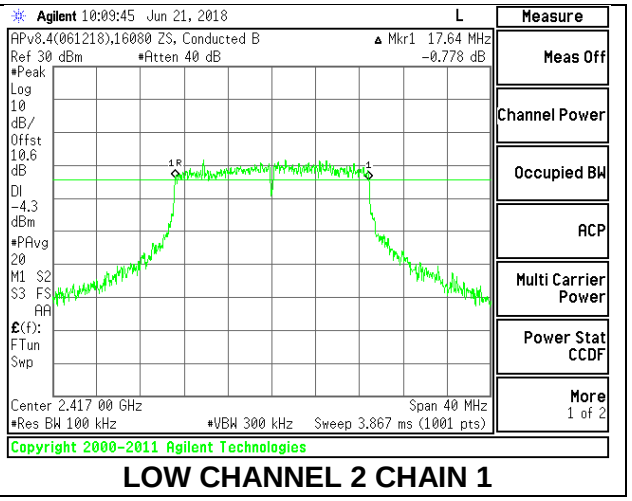



LOW CHANNEL 1 CHAIN 1

## LOW CHANNEL 2

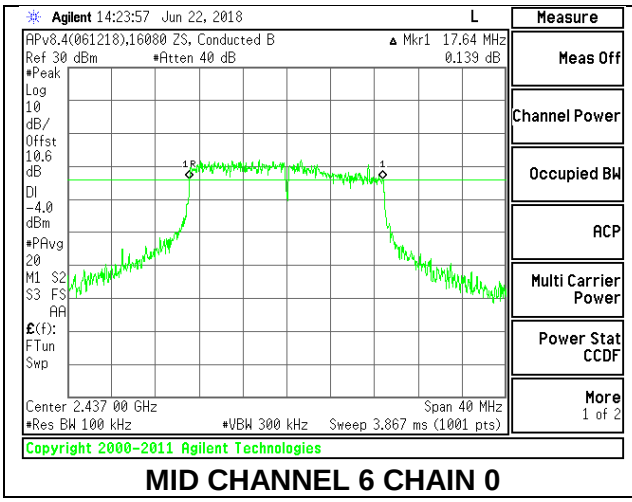



LOW CHANNEL 2 CHAIN 0

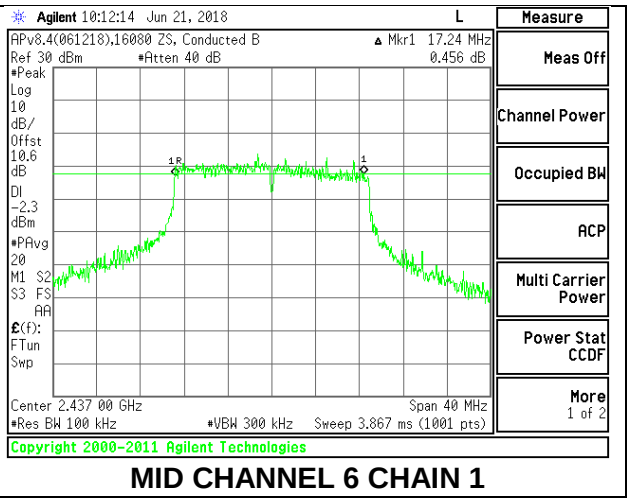



LOW CHANNEL 2 CHAIN 1

## MID CHANNEL 6

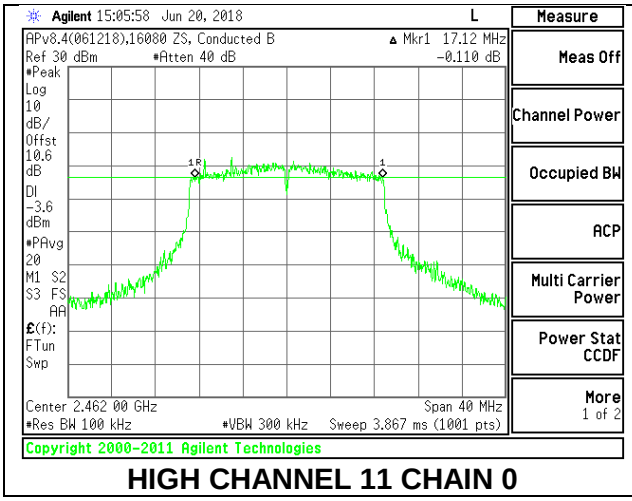



MID CHANNEL 6 CHAIN 0

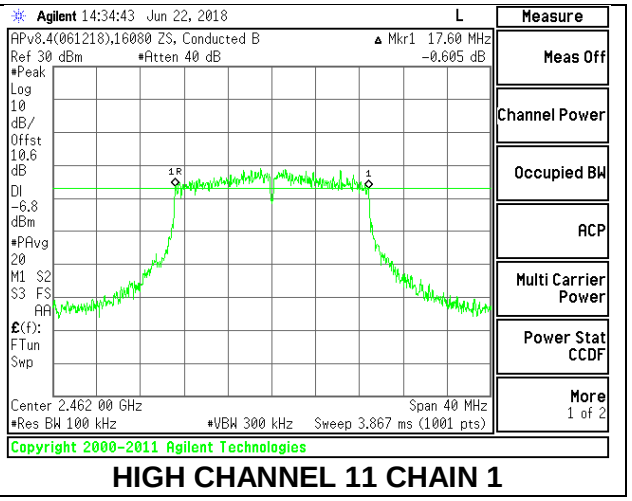



MID CHANNEL 6 CHAIN 1

## HIGH CHANNEL 11

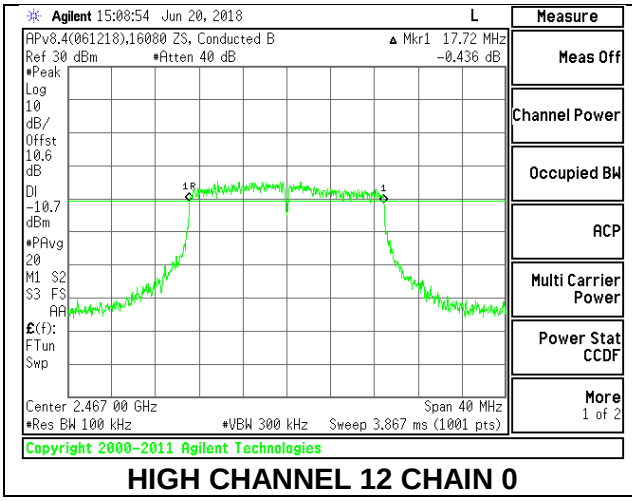



HIGH CHANNEL 11 CHAIN 0

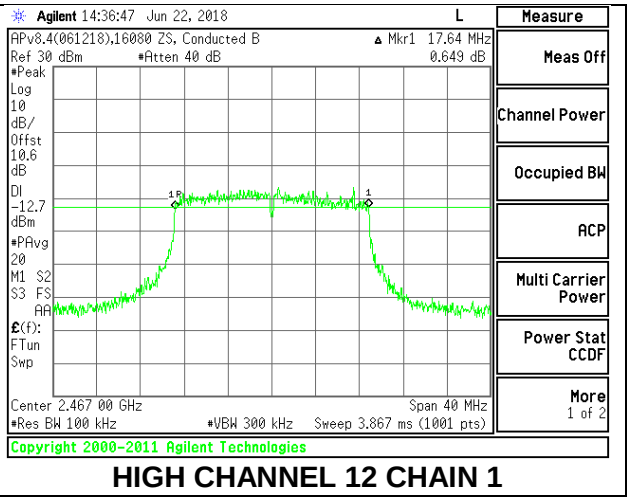



HIGH CHANNEL 11 CHAIN 1

## HIGH CHANNEL 12

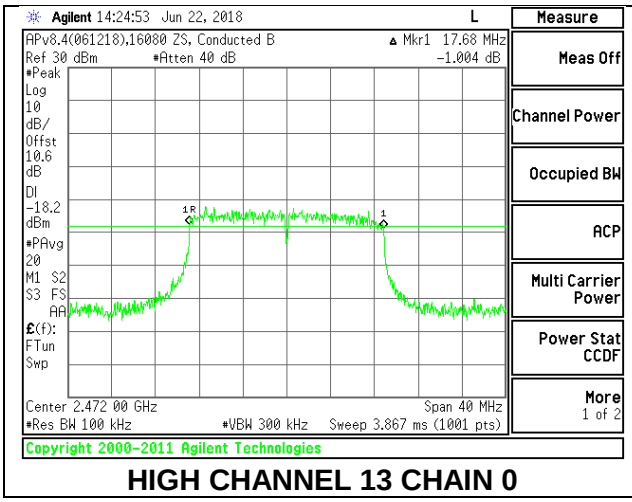



HIGH CHANNEL 12 CHAIN 0

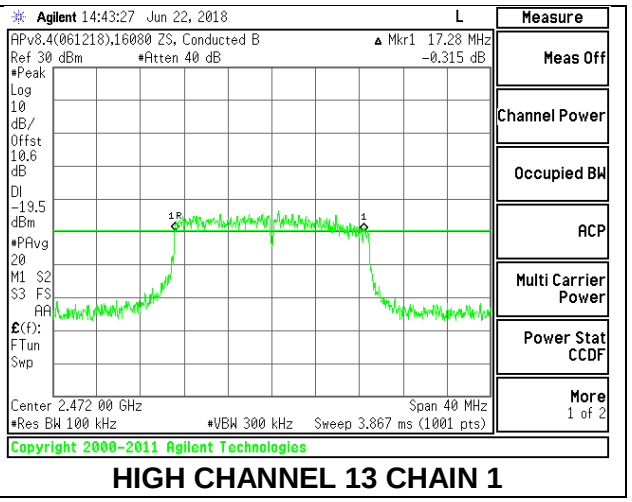



HIGH CHANNEL 12 CHAIN 1

## HIGH CHANNEL 13




HIGH CHANNEL 13 CHAIN 0




HIGH CHANNEL 13 CHAIN 1

## 8.4. OUTPUT POWER

**LIMITS**

FCC §15.247 (b) (3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**TEST PROCEDURE**

The transmitter output is connected to a power meter.The cable assembly insertion loss was entered as an offset in the power meter to allow for a gated Average reading of power.

**DIRECTIONAL ANTENNA GAIN**

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

| Band (GHz) | Chain 0 Antenna Gain (dBi) | Chain 1 Antenna Gain (dBi) | Uncorrelated Chains Directional Gain (dBi) |
|---|---|---|---|
| 2.4 | -1.50 | -8.50 | -3.72 |

**RESULTS**

| ID: | GE43578 | Date: | 06/18/18 |
|---|---|---|---|



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

### 8.4.1. 802.11b MODE

**Limits**

| Channel | Frequency (MHz) | Directional Gain (dBi) | FCC/ISED Power Limit (dBm) | ISED EIRP Limit (dBm) | Max Power (dBm) |
|---|---|---|---|---|---|
| Low 1 | 2412 | -3.72 | 30.00 | 36 | 30.00 |
| Mid 6 | 2437 | -3.72 | 30.00 | 36 | 30.00 |
| High 11 | 2462 | -3.72 | 30.00 | 36 | 30.00 |
| High 12 | 2467 | -3.72 | 30.00 | 36 | 30.00 |
| High 13 | 2472 | -3.72 | 30.00 | 36 | 30.00 |

**Results**

| Channel | Frequency (MHz) | Chain 0 Meas Power (dBm) | Chain 1 Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Margi (dB) |
|---|---|---|---|---|---|---|
| Low 1 | 2412 | 15.51 | 14.34 | 17.97 | 30.00 | -12.03 |
| Mid 6 | 2437 | 15.47 | 13.98 | 17.80 | 30.00 | -12.20 |
| High 11 | 2462 | 15.91 | 14.38 | 18.22 | 30.00 | -11.78 |
| High 12 | 2467 | 14.91 | 13.01 | 17.07 | 30.00 | -12.93 |
| High 13 | 2472 | 12.02 | 10.04 | 14.15 | 30.00 | -15.85 |


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

### 8.4.2. 802.11g MODE

**Limits**

| Channel | Frequency (MHz) | Directional Gain (dBi) | FCC/ISED Power Limit (dBm) | ISED EIRP Limit (dBm) | Max Power (dBm) |
|---|---|---|---|---|---|
| Low 1 | 2412 | -3.72 | 30.00 | 36 | 30.00 |
| Low 2 | 2417 | -3.72 | 30.00 | 36 | 30.00 |
| Mid 6 | 2437 | -3.72 | 30.00 | 36 | 30.00 |
| High 11 | 2462 | -3.72 | 30.00 | 36 | 30.00 |
| High 12 | 2467 | -3.72 | 30.00 | 36 | 30.00 |
| High 13 | 2472 | -3.72 | 30.00 | 36 | 30.00 |

**Results**

| Channel | Frequency (MHz) | Chain 0 Meas Power (dBm) | Chain 1 Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Margi (dB) |
|---|---|---|---|---|---|---|
| Low 1 | 2412 | 7.71 | 5.76 | 9.85 | 30.00 | -20.15 |
| Low 2 | 2417 | 14.76 | 12.52 | 16.79 | 30.00 | -13.21 |
| Mid 6 | 2437 | 15.89 | 13.96 | 18.04 | 30.00 | -11.96 |
| High 11 | 2462 | 13.94 | 11.94 | 16.06 | 30.00 | -13.94 |
| High 12 | 2467 | 9.23 | 7.07 | 11.29 | 30.00 | -18.71 |
| High 13 | 2472 | 3.05 | 1.24 | 5.25 | 30.00 | -24.75 |

### 8.4.3. 802.11n HT20 MODE

**Limits**

| Channel | Frequency (MHz) | Directional Gain (dBi) | FCC/ISED Power Limit (dBm) | ISED EIRP Limit (dBm) | Max Power (dBm) |
|---|---|---|---|---|---|
| Low 1 | 2412 | -3.72 | 30.00 | 36 | 30.00 |
| Low 2 | 2417 | -3.72 | 30.00 | 36 | 30.00 |
| Mid 6 | 2437 | -3.72 | 30.00 | 36 | 30.00 |
| High 11 | 2462 | -3.72 | 30.00 | 36 | 30.00 |
| High 12 | 2467 | -3.72 | 30.00 | 36 | 30.00 |
| High 13 | 2472 | -3.72 | 30.00 | 36 | 30.00 |

**Results**

| Channel | Frequency (MHz) | Chain 0 Meas Power (dBm) | Chain 1 Meas Power (dBm) | Total Corr'd Power (dBm) | Power Limit (dBm) | Margi (dB) |
|---|---|---|---|---|---|---|
| Low 1 | 2412 | 7.73 | 5.81 | 9.89 | 30.00 | -20.11 |
| Low 2 | 2417 | 15.21 | 13.69 | 17.53 | 30.00 | -12.47 |
| Mid 6 | 2437 | 15.71 | 14.03 | 17.96 | 30.00 | -12.04 |
| High 11 | 2462 | 13.26 | 11.25 | 15.38 | 30.00 | -14.62 |
| High 12 | 2467 | 7.77 | 5.89 | 9.94 | 30.00 | -20.06 |
| High 13 | 2472 | 0.92 | -0.55 | 3.26 | 30.00 | -26.74 |


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

# 8.5. POWER SPECTRAL DENSITY

**LIMITS**

FCC §15.247 (e)

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

**RESULTS**

## 8.5.1. 802.11b MODE

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

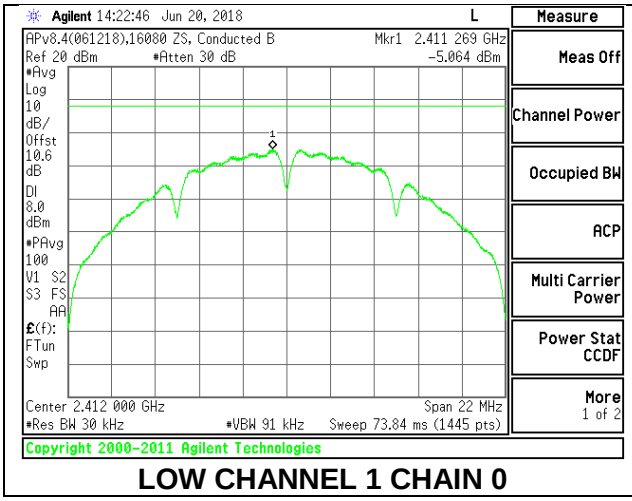
**PSD Results**

| Channel | Frequency (MHz) | Chain 0 Meas (dBm/ 3kHz) | Chain 1 Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz) | Limit (dBm/ 3kHz) | Margin (dB) |
|---|---|---|---|---|---|---|
| Low 1 | 2412 | -5.064 | **-6.290** | -2.62 | 8.0 | -10.6 |
| Mid 6 | 2437 | -5.403 | -6.897 | -3.08 | 8.0 | -11.1 |
| High 11 | 2462 | **-4.564** | -6.348 | -2.35 | 8.0 | -10.4 |
| High 12 | 2467 | -5.271 | -7.550 | -3.25 | 8.0 | -11.3 |
| High 13 | 2472 | -8.597 | -10.891 | -6.58 | 8.0 | -14.6 |

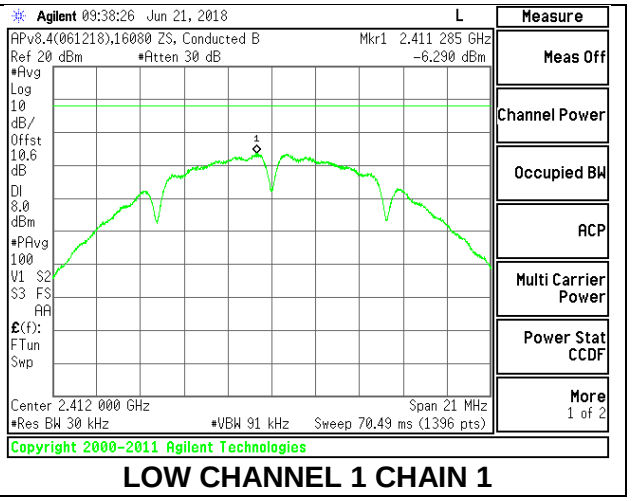


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## LOW CHANNEL 1

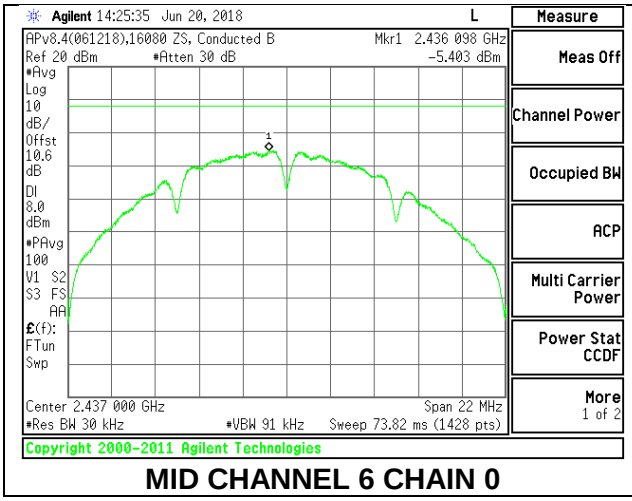



LOW CHANNEL 1 CHAIN 0

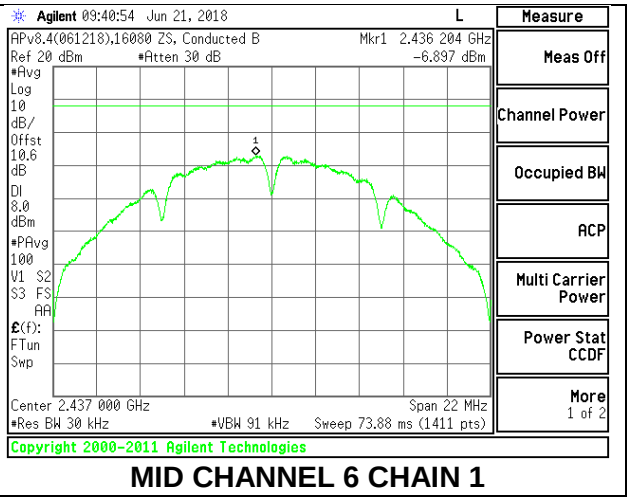



LOW CHANNEL 1 CHAIN 1

## MID CHANNEL 6

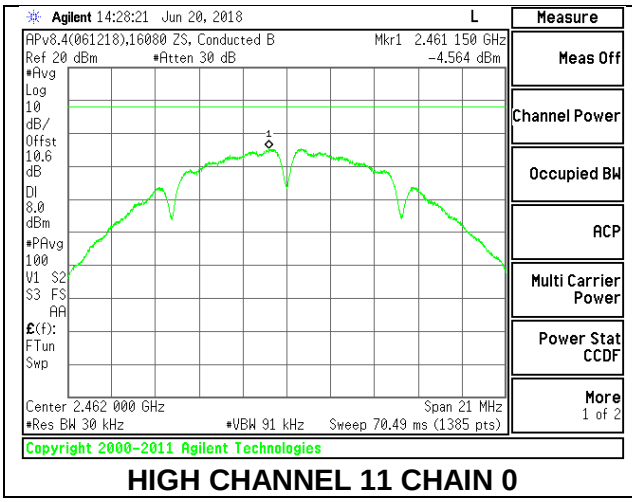



MID CHANNEL 6 CHAIN 0

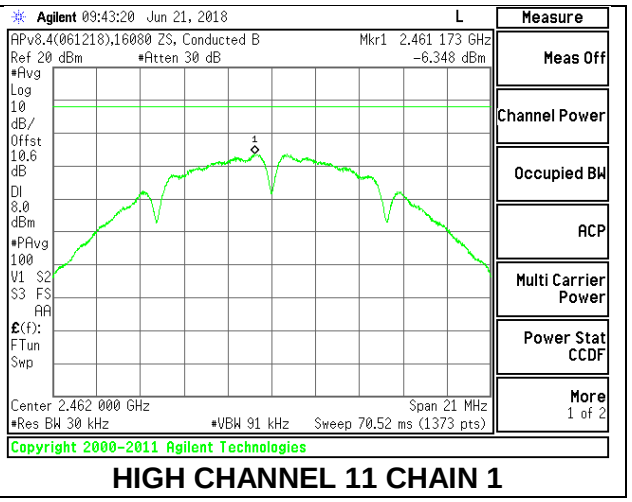



MID CHANNEL 6 CHAIN 1

## HIGH CHANNEL 11

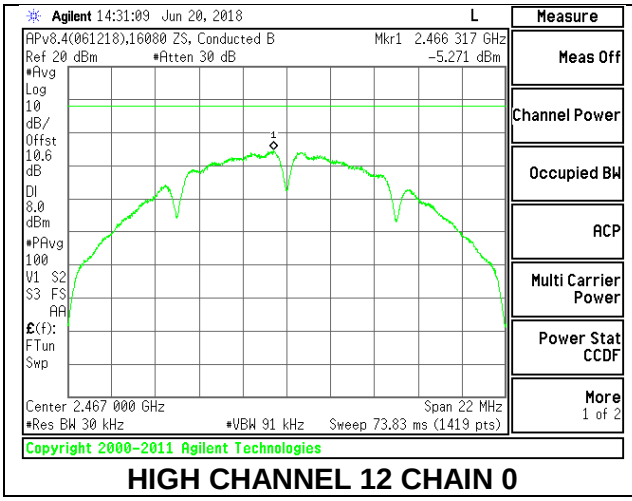



HIGH CHANNEL 11 CHAIN 0

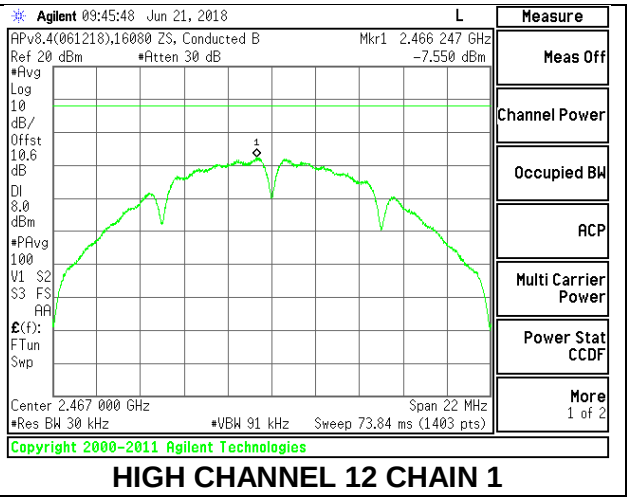



HIGH CHANNEL 11 CHAIN 1

## HIGH CHANNEL 12

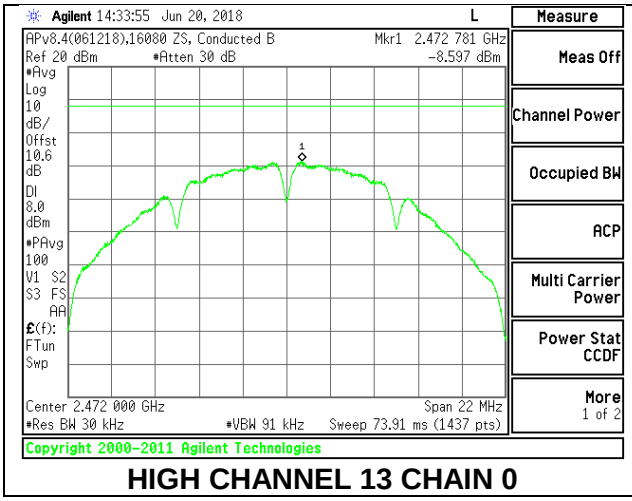



HIGH CHANNEL 12 CHAIN 0

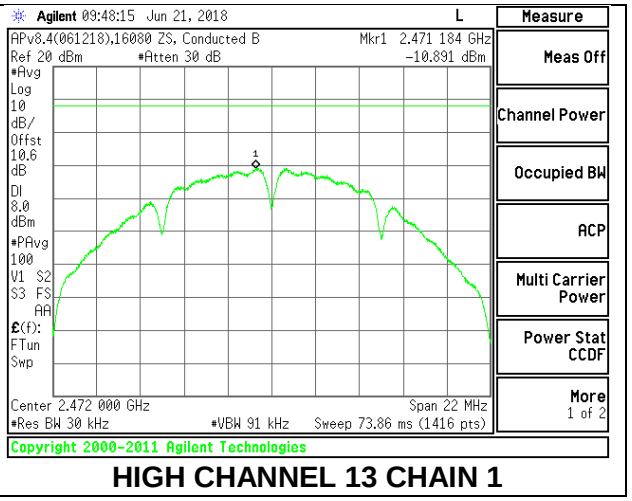



HIGH CHANNEL 12 CHAIN 1

## HIGH CHANNEL 13




HIGH CHANNEL 13 CHAIN 0




HIGH CHANNEL 13 CHAIN 1

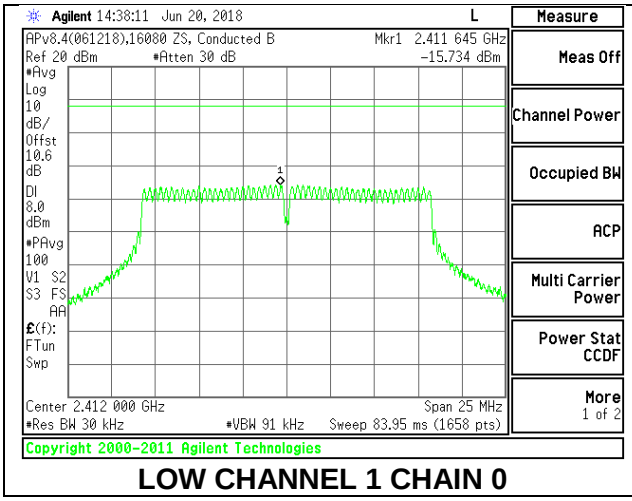
## 8.5.2. 802.11g MODE

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

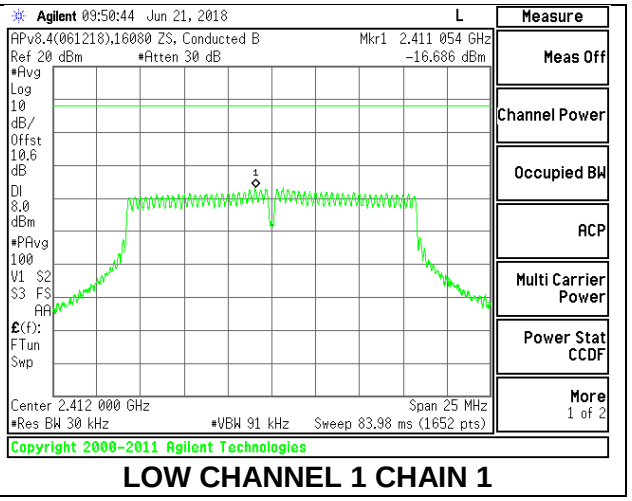
**PSD Results**

| Channel | Frequency (MHz) | Chain 0 Meas (dBm/ 3kHz) | Chain 1 Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz) | Limit (dBm/ 3kHz) | Margin (dB) |
|---|---|---|---|---|---|---|
| Low 1 | 2412 | -15.734 | -16.686 | -13.17 | 8.0 | -21.2 |
| Low 2 | 2417 | -8.302 | -10.419 | -6.22 | 8.0 | -14.2 |
| Mid 6 | 2437 | **-6.946** | **-9.571** | -5.05 | 8.0 | -13.1 |
| High 11 | 2462 | -8.407 | -10.996 | -6.50 | 8.0 | -14.5 |
| High 12 | 2467 | -13.583 | -15.839 | -11.56 | 8.0 | -19.6 |
| High 13 | 2472 | -20.058 | -21.931 | -17.88 | 8.0 | -25.9 |

## LOW CHANNEL 1

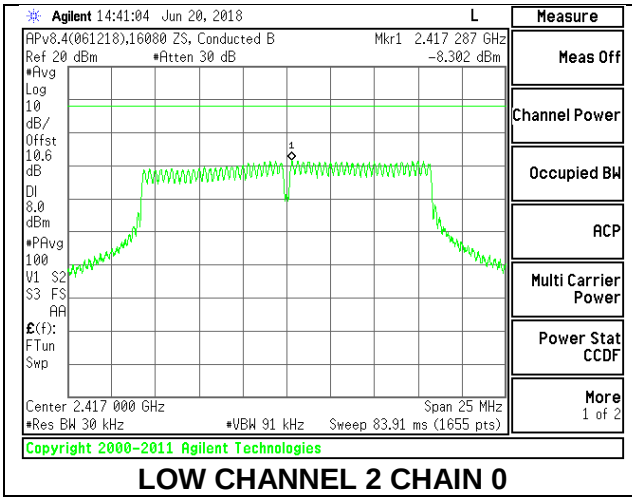



LOW CHANNEL 1 CHAIN 0

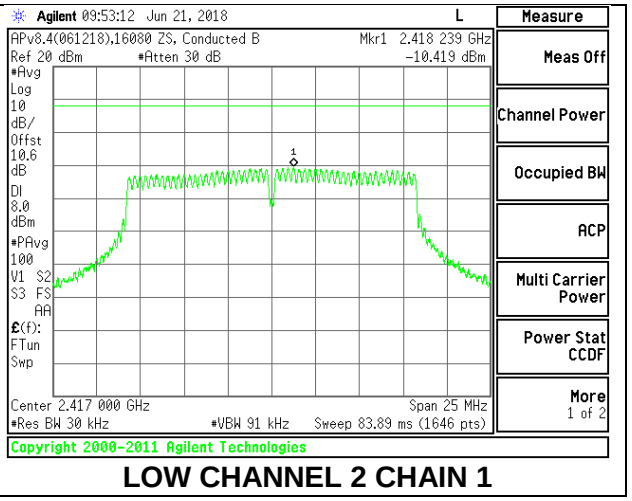



LOW CHANNEL 1 CHAIN 1

## LOW CHANNEL 2

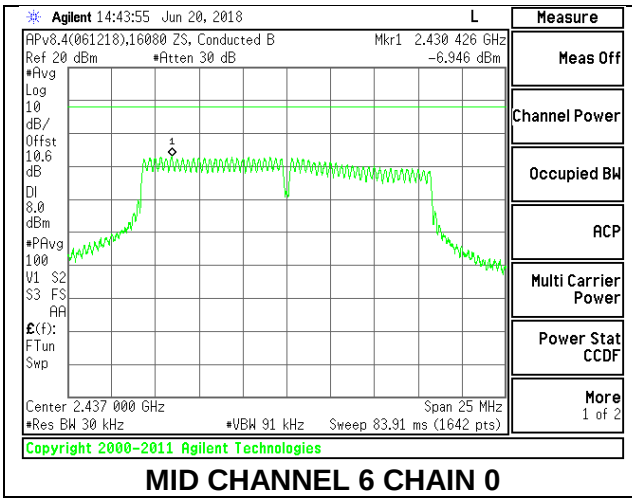



LOW CHANNEL 2 CHAIN 0

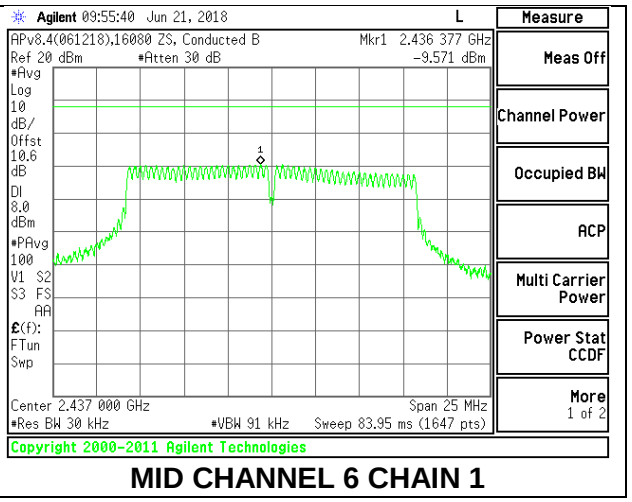



LOW CHANNEL 2 CHAIN 1

## MID CHANNEL 6

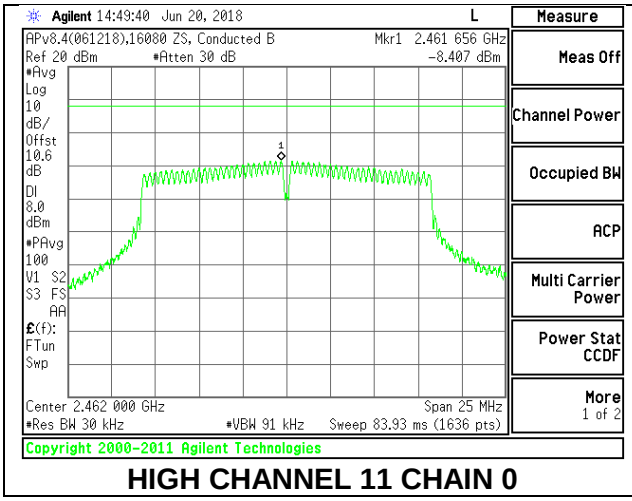



MID CHANNEL 6 CHAIN 0

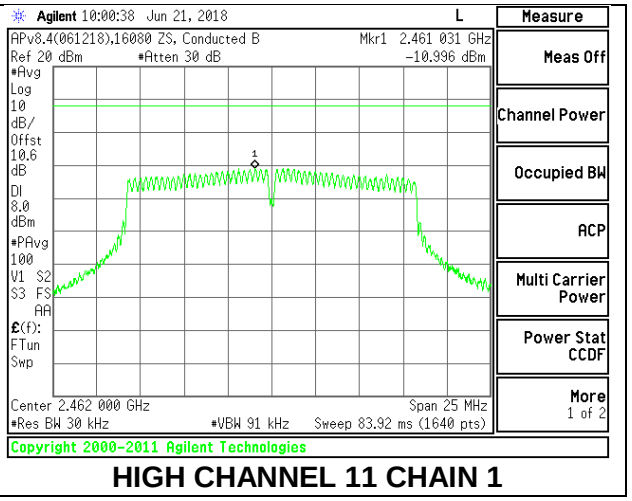



MID CHANNEL 6 CHAIN 1

## HIGH CHANNEL 11

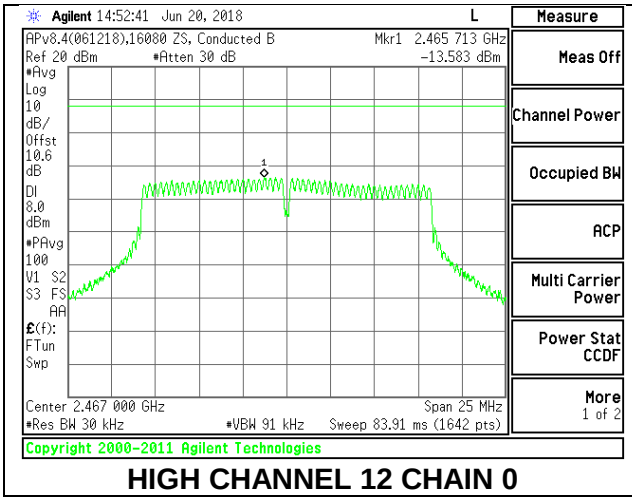



HIGH CHANNEL 11 CHAIN 0

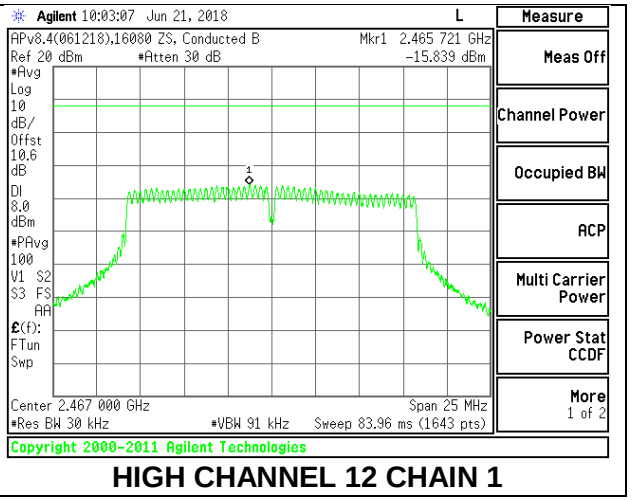



HIGH CHANNEL 11 CHAIN 1

## HIGH CHANNEL 12

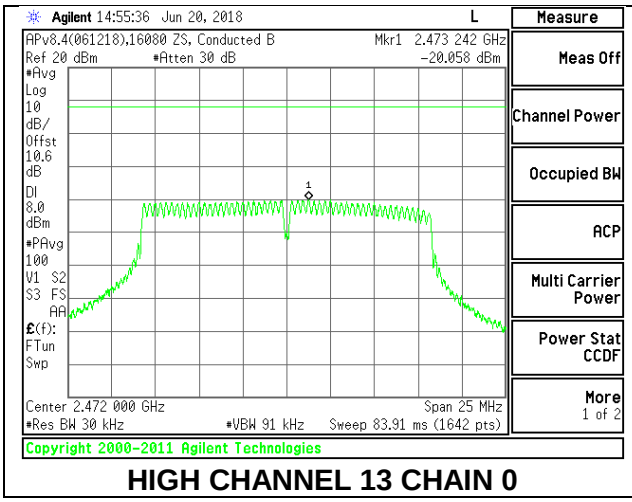



HIGH CHANNEL 12 CHAIN 0

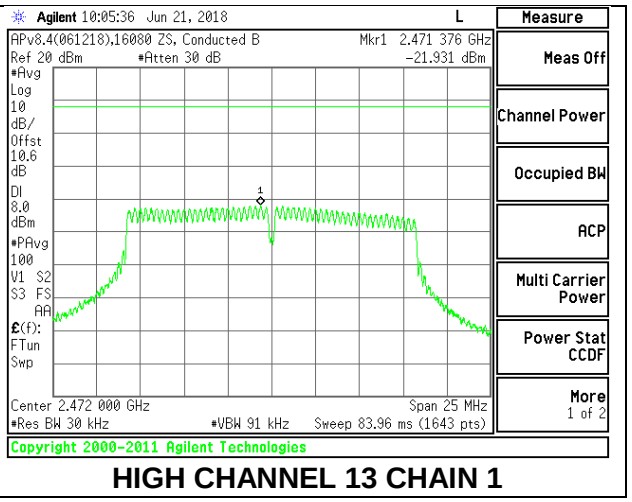



HIGH CHANNEL 12 CHAIN 1

## HIGH CHANNEL 13




HIGH CHANNEL 13 CHAIN 0




HIGH CHANNEL 13 CHAIN 1

## 8.5.3. 802.11n HT20 MODE

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

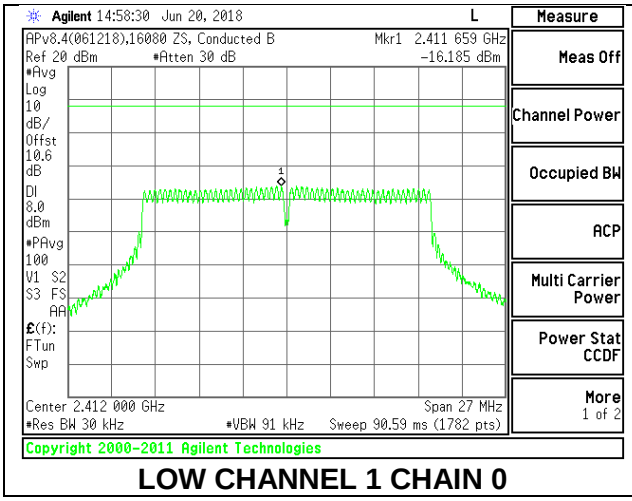
**PSD Results**

| Channel | Frequency (MHz) | Chain 0 Meas (dBm/ 3kHz) | Chain 1 Meas (dBm/ 3kHz) | Total Corr'd PSD (dBm/ 3kHz) | Limit (dBm/ 3kHz) | Margin (dB) |
|---|---|---|---|---|---|---|
| Low 1 | 2412 | -16.185 | -17.450 | -13.66 | 8.0 | -21.7 |
| Low 2 | 2417 | -8.199 | -9.936 | -5.87 | 8.0 | -13.9 |
| Mid 6 | 2437 | **-7.498** | **-9.708** | -5.35 | 8.0 | -13.4 |
| High 11 | 2462 | -9.254 | -11.490 | -7.12 | 8.0 | -15.1 |
| High 12 | 2467 | -15.435 | -17.253 | -13.14 | 8.0 | -21.1 |
| High 13 | 2472 | -22.716 | -23.780 | -20.11 | 8.0 | -28.1 |

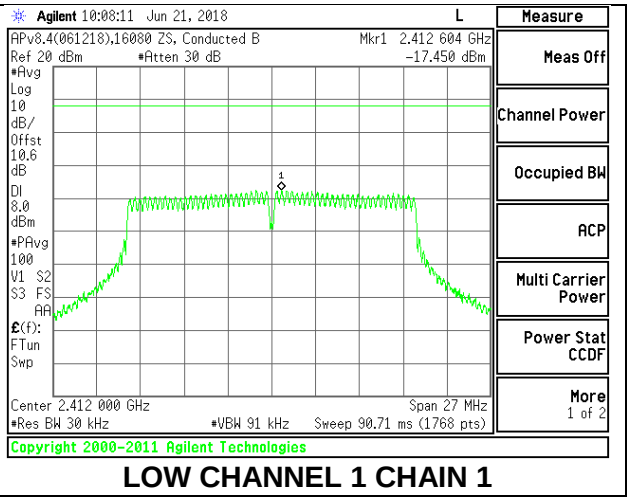


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## LOW CHANNEL 1

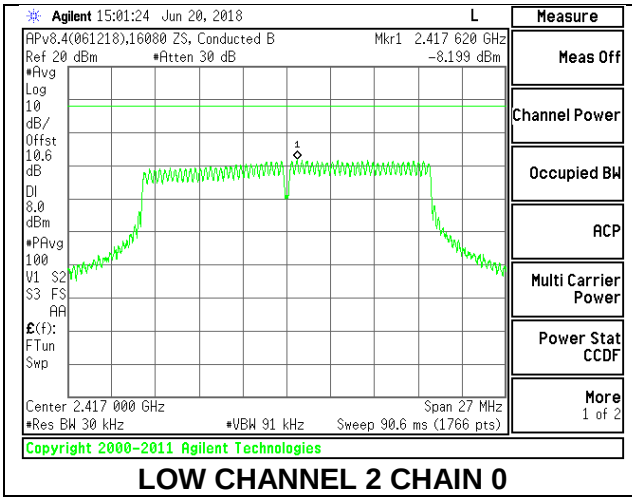



LOW CHANNEL 1 CHAIN 0

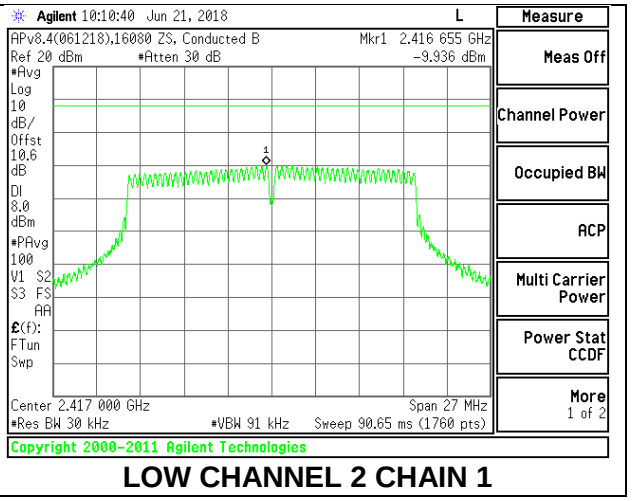



LOW CHANNEL 1 CHAIN 1

## LOW CHANNEL 2

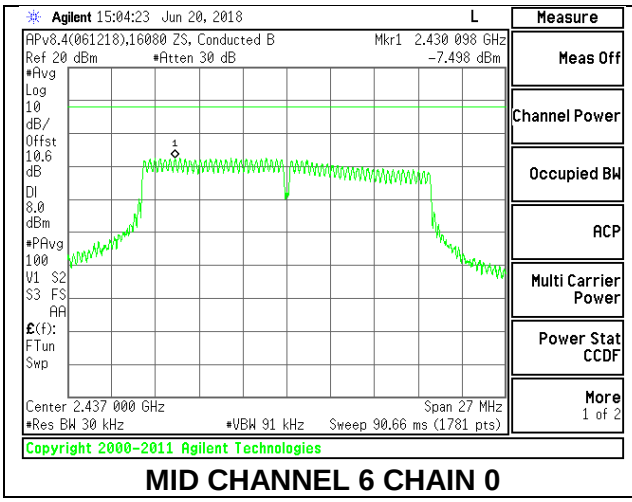



LOW CHANNEL 2 CHAIN 0

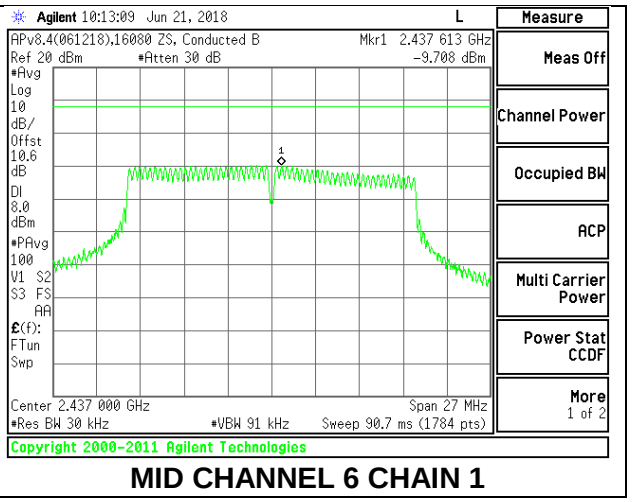



LOW CHANNEL 2 CHAIN 1

## MID CHANNEL 6

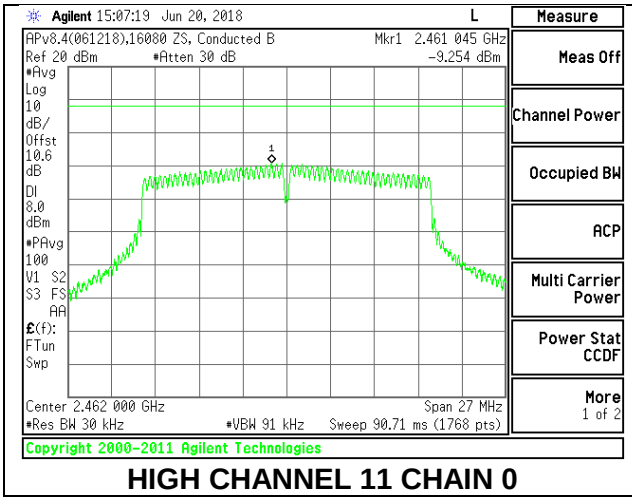



MID CHANNEL 6 CHAIN 0

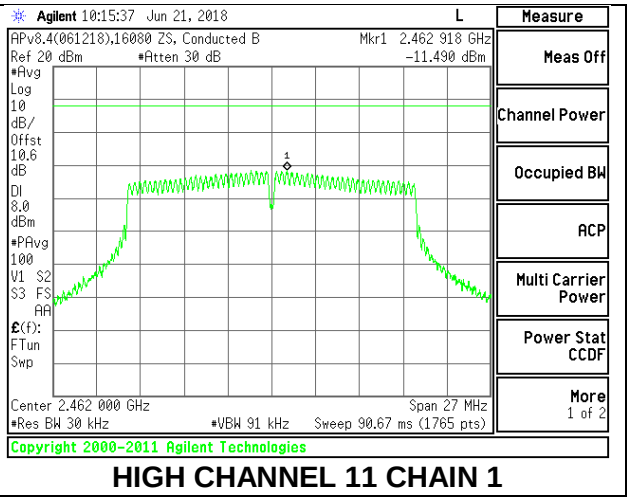



MID CHANNEL 6 CHAIN 1

## HIGH CHANNEL 11

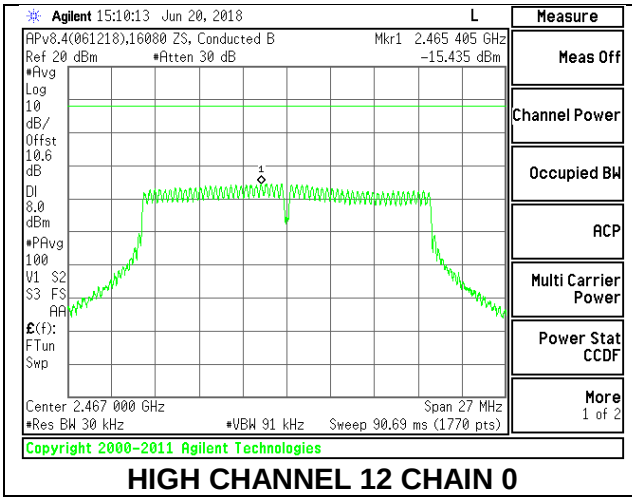



HIGH CHANNEL 11 CHAIN 0

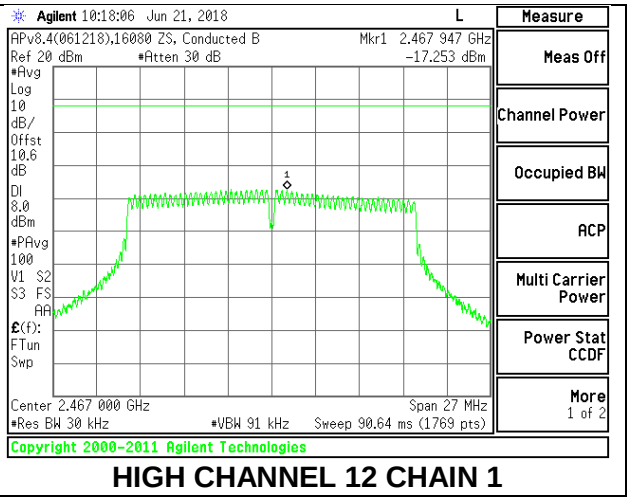



HIGH CHANNEL 11 CHAIN 1

## HIGH CHANNEL 12

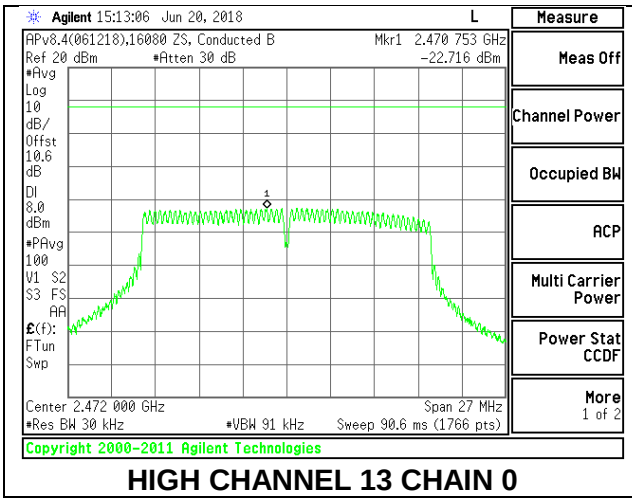



HIGH CHANNEL 12 CHAIN 0

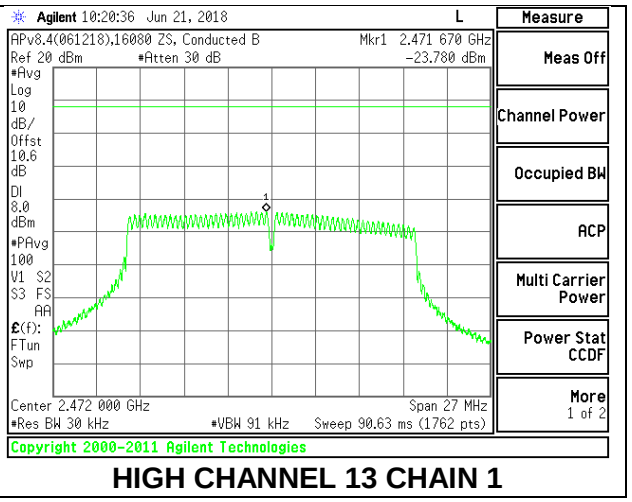



HIGH CHANNEL 12 CHAIN 1

## HIGH CHANNEL 13




HIGH CHANNEL 13 CHAIN 0




HIGH CHANNEL 13 CHAIN 1

## 8.6. CONDUCTED SPURIOUS EMISSIONS

**LIMITS**

FCC §15.247 (d)

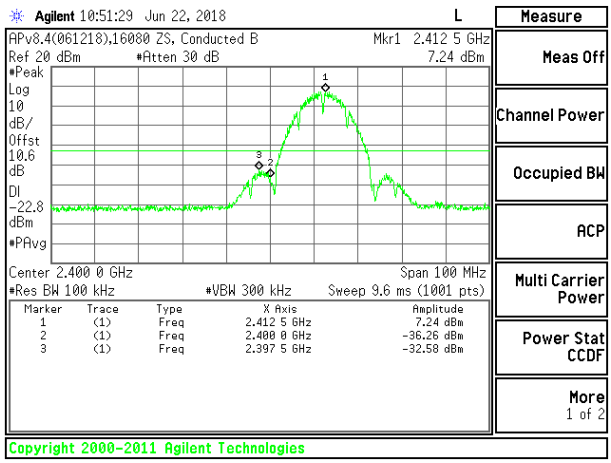
Output power was measured based on the use of peak measurement, therefore the required attenuation is 20 dB.

**RESULTS**

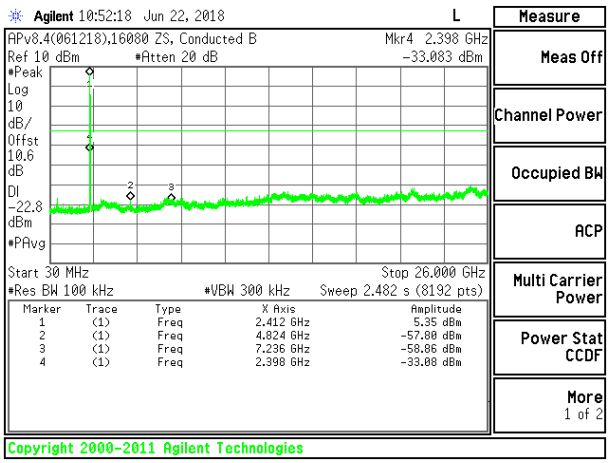


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

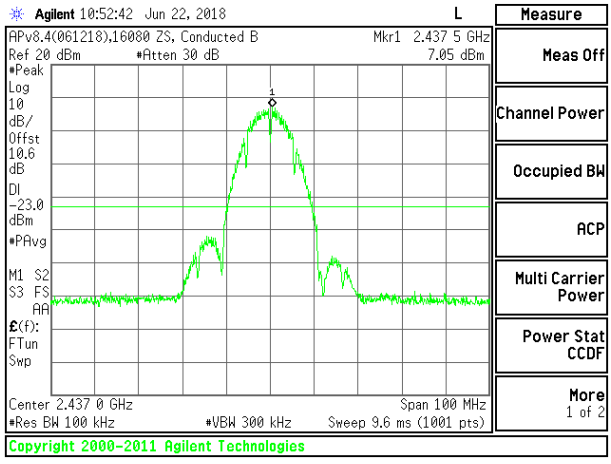
## 8.6.1. 802.11b MODE



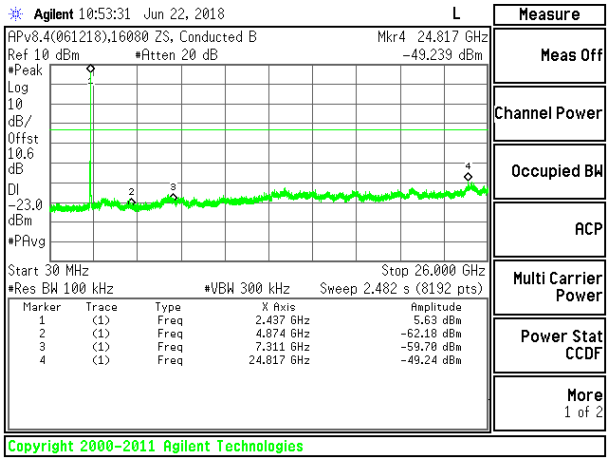

**LOW CHANNEL 1 BANDEDGE CHAIN 0**



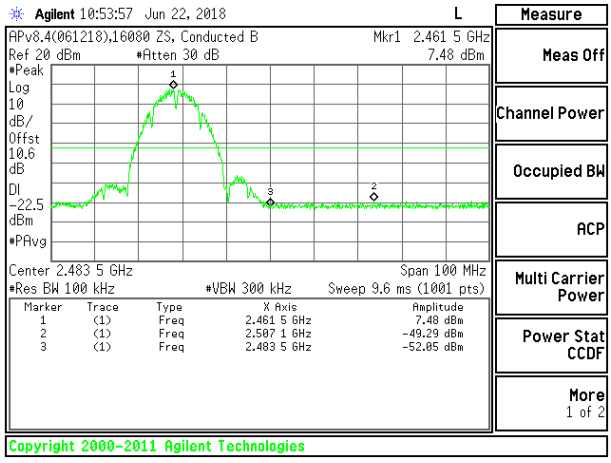

**OUT-OF-BAND LOW CHANNEL 1 CHAIN 0**



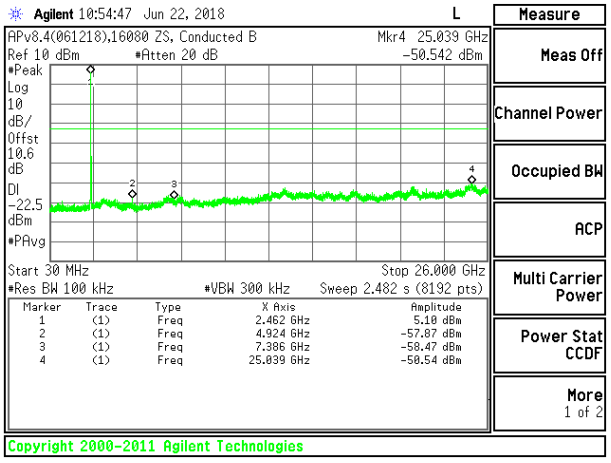

**IN-BAND REFERENCE LEVEL CHAIN 0**



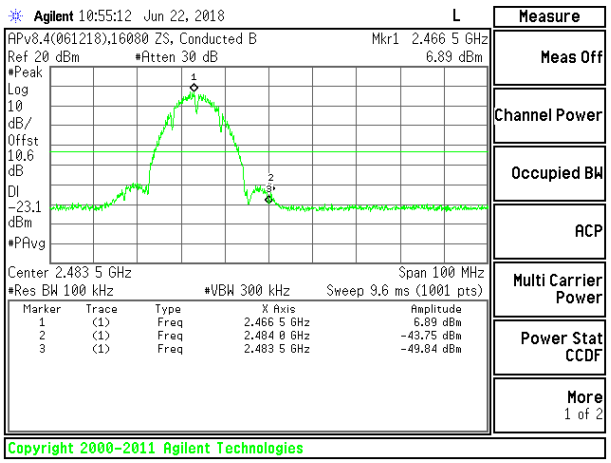

**OUT-OF-BAND MID CHANNEL CHAIN 0**



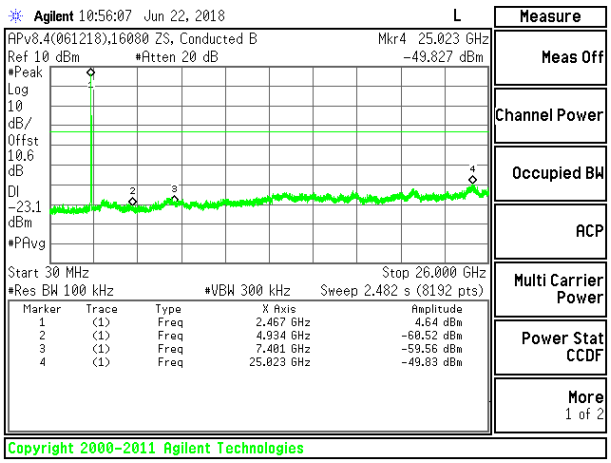

**HIGH CHANNEL 11 BANDEDGE CHAIN 0**



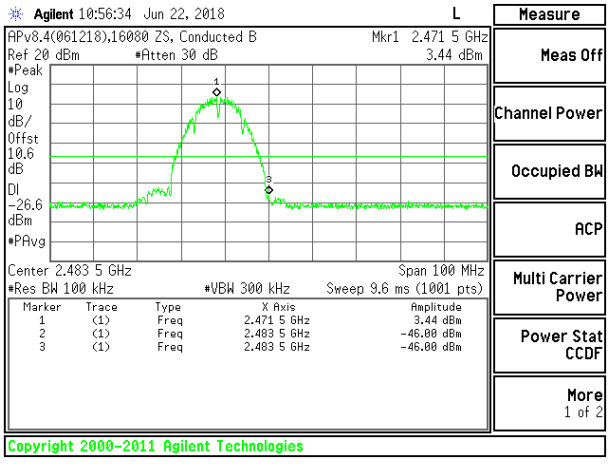

**OUT-OF-BAND HIGH CHANNEL 11 CHAIN 0**



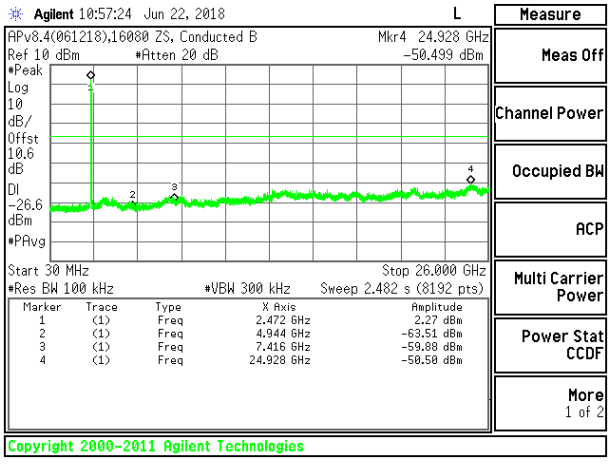

**HIGH CHANNEL 12 BANDEDGE CHAIN 0**



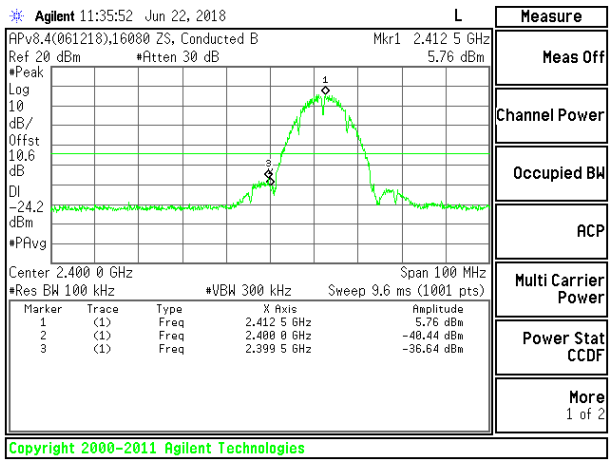

**OUT-OF-BAND HIGH CHANNEL 12 CHAIN 0**



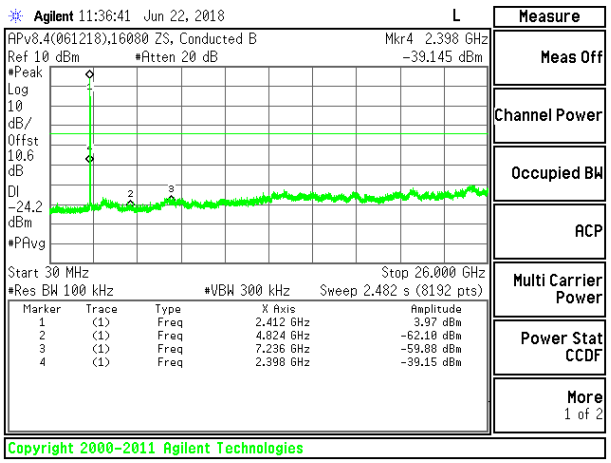

**HIGH CHANNEL 13 BANDEDGE CHAIN 0**



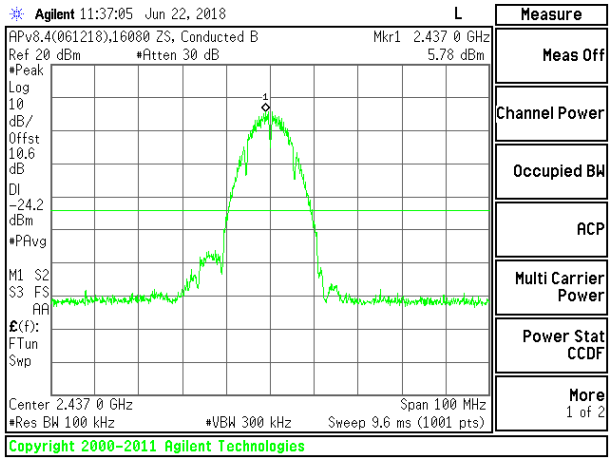

**OUT-OF-BAND HIGH CHANNEL 13 CHAIN 0**



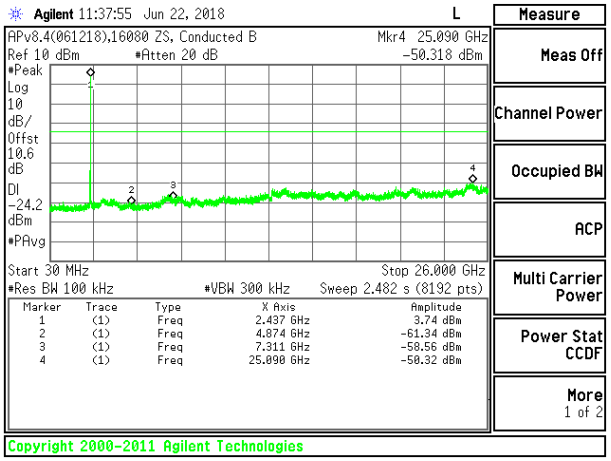

**LOW CHANNEL 1 BANDEDGE CHAIN 1**



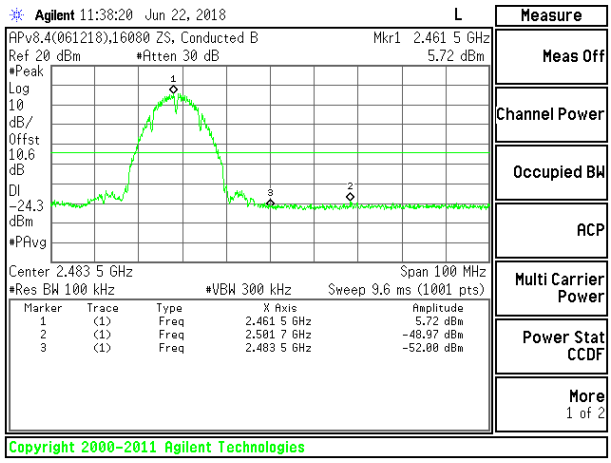

**OUT-OF-BAND LOW CHANNEL 1 CHAIN 1**



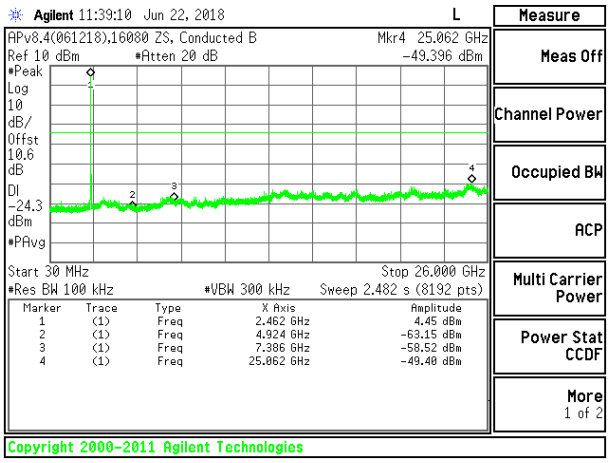

**IN-BAND REFERENCE LEVEL CHAIN 1**




**OUT-OF-BAND MID CHANNEL CHAIN 1**



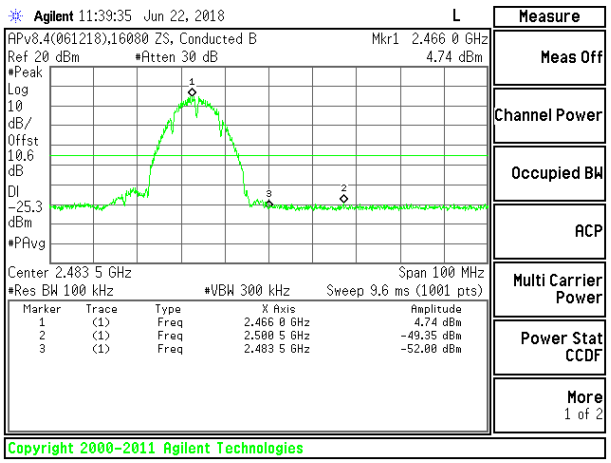

**HIGH CHANNEL 11 BANDEDGE CHAIN 1**



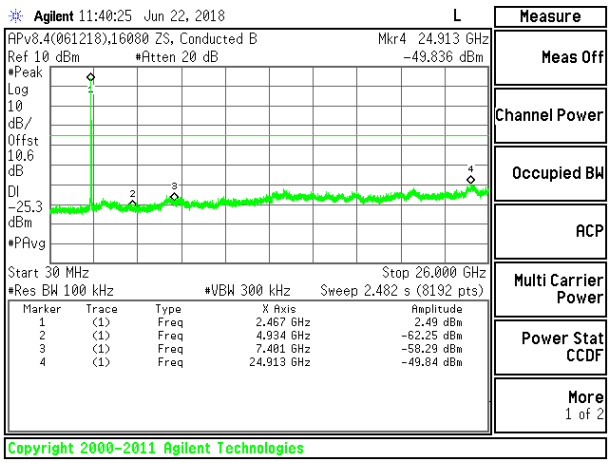

**OUT-OF-BAND HIGH CHANNEL 11 CHAIN 1**



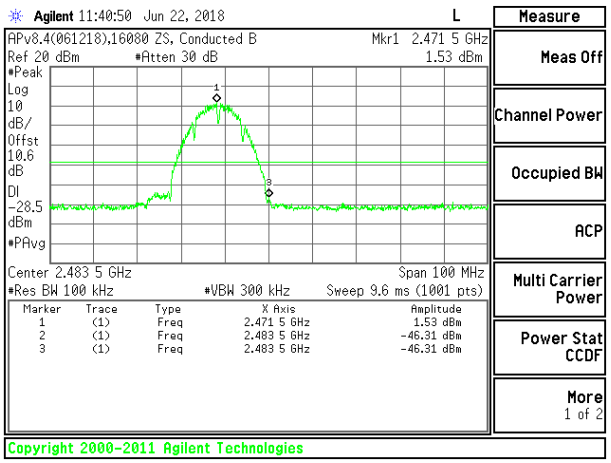
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888



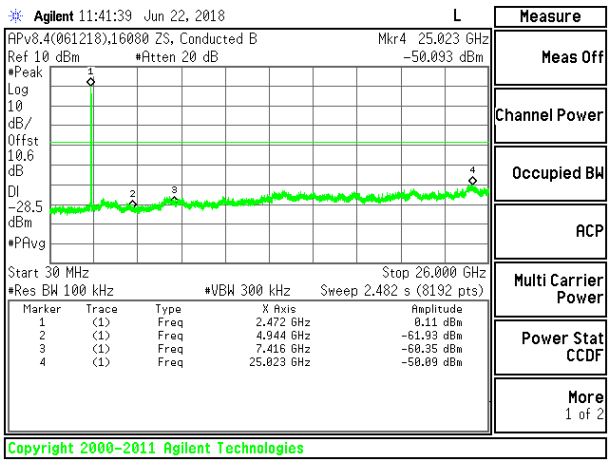

**HIGH CHANNEL 12 BANDEDGE CHAIN 1**




**OUT-OF-BAND HIGH CHANNEL 12 CHAIN 1**

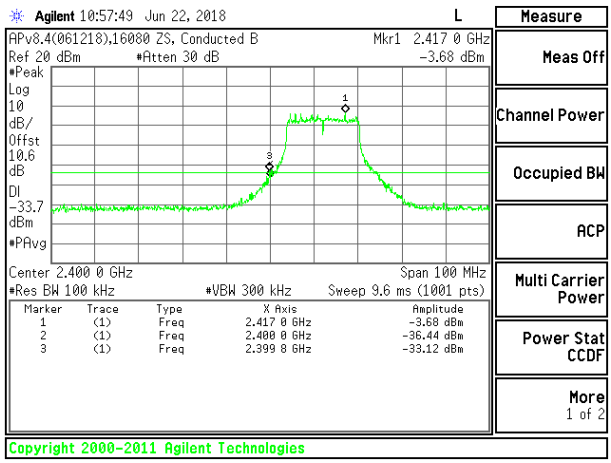



**HIGH CHANNEL 13 BANDEDGE CHAIN 1**

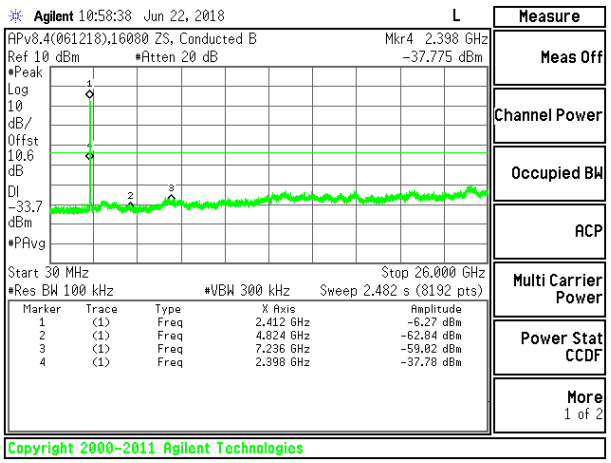



**OUT-OF-BAND HIGH CHANNEL 13 CHAIN 1**

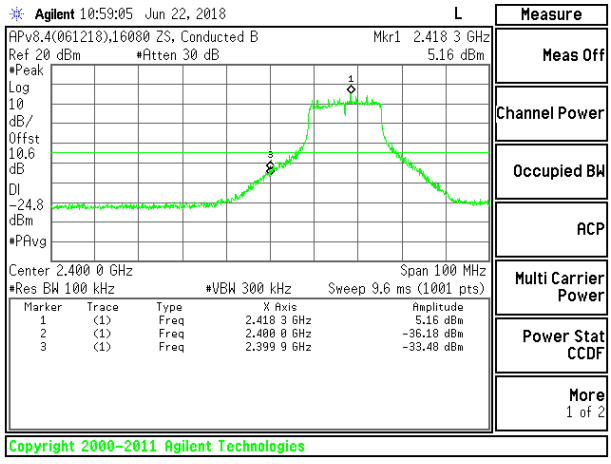
## 8.6.2. 802.11g MODE



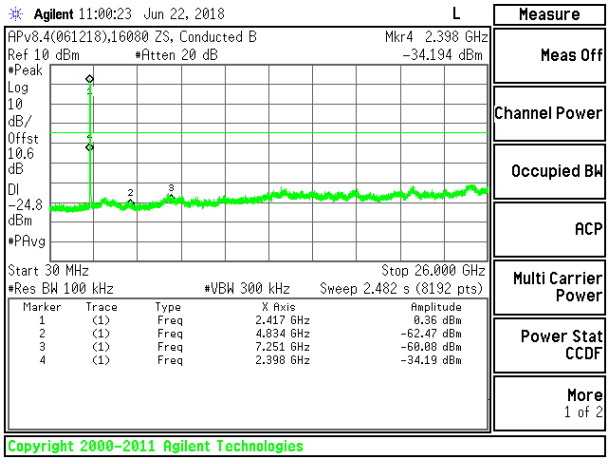

**LOW CHANNEL 1 BANDEDGE CHAIN 0**



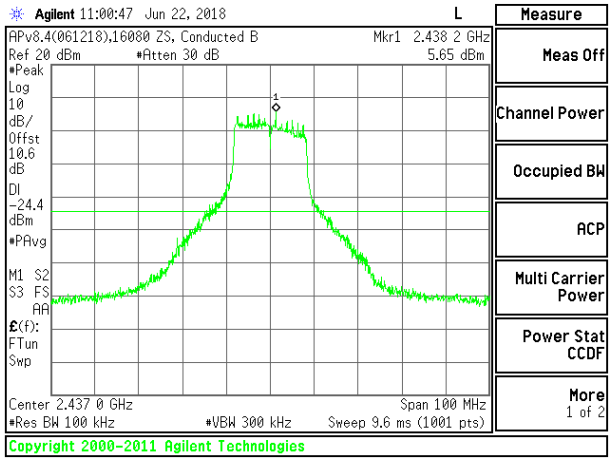

**OUT-OF-BAND LOW CHANNEL 1 CHAIN 0**



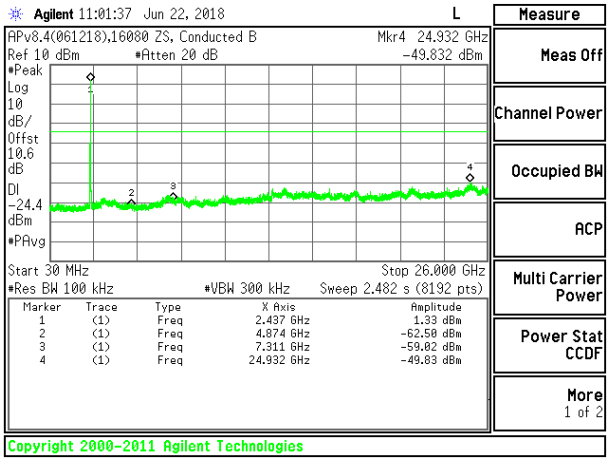

**LOW CHANNEL 2 BANDEDGE CHAIN 0**



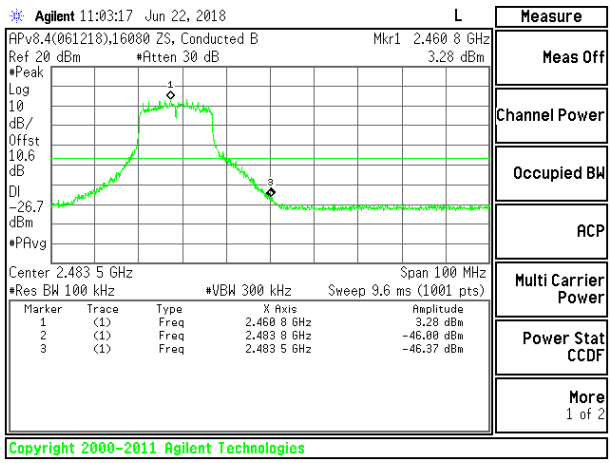

**OUT-OF-BAND LOW CHANNEL 2 CHAIN 0**



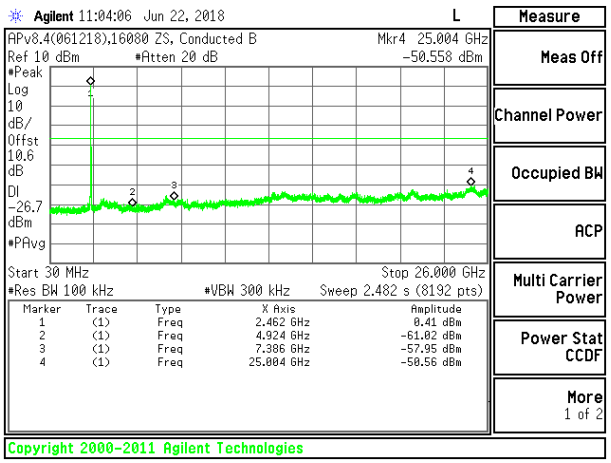

**IN-BAND REFERENCE LEVEL CHAIN 0**



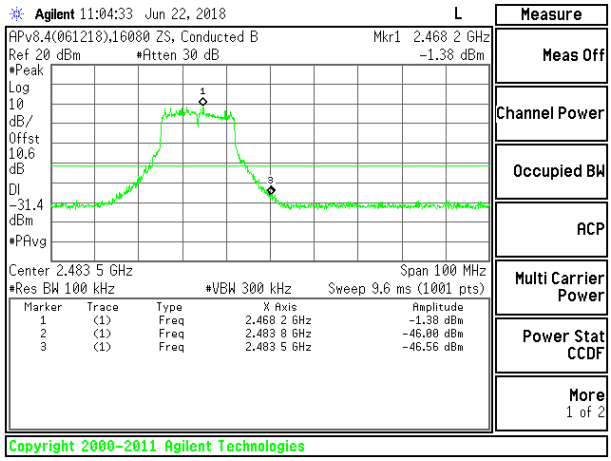

**OUT-OF-BAND MID CHANNEL CHAIN 0**



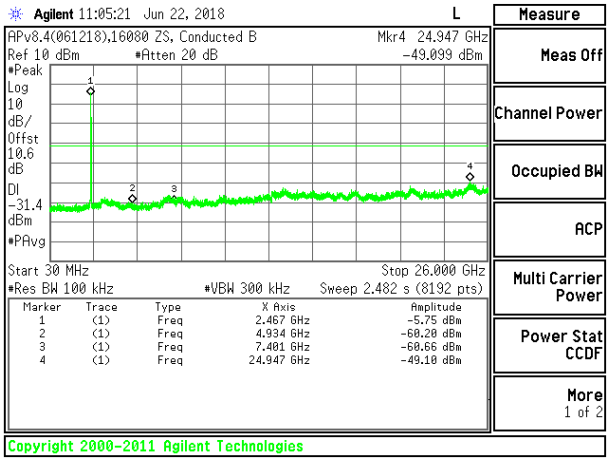

**HIGH CHANNEL 11 BANDEDGE CHAIN 0**



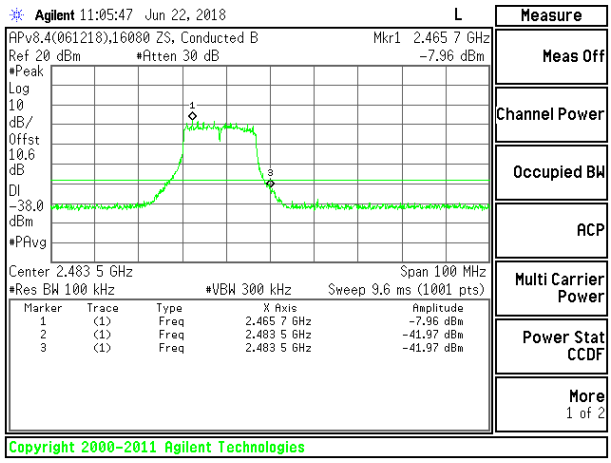

**OUT-OF-BAND HIGH CHANNEL 11 CHAIN 0**



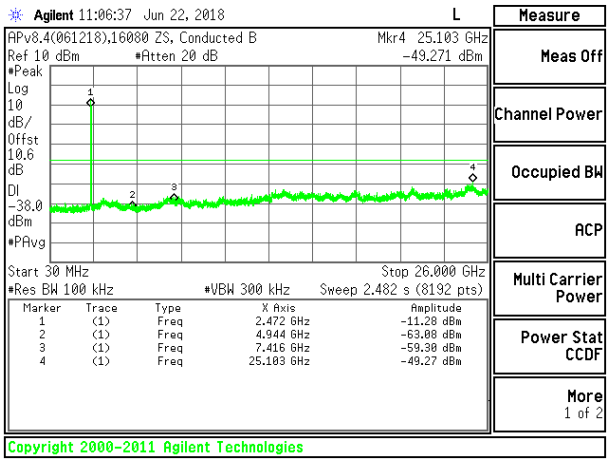

**HIGH CHANNEL 12 BANDEDGE CHAIN 0**




**OUT-OF-BAND HIGH CHANNEL 12 CHAIN 0**



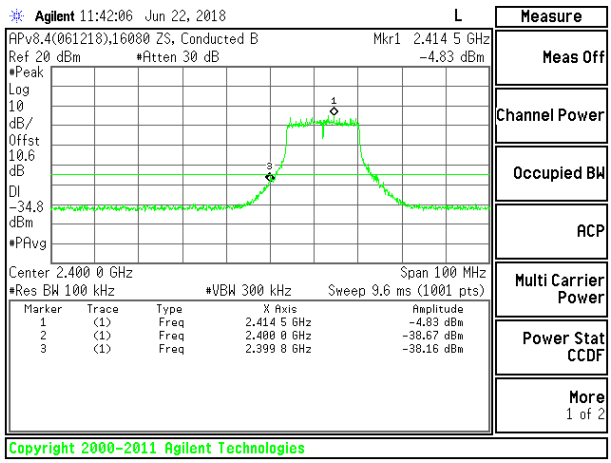

**HIGH CHANNEL 13 BANDEDGE CHAIN 0**



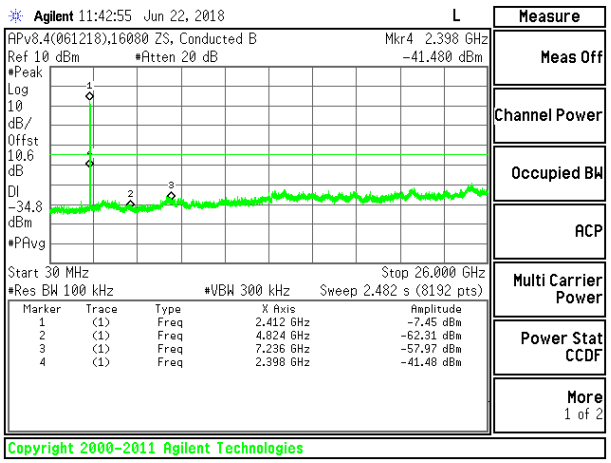

**OUT-OF-BAND HIGH CHANNEL 13 CHAIN 0**



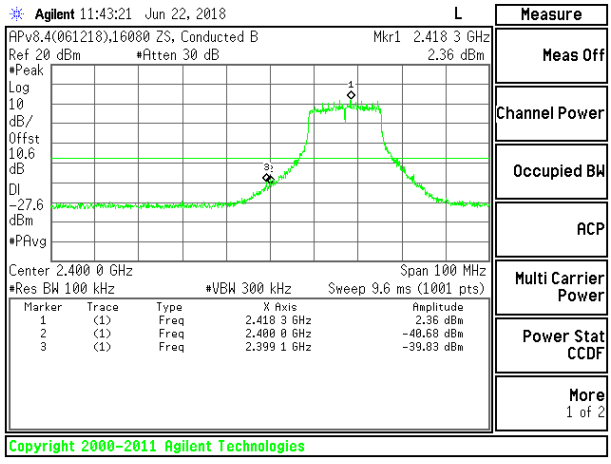
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888



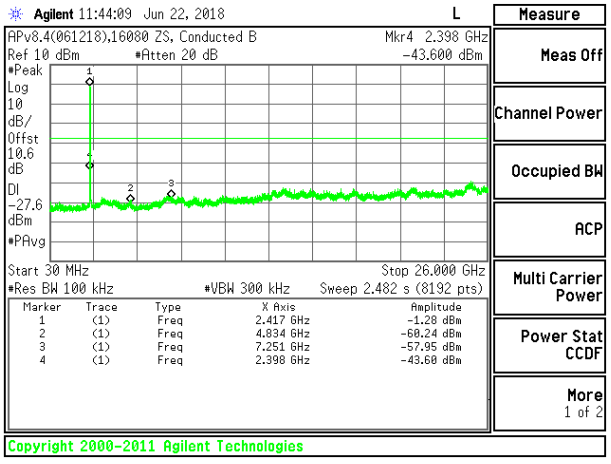

**LOW CHANNEL 1 BANDEDGE CHAIN 1**



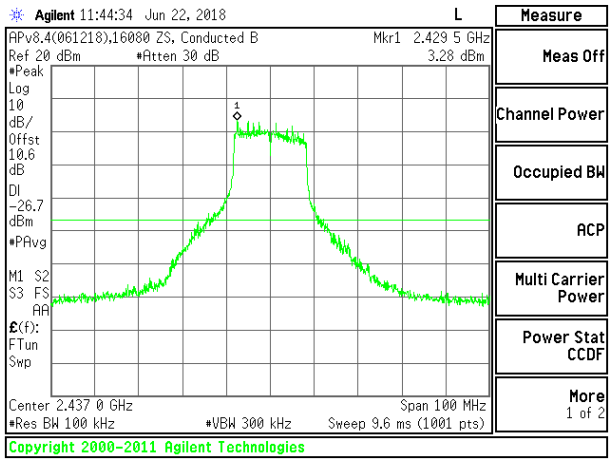

**OUT-OF-BAND LOW CHANNEL 1 CHAIN 1**



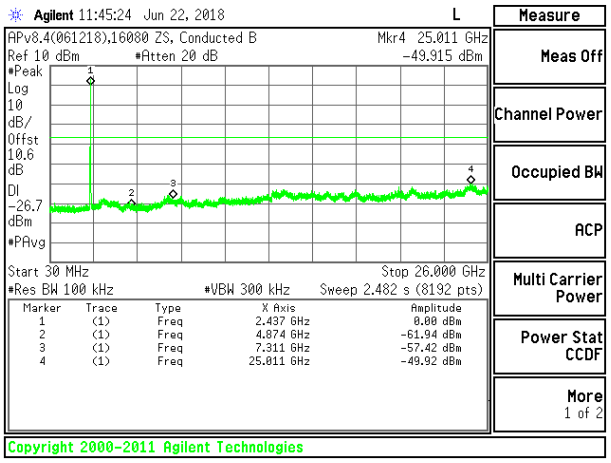

**LOW CHANNEL 2 BANDEDGE CHAIN 1**




**OUT-OF-BAND LOW CHANNEL 2 CHAIN 1**



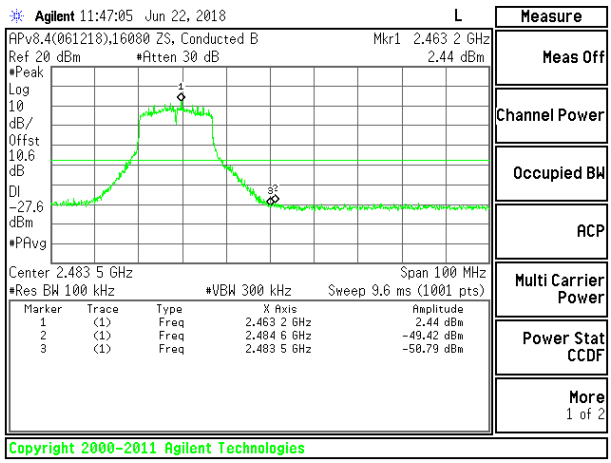

**IN-BAND REFERENCE LEVEL CHAIN 1**



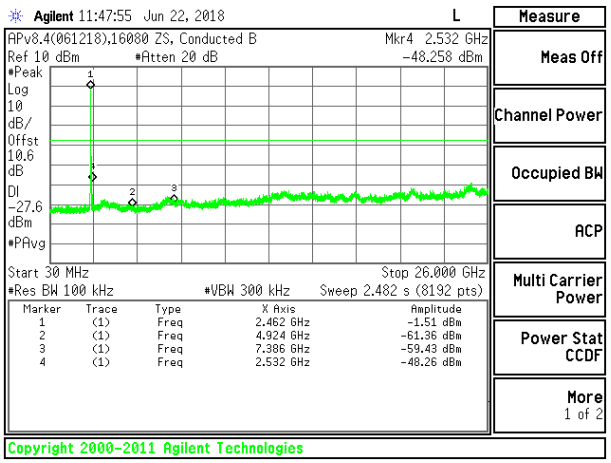

**OUT-OF-BAND MID CHANNEL CHAIN 1**



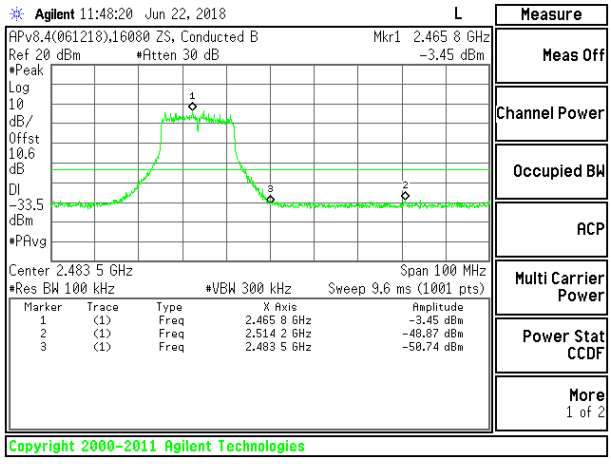
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888



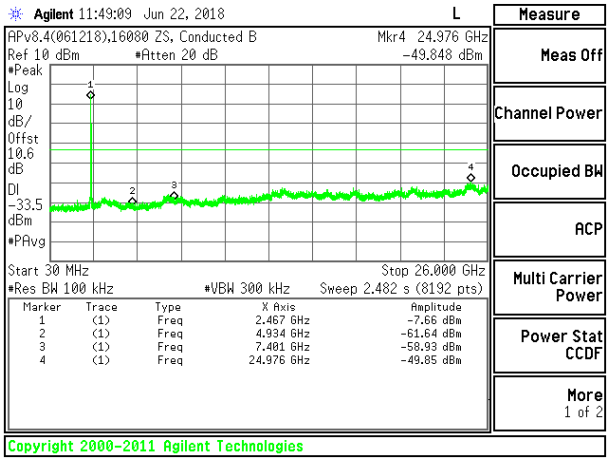

**HIGH CHANNEL 11 BANDEDGE CHAIN 1**



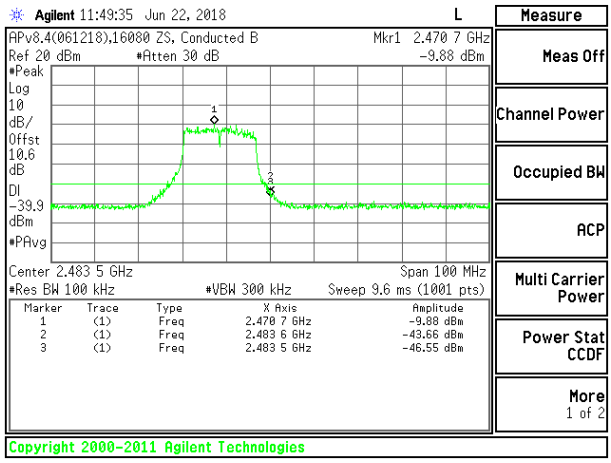

**OUT-OF-BAND HIGH CHANNEL 11 CHAIN 1**



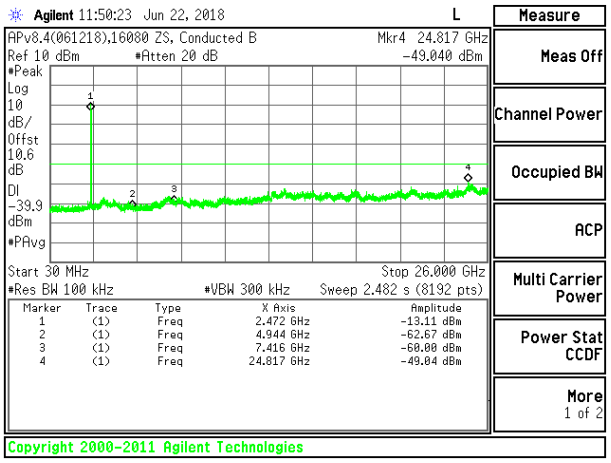

**HIGH CHANNEL 12 BANDEDGE CHAIN 1**




**OUT-OF-BAND HIGH CHANNEL 12 CHAIN 1**

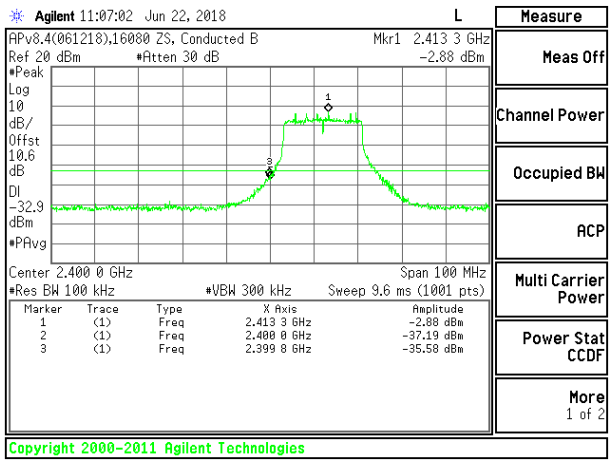



**HIGH CHANNEL 13 BANDEDGE CHAIN 1**

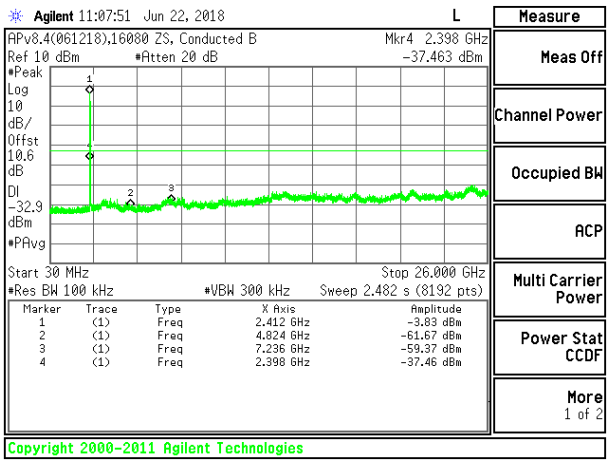



**OUT-OF-BAND HIGH CHANNEL 13 CHAIN 1**

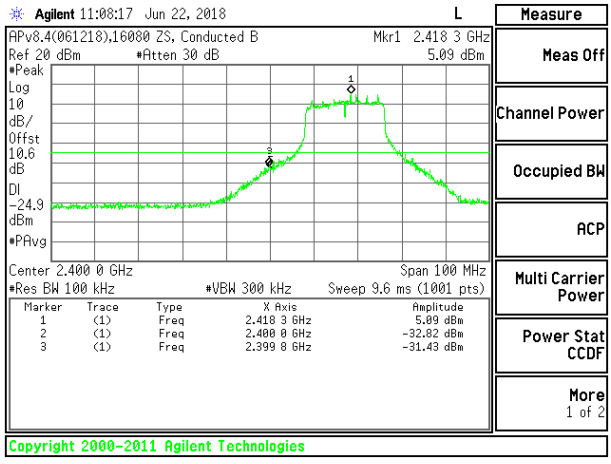
## 8.6.3. 802.11n HT20 MODE



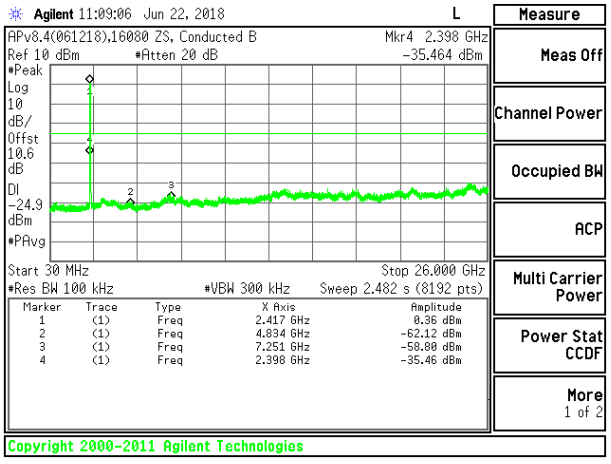

**LOW CHANNEL 1 BANDEDGE CHAIN 0**



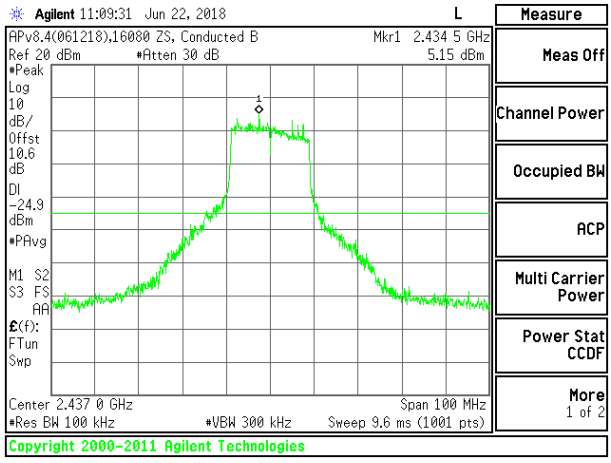

**OUT-OF-BAND LOW CHANNEL 1 CHAIN 0**



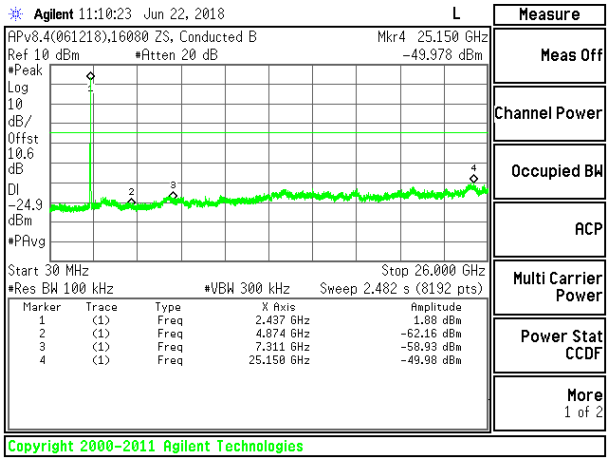

**LOW CHANNEL 2 BANDEDGE CHAIN 0**



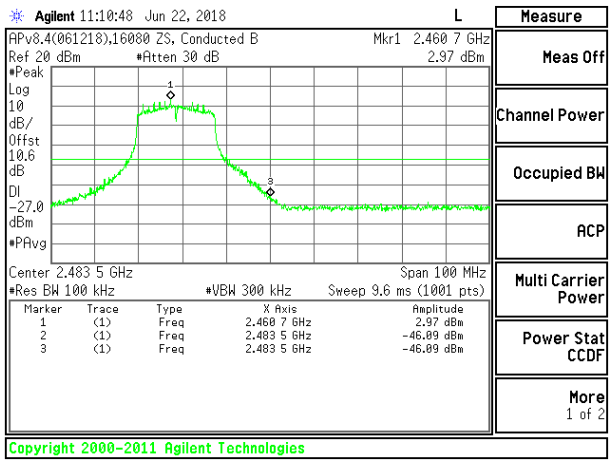

**OUT-OF-BAND LOW CHANNEL 2 CHAIN 0**



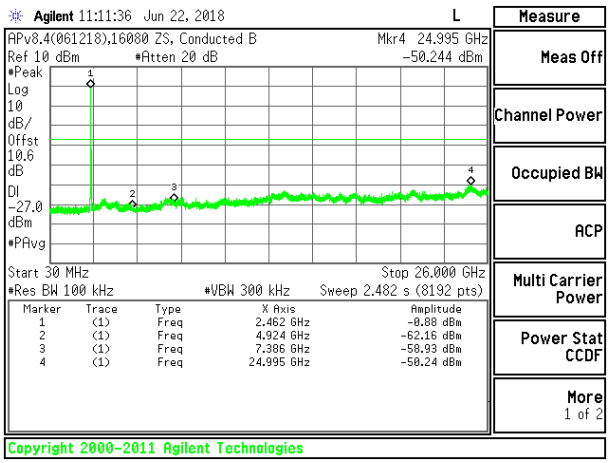

**IN-BAND REFERENCE LEVEL CHAIN 0**



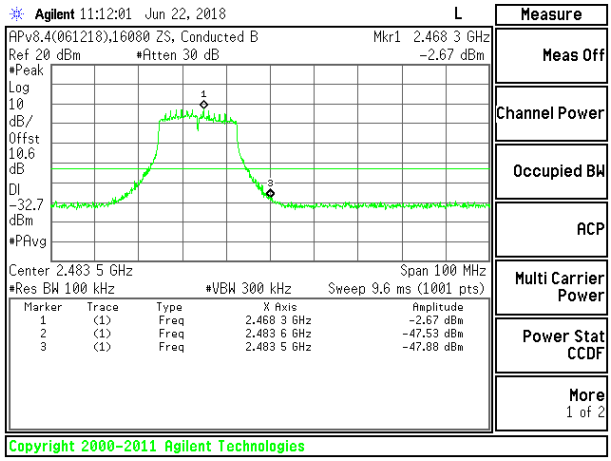

**OUT-OF-BAND MID CHANNEL CHAIN 0**



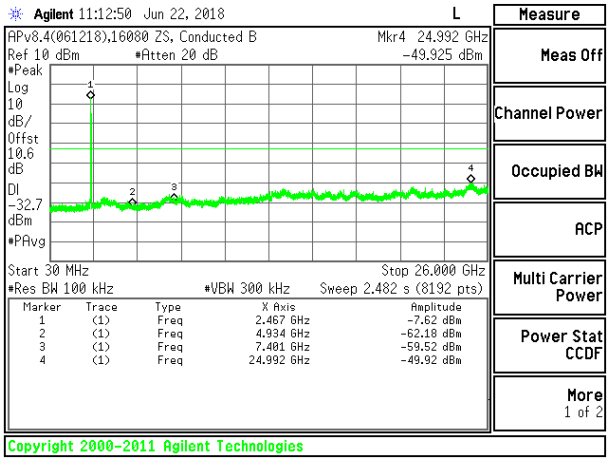

**HIGH CHANNEL 11 BANDEDGE CHAIN 0**



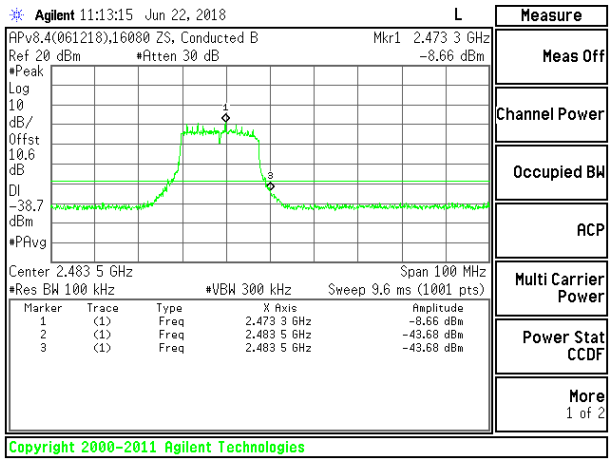

**OUT-OF-BAND HIGH CHANNEL 11 CHAIN 0**



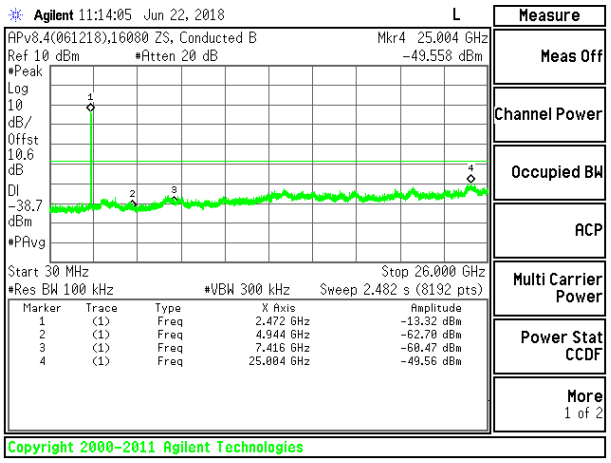

**HIGH CHANNEL 12 BANDEDGE CHAIN 0**




**OUT-OF-BAND HIGH CHANNEL 12 CHAIN 0**



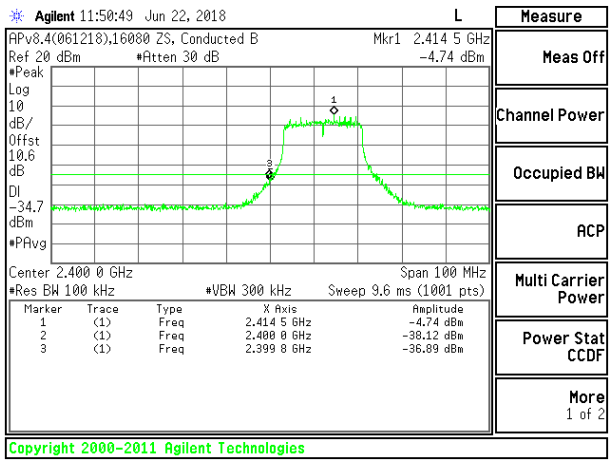

**HIGH CHANNEL 13 BANDEDGE CHAIN 0**



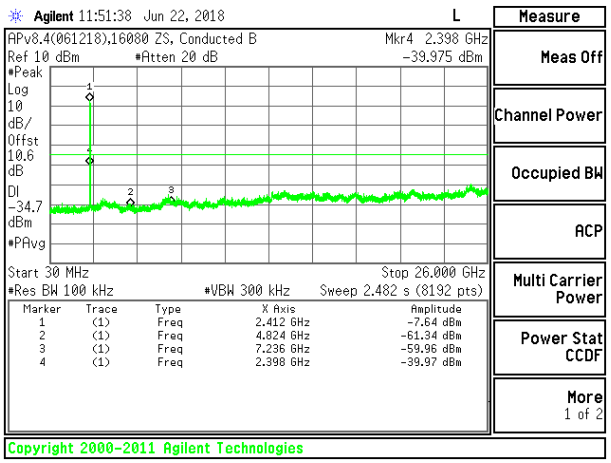

**OUT-OF-BAND HIGH CHANNEL 13 CHAIN 0**



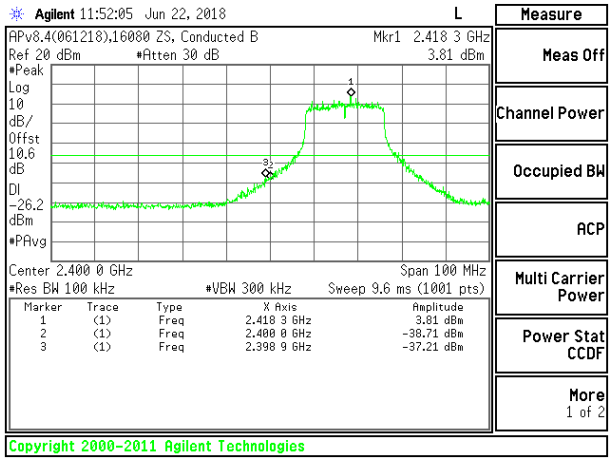
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888



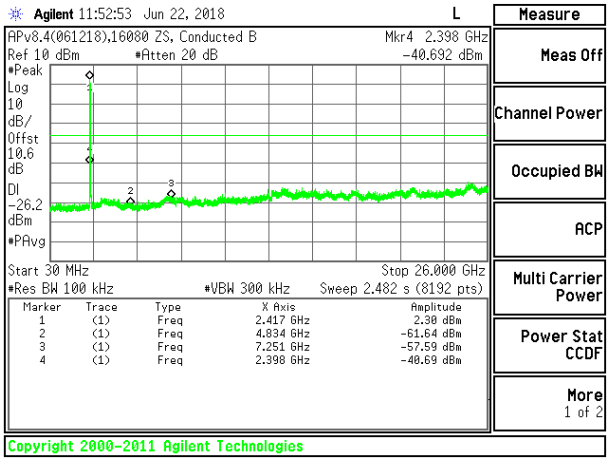

**LOW CHANNEL 1 BANDEDGE CHAIN 1**



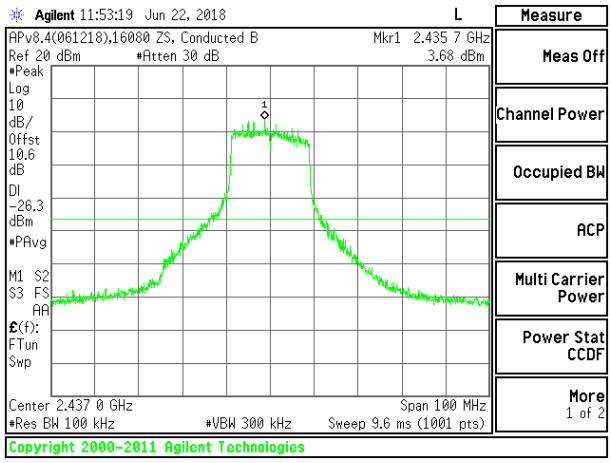

**OUT-OF-BAND LOW CHANNEL 1 CHAIN 1**



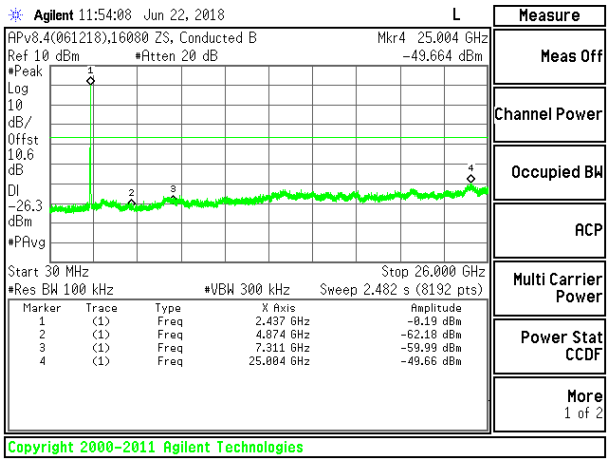

**LOW CHANNEL 2 BANDEDGE CHAIN 1**




**OUT-OF-BAND LOW CHANNEL 2 CHAIN 1**



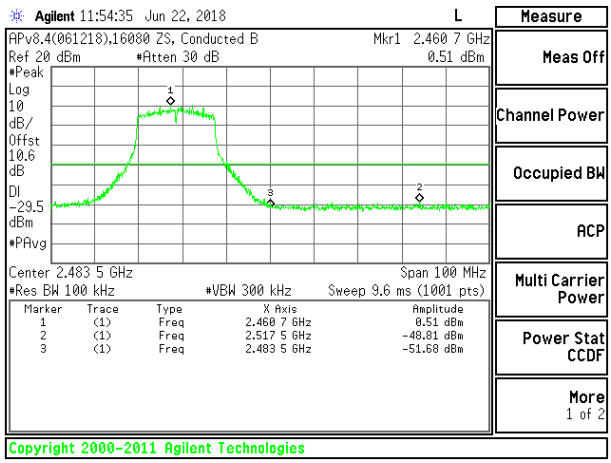

**IN-BAND REFERENCE LEVEL CHAIN 1**



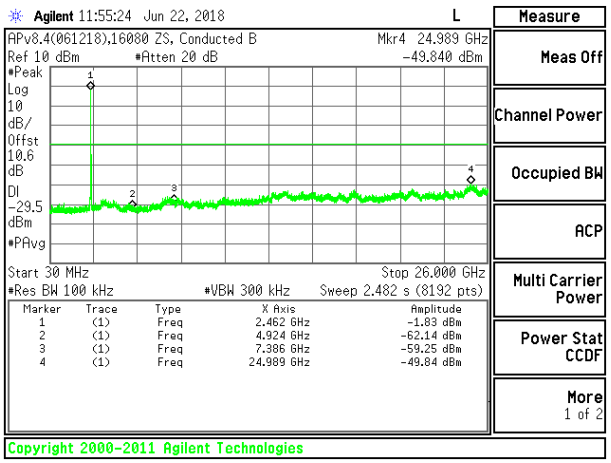

**OUT-OF-BAND MID CHANNEL CHAIN 1**



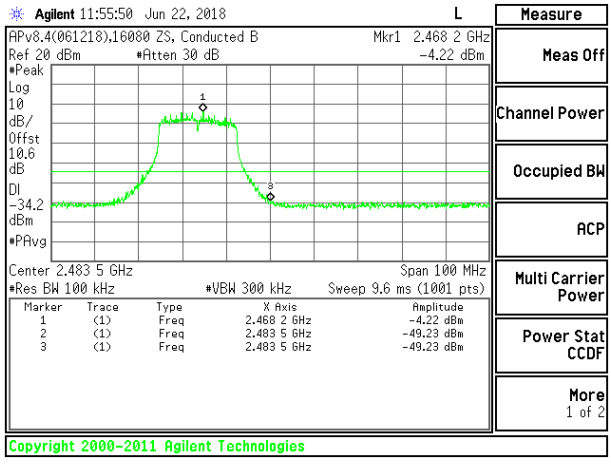
UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888



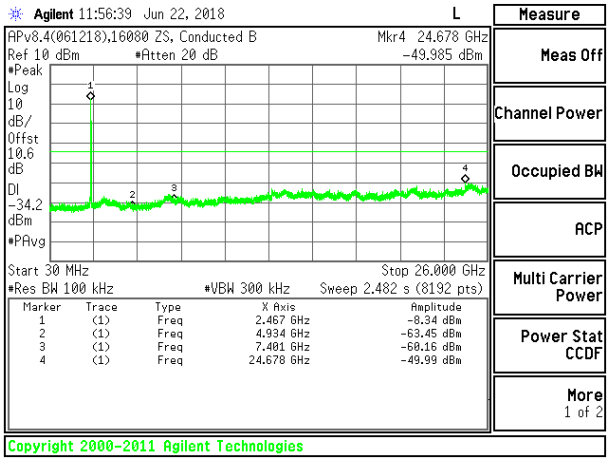

**HIGH CHANNEL 11 BANDEDGE CHAIN 1**



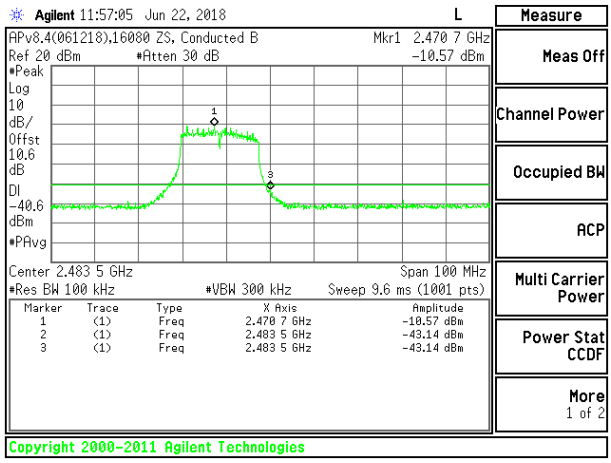

**OUT-OF-BAND HIGH CHANNEL 11 CHAIN 1**



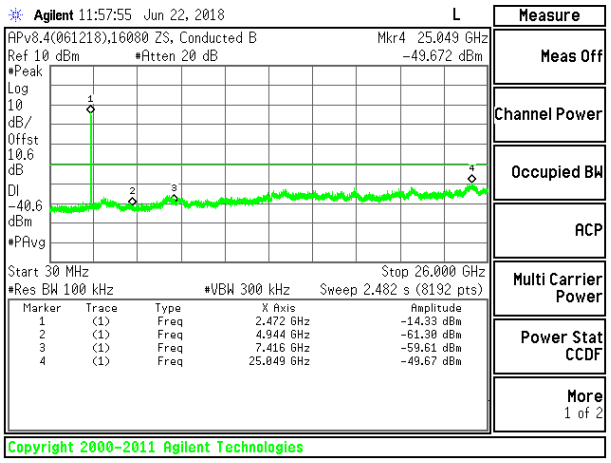

**HIGH CHANNEL 12 BANDEDGE CHAIN 1**




**OUT-OF-BAND HIGH CHANNEL 12 CHAIN 1**




**HIGH CHANNEL 13 BANDEDGE CHAIN 1**




**OUT-OF-BAND HIGH CHANNEL 13 CHAIN 1**



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

# 9. RADIATED TEST RESULTS

**LIMITS**

FCC §15.205 and §15.209

| Frequency Range (MHz) | Field Strength Limit (uV/m) at 3 m | Field Strength Limit (dBuV/m) at 3 m |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) @ 300 m | - |
| 0.490-1.705 | 24000/F(kHz) @ 30 m | - |
| 1.705 - 30 | 30 @ 30m | - |
| 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 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

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.

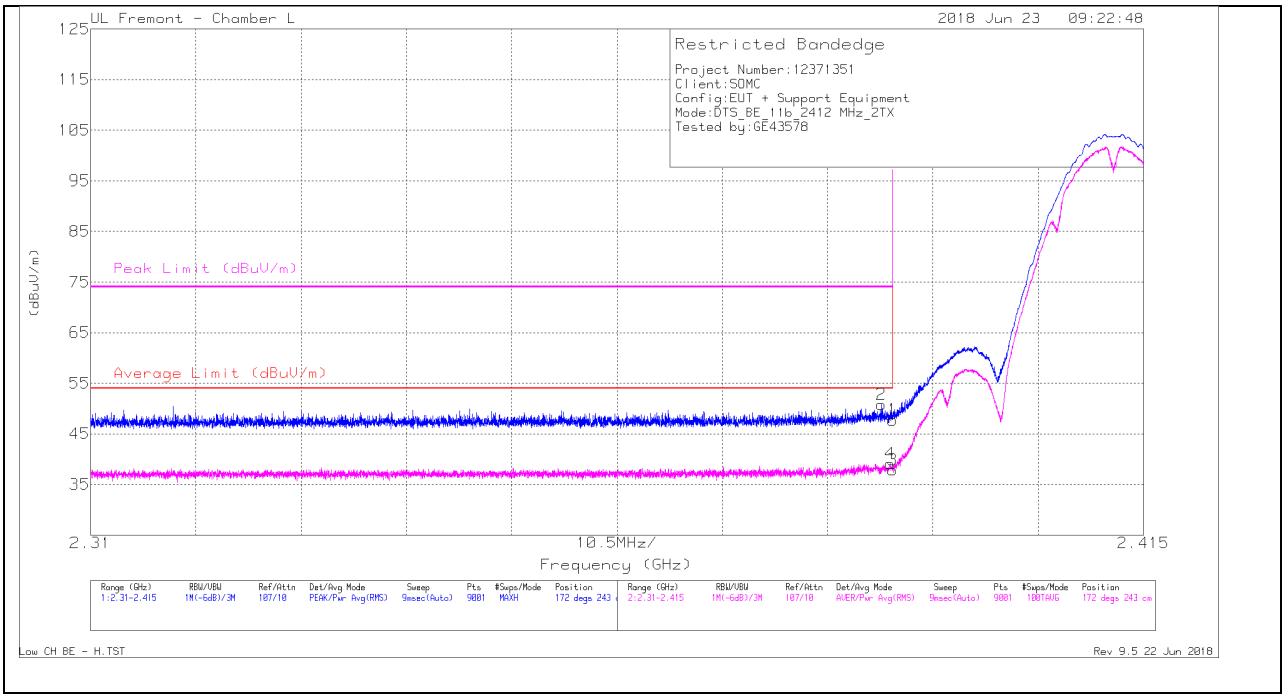

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

# 9.1. TRANSMITTER ABOVE 1 GHz

## 9.1.1. TX ABOVE 1 GHz 802.11b MODE IN THE 2.4 GHz BAND

### BANDEDGE (LOW CHANNEL, CH 1)

### HORIZONTAL RESULT

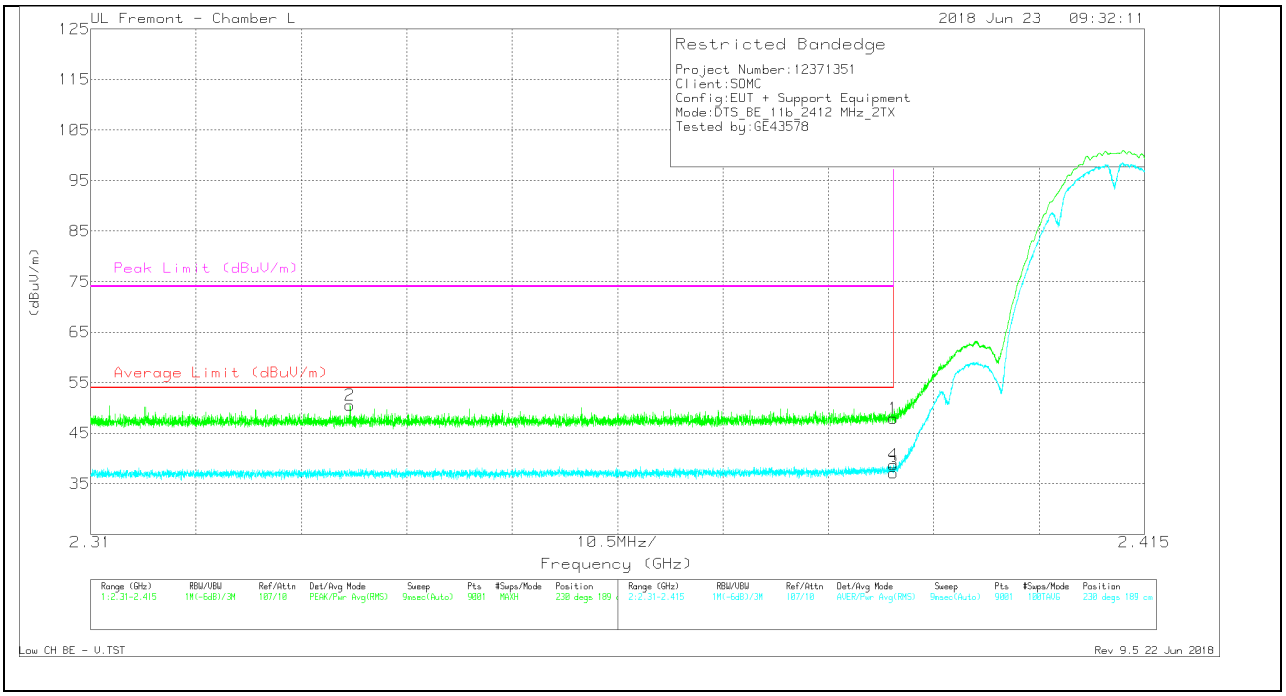



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.39 | 38.85 | Pk | 31.8 | -22.9 | 0 | 47.75 | - | - | 74 | -26.25 | 172 | 243 | H |
| 2 | * 2.389 | 41.89 | Pk | 31.8 | -22.9 | 0 | 50.79 | - | - | 74 | -23.21 | 172 | 243 | H |
| 3 | * 2.39 | 28.92 | RMS | 31.8 | -22.9 | 0 | 37.82 | 54 | -16.18 | - | - | 172 | 243 | H |
| 4 | * 2.39 | 30.17 | RMS | 31.8 | -22.9 | 0 | 39.07 | 54 | -14.93 | - | - | 172 | 243 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



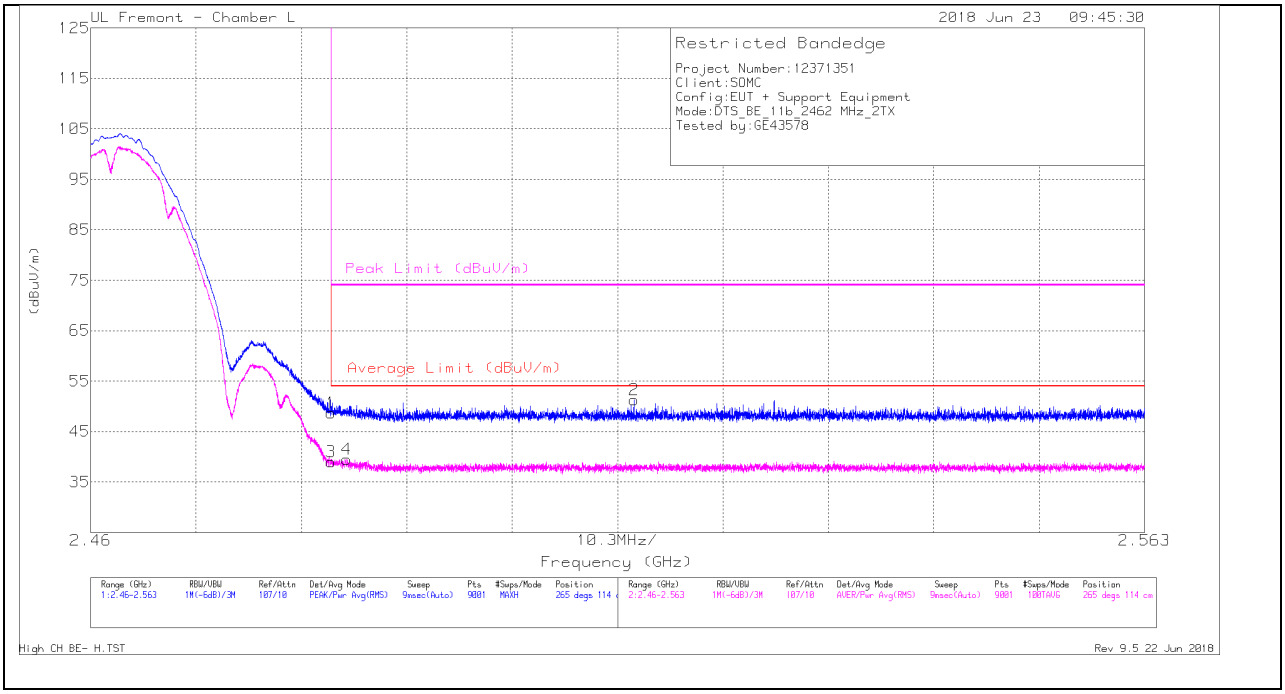

## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.39 | 39.02 | Pk | 31.8 | -22.9 | 0 | 47.92 | - | - | 74 | -26.08 | 230 | 189 | V |
| 2 | * 2.336 | 41.99 | Pk | 31.5 | -23 | 0 | 50.49 | - | - | 74 | -23.51 | 230 | 189 | V |
| 3 | * 2.39 | 28.24 | RMS | 31.8 | -22.9 | 0 | 37.14 | 54 | -16.86 | - | - | 230 | 189 | V |
| 4 | * 2.39 | 29.81 | RMS | 31.8 | -22.9 | 0 | 38.71 | 54 | -15.29 | - | - | 230 | 189 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# BANDEDGE (HIGH CHANNEL, CH 11)

## HORIZONTAL RESULT

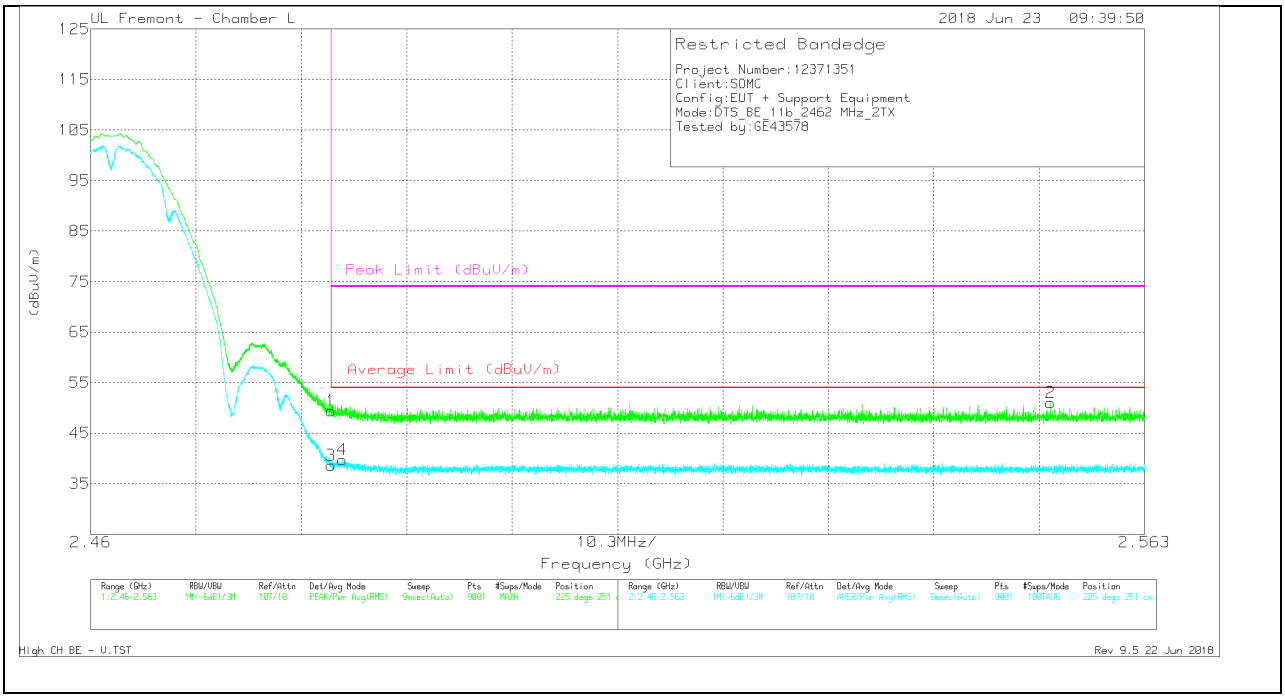



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 39.13 | Pk | 32.3 | -22.7 | 0 | 48.73 | - | - | 74 | -25.27 | 265 | 114 | H |
| 2 | 2.513 | 41.61 | Pk | 32.3 | -22.6 | 0 | 51.31 | - | - | 74 | -22.69 | 265 | 114 | H |
| 3 | * 2.484 | 29.4 | RMS | 32.3 | -22.7 | 0 | 39 | 54 | -15 | - | - | 265 | 114 | H |
| 4 | * 2.485 | 29.88 | RMS | 32.3 | -22.7 | 0 | 39.48 | 54 | -14.52 | - | - | 265 | 114 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



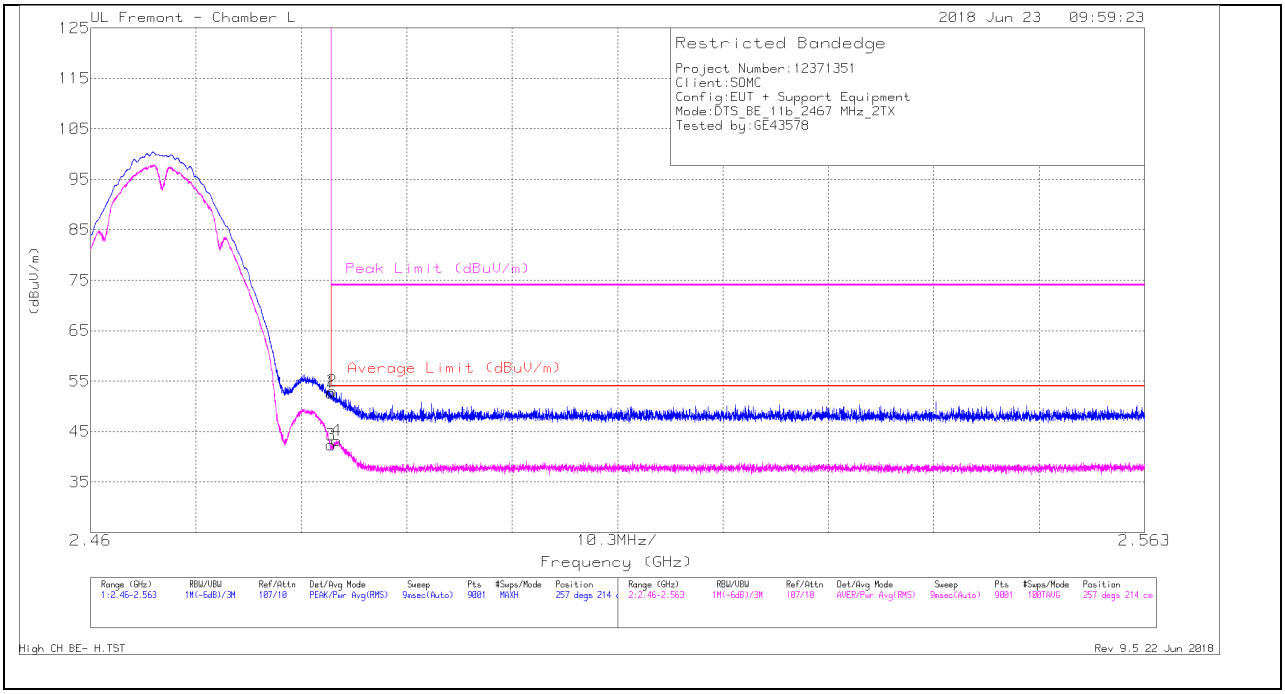

## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 39.88 | Pk | 32.3 | -22.7 | 0 | 49.48 | - | - | 74 | -24.52 | 225 | 251 | V |
| 2 | 2.554 | 41.38 | Pk | 32.3 | -22.7 | 0 | 50.98 | - | - | 74 | -23.02 | 225 | 251 | V |
| 3 | * 2.484 | 29.03 | RMS | 32.3 | -22.7 | 0 | 38.63 | 54 | -15.37 | - | - | 225 | 251 | V |
| 4 | * 2.485 | 30.13 | RMS | 32.3 | -22.7 | 0 | 39.73 | 54 | -14.27 | - | - | 225 | 251 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# BANDEDGE (HIGH CHANNEL, CH 12)

## HORIZONTAL RESULT

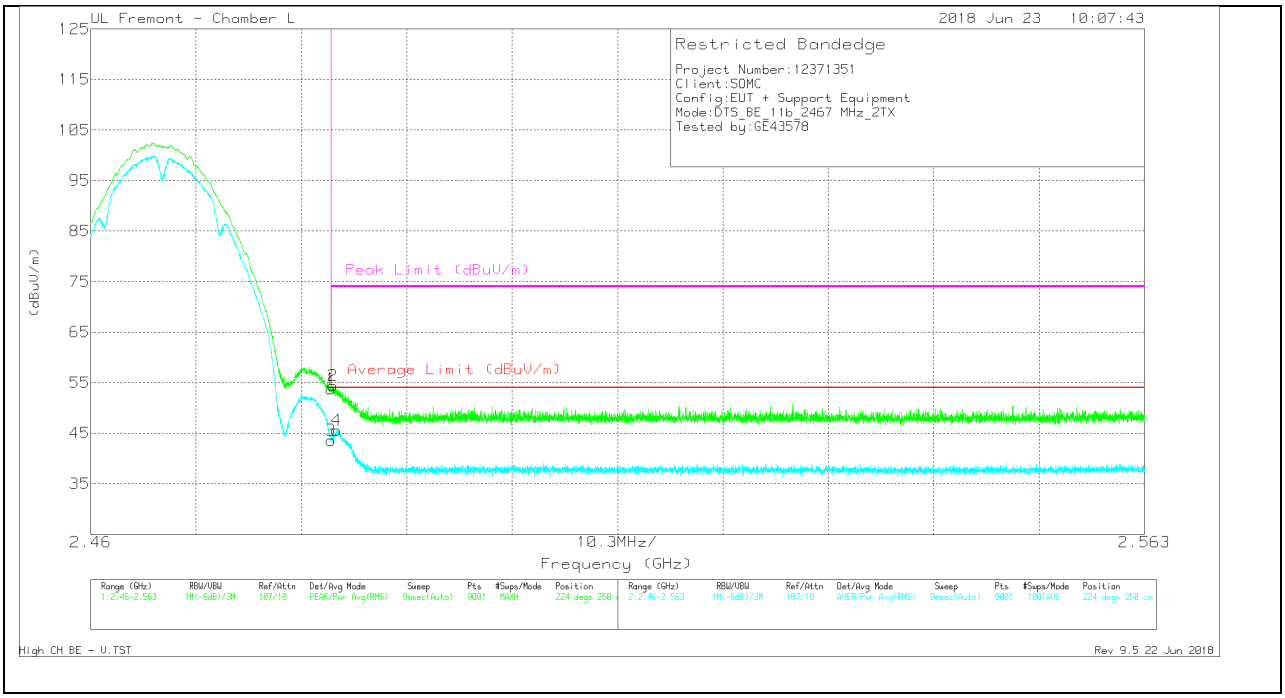



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 43.11 | Pk | 32.3 | -22.7 | 0 | 52.71 | - | - | 74 | -21.29 | 257 | 214 | H |
| 2 | * 2.484 | 43.46 | Pk | 32.3 | -22.7 | 0 | 53.06 | - | - | 74 | -20.94 | 257 | 214 | H |
| 3 | * 2.484 | 32.69 | RMS | 32.3 | -22.7 | 0 | 42.29 | 54 | -11.71 | - | - | 257 | 214 | H |
| 4 | * 2.484 | 33.65 | RMS | 32.3 | -22.7 | 0 | 43.25 | 54 | -10.75 | - | - | 257 | 214 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



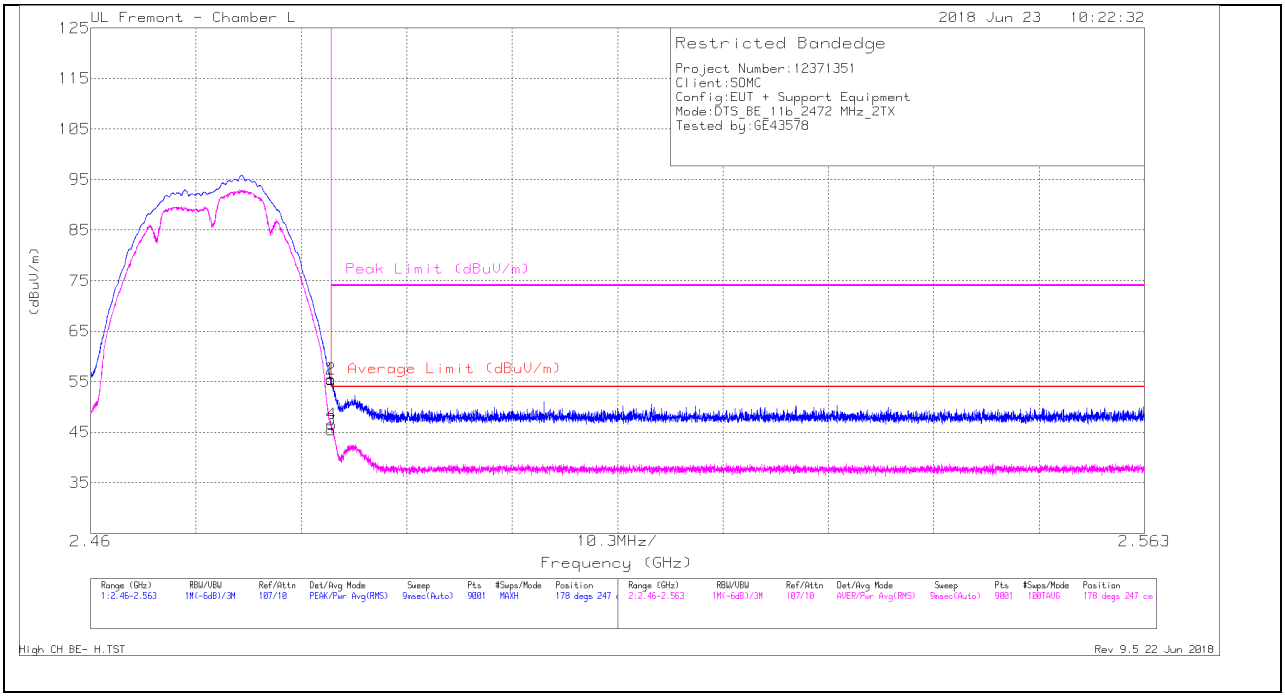

## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 44.12 | Pk | 32.3 | -22.7 | 0 | 53.72 | - | - | 74 | -20.28 | 224 | 250 | V |
| 2 | * 2.484 | 44.77 | Pk | 32.3 | -22.7 | 0 | 54.37 | - | - | 74 | -19.63 | 224 | 250 | V |
| 3 | * 2.484 | 33.97 | RMS | 32.3 | -22.7 | 0 | 43.57 | 54 | -10.43 | - | - | 224 | 250 | V |
| 4 | * 2.484 | 35.96 | RMS | 32.3 | -22.7 | 0 | 45.56 | 54 | -8.44 | - | - | 224 | 250 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# BANDEDGE (HIGH CHANNEL, CH 13)

## HORIZONTAL RESULT

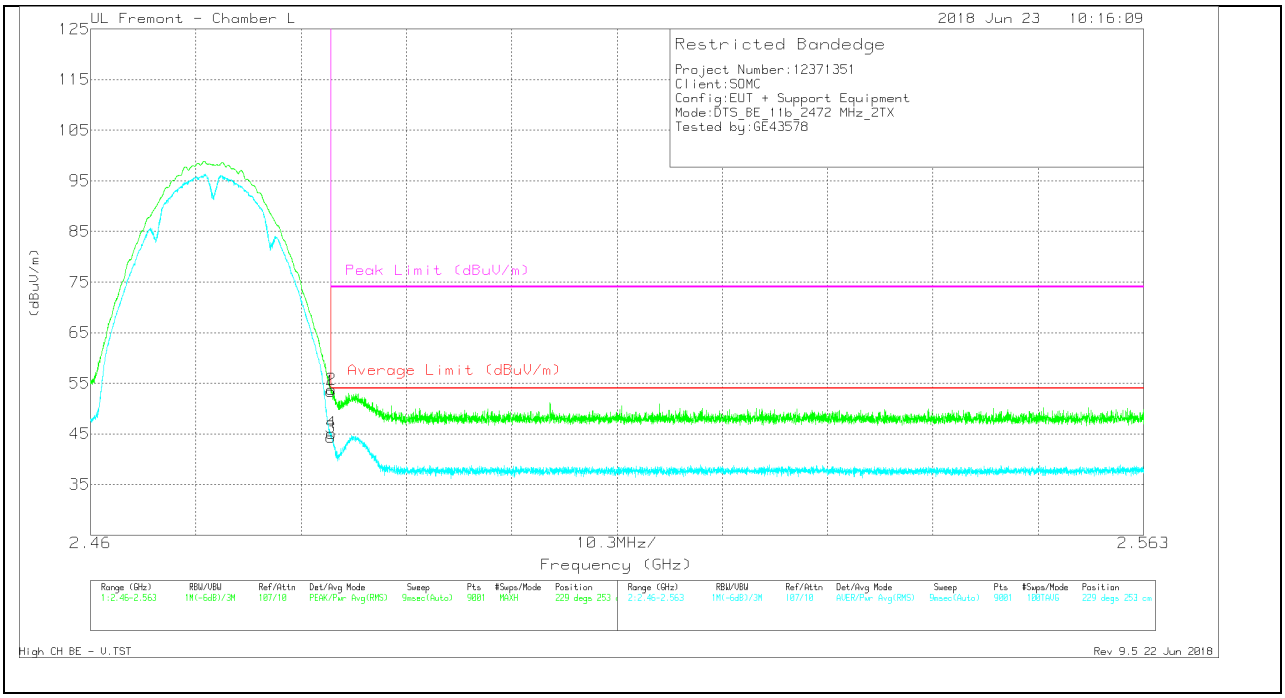



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 45.78 | Pk | 32.3 | -22.7 | 0 | 55.38 | - | - | 74 | -18.62 | 178 | 247 | H |
| 2 | * 2.484 | 45.87 | Pk | 32.3 | -22.7 | 0 | 55.47 | - | - | 74 | -18.53 | 178 | 247 | H |
| 3 | * 2.484 | 35.87 | RMS | 32.3 | -22.7 | 0 | 45.47 | 54 | -8.53 | - | - | 178 | 247 | H |
| 4 | * 2.484 | 36.97 | RMS | 32.3 | -22.7 | 0 | 46.57 | 54 | -7.43 | - | - | 178 | 247 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



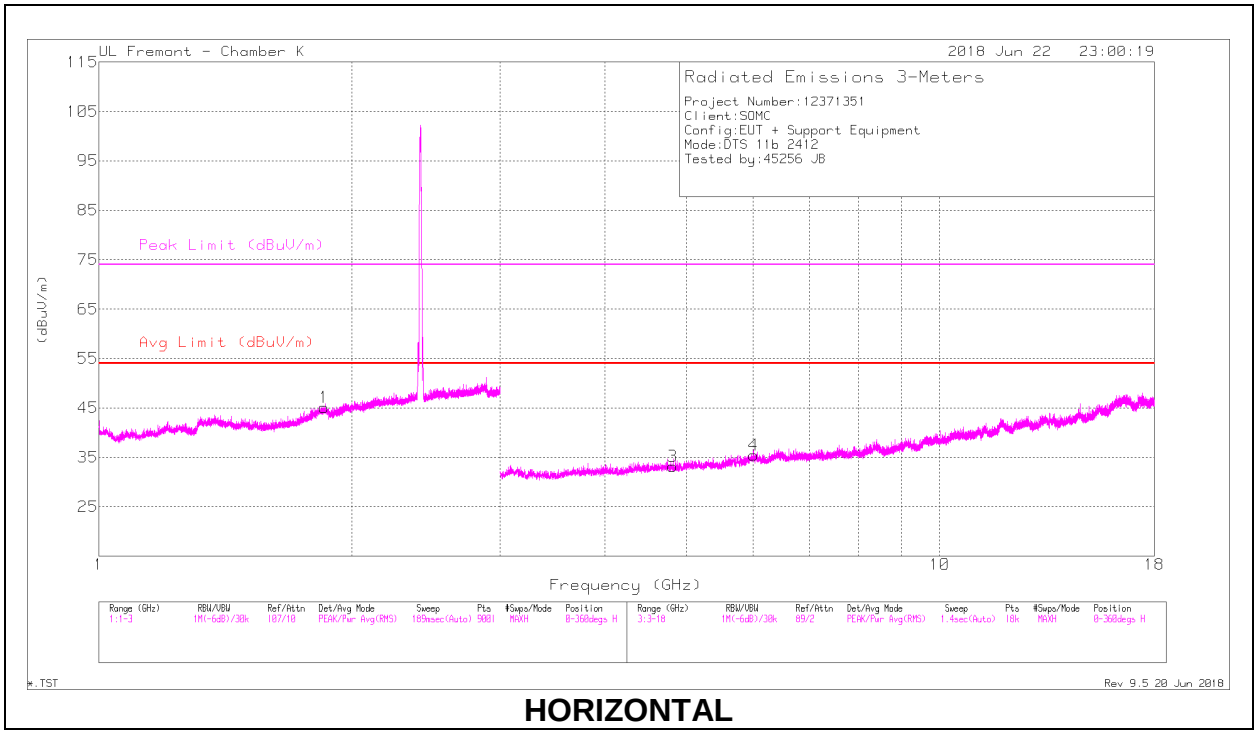

### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 43.85 | Pk | 32.3 | -22.7 | 0 | 53.45 | - | - | 74 | -20.55 | 229 | 253 | V |
| 2 | * 2.484 | 44.19 | Pk | 32.3 | -22.7 | 0 | 53.79 | - | - | 74 | -20.21 | 229 | 253 | V |
| 3 | * 2.484 | 34.74 | RMS | 32.3 | -22.7 | 0 | 44.34 | 54 | -9.66 | - | - | 229 | 253 | V |
| 4 | * 2.484 | 35.54 | RMS | 32.3 | -22.7 | 0 | 45.14 | 54 | -8.86 | - | - | 229 | 253 | V |

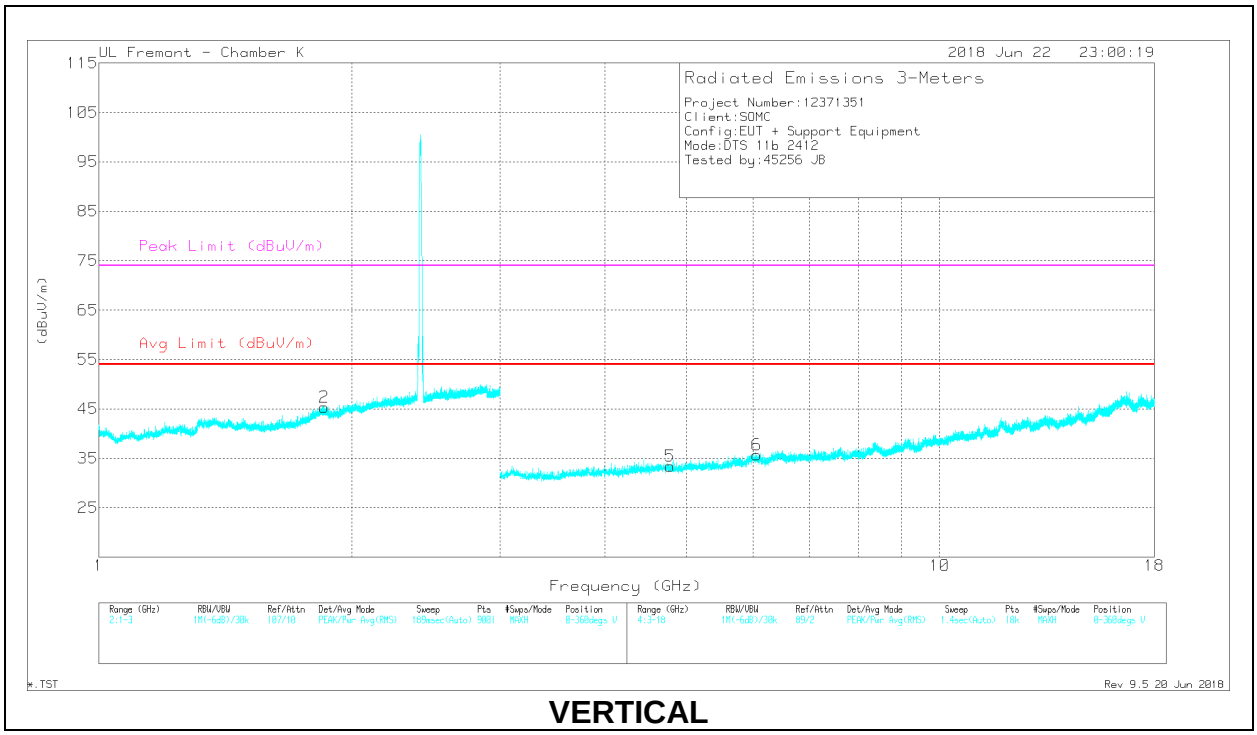
* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# HARMONICS AND SPURIOUS EMISSIONS

## LOW CHANNEL, CH 1 RESULTS




**HORIZONTAL**




**VERTICAL**

## RADIATED EMISSIONS

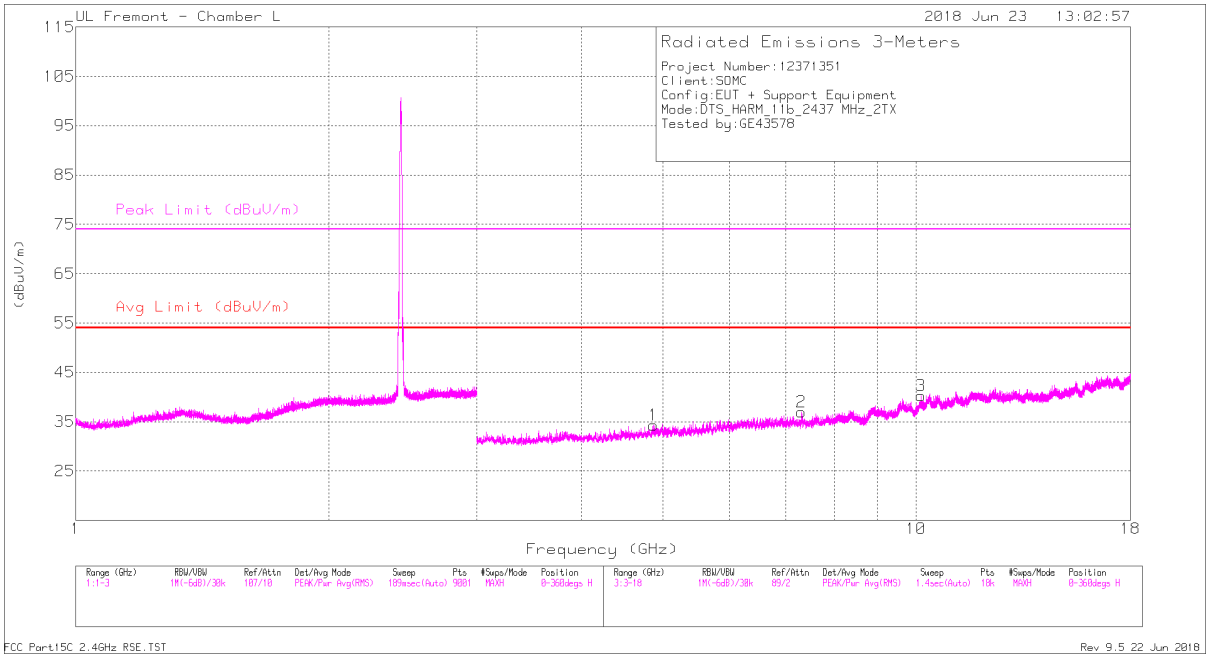
### Radiated Emissions

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (dB) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.855 | 30.88 | PK2 | 30.4 | -9 | 0 | 52.28 | - | - | - | - | 87 | 116 | H |
| 2 | 1.853 | 29.86 | PK2 | 30.4 | -9 | 0 | 51.26 | - | - | - | - | 23 | 367 | V |
| 3 | * 4.812 | 37.84 | PK2 | 34.2 | -31 | 0 | 41.04 | - | - | 74 | -32.96 | 135 | 161 | H |
| | * 4.812 | 28.6 | MAv1 | 34.2 | -31 | 0 | 31.8 | 54 | -22.2 | - | - | 135 | 161 | H |
| 4 | 6.01 | 36.83 | PK2 | 35.2 | -28.1 | 0 | 43.93 | - | - | - | - | 352 | 152 | H |
| 5 | * 4.781 | 37.31 | PK2 | 34.1 | -30.7 | 0 | 40.71 | - | - | 74 | -33.29 | 128 | 389 | V |
| | * 4.781 | 27.34 | MAv1 | 34.1 | -30.7 | 0 | 30.74 | 54 | -23.26 | - | - | 128 | 389 | V |
| 6 | 6.055 | 35.47 | PK2 | 35.3 | -27.7 | 0 | 43.07 | - | - | - | - | 164 | 118 | V |

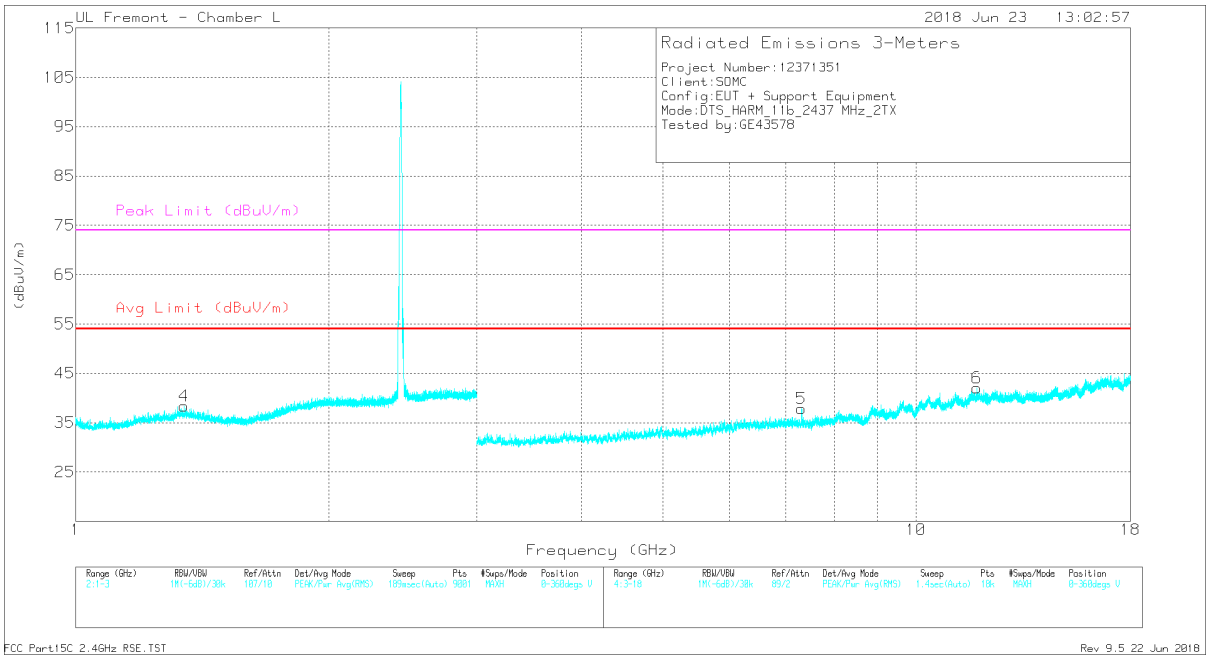
* - indicates frequency in CFR47 Pt 15 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## MID CHANNEL, CH 6 RESULTS




**HORIZONTAL**




**VERTICAL**

## RADIATED EMISSIONS

### Radiated Emissions

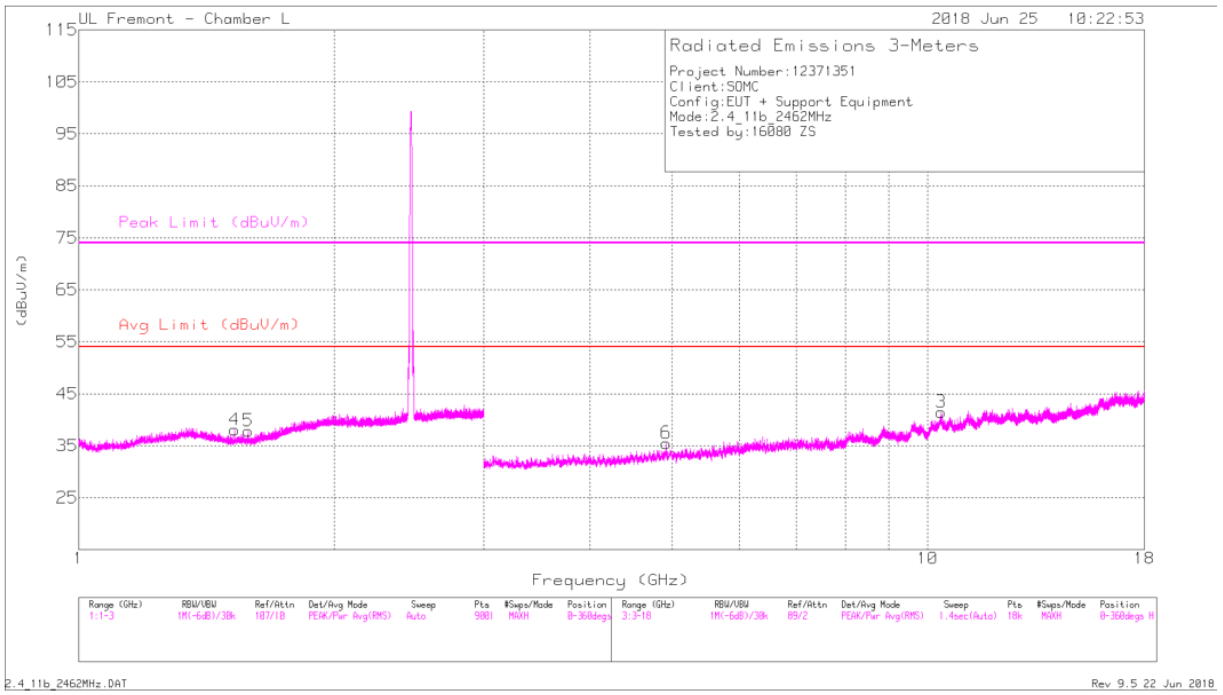
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | * 1.344 | 40.36 | PK2 | 29.5 | -24.8 | 0 | 45.06 | - | - | 74 | -28.94 | 56 | 100 | V |
| | * 1.347 | 30.85 | MAv1 | 29.5 | -24.8 | 0 | 35.55 | 54 | -18.45 | - | - | 56 | 100 | V |
| 1 | * 4.874 | 36.12 | PK2 | 34.2 | -29.1 | 0 | 41.22 | - | - | 74 | -32.78 | 258 | 115 | H |
| | * 4.874 | 26.23 | MAv1 | 34.2 | -29.1 | 0 | 31.33 | 54 | -22.67 | - | - | 258 | 115 | H |
| 2 | * 7.311 | 35.61 | PK2 | 35.7 | -25.2 | 0 | 46.11 | - | - | 74 | -27.89 | 199 | 157 | H |
| | * 7.31 | 27.01 | MAv1 | 35.7 | -25.2 | 0 | 37.51 | 54 | -16.49 | - | - | 199 | 157 | H |
| 3 | 10.138 | 28.82 | PK2 | 37.3 | -19.5 | 0 | 46.62 | - | - | - | - | 358 | 100 | H |
| 5 | * 11.807 | 29.29 | PK2 | 38.6 | -20.7 | 0 | 47.19 | - | - | 74 | -26.81 | 105 | 298 | V |
| | * 11.809 | 20.04 | MAv1 | 38.6 | -20.7 | 0 | 37.94 | 54 | -16.06 | - | - | 105 | 298 | V |
| 6 | * 7.308 | 35.08 | PK2 | 35.7 | -25.2 | 0 | 45.58 | - | - | 74 | -28.42 | 128 | 294 | V |
| | * 7.31 | 26.71 | MAv1 | 35.7 | -25.2 | 0 | 37.21 | 54 | -16.79 | - | - | 128 | 294 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

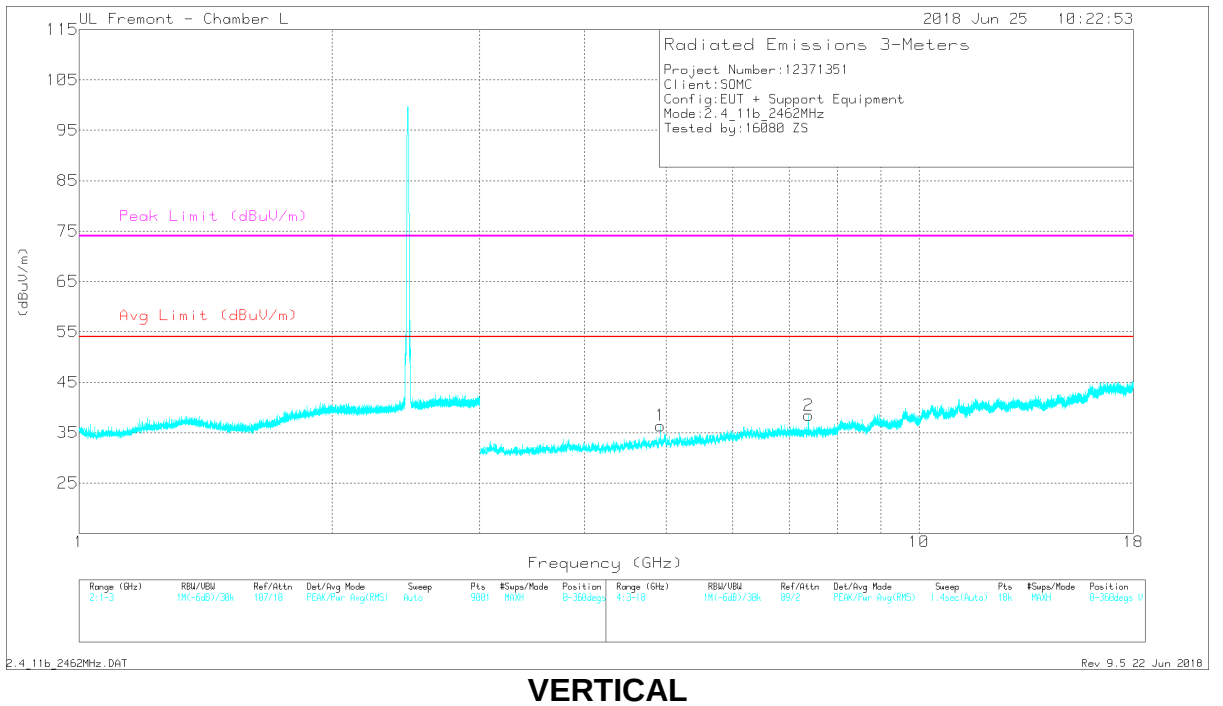


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## HIGH CHANNEL, CH 11 RESULTS




**HORIZONTAL**




**VERTICAL**

## RADIATED EMISSIONS

### Radiated Emissions

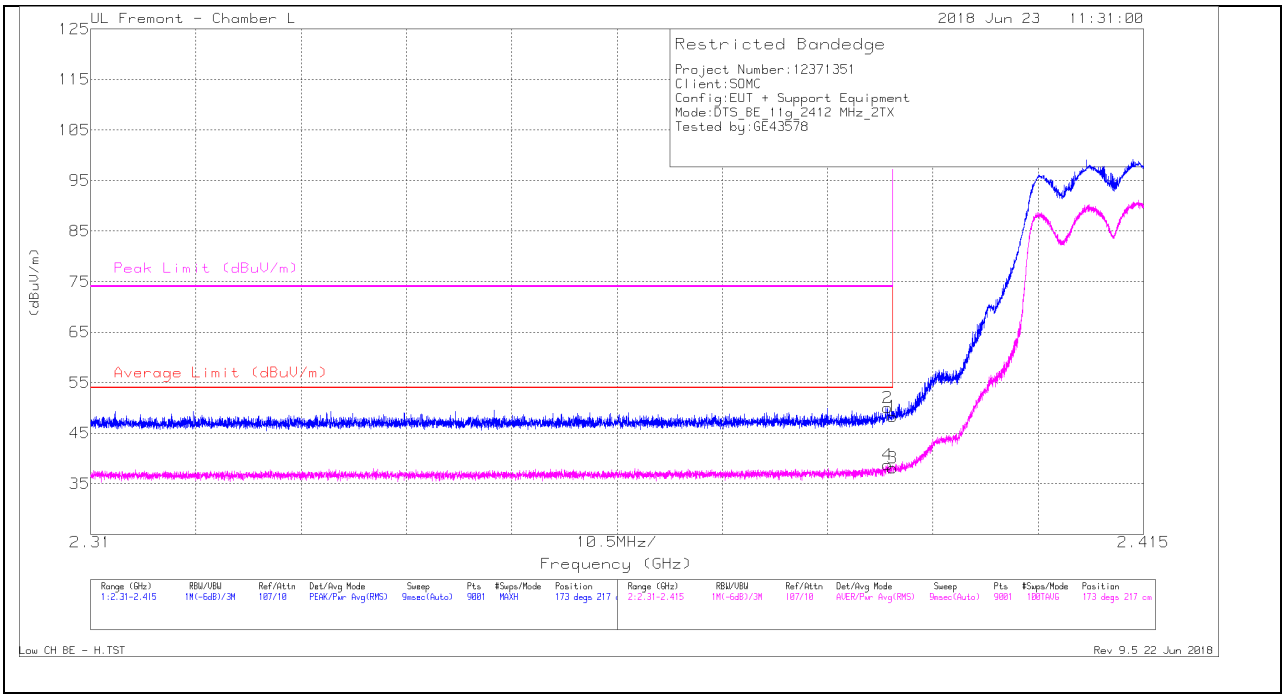
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | * 1.524 | 40.1 | PK2 | 28.1 | -24.4 | 43.8 | - | - | 74 | -30.2 | 167 | 220 | H |
| | * 1.525 | 30.34 | MAv1 | 28.1 | -24.4 | 34.04 | 54 | -19.96 | - | - | 167 | 220 | H |
| 5 | * 1.584 | 40.41 | PK2 | 28 | -24.3 | 44.11 | - | - | 74 | -29.89 | 166 | 353 | H |
| | * 1.585 | 29.93 | MAv1 | 28 | -24.3 | 33.63 | 54 | -20.37 | - | - | 166 | 353 | H |
| 3 | 10.369 | 28.58 | PK2 | 37.5 | -19.6 | 46.48 | - | - | - | - | 256 | 115 | H |
| 6 | * 4.923 | 36.16 | PK2 | 34.2 | -27.8 | 42.56 | - | - | 74 | -31.44 | 288 | 277 | H |
| | * 4.924 | 27.98 | MAv1 | 34.2 | -27.9 | 34.28 | 54 | -19.72 | - | - | 288 | 277 | H |
| 1 | * 4.924 | 35.23 | PK2 | 34.2 | -27.9 | 41.53 | - | - | 74 | -32.47 | 74 | 172 | V |
| | * 4.924 | 27.57 | MAv1 | 34.2 | -27.9 | 33.87 | 54 | -20.13 | - | - | 74 | 172 | V |
| 2 | * 7.385 | 33.37 | PK2 | 35.7 | -24.9 | 44.17 | - | - | 74 | -29.83 | 48 | 227 | V |
| | * 7.387 | 25.96 | MAv1 | 35.7 | -24.9 | 36.76 | 54 | -17.24 | - | - | 48 | 227 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

## 9.1.2. TX ABOVE 1 GHz 802.11g MODE IN THE 2.4 GHz BAND

### BANDEDGE (LOW CHANNEL, CH 1)

### HORIZONTAL RESULT

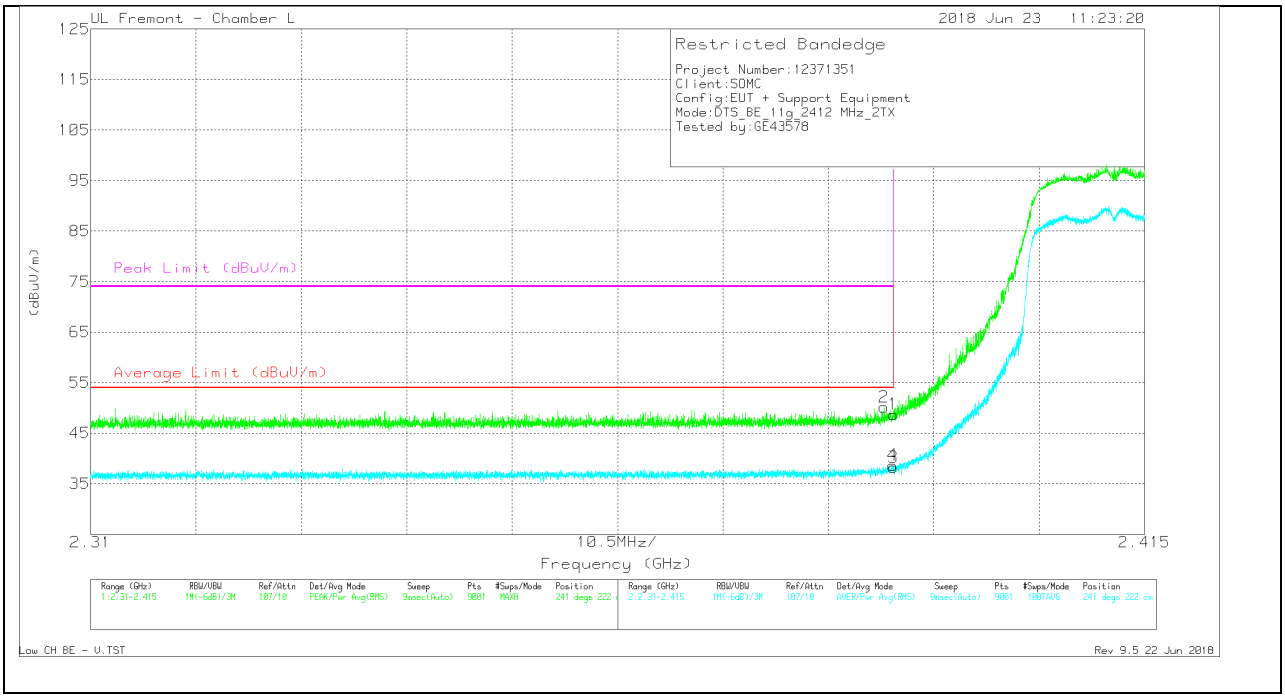



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.39 | 39.45 | Pk | 31.8 | -22.9 | 0 | 48.35 | - | - | 74 | -25.65 | 173 | 217 | H |
| 2 | * 2.389 | 41.14 | Pk | 31.8 | -22.9 | 0 | 50.04 | - | - | 74 | -23.96 | 173 | 217 | H |
| 3 | * 2.39 | 29.17 | RMS | 31.8 | -22.9 | 0 | 38.07 | 54 | -15.93 | - | - | 173 | 217 | H |
| 4 | * 2.389 | 29.81 | RMS | 31.8 | -22.9 | 0 | 38.71 | 54 | -15.29 | - | - | 173 | 217 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



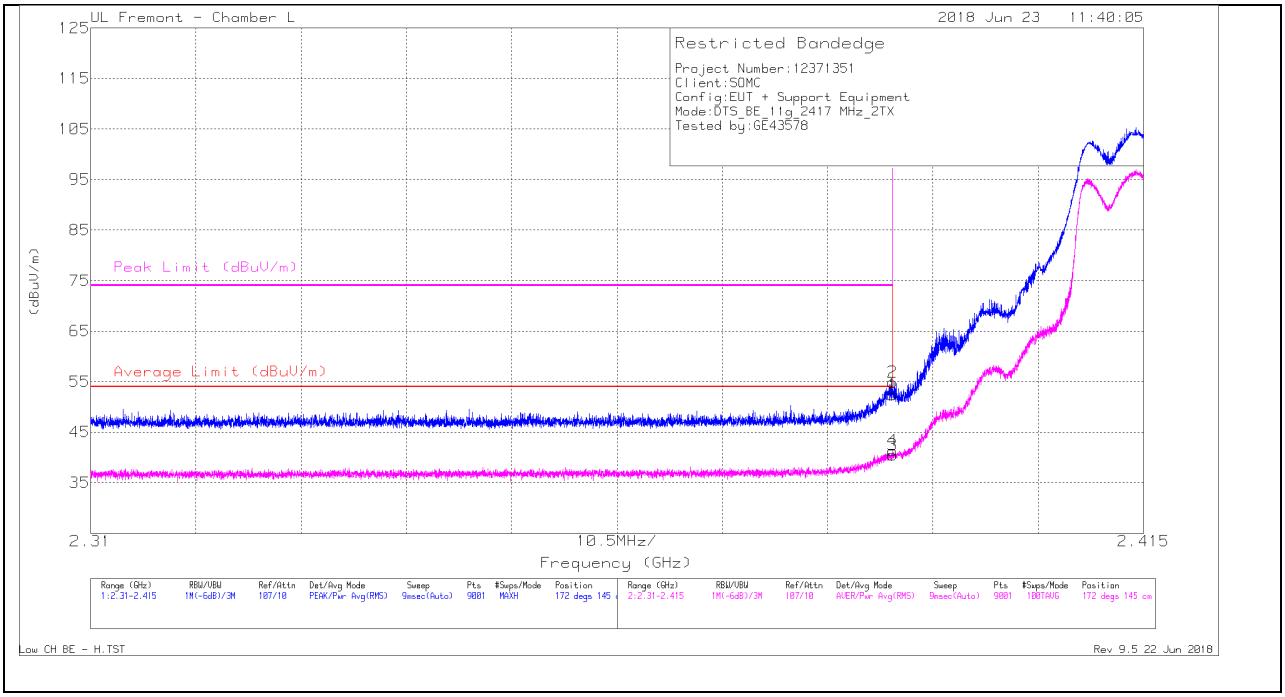

## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.39 | 39.84 | Pk | 31.8 | -22.9 | 0 | 48.74 | - | - | 74 | -25.26 | 241 | 222 | V |
| 2 | * 2.389 | 41.22 | Pk | 31.8 | -22.9 | 0 | 50.12 | - | - | 74 | -23.88 | 241 | 222 | V |
| 3 | * 2.39 | 29.37 | RMS | 31.8 | -22.9 | 0 | 38.27 | 54 | -15.73 | - | - | 241 | 222 | V |
| 4 | * 2.39 | 29.78 | RMS | 31.8 | -22.9 | 0 | 38.68 | 54 | -15.32 | - | - | 241 | 222 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# BANDEDGE (LOW CHANNEL, CH 2)

## HORIZONTAL RESULT

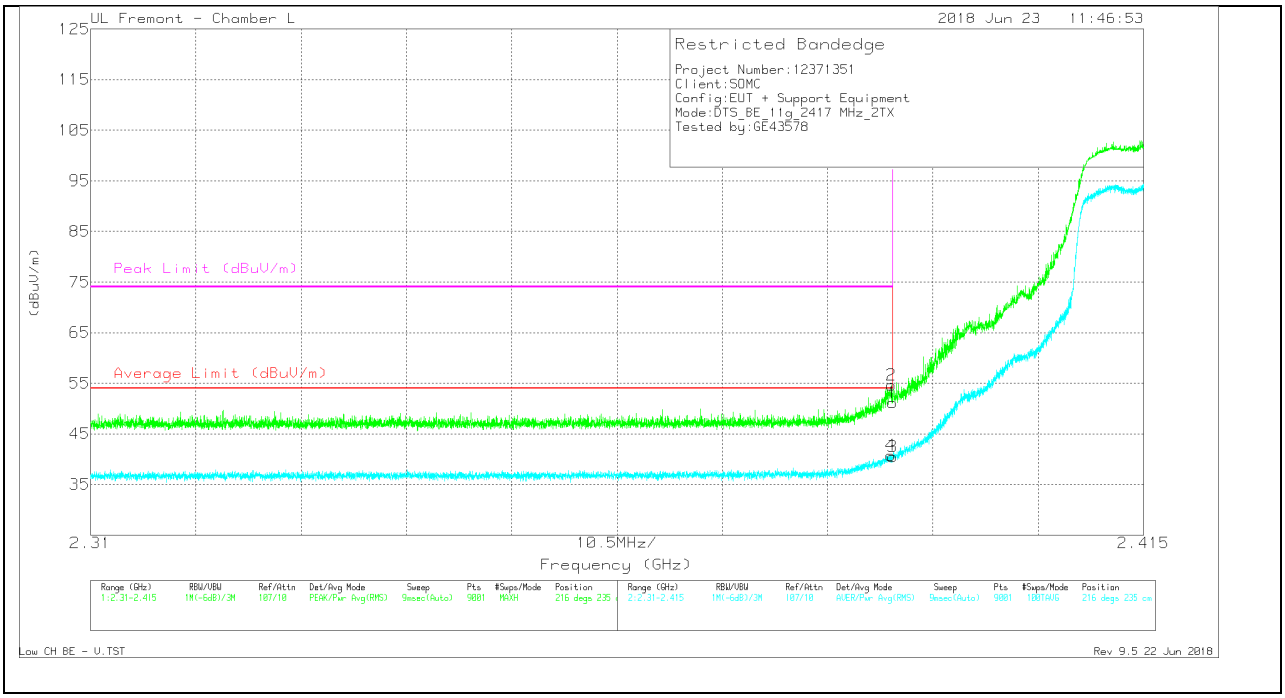



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.39 | 43.45 | Pk | 31.8 | -22.9 | 0 | 52.35 | - | - | 74 | -21.65 | 172 | 145 | H |
| 2 | * 2.39 | 46 | Pk | 31.8 | -22.9 | 0 | 54.9 | - | - | 74 | -19.1 | 172 | 145 | H |
| 3 | * 2.39 | 31.56 | RMS | 31.8 | -22.9 | 0 | 40.46 | 54 | -13.54 | - | - | 172 | 145 | H |
| 4 | * 2.39 | 32.41 | RMS | 31.8 | -22.9 | 0 | 41.31 | 54 | -12.69 | - | - | 172 | 145 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



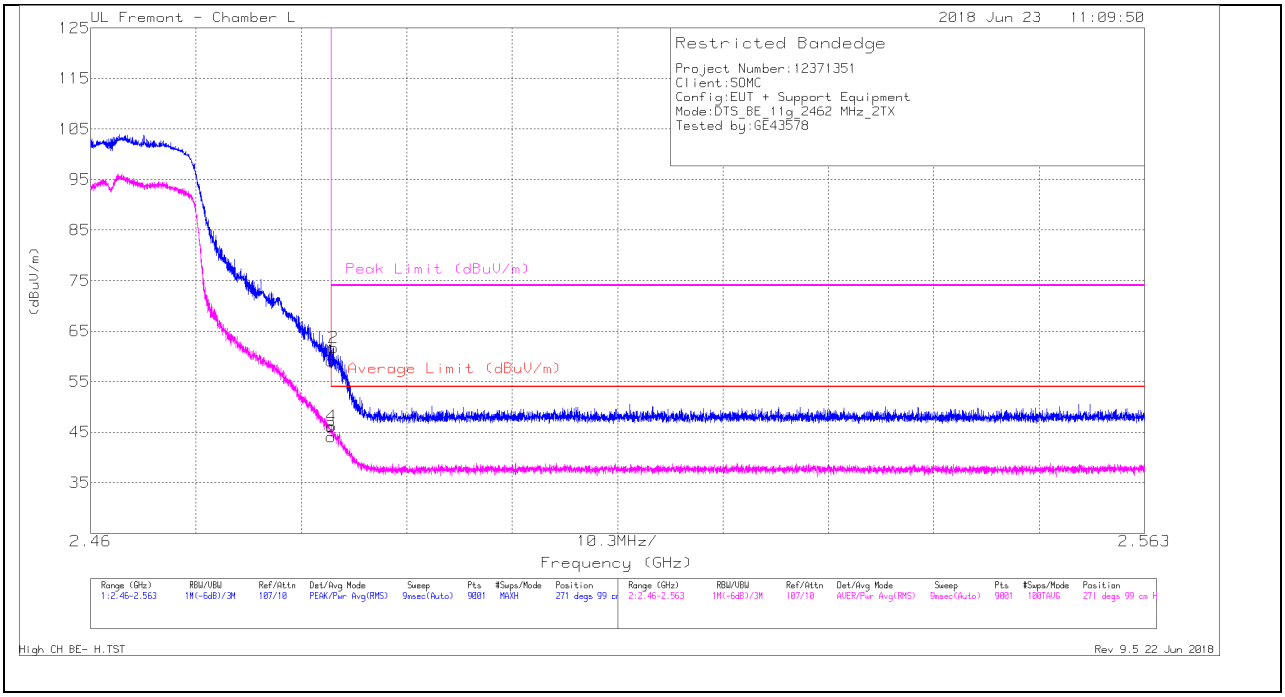

## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.39 | 42.3 | Pk | 31.8 | -22.9 | 0 | 51.2 | - | - | 74 | -22.8 | 216 | 235 | V |
| 2 | * 2.39 | 45.78 | Pk | 31.8 | -22.9 | 0 | 54.68 | - | - | 74 | -19.32 | 216 | 235 | V |
| 3 | * 2.39 | 31.59 | RMS | 31.8 | -22.9 | 0 | 40.49 | 54 | -13.51 | - | - | 216 | 235 | V |
| 4 | * 2.39 | 31.86 | RMS | 31.8 | -22.9 | 0 | 40.76 | 54 | -13.24 | - | - | 216 | 235 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# BANDEDGE (HIGH CHANNEL, CH 11)

## HORIZONTAL RESULT

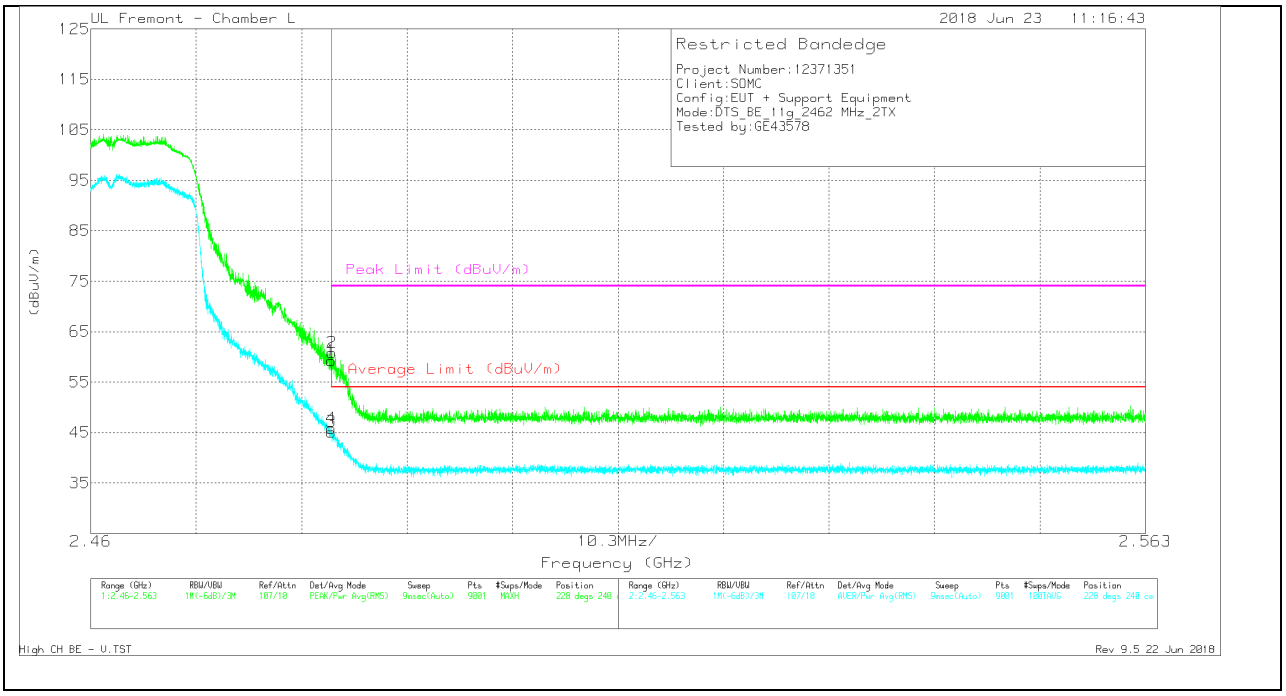



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 49.51 | Pk | 32.3 | -22.7 | 0 | 59.11 | - | - | 74 | -14.89 | 271 | 99 | H |
| 2 | * 2.484 | 52.17 | Pk | 32.3 | -22.7 | 0 | 61.77 | - | - | 74 | -12.23 | 271 | 99 | H |
| 3 | * 2.484 | 34.51 | RMS | 32.3 | -22.7 | 0 | 44.11 | 54 | -9.89 | - | - | 271 | 99 | H |
| 4 | * 2.484 | 36.57 | RMS | 32.3 | -22.7 | 0 | 46.17 | 54 | -7.83 | - | - | 271 | 99 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



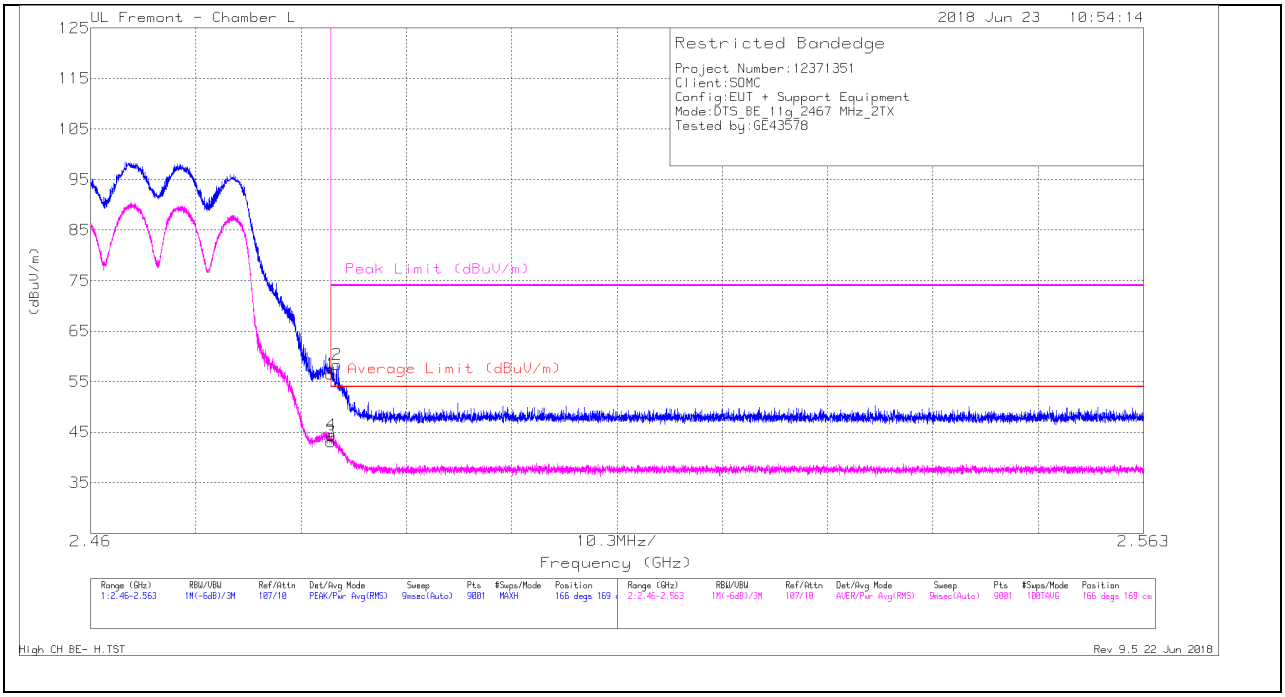

## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 49.67 | Pk | 32.3 | -22.7 | 0 | 59.27 | - | - | 74 | -14.73 | 228 | 240 | V |
| 2 | * 2.484 | 51.3 | Pk | 32.3 | -22.7 | 0 | 60.9 | - | - | 74 | -13.1 | 228 | 240 | V |
| 3 | * 2.484 | 35.54 | RMS | 32.3 | -22.7 | 0 | 45.14 | 54 | -8.86 | - | - | 228 | 240 | V |
| 4 | * 2.484 | 36.18 | RMS | 32.3 | -22.7 | 0 | 45.78 | 54 | -8.22 | - | - | 228 | 240 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# BANDEDGE (HIGH CHANNEL, CH 12)

## HORIZONTAL RESULT

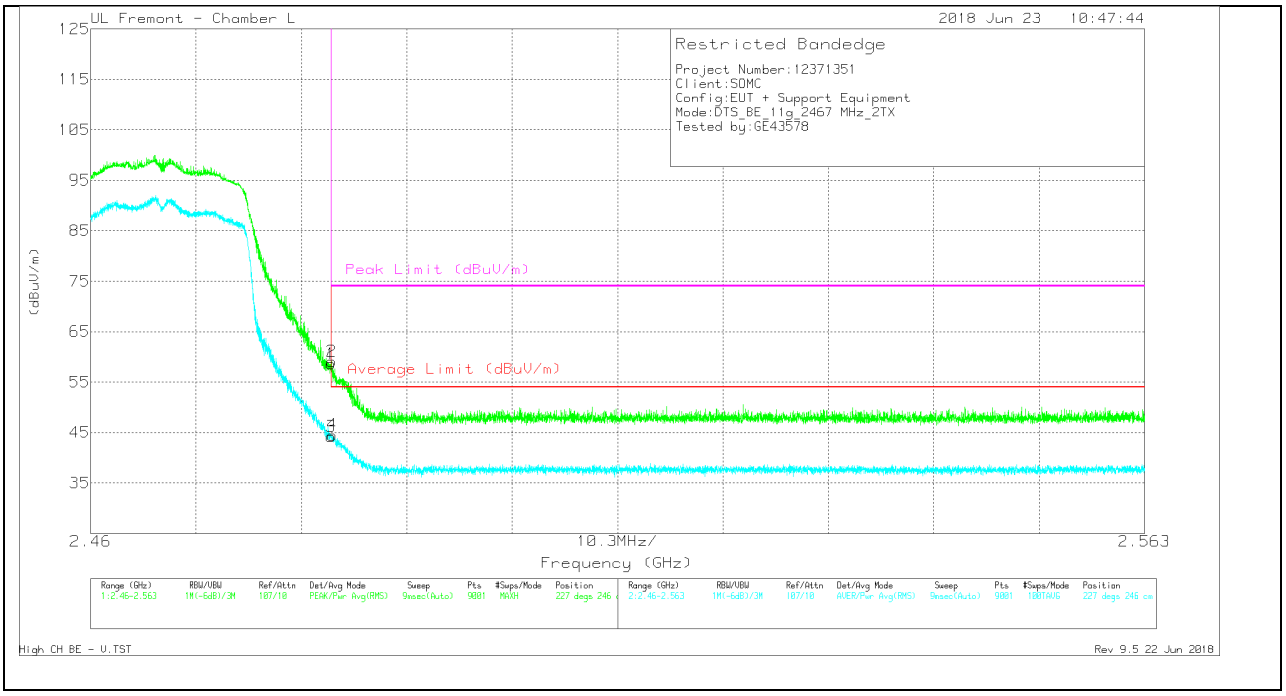



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 46.86 | Pk | 32.3 | -22.7 | 0 | 56.46 | - | - | 74 | -17.54 | 166 | 169 | H |
| 2 | * 2.484 | 48.71 | Pk | 32.3 | -22.7 | 0 | 58.31 | - | - | 74 | -15.69 | 166 | 169 | H |
| 3 | * 2.484 | 33.55 | RMS | 32.3 | -22.7 | 0 | 43.15 | 54 | -10.85 | - | - | 166 | 169 | H |
| 4 | * 2.484 | 34.82 | RMS | 32.3 | -22.7 | 0 | 44.42 | 54 | -9.58 | - | - | 166 | 169 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



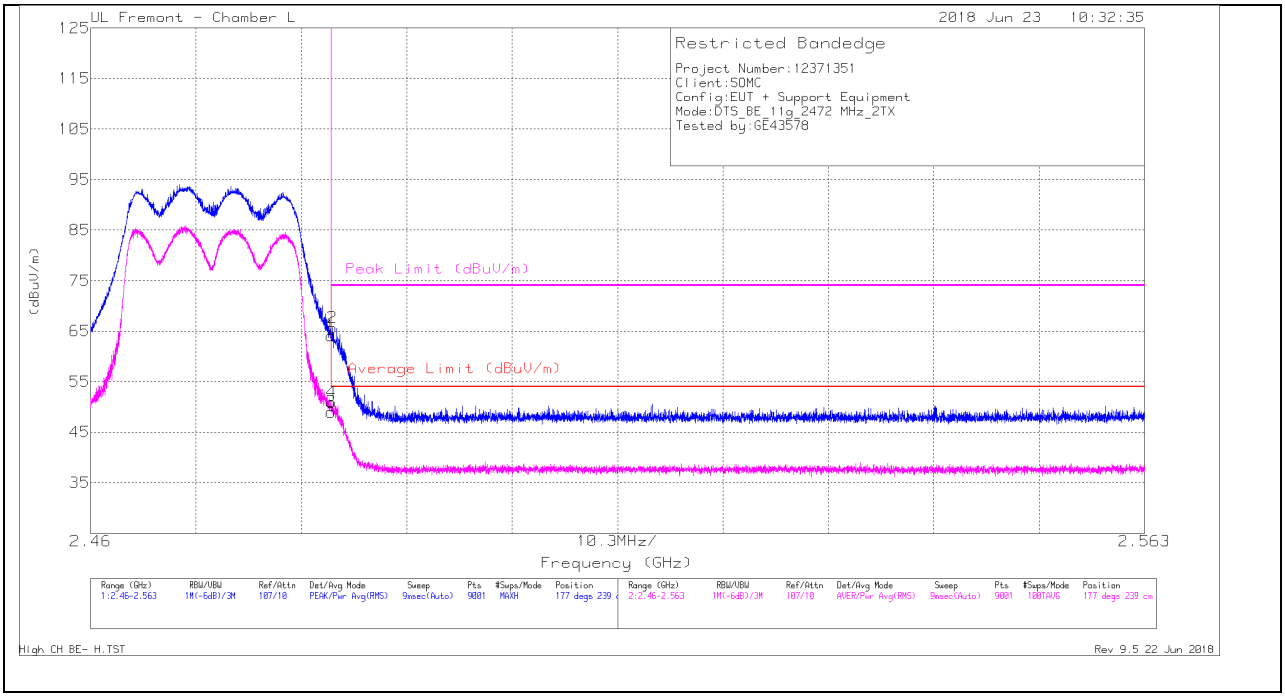

## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 48.96 | Pk | 32.3 | -22.7 | 0 | 58.56 | - | - | 74 | -15.44 | 227 | 246 | V |
| 2 | * 2.484 | 49.48 | Pk | 32.3 | -22.7 | 0 | 59.08 | - | - | 74 | -14.92 | 227 | 246 | V |
| 3 | * 2.484 | 34.59 | RMS | 32.3 | -22.7 | 0 | 44.19 | 54 | -9.81 | - | - | 227 | 246 | V |
| 4 | * 2.484 | 34.92 | RMS | 32.3 | -22.7 | 0 | 44.52 | 54 | -9.48 | - | - | 227 | 246 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# BANDEDGE (HIGH CHANNEL, CH 13)

## HORIZONTAL RESULT

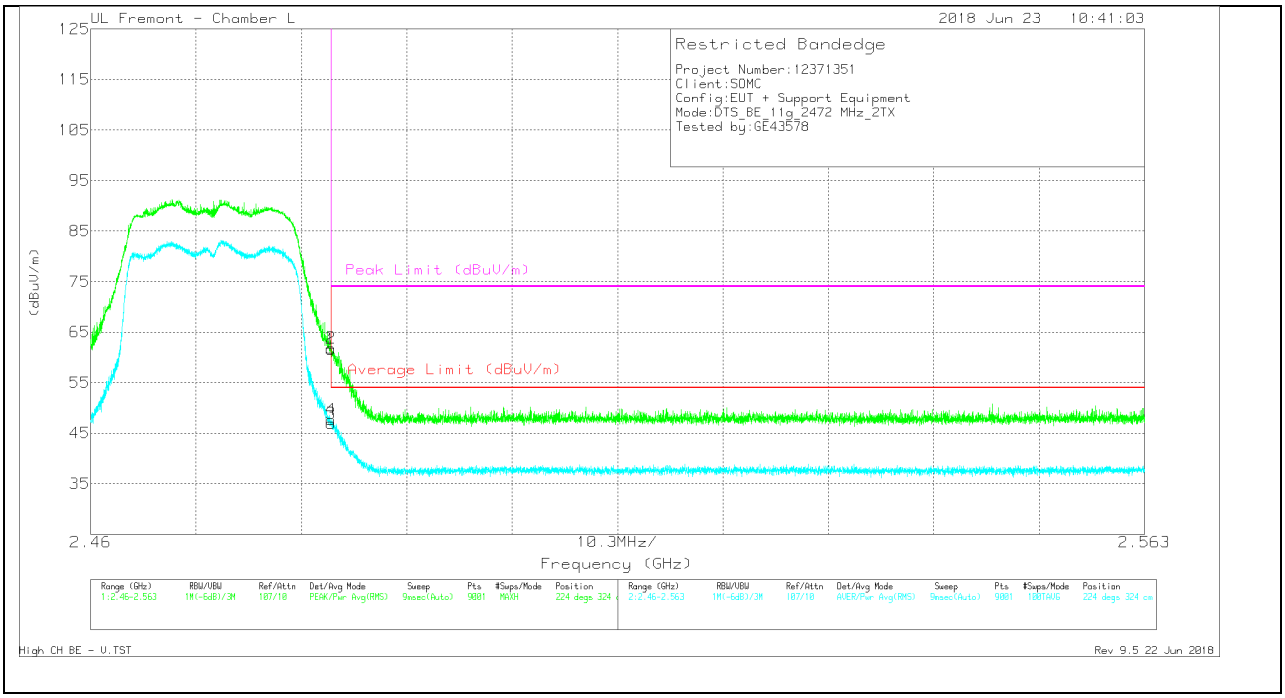



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 54.5 | Pk | 32.3 | -22.7 | 0 | 64.1 | - | - | 74 | -9.9 | 177 | 239 | H |
| 2 | * 2.484 | 56.04 | Pk | 32.3 | -22.7 | 0 | 65.64 | - | - | 74 | -8.36 | 177 | 239 | H |
| 3 | * 2.484 | 39.39 | RMS | 32.3 | -22.7 | 0 | 48.99 | 54 | -5.01 | - | - | 177 | 239 | H |
| 4 | * 2.484 | 41.3 | RMS | 32.3 | -22.7 | 0 | 50.9 | 54 | -3.1 | - | - | 177 | 239 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



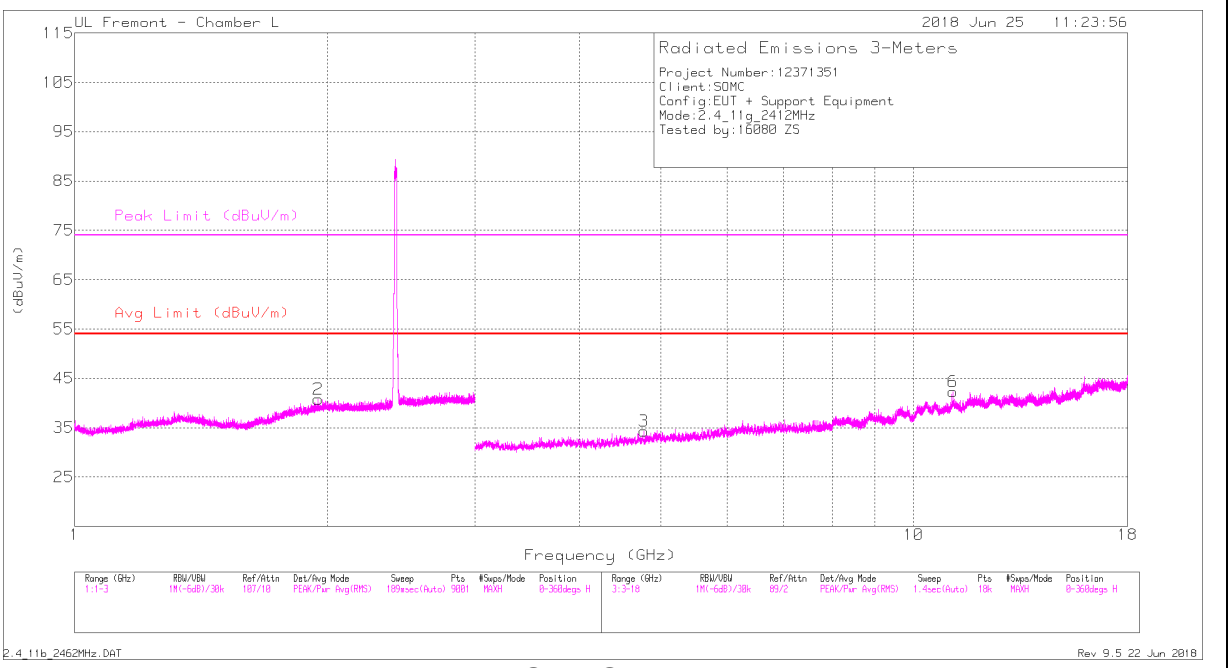

## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 51.98 | Pk | 32.3 | -22.7 | 0 | 61.58 | - | - | 74 | -12.42 | 224 | 324 | V |
| 2 | * 2.484 | 52.21 | Pk | 32.3 | -22.7 | 0 | 61.81 | - | - | 74 | -12.19 | 224 | 324 | V |
| 3 | * 2.484 | 37.39 | RMS | 32.3 | -22.7 | 0 | 46.99 | 54 | -7.01 | - | - | 224 | 324 | V |
| 4 | * 2.484 | 38.09 | RMS | 32.3 | -22.7 | 0 | 47.69 | 54 | -6.31 | - | - | 224 | 324 | V |

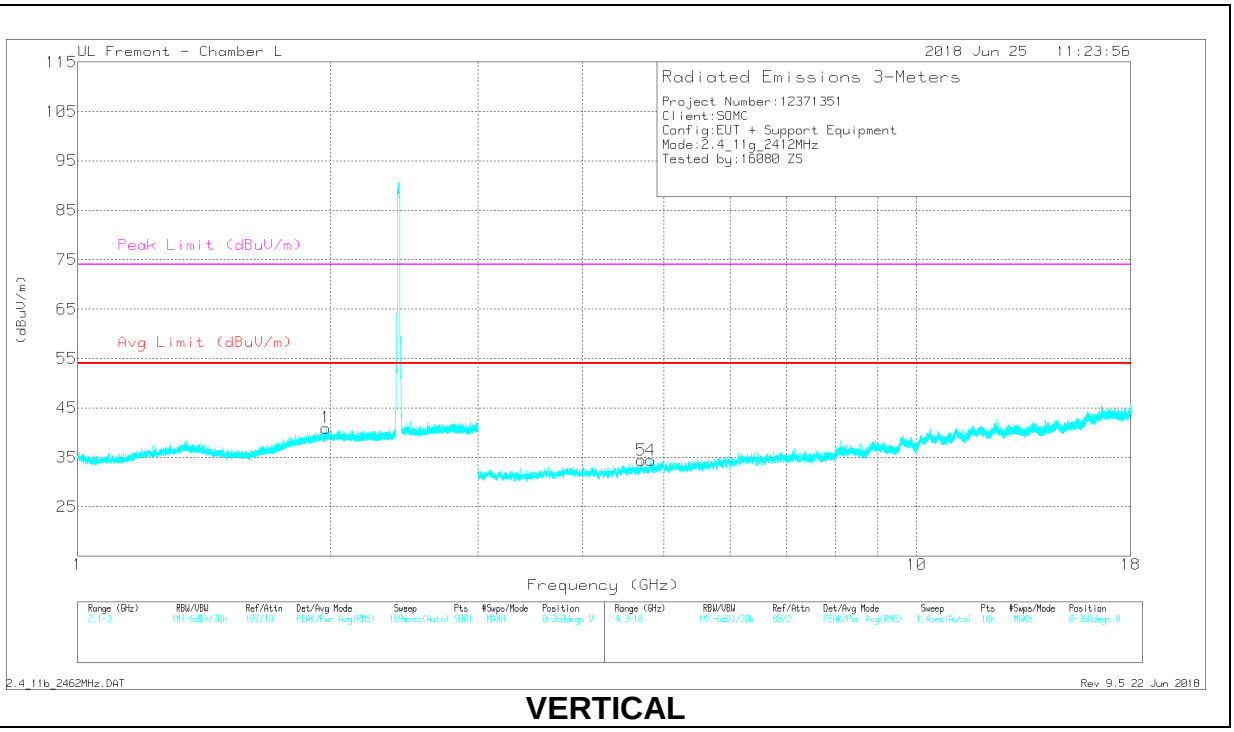
* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# HARMONICS AND SPURIOUS EMISSIONS

## LOW CHANNEL, CH 1 RESULTS




**HORIZONTAL**




**VERTICAL**

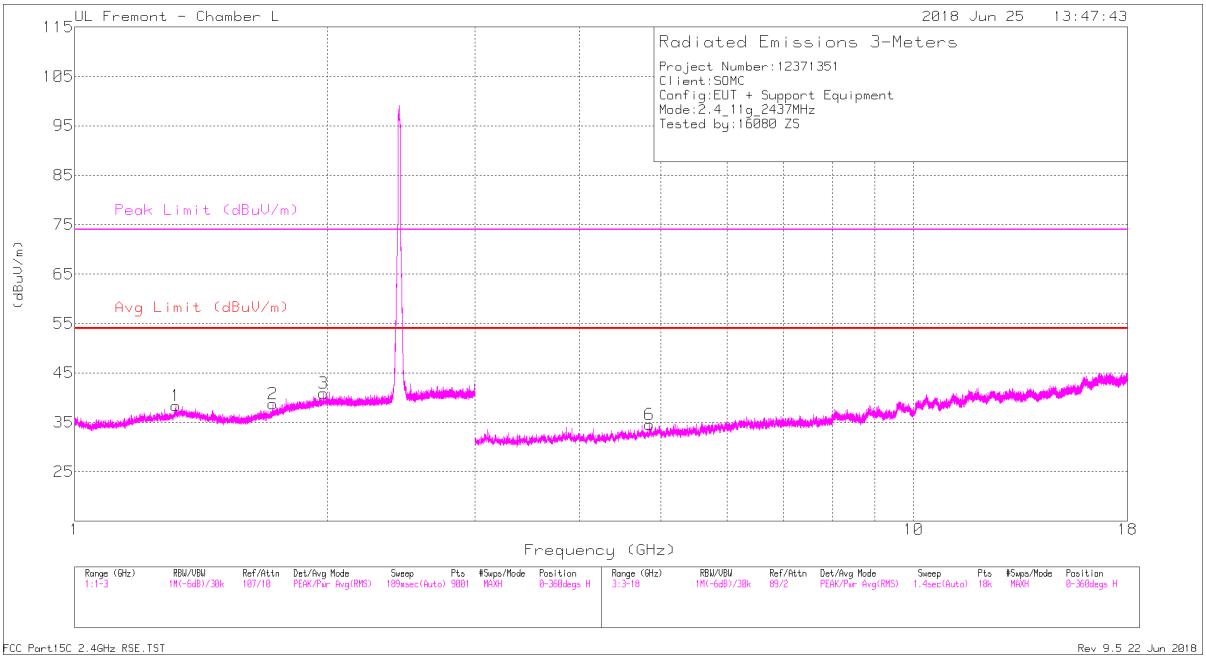
## RADIATED EMISSIONS

### Radiated Emissions

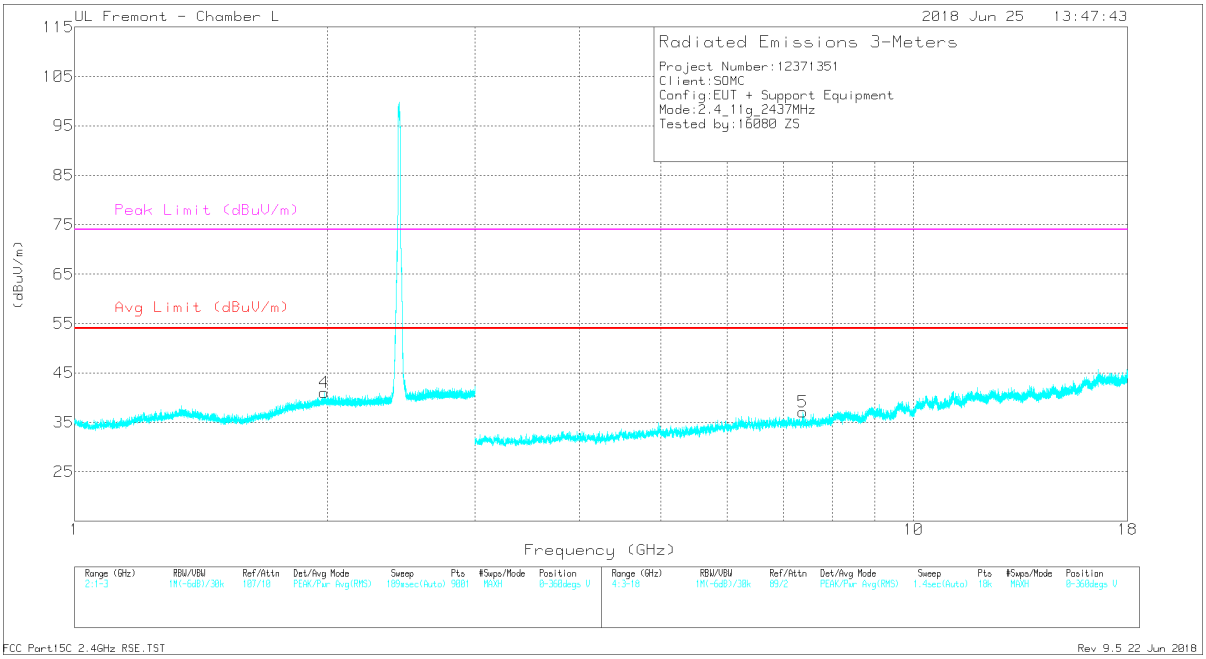
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 1.952 | 32.82 | PK2 | 31.5 | -23.6 | 40.72 | - | - | - | - | 0-360 | 202 | H |
| 1 | 1.978 | 32.97 | PK2 | 31.6 | -23.6 | 40.97 | - | - | - | - | 0-360 | 202 | V |
| 3 | * 4.776 | 34.98 | PK2 | 34.1 | -29 | 40.08 | - | - | 74 | -33.92 | 6 | 117 | H |
| | * 4.774 | 26.18 | MAv1 | 34.1 | -29.1 | 31.18 | 54 | -22.82 | - | - | 6 | 117 | H |
| 6 | * 11.147 | 28.9 | PK2 | 37.9 | -18.8 | 48 | - | - | 74 | -26 | 200 | 173 | H |
| | * 11.147 | 19.5 | MAv1 | 37.9 | -18.8 | 38.6 | 54 | -15.4 | - | - | 200 | 173 | H |
| 4 | * 4.825 | 35.03 | PK2 | 34.2 | -29 | 40.23 | - | - | 74 | -33.77 | 164 | 261 | V |
| | * 4.823 | 25.48 | MAv1 | 34.2 | -29 | 30.68 | 54 | -23.32 | - | - | 164 | 261 | V |
| 5 | * 4.697 | 35.26 | PK2 | 34 | -28.5 | 40.76 | - | - | 74 | -33.24 | 188 | 392 | V |
| | * 4.696 | 26.39 | MAv1 | 34 | -28.5 | 31.89 | 54 | -22.11 | - | - | 188 | 392 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

## MID CHANNEL, CH 6 RESULTS




**HORIZONTAL**




**VERTICAL**

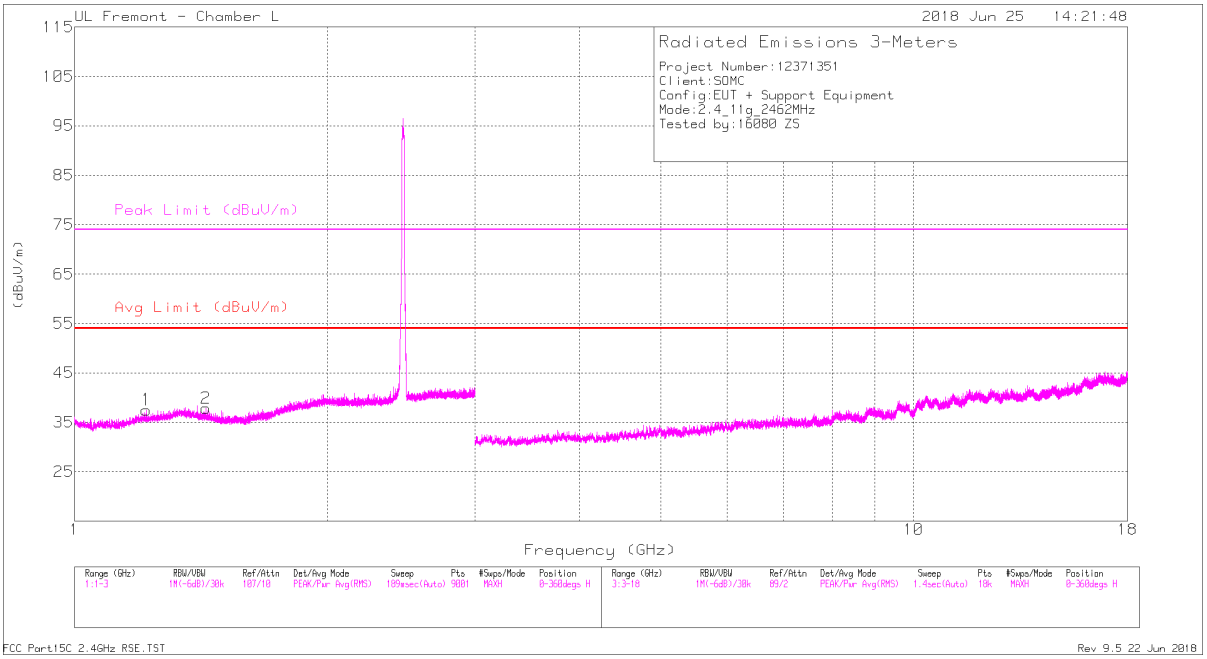
## RADIATED EMISSIONS

### Radiated Emissions

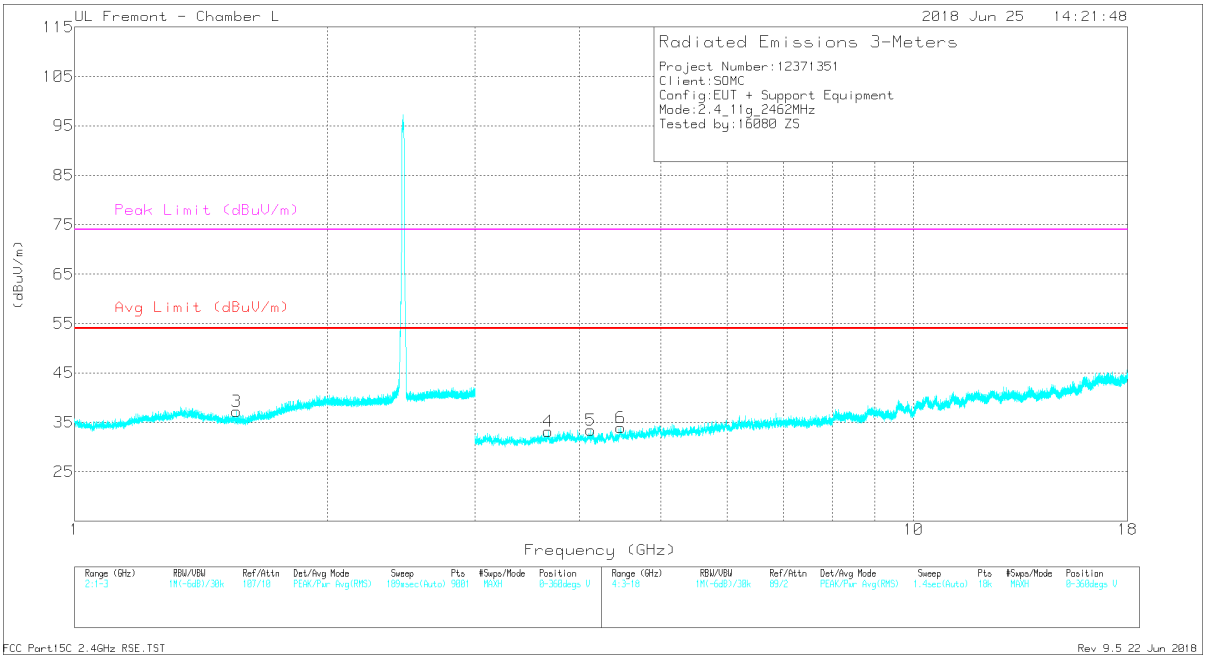
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 1.321 | 39.2 | PK2 | 29.2 | -24.8 | 43.6 | - | - | 74 | -30.4 | 329 | 334 | H |
| | * 1.32 | 30.91 | MAv1 | 29.2 | -24.8 | 35.31 | 54 | -18.69 | - | - | 329 | 334 | H |
| 2 | * 1.719 | 39.46 | PK2 | 29.2 | -24 | 44.66 | - | - | 74 | -29.34 | 209 | 301 | H |
| | * 1.722 | 29.86 | MAv1 | 29.3 | -24 | 35.16 | 54 | -18.84 | - | - | 209 | 301 | H |
| 3 | 1.98 | 32.87 | PK2 | 31.6 | -23.6 | 40.87 | - | - | - | - | 0-360 | 100 | H |
| 4 | 1.984 | 33.05 | PK2 | 31.6 | -23.6 | 41.05 | - | - | - | - | 0-360 | 100 | V |
| 6 | * 4.848 | 34.91 | PK2 | 34.2 | -29.1 | 40.01 | - | - | 74 | -33.99 | 65 | 333 | H |
| | * 4.846 | 25.66 | MAv1 | 34.2 | -29.1 | 30.76 | 54 | -23.24 | - | - | 65 | 333 | H |
| 5 | * 7.376 | 32.59 | PK2 | 35.6 | -24.8 | 43.39 | - | - | 74 | -30.61 | 212 | 127 | V |
| | * 7.377 | 22.48 | MAv1 | 35.6 | -24.8 | 33.28 | 54 | -20.72 | - | - | 212 | 127 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

## HIGH CHANNEL, CH 11 RESULTS




**HORIZONTAL**




**VERTICAL**

## RADIATED EMISSIONS

### Radiated Emissions

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 1.218 | 40.14 | PK2 | 28.5 | -25.1 | 43.54 | - | - | 74 | -30.46 | 177 | 100 | H |
| | * 1.215 | 30.5 | MAv1 | 28.5 | -25.1 | 33.9 | 54 | -20.1 | - | - | 177 | 100 | H |
| 2 | 1.435 | 33.86 | PK2 | 28.6 | -24.6 | 37.86 | - | - | - | - | 0-360 | 100 | H |
| 3 | * 1.559 | 39.91 | PK2 | 28.1 | -24.4 | 43.61 | - | - | 74 | -30.39 | 242 | 181 | V |
| | * 1.561 | 30 | MAv1 | 28.1 | -24.4 | 33.7 | 54 | -20.3 | - | - | 242 | 181 | V |
| 4 | * 3.666 | 35.54 | PK2 | 33.2 | -29.7 | 39.04 | - | - | 74 | -34.96 | 62 | 202 | V |
| | * 3.667 | 26.72 | MAv1 | 33.2 | -29.7 | 30.22 | 54 | -23.78 | - | - | 62 | 202 | V |
| 5 | * 4.127 | 35.18 | PK2 | 33.5 | -29.1 | 39.58 | - | - | 74 | -34.42 | 331 | 286 | V |
| | * 4.124 | 25.7 | MAv1 | 33.5 | -29.2 | 30 | 54 | -24 | - | - | 331 | 286 | V |
| 6 | 4.476 | 29.17 | PK2 | 33.7 | -28.9 | 33.97 | - | - | - | - | 0-360 | 202 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

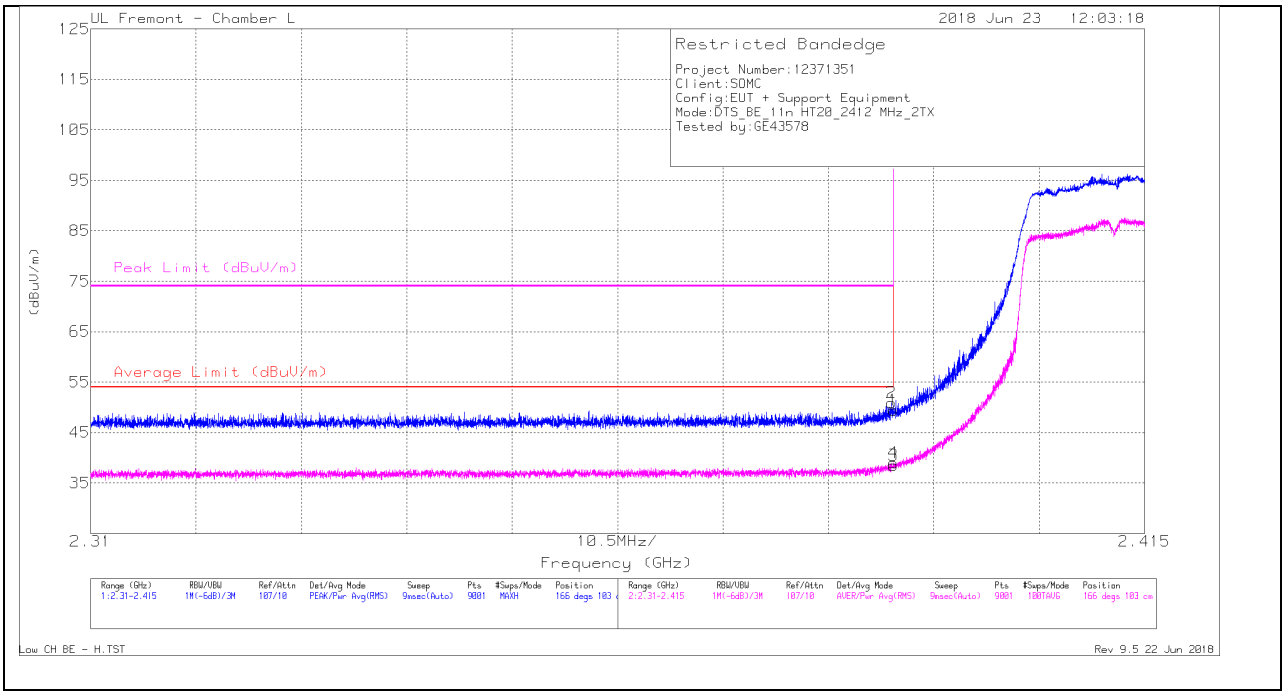


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## 9.1.3. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 2.4 GHz BAND

### BANDEDGE (LOW CHANNEL, CH 1)

### HORIZONTAL RESULT

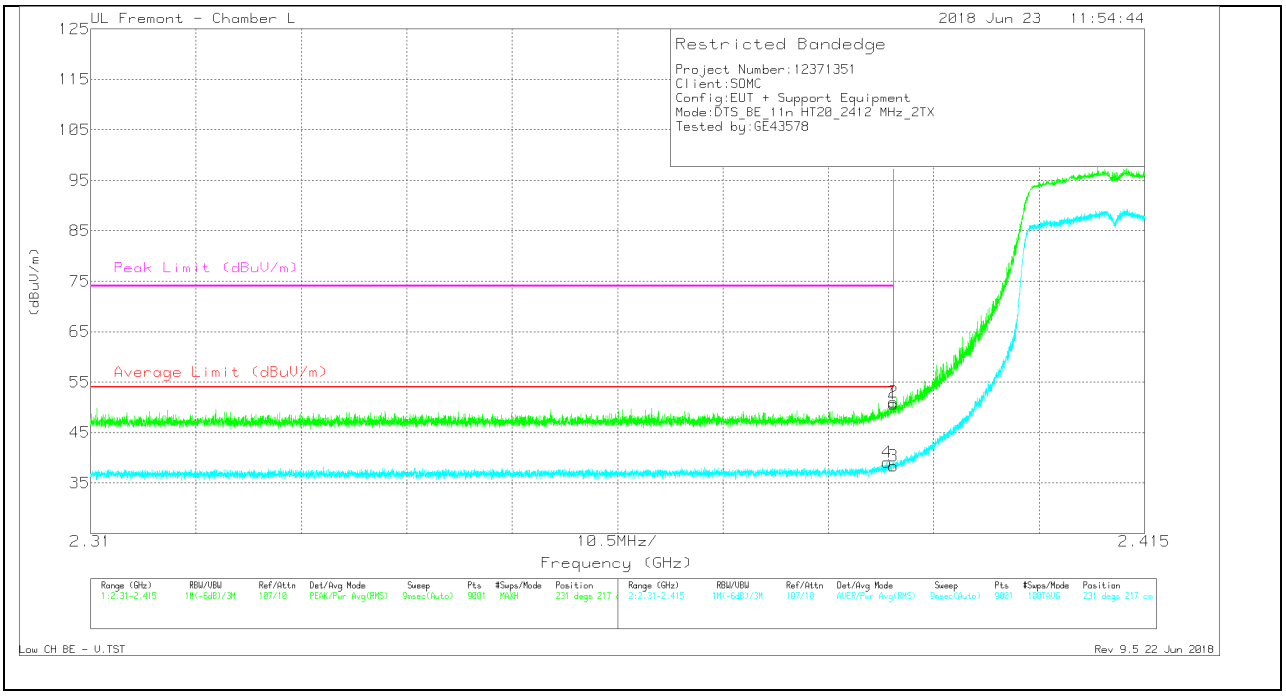



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.39 | 40.48 | Pk | 31.8 | -22.9 | 0 | 49.38 | - | - | 74 | -24.62 | 166 | 103 | H |
| 2 | * 2.39 | 41.96 | Pk | 31.8 | -22.9 | 0 | 50.86 | - | - | 74 | -23.14 | 166 | 103 | H |
| 3 | * 2.39 | 29.5 | RMS | 31.8 | -22.9 | .1 | 38.5 | 54 | -15.5 | - | - | 166 | 103 | H |
| 4 | * 2.39 | 29.94 | RMS | 31.8 | -22.9 | .1 | 38.94 | 54 | -15.06 | - | - | 166 | 103 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



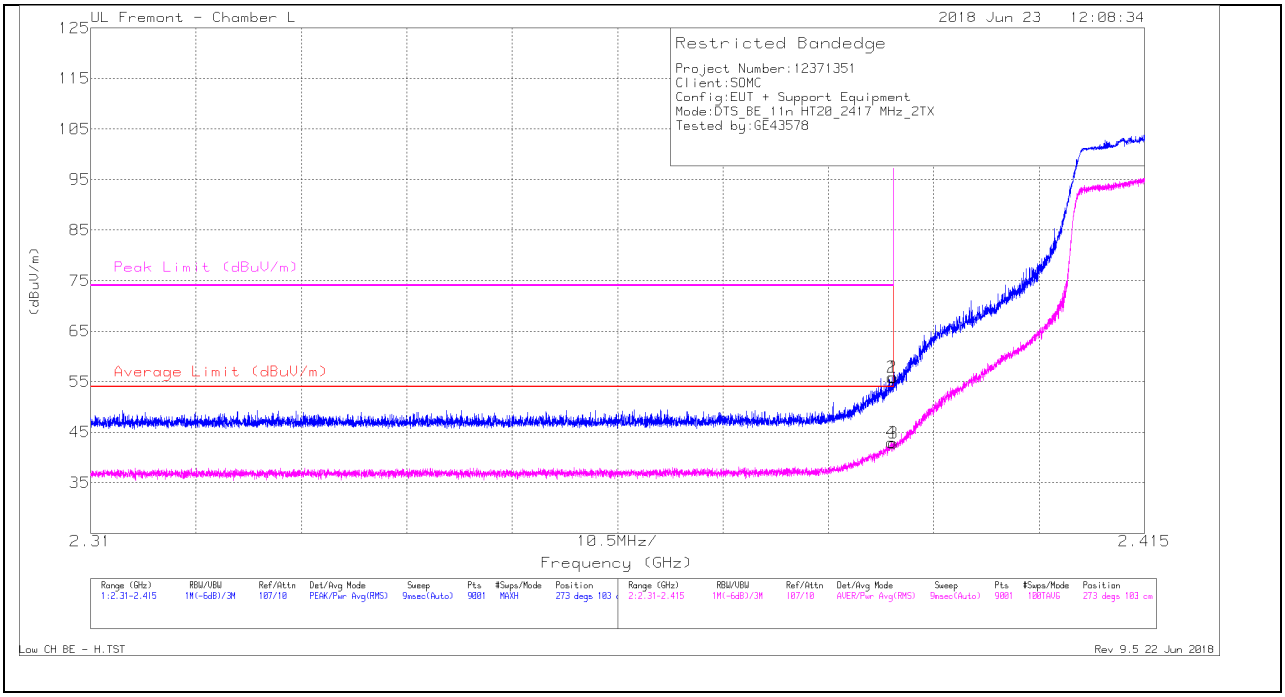

## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.39 | 41.72 | Pk | 31.8 | -22.9 | 0 | 50.62 | - | - | 74 | -23.38 | 231 | 217 | V |
| 2 | * 2.39 | 42.11 | Pk | 31.8 | -22.9 | 0 | 51.01 | - | - | 74 | -22.99 | 231 | 217 | V |
| 3 | * 2.39 | 29.35 | RMS | 31.8 | -22.9 | .1 | 38.35 | 54 | -15.65 | - | - | 231 | 217 | V |
| 4 | * 2.389 | 30.07 | RMS | 31.8 | -22.9 | .1 | 39.07 | 54 | -14.93 | - | - | 231 | 217 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# BANDEDGE (LOW CHANNEL, CH 2)

## HORIZONTAL RESULT

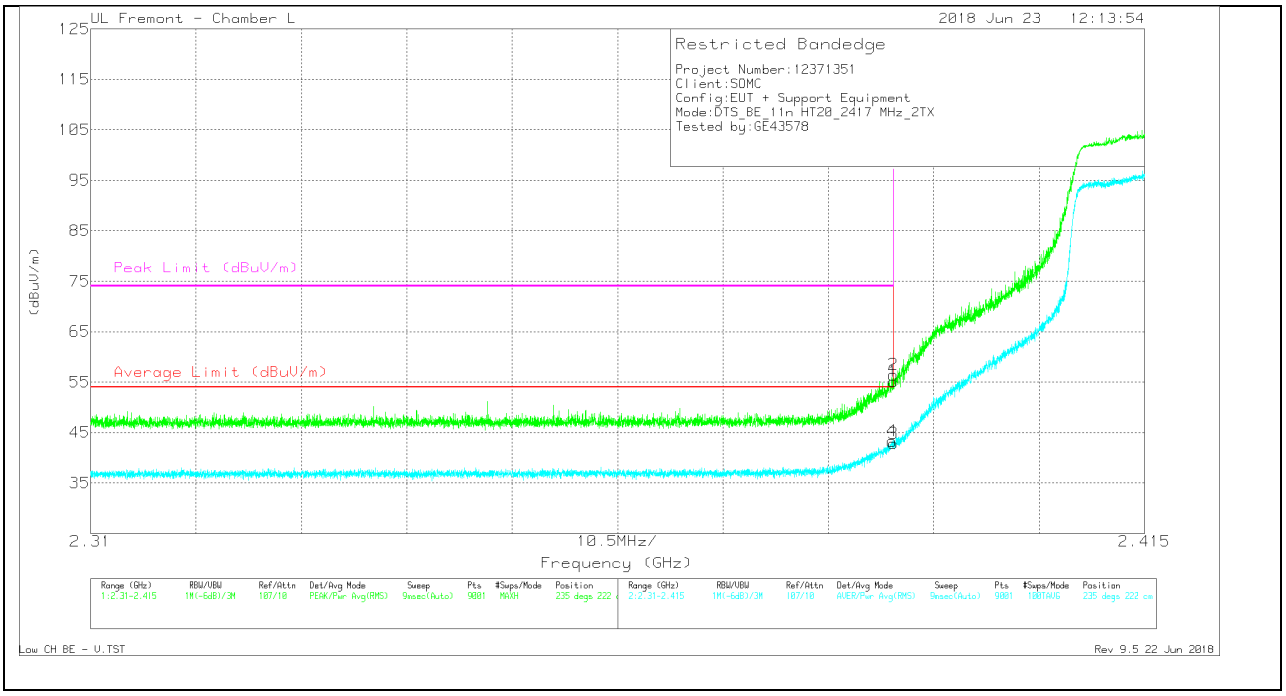



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.39 | 46.96 | Pk | 31.8 | -22.9 | 0 | 55.86 | - | - | 74 | -18.14 | 273 | 103 | H |
| 2 | * 2.39 | 46.92 | Pk | 31.8 | -22.9 | 0 | 55.82 | - | - | 74 | -18.18 | 273 | 103 | H |
| 3 | * 2.39 | 33.83 | RMS | 31.8 | -22.9 | .1 | 42.83 | 54 | -11.17 | - | - | 273 | 103 | H |
| 4 | * 2.39 | 34.01 | RMS | 31.8 | -22.9 | .1 | 43.01 | 54 | -10.99 | - | - | 273 | 103 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



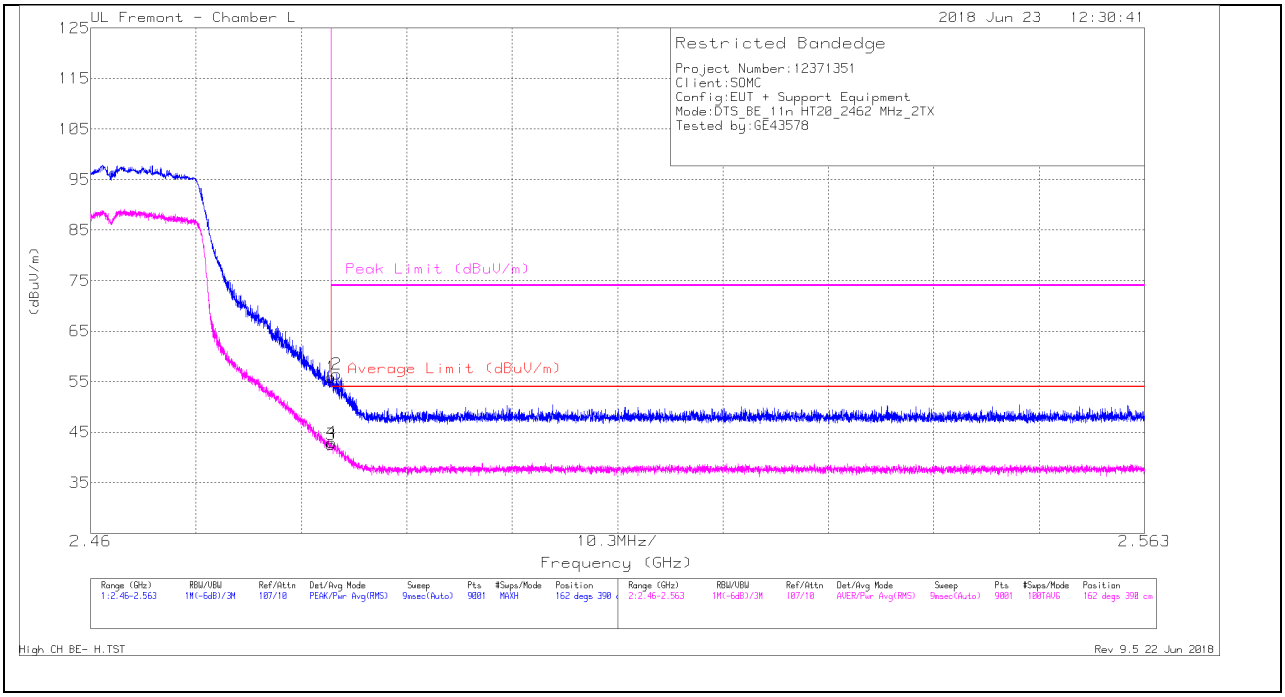

## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.39 | 46.25 | Pk | 31.8 | -22.9 | 0 | 55.15 | - | - | 74 | -18.85 | 235 | 222 | V |
| 2 | * 2.39 | 47.54 | Pk | 31.8 | -22.9 | 0 | 56.44 | - | - | 74 | -17.56 | 235 | 222 | V |
| 3 | * 2.39 | 33.89 | RMS | 31.8 | -22.9 | .1 | 42.89 | 54 | -11.11 | - | - | 235 | 222 | V |
| 4 | * 2.39 | 34.28 | RMS | 31.8 | -22.9 | .1 | 43.28 | 54 | -10.72 | - | - | 235 | 222 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# BANDEDGE (HIGH CHANNEL, CH 11)

## HORIZONTAL RESULT

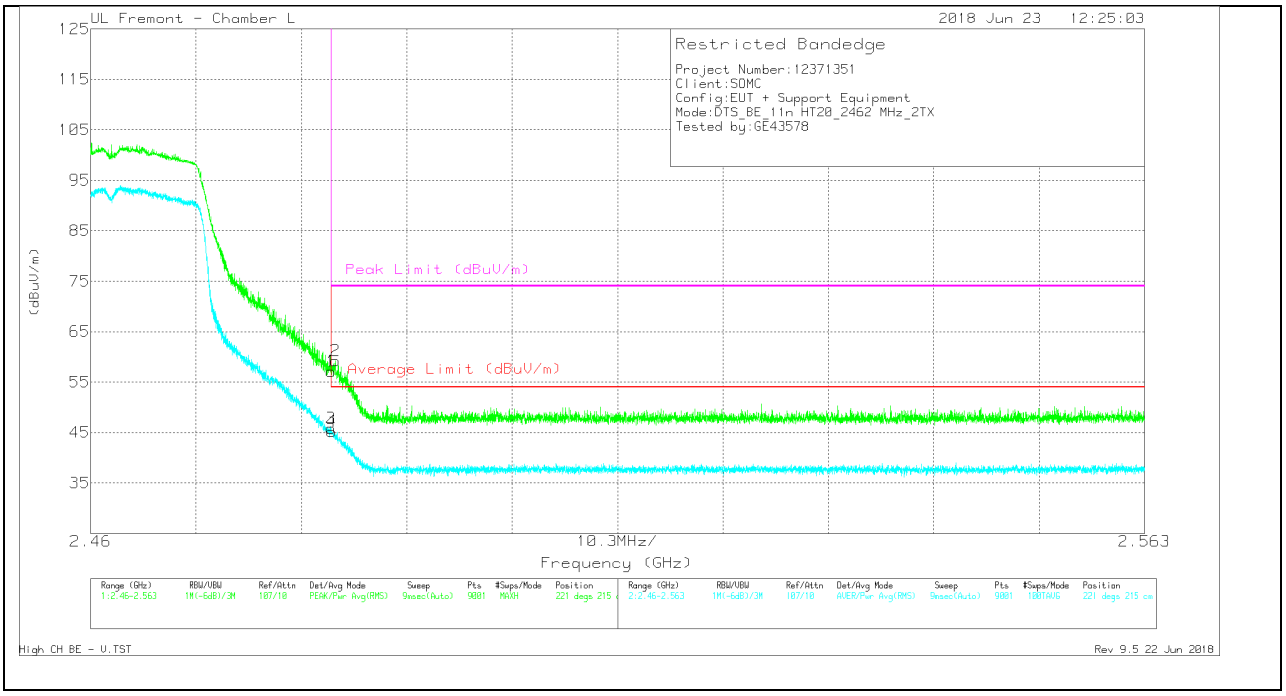



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 46.31 | Pk | 32.3 | -22.7 | 0 | 55.91 | - | - | 74 | -18.09 | 162 | 390 | H |
| 2 | * 2.484 | 46.88 | Pk | 32.3 | -22.7 | 0 | 56.48 | - | - | 74 | -17.52 | 162 | 390 | H |
| 3 | * 2.484 | 32.93 | RMS | 32.3 | -22.7 | .1 | 42.63 | 54 | -11.37 | - | - | 162 | 390 | H |
| 4 | * 2.484 | 33.22 | RMS | 32.3 | -22.7 | .1 | 42.92 | 54 | -11.08 | - | - | 162 | 390 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



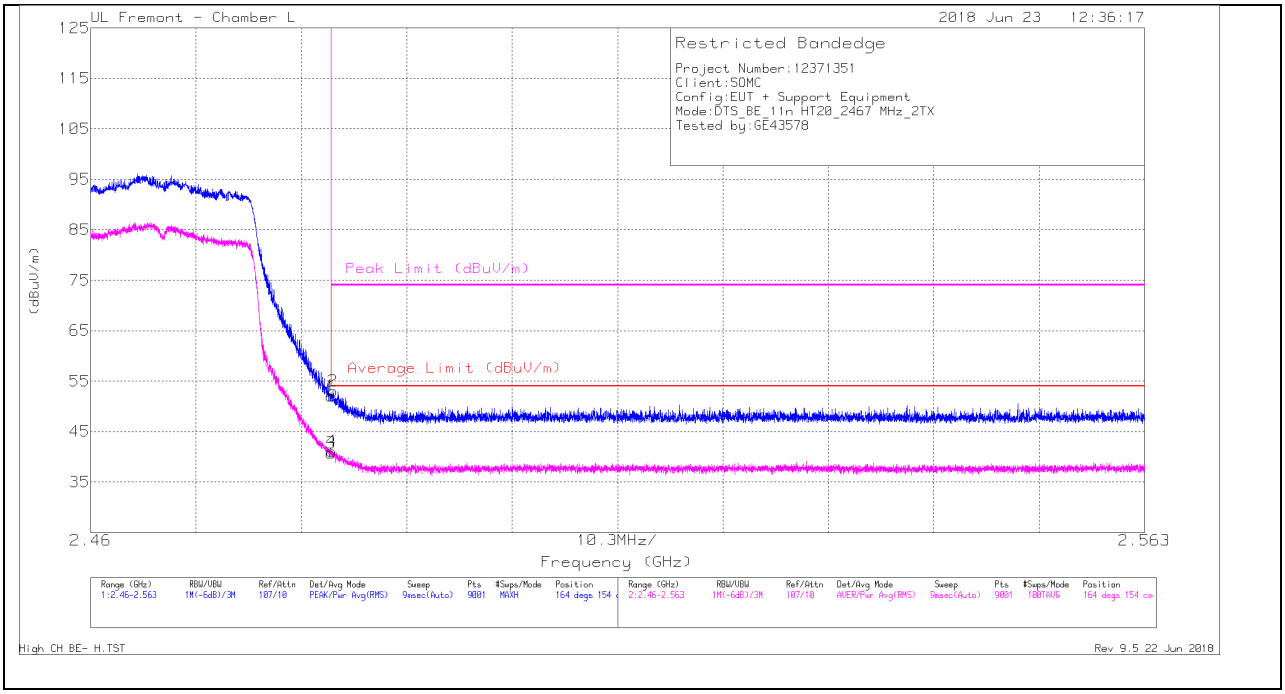

Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 47.52 | Pk | 32.3 | -22.7 | 0 | 57.12 | - | - | 74 | -16.88 | 221 | 215 | V |
| 2 | * 2.484 | 49.65 | Pk | 32.3 | -22.7 | 0 | 59.25 | - | - | 74 | -14.75 | 221 | 215 | V |
| 3 | * 2.484 | 36.08 | RMS | 32.3 | -22.7 | .1 | 45.78 | 54 | -8.22 | - | - | 221 | 215 | V |
| 4 | * 2.484 | 35.5 | RMS | 32.3 | -22.7 | .1 | 45.2 | 54 | -8.8 | - | - | 221 | 215 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# BANDEDGE (HIGH CHANNEL, CH 12)

## HORIZONTAL RESULT




Trace Markers

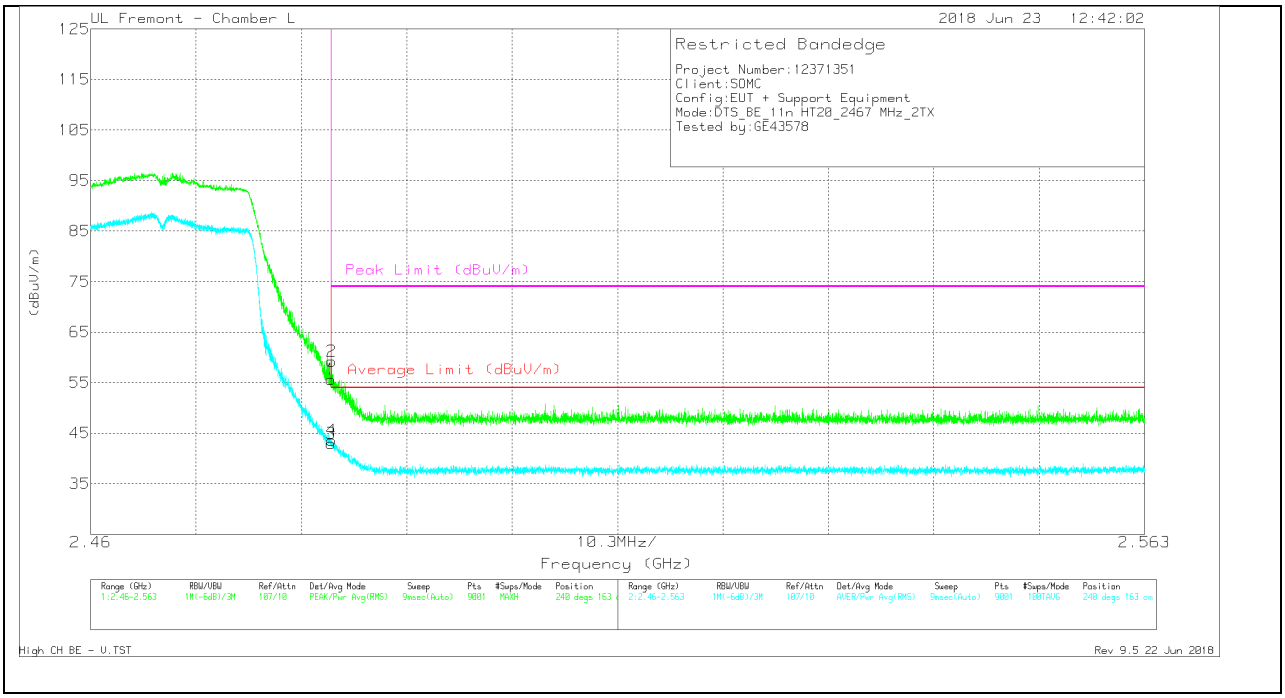
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 42.42 | Pk | 32.3 | -22.7 | 0 | 52.02 | - | - | 74 | -21.98 | 164 | 154 | H |
| 2 | * 2.484 | 43.45 | Pk | 32.3 | -22.7 | 0 | 53.05 | - | - | 74 | -20.95 | 164 | 154 | H |
| 3 | * 2.484 | 31.01 | RMS | 32.3 | -22.7 | .1 | 40.71 | 54 | -13.29 | - | - | 164 | 154 | H |
| 4 | * 2.484 | 31.44 | RMS | 32.3 | -22.7 | .1 | 41.14 | 54 | -12.86 | - | - | 164 | 154 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## VERTICAL RESULT



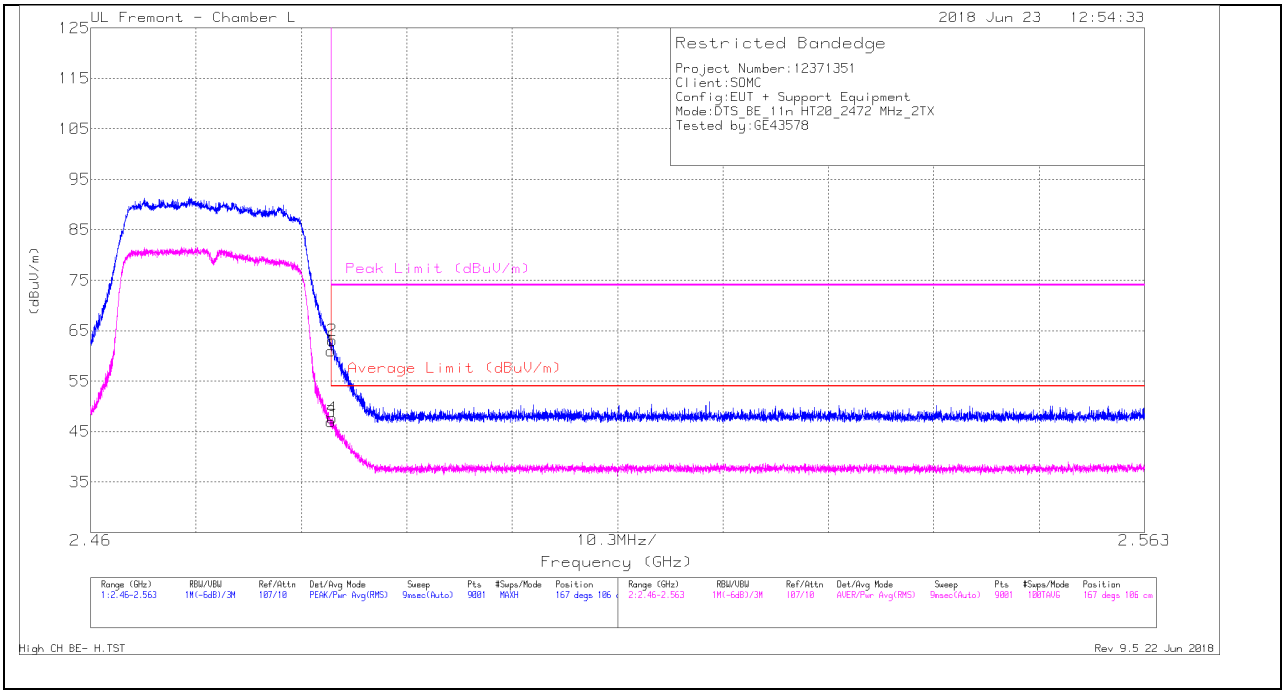

## Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 45.98 | Pk | 32.3 | -22.7 | 0 | 55.58 | - | - | 74 | -18.42 | 240 | 163 | V |
| 2 | * 2.484 | 49.62 | Pk | 32.3 | -22.7 | 0 | 59.22 | - | - | 74 | -14.78 | 240 | 163 | V |
| 3 | * 2.484 | 33.32 | RMS | 32.3 | -22.7 | .1 | 43.02 | 54 | -10.98 | - | - | 240 | 163 | V |
| 4 | * 2.484 | 33.9 | RMS | 32.3 | -22.7 | .1 | 43.6 | 54 | -10.4 | - | - | 240 | 163 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# BANDEDGE (HIGH CHANNEL, CH 13)

## HORIZONTAL RESULT

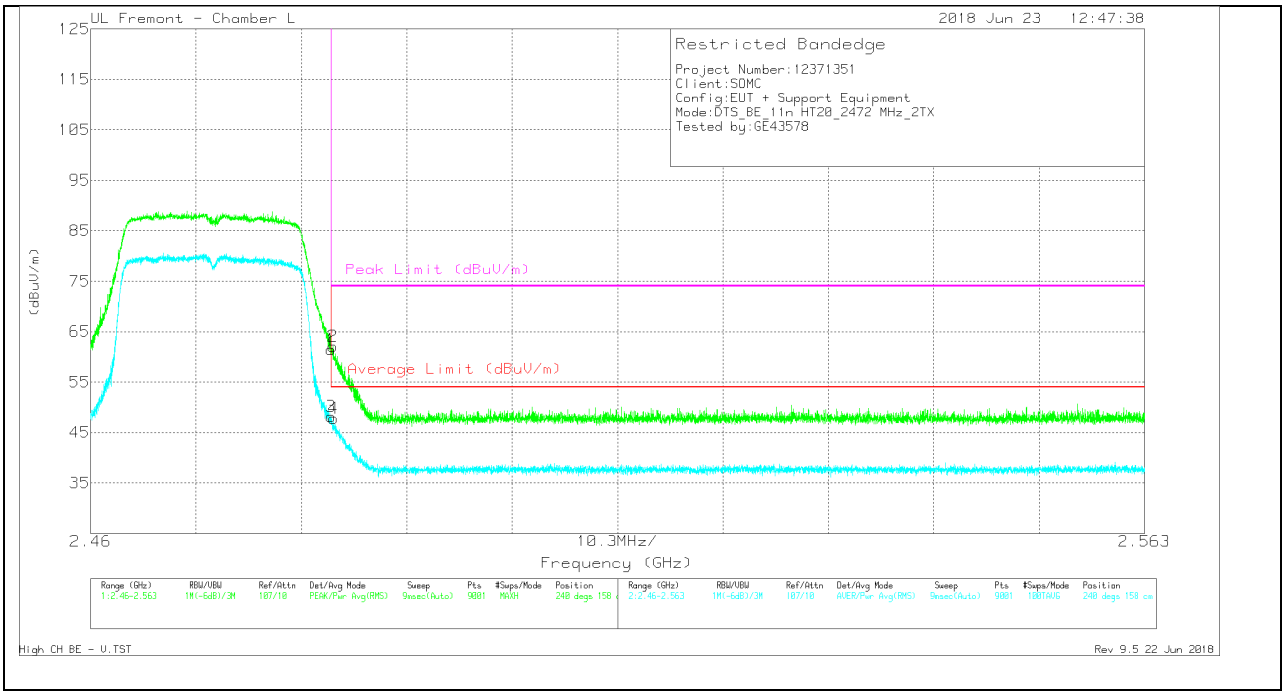



Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 51.41 | Pk | 32.3 | -22.7 | 0 | 61.01 | - | - | 74 | -12.99 | 167 | 106 | H |
| 2 | * 2.484 | 53.53 | Pk | 32.3 | -22.7 | 0 | 63.13 | - | - | 74 | -10.87 | 167 | 106 | H |
| 3 | * 2.484 | 37.29 | RMS | 32.3 | -22.7 | .1 | 46.99 | 54 | -7.01 | - | - | 167 | 106 | H |
| 4 | * 2.484 | 37.93 | RMS | 32.3 | -22.7 | .1 | 47.63 | 54 | -6.37 | - | - | 167 | 106 | H |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT



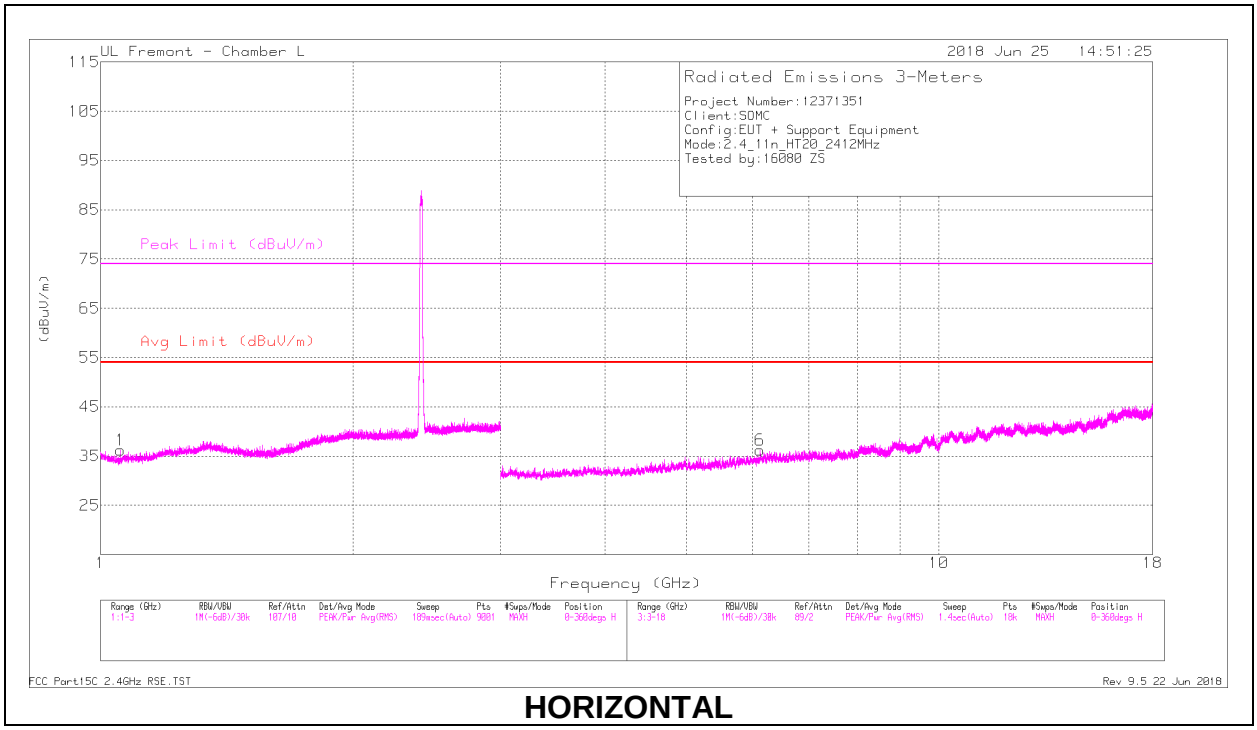

Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 51.92 | Pk | 32.3 | -22.7 | 0 | 61.52 | - | - | 74 | -12.48 | 240 | 158 | V |
| 2 | * 2.484 | 52.47 | Pk | 32.3 | -22.7 | 0 | 62.07 | - | - | 74 | -11.93 | 240 | 158 | V |
| 3 | * 2.484 | 38.53 | RMS | 32.3 | -22.7 | .1 | 48.23 | 54 | -5.77 | - | - | 240 | 158 | V |
| 4 | * 2.484 | 38.16 | RMS | 32.3 | -22.7 | .1 | 47.86 | 54 | -6.14 | - | - | 240 | 158 | V |

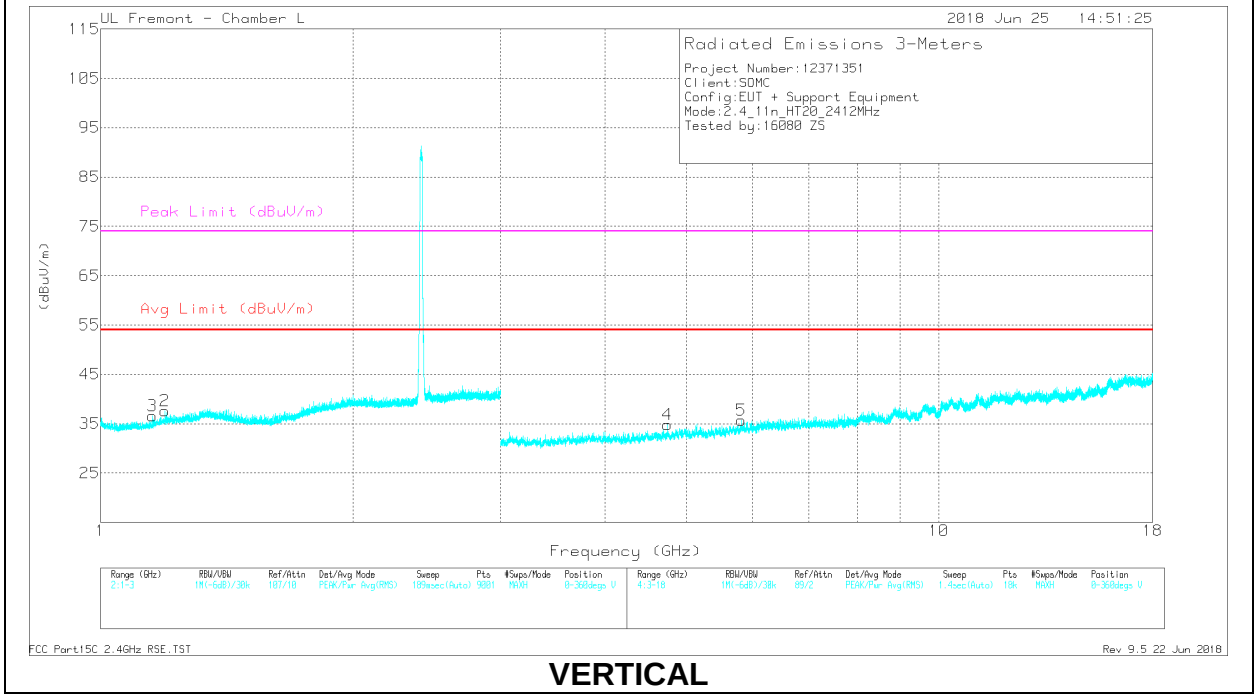
* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector
RMS - RMS detection

# HARMONICS AND SPURIOUS EMISSIONS

## LOW CHANNEL, CH 1 RESULTS




**HORIZONTAL**




**VERTICAL**

## RADIATED EMISSIONS

### Radiated Emissions

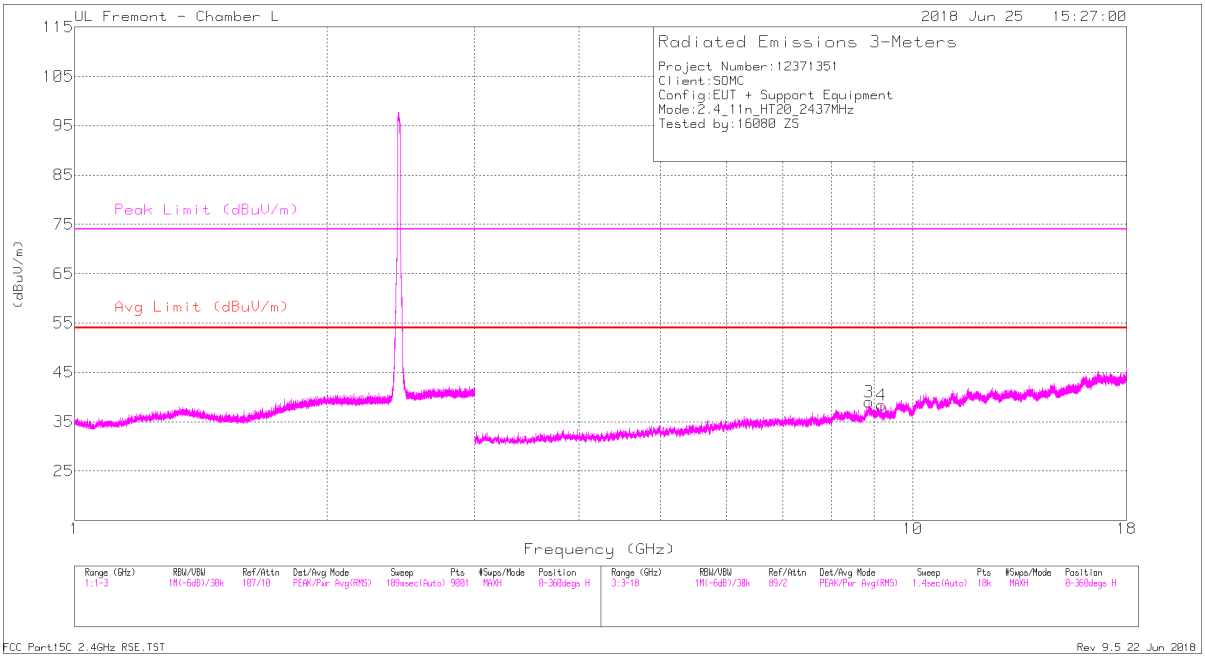
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 1.056 | 40.66 | PK2 | 26.8 | -25.4 | 0 | 42.06 | - | - | 74 | -31.94 | 325 | 251 | H |
| | * 1.058 | 31.3 | MAv1 | 26.9 | -25.4 | .1 | 32.9 | 54 | -21.1 | - | - | 325 | 251 | H |
| 2 | * 1.194 | 40.32 | PK2 | 28.3 | -25.1 | 0 | 43.52 | - | - | 74 | -30.48 | 272 | 296 | V |
| | * 1.193 | 30.56 | MAv1 | 28.2 | -25.1 | .1 | 33.76 | 54 | -20.24 | - | - | 272 | 296 | V |
| 3 | * 1.154 | 41 | PK2 | 27.6 | -25.2 | 0 | 43.4 | - | - | 74 | -30.6 | 353 | 305 | V |
| | * 1.154 | 31.02 | MAv1 | 27.6 | -25.2 | .1 | 33.52 | 54 | -20.48 | - | - | 353 | 305 | V |
| 6 | 6.126 | 27.51 | PK2 | 35.4 | -26.7 | 0 | 36.21 | - | - | - | - | 0-360 | 202 | H |
| 4 | * 4.744 | 35.41 | PK2 | 34 | -28.8 | 0 | 40.61 | - | - | 74 | -33.39 | 132 | 173 | V |
| | * 4.742 | 25.78 | MAv1 | 34 | -28.8 | .1 | 31.08 | 54 | -22.92 | - | - | 132 | 173 | V |
| 5 | 5.814 | 28.7 | PK2 | 35.1 | -28.1 | 0 | 35.7 | - | - | - | - | 0-360 | 202 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

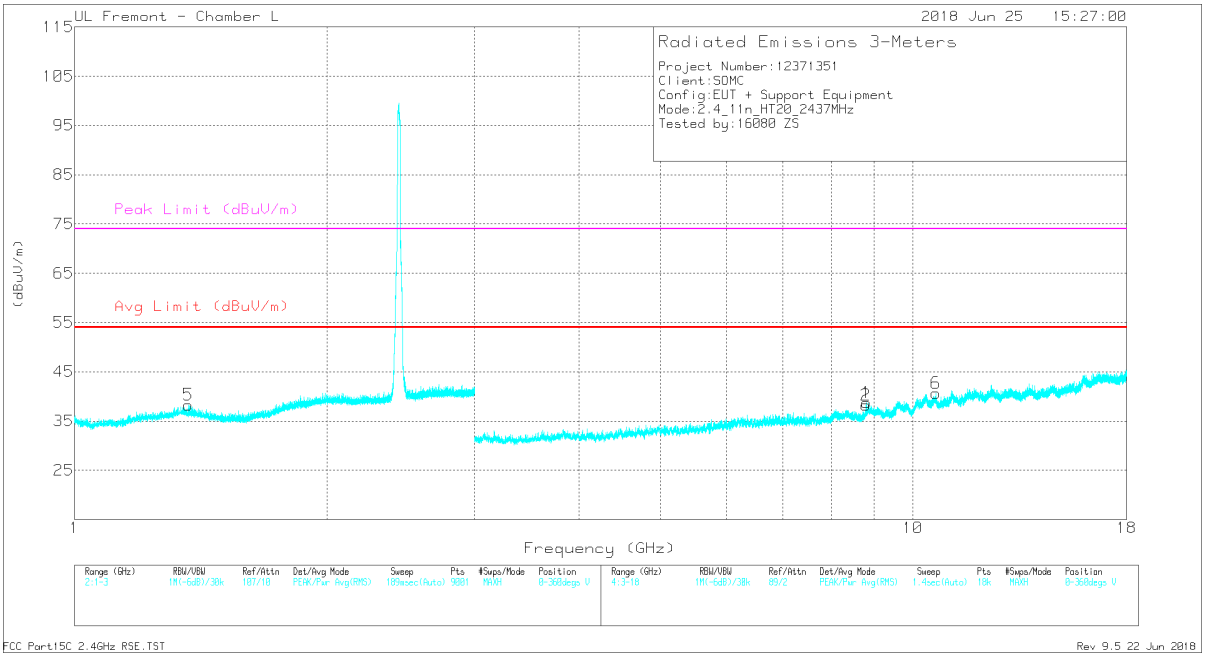


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## MID CHANNEL, CH 6 RESULTS




**HORIZONTAL**




**VERTICAL**

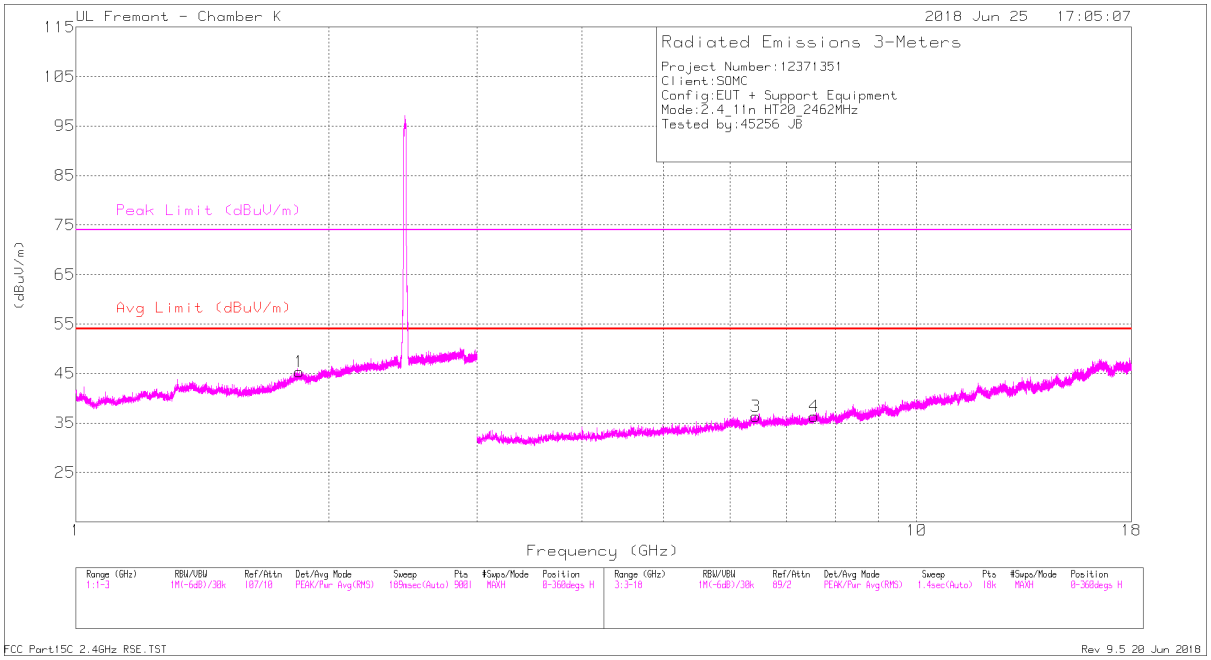
## RADIATED EMISSIONS

Radiated Emissions

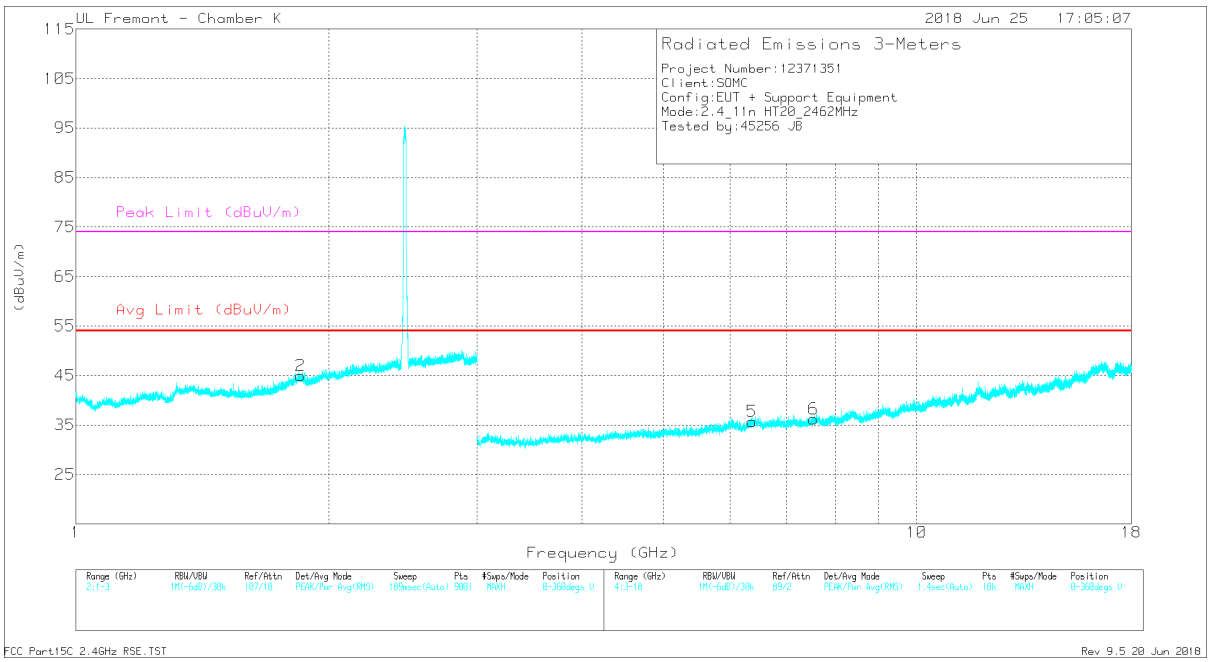
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF EMC4294 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | * 1.366 | 39.86 | PK2 | 29.4 | -24.8 | 0 | 44.46 | - | - | 74 | -29.54 | 341 | 102 | V |
| | * 1.365 | 30.32 | MAv1 | 29.4 | -24.8 | .1 | 35.02 | 54 | -18.98 | - | - | 341 | 102 | V |
| 3 | 8.864 | 24.56 | PK2 | 36.2 | -21.8 | 0 | 38.96 | - | - | - | - | 0-360 | 201 | H |
| 4 | * 9.187 | 30.07 | PK2 | 36.4 | -22.1 | 0 | 44.37 | - | - | 74 | -29.63 | 300 | 142 | H |
| | * 9.188 | 20.24 | MAv1 | 36.4 | -22.1 | .1 | 34.64 | 54 | -19.36 | - | - | 300 | 142 | H |
| 1 | 8.813 | 25.18 | PK2 | 36.1 | -22.5 | 0 | 38.78 | - | - | - | - | 0-360 | 201 | V |
| 2 | 8.799 | 24.59 | PK2 | 36.1 | -22.5 | 0 | 38.19 | - | - | - | - | 0-360 | 201 | V |
| 6 | * 10.663 | 28.67 | PK2 | 37.6 | -19.3 | 0 | 46.97 | - | - | 74 | -27.03 | 121 | 266 | V |
| | * 10.661 | 19.53 | MAv1 | 37.6 | -19.2 | .1 | 38.03 | 54 | -15.97 | - | - | 121 | 266 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average

## HIGH CHANNEL, CH 11 RESULTS




**HORIZONTAL**




**VERTICAL**

## RADIATED EMISSIONS

### Radiated Emissions

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T344 (dB) | Amp/Cbl/Fltr/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.844 | 29.22 | PK2 | 30.4 | -9 | 0 | 50.62 | - | - | - | - | 61 | 303 | H |
| 2 | 1.852 | 30.32 | PK2 | 30.4 | -9 | 0 | 51.72 | - | - | - | - | 173 | 199 | V |
| 3 | 6.436 | 35.21 | PK2 | 35.4 | -26.9 | 0 | 43.71 | - | - | - | - | 135 | 368 | H |
| 4 | * 7.555 | 34.34 | PK2 | 35.6 | -26.1 | 0 | 43.84 | - | - | 74 | -30.16 | 50 | 339 | H |
| | * 7.556 | 24.7 | MAv1 | 35.6 | -26.1 | .1 | 34.3 | 54 | -19.7 | - | - | 50 | 339 | H |
| 5 | 6.373 | 35.38 | PK2 | 35.4 | -27.4 | 0 | 43.38 | - | - | - | - | 118 | 107 | V |
| 6 | * 7.537 | 34.69 | PK2 | 35.6 | -26.3 | 0 | 43.99 | - | - | 74 | -30.01 | 17 | 378 | V |
| | * 7.541 | 24.65 | MAv1 | 35.6 | -26.2 | .1 | 34.15 | 54 | -19.85 | - | - | 17 | 378 | V |

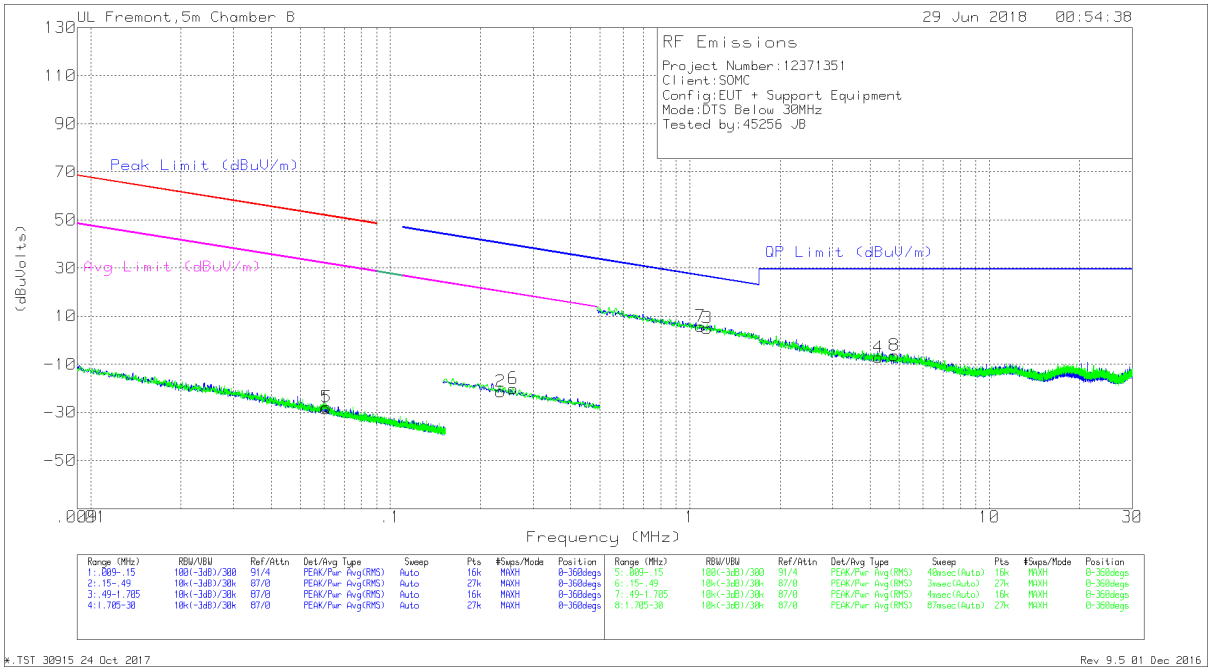
* - indicates frequency in CFR47 Pt 15 Restricted Band
PK2 - KDB558074 Method: Maximum Peak
MAv1 - KDB558074 Option 1 Maximum RMS Average



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## 9.2. Worst Case Below 30 MHz

**SPURIOUS EMISSIONS 9 kHz TO 30 MHz (WORST-CASE CONFIGURATION)**




**HORIZTONAL AND VERTICAL PLOT**

## Below 30 MHz Data

Trace Markers

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dB/m) | Cbl (dB) | Dist Corr 300m | Corrected Reading (dBuVolts) | Peak Limit (dBuV/m) | Margin (dB) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Avg Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .06068 | 35.72 | Pk | 14.5 | 1.4 | -80 | -28.38 | 51.92 | -80.3 | 31.92 | -60.3 | - | - | - | - | 0-360 |
| 5 | .06136 | 36.37 | Pk | 14.5 | 1.4 | -80 | -27.73 | 51.83 | -79.56 | 31.83 | -59.56 | - | - | - | - | 0-360 |
| 2 | .23335 | 43.3 | Pk | 13.9 | 1.5 | -80 | -21.3 | - | - | - | - | 40.26 | -61.56 | 20.26 | -41.56 | 0-360 |
| 6 | .25714 | 44.6 | Pk | 13.8 | 1.5 | -80 | -20.1 | - | - | - | - | 39.41 | -59.51 | 19.41 | -39.51 | 0-360 |

Pk - Peak detector

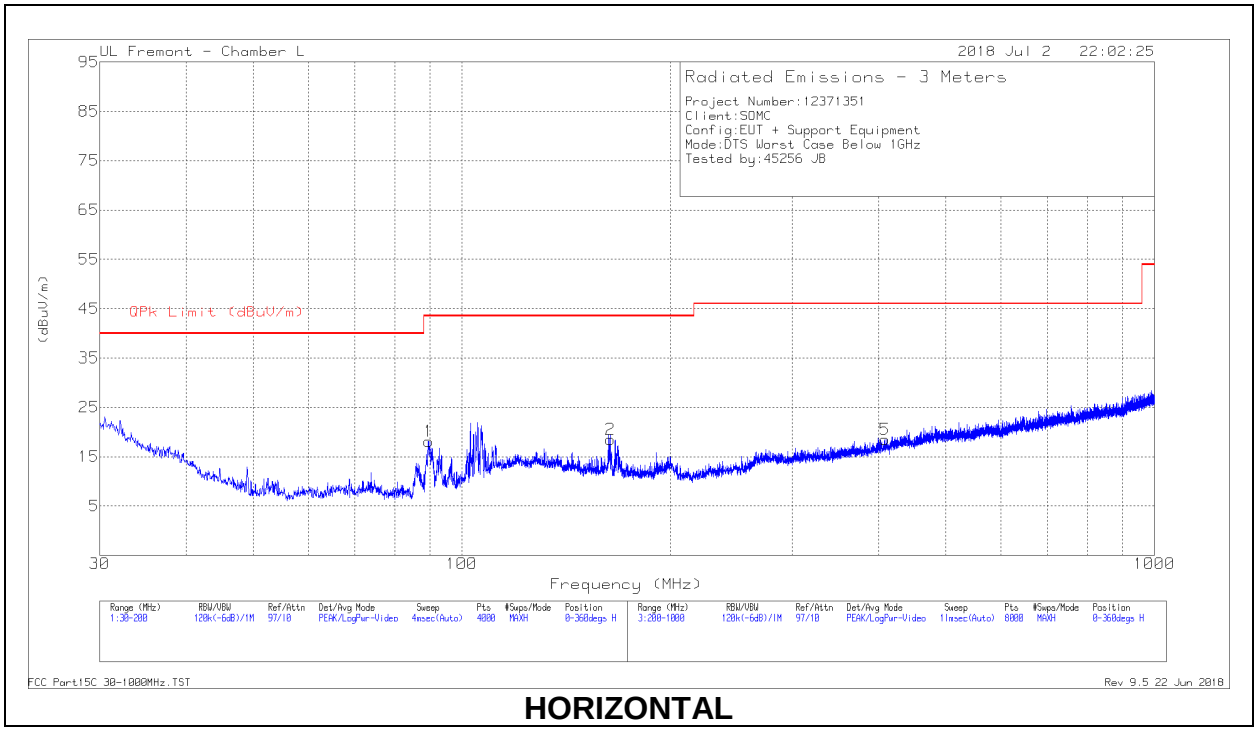
| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dB/m) | Cbl (dB) | Dist Corr (dB) 40Log | Corrected Reading (dBuVolts) | QP Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Avg Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | 1.08595 | 30.02 | Pk | 14.3 | 1.5 | -40 | 5.82 | 26.91 | -21.09 | - | - | - | - | 0-360 |
| 3 | 1.14231 | 29.26 | Pk | 14.3 | 1.5 | -40 | 5.06 | 26.47 | -21.41 | - | - | - | - | 0-360 |
| 4 | 4.26002 | 16.9 | Pk | 14.5 | 1.5 | -40 | -7.1 | 29.5 | -36.6 | - | - | - | - | 0-360 |
| 8 | 4.81756 | 17.83 | Pk | 14.4 | 1.5 | -40 | -6.27 | 29.5 | -35.77 | - | - | - | - | 0-360 |

Pk - Peak detector

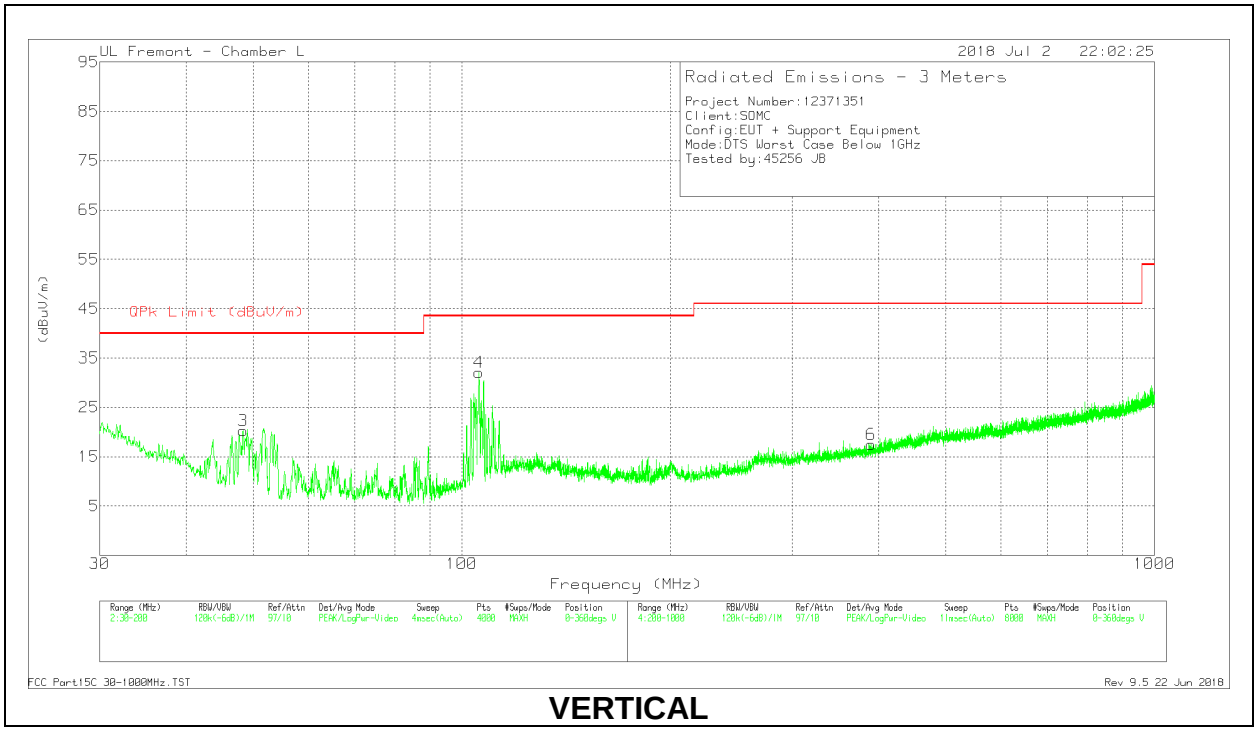


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## 9.3. Worst Case Below 1 GHz




**HORIZONTAL**




**VERTICAL**

**Below 1GHz DATA**

Trace Markers

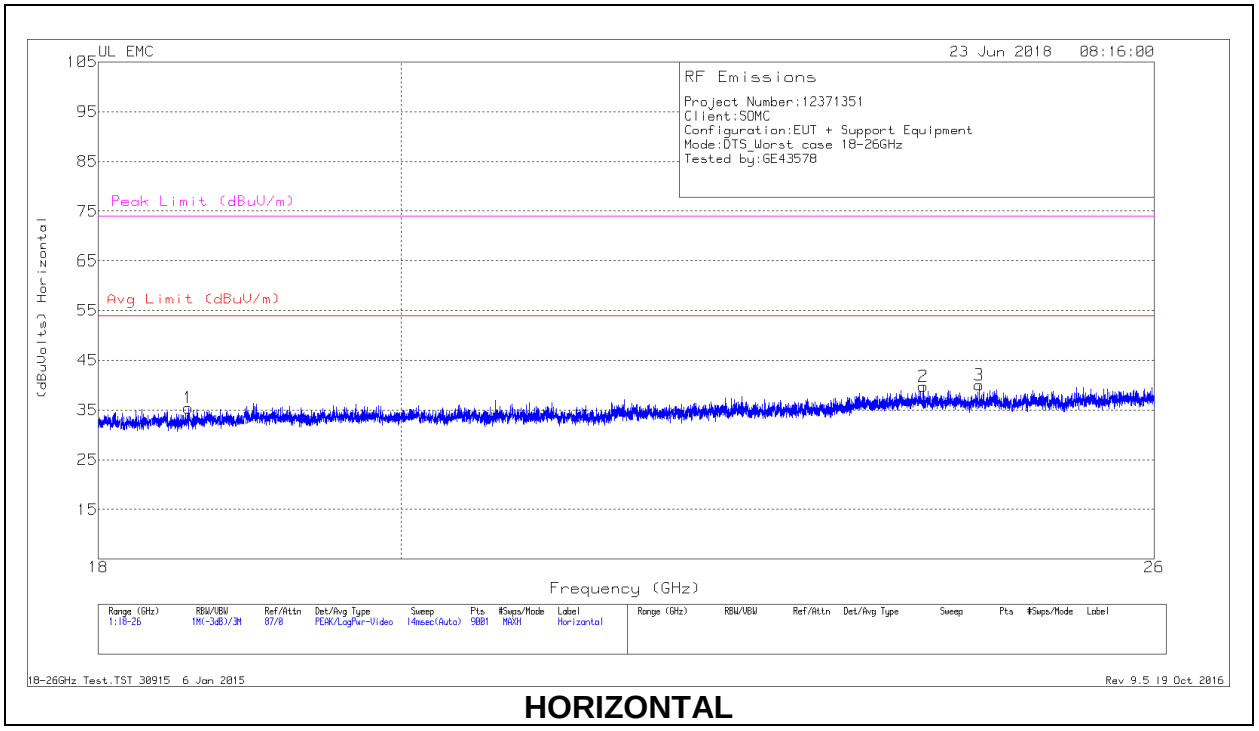
| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AF T477 (dB/m) | Amp/Cbl (dB) | Corrected Reading (dBuV/m) | QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 89.4729 | 37.08 | Pk | 12 | -31 | 18.08 | 43.52 | -25.44 | 0-360 | 199 | H |
| 2 | * 163.9522 | 32.64 | Pk | 16.4 | -30.5 | 18.54 | 43.52 | -24.98 | 0-360 | 199 | H |
| 3 | 48.3222 | 38.35 | Pk | 13.3 | -31.4 | 20.25 | 40 | -19.75 | 0-360 | 100 | V |
| 4 | 105.7971 | 46.83 | Pk | 16.2 | -30.9 | 32.13 | 43.52 | -11.39 | 0-360 | 100 | V |
| 5 | * 408.1271 | 27.96 | Pk | 20.2 | -29.7 | 18.46 | 46.02 | -27.56 | 0-360 | 299 | H |
| 6 | 390.1247 | 27.43 | Pk | 19.7 | -29.7 | 17.43 | 46.02 | -28.59 | 0-360 | 199 | V |

* - indicates frequency in CFR47 Pt 15 Restricted Band
Pk - Peak detector

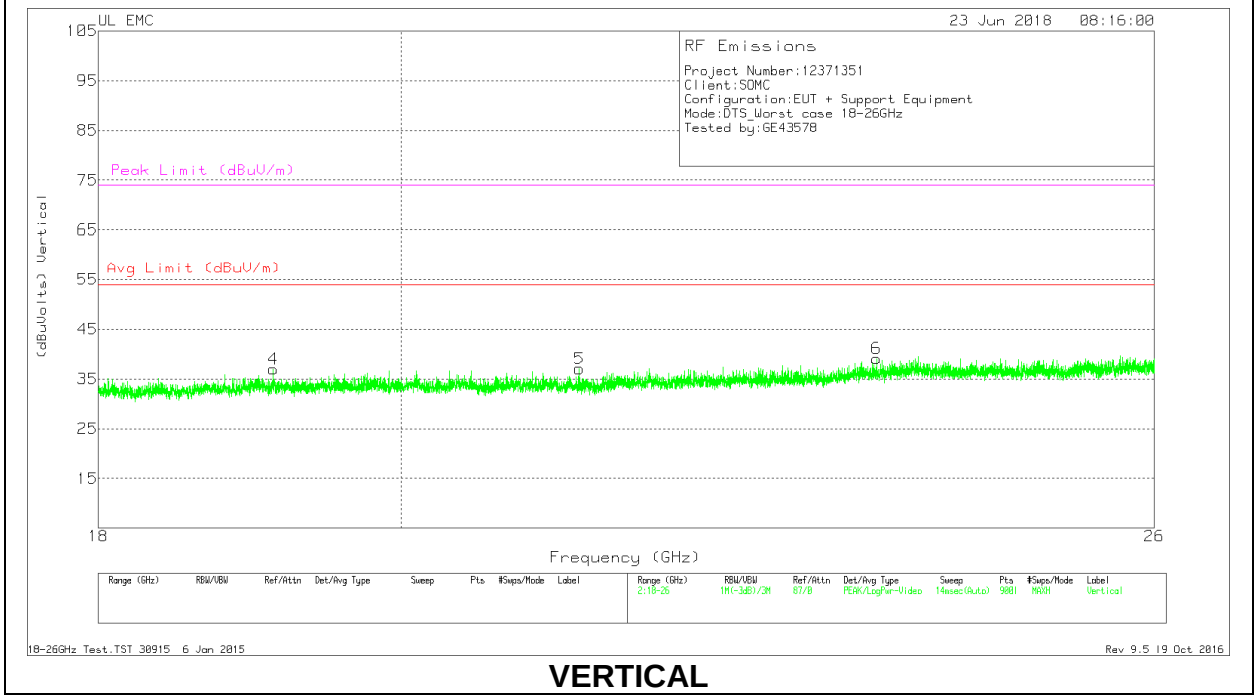


UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

## 9.4. Worst Case 18-26 GHz




**HORIZONTAL**




**VERTICAL**

**18 – 26GHz DATA**

Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | T89 AF (dB/m) | Amp/Cbl (dB) | Dist Corr (dB) | Corrected Reading (dBuVolts) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 18.572 | 37.91 | Pk | 32.3 | -25.3 | -9.5 | 35.41 | 54 | -18.59 | 74 | -38.59 |
| 2 | 23.989 | 39.78 | Pk | 33.9 | -24.4 | -9.5 | 39.78 | 54 | -14.22 | 74 | -34.22 |
| 3 | 24.461 | 39.8 | Pk | 34 | -24.3 | -9.5 | 40 | 54 | -14 | 74 | -34 |
| 4 | 19.131 | 38.49 | Pk | 32.5 | -24.5 | -9.5 | 36.99 | 54 | -17.01 | 74 | -37.01 |
| 5 | 21.281 | 38.88 | Pk | 33 | -25.3 | -9.5 | 37.08 | 54 | -16.92 | 74 | -36.92 |
| 6 | 23.603 | 38.83 | Pk | 33.9 | -24.1 | -9.5 | 39.13 | 54 | -14.87 | 74 | -34.87 |

Pk - Peak detector



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

# 10. AC POWER LINE CONDUCTED EMISSIONS

**LIMITS**

FCC §15.207 (a)

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

* Decreases with the logarithm of the frequency.

**TEST PROCEDURE**

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

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

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

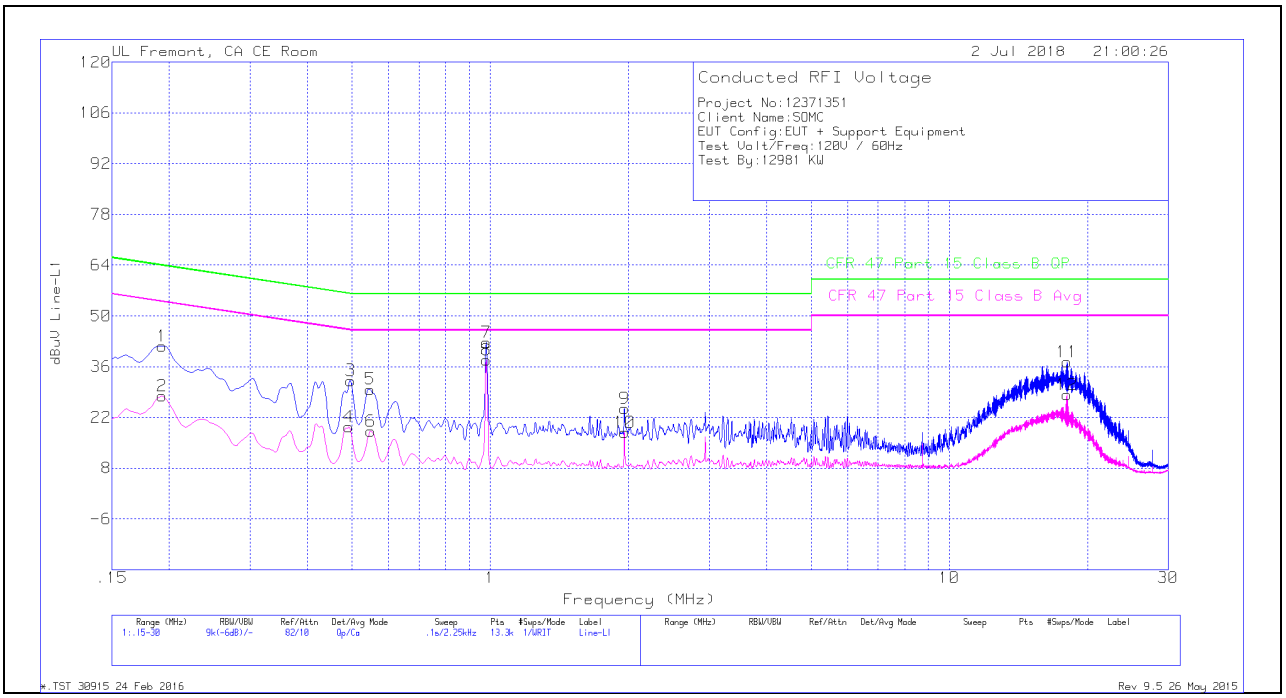
**RESULTS**



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888

### 10.1.1. AC Power Line Norm

## LINE 1 RESULTS



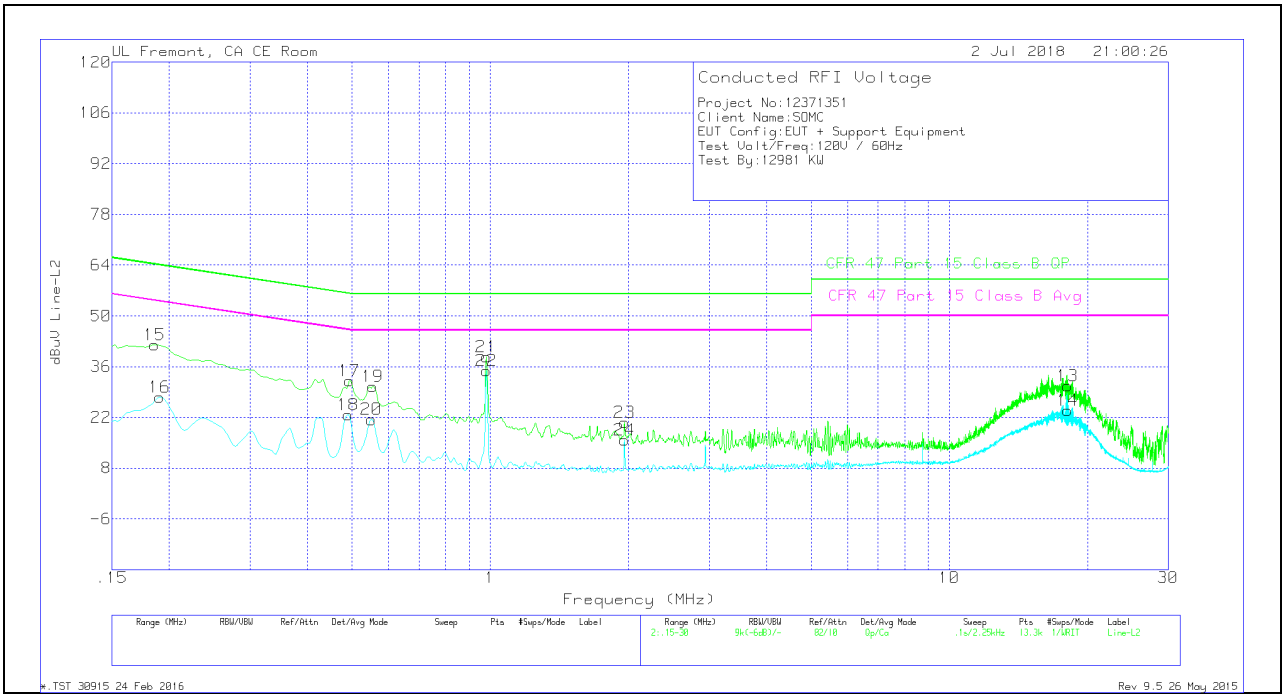

Trace Markers

| Range 1: Line-L1 .15 - 30MHz | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | LISN L1 | LC Cables C1&C3 | Limiter (dB) | Corrected Reading dBuV | CFR 47 Part 15 Class B QP | QP Margin (dB) | CFR 47 Part 15 Class B Avg | Av(CISPR) Margin (dB) |
| 1 | .19275 | 31.63 | Qp | 0 | 0 | 10.1 | 41.73 | 63.92 | -22.19 | - | - |
| 2 | .19275 | 17.77 | Ca | 0 | 0 | 10.1 | 27.87 | - | - | 53.92 | -26.05 |
| 3 | .4965 | 22.08 | Qp | 0 | 0 | 10.1 | 32.18 | 56.06 | -23.88 | - | - |
| 4 | .492 | 9.25 | Ca | 0 | 0 | 10.1 | 19.35 | - | - | 46.13 | -26.78 |
| 5 | .54825 | 19.65 | Qp | 0 | 0 | 10.1 | 29.75 | 56 | -26.25 | - | - |
| 6 | .54937 | 8.09 | Ca | 0 | 0 | 10.1 | 18.19 | - | - | 46 | -27.81 |
| 7 | .98025 | 32.46 | Qp | 0 | .1 | 10.1 | 42.66 | 56 | -13.34 | - | - |
| 8 | .98025 | 27.63 | Ca | 0 | .1 | 10.1 | 37.83 | - | - | 46 | -8.17 |
| 9 | 1.96125 | 14.21 | Qp | 0 | .1 | 10.1 | 24.41 | 56 | -31.59 | - | - |
| 10 | 1.96125 | 7.69 | Ca | 0 | .1 | 10.1 | 17.89 | - | - | 46 | -28.11 |
| 11 | 18.051 | 26.54 | Qp | .1 | .3 | 10.3 | 37.24 | 60 | -22.76 | - | - |
| 12 | 18.051 | 17.58 | Ca | .1 | .3 | 10.3 | 28.28 | - | - | 50 | -21.72 |

Qp - Quasi-Peak detector

Ca - CISPR average detection

# LINE 2 RESULTS




## Trace Markers

| Range 2: Line-L2 .15 - 30MHz | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | LISN L2 | LC Cables C2&C3 | Limiter (dB) | Corrected Reading dBuV | CFR 47 Part 15 Class B QP | QP Margin (dB) | CFR 47 Part 15 Class B Avg | Av(CISPR) Margin (dB) |
| 13 | 18.123 | 20.06 | Qp | .1 | .3 | 10.3 | 30.76 | 60 | -29.24 | - | - |
| 14 | 18.123 | 13.2 | Ca | .1 | .3 | 10.3 | 23.9 | - | - | 50 | -26.1 |
| 15 | .186 | 31.98 | Qp | 0 | 0 | 10.1 | 42.08 | 64.21 | -22.13 | - | - |
| 16 | .1905 | 17.53 | Ca | 0 | 0 | 10.1 | 27.63 | - | - | 54.01 | -26.38 |
| 17 | .49425 | 22.04 | Qp | 0 | 0 | 10.1 | 32.14 | 56.1 | -23.96 | - | - |
| 18 | .48975 | 12.57 | Ca | 0 | 0 | 10.1 | 22.67 | - | - | 46.17 | -23.5 |
| 19 | .555 | 20.41 | Qp | 0 | 0 | 10.1 | 30.51 | 56 | -25.49 | - | - |
| 20 | .55162 | 11.31 | Ca | 0 | 0 | 10.1 | 21.41 | - | - | 46 | -24.59 |
| 21 | .98025 | 28.43 | Qp | 0 | .1 | 10.1 | 38.63 | 56 | -17.37 | - | - |
| 22 | .98025 | 24.64 | Ca | 0 | .1 | 10.1 | 34.84 | - | - | 46 | -11.16 |
| 23 | 1.96125 | 10.37 | Qp | 0 | .1 | 10.1 | 20.57 | 56 | -35.43 | - | - |
| 24 | 1.96125 | 5.54 | Ca | 0 | .1 | 10.1 | 15.74 | - | - | 46 | -30.26 |

Qp - Quasi-Peak detector

Ca - CISPR average detection



UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 771-1000 FAX:(510) 661-0888