



**FCC CFR47 PART 15 SUBPART C**  
**DTS Wireless LAN**  
**CERTIFICATION TEST REPORT**  
**FOR**  
**AIRWAY CLEARANCE SYSTEM**  
**PRODUCT NAME: PMACS1WI**  
**FCC ID: 2AJKO-PMACS1WI**  
**REPORT NUMBER: 4787592605-E1V2**  
**ISSUE DATE: DEC 26, 2016**

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Revision History

| <u>Rev.</u> | <u>Issue Date</u> | <u>Revisions</u>          | <u>Revised By</u> |
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| V1          | 12/21/16          | Initial issue             | Junwhan Lee       |
| V2          | 12/26/16          | Addressed TCB's questions | Junwhan Lee       |

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Hill-Rom Services Private Limited  
**EUT DESCRIPTION:** Airway Clearance System  
**PRODUCT NAME:** PMACS1WI  
**SERIAL NUMBER:** PREDVM0036 (RADIATED & CONDUCTED)  
**DATE TESTED:** OCT 07, 2016 - DEC 21, 2016

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

UL Korea, Ltd. 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 Korea, Ltd. 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 Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. 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 IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For  
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UL Korea, Ltd.

Tested By:



Junwhan Lee  
Suwon Lab Engineer  
UL Korea, Ltd.

## 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 v03r05 and ANSI C63.10-2013.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 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.

| 218 Maeyeong-ro                     |           |
|-------------------------------------|-----------|
| <input checked="" type="checkbox"/> | Chamber 1 |
| <input checked="" type="checkbox"/> | Chamber 2 |

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## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

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

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

### 4.3. MEASUREMENT UNCERTAINTY

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

| PARAMETER                             | UNCERTAINTY |
|---------------------------------------|-------------|
| Conducted Disturbance, 0.15 to 30 MHz | 2.32 dB     |
| Radiated Disturbance, Below 1GHz      | 4.14 dB     |
| Radiated Disturbance, Above 1 GHz     | 5.97 dB     |

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a Airway Clearance System with DTS/UNII a/b/g/n and BT/BLE features.  
This test report addresses the DTS (WLAN) operational mode.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum total conducted average output power as follows:

| Frequency Range [MHz] | Mode         | Average Power [dBm] | Average Power [mW] | Output Power [dBm] (Peak) | Output Power [mW] (Peak) |
|-----------------------|--------------|---------------------|--------------------|---------------------------|--------------------------|
| 2412 - 2462           | 802.11b      | 15.49               | 35.40              | 21.51                     | 141.58                   |
|                       | 802.11g      | 14.32               | 27.04              | 22.42                     | 174.58                   |
|                       | 802.11n HT20 | 12.08               | 16.14              | 20.29                     | 106.91                   |

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an PCB antennas, with a antenna's maximum gain of 0.99 dBi.

### 5.4. WORST-CASE CONFIGURATION AND MODE

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

Radiated emission above 1GHz was performed with the EUT set to transmit low/mid/high channels.

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

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

802.11b mode: 11 Mbps  
802.11g mode: 54 Mbps  
802.11n HT20 mode: MCS7

This device supports simultaneous transmission operation, Which allows for two modules(Bluetooth & WLAN) to operate independent of one another in the Bluetooth(2.4GHz) and WLAN(2.4GHz & 5GHz) bands simultaneously on each antenna. The following tables show the worst case configurations determined during testing. The data for Scenario A configuration is contained in this test report.

**Scenario A Configuration: Bluetooth transmitting in 2.4GHz and WLAN in 2.4GHz mode**

| Description              | Bluetooth 2.4GHz Tx | WLAN 2.4GHz Tx |
|--------------------------|---------------------|----------------|
| Channel                  | 78                  | 11             |
| Operating Frequency(MHz) | 2480                | 2462           |
| Data Rate                | 1 Mbps              | 11 Mbps        |
| Mode                     | Basic FSK           | 802.11b        |

**Scenario B Configuration: Bluetooth transmitting in 2.4GHz and WLAN in 5GHz mode**

| Description              | Bluetooth 2.4GHz Tx | WLAN 5GHz Tx |
|--------------------------|---------------------|--------------|
| Channel                  | 78                  | 48           |
| Operating Frequency(MHz) | 2480                | 5240         |
| Data Rate                | 1 Mbps              | 6 Mbps       |
| Mode                     | Basic FSK           | 802.11a      |

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Support Equipment List |                                            |               |               |        |
|------------------------|--------------------------------------------|---------------|---------------|--------|
| Description            | Manufacturer                               | Model         | Serial Number | FCC ID |
| Adapter                | SHENZHEN<br>MEGMEET<br>ELECTRICAL CO., LTD | MANGO120-24CK | 8801631000045 | N/A    |

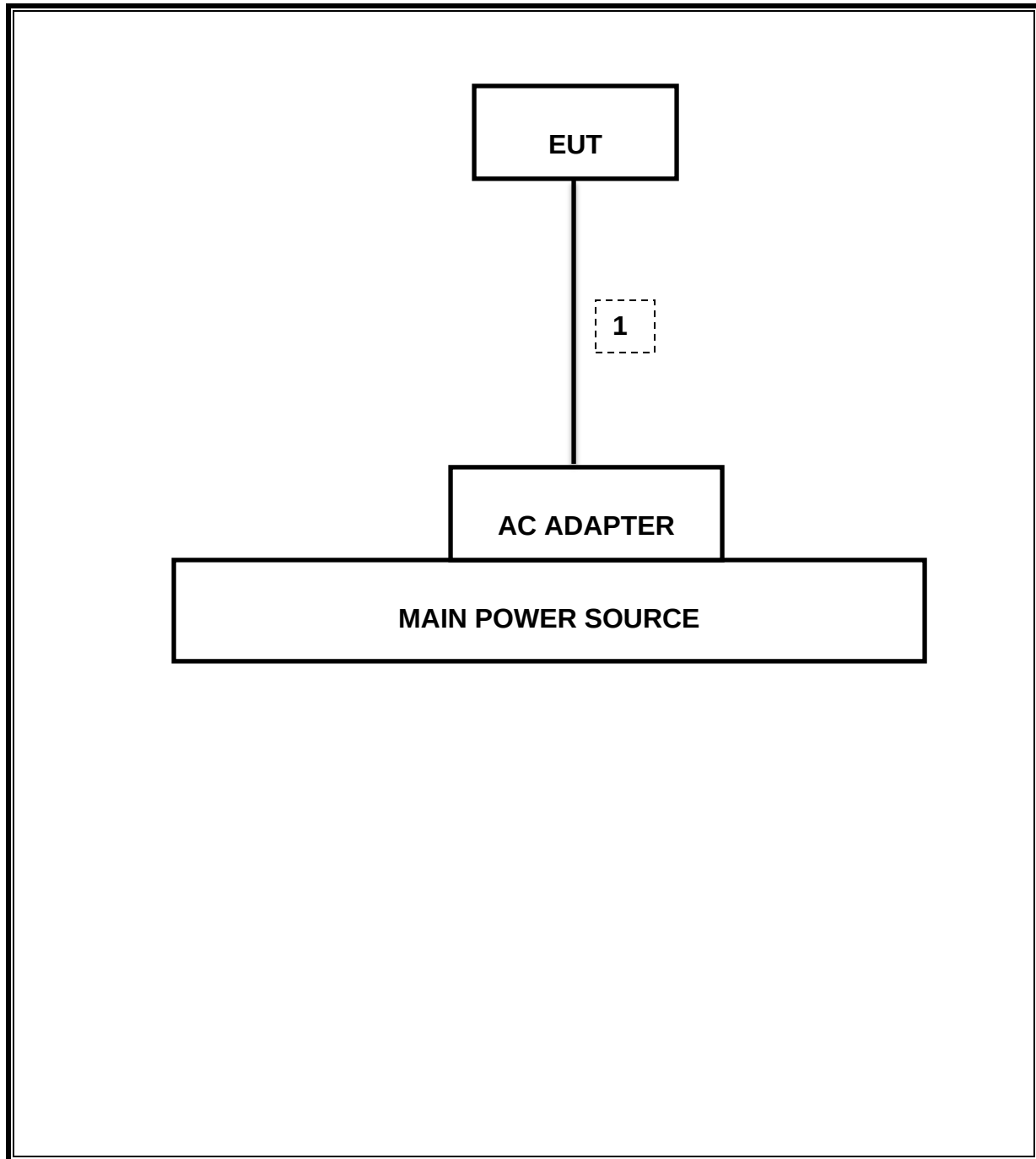
### I/O CABLES

| I/O Cable List |          |                      |                |            |                  |         |
|----------------|----------|----------------------|----------------|------------|------------------|---------|
| Cable No       | Port     | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1              | DC Power | 1                    | Mini-DIN       | Shielded   | 1.2m             | N/A     |

### TEST SETUP

The EUT is a stand-alone unit during the tests.  
Test software exercised the EUT to enable DTS mode.

**SETUP DIAGRAM FOR TESTS**



## 6. TEST AND MEASUREMENT EQUIPMENT

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

| Test Equipment List        |               |                        |             |          |
|----------------------------|---------------|------------------------|-------------|----------|
| Description                | Manufacturer  | Model                  | S/N         | Cal Due  |
| Antenna, Bilog, 30MHz-1GHz | SCHWARZBECK   | VULB9163               | 749         | 04-25-17 |
| Antenna, Horn, 18 GHz      | ETS           | 3115                   | 00161451    | 05-17-17 |
| Antenna, Horn, 18 GHz      | ETS           | 3117                   | 00168724    | 06-17-17 |
| Antenna, Horn, 18 GHz      | ETS           | 3117                   | 00168717    | 06-17-17 |
| Antenna, Horn, 40 GHz      | ETS           | 3116C                  | 00166155    | 11-30-17 |
| Antenna, Horn, 40 GHz      | ETS           | 3116C-PA               | 00168841    | 12-15-17 |
| Preamplifier, 1000 MHz     | Sonoma        | 310N                   | 341282      | 08-17-17 |
| Preamplifier, 1000 MHz     | Sonoma        | 310N                   | 351741      | 08-16-17 |
| Preamplifier               | ETS           | 3115-PA                | 00167475    | 08-17-17 |
| Preamplifier, 18 GHz       | Miteq         | AFS42-00101800-25-S-42 | 1896138     | 08-16-17 |
| Spectrum Analyzer, 44 GHz  | Agilent / HP  | N9030A                 | MY54170614  | 08-17-17 |
| Spectrum Analyzer, 44 GHz  | Agilent / HP  | N9030A                 | MY54490312  | 08-16-17 |
| Bluetooth Tester           | TESCOM        | TC-3000C               | 3000C000546 | 08-18-17 |
| Average Power Sensor       | R&S           | NRZ-Z91                | 102681      | 08-16-17 |
| Average Power Sensor       | Agilent / HP  | U2000                  | MY54270007  | 08-17-17 |
| EMI Test Receive, 40 GHz   | R&S           | ESU40                  | 100439      | 08-17-17 |
| EMI Test Receive, 40 GHz   | R&S           | ESU40                  | 100457      | 08-16-17 |
| EMI Test Receive, 3 GHz    | R&S           | ESR3                   | 101832      | 08-16-17 |
| Attenuator / Switch driver | HP            | 11713A                 | 3748A04272  | N/A      |
| Low Pass Filter 5GHz       | Micro-Tronics | LPS17541               | 009         | 08-17-17 |
| Low Pass Filter 5GHz       | Micro-Tronics | LPS17541               | 015         | 08-16-17 |
| High Pass Filter 3GHz      | Micro-Tronics | HPM17543               | 010         | 08-17-17 |
| High Pass Filter 3GHz      | Micro-Tronics | HPM17543               | 015         | 08-16-17 |
| High Pass Filter 6GHz      | Micro-Tronics | HPM17542               | 009         | 08-17-17 |
| High Pass Filter 6GHz      | Micro-Tronics | HPM17542               | 016         | 08-16-17 |
| LISN                       | R&S           | ENV-216                | 101836      | 08-16-17 |
| LISN                       | R&S           | ENV-216                | 101837      | 08-16-17 |
| Attenuator                 | PASTERNAK     | PE7087-10              | A009        | 08-16-17 |
| Antenna, Loop, 9kHz-30MHz  | R&S           | HFH2-Z2                | 100418      | 11-25-17 |

## 7. MEASUREMENT METHODS

KDB 558074 D01 DTS Meas Guidance v03r05: Measurement Procedure §9.2.3.1 AVGPM is used for average power and §9.1.1 is used for peak power and §10.2 is used for peak power spectral density.

Unwanted emissions within Restricted Bands are measured using traditional radiated procedures.

Band edge emissions within Restricted Bands are measured using RMS with duty cycle factor offset method.

## 8. ON TIME, DUTY CYCLE AND MEASUREMENT METHODS

### LIMITS

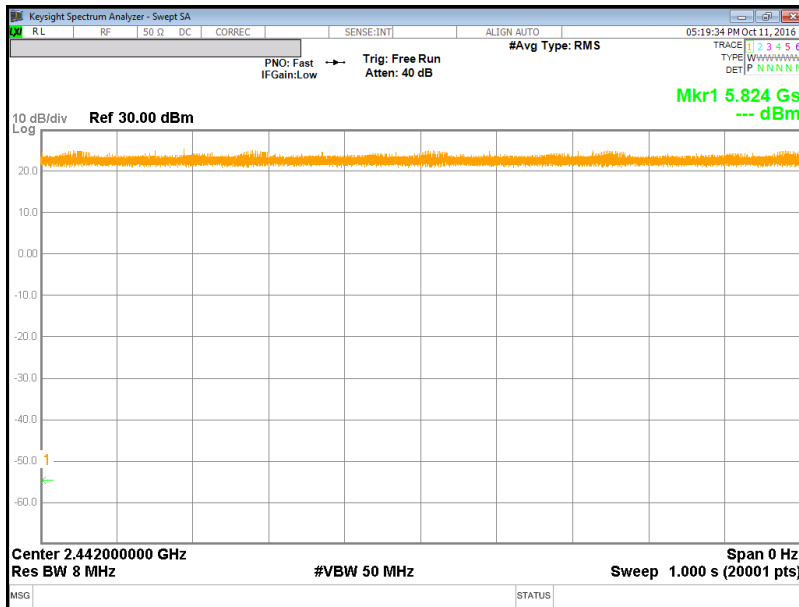
None; for reporting purposes only.

### 8.1. ON TIME AND DUTY CYCLE RESULTS

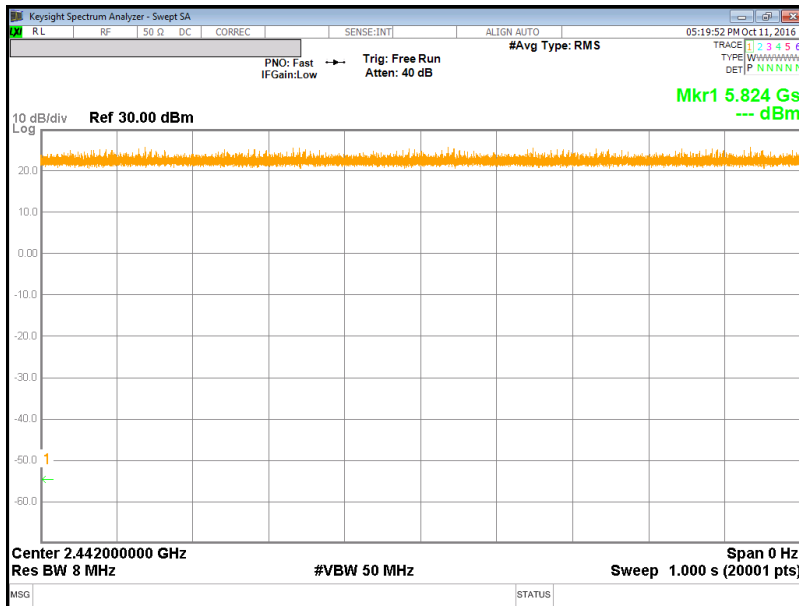
| Mode          | ON Time<br>B<br>[msec] | Period<br>[msec] | Duty Cycle<br>x<br>[linear] | Duty<br>Cycle<br>[%] | Duty Cycle<br>Correction Factor<br>[dB] | 1/T<br>Minimum VBW<br>[kHz] |
|---------------|------------------------|------------------|-----------------------------|----------------------|-----------------------------------------|-----------------------------|
| 2400MHz Bands |                        |                  |                             |                      |                                         |                             |
| 802.11b       | 1000                   | 1000             | 1.000                       | 100.0%               | 0.00                                    | 0.010                       |
| 802.11g       | 1000                   | 1000             | 1.000                       | 100.0%               | 0.00                                    | 0.010                       |
| 802.11n HT20  | 1000                   | 1000             | 1.000                       | 100.0%               | 0.00                                    | 0.010                       |



[802.11b]



[802.11g]



[802.11n]

## 9. SUMMARY TABLE

| FCC Part Section   | Test Description                        | Test Limit | Test Condition       | Test Result | Worst Case        |
|--------------------|-----------------------------------------|------------|----------------------|-------------|-------------------|
| 15.247 (a)(2)      | Occupied Band width (6dB)               | >500KHz    | Conducted            | Pass        | 9.062 MHz         |
| 2.1051, 15.247 (d) | Band Edge / Conducted Spurious Emission | -20dBc     |                      | Pass        | -31.029 dBm       |
| 15.247             | TX conducted output power               | <30dBm     |                      | Pass        | 22.42 dBm (Peak)  |
| 15.247             | PSD                                     | <8dBm      |                      | Pass        | 5.902 dBm         |
| 15.207 (a)         | AC Power Line conducted emissions       | Section 10 | Power Line conducted | Pass        | 48.6 dBuV (Qp)    |
| 15.205, 15.209     | Radiated Spurious Emission              | < 54dBuV/m | Radiated             | Pass        | 53.05 dBuV/m (Av) |

## 10. ANTENNA PORT TEST RESULTS

### 10.1. 6 dB BANDWIDTH

#### LIMITS

FCC §15.247 (a) (2)

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

#### TEST PROCEDURE

Reference to KDB 558074 D01 DTS Meas Guidance v03r05: The transmitter output is connected to a spectrum analyzer with the RBW set to 100 kHz, the VBW  $\geq 3 \times$  RBW, peak detector and max hold.

#### RESULTS

##### 10.1.1. 802.11b MODE IN THE 2.4 GHz BAND

| Channel | Frequency [MHz] | 6 dB Bandwidth [MHz] | Minimum Limit [MHz] |
|---------|-----------------|----------------------|---------------------|
| Low     | 2412            | 9.062                | 0.5                 |
| Mid     | 2437            | 9.063                | 0.5                 |
| High    | 2462            | 9.086                | 0.5                 |
| Worst   |                 | 9.062                | 0.5                 |

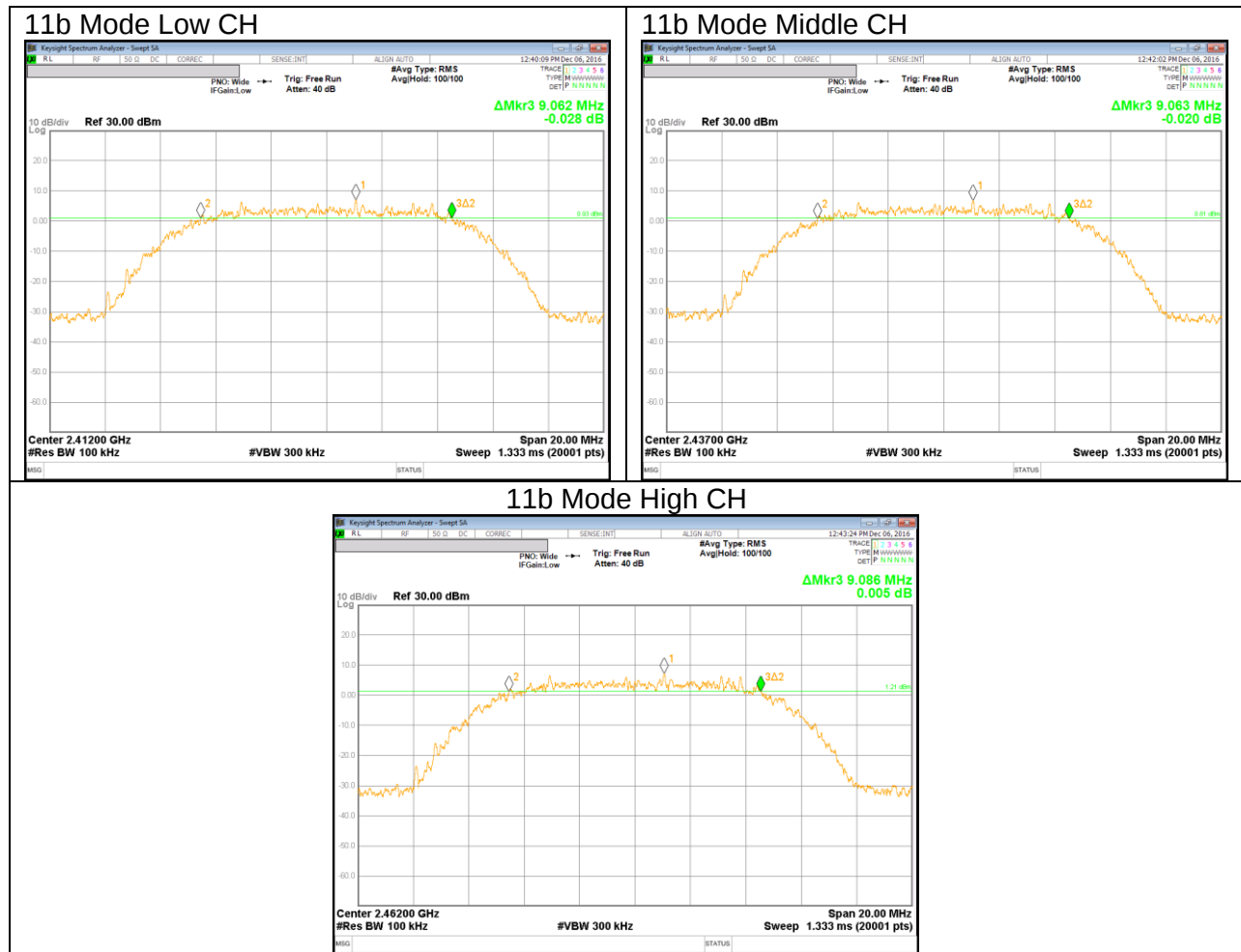
##### 10.1.2. 802.11g MODE IN THE 2.4 GHz BAND

| Channel | Frequency [MHz] | 6 dB Bandwidth [MHz] | Minimum Limit [MHz] |
|---------|-----------------|----------------------|---------------------|
| 1       | 2412            | 16.523               | 0.5                 |
| 4       | 2427            | 16.509               | 0.5                 |
| 6       | 2437            | 16.496               | 0.5                 |
| 8       | 2447            | 16.490               | 0.5                 |
| 11      | 2462            | 16.473               | 0.5                 |
| Worst   |                 | 16.473               | 0.5                 |

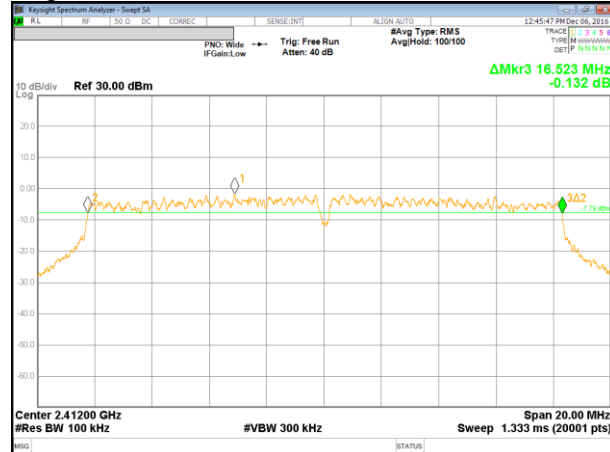
**10.1.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND**

| Channel | Frequency<br>[MHz] | 6 dB Bandwidth<br>[MHz] | Minimum Limit<br>[MHz] |
|---------|--------------------|-------------------------|------------------------|
| 1       | 2412               | 17.753                  | 0.5                    |
| 4       | 2427               | 17.752                  | 0.5                    |
| 6       | 2437               | 17.762                  | 0.5                    |
| 8       | 2447               | 17.750                  | 0.5                    |
| 11      | 2462               | 17.779                  | 0.5                    |
| Worst   |                    | 17.750                  | 0.5                    |

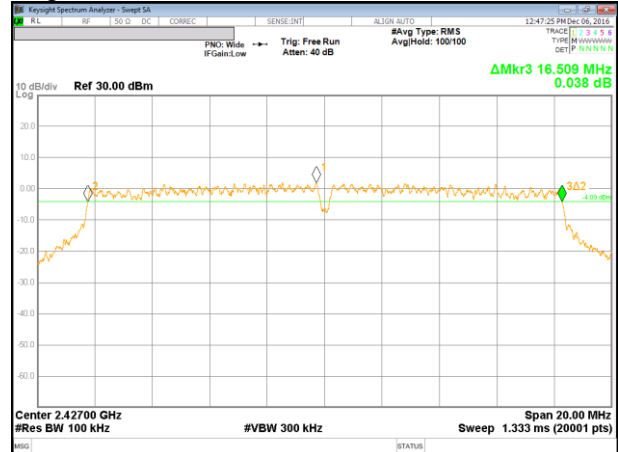
## 10.1.4. 6 dB BANDWIDTH PLOTS



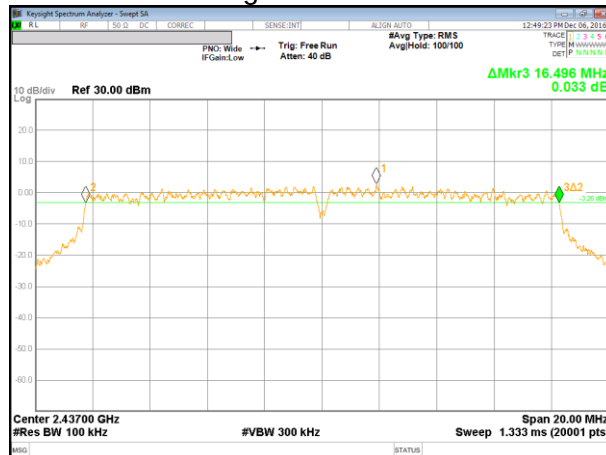
### 11g Mode 1 CH



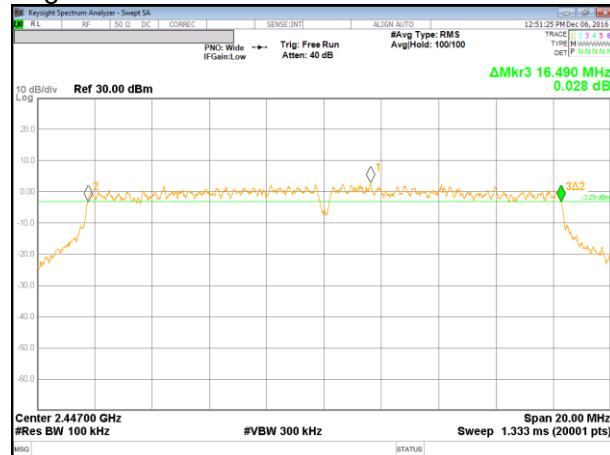
### 11g Mode 4 CH



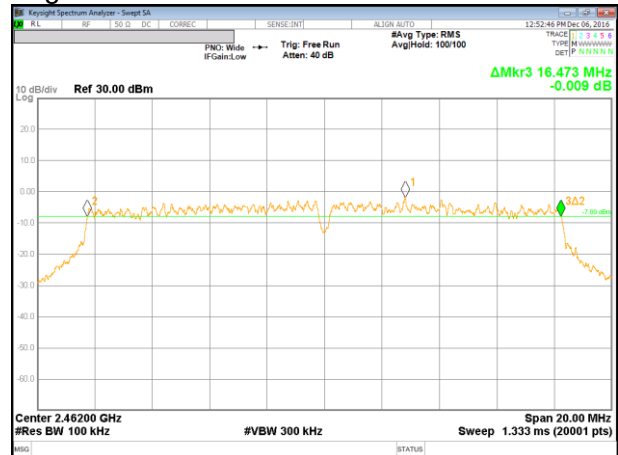
### 11g Mode 6 CH



### 11g Mode 8 CH



### 11g Mode 11 CH





## 10.2. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

### RESULTS

#### 10.2.1. 802.11b MODE IN THE 2.4 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|---------|-----------------|---------------------|
| Low     | 2412            | 11.817              |
| Mid     | 2437            | 11.797              |
| High    | 2462            | 11.819              |
| Worst   |                 | 11.819              |

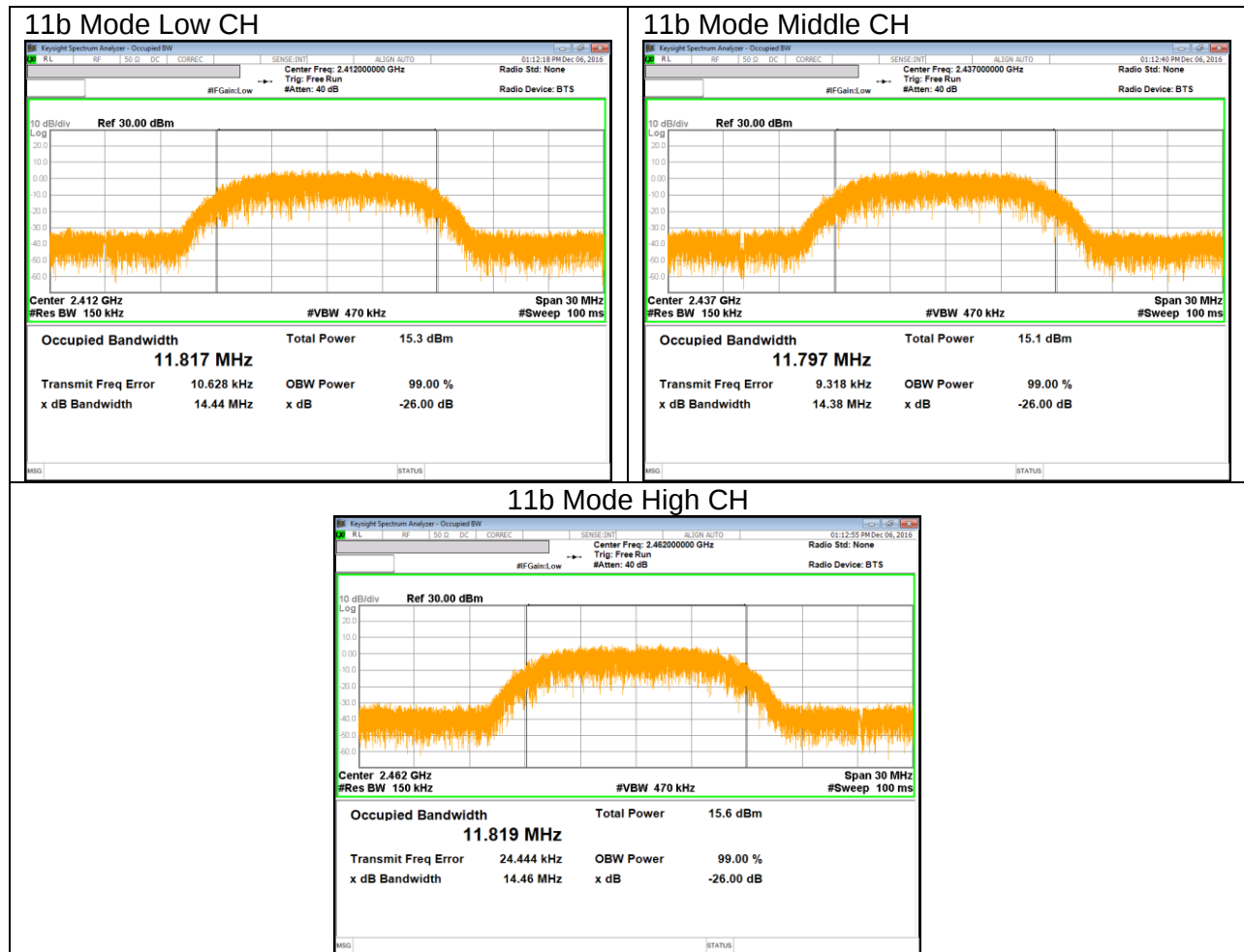
#### 10.2.2. 802.11g MODE IN THE 2.4 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|---------|-----------------|---------------------|
| 1       | 2412            | 16.494              |
| 4       | 2427            | 16.532              |
| 6       | 2437            | 16.532              |
| 8       | 2447            | 16.527              |
| 11      | 2462            | 16.498              |
| Worst   |                 | 16.532              |

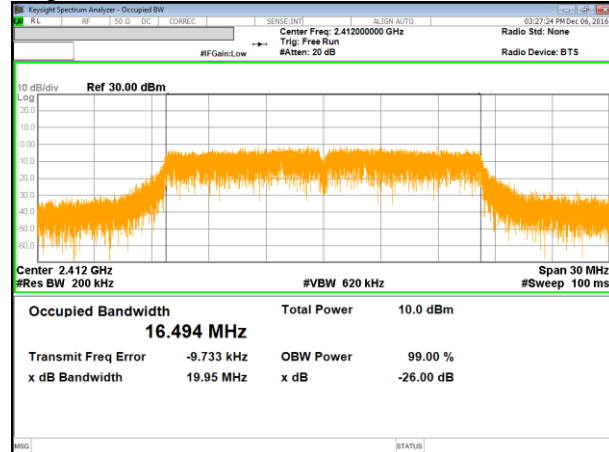
#### 10.2.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

| Channel | Frequency [MHz] | 99% Bandwidth [MHz] |
|---------|-----------------|---------------------|
| 1       | 2412            | 17.655              |
| 4       | 2427            | 17.678              |
| 6       | 2437            | 17.682              |
| 8       | 2447            | 17.657              |
| 11      | 2462            | 17.668              |
| Worst   |                 | 17.682              |

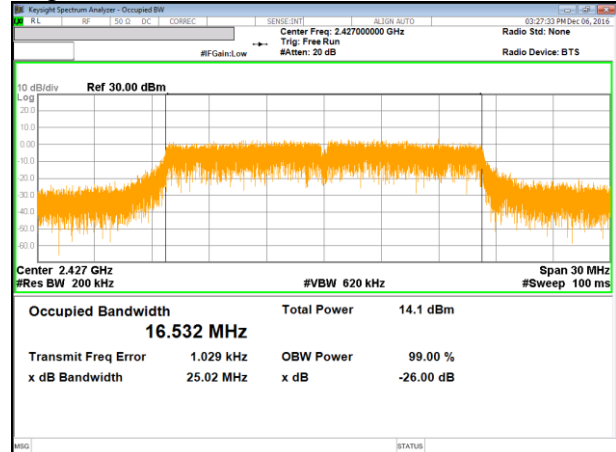
## 10.2.4. 99% BANDWIDTH PLOTS



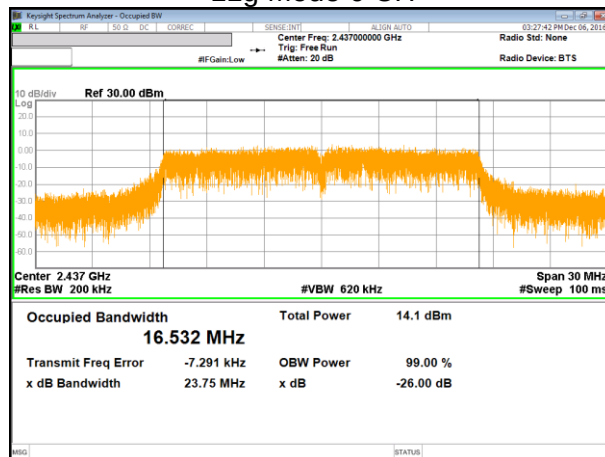
### 11g Mode 1 CH



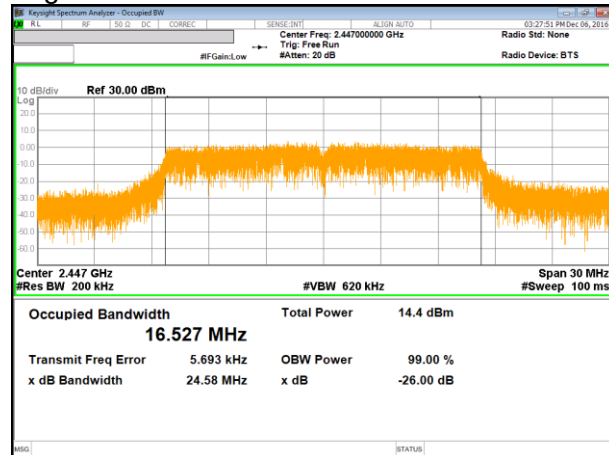
### 11g Mode 4 CH



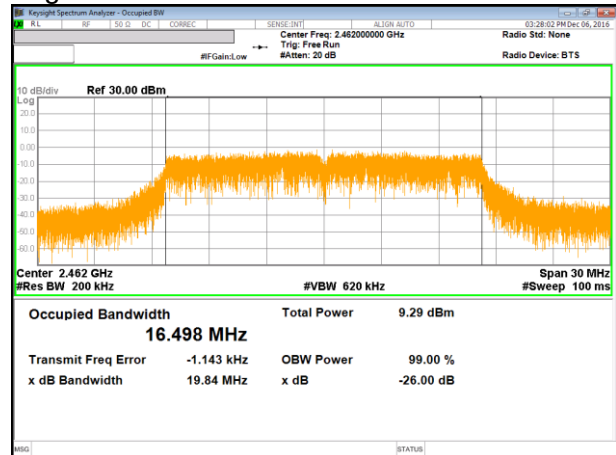
### 11g Mode 6 CH



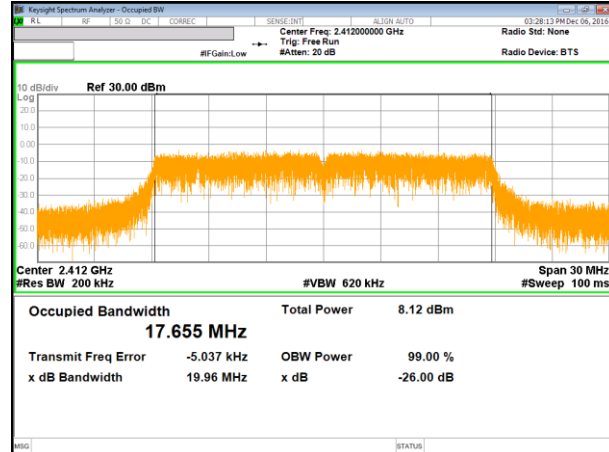
### 11g Mode 8 CH



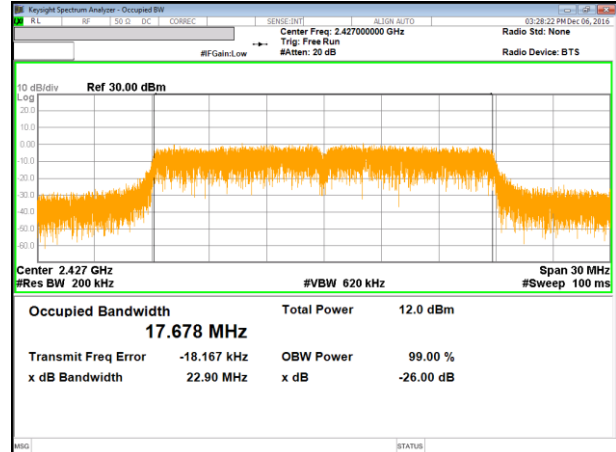
### 11g Mode 11 CH



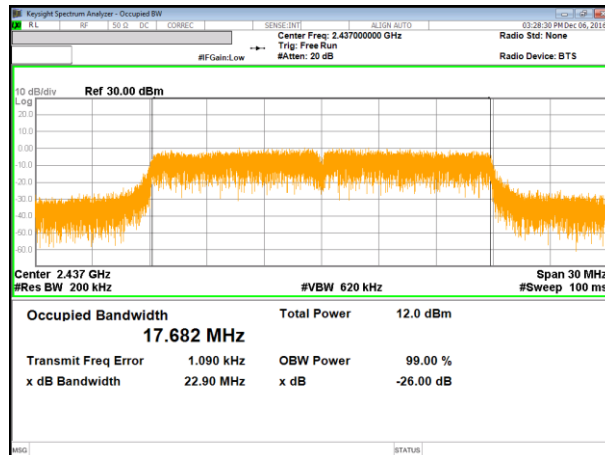
### 11n HT20 Mode 1 CH



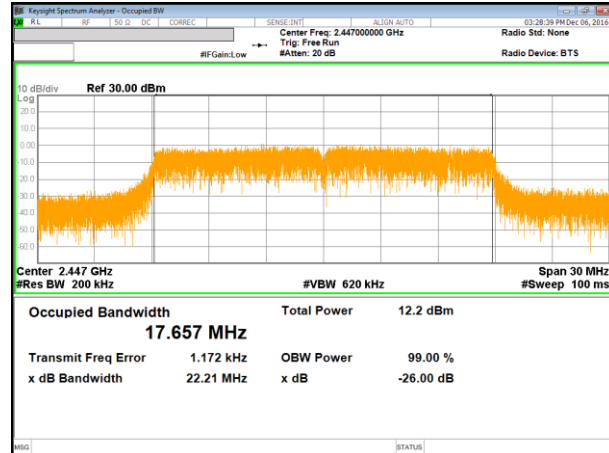
### 11n HT20 Mode 4 CH



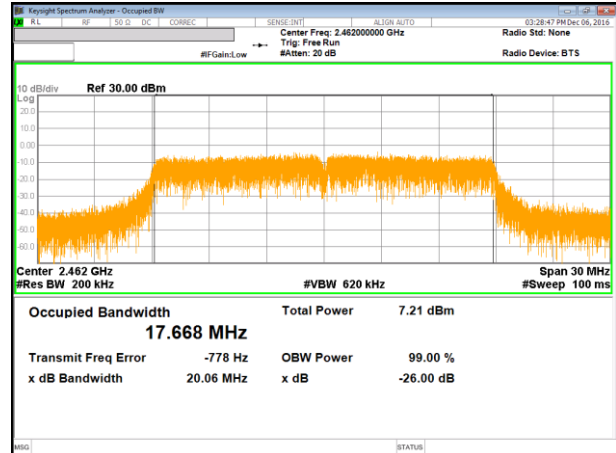
### 11n HT20 Mode 6 CH



### 11n HT20 Mode 8 CH



### 11n HT20 Mode 11 CH



### **10.3. AVERAGE POWER**

#### **LIMITS**

None; for reporting purposes only.

#### **TEST PROCEDURE**

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10.1 dB (including 10 dB pad and 0.1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

## **RESULTS**

### **10.3.1. 802.11b MODE IN THE 2.4 GHz BAND**

| Channel | Frequency (MHz) | Avg Power (dBm) |
|---------|-----------------|-----------------|
| Low     | 2412            | 15.13           |
| Mid     | 2437            | 15.14           |
| High    | 2462            | 15.49           |
| Worst   |                 | 15.49           |

### **10.3.2. 802.11g MODE IN THE 2.4 GHz BAND**

| Channel | Frequency (MHz) | Avg Power (dBm) |
|---------|-----------------|-----------------|
| 1       | 2412            | 10.03           |
| 4       | 2427            | 14.11           |
| 6       | 2437            | 14.09           |
| 8       | 2447            | 14.32           |
| 11      | 2462            | 9.13            |
| Worst   |                 | 14.32           |

### **10.3.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND**

| Channel | Frequency (MHz) | Avg Power (dBm) |
|---------|-----------------|-----------------|
| 1       | 2412            | 8.05            |
| 4       | 2427            | 11.96           |
| 6       | 2437            | 11.96           |
| 8       | 2447            | 12.08           |
| 11      | 2462            | 7.04            |
| Worst   |                 | 12.08           |

## 10.4. OUTPUT POWER(Peak)

### LIMITS

FCC §15.247

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.

### DIRECTIONAL ANTENNA GAIN

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

### RESULTS

#### 10.4.1. 802.11b MODE IN THE 2.4 GHz BAND

##### Limits

| Channel | Frequency<br>[MHz] | Directional<br>Gain<br>Primary<br>[dBi] | FCC<br>Power<br>Limit<br>[dBm] | IC<br>Power<br>Limit<br>[dBm] | IC<br>EIRP<br>Limit<br>[dBm] | Max<br>Power<br>[dBm] |
|---------|--------------------|-----------------------------------------|--------------------------------|-------------------------------|------------------------------|-----------------------|
| Low     | 2412               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |
| Mid     | 2437               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |
| High    | 2462               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |

##### Results

| Channel | Frequency<br>[MHz] | Primary<br>Meas<br>Power<br>[dBm] | Total<br>Power<br>[dBm] | Power<br>Limit<br>[dBm] | Margin<br>[dB] |
|---------|--------------------|-----------------------------------|-------------------------|-------------------------|----------------|
| Low     | 2412               | 21.11                             | 21.11                   | 30.00                   | -8.89          |
| Mid     | 2437               | 21.01                             | 21.01                   | 30.00                   | -8.99          |
| High    | 2462               | 21.51                             | 21.51                   | 30.00                   | -8.49          |
| Worst   |                    |                                   | 21.51                   | 30.00                   | -8.49          |

## 10.4.2. 802.11g MODE IN THE 2.4 GHz BAND

### Limits

| Channel | Frequency<br>[MHz] | Directional<br>Gain<br>Primary<br>[dBi] | FCC<br>Power<br>Limit<br>[dBm] | IC<br>Power<br>Limit<br>[dBm] | IC<br>EIRP<br>Limit<br>[dBm] | Max<br>Power<br>[dBm] |
|---------|--------------------|-----------------------------------------|--------------------------------|-------------------------------|------------------------------|-----------------------|
| 1       | 2412               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |
| 4       | 2427               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |
| 6       | 2437               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |
| 8       | 2447               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |
| 11      | 2462               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |

### Results

| Channel | Frequency<br>[MHz] | Primary<br>Meas<br>Power<br>[dBm] | Total<br>Power<br>[dBm] | Power<br>Limit<br>[dBm] | Margin<br>[dB] |
|---------|--------------------|-----------------------------------|-------------------------|-------------------------|----------------|
| 1       | 2412               | 18.20                             | 18.20                   | 30.00                   | -11.80         |
| 4       | 2427               | 22.20                             | 22.20                   | 30.00                   | -7.80          |
| 6       | 2437               | 22.16                             | 22.16                   | 30.00                   | -7.84          |
| 8       | 2447               | 22.42                             | 22.42                   | 30.00                   | -7.58          |
| 11      | 2462               | 17.49                             | 17.49                   | 30.00                   | -12.51         |
| Worst   |                    |                                   | 22.42                   | 30.00                   | -7.58          |

### 10.4.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

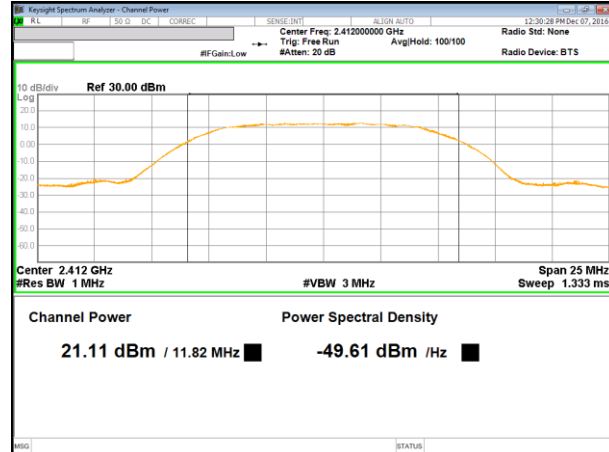
#### Limits

| Channel | Frequency<br>[MHz] | Directional<br>Gain<br>Primary<br>[dBi] | FCC<br>Power<br>Limit<br>[dBm] | IC<br>Power<br>Limit<br>[dBm] | IC<br>EIRP<br>Limit<br>[dBm] | Max<br>Power<br>[dBm] |
|---------|--------------------|-----------------------------------------|--------------------------------|-------------------------------|------------------------------|-----------------------|
| 1       | 2412               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |
| 4       | 2427               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |
| 6       | 2437               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |
| 8       | 2447               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |
| 11      | 2462               | 0.99                                    | 30.00                          | 30.00                         | 36.00                        | 30.00                 |

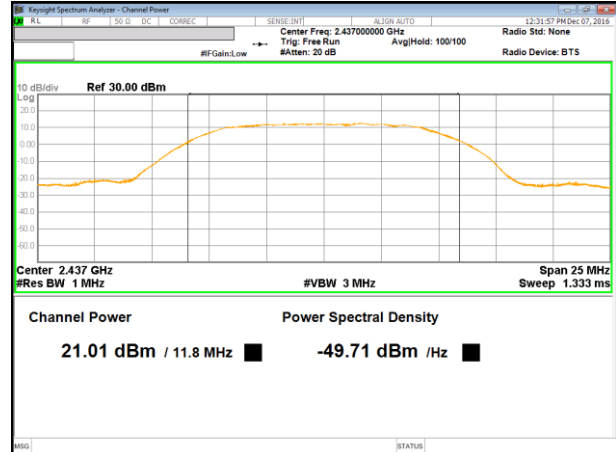
#### Results

| Channel | Frequency<br>[MHz] | Primary<br>Meas<br>Power<br>[dBm] | Total<br>Power<br>[dBm] | Power<br>Limit<br>[dBm] | Margin<br>[dB] |
|---------|--------------------|-----------------------------------|-------------------------|-------------------------|----------------|
| 1       | 2412               | 16.35                             | 16.35                   | 30.00                   | -13.65         |
| 4       | 2427               | 20.18                             | 20.18                   | 30.00                   | -9.82          |
| 6       | 2437               | 20.10                             | 20.10                   | 30.00                   | -9.90          |
| 8       | 2447               | 20.29                             | 20.29                   | 30.00                   | -9.71          |
| 11      | 2462               | 15.35                             | 15.35                   | 30.00                   | -14.65         |
| Worst   |                    |                                   | 20.29                   | 30.00                   | -9.71          |

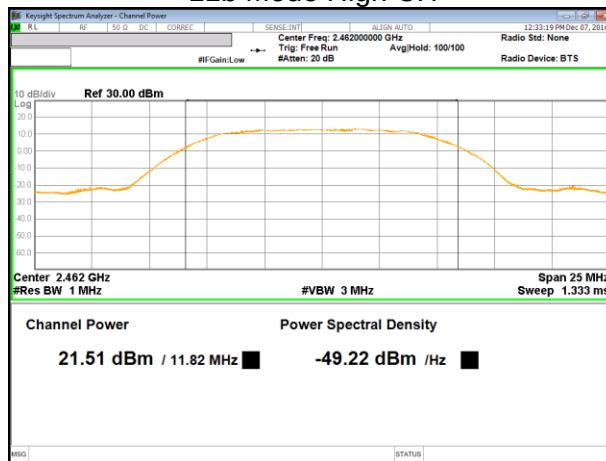
### 11b Mode Low CH



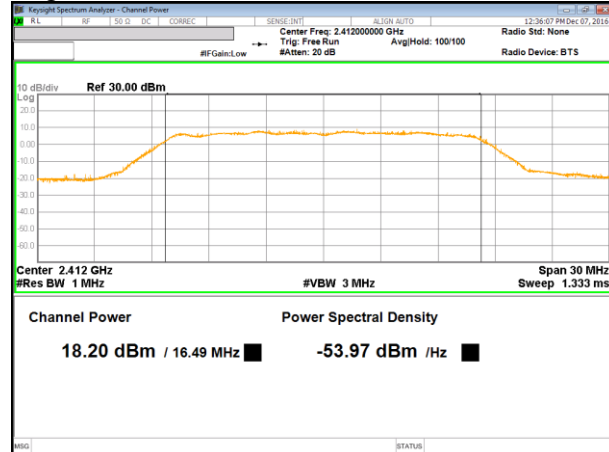
### 11b Mode Middle CH



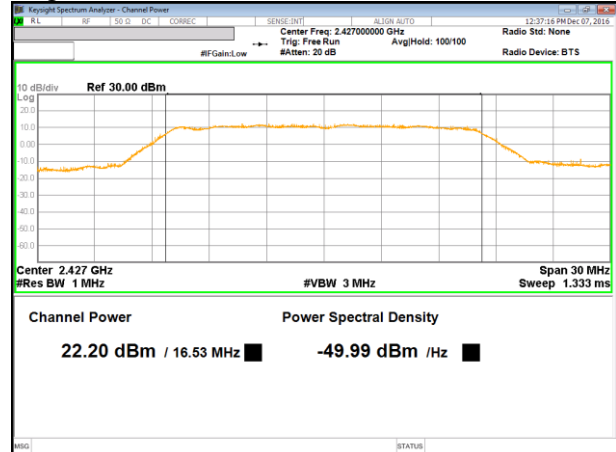
### 11b Mode High CH



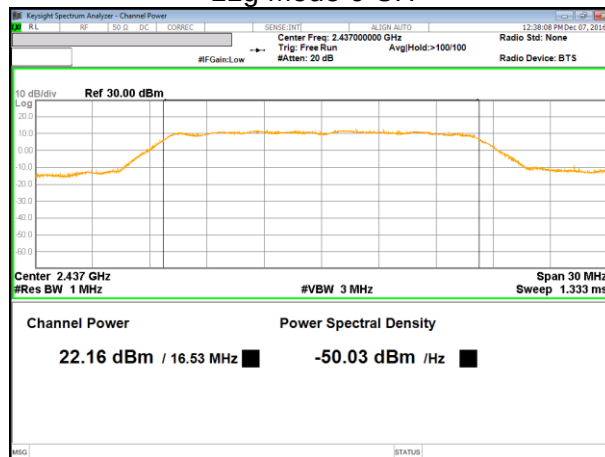
### 11g Mode 1 CH



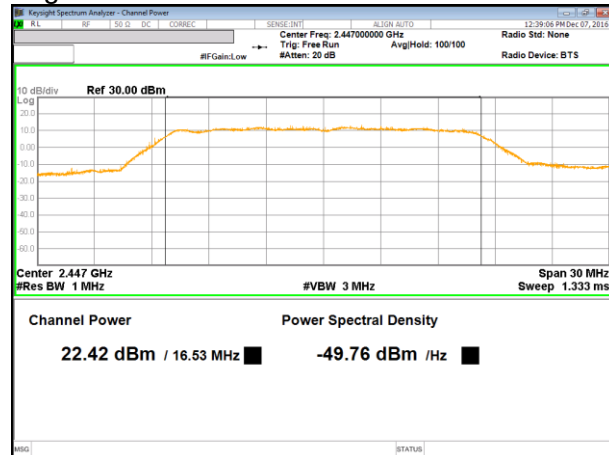
### 11g Mode 4 CH



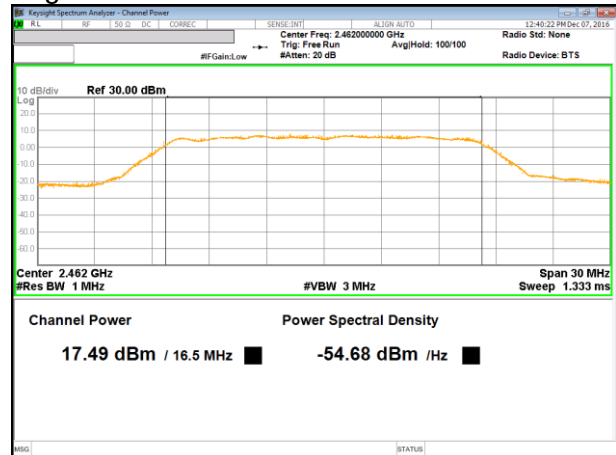
### 11g Mode 6 CH



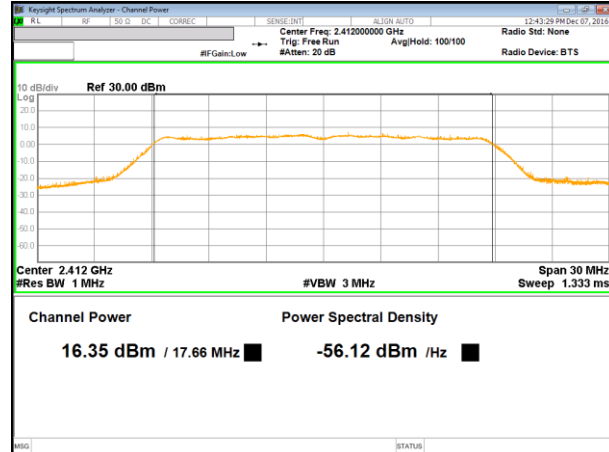
### 11g Mode 8 CH



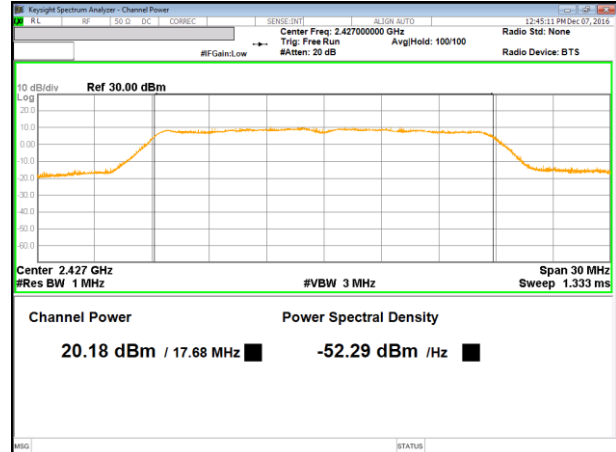
### 11g Mode 11 CH



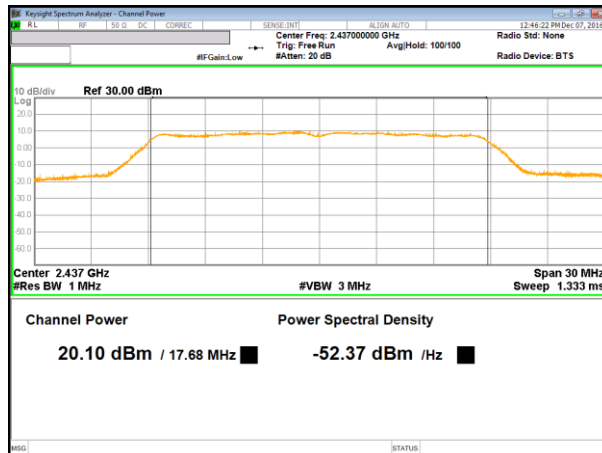
### 11n HT20 Mode 1 CH



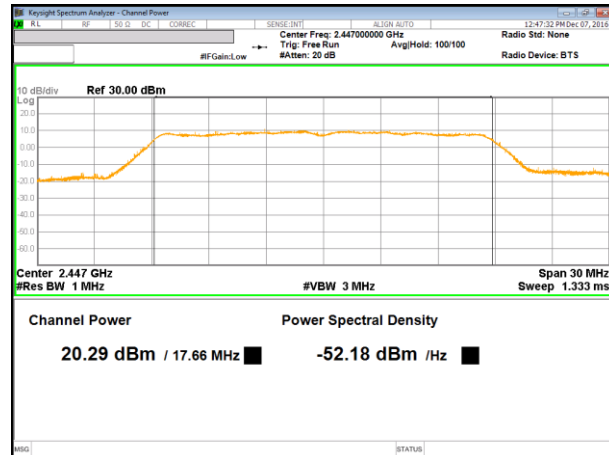
### 11n HT20 Mode 4 CH



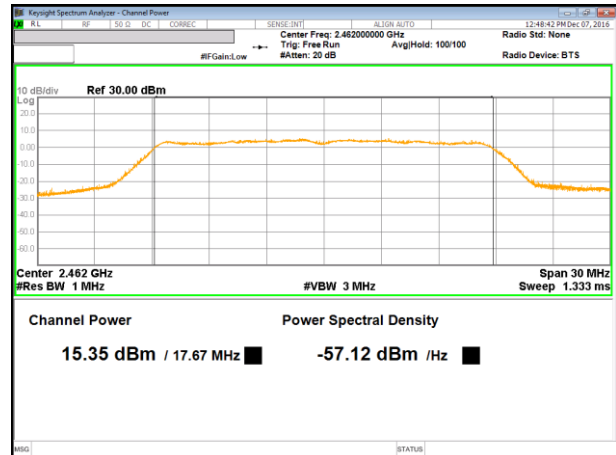
### 11n HT20 Mode 6 CH



### 11n HT20 Mode 8 CH



### 11n HT20 Mode 11 CH



## **10.5. PSD**

### **LIMITS**

FCC §15.247

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.

### **TEST PROCEDURE**

Power Spectral Density was performed utilizing the "Method PkPSD(10.1)" under KDB558074 D01 DTS Meas Guidance v03r05

## RESULTS

### 10.5.1. 802.11b MODE IN THE 2.4 GHz BAND

#### PSD Results

| Channel | Frequency [MHz] | PSD Meas [dBm] |  | Final PSD [dBm] | Limit [dBm] | Margin [dB] |
|---------|-----------------|----------------|--|-----------------|-------------|-------------|
| Low     | 2412            | 5.65           |  | 5.650           | 8.00        | -2.350      |
| Mid     | 2437            | 5.661          |  | 5.661           | 8.00        | -2.339      |
| High    | 2462            | 5.902          |  | 5.902           | 8.00        | -2.098      |

### 10.5.2. 802.11g MODE IN THE 2.4 GHz BAND

#### PSD Results

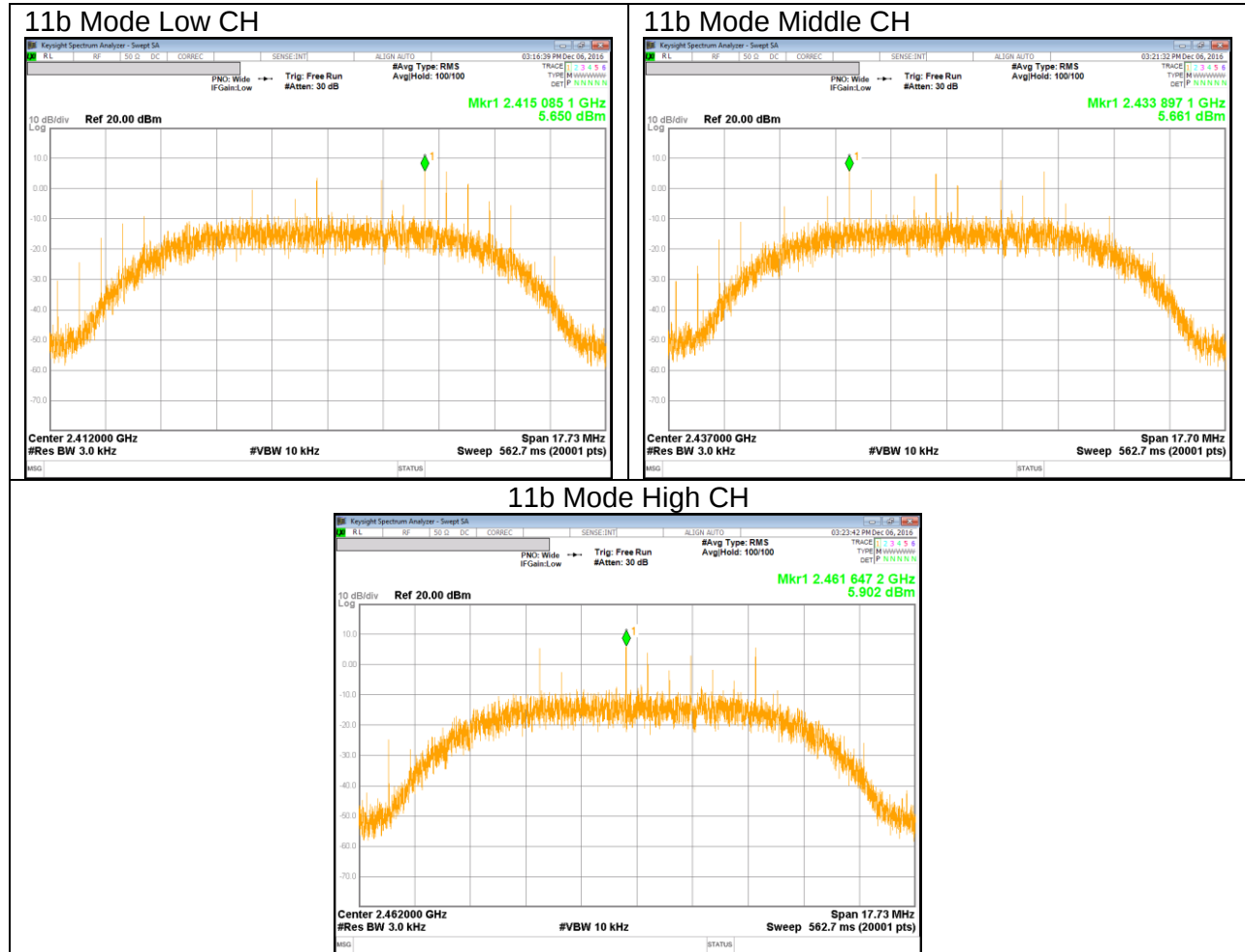
| Channel | Frequency [MHz] | PSD Meas [dBm] |  | Final PSD [dBm] | Limit [dBm] | Margin [dB] |
|---------|-----------------|----------------|--|-----------------|-------------|-------------|
| 1       | 2412            | -15.383        |  | -15.383         | 8.00        | -23.383     |
| 4       | 2427            | -11.737        |  | -11.737         | 8.00        | -19.737     |
| 6       | 2437            | -11.459        |  | -11.459         | 8.00        | -19.459     |
| 8       | 2447            | -11.128        |  | -11.128         | 8.00        | -19.128     |
| 11      | 2462            | -16.355        |  | -16.355         | 8.00        | -24.355     |

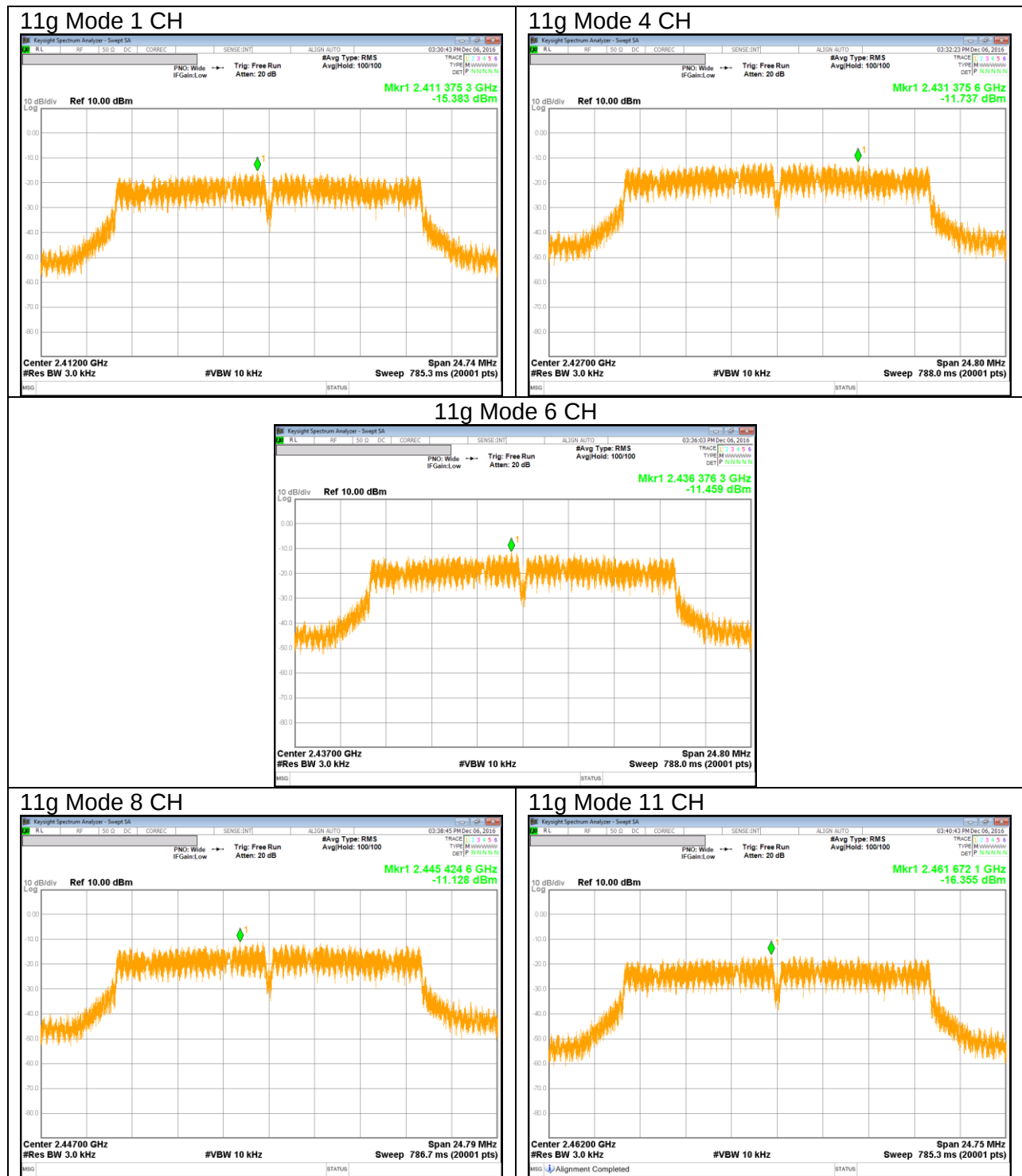
### 10.5.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND

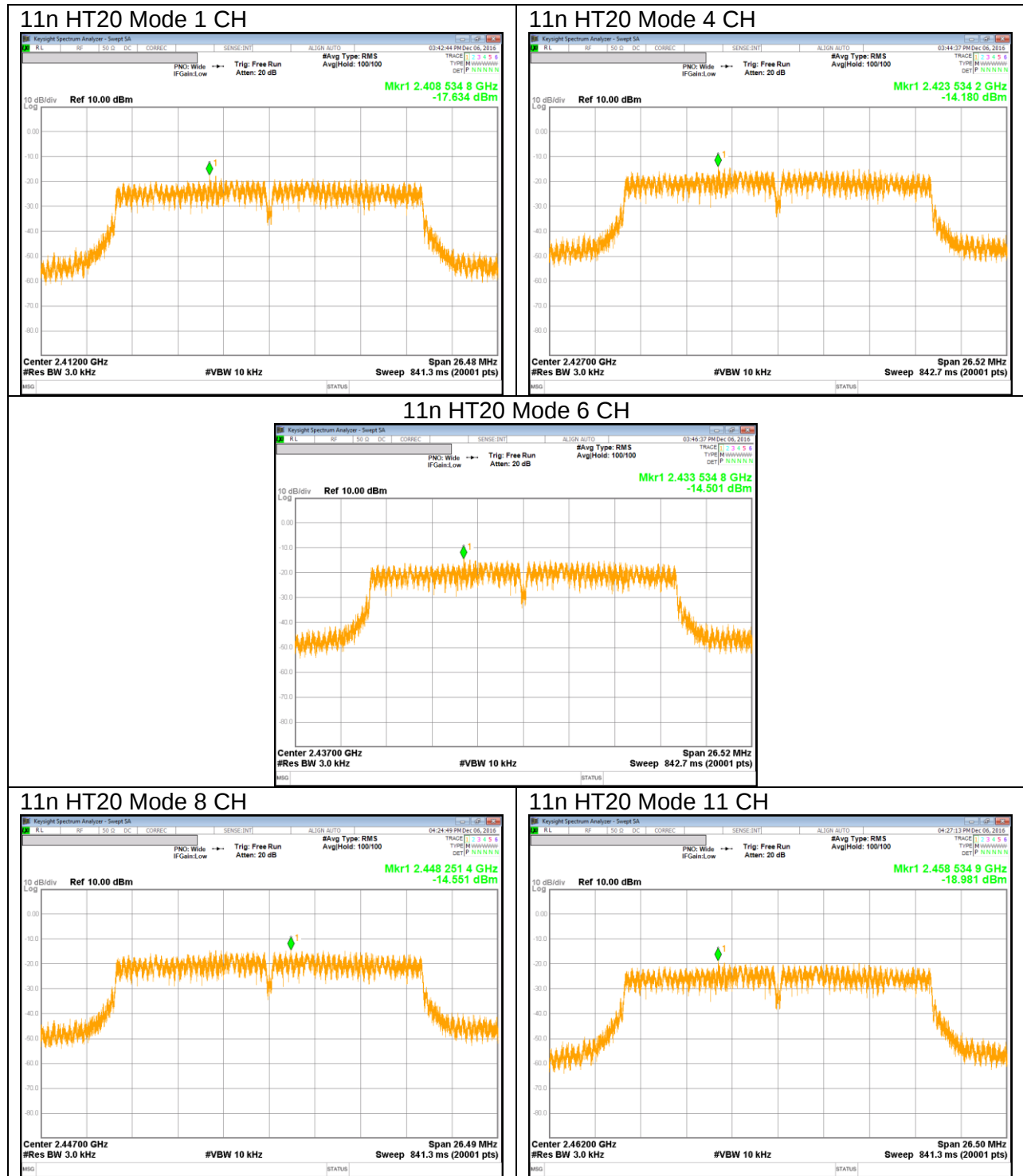
#### PSD Results

| Channel | Frequency [MHz] | PSD Meas [dBm] |  | Final PSD [dBm] | Limit [dBm] | Margin [dB] |
|---------|-----------------|----------------|--|-----------------|-------------|-------------|
| 1       | 2412            | -17.634        |  | -17.634         | 8.00        | -25.634     |
| 4       | 2427            | -14.180        |  | -14.180         | 8.00        | -22.180     |
| 6       | 2437            | -14.501        |  | -14.501         | 8.00        | -22.501     |
| 8       | 2447            | -14.551        |  | -14.551         | 8.00        | -22.551     |
| 11      | 2462            | -18.981        |  | -18.981         | 8.00        | -26.981     |

## 10.5.4. PSD PLOTS







## **10.6. OUT-OF-BAND EMISSIONS**

### **LIMITS**

FCC §15.247 (d)

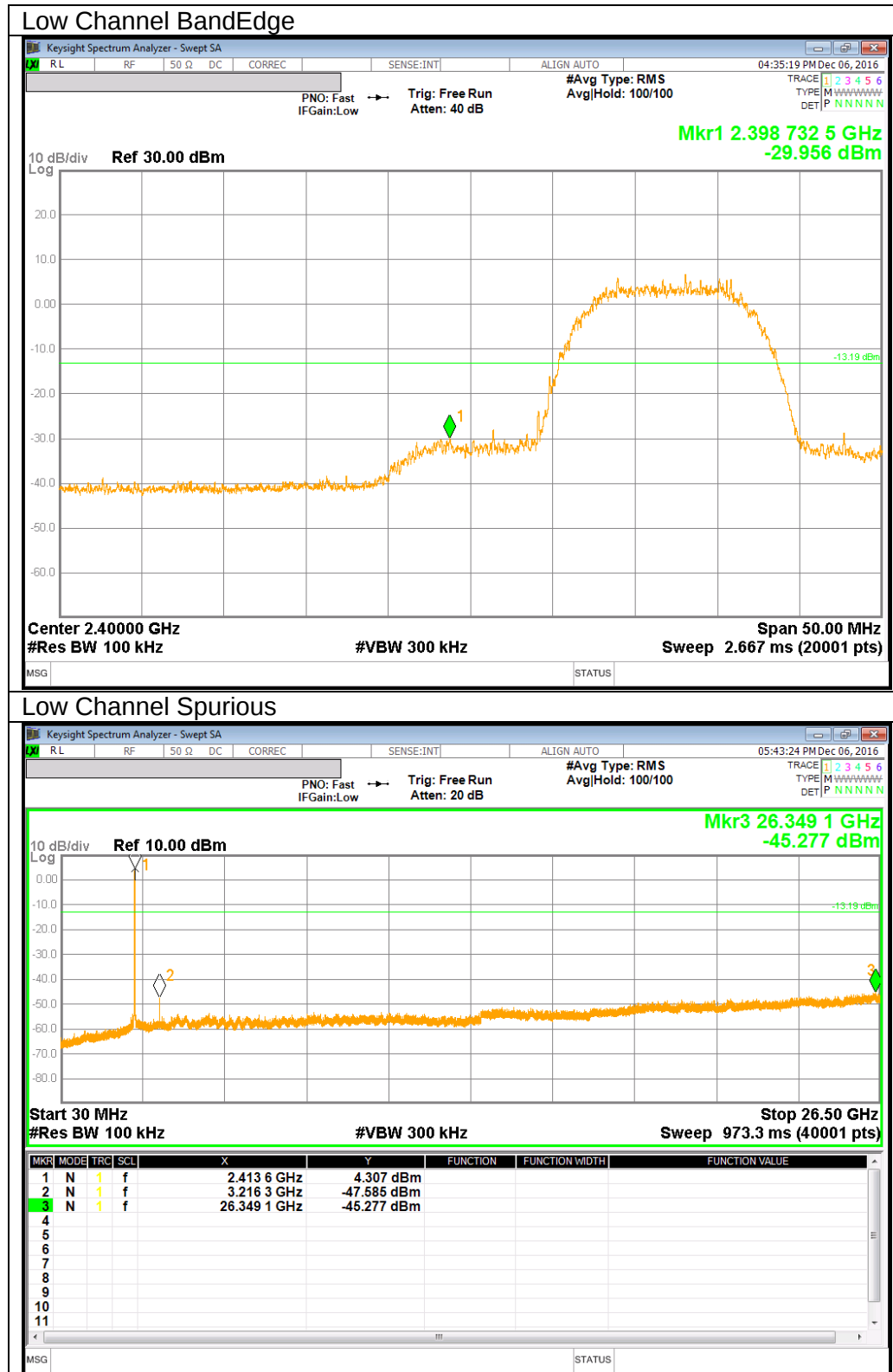
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

### **TEST PROCEDURE**

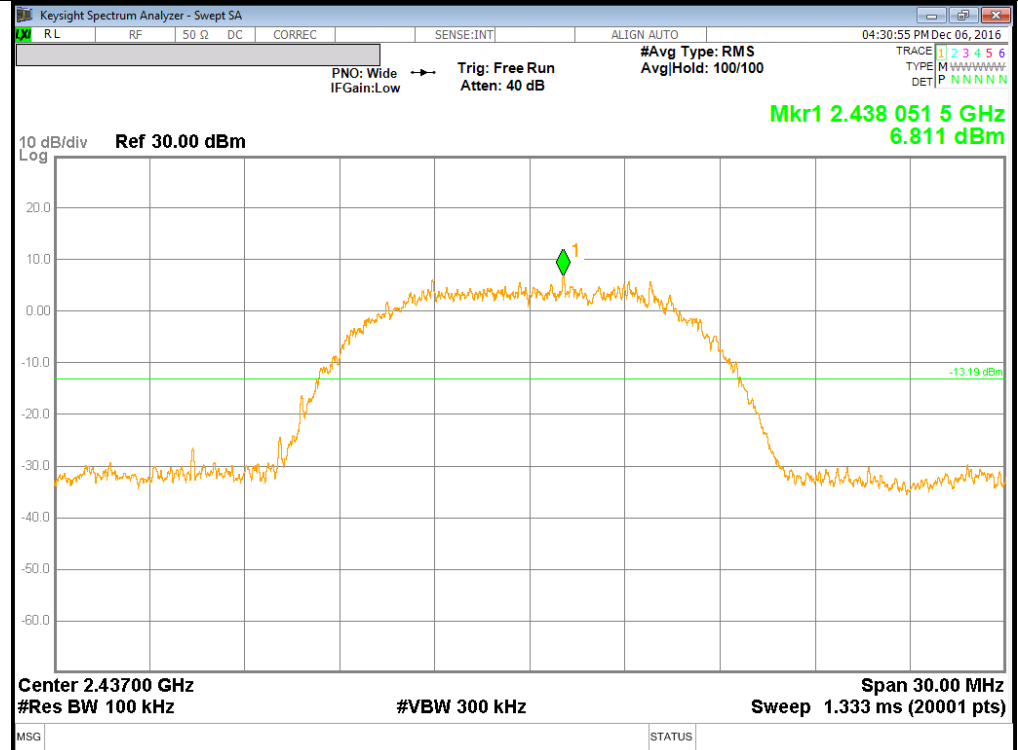
The transmitter output is connected to a spectrum analyzer with RBW = 100 kHz, VBW = 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, bandedge (where measurements to the general radiated limits will not be made) and out-of-band emissions.

## RESULTS

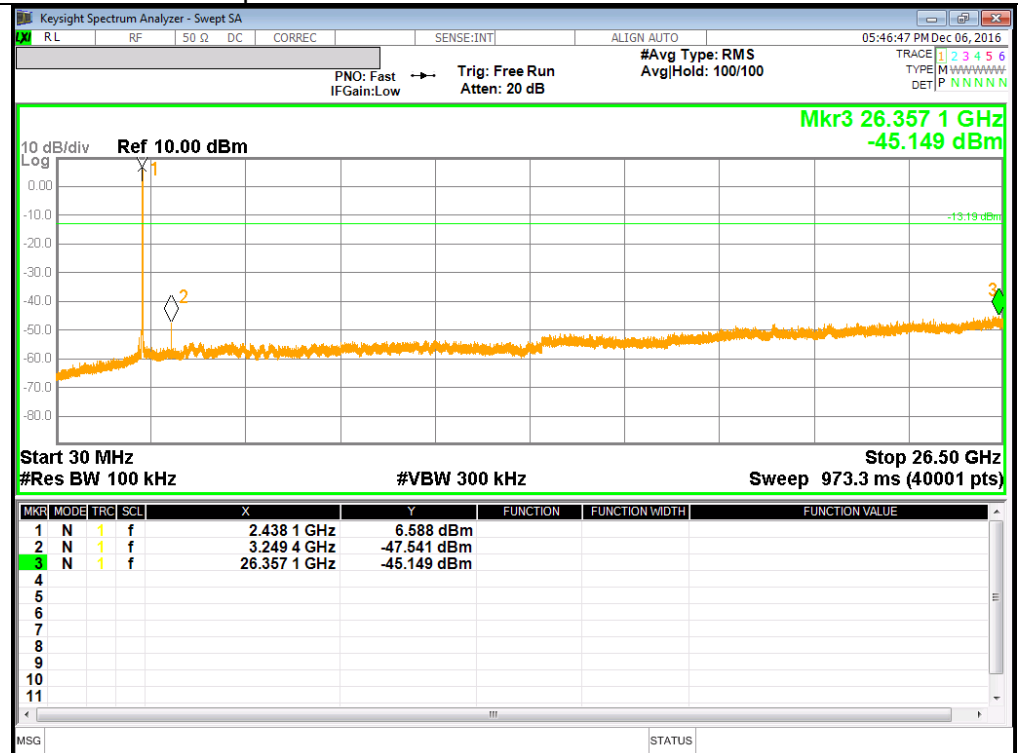
### 10.6.1. 802.11b MODE IN THE 2.4 GHZ BAND

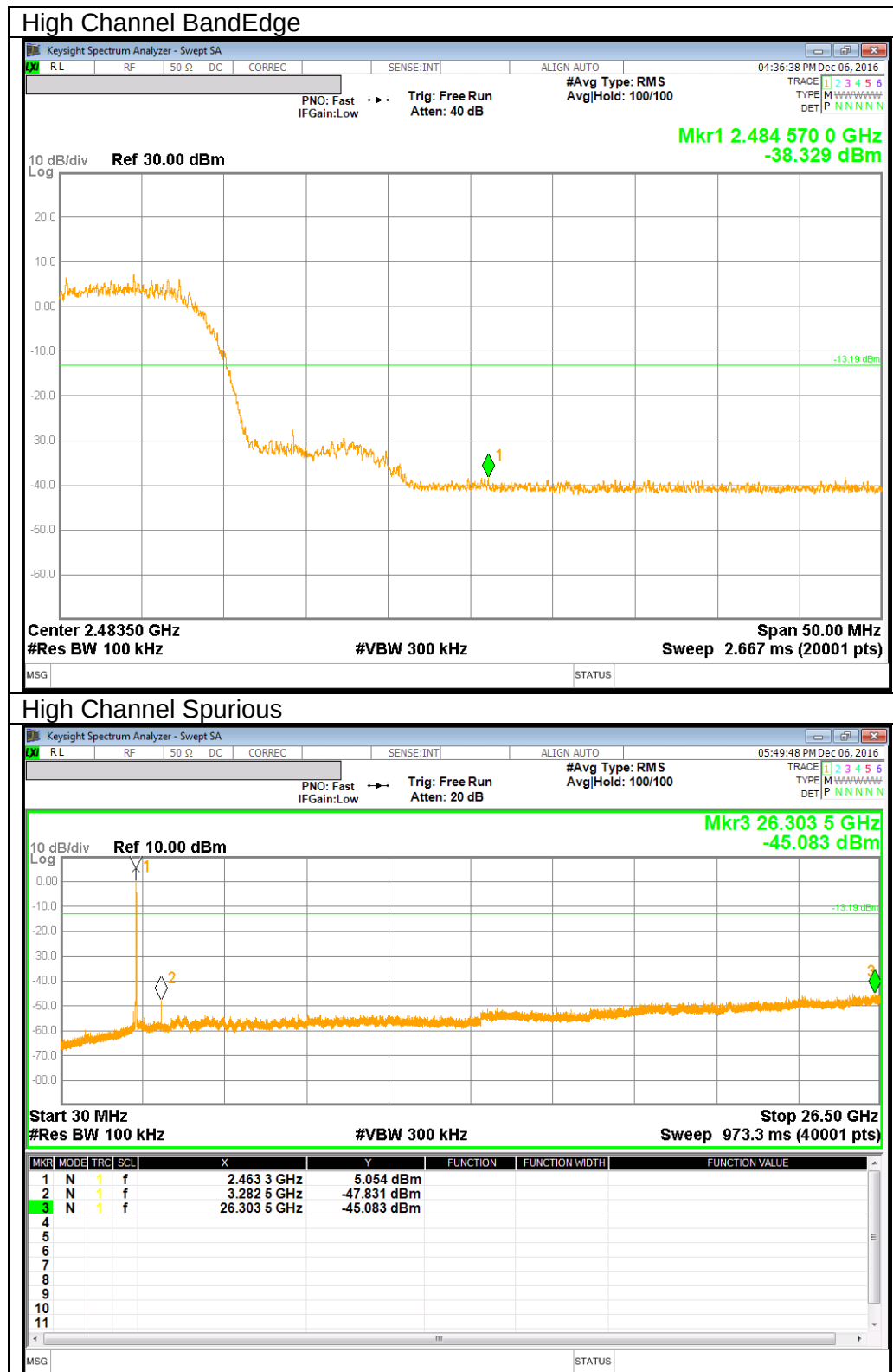


### Middle Channel BandEdge

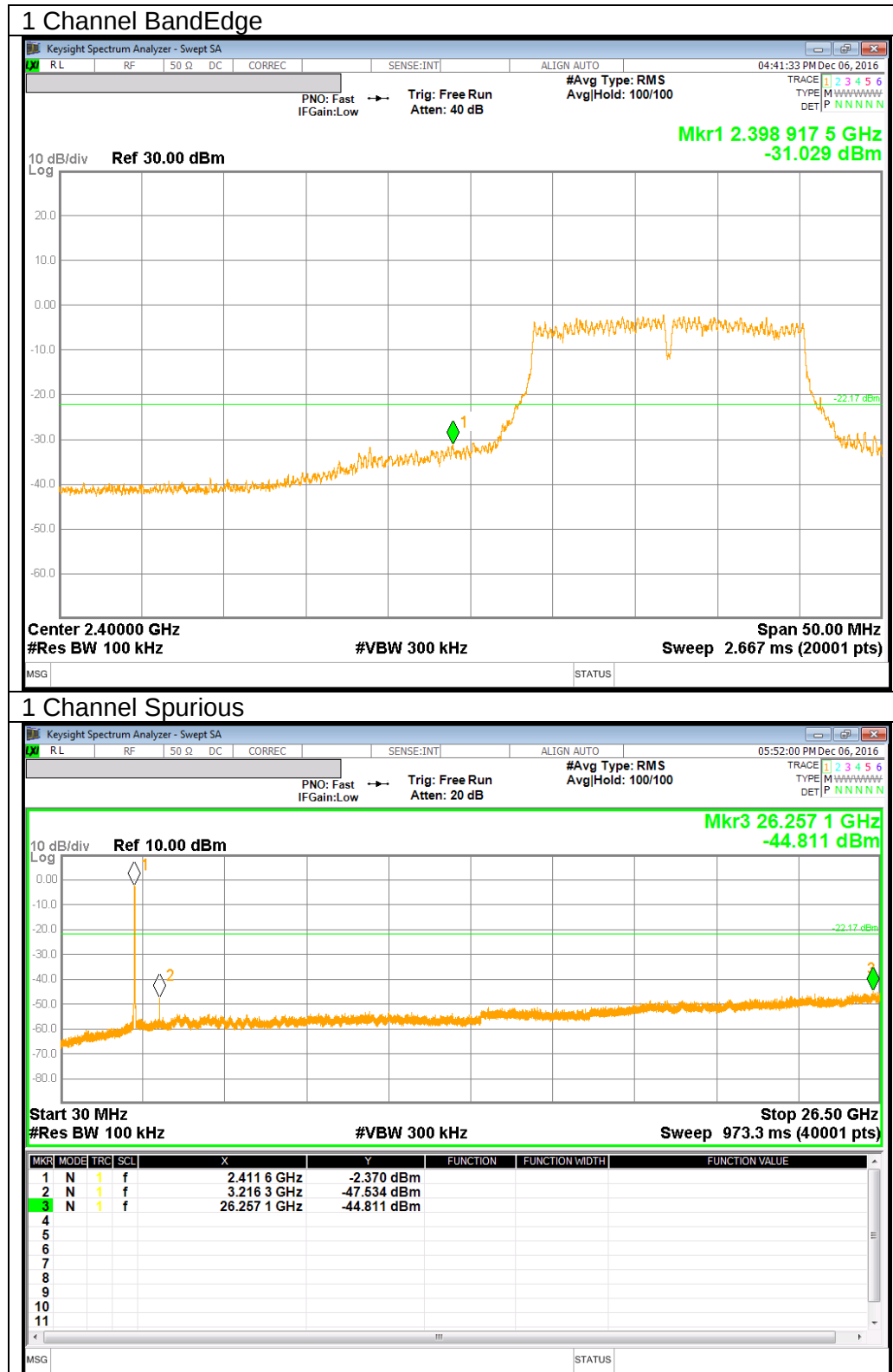


### Middle Channel Spurious

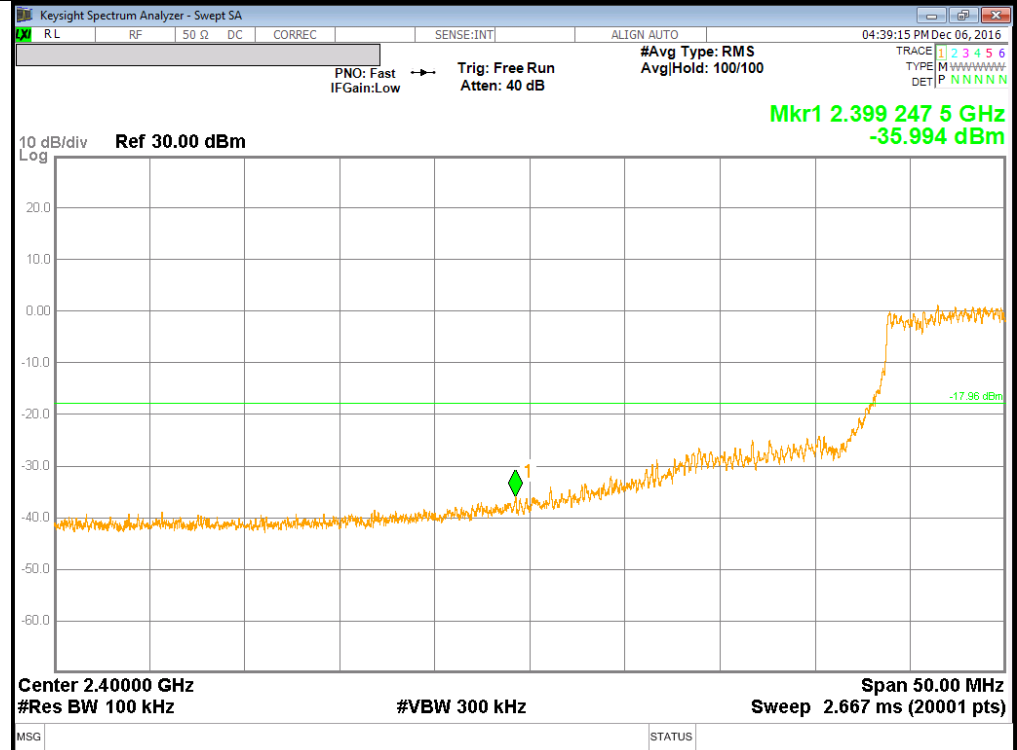




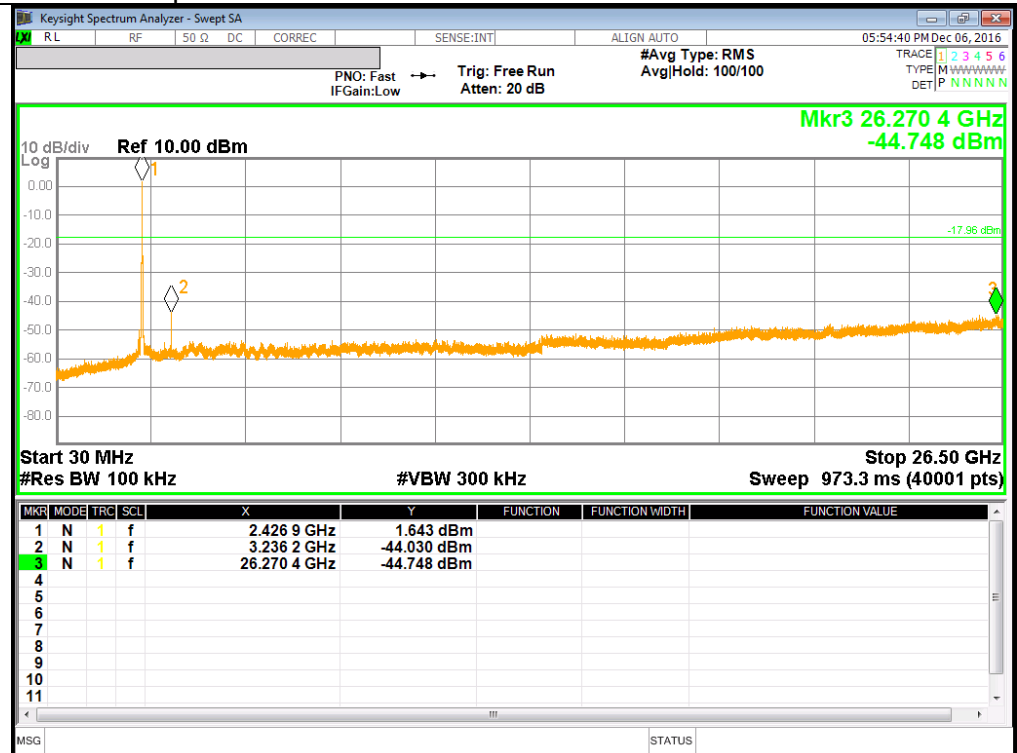
## 10.6.2. 802.11g MODE IN THE 2.4 GHZ BAND



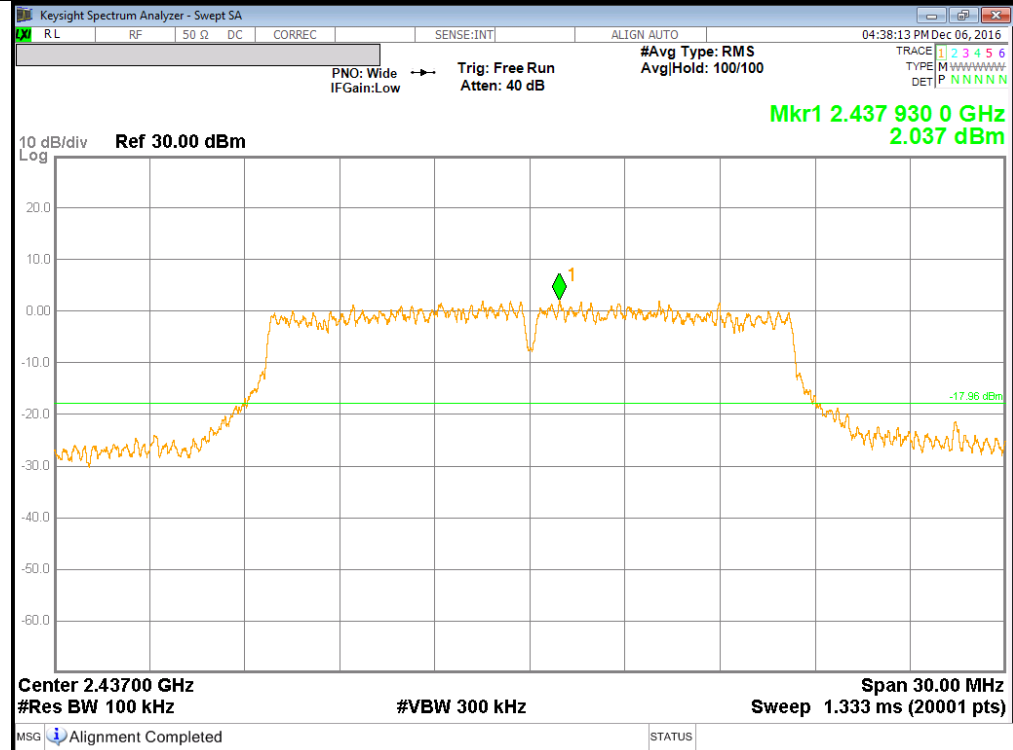
#### 4 Channel BandEdge



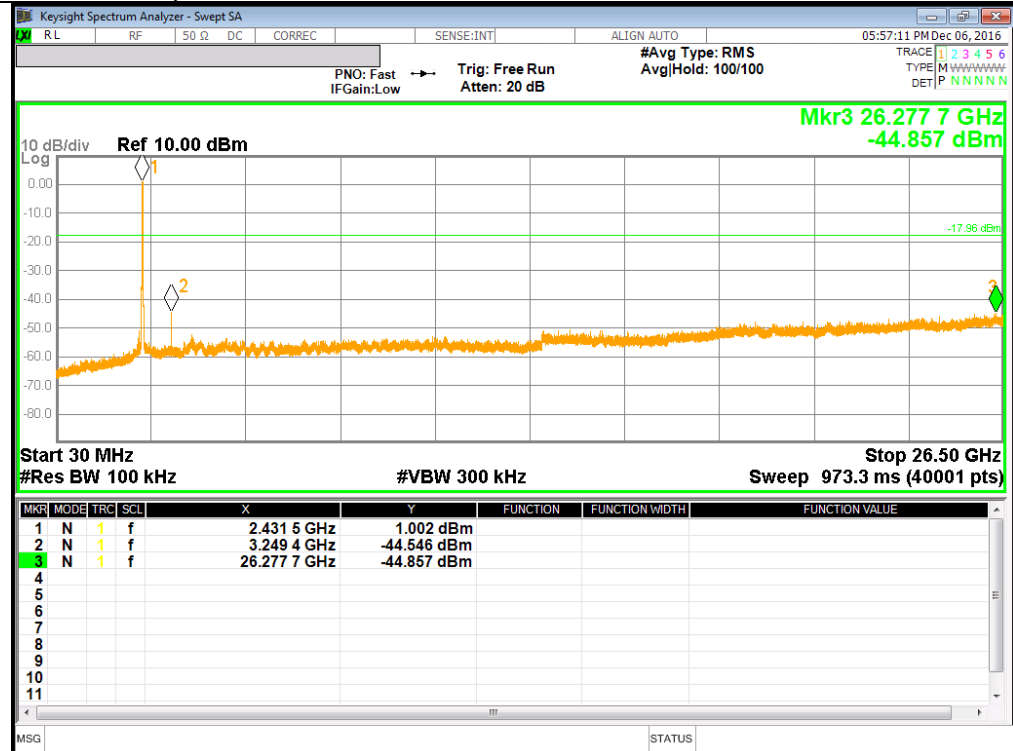
#### 4 Channel Spurious



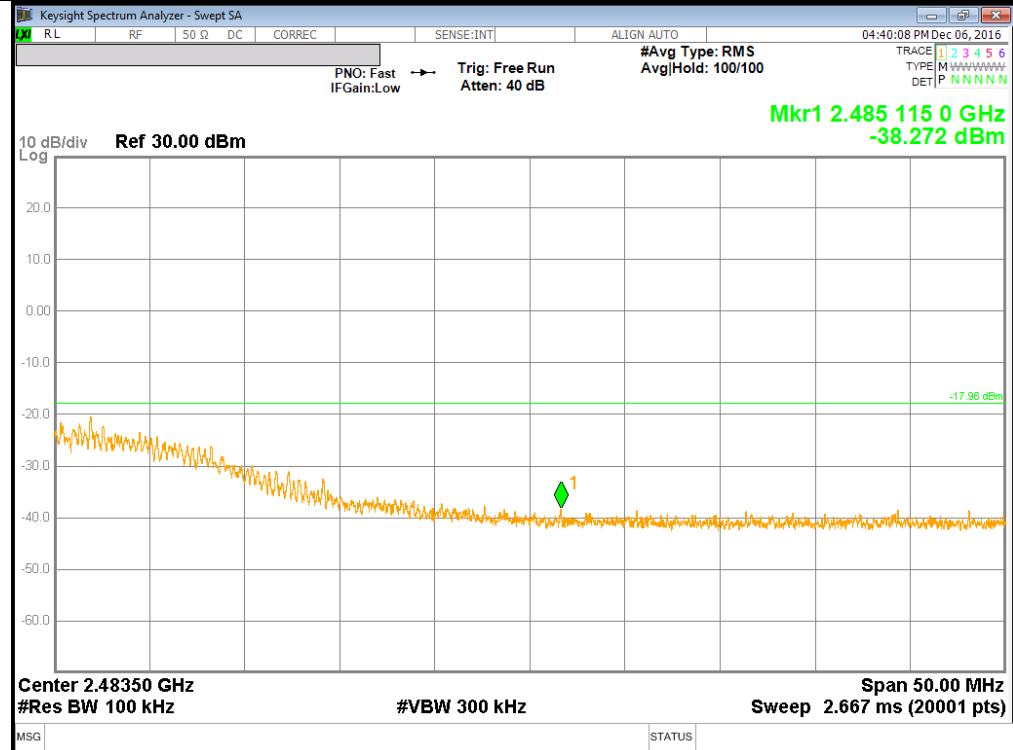
## 6 Channel BandEdge



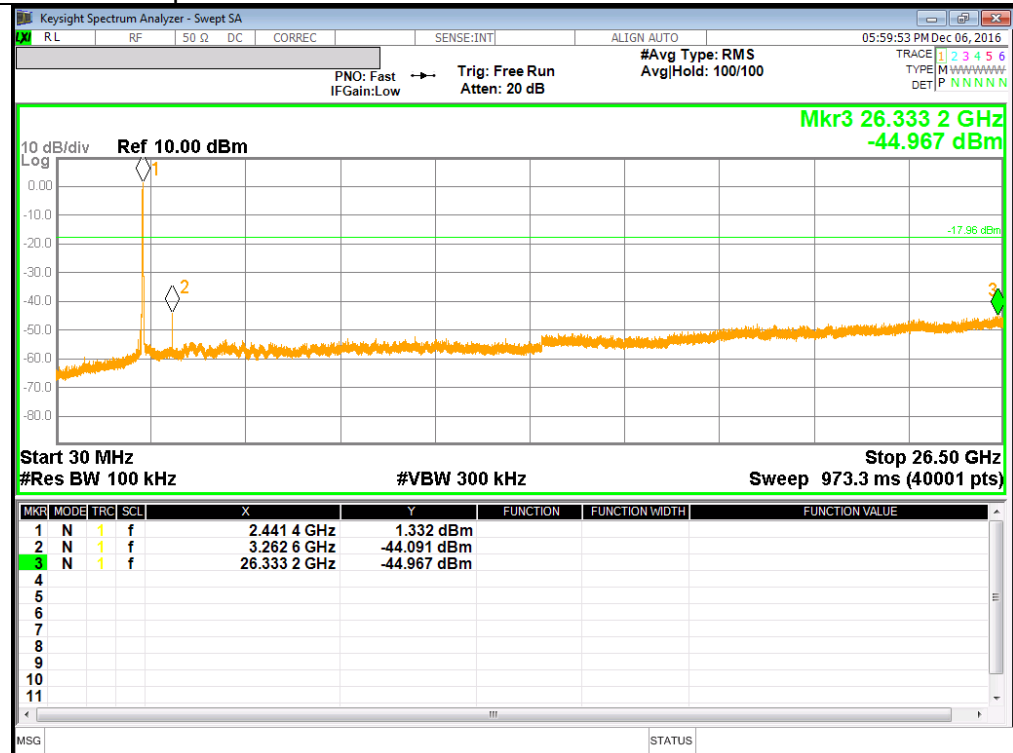
## 6 Channel Spurious



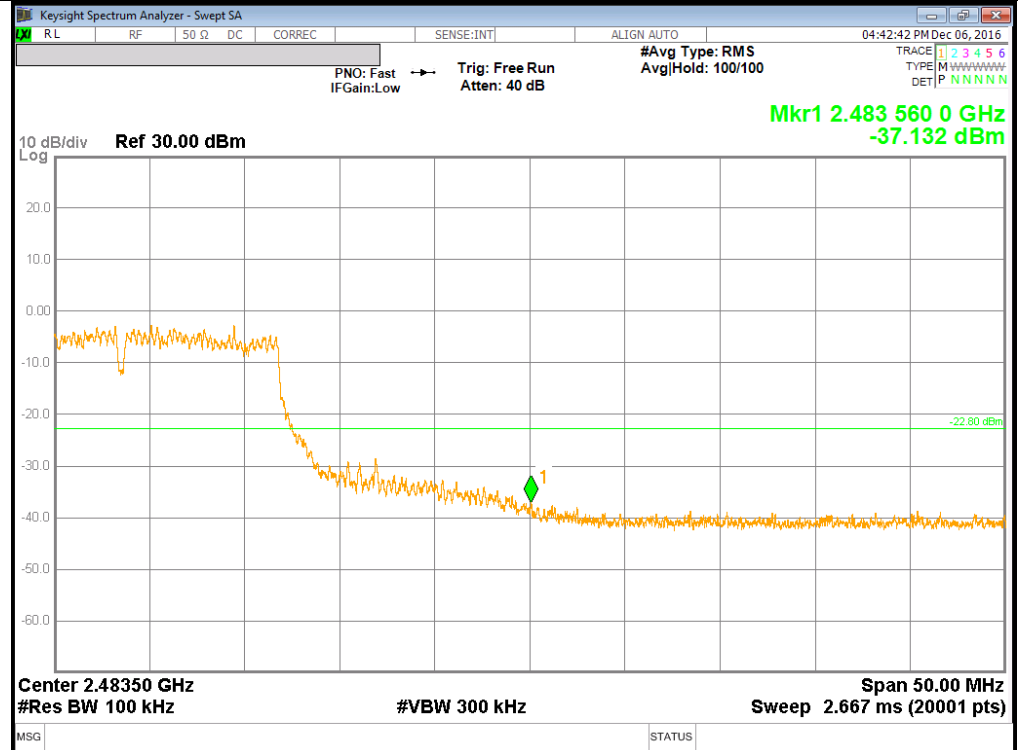
## 8 Channel BandEdge



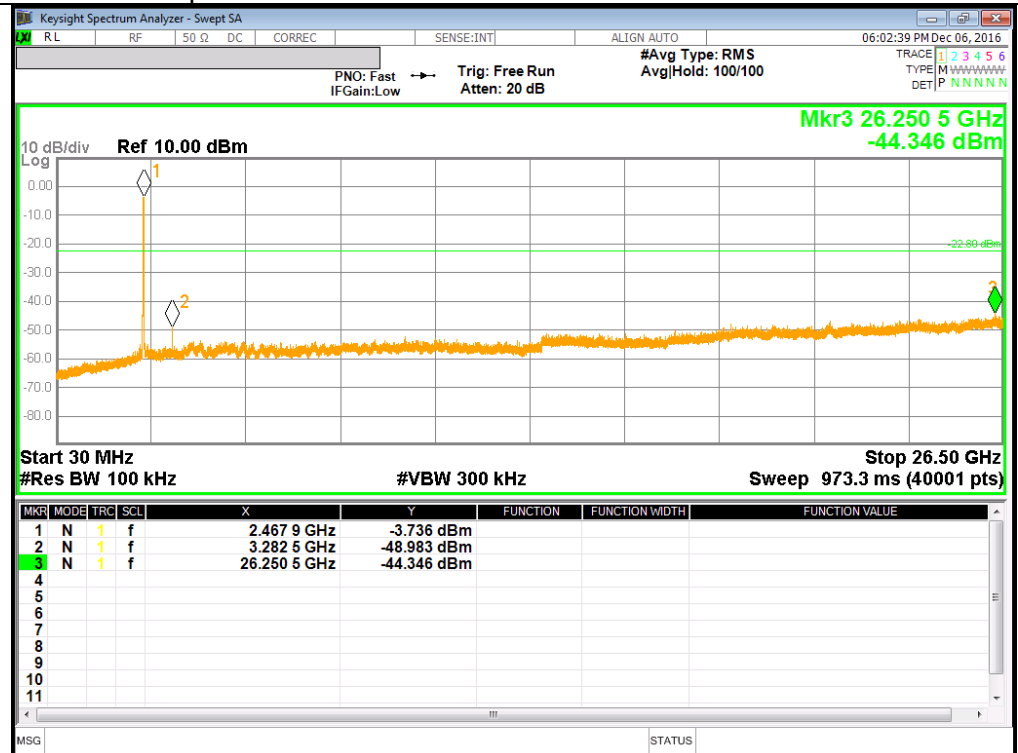
## 8 Channel Spurious



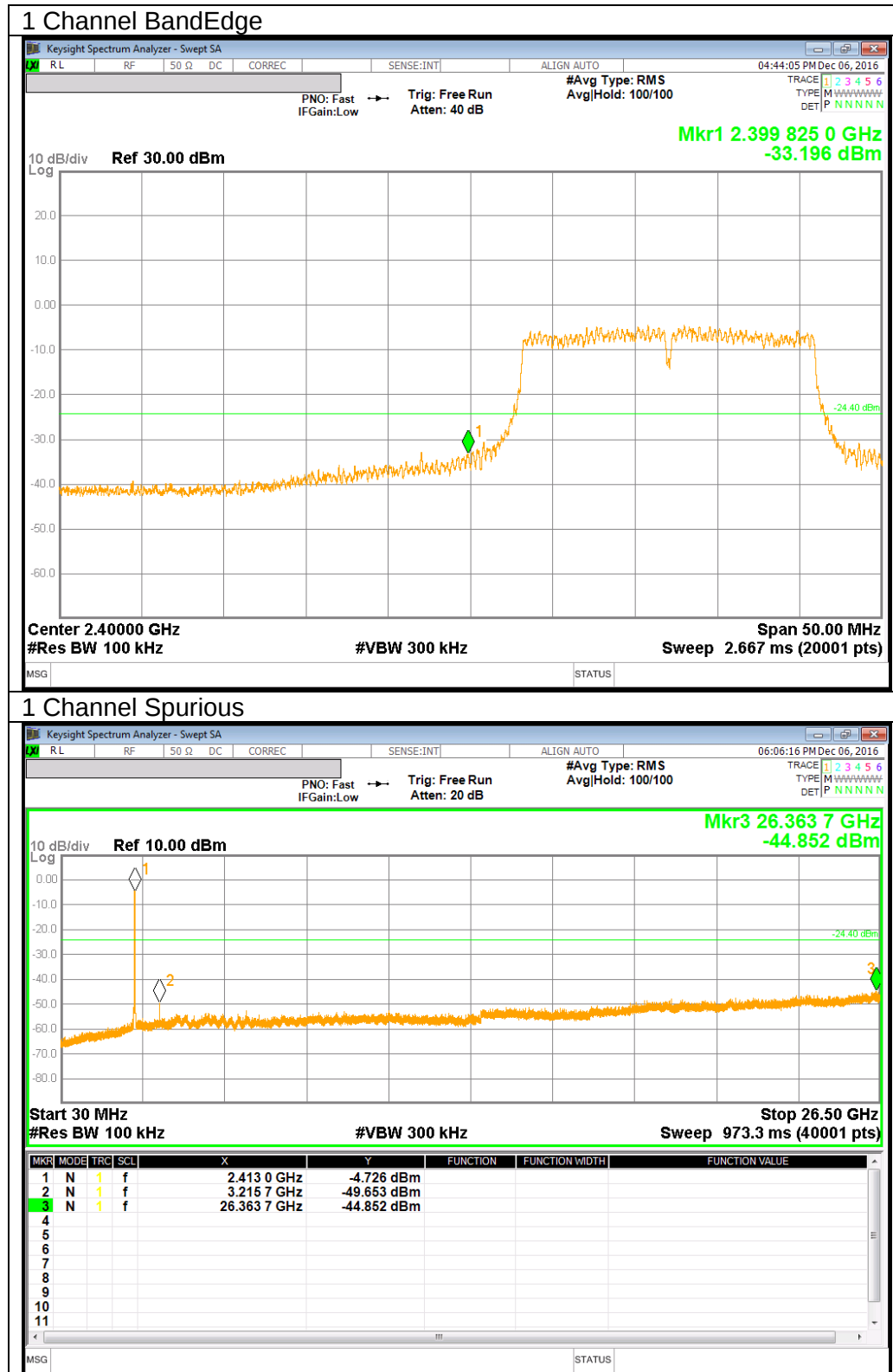
## 11 Channel BandEdge



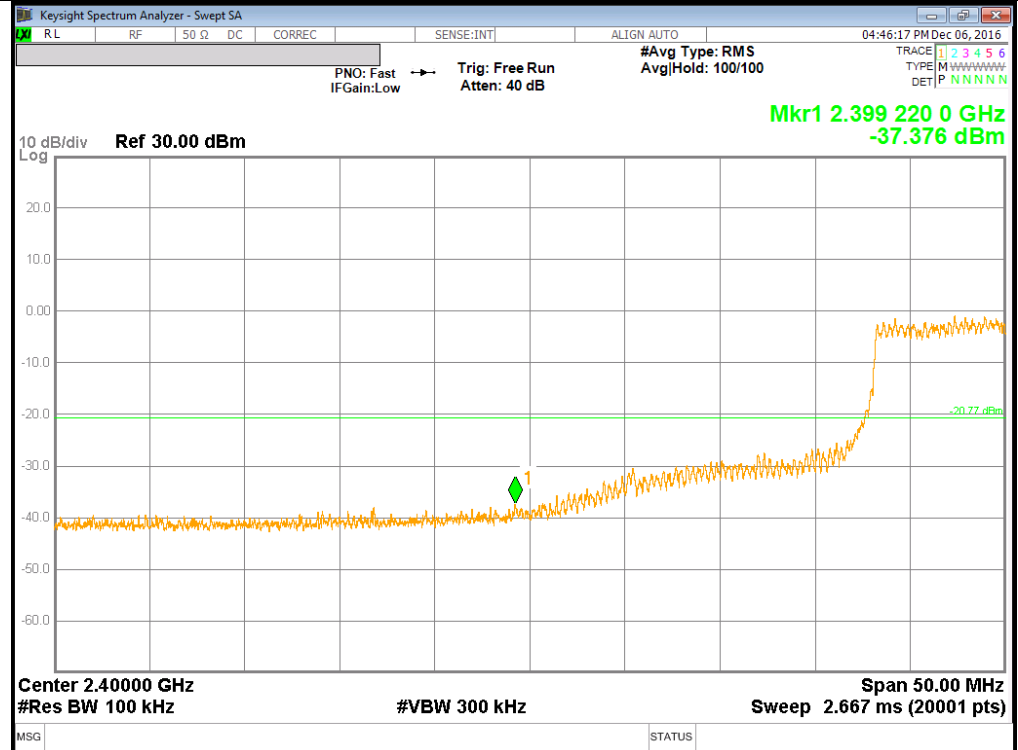
## 11 Channel Spurious



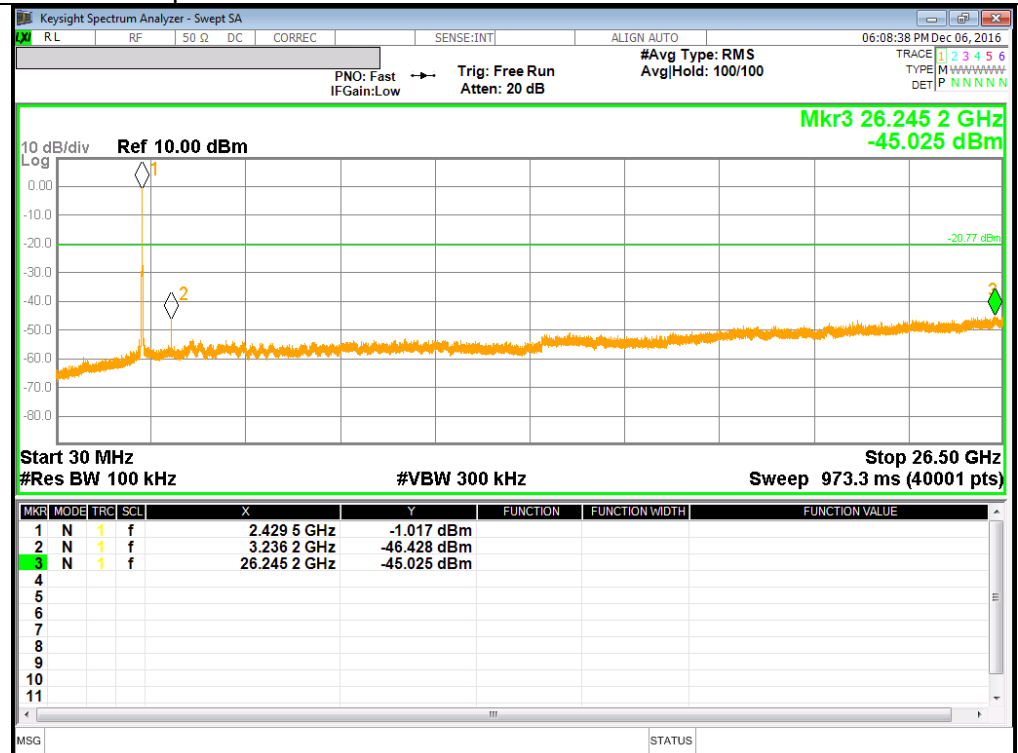
### 10.6.3. 802.11n HT20 MODE IN THE 2.4 GHz BAND



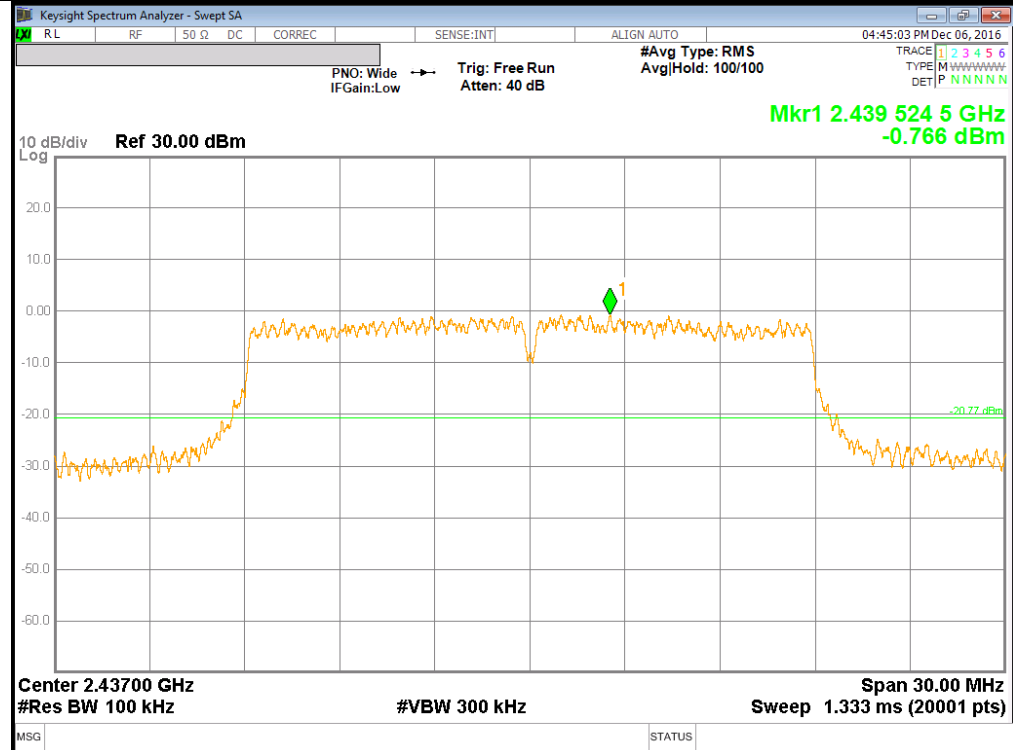
#### 4 Channel BandEdge



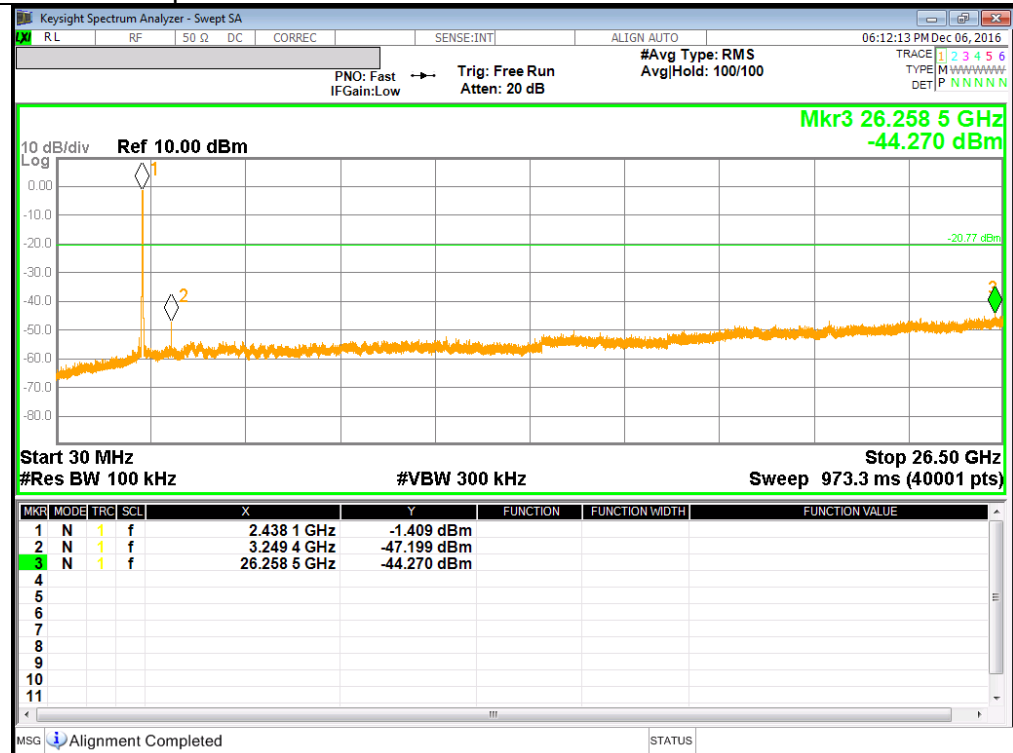
#### 4 Channel Spurious



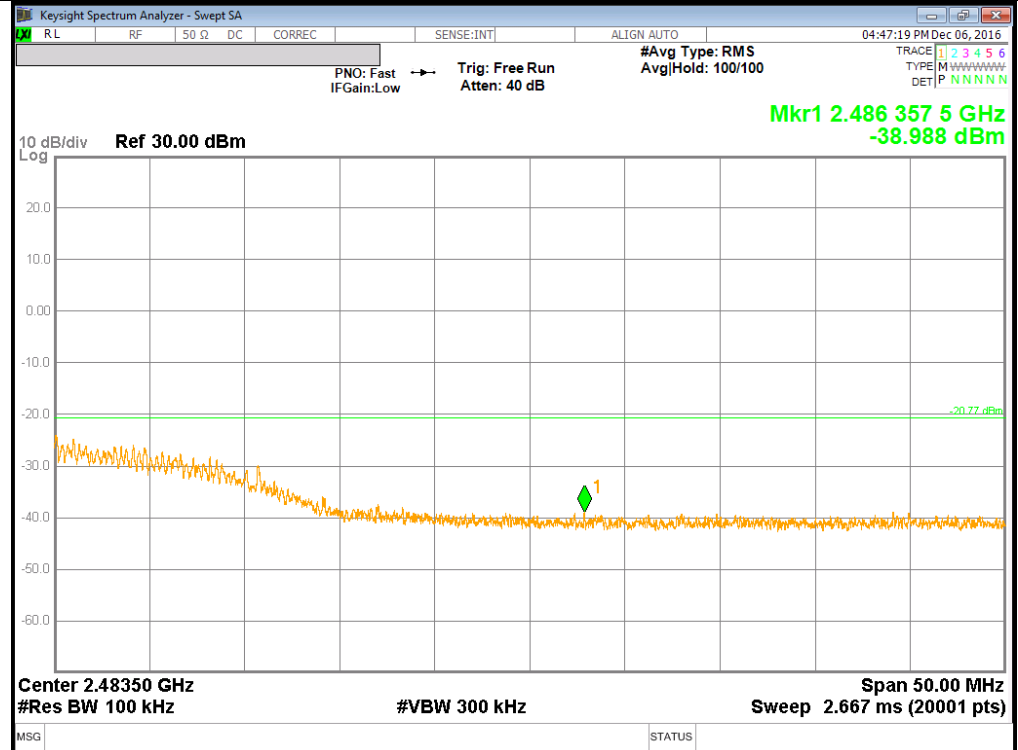
## 6 Channel BandEdge



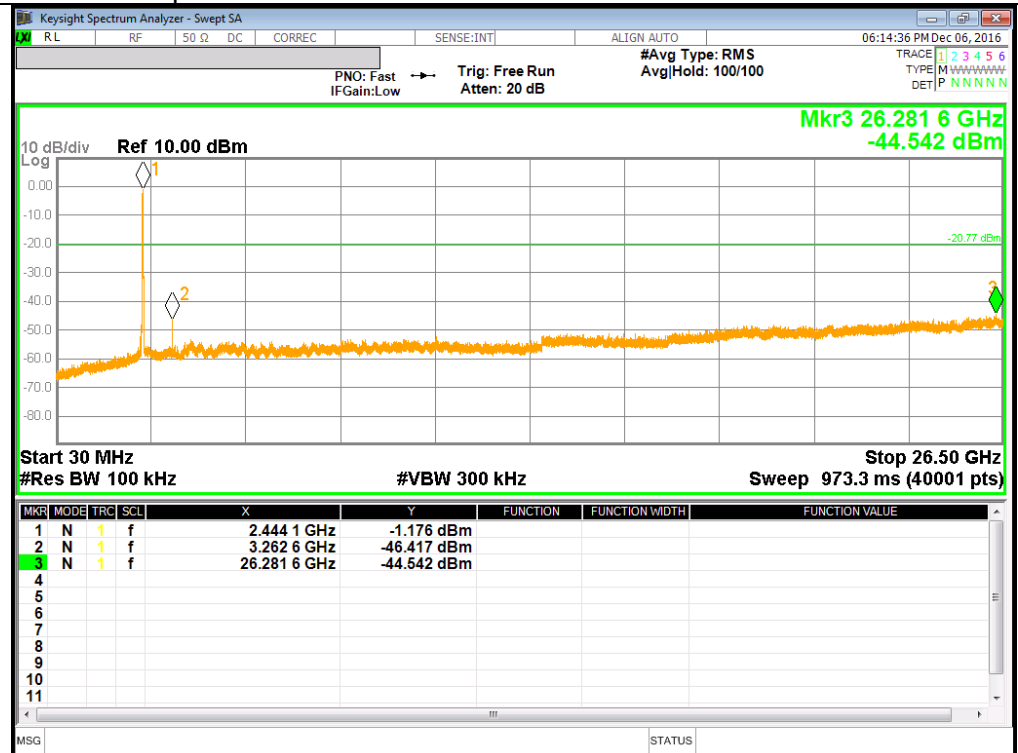
## 6 Channel Spurious



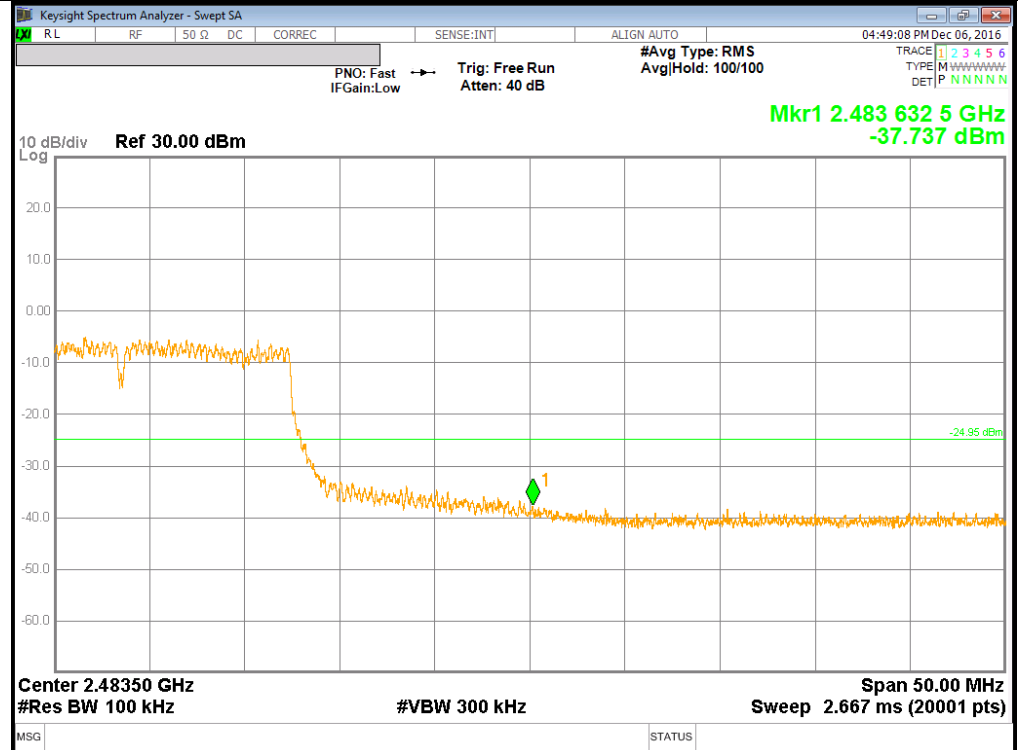
### 8 Channel BandEdge



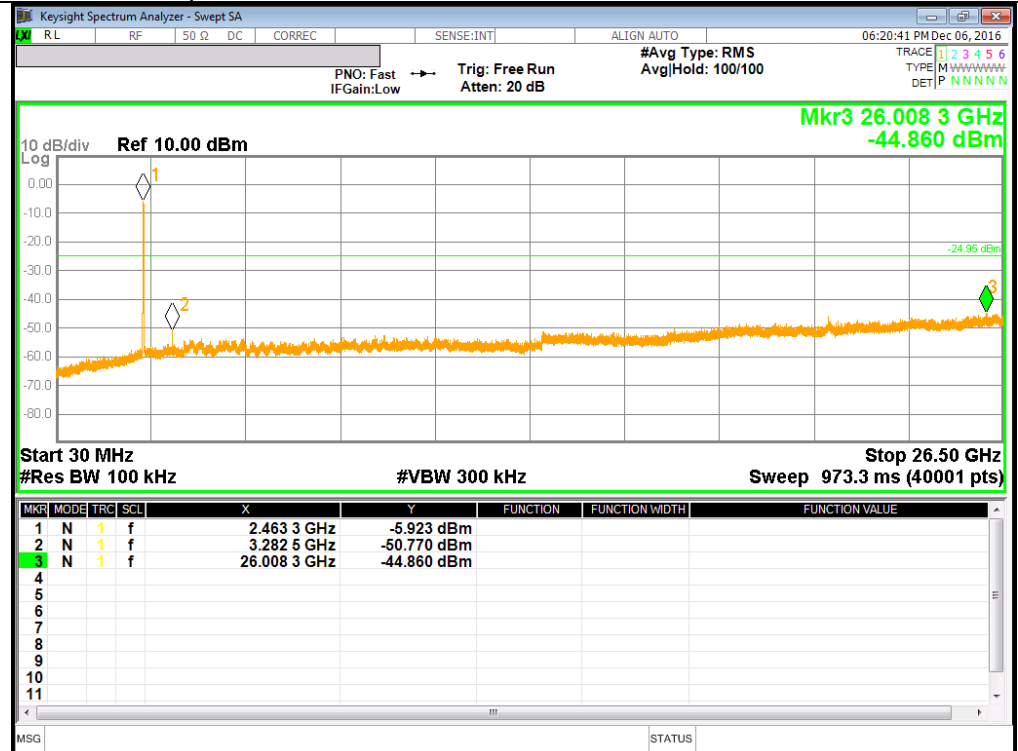
### 8 Channel Spurious



## 11 Channel BandEdge



## 11 Channel Spurious



## 11. RADIATED TEST RESULTS

### 11.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §15.205 and §15.209

| Limits for radiated disturbance of an intentional radiator |                 |                          |
|------------------------------------------------------------|-----------------|--------------------------|
| Frequency range (MHz)                                      | Limits (μV/m)   | Measurement Distance (m) |
| 0.009 – 0.490                                              | 2400 / F (kHz)  | 300                      |
| 0.490 – 1.705                                              | 24000 / F (kHz) | 30                       |
| 1.705 – 30.0                                               | 30              | 30                       |
| 30 – 88                                                    | 100**           | 3                        |
| 88 - 216                                                   | 150**           | 3                        |
| 216 – 960                                                  | 200**           | 3                        |
| Above 960                                                  | 500             | 3                        |

\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

## **TEST PROCEDURE**

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz and 150 cm for above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor for average measurements. (Restricted bandedge, Final detection of spurious harmonic emissions)

Duty cycle factor=  $10\log(1/x)$  For this sample B,G,N mode = 0dB (duty cycle >98%)

Pre-scans to detect harmonic and spurious emissions, the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

The spectrum from 1 GHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

(From 30MHz to 1GHz, test was performed with the EUT set to transmit at the channel with highest output power)

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.

Note : Emission was pre-scanned from 9KHz to 30MHz; No emissions were detected which was at least 20dB below the specification limit (consider distance correction factor).

Per FCC part 15.31(o), test results were not reported.

Formula for converting the filed strength from uV/m to dBuV/m is:

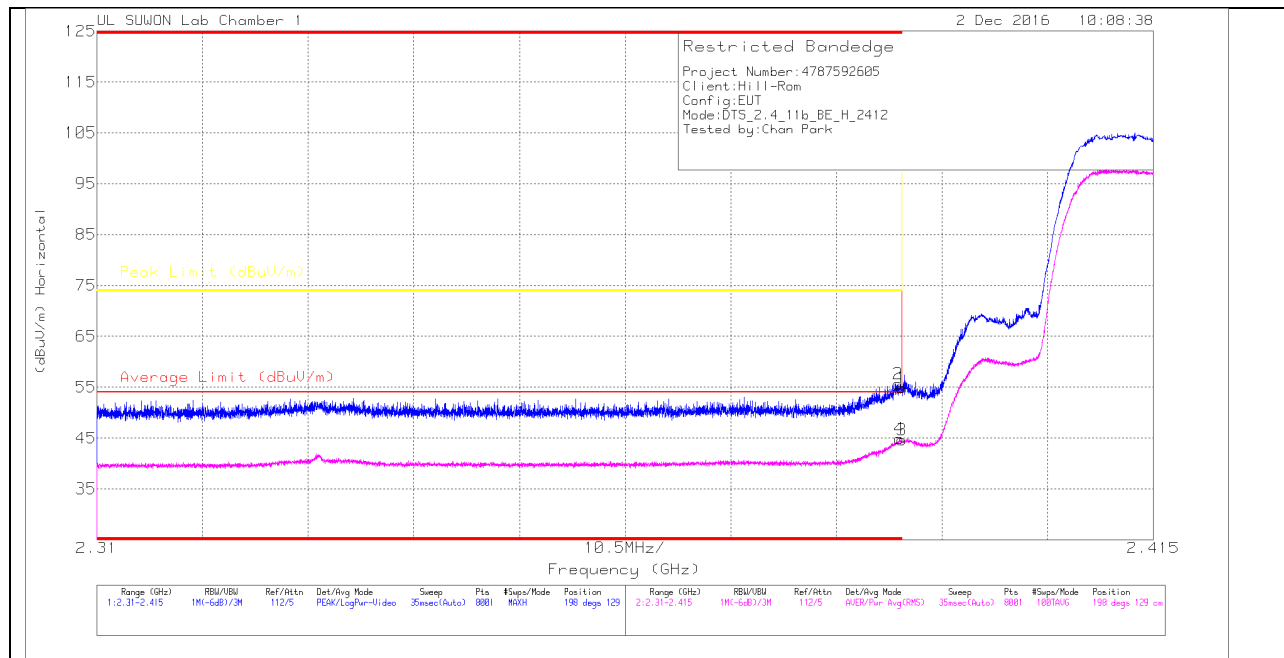
Limit (dBuV/m) =  $20 \log \text{limit (uV/m)}$

## 11.2. TRANSMITTER ABOVE 1 GHz

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

#### RESTRICTED BANDEDGE (LOW CHANNEL)

##### HORIZONTAL PEAK AND AVERAGE PLOT



##### HORIZONTAL DATA

###### Trace Markers

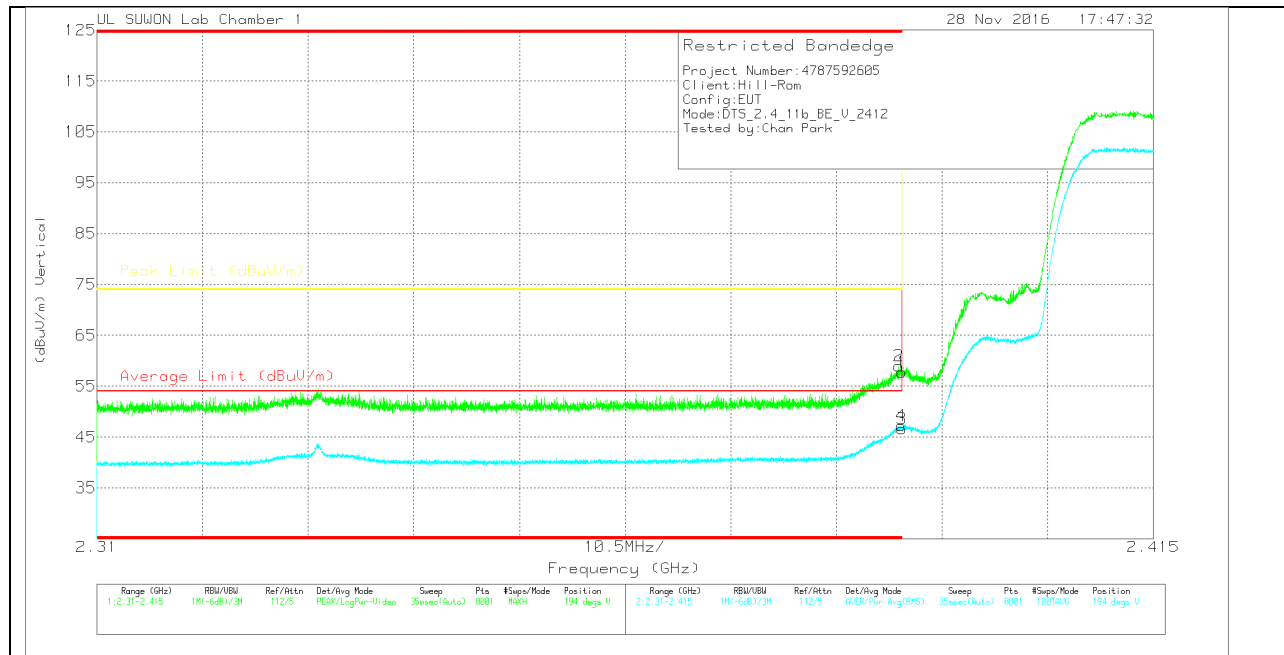
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117/0016 8717/_150 619 | 10dB[dB] | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|-------------------------|----------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.39          | 51.54                | Pk  |                         | -28.4    | 54.94                      | -                      | -           | 74                  | -19.06         | 198            | 129         | H        |
| 2      | * 2.39          | 52.22                | Pk  |                         | -28.4    | 55.62                      | -                      | -           | 74                  | -18.38         | 198            | 129         | H        |
| 3      | * 2.39          | 41.25                | RMS |                         | -28.4    | 44.65                      | 54                     | -9.35       | -                   | -              | 198            | 129         | H        |
| 4      | * 2.39          | 41.49                | RMS |                         | -28.4    | 44.89                      | 54                     | -9.11       | -                   | -              | 198            | 129         | H        |

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

Pk - Peak detector

RMS - RMS detection

## VERTICAL PEAK AND AVERAGE PLOT



## VERTICAL DATA

### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717)_150 619 | 10dB[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          | 54.33                | Pk  | 31.8                    | -28.4    | 57.73                      | -                      | -           | 74                  | -16.27         | 194            | 187         | V        |
| 2      | * 2.39          | 55.57                | Pk  | 31.8                    | -28.4    | 58.97                      | -                      | -           | 74                  | -15.03         | 194            | 187         | V        |
| 3      | * 2.39          | 43.22                | RMS | 31.8                    | -28.4    | 46.62                      | 54                     | -7.38       | -                   | -              | 194            | 187         | V        |
| 4      | * 2.39          | 43.86                | RMS | 31.8                    | -28.4    | 47.26                      | 54                     | -6.74       | -                   | -              | 194            | 187         | V        |

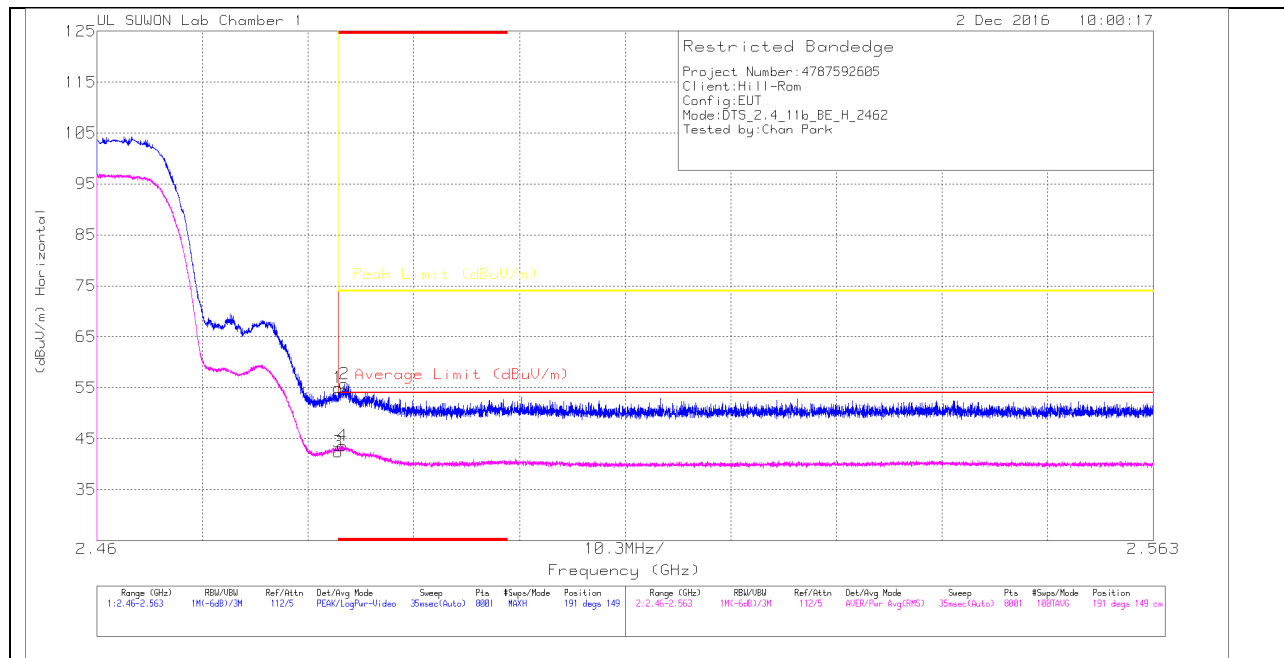
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

## AUTHORIZED BANDEDGE (HIGH CHANNEL)

### HORIZONTAL PEAK AND AVERAGE PLOT



### HORIZONTAL DATA

#### Trace Markers

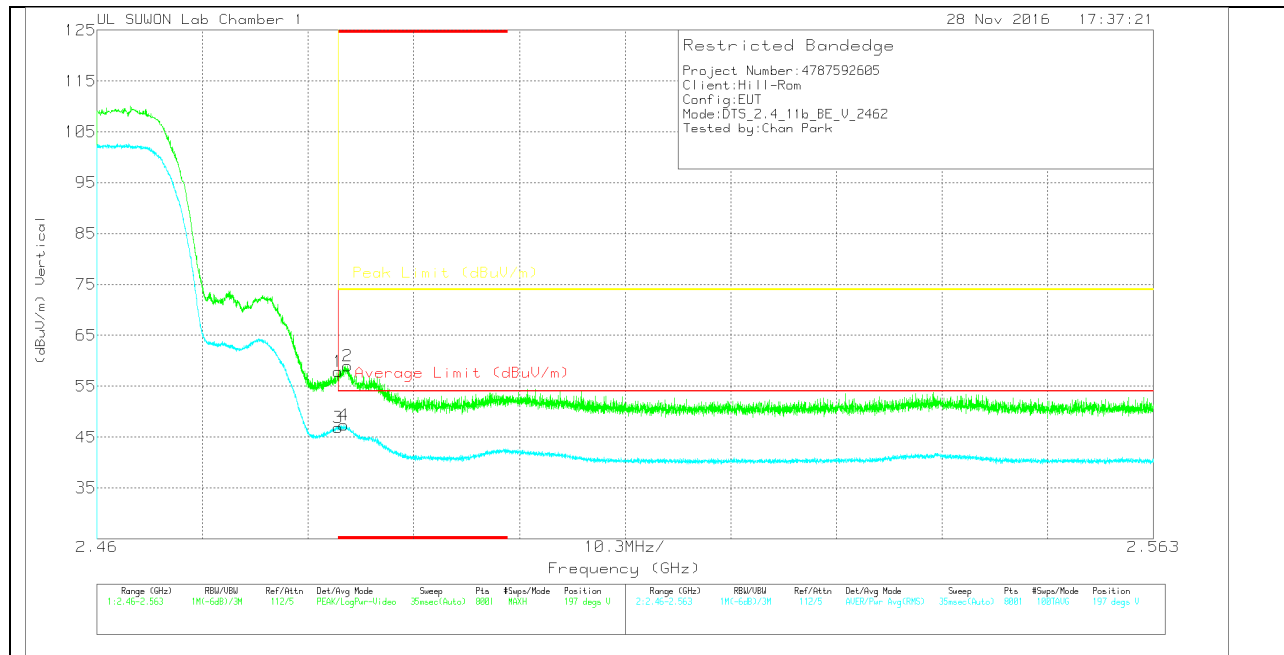
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717)_150 619 | 10dB[dB] | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|-------------------------|----------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.484         | 51.28                | Pk  | 32                      | -28.3    | 54.98                      | -                      | -           | 74                  | -19.02         | 191            | 149         | H        |
| 2      | * 2.484         | 52.03                | Pk  | 32                      | -28.3    | 55.73                      | -                      | -           | 74                  | -18.27         | 191            | 149         | H        |
| 3      | * 2.484         | 38.76                | RMS | 32                      | -28.3    | 42.46                      | 54                     | -11.54      | -                   | -              | 191            | 149         | H        |
| 4      | * 2.484         | 39.93                | RMS | 32                      | -28.3    | 43.63                      | 54                     | -10.37      | -                   | -              | 191            | 149         | H        |

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

Pk - Peak detector

RMS - RMS detection

## VERTICAL PEAK AND AVERAGE PLOT



## VERTICAL DATA

### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717)_150 619 | 10dB[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         | 54.17                | Pk  | 32                      | -28.3    | 57.87                      | -                      | -           | 74                  | -16.13         | 197            | 203         | V        |
| 2      | * 2.484         | 55.3                 | Pk  | 32                      | -28.3    | 59                         | -                      | -           | 74                  | -15            | 197            | 203         | V        |
| 3      | * 2.484         | 43.2                 | RMS | 32                      | -28.3    | 46.9                       | 54                     | -7.1        | -                   | -              | 197            | 203         | V        |
| 4      | * 2.484         | 43.62                | RMS | 32                      | -28.3    | 47.32                      | 54                     | -6.68       | -                   | -              | 197            | 203         | V        |

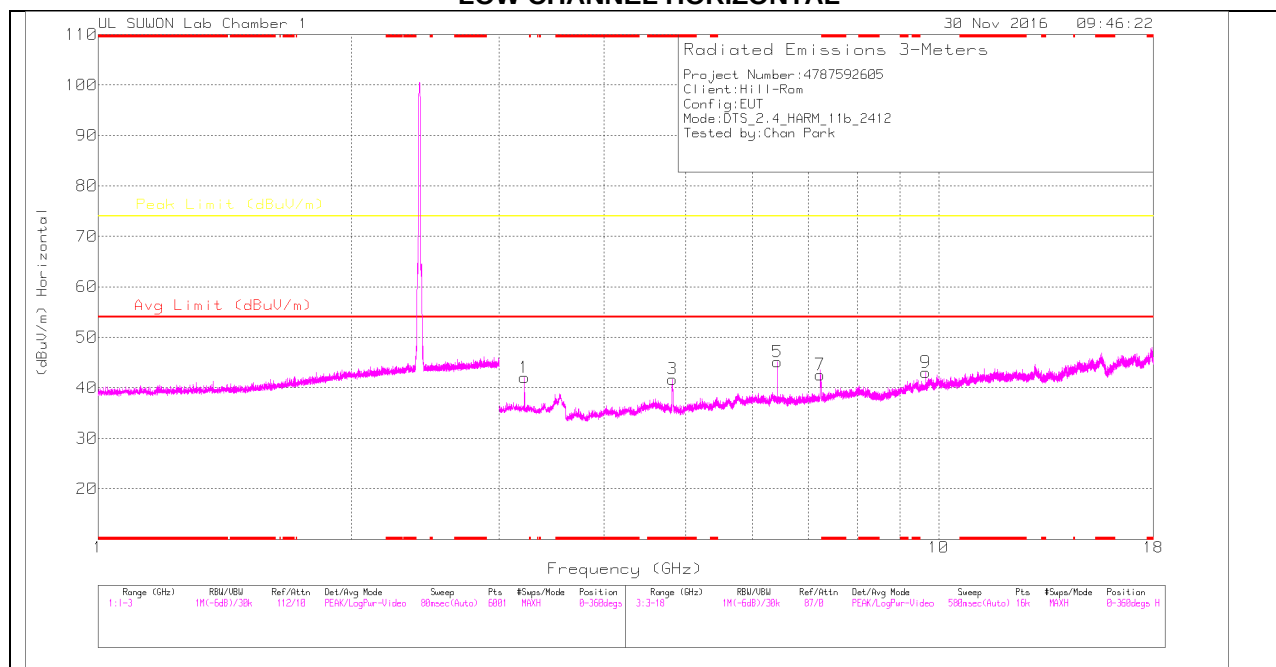
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

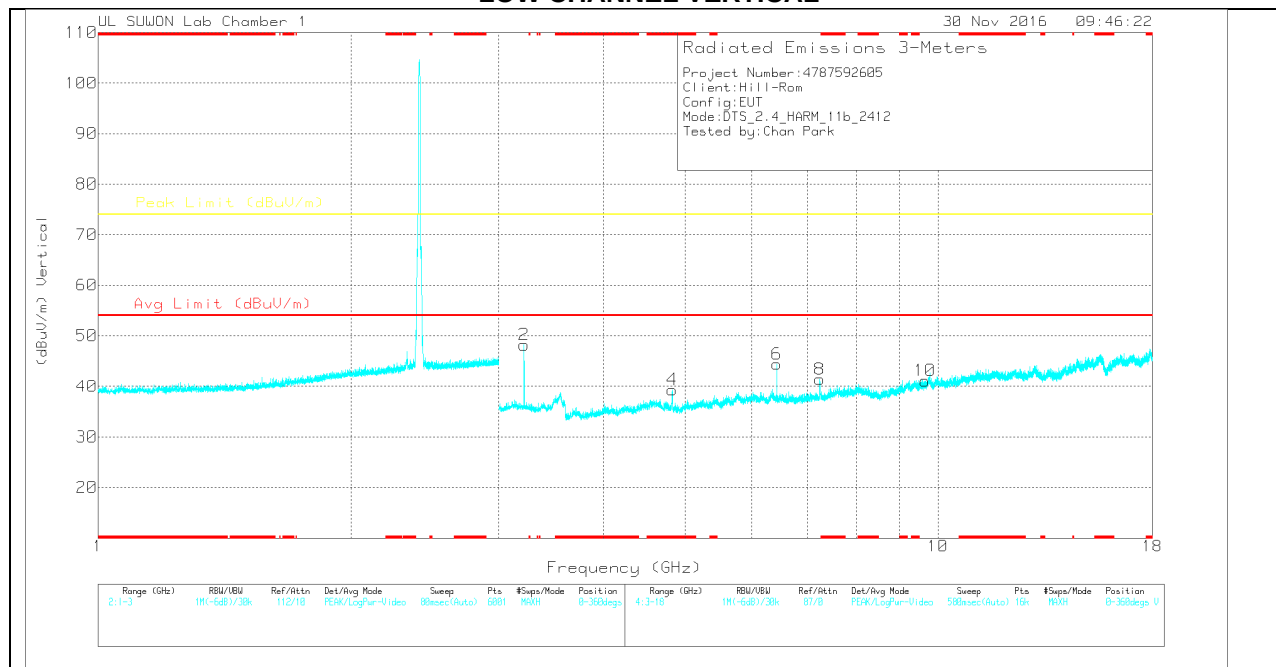
RMS - RMS detection

## HARMONICS AND SPURIOUS EMISSIONS

### LOW CHANNEL HORIZONTAL



### LOW CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

## LOW CHANNEL DATA

### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717)_150 619 | 3GHz_HP[d B] | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|-------------------------|--------------|----------------------------|--------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| 1      | 3.216           | 45.5                 | PK  | 32.6                    | -36.1        | 42                         | -                  | -           | 74                  | -32         | 0-360          | 250         | H        |
| 3      | * 4.825         | 41.22                | PK  | 34                      | -33.5        | 41.72                      | -                  | -           | 74                  | -32.28      | 0-360          | 150         | H        |
| 5      | 6.432           | 40.62                | PK  | 35.4                    | -30.9        | 45.12                      | -                  | -           | 74                  | -28.88      | 0-360          | 250         | H        |
| 7      | 7.232           | 37.65                | PK  | 35.7                    | -30.8        | 42.55                      | -                  | -           | 74                  | -31.45      | 0-360          | 150         | H        |
| 9      | 9.648           | 33.35                | PK  | 37.1                    | -27.4        | 43.05                      | -                  | -           | 74                  | -30.95      | 0-360          | 150         | H        |
| 2      | 3.216           | 51.72                | PK  | 32.6                    | -36.1        | 48.22                      | -                  | -           | 74                  | -25.78      | 0-360          | 150         | V        |
| 4      | * 4.828         | 38.82                | PK  | 34                      | -33.5        | 39.32                      | -                  | -           | 74                  | -34.68      | 0-360          | 250         | V        |
| 6      | 6.432           | 39.9                 | PK  | 35.4                    | -30.9        | 44.4                       | -                  | -           | 74                  | -29.6       | 0-360          | 250         | V        |
| 8      | 7.233           | 36.48                | PK  | 35.7                    | -30.8        | 41.38                      | -                  | -           | 74                  | -32.62      | 0-360          | 250         | V        |
| 10     | 9.647           | 31.41                | PK  | 37.1                    | -27.4        | 41.11                      | -                  | -           | 74                  | -32.89      | 0-360          | 250         | V        |

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

PK – Peak detector

### Radiated Emissions

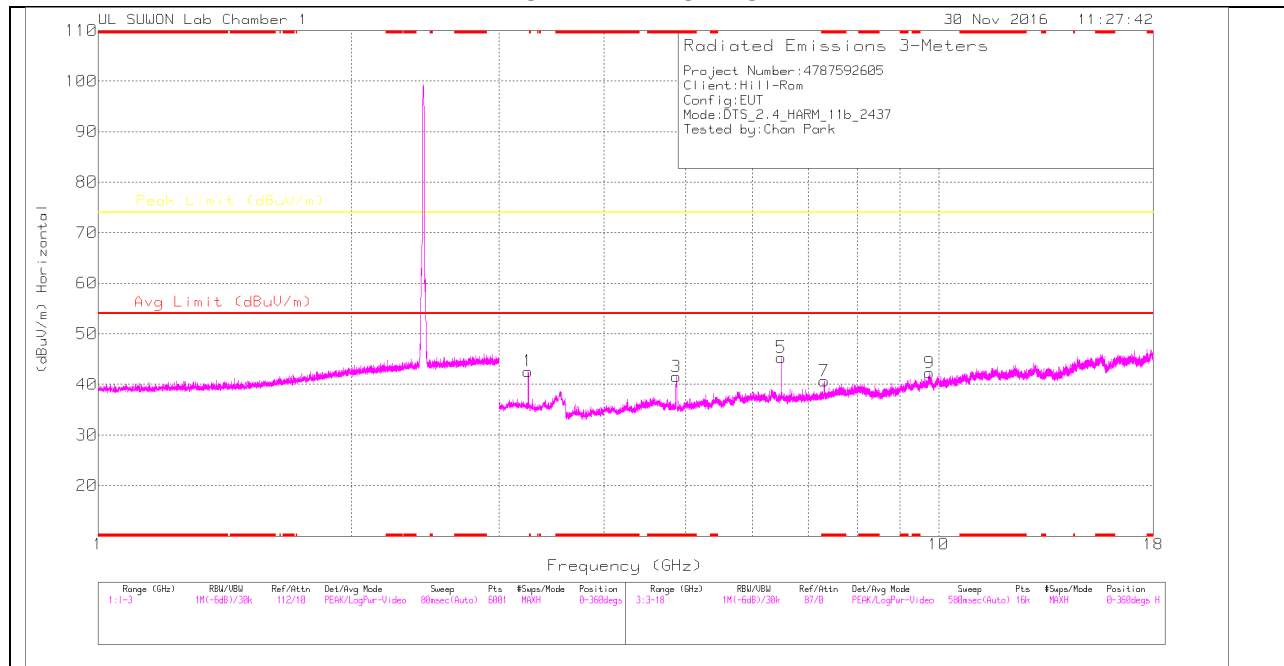
| Frequency (GHz) | Meter Reading (dBuV) | Det  | 3117(0016 8717)_150 619 | 3GHz_HP[dB] | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|----------------------|------|-------------------------|-------------|----------------------------|--------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| 3.216           | 52.94                | PK2  | 32.6                    | -36.1       | 49.44                      | -                  | -           | 74                  | -24.56      | 317            | 283         | H        |
| * 4.824         | 53.44                | PK2  | 34                      | -33.5       | 53.94                      | -                  | -           | 74                  | -20.06      | 246            | 160         | H        |
| * 4.824         | 41.3                 | MAV1 | 34                      | -33.5       | 41.8                       | 54                 | -12.2       | -                   | -           | 246            | 160         | H        |
| 6.432           | 47.24                | PK2  | 35.4                    | -30.9       | 51.74                      | -                  | -           | 74                  | -22.26      | 298            | 254         | H        |
| 7.236           | 48.84                | PK2  | 35.7                    | -30.8       | 53.74                      | -                  | -           | 74                  | -20.26      | 252            | 144         | H        |
| 3.216           | 56.54                | PK2  | 32.6                    | -36.1       | 53.04                      | -                  | -           | 74                  | -20.96      | 172            | 326         | V        |
| * 4.824         | 51.24                | PK2  | 34                      | -33.5       | 51.74                      | -                  | -           | 74                  | -22.26      | 334            | 113         | V        |
| * 4.823         | 38.97                | MAV1 | 34                      | -33.5       | 39.47                      | 54                 | -14.53      | -                   | -           | 334            | 113         | V        |
| 6.432           | 47.13                | PK2  | 35.4                    | -30.9       | 51.63                      | -                  | -           | 74                  | -22.37      | 213            | 209         | V        |
| 7.236           | 47.86                | PK2  | 35.7                    | -30.8       | 52.76                      | -                  | -           | 74                  | -21.24      | 142            | 148         | V        |

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

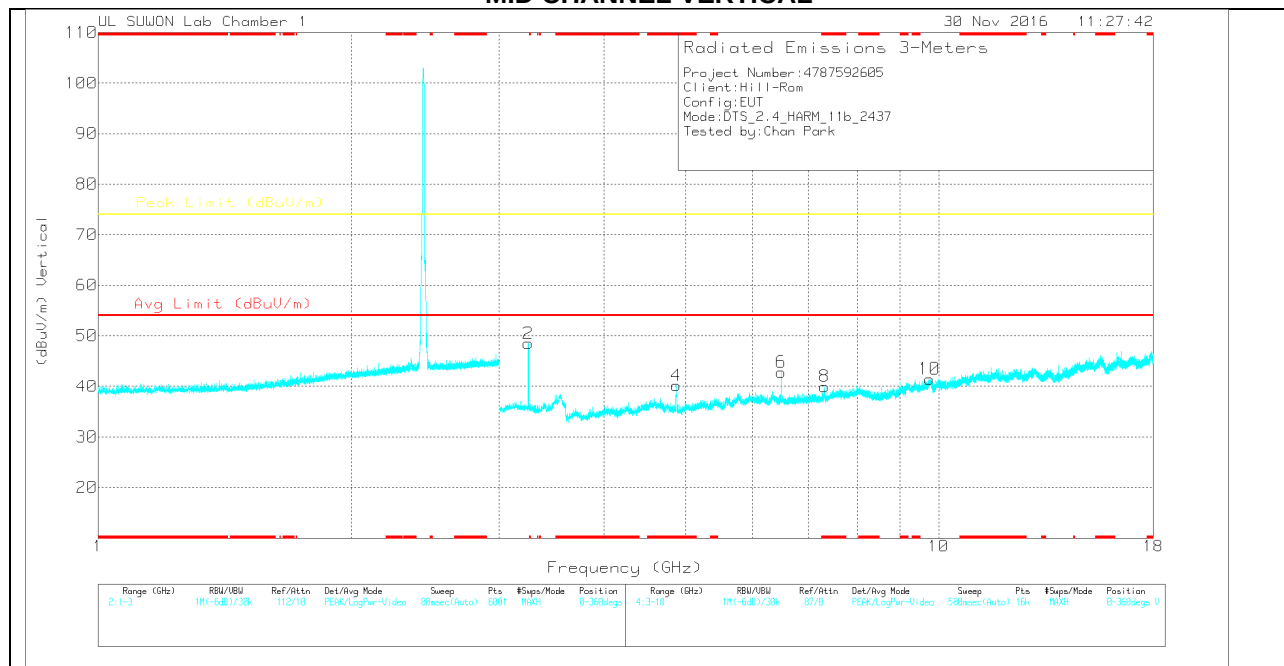
PK2 - KDB558074 Method: Maximum Peak

MAV1 - KDB558074 Option 1 Maximum RMS Average

### MID CHANNEL HORIZONTAL



### MID CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

## MID CHANNEL DATA

### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717)_150 619 | 3GHz_HP[d B] | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|-------------------------|--------------|----------------------------|--------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| 1      | 3.248           | 45.79                | PK  | 32.6                    | -35.8        | 42.59                      | -                  | -           | 74                  | -31.41      | 0-360          | 250         | H        |
| 3      | * 4.874         | 41.13                | PK  | 34                      | -33.6        | 41.53                      | -                  | -           | 74                  | -32.47      | 0-360          | 150         | H        |
| 5      | 6.499           | 40.59                | PK  | 35.4                    | -30.7        | 45.29                      | -                  | -           | 74                  | -28.71      | 0-360          | 250         | H        |
| 7      | * 7.309         | 35.44                | PK  | 35.7                    | -30.5        | 40.64                      | -                  | -           | 74                  | -33.36      | 0-360          | 150         | H        |
| 9      | 9.748           | 31.89                | PK  | 37.2                    | -26.8        | 42.29                      | -                  | -           | 74                  | -31.71      | 0-360          | 250         | H        |
| 2      | 3.249           | 51.69                | PK  | 32.6                    | -35.8        | 48.49                      | -                  | -           | 74                  | -25.51      | 0-360          | 150         | V        |
| 4      | * 4.873         | 39.75                | PK  | 34                      | -33.6        | 40.15                      | -                  | -           | 74                  | -33.85      | 0-360          | 150         | V        |
| 6      | 6.499           | 38.13                | PK  | 35.4                    | -30.7        | 42.83                      | -                  | -           | 74                  | -31.17      | 0-360          | 250         | V        |
| 8      | * 7.311         | 34.77                | PK  | 35.7                    | -30.5        | 39.97                      | -                  | -           | 74                  | -34.03      | 0-360          | 150         | V        |
| 10     | 9.752           | 30.95                | PK  | 37.2                    | -26.7        | 41.45                      | -                  | -           | 74                  | -32.55      | 0-360          | 150         | V        |

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

PK – Peak detector

### Radiated Emissions

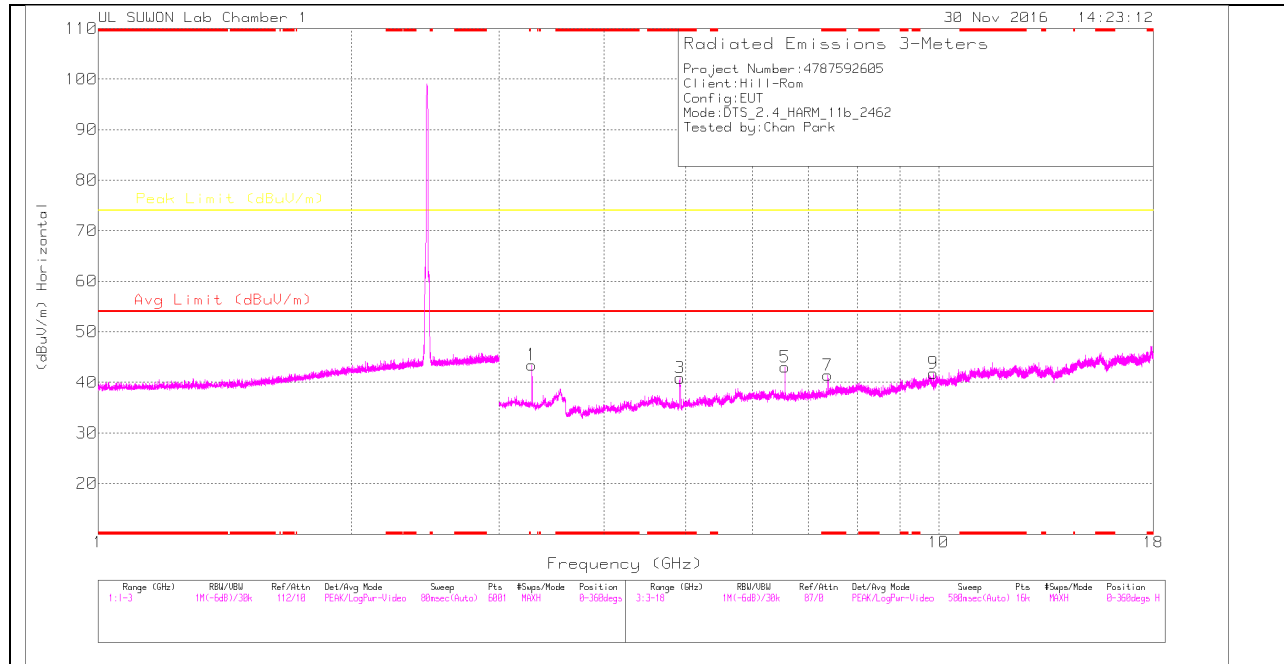
| Frequency (GHz) | Meter Reading (dBuV) | Det  | 3117(0016 8717)_150 619 | 3GHz_HP[d B] | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|----------------------|------|-------------------------|--------------|----------------------------|--------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| 3.249           | 52.97                | PK2  | 32.6                    | -35.8        | 49.77                      | -                  | -           | 74                  | -24.23      | 316            | 281         | H        |
| * 4.874         | 53.4                 | PK2  | 34                      | -33.6        | 53.8                       | -                  | -           | 74                  | -20.2       | 241            | 168         | H        |
| * 4.873         | 40.4                 | MAv1 | 34                      | -33.6        | 40.8                       | 54                 | -13.2       | -                   | -           | 241            | 168         | H        |
| 6.498           | 46.62                | PK2  | 35.4                    | -30.7        | 51.32                      | -                  | -           | 74                  | -22.68      | 292            | 296         | H        |
| * 7.309         | 47.57                | PK2  | 35.7                    | -30.5        | 52.77                      | -                  | -           | 74                  | -21.23      | 252            | 135         | H        |
| * 7.309         | 35.65                | MAv1 | 35.7                    | -30.5        | 40.85                      | 54                 | -13.15      | -                   | -           | 252            | 135         | H        |
| 3.249           | 56.13                | PK2  | 32.6                    | -35.8        | 52.93                      | -                  | -           | 74                  | -21.07      | 163            | 166         | V        |

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

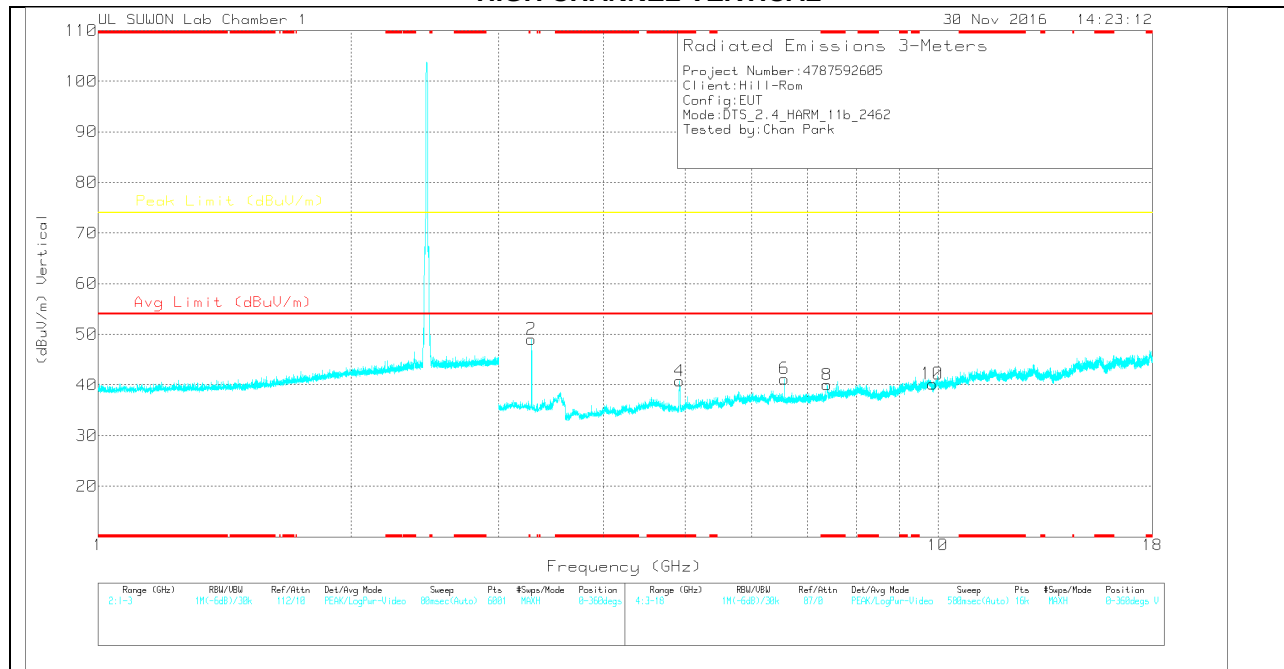
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

### HIGH CHANNEL HORIZONTAL



### HIGH CHANNEL VERTICAL



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

## HIGH CHANNEL DATA

### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717)_150 619 | 3GHz_HP[d B] | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|-------------------------|--------------|----------------------------|--------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| 1      | 3.282           | 46.53                | PK  | 32.6                    | -35.7        | 43.43                      | -                  | -           | 74                  | -30.57      | 0-360          | 250         | H        |
| 3      | * 4.923         | 40.28                | PK  | 34                      | -33.4        | 40.88                      | -                  | -           | 74                  | -33.12      | 0-360          | 250         | H        |
| 5      | 6.565           | 38.42                | PK  | 35.5                    | -30.9        | 43.02                      | -                  | -           | 74                  | -30.98      | 0-360          | 250         | H        |
| 7      | * 7.382         | 36.18                | PK  | 35.8                    | -30.6        | 41.38                      | -                  | -           | 74                  | -32.62      | 0-360          | 150         | H        |
| 9      | 9.848           | 32.02                | PK  | 37.3                    | -27.5        | 41.82                      | -                  | -           | 74                  | -32.18      | 0-360          | 250         | H        |
| 2      | 3.282           | 52.13                | PK  | 32.6                    | -35.7        | 49.03                      | -                  | -           | 74                  | -24.97      | 0-360          | 150         | V        |
| 4      | * 4.923         | 40.19                | PK  | 34                      | -33.4        | 40.79                      | -                  | -           | 74                  | -33.21      | 0-360          | 250         | V        |
| 6      | 6.565           | 36.62                | PK  | 35.5                    | -30.9        | 41.22                      | -                  | -           | 74                  | -32.78      | 0-360          | 250         | V        |
| 8      | * 7.381         | 34.84                | PK  | 35.8                    | -30.6        | 40.04                      | -                  | -           | 74                  | -33.96      | 0-360          | 250         | V        |
| 10     | 9.847           | 30.41                | PK  | 37.3                    | -27.5        | 40.21                      | -                  | -           | 74                  | -33.79      | 0-360          | 250         | V        |

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

PK – Peak detector

### Radiated Emissions

| Frequency (GHz) | Meter Reading (dBuV) | Det  | 3117(0016 8717)_150 619 | 3GHz_HP[d B] | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|----------------------|------|-------------------------|--------------|----------------------------|--------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| 3.283           | 52.11                | PK2  | 32.6                    | -35.7        | 49.01                      | -                  | -           | 74                  | -24.99      | 229            | 168         | H        |
| * 4.924         | 53.24                | PK2  | 34                      | -33.4        | 53.84                      | -                  | -           | 74                  | -20.16      | 249            | 149         | H        |
| * 4.924         | 40.48                | MAv1 | 34                      | -33.4        | 41.08                      | 54                 | -12.92      | -                   | -           | 249            | 149         | H        |
| 6.565           | 46.7                 | PK2  | 35.5                    | -30.9        | 51.3                       | -                  | -           | 74                  | -22.7       | 301            | 296         | H        |
| * 7.386         | 47.78                | PK2  | 35.8                    | -30.6        | 52.98                      | -                  | -           | 74                  | -21.02      | 256            | 136         | H        |
| * 7.384         | 35.47                | MAv1 | 35.8                    | -30.6        | 40.67                      | 54                 | -13.33      | -                   | -           | 256            | 136         | H        |
| 3.283           | 56.09                | PK2  | 32.6                    | -35.7        | 52.99                      | -                  | -           | 74                  | -21.01      | 161            | 147         | V        |
| * 4.924         | 52.2                 | PK2  | 34                      | -33.4        | 52.8                       | -                  | -           | 74                  | -21.2       | 334            | 146         | V        |
| * 4.923         | 39.38                | MAv1 | 34                      | -33.4        | 39.98                      | 54                 | -14.02      | -                   | -           | 334            | 146         | V        |

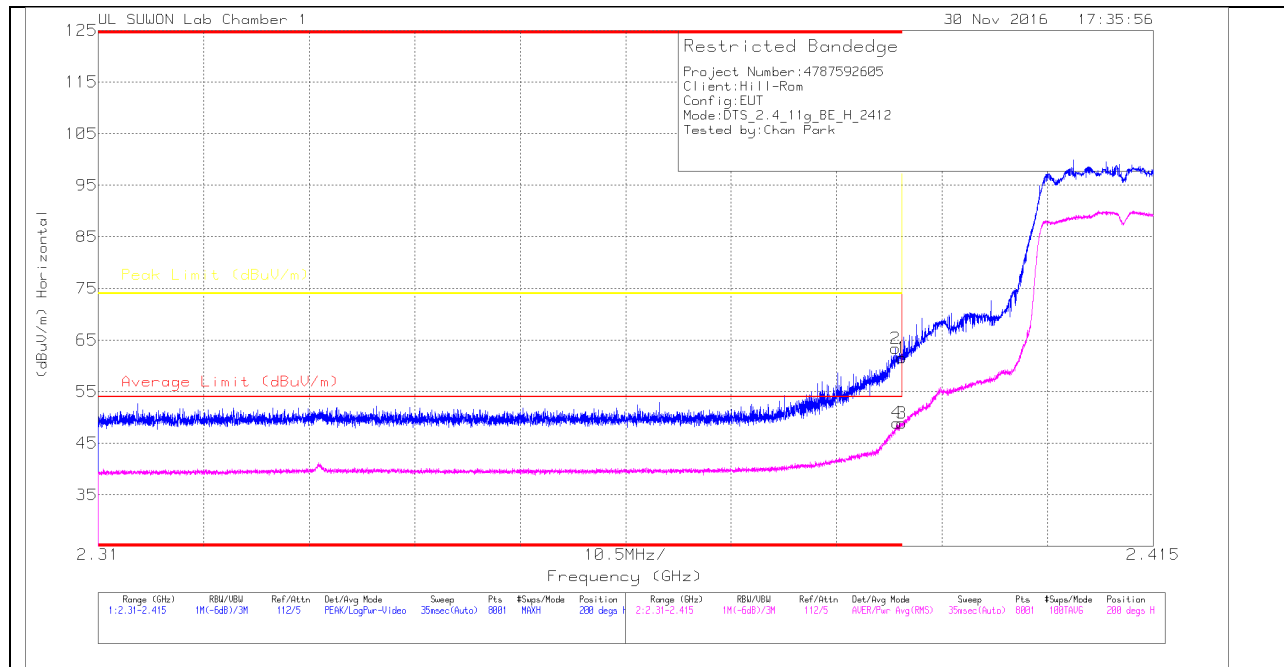
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

PK2 - KDB558074 Method: Maximum Peak

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

### RESTRICTED BANDEDGE (1 CHANNEL)

#### HORIZONTAL PEAK AND AVERAGE PLOT



#### HORIZONTAL DATA

##### Trace Markers

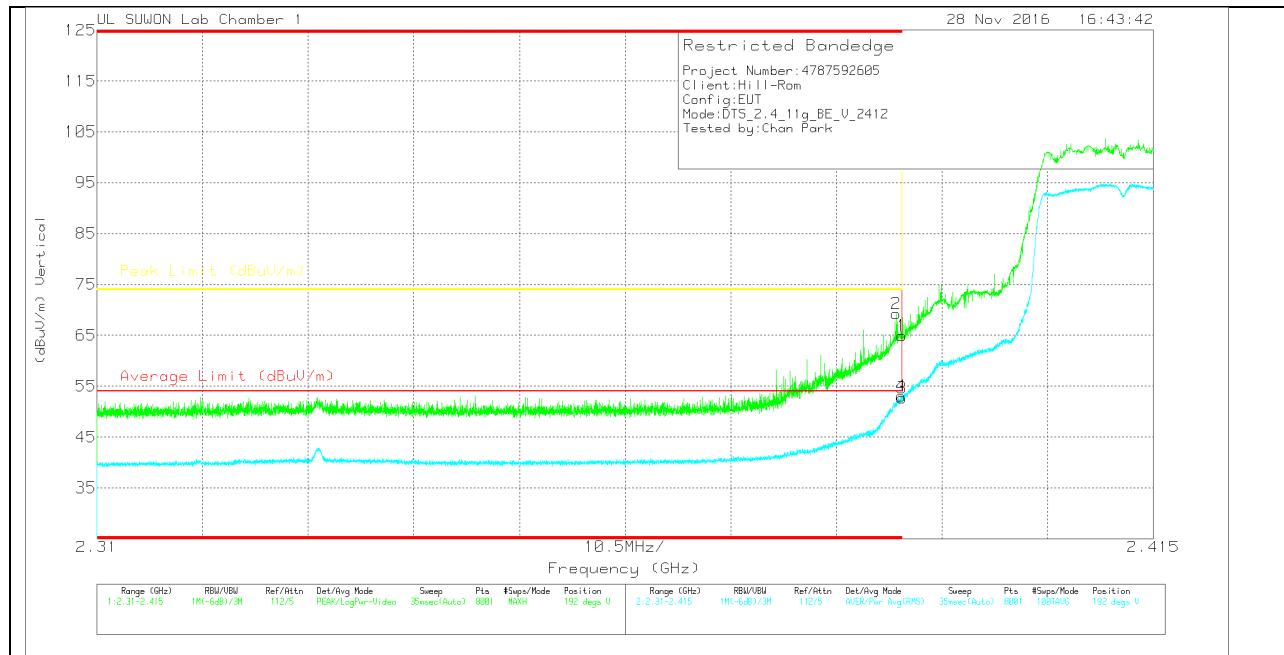
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717)_150 619 | 10dB[dB] | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|-------------------------|----------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.39          | 58.15                | Pk  | 31.8                    | -28.4    | 61.55                      | -                      | -           | 74                  | -12.45         | 200            | 159         | H        |
| 2      | * 2.389         | 59.98                | Pk  | 31.8                    | -28.4    | 63.38                      | -                      | -           | 74                  | -10.62         | 200            | 159         | H        |
| 3      | * 2.39          | 45.5                 | RMS | 31.8                    | -28.4    | 48.9                       | 54                     | -5.1        | -                   | -              | 200            | 159         | H        |
| 4      | * 2.389         | 45.55                | RMS | 31.8                    | -28.4    | 48.95                      | 54                     | -5.05       | -                   | -              | 200            | 159         | H        |

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

Pk - Peak detector

RMS - RMS detection

## VERTICAL PEAK AND AVERAGE PLOT



## VERTICAL DATA

### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717)_150 619 | 10dB[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          | 61.52                | Pk  | 31.8                    | -28.4    | 64.92                      | -                      | -           | 74                  | -9.08          | 192            | 199         | V        |
| 2      | * 2.389         | 65.84                | Pk  | 31.8                    | -28.4    | 69.24                      | -                      | -           | 74                  | -4.76          | 192            | 199         | V        |
| 3      | * 2.39          | 49.32                | RMS | 31.8                    | -28.4    | 52.72                      | 54                     | -1.28       | -                   | -              | 192            | 199         | V        |
| 4      | * 2.39          | 49.69                | RMS | 31.8                    | -28.4    | 53.09                      | 54                     | -91         | -                   | -              | 192            | 199         | V        |

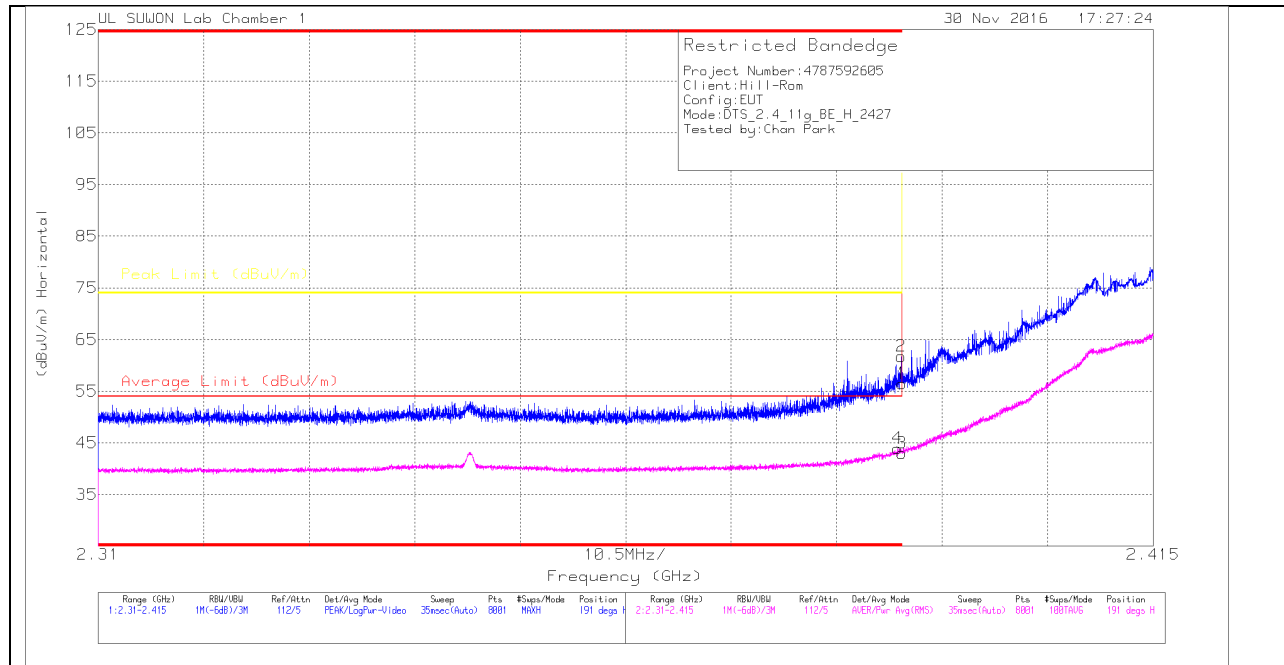
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

## RESTRICTED BANDEDGE (4 CHANNEL)

### HORIZONTAL PEAK AND AVERAGE PLOT



### HORIZONTAL DATA

#### Trace Markers

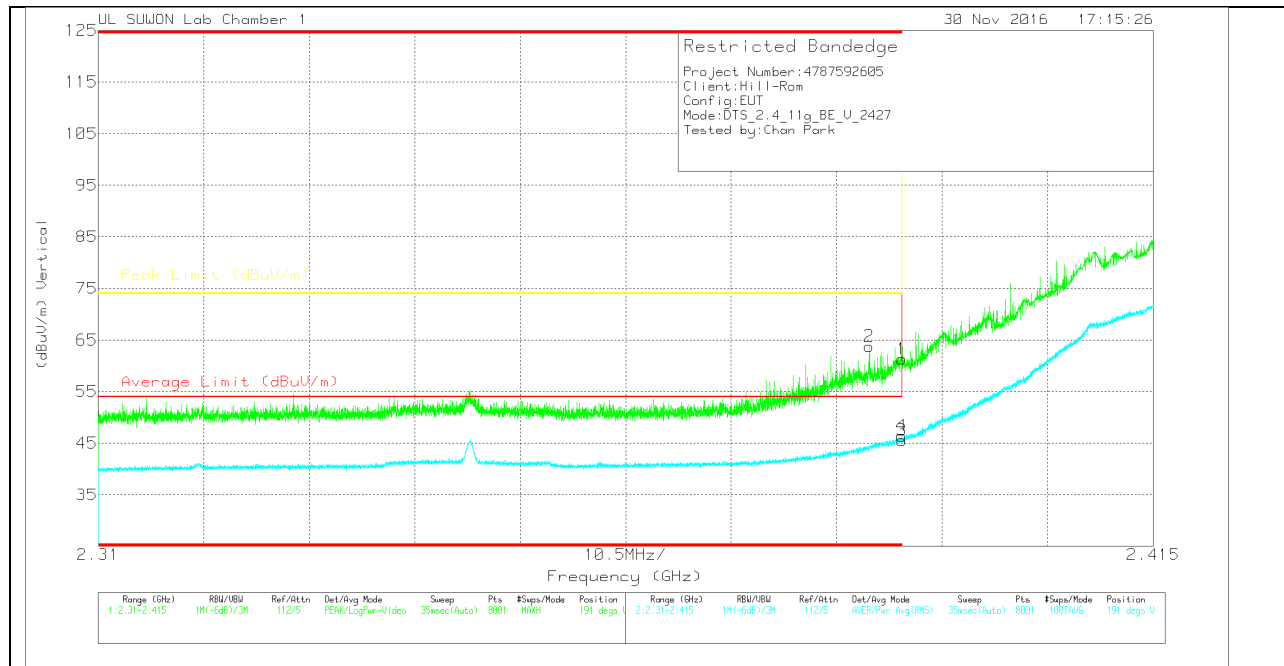
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717)_150 619 | 10dB[dB] | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|-------------------------|----------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.39          | 53.09                | Pk  | 31.8                    | -28.4    | 56.49                      | -                      | -           | 74                  | -17.51         | 191            | 131         | H        |
| 2      | * 2.39          | 58.35                | Pk  | 31.8                    | -28.4    | 61.75                      | -                      | -           | 74                  | -12.25         | 191            | 131         | H        |
| 3      | * 2.39          | 39.62                | RMS | 31.8                    | -28.4    | 43.02                      | 54                     | -10.98      | -                   | -              | 191            | 131         | H        |
| 4      | * 2.39          | 40.55                | RMS | 31.8                    | -28.4    | 43.95                      | 54                     | -10.05      | -                   | -              | 191            | 131         | H        |

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

Pk - Peak detector

RMS - RMS detection

## VERTICAL PEAK AND AVERAGE PLOT



## VERTICAL DATA

### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717)_150 619 | 10dB[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          | 57.93                | Pk  | 31.8                    | -28.4    | 61.33                      | -                      | -           | 74                  | -12.67         | 191            | 178         | V        |
| 2      | * 2.387         | 60.47                | Pk  | 31.8                    | -28.5    | 63.77                      | -                      | -           | 74                  | -10.23         | 191            | 178         | V        |
| 3      | * 2.39          | 42.16                | RMS | 31.8                    | -28.4    | 45.56                      | 54                     | -8.44       | -                   | -              | 191            | 178         | V        |
| 4      | * 2.39          | 43.02                | RMS | 31.8                    | -28.4    | 46.42                      | 54                     | -7.58       | -                   | -              | 191            | 178         | V        |

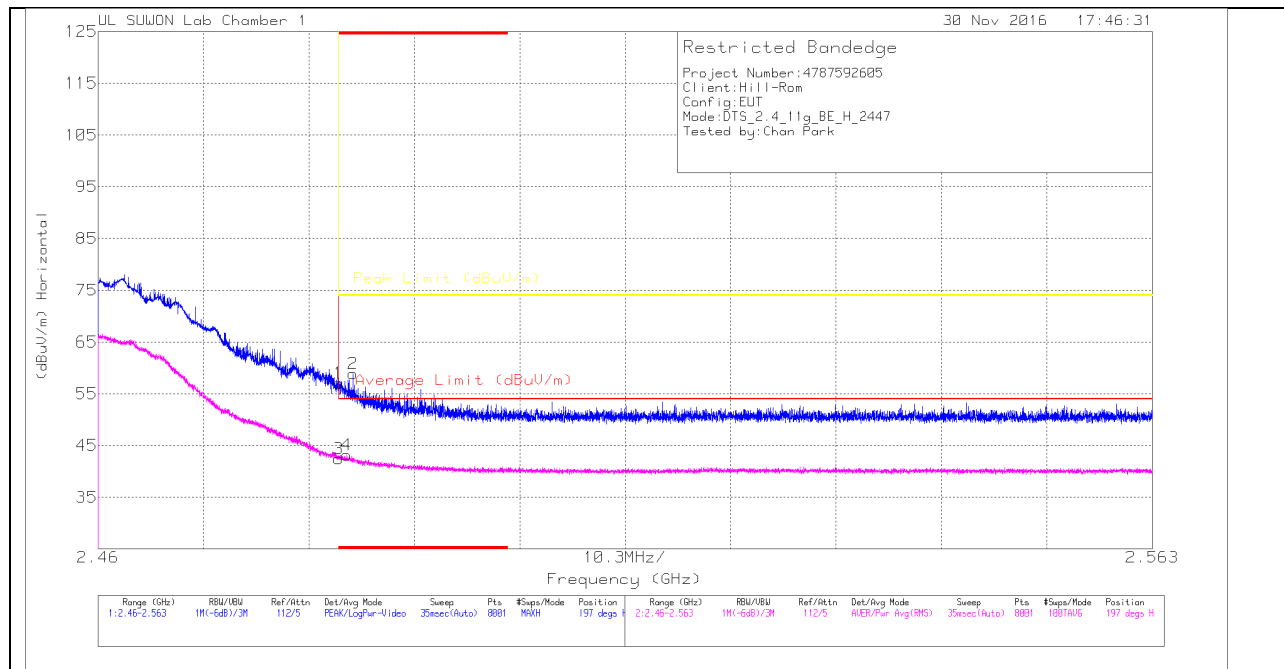
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

## RESTRICTED BANDEDGE (8 CHANNEL)

### HORIZONTAL PEAK AND AVERAGE PLOT



### HORIZONTAL DATA

#### Trace Markers

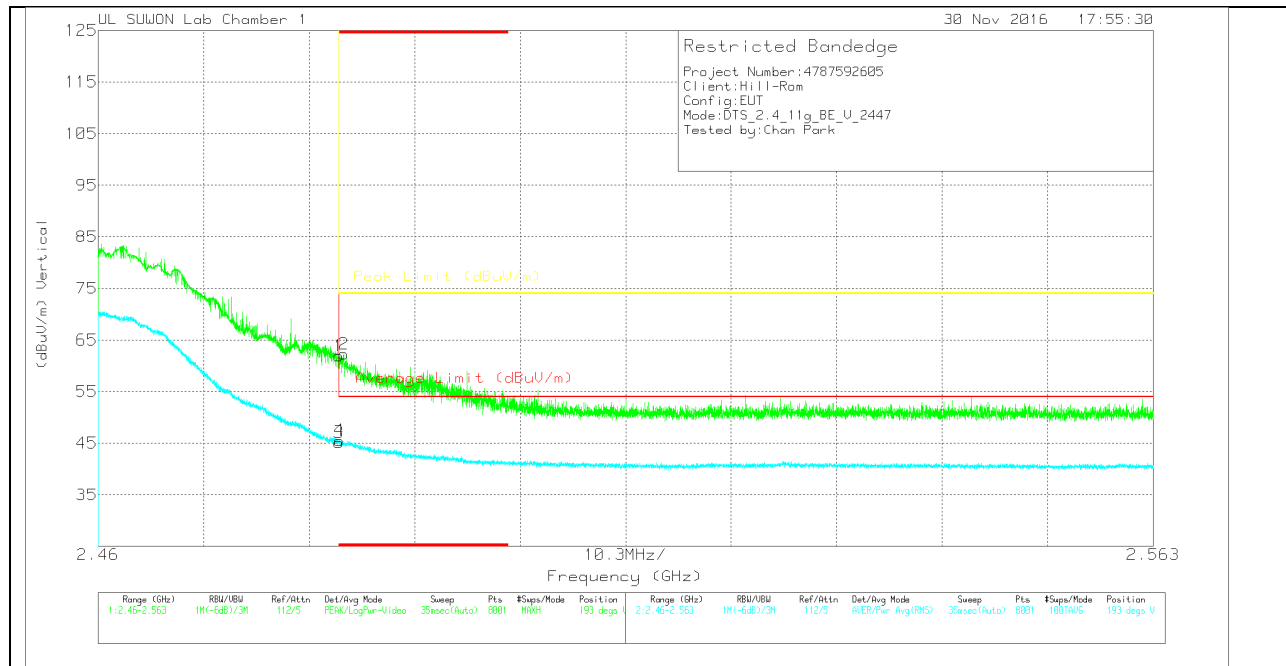
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717_150 619) | 10dB[dB] | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|-------------------------|----------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.484         | 53.36                | Pk  | 32                      | -28.3    | 57.06                      | -                      | -           | 74                  | -16.94         | 197            | 174         | H        |
| 2      | * 2.485         | 55.19                | Pk  | 32                      | -28.3    | 58.89                      | -                      | -           | 74                  | -15.11         | 197            | 174         | H        |
| 3      | * 2.484         | 38.73                | RMS | 32                      | -28.3    | 42.43                      | 54                     | -11.57      | -                   | -              | 197            | 174         | H        |
| 4      | * 2.484         | 39.48                | RMS | 32                      | -28.3    | 43.18                      | 54                     | -10.82      | -                   | -              | 197            | 174         | H        |

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

Pk - Peak detector

RMS - RMS detection

## VERTICAL PEAK AND AVERAGE PLOT



## VERTICAL DATA

### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717)_150 619 | 10dB[dB] | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|-------------------------|----------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.484         | 58.22                | Pk  | 32                      | -28.3    | 61.92                      | -                      | -           | 74                  | -12.08         | 193            | 207         | V        |
| 2      | * 2.484         | 58.57                | Pk  | 32                      | -28.3    | 62.27                      | -                      | -           | 74                  | -11.73         | 193            | 207         | V        |
| 3      | * 2.484         | 41.45                | RMS | 32                      | -28.3    | 45.15                      | 54                     | -8.85       | -                   | -              | 193            | 207         | V        |
| 4      | * 2.484         | 41.84                | RMS | 32                      | -28.3    | 45.54                      | 54                     | -8.46       | -                   | -              | 193            | 207         | V        |

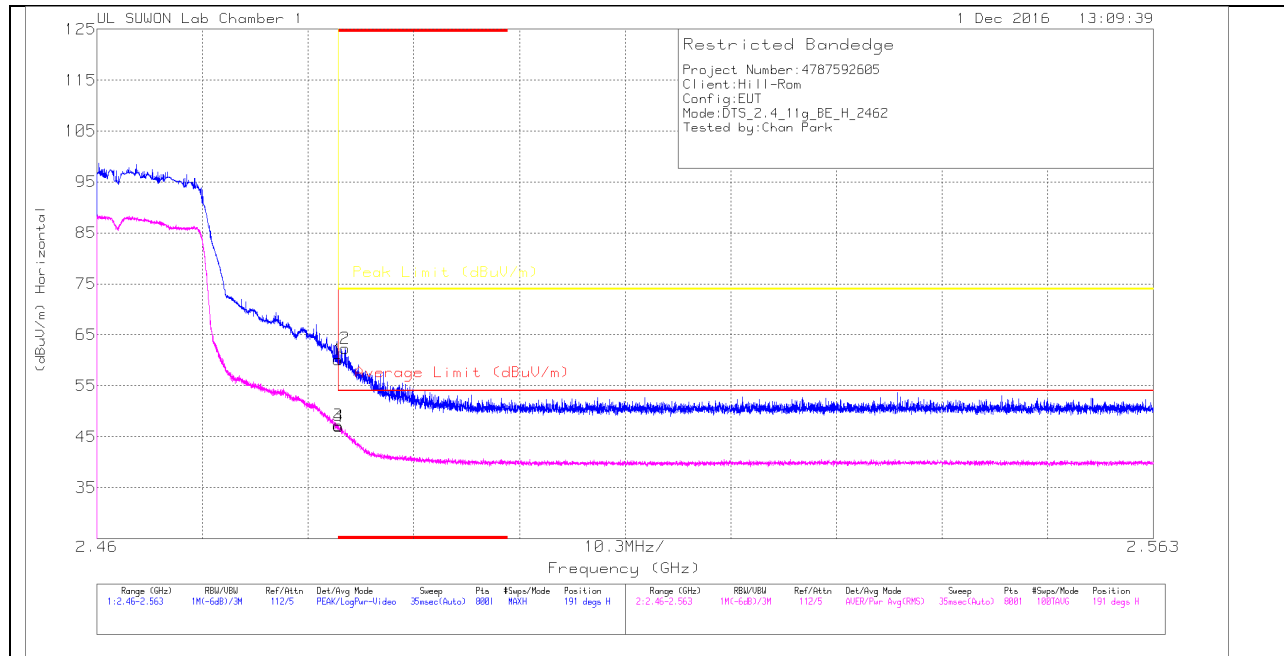
\* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

## RESTRICTED BANDEDGE (11 CHANNEL)

### HORIZONTAL PEAK AND AVERAGE PLOT



### HORIZONTAL DATA

#### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 3117(0016 8717)_150 619 | 10dB[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         | 56.4                 | Pk  | 32                      | -28.3    | 60.1                       | -                      | -           | 74                  | -13.9          | 191            | 149         | H        |
| 2      | * 2.484         | 58.57                | Pk  | 32                      | -28.3    | 62.27                      | -                      | -           | 74                  | -11.73         | 191            | 149         | H        |
| 3      | * 2.484         | 43.55                | RMS | 32                      | -28.3    | 47.25                      | 54                     | -6.75       | -                   | -              | 191            | 149         | H        |
| 4      | * 2.484         | 43.26                | RMS | 32                      | -28.3    | 46.96                      | 54                     | -7.04       | -                   | -              | 191            | 149         | H        |

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

Pk - Peak detector

RMS - RMS detection