**Operation Mode:** TX / IEEE 802.11n HT20 MHz/ CH High **Test Date:** March 28, 2013

**Temperature:** 24°C **Tested by:** Leevin Li

**Humidity:** 52% RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Pole (V/H) | Remark |
|---|---|---|---|---|---|---|---|
| 3295.0000 | 52.03 | -4.05 | 47.98 | 74.00 | -26.02 | V | Peak |
| 4428.3333 | 45.23 | -0.77 | 44.46 | 74.00 | -29.54 | V | Peak |
| 4910.0000 | 45.27 | 0.91 | 46.18 | 74.00 | -27.82 | V | Peak |
| 5816.6667 | 44.35 | 2.81 | 47.16 | 74.00 | -26.84 | V | Peak |
| 6496.6667 | 44.63 | 4.53 | 49.16 | 74.00 | -24.84 | V | Peak |
| 7120.0000 | 44.24 | 6.96 | 51.20 | 74.00 | -22.80 | V | Peak |
| | | | | | | | |
| 3295.0000 | 47.91 | -4.05 | 43.86 | 74.00 | -30.14 | H | Peak |
| 4201.6667 | 45.75 | -1.57 | 44.18 | 74.00 | -29.82 | H | Peak |
| 4938.3333 | 44.99 | 1.04 | 46.03 | 74.00 | -27.97 | H | Peak |
| 5363.3333 | 44.59 | 1.53 | 46.12 | 74.00 | -27.88 | H | Peak |
| 5930.0000 | 43.85 | 2.98 | 46.83 | 74.00 | -27.17 | H | Peak |
| 6865.0000 | 44.15 | 5.72 | 49.87 | 74.00 | -24.13 | H | Peak |

**REMARKS**:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 MHz / CH Low **Test Date:** March 28, 2013

**Temperature:** 24°C **Tested by:** Leevin Li

**Humidity:** 52% RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Pole (V/H) | Remark |
|---|---|---|---|---|---|---|---|
| 3238.3333 | 54.68 | -4.07 | 50.61 | 74.00 | -23.39 | V | Peak |
| 4003.3333 | 46.41 | -2.51 | 43.90 | 74.00 | -30.10 | V | Peak |
| 4485.0000 | 45.75 | -0.67 | 45.08 | 74.00 | -28.92 | V | Peak |
| 5080.0000 | 44.24 | 1.41 | 45.65 | 74.00 | -28.35 | V | Peak |
| 5873.3333 | 43.95 | 2.89 | 46.84 | 74.00 | -27.16 | V | Peak |
| 6496.6667 | 45.02 | 4.53 | 49.55 | 74.00 | -24.45 | V | Peak |
| | | | | | | | |
| 3238.3333 | 50.15 | -4.07 | 46.08 | 74.00 | -27.92 | H | Peak |
| 4400.0000 | 45.11 | -0.82 | 44.29 | 74.00 | -29.71 | H | Peak |
| 4938.3333 | 45.35 | 1.04 | 46.39 | 74.00 | -27.61 | H | Peak |
| 5618.3333 | 44.79 | 2.01 | 46.80 | 74.00 | -27.20 | H | Peak |
| 6156.6667 | 45.18 | 3.55 | 48.73 | 74.00 | -25.27 | H | Peak |
| 6921.6667 | 44.96 | 5.95 | 50.91 | 74.00 | -23.09 | H | Peak |

**REMARKS**:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

**Operation Mode:** TX / IEEE 802.11n HT40 MHz / CH Mid **Test Date:** March 28, 2013

**Temperature:** 24°C **Tested by:** Leevin Li

**Humidity:** 52% RH **Polarity:** Ver. / Hor.

| Frequency (MHz) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Pole (V/H) | Remark |
|---|---|---|---|---|---|---|---|
| 3238.3333 | 53.24 | -4.07 | 49.17 | 74.00 | -24.83 | V | Peak |
| 4598.3333 | 45.14 | -0.46 | 44.68 | 74.00 | -29.32 | V | Peak |
| 5108.3333 | 44.86 | 1.44 | 46.30 | 74.00 | -27.70 | V | Peak |
| 5845.0000 | 43.72 | 2.85 | 46.57 | 74.00 | -27.43 | V | Peak |
| 6496.6667 | 43.59 | 4.53 | 48.12 | 74.00 | -25.88 | V | Peak |
| 6921.6667 | 44.85 | 5.95 | 50.80 | 74.00 | -23.20 | V | Peak |
| | | | | | | | |
| 3238.3333 | 50.51 | -4.07 | 46.44 | 74.00 | -27.56 | H | Peak |
| 4286.6667 | 44.80 | -1.25 | 43.55 | 74.00 | -30.45 | H | Peak |
| 5051.6667 | 44.70 | 1.38 | 46.08 | 74.00 | -27.92 | H | Peak |
| 5760.0000 | 44.48 | 2.61 | 47.09 | 74.00 | -26.91 | H | Peak |
| 6156.6667 | 43.70 | 3.55 | 47.25 | 74.00 | -26.75 | H | Peak |
| 6950.0000 | 44.49 | 6.09 | 50.58 | 74.00 | -23.42 | H | Peak |

**REMARKS**:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

| | | | |
|---|---|---|---|
| **Operation Mode:** | TX / IEEE 802.11n HT40 MHz / CH High | **Test Date:** | March 28, 2013 |
| **Temperature:** | 24°C | **Tested by:** | Leevin Li |
| **Humidity:** | 52% RH | **Polarity:** | Ver. / Hor. |

| Frequency (MHz) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Pole (V/H) | Remark |
|---|---|---|---|---|---|---|---|
| 3266.6667 | 51.89 | -4.06 | 47.83 | 74.00 | -26.17 | V | Peak |
| 4456.6667 | 44.54 | -0.72 | 43.82 | 74.00 | -30.18 | V | Peak |
| 4938.3333 | 45.31 | 1.04 | 46.35 | 74.00 | -27.65 | V | Peak |
| 5901.6667 | 44.44 | 2.94 | 47.38 | 74.00 | -26.62 | V | Peak |
| 6695.0000 | 43.41 | 5.14 | 48.55 | 74.00 | -25.45 | V | Peak |
| 7063.3333 | 45.08 | 6.67 | 51.75 | 74.00 | -22.25 | V | Peak |
| | | | | | | | |
| 3266.6667 | 48.90 | -4.06 | 44.84 | 74.00 | -29.16 | H | Peak |
| 3833.3333 | 45.54 | -2.50 | 43.04 | 74.00 | -30.96 | H | Peak |
| 4966.6667 | 45.19 | 1.17 | 46.36 | 74.00 | -27.64 | H | Peak |
| 5731.6667 | 43.76 | 2.49 | 46.25 | 74.00 | -27.75 | H | Peak |
| 6128.3333 | 44.34 | 3.47 | 47.81 | 74.00 | -26.19 | H | Peak |
| 6950.0000 | 44.13 | 6.09 | 50.22 | 74.00 | -23.78 | H | Peak |

**REMARKS**:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

## 7.3. 6dB BANDWIDTH MEASUREMENT

### 7.3.1. LIMITS

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

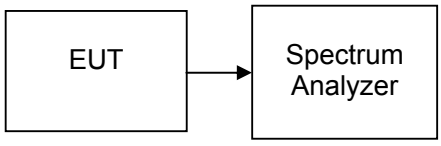
### 7.3.2. TEST INSTRUMENTS

| Name of Equipment | Manufacturer | Model | Serial Number | Last Calibration | Calibration Due |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | US44300399 | 03/09/2013 | 03/08/2014 |

### 7.3.3. TEST PROCEDURES (please refer to measurement standard)

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 1-5 % of the emission bandwidth (EBW), VBW = ≥ 3 x RBW, Sweep = auto.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

### 7.3.4. TEST SETUP



### 7.3.5. TEST RESULTS

*No non-compliance noted*

**Test Data**

**Test mode: IEEE 802.11b**

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Test Result |
|---|---|---|---|---|
| Low | 2412 | 8105 | >500 | PASS |
| Mid | 2437 | 8145 | | PASS |
| High | 2462 | 8103 | | PASS |

**Test mode: IEEE 802.11g**

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Test Result |
|---|---|---|---|---|
| Low | 2412 | 15107 | >500 | PASS |
| Mid | 2437 | 15115 | | PASS |
| High | 2462 | 15111 | | PASS |

**Test mode: IEEE 802.11n HT20 MHz**

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Test Result |
|---|---|---|---|---|
| Low | 2412 | 15117 | >500 | PASS |
| Mid | 2437 | 15105 | | PASS |
| High | 2462 | 15110 | | PASS |

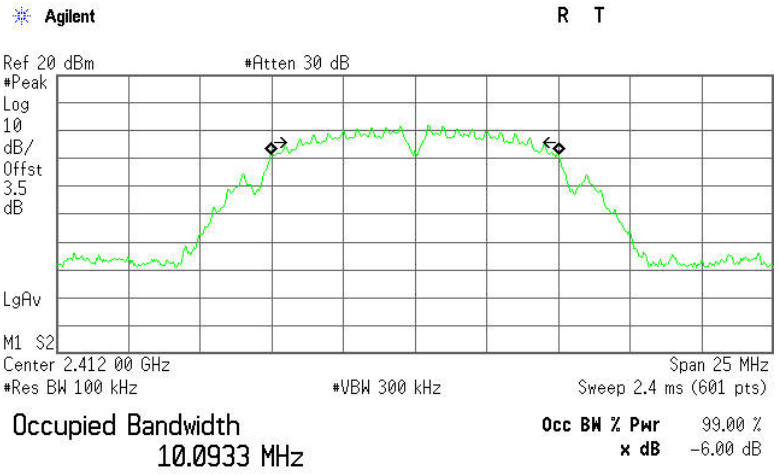
**Test mode: IEEE 802.11n HT40 MHz**

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Test Result |
|---|---|---|---|---|
| Low | 2422 | 36127 | >500 | PASS |
| Mid | 2437 | 36347 | | PASS |
| High | 2452 | 36116 | | PASS |

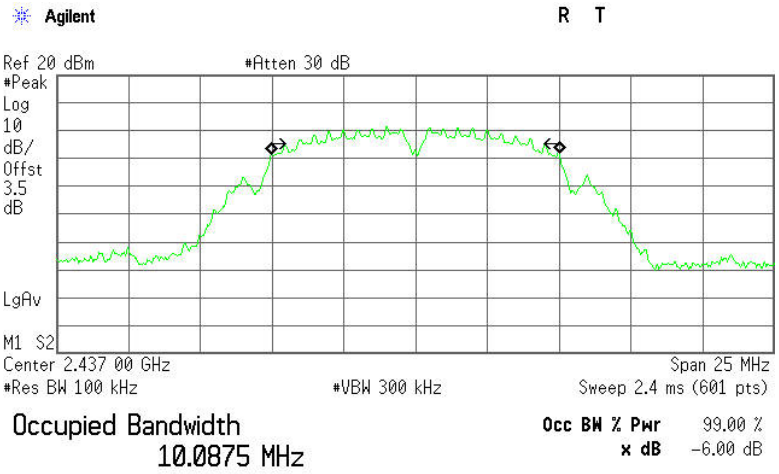
## Test Plot

### IEEE 802.11b mode

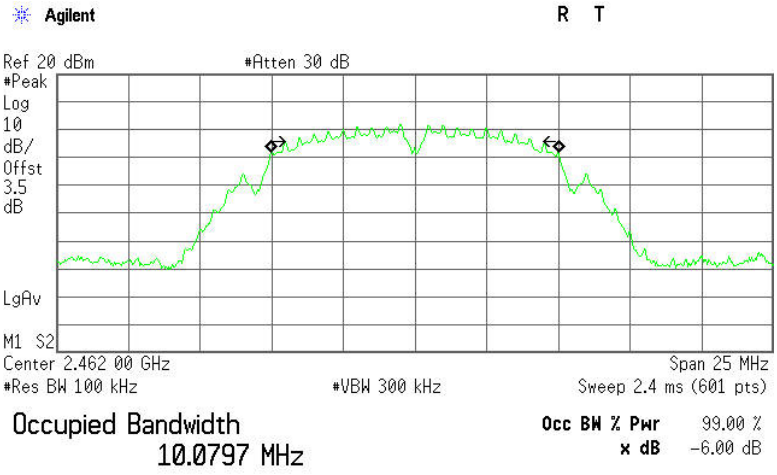
### 6dB Bandwidth (CH Low)




### 6dB Bandwidth (CH Mid)

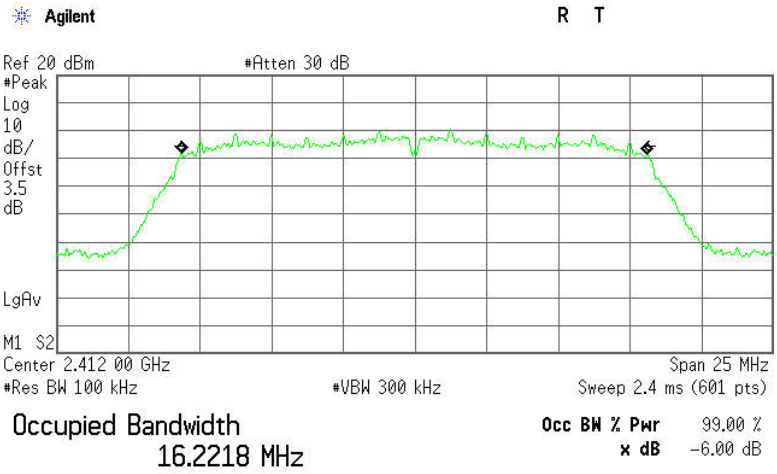


### 6dB Bandwidth (CH High)

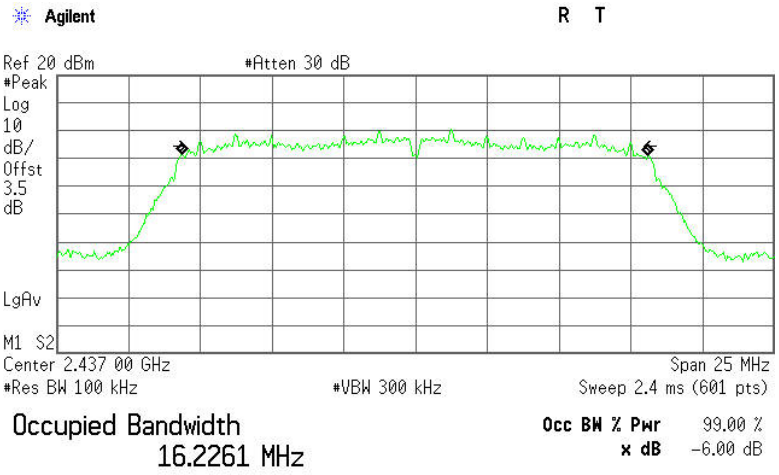



### IEEE 802.11g mode

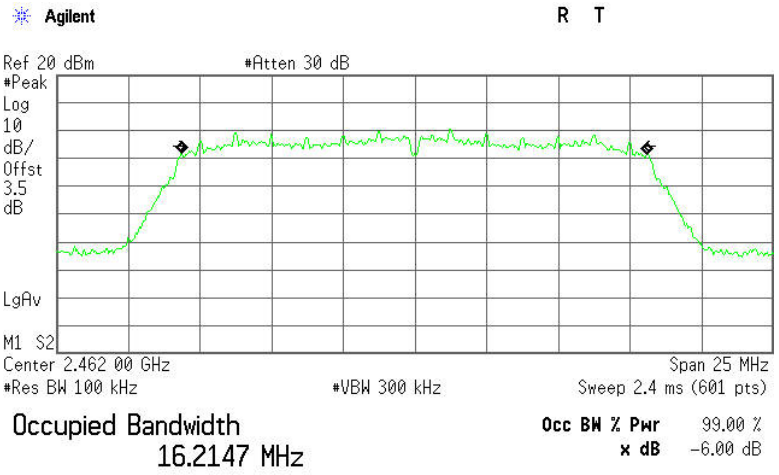
### 6dB Bandwidth (CH Low)



## 6dB Bandwidth (CH Mid)

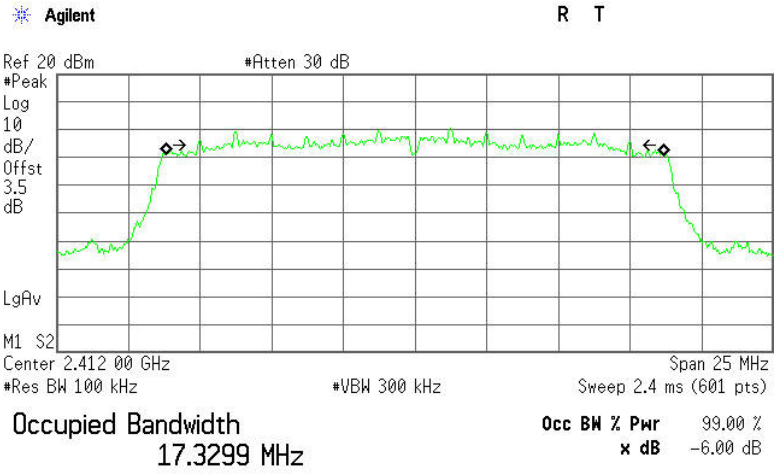



## 6dB Bandwidth (CH High)

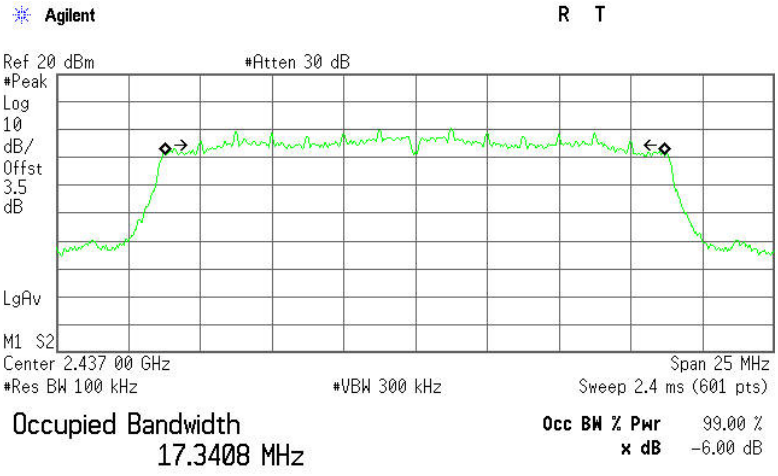


## IEEIEEE 802.11n HT20 MHz mode

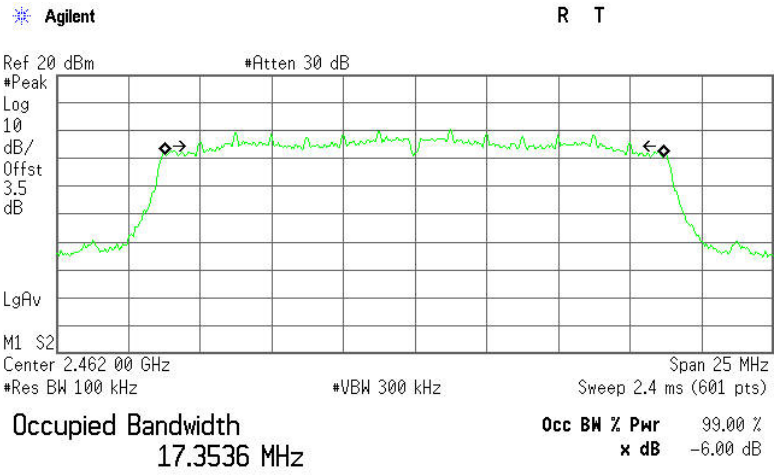
### 6dB Bandwidth (CH Low)




### 6dB Bandwidth (CH Mid)



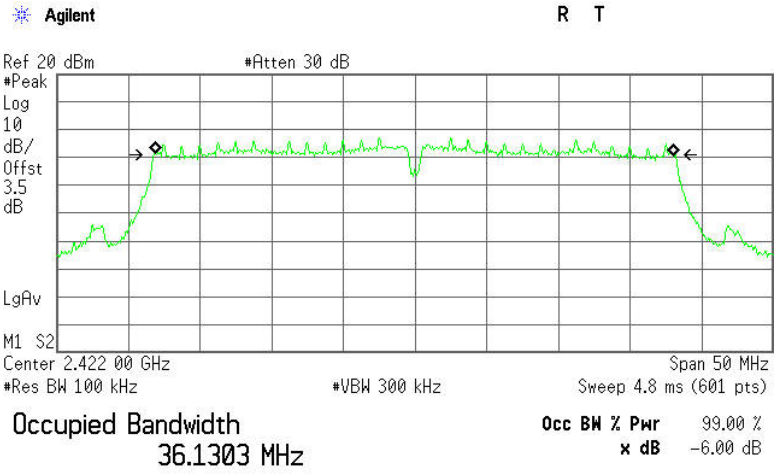
### 6dB Bandwidth (CH High)




**Transmit Freq Error** -25.771 kHz
**x dB Bandwidth** 15.110 MHz

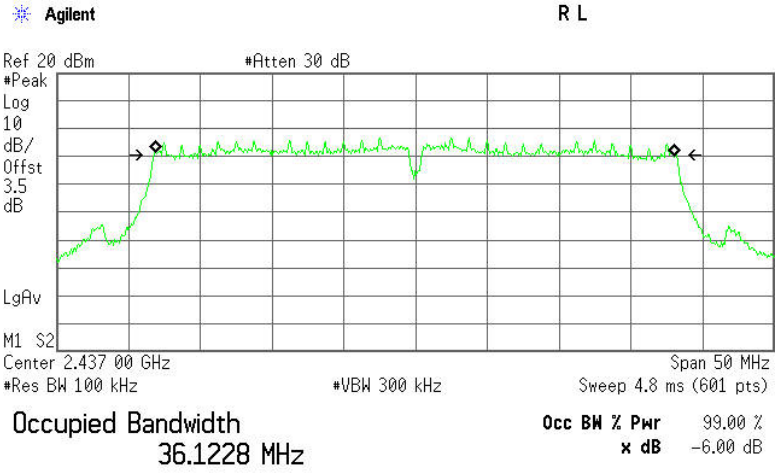
## IEEE 802.11n HT40 MHz mode

### 6dB Bandwidth (CH Low)



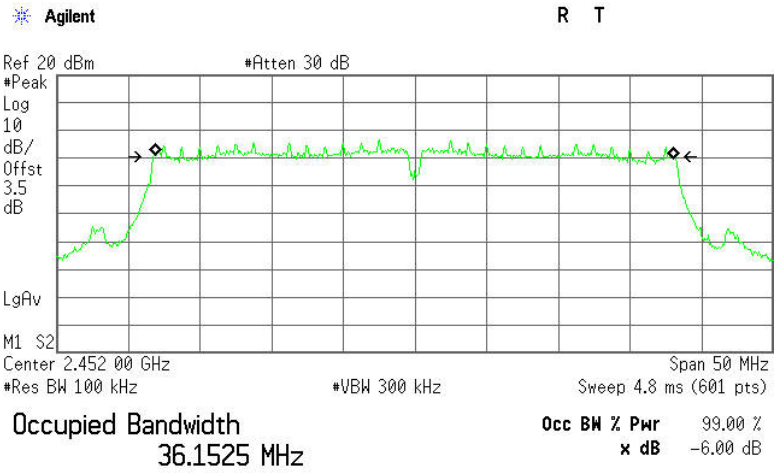

**Transmit Freq Error** -33.103 kHz
**x dB Bandwidth** 36.127 MHz

## 6dB Bandwidth (CH Mid)




**Transmit Freq Error** -32.608 kHz
**x dB Bandwidth** 36.347 MHz

## 6dB Bandwidth (CH High)




**Transmit Freq Error** -43.732 kHz
**x dB Bandwidth** 36.116 MHz

## 7.4. PEAK OUTPUT POWER

### 7.4.1. LIMITS

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.

2. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

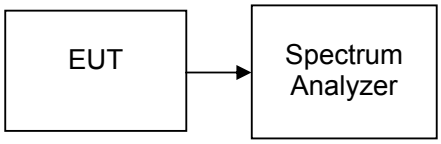
### 7.4.2. TEST INSTRUMENTS

| Name of Equipment | Manufacturer | Model | Serial Number | Last Calibration | Calibration Due |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | US44300399 | 03/09/2013 | 03/08/2014 |

### 7.4.3. TEST PROCEDURES (please refer to measurement standard)

1. This procedure provides an integrated measurement alternative when the maximum available RBW < EBW.
2. Set the RBW = 1 MHz.
3. Set the VBW = 3 MHz.
4. Set the span to a value that is 5-30 % greater than the EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges(for some analyzers, this may require a manual overrideto ensure use of peak detector). If the spectrum analyzer does not have a band power function, sum the spectrum levels (in linear power units) at 1 MHz intervals extending across the EBW of the spectrum.

### 7.4.4. TEST SETUP




### 7.4.5. TEST RESULTS

*No non-compliance noted*

**Test Data**

**Test mode: IEEE 802.11b**

| Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | Limit (W) | Result |
|---|---|---|---|---|---|
| Low | 2412 | 19.48 | 0.08872 | 1 | PASS |
| Mid | 2437 | 21.74 | 0.14928 | | PASS |
| High | 2462 | 19.13 | 0.08185 | | PASS |

**Test mode: IEEE 802.11g**

| Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | Limit (W) | Result |
|---|---|---|---|---|---|
| Low | 2412 | 22.25 | 0.16788 | 1 | PASS |
| Mid | 2437 | 23.49 | 0.22336 | | PASS |
| High | 2462 | 21.91 | 0.15524 | | PASS |

**Test mode: IEEE 802.11n HT20 MHz**

| Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | Limit (W) | Result |
|---|---|---|---|---|---|
| Low | 2412 | 21.87 | 0.15382 | 1 | PASS |
| Mid | 2437 | 23.31 | 0.21429 | | PASS |
| High | 2462 | 21.78 | 0.15066 | | PASS |

**Test mode: IEEE 802.11n HT40 MHz**

| Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | Limit (W) | Result |
|---|---|---|---|---|---|
| Low | 2422 | 20.65 | 0.11614 | 1 | PASS |
| Mid | 2437 | 22.00 | 0.15849 | | PASS |
| High | 2452 | 20.75 | 0.11885 | | PASS |

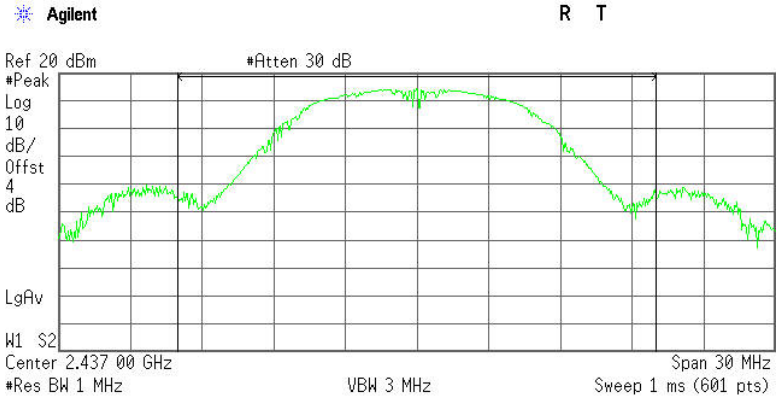
## Test Plot

### IEEE 802.11b mode

### Peak power (CH Low)

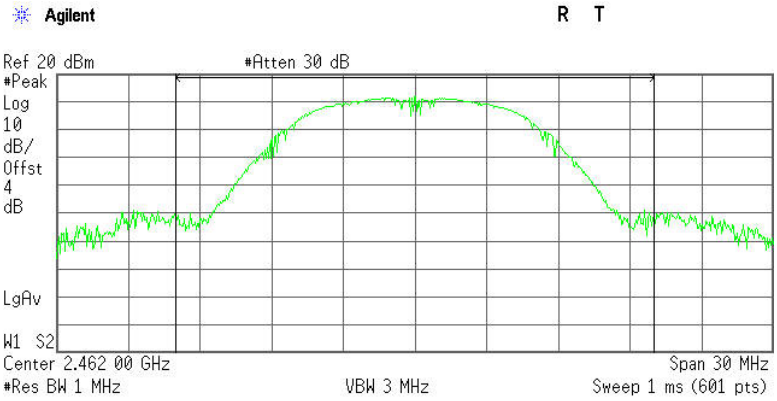

| Channel Power | Power Spectral Density |
|---|---|
| 19.48 dBm /20.0000 MHz | -53.54 dBm/Hz |

### Peak power (CH Mid)



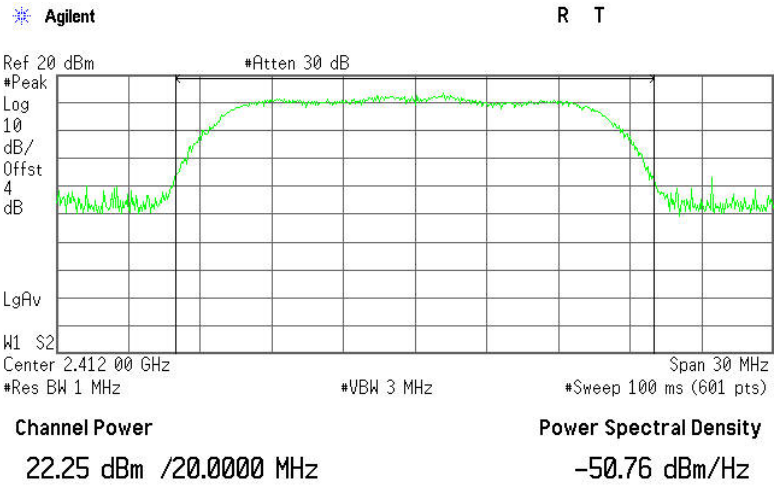

| Channel Power | Power Spectral Density |
|---|---|
| 21.74 dBm /20.0000 MHz | -51.27 dBm/Hz |

### Peak power (CH High)

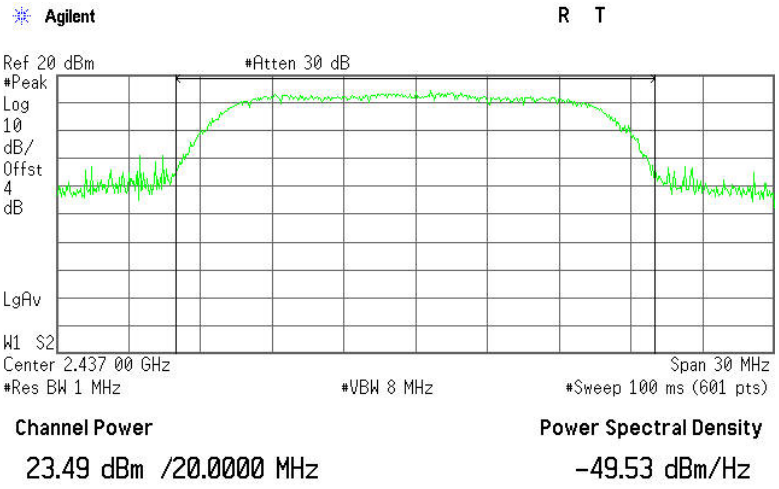



### IEEE 802.11g mode

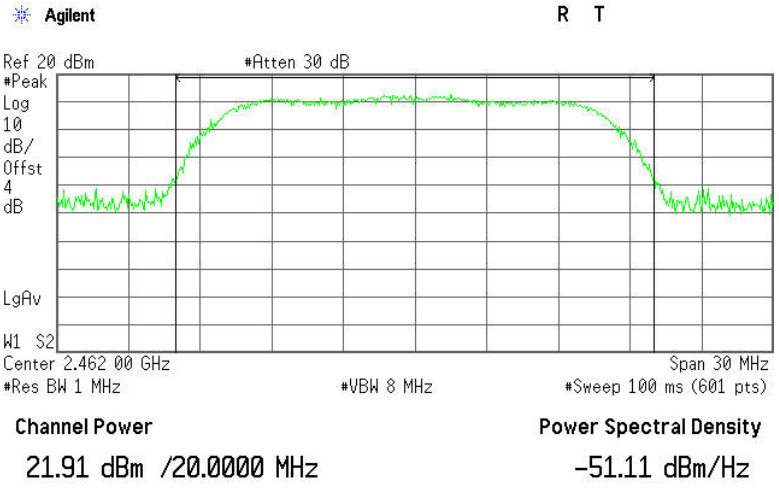
### Peak power (CH Low)



## Peak power (CH Mid)

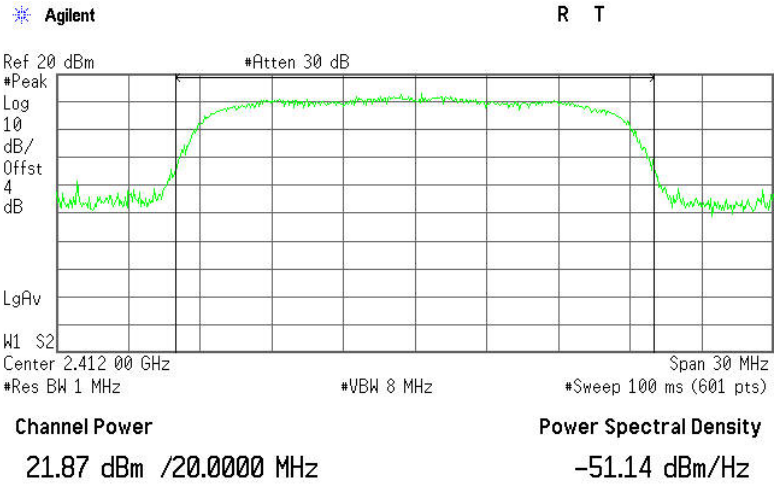



## Peak power (CH High)

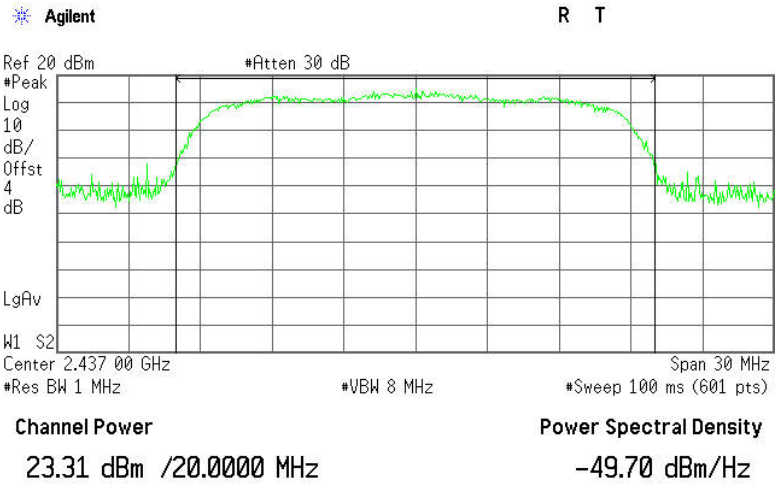


## IEEE 802.11n HT20 MHz mode

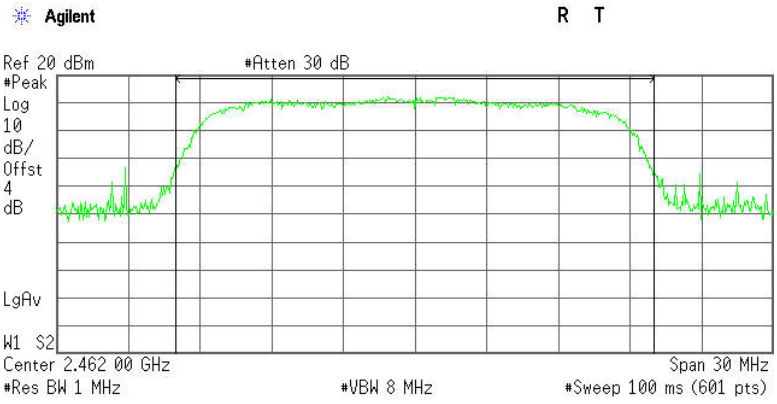
### Peak power (CH Low)




### Peak power (CH Mid)

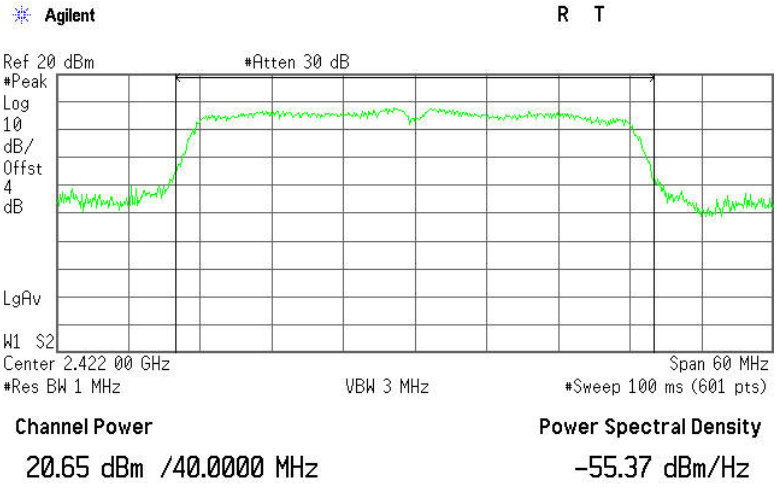


### Peak power (CH High)

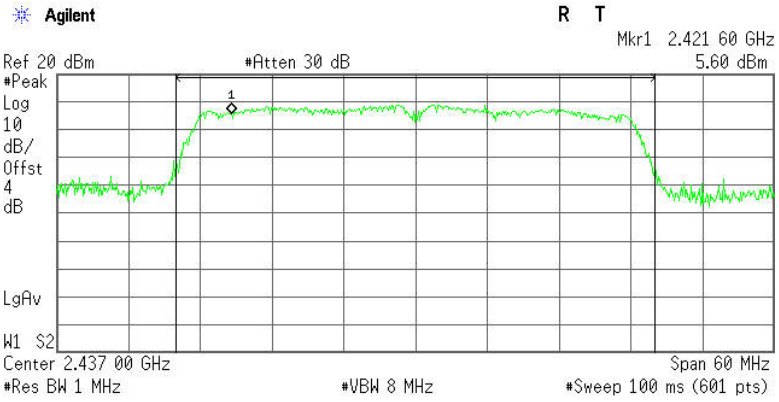



### IEEE 802.11n HT40 MHz mode

### Peak power (CH Low)



## Peak power (CH Mid)



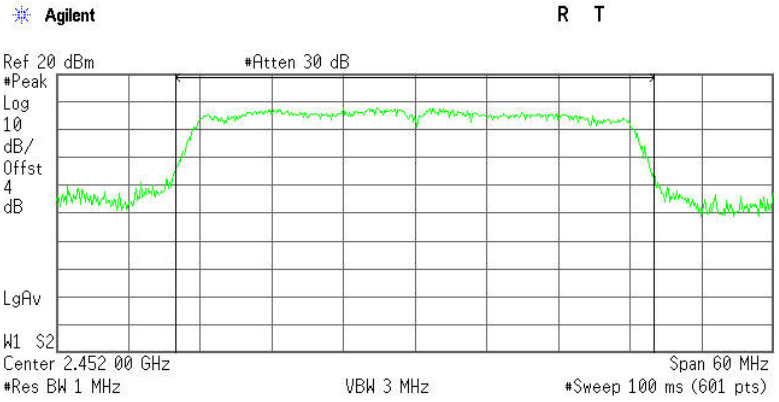

**Channel Power**

22.00 dBm /40.0000 MHz

**Power Spectral Density**

-54.02 dBm/Hz

## Peak power (CH High)




**Channel Power**

20.75 dBm /40.0000 MHz

**Power Spectral Density**

-55.27 dBm/Hz

## 7.5. BAND EDGES MEASUREMENT

### 7.5.1. LIMITS

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in 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. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

### 7.5.2. TEST INSTRUMENTS

| Radiated Emission Test Site 966（2） | | | | | |
|---|---|---|---|---|---|
| **Name of Equipment** | **Manufacturer** | **Model Number** | **Serial Number** | **Last Calibration** | **Due Calibration** |
| PSA Series Spectrum Analyzer | Agilent | E4446A | US44300399 | 03/09/2013 | 03/08/2014 |
| ESCI EMI TEST RECEIVER.ESCI | ROHDE&SCHWARZ | ESCI | 100783 | 03/09/2013 | 03/08/2014 |
| Amplifier | MITEQ | AM-1604-3000 | 1123808 | 03/18/2013 | 03/18/2014 |
| High Noise Amplifier | Agilent | 8449B | 3008A01838 | 03/18/2013 | 03/18/2014 |
| Board-Band Horn Antenna | Schwarzbeck | BBHA 9170 | 9170-497 | 06/21/2012 | 06/21/2013 |
| Bilog Antenna | SCHAFFNER | CBL6143 | 5082 | 03/02/2013 | 03/01/2014 |
| Horn Antenna | SCHWARZBECK | BBHA9120 | D286 | 03/02/2013 | 03/01/2014 |
| Loop Antenna | A、R、A | PLA-1030/B | 1029 | 03/23/2013 | 03/23/2014 |
| Turn Table | N/A | N/A | N/A | N.C.R | N.C.R |
| Controller | Sunol Sciences | SC104V | 022310-1 | N.C.R | N.C.R |
| Controller | CT | N/A | N/A | N.C.R | N.C.R |
| Temp. / Humidity Meter | Anymetre | JR913 | N/A | 03/04/2013 | 03/03/2014 |
| Antenna Tower | SUNOL | TLT2 | N/A | N.C.R | N.C.R |
| Test S/W | FARAD | LZ-RF / CCS-SZ-3A2 | | | |

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

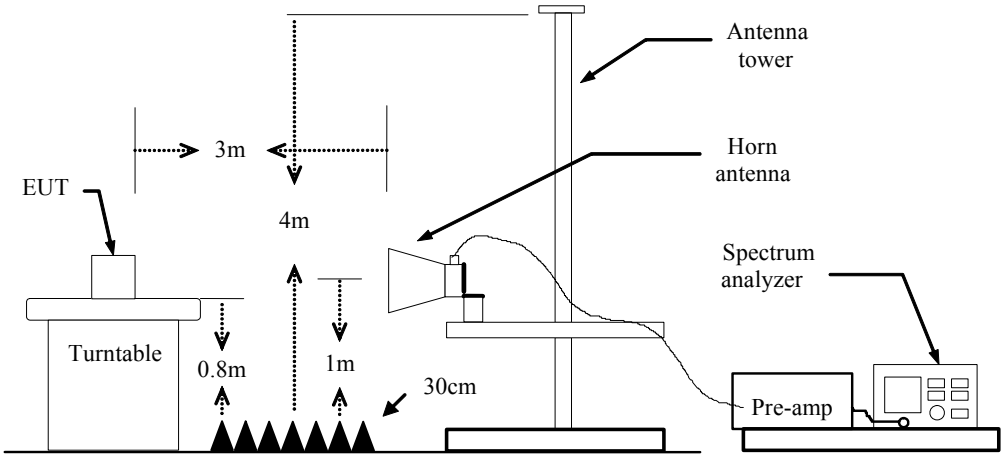
2. The FCC Site Registration number is 101879.

3. N.C.R = No Calibration Required.

### 7.5.3. TEST PROCEDURES (please refer to measurement standard)

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are

### 7.5.4. TEST SETUP



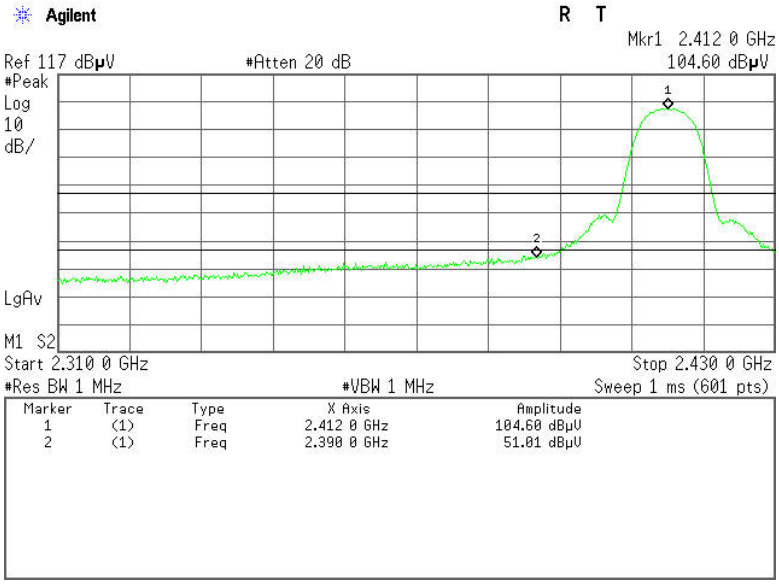
## 7.5.5. TEST RESULTS

**Test Plot**

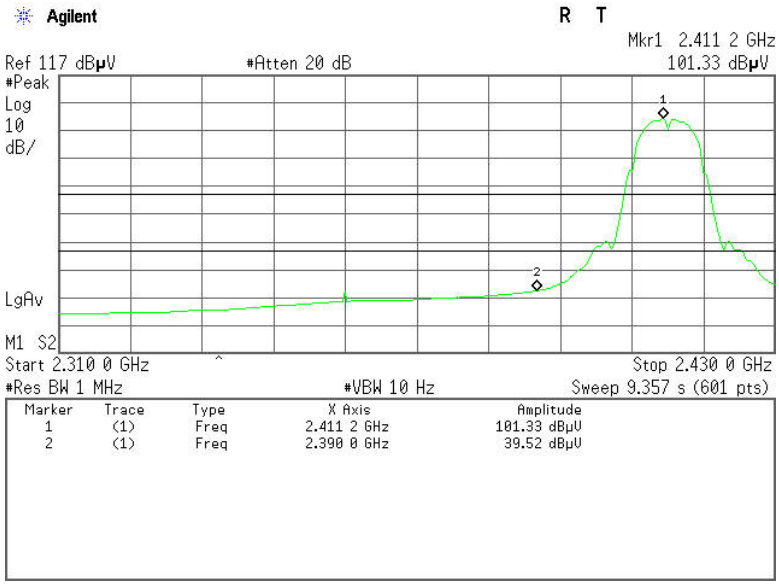
**IEEE 802.11b mode**

**Band Edges (CH Low)**

**Detector mode: Peak** **Polarity: Vertical**

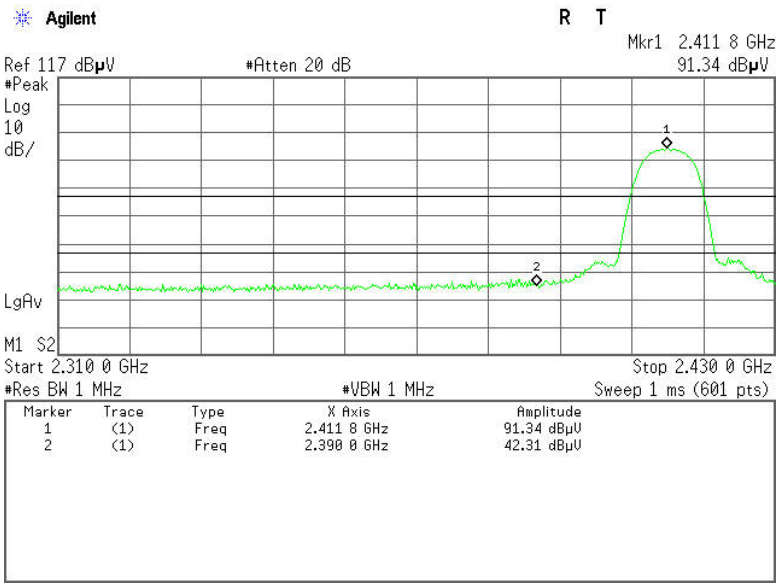



**Detector mode: Average** **Polarity: Vertical**

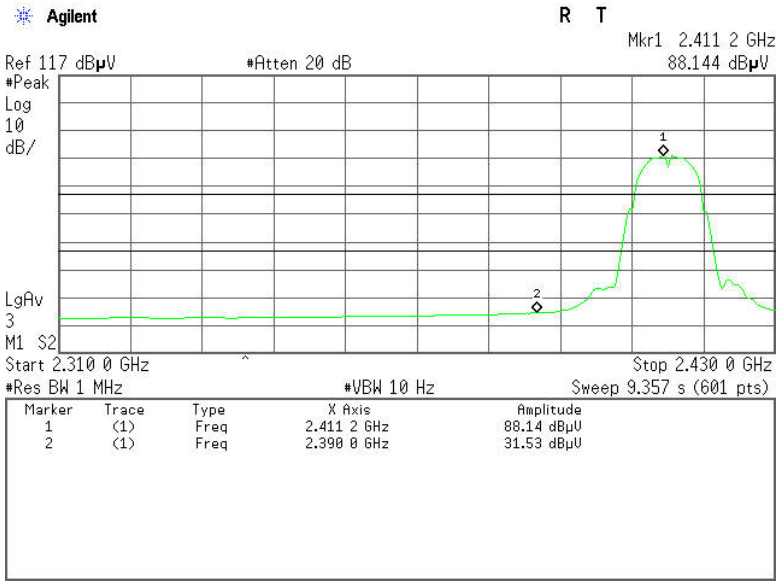



| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2390.0000 | 44.41 | -6.60 | 51.01 | 74.00 | -22.99 | Peak | Vertical |
| 2 | 2390.0000 | 32.92 | -6.60 | 39.52 | 54.00 | -14.48 | Average | Vertical |

**Detector mode: Peak** **Polarity: Horizontal**



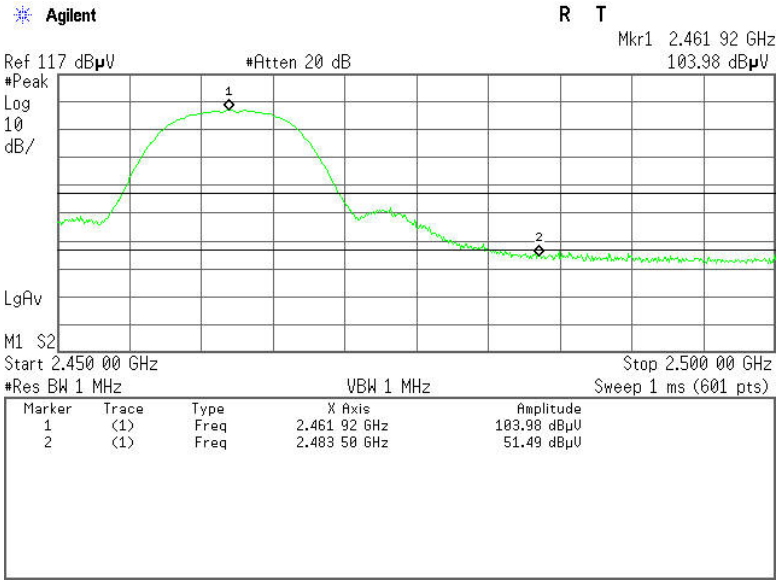

**Detector mode: Average** **Polarity: Horizontal**



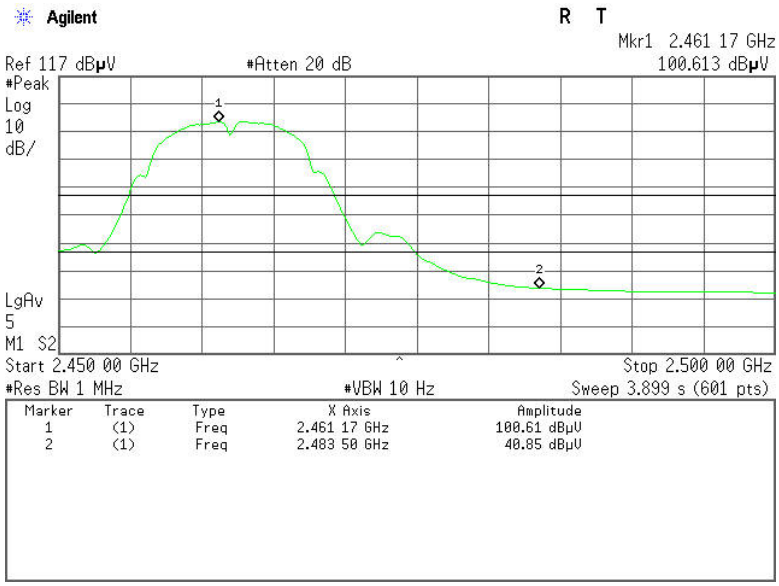

| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2390.0000 | 35.71 | -6.60 | 42.31 | 74.00 | -31.69 | Peak | Horizontal |
| 2 | 2390.0000 | 24.93 | -6.60 | 31.53 | 54.00 | -22.47 | Average | Horizontal |

## Band Edges (CH High)

### Detector mode: Peak  Polarity: Vertical

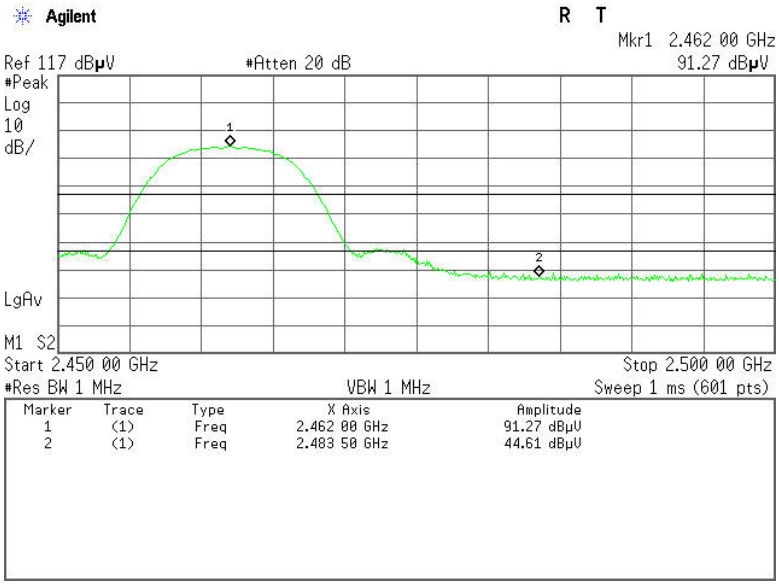



### Detector mode: Average  Polarity: Vertical

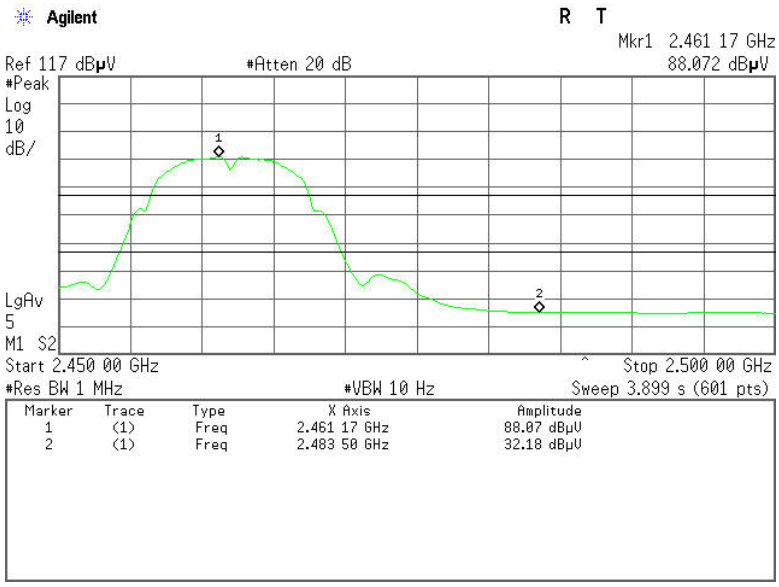



| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2483.5000 | 45.25 | -6.24 | 51.49 | 74.00 | -22.51 | Peak | Vertical |
| 2 | 2483.5000 | 34.61 | -6.24 | 40.85 | 54.00 | -13.15 | AVG | Vertical |

**Detector mode: Peak** **Polarity: Horizontal**




**Detector mode: Average** **Polarity: Horizontal**

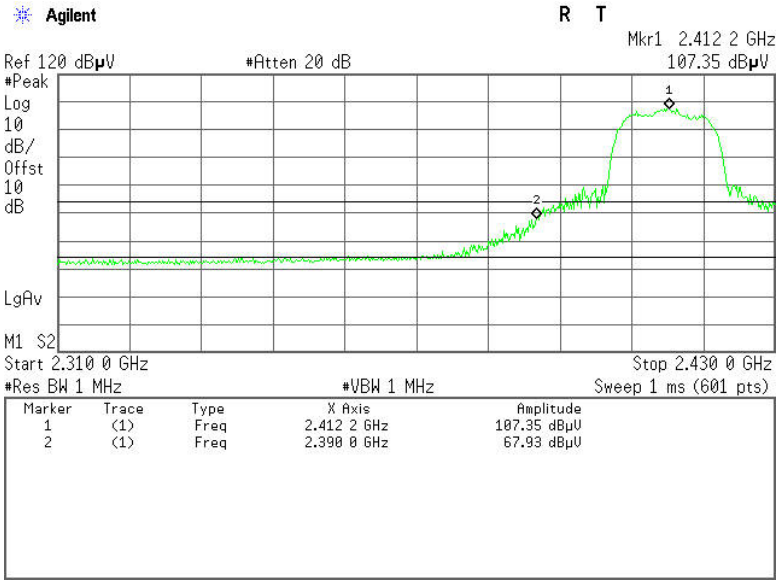



| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2483.5000 | 38.37 | -6.24 | 44.61 | 74.00 | -29.39 | Peak | Horizontal |
| 2 | 2483.5000 | 25.94 | -6.24 | 32.18 | 54.00 | -21.82 | AVG | Horizontal |

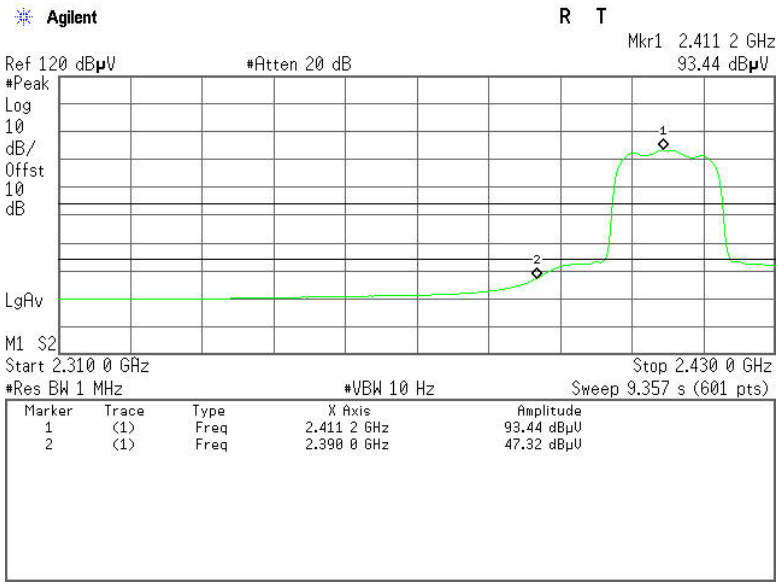
## IEEE 802.11g mode

## Band Edges (CH Low)

### Detector mode: Peak  Polarity: Vertical

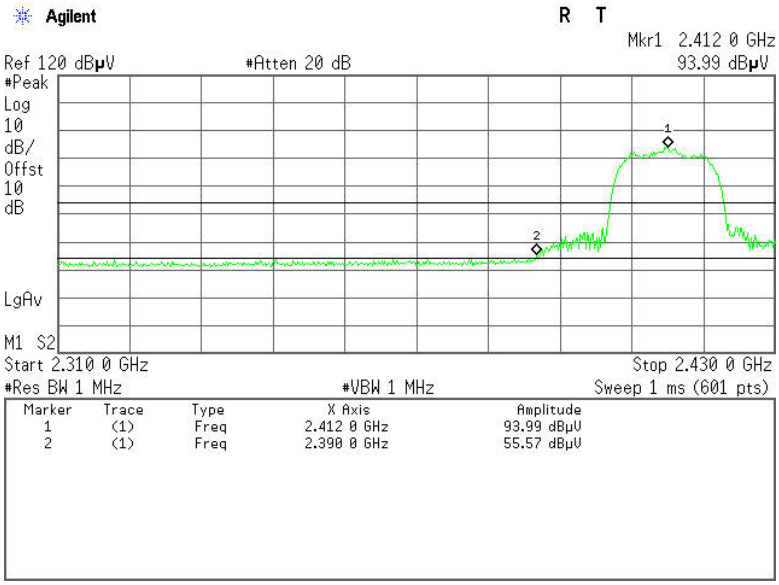



### Detector mode: Average  Polarity: Vertical

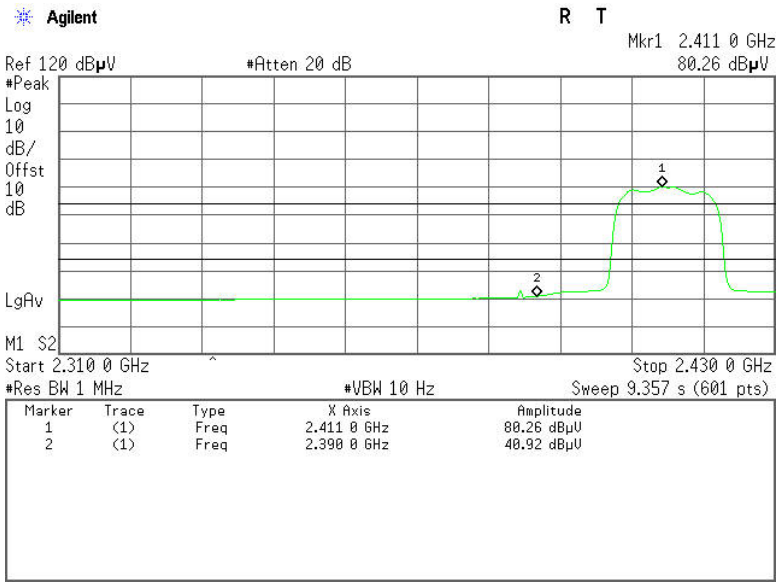



| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2390.0000 | 61.33 | -6.60 | 67.93 | 74.00 | -6.07 | Peak | Vertical |
| 2 | 2390.0000 | 40.72 | -6.60 | 47.32 | 54.00 | -6.68 | Average | Vertical |

**Detector mode: Peak** **Polarity: Horizontal**



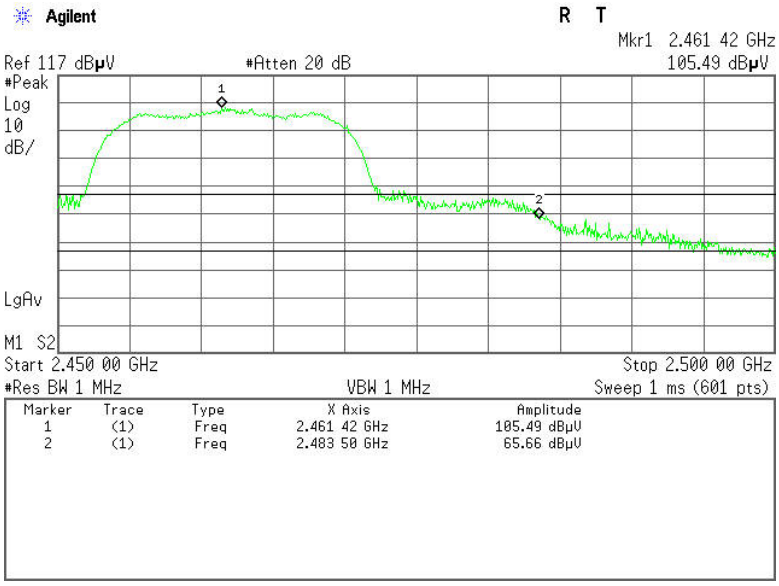

**Detector mode: Average** **Polarity: Horizontal**



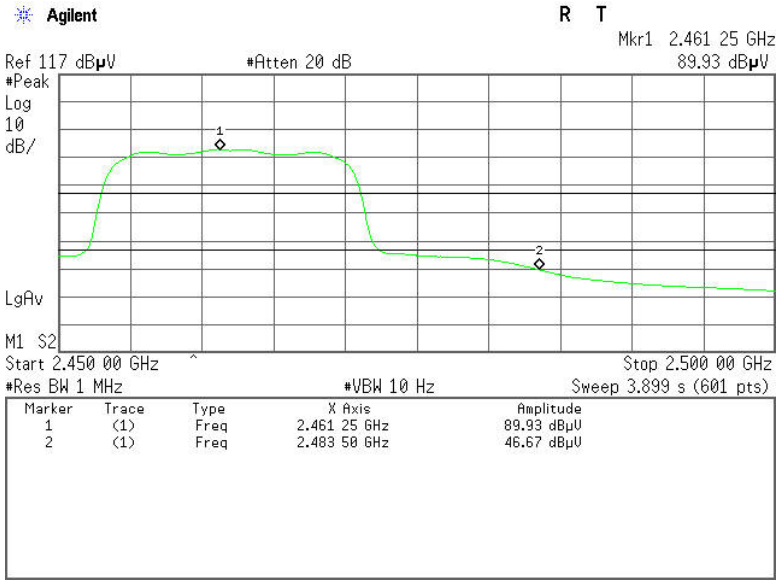

| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2390.0000 | 48.97 | -6.60 | 55.57 | 74.00 | -18.43 | Peak | Horizontal |
| 2 | 2390.0000 | 34.32 | -6.60 | 40.92 | 54.00 | -13.08 | Average | Horizontal |

## Band Edges (CH High)

### Detector mode: Peak  Polarity: Vertical

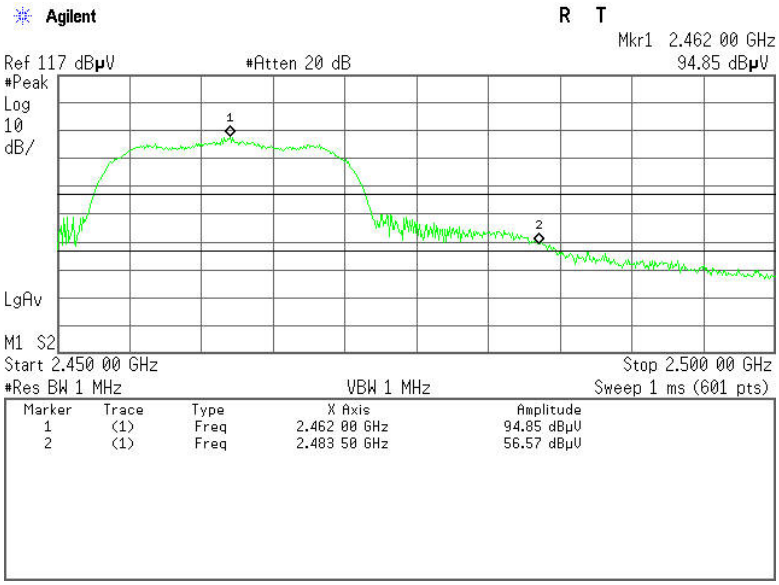



### Detector mode: Average  Polarity: Vertical

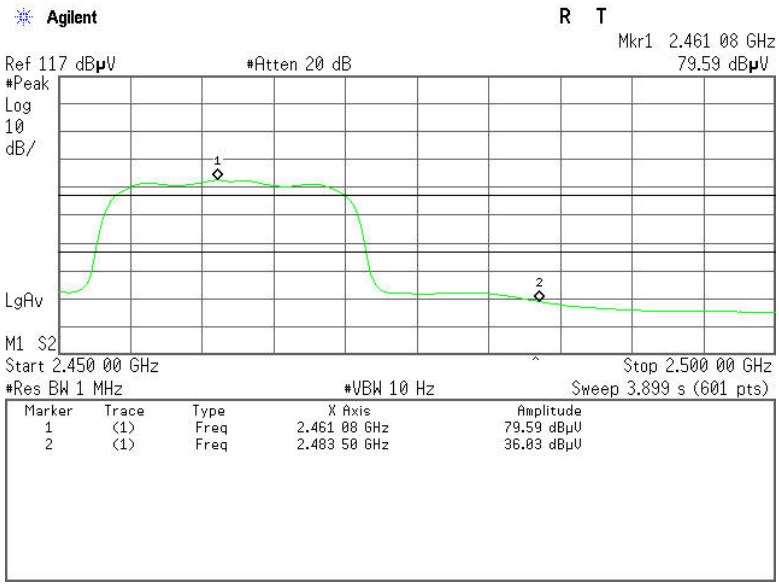



| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2483.5000 | 59.42 | -6.24 | 65.66 | 74.00 | -8.34 | Peak | Vertical |
| 2 | 2483.5000 | 40.43 | -6.24 | 46.67 | 54.00 | -7.33 | AVG | Vertical |

**Detector mode: Peak** **Polarity: Horizontal**




**Detector mode: Average** **Polarity: Horizontal**

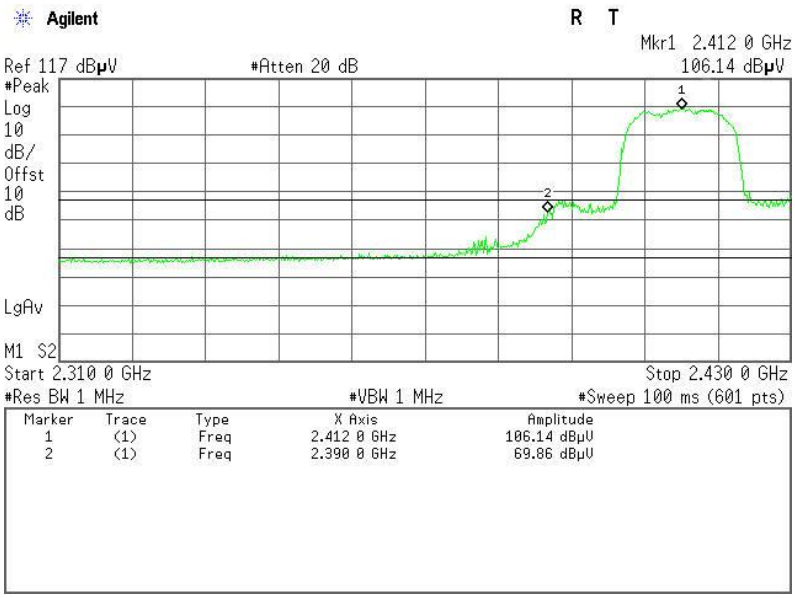



| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2483.5000 | 50.33 | -6.24 | 56.57 | 74.00 | -17.43 | Peak | Horizontal |
| 2 | 2483.5000 | 29.79 | -6.24 | 36.03 | 54.00 | -17.97 | AVG | Horizontal |

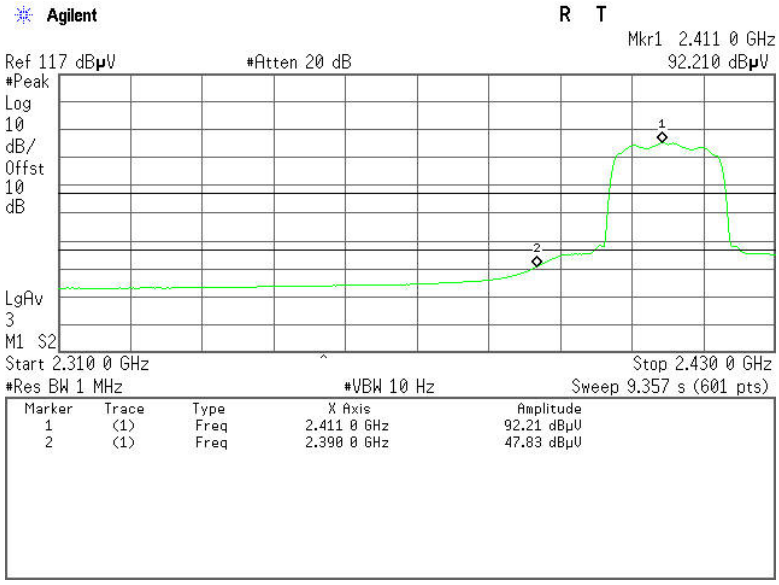
## IEEE 802.11n HT20 MHz mode

### Band Edges (CH Low)

**Detector mode: Peak** **Polarity: Vertical**

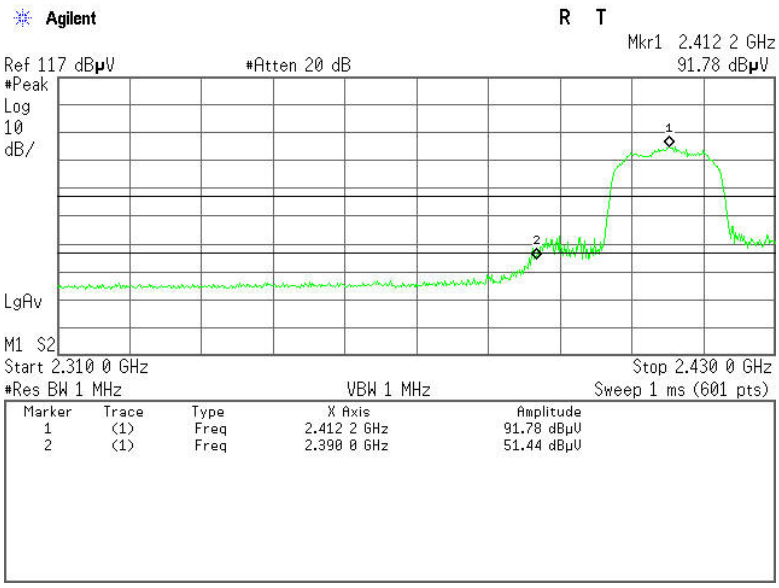



**Detector mode: Average** **Polarity: Vertical**

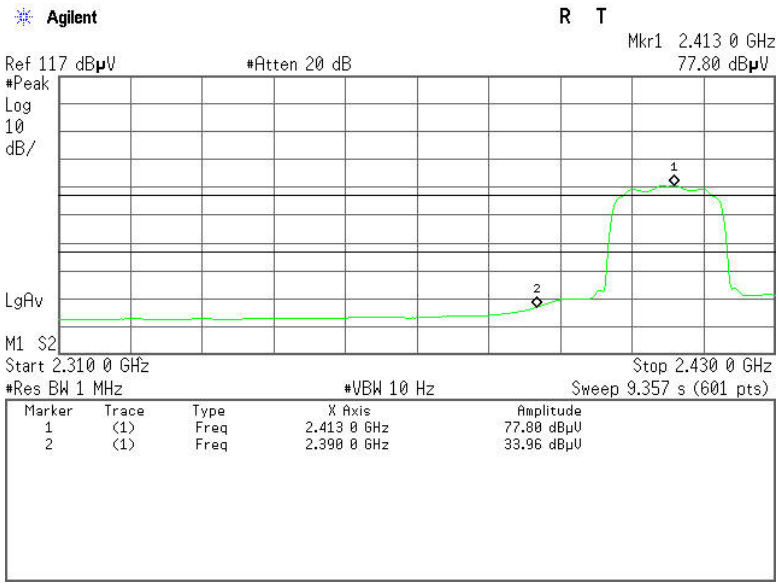



| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2390.0000 | 63.26 | -6.60 | 69.86 | 74.00 | -4.14 | Peak | Vertical |
| 2 | 2390.0000 | 41.23 | -6.60 | 47.83 | 54.00 | -6.17 | Average | Vertical |

**Detector mode: Peak** **Polarity: Horizontal**



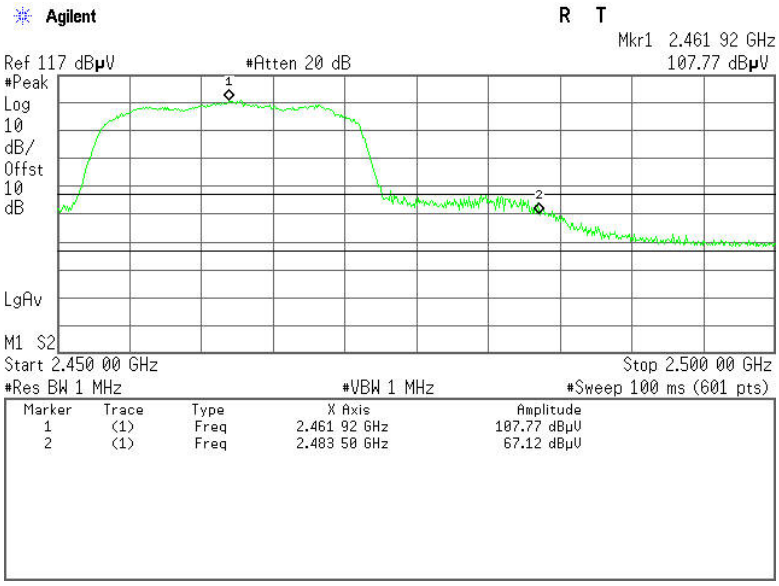

**Detector mode: Average** **Polarity: Horizontal**



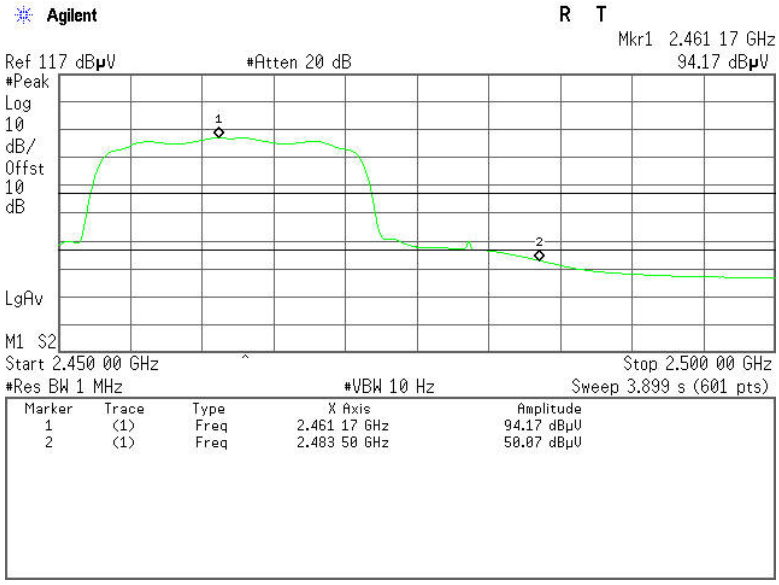

| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2390.0000 | 44.84 | -6.60 | 51.44 | 74.00 | -22.56 | Peak | Horizontal |
| 2 | 2390.0000 | 27.36 | -6.60 | 33.96 | 54.00 | -20.04 | Average | Horizontal |

## Band Edges (CH High)

### Detector mode: Peak  Polarity: Vertical

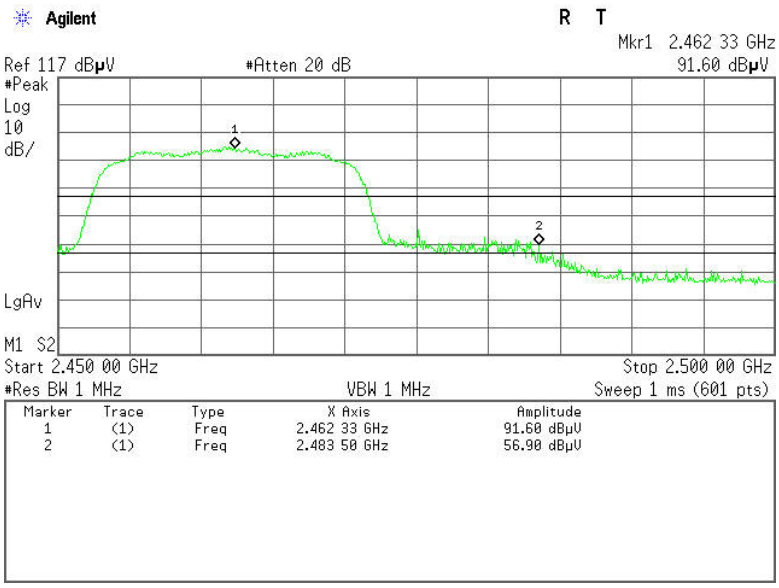



### Detector mode: Average  Polarity: Vertical

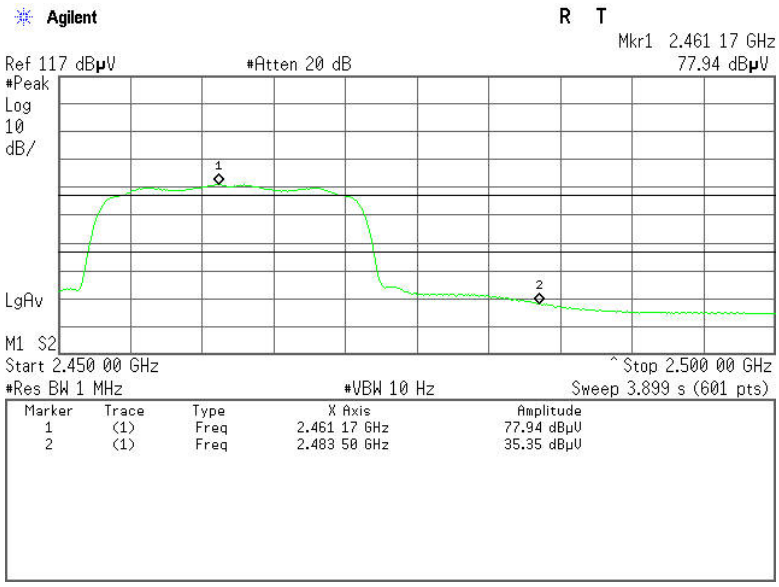



| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2483.5000 | 60.88 | -6.24 | 67.12 | 74.00 | -6.88 | Peak | Vertical |
| 2 | 2483.5000 | 43.83 | -6.24 | 50.07 | 54.00 | -3.93 | AVG | Vertical |

**Detector mode: Peak** **Polarity: Horizontal**




**Detector mode: Average** **Polarity: Horizontal**

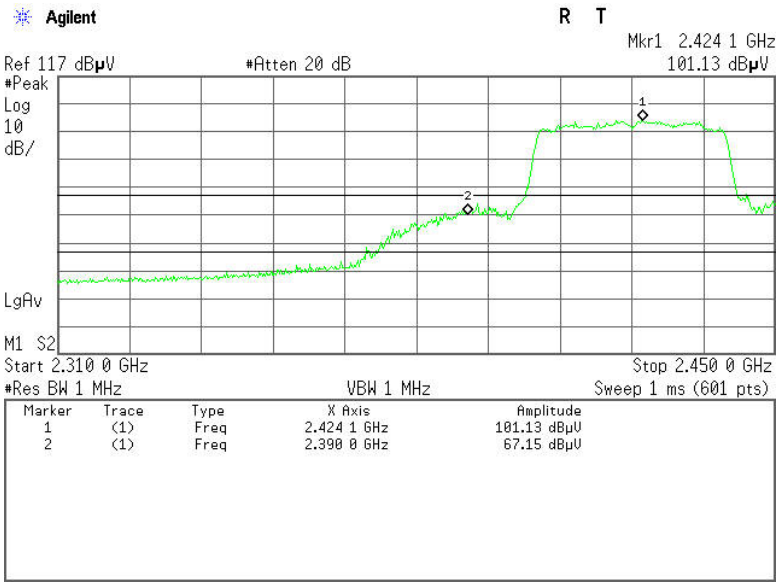



| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2483.5000 | 50.66 | -6.24 | 56.90 | 74.00 | -17.10 | Peak | Horizontal |
| 2 | 2483.5000 | 29.11 | -6.24 | 35.35 | 54.00 | -18.65 | AVG | Horizontal |

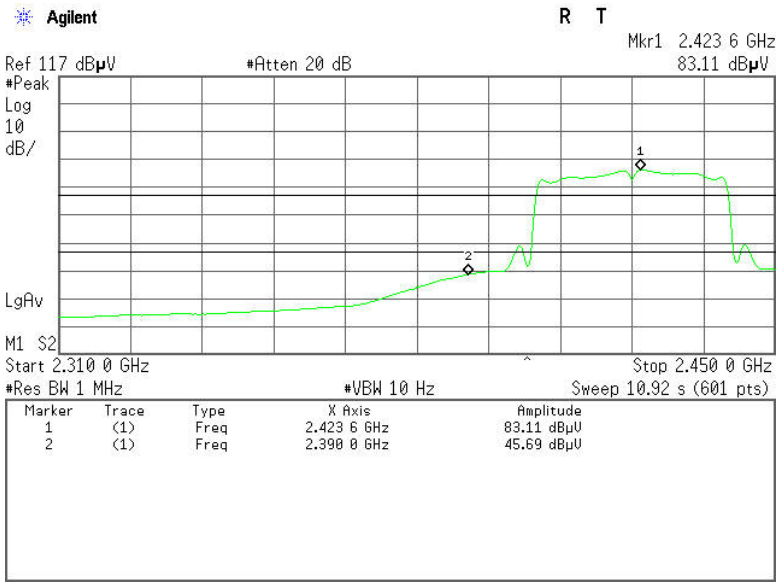
## IEEE 802.11n HT40 MHz mode

## Band Edges (CH Low)

### Detector mode: Peak  Polarity: Vertical

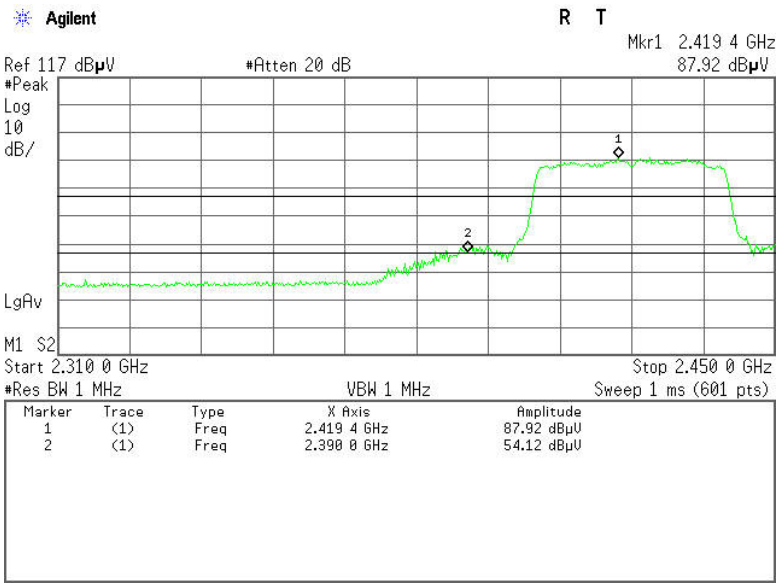



### Detector mode: Average  Polarity: Vertical

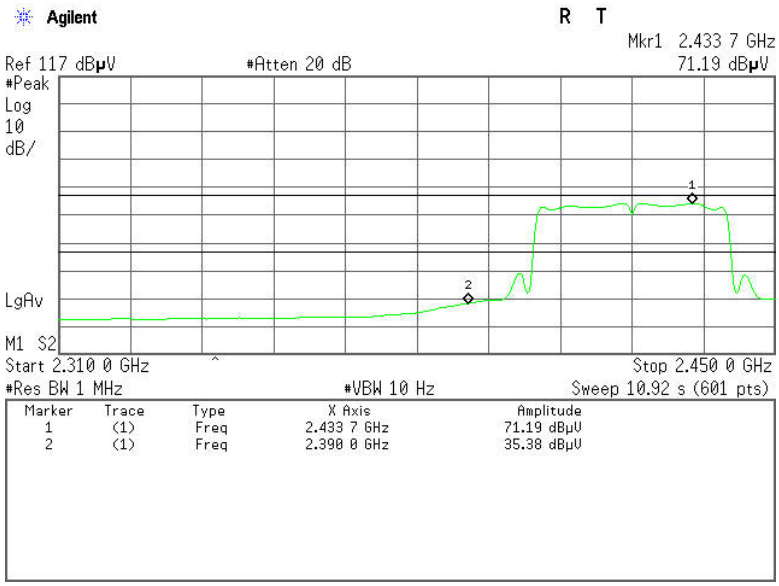



| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2390.0000 | 60.55 | -6.60 | 67.15 | 74.00 | -6.85 | Peak | Vertical |
| 2 | 2390.0000 | 39.09 | -6.60 | 45.69 | 54.00 | -8.31 | Average | Vertical |

**Detector mode: Peak** **Polarity: Horizontal**



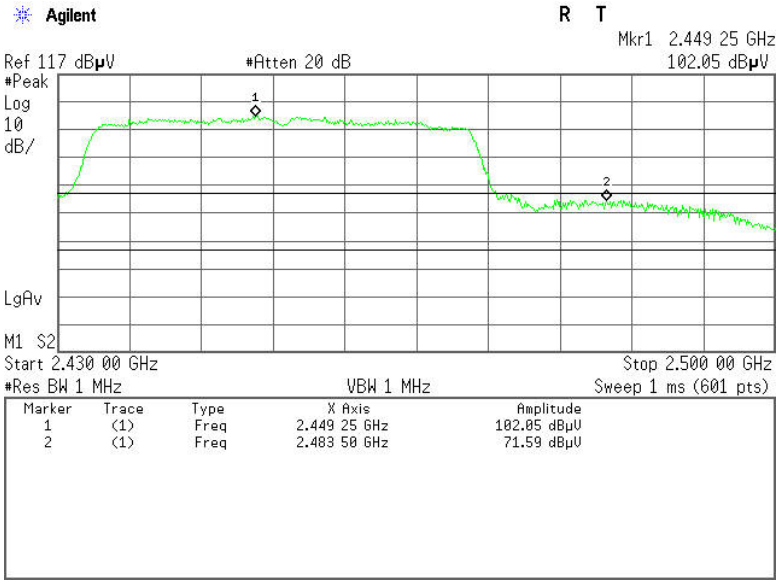

**Detector mode: Average** **Polarity: Horizontal**



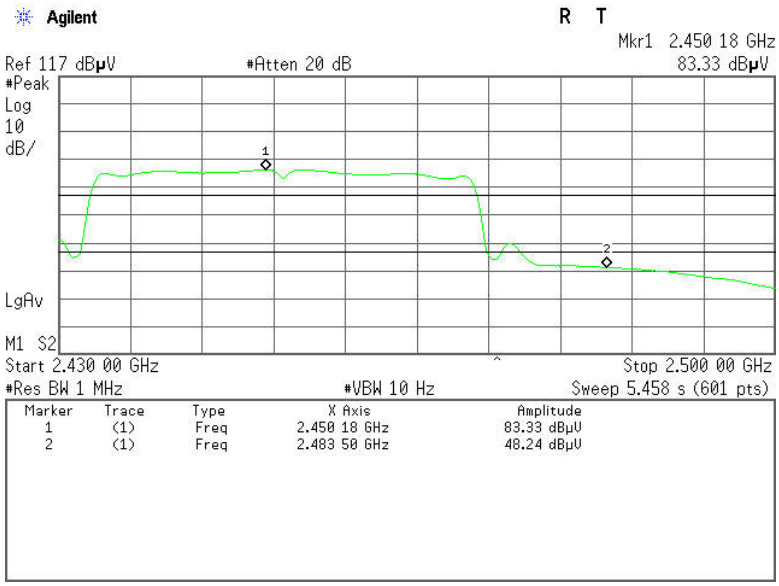

| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2390.0000 | 47.52 | -6.60 | 54.12 | 74.00 | -19.88 | Peak | Horizontal |
| 2 | 2390.0000 | 28.78 | -6.60 | 35.38 | 54.00 | -18.62 | Average | Horizontal |

## Band Edges (CH High)

### Detector mode: Peak  Polarity: Vertical

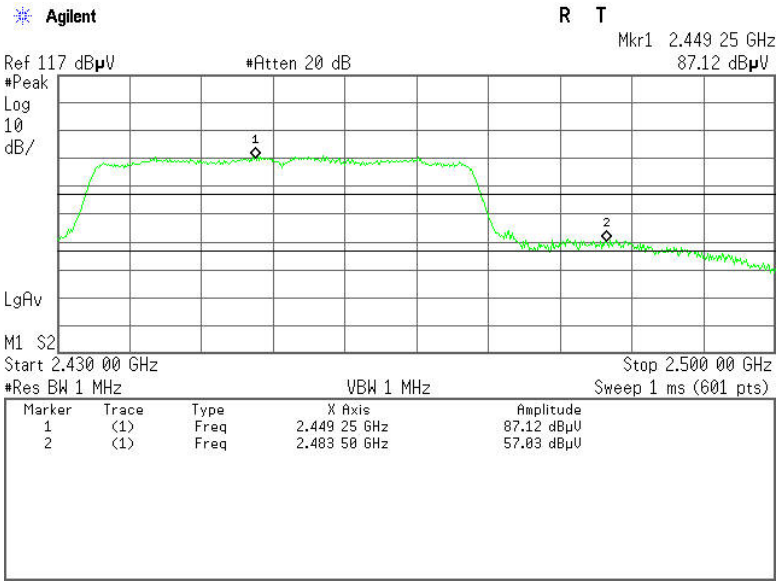



### Detector mode: Average  Polarity: Vertical

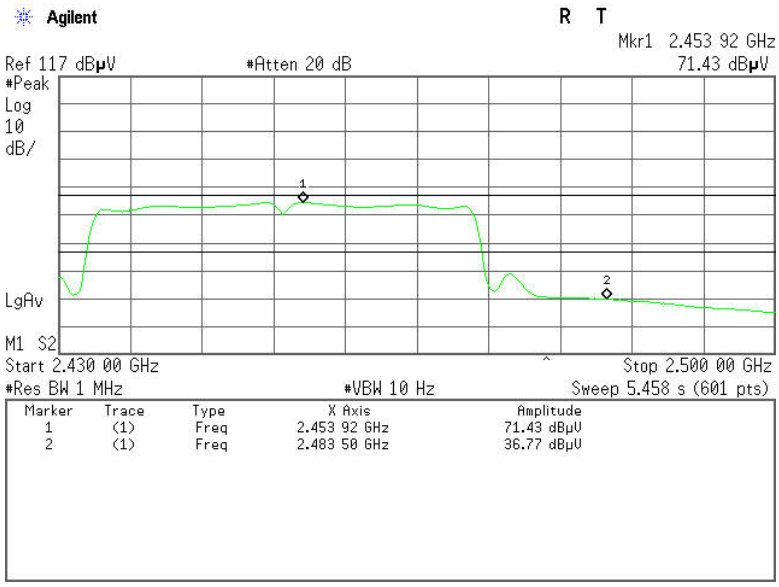



| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2483.5000 | 65.35 | -6.24 | 71.59 | 74.00 | -2.41 | Peak | Vertical |
| 2 | 2483.5000 | 42.00 | -6.24 | 48.24 | 54.00 | -5.76 | AVG | Vertical |

**Detector mode: Peak** **Polarity: Horizontal**




**Detector mode: Average** **Polarity: Horizontal**




| No. | Frequency (MHz) | Reading (dBuV) | Corrected (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Detector | Antenna Pole |
|---|---|---|---|---|---|---|---|---|
| 1 | 2483.5000 | 50.79 | -6.24 | 57.03 | 74.00 | -16.97 | Peak | Horizontal |
| 2 | 2483.5000 | 30.53 | -6.24 | 36.77 | 54.00 | -17.23 | AVG | Horizontal |

# 7.6. PEAK POWER SPECTRAL DENSITY MEASUREMENT

## 7.6.1. LIMITS

According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

## 7.6.2. TEST INSTRUMENTS

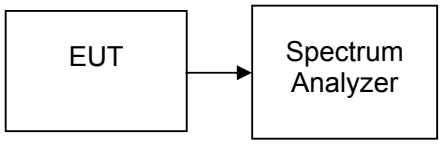
| Name of Equipment | Manufacturer | Model | Serial Number | Last Calibration | Calibration Due |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4446A | US44300399 | 03/09/2013 | 03/08/2014 |

## 7.6.3. TEST PROCEDURES (please refer to measurement standard)

§15.247(e)specifies a conducted power spectral density (PSD) limit of 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission. The same method as used to determine the conducted output power shall be used to determine the power spectral density (i.e.,if peak-detected fundamental power was measured then use the peak PSD procedure and if average fundamental power was measured then use the average PSD procedure).

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW = 100 kHz.
3. Set the VBW ≥ 300 kHz.
4. Set the span to 5-30 % greater than the EBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
10. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(3 kHz/100 kHz= -15.2 dB).
11. The resulting peak PSD level must be ≤ 8 dBm.

## 7.6.4. TEST SETUP



### 7.6.5. TEST RESULTS

*No non-compliance noted*

**Test Data**

**Test mode: IEEE 802.11b**

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Test Result |
|---|---|---|---|---|
| Low | 2412 | -6.14 | 8 | PASS |
| Mid | 2437 | -3.96 | | PASS |
| High | 2462 | -6.04 | | PASS |

**Test mode: IEEE 802.11g**

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Test Result |
|---|---|---|---|---|
| Low | 2412 | -9.98 | 8 | PASS |
| Mid | 2437 | -8.41 | | PASS |
| High | 2462 | -10.29 | | PASS |

**Test mode: IEEE 802.11n HT20 MHz**

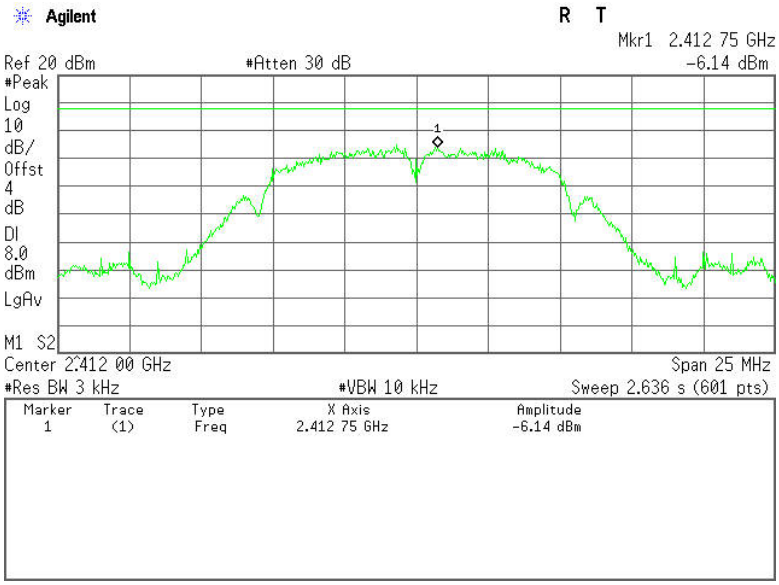
| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Test Result |
|---|---|---|---|---|
| Low | 2412 | -9.83 | 8 | PASS |
| Mid | 2437 | -8.50 | | PASS |
| High | 2462 | -10.35 | | PASS |

**Test mode: IEEE 802.11n HT40 MHz**

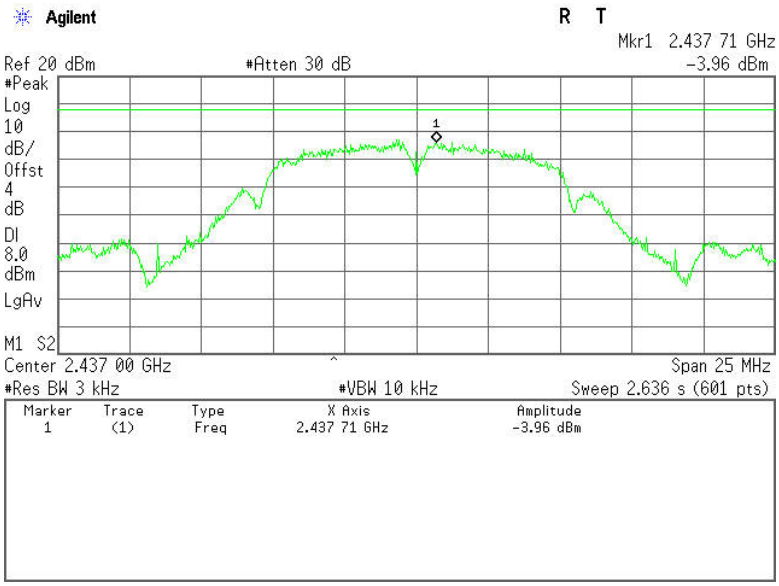
| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Test Result |
|---|---|---|---|---|
| Low | 2422 | -13.95 | 8 | PASS |
| Mid | 2437 | -12.03 | | PASS |
| High | 2452 | -14.73 | | PASS |

## Test Plot IEEE 802.11b mode

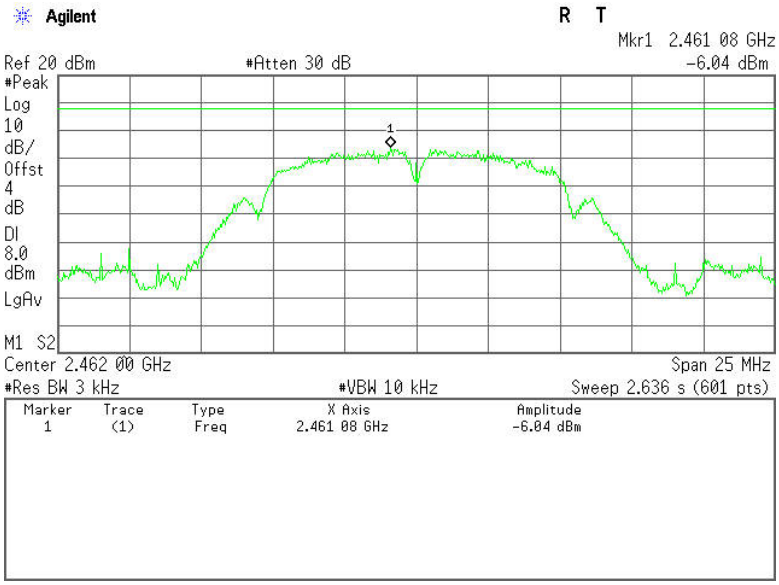
### PPSD (CH Low)




### PPSD (CH Mid)

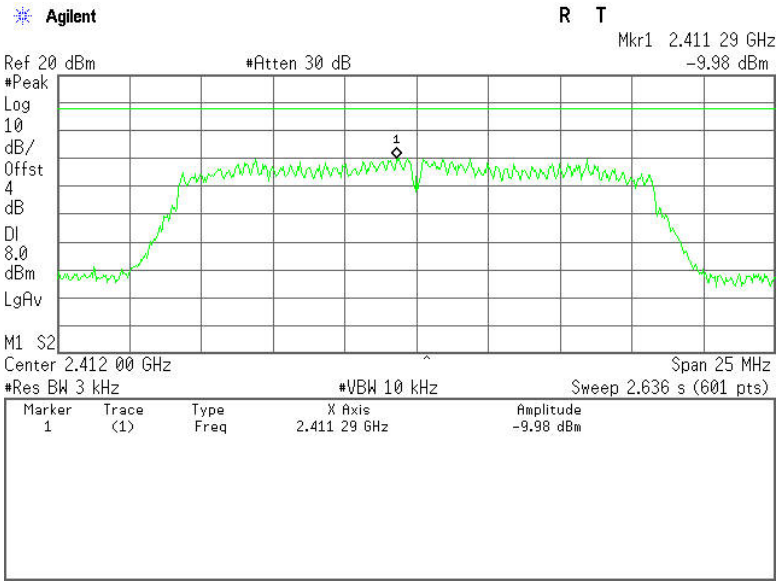


## PPSD (CH High)

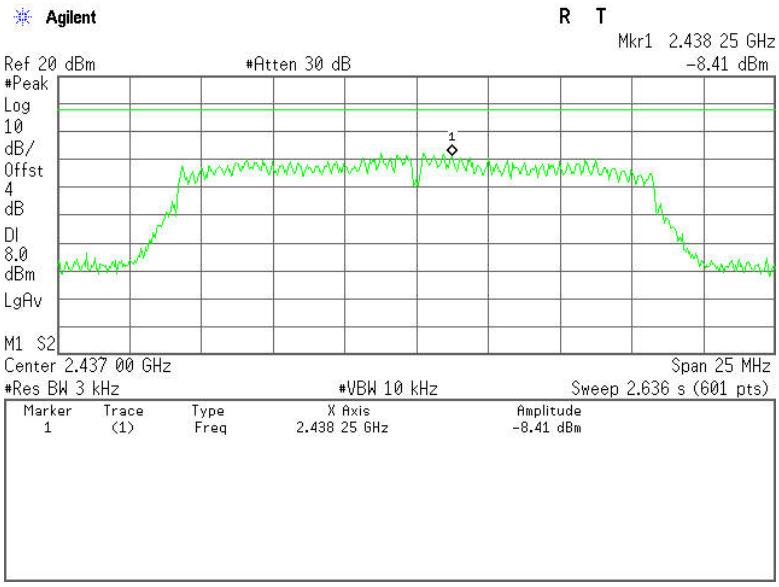



## IEEE 802.11g mode

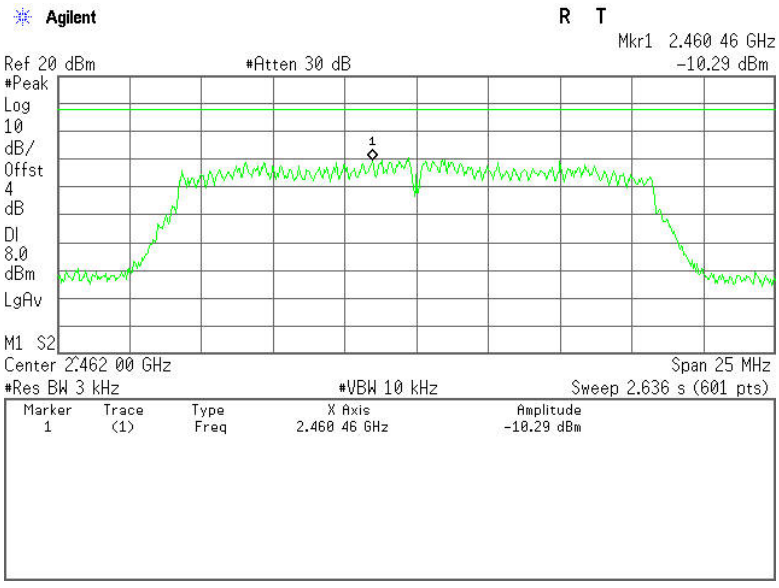
## PPSD (CH Low)



## PPSD (CH Mid)

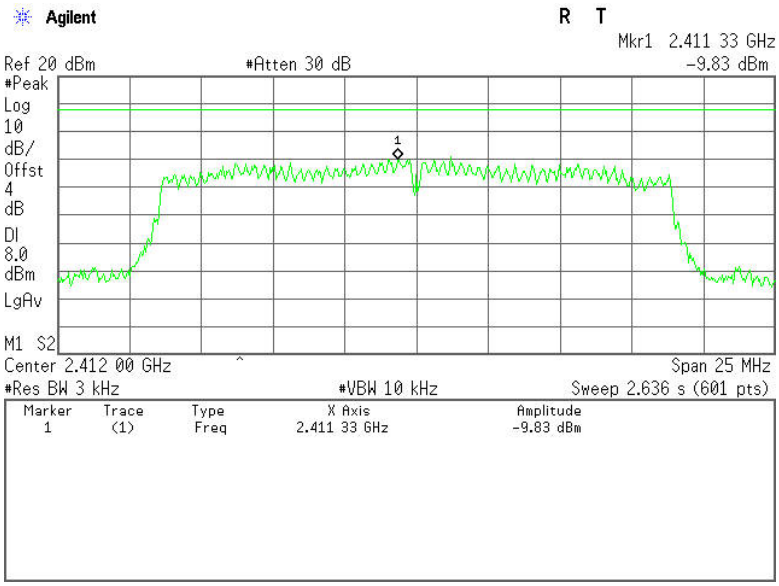



## PPSD (CH High)

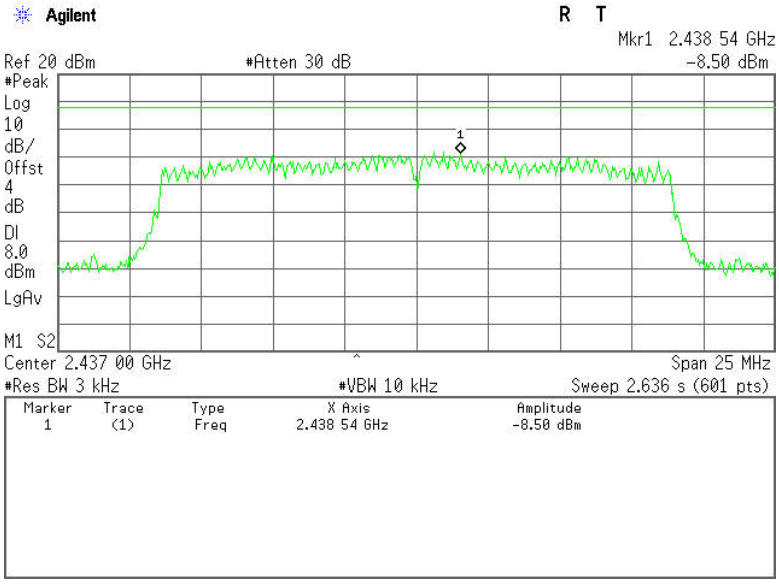


## IEEE 802.11n HT20 MHz mode

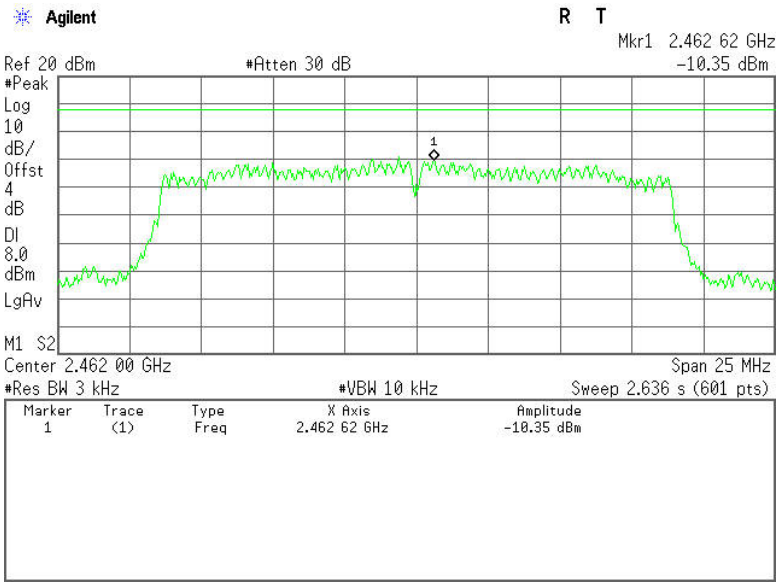
### PPSD (CH Low)




### PPSD (CH Mid)

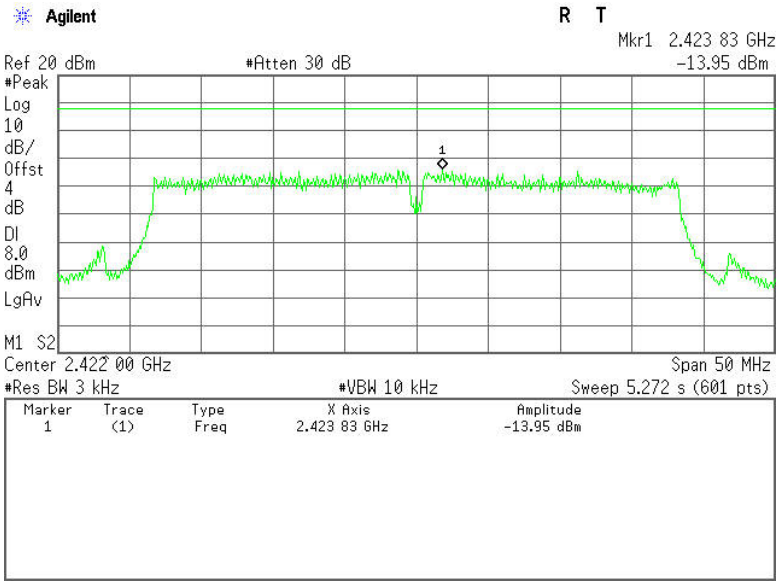


**PPSD (CH High)**

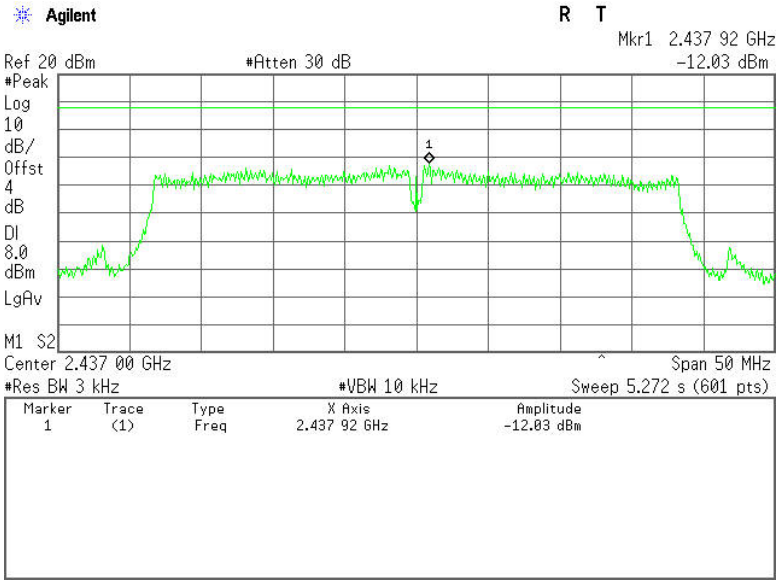



**IEEE 802.11n HT40 MHz mode**

**PPSD (CH Low)**



## PPSD (CH Mid)




## PPSD (CH High)