

**Test Mode:** TX / IEEE 802.11g (CH Mid)**Tested by:** Sam Zeng**Ambient temperature:** 24°C**Relative humidity:** 52% RH**Date:** May 28, 2017

| Frequency (MHz) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Pole (V/H) | Remark |
|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------------------|--------|
| 1333.000        | 47.68          | -7.30                    | 40.38           | 74.00          | -33.62      | V                  | Peak   |
| 1900.000        | 48.45          | -5.63                    | 42.82           | 74.00          | -31.18      | V                  | Peak   |
| 2242.000        | 45.87          | -3.67                    | 42.20           | 74.00          | -31.80      | V                  | Peak   |
| 2521.000        | 47.39          | -2.22                    | 45.17           | 74.00          | -28.83      | V                  | Peak   |
| 3079.000        | 44.39          | -1.23                    | 43.16           | 74.00          | -30.84      | V                  | Peak   |
| 3961.000        | 46.15          | 1.43                     | 47.58           | 74.00          | -26.42      | V                  | Peak   |
|                 |                |                          |                 |                |             |                    |        |
| 1342.000        | 47.52          | -7.27                    | 40.25           | 74.00          | -33.75      | H                  | Peak   |
| 2098.000        | 47.33          | -4.46                    | 42.87           | 74.00          | -31.13      | H                  | Peak   |
| 2521.000        | 46.62          | -2.22                    | 44.40           | 74.00          | -29.60      | H                  | Peak   |
| 2800.000        | 45.34          | -1.72                    | 43.62           | 74.00          | -30.38      | H                  | Peak   |
| 3223.000        | 44.57          | -0.99                    | 43.58           | 74.00          | -30.42      | H                  | Peak   |
| 3871.000        | 44.87          | 1.05                     | 45.92           | 74.00          | -28.08      | 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).



Test Mode: TX / IEEE 802.11g (CH High)

Tested by: Sam Zeng

Ambient temperature: 24°C

Relative humidity: 52% RH

Date: May 28, 2017

| Frequency (MHz) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Pole (V/H) | Remark |
|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------------------|--------|
| 1297.000        | 47.23          | -7.44                    | 39.79           | 74.00          | -34.21      | V                  | Peak   |
| 1900.000        | 49.38          | -5.63                    | 43.75           | 74.00          | -30.25      | V                  | Peak   |
| 2512.000        | 45.67          | -2.24                    | 43.43           | 74.00          | -30.57      | V                  | Peak   |
| 2818.000        | 44.87          | -1.69                    | 43.18           | 74.00          | -30.82      | V                  | Peak   |
| 3961.000        | 45.93          | 1.43                     | 47.36           | 74.00          | -26.64      | V                  | Peak   |
| 4762.000        | 43.97          | 4.20                     | 48.17           | 74.00          | -25.83      | V                  | Peak   |
|                 |                |                          |                 |                |             |                    |        |
| 1333.000        | 48.14          | -7.30                    | 40.84           | 74.00          | -33.16      | H                  | Peak   |
| 2242.000        | 46.01          | -3.67                    | 42.34           | 74.00          | -31.66      | H                  | Peak   |
| 2530.000        | 46.57          | -2.21                    | 44.36           | 74.00          | -29.64      | H                  | Peak   |
| 3079.000        | 45.42          | -1.23                    | 44.19           | 74.00          | -29.81      | H                  | Peak   |
| 3781.000        | 44.06          | 0.67                     | 44.73           | 74.00          | -29.27      | H                  | Peak   |
| 4672.000        | 44.12          | 3.91                     | 48.03           | 74.00          | -25.97      | 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).

Test Mode: TX / IEEE 802.11n HT20 MHz (CH Low)Tested by: Sam ZengAmbient temperature: 24°CRelative humidity: 52% RHDate: May 28, 2017

| Frequency (MHz) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Pole (V/H) | Remark |
|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------------------|--------|
| 1351.000        | 47.60          | -7.24                    | 40.36           | 74.00          | -33.64      | V                  | Peak   |
| 2161.000        | 47.37          | -4.12                    | 43.25           | 74.00          | -30.75      | V                  | Peak   |
| 2539.000        | 46.83          | -2.19                    | 44.64           | 74.00          | -29.36      | V                  | Peak   |
| 3079.000        | 44.47          | -1.23                    | 43.24           | 74.00          | -30.76      | V                  | Peak   |
| 3727.000        | 44.32          | 0.44                     | 44.76           | 74.00          | -29.24      | V                  | Peak   |
| 4753.000        | 44.34          | 4.17                     | 48.51           | 74.00          | -25.49      | V                  | Peak   |
|                 |                |                          |                 |                |             |                    |        |
| 1297.000        | 48.40          | -7.44                    | 40.96           | 74.00          | -33.04      | H                  | Peak   |
| 2242.000        | 46.18          | -3.67                    | 42.51           | 74.00          | -31.49      | H                  | Peak   |
| 2530.000        | 46.85          | -2.21                    | 44.64           | 74.00          | -29.36      | H                  | Peak   |
| 2800.000        | 45.70          | -1.72                    | 43.98           | 74.00          | -30.02      | H                  | Peak   |
| 3961.000        | 43.60          | 1.43                     | 45.03           | 74.00          | -28.97      | H                  | Peak   |
| 4429.000        | 43.04          | 3.10                     | 46.14           | 74.00          | -27.86      | 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).

Test Mode: TX / IEEE 802.11n HT20 MHz (CH Mid)Tested by: Sam ZengAmbient temperature: 24°CRelative humidity: 52% RHDate: May 28, 2017

| Frequency (MHz) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Pole (V/H) | Remark |
|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------------------|--------|
| 1207.000        | 48.86          | -7.76                    | 41.10           | 74.00          | -32.90      | V                  | Peak   |
| 1720.000        | 48.35          | -6.44                    | 41.91           | 74.00          | -32.09      | V                  | Peak   |
| 2143.000        | 46.06          | -4.22                    | 41.84           | 74.00          | -32.16      | V                  | Peak   |
| 2494.000        | 46.77          | -2.29                    | 44.48           | 74.00          | -29.52      | V                  | Peak   |
| 3196.000        | 44.03          | -1.03                    | 43.00           | 74.00          | -31.00      | V                  | Peak   |
| 3961.000        | 44.85          | 1.43                     | 46.28           | 74.00          | -27.72      | V                  | Peak   |
|                 |                |                          |                 |                |             |                    |        |
| 1198.000        | 47.99          | -7.80                    | 40.19           | 74.00          | -33.81      | H                  | Peak   |
| 1657.000        | 46.81          | -6.58                    | 40.23           | 74.00          | -33.77      | H                  | Peak   |
| 2116.000        | 45.82          | -4.36                    | 41.46           | 74.00          | -32.54      | H                  | Peak   |
| 2503.000        | 47.24          | -2.25                    | 44.99           | 74.00          | -29.01      | H                  | Peak   |
| 3214.000        | 43.53          | -1.00                    | 42.53           | 74.00          | -31.47      | H                  | Peak   |
| 3673.000        | 44.50          | 0.21                     | 44.71           | 74.00          | -29.29      | 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).

Test Mode: TX / EEE 802.11n HT20 MHz (CH High)Tested by: Sam ZengAmbient temperature: 24°CRelative humidity: 52% RHDate: May 28, 2017

| Frequency (MHz) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Pole (V/H) | Remark |
|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------------------|--------|
| 1180.000        | 48.76          | -7.87                    | 40.89           | 74.00          | -33.11      | V                  | Peak   |
| 2224.000        | 46.82          | -3.77                    | 43.05           | 74.00          | -30.95      | V                  | Peak   |
| 2512.000        | 46.46          | -2.24                    | 44.22           | 74.00          | -29.78      | V                  | Peak   |
| 3394.000        | 43.81          | -0.70                    | 43.11           | 74.00          | -30.89      | V                  | Peak   |
| 4024.000        | 43.77          | 1.67                     | 45.44           | 74.00          | -28.56      | V                  | Peak   |
| 4987.000        | 42.96          | 4.94                     | 47.90           | 74.00          | -26.10      | V                  | Peak   |
|                 |                |                          |                 |                |             |                    |        |
| 1342.000        | 47.59          | -7.27                    | 40.32           | 74.00          | -33.68      | H                  | Peak   |
| 2224.000        | 46.65          | -3.77                    | 42.88           | 74.00          | -31.12      | H                  | Peak   |
| 2512.000        | 47.00          | -2.24                    | 44.76           | 74.00          | -29.24      | H                  | Peak   |
| 2800.000        | 45.66          | -1.72                    | 43.94           | 74.00          | -30.06      | H                  | Peak   |
| 3880.000        | 44.25          | 1.08                     | 45.33           | 74.00          | -28.67      | H                  | Peak   |
| 4906.000        | 42.68          | 4.67                     | 47.35           | 74.00          | -26.65      | 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).

Test Mode: TX / IEEE 802.11n HT40 MHz (CH Low)Tested by: Sam ZengAmbient temperature: 24°CRelative humidity: 52% RHDate: May 28, 2017

| Frequency (MHz) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Pole (V/H) | Remark |
|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------------------|--------|
| 1333.000        | 47.65          | -7.30                    | 40.35           | 74.00          | -33.65      | V                  | Peak   |
| 2152.000        | 45.92          | -4.17                    | 41.75           | 74.00          | -32.25      | V                  | Peak   |
| 2512.000        | 46.55          | -2.24                    | 44.31           | 74.00          | -29.69      | V                  | Peak   |
| 3169.000        | 44.58          | -1.08                    | 43.50           | 74.00          | -30.50      | V                  | Peak   |
| 3961.000        | 44.39          | 1.43                     | 45.82           | 74.00          | -28.18      | V                  | Peak   |
| 4762.000        | 43.47          | 4.20                     | 47.67           | 74.00          | -26.33      | V                  | Peak   |
|                 |                |                          |                 |                |             |                    |        |
| 1333.000        | 48.00          | -7.30                    | 40.70           | 74.00          | -33.30      | H                  | Peak   |
| 2233.000        | 47.23          | -3.72                    | 43.51           | 74.00          | -30.49      | H                  | Peak   |
| 2530.000        | 46.97          | -2.21                    | 44.76           | 74.00          | -29.24      | H                  | Peak   |
| 3214.000        | 45.05          | -1.00                    | 44.05           | 74.00          | -29.95      | H                  | Peak   |
| 4060.000        | 44.15          | 1.80                     | 45.95           | 74.00          | -28.05      | H                  | Peak   |
| 4870.000        | 42.50          | 4.56                     | 47.06           | 74.00          | -26.94      | 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).

**Test Mode:** TX / IEEE 802.11n HT40 MHz (CH Mid)**Tested by:** Sam Zeng**Ambient temperature:** 24°C**Relative humidity:** 52% RH**Date:** May 28, 2017

| Frequency (MHz) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Pole (V/H) | Remark |
|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------------------|--------|
| 1342.000        | 47.15          | -7.27                    | 39.88           | 74.00          | -34.12      | V                  | Peak   |
| 2188.000        | 45.98          | -3.97                    | 42.01           | 74.00          | -31.99      | V                  | Peak   |
| 2539.000        | 46.70          | -2.19                    | 44.51           | 74.00          | -29.49      | V                  | Peak   |
| 3169.000        | 44.30          | -1.08                    | 43.22           | 74.00          | -30.78      | V                  | Peak   |
| 3997.000        | 42.90          | 1.58                     | 44.48           | 74.00          | -29.52      | V                  | Peak   |
| 4888.000        | 42.20          | 4.61                     | 46.81           | 74.00          | -27.19      | V                  | Peak   |
|                 |                |                          |                 |                |             |                    |        |
| 1216.000        | 47.85          | -7.73                    | 40.12           | 74.00          | -33.88      | H                  | Peak   |
| 1612.000        | 47.59          | -6.67                    | 40.92           | 74.00          | -33.08      | H                  | Peak   |
| 2503.000        | 46.39          | -2.25                    | 44.14           | 74.00          | -29.86      | H                  | Peak   |
| 2800.000        | 45.52          | -1.72                    | 43.80           | 74.00          | -30.20      | H                  | Peak   |
| 3673.000        | 44.89          | 0.21                     | 45.10           | 74.00          | -28.90      | H                  | Peak   |
| 4816.000        | 42.83          | 4.38                     | 47.21           | 74.00          | -26.79      | 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).

**Test Mode:** TX / EEE 802.11n HT40 MHz (CH High)**Tested by:** Sam Zeng**Ambient temperature:** 24°C**Relative humidity:** 52% RH**Date:** May 28, 2017

| Frequency (MHz) | Reading (dBuV) | Correction Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Pole (V/H) | Remark |
|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------------------|--------|
| 1504.000        | 47.69          | -6.87                    | 40.82           | 74.00          | -33.18      | V                  | Peak   |
| 2242.000        | 46.58          | -3.67                    | 42.91           | 74.00          | -31.09      | V                  | Peak   |
| 2521.000        | 46.42          | -2.22                    | 44.20           | 74.00          | -29.80      | V                  | Peak   |
| 3169.000        | 44.61          | -1.08                    | 43.53           | 74.00          | -30.47      | V                  | Peak   |
| 3961.000        | 46.77          | 1.43                     | 48.20           | 74.00          | -25.80      | V                  | Peak   |
| 4762.000        | 44.39          | 4.20                     | 48.59           | 74.00          | -25.41      | V                  | Peak   |
|                 |                |                          |                 |                |             |                    |        |
| 1180.000        | 48.45          | -7.87                    | 40.58           | 74.00          | -33.42      | H                  | Peak   |
| 2233.000        | 46.80          | -3.72                    | 43.08           | 74.00          | -30.92      | H                  | Peak   |
| 2494.000        | 46.56          | -2.29                    | 44.27           | 74.00          | -29.73      | H                  | Peak   |
| 2926.000        | 44.73          | -1.49                    | 43.24           | 74.00          | -30.76      | H                  | Peak   |
| 4429.000        | 43.49          | 3.10                     | 46.59           | 74.00          | -27.41      | H                  | Peak   |
| 5338.000        | 41.22          | 5.58                     | 46.80           | 74.00          | -27.20      | 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. The minimum 6 dB bandwidth shall be at least 500 kHz.

#### 7.3.2. TEST INSTRUMENTS

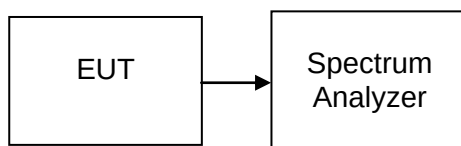
| Name of Equipment | Manufacturer | Model  | Serial Number | Last Calibration | Calibration Due |
|-------------------|--------------|--------|---------------|------------------|-----------------|
| Spectrum Analyzer | Agilent      | N9010A | MY52221469    | 02/21/2017       | 02/20/2018      |

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

##### 8.2 Option 2:

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW  $\geq$  3 RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be  $\geq$  6 dB.

#### 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            | 9014            | >500        | PASS        |
| Mid     | 2437            | 9041            |             | PASS        |
| High    | 2462            | 9047            |             | PASS        |

**Test mode: IEEE 802.11g**

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Test Result |
|---------|-----------------|-----------------|-------------|-------------|
| Low     | 2412            | 15880           | >500        | PASS        |
| Mid     | 2437            | 16020           |             | PASS        |
| High    | 2462            | 16000           |             | PASS        |

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

| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Test Result |
|---------|-----------------|-----------------|-------------|-------------|
| Low     | 2412            | 16770           | >500        | PASS        |
| Mid     | 2437            | 16790           |             | PASS        |
| High    | 2462            | 16790           |             | PASS        |

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

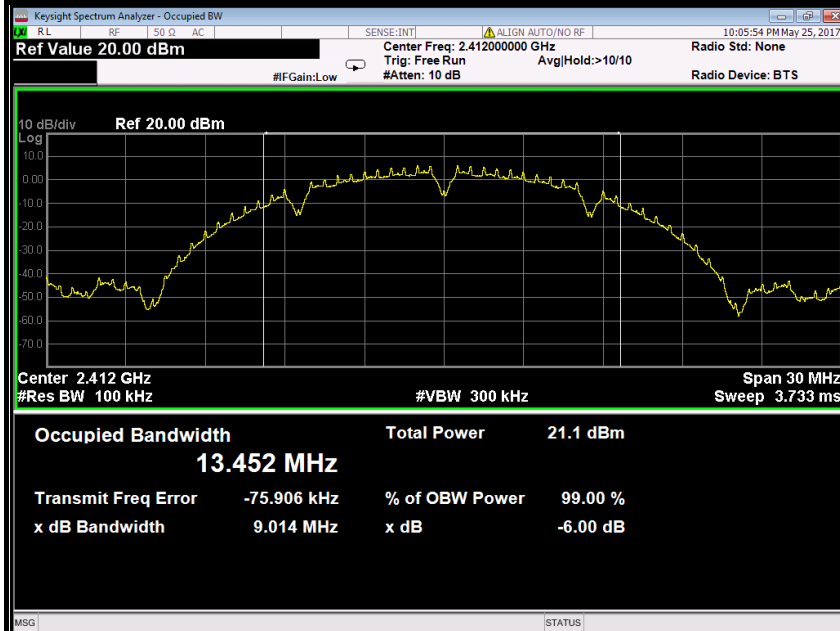
| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Test Result |
|---------|-----------------|-----------------|-------------|-------------|
| Low     | 2422            | 35690           | >500        | PASS        |
| Mid     | 2437            | 35700           |             | PASS        |
| High    | 2452            | 35350           |             | PASS        |



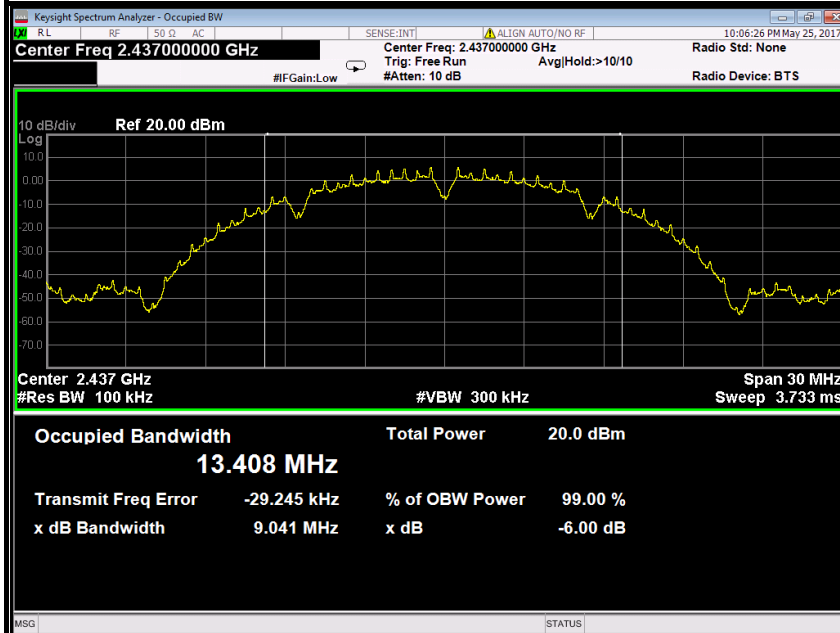
### Test Plot

#### IEEE 802.11b mode

#### 6dB Bandwidth (CH Low)

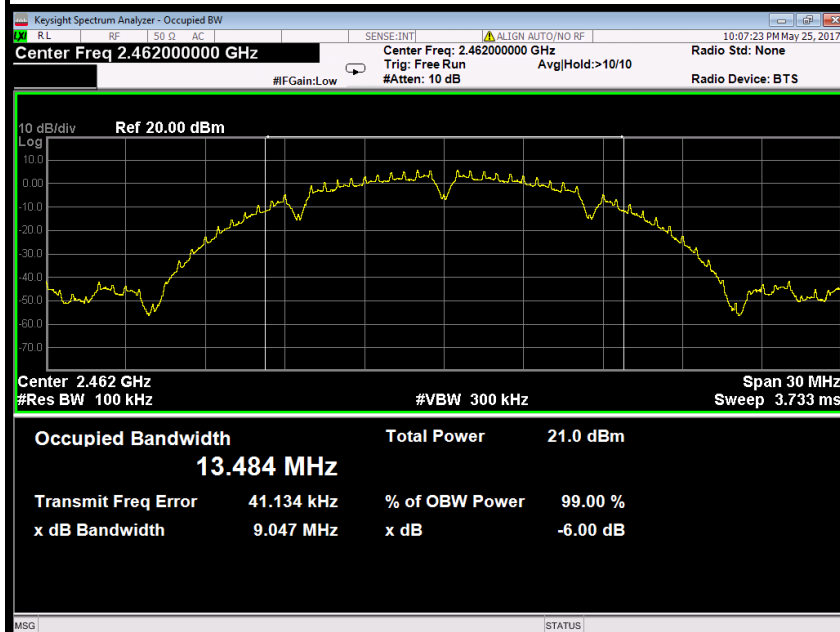


#### 6dB Bandwidth (CH Mid)



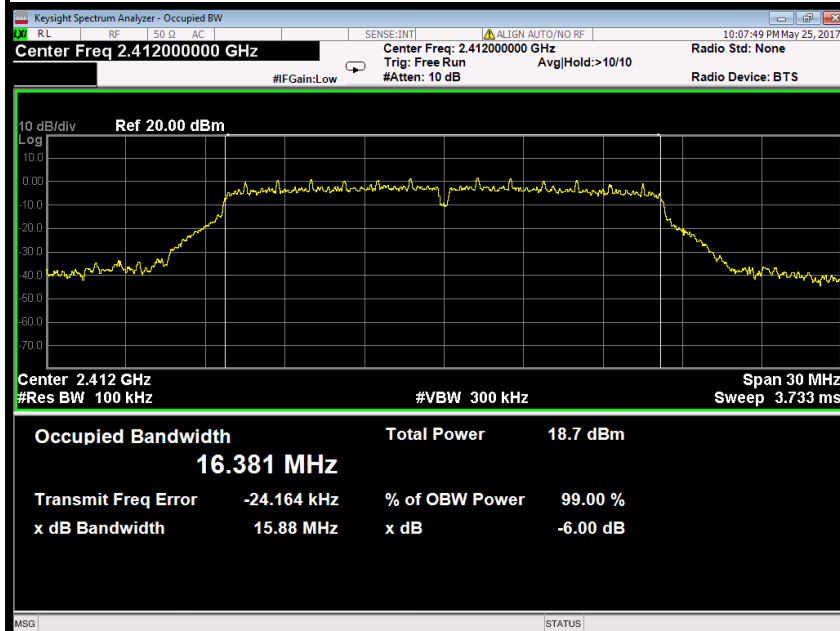


### 6dB Bandwidth (CH High)



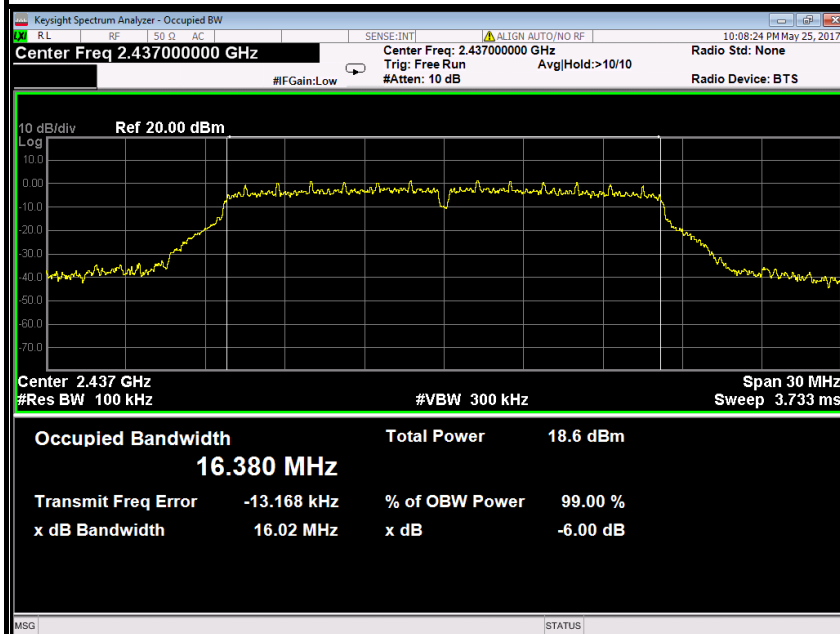
### IEEE 802.11g mode

### 6dB Bandwidth (CH Low)

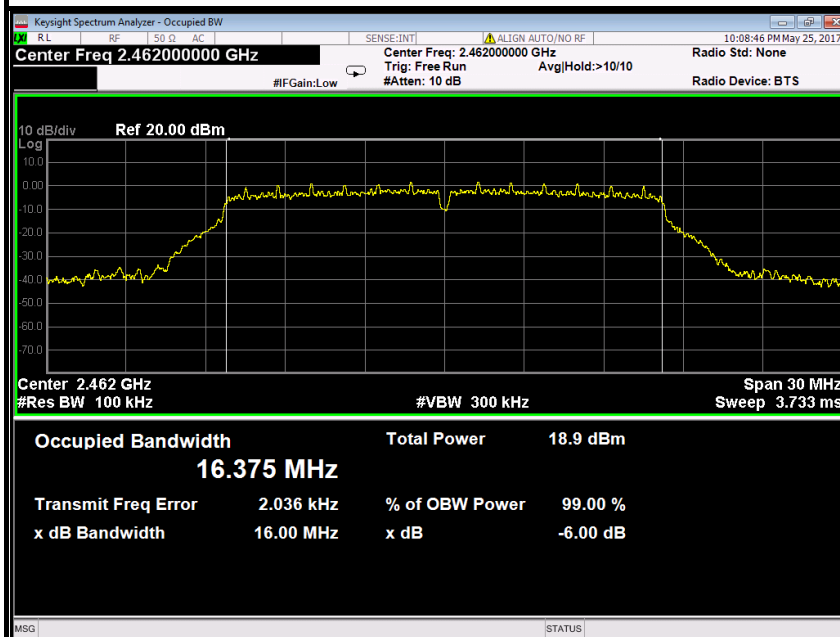




### 6dB Bandwidth (CH Mid)



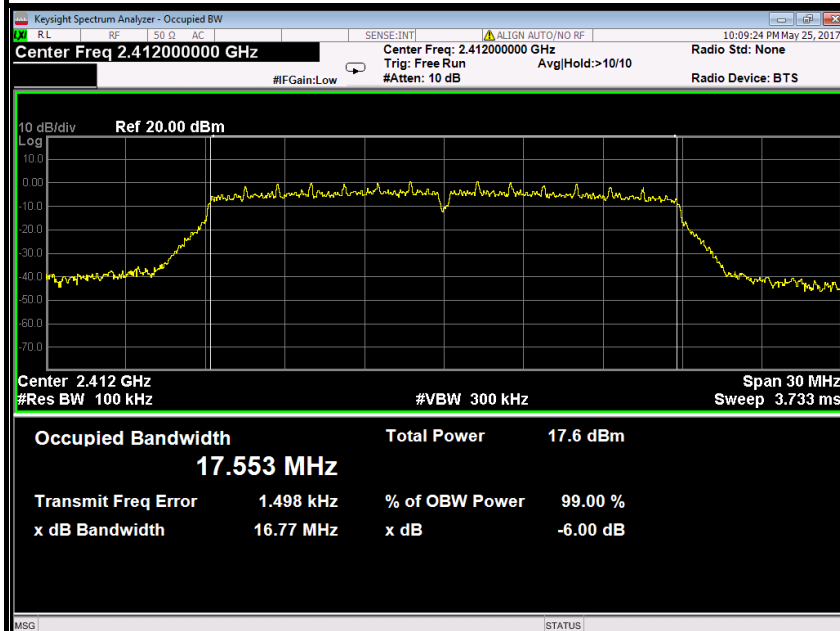
### 6dB Bandwidth (CH High)



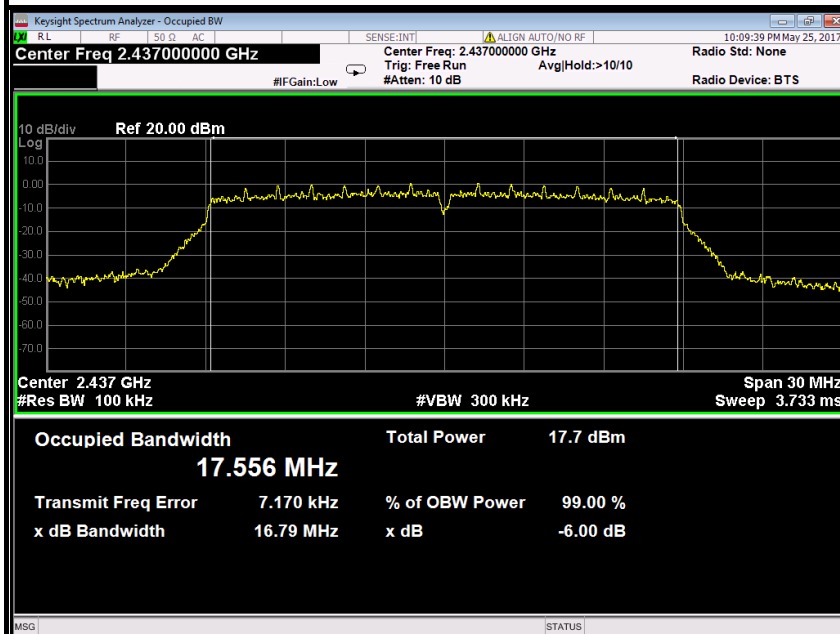


## IEEE 802.11n HT20 MHz mode

### 6dB Bandwidth (CH Low)

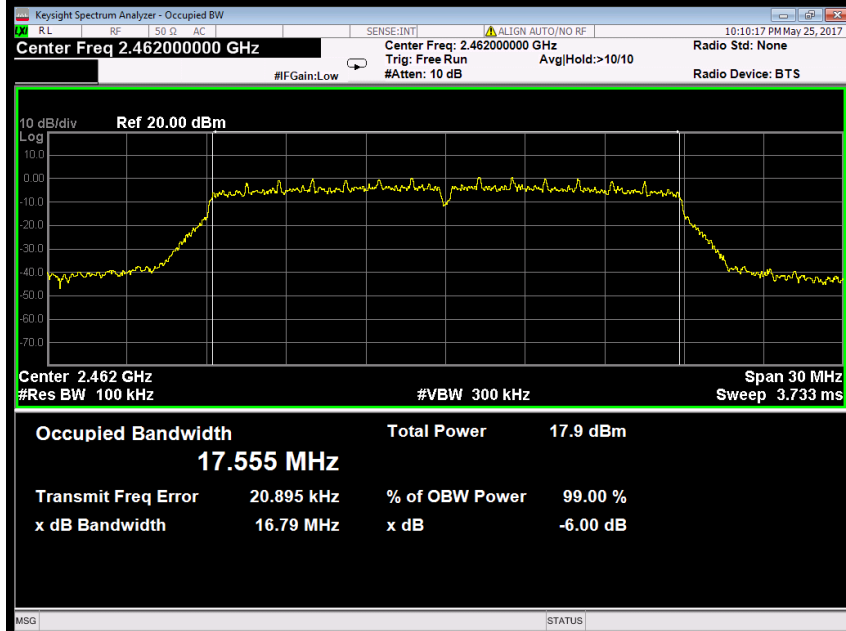


### 6dB Bandwidth (CH Mid)



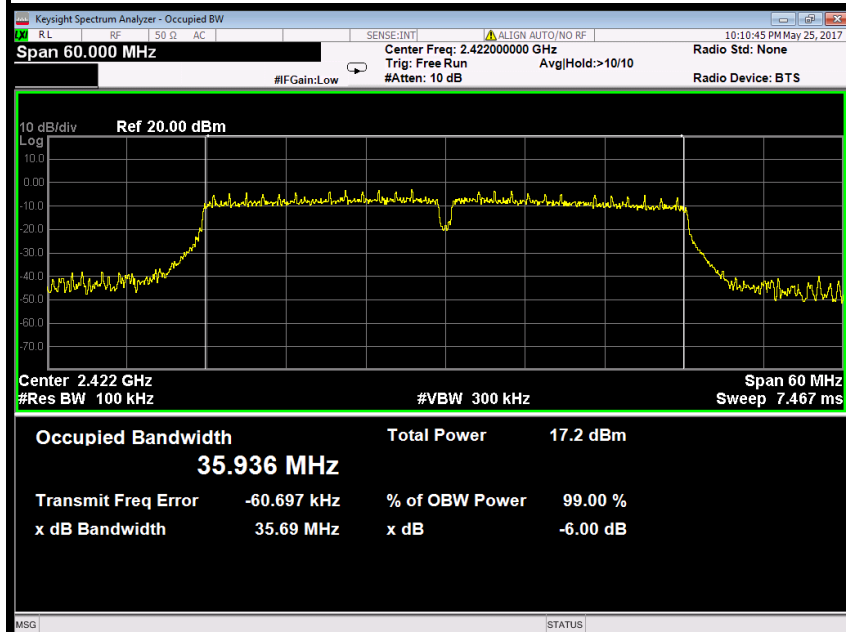


### 6dB Bandwidth (CH High)



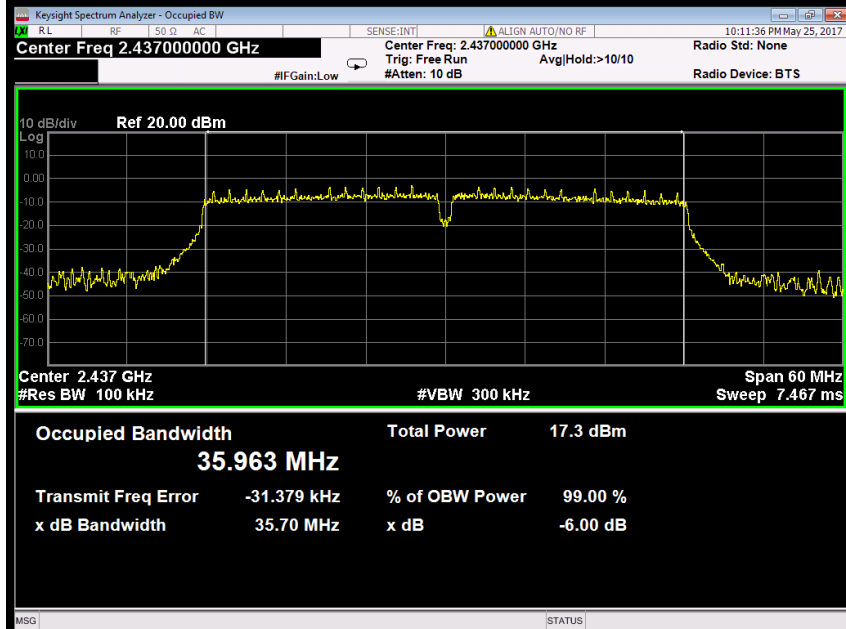
### IEEE 802.11n HT40 MHz mode

### 6dB Bandwidth (CH Low)

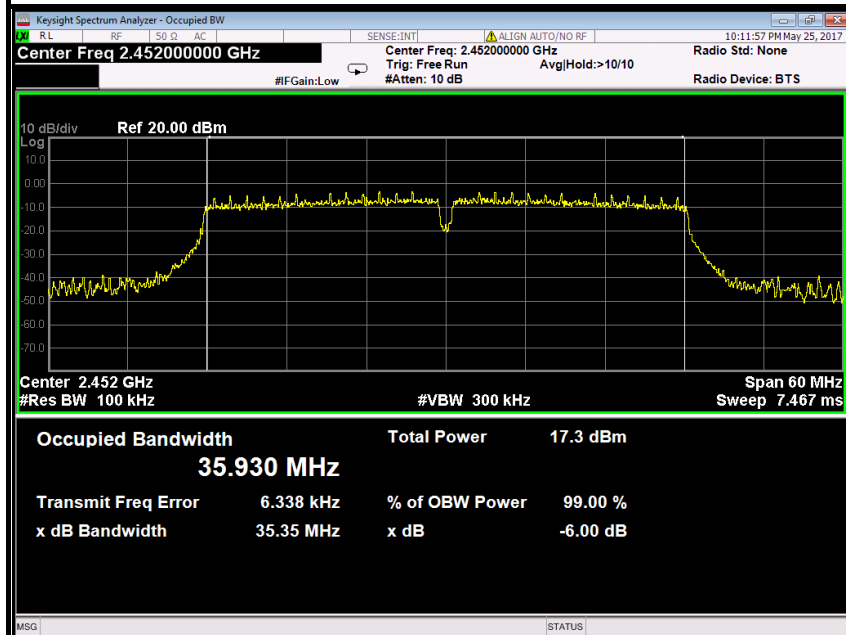




### 6dB Bandwidth (CH Mid)



### 6dB Bandwidth (CH High)





## 7.4. ANTENNA GAIN

### MEASUREMENT

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For normal WLAN devices, the DSSS mode is used.

### MEASUREMENT PARAMETERS

| Measurement parameter |          |
|-----------------------|----------|
| Detector              | Peak     |
| Sweep time            | Auto     |
| Resolution bandwidth  | 3 MHz    |
| Video bandwidth       | 3 MHz    |
| Trace-Mode            | Max hold |

### LIMITS

| FCC          | IC |
|--------------|----|
| Antenna Gain |    |
| 6 dBi        |    |



## **TEST RESULTS**

PASS

Please refer to antenna report;



## 7.5. PEAK OUTPUT POWER

### 7.5.1. 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.

### 7.5.2. TEST INSTRUMENTS

| Name of Equipment | Manufacturer | Model   | Serial Number | Last Calibration | Calibration Due |
|-------------------|--------------|---------|---------------|------------------|-----------------|
| Power Meter       | Anritsu      | ML2495A | 1204003       | 02/21/2017       | 02/20/2018      |
| Power Sensor      | Anritsu      | MA2411B | 1126150       | 02/21/2017       | 02/20/2018      |

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

#### 9.1.1 RBW $\geq$ DTS bandwidth

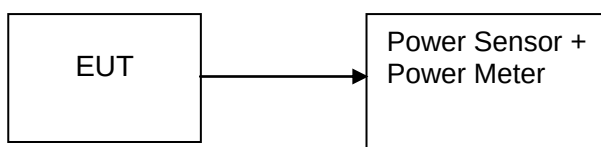
This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the *DTS bandwidth*.

- a) Set the RBW  $\geq$  DTS bandwidth.
- b) Set VBW  $\geq$  3 RBW.
- c) Set span  $\geq$  3 x RBW
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

#### 9.1.3 PKPM1 Peak power meter method

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

### 7.5.4. TEST SETUP



**7.5.5. TEST RESULTS***No non-compliance noted***Test Data****Test mode: IEEE 802.11b**

| Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | Peak / AVG | Limit (W) | Result |
|---------|-----------------|--------------------|------------------|------------|-----------|--------|
| Low     | 2412            | 17.10              | 0.05129          | Peak       | 1         | PASS   |
| Mid     | 2437            | 17.10              | 0.05129          |            |           | PASS   |
| High    | 2462            | 17.10              | 0.05129          |            |           | PASS   |
| Low     | 2412            | 14.80              | 0.03020          | AVG        | 1         | PASS   |
| Mid     | 2437            | 14.90              | 0.03090          |            |           | PASS   |
| High    | 2462            | 15.20              | 0.03311          |            |           | PASS   |

**Test mode: IEEE 802.11g**

| Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | Peak / AVG | Limit (W) | Result |
|---------|-----------------|--------------------|------------------|------------|-----------|--------|
| Low     | 2412            | 22.90              | 0.19498          | Peak       | 1         | PASS   |
| Mid     | 2437            | 22.80              | 0.19055          |            |           | PASS   |
| High    | 2462            | 22.80              | 0.19055          |            |           | PASS   |
| Low     | 2412            | 14.20              | 0.02630          | AVG        | 1         | PASS   |
| Mid     | 2437            | 13.50              | 0.02239          |            |           | PASS   |
| High    | 2462            | 14.30              | 0.02692          |            |           | PASS   |

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

| Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | Peak / AVG | Limit (W) | Result |
|---------|-----------------|--------------------|------------------|------------|-----------|--------|
| Low     | 2412            | 22.60              | 0.18197          | Peak       | 1         | PASS   |
| Mid     | 2437            | 22.20              | 0.16596          |            |           | PASS   |
| High    | 2462            | 23.00              | 0.19953          |            |           | PASS   |
| Low     | 2412            | 12.90              | 0.01950          | AVG        | 1         | PASS   |
| Mid     | 2437            | 13.00              | 0.01995          |            |           | PASS   |
| High    | 2462            | 13.10              | 0.02042          |            |           | PASS   |

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

| Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | Peak / AVG | Limit (W) | Result |
|---------|-----------------|--------------------|------------------|------------|-----------|--------|
| Low     | 2422            | 21.90              | 0.15488          | Peak       | 1         | PASS   |
| Mid     | 2437            | 22.60              | 0.18197          |            |           | PASS   |
| High    | 2452            | 23.10              | 0.20417          |            |           | PASS   |
| Low     | 2422            | 11.30              | 0.01349          | AVG        | 1         | PASS   |
| Mid     | 2437            | 12.30              | 0.01698          |            |           | PASS   |
| High    | 2452            | 13.20              | 0.02089          |            |           | PASS   |



## 7.6. BAND EDGES MEASUREMENT

### 7.6.1. LIMITS

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum 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. 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)).

### 7.6.2. 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        | N9010A             | MY55370330    | 02/21/2017       | 02/20/2018      |
| EMI TEST RECEIVER                  | ROHDE&SCHWARZ  | ESCI               | 100783        | 02/21/2017       | 02/20/2018      |
| Amplifier                          | EMEC           | EM330              | 060661        | 03/18/2017       | 03/17/2018      |
| High Noise Amplifier               | Agilent        | 8449B              | 3008A01838    | 02/21/2017       | 02/20/2018      |
| Loop Antenna                       | COM-POWER      | AL-130             | 121044        | 09/25/2016       | 09/24/2017      |
| Bilog Antenna                      | SCHAFFNER      | CBL6143            | 5082          | 02/21/2017       | 02/20/2018      |
| Horn Antenna                       | SCHWARZBECK    | BBHA9120           | D286          | 02/28/2017       | 02/27/2018      |
| Board-Band Horn Antenna            | Schwarzbeck    | BBHA 9170          | 9170-497      | 02/28/2017       | 02/27/2018      |
| Turn Table                         | N/A            | N/A                | N/A           | N.C.R            | N.C.R           |
| Antenna Tower                      | SUNOL          | TLT2               | 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           | 02/21/2017       | 02/20/2018      |
| 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.

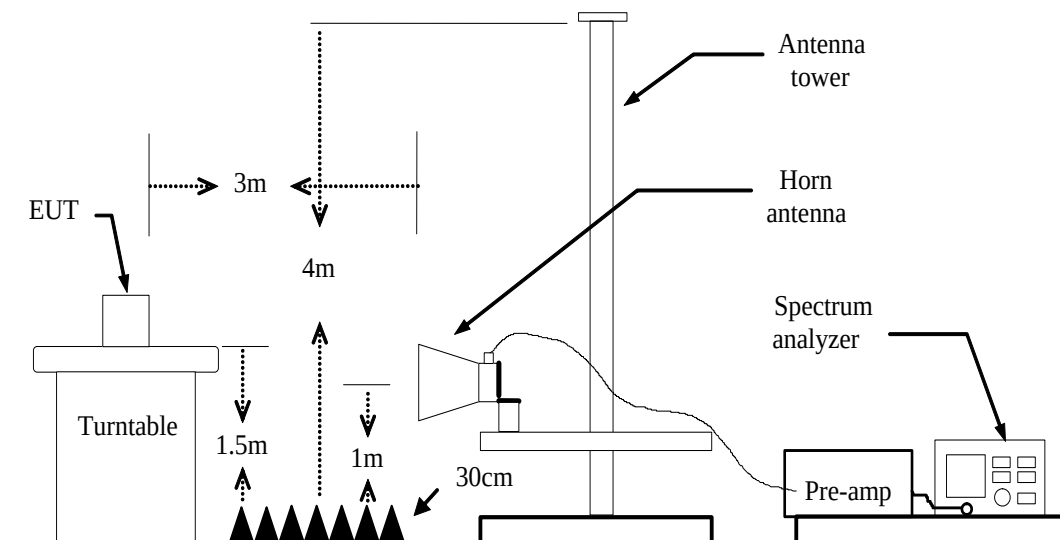
3. N.C.R = No Calibration Required.



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

1. The EUT is placed on a turntable, which is 1.5m 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=1MHz / VBW=3MHz / Sweep=AUTO
  - (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO / Detector=PEAK
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

### 7.6.4. TEST SETUP



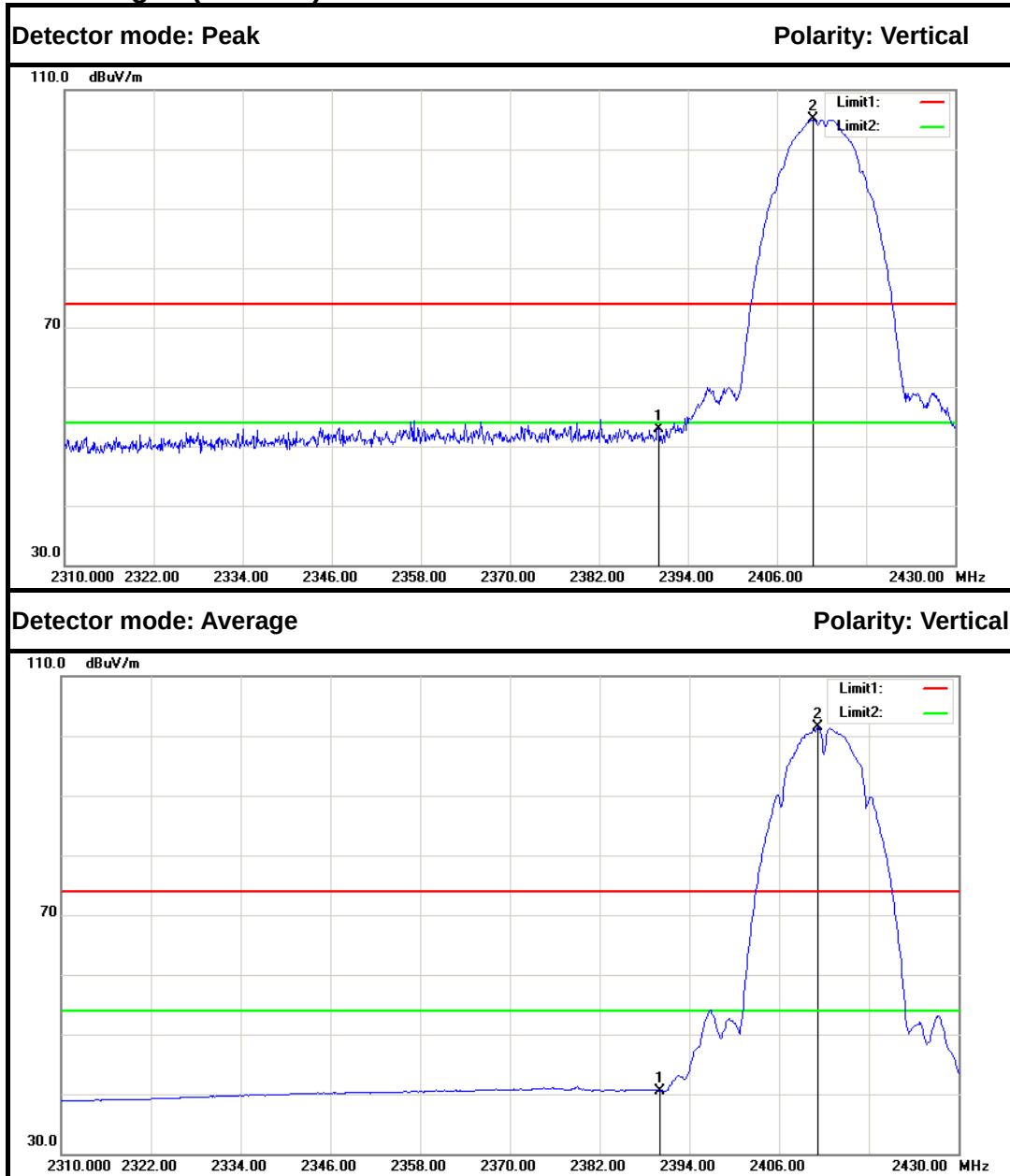


## 7.6.5. TEST RESULTS

### Test Plot

IEEE 802.11b mode

Band Edges (CH Low)

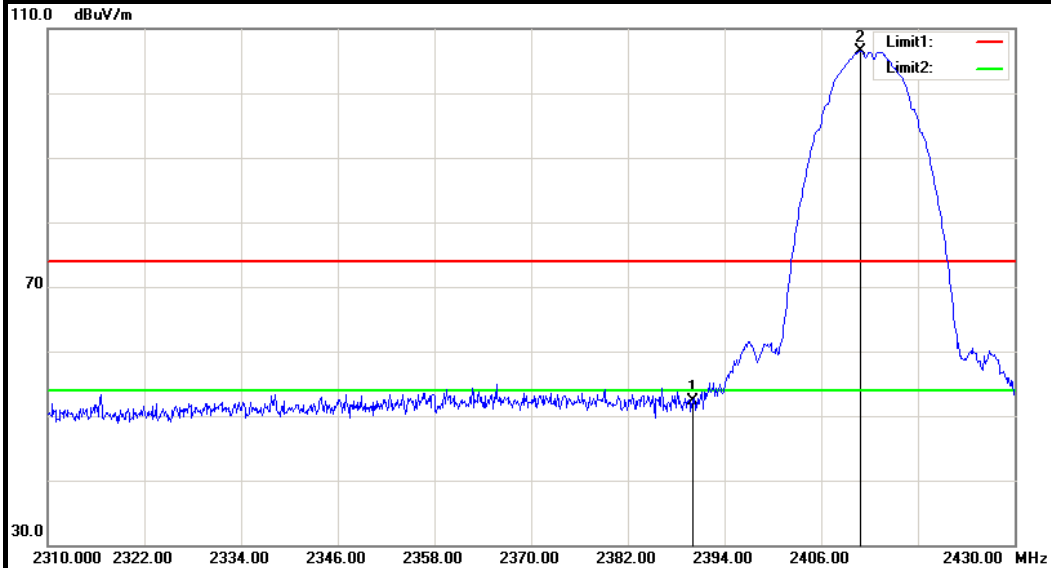


| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2390.000        | 55.74        | -2.86         | 52.88         | 74.00        | -21.12      | Peak    | Vertical      |
| 2.  | 2410.920        | 107.78       | -2.75         | 105.03        | ---          | ---         | Peak    | Vertical      |
| 3.  | 2390.000        | 43.43        | -2.86         | 40.57         | 54.00        | -13.43      | Average | Vertical      |
| 4.  | 2411.160        | 104.18       | -2.75         | 101.43        | ---          | ---         | Average | Vertical      |



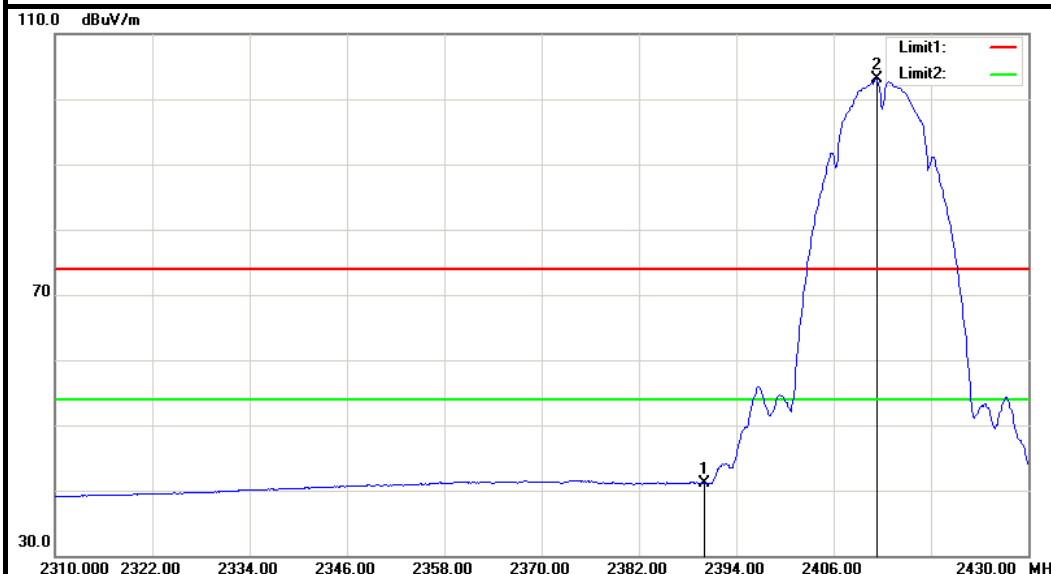
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

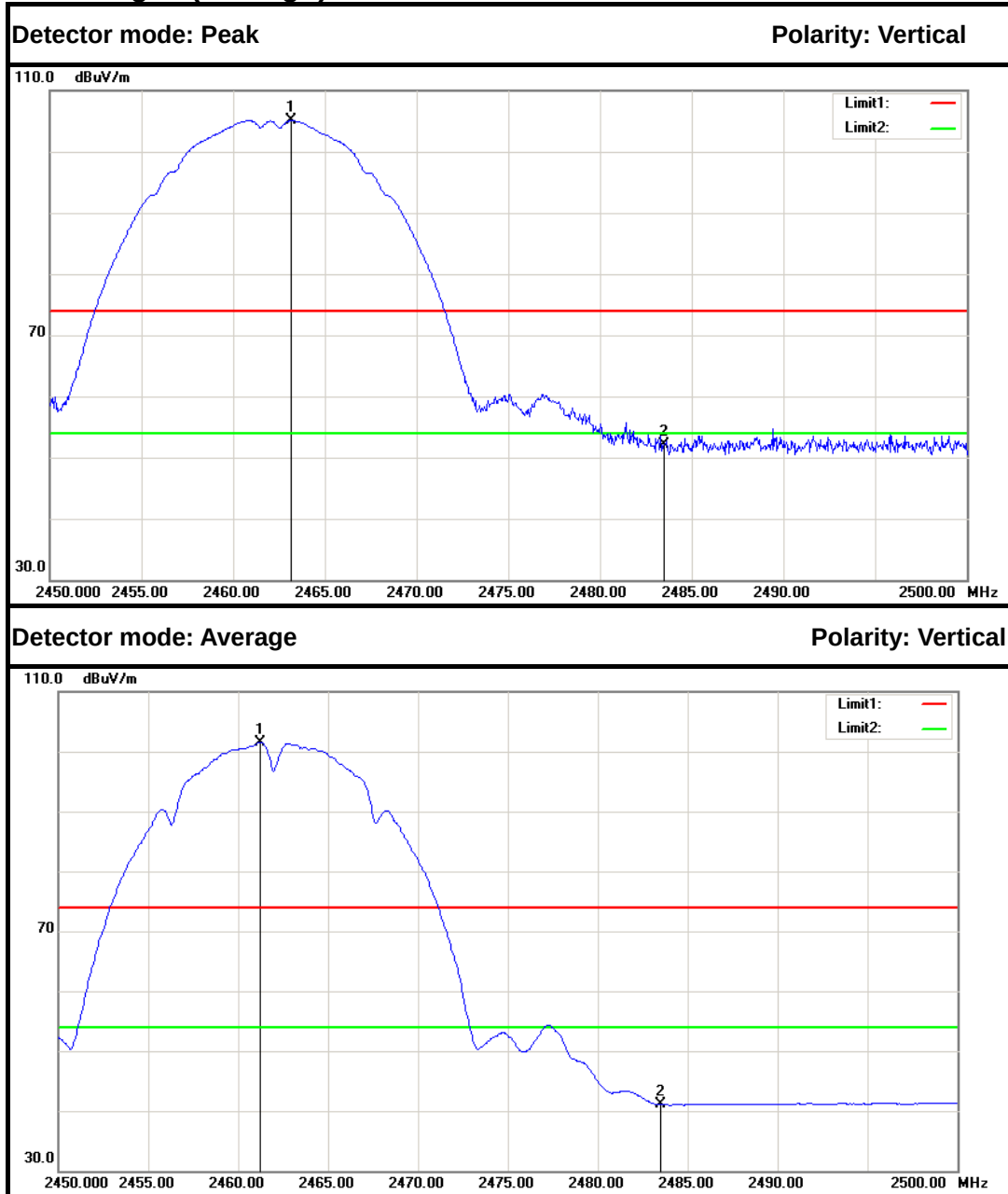
Polarity: Horizontal



| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2390.000        | 55.20        | -2.86         | 52.34         | 74.00        | -21.66      | Peak    | Horizontal    |
| 2.  | 2410.920        | 109.23       | -2.75         | 106.48        | ---          | ---         | Peak    | Horizontal    |
| 3.  | 2390.000        | 43.88        | -2.86         | 41.02         | 54.00        | -12.98      | Average | Horizontal    |
| 4.  | 2411.280        | 105.78       | -2.75         | 103.03        | ---          | ---         | Average | Horizontal    |



### Band Edges (CH High)

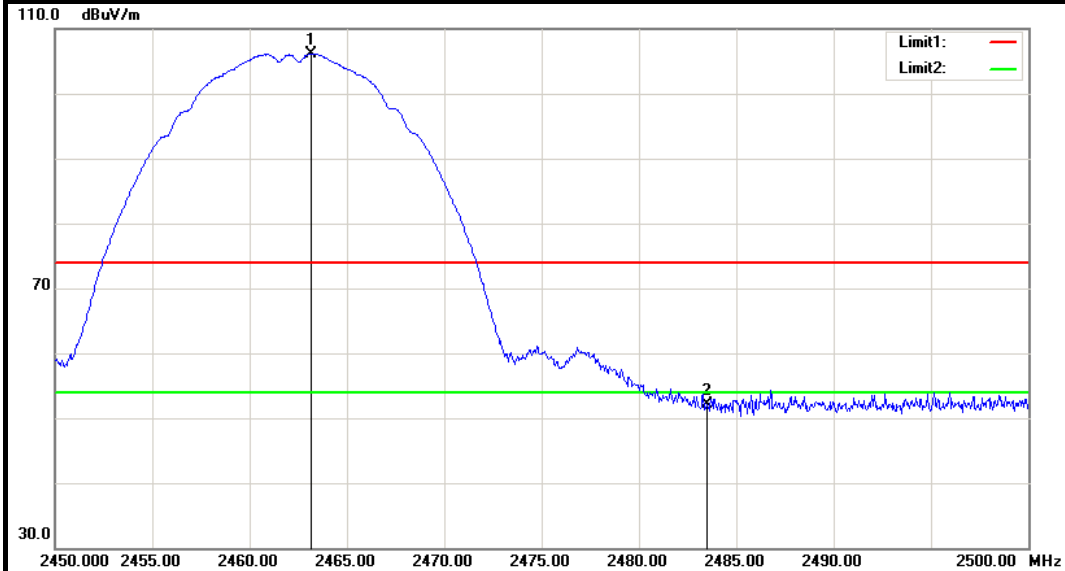


| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2463.150        | 107.54       | -2.46         | 105.08        | ---          | ---         | Peak    | Vertical      |
| 2.  | 2483.500        | 54.53        | -2.35         | 52.18         | 74.00        | -21.82      | Peak    | Vertical      |
| 3.  | 2461.250        | 104.03       | -2.47         | 101.56        | ---          | ---         | Average | Vertical      |
| 4.  | 2483.500        | 43.41        | -2.35         | 41.06         | 54.00        | -12.94      | Average | Vertical      |



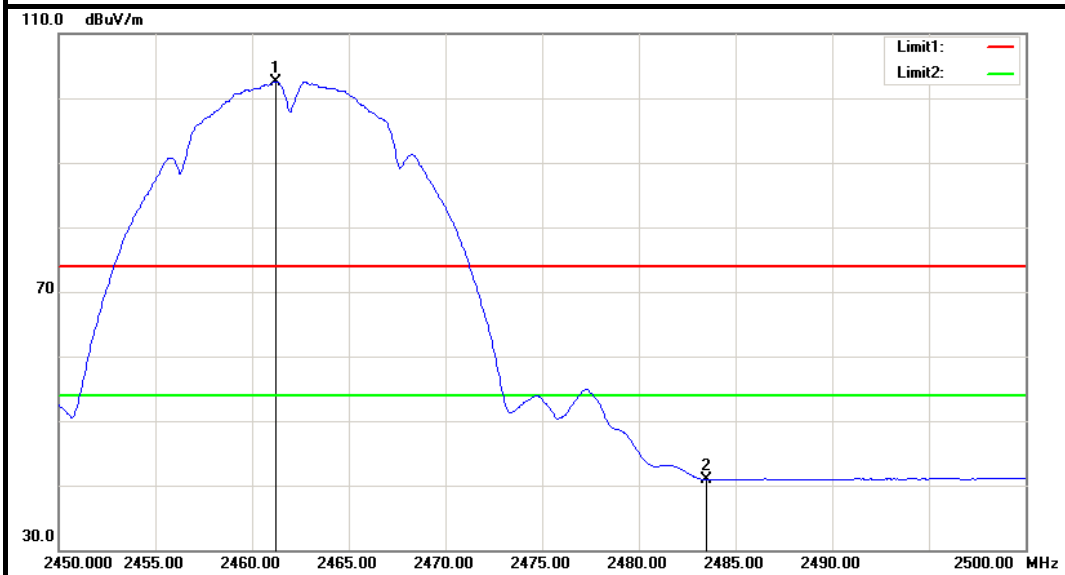
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

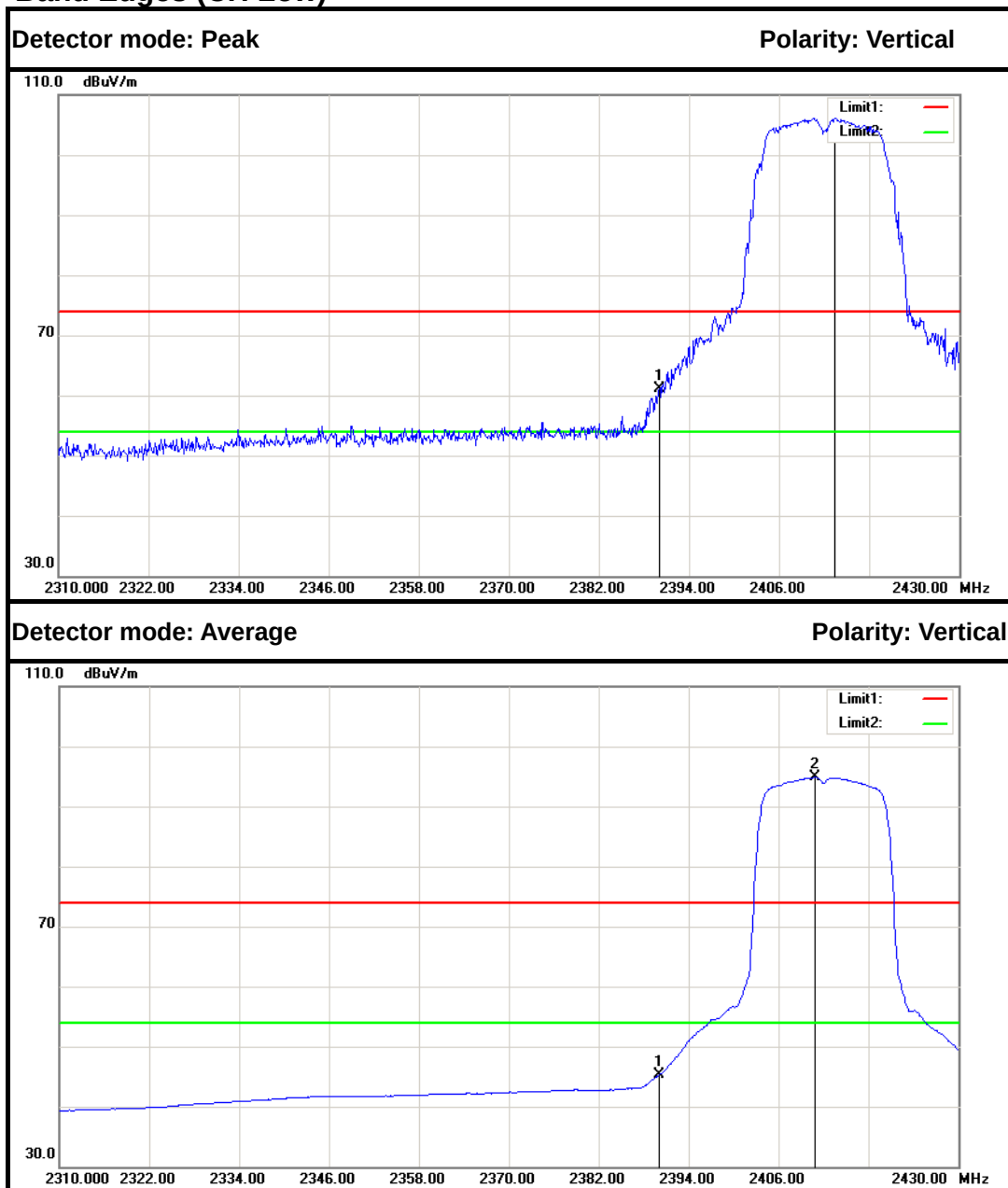
Polarity: Horizontal



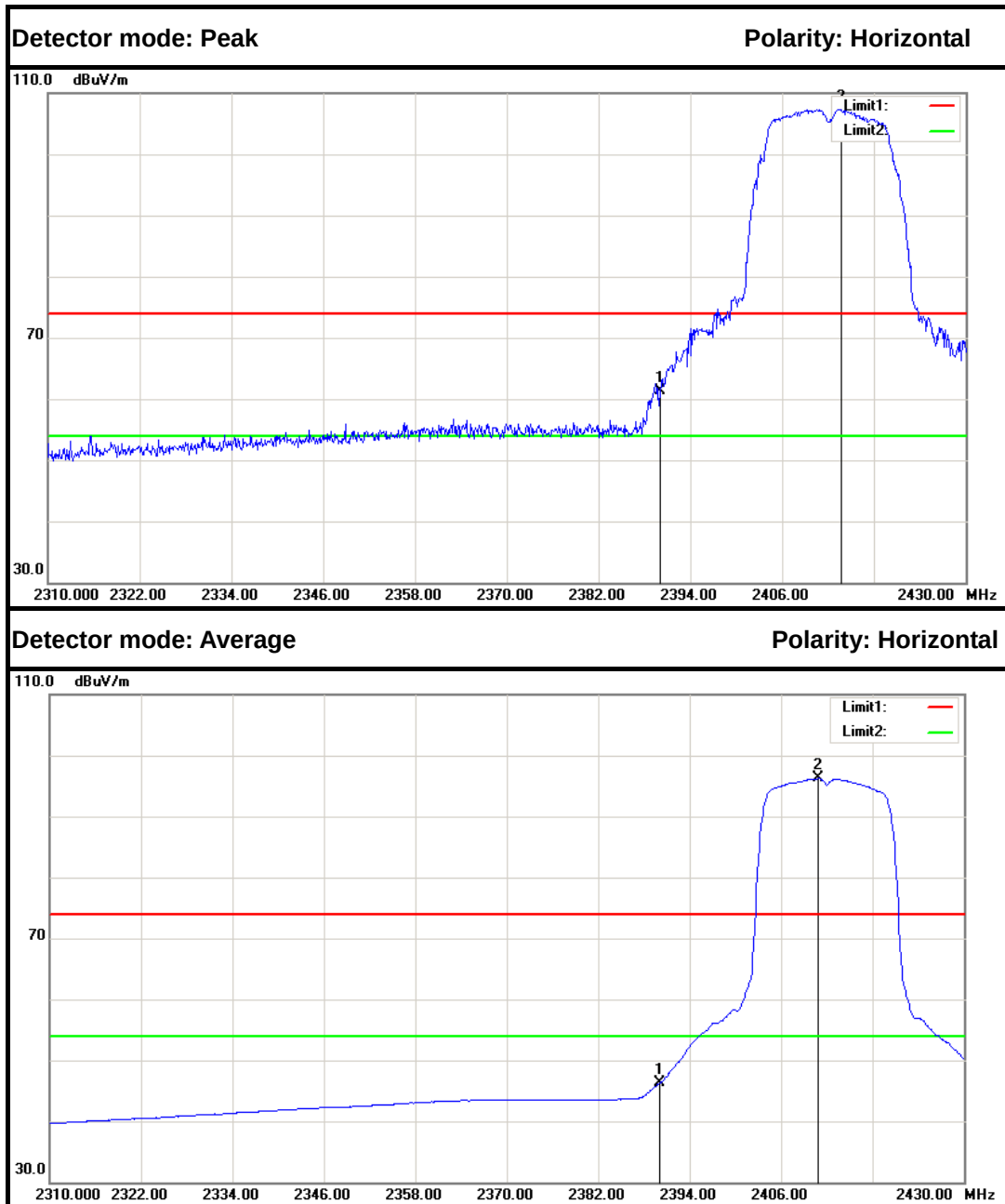
| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2463.150        | 108.61       | -2.46         | 106.15        | ---          | ---         | Peak    | Horizontal    |
| 2.  | 2483.500        | 54.44        | -2.35         | 52.09         | 74.00        | -21.91      | Peak    | Horizontal    |
| 3.  | 2461.250        | 105.02       | -2.47         | 102.55        | ---          | ---         | Average | Horizontal    |
| 4.  | 2483.500        | 43.27        | -2.35         | 40.92         | 54.00        | -13.08      | Average | Horizontal    |



IEEE 802.11g mode  
Band Edges (CH Low)



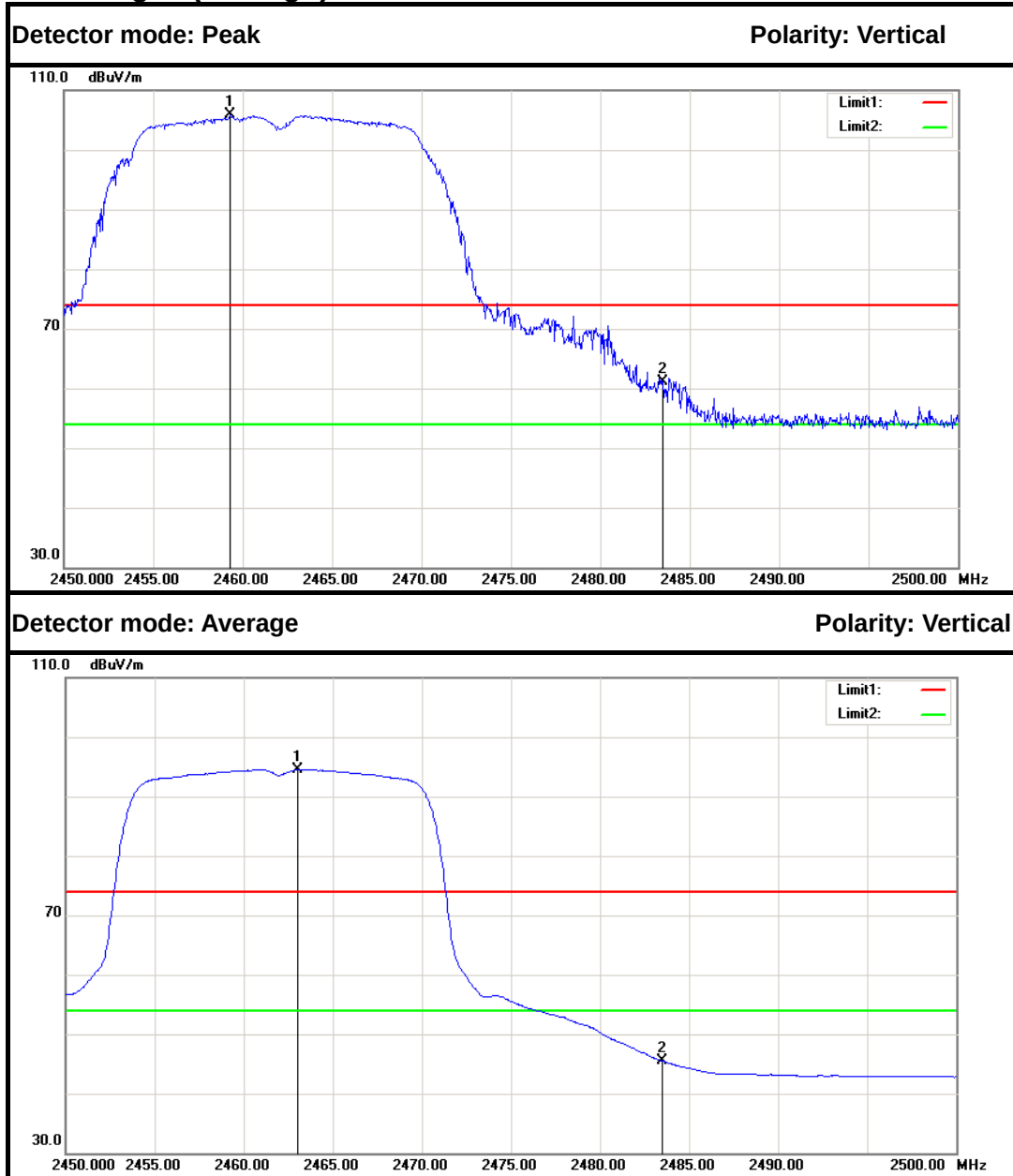
| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2390.000        | 63.90        | -2.86         | 61.04         | 74.00        | -12.96      | Peak    | Vertical      |
| 2.  | 2413.440        | 108.75       | -2.73         | 106.02        | ---          | ---         | Peak    | Vertical      |
| 3.  | 2390.000        | 48.09        | -2.86         | 45.23         | 54.00        | -8.77       | Average | Vertical      |
| 4.  | 2410.920        | 97.58        | -2.75         | 94.83         | ---          | ---         | Average | Vertical      |



| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2390.000        | 64.19        | -2.86         | 61.33         | 74.00        | -12.67      | Peak    | Horizontal    |
| 2.  | 2413.680        | 110.06       | -2.73         | 107.33        | ---          | ---         | Peak    | Horizontal    |
| 3.  | 2390.000        | 49.12        | -2.86         | 46.26         | 54.00        | -7.74       | Average | Horizontal    |
| 4.  | 2410.920        | 98.97        | -2.75         | 96.22         | ---          | ---         | Average | Horizontal    |



### Band Edges (CH High)

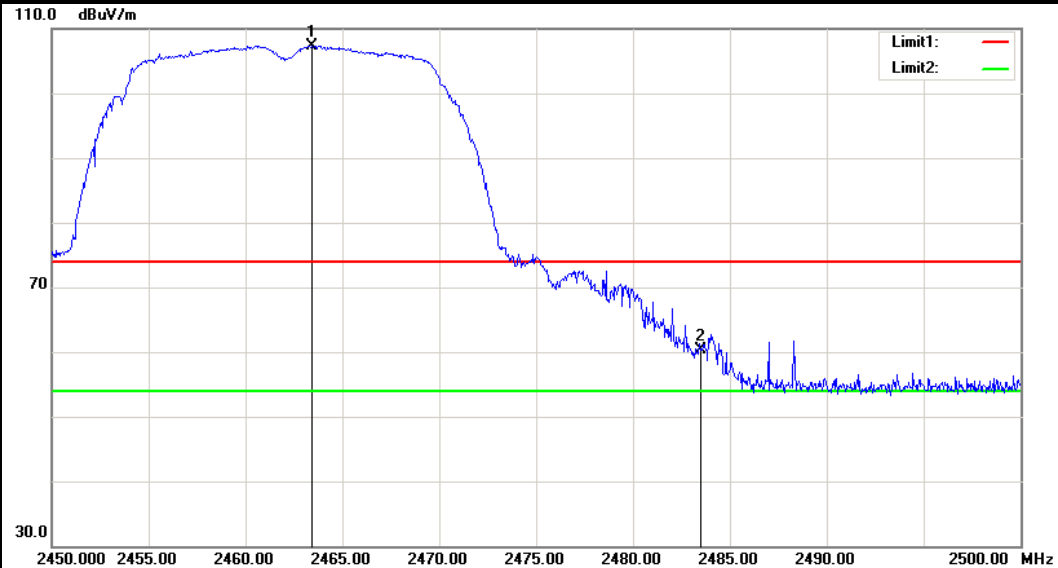


| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2459.300        | 108.31       | -2.48         | 105.83        | ---          | ---         | Peak    | Vertical      |
| 2.  | 2483.500        | 63.37        | -2.35         | 61.02         | 74.00        | -12.98      | Peak    | Vertical      |
| 3.  | 2463.050        | 97.00        | -2.46         | 94.54         | ---          | ---         | Average | Vertical      |
| 4.  | 2483.500        | 47.81        | -2.35         | 45.46         | 54.00        | -8.54       | Average | Vertical      |



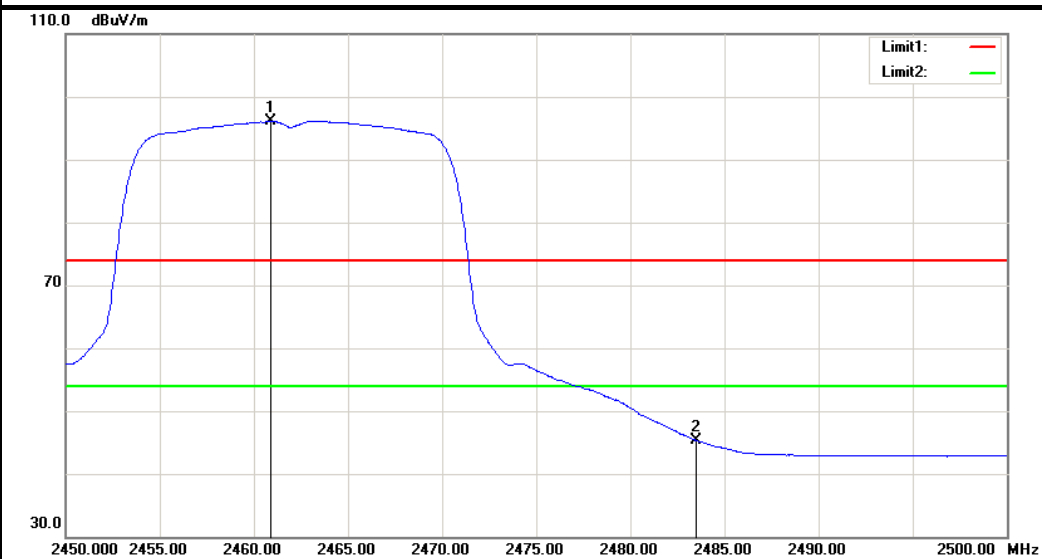
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

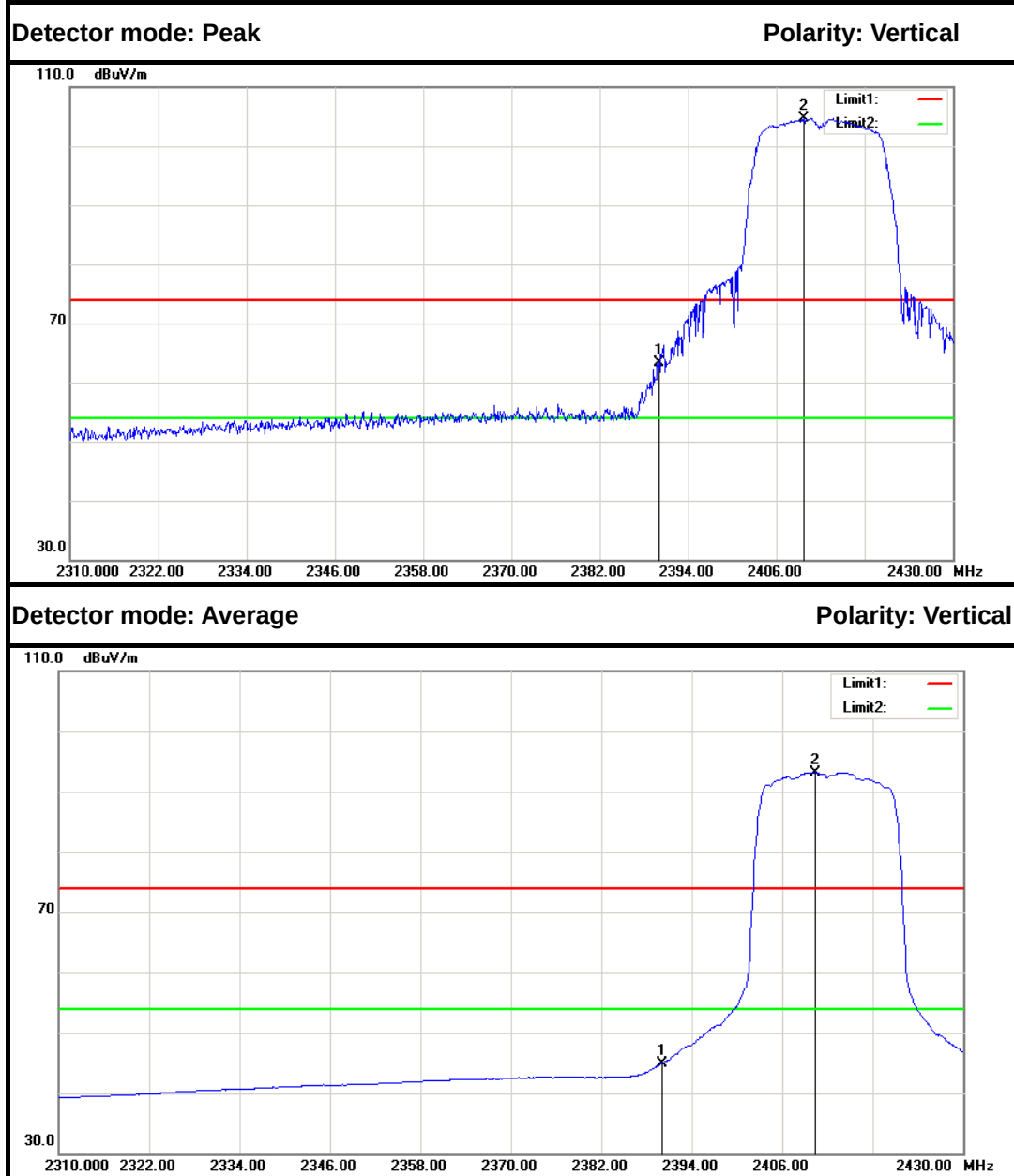
Polarity: Horizontal



| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2463.450        | 109.81       | -2.46         | 107.35        | ---          | ---         | Peak    | Horizontal    |
| 2.  | 2483.500        | 62.68        | -2.35         | 60.33         | 74.00        | -13.67      | Peak    | Horizontal    |
| 3.  | 2460.900        | 98.56        | -2.47         | 96.09         | ---          | ---         | Average | Horizontal    |
| 4.  | 2483.500        | 47.68        | -2.35         | 45.33         | 54.00        | -8.67       | Average | Horizontal    |



IEEE 802.11n HT20 MHz mode  
Band Edges (CH Low)

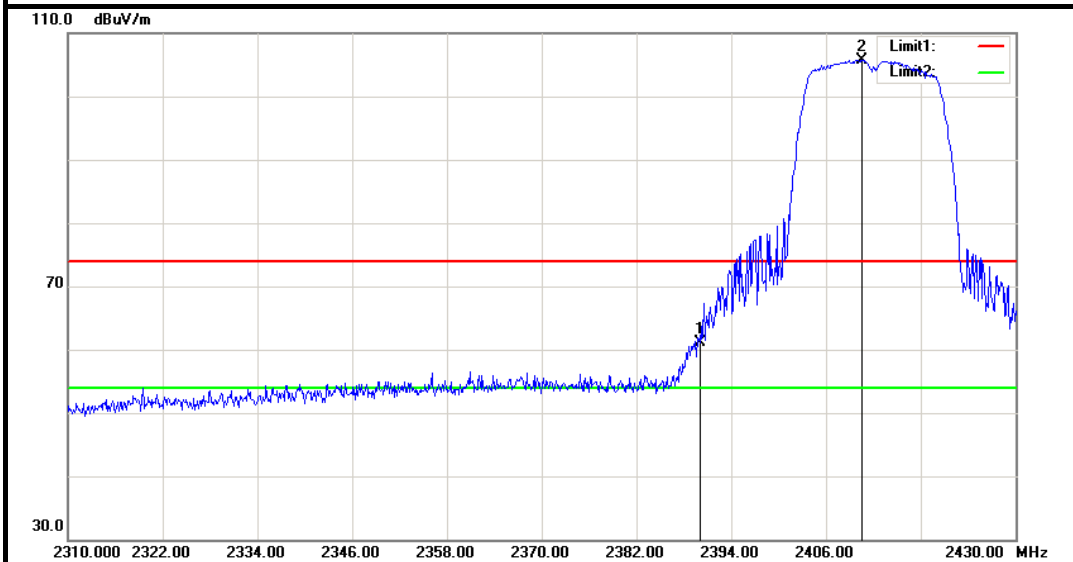


| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2390.000        | 66.14        | -2.86         | 63.28         | 74.00        | -10.72      | Peak    | Vertical      |
| 2.  | 2409.720        | 107.39       | -2.75         | 104.64        | ---          | ---         | Peak    | Vertical      |
| 3.  | 2390.000        | 47.79        | -2.86         | 44.93         | 54.00        | -9.07       | Average | Vertical      |
| 4.  | 2410.440        | 95.93        | -2.75         | 93.18         | ---          | ---         | Average | Vertical      |



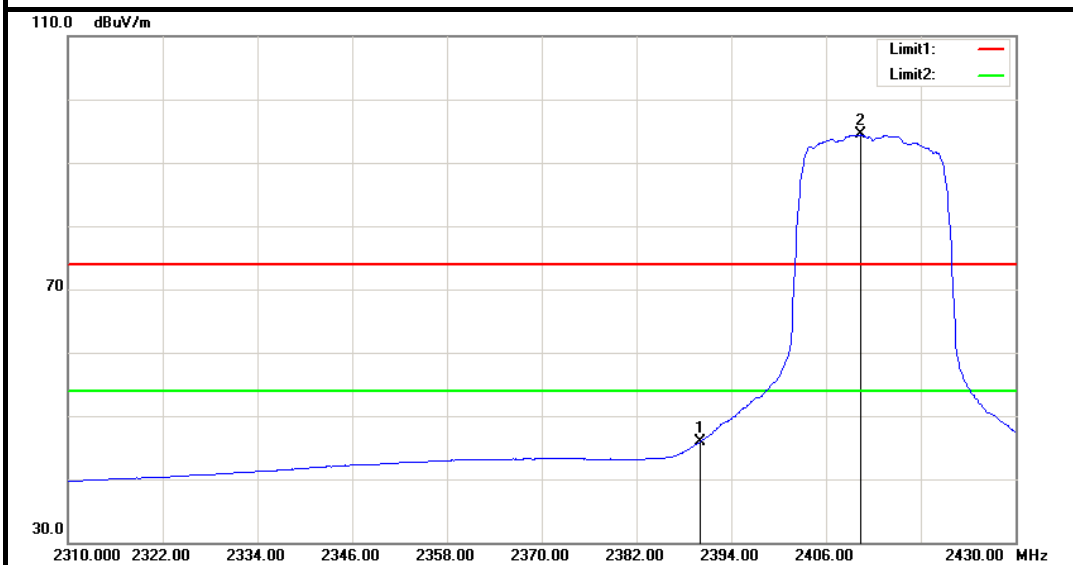
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

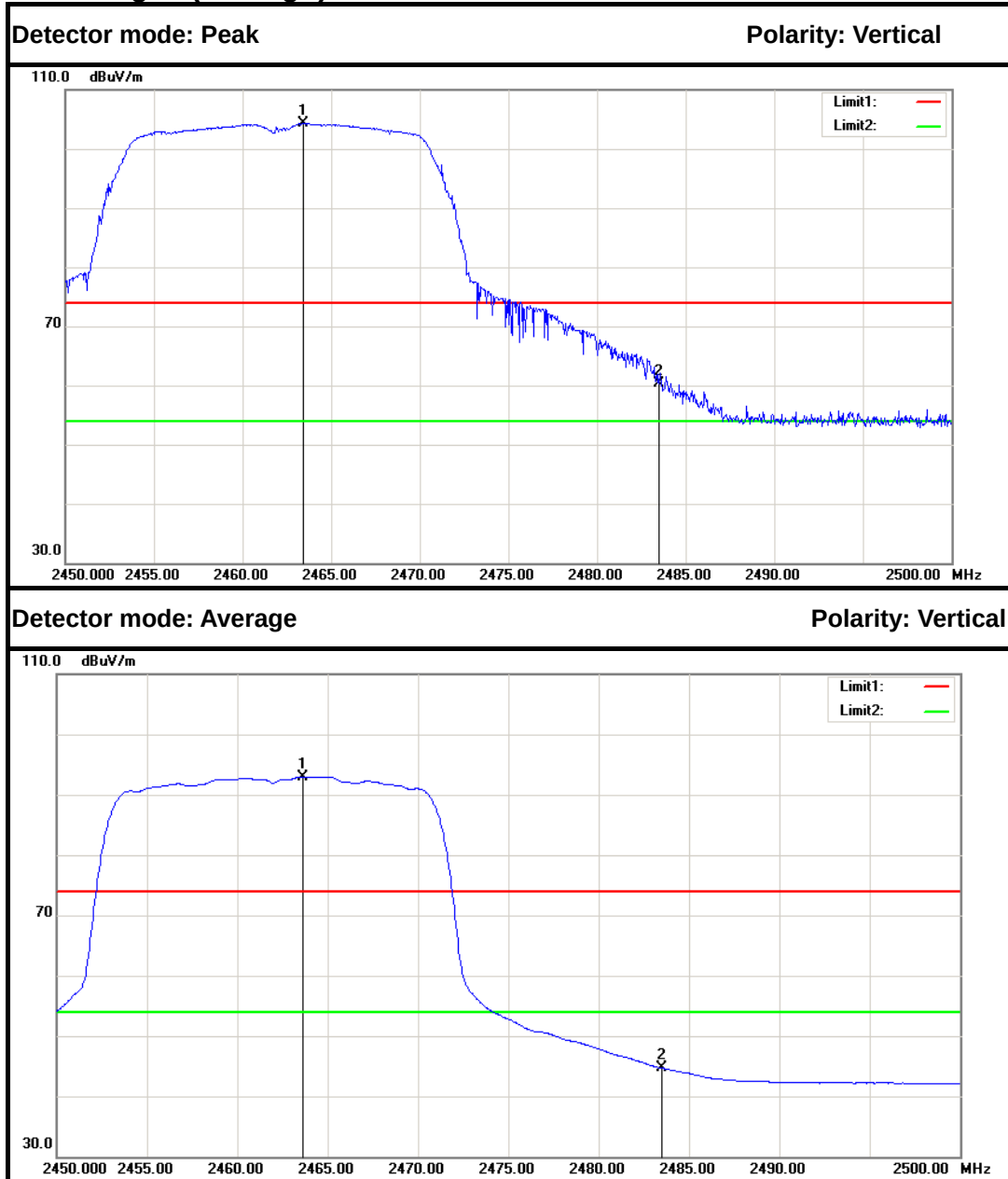
Polarity: Horizontal



| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2390.000        | 63.88        | -2.86         | 61.02         | 74.00        | -12.98      | Peak    | Horizontal    |
| 2.  | 2410.560        | 108.53       | -2.75         | 105.78        | ---          | ---         | Peak    | Horizontal    |
| 3.  | 2390.000        | 48.75        | -2.86         | 45.89         | 54.00        | -8.11       | Average | Horizontal    |
| 4.  | 2410.440        | 97.16        | -2.75         | 94.41         | ---          | ---         | Average | Horizontal    |



### Band Edges (CH High)

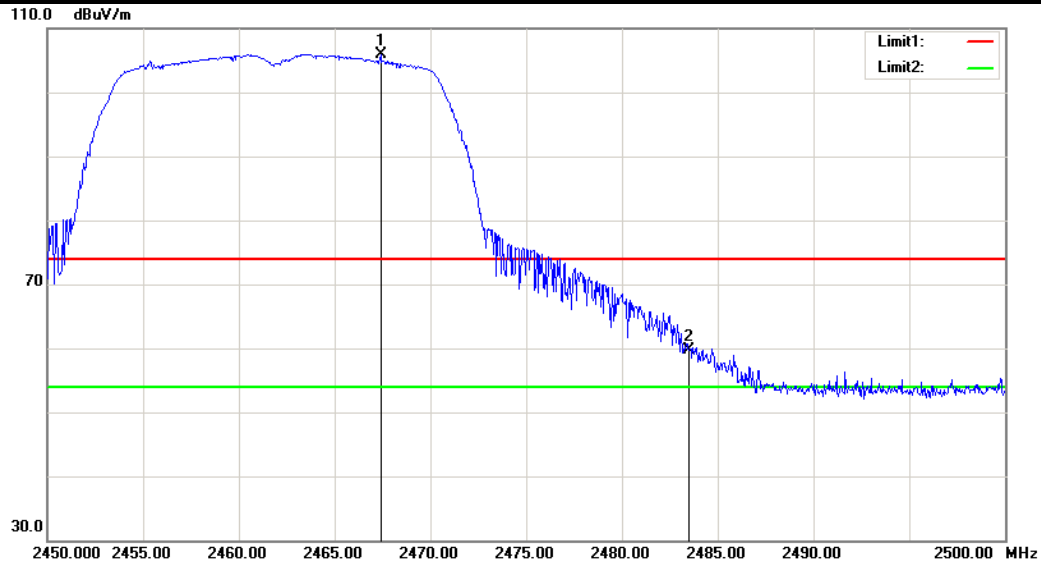


| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2463.400        | 106.80       | -2.46         | 104.34        | ---          | ---         | Peak    | Vertical      |
| 2.  | 2483.500        | 62.67        | -2.35         | 60.32         | 74.00        | -13.68      | Peak    | Vertical      |
| 3.  | 2463.650        | 95.44        | -2.46         | 92.98         | ---          | ---         | Average | Vertical      |
| 4.  | 2483.500        | 47.05        | -2.35         | 44.70         | 54.00        | -9.30       | Average | Vertical      |



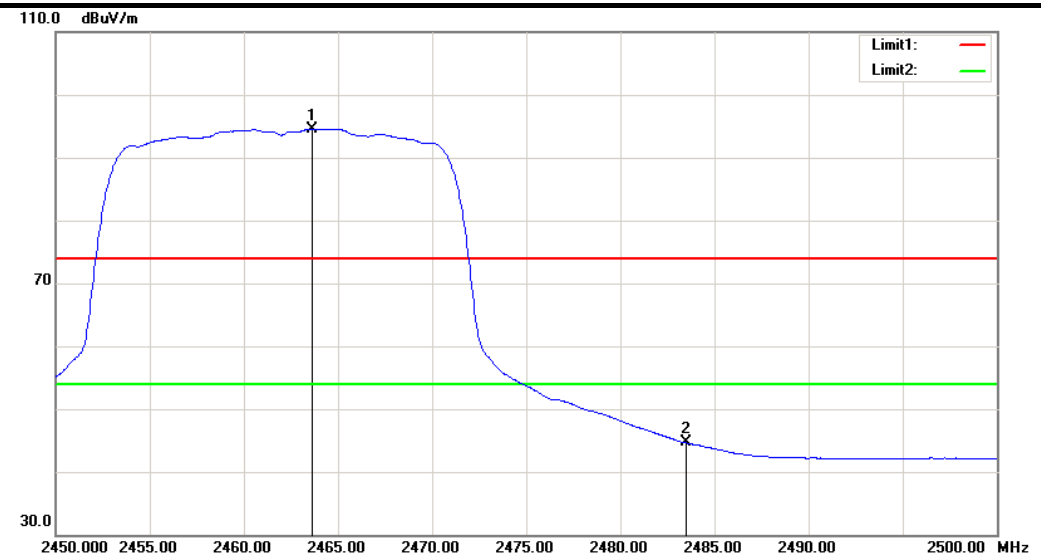
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

Polarity: Horizontal



| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2467.400        | 108.41       | -2.44         | 105.97        | ---          | ---         | Peak    | Horizontal    |
| 2.  | 2483.500        | 62.06        | -2.35         | 59.71         | 74.00        | -14.29      | Peak    | Horizontal    |
| 3.  | 2463.600        | 97.02        | -2.46         | 94.56         | ---          | ---         | Average | Horizontal    |
| 4.  | 2483.500        | 46.96        | -2.35         | 44.61         | 54.00        | -9.39       | Average | Horizontal    |

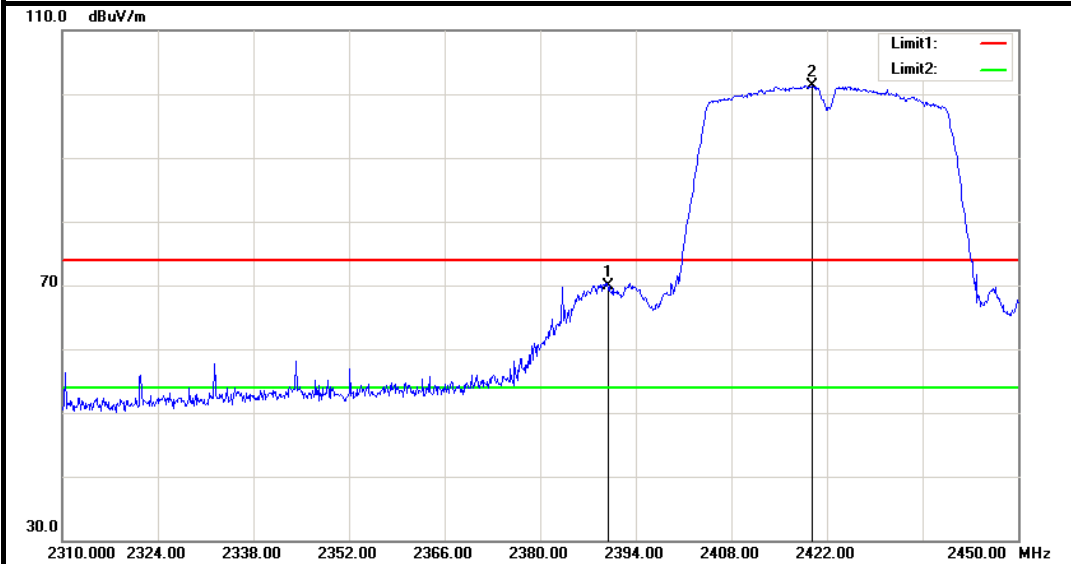


IEEE 802.11n HT40 MHz mode

Band Edges (CH Low)

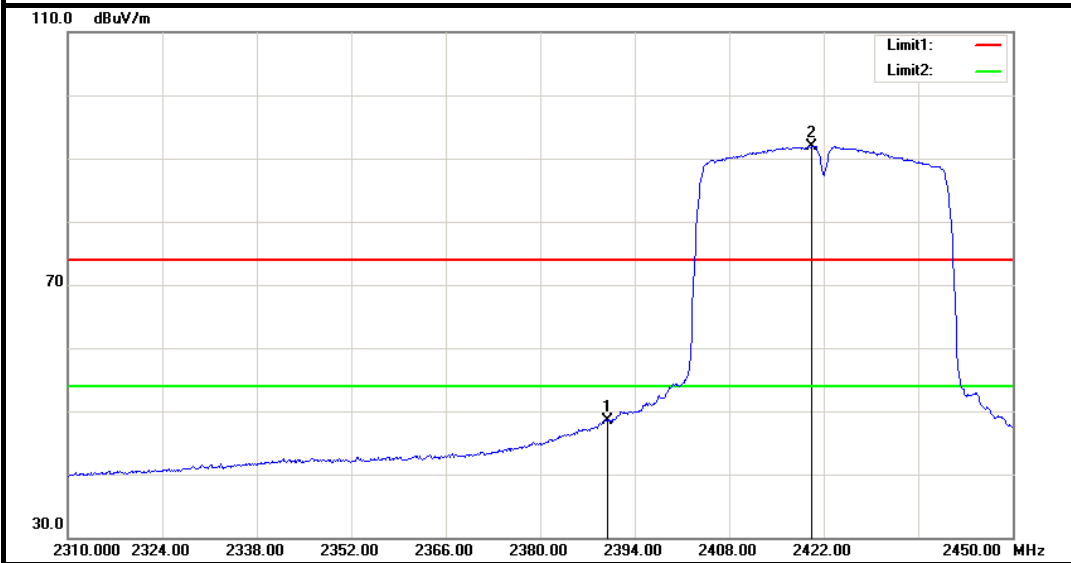
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical

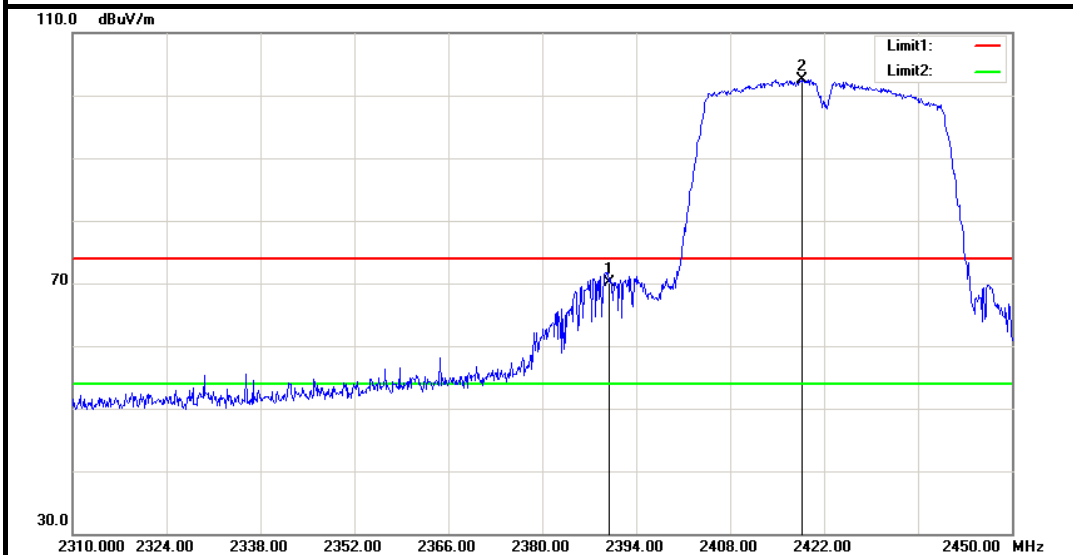


| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2390.000        | 72.69        | -2.86         | 69.83         | 74.00        | -4.17       | Peak    | Vertical      |
| 2.  | 2419.760        | 104.09       | -2.70         | 101.39        | ---          | ---         | Peak    | Vertical      |
| 3.  | 2390.000        | 51.41        | -2.86         | 48.55         | 54.00        | -5.45       | Average | Vertical      |
| 4.  | 2420.180        | 94.63        | -2.70         | 91.93         | ---          | ---         | Average | Vertical      |



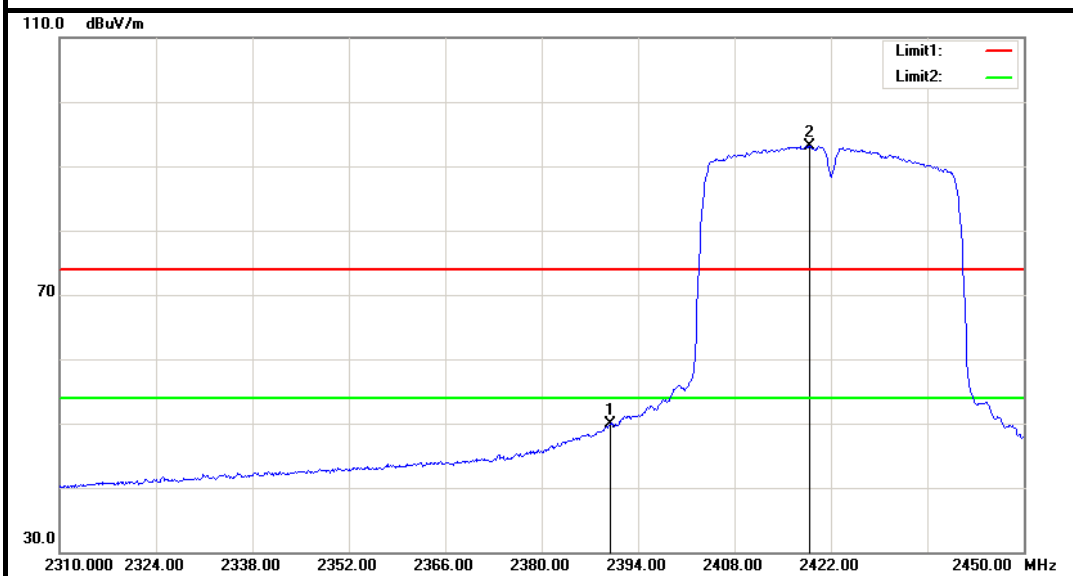
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

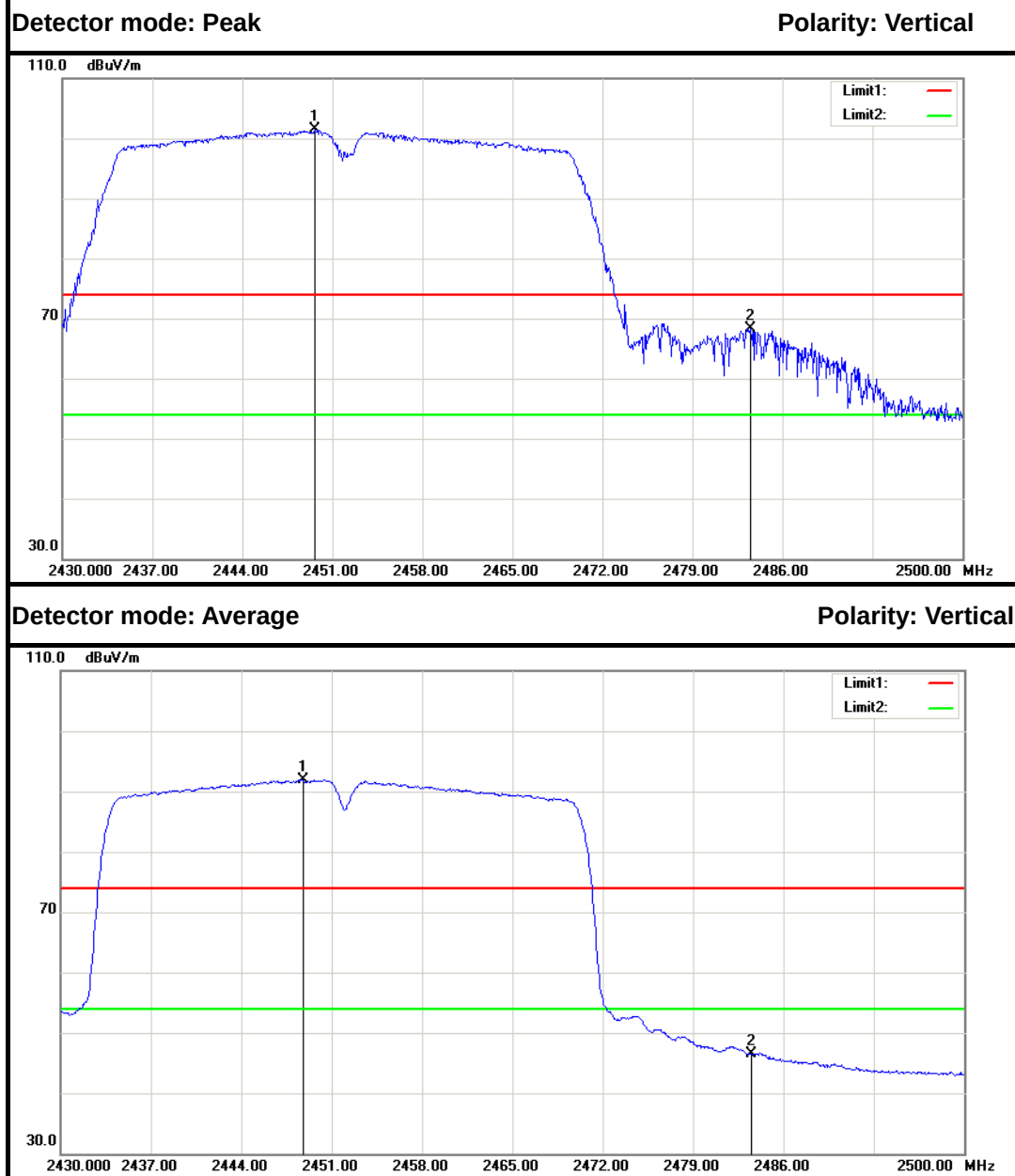
Polarity: Horizontal



| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2390.000        | 72.95        | -2.86         | 70.09         | 74.00        | -3.91       | Peak    | Horizontal    |
| 2.  | 2418.780        | 105.18       | -2.71         | 102.47        | ---          | ---         | Peak    | Horizontal    |
| 3.  | 2390.000        | 52.67        | -2.86         | 49.81         | 54.00        | -4.19       | Average | Horizontal    |
| 4.  | 2418.920        | 95.86        | -2.70         | 93.16         | ---          | ---         | Average | Horizontal    |



### Band Edges (CH High)

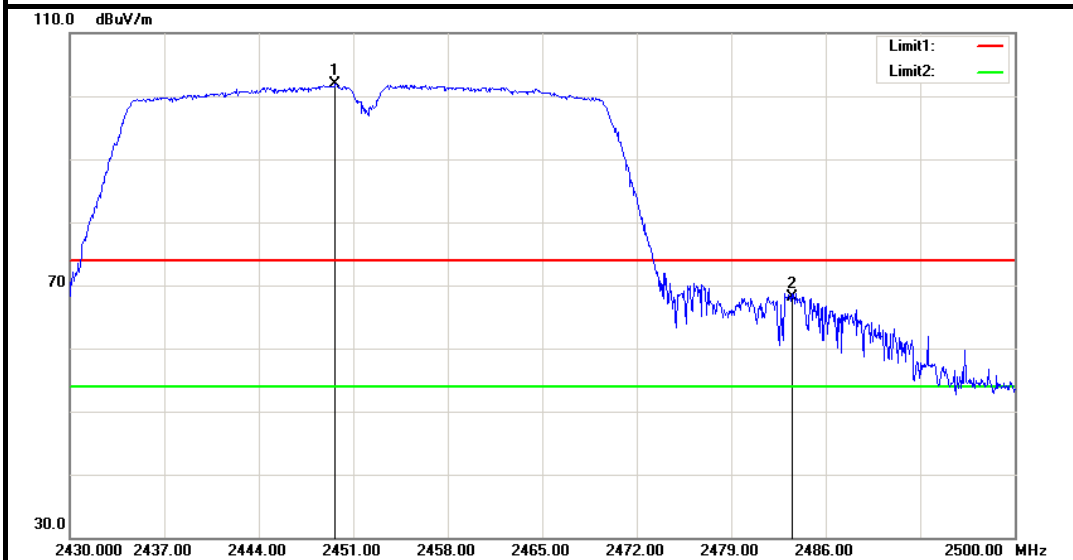


| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2449.600        | 104.05       | -2.54         | 101.51        | ---          | ---         | Peak    | Vertical      |
| 2.  | 2483.500        | 70.56        | -2.35         | 68.21         | 74.00        | -5.79       | Peak    | Vertical      |
| 3.  | 2448.760        | 94.48        | -2.54         | 91.94         | ---          | ---         | Average | Vertical      |
| 4.  | 2483.500        | 48.92        | -2.35         | 46.57         | 54.00        | -7.43       | Average | Vertical      |



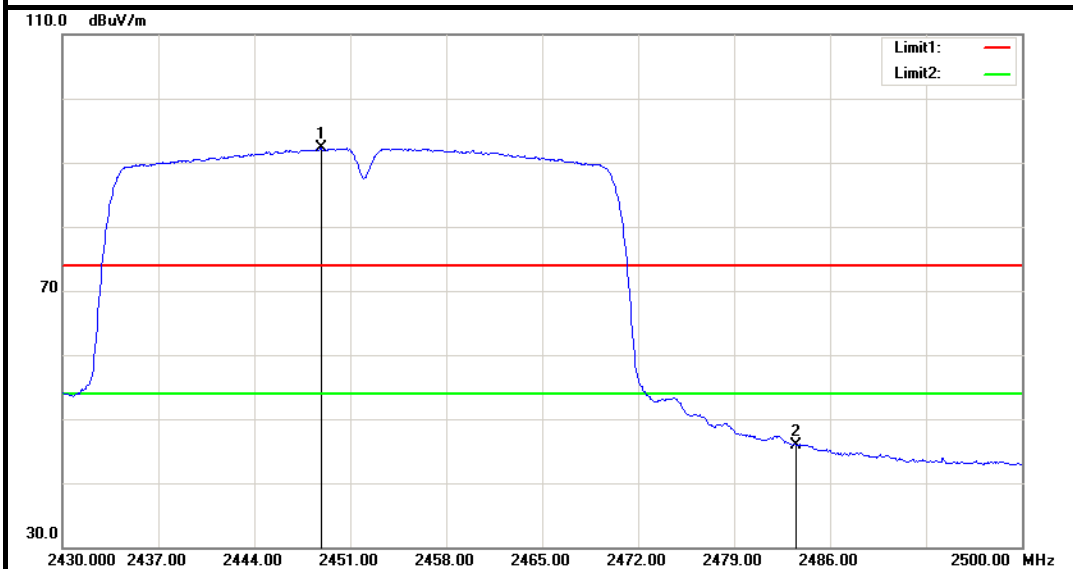
Detector mode: Peak

Polarity: Horizontal



Detector mode: Average

Polarity: Horizontal



| No. | Frequency (MHz) | Reading (dB) | Factor (dB/m) | Result (dB/m) | Limit (dB/m) | Margin (dB) | Remark  | Antenna Polar |
|-----|-----------------|--------------|---------------|---------------|--------------|-------------|---------|---------------|
| 1.  | 2449.670        | 104.42       | -2.54         | 101.88        | ---          | ---         | Peak    | Horizontal    |
| 2.  | 2483.500        | 70.50        | -2.35         | 68.15         | 74.00        | -5.85       | Peak    | Horizontal    |
| 3.  | 2448.900        | 94.79        | -2.54         | 92.25         | ---          | ---         | Average | Horizontal    |
| 4.  | 2483.500        | 48.24        | -2.35         | 45.89         | 54.00        | -8.11       | Average | Horizontal    |



## 7.7. PEAK POWER SPECTRAL DENSITY MEASUREMENT

### 7.7.1. 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.

### 7.7.2. TEST INSTRUMENTS

| Name of Equipment | Manufacturer | Model  | Serial Number | Last Calibration | Calibration Due |
|-------------------|--------------|--------|---------------|------------------|-----------------|
| Spectrum Analyzer | Agilent      | N9010A | MY52221469    | 02/21/2017       | 02/20/2018      |

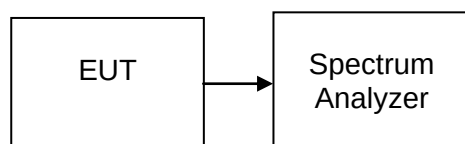
### 7.7.3. TEST PROCEDURES (please refer to measurement standard)

§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).

### 10.2 Method PKPSD (peak PSD)

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
4. Set the VBW  $\geq 3 \times \text{RBW}$ .
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 amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### 7.7.4. TEST SETUP



**7.7.5. TEST RESULTS***No non-compliance noted***Test Data****Test mode: IEEE 802.11b**

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Test Result |
|---------|-----------------|------------|-------------|-------------|
| Low     | 2412            | -7.627     | 8           | PASS        |
| Mid     | 2437            | -7.168     |             | PASS        |
| High    | 2462            | -8.029     |             | PASS        |

**Test mode: IEEE 802.11g**

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Test Result |
|---------|-----------------|------------|-------------|-------------|
| Low     | 2412            | -13.876    | 8           | PASS        |
| Mid     | 2437            | -13.369    |             | PASS        |
| High    | 2462            | -13.108    |             | PASS        |

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

| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Test Result |
|---------|-----------------|------------|-------------|-------------|
| Low     | 2412            | -13.778    | 8           | PASS        |
| Mid     | 2437            | -14.951    |             | PASS        |
| High    | 2462            | -13.917    |             | PASS        |

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

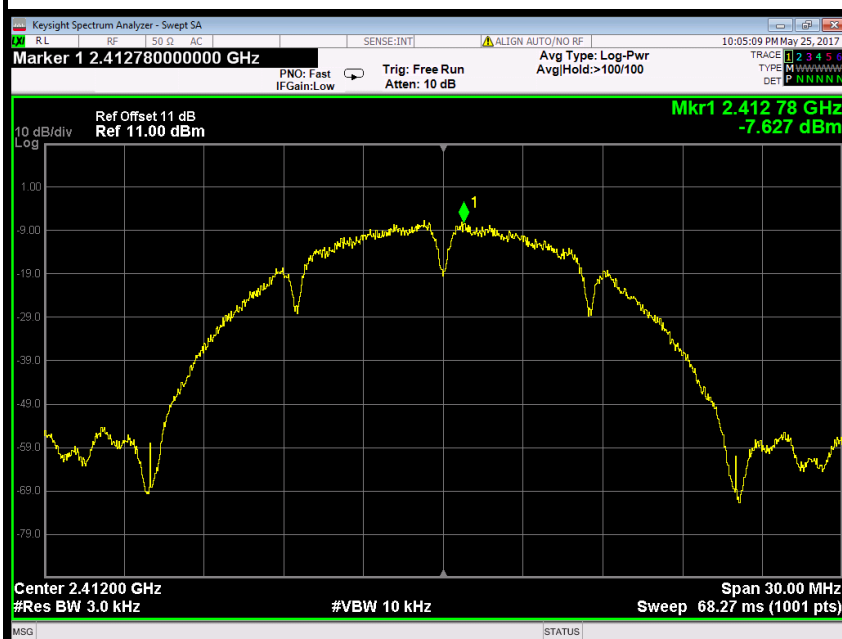
| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm) | Test Result |
|---------|-----------------|------------|-------------|-------------|
| Low     | 2422            | -17.582    | 8           | PASS        |
| Mid     | 2437            | -17.521    |             | PASS        |
| High    | 2452            | -16.883    |             | PASS        |



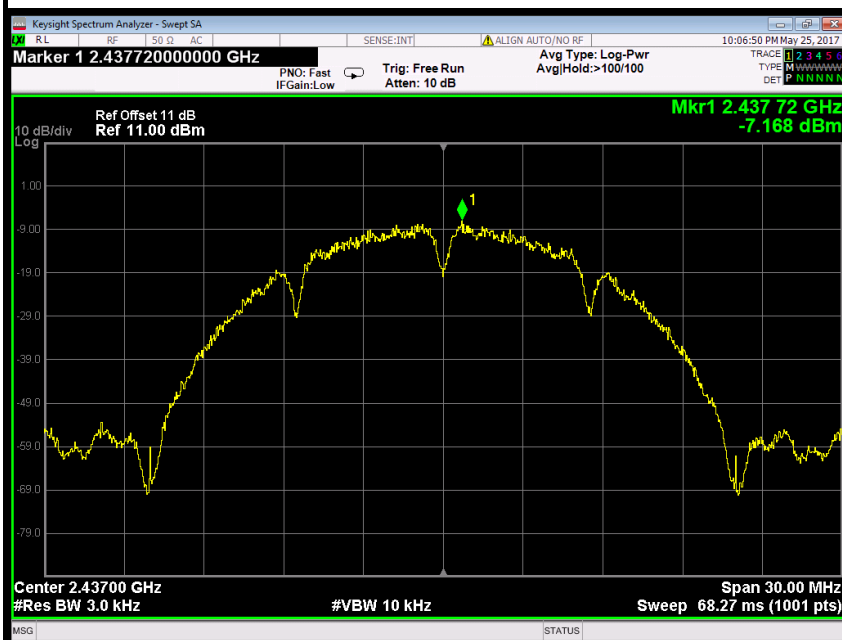
## Test Plot

### IEEE 802.11b mode

#### PPSD (CH Low)

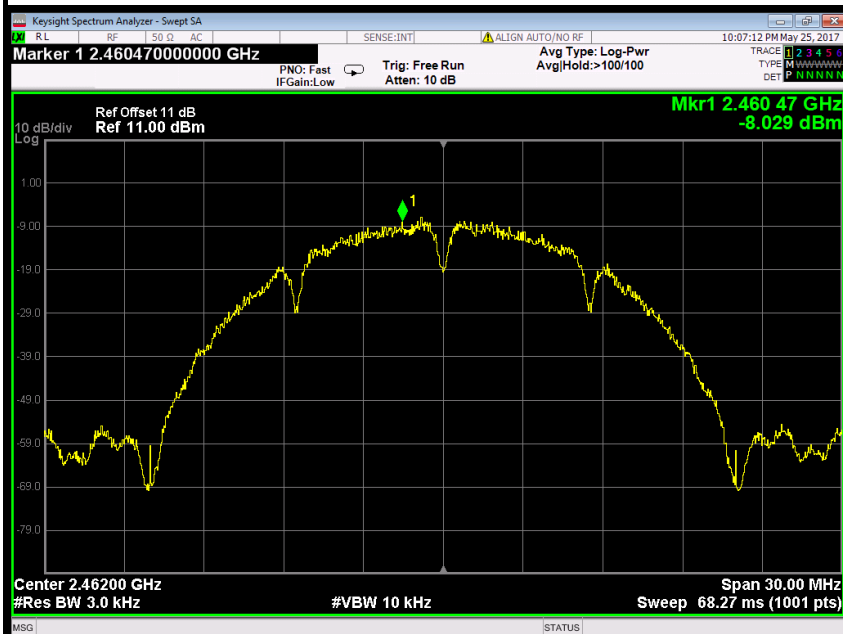


#### PPSD (CH Mid)



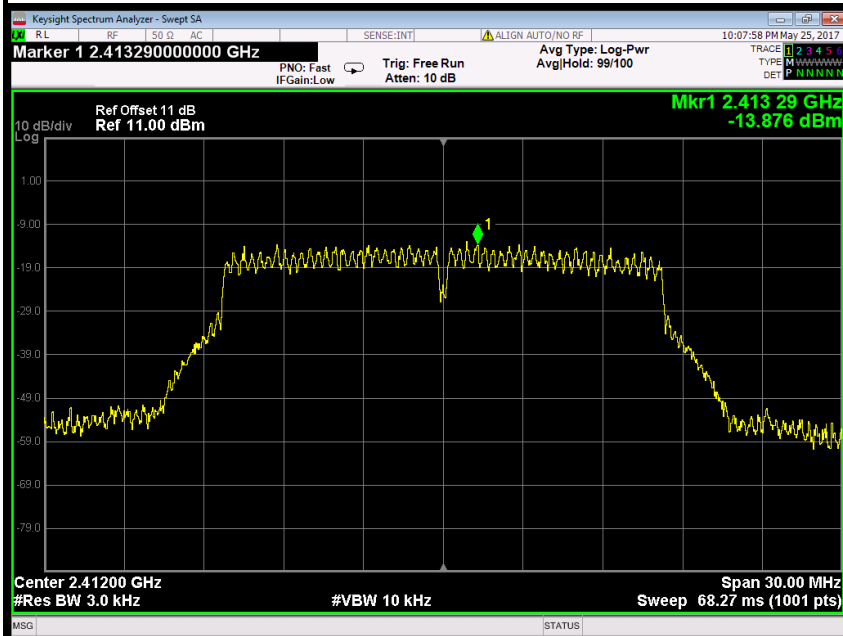


### PPSD (CH High)



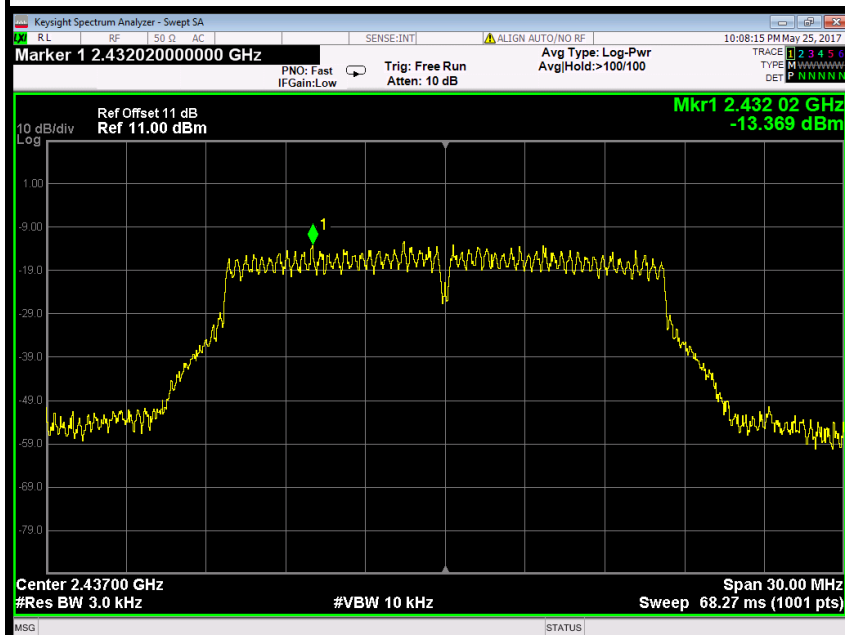
### IEEE 802.11g mode

### PPSD (CH Low)

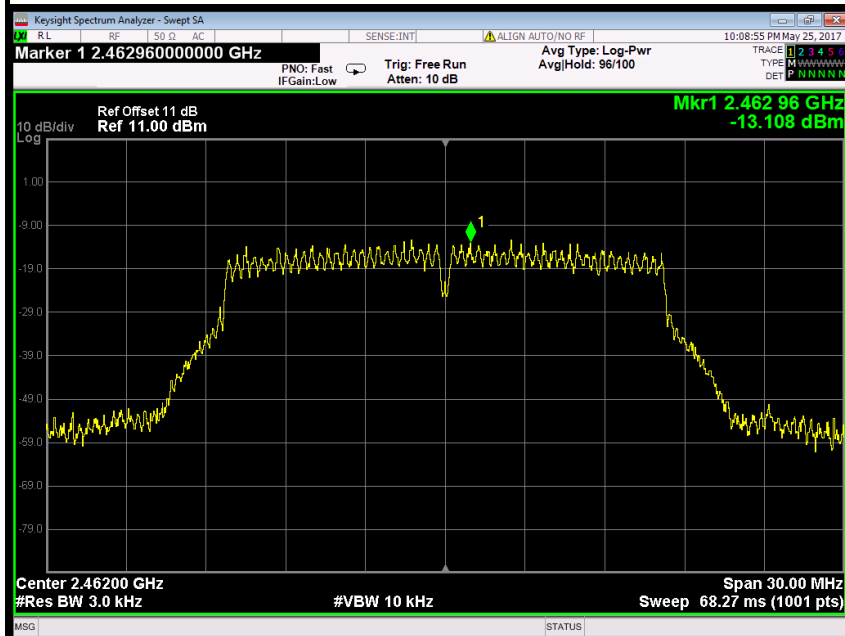




### PPSD (CH Mid)



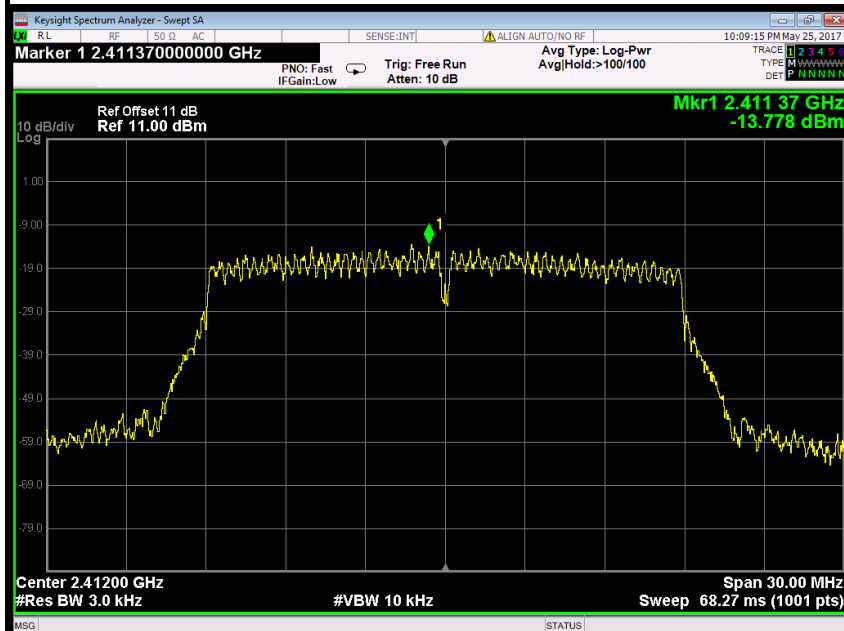
### PPSD (CH High)



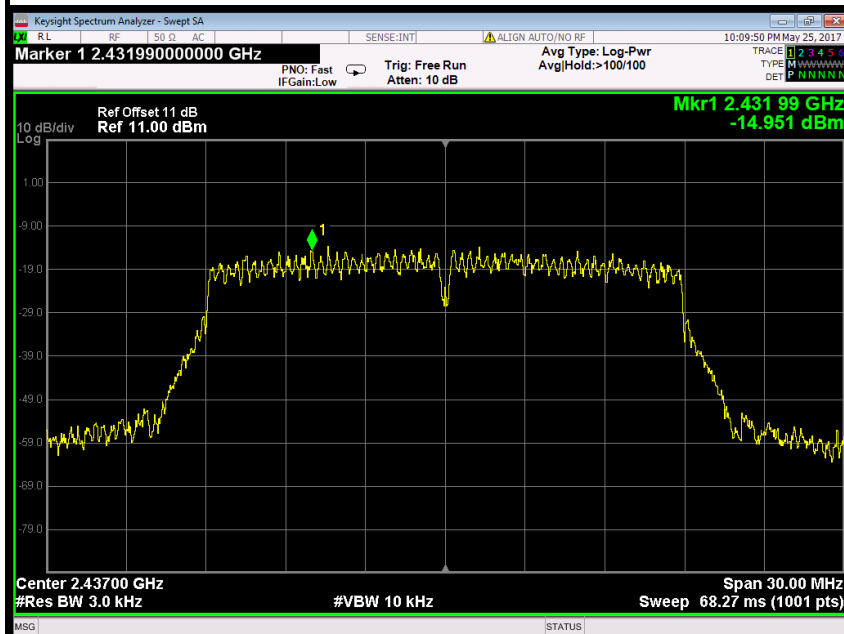


IEEE 802.11n HT20 MHz mode

PPSD (CH Low)

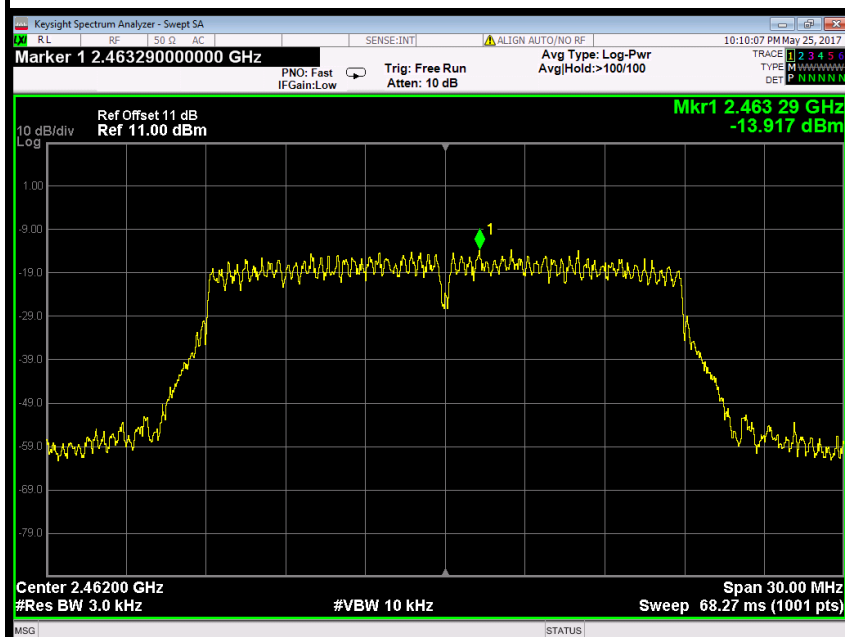


PPSD (CH Mid)





### PPSD (CH High)



### IEEE 802.11n HT40 MHz mode

### PPSD (CH Low)

