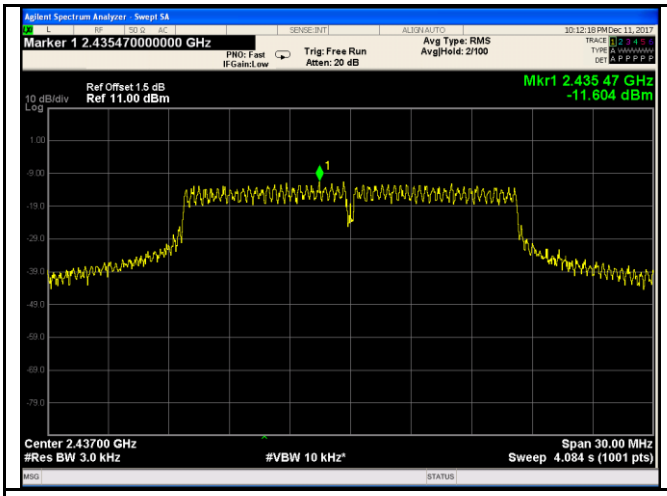
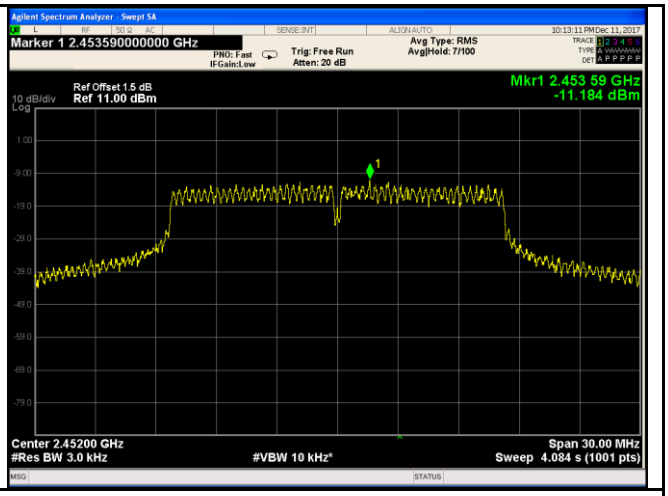
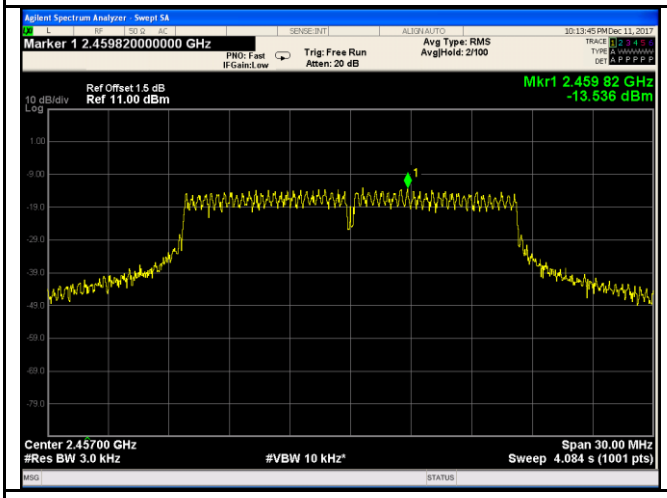


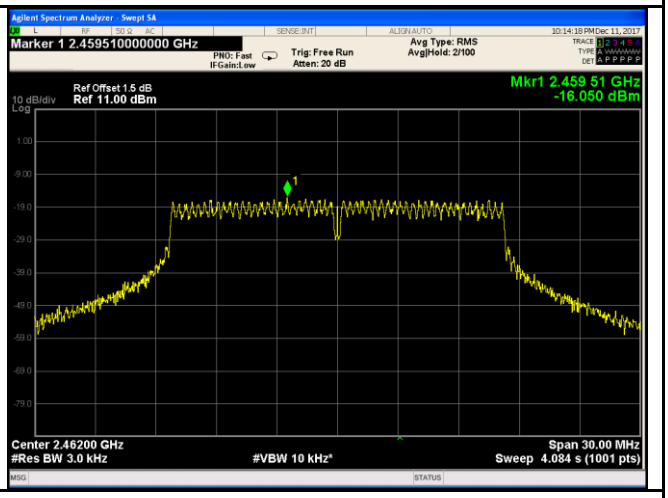

802.11g - 6 CH 2437



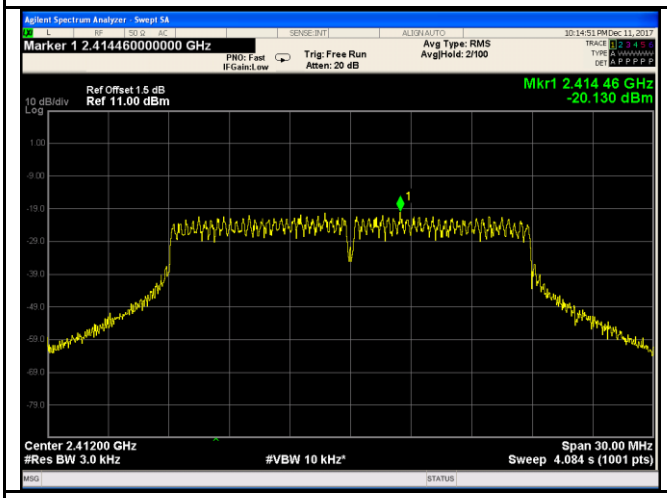

802.11g - 9 CH 2452



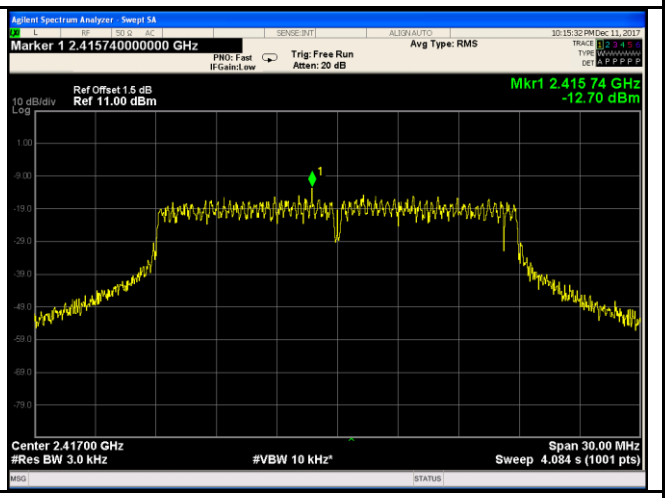

802.11g - 10 CH 2457



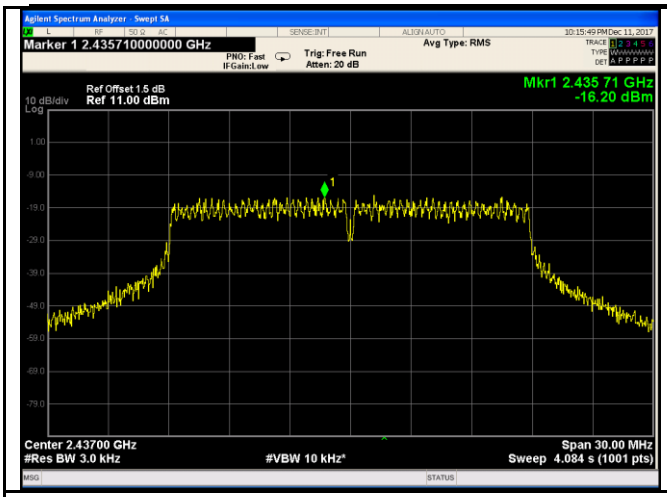

802.11g - 11 CH 2462



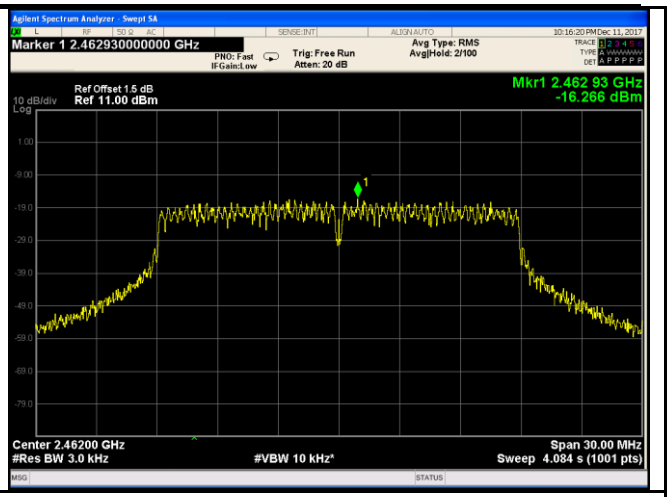

802.11n20 - 1 CH 2412



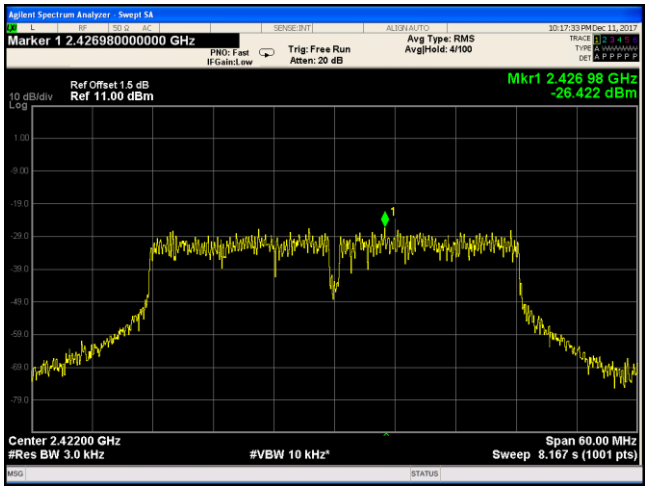

802.11n20 - 2 CH 2417



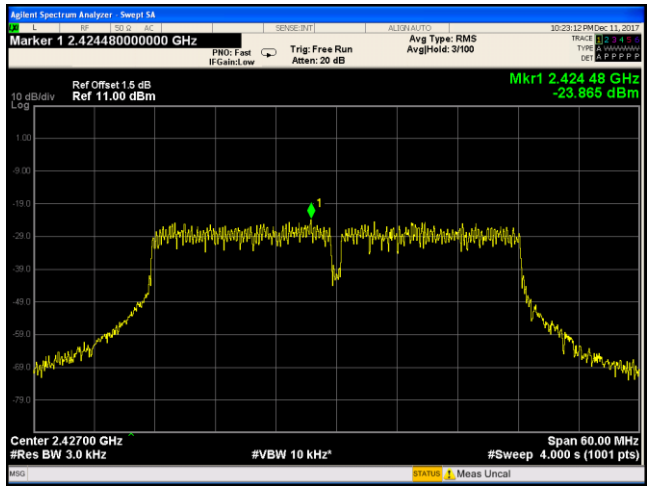

802.11n20 - 6 CH 2437



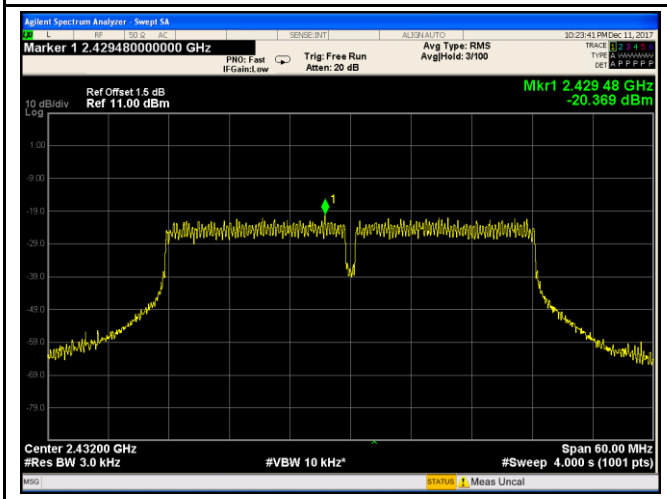

802.11n20 - 11 CH 2462



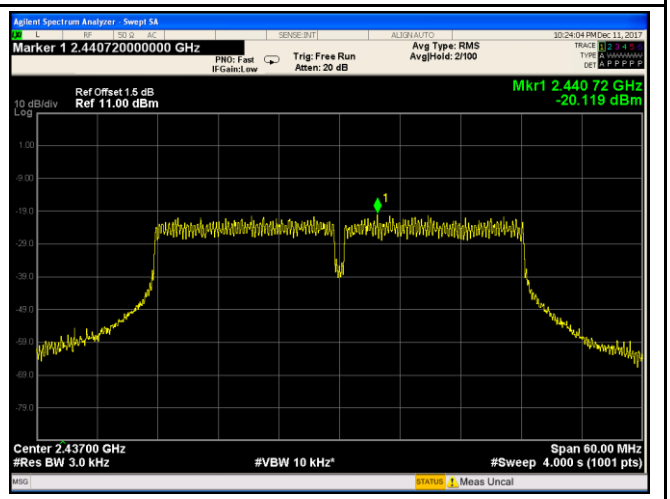

802.11n40 - 3 CH 2422



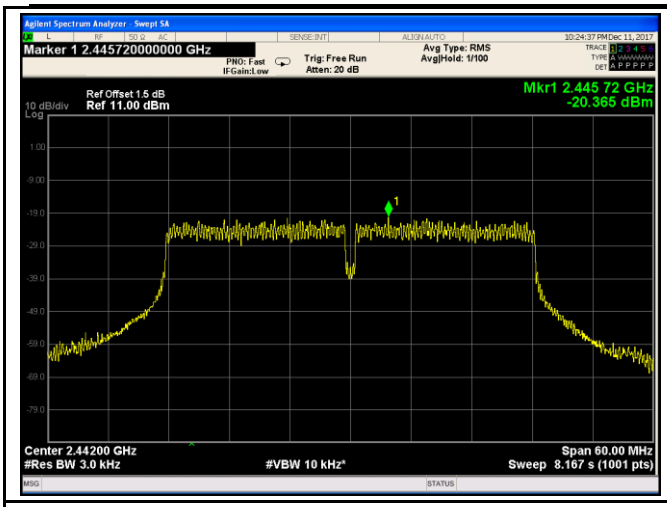

802.11n40 - 4 CH 2427



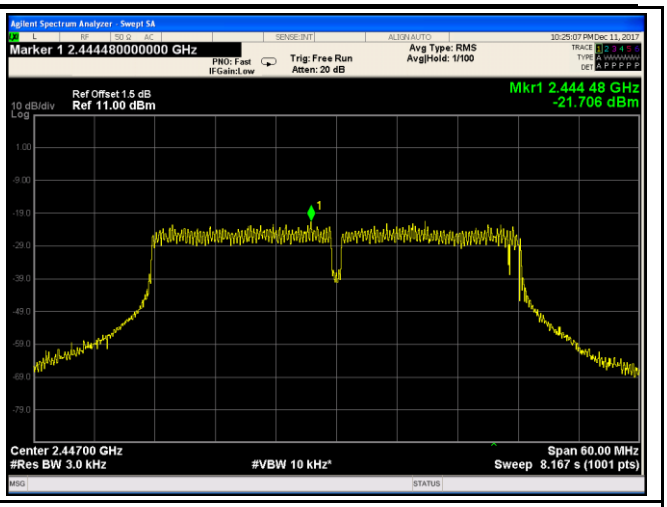

802.11n40 -5 CH 2432



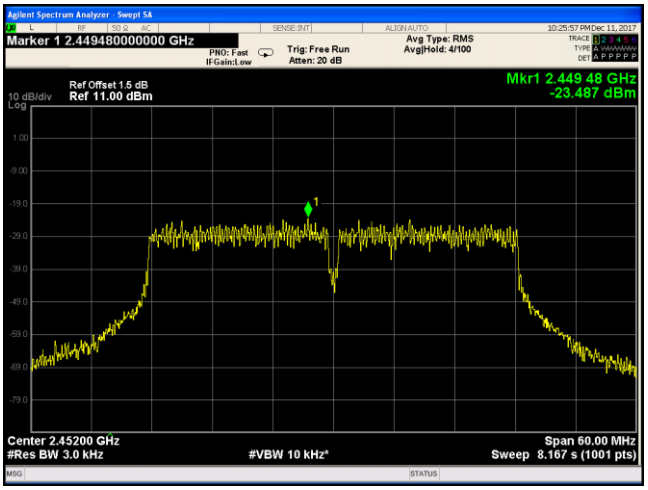

802.11n40 – 6 CH 2437




802.11n40 - 7 CH 2442




802.11n40 - 8 CH 2447

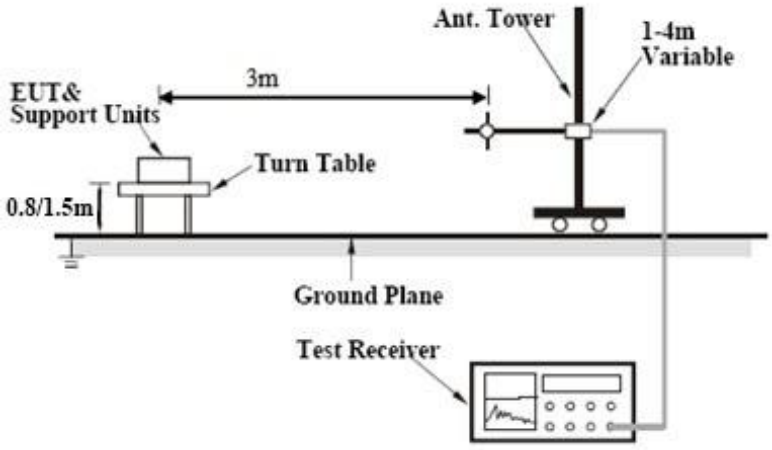



802.11n40 - 9 CH 2452

## 6.5 Band-Edge & Unwanted Emissions into Non-Restricted Frequency Bands

| | |
| --- | --- |
| Temperature | 24°C |
| Relative Humidity | 57% |
| Atmospheric Pressure | 1007mbar |
| Test date : | December 1,9 and 10,2017 |
| Tested By : | Aaron Liang |

**Requirement(s):**

| Spec | Item | Requirement | Applicable |
| --- | --- | --- | --- |
| §15.247(d) | a) | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. | ☑ |
| Test Setup |  | | |
| Test Procedure | Radiated Method Only<br>- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.<br>- 2. Position the EUT without connection to measurement instrument. Put it on the Rotated table and turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range. | | |

| | |
|---|---|
| | - 3. First, set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, check the emission of EUT, if pass then set Spectrum Analyzer as below:<br>a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz.<br>b. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz.<br>c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz.<br>- 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.<br>- 5. Repeat above procedures until all measured frequencies were complete. |
| Remark | |
| Result | ☑ Pass ☐ Fail |

**Test Data** ☑ Yes ☐ N/A

**Test Plot** ☑ Yes (See below) ☐ N/A

| 2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Restricted Band) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Modulation | N(TX) | Freq.(MHz) | Measure Distance (m) | Antenna (White) | | Antenna (Blue) | | Antenna (Black) | | Limit (dBuV/m) PK | Result |
| | | | | Fre. (MHz) Pk | Level (dBuV/m) PK | Fre. (MHz) Pk | Level (dBuV/m) PK | Fre. (MHz) Pk | Level (dBuV/m) PK | | |
| 11b | 1 | 2412 | 3 | 2386.03 | 64.02 | 2390.00 | 68.46 | 2386.11 | 64.53 | 74 | Pass |
| 11b | 1 | 2462 | 3 | 2483.50 | 66.16 | 2483.50 | 63.21 | 2489.25 | 62.87 | 74 | Pass |
| 11g | 1 | 2412 | 3 | 2390.00 | 67.14 | 2390.00 | 69.26 | 2390.00 | 70.77 | 74 | Pass |
| 11g | 1 | 2417 | 3 | 2390.00 | 68.28 | 2390.00 | 69.84 | 2390.00 | 71.90 | 74 | Pass |
| 11g | 1 | 2422 | 3 | 2390.00 | 69.75 | / | / | 2390.00 | 68.67 | 74 | Pass |
| 11g | 1 | 2452 | 3 | 2483.50 | 67.63 | 2483.50 | 73.49 | 2483.50 | 72.51 | 74 | Pass |
| 11g | 1 | 2457 | 3 | 2483.50 | 70.02 | 2483.50 | 72.36 | 2483.50 | 70.52 | 74 | Pass |
| 11g | 1 | 2462 | 3 | 2483.50 | 68.41 | 2483.50 | 70.98 | 2483.50 | 72.44 | 74 | Pass |

| 2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Restricted Band) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Modulation | N(TX) | Freq.(MHz) | Measure Distance(m) | Antenna (White+Blue+Black) | | Limit (dBuV/m) PK | Result |
| | | | | Fre.(MHz) Pk | Level(dBuV/m) PK | | |
| HT20 | 3 | 2412 | 3 | 2388.00 | 73.44 | 74 | Pass |
| HT20 | 3 | 2417 | 3 | 2390.00 | 70.08 | 74 | Pass |
| HT20 | 3 | 2462 | 3 | 2485.90 | 72.83 | 74 | Pass |
| HT40 | 3 | 2422 | 3 | 2385.53 | 69.85 | 74 | Pass |
| HT40 | 3 | 2427 | 3 | 2390.00 | 71.16 | 74 | Pass |
| HT40 | 3 | 2432 | 3 | 2387.76 | 71.29 | 74 | Pass |
| HT40 | 3 | 2437 | 3 | 2390.00 | 69.93 | 74 | Pass |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| HT40 | 3 | 2437 | 3 | 2485.00 | 67.94 | 74 | Pass |
| HT40 | 3 | 2442 | 3 | 2483.5 | 70.87 | 74 | Pass |
| HT40 | 3 | 2447 | 3 | 2484.10 | 70.95 | 74 | Pass |
| HT40 | 3 | 2452 | 3 | 2483.50 | 69.58 | 74 | Pass |

**2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Restricted Band)**

| Modulation | N(TX) | Freq.(MHz) | Measure Distance (m) | Antenna (White) | | Antenna (Blue) | | Antenna (Black) | | Limit (dBuV/m) AV | Result |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Fre. (MHz) AV | Level (dBuV/m) AV | Fre. (MHz) AV | Level (dBuV/m) AV | Fre. (MHz) AV | Level (dBuV/m) AV | | |
| 11b | 1 | 2412 | 3 | 2386.03 | 51.25 | 2390.00 | 51.50 | 2386.11 | 49.96 | 54 | Pass |
| 11b | 1 | 2462 | 3 | 2483.50 | 50.38 | 2483.50 | 49.86 | 2489.25 | 49.83 | 54 | Pass |
| 11g | 1 | 2412 | 3 | 2390.00 | 51.33 | 2390.00 | 52.10 | 2390.00 | 53.26 | 54 | Pass |
| 11g | 1 | 2417 | 3 | 2390.00 | 49.32 | 2390.00 | 53.71 | 2390.00 | 53.21 | 54 | Pass |
| 11g | 1 | 2422 | 3 | 2390.00 | 50.31 | / | / | 2390.00 | 51.69 | 54 | Pass |
| 11g | 1 | 2452 | 3 | 2483.50 | 52.44 | 2483.50 | 52.91 | 2483.50 | 53.84 | 54 | Pass |
| 11g | 1 | 2457 | 3 | 2483.50 | 52.83 | 2483.50 | 52.27 | 2483.50 | 53.25 | 54 | Pass |
| 11g | 1 | 2462 | 3 | 2483.50 | 52.24 | 2483.50 | 53.28 | 2483.50 | 53.30 | 54 | Pass |

| 2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Restricted Band) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Modulation | N(TX) | Freq.(MHz) | Measure Distance(m) | Antenna (White+Blue+Black) | | Limit (dBuV/m) AV | Result |
| | | | | Fre.(MHz) AV | Level(dBuV/m) AV | | |
| HT20 | 3 | 2412 | 3 | 2390.00 | 53.21 | 54 | Pass |
| HT20 | 3 | 2417 | 3 | 2390.00 | 51.43 | 54 | Pass |
| HT20 | 3 | 2462 | 3 | 2485.30 | 53.00 | 54 | Pass |
| HT40 | 3 | 2422 | 3 | 2384.57 | 53.03 | 54 | Pass |
| HT40 | 3 | 2427 | 3 | 2390.00 | 52.75 | 54 | Pass |
| HT40 | 3 | 2432 | 3 | 2384.57 | 52.54 | 54 | Pass |
| HT40 | 3 | 2437 | 3 | 2390.00 | 52.52 | 54 | Pass |
| HT40 | 3 | 2437 | 3 | 2483.50 | 51.14 | 54 | Pass |
| HT40 | 3 | 2442 | 3 | 2483.50 | 52.02 | 54 | Pass |
| HT40 | 3 | 2447 | 3 | 2484.10 | 52.78 | 54 | Pass |
| HT40 | 3 | 2452 | 3 | 2483.50 | 52.69 | 54 | Pass |

| 2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Non-restricted Band) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Modulation | N(TX) | Test Freq,(MHz) | (i)-(O)dB | | | Limit(dB) | Result |
| | | | Antenna (White) | Antenna (Blue) | Antenna (Black) | | |
| 11b | 1 | 2412 | 32.67 | 33.49 | 48.14 | 30 | Pass |
| 11g | 1 | 2412 | 31.29 | 31.59 | 30.12 | 30 | Pass |
| 11g | 1 | 2417 | 32.91 | 31.88 | 30.10 | 30 | Pass |
| 11g | 1 | 2422 | 39.78 | / | 38.24 | 30 | Pass |

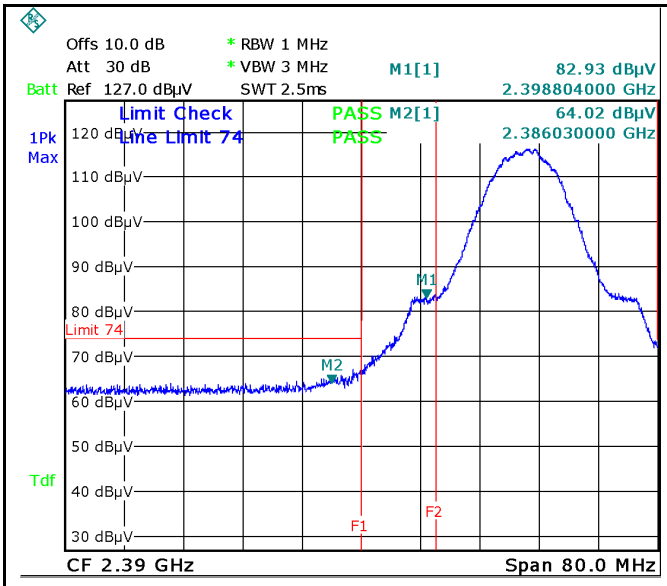
| 2400-2483.5MHz Transmitter Radiated Bandedge Emissions (Non-restricted Band) | | | | | |
|---|---|---|---|---|---|
| Modulation | N(TX) | Test Freq,(MHz) | (i)-(O)dB<br>Antenna (White+Blue+Black) | Limit(dB) | Result |
| HT20 | 3 | 2412 | 33.88 | 30 | Pass |
| HT20 | 3 | 2417 | 32.65 | 30 | Pass |
| HT40 | 3 | 2422 | 32.63 | 30 | Pass |
| HT40 | 3 | 2427 | 39.08 | 30 | Pass |
| HT40 | 3 | 2432 | 34.69 | 30 | Pass |
| HT40 | 3 | 2437 | 38.69 | 30 | Pass |

## Test Plots

## Restricted frequency band result

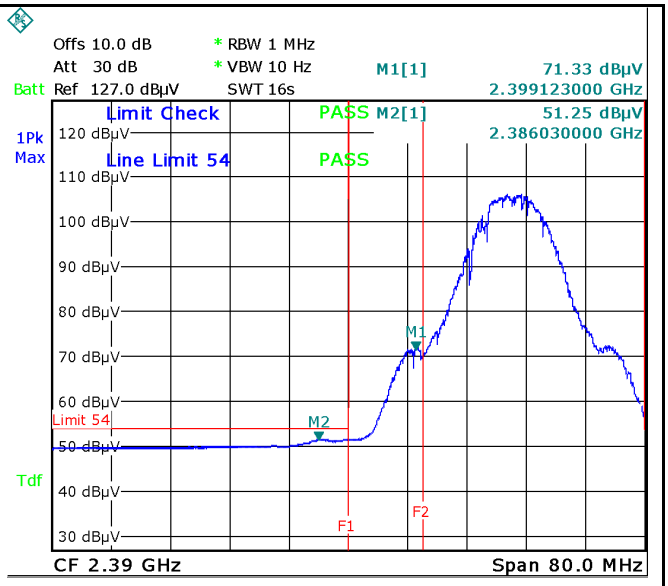
## b mode

## Antenna (White)



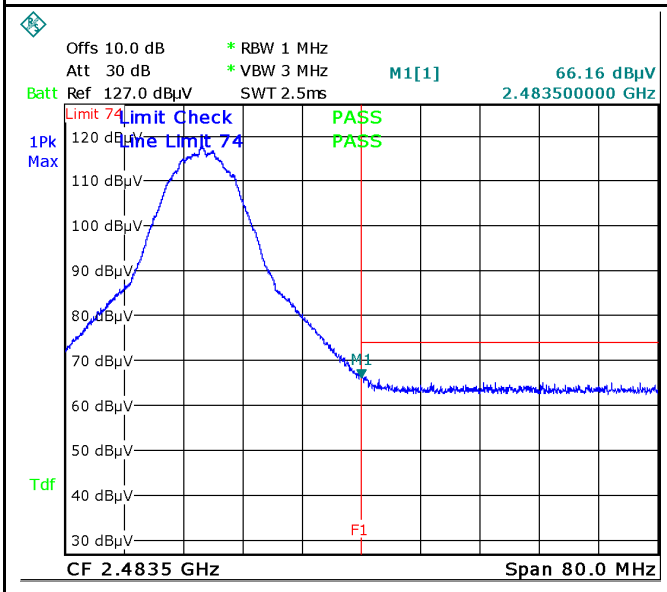

1 CH (Peak) - 802.11b

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



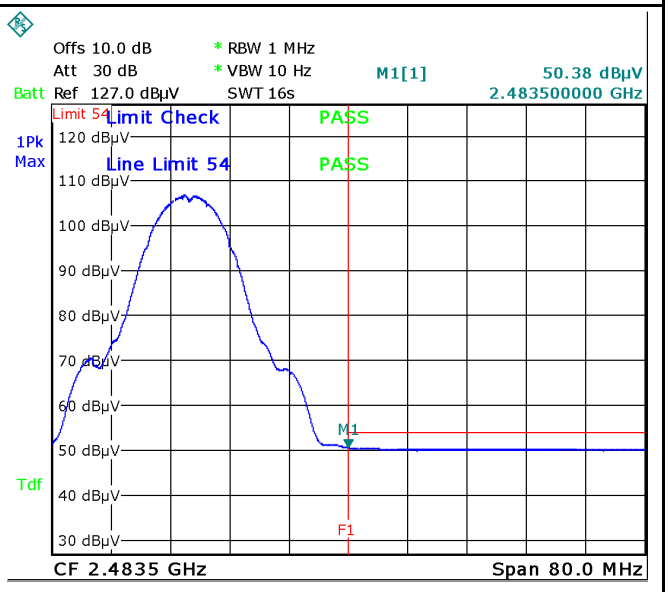

1 CH (Average) - 802.11b

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




11 CH (Peak) - 802.11b

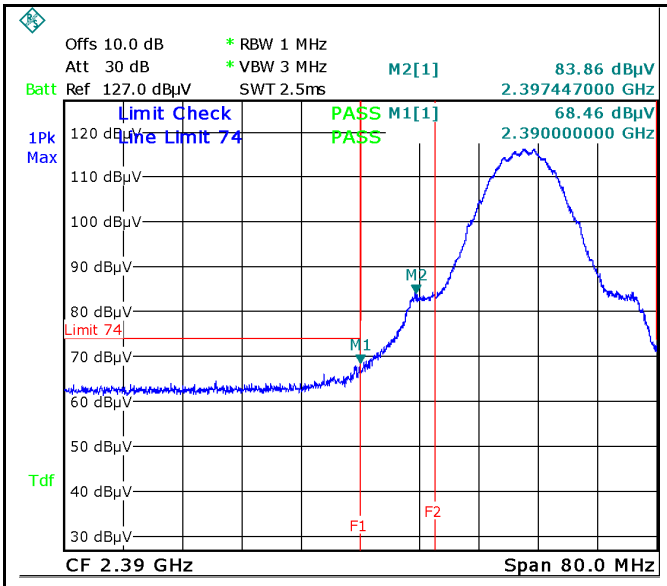
**Note: F1 is frequency 2483.5MHz**




11 CH (Average) - 802.11b

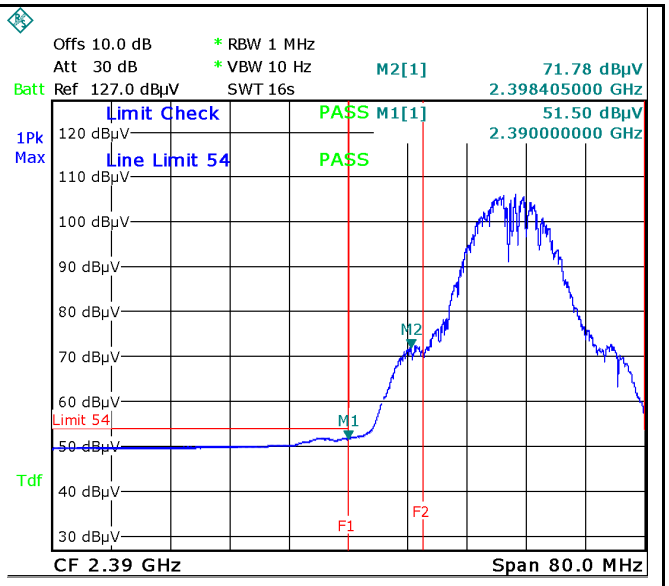
**Note: F1 is frequency 2483.5MHz**

## Antenna (Blue):



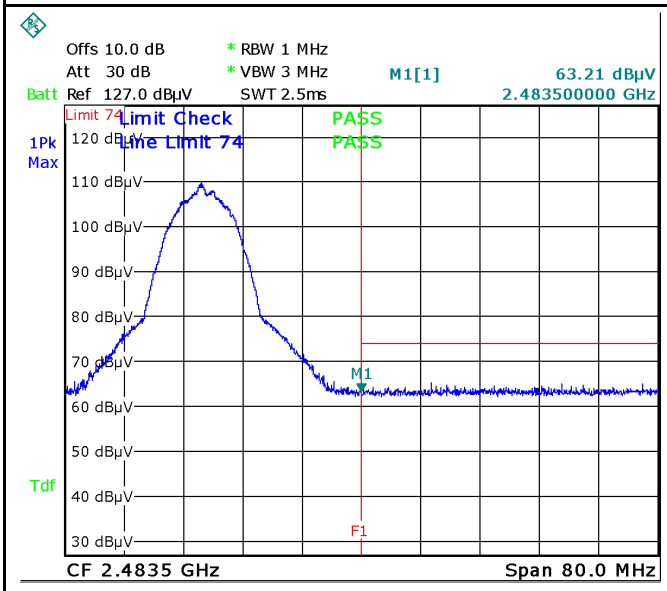

1 CH (Peak) - 802.11b

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



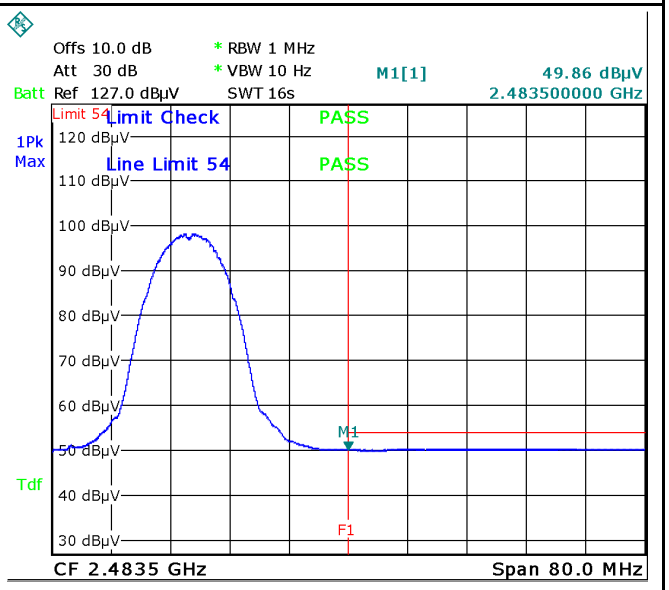

1 CH (Average) - 802.11b

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




11 CH (Peak) - 802.11b

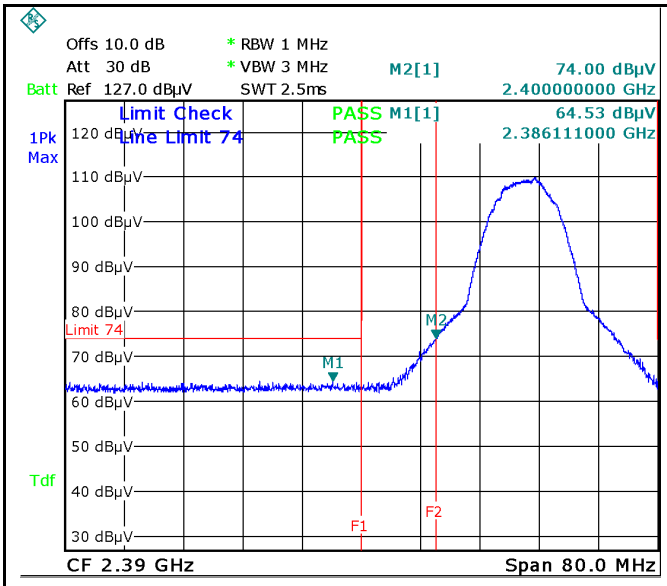
**Note: F1 is frequency 2483.5MHz**




11 CH (Average) - 802.11b

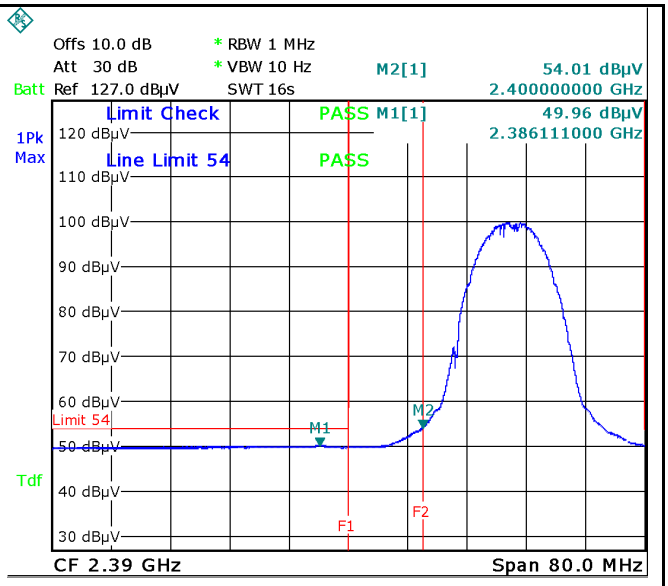
**Note: F1 is frequency 2483.5MHz**

## Antenna (Black):



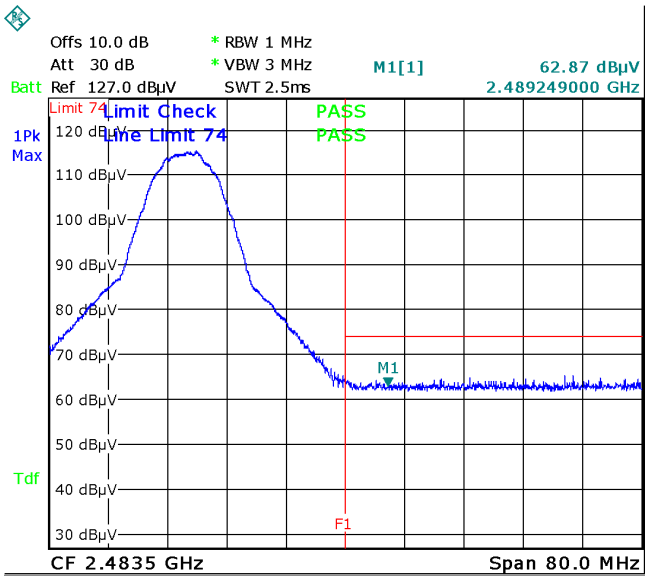

1 CH (Peak) - 802.11b

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



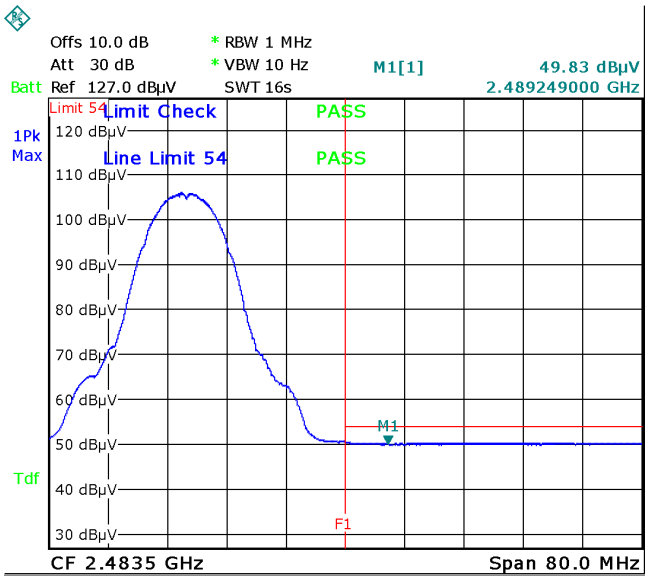

1 CH (Average) - 802.11b

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




1 CH (Peak) - 802.11b

**Note: F1 is frequency 2483.5MHz**

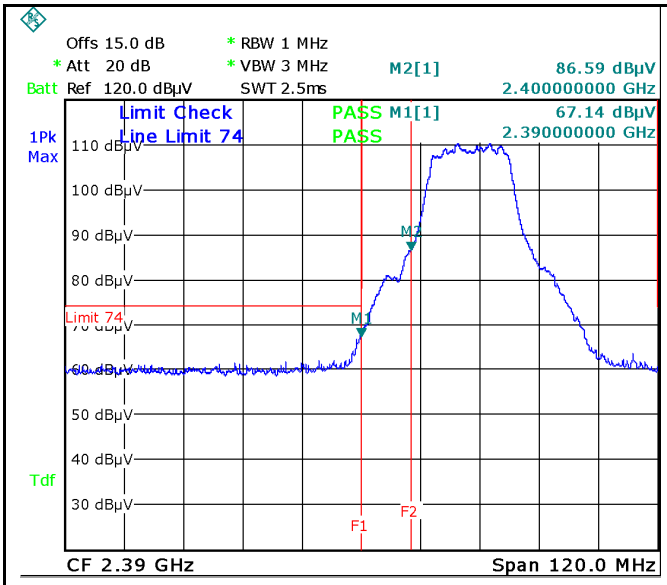



11 CH (Average) - 802.11b

**Note: F1 is frequency 2483.5MHz**

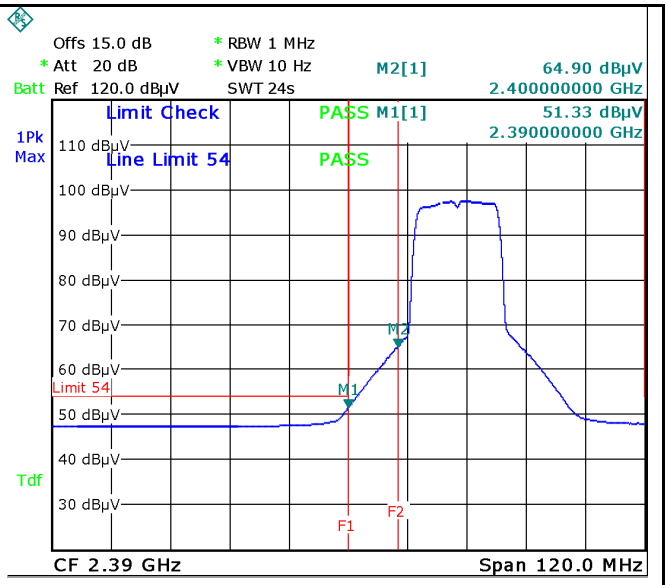
## g mode:

## Antenna (White):



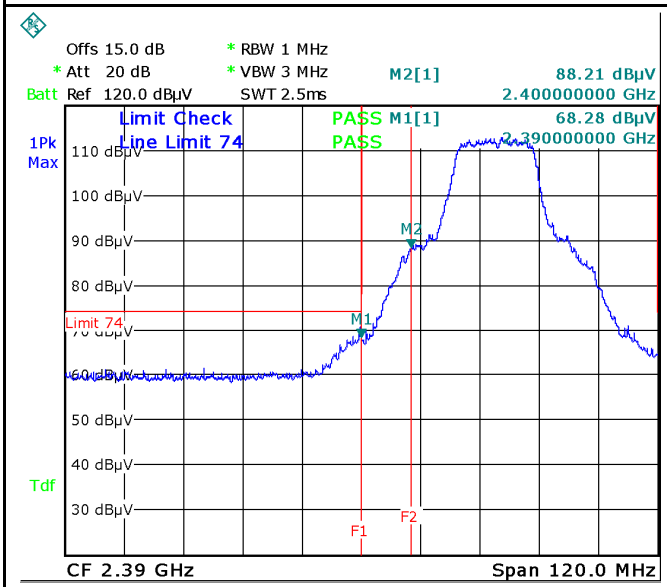

1 CH (Peak) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



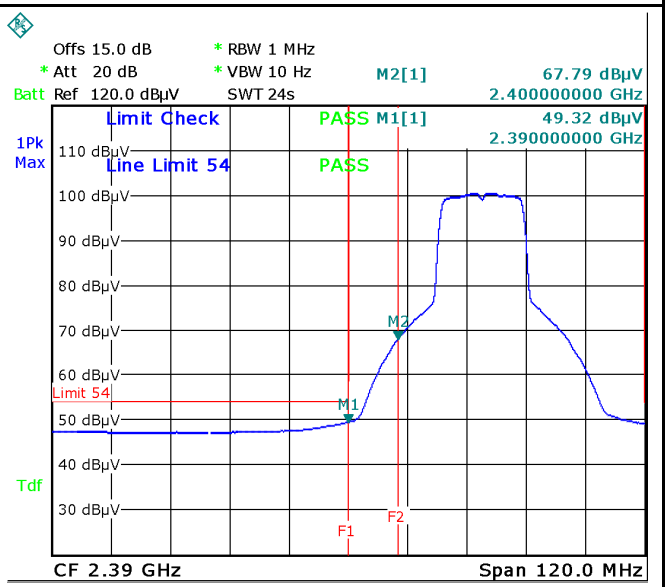

1CH (Average) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



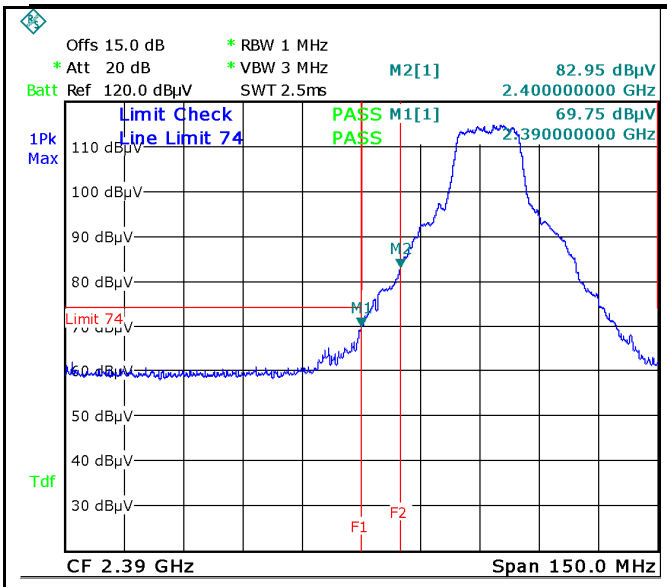

2 CH (Peak) - 802.11g

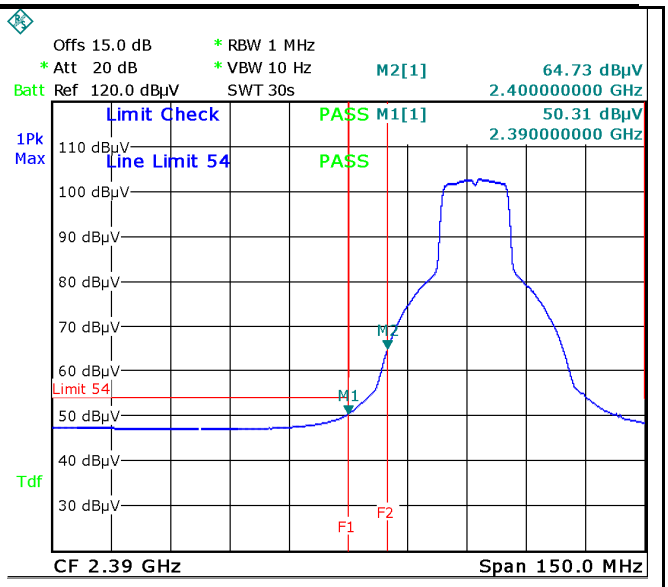
**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




2 CH (Average) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



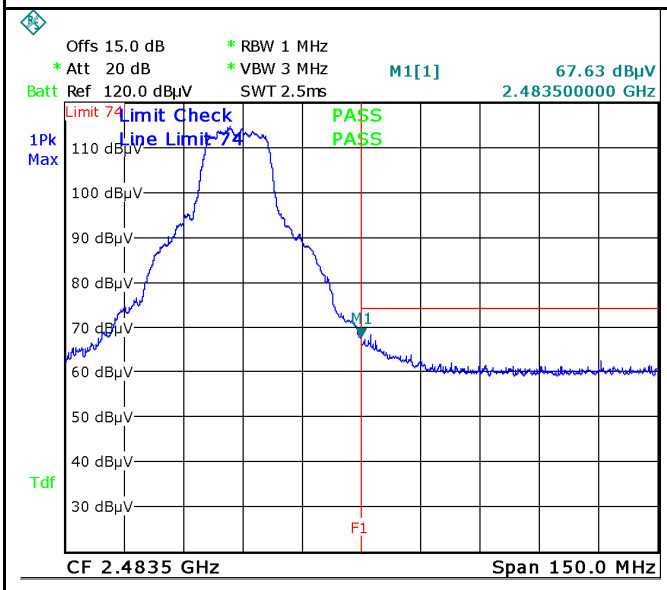



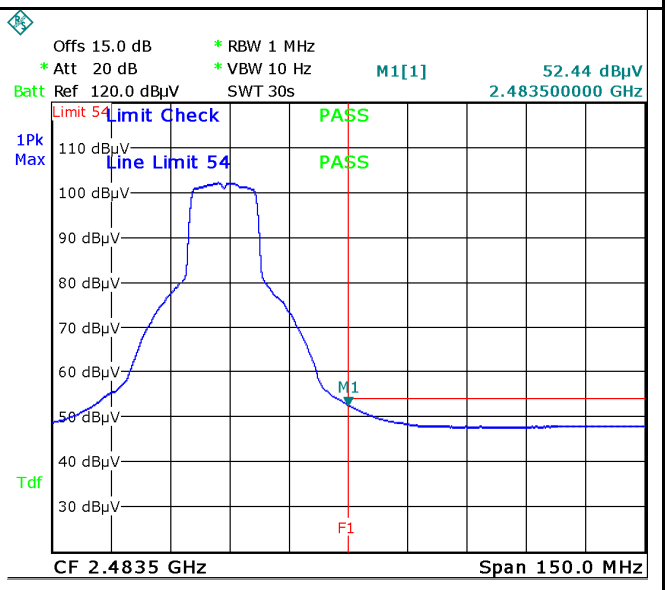

3 CH (Peak) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**

3 CH (Average) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



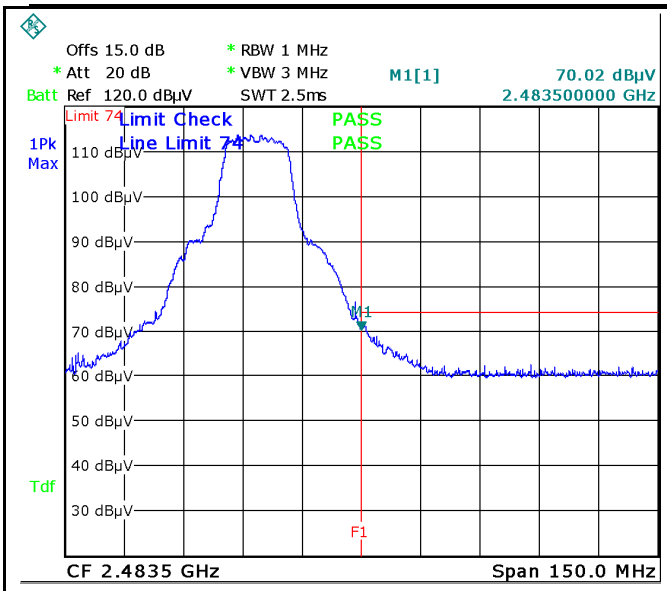




9 CH (Peak) - 802.11g

**Note: F1 is frequency 2483.5MHz**

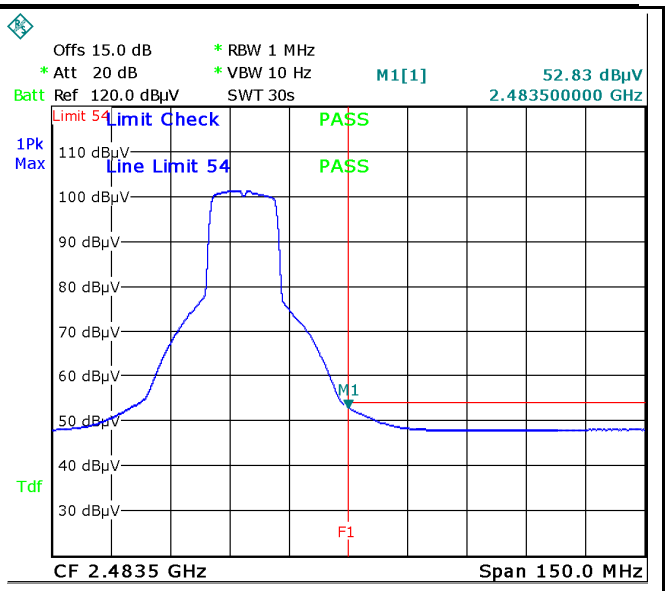
9 CH (Average) - 802.11g

**Note: F1 is frequency 2483.5MHz**



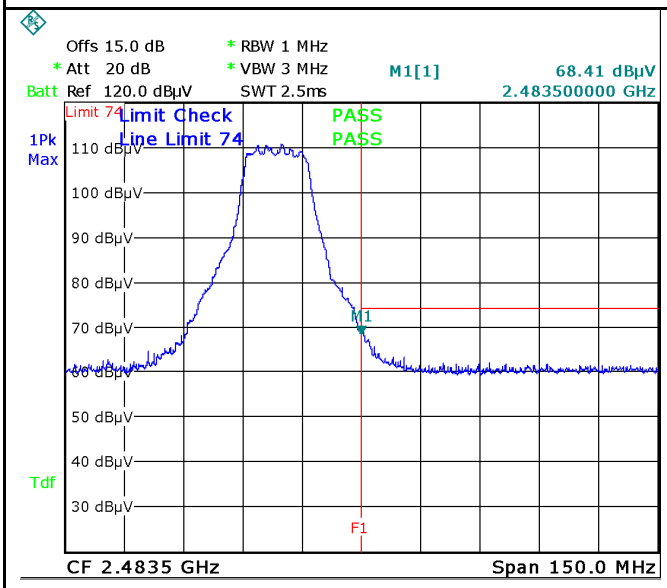

10 CH (Peak) - 802.11g

**Note: F1 is frequency 2483.5MHz**



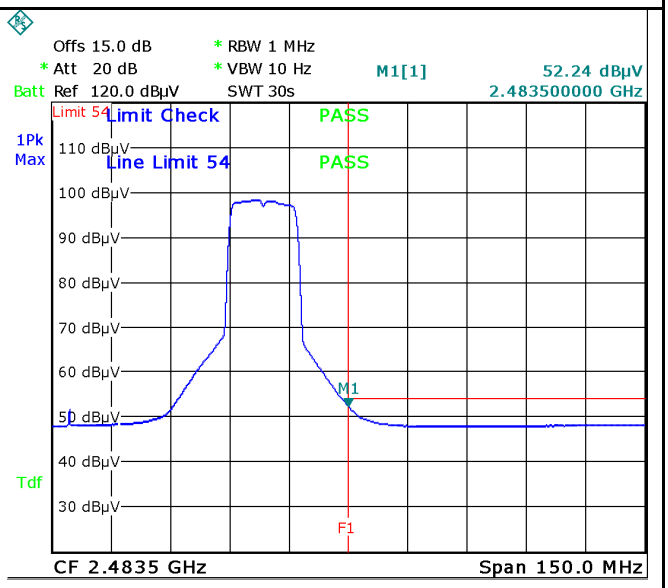

10 CH (Average) - 802.11g

**Note: F1 is frequency 2483.5MHz**




11 CH (Peak) - 802.11g

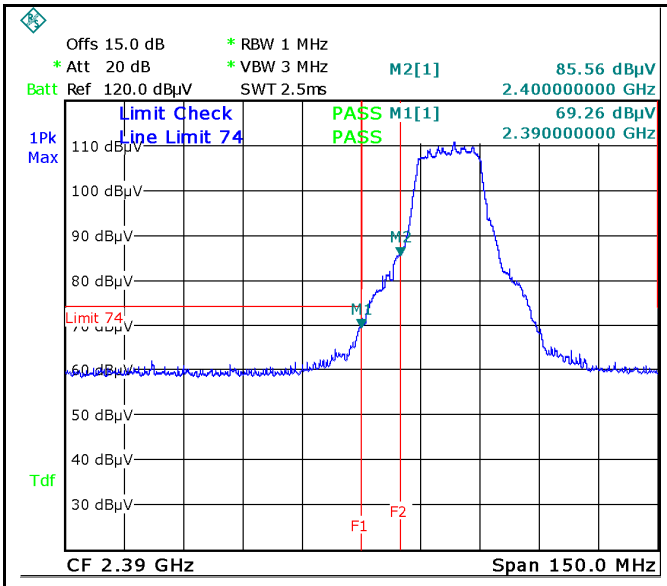
**Note: F1 is frequency 2483.5MHz**




11 CH (Average) - 802.11g

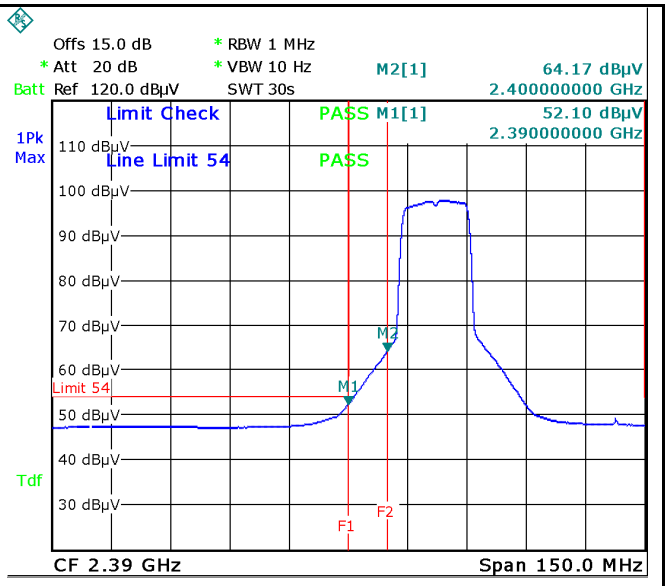
**Note: F1 is frequency 2483.5MHz**

## Antenna (Blue):



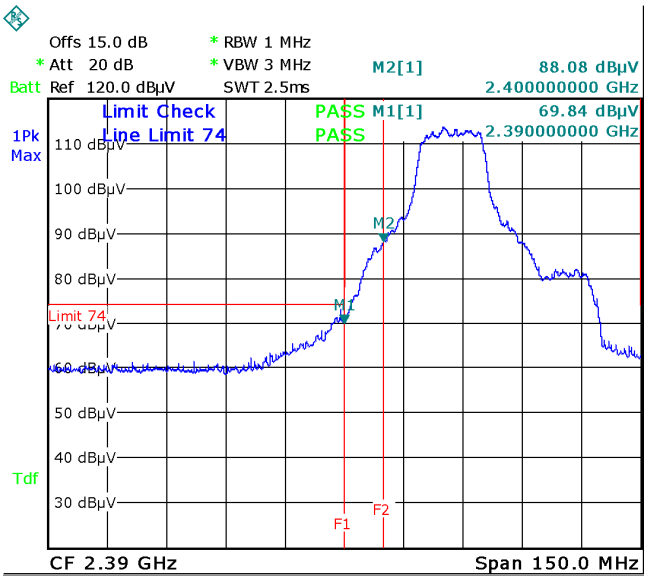

1 CH (Peak) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



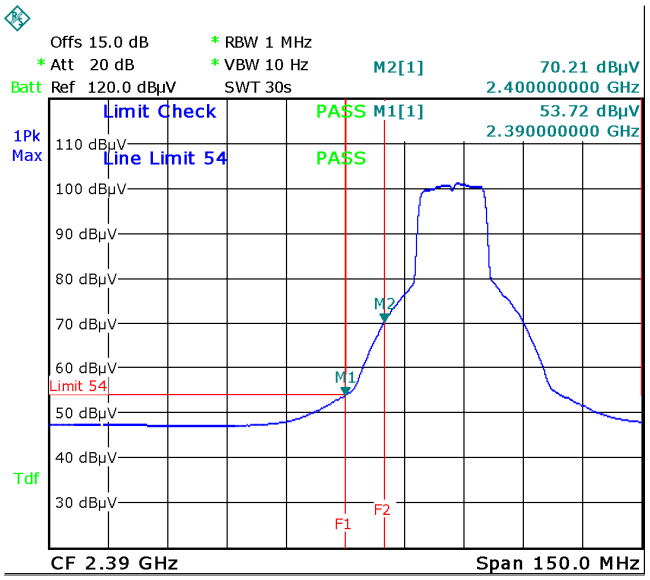

1CH (Average) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



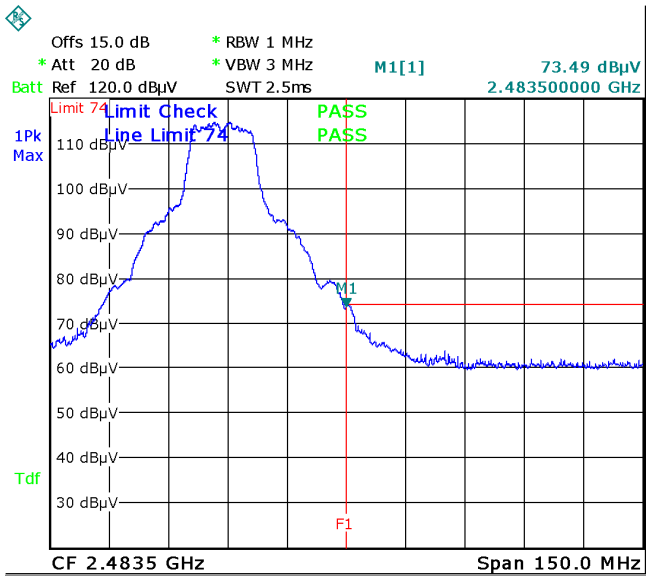

2 CH (Peak) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



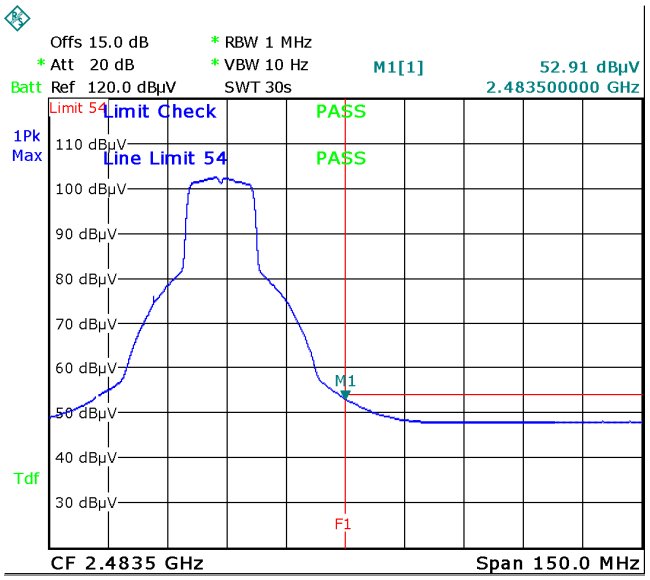

2 CH (Average) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



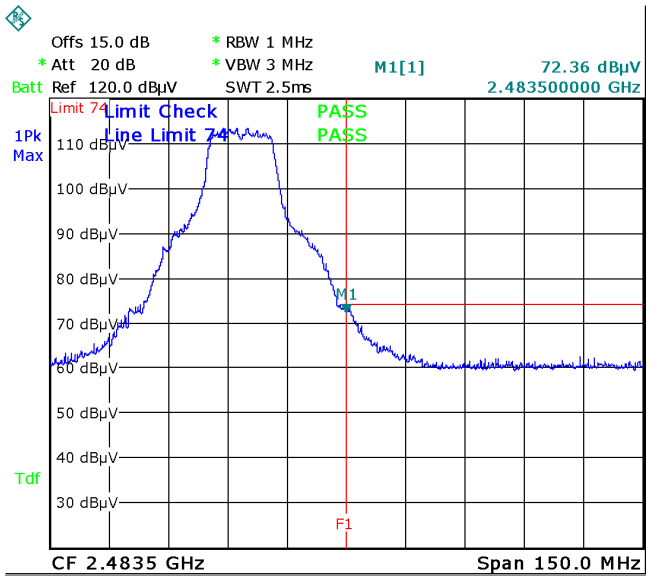

9 CH (Peak) - 802.11g

**Note: F1 is frequency 2483.5MHz**



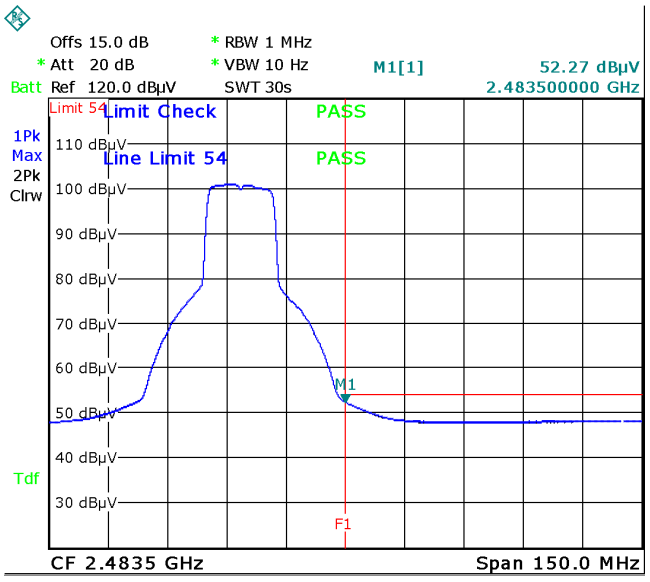

9 CH (Average) - 802.11g

**Note: F1 is frequency 2483.5MHz**



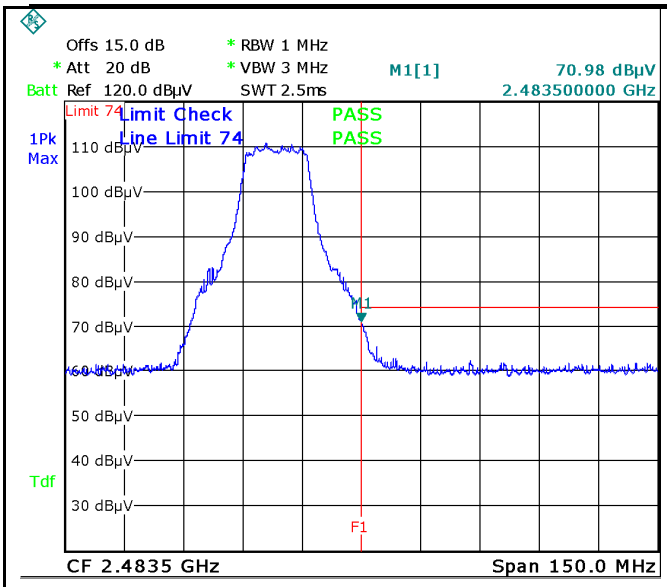

10 CH (Peak) - 802.11g

**Note: F1 is frequency 2483.5MHz**



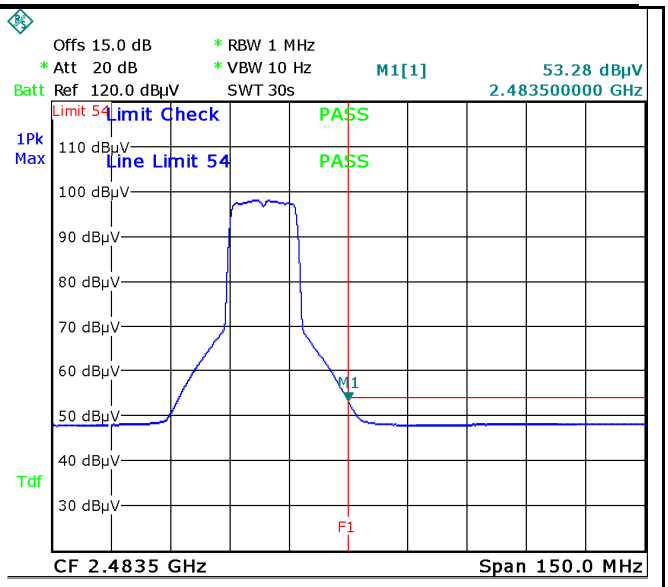

10 CH (Average) - 802.11g

**Note: F1 is frequency 2483.5MHz**




11 CH (Peak) - 802.11g

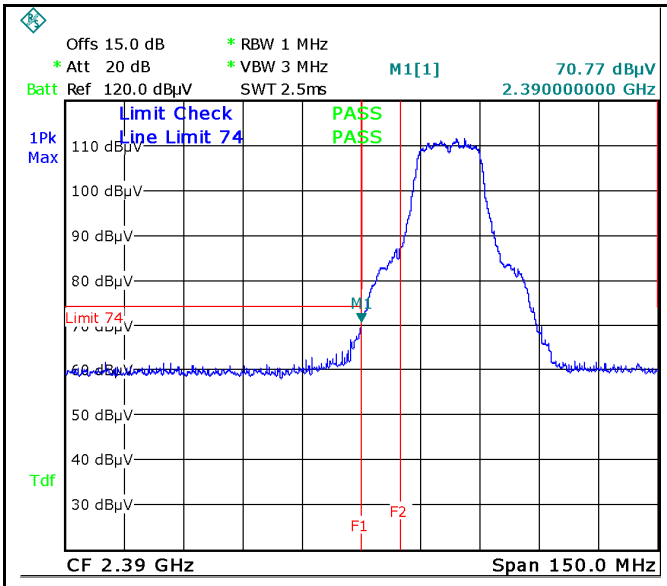
**Note: F1 is frequency 2483.5MHz**




11 CH (Average) - 802.11g

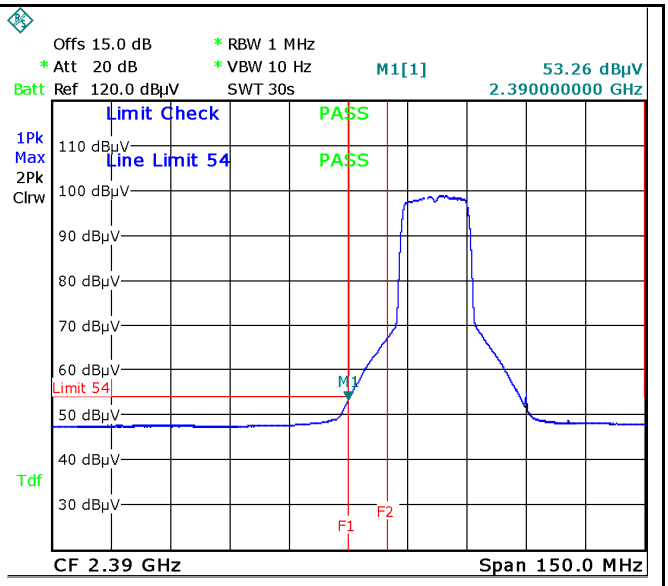
**Note: F1 is frequency 2483.5MHz**

## Antenna (Black):



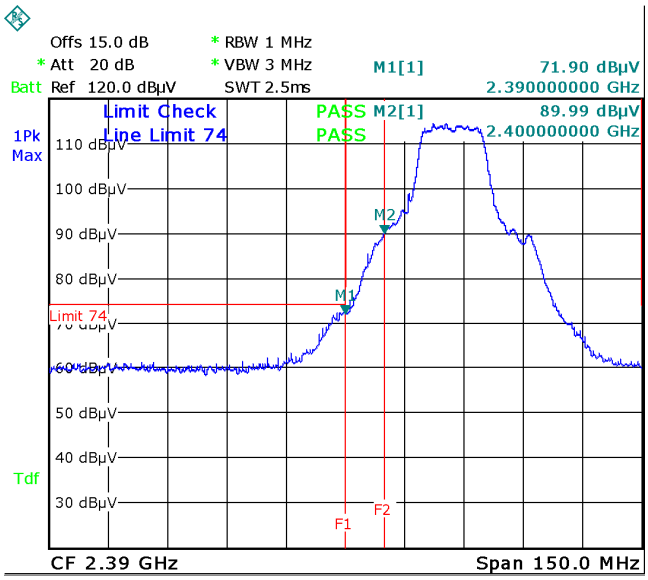

1 CH (Peak) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



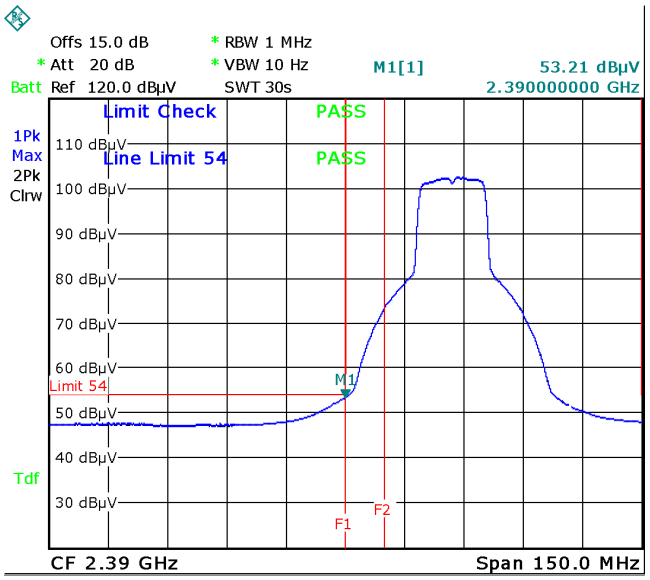

1CH (Average) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



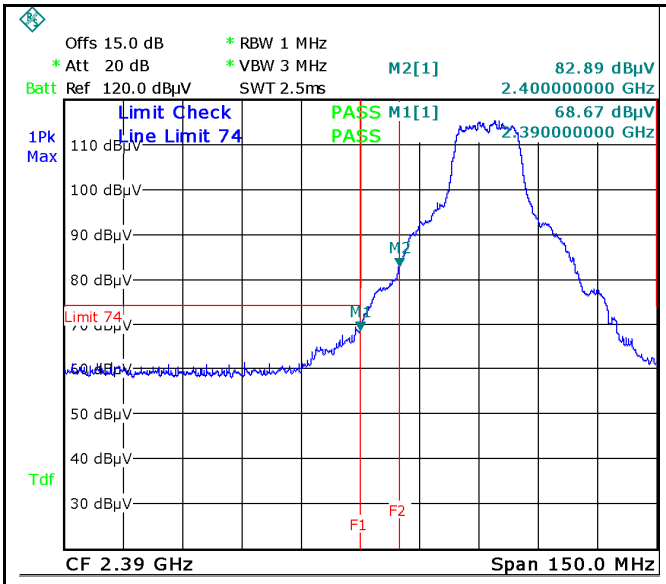

2 CH (Peak) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



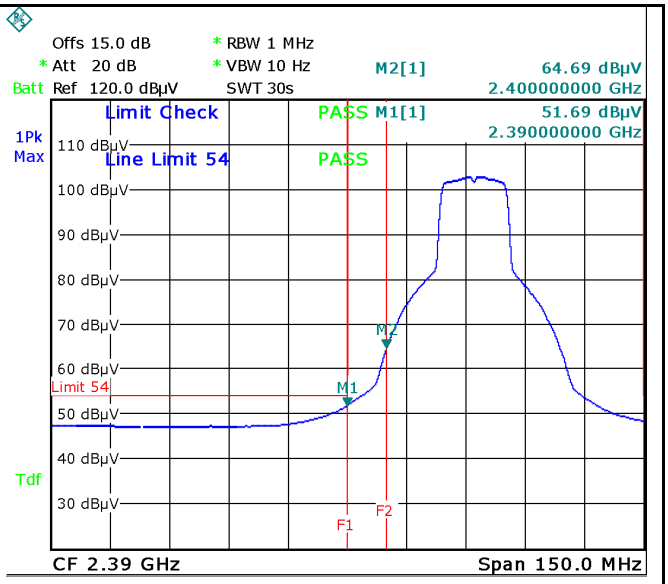

2 CH (Average) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



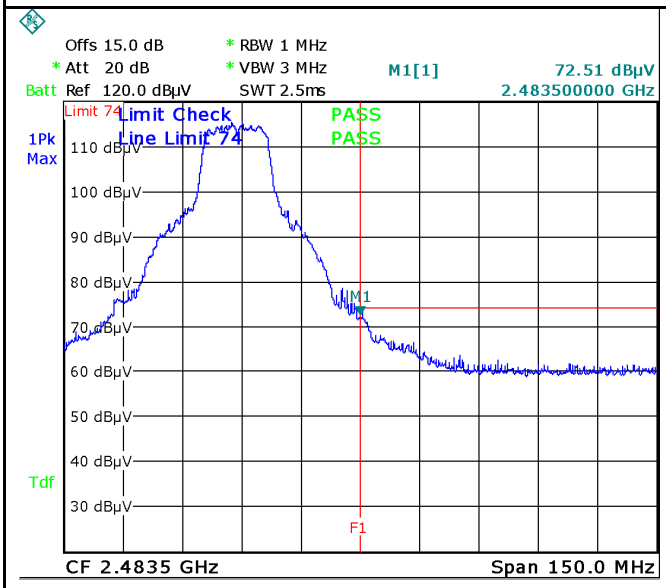

3 CH (Peak) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



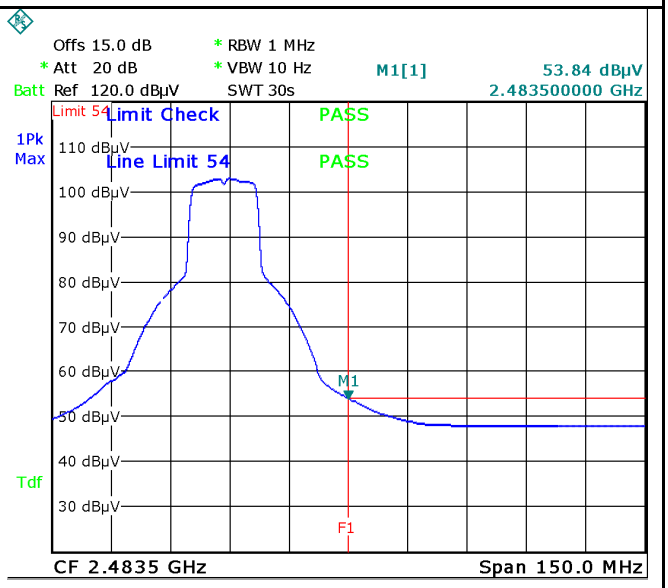

3 CH (Average) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



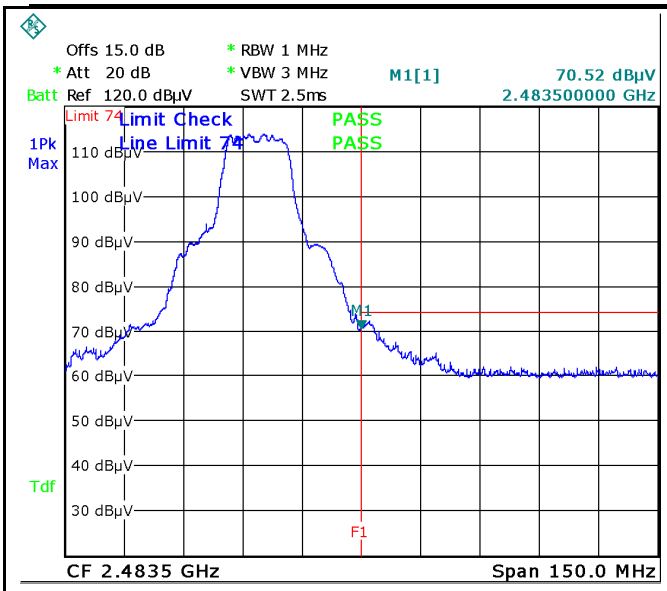

9 CH (Peak) - 802.11g

**Note: F1 is frequency 2483.5MHz**



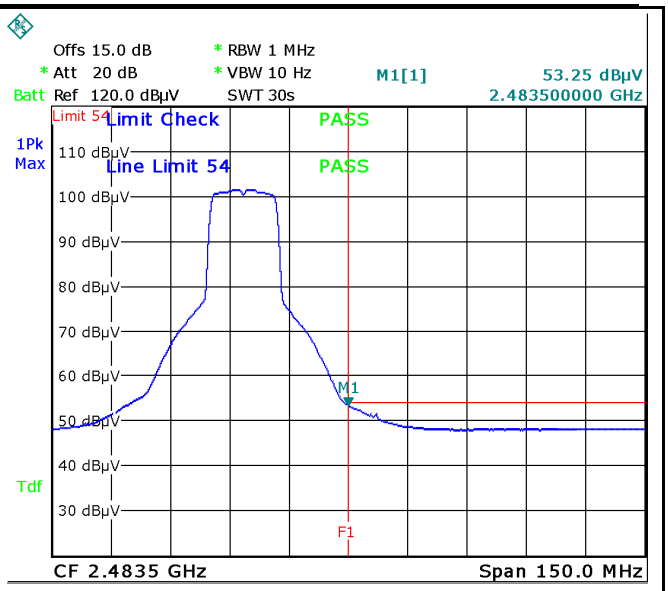

9 CH (Average) - 802.11g

**Note: F1 is frequency 2483.5MHz**



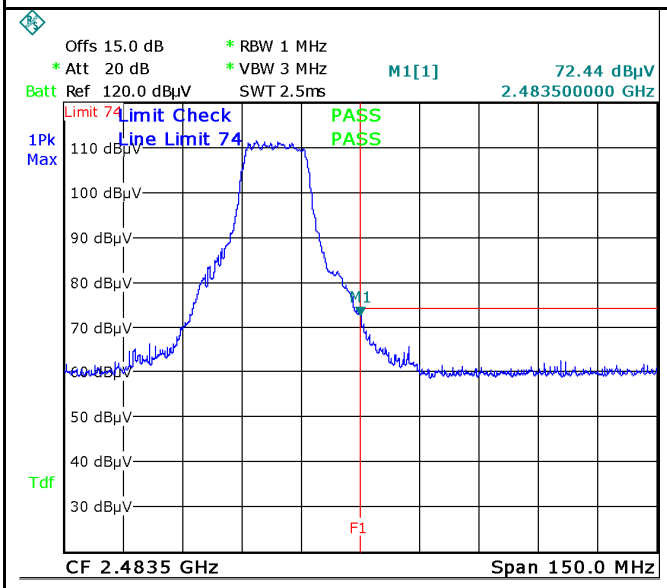

10 CH (Peak) - 802.11g

**Note: F1 is frequency 2483.5MHz**



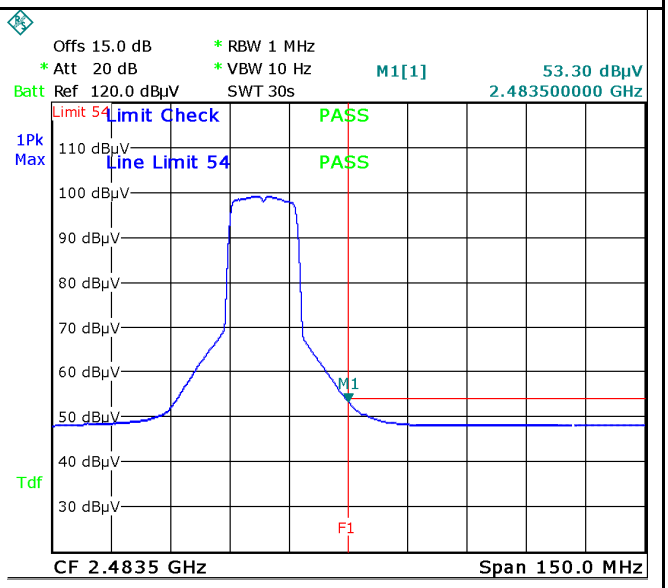

10 CH (Average) - 802.11g

**Note: F1 is frequency 2483.5MHz**




11 CH (Peak) - 802.11g

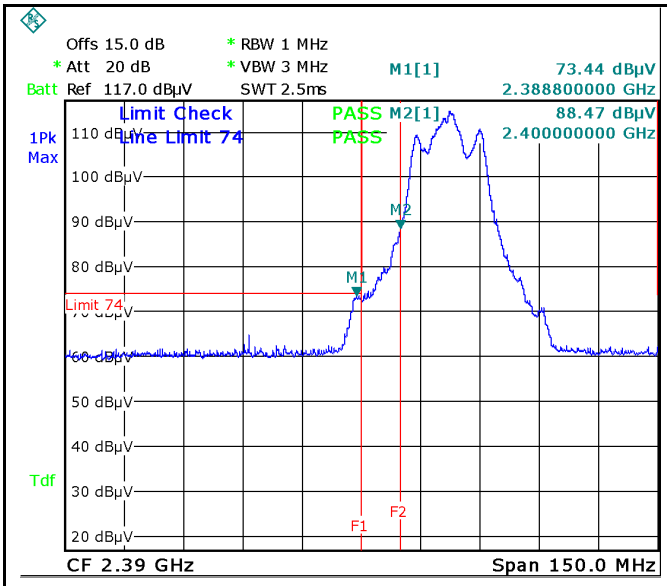
**Note: F1 is frequency 2483.5MHz**




11 CH (Average) - 802.11g

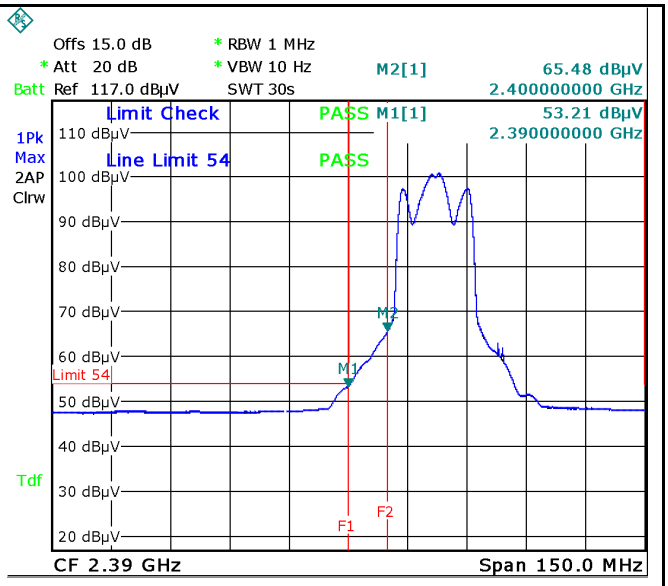
**Note: F1 is frequency 2483.5MHz**

## N20 mode:



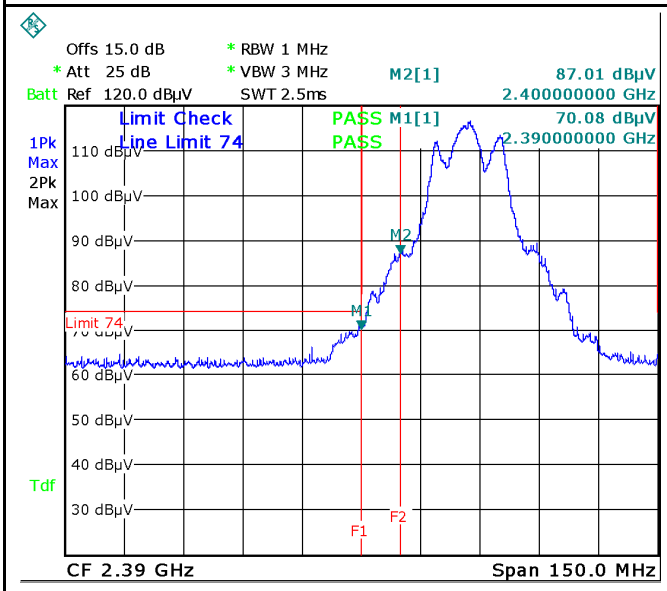

1 CH (Peak) - 802.11n20

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



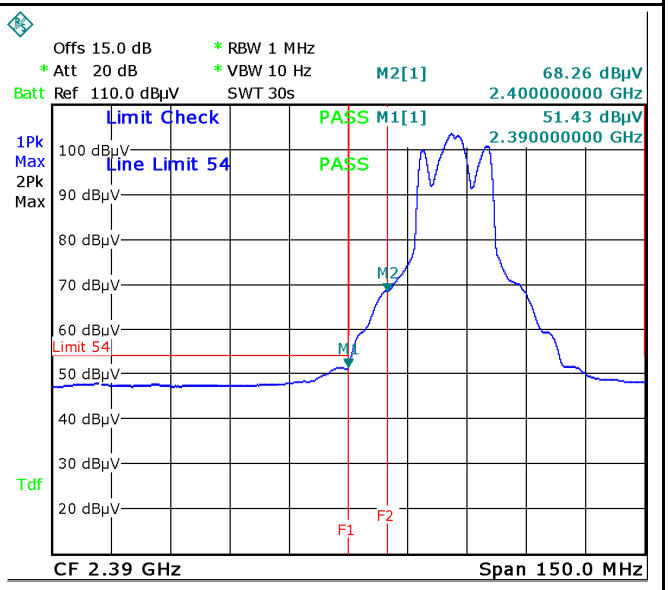

1CH (Average) - 802.11n20

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




2 CH (Peak) - 802.11n20

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**

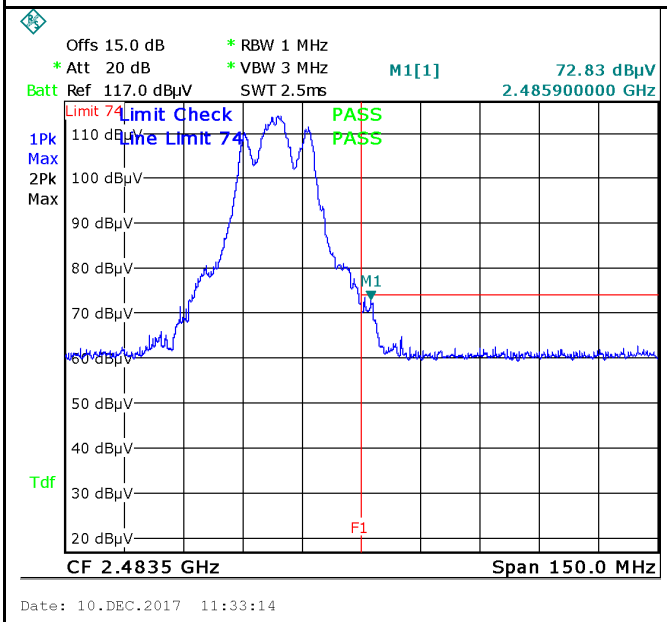



2 CH (Average) - 802.11n20

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**

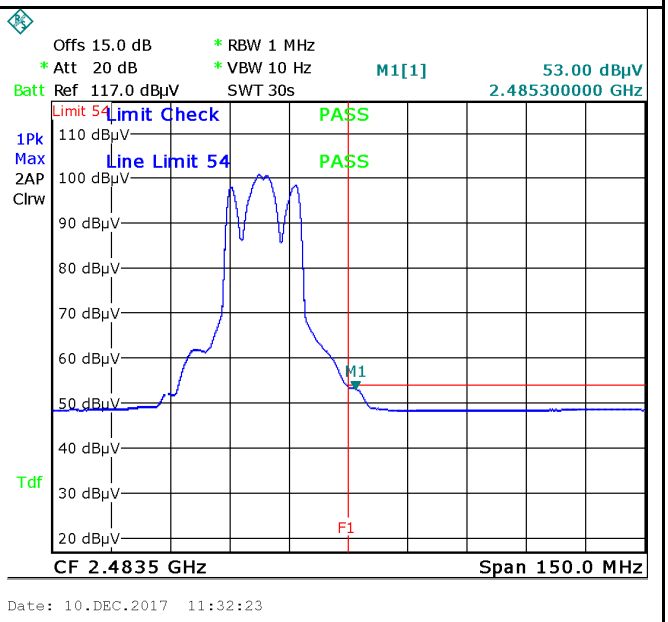
10 CH (Peak) - 802.11n20

**Note: F1 is frequency 2483.5MHz**




Band Edge, 10 CH (Average) - 802.11n20

**Note: F1 is frequency 2483.5MHz**



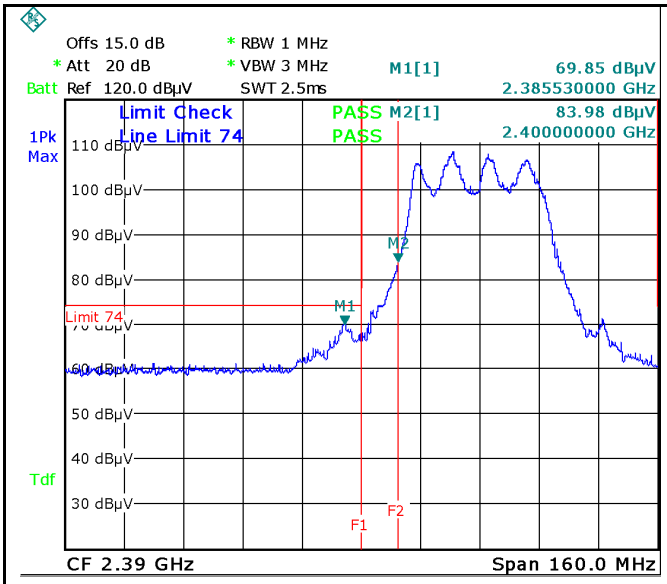

11 CH (Peak) - 802.11n20

**Note: F1 is frequency 2483.5MHz**

11 CH (Average) - 802.11n20

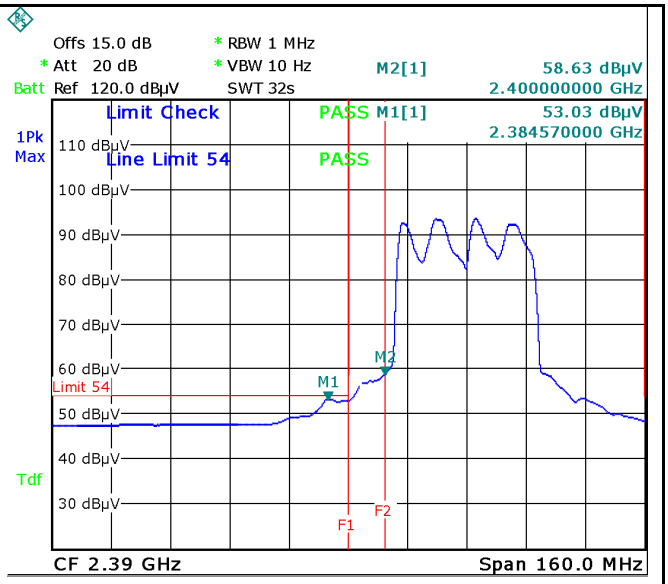
**Note: F1 is frequency 2483.5MHz**

## N40 mode:



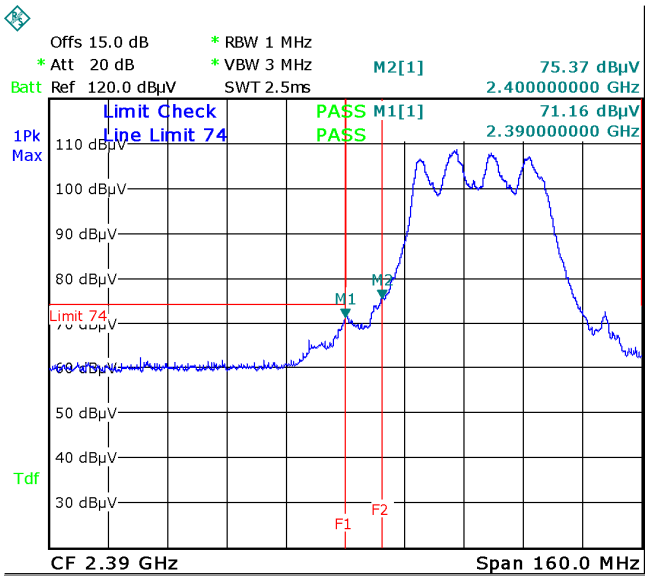

CH 3 (Peak) - 802.11n40

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



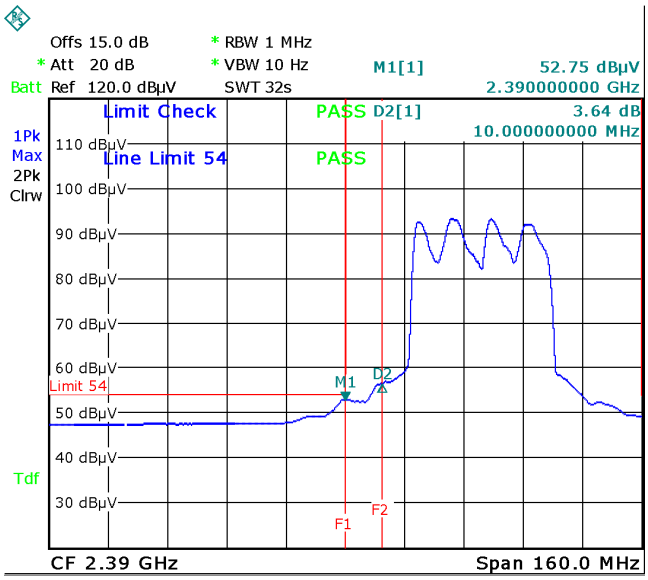

CH 3 (Average) - 802.11n40

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



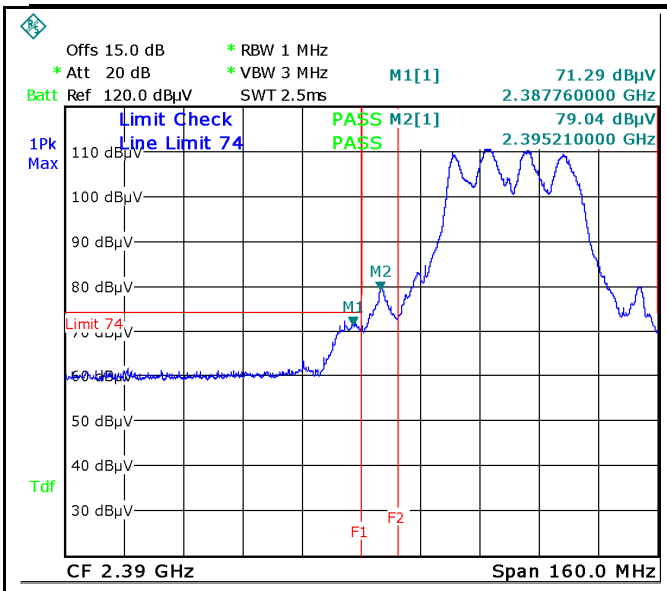

CH 4 (Peak) - 802.11n40

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



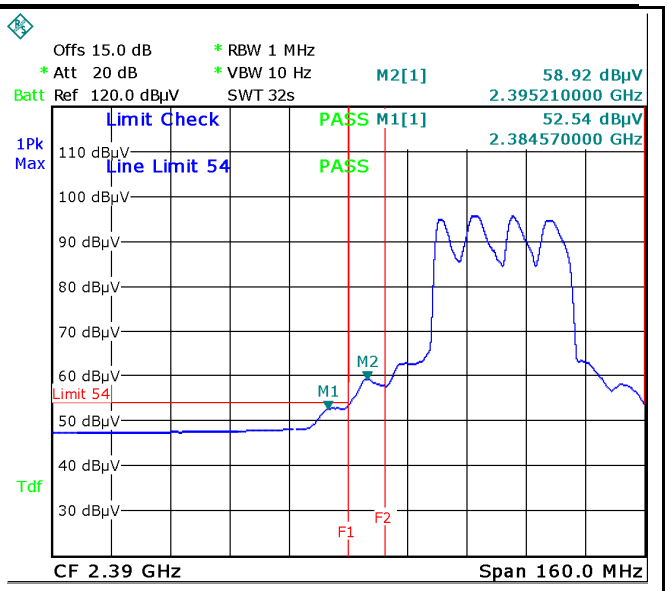

CH 4 (Average) - 802.11n40

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



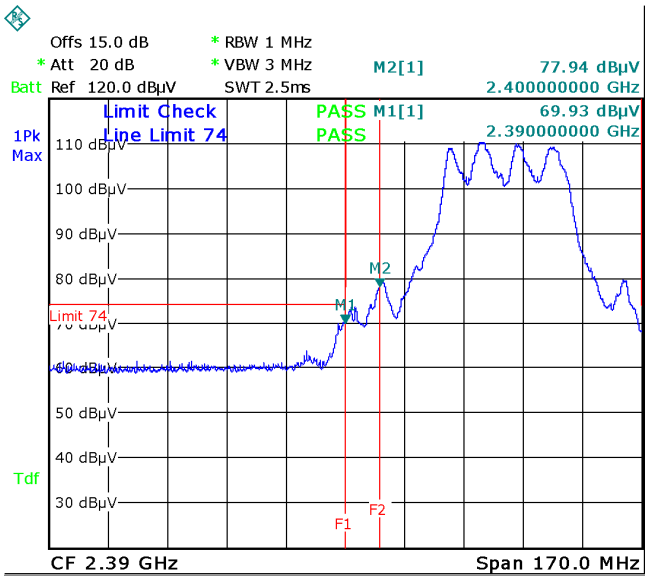

CH 5 (Peak) - 802.11n40

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



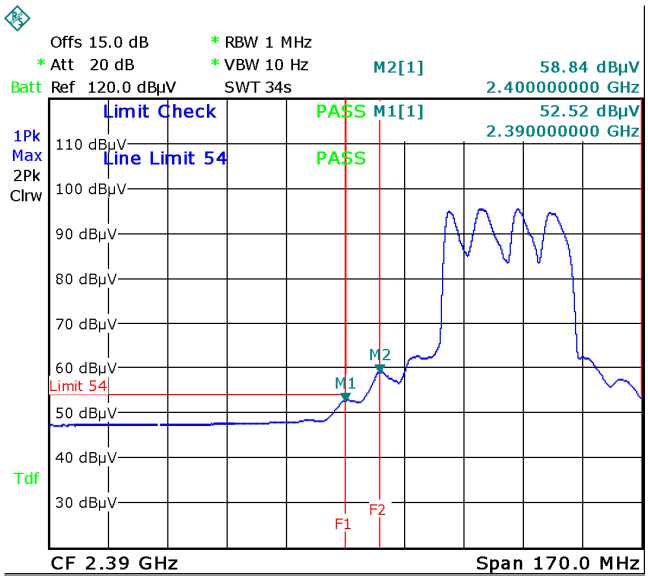

CH 5 (Average) - 802.11n40

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



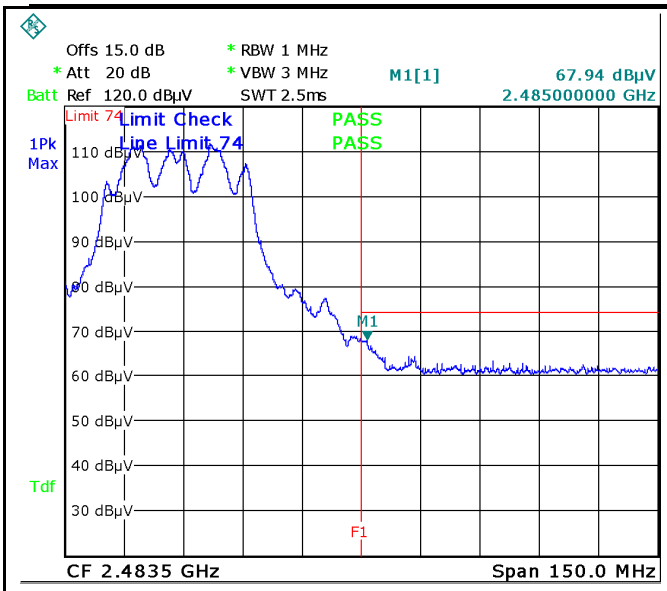

CH 6 (Peak) - 802.11n40

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



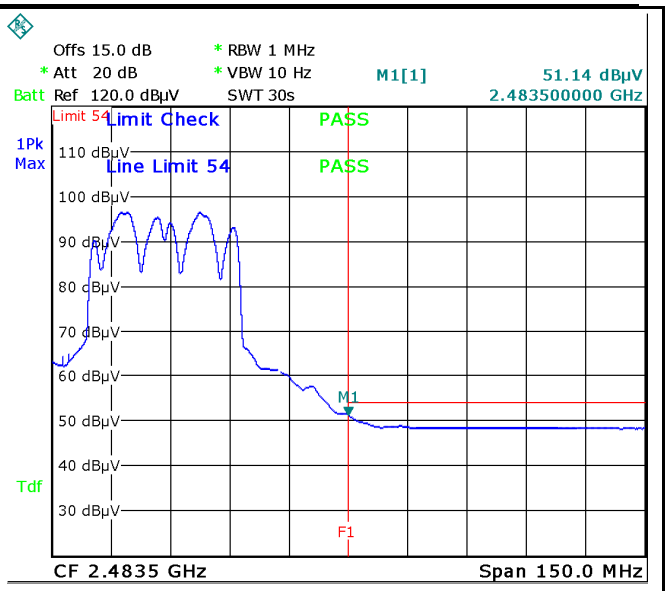

CH 6 (Average) - 802.11n40

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



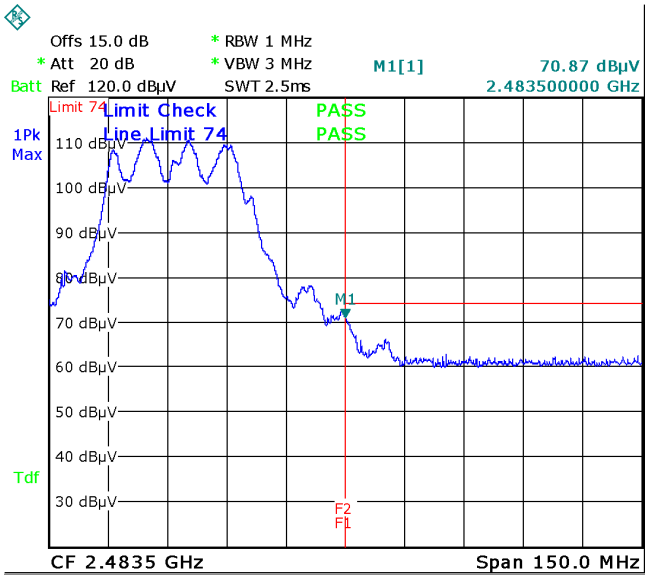

CH 6 (Peak) - 802.11n40

**Note: F1 is frequency 2483.5MHz**



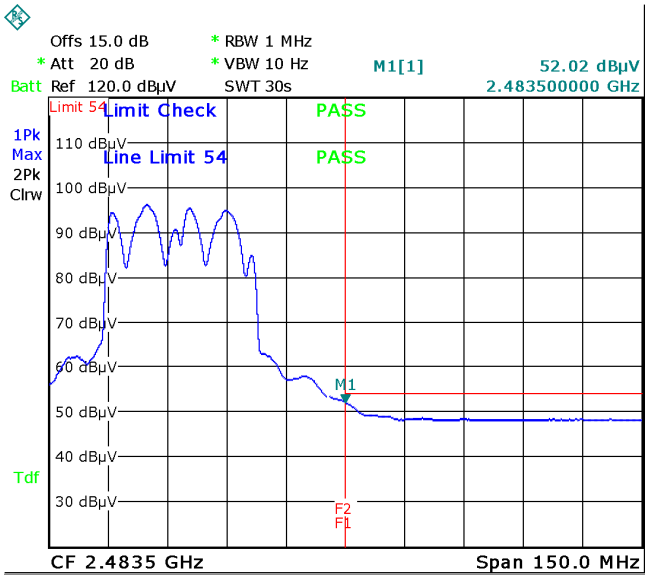

CH 6 (Average) - 802.11n40

**Note: F1 is frequency 2483.5MHz**



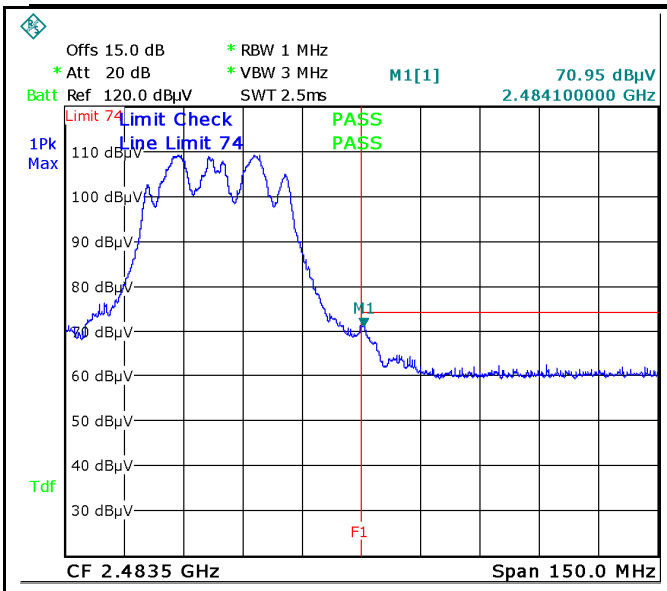

CH 7 (Peak) - 802.11n40

**Note: F1 is frequency 2483.5MHz**



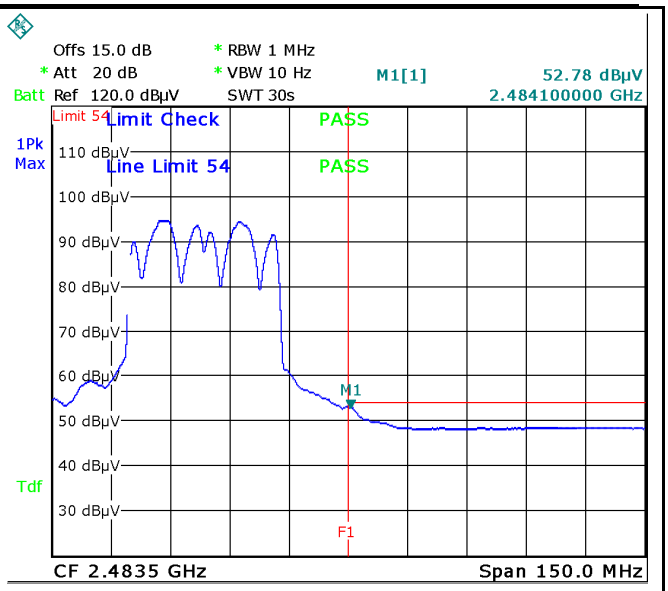

CH 7 (Average) - 802.11n40

**Note: F1 is frequency 2483.5MHz**



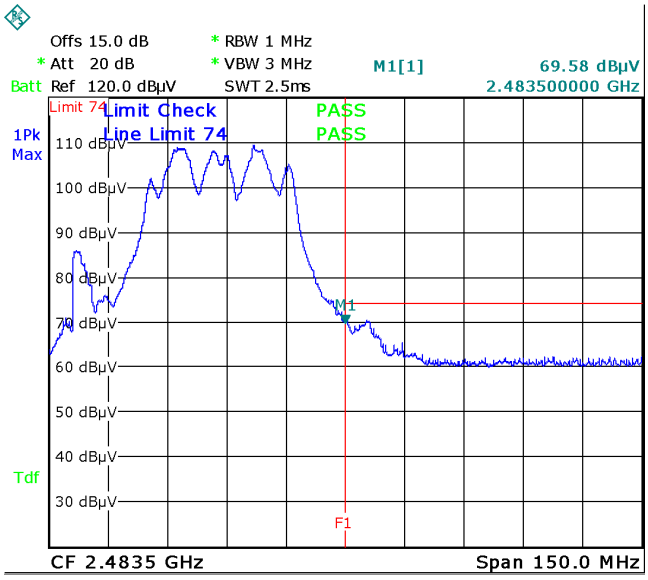

CH 8 (Peak) - 802.11n40

**Note: F1 is frequency 2483.5MHz**



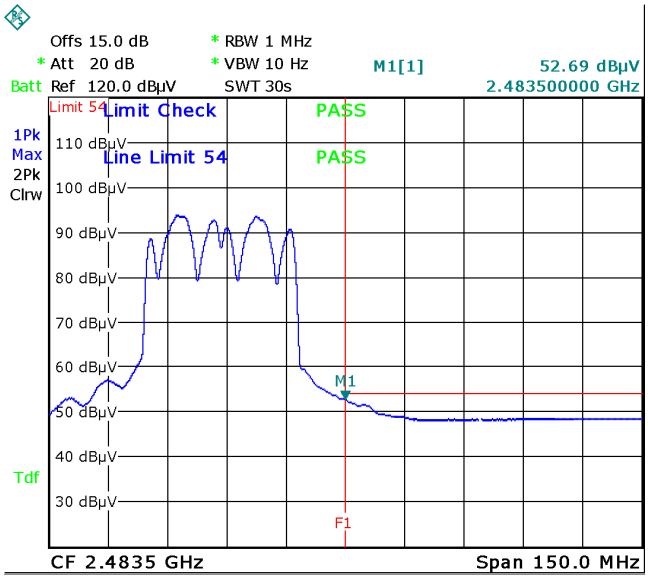

CH 8 (Average) - 802.11n40

**Note: F1 is frequency 2483.5MHz**




CH 9 (Peak) - 802.11n40

**Note: F1 is frequency 2483.5MHz**



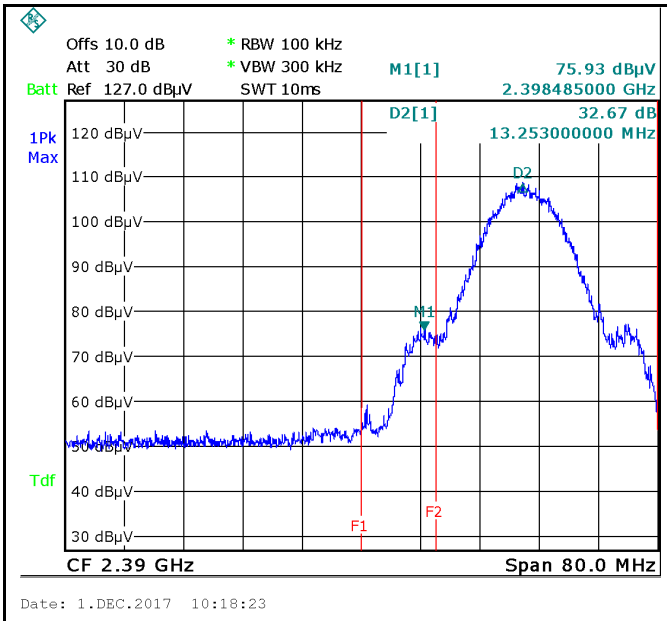

CH 9 (Average) - 802.11n40

**Note: F1 is frequency 2483.5MHz**

## Bandedge result

### b mode

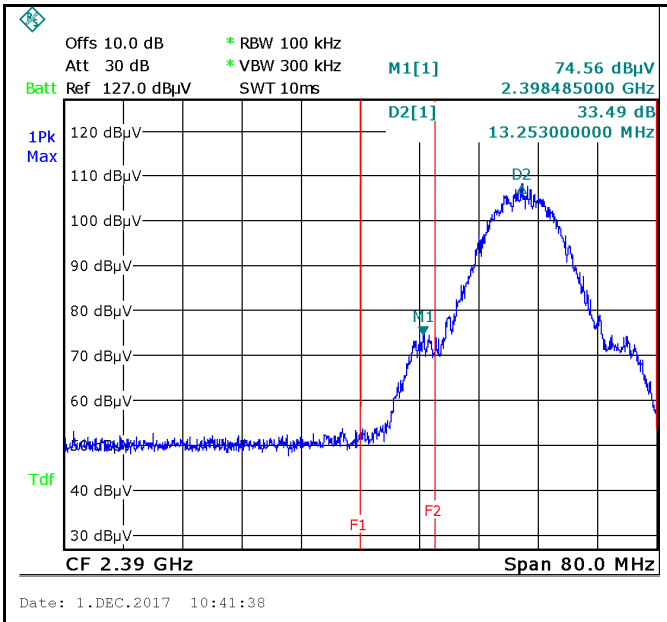
### Antenna (White)




1 CH - 802.11b

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**

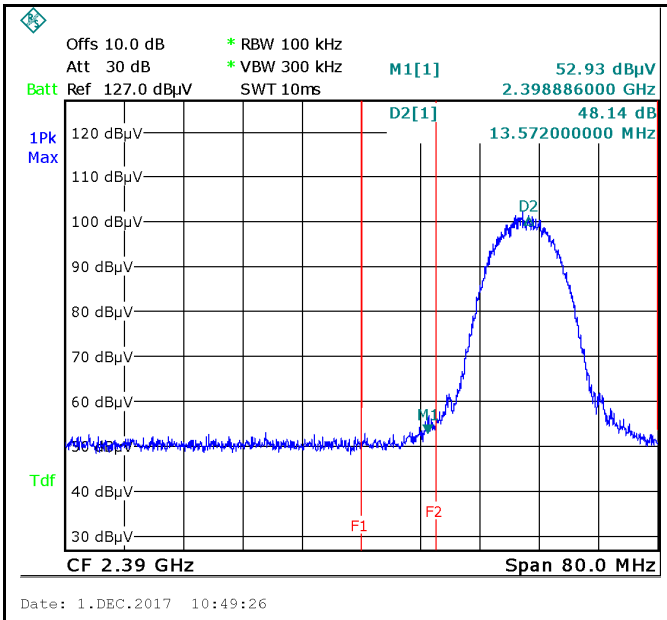
### Antenna (Blue):




1CH - 802.11b

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**

## Antenna (Black):

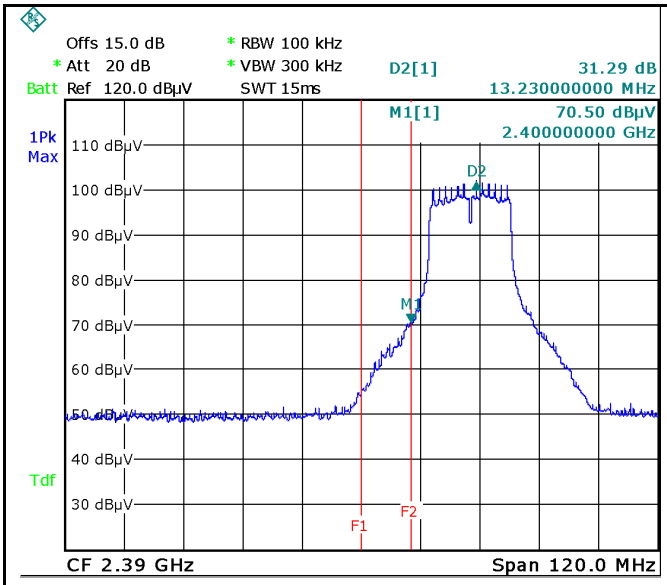



1 CH (Peak) - 802.11b

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**

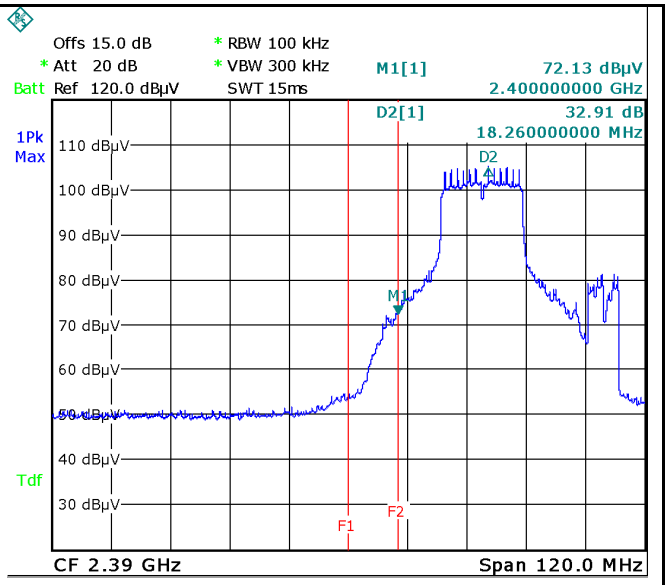
g mode:

Antenna (White):



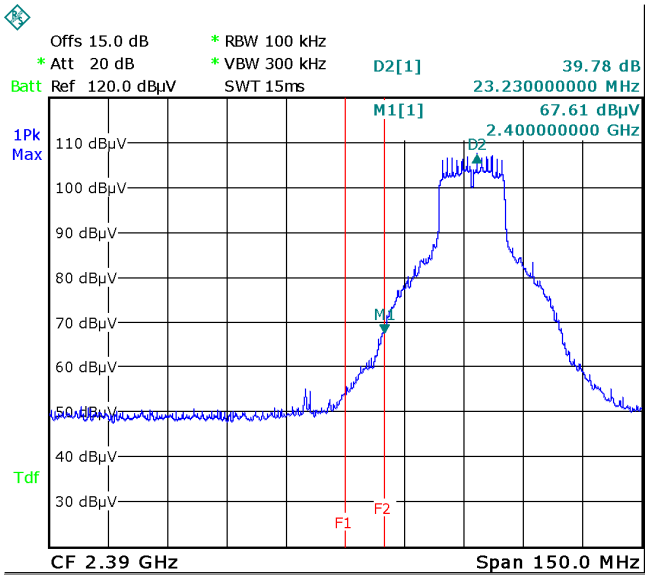

1 CH (Peak) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




2 CH (Peak) - 802.11g

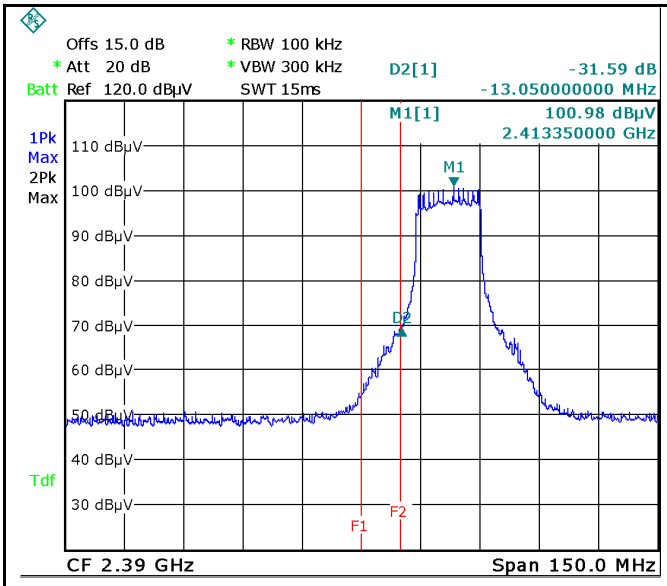
**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




3 (Peak) - 802.11g

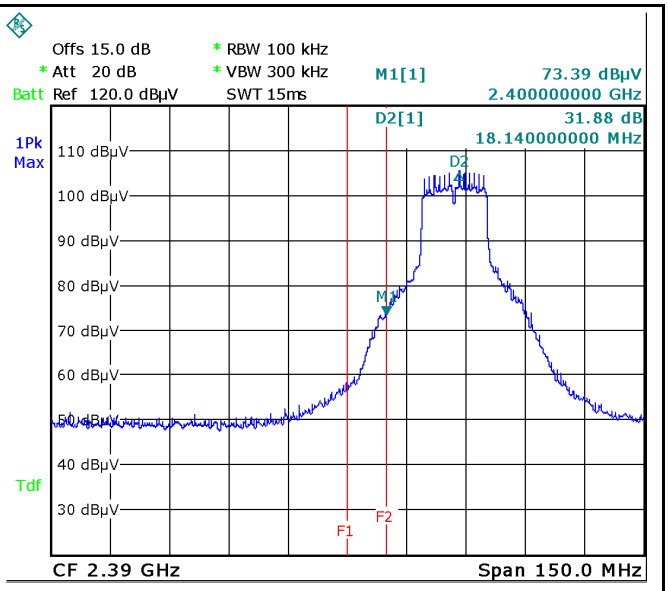
**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**

## Antenna (Blue):




1 CH (Peak) - 802.11g

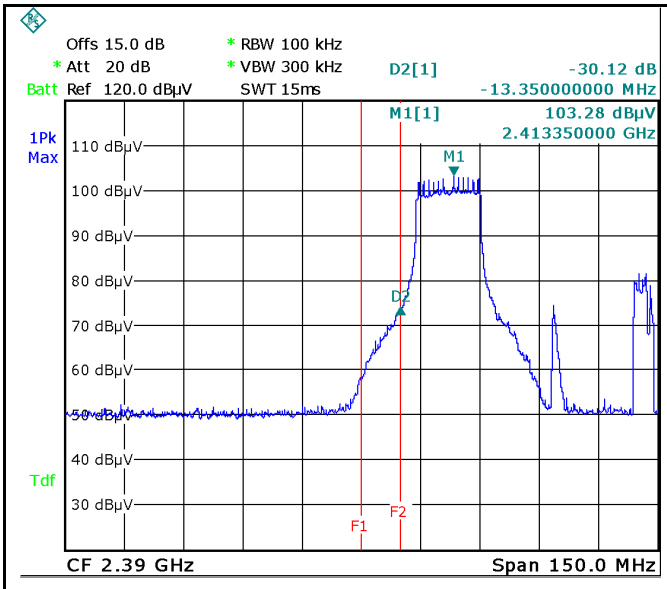
**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




2 CH (Peak) - 802.11g

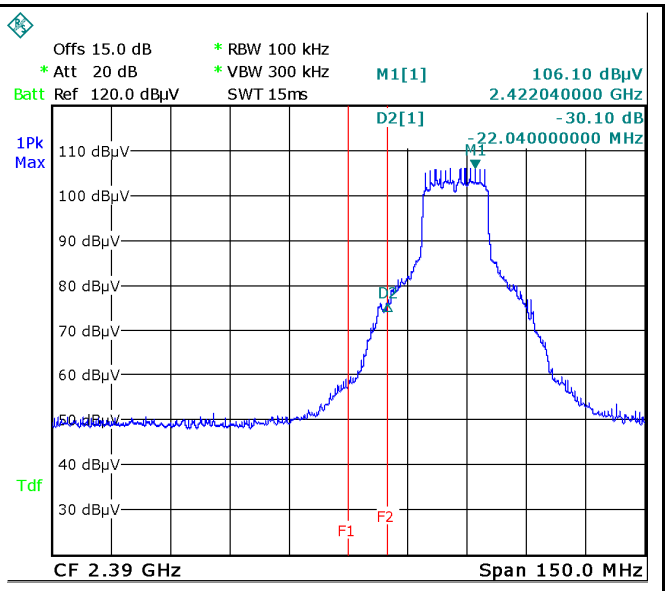
**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**

## Antenna (Black):



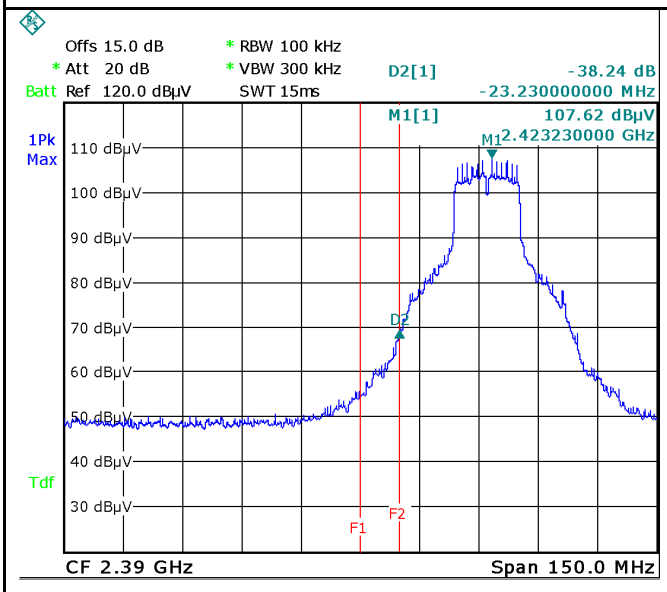

1 CH (Peak) - 802.11g

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




2 CH (Peak) - 802.11g

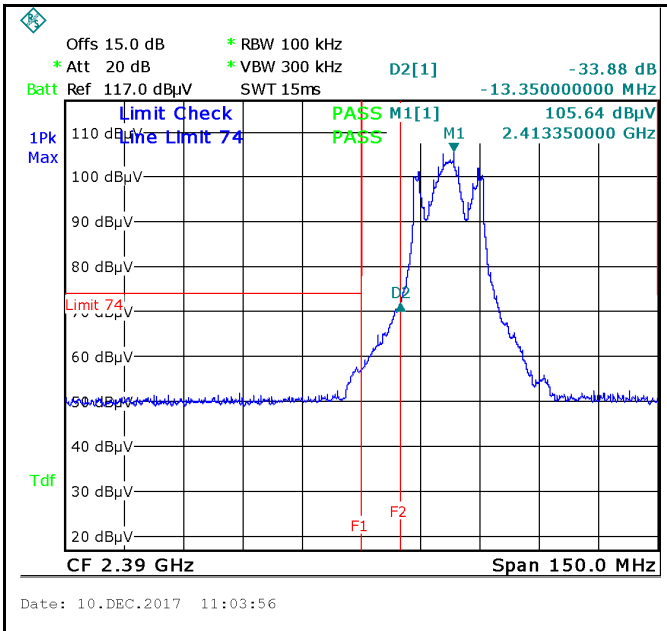
**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




3 CH (Peak) - 802.11g

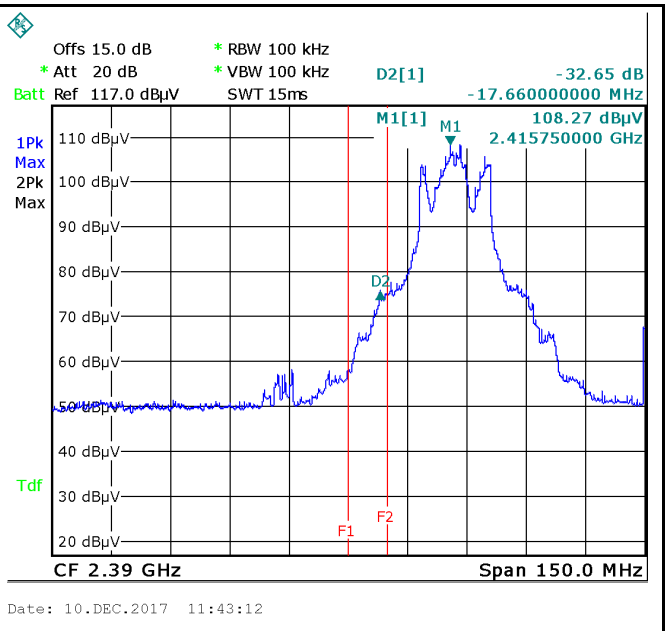
**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**

## N20 mode:




1 CH (Peak) - 802.11n20

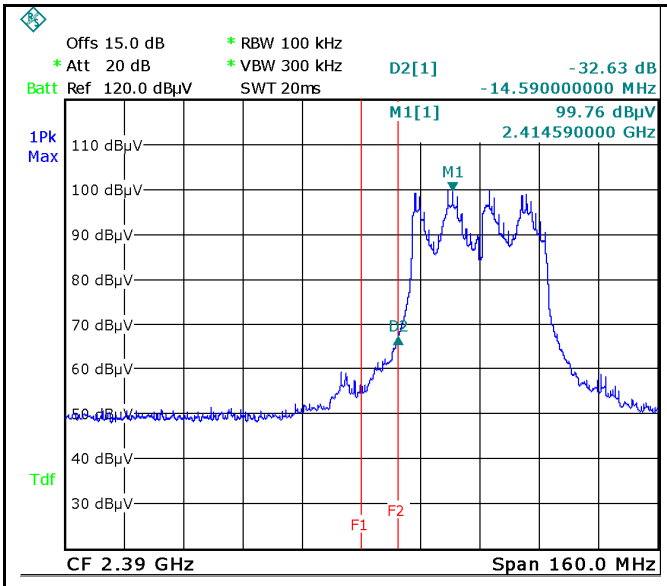
**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




2 CH (Peak) - 802.11n20

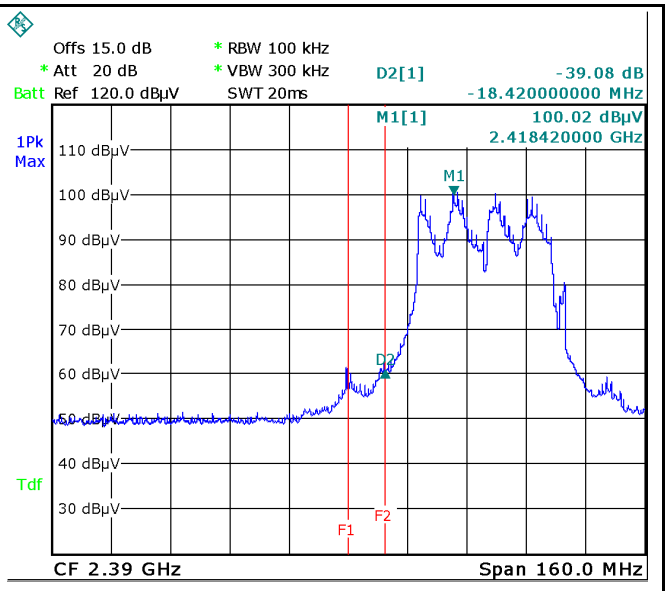
**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**

## N40 mode:



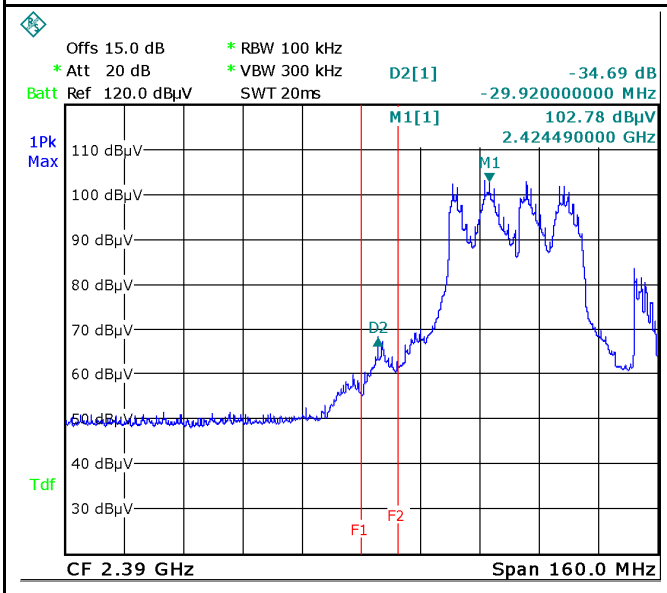

CH 3 (Peak) - 802.11n40

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**



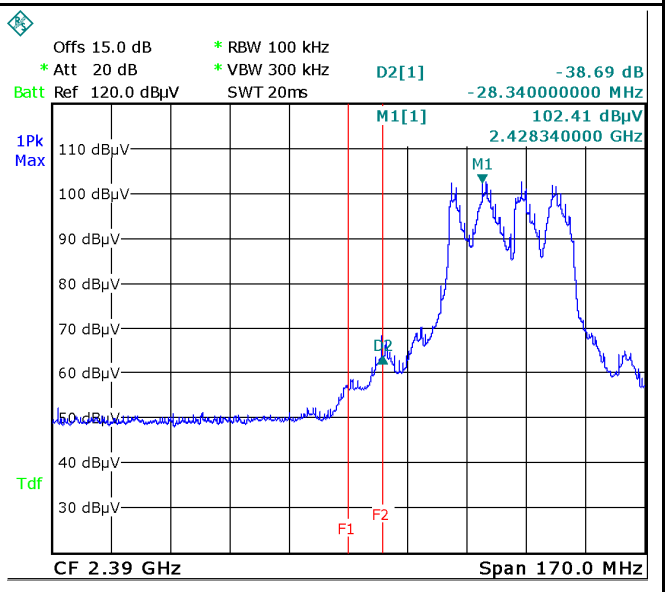

CH 4 (Peak) - 802.11n40

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




CH 5 (Peak) - 802.11n40

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**




CH 6 (Peak) - 802.11n40

**Note: F1 is frequency 2390MHz; F2 is frequency 2400MHz**

## 6.6 AC Power Line Conducted Emissions

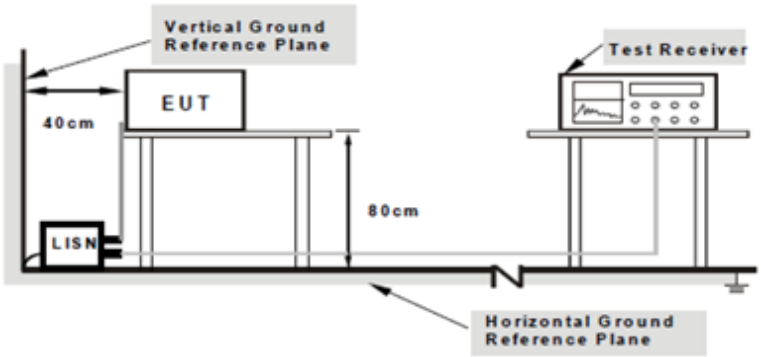
| | |
|---|---|
| Temperature | 23°C |
| Relative Humidity | 56% |
| Atmospheric Pressure | 1006mbar |
| Test date : | November 15 , 2017 |
| Tested By : | Aaron Liang |

**Requirement(s):**

| Spec | Item | Requirement | Applicable |
|---|---|---|---|
| 47CFR§15.207, RSS210 (A8.1) | a) | For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges. | ☑ |

| Frequency ranges (MHz) | Limit (dBμV) | |
|---|---|---|
| | QP | Average |
| 0.15 ~ 0.5 | 66 – 56 | 56 – 46 |
| 0.5 ~ 5 | 56 | 46 |
| 5 ~ 30 | 60 | 50 |

**Test Setup**




Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.

**Procedure**

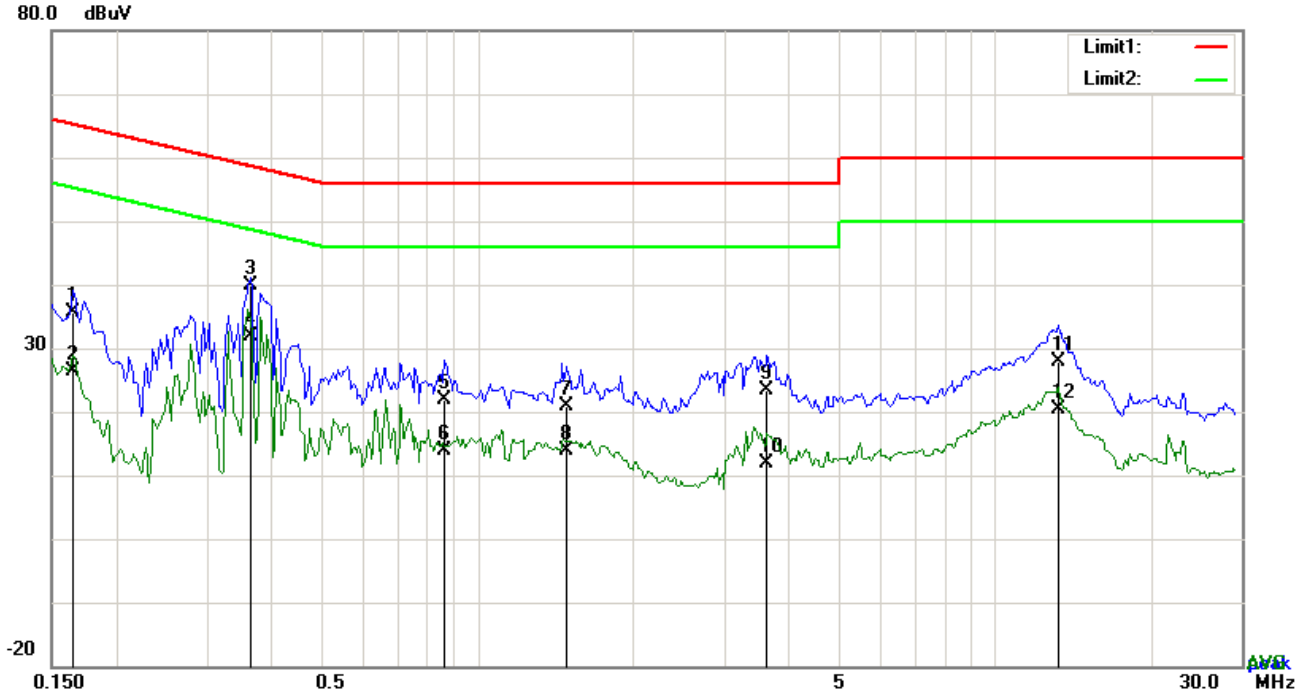
1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss

| | |
| --- | --- |
| | coaxial cable.<br>4. All other supporting equipment were powered separately from another main supply.<br>5. The EUT was switched on and allowed to warm up to its normal operating condition.<br>6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.<br>7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz.<br>8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power). |
| Remark | |
| Result | ☑ Pass ☐ Fail |

**Test Data** ☑ Yes ☐ N/A

**Test Plot** ☑ Yes (See below) ☐ N/A

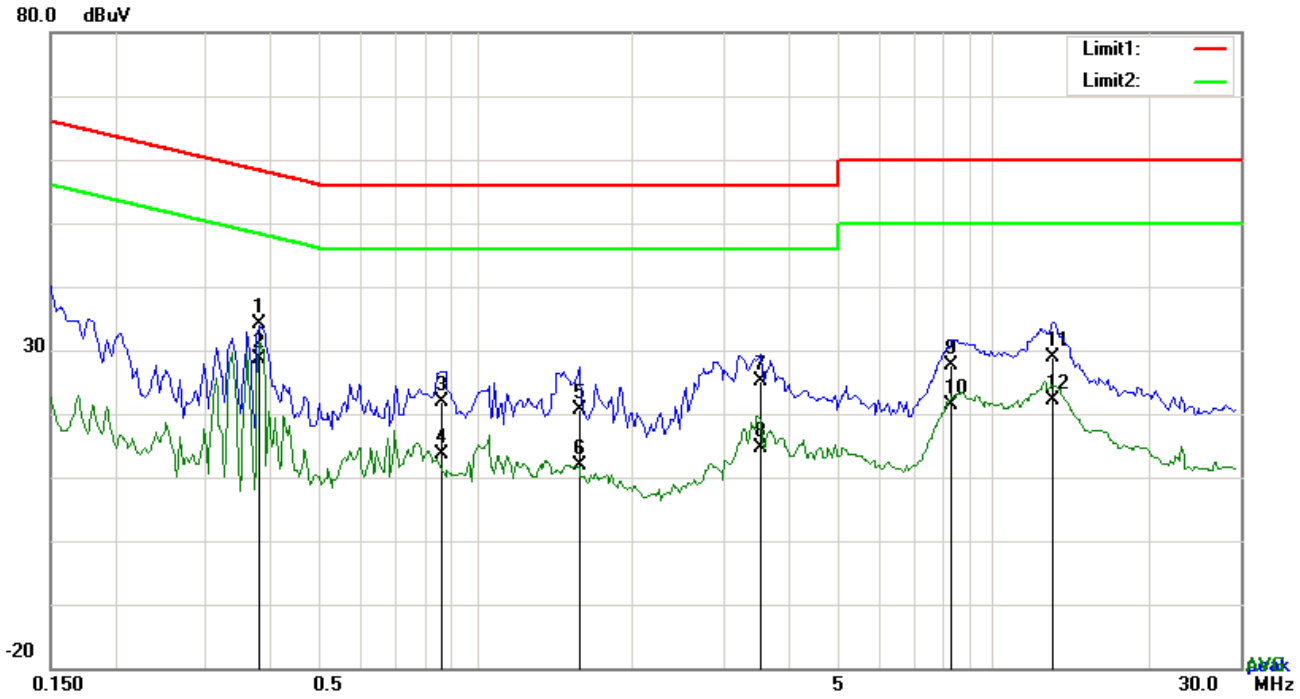
| Test Model: | 2.4G WIFI |
|---|---|




*Test Data*

Phase Line Plot at 120Vac, 60Hz

| No. | P/L | Frequency | Reading | Detector | Corrected | Result | Limit | Margin |
|---|---|---|---|---|---|---|---|---|
| | | (MHz) | (dBuV) | | (dB} | (dBuV) | (dBuV) | (dB) |
| 1 | L | 0.1656 | 25.56 | QP | 10.02 | 35.58 | 65.18 | -29.60 |
| 2 | L | 0.1656 | 16.44 | AVG | 10.02 | 26.46 | 55.18 | -28.72 |
| 3 | L | 0.3645 | 29.96 | QP | 10.02 | 39.98 | 58.63 | -18.65 |
| 4 | L | 0.3645 | 21.79 | AVG | 10.02 | 31.81 | 48.63 | -16.82 |
| 5 | L | 0.8637 | 11.81 | QP | 10.03 | 21.84 | 56.00 | -34.16 |
| 6 | L | 0.8637 | 3.94 | AVG | 10.03 | 13.97 | 46.00 | -32.03 |
| 7 | L | 1.4874 | 10.89 | QP | 10.03 | 20.92 | 56.00 | -35.08 |
| 8 | L | 1.4874 | 3.78 | AVG | 10.03 | 13.81 | 46.00 | -32.19 |
| 9 | L | 3.6396 | 13.29 | QP | 10.06 | 23.35 | 56.00 | -32.65 |
| 10 | L | 3.6396 | 1.81 | AVG | 10.06 | 11.87 | 46.00 | -34.13 |
| 11 | L | 13.3077 | 17.80 | QP | 10.18 | 27.98 | 60.00 | -32.02 |
| 12 | L | 13.3077 | 10.29 | AVG | 10.18 | 20.47 | 50.00 | -29.53 |



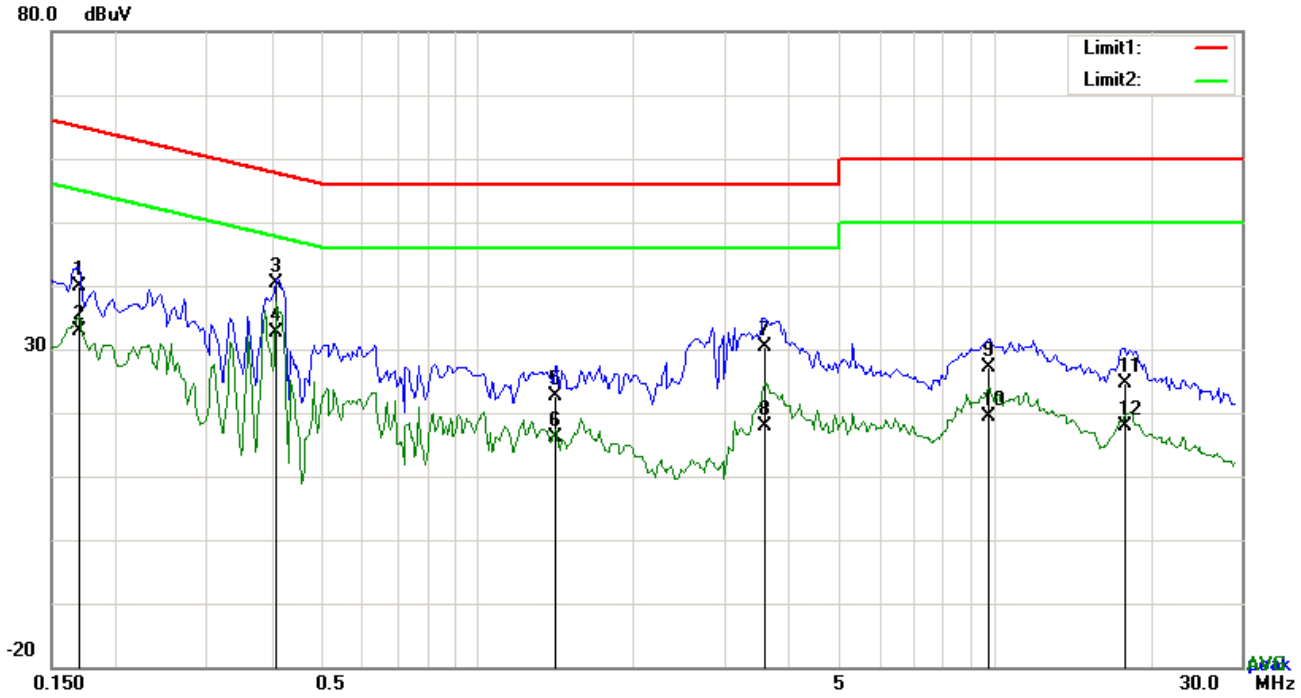

*Test Data*

Phase Neutral Plot at 120Vac, 60Hz

| No. | P/L | Frequency | Reading | Detector | Corrected | Result | Limit | Margin |
|---|---|---|---|---|---|---|---|---|
| | | (MHz) | (dBuV) | | (dB} | (dBuV) | (dBuV) | (dB) |
| 1 | N | 0.3801 | 24.07 | QP | 10.02 | 34.09 | 58.28 | -24.19 |
| 2 | N | 0.3801 | 18.68 | AVG | 10.02 | 28.70 | 48.28 | -19.58 |
| 3 | N | 0.8559 | 11.81 | QP | 10.03 | 21.84 | 56.00 | -34.16 |
| 4 | N | 0.8559 | 3.61 | AVG | 10.03 | 13.64 | 46.00 | -32.36 |
| 5 | N | 1.5813 | 10.58 | QP | 10.04 | 20.62 | 56.00 | -35.38 |
| 6 | N | 1.5813 | 1.74 | AVG | 10.04 | 11.78 | 46.00 | -34.22 |
| 7 | N | 3.5421 | 15.00 | QP | 10.06 | 25.06 | 56.00 | -30.94 |
| 8 | N | 3.5421 | 4.55 | AVG | 10.06 | 14.61 | 46.00 | -31.39 |
| 9 | N | 8.3196 | 17.61 | QP | 10.12 | 27.73 | 60.00 | -32.27 |
| 10 | N | 8.3196 | 11.25 | AVG | 10.12 | 21.37 | 50.00 | -28.63 |
| 11 | N | 13.0386 | 18.79 | QP | 10.18 | 28.97 | 60.00 | -31.03 |
| 12 | N | 13.0386 | 12.04 | AVG | 10.18 | 22.22 | 50.00 | -27.78 |

| Test Mode: | 2.4GWIFI |
|---|---|

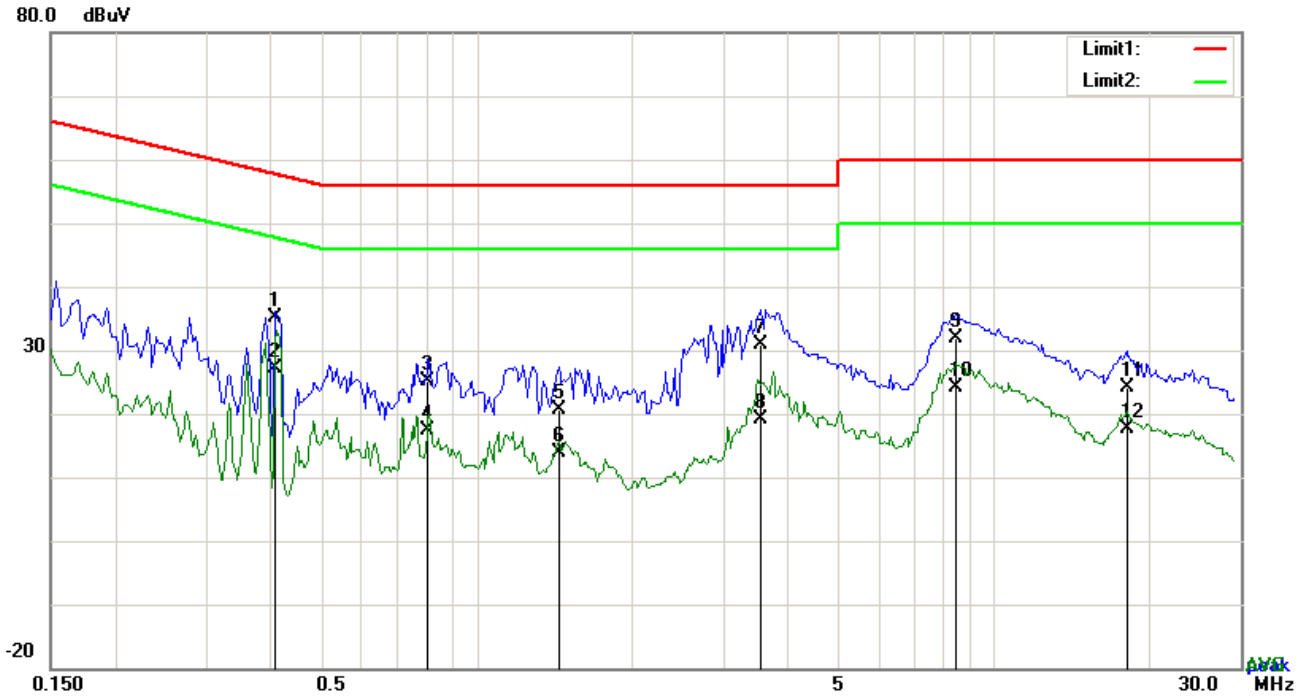
*240V/60Hz*




## *Test Data*

### Phase Line Plot at 240Vac, 60Hz

| No. | P/L | Frequency (MHz) | Reading (dBµV) | Detector | Corrected (dB) | Result (dBµV) | Limit (dBµV) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 1 | L1 | 0.1695 | 29.81 | QP | 10.03 | 39.84 | 64.98 | -25.14 |
| 2 | L1 | 0.1695 | 22.84 | AVG | 10.03 | 32.87 | 54.98 | -22.11 |
| 3 | L1 | 0.4074 | 30.31 | QP | 10.03 | 40.34 | 57.70 | -17.36 |
| 4 | L1 | 0.4074 | 22.57 | AVG | 10.03 | 32.60 | 47.70 | -15.10 |
| 5 | L1 | 1.4175 | 12.55 | QP | 10.04 | 22.59 | 56.00 | -33.41 |
| 6 | L1 | 1.4175 | 5.99 | AVG | 10.04 | 16.03 | 46.00 | -29.97 |
| 7 | L1 | 3.5889 | 20.31 | QP | 10.06 | 30.37 | 56.00 | -25.63 |
| 8 | L1 | 3.5889 | 7.86 | AVG | 10.06 | 17.92 | 46.00 | -28.08 |
| 9 | L1 | 9.7470 | 16.98 | QP | 10.15 | 27.13 | 60.00 | -32.87 |
| 10 | L1 | 9.7470 | 9.29 | AVG | 10.15 | 19.44 | 50.00 | -30.56 |
| 11 | L1 | 17.8512 | 14.25 | QP | 10.27 | 24.52 | 60.00 | -35.48 |
| 12 | L1 | 17.8512 | 7.49 | AVG | 10.27 | 17.76 | 50.00 | -32.24 |




*Test Data*

## Phase Neutral Plot at 240Vac, 60Hz

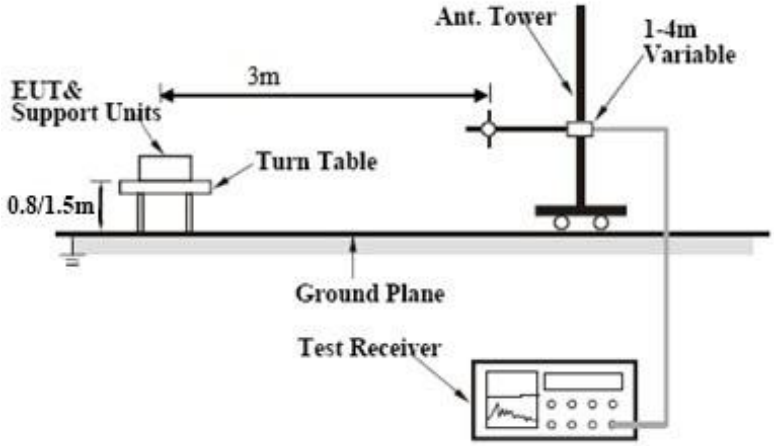
| No. | P/L | Frequency (MHz) | Reading (dBµV) | Detector | Corrected (dB) | Result (dBµV) | Limit (dBµV) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 1 | N | 0.4074 | 25.00 | QP | 10.03 | 35.03 | 57.70 | -22.67 |
| 2 | N | 0.4074 | 17.16 | AVG | 10.03 | 27.19 | 47.70 | -20.51 |
| 3 | N | 0.8052 | 15.00 | QP | 10.03 | 25.03 | 56.00 | -30.97 |
| 4 | N | 0.8052 | 7.45 | AVG | 10.03 | 17.48 | 46.00 | -28.52 |
| 5 | N | 1.4409 | 10.68 | QP | 10.04 | 20.72 | 56.00 | -35.28 |
| 6 | N | 1.4409 | 3.86 | AVG | 10.04 | 13.90 | 46.00 | -32.10 |
| 7 | N | 3.5421 | 20.72 | QP | 10.06 | 30.78 | 56.00 | -25.22 |
| 8 | N | 3.5421 | 9.00 | AVG | 10.06 | 19.06 | 46.00 | -26.94 |
| 9 | N | 8.4405 | 21.65 | QP | 10.13 | 31.78 | 60.00 | -28.22 |
| 10 | N | 8.4405 | 14.05 | AVG | 10.13 | 24.18 | 50.00 | -25.82 |
| 11 | N | 18.1242 | 13.91 | QP | 10.27 | 24.18 | 60.00 | -35.82 |
| 12 | N | 18.1242 | 7.45 | AVG | 10.27 | 17.72 | 50.00 | -32.28 |

## 6.7 Radiated Spurious Emissions

| | |
| --- | --- |
| Temperature | 25°C |
| Relative Humidity | 54% |
| Atmospheric Pressure | 1006mbar |
| Test date : | December 10 and 11, 2015 |
| Tested By : | Winnie Zhang |

**Requirement(s):**

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td rowspan="3">47CFR§15.247(d), RSS210 (A8.5)</td><td>a)</td><td>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges
<table>
<tr><th>Frequency range (MHz)</th><th>Field Strength (μV/m)</th></tr>
<tr><td>30 – 88</td><td>100</td></tr>
<tr><td>88 – 216</td><td>150</td></tr>
<tr><td>216 960</td><td>200</td></tr>
<tr><td>Above 960</td><td>500</td></tr>
</table></td><td>☑</td></tr>
<tr><td>b)</td><td>For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required<br>☒ 20 dB down ☐ 30 dB down</td><td>☑</td></tr>
<tr><td>c)</td><td>or restricted band, emission must also comply with the radiated emission limits specified in 15.209</td><td>☑</td></tr>
</table>

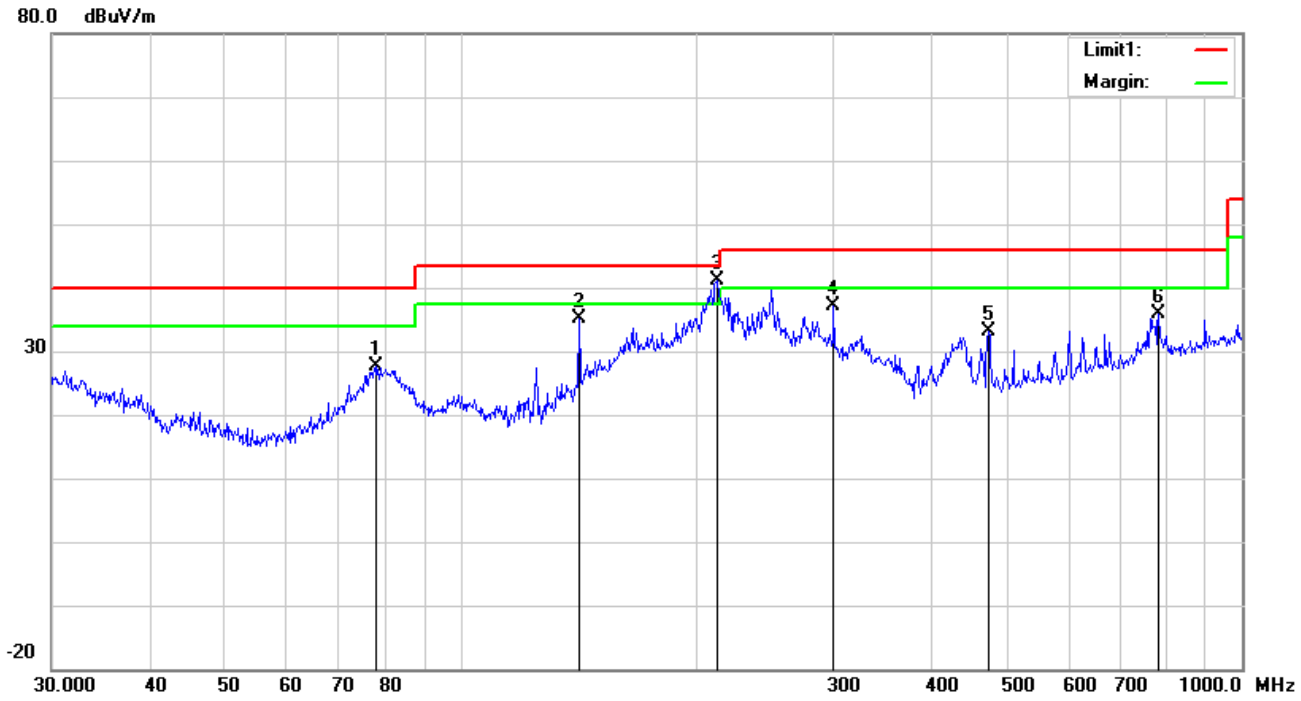
| | |
| --- | --- |
| Test Setup |  |
| Procedure | 1. The EUT was switched on and allowed to warm up to its normal operating condition.<br>2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:<br>a. Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen.<br>b. The EUT was then rotated to the direction that gave the maximum emission.<br>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.<br>3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz.<br>4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz.<br>The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz.<br>5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured. |
| Remark | Different RF configuration has been evaluated but not much difference was found. The data presented here is the worst case data with EUT under 802.11n – HT20-2437MHz mode. |
| Result | ☑ Pass ☐ Fail |

**Test Data** ☑ Yes ☐ N/A

**Test Plot** ☑ Yes (See below) ☐ N/A

| Test Model: | 2.4G WIFI |
| --- | --- |

(Below 1GHz)

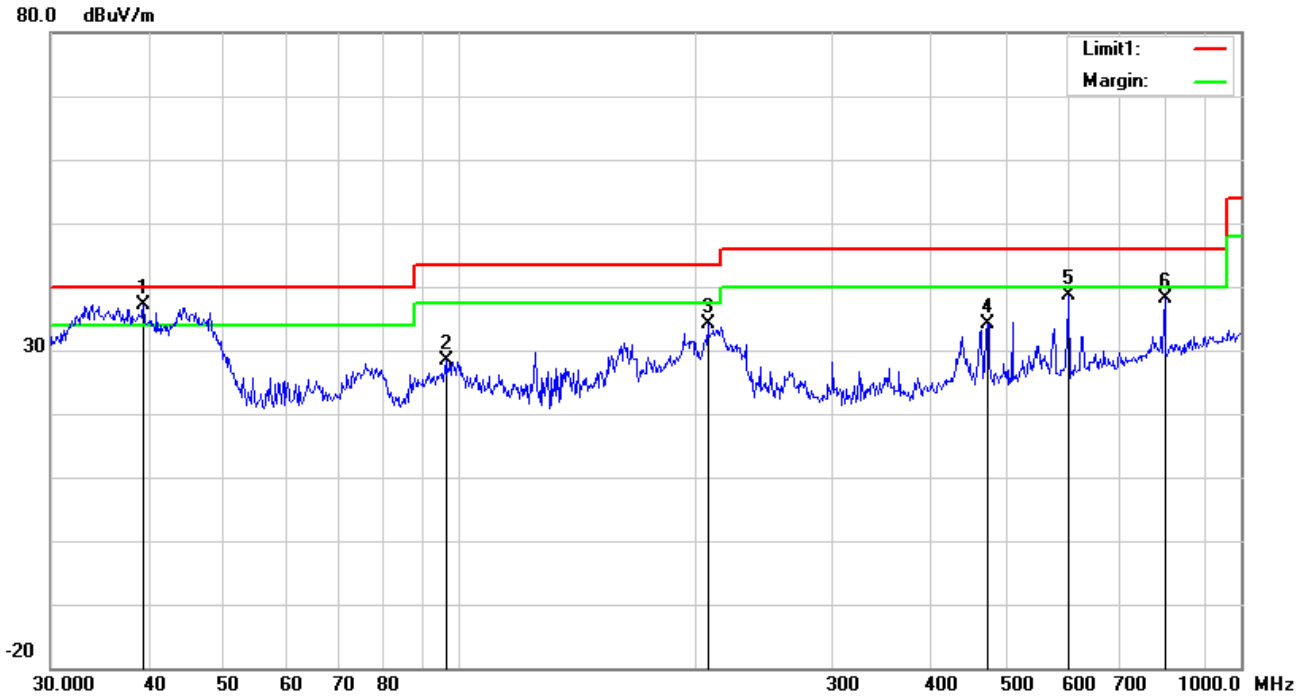



*Test Data*

Horizontal Polarity Plot @3m

| No. | Frequency | Reading | Detector | Ant_F | PA_G | Cab_L | Result | Limit | Margin | Height | Degree |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | (MHz) | (dBuV/m) | | (dB/m) | (dB) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | |
| 1 | 78.1389 | 41.34 | peak | 7.64 | 22.41 | 1.02 | 27.59 | 40.00 | -12.41 | 100 | 239 |
| 2 | 141.8262 | 43.53 | peak | 12.60 | 22.40 | 1.28 | 35.01 | 43.50 | -8.49 | 100 | 339 |
| 3 | 213.0151 | 50.03 | QP | 11.92 | 22.36 | 1.58 | 41.17 | 43.50 | -2.33 | 100 | 270 |
| 4 | 300.3673 | 43.93 | peak | 13.61 | 22.29 | 1.79 | 37.04 | 46.00 | -8.96 | 100 | 105 |
| 5 | 473.8347 | 35.66 | peak | 17.18 | 21.86 | 2.27 | 33.25 | 46.00 | -12.75 | 100 | 282 |
| 6 | 782.3453 | 32.85 | peak | 21.19 | 21.19 | 2.93 | 35.78 | 46.00 | -10.22 | 100 | 217 |

(Below 1GHz)




*Test Data*

Vertical Polarity Plot @3m

| No. | Frequency | Reading | Detector | Ant_F | PA_G | Cab_L | Result | Limit | Margin | Height | Degree |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | (MHz) | (dBuV/m) | | (dB/m) | (dB) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | |
| 1 | 39.4372 | 44.42 | QP | 14.31 | 22.28 | 0.79 | 37.24 | 40.00 | -2.76 | 200 | 276 |
| 2 | 96.0986 | 40.13 | peak | 9.46 | 22.32 | 1.02 | 28.29 | 43.50 | -15.21 | 100 | 188 |
| 3 | 207.8501 | 42.98 | peak | 11.99 | 22.37 | 1.57 | 34.17 | 43.50 | -9.33 | 100 | 82 |
| 4 | 473.8347 | 36.63 | peak | 17.18 | 21.86 | 2.27 | 34.22 | 46.00 | -11.78 | 100 | 311 |
| 5 | 601.4265 | 38.72 | peak | 19.12 | 21.58 | 2.49 | 38.75 | 46.00 | -7.25 | 100 | 144 |
| 6 | 798.9797 | 34.91 | peak | 21.39 | 21.15 | 2.96 | 38.11 | 46.00 | -7.89 | 100 | 63 |

| Test Mode: | Transmitting Mode |
|---|---|

(Above 1GHz)

Note: Other modes were verified, only the result of worst case basic rate mode was presented.

Mode: 802.11b

Antenna (Black)

Low Channel (2412 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4830.532 | 54.05 | AV | V | 33.42 | 46.11 | 7.92 | 49.28 | 54 | -4.72 |
| 4830.532 | 53.81 | AV | H | 33.42 | 46.11 | 7.92 | 49.04 | 54 | -4.96 |
| 4830.532 | 64.14 | PK | V | 33.42 | 46.11 | 7.92 | 59.37 | 74 | -14.63 |
| 4830.532 | 64.18 | PK | H | 33.42 | 46.11 | 7.92 | 59.41 | 74 | -14.59 |
| 3840.534 | 58.47 | AV | V | 31.44 | 48.97 | 6.64 | 47.58 | 54 | -6.42 |
| 3840.534 | 58.13 | AV | H | 31.44 | 48.97 | 6.64 | 47.24 | 54 | -6.76 |
| 3840.534 | 62.2 | PK | V | 31.44 | 48.97 | 6.64 | 51.31 | 74 | -22.69 |
| 3840.534 | 59.87 | PK | H | 31.44 | 48.97 | 6.64 | 48.98 | 74 | -25.02 |

Middle Channel (2437 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4874.002 | 53.92 | AV | V | 33.53 | 45.93 | 7.94 | 49.46 | 54 | -4.54 |
| 4874.002 | 54.05 | AV | H | 33.53 | 45.93 | 7.94 | 49.59 | 54 | -4.41 |
| 4874.002 | 66.72 | PK | V | 33.53 | 45.93 | 7.94 | 62.26 | 74 | -11.74 |
| 4874.002 | 64.69 | PK | H | 33.53 | 45.93 | 7.94 | 60.23 | 74 | -13.77 |
| 1393.022 | 62.32 | AV | V | 25.25 | 48.31 | 3.99 | 43.25 | 54 | -10.75 |
| 3840.534 | 58.47 | AV | H | 31.44 | 48.97 | 6.64 | 47.58 | 54 | -6.42 |
| 1393.022 | 64.48 | PK | V | 25.25 | 48.31 | 3.99 | 45.41 | 74 | -28.59 |
| 3840.534 | 61.83 | PK | H | 31.44 | 48.97 | 6.64 | 50.94 | 74 | -23.06 |

High Channel (2462 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4926.683 | 51.37 | AV | V | 33.67 | 45.72 | 7.96 | 47.28 | 54 | -6.72 |
| 4926.683 | 52.33 | AV | H | 33.67 | 45.72 | 7.96 | 48.24 | 54 | -5.76 |
| 4926.683 | 64.2 | PK | V | 33.67 | 45.72 | 7.96 | 60.11 | 74 | -13.89 |
| 4926.683 | 62.93 | PK | H | 33.67 | 45.72 | 7.96 | 58.84 | 74 | -15.16 |
| 3840.534 | 59.44 | AV | V | 31.44 | 48.97 | 6.64 | 48.55 | 54 | -5.45 |
| 1332 | 66.56 | AV | H | 25.09 | 48.3 | 3.89 | 47.24 | 54 | -6.76 |
| 3840.534 | 62.28 | PK | V | 31.44 | 48.97 | 6.64 | 51.39 | 74 | -22.61 |
| 1332 | 60.34 | PK | H | 25.09 | 48.3 | 3.89 | 41.02 | 74 | -32.98 |

**Note:**

*1, The testing has been conformed to 10*2462MHz=24,620MHz*

*2, All other emissions more than 30 dB below the limit*

*3, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.*

Mode: 802.11g

Antenna (White)

Channel (2412 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4917.863 | 46.28 | AV | V | 33.64 | 45.76 | 7.96 | 42.12 | 54 | -11.88 |
| 4685.613 | 47.3 | AV | H | 33.09 | 46.69 | 7.63 | 41.33 | 54 | -12.67 |
| 4917.863 | 57.28 | PK | V | 33.64 | 45.76 | 7.96 | 53.12 | 74 | -20.88 |
| 4685.613 | 58 | PK | H | 33.09 | 46.69 | 7.63 | 52.03 | 74 | -21.97 |
| 1395.52 | 58.31 | AV | V | 25.26 | 48.31 | 3.99 | 39.25 | 54 | -14.75 |
| 1019.905 | 62.82 | AV | H | 24.33 | 48.23 | 3.4 | 42.32 | 54 | -11.68 |
| 1395.52 | 61.09 | PK | V | 25.26 | 48.31 | 3.99 | 42.03 | 74 | -31.97 |
| 1019.905 | 65.69 | PK | H | 24.33 | 48.23 | 3.4 | 45.19 | 74 | -28.81 |

Channel (2417 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4830.532 | 53.82 | AV | V | 33.42 | 46.11 | 7.92 | 49.05 | 54 | -4.95 |
| 4830.532 | 53.85 | AV | H | 33.42 | 46.11 | 7.92 | 49.08 | 54 | -4.92 |
| 4830.532 | 64.4 | PK | V | 33.42 | 46.11 | 7.92 | 59.63 | 74 | -14.37 |
| 4830.532 | 65.95 | PK | H | 33.42 | 46.11 | 7.92 | 61.18 | 74 | -12.82 |
| 1018.079 | 60.63 | AV | V | 24.33 | 48.23 | 3.4 | 40.13 | 54 | -13.87 |
| 1019.905 | 60.63 | AV | H | 24.33 | 48.23 | 3.4 | 40.13 | 54 | -13.87 |
| 1018.079 | 63.92 | PK | V | 24.33 | 48.23 | 3.4 | 43.42 | 74 | -30.58 |
| 1019.905 | 64.49 | PK | H | 24.33 | 48.23 | 3.4 | 43.99 | 74 | -30.01 |

Channel (2422 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4847.873 | 54.73 | AV | V | 33.46 | 46.04 | 7.93 | 50.08 | 54 | -3.92 |
| 4847.873 | 54.62 | AV | H | 33.46 | 46.04 | 7.93 | 49.97 | 54 | -4.03 |
| 4847.873 | 69.29 | PK | V | 33.46 | 46.04 | 7.93 | 64.64 | 74 | -9.36 |
| 4847.873 | 67.99 | PK | H | 33.46 | 46.04 | 7.93 | 63.34 | 74 | -10.66 |
| 1393.022 | 64.4 | AV | V | 25.25 | 48.31 | 3.99 | 45.33 | 54 | -8.67 |
| 1019.905 | 60.71 | AV | H | 24.33 | 48.23 | 3.4 | 40.21 | 54 | -13.79 |
| 1393.022 | 67.82 | PK | V | 25.25 | 48.31 | 3.99 | 48.75 | 74 | -25.25 |
| 1019.905 | 63.78 | PK | H | 24.33 | 48.23 | 3.4 | 43.28 | 74 | -30.72 |

### Channel (2437 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4874.002 | 53.67 | AV | V | 33.53 | 45.93 | 7.94 | 49.21 | 54 | -4.79 |
| 4874.002 | 53.47 | AV | H | 33.53 | 45.93 | 7.94 | 49.01 | 54 | -4.99 |
| 4874.002 | 65.9 | PK | V | 33.53 | 45.93 | 7.94 | 61.44 | 74 | -12.56 |
| 4874.002 | 67.2 | PK | H | 33.53 | 45.93 | 7.94 | 62.74 | 74 | -11.26 |
| 1393.022 | 58.19 | AV | V | 25.25 | 48.31 | 3.99 | 39.12 | 54 | -14.88 |
| 1390.528 | 57.62 | AV | H | 25.25 | 48.31 | 3.98 | 38.54 | 54 | -15.46 |
| 1393.022 | 59.55 | PK | V | 25.25 | 48.31 | 3.99 | 40.48 | 74 | -33.52 |
| 1390.528 | 58.73 | PK | H | 25.25 | 48.31 | 3.98 | 39.65 | 74 | -34.35 |

### Channel (2452 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4909.06 | 54.06 | AV | V | 33.62 | 45.79 | 7.95 | 49.84 | 54 | -4.16 |
| 4900.272 | 51.53 | AV | H | 33.59 | 45.83 | 7.95 | 47.24 | 54 | -6.76 |
| 4909.06 | 66.35 | PK | V | 33.62 | 45.79 | 7.95 | 62.13 | 74 | -11.87 |
| 4900.272 | 63.85 | PK | H | 33.59 | 45.83 | 7.95 | 59.56 | 74 | -14.44 |
| 3840.534 | 56.1 | AV | V | 31.44 | 48.97 | 6.64 | 45.21 | 54 | -8.79 |
| 1019.905 | 60.53 | AV | H | 24.33 | 48.23 | 3.4 | 40.03 | 54 | -13.97 |
| 3840.534 | 61.48 | PK | V | 31.44 | 48.97 | 6.64 | 50.59 | 74 | -23.41 |
| 1019.905 | 65.25 | PK | H | 24.33 | 48.23 | 3.4 | 44.75 | 74 | -29.25 |

### Channel (2457 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4917.863 | 51.4 | AV | V | 33.64 | 45.76 | 7.96 | 47.24 | 54 | -6.76 |
| 4830.532 | 52.35 | AV | H | 33.42 | 46.11 | 7.92 | 47.58 | 54 | -6.42 |
| 4917.863 | 63.35 | PK | V | 33.64 | 45.76 | 7.96 | 59.19 | 74 | -14.81 |
| 4830.532 | 69.39 | PK | H | 33.42 | 46.11 | 7.92 | 64.62 | 74 | -9.38 |
| 1018.079 | 60.38 | AV | V | 24.33 | 48.23 | 3.4 | 39.88 | 54 | -14.12 |
| 3840.534 | 53.81 | AV | H | 31.44 | 48.97 | 6.64 | 42.92 | 54 | -11.08 |
| 1018.079 | 62.39 | PK | V | 24.33 | 48.23 | 3.4 | 41.89 | 74 | -32.11 |
| 3840.534 | 62.82 | PK | H | 31.44 | 48.97 | 6.64 | 51.93 | 74 | -22.07 |

Channel (2462 MHz)

| Frequency (MHz) | S.A. Reading (dBμV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4926.683 | 52.3 | AV | V | 33.67 | 45.72 | 7.96 | 48.21 | 54 | -5.79 |
| 4926.683 | 51.88 | AV | H | 33.67 | 45.72 | 7.96 | 47.79 | 54 | -6.21 |
| 4926.683 | 59.35 | PK | V | 33.67 | 45.72 | 7.96 | 55.26 | 74 | -18.74 |
| 4926.683 | 58.27 | PK | H | 33.67 | 45.72 | 7.96 | 54.18 | 74 | -19.82 |
| 3840.534 | 56.14 | AV | V | 31.44 | 48.97 | 6.64 | 45.25 | 54 | -8.75 |
| 1019.905 | 60.71 | AV | H | 24.33 | 48.23 | 3.4 | 40.21 | 54 | -13.79 |
| 3840.534 | 63.92 | PK | V | 31.44 | 48.97 | 6.64 | 53.03 | 74 | -20.97 |
| 1019.905 | 63.5 | PK | H | 24.33 | 48.23 | 3.4 | 43 | 74 | -31 |

Note:

*1, The testing has been conformed to 10*2462MHz=24,620MHz*

*2, All other emissions more than 30 dB below the limit*

*3, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.*

Mode: 802.11n20

Antenna (White+ Blue+ Black)

Channel (2412 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4830.532 | 48.98 | AV | V | 33.42 | 46.11 | 7.92 | 44.21 | 54 | -9.79 |
| 4830.532 | 49.02 | AV | H | 33.42 | 46.11 | 7.92 | 44.25 | 54 | -9.75 |
| 4830.532 | 58.26 | PK | V | 33.42 | 46.11 | 7.92 | 53.49 | 74 | -20.51 |
| 4830.532 | 57 | PK | H | 33.42 | 46.11 | 7.92 | 52.23 | 74 | -21.77 |
| 1395.52 | 58.64 | AV | V | 25.26 | 48.31 | 3.99 | 39.58 | 54 | -14.42 |
| 3840.534 | 52.28 | AV | H | 31.44 | 48.97 | 6.64 | 41.39 | 54 | -12.61 |
| 1395.52 | 63.57 | PK | V | 25.26 | 48.31 | 3.99 | 44.51 | 74 | -29.49 |
| 3840.534 | 60.95 | PK | H | 31.44 | 48.97 | 6.64 | 50.06 | 74 | -23.94 |

Channel (2417 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4830.532 | 54.75 | AV | V | 33.42 | 46.11 | 7.92 | 49.98 | 54 | -4.02 |
| 4830.532 | 53.23 | AV | H | 33.42 | 46.11 | 7.92 | 48.46 | 54 | -5.54 |
| 4830.532 | 66.89 | PK | V | 33.42 | 46.11 | 7.92 | 62.12 | 74 | -11.88 |
| 4830.532 | 63.89 | PK | H | 33.42 | 46.11 | 7.92 | 59.12 | 74 | -14.88 |
| 3840.534 | 62.82 | AV | V | 31.44 | 48.97 | 6.64 | 51.93 | 74 | -22.07 |
| 3840.534 | 54.17 | AV | H | 31.44 | 48.97 | 6.64 | 43.28 | 54 | -10.72 |
| 3840.534 | 56.57 | PK | V | 31.44 | 48.97 | 6.64 | 45.68 | 54 | -8.32 |
| 3840.534 | 60.54 | PK | H | 31.44 | 48.97 | 6.64 | 49.65 | 74 | -24.35 |

Channel (2437 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4874.002 | 53.7 | AV | V | 33.53 | 45.93 | 7.94 | 49.24 | 54 | -4.76 |
| 4874.002 | 52.59 | AV | H | 33.53 | 45.93 | 7.94 | 48.13 | 54 | -5.87 |
| 4874.002 | 64.66 | PK | V | 33.53 | 45.93 | 7.94 | 60.2 | 74 | -13.8 |
| 4874.002 | 62.81 | PK | H | 33.53 | 45.93 | 7.94 | 58.35 | 74 | -15.65 |
| 3840.534 | 55.26 | AV | V | 31.44 | 48.97 | 6.64 | 44.37 | 54 | -9.63 |
| 3840.534 | 54.54 | AV | H | 31.44 | 48.97 | 6.64 | 43.65 | 54 | -10.35 |
| 3840.534 | 62.79 | PK | V | 31.44 | 48.97 | 6.64 | 51.9 | 74 | -22.1 |
| 3840.534 | 59.93 | PK | H | 31.44 | 48.97 | 6.64 | 49.04 | 74 | -24.96 |

Channel (2457 MHz)

| Frequency (MHz) | S.A. Reading (dBμV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4926.683 | 54.37 | AV | V | 33.67 | 45.72 | 7.96 | 50.28 | 54 | -3.72 |
| 4909.06 | 53.46 | AV | H | 33.62 | 45.79 | 7.95 | 49.24 | 54 | -4.76 |
| 4926.683 | 66.92 | PK | V | 33.67 | 45.72 | 7.96 | 62.83 | 74 | -11.17 |
| 4909.06 | 65.87 | PK | H | 33.62 | 45.79 | 7.95 | 61.65 | 74 | -12.35 |
| 3840.534 | 57.12 | AV | V | 31.44 | 48.97 | 6.64 | 46.23 | 54 | -7.77 |
| 3840.534 | 56.57 | AV | H | 31.44 | 48.97 | 6.64 | 45.68 | 54 | -8.32 |
| 3840.534 | 61.87 | PK | V | 31.44 | 48.97 | 6.64 | 50.98 | 74 | -23.02 |
| 3840.534 | 61.46 | PK | H | 31.44 | 48.97 | 6.64 | 50.57 | 74 | -23.43 |

Channel (2462 MHz)

| Frequency (MHz) | S.A. Reading (dBμV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4935.518 | 52.6 | AV | V | 33.7 | 45.69 | 7.96 | 48.57 | 54 | -5.43 |
| 4935.518 | 54.92 | AV | H | 33.7 | 45.69 | 7.96 | 50.89 | 54 | -3.11 |
| 4935.518 | 63.44 | PK | V | 33.7 | 45.69 | 7.96 | 59.41 | 74 | -14.59 |
| 4935.518 | 68.02 | PK | H | 33.7 | 45.69 | 7.96 | 63.99 | 74 | -10.01 |
| 3840.534 | 53.45 | AV | V | 31.44 | 48.97 | 6.64 | 42.56 | 54 | -11.44 |
| 1019.905 | 61.58 | AV | H | 24.33 | 48.23 | 3.4 | 41.08 | 54 | -12.92 |
| 3840.534 | 58.9 | PK | V | 31.44 | 48.97 | 6.64 | 48.01 | 74 | -25.99 |
| 1019.905 | 64.25 | PK | H | 24.33 | 48.23 | 3.4 | 43.75 | 74 | -30.25 |

**Note:**

*1, The testing has been conformed to 10*2462MHz=24,620MHz*

*2, All other emissions more than 30 dB below the limit*

*3, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.*

Mode: 802.11n40

Antenna (White+ Blue+ Black)

Channel (2422 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4891.499 | 48.62 | AV | V | 33.57 | 45.86 | 7.95 | 44.28 | 54 | -9.72 |
| 4847.873 | 49.98 | AV | H | 33.46 | 46.04 | 7.93 | 45.33 | 54 | -8.67 |
| 4891.499 | 57.09 | PK | V | 33.57 | 45.86 | 7.95 | 52.75 | 74 | -21.25 |
| 4847.873 | 58.7 | PK | H | 33.46 | 46.04 | 7.93 | 54.05 | 74 | -19.95 |
| 3840.534 | 53.05 | AV | V | 31.44 | 48.97 | 6.64 | 42.16 | 54 | -11.84 |
| 3840.534 | 53.94 | AV | H | 31.44 | 48.97 | 6.64 | 43.05 | 54 | -10.95 |
| 3840.534 | 60.43 | PK | V | 31.44 | 48.97 | 6.64 | 49.54 | 74 | -24.46 |
| 3840.534 | 60.28 | PK | H | 31.44 | 48.97 | 6.64 | 49.39 | 74 | -24.61 |

Channel (2427 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4926.683 | 50.11 | AV | V | 33.67 | 45.72 | 7.96 | 46.02 | 54 | -7.98 |
| 4865.277 | 50.11 | AV | H | 33.5 | 45.97 | 7.94 | 45.58 | 54 | -8.42 |
| 4926.683 | 57.9 | PK | V | 33.67 | 45.72 | 7.96 | 53.81 | 74 | -20.19 |
| 4865.277 | 57.76 | PK | H | 33.5 | 45.97 | 7.94 | 53.23 | 74 | -20.77 |
| 3840.534 | 53.4 | AV | V | 31.44 | 48.97 | 6.64 | 42.51 | 54 | -11.49 |
| 1393.022 | 58.95 | AV | H | 25.25 | 48.31 | 3.99 | 39.88 | 54 | -14.12 |
| 3840.534 | 61.4 | PK | V | 31.44 | 48.97 | 6.64 | 50.51 | 74 | -23.49 |
| 1393.022 | 63.61 | PK | H | 25.25 | 48.31 | 3.99 | 44.54 | 74 | -29.46 |

Channel (2432 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4856.567 | 49.84 | AV | V | 33.48 | 46 | 7.93 | 45.25 | 54 | -8.75 |
| 4865.277 | 49.08 | AV | H | 33.5 | 45.97 | 7.94 | 44.55 | 54 | -9.45 |
| 4856.567 | 59.94 | PK | V | 33.48 | 46 | 7.93 | 55.35 | 74 | -18.65 |
| 4865.277 | 60.54 | PK | H | 33.5 | 45.97 | 7.94 | 56.01 | 74 | -17.99 |
| 3840.534 | 54.17 | AV | V | 31.44 | 48.97 | 6.64 | 43.28 | 54 | -10.72 |
| 1018.079 | 60.78 | AV | H | 24.33 | 48.23 | 3.4 | 40.28 | 54 | -13.72 |
| 3840.534 | 61.19 | PK | V | 31.44 | 48.97 | 6.64 | 50.3 | 74 | -23.7 |
| 1018.079 | 64.14 | PK | H | 24.33 | 48.23 | 3.4 | 43.64 | 74 | -30.36 |

Channel (2437 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4882.743 | 51.54 | AV | V | 33.55 | 45.9 | 7.94 | 47.13 | 54 | -6.87 |
| 4882.743 | 51.69 | AV | H | 33.55 | 45.9 | 7.94 | 47.28 | 54 | -6.72 |
| 4882.743 | 60.84 | PK | V | 33.55 | 45.9 | 7.94 | 56.43 | 74 | -17.57 |
| 4882.743 | 62.71 | PK | H | 33.55 | 45.9 | 7.94 | 58.3 | 74 | -15.7 |
| 3840.534 | 54.17 | AV | V | 31.44 | 48.97 | 6.64 | 43.28 | 54 | -10.72 |
| 3840.534 | 53.07 | AV | H | 31.44 | 48.97 | 6.64 | 42.18 | 54 | -11.82 |
| 3840.534 | 62.35 | PK | V | 31.44 | 48.97 | 6.64 | 51.46 | 74 | -22.54 |
| 3840.534 | 59.08 | PK | H | 31.44 | 48.97 | 6.64 | 48.19 | 74 | -25.81 |

Channel (2442 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4900.272 | 51.54 | AV | V | 33.59 | 45.83 | 7.95 | 47.25 | 54 | -6.75 |
| 4900.272 | 52.54 | AV | H | 33.59 | 45.83 | 7.95 | 48.25 | 54 | -5.75 |
| 4900.272 | 60.43 | PK | V | 33.59 | 45.83 | 7.95 | 56.14 | 74 | -17.86 |
| 4900.272 | 62.67 | PK | H | 33.59 | 45.83 | 7.95 | 58.38 | 74 | -15.62 |
| 3840.534 | 53.94 | AV | V | 31.44 | 48.97 | 6.64 | 43.05 | 54 | -10.95 |
| 3840.534 | 53.45 | AV | H | 31.44 | 48.97 | 6.64 | 42.56 | 54 | -11.44 |
| 3840.534 | 61.59 | PK | V | 31.44 | 48.97 | 6.64 | 50.7 | 74 | -23.3 |
| 3840.534 | 59.39 | PK | H | 31.44 | 48.97 | 6.64 | 48.5 | 74 | -25.5 |

Channel (2447 MHz)

| Frequency (MHz) | S.A. Reading (dBµV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBµV/m) | Limit (dBµV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 4900.272 | 51.54 | AV | V | 33.59 | 45.83 | 7.95 | 47.25 | 54 | -6.75 |
| 4900.272 | 52.54 | AV | H | 33.59 | 45.83 | 7.95 | 48.25 | 54 | -5.75 |
| 4900.272 | 60.43 | PK | V | 33.59 | 45.83 | 7.95 | 56.14 | 74 | -17.86 |
| 4900.272 | 62.67 | PK | H | 33.59 | 45.83 | 7.95 | 58.38 | 74 | -15.62 |
| 3840.534 | 53.94 | AV | V | 31.44 | 48.97 | 6.64 | 43.05 | 54 | -10.95 |
| 3840.534 | 53.45 | AV | H | 31.44 | 48.97 | 6.64 | 42.56 | 54 | -11.44 |
| 3840.534 | 61.59 | PK | V | 31.44 | 48.97 | 6.64 | 50.7 | 74 | -23.3 |
| 3840.534 | 59.39 | PK | H | 31.44 | 48.97 | 6.64 | 48.5 | 74 | -25.5 |

Channel (2452 MHz)

| Frequency (MHz) | S.A. Reading (dBμV) | Detector (PK/AV) | Polarity (H/V) | Ant. Factor (dB/m) | Cable Loss (dB) | Pre-Amp. Gain (dB) | Cord Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4891.499 | 49.92 | AV | V | 33.57 | 45.86 | 7.95 | 45.58 | 54 | -8.42 |
| 4909.06 | 51.47 | AV | H | 33.62 | 45.79 | 7.95 | 47.25 | 54 | -6.75 |
| 4891.499 | 57.7 | PK | V | 33.57 | 45.86 | 7.95 | 53.36 | 74 | -20.64 |
| 4909.06 | 59.64 | PK | H | 33.62 | 45.79 | 7.95 | 55.42 | 74 | -18.58 |
| 3840.534 | 53.45 | AV | V | 31.44 | 48.97 | 6.64 | 42.56 | 54 | -11.44 |
| 3840.534 | 52.17 | AV | H | 31.44 | 48.97 | 6.64 | 41.28 | 54 | -12.72 |
| 3840.534 | 61.43 | PK | V | 31.44 | 48.97 | 6.64 | 50.54 | 74 | -23.46 |
| 3840.534 | 59.15 | PK | H | 31.44 | 48.97 | 6.64 | 48.26 | 74 | -25.74 |

**Note:**

*1, The testing has been conformed to 10*2462MHz=24,620MHz*

*2, All other emissions more than 30 dB below the limit*

*3, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.*

# Annex A. TEST INSTRUMENT

| Instrument | Model | Serial # | Cal Date | Cal Due | In use |
|---|---|---|---|---|---|
| **AC Line Conducted** | | | | | |
| EMI test receiver | ESCS30 | 8471241027 | 09/15/2017 | 09/14/2018 | ☑ |
| Line Impedance | LI-125A | 191106 | 09/23/2017 | 09/22/2018 | ☑ |
| Line Impedance | LI-125A | 191107 | 09/23/2017 | 09/22/2018 | ☑ |
| ISN | ISN T800 | 34373 | 09/23/2017 | 09/22/2018 | ☐ |
| Transient Limiter | LIT-153 | 531118 | 08/30/2017 | 08/29/2018 | ☐ |
| **RF conducted test** | | | | | |
| Agilent ESA-E SERIES | E4407B | MY45108319 | 09/15/2017 | 09/14/2018 | ☑ |
| Power Splitter | 1# | 1# | 08/30/2017 | 08/29/2018 | ☑ |
| DC Power Supply | E3640A | MY40004013 | 09/15/2017 | 09/14/2018 | ☑ |
| **Radiated Emissions** | | | | | |
| EMI test receiver | ESL6 | 100262 | 09/15/2017 | 09/14/2018 | ☑ |
| Positioning Controller | UC3000 | MF780208282 | 11/18/2016 | 11/17/2017 | ☑ |
| OPT 010 AMPLIFIER (0.1-1300MHz) | 8447E | 2727A02430 | 08/30/2017 | 08/29/2018 | ☑ |
| Microwave Preamplifier (1 ~ 26.5GHz) | 8449B | 3008A02402 | 03/23/2017 | 03/22/2018 | ☑ |
| Horn Antenna | BBHA9170 | 3145226D1 | 09/27/2017 | 09/26/2018 | ☑ |
| Active Antenna (9kHz-30MHz) | AL-130 | 121031 | 10/12/2017 | 10/11/2018 | ☑ |
| Bilog Antenna (30MHz~6GHz) | JB6 | A110712 | 09/19/2017 | 09/18/2018 | ☑ |
| Double Ridge Horn Antenna (1 ~18GHz) | AH-118 | 71283 | 09/22/2017 | 09/21/2018 | ☑ |
| Universal Radio Communication Tester | CMU200 | 121393 | 09/23/2017 | 09/22/2018 | ☑ |

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
| --- | --- | --- | --- | --- | --- |
| 3m Semi-anechoic Chamber | ETS-LINDGREN | 9m*6m*6m | Euroshieldpn-CT0001143-1216 | May 06,17 | May 05,18 |
| Horn Antenna (18GHz-40GHz) | N/A | QWH-SL-18-40-K-SG/QMS-00361 | 15433 | Dec. 16,16 | Dec. 15,17 |
| Test Software | ADT | ADT_Radiated_V7.6.15.9.2 | N/A | N/A | N/A |
| 10dB Attenuator | JFW/USA | 50HF-010-SMA | 1505 | Jul. 24,17 | Jul. 23,18 |
| MXE EMI Receiver | KEYSIGHT | N9038A-544 | MY54450026 | Mar. 10,17 | Mar. 09,18 |
| Signal Pre-Amplifier | EMSI | EMC 184045B | 980259 | Jul. 24,17 | Jul. 23,18 |

# Annex B. EUT and Test Setup Photographs

## Annex B.i. Photograph EUT External Photo

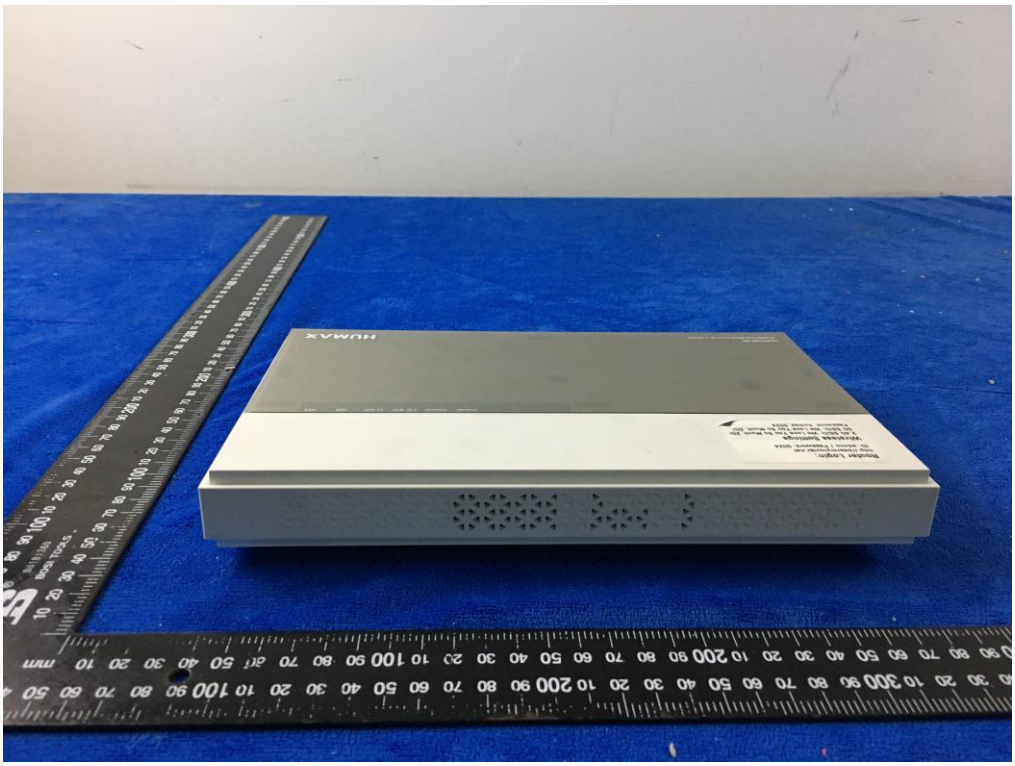
Whole Package View


Adapter - Front View

EUT - Front View

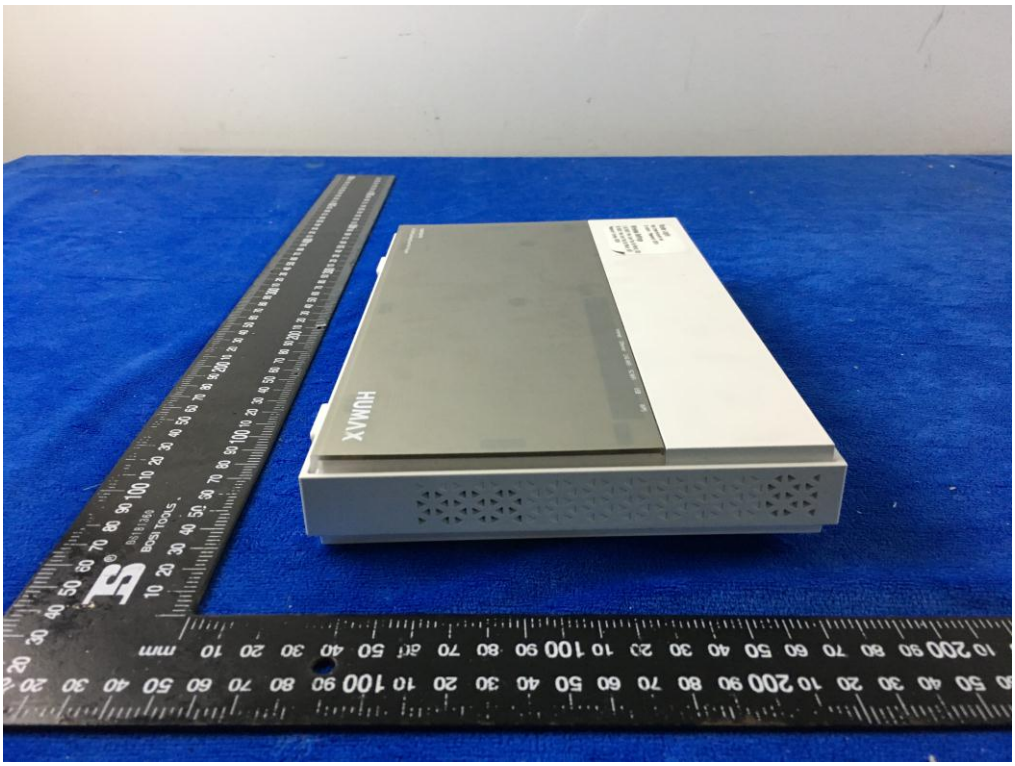

EUT - Rear View

EUT - Top View

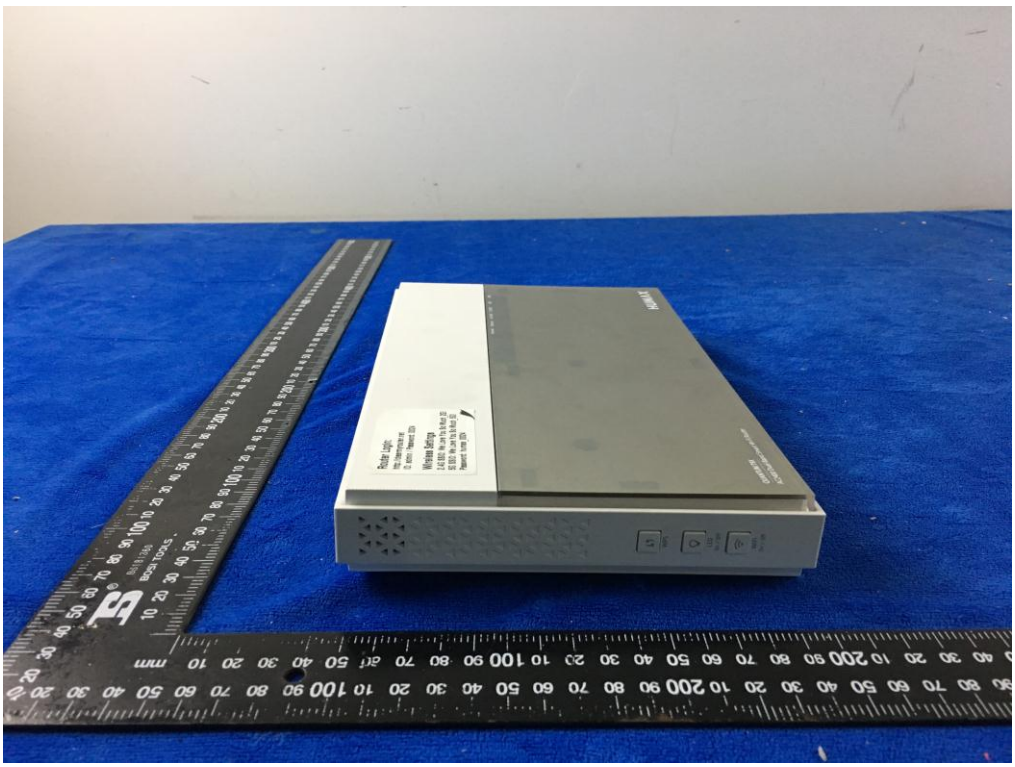



EUT - Bottom View

EUT - Left View



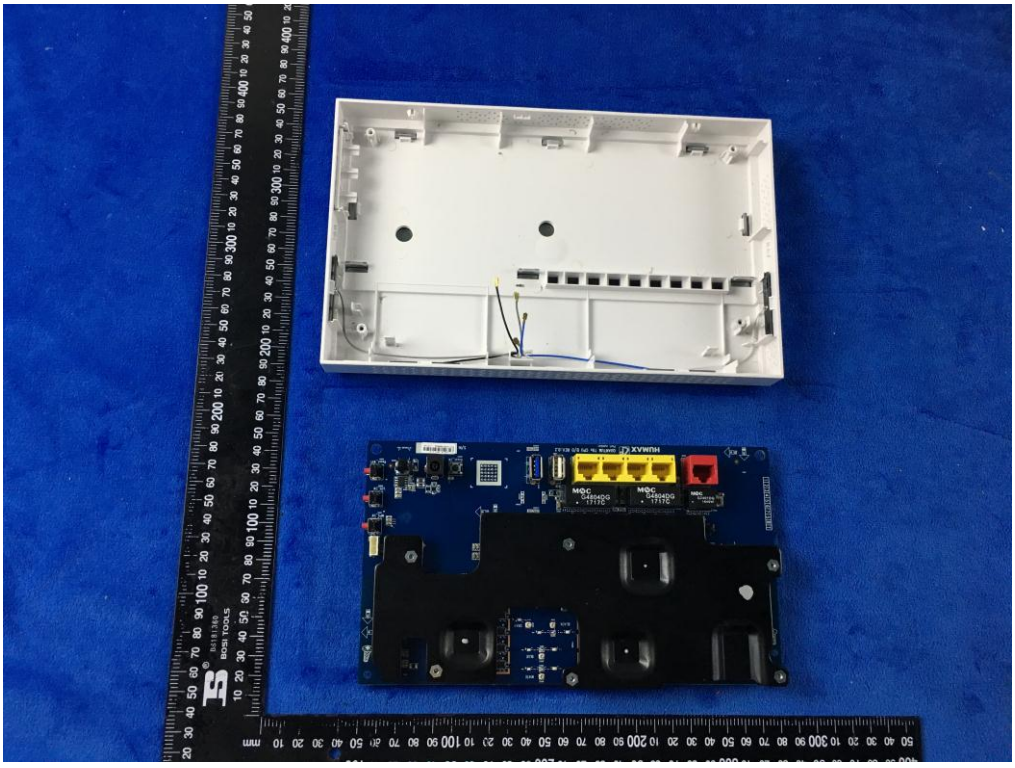

EUT - Right View



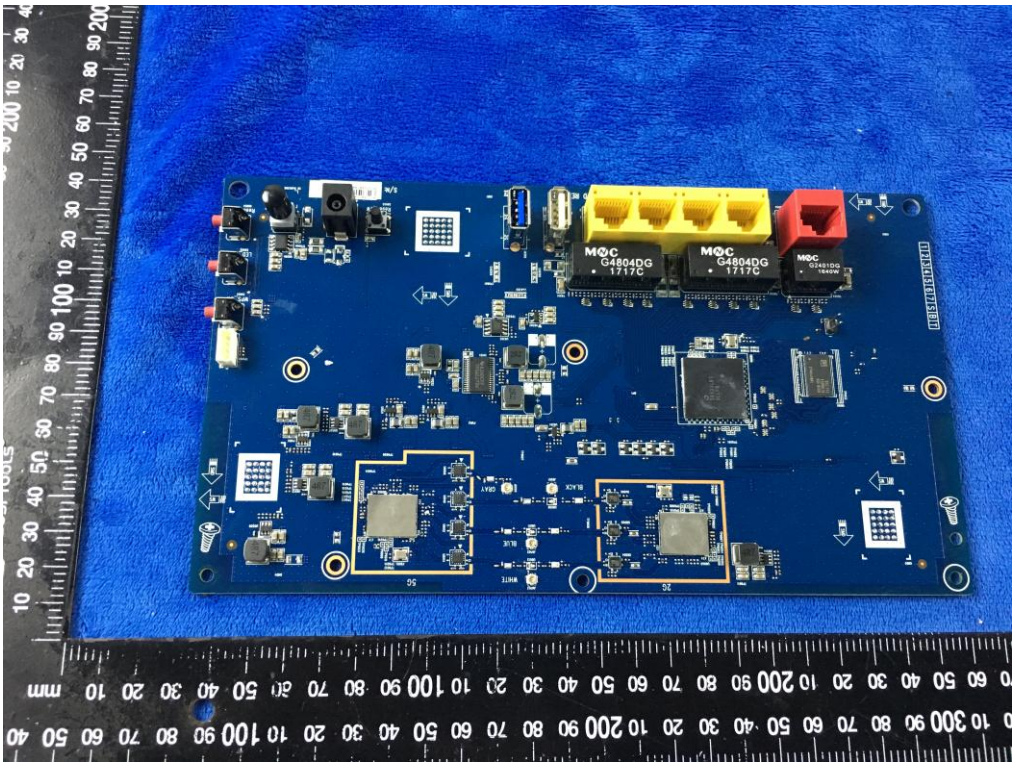
## Annex B.ii. Photograph: EUT Internal Photo

Cover Off - Top View 1

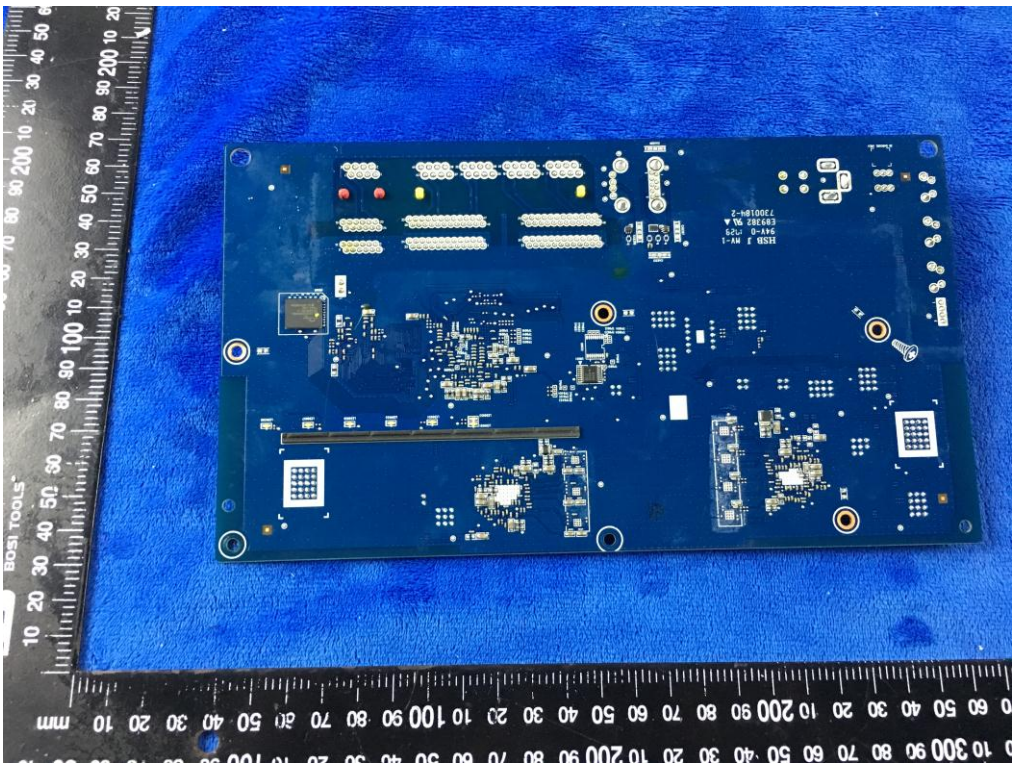
Cover Off - Top View 2



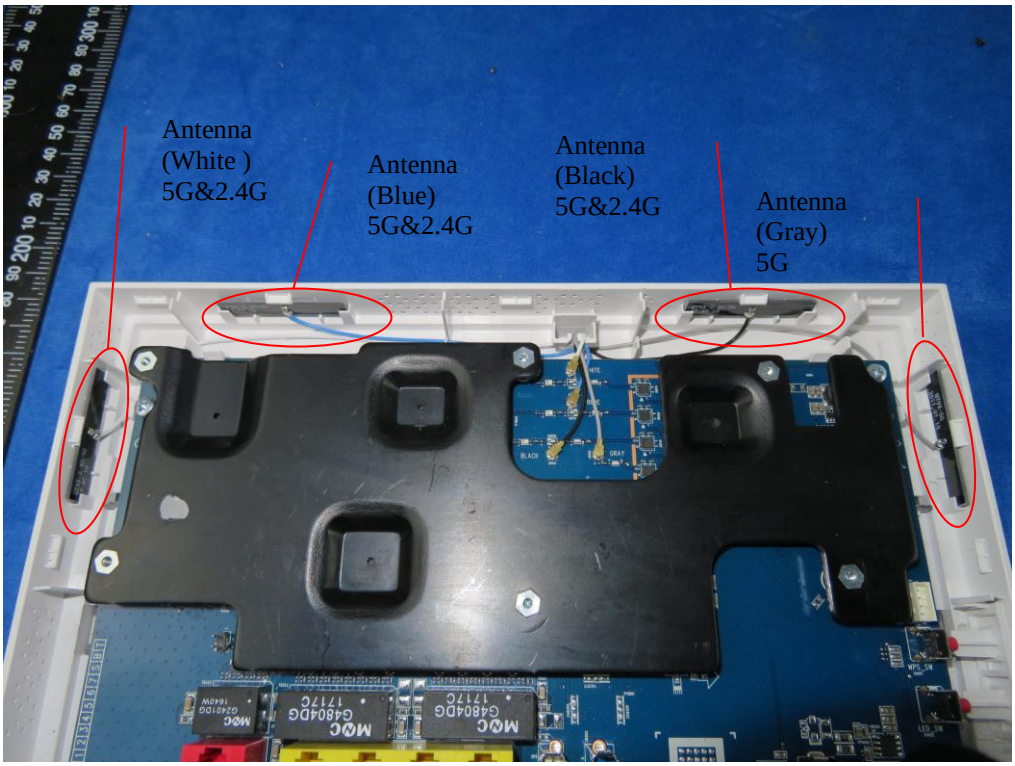
Mainboard with Shielding - Front View




Mainboard without Shielding - Front View

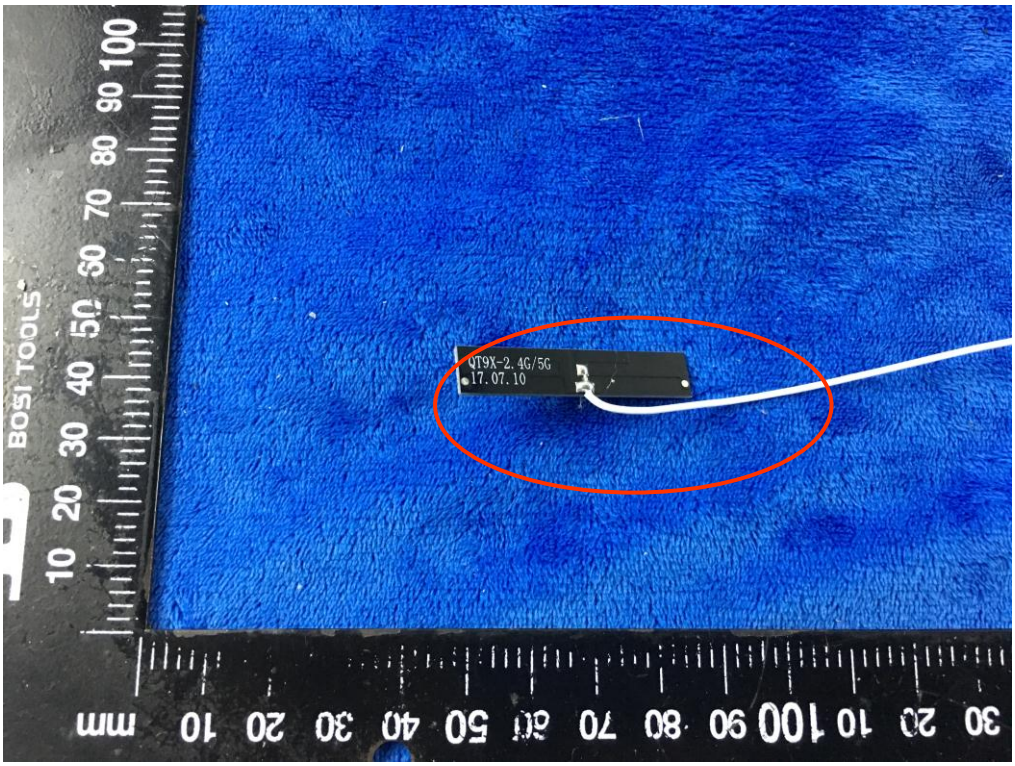


2.4G&5G Antenna View

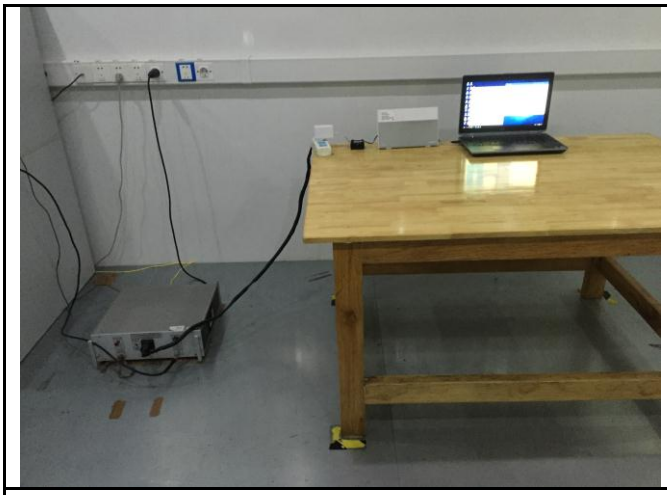



Close-up View

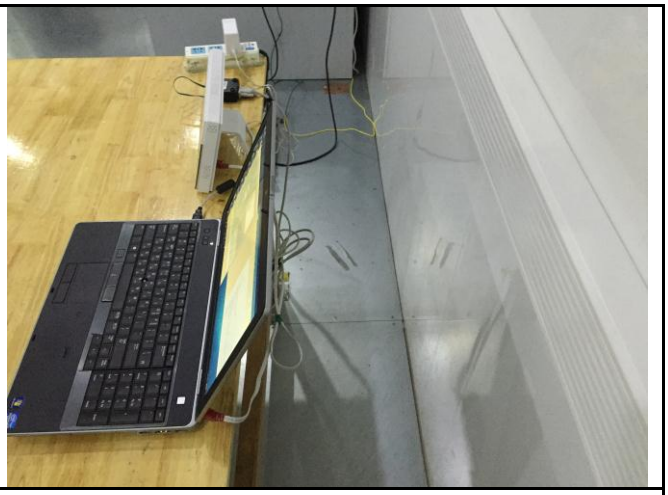
Note : Because all of the antenna are same, we only show the one, as a Close-up.



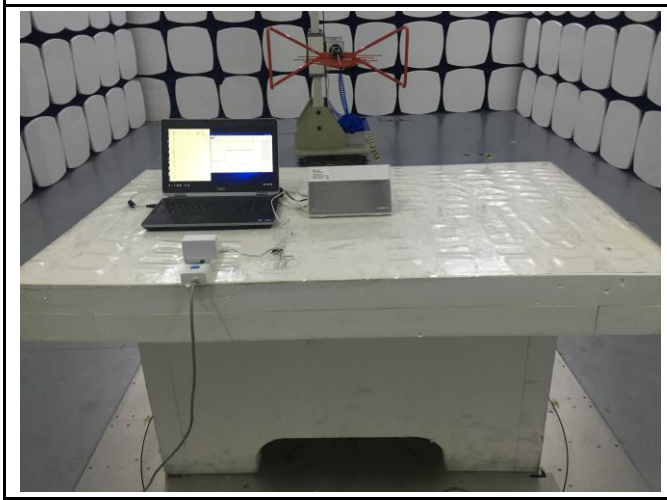
## Annex B.iii. Photograph: Test Setup Photo



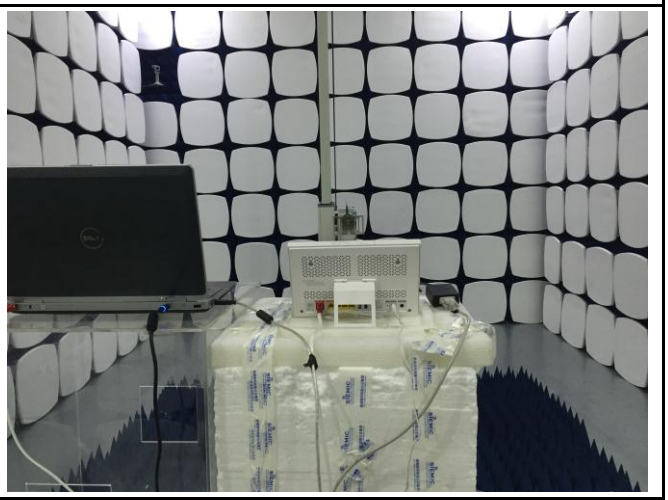
Conducted Emissions Test Setup Front View



Conducted Emissions Test Setup Side View



Radiated Spurious Emissions Test Setup Below 1GHz

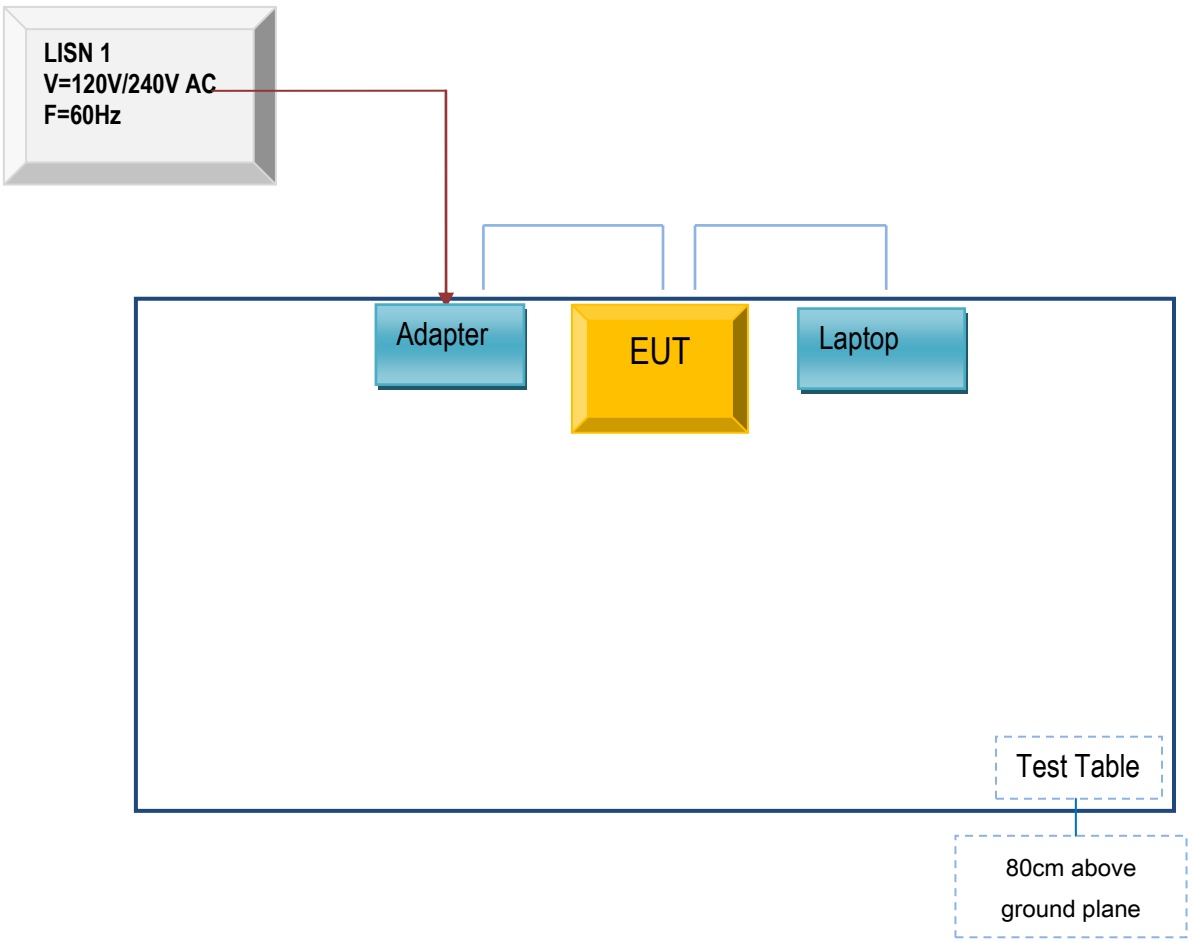


Radiated Spurious Emissions Test Setup Above 1GHz

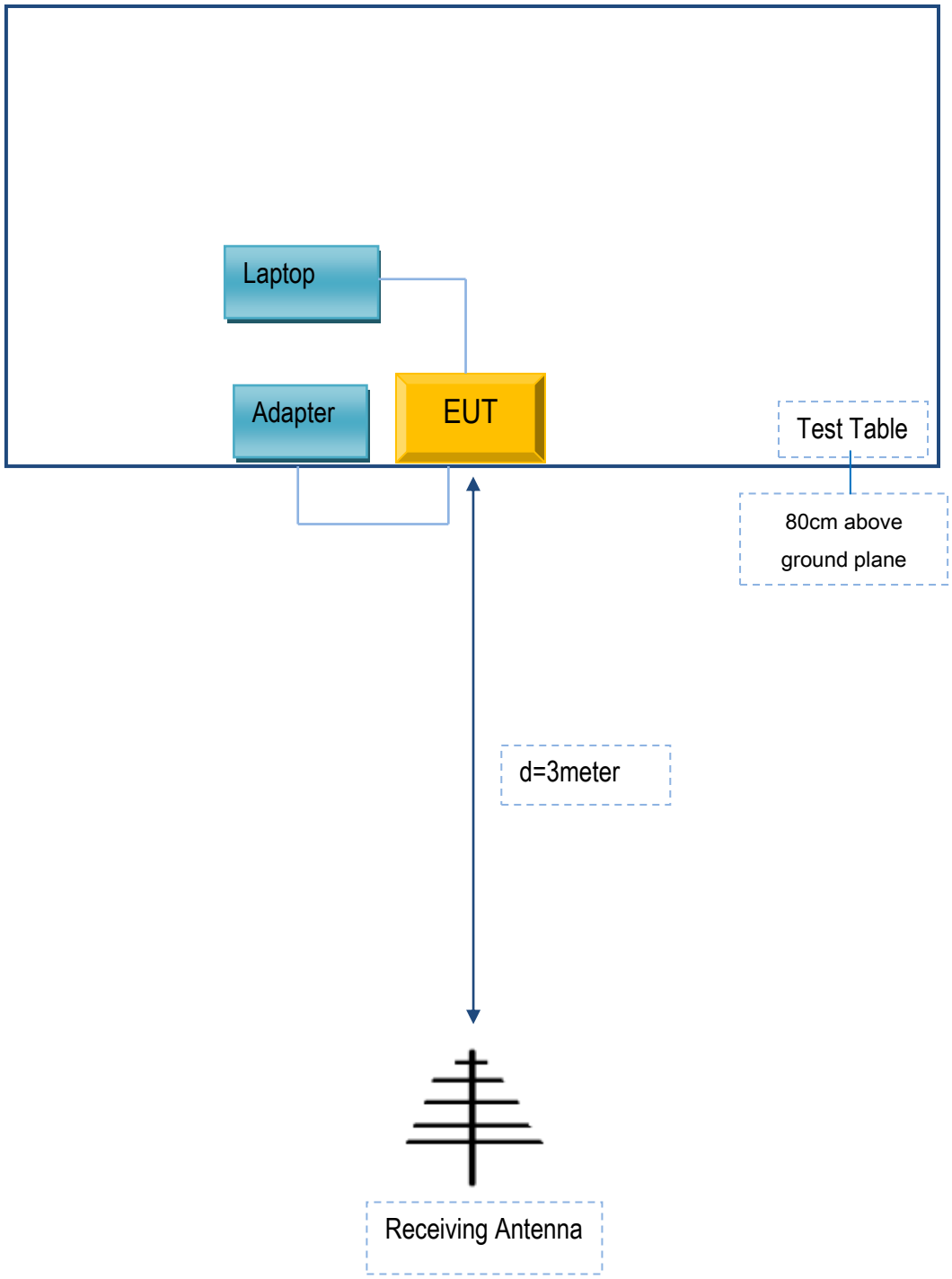
# Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

## Annex C.ii. TEST SET UP BLOCK

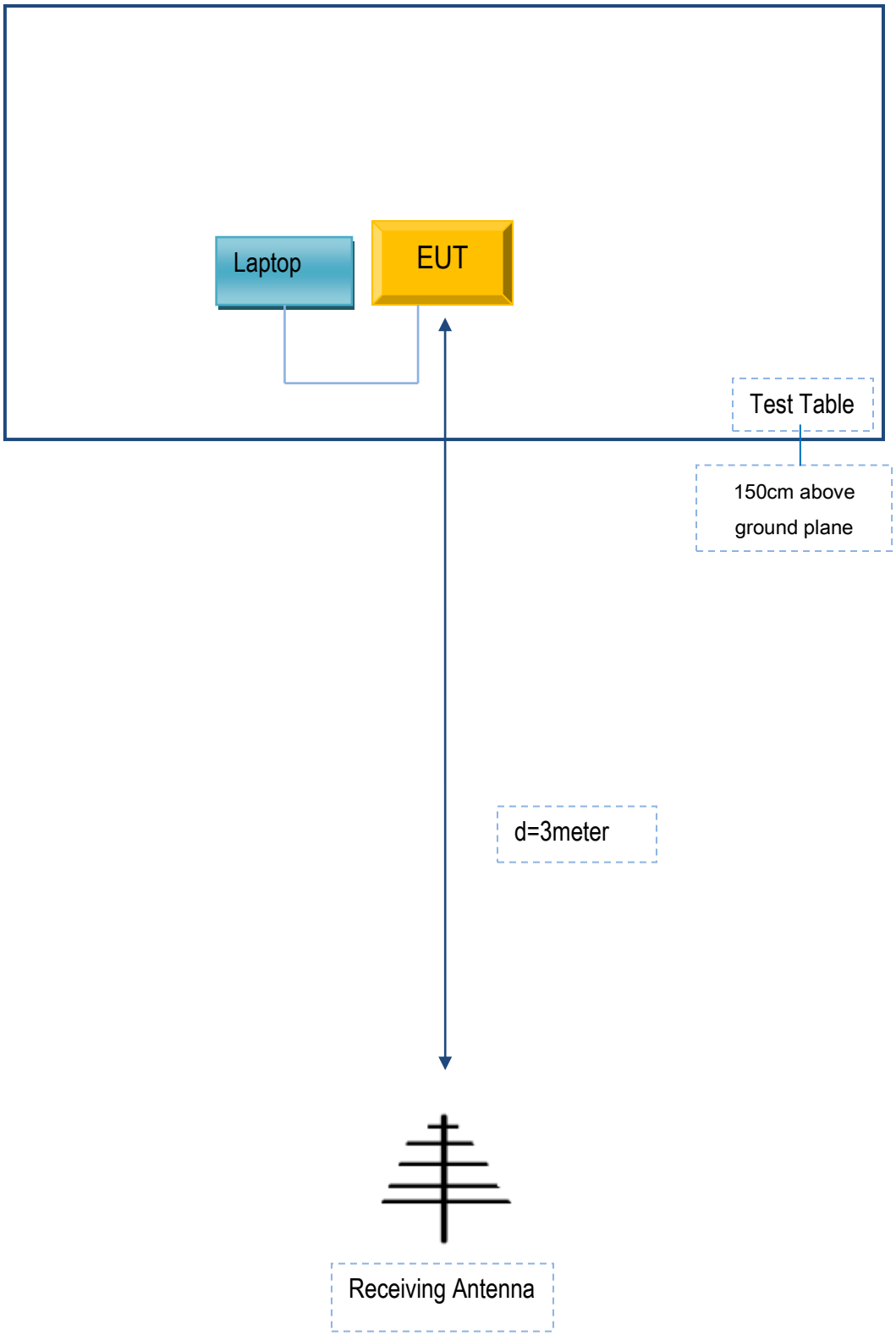
### Block Configuration Diagram for AC Line Conducted Emissions



## Block Configuration Diagram for Radiated Emissions （Below 1GHz）.



## Block Configuration Diagram for Radiated Emissions （Above 1GHz）.



## Annex C. il. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

| Manufacturer | Equipment Description | Model | Serial No |
| --- | --- | --- | --- |
| Humax Co., Ltd. | Adapter | ADS-30FD-12 12030E | N/A |
| Lenovo | Laptop | E40 | N/A |

# Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see attachment

# Annex E. DECLARATION OF SIMILARITY

**Humax Co., Ltd.**

To: SIEMIC ,775 Montague Expressway, Milpitas, CA 95035,USA

## Declaration Letter

Dear Sir,

For our business issue and marketing requirement, we would like to list 3 model numbers on the **FCC&CE** certificates and reports, as following:

Model No.: QUANTUM T9x,QUANTUM T7x ,QUANTUM T5x

FCC ID: O6ZT9X

We declare that, All the model PCB, Antenna and appearance shape, accessories are the same. The difference of these is listed as below:

| Main Model No | Serial Model No | Difference |
| --- | --- | --- |
| QUANTUM T9x | QUANTUM T7x ,QUANTUM T5x | only unused antennas is removed |

Thank you!

Signature:

Printed name/ title: Inseok Seo / Senior Engineer

Address: HUMAX Village, 11-4, Sunae-dong, Bundang-gu, Seongnam city, Gyeonggi-do, South Korea 463-825