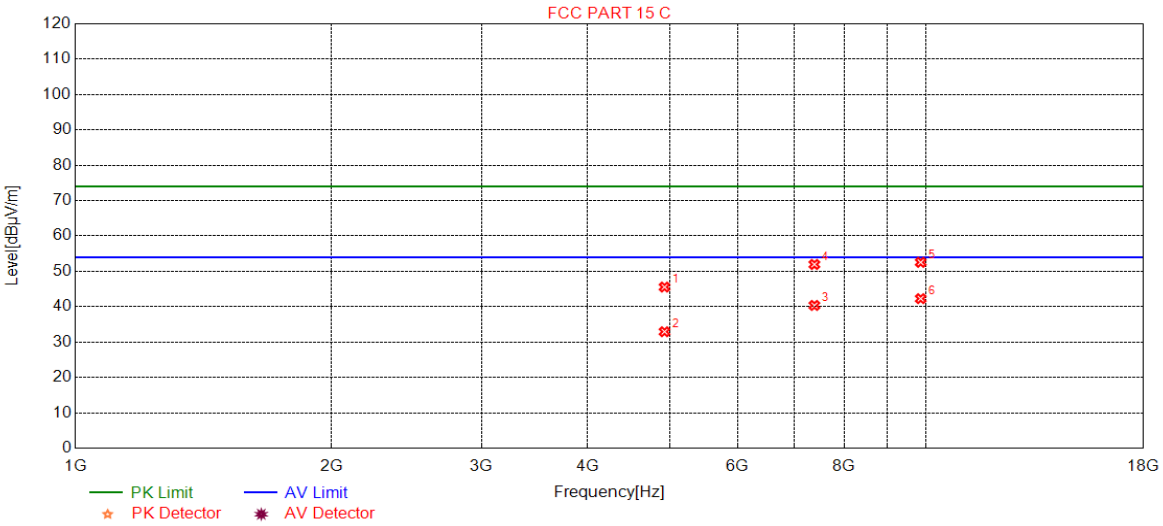
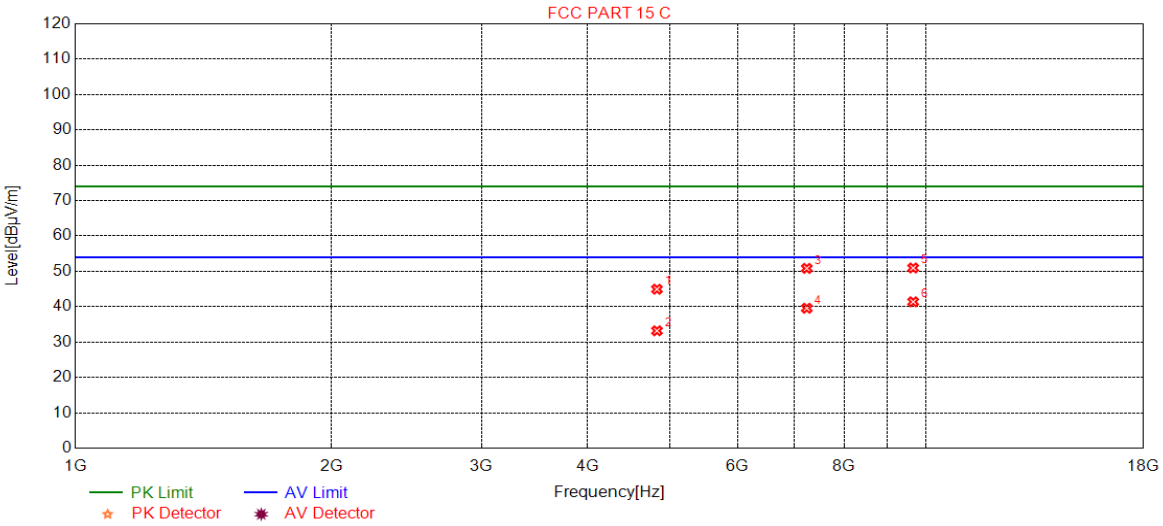
## 4.9.2.1.15 802.11N20_ Highest Channel_ Vertical




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 4924.0000 | 45.56 | 7.64 | 74.00 | 28.44 | 150 | 28 | Vertical |
| 2 | 4924.0000 | 32.93 | 7.64 | 54.00 | 21.07 | 150 | 88 | Vertical |
| 3 | 7386.0000 | 40.37 | 14.54 | 54.00 | 13.63 | 150 | 233 | Vertical |
| 4 | 7386.0000 | 51.95 | 14.54 | 74.00 | 22.05 | 150 | 100 | Vertical |
| 5 | 9848.0000 | 52.55 | 18.80 | 74.00 | 21.45 | 150 | 23 | Vertical |
| 6 | 9848.0000 | 42.28 | 18.80 | 54.00 | 11.72 | 150 | 216 | Vertical |

## 4.9.2.1.16 802.11N20_Lowest Channel_ Horizontal




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 4824.0000 | 44.95 | 7.37 | 74.00 | 29.05 | 150 | 40 | Horizontal |
| 2 | 4824.0000 | 33.19 | 7.37 | 54.00 | 20.81 | 150 | 308 | Horizontal |
| 3 | 7236.0000 | 50.84 | 14.07 | 74.00 | 23.16 | 150 | 89 | Horizontal |
| 4 | 7236.0000 | 39.57 | 14.07 | 54.00 | 14.43 | 150 | 175 | Horizontal |
| 5 | 9648.0000 | 50.96 | 17.97 | 74.00 | 23.04 | 150 | 272 | Horizontal |
| 6 | 9648.0000 | 41.39 | 17.97 | 54.00 | 12.61 | 150 | 16 | Horizontal |



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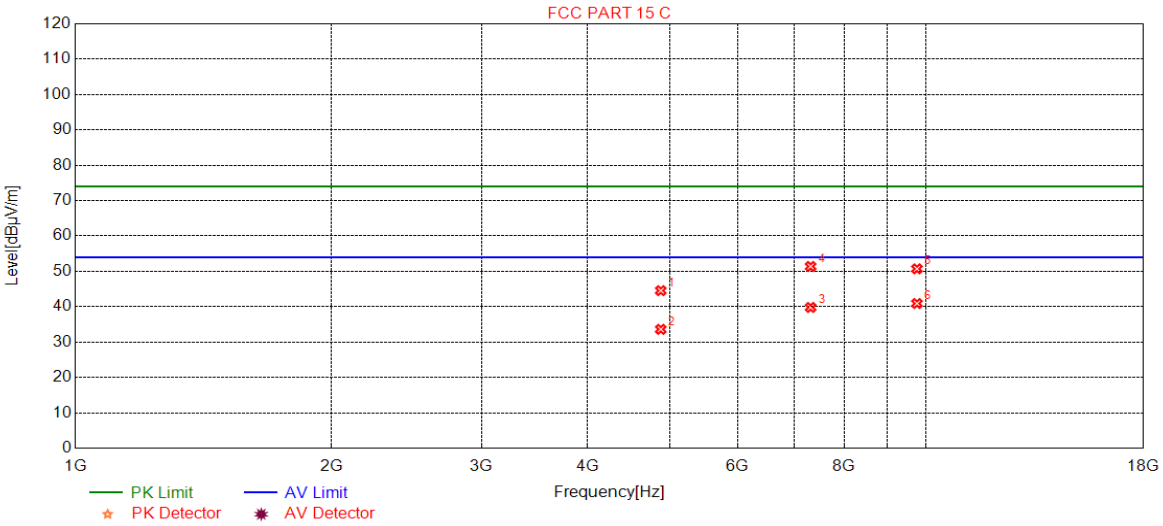
## 4.9.2.1.17 802.11N20_ Middle Channel_ Horizontal




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 4874.0000 | 44.55 | 7.50 | 74.00 | 29.45 | 150 | 117 | Horizontal |
| 2 | 4874.0000 | 33.61 | 7.50 | 54.00 | 20.39 | 150 | 230 | Horizontal |
| 3 | 7311.0000 | 39.80 | 14.29 | 54.00 | 14.20 | 150 | 319 | Horizontal |
| 4 | 7311.0000 | 51.39 | 14.29 | 74.00 | 22.61 | 150 | 206 | Horizontal |
| 5 | 9748.0000 | 50.71 | 18.25 | 74.00 | 23.29 | 150 | 272 | Horizontal |
| 6 | 9748.0000 | 40.91 | 18.25 | 54.00 | 13.09 | 150 | 342 | Horizontal |



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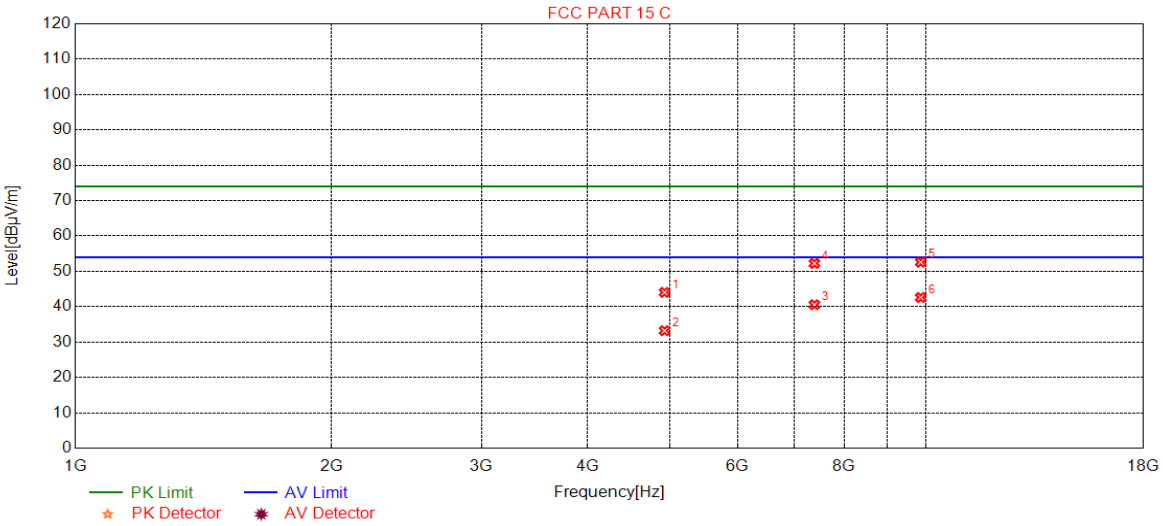
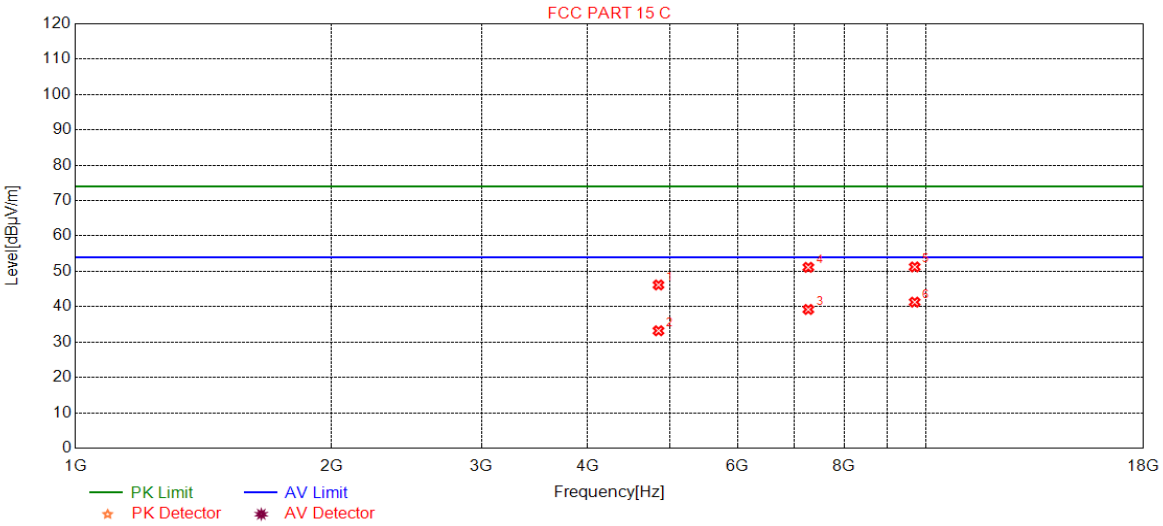
## 4.9.2.1.18 802.11N20_ Highest Channel_ Horizontal



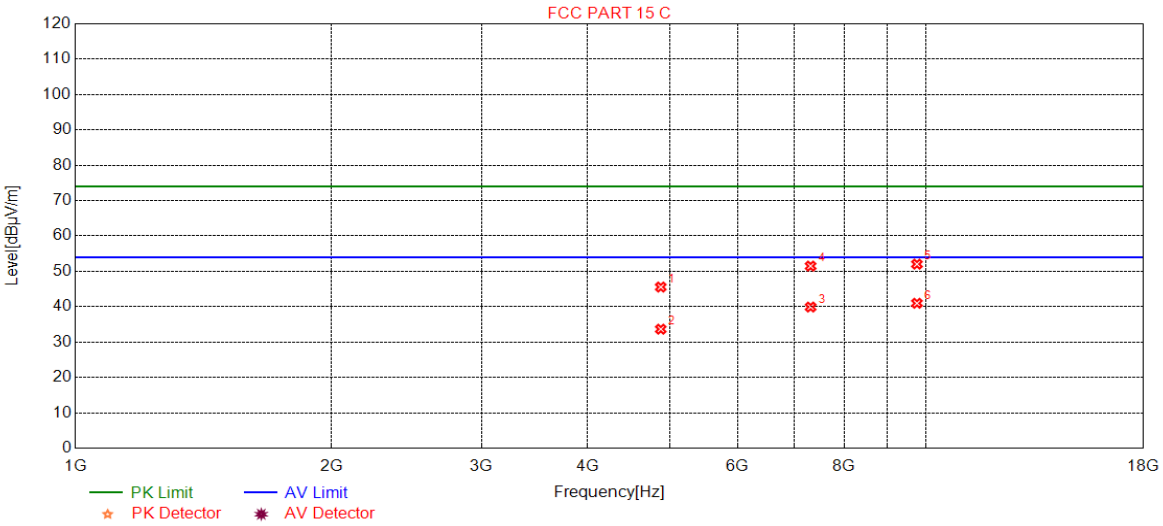

| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 4924.0000 | 44.05 | 7.64 | 74.00 | 29.95 | 150 | 198 | Horizontal |
| 2 | 4924.0000 | 33.23 | 7.64 | 54.00 | 20.77 | 150 | 102 | Horizontal |
| 3 | 7386.0000 | 40.57 | 14.54 | 54.00 | 13.43 | 150 | 271 | Horizontal |
| 4 | 7386.0000 | 52.25 | 14.54 | 74.00 | 21.75 | 150 | 210 | Horizontal |
| 5 | 9848.0000 | 52.60 | 18.80 | 74.00 | 21.40 | 150 | 16 | Horizontal |
| 6 | 9848.0000 | 42.62 | 18.80 | 54.00 | 11.38 | 150 | 208 | Horizontal |

## 4.9.2.1.19 802.11N40_Lowest Channel_ Vertical



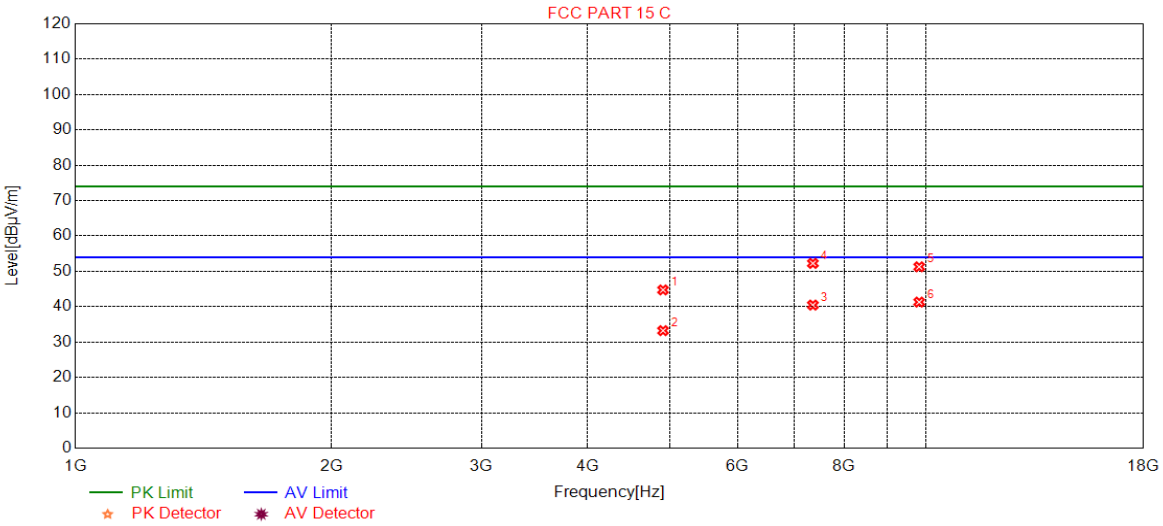

| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 4844.0000 | 46.16 | 7.42 | 74.00 | 27.84 | 150 | 52 | Vertical |
| 2 | 4844.0000 | 33.20 | 7.42 | 54.00 | 20.80 | 150 | 113 | Vertical |
| 3 | 7266.0000 | 39.23 | 14.15 | 54.00 | 14.77 | 150 | 101 | Vertical |
| 4 | 7266.0000 | 51.14 | 14.15 | 74.00 | 22.86 | 150 | 198 | Vertical |
| 5 | 9688.0000 | 51.25 | 18.05 | 74.00 | 22.75 | 150 | 131 | Vertical |
| 6 | 9688.0000 | 41.29 | 18.05 | 54.00 | 12.71 | 150 | 110 | Vertical |

## 4.9.2.1.20 802.11N40_ Middle Channel_ Vertical




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 4874.0000 | 45.57 | 7.50 | 74.00 | 28.43 | 150 | 100 | Vertical |
| 2 | 4874.0000 | 33.65 | 7.50 | 54.00 | 20.35 | 150 | 294 | Vertical |
| 3 | 7311.0000 | 39.91 | 14.29 | 54.00 | 14.09 | 150 | 306 | Vertical |
| 4 | 7311.0000 | 51.49 | 14.29 | 74.00 | 22.51 | 150 | 64 | Vertical |
| 5 | 9748.0000 | 52.04 | 18.25 | 74.00 | 21.96 | 150 | 67 | Vertical |
| 6 | 9748.0000 | 40.98 | 18.25 | 54.00 | 13.02 | 150 | 217 | Vertical |

## 4.9.2.1.21 802.11N40_ Highest Channel_ Vertical




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 4904.0000 | 44.75 | 7.58 | 74.00 | 29.25 | 150 | 52 | Vertical |
| 2 | 4904.0000 | 33.23 | 7.58 | 54.00 | 20.77 | 150 | 40 | Vertical |
| 3 | 7356.0000 | 40.47 | 14.44 | 54.00 | 13.53 | 150 | 148 | Vertical |
| 4 | 7356.0000 | 52.26 | 14.44 | 74.00 | 21.74 | 150 | 245 | Vertical |
| 5 | 9808.0000 | 51.29 | 18.49 | 74.00 | 22.71 | 150 | 152 | Vertical |
| 6 | 9808.0000 | 41.31 | 18.49 | 54.00 | 12.69 | 150 | 238 | Vertical |



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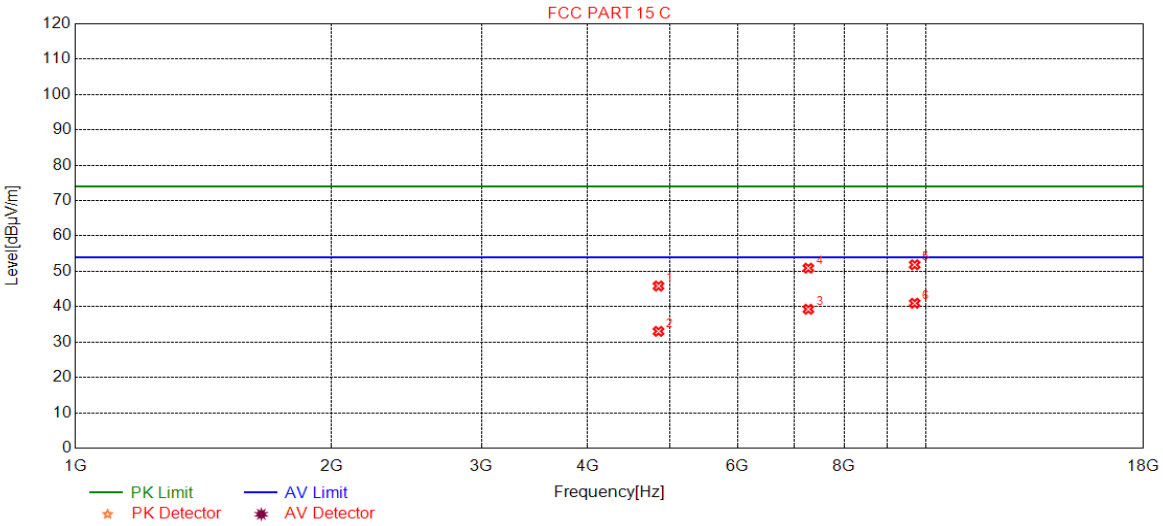
## 4.9.2.1.22 802.11N40_Lowest Channel_ Horizontal




**Suspected List**

| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 4844.0000 | 45.86 | 7.42 | 74.00 | 28.14 | 150 | 223 | Horizontal |
| 2 | 4844.0000 | 33.03 | 7.42 | 54.00 | 20.97 | 150 | 175 | Horizontal |
| 3 | 7266.0000 | 39.29 | 14.15 | 54.00 | 14.71 | 150 | 151 | Horizontal |
| 4 | 7266.0000 | 50.91 | 14.15 | 74.00 | 23.09 | 150 | 102 | Horizontal |
| 5 | 9688.0000 | 51.87 | 18.05 | 74.00 | 22.13 | 150 | 16 | Horizontal |
| 6 | 9688.0000 | 40.98 | 18.05 | 54.00 | 13.02 | 150 | 123 | Horizontal |



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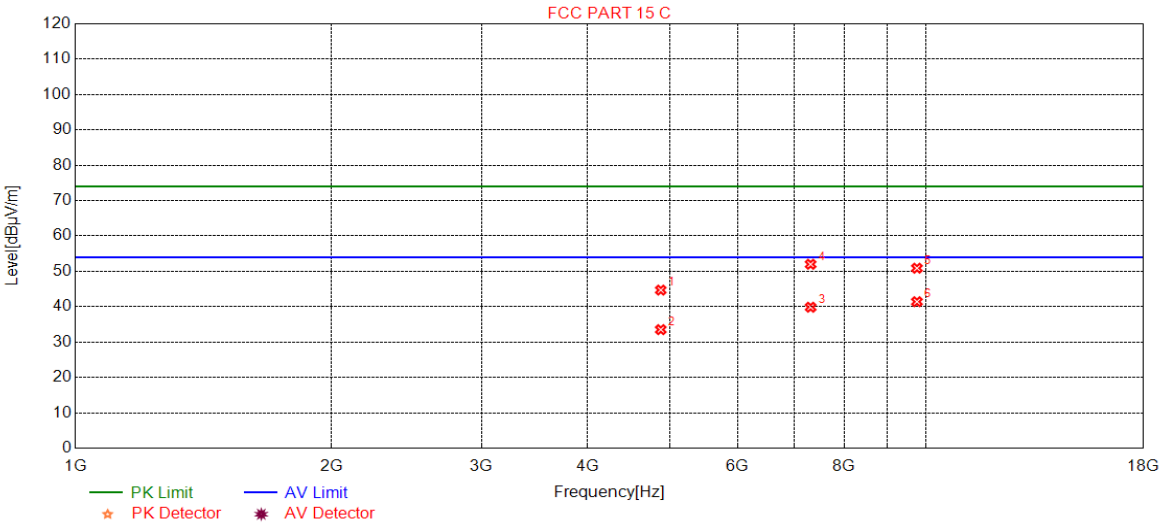
### 4.9.2.1.23 802.11N40_ Middle Channel_ Horizontal




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 4874.0000 | 44.70 | 7.50 | 74.00 | 29.30 | 150 | 308 | Horizontal |
| 2 | 4874.0000 | 33.52 | 7.50 | 54.00 | 20.48 | 150 | 18 | Horizontal |
| 3 | 7311.0000 | 39.86 | 14.29 | 54.00 | 14.14 | 150 | 175 | Horizontal |
| 4 | 7311.0000 | 52.00 | 14.29 | 74.00 | 22.00 | 150 | 321 | Horizontal |
| 5 | 9748.0000 | 50.89 | 18.25 | 74.00 | 23.11 | 150 | 208 | Horizontal |
| 6 | 9748.0000 | 41.42 | 18.25 | 54.00 | 12.58 | 150 | 16 | Horizontal |



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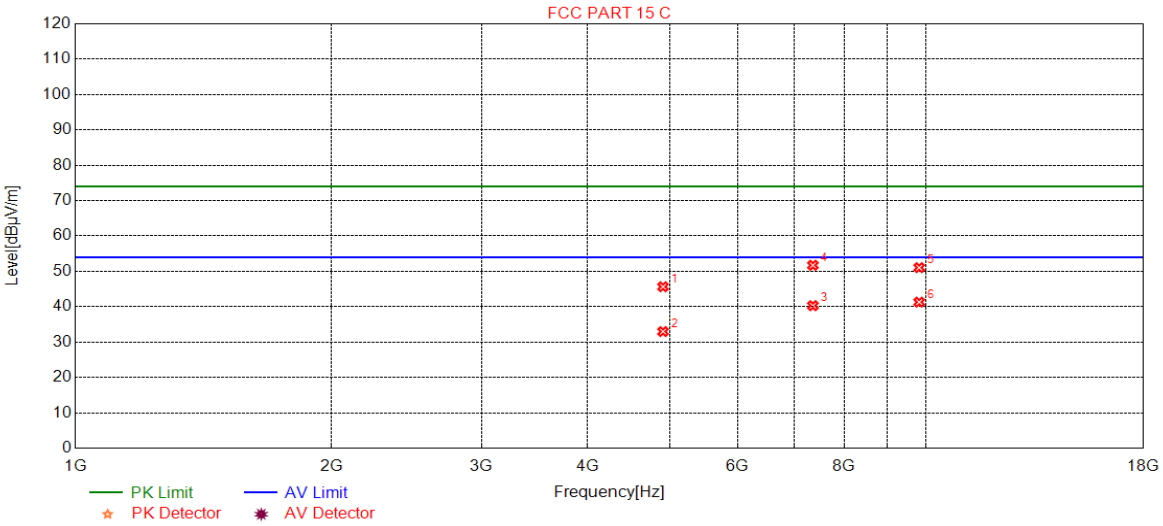
### 4.9.2.1.24 802.11N40_ Highest Channel_ Horizontal




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 4904.0000 | 45.65 | 7.58 | 74.00 | 28.35 | 150 | 61 | Horizontal |
| 2 | 4904.0000 | 32.98 | 7.58 | 54.00 | 21.02 | 150 | 332 | Horizontal |
| 3 | 7356.0000 | 40.29 | 14.44 | 54.00 | 13.71 | 150 | 344 | Horizontal |
| 4 | 7356.0000 | 51.72 | 14.44 | 74.00 | 22.28 | 150 | 344 | Horizontal |
| 5 | 9808.0000 | 51.05 | 18.49 | 74.00 | 22.95 | 150 | 252 | Horizontal |
| 6 | 9808.0000 | 41.30 | 18.49 | 54.00 | 12.70 | 150 | 273 | Horizontal |

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

   Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) Scan from 9kHz to 25GHz, the disturbance between 9KHz to 30MHz and 18GHz to 25GHz was very low, and the above harmonics were the highest point could be found when testing, The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3）As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

4）All Modes have been tested, but only the worst case data displayed in this report.

## 4.10 Restricted bands around fundamental frequency

| | | | |
|---|---|---|---|
| Test Requirement: | 47 CFR Part 15C Section 15.209 and 15.205 | | |
| Test Method: | ANSI C63.10: 2013 Section 11.12 | | |
| Test Site: | Measurement Distance: 3m or 10m (Semi-Anechoic Chamber) | | |
| Limit: | Frequency | Limit (dBuV/m @3m) | Remark |
| | 30MHz-88MHz | 40.0 | Quasi-peak Value |
| | 88MHz-216MHz | 43.5 | Quasi-peak Value |
| | 216MHz-960MHz | 46.0 | Quasi-peak Value |
| | 960MHz-1GHz | 54.0 | Quasi-peak Value |
| | Above 1GHz | 54.0 | Average Value |
| | | 74.0 | Peak Value |
| Test Setup: | | | |

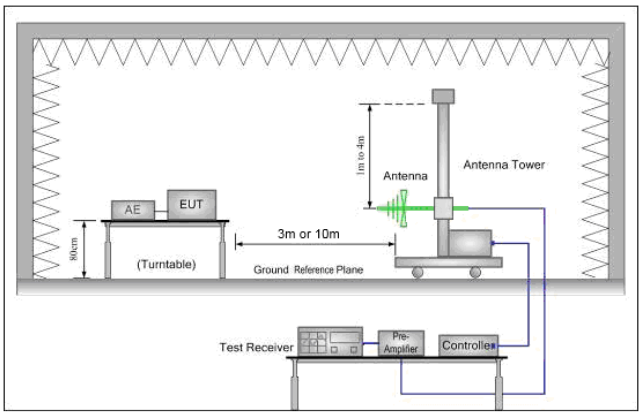



Figure 1. 30MHz to 1GHz

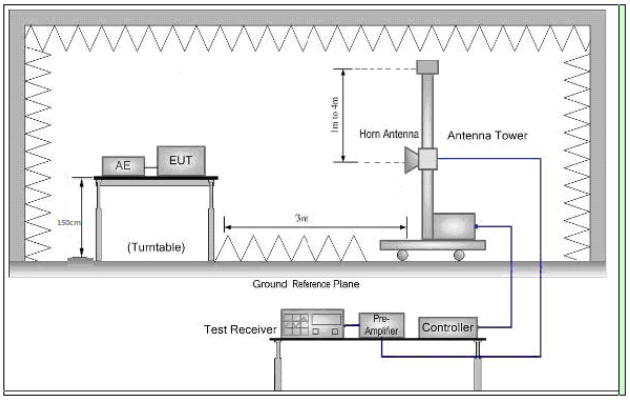



Figure 2. Above 1 GHz

| | |
|---|---|
| Test Procedure: | a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.<br>b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.<br>c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.<br>d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.<br>e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.<br>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.<br>g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel<br>h. Test the EUT in the lowest channel , the Highest channel<br>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode,And found the X axis positioning which it is worse case.<br>j. Repeat above procedures until all frequencies measured was complete. |
| Exploratory Test Mode: | Transmitting with all kind of modulations, data rates.<br>Charge + Transmitting mode. |
| Final Test Mode: | Pretest the EUT at Charge +Transmitting mode.<br>Through Pre-scan, find the<br>1Mbps of rate is the worst case of 802.11B;<br>6Mbps of rate is the worst case of 802.11G ;<br>6.5Mbps of rate is the worst case of 802.11N(HT20);<br>13.5Mbps of rate is the worst case of 802.11N(HT40).<br>Only the worst case is recorded in the report. |
| Instruments Used: | Refer to section 5.10 for details |
| Test Results: | Pass |



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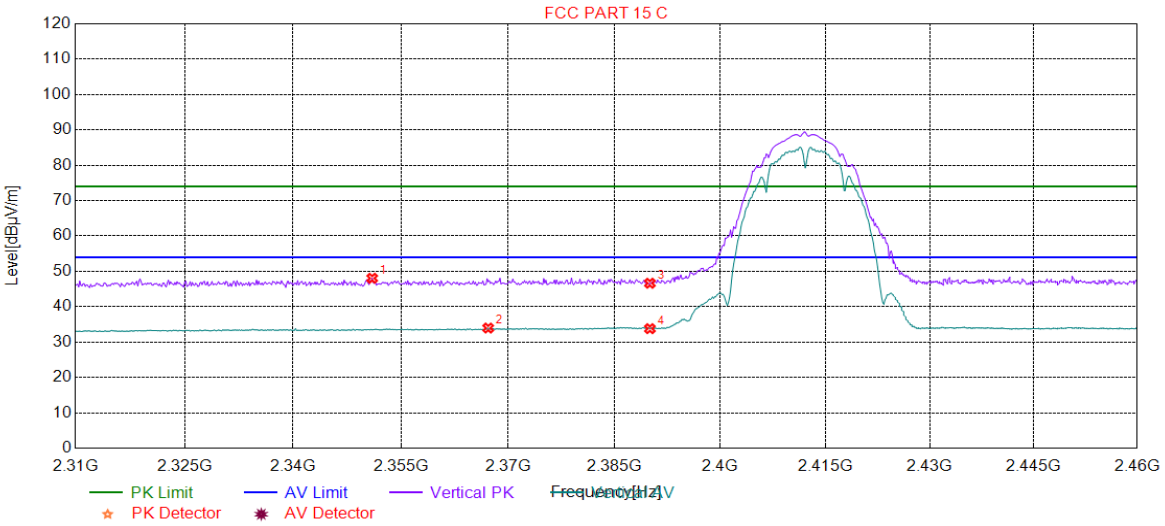
**Test plot as follows:**

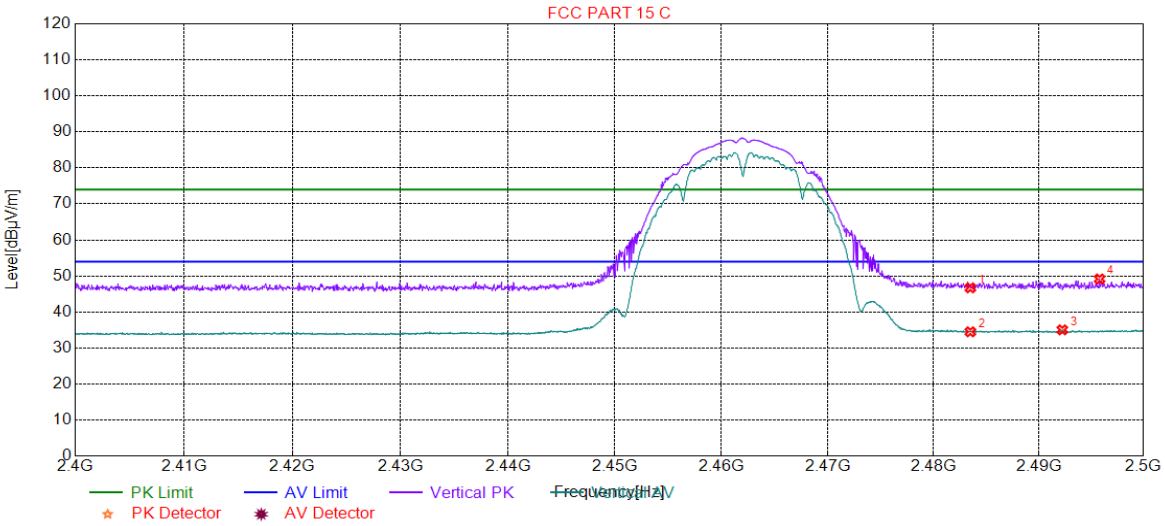
### 4.10.1 ANT1

### 4.10.1.1 802.11B_Lowest Channel_ Vertical



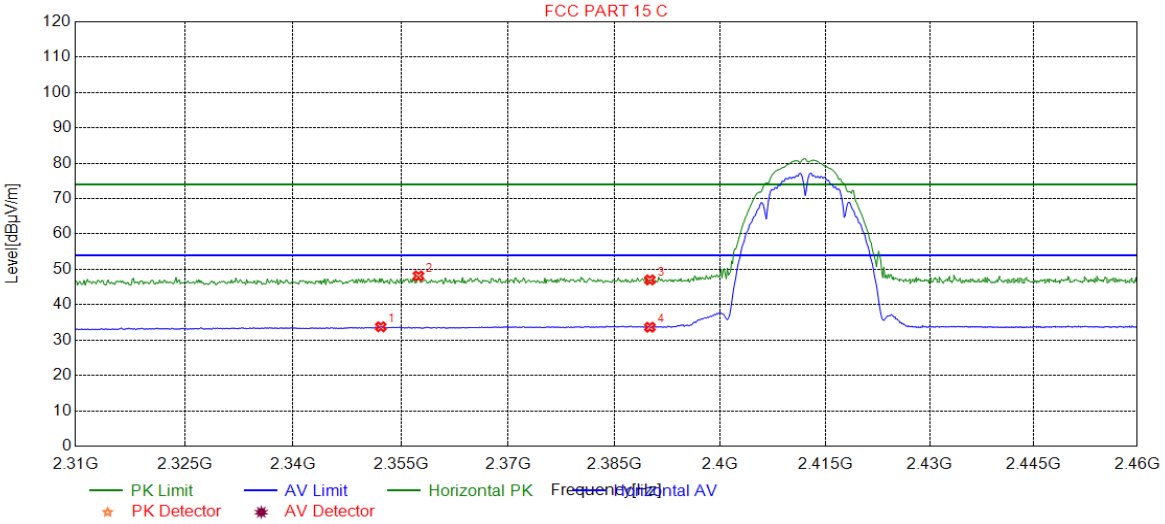

| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 2350.9910 | 48.05 | 1.07 | 74.00 | 25.95 | 150 | 75 | Vertical |
| 2 | 2367.2072 | 33.97 | 1.15 | 54.00 | 20.03 | 150 | 177 | Vertical |
| 3 | 2390.0000 | 46.64 | 1.25 | 74.00 | 27.36 | 150 | 137 | Vertical |
| 4 | 2390.0000 | 33.80 | 1.25 | 54.00 | 20.20 | 150 | 12 | Vertical |

### 4.10.1.2 802.11B_ Highest Channel_ Vertical




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 2483.5000 | 46.70 | 1.52 | 74.00 | 27.30 | 150 | 61 | Vertical |
| 2 | 2483.5000 | 34.50 | 1.52 | 54.00 | 19.50 | 150 | 339 | Vertical |
| 3 | 2492.2461 | 35.05 | 1.55 | 54.00 | 18.95 | 150 | 92 | Vertical |
| 4 | 2495.7979 | 49.17 | 1.56 | 74.00 | 24.83 | 150 | 177 | Vertical |

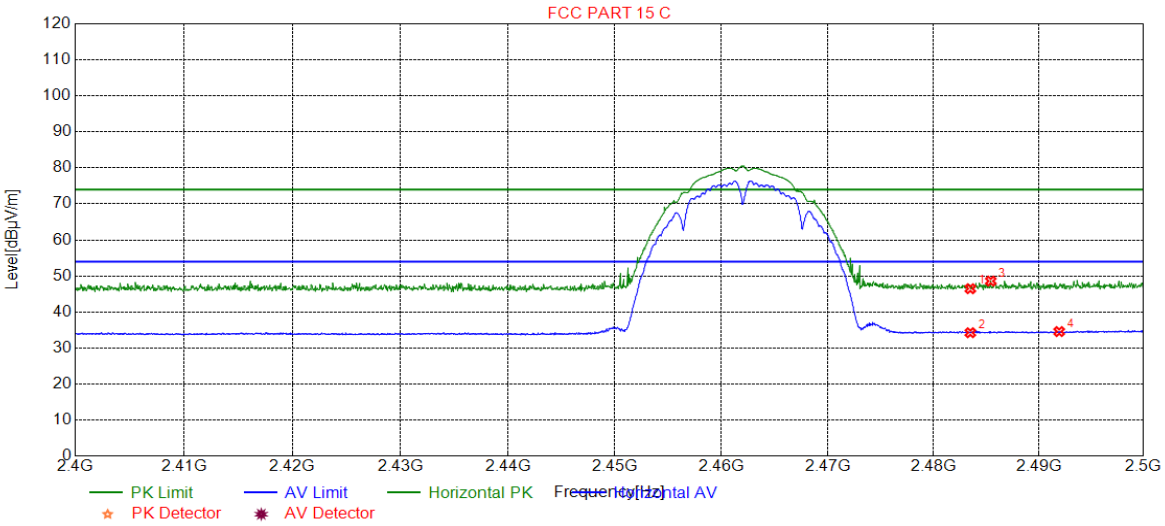
### 4.10.1.3 802.11B_Lowest Channel_ Horizontal




**Suspected List**

| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 2352.1922 | 33.76 | 1.08 | 54.00 | 20.24 | 150 | 51 | Horizontal |
| 2 | 2357.4474 | 48.15 | 1.10 | 74.00 | 25.85 | 150 | 17 | Horizontal |
| 3 | 2390.0000 | 47.02 | 1.25 | 74.00 | 26.98 | 150 | 23 | Horizontal |
| 4 | 2390.0000 | 33.64 | 1.25 | 54.00 | 20.36 | 150 | 26 | Horizontal |

### 4.10.1.4 802.11B_ Highest Channel_ Horizontal




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 2483.5000 | 46.46 | 1.52 | 74.00 | 27.54 | 150 | 48 | Horizontal |
| 2 | 2483.5000 | 34.25 | 1.52 | 54.00 | 19.75 | 150 | 147 | Horizontal |
| 3 | 2485.4427 | 48.58 | 1.53 | 74.00 | 25.42 | 150 | 185 | Horizontal |
| 4 | 2491.9460 | 34.57 | 1.55 | 54.00 | 19.43 | 150 | 14 | Horizontal |



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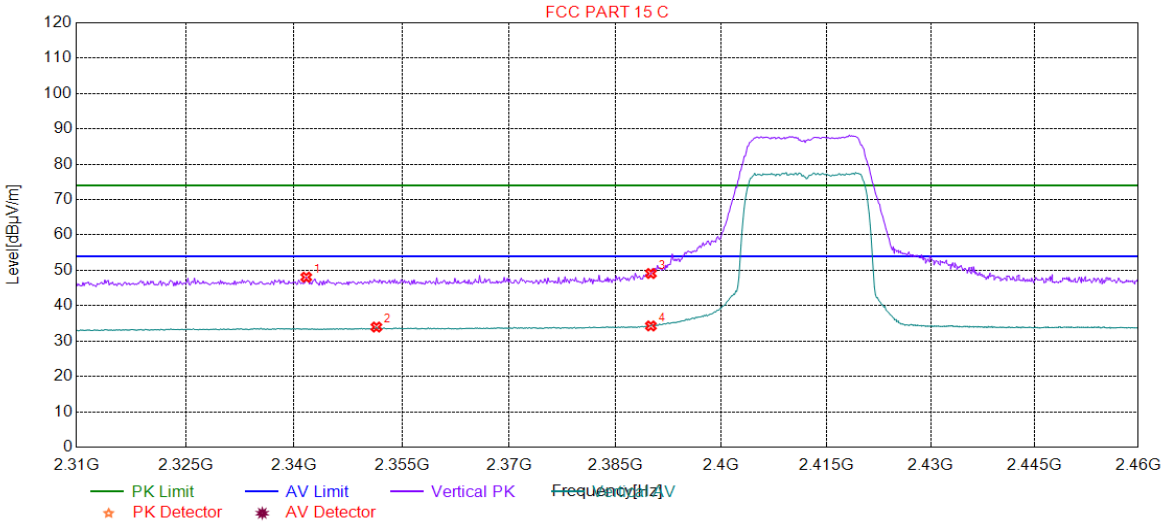
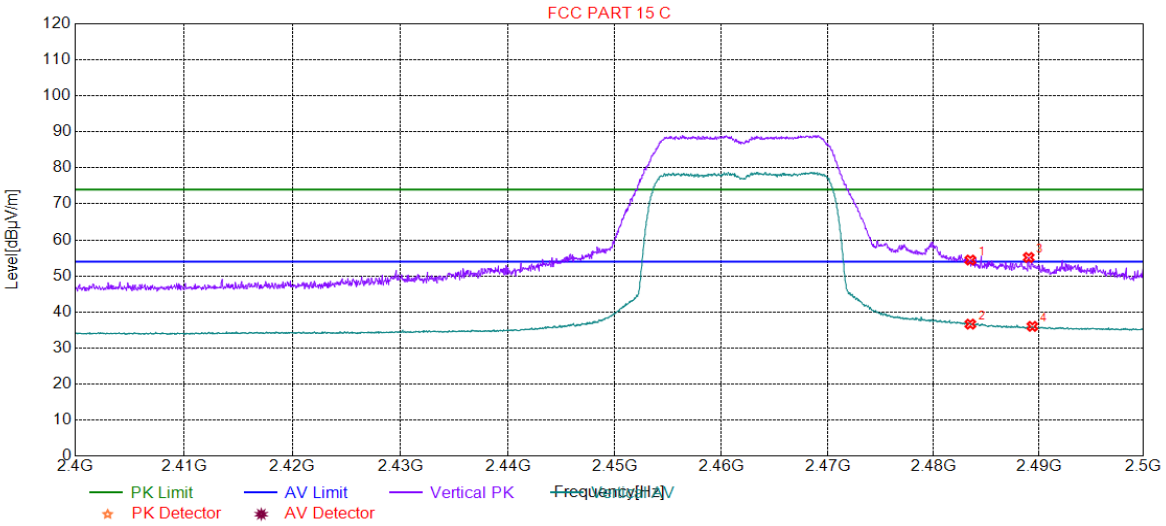
### 4.10.1.5 802.11G_Lowest Channel_ Vertical



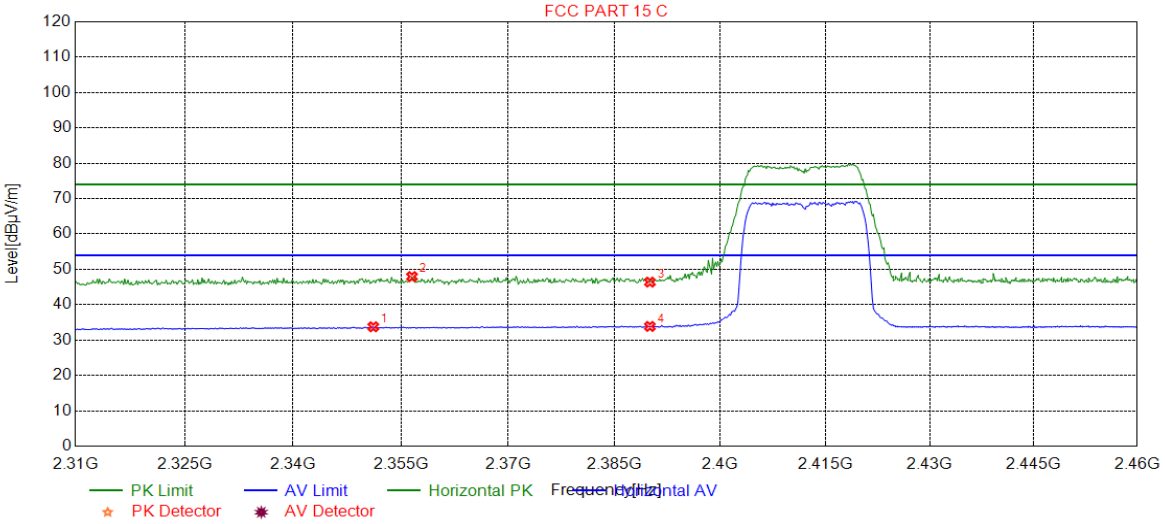

| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 2341.6817 | 48.07 | 1.03 | 74.00 | 25.93 | 150 | 80 | Vertical |
| 2 | 2351.4414 | 33.97 | 1.08 | 54.00 | 20.03 | 150 | 21 | Vertical |
| 3 | 2390.0000 | 49.11 | 1.25 | 74.00 | 24.89 | 150 | 42 | Vertical |
| 4 | 2390.0000 | 34.28 | 1.25 | 54.00 | 19.72 | 150 | 180 | Vertical |

### 4.10.1.6 802.11G_ Highest Channel_ Vertical




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 2483.5000 | 54.42 | 1.52 | 74.00 | 19.58 | 150 | 31 | Vertical |
| 2 | 2483.5000 | 36.64 | 1.52 | 54.00 | 17.36 | 150 | 31 | Vertical |
| 3 | 2489.0445 | 55.13 | 1.54 | 74.00 | 18.87 | 150 | 346 | Vertical |
| 4 | 2489.3947 | 36.01 | 1.54 | 54.00 | 17.99 | 150 | 290 | Vertical |

### 4.10.1.7 802.11G_Lowest Channel_ Horizontal




**Suspected List**

| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 2351.1411 | 33.76 | 1.08 | 54.00 | 20.24 | 150 | 116 | Horizontal |
| 2 | 2356.5465 | 47.95 | 1.10 | 74.00 | 26.05 | 150 | 263 | Horizontal |
| 3 | 2390.0000 | 46.39 | 1.25 | 74.00 | 27.61 | 150 | 14 | Horizontal |
| 4 | 2390.0000 | 33.87 | 1.25 | 54.00 | 20.13 | 150 | 266 | Horizontal |



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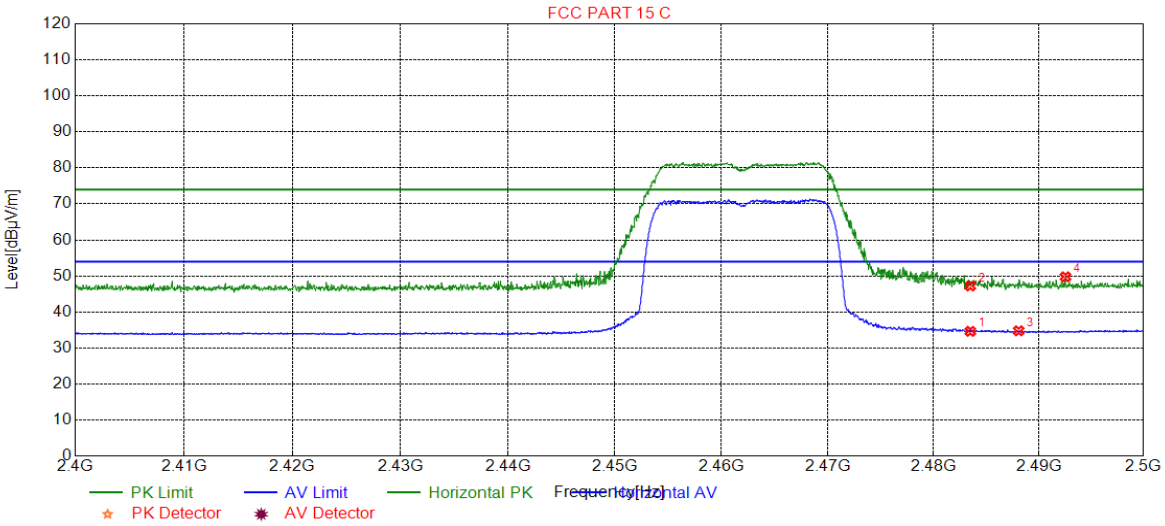
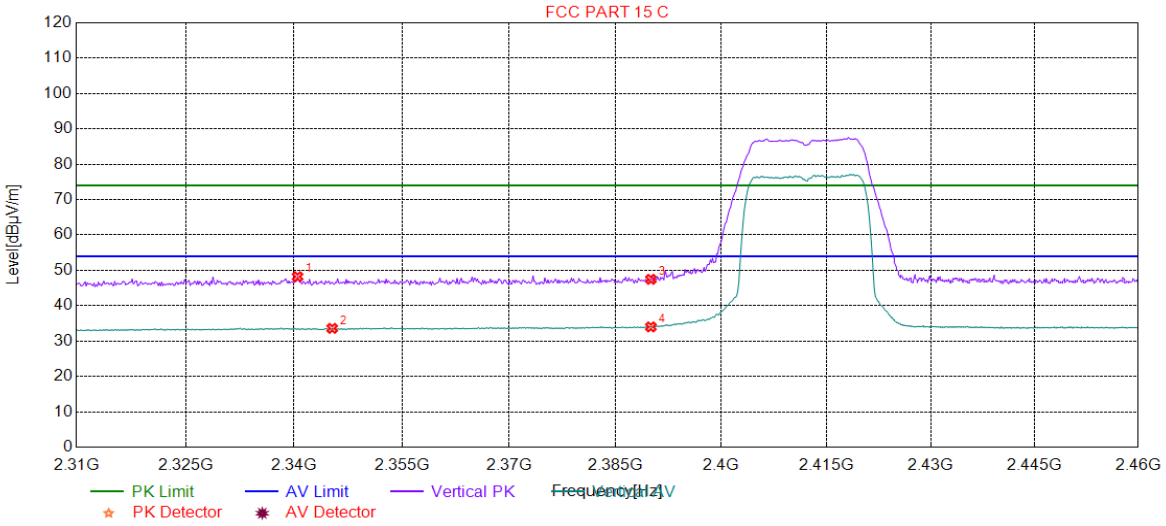
### 4.10.1.8 802.11G_ Highest Channel_ Horizontal



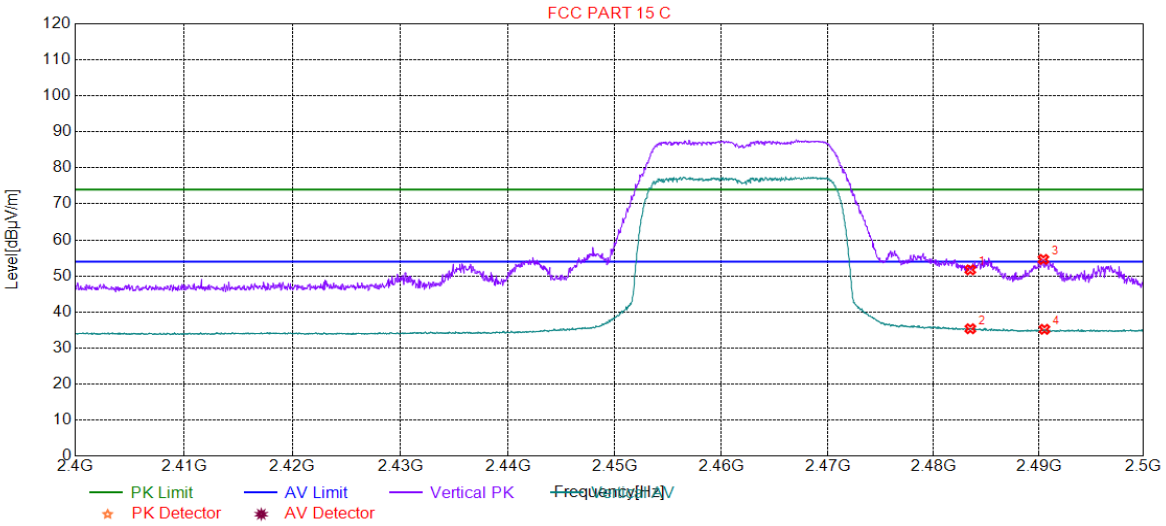

| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 2483.5000 | 34.63 | 1.52 | 54.00 | 19.37 | 150 | 247 | Horizontal |
| 2 | 2483.5000 | 47.22 | 1.52 | 74.00 | 26.78 | 150 | 106 | Horizontal |
| 3 | 2488.0940 | 34.78 | 1.54 | 54.00 | 19.22 | 150 | 244 | Horizontal |
| 4 | 2492.5463 | 49.77 | 1.55 | 74.00 | 24.23 | 150 | 244 | Horizontal |

## 4.10.1.9 802.11N20_Lowest Channel_ Vertical



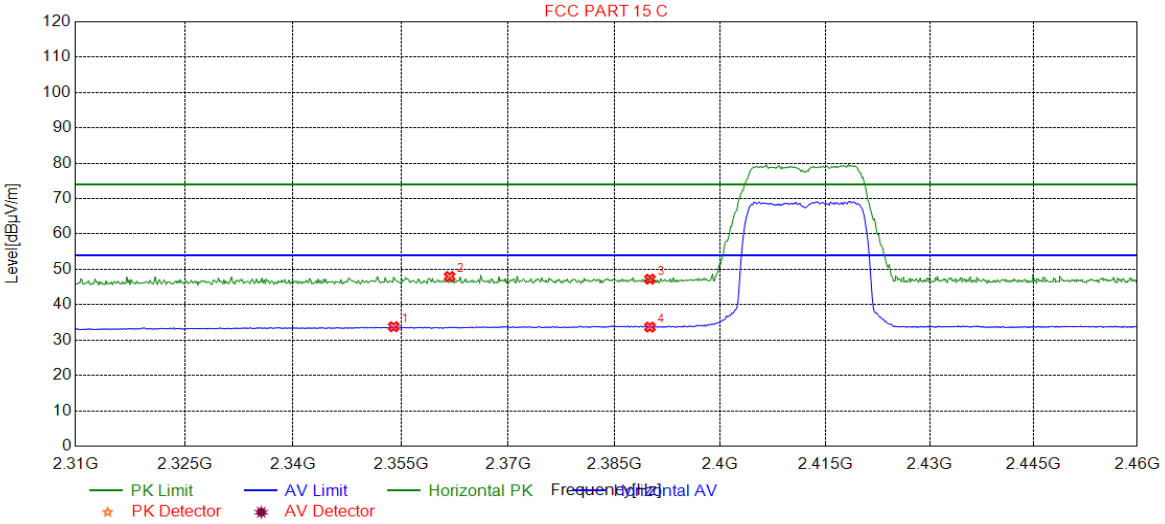

| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 2340.4805 | 48.22 | 1.03 | 74.00 | 25.78 | 150 | 292 | Vertical |
| 2 | 2345.2853 | 33.60 | 1.05 | 54.00 | 20.40 | 150 | 231 | Vertical |
| 3 | 2390.0000 | 47.47 | 1.25 | 74.00 | 26.53 | 150 | 176 | Vertical |
| 4 | 2390.0000 | 34.02 | 1.25 | 54.00 | 19.98 | 150 | 198 | Vertical |

## 4.10.1.10 802.11N20_ Highest Channel_ Vertical




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 2483.5000 | 51.70 | 1.52 | 74.00 | 22.30 | 150 | 324 | Vertical |
| 2 | 2483.5000 | 35.36 | 1.52 | 54.00 | 18.64 | 150 | 108 | Vertical |
| 3 | 2490.4452 | 54.60 | 1.54 | 74.00 | 19.40 | 150 | 319 | Vertical |
| 4 | 2490.5453 | 35.19 | 1.54 | 54.00 | 18.81 | 150 | 100 | Vertical |

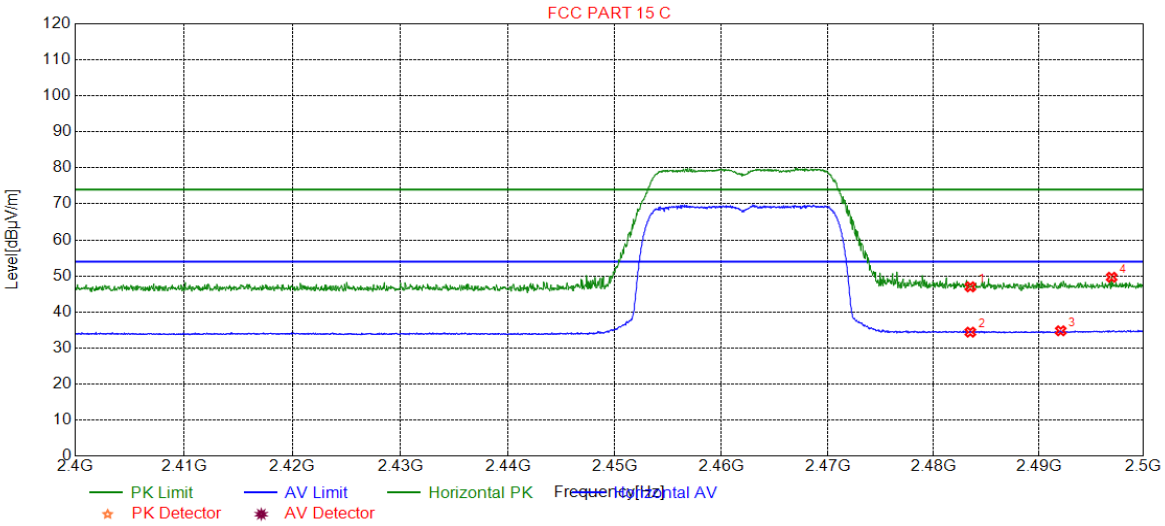
## 4.10.1.11 802.11N20_Lowest Channel_ Horizontal




**Suspected List**

| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 2353.9940 | 33.78 | 1.09 | 54.00 | 20.22 | 150 | 168 | Horizontal |
| 2 | 2361.8018 | 47.98 | 1.12 | 74.00 | 26.02 | 150 | 96 | Horizontal |
| 3 | 2390.0000 | 47.23 | 1.25 | 74.00 | 26.77 | 150 | 278 | Horizontal |
| 4 | 2390.0000 | 33.67 | 1.25 | 54.00 | 20.33 | 150 | 219 | Horizontal |

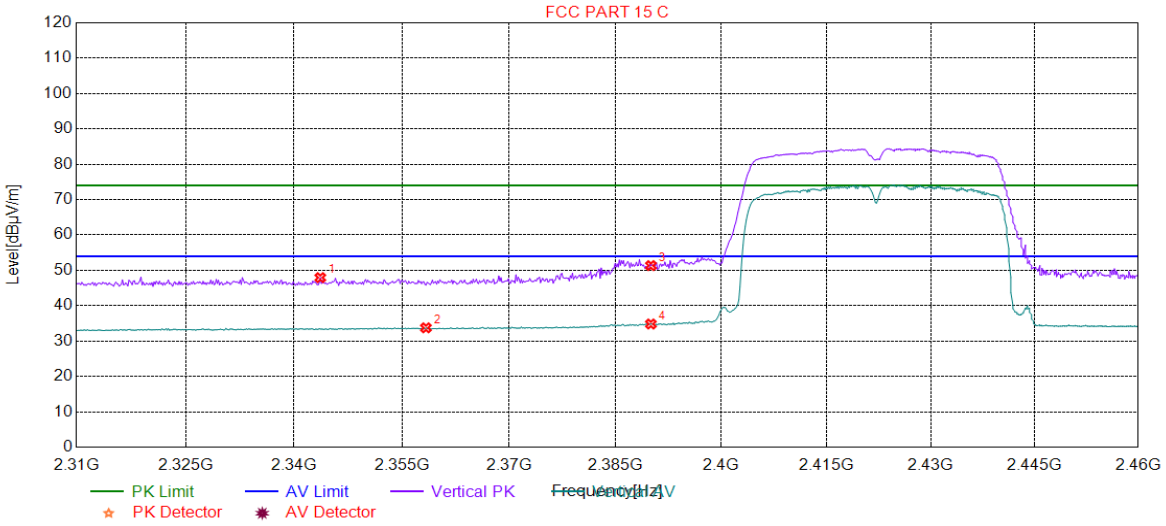
## 4.10.1.12 802.11N20_ Highest Channel_ Horizontal




**Suspected List**

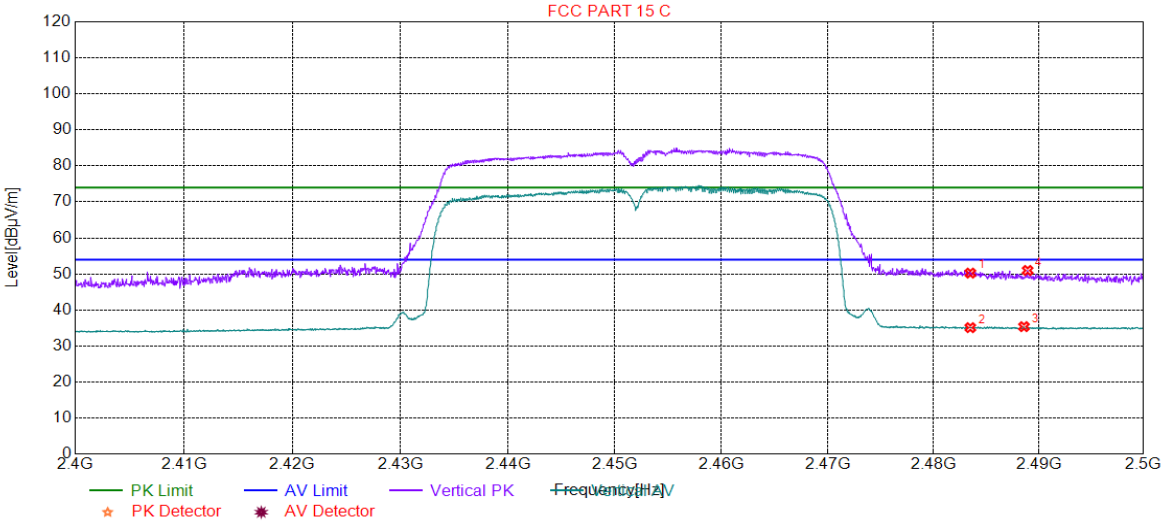
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 2483.5000 | 46.98 | 1.52 | 74.00 | 27.02 | 150 | 247 | Horizontal |
| 2 | 2483.5000 | 34.40 | 1.52 | 54.00 | 19.60 | 150 | 14 | Horizontal |
| 3 | 2492.0960 | 34.78 | 1.55 | 54.00 | 19.22 | 150 | 262 | Horizontal |
| 4 | 2496.9485 | 49.65 | 1.56 | 74.00 | 24.35 | 150 | 14 | Horizontal |

## 4.10.1.13 802.11N40_Lowest Channel_ Vertical



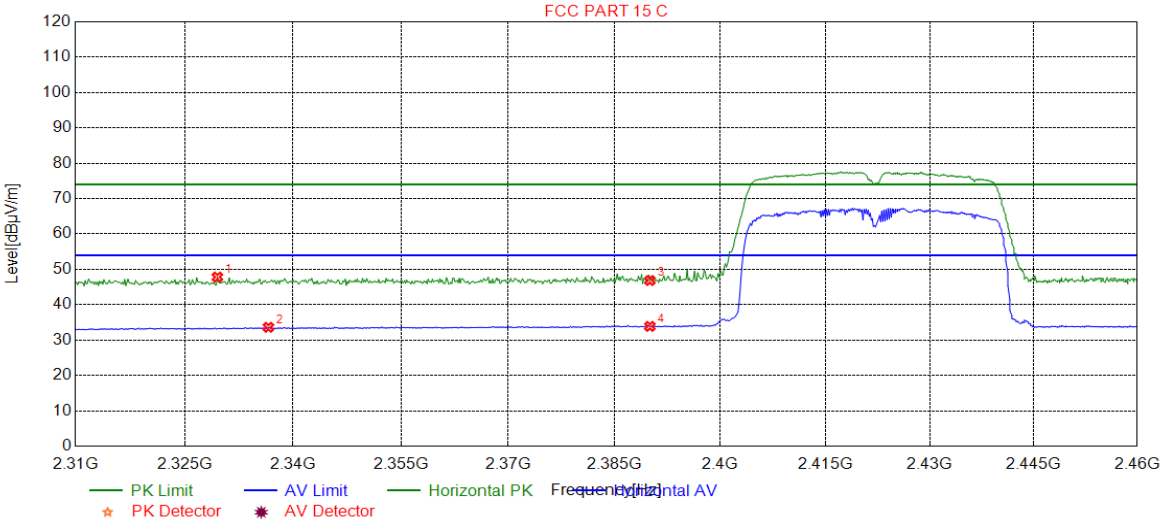

| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 2343.6336 | 47.94 | 1.04 | 74.00 | 26.06 | 150 | 231 | Vertical |
| 2 | 2358.3483 | 33.75 | 1.11 | 54.00 | 20.25 | 150 | 52 | Vertical |
| 3 | 2390.0000 | 51.34 | 1.25 | 74.00 | 22.66 | 150 | 146 | Vertical |
| 4 | 2390.0000 | 34.83 | 1.25 | 54.00 | 19.17 | 150 | 319 | Vertical |

### 4.10.1.14 802.11N40_ Highest Channel_ Vertical




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 2483.5000 | 50.24 | 1.52 | 74.00 | 23.76 | 150 | 2 | Vertical |
| 2 | 2483.5000 | 35.10 | 1.52 | 54.00 | 18.90 | 150 | 100 | Vertical |
| 3 | 2488.5943 | 35.38 | 1.54 | 54.00 | 18.62 | 150 | 293 | Vertical |
| 4 | 2488.9445 | 50.97 | 1.54 | 74.00 | 23.03 | 150 | 2 | Vertical |

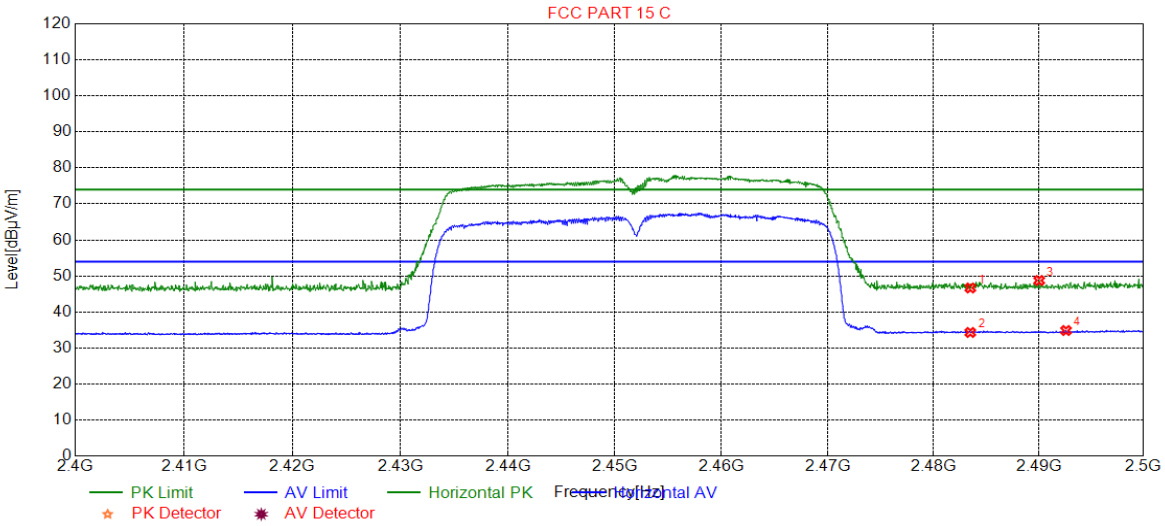
## 4.10.1.15 802.11N40_Lowest Channel_ Horizontal




**Suspected List**

| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|---|---|---|---|---|---|---|---|---|
| 1 | 2329.5195 | 47.82 | 0.98 | 74.00 | 26.18 | 150 | 22 | Horizontal |
| 2 | 2336.5766 | 33.62 | 1.01 | 54.00 | 20.38 | 150 | 240 | Horizontal |
| 3 | 2390.0000 | 46.85 | 1.25 | 74.00 | 27.15 | 150 | 62 | Horizontal |
| 4 | 2390.0000 | 33.88 | 1.25 | 54.00 | 20.12 | 150 | 243 | Horizontal |

### 4.10.1.16 802.11N40_ Highest Channel_ Horizontal




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 2483.5000 | 46.67 | 1.52 | 74.00 | 27.33 | 150 | 166 | Horizontal |
| 2 | 2483.5000 | 34.32 | 1.52 | 54.00 | 19.68 | 150 | 98 | Horizontal |
| 3 | 2490.0450 | 48.74 | 1.54 | 74.00 | 25.26 | 150 | 56 | Horizontal |
| 4 | 2492.5963 | 34.86 | 1.55 | 54.00 | 19.14 | 150 | 94 | Horizontal |

*Remark:*
*The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:*
*Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor*

All Modes have been tested, but only the worst case data displayed in this report.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# 5 Measurement Uncertainty (95% confidence levels, k=2)

| No. | Item | Measurement Uncertainty |
|---|---|---|
| 1 | Total RF power, conducted | ±0.75dB |
| 2 | RF power density, conducted | ±2.84dB |
| 3 | Spurious emissions, conducted | ±0.75dB |
| 4 | Radiated Spurious emission test | ±4.5dB (30MHz-1GHz) |
| | | ±4.8dB (1GHz-25GHz) |
| 5 | Conduct emission test | ±3.12 dB (9KHz- 30MHz) |
| 6 | Temperature test | ±1°C |
| 7 | Humidity test | ±3% |
| 8 | DC and low frequency voltages | ±0.5% |

# 6 Equipment List

| Conducted Emission | | | | | |
|---|---|---|---|---|---|
| Test Equipment | Manufacturer | Model No. | Inventory No. | Cal. date (yyyy-mm-dd) | Cal.Duedate (yyyy-mm-dd) |
| Shielding Room | ZhongYu Electron | GB-88 | SEM001-06 | 2017/5/10 | 2020/5/9 |
| LISN | Rohde & Schwarz | ENV216 | SEM007-01 | 2018/9/2 | 2019/9/2 |
| LISN | ETS-LINDGREN | Feb-16 | SEM007-02 | 2018/4/2 | 2019/4/1 |
| Measurement Software | AUDIX | e3 V5.4.1221d | N/A | N/A | N/A |
| Coaxial Cable | SGS | N/A | SEM024-01 | 2018/7/12 | 2019/7/11 |
| 2 Line ISN | Fischer Custom Communications Inc. | FCC-TLISN-T2-02 | EMC0122 | 2019/2/11 | 2020/2/10 |
| EMI Test Receiver | Rohde & Schwarz | ESCI | SEM004-02 | 2018/4/2 | 2019/4/1 |

| RF conducted test | | | | | |
|---|---|---|---|---|---|
| Test Equipment | Manufacturer | Model No. | Inventory No. | Cal. date (yyyy-mm-dd) | Cal.Duedate (yyyy-mm-dd) |
| DC Power Supply | Agilent Technologies Inc | 66311B | W009-09 | 2018/9/15 | 2019/9/15 |
| Signal Analyzer | Rohde & Schwarz | FSV | W025-05 | 2018/3/13 | 2019/3/12 |
| Coaxial Cable | SGS | N/A | SEM031-01 | 2018/7/13 | 2019/7/12 |
| Attenuator | Weinschel Associates | WA41 | SEM021-09 | N/A | N/A |
| Signal Generator | KEYSIGHT | N5173B | SEM006-05 | 2018/9/2 | 2019/9/2 |
| Temperature Chamber | GIANT FORCE | ICT-150-40-CP-AR | W027-03 | 2018/11/27 | 2019/11/27 |
| Power Meter | Rohde & Schwarz | NRVS | SEM014-02 | 2018/9/2 | 2019/9/2 |

| RE in Chamber | | | | | |
|---|---|---|---|---|---|
| Test Equipment | Manufacturer | Model No. | Inventory No. | Cal. date (yyyy-mm-dd) | Cal.Due date (yyyy-mm-dd) |
| 3m Semi-Anechoic Chamber | ETS-LINDGREN | N/A | SEM001-01 | 2017/8/5 | 2020/8/4 |
| Measurement Software | AUDIX | e3 V8.2014-6-27 | N/A | N/A | N/A |
| Coaxial Cable | SGS | N/A | SEM025-01 | 2018/7/12 | 2019/7/11 |
| MXE EMI Receiver (20Hz-8.4GHz) | Agilent Technologies | N9038A | SEM004-05 | 2018/9/2 | 2019/9/2 |
| BiConiLog Antenna (26-3000MHz) | ETS-LINDGREN | 3142C | SEM003-01 | 2017/6/27 | 2020/6/26 |
| Pre-amplifier (0.1-1.3GHz) | Agilent Technologies | 8447D | SEM005-01 | 2018/4/2 | 2019/4/1 |

| RE in Chamber | | | | | |
|---|---|---|---|---|---|
| Test Equipment | Manufacturer | Model No. | Inventory No. | Cal. date (yyyy-mm-dd) | Cal.Due date (yyyy-mm-dd) |
| 3m Semi-Anechoic Chamber | AUDIX | N/A | SEM001-02 | 2018/3/13 | 2021/3/12 |
| Measurement Software | AUDIX | e3V8.2014-6-27 | N/A | N/A | N/A |
| Coaxial Cable | SGS | N/A | SEM026-01 | 2018/7/12 | 2019/7/11 |
| EXA Signal Analyzer (10Hz-26.5GHz) | Agilent Technologies Inc | N9010A | SEM004-09 | 2018/4/13 | 2019/4/12 |
| BiConiLog Antenna (26-3000MHz) | ETS-Lindgren | 3142C | SEM003-01 | 2017/6/27 | 2020/6/26 |
| Horn Antenna (0.8-18GHz) | Rohde & Schwarz | HF907 | SEM003-07 | 2018/4/13 | 2021/4/12 |
| Pre-amplifier(0.1-1.3GHz) | HP | 8447D | SEM005-02 | 2018/9/2 | 2019/9/2 |
| Low Noise Amplifier(100MHz-18GHz) | Black Diamond Series | BDLNA-0118-352810 | SEM005-05 | 2018/9/27 | 2019/9/27 |
| Pre-amplifier(18-26GHz) | Rohde & Schwarz | CH14-H052 | SEM005-17 | 2018/4/2 | 2019/4/1 |
| Band filter | N/A | N/A | SEM023-01 | N/A | N/A |

# 7 Photographs - EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for ZR/2019/10012.

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The End



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