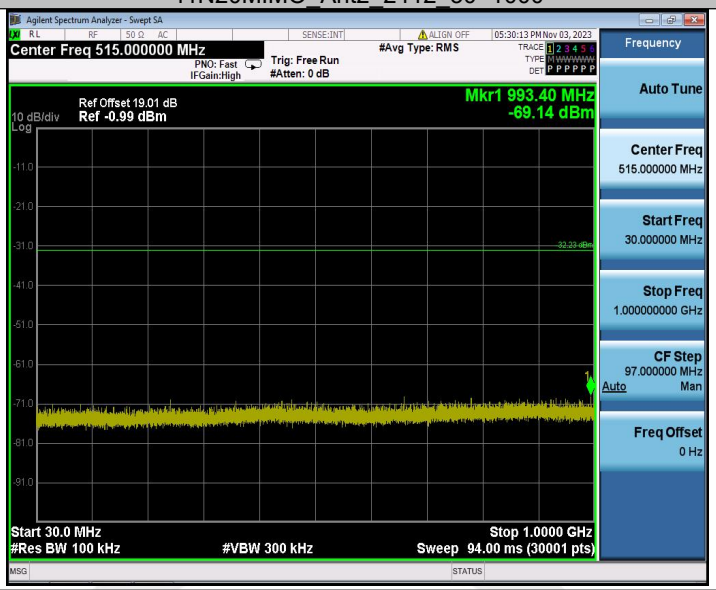
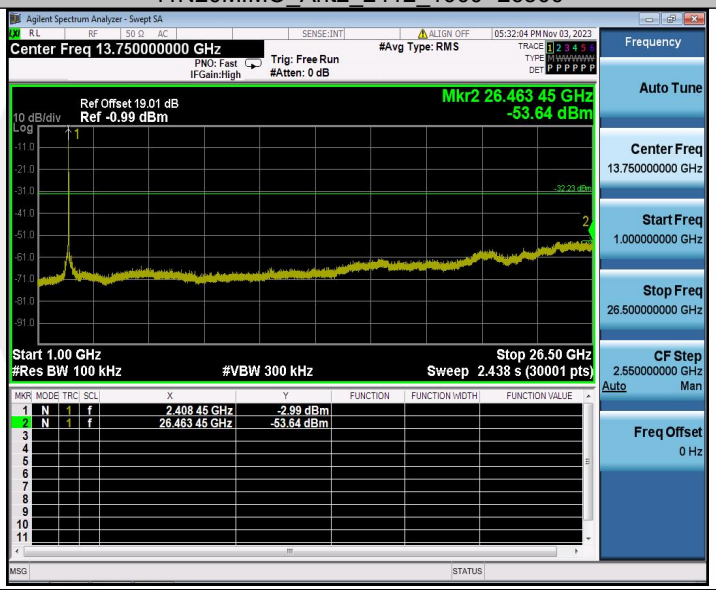
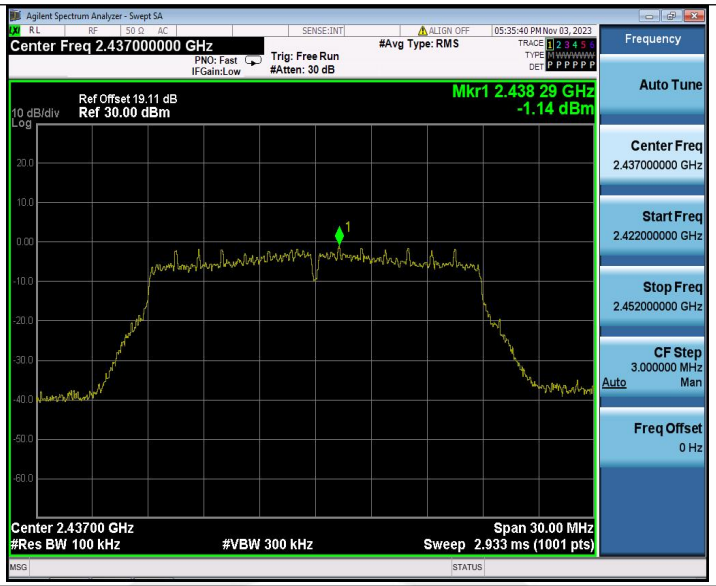
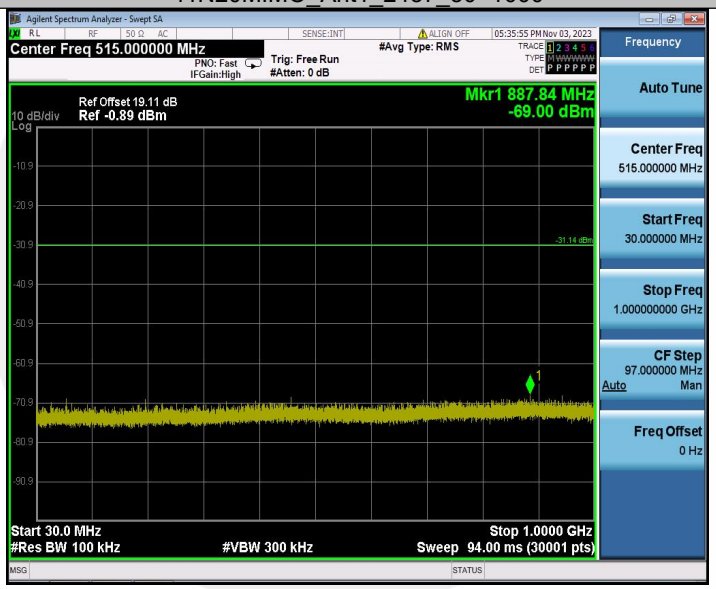
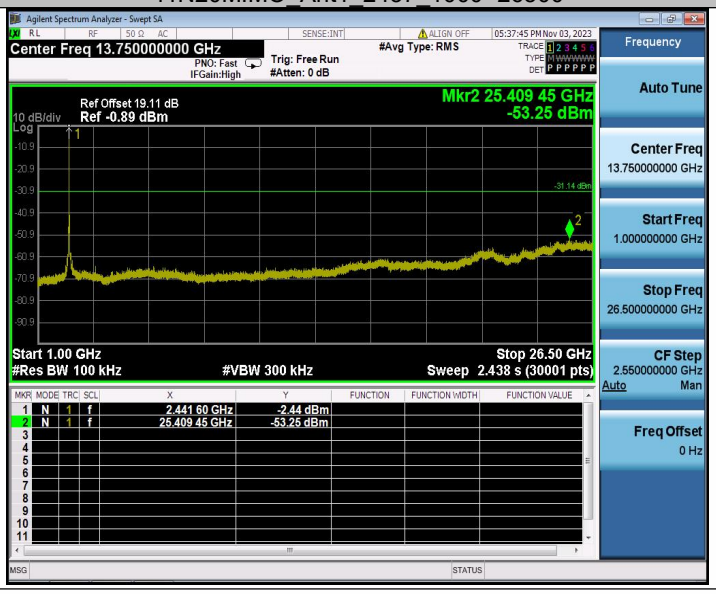
| 11N20MIMO_Ant2_2412_30~1000 |
| --- |
|  |
| 11N20MIMO_Ant2_2412_1000~26500 |
|  |
| 11N20MIMO_Ant1_2437_0~Reference |

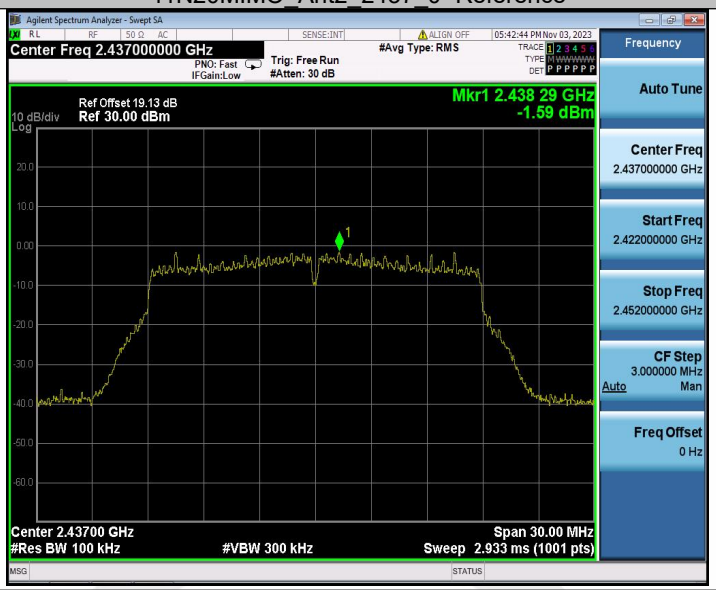
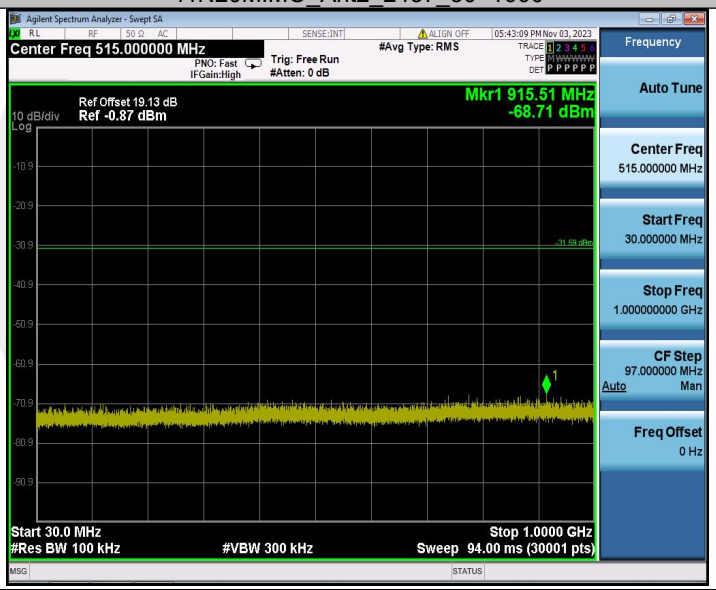


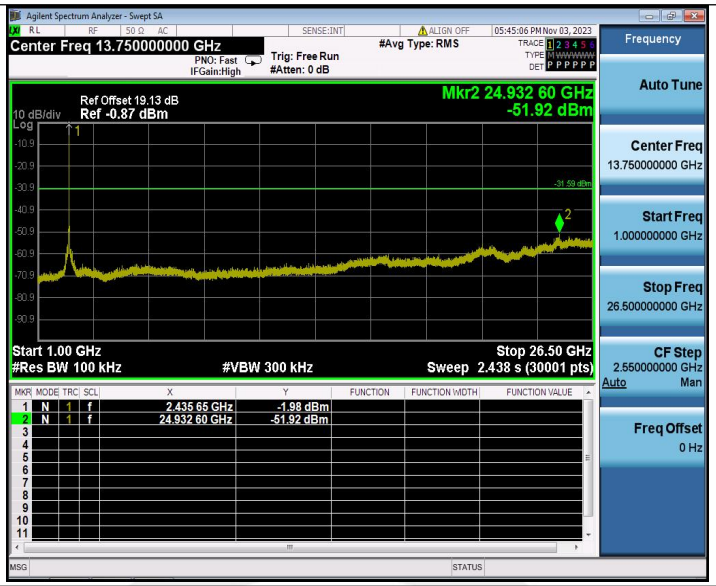

11N20MIMO_Ant1_2437_30~1000



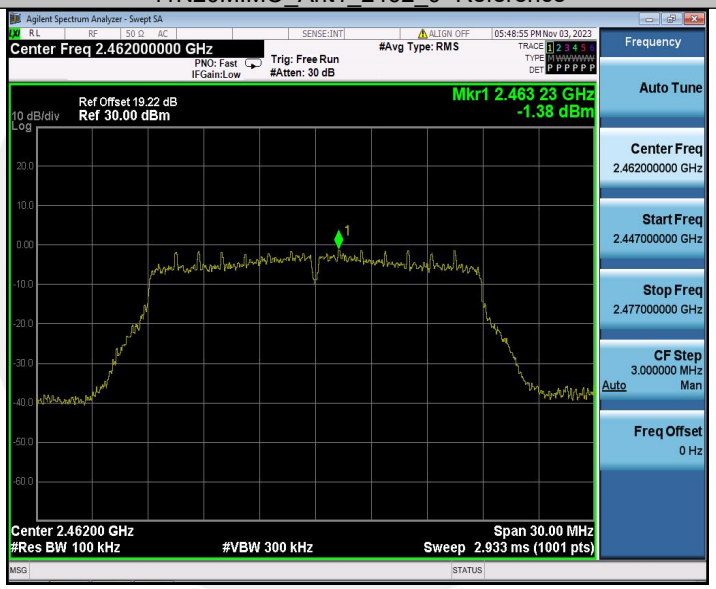

11N20MIMO_Ant1_2437_1000~26500



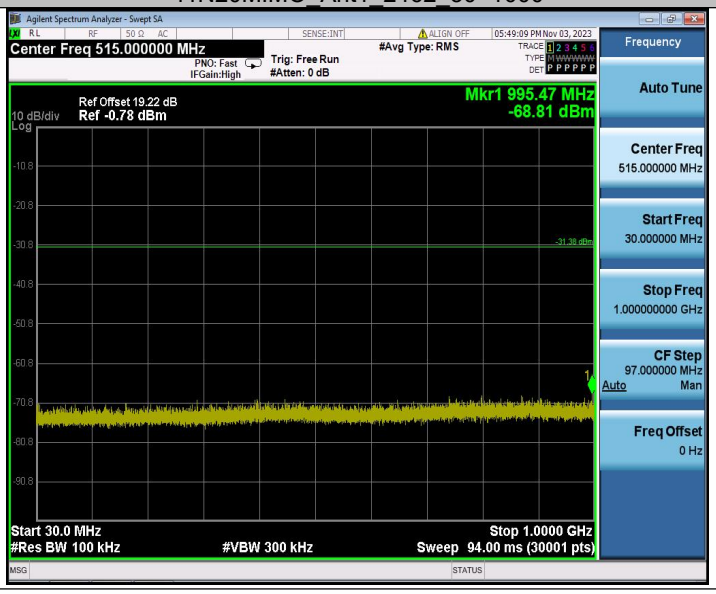
| 11N20MIMO_Ant2_2437_0~Reference |
| --- |
|  |
| 11N20MIMO_Ant2_2437_30~1000 |
|  |
| 11N20MIMO_Ant2_2437_1000~26500 |



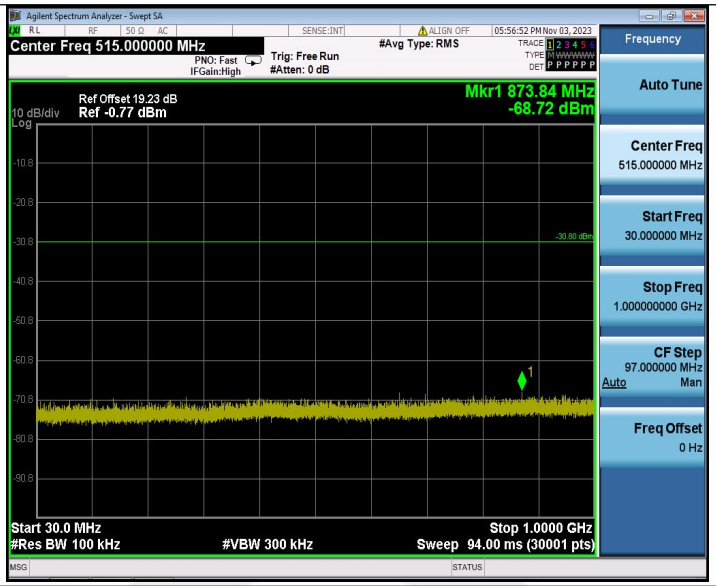

11N20MIMO_Ant1_2462_0~Reference



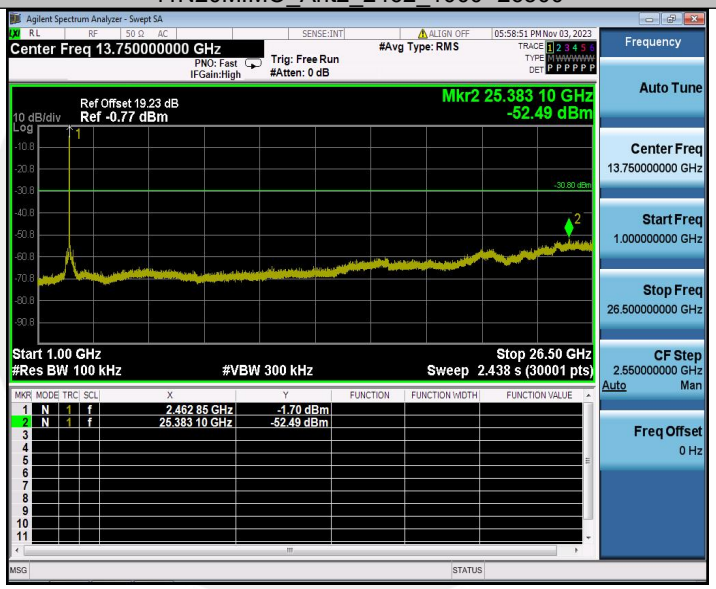

11N20MIMO_Ant1_2462_30~1000



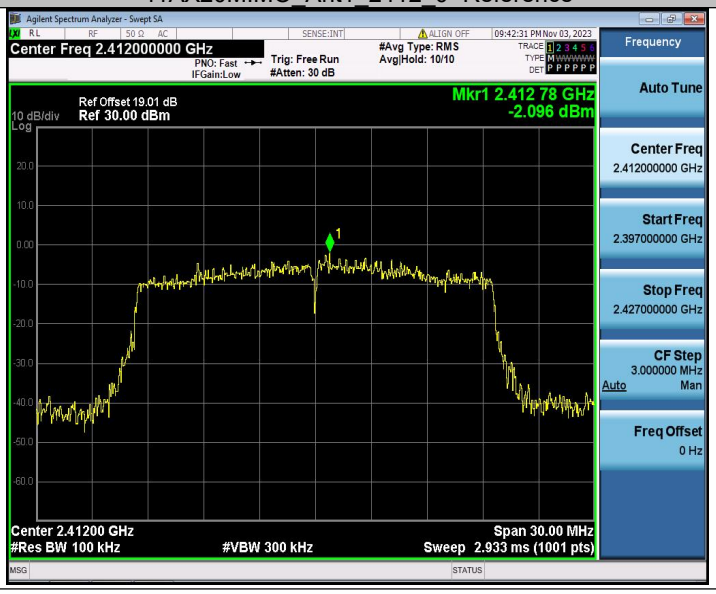
| 11N20MIMO_Ant1_2462_1000~26500 |
| --- |
|  |
| 11N20MIMO_Ant2_2462_0~Reference |
|  |
| 11N20MIMO_Ant2_2462_30~1000 |

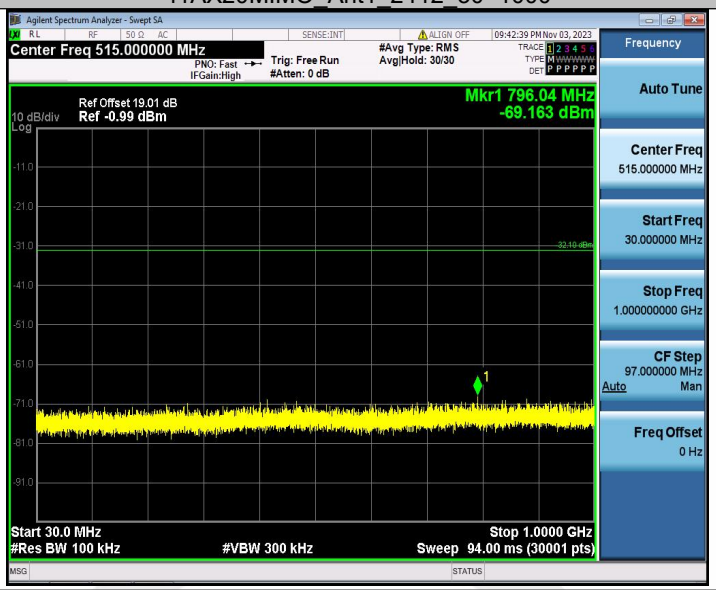



11N20MIMO_Ant2_2462_1000~26500

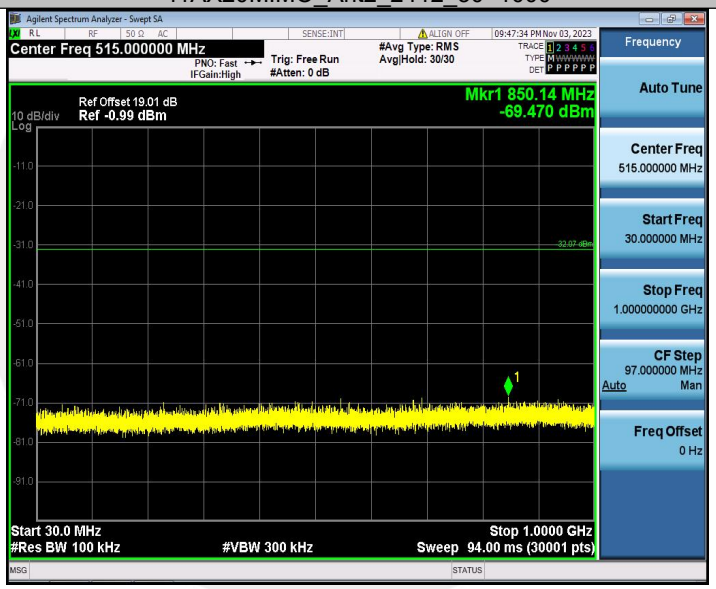



11AX20MIMO_Ant1_2412_0~Reference

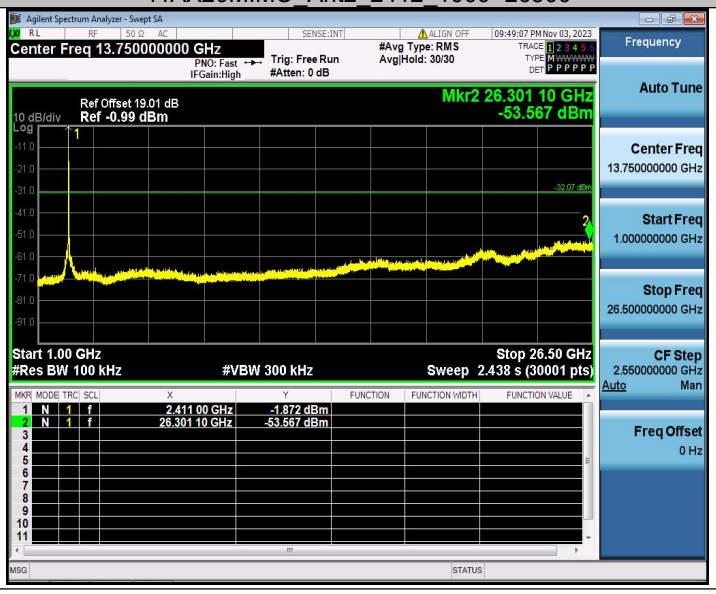


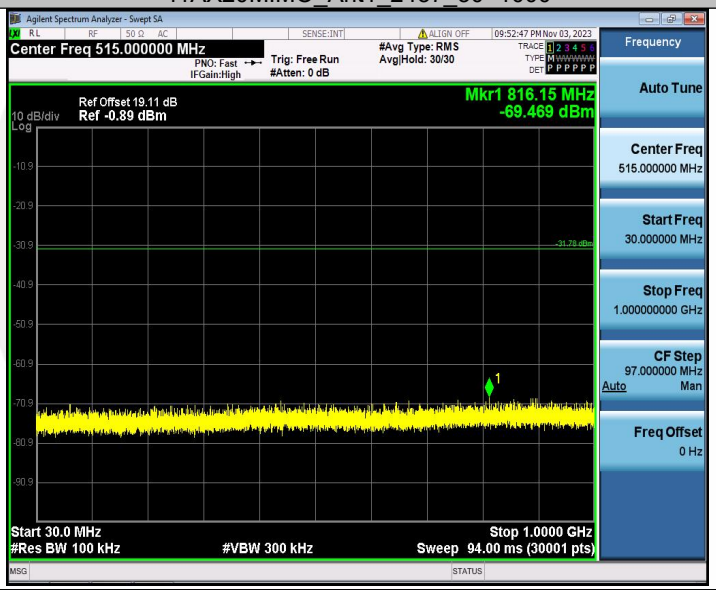
| 11AX20MIMO_Ant1_2412_30~1000 |
| --- |
|  |
| 11AX20MIMO_Ant1_2412_1000~26500 |
|  |
| 11AX20MIMO_Ant2_2412_0~Reference |

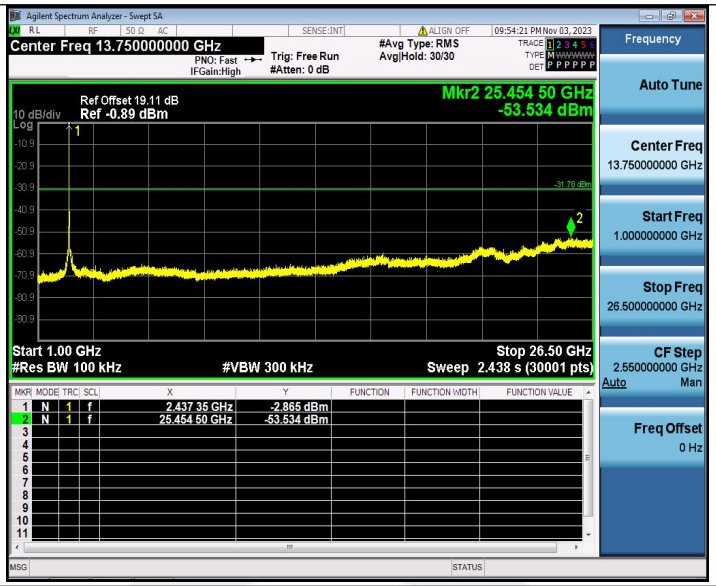

11AX20MIMO_Ant2_2412_30~1000



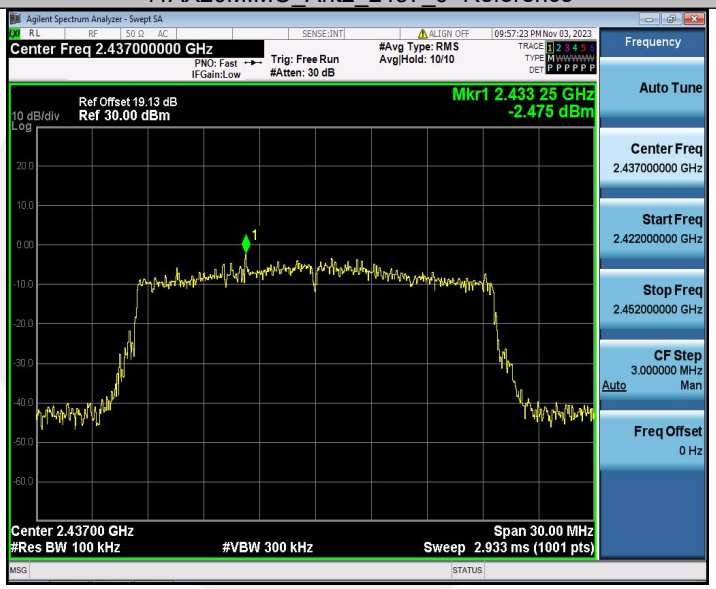

11AX20MIMO_Ant2_2412_1000~26500



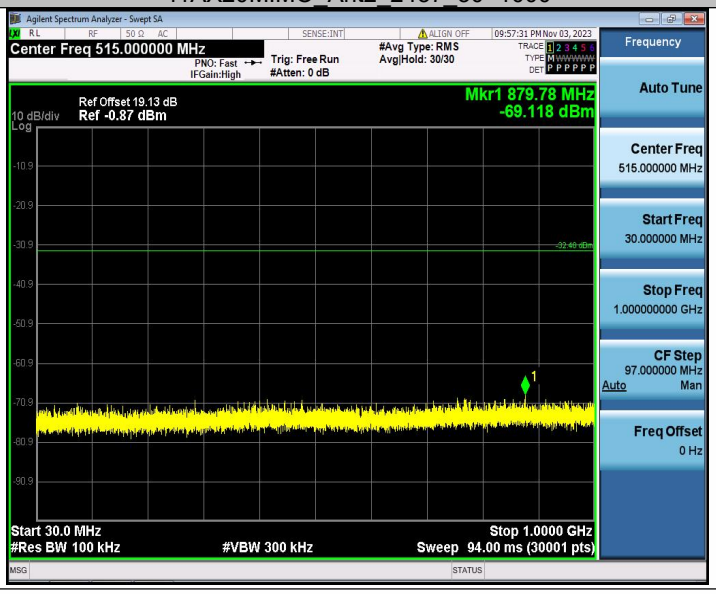
| 11AX20MIMO_Ant1_2437_0~Reference |
| --- |
|  |
| 11AX20MIMO_Ant1_2437_30~1000 |
|  |
| 11AX20MIMO_Ant1_2437_1000~26500 |

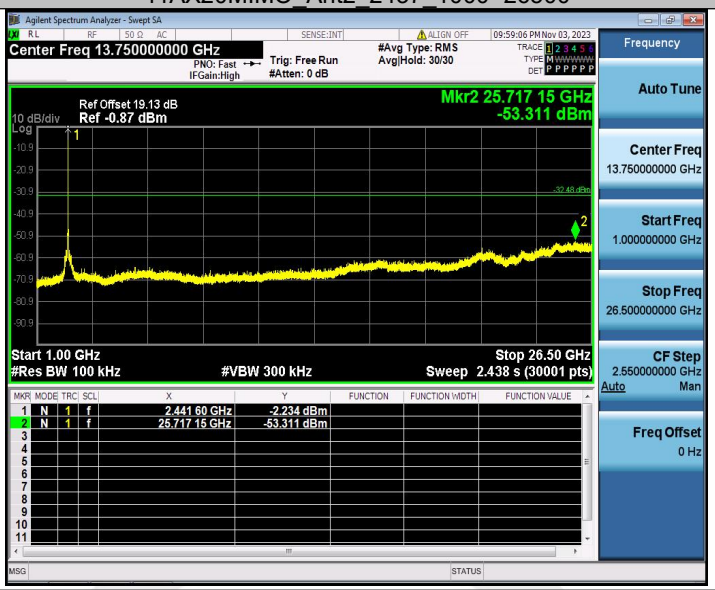
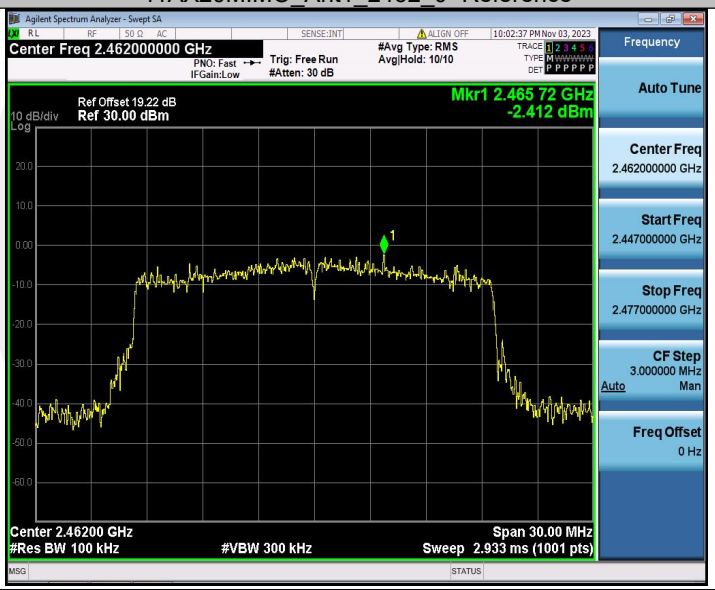


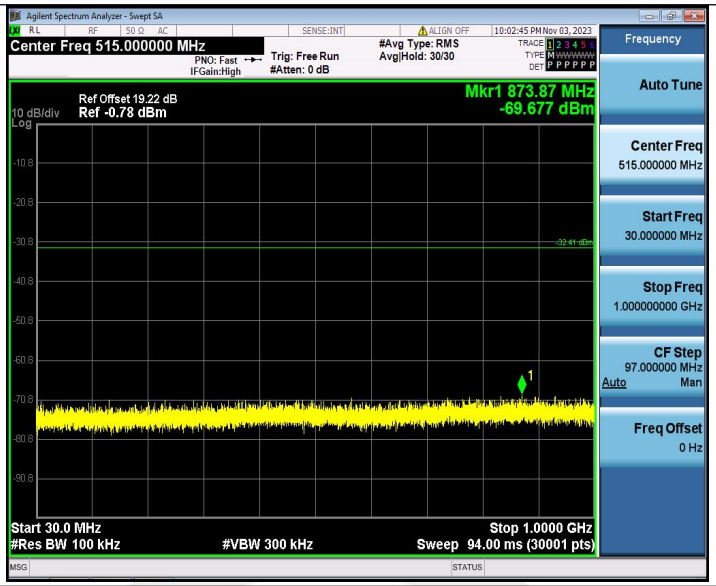

11AX20MIMO_Ant2_2437_0~Reference




11AX20MIMO_Ant2_2437_30~1000

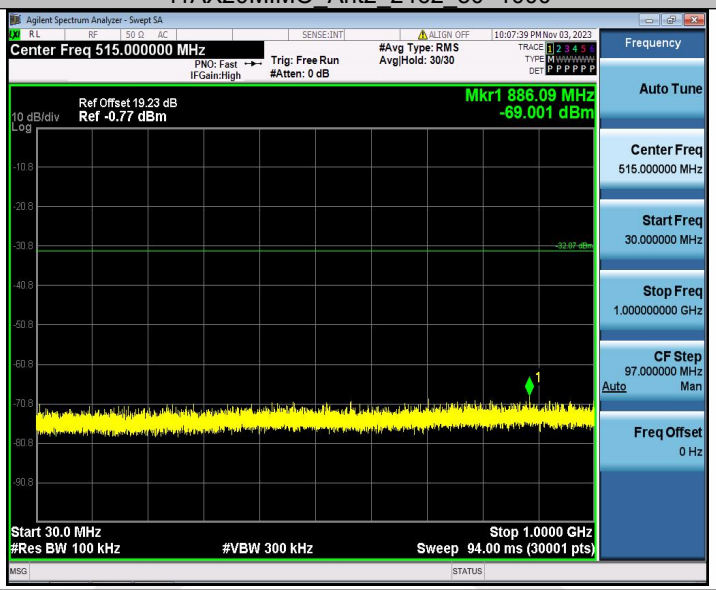


| 11AX20MIMO_Ant2_2437_1000~26500 |
| --- |
|  |
| 11AX20MIMO_Ant1_2462_0~Reference |
|  |
| 11AX20MIMO_Ant1_2462_30~1000 |




11AX20MIMO_Ant1_2462_1000~26500


11AX20MIMO_Ant2_2462_0~Reference

| 11AX20MIMO_Ant2_2462_30~1000 |
| --- |
|  |
| 11AX20MIMO_Ant2_2462_1000~26500 |
|  |

## 8.6 RADIATED SPURIOUS EMISSION

### 8.6.1 Applicable Standard

According to FCC Part 15.247(d),15.205, 15.209 and KDB 558074 D01 15.247 Meas Guidancev05r02
According to IC RSS-Gen and RSS-247

### 8.6.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part15.205, Restricted bands

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090-0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.15 |
| 10.495-0.505 | 16.69475-16.69525 | 608-614 | 5.35-5.46 |
| 2.1735-2.1905 | 16.80425-16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.17725-4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.20725-4.20775 | 73-74.6 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 74.8-75.2 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 123-138 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 149.9-150.05 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 156.52475-156.52525 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.7-156.9 | 2690-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 162.0125-167.17 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 167.72-173.2 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 240-285 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | (2) |
| 13.36-13.41 | | | |

According toFCC Part15.205the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

| Restricted Frequency(MHz) | Field Strength (μV/m) | Field Strength (dBμV/m) | Measurement Distance |
|---|---|---|---|
| 0.009-0.490 | 2400/F(KHz) | 20 log (uV/m) | 300 |
| 0.490-1.705 | 24000/F(KHz) | 20 log (uV/m) | 30 |
| 1.705-30 | 30 | 29.5 | 30 |
| 30-88 | 100 | 40 | 3 |
| 88-216 | 150 | 43.5 | 3 |
| 216-960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |

### 8.6.3 Test Configuration

Test according to clause 6.2 radio frequency test setup

### 8.6.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:
For Above 1GHz:
The EUT was placed on a turn table which is 1.5m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

For Below 1GHz:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 100 kHz for
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For Below 30MHz:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 9kHz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
For Below 150KHz:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 200Hz
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Follow the guidelines in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit. Submit this data.
Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log(dwell time/100 ms), in an effort to demonstrate compliance with the limit. Submit this data.
Repeat above procedures until all frequency measured was complete.

### 8.6.5 Test Results

| | |
|---|---|
| Temperature: | 26° C |
| Relative Humidity: | 54% |
| ATM Pressure: | 1011 mbar |

■ Spurious Emission below 30MHz(9KHz to 30MHz)

| Freq. (MHz) | Ant.Pol. H/V | Emission Level(dBuV/m) | | Limit 3m(dBuV/m) | | Over(dB) | |
|---|---|---|---|---|---|---|---|
| | | PK | AV | PK | AV | PK | AV |
| -- | -- | -- | -- | -- | -- | -- | -- |

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
Distance extrapolation factor =40log(Specific distance/ test distance)( dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor

■ Spurious Emission Above 1GHz(1GHz to 25GHz)

All theantenna( Antenna 1&2 )and modes( 802.11b/g/n )have been tested and the worst( Antenna 1,802.11b) resultrecorded was report as below:

| Test mode: | 802.11b | Frequency: | Channel 1: 2412MHz |
|---|---|---|---|

| Freq. (MHz) | Ant.Pol. | Emission Level(dBuV/m) | | Limit 3m(dBuV/m) | | Over(dB) | |
|---|---|---|---|---|---|---|---|
| | H/V | PK | AV | PK | AV | PK | AV |
| 11505 | V | 60.70 | 48.42 | 74.00 | 54.00 | 13.30 | 5.58 |
| 14643.7 | V | 64.03 | 47.40 | 74.00 | 54.00 | 9.97 | 6.60 |
| 17962.5 | V | 70.61 | 47.89 | 74.00 | 54.00 | 3.39 | 6.11 |
| 11505 | H | 61.31 | 47.59 | 74.00 | 54.00 | 12.69 | 6.41 |
| 14733.7 | H | 64.82 | 46.43 | 74.00 | 54.00 | 9.18 | 7.57 |
| 17619.3 | H | 70.59 | 50.40 | 74.00 | 54.00 | 3.41 | 3.60 |

| Test mode: | 802.11b | Frequency: | Channel 6: 2437MHz |
|---|---|---|---|

| Freq. (MHz) | Ant.Pol. | Emission Level(dBuV/m) | | Limit 3m(dBuV/m) | | Over(dB) | |
|---|---|---|---|---|---|---|---|
| | H/V | PK | AV | PK | AV | PK | AV |
| 11418.7 | V | 61.25 | 47.08 | 74.00 | 54.00 | 12.75 | 6.92 |
| 14715 | V | 64.86 | 46.82 | 74.00 | 54.00 | 9.14 | 7.18 |
| 17610 | V | 70.78 | 50.33 | 74.00 | 54.00 | 3.22 | 3.67 |
| 11461.8 | H | 61.09 | 47.38 | 74.00 | 54.00 | 12.91 | 6.62 |
| 14679.3 | H | 64.61 | 46.92 | 74.00 | 54.00 | 9.39 | 7.08 |
| 17602.5 | H | 71.38 | 50.57 | 74.00 | 54.00 | 2.62 | 3.43 |

| Test mode: | 802.11b | Frequency: | Channel 11: 2462MHz |
|---|---|---|---|

| Freq. (MHz) | Ant.Pol. | Emission Level(dBuV/m) | | Limit 3m(dBuV/m) | | Over(dB) | |
|---|---|---|---|---|---|---|---|
| | H/V | PK | AV | PK | AV | PK | AV |
| 11529.3 | V | 61.25 | 47.58 | 74.00 | 54.00 | 12.75 | 6.42 |
| 14593.1 | V | 64.40 | 48.15 | 74.00 | 54.00 | 9.60 | 5.85 |
| 17643.75 | V | 71.60 | 48.85 | 74.00 | 54.00 | 2.40 | 5.15 |
| 11503.1 | H | 60.56 | 47.83 | 74.00 | 54.00 | 13.44 | 6.17 |
| 14578.1 | H | 65.44 | 48.21 | 74.00 | 54.00 | 8.56 | 5.79 |
| 17604.3 | H | 71.93 | 50.64 | 74.00 | 54.00 | 2.07 | 3.36 |

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
(2) Emission Level= Reading Level+Correct Factor.
(3) Correct Factor= Ant_F + Cab_L - Preamp
(4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

All the antenna( Antenna 1&2 ) and modes( 802.11b/g/n ) have been tested and the worst( Antenna 1,802.11b) resultrecorded was report as below:

| Test mode: | 802.11b | Frequency: | Channel 1: 2412MHz |
|---|---|---|---|

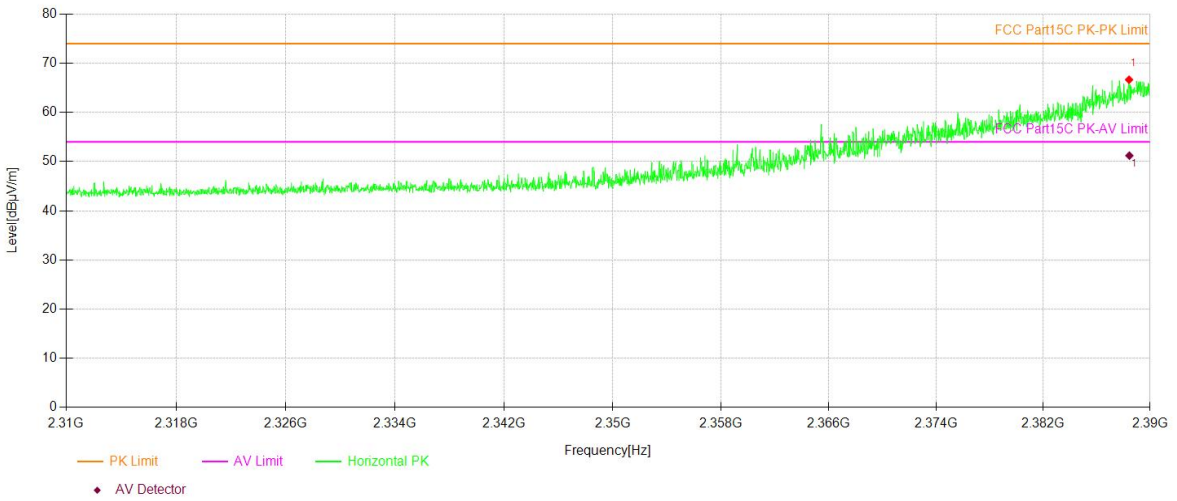
| Frequency (MHz) | Polarity | PK(dBuV/m) (VBW=3MHz) | Limit 3m (dBuV/m) | AV(dBuV/m) (VBW=10Hz) | Limit 3m (dBuV/m) |
|---|---|---|---|---|---|
| 2388.42 | H | 66.64 | 74.00 | 51.21 | 54.00 |
| 2387.09 | V | 63.10 | 74.00 | 48.31 | 54.00 |

| Test mode: | 802.11b | Frequency: | Channel 11: 2462MHz |
|---|---|---|---|

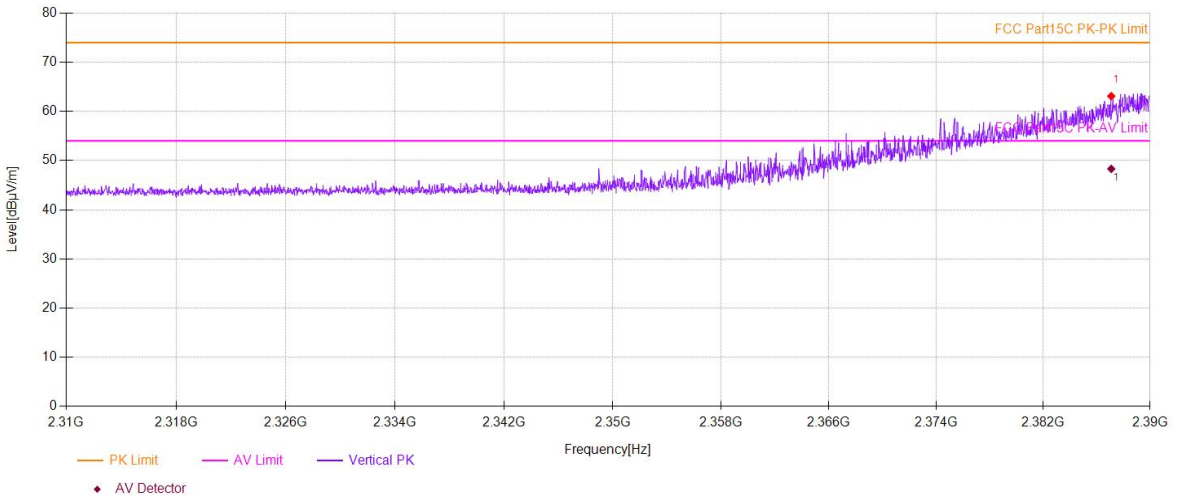
| Frequency (MHz) | Polarity | PK(dBuV/m) (VBW=3MHz) | Limit 3m (dBuV/m) | AV(dBuV/m) (VBW=10Hz) | Limit 3m (dBuV/m) |
|---|---|---|---|---|---|
| 2484.51 | H | 63.38 | 74.00 | 49.63 | 54.00 |
| 2483.73 | V | 65.45 | 74.00 | 50.53 | 54.00 |

**Note:** (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
(2) Emission Level= Reading Level+Correct Factor.
(3) Correct Factor= Ant_F + Cab_L - Preamp
(4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

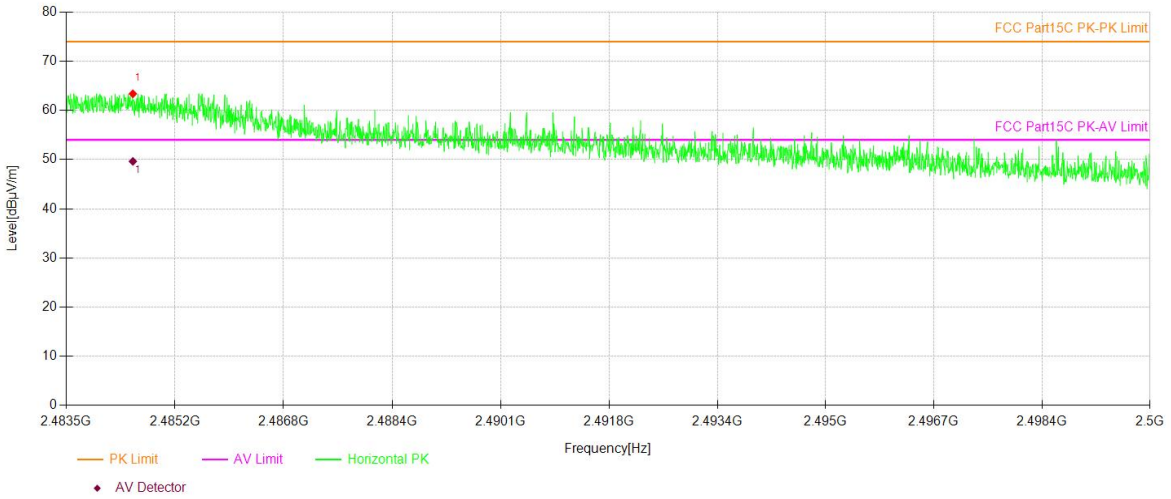
| Test Model | 802.11b | Spurious Emission in Restricted Band 2310-2390MHz<br>Channel 1: 2412MHz | VBW=3MHz | Polarity: H |
|---|---|---|---|---|



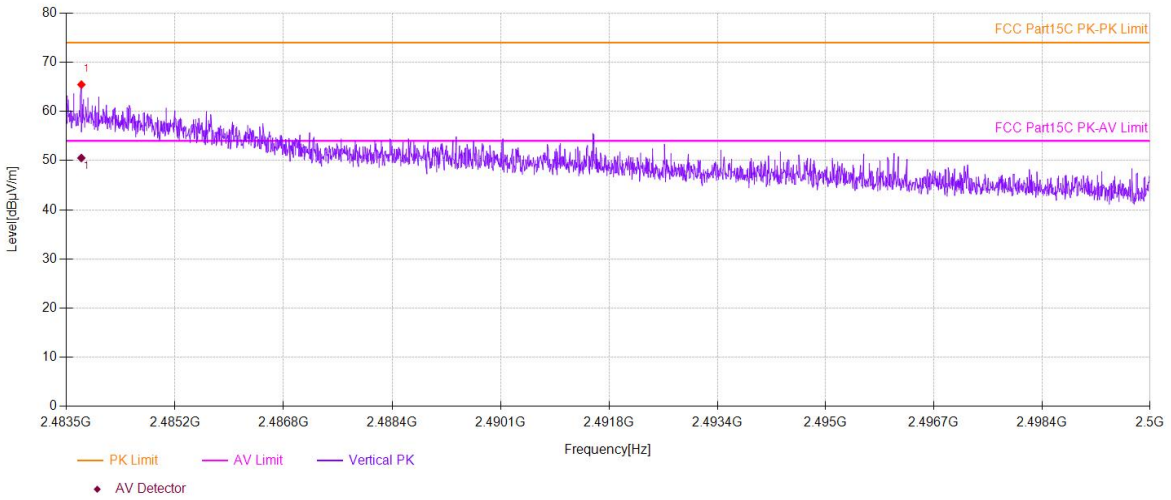

| Test Model | 802.11b | Spurious Emission in Restricted Band 2310-2390MHz<br>Channel 1: 2412MHz | VBW=3MHz | Polarity: V |
|---|---|---|---|---|



| Test Model | 802.11b | Spurious Emission in Restricted Band 2483.5-2500MHz<br>Channel 11: 2462MHz | VBW=3MHz | Polarity: H |
|---|---|---|---|---|



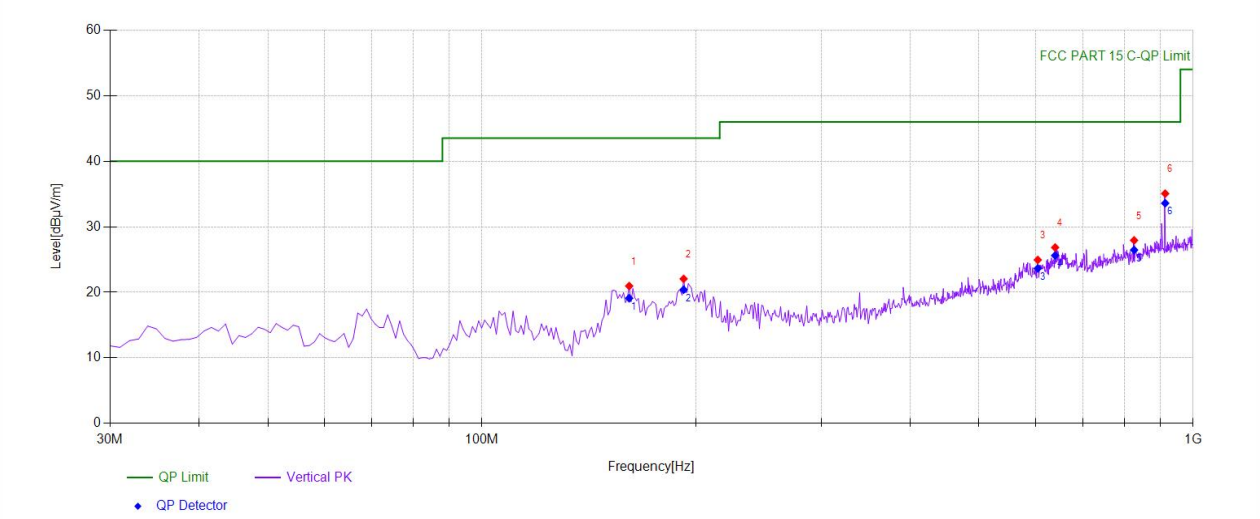

| Test Model | 802.11b | Spurious Emission in Restricted Band2483.5-2500MHz<br>Channel 11: 2462MHz | VBW=3MHz | Polarity: V |
|---|---|---|---|---|



■ Spurious Emission below 1GHz (30MHz to 1GHz)

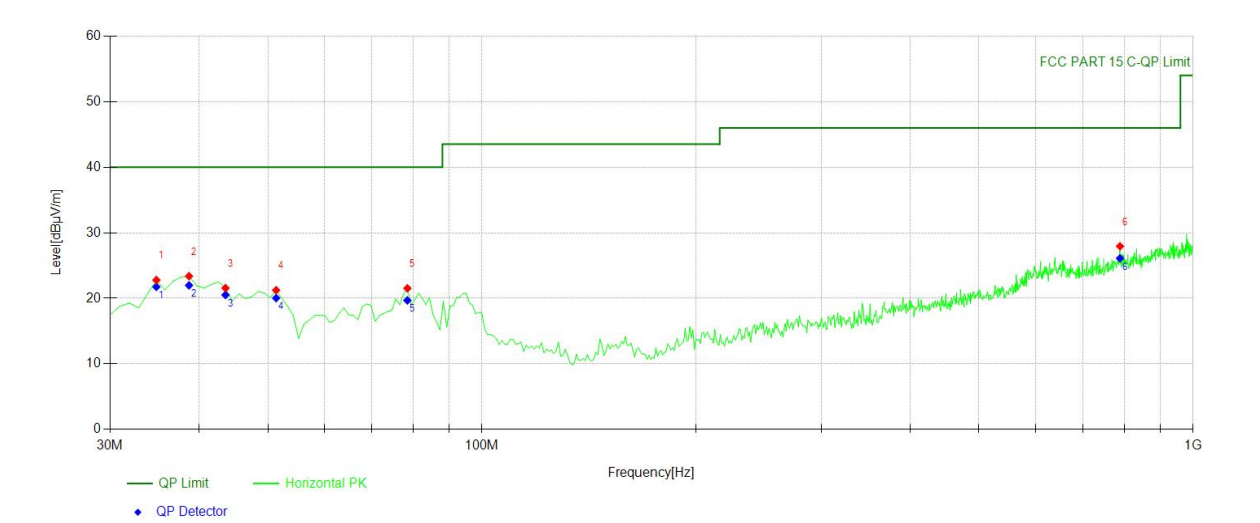
All the antenna(Antenna 1&2) and modes(802.11b/g/n) have been tested and the worst(Antenna 1,802.11b) resultrecorded was report as below:

| Mode: | 11B 2412 |
|---|---|



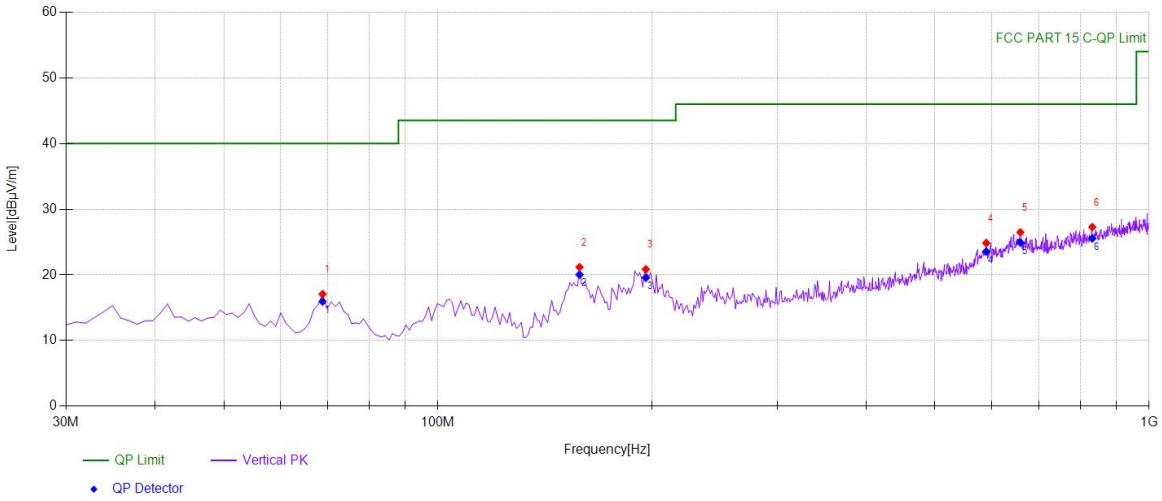

| Suspected Data List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBµV] | Factor [dB/m] | Level [dBµV/m] | Detector | Limit [dBµV/m] | Margin [dB] | Polarity |
| 1 | 161.0811 | 40.50 | -19.54 | 20.96 | PK | 43.50 | 22.54 | Vertical |
| 2 | 192.1522 | 39.67 | -17.61 | 22.06 | PK | 43.50 | 21.44 | Vertical |
| 3 | 604.8148 | 32.06 | -7.11 | 24.95 | PK | 46.00 | 21.05 | Vertical |
| 4 | 639.7698 | 33.10 | -6.26 | 26.84 | PK | 46.00 | 19.16 | Vertical |
| 5 | 826.1962 | 32.12 | -4.19 | 27.93 | PK | 46.00 | 18.07 | Vertical |
| 6 | 913.5836 | 37.91 | -2.85 | 35.06 | PK | 46.00 | 10.94 | Vertical |

| Mode: | 11B 2412 |
|---|---|



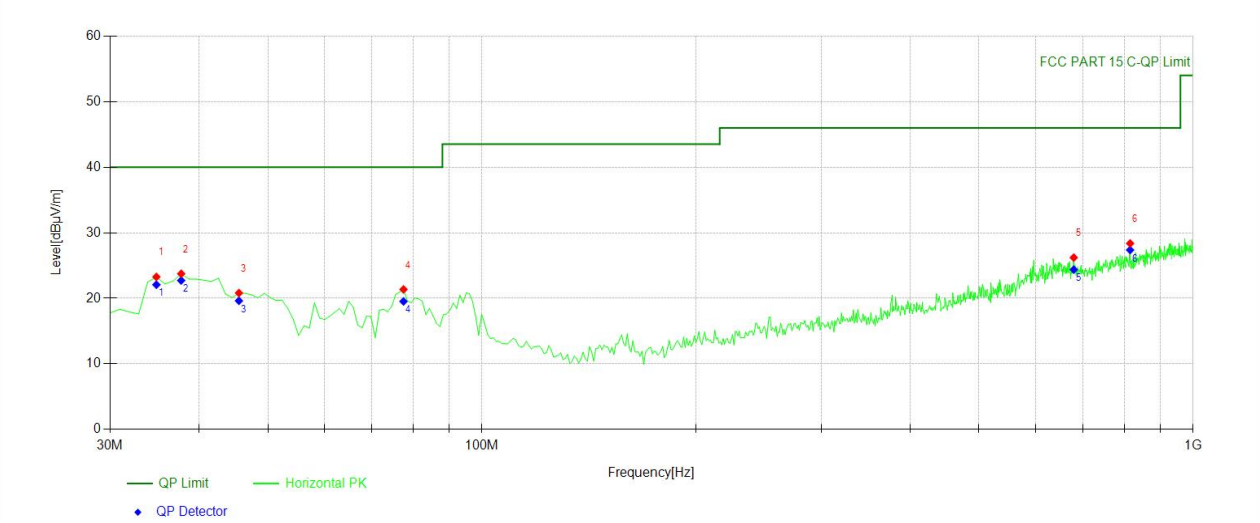

| Suspected Data List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBµV] | Factor [dB/m] | Level [dBµV/m] | Detector | Limit [dBµV/m] | Margin [dB] | Polarity |
| 1 | 34.8549 | 41.02 | -18.23 | 22.79 | PK | 40.00 | 17.21 | Horizontal |
| 2 | 38.7387 | 41.37 | -17.99 | 23.38 | PK | 40.00 | 16.62 | Horizontal |
| 3 | 43.5936 | 39.22 | -17.66 | 21.56 | PK | 40.00 | 18.44 | Horizontal |
| 4 | 51.3614 | 38.63 | -17.39 | 21.24 | PK | 40.00 | 18.76 | Horizontal |
| 5 | 78.5485 | 42.80 | -21.27 | 21.53 | PK | 40.00 | 18.47 | Horizontal |
| 6 | 789.2993 | 32.47 | -4.53 | 27.94 | PK | 46.00 | 18.06 | Horizontal |

| Mode: | 11B 2437 |
|---|---|



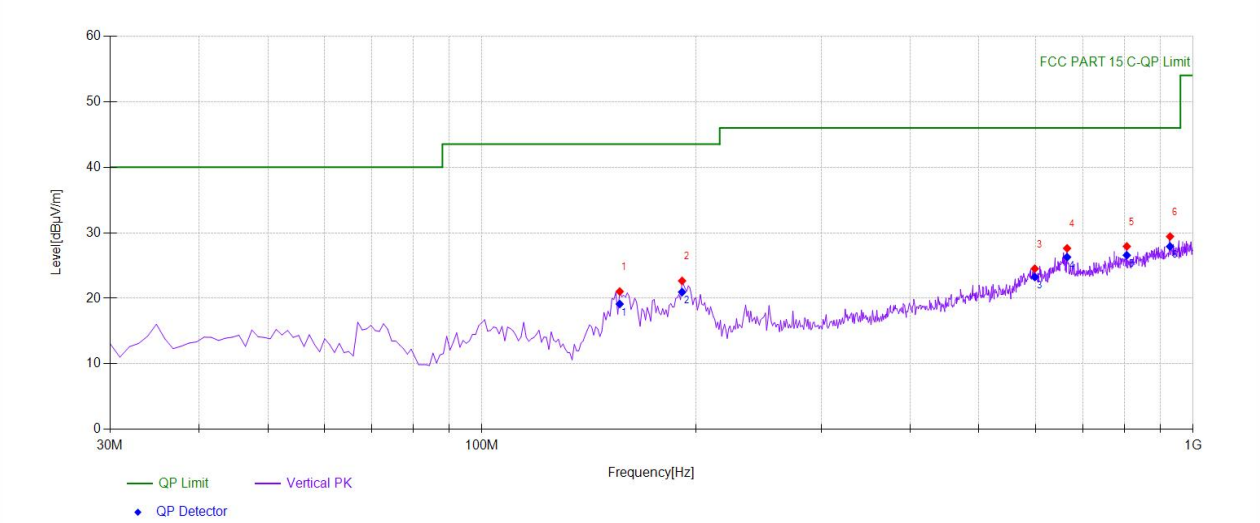

| Suspected Data List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBµV] | Factor [dB/m] | Level [dBµV/m] | Detector | Limit [dBµV/m] | Margin [dB] | Polarity |
| 1 | 68.8388 | 36.87 | -19.80 | 17.07 | PK | 40.00 | 22.93 | Vertical |
| 2 | 158.1682 | 40.82 | -19.64 | 21.18 | PK | 43.50 | 22.32 | Vertical |
| 3 | 196.036 | 38.24 | -17.38 | 20.86 | PK | 43.50 | 22.64 | Vertical |
| 4 | 590.2503 | 31.99 | -7.14 | 24.85 | PK | 46.00 | 21.15 | Vertical |
| 5 | 659.1892 | 32.63 | -6.14 | 26.49 | PK | 46.00 | 19.51 | Vertical |
| 6 | 832.022 | 31.35 | -4.07 | 27.28 | PK | 46.00 | 18.72 | Vertical |

| Mode: | 11B 2437 |
|---|---|



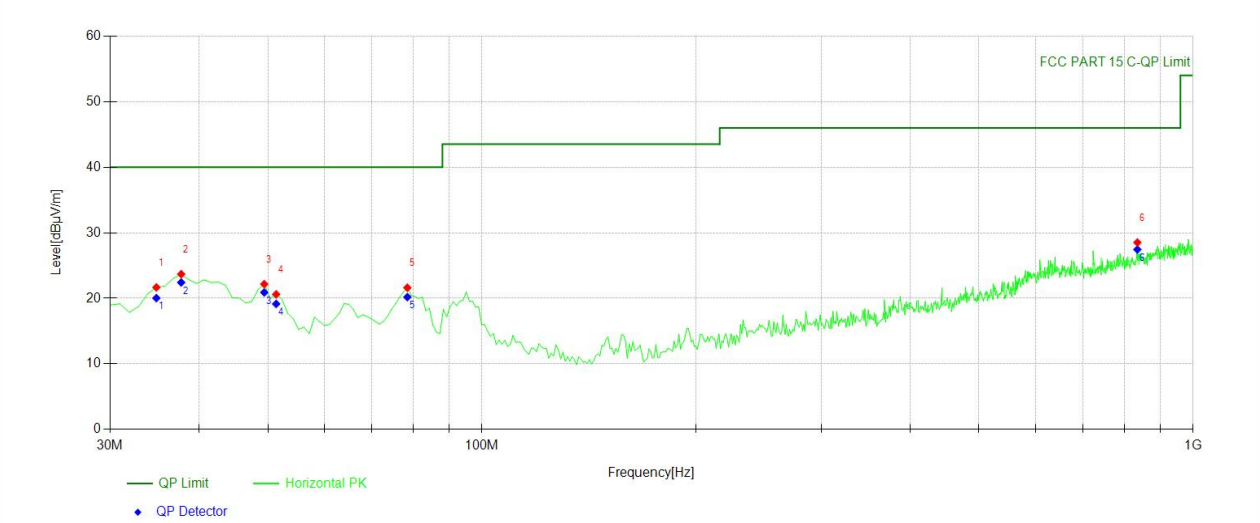

| Suspected Data List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBµV] | Factor [dB/m] | Level [dBµV/m] | Detector | Limit [dBµV/m] | Margin [dB] | Polarity |
| 1 | 34.8549 | 41.50 | -18.23 | 23.27 | PK | 40.00 | 16.73 | Horizontal |
| 2 | 37.7678 | 41.80 | -18.05 | 23.75 | PK | 40.00 | 16.25 | Horizontal |
| 3 | 45.5355 | 38.34 | -17.53 | 20.81 | PK | 40.00 | 19.19 | Horizontal |
| 4 | 77.5776 | 42.48 | -21.12 | 21.36 | PK | 40.00 | 18.64 | Horizontal |
| 5 | 679.5796 | 32.31 | -6.10 | 26.21 | PK | 46.00 | 19.79 | Horizontal |
| 6 | 815.5155 | 32.68 | -4.31 | 28.37 | PK | 46.00 | 17.63 | Horizontal |

| Mode: | 11B 2462 |
|---|---|




| Suspected Data List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBµV] | Factor [dB/m] | Level [dBµV/m] | Detector | Limit [dBµV/m] | Margin [dB] | Polarity |
| 1 | 156.2262 | 40.71 | -19.67 | 21.04 | PK | 43.50 | 22.46 | Vertical |
| 2 | 191.1812 | 40.34 | -17.68 | 22.66 | PK | 43.50 | 20.84 | Vertical |
| 3 | 598.989 | 31.66 | -7.14 | 24.52 | PK | 46.00 | 21.48 | Vertical |
| 4 | 665.015 | 33.77 | -6.14 | 27.63 | PK | 46.00 | 18.37 | Vertical |
| 5 | 806.7768 | 32.29 | -4.37 | 27.92 | PK | 46.00 | 18.08 | Vertical |
| 6 | 928.1481 | 32.10 | -2.67 | 29.43 | PK | 46.00 | 16.57 | Vertical |

| Mode: | 11B 2462 |
|---|---|




| Suspected Data List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBµV] | Factor [dB/m] | Level [dBµV/m] | Detector | Limit [dBµV/m] | Margin [dB] | Polarity |
| 1 | 34.8549 | 39.90 | -18.23 | 21.67 | PK | 40.00 | 18.33 | Horizontal |
| 2 | 37.7678 | 41.74 | -18.05 | 23.69 | PK | 40.00 | 16.31 | Horizontal |
| 3 | 49.4194 | 39.42 | -17.25 | 22.17 | PK | 40.00 | 17.83 | Horizontal |
| 4 | 51.3614 | 38.00 | -17.39 | 20.61 | PK | 40.00 | 19.39 | Horizontal |
| 5 | 78.5485 | 42.89 | -21.27 | 21.62 | PK | 40.00 | 18.38 | Horizontal |
| 6 | 834.9349 | 32.51 | -3.99 | 28.52 | PK | 46.00 | 17.48 | Horizontal |