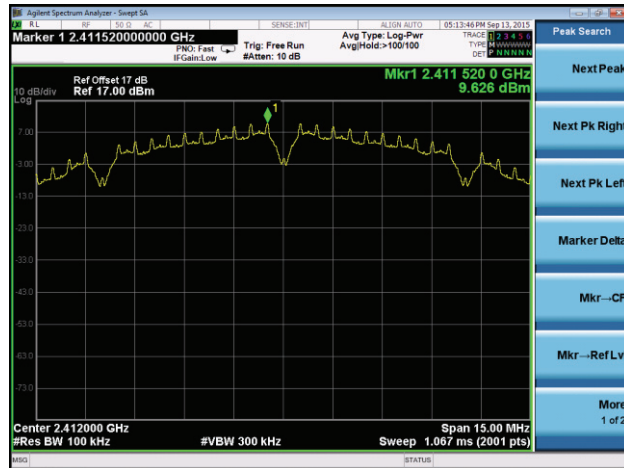


802.11b Out-of-Band Emissions

Channel 01 (2412MHz)

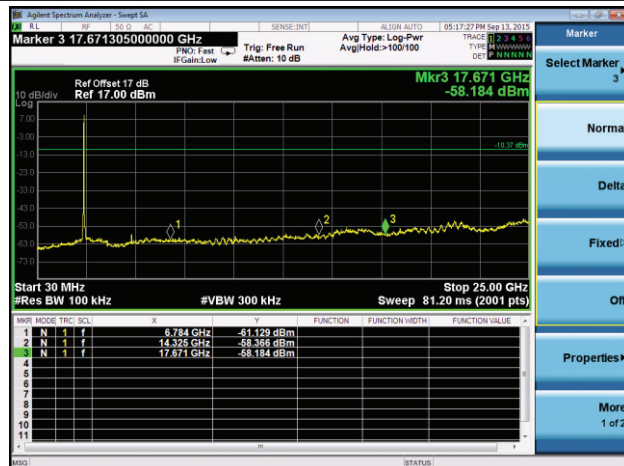
100kHz PSD reference Level



Low Band Edge

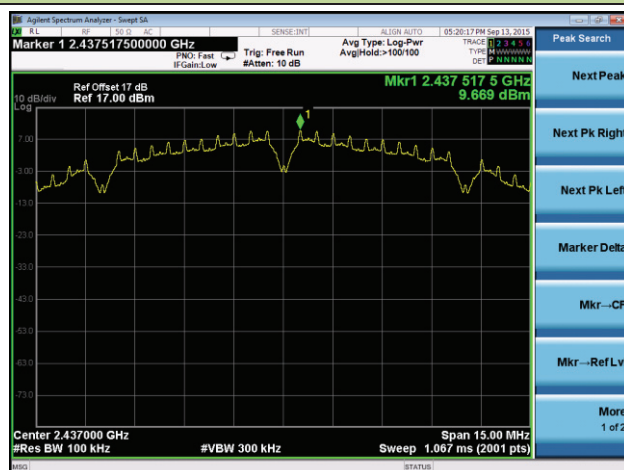


Spurious Emission 30MHz ~ 25GHz

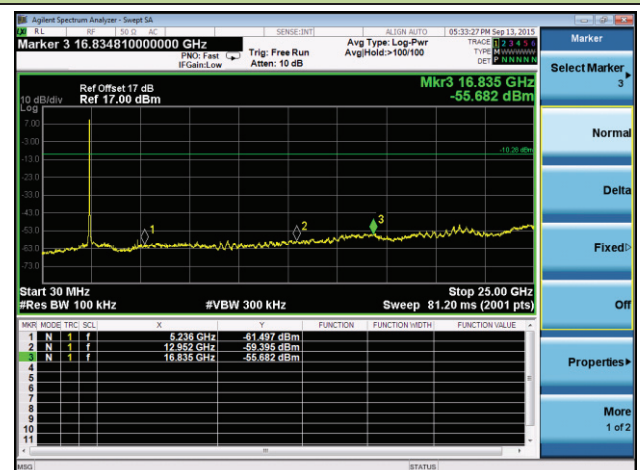


Channel 06 (2437MHz)

100kHz PSD reference Level

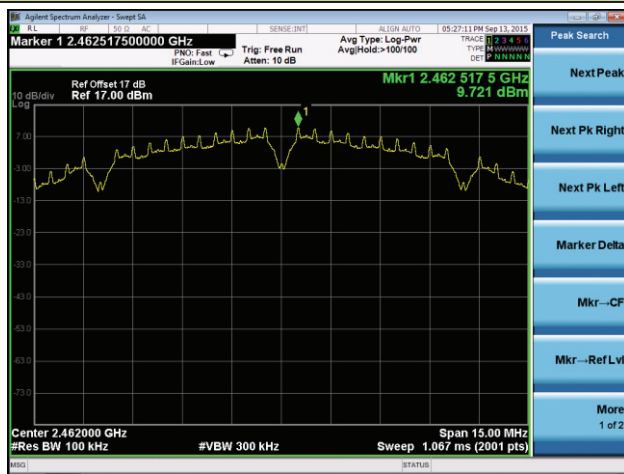


Spurious Emission 30MHz ~ 25GHz



Channel 11 (2462MHz)

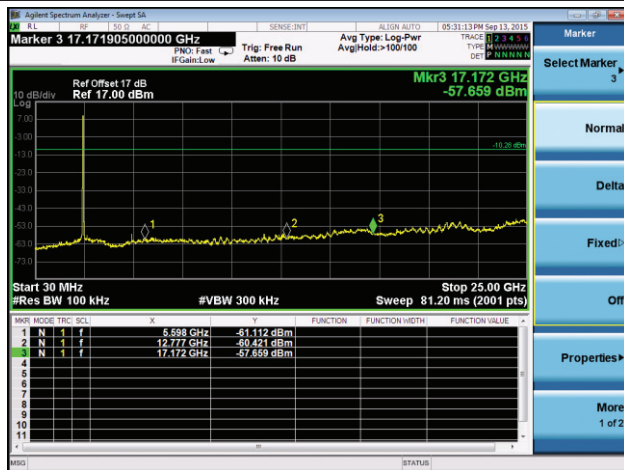
100kHz PSD reference Level



High Band Edge



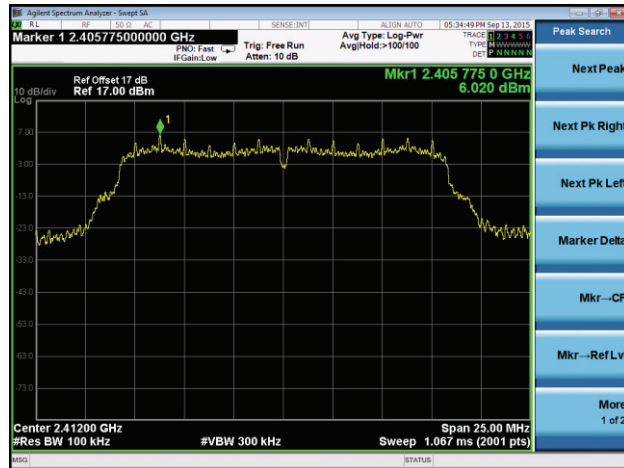
Spurious Emission 30MHz ~ 25GHz



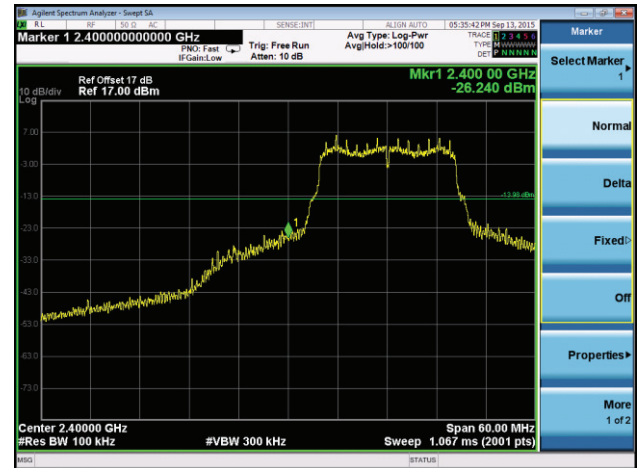
802.11g Out-of-Band Emissions

Channel 01 (2412MHz)

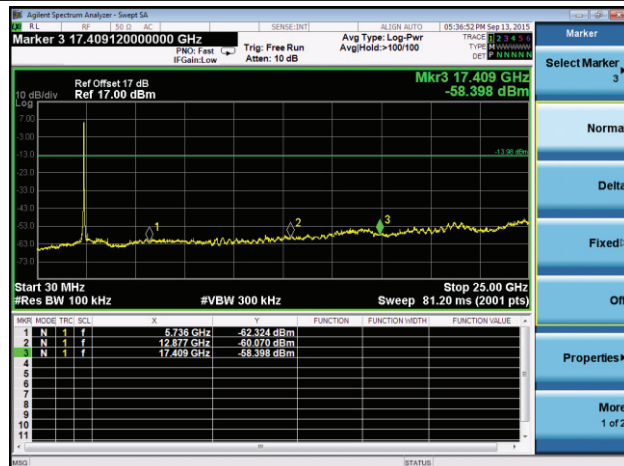
100kHz PSD reference Level



Low Band Edge



Spurious Emission 30MHz ~ 25GHz

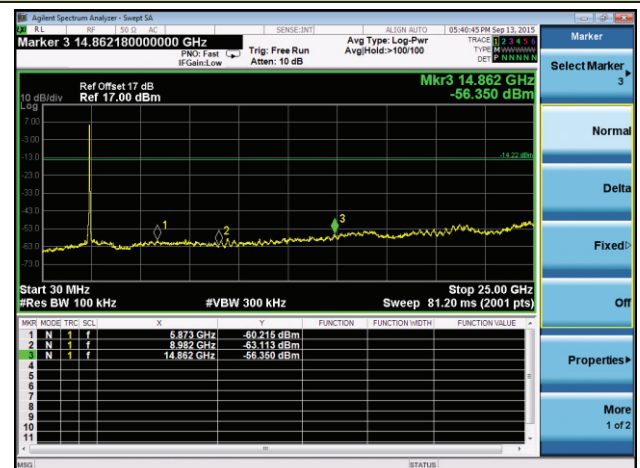


Channel 06 (2437MHz)

100kHz PSD reference Level

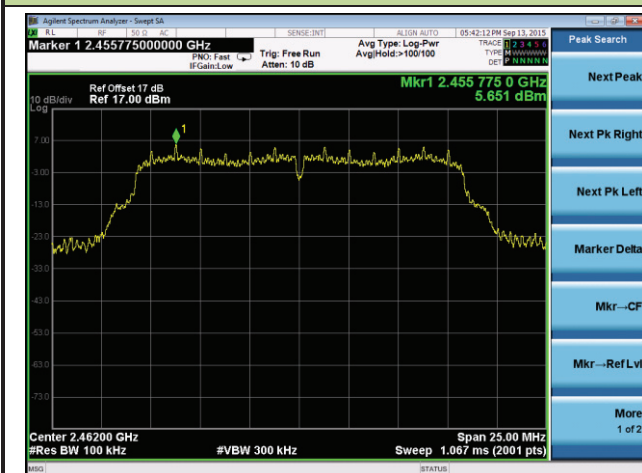


Spurious Emission 30MHz ~ 25GHz

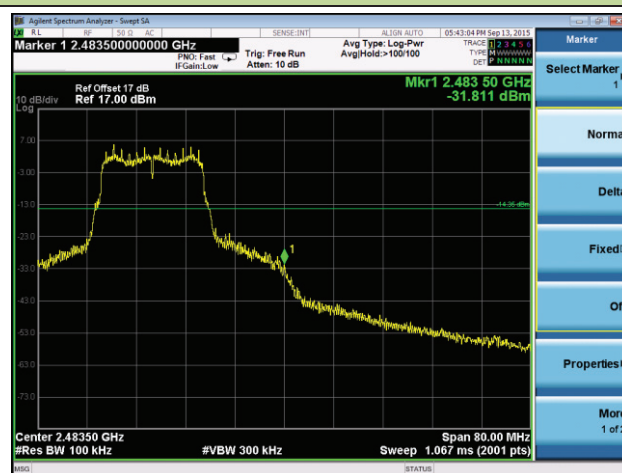


Channel 11 (2462MHz)

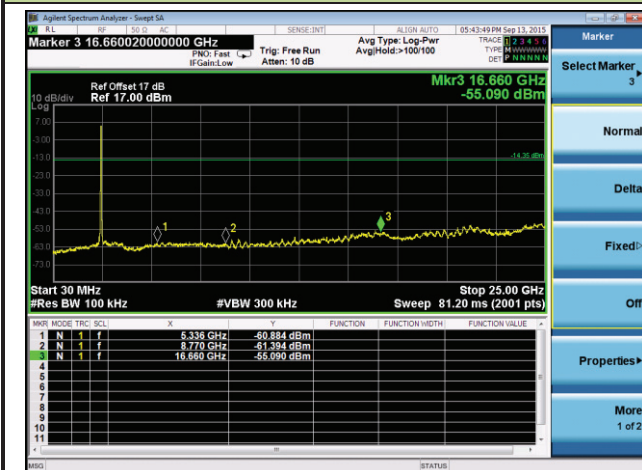
100kHz PSD reference Level



High Band Edge



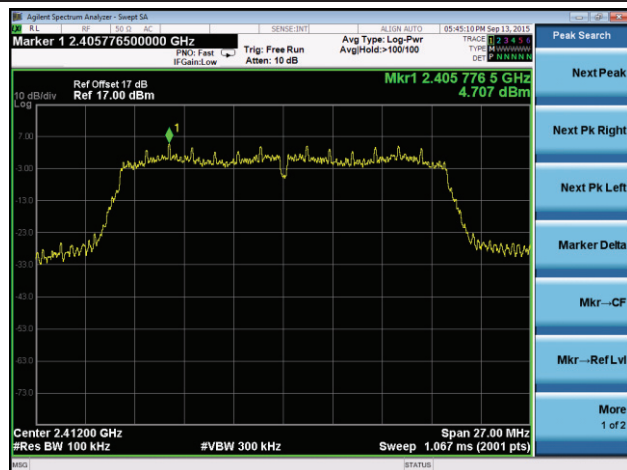
Spurious Emission 30MHz ~ 25GHz



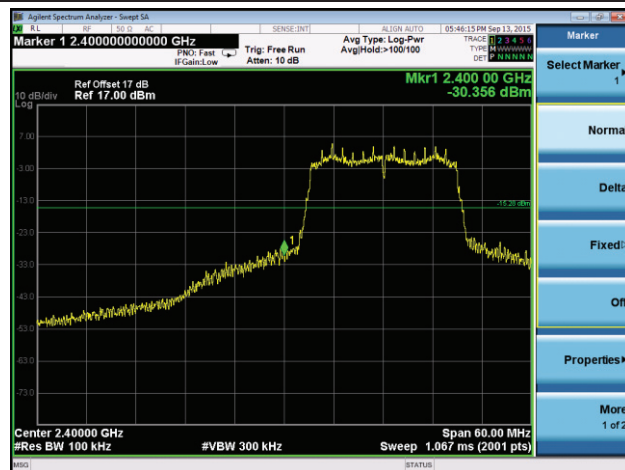
802.11n-HT20 Out-of-Band Emissions

Channel 01 (2412MHz)

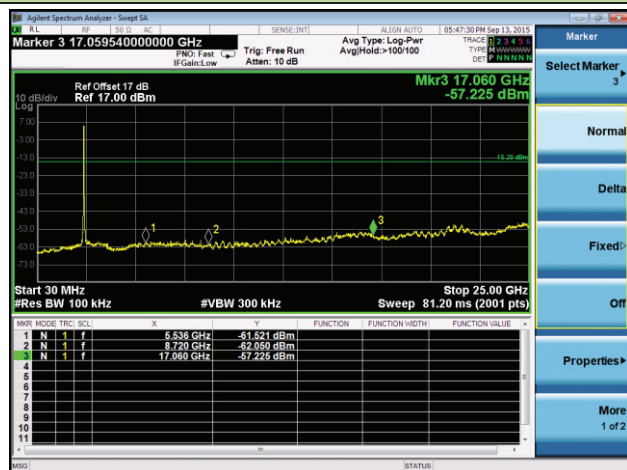
100kHz PSD reference Level



Low Band Edge

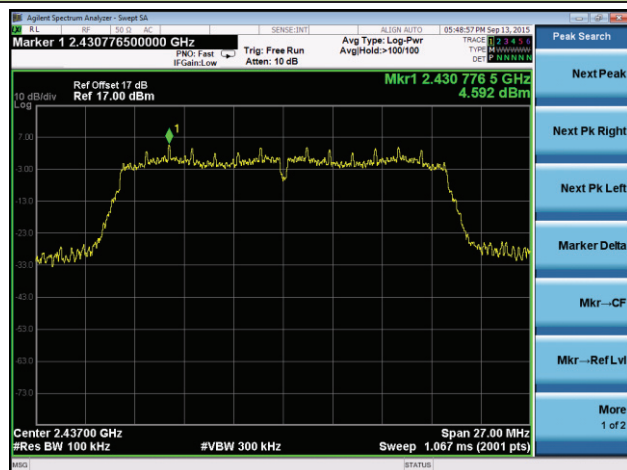


Spurious Emission 30MHz ~ 25GHz

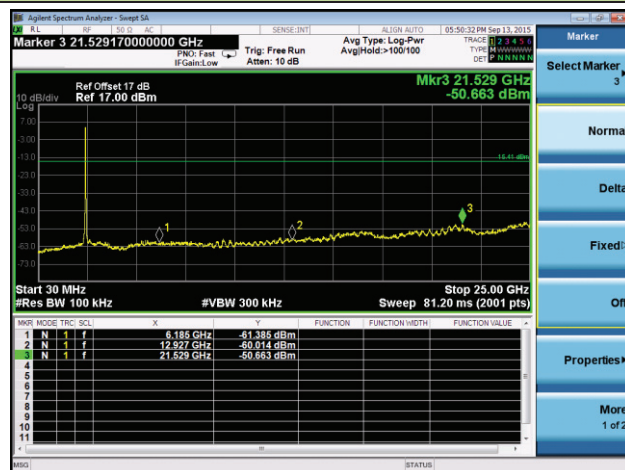


Channel 06 (2437MHz)

100kHz PSD reference Level

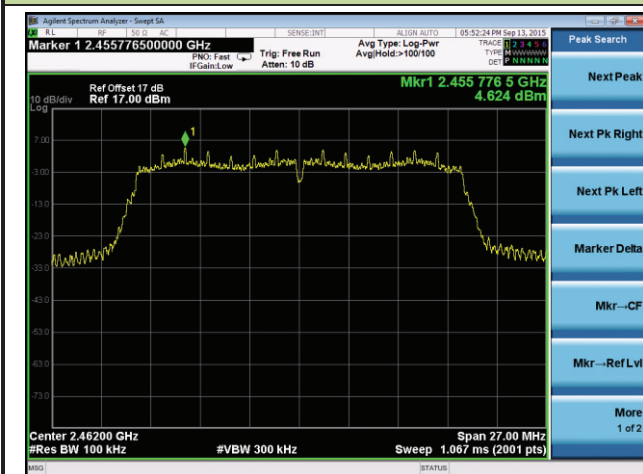


Spurious Emission 30MHz ~ 25GHz

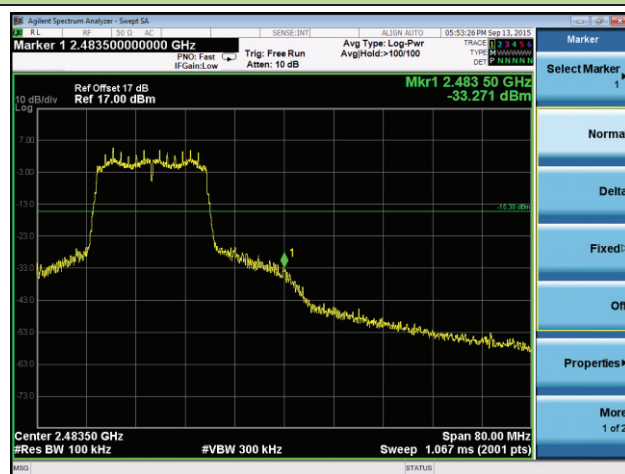


Channel 11 (2462MHz)

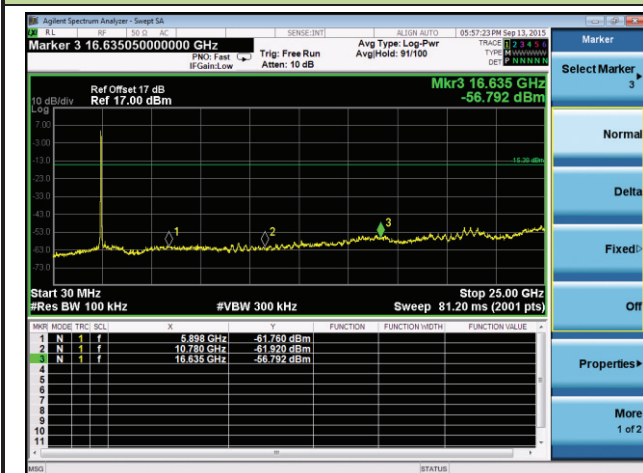
100kHz PSD reference Level



High Band Edge



Spurious Emission 30MHz ~ 25GHz



7.6. Radiated Spurious Emission Measurement

7.6.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

| FCC Part 15 Subpart C Paragraph 15.209 | | |
|--|-------------------------|-------------------------------|
| Frequency [MHz] | Field Strength [V/m] | Measured Distance [Meters] |
| 0.009 - 0.490 | 2400/F (kHz) | 300 |
| 0.490 - 1.705 | 24000/F (kHz) | 30 |
| 1.705 - 30 | 30 | 30 |
| 30 - 88 | 100 | 3 |
| 88 - 216 | 150 | 3 |
| 216 - 960 | 200 | 3 |
| Above 960 | 500 | 3 |

7.6.2. Test Procedure Used

KDB 558074 D01v03r03 - Section 12.2.3 (quasi-peak measurements)

KDB 558074 D01v03r03 - Section 12.2.4 (peak power measurements)

KDB 558074 D01v03r03 - Section 12.2.5 (average power measurements) & ANSI C63.10 - 2013

7.6.3. Test Setting

Peak Field Strength Measurements per Section 12.2.4 of KDB 558074 D01v03r03

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple

6. Trace mode = max hold

7. Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

| Frequency | RBW |
|---------------|---------------|
| 9 ~ 150 kHz | 200 ~ 300 Hz |
| 0.15 ~ 30 MHz | 9 ~ 10 kHz |
| 30 ~ 1000 MHz | 100 ~ 120 kHz |
| > 1000 MHz | 1 MHz |

Average Field Strength Measurements per Section 12.2.5.1 of KDB 558074 D01v03r03

1. RBW = 1MHz.

2. VBW $\geq 3 \times$ RBW.

3. Detector = RMS, if span/(# of points in sweep) \leq (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.

4. Averaging type = power (*i.e.*, RMS).

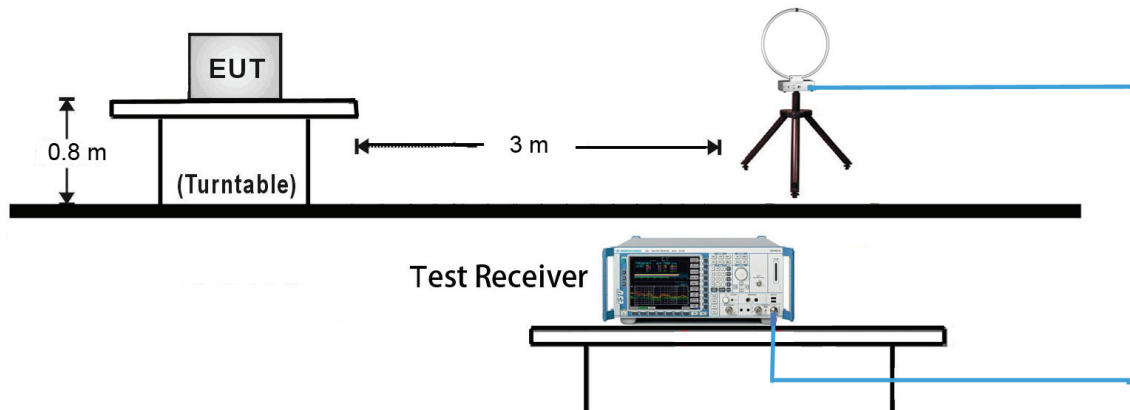
- As an alternative, the detector and averaging type may be set for linear voltage averaging.
- Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.

5. Sweep time = auto.

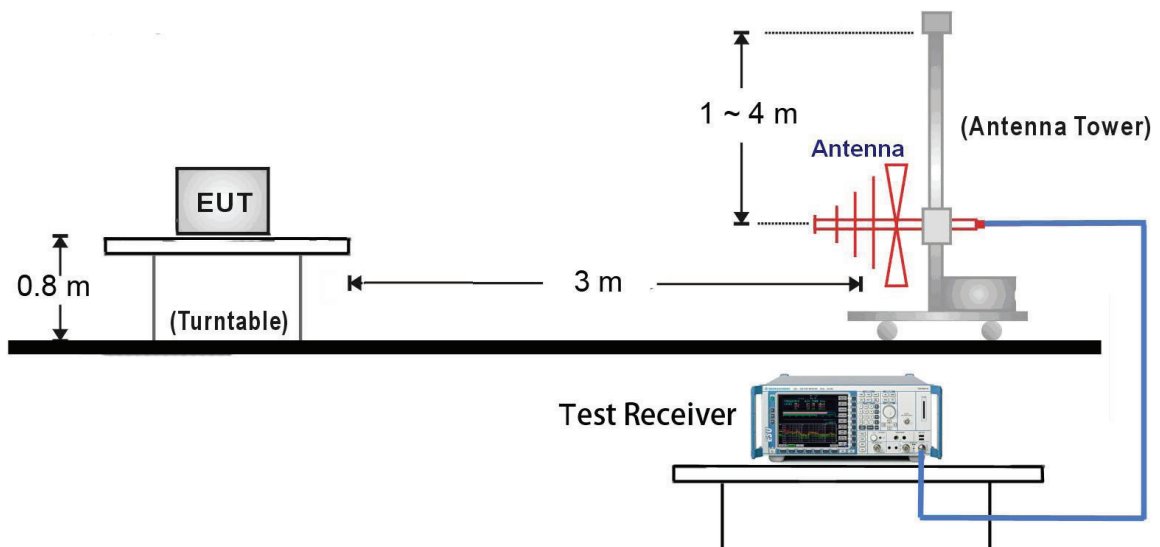
6. Perform a trace average of at least 100 traces.

7.6.4. Test Setup

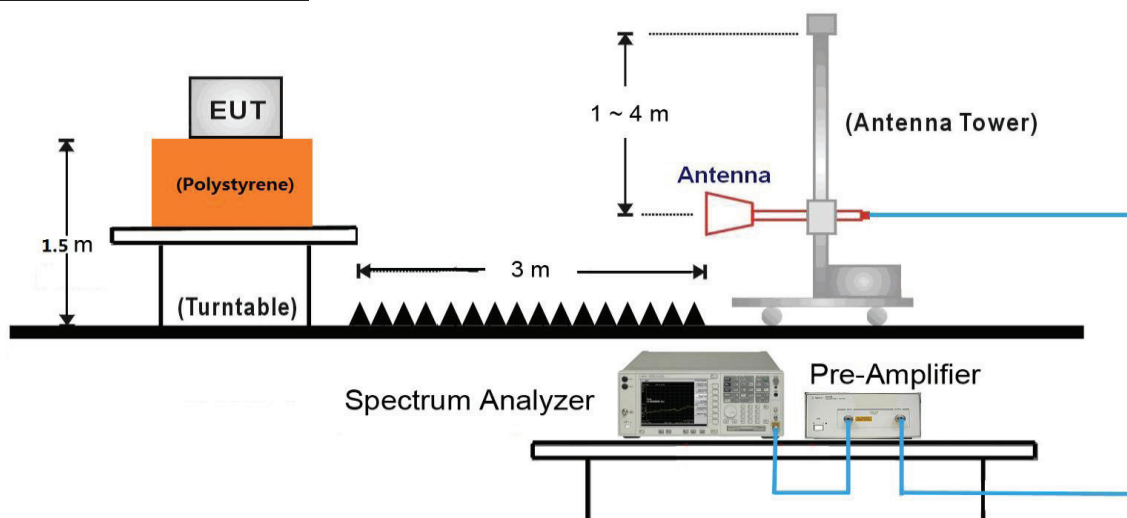
9kHz ~ 30MHz Test Setup:



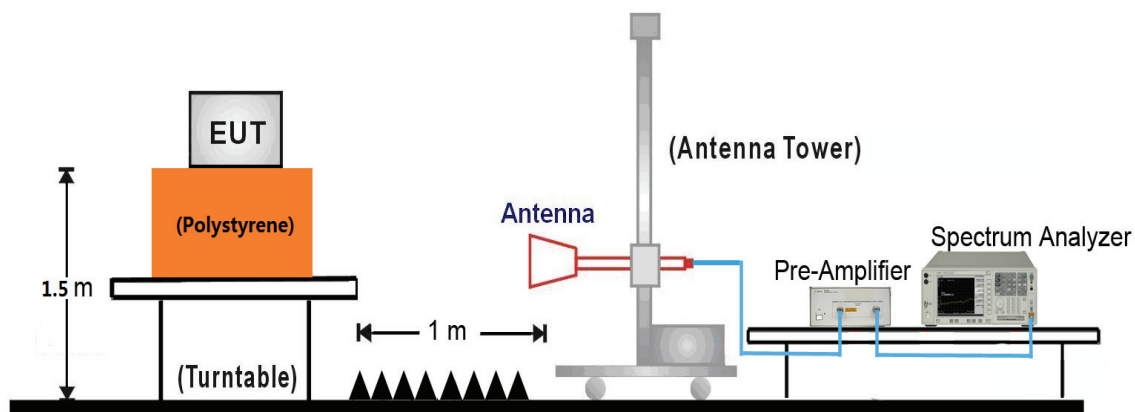
30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:



18GHz ~ 25GHz Test Setup:



7.6.5. Test Result

| | | | |
|---------------|---|----------------|-----------|
| Test Mode: | 802.11b | Test Site: | AC1 |
| Test Channel: | 01 | Test Engineer: | Roy Cheng |
| Remark: | 1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. | | |

| Mark | Frequency (MHz) | Reading Level (dBμV) | Factor (dB) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|--|-----------------|----------------------|-------------|------------------------|----------------|-------------|----------|--------------|
| * | 2447.0 | 38.0 | -3.8 | 34.2 | 82.5 | -48.3 | Peak | Horizontal |
| * | 4412.0 | 36.6 | 1.4 | 38.0 | 82.5 | -44.5 | Peak | Horizontal |
| | 4965.0 | 35.7 | 2.9 | 38.7 | 74.0 | -35.3 | Peak | Horizontal |
| | 5377.0 | 35.6 | 3.0 | 38.6 | 74.0 | -35.4 | Peak | Horizontal |
| * | 2552.0 | 36.8 | -3.5 | 33.3 | 82.5 | -49.2 | Peak | Vertical |
| * | 4488.0 | 35.7 | 1.6 | 37.3 | 82.5 | -45.2 | Peak | Vertical |
| | 4775.0 | 35.7 | 2.6 | 38.3 | 74.0 | -35.7 | Peak | Vertical |
| | 5388.0 | 34.1 | 3.1 | 37.2 | 74.0 | -36.8 | Peak | Vertical |
| Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (102.5dBμV/m). Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB) | | | | | | | | |

| | | | |
|---------------|---|----------------|-----------|
| Test Mode: | 802.11b | Test Site: | AC1 |
| Test Channel: | 06 | Test Engineer: | Roy Cheng |
| Remark: | 1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. | | |

| Mark | Frequency (MHz) | Reading Level (dBμV) | Factor (dB) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|--|-----------------|----------------------|-------------|------------------------|----------------|-------------|----------|--------------|
| * | 3525.0 | 37.0 | -1.0 | 36.0 | 82.3 | -46.3 | Peak | Horizontal |
| * | 4495.0 | 35.0 | 1.6 | 36.6 | 82.3 | -45.7 | Peak | Horizontal |
| | 4777.0 | 35.3 | 2.7 | 38.0 | 74.0 | -36.0 | Peak | Horizontal |
| | 5422.0 | 34.5 | 3.3 | 37.8 | 74.0 | -36.2 | Peak | Horizontal |
| * | 3529.0 | 37.6 | -1.0 | 36.6 | 82.3 | -45.7 | Peak | Vertical |
| * | 4462.0 | 36.1 | 1.5 | 37.6 | 82.3 | -44.7 | Peak | Vertical |
| | 4889.0 | 35.4 | 2.7 | 38.1 | 74.0 | -35.9 | Peak | Vertical |
| | 5429.0 | 34.5 | 3.3 | 37.8 | 74.0 | -36.2 | Peak | Vertical |
| Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (102.3dBμV/m). Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB) | | | | | | | | |

| | | | |
|---------------|---|----------------|-----------|
| Test Mode: | 802.11b | Test Site: | AC1 |
| Test Channel: | 11 | Test Engineer: | Roy Cheng |
| Remark: | 1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. | | |

| Mark | Frequency (MHz) | Reading Level (dBμV) | Factor (dB) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|--|-----------------|----------------------|-------------|------------------------|----------------|-------------|----------|--------------|
| * | 3546.0 | 36.5 | -0.9 | 35.6 | 82.1 | -46.5 | Peak | Horizontal |
| * | 4474.0 | 34.8 | 1.6 | 36.4 | 82.1 | -45.7 | Peak | Horizontal |
| | 4815.0 | 33.6 | 2.7 | 36.3 | 74.0 | -37.7 | Peak | Horizontal |
| | 5400.0 | 33.7 | 3.1 | 36.8 | 74.0 | -37.2 | Peak | Horizontal |
| * | 3496.0 | 36.0 | -1.1 | 34.9 | 82.1 | -47.2 | Peak | Vertical |
| * | 4477.0 | 35.4 | 1.6 | 37.0 | 82.1 | -45.1 | Peak | Vertical |
| | 4926.0 | 33.8 | 2.8 | 36.6 | 74.0 | -37.4 | Peak | Vertical |
| | 5451.0 | 33.8 | 3.4 | 37.2 | 74.0 | -36.8 | Peak | Vertical |
| Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (102.1dBμV/m). Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB) | | | | | | | | |

| | | | |
|---------------|---|----------------|-----------|
| Test Mode: | 802.11g | Test Site: | AC1 |
| Test Channel: | 01 | Test Engineer: | Roy Cheng |
| Remark: | 1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. | | |

| Mark | Frequency (MHz) | Reading Level (dBμV) | Factor (dB) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|--|-----------------|----------------------|-------------|------------------------|----------------|-------------|----------|--------------|
| * | 3529.0 | 38.5 | -1.0 | 37.5 | 86.5 | -49.0 | Peak | Horizontal |
| * | 4415.0 | 35.2 | 1.4 | 36.6 | 86.5 | -49.9 | Peak | Horizontal |
| | 4646.0 | 35.3 | 2.1 | 37.4 | 74.0 | -36.6 | Peak | Horizontal |
| | 5442.0 | 34.6 | 3.4 | 38.0 | 74.0 | -36.0 | Peak | Horizontal |
| * | 3462.0 | 37.9 | -1.4 | 36.5 | 86.5 | -50.0 | Peak | Vertical |
| * | 4458.0 | 34.8 | 1.5 | 36.3 | 86.5 | -50.2 | Peak | Vertical |
| | 4928.0 | 34.9 | 2.8 | 37.7 | 74.0 | -36.3 | Peak | Vertical |
| | 5441.0 | 34.6 | 3.4 | 38.0 | 74.0 | -36.0 | Peak | Vertical |
| Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (106.5dBμV/m). Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB) | | | | | | | | |

| | | | |
|---------------|---|----------------|-----------|
| Test Mode: | 802.11g | Test Site: | AC1 |
| Test Channel: | 06 | Test Engineer: | Roy Cheng |
| Remark: | 1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. | | |

| Mark | Frequency (MHz) | Reading Level (dBμV) | Factor (dB) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|--|-----------------|----------------------|-------------|------------------------|----------------|-------------|----------|--------------|
| * | 3518.0 | 37.0 | -1.0 | 36.0 | 85.6 | -49.6 | Peak | Horizontal |
| * | 4425.0 | 34.0 | 1.4 | 35.4 | 85.6 | -50.2 | Peak | Horizontal |
| | 4814.0 | 34.8 | 2.7 | 37.5 | 74.0 | -36.5 | Peak | Horizontal |
| | 5358.0 | 34.1 | 3.0 | 37.1 | 74.0 | -36.9 | Peak | Horizontal |
| * | 3529.0 | 37.9 | -1.0 | 36.9 | 85.6 | -48.7 | Peak | Vertical |
| * | 4469.0 | 34.8 | 1.6 | 36.4 | 85.6 | -49.2 | Peak | Vertical |
| | 4824.0 | 35.8 | 2.7 | 38.5 | 74.0 | -35.5 | Peak | Vertical |
| | 5399.0 | 34.7 | 3.1 | 37.8 | 74.0 | -36.2 | Peak | Vertical |
| Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (105.6dBμV/m). Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB) | | | | | | | | |

| | | | |
|---------------|---|----------------|-----------|
| Test Mode: | 802.11g | Test Site: | AC1 |
| Test Channel: | 11 | Test Engineer: | Roy Cheng |
| Remark: | 1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. | | |

| Mark | Frequency (MHz) | Reading Level (dBμV) | Factor (dB) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|--|-----------------|----------------------|-------------|------------------------|----------------|-------------|----------|--------------|
| * | 3526.0 | 36.8 | -1.0 | 35.8 | 84.7 | -48.9 | Peak | Horizontal |
| * | 4419.0 | 34.5 | 1.4 | 35.9 | 84.7 | -48.8 | Peak | Horizontal |
| | 4925.0 | 34.7 | 2.8 | 37.5 | 74.0 | -36.5 | Peak | Horizontal |
| | 5377.0 | 36.0 | 3.0 | 39.0 | 74.0 | -35.0 | Peak | Horizontal |
| * | 3529.0 | 36.3 | -1.0 | 35.3 | 84.7 | -49.4 | Peak | Vertical |
| * | 4421.0 | 34.8 | 1.4 | 36.2 | 84.7 | -48.5 | Peak | Vertical |
| | 4958.0 | 33.8 | 2.9 | 36.7 | 74.0 | -37.3 | Peak | Vertical |
| | 5392.0 | 34.2 | 3.1 | 37.3 | 74.0 | -36.7 | Peak | Vertical |
| Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (104.7dBμV/m). Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB) | | | | | | | | |

| | | | |
|---------------|---|----------------|-----------|
| Test Mode: | 802.11n-HT20 | Test Site: | AC1 |
| Test Channel: | 01 | Test Engineer: | Roy Cheng |
| Remark: | 1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. | | |

| Mark | Frequency (MHz) | Reading Level (dBμV) | Factor (dB) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|--|-----------------|----------------------|-------------|------------------------|----------------|-------------|----------|--------------|
| * | 3515.0 | 37.1 | -1.1 | 36.0 | 83.5 | -47.5 | Peak | Horizontal |
| * | 4416.0 | 34.7 | 1.4 | 36.1 | 83.5 | -47.4 | Peak | Horizontal |
| | 4718.0 | 34.8 | 2.4 | 37.2 | 74.0 | -36.8 | Peak | Horizontal |
| | 5395.0 | 34.8 | 3.1 | 37.9 | 74.0 | -36.1 | Peak | Horizontal |
| * | 3526.0 | 36.9 | -1.0 | 35.9 | 83.5 | -47.6 | Peak | Vertical |
| * | 4419.0 | 33.9 | 1.4 | 35.3 | 83.5 | -48.2 | Peak | Vertical |
| | 4952.0 | 33.7 | 2.9 | 36.6 | 74.0 | -37.4 | Peak | Vertical |
| | 5359.0 | 33.3 | 3.0 | 36.3 | 74.0 | -37.7 | Peak | Vertical |
| Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (103.5dBμV/m). Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB) | | | | | | | | |

| | | | |
|---------------|---|----------------|-----------|
| Test Mode: | 802.11n-HT20 | Test Site: | AC1 |
| Test Channel: | 06 | Test Engineer: | Roy Cheng |
| Remark: | 1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. | | |

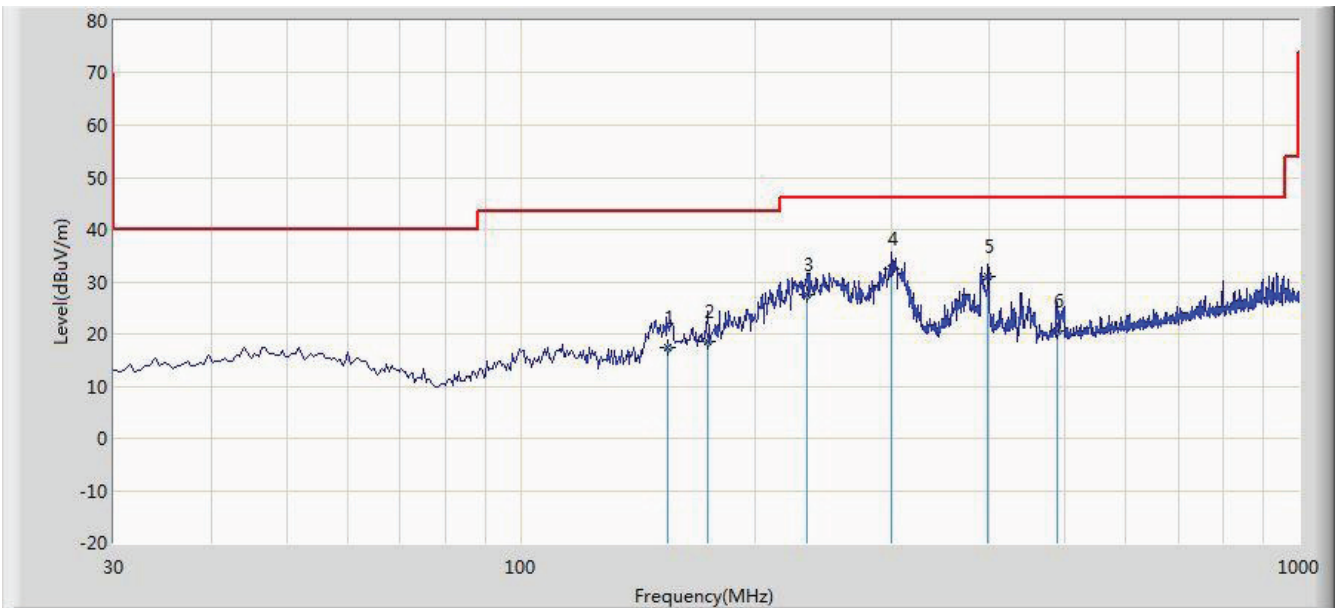
| Mark | Frequency (MHz) | Reading Level (dBμV) | Factor (dB) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|--|-----------------|----------------------|-------------|------------------------|----------------|-------------|----------|--------------|
| * | 3529.0 | 37.5 | -1.0 | 36.5 | 83.0 | -46.5 | Peak | Horizontal |
| * | 4419.0 | 35.5 | 1.4 | 36.9 | 83.0 | -46.1 | Peak | Horizontal |
| | 4952.0 | 34.7 | 2.9 | 37.6 | 74.0 | -36.4 | Peak | Horizontal |
| | 5386.0 | 33.9 | 3.0 | 36.9 | 74.0 | -37.1 | Peak | Horizontal |
| * | 3529.0 | 38.6 | -1.0 | 37.6 | 83.0 | -45.4 | Peak | Vertical |
| * | 4429.0 | 34.6 | 1.5 | 36.1 | 83.0 | -45.9 | Peak | Vertical |
| | 4935.0 | 36.0 | 2.8 | 38.8 | 74.0 | -35.2 | Peak | Vertical |
| | 5392.0 | 34.2 | 3.1 | 37.3 | 74.0 | -36.7 | Peak | Vertical |
| Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (103.0dBμV/m). Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB) | | | | | | | | |

| | | | |
|---------------|---|----------------|-----------|
| Test Mode: | 802.11n-HT20 | Test Site: | AC1 |
| Test Channel: | 11 | Test Engineer: | Roy Cheng |
| Remark: | 1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report. | | |

| Mark | Frequency (MHz) | Reading Level (dBμV) | Factor (dB) | Measure Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Polarization |
|--|-----------------|----------------------|-------------|------------------------|----------------|-------------|----------|--------------|
| * | 3419.0 | 37.3 | -1.6 | 35.7 | 82.6 | -46.9 | Peak | Horizontal |
| * | 4416.0 | 35.0 | 1.4 | 36.4 | 82.6 | -46.2 | Peak | Horizontal |
| | 4828.0 | 36.8 | 2.7 | 39.5 | 74.0 | -34.5 | Peak | Horizontal |
| | 5362.0 | 33.6 | 3.0 | 36.6 | 74.0 | -37.4 | Peak | Horizontal |
| * | 3515.0 | 37.6 | -1.1 | 36.5 | 82.6 | -46.1 | Peak | Vertical |
| * | 4415.0 | 34.0 | 1.4 | 35.4 | 82.6 | -47.2 | Peak | Vertical |
| | 4925.0 | 33.7 | 2.8 | 36.5 | 74.0 | -37.5 | Peak | Vertical |
| | 5362.0 | 34.6 | 3.0 | 37.6 | 74.0 | -36.4 | Peak | Vertical |
| Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (102.6dBμV/m). | | | | | | | | |
| Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB) | | | | | | | | |
| Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB) | | | | | | | | |

The worst case of Radiated Emission below 1GHz:

| | |
|--|--------------------------|
| Site: AC 1 | Time: 2015/09/30 - 16:13 |
| Limit: FCC_Part15.209_RE(3m) | Engineer: Peak Wang |
| Probe: VULB9162_0.03-8GHz | Polarity: Horizontal |
| EUT: Audio Conference Phone | Power: AC 120V/60Hz |
| Worse Case Mode: Transmit at Channel 2437MHz by 802.11b | |



| No | Flag | Mark | Frequency (MHz) | Measure Level (dBuV/m) | Reading Level (dBuV) | Over Limit (dB) | Limit (dBuV/m) | Factor (dB) | Type |
|----|------|------|-----------------|------------------------|----------------------|-----------------|----------------|-------------|------|
| 1 | | | 154.250 | 17.499 | 7.900 | -26.001 | 43.500 | 9.598 | QP |
| 2 | | | 174.200 | 18.533 | 8.090 | -24.967 | 43.500 | 10.443 | QP |
| 3 | | | 233.240 | 27.496 | 14.360 | -18.504 | 46.000 | 13.136 | QP |
| 4 | | * | 299.845 | 32.418 | 17.910 | -13.582 | 46.000 | 14.508 | QP |
| 5 | | | 398.203 | 30.919 | 14.300 | -15.081 | 46.000 | 16.619 | QP |
| 6 | | | 490.310 | 20.701 | 2.630 | -25.299 | 46.000 | 18.072 | QP |

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)