

802.11b AVGPSD - Ant 3 / Ant 0 + 1 + 2 + 3

Channel 01 (2412MHz)



Channel 06 (2437MHz)

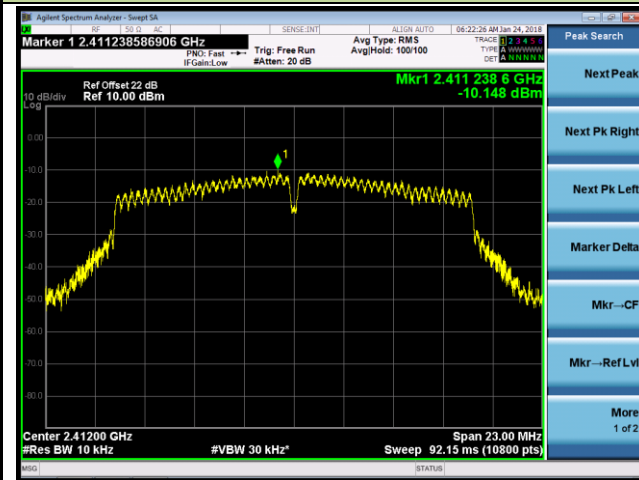


Channel 11 (2462MHz)

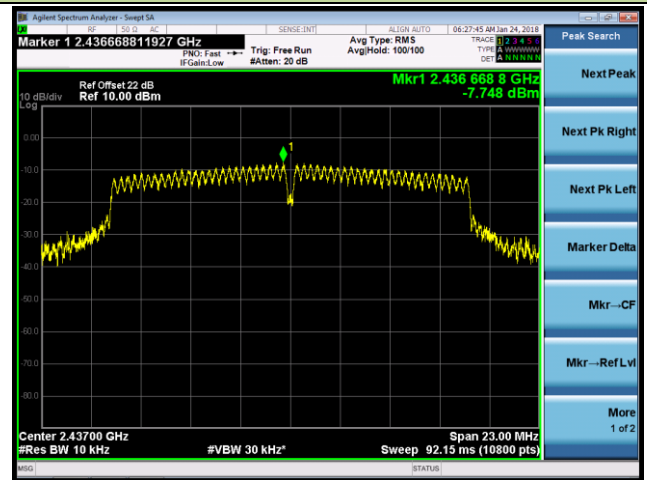


802.11g AVGPDS - Ant 3 / Ant 0 + 1 + 2 + 3

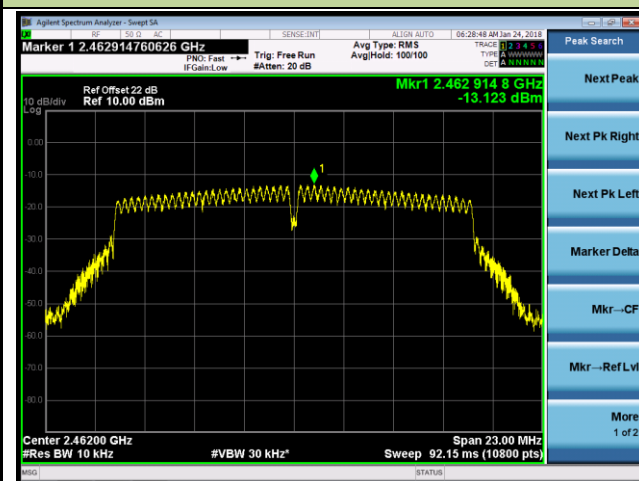
Channel 01 (2412MHz)



Channel 06 (2437MHz)

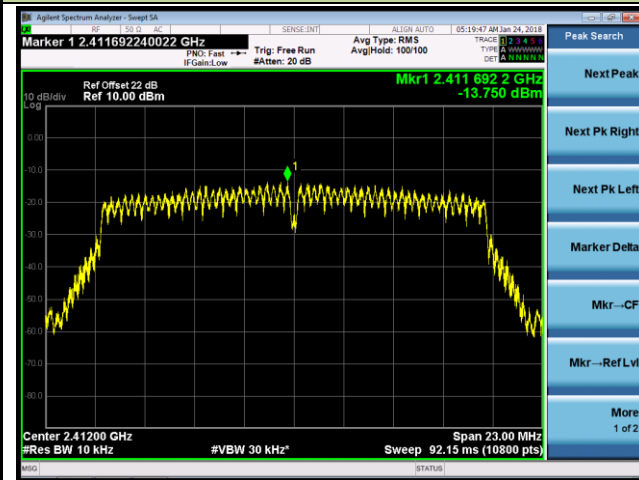


Channel 11 (2462MHz)

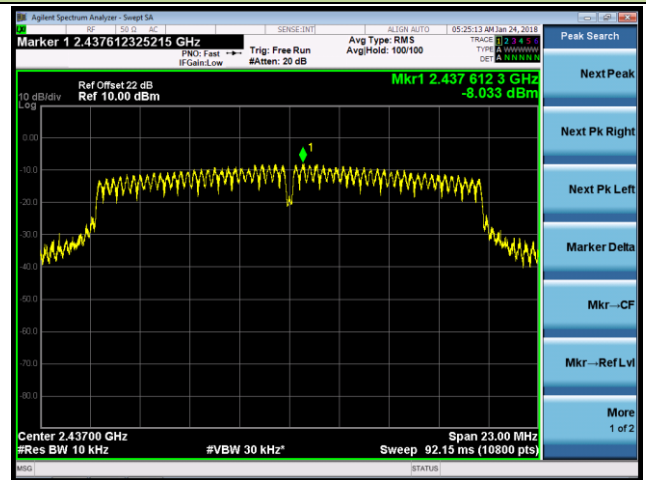


802.11n-HT20 AVGPST - Ant 3 / Ant 0 + 1 + 2 + 3

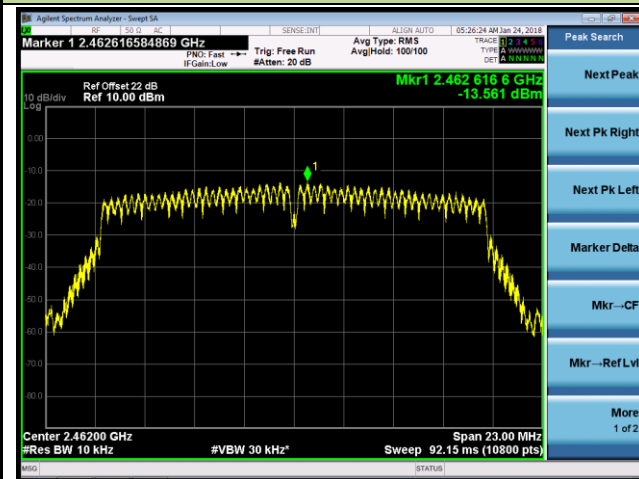
Channel 01 (2412MHz)



Channel 06 (2437MHz)

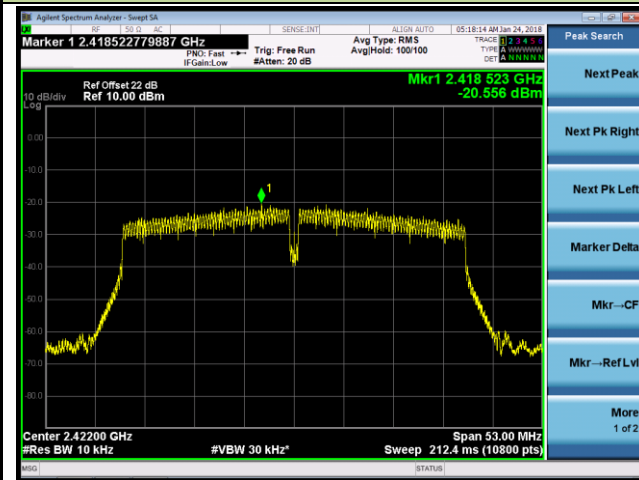


Channel 11 (2462MHz)

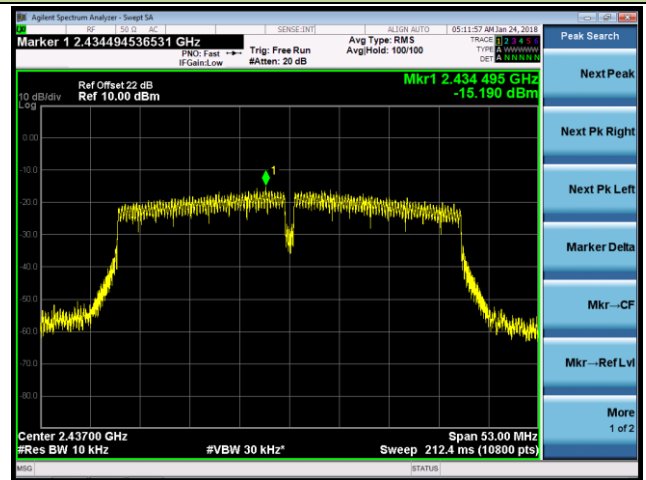


802.11n-HT40 AVGPSD - Ant 3 / Ant 0 + 1 + 2 + 3

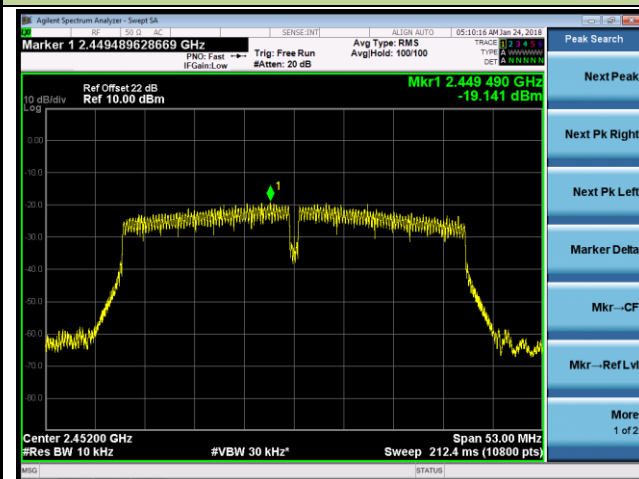
Channel 03 (2422MHz)



Channel 06 (2437MHz)



Channel 09 (2452MHz)



7.5. Conducted Band Edge and Out-of-Band Emissions

7.5.1. Test Limit

The limit for out-of-band spurious emissions at the band edge is 30dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the PSD procedure.

7.5.2. Test Procedure Used

KDB 558074 D01v04 - Section 11.2 & Section 11.3

7.5.3. Test Setting

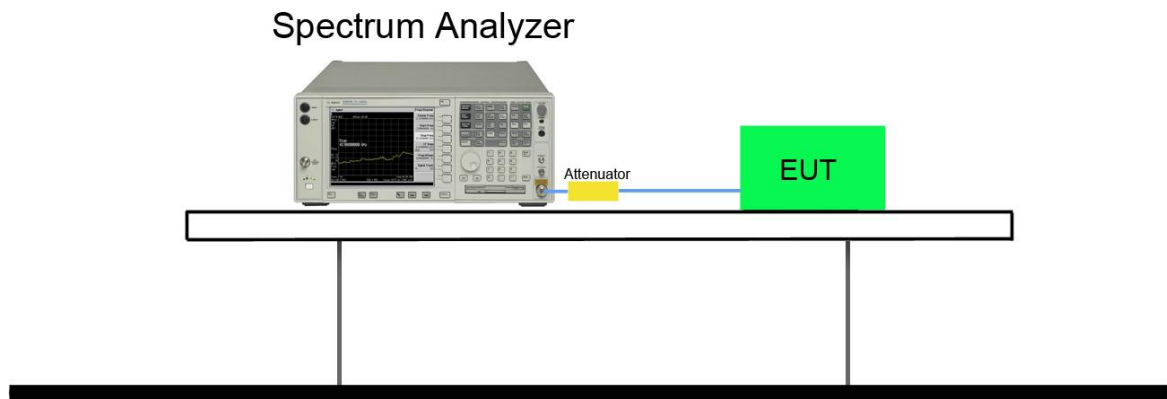
Reference level measurement

1. Set instrument center frequency to DTS channel center frequency
2. Set the span to ≥ 1.5 times the DTS bandwidth
3. Set the RBW = 100 kHz
4. Set the VBW $\geq 3 \times$ RBW
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize

Emission level measurement

1. Set the center frequency and span to encompass frequency range to be measured
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

7.5.4. Test Setup



7.5.5. Test Result

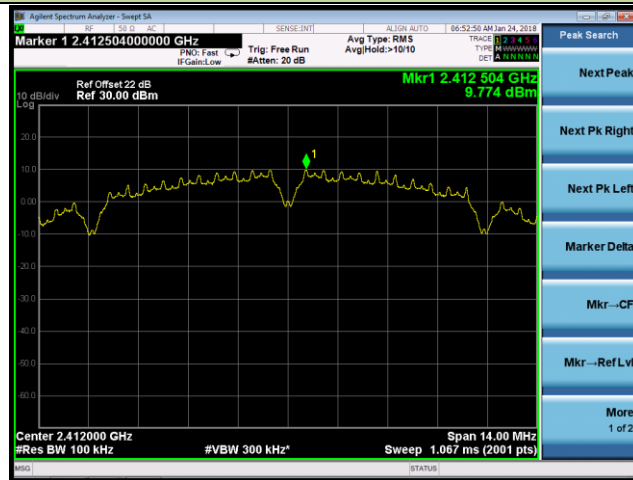
Product	AC2300 Wireless MU-MIMO Gigabit Router	Temperature	25°C
Test Engineer	Kevin Ker	Relative Humidity	51%
Test Site	SR1	Test Date	2018/01/24

Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	Limit	Result
Ant 0 / Ant 0 + 1 + 2 + 3					
802.11b	1Mbps	01	2412	30dBc	Pass
802.11b	1Mbps	06	2437	30dBc	Pass
802.11b	1Mbps	11	2462	30dBc	Pass
802.11g	6Mbps	01	2412	30dBc	Pass
802.11g	6Mbps	06	2437	30dBc	Pass
802.11g	6Mbps	11	2462	30dBc	Pass
802.11n-HT20	MCS0	01	2412	30dBc	Pass
802.11n-HT20	MCS0	06	2437	30dBc	Pass
802.11n-HT20	MCS0	11	2462	30dBc	Pass
802.11n-HT40	MCS0	03	2422	30dBc	Pass
802.11n-HT40	MCS0	06	2437	30dBc	Pass
802.11n-HT40	MCS0	09	2452	30dBc	Pass

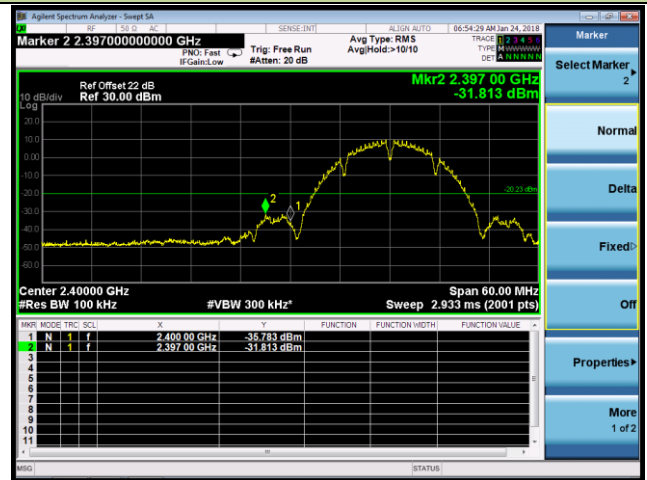
802.11b Out-of-Band Emissions - Ant 0 / Ant 0 + 1 + 2 + 3

Channel 01 (2412MHz)

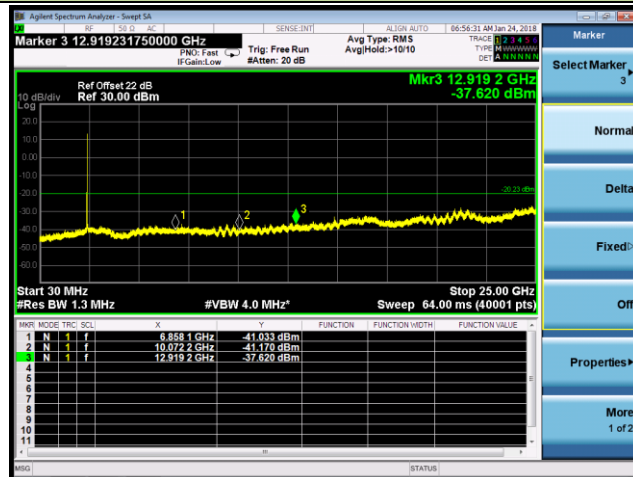
100kHz PSD Reference Level



Low Band Edge



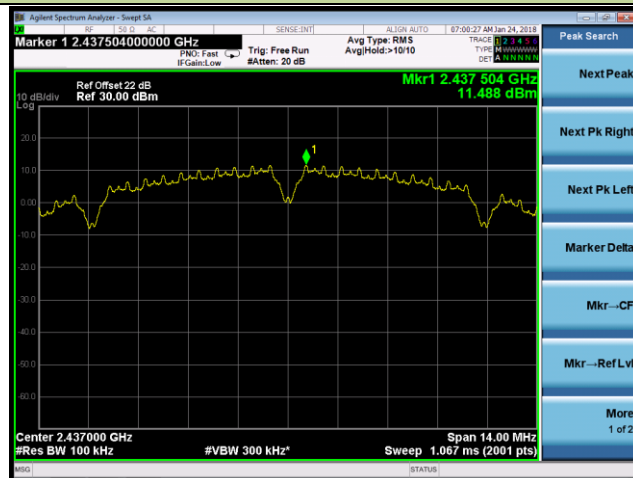
Spurious Emission



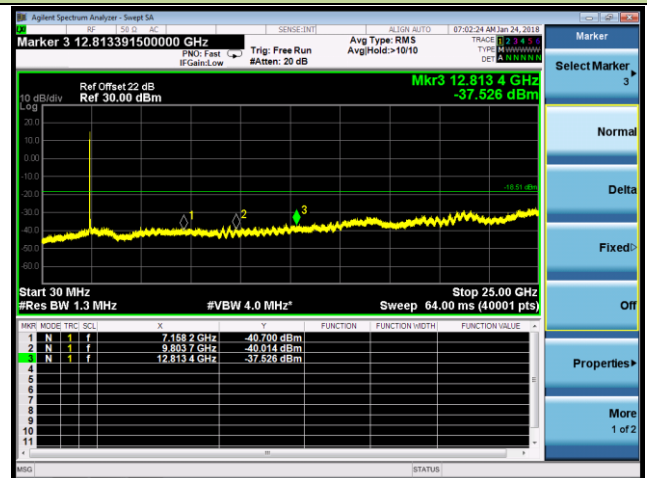
Note: The value of the display line is -20.23

Channel 06 (2437MHz)

100kHz PSD Reference Level



Spurious Emission

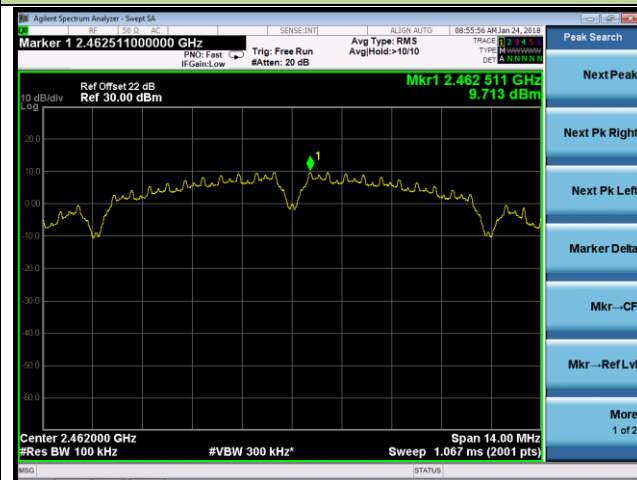


Note: The value of the display line is -18.51

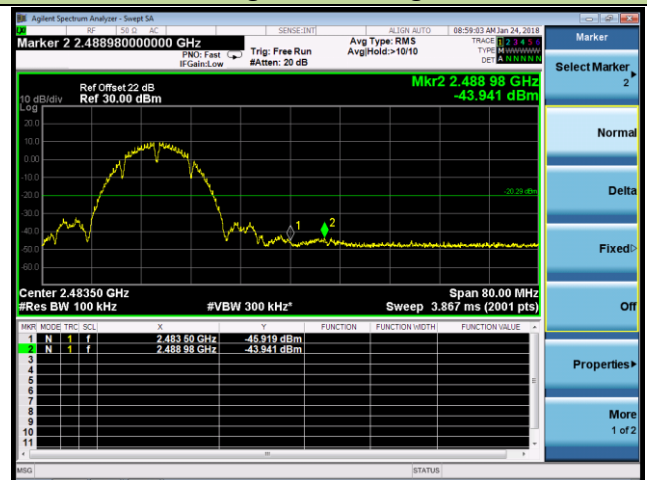
802.11b Out-of-Band Emissions - Ant 0 / Ant 0 + 1 + 2 + 3

Channel 11 (2462MHz)

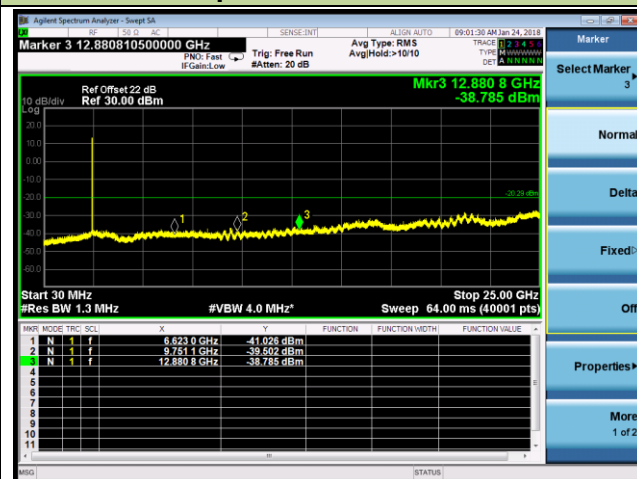
100kHz PSD Reference Level



High Band Edge



Spurious Emission

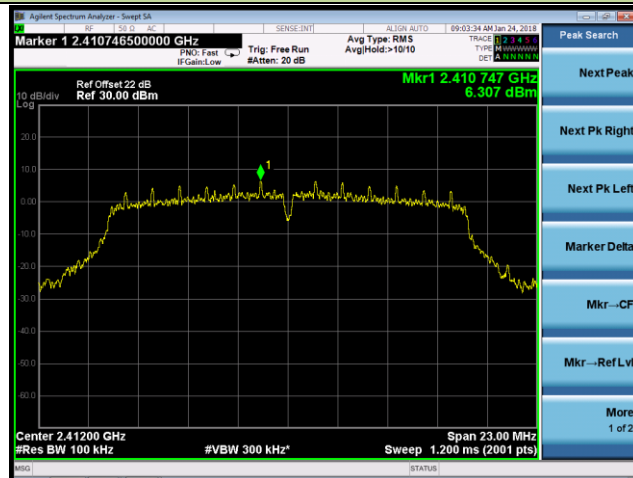


Note: The value of the display line is -20.29

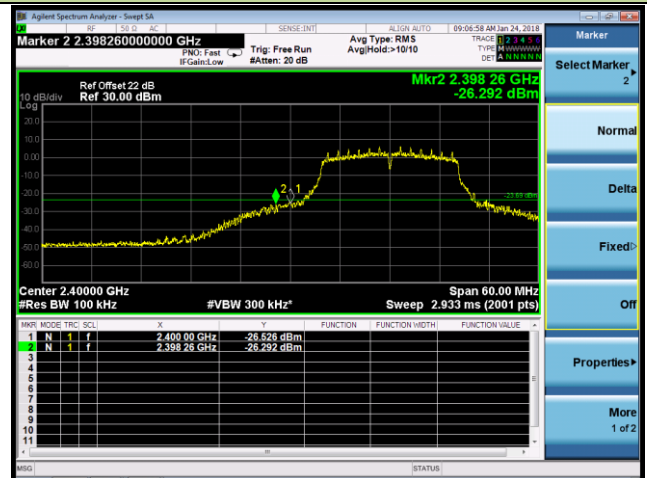
802.11g Out-of-Band Emissions - Ant 0 / Ant 0 + 1 + 2 + 3

Channel 01 (2412MHz)

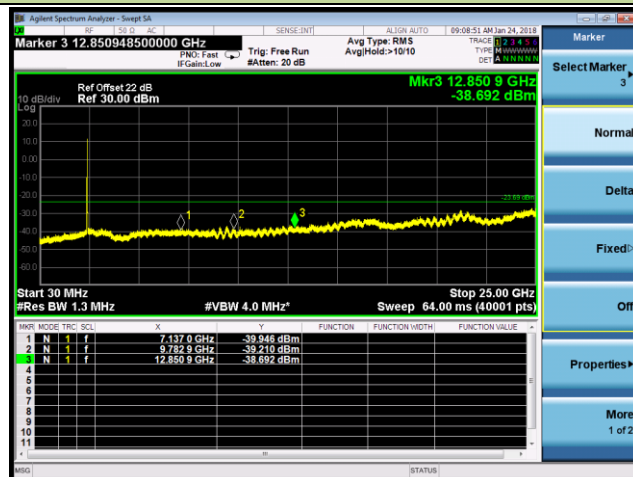
100kHz PSD Reference Level



Low Band Edge



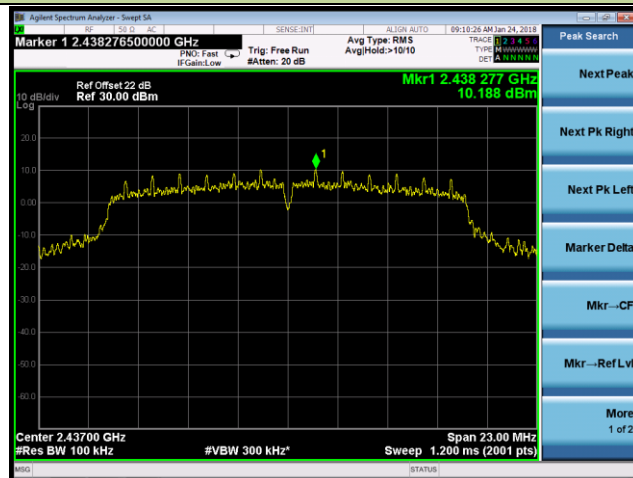
Spurious Emission



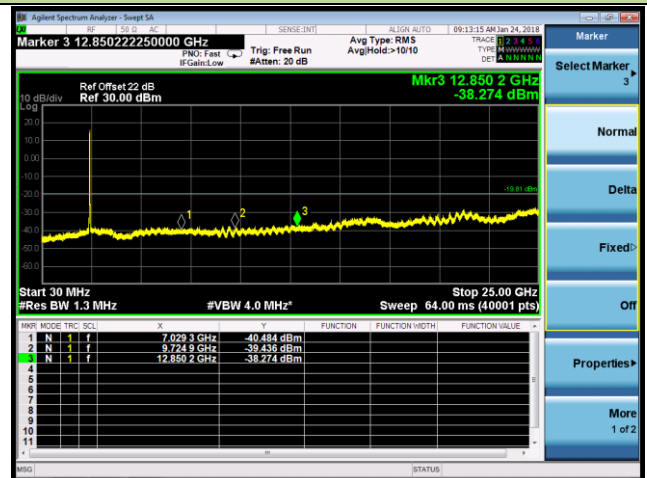
Note: The value of the display line is -23.69

Channel 06 (2437MHz)

100kHz PSD Reference Level



Spurious Emission



Note: The value of the display line is -19.81

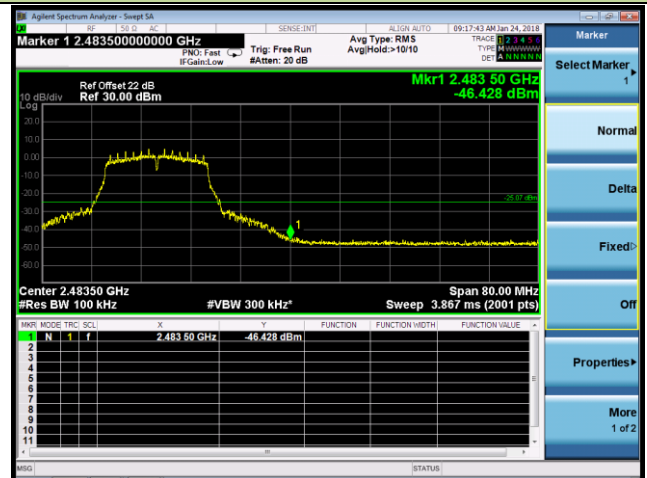
802.11g Out-of-Band Emissions - Ant 0 / Ant 0 + 1 + 2 + 3

Channel 11 (2462MHz)

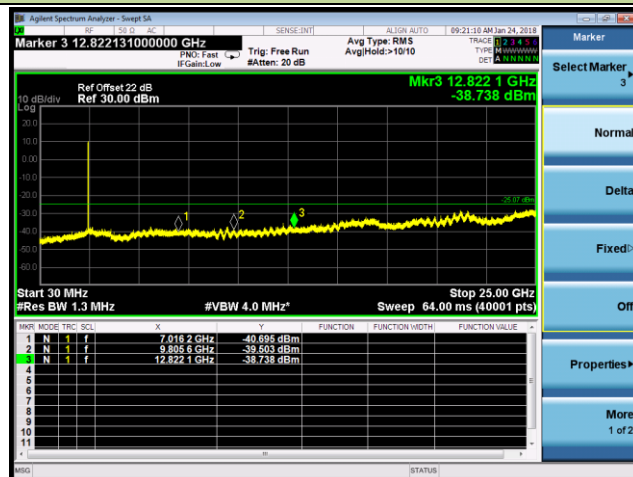
100kHz PSD Reference Level



High Band Edge



Spurious Emission

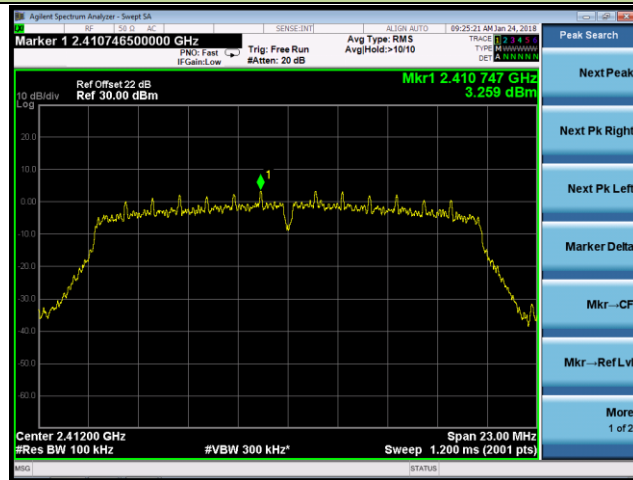


Note: The value of the display line is -25.07

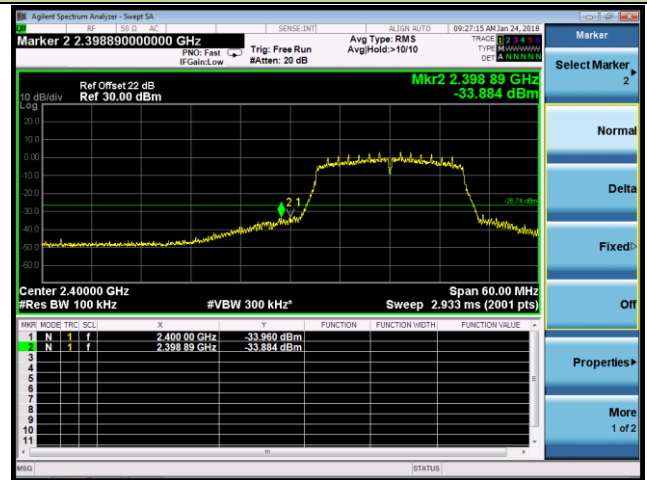
802.11n-HT20 Out-of-Band Emissions - Ant 0 / Ant 0 + 1 + 2 + 3

Channel 01 (2412MHz)

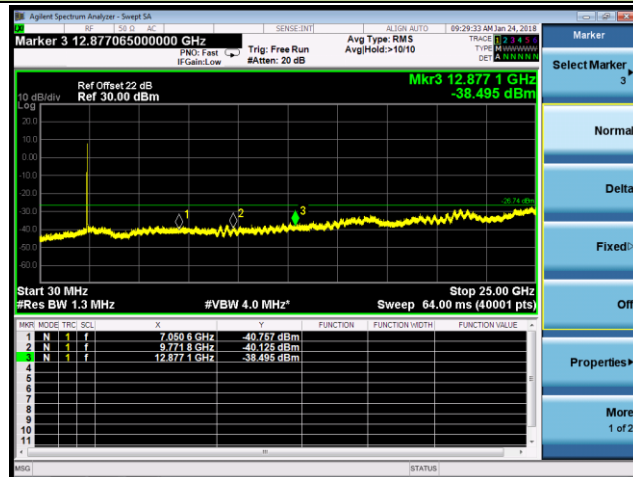
100kHz PSD Reference Level



Low Band Edge



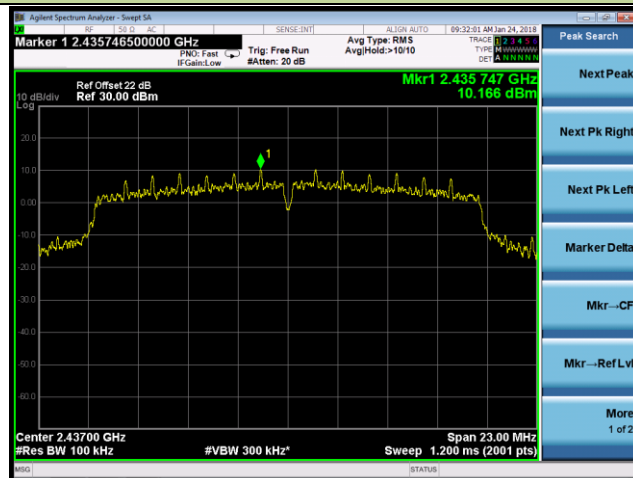
Spurious Emission



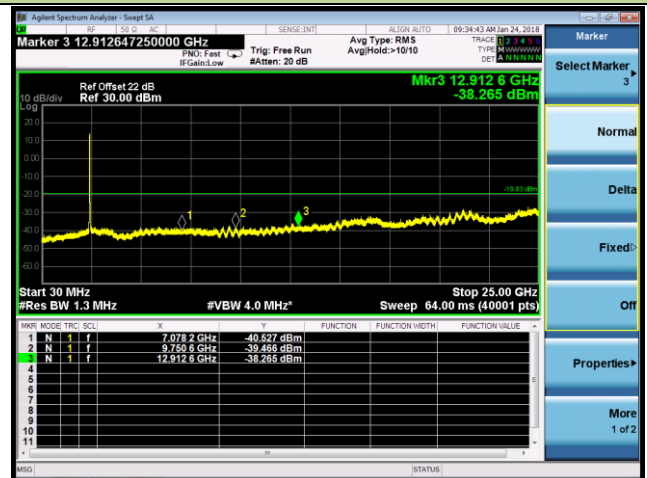
Note: The value of the display line is -26.74

Channel 06 (2437MHz)

100kHz PSD Reference Level



Spurious Emission

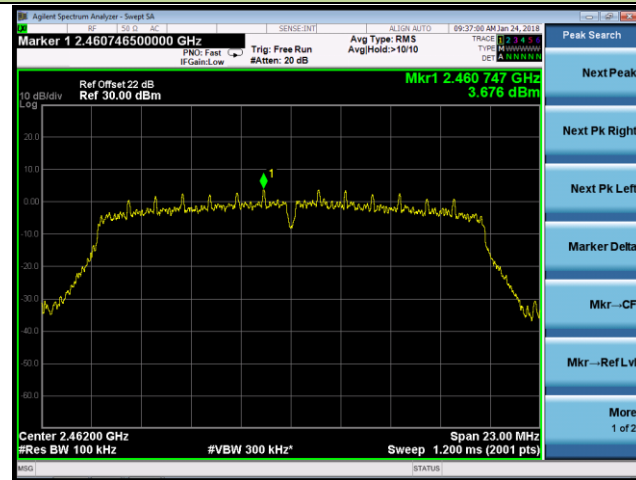


Note: The value of the display line is -19.83

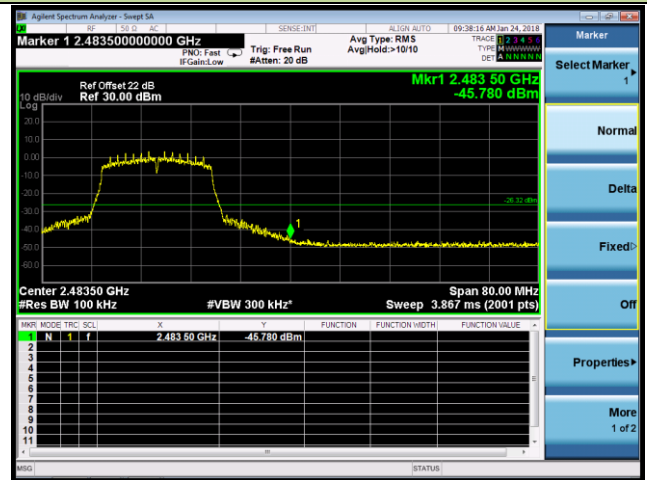
802.11n-HT20 Out-of-Band Emissions - Ant 0 / Ant 0 + 1 + 2 + 3

Channel 11 (2462MHz)

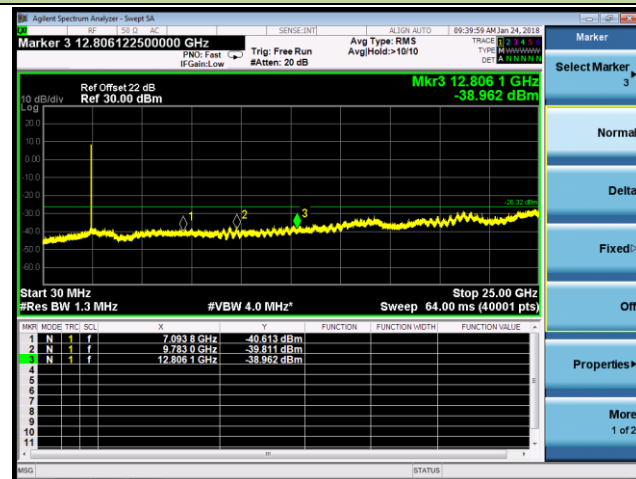
100kHz PSD Reference Level



High Band Edge



Spurious Emission

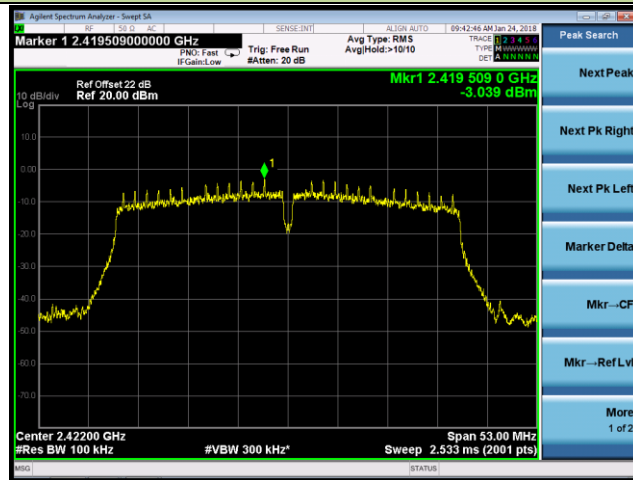


Note: The value of the display line is -26.32

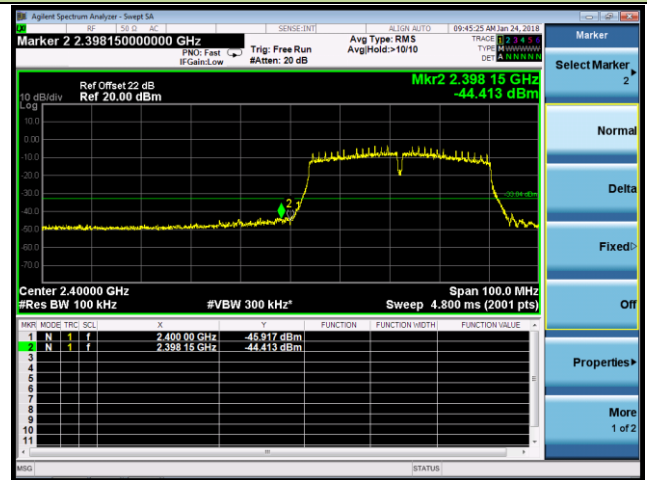
802.11n-HT40 Out-of-Band Emissions - Ant 0 / Ant 0 + 1 + 2 + 3

Channel 01 (2412MHz)

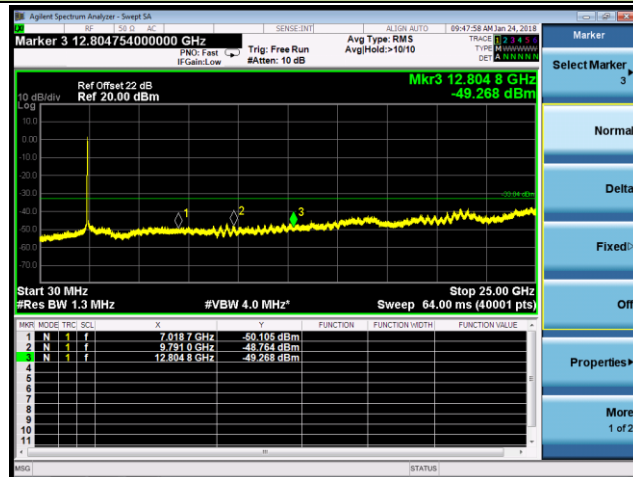
100kHz PSD Reference Level



Low Band Edge



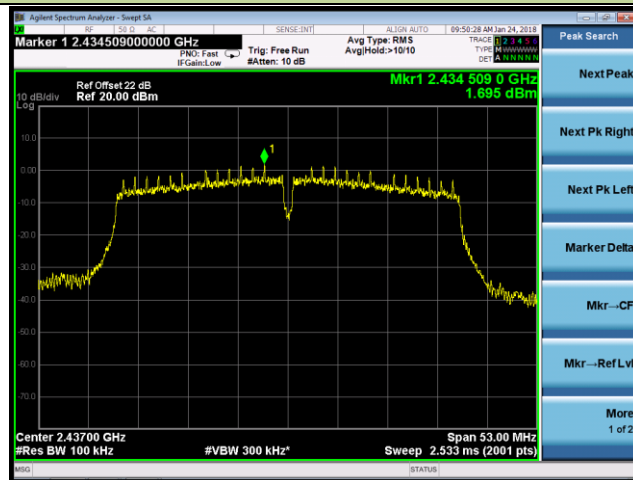
Spurious Emission



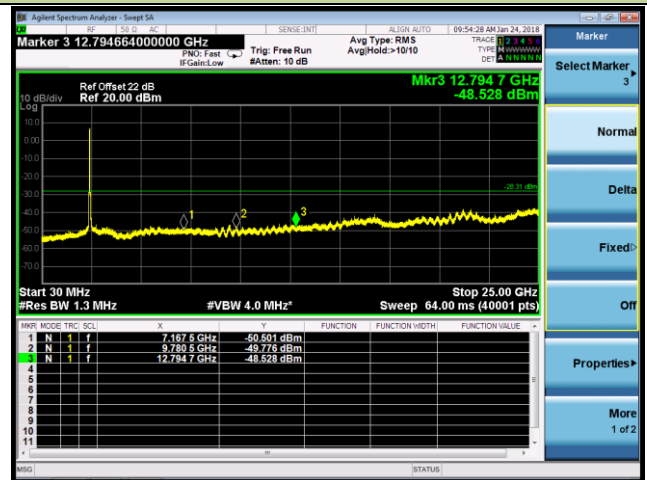
Note: The value of the display line is -33.04

Channel 06 (2437MHz)

100kHz PSD Reference Level



Spurious Emission

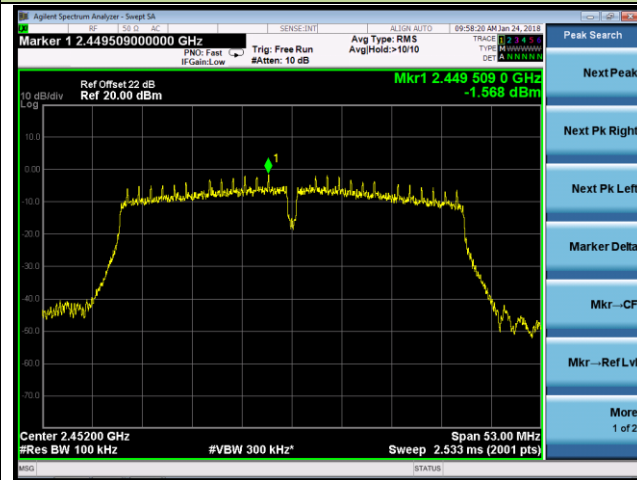


Note: The value of the display line is -29.31

802.11n-HT40 Out-of-Band Emissions - Ant 0 / Ant 0 + 1 + 2 + 3

Channel 11 (2462MHz)

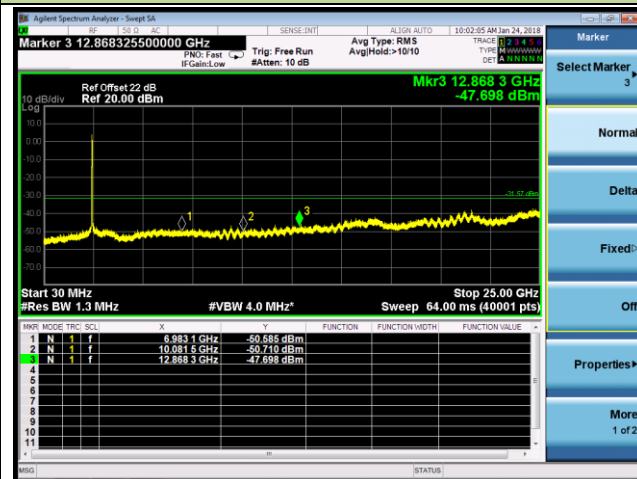
100kHz PSD Reference Level



High Band Edge



Spurious Emission



Note: The value of the display line is -31.57

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 [uV/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

ANSI C63.10 Section 6.3 (General Requirements)

ANSI C63.10 Section 6.4 (Standard test method below 30MHz)

ANSI C63.10 Section 6.5 (Standard test method above 30MHz to 1GHz)

ANSI C63.10 Section 6.6 (Standard test method above 1GHz)

7.6.3. Test Setting

Peak Field Strength Measurements

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

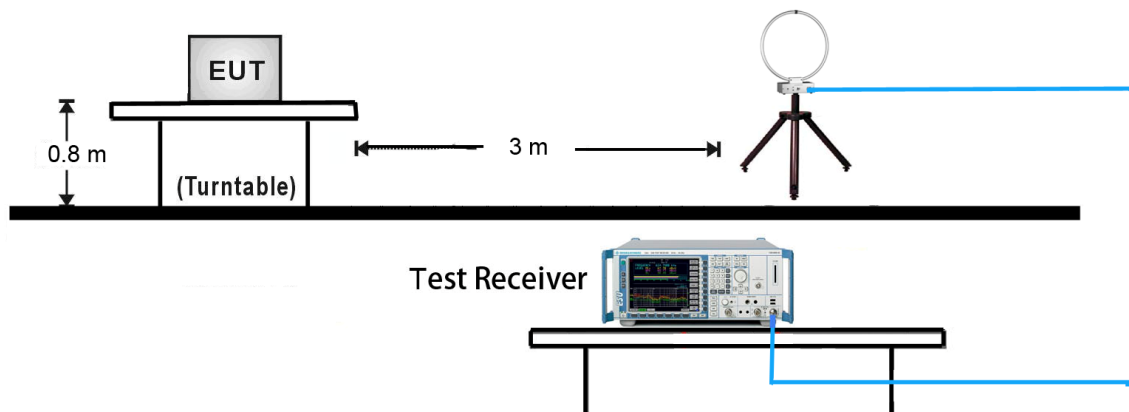
Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

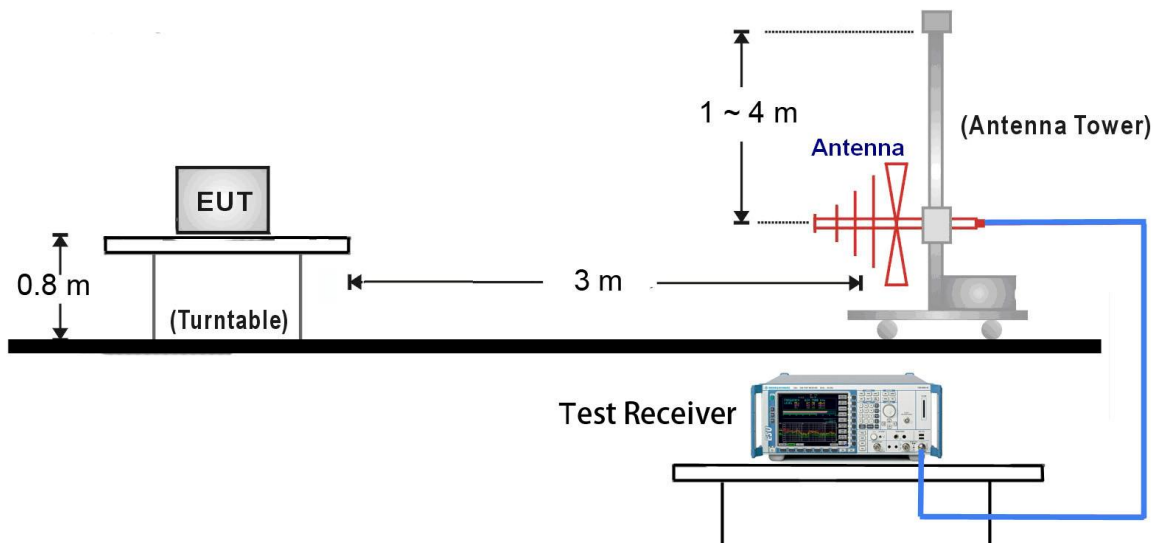
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW $\geq 1/T$
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

7.6.4. Test Setup

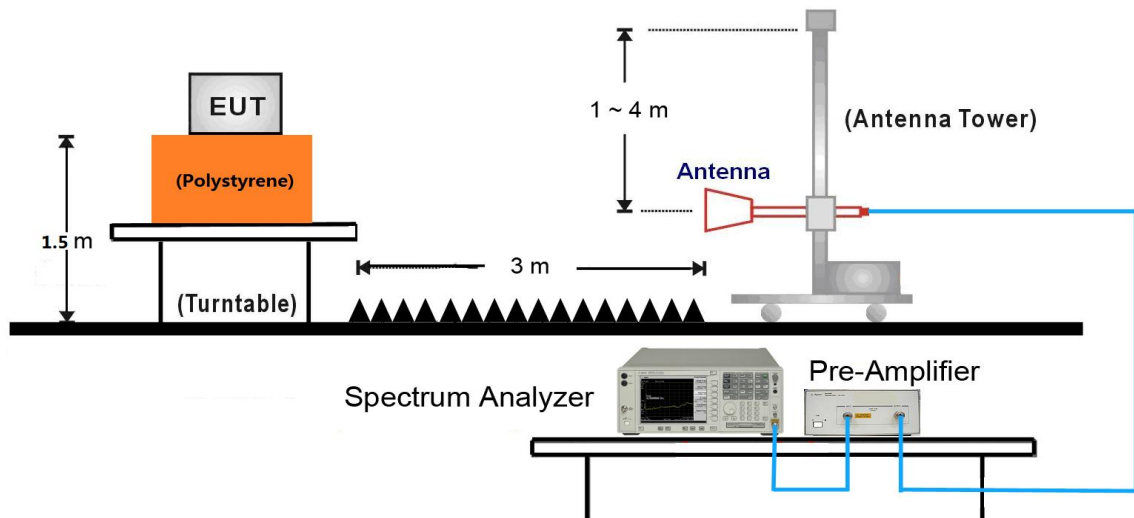
9kHz ~ 30MHz Test Setup:



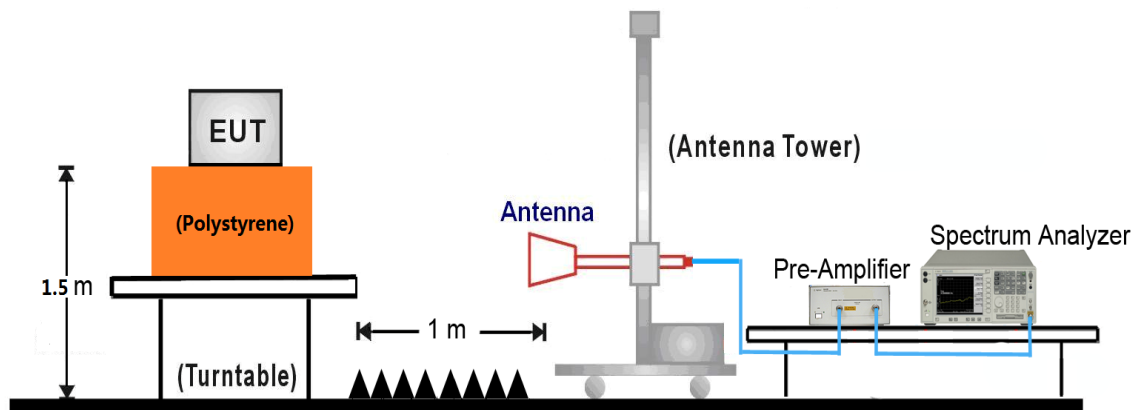
30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:



18GHz ~25GHz Test Setup:



7.6.5. Test Result

Test Mode:	802.11b - Ant 0 + 1 + 2 + 3	Test Site:	AC1
Test Channel:	01	Test Engineer:	Kevin Ker
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
	7434.5	35.5	12.7	48.2	74.0	-25.8	Peak	Horizontal
	8395.0	36.2	12.2	48.4	74.0	-25.6	Peak	Horizontal
*	9857.0	33.5	16.2	49.7	88.7	-39.0	Peak	Horizontal
*	12840.5	32.6	19.2	51.8	88.7	-36.9	Peak	Horizontal
	7579.0	36.0	12.7	48.7	74.0	-25.3	Peak	Vertical
	8250.5	36.5	11.9	48.4	74.0	-25.6	Peak	Vertical
*	9814.5	33.8	15.4	49.2	88.7	-39.5	Peak	Vertical
*	12891.5	33.5	19.4	52.9	88.7	-35.8	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (118.7dBμV/m) or FCC 15.209 which is higher.

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 - Ant 0 + 1 + 2 + 3	Test Site:	AC1
Test Channel:	06	Test Engineer:	Kevin Ker
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
	7502.5	35.4	12.8	48.2	74.0	-25.8	Peak	Horizontal
	8250.5	35.8	11.9	47.7	74.0	-26.3	Peak	Horizontal
*	9874.0	34.1	15.8	49.9	89.3	-39.4	Peak	Horizontal
*	12866.0	34.0	19.3	53.3	89.3	-36.0	Peak	Horizontal
	7417.5	35.4	12.6	48.0	74.0	-26.0	Peak	Vertical
	8480.0	35.5	12.7	48.2	74.0	-25.8	Peak	Vertical
*	9823.0	34.4	15.6	50.0	89.3	-39.3	Peak	Vertical
*	12866.0	34.0	19.3	53.3	89.3	-36.0	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (119.3dBμV/m) or FCC 15.209 which is higher.

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 - Ant 0 + 1 + 2 + 3	Test Site:	AC1
Test Channel:	11	Test Engineer:	Kevin Ker
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
	7417.5	35.4	12.6	48.0	74.0	-26.0	Peak	Horizontal
	8463.0	33.9	12.6	46.5	74.0	-27.5	Peak	Horizontal
*	10044.0	33.0	15.5	48.5	89.6	-41.1	Peak	Horizontal
*	12840.5	32.6	19.2	51.8	89.6	-37.8	Peak	Horizontal
	7545.0	34.7	12.8	47.5	74.0	-26.5	Peak	Vertical
	8318.5	36.6	11.9	48.5	74.0	-25.5	Peak	Vertical
*	10222.5	35.1	16.3	51.4	89.6	-38.2	Peak	Vertical
*	12840.5	32.6	19.2	51.8	89.6	-37.8	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (119.6dBμV/m) or FCC 15.209 which is higher.

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 - Ant 0 + 1 + 2 + 3	Test Site:	AC1
Test Channel:	01	Test Engineer:	Kevin Ker
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
	7545.0	34.7	12.8	47.5	74.0	-26.5	Peak	Horizontal
	8352.5	35.6	12.0	47.6	74.0	-26.4	Peak	Horizontal
*	9823.0	33.1	15.6	48.7	87.4	-38.7	Peak	Horizontal
*	12789.5	32.9	19.0	51.9	87.4	-35.5	Peak	Horizontal
	7451.5	35.8	12.8	48.6	74.0	-25.4	Peak	Vertical
	8276.0	35.9	11.9	47.8	74.0	-26.2	Peak	Vertical
*	9993.0	35.3	15.4	50.7	87.4	-36.7	Peak	Vertical
*	12789.5	32.9	19.0	51.9	87.4	-35.5	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (117.4dBμV/m) or FCC 15.209 which is higher.

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 - Ant 0 + 1 + 2 + 3	Test Site:	AC1
Test Channel:	06	Test Engineer:	Kevin Ker
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
	7451.5	35.8	12.8	48.6	74.0	-25.4	Peak	Horizontal
	8242.0	36.5	11.9	48.4	74.0	-25.6	Peak	Horizontal
*	9959.0	36.2	15.3	51.5	87.8	-36.3	Peak	Horizontal
*	12713.0	33.6	18.8	52.4	87.8	-35.4	Peak	Horizontal
	7528.0	35.8	12.8	48.6	74.0	-25.4	Peak	Vertical
	8199.5	36.1	12.0	48.1	74.0	-25.9	Peak	Vertical
*	9882.5	35.4	15.6	51.0	87.8	-36.8	Peak	Vertical
*	12713.0	33.6	18.8	52.4	87.8	-35.4	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (117.8dBμV/m) or FCC 15.209 which is higher.

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 - Ant 0 + 1 + 2 + 3	Test Site:	AC1
Test Channel:	11	Test Engineer:	Kevin Ker
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
	7528.0	35.8	12.8	48.6	74.0	-25.4	Peak	Horizontal
	8352.5	34.2	12.0	46.2	74.0	-27.8	Peak	Horizontal
*	9712.5	35.9	14.7	50.6	88.1	-37.5	Peak	Horizontal
*	12781.0	31.1	19.0	50.1	88.1	-38.0	Peak	Horizontal
	7477.0	35.1	12.8	47.9	74.0	-26.1	Peak	Vertical
	8233.5	36.7	11.9	48.6	74.0	-25.4	Peak	Vertical
*	10035.5	34.9	15.5	50.4	88.1	-37.7	Peak	Vertical
*	12781.0	31.1	19.0	50.1	88.1	-38.0	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (118.1dBμV/m) or FCC 15.209 which is higher.

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 - Ant 0 + 1 + 2 + 3	Test Site:	AC1
Test Channel:	01	Test Engineer:	Kevin Ker
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
	7477.0	35.1	12.8	47.9	74.0	-26.1	Peak	Horizontal
	8318.5	34.7	11.9	46.6	74.0	-27.4	Peak	Horizontal
*	9967.5	33.8	15.3	49.1	85.7	-36.6	Peak	Horizontal
*	12925.5	30.7	19.6	50.3	85.7	-35.4	Peak	Horizontal
	7502.5	33.7	12.8	46.5	74.0	-27.5	Peak	Vertical
	8463.0	34.0	12.6	46.6	74.0	-27.4	Peak	Vertical
*	10197.0	34.1	16.2	50.3	85.7	-35.4	Peak	Vertical
*	12925.5	30.7	19.6	50.3	85.7	-35.4	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (115.7dBμV/m) or FCC 15.209 which is higher.

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 - Ant 0 + 1 + 2 + 3	Test Site:	AC1
Test Channel:	06	Test Engineer:	Kevin Ker
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
	7502.5	33.7	12.8	46.5	74.0	-27.5	Peak	Horizontal
	8191.0	38.2	12.0	50.2	74.0	-23.8	Peak	Horizontal
*	9857.0	33.3	16.2	49.5	86.6	-37.1	Peak	Horizontal
*	12891.5	32.0	19.4	51.4	86.6	-35.2	Peak	Horizontal
	7366.5	36.5	12.5	49.0	74.0	-25.0	Peak	Vertical
	8301.5	36.4	11.9	48.3	74.0	-25.7	Peak	Vertical
*	9797.5	35.4	15.1	50.5	86.6	-36.1	Peak	Vertical
*	12891.5	32.0	19.4	51.4	86.6	-35.2	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (116.6dBμV/m) or FCC 15.209 which is higher.

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 - Ant 0 + 1 + 2 + 3	Test Site:	AC1
Test Channel:	11	Test Engineer:	Kevin Ker
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
	7366.5	36.5	12.5	49.0	74.0	-25.0	Peak	Horizontal
	8395.0	35.0	12.2	47.2	74.0	-26.8	Peak	Horizontal
*	9721.0	34.4	14.7	49.1	87.8	-38.7	Peak	Horizontal
*	12891.5	30.9	19.4	50.3	87.8	-37.5	Peak	Horizontal
	7451.5	35.5	12.8	48.3	74.0	-25.7	Peak	Vertical
	8395.0	35.8	12.2	48.0	74.0	-26.0	Peak	Vertical
*	10129.0	35.1	15.9	51.0	87.8	-36.8	Peak	Vertical
*	12891.5	30.9	19.4	50.3	87.8	-37.5	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (117.8dBμV/m) or FCC 15.209 which is higher.

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-HT40 - Ant 0 + 1 + 2 + 3	Test Site:	AC1
Test Channel:	03	Test Engineer:	Kevin Ker
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
	7451.5	35.5	12.8	48.3	74.0	-25.7	Peak	Horizontal
	8488.5	34.9	12.7	47.6	74.0	-26.4	Peak	Horizontal
*	10171.5	35.2	16.1	51.3	80.0	-28.7	Peak	Horizontal
*	12781.0	31.3	19.0	50.3	80.0	-29.7	Peak	Horizontal
	7562.0	35.7	12.8	48.5	74.0	-25.5	Peak	Vertical
	8446.0	35.2	12.5	47.7	74.0	-26.3	Peak	Vertical
*	10069.5	34.0	15.6	49.6	80.0	-30.4	Peak	Vertical
*	12781.0	31.3	19.0	50.3	80.0	-29.7	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (110.0dBμV/m) or FCC 15.209 which is higher.

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-HT40 - Ant 0 + 1 + 2 + 3	Test Site:	AC1
Test Channel:	06	Test Engineer:	Kevin Ker
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
	7562.0	35.7	12.8	48.5	74.0	-25.5	Peak	Horizontal
	8352.5	36.1	12.0	48.1	74.0	-25.9	Peak	Horizontal
*	9857.0	33.8	16.2	50.0	81.0	-31.0	Peak	Horizontal
*	12738.5	31.5	18.9	50.4	81.0	-30.6	Peak	Horizontal
	7417.5	35.3	12.6	47.9	74.0	-26.1	Peak	Vertical
	8429.0	34.0	12.4	46.4	74.0	-27.6	Peak	Vertical
*	10171.5	33.4	16.1	49.5	81.0	-31.5	Peak	Vertical
*	12738.5	31.5	18.9	50.4	81.0	-30.6	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (111.0dBμV/m) or FCC 15.209 which is higher.

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-HT40 - Ant 0 + 1 + 2 + 3	Test Site:	AC1
Test Channel:	09	Test Engineer:	Kevin Ker
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
	7417.5	35.3	12.6	47.9	74.0	-26.1	Peak	Horizontal
	8284.5	36.9	11.9	48.8	74.0	-25.2	Peak	Horizontal
*	9916.5	34.2	15.3	49.5	82.0	-32.5	Peak	Horizontal
*	12781.0	31.5	19.0	50.5	82.0	-31.5	Peak	Horizontal
	7553.5	35.8	12.8	48.6	74.0	-25.4	Peak	Vertical
	8242.0	37.2	11.9	49.1	74.0	-24.9	Peak	Vertical
*	9967.5	35.9	15.3	51.2	82.0	-30.8	Peak	Vertical
*	12781.0	31.5	19.0	50.5	82.0	-31.5	Peak	Vertical

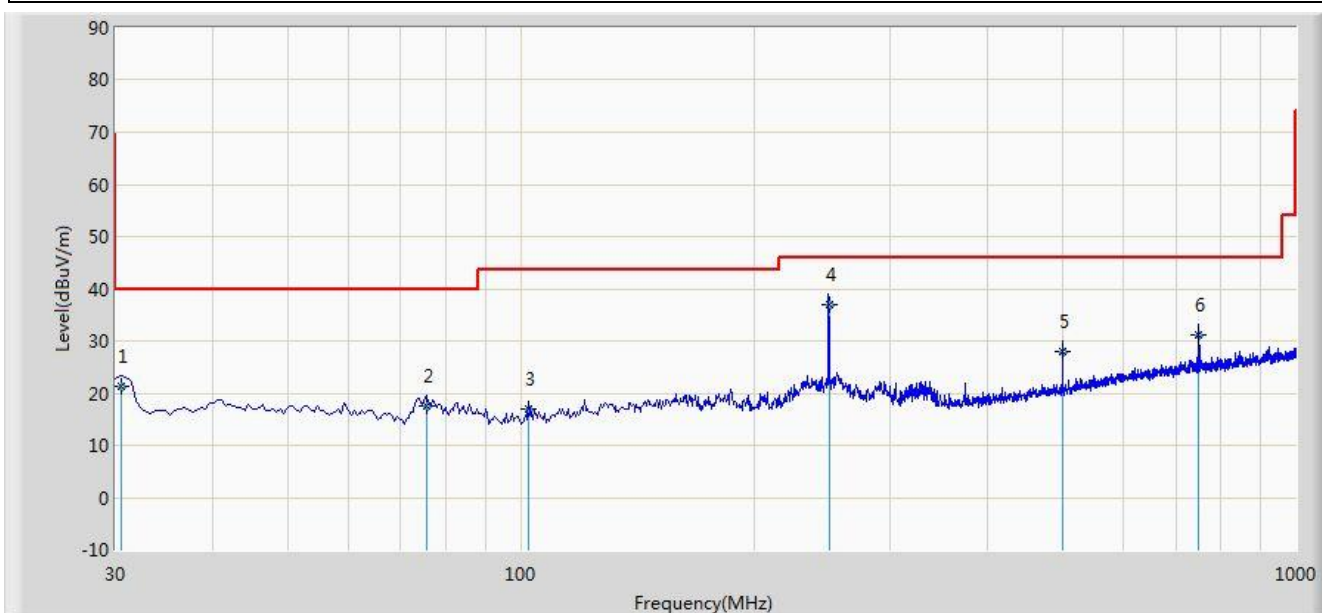
Note 1: “*” is not in restricted band, its limit is 30dBc of the fundamental emission level (112.0dBμV/m) or FCC 15.209 which is higher.

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: AC1	Time: 2018/01/19 - 14:16
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: VULB 9168_20-2000MHz	Polarity: Horizontal
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Worst Case Mode: Transmit by 802.11n-HT20 at channel 2412MHz, Ant 0 + 1 + 2 + 3	



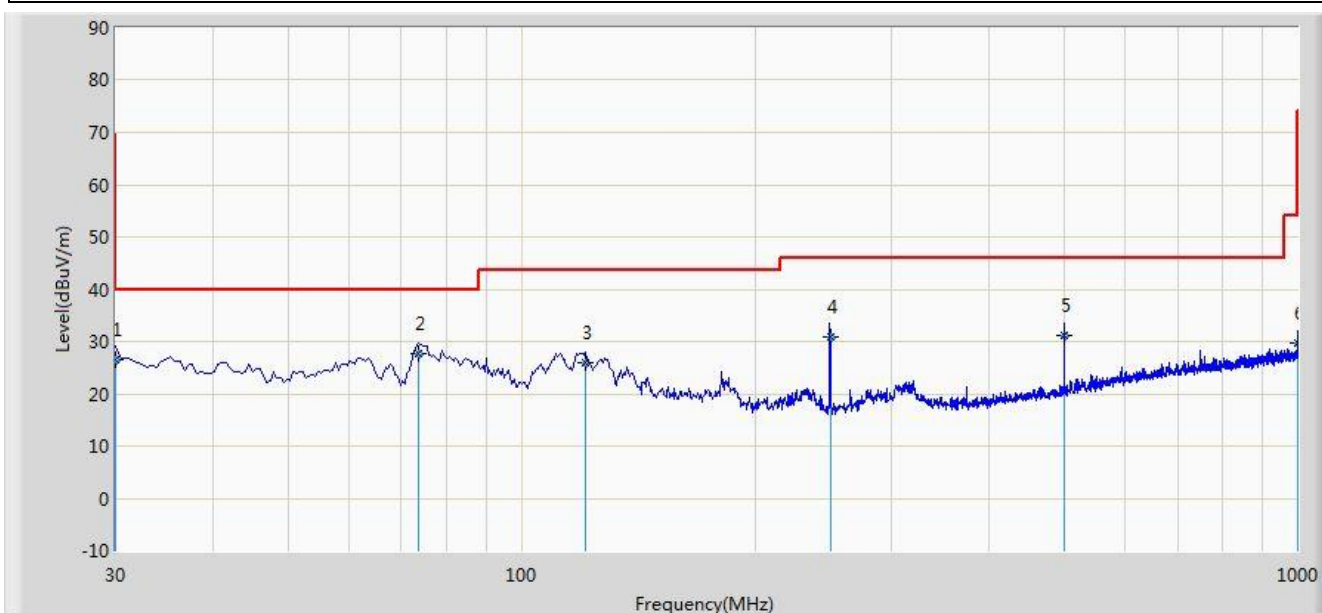
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			30.482	21.268	7.530	-18.732	40.000	13.738	QP
2			75.590	17.500	6.740	-22.500	40.000	10.760	QP
3			102.265	16.978	5.680	-26.522	43.500	11.298	QP
4		*	250.150	36.917	23.890	-9.083	46.000	13.027	QP
5			500.013	27.990	9.420	-18.010	46.000	18.570	QP
6			750.225	31.164	8.360	-14.836	46.000	22.803	QP

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

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

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

Site: AC1	Time: 2018/01/19 - 14:20
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: VULB 9168_20-2000MHz	Polarity: Vertical
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Worst Case Mode: Transmit by 802.11n-HT20 at channel 2412MHz, Ant 0 + 1 + 2 + 3	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			30.000	26.405	12.690	-13.595	40.000	13.715	QP
2		*	73.650	27.579	16.530	-12.421	40.000	11.049	QP
3			120.690	25.885	12.610	-17.615	43.500	13.275	QP
4			250.050	30.994	17.970	-15.006	46.000	13.024	QP
5			500.010	31.250	12.680	-14.750	46.000	18.570	QP
6			1000.000	29.835	4.670	-24.165	54.000	25.165	QP

Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

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

Note 2: The test trace is same as the ambient noise and the amplitude of the emissions are attenuated more than 20dB below the permissible (the test frequency range: 9kHz ~ 30MHz, 18GHz ~ 25GHz), therefore no data appear in the report.

7.7. Radiated Restricted Band Edge Measurement

7.7.1. Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 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	8.25 - 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	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	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 - 156.525	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	--	--	--

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

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/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

7.7.2.Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

ANSI C63.10 Section 6.6 (Standard test method above 1GHz)

7.7.3.Test Setting

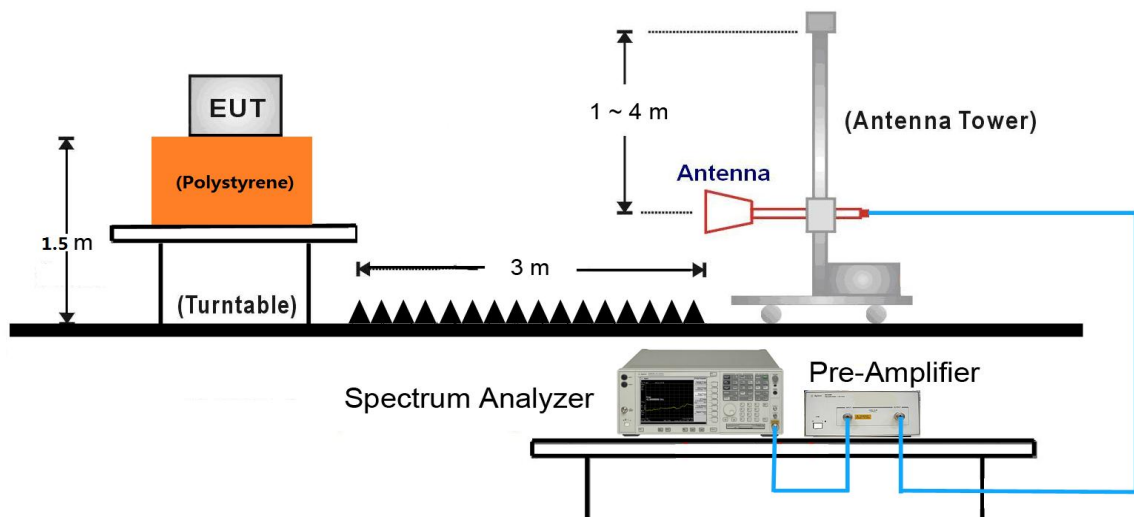
Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Field Strength Measurements

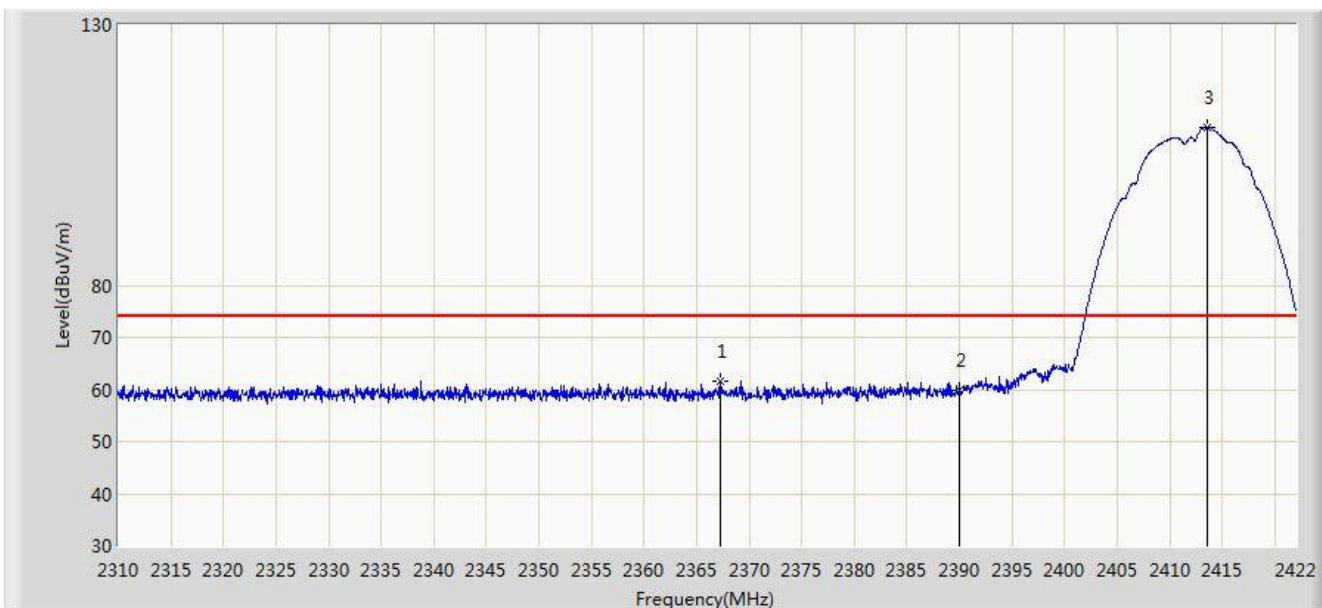
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW $\geq 1/T$
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

7.7.4.Test Setup



7.7.5.Test Result

Site: AC1	Time: 2017/12/16 - 14:19
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Horizontal
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2412MHz, Ant 0 + 1 + 2 + 3	

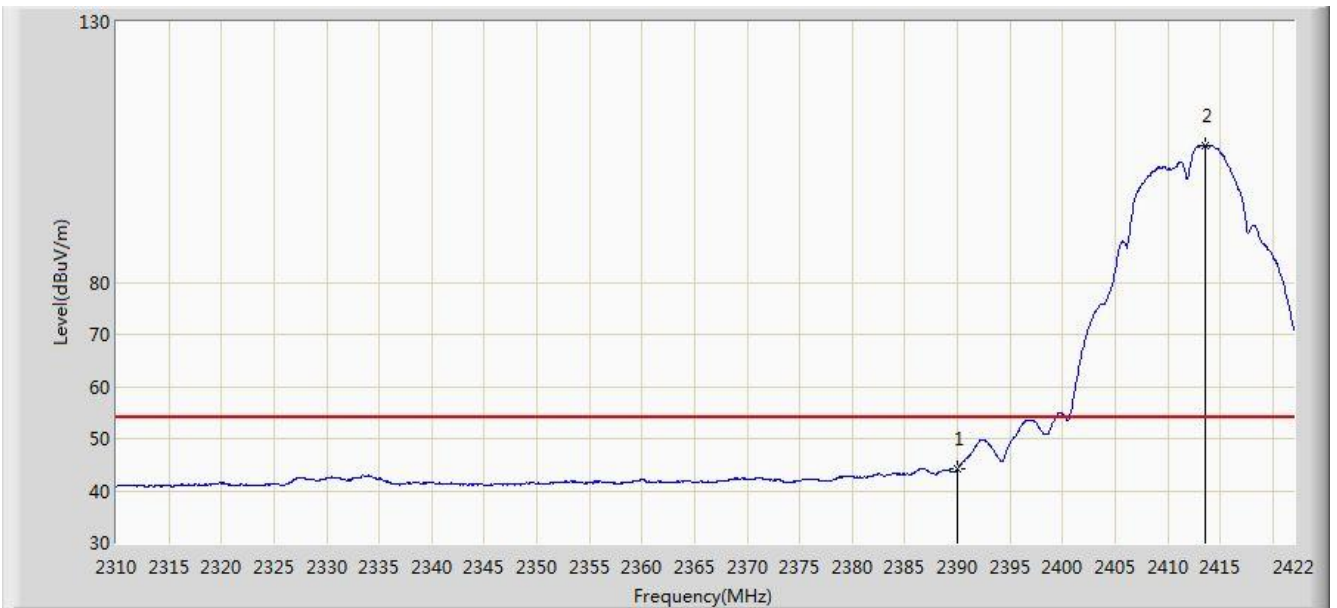


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2367.232	61.509	28.923	-12.491	74.000	32.586	PK
2			2390.000	59.889	27.335	-14.111	74.000	32.554	PK
3		*	2413.600	110.318	77.794	N/A	N/A	32.524	PK

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

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

Site: AC1	Time: 2017/12/16 - 14:21
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Horizontal
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2412MHz, Ant 0 + 1 + 2 + 3	

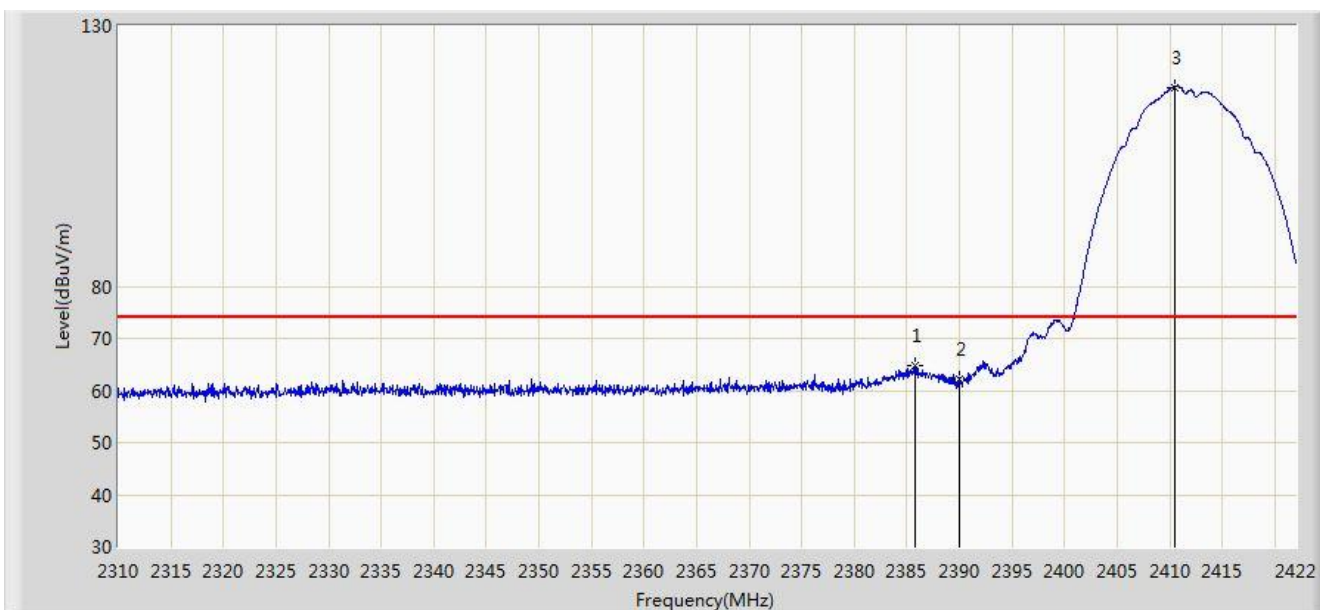


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	44.168	11.614	-9.832	54.000	32.554	AV
2		*	2413.600	106.256	73.732	N/A	N/A	32.524	AV

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

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

Site: AC1	Time: 2017/12/16 - 14:17
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Vertical
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2412MHz, Ant 0 + 1 + 2 + 3	

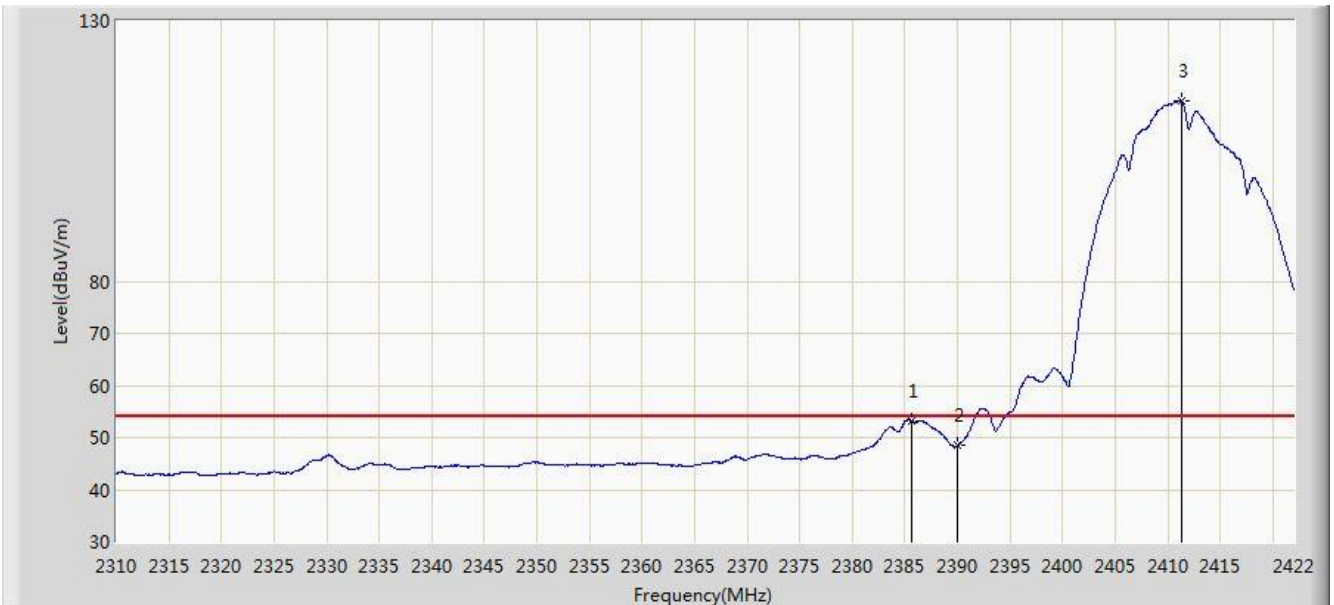


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2385.824	64.798	32.238	-9.202	74.000	32.560	PK
2			2390.000	62.139	29.585	-11.861	74.000	32.554	PK
3		*	2410.464	118.252	85.724	N/A	N/A	32.527	PK

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

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

Site: AC1	Time: 2017/12/16 - 14:15
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Vertical
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2412MHz, Ant 0 + 1 + 2 + 3	

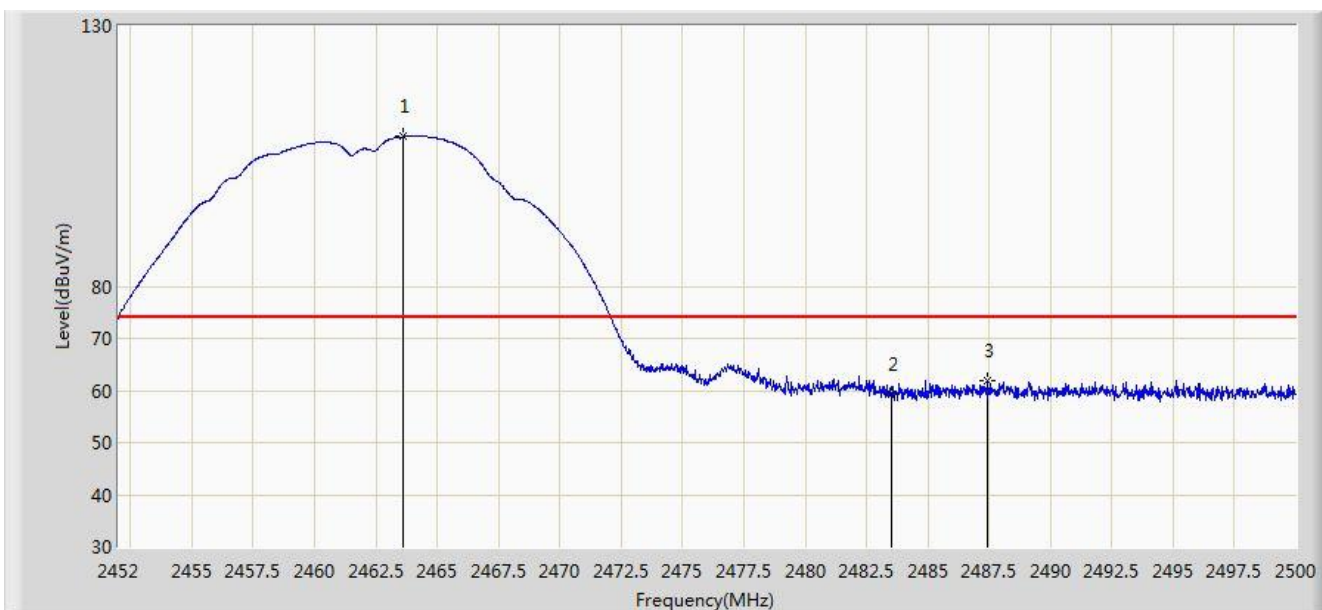


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2385.712	53.191	20.631	-0.809	54.000	32.560	AV
2			2390.000	48.413	15.859	-5.587	54.000	32.554	AV
3		*	2411.304	114.639	82.113	N/A	N/A	32.526	AV

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

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

Site: AC1	Time: 2017/12/16 - 14:40
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Horizontal
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2462MHz, Ant 0 + 1 + 2 + 3	

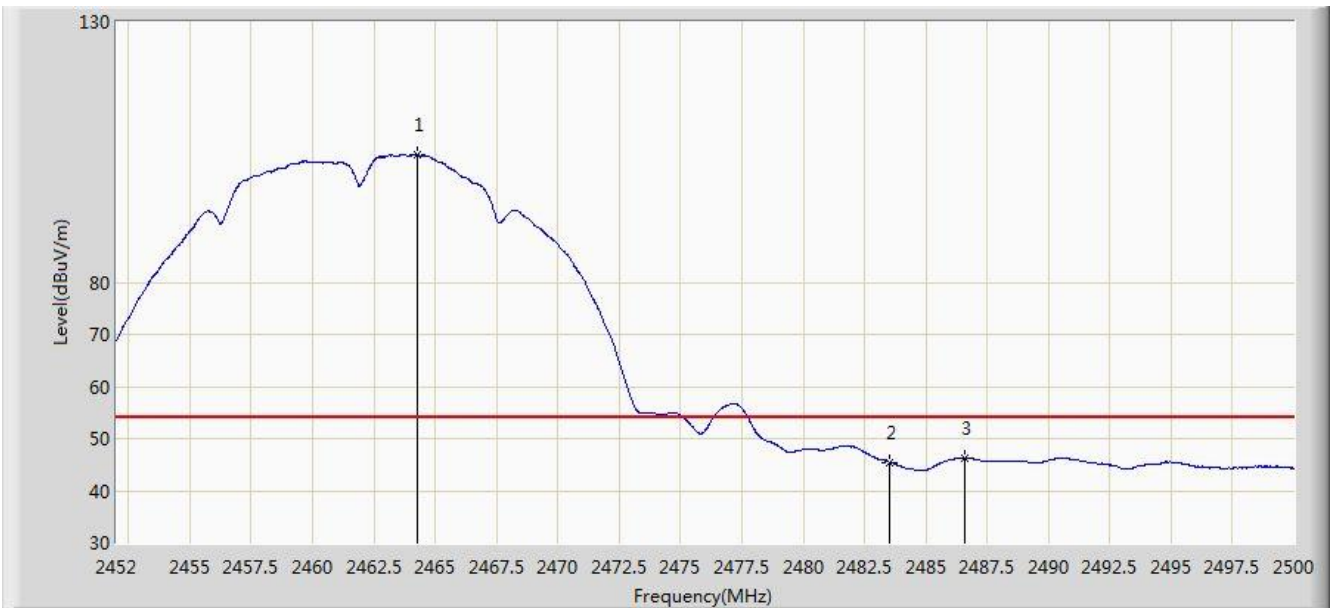


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2463.616	108.740	76.219	N/A	N/A	32.521	PK
2			2483.500	59.310	26.729	-14.690	74.000	32.580	PK
3			2487.448	62.005	29.413	-11.995	74.000	32.592	PK

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

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

Site: AC1	Time: 2017/12/16 - 14:41
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Horizontal
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2462MHz, Ant 0 + 1 + 2 + 3	

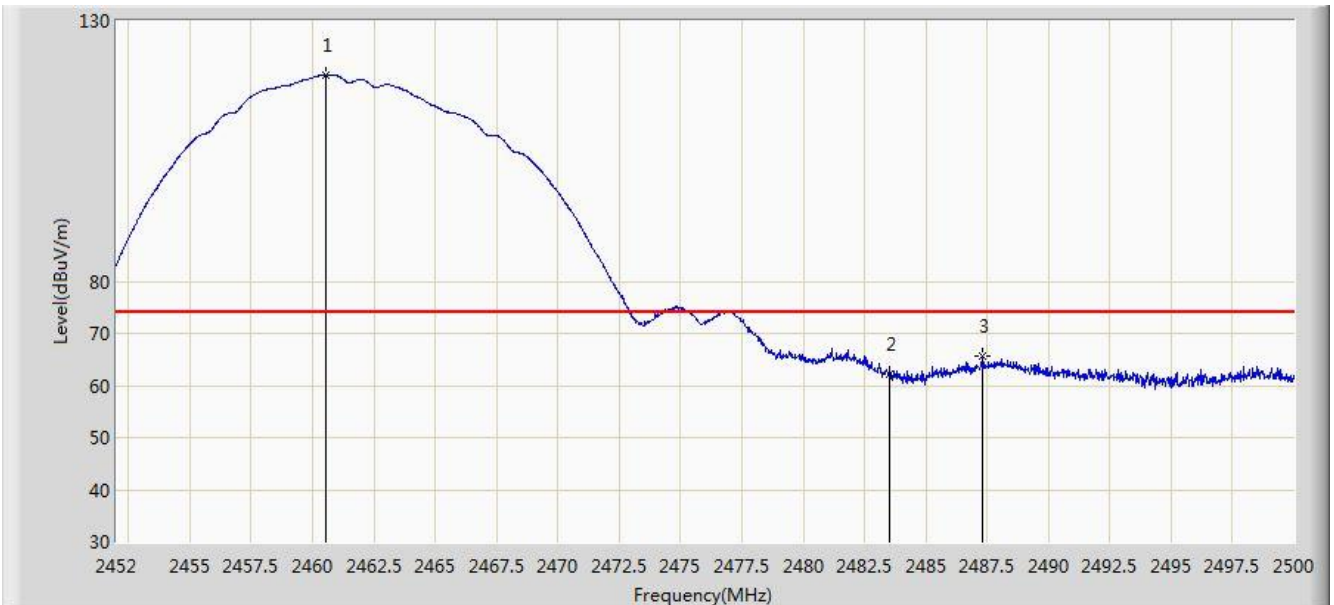


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2464.288	104.475	71.952	N/A	N/A	32.523	AV
2			2483.500	45.488	12.907	-8.512	54.000	32.580	AV
3			2486.560	46.309	13.719	-7.691	54.000	32.590	AV

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

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

Site: AC1	Time: 2017/12/16 - 14:37
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Vertical
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2462MHz, Ant 0 + 1 + 2 + 3	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2460.544	119.602	87.088	N/A	N/A	32.514	PK
2			2483.500	62.287	29.706	-11.713	74.000	32.580	PK
3			2487.328	65.762	33.170	-8.238	74.000	32.592	PK

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

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

Site: AC1	Time: 2017/12/16 - 14:35
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Vertical
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11b at Channel 2462MHz, Ant 0 + 1 + 2 + 3	

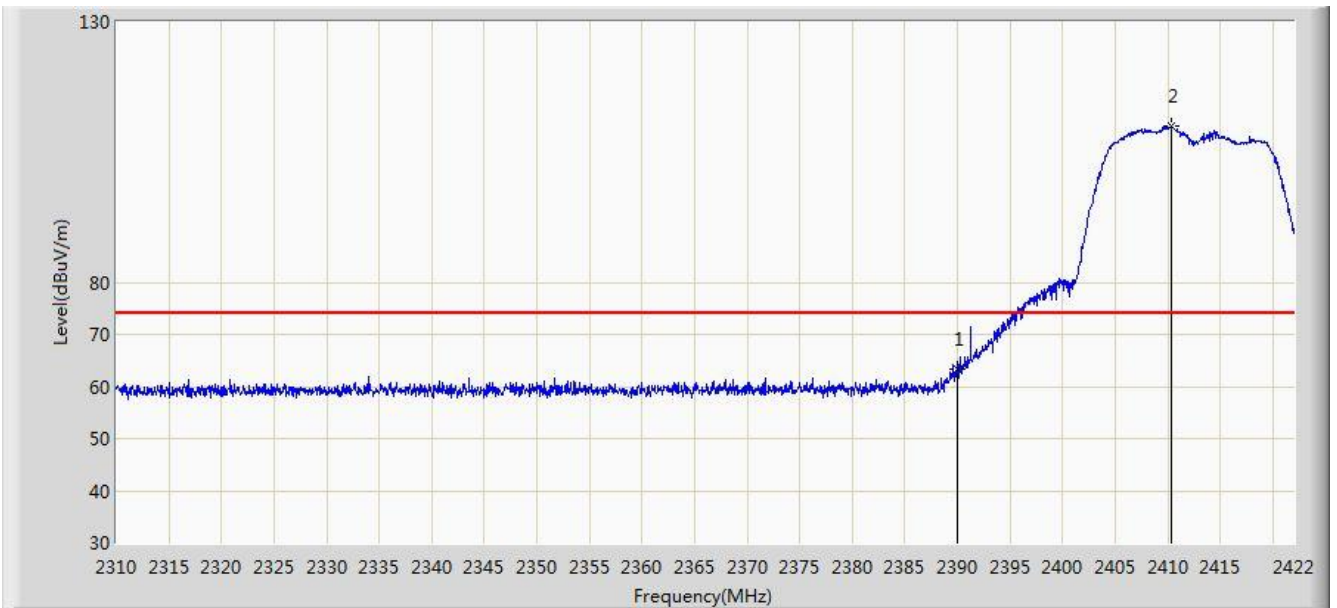


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2461.312	115.561	83.046	N/A	N/A	32.516	AV
2			2483.500	50.752	18.171	-3.248	54.000	32.580	AV
3			2487.808	52.838	20.245	-1.162	54.000	32.593	AV

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

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

Site: AC1	Time: 2017/12/16 - 14:57
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Horizontal
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2412MHz, Ant 0 + 1 + 2 + 3	

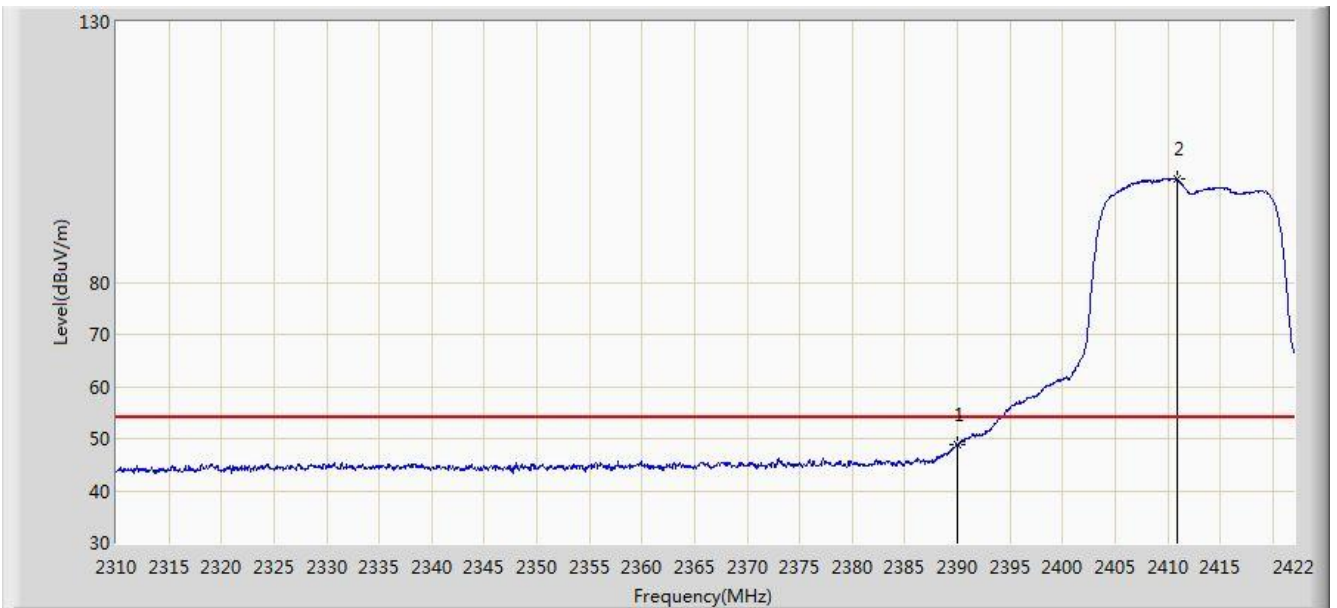


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	63.220	30.666	-10.780	74.000	32.554	PK
2		*	2410.296	110.086	77.558	N/A	N/A	32.528	PK

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

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

Site: AC1	Time: 2017/12/16 - 14:59
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Horizontal
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2412MHz, Ant 0 + 1 + 2 + 3	

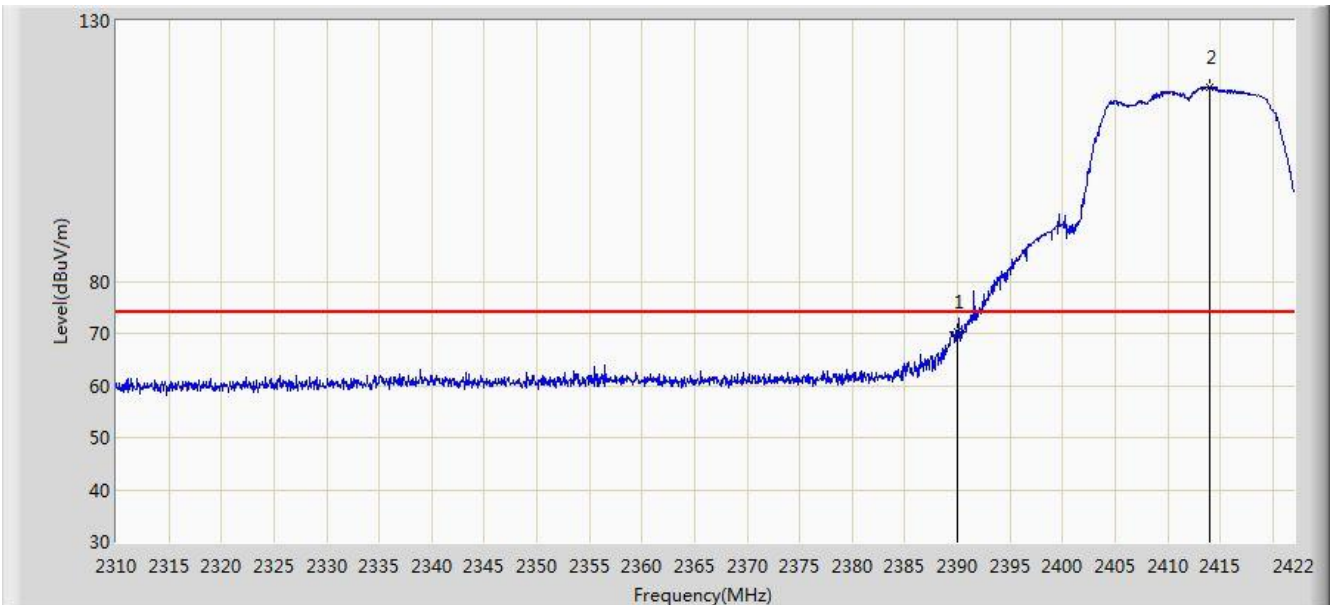


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	48.845	16.291	-5.155	54.000	32.554	AV
2		*	2410.912	99.747	67.220	N/A	N/A	32.527	AV

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

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

Site: AC1	Time: 2017/12/16 - 14:56
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Vertical
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2412MHz, Ant 0 + 1 + 2 + 3	

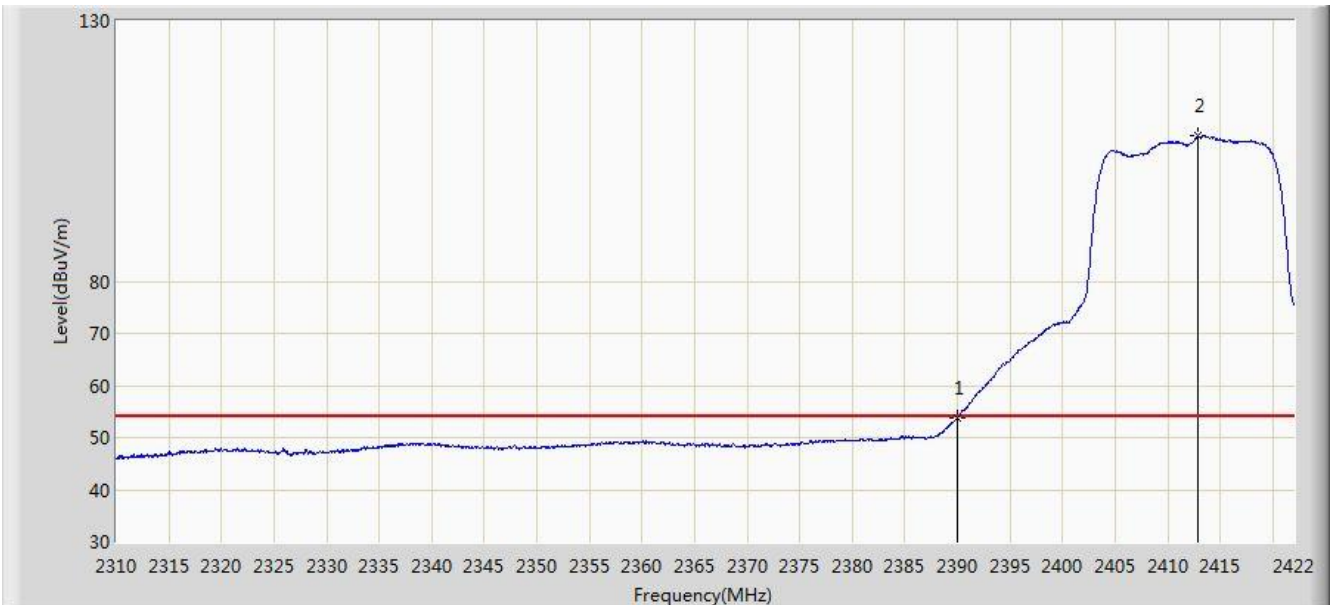


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	70.429	37.875	-3.571	74.000	32.554	PK
2		*	2414.048	117.356	84.833	N/A	N/A	32.523	PK

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

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

Site: AC1	Time: 2017/12/16 - 14:53
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Vertical
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2412MHz, Ant 0 + 1 + 2 + 3	

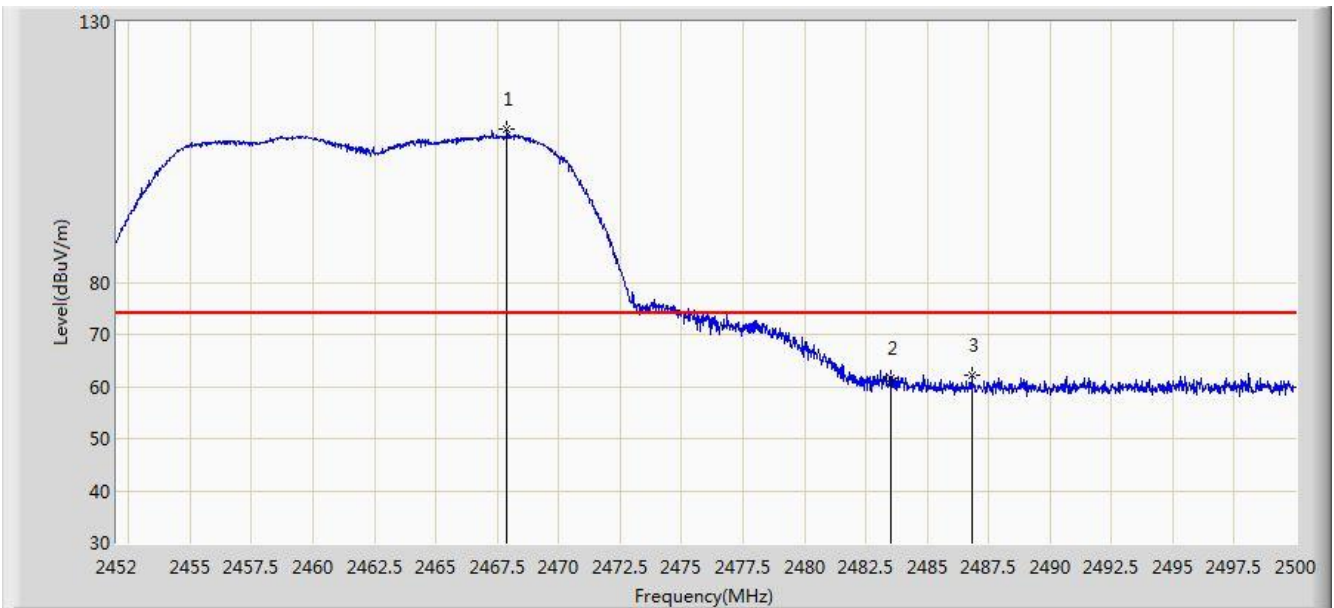


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	53.811	21.257	-0.189	54.000	32.554	AV
2		*	2412.872	107.840	75.315	N/A	N/A	32.524	AV

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

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

Site: AC1	Time: 2017/12/16 - 15:41
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Horizontal
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2462MHz, Ant 0 + 1 + 2 + 3	

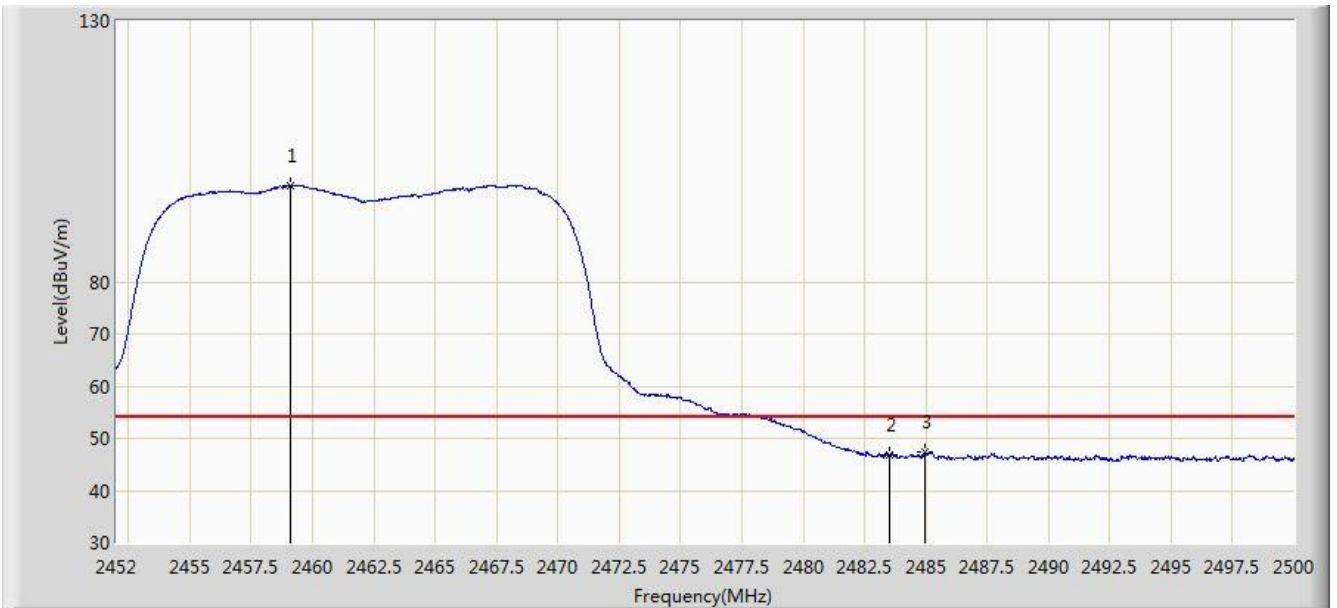


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2467.888	109.542	77.008	N/A	N/A	32.533	PK
2			2483.500	61.698	29.117	-12.302	74.000	32.580	PK
3			2486.800	62.135	29.545	-11.865	74.000	32.590	PK

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

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

Site: AC1	Time: 2017/12/16 - 15:42
Limit: FCC_Part15.209_RE(3m)	Engineer: Kevin Ker
Probe: BBHA9120D_1GHz_18GHz	Polarity: Horizontal
EUT: AC2300 Wireless MU-MIMO Gigabit Router	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11g at channel 2462MHz, Ant 0 + 1 + 2 + 3	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2459.104	98.499	65.988	N/A	N/A	32.511	AV
2			2483.500	46.827	14.246	-7.173	54.000	32.580	AV
2			2484.976	47.414	14.829	-6.586	54.000	32.585	AV

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

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