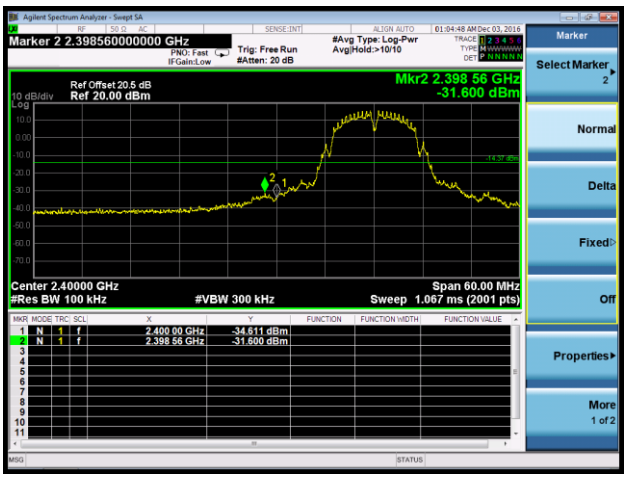
802.11b Out-of-Band Emissions - Ant 0

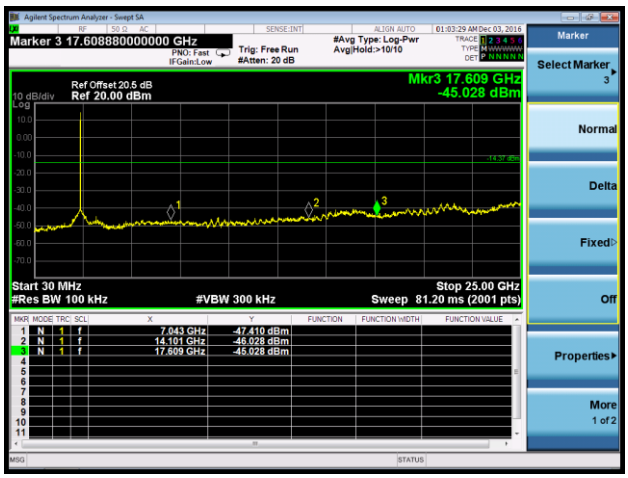
100kHz PSD Reference Level

Channel 01 (2412MHz)

Low Band Edge

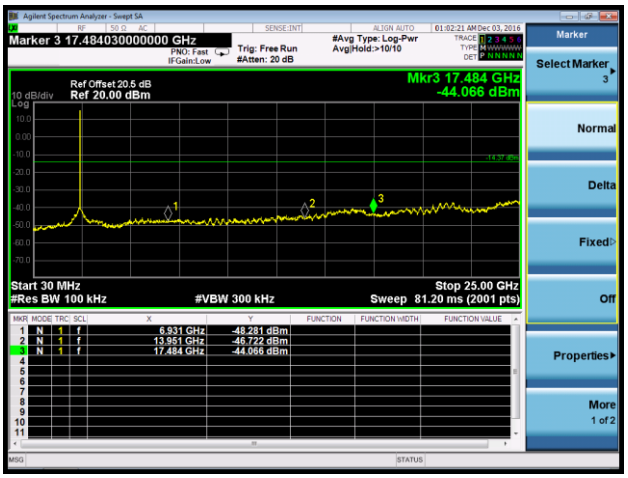


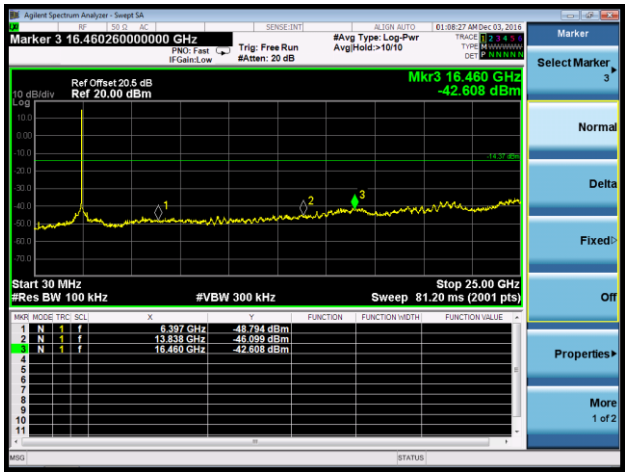
Spurious Emission



Channel 06 (2437MHz)

Spurious Emission



Channel 11 (2462MHz)	
High Band Edge	**Spurious Emission**
	

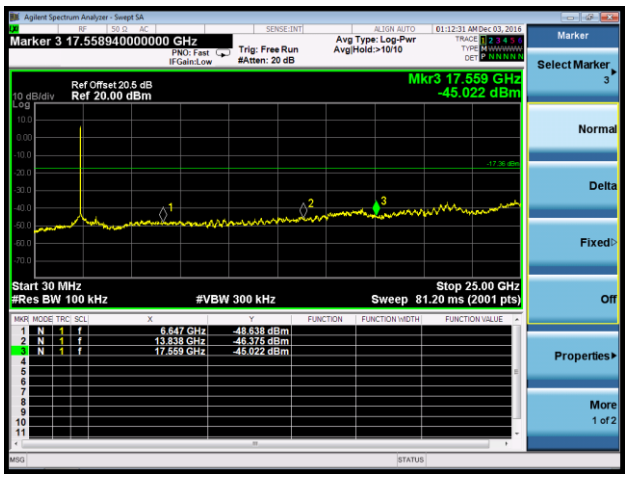
802.11g Out-of-Band Emissions - Ant 0

100kHz PSD Reference Level

Channel 01 (2412MHz)

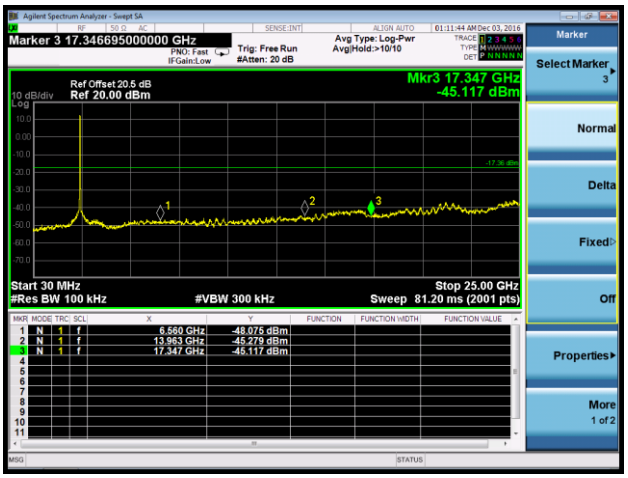
Low Band Edge

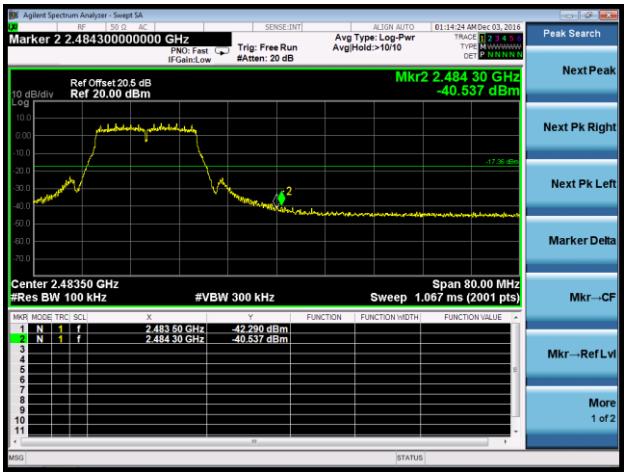
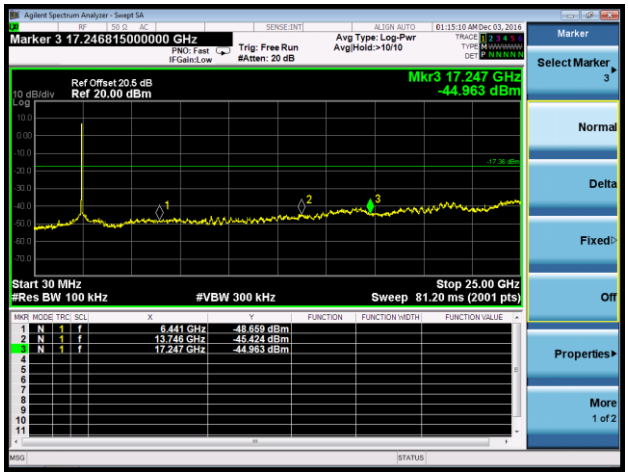
Spurious Emission



Channel 06 (2437MHz)

Spurious Emission



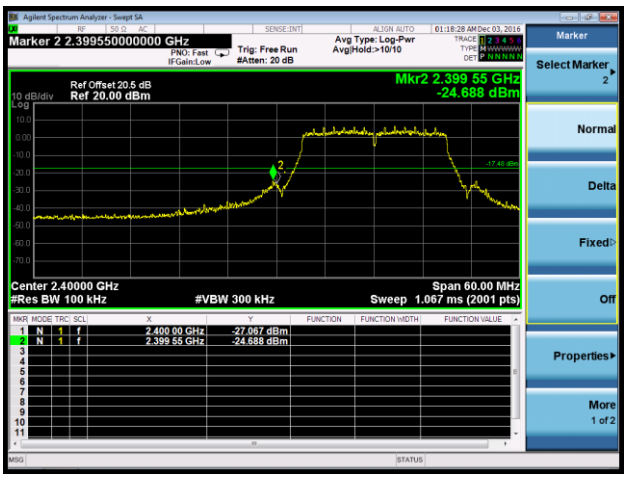
Channel 11 (2462MHz)	
High Band Edge	**Spurious Emission**
	

802.11n-HT20 Out-of-Band Emissions - Ant 0

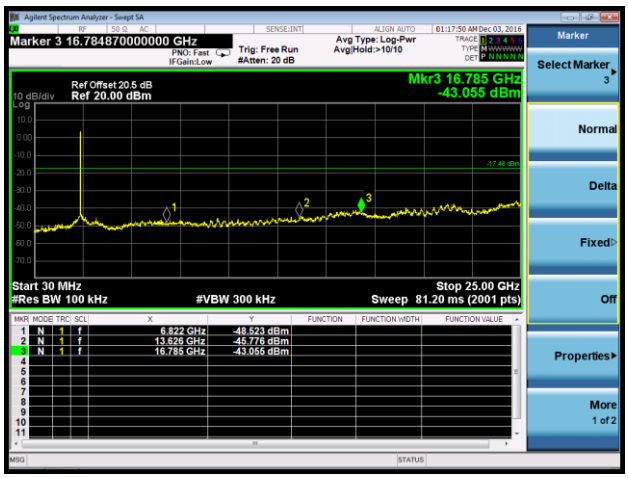
100kHz PSD Reference Level

Channel 01 (2412MHz)

Low Band Edge

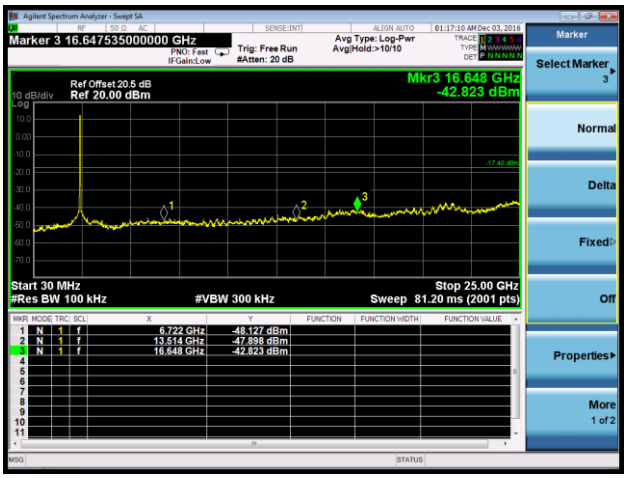


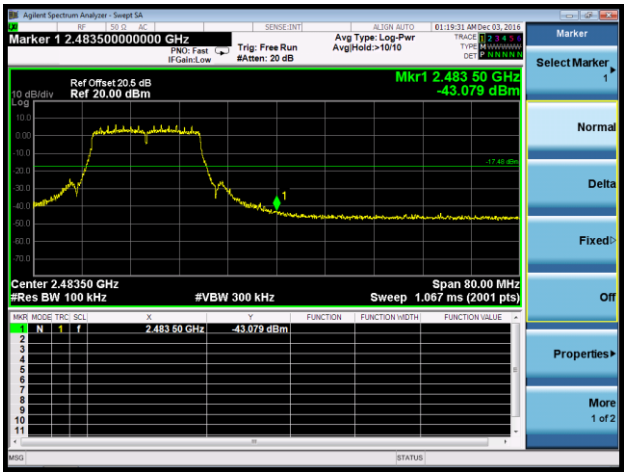
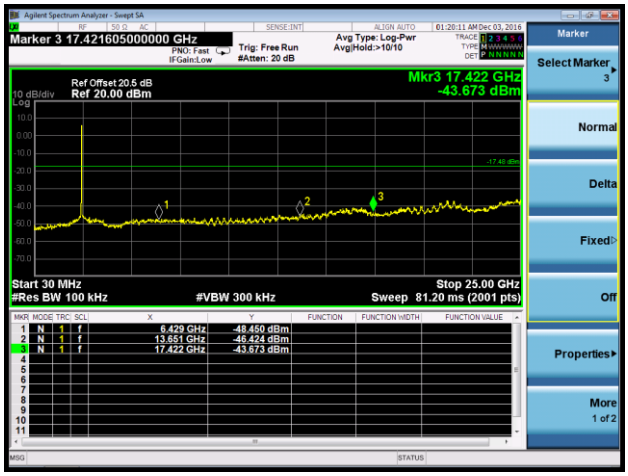
Spurious Emission



Channel 06 (2437MHz)

Spurious Emission



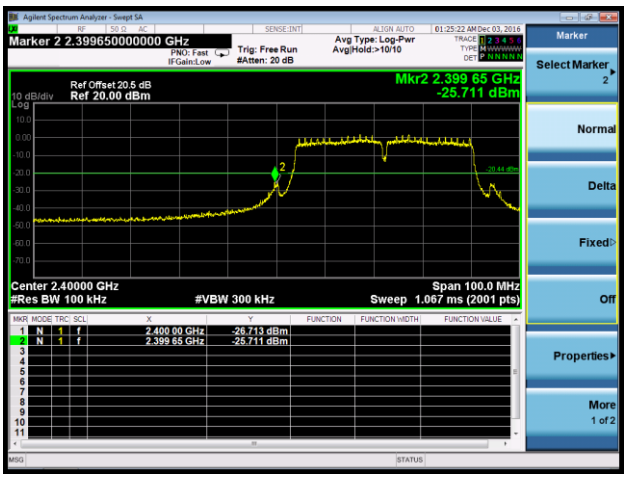
Channel 11 (2462MHz)	
High Band Edge	**Spurious Emission**
	

802.11n-HT40 Out-of-Band Emissions - Ant 0

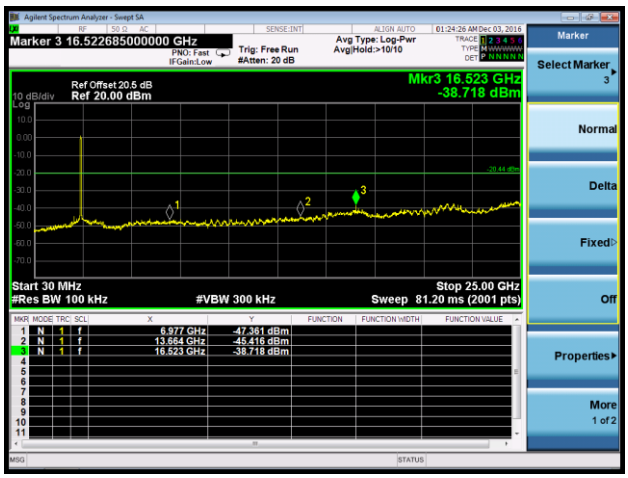
100kHz PSD Reference Level

Channel 03 (2422MHz)

Low Band Edge

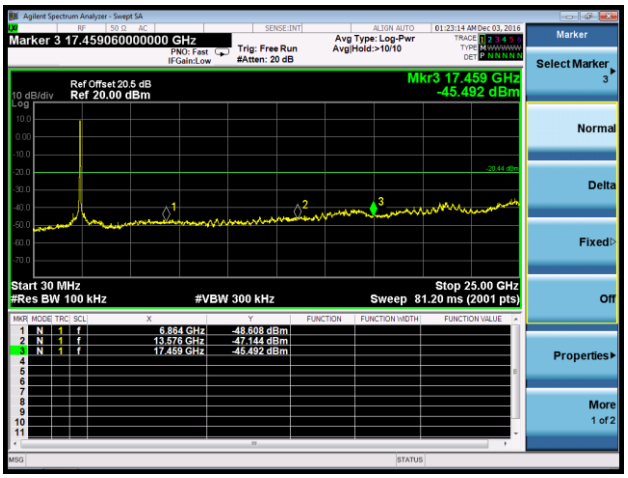


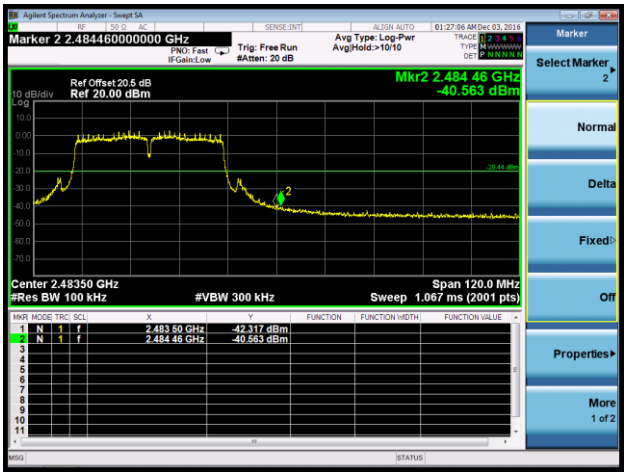
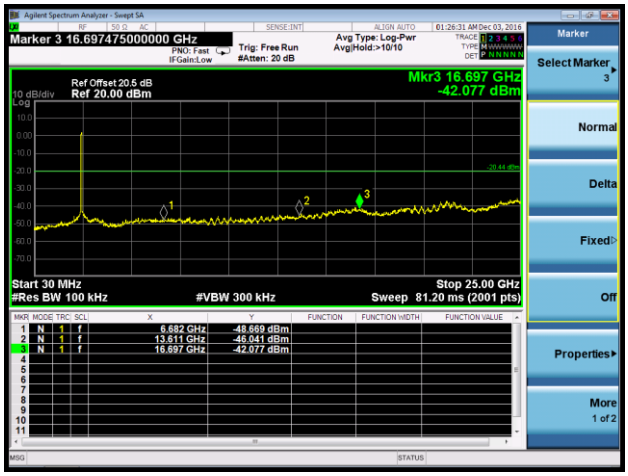
Spurious Emission



Channel 06 (2437MHz)

Spurious Emission



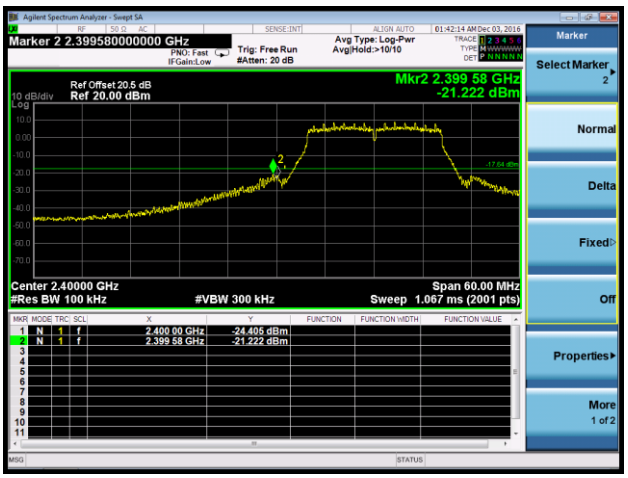
Channel 09 (2452MHz)	
High Band Edge	**Spurious Emission**
	

802.11g Out-of-Band Emissions - Ant 1

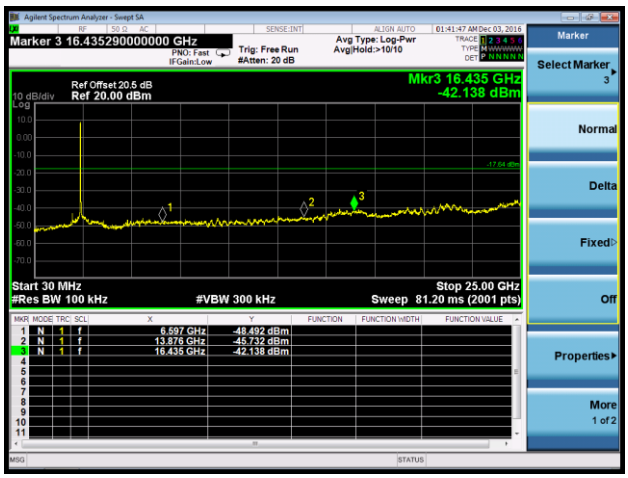
100kHz PSD Reference Level

Channel 01 (2412MHz)

Low Band Edge

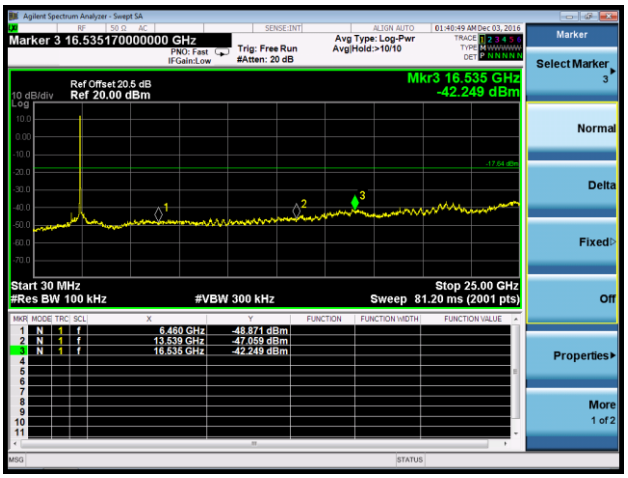


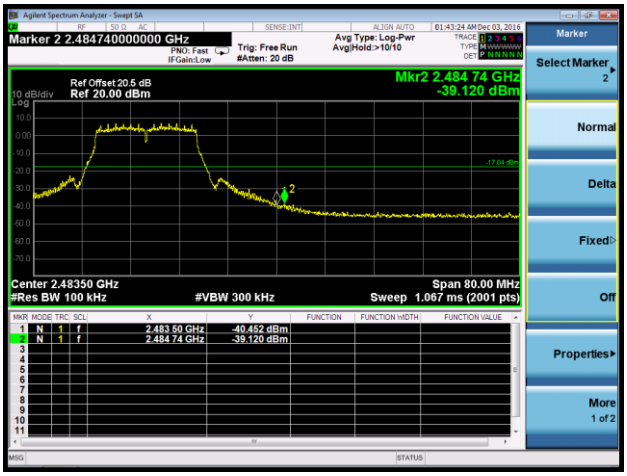
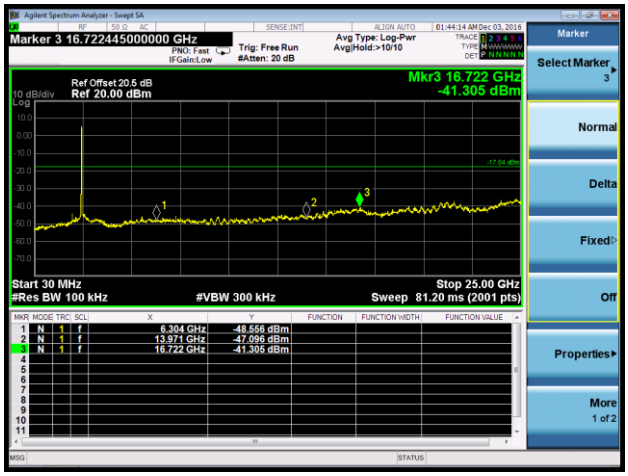
Spurious Emission



Channel 06 (2437MHz)

Spurious Emission



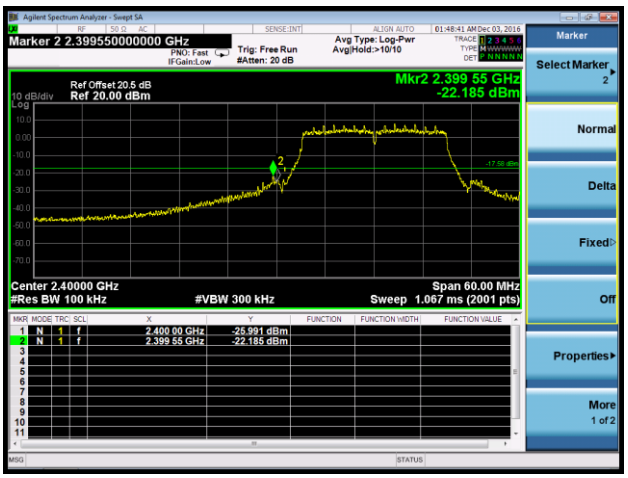
Channel 11 (2462MHz)	
High Band Edge	**Spurious Emission**
	

802.11n-HT20 Out-of-Band Emissions - Ant 1

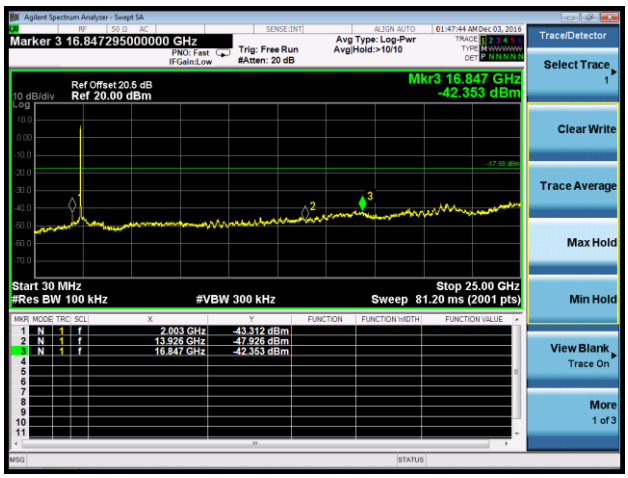
100kHz PSD Reference Level

Channel 01 (2412MHz)

Low Band Edge

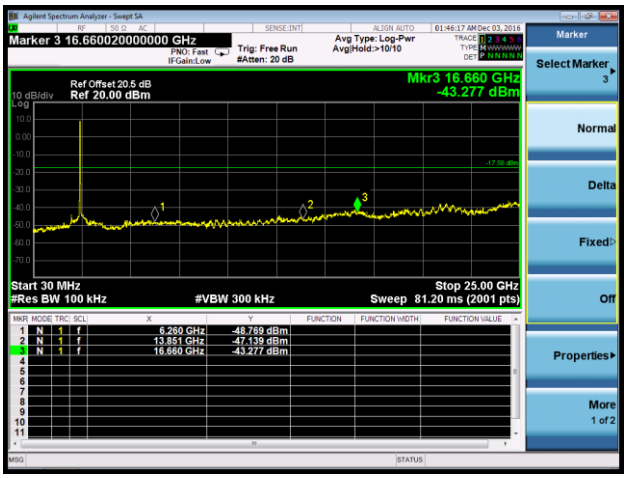


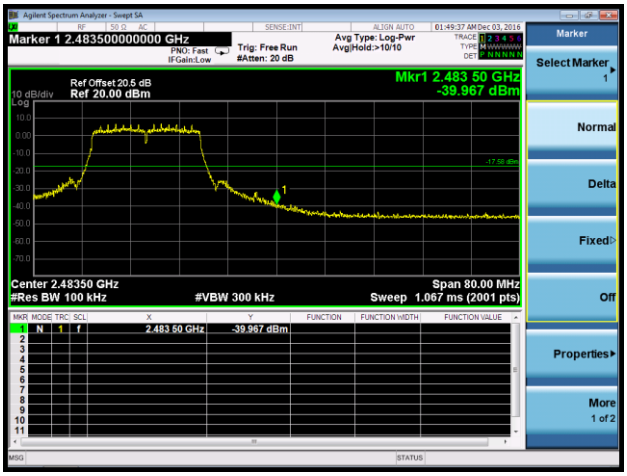
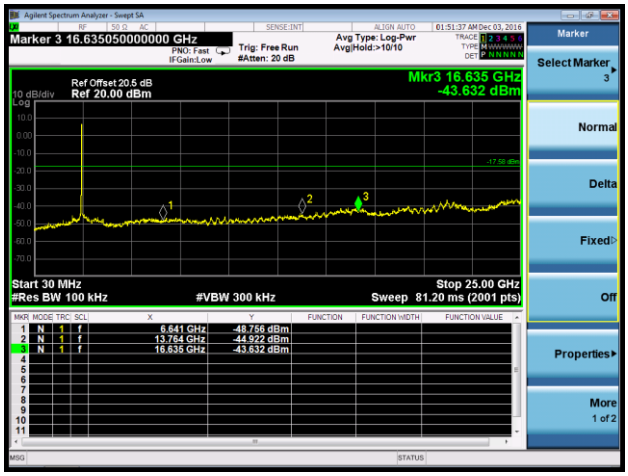
Spurious Emission



Channel 06 (2437MHz)

Spurious Emission



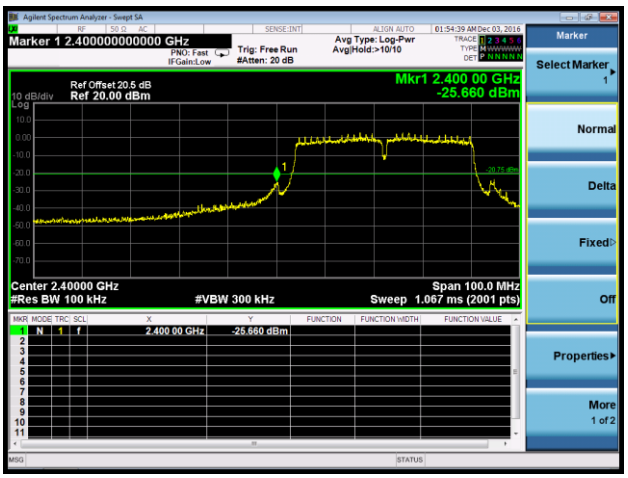
Channel 11 (2462MHz)	
High Band Edge	**Spurious Emission**
	

802.11n-HT40 Out-of-Band Emissions - Ant 1

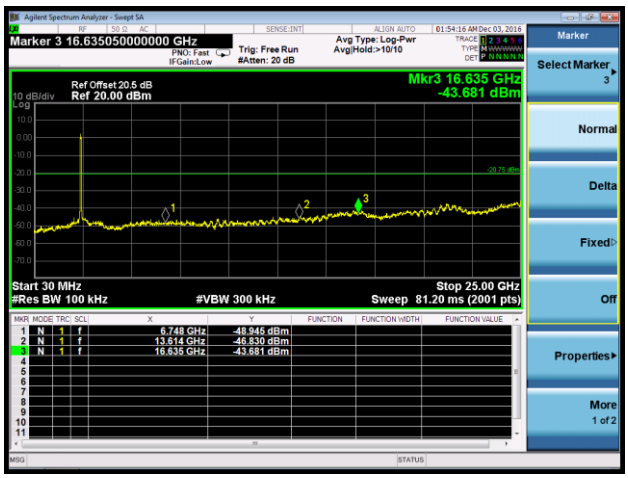
100kHz PSD Reference Level

Channel 03 (2422MHz)

Low Band Edge

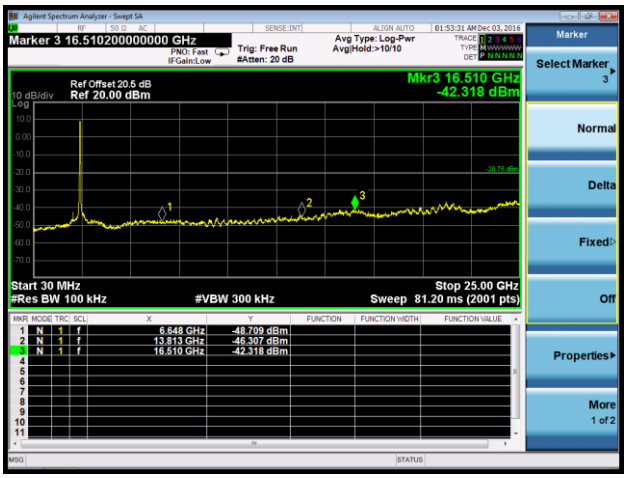


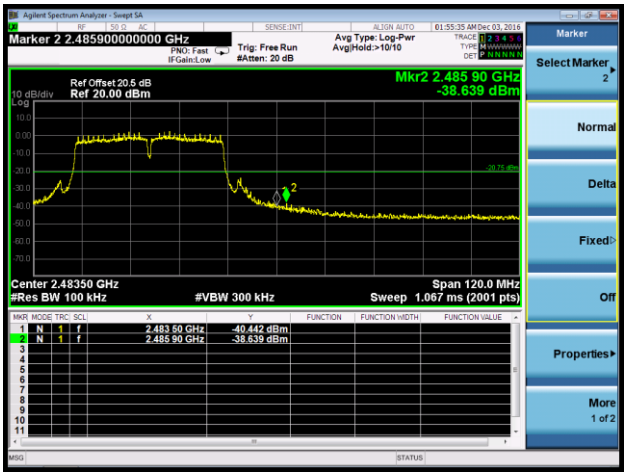
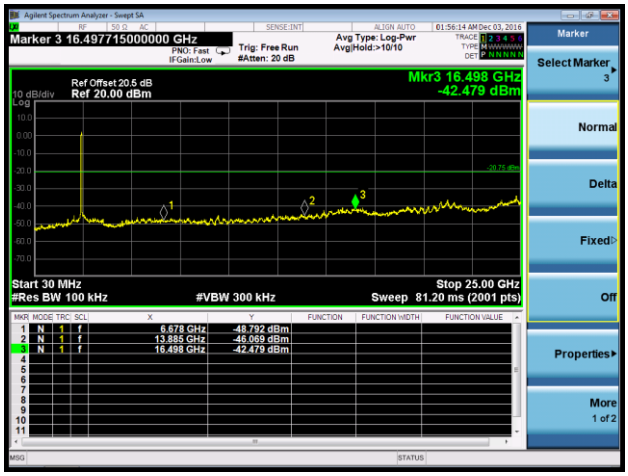
Spurious Emission



Channel 06 (2437MHz)

Spurious Emission



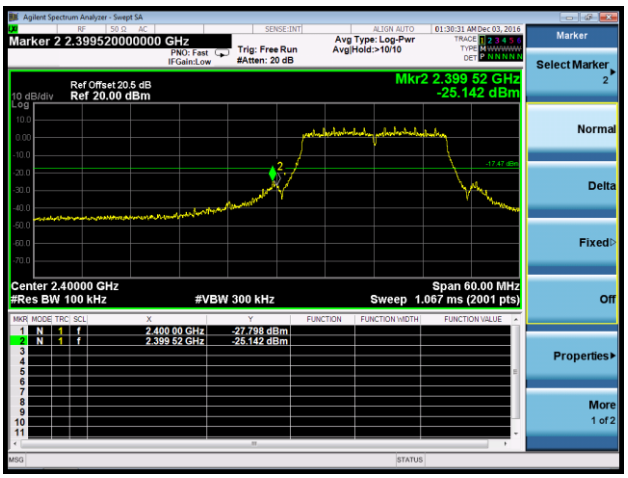
Channel 09 (2452MHz)	
High Band Edge	**Spurious Emission**
	

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

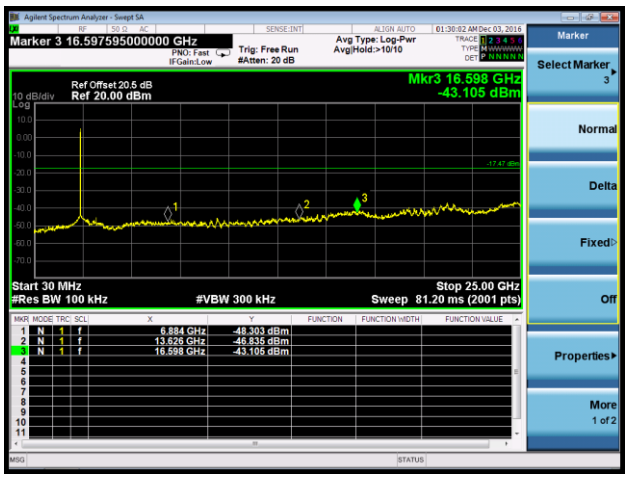
100kHz PSD Reference Level

Channel 01 (2412MHz)

Low Band Edge

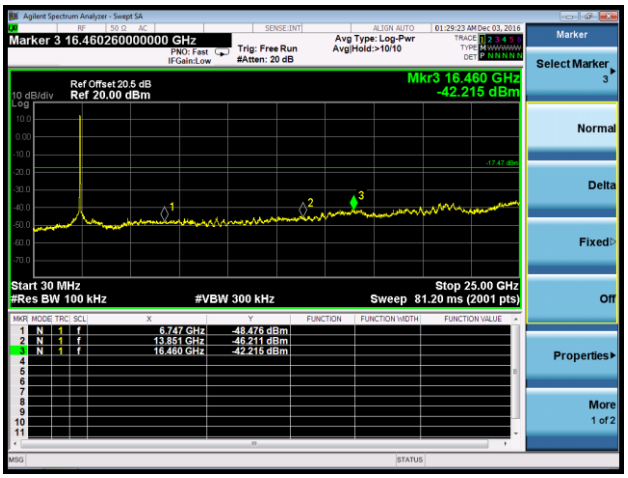


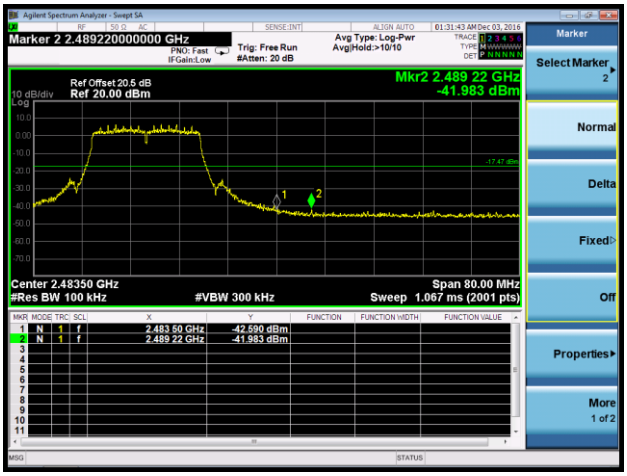
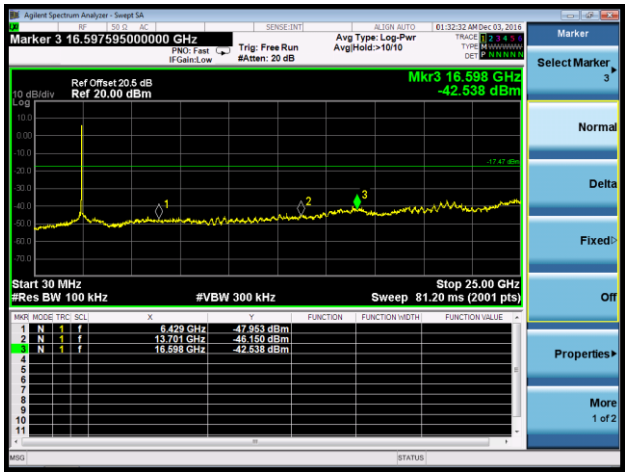
Spurious Emission



Channel 06 (2437MHz)

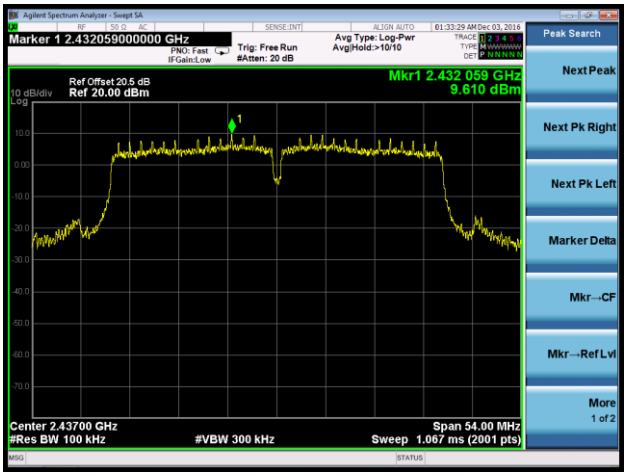
Spurious Emission



Channel 11 (2462MHz)	
High Band Edge	**Spurious Emission**
	

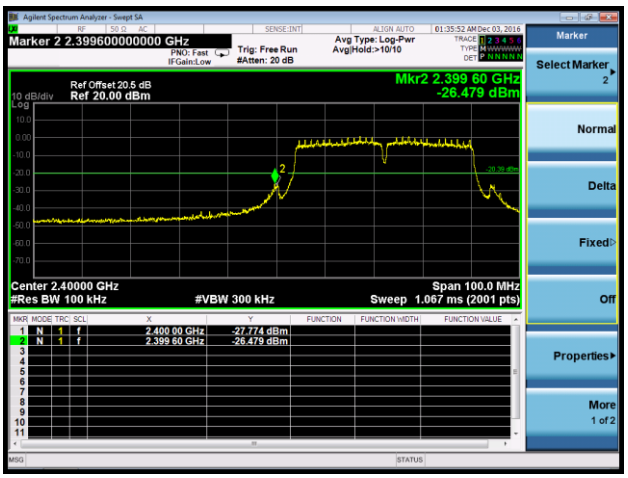
802.11n-HT40 Out-of-Band Emissions - Ant 0 / Ant 0 + 1

100kHz PSD Reference Level

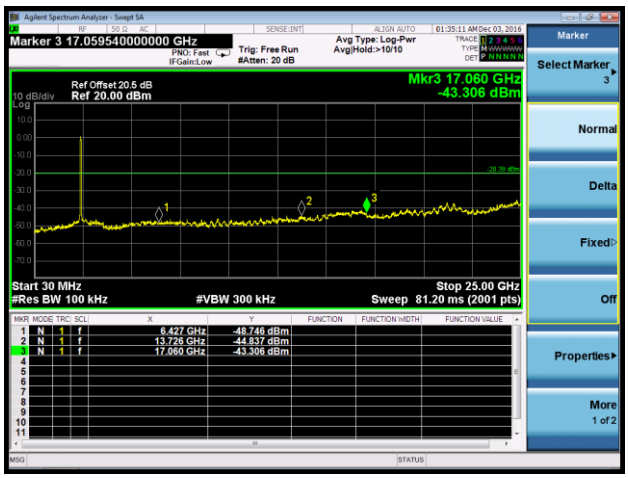


Channel 03 (2422MHz)

Low Band Edge

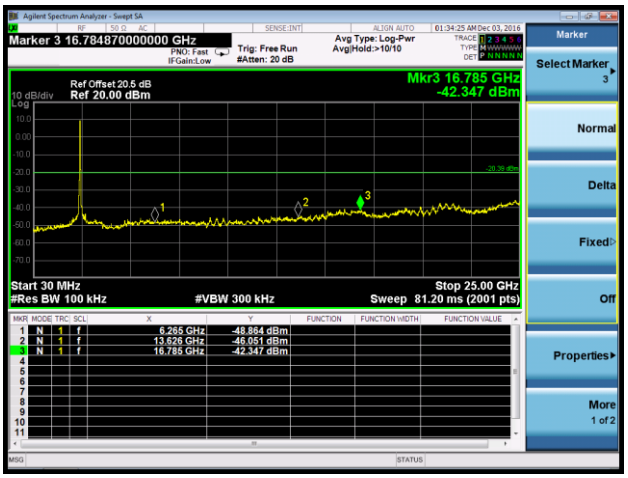


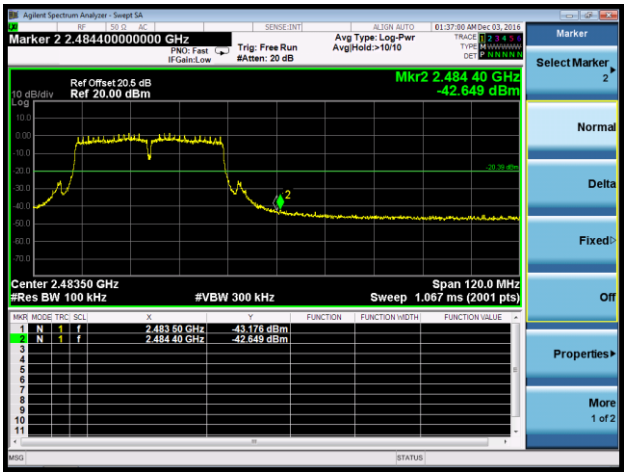
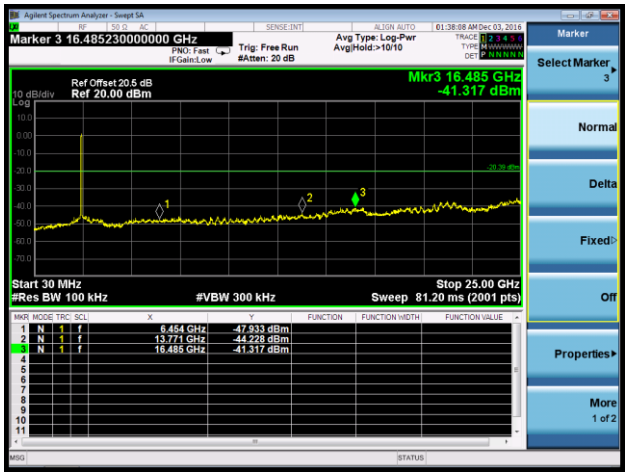
Spurious Emission



Channel 06 (2437MHz)

Spurious Emission



Channel 09 (2452MHz)	
High Band Edge	**Spurious Emission**
	

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

KDB 558074 D01v03r05 – Section 12.2.3 (quasi-peak measurements)

KDB 558074 D01v03r05 – Section 12.2.4 (peak power measurements)

KDB 558074 D01v03r05 – Section 12.2.5 (average power measurements)

7.6.3. Test Setting

Peak Field Strength Measurements per Section 12.2.4 of KDB 558074 D01v03r05

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

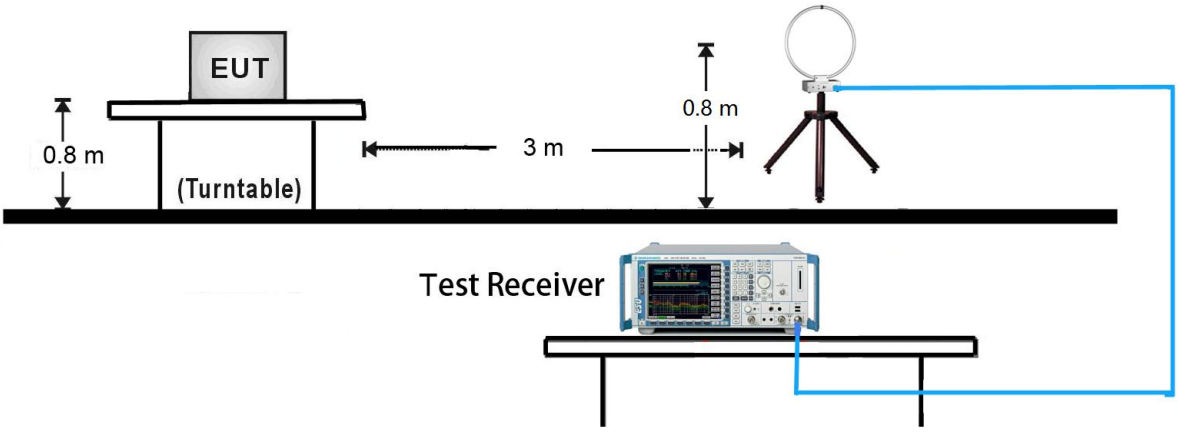
Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements per Section 12.2.5.3 of KDB 558074 D01v03r05

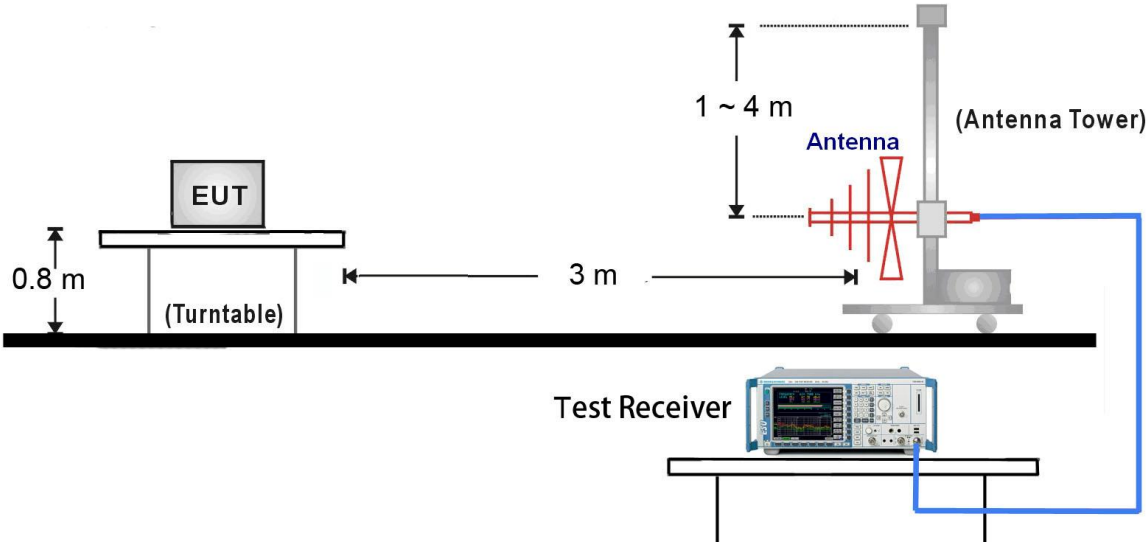
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW ≥ 1/T
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). 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

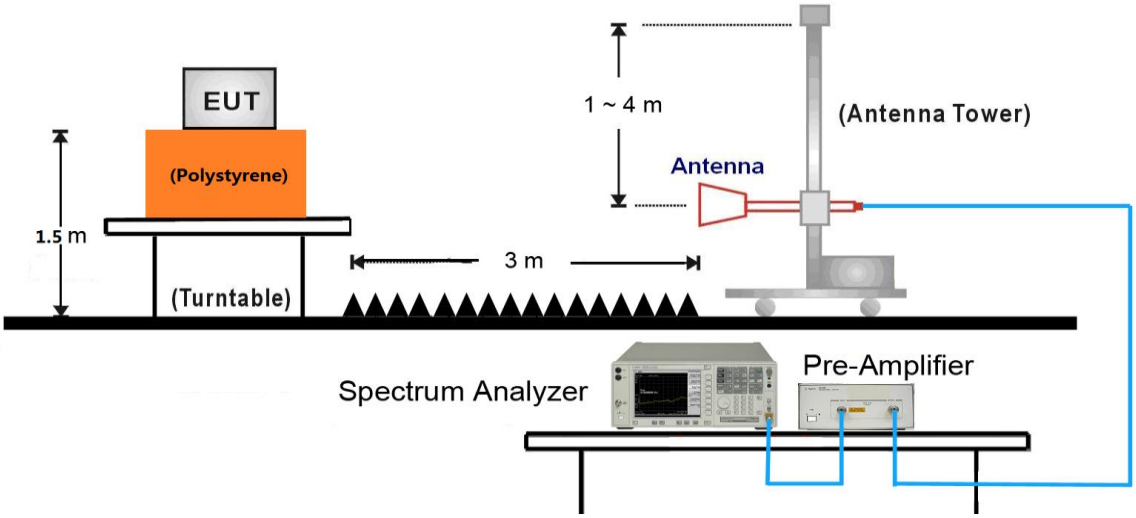
9kHz ~ 30MHz Test Setup:



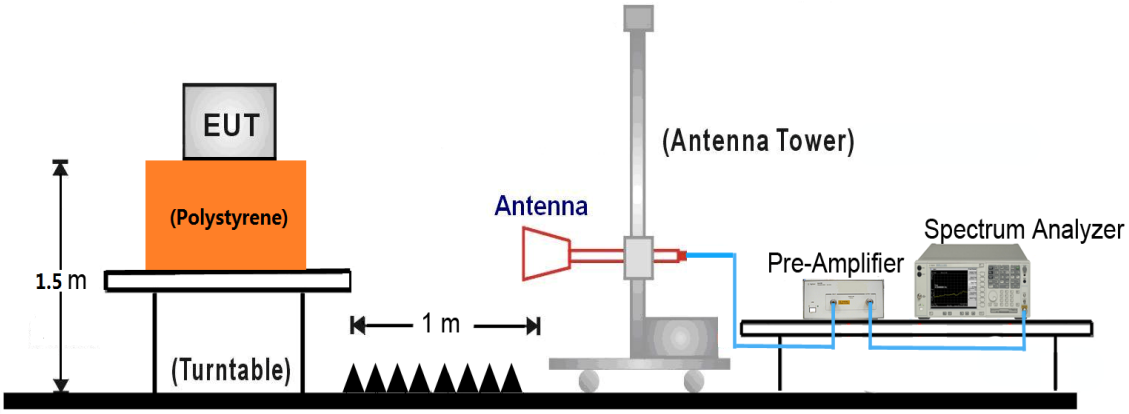
30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:



18GHz ~25GHz Test Setup:



7.6.5. Test Result

Test Mode:	802.11b - Ant 0	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 30dB 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
	4825.0	49.6	2.7	52.3	74.0	-21.7	Peak	Horizontal
	7426.0	33.2	10.7	43.9	74.0	-30.1	Peak	Horizontal
*	8616.0	32.6	11.2	43.8	84.0	-40.2	Peak	Horizontal
*	9644.5	39.0	12.7	51.7	84.0	-32.3	Peak	Horizontal
	4825.0	45.3	2.7	48.0	74.0	-26.0	Peak	Vertical
	7426.0	33.2	10.7	43.9	74.0	-30.1	Peak	Vertical
*	8743.5	32.1	11.7	43.8	84.0	-40.2	Peak	Vertical
*	9644.5	36.9	12.7	49.6	84.0	-34.4	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (114.0dBμV/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:	802.11b - Ant 0	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 30dB 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
	4876.0	46.7	2.6	49.3	74.0	-24.7	Peak	Horizontal
	7545.0	33.8	10.9	44.7	74.0	-29.3	Peak	Horizontal
*	8743.5	32.1	11.7	43.8	85.1	-41.3	Peak	Horizontal
*	9746.5	36.0	12.7	48.7	85.1	-36.4	Peak	Horizontal
	4876.0	42.1	2.6	44.7	74.0	-29.3	Peak	Vertical
	7545.0	33.8	10.9	44.7	74.0	-29.3	Peak	Vertical
*	8718.0	32.9	11.4	44.3	85.1	-40.8	Peak	Vertical
*	9644.5	33.9	12.7	46.6	85.1	-38.5	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (115.1dBμV/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:	802.11b - Ant 0	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 30dB 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
	4927.0	42.4	2.6	45.0	74.0	-29.0	Peak	Horizontal
	7502.5	34.0	11.0	45.0	74.0	-29.0	Peak	Horizontal
*	8769.0	30.9	11.8	42.7	84.7	-42.0	Peak	Horizontal
*	9644.5	33.9	12.7	46.6	84.7	-38.1	Peak	Horizontal
	4927.0	40.1	2.6	42.7	74.0	-31.3	Peak	Vertical
	7383.5	34.0	10.7	44.7	74.0	-29.3	Peak	Vertical
*	8769.0	30.9	11.8	42.7	84.7	-42.0	Peak	Vertical
*	9678.5	32.9	12.5	45.4	84.7	-39.3	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (114.7dBμV/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:	802.11g - Ant 0	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 30dB 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
	4825.0	41.8	2.7	44.5	74.0	-29.5	Peak	Horizontal
	7460.0	33.1	11.1	44.2	74.0	-29.8	Peak	Horizontal
*	8871.0	31.4	11.5	42.9	82.3	-39.4	Peak	Horizontal
*	9925.0	33.1	13.3	46.4	82.3	-35.9	Peak	Horizontal
	4825.0	37.0	2.7	39.7	74.0	-34.3	Peak	Vertical
	7375.0	32.2	10.8	43.0	74.0	-31.0	Peak	Vertical
*	8701.0	31.7	11.4	43.1	82.3	-39.2	Peak	Vertical
*	9644.5	33.5	12.7	46.2	82.3	-36.1	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (112.3dBμV/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:	802.11g - Ant 0	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 30dB 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
	4884.5	46.2	2.7	48.9	74.0	-25.1	Peak	Horizontal
	7477.0	34.6	10.8	45.4	74.0	-28.6	Peak	Horizontal
*	8675.5	32.9	11.2	44.1	84.2	-40.1	Peak	Horizontal
*	9644.5	33.5	12.7	46.2	84.2	-38.0	Peak	Horizontal
	4876.0	38.2	2.6	40.8	74.0	-33.2	Peak	Vertical
	7477.0	34.6	10.8	45.4	74.0	-28.6	Peak	Vertical
*	8956.0	32.6	11.6	44.2	84.2	-40.0	Peak	Vertical
*	9755.0	33.6	13.0	46.6	84.2	-37.6	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (114.2dBμV/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	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 30dB 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
	4646.5	35.6	2.5	38.1	74.0	-35.9	Peak	Horizontal
	4910.0	37.1	2.5	39.6	74.0	-34.4	Peak	Horizontal
*	6193.5	35.2	5.9	41.1	83.9	-42.8	Peak	Horizontal
*	8956.0	32.6	11.6	44.2	83.9	-39.7	Peak	Horizontal
	4655.0	35.9	2.6	38.5	74.0	-35.5	Peak	Vertical
	4910.0	37.1	2.5	39.6	74.0	-34.4	Peak	Vertical
*	6431.5	34.2	6.7	40.9	83.9	-43.0	Peak	Vertical
*	8582.0	31.8	11.0	42.8	83.9	-41.1	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (113.9dBμV/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	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 30dB 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
	4825.0	40.7	2.7	43.4	74.0	-30.6	Peak	Horizontal
	5003.5	36.6	2.7	39.3	74.0	-34.7	Peak	Horizontal
*	6431.5	36.7	6.7	43.4	82.8	-39.4	Peak	Horizontal
*	8854.0	31.0	11.7	42.7	82.8	-40.1	Peak	Horizontal
	4561.5	34.5	1.9	36.4	74.0	-37.6	Peak	Vertical
	5071.5	35.7	3.1	38.8	74.0	-35.2	Peak	Vertical
*	6125.5	34.5	5.6	40.1	82.8	-42.7	Peak	Vertical
*	8854.0	31.0	11.7	42.7	82.8	-40.1	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (112.8dBμV/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-HT20 - Ant 0	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 30dB 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
	4876.0	45.2	2.6	47.8	74.0	-26.2	Peak	Horizontal
	5148.0	35.3	3.1	38.4	74.0	-35.6	Peak	Horizontal
*	6431.5	36.8	6.7	43.5	83.1	-39.6	Peak	Horizontal
*	8573.5	33.2	11.0	44.2	83.1	-38.9	Peak	Horizontal
	4867.5	38.8	2.6	41.4	74.0	-32.6	Peak	Vertical
	7307.0	36.2	10.7	46.9	74.0	-27.1	Peak	Vertical
*	8573.5	33.2	11.0	44.2	83.1	-38.9	Peak	Vertical
*	13010.5	30.7	17.6	48.3	83.1	-34.8	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 30dBc of the fundamental emission level (113.1dBμV/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)