

## 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 100kHz bandwidth per the PSD procedure.

### 7.5.2. Test Procedure Used

KDB 558074 D01v03r02 - Section 11.2 & Section 11.3

### 7.5.3. Test Setting

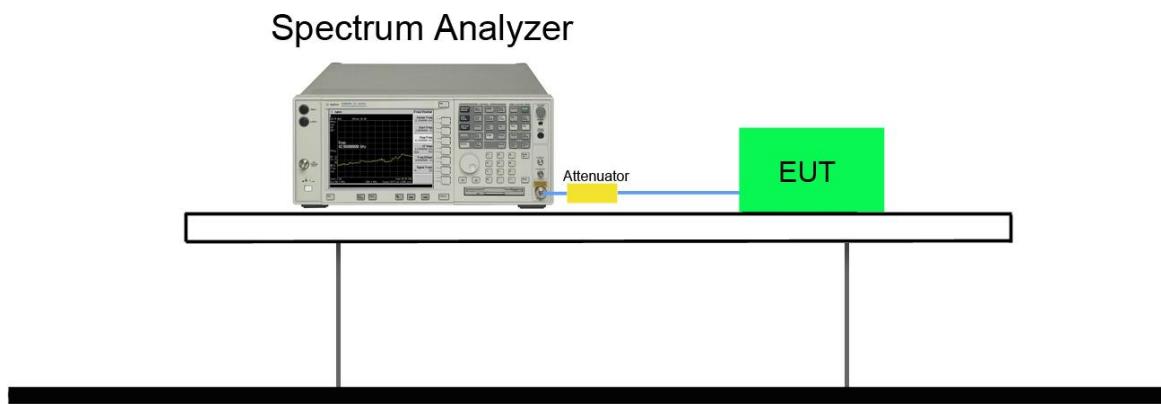
#### 1. Reference level measurement

- (a) Set instrument center frequency to DTS channel center frequency
- (b) Set the span to  $\geq$  1.5 times the DTS bandwidth
- (c) Set the RBW = 100 kHz
- (d) Set the VBW  $\geq$  3 x RBW
- (e) Detector = peak
- (f) Sweep time = auto couple
- (g) Trace mode = max hold
- (h) Allow trace to fully stabilize

#### 2. Emission level measurement

- (a) Set the center frequency and span to encompass frequency range to be measured
- (b) RBW = 100kHz
- (c) VBW = 300kHz
- (d) Detector = Peak
- (e) Trace mode = max hold
- (f) Sweep time = auto couple
- (g) The trace was allowed to stabilize

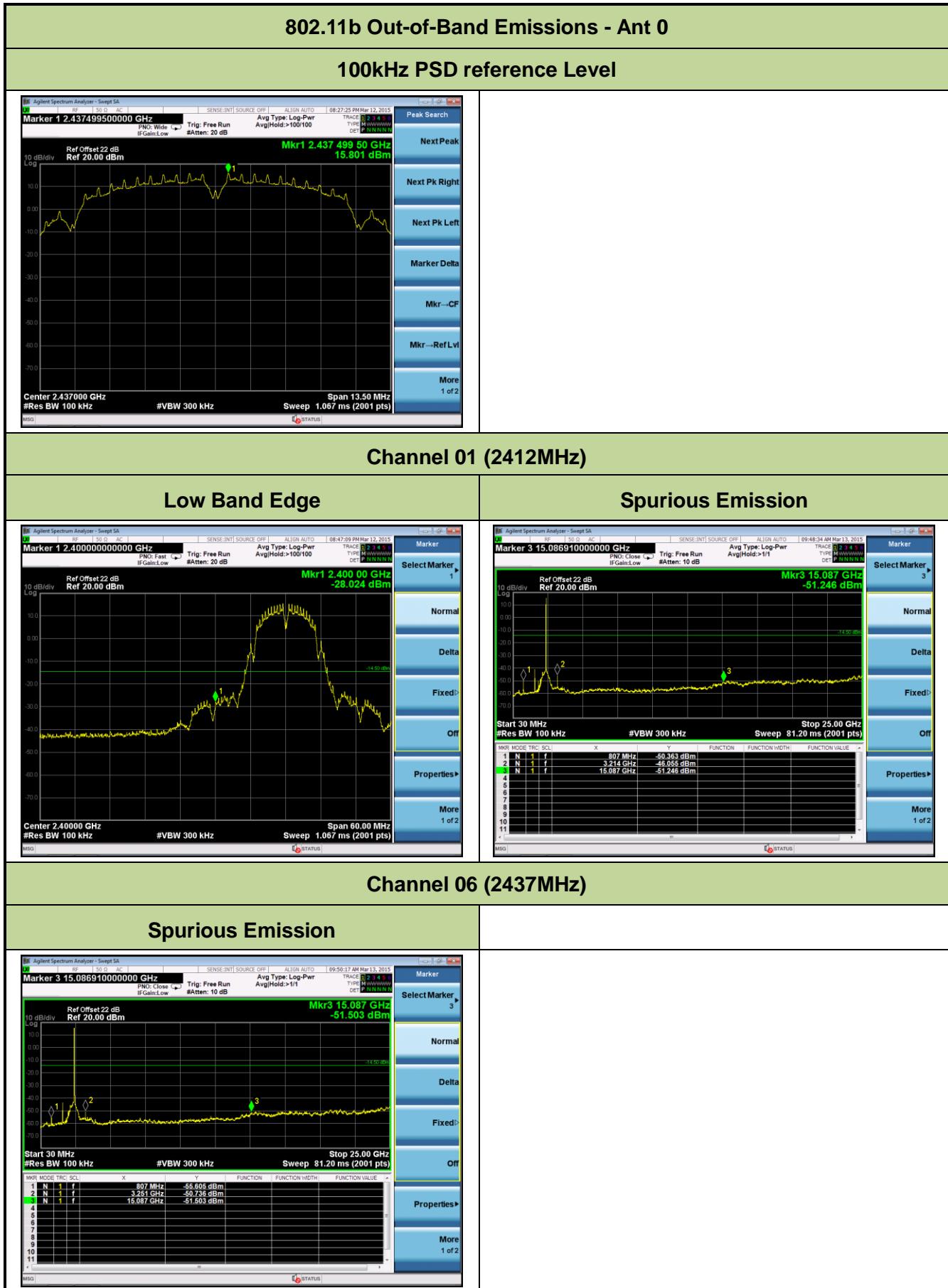
#### 7.5.4. Test Setup

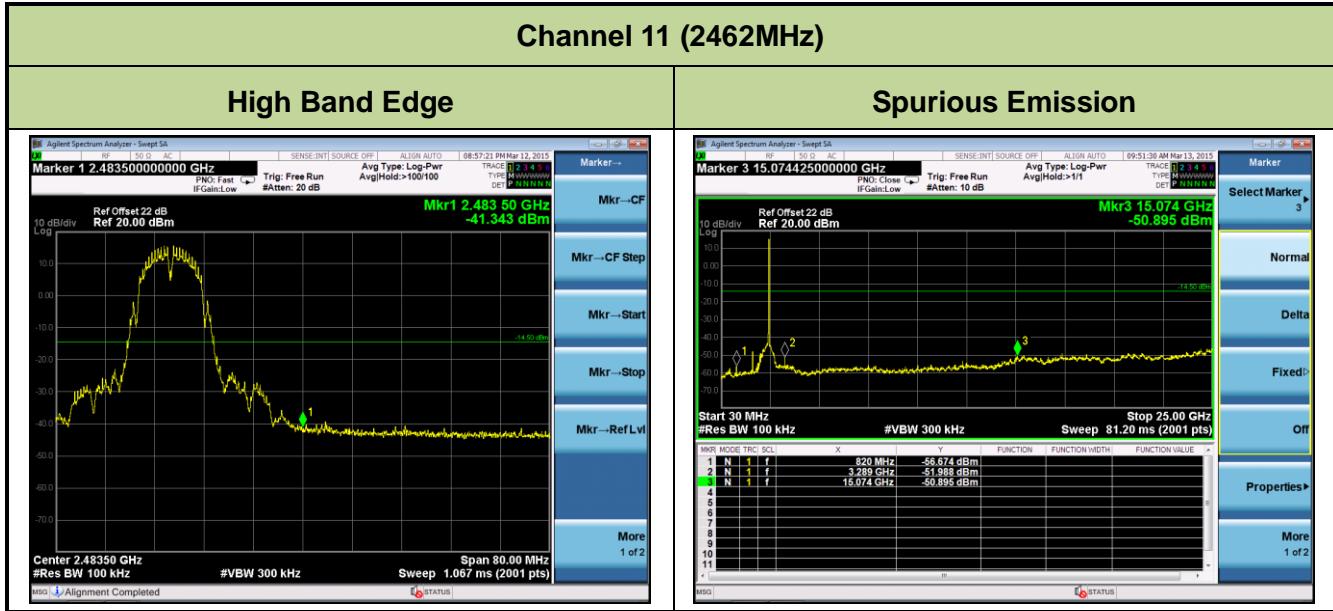


### 7.5.5. Test Result

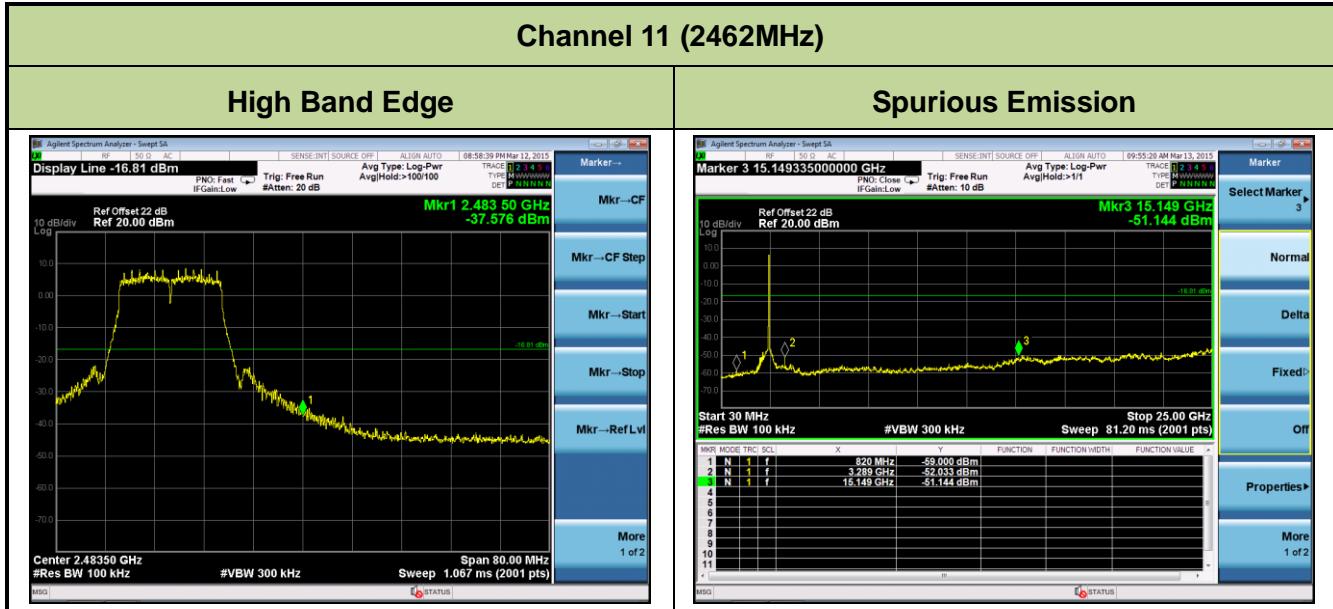
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Limit	Result
Ant 0					
802.11b	1	01	2412	30dBc	Pass
802.11b	1	06	2437	30dBc	Pass
802.11b	1	11	2462	30dBc	Pass
802.11g	6	01	2412	30dBc	Pass
802.11g	6	06	2437	30dBc	Pass
802.11g	6	11	2462	30dBc	Pass
802.11n-HT20	6.5	01	2412	30dBc	Pass
802.11n-HT20	6.5	06	2437	30dBc	Pass
802.11n-HT20	6.5	11	2462	30dBc	Pass
802.11n-HT40	13.5	03	2422	30dBc	Pass
802.11n-HT40	13.5	06	2437	30dBc	Pass
802.11n-HT40	13.5	09	2452	30dBc	Pass
Ant 1					
802.11n-HT20	6.5	01	2412	30dBc	Pass
802.11n-HT20	6.5	06	2437	30dBc	Pass
802.11n-HT20	6.5	11	2462	30dBc	Pass
802.11n-HT40	13.5	03	2422	30dBc	Pass
802.11n-HT40	13.5	06	2437	30dBc	Pass
802.11n-HT40	13.5	09	2452	30dBc	Pass

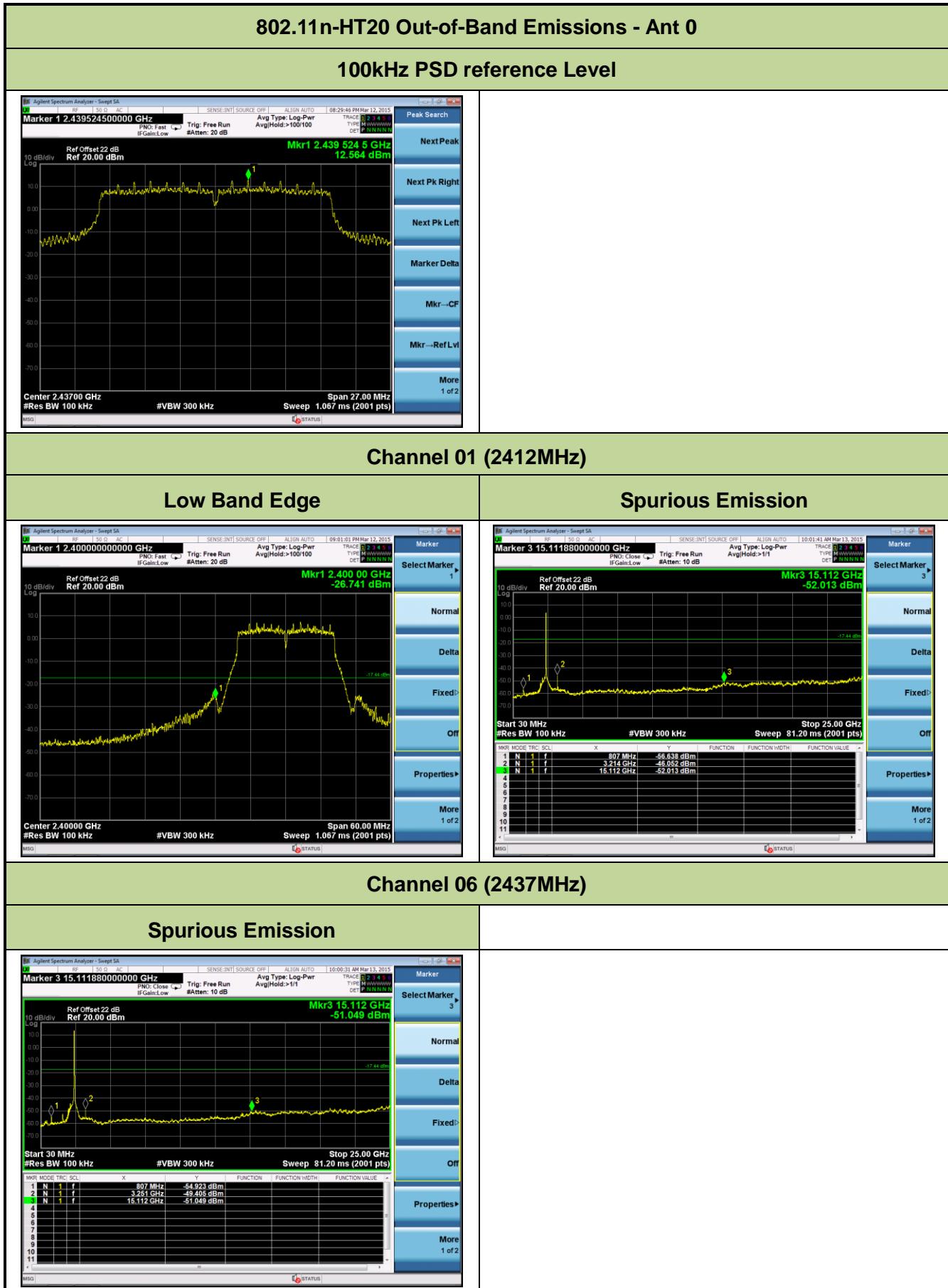
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Limit	Result
<b>Ant 0 / Ant 0 + 1</b>					
802.11n-HT20	6.5	01	2412	30dBc	Pass
802.11n-HT20	6.5	06	2437	30dBc	Pass
802.11n-HT20	6.5	11	2462	30dBc	Pass
802.11n-HT40	13.5	03	2422	30dBc	Pass
802.11n-HT40	13.5	06	2437	30dBc	Pass
802.11n-HT40	13.5	09	2452	30dBc	Pass
<b>Ant 1 / Ant 0 + 1</b>					
802.11n-HT20	6.5	01	2412	30dBc	Pass
802.11n-HT20	6.5	06	2437	30dBc	Pass
802.11n-HT20	6.5	11	2462	30dBc	Pass
802.11n-HT40	13.5	03	2422	30dBc	Pass
802.11n-HT40	13.5	06	2437	30dBc	Pass
802.11n-HT40	13.5	09	2452	30dBc	Pass

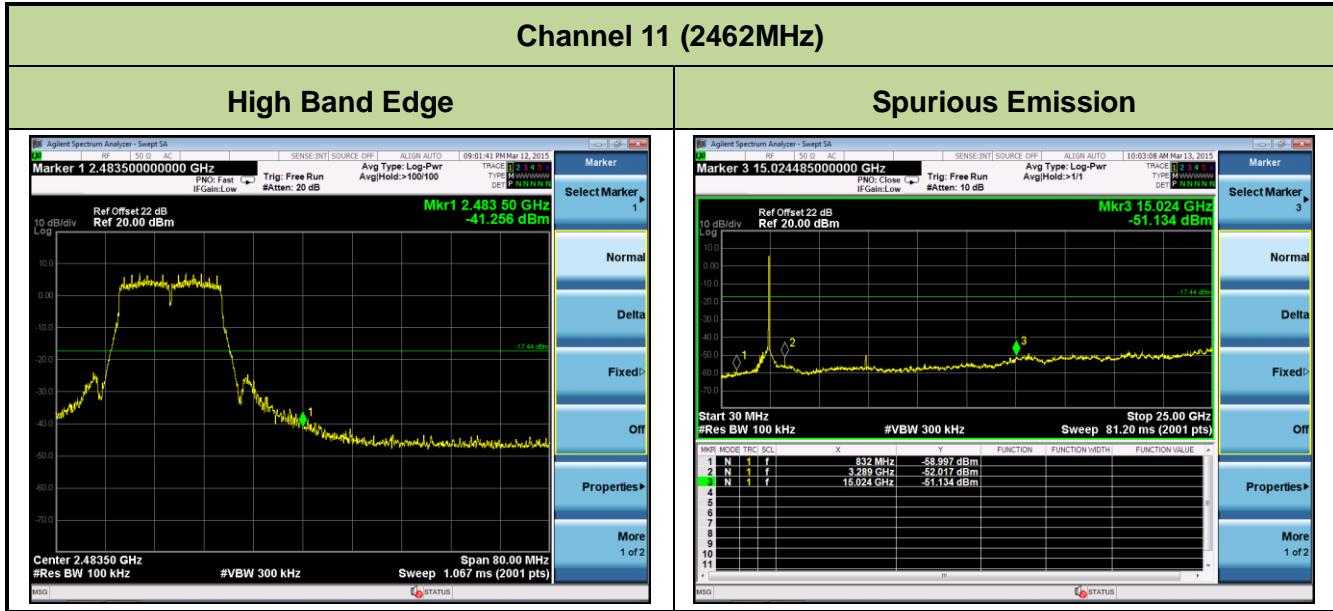


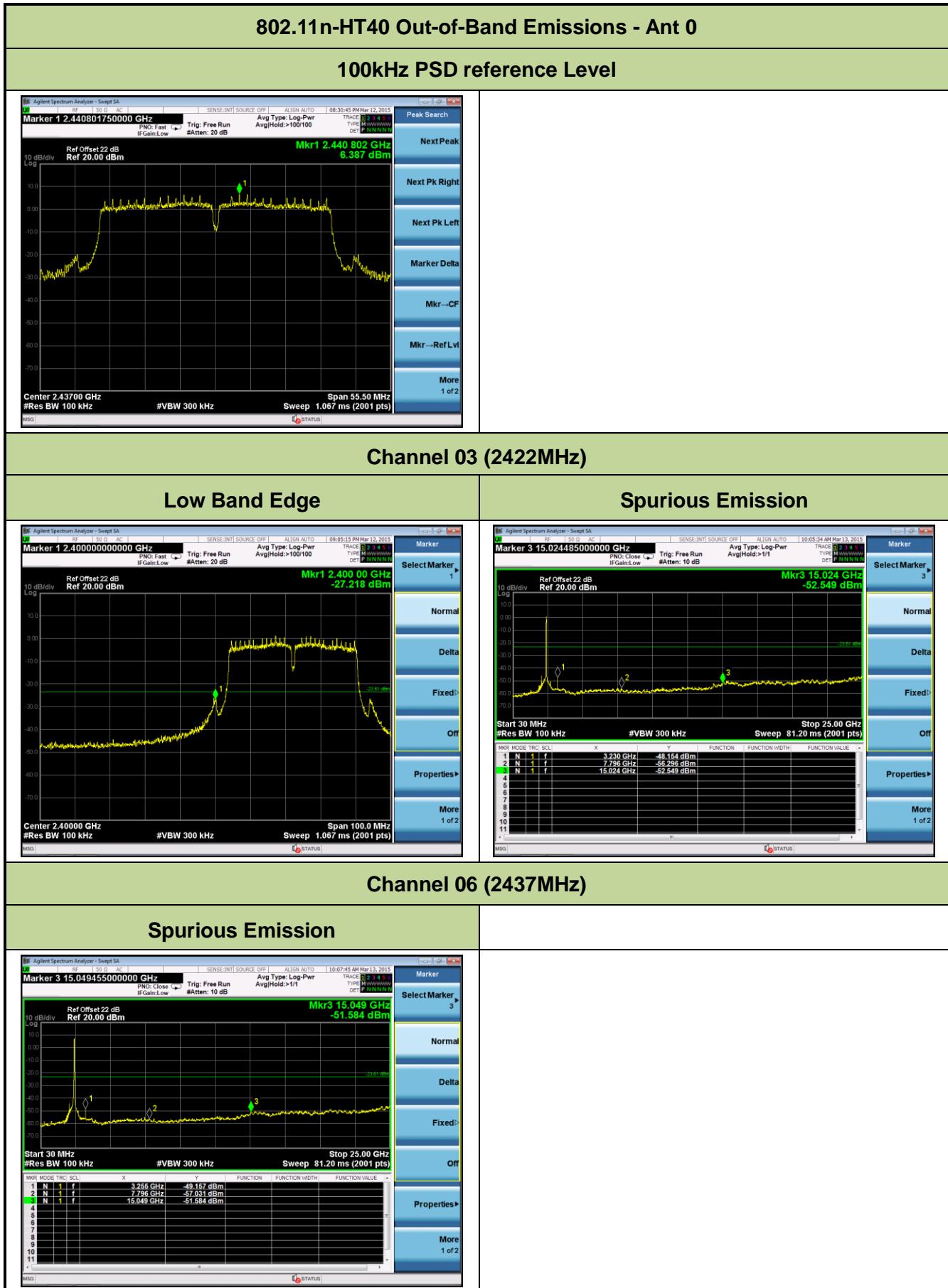


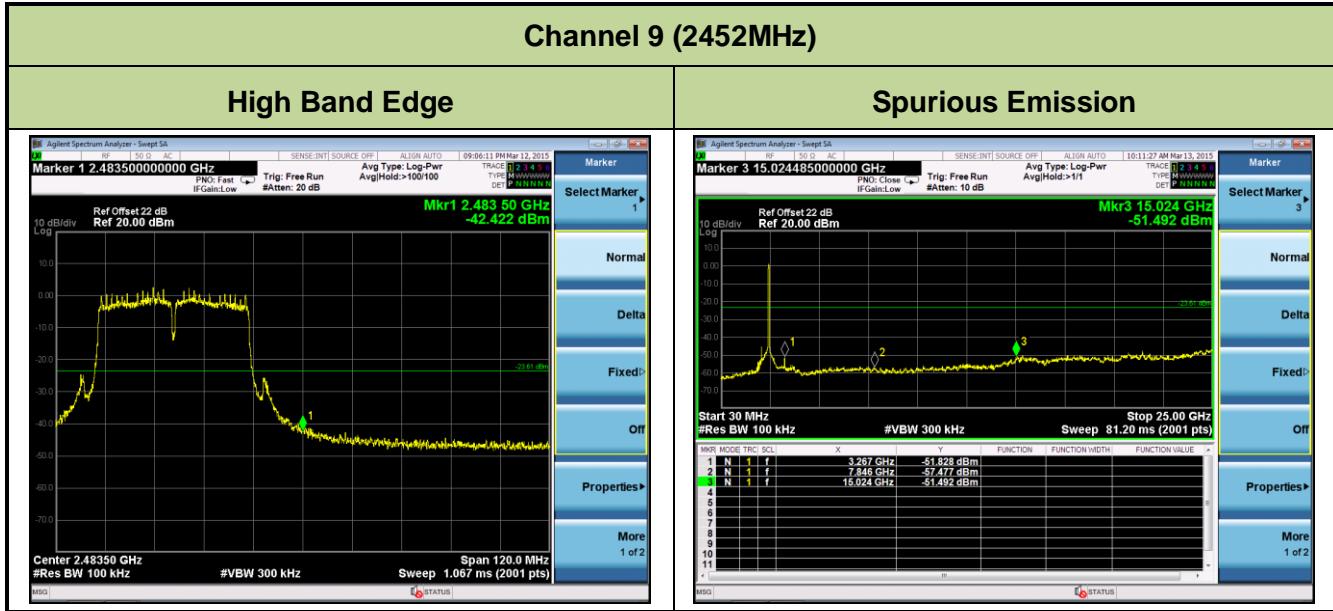




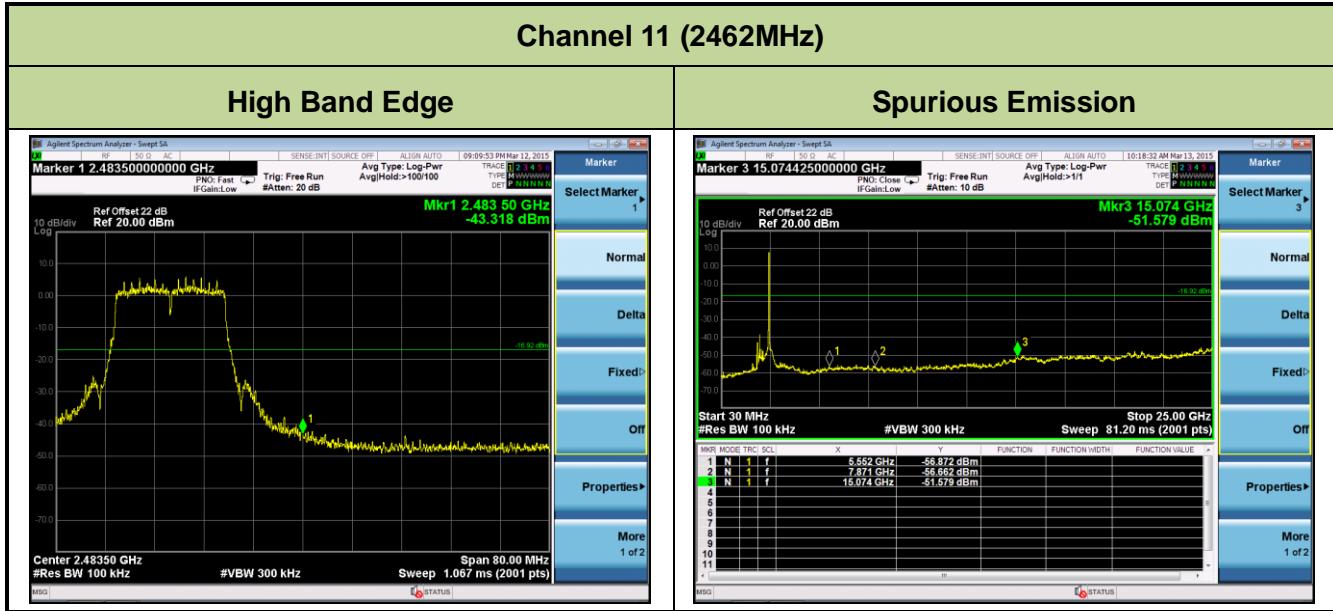


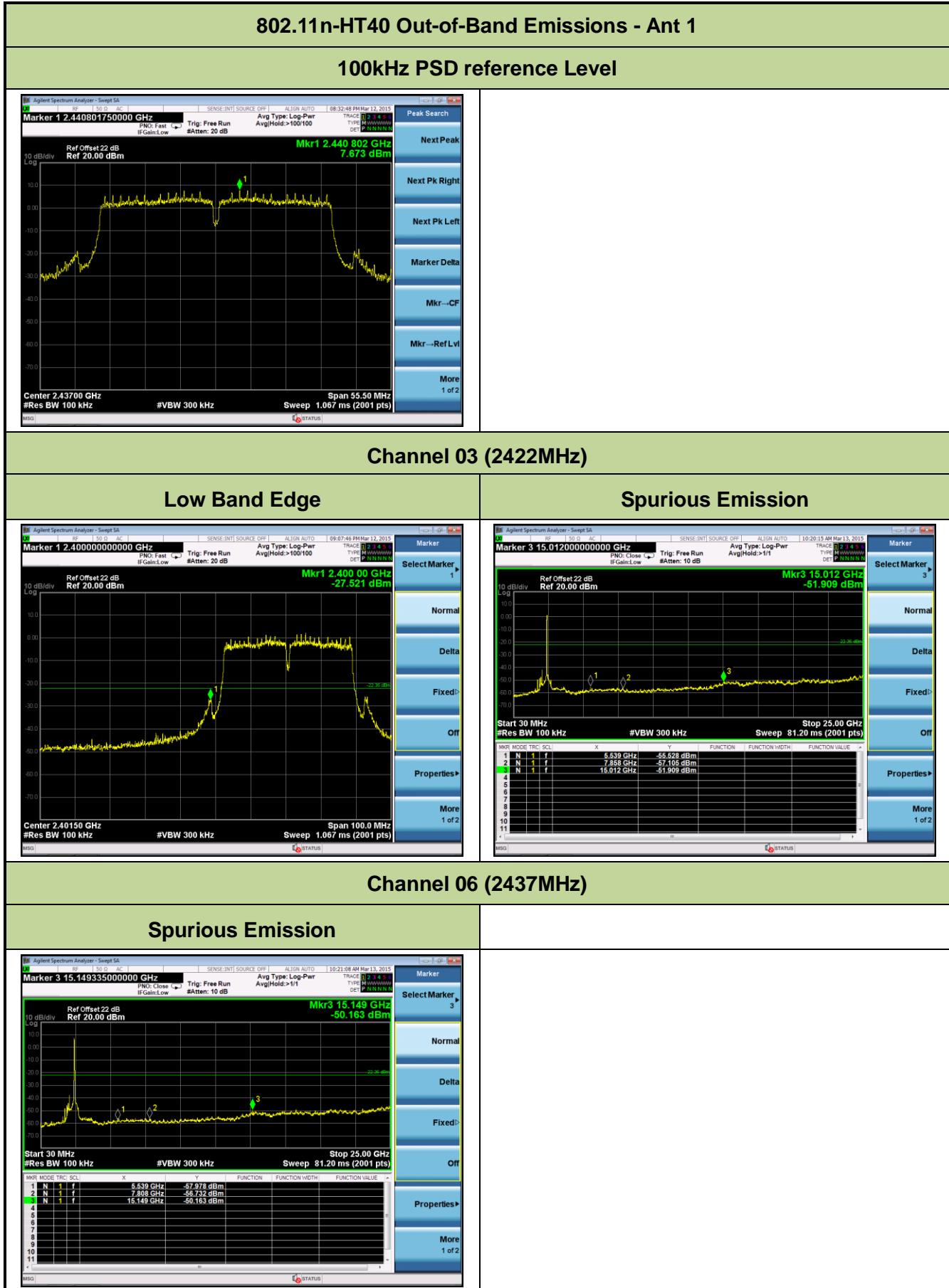


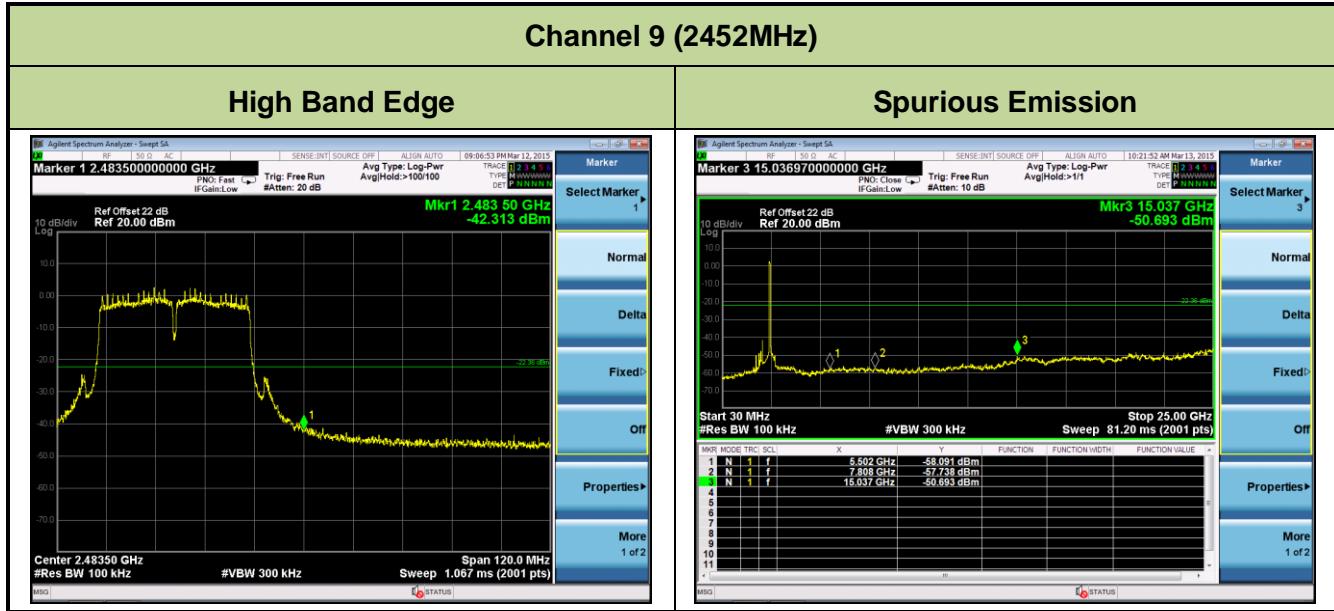


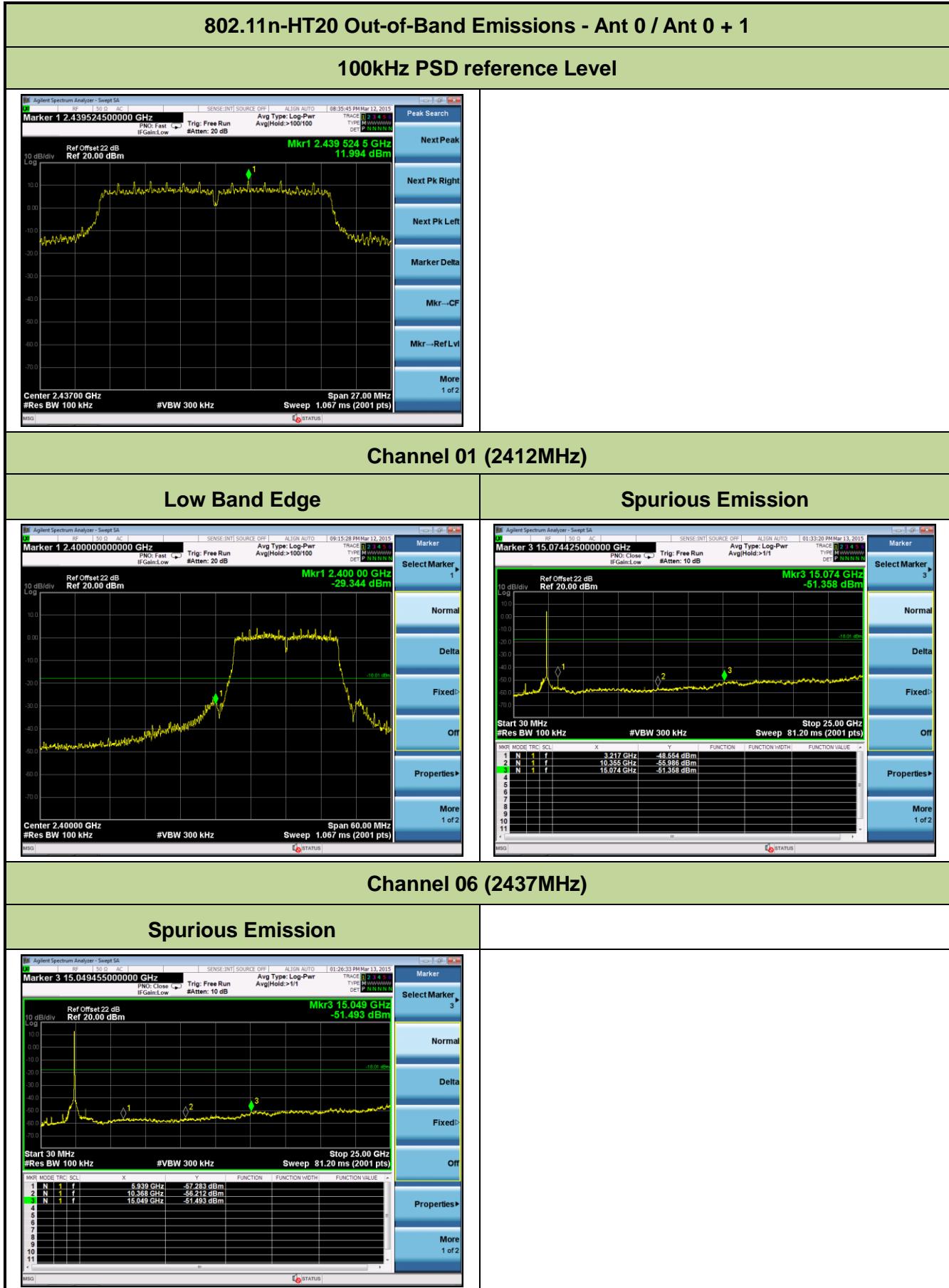


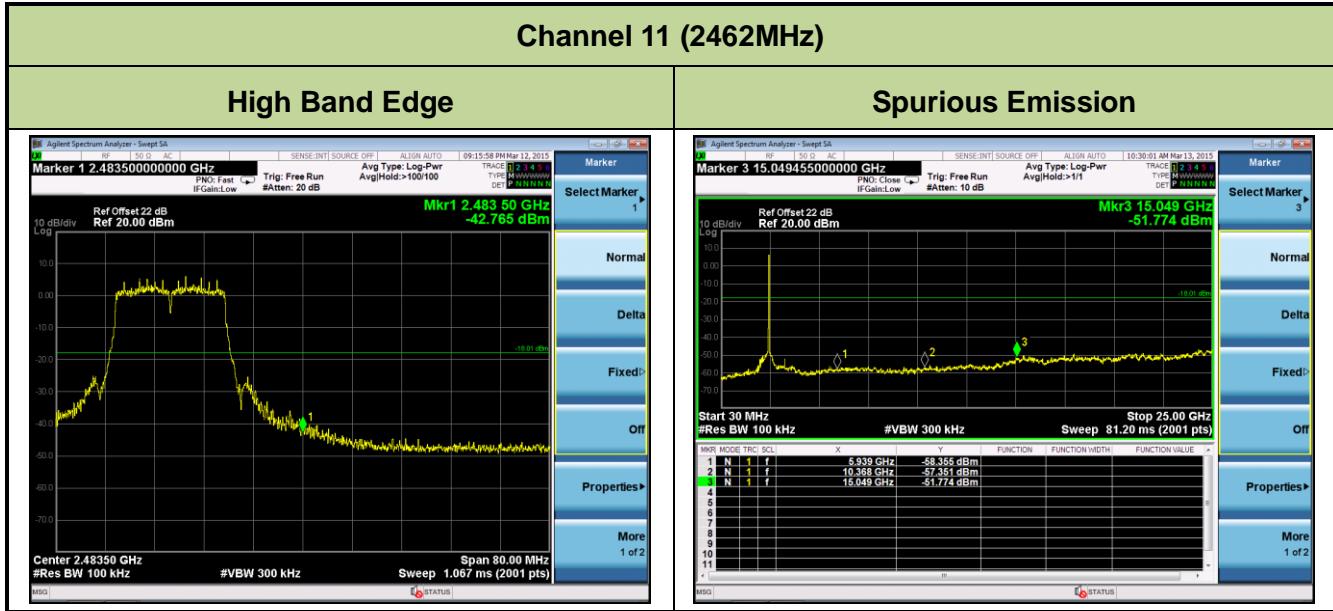


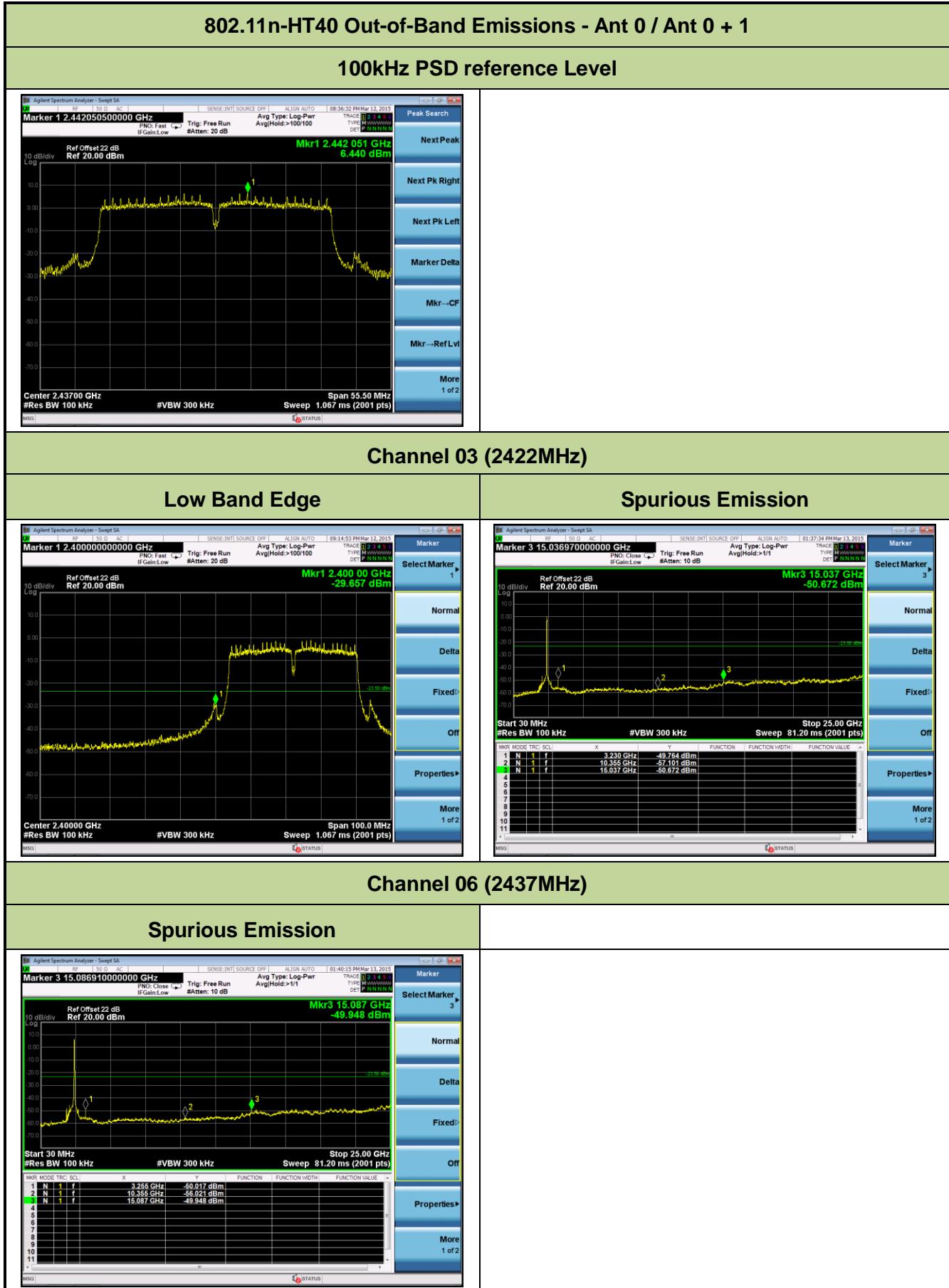


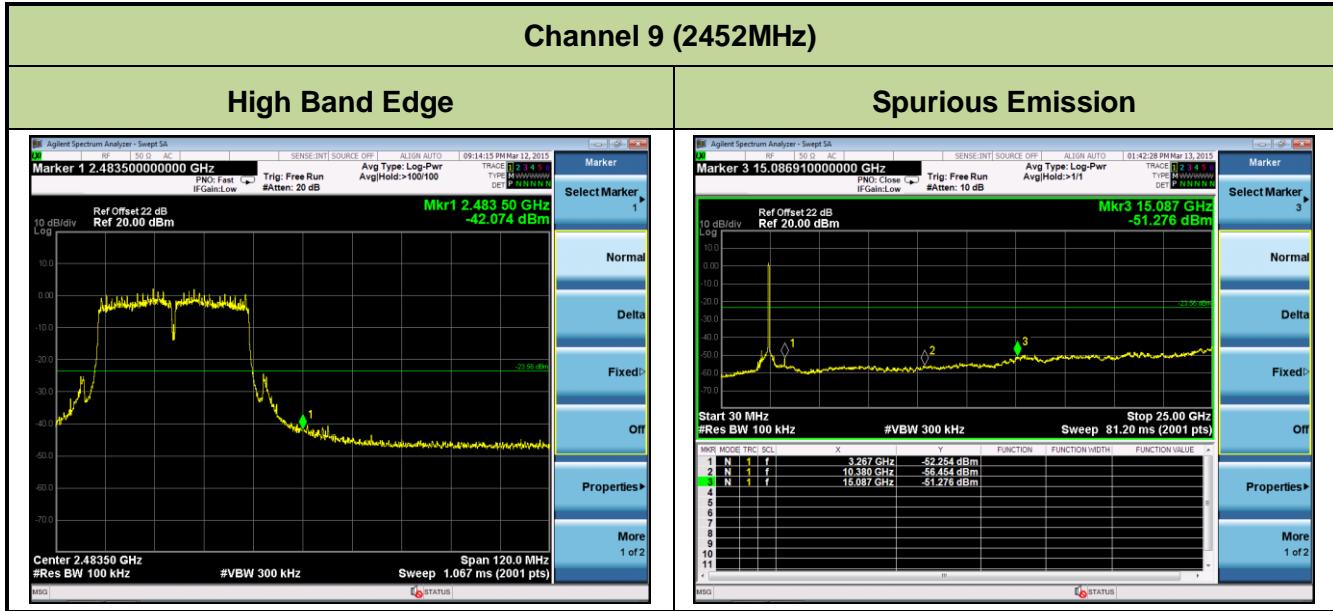


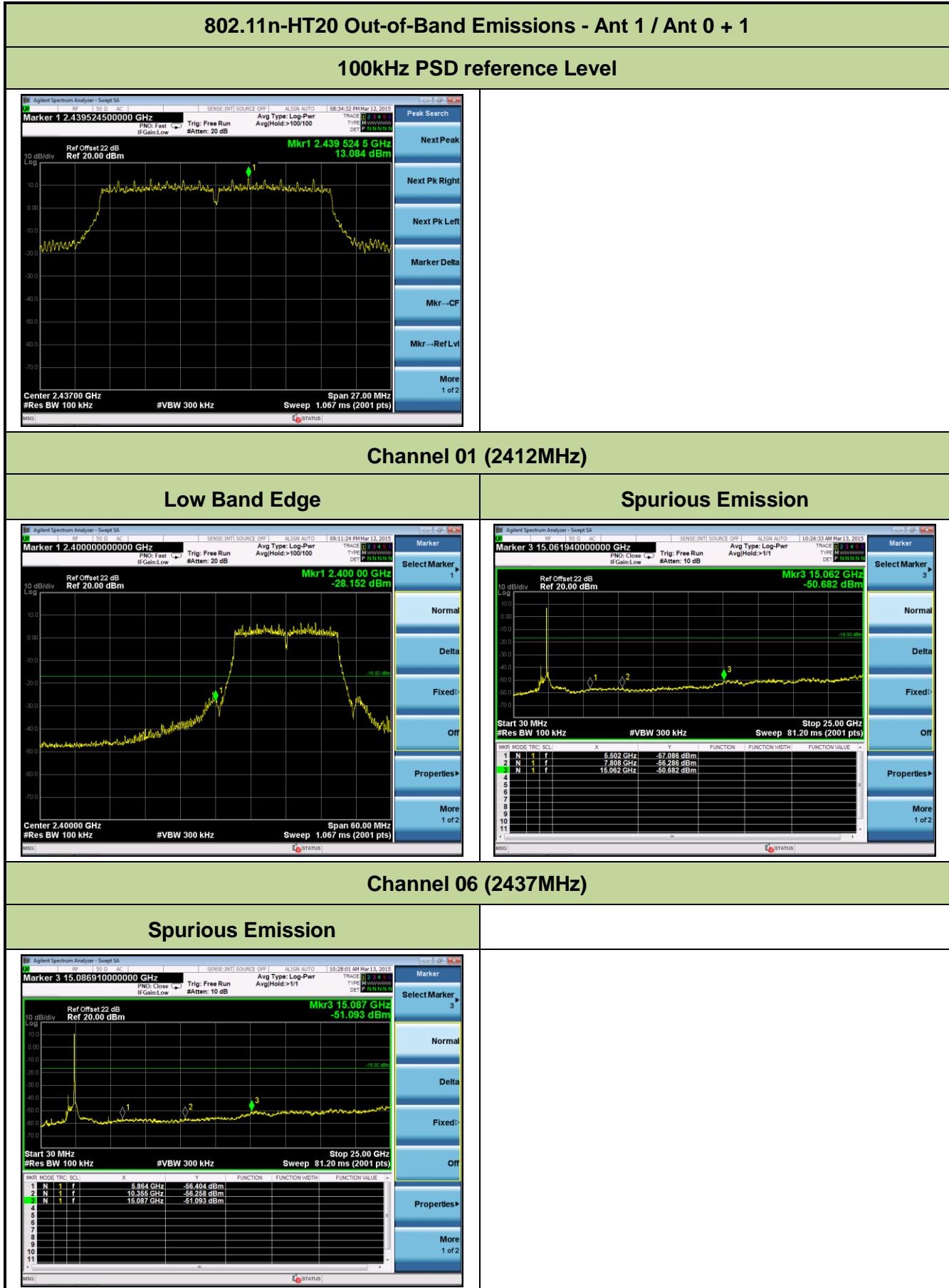


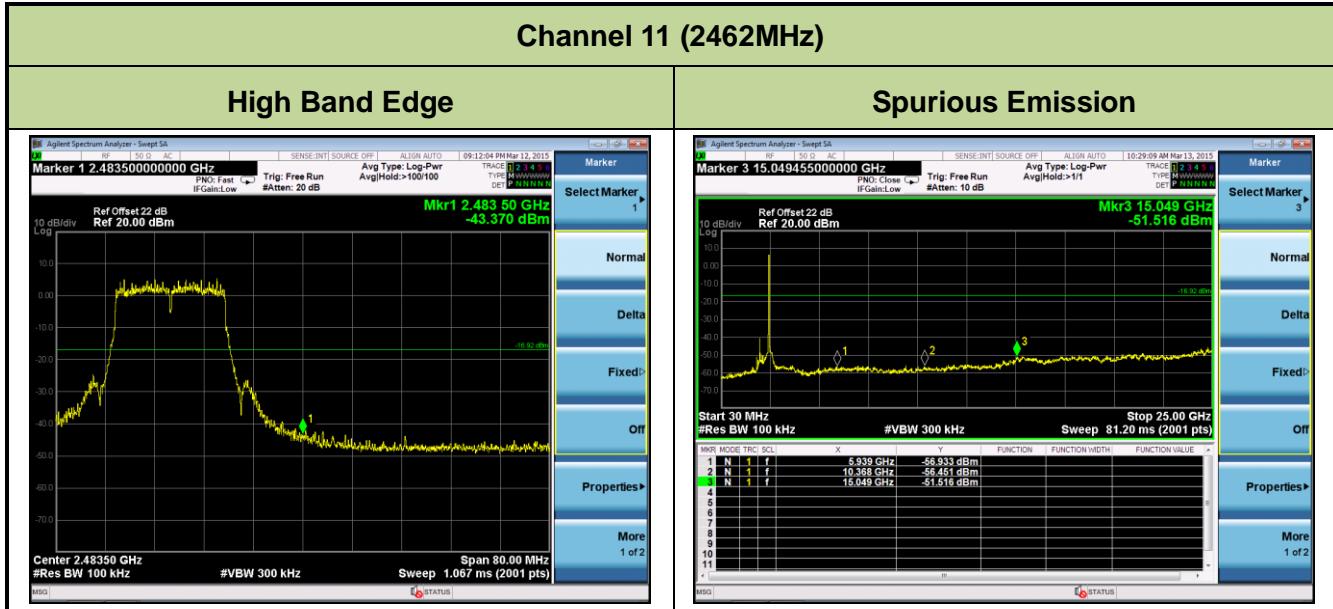


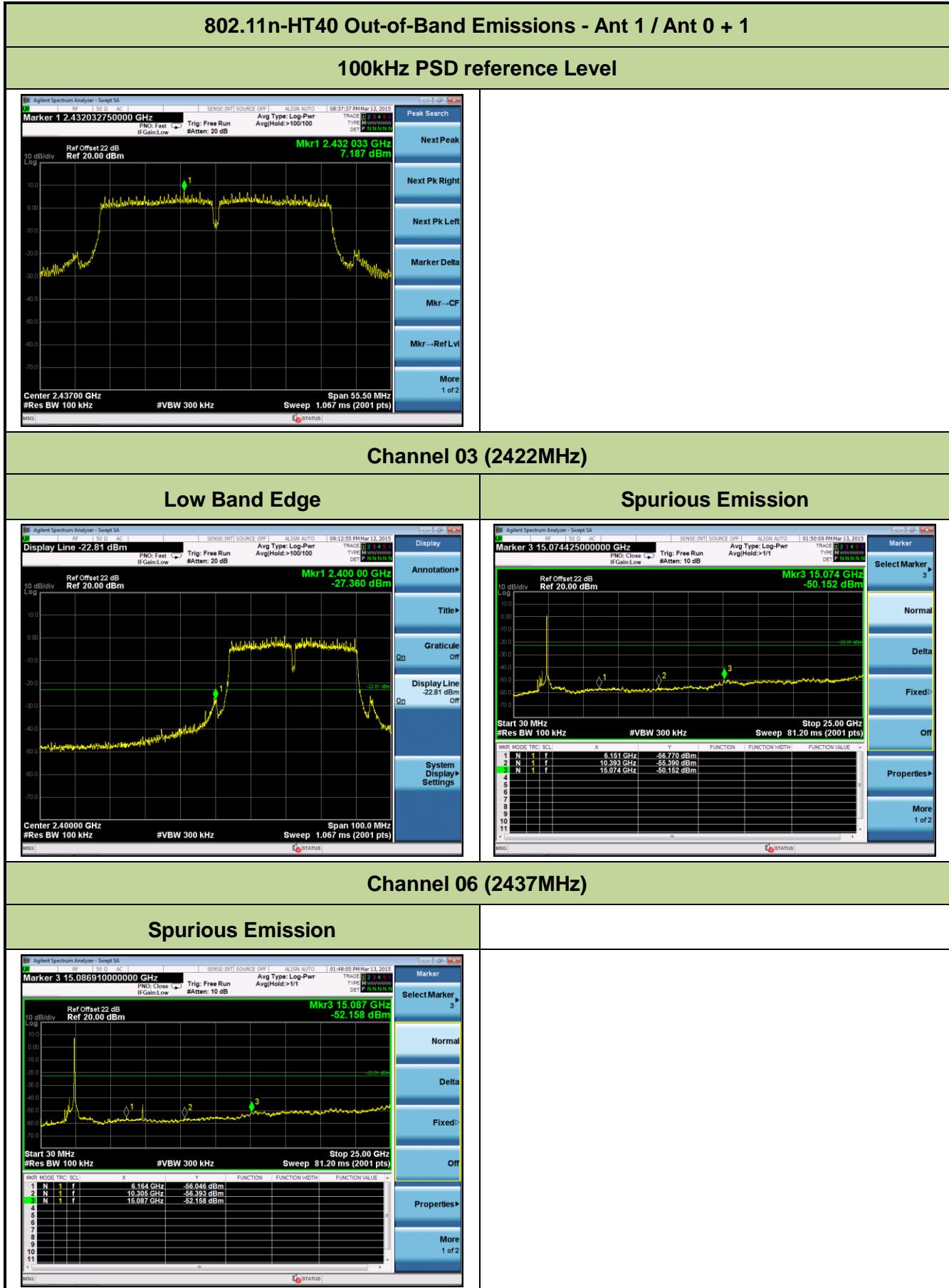


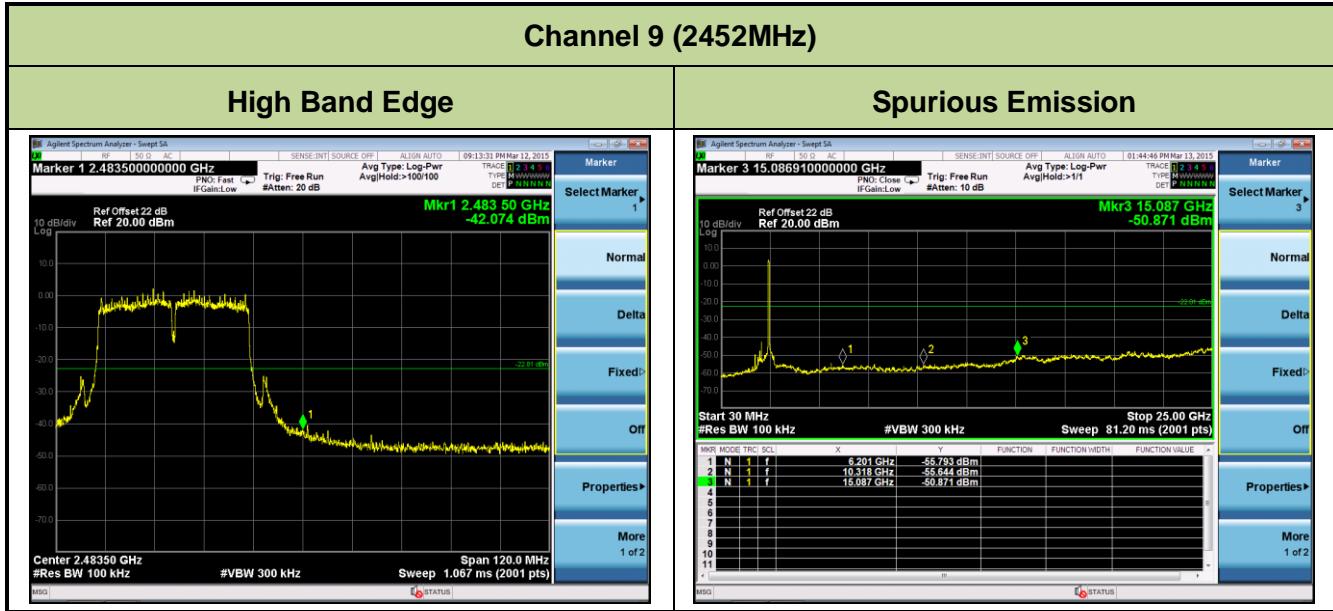












## 7.6. Radiated Spurious Emission Measurement

### 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 D01v03r02 - Section 12.2.3 (quasi-peak measurements)

KDB 558074 D01v03r02 - Section 12.2.4 (peak power measurements)

KDB 558074 D01v03r02 - Section 12.2.5 (average power measurements)

### 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**

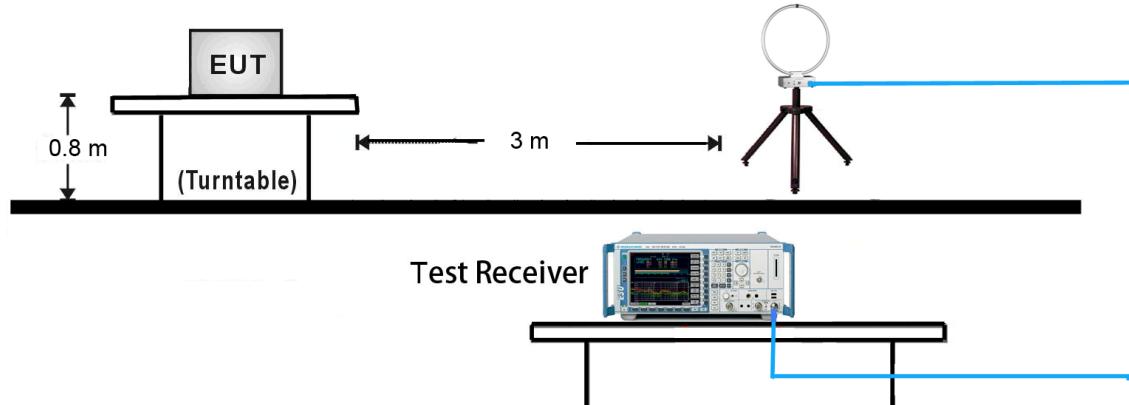
Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

#### **Average Field Strength Measurements**

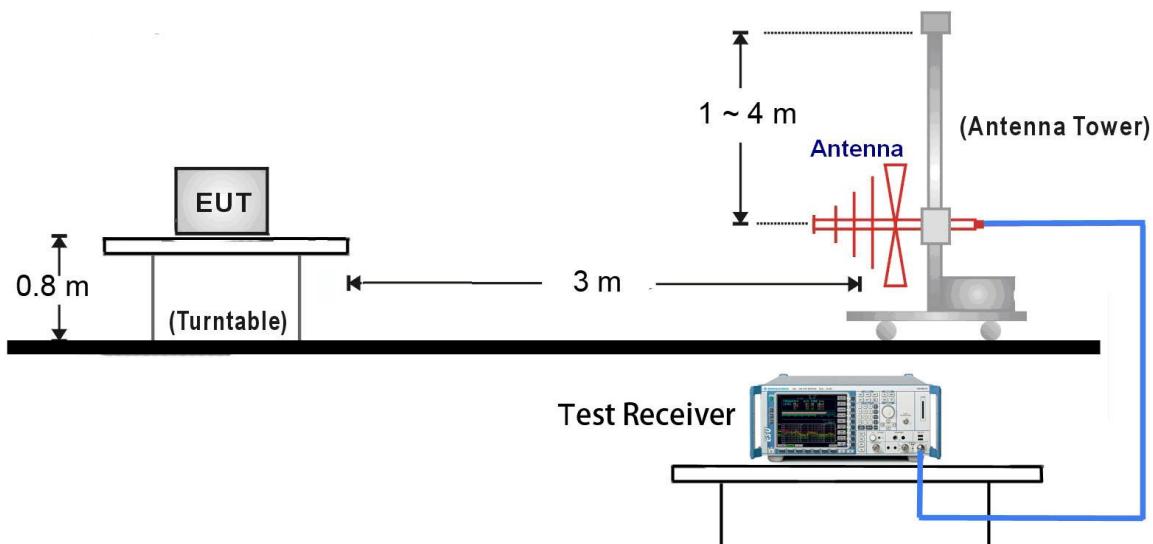
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW  $\geq 1/T$
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB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

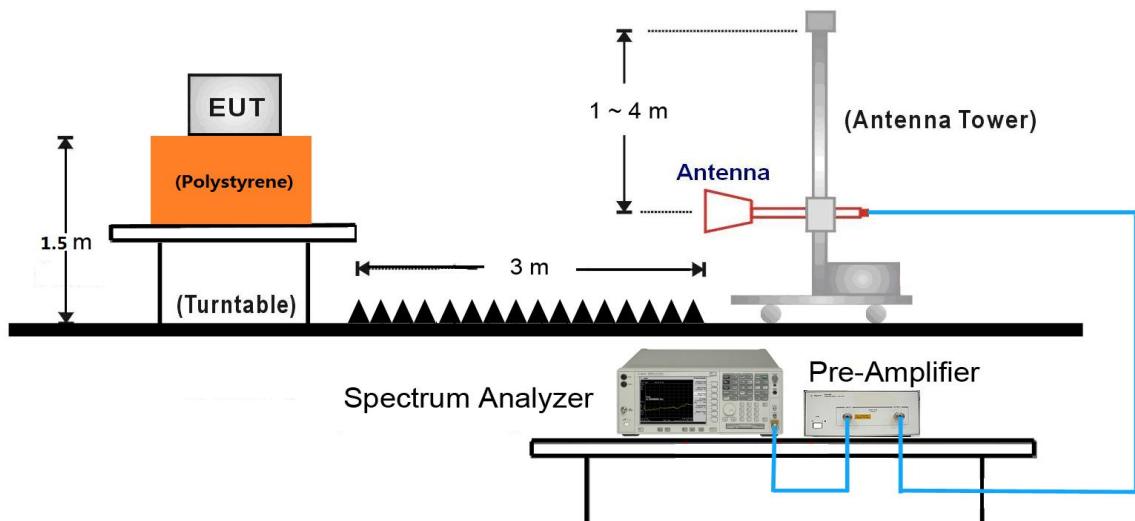
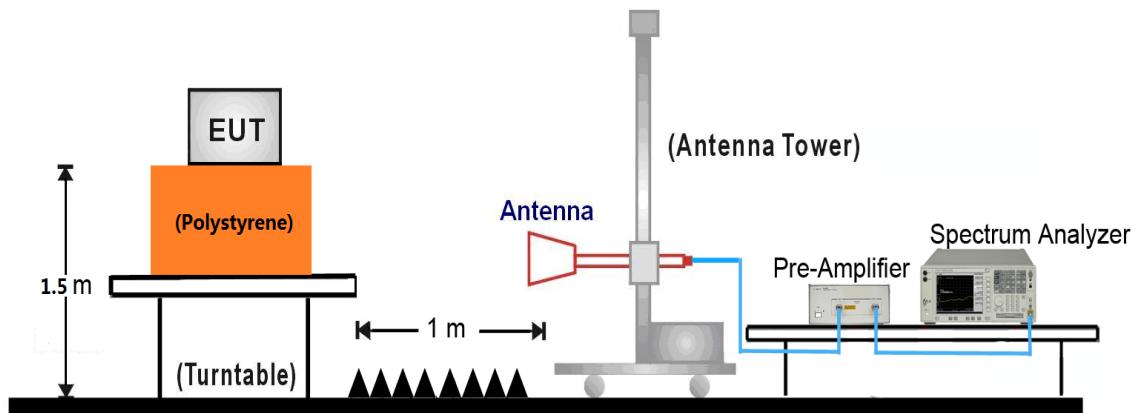
#### 7.6.4. Test Setup

##### 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	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 (dB $\mu$ V)	Factor (dB)	Measure Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector	Polarization
*	3218.5	50.4	4.1	54.5	94.1	-39.6	Peak	Horizontal
*	3426.7	38.7	4.0	42.7	94.1	-51.4	Peak	Horizontal
	4865.5	36.8	7.3	44.1	74.0	-29.9	Peak	Horizontal
	8355.5	36.1	15.2	51.3	74.0	-22.7	Peak	Horizontal
*	3218.5	47.2	4.1	51.3	94.1	-42.8	Peak	Vertical
*	4352.6	36.8	6.1	42.9	94.1	-51.2	Peak	Vertical
	5022.6	35.9	7.6	43.5	74.0	-30.5	Peak	Vertical
	8216.4	36.2	15.4	51.6	74.0	-22.4	Peak	Vertical

Note 1: “\*” is not in restricted band, its limit is 20dBc of the fundamental emission level (114.1dB $\mu$ V/m).

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + 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 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dB $\mu$ V)	Factor (dB)	Measure Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector	Polarization
*	3252.5	46.8	4.0	50.8	95.4	-44.6	Peak	Horizontal
*	4426.9	37.0	6.2	43.2	95.4	-52.2	Peak	Horizontal
	4869.1	37.5	7.3	44.8	74.0	-29.2	Peak	Horizontal
	8256.6	36.1	15.3	51.4	74.0	-22.6	Peak	Horizontal
*	3252.5	44.4	4.0	48.4	95.4	-47.0	Peak	Vertical
*	4446.9	37.2	6.2	43.4	95.4	-52.0	Peak	Vertical
	4863.3	36.7	7.3	44.0	74.0	-30.0	Peak	Vertical
	7310.2	33.2	14.8	48.0	54.0	-6.0	Average	Vertical
	7315.5	41.4	14.9	56.3	74.0	-17.7	Peak	Vertical

Note 1: “\*” is not in restricted band, its limit is 20dBc of the fundamental emission level (115.4dB $\mu$ V/m).

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + 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 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dB $\mu$ V)	Factor (dB)	Measure Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector	Polarization
*	3126.5	40.1	4.2	44.3	94.0	-49.7	Peak	Horizontal
*	4463.3	37.3	6.2	43.5	94.0	-50.5	Peak	Horizontal
	4863.3	36.6	7.3	43.9	74.0	-30.1	Peak	Horizontal
	8256.5	36.2	15.3	51.5	74.0	-22.5	Peak	Horizontal
*	3145.7	39.8	4.2	44.0	94.0	-50.0	Peak	Vertical
*	4426.4	36.9	6.2	43.1	94.0	-50.9	Peak	Vertical
	4623.9	37.7	6.6	44.3	74.0	-29.7	Peak	Vertical
	8421.4	35.6	15.4	51.0	74.0	-23.0	Peak	Vertical

Note 1: “\*\*” is not in restricted band, its limit is 20dBc of the fundamental emission level (114.0dB $\mu$ V/m).

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + 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 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dB $\mu$ V)	Factor (dB)	Measure Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector	Polarization
*	3145.7	39.9	4.2	44.1	92.0	-47.9	Peak	Horizontal
*	4457.0	37.2	6.2	43.4	92.0	-48.6	Peak	Horizontal
	4897.4	37.6	7.4	45.0	74.0	-29.0	Peak	Horizontal
	8365.6	35.4	15.2	50.6	74.0	-23.4	Peak	Horizontal
*	3218.5	47.2	4.1	51.3	92.0	-40.7	Peak	Vertical
*	4456.7	37.1	6.2	43.3	92.0	-48.7	Peak	Vertical
	4763.9	37.2	6.9	44.1	74.0	-29.9	Peak	Vertical
	8194.7	36.7	15.5	52.2	74.0	-21.8	Peak	Vertical

Note 1: “\*\*” is not in restricted band, its limit is 20dBc of the fundamental emission level (112.0dB $\mu$ V/m).

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + 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 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dB $\mu$ V)	Factor (dB)	Measure Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector	Polarization
*	3126.6	39.2	4.2	43.4	95.9	-52.5	Peak	Horizontal
*	4486.4	37.0	6.3	43.3	95.9	-52.6	Peak	Horizontal
	7315.5	39.9	14.9	54.8	74.0	-19.2	Peak	Horizontal
	8245.7	36.1	15.3	51.4	74.0	-22.6	Peak	Horizontal
*	3244.7	39.2	4.0	43.2	95.9	-52.7	Peak	Vertical
*	4479.0	37.0	6.3	43.3	95.9	-52.6	Peak	Vertical
	5026.4	36.2	7.6	43.8	74.0	-30.2	Peak	Vertical
	7315.5	42.5	14.9	57.4	74.0	-16.6	Peak	Vertical

Note 1: “\*\*” is not in restricted band, its limit is 20dBc of the fundamental emission level (115.9dB $\mu$ V/m).

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + 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 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dB $\mu$ V)	Factor (dB)	Measure Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector	Polarization
*	3204.9	39.1	4.1	43.2	92.5	-49.3	Peak	Horizontal
*	4421.4	36.7	6.2	42.9	92.5	-49.6	Peak	Horizontal
	4869.3	36.4	7.3	43.7	74.0	-30.3	Peak	Horizontal
	8425.7	35.6	15.4	51.0	74.0	-23.0	Peak	Horizontal
*	3105.3	38.5	4.1	42.6	92.5	-49.9	Peak	Vertical
*	4487.4	37.3	6.3	43.6	92.5	-48.9	Peak	Vertical
	5002.4	36.1	7.6	43.7	74.0	-30.3	Peak	Vertical
	7383.5	39.3	14.9	54.2	74.0	-19.8	Peak	Vertical

Note 1: “\*\*” is not in restricted band, its limit is 20dBc of the fundamental emission level (112.5dB $\mu$ V/m).

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)