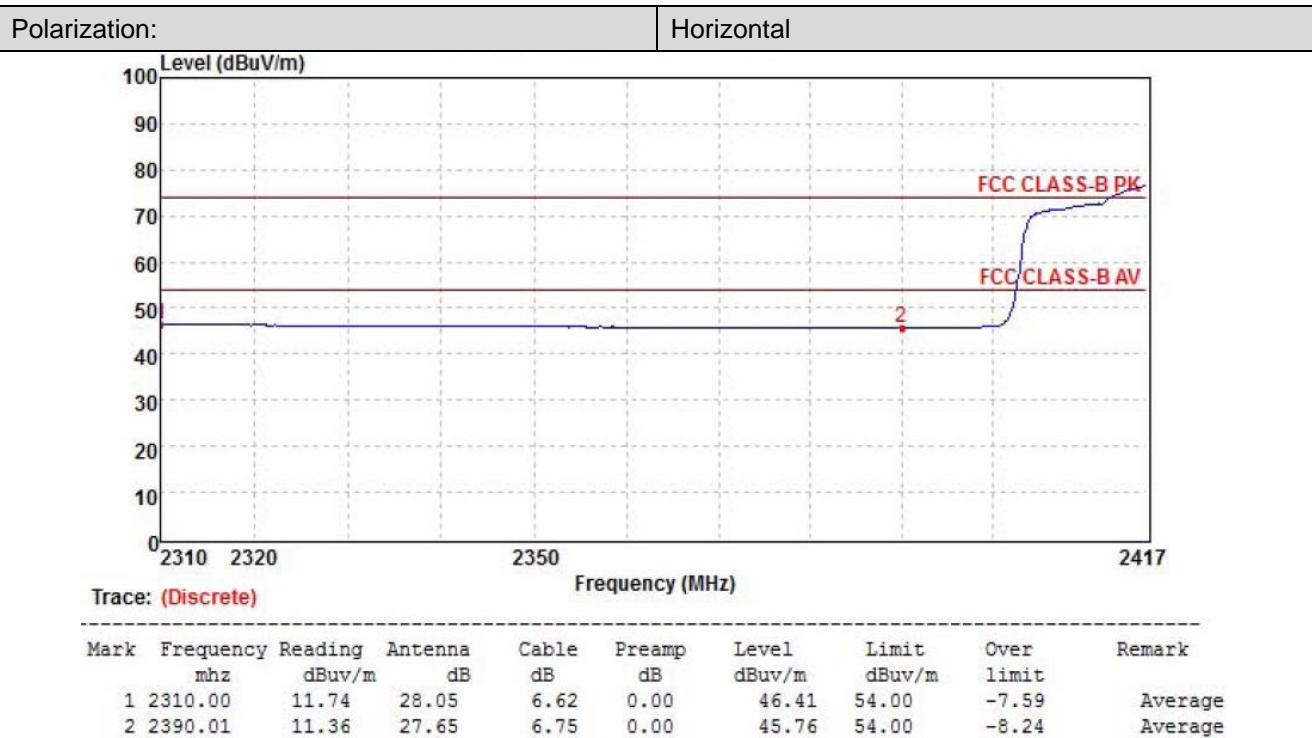
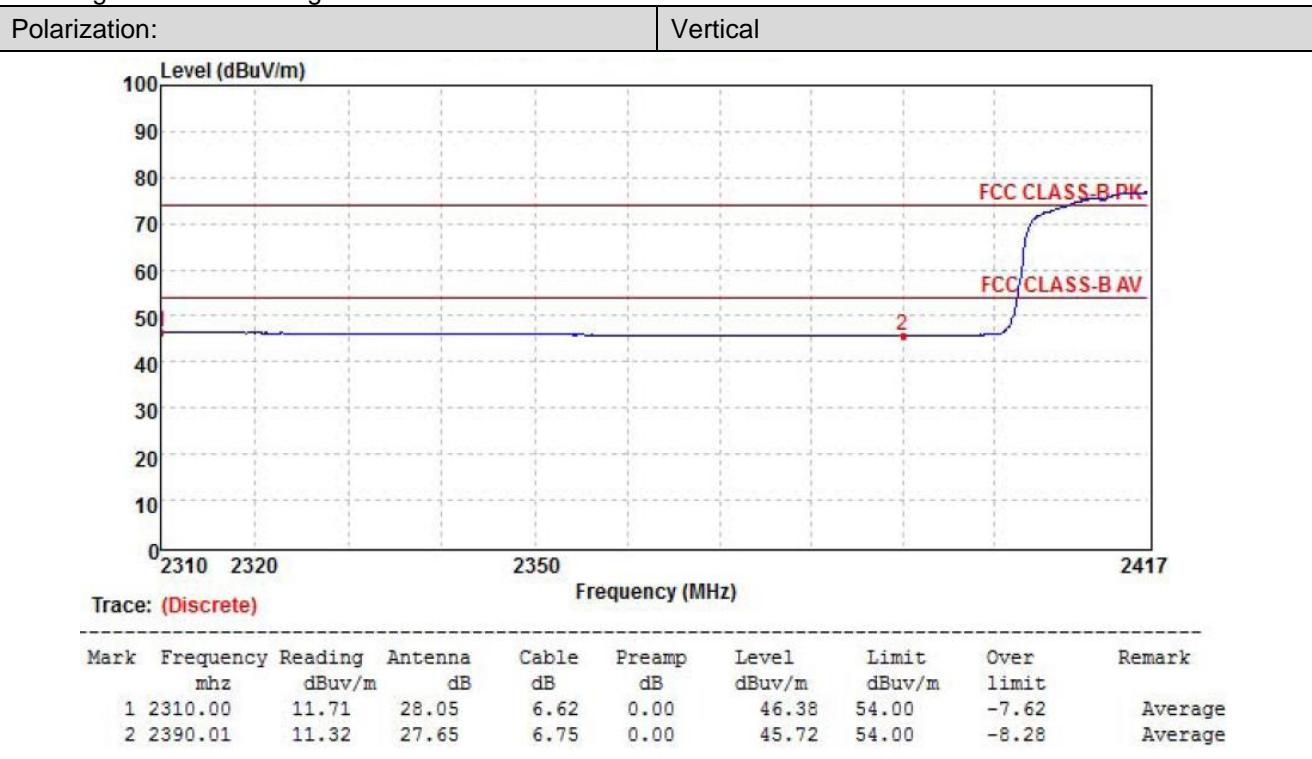
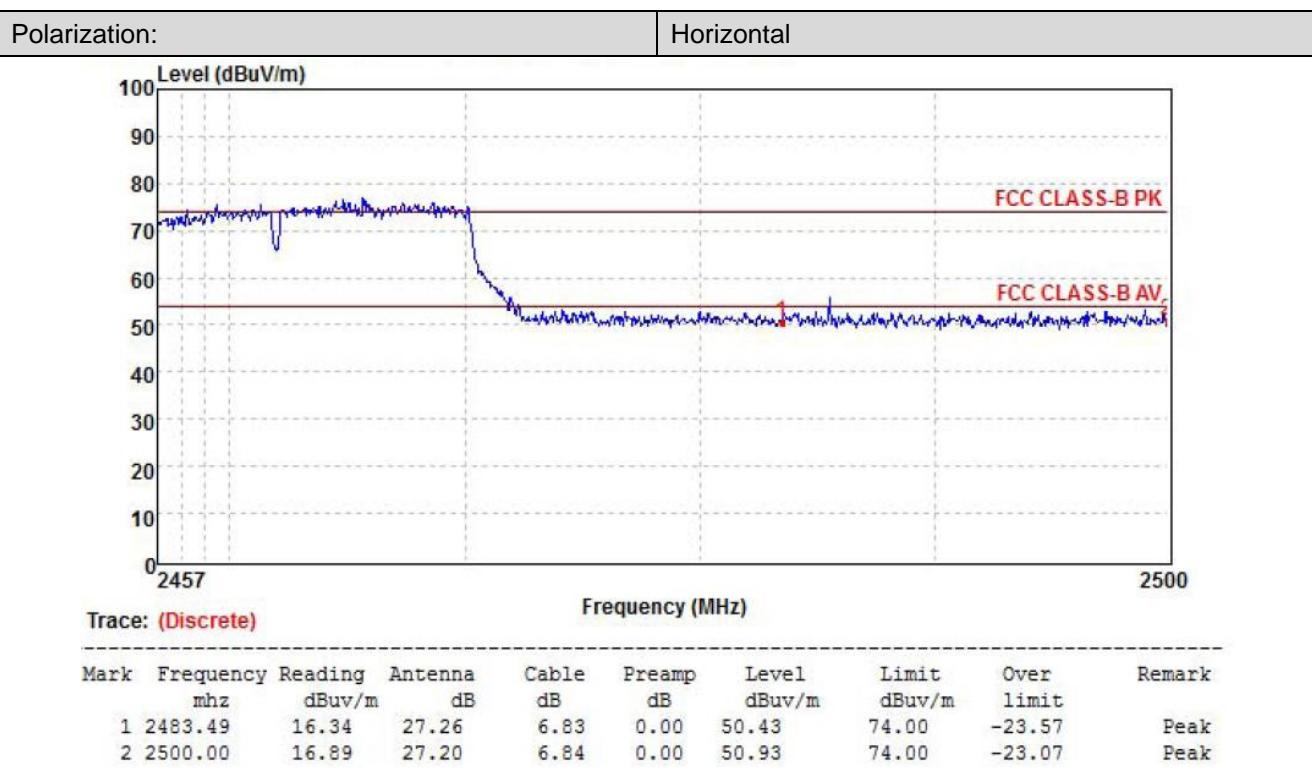
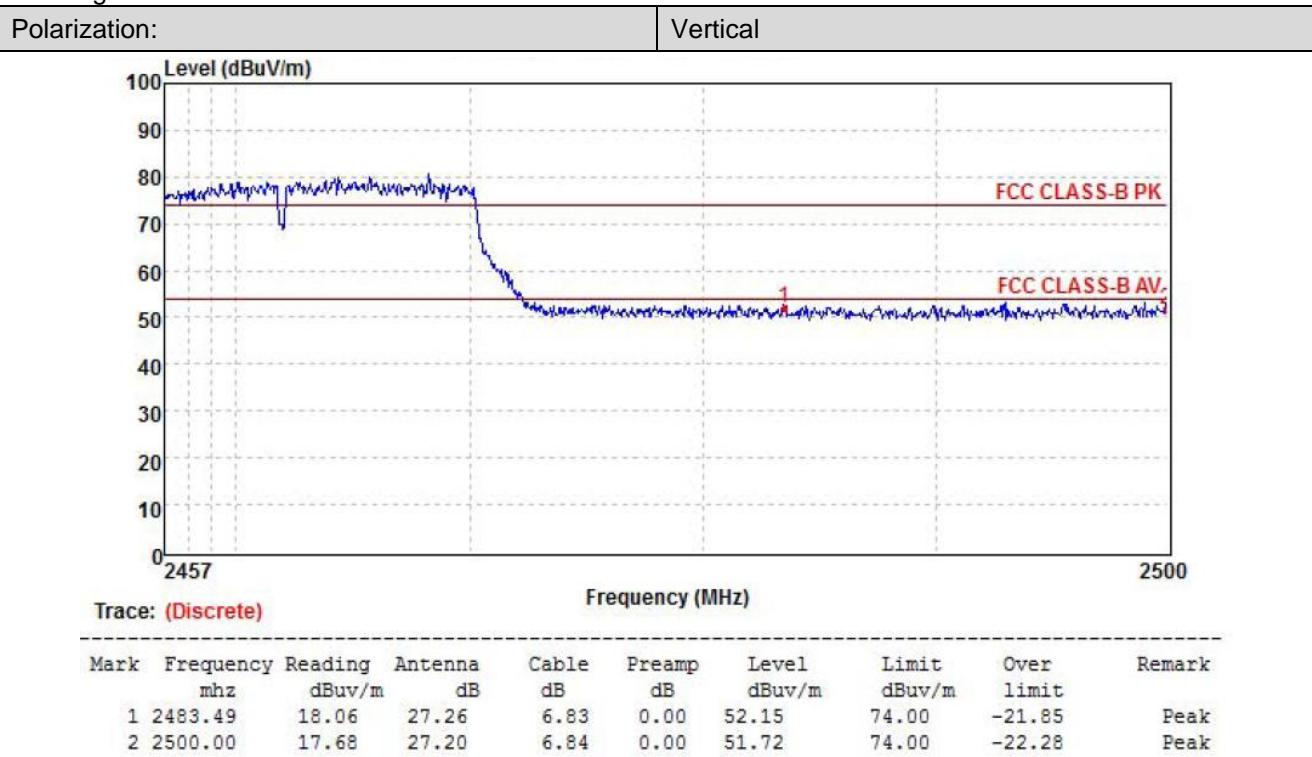


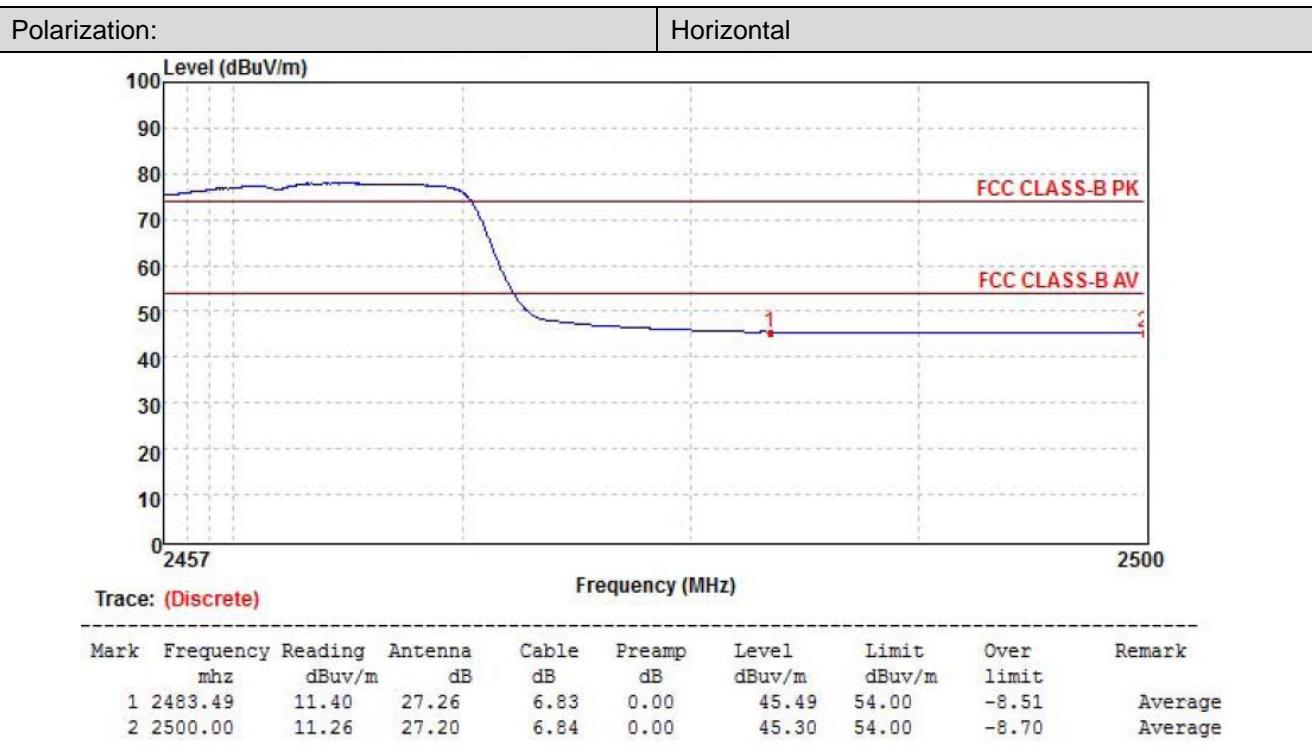
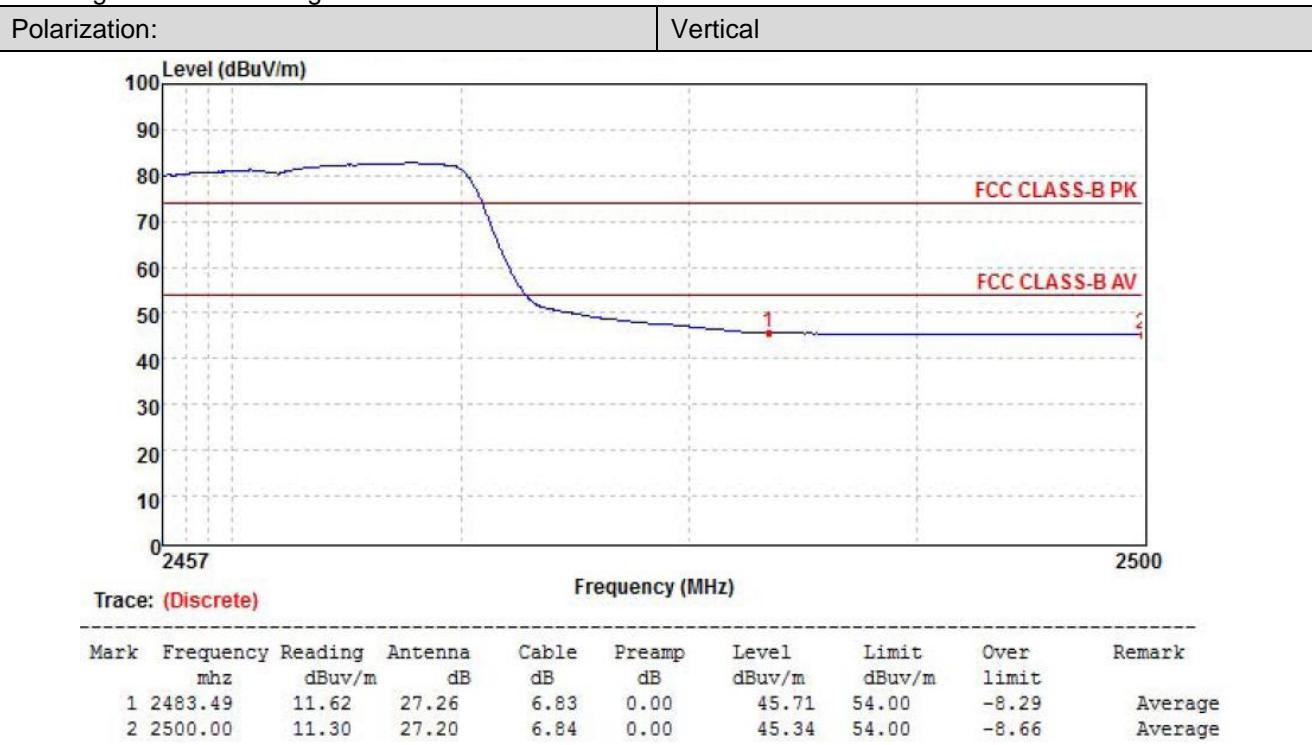
## 802.11g-2412MHz Average:



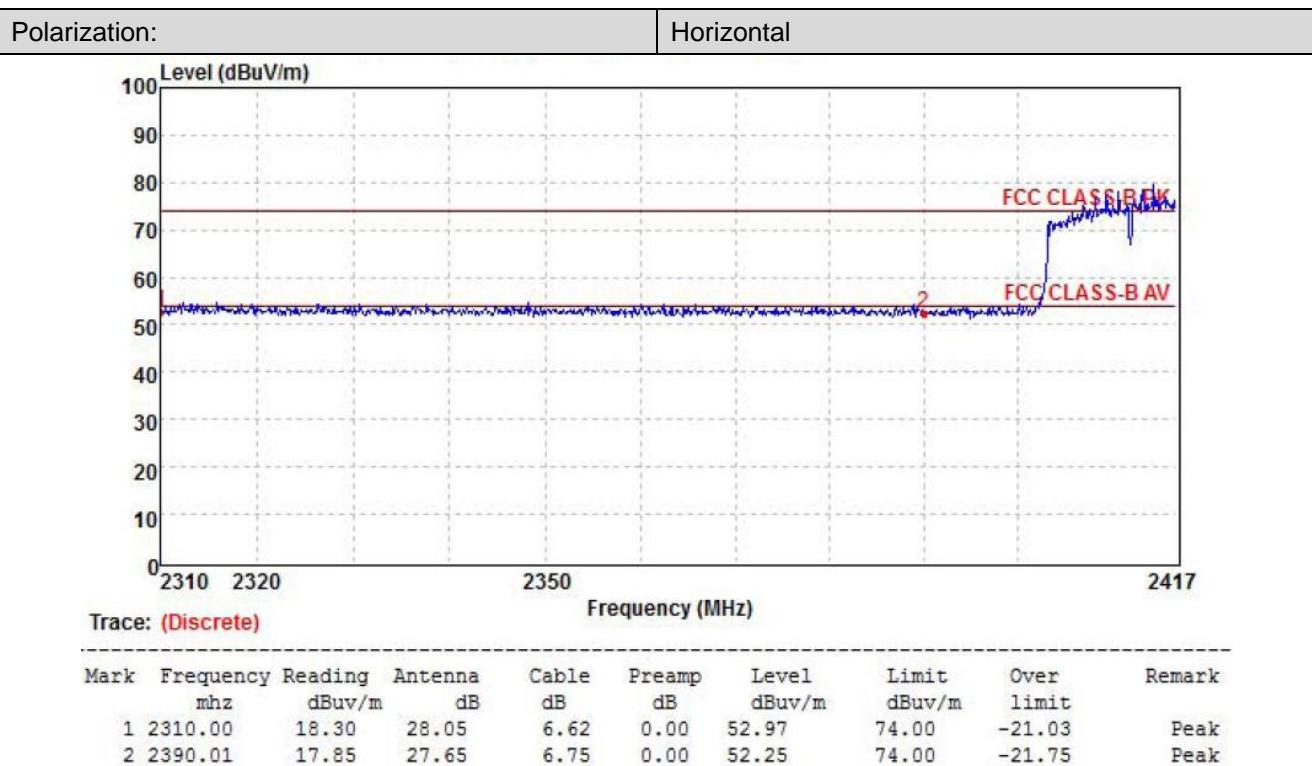
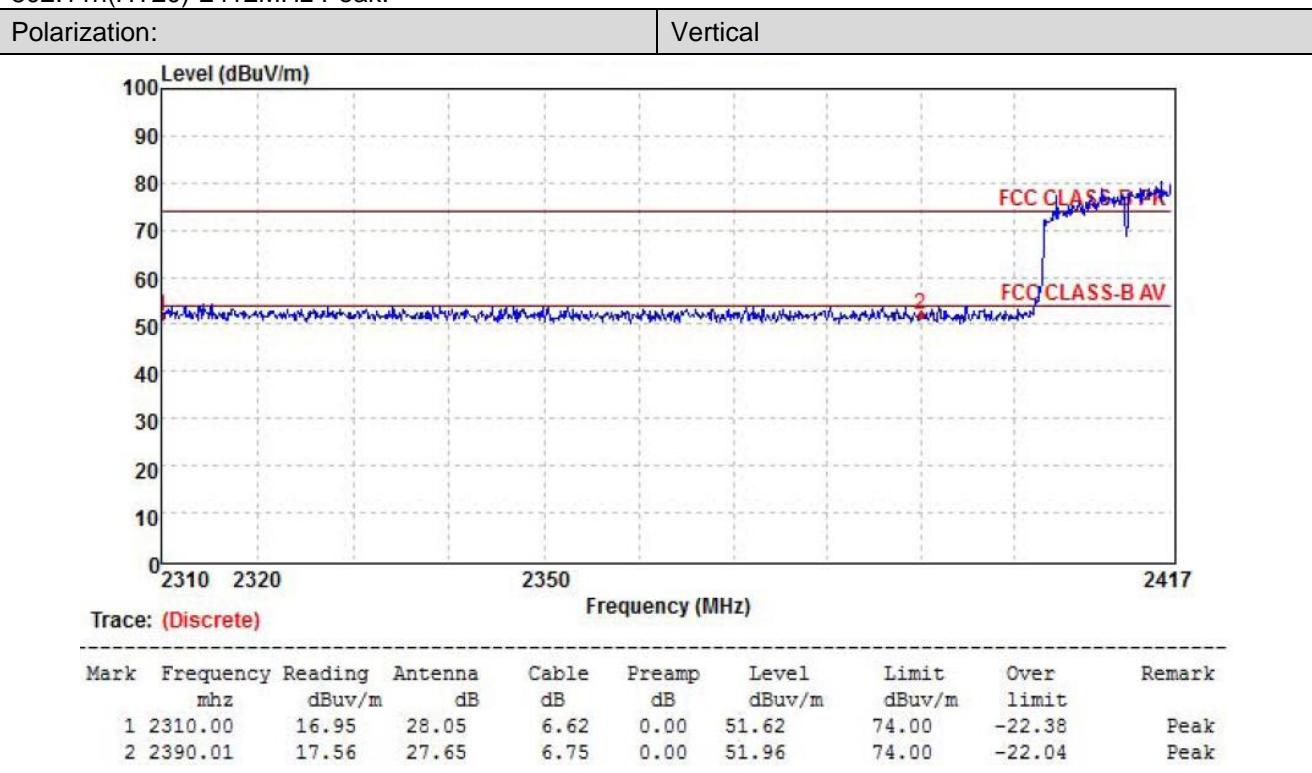
## 802.11g-2462MHz Peak:



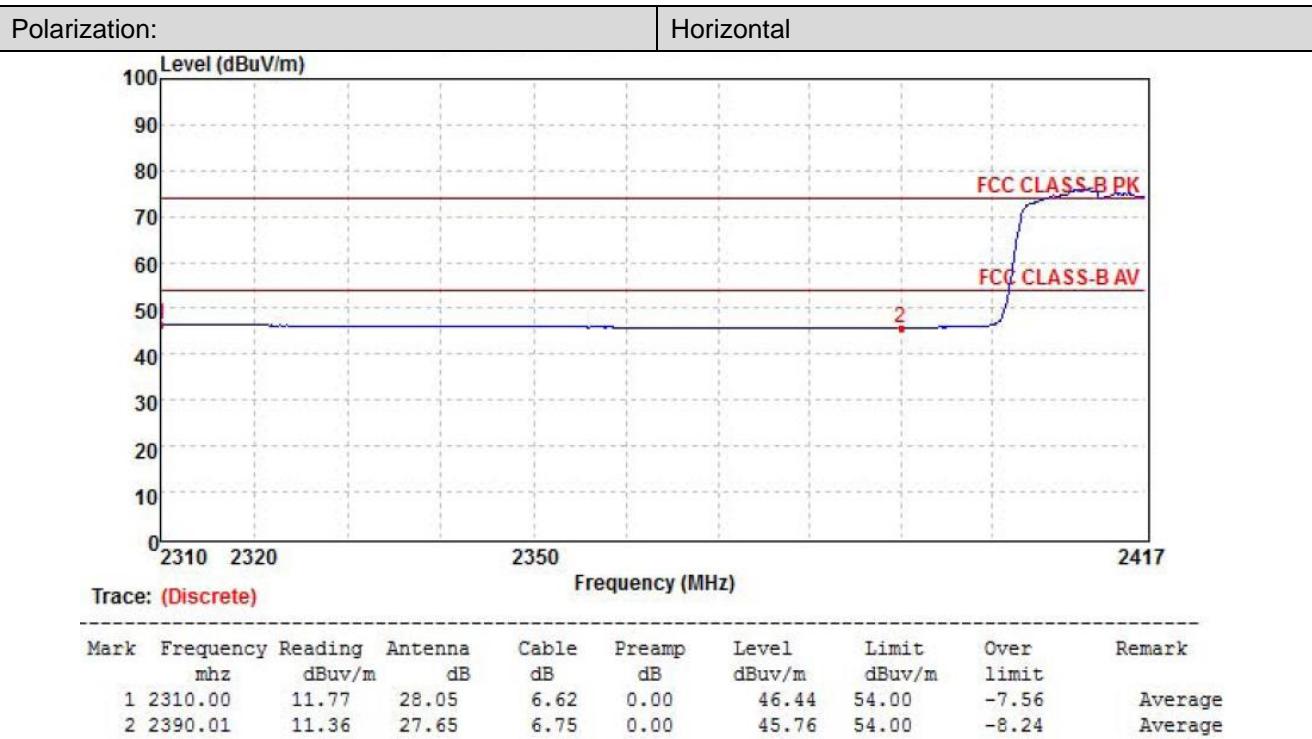
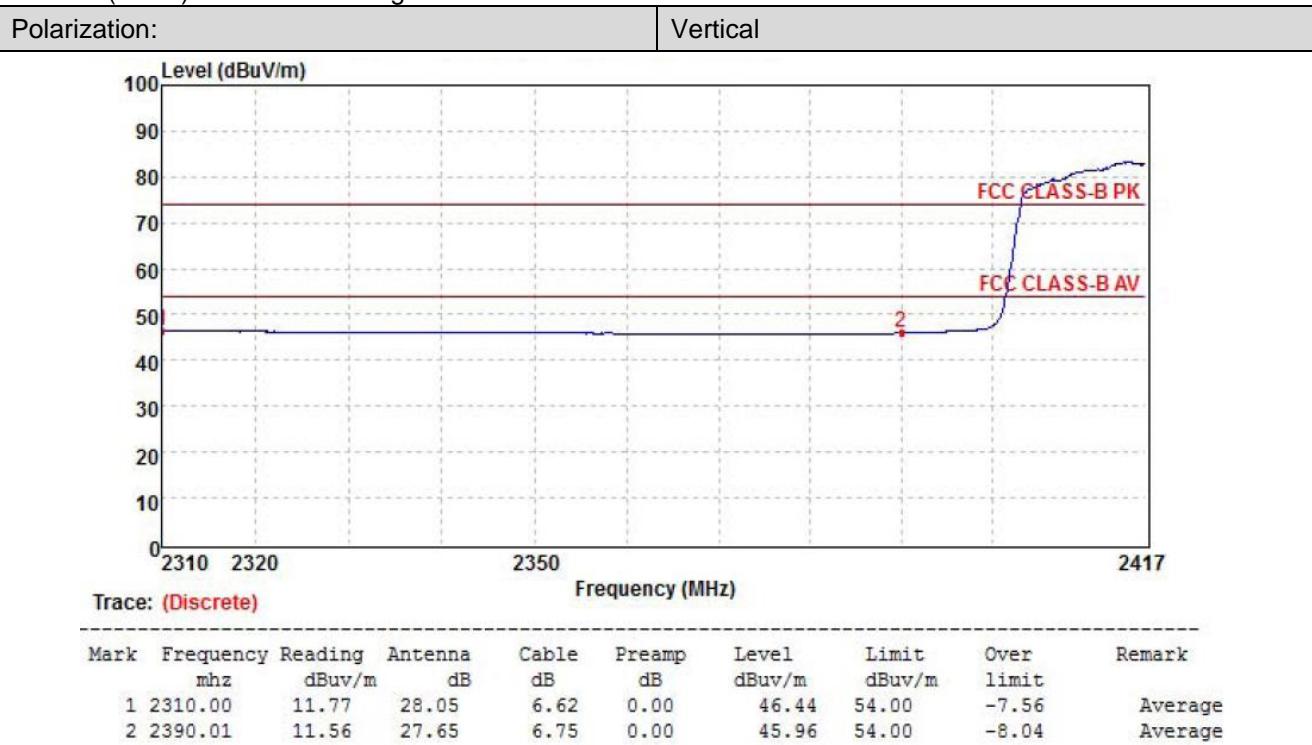
## 802.11g-2462MHz Average:



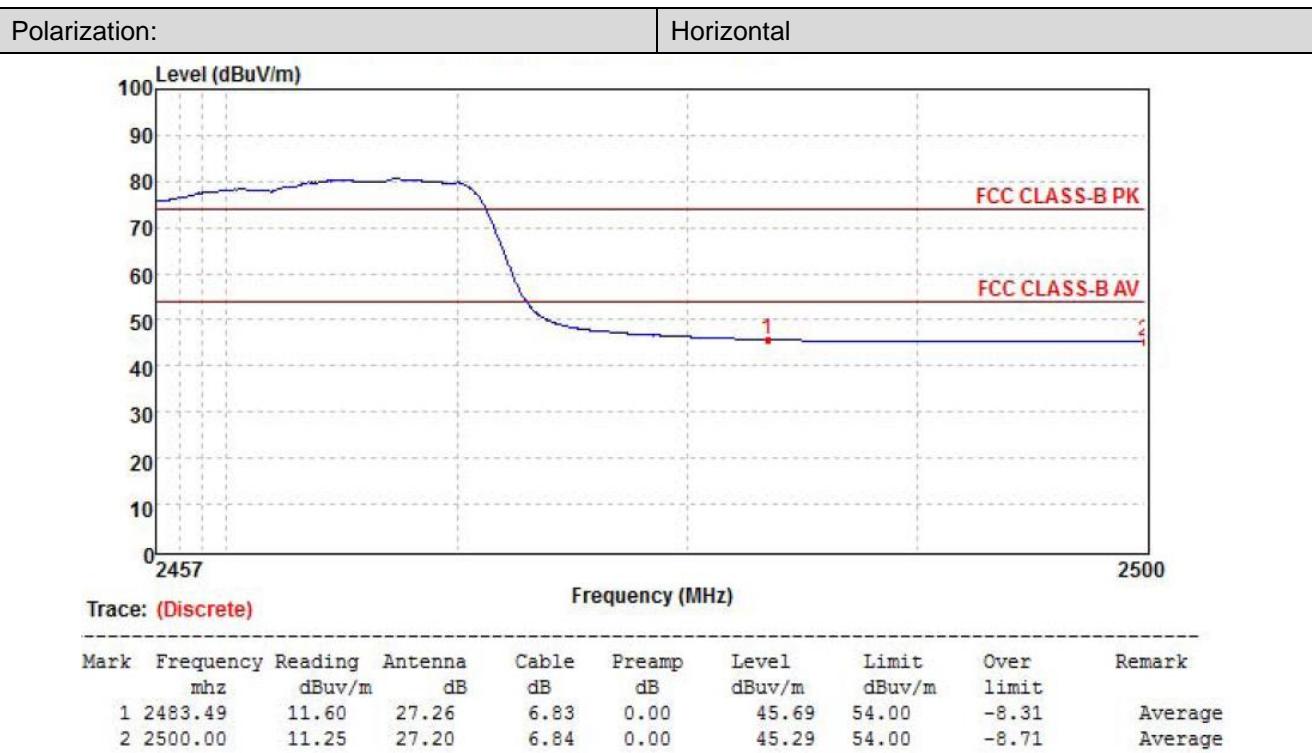
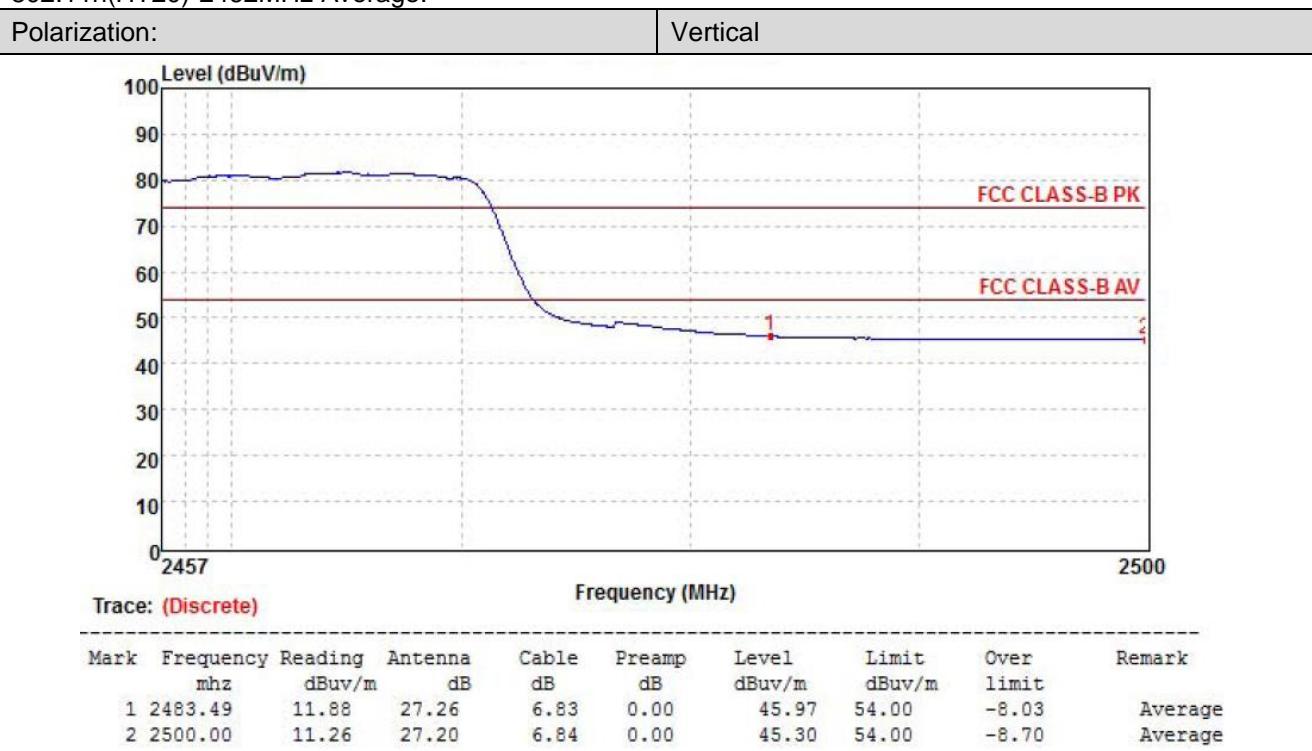
## 802.11n(HT20)-2412MHz Peak:



## 802.11n(HT20)-2412MHz Average:



## 802.11n(HT20)-2462MHz Average:

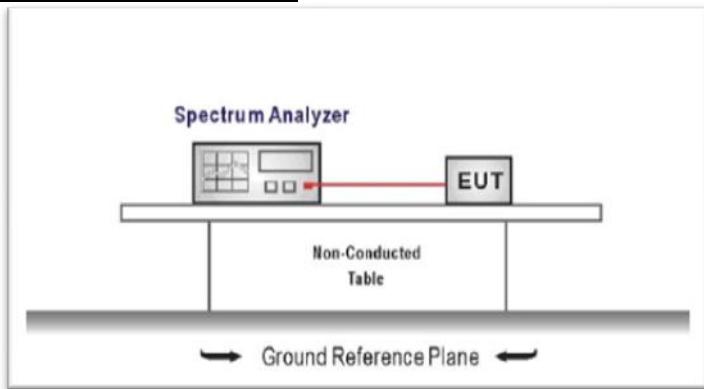


## 5.7. Band edge and Spurious Emissions (conducted)

### LIMIT

**FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

### TEST CONFIGURATION



### TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Establish a reference level by using the following procedure  
Center frequency=DTS channel center frequency  
The span = 1.5 times the DTS bandwidth.  
 $RBW = 100 \text{ kHz}$ ,  $VBW \geq 3 \times RBW$   
Detector = peak, Sweep time = auto couple, Trace mode = max hold  
Allow trace to fully stabilize  
Use the peak marker function to determine the maximum PSD level  
  
Note: the channel found to contain the maximum PSD level can be used to establish the reference level.
3. Emission level measurement  
Set the center frequency and span to encompass frequency range to be measured  
 $RBW = 100 \text{ kHz}$ ,  $VBW \geq 3 \times RBW$   
Detector = peak, Sweep time = auto couple, Trace mode = max hold  
Allow trace to fully stabilize  
Use the peak marker function to determine the maximum amplitude level.
4. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
5. Ensure that the amplitude of all unwanted emission outside of the authorized frequency band excluding restricted frequency bands) are attenuated by at least the minimum requirements specified (at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz). Report the three highest emission relative to the limit.

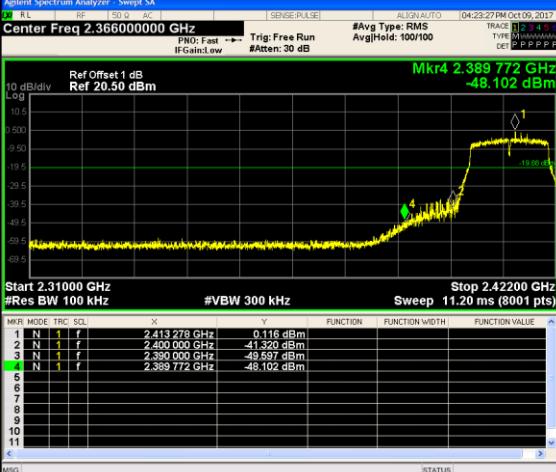
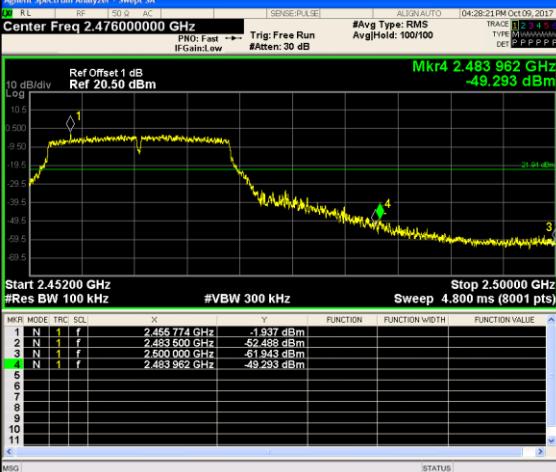
### TEST MODE:

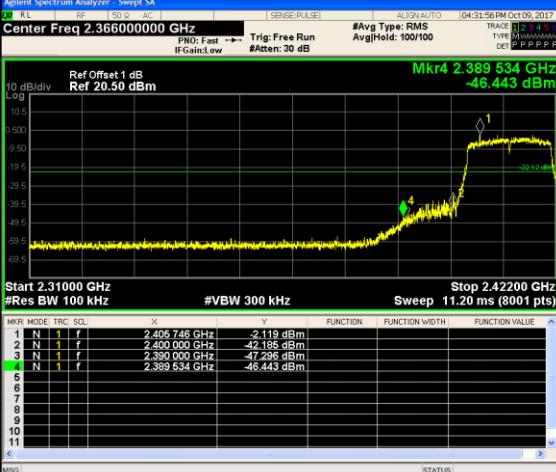
Please refer to the clause 3.3

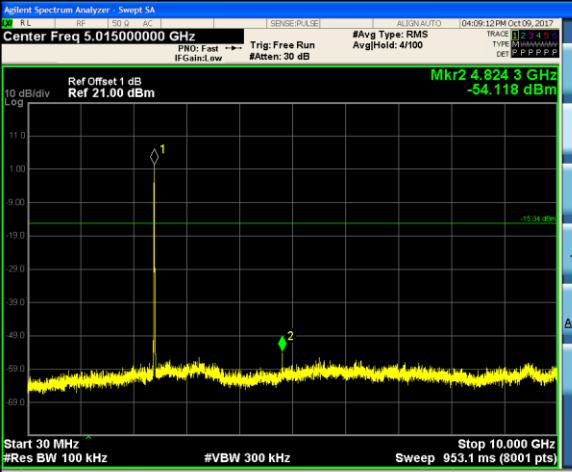
### TEST RESULTS

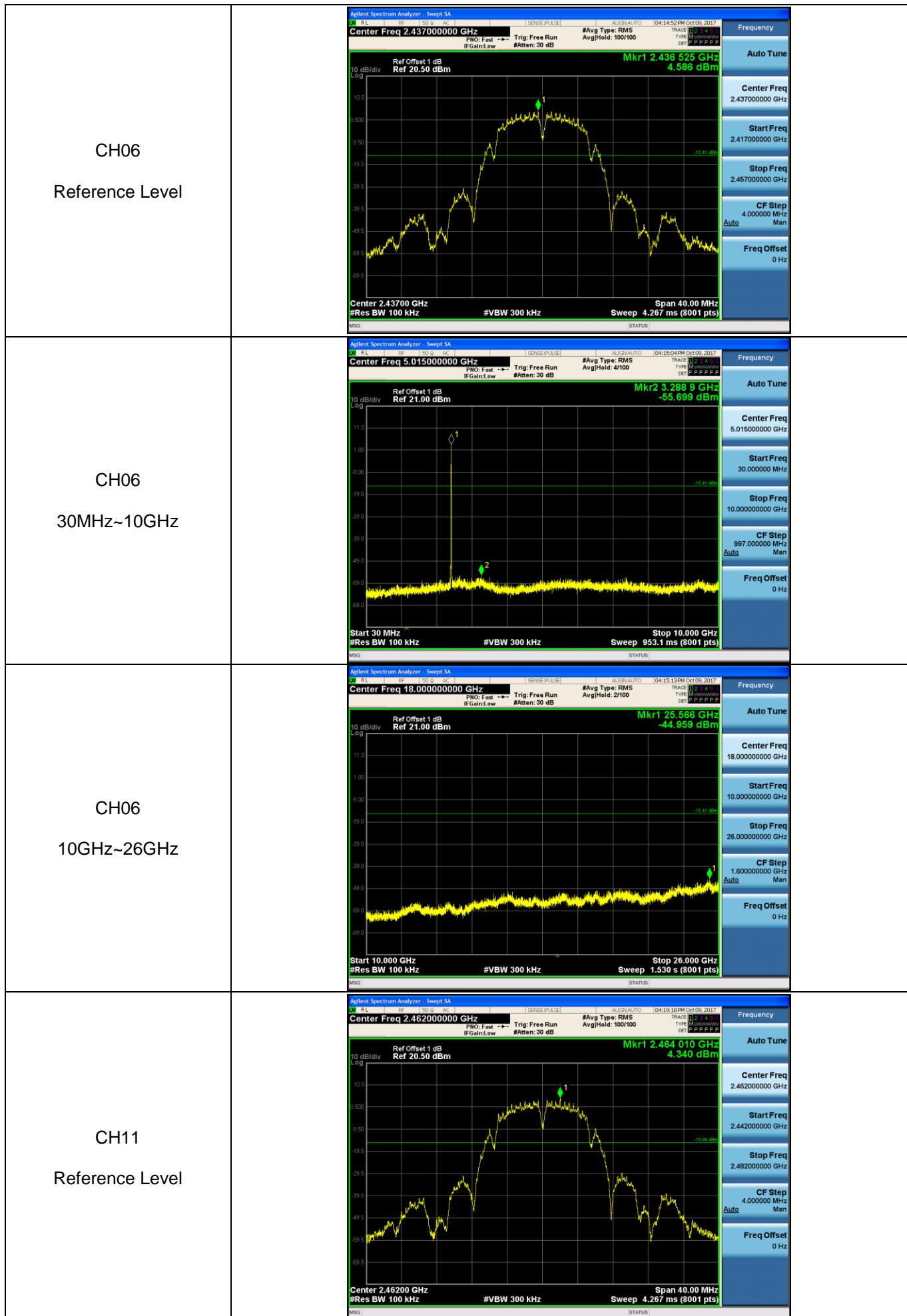
Passed       Not Applicable

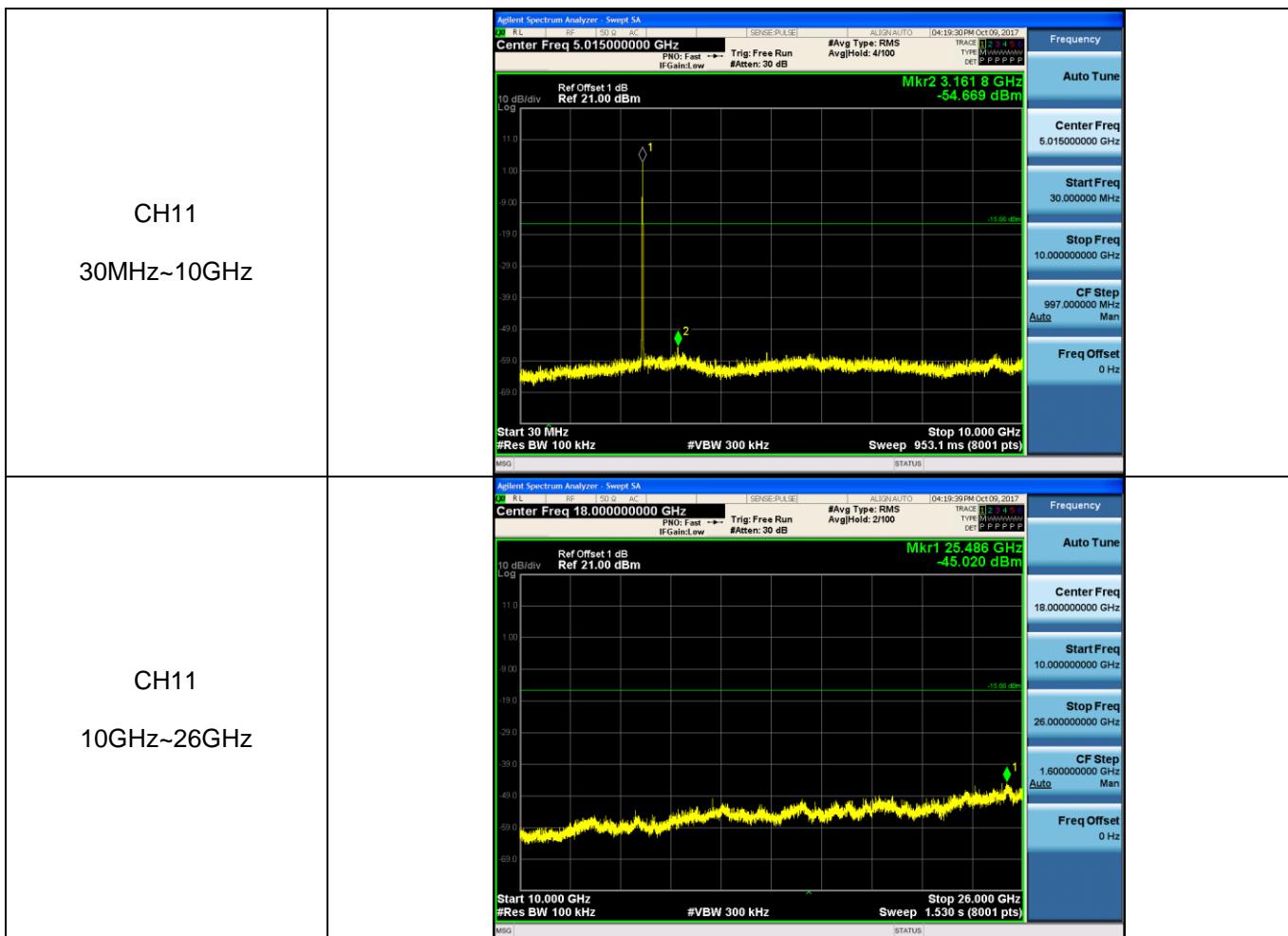
Test Item:	Bandedge	Type:	802.11 b
CH01			<p>Frequency Auto Tune</p> <p>Center Freq 2.36600000 GHz</p> <p>Start Freq 2.31000000 GHz</p> <p>Stop Freq 2.42200000 GHz</p> <p>CF Step 11.200000 MHz Man</p> <p>Freq Offset 0 Hz</p>
CH11			<p>Frequency Auto Tune</p> <p>Center Freq 2.47600000 GHz</p> <p>Start Freq 2.45200000 GHz</p> <p>Stop Freq 2.50000000 GHz</p> <p>CF Step 4.800000 MHz Man</p> <p>Freq Offset 0 Hz</p>

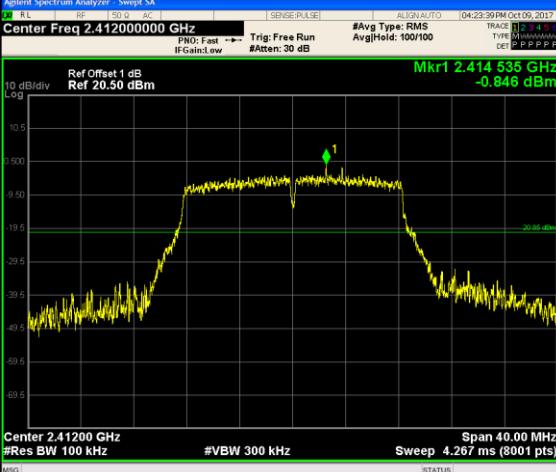
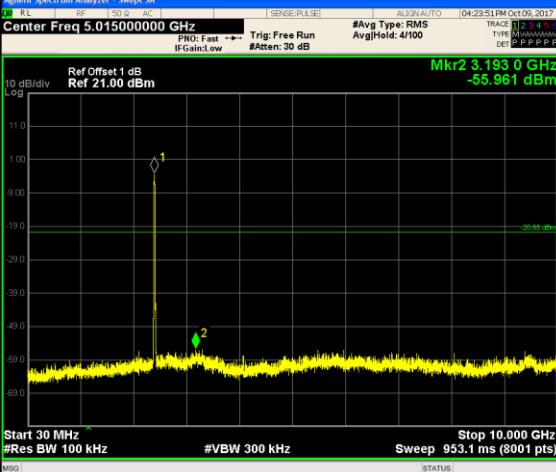
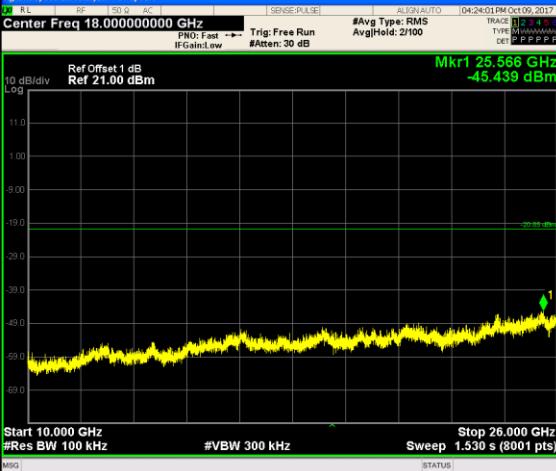
Test Item:	Bandedge	Type:	802.11 g
CH01			<p>Frequency Auto Tune</p> <p>Center Freq 2.36600000 GHz</p> <p>Start Freq 2.31000000 GHz</p> <p>Stop Freq 2.42200000 GHz</p> <p>CF Step 11.200000 MHz Man</p> <p>Freq Offset 0 Hz</p>
CH11			<p>Frequency Auto Tune</p> <p>Center Freq 2.47600000 GHz</p> <p>Start Freq 2.45200000 GHz</p> <p>Stop Freq 2.50000000 GHz</p> <p>CF Step 4.800000 MHz Man</p> <p>Freq Offset 0 Hz</p>

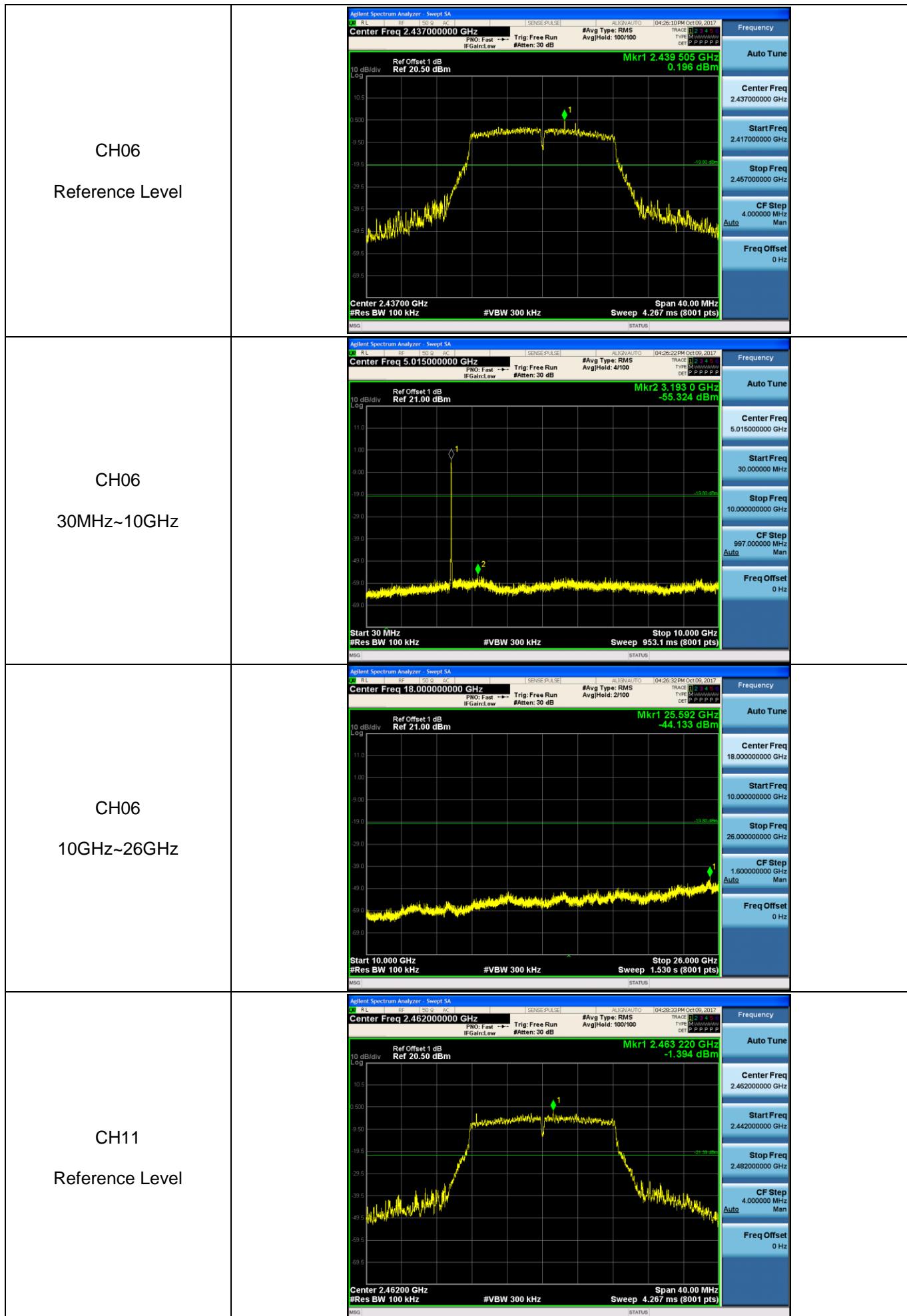
Test Item:	Bandedge	Type:	802.11 n(HT20)
CH01			
CH11			

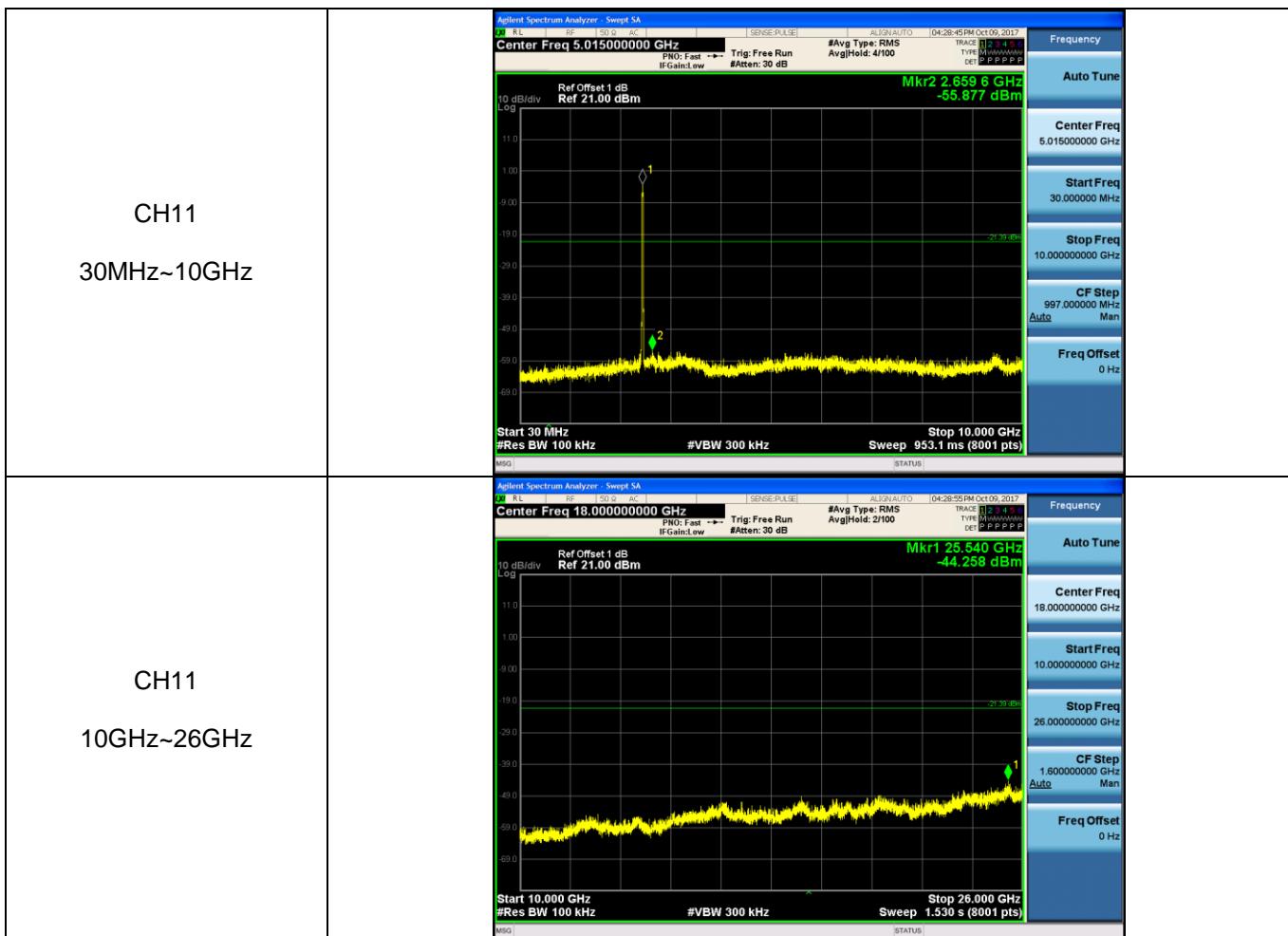
Test Item:	SE	Type:	802.11 b
CH01 Reference Level		 A screenshot of an Agilent Spectrum Analyzer showing a reference level measurement. The center frequency is 2.412 GHz, and the span is 40.00 MHz. The plot shows a noisy baseline with a sharp peak at the center frequency labeled 'Mkr1 2.413 010 GHz' at -46.62 dBm. The right side of the screen displays various parameters: Frequency (Auto Tune), Center Freq (2.412000000 GHz), Start Freq (2.392000000 GHz), Stop Freq (2.432000000 GHz), CF Step (4.000000 MHz Man), and Freq Offset (0 Hz). The status bar indicates 'MSG' and 'STATUS'.	
CH01 30MHz~10GHz		 A screenshot of an Agilent Spectrum Analyzer showing a measurement from 30 MHz to 10 GHz. The center frequency is 5.015 GHz, and the span is 10.000 GHz. A prominent peak is labeled 'Mkr2 4.823 GHz' at -54.118 dBm. The plot includes two numbered markers: '1' pointing to a sharp peak at approximately 30 MHz and '2' pointing to a peak at approximately 4.8 GHz. The right side of the screen displays parameters: Frequency (Auto Tune), Center Freq (5.015000000 GHz), Start Freq (30.000000 MHz), Stop Freq (10.000000000 GHz), CF Step (997.000000 MHz Man), and Freq Offset (0 Hz). The status bar indicates 'MSG' and 'STATUS'.	
CH01 10GHz~26GHz		 A screenshot of an Agilent Spectrum Analyzer showing a measurement from 10 GHz to 26 GHz. The center frequency is 18.000 GHz, and the span is 26.000 GHz. A peak is labeled 'Mkr1 25.352 GHz' at -43.885 dBm. The plot includes two numbered markers: '1' pointing to a peak at approximately 25.352 GHz and '2' pointing to a peak at approximately 18.000 GHz. The right side of the screen displays parameters: Frequency (Auto Tune), Center Freq (18.000000000 GHz), Start Freq (10.000000000 GHz), Stop Freq (26.000000000 GHz), CF Step (1.600000000 GHz Man), and Freq Offset (0 Hz). The status bar indicates 'MSG' and 'STATUS'.	

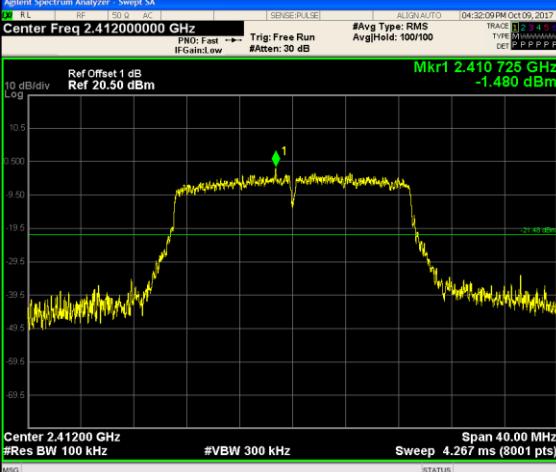
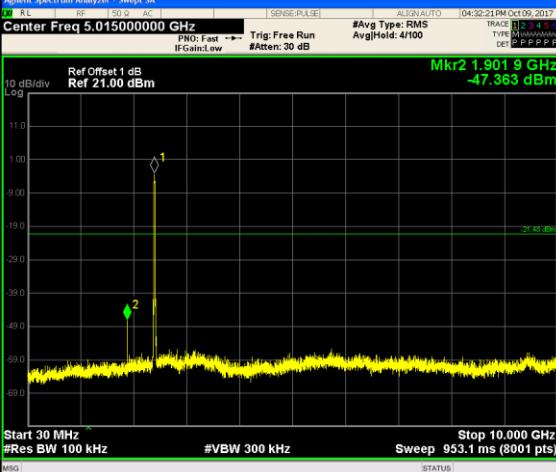
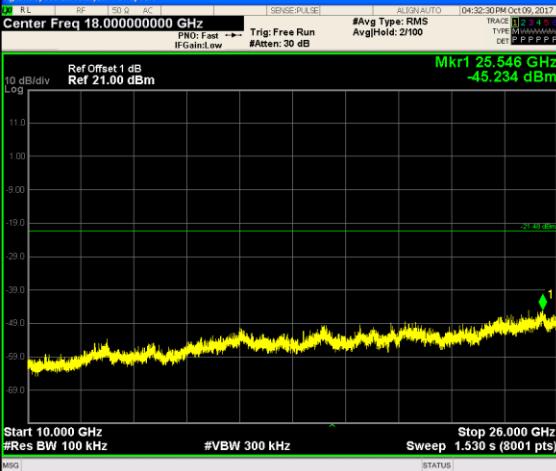
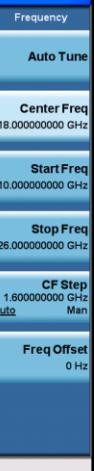


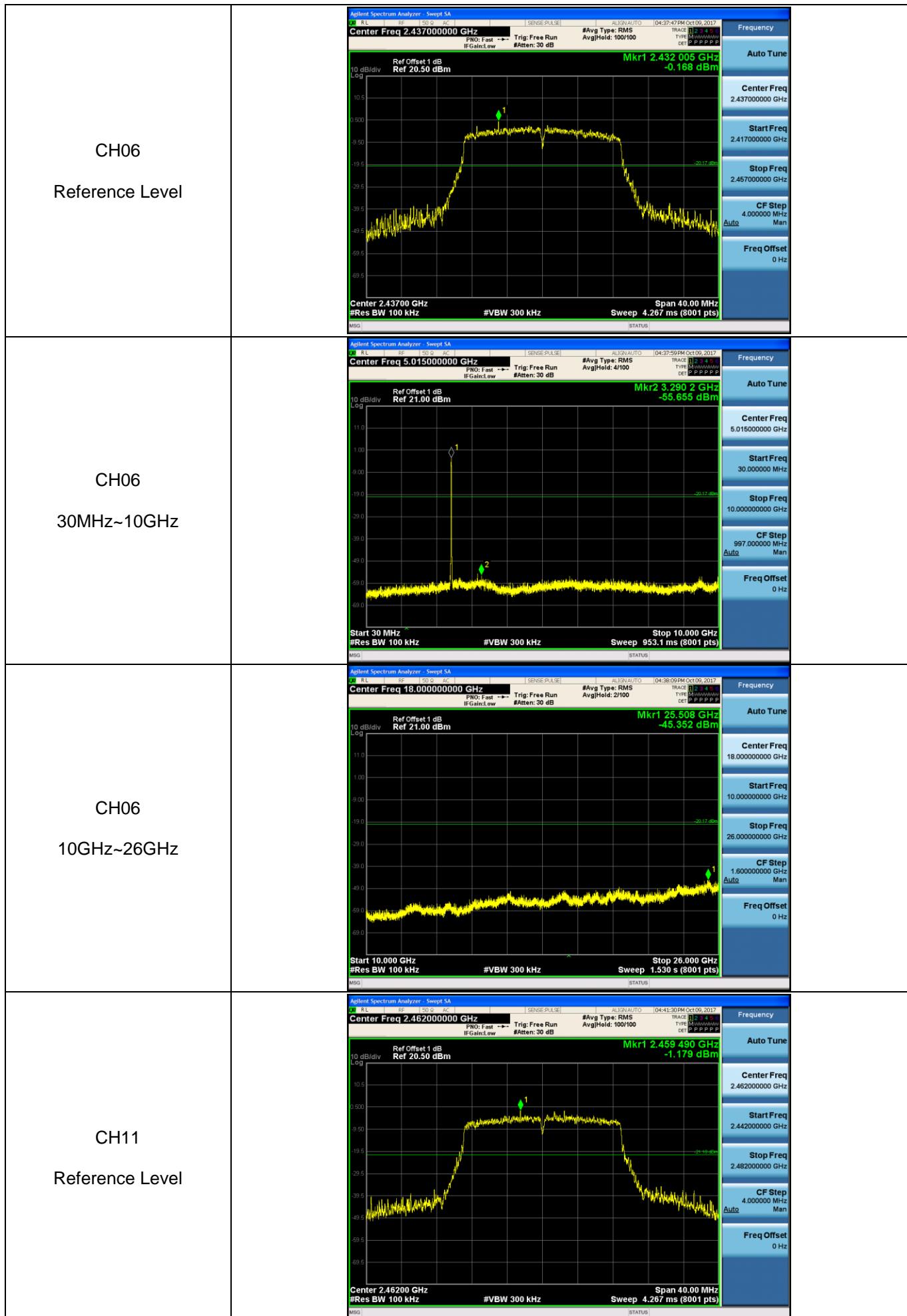


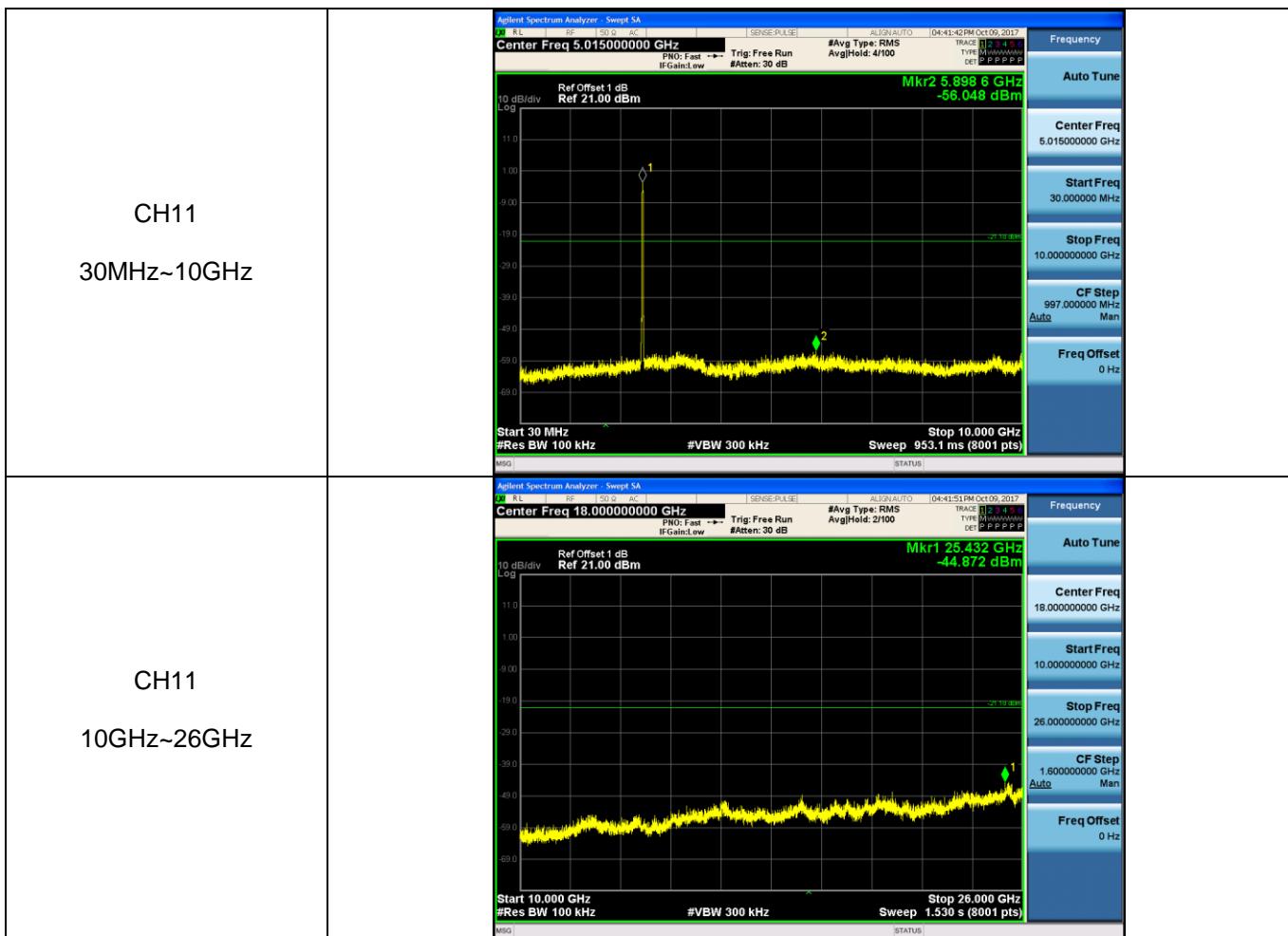
Test Item:	SE	Type:	802.11 g
CH01 Reference Level			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39200000 GHz</p> <p>Stop Freq 2.43200000 GHz</p> <p>CF Step 4.000000 MHz Man</p> <p>Freq Offset 0 Hz</p>
CH01 30MHz~10GHz			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 5.01500000 GHz</p> <p>Start Freq 30.000000 MHz</p> <p>Stop Freq 10.00000000 GHz</p> <p>CF Step 997.000000 MHz Man</p> <p>Freq Offset 0 Hz</p>
CH01 10GHz~26GHz			<p>Frequency</p> <p>Auto Tune</p> <p>Center Freq 18.00000000 GHz</p> <p>Start Freq 10.00000000 GHz</p> <p>Stop Freq 26.00000000 GHz</p> <p>CF Step 1.60000000 GHz Man</p> <p>Freq Offset 0 Hz</p>





Test Item:	SE	Type:	802.11 n(HT20)
CH01 Reference Level			
CH01 30MHz~10GHz			
CH01 10GHz~26GHz			





## 5.8. Spurious Emissions (radiated)

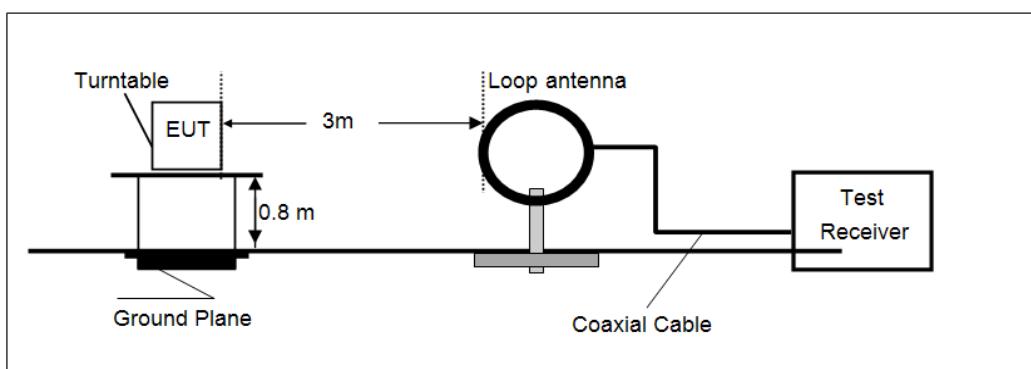
### LIMIT

#### FCC CFR Title 47 Part 15 Subpart C Section 15.209

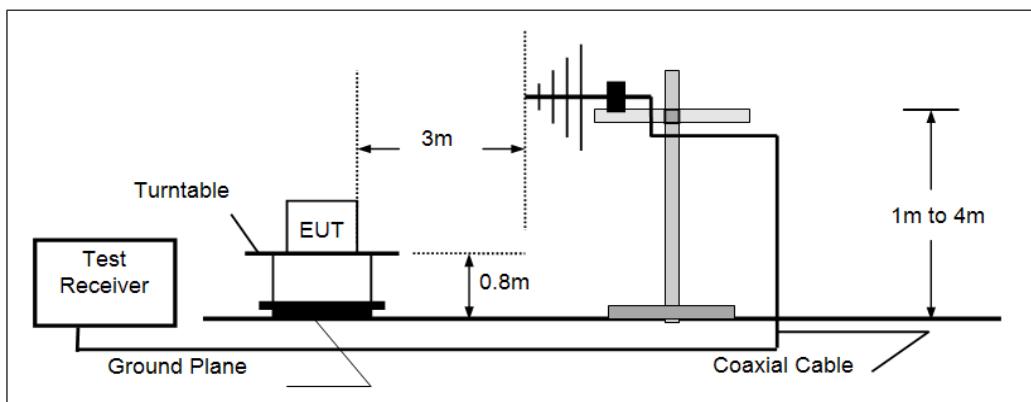
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

### TEST CONFIGURATION

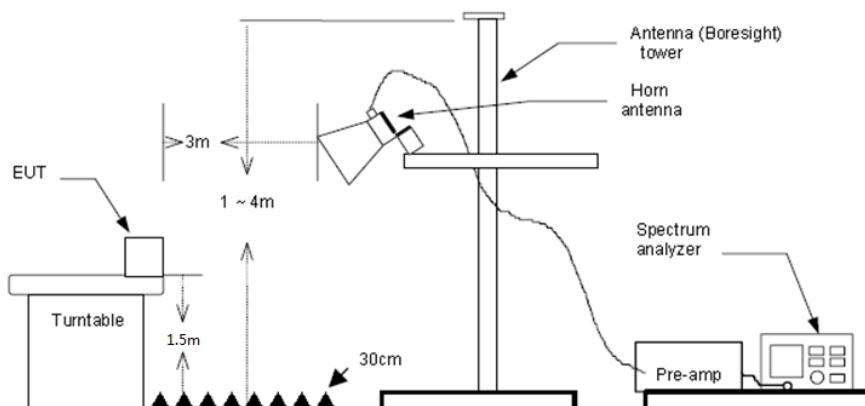
- 9kHz ~30MHz



- 30MHz ~ 1GHz



- Above 1GHz



## TEST PROCEDURE

1. The EUT was tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
2. The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna.
5. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Below 1GHz, RBW=120kHz, VBW=300kHz, Sweep=auto, Detector function=peak, Trace=max hold;  
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
  - (3) Above 1GHz, RBW=1MHz, VBW=3MHz PEAK detector for Peak value.  
RBW=1MHz, VBW=3MHz RMS detector for Average value.

## TEST MODE:

Please refer to the clause 3.3

## TEST RESULTS

Passed       Not Applicable

### Note:

- 1) Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2) The emission levels of other frequencies are very lower than the limit and not show in test report.

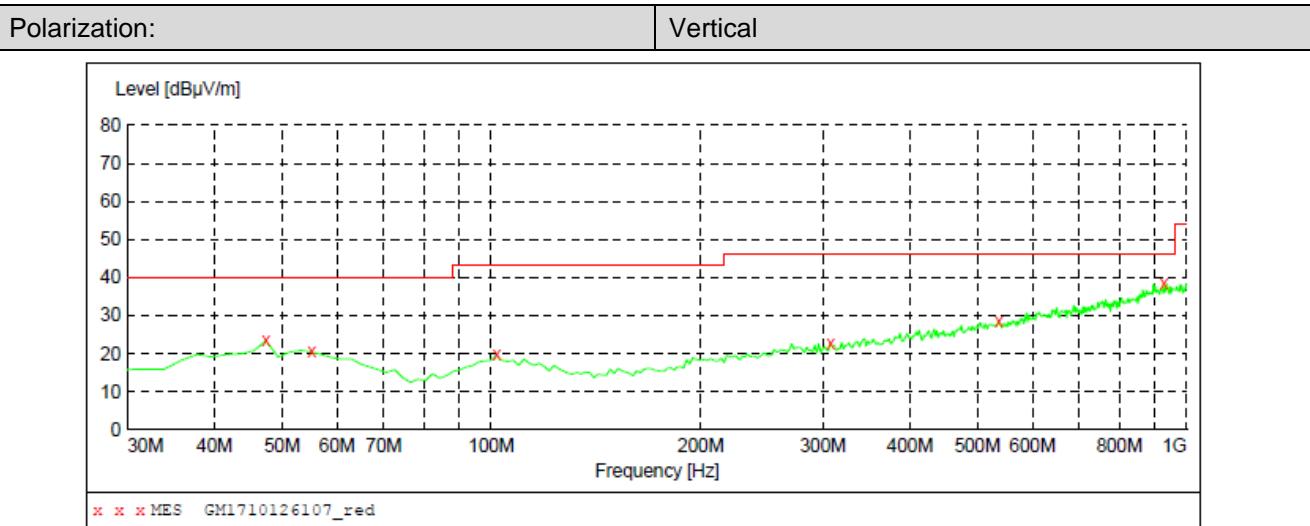
### ➤ **9kHz ~ 30MHz**

The EUT was pre-scanned the frequency band (9kHz~30MHz), found the radiated level lower than the limit, so don't show on the report.

### ➤ **30MHz ~1000MHz**

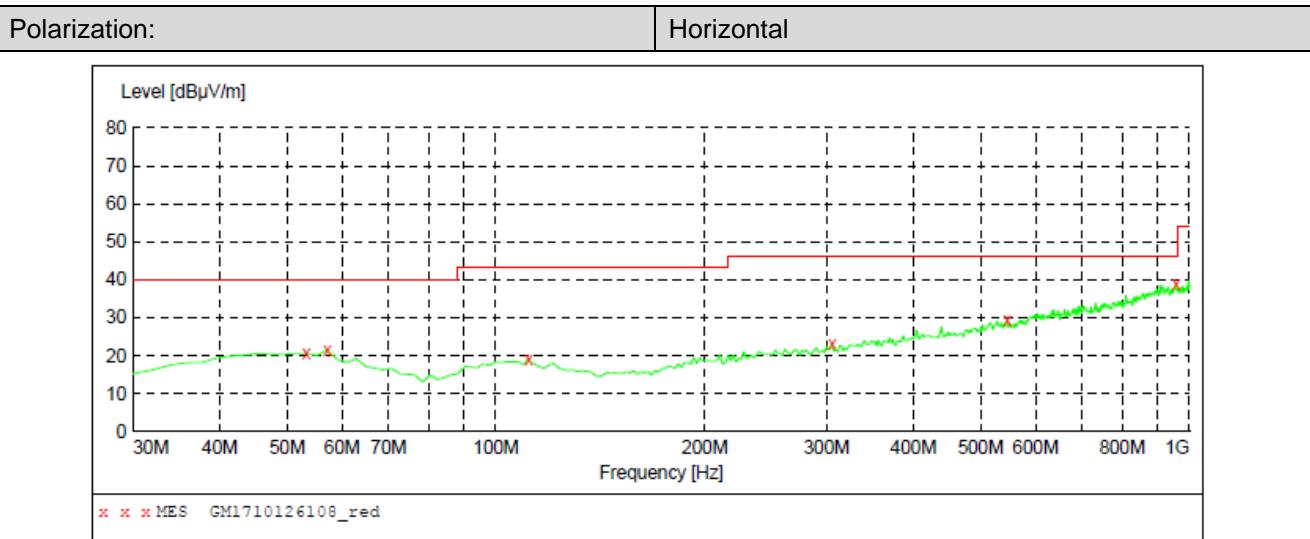
Have pre-scan all modulation mode, found the 802.11b mode CH01 which it was worst case, so only the worst case's data on the test report.

## &gt; 30MHz ~ 1GHz

**MEASUREMENT RESULT: "GM1710126107\_red"**

10/12/2017 9:50PM

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	23.40	-8.8	40.0	16.6	QP	100.0	337.00	VERTICAL
55.220000	20.50	-9.2	40.0	19.5	QP	100.0	248.00	VERTICAL
101.780000	19.70	-10.5	43.5	23.8	QP	100.0	1.00	VERTICAL
307.420000	22.70	-7.1	46.0	23.3	QP	100.0	168.00	VERTICAL
536.340000	28.70	-1.0	46.0	17.3	QP	100.0	260.00	VERTICAL
926.280000	38.40	7.1	46.0	7.6	QP	100.0	1.00	VERTICAL

**MEASUREMENT RESULT: "GM1710126108\_red"**

10/12/2017 9:53PM

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
53.280000	20.60	-9.0	40.0	19.4	QP	100.0	28.00	HORIZONTAL
57.160000	21.50	-9.4	40.0	18.5	QP-	300.0	276.00	HORIZONTAL
111.480000	19.20	-11.0	43.5	24.3	QP	100.0	314.00	HORIZONTAL
305.480000	23.20	-7.2	46.0	22.8	QP	300.0	50.00	HORIZONTAL
546.040000	29.20	-0.8	46.0	16.8	QP	300.0	39.00	HORIZONTAL
955.380000	39.10	7.3	46.0	6.9	QP	300.0	287.00	HORIZONTAL

## &gt; Above 1 GHz

802.11b CH01									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1706.70	35.98	25.21	5.78	36.94	30.03	74.00	-43.97	Vertical	Peak
4096.88	33.29	29.89	8.86	37.89	34.15	74.00	-39.85	Vertical	Peak
4821.76	35.68	31.56	9.55	36.90	39.89	74.00	-34.11	Vertical	Peak
8145.93	32.09	36.86	12.64	34.54	47.05	74.00	-26.95	Vertical	Peak
1706.70	35.98	25.21	5.78	36.94	30.03	74.00	-43.97	Horizontal	Peak
3176.16	34.79	28.80	7.69	38.20	33.08	74.00	-40.92	Horizontal	Peak
4821.76	35.68	31.56	9.55	36.90	39.89	74.00	-34.11	Horizontal	Peak
7099.75	32.45	35.60	11.85	34.93	44.97	74.00	-29.03	Horizontal	Peak

802.11b CH06									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1350.36	34.89	26.05	4.92	36.49	29.37	74.00	-44.63	Vertical	Peak
3176.16	34.46	28.80	7.69	38.20	32.75	74.00	-41.25	Vertical	Peak
4983.99	32.52	31.48	9.66	36.44	37.22	74.00	-36.78	Vertical	Peak
6799.06	32.70	34.00	11.60	34.99	43.31	74.00	-30.69	Vertical	Peak
1406.50	35.23	25.89	5.02	36.47	29.67	74.00	-44.33	Horizontal	Peak
3233.26	36.03	28.60	7.76	38.26	34.13	74.00	-39.87	Horizontal	Peak
4871.10	33.70	31.46	9.59	36.76	37.99	74.00	-36.01	Horizontal	Peak
7117.84	32.30	35.71	11.86	34.96	44.91	74.00	-29.09	Horizontal	Peak

802.11b CH11									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2151.59	35.34	27.12	6.40	37.33	31.53	74.00	-42.47	Vertical	Peak
3634.91	34.95	29.30	8.31	38.26	34.30	74.00	-39.70	Vertical	Peak
4920.96	35.60	31.42	9.62	36.62	40.02	74.00	-33.98	Vertical	Peak
7135.98	31.67	35.82	11.86	34.99	44.36	74.00	-29.64	Vertical	Peak
1244.73	36.75	26.25	4.74	36.55	31.19	74.00	-42.81	Horizontal	Peak
3057.17	34.83	28.72	7.55	38.22	32.88	74.00	-41.12	Horizontal	Peak
4310.85	34.26	30.23	9.05	37.60	35.94	74.00	-38.06	Horizontal	Peak
5191.17	33.33	31.54	9.82	36.21	38.48	74.00	-35.52	Horizontal	Peak

## Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

802.11g					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1689.41	35.92	25.17	5.74	36.91	29.92	74.00	-44.08	Vertical	Peak
3498.74	36.01	28.99	8.11	38.41	34.70	74.00	-39.30	Vertical	Peak
4821.76	35.09	31.56	9.55	36.90	39.30	74.00	-34.70	Vertical	Peak
6594.52	32.20	34.19	11.35	35.36	42.38	74.00	-31.62	Vertical	Peak
1689.41	35.92	25.17	5.74	36.91	29.92	74.00	-44.08	Horizontal	Peak
3192.37	35.67	28.80	7.71	38.20	33.98	74.00	-40.02	Horizontal	Peak
4821.76	35.09	31.56	9.55	36.90	39.30	74.00	-34.70	Horizontal	Peak
7413.73	31.63	36.27	12.11	34.83	45.18	74.00	-28.82	Horizontal	Peak

802.11g					CH06				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1719.78	35.19	25.24	5.80	36.97	29.26	74.00	-44.74	Vertical	Peak
3010.83	35.49	28.62	7.49	38.23	33.37	74.00	-40.63	Vertical	Peak
4547.56	32.49	30.80	9.37	37.32	35.34	74.00	-38.66	Vertical	Peak
6203.70	31.30	32.91	11.01	35.29	39.93	74.00	-34.07	Vertical	Peak
1367.66	34.68	25.99	4.95	36.48	29.14	74.00	-44.86	Horizontal	Peak
3570.71	35.38	29.21	8.22	38.31	34.50	74.00	-39.50	Horizontal	Peak
4871.10	33.57	31.46	9.59	36.76	37.86	74.00	-36.14	Horizontal	Peak
6511.12	32.32	34.02	11.20	35.34	42.20	74.00	-31.80	Horizontal	Peak

802.11g					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1711.05	36.97	25.22	5.79	36.95	31.03	74.00	-42.97	Vertical	Peak
3543.55	35.03	29.13	8.18	38.35	33.99	74.00	-40.01	Vertical	Peak
4920.96	35.48	31.42	9.62	36.62	39.90	74.00	-34.10	Vertical	Peak
7489.60	32.21	36.12	12.36	34.89	45.80	74.00	-28.20	Vertical	Peak
1711.05	34.80	25.22	5.79	36.95	28.86	74.00	-45.14	Horizontal	Peak
3064.96	34.66	28.73	7.56	38.22	32.73	74.00	-41.27	Horizontal	Peak
5086.52	32.36	31.85	9.74	36.31	37.64	74.00	-36.36	Horizontal	Peak
6851.19	32.13	34.36	11.66	34.94	43.21	74.00	-30.79	Horizontal	Peak

## Remark:

- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

802.11n(HT20)					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1672.30	35.68	25.12	5.71	36.87	29.64	74.00	-44.36	Vertical	Peak
3208.66	35.35	28.75	7.73	38.22	33.61	74.00	-40.39	Vertical	Peak
4617.55	33.22	30.95	9.47	37.21	36.43	74.00	-37.57	Vertical	Peak
6219.51	31.87	32.94	11.01	35.29	40.53	74.00	-33.47	Vertical	Peak
1336.68	35.97	26.09	4.89	36.49	30.46	74.00	-43.54	Horizontal	Peak
3072.77	35.92	28.75	7.57	38.22	34.02	74.00	-39.98	Horizontal	Peak
4821.76	35.65	31.56	9.55	36.90	39.86	74.00	-34.14	Horizontal	Peak
7432.62	32.49	36.23	12.18	34.85	46.05	74.00	-27.95	Horizontal	Peak

802.11n(HT20)					CH06				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
1746.25	40.77	25.29	5.86	37.03	34.89	74.00	-39.11	Vertical	Peak
3080.60	35.70	28.76	7.58	38.22	33.82	74.00	-40.18	Vertical	Peak
5164.81	32.79	31.64	9.80	36.24	37.99	74.00	-36.01	Vertical	Peak
7489.60	32.18	36.12	12.36	34.89	45.77	74.00	-28.23	Vertical	Peak
2102.85	34.03	26.72	6.36	37.32	29.79	74.00	-44.21	Horizontal	Peak
3525.56	36.37	29.08	8.15	38.37	35.23	74.00	-38.77	Horizontal	Peak
5164.81	32.79	31.64	9.80	36.24	37.99	74.00	-36.01	Horizontal	Peak
6662.01	31.78	34.20	11.43	35.25	42.16	74.00	-31.84	Horizontal	Peak

802.11n(HT20)					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2269.73	34.00	27.92	6.56	37.54	30.94	74.00	-43.06	Vertical	Peak
4065.71	33.45	29.83	8.83	37.96	34.15	74.00	-39.85	Vertical	Peak
5821.21	30.90	32.14	10.60	35.33	38.31	74.00	-35.69	Vertical	Peak
7432.62	30.80	36.23	12.18	34.85	44.36	74.00	-29.64	Vertical	Peak
1768.62	35.98	25.34	5.90	37.07	30.15	74.00	-43.85	Horizontal	Peak
3241.50	36.38	28.55	7.77	38.27	34.43	74.00	-39.57	Horizontal	Peak
4797.27	33.74	31.59	9.54	36.96	37.91	74.00	-36.09	Horizontal	Peak
6527.71	31.87	34.06	11.23	35.34	41.82	74.00	-32.18	Horizontal	Peak

## Remark:

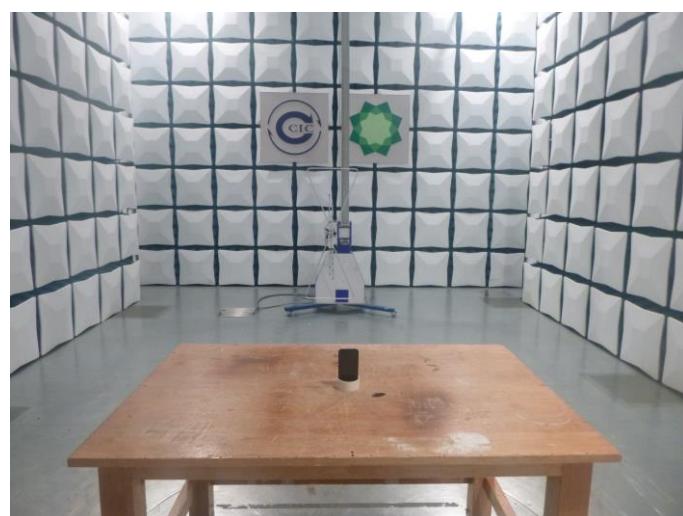
- Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
- The emission levels of other frequencies are very lower than the limit and not show in test report.

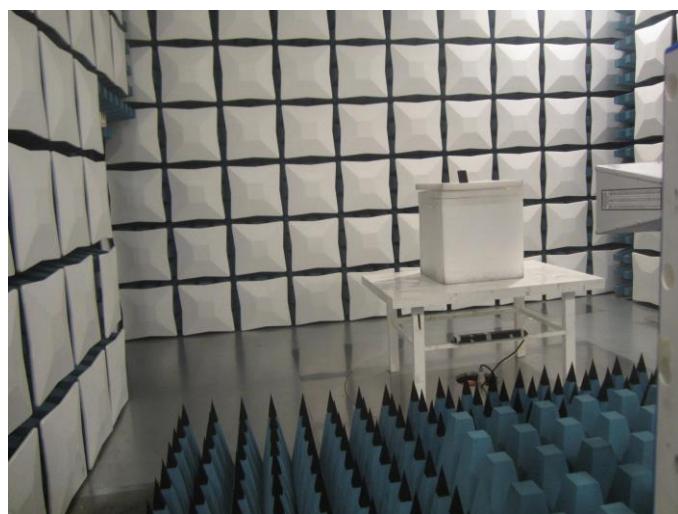
## 6. TEST SETUP PHOTOS

Conducted Emissions



Radiated Emissions





## **7. EXTERANAL AND INTERNAL PHOTOS**

Reference to the test report No.: TRE1709024801.

.....End of Report.....