

## 5.5. Radiated Emissions Measurement

### 5.5.1. Standard Applicable

15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	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	8.025-8.5
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	156.52475-156.52525	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			

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

\2\ Above 38.6

According to §15.247 (d): 20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

### 5.5.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak, 1 MHz / 1/B kHz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP/AVG
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP/AVG
Start ~ Stop Frequency	30MHz~1000MHz / RB 100kHz for QP

### 5.5.3. Test Procedures

#### 1) Sequence of testing 9 kHz to 30 MHz

##### **Setup:**

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.
- If the EUT is a floor standing device, it is placed on the ground.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions.
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

##### **Premeasurement:**

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna height is 0.8 meter.
- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

##### **Final measurement:**

- Identified emissions during the premeasurement the software maximizes by rotating the turntable position (0° to 360°) and by rotating the elevation axes (0° to 360°).
- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

## 2) Sequence of testing 30 MHz to 1 GHz

### Setup:

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

### Premeasurement:

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 to 3 meter.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

### Final measurement:

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ( $\pm 45^\circ$ ) and antenna movement between 1 and 4 meter.
- The final measurement will be done with QP detector with an EMI receiver.
- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

### 3) Sequence of testing 1 GHz to 18 GHz

#### **Setup:**

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 3 meter.
- The EUT was set into operation.

#### **Premeasurement:**

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height scan range is 1 meter to 2.5 meter.
- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

#### **Final measurement:**

- The final measurement will be performed with minimum the six highest peaks.
- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position ( $\pm 45^\circ$ ) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.
- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

#### 4) Sequence of testing above 18 GHz

##### **Setup:**

- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.
- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.
- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.
- Auxiliary equipment and cables were positioned to simulate normal operation conditions
- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.
- The measurement distance is 1 meter.
- The EUT was set into operation.

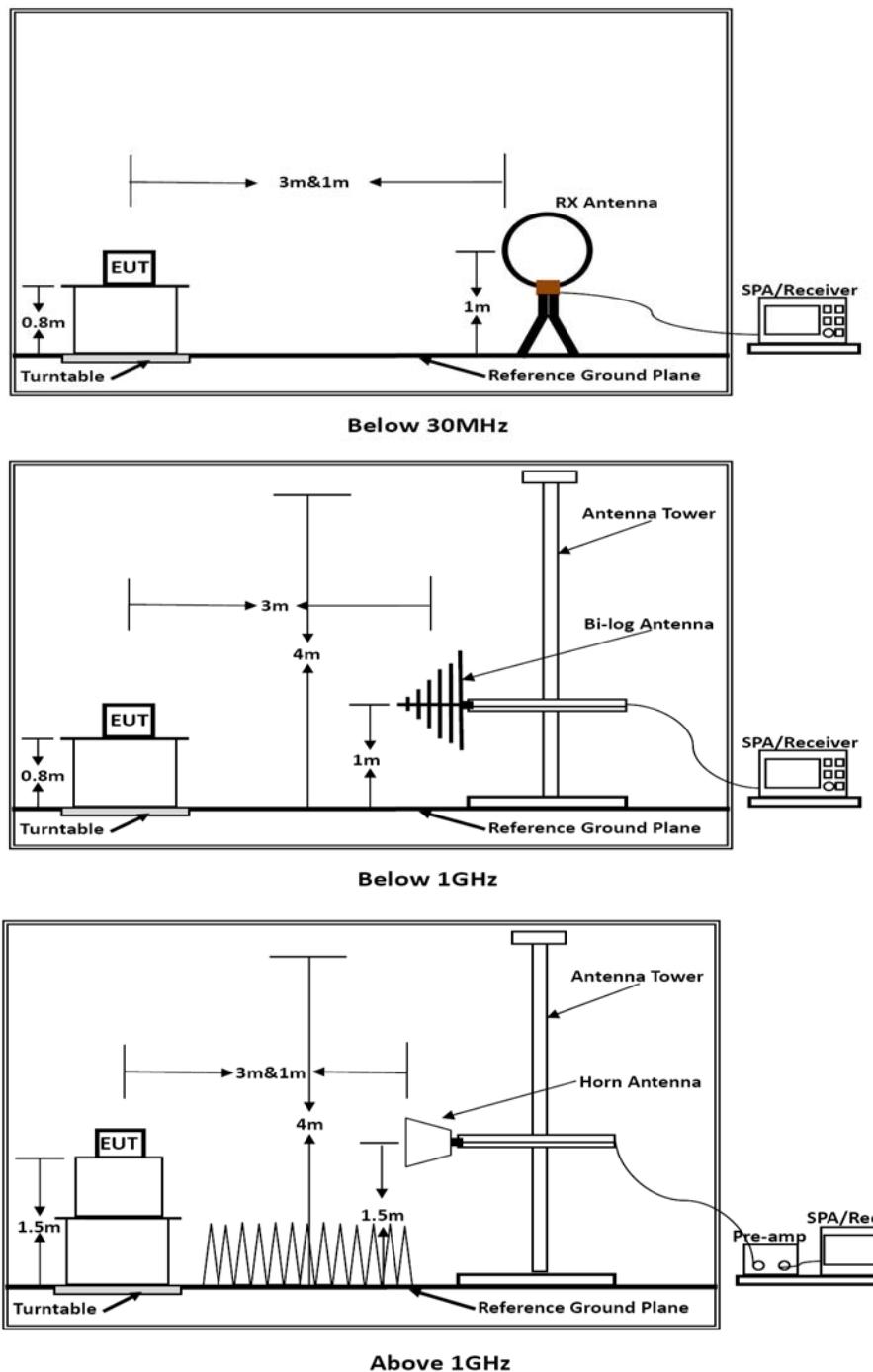
##### **Premereasurement:**

- The antenna is moved spherical over the EUT in different polarisations of the antenna.

##### **Final measurement:**

- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

### 5.5.4. Test Setup Layout



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1.5m.

Distance extrapolation factor =  $20 \log (\text{specific distance [3m]} / \text{test distance [1.5m]})$  (dB);  
 Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

### 5.5.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

### 5.5.6. Results of Radiated Emissions (9kHz~30MHz)

Temperature	25°C	Humidity	60%
Test Engineer	Jacky	Configurations	IEEE 802.11b/g/n

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Over Limit (dBuV)	Remark
-	-	-	-	See Note

Note:

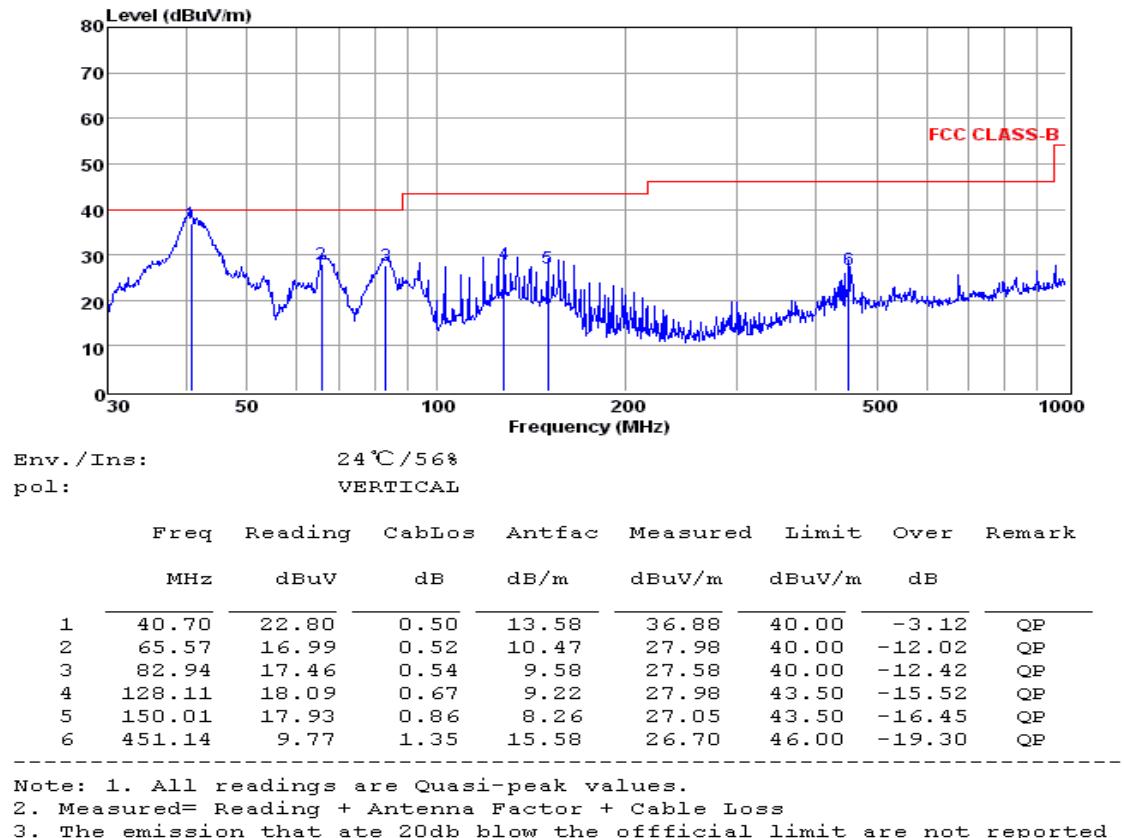
The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

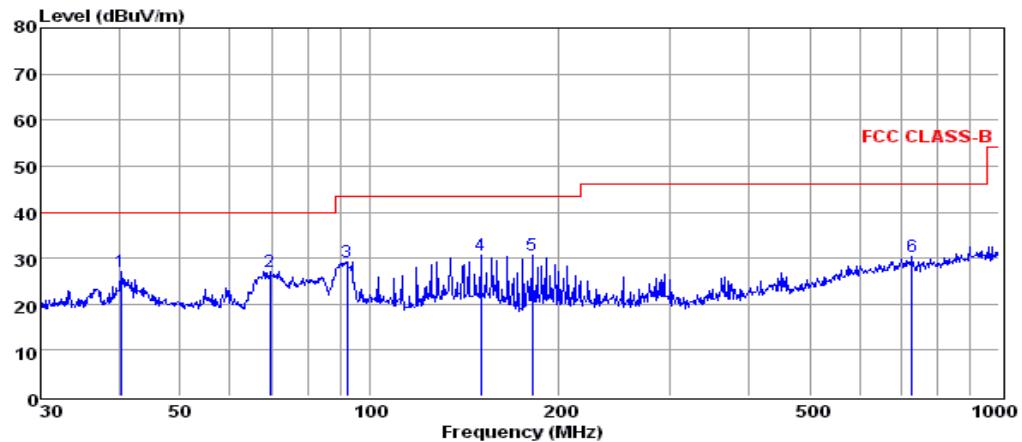
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);  
Limit line = specific limits (dBuV) + distance extrapolation factor.

### 5.5.7. Results of Radiated Emissions (30MHz~1GHz)

Temperature	25°C	Humidity	60%
Test Engineer	Jacky	Configurations	IEEE 802.11b

Test result for IEEE 802.11b (High Channel)





Env. / Ins:  
pol:

24 °C / 56%  
HORIZONTAL

Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark	
							MHz	dBuV
1	40.28	13.07	0.38	13.58	27.03	40.00	-12.97	QP
2	69.36	17.69	0.51	8.91	27.11	40.00	-12.89	QP
3	92.14	16.42	0.56	12.30	29.28	43.50	-14.22	QP
4	150.01	21.52	0.86	8.26	30.64	43.50	-12.86	QP
5	181.28	19.91	0.89	9.79	30.59	43.50	-12.91	QP
6	726.81	9.46	1.70	19.15	30.31	46.00	-15.69	QP

Note: 1. All readings are Quasi-peak values.  
2. Measured = Reading + Antenna Factor + Cable Loss  
3. The emission that ate 20db blow the official limit are not reported

#### Note:

- 1). Pre-scan all mode and recorded the worst case results in this report (IEEE 802.11b (High Channel)).  
Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 2). Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

## 5.5.8. Results for Radiated Emissions (Above 1GHz)

IEEE 802.11b(Worst mode Chain1)

Channel 1

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.00	64.13	33.06	35.04	3.94	66.09	74	-7.91	Peak	Horizontal
4824.00	47.45	33.06	35.04	3.94	49.41	54	-4.59	Average	Horizontal
4824.00	61.6	33.06	35.04	3.94	63.56	74	-10.44	Peak	Vertical
4824.00	45.82	33.06	35.04	3.94	47.78	54	-6.22	Average	Vertical

Channel 6

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.00	64.29	33.16	35.15	3.96	66.26	74	-7.74	Peak	Horizontal
4874.00	47.07	33.16	35.15	3.96	49.04	54	-4.96	Average	Horizontal
4874.00	61.88	33.16	35.15	3.96	63.85	74	-10.15	Peak	Vertical
4874.00	45.48	33.16	35.15	3.96	47.45	54	-6.55	Average	Vertical

Channel 11

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.00	65.78	33.26	35.14	3.98	67.88	74	-6.12	Peak	Horizontal
4924.00	47.67	33.26	35.14	3.98	49.77	54	-4.23	Average	Horizontal
4924.00	61.75	33.26	35.14	3.98	63.85	74	-10.15	Peak	Vertical
4924.00	45.59	33.26	35.14	3.98	47.69	54	-6.31	Average	Vertical

## IEEE 802.11g(Worst mode Chain1)

## Channel 1

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.00	63.18	33.06	35.04	3.94	65.14	74	-8.86	Peak	Horizontal
4824.00	46.76	33.06	35.04	3.94	48.72	54	-5.28	Average	Horizontal
4824.00	60.89	33.06	35.04	3.94	62.85	74	-11.15	Peak	Vertical
4824.00	43.07	33.06	35.04	3.94	45.03	54	-8.97	Average	Vertical

## Channel 6

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.00	63.45	33.16	35.15	3.96	65.42	74	-8.58	Peak	Horizontal
4874.00	46.26	33.16	35.15	3.96	48.23	54	-5.77	Average	Horizontal
4874.00	60.71	33.16	35.15	3.96	62.68	74	-11.32	Peak	Vertical
4874.00	43.57	33.16	35.15	3.96	45.54	54	-8.46	Average	Vertical

## Channel 11

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.00	63.02	33.26	35.14	3.98	65.12	74	-8.88	Peak	Horizontal
4924.00	46.34	33.26	35.14	3.98	48.44	54	-5.56	Average	Horizontal
4924.00	60.75	33.26	35.14	3.98	62.85	74	-11.15	Peak	Vertical
4924.00	43.26	33.26	35.14	3.98	45.36	54	-8.64	Average	Vertical

## IEEE 802.11n HT20(Worts mode Chain0+Chain1)

## Channel 1

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4824.00	66.2	33.06	35.04	3.94	68.16	74	-5.84	Peak	Horizontal
4824.00	49.56	33.06	35.04	3.94	51.52	54	-2.48	Average	Horizontal
4824.00	64.82	33.06	35.04	3.94	66.78	74	-7.22	Peak	Vertical
4824.00	46.06	33.06	35.04	3.94	48.02	54	-5.98	Average	Vertical

## Channel 6

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.00	66.31	33.16	35.15	3.96	68.28	74	-5.72	Peak	Horizontal
4874.00	49.16	33.16	35.15	3.96	51.13	54	-2.87	Average	Horizontal
4874.00	64.46	33.16	35.15	3.96	66.43	74	-7.57	Peak	Vertical
4874.00	46.72	33.16	35.15	3.96	48.69	54	-5.31	Average	Vertical

## Channel 11

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4924.00	66.04	33.26	35.14	3.98	68.14	74	-5.86	Peak	Horizontal
4924.00	49.67	33.26	35.14	3.98	51.77	54	-2.23	Average	Horizontal
4924.00	63.98	33.26	35.14	3.98	66.08	74	-7.92	Peak	Vertical
4924.00	46.36	33.26	35.14	3.98	48.46	54	-5.54	Average	Vertical

## IEEE 802.11n HT40(Worts mode Chain0+Chain1)

## Channel 3

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4844.00	64.07	33.06	35.04	3.94	66.03	74	-7.97	Peak	Horizontal
4844.00	47.18	33.06	35.04	3.94	49.14	54	-4.86	Average	Horizontal
4844.00	62.82	33.06	35.04	3.94	64.78	74	-9.22	Peak	Vertical
4844.00	44.07	33.06	35.04	3.94	46.03	54	-7.97	Average	Vertical

## Channel 6

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4874.00	64.29	33.16	35.15	3.96	66.26	74	-7.74	Peak	Horizontal
4874.00	47.04	33.16	35.15	3.96	49.01	54	-4.99	Average	Horizontal
4874.00	62.77	33.16	35.15	3.96	64.74	74	-9.26	Peak	Vertical
4874.00	44.42	33.16	35.15	3.96	46.39	54	-7.61	Average	Vertical

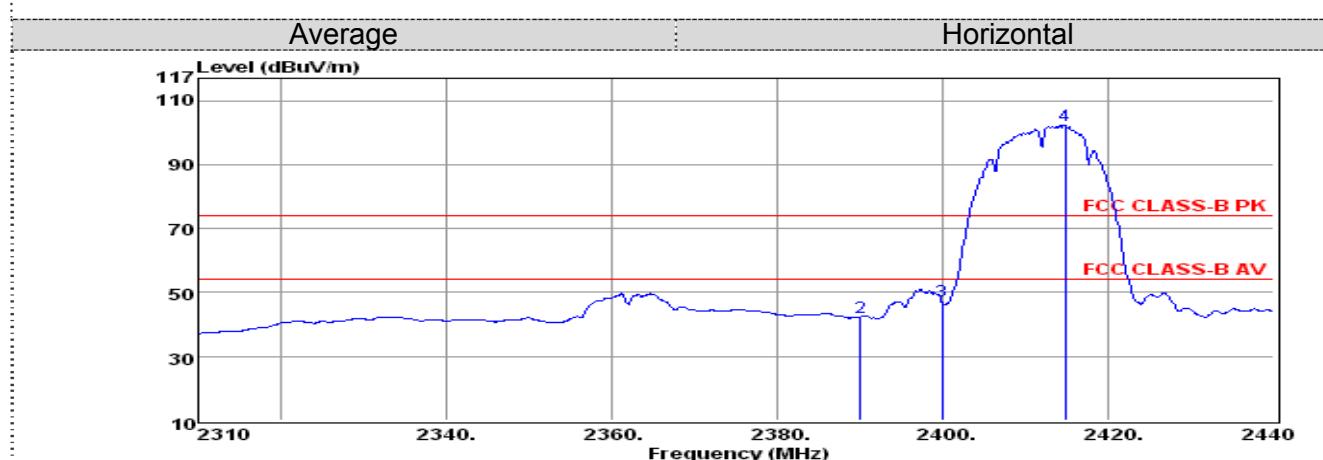
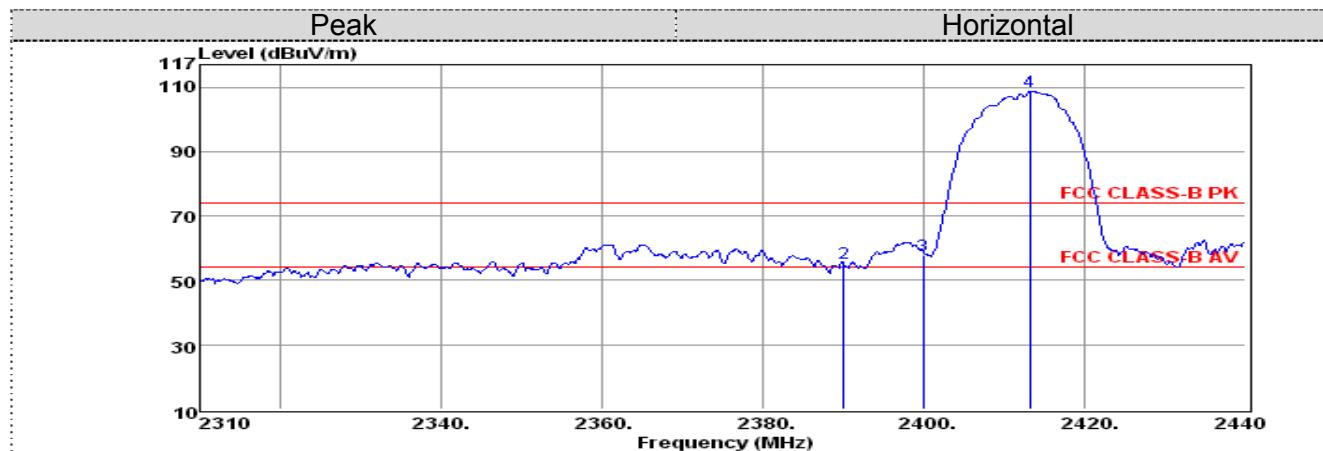
## Channel 9

Freq. MHz	Reading dBuv	Ant. Fac. dB/m	Pre. Fac. dB	Cab. Loss dB	Measured dBuv/m	Limit dBuv/m	Margin dB	Remark	Pol.
4904.00	64.56	33.26	35.14	3.98	66.66	74	-7.34	Peak	Horizontal
4904.00	47.42	33.26	35.14	3.98	49.52	54	-4.48	Average	Horizontal
4904.00	61.88	33.26	35.14	3.98	63.98	74	-10.02	Peak	Vertical
4904.00	43.97	33.26	35.14	3.98	46.07	54	-7.93	Average	Vertical

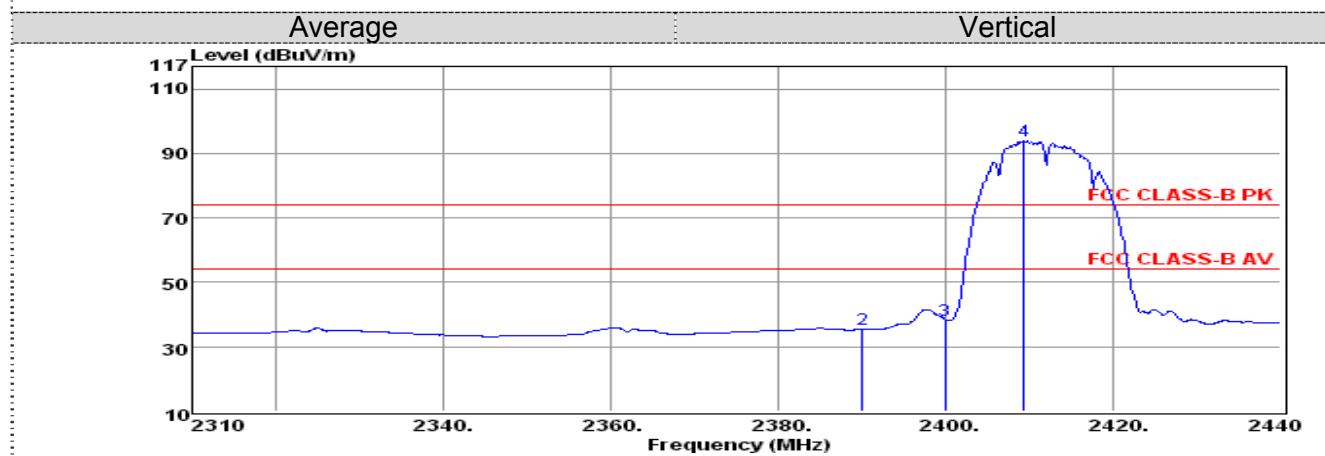
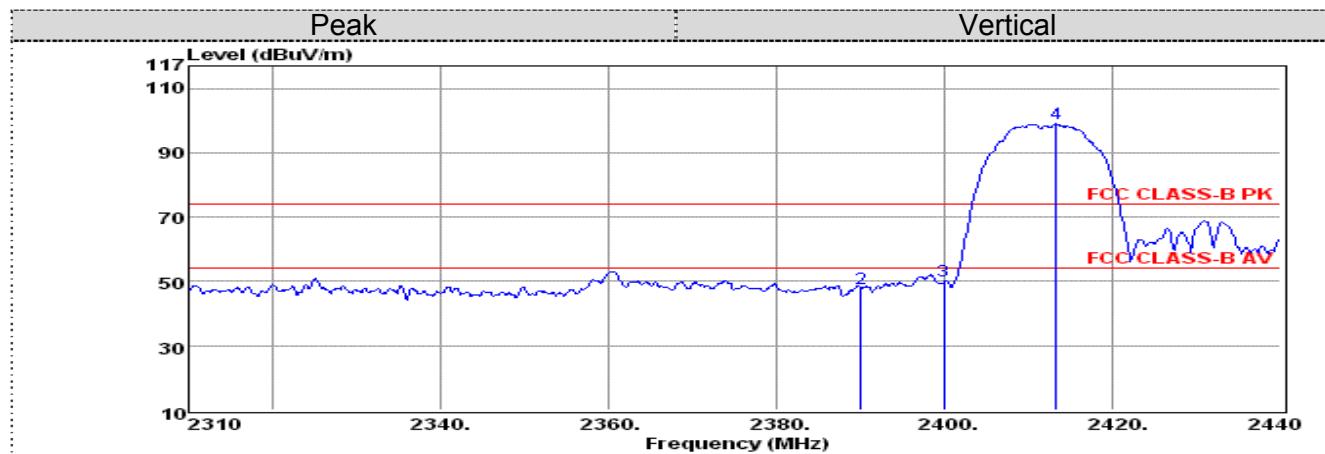
## Notes:

- 1). Measuring frequencies from 9k~10th harmonic or 26.5GHz (which is less), No emission found between lowest internal used/generated frequency to 30MHz.
- 2). Radiated emissions measured in frequency range from 9k~10th harmonic or 26.5GHz (which is less) were made with an instrument using Peak detector mode.
- 3). Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

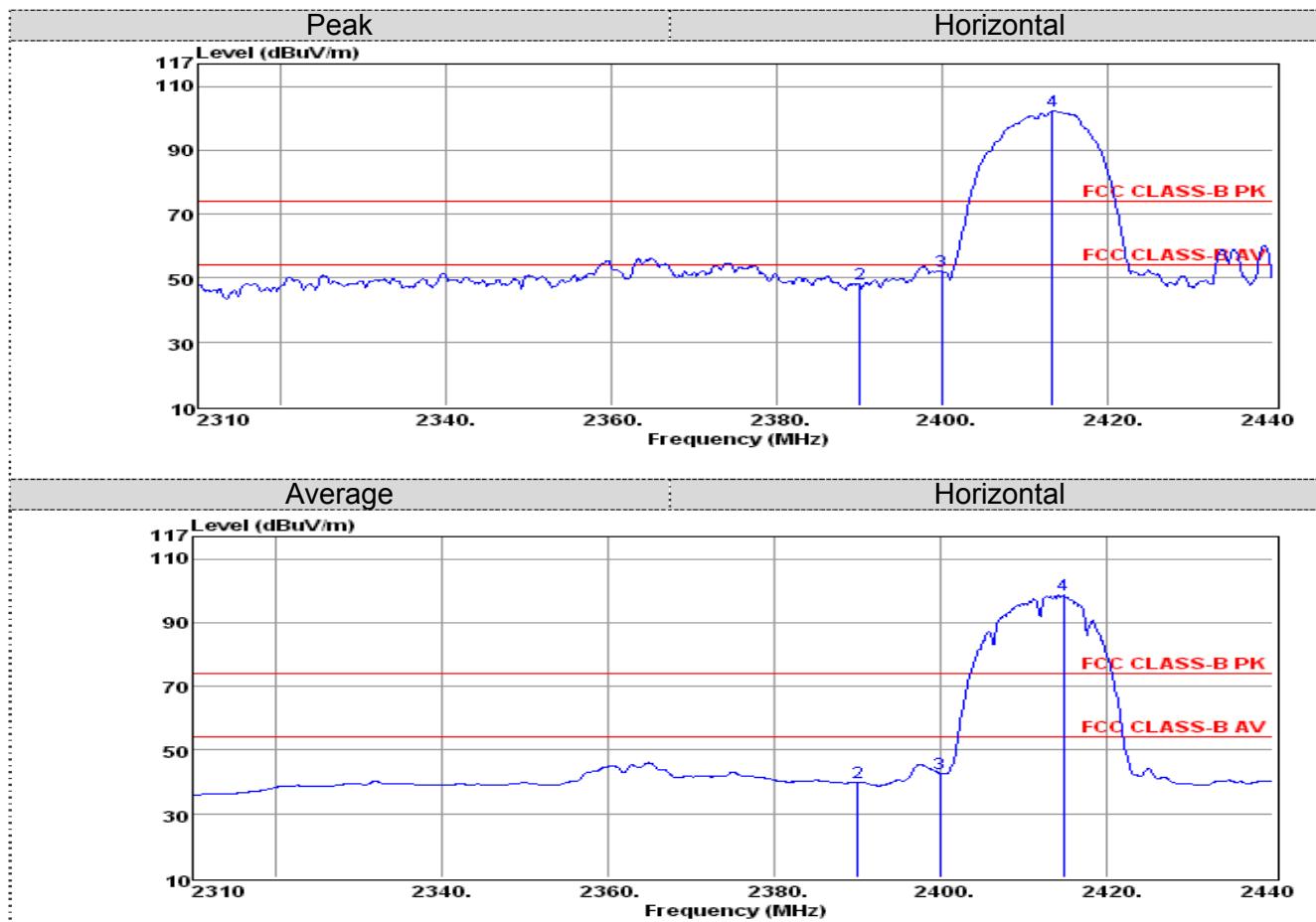
## 5.5.9. Results of Restricted Bands Test (Radiated)

Test Plot of IEEE 802.11b(2412MHz)-Chain 0

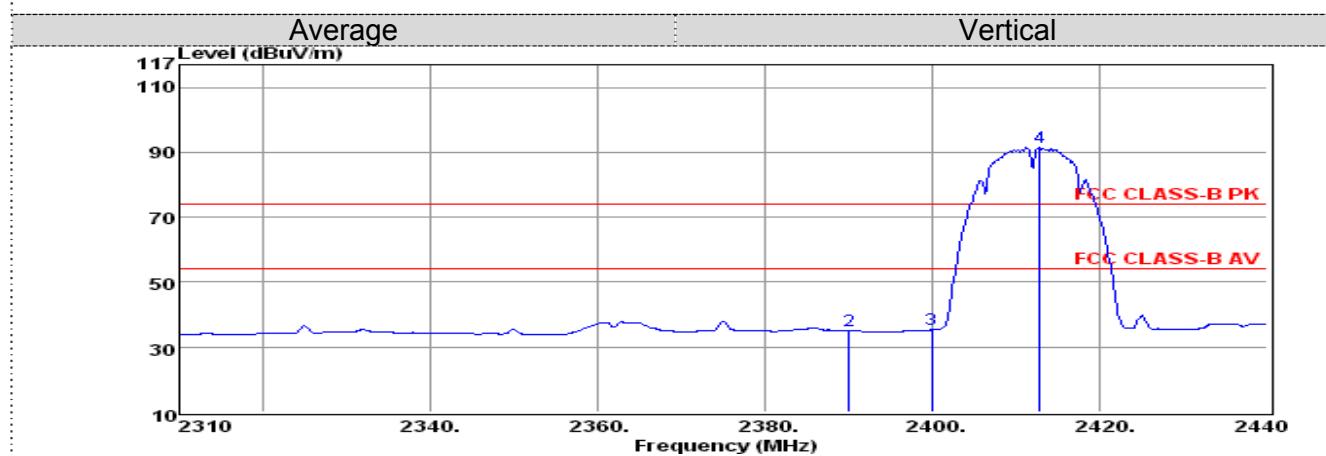
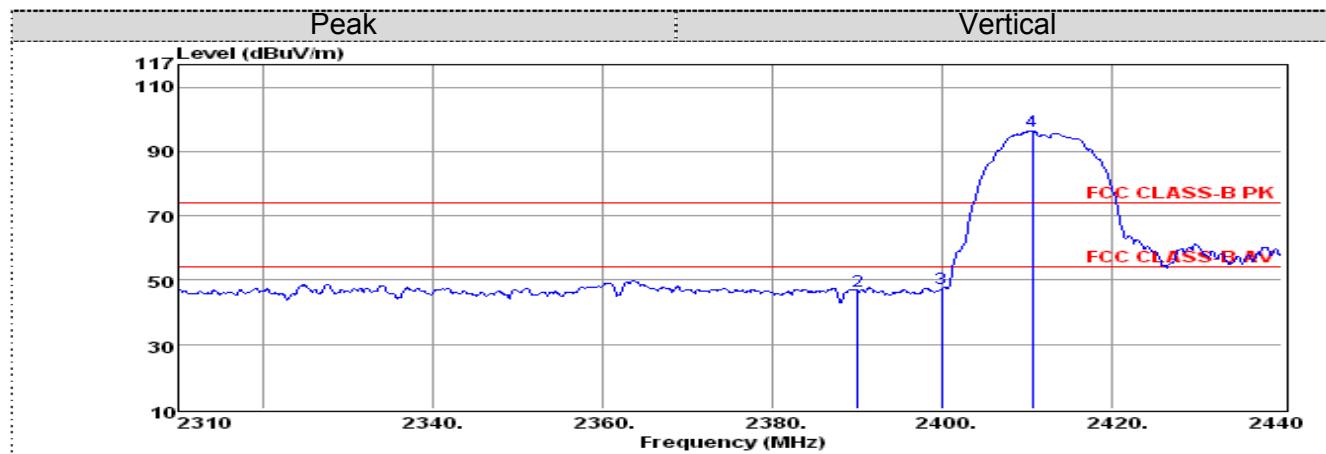
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.00	54.25	-3.99	50.26	74.00	-23.74	Peak
2	2390.00	59.39	-4.11	55.28	74.00	-18.72	Peak
3	2310.00	41.14	-3.99	37.15	54.00	-16.85	Average
4	2390.00	46.48	-4.11	42.37	54.00	-11.63	Average



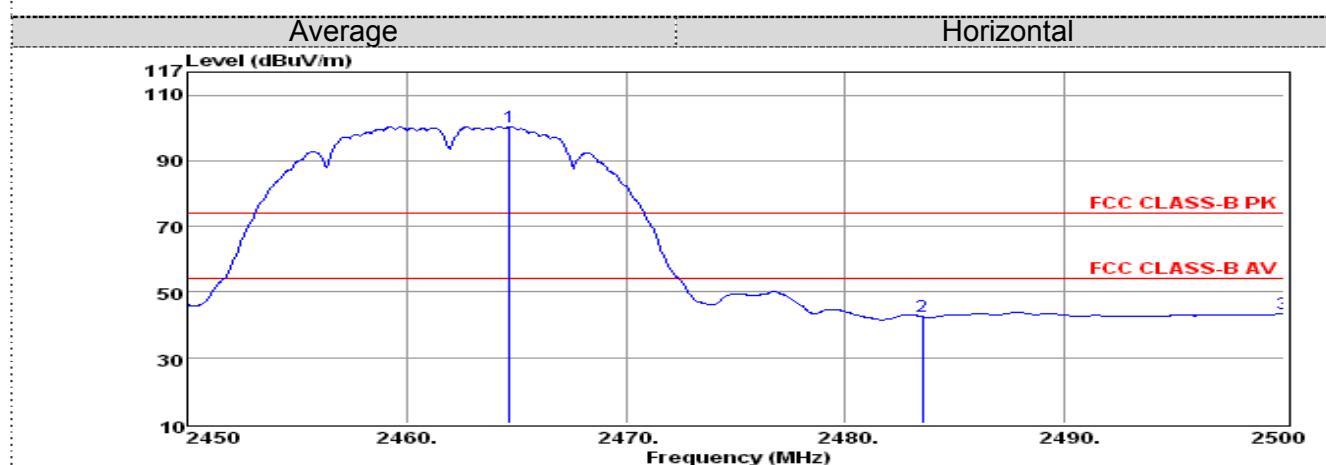
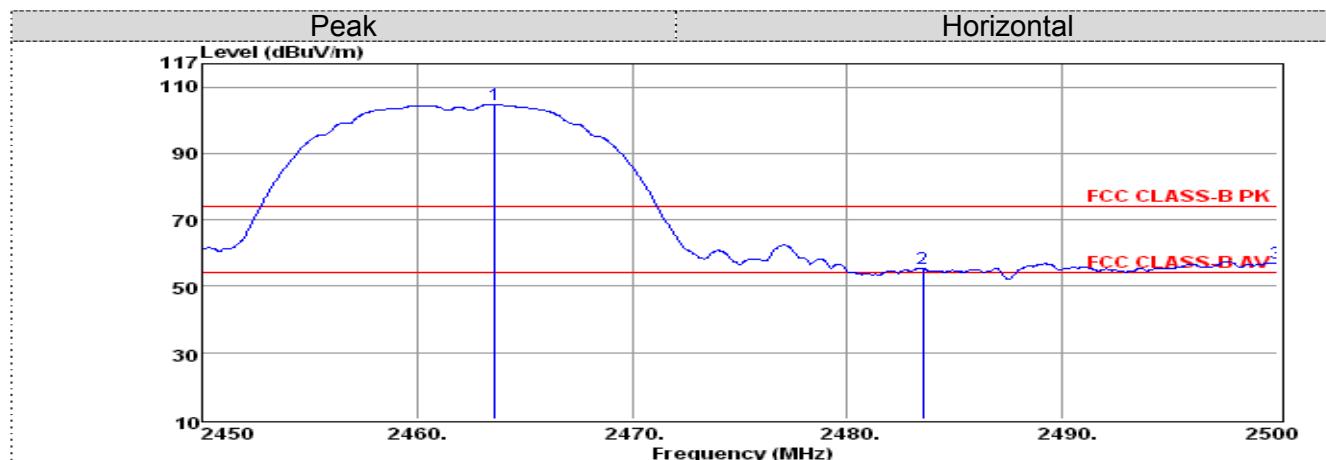
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.00	50.74	-3.99	46.75	74.00	-27.25	Peak
2	2390.00	52.08	-4.11	47.97	74.00	-26.03	Peak
3	2310.00	38.08	-3.99	34.09	54.00	-19.91	Average
4	2390.00	39.61	-4.11	35.50	54.00	-18.50	Average

**Test Plot of IEEE 802.11b(2412MHz)-Chain 1**

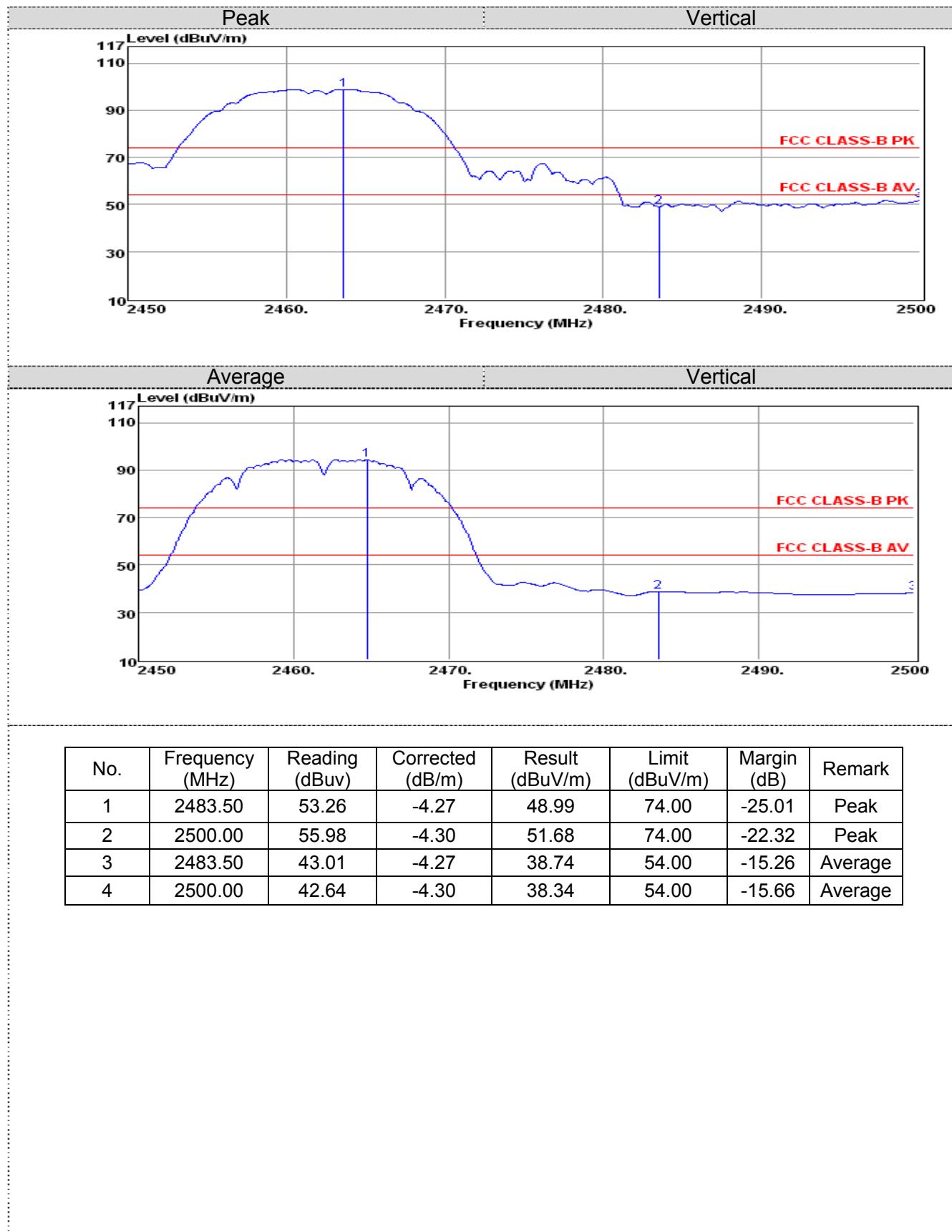
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.00	51.57	-3.99	47.58	74.00	-26.42	Peak
2	2390.00	52.1	-4.11	47.99	74.00	-26.01	Peak
3	2310.00	39.9	-3.99	35.91	54.00	-18.09	Average
4	2390.00	43.82	-4.11	39.71	54.00	-14.29	Average

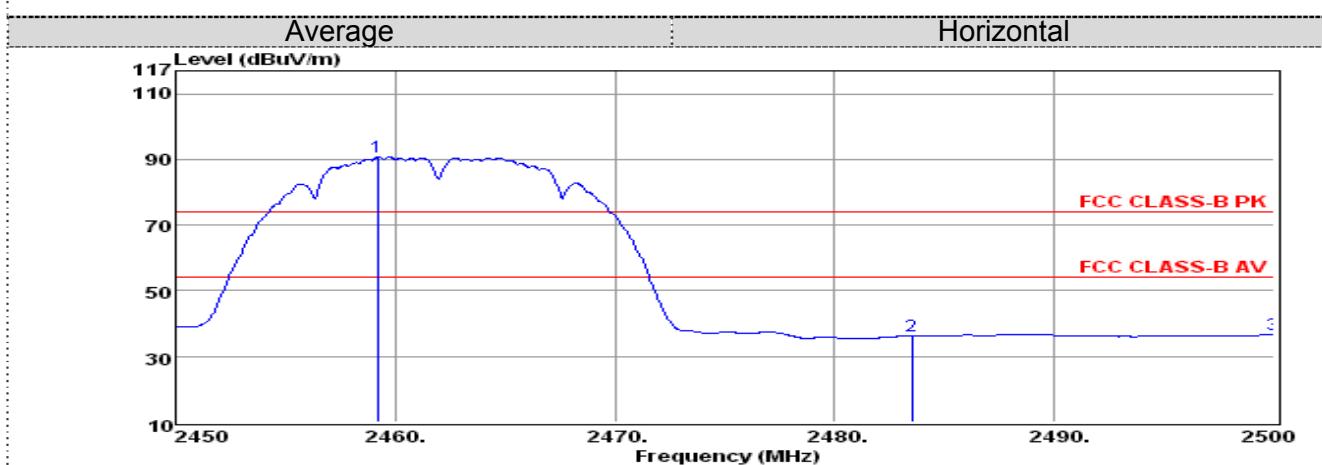
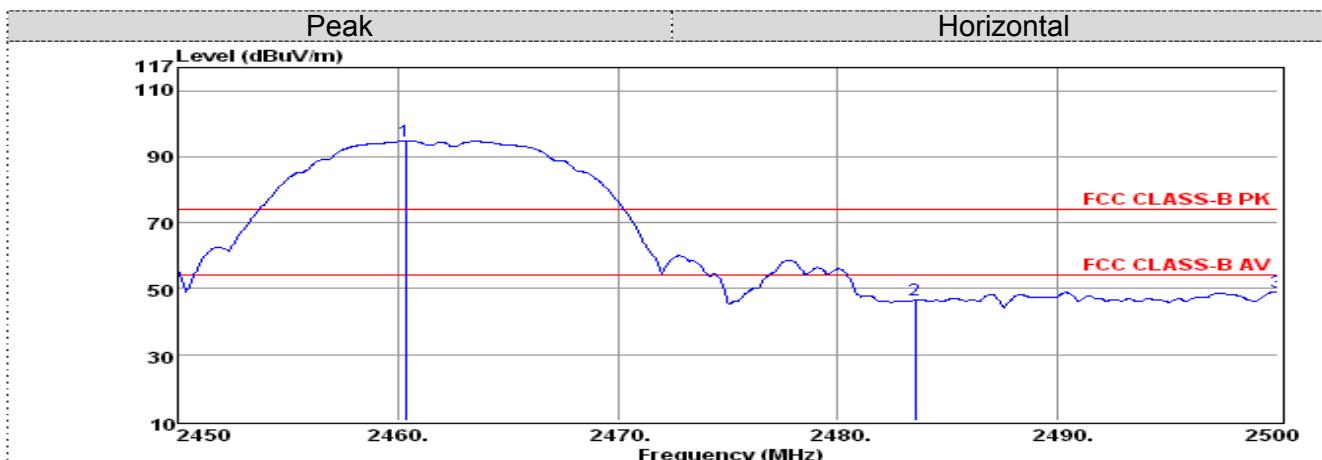


No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.00	50.66	-3.99	46.67	74.00	-27.33	Peak
2	2390.00	50.62	-4.11	46.51	74.00	-27.49	Peak
3	2310.00	38.05	-3.99	34.06	54.00	-19.94	Average
4	2390.00	39.09	-4.11	34.98	54.00	-19.02	Average

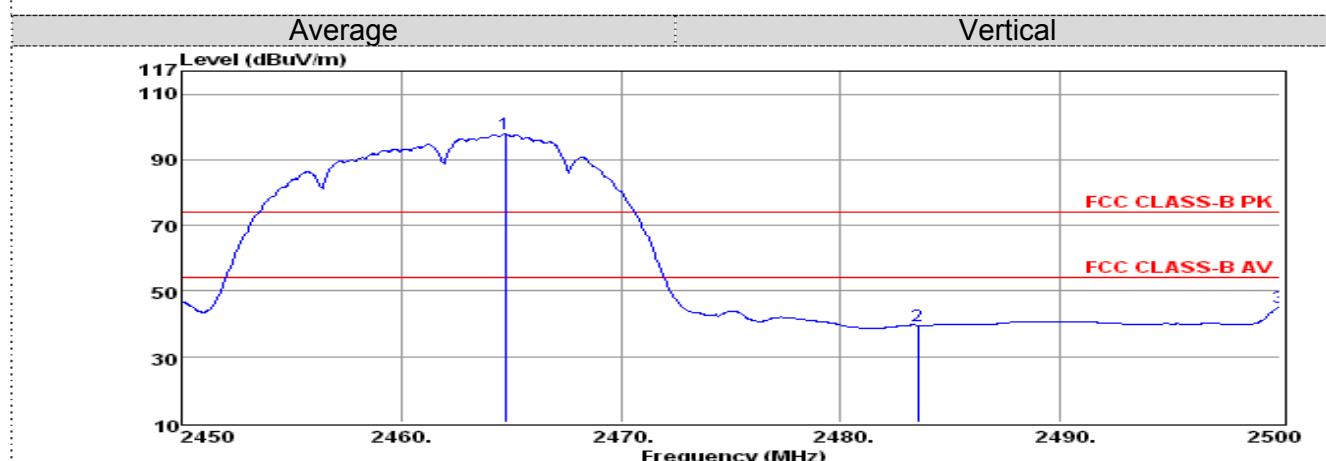
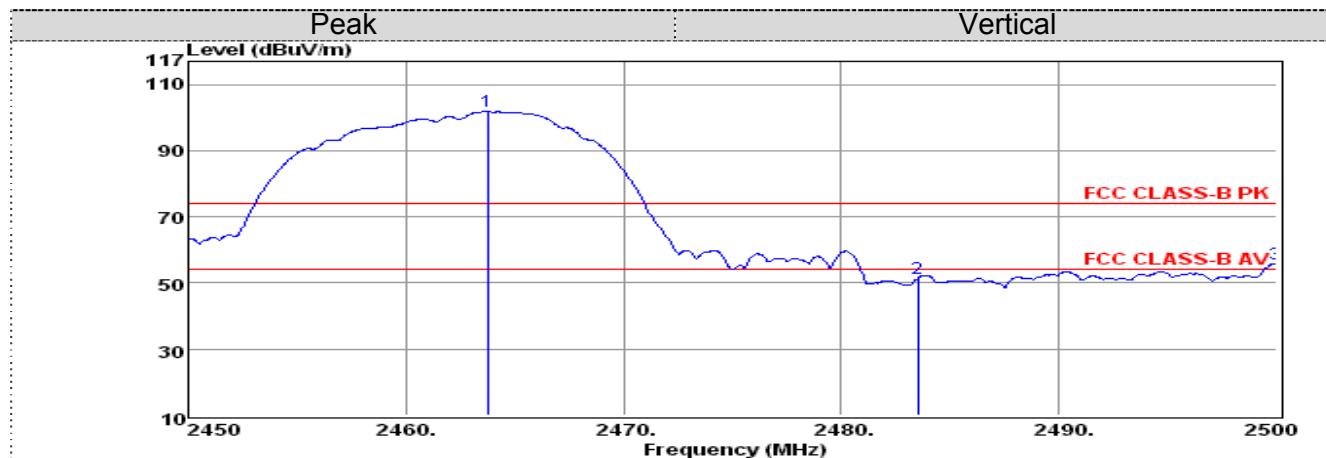
**Test Plot of IEEE 802.11b(2462MHz)-Chain 0**

No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.50	59.68	-4.27	55.41	74.00	-18.59	Peak
2	2500.00	61.06	-4.30	56.76	74.00	-17.24	Peak
3	2483.50	46.75	-4.27	42.48	54.00	-11.52	Average
4	2500.00	47.80	-4.30	43.50	54.00	-10.50	Average

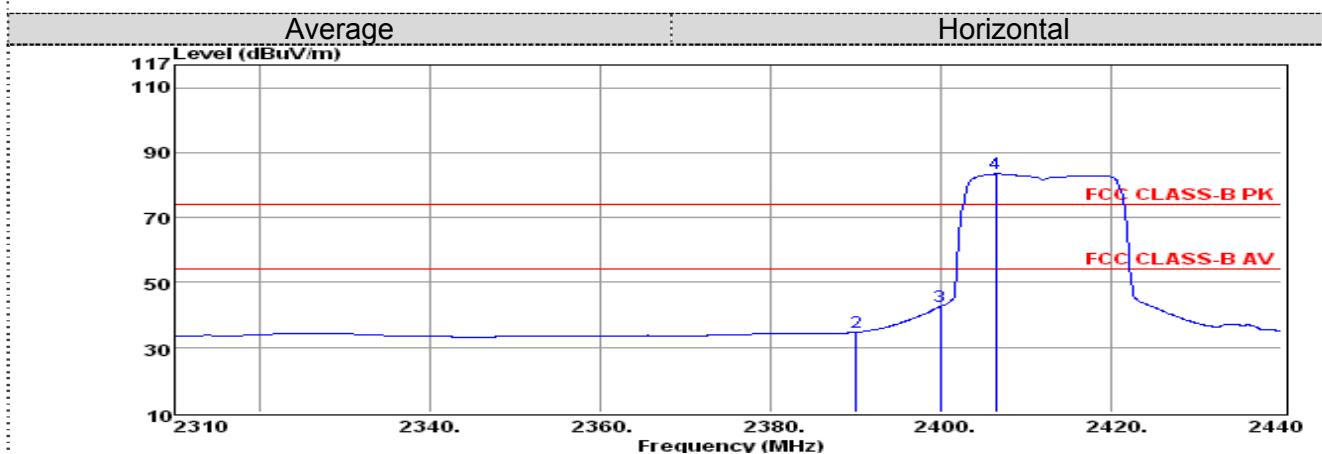
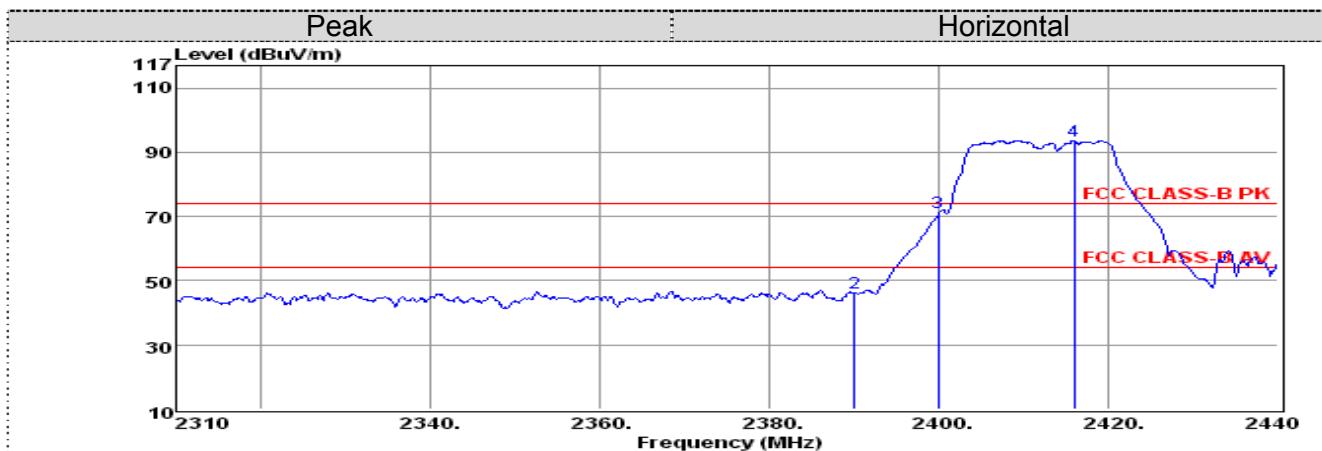


**Test Plot of IEEE 802.11b(2462MHz)-Chain 1**

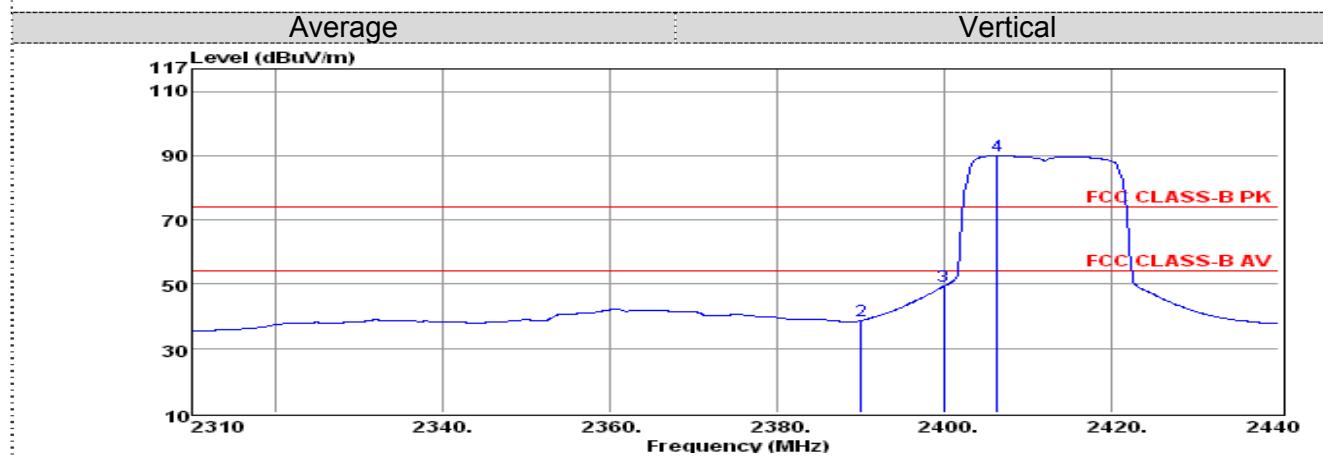
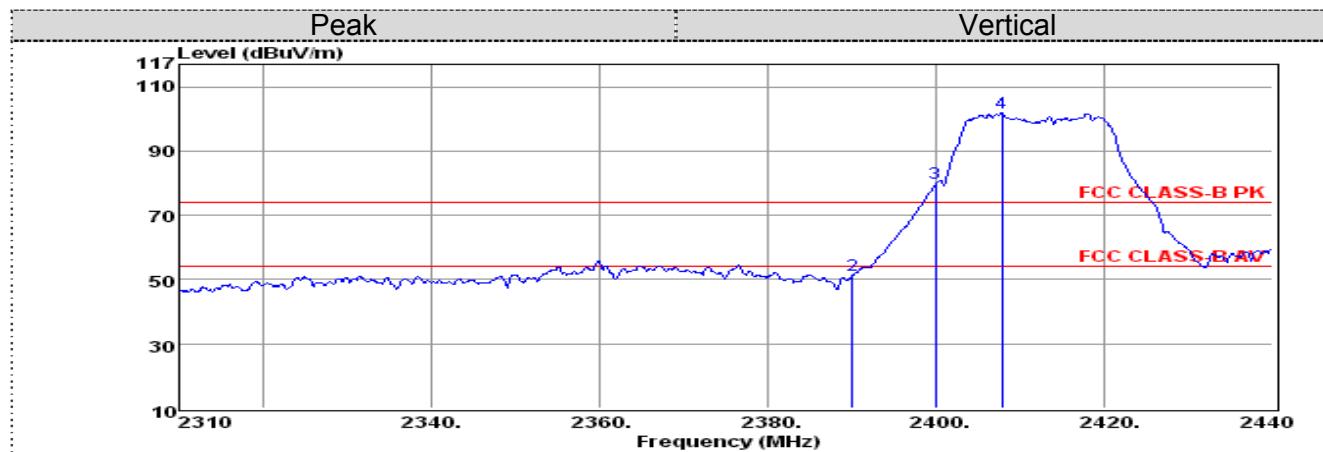
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.50	50.75	-4.27	46.48	74.00	-27.52	Peak
2	2500.00	53.15	-4.30	48.85	74.00	-25.15	Peak
3	2483.50	40.63	-4.27	36.36	54.00	-17.64	Average
4	2500.00	41.15	-4.30	36.85	54.00	-17.15	Average



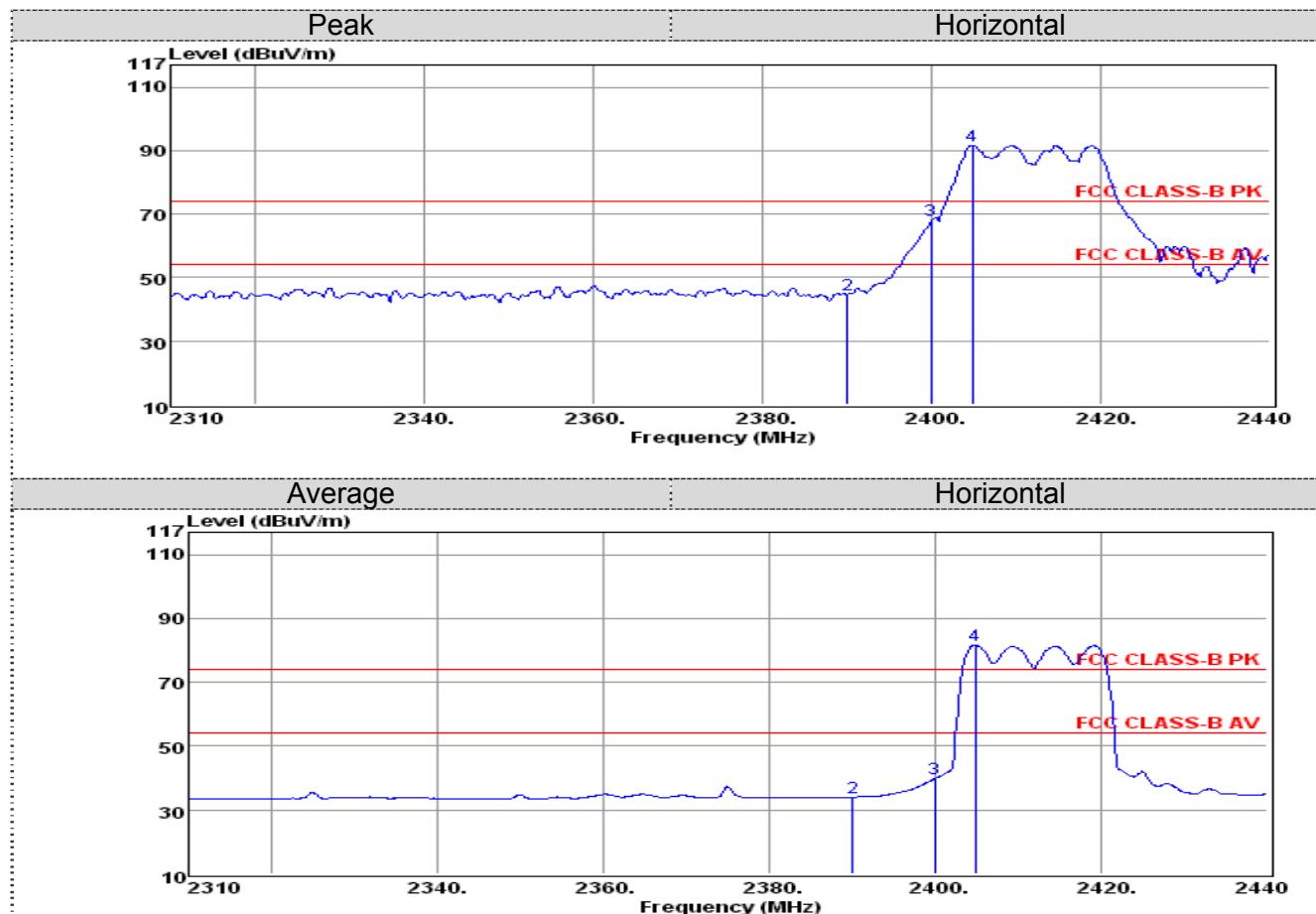
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.50	55.63	-4.27	51.36	74.00	-22.64	Peak
2	2500.00	60.14	-4.30	55.84	74.00	-18.16	Peak
3	2483.50	43.89	-4.27	39.62	54.00	-14.38	Average
4	2500.00	49.26	-4.30	44.96	54.00	-9.04	Average

**Test Plot of IEEE 802.11g(2412MHz)-Chain 0**

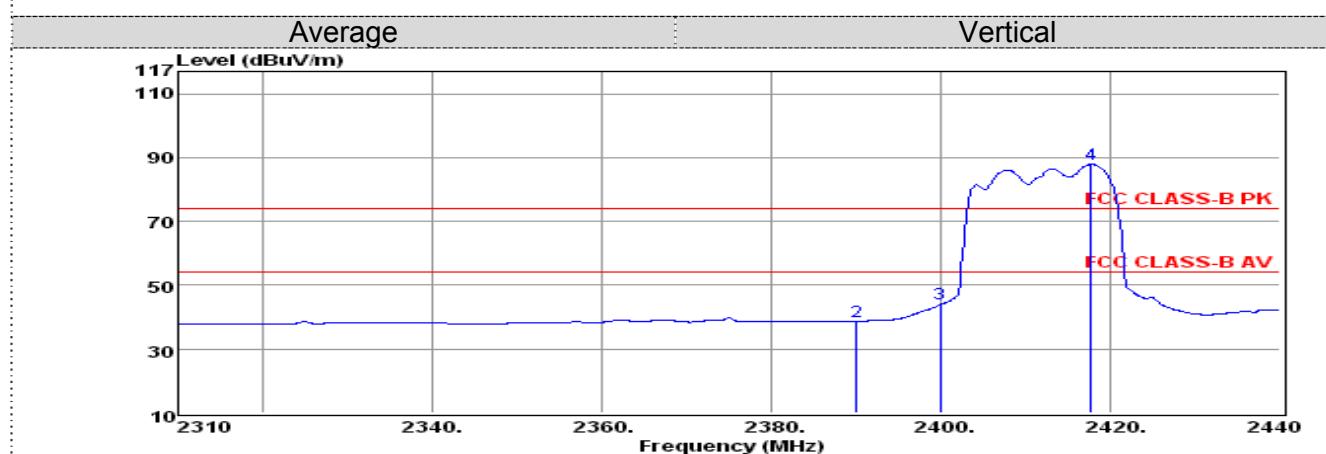
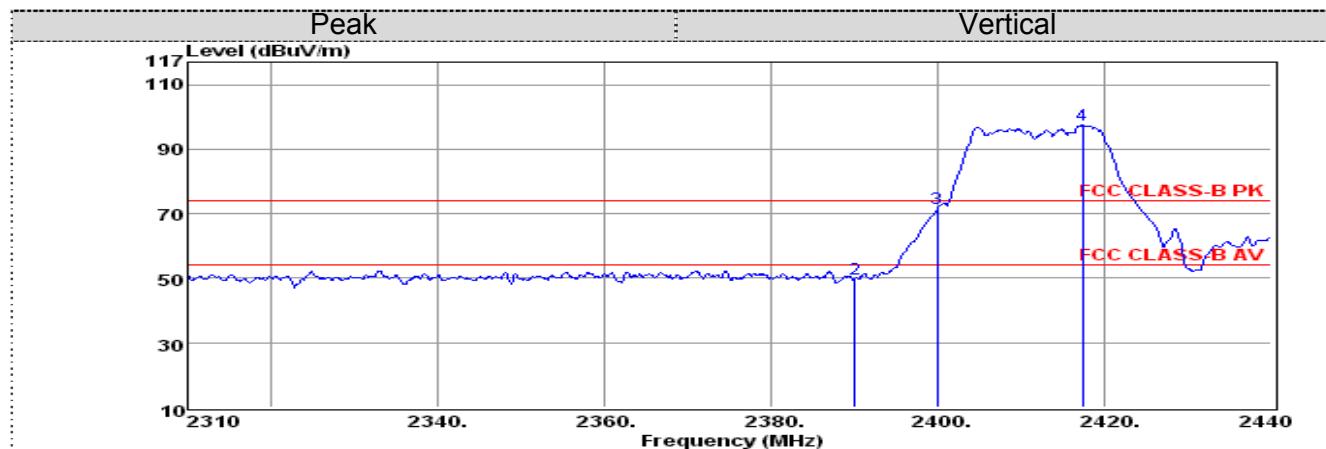
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.00	48.00	-3.99	44.01	74.00	-29.99	Peak
2	2390.00	50.43	-4.11	46.32	74.00	-27.68	Peak
3	2310.00	37.46	-3.99	33.47	54.00	-20.53	Average
4	2390.00	38.82	-4.11	34.71	54.00	-19.29	Average



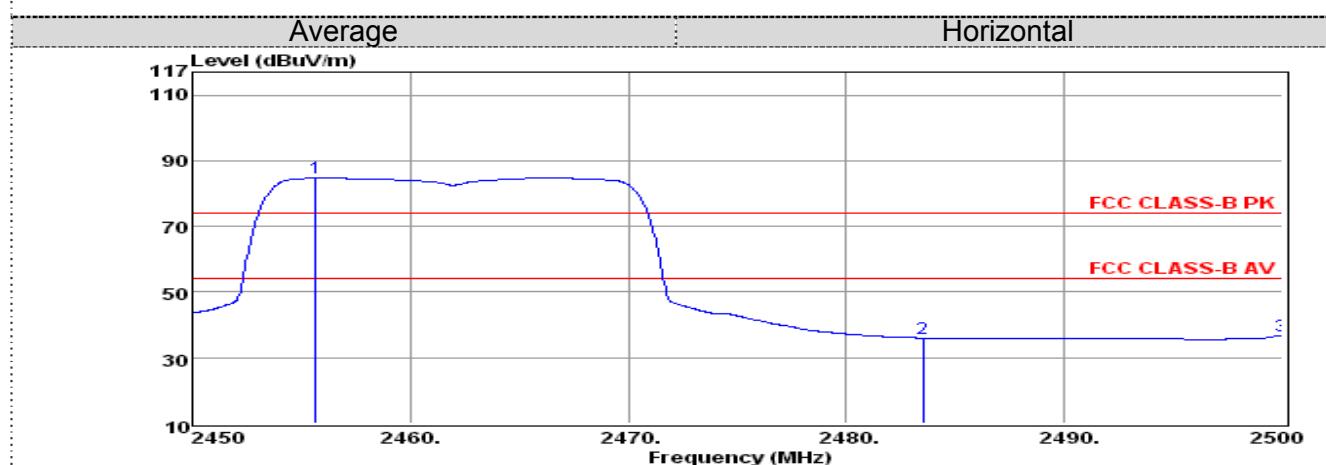
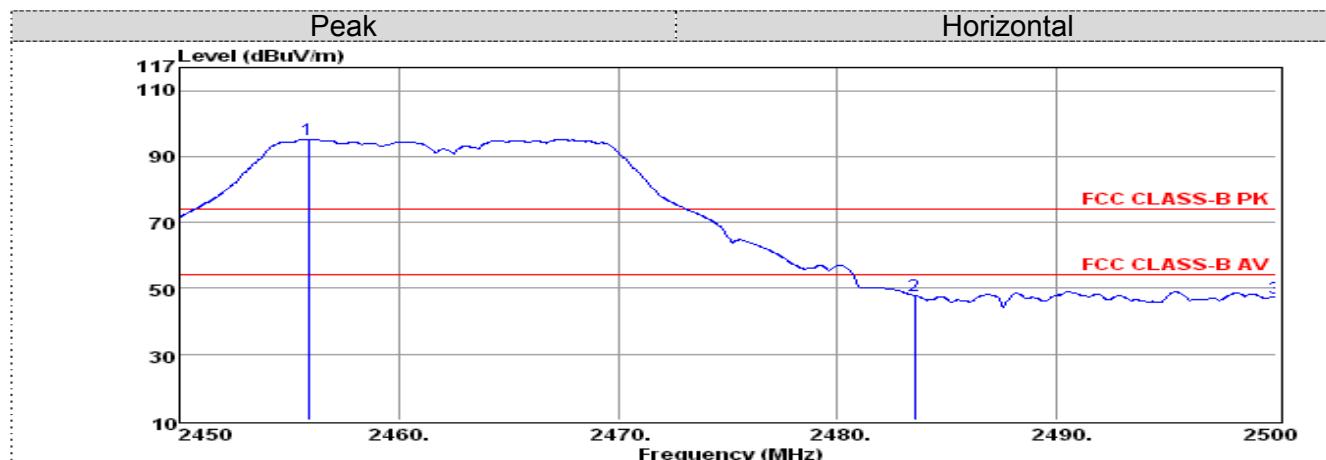
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.00	50.04	-3.99	46.05	74.00	-27.95	Peak
2	2390.00	55.36	-4.11	51.25	74.00	-22.75	Peak
3	2310.00	39.35	-3.99	35.36	54.00	-18.64	Average
4	2390.00	42.77	-4.11	38.66	54.00	-15.34	Average

**Test Plot of IEEE 802.11g(2412MHz)-Chain 1**

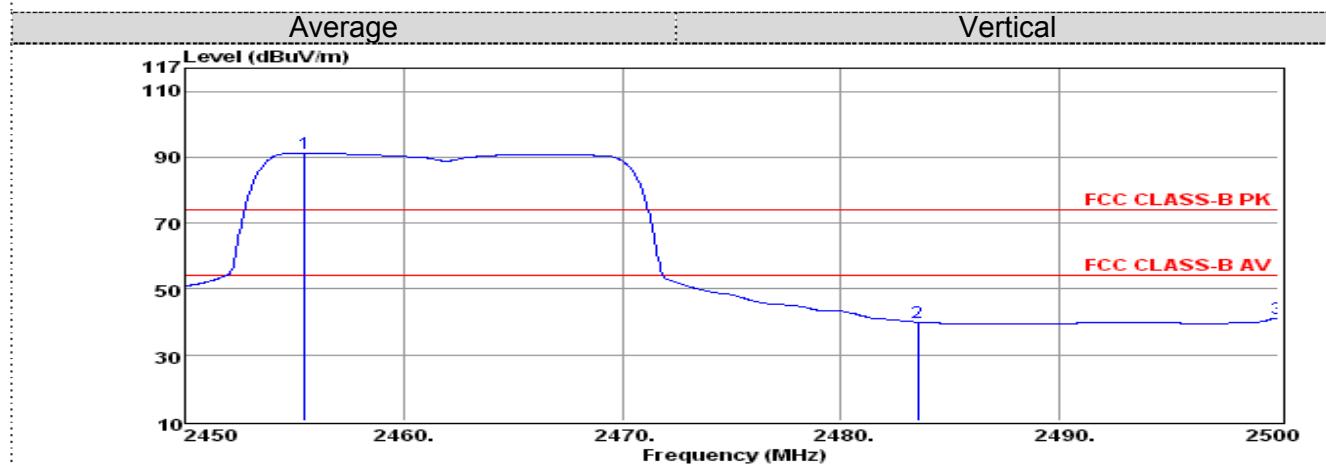
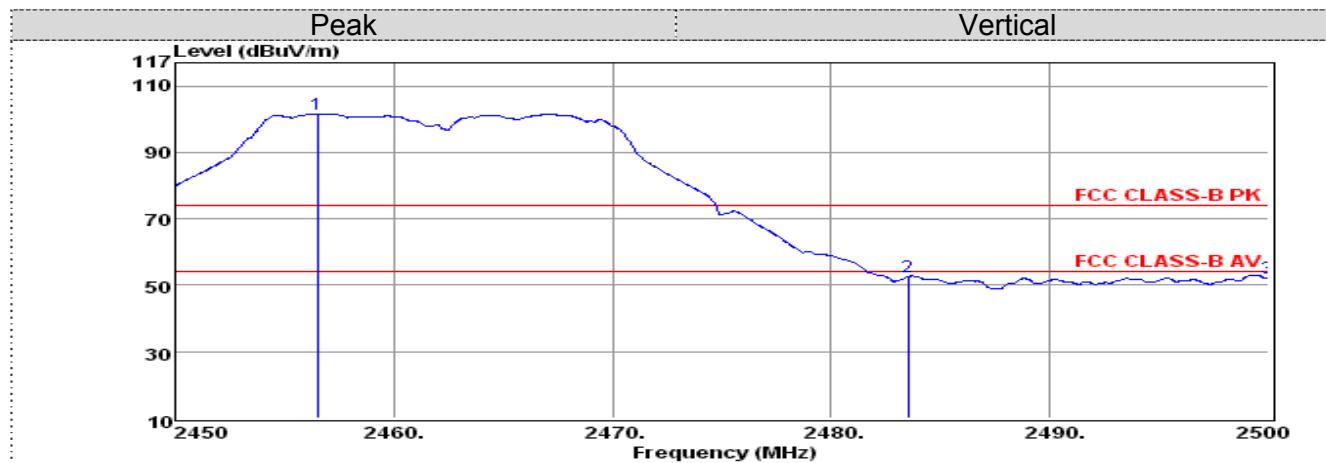
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.00	48.17	-3.99	44.18	74.00	-29.82	Peak
2	2390.00	48.66	-4.11	44.55	74.00	-29.45	Peak
3	2310.00	37.41	-3.99	33.42	54.00	-20.58	Average
4	2390.00	38.12	-4.11	34.01	54.00	-19.99	Average



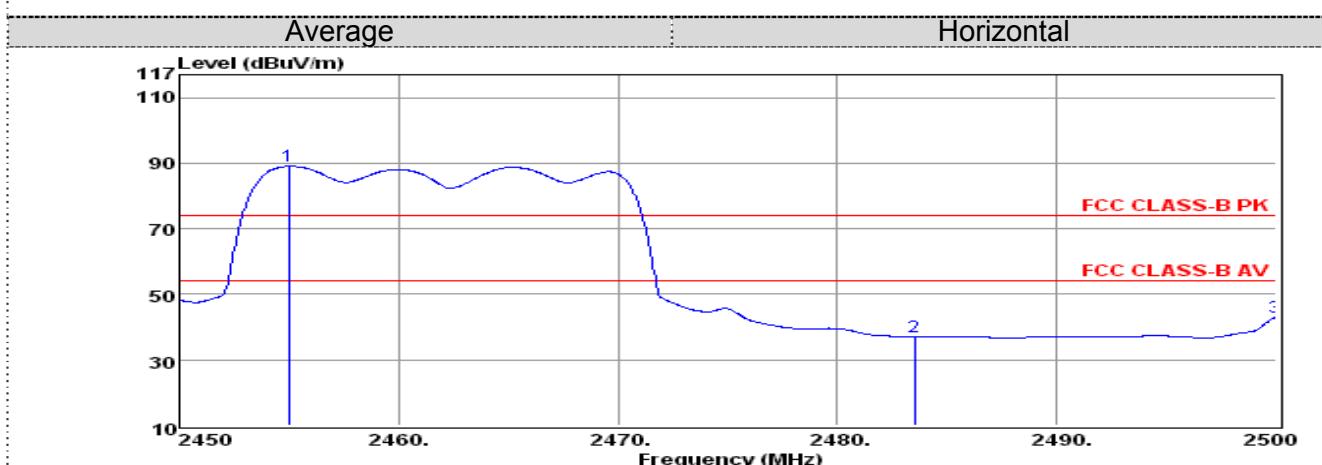
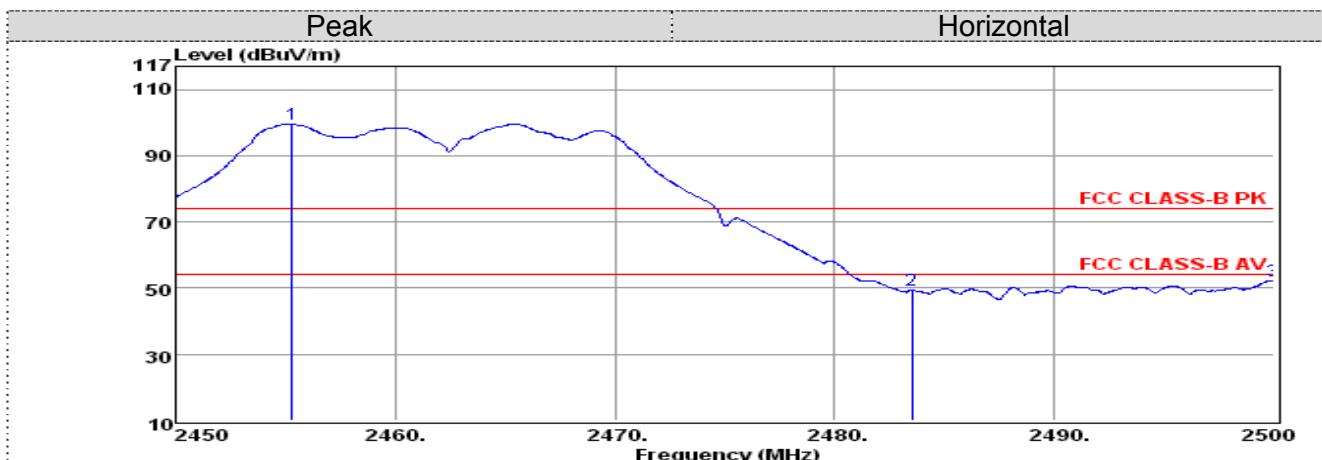
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.00	54.48	-3.99	50.49	74.00	-23.51	Peak
2	2390.00	54.06	-4.11	49.95	74.00	-24.05	Peak
3	2310.00	41.79	-3.99	37.80	54.00	-16.20	Average
4	2390.00	42.76	-4.11	38.65	54.00	-15.35	Average

**Test Plot of IEEE 802.11g(2462MHz)-Chain 0**

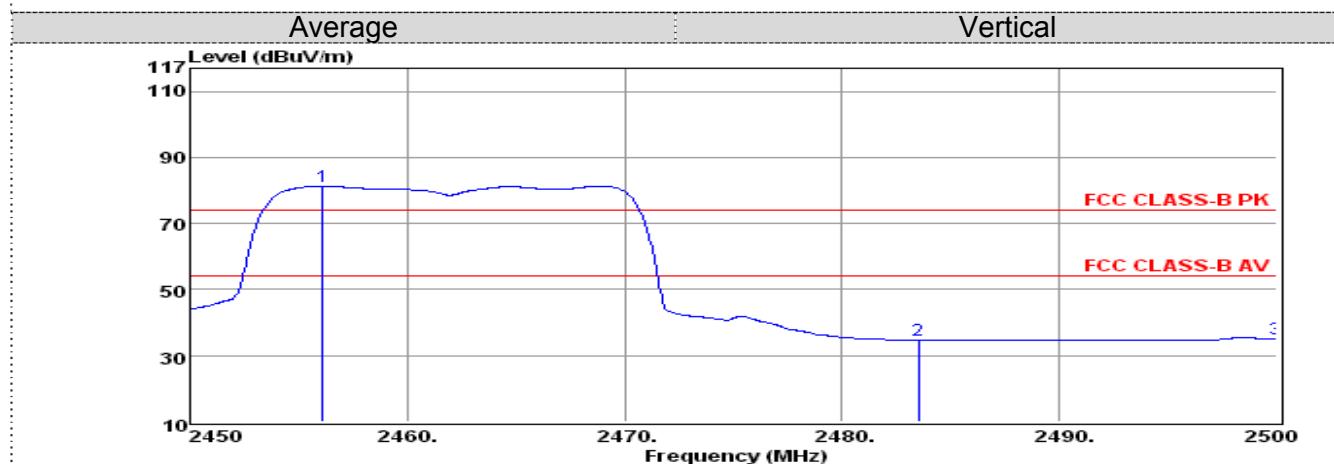
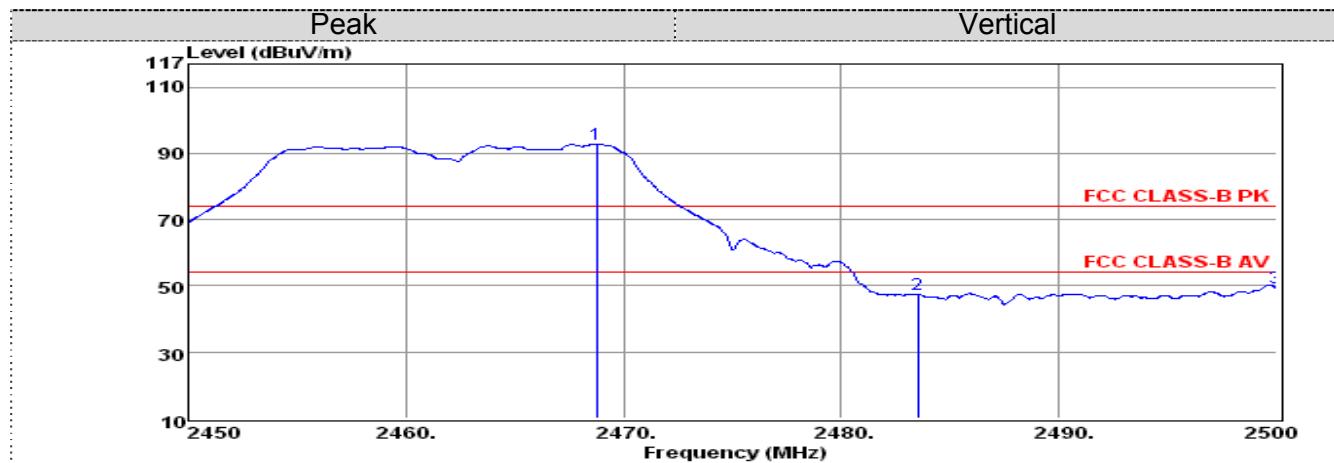
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.50	52.17	-4.27	47.90	74.00	-26.10	Peak
2	2500.00	51.48	-4.30	47.18	74.00	-26.82	Peak
3	2483.50	40.28	-4.27	36.01	54.00	-17.99	Average
4	2500.00	41.09	-4.30	36.79	54.00	-17.21	Average



No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.50	56.82	-4.27	52.55	74.00	-21.45	Peak
2	2500.00	56.63	-4.30	52.33	74.00	-21.67	Peak
3	2483.50	44.25	-4.27	39.98	54.00	-14.02	Average
4	2500.00	45.52	-4.30	41.22	54.00	-12.78	Average

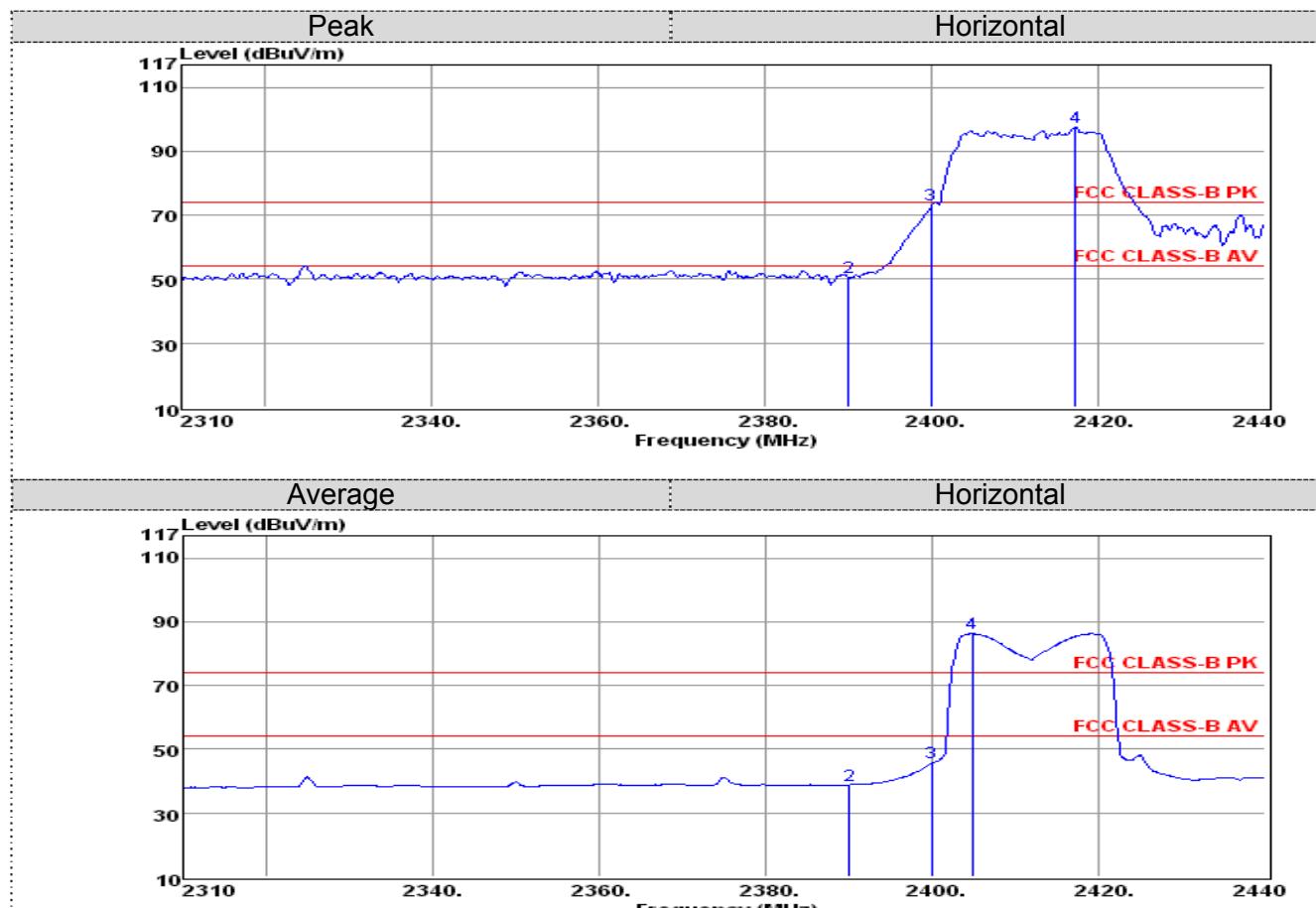
**Test Plot of IEEE 802.11g(2462MHz)-Chain 1**

No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.50	53.59	-4.27	49.32	74.00	-24.68	Peak
2	2500.00	56.55	-4.30	52.25	74.00	-21.75	Peak
3	2483.50	41.29	-4.27	37.02	54.00	-16.98	Average
4	2500.00	47.14	-4.30	42.84	54.00	-11.16	Average

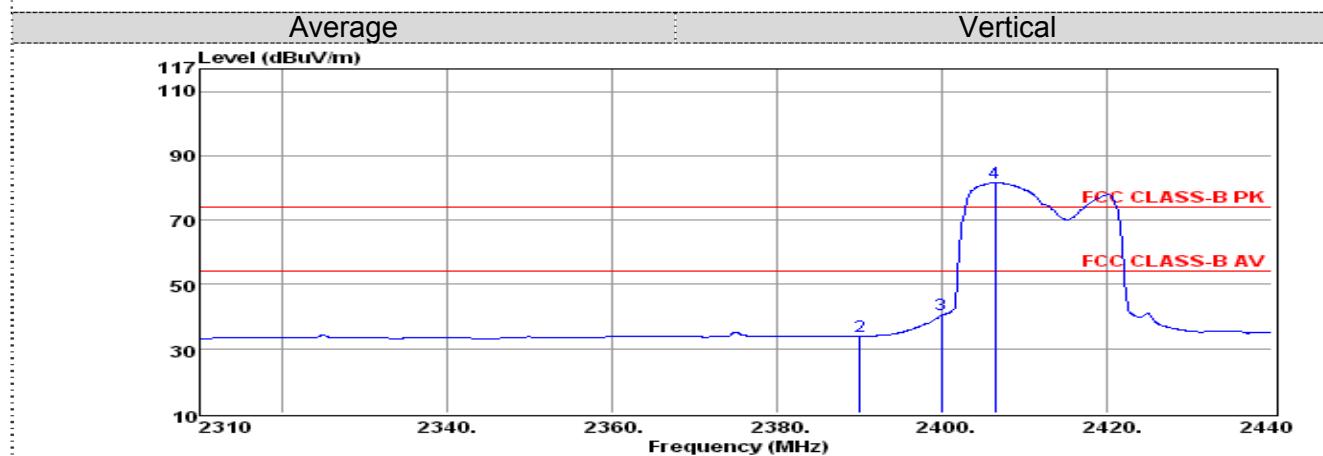
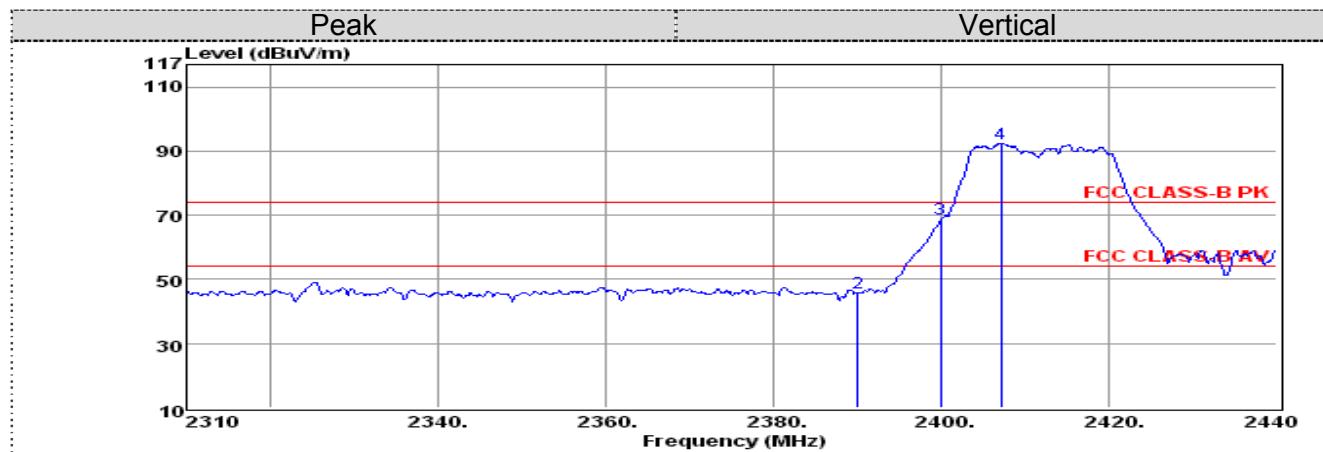


No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.50	51.61	-4.27	47.34	74.00	-26.66	Peak
2	2500.00	53.65	-4.30	49.35	74.00	-24.65	Peak
3	2483.50	38.96	-4.27	34.69	54.00	-19.31	Average
4	2500.00	39.53	-4.30	35.23	54.00	-18.77	Average

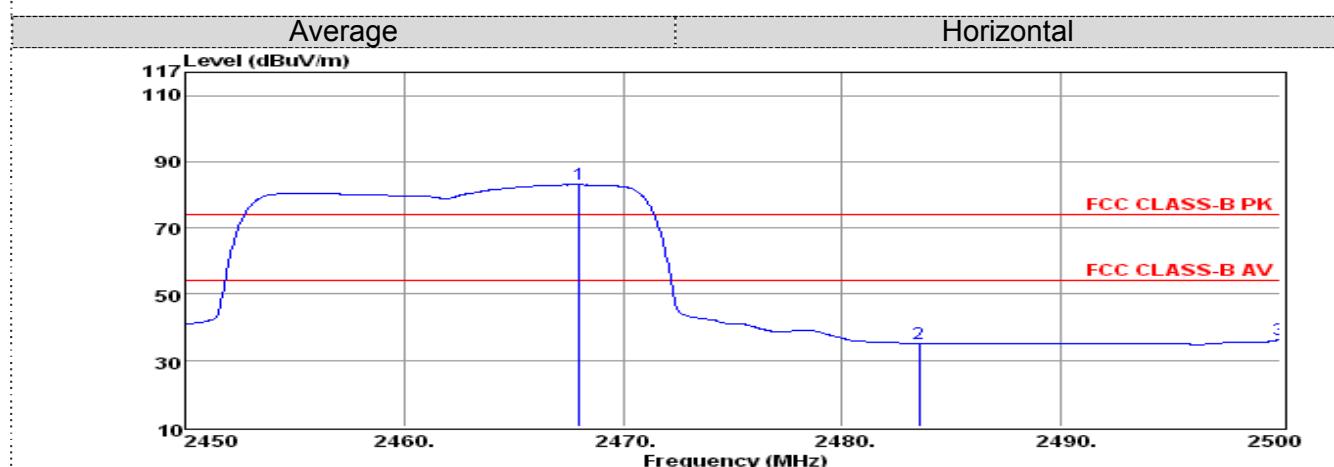
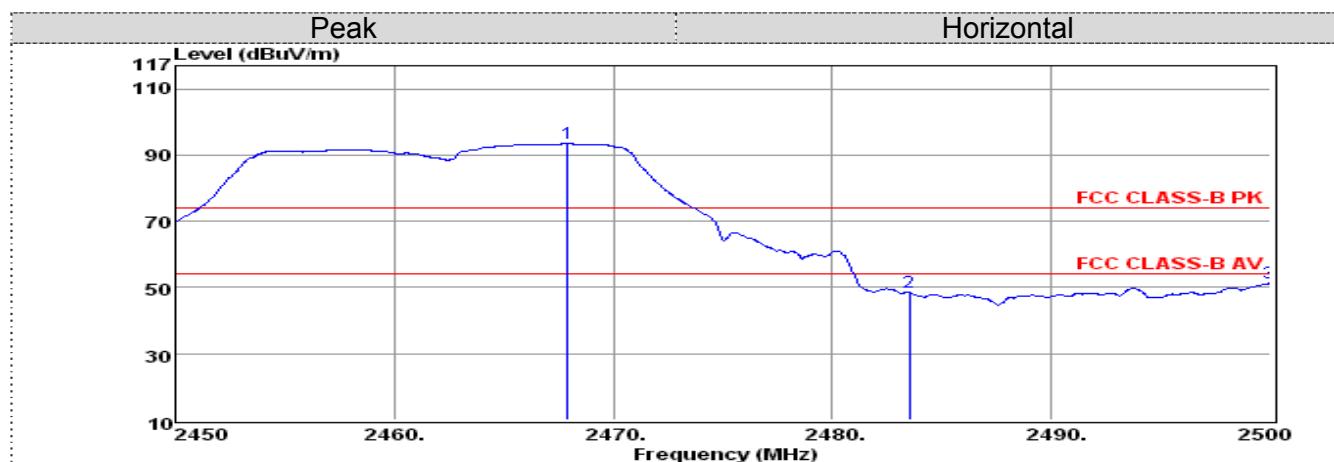
### Test Plot of IEEE 802.11n-HT20(2412MHz)-Chain 0+Chain 1



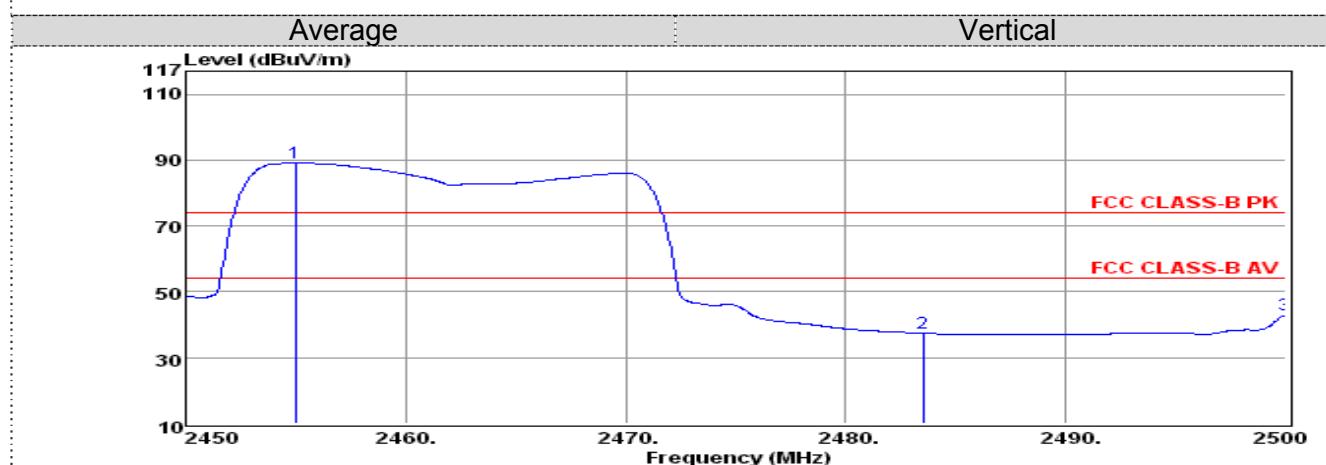
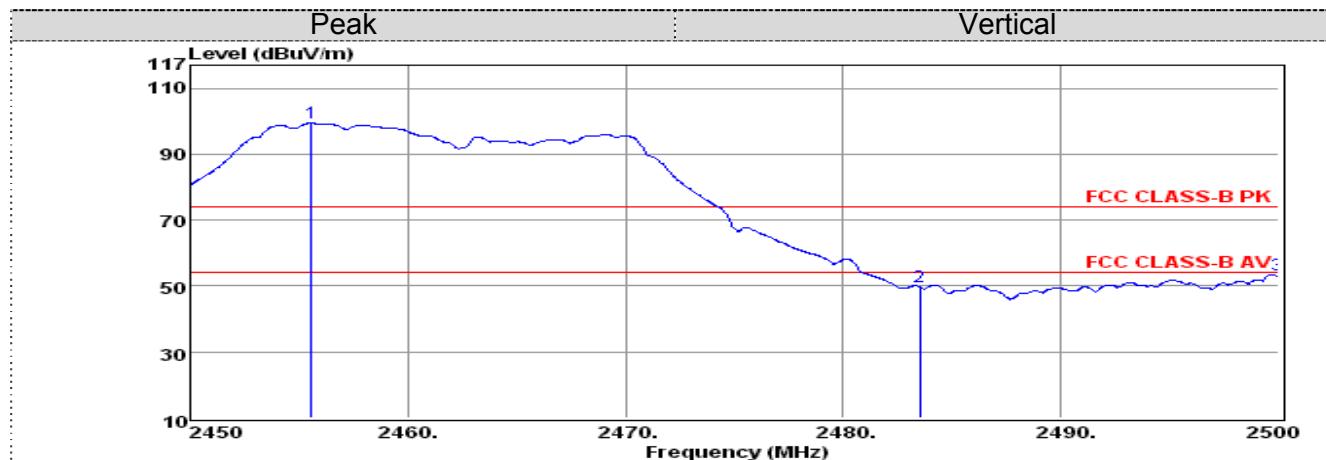
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.00	53.88	-3.99	49.89	74.00	-24.11	Peak
2	2390.00	54.58	-4.11	50.47	74.00	-23.53	Peak
3	2310.00	41.99	-3.99	38.00	54.00	-16.00	Average
4	2390.00	42.93	-4.11	38.82	54.00	-15.18	Average



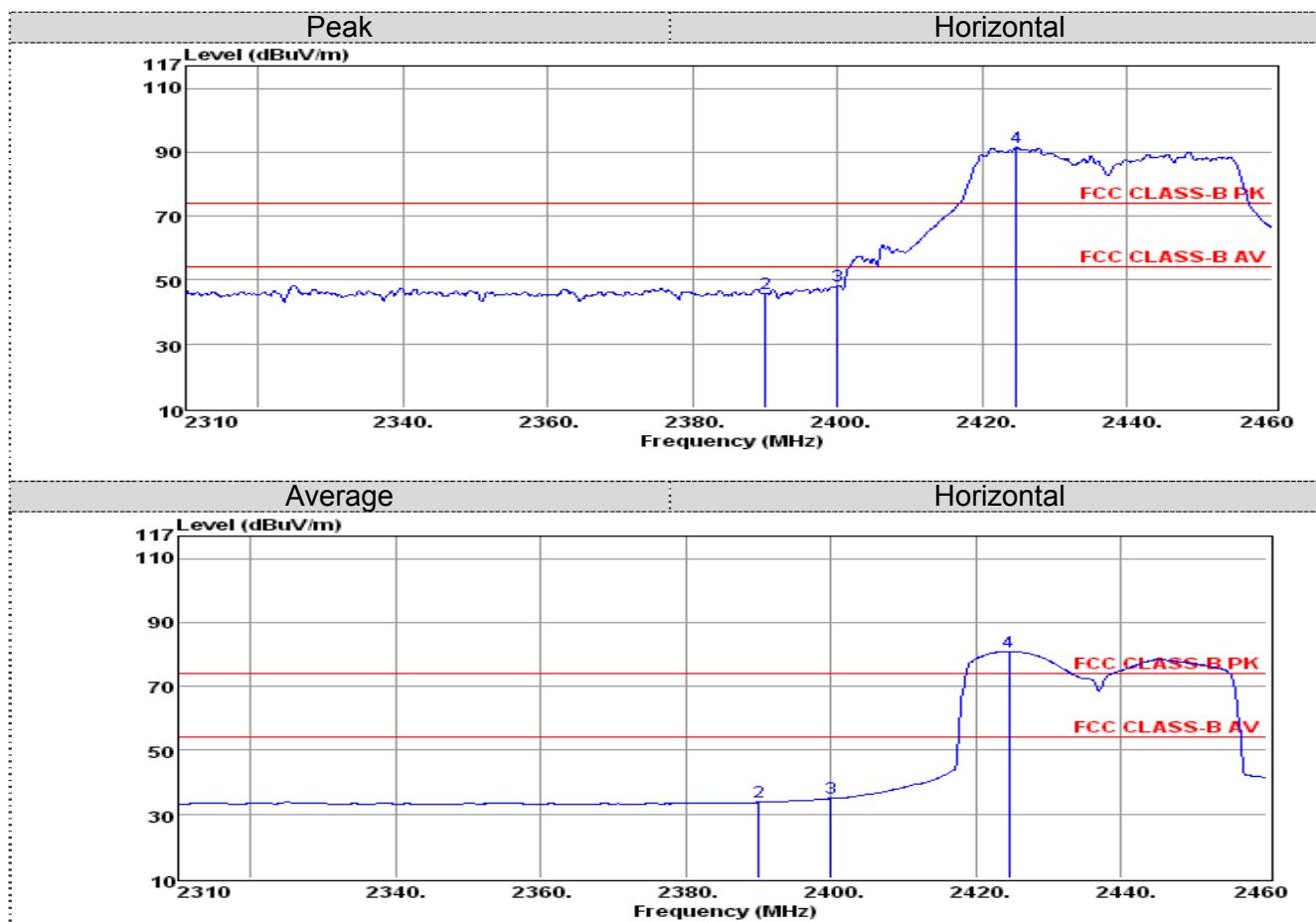
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.00	50.55	-3.99	46.56	74.00	-27.44	Peak
2	2390.00	49.85	-4.11	45.74	74.00	-28.26	Peak
3	2310.00	37.22	-3.99	33.23	54.00	-20.77	Average
4	2390.00	37.93	-4.11	33.82	54.00	-20.18	Average

**Test Plot of IEEE 802.11n-HT20(2462MHz)-Chain 0+Chain 1**

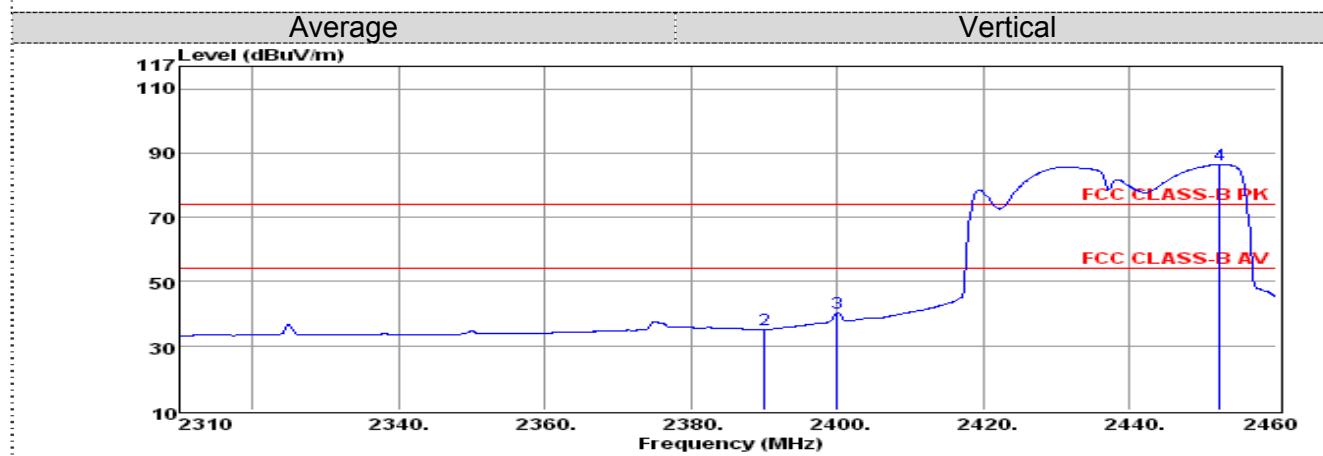
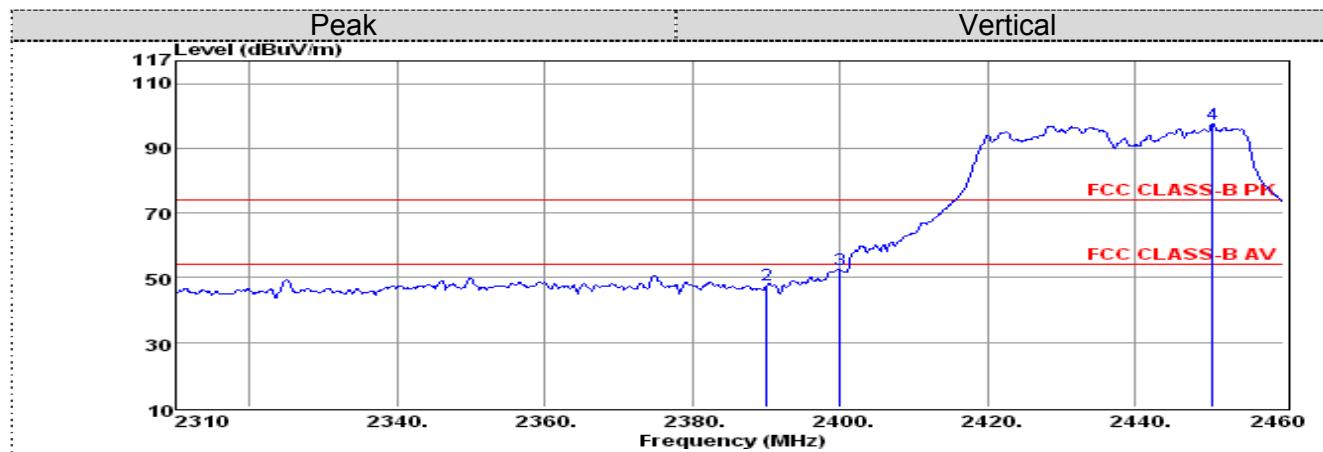
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.50	52.74	-4.27	48.47	74.00	-25.53	Peak
2	2500.00	55.50	-4.30	51.20	74.00	-22.80	Peak
3	2483.50	39.29	-4.27	35.02	54.00	-18.98	Average
4	2500.00	40.41	-4.30	36.11	54.00	-17.89	Average



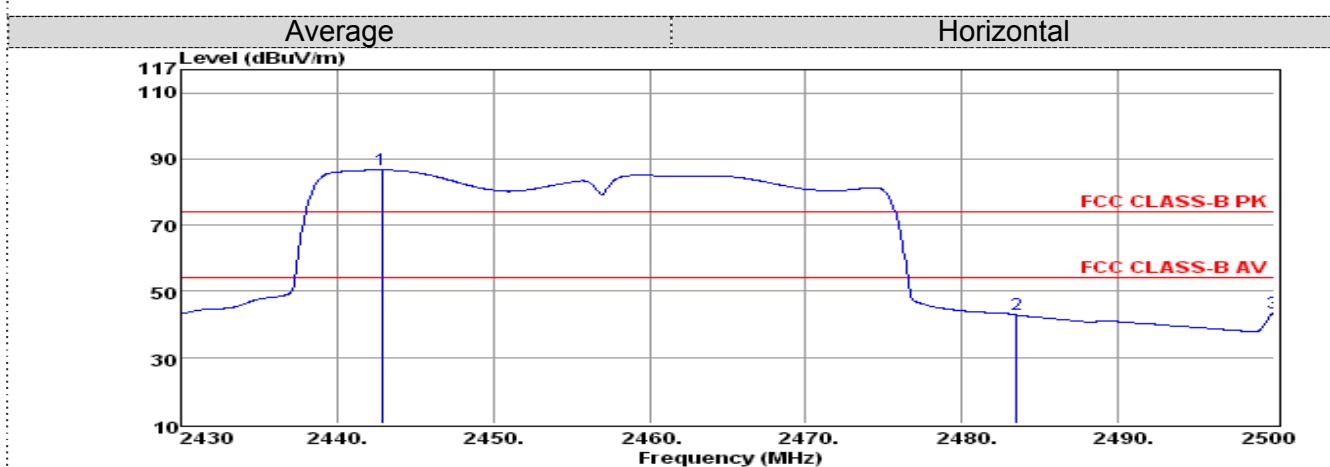
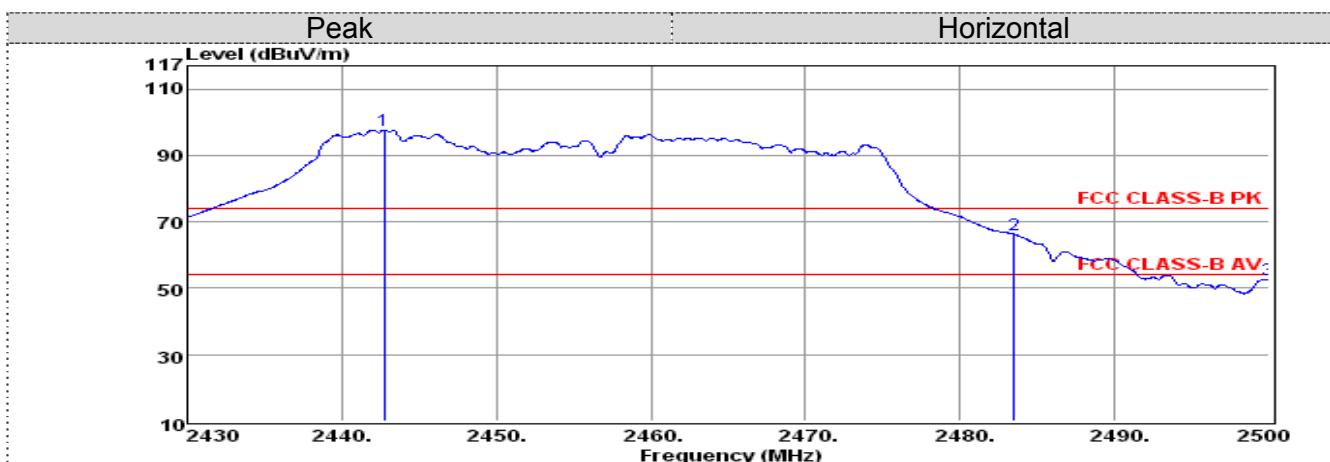
No.	Frequency (MHz)	Reading (dBuV)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.50	54.10	-4.27	49.83	74.00	-24.17	Peak
2	2500.00	57.49	-4.30	53.19	74.00	-20.81	Peak
3	2483.50	41.61	-4.27	37.34	54.00	-16.66	Average
4	2500.00	47.13	-4.30	42.83	54.00	-11.17	Average

**Test Plot of IEEE 802.11n-HT40(2422MHz)-Chain 0+Chain 1**

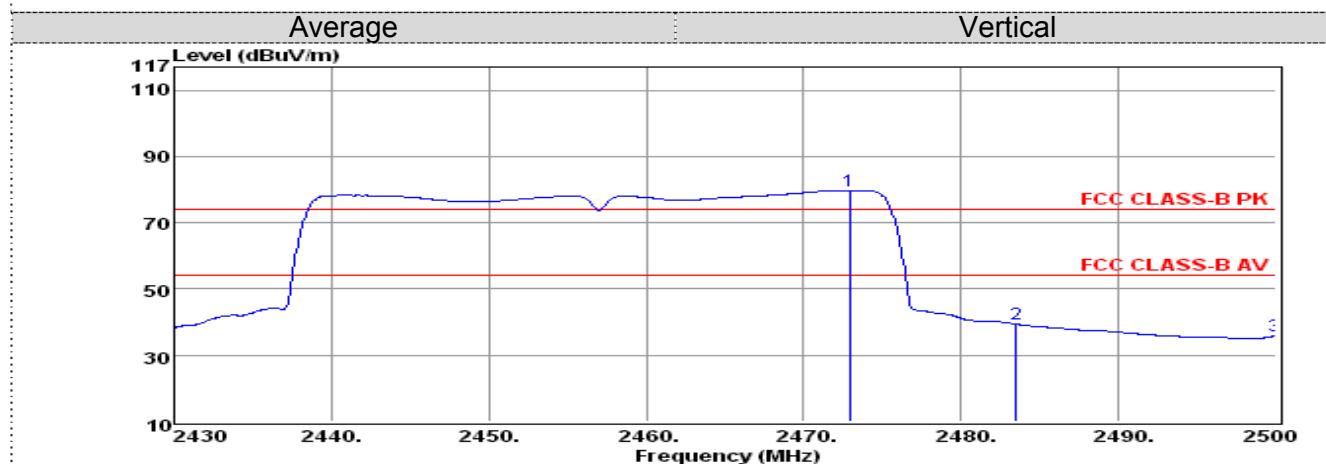
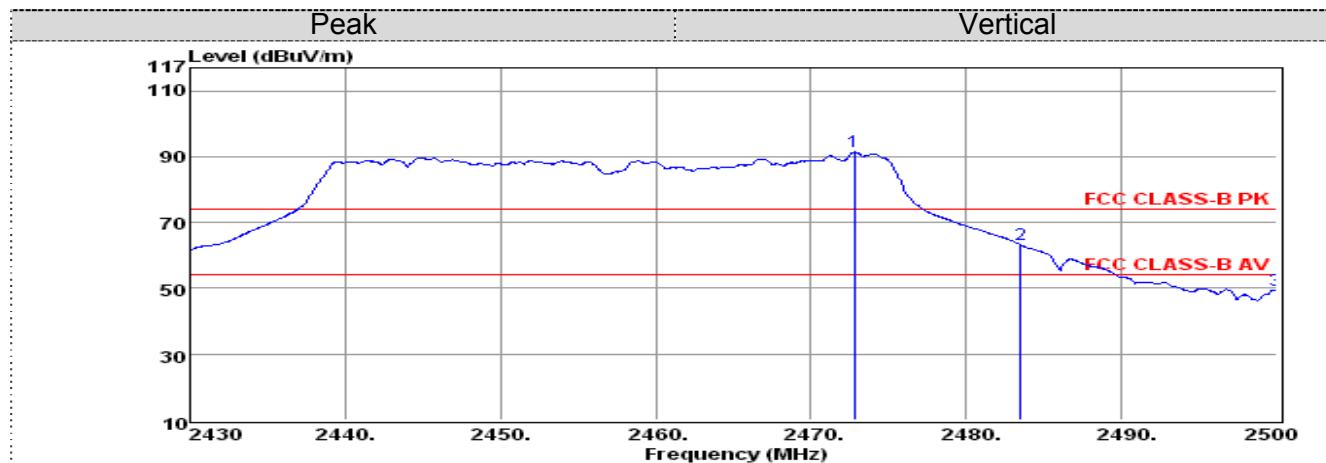
No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.00	50.89	-3.99	46.90	74.00	-27.10	Peak
2	2390.00	49.89	-4.11	45.78	74.00	-28.22	Peak
3	2310.00	37.23	-3.99	33.24	54.00	-20.76	Average
4	2390.00	37.79	-4.11	33.68	54.00	-20.32	Average



No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.00	49.67	-3.99	45.68	74.00	-28.32	Peak
2	2390.00	51.93	-4.11	47.82	74.00	-26.18	Peak
3	2310.00	37.23	-3.99	33.24	54.00	-20.76	Average
4	2390.00	39.16	-4.11	35.05	54.00	-18.95	Average

**Test Plot of IEEE 802.11n-HT40(2452MHz)-Chain 0+Chain 1**

No.	Frequency (MHz)	Reading (dBuv)	Corrected (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.50	70.51	-4.27	66.24	74.00	-7.76	Peak
2	2500.00	56.69	-4.30	52.39	74.00	-21.61	Peak
3	2483.50	47.10	-4.27	42.83	54.00	-11.17	Average
4	2500.00	47.71	-4.30	43.41	54.00	-10.59	Average



No.	Frequency (MHz)	Reading (dB <sub>UV</sub> )	Corrected (dB/m)	Result (dB <sub>UV</sub> /m)	Limit (dB <sub>UV</sub> /m)	Margin (dB)	Remark
1	2483.50	67.50	-4.27	63.23	74.00	-10.77	Peak
2	2500.00	53.58	-4.30	49.28	74.00	-24.72	Peak
3	2483.50	43.67	-4.27	39.40	54.00	-14.60	Average
4	2500.00	40.06	-4.30	35.76	54.00	-18.24	Average

## 5.6. Conducted Spurious Emissions and Band Edges Test

### 5.6.1. Standard Applicable

According to §15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

### 5.6.2. Measuring Instruments and Setting

Please refer to section 6 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Detector	Peak
Attenuation	Auto
RB / VB (Emission in restricted band)	100KHz/300KHz
RB / VB (Emission in non-restricted band)	100KHz/300KHz

### 5.6.3. Test Procedures

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz

The spectrum from 9kHz to 26.5GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

### 5.6.4. Test Setup Layout

This test setup layout is the same as that shown in section 5.4.4.

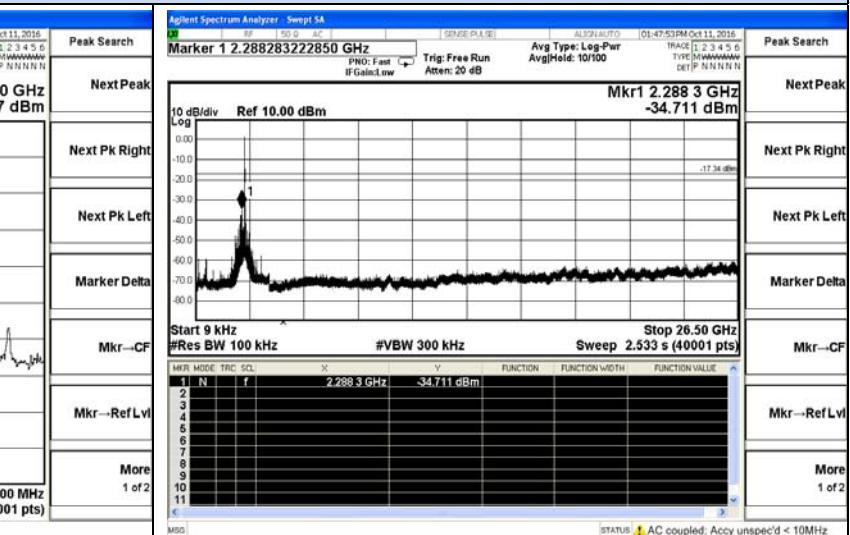
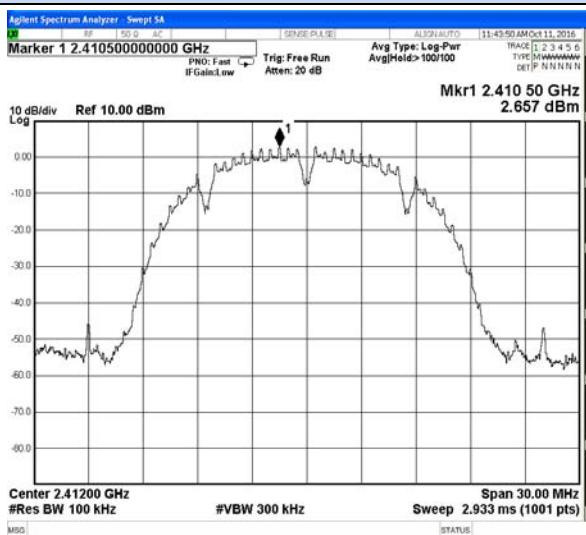
### 5.6.5. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

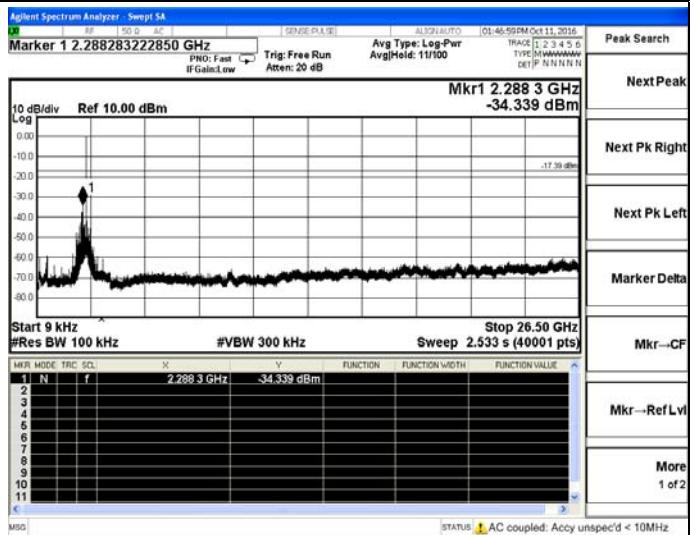
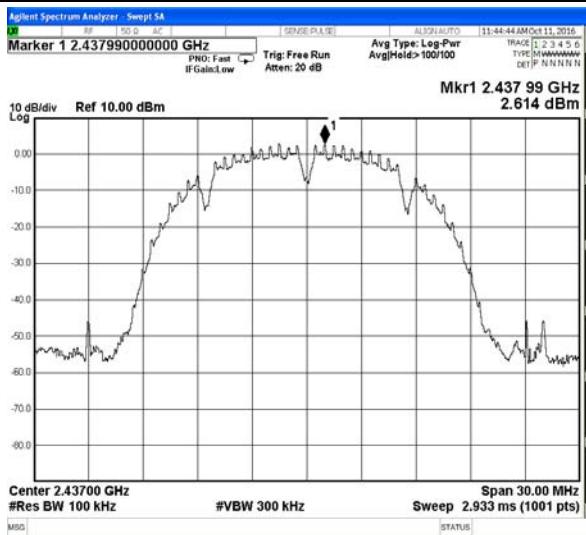
### 5.6.6. Test Results of Conducted Spurious Emissions

## Test plot of Conducted Spurious Emission

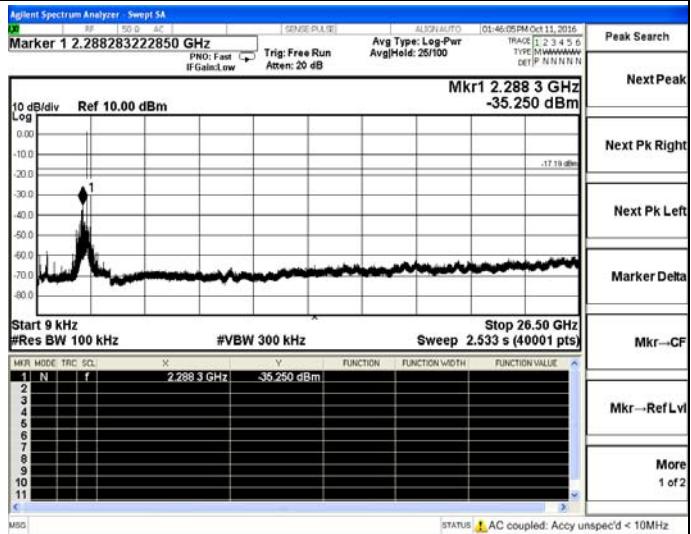
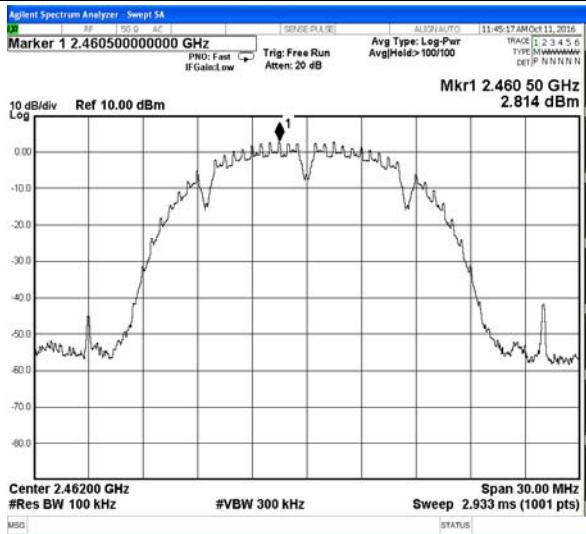
## IEEE 802.11b-Chain 0



## Low channel Reference



## Middle channel Reference

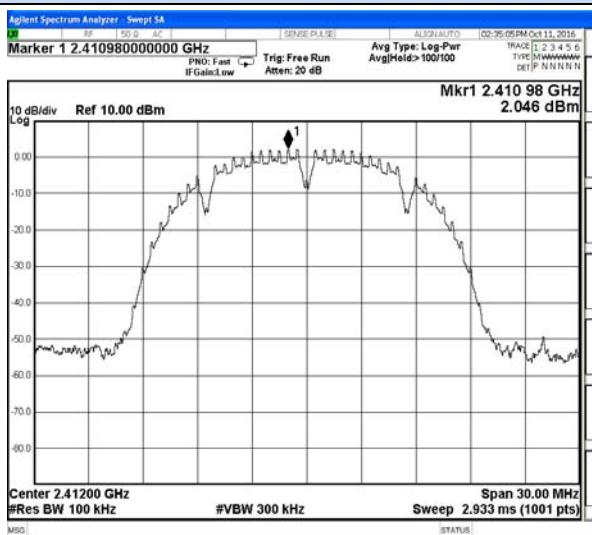


## High channel Reference

## High channel

## Test plot of Conducted Spurious Emission

## IEEE 802.11b-Chain 1



Peak Search

Next Peak

Next Pk Right

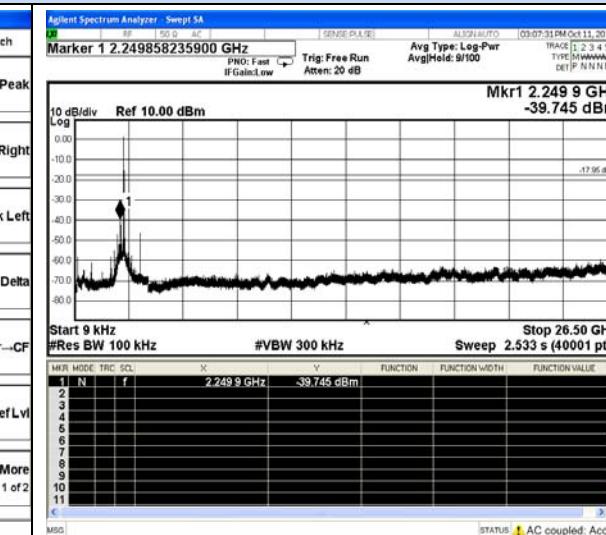
Next Pk Left

Marker Delta

Mkr--CF

Mkr--Ref Lvl

More 1 of 2



Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

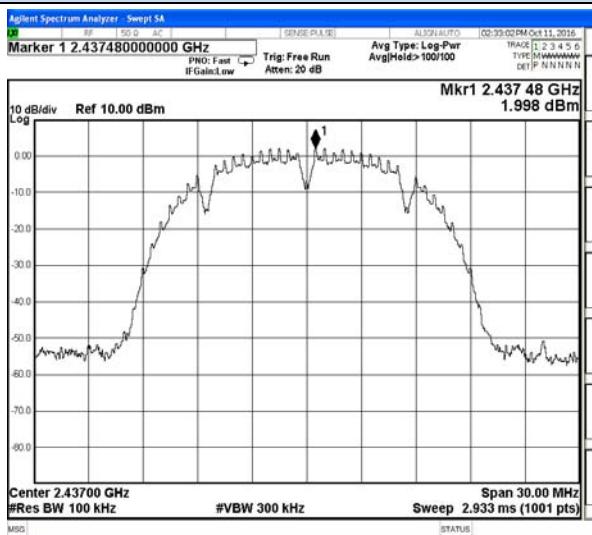
Mkr--CF

Mkr--Ref Lvl

More 1 of 2

## Low channel Reference

## Low channel



Peak Search

Next Peak

Next Pk Right

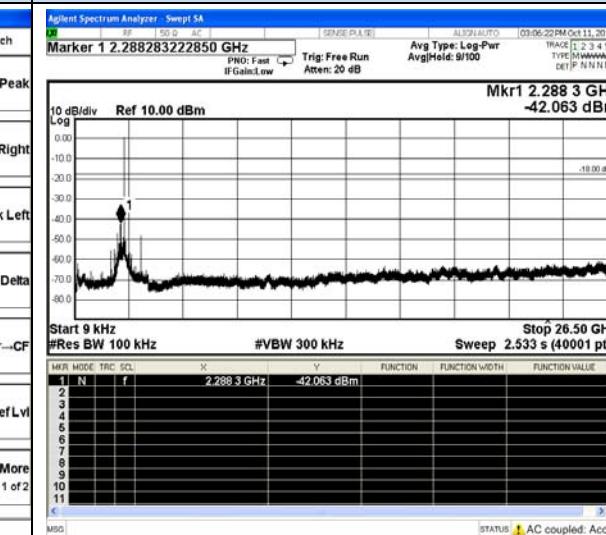
Next Pk Left

Marker Delta

Mkr--CF

Mkr--Ref Lvl

More 1 of 2



Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

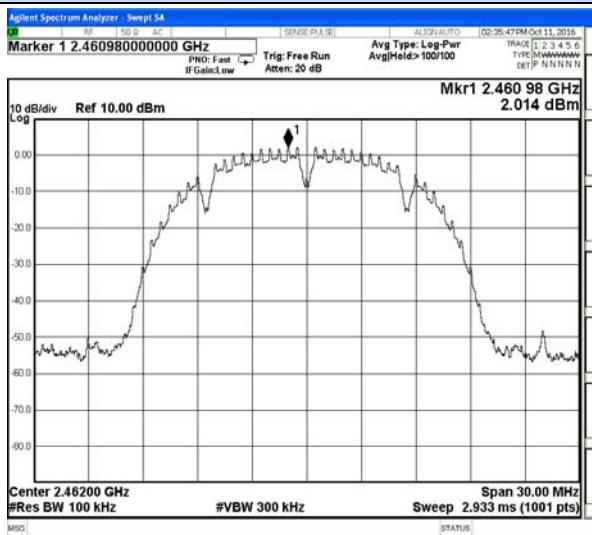
Mkr--CF

Mkr--Ref Lvl

More 1 of 2

## Middle channel Reference

## Middle channel



Peak Search

Next Peak

Next Pk Right

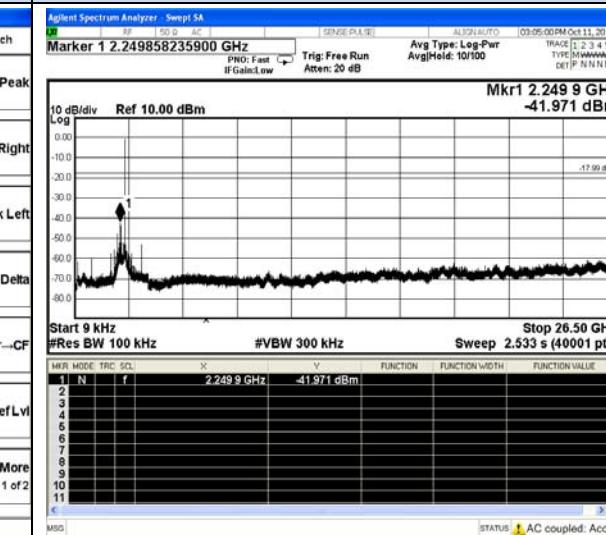
Next Pk Left

Marker Delta

Mkr--CF

Mkr--Ref Lvl

More 1 of 2



Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr--CF

Mkr--Ref Lvl

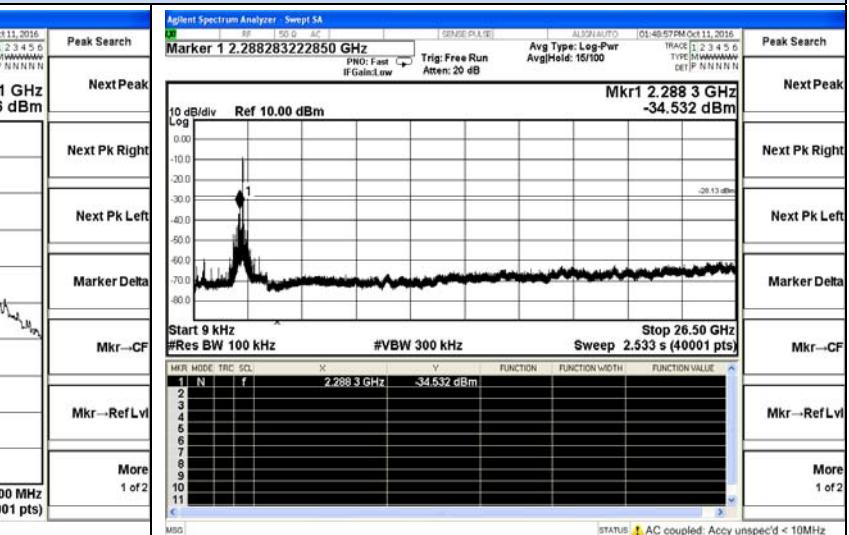
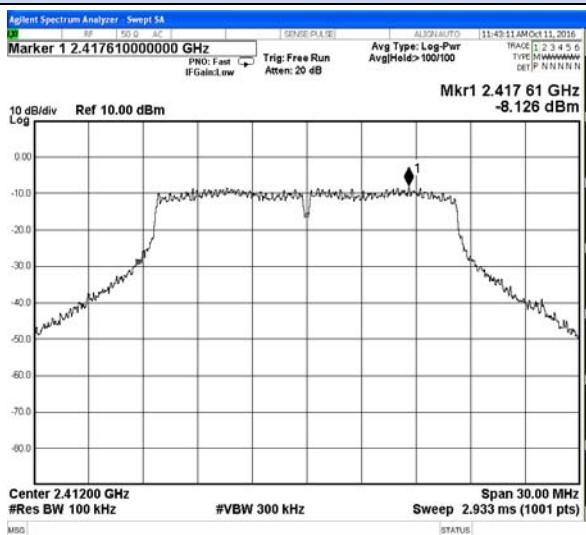
More 1 of 2

## High channel Reference

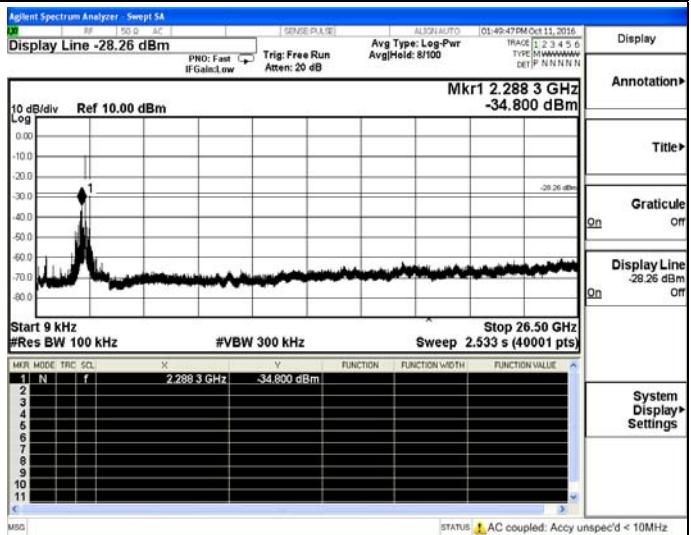
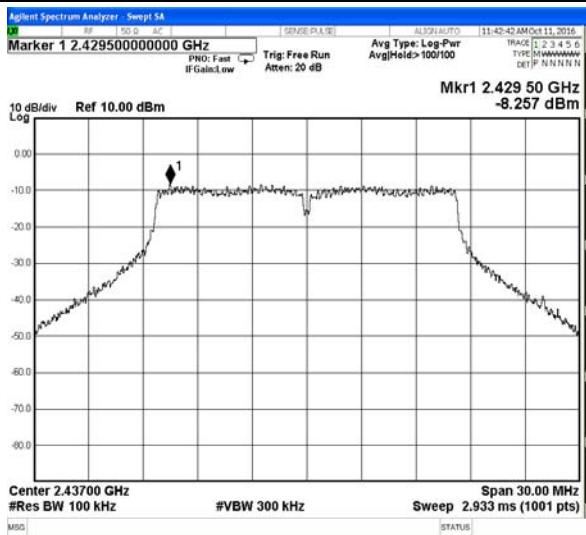
## High channel

## Test plot of Conducted Spurious Emission

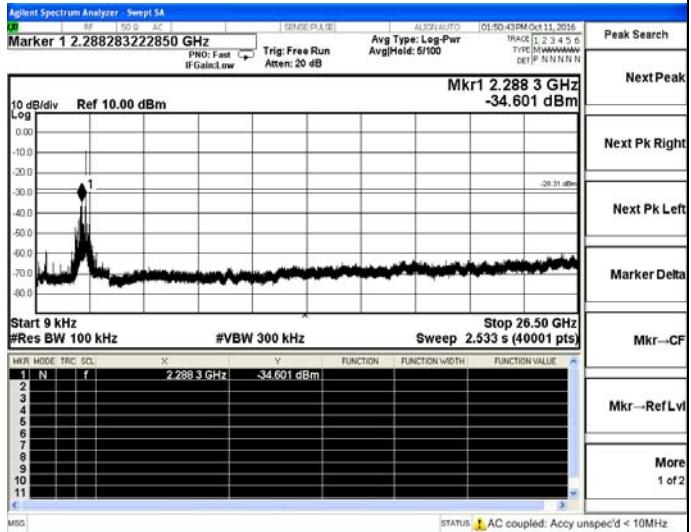
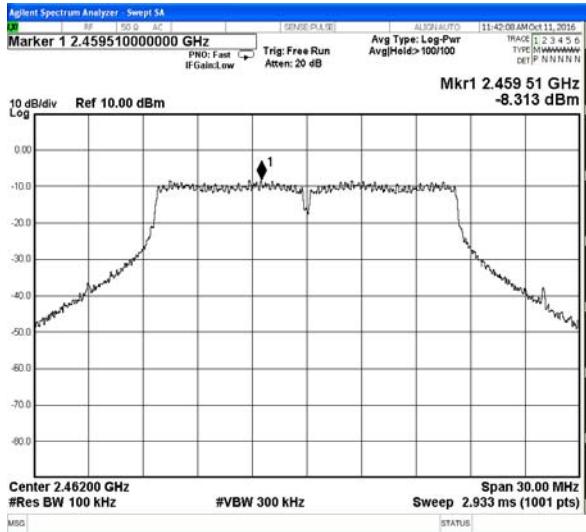
## IEEE 802.11g-Chain 0



## Low channel Reference



## Middle channel Reference

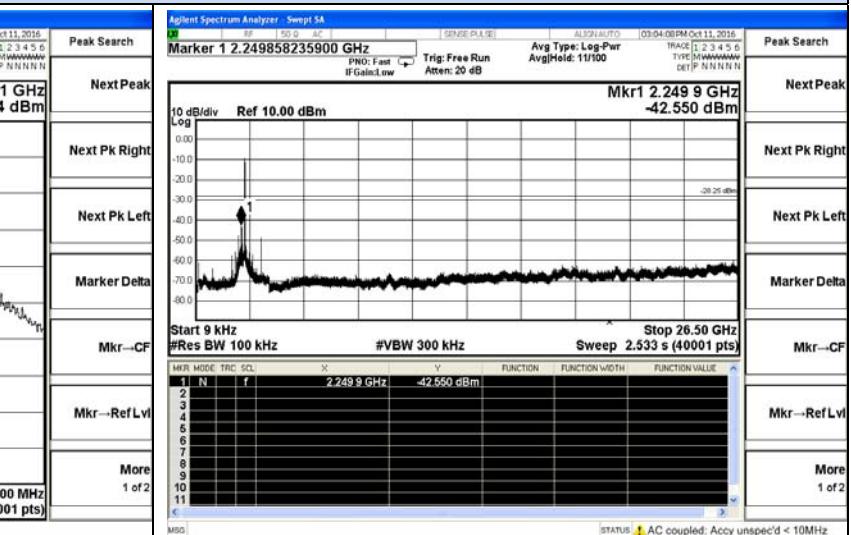
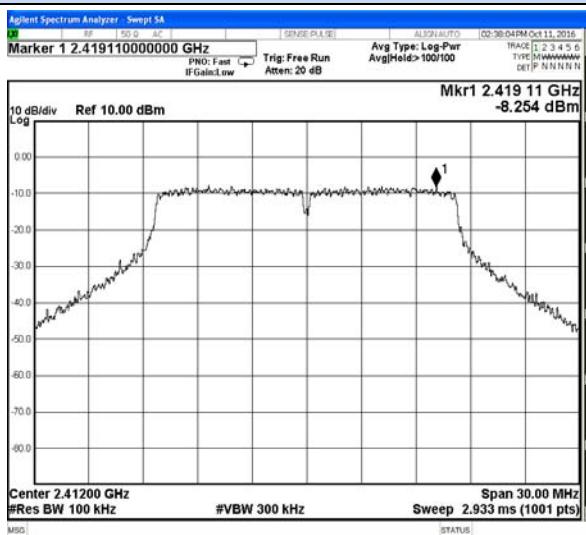


## High channel Reference

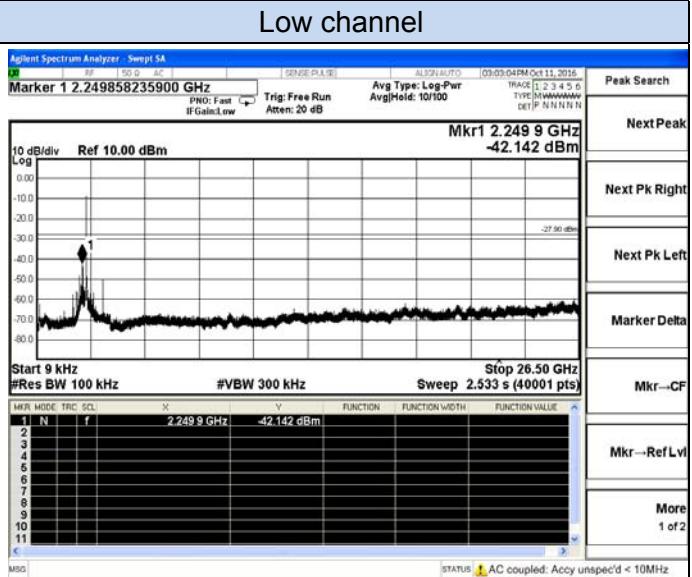
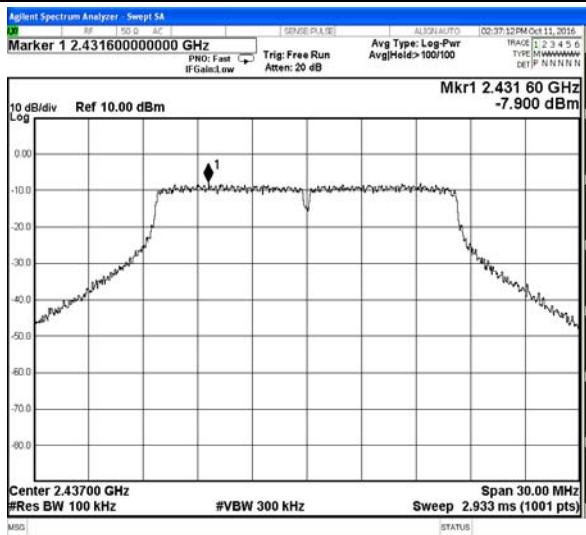
## High channel

## Test plot of Conducted Spurious Emission

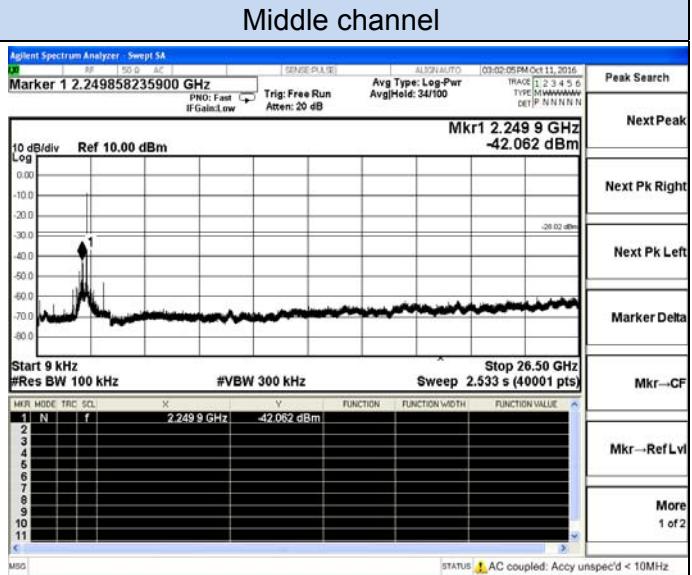
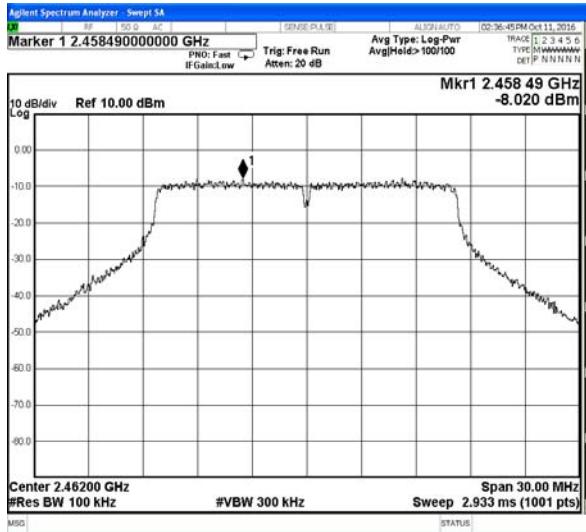
## IEEE 802.11g-Chain 1



## Low channel Reference



## Middle channel Reference

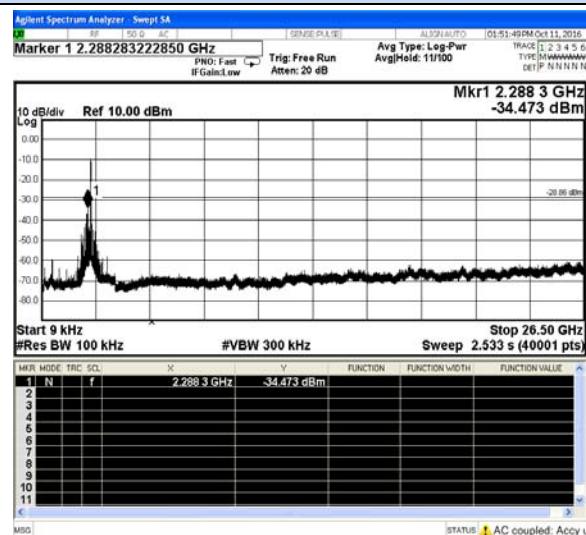
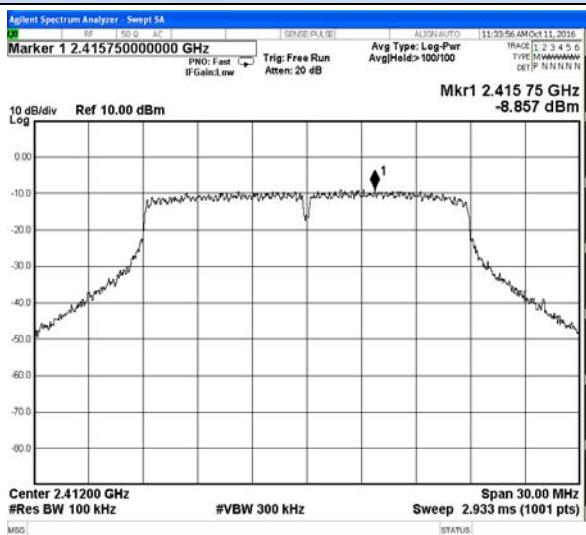


## High channel Reference

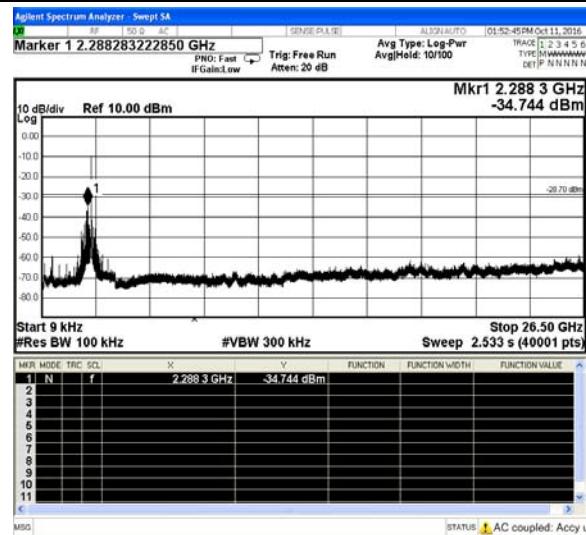
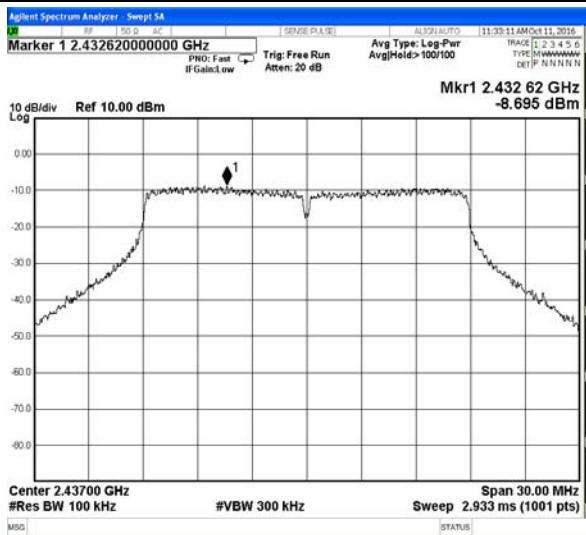
## High channel

## Test plot of Conducted Spurious Emission

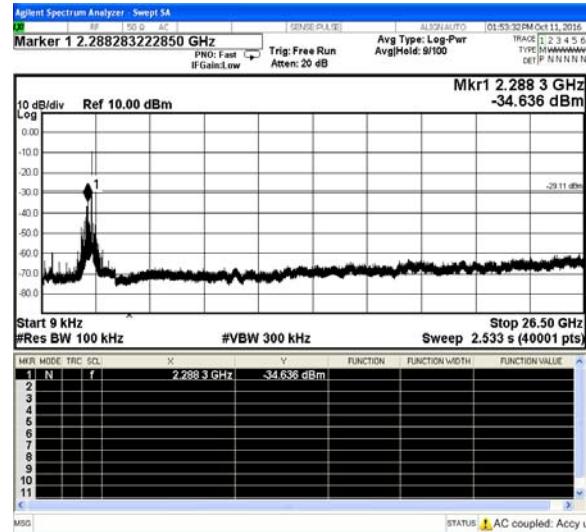
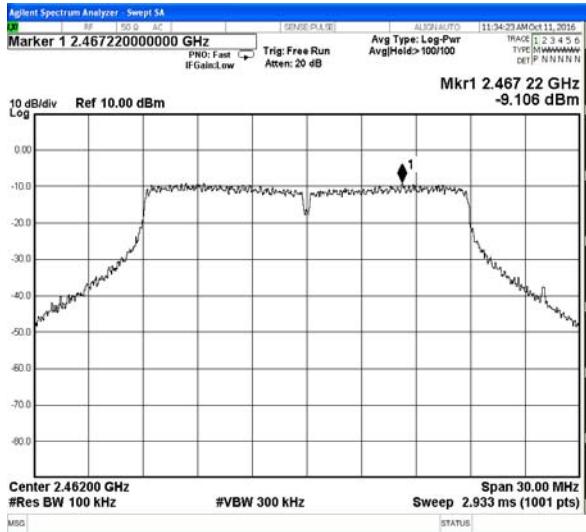
## IEEE 802.11n-HT20-Chain 0



## Low channel Reference



## Middle channel Reference

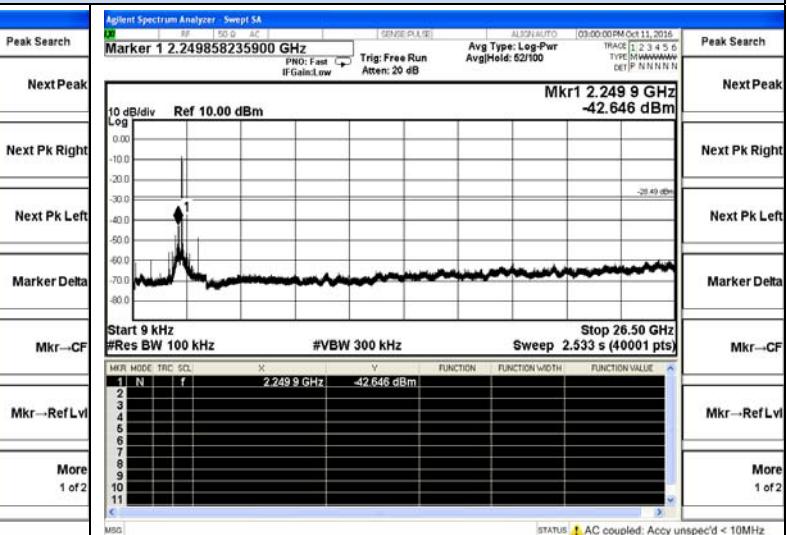
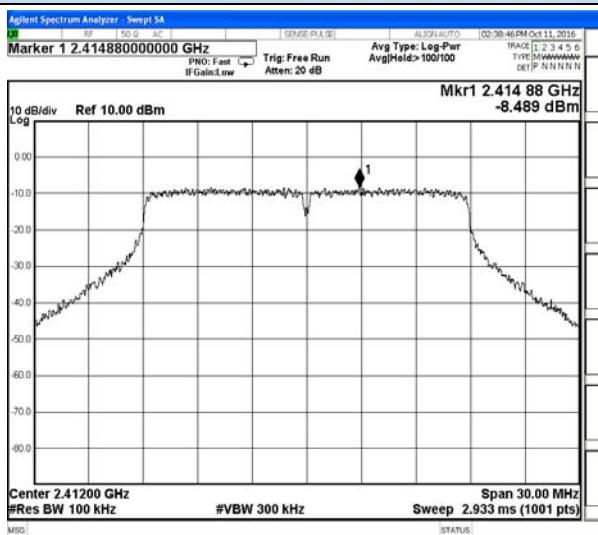


## High channel Reference

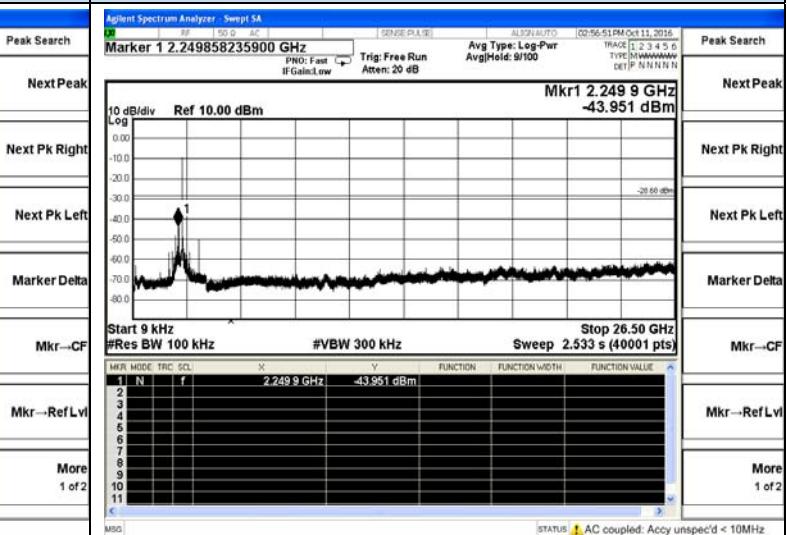
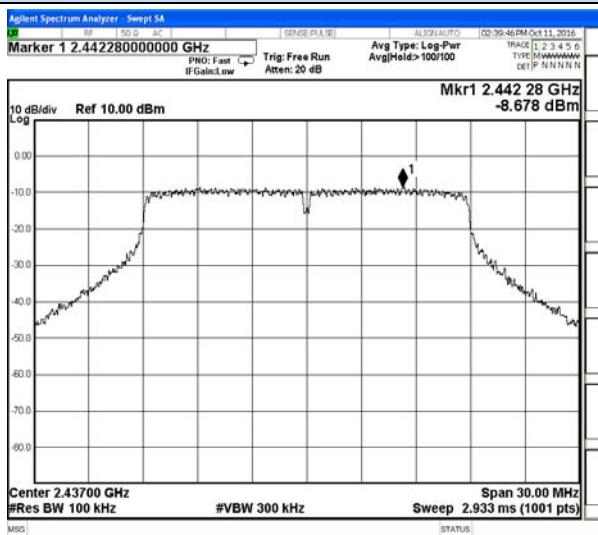
## High channel

## Test plot of Conducted Spurious Emission

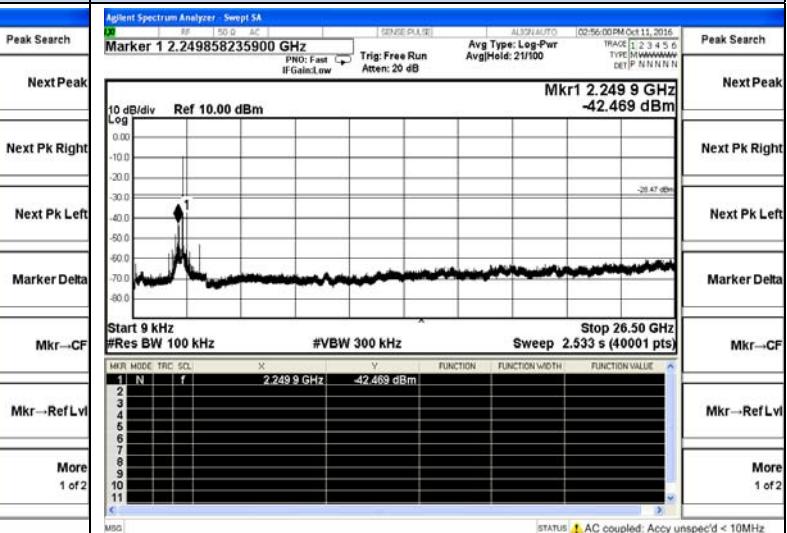
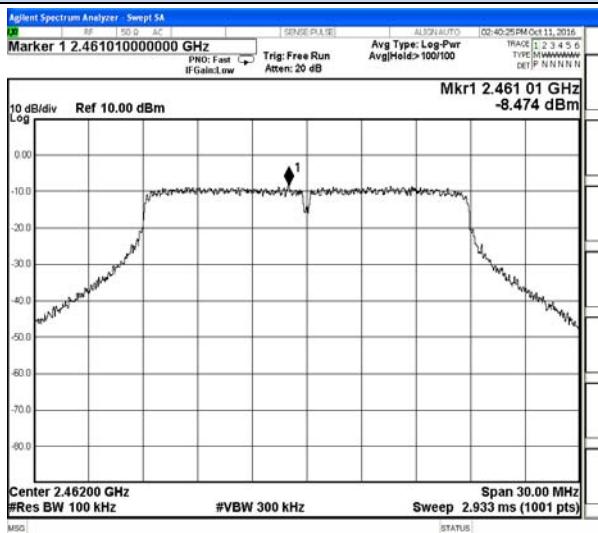
## IEEE 802.11n-HT20-Chain 1



## Low channel Reference



## Middle channel Reference

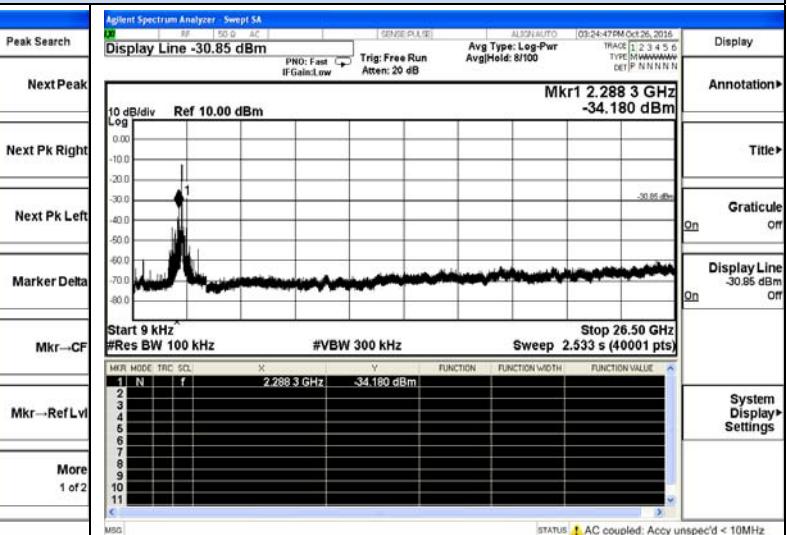
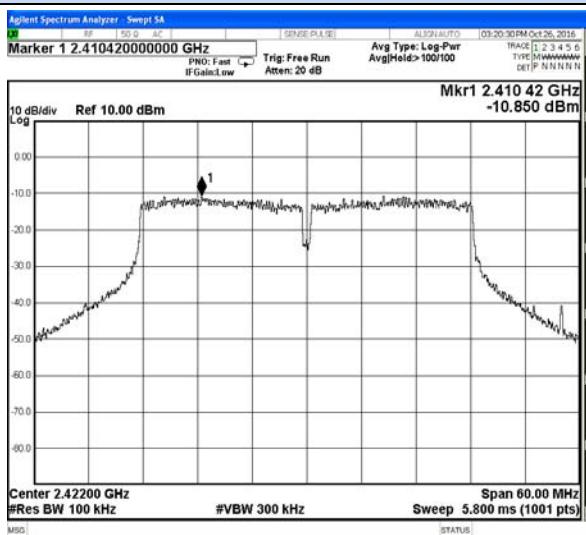


## High channel Reference

## High channel

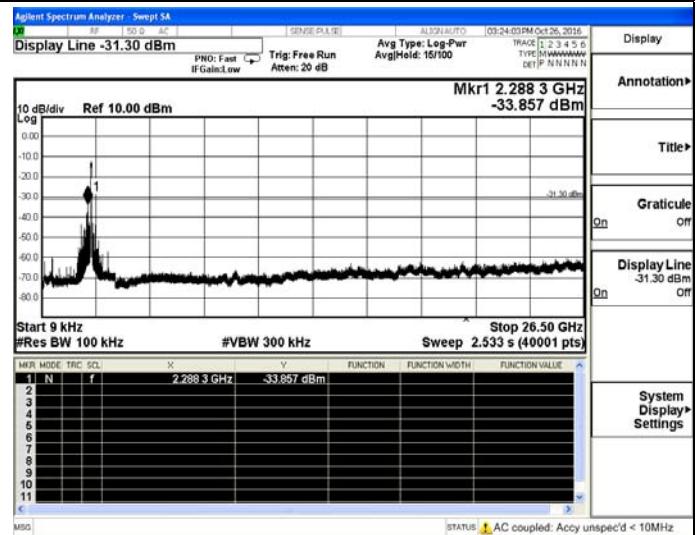
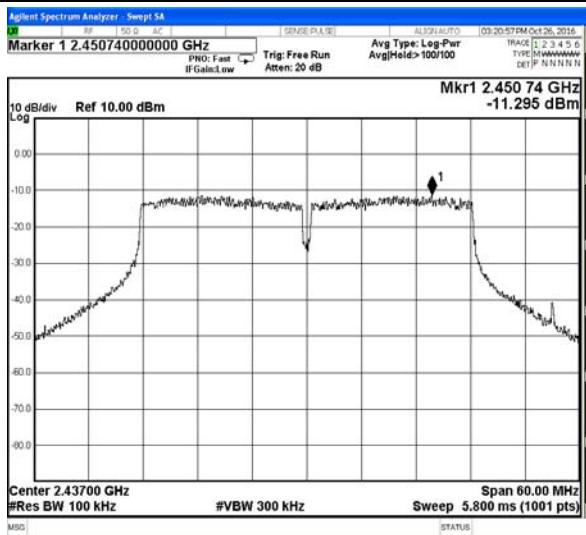
## Test plot of Conducted Spurious Emission

## IEEE 802.11n-HT40-Chain 0



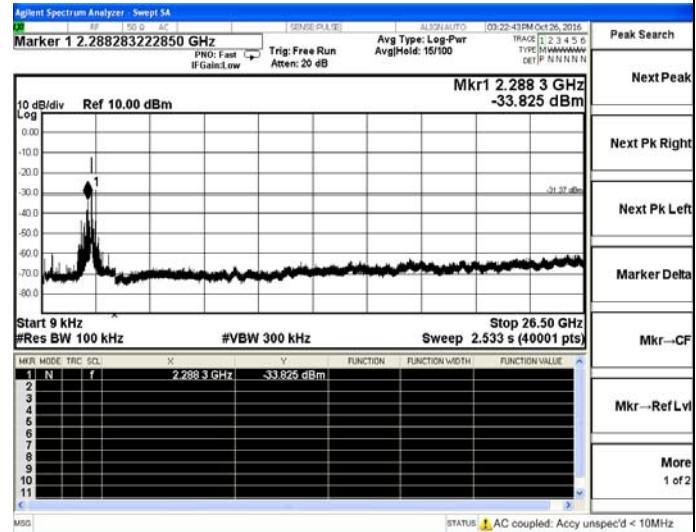
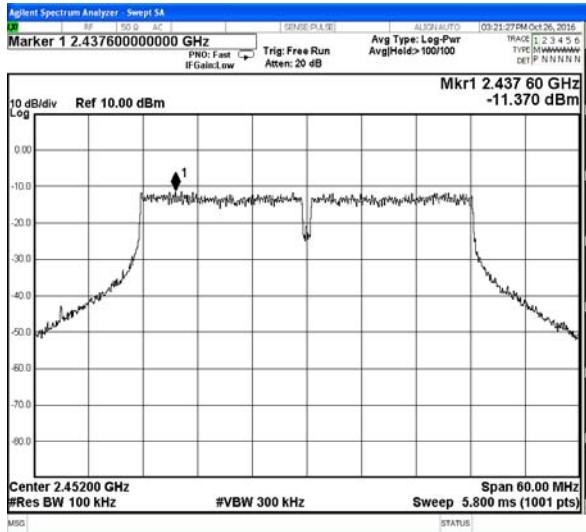
## Low channel Reference

## Low channel



## Middle channel Reference

## Middle channel

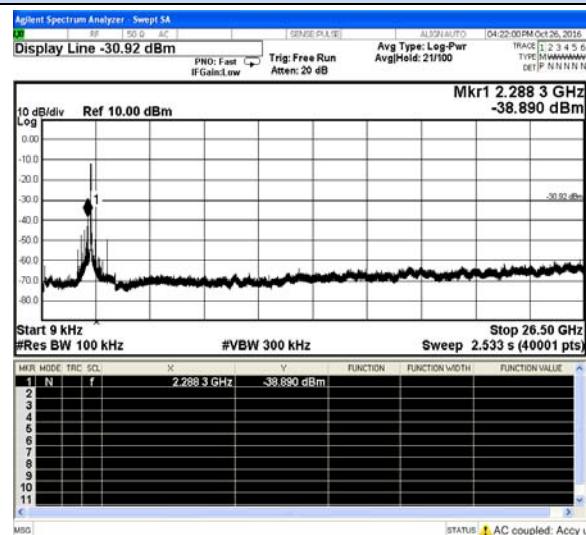
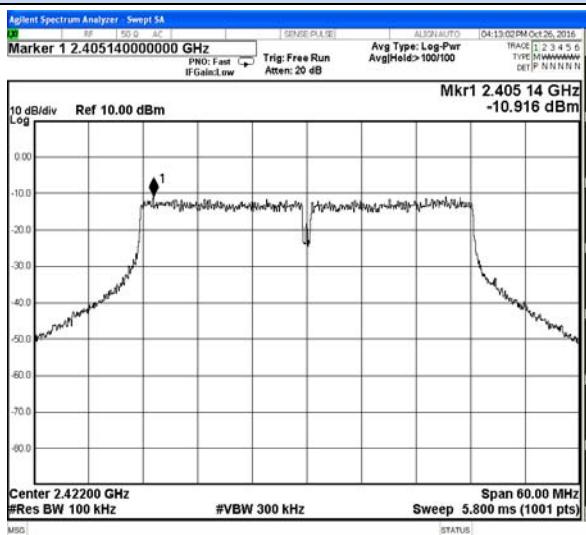


## High channel Reference

## High channel

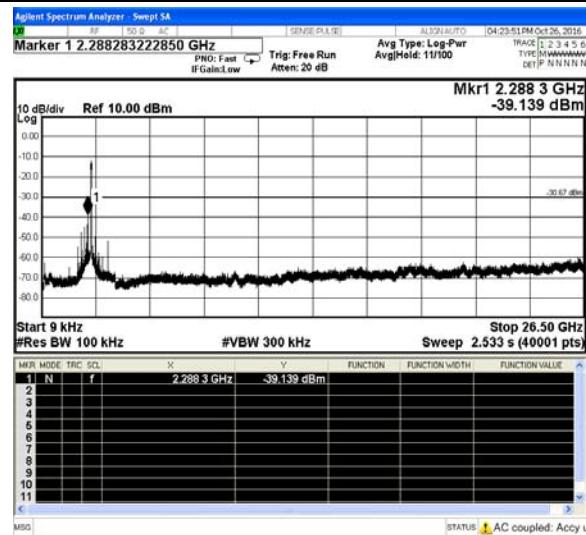
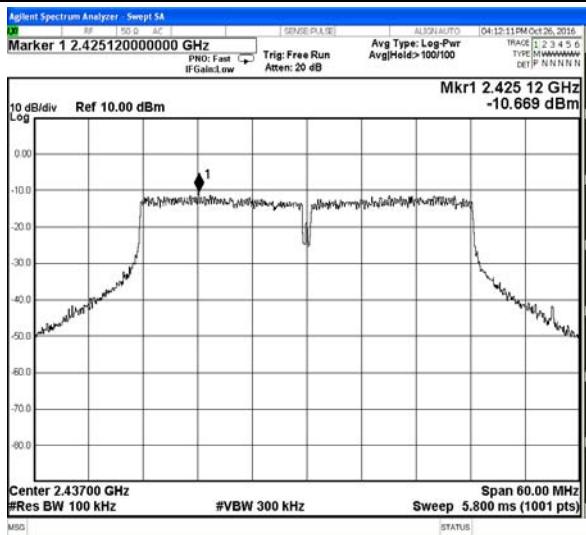
## Test plot of Conducted Spurious Emission

## IEEE 802.11n-HT40-Chain 1



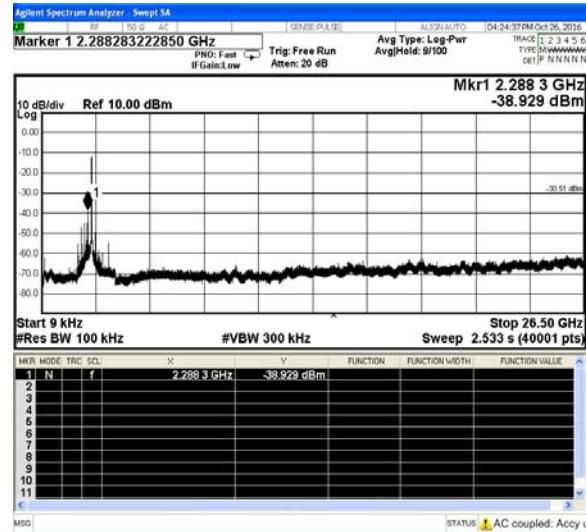
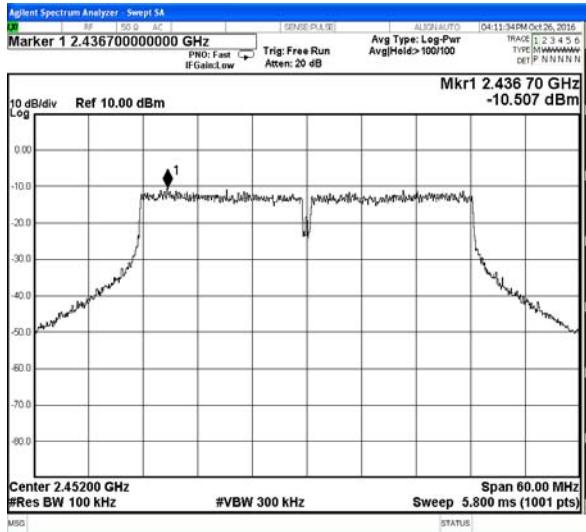
## Low channel Reference

## Low channel



## Middle channel Reference

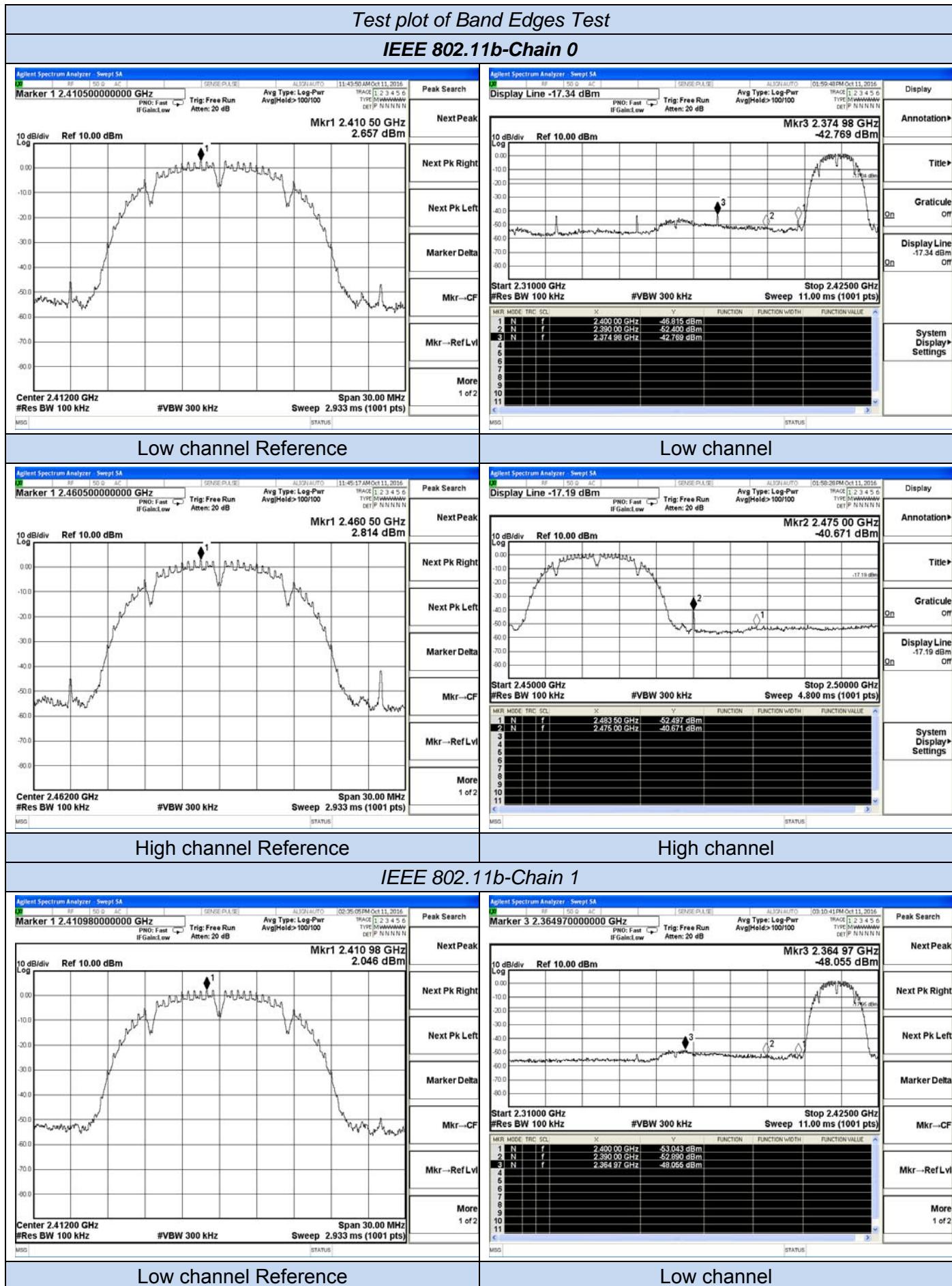
## Middle channel

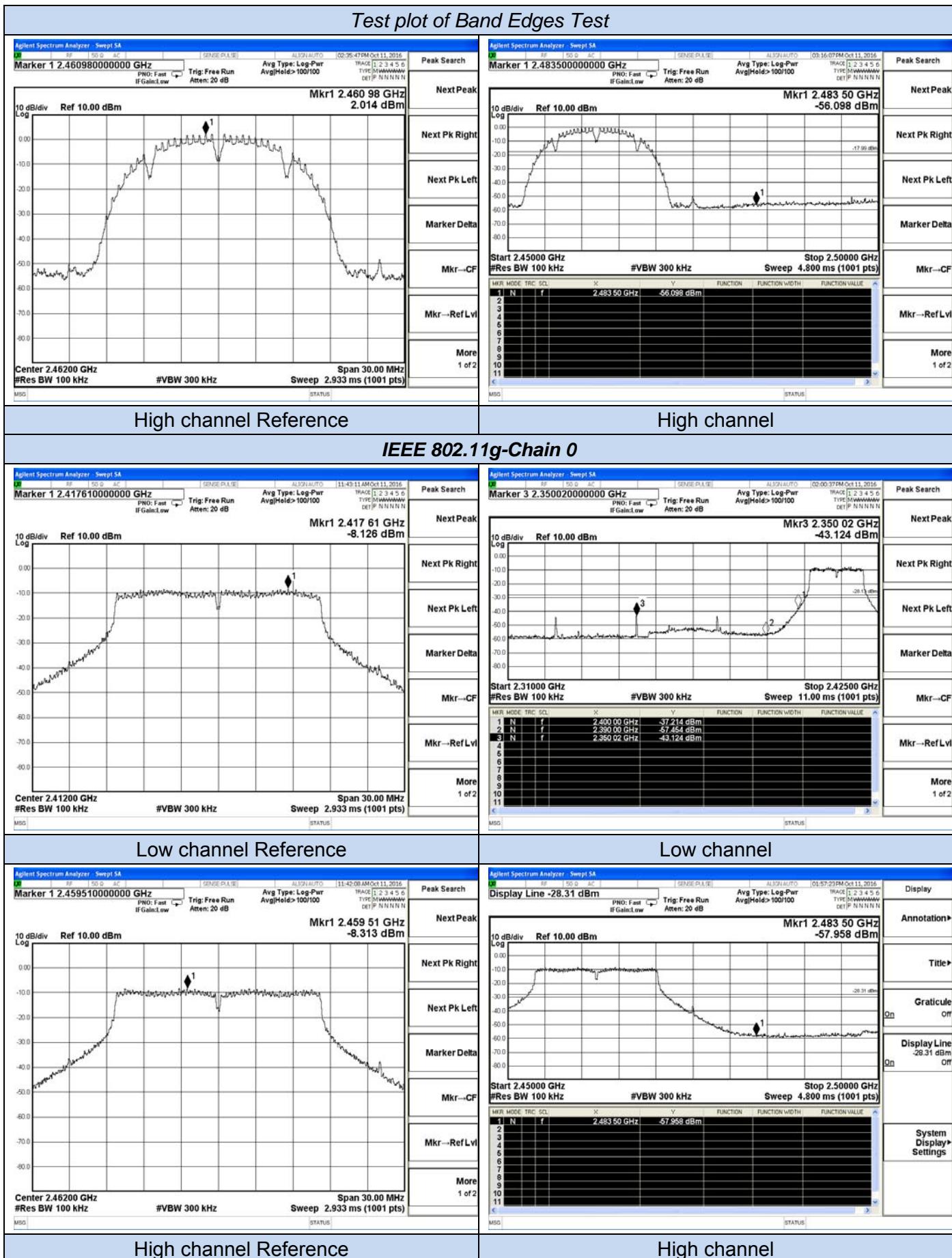


## High channel Reference

## High channel

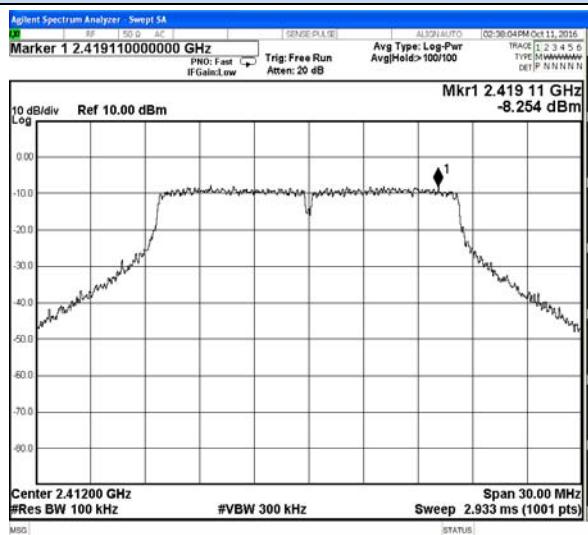
## 5.6.7. Test Results of Band Edges Test





## Test plot of Band Edges Test

## IEEE 802.11g-Chain 1



Peak Search

Next Peak

Next Pk Right

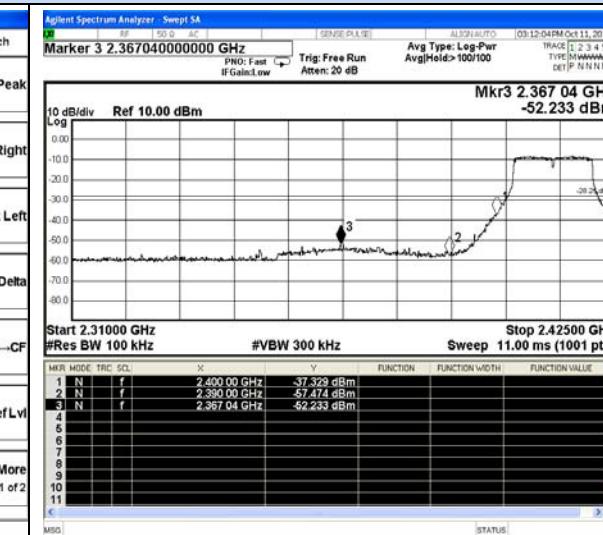
Next Pk Left

Marker Delta

Mkr—CF

Mkr—Ref Lvl

More 1 of 2



Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

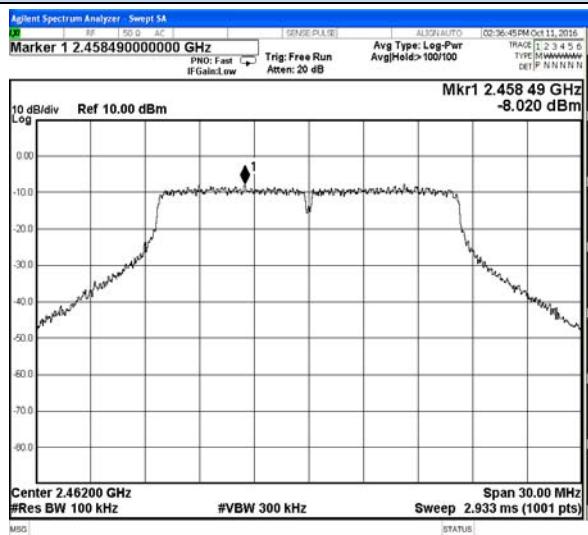
Mkr—CF

Mkr—Ref Lvl

More 1 of 2

## Low channel Reference

## Low channel



Peak Search

Next Peak

Next Pk Right

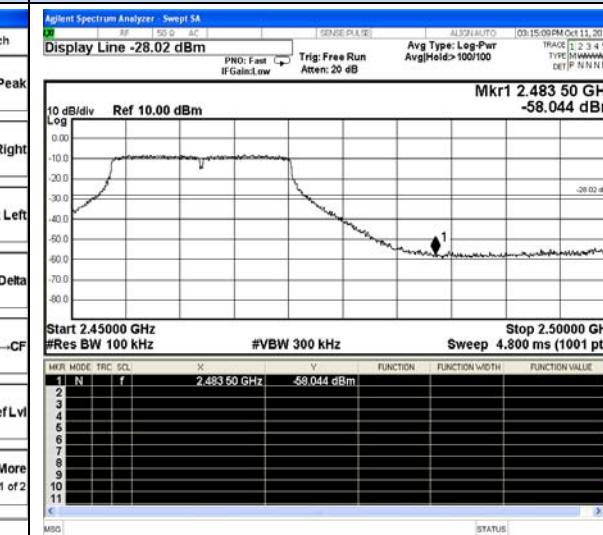
Next Pk Left

Marker Delta

Mkr—CF

Mkr—Ref Lvl

More 1 of 2



Display

Annotation&gt;

Title&gt;

Graticule On

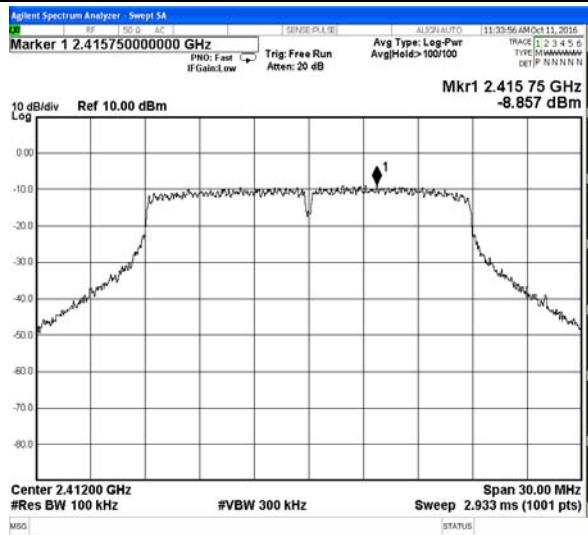
Display Line -28.02 dBm Off

System Display&gt; Settings

## High channel Reference

## High channel

## IEEE 802.11n-HT20-Chain 0



Peak Search

Next Peak

Next Pk Right

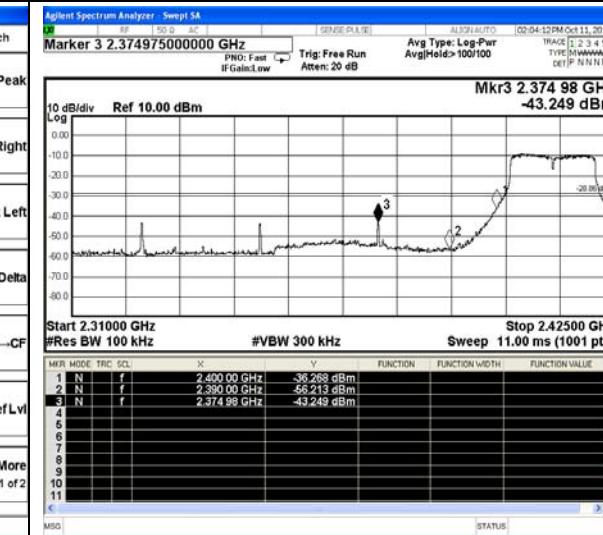
Next Pk Left

Marker Delta

Mkr—CF

Mkr—Ref Lvl

More 1 of 2



Peak Search

Next Peak

Next Pk Right

Next Pk Left

Marker Delta

Mkr—CF

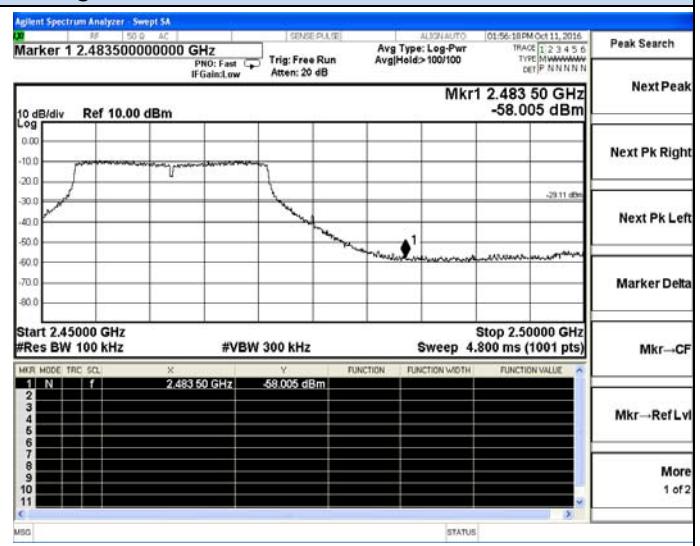
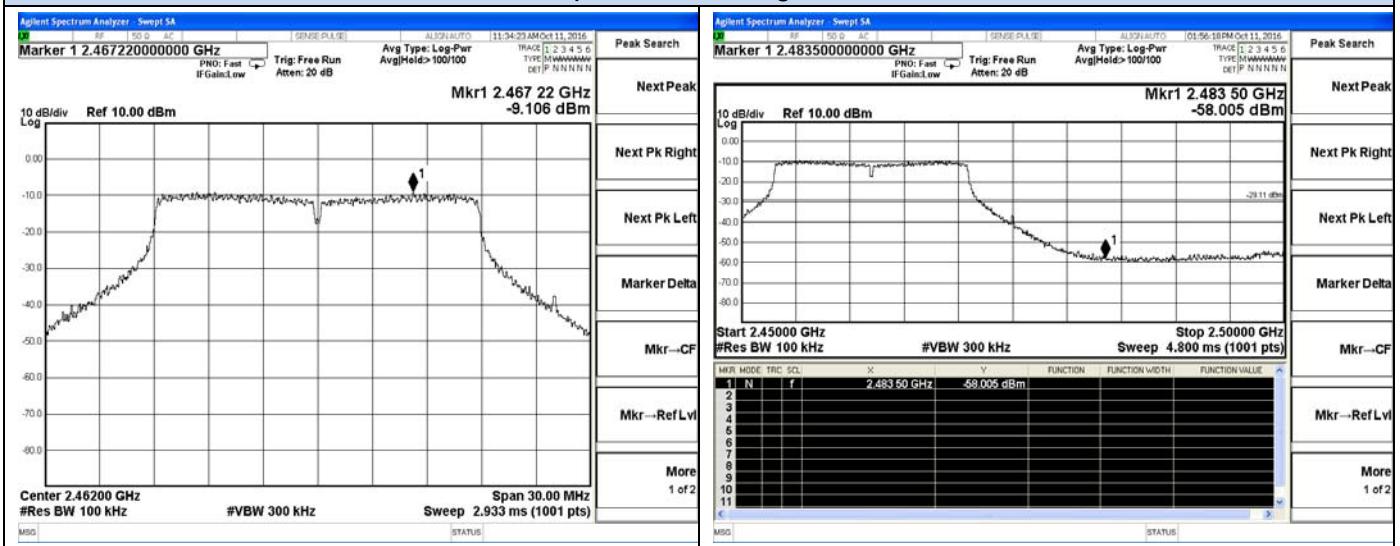
Mkr—Ref Lvl

More 1 of 2

## Low channel Reference

## Low channel

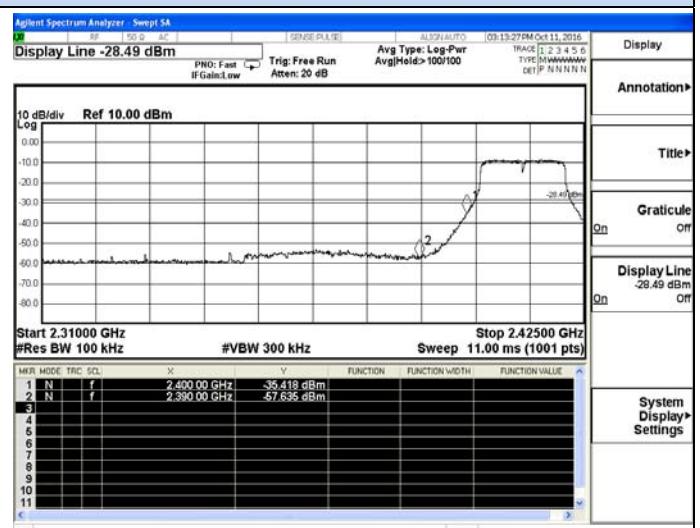
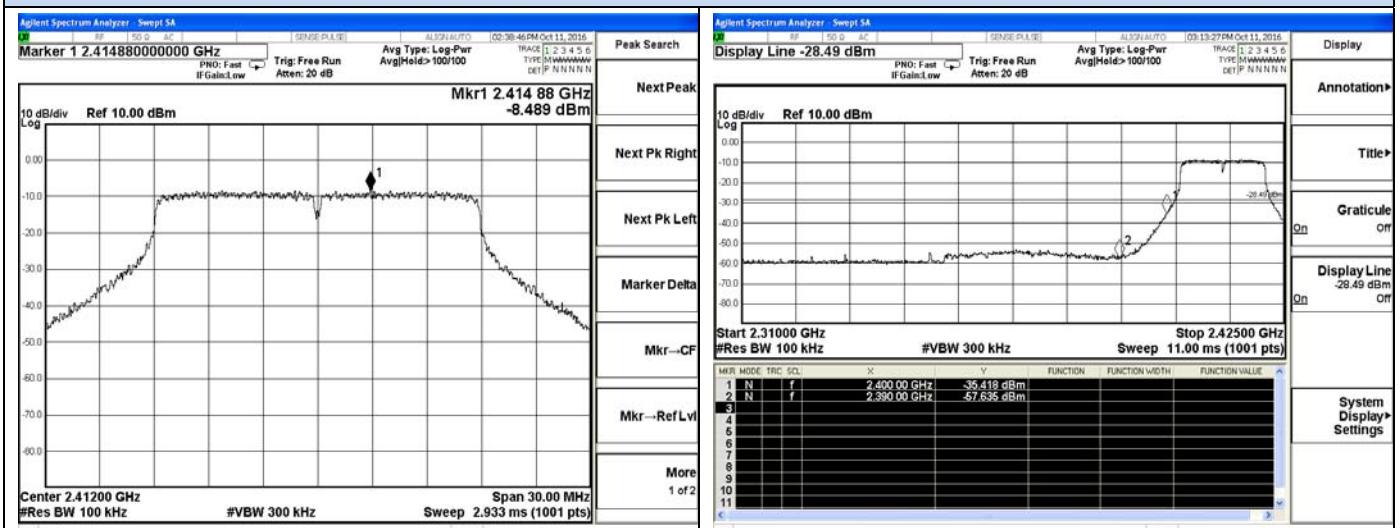
## Test plot of Band Edges Test



High channel Reference

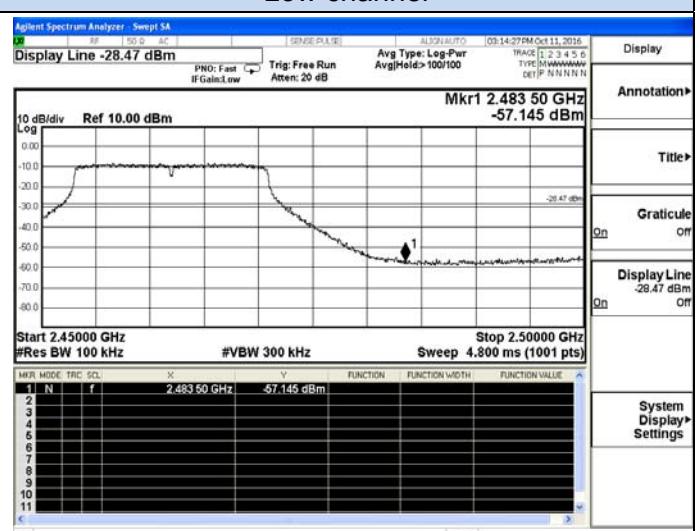
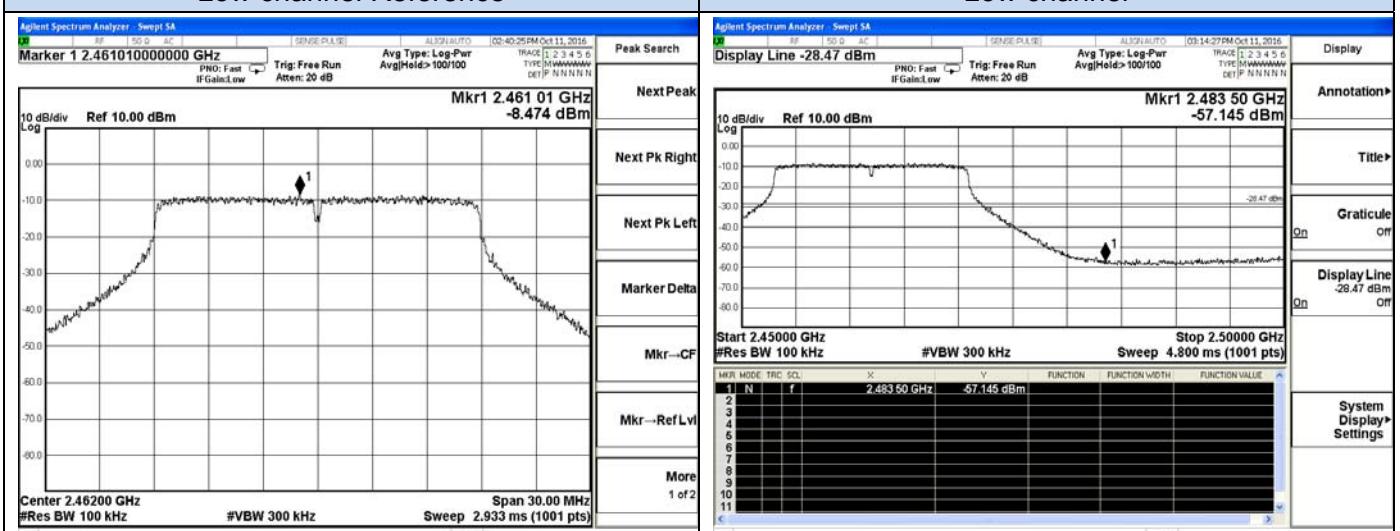
High channel

## IEEE 802.11n-HT20-Chain 1



Low channel Reference

Low channel

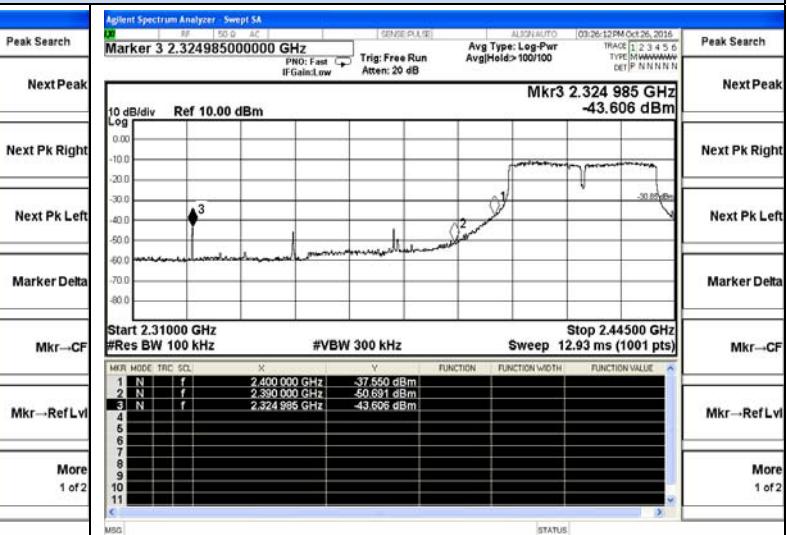
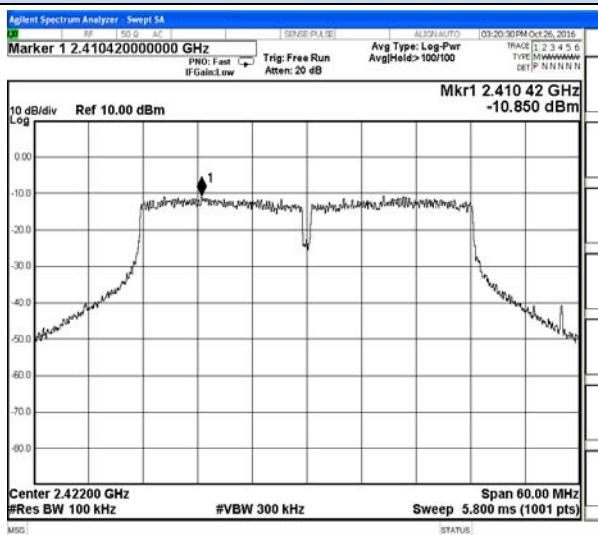


High channel Reference

High channel

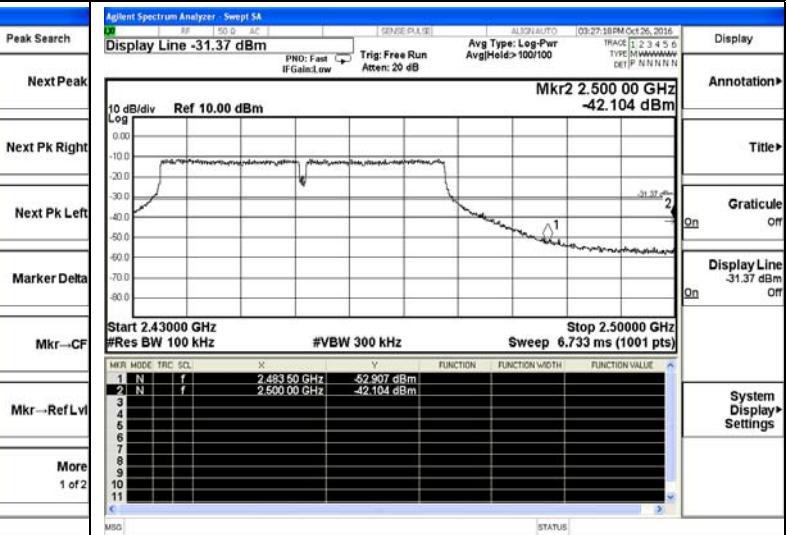
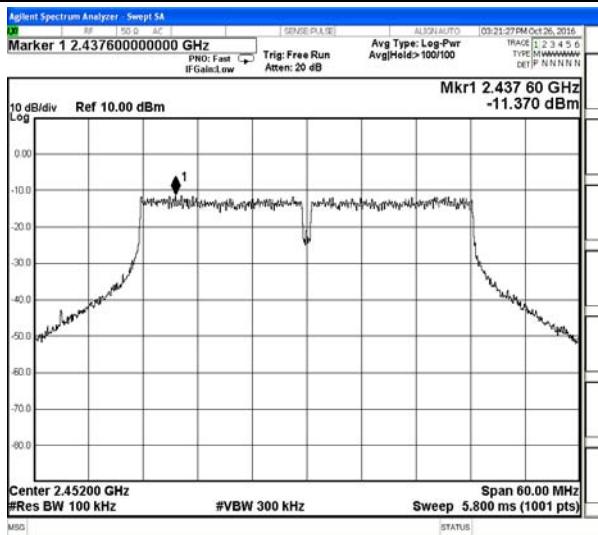
## Test plot of Band Edges Test

## IEEE 802.11n-HT40-Chain 0



## Low channel Reference

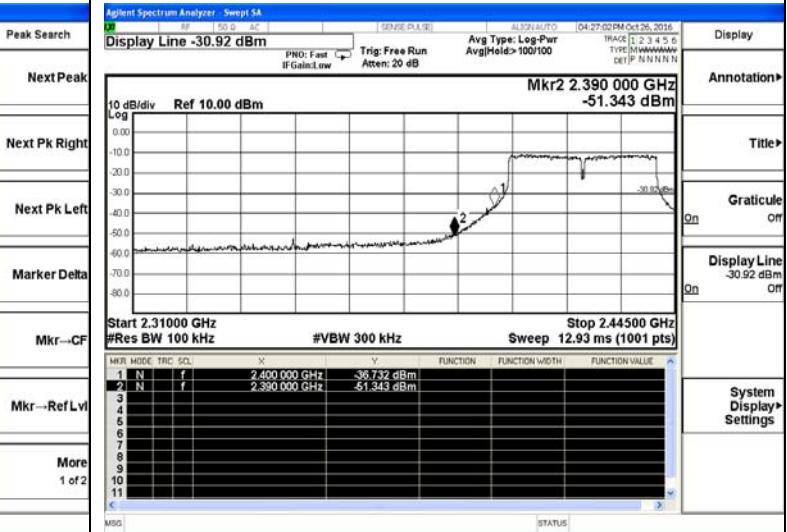
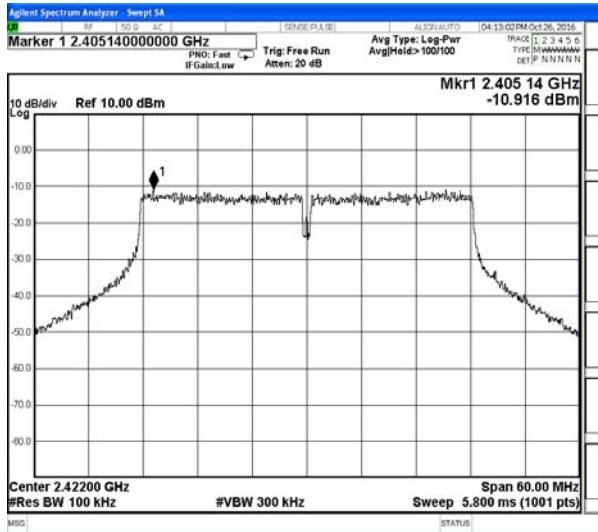
## Low channel



## High channel Reference

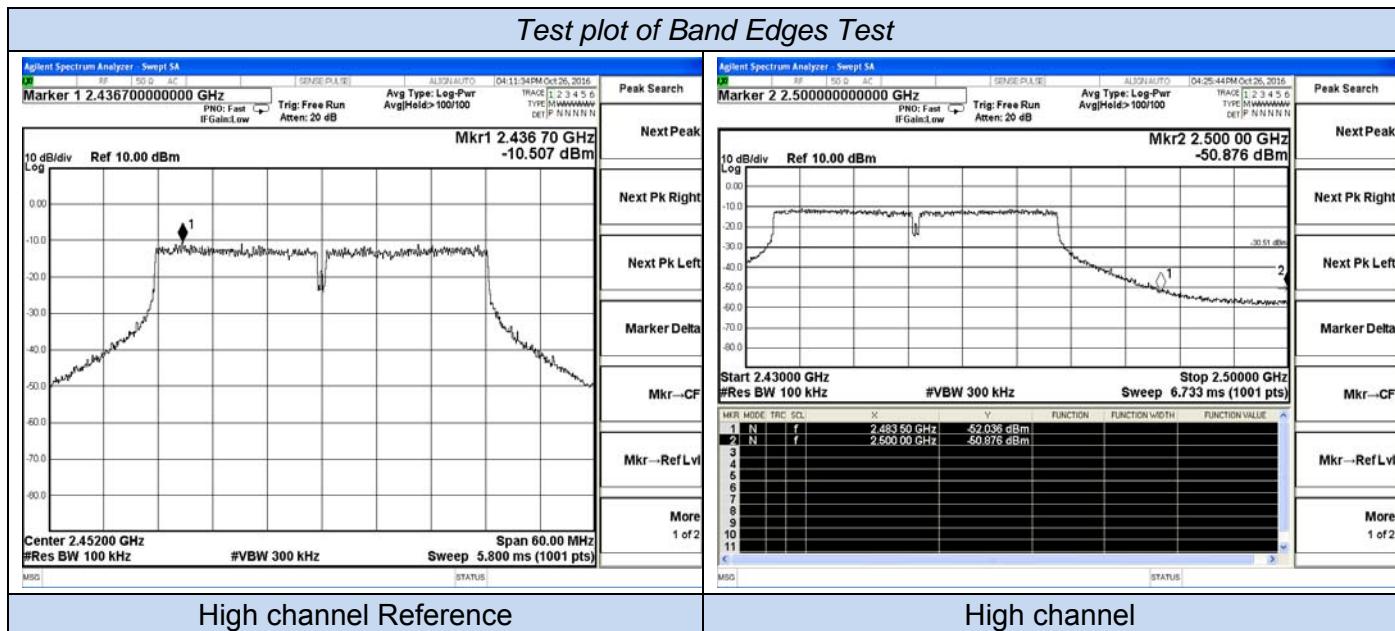
## High channel

## IEEE 802.11n-HT40-Chain 1



## Low channel Reference

## Low channel



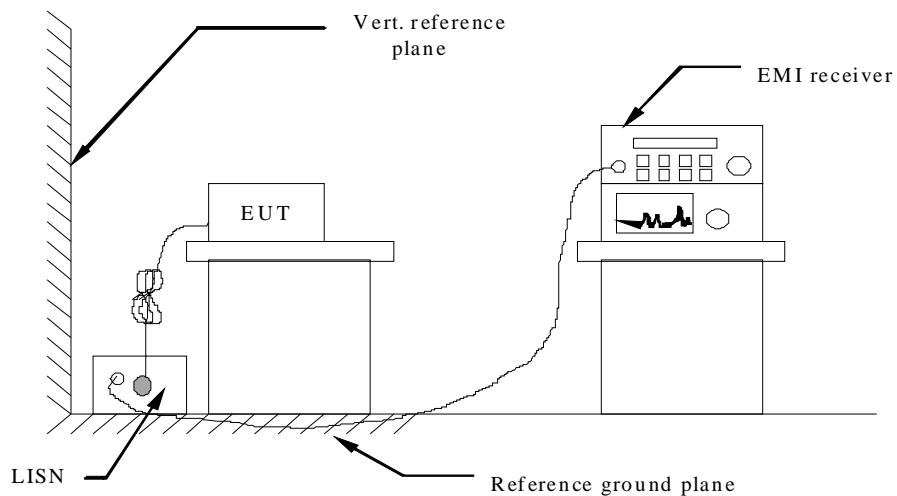
## 5.7. Power line conducted emissions

### 5.7.1 Standard Applicable

According to §15.207 (a): For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

### 5.7.2 Block Diagram of Test Setup

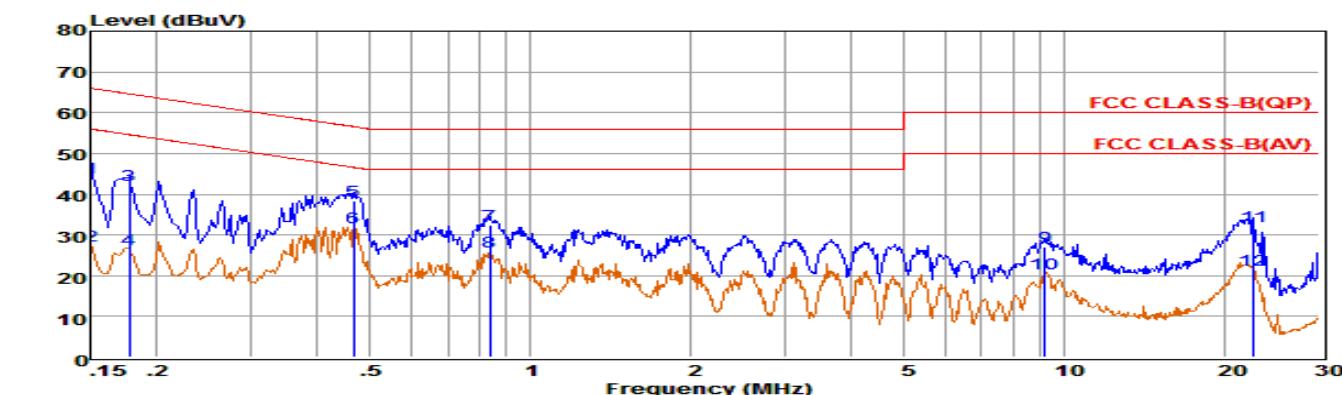


### 5.7.3 Test Results

**PASS.**

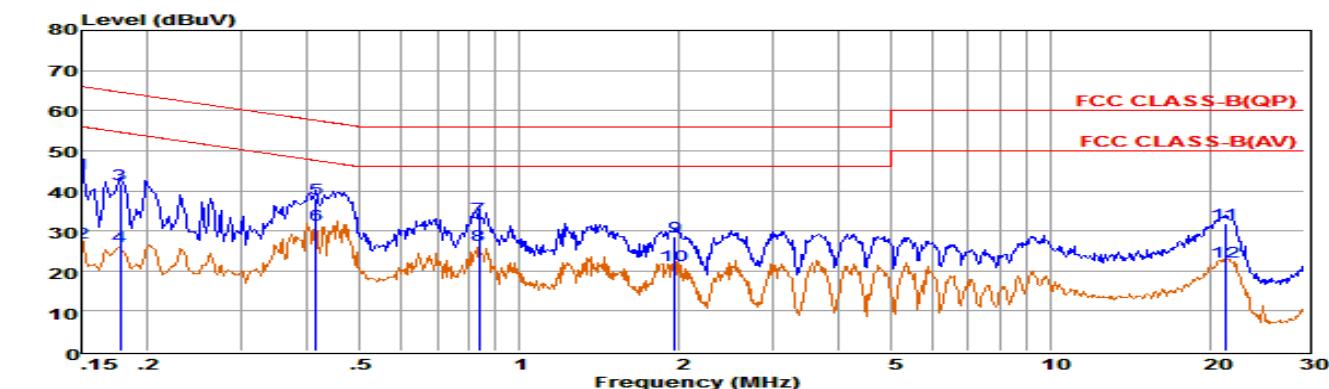
The test data please refer to following page.

## Test result for IEEE 802.11b (AC 120V)



Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	dB
1	0.15	24.49	9.57	0.02	10.00	44.08	66.00	-21.92 QP
2	0.15	7.86	9.57	0.02	10.00	27.45	55.99	-28.54 Average
3	0.18	22.54	9.61	0.02	10.00	42.17	64.59	-22.42 QP
4	0.18	6.70	9.61	0.02	10.00	26.33	54.59	-28.26 Average
5	0.47	18.65	9.62	0.04	10.00	38.31	56.58	-18.27 QP
6	0.47	12.11	9.62	0.04	10.00	31.77	46.58	-14.81 Average
7	0.84	12.87	9.63	0.04	10.00	32.54	56.00	-23.46 QP
8	0.84	6.12	9.63	0.04	10.00	25.79	46.00	-20.21 Average
9	9.20	7.23	9.69	0.08	10.00	27.00	60.00	-33.00 QP
10	9.21	0.70	9.69	0.08	10.00	20.47	50.00	-29.53 Average
11	22.66	12.32	9.71	0.12	10.00	32.15	60.00	-27.85 QP
12	22.66	1.55	9.71	0.12	10.00	21.38	50.00	-28.62 Average

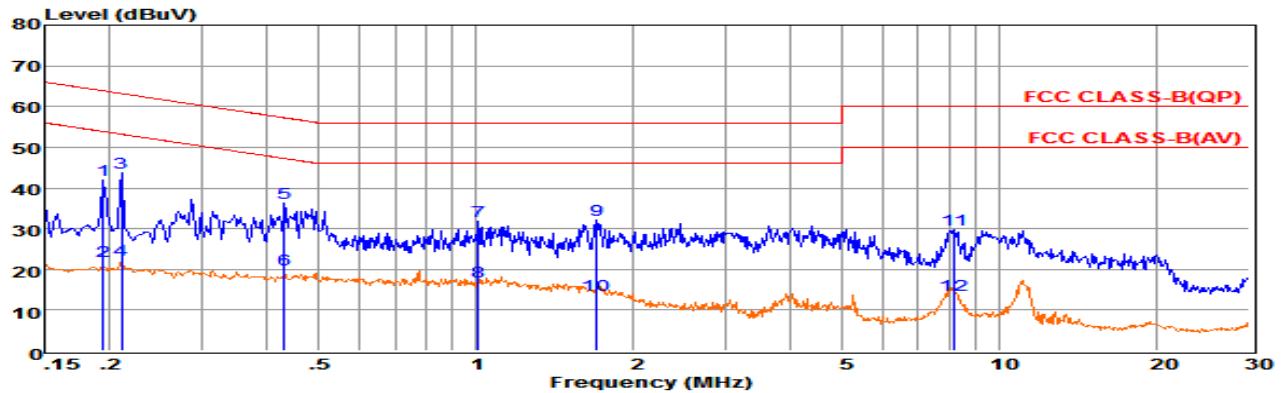
Remarks: 1. Measured = Reading +Cable Loss +Aux2 Fac.  
2. The emission levels that are 20dB below the official limit are not reported.



Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	dB
1	0.15	24.46	9.70	0.02	10.00	44.18	66.00	-21.82 QP
2	0.15	7.33	9.70	0.02	10.00	27.05	55.99	-28.94 Average
3	0.18	21.85	9.64	0.02	10.00	41.51	64.59	-23.08 QP
4	0.18	6.54	9.63	0.02	10.00	26.19	54.59	-28.40 Average
5	0.41	18.40	9.61	0.04	10.00	38.05	57.55	-19.50 QP
6	0.41	11.76	9.61	0.04	10.00	31.41	47.55	-16.14 Average
7	0.84	13.60	9.63	0.04	10.00	33.27	56.00	-22.73 QP
8	0.84	6.71	9.63	0.04	10.00	26.38	46.00	-19.62 Average
9	1.96	8.99	9.63	0.05	10.00	28.67	56.00	-27.33 QP
10	1.96	1.67	9.63	0.05	10.00	21.35	46.00	-24.65 Average
11	21.26	11.95	9.84	0.12	10.00	31.91	60.00	-28.09 QP
12	21.26	2.23	9.84	0.12	10.00	22.19	50.00	-27.81 Average

Remarks: 1. Measured = Reading +Cable Loss +Aux2 Fac.  
2. The emission levels that are 20dB below the official limit are not reported.

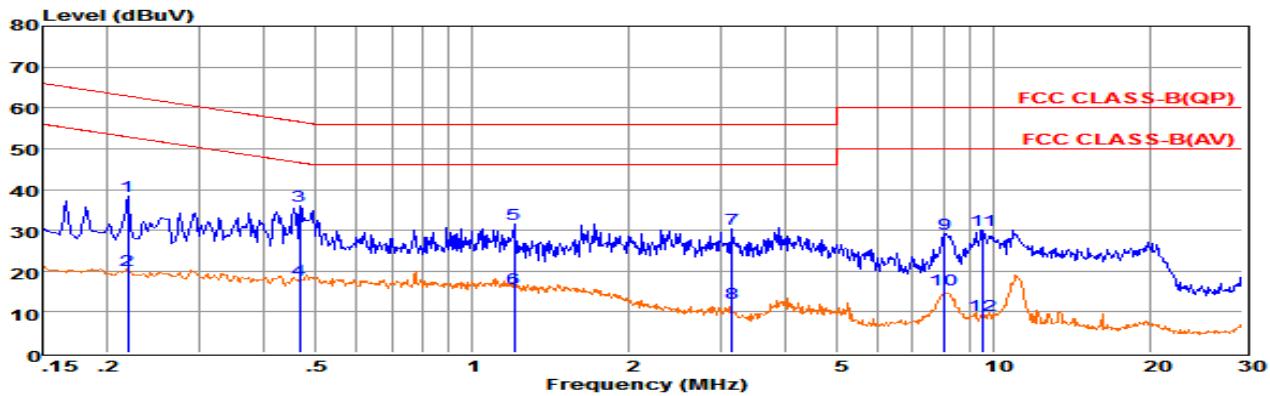
## Test result for IEEE 802.11b (AC 240V)



Env. Ins: 24\*/56%  
Pol: NEUTRAL

Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
MHz	dBuV	dB	dB	dB	dB	dBuV	dBuV	dB
1	0.19	22.19	9.60	0.02	10.00	41.81	63.84	-22.03 QP
2	0.19	2.48	9.60	0.02	10.00	22.10	53.84	-31.74 Average
3	0.21	24.17	9.59	0.03	10.00	43.79	63.18	-19.39 QP
4	0.21	2.55	9.59	0.03	10.00	22.17	53.18	-31.01 Average
5	0.43	16.61	9.62	0.04	10.00	36.27	57.24	-20.97 QP
6	0.43	0.19	9.62	0.04	10.00	19.85	47.24	-27.39 Average
7	1.01	12.23	9.63	0.05	10.00	31.91	56.00	-24.09 QP
8	1.01	-2.75	9.63	0.05	10.00	16.93	46.00	-29.07 Average
9	1.70	12.50	9.63	0.05	10.00	32.18	56.00	-23.82 QP
10	1.70	-5.93	9.63	0.05	10.00	13.75	46.00	-32.25 Average
11	8.19	9.99	9.70	0.07	10.00	29.76	60.00	-30.24 QP
12	8.19	-6.15	9.70	0.07	10.00	13.62	50.00	-36.38 Average

Remarks: 1. Measured = Reading +Cable Loss +Aux2 Fac.  
2. The emission levels that are 20dB below the official limit are not reported.



Env. Ins: 24\*/56%  
Pol: LINE

Freq	Reading	LISNFac	CabLos	Aux2Fac	Measured	Limit	Over	Remark
MHz	dBuV	dB	dB	dB	dB	dBuV	dBuV	dB
1	0.22	18.73	9.63	0.03	10.00	38.39	62.88	-24.49 QP
2	0.22	0.56	9.63	0.03	10.00	20.22	52.87	-32.65 Average
3	0.47	16.29	9.62	0.04	10.00	35.95	56.58	-20.63 QP
4	0.47	-1.76	9.62	0.04	10.00	17.90	46.58	-28.68 Average
5	1.20	11.92	9.63	0.05	10.00	31.60	56.00	-24.40 QP
6	1.20	-3.81	9.63	0.05	10.00	15.87	46.00	-30.13 Average
7	3.16	10.50	9.64	0.06	10.00	30.20	56.00	-25.80 QP
8	3.16	-7.45	9.64	0.06	10.00	12.25	46.00	-33.75 Average
9	8.06	9.45	9.68	0.07	10.00	29.20	60.00	-30.80 QP
10	8.06	-4.19	9.68	0.07	10.00	15.56	50.00	-34.44 Average
11	9.55	10.25	9.69	0.08	10.00	30.02	60.00	-29.98 QP
12	9.55	-10.67	9.69	0.08	10.00	9.10	50.00	-40.90 Average

Remarks: 1. Measured = Reading +Cable Loss +Aux2 Fac.  
2. The emission levels that are 20dB below the official limit are not reported.

\*\*\*Note: Pre-scan all mode and recorded the worst case results in this report (IEEE 802.11b).

## 5.8. Antenna Requirements

### 5.8.1 Standard Applicable

According to antenna requirement of §15.203.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

And according to §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

### 5.8.2 Antenna Connected Construction

#### 5.8.2.1. Standard Applicable

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

#### 5.8.2.2. Antenna Connector Construction

The directional gains of antenna used for transmitting is 14.0dBi, and the antenna is panel antenna connect to PCB board and no consideration of replacement. Please see EUT photo for details.

#### 5.8.2.3. Results: Compliance.

### Measurement

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

Conducted power refers ANSI C63.10:2013 Output power test procedure for DTS devices.

Radiated power refers to ANSI C63.10:2013 Radiated emissions tests.

### Measurement parameters

Measurement parameter	
Detector:	Peak
Sweep Time:	Auto
Resolution bandwidth:	1MHz
Video bandwidth:	3MHz
Trace-Mode:	Max hold

**Limits**

FCC	IC
Antenna Gain	
6 dBi	

Note: The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module. For WLAN devices, the DSSS mode is used;

<b>Chain 0</b>				
T <sub>nom</sub>	V <sub>nom</sub>	Lowest Channel 2412 MHz	Middle Channel 2437 MHz	Highest Channel 2462 MHz
Conducted power [dBm] Measured with DSSS modulation		6.89	6.52	6.77
Radiated power [dBm] Measured with DSSS modulation		20.25	20.40	20.33
Gain [dBi] Calculated		13.36	13.88	13.56
Measurement uncertainty		$\pm 1.6$ dB (cond.) / $\pm 3.8$ dB (rad.)		

<b>Chain 1</b>				
T <sub>nom</sub>	V <sub>nom</sub>	Lowest Channel 2412 MHz	Middle Channel 2437 MHz	Highest Channel 2462 MHz
Conducted power [dBm] Measured with DSSS modulation		6.85	6.59	6.82
Radiated power [dBm] Measured with DSSS modulation		20.30	20.37	20.51
Gain [dBi] Calculated		13.45	13.78	13.69
Measurement uncertainty		$\pm 1.6$ dB (cond.) / $\pm 3.8$ dB (rad.)		

Result: -/-

## 6. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal Date	Due Date
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	June 18, 2016	June 17, 2017
Signal analyzer	Agilent	E4448A(External mixers to 40GHz)	US44300469	9kHz~40GHz	July 16, 2016	July 15, 2017
Signal analyzer	Agilent	N9020A	MY50510140	9kHz~26.5GHz	October 27, 2015	October 27, 2016
LISN	MESS Tec	NNB-2/16Z	99079	9KHz-30MHz	June 18, 2016	June 17, 2017
LISN (Support Unit)	EMCO	3819/2NM	9703-1839	9KHz-30MHz	June 18, 2016	June 17, 2017
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9KHz-30MHz	June 18, 2016	June 17, 2017
ISN	SCHAFFNER	ISN ST08	21653	9KHz-30MHz	June 18, 2016	June 17, 2017
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30M-18GHz 3m	June 18, 2016	June 17, 2017
Amplifier	SCHAFFNER	COA9231A	18667	9kHz-2GHz	June 18, 2016	June 17, 2017
Amplifier	Agilent	8449B	3008A02120	1GHz-26.5GHz	July 16, 2016	July 15, 2017
Amplifier	MITEQ	AMF-6F-2604 00	9121372	26.5GHz-40GHz	July 16, 2016	July 15, 2017
Loop Antenna	R&S	HFH2-Z2	860004/001	9K-30MHz	June 18, 2016	June 17, 2017
By-log Antenna	SCHWARZBECK	VULB9163	9163-470	30MHz-1GHz	June 10, 2016	June 09, 2017
Horn Antenna	EMCO	3115	6741	1GHz-18GHz	June 10, 2016	June 09, 2017
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15GHz-40GHz	June 10, 2016	June 09, 2017
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz-1GHz	June 18, 2016	June 17, 2017
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1GHz-40GHz	June 18, 2016	June 17, 2017
Power Meter	R&S	NRVS	100444	DC-40GHz	June 18, 2016	June 17, 2017
Power Sensor	R&S	NRV-Z51	100458	DC-30GHz	June 18, 2016	June 17, 2017
Power Sensor	R&S	NRV-Z32	10057	30MHz-6GHz	June 18, 2016	June 17, 2017
AC Power Source	HPC	HPA-500E	HPA-9100024	AC 0~300V	June 18, 2016	June 17, 2017
DC power Soure	GW	GPC-6030D	C671845	DC 1V-60V	June 18, 2016	June 17, 2017
Temp. and Humidigy Chamber	Giant Force	GTH-225-20-S	MAB0103-00	N/A	June 18, 2016	June 17, 2017
RF CABLE-1m	JYE Bao	RG142	CB034-1m	20MHz-7GHz	June 18, 2016	June 17, 2017
RF CABLE-2m	JYE Bao	RG142	CB)35-2m	20MHz-1GHz	June 18, 2016	June 17, 2017

Note: All equipment through GRGT EST calibration

## 7. TEST SETUP PHOTOGRAPHS OF EUT

Please refer to separated files for Test Setup Photos of the EUT.

## 8. EXTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for External Photos of the EUT.

## 9. INTERIOR PHOTOGRAPHS OF THE EUT

Please refer to separated files for Internal Photos of the EUT.

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