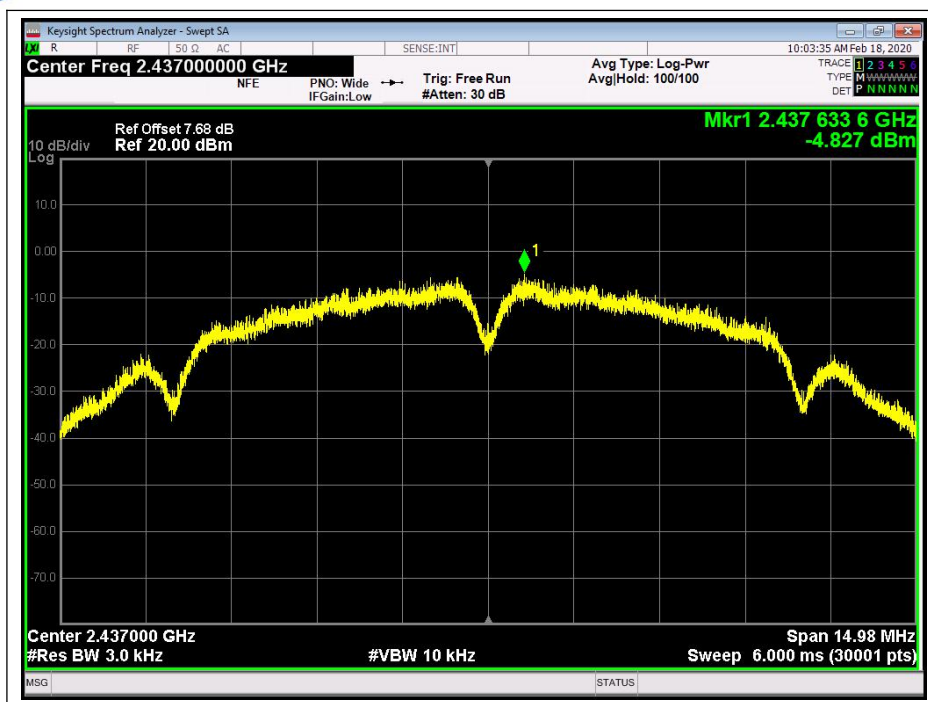
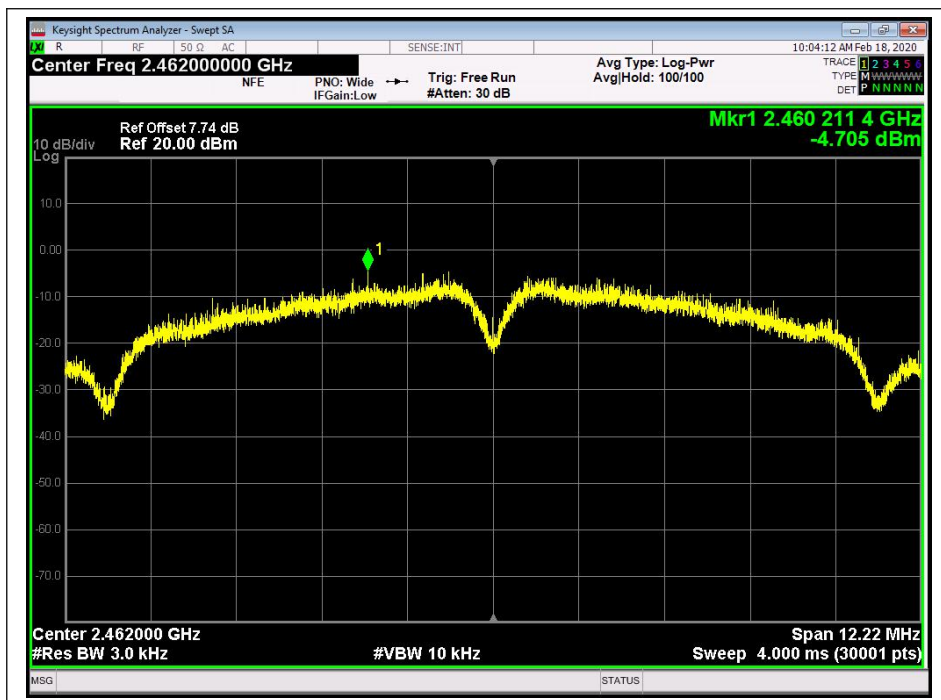




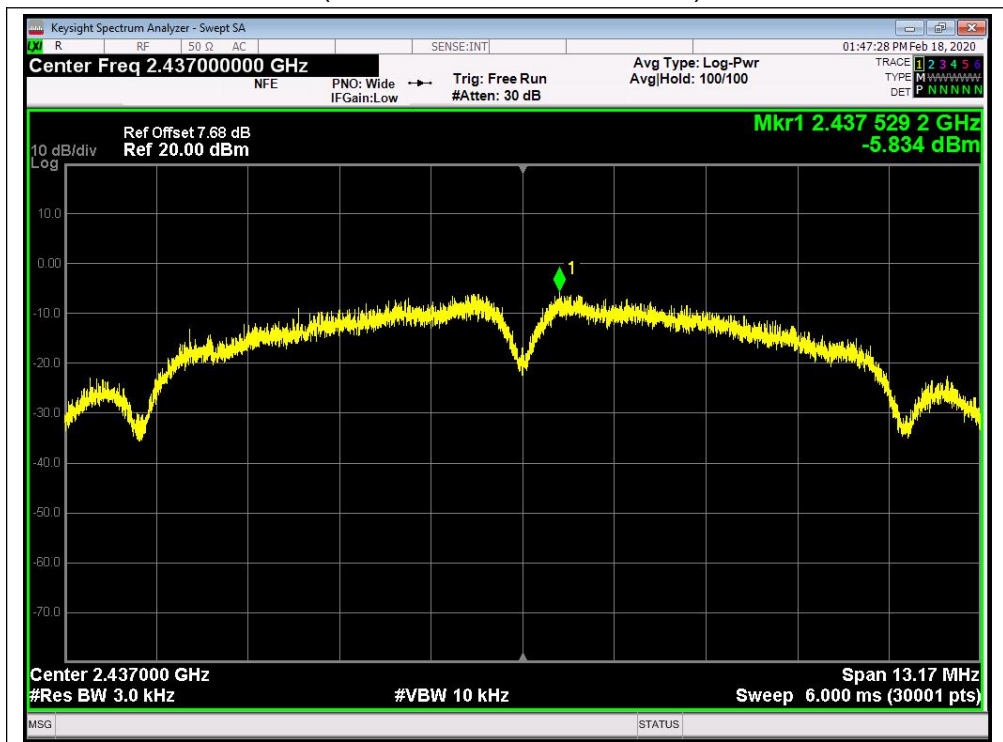
(Channel = 6, 802.11b;ANT0)



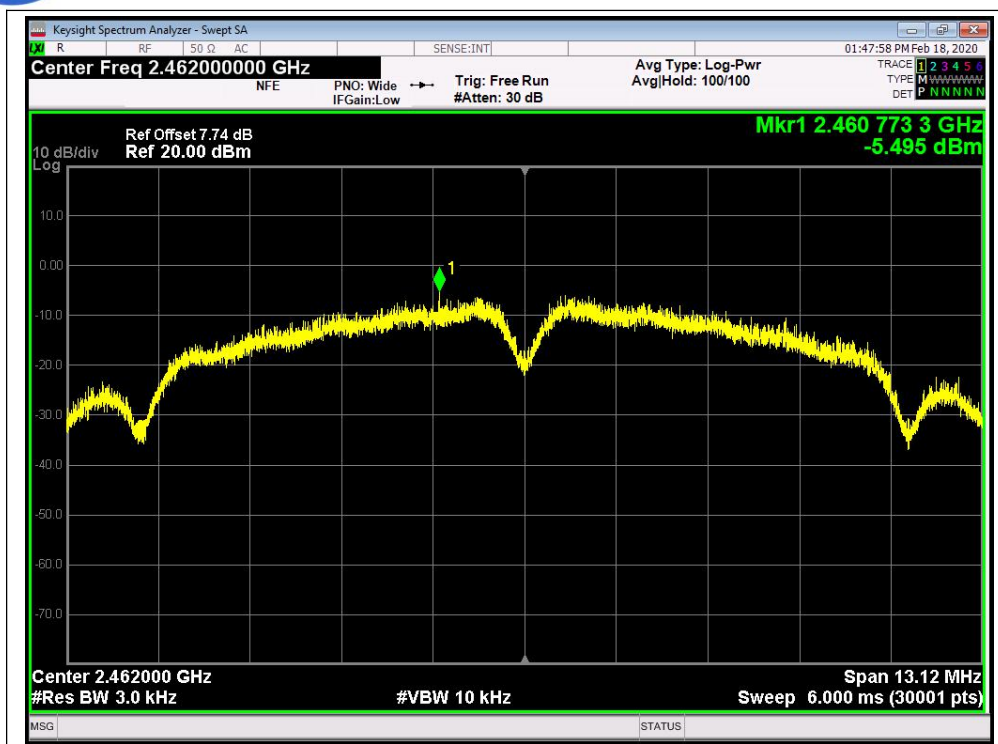
(Channel = 11, 802.11b;ANT0)



(Channel = 1, 802.11b;ANT1)



(Channel = 6, 802.11b;ANT1)



(Channel = 11, 802.11b;ANT1)

802.11g Test mode

A. Test Verdict:

ANT 0

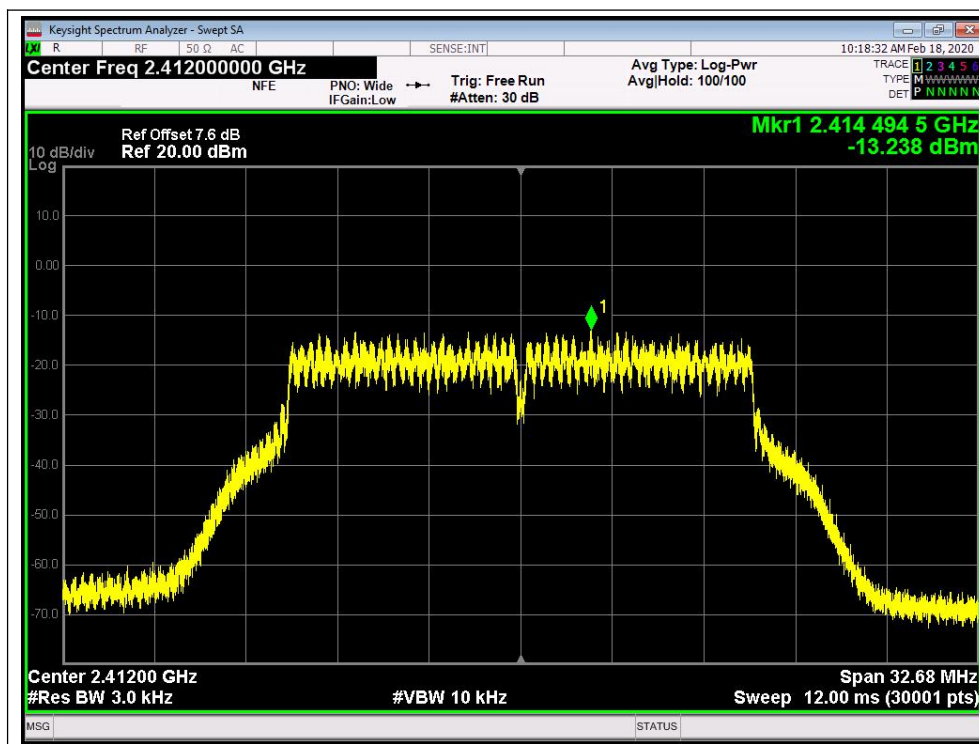
Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-13.23	8	PASS
6	2437	-13.39	8	PASS
11	2462	-13.45	8	PASS

ANT 1

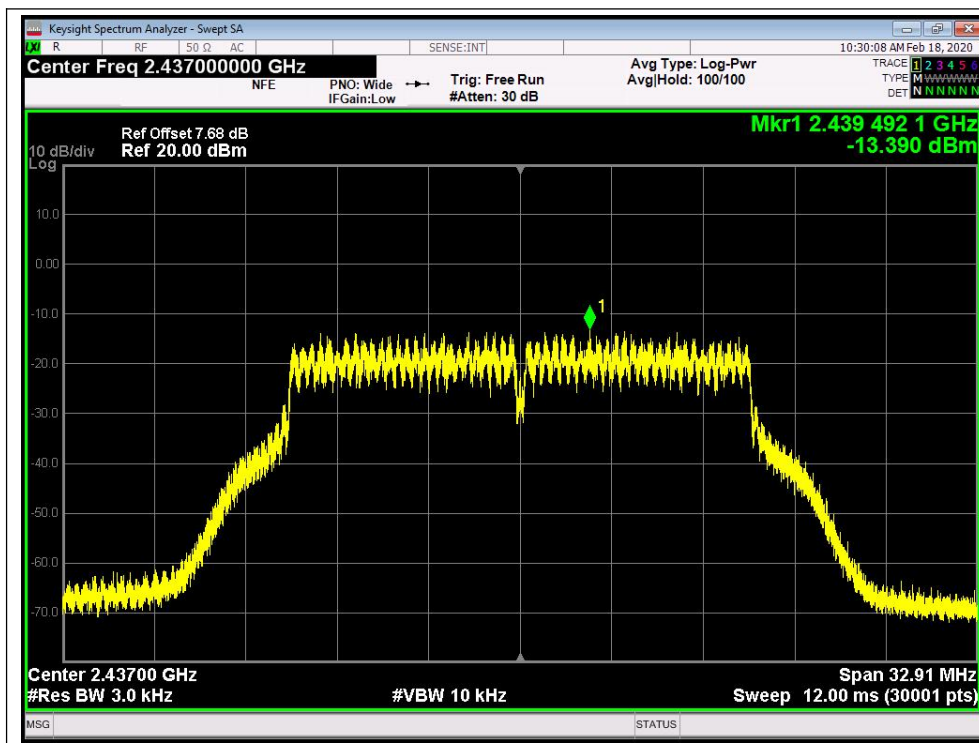
Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-13.51	8	PASS
6	2437	-13.40	8	PASS
11	2462	-13.50	8	PASS



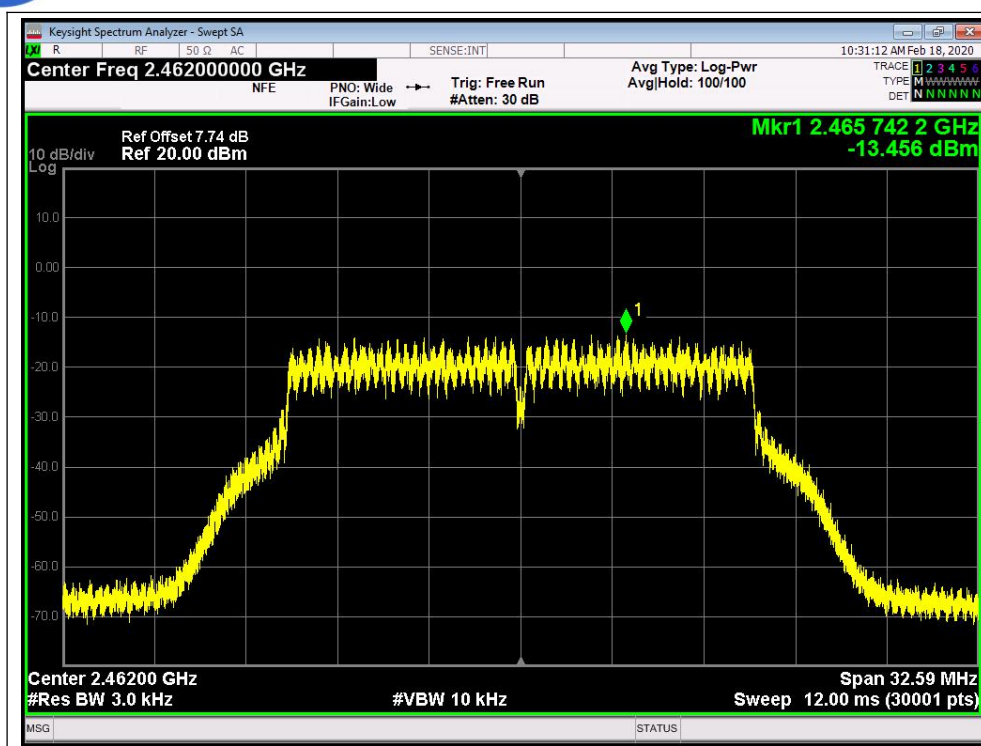
B. Test Plots:



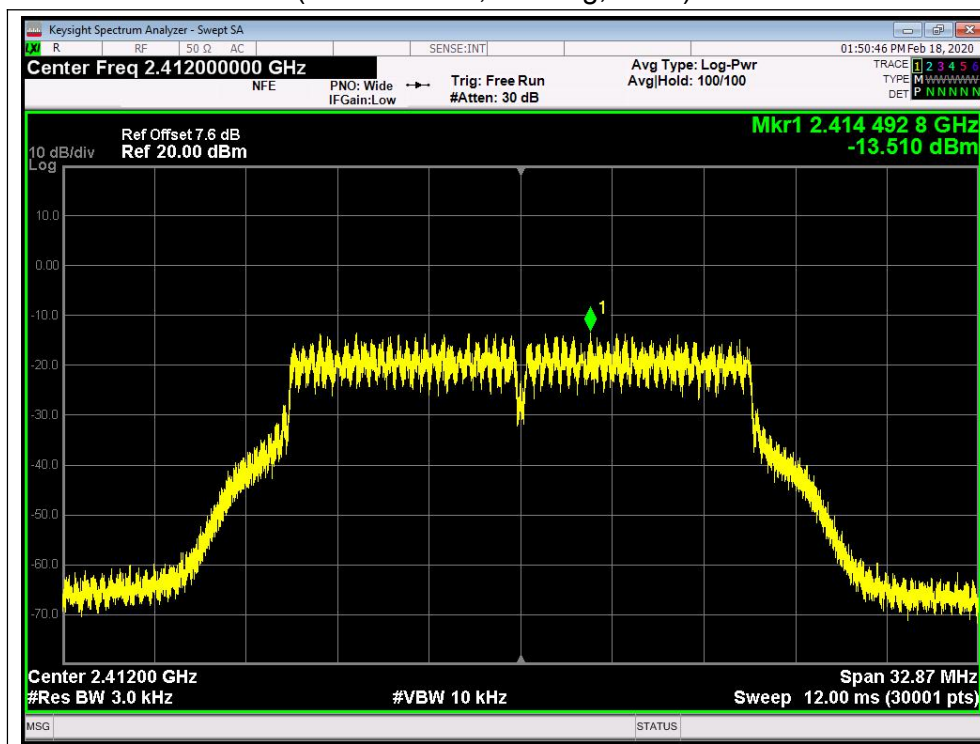
(Channel = 1, 802.11g;ANT0)



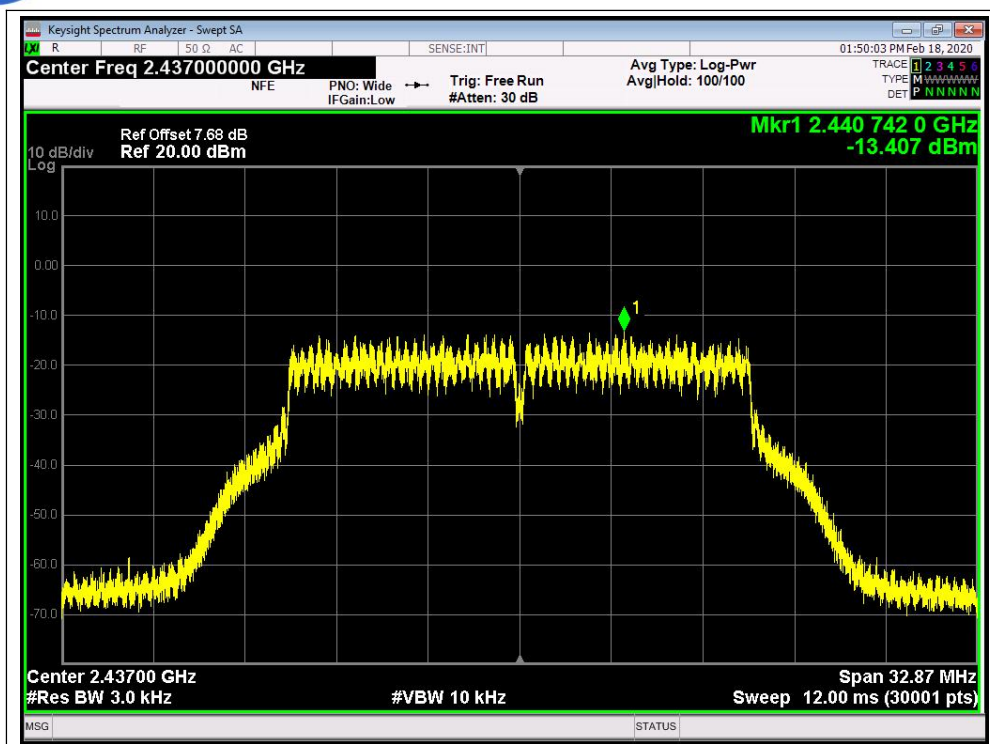
(Channel = 6, 802.11g;ANT0)



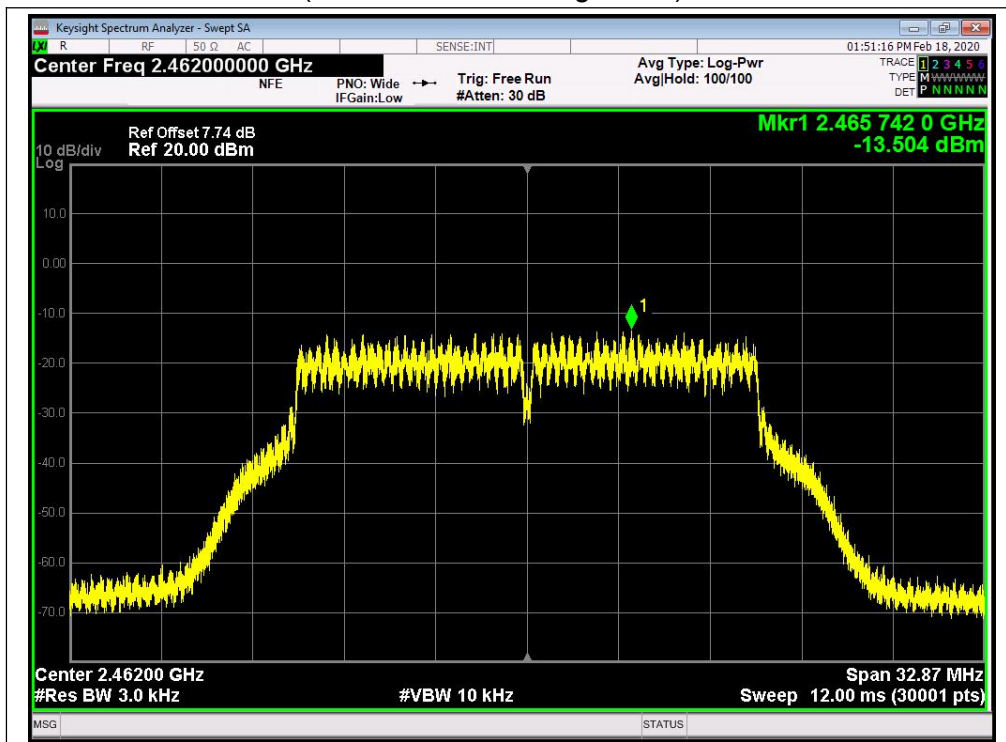
(Channel = 11, 802.11g;ANT0)



(Channel = 1, 802.11g;ANT1)



(Channel = 6, 802.11g;ANT1)



(Channel = 11, 802.11g;ANT1)

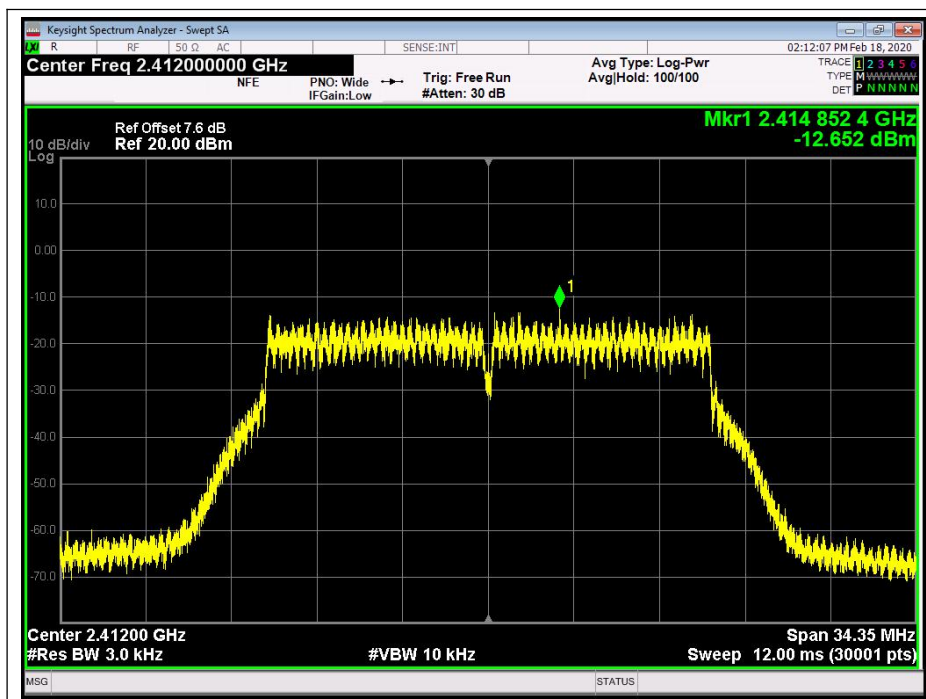


802.11n-20MHz Test mode

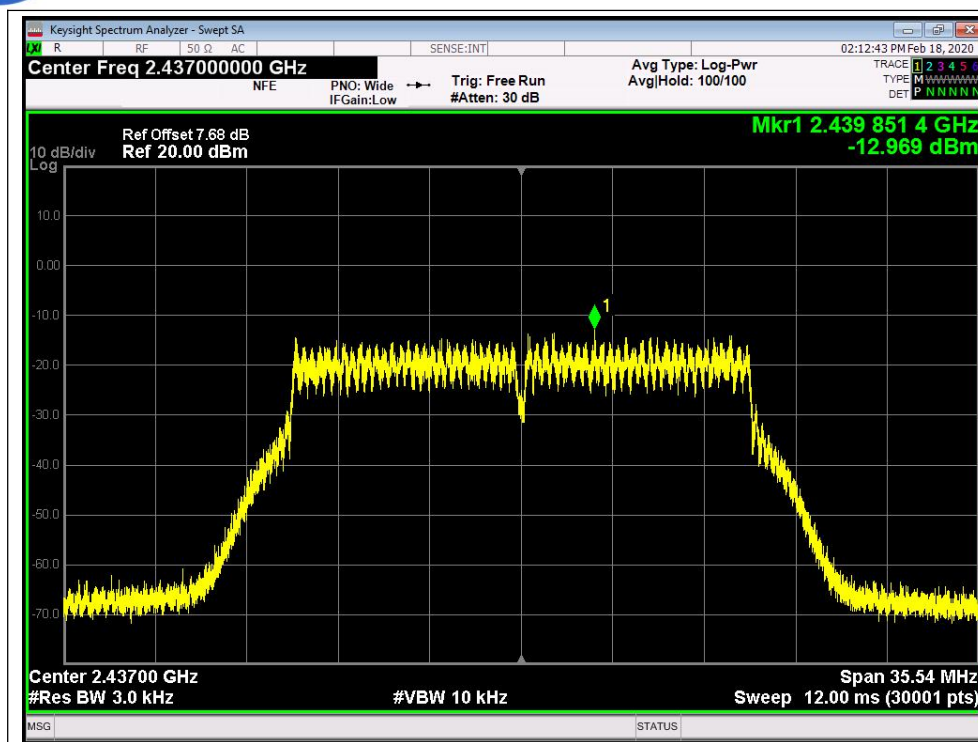
A. Test Verdict:

Spectral power density (dBm/3kHz)						
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)			Limit (dBm/3kHz)	Verdict
		ANT 0	ANT 1	Total		
1	2412	-12.65	-12.33	-9.47	8	PASS
6	2437	-12.96	-13.11	-9.05	8	PASS
11	2462	-12.76	-12.19	-9.45	8	PASS

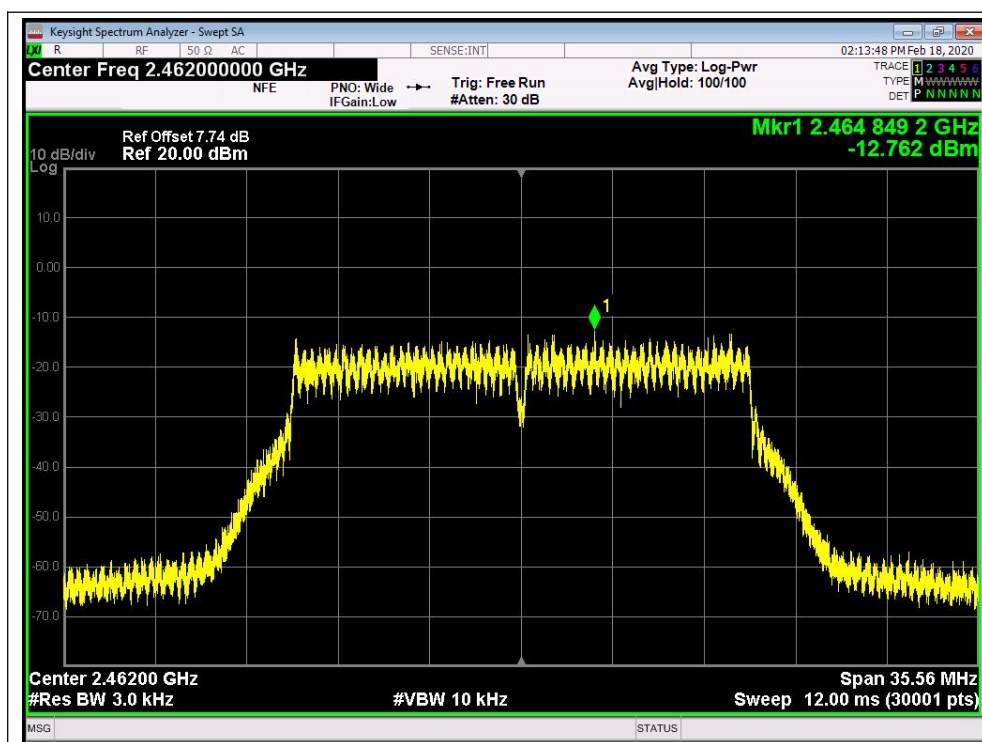
B. Test Plots:



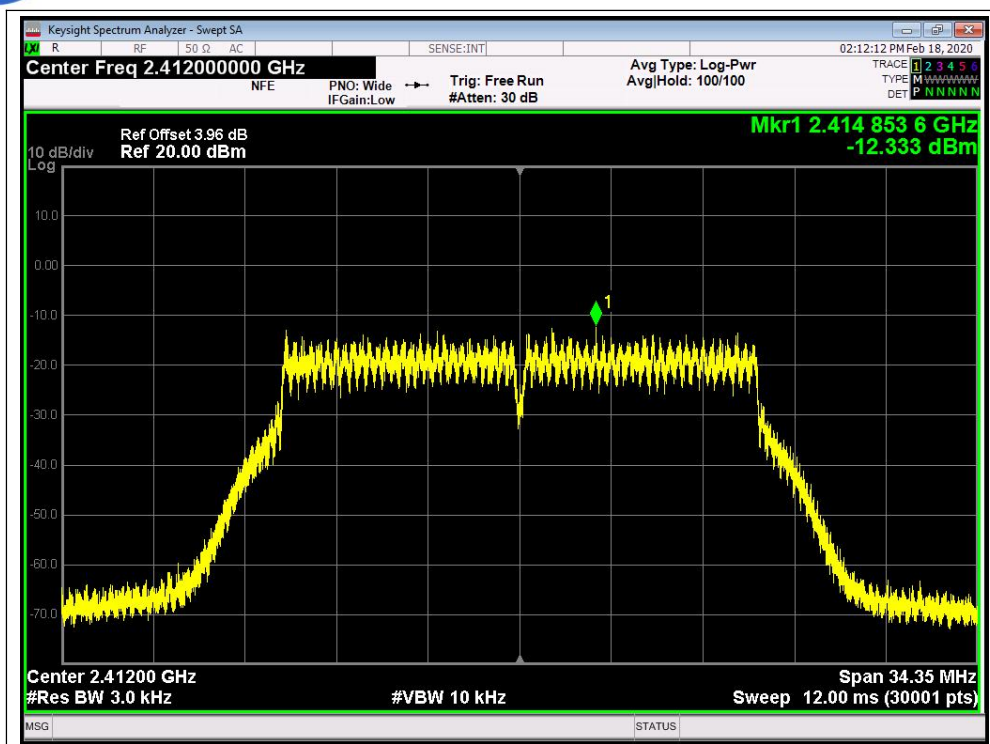
(Channel = 1, 802.11n-20MHz;ANT0)



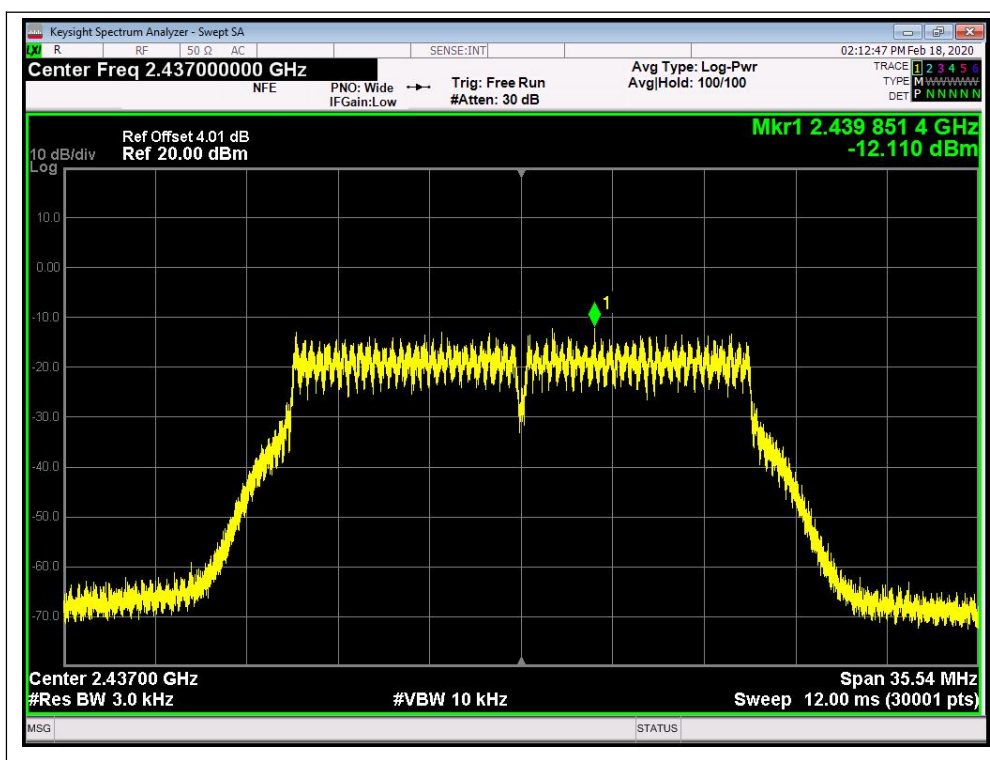
(Channel = 6, 802.11n-20MHz;ANT0)



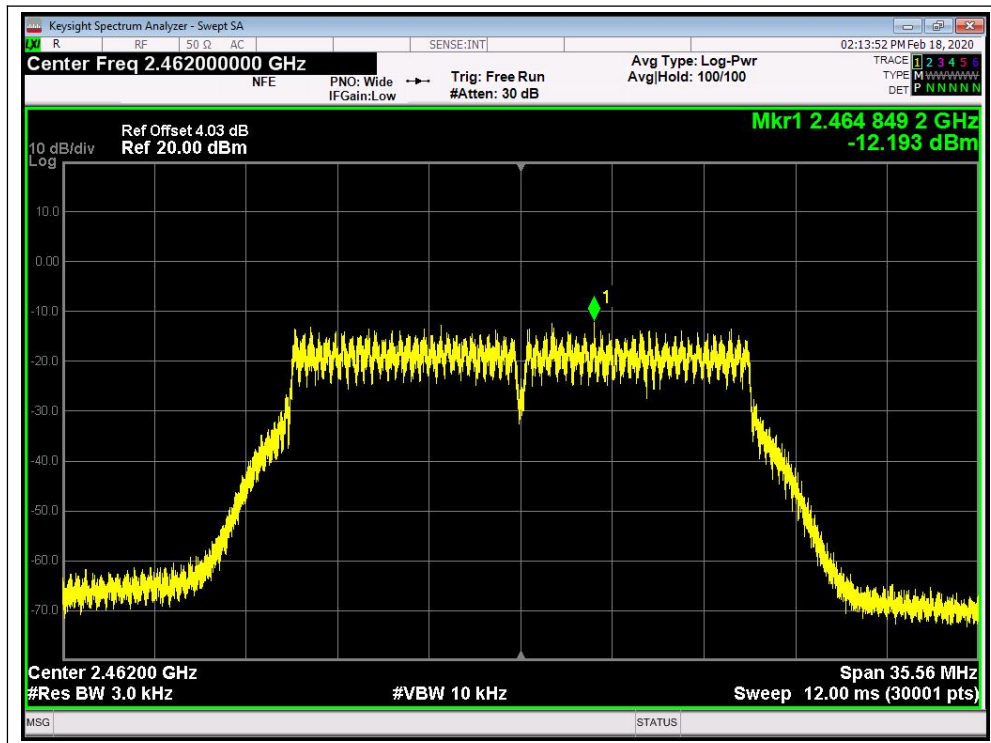
(Channel = 11, 802.11n-20MHz;ANT0)



(Channel = 1, 802.11n-20MHz;ANT1)



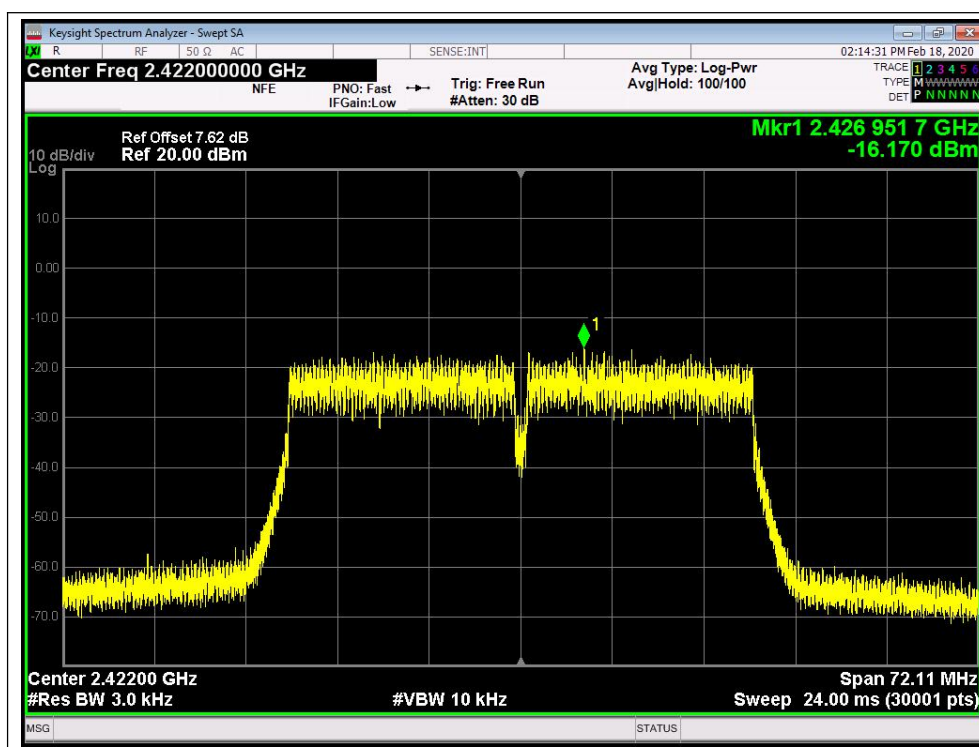
(Channel = 6, 802.11n-20MHz;ANT1)



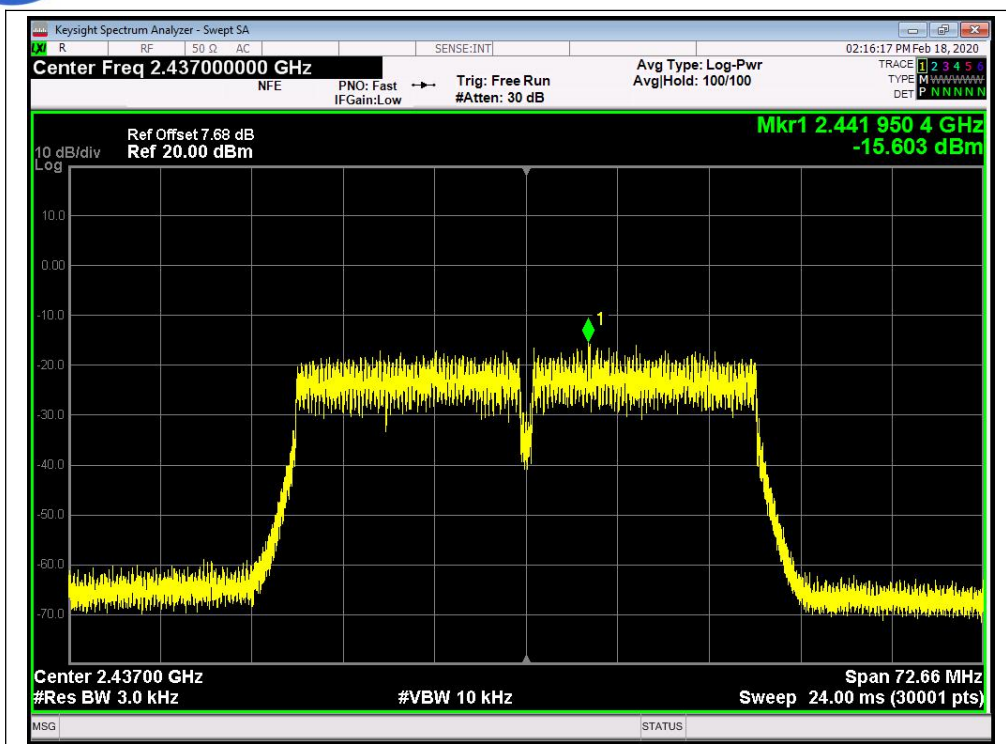
(Channel = 11, 802.11n-20MHz;ANT1)

**802.11n-40MHz Test mode****A. Test Verdict:**

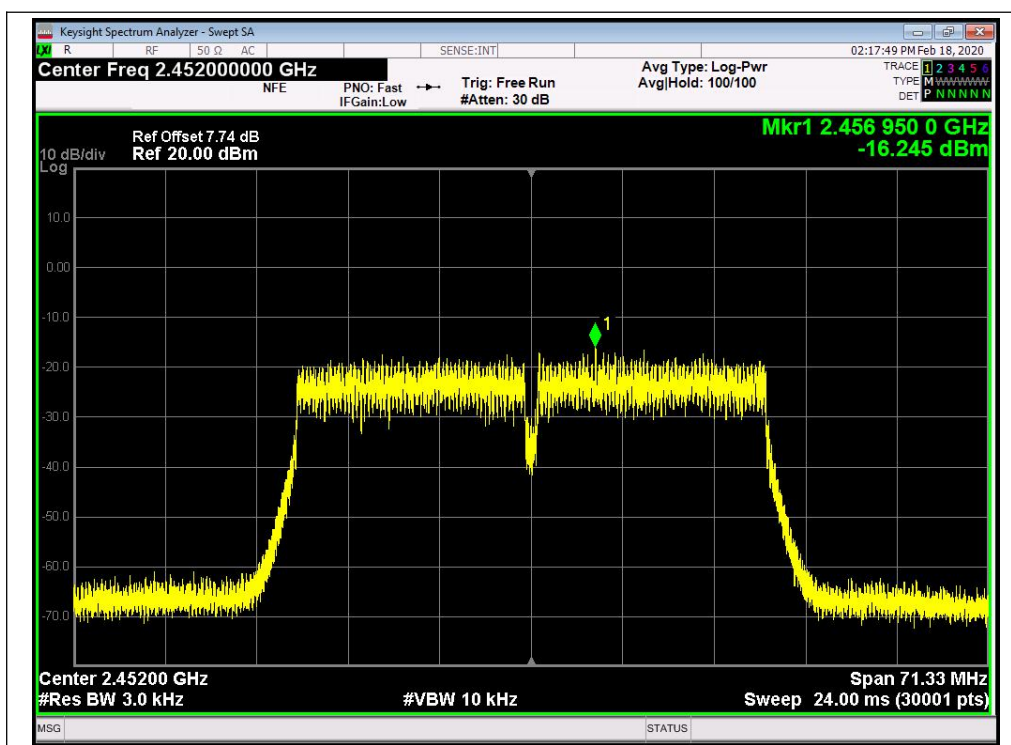
Spectral power density (dBm/3kHz)						
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)			Limit (dBm/3kHz)	Verdict
		ANT 0	ANT 1	Total		
3	2422	-16.17	-15.08	-12.58	8	PASS
6	2437	-15.60	-15.38	-12.48	8	PASS
9	2452	-16.24	-15.44	-12.81	8	PASS

B. Test Plots:

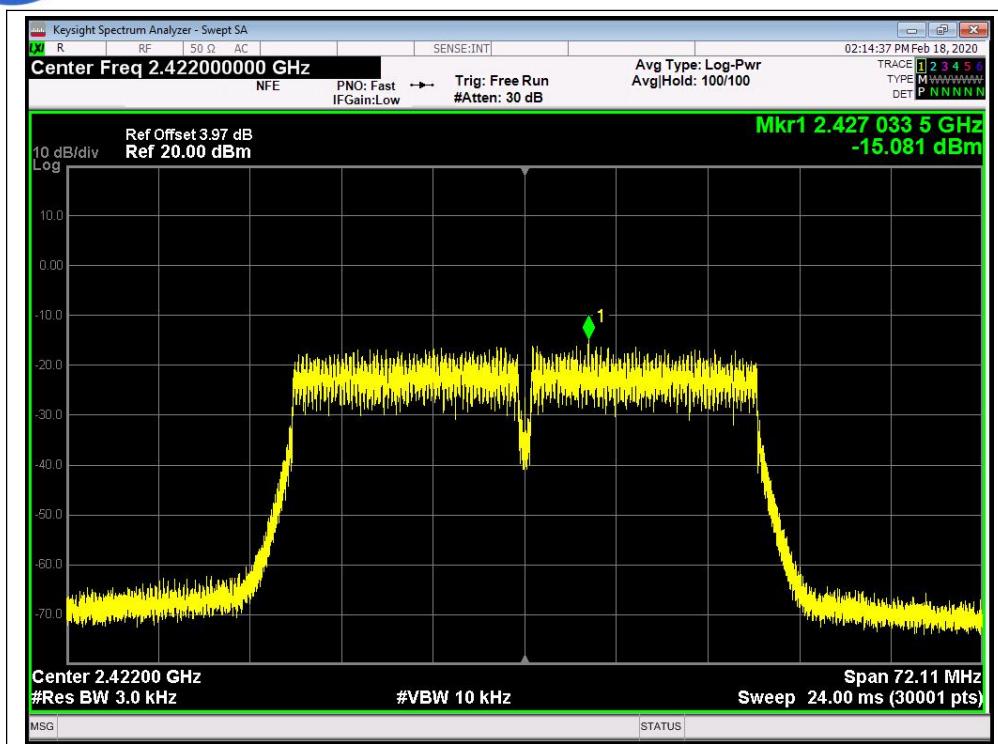
(Channel = 3, 802.11n-40MHz;ANT0)



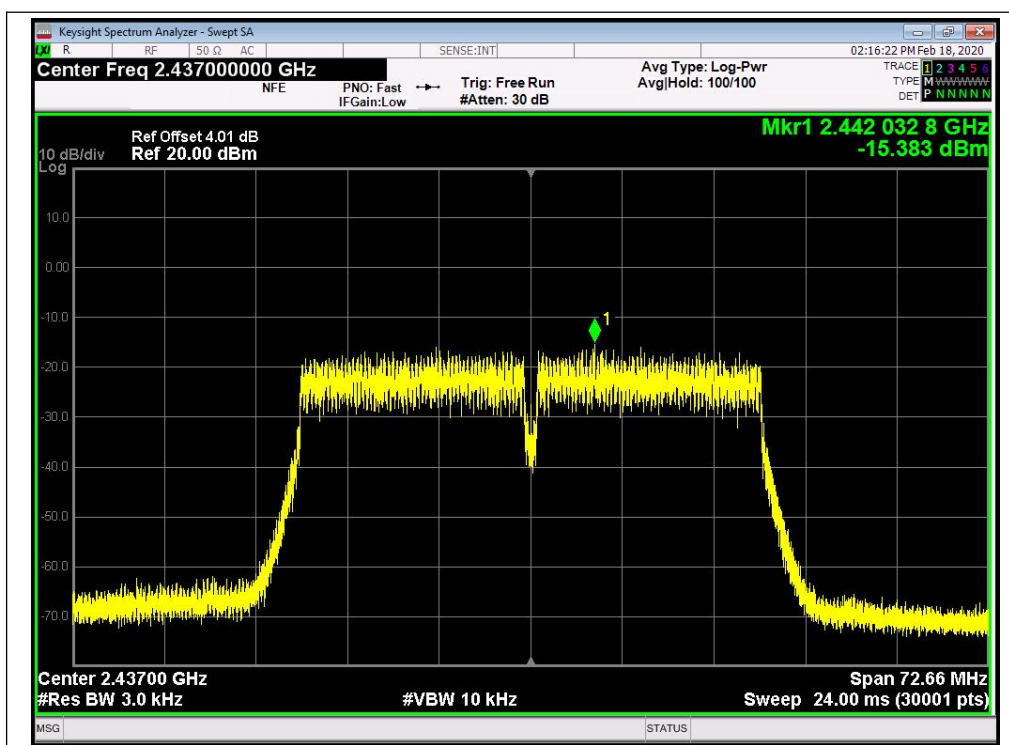
(Channel = 6, 802.11n-40MHz;ANT0)



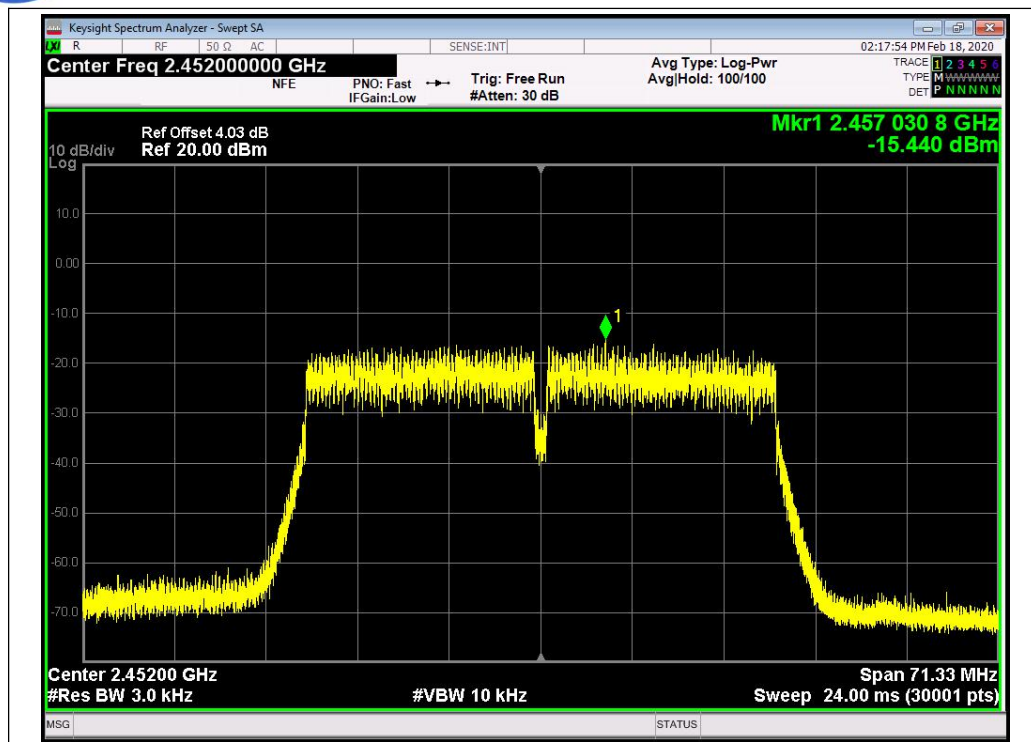
(Channel = 9, 802.11n-40MHz;ANT0)



(Channel = 3, 802.11n-40MHz;ANT1)



(Channel = 6, 802.11n-40MHz;ANT1)



(Channel = 9, 802.11n-40MHz;ANT1)

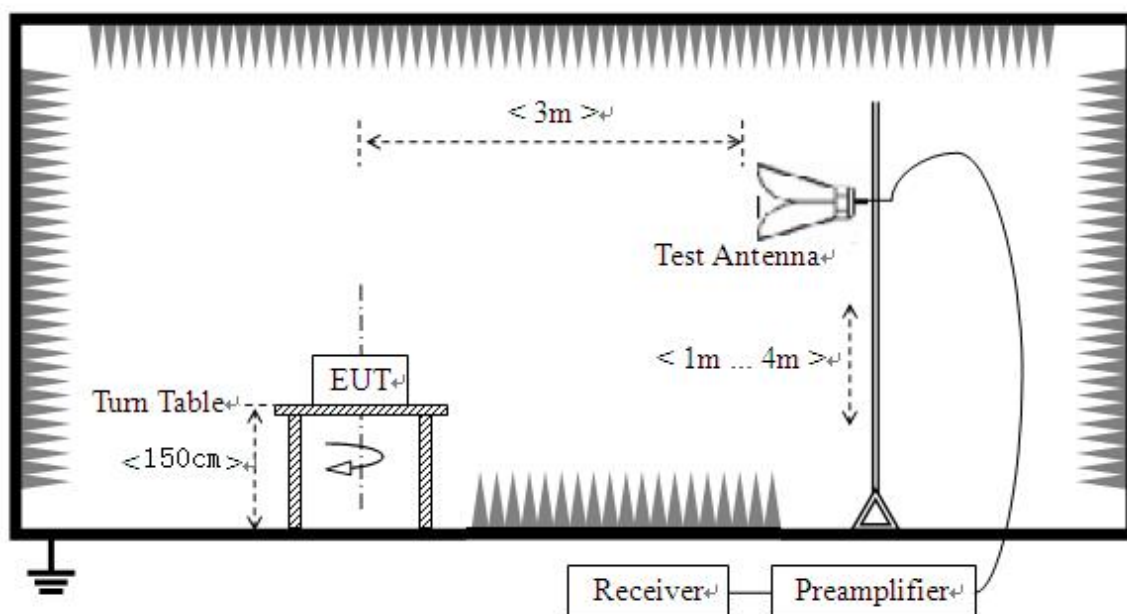
2.6. Restricted Frequency Bands

2.6.1. Requirement

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

2.6.2. Test Description

A. Test Setup



The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

For the Test Antenna:

Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

KDB 558074 Section 12.1 was used in order to prove compliance.



For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasipeak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

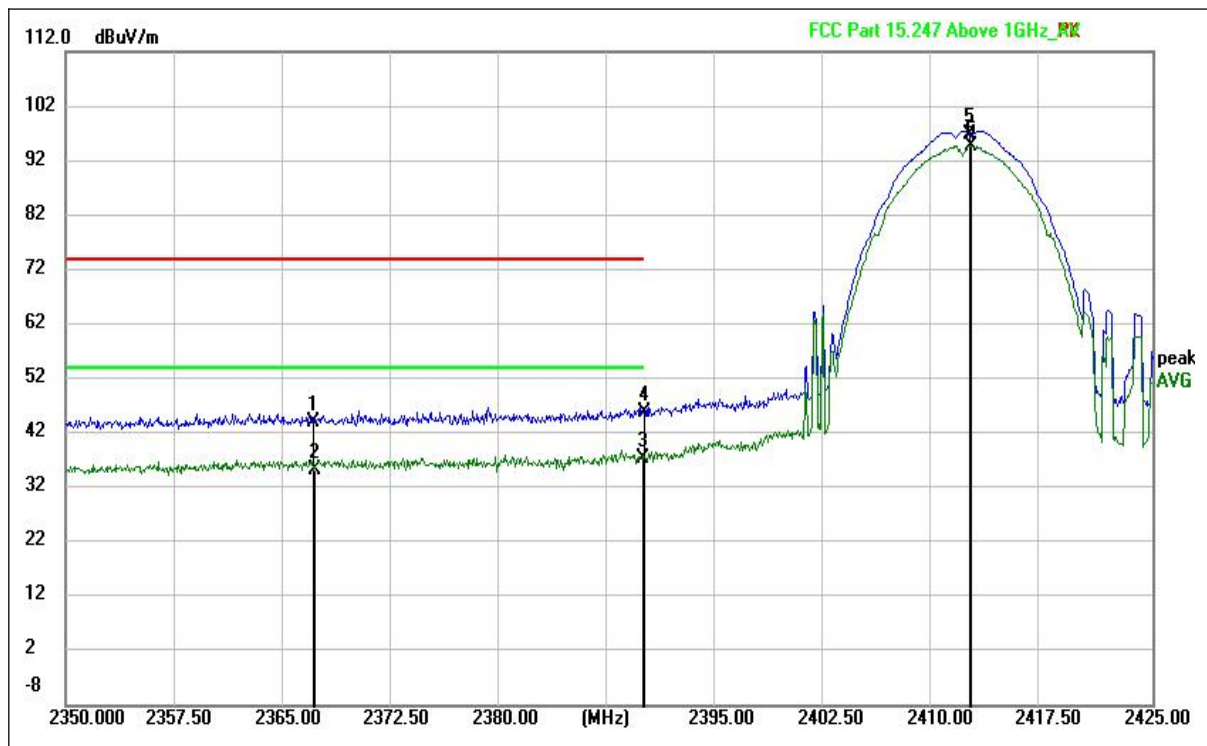
B. Equipments List:

Please refer ANNEX B(4).



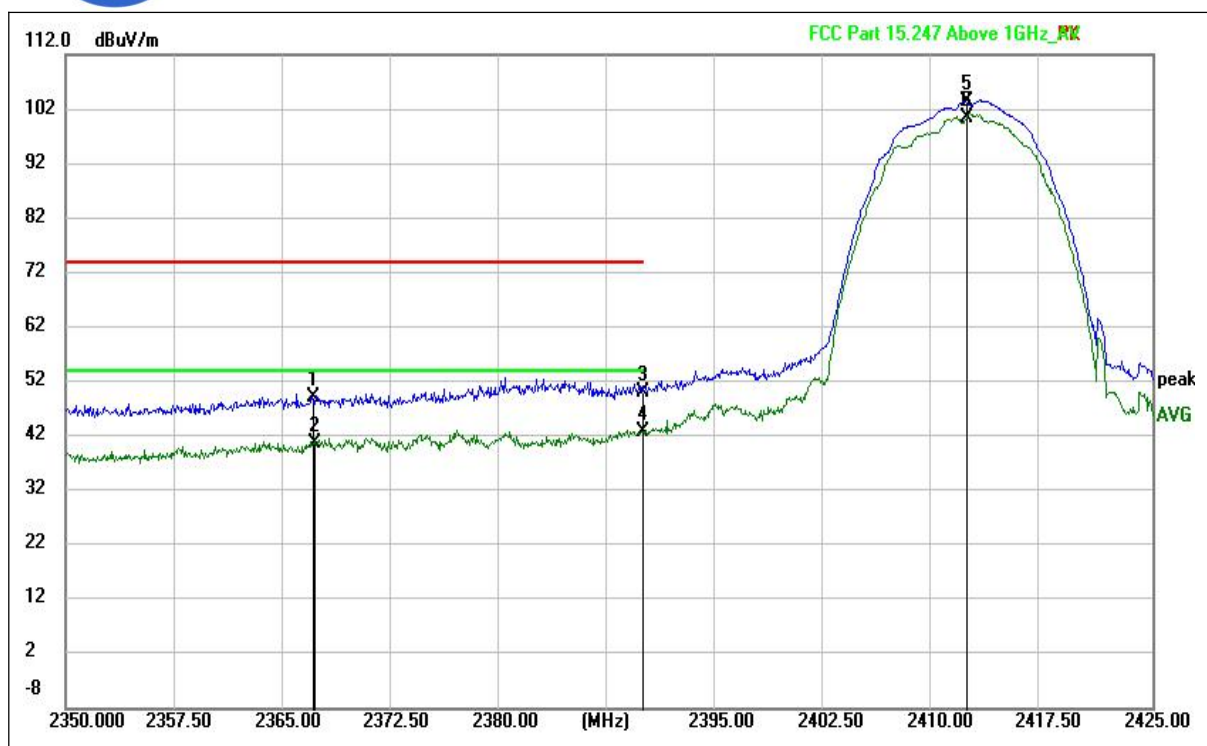
2.6.3. Test Result

802.11b Test mode



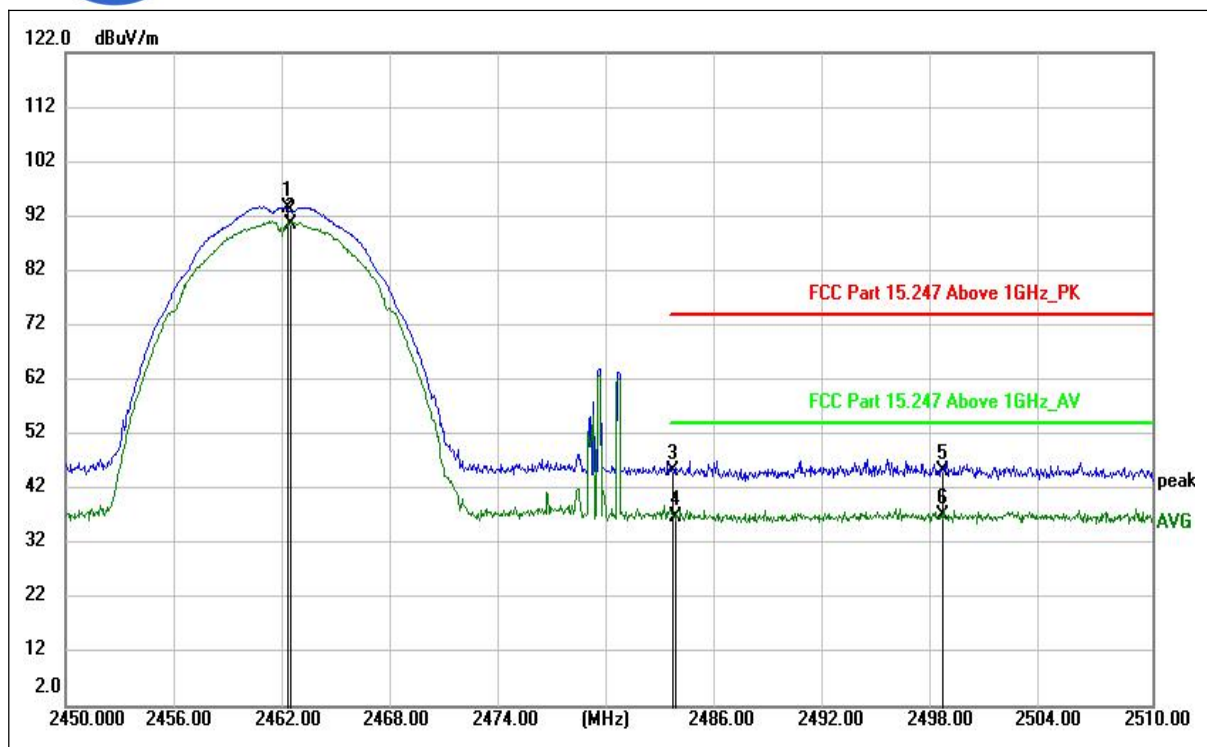
(802.11b _2412MHz, Antenna Horizontal)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2367.032	36.50	7.40	43.90	74.00	-30.10	peak	H
2367.164	27.94	7.40	35.34	54.00	-18.66	AVG	H
2390.000	29.46	7.99	37.45	54.00	-16.55	AVG	H
2390.000	37.94	7.99	45.93	74.00	-28.07	peak	H
2412.366	88.15	8.64	96.79	N/A	N/A	peak	H
2412.419	86.01	8.64	94.65	N/A	N/A	AVG	H



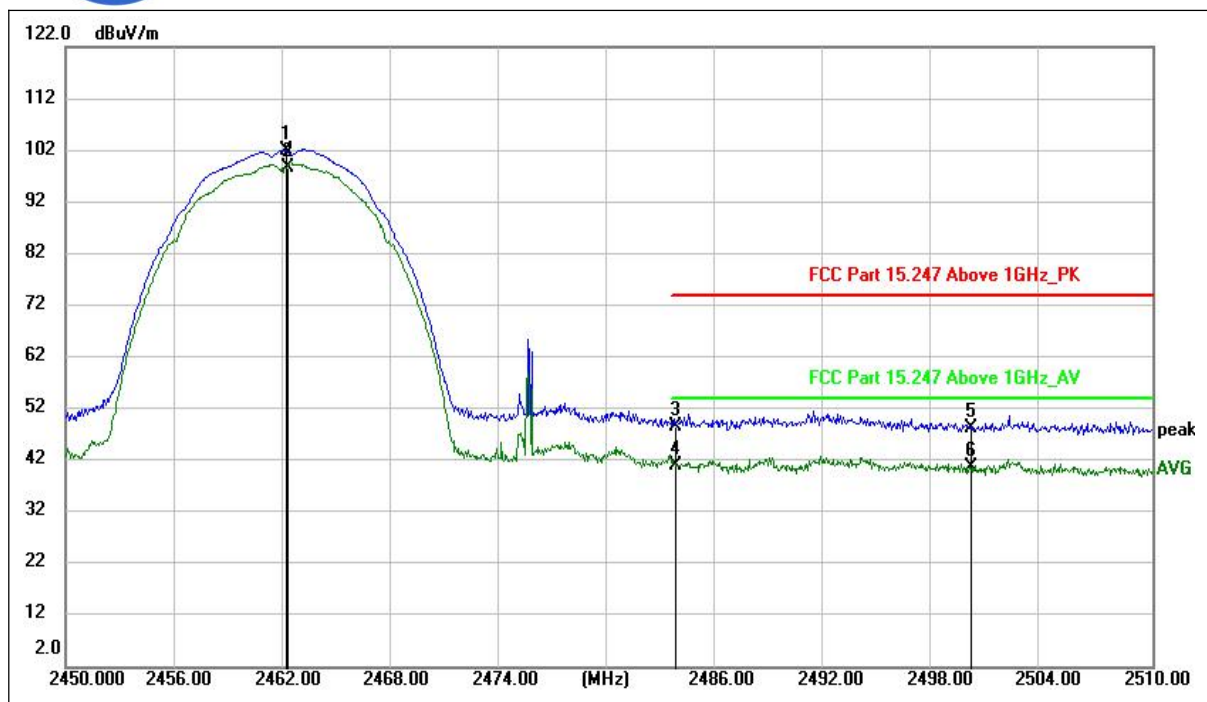
(802.11b _2412MHz, Antenna Vertical)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2367.059	41.78	7.40	49.18	74.00	-24.82	peak	V
2367.179	33.26	7.40	40.66	54.00	-13.34	AVG	V
2390.000	41.93	7.99	49.92	74.00	-24.08	peak	V
2390.000	34.71	7.99	42.70	54.00	-11.30	AVG	V
2412.137	94.70	8.63	103.33	N/A	N/A	peak	V
2412.216	91.63	8.64	100.27	N/A	N/A	AVG	V



(802.11b _2462MHz, Antenna Horizontal)

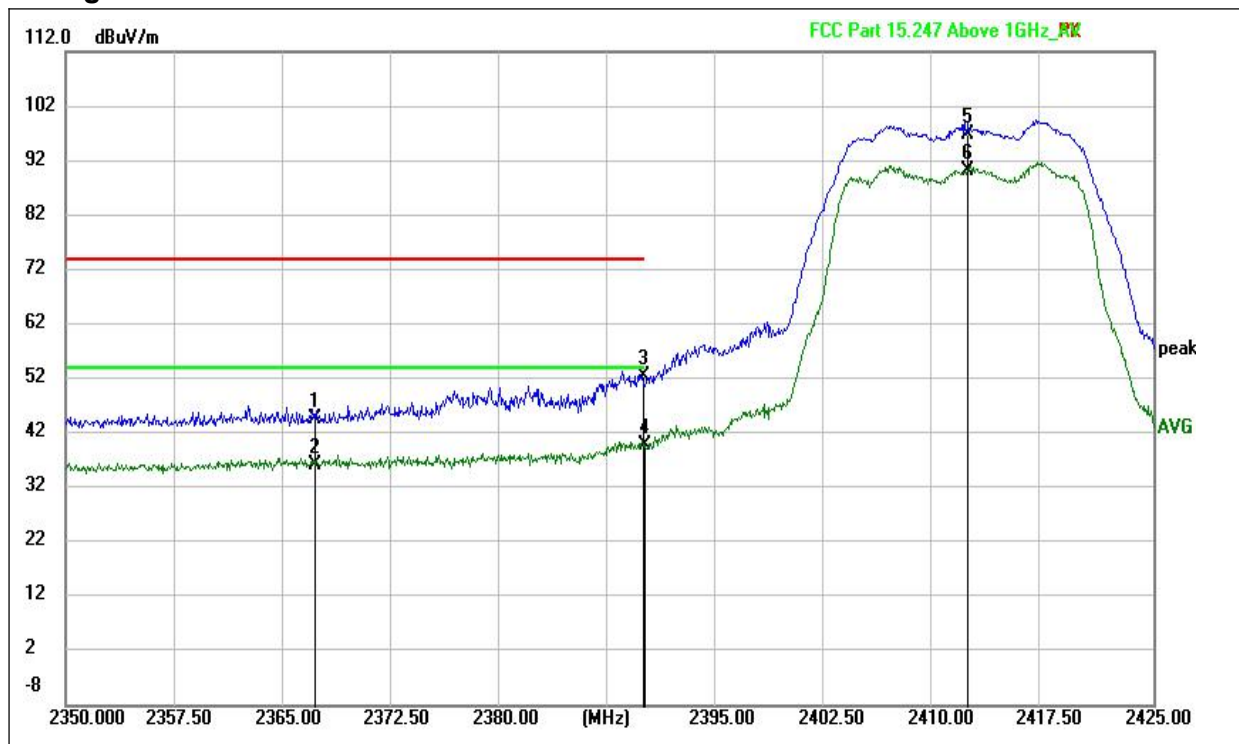
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2462.183	85.51	7.89	93.40	N/A	N/A	peak	H
2462.414	82.63	7.89	90.52	N/A	N/A	AVG	H
2483.500	36.83	8.35	45.18	74.00	28.82	peak	H
2483.500	28.51	8.37	36.88	54.00	-17.12	AVG	H
2498.396	36.93	8.34	45.27	74.00	-28.73	peak	H
2498.396	28.76	8.34	37.10	54.00	-16.90	AVG	H



(802.11b_2462MHz, Antenna Vertical)

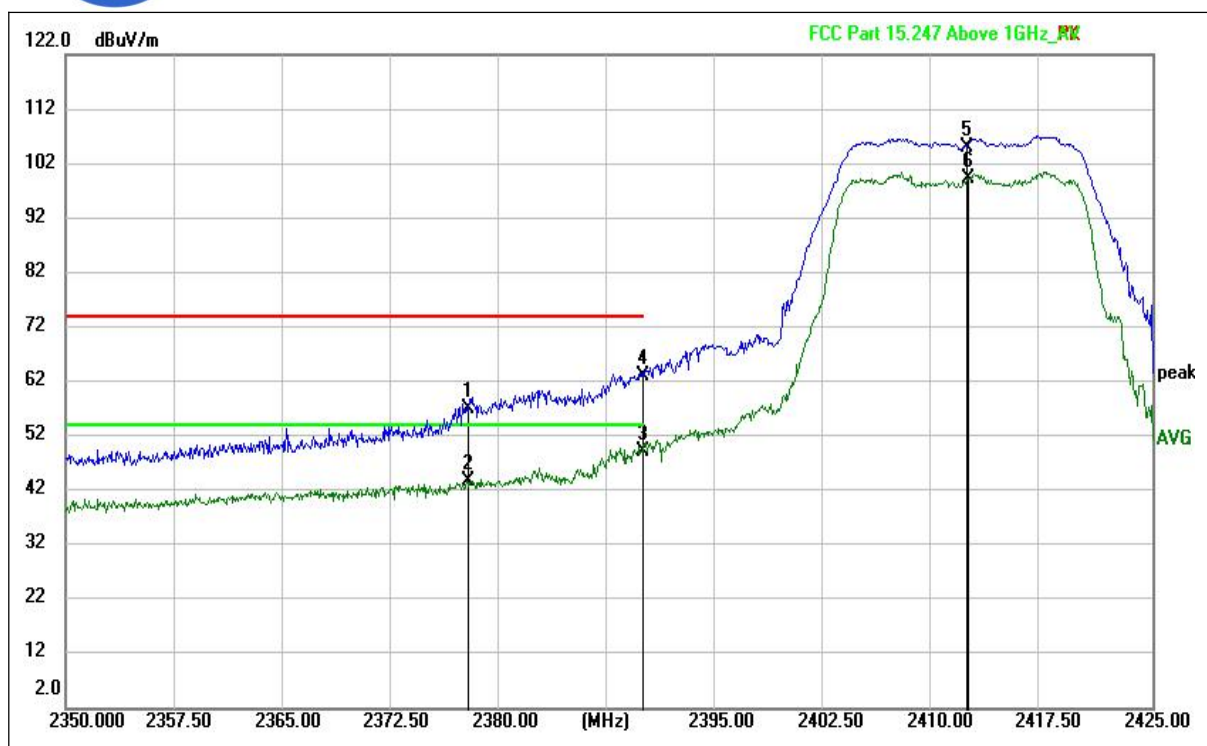
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2462.126	94.03	7.88	101.91	N/A	N/A	peak	V
2462.216	90.69	7.89	98.58	N/A	N/A	AVG	V
2483.500	40.71	7.99	48.70	74.00	-25.30	peak	V
2483.500	33.04	7.99	41.03	54.00	-12.97	AVG	V
2499.947	39.99	8.34	48.33	74.00	-25.67	peak	V
2499.947	32.27	8.34	40.61	54.00	-13.39	AVG	V

802.11g Test mode



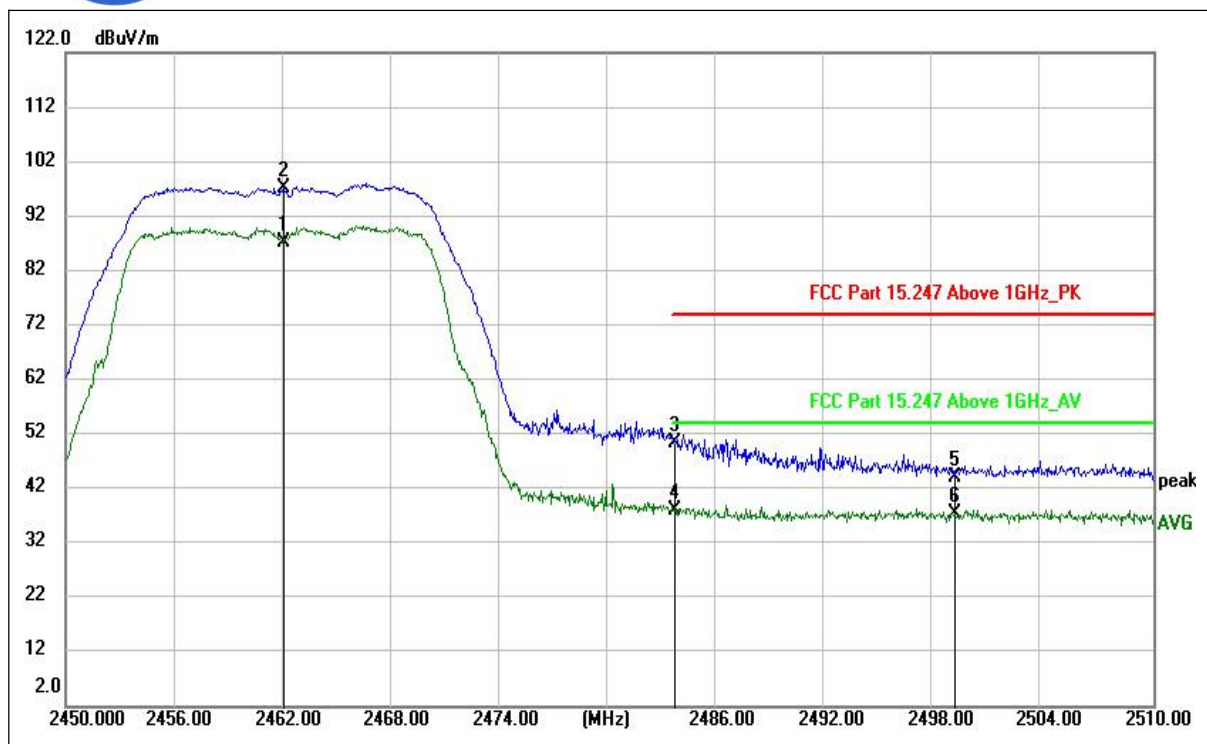
(802.11g _2412MHz, Antenna Horizontal)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2367.224	37.23	7.40	44.63	74.00	-29.37	peak	H
2367.224	28.72	7.40	36.12	54.00	-17.88	AVG	H
2390.000	44.48	7.99	52.47	74.00	-21.53	peak	H
2390.000	31.71	7.99	39.70	54.00	-14.30	AVG	H
2412.164	88.15	8.64	96.79	N/A	N/A	peak	H
2412.209	81.64	8.64	90.28	N/A	N/A	AVG	H



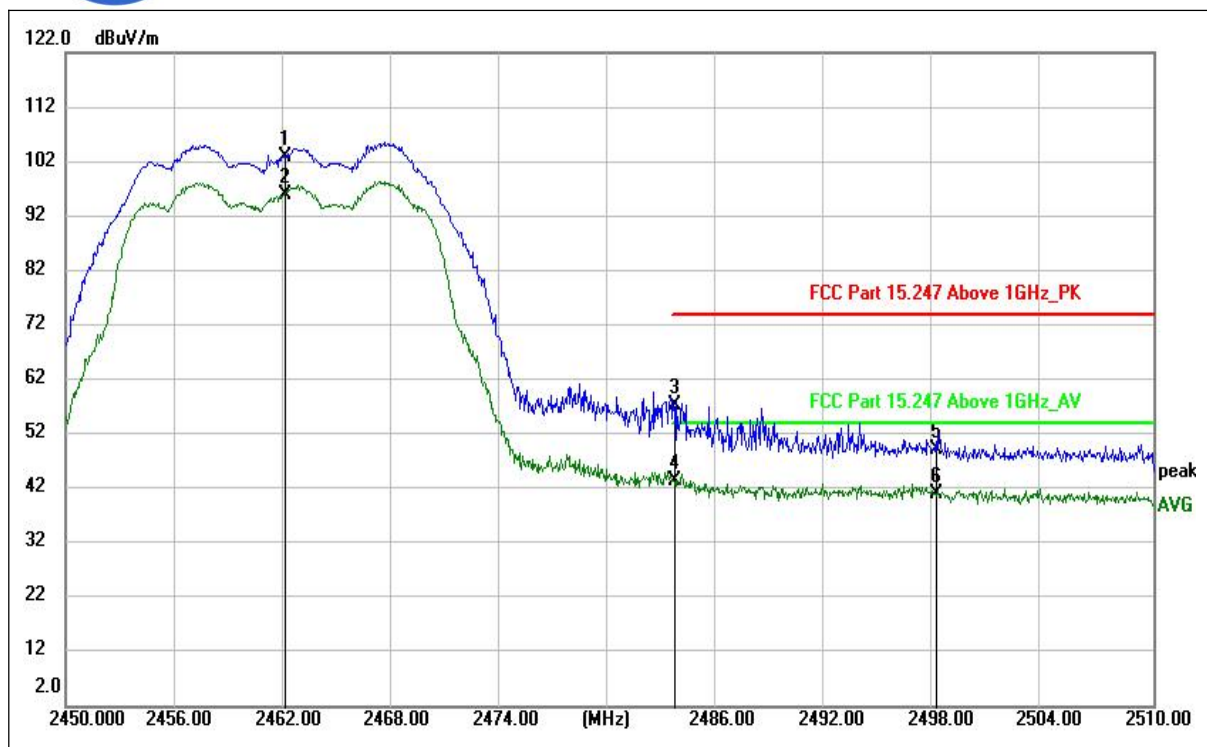
(802.11g _2412MHz, Antenna Vertical)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2377.814	49.86	7.29	57.15	74.00	-16.85	peak	V
2377.814	36.55	7.29	43.84	54.00	-10.16	AVG	V
2390.000	41.23	7.99	49.22	54.00	-4.78	AVG	V
2390.000	55.06	7.99	63.05	74.00	-10.95	peak	V
2412.126	96.32	8.63	104.95	N/A	N/A	peak	V
2412.284	90.72	8.64	99.36	N/A	N/A	AVG	V



(802.11g _2462MHz, Antenna Horizontal)

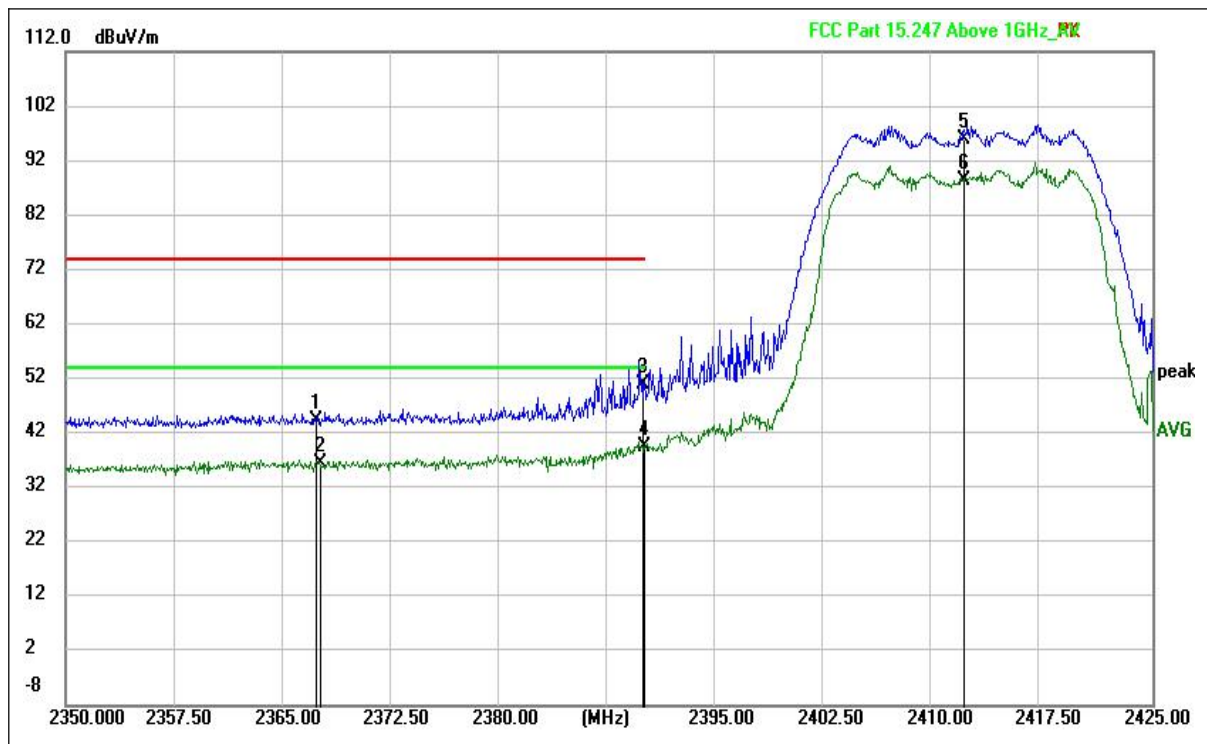
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2462.003	79.37	7.88	87.25	N/A	N/A	AVG	H
2462.039	89.37	7.88	97.25	N/A	N/A	peak	H
2483.500	42.07	8.36	50.43	74.00	-23.57	peak	H
2483.500	29.57	8.37	37.94	54.00	-16.06	AVG	H
2499.062	35.85	8.33	44.18	74.00	-29.82	peak	H
2499.062	29.05	8.33	37.38	54.00	-16.62	AVG	H



(802.11g _2462MHz, Antenna Vertical)

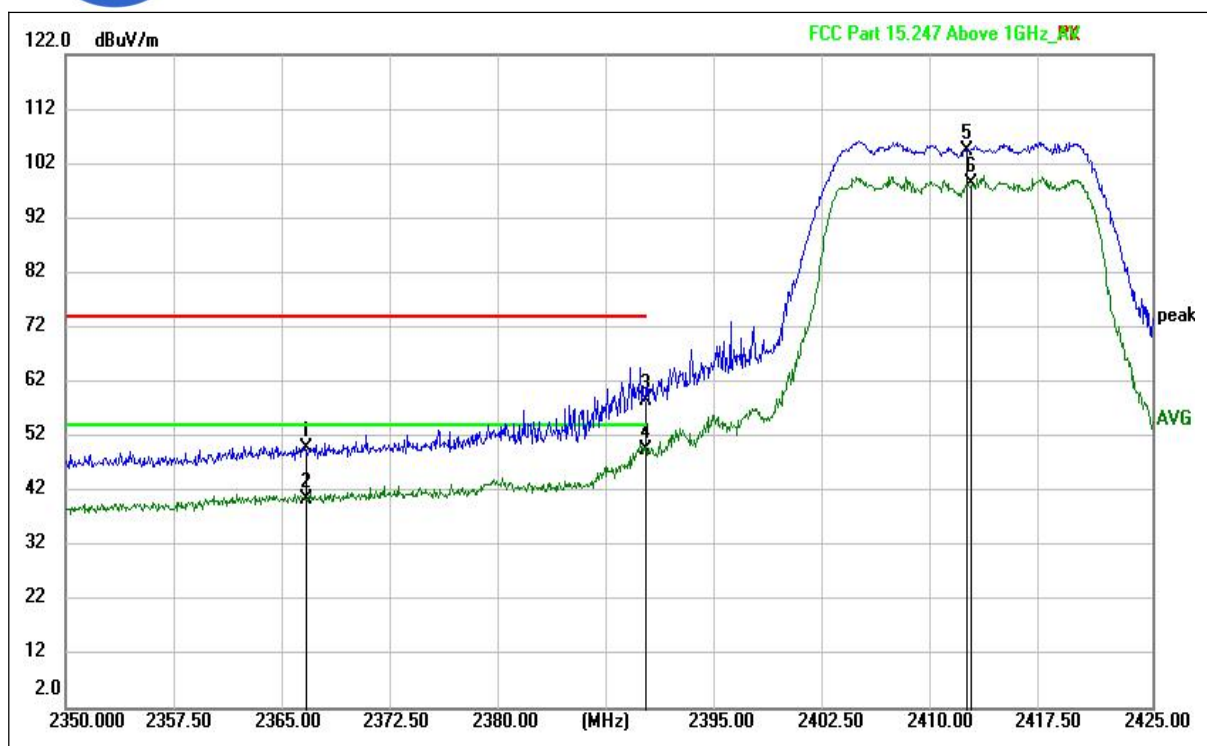
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2462.096	94.89	7.88	102.77	N/A	N/A	peak	V
2462.096	88.10	7.88	95.98	N/A	N/A	AVG	V
2483.500	49.10	8.36	57.46	74.00	-16.54	peak	V
2483.500	35.23	8.37	43.60	54.00	-10.40	AVG	V
2497.961	40.93	8.34	49.27	74.00	-24.73	peak	V
2498.060	32.65	8.34	40.99	54.00	-13.01	AVG	V

802.11n-20MHz Test mode



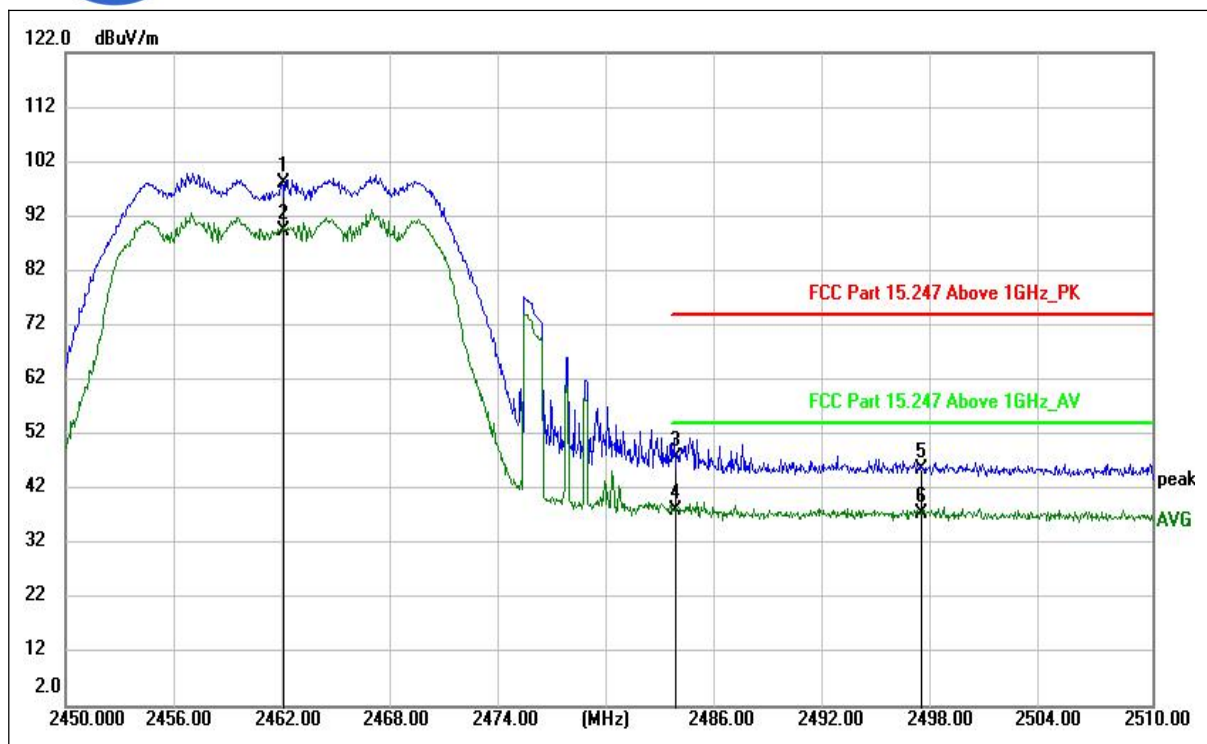
(802.11n_20M_2412MHz, Antenna Horizontal)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2367.276	36.84	7.40	44.24	74.00	-29.76	peak	H
2367.479	29.22	7.39	36.61	54.00	-17.39	AVG	H
2390.000	42.86	7.99	50.85	74.00	-23.15	peak	H
2390.000	31.49	7.99	39.48	54.00	-14.52	AVG	H
2412.014	87.19	8.64	95.83	N/A	N/A	peak	H
2412.014	79.73	8.64	88.37	N/A	N/A	AVG	H



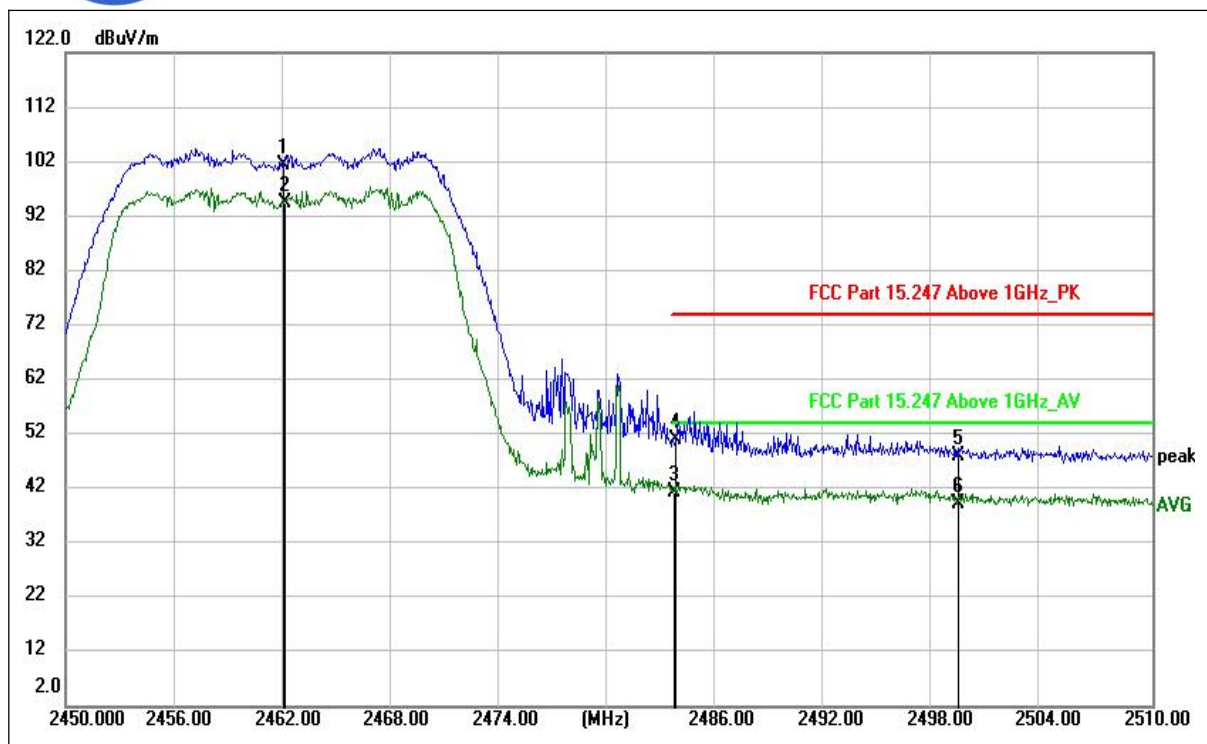
(802.11n_20M_2412MHz, Antenna Vertical)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2366.568	42.45	7.41	49.86	74.00	-24.14	peak	V
2366.568	33.04	7.41	40.45	54.00	-13.55	AVG	V
2390.000	50.50	7.99	58.49	74.00	-15.51	peak	V
2390.000	41.44	7.99	49.43	54.00	-4.57	AVG	V
2412.122	95.78	8.63	104.41	N/A	N/A	peak	V
2412.419	89.83	8.64	98.47	N/A	N/A	AVG	V



(802.11n_20M_2462MHz, Antenna Horizontal)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2462.003	90.08	7.88	97.96	N/A	N/A	peak	H
2462.003	81.44	7.88	89.32	N/A	N/A	AVG	H
2483.500	39.35	8.36	47.71	74.00	-26.29	peak	H
2483.500	29.65	8.37	38.02	54.00	-15.98	AVG	H
2497.187	37.18	8.34	45.52	74.00	-28.48	peak	H
2497.226	29.21	8.34	37.55	54.00	-16.45	AVG	H

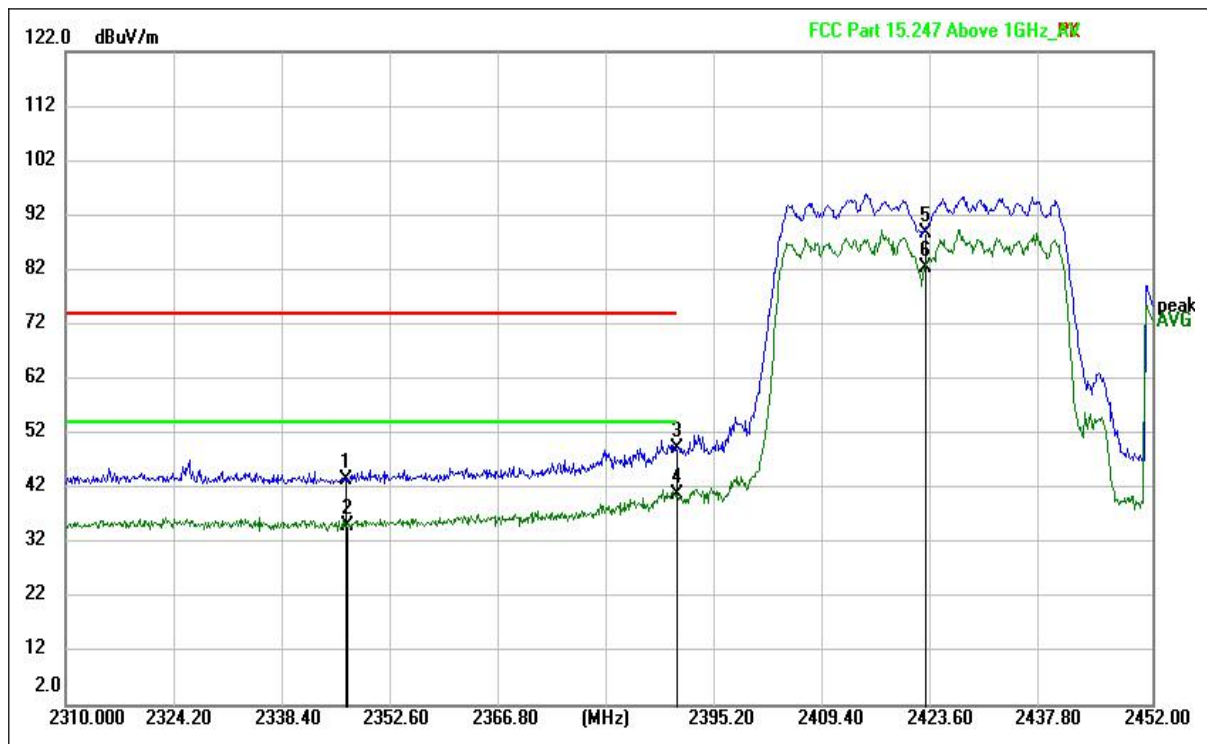


(802.11n_20M_2462MHz, Antenna Vertical)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2462.003	93.46	7.88	101.34	N/A	N/A	peak	V
2462.099	86.64	7.88	94.52	N/A	N/A	AVG	V
2483.500	32.99	8.36	41.35	54.00	-12.65	AVG	V
2483.500	42.66	8.37	51.03	74.00	-22.97	peak	V
2499.212	39.60	8.33	47.93	74.00	-26.07	peak	V
2499.260	30.94	8.33	39.27	54.00	-14.73	AVG	V

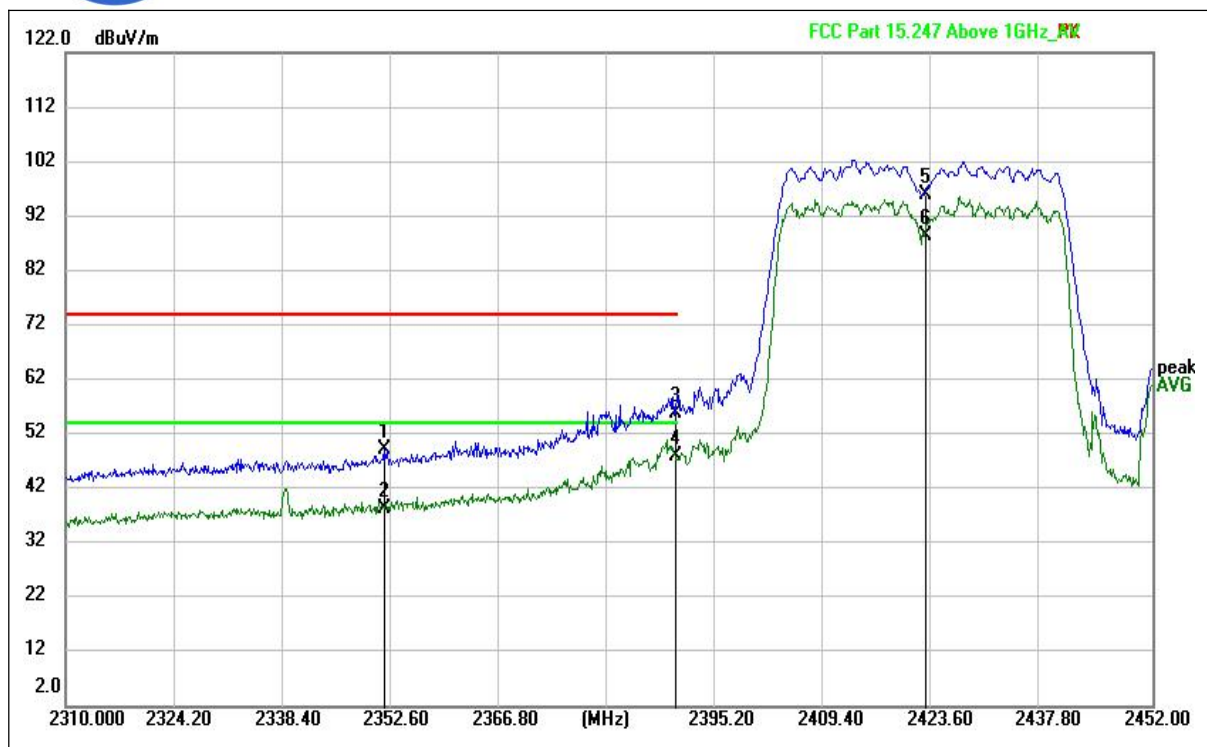


802.11n-40MHz Test mode



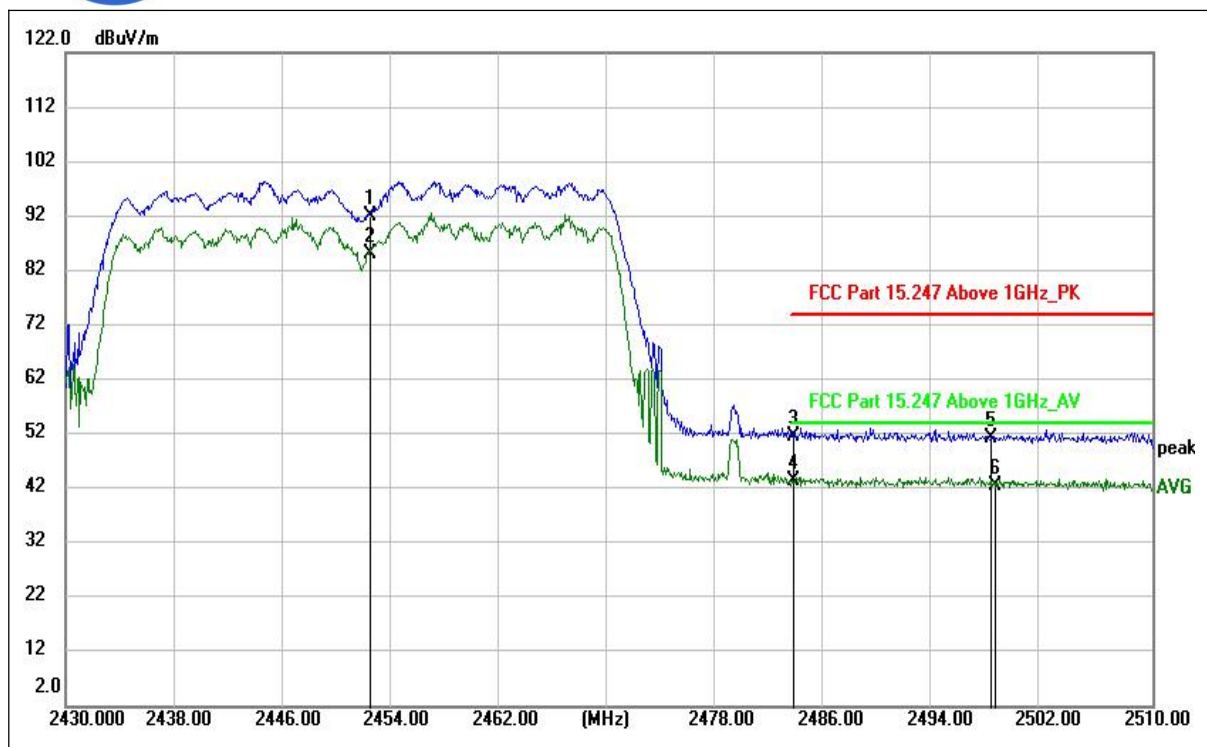
(802.11n_40M _2422MHz, Antenna Horizontal)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2346.608	35.85	7.67	43.52	74.00	-30.48	peak	H
2346.849	27.40	7.67	35.07	54.00	-18.93	AVG	H
2390.000	41.09	7.99	49.08	74.00	-24.92	peak	H
2390.000	32.72	7.99	40.71	54.00	-13.29	AVG	H
2422.223	80.14	8.61	88.75	N/A	N/A	peak	H
2422.421	73.80	8.61	82.41	N/A	N/A	AVG	H



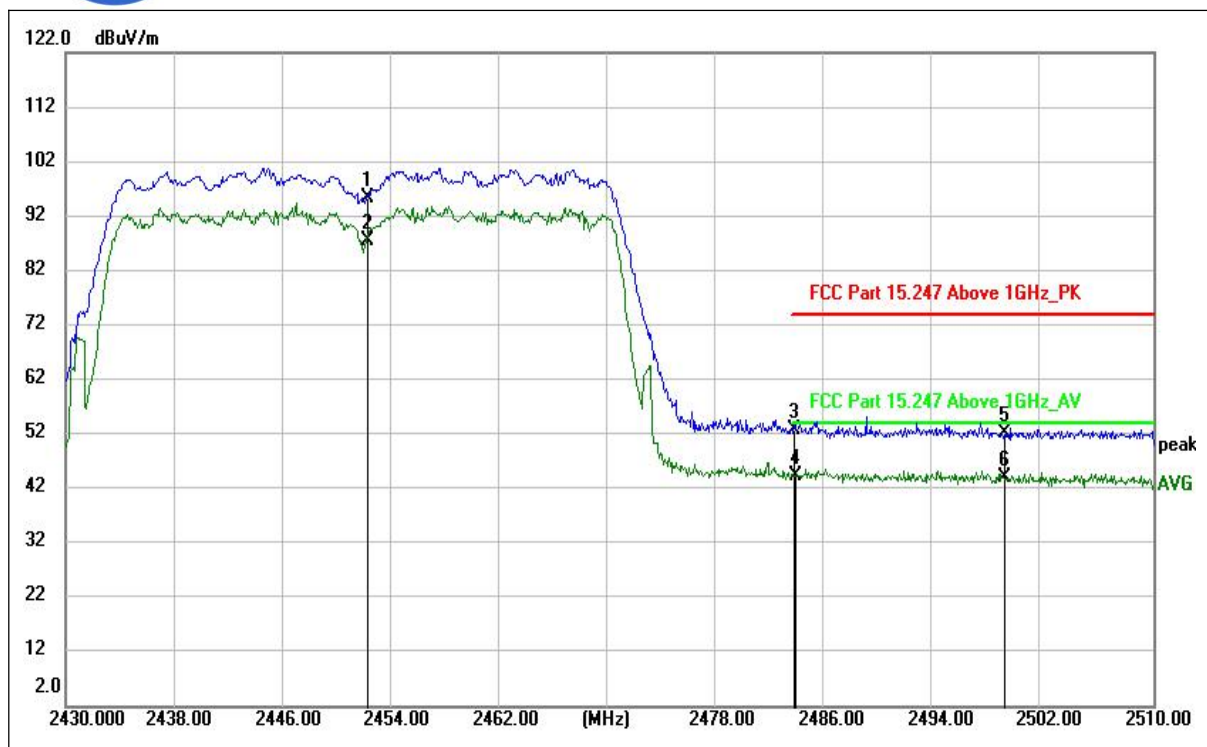
(802.11n_40M_2422MHz, Antenna Vertical)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2351.734	41.45	7.69	49.14	74.00	-24.86	peak	V
2351.734	30.66	7.69	38.35	54.00	-15.65	AVG	V
2390.000	47.96	7.99	55.95	74.00	-18.05	peak	V
2390.000	39.97	7.99	47.96	54.00	-6.04	AVG	V
2422.322	87.29	8.61	95.90	N/A	N/A	peak	V
2422.322	79.75	8.61	88.36	N/A	N/A	AVG	V



(802.11n_40M_2452MHz, Antenna Horizontal)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2452.328	84.37	7.75	92.12	N/A	N/A	peak	H
2452.372	77.28	7.75	85.03	N/A	N/A	AVG	H
2483.500	43.24	8.36	51.60	74.00	-22.40	peak	H
2483.500	35.00	8.37	43.37	54.00	-10.63	AVG	H
2498.036	43.01	8.34	51.35	74.00	-22.65	peak	H
2498.332	34.09	8.34	42.43	54.00	-11.57	AVG	H



(802.11n_40M_2452MHz, Antenna Vertical)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
2452.180	87.62	7.74	95.36	N/A	N/A	peak	V
2452.180	79.86	7.74	87.60	N/A	N/A	AVG	V
2483.500	44.52	8.36	52.88	74.00	-21.12	peak	V
2483.500	35.87	8.37	44.24	54.00	-9.76	AVG	V
2498.968	43.92	8.33	52.25	74.00	-21.75	peak	V
2499.056	35.85	8.33	44.18	54.00	-9.82	AVG	V

2.7. Conducted Emission

2.7.1. Requirement

According to FCC section 15.207, for an intentional radiator that 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 within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN).

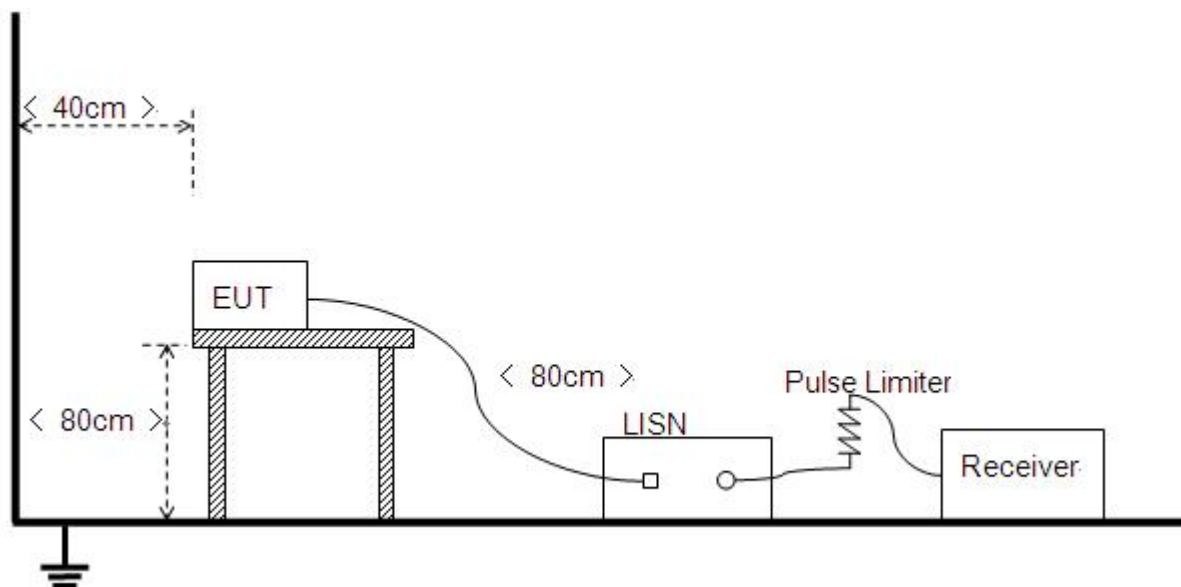
Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

- The lower limit shall apply at the band edges.
- The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

2.7.2. Test Description

A. Test Setup:



The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10 2013.



B. Equipments List:

Please refer ANNEX B(4).

2.7.3. Test Result

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

Note: Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

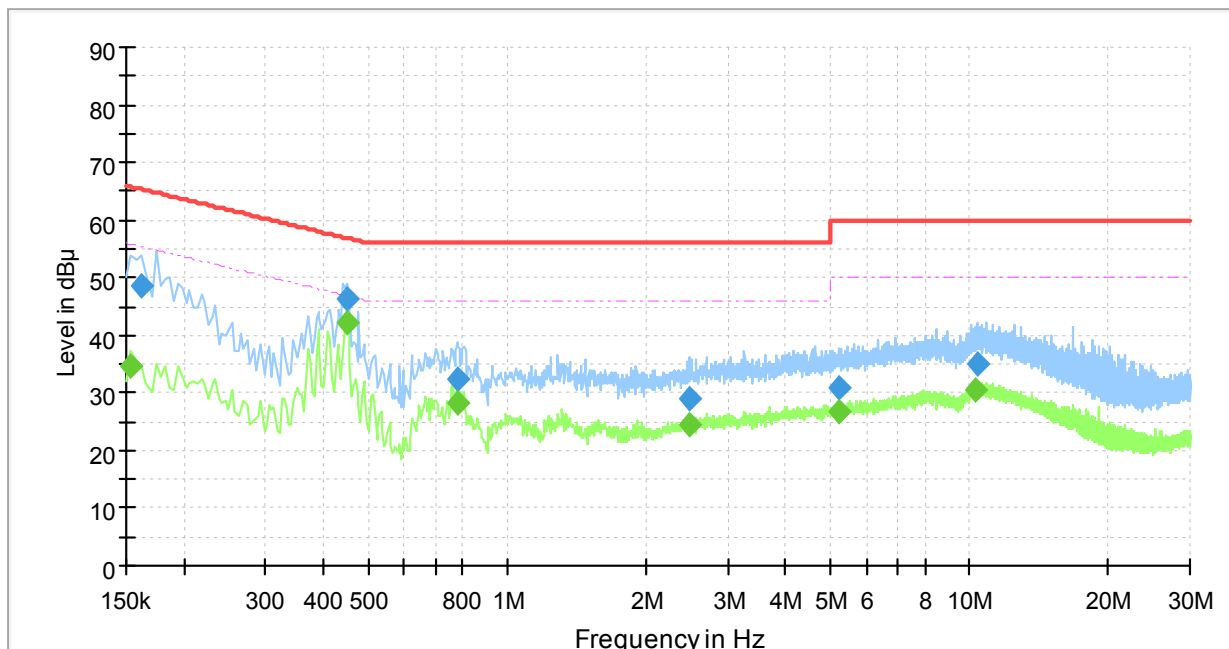
A. Test setup:

The EUT configuration of the emission tests is EUT +Wlan Link.

Note: The test voltage is AC 120V/60Hz.

B. Test Plots:

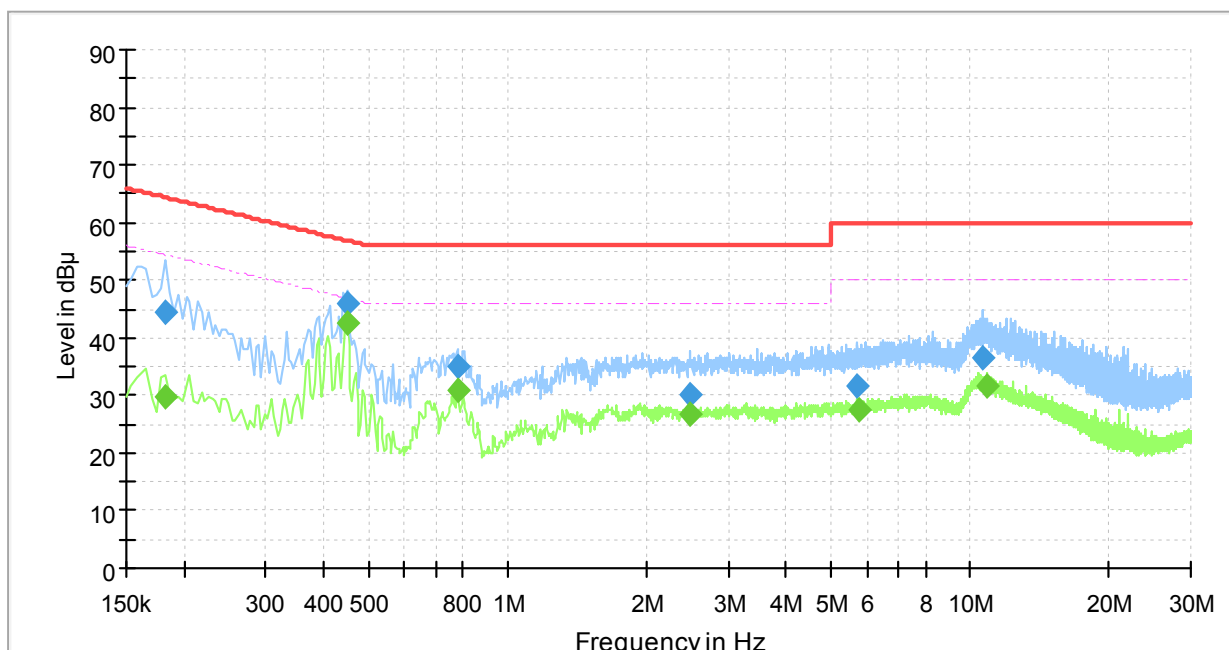
Full Spectrum



(Plot A: L Phase)

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.154000	---	34.58	55.78	21.21	L1	10.2
0.162000	48.50	---	65.36	16.86	L1	10.2
0.450000	---	42.25	46.88	4.63	L1	10.2
0.450000	46.37	---	56.88	10.50	L1	10.2
0.778000	32.22	---	56.00	23.78	L1	10.2
0.782000	---	28.32	46.00	17.68	L1	10.2
2.482000	29.09	---	56.00	26.91	L1	10.3
2.490000	---	24.31	46.00	21.69	L1	10.3
5.242000	30.70	---	60.00	29.30	L1	10.4
5.242000	---	26.79	50.00	23.21	L1	10.4
10.358000	---	30.37	50.00	19.63	L1	10.6
10.366000	35.17	---	60.00	24.83	L1	10.6

Full Spectrum



(Plot A: N Phase)

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)
0.182000	---	29.71	54.39	24.68	N	10.5
0.182000	44.38	---	64.39	20.01	N	10.5
0.450000	---	42.52	46.88	4.35	N	10.4
0.450000	45.98	---	56.88	10.90	N	10.4
0.782000	---	31.06	46.00	14.94	N	10.4
0.782000	35.09	---	56.00	20.91	N	10.4
2.490000	29.96	---	56.00	26.04	N	10.5
2.490000	---	26.58	46.00	19.42	N	10.5
5.694000	31.71	---	60.00	28.29	N	10.7
5.730000	---	27.63	50.00	22.37	N	10.7
10.678000	36.36	---	60.00	23.64	N	10.9
10.906000	---	31.54	50.00	18.46	N	10.9



2.8. Radiated Emission

2.8.1. Requirement

According to FCC section 15.247(d), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
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

Note:

For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

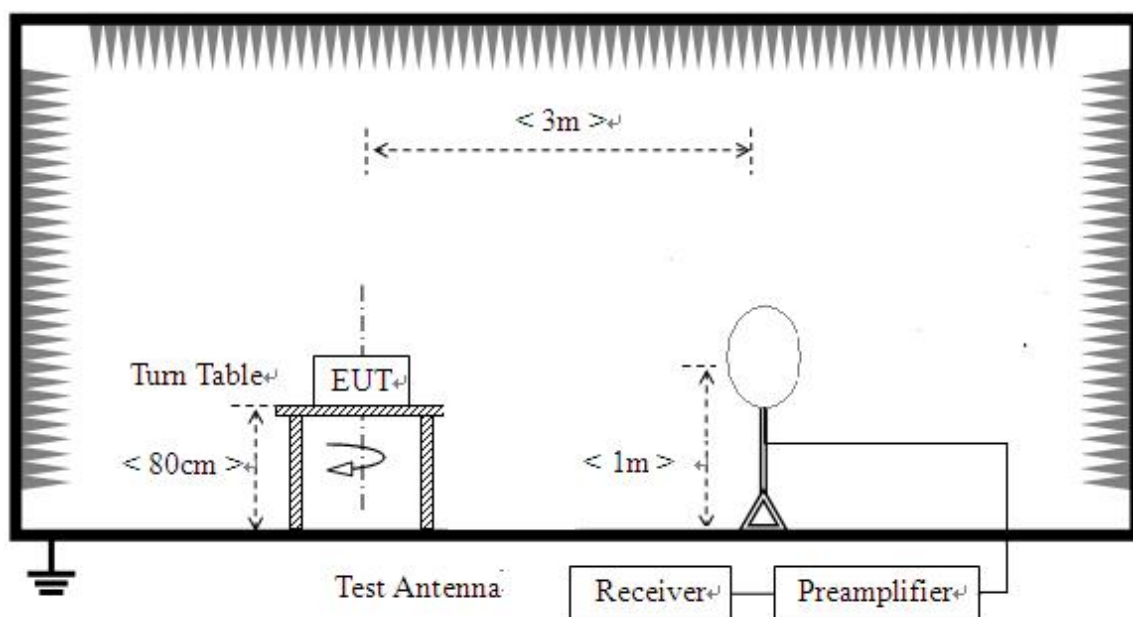
For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK)

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table)

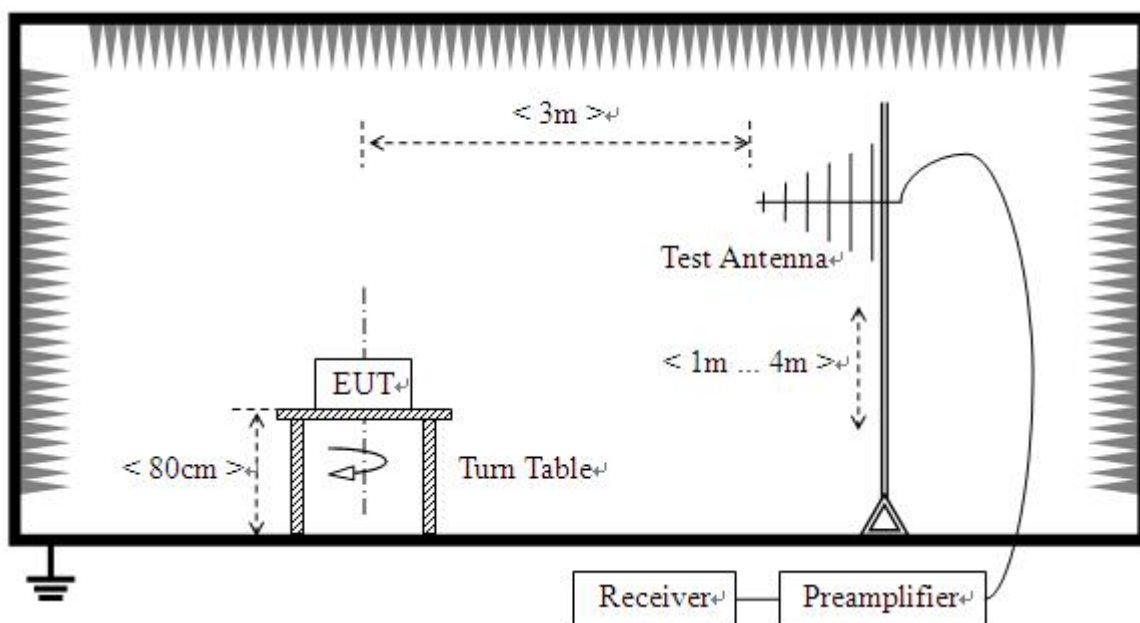
2.8.2. Test Description

A. Test Setup:

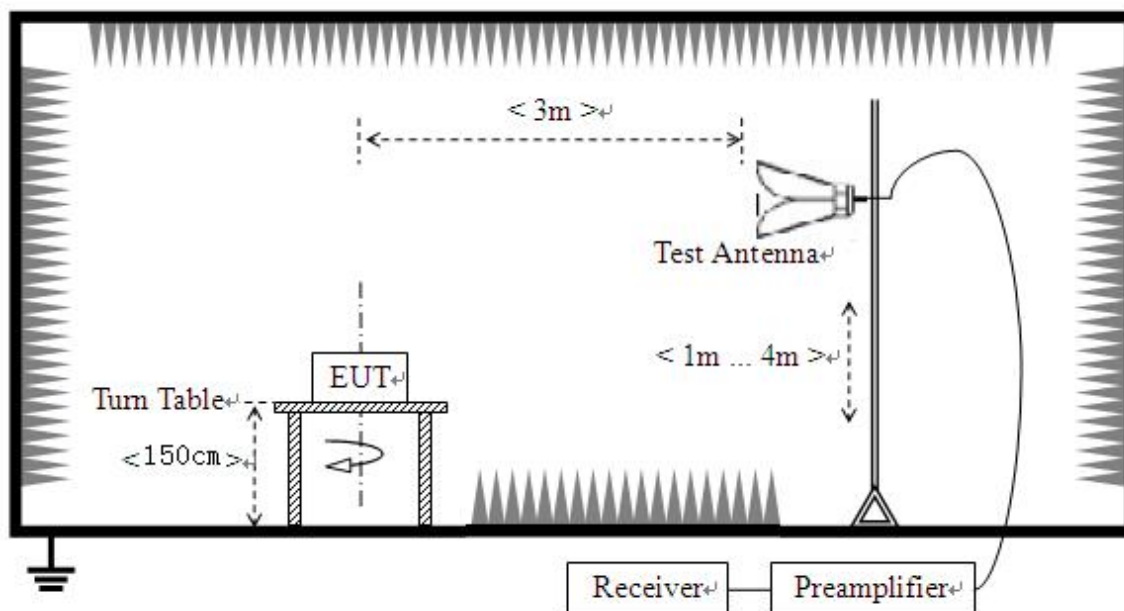
- 1) For radiated emissions from 9kHz to 30MHz



- 2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 3GHz



The RF absorbing material used on the reference ground plane and on the turntable have a maximum height (thickness) of 30 cm (12 in) and have a minimum-rated attenuation of 20 dB at all frequencies from 1 GHz to 18 GHz. Test site have a minimum area of the ground plane covered with RF absorbing material as specified in Figure 6 of ANSI C63.4: 2014.

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.10 (2013). For radiated emissions below or equal to 1GHz, The EUT was set-up on insulator 80cm above the Ground Plane, For radiated emissions above 1GHz, The EUT was set-up on insulator 150cm above the Ground Plane. The set-up and test methods were according to ANSI C63.10

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.



The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading

For the Test Antenna:

(a) In the frequency range of 9kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.

(b) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Place the test antenna at 3m away from area of the EUT, while keeping the test antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The test antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final test antenna elevation shall be that which maximizes the emissions. The test antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. The emission levels at both horizontal and vertical polarizations should be tested.

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.



- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasipeak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
- 4. All modes of operation were investigated and the worst-case emissions are reported.

A. Equipments List:

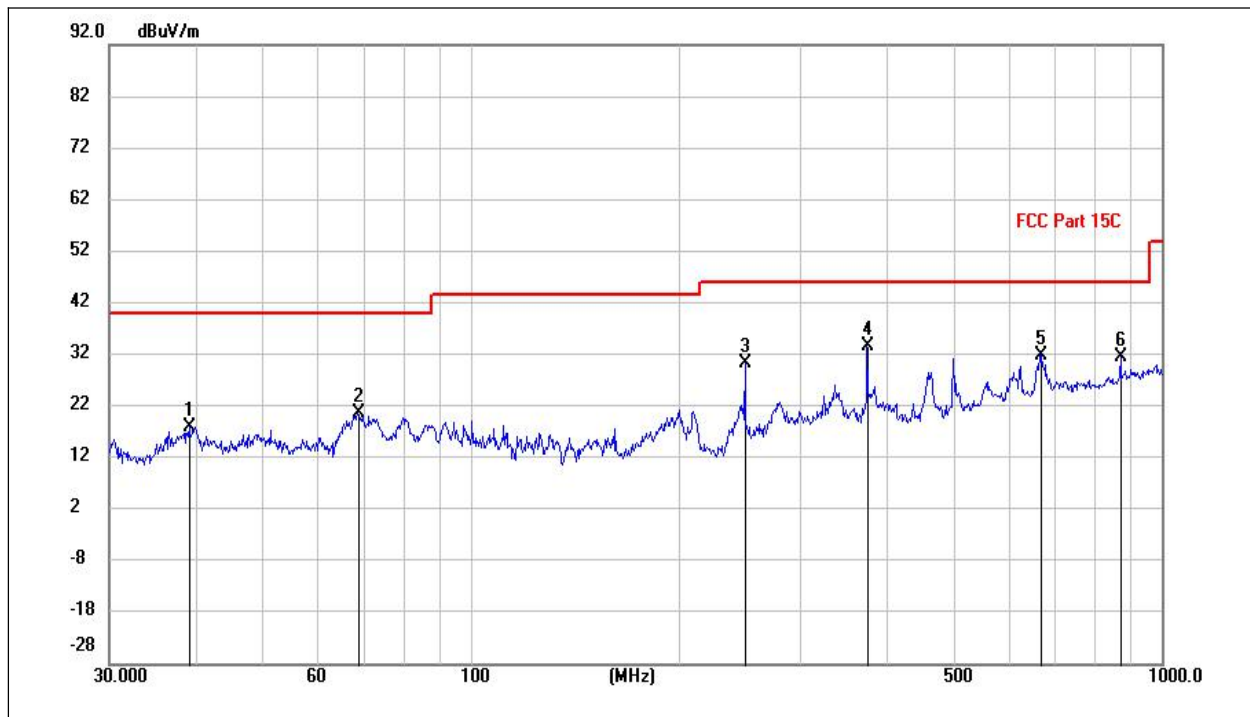
Please refer ANNEX B(4).

2.8.3. Test Result

Note1: For the frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

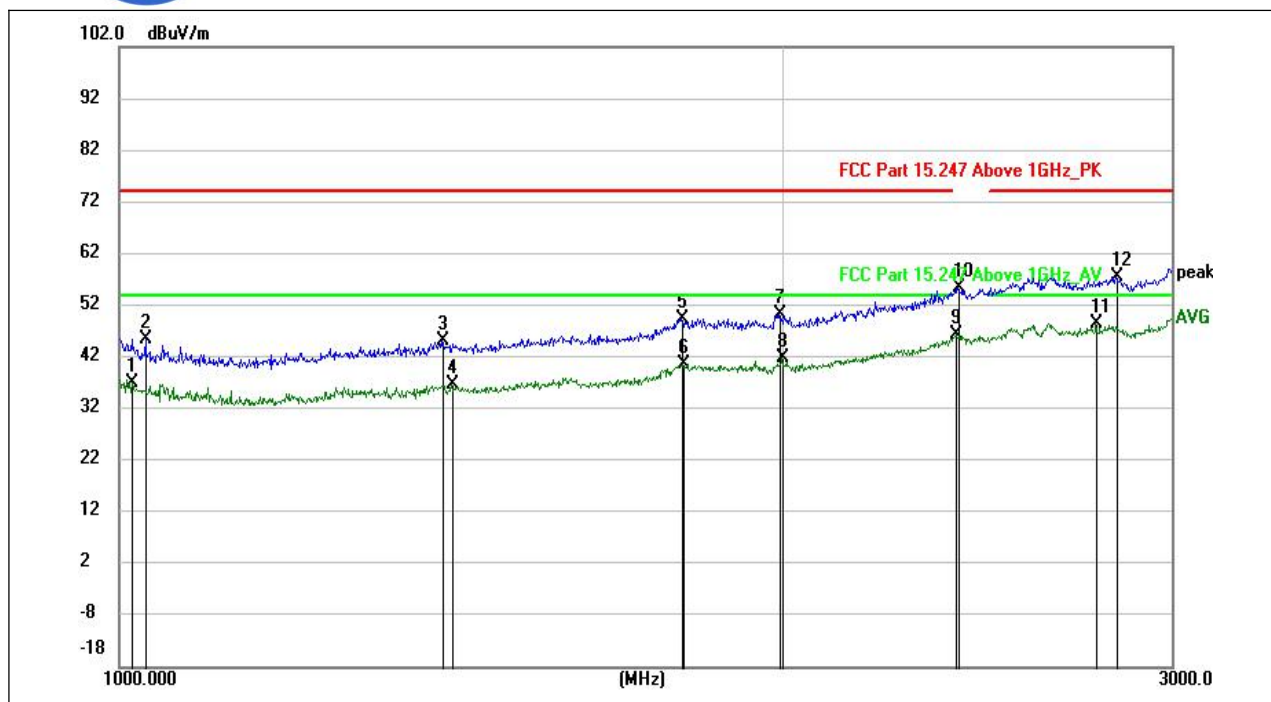
Note2: For the frequency, which started from 18GHz to 40GHz, was pre-scanned and the result which was 10dB lower than the limit was not recorded.

802.11b Test mode



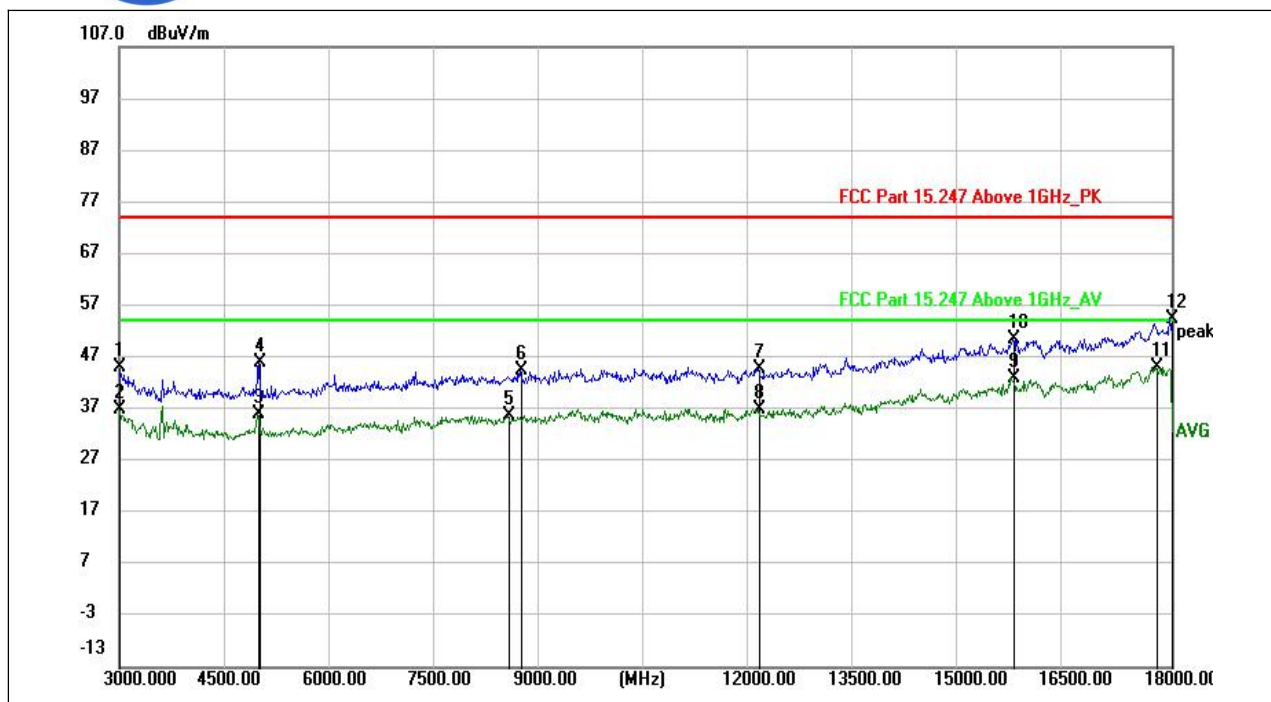
(802.11b _2412MHz, Antenna Horizontal, 30MHz to 1GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
39.1959	3.43	14.49	17.92	40.00	-22.08	peak	H
68.8601	8.43	12.28	20.71	40.00	-19.29	peak	H
249.9942	15.45	14.89	30.34	46.00	-15.66	peak	H
375.0169	15.28	18.39	33.67	46.00	-12.33	peak	H
667.2058	7.36	24.40	31.76	46.00	-14.24	peak	H
875.0935	4.05	27.50	31.55	46.00	-14.45	peak	H



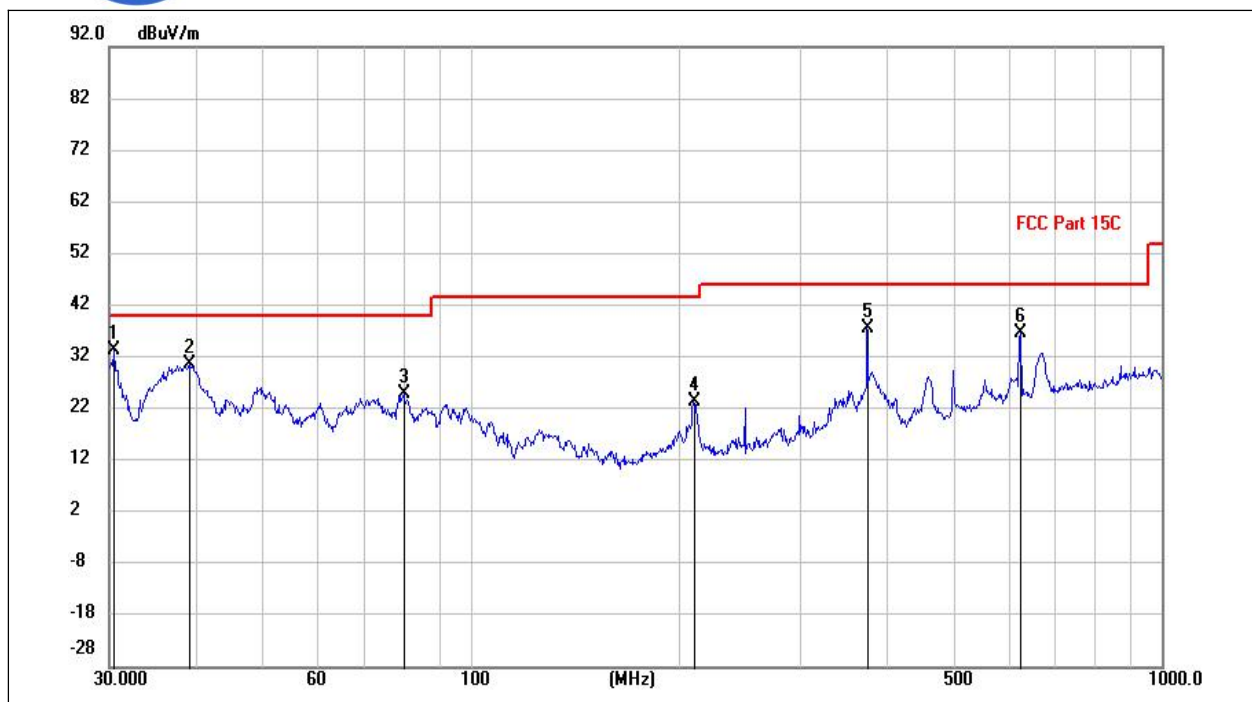
(802.11b _2412MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
1013.382	7.79	29.38	37.17	54.00	-16.83	AVG	H
1028.750	16.41	29.14	45.55	74.00	-28.45	peak	H
1401.200	11.69	33.46	45.15	74.00	-28.85	peak	H
1416.289	3.76	32.96	36.72	54.00	-17.28	AVG	H
1799.849	11.36	37.95	49.31	74.00	-24.69	peak	H
1803.213	3.00	37.72	40.72	54.00	-13.28	AVG	H
1992.807	12.27	38.10	50.37	74.00	-23.63	peak	H
2000.044	3.66	38.20	41.86	54.00	-12.14	AVG	H
2397.533	2.72	43.52	46.24	N/A	N/A	AVG	H
2401.092	11.63	43.64	55.27	N/A	N/A	peak	H
2773.975	3.85	44.49	48.34	54.00	-5.66	AVG	H
2834.510	12.75	44.85	57.60	74.00	-16.40	peak	H



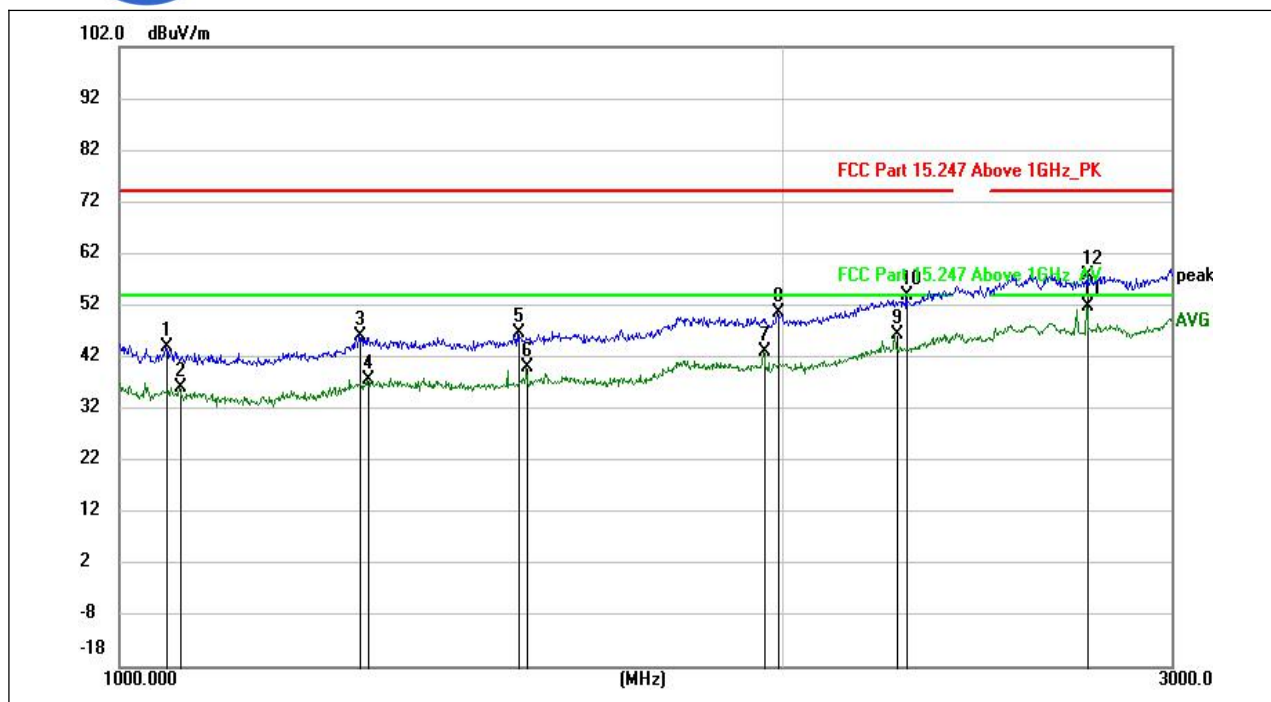
(802.11b_2412MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
3000.000	51.73	-6.80	44.93	74.00	-29.07	peak	H
3000.000	43.75	-6.80	36.95	54.00	-17.05	AVG	H
4993.500	39.49	-3.58	35.91	54.00	-18.09	AVG	H
4999.500	49.69	-3.67	46.02	74.00	-27.98	peak	H
8555.250	34.45	1.16	35.61	54.00	-18.39	AVG	H
8718.000	43.20	1.38	44.58	74.00	-29.42	peak	H
12114.750	40.98	3.88	44.86	74.00	-29.14	peak	H
12114.750	33.13	3.88	37.01	54.00	-16.99	AVG	H
15735.750	31.67	11.25	42.92	54.00	-11.08	AVG	H
15744.750	39.34	11.05	50.39	74.00	-23.61	peak	H
17782.500	30.32	14.83	45.15	54.00	-8.85	AVG	H
17985.750	39.29	15.02	54.31	74.00	-19.69	peak	H



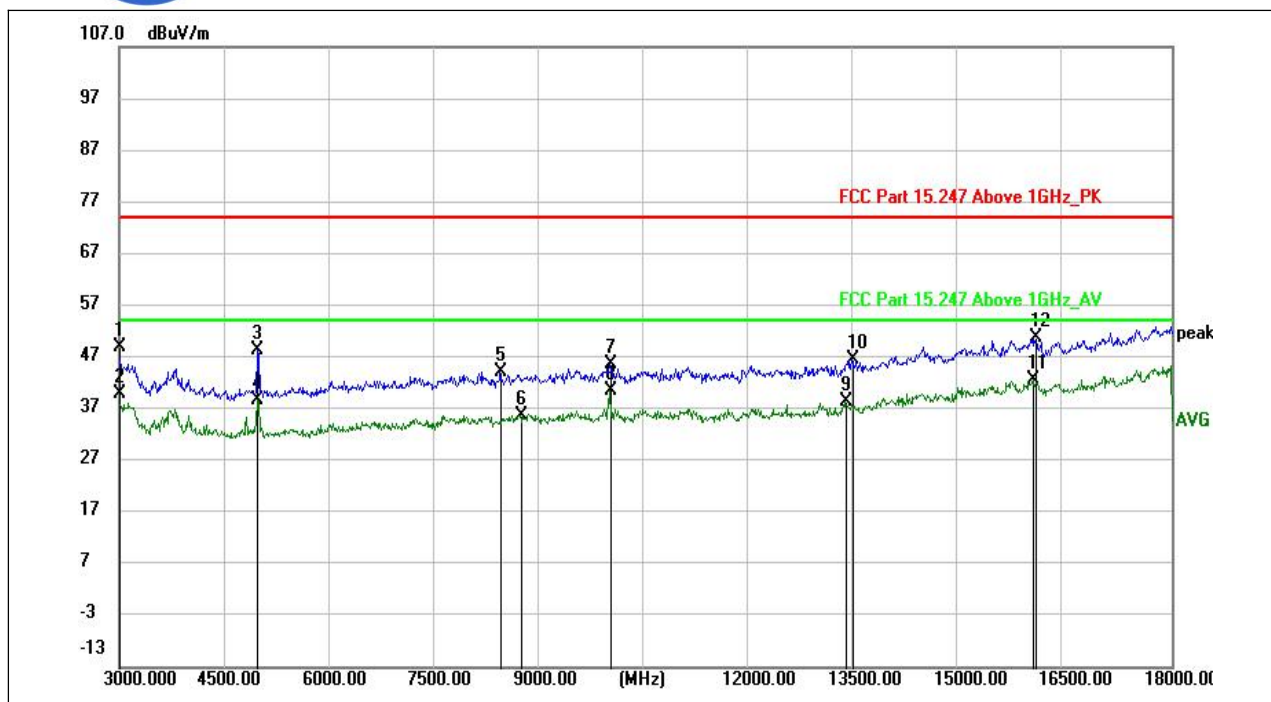
(802.11b _2412MHz, Antenna Vertical, 30MHz to 1GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
30.5306	20.26	12.95	33.21	40.00	-6.79	peak	V
39.1822	16.17	14.47	30.64	40.00	-9.36	peak	V
80.1508	13.95	10.91	24.86	40.00	-15.14	peak	V
210.3799	9.98	13.33	23.31	43.50	-20.19	peak	V
375.0169	19.12	18.39	37.51	46.00	-8.49	peak	V
625.0780	12.84	23.84	36.68	46.00	-9.32	peak	V



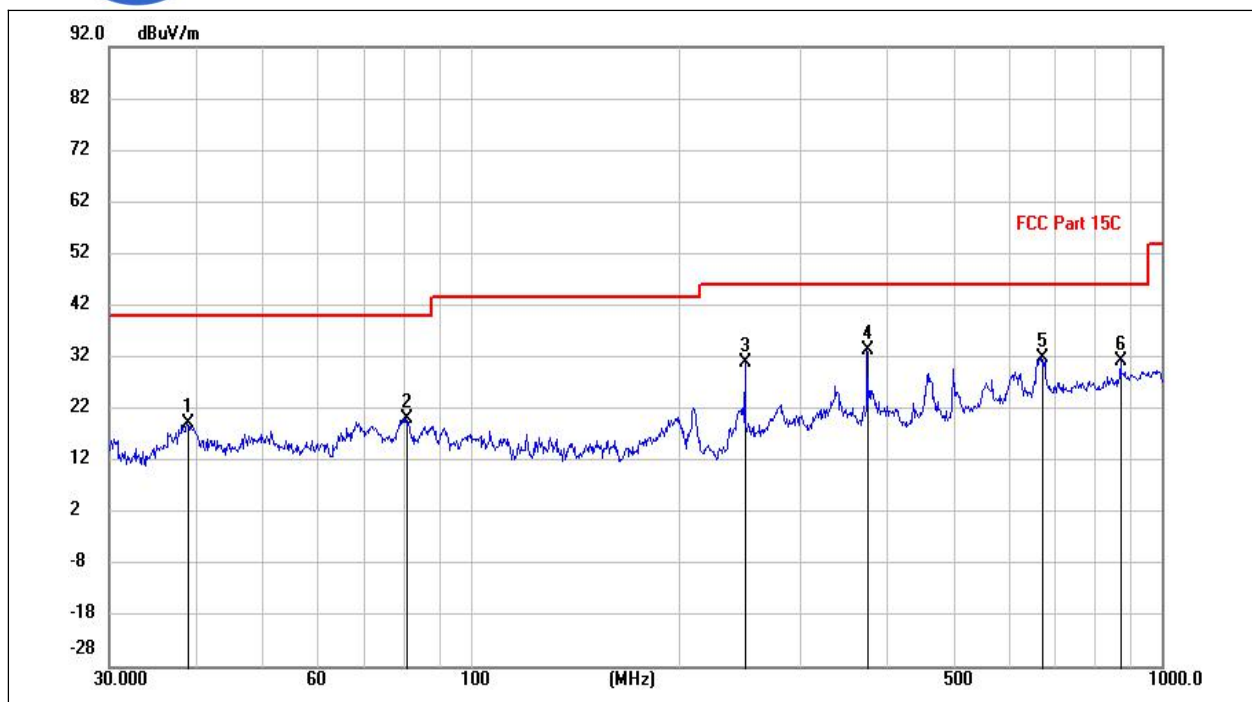
(802.11b _2412MHz, Antenna Vertical , 1GHz to 3GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
1049.930	13.48	30.41	43.89	74.00	-30.11	peak	V
1066.438	6.26	30.00	36.26	54.00	-17.74	AVG	V
1285.423	14.18	31.94	46.12	74.00	-27.88	peak	V
1296.485	5.63	32.05	37.68	54.00	-16.32	AVG	V
1516.786	12.54	33.99	46.53	74.00	-27.47	peak	V
1530.848	5.57	34.35	39.92	54.00	-14.08	AVG	V
1960.774	5.65	37.31	42.96	54.00	-11.04	AVG	V
1988.979	12.44	38.04	50.48	74.00	-23.52	peak	V
2250.024	6.15	40.34	46.49	54.00	-7.51	AVG	V
2275.504	13.50	40.51	54.01	74.00	-19.99	peak	V
2749.852	7.13	44.60	51.73	54.00	-2.27	AVG	V
2750.004	13.13	44.59	57.72	74.00	-16.28	peak	V



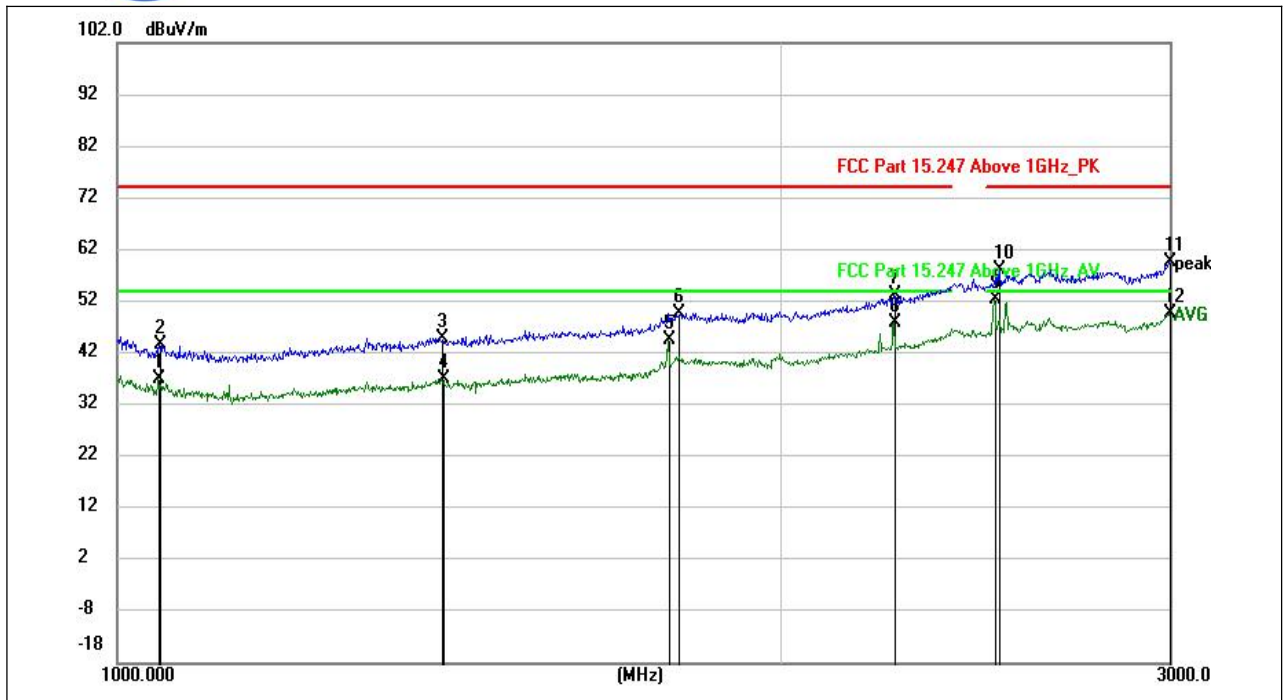
(802.11b_2412MHz, Antenna Vertical, 3GHz to 18GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
3000.000	53.35	-4.50	48.85	74.00	-25.15	peak	V
3000.000	44.50	-4.50	40.00	54.00	-14.00	AVG	V
4980.000	51.21	-2.83	48.38	74.00	-25.62	peak	V
4980.000	41.59	-2.83	38.76	54.00	-15.24	AVG	V
8445.000	43.30	0.95	44.25	74.00	-29.75	peak	V
8729.250	34.38	1.40	35.78	54.00	-18.22	AVG	V
9999.750	43.09	2.61	45.70	74.00	-28.30	peak	V
9999.750	37.81	2.61	40.42	54.00	-13.58	AVG	V
13363.500	32.04	6.51	38.55	54.00	-15.45	AVG	V
13444.500	40.16	6.47	46.63	74.00	-27.37	peak	V
16032.750	31.03	11.74	42.77	54.00	-11.23	AVG	V
16058.250	39.42	11.46	50.88	74.00	-23.12	peak	V



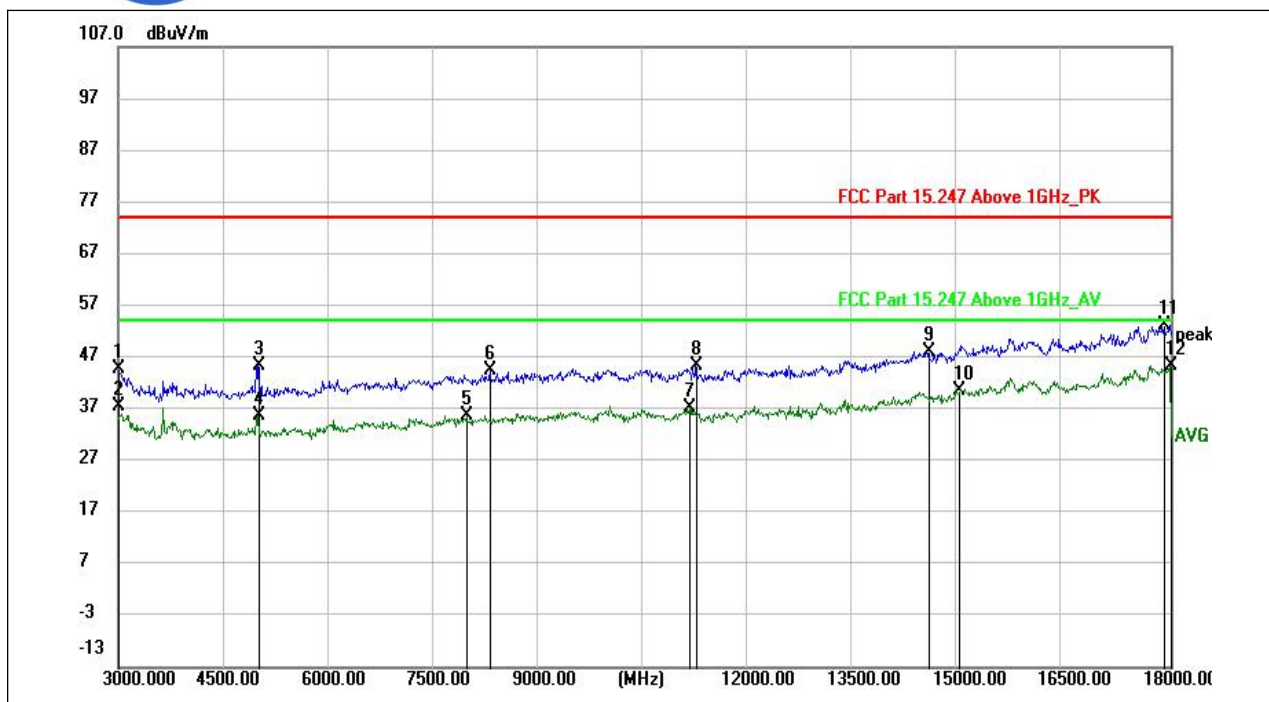
(802.11b _2437MHz, Antenna Horizontal, 30MHz to 1GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
38.9903	4.90	14.19	19.09	40.00	-20.91	peak	H
80.8991	9.66	10.52	20.18	40.00	-19.82	peak	H
249.9942	16.02	14.89	30.91	46.00	-15.09	peak	H
375.0169	14.93	18.39	33.32	46.00	-12.68	peak	H
672.1371	7.20	24.58	31.78	46.00	-14.22	peak	H
875.0935	3.63	27.50	31.13	46.00	-14.87	peak	H



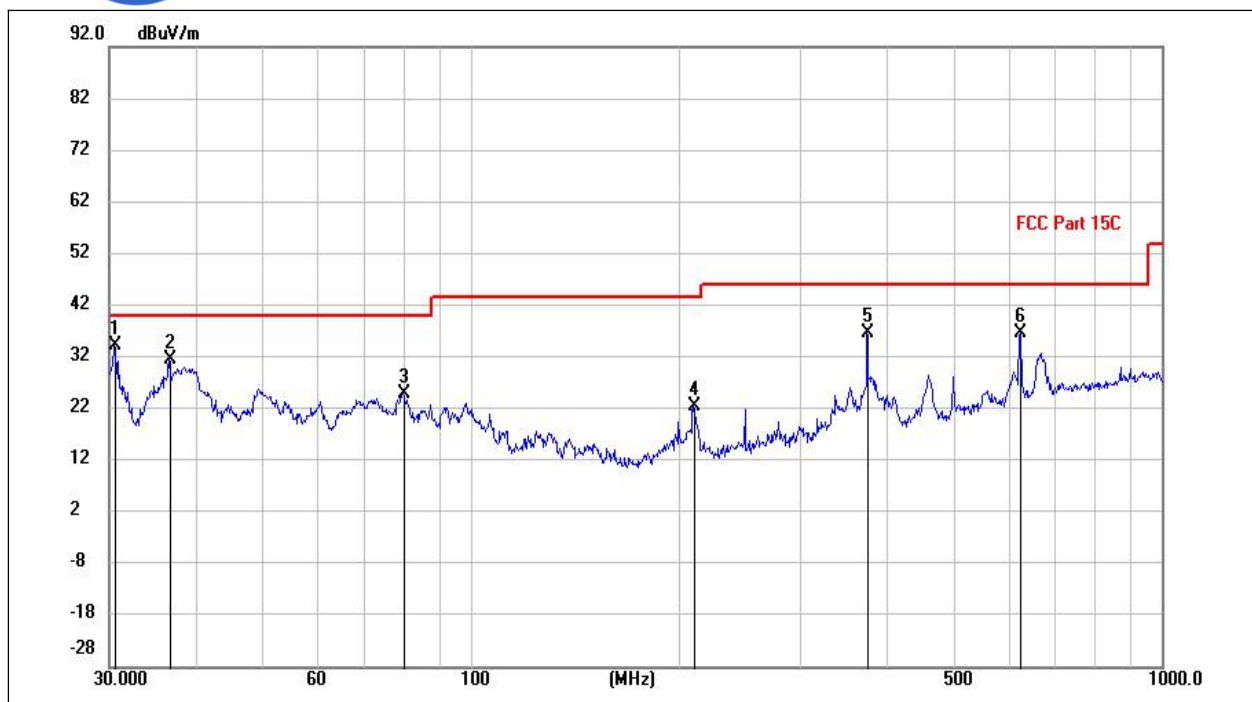
(802.11b _2437MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
1044.810	7.21	29.96	37.17	54.00	-16.83	AVG	H
1045.958	13.43	30.08	43.51	74.00	-30.49	peak	H
1403.202	11.58	33.38	44.96	74.00	-29.04	peak	H
1404.436	3.57	33.34	36.91	54.00	-17.09	AVG	H
1778.717	8.43	36.24	44.67	54.00	-9.33	AVG	H
1796.787	11.98	37.74	49.72	74.00	-24.28	peak	H
2250.147	13.04	40.34	53.38	74.00	-20.62	peak	H
2250.147	7.61	40.34	47.95	54.00	-6.05	AVG	H
2499.880	8.99	43.32	52.31	54.00	-1.69	AVG	H
2512.959	14.72	43.47	58.19	74.00	-15.81	peak	H
2998.682	12.07	47.56	59.63	74.00	-14.37	peak	H
2998.682	2.23	47.56	49.79	54.00	-4.21	AVG	H



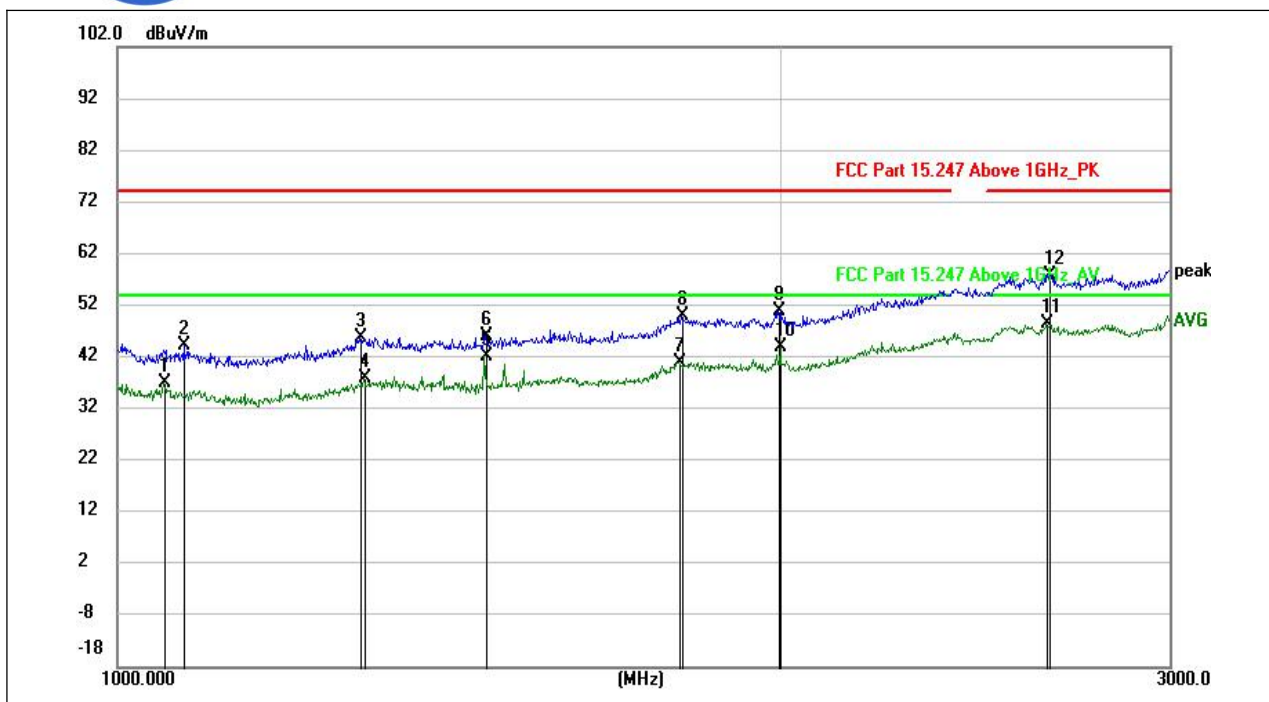
(802.11b_2437MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
3000.000	51.58	-6.80	44.78	74.00	-29.22	peak	H
3000.000	44.32	-6.80	37.52	54.00	-16.48	AVG	H
4999.500	48.94	-3.67	45.27	74.00	-28.73	peak	H
4999.500	39.32	-3.67	35.65	54.00	-18.35	AVG	H
7975.500	34.84	0.93	35.77	54.00	-18.23	AVG	H
8307.750	43.47	0.84	44.31	74.00	-29.69	peak	H
11134.500	34.04	3.17	37.21	54.00	-16.79	AVG	H
11247.750	42.13	3.11	45.24	74.00	-28.76	peak	H
14543.250	39.45	8.60	48.05	74.00	-25.95	peak	H
14975.250	30.36	10.05	40.41	54.00	-13.59	AVG	H
17898.750	38.56	14.53	53.09	74.00	-20.91	peak	H
17991.000	30.40	15.00	45.40	54.00	-8.60	AVG	H



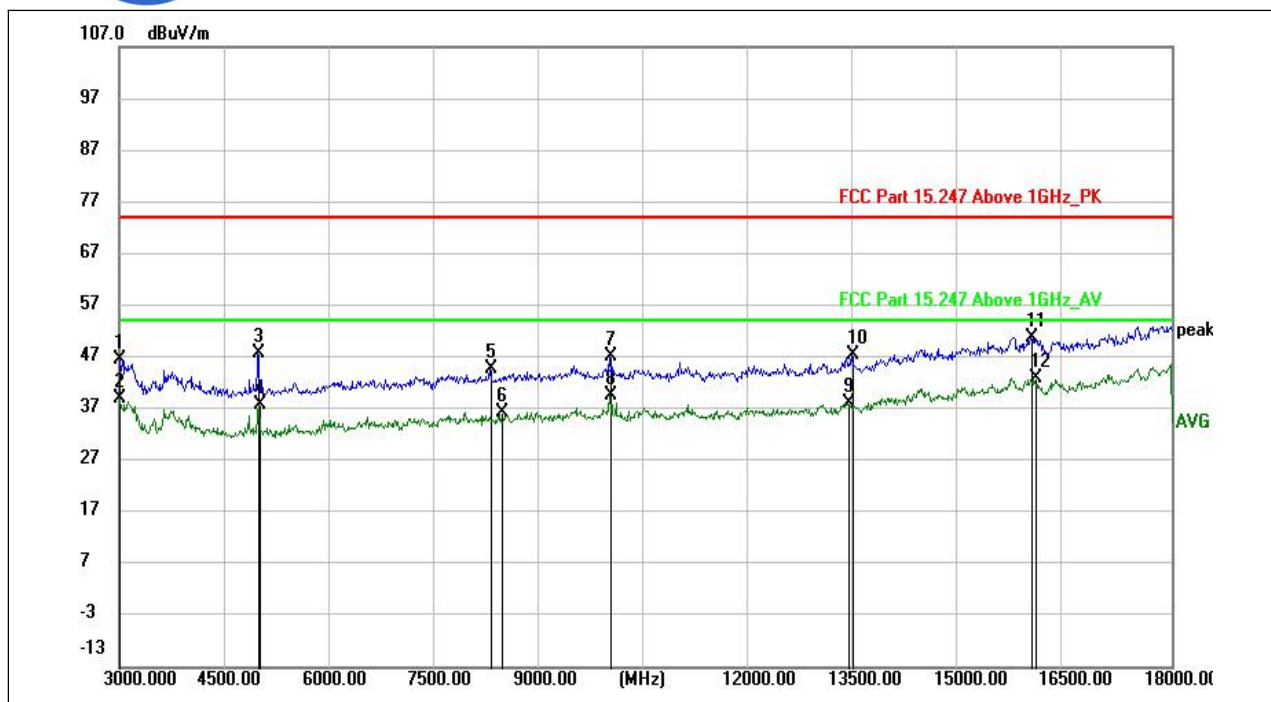
(802.11b _2437MHz, Antenna Vertical, 30MHz to 1GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
30.5681	21.49	12.88	34.37	40.00	-5.63	peak	V
36.7533	18.09	13.46	31.55	40.00	-8.45	peak	V
79.9403	13.87	10.94	24.81	40.00	-15.19	peak	V
210.4537	9.14	13.33	22.47	43.50	-21.03	peak	V
375.0169	18.39	18.39	36.78	46.00	-9.22	peak	V
625.0780	12.96	23.84	36.80	46.00	-9.20	peak	V



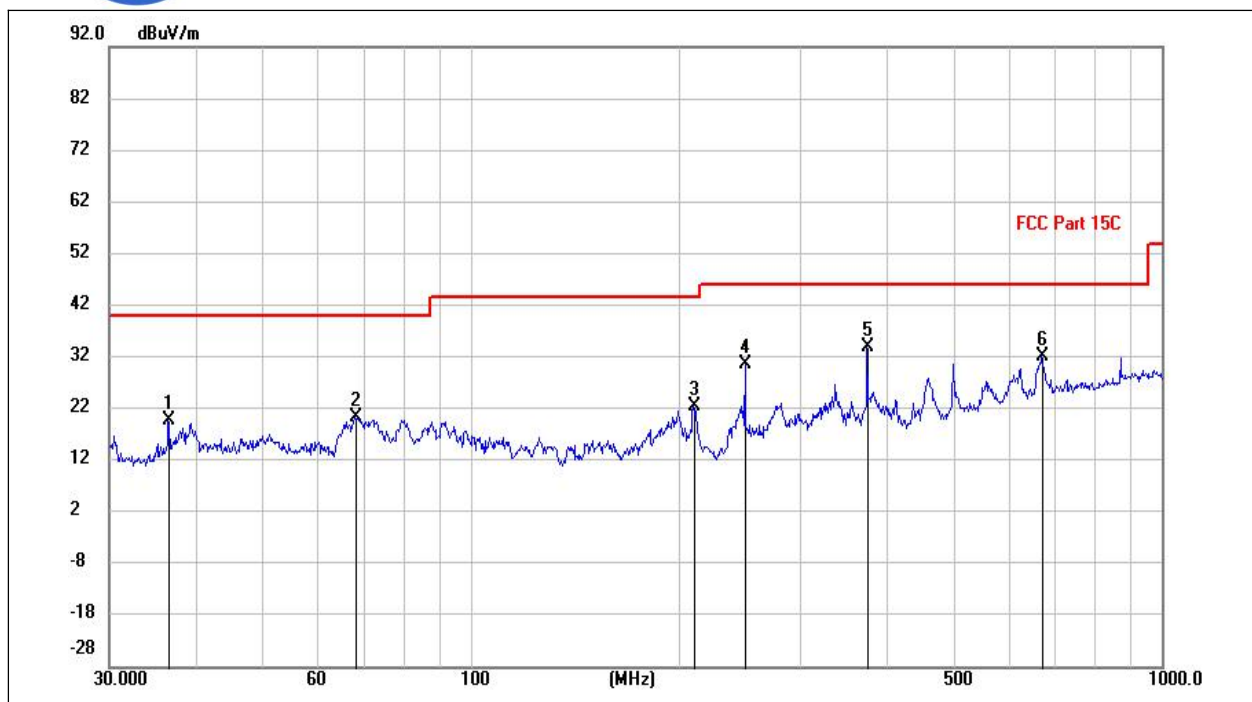
(802.11b_2437MHz, Antenna Vertical , 1GHz to 3GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
1050.045	6.54	30.41	36.95	54.00	-17.05	AVG	V
1072.724	14.19	30.08	44.27	74.00	-29.73	peak	V
1289.596	13.90	31.99	45.89	74.00	-28.11	peak	V
1294.351	5.88	32.04	37.92	54.00	-16.08	AVG	V
1468.981	8.87	33.42	42.29	54.00	-11.71	AVG	V
1469.385	12.73	33.42	46.15	74.00	-27.85	peak	V
1799.355	3.14	37.92	41.06	54.00	-12.94	AVG	V
1803.213	12.16	37.72	49.88	74.00	-24.12	peak	V
1994.668	12.70	38.13	50.83	74.00	-23.17	peak	V
1999.605	5.81	38.20	44.01	54.00	-9.99	AVG	V
2639.446	3.43	45.04	48.47	54.00	-5.53	AVG	V
2649.032	12.43	45.49	57.92	74.00	-16.08	peak	V



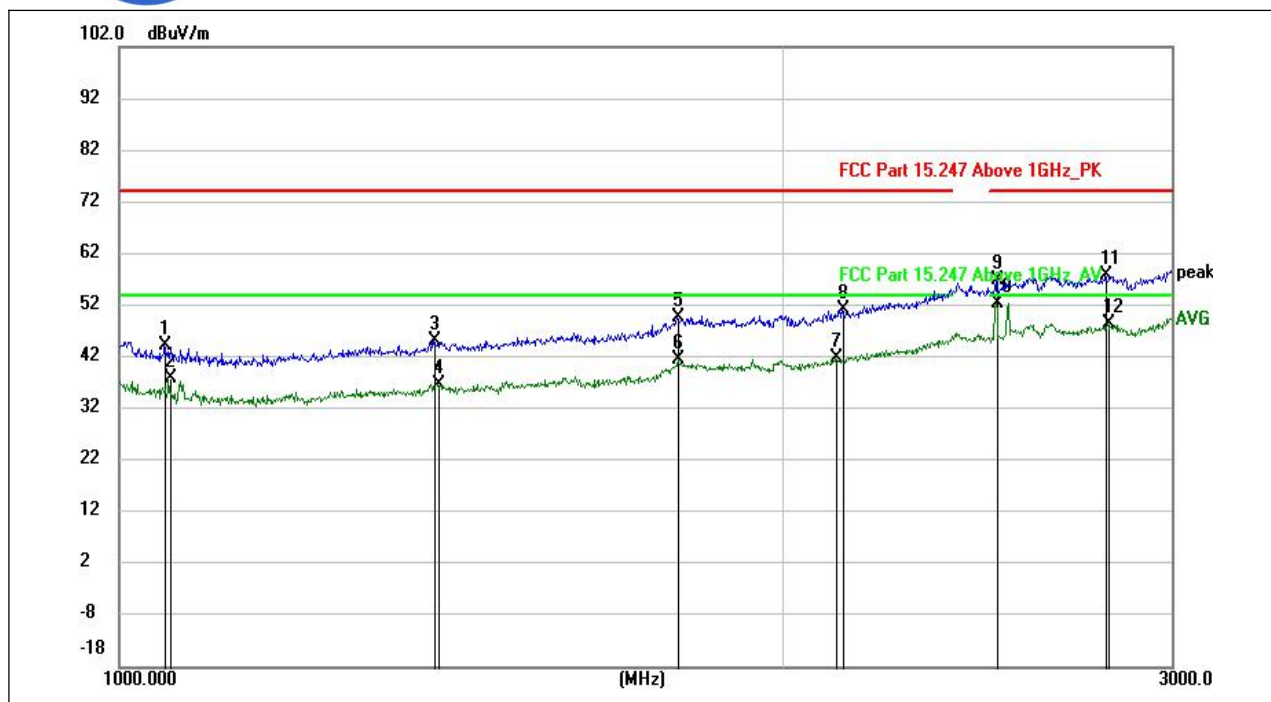
(802.11b _2437MHz, Antenna Vertical, 3GHz to 18GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
3015.000	51.36	-4.69	46.67	74.00	-27.33	peak	V
3015.000	43.63	-4.69	38.94	54.00	-15.06	AVG	V
4993.500	50.50	-2.80	47.70	74.00	-26.30	peak	V
4999.500	40.61	-2.78	37.83	54.00	-16.17	AVG	V
8304.000	43.74	0.88	44.62	74.00	-29.38	peak	V
8445.750	35.36	0.95	36.31	54.00	-17.69	AVG	V
9999.750	44.43	2.61	47.04	74.00	-26.96	peak	V
9999.750	36.96	2.61	39.57	54.00	-14.43	AVG	V
13401.000	31.85	6.37	38.22	54.00	-15.78	AVG	V
13462.500	40.81	6.55	47.36	74.00	-26.64	peak	V
15999.750	39.14	11.66	50.80	74.00	-23.20	peak	V
16052.250	31.31	11.53	42.84	54.00	-11.16	AVG	V



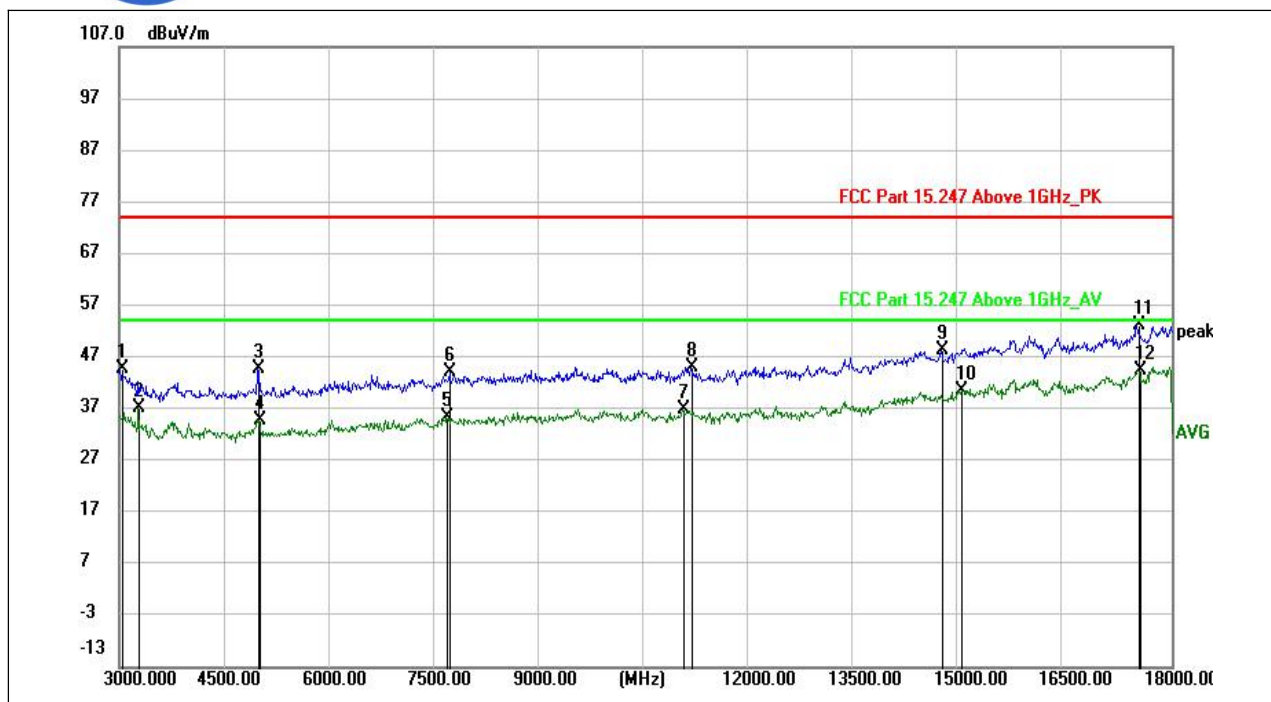
(802.11b _2462MHz, Antenna Horizontal, 30MHz to 1GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
36.5925	6.27	13.37	19.64	40.00	-20.36	peak	H
68.1275	7.85	12.42	20.27	40.00	-19.73	peak	H
210.4168	9.04	13.33	22.37	43.50	-21.13	peak	H
249.9942	15.61	14.89	30.50	46.00	-15.50	peak	H
375.0169	15.46	18.39	33.85	46.00	-12.15	peak	H
672.2549	7.59	24.58	32.17	46.00	-13.83	peak	H



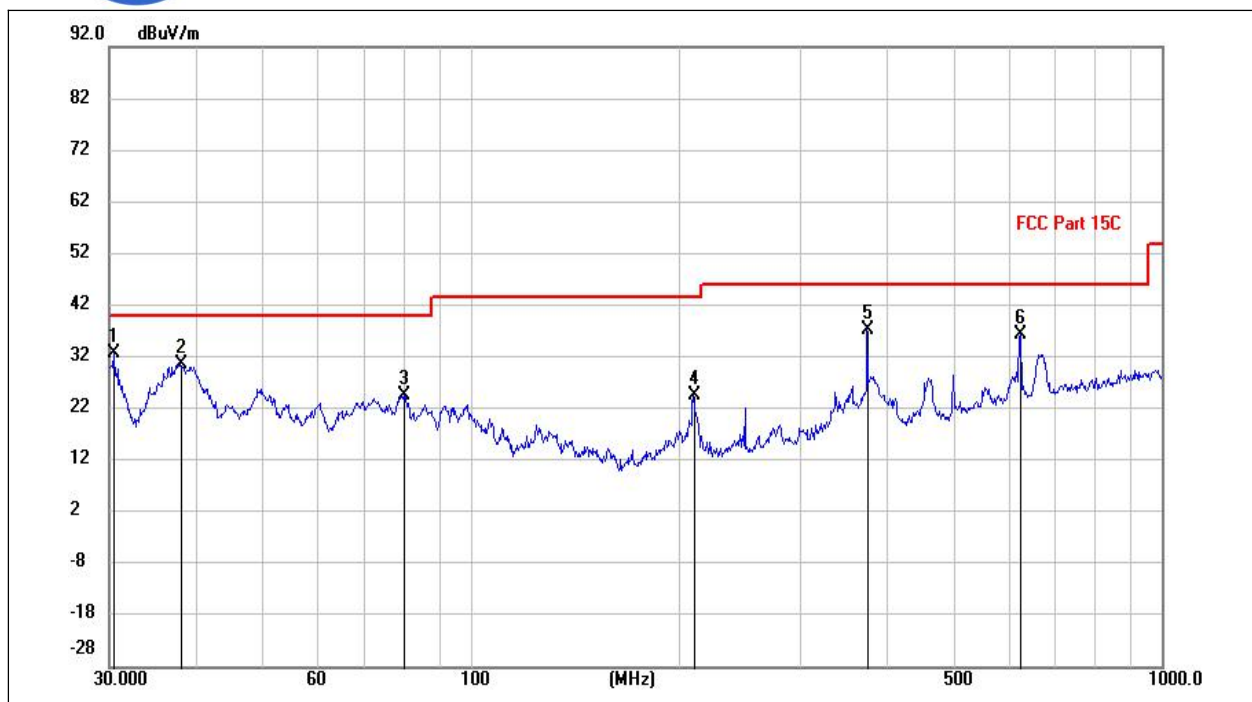
(802.11b _2462MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
1048.950	14.03	30.36	44.39	74.00	-29.61	peak	H
1054.149	7.61	30.22	37.83	54.00	-16.17	AVG	H
1389.091	11.86	33.22	45.08	74.00	-28.92	peak	H
1395.439	3.40	33.39	36.79	54.00	-17.21	AVG	H
1792.449	12.33	37.35	49.68	74.00	-24.32	peak	H
1794.025	3.95	37.50	41.45	54.00	-12.55	AVG	H
2114.956	3.13	38.68	41.81	54.00	-12.19	AVG	H
2128.709	12.26	38.88	51.14	74.00	-22.86	peak	H
2500.017	13.55	43.32	56.87	74.00	-17.13	peak	H
2500.017	9.17	43.32	52.49	54.00	-1.51	AVG	H
2802.462	12.03	45.90	57.93	74.00	-16.07	peak	H
2809.244	3.17	45.25	48.42	54.00	-5.58	AVG	H



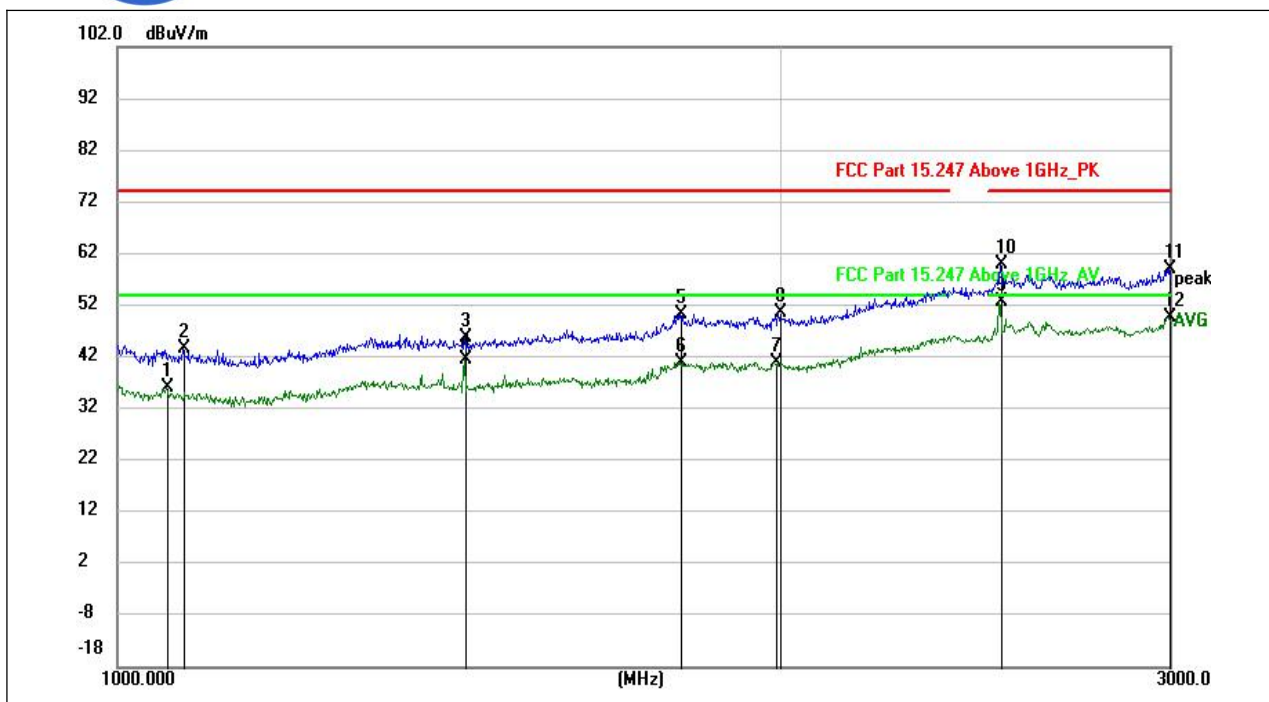
(802.11b_2462MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
3033.750	50.93	-6.07	44.86	74.00	-29.14	peak	H
3282.000	43.15	-5.93	37.22	54.00	-16.78	AVG	H
4995.000	48.28	-3.60	44.68	74.00	-29.32	peak	H
4999.500	38.51	-3.67	34.84	54.00	-19.16	AVG	H
7679.250	34.84	0.60	35.44	54.00	-18.56	AVG	H
7719.000	44.10	-0.01	44.09	74.00	-29.91	peak	H
11043.000	33.57	3.44	37.01	54.00	-16.99	AVG	H
11151.000	42.03	3.13	45.16	74.00	-28.84	peak	H
14730.000	39.03	9.37	48.40	74.00	-25.60	peak	H
14996.250	29.99	10.49	40.48	54.00	-13.52	AVG	H
17524.500	39.28	13.89	53.17	74.00	-20.83	peak	H
17535.750	30.72	13.71	44.43	54.00	-9.57	AVG	H



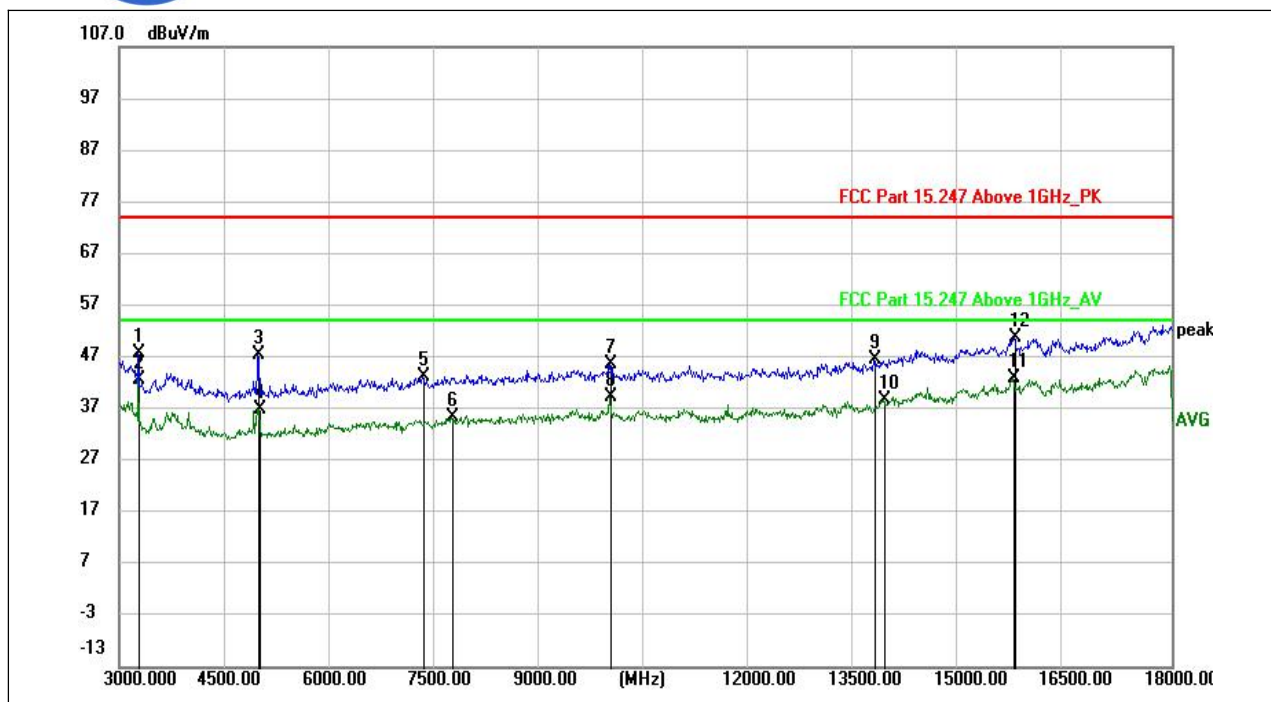
(802.11b _2462MHz, Antenna Vertical, 30MHz to 1GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
30.5092	19.64	12.99	32.63	40.00	-7.37	peak	V
38.0783	16.66	14.00	30.66	40.00	-9.34	peak	V
80.1227	13.78	10.92	24.70	40.00	-15.30	peak	V
210.2693	11.29	13.32	24.61	43.50	-18.89	peak	V
375.0169	18.83	18.39	37.22	46.00	-8.78	peak	V
625.0780	12.66	23.84	36.50	46.00	-9.50	peak	V



(802.11b _2462MHz, Antenna Vertical , 1GHz to 3GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
1053.280	5.78	30.25	36.03	54.00	-17.97	AVG	V
1071.841	13.71	30.07	43.78	74.00	-30.22	peak	V
1437.846	12.89	33.02	45.91	74.00	-28.09	peak	V
1437.846	8.50	33.02	41.52	54.00	-12.48	AVG	V
1800.937	12.49	37.89	50.38	74.00	-23.62	peak	V
1800.937	3.13	37.89	41.02	54.00	-12.98	AVG	V
1987.668	2.97	38.02	40.99	54.00	-13.01	AVG	V
1997.300	12.43	38.16	50.59	74.00	-23.41	peak	V
2515.307	9.30	43.50	52.80	54.00	-1.20	AVG	V
2515.583	16.30	43.50	59.80	74.00	-14.20	peak	V
2999.506	11.34	47.65	58.99	74.00	-15.01	peak	V
2999.506	2.07	47.65	49.72	54.00	-4.28	AVG	V



(802.11b _2462MHz, Antenna Vertical, 3GHz to 18GHz)

Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Pol
3282.000	53.64	-5.93	47.71	74.00	-26.29	peak	V
3282.000	48.62	-5.93	42.69	54.00	-11.31	AVG	V
4993.500	50.40	-2.80	47.60	74.00	-26.40	peak	V
4999.500	39.77	-2.78	36.99	54.00	-17.01	AVG	V
7340.250	43.52	-0.22	43.30	74.00	-30.70	peak	V
7745.250	35.13	0.13	35.26	54.00	-18.74	AVG	V
9999.750	43.13	2.61	45.74	74.00	-28.26	peak	V
9999.750	36.59	2.61	39.20	54.00	-14.80	AVG	V
13760.250	39.40	7.05	46.45	74.00	-27.55	peak	V
13903.500	31.20	7.58	38.78	54.00	-15.22	AVG	V
15741.750	31.78	11.12	42.90	54.00	-11.10	AVG	V
15763.500	40.07	10.64	50.71	74.00	-23.29	peak	V