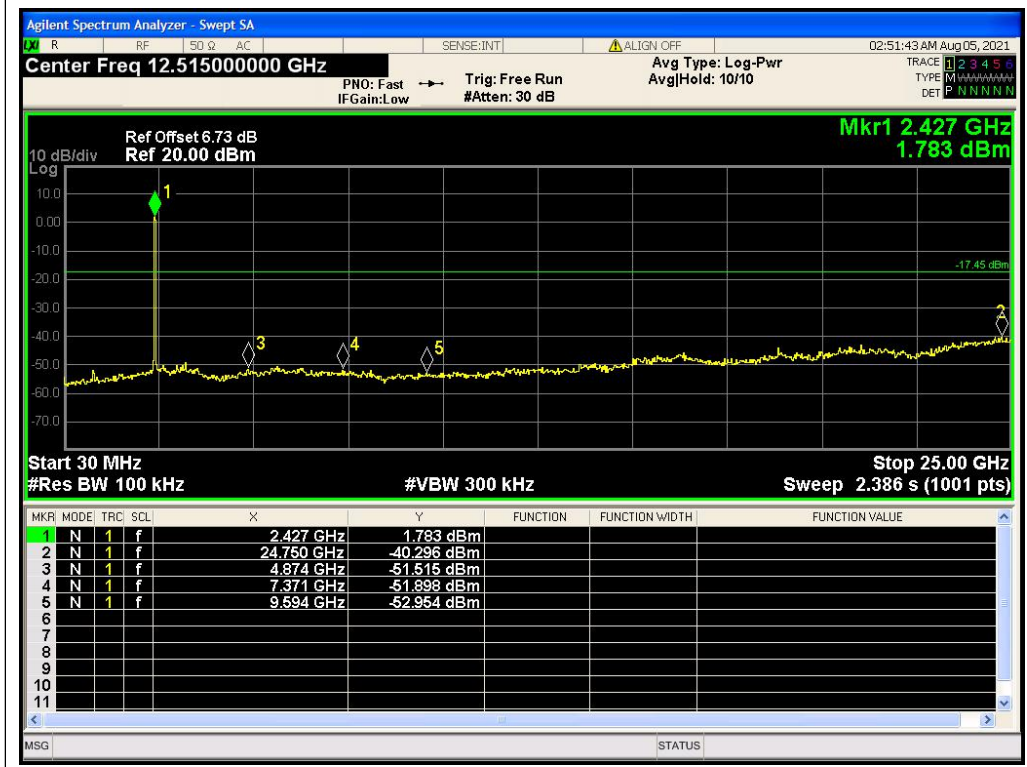
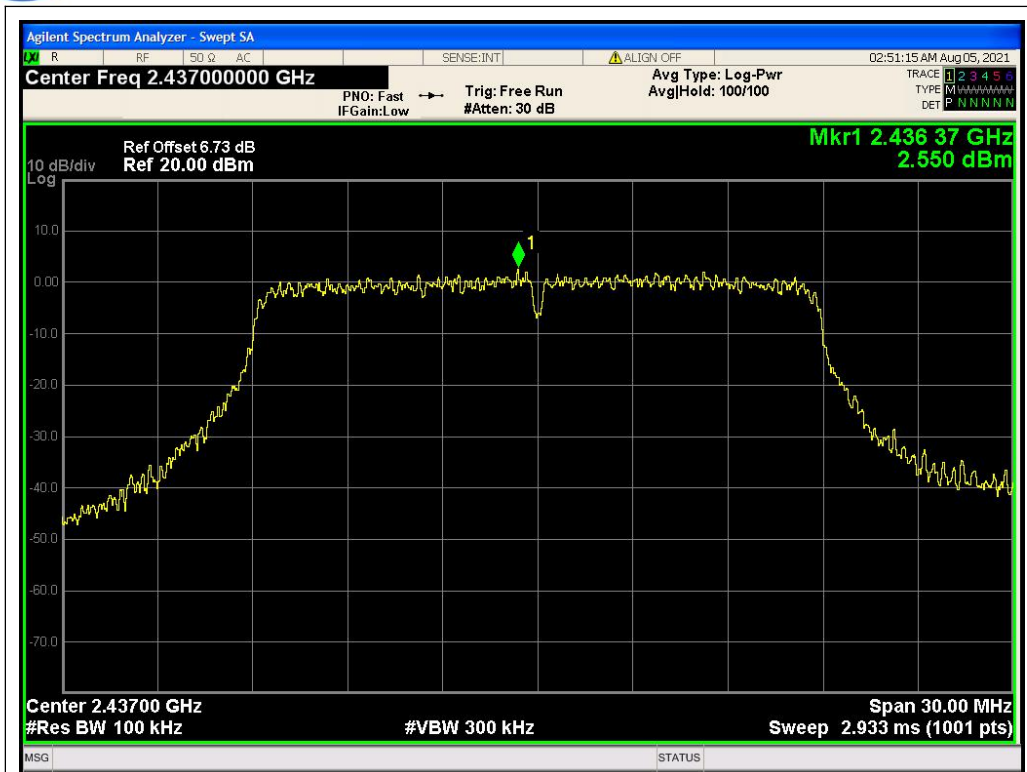
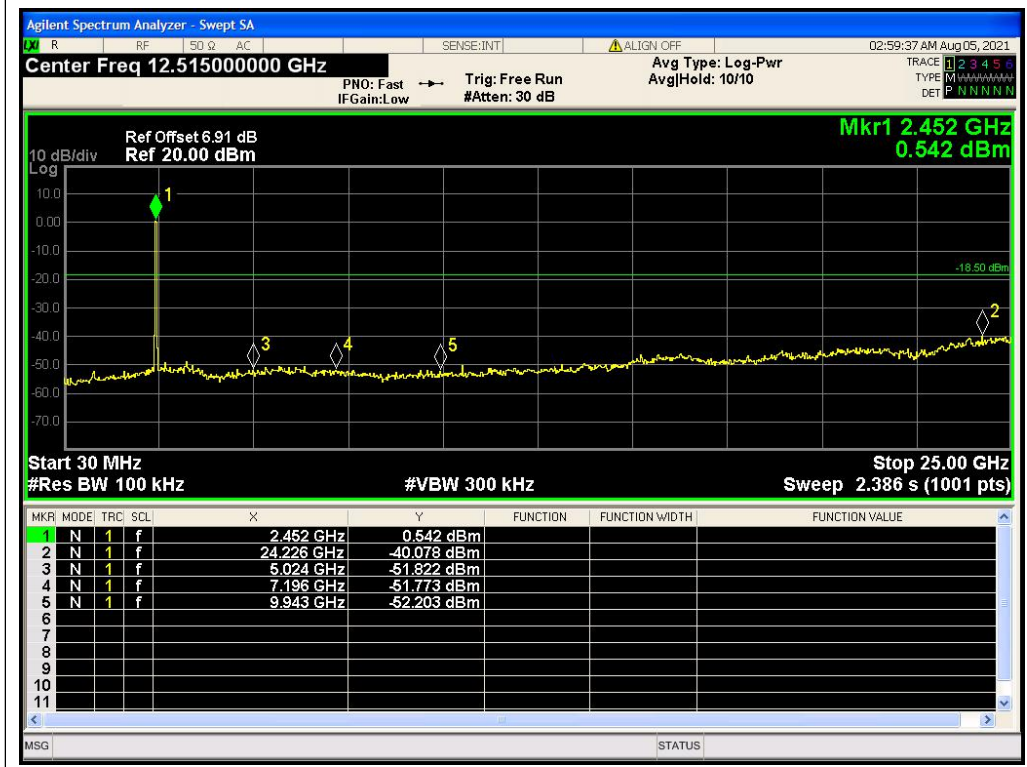
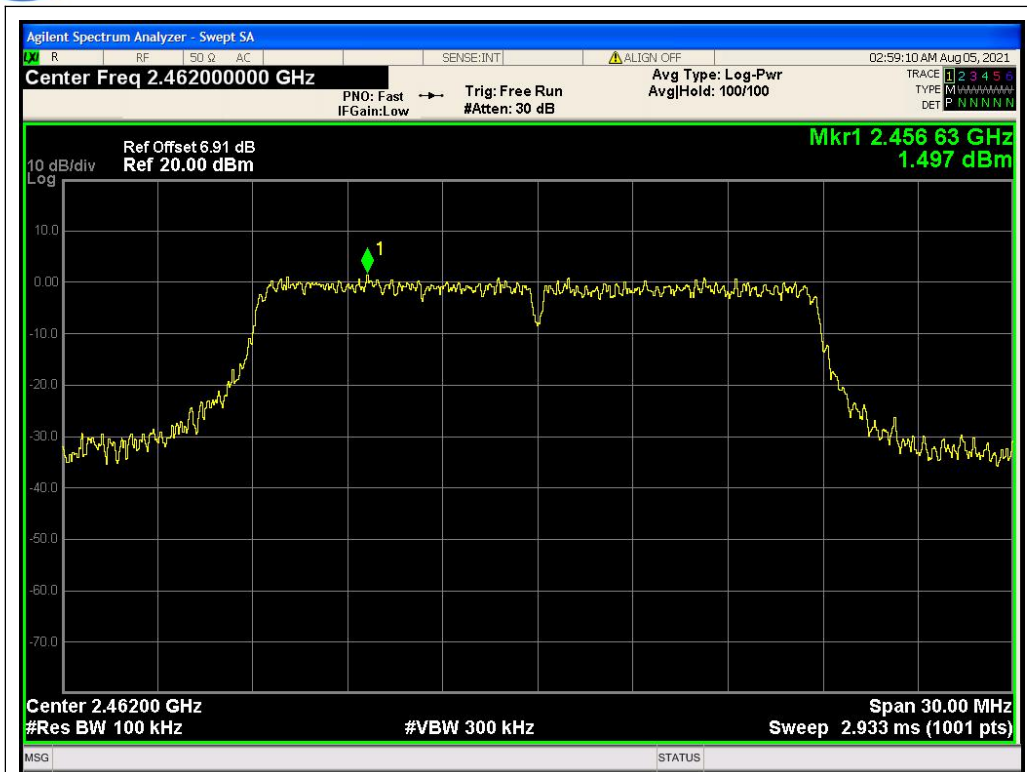


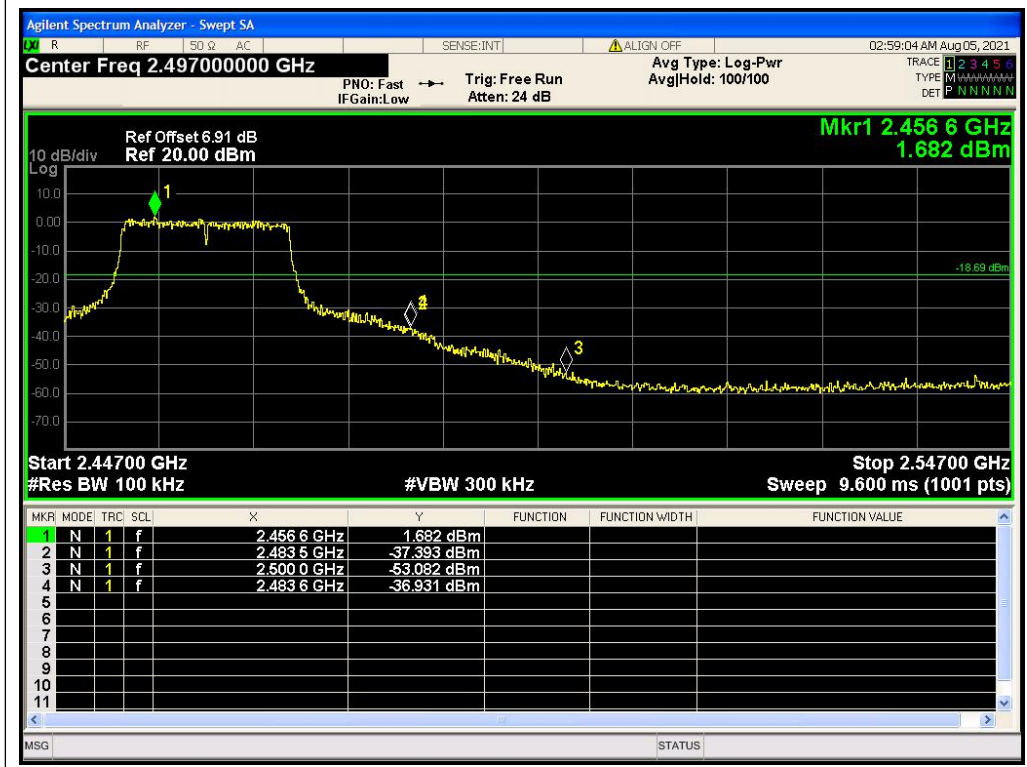
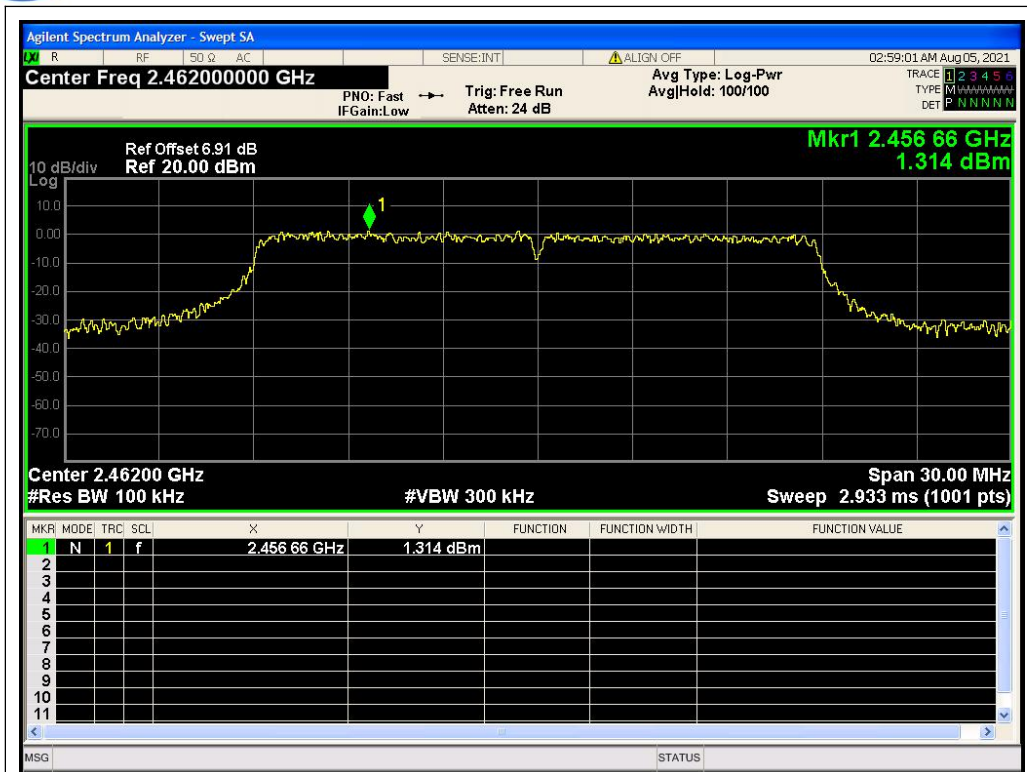
(802.11 HT20, Band Edge @ Channel = 1)



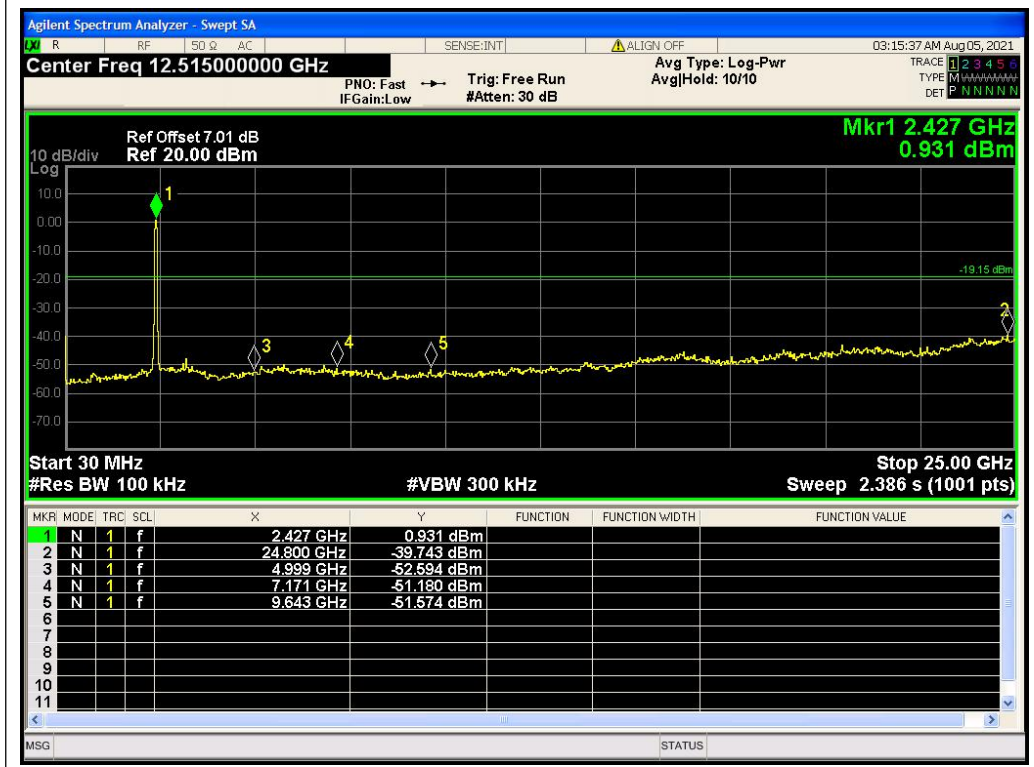
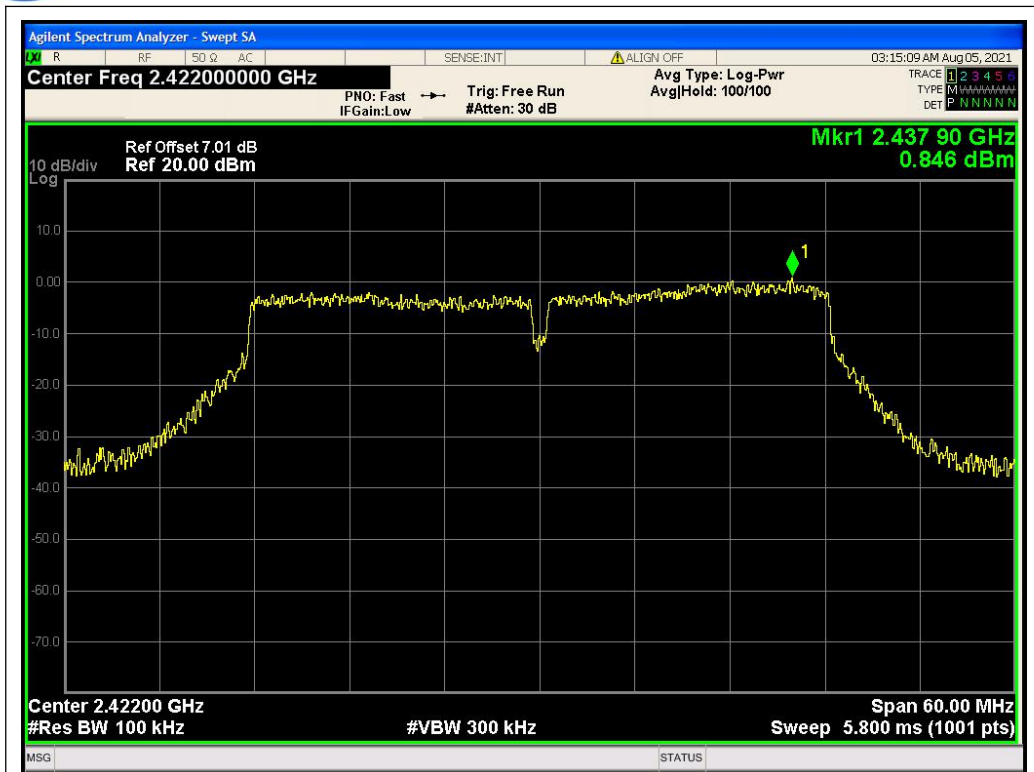
(802.11 HT20, Channel = 6, 30MHz to 25GHz)



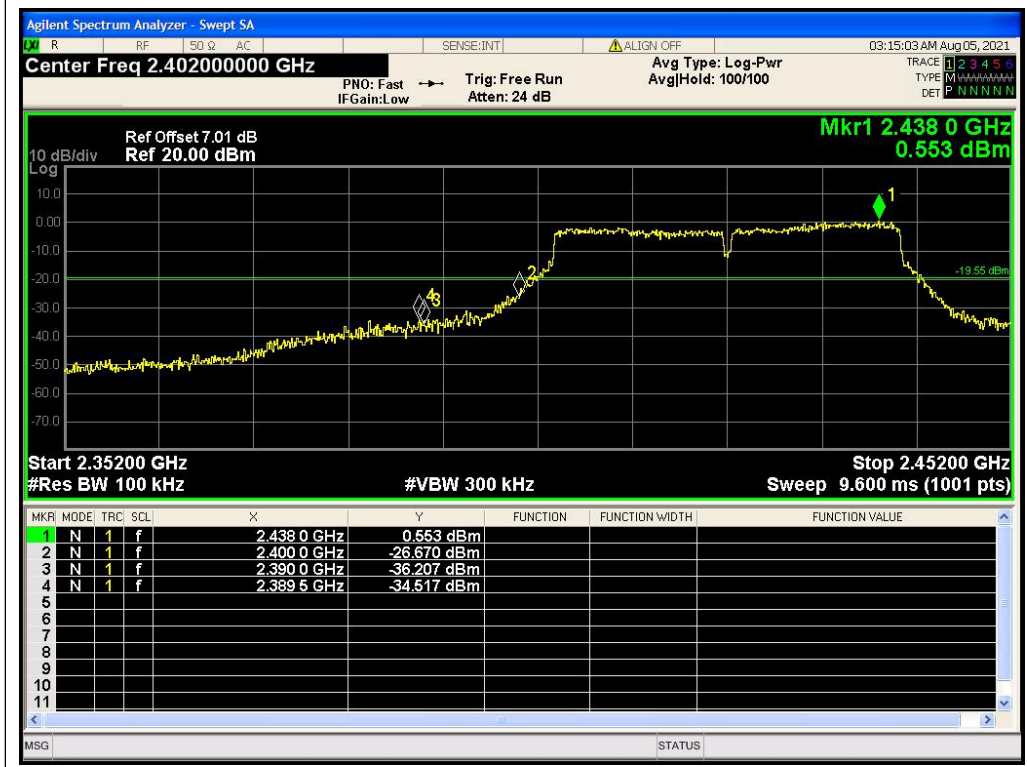
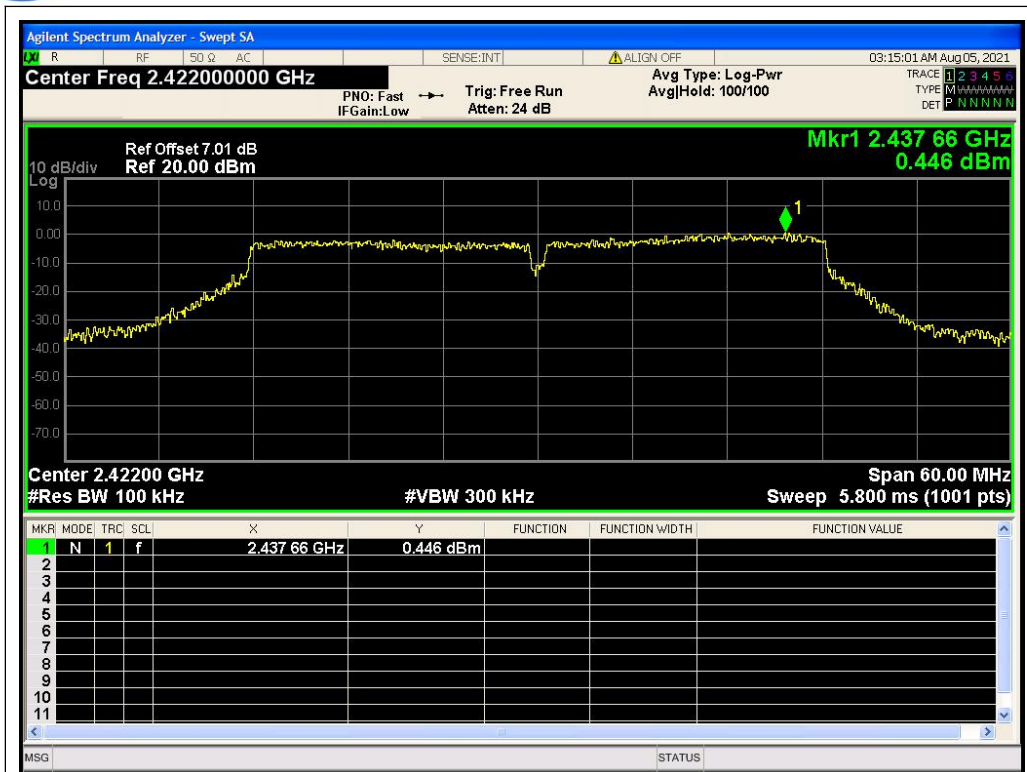
(802.11 HT20, Channel = 11, 30MHz to 25GHz)



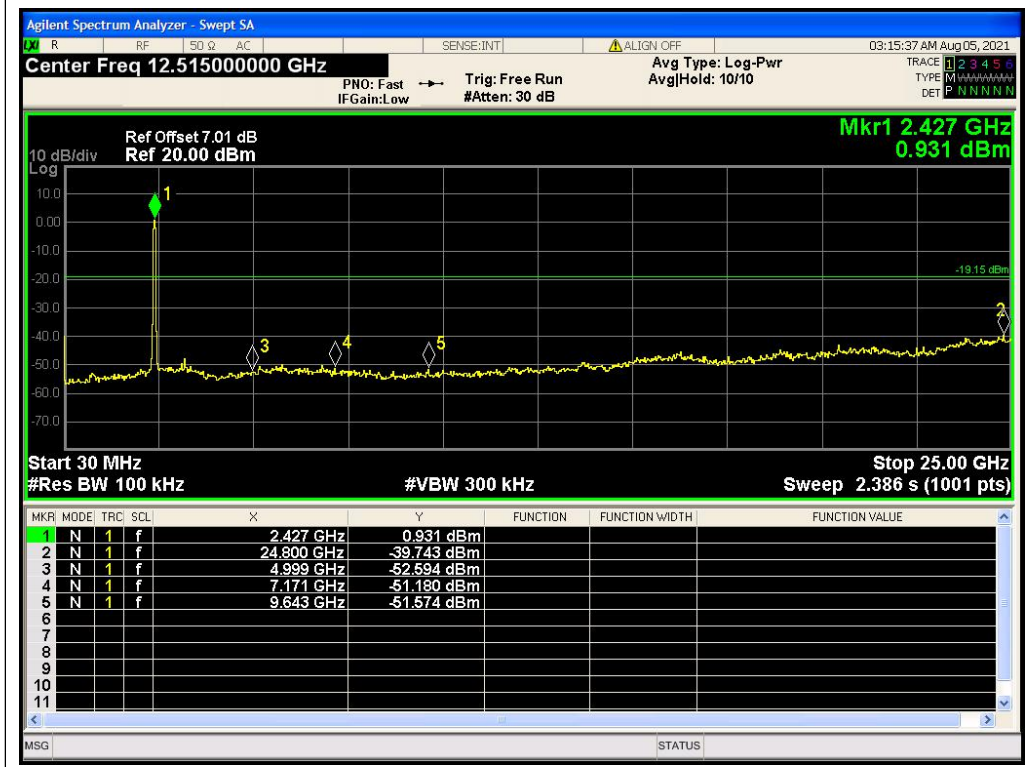
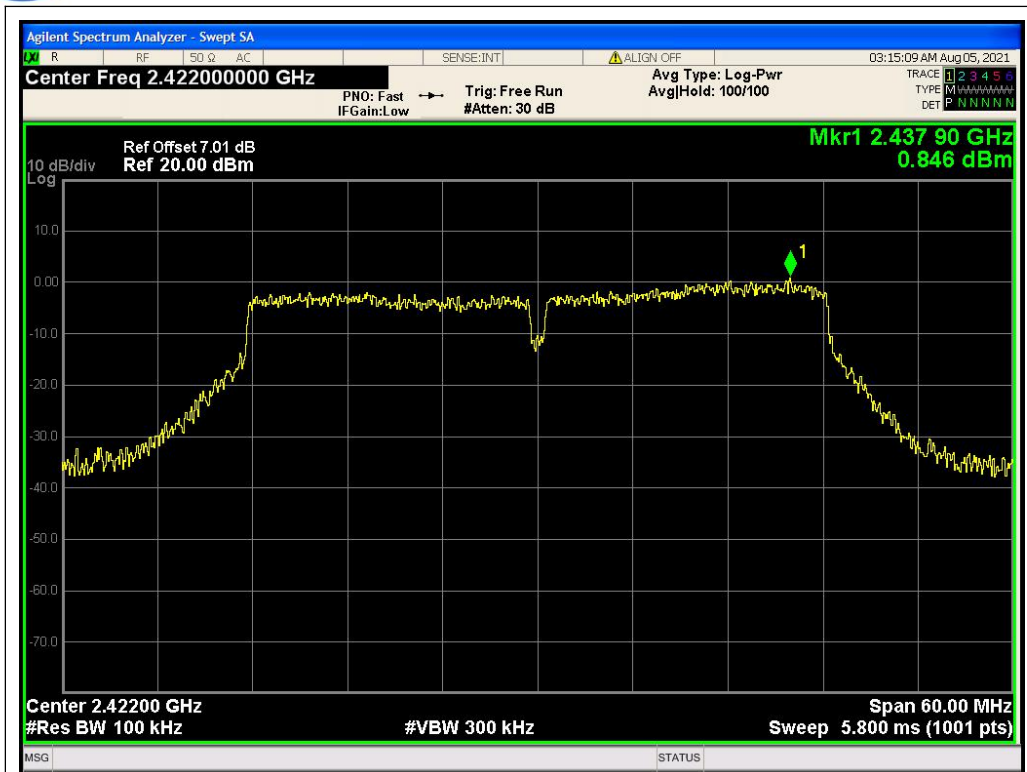
(802.11 HT20, Band Edge @ Channel = 11)



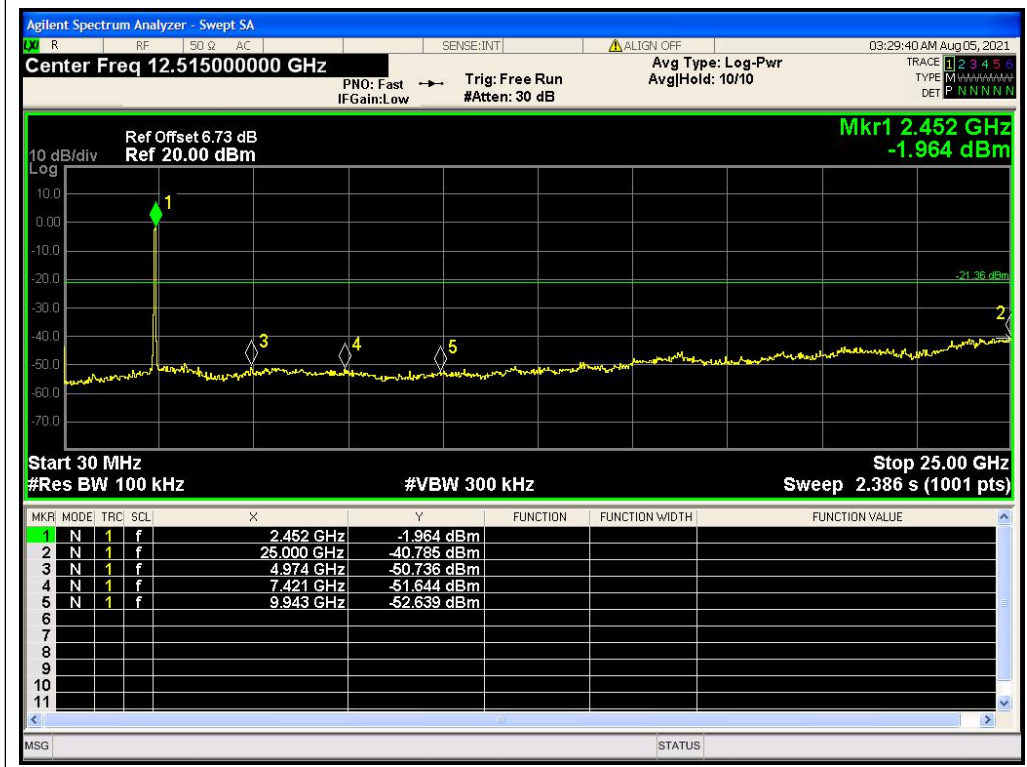
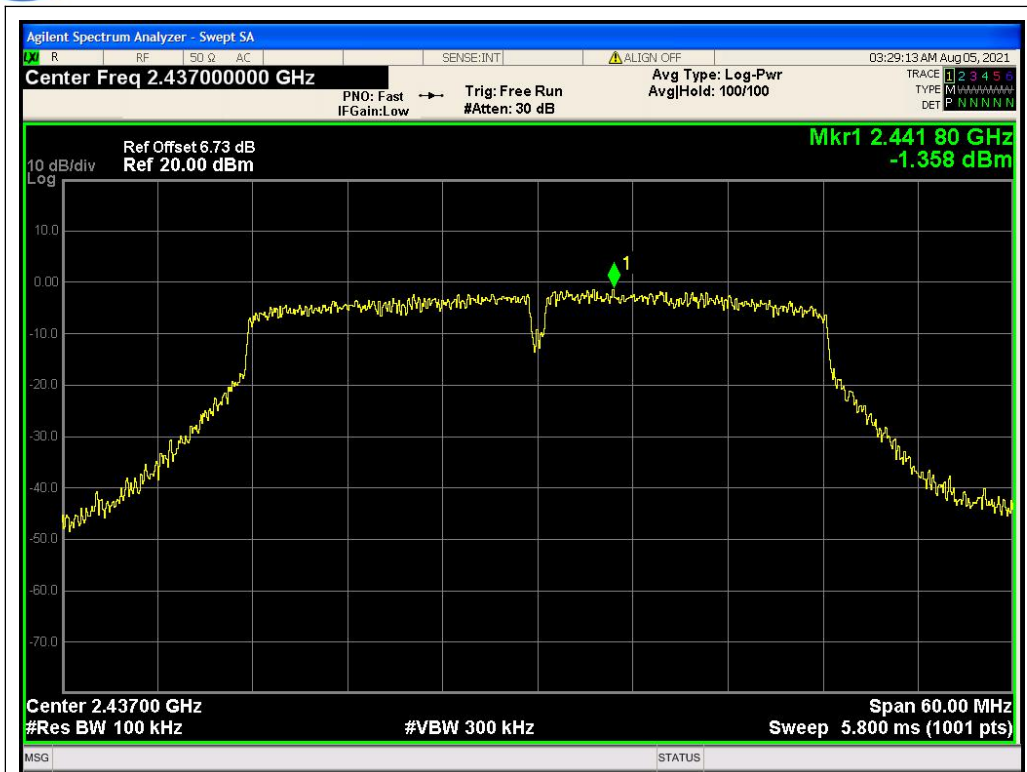
(802.11 HT40, Channel = 3, 30MHz to 25GHz)



(802.11 HT40, Band Edge @ Channel = 3)

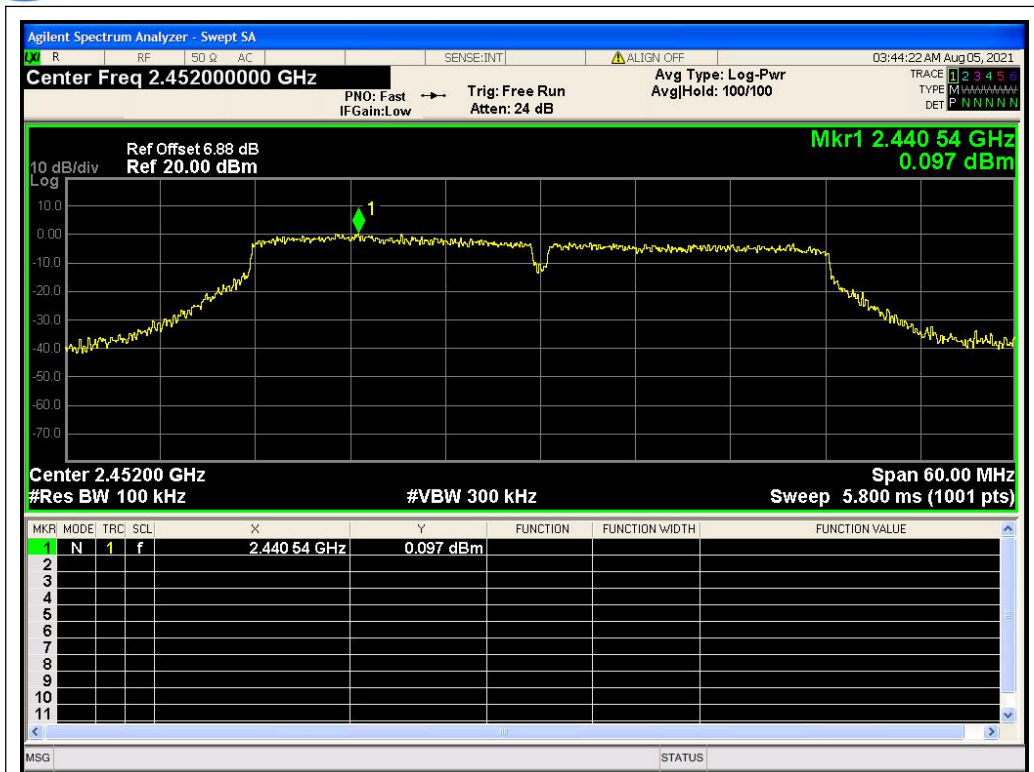


(802.11 HT40, Channel = 6, 30MHz to 25GHz)



(802.11 HT40, Channel = 9, 30MHz to 25GHz)





(802.11 HT40, Band Edge @ Channel = 9)

## 2.5. Power spectral density (PSD)

### 2.5.1. Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

### 2.5.2. Test Description

#### A. Test Set:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

KDB 558074 D01 v05r02 Section 10.2 was used in order to prove compliance.

#### B. Equipments List:

Please refer ANNEX B(4).



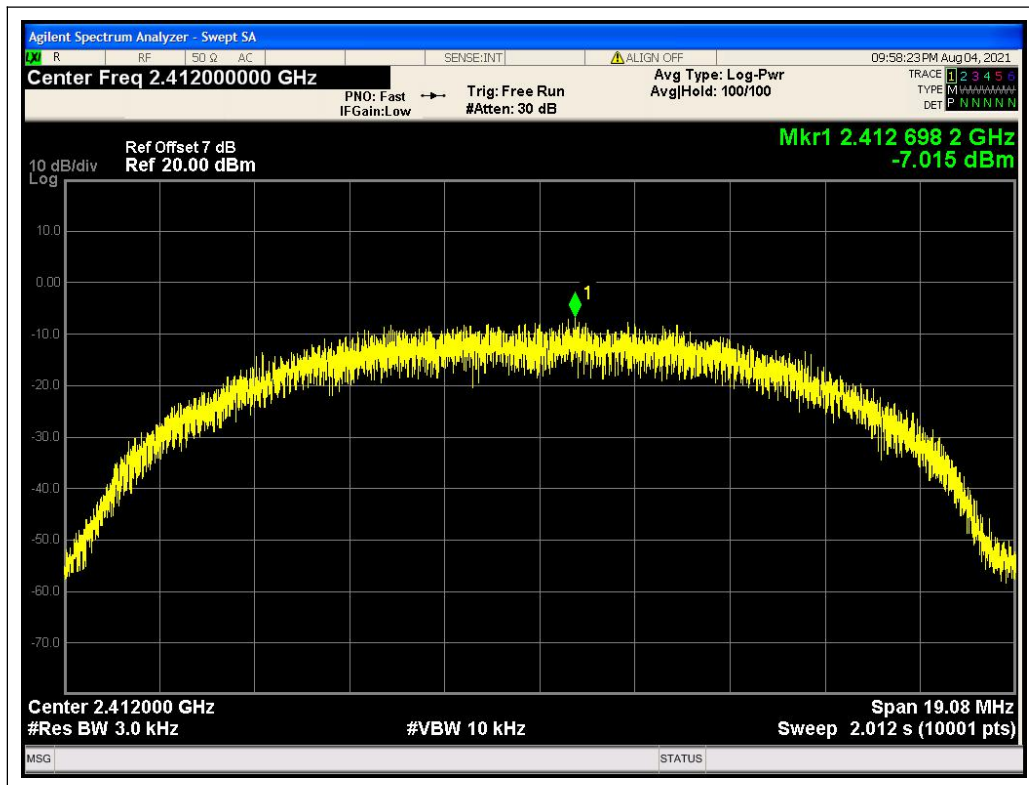
2.5.3. Test Result

802.11b Test mode

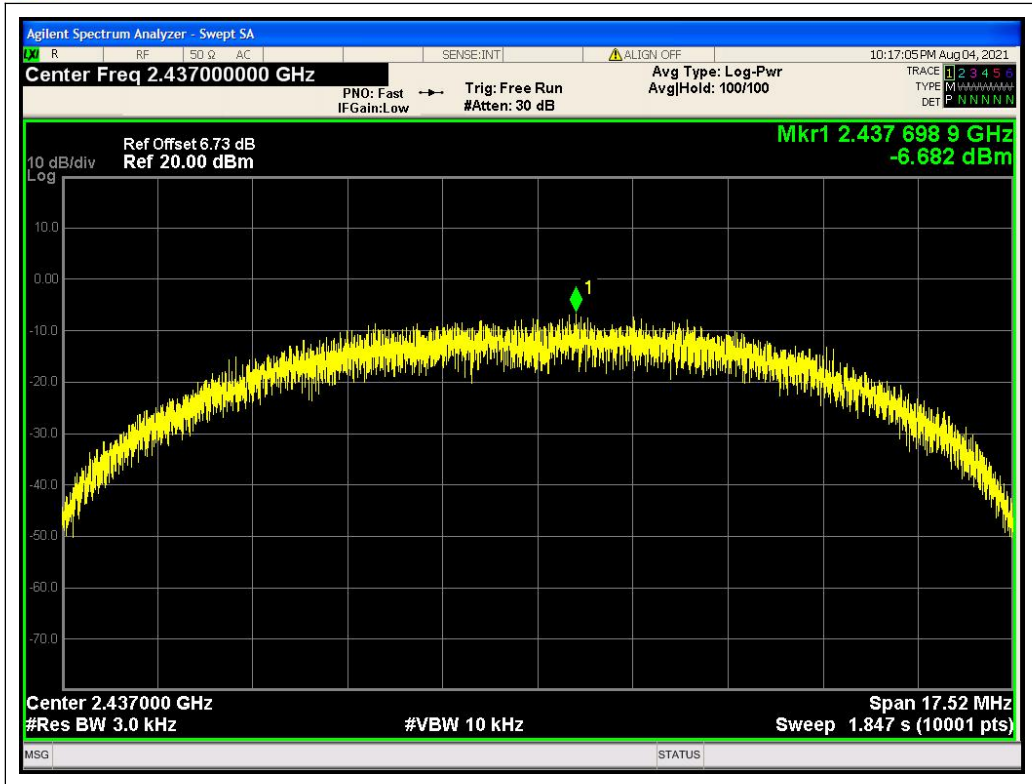
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-7.015	8	<b>PASS</b>
6	2437	-6.682	8	<b>PASS</b>
11	2462	-7.940	8	<b>PASS</b>

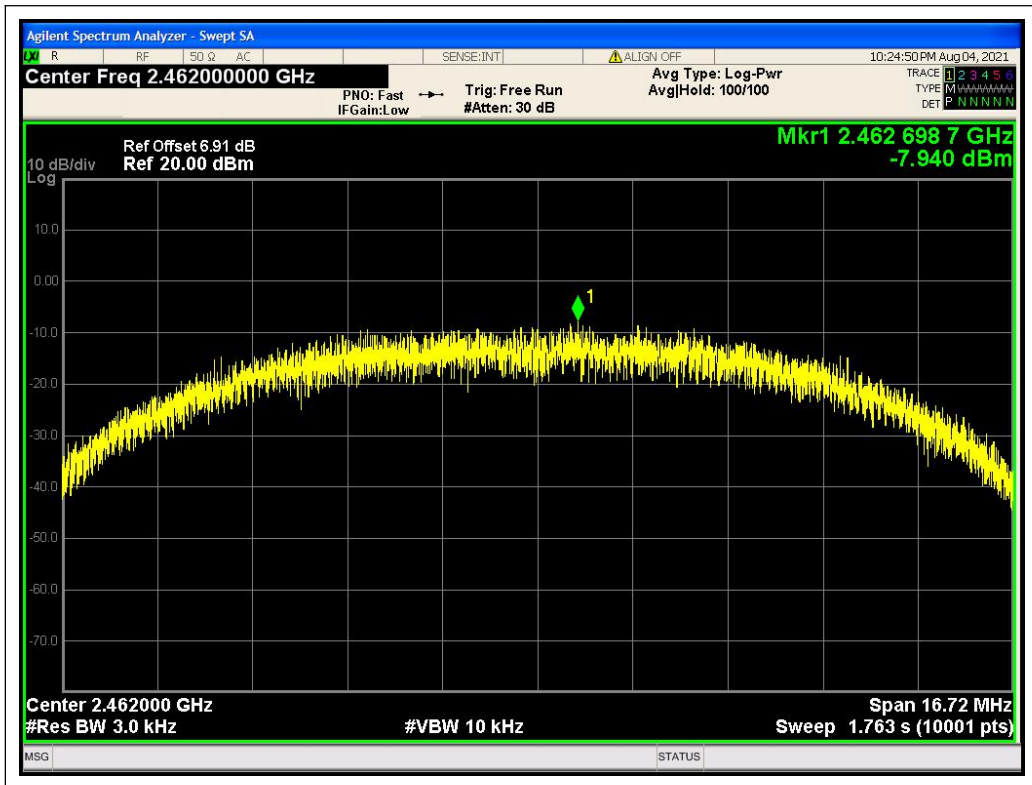
B. Test Plots:



(Channel = 1, 802.11b)



(Channel = 6, 802.11b)



(Channel = 11, 802.11b)

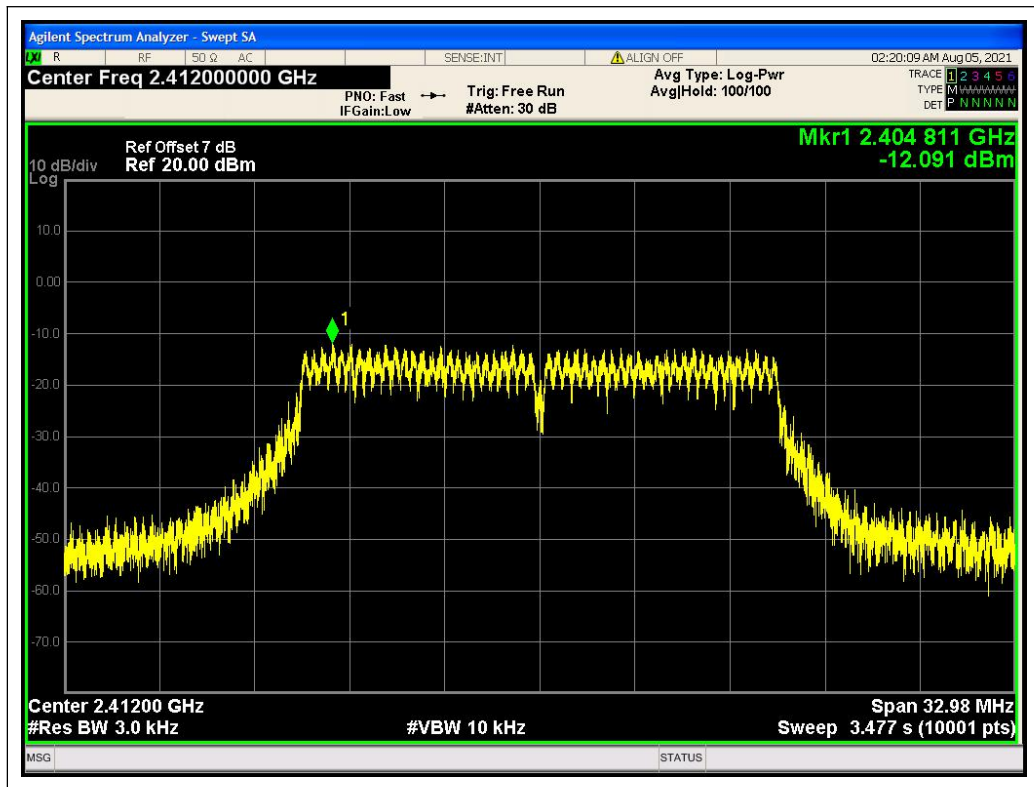


802.11g Test mode

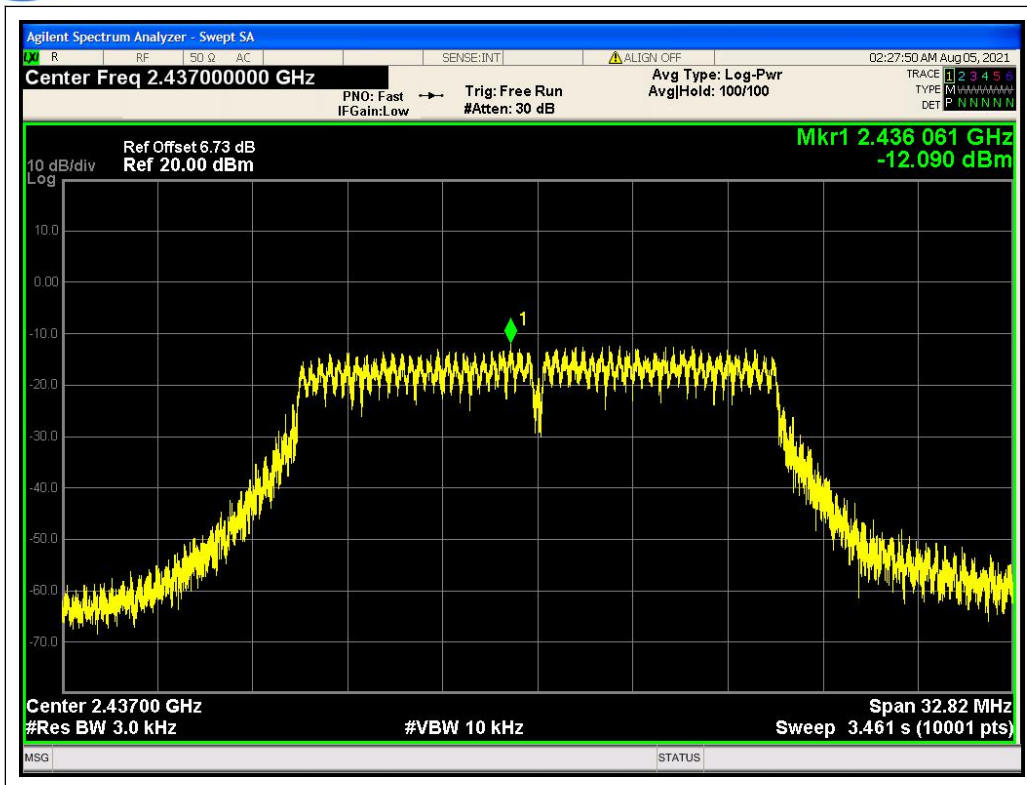
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-12.091	8	PASS
6	2437	-12.090	8	PASS
11	2462	-12.886	8	PASS

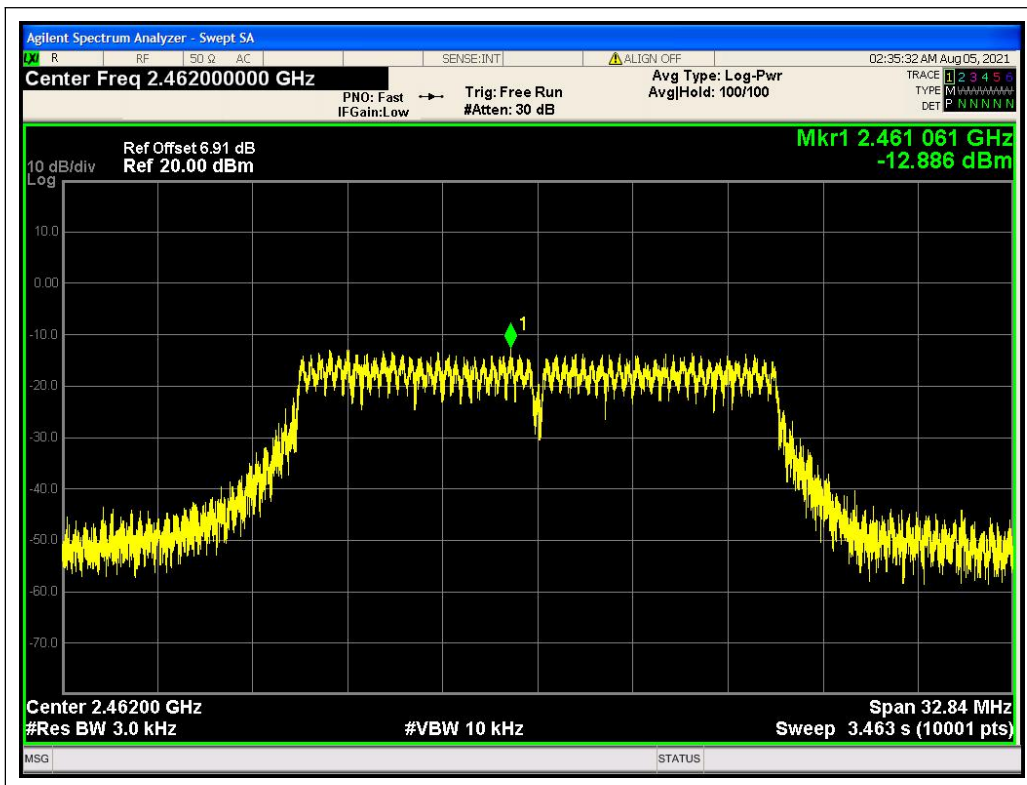
B. Test Plots:



(Channel = 1, 802.11g)



(Channel = 6, 802.11g)



(Channel = 11, 802.11g)

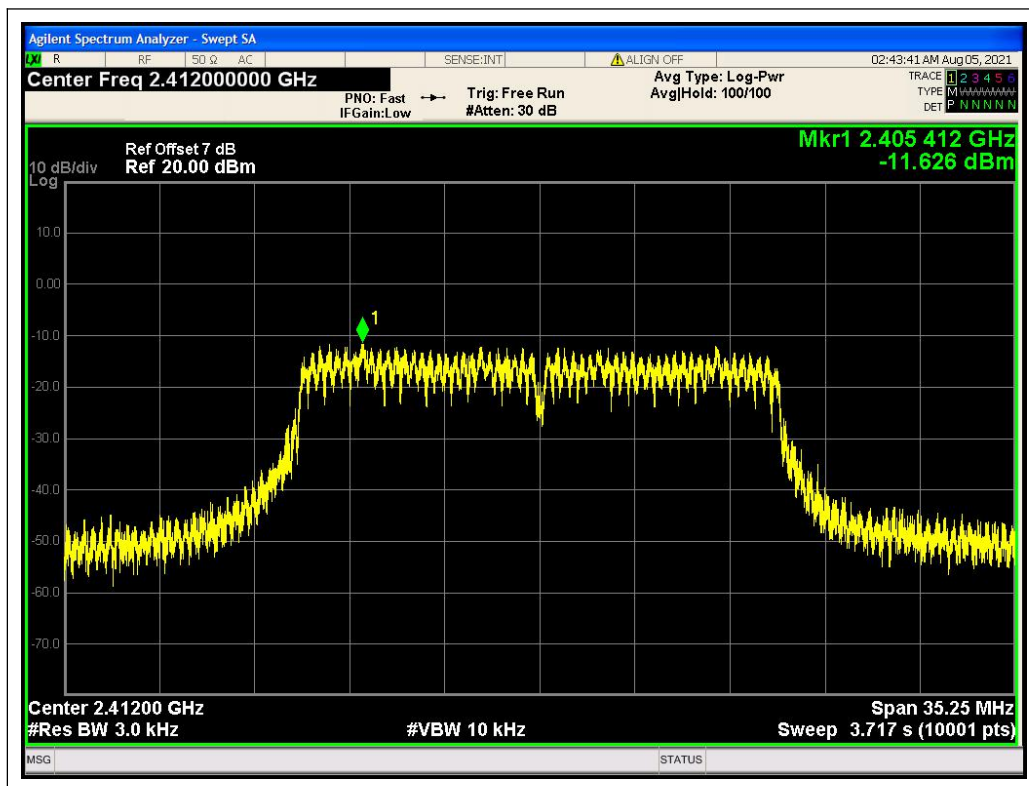


802.11n-20MHz Test mode

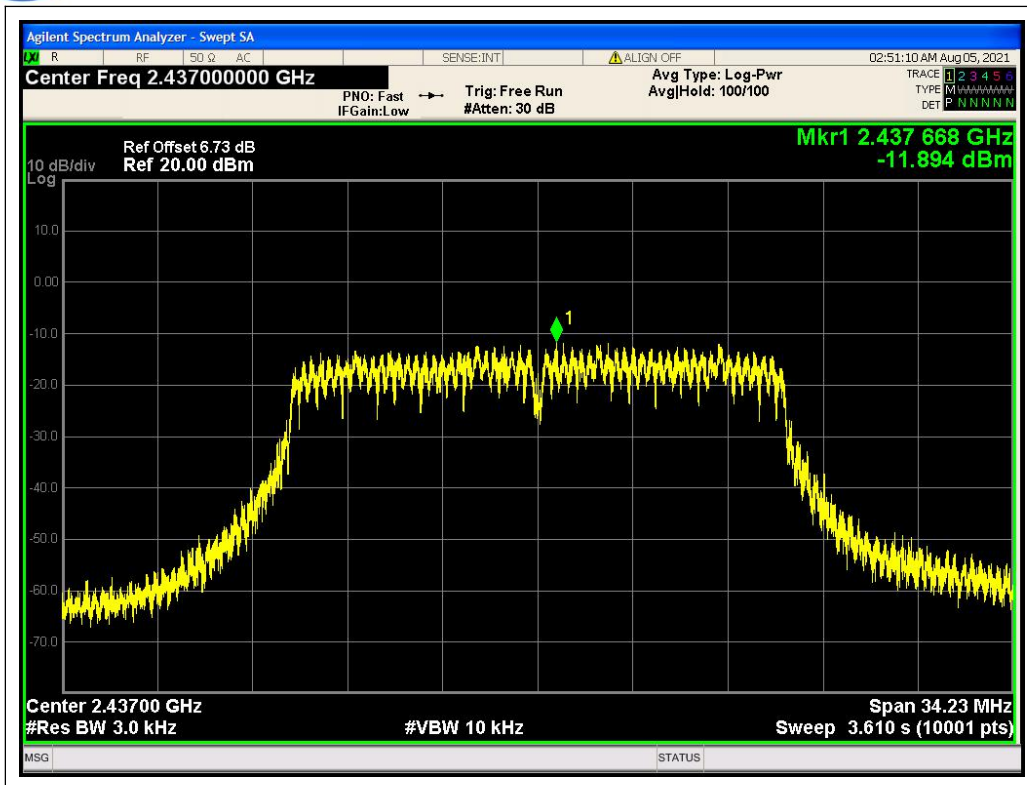
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-11.626	8	PASS
6	2437	-11.894	8	PASS
11	2462	-12.695	8	PASS

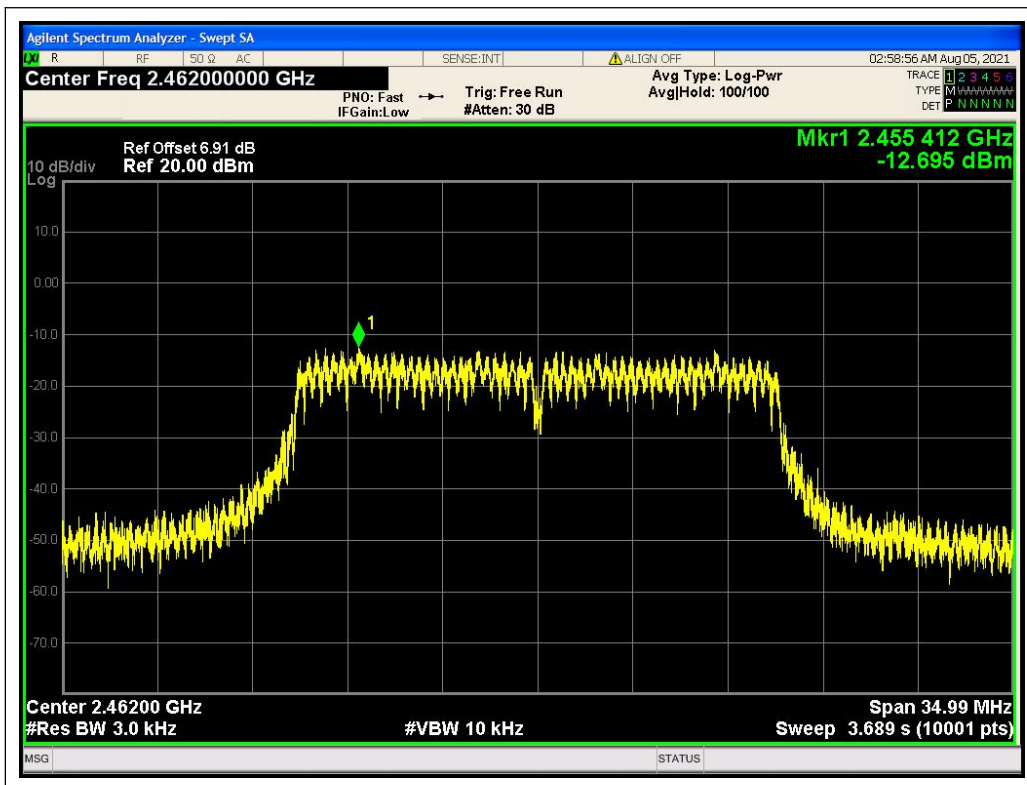
B. Test Plots:



(Channel = 1, 802.11n-20MHz)



(Channel = 6, 802.11n-20MHz)



(Channel = 11, 802.11n-20MHz)



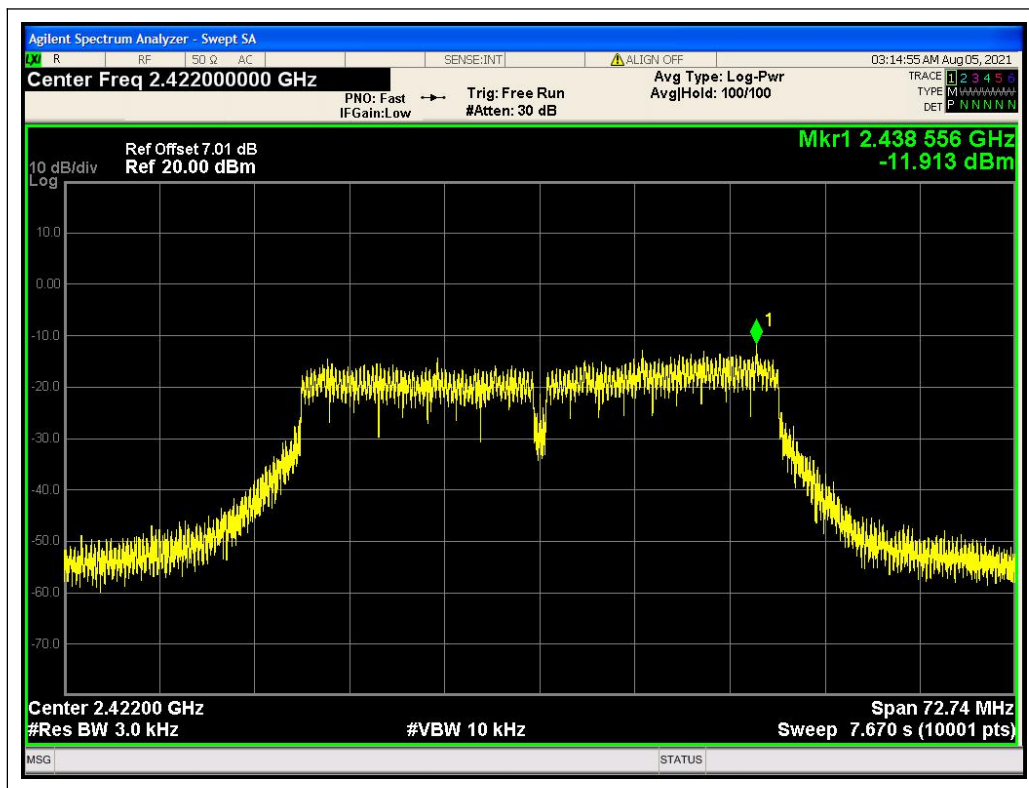


802.11n-40MHz Test mode

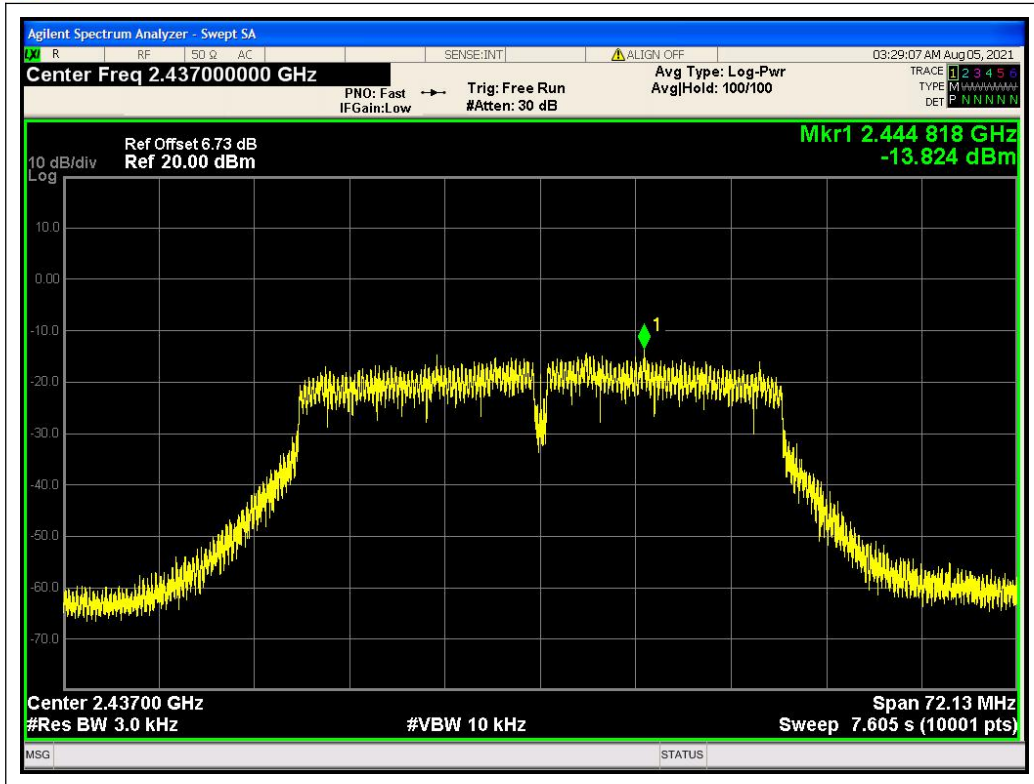
C. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
3	2422	-11.913	8	PASS
6	2437	-13.824	8	PASS
9	2452	-12.405	8	PASS

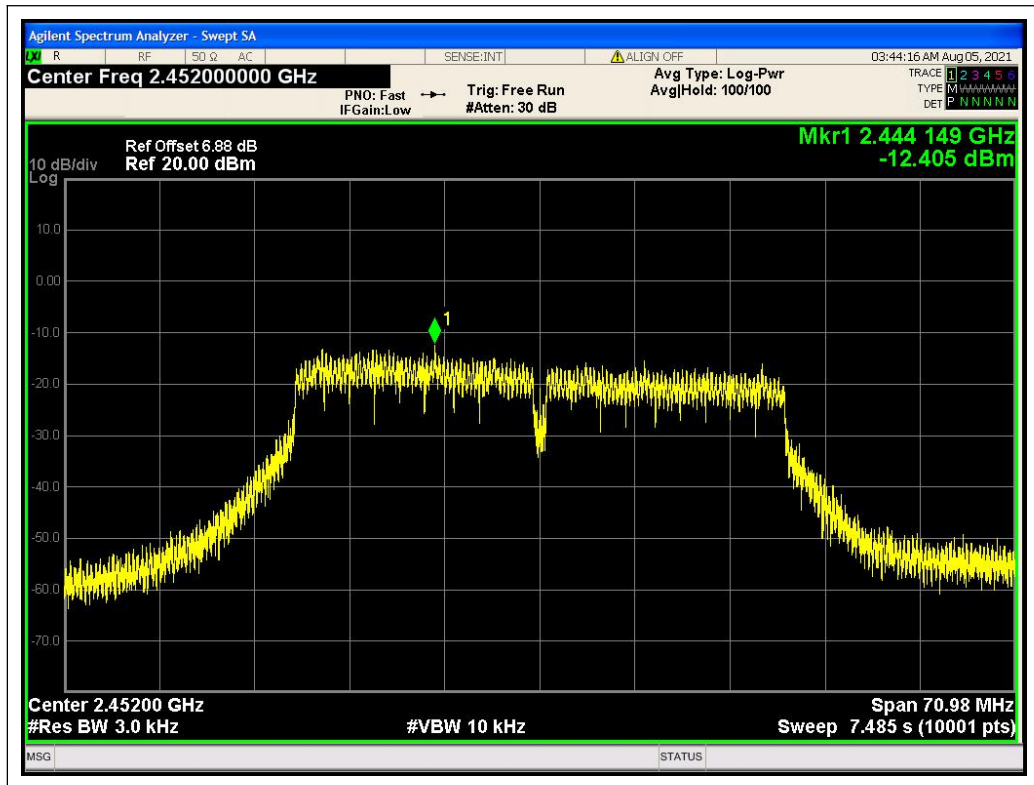
D. Test Plots:



(Channel = 3, 802.11n-40MHz)



(Channel = 6, 802.11n-40MHz)



(Channel = 9, 802.11n-40MHz)

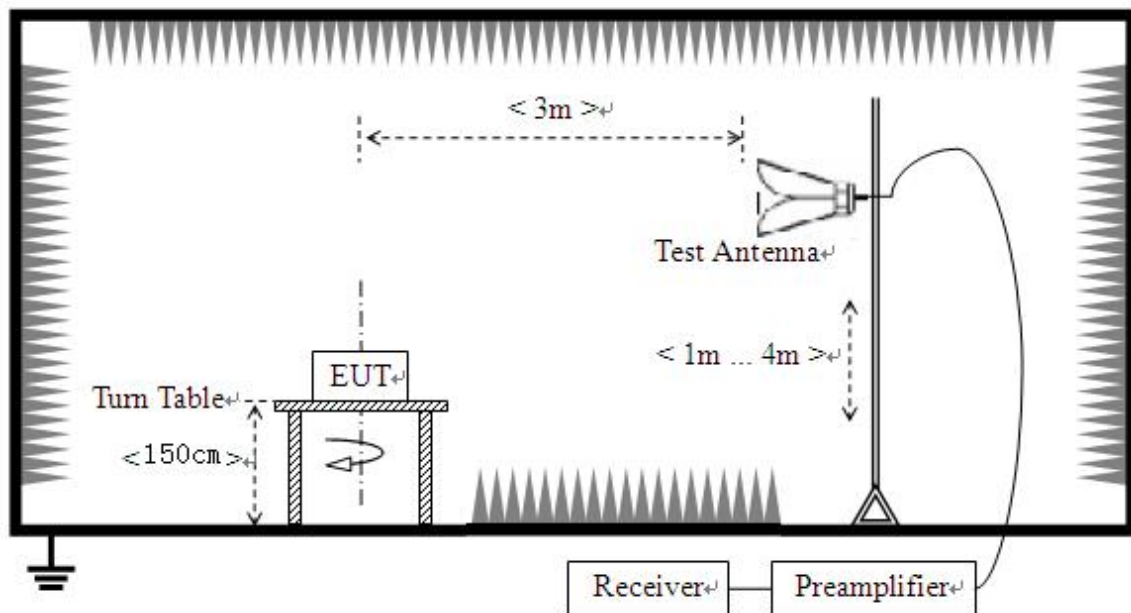
## 2.6. Restricted Frequency Bands

### 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 D01 v05r02 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.

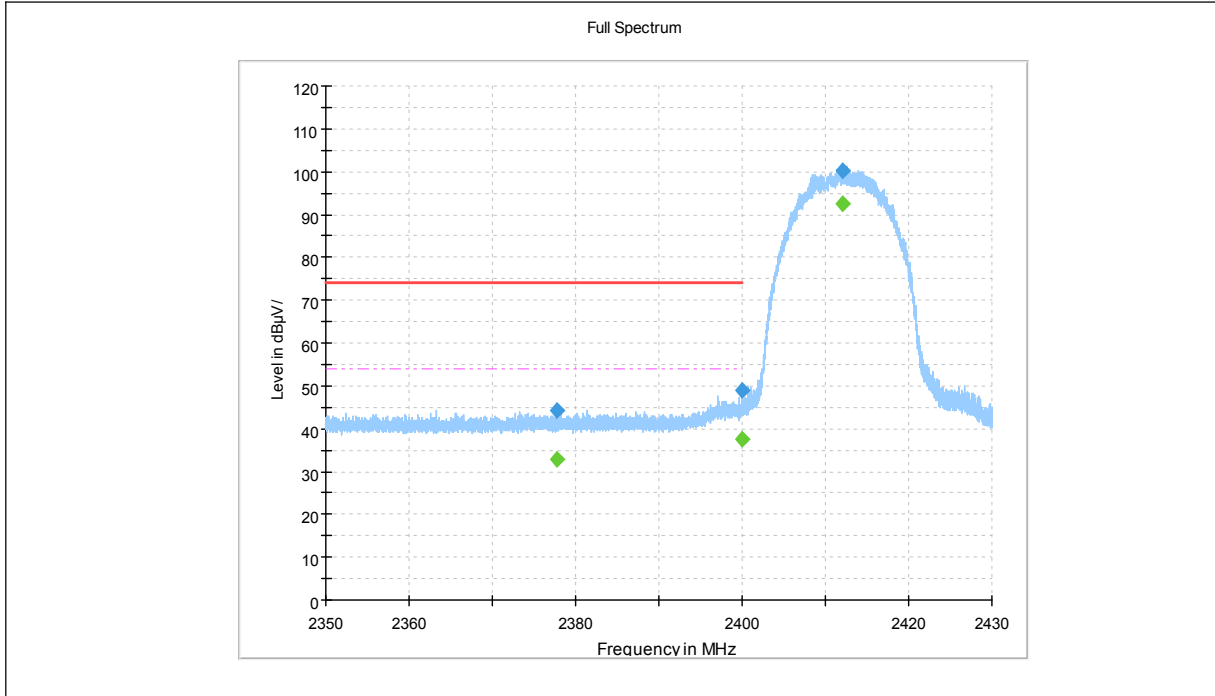
## **B. Equipments List:**

Please refer ANNEX B(4).



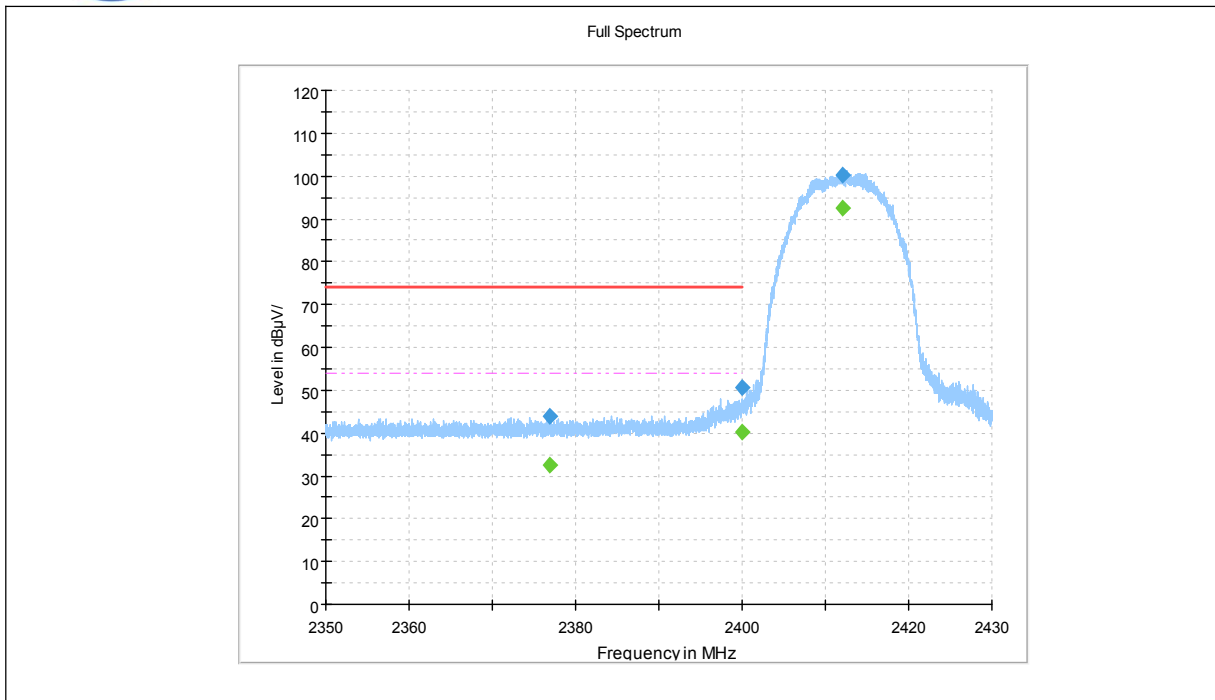
2.6.3. Test Result

802.11b Test mode



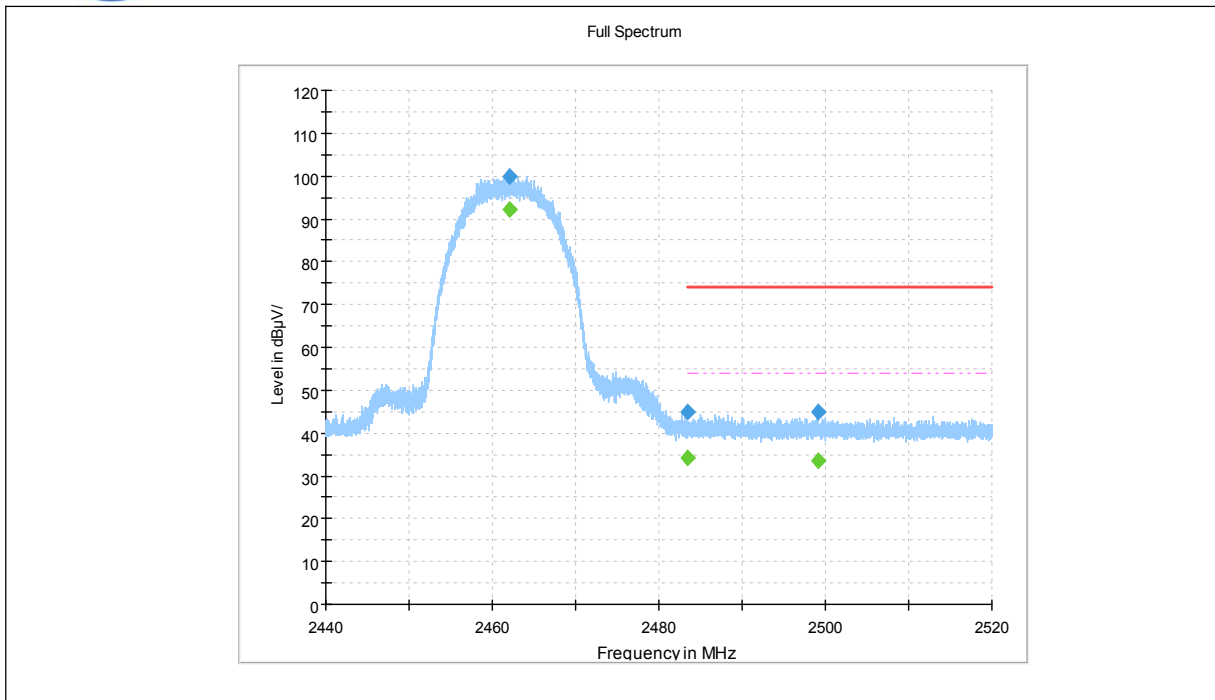
(802.11b\_2412MHz, Antenna Horizontal)

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2353.760000	55.55	---	74.00	19.45	H	7.4	PASS
2353.760000	---	29.85	54.00	24.15	H	7.4	PASS
2399.983333	---	31.71	54.00	22.29	H	8.0	PASS
2399.983333	54.89	---	74.00	19.11	H	8.0	PASS
2402.001667	93.00	---	---	---	H	8.7	PASS
2402.001667	---	88.98	---	---	H	8.7	PASS



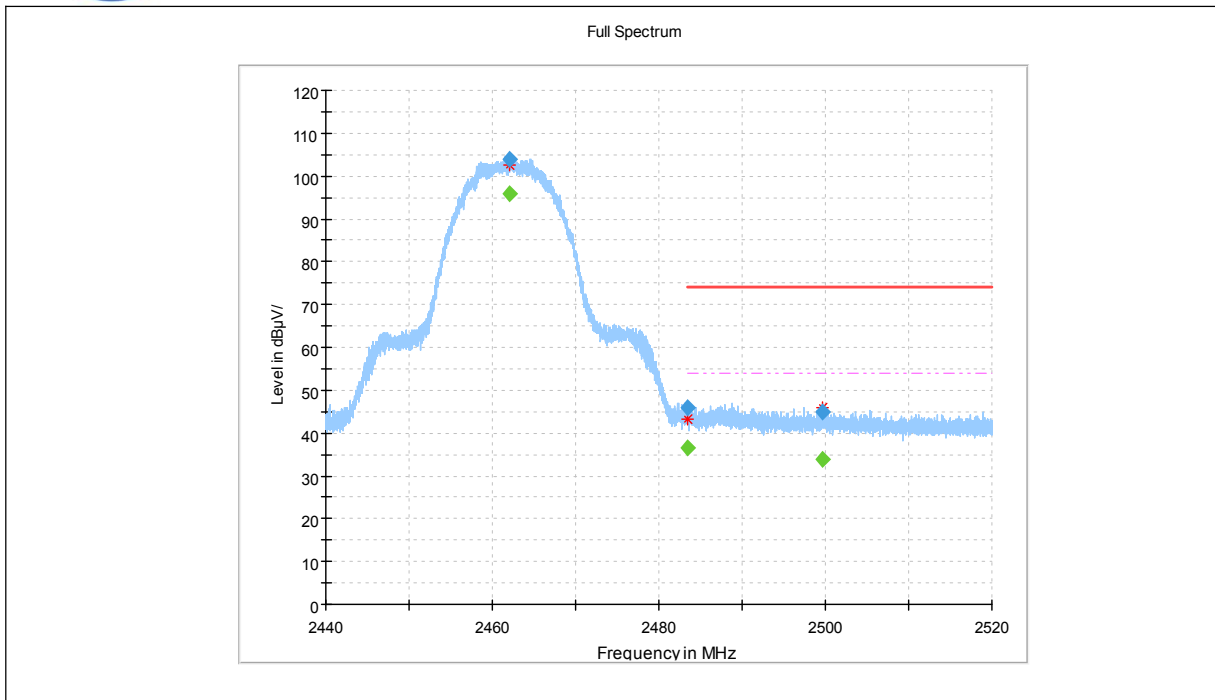
(802.11b\_2412MHz, Antenna Vertical)

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2376.824000	---	32.51	54.00	21.49	V	7.4	PASS
2376.824000	43.89	---	74.00	30.11	V	7.4	PASS
2400.000000	50.45	---	74.00	23.55	V	7.9	PASS
2400.000000	---	40.33	54.00	13.67	V	7.9	PASS
2412.000000	100.34	---	---	---	V	8.7	PASS
2412.000000	---	92.55	---	---	V	8.7	PASS



(802.11b\_2462MHz, Antenna Horizontal)

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2462.000000	---	92.16	---	---	H	7.9	PASS
2462.000000	100.01	---	---	---	H	7.9	PASS
2483.504000	---	34.08	54.00	19.92	H	8.3	PASS
2483.504000	45.02	---	74.00	28.98	H	8.3	PASS
2499.152000	---	33.51	54.00	20.49	H	8.4	PASS
2499.152000	44.92	---	74.00	29.08	H	8.4	PASS



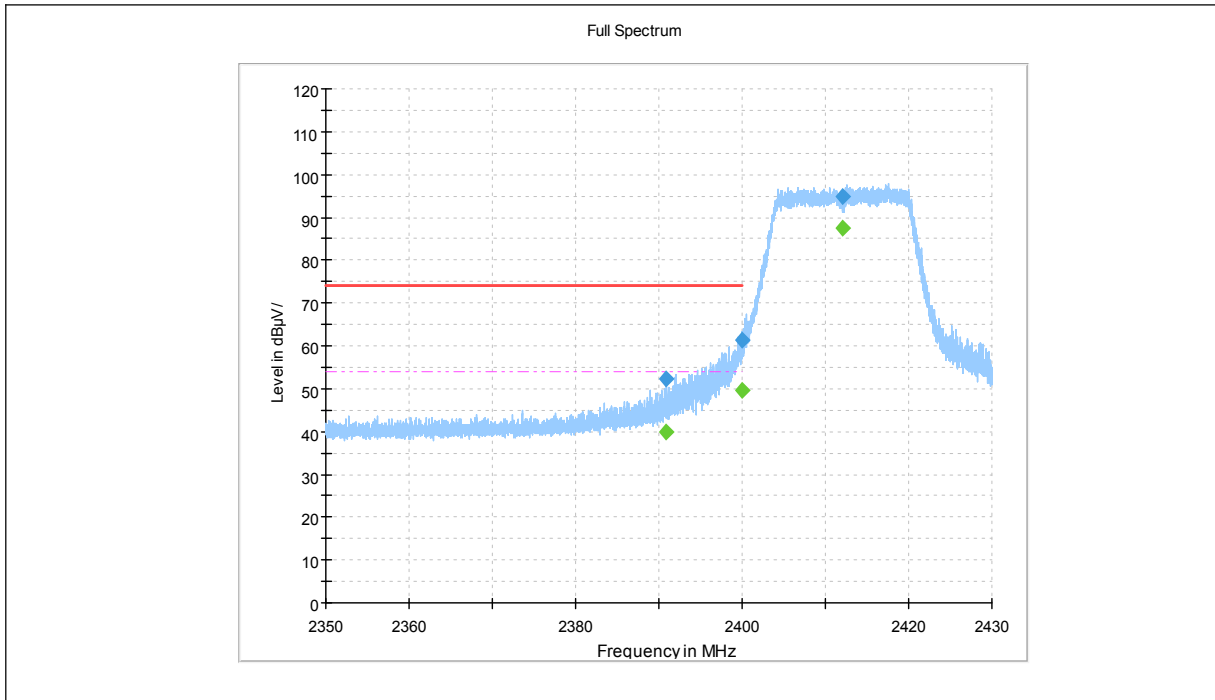
(802.11b\_2462MHz, Antenna Vertical)

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2462.000000	103.78	---	---	---	V	7.9	PASS
2462.000000	---	95.91	---	---	V	7.9	PASS
2483.504000	45.82	---	74.00	28.18	V	8.3	PASS
2483.504000	---	36.37	54.00	17.63	V	8.3	PASS
2499.680000	---	34.02	54.00	19.98	V	8.4	PASS
2499.680000	44.99	---	74.00	29.01	V	8.4	PASS



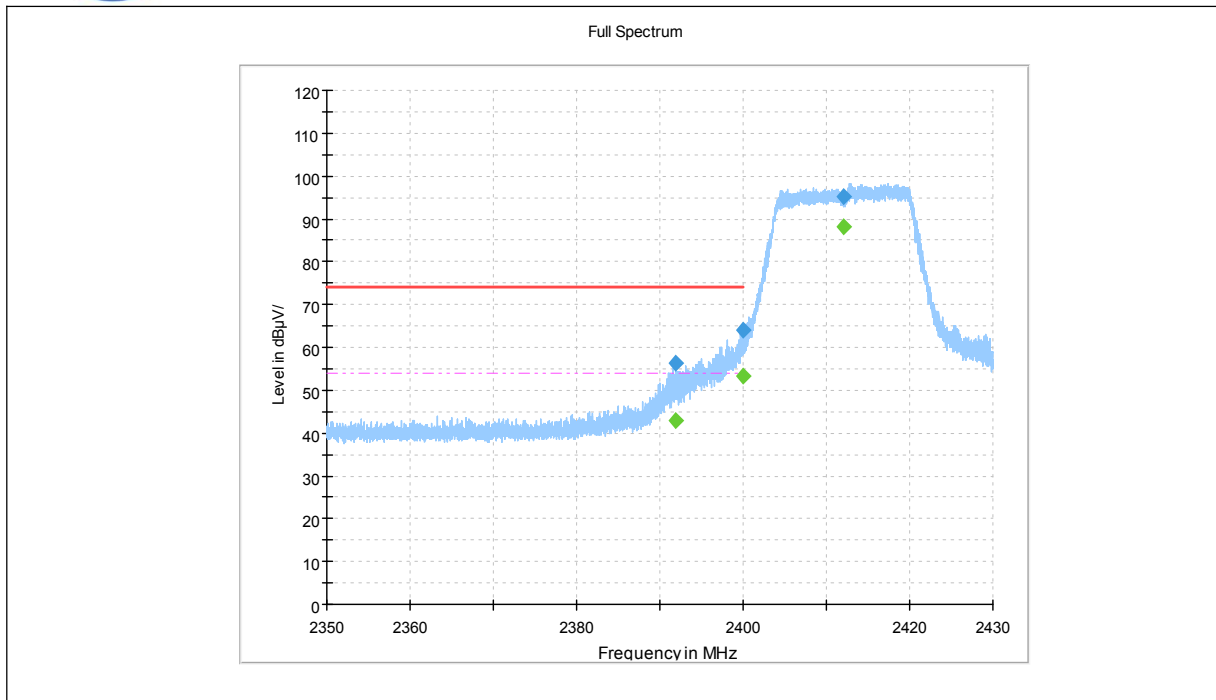


802.11g Test mode



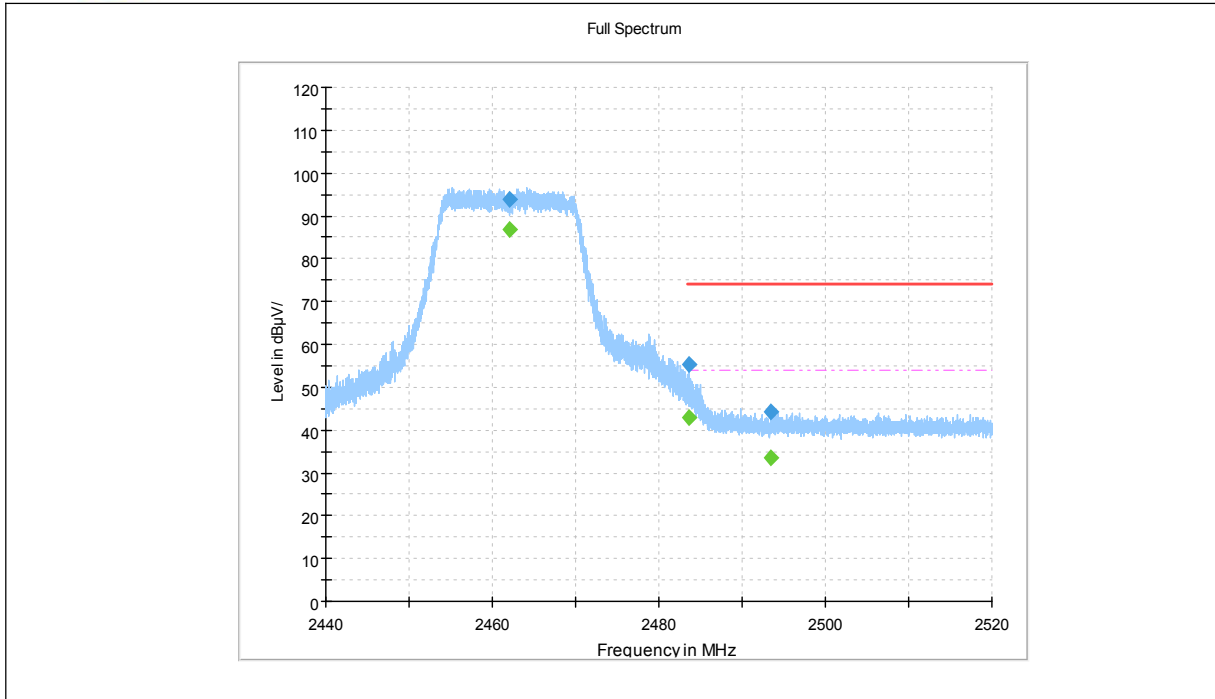
(802.11g \_2412MHz, Antenna Horizontal)

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V//m)	Limit (dB µ V//m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2390.944000	52.38	---	74.00	21.62	H	7.4	PASS
2390.944000	---	39.92	54.00	14.08	H	7.4	PASS
2400.000000	61.26	---	74.00	12.74	H	8.0	PASS
2400.000000	---	49.52	54.00	4.48	H	8.0	PASS
2412.000000	---	87.64	---	---	H	8.7	PASS
2412.000000	94.72	---	---	---	H	8.7	PASS



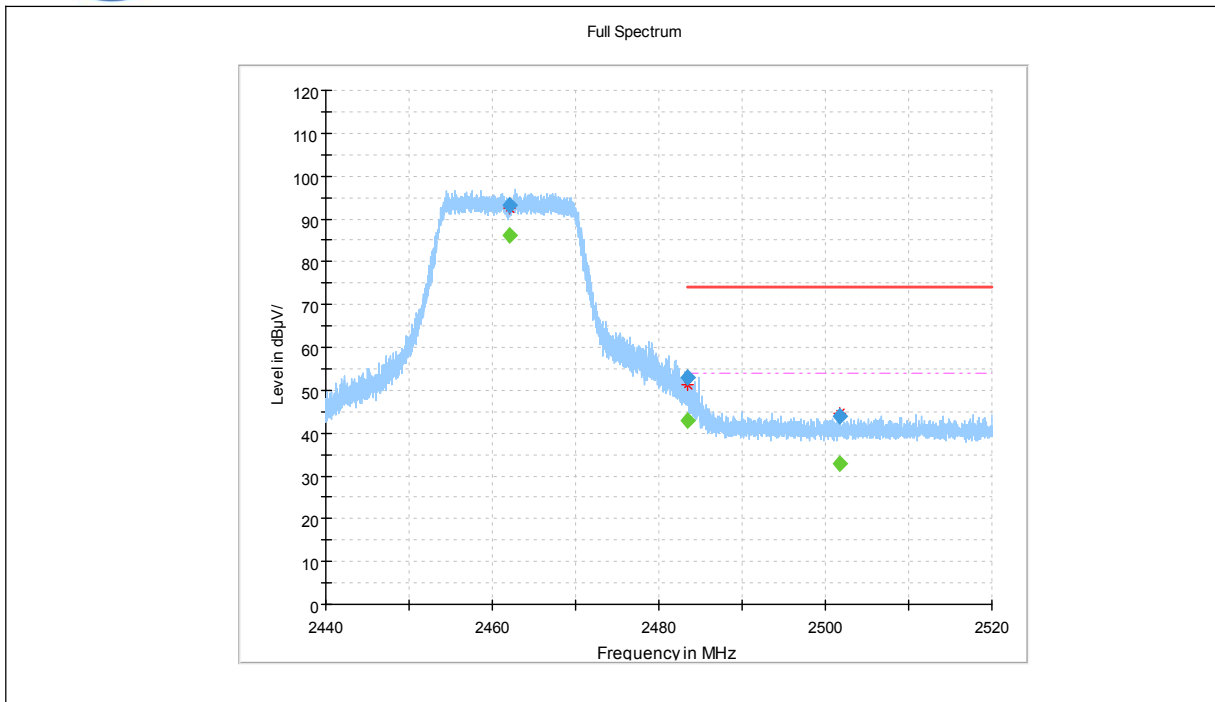
(802.11g \_2412MHz, Antenna Vertical)

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2391.856000	56.18	---	74.00	17.82	V	7.3	PASS
2391.856000	---	43.07	54.00	10.93	V	7.3	PASS
2400.000000	64.07	---	74.00	9.93	V	8.0	PASS
2400.000000	---	53.19	54.00	0.81	V	8.0	PASS
2412.000000	---	88.05	---	---	V	8.7	PASS
2412.000000	95.10	---	---	---	V	8.7	PASS



(802.11g \_2462MHz, Antenna Horizontal)

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2462.000000	93.91	---	---	---	H	7.9	PASS
2462.000000	---	86.88	---	---	H	7.9	PASS
2483.544000	55.37	---	74.00	18.63	H	8.3	PASS
2483.544000	---	42.77	54.00	11.23	H	8.3	PASS
2493.424000	---	33.57	54.00	20.43	H	8.4	PASS
2493.424000	44.17	---	74.00	29.83	H	8.4	PASS

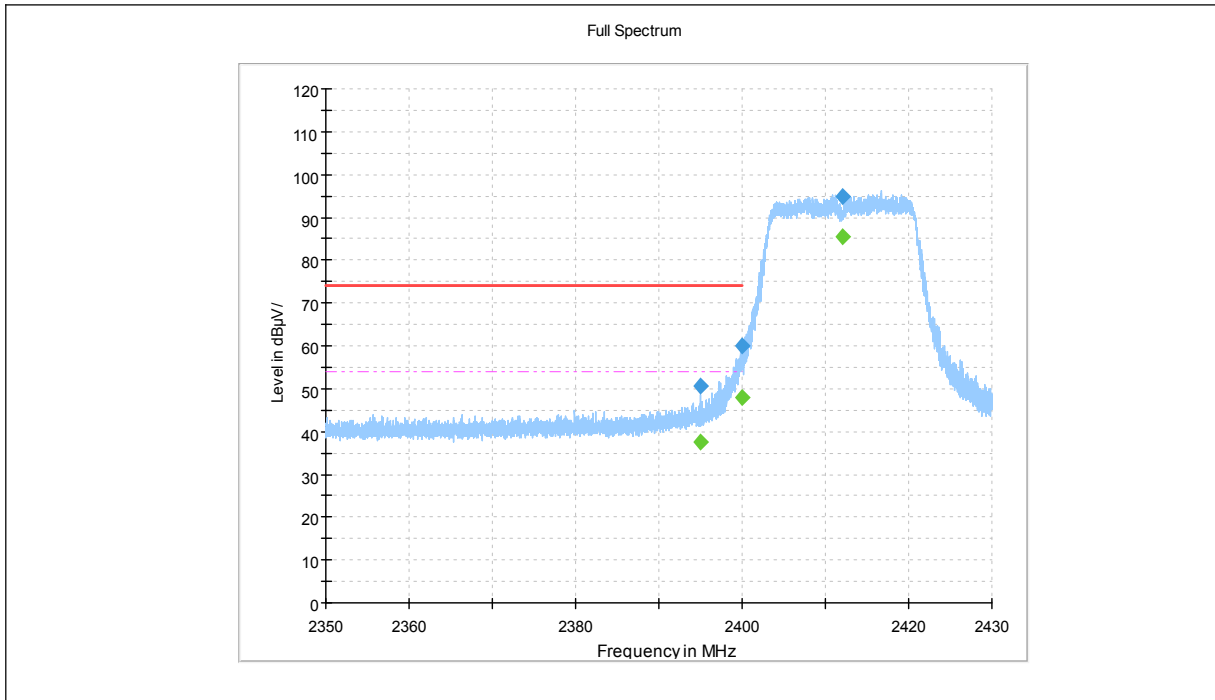


(802.11g\_2462MHz, Antenna Vertical)

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2462.008000	93.10	---	---	---	V	7.9	PASS
2462.008000	---	86.05	---	---	V	7.9	PASS
2483.504000	---	42.74	54.00	11.26	V	8.3	PASS
2483.504000	52.92	---	74.00	21.08	V	8.3	PASS
2501.680000	43.95	---	74.00	30.05	V	8.3	PASS
2501.680000	---	32.86	54.00	21.14	V	8.3	PASS

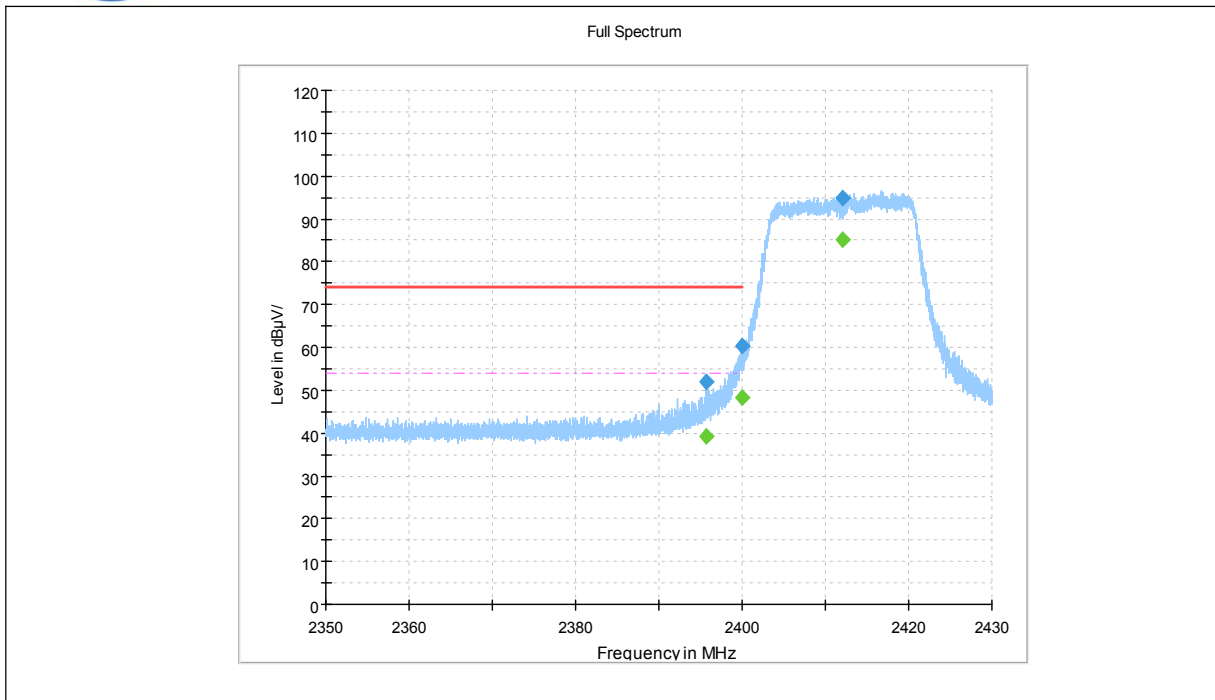


802.11n-20MHz Test mode



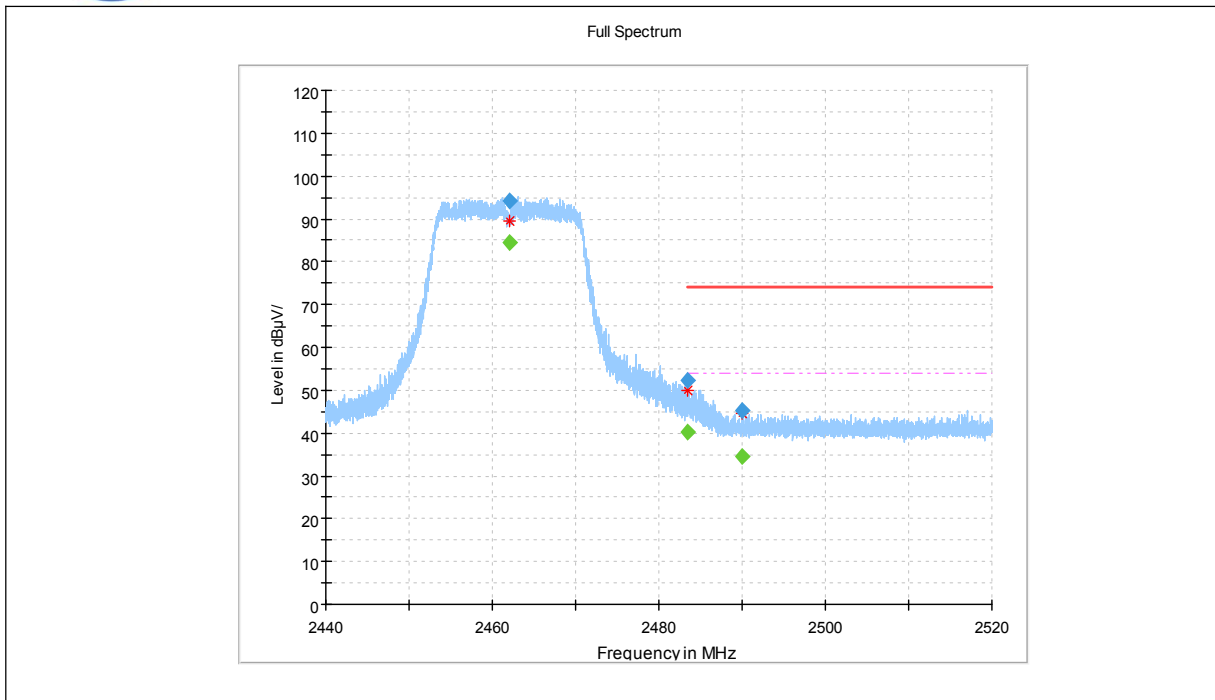
(802.11n\_20M\_2412MHz, Antenna Horizontal)

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V//m)	Limit (dB µ V//m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2395.000000	---	37.54	54.00	16.46	H	7.5	PASS
2395.000000	50.50	---	74.00	23.50	H	7.5	PASS
2400.000000	60.05	---	74.00	13.95	H	8.0	PASS
2400.000000	---	47.86	54.00	6.14	H	8.0	PASS
2412.000000	94.88	---	---	---	H	8.6	PASS
2412.000000	---	85.31	---	---	H	8.6	PASS



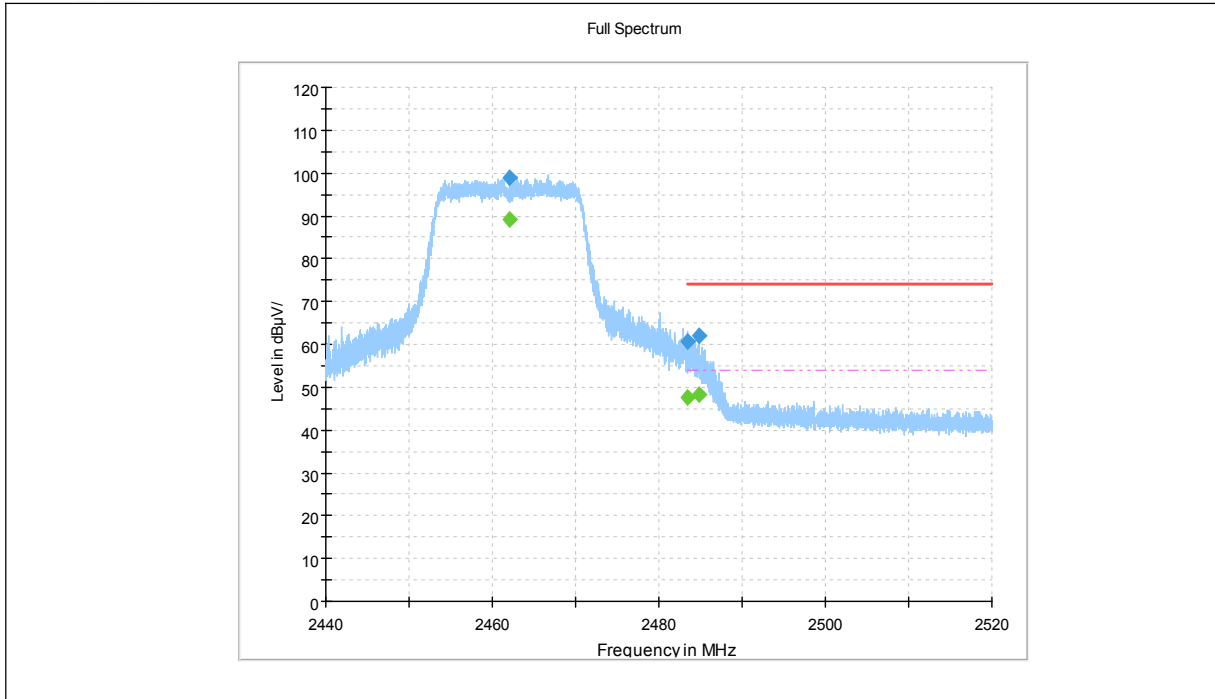
(802.11n\_20M\_2412MHz, Antenna Vertical)

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2395.632000	51.99	---	74.00	22.01	V	7.5	PASS
2395.632000	---	39.12	54.00	14.88	V	7.5	PASS
2400.000000	---	48.36	54.00	5.64	V	8.0	PASS
2400.000000	60.26	---	74.00	13.74	V	8.0	PASS
2412.000000	94.79	---	---	---	V	8.6	PASS
2412.000000	---	85.26	---	---	V	8.6	PASS



(802.11n\_20M\_2462MHz, Antenna Horizontal)

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2462.000000	94.14	---	---	---	H	7.9	PASS
2462.000000	---	84.59	---	---	H	7.9	PASS
2483.512000	52.34	---	74.00	19.66	H	8.3	PASS
2483.512000	---	40.13	54.00	13.87	H	8.3	PASS
2490.072000	---	34.40	54.00	19.60	H	8.4	PASS
2490.072000	45.14	---	74.00	28.86	H	8.4	PASS



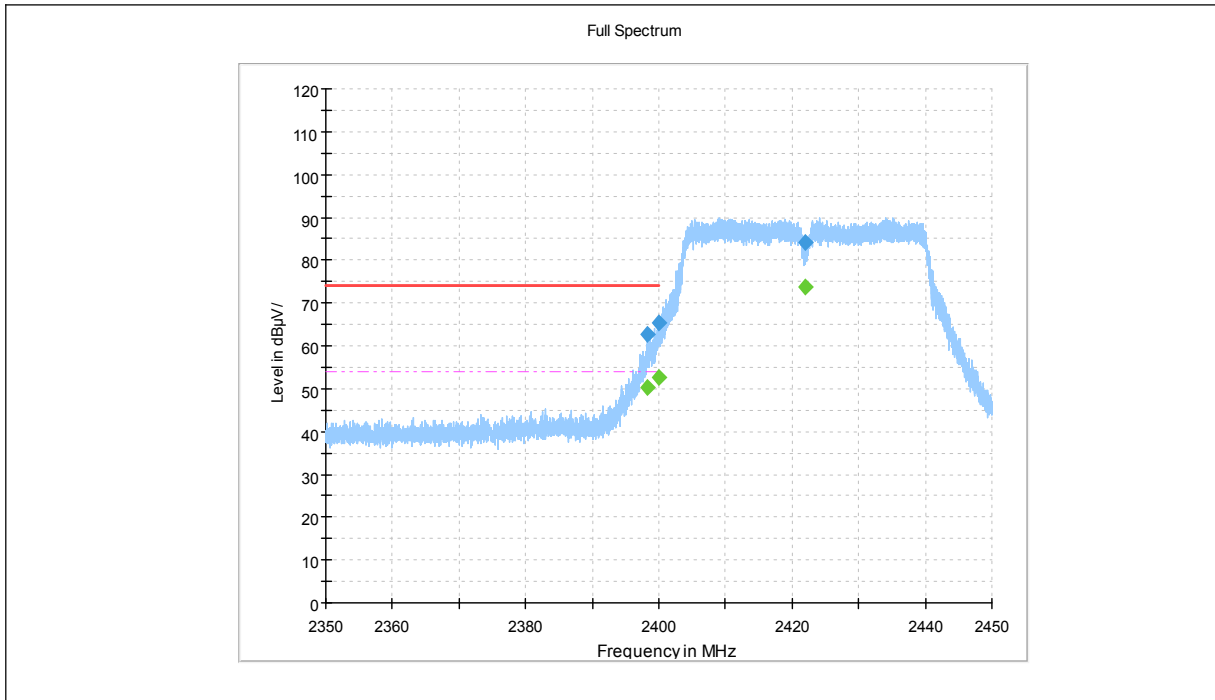
(802.11n\_20M\_2462MHz, Antenna Vertical)

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2462.000000	---	89.09	---	---	V	7.9	PASS
2462.000000	98.75	---	---	---	V	7.9	PASS
2483.504000	60.68	---	74.00	13.32	V	8.3	PASS
2483.504000	---	47.66	54.00	6.34	V	8.3	PASS
2484.864000	61.91	---	74.00	12.09	V	8.4	PASS
2484.864000	---	48.17	54.00	5.83	V	8.4	PASS



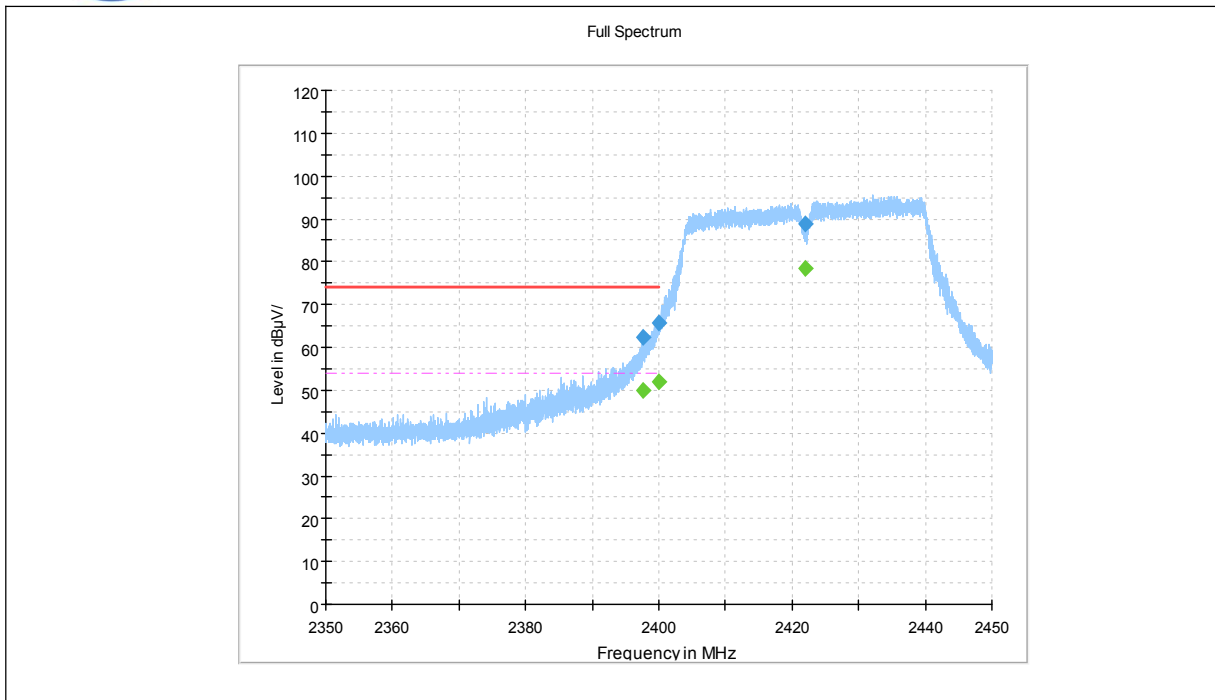


802.11n-40MHz Test mode



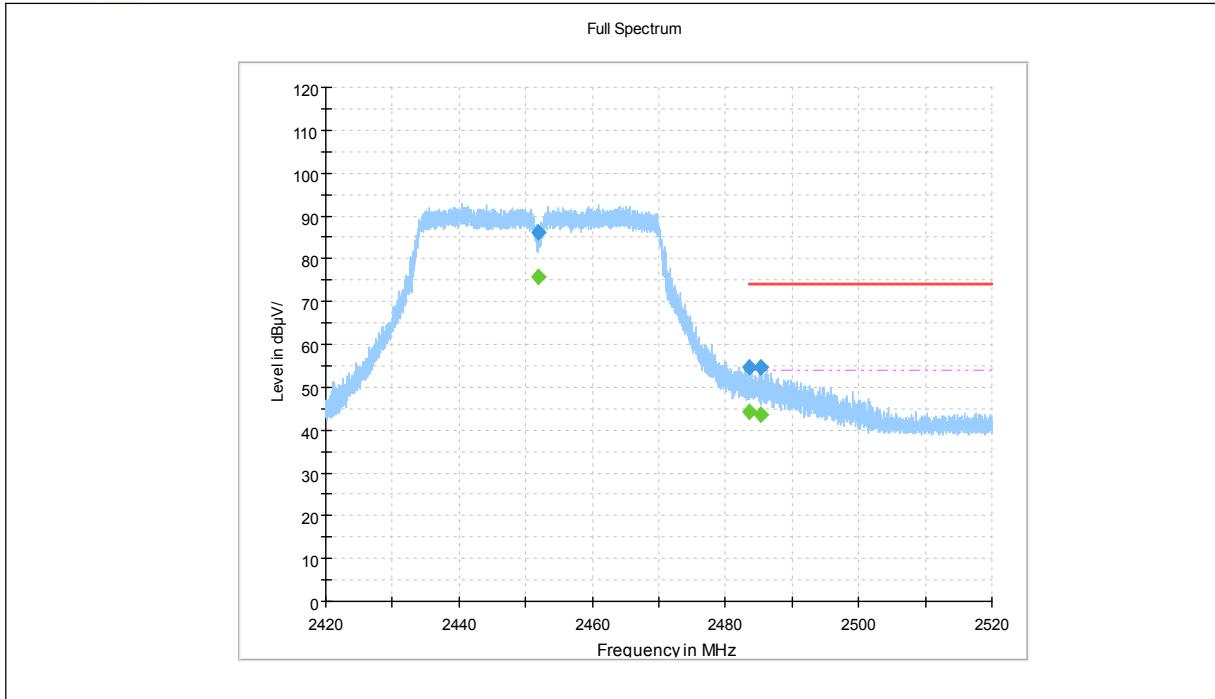
(802.11n\_40M\_2422MHz, Antenna Horizontal)

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V//m)	Limit (dB µ V//m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2398.240000	---	50.33	54.00	3.67	H	7.5	PASS
2398.240000	62.73	---	74.00	11.27	H	7.5	PASS
2400.000000	---	52.74	54.00	1.26	H	7.8	PASS
2400.000000	65.53	---	74.00	8.47	H	7.8	PASS
2422.000000	---	73.61	---	---	H	8.6	PASS
2422.000000	84.12	---	---	---	H	8.6	PASS



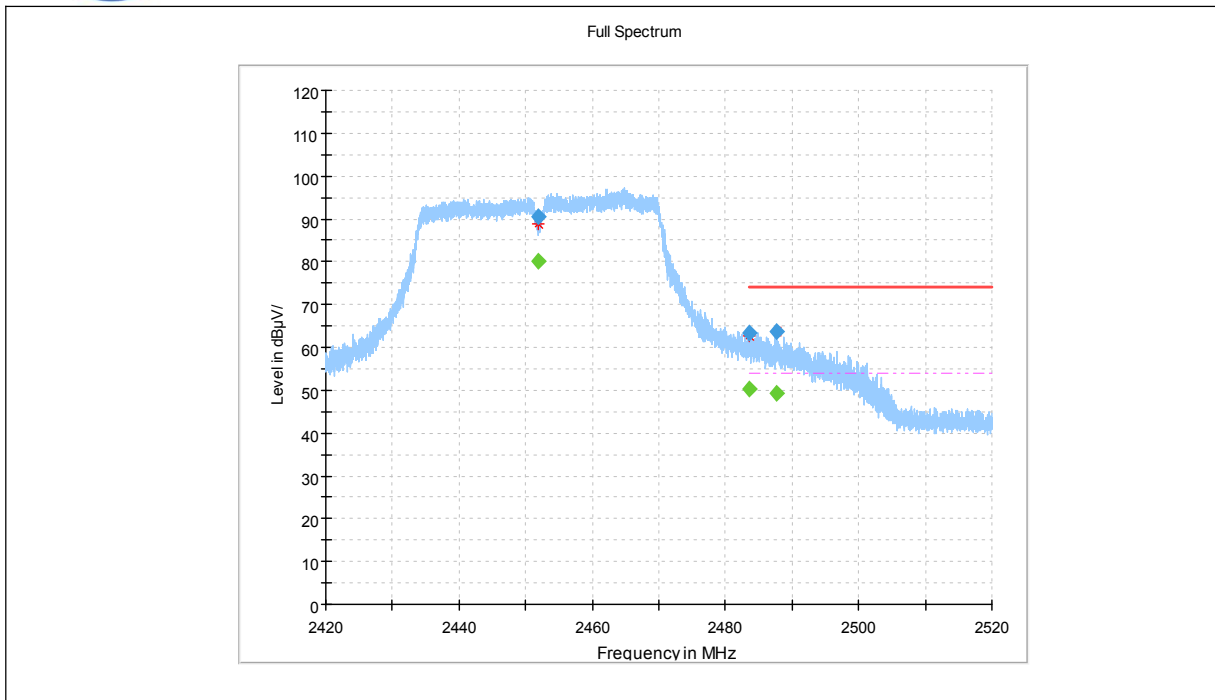
(802.11n\_40M\_2422MHz, Antenna Vertical)

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2397.660000	---	49.88	54.00	4.12	V	7.7	PASS
2397.660000	62.44	---	74.00	11.56	V	7.7	PASS
2400.000000	65.84	---	74.00	8.16	V	7.9	PASS
2400.000000	---	51.86	54.00	2.24	V	7.9	PASS
2422.000000	88.88	---	---	---	V	8.6	PASS
2422.000000	---	78.31	---	---	V	8.6	PASS



(802.11n\_40M\_2452MHz, Antenna Horizontal)

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2452.000000	---	75.77	---	---	H	7.8	PASS
2452.000000	85.99	---	---	---	H	7.8	PASS
2483.500000	54.80	---	74.00	19.20	H	8.3	PASS
2483.500000	---	44.08	54.00	9.92	H	8.3	PASS
2485.200000	54.64	---	74.00	19.36	H	8.4	PASS
2485.200000	---	43.45	54.00	10.55	H	8.4	PASS



(802.11n\_40M\_2452MHz, Antenna Vertical)

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
2452.000000	---	80.01	---	---	V	7.8	PASS
2452.000000	90.57	---	---	---	V	7.8	PASS
2483.500000	63.45	---	74.00	10.55	V	8.3	PASS
2483.500000	---	50.24	54.00	3.76	V	8.3	PASS
2487.680000	63.62	---	74.00	10.38	V	8.4	PASS
2487.680000	---	49.42	54.00	4.58	V	8.4	PASS

## 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 $\mu$ H/50 $\Omega$  line impedance stabilization network (LISN).

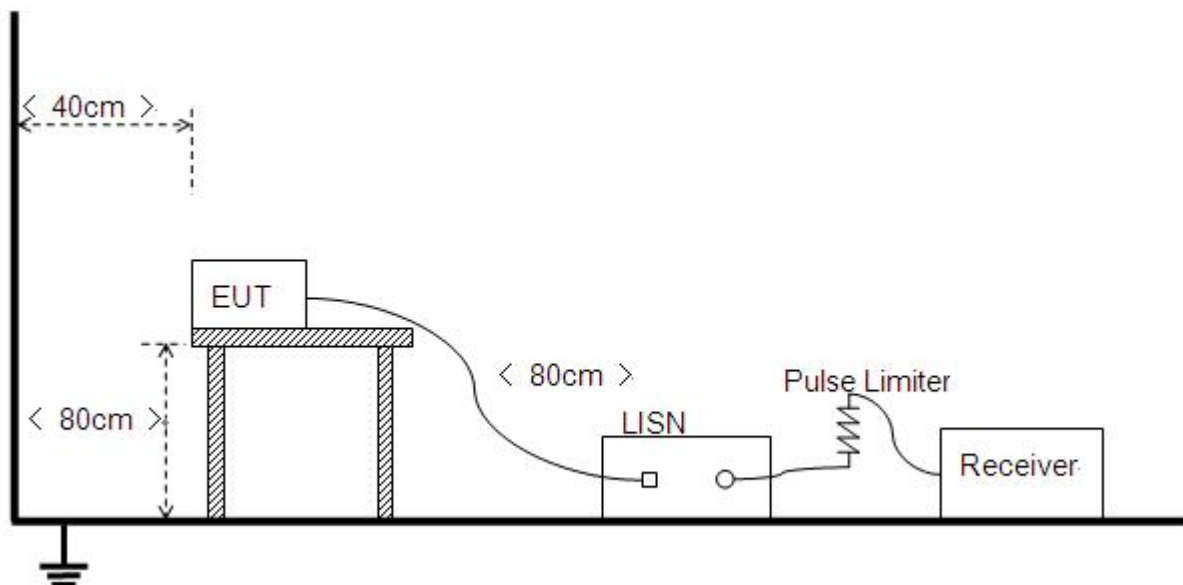
Frequency range (MHz)	Conducted Limit (dB $\mu$ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

**NOTE:**

- (a) The lower limit shall apply at the band edges.
- (b) 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.

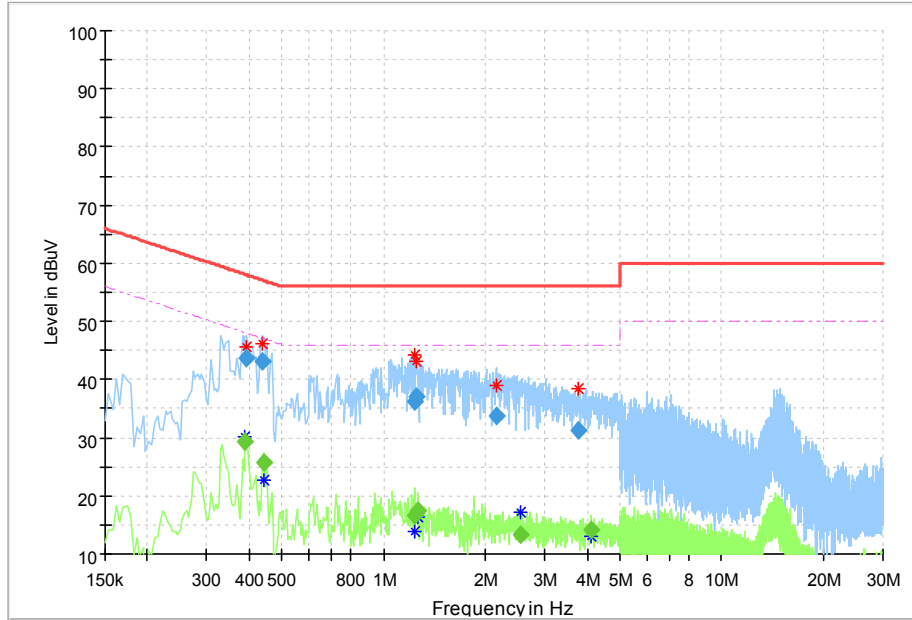
**Note:** Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

#### A. Test setup:

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

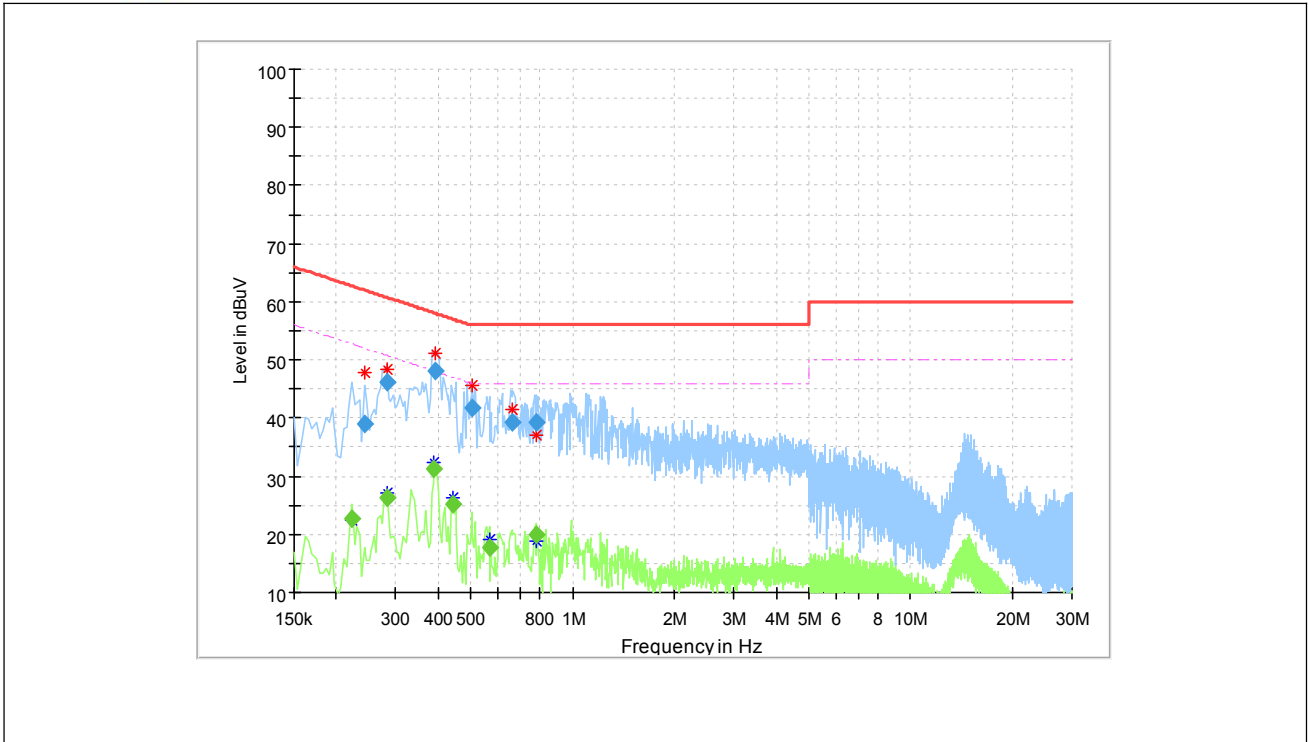
**Note:** The test voltage is AC 120V/60Hz.

**B. Test Plots:**



(Plot A: L Phase)

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	Verdict
0.390000	---	30.21	48.06	17.86	L	10.0	PASS
0.394000	45.64	---	57.98	12.34	L	10.0	PASS
0.438000	46.06	---	57.10	11.04	L	10.0	PASS
0.442000	---	22.79	47.02	24.24	L	10.0	PASS
1.234000	---	13.81	46.00	32.19	L	10.0	PASS
1.234000	44.10	---	56.00	11.90	L	10.0	PASS
1.254000	43.02	---	56.00	12.98	L	10.0	PASS
1.262000	---	16.45	46.00	29.55	L	10.0	PASS
2.158000	39.00	---	56.00	17.00	L	10.0	PASS
2.546000	---	17.07	46.00	28.93	L	10.0	PASS
3.766000	38.44	---	56.00	17.56	L	10.1	PASS
4.102000	---	13.05	46.00	32.95	L	10.1	PASS



(Plot A: N Phase)

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	Verdict
0.222000	---	22.49	52.74	30.25	N	10.0	PASS
0.242000	47.78	---	62.03	14.25	N	10.0	PASS
0.282000	---	27.11	50.76	23.64	N	10.0	PASS
0.282000	48.38	---	60.76	12.37	N	10.0	PASS
0.390000	---	32.37	48.06	15.69	N	10.0	PASS
0.394000	51.12	---	57.98	6.86	N	10.0	PASS
0.442000	---	26.27	47.02	20.75	N	10.0	PASS
0.502000	45.71	---	56.00	10.29	N	10.0	PASS
0.566000	---	19.17	46.00	26.83	N	10.0	PASS
0.666000	41.36	---	56.00	14.64	N	10.0	PASS
0.782000	37.12	---	56.00	18.88	N	10.0	PASS
0.782000	---	18.70	46.00	27.30	N	10.0	PASS





## 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 ( $\mu\text{V}/\text{m}$ )	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.

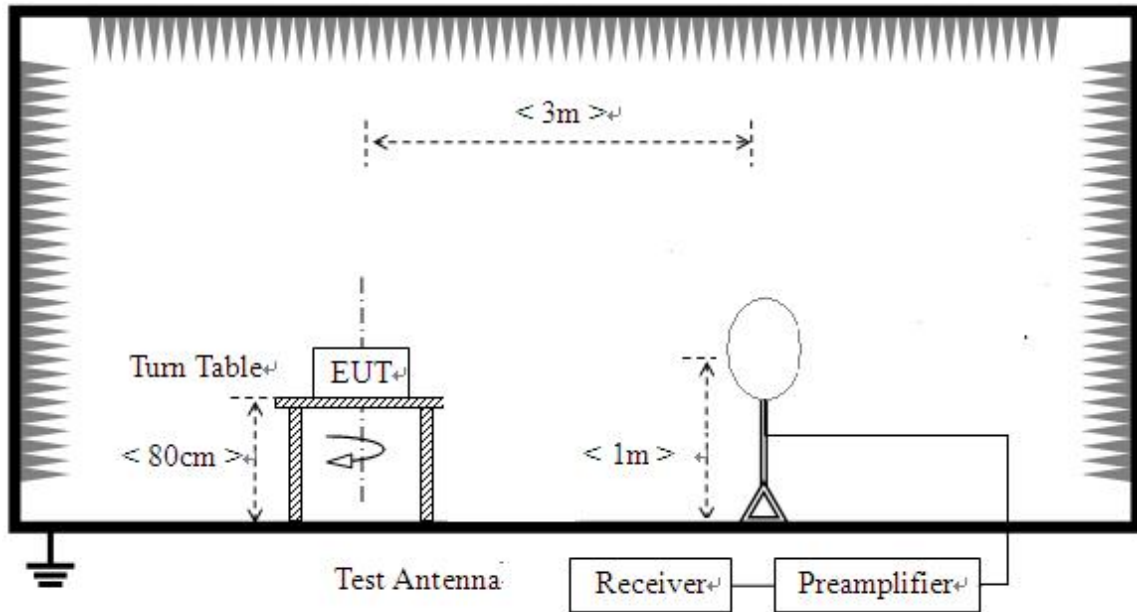
For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK)

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)

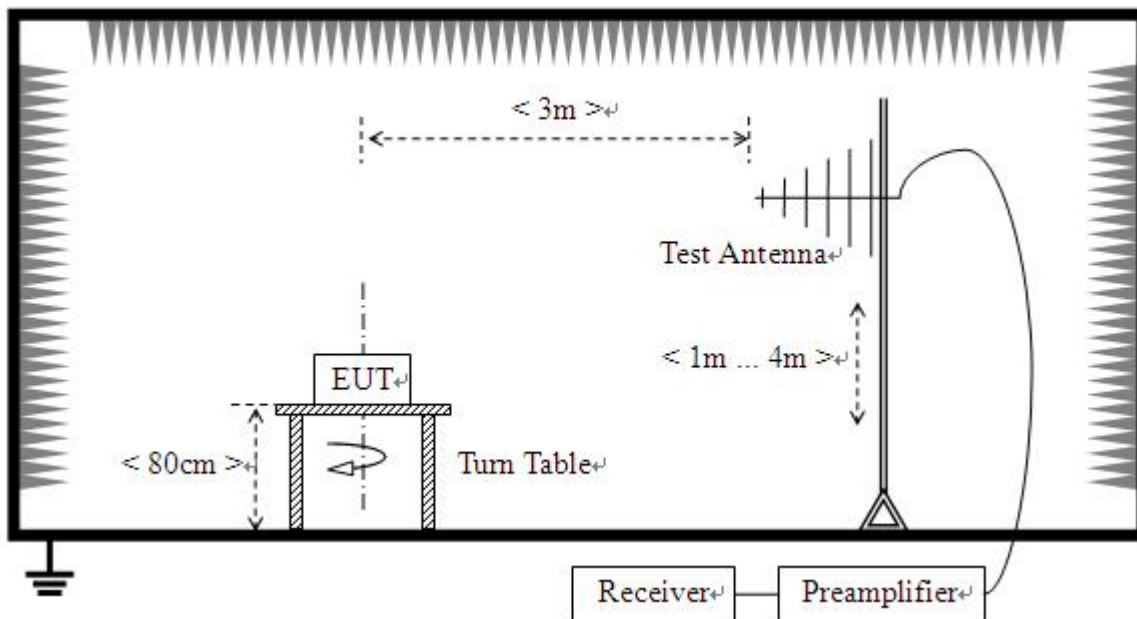
### 2.8.2. Test Description

#### A. Test Setup:

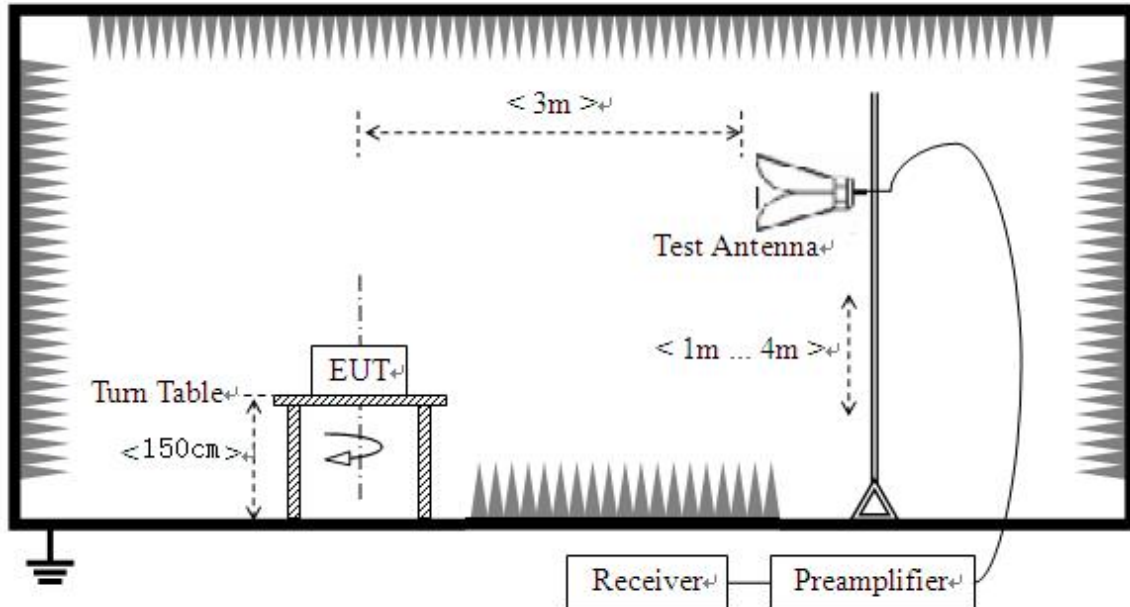
- 1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz



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:**

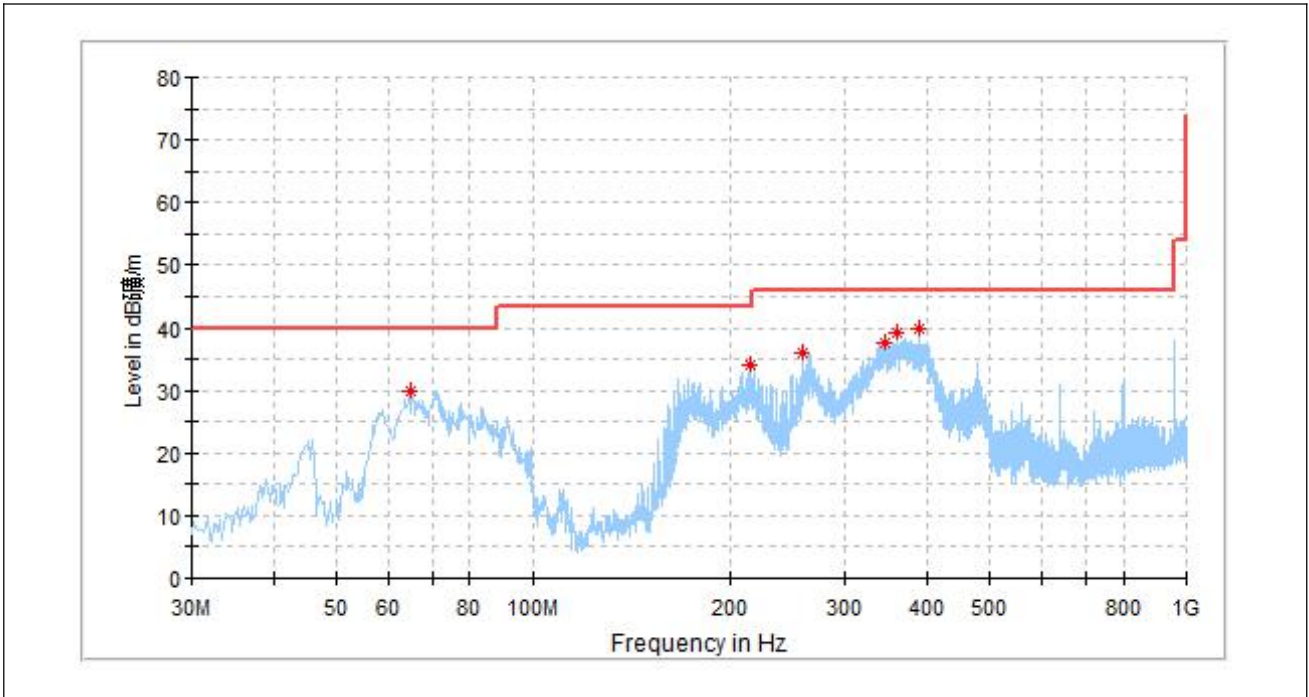
Please refer to ANNEX B(4).

**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.

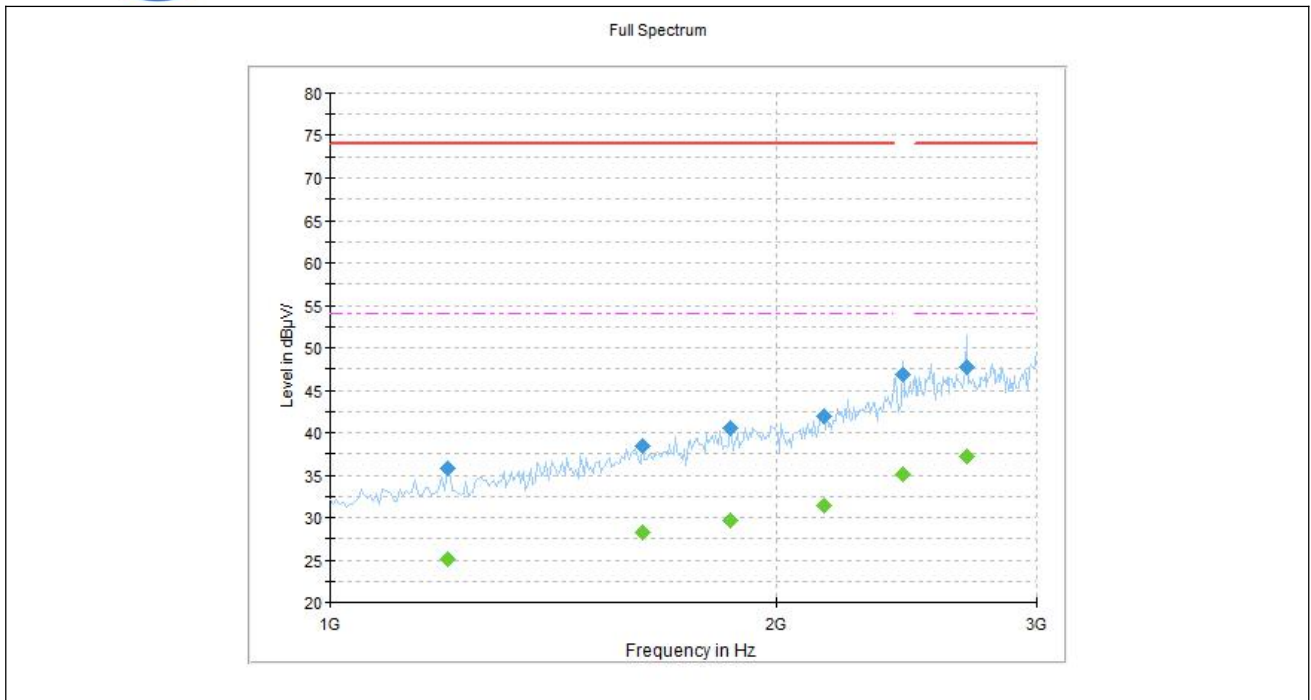
**Note2:** For the frequency, which started from 18GHz to 40GHz, was pre-scanned and the result which was 10dB lower than the limit was not recorded.

**802.11b Test mode**



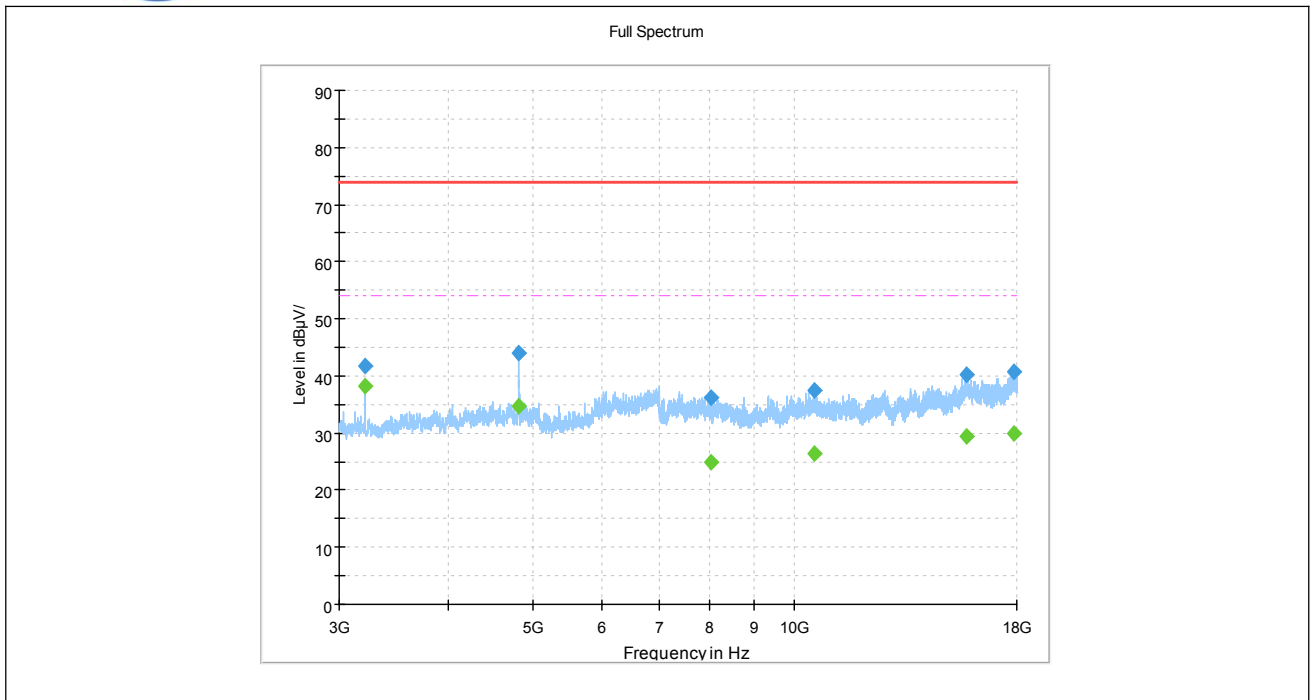
(802.11b\_2412MHz, Antenna Horizontal, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
44.744000	13.60	40.00	26.40	H	-14.7	PASS
113.032000	10.80	43.50	32.70	H	-20.8	PASS
178.410000	24.69	43.50	18.81	H	-22.1	PASS
263.770000	30.52	46.00	15.48	H	-19.4	PASS
390.646000	36.00	46.00	10.00	H	-15.2	PASS
640.130000	31.06	46.00	14.94	H	-12.3	PASS



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

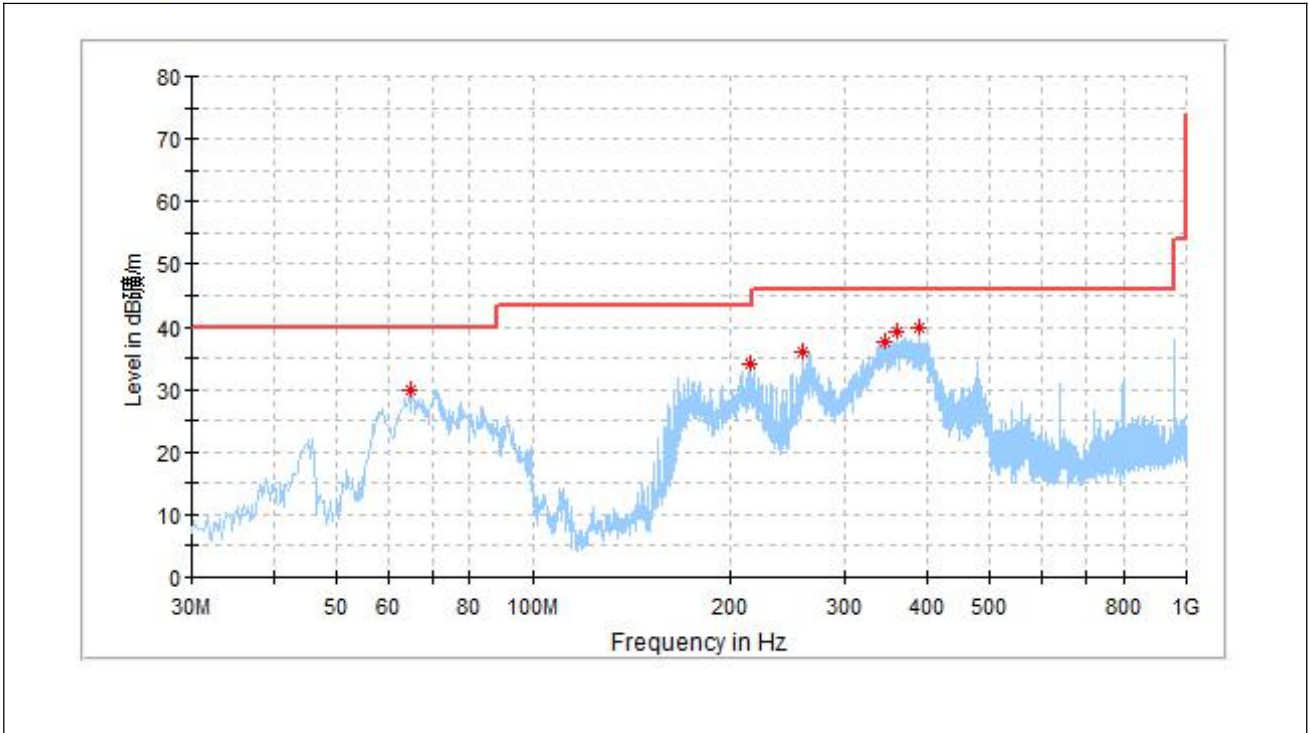
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
1200.000000	---	25.16	54.00	28.84	H	-0.4	PASS
1200.000000	35.73	---	74.00	38.27	H	-0.4	PASS
1625.000000	38.49	---	74.00	35.51	H	3.3	PASS
1625.000000	---	28.17	54.00	25.83	H	3.3	PASS
1865.000000	---	29.67	54.00	24.33	H	5.8	PASS
1865.000000	40.57	---	74.00	33.43	H	5.8	PASS
2155.000000	---	31.43	54.00	22.57	H	8.3	PASS
2155.000000	41.93	---	74.00	32.07	H	8.3	PASS
2435.000000	46.88	---	---	---	H	12.4	PASS
2435.000000	---	35.06	---	---	H	12.4	PASS
2690.000000	---	37.18	54.00	16.82	H	14.8	PASS
2690.000000	47.77	---	74.00	26.23	H	14.8	PASS



(802.11b\_2412MHz, Antenna Horizontal, 3GHz to 18GHz)

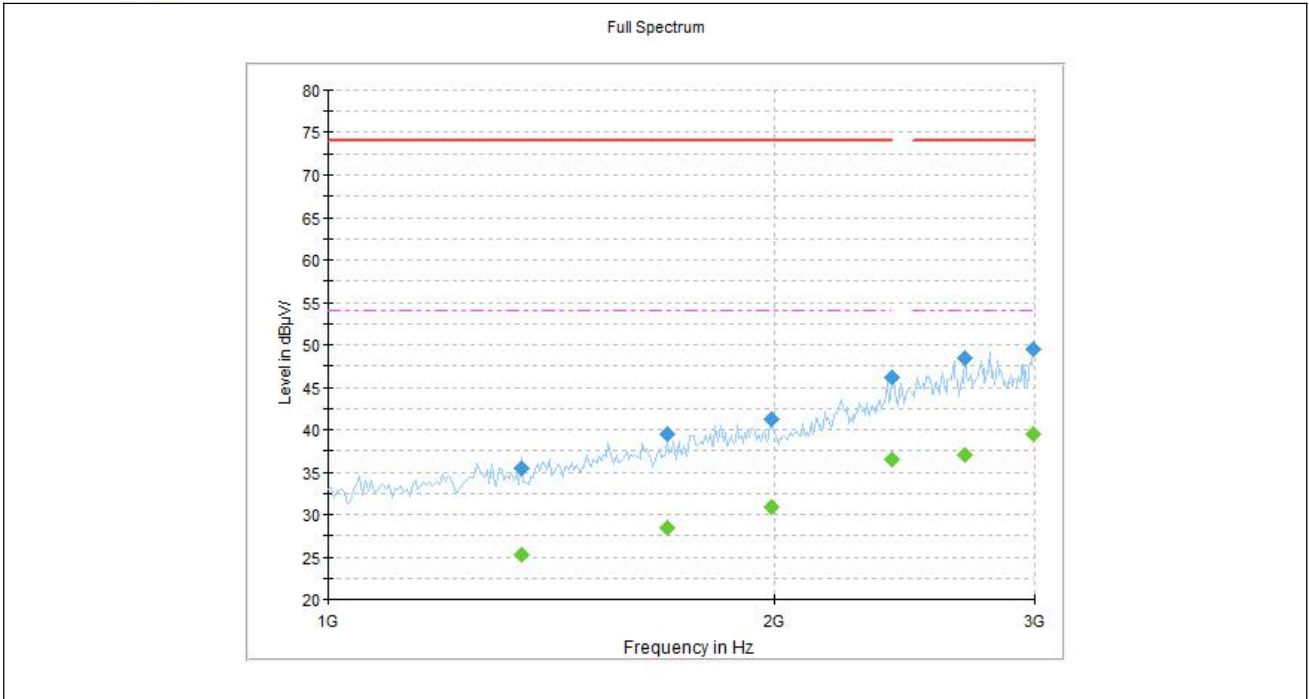
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
3216.000000	---	38.12	54.00	15.88	H	30.5	PASS
3216.000000	41.70	---	74.00	32.30	H	30.5	PASS
4824.000000	44.07	---	74.00	29.93	H	33.3	PASS
4824.000000	---	34.80	54.00	19.20	H	33.3	PASS
8005.500000	36.31	---	74.00	37.69	H	35.2	PASS
8005.500000	---	24.91	54.00	29.09	H	35.2	PASS
10543.500000	---	26.35	54.00	27.65	H	37.0	PASS
10543.500000	37.35	---	74.00	36.65	H	37.0	PASS
15777.000000	40.25	---	74.00	33.75	H	43.7	PASS
15777.000000	---	29.30	54.00	24.70	H	43.7	PASS
17862.000000	40.76	---	74.00	33.24	H	47.7	PASS
17862.000000	---	29.80	54.00	24.20	H	47.7	PASS





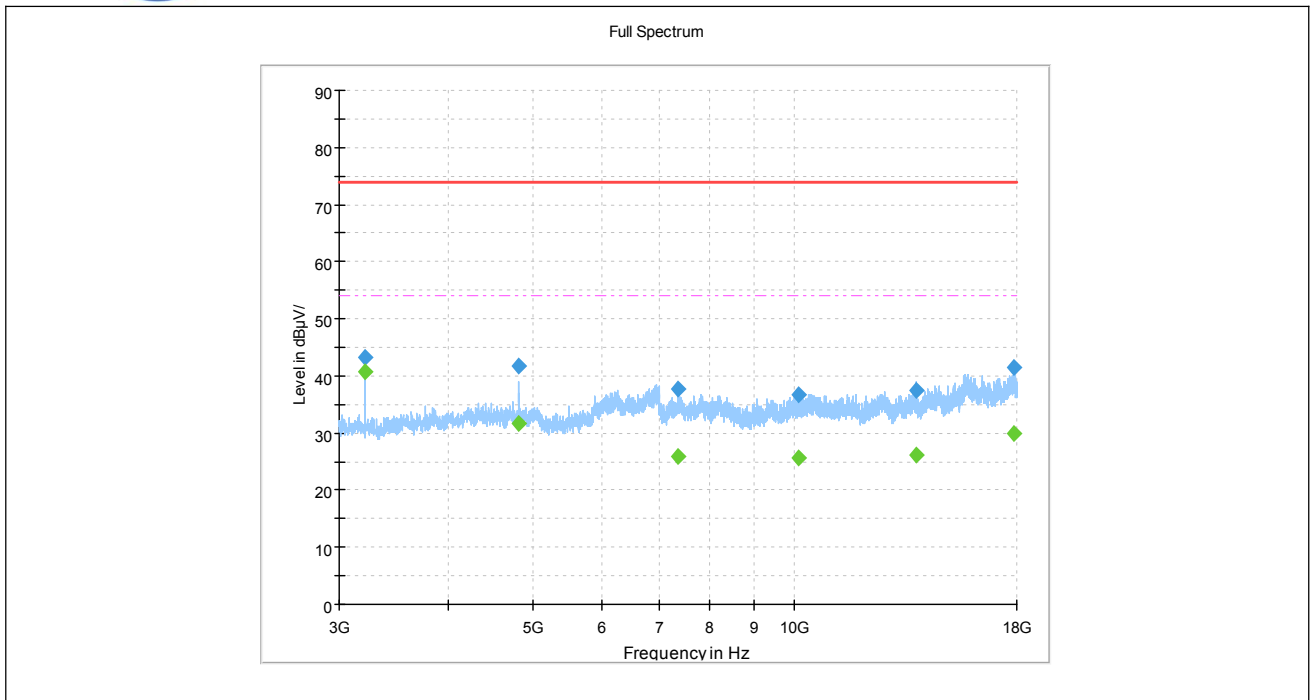
(802.11b\_2412MHz, Antenna Vertical, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
65.114000	29.99	40.00	10.01	V	-21.2	PASS
215.658000	33.99	43.50	9.51	V	-19.8	PASS
258.532000	36.01	46.00	9.99	V	-19.7	PASS
345.250000	37.56	46.00	8.44	V	-16.6	PASS
360.576000	39.27	46.00	6.73	V	-16.3	PASS
390.064000	39.79	46.00	6.21	V	-15.2	PASS



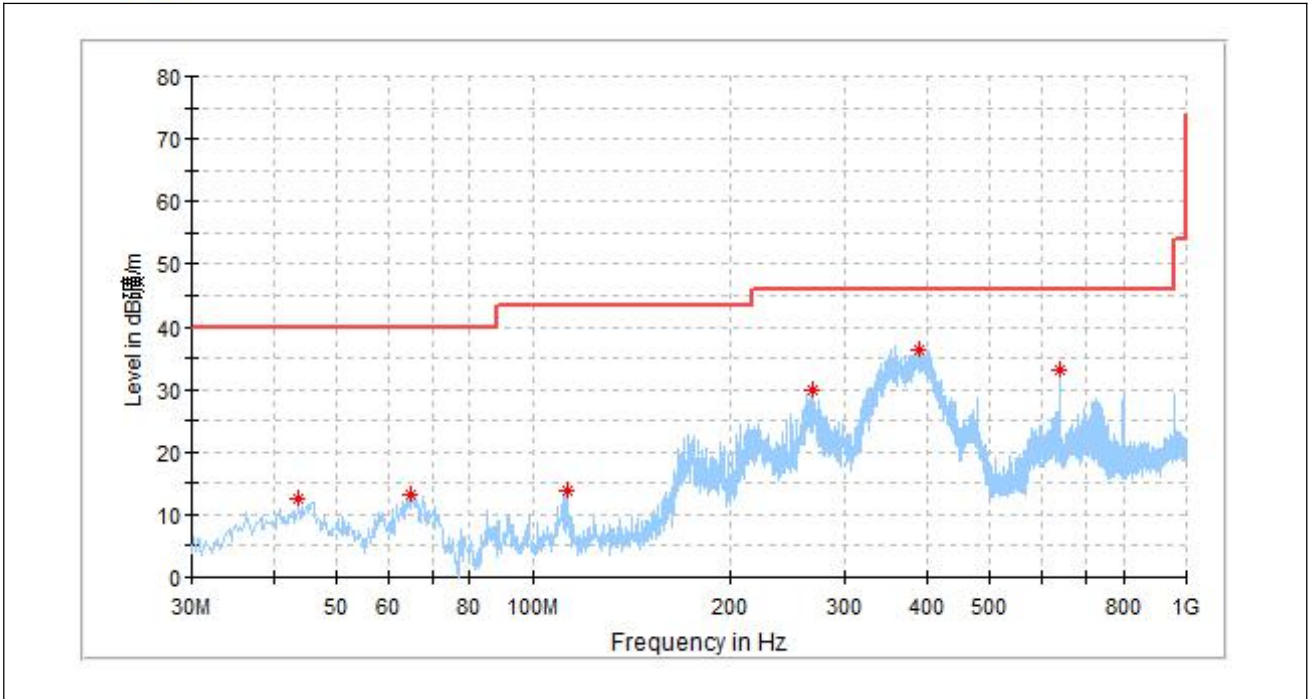
(802.11b\_2412MHz, Antenna Vertical, 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
1350.000000	---	25.26	54.00	28.74	V	0.3	PASS
1350.000000	35.45	---	74.00	38.55	V	0.3	PASS
1695.000000	---	28.41	54.00	25.59	V	3.8	PASS
1695.000000	39.49	---	74.00	34.51	V	3.8	PASS
1990.000000	---	30.90	54.00	23.10	V	7.3	PASS
1990.000000	41.25	---	74.00	32.75	V	7.3	PASS
2400.000000	46.08	---	74.00	27.92	V	13.5	PASS
2400.000000	---	36.48	54.00	17.52	V	13.5	PASS
2690.000000	---	36.97	54.00	17.03	V	14.8	PASS
2690.000000	48.49	---	74.00	25.51	V	14.8	PASS
2995.000000	49.56	---	74.00	24.44	V	17.9	PASS
2995.000000	---	39.55	54.00	14.45	V	17.9	PASS



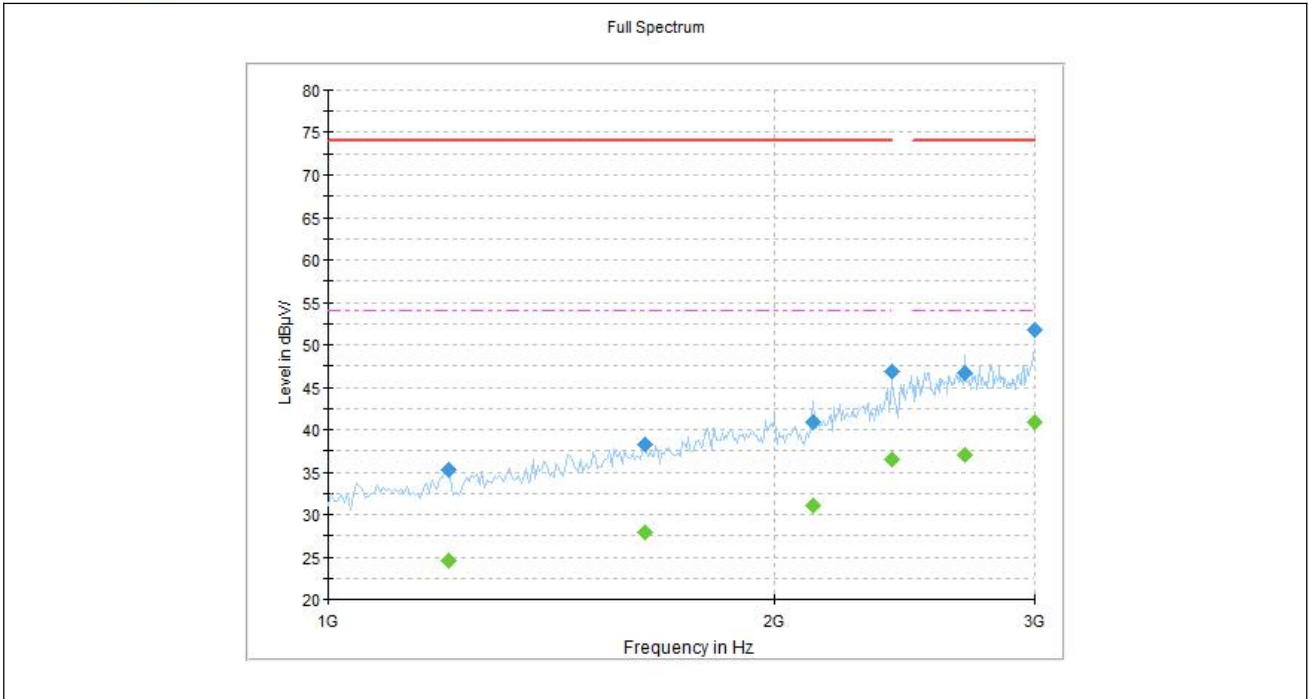
(802.11b\_2412MHz, Antenna Vertical, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
3216.000000	43.34	---	74.00	30.66	V	30.5	PASS
3216.000000	---	40.65	54.00	13.35	V	30.5	PASS
4824.000000	---	31.68	54.00	22.32	V	33.3	PASS
4824.000000	41.61	---	74.00	32.39	V	33.3	PASS
7344.000000	37.60	---	74.00	36.40	V	35.2	PASS
7344.000000	---	25.78	54.00	28.22	V	35.2	PASS
10116.000000	36.76	---	74.00	37.24	V	37.0	PASS
10116.000000	---	25.70	54.00	28.30	V	37.0	PASS
13804.500000	37.48	---	74.00	36.52	V	43.7	PASS
13804.500000	---	26.06	54.00	27.94	V	43.7	PASS
17845.500000	---	29.81	54.00	24.19	V	47.7	PASS
17845.500000	41.59	---	74.00	32.41	V	47.7	PASS



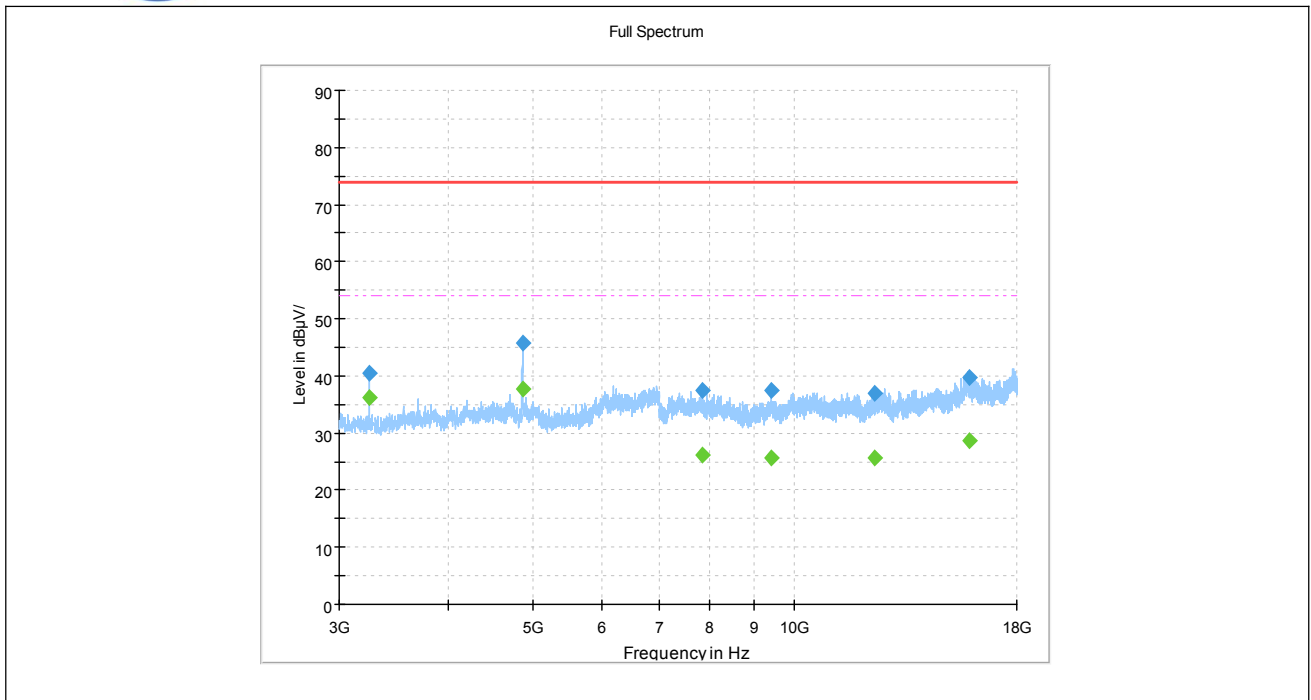
(802.11b\_2437MHz, Antenna Horizontal, 30MHz to 1GHz)

Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
43.774000	12.51	40.00	27.49	H	-14.7	PASS
64.920000	13.19	40.00	26.81	H	-21.2	PASS
113.032000	13.68	43.50	29.82	H	-20.8	PASS
267.068000	29.90	46.00	16.10	H	-19.1	PASS
389.094000	36.37	46.00	9.63	H	-15.3	PASS
640.130000	33.19	46.00	12.81	H	-12.3	PASS



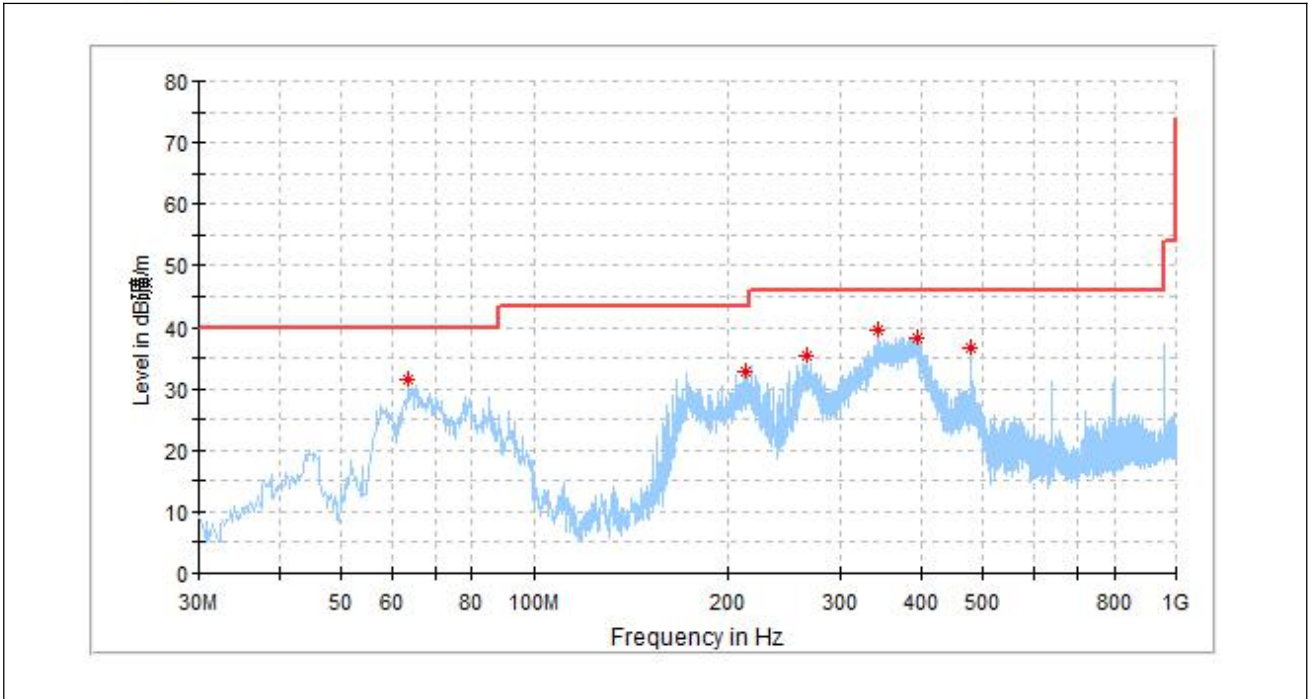
(802.11b\_2437MHz, Antenna Horizontal, 1GHz to 3GHz)

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
1205.000000	35.22	---	74.00	38.78	H	-0.8	PASS
1205.000000	---	24.55	54.00	29.45	H	-0.8	PASS
1635.000000	---	27.85	54.00	26.15	H	3.4	PASS
1635.000000	38.23	---	74.00	35.77	H	3.4	PASS
2125.000000	---	31.12	54.00	22.88	H	8.2	PASS
2125.000000	40.83	---	74.00	33.17	H	8.2	PASS
2400.000000	46.89	---	74.00	27.11	H	13.5	PASS
2400.000000	---	36.51	54.00	17.49	H	13.5	PASS
2690.000000	---	36.98	54.00	17.02	H	14.8	PASS
2690.000000	46.73	---	74.00	27.27	H	14.8	PASS
3000.000000	---	40.81	54.00	13.19	H	18.4	PASS
3000.000000	51.81	---	74.00	22.19	H	18.4	PASS



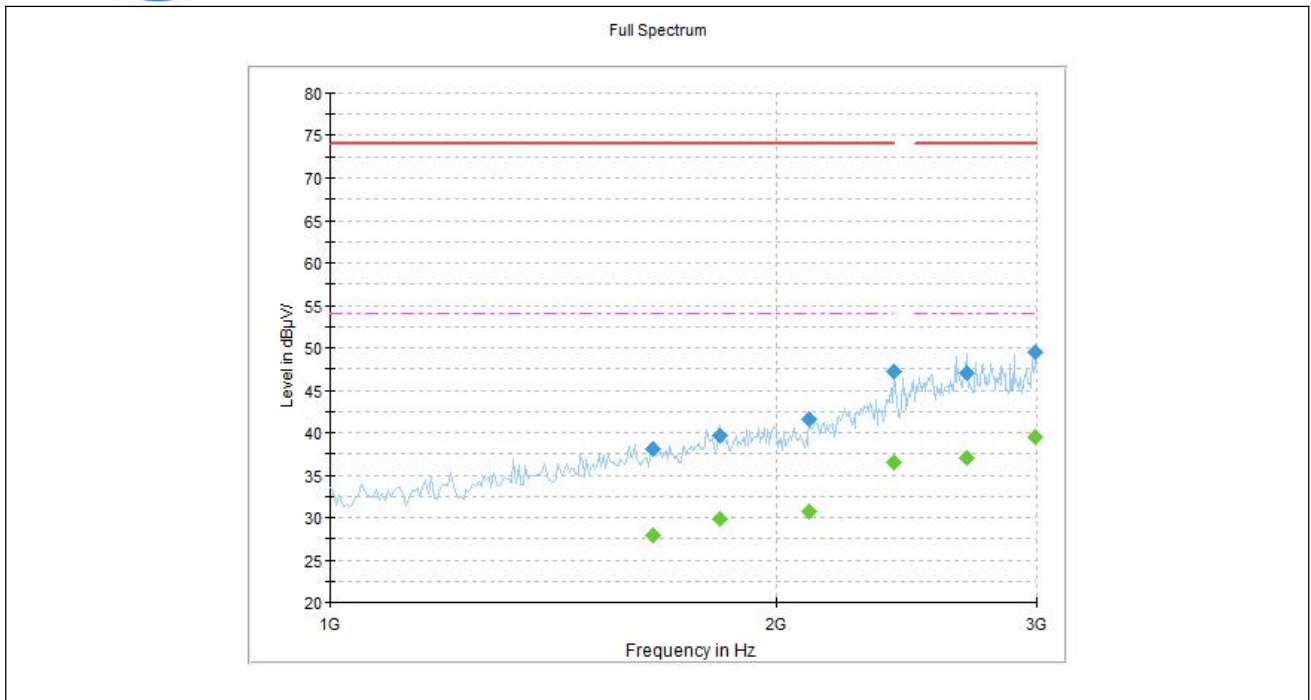
(802.11b\_2437MHz, Antenna Horizontal, 3GHz to 18GHz)

Frequency (MHz)	MaxPeak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
3249.000000	40.55	---	74.00	33.45	H	30.5	PASS
3249.000000	---	36.28	54.00	17.72	H	30.5	PASS
4873.500000	---	37.79	54.00	16.21	H	33.3	PASS
4873.500000	45.74	---	74.00	28.26	H	33.3	PASS
7836.000000	---	26.12	54.00	27.88	H	35.2	PASS
7836.000000	37.54	---	74.00	36.46	H	35.2	PASS
9406.500000	---	25.70	54.00	28.30	H	37.0	PASS
9406.500000	37.48	---	74.00	36.52	H	37.0	PASS
12357.000000	---	25.61	54.00	28.39	H	43.7	PASS
12357.000000	36.88	---	74.00	37.12	H	43.7	PASS
15883.500000	39.73	---	74.00	34.27	H	47.7	PASS
15883.500000	---	28.67	54.00	25.33	H	47.7	PASS



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

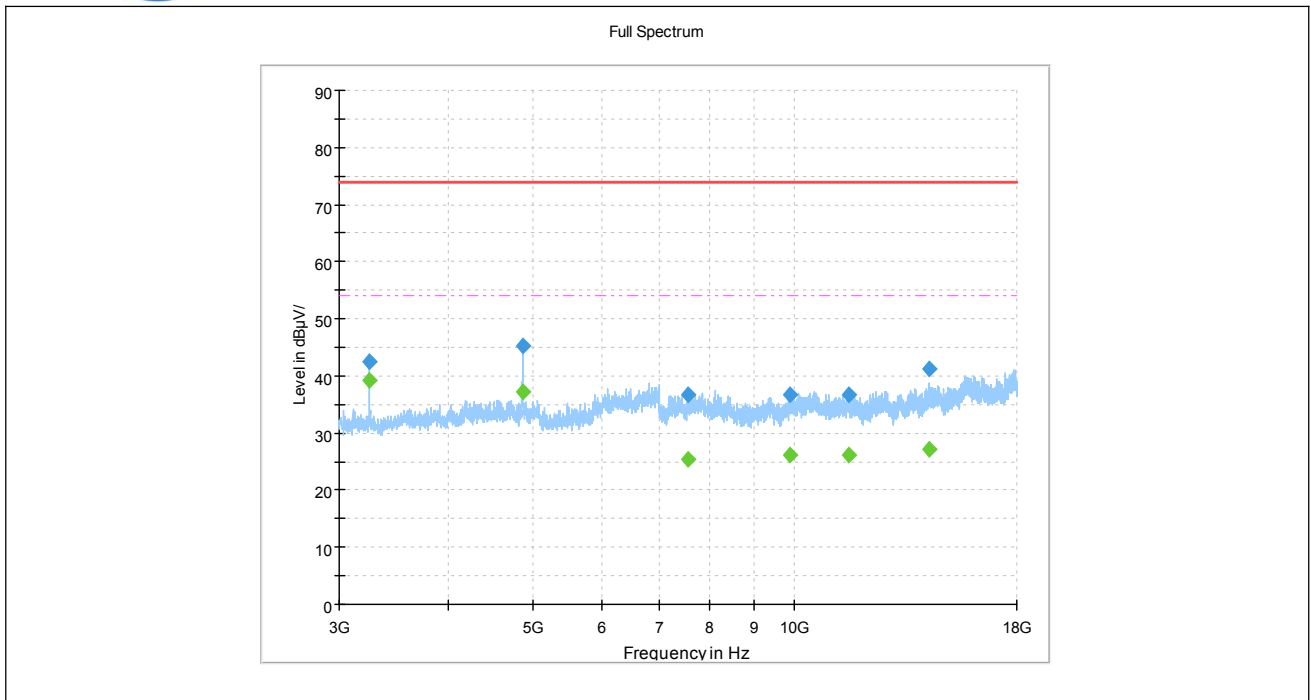
Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
63.756000	31.58	40.00	8.42	V	-20.9	PASS
212.748000	32.63	43.50	10.87	V	-20.0	PASS
265.710000	35.39	46.00	10.61	V	-19.2	PASS
344.086000	39.50	46.00	6.50	V	-16.6	PASS
395.690000	38.18	46.00	7.82	V	-15.0	PASS
480.080000	36.77	46.00	9.23	V	-14.1	PASS



(802.11b\_2437MHz, Antenna Vertical, 1GHz to 3GHz)

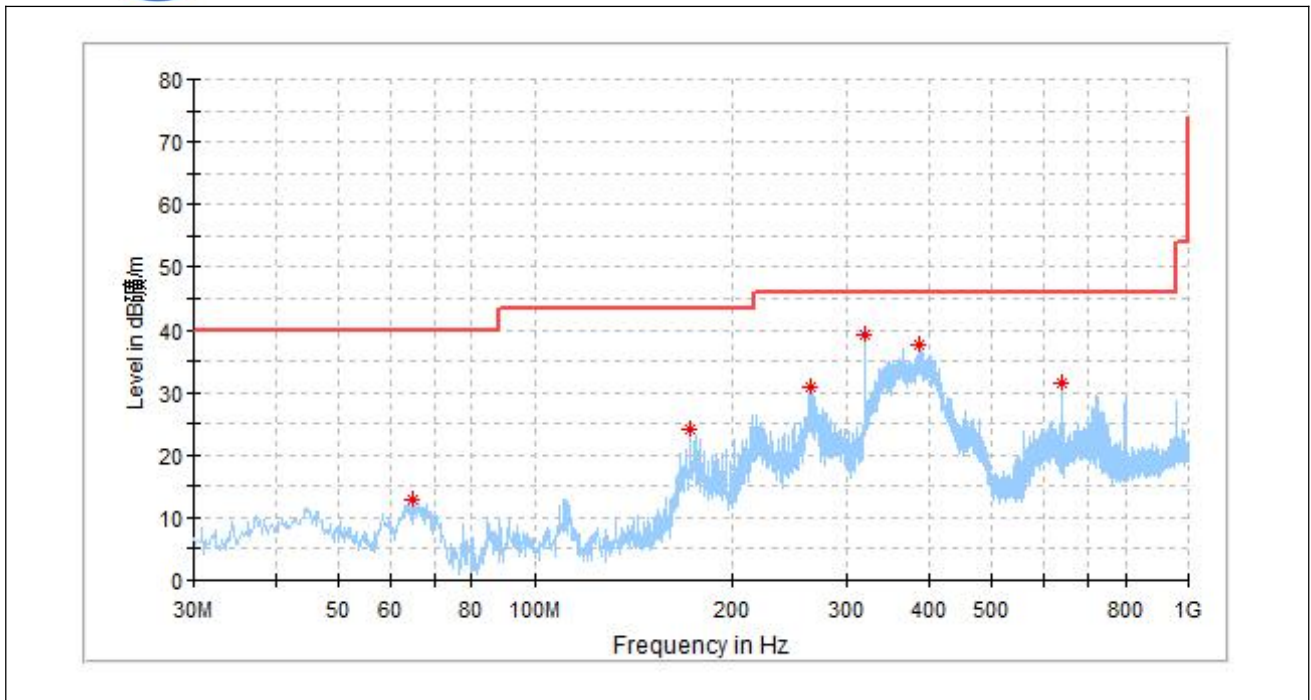
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
1650.000000	---	27.85	54.00	26.15	V	3.3	PASS
1650.000000	38.06	---	74.00	35.94	V	3.3	PASS
1835.000000	39.57	---	74.00	34.43	V	6.0	PASS
1835.000000	---	29.86	54.00	24.14	V	6.0	PASS
2105.000000	41.59	---	74.00	32.41	V	7.8	PASS
2105.000000	---	30.63	54.00	23.37	V	7.8	PASS
2400.000000	---	36.46	54.00	17.54	V	13.5	PASS
2400.000000	47.13	---	74.00	26.87	V	13.5	PASS
2690.000000	---	36.97	54.00	17.03	V	14.8	PASS
2690.000000	47.02	---	74.00	26.98	V	14.8	PASS
2995.000000	---	39.54	54.00	14.46	V	17.9	PASS
2995.000000	49.42	---	74.00	24.58	V	17.9	PASS





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

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
3249.000000	---	39.31	54.00	14.69	V	30.5	PASS
3249.000000	42.57	---	74.00	31.43	V	30.5	PASS
4873.500000	---	37.18	54.00	16.82	V	33.3	PASS
4873.500000	45.23	---	74.00	28.77	V	33.3	PASS
7557.000000	36.78	---	74.00	37.22	V	35.2	PASS
7557.000000	---	25.42	54.00	28.58	V	35.2	PASS
9895.500000	---	26.12	54.00	27.88	V	37.0	PASS
9895.500000	36.73	---	74.00	37.27	V	37.0	PASS
11533.500000	---	26.09	54.00	27.91	V	43.7	PASS
11533.500000	36.64	---	74.00	37.36	V	43.7	PASS
14263.500000	41.30	---	74.00	32.70	V	47.7	PASS
14263.500000	---	27.16	54.00	26.84	V	47.7	PASS



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

Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)	Verdict
64.726000	12.98	40.00	27.02	H	-21.1	PASS
172.784000	24.03	43.50	19.47	H	-21.8	PASS
264.740000	30.93	46.00	15.07	H	-19.3	PASS
320.030000	39.14	46.00	6.86	H	-16.7	PASS
387.736000	37.47	46.00	8.53	H	-15.3	PASS
640.130000	31.60	46.00	14.40	H	-12.3	PASS