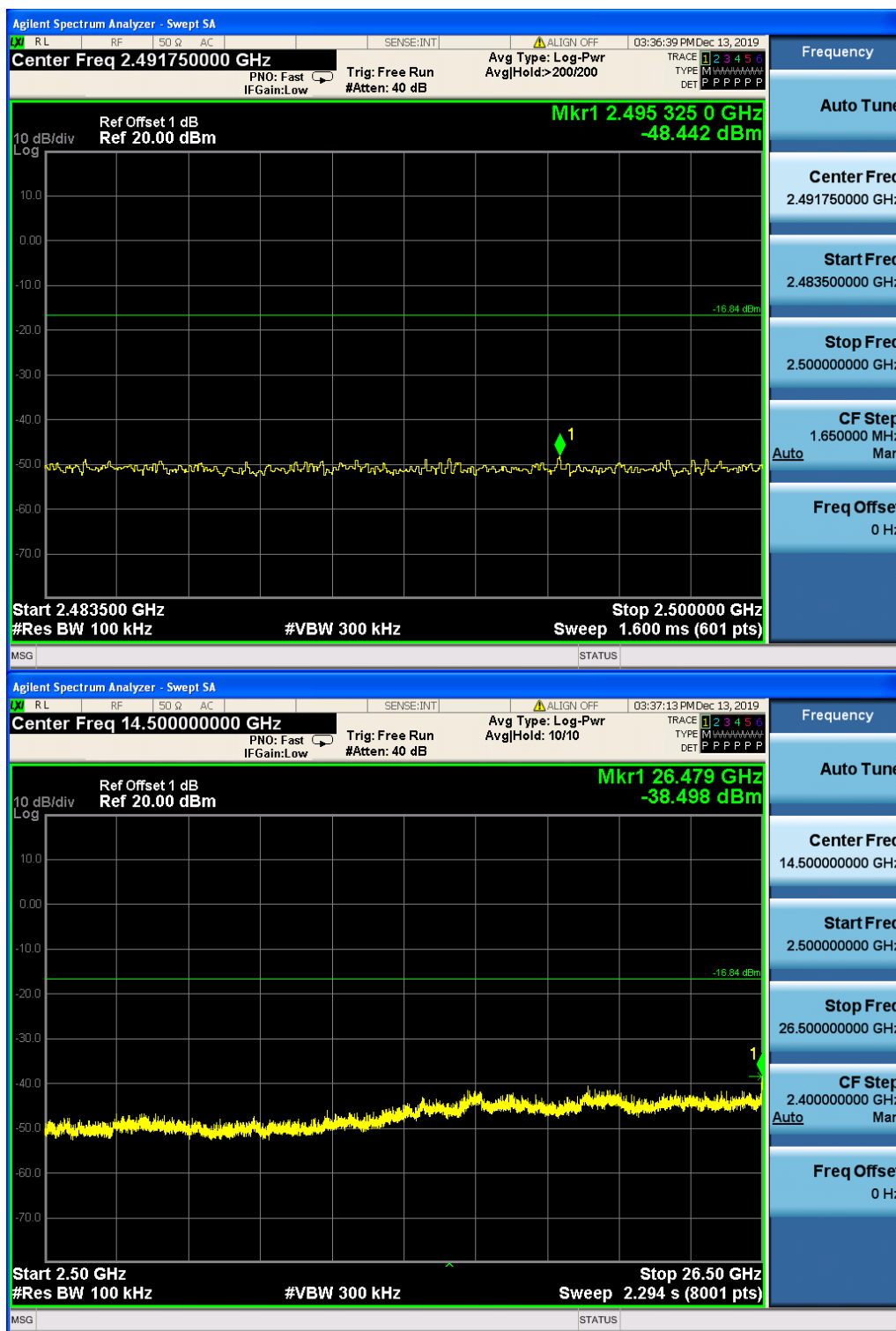
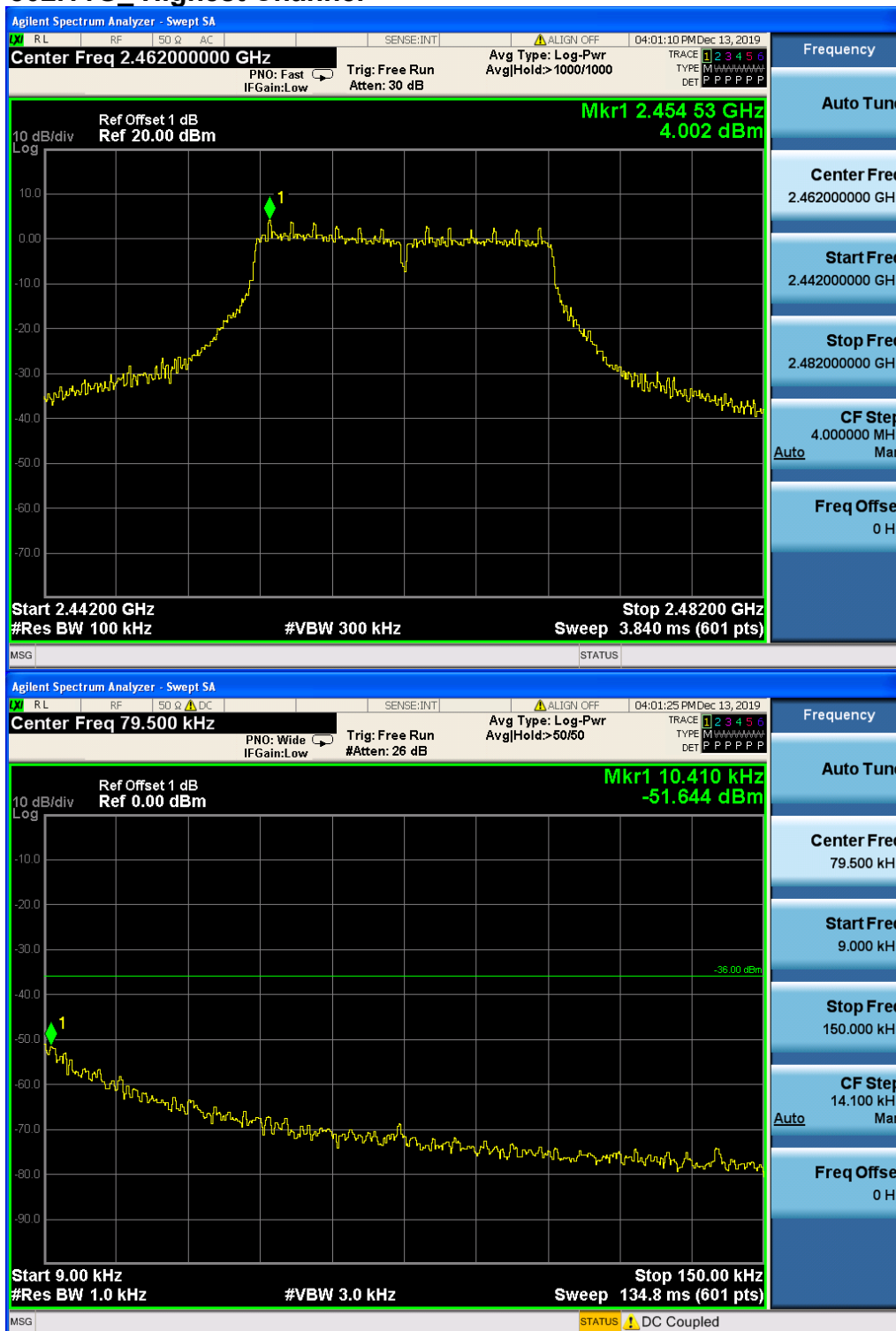
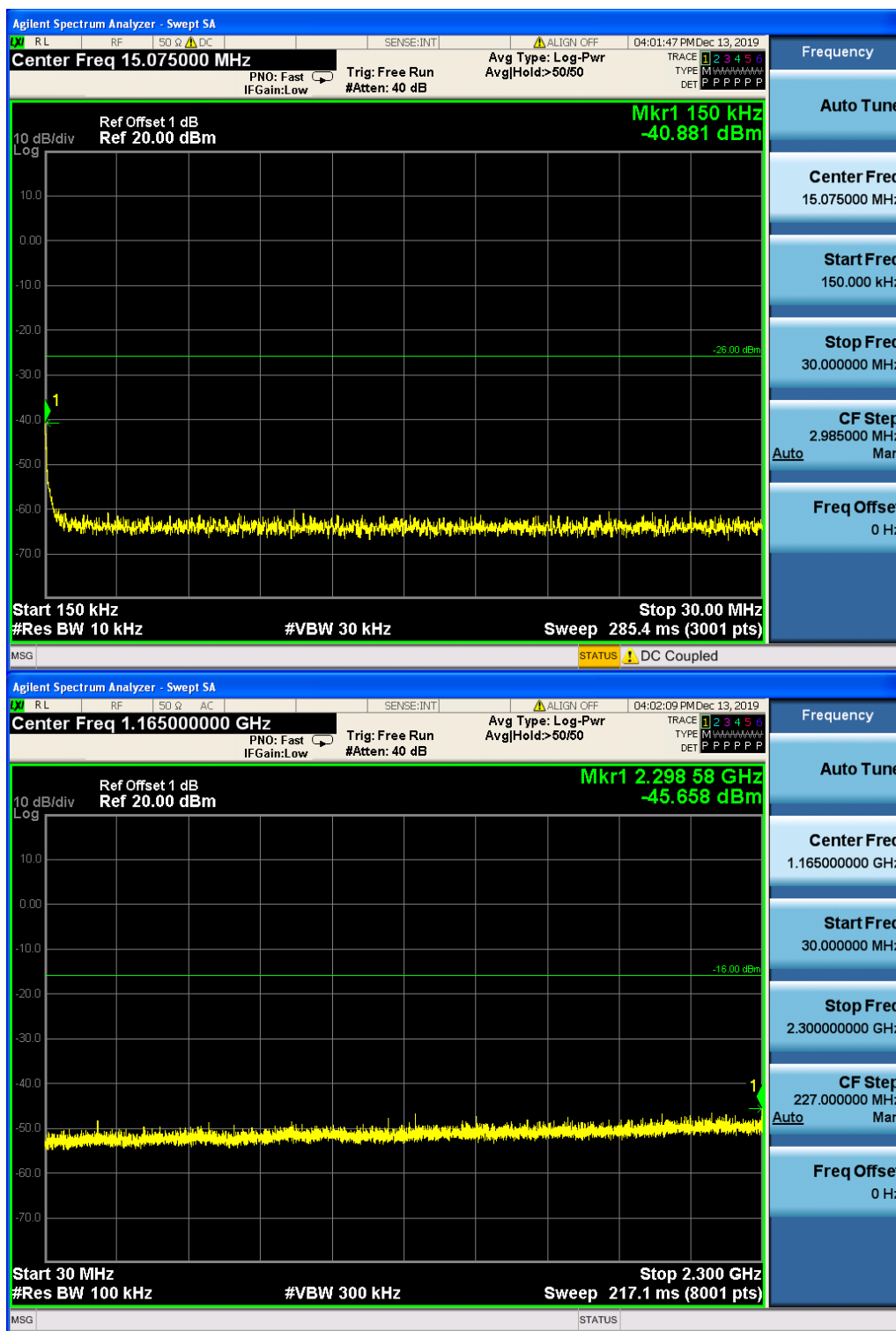


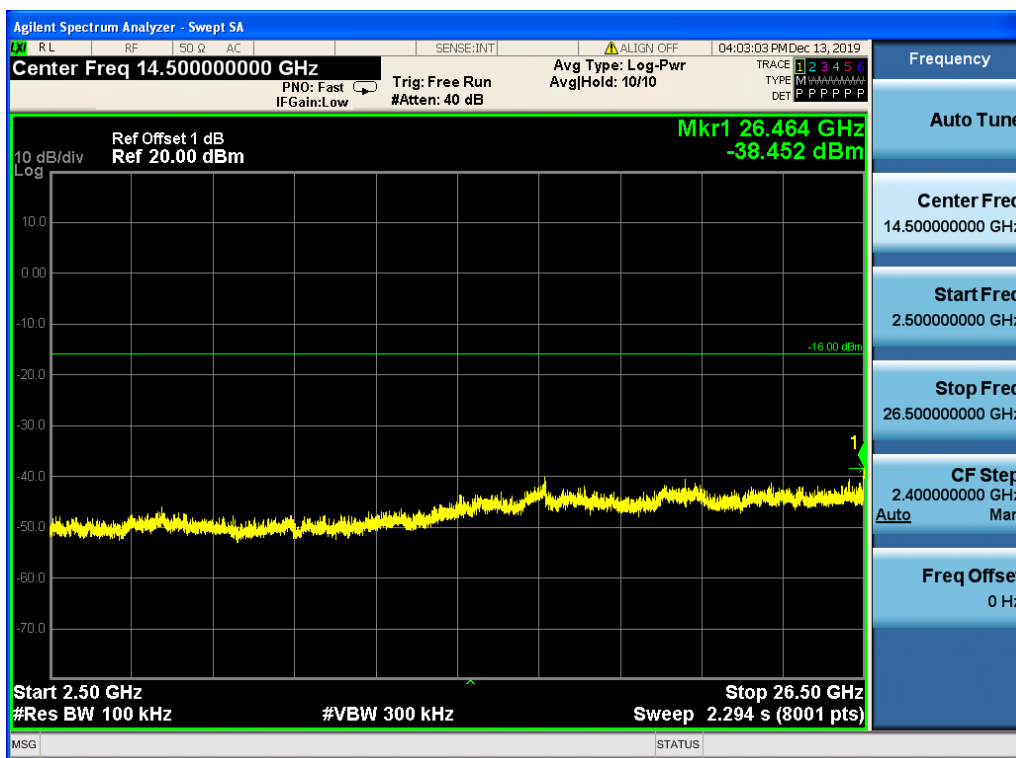


4.8.1.1.6 802.11G_Highest Channel

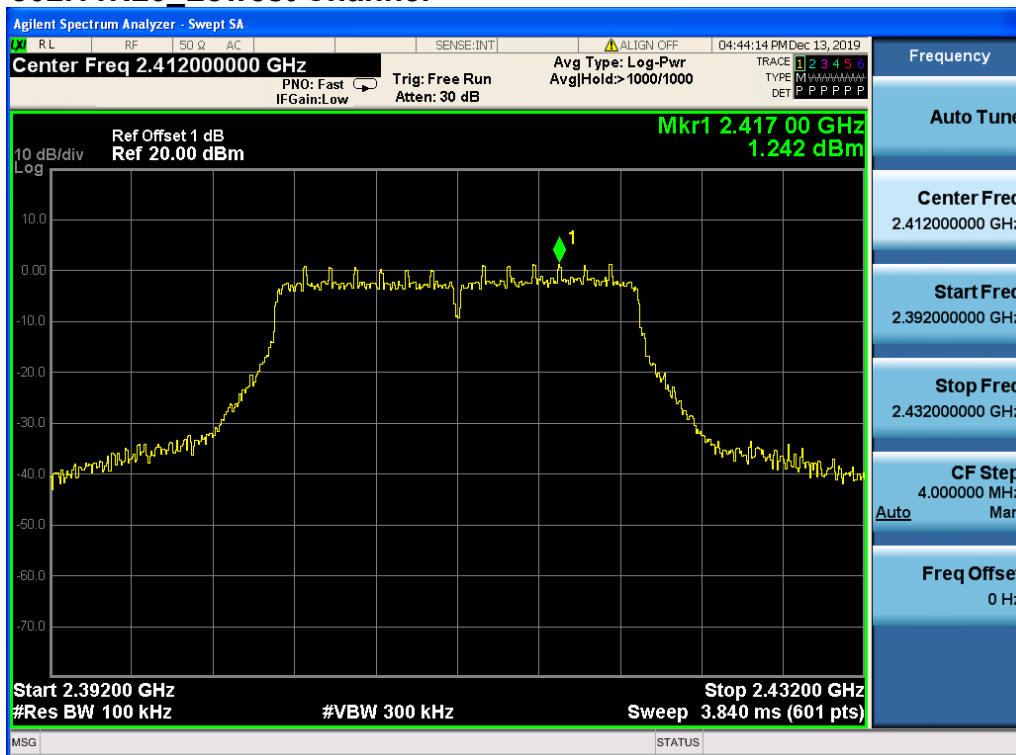


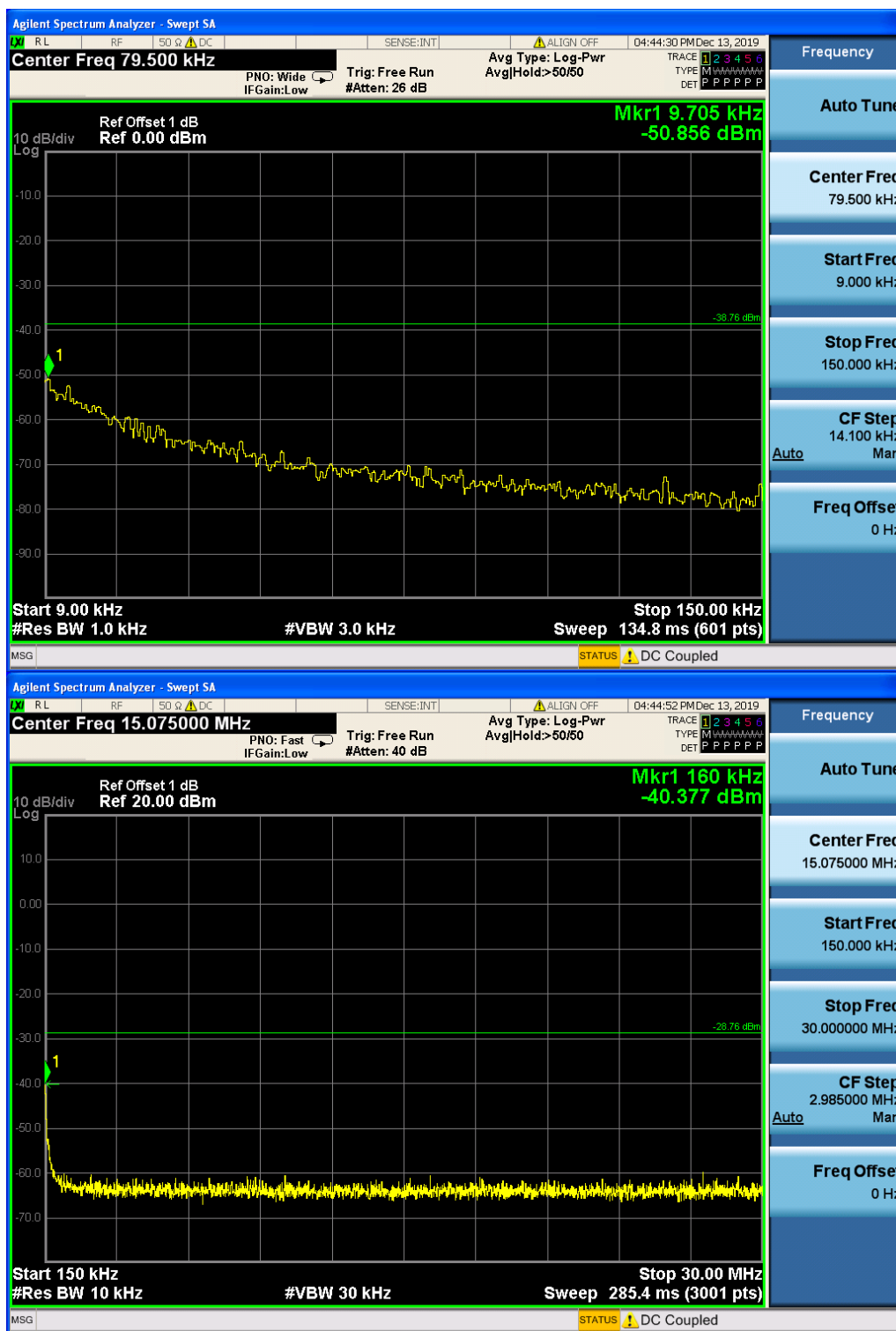




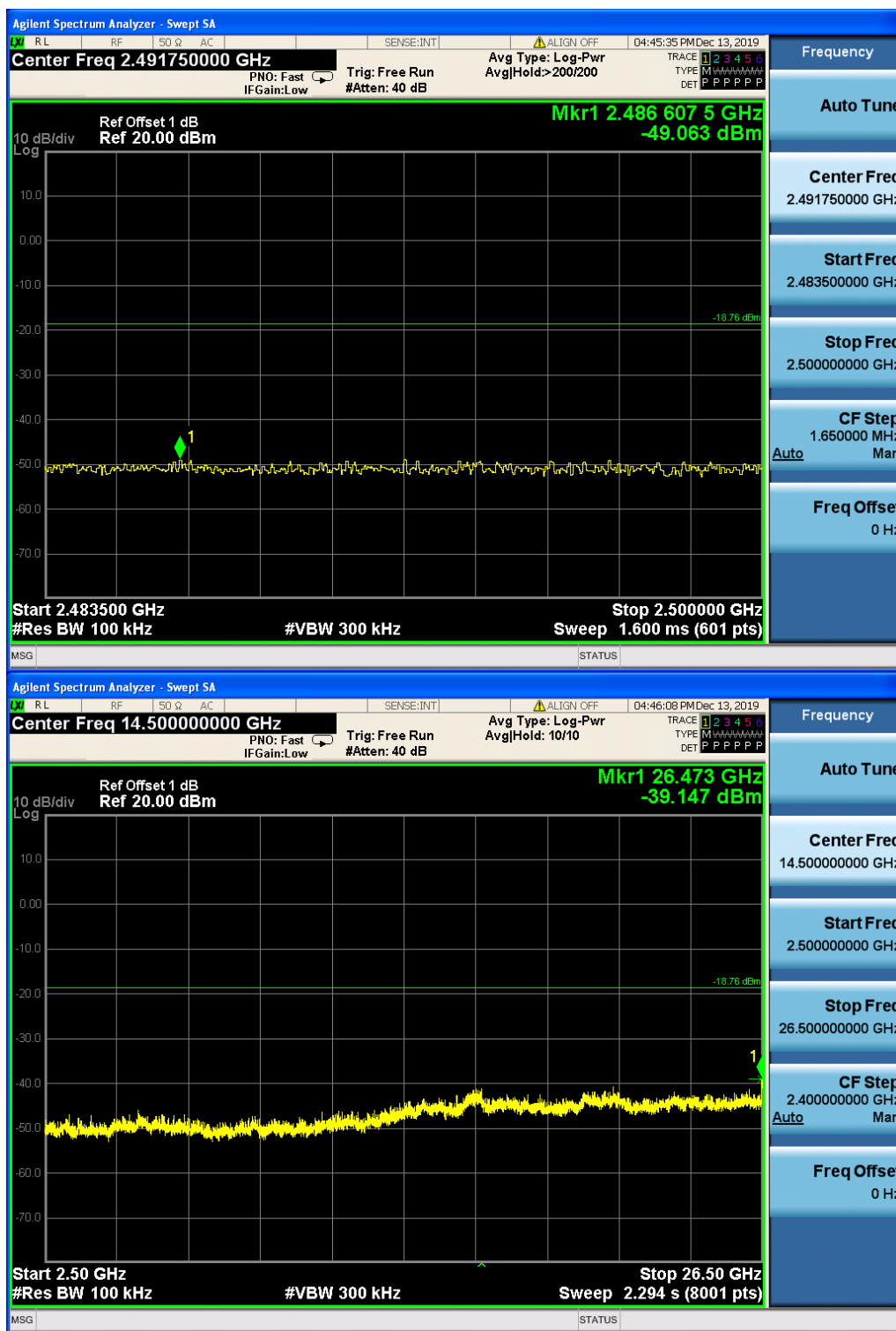


4.8.1.1.7 802.11N20_Lowest Channel



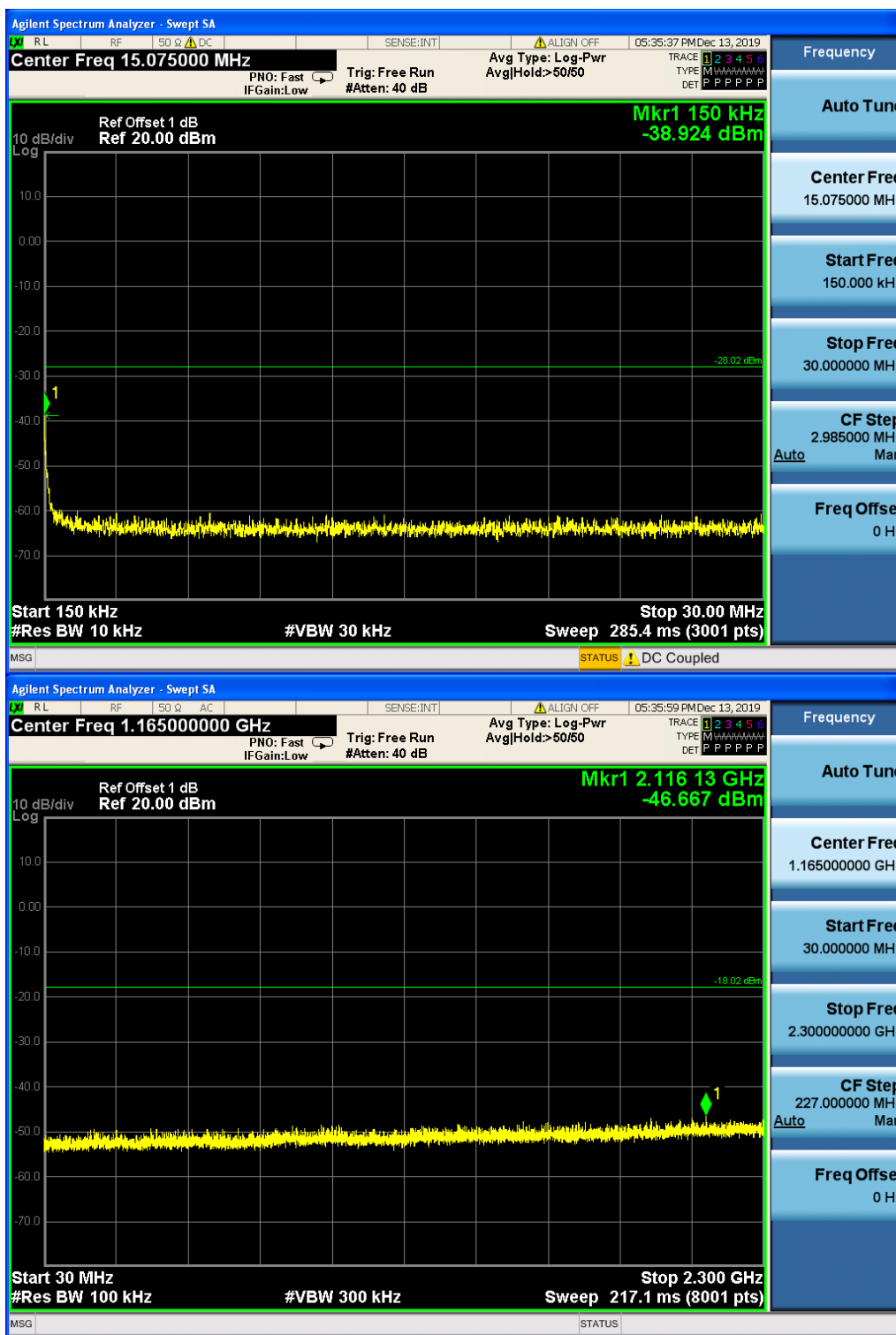




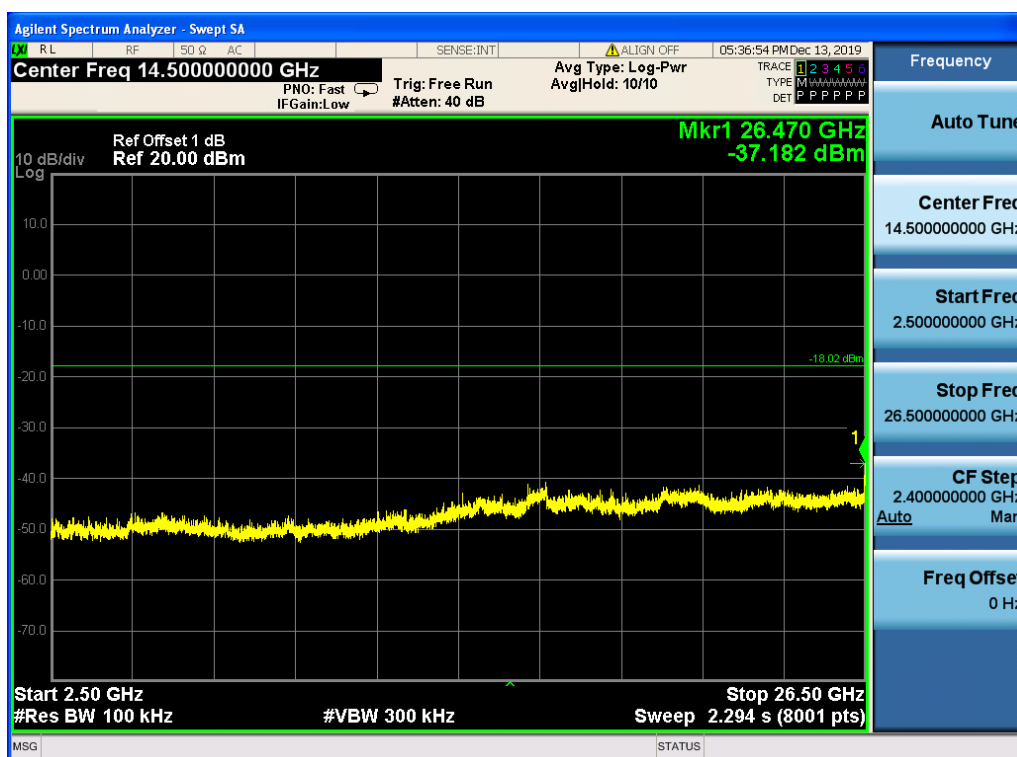


4.8.1.1.8 802.11 N20_ Middle Channel

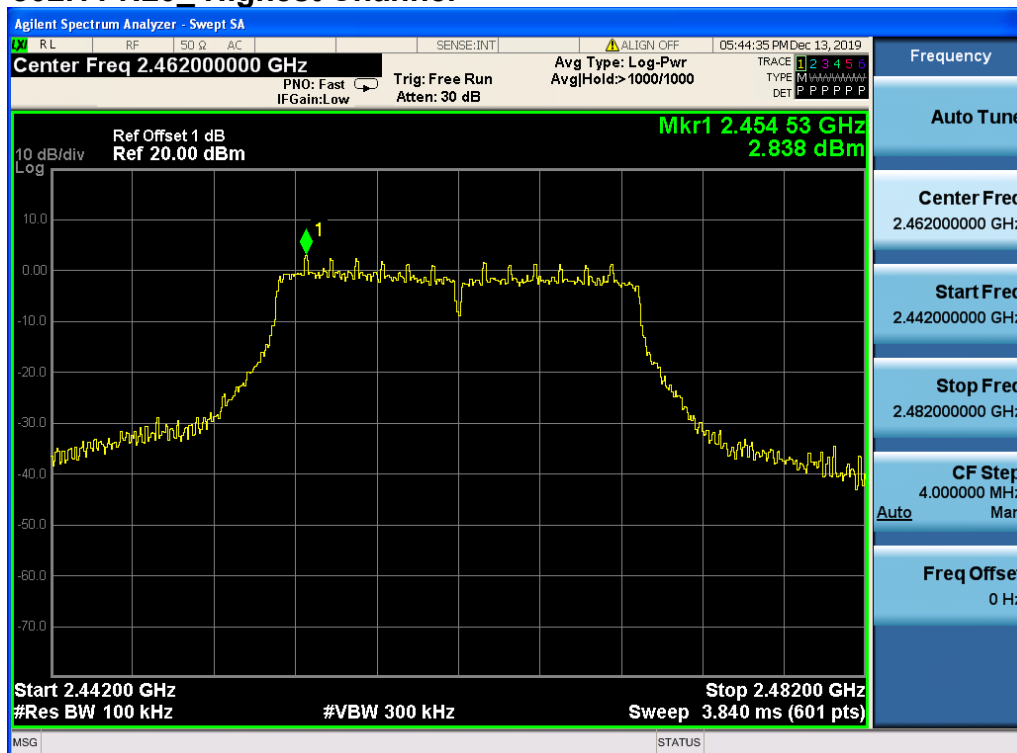








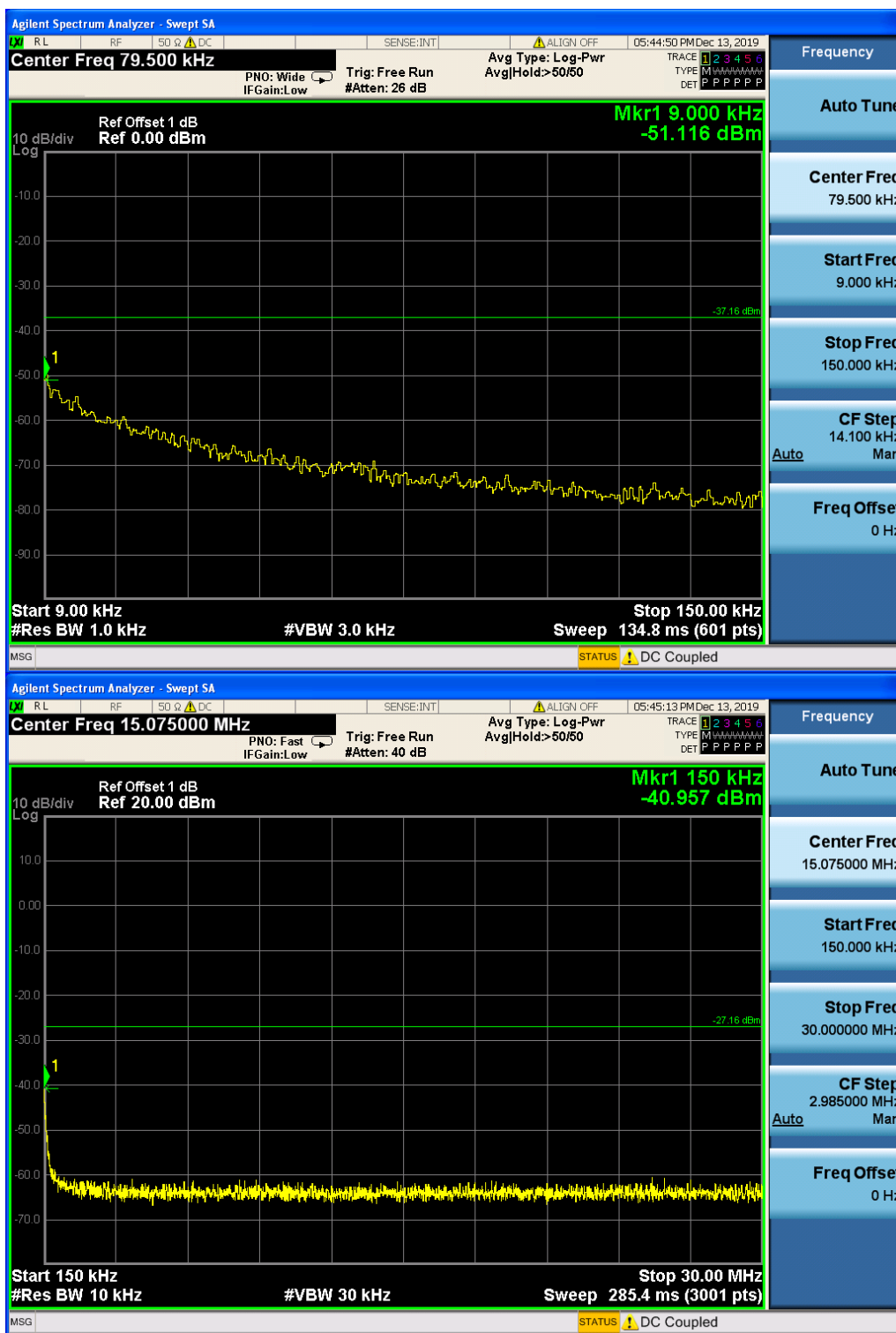
4.8.1.1.9 802.11 N20_ Highest Channel

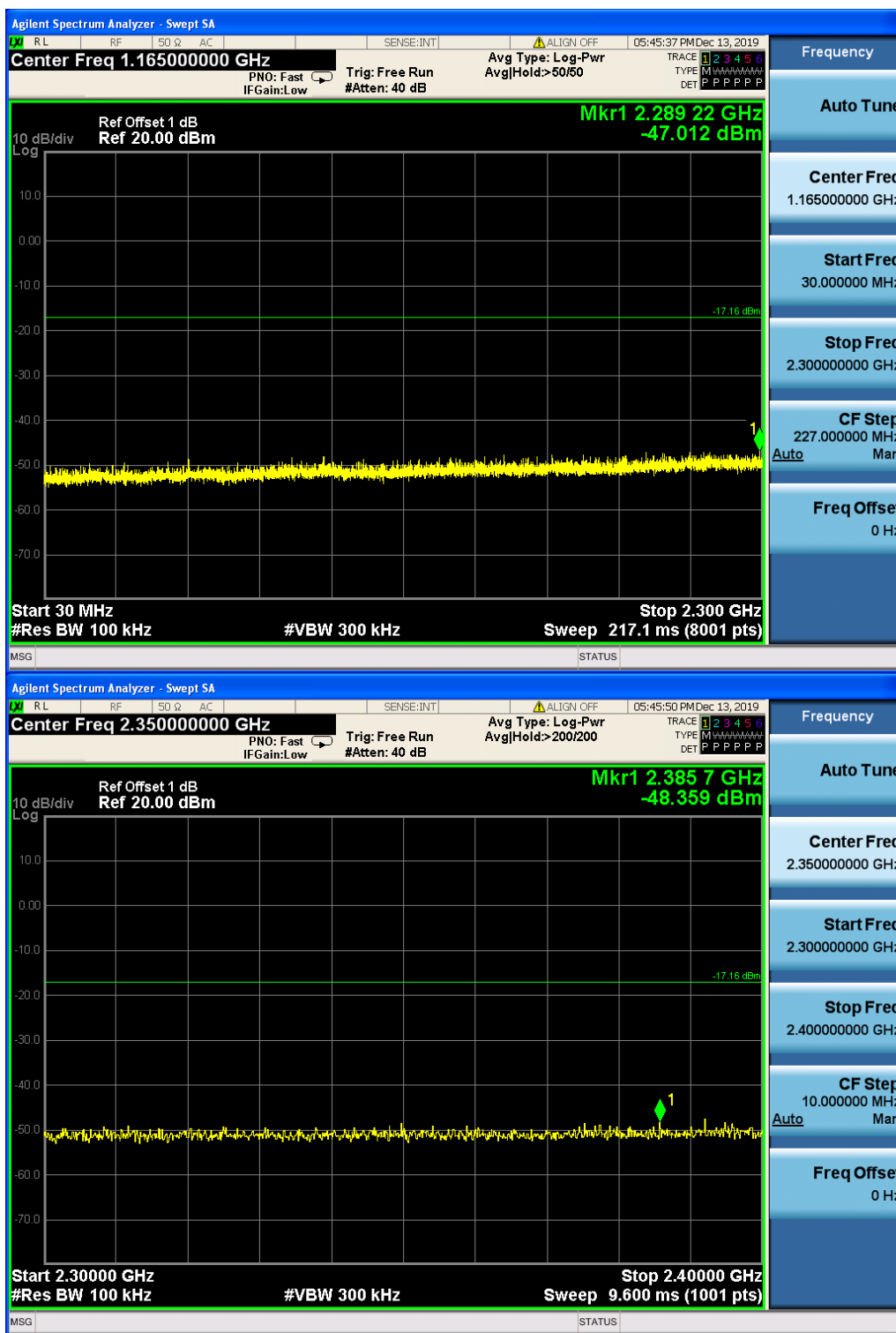


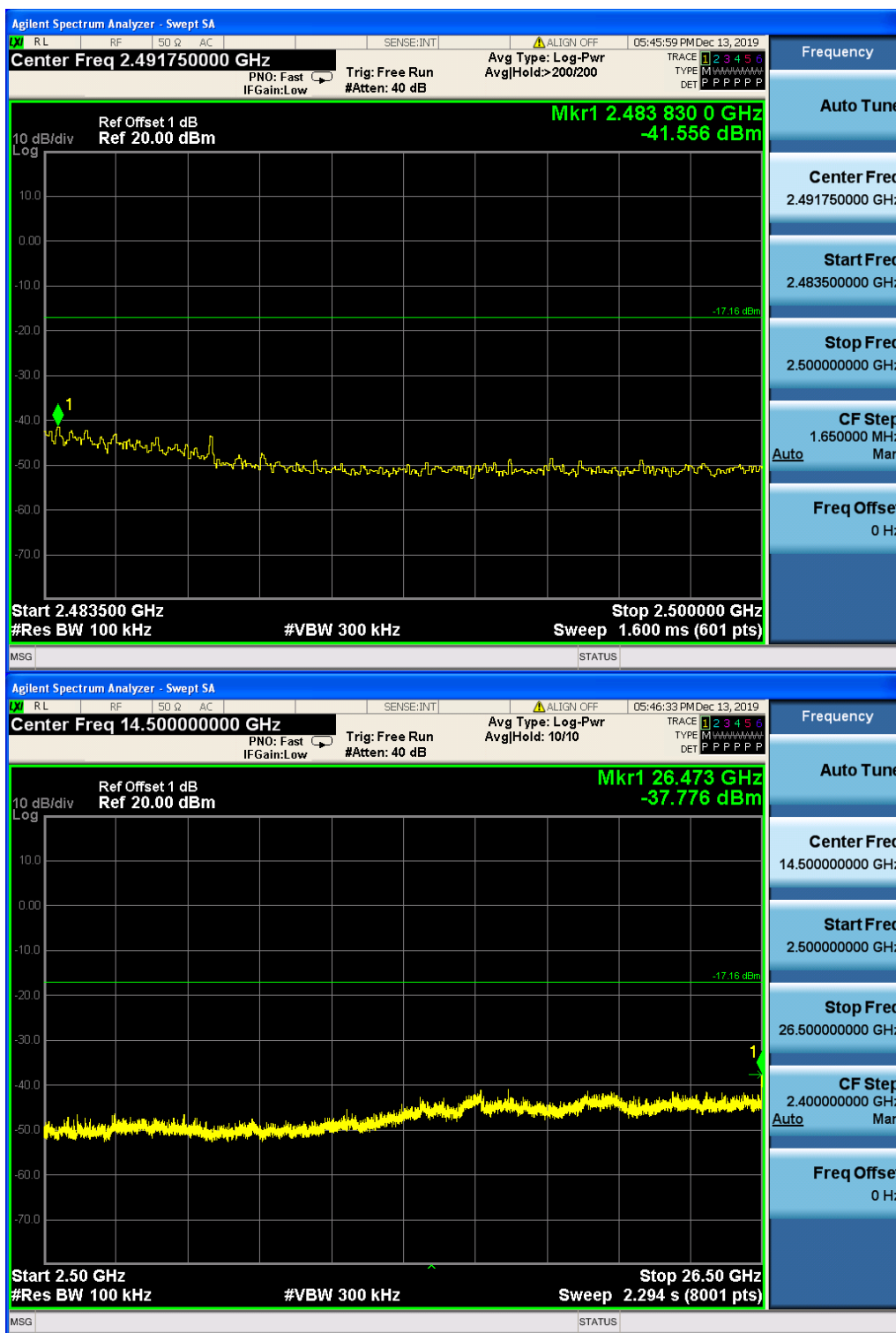
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Remark:

Scan from 9kHz to 25GHz, the disturbance between 9KHz to 30MHz was very low, and the above harmonics were the highest point could be found when testing, The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.



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4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 :2013 Section 11.12				
Test Site:	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Remark: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				

Test Setup:	
-------------	--



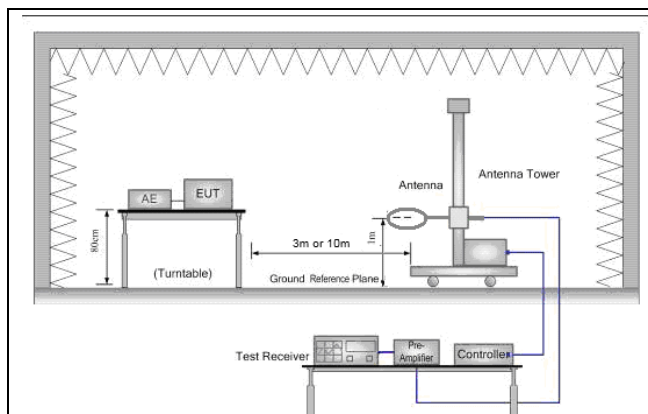


Figure 1. Below 30MHz

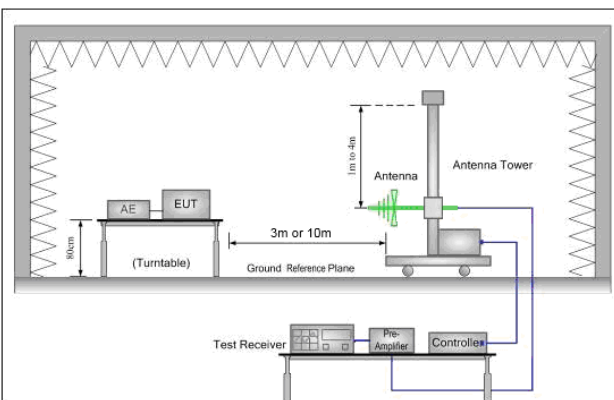


Figure 2. 30MHz to 1GHz

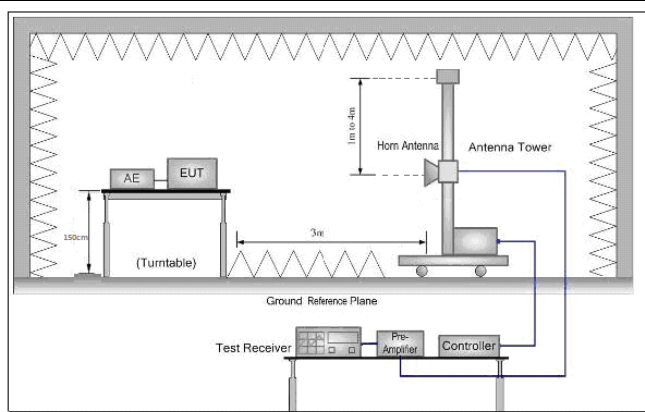


Figure 3. Above 1 GHz

Test Procedure:

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height 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.
- 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be





	re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. h. Test the EUT in the lowest channel, the middle channel ,the Highest channel i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. j. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.
Final Test Mode:	Pretest the EUT at Charge + Transmitting mode. Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11B; 6Mbps of rate is the worst case of 802.11G; 6.5Mbps of rate is the worst case of 802.11N(HT20); For below 1GHz, through Pre-scan, find the 1Mbps of rate of 802.11B at lowest channel is the worst case. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



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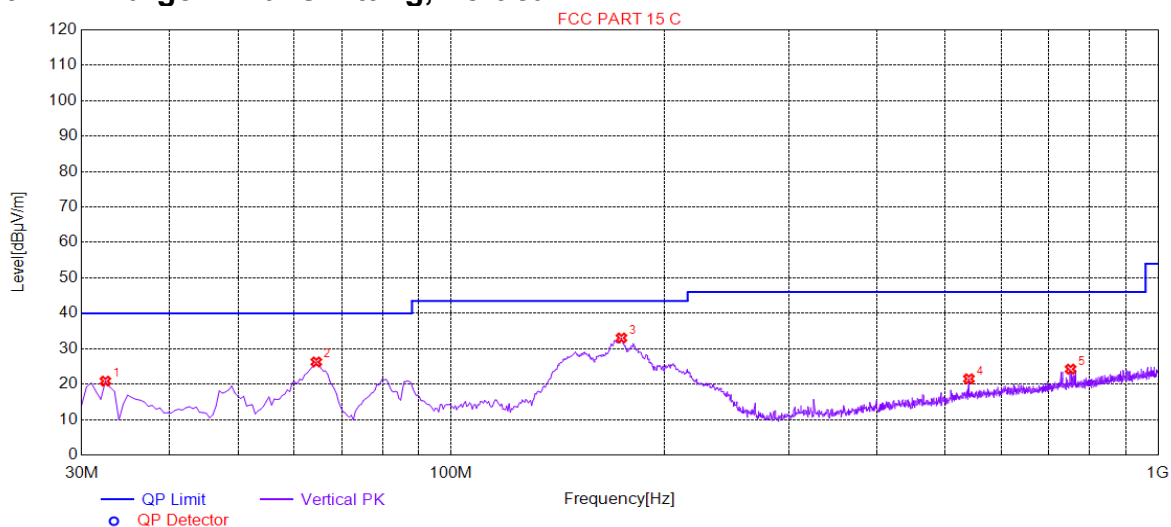
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4.9.1 Radiated emission below 1GHz

4.9.1.1 Charge + Transmitting, Vertical

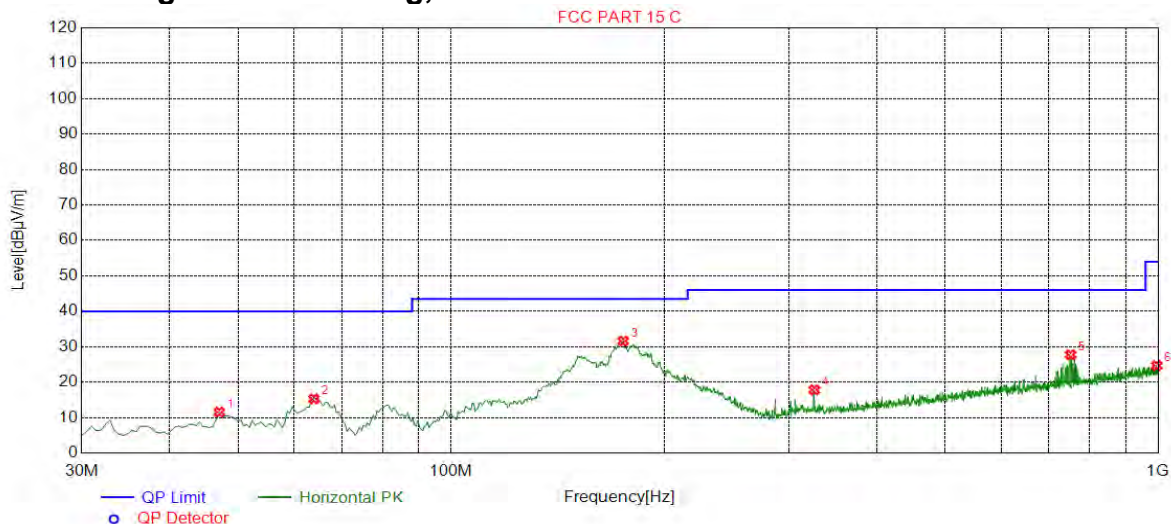


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	32.4262	20.86	-32.80	40.00	19.14	100	181	Vertical
2	64.4522	26.27	-32.79	40.00	13.73	100	247	Vertical
3	174.1171	33.05	-33.32	43.50	10.45	100	317	Vertical
4	539.9900	21.51	-21.69	46.00	24.49	100	282	Vertical
5	752.0410	24.25	-17.40	46.00	21.75	100	282	Vertical



4.9.1.2 Charge + Transmitting, Horizontal



Suspected List

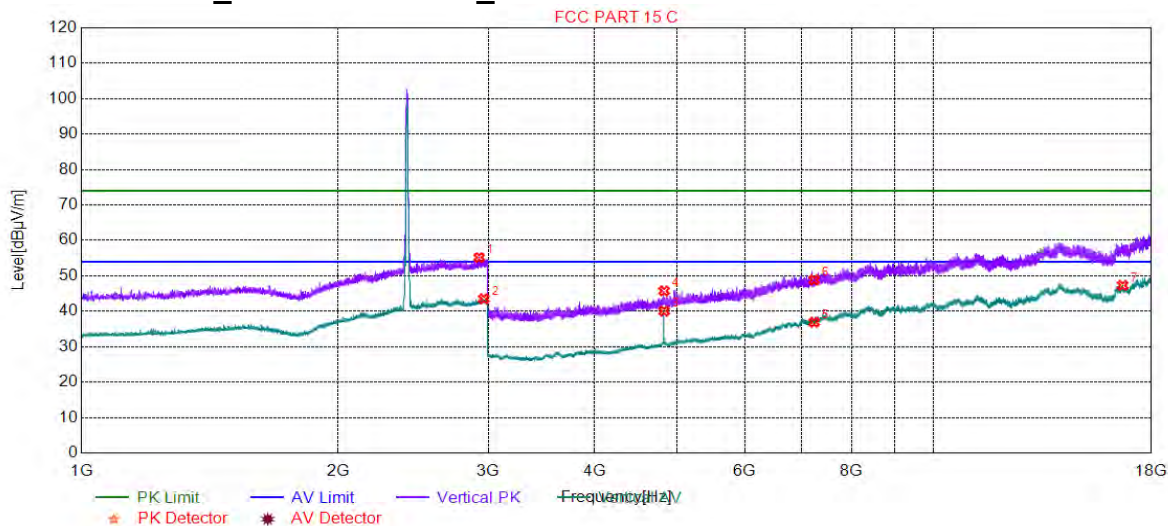
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.9835	11.54	-30.20	40.00	28.46	100	34	Horizontal
2	63.9670	15.29	-32.66	40.00	24.71	100	90	Horizontal
3	175.0875	31.60	-33.25	43.50	11.90	100	124	Horizontal
4	326.4832	17.81	-27.08	46.00	28.19	100	128	Horizontal
5	752.0410	27.75	-17.40	46.00	18.25	100	334	Horizontal
6	995.6328	24.68	-13.92	54.00	29.32	100	225	Horizontal



4.9.2 Transmitter emission above 1GHz

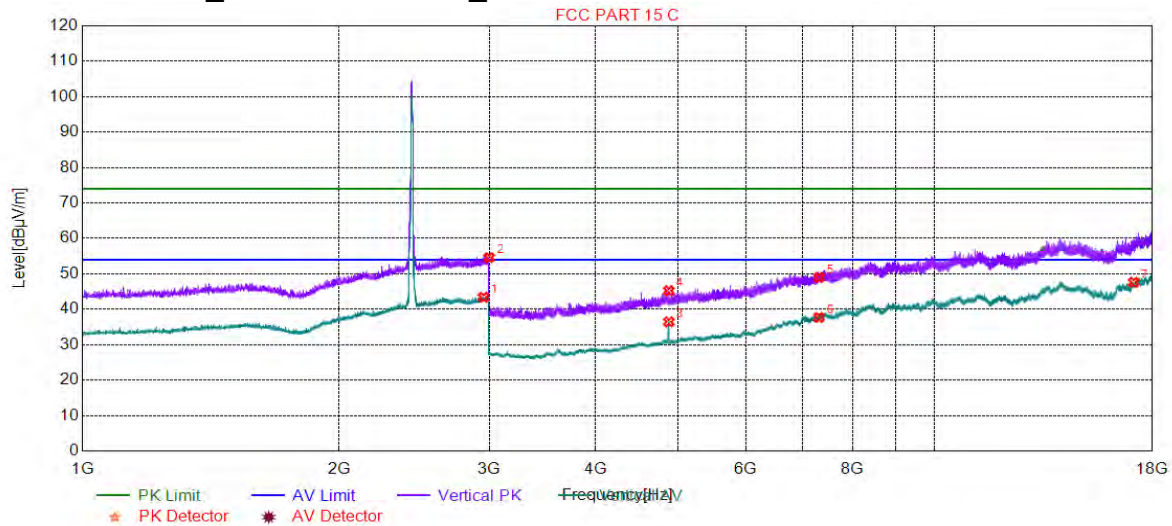
4.9.2.1 ANT1

4.9.2.1.1 802.11B_Lowest Channel_ Vertical



Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2927.481	55.18	9.44	74.00	18.82	150	305	Vertical
2	2964.991	43.51	9.61	54.00	10.49	150	331	Vertical
3	4824.000	40.06	-18.21	54.00	13.94	150	233	Vertical
4	4824.000	45.74	-18.21	74.00	28.26	150	260	Vertical
5	7236.000	36.91	-9.99	54.00	17.09	150	270	Vertical
6	7236.000	48.84	-9.99	74.00	25.16	150	168	Vertical
7	16653.53	47.31	0.41	54.00	6.69	150	320	Vertical

4.9.2.2 802.11B_ Middle Channel_ Vertical



Suspected List

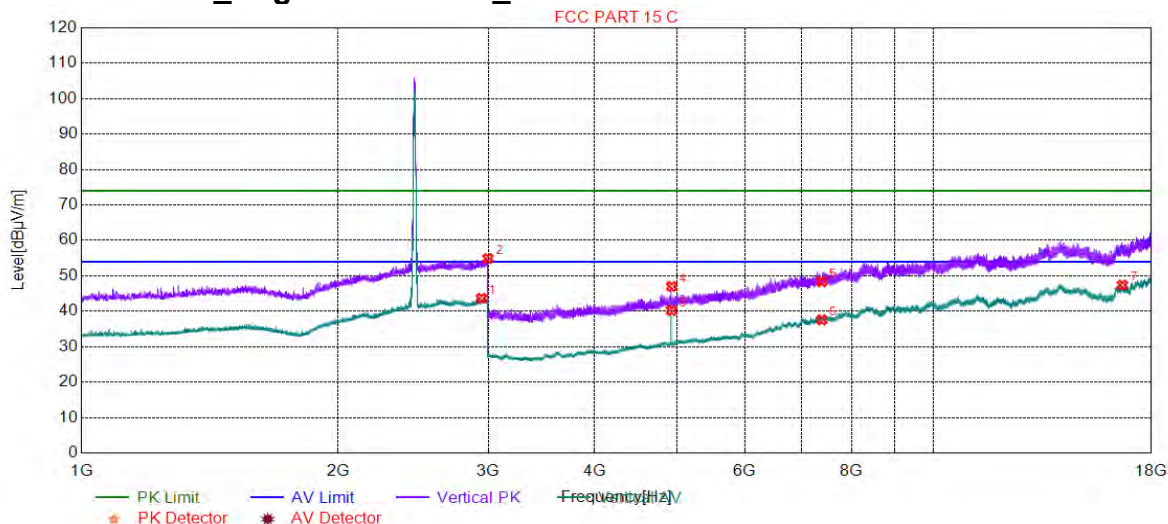
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2954.488	43.39	9.66	54.00	10.61	150	318	Vertical
2	2998.999	54.58	9.45	74.00	19.42	150	59	Vertical
3	4874.000	36.45	-17.99	54.00	17.55	150	252	Vertical
4	4874.000	45.21	-17.99	74.00	28.79	150	252	Vertical
5	7311.000	48.99	-9.74	74.00	25.01	150	18	Vertical
6	7311.000	37.69	-9.74	54.00	16.31	150	360	Vertical
7	17109.50	47.61	0.04	54.00	6.39	150	18	Vertical



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4.9.2.2.1 802.11B_ Highest Channel_ Vertical

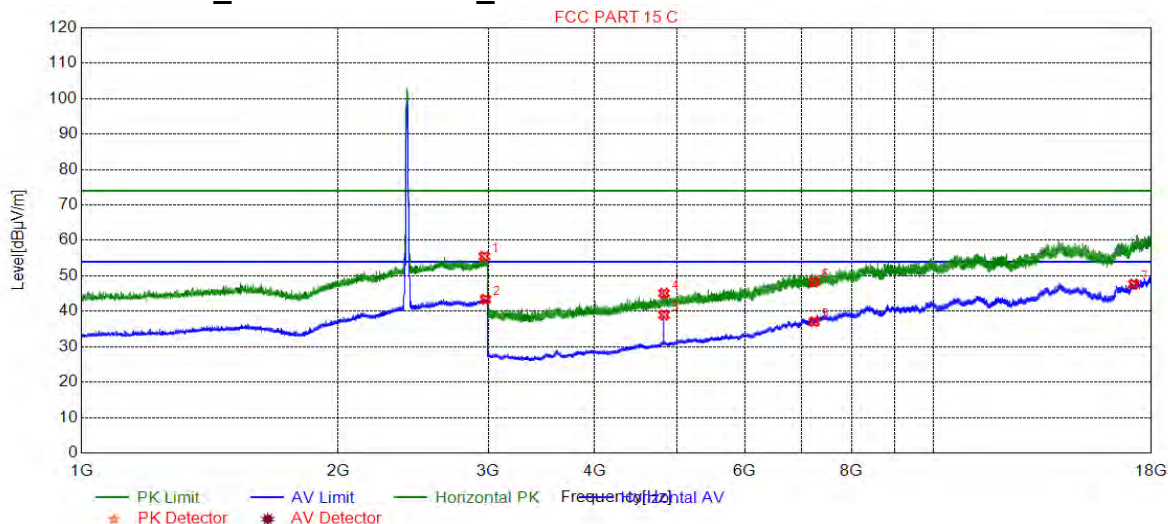


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2946.486	43.67	9.64	54.00	10.33	150	333	Vertical
2	2998.499	54.91	9.46	74.00	19.09	150	320	Vertical
3	4924.000	40.20	-17.72	54.00	13.80	150	259	Vertical
4	4924.000	47.01	-17.72	74.00	26.99	150	232	Vertical
5	7386.000	48.37	-9.55	74.00	25.63	150	118	Vertical
6	7386.000	37.58	-9.55	54.00	16.42	150	68	Vertical
7	16635.93	47.39	0.34	54.00	6.61	150	118	Vertical



4.9.2.2.2 802.11B_Lowest Channel_ Horizontal



Suspected List

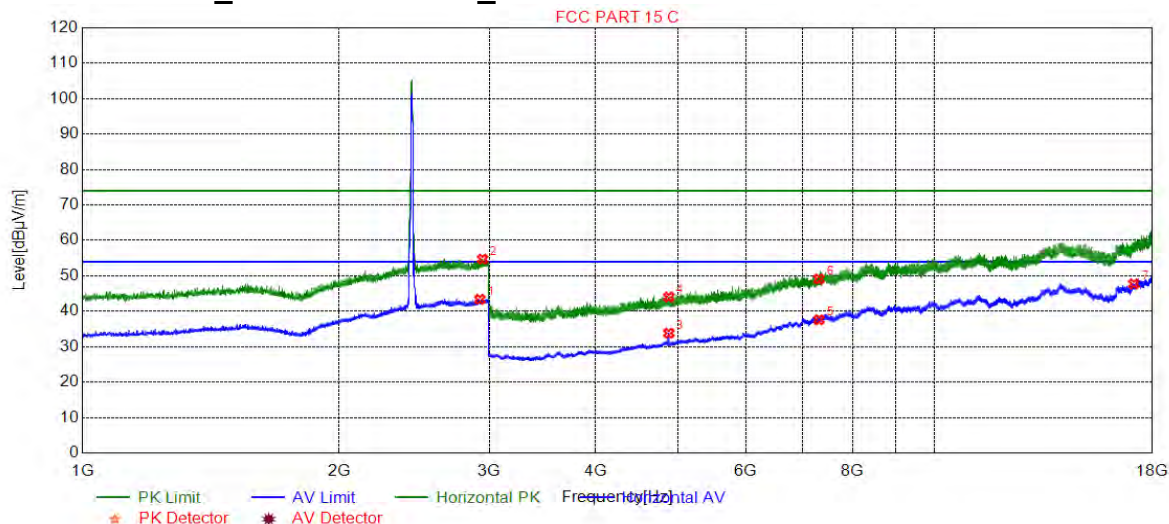
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2968.992	55.47	9.59	74.00	18.53	150	2	Horizontal
2	2977.994	43.37	9.55	54.00	10.63	150	122	Horizontal
3	4824.000	38.97	-18.21	54.00	15.03	150	206	Horizontal
4	4824.000	45.08	-18.21	74.00	28.92	150	178	Horizontal
5	7236.000	37.06	-9.99	54.00	16.94	150	217	Horizontal
6	7236.000	48.31	-9.99	74.00	25.69	150	117	Horizontal
7	17156.80	47.68	0.06	54.00	6.32	150	318	Horizontal



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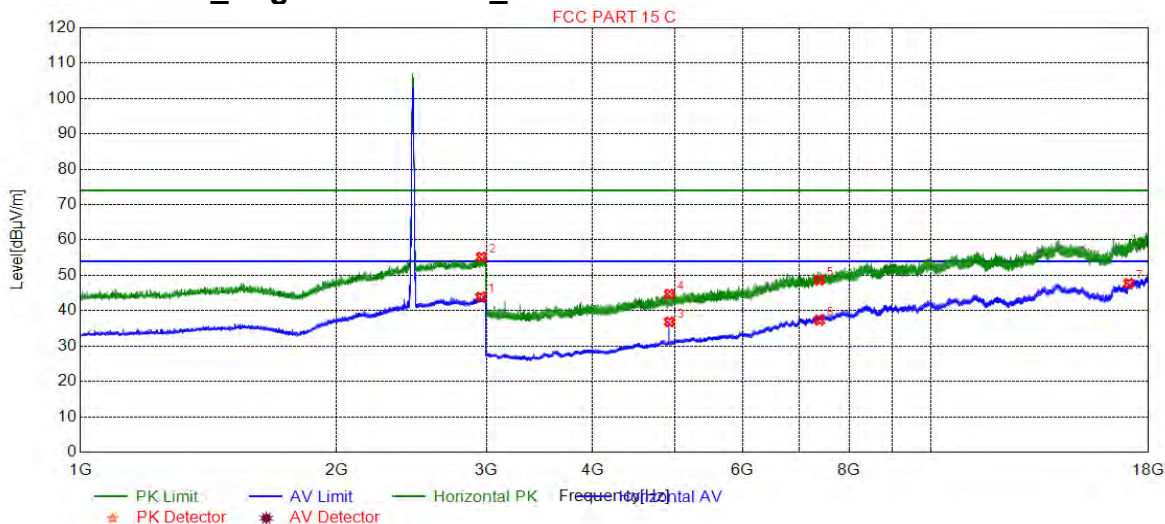
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4.9.2.2.3 802.11B_ Middle Channel_ Horizontal



Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2924.981	43.37	9.41	54.00	10.63	150	53	Horizontal
2	2946.986	54.73	9.65	74.00	19.27	150	53	Horizontal
3	4874.000	33.83	-17.99	54.00	20.17	150	207	Horizontal
4	4874.000	44.01	-17.99	74.00	29.99	150	180	Horizontal
5	7311.000	37.60	-9.74	54.00	16.40	150	68	Horizontal
6	7311.000	49.11	-9.74	74.00	24.89	150	218	Horizontal
7	17117.20	47.74	0.05	54.00	6.26	150	218	Horizontal

4.9.2.2.4 802.11B_ Highest Channel_ Horizontal

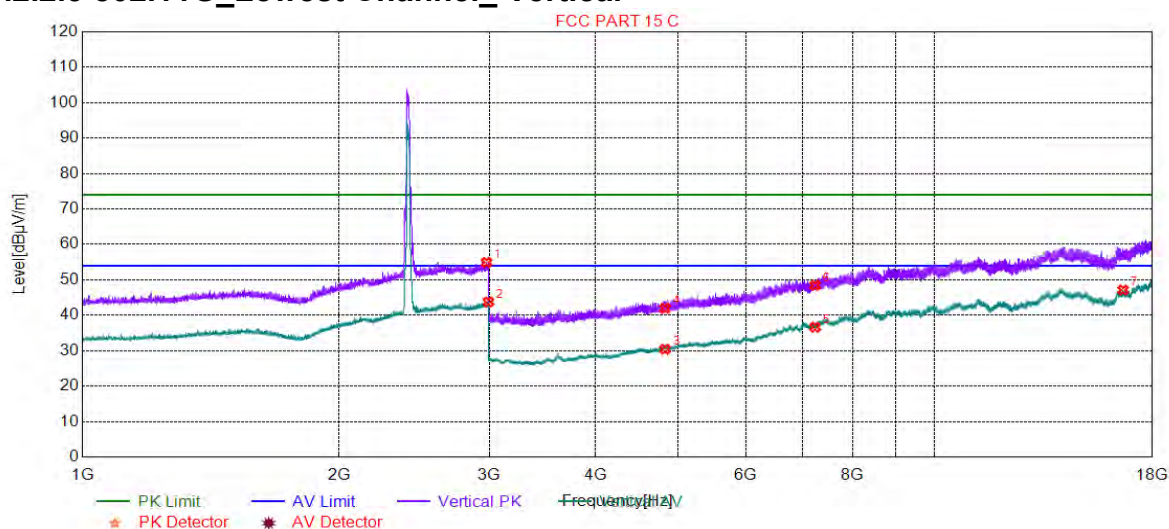


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2955.488	43.90	9.65	54.00	10.10	150	220	Horizontal
2	2960.990	55.20	9.63	74.00	18.80	150	96	Horizontal
3	4924.000	36.84	-17.72	54.00	17.16	150	205	Horizontal
4	4924.000	44.70	-17.72	74.00	29.30	150	177	Horizontal
5	7386.000	48.63	-9.55	74.00	25.37	150	18	Horizontal
6	7386.000	37.33	-9.55	54.00	16.67	150	326	Horizontal
7	17063.30	47.72	0.30	54.00	6.28	150	69	Horizontal



4.9.2.2.5 802.11G_Lowest Channel_Vertical

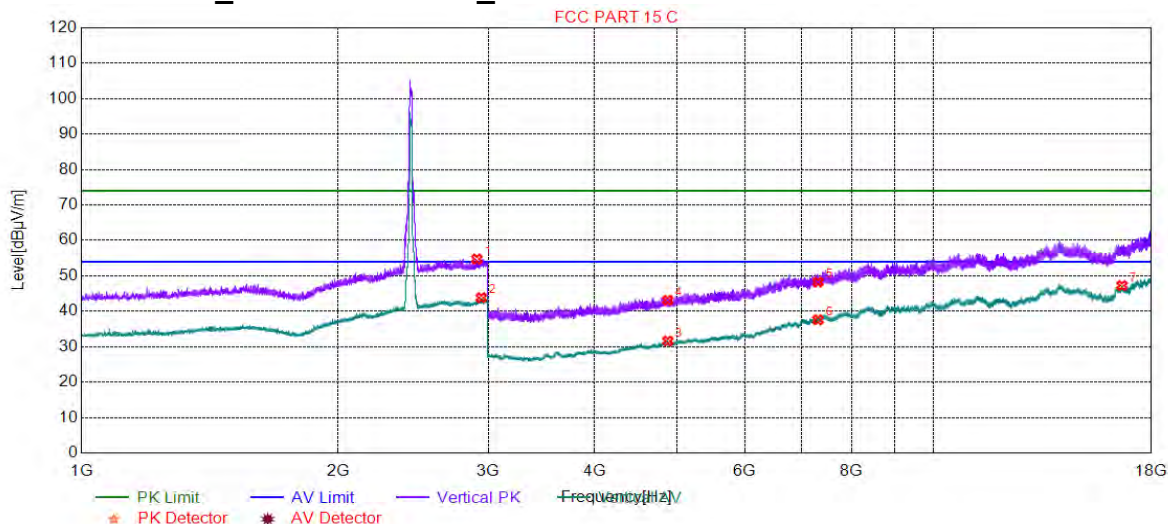


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2978.994	54.94	9.55	74.00	19.06	150	349	Vertical
2	2993.498	43.78	9.48	54.00	10.22	150	18	Vertical
3	4824.000	30.43	-18.21	54.00	23.57	150	40	Vertical
4	4824.000	41.95	-18.21	74.00	32.05	150	177	Vertical
5	7236.000	36.63	-9.99	54.00	17.37	150	219	Vertical
6	7236.000	48.44	-9.99	74.00	25.56	150	320	Vertical
7	16626.58	47.14	0.30	54.00	6.86	150	18	Vertical

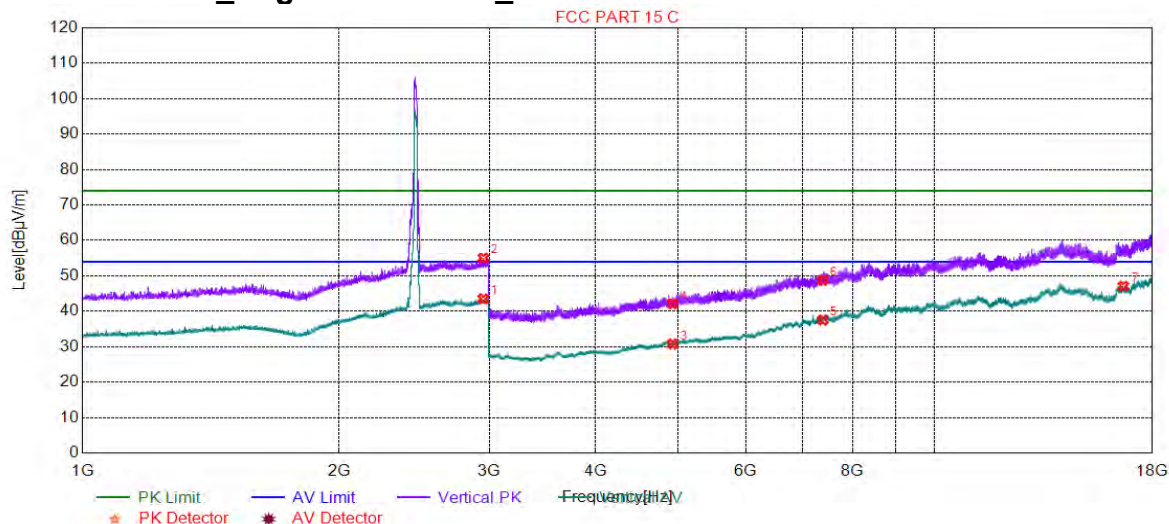


4.9.2.2.6 802.11G_ Middle Channel_ Vertical



Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2908.977	54.76	9.24	74.00	19.24	150	322	Vertical
2	2943.986	43.84	9.62	54.00	10.16	150	350	Vertical
3	4874.000	31.63	-17.99	54.00	22.37	150	144	Vertical
4	4874.000	43.12	-17.99	74.00	30.88	150	342	Vertical
5	7311.000	48.25	-9.74	74.00	25.75	150	69	Vertical
6	7311.000	37.59	-9.74	54.00	16.41	150	220	Vertical
7	16624.38	47.25	0.29	54.00	6.75	150	269	Vertical

4.9.2.2.7 802.11G_ Highest Channel_ Vertical

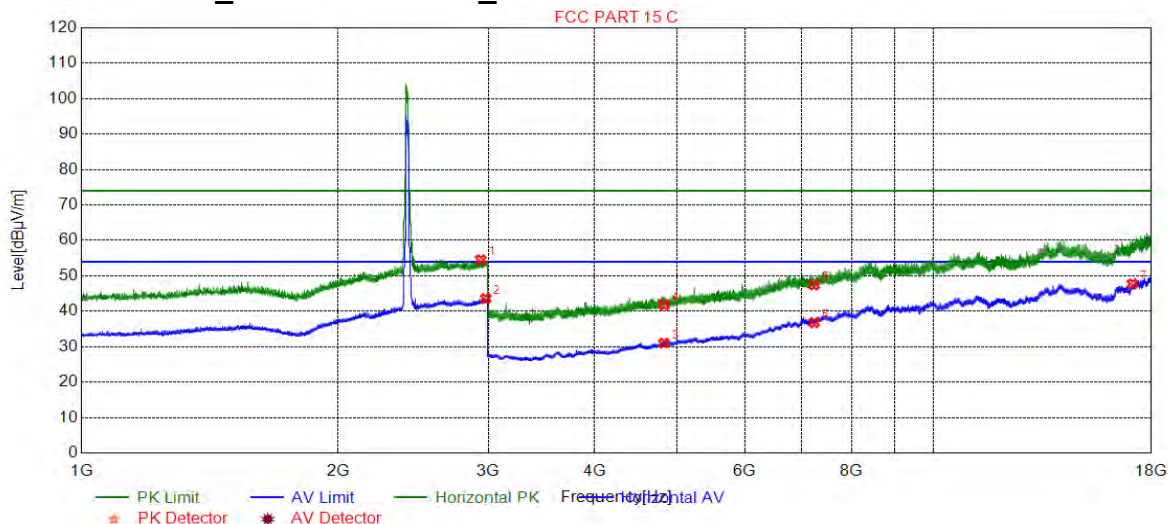


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2951.988	43.52	9.67	54.00	10.48	150	128	Vertical
2	2953.988	55.05	9.66	74.00	18.95	150	197	Vertical
3	4924.000	30.78	-17.72	54.00	23.22	150	342	Vertical
4	4924.000	42.10	-17.72	74.00	31.90	150	205	Vertical
5	7386.000	37.54	-9.55	54.00	16.46	150	325	Vertical
6	7386.000	48.74	-9.55	74.00	25.26	150	325	Vertical
7	16640.33	47.10	0.36	54.00	6.90	150	325	Vertical



4.9.2.2.8 802.11G_Lowest Channel_ Horizontal



Suspected List

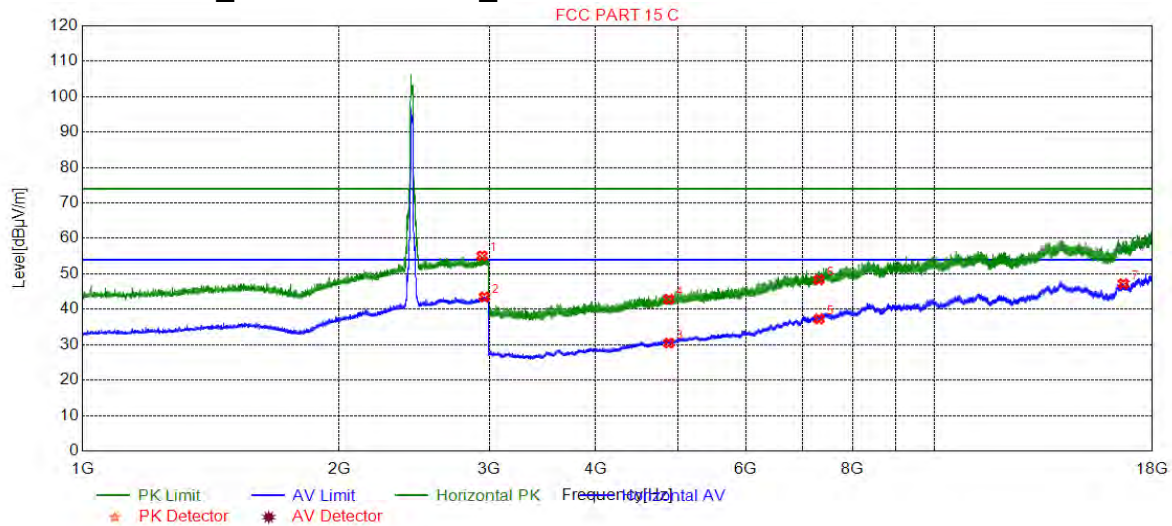
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2939.985	54.54	9.57	74.00	19.46	150	139	Horizontal
2	2979.995	43.62	9.54	54.00	10.38	150	342	Horizontal
3	4824.000	31.03	-18.21	54.00	22.97	150	287	Horizontal
4	4824.000	41.73	-18.21	74.00	32.27	150	287	Horizontal
5	7236.000	36.78	-9.99	54.00	17.22	150	360	Horizontal
6	7236.000	47.42	-9.99	74.00	26.58	150	360	Horizontal
7	17097.95	47.73	0.05	54.00	6.27	150	360	Horizontal



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4.9.2.2.9 802.11G_ Middle Channel_ Horizontal

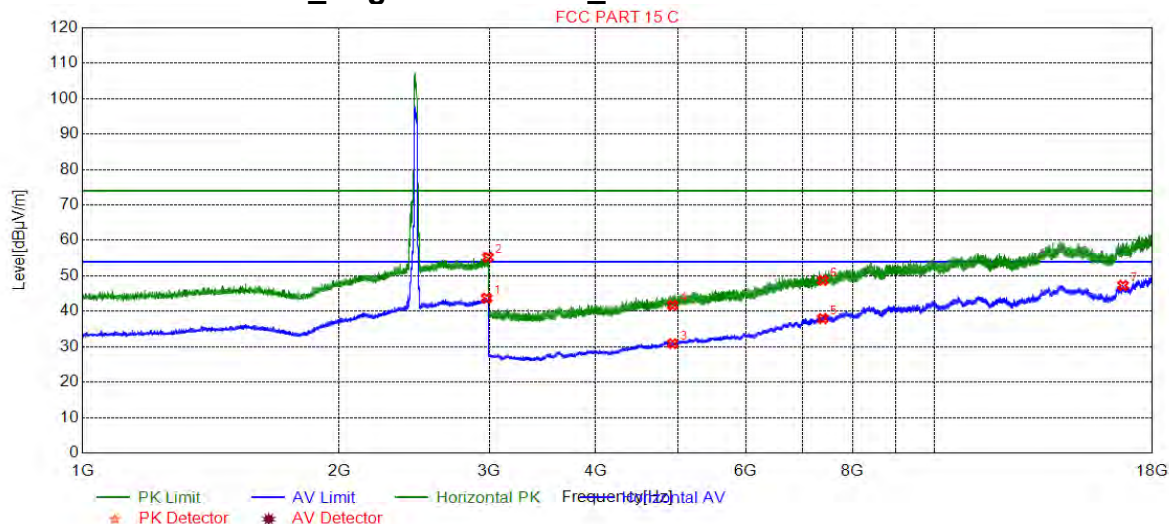


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2942.485	55.10	9.60	74.00	18.90	150	152	Horizontal
2	2961.490	43.47	9.63	54.00	10.53	150	97	Horizontal
3	4874.000	30.48	-17.99	54.00	23.52	150	206	Horizontal
4	4874.000	42.81	-17.99	74.00	31.19	150	315	Horizontal
5	7311.000	37.29	-9.74	54.00	16.71	150	320	Horizontal
6	7311.000	48.34	-9.74	74.00	25.66	150	320	Horizontal
7	16640.88	47.22	0.36	54.00	6.78	150	118	Horizontal



4.9.2.2.10 802.11G_ Highest Channel_ Horizontal

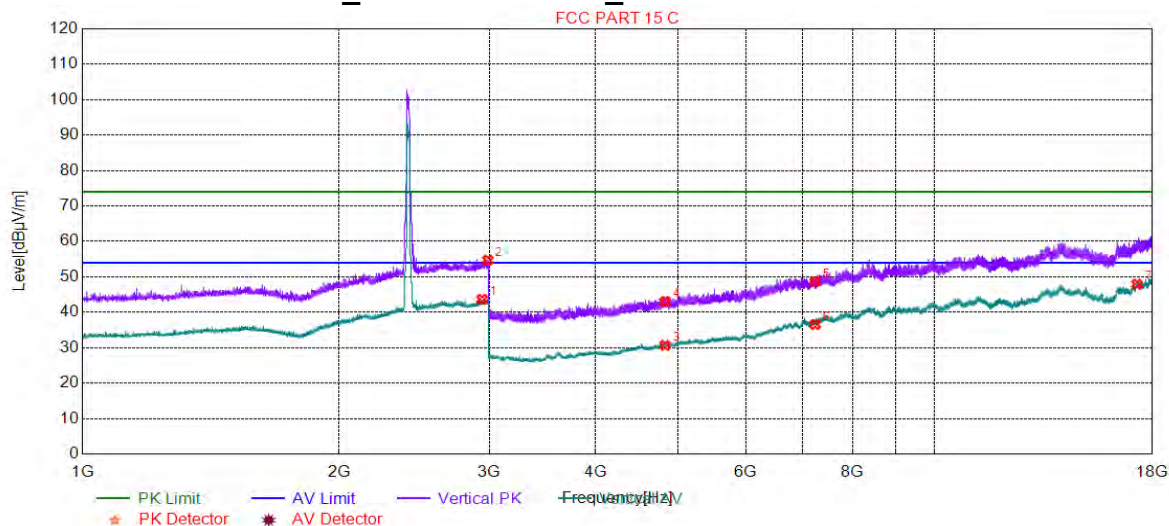


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2979.995	43.72	9.54	54.00	10.28	150	109	Horizontal
2	2989.497	55.25	9.50	74.00	18.75	150	342	Horizontal
3	4924.000	30.86	-17.72	54.00	23.14	150	9	Horizontal
4	4924.000	41.68	-17.72	74.00	32.32	150	173	Horizontal
5	7386.000	37.94	-9.55	54.00	16.06	150	68	Horizontal
6	7386.000	48.73	-9.55	74.00	25.27	150	68	Horizontal
7	16622.18	47.30	0.28	54.00	6.70	150	68	Horizontal



4.9.2.2.11 802.11N20_Lowest Channel_Vertical

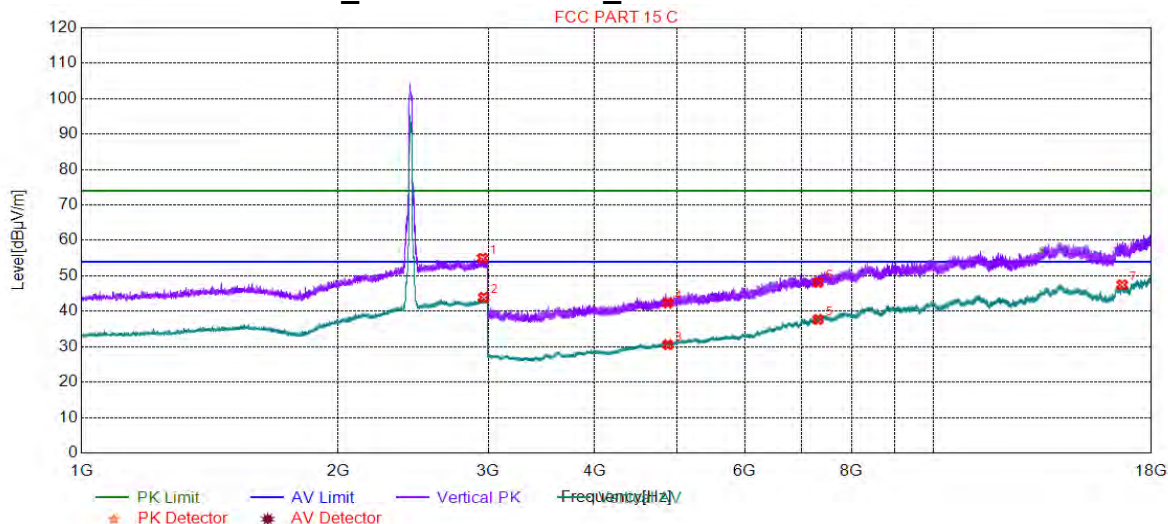


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2941.985	43.69	9.59	54.00	10.31	150	183	Vertical
2	2989.497	54.72	9.50	74.00	19.28	150	169	Vertical
3	4824.000	30.68	-18.21	54.00	23.32	150	260	Vertical
4	4824.000	43.01	-18.21	74.00	30.99	150	69	Vertical
5	7236.000	48.68	-9.99	74.00	25.32	150	322	Vertical
6	7236.000	36.56	-9.99	54.00	17.44	150	170	Vertical
7	17263.51	47.95	0.53	54.00	6.05	150	271	Vertical



4.9.2.2.12 802.11N20_Middle Channel_Vertical

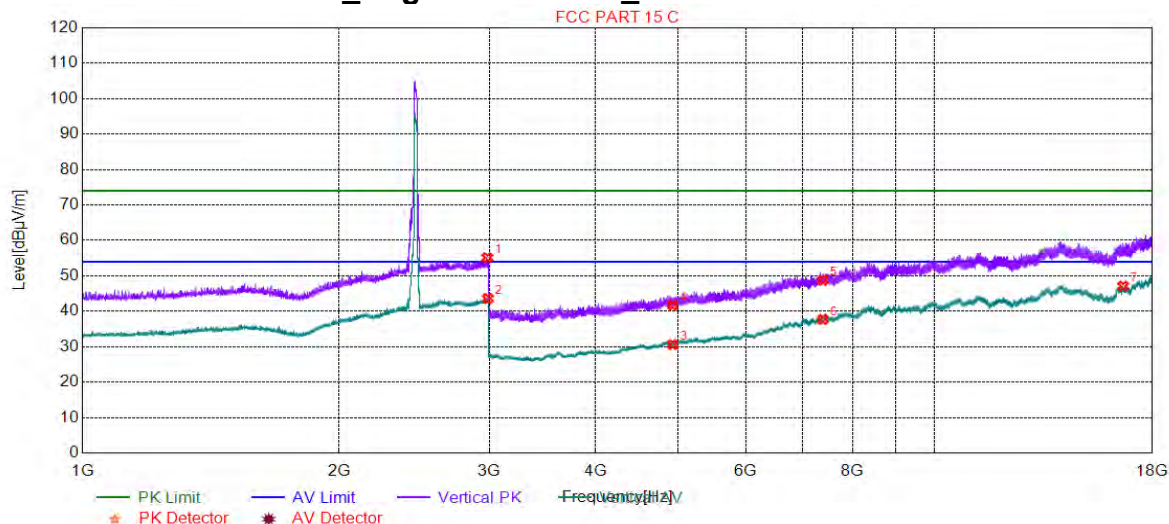


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2955.488	55.01	9.65	74.00	18.99	150	31	Vertical
2	2963.991	43.92	9.62	54.00	10.08	150	44	Vertical
3	4874.000	30.57	-17.99	54.00	23.43	150	231	Vertical
4	4874.000	42.33	-17.99	74.00	31.67	150	177	Vertical
5	7311.000	37.71	-9.74	54.00	16.29	150	360	Vertical
6	7311.000	48.13	-9.74	74.00	25.87	150	68	Vertical
7	16629.88	47.48	0.31	54.00	6.52	150	18	Vertical



4.9.2.2.13 802.11N20_ Highest Channel_ Vertical

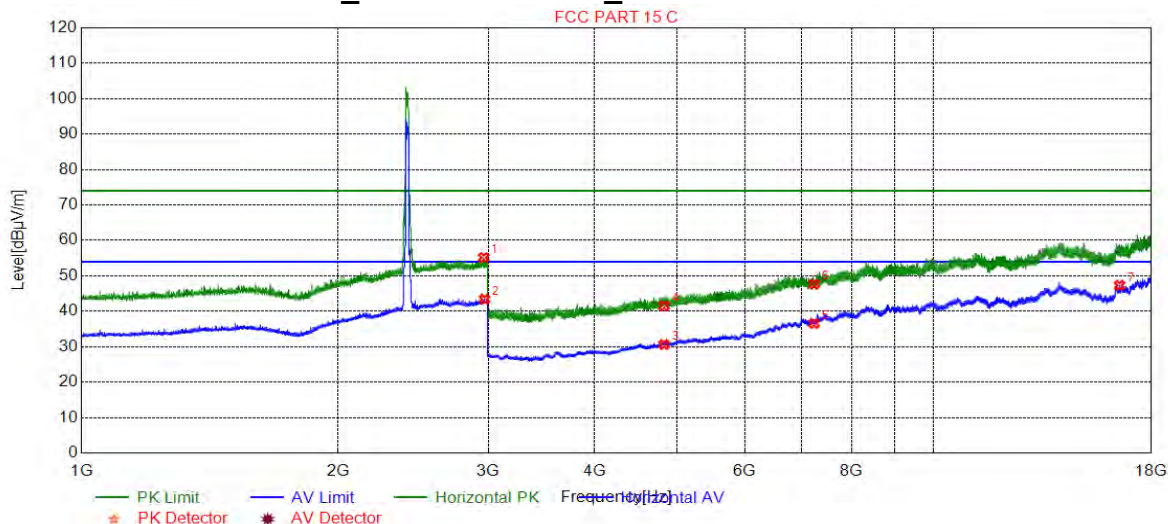


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2984.996	55.16	9.52	74.00	18.84	150	114	Vertical
2	2988.997	43.63	9.50	54.00	10.37	150	264	Vertical
3	4924.000	30.62	-17.72	54.00	23.38	150	315	Vertical
4	4924.000	41.75	-17.72	74.00	32.25	150	69	Vertical
5	7386.000	48.75	-9.55	74.00	25.25	150	119	Vertical
6	7386.000	37.70	-9.55	54.00	16.30	150	172	Vertical
7	16627.13	47.11	0.30	54.00	6.89	150	18	Vertical



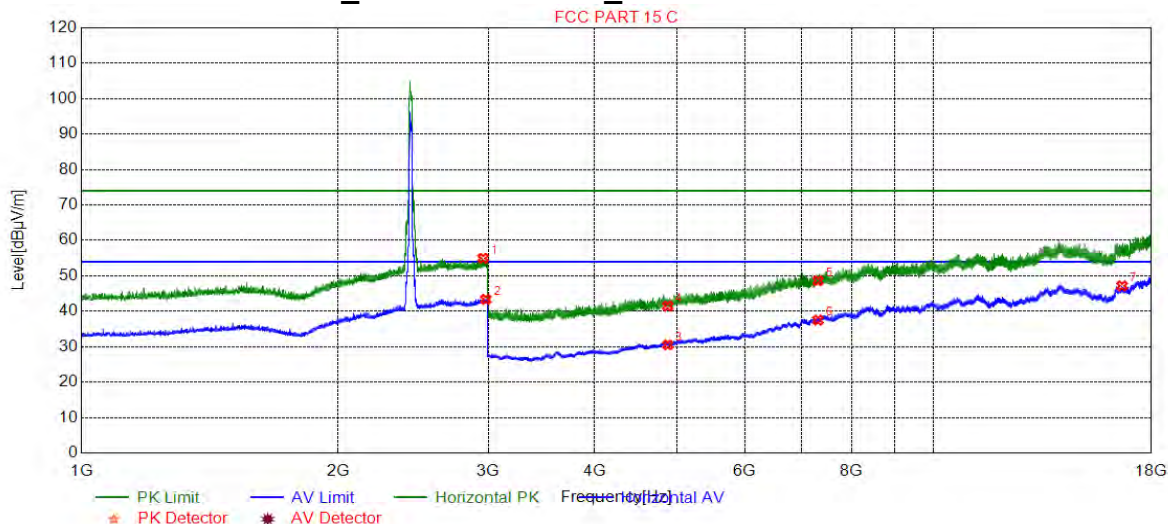
4.9.2.2.14 802.11N20_Lowest Channel_Horizontal



Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2963.991	55.17	9.62	74.00	18.83	150	329	Horizontal
2	2969.992	43.40	9.59	54.00	10.60	150	15	Horizontal
3	4824.000	30.64	-18.21	54.00	23.36	150	150	Horizontal
4	4824.000	41.52	-18.21	74.00	32.48	150	232	Horizontal
5	7236.000	36.55	-9.99	54.00	17.45	150	168	Horizontal
6	7236.000	47.68	-9.99	74.00	26.32	150	18	Horizontal
7	16513.82	47.32	0.32	54.00	6.68	150	168	Horizontal

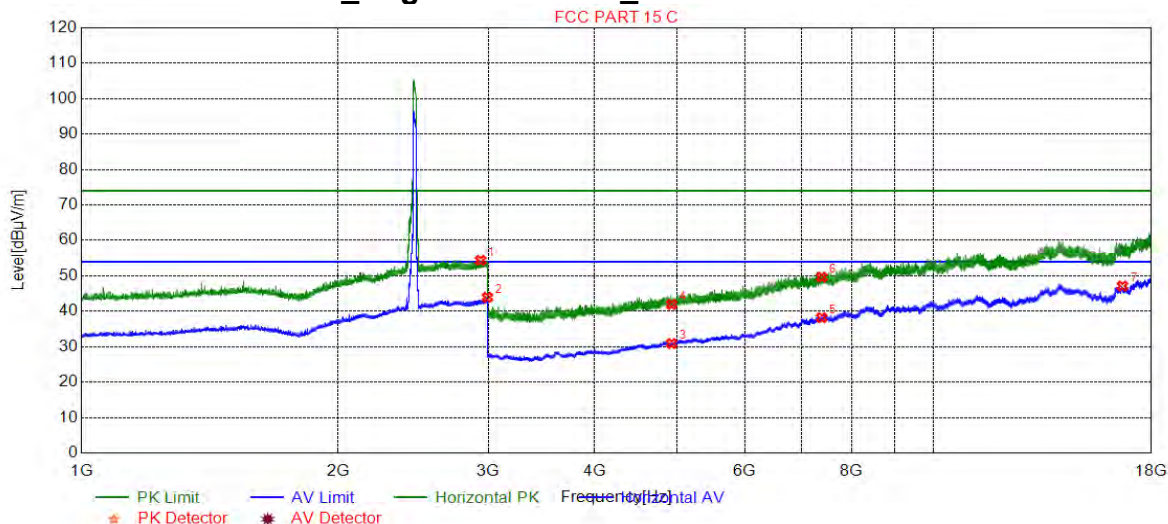


4.9.2.2.15 802.11N20_ Middle Channel_ Horizontal



Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2958.489	54.99	9.64	74.00	19.01	150	342	Horizontal
2	2981.495	43.38	9.54	54.00	10.62	150	262	Horizontal
3	4874.000	30.53	-17.99	54.00	23.47	150	342	Horizontal
4	4874.000	41.45	-17.99	74.00	32.55	150	342	Horizontal
5	7311.000	48.64	-9.74	74.00	25.36	150	69	Horizontal
6	7311.000	37.50	-9.74	54.00	16.50	150	360	Horizontal
7	16627.13	47.16	0.30	54.00	6.84	150	18	Horizontal

4.9.2.2.16 802.11N20_ Highest Channel_ Horizontal



Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2938.484	54.39	9.56	74.00	19.61	150	178	Horizontal
2	2992.998	43.96	9.48	54.00	10.04	150	259	Horizontal
3	4924.000	30.89	-17.72	54.00	23.11	150	342	Horizontal
4	4924.000	41.94	-17.72	74.00	32.06	150	342	Horizontal
5	7386.000	38.20	-9.55	54.00	15.80	150	322	Horizontal
6	7386.000	49.64	-9.55	74.00	24.36	150	222	Horizontal
7	16643.08	47.12	0.37	54.00	6.88	150	172	Horizontal

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

2) Scan from 9kHz to 25GHz, the disturbance between 9KHz to 30MHz and 18GHz to 25GHz was very low, and the above harmonics were the highest point could be found when testing, The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

4) All Modes have been tested, but only the worst case data displayed in this report.



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4.10 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10: 2013 Section 11.12		
Test Site:	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m @3m)	Remark
	30MHz-88MHz	40.0	Quasi-peak Value
	88MHz-216MHz	43.5	Quasi-peak Value
	216MHz-960MHz	46.0	Quasi-peak Value
	960MHz-1GHz	54.0	Quasi-peak Value
	Above 1GHz	54.0	Average Value
		74.0	Peak Value
Test Setup:			

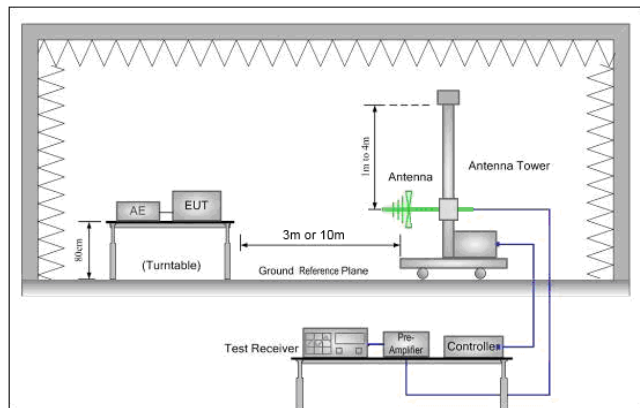


Figure 1. 30MHz to 1GHz

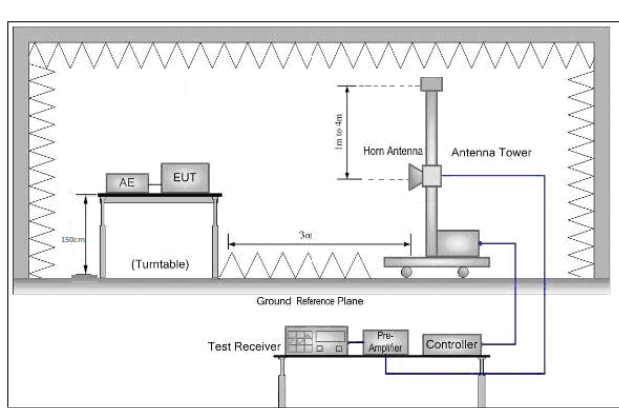


Figure 2. Above 1 GHz

Test Procedure:	a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. d. The antenna height 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. e. 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. f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel h. Test the EUT in the lowest channel , the Highest channel i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. j. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.
Final Test Mode:	Pretest the EUT at Charge +Transmitting mode. Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11B; 6Mbps of rate is the worst case of 802.11G ; 6.5Mbps of rate is the worst case of 802.11N(HT20); Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass

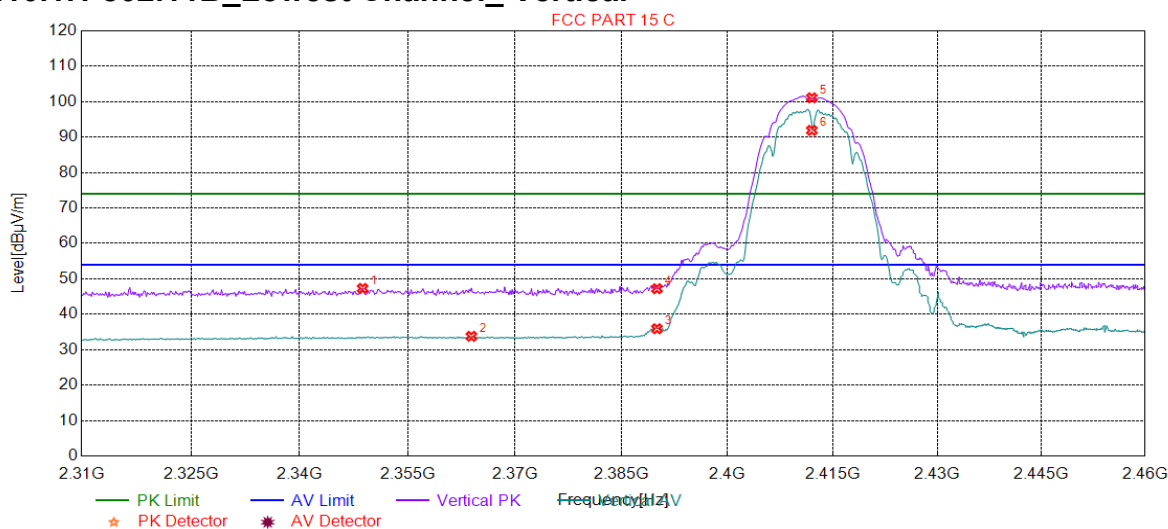




Test plot as follows:

4.10.1 ANT1

4.10.1.1 802.11B_Lowest Channel_ Vertical

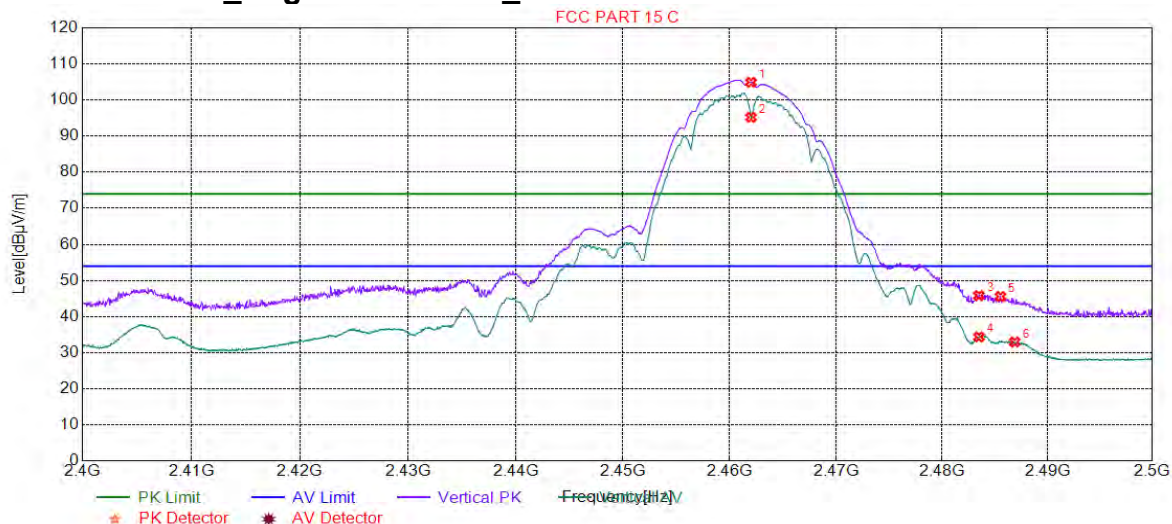


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2348.738	47.31	7.80	74.00	26.69	150	50	Vertical
2	2363.903	33.78	7.80	54.00	20.22	150	320	Vertical
3	2390.000	35.93	7.77	54.00	18.07	150	287	Vertical
4	2390.000	47.23	7.77	74.00	26.77	150	360	Vertical
5	2412.000	101.10	7.81	74.00	-27.10	150	303	Vertical
6	2412.000	91.91	7.81	54.00	-37.91	150	303	Vertical



4.10.1.2 802.11B_ Highest Channel_ Vertical

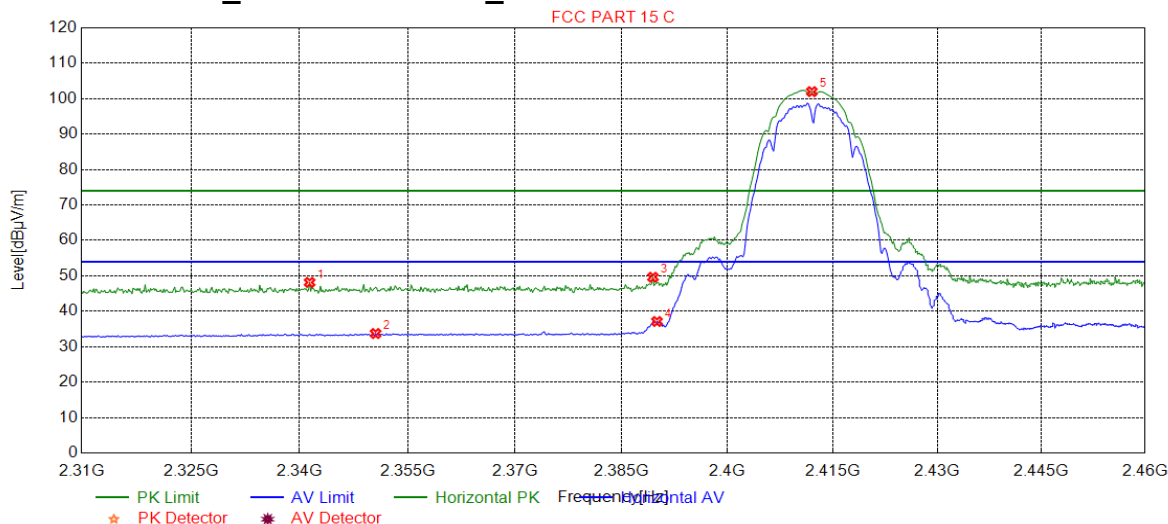


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.000	104.91	7.98	74.00	-30.91	150	283	Vertical
2	2462.000	95.20	7.98	54.00	-41.20	150	283	Vertical
3	2483.500	45.81	8.01	74.00	28.19	150	300	Vertical
4	2483.500	34.36	8.01	54.00	19.64	150	278	Vertical
5	2485.542	45.55	8.01	74.00	28.45	150	289	Vertical
6	2486.893	32.96	8.01	54.00	21.04	150	283	Vertical

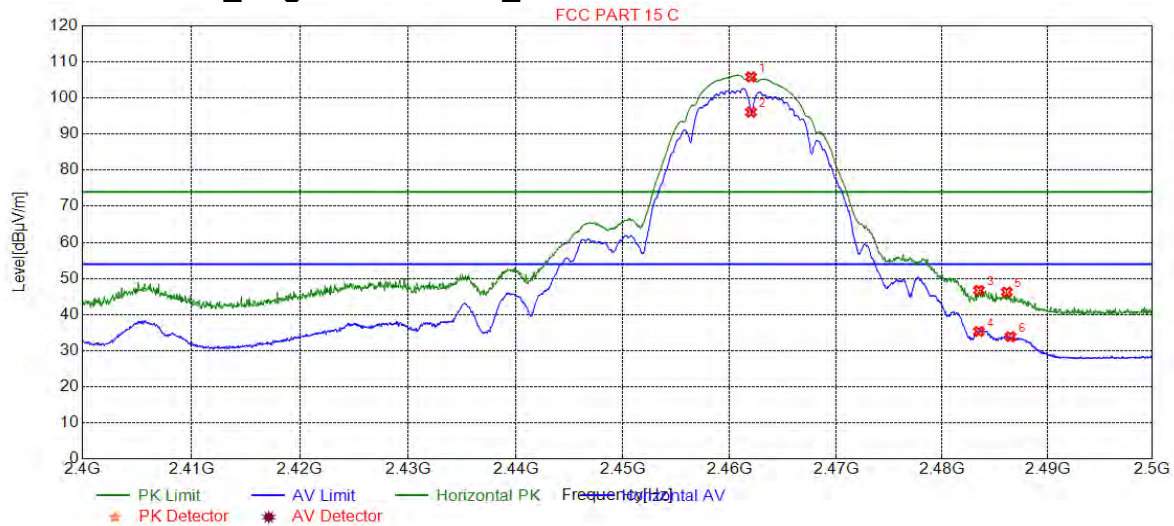


4.10.1.3 802.11B_Lowest Channel_ Horizontal



Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2341.381	48.15	7.73	74.00	25.85	150	224	Horizontal
2	2350.540	33.73	7.81	54.00	20.27	150	302	Horizontal
3	2389.429	49.61	7.77	74.00	24.39	150	232	Horizontal
4	2390.000	37.12	7.77	54.00	16.88	150	220	Horizontal
5	2412.000	102.00	7.81	74.00	-28.00	150	220	Horizontal

4.10.1.4 802.11B_ Highest Channel_ Horizontal

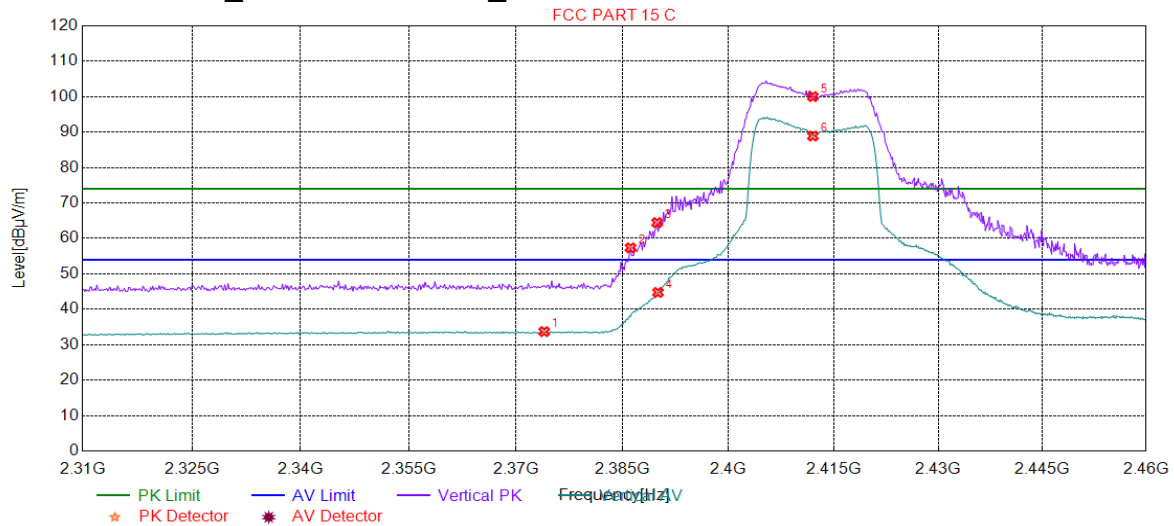


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.000	105.84	7.98	74.00	-31.84	150	209	Horizontal
2	2462.000	96.08	7.98	54.00	-42.08	150	209	Horizontal
3	2483.500	46.73	8.01	74.00	27.27	150	203	Horizontal
4	2483.500	35.31	8.01	54.00	18.69	150	214	Horizontal
5	2486.143	46.22	8.01	74.00	27.78	150	209	Horizontal
6	2486.493	33.88	8.01	54.00	20.12	150	209	Horizontal



4.10.1.5 802.11G_Lowest Channel_ Vertical



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2373.964	33.71	7.79	54.00	20.29	150	17	Vertical
2	2386.126	57.35	7.77	74.00	16.65	150	282	Vertical
3	2389.879	64.46	7.77	74.00	9.54	150	282	Vertical
4	2390.000	44.76	7.77	54.00	9.24	150	294	Vertical
5	2412.000	100.03	7.81	74.00	-26.03	150	298	Vertical
6	2412.000	88.90	7.81	54.00	-34.90	150	278	Vertical



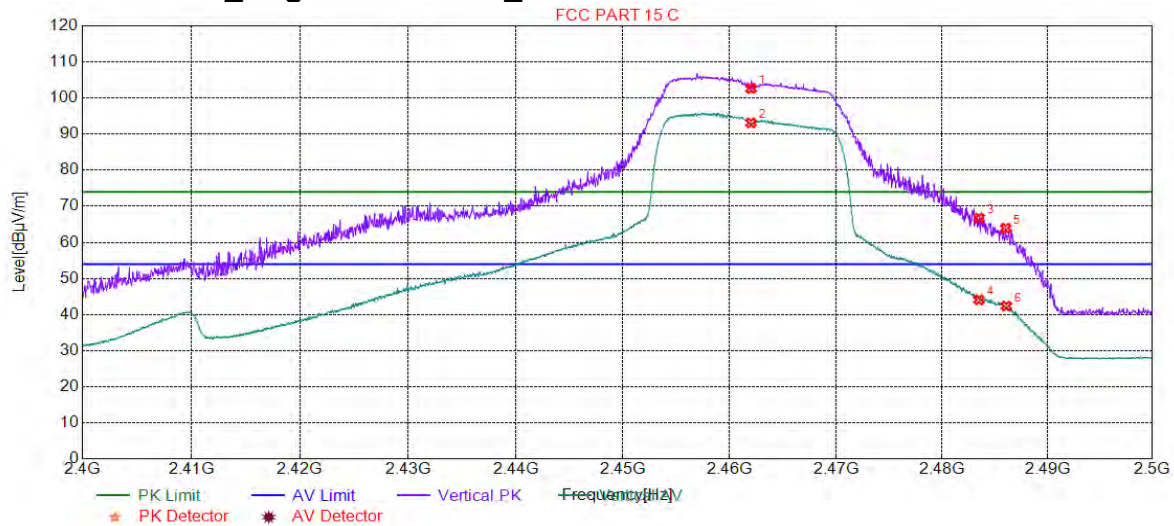
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4.10.1.6 802.11G_ Highest Channel_ Vertical

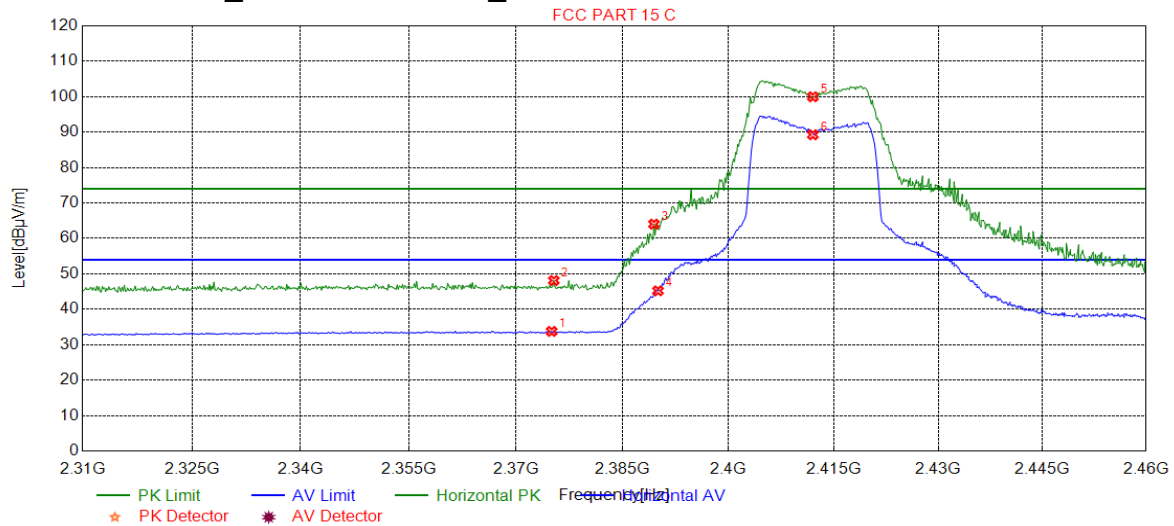


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.000	102.64	7.98	74.00	-28.64	150	294	Vertical
2	2462.000	93.11	7.98	54.00	-39.11	150	282	Vertical
3	2483.500	66.73	8.01	74.00	7.27	150	288	Vertical
4	2483.500	44.10	8.01	54.00	9.90	150	277	Vertical
5	2486.043	63.95	8.01	74.00	10.05	150	321	Vertical
6	2486.093	42.36	8.01	54.00	11.64	150	277	Vertical



4.10.1.7 802.11G_Lowest Channel_ Horizontal

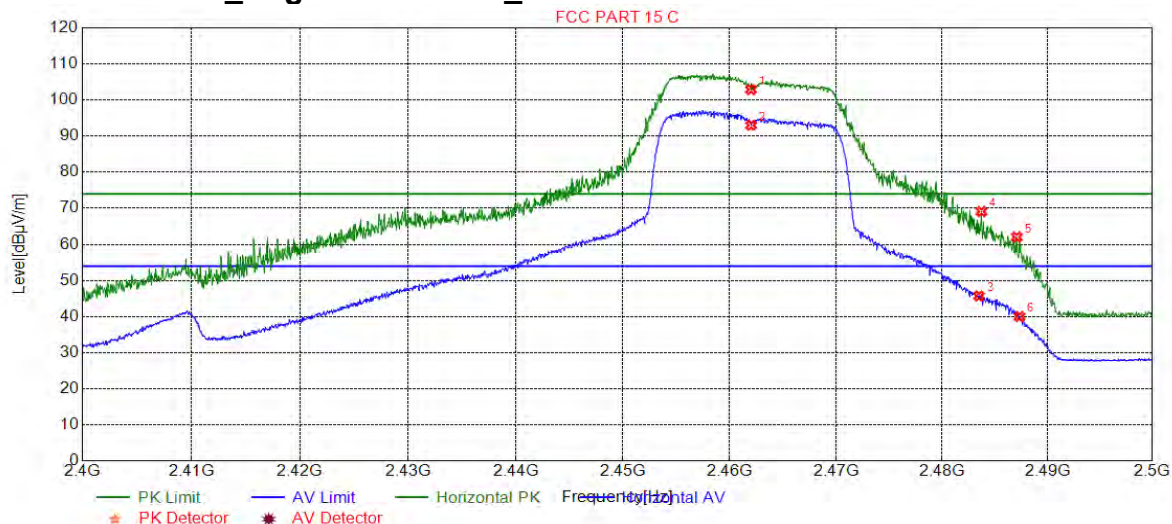


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2375.015	33.77	7.78	54.00	20.23	150	258	Horizontal
2	2375.315	48.12	7.78	74.00	25.88	150	133	Horizontal
3	2389.429	64.05	7.77	74.00	9.95	150	206	Horizontal
4	2390.000	45.21	7.77	54.00	8.79	150	206	Horizontal
5	2412.000	99.98	7.81	74.00	-25.98	150	210	Horizontal
6	2412.000	89.27	7.81	54.00	-35.27	150	210	Horizontal



4.10.1.8 802.11G_ Highest Channel_ Horizontal

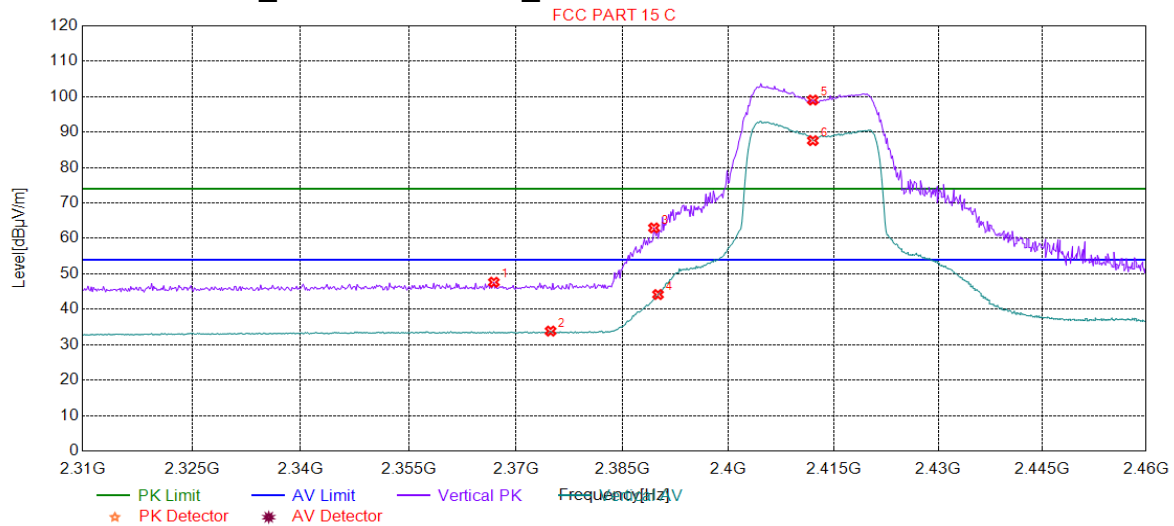


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.000	102.89	7.98	74.00	-28.89	150	210	Horizontal
2	2462.000	92.98	7.98	54.00	-38.98	150	215	Horizontal
3	2483.500	45.68	8.01	54.00	8.32	150	210	Horizontal
4	2483.741	69.09	8.01	74.00	4.91	150	210	Horizontal
5	2487.093	62.05	8.01	74.00	11.95	150	210	Horizontal
6	2487.343	40.00	8.01	54.00	14.00	150	215	Horizontal



4.10.1.9 802.11N20_Lowest Channel_ Vertical



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2366.906	47.64	7.79	74.00	26.36	150	164	Vertical
2	2374.864	33.85	7.79	54.00	20.15	150	327	Vertical
3	2389.429	62.97	7.77	74.00	11.03	150	281	Vertical
4	2390.000	44.17	7.77	54.00	9.83	150	298	Vertical
5	2412.000	99.05	7.81	74.00	-25.05	150	281	Vertical
6	2412.000	87.60	7.81	54.00	-33.60	150	285	Vertical



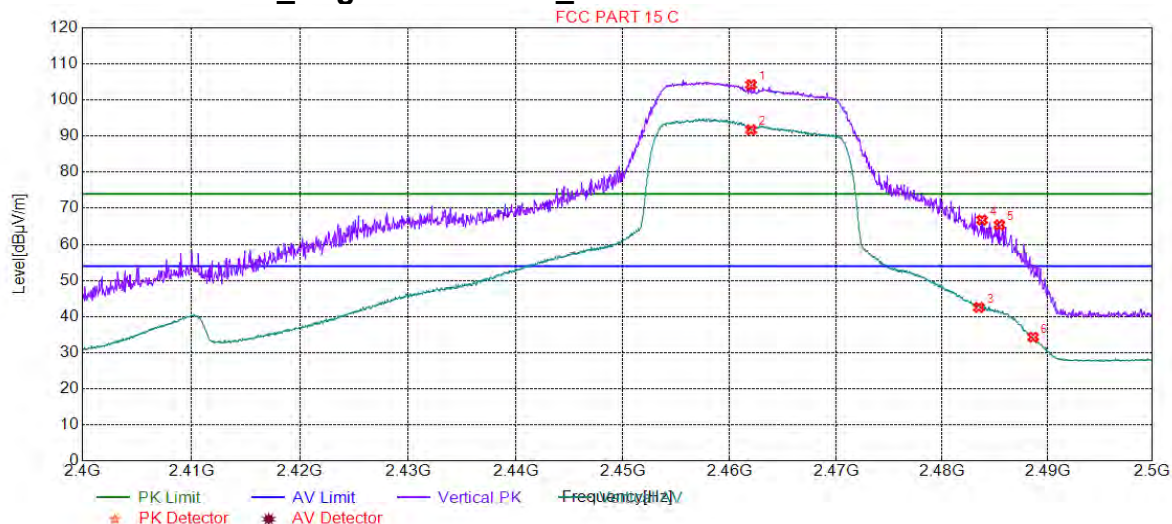
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4.10.1.10 802.11N20_ Highest Channel_ Vertical

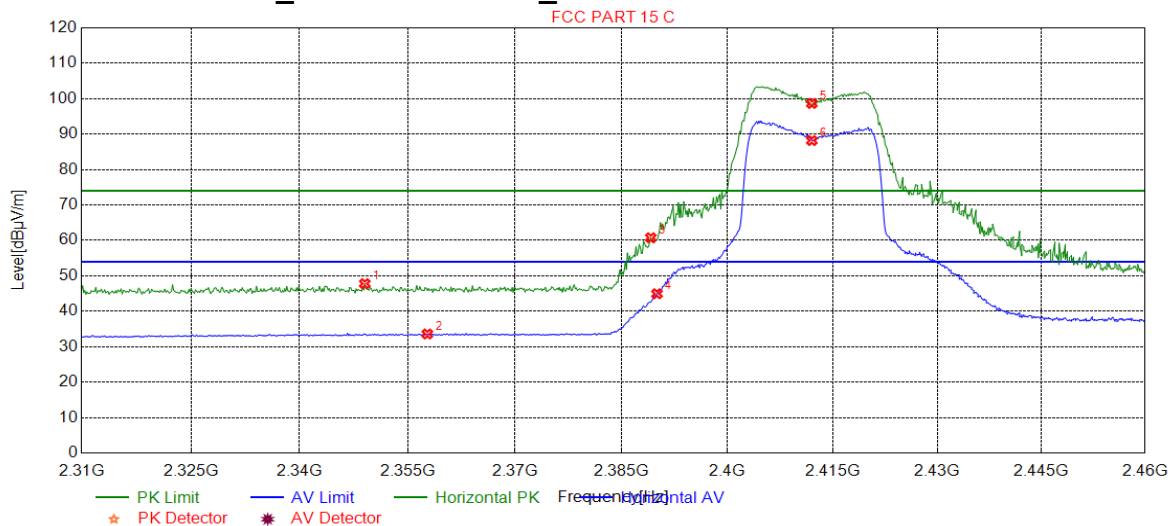


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.000	104.22	7.98	74.00	-30.22	150	277	Vertical
2	2462.000	91.72	7.98	54.00	-37.72	150	282	Vertical
3	2483.500	42.55	8.01	54.00	11.45	150	288	Vertical
4	2483.791	66.76	8.01	74.00	7.24	150	304	Vertical
5	2485.442	65.39	8.01	74.00	8.61	150	299	Vertical
6	2488.644	34.31	8.02	54.00	19.69	150	272	Vertical



4.10.1.11 802.11N20_Lowest Channel_ Horizontal

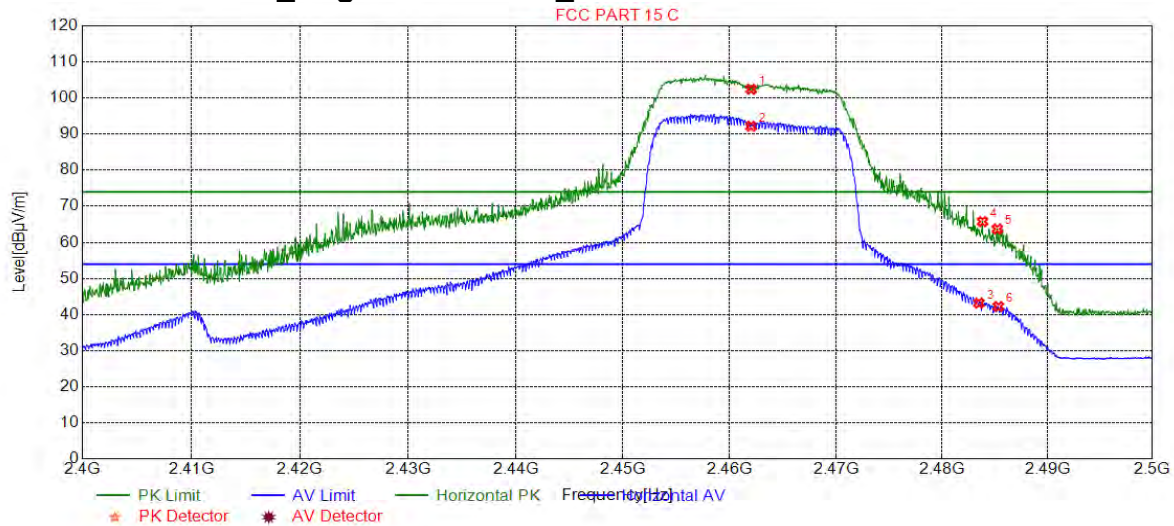


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2349.039	47.80	7.80	74.00	26.20	150	19	Horizontal
2	2357.747	33.60	7.80	54.00	20.40	150	254	Horizontal
3	2389.129	60.76	7.77	74.00	13.24	150	211	Horizontal
4	2390.000	44.95	7.77	54.00	9.05	150	207	Horizontal
5	2412.000	98.66	7.81	74.00	-24.66	150	207	Horizontal
6	2412.000	88.19	7.81	54.00	-34.19	150	211	Horizontal



4.10.1.12 802.11N20_ Highest Channel_ Horizontal



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.000	102.42	7.98	74.00	-28.42	150	208	Horizontal
2	2462.000	92.19	7.98	54.00	-38.19	150	208	Horizontal
3	2483.500	43.19	8.01	54.00	10.81	150	213	Horizontal
4	2483.841	65.76	8.01	74.00	8.24	150	208	Horizontal
5	2485.242	63.72	8.01	74.00	10.28	150	213	Horizontal
6	2485.342	42.23	8.01	54.00	11.77	150	208	Horizontal

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

All Modes have been tested, but only the worst case data displayed in this report.





Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Total RF power, conducted	±0.75dB
2	RF power density, conducted	±2.84dB
3	Spurious emissions, conducted	±0.75dB
4	Radiated Spurious emission test	±4.5dB (30MHz-1GHz)
		±4.8dB (1GHz-25GHz)
5	Conduct emission test	±3.12 dB (9KHz- 30MHz)
6	Temperature test	±1°C
7	Humidity test	±3%
8	DC and low frequency voltages	±0.5%



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5 Equipment List

Conducted Emission					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal. Due date
				(yyyy-mm-dd)	(yyyy-mm-dd)
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2017/5/10	2020/5/9
LISN	Rohde & Schwarz	ENV216	SEM007-01	2019/7/14	2020/7/14
LISN	ETS-LINDGREN	Feb-16	SEM007-02	2019/4/1	2020/3/31
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2019/6/12	2020/6/11
2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	EMC0122	2019/2/11	2020/2/10
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2019/3/2	2020/3/1

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal. Due date
				(yyyy-mm-dd)	(yyyy-mm-dd)
DC Power Supply	Agilent Technologies Inc	66311B	W009-09	2019/7/15	2020/7/15
Signal Analyzer	Rohde & Schwarz	FSV	W025-05	2019/1/13	2020/1/12
Coaxial Cable	SGS	N/A	SEM031-01	2019/6/12	2020/6/11
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2019/7/14	2020/7/14
Temperature Chamber	GIANT FORCE	ICT-150-40-CP-AR	W027-03	2019/10/27	2020/10/27
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2019/7/14	2020/7/14

RE in Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal. Due date
				(yyyy-mm-dd)	(yyyy-mm-dd)
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017/8/5	2020/8/4
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2019/6/12	2020/6/11
MXE EMI Receiver (20Hz-8.4GHz)	Agilent Technologies	N9038A	SEM004-05	2019/7/14	2020/7/14
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017/6/27	2020/6/26
Pre-amplifier (0.1-1.3GHz)	Agilent Technologies	8447D	SEM005-01	2019/3/2	2020/3/1

RE in Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date	Cal. Due date
				(yyyy-mm-dd)	(yyyy-mm-dd)
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018/3/13	2021/3/12
Measurement Software	AUDIX	e3V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2019/6/12	2020/6/11
EXA Signal Analyzer (10Hz-26.5GHz)	Agilent Technologies Inc	N9010A	SEM004-09	2019/3/12	2020/3/11
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017/6/27	2020/6/26
Horn Antenna (0.8-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018/4/13	2021/4/12
Pre-amplifier(0.1-1.3GHz)	HP	8447D	SEM005-02	2019/7/14	2020/7/14
Low Noise Amplifier(100MHz-18GHz)	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2019/9/3	2020/9/2
Horn Antenna (15-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017/10/17	2020/10/16
Pre-amplifier(18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2019/3/2	2020/3/1
Band filter	N/A	N/A	SEM023-01	N/A	N/A



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RE in Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2018/3/31	2021/3/30
EMI Test Receiver (9k-7GHz)	Rohde & Schwarz	ESR	SEM004-03	2019/3/2	2020/3/1
Trilog-Broadband Antenna(25M-2GHz)	Schwarzbeck	VULB9168	SEM003-18	2018/3/15	2020/3/14
Pre-amplifier (9k-1GHz)	Sonoma	310N	SEM005-03	2019/3/12	2020/3/11
Loop Antenna (9kHz-30MHz)	ETS-Lindgren	6502	SEM003-08	2017/8/22	2020/8/21
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM029-01	2019/6/12	2020/6/11

6 Photographs - EUT Constructional Details

Refer to Appendix A - Photographs of Set-Up for HR/2019/B0013.

The End

