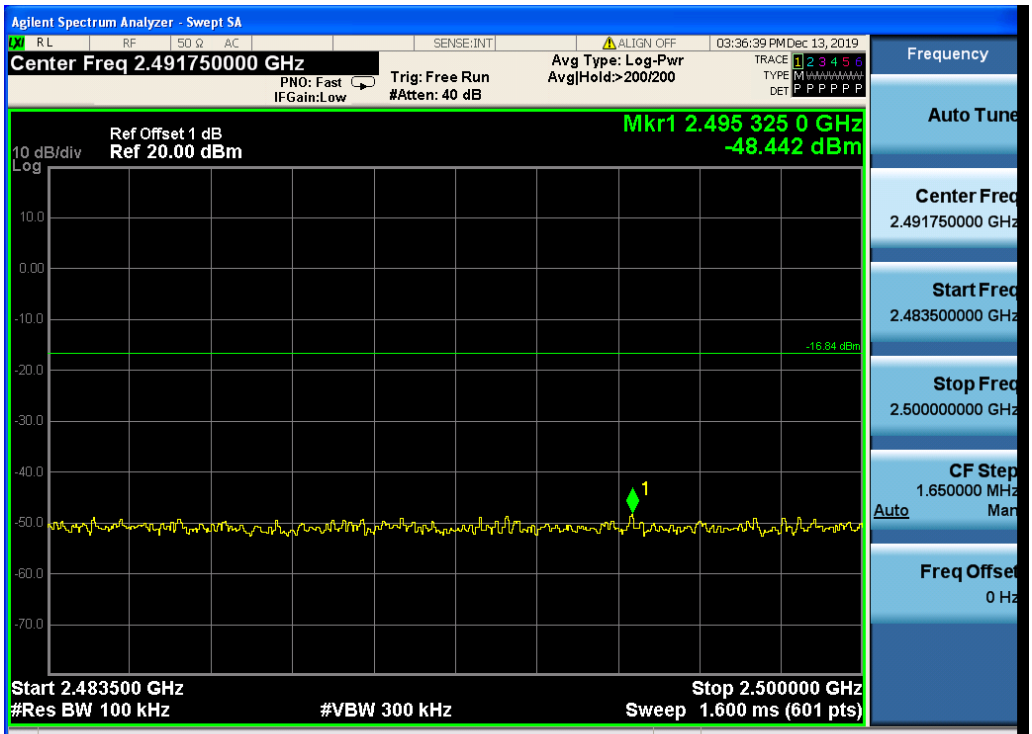
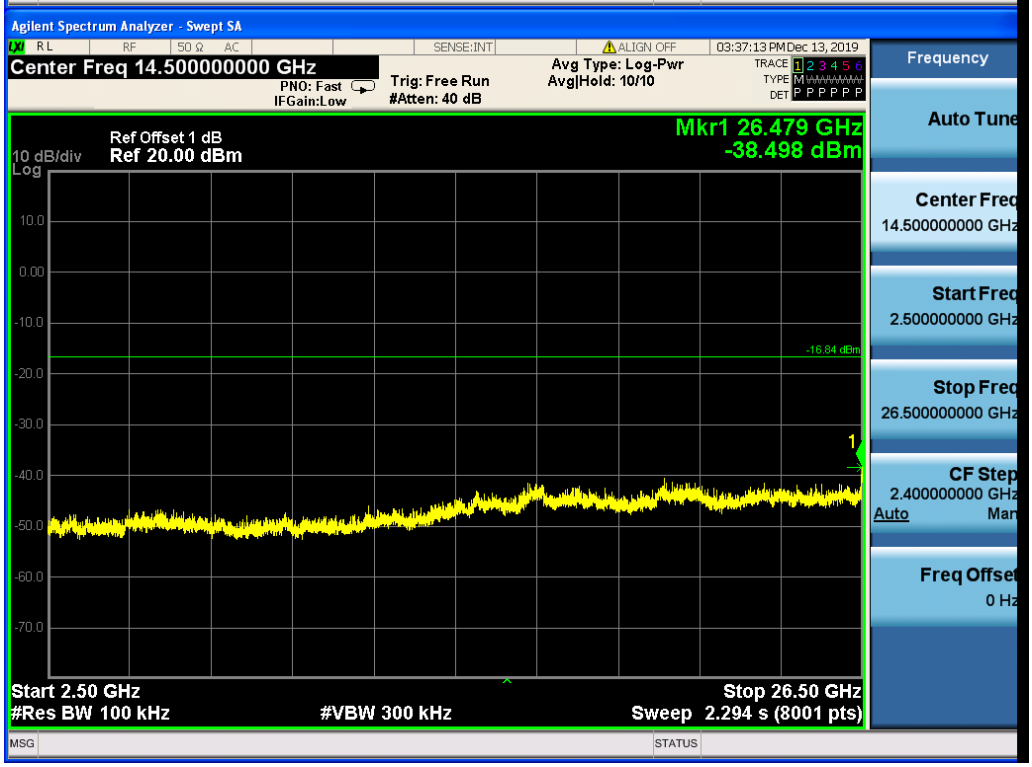
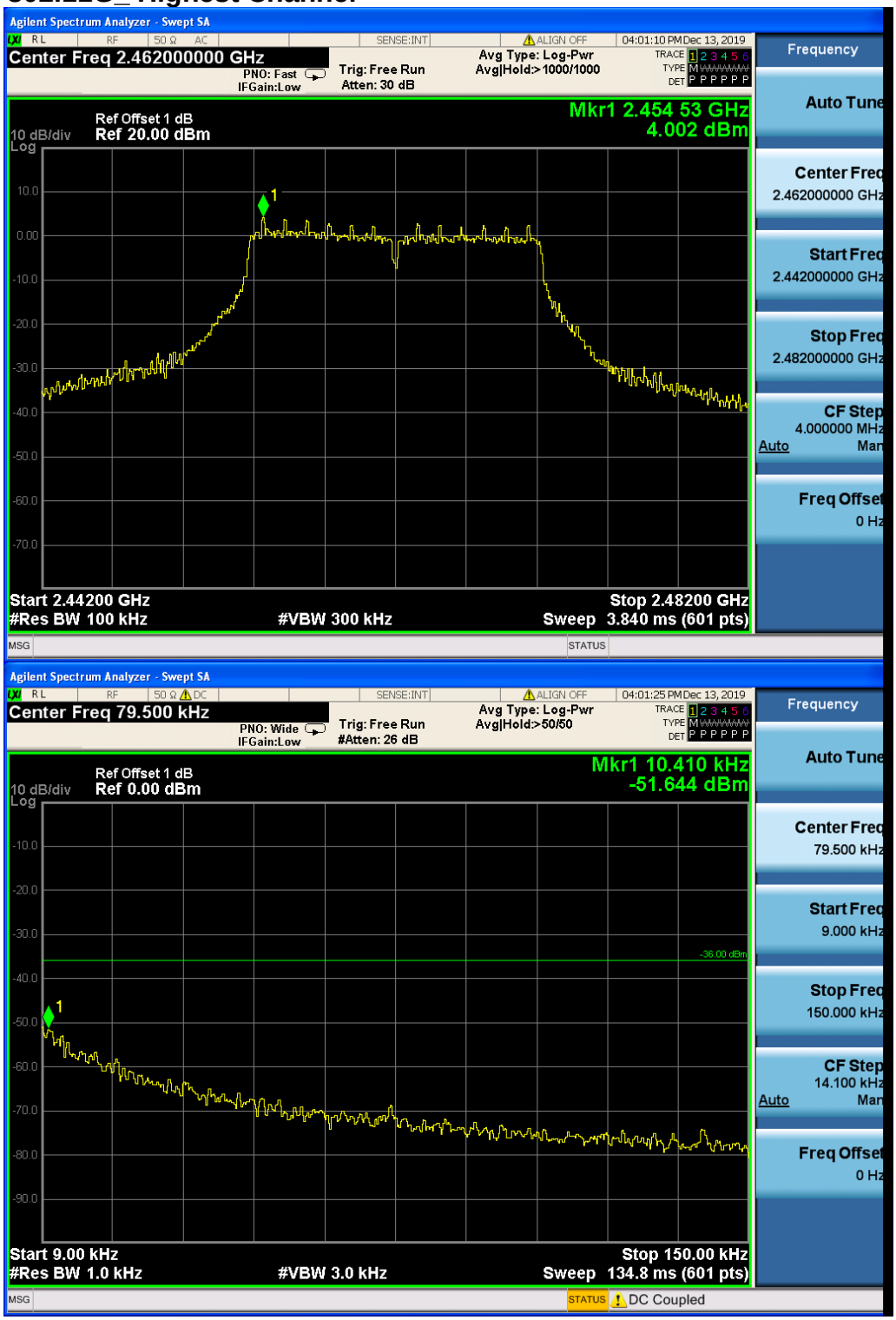
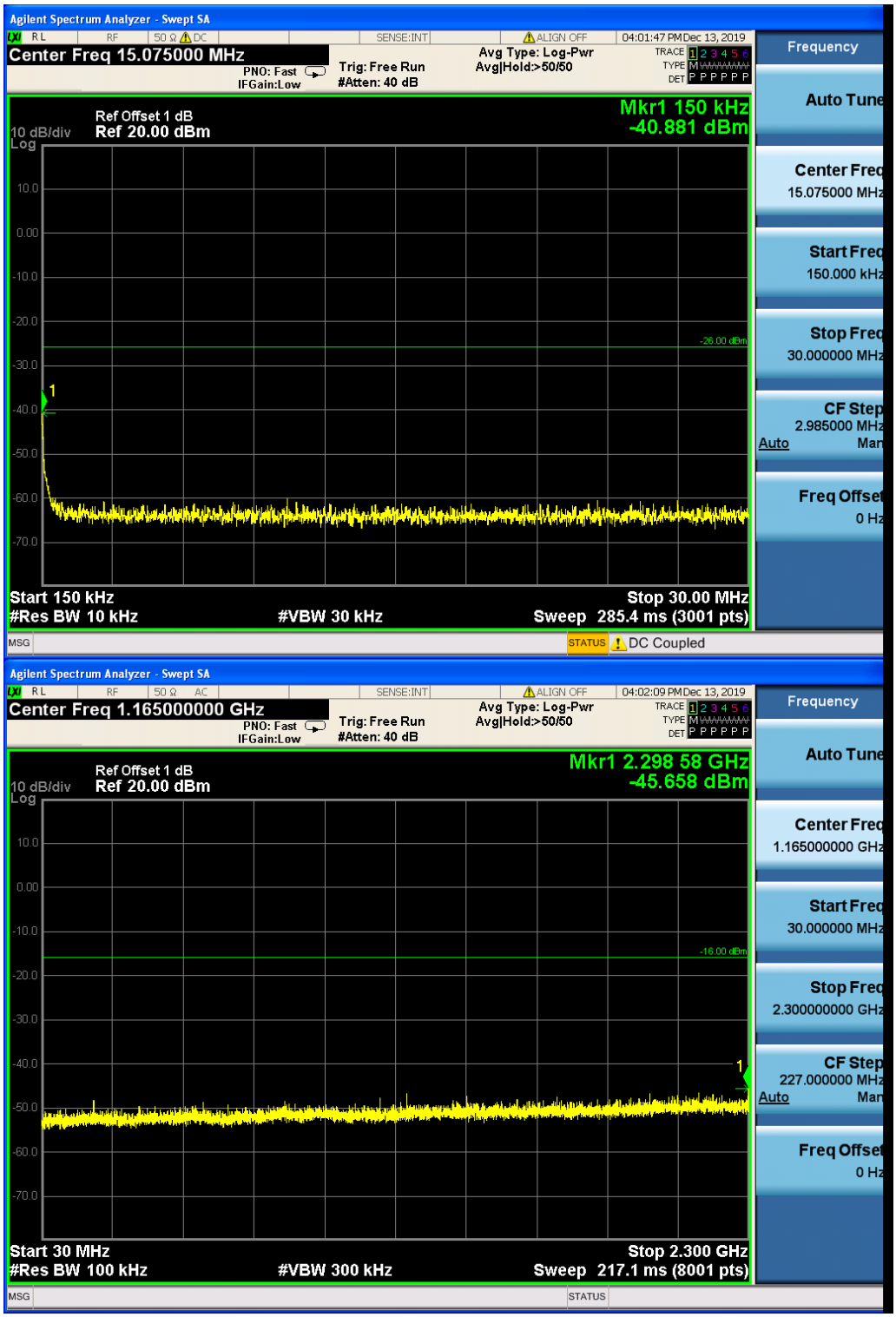


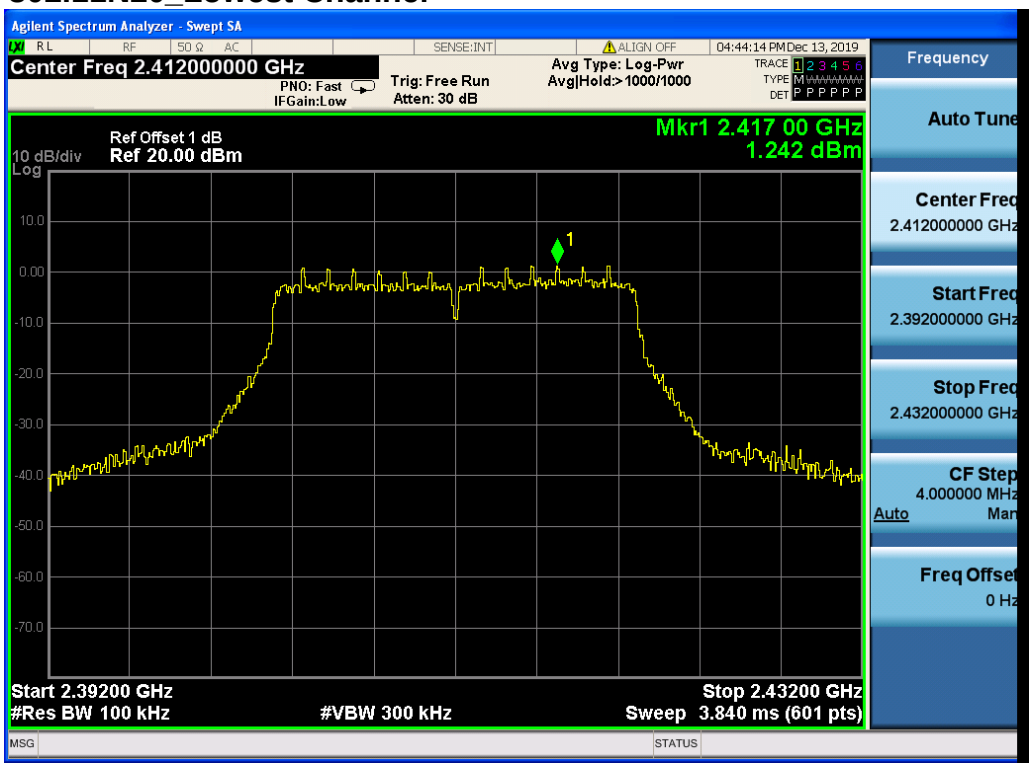


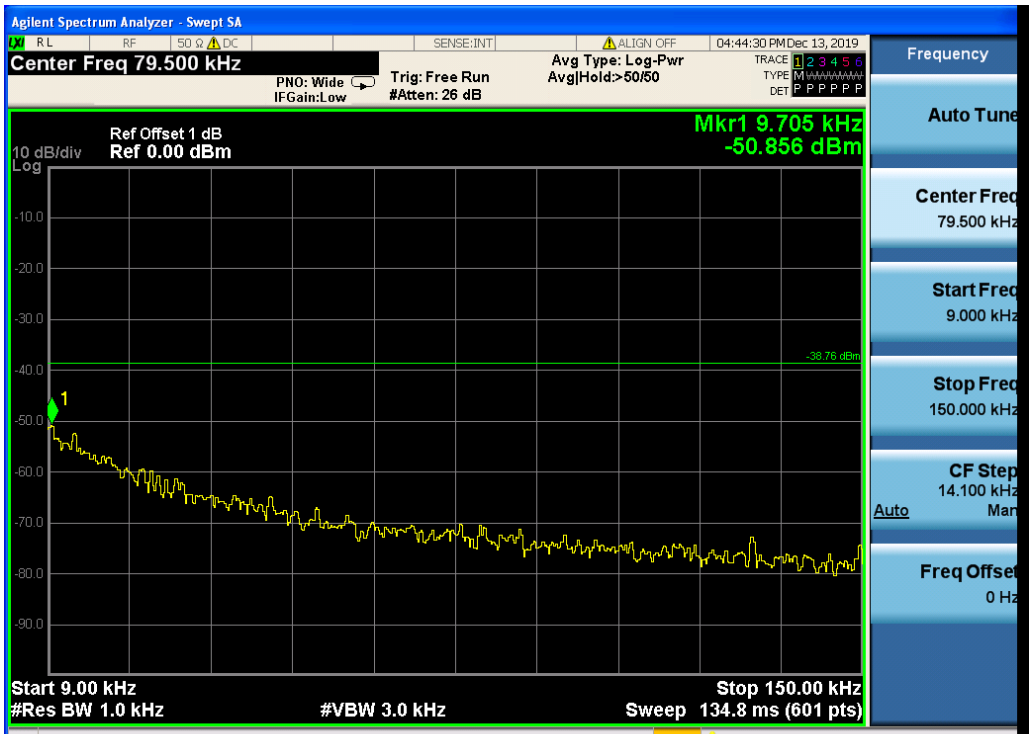
4.8.1.1.6 802.11G_ Highest Channel

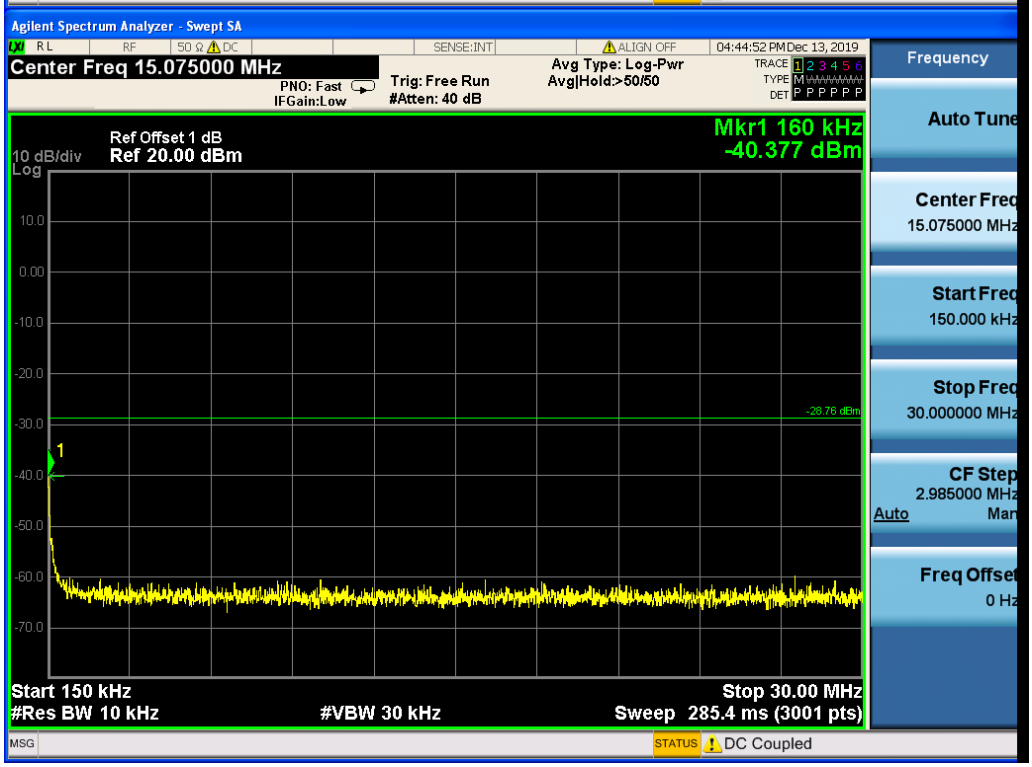


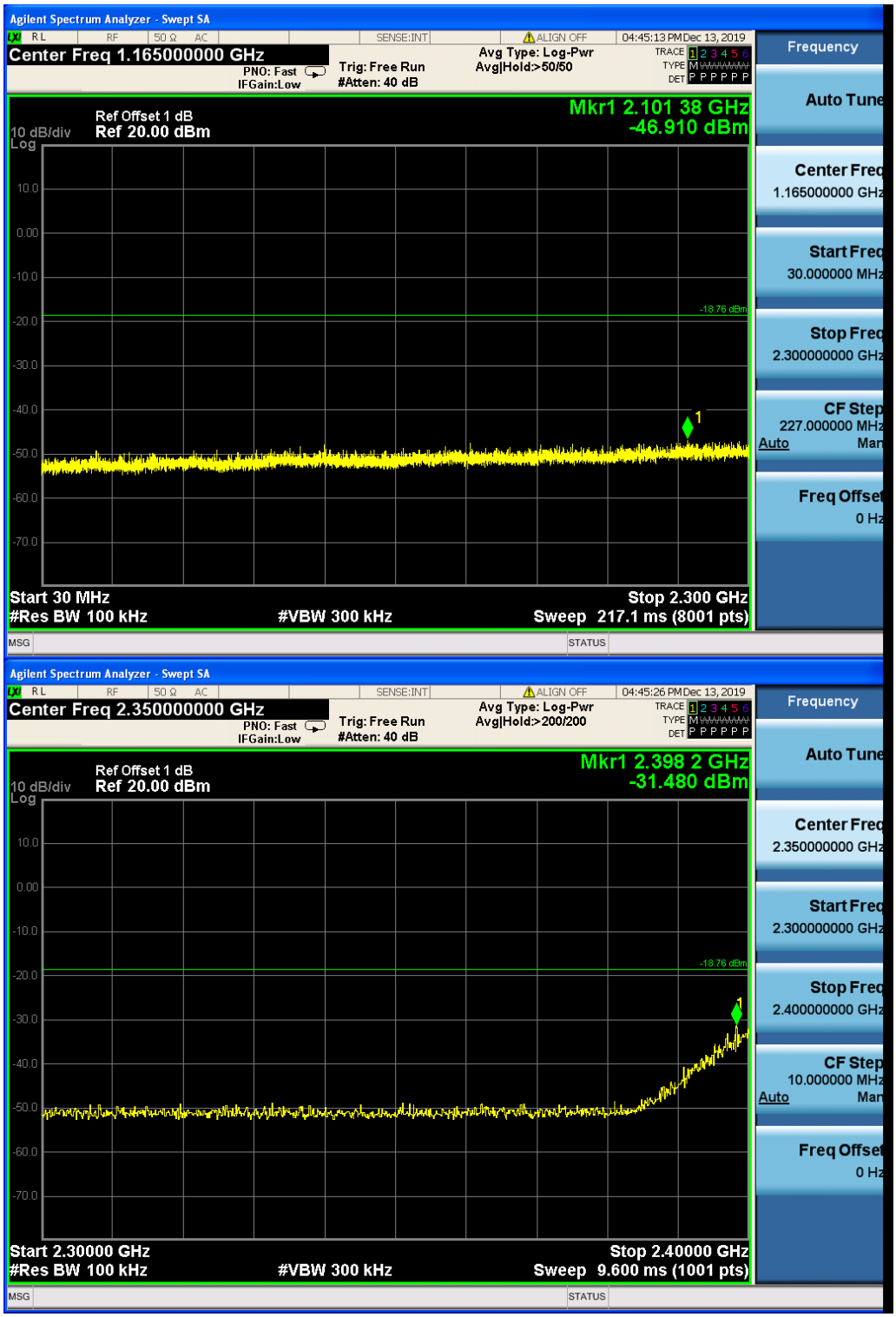


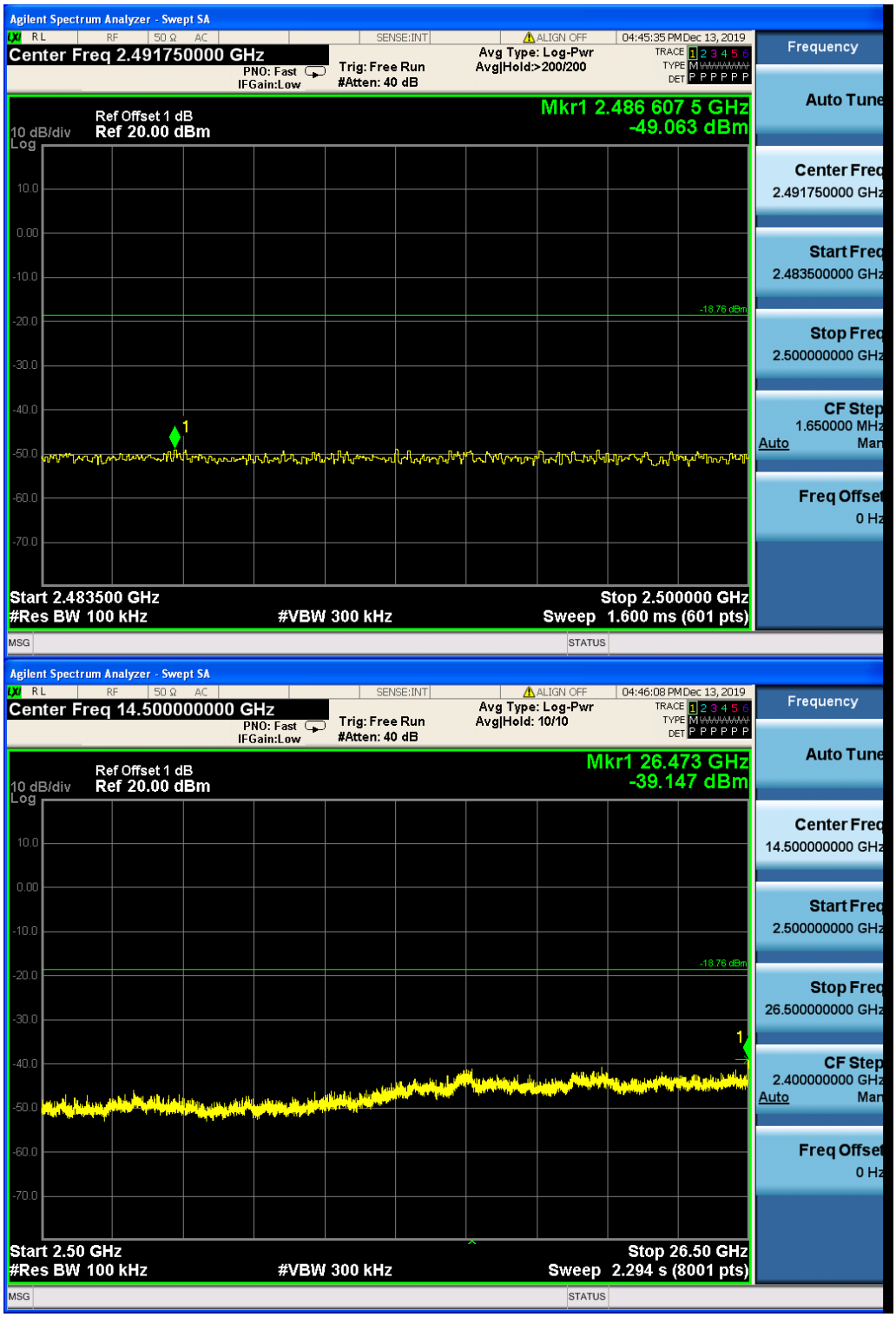
4.8.1.1.7 802.11N20_Lowest Channel



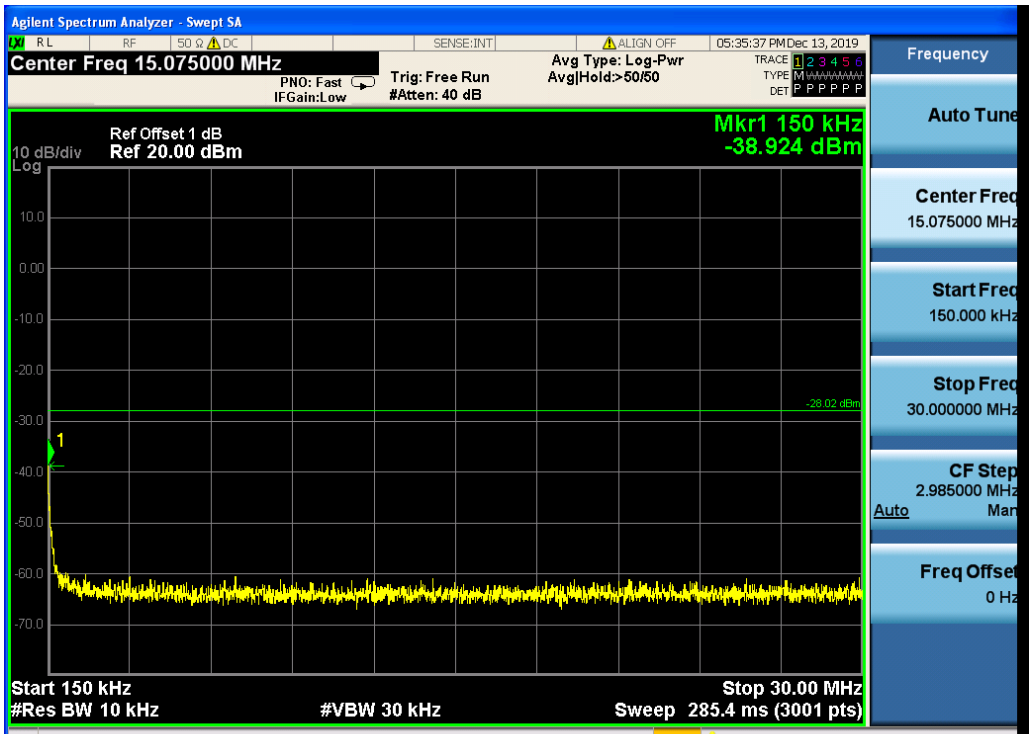


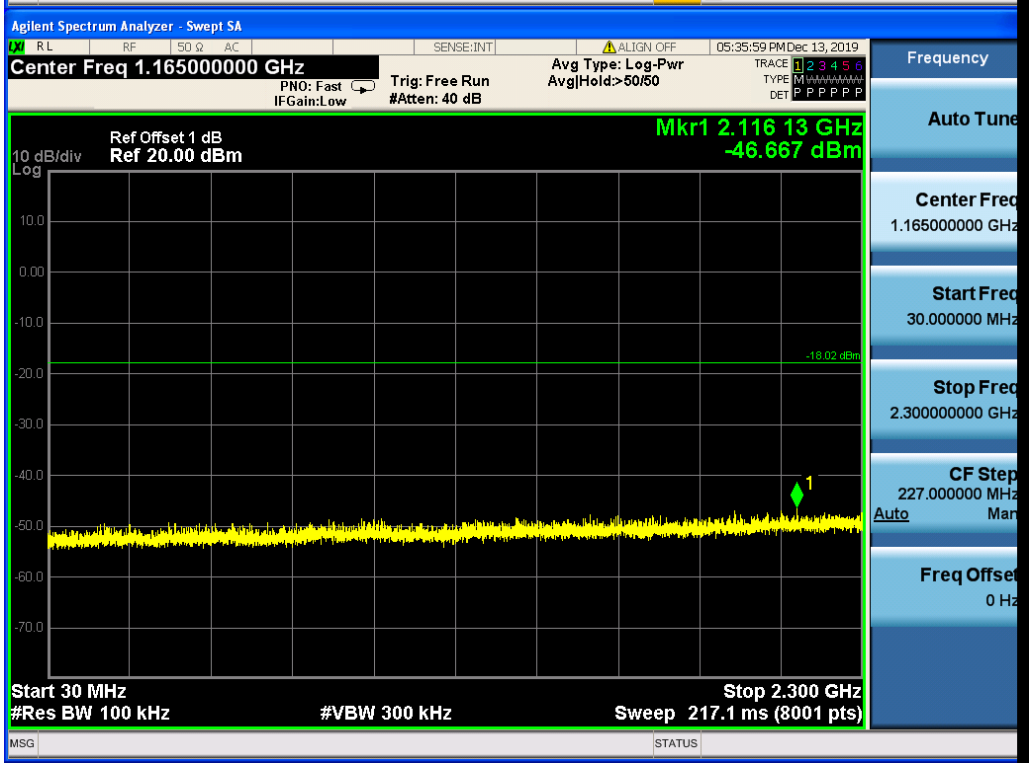


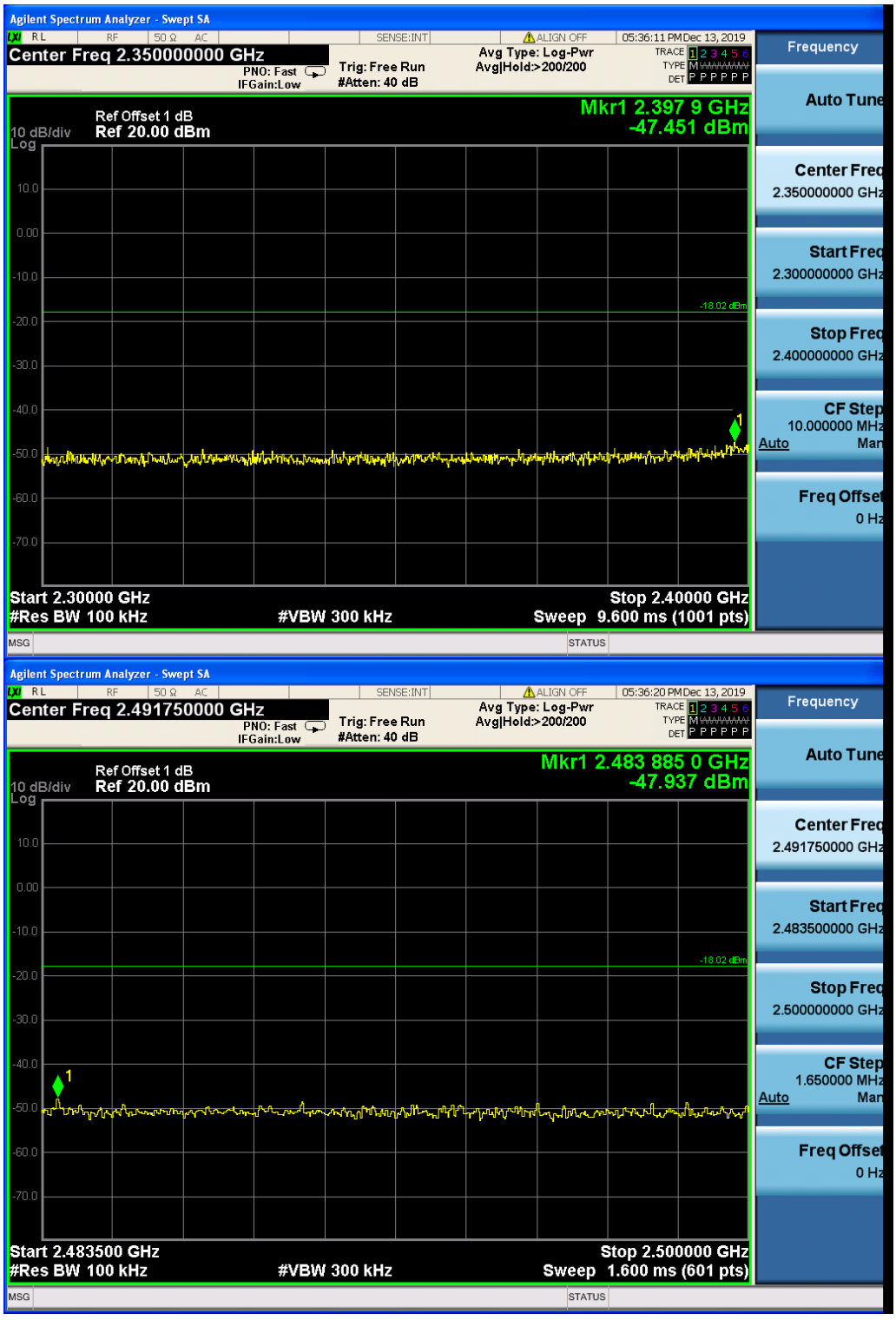




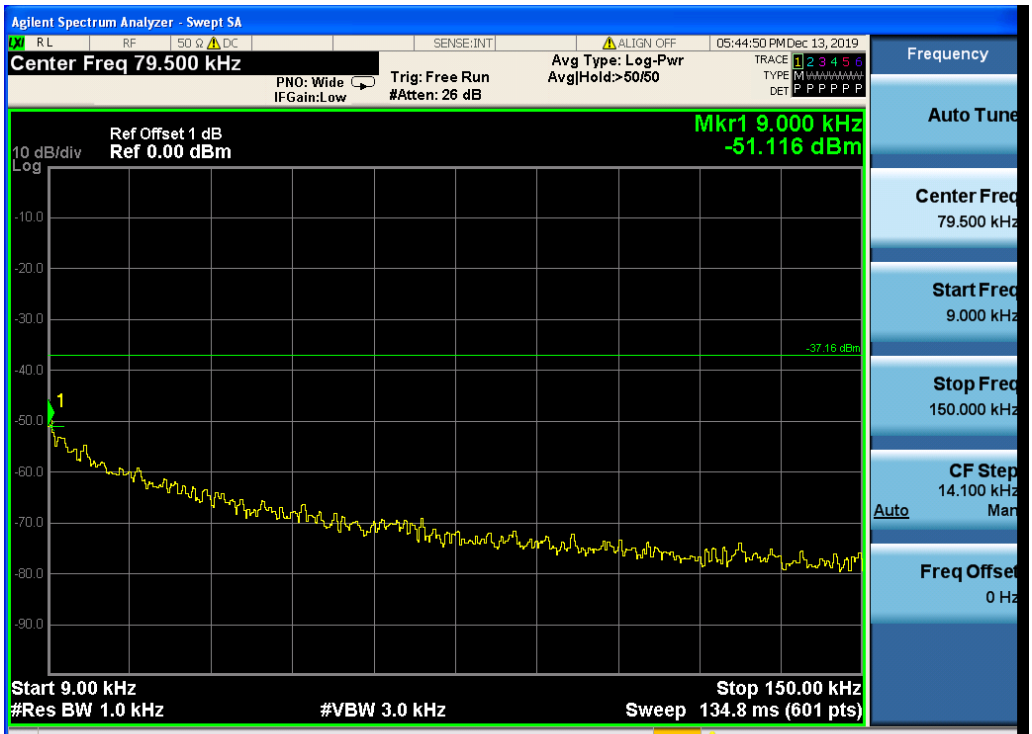
4.8.1.1.8 802.11 N20_ Middle Channel

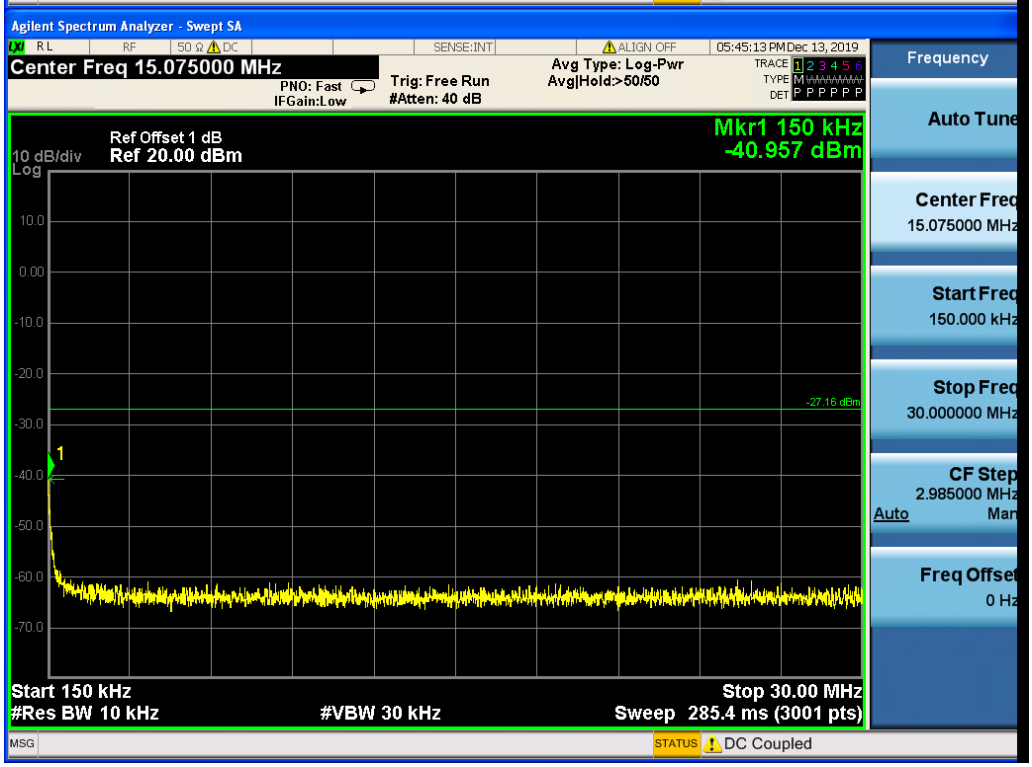


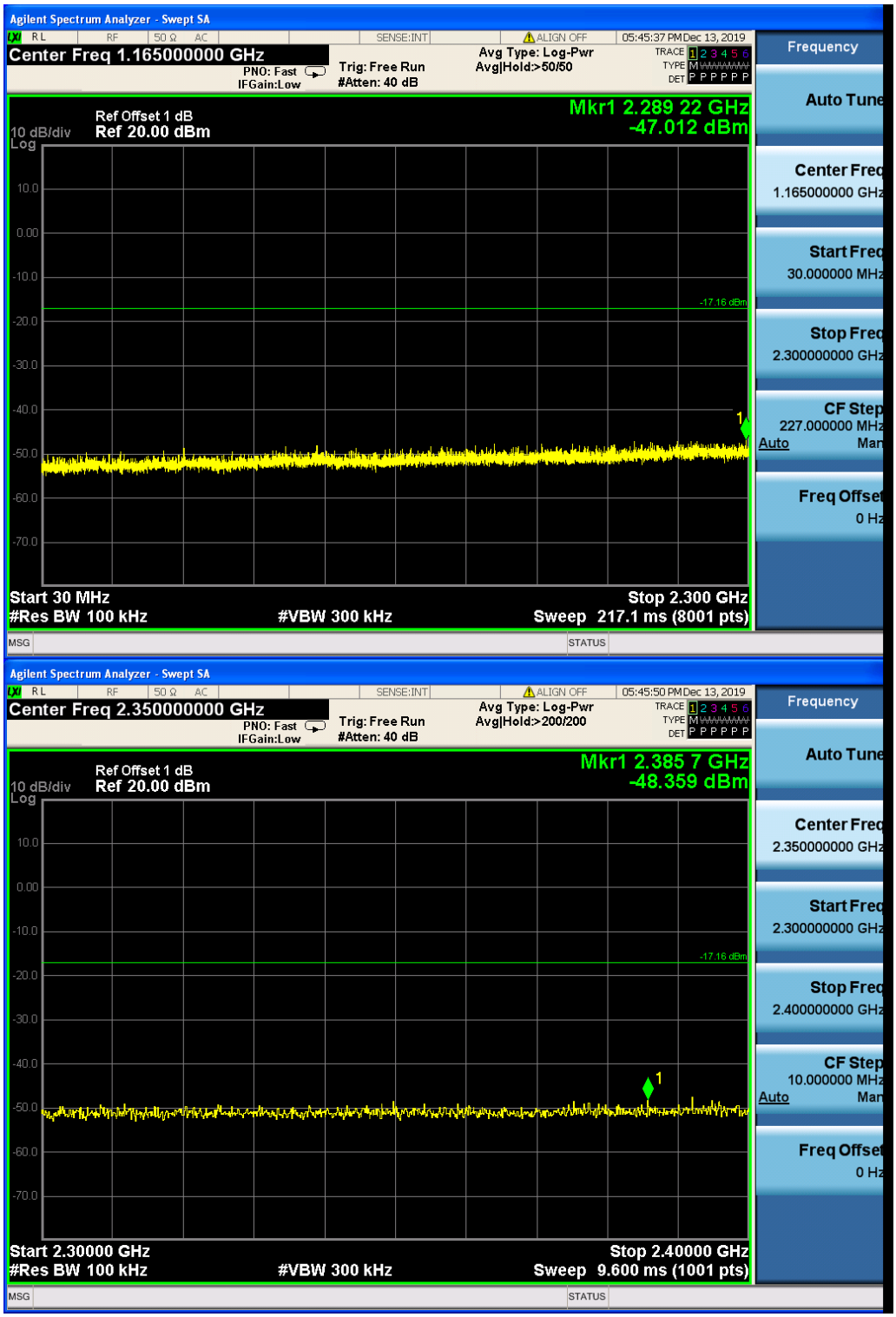


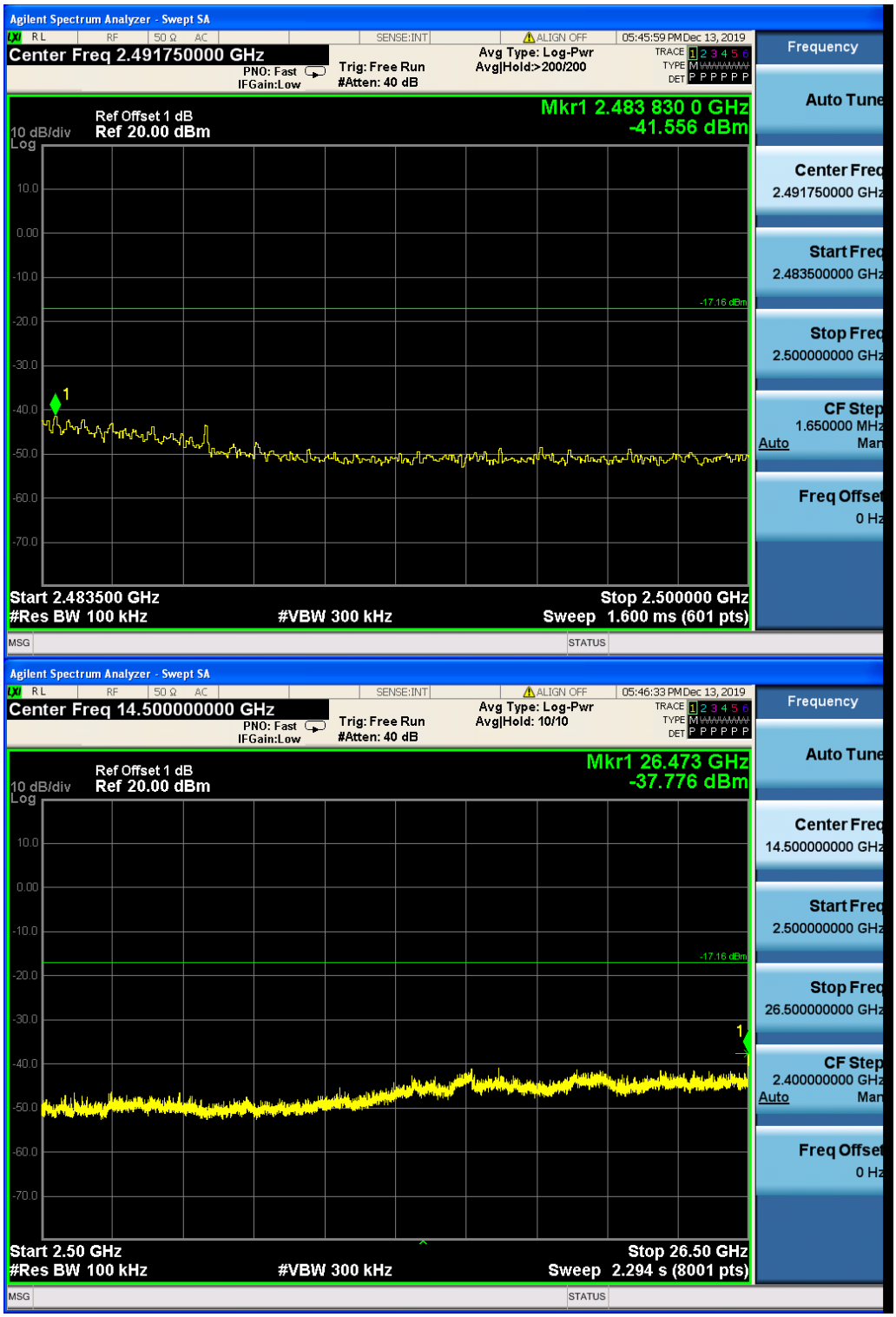


4.8.1.1.9 802.11 N20_ Highest Channel









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.

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China 518057 t (86–755) 26012053 f (86–755) 26710594 www.sgsgroup.com.cn
中国·深圳·科技园中区M–10栋一号厂房 邮编: 518057 t (86–755) 26012053 f (86–755) 26710594 sgs.china@sgs.com

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:	

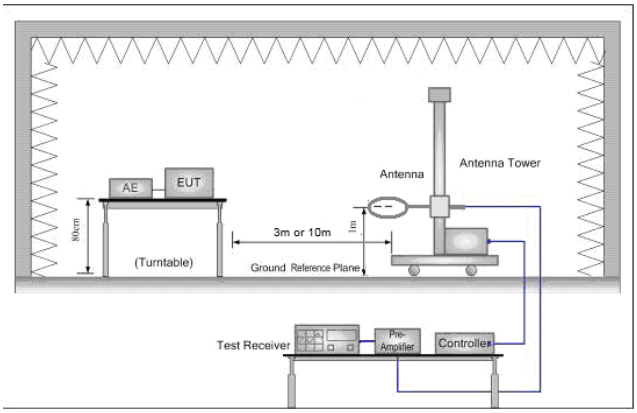


Figure 1. Below 30MHz

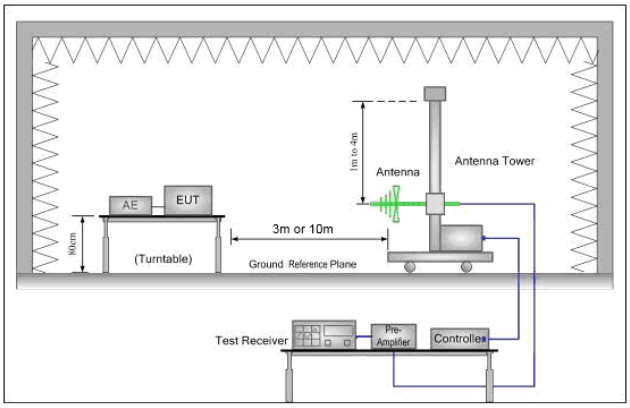


Figure 2. 30MHz to 1GHz

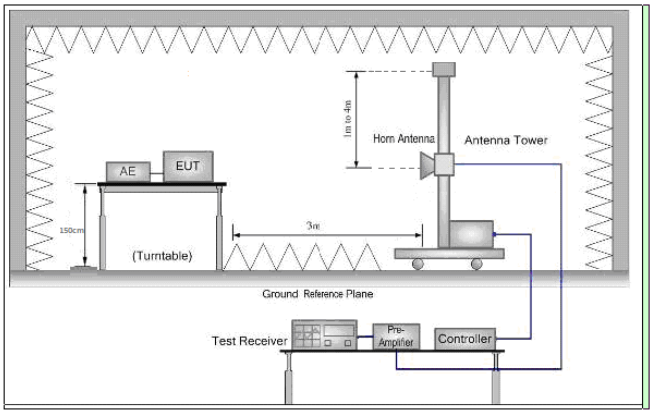


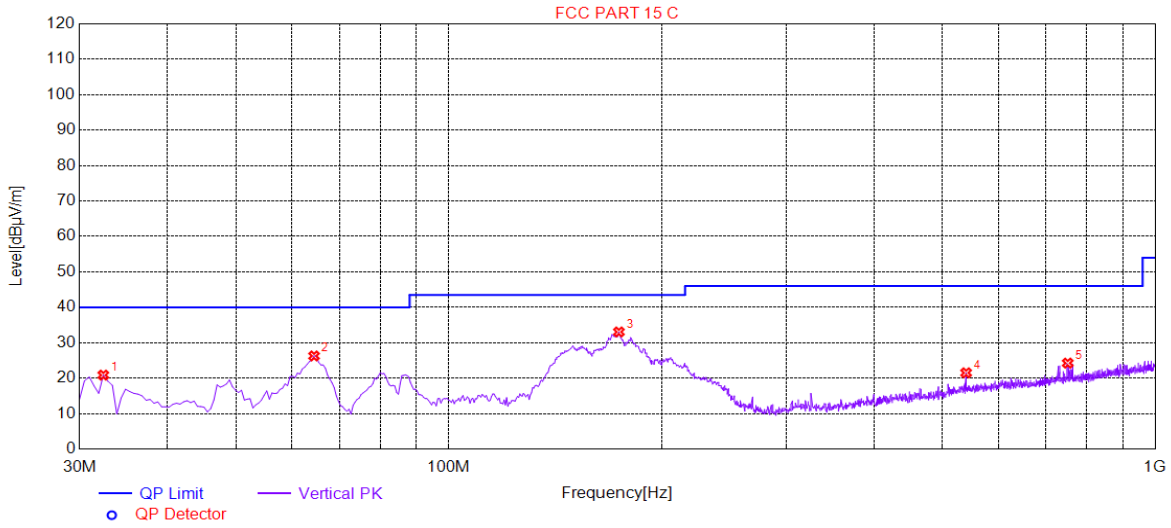
Figure 3. Above 1 GHz

Test Procedure:	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(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. f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. g. 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

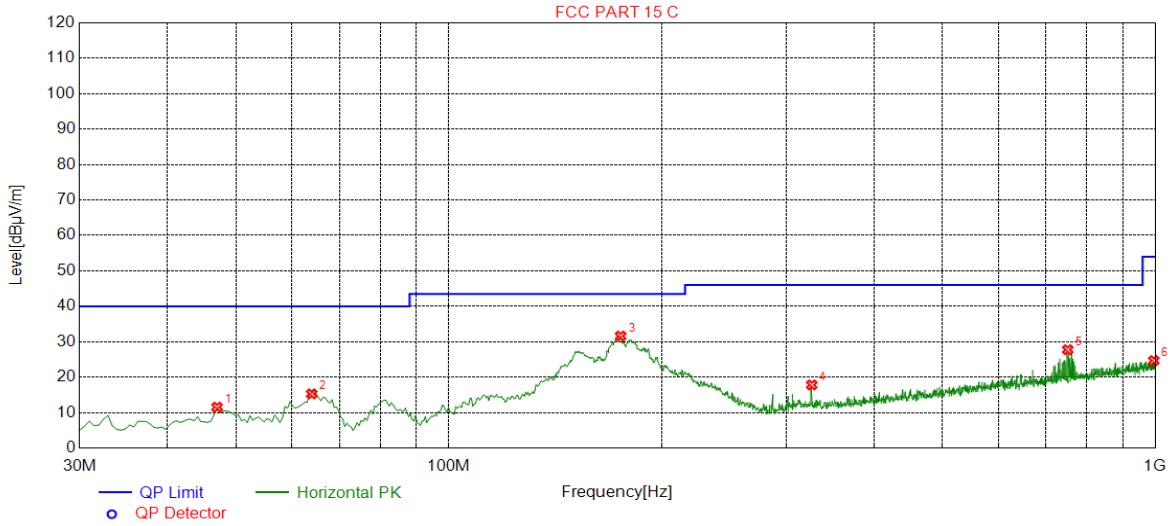
4.9.1 Radiated emission below 1GHz

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	266	181	Vertical
2	64.4522	26.27	-32.79	40.00	13.73	255	247	Vertical
3	174.1171	33.05	-33.32	43.50	10.45	267	317	Vertical
4	539.9900	21.51	-21.69	46.00	24.49	209	282	Vertical
5	752.0410	24.25	-17.40	46.00	21.75	235	282	Vertical

4.9.1.2 Charge + Transmitting, Horizontal



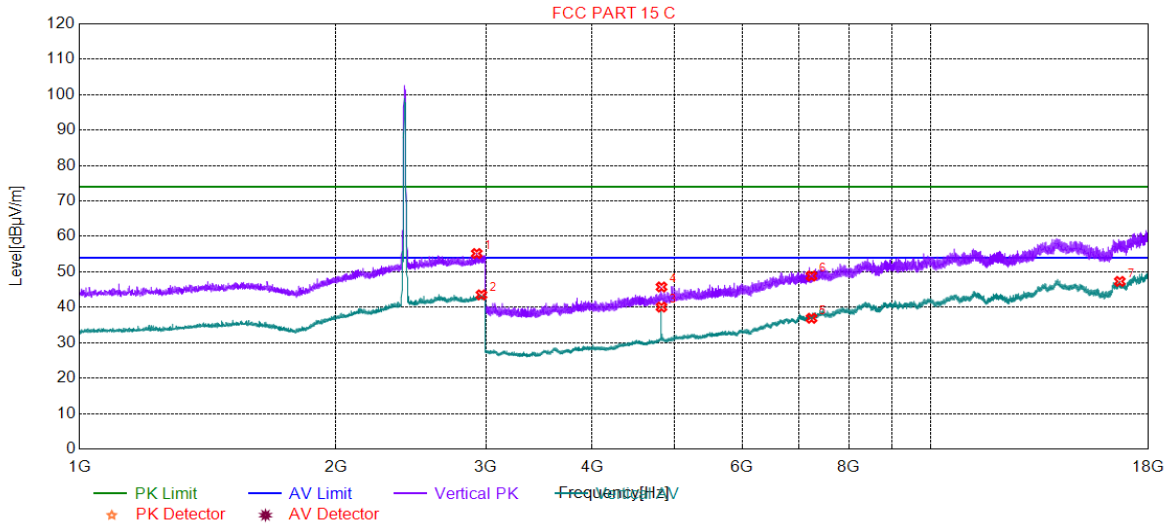
Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.9835	11.54	-30.20	40.00	28.46	101	34	Horizontal
2	63.9670	15.29	-32.66	40.00	24.71	224	90	Horizontal
3	175.0875	31.60	-33.25	43.50	11.90	185	124	Horizontal
4	326.4832	17.81	-27.08	46.00	28.19	231	128	Horizontal
5	752.0410	27.75	-17.40	46.00	18.25	149	334	Horizontal
6	995.6328	24.68	-13.92	54.00	29.32	197	225	Horizontal

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgsgroup.com.cn
中国·深圳·科技园中区M-10栋一号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

4.9.2 Transmitter emission above 1GHz

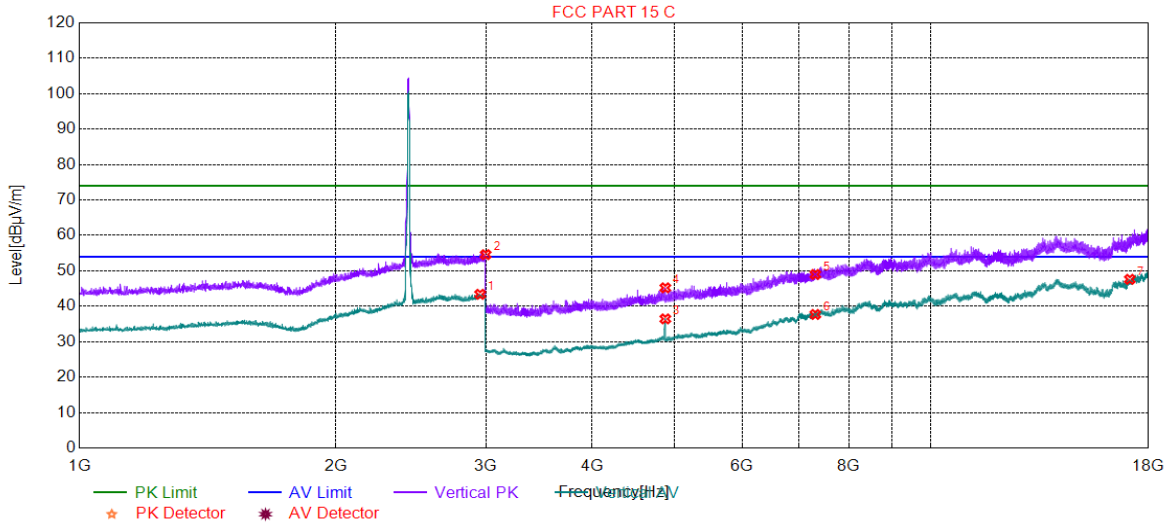
4.9.2.1 ANT1

4.9.2.1.1 802.11B_Lowest Channel_ Vertical



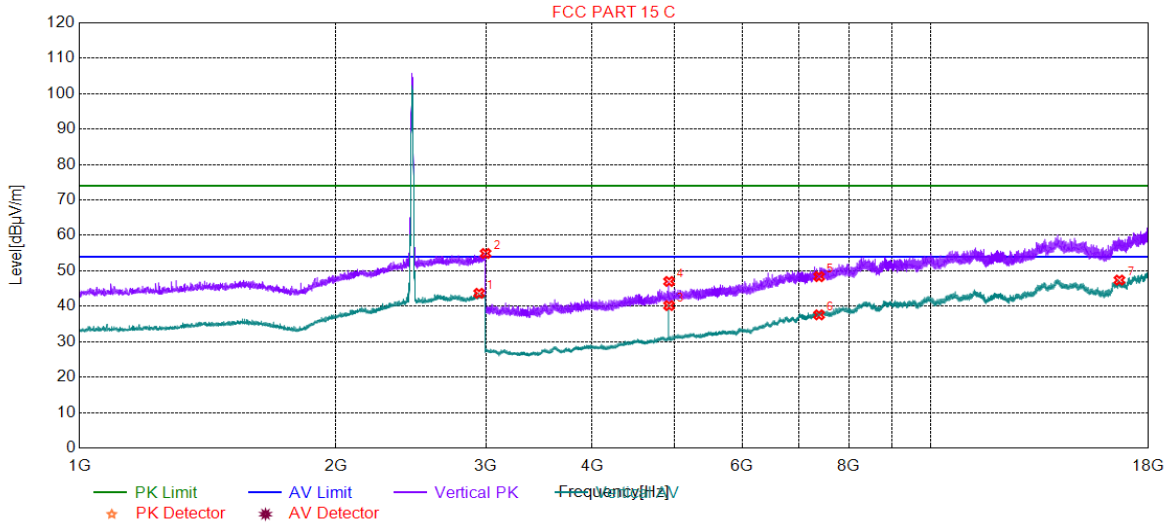
Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2927.481	55.18	9.44	74.00	18.82	198	305	Vertical
2	2964.991	43.51	9.61	54.00	10.49	150	331	Vertical
3	4824.000	40.06	-18.21	54.00	13.94	238	233	Vertical
4	4824.000	45.74	-18.21	74.00	28.26	207	260	Vertical
5	7236.000	36.91	-9.99	54.00	17.09	183	270	Vertical
6	7236.000	48.84	-9.99	74.00	25.16	245	168	Vertical
7	16653.53	47.31	0.41	54.00	6.69	230	320	Vertical

4.9.2.2 802.11B_ Middle Channel_ Vertical



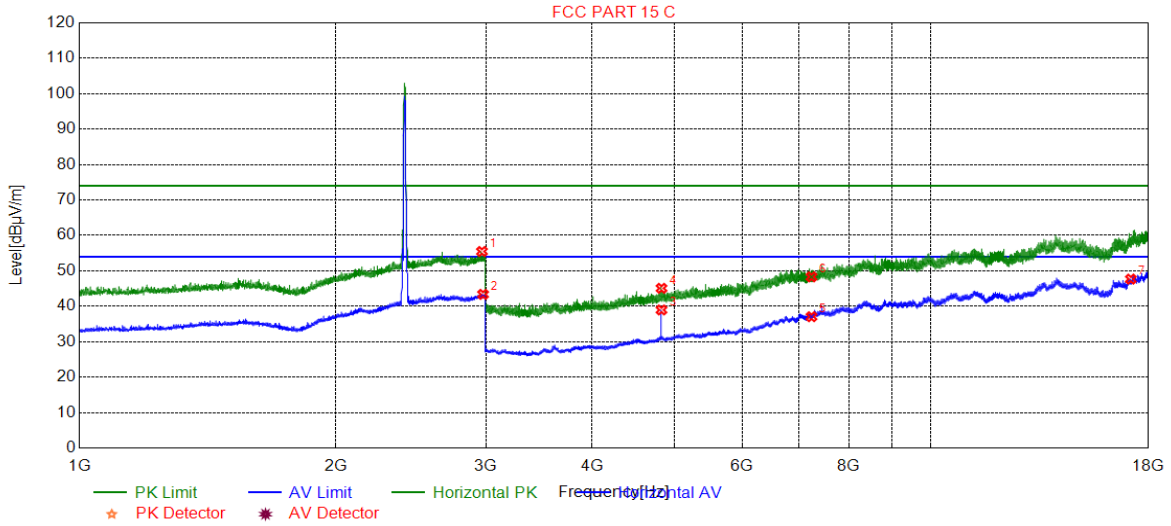
Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2954.488	43.39	9.66	54.00	10.61	292	318	Vertical
2	2998.999	54.58	9.45	74.00	19.42	257	59	Vertical
3	4874.000	36.45	-17.99	54.00	17.55	226	252	Vertical
4	4874.000	45.21	-17.99	74.00	28.79	258	252	Vertical
5	7311.000	48.99	-9.74	74.00	25.01	240	18	Vertical
6	7311.000	37.69	-9.74	54.00	16.31	218	360	Vertical
7	17109.50	47.61	0.04	54.00	6.39	296	18	Vertical

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	186	333	Vertical
2	2998.499	54.91	9.46	74.00	19.09	216	320	Vertical
3	4924.000	40.20	-17.72	54.00	13.80	216	259	Vertical
4	4924.000	47.01	-17.72	74.00	26.99	246	232	Vertical
5	7386.000	48.37	-9.55	74.00	25.63	155	118	Vertical
6	7386.000	37.58	-9.55	54.00	16.42	269	68	Vertical
7	16635.93	47.39	0.34	54.00	6.61	217	118	Vertical

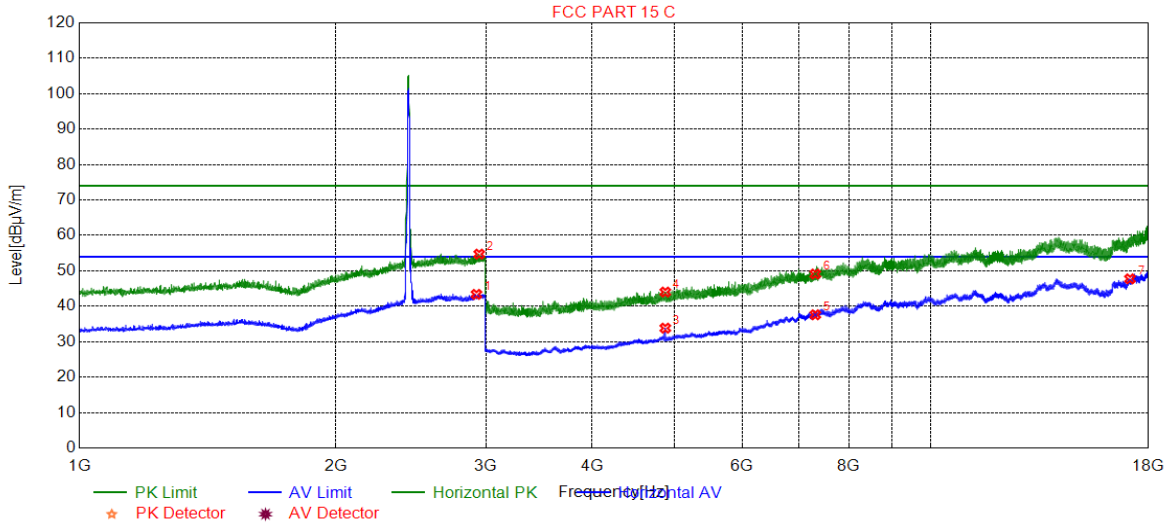
4.9.2.2.2 802.11B_Lowest Channel_ Horizontal



Suspected List

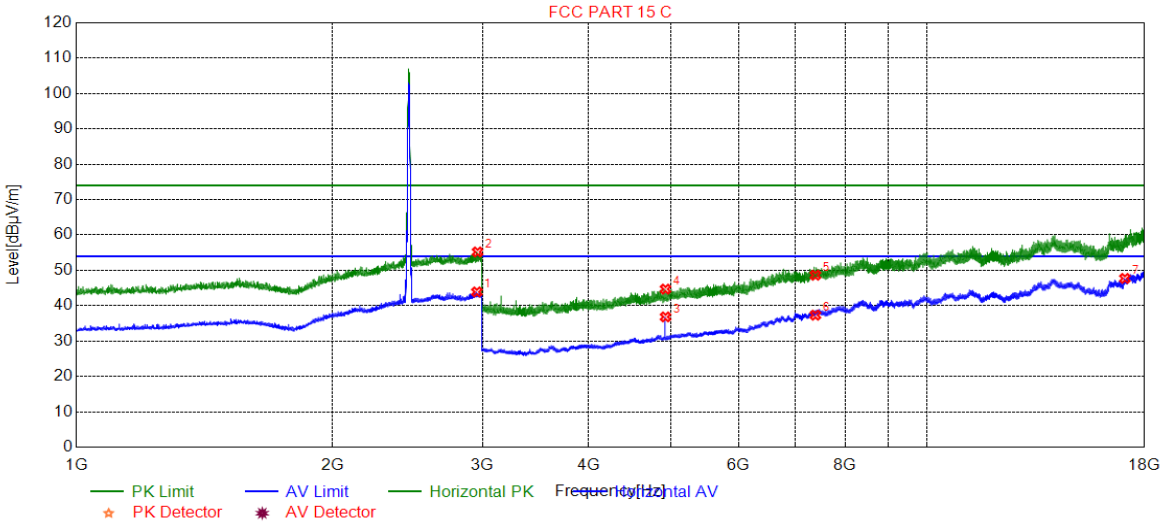
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2968.992	55.47	9.59	74.00	18.53	136	2	Horizontal
2	2977.994	43.37	9.55	54.00	10.63	200	122	Horizontal
3	4824.000	38.97	-18.21	54.00	15.03	186	206	Horizontal
4	4824.000	45.08	-18.21	74.00	28.92	160	178	Horizontal
5	7236.000	37.06	-9.99	54.00	16.94	212	217	Horizontal
6	7236.000	48.31	-9.99	74.00	25.69	220	117	Horizontal
7	17156.80	47.68	0.06	54.00	6.32	118	318	Horizontal

4.9.2.2.3 802.11B_ Middle Channel_ Horizontal



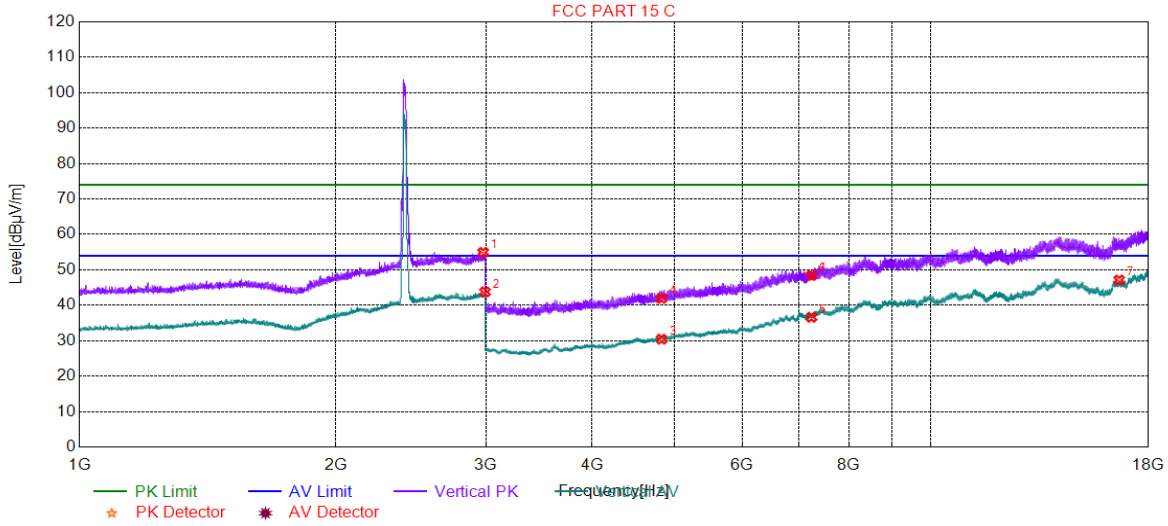
Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2924.981	43.37	9.41	54.00	10.63	153	53	Horizontal
2	2946.986	54.73	9.65	74.00	19.27	208	53	Horizontal
3	4874.000	33.83	-17.99	54.00	20.17	158	207	Horizontal
4	4874.000	44.01	-17.99	74.00	29.99	123	180	Horizontal
5	7311.000	37.60	-9.74	54.00	16.40	112	68	Horizontal
6	7311.000	49.11	-9.74	74.00	24.89	177	218	Horizontal
7	17117.20	47.74	0.05	54.00	6.26	212	218	Horizontal

4.9.2.2.4 802.11B_ Highest Channel_ Horizontal



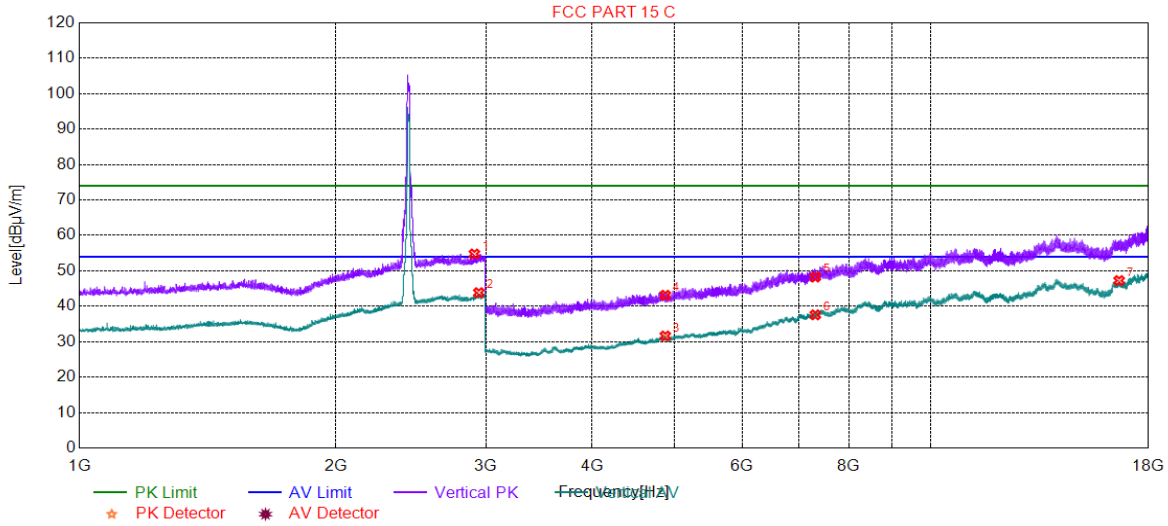
Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2955.488	43.90	9.65	54.00	10.10	238	220	Horizontal
2	2960.990	55.20	9.63	74.00	18.80	133	96	Horizontal
3	4924.000	36.84	-17.72	54.00	17.16	241	205	Horizontal
4	4924.000	44.70	-17.72	74.00	29.30	182	177	Horizontal
5	7386.000	48.63	-9.55	74.00	25.37	210	18	Horizontal
6	7386.000	37.33	-9.55	54.00	16.67	181	326	Horizontal
7	17063.30	47.72	0.30	54.00	6.28	104	69	Horizontal

4.9.2.2.5 802.11G_Lowest Channel_ Vertical



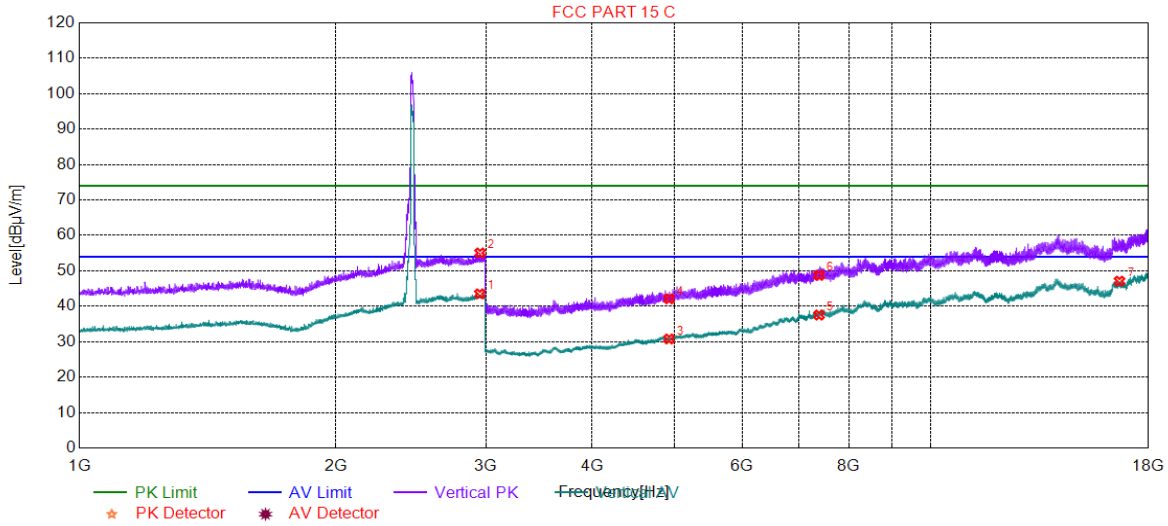
Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2978.994	54.94	9.55	74.00	19.06	297	349	Vertical
2	2993.498	43.78	9.48	54.00	10.22	159	18	Vertical
3	4824.000	30.43	-18.21	54.00	23.57	283	40	Vertical
4	4824.000	41.95	-18.21	74.00	32.05	295	177	Vertical
5	7236.000	36.63	-9.99	54.00	17.37	204	219	Vertical
6	7236.000	48.44	-9.99	74.00	25.56	251	320	Vertical
7	16626.58	47.14	0.30	54.00	6.86	185	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	271	322	Vertical
2	2943.986	43.84	9.62	54.00	10.16	230	350	Vertical
3	4874.000	31.63	-17.99	54.00	22.37	257	144	Vertical
4	4874.000	43.12	-17.99	74.00	30.88	280	342	Vertical
5	7311.000	48.25	-9.74	74.00	25.75	170	69	Vertical
6	7311.000	37.59	-9.74	54.00	16.41	297	220	Vertical
7	16624.38	47.25	0.29	54.00	6.75	292	269	Vertical

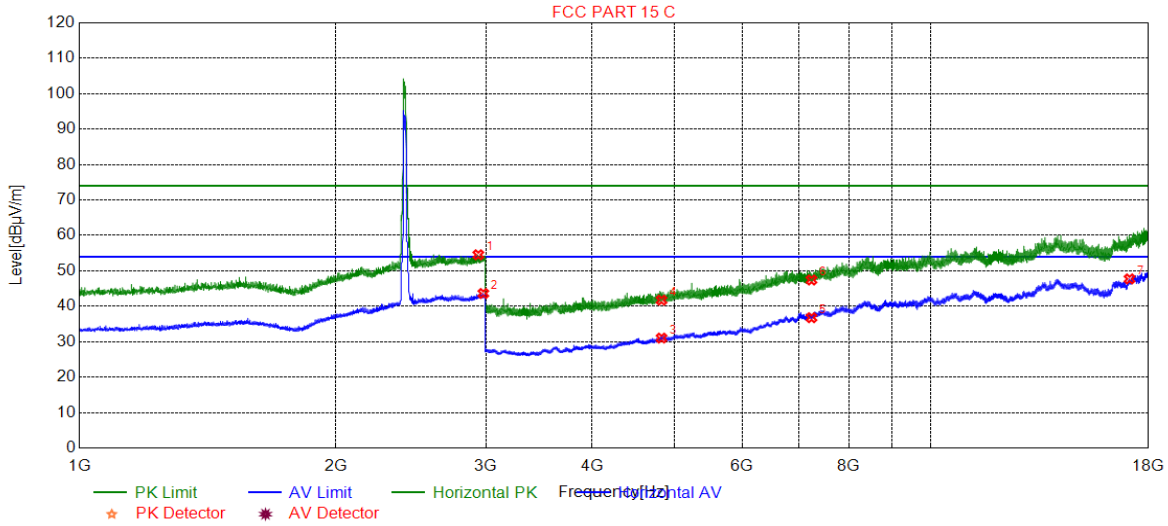
4.9.2.2.7 802.11G_ Highest Channel_ Vertical



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	220	128	Vertical
2	2953.988	55.05	9.66	74.00	18.95	181	197	Vertical
3	4924.000	30.78	-17.72	54.00	23.22	228	342	Vertical
4	4924.000	42.10	-17.72	74.00	31.90	262	205	Vertical
5	7386.000	37.54	-9.55	54.00	16.46	213	325	Vertical
6	7386.000	48.74	-9.55	74.00	25.26	196	325	Vertical
7	16640.33	47.10	0.36	54.00	6.90	273	325	Vertical

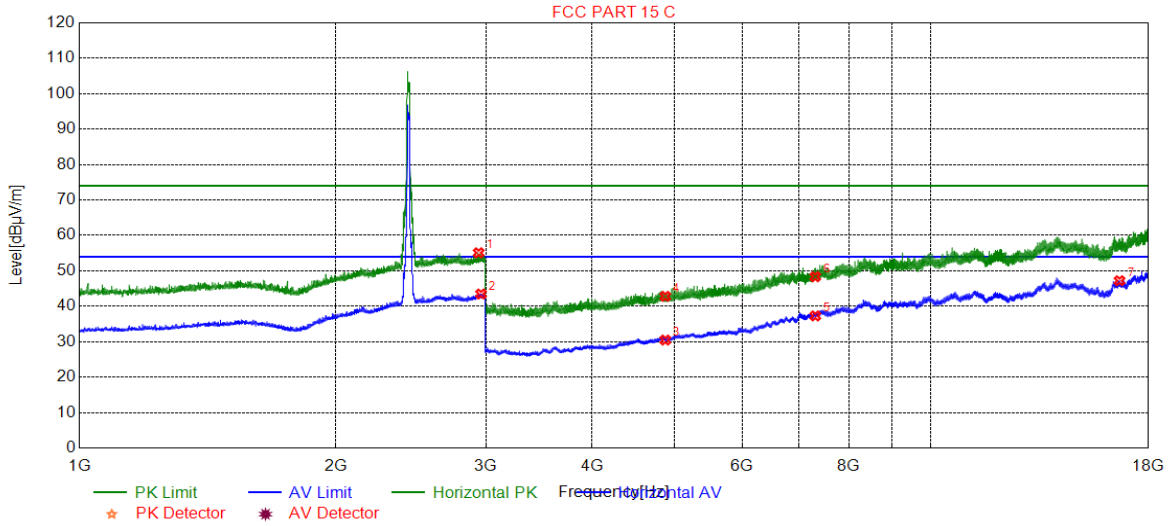
4.9.2.2.8 802.11G_Lowest Channel_ Horizontal



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	239	139	Horizontal
2	2979.995	43.62	9.54	54.00	10.38	242	342	Horizontal
3	4824.000	31.03	-18.21	54.00	22.97	183	287	Horizontal
4	4824.000	41.73	-18.21	74.00	32.27	210	287	Horizontal
5	7236.000	36.78	-9.99	54.00	17.22	135	360	Horizontal
6	7236.000	47.42	-9.99	74.00	26.58	102	360	Horizontal
7	17097.95	47.73	0.05	54.00	6.27	207	360	Horizontal

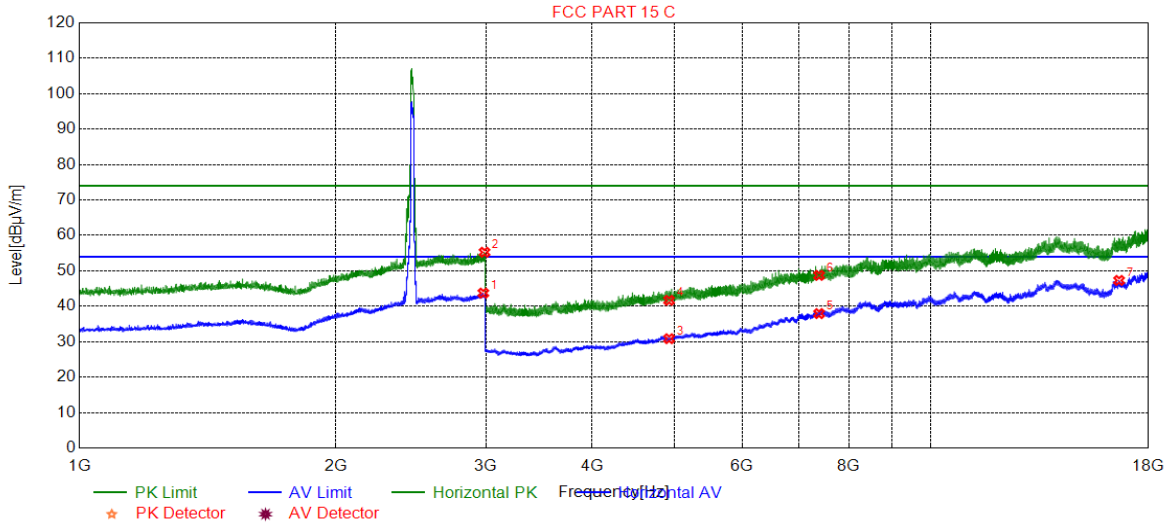
4.9.2.2.9 802.11G_ Middle Channel_ Horizontal



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	248	152	Horizontal
2	2961.490	43.47	9.63	54.00	10.53	113	97	Horizontal
3	4874.000	30.48	-17.99	54.00	23.52	123	206	Horizontal
4	4874.000	42.81	-17.99	74.00	31.19	208	315	Horizontal
5	7311.000	37.29	-9.74	54.00	16.71	225	320	Horizontal
6	7311.000	48.34	-9.74	74.00	25.66	148	320	Horizontal
7	16640.88	47.22	0.36	54.00	6.78	117	118	Horizontal

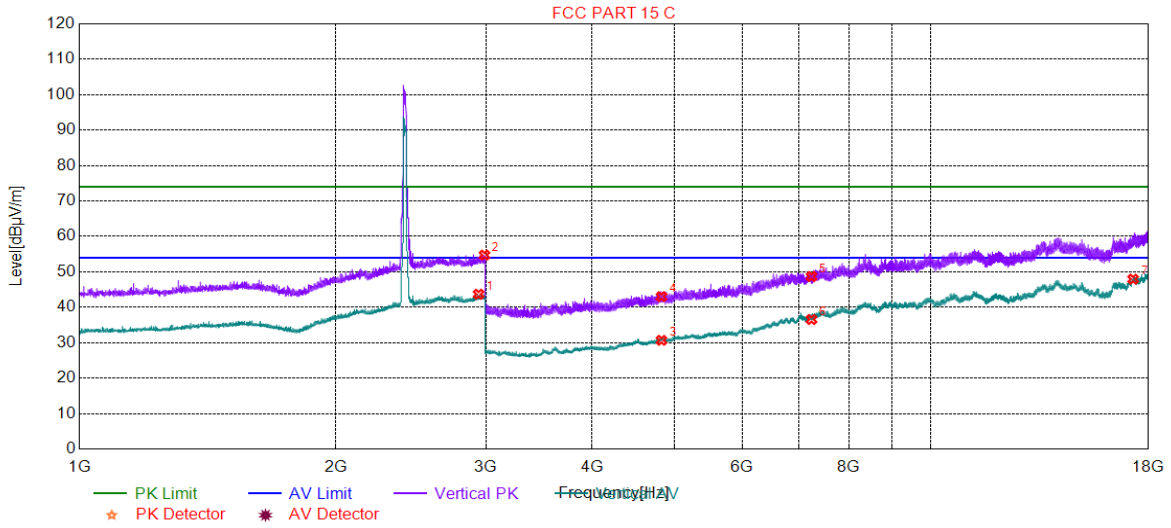
4.9.2.2.10 802.11G_ Highest Channel_ Horizontal



Suspected List

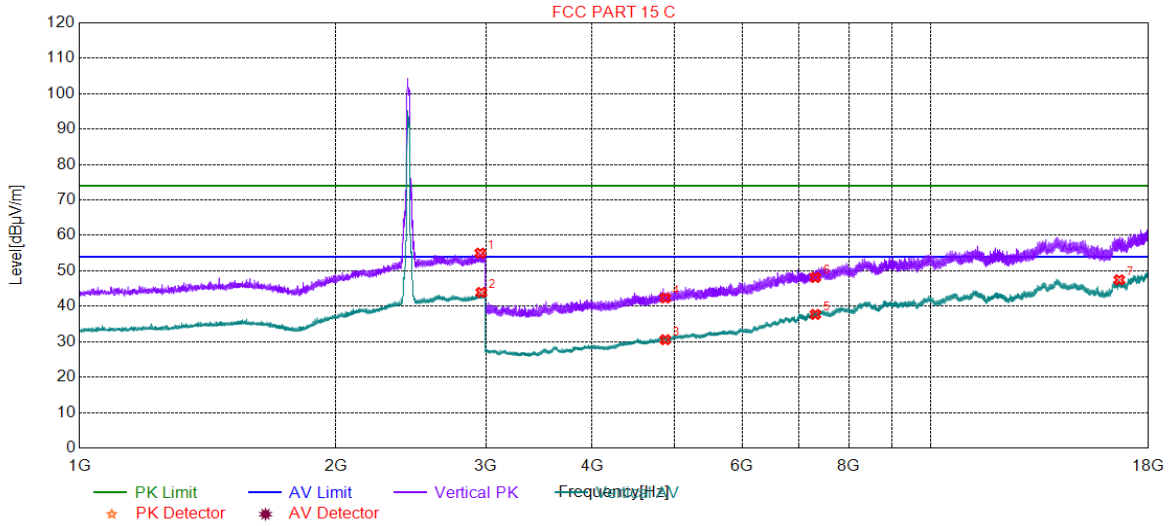
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2979.995	43.72	9.54	54.00	10.28	230	109	Horizontal
2	2989.497	55.25	9.50	74.00	18.75	208	342	Horizontal
3	4924.000	30.86	-17.72	54.00	23.14	142	9	Horizontal
4	4924.000	41.68	-17.72	74.00	32.32	234	173	Horizontal
5	7386.000	37.94	-9.55	54.00	16.06	187	68	Horizontal
6	7386.000	48.73	-9.55	74.00	25.27	165	68	Horizontal
7	16622.18	47.30	0.28	54.00	6.70	214	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	256	183	Vertical
2	2989.497	54.72	9.50	74.00	19.28	282	169	Vertical
3	4824.000	30.68	-18.21	54.00	23.32	270	260	Vertical
4	4824.000	43.01	-18.21	74.00	30.99	165	69	Vertical
5	7236.000	48.68	-9.99	74.00	25.32	277	322	Vertical
6	7236.000	36.56	-9.99	54.00	17.44	289	170	Vertical
7	17263.51	47.95	0.53	54.00	6.05	244	271	Vertical

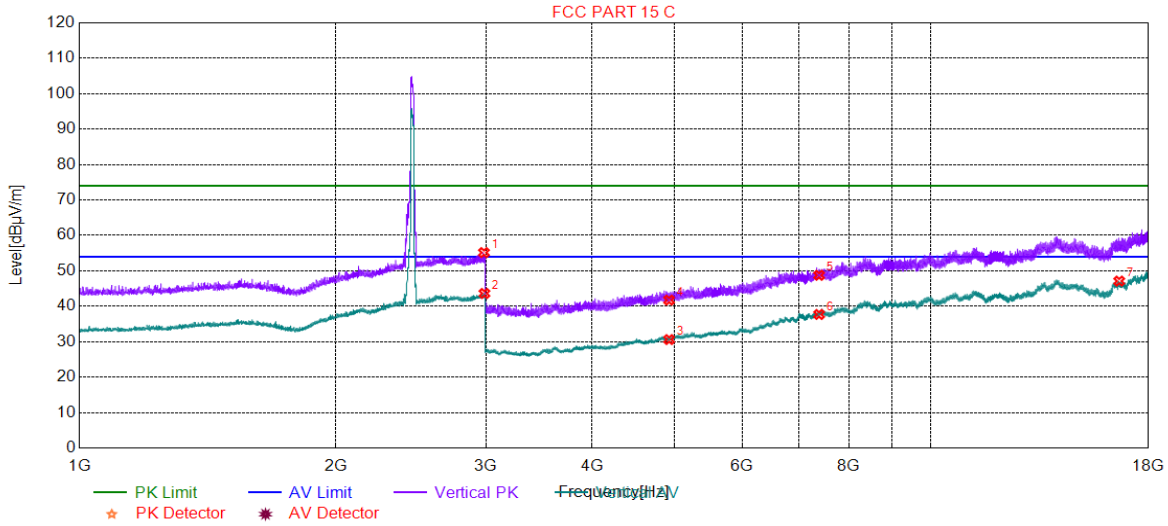
4.9.2.2.12 802.11N20_ Middle Channel_ Vertical



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	260	31	Vertical
2	2963.991	43.92	9.62	54.00	10.08	201	44	Vertical
3	4874.000	30.57	-17.99	54.00	23.43	223	231	Vertical
4	4874.000	42.33	-17.99	74.00	31.67	277	177	Vertical
5	7311.000	37.71	-9.74	54.00	16.29	217	360	Vertical
6	7311.000	48.13	-9.74	74.00	25.87	171	68	Vertical
7	16629.88	47.48	0.31	54.00	6.52	269	18	Vertical

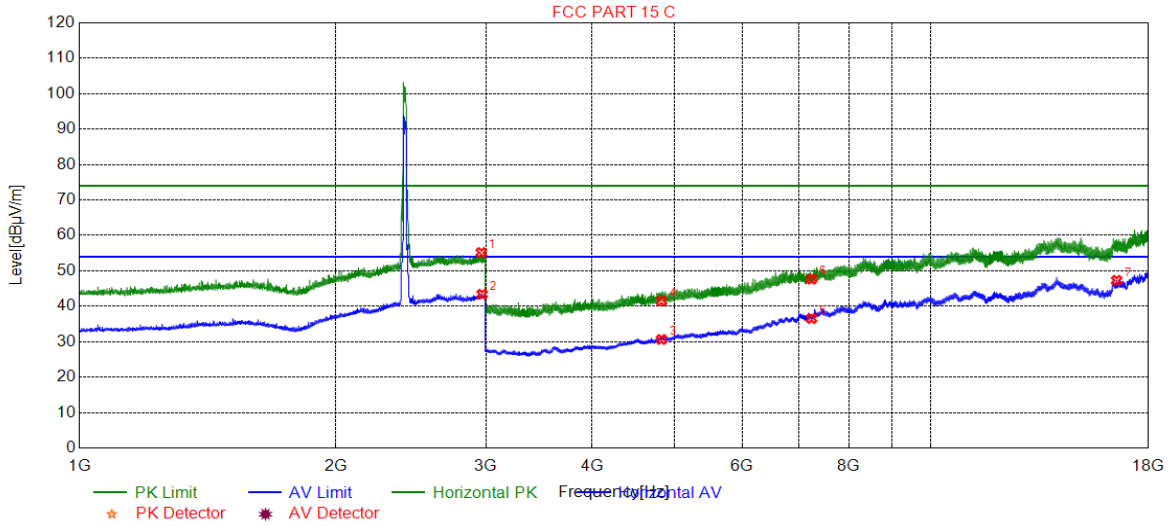
4.9.2.2.13 802.11N20_ Highest Channel_ Vertical



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	267	114	Vertical
2	2988.997	43.63	9.50	54.00	10.37	242	264	Vertical
3	4924.000	30.62	-17.72	54.00	23.38	186	315	Vertical
4	4924.000	41.75	-17.72	74.00	32.25	232	69	Vertical
5	7386.000	48.75	-9.55	74.00	25.25	207	119	Vertical
6	7386.000	37.70	-9.55	54.00	16.30	291	172	Vertical
7	16627.13	47.11	0.30	54.00	6.89	275	18	Vertical

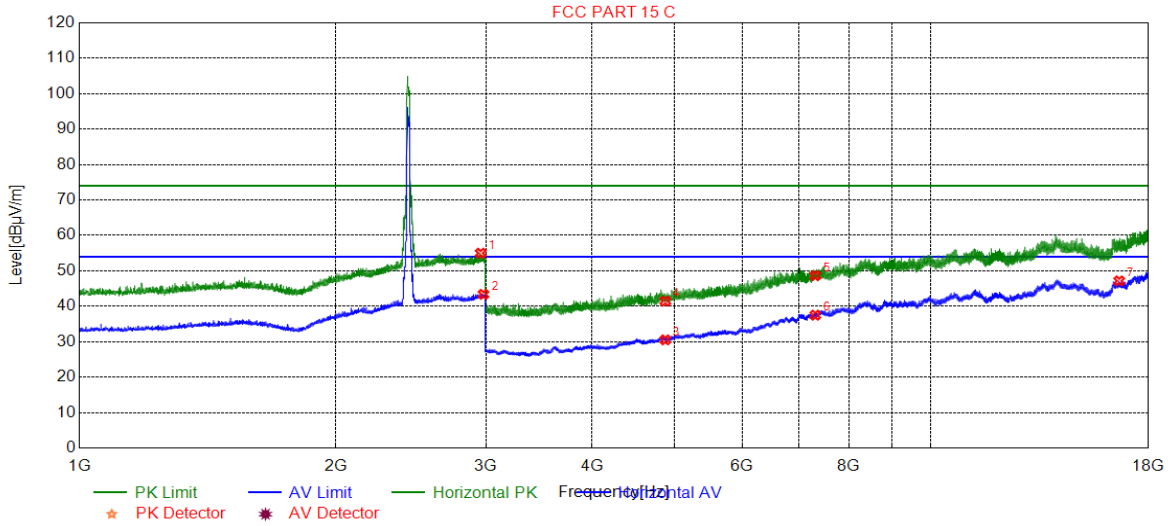
4.9.2.2.14 802.11N20_Lowest Channel_ Horizontal



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	128	329	Horizontal
2	2969.992	43.40	9.59	54.00	10.60	138	15	Horizontal
3	4824.000	30.64	-18.21	54.00	23.36	149	150	Horizontal
4	4824.000	41.52	-18.21	74.00	32.48	104	232	Horizontal
5	7236.000	36.55	-9.99	54.00	17.45	222	168	Horizontal
6	7236.000	47.68	-9.99	74.00	26.32	169	18	Horizontal
7	16513.82	47.32	0.32	54.00	6.68	154	168	Horizontal

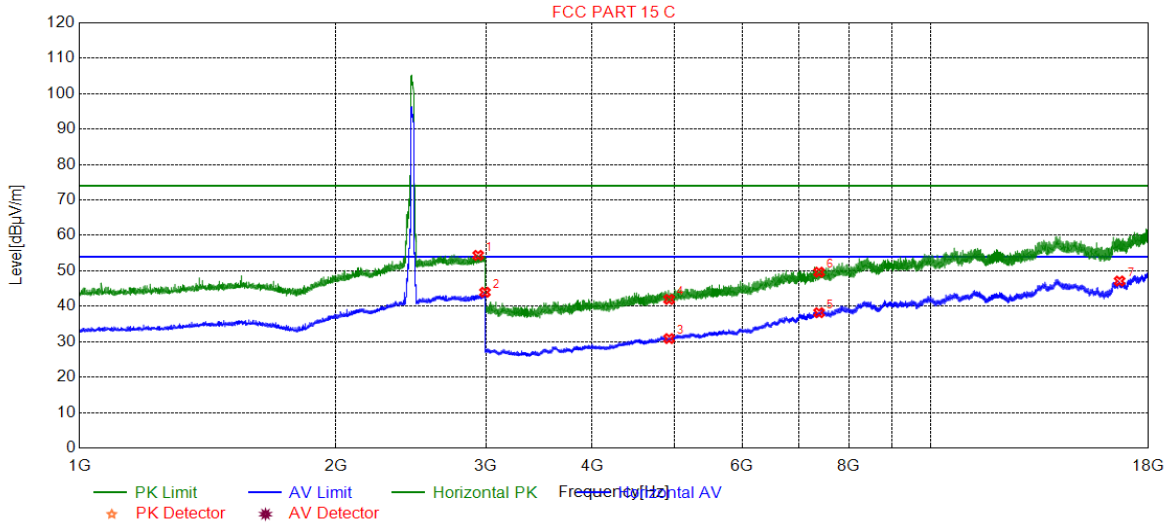
4.9.2.2.15 802.11N20_ Middle Channel_ Horizontal



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	158	342	Horizontal
2	2981.495	43.38	9.54	54.00	10.62	102	262	Horizontal
3	4874.000	30.53	-17.99	54.00	23.47	116	342	Horizontal
4	4874.000	41.45	-17.99	74.00	32.55	240	342	Horizontal
5	7311.000	48.64	-9.74	74.00	25.36	133	69	Horizontal
6	7311.000	37.50	-9.74	54.00	16.50	166	360	Horizontal
7	16627.13	47.16	0.30	54.00	6.84	109	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	232	178	Horizontal
2	2992.998	43.96	9.48	54.00	10.04	162	259	Horizontal
3	4924.000	30.89	-17.72	54.00	23.11	147	342	Horizontal
4	4924.000	41.94	-17.72	74.00	32.06	176	342	Horizontal
5	7386.000	38.20	-9.55	54.00	15.80	221	322	Horizontal
6	7386.000	49.64	-9.55	74.00	24.36	224	222	Horizontal
7	16643.08	47.12	0.37	54.00	6.88	226	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:

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

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:			

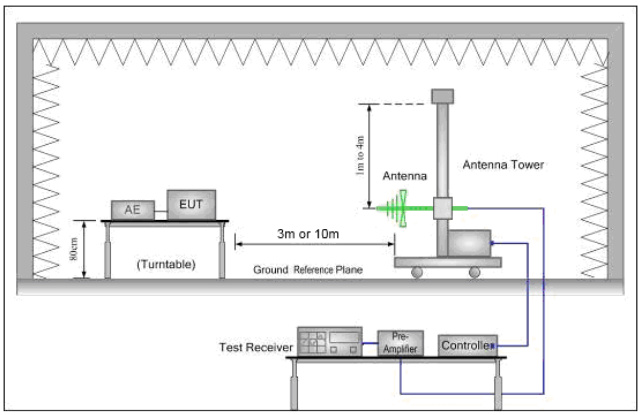


Figure 1. 30MHz to 1GHz

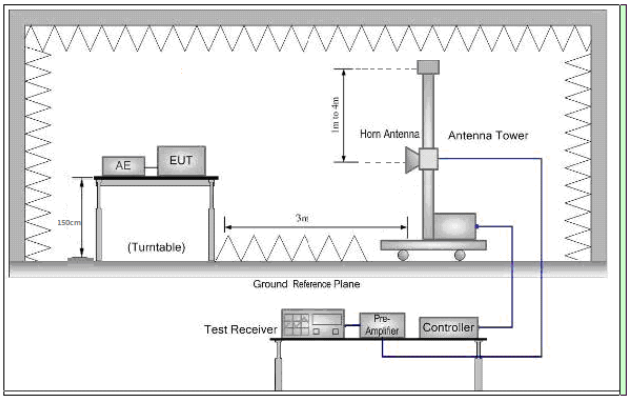


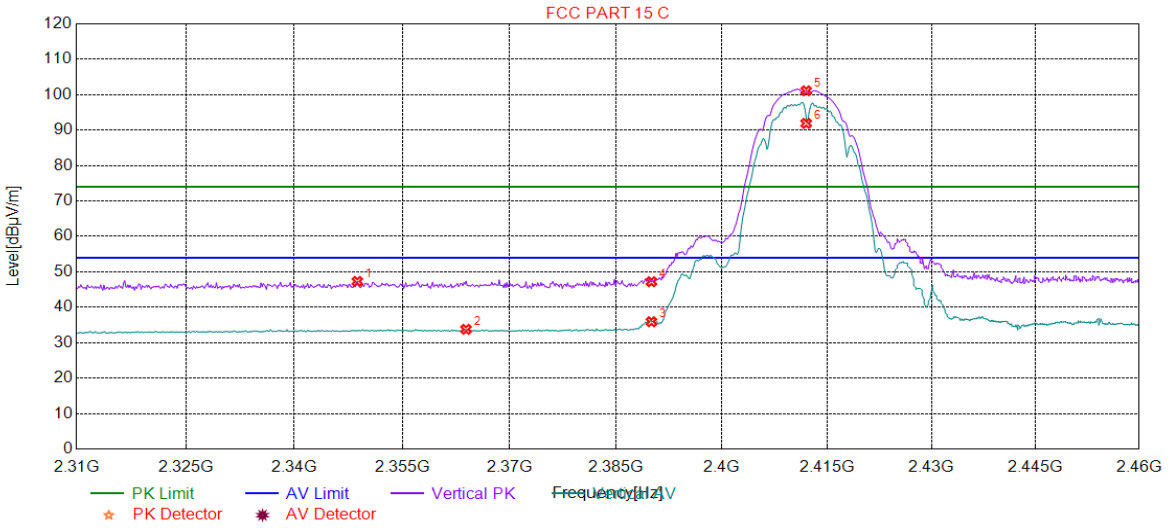
Figure 2. Above 1 GHz

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:

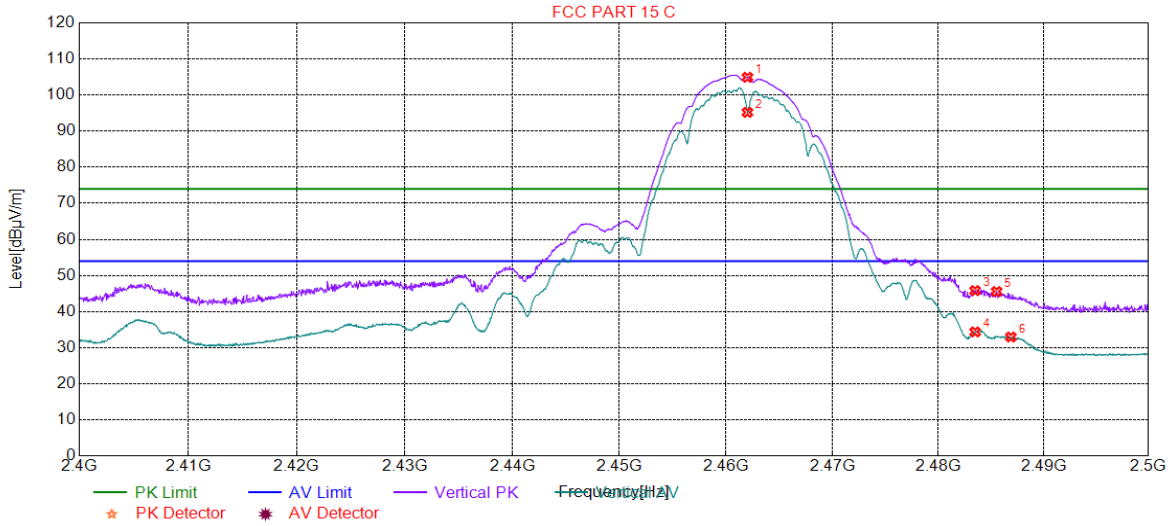
4.10.1 ANT1

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	293	50	Vertical
2	2363.903	33.78	7.80	54.00	20.22	171	320	Vertical
3	2390.000	35.93	7.77	54.00	18.07	222	287	Vertical
4	2390.000	47.23	7.77	74.00	26.77	207	360	Vertical
5	2412.000	101.10	7.81	74.00	-27.10	170	303	Vertical
6	2412.000	91.91	7.81	54.00	-37.91	278	303	Vertical

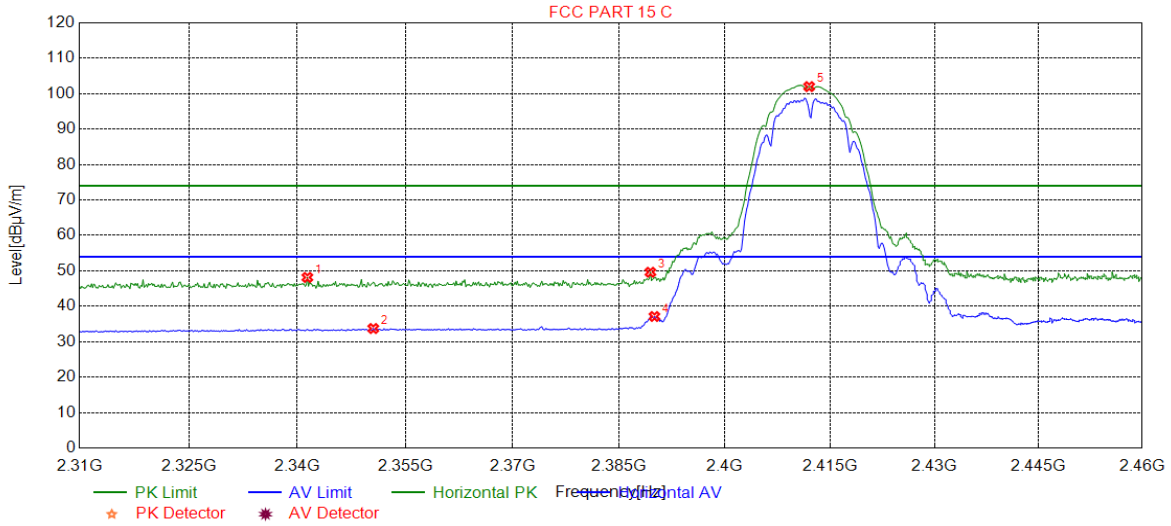
4.10.1.2 802.11B_ Highest Channel_ Vertical



Suspected List

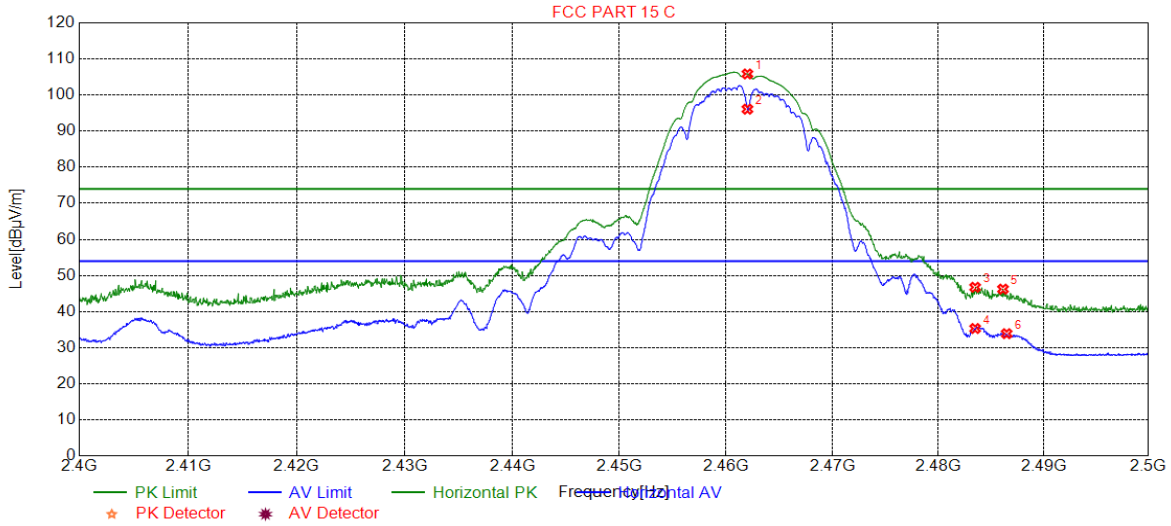
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2462.000	104.91	7.98	74.00	-30.91	265	283	Vertical
2	2462.000	95.20	7.98	54.00	-41.20	204	283	Vertical
3	2483.500	45.81	8.01	74.00	28.19	284	300	Vertical
4	2483.500	34.36	8.01	54.00	19.64	224	278	Vertical
5	2485.542	45.55	8.01	74.00	28.45	230	289	Vertical
6	2486.893	32.96	8.01	54.00	21.04	227	283	Vertical

4.10.1.3 802.11B_Lowest Channel_ Horizontal



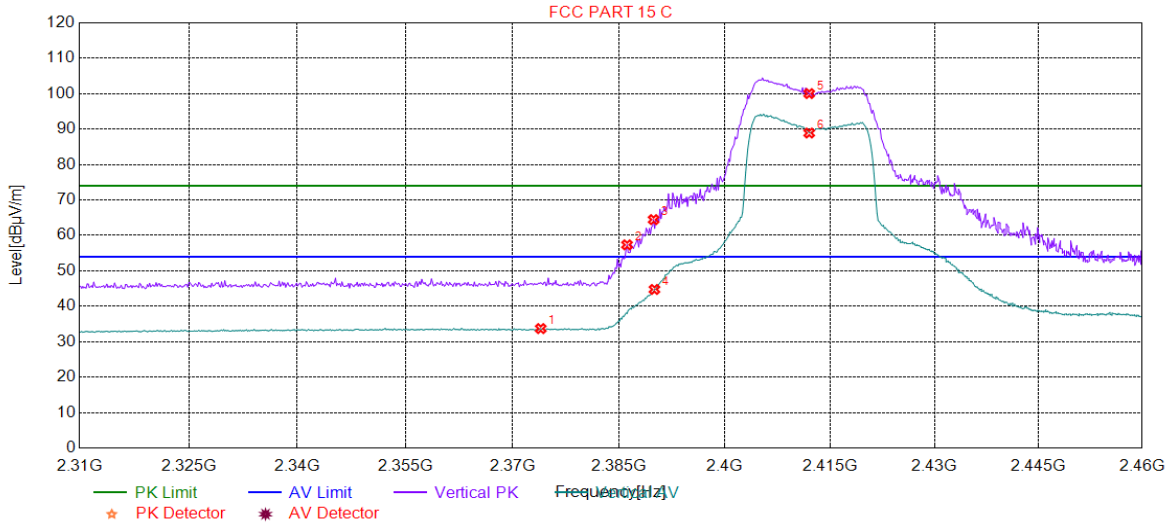
Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2341.381	48.15	7.73	74.00	25.85	115	224	Horizontal
2	2350.540	33.73	7.81	54.00	20.27	168	302	Horizontal
3	2389.429	49.61	7.77	74.00	24.39	236	232	Horizontal
4	2390.000	37.12	7.77	54.00	16.88	225	220	Horizontal
5	2412.000	102.00	7.81	74.00	-28.00	213	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	239	209	Horizontal
2	2462.000	96.08	7.98	54.00	-42.08	188	209	Horizontal
3	2483.500	46.73	8.01	74.00	27.27	110	203	Horizontal
4	2483.500	35.31	8.01	54.00	18.69	247	214	Horizontal
5	2486.143	46.22	8.01	74.00	27.78	130	209	Horizontal
6	2486.493	33.88	8.01	54.00	20.12	229	209	Horizontal

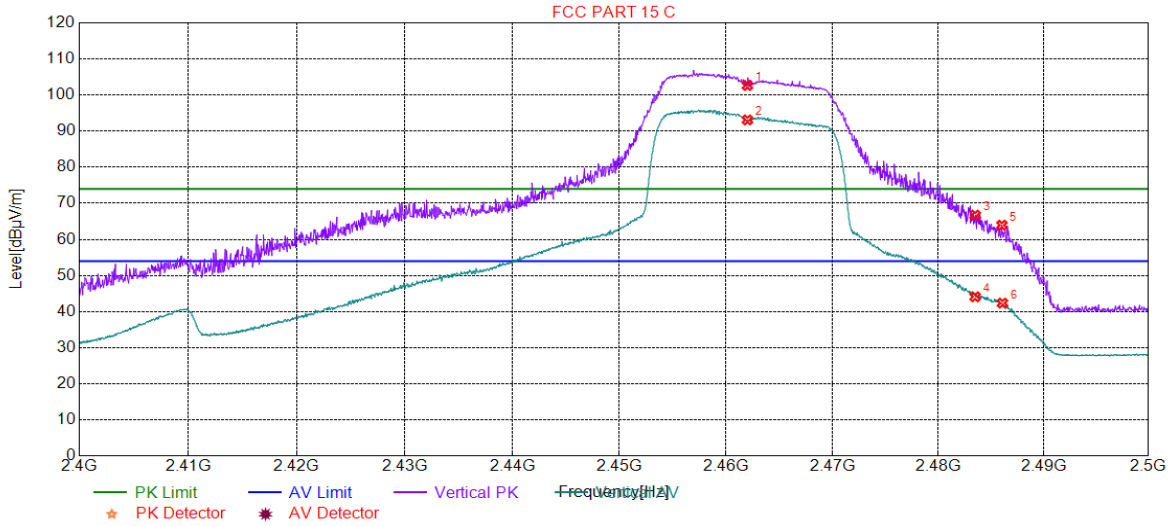
4.10.1.5 802.11G_Lowest Channel_ Vertical



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	177	17	Vertical
2	2386.126	57.35	7.77	74.00	16.65	189	282	Vertical
3	2389.879	64.46	7.77	74.00	9.54	206	282	Vertical
4	2390.000	44.76	7.77	54.00	9.24	165	294	Vertical
5	2412.000	100.03	7.81	74.00	-26.03	271	298	Vertical
6	2412.000	88.90	7.81	54.00	-34.90	275	278	Vertical

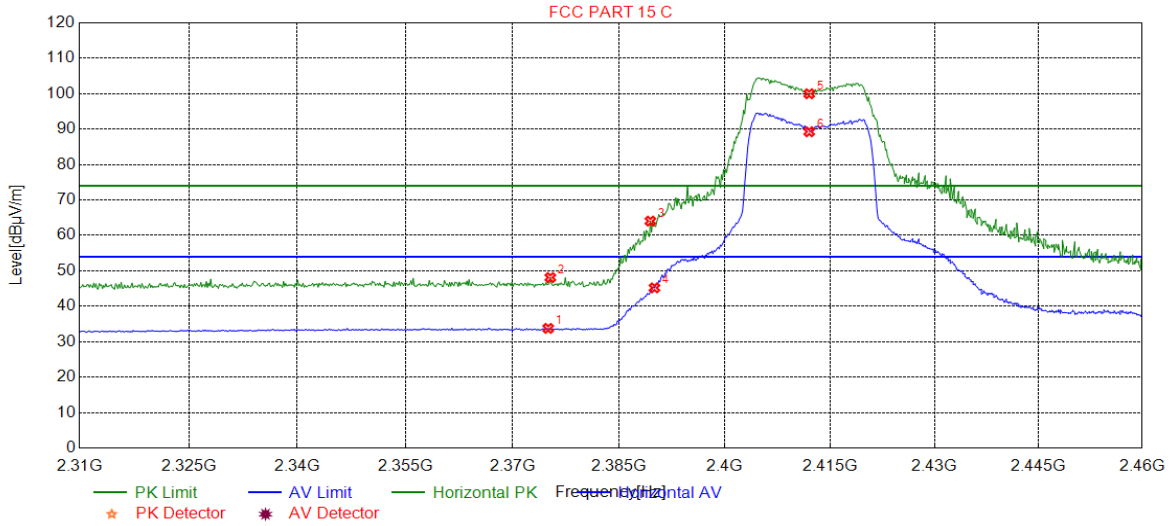
4.10.1.6 802.11G_ Highest Channel_ Vertical



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	232	294	Vertical
2	2462.000	93.11	7.98	54.00	-39.11	247	282	Vertical
3	2483.500	66.73	8.01	74.00	7.27	155	288	Vertical
4	2483.500	44.10	8.01	54.00	9.90	155	277	Vertical
5	2486.043	63.95	8.01	74.00	10.05	160	321	Vertical
6	2486.093	42.36	8.01	54.00	11.64	222	277	Vertical

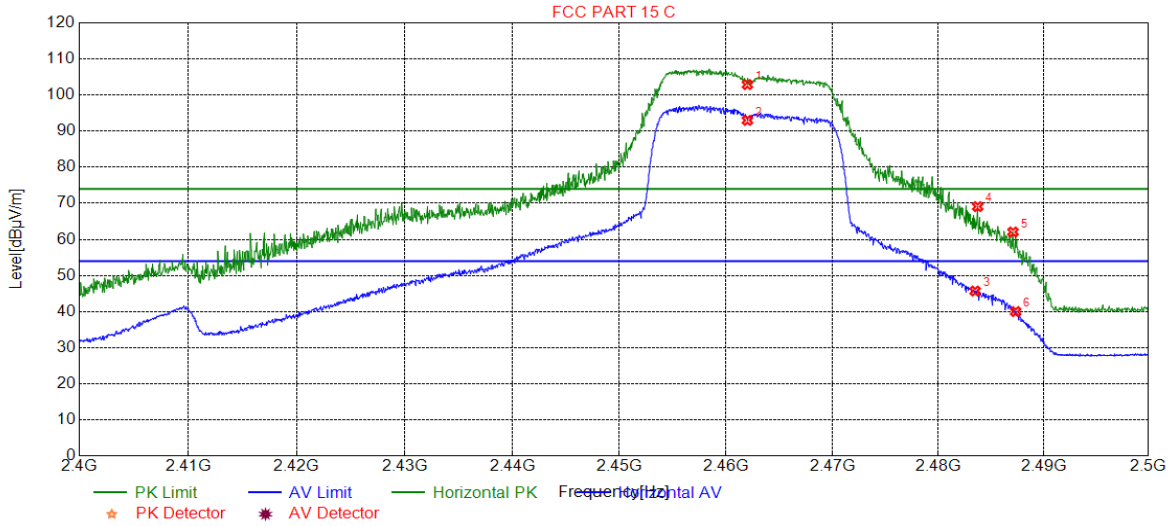
4.10.1.7 802.11G_Lowest Channel_ Horizontal



Suspected List

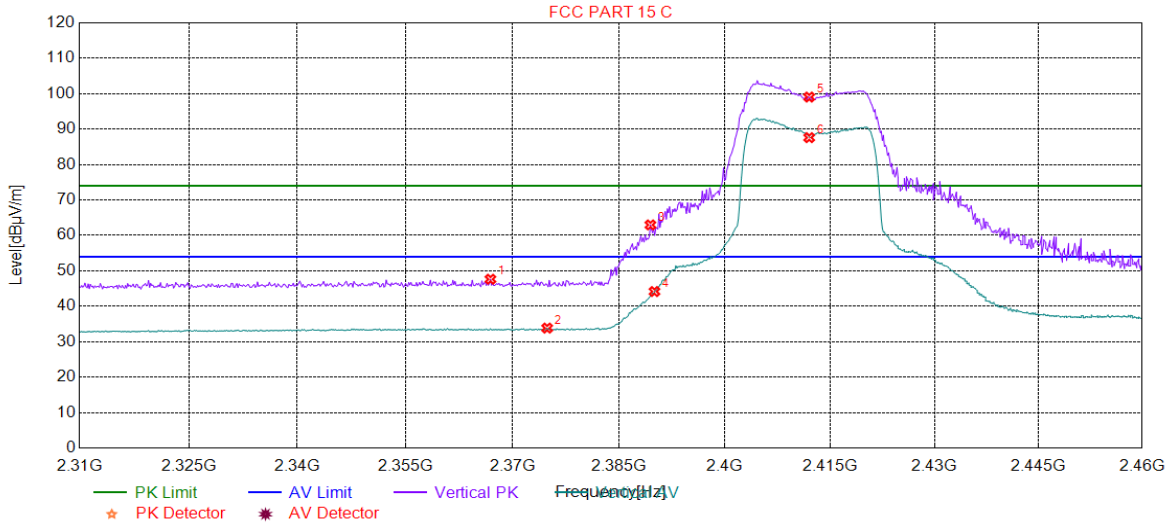
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2375.015	33.77	7.78	54.00	20.23	232	258	Horizontal
2	2375.315	48.12	7.78	74.00	25.88	202	133	Horizontal
3	2389.429	64.05	7.77	74.00	9.95	200	206	Horizontal
4	2390.000	45.21	7.77	54.00	8.79	152	206	Horizontal
5	2412.000	99.98	7.81	74.00	-25.98	145	210	Horizontal
6	2412.000	89.27	7.81	54.00	-35.27	121	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	241	210	Horizontal
2	2462.000	92.98	7.98	54.00	-38.98	221	215	Horizontal
3	2483.500	45.68	8.01	54.00	8.32	122	210	Horizontal
4	2483.741	69.09	8.01	74.00	4.91	229	210	Horizontal
5	2487.093	62.05	8.01	74.00	11.95	127	210	Horizontal
6	2487.343	40.00	8.01	54.00	14.00	173	215	Horizontal

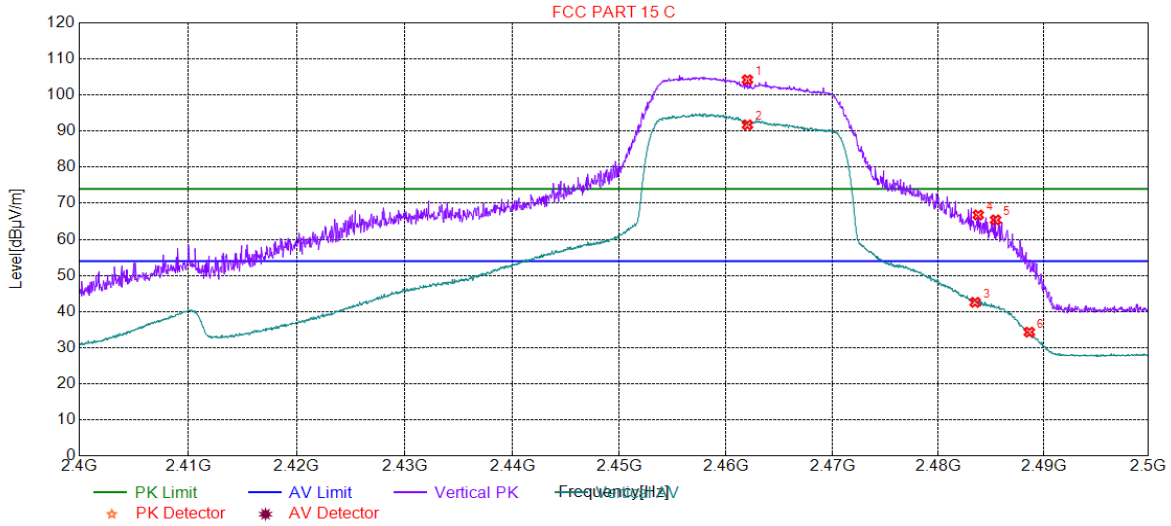
4.10.1.9 802.11N20_Lowest Channel_ Vertical



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	231	164	Vertical
2	2374.864	33.85	7.79	54.00	20.15	283	327	Vertical
3	2389.429	62.97	7.77	74.00	11.03	254	281	Vertical
4	2390.000	44.17	7.77	54.00	9.83	160	298	Vertical
5	2412.000	99.05	7.81	74.00	-25.05	173	281	Vertical
6	2412.000	87.60	7.81	54.00	-33.60	215	285	Vertical

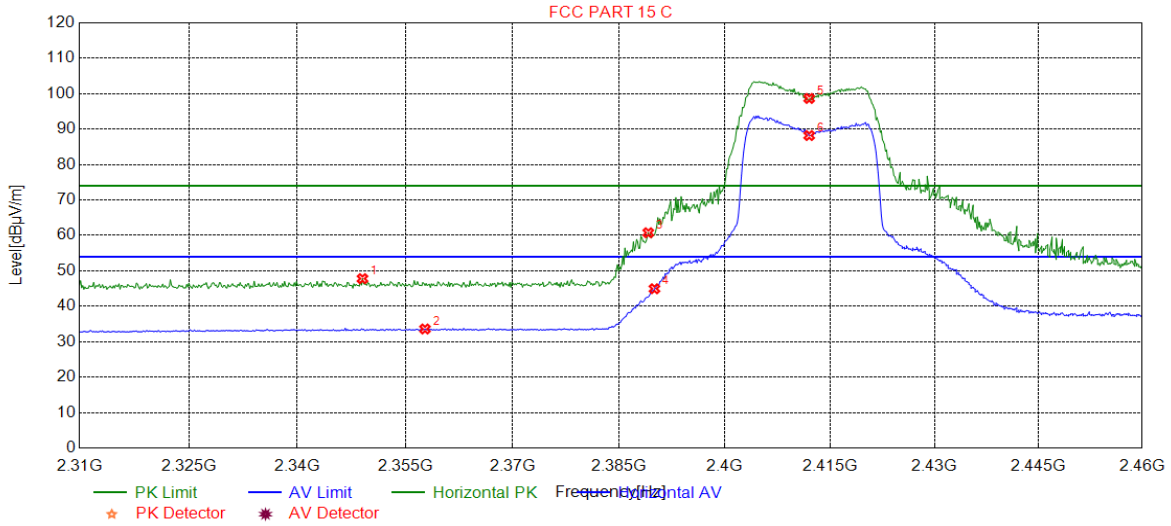
4.10.1.10 802.11N20_ Highest Channel_ Vertical



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	193	277	Vertical
2	2462.000	91.72	7.98	54.00	-37.72	259	282	Vertical
3	2483.500	42.55	8.01	54.00	11.45	269	288	Vertical
4	2483.791	66.76	8.01	74.00	7.24	182	304	Vertical
5	2485.442	65.39	8.01	74.00	8.61	265	299	Vertical
6	2488.644	34.31	8.02	54.00	19.69	163	272	Vertical

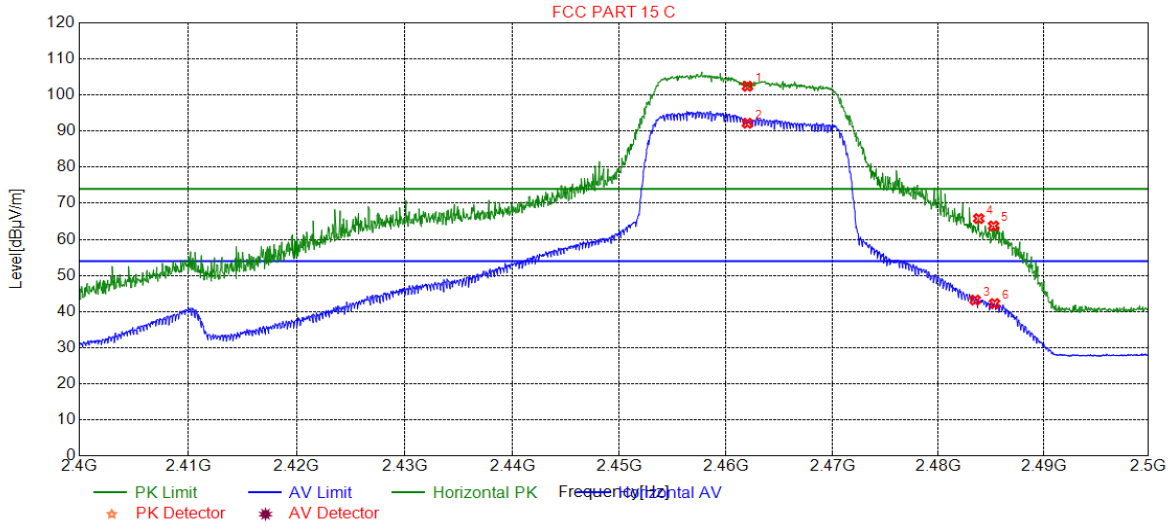
4.10.1.11 802.11N20_Lowest Channel_ Horizontal



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	149	19	Horizontal
2	2357.747	33.60	7.80	54.00	20.40	148	254	Horizontal
3	2389.129	60.76	7.77	74.00	13.24	236	211	Horizontal
4	2390.000	44.95	7.77	54.00	9.05	118	207	Horizontal
5	2412.000	98.66	7.81	74.00	-24.66	117	207	Horizontal
6	2412.000	88.19	7.81	54.00	-34.19	172	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	149	208	Horizontal
2	2462.000	92.19	7.98	54.00	-38.19	196	208	Horizontal
3	2483.500	43.19	8.01	54.00	10.81	148	213	Horizontal
4	2483.841	65.76	8.01	74.00	8.24	218	208	Horizontal
5	2485.242	63.72	8.01	74.00	10.28	117	213	Horizontal
6	2485.342	42.23	8.01	54.00	11.77	200	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.

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China 518057 t (86–755) 26012053 f (86–755) 26710594 www.sgsgroup.com.cn
中国·深圳·科技园中区M–10栋一号厂房 邮编: 518057 t (86–755) 26012053 f (86–755) 26710594 sgs.china@sgs.com

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

Lab A:

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	Temperature test	±1°C
5	Humidity test	±3%
6	DC and low frequency voltages	±0.5%

Lab B:

No.	Item	Measurement Uncertainty
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)
2	Radiated Emission	± 4.8dB (Below 1GHz)
		± 4.8dB (1GHz to 6GHz)
		± 4.5dB (6GHz to 18GHz)
		± 5.02dB (Above 18GHz)

6 Equipment List

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No	Cal. date (yyyy-mm-dd)	Cal.Duedate (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
				2020/1/3	2021/1/2
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

CE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2019-09-07	2020-09-06
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2019-07-16	2020-07-15
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2018-12-16	2019-12-15
				2019-12-06	2020-12-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR

RSE Test System					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2019-06-27	2020-06-26
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2019-09-07	2020-09-06
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2019-10-13	2021-10-12
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2019-10-13	2021-10-12
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2019-10-13	2021-10-12
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2019-12-03	2020-12-02
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2019-11-18	2020-11-17
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2018-12-16	2019-12-15
				2019-12-06	2020-12-05
Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	NCR	NCR

7 Photographs - EUT Constructional Details

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

The End

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch Electronic EMC Laboratory.
No.1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgsgroup.com.cn
中国·深圳·科技园中区M-10栋一号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com