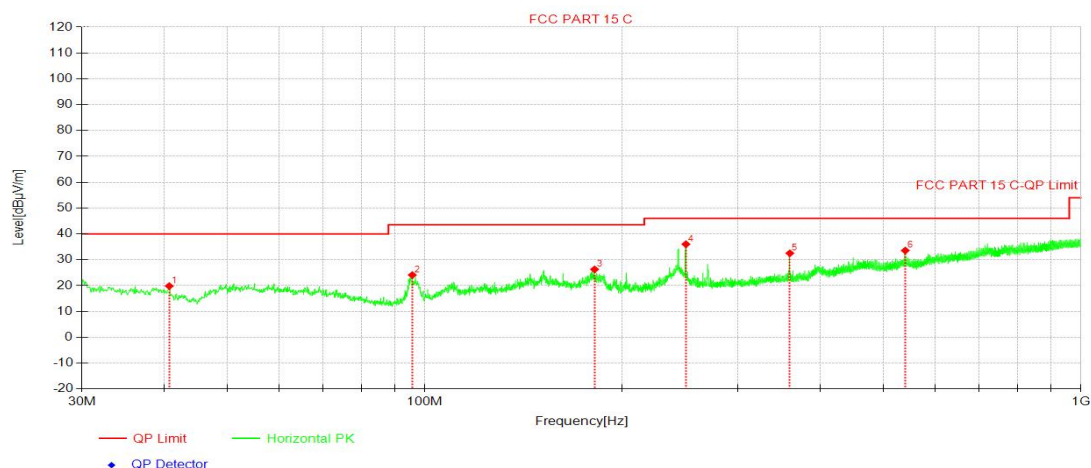




Test data

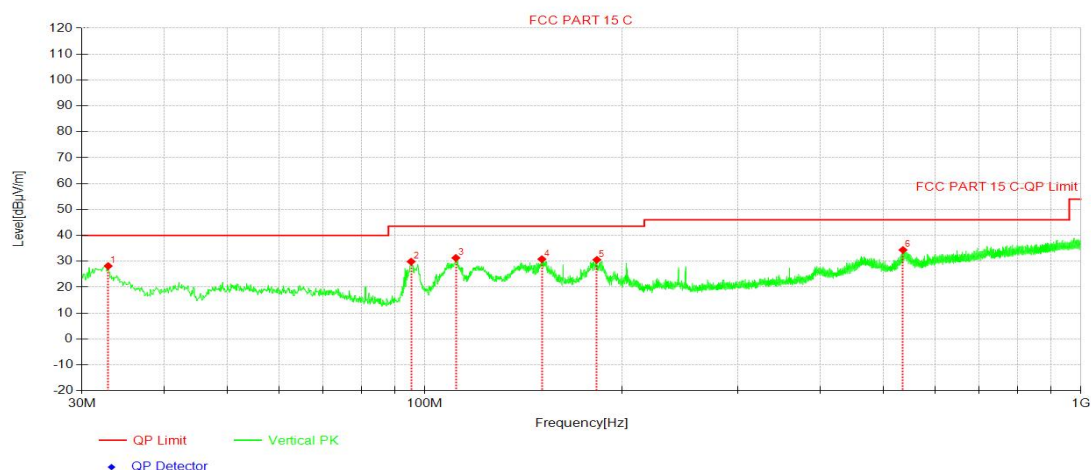
For 30-1000MHz

Horizontal:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	40.77	28.53	-8.71	19.82	40.00	20.18	100	58	PK
2	95.68	36.14	-12.04	24.10	43.50	19.40	100	266	PK
3	181.43	34.14	-7.86	26.28	43.50	17.22	100	248	PK
4	250.02	43.80	-7.79	36.01	46.00	9.99	100	15	PK
5	360.03	36.91	-4.39	32.52	46.00	13.48	100	175	PK
6	539.88	33.52	0.05	33.57	46.00	12.43	100	76	PK

Vertical :



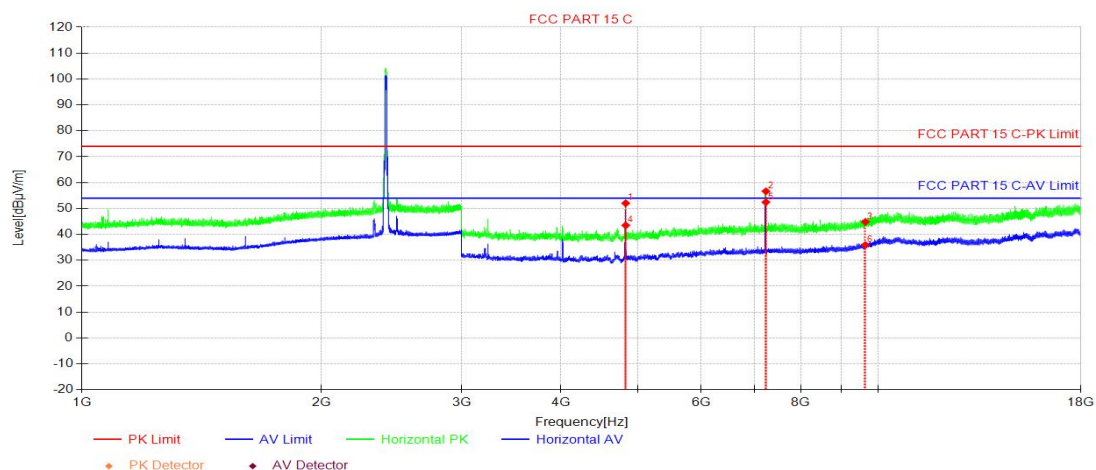
NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	32.91	36.31	-8.12	28.19	40.00	11.81	100	357	PK
2	95.29	41.97	-12.08	29.89	43.50	13.61	100	298	PK
3	111.49	41.11	-9.80	31.31	43.50	12.19	100	246	PK
4	150.78	37.82	-7.00	30.82	43.50	12.68	100	325	PK
5	182.89	39.13	-8.55	30.58	43.50	12.92	100	333	PK
6	535.52	34.42	-0.04	34.38	46.00	11.62	100	22	PK



For above 1GHz

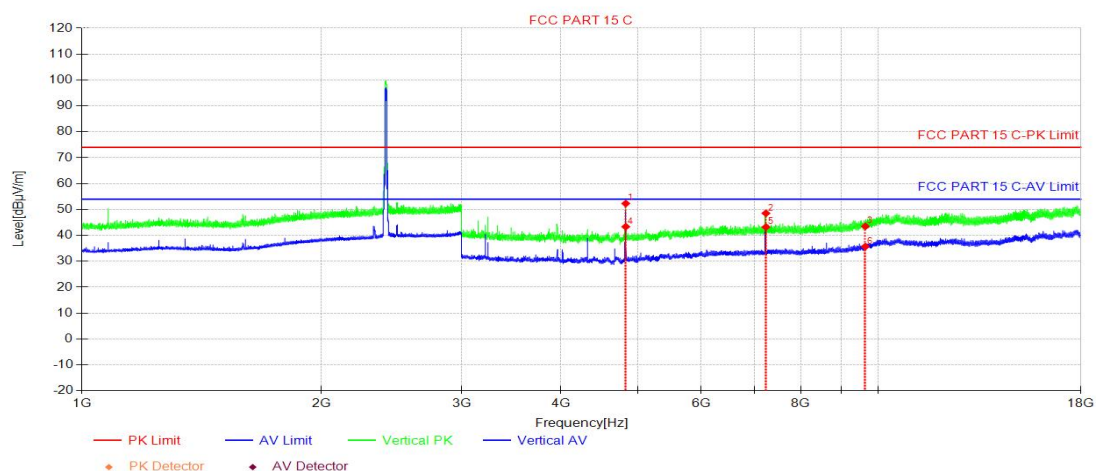
11B 2412MHz

Horizontal:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	4824.00	56.66	-4.63	52.03	74.00	21.97	150	199	PK
2	7236.00	58.35	-1.70	56.65	74.00	17.35	150	173	PK
3	9648.00	43.78	1.07	44.85	74.00	29.15	150	199	PK
4	4824.00	48.11	-4.63	43.48	54.00	10.52	150	199	AV
5	7236.00	54.13	-1.70	52.43	54.00	1.57	150	173	AV
6	9648.00	34.81	1.07	35.88	54.00	18.12	150	148	AV

Vertical:

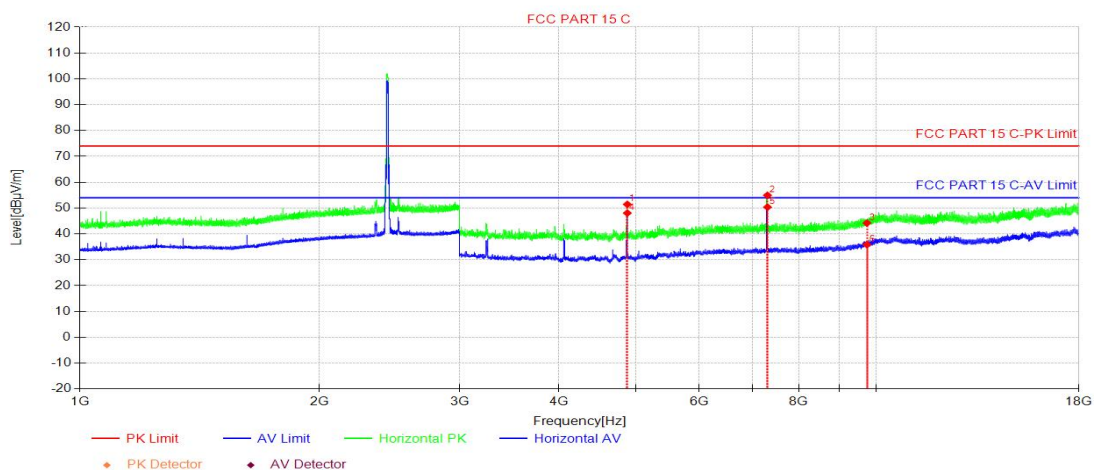


NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	4824.00	56.93	-4.63	52.30	74.00	21.70	150	304	PK
2	7236.00	50.24	-1.70	48.54	74.00	25.46	150	126	PK
3	9648.00	42.43	1.07	43.50	74.00	30.50	150	126	PK
4	4824.00	47.99	-4.63	43.36	54.00	10.64	150	329	AV
5	7236.00	44.93	-1.70	43.23	54.00	10.77	150	126	AV
6	9648.00	34.63	1.07	35.70	54.00	18.30	150	279	AV

11B 2437MHz

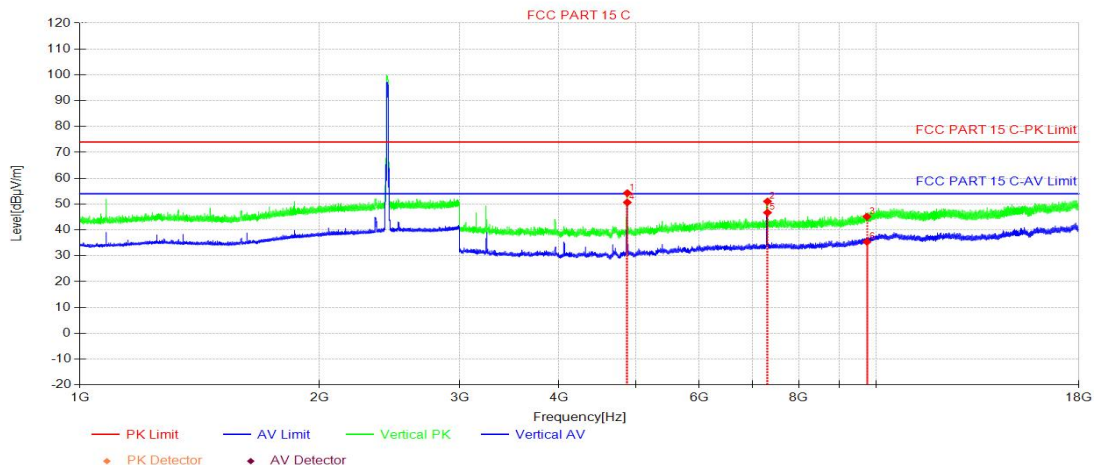


Horizontal:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	4874.00	56.13	-4.70	51.43	74.00	22.57	150	98	PK
2	7311.00	56.47	-1.53	54.94	74.00	19.06	150	175	PK
3	9748.00	42.64	1.56	44.20	74.00	29.80	150	175	PK
4	4874.00	52.76	-4.70	48.06	54.00	5.94	150	200	AV
5	7311.00	51.88	-1.53	50.35	54.00	3.65	150	175	AV
6	9748.00	34.29	1.56	35.85	54.00	18.15	150	349	AV

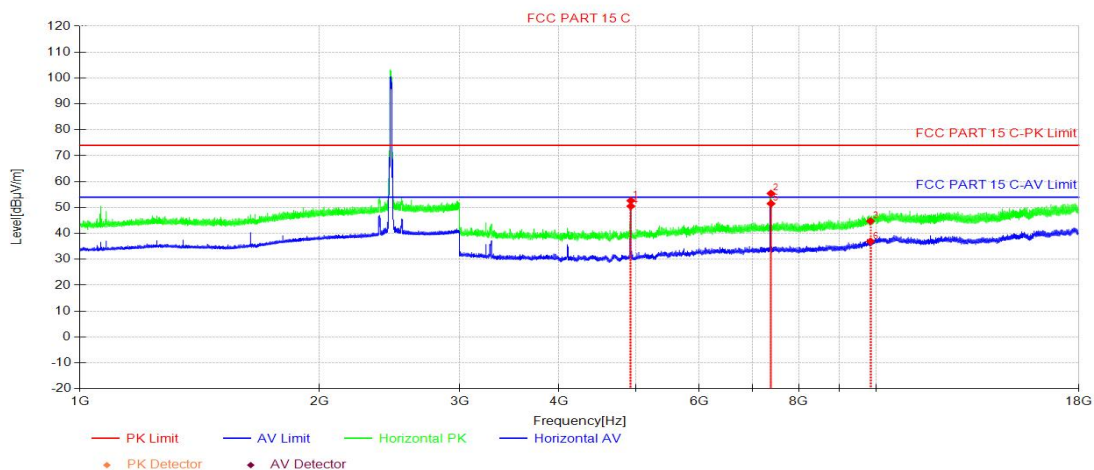
Vertical:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	4874.00	58.96	-4.70	54.26	74.00	19.74	150	99	PK
2	7311.00	52.55	-1.53	51.02	74.00	22.98	150	126	PK
3	9748.00	43.59	1.56	45.15	74.00	28.85	150	99	PK
4	4874.00	55.33	-4.70	50.63	54.00	3.37	150	99	AV
5	7311.00	48.22	-1.53	46.69	54.00	7.31	150	126	AV
6	9748.00	33.80	1.56	35.36	54.00	18.64	150	354	AV

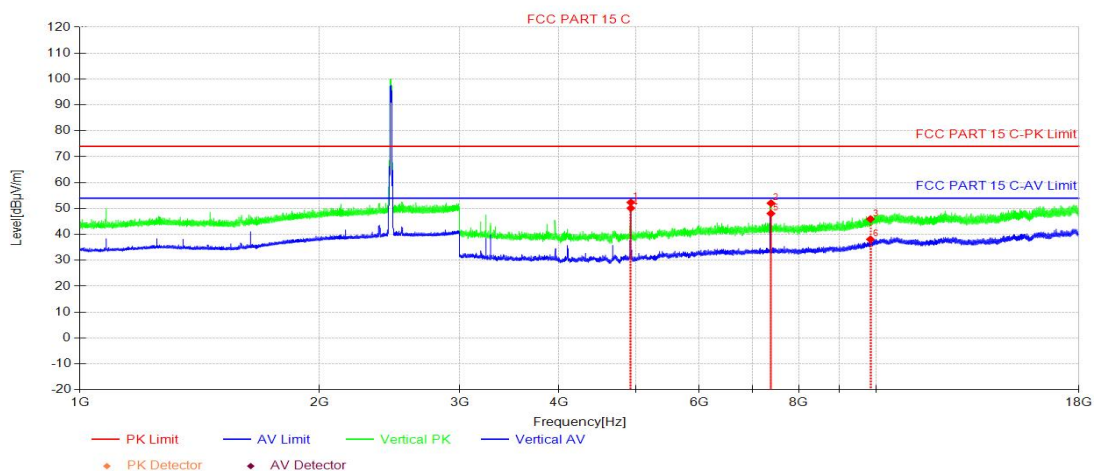
**11B 2462MHz**

Horizontal:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	4923.85	57.43	-4.79	52.64	74.00	21.36	150	201	PK
2	7386.00	56.73	-1.32	55.41	74.00	18.59	150	175	PK
3	9848.00	42.74	2.00	44.74	74.00	29.26	150	175	PK
4	4924.00	55.29	-4.79	50.50	54.00	3.50	150	201	AV
5	7386.00	52.80	-1.32	51.48	54.00	2.52	150	201	AV
6	9848.00	34.92	2.00	36.92	54.00	17.08	150	125	AV

Vertical:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	4923.85	57.15	-4.79	52.36	74.00	21.64	150	229	PK
2	7386.00	53.36	-1.32	52.04	74.00	21.96	150	126	PK
3	9848.00	43.94	2.00	45.94	74.00	28.06	150	305	PK
4	4924.00	54.92	-4.79	50.13	54.00	3.87	150	202	AV
5	7386.00	49.37	-1.32	48.05	54.00	5.95	150	126	AV
6	9848.00	36.08	2.00	38.08	54.00	15.92	150	102	AV

Note:



1. The Measurement (Result Level) is calculated by Reading Level adding the Correct Factor(maybe including Ant.Factor and the Cable Factor etc.), The basic equation is as follows:

Result Level= Reading Level + Correct Factor(including Ant.Factor, Cable Factor etc.)

2. The amplitude of 9KHz to 30MHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

3. The amplitude of 18GHz to 25GHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be report.

4. All channels had been pre-test,only the worst case was reported.



3.9 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10: 2020 Section 11.12		
Test Site:	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m)	Remark
	30MHz-88MHz	40.0	Quasi-peak
	88MHz-216MHz	43.5	Quasi-peak
	216MHz-960MHz	46.0	Quasi-peak
	960MHz-1GHz	54.0	Quasi-peak
	Above 1GHz	54.0	Average Value
		74.0	Peak Value
Test Setup:			

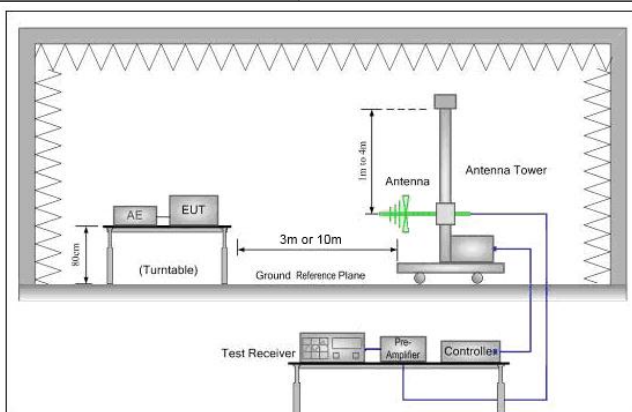


Figure 1. 30MHz to 1GHz

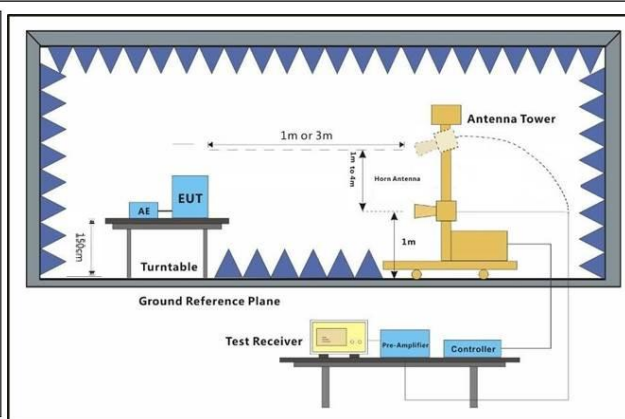


Figure 2. Above 1 GHz

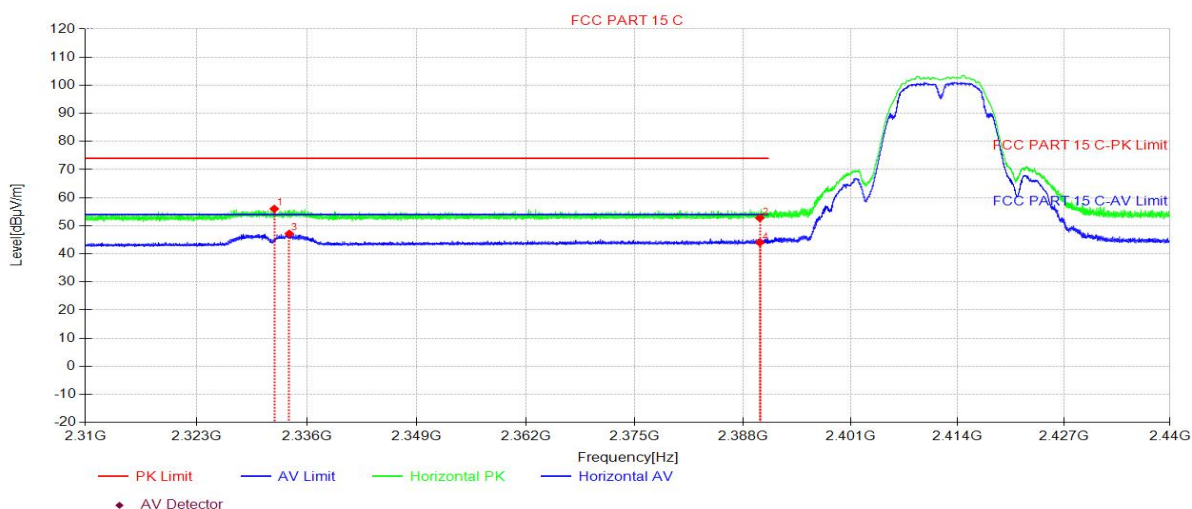


Test Procedure:	- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. - For above 1GHz, the EUT was placed on the top of a rotating 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 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. - 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 - Test the EUT in the lowest channel , the Highest channel - 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. - Repeat above procedures until all frequencies measured was complete.
Test Configuration:	Measurements Below 1000MHz • RBW = 120 kHz • VBW = 300 kHz • Detector = Peak • Trace mode = max hold Peak Measurements Above 1000 MHz • RBW = 1 MHz • VBW $\geq$ 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold Average Measurements Above 1000MHz • RBW = 1 MHz • VBW = 10 Hz, when duty cycle is no less than 98 percent. • VBW $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. 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 2.9 for details
Test Results:	Pass



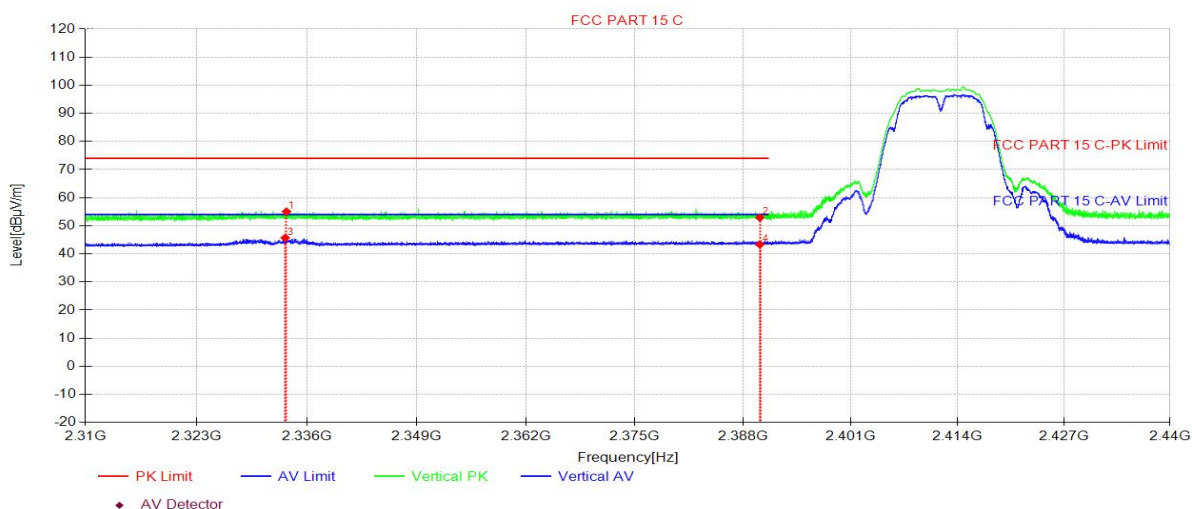
Test Date
11n20 2412MHz

Horizontal:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2332.14	57.07	-1.06	56.01	74.00	17.99	150	179	PK
2	2390.01	53.57	-0.80	52.77	74.00	21.23	150	65	PK
3	2333.91	48.23	-1.05	47.18	54.00	6.82	150	179	AV
4	2390.01	44.83	-0.80	44.03	54.00	9.97	150	169	AV

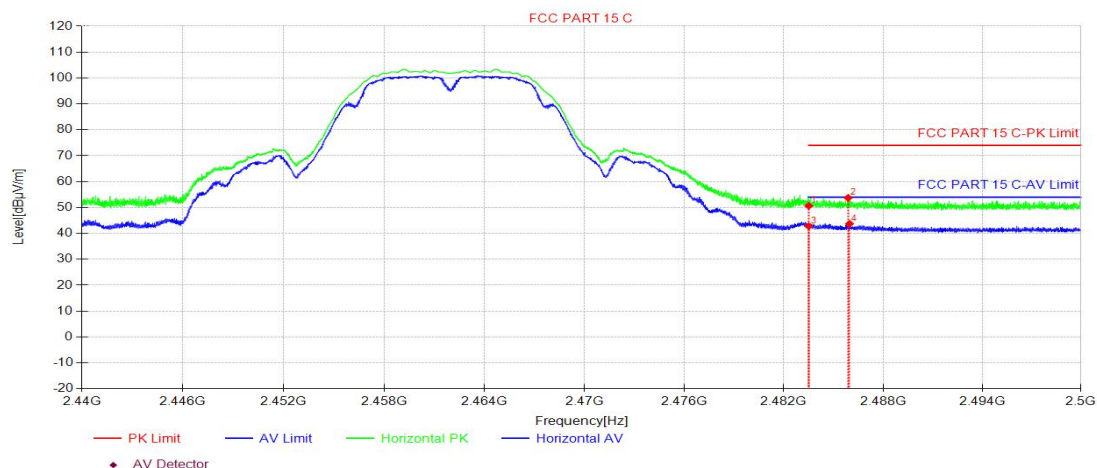
Vertical:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2378.28	56.53	-0.84	55.69	74.00	18.31	150	77	PK
2	2390.01	54.31	-0.80	53.51	74.00	20.49	150	346	PK
3	2377.66	45.11	-0.84	44.27	54.00	9.73	150	218	AV
4	2390.01	44.23	-0.80	43.43	54.00	10.57	150	122	AV

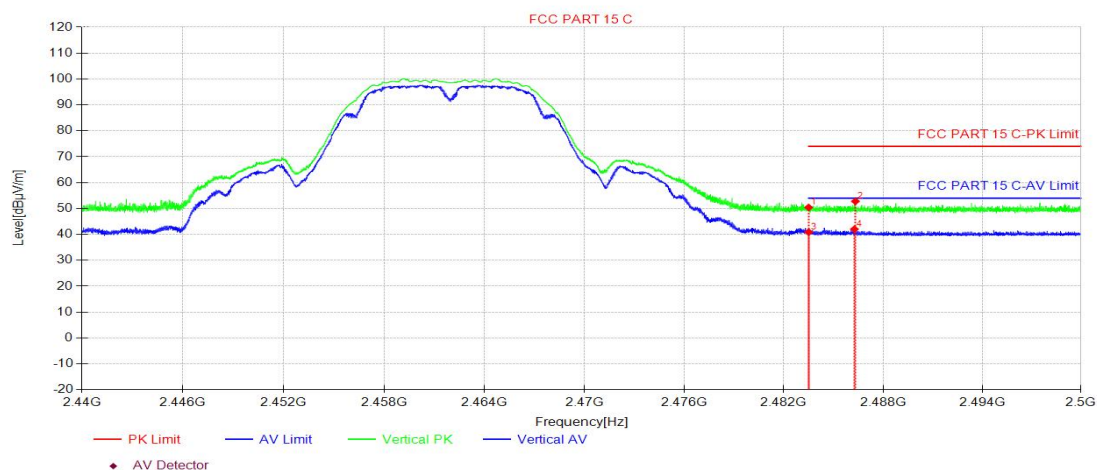
**11n20 2462MHz**

Horizontal:



NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2483.51	50.93	-0.29	50.64	74.00	23.36	150	177	PK
2	2485.89	54.00	-0.27	53.73	74.00	20.27	150	189	PK
3	2483.51	43.08	-0.29	42.79	54.00	11.21	150	189	AV
4	2485.98	44.00	-0.27	43.73	54.00	10.27	150	177	AV

Vertical:



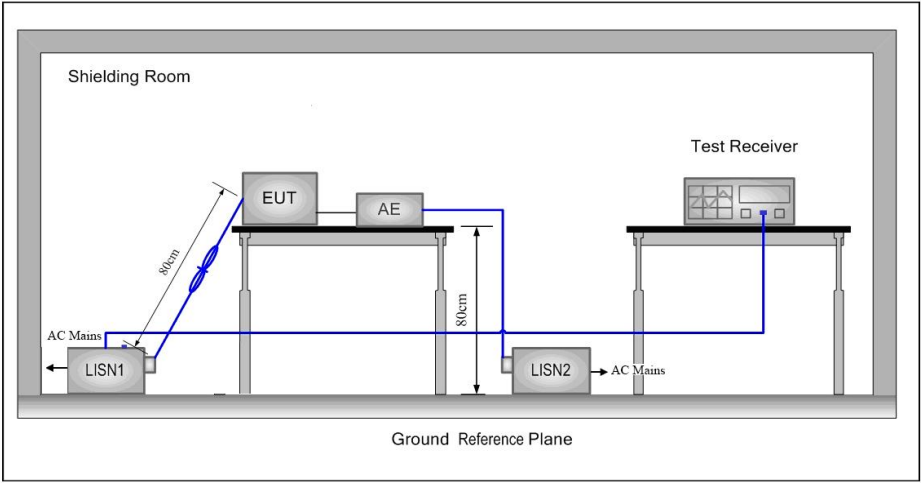
NO.	Freq. [MHz]	Reading Level [dBμV]	Correct Factor [dB/m]	Result Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Detector
1	2483.50	50.69	-0.29	50.40	74.00	23.60	150	305	PK
2	2486.33	53.03	-0.26	52.77	74.00	21.23	150	315	PK
3	2483.50	41.15	-0.29	40.86	54.00	13.14	150	315	AV
4	2486.27	42.30	-0.26	42.04	54.00	11.96	150	315	AV

Note:

1. The 802.11n HT20 is the worse case.
2. The Measurement (Result Level) is calculated by Reading Level adding the Correct Factor(maybe including Ant.Factor and the Cable Factor etc.), The basic equation is as follows:
Result Level= Reading Level + Correct Factor(including Ant.Factor ,Cable Factor etc.)



3.10AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2020		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
	* Decreases with the logarithm of the frequency.		
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 2020 on conducted measurement.		
Test Setup:			
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.		



	Charge + Transmitting mode.
Final Test Mode:	Through Pre-scan, find the 6.5Mbps of rate of 802.11n(HT20) at lowest channel is the worst case. Charge + Transmitting mode. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 2.9 for details
Test Results:	Pass

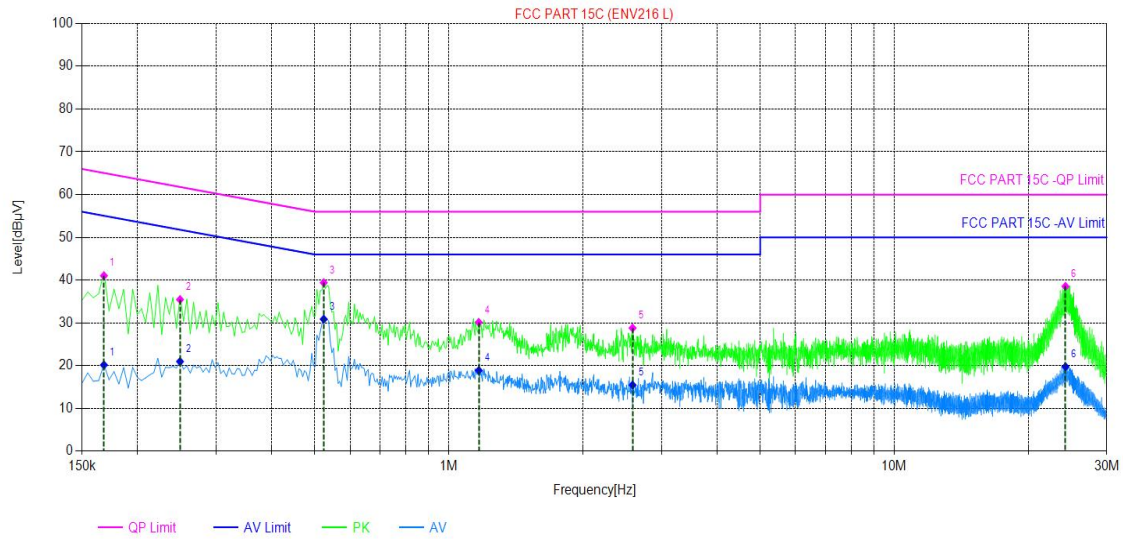


Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

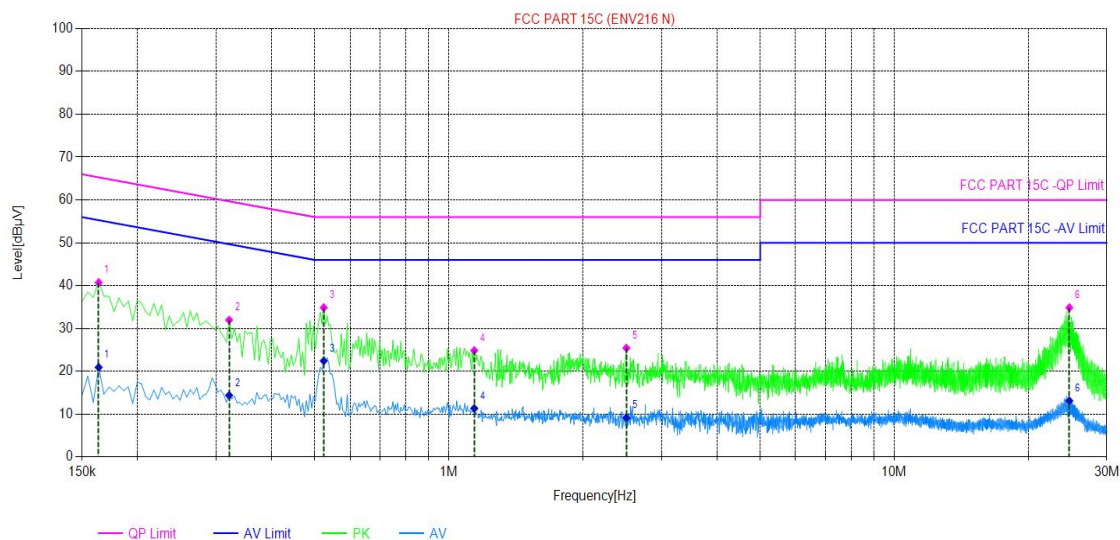
Live Line:



NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.168	9.91	41.04	65.06	24.02	20.18	55.06	34.88	PASS
2	0.249	9.91	35.47	61.79	26.32	20.99	51.79	30.80	PASS
3	0.5235	9.86	39.41	56.00	16.59	30.88	46.00	15.12	PASS
4	1.167	9.72	30.13	56.00	25.87	18.89	46.00	27.11	PASS
5	2.5845	9.74	28.81	56.00	27.19	15.49	46.00	30.51	PASS
6	24.243	10.20	38.55	60.00	21.45	19.77	50.00	30.23	PASS



Neutral Line:



NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.1635	9.81	40.72	65.28	24.56	20.94	55.28	34.34	PASS
2	0.321	9.88	31.99	59.68	27.69	14.40	49.68	35.28	PASS
3	0.5235	9.72	34.87	56.00	21.13	22.45	46.00	23.55	PASS
4	1.14	9.70	24.85	56.00	31.15	11.36	46.00	34.64	PASS
5	2.5035	9.82	25.43	56.00	30.57	9.16	46.00	36.84	PASS
6	24.7245	10.14	34.86	60.00	25.14	13.13	50.00	36.87	PASS

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. The Measurement (Result Level) is calculated by Reading Level adding the Correct Factor(maybe including LISN Factor and the Cable Factor etc.), The basic equation is as follows:

Result Level= Reading Level + Correct Factor(including LISN Factor, Cable Factor etc.)



4 Appendix

Appendix A: Duty Cycle

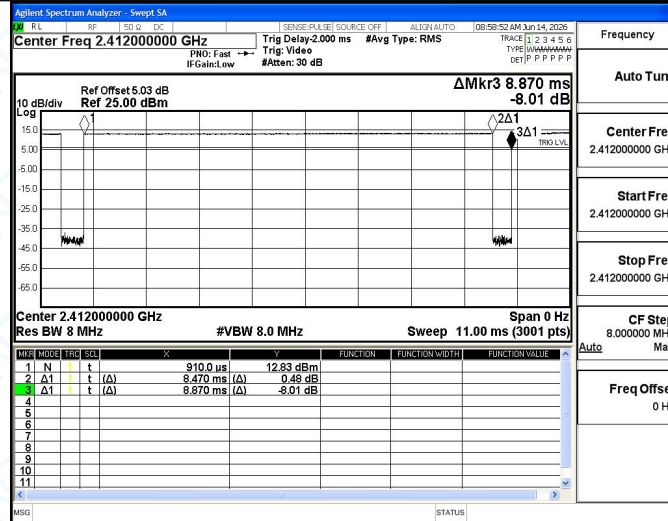
Test Result

TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor
11B	Ant1	2412	8.47	8.87	95.49	0.20
		2437	8.48	8.96	94.64	0.24
		2462	8.48	8.89	95.39	0.20
11G	Ant1	2412	1.41	1.57	89.81	0.47
		2437	1.40	1.61	86.96	0.61
		2462	1.40	1.55	90.32	0.44
11N20SISO	Ant1	2412	1.32	1.46	90.41	0.44
		2437	1.31	1.52	86.18	0.65
		2462	1.32	1.53	86.27	0.64

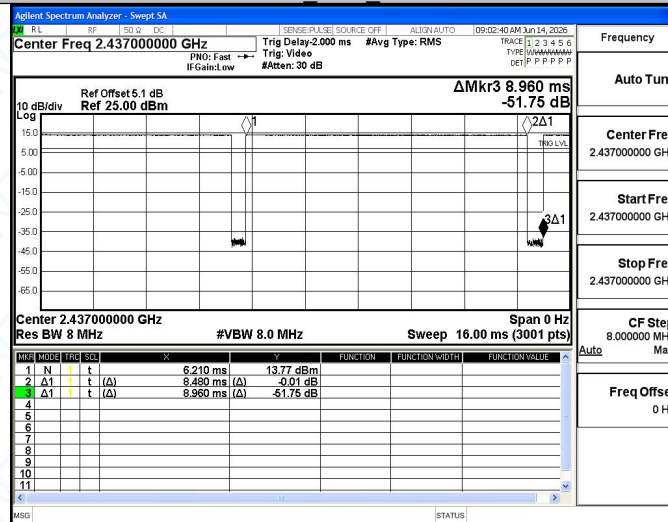


Test Graphs

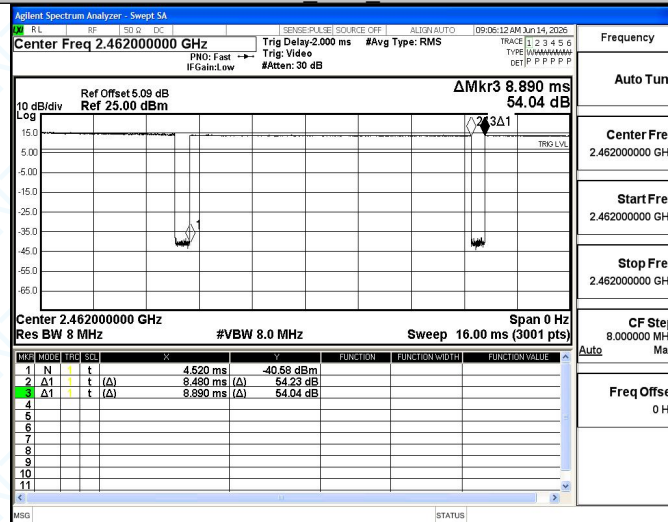
11B Ant1 2412



11B Ant1 2437

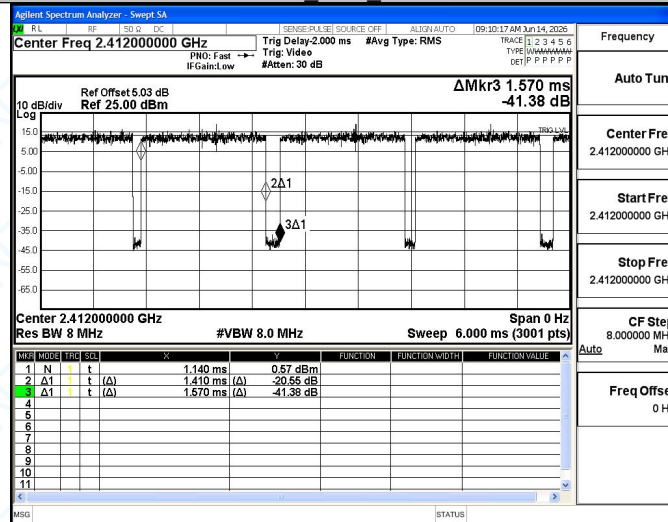


11B Ant1 2462

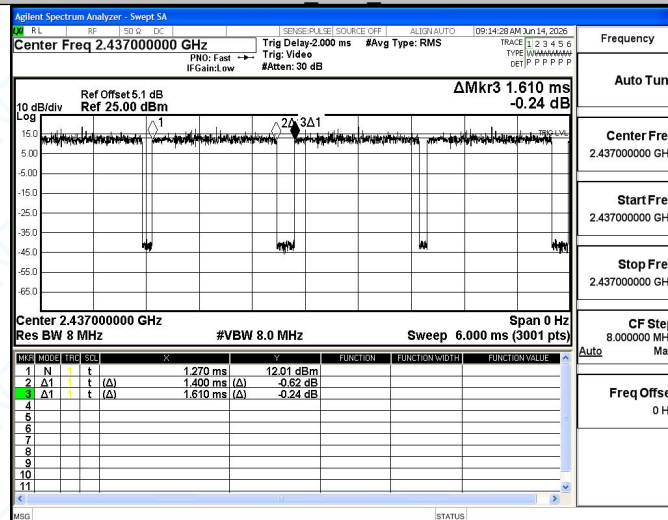




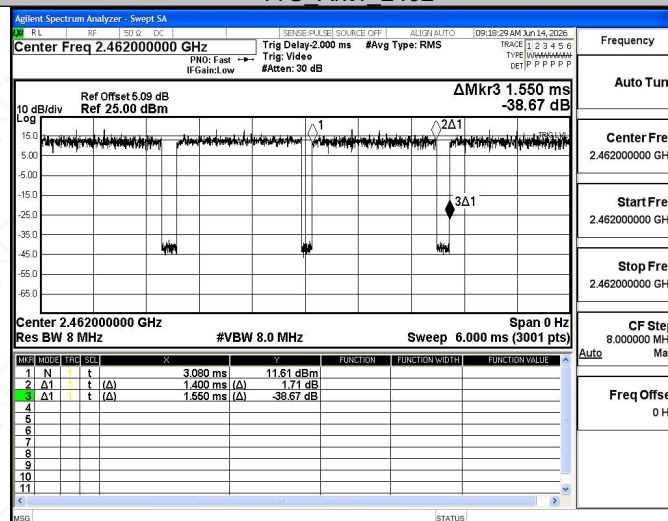
11G Ant1 2412



11G Ant1 2437

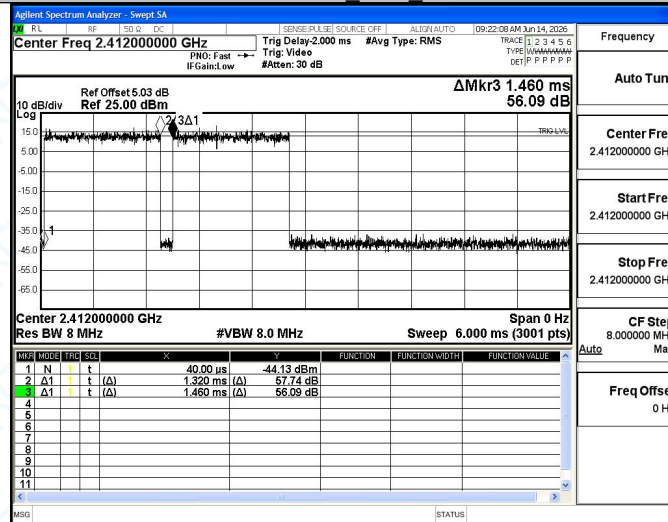


11G Ant1 2462

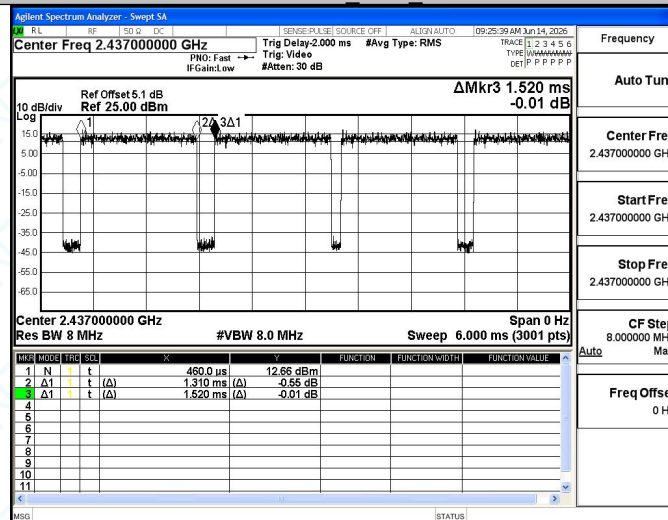




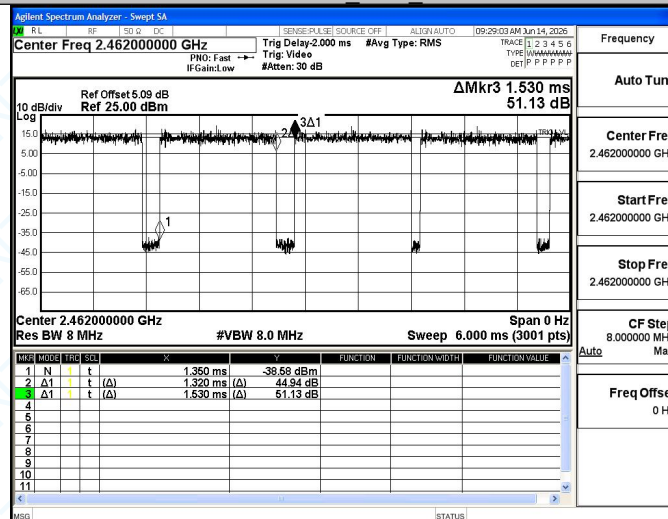
11N20SISO Ant1 2412



11N20SISO Ant1 2437



11N20SISO Ant1 2462





Appendix B: DTS Bandwidth

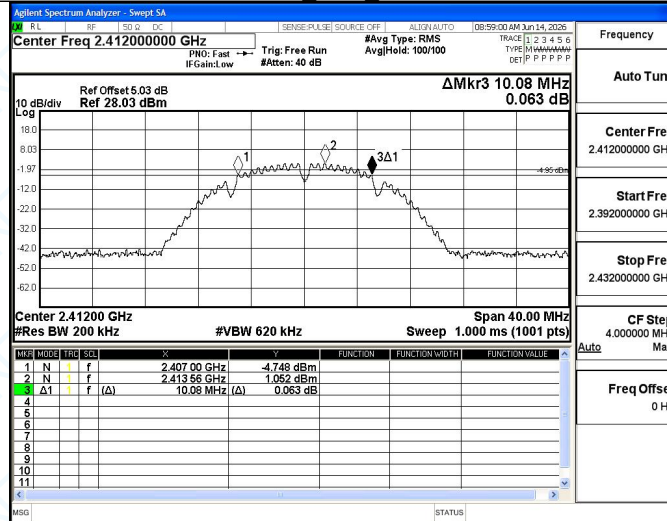
Test Result

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	10.080	2407.000	2417.080	0.5	PASS
		2437	10.080	2432.000	2442.080	0.5	PASS
		2462	10.040	2457.040	2467.080	0.5	PASS
11G	Ant1	2412	15.920	2404.120	2420.040	0.5	PASS
		2437	15.720	2429.080	2444.800	0.5	PASS
		2462	15.480	2454.360	2469.840	0.5	PASS
11N20SISO	Ant1	2412	16.120	2403.520	2419.640	0.5	PASS
		2437	15.280	2429.480	2444.760	0.5	PASS
		2462	16.320	2453.520	2469.840	0.5	PASS

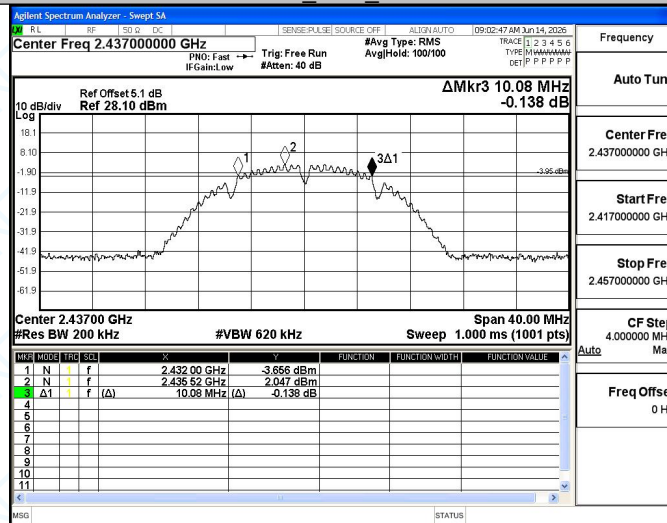


Test Graphs

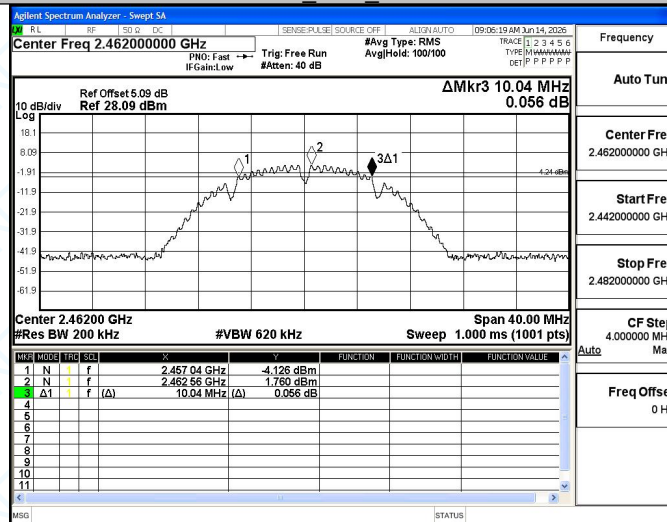
11B_Ant1_2412



11B_Ant1_2437

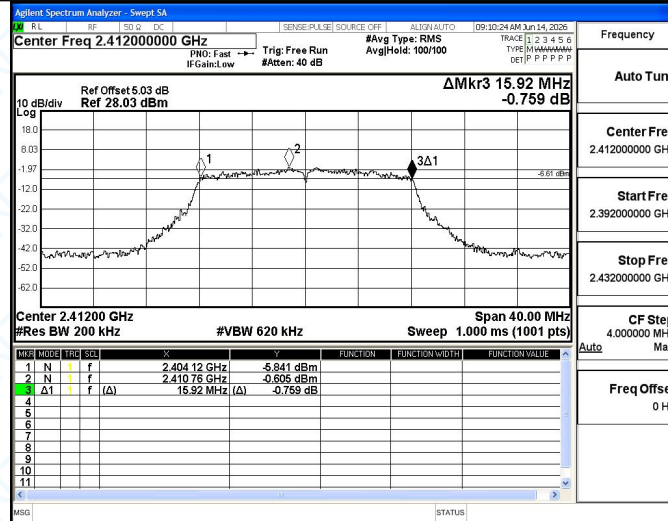


11B_Ant1_2462

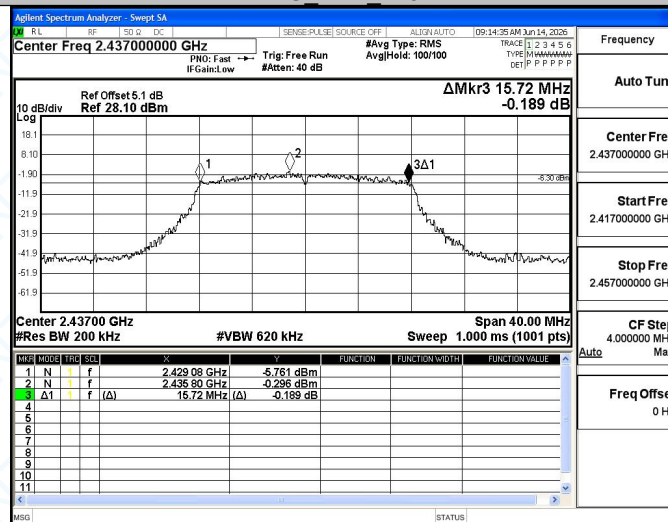




11G Ant1 2412



11G Ant1 2437



11G Ant1 2462

