

Appendix A: Test Results of Wi-Fi 802.11 b/g/n

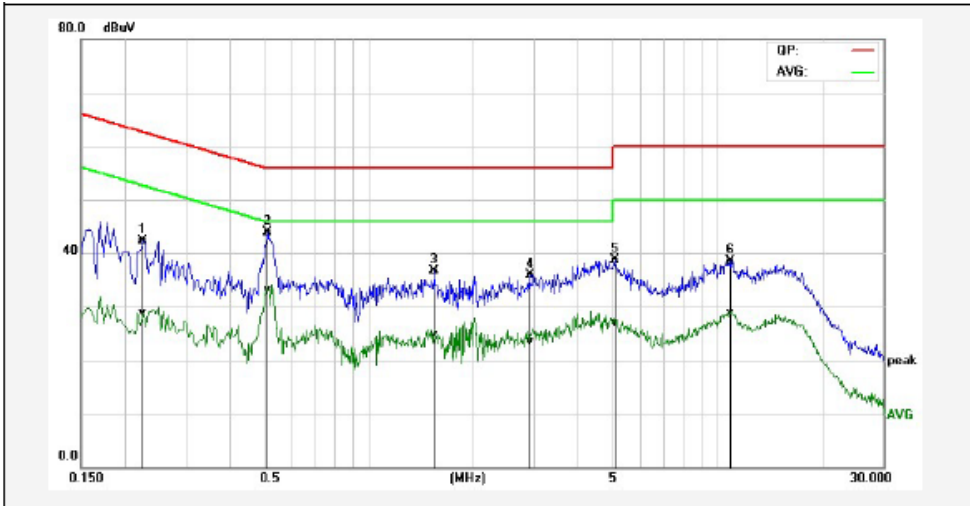
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Appendix A.1 Test Results of Conducted Emission on AC Mains

Test Mode:

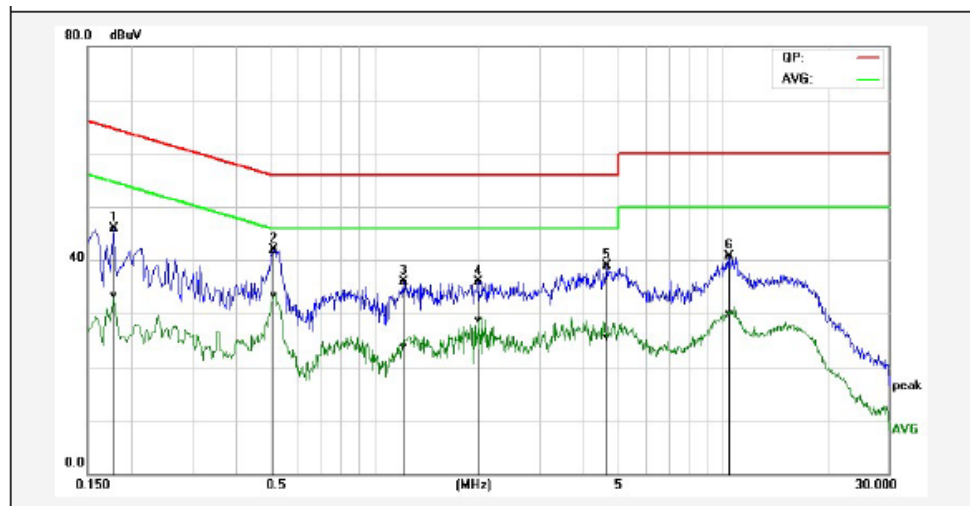
Mode10

L



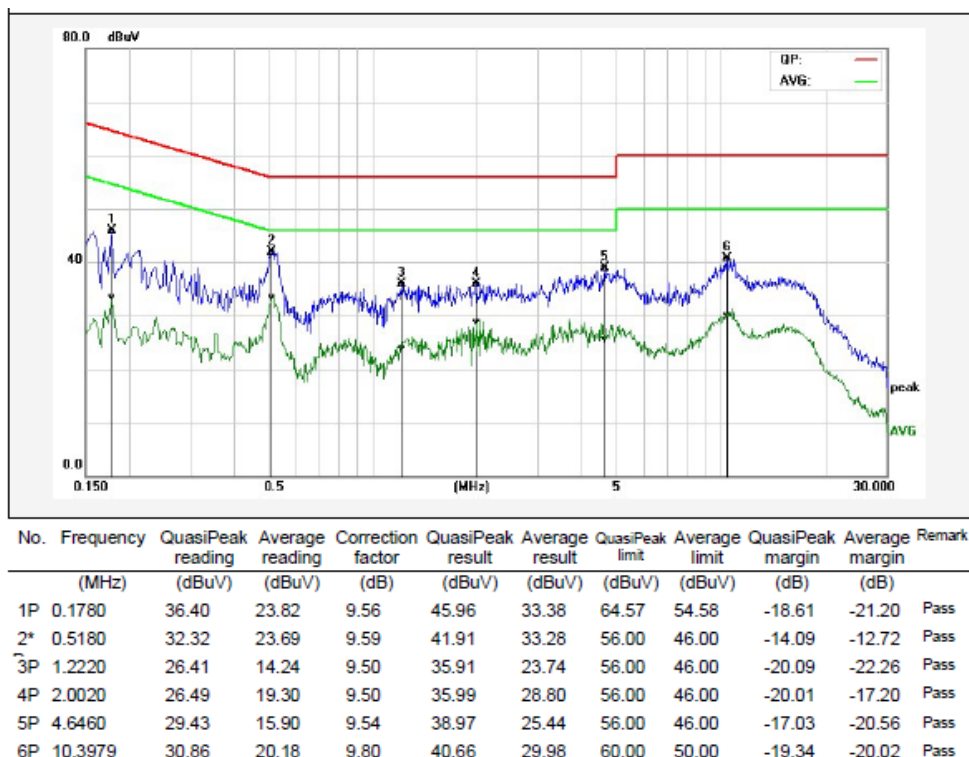
No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.2260	32.79	19.46	9.50	42.29	28.96	62.59	52.60	-20.30	-23.64	Pass
2*	0.5180	34.43	23.56	9.48	43.91	33.04	56.00	46.00	-12.09	-12.96	Pass
3P	1.5540	27.16	15.15	9.50	36.66	24.65	56.00	46.00	-19.34	-21.35	Pass
4P	2.9260	26.14	13.86	9.69	35.83	23.55	56.00	46.00	-20.17	-22.45	Pass
5P	5.0620	28.96	17.11	9.76	38.72	26.87	60.00	50.00	-21.28	-23.13	Pass
6P	10.8540	28.85	19.24	9.73	38.58	28.97	60.00	50.00	-21.42	-21.03	Pass

N



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1P	0.1780	36.40	23.82	9.56	45.96	33.38	64.57	54.58	-18.61	-21.20	Pass
2*	0.5180	32.32	23.69	9.59	41.91	33.28	56.00	46.00	-14.09	-12.72	Pass
3P	1.2220	26.41	14.24	9.50	35.91	23.74	56.00	46.00	-20.09	-22.26	Pass
4P	2.0020	26.49	19.30	9.50	35.99	28.80	56.00	46.00	-20.01	-17.20	Pass
5P	4.6460	29.43	15.90	9.54	38.97	25.44	56.00	46.00	-17.03	-20.56	Pass
6P	10.3979	30.86	20.18	9.80	40.66	29.98	60.00	50.00	-19.34	-20.02	Pass

N



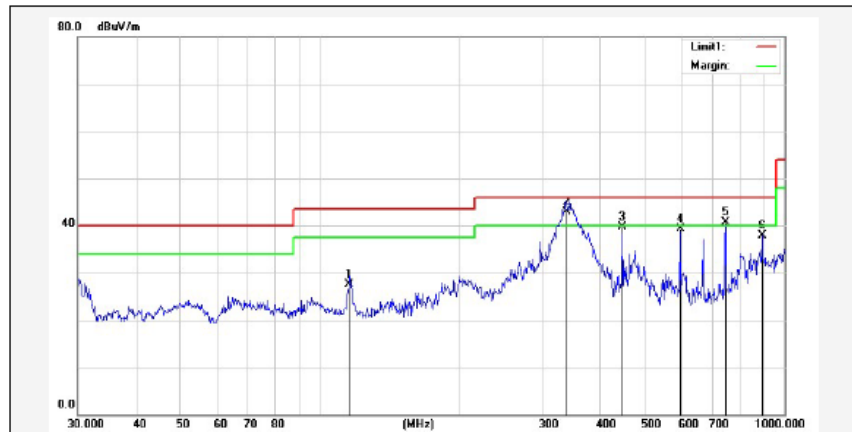
Appendix A.2 Test Results of Radiated Spurious Emission

Below 1GHz:

All modes have been tested, and the report only reflects the worst mode.

Test Mode: Mode 7(worst mode)

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	115.7256	41.85	-14.36	27.49	43.50	-16.01			QP
2*	338.4001	51.94	-8.95	42.99	46.00	-3.01			QP
3	446.4141	45.20	-5.48	39.72	46.00	-6.28			QP
4	595.1327	42.21	-3.00	39.21	46.00	-6.79			QP
5†	744.8660	41.67	-0.89	40.78	46.00	-5.22			QP
6	893.8567	36.92	1.07	37.99	46.00	-8.01			QP

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Remark
1	52.2080	43.75	-11.60	32.15	40.00	-7.85			QP
2	338.4001	43.11	-8.95	34.16	46.00	-11.84			QP
3*	501.1790	46.12	-4.84	41.28	46.00	-4.72			QP
4	595.1326	41.30	-3.00	38.30	46.00	-7.70			QP
5	744.8660	39.58	-0.89	38.69	46.00	-7.31			QP
6	893.8567	37.09	1.07	38.16	46.00	-7.84			QP

Above 1GHz:

Note: All models were tested, and only the worst model(802.11b, ANT 1) were reported in the report.

802.11 b-Low (worst mode) Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2423.591	52.88	-19.93	32.95	54.00	-21.05	AVG
2	2425.957	64.99	-19.93	45.06	74.00	-28.94	peak
3	5004.148	61.65	-15.59	46.06	74.00	-27.94	peak
4	5006.578	48.83	-15.59	33.24	54.00	-20.76	AVG
5	6646.506	58.46	-10.91	47.55	74.00	-26.45	peak
6	6647.251	46.12	-10.91	35.21	54.00	-18.79	AVG
7	12069.74	54.7	-3.09	51.61	74.00	-22.39	peak
8	12071.57	41.33	-3.09	38.24	54.00	-15.76	AVG
9	14779.49	39.67	-1	38.67	54.00	-15.33	AVG
10	14782.33	52.92	-0.99	51.93	74.00	-22.07	peak
11	17995.65	35.91	4.44	40.35	54.00	-13.65	AVG
12	18000	50.57	4.46	55.03	74.00	-18.97	peak

802.11 b-Low (worst mode) Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1011.652	64.76	-23.18	41.58	74.00	-32.42	peak
2	1011.652	64.76	-23.18	41.58	54.00	-12.42	AVG
3	2384.166	70.82	-19.93	50.89	74.00	-23.11	peak
4	2385.157	52.5	-19.93	32.57	54.00	-21.43	AVG
5	5002.089	50.9	-15.61	35.29	54.00	-18.71	AVG
6	5004.148	61.81	-15.59	46.22	74.00	-27.78	peak
7	9462.66	41.14	-6.37	34.77	54.00	-19.23	AVG
8	9463.32	54.7	-6.37	48.33	74.00	-25.67	peak
9	14867.13	39.63	-0.98	38.65	54.00	-15.35	AVG
10	14868.2	53.09	-0.98	52.11	74.00	-21.89	peak
11	17995.98	33.22	4.44	37.66	54.00	-16.34	AVG
12	18000	50.75	4.46	55.21	74.00	-18.79	peak

802.11 b-Middle (worst mode) Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5004.148	61.42	-15.59	45.83	74.00	-28.17	peak
2	5006.375	50.26	-15.59	34.67	54.00	-19.33	AVG
3	5817.483	66.06	-12.75	53.31	74.00	-20.69	peak
4	5819.605	45.72	-12.73	32.99	54.00	-21.01	AVG
5	8877.99	45.79	-7.81	37.98	54.00	-16.02	AVG
6	8879.167	57.08	-7.81	49.27	74.00	-24.73	peak
7	13165.32	53.2	-2.8	50.4	74.00	-23.6	peak
8	13167.67	41.05	-2.8	38.25	54.00	-15.75	AVG
9	16312.02	51.74	-0.54	51.2	74.00	-22.8	peak
10	16315.01	39.05	-0.56	38.49	54.00	-15.51	AVG
11	17996.23	34.78	4.44	39.22	54.00	-14.78	AVG
12	18000	49.05	4.46	53.51	74.00	-20.49	peak



802.11 b-Middle (worst mode) Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2123.366	63.56	-20.65	42.91	74.00	-31.09	peak
2	2125.88	51.7	-20.63	31.07	54.00	-22.93	AVG
3	5151.196	68.15	-14.86	53.29	74.00	-20.71	peak
4	5152.759	54.38	-14.86	39.52	54.00	-14.48	AVG
5	7419.751	56.64	-9.08	47.56	74.00	-26.44	peak
6	7420.609	45.32	-9.07	36.25	54.00	-17.75	AVG
7	10203.43	54.61	-6.04	48.57	74.00	-25.43	peak
8	10205.28	40.8	-6.03	34.77	54.00	-19.23	AVG
9	13473.91	53.63	-2.48	51.15	74.00	-22.85	peak
10	13475.34	42.49	-2.48	40.01	54.00	-13.99	AVG
11	17996.55	36.43	4.44	40.87	54.00	-13.13	AVG
12	18000	49.3	4.46	53.76	74.00	-20.24	peak

802.11 b-High (worst mode) Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1010.987	54.14	-23.16	30.98	54.00	-23.02	AVG
2	1011.652	64.66	-23.18	41.48	74.00	-32.52	peak
3	2396.808	51.93	-19.89	32.04	54.00	-21.96	AVG
4	2398.016	63.07	-19.88	43.19	74.00	-30.81	peak
5	3555.586	61.45	-17.67	43.78	74.00	-30.22	peak
6	3557.01	50.76	-17.65	33.11	54.00	-20.89	AVG
7	4975.246	62.33	-15.6	46.73	74.00	-27.27	peak
8	4977.382	50.23	-15.6	34.63	54.00	-19.37	AVG
9	14780.66	38.38	-1	37.38	54.00	-16.62	AVG
10	14782.33	54.6	-0.99	53.61	74.00	-20.39	peak
11	17587.75	51.86	3.35	55.21	74.00	-18.79	peak
12	17588.68	35.86	3.35	39.21	54.00	-14.79	AVG

802.11 b-High (worst mode) Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1423.803	66.8	-24.72	42.08	74.00	-31.92	peak
2	1425.774	56.28	-24.71	31.57	54.00	-22.43	AVG
3	5210.31	53.03	-14.76	38.27	54.00	-15.73	AVG
4	5211.217	64.8	-14.76	50.04	74.00	-23.96	peak
5	7164.229	45.23	-9.77	35.46	54.00	-18.54	AVG
6	7166.315	57.04	-9.77	47.27	74.00	-26.73	peak
7	10201	41.74	-6.03	35.71	54.00	-18.29	AVG
8	10203.43	54.24	-6.04	48.2	74.00	-25.8	peak
9	14192.64	42.02	-1.13	40.89	54.00	-13.11	AVG
10	14194.95	52.02	-1.12	50.9	74.00	-23.1	peak
11	17997.04	36.26	4.45	40.71	54.00	-13.29	AVG
12	18000	49.33	4.46	53.79	74.00	-20.21	peak

Node:

- 1、 Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported..
- 2、 Radiated emissions measured in frequency above 1GHz were made with an instrument using peak/average detector mode.
- 3、 Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
- 4、 Margin (dB), result in dBuV/m – limit in dBuV/m.

Restricted band Requirements

Note: All models were tested, and only the worst model(802.11n, MIMO) were reported in the report.

802.11 n(HT20)-Low (worst mode)

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2349.599	50.70	-3.10	47.60	74.00	-26.40	peak
2	2349.599	35.88	-3.10	32.78	54.00	-21.22	AVG
3	2390.000	53.46	-2.94	50.52	74.00	-23.48	peak
4	2390.000	38.59	-2.94	35.65	54.00	-18.35	AVG

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2382.425	58.23	-2.98	55.25	74.00	-18.75	peak
2	2382.425	36.45	-2.98	33.47	54.00	-20.53	AVG
3	2390.000	58.19	-2.94	55.25	74.00	-18.75	peak
4	2390.000	37.70	-2.94	34.76	54.00	-19.24	AVG

802.11 n(HT20)-High (worst mode)

Horizontal

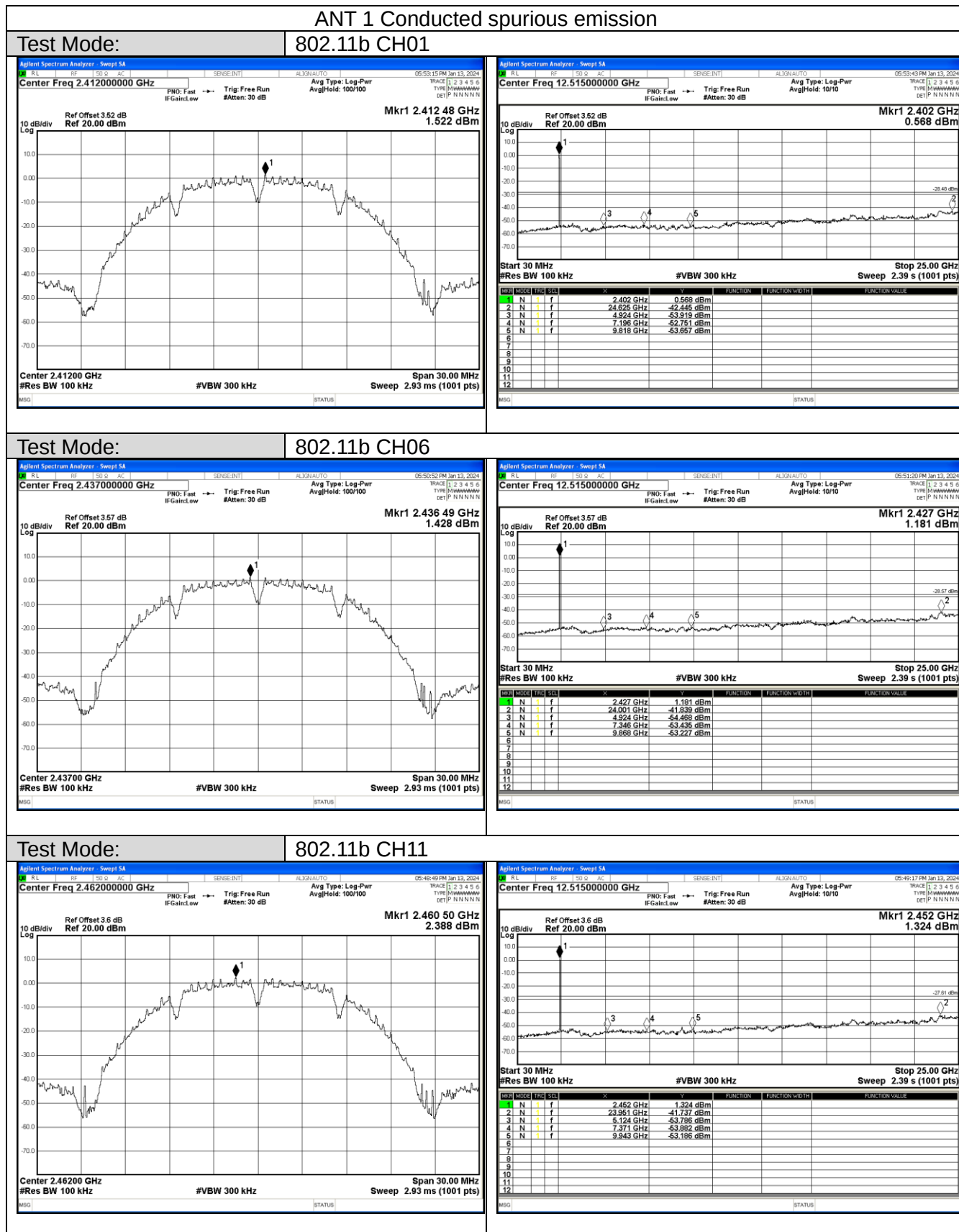
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	59.31	-2.43	56.88	74.00	-17.12	peak
2	2483.500	39.42	-2.43	36.99	54.00	-17.01	AVG
3	2485.331	60.64	-2.42	58.22	74.00	-15.78	peak
4	2485.331	41.32	-2.42	38.90	54.00	-15.10	AVG

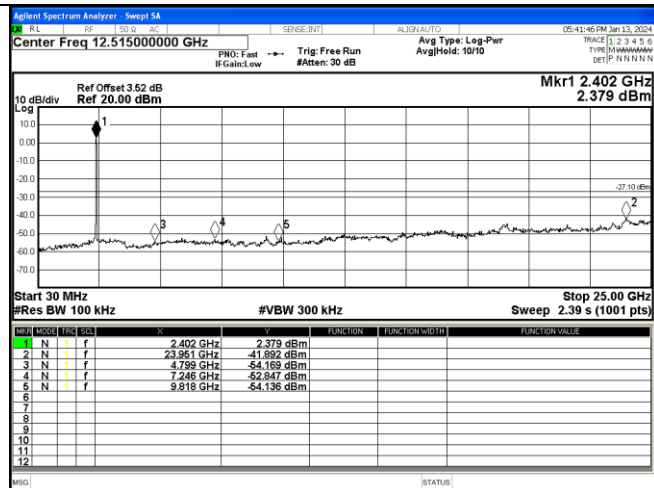
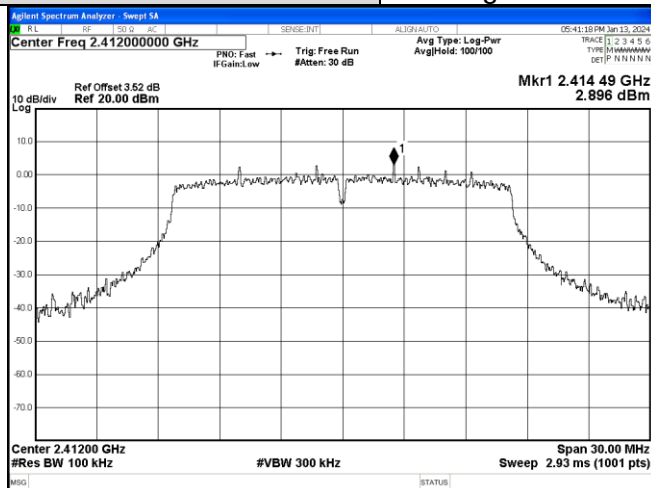
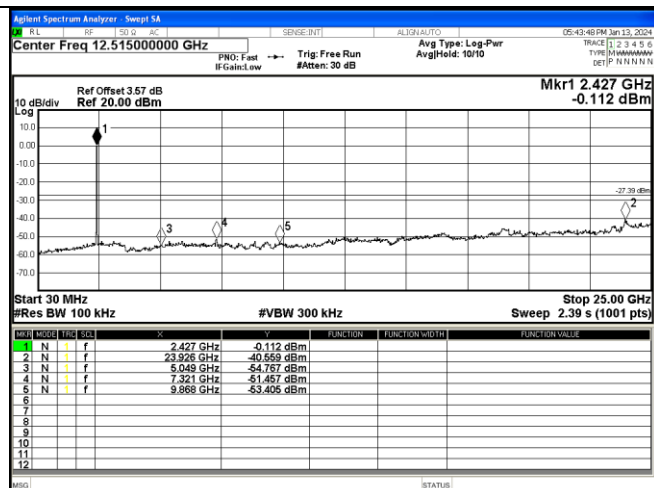
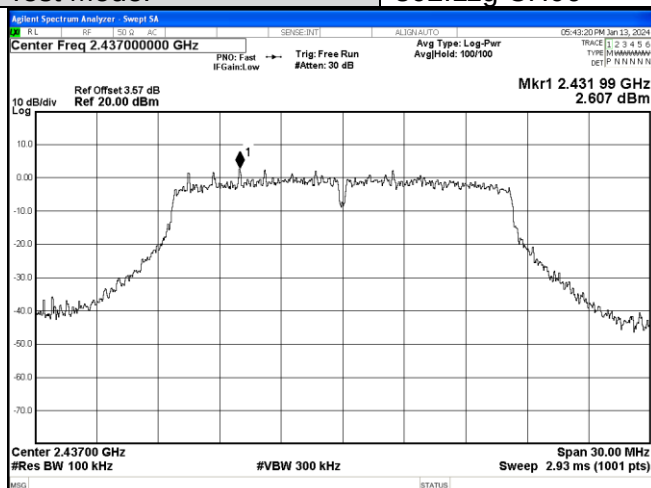
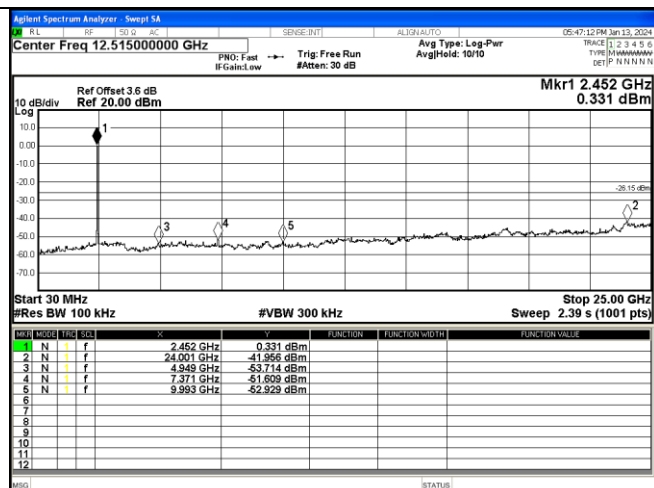
Vertical

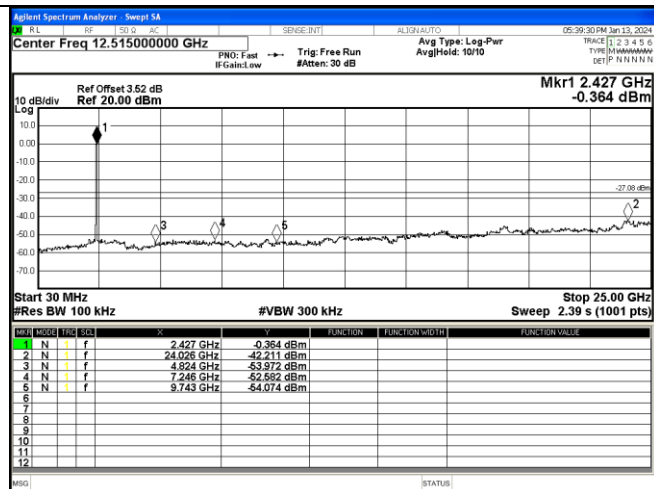
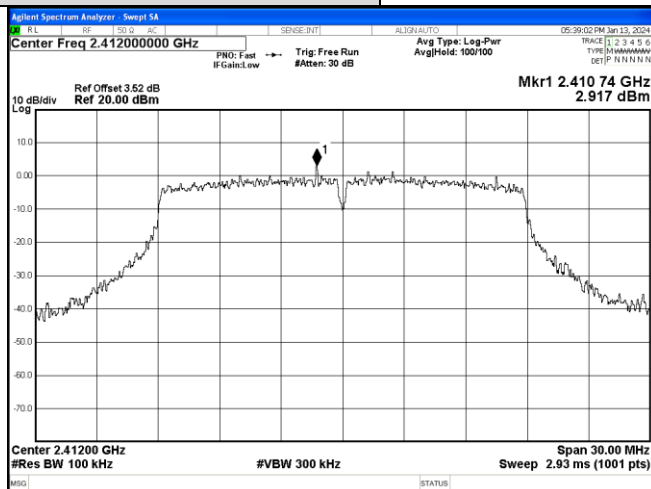
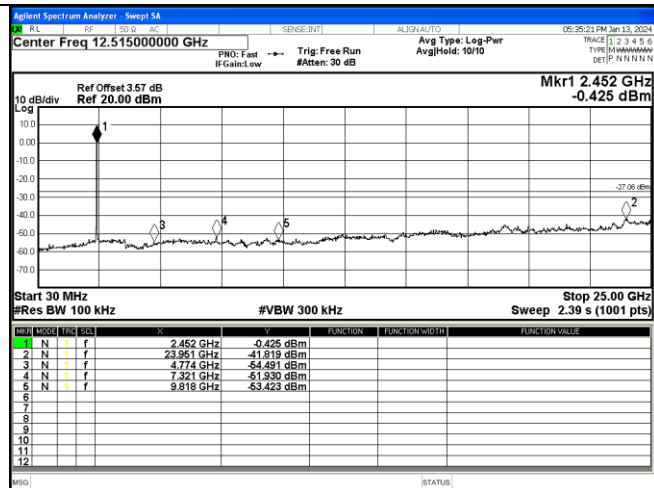
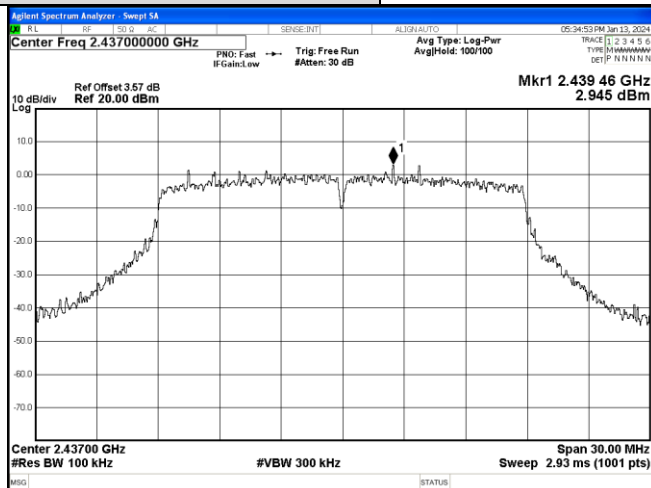
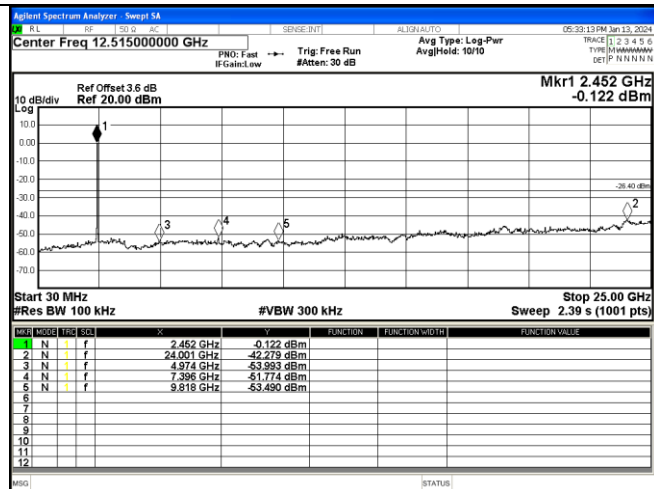
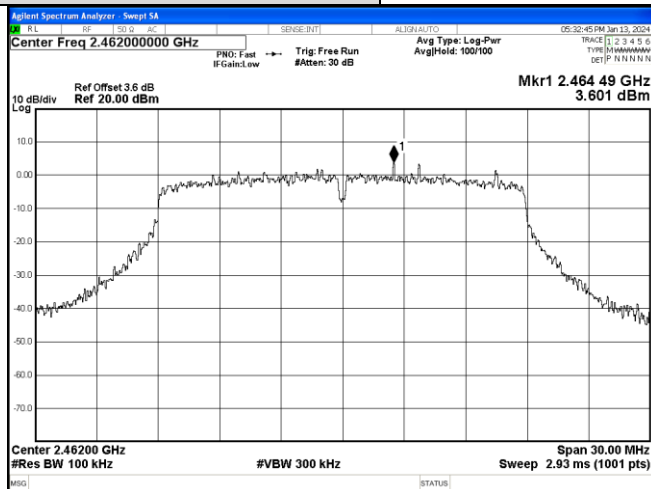
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	47.76	-2.43	45.33	74.00	-28.67	peak
2	2483.500	34.99	-2.43	32.56	54.00	-21.44	AVG
3	2486.533	50.83	-2.41	48.42	74.00	-25.58	peak
4	2486.533	36.48	-2.41	34.07	54.00	-19.93	AVG

Appendix A.3 Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Note: All models were tested, and only the worst model(ANT 1) were reported in the report.



Test Mode: 802.11g CH01

Test Mode: 802.11g CH06

Test Mode: 802.11g CH11


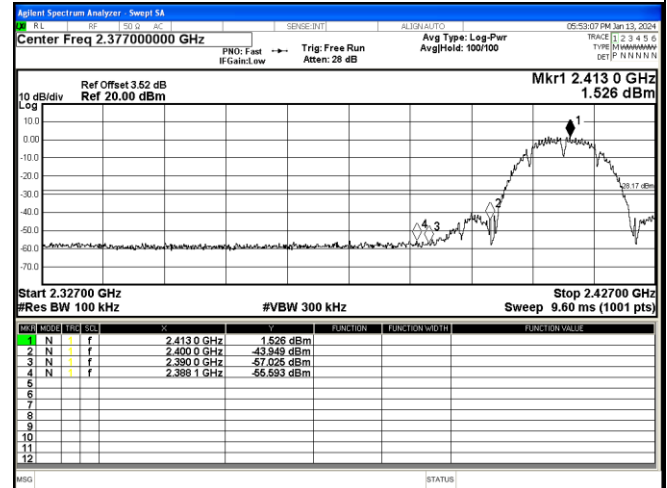
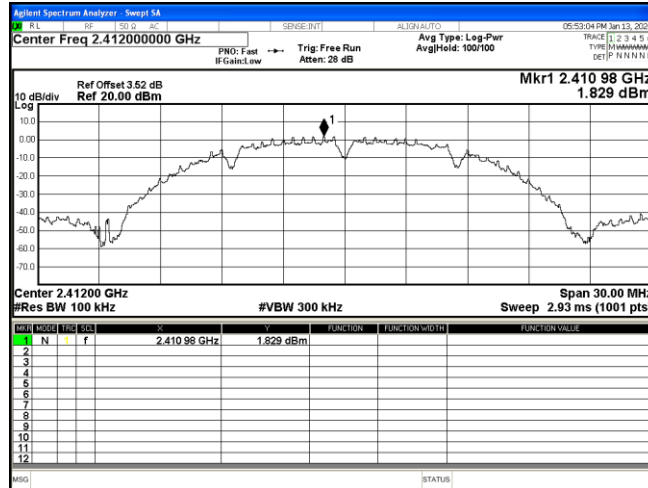
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Test Mode: 802.11n20 CH06

Test Mode: 802.11n20 CH11




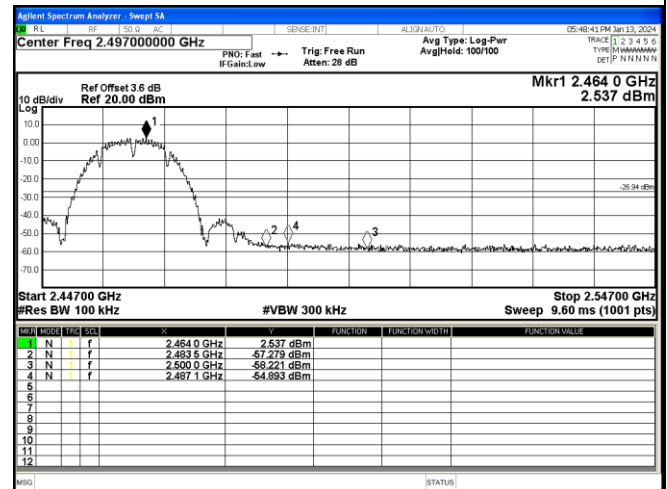
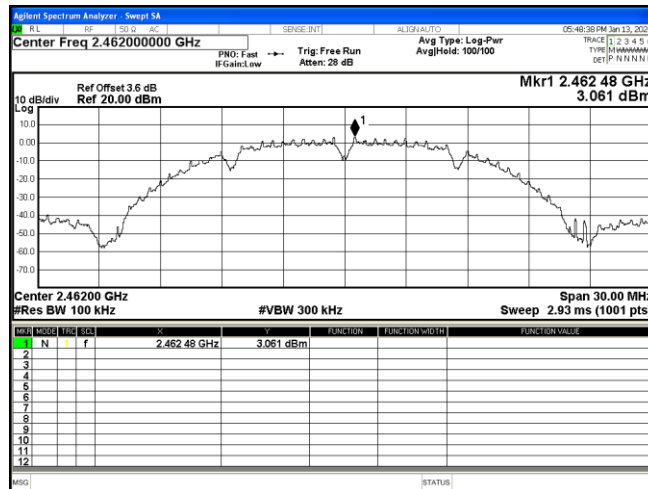
Note: All models were tested, and only the worst model(ANT 1) were reported in the report.

For Band edge(it's also the reference level for conducted spurious emission)

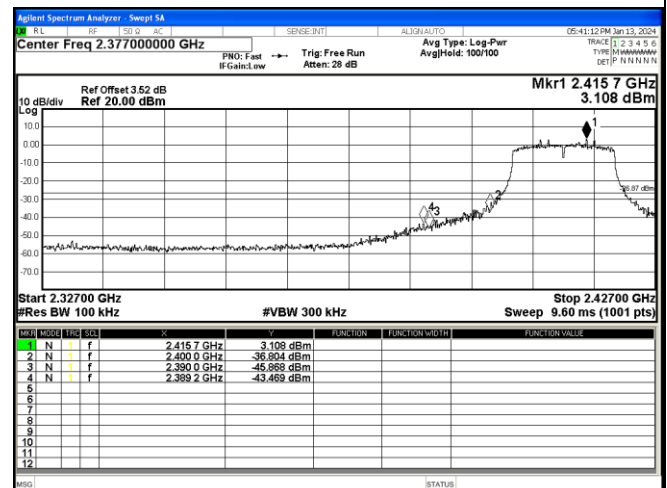
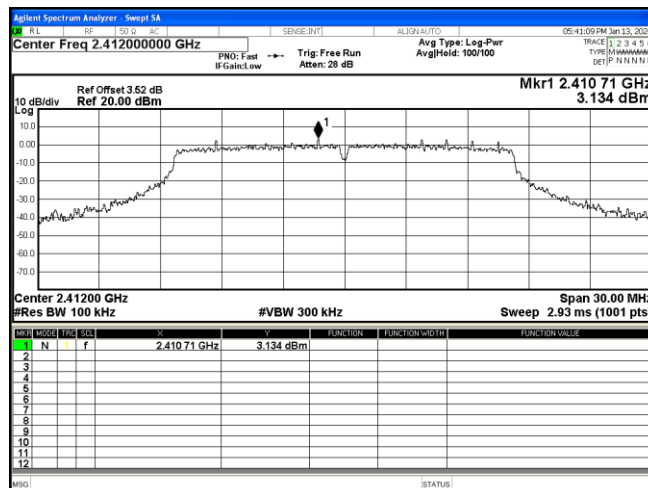
Test Mode: 802.11b CH01

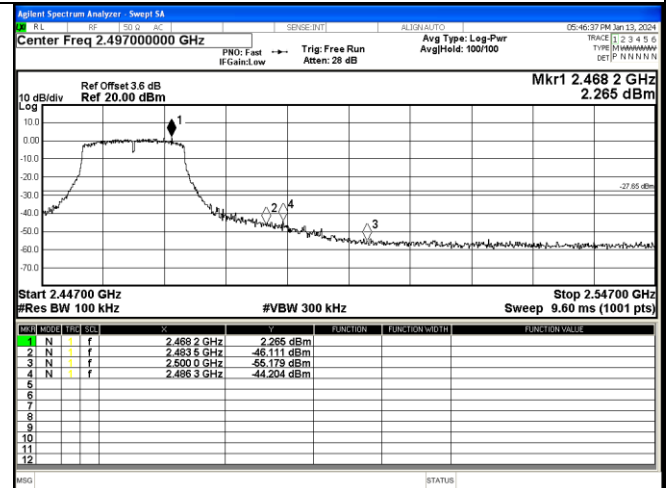
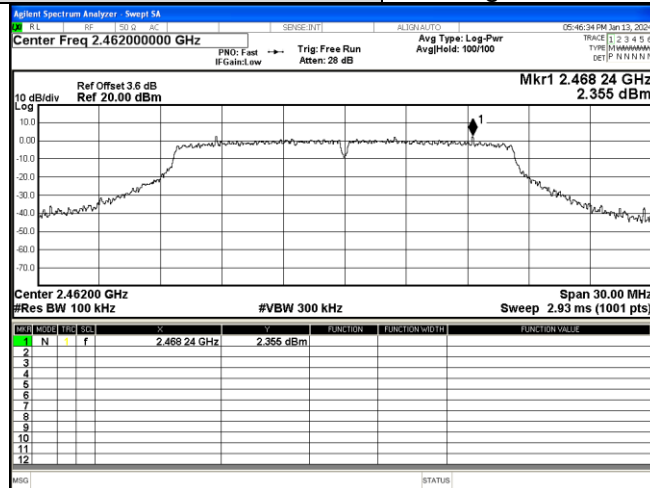
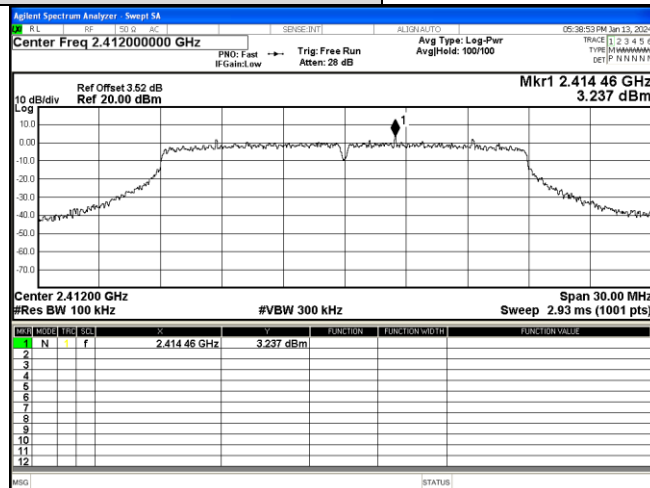
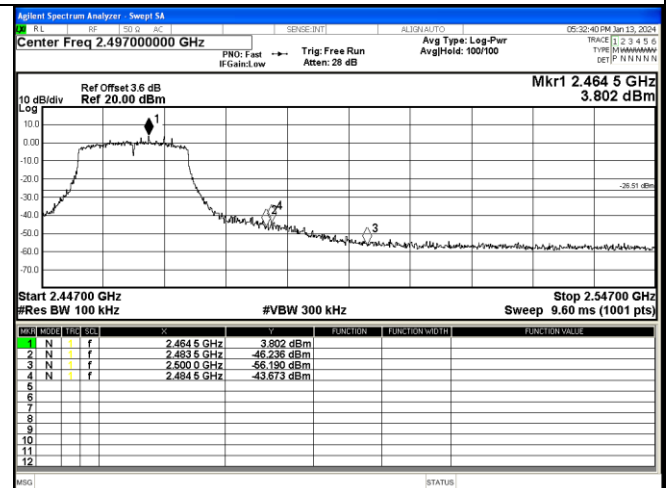
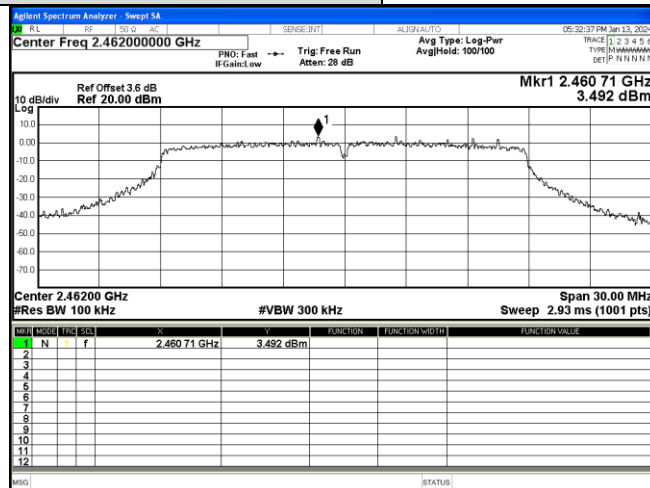


Test Mode: 802.11b CH011



Test Mode: 802.11g CH01



Test Mode: 802.11g CH11

Test Mode: 802.11n20 CH01

Test Mode: 802.11n20 CH11


Appendix A.4 Test Results of Conducted Power Spectral Density

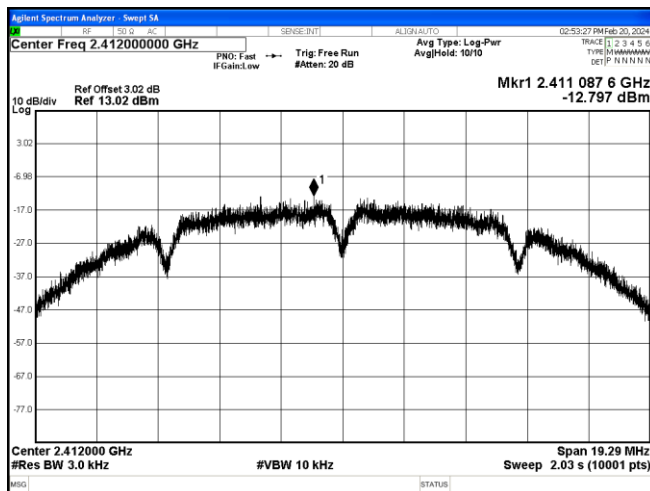
802.11b					
Frequency	Power Density			Limit (dBm/3KHz)	Result
	(dBm/3kHz)				
	Ant1	Ant2	Total		
CH01	-12.797	-8.956	---	8	Pass
CH06	-12.913	-11.459	---	8	Pass
CH11	-12.824	-11.349	---	8	Pass

802.11g					
Frequency	Power Density			Limit (dBm/3KHz)	Result
	(dBm/3kHz)				
	Ant1	Ant2	Total		
CH01	-14.423	-12.083	---	8	Pass
CH06	-14.975	-12.995	---	8	Pass
CH11	-14.952	-13.649	---	8	Pass

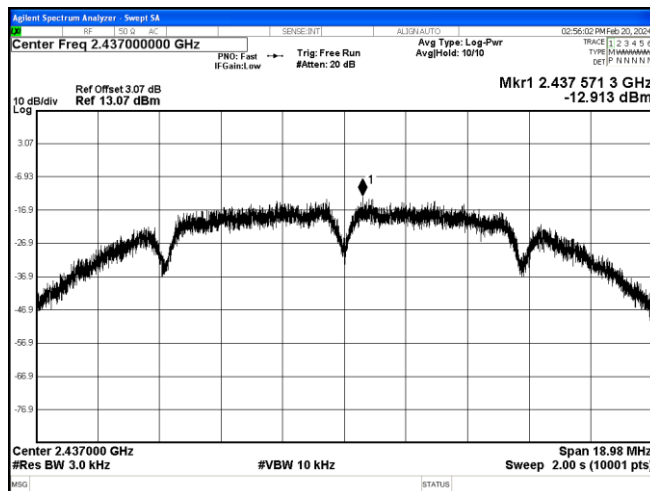
802.11n20					
Frequency	Power Density			Limit (dBm/3KHz)	Result
	(dBm/3kHz)				
	Ant1	Ant2	Total		
CH01	-15.195	-13.721	-11.385	8	Pass
CH06	-15.047	-13.071	-10.937	8	Pass
CH11	-15.147	-12.888	-10.862	8	Pass

ANT1

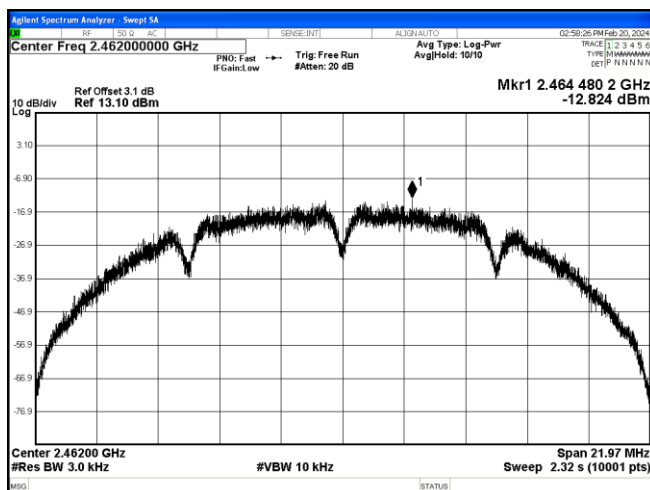
Test Mode: 802.11b CH01



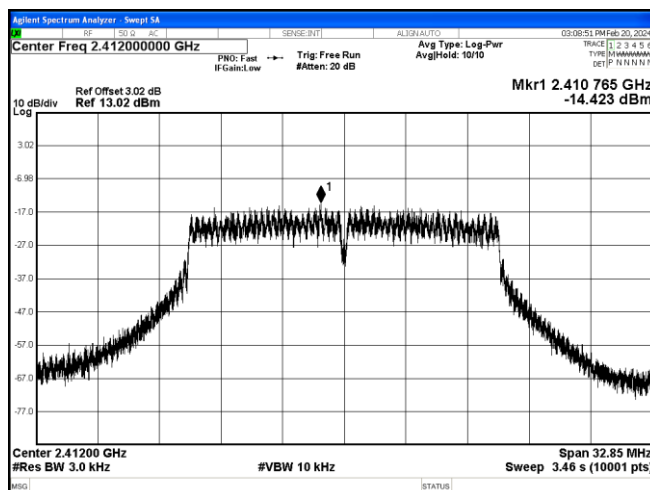
Test Mode: 802.11b CH06



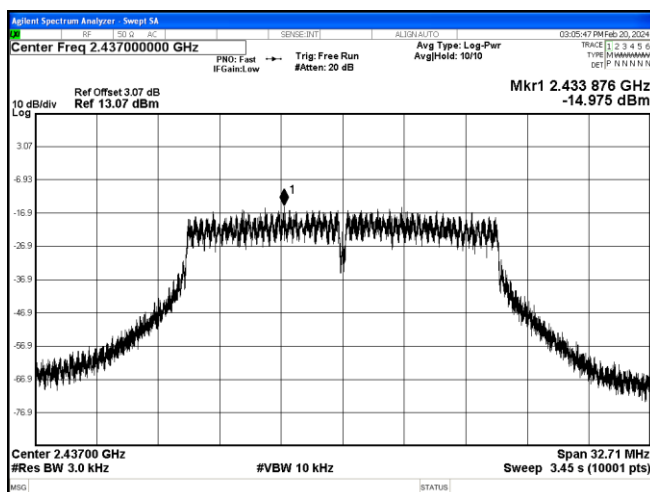
Test Mode: 802.11b CH11



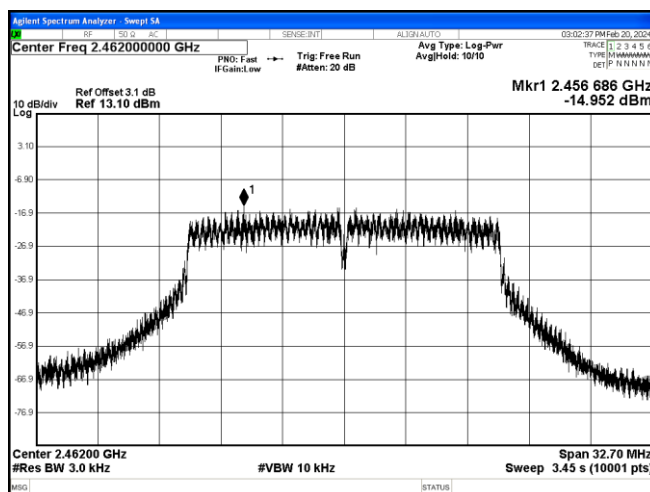
Test Mode: 802.11g CH01



Test Mode: 802.11g CH06

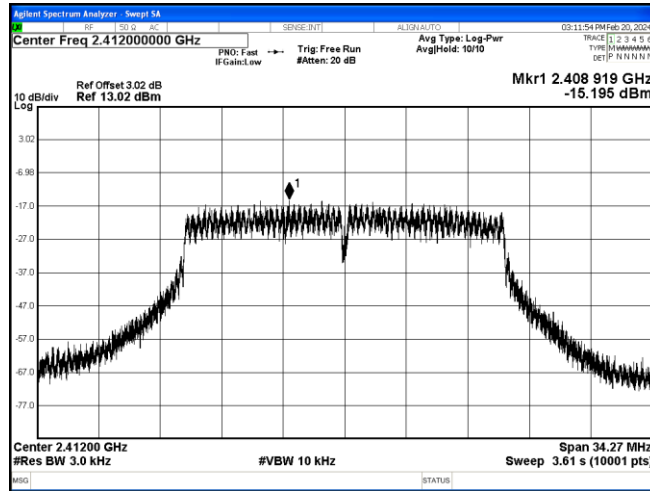


Test Mode: 802.11g CH11

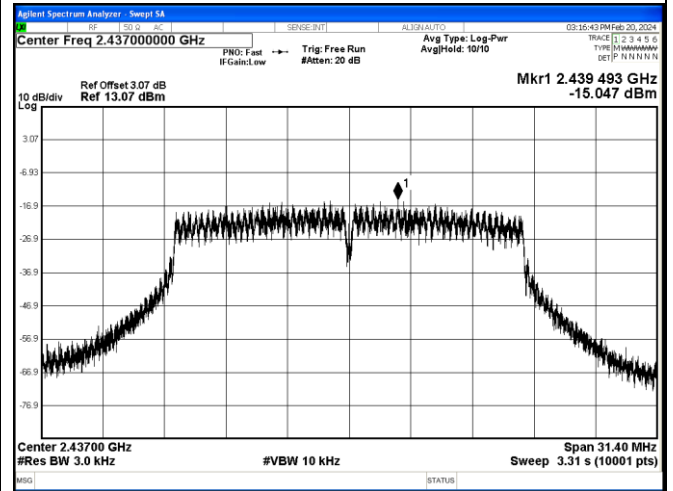




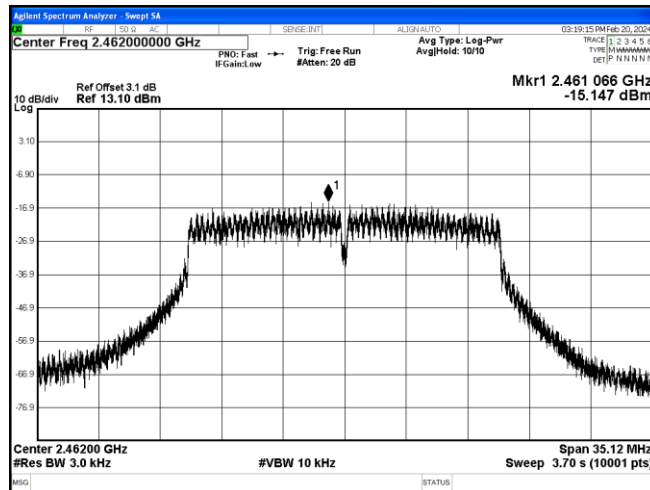
Test Mode: 802.11n20 CH01



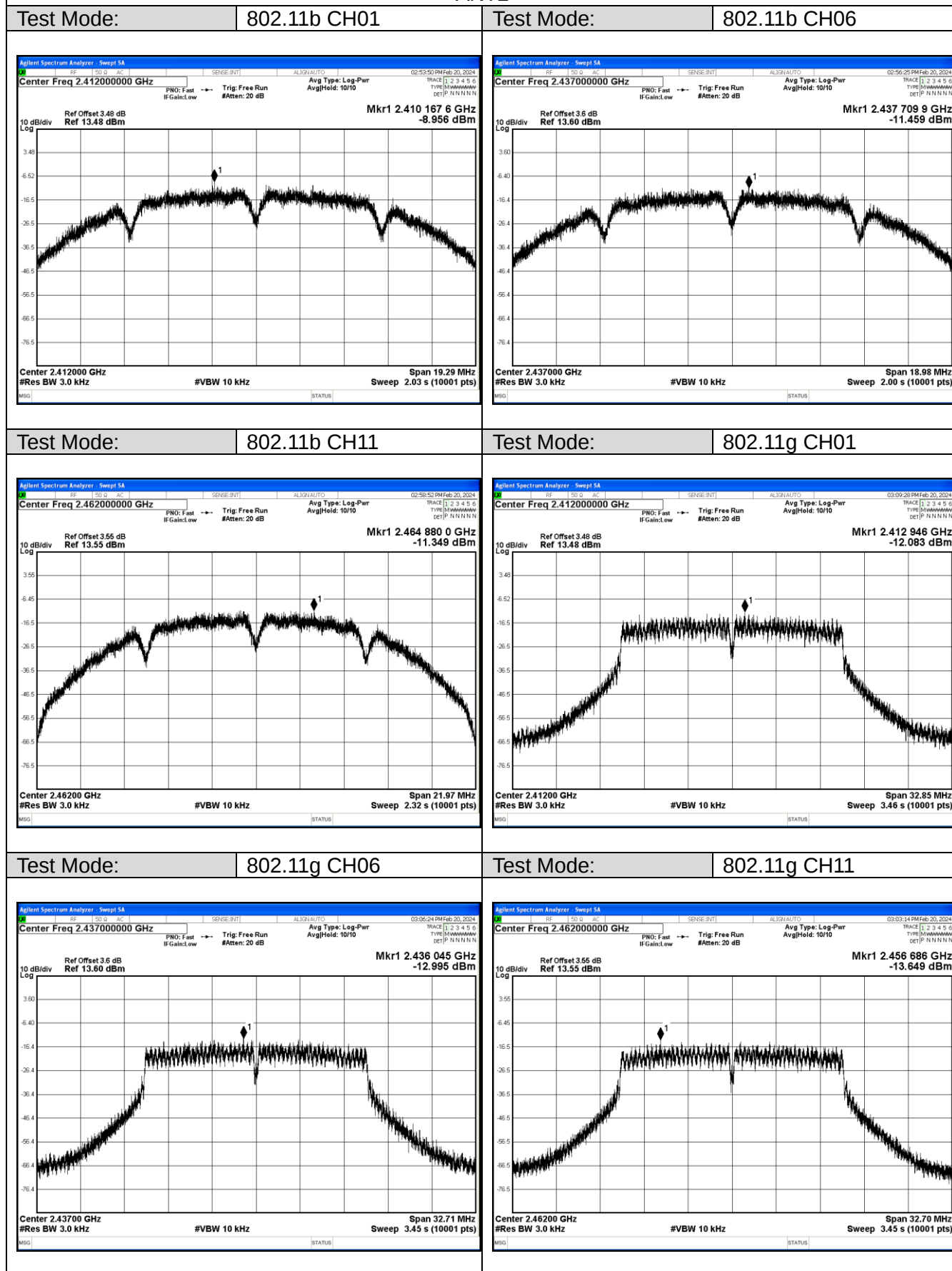
Test Mode: 802.11n20 CH06



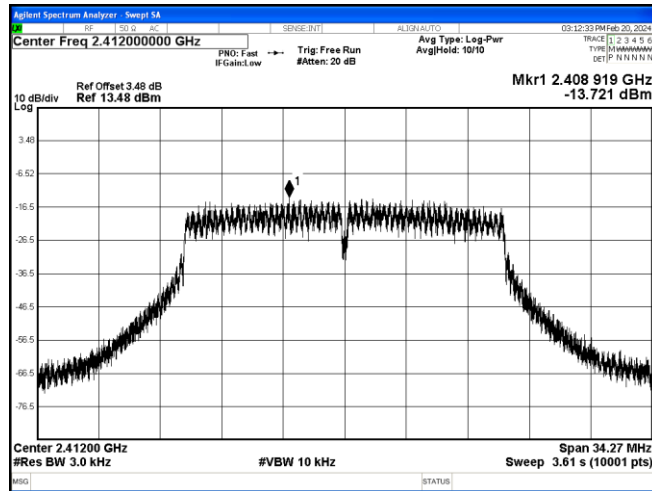
Test Mode: 802.11n20 CH11



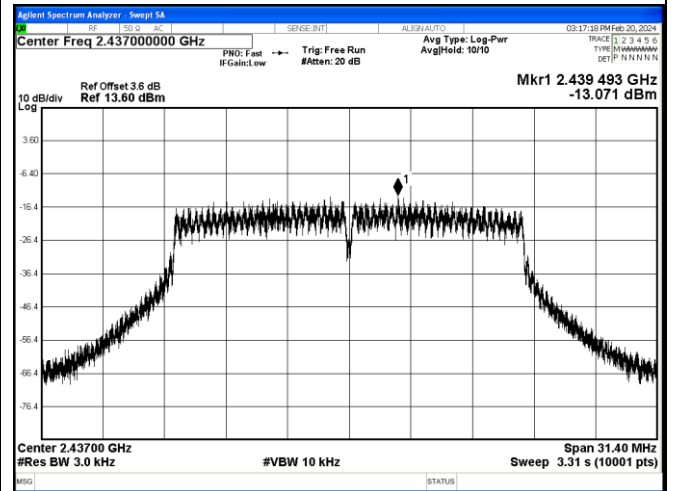
ANT2



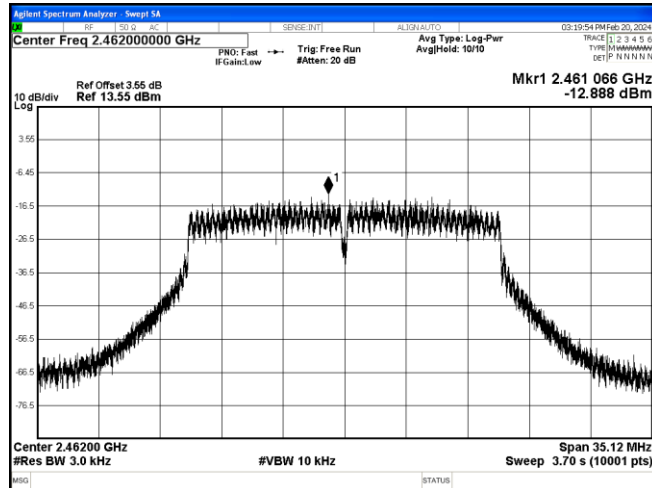
Test Mode: 802.11n20 CH01



Test Mode: 802.11n20 CH06



Test Mode: 802.11n20 CH11



Appendix A.5 Test Results of 6dB and 99% BANDWIDTH

Note: All models were tested, and only the worst model(Antenna 1) were reported in the report.

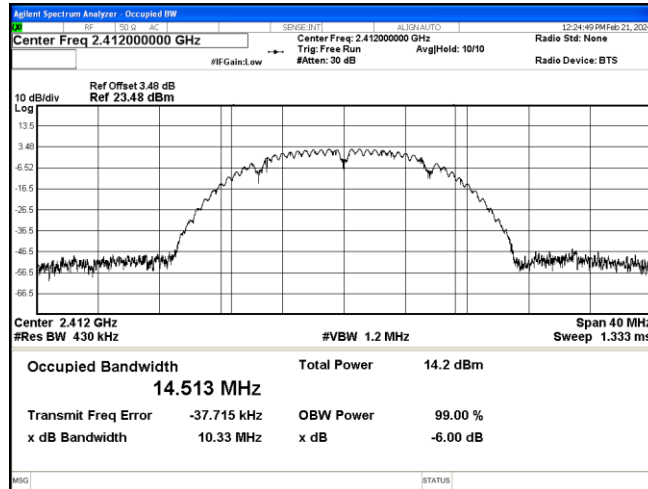
802.11b				
Frequency	Bandwidth (MHz)		6dB limit (KHz)	Result
	99%	6dB		
CH01	14.513	9.86	0.5	Pass
CH06	14.523	9.58	0.5	Pass
CH11	14.515	10.01	0.5	Pass

802.11g				
Frequency	Bandwidth (MHz)		6dB limit (KHz)	Result
	99%	6dB		
CH01	16.520	16.39	0.5	Pass
CH06	16.497	16.03	0.5	Pass
CH11	16.533	16.36	0.5	Pass

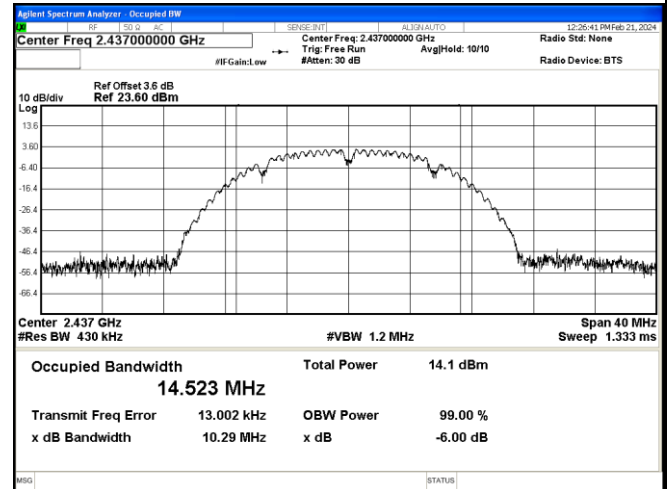
802.11n20				
Frequency	Bandwidth (MHz)		6dB limit (KHz)	Result
	99%	6dB		
CH01	17.640	17.61	0.5	Pass
CH06	17.681	15.84	0.5	Pass
CH11	17.671	17.59	0.5	Pass

99% Bandwidth

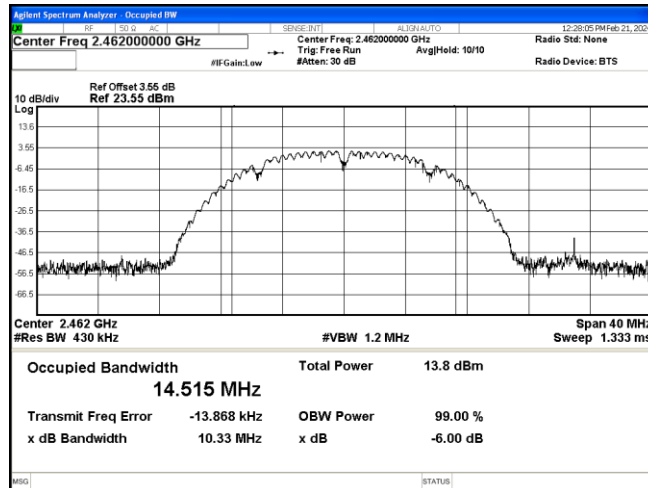
Test Mode: 802.11b CH01



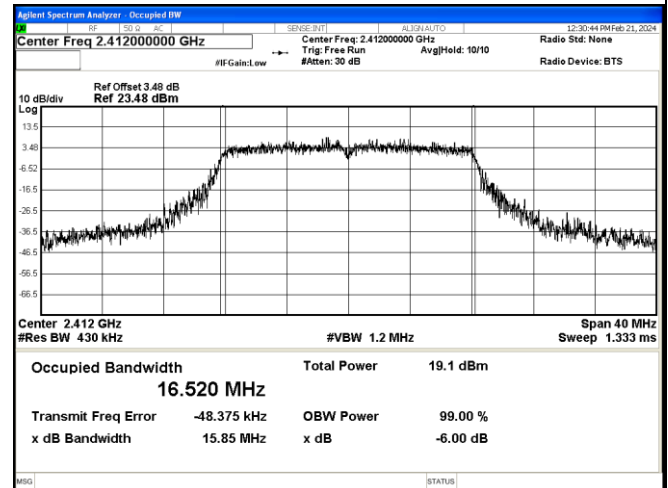
Test Mode: 802.11b CH06



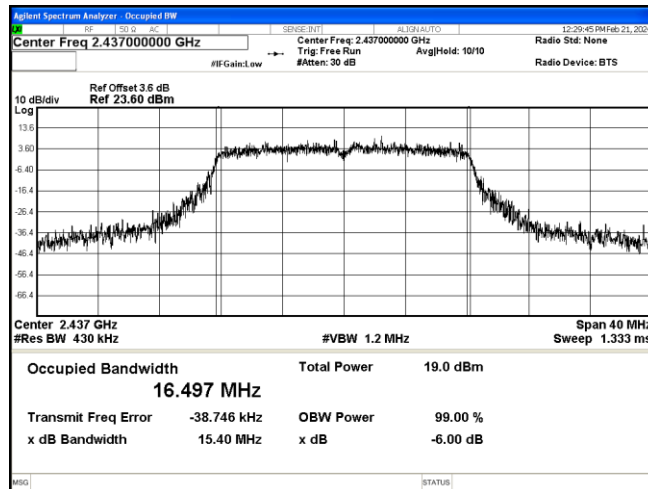
Test Mode: 802.11b CH11



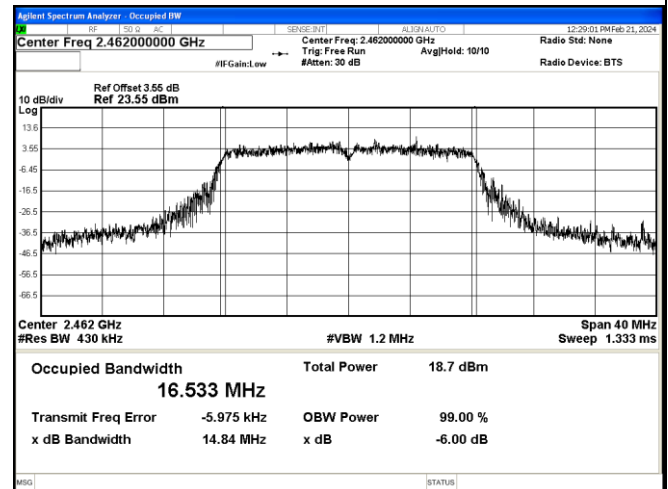
Test Mode: 802.11g CH01



Test Mode: 802.11g CH06

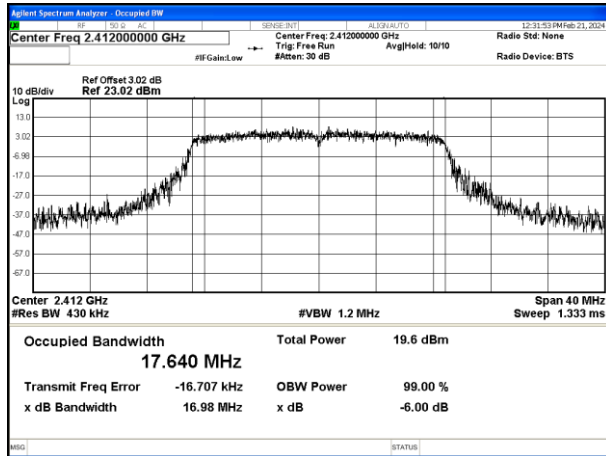


Test Mode: 802.11g CH11

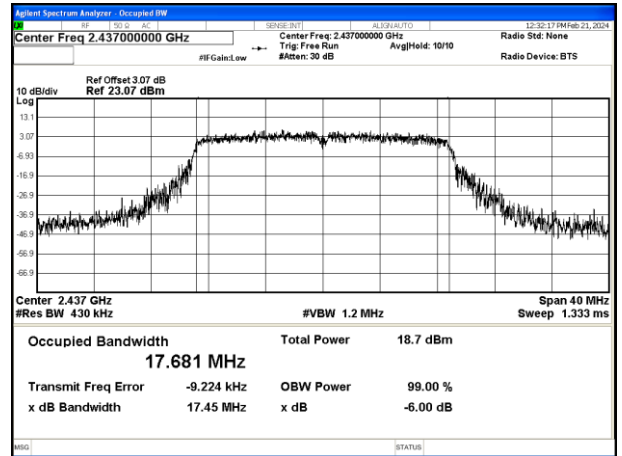




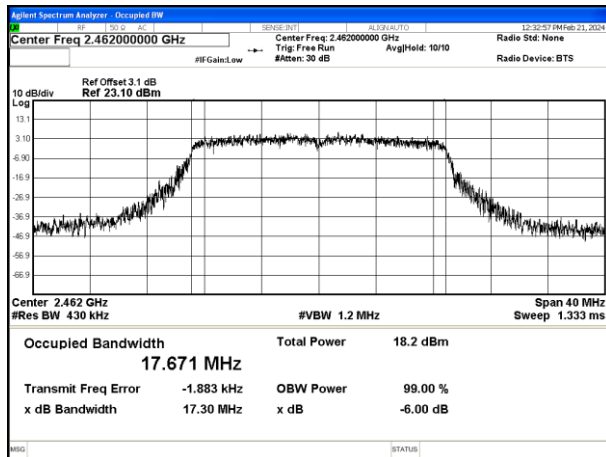
Test Mode: 802.11n20 CH01



Test Mode: 802.11n20 CH06

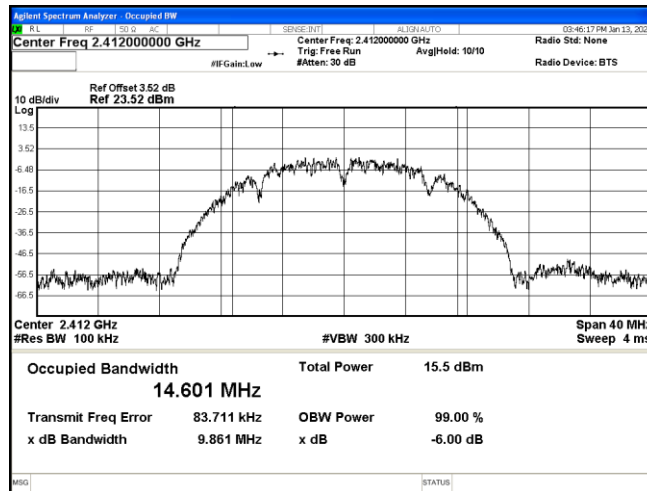


Test Mode: 802.11n20 CH11

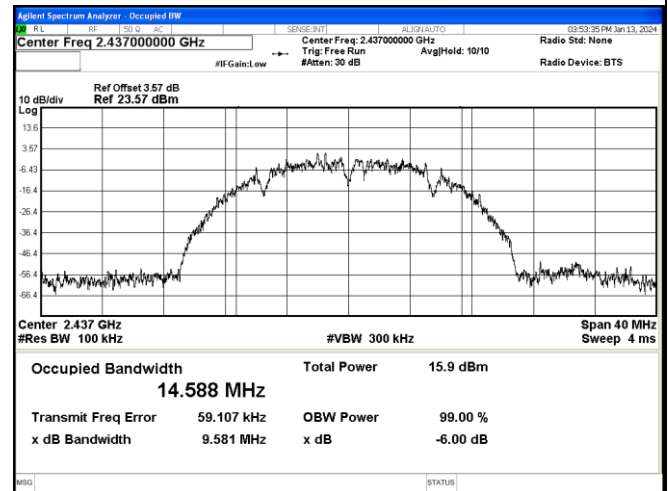


6dB Bandwidth

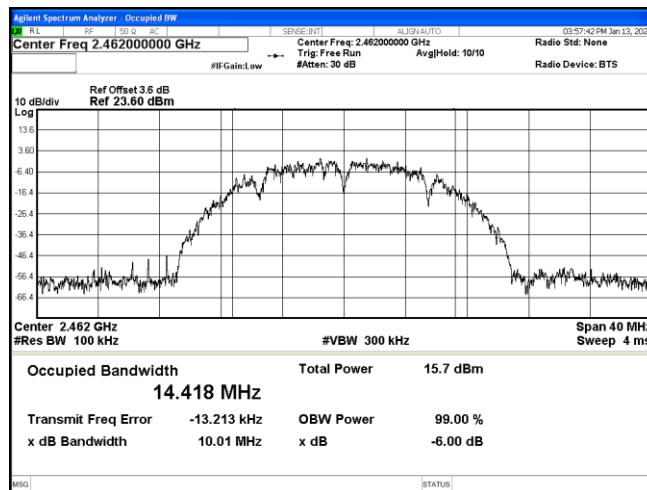
Test Mode: 802.11b CH01



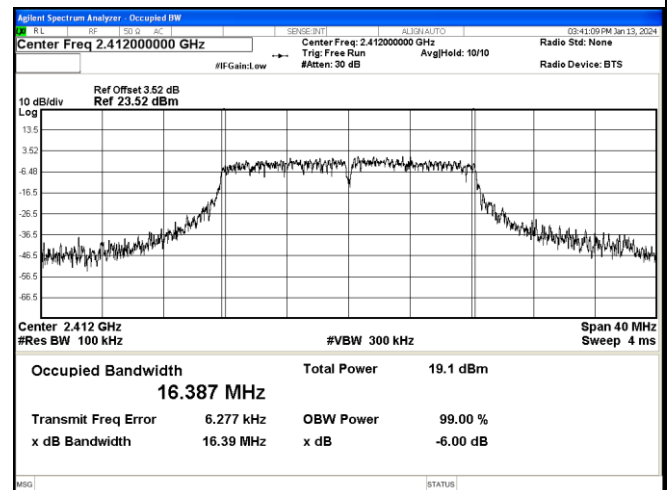
Test Mode: 802.11b CH06



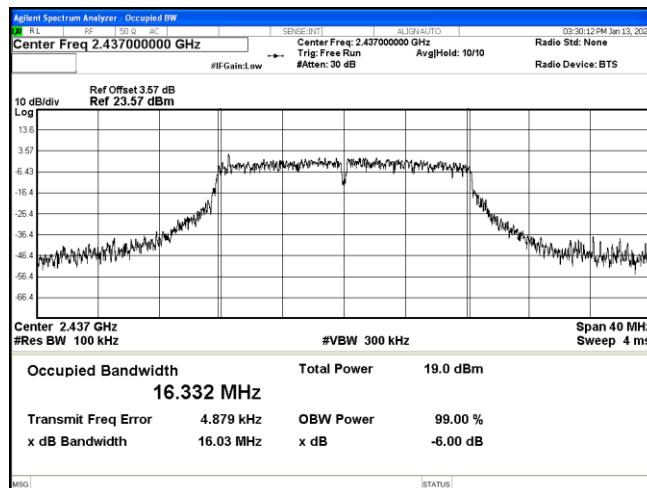
Test Mode: 802.11b CH11



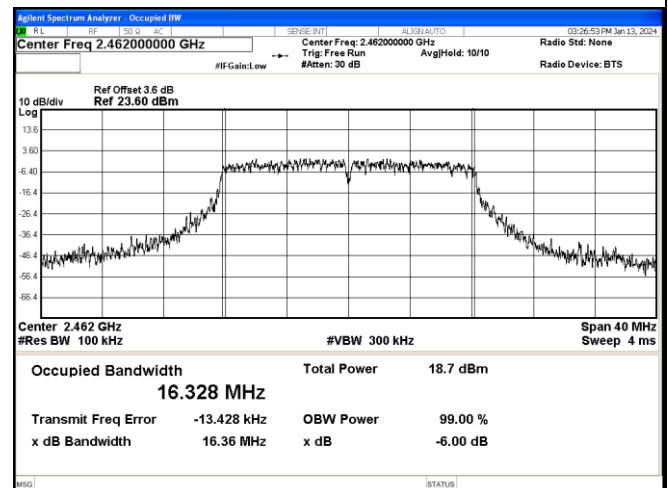
Test Mode: 802.11g CH01



Test Mode: 802.11g CH06



Test Mode: 802.11g CH11



Appendix A.6 Test Results of Maximum Conducted Output Power

For FCC:

802.11b								
Test Channel	Frequency	Conducted Power (dBm)			Total [W]		Limit	Result
	(MHz)	Ant1	Ant2	Total	Ant1	Ant2	[W]	
CH01	2412	14.058	13.698	/	0.03	0.02	1	Pass
CH06	2437	13.141	13.133	/	0.02	0.02	1	Pass
CH11	2462	13.374	12.880	/	0.02	0.02	1	Pass

802.11g								
Test Channel	Frequency	Conducted Power (dBm)			Total [W]		Limit	Result
	(MHz)	Ant1	Ant2	Total	Ant1	Ant2	[W]	
CH01	2412	15.077	14.530	/	0.03	0.03	1	Pass
CH06	2437	14.364	14.524	/	0.03	0.03	1	Pass
CH11	2462	14.191	13.986	/	0.03	0.03	1	Pass

802.11n20							
Test Channel	Frequency	Conducted Power (dBm)			Total [W]	Limit	Result
	(MHz)	Ant1	Ant2	Total		[W]	
CH01	2412	12.593	11.652	15.158	0.0328	1	Pass
CH06	2437	11.739	11.451	14.608	0.0289	1	Pass
CH11	2462	10.872	10.826	13.859	0.0243	1	Pass

Note:

- 1) The cable loss is taken into account in results.
- 2) Antenna gain(G) of 802.11 b/g/n: 2.97 dBi(ANT1) and 2.97 dBi(ANT2)
e.i.r.p.=P(Peak power)+ G, which is far below the 4 W.

For IC:

802.11b								
Test Channel	Frequency	Conducted Power (dBm)			E.R.I.P [dBm]		Limit	Result
	(MHz)	Ant1	Ant2	Total	Ant1	Ant2	[dBm]	
CH01	2412	14.058	13.698	/	17.03	16.67	36	Pass
CH06	2437	13.141	13.133	/	16.11	16.10	36	Pass
CH11	2462	13.374	12.880	/	16.34	15.85	36	Pass

802.11g								
Test Channel	Frequency	Conducted Power (dBm)			E.R.I.P [dBm]		Limit	Result
	(MHz)	Ant1	Ant2	Total	Ant1	Ant2	[dBm]	
CH01	2412	15.077	14.530	/	18.05	17.50	36	Pass
CH06	2437	14.364	14.524	/	17.33	17.49	36	Pass
CH11	2462	14.191	13.986	/	17.16	16.96	36	Pass

802.11n20							
Test Channel	Frequency	Conducted Power (dBm)			E.R.I.P [dBm]	Limit	Result
	(MHz)	Ant1	Ant2	Total	Total	[dBm]	
CH01	2412	12.593	11.652	15.158	18.128	36	Pass
CH06	2437	11.739	11.451	14.608	17.578	36	Pass
CH11	2462	10.872	10.826	13.859	16.829	36	Pass

Note:

- 1) The cable loss is taken into account in results.
 - 2) Antenna gain(G) of 802.11 b/g/n: 2.97 dBi(ANT1) and 2.97 dBi(ANT2)
- e.i.r.p.=P(Peak power)+ G, which is far below the 4 W.