

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

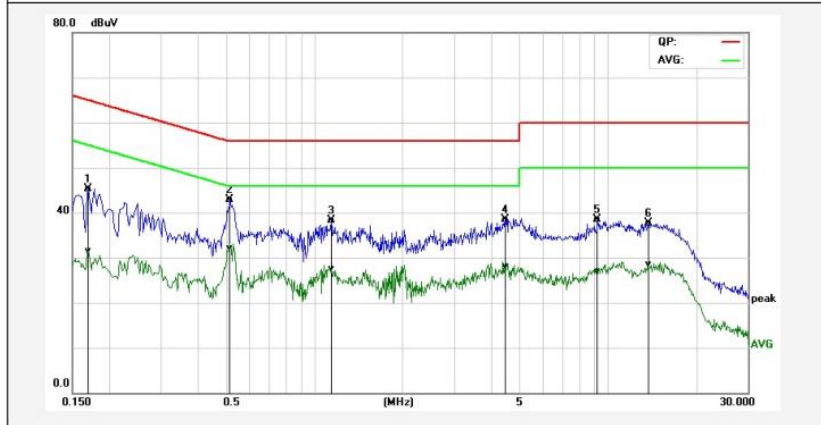
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Appendix A.1 Test Results of Conducted Emission on AC Mains

Test Mode:

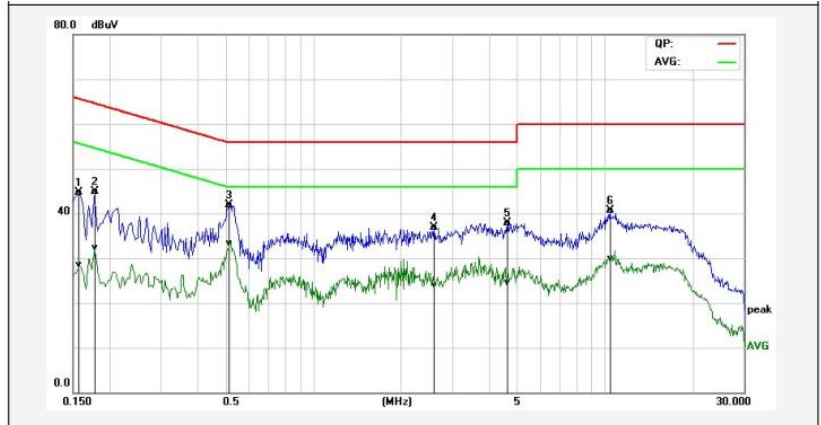
Mode10

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	0.1700	35.75	21.87	9.56	45.31	31.43	64.96	54.96	-19.65	-23.53	Pass
2*	0.5180	33.43	22.56	9.48	42.91	32.04	56.00	46.00	-13.09	-13.96	Pass
3P	1.1420	28.73	18.09	9.50	38.23	27.59	56.00	46.00	-17.77	-18.41	Pass
4P	4.4699	28.68	18.35	9.84	38.52	28.19	56.00	46.00	-17.48	-17.81	Pass
5P	9.2100	28.83	17.32	9.65	38.48	26.97	60.00	50.00	-21.52	-23.03	Pass
6P	13.7060	27.92	18.56	9.85	37.77	28.41	60.00	50.00	-22.23	-21.59	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	0.1580	35.26	18.90	9.52	44.78	28.42	65.56	55.57	-20.78	-27.15	Pass
2P	0.1780	35.40	22.82	9.56	44.96	32.38	64.57	54.58	-19.61	-22.20	Pass
3*	0.5180	32.32	23.69	9.59	41.91	33.28	56.00	46.00	-14.09	-12.72	Pass
4P	2.5980	27.34	14.63	9.50	36.84	24.13	56.00	46.00	-19.16	-21.87	Pass
5P	4.6460	28.43	14.90	9.54	37.97	24.44	56.00	46.00	-18.03	-21.56	Pass
6P	10.3979	30.86	20.18	9.80	40.66	29.98	60.00	50.00	-19.34	-20.02	Pass

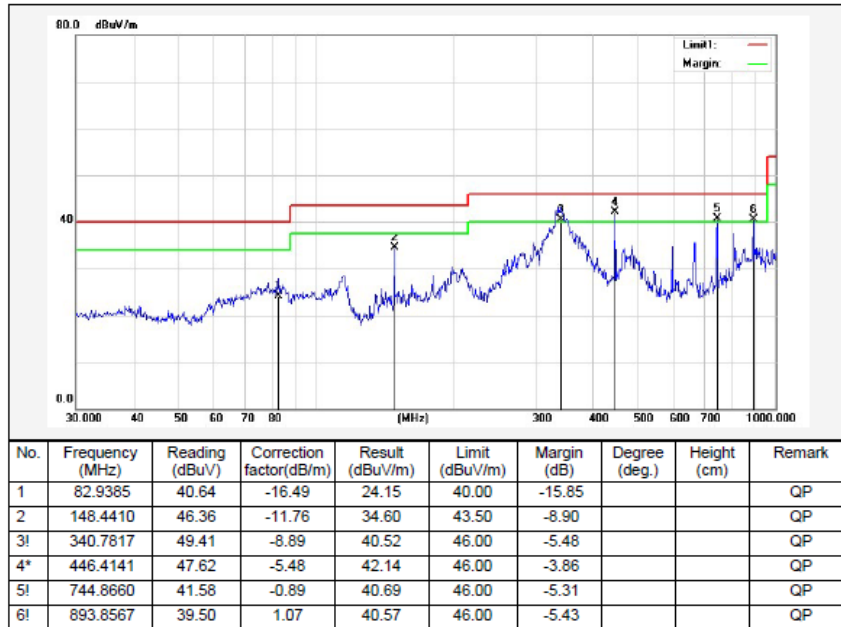
Appendix A.2 Test Results of Radiated Spurious Emission

Below 1GHz:

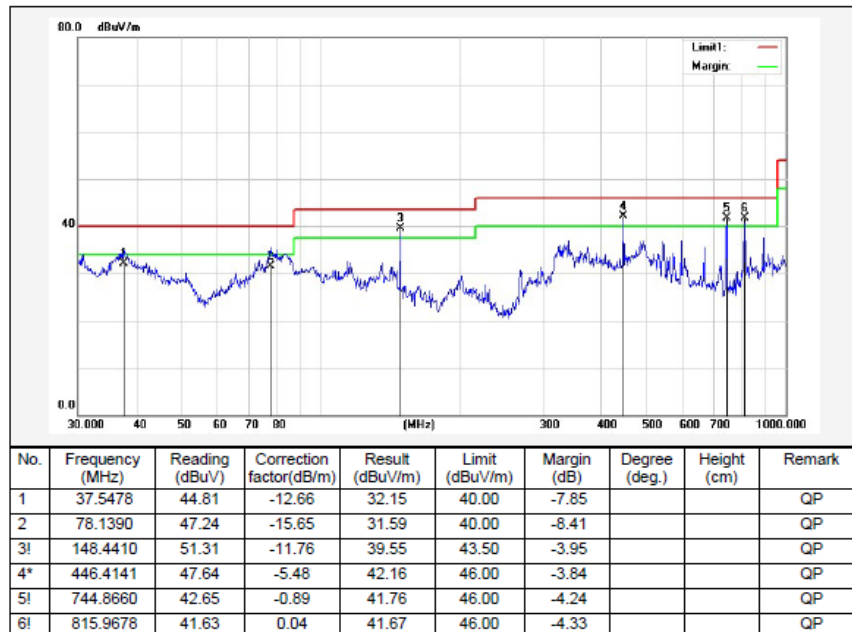
All modes have been tested, and the report only reflects the worst mode.

Test Mode: Mode 7(worst mode)

Horizontal



Vertical



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	6841.814	57.00	-10.14	46.86	74.00	-27.14	peak
2	6841.814	40.84	-10.14	30.70	54.00	-23.30	AVG
3	7907.891	55.86	-8.49	47.37	74.00	-26.63	peak
4	7907.891	41.05	-8.49	32.56	54.00	-21.44	AVG
5	9629.202	55.52	-6.78	48.74	74.00	-25.26	peak
6	9629.202	40.90	-6.78	34.12	54.00	-19.88	AVG
7	11259.285	54.19	-5.10	49.09	74.00	-24.91	peak
8	11259.285	40.19	-5.10	35.09	54.00	-18.91	AVG
9	12424.406	53.93	-3.18	50.75	74.00	-23.25	peak
10	12424.406	35.33	-3.18	32.15	54.00	-21.85	AVG
11	14782.331	53.84	-0.99	52.85	74.00	-21.15	peak
12	14782.331	35.86	-0.99	34.87	54.00	-19.13	AVG

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	6841.814	56.87	-10.14	46.73	74.00	-27.27	peak
2	6841.814	42.30	-10.14	32.16	54.00	-21.84	AVG
3	7549.811	56.69	-8.89	47.80	74.00	-26.20	peak
4	7549.811	40.54	-8.89	31.65	54.00	-22.35	AVG
5	9463.320	54.70	-6.37	48.33	74.00	-25.67	peak
6	9463.320	40.53	-6.37	34.16	54.00	-19.84	AVG
7	11390.479	54.08	-4.61	49.47	74.00	-24.53	peak
8	11390.479	40.50	-4.61	35.89	54.00	-18.11	AVG
9	12424.406	53.79	-3.18	50.61	74.00	-23.39	peak
10	12424.406	37.41	-3.18	34.23	54.00	-19.77	AVG
11	14868.203	53.09	-0.98	52.11	74.00	-21.89	peak
12	14868.203	36.06	-0.98	35.08	54.00	-18.92	AVG

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	7376.898	57.30	-9.16	48.14	74.00	-25.86	peak
2	7376.898	41.76	-9.16	32.60	54.00	-21.40	AVG
3	8879.167	56.95	-7.81	49.14	74.00	-24.86	peak
4	8879.167	41.87	-7.81	34.06	54.00	-19.94	AVG
5	10203.426	54.82	-6.04	48.78	74.00	-25.22	peak
6	10203.426	40.19	-6.04	34.15	54.00	-19.85	AVG
7	12000.026	54.04	-2.95	51.09	74.00	-22.91	peak
8	12000.026	38.08	-2.95	35.13	54.00	-18.87	AVG
9	13473.912	53.89	-2.48	51.41	74.00	-22.59	peak
10	13473.912	39.07	-2.48	36.59	54.00	-17.41	AVG
11	14782.331	53.76	-0.99	52.77	74.00	-21.23	peak
12	14782.331	36.46	-0.99	35.47	54.00	-18.53	AVG

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	6646.506	58.46	-10.91	47.55	74.00	-26.45	peak
2	6646.506	43.56	-10.91	32.65	54.00	-21.35	AVG
3	7593.669	56.08	-8.90	47.18	74.00	-26.82	peak
4	7593.669	41.35	-8.90	32.45	54.00	-21.55	AVG
5	8879.167	56.03	-7.81	48.22	74.00	-25.78	peak
6	8879.167	41.67	-7.81	33.86	54.00	-20.14	AVG
7	11456.648	54.26	-4.52	49.74	74.00	-24.26	peak
8	11456.648	38.60	-4.52	34.08	54.00	-19.92	AVG
9	12069.735	54.70	-3.09	51.61	74.00	-22.39	peak
10	12069.735	37.16	-3.09	34.07	54.00	-19.93	AVG
11	14782.331	52.92	-0.99	51.93	74.00	-22.07	peak
12	14782.331	36.01	-0.99	35.02	54.00	-18.98	AVG

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	6802.299	57.36	-10.25	47.11	74.00	-26.89	peak
2	6802.299	44.37	-10.25	34.12	54.00	-19.88	AVG
3	7549.811	56.87	-8.89	47.98	74.00	-26.02	peak
4	7549.811	40.76	-8.89	31.87	54.00	-22.13	AVG
5	9463.320	55.65	-6.37	49.28	74.00	-24.72	peak
6	9463.320	39.81	-6.37	33.44	54.00	-20.56	AVG
7	11390.479	54.65	-4.61	50.04	74.00	-23.96	peak
8	11390.479	37.87	-4.61	33.26	54.00	-20.74	AVG
9	12424.406	54.27	-3.18	51.09	74.00	-22.91	peak
10	12424.406	39.03	-3.18	35.85	54.00	-18.15	AVG
11	14782.331	53.06	-0.99	52.07	74.00	-21.93	peak
12	14782.331	36.04	-0.99	35.05	54.00	-18.95	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	7549.811	55.81	-8.89	46.92	74.00	-27.08	peak
2	7549.811	42.04	-8.89	33.15	54.00	-20.85	AVG
3	8428.146	56.17	-8.22	47.95	74.00	-26.05	peak
4	8428.146	43.00	-8.22	34.78	54.00	-19.22	AVG
5	8982.627	57.14	-7.74	49.40	74.00	-24.60	peak
6	8982.627	40.71	-7.74	32.97	54.00	-21.03	AVG
7	9854.908	55.23	-6.39	48.84	74.00	-25.16	peak
8	9854.908	41.68	-6.39	35.29	54.00	-18.71	AVG
9	12496.581	53.92	-2.88	51.04	74.00	-22.96	peak
10	12496.581	36.96	-2.88	34.08	54.00	-19.92	AVG
11	14194.951	52.38	-1.12	51.26	74.00	-22.74	peak
12	14194.951	35.46	-1.12	34.34	54.00	-19.66	AVG

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	2385.811	41.99	2.98	44.97	74.00	-29.03	peak
2	2385.811	26.65	2.98	29.63	54.00	-24.37	AVG
3	2390.000	40.29	3.01	43.30	74.00	-30.70	peak
4	2390.000	25.66	3.01	28.67	54.00	-25.33	AVG

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2380.862	46.16	2.95	49.11	74.00	-24.89	peak
2	2380.862	30.57	2.95	33.52	54.00	-20.48	AVG
3	2390.000	51.82	3.01	54.83	74.00	-19.17	peak
4	2390.000	31.85	3.01	34.86	54.00	-19.14	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	42.29	3.54	45.83	74.00	-28.17	peak
2	2483.500	29.11	3.54	32.65	54.00	-21.35	AVG
3	2485.451	45.92	3.55	49.47	74.00	-24.53	peak
4	2485.451	30.96	3.55	34.51	54.00	-19.49	AVG

Vertical

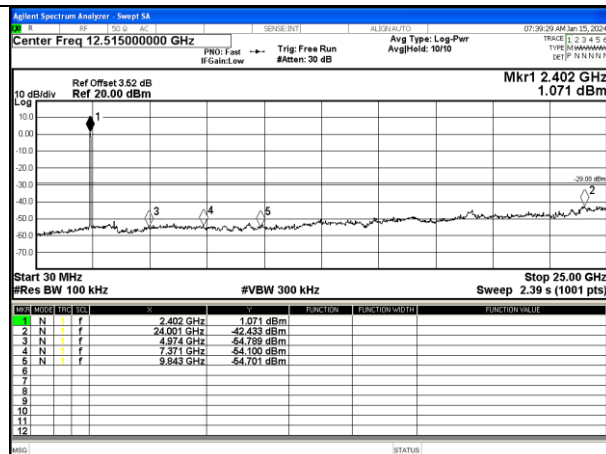
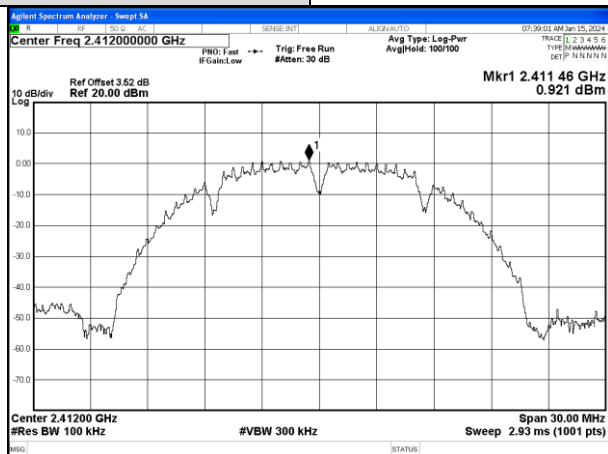
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	53.34	3.54	56.88	74.00	-17.12	peak
2	2483.500	35.91	3.54	39.45	54.00	-14.55	AVG
3	2484.609	55.18	3.55	58.73	74.00	-15.27	peak
4	2484.609	38.07	3.55	41.62	54.00	-12.38	AVG

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

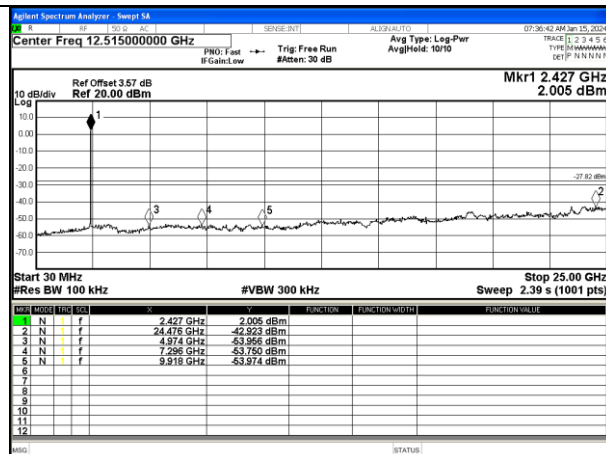
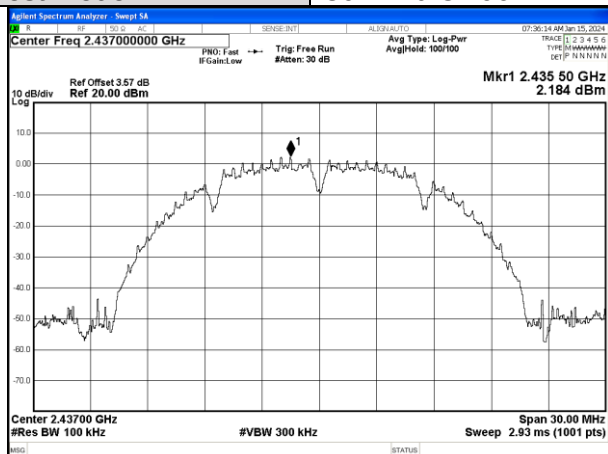
Note: All models were tested, and only the worst model(ANT 1) were reported in the report.

Conducted spurious emission

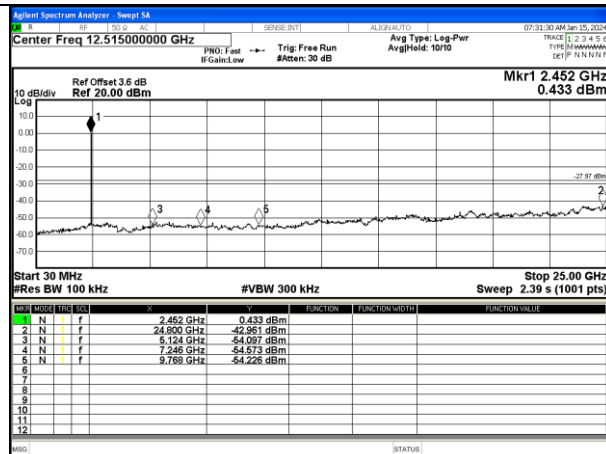
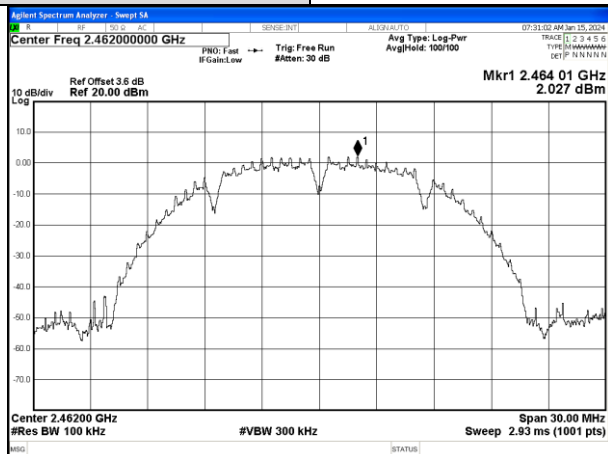
Test Mode: 802.11b CH01

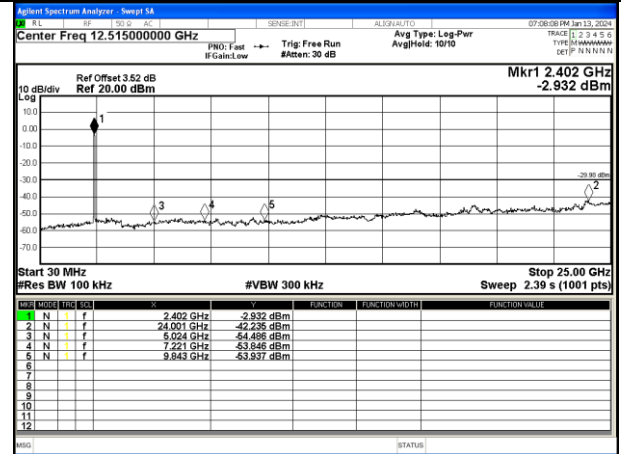
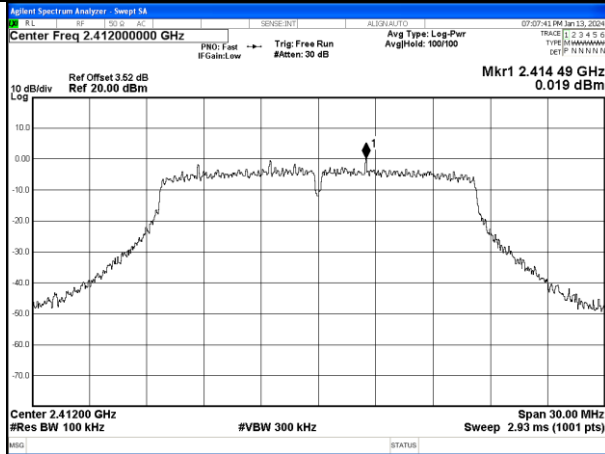
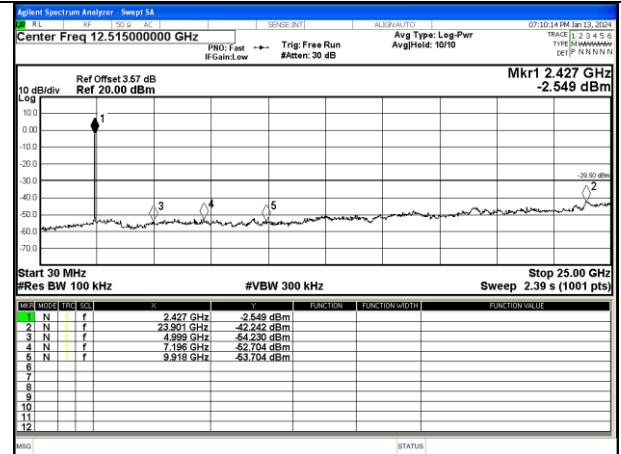
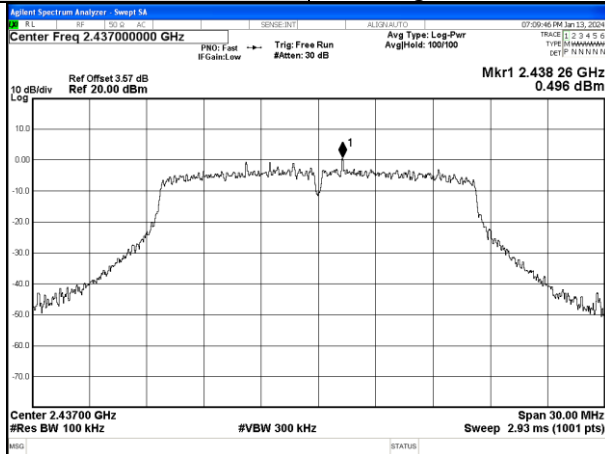
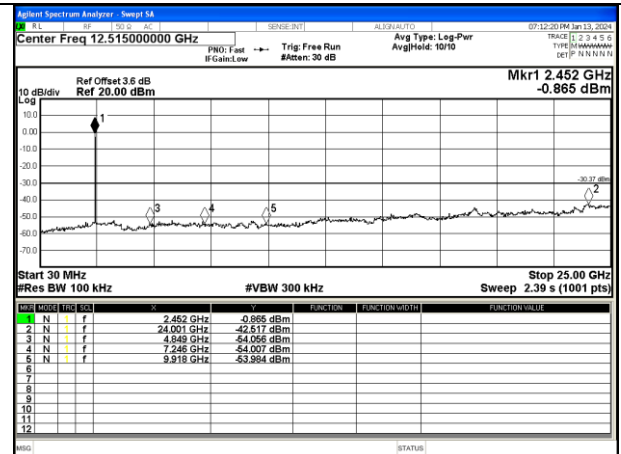
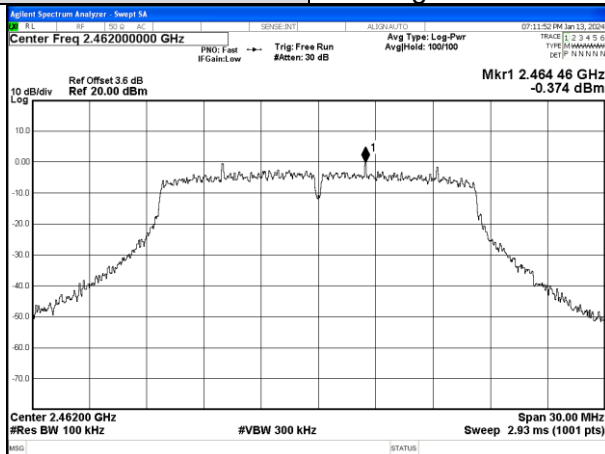


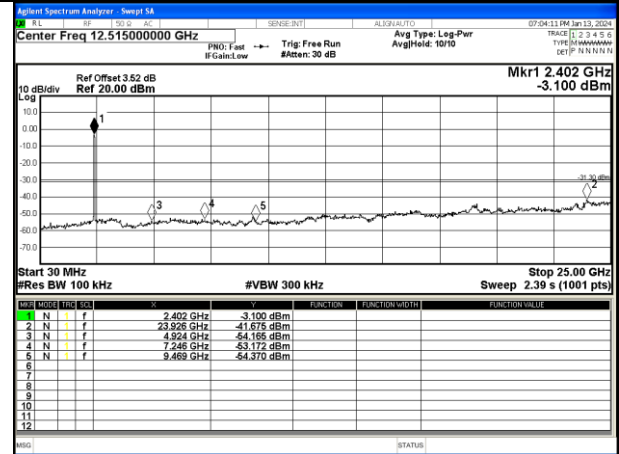
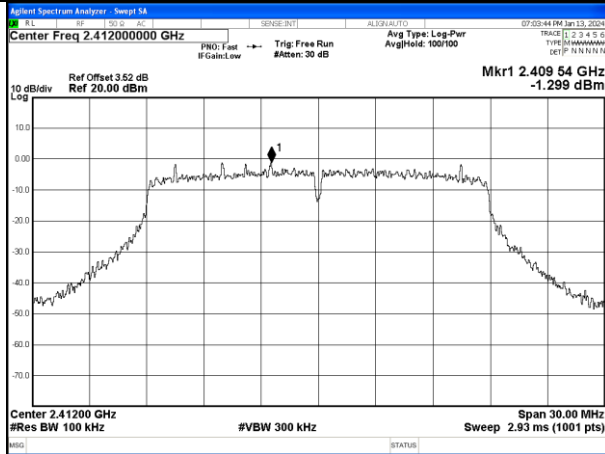
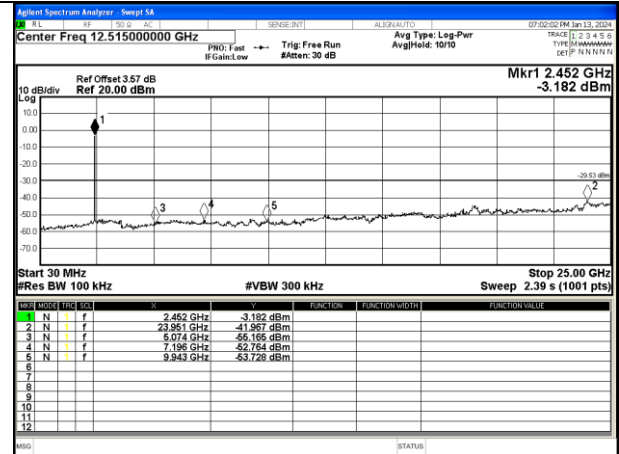
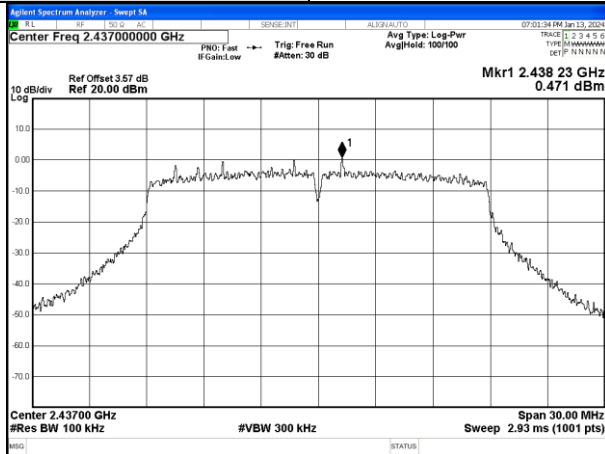
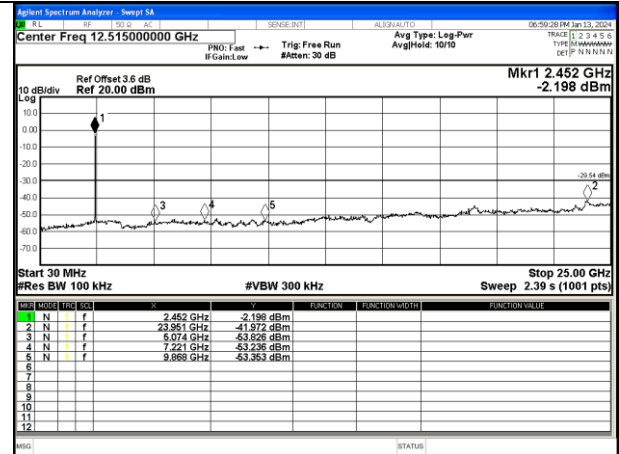
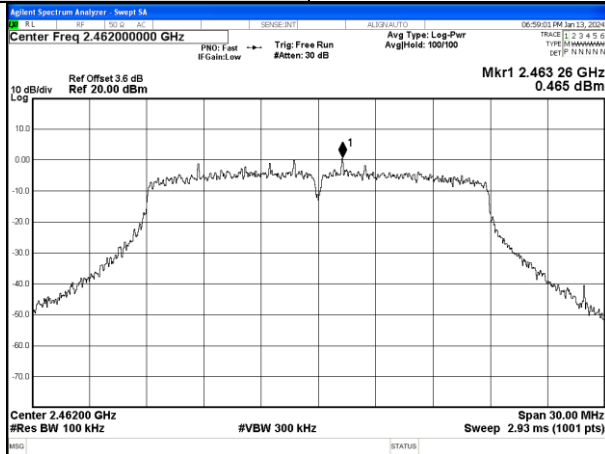
Test Mode: 802.11b CH06



Test Mode: 802.11b CH11



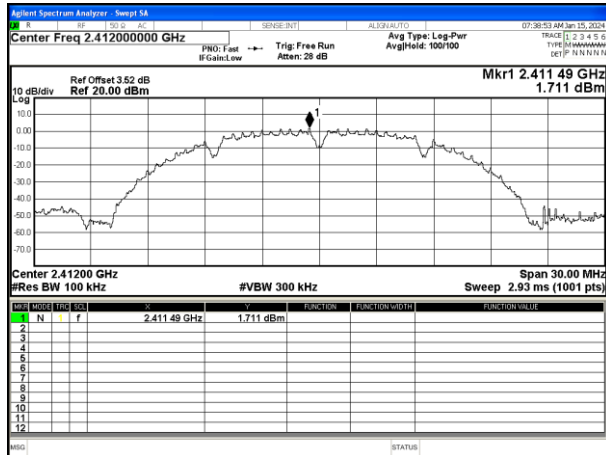
Test Mode: 802.11g CH01

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


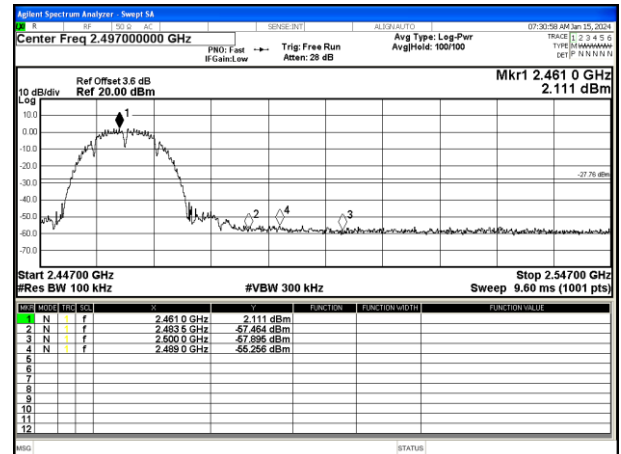
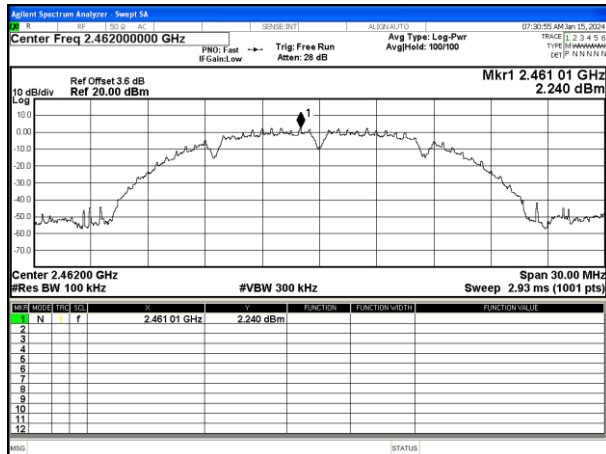
Note: All models were tested, and only the worst model(ANT 1) were reported in the report.

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

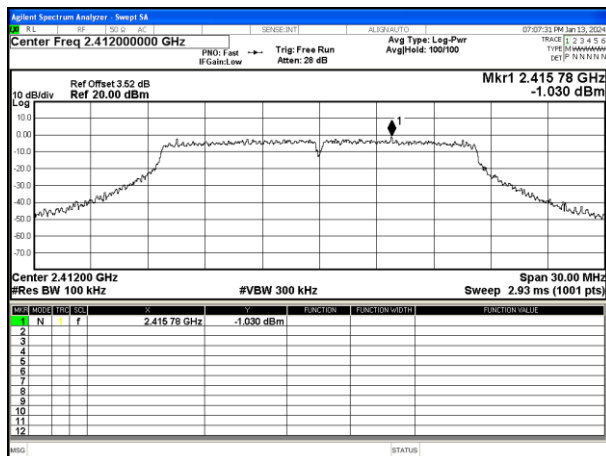
Test Mode: 802.11b CH01



Test Mode: 802.11b CH011

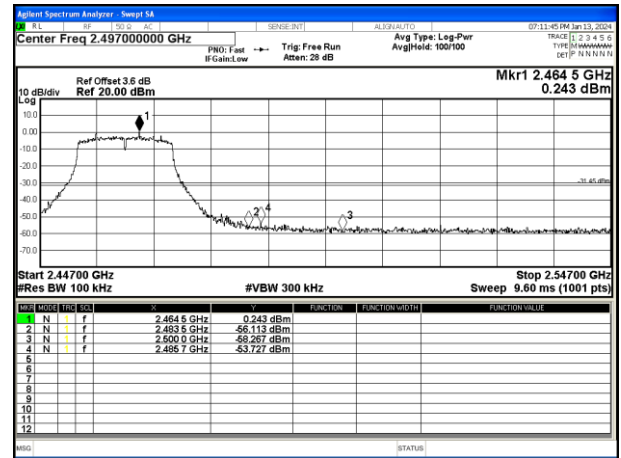
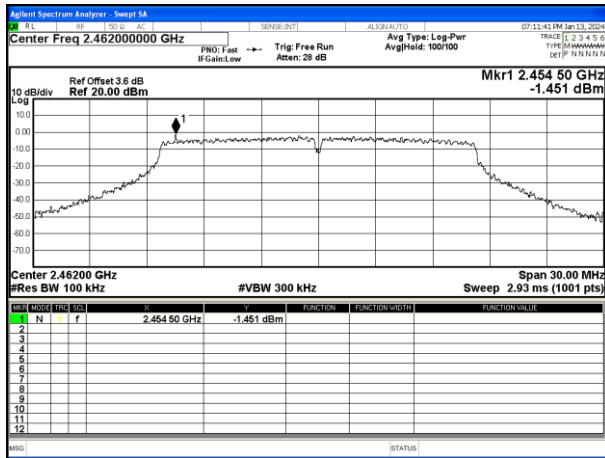


Test Mode: 802.11g CH01

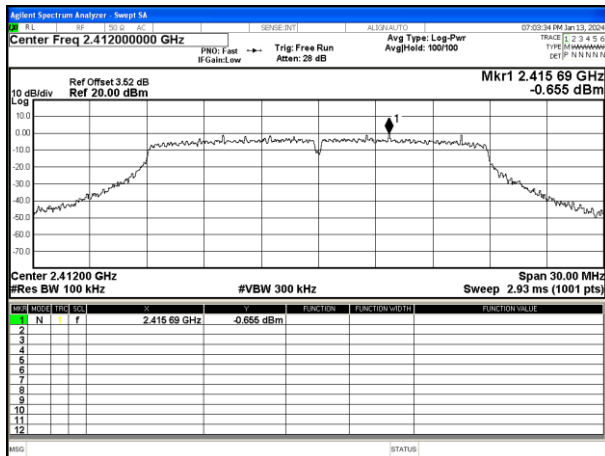




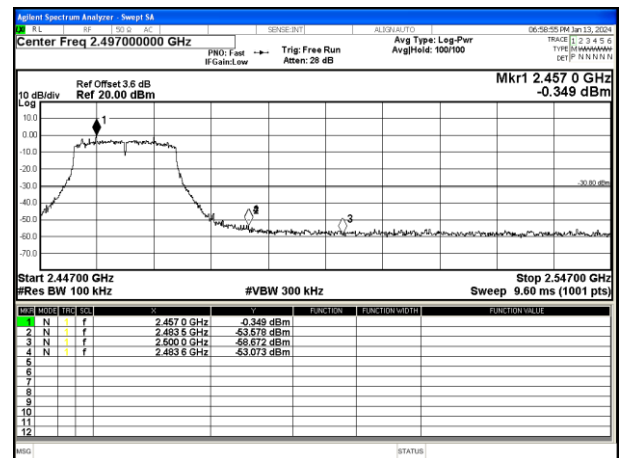
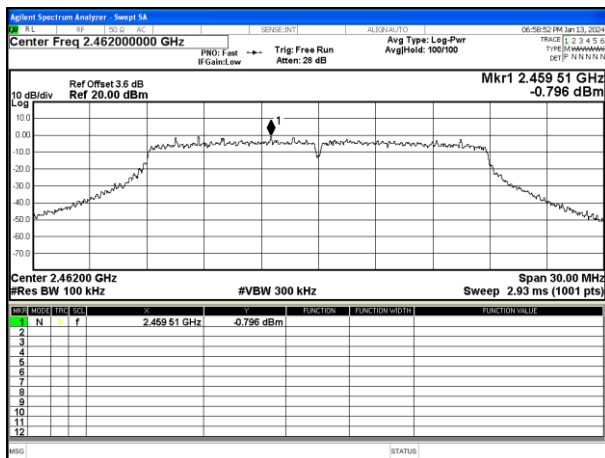
Test Mode: 802.11g CH11



Test Mode: 802.11n20 CH01



Test Mode: 802.11n20 CH11



Appendix A.4 Test Results of Conducted Power Spectral Density

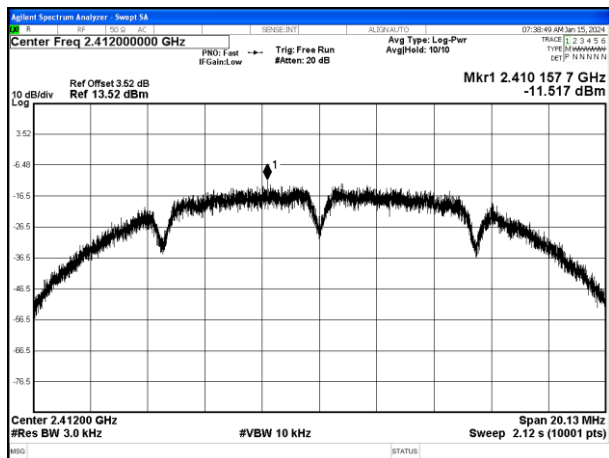
802.11b					
Frequency	Power Density			Limit (dBm/3KHz)	Result
	(dBm/3kHz)				
	Ant1	Ant2	Total		
CH01	-11.517	-10.775	---	8	Pass
CH06	-11.792	-10.469	---	8	Pass
CH11	-11.255	-9.672	---	8	Pass

802.11g					
Frequency	Power Density			Limit (dBm/3KHz)	Result
	(dBm/3kHz)				
	Ant1	Ant2	Total		
CH01	-12.561	-9.678	---	8	Pass
CH06	-12.769	-9.432	---	8	Pass
CH11	-14.048	-7.888	---	8	Pass

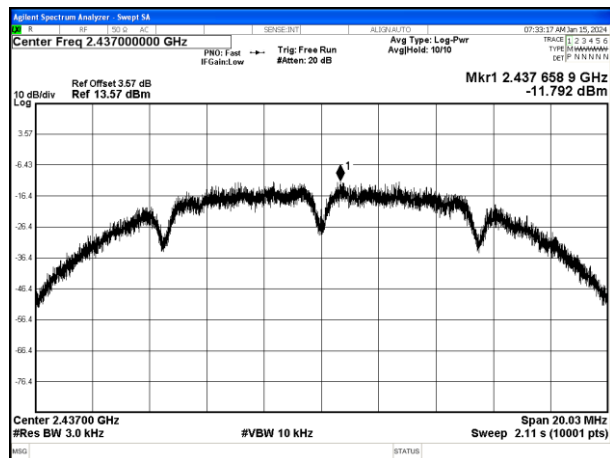
802.11n20					
Frequency	Power Density			Limit (dBm/3KHz)	Result
	(dBm/3kHz)				
	Ant1	Ant2	Total		
CH01	-14.026	-10.498	-8.90	8	Pass
CH06	-14.163	-9.242	-8.03	8	Pass
CH11	-14.324	-8.600	-7.57	8	Pass

ANT1

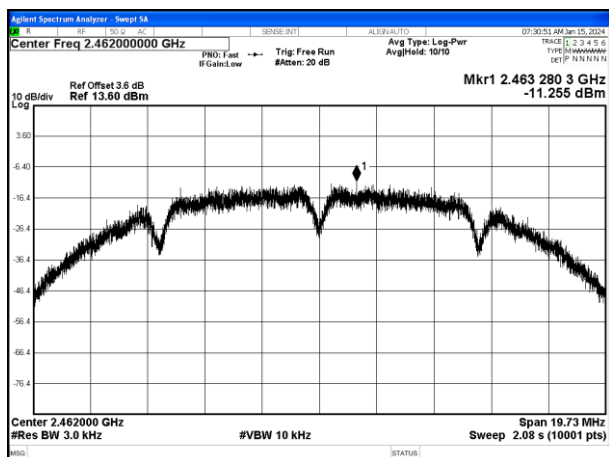
Test Mode: 802.11b CH01



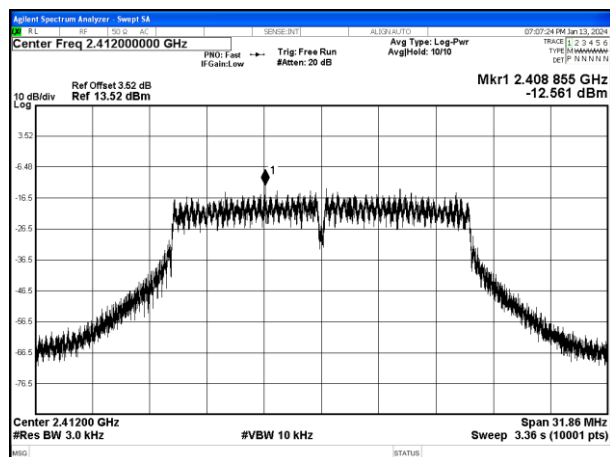
Test Mode: 802.11b CH06



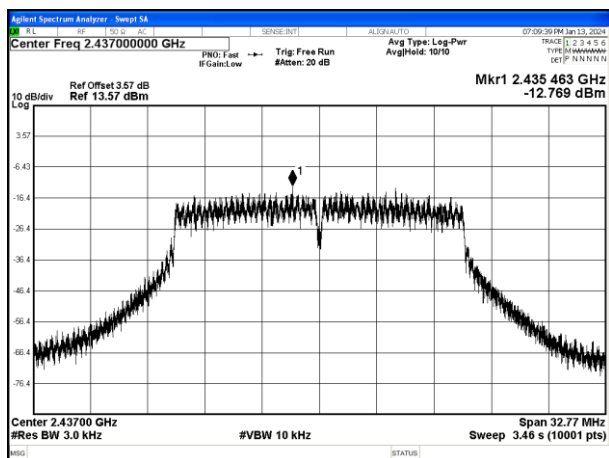
Test Mode: 802.11b CH11



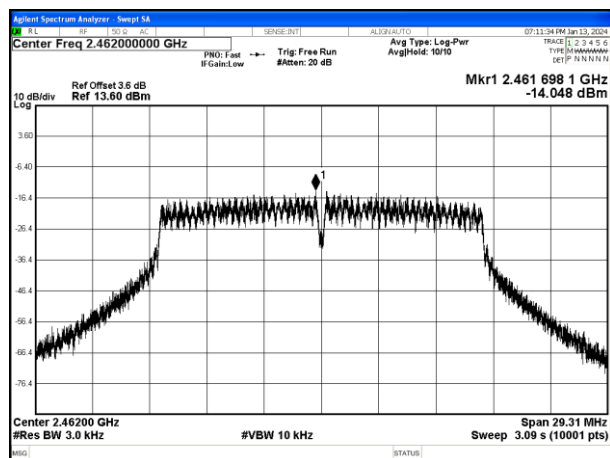
Test Mode: 802.11g CH01



Test Mode: 802.11g CH06

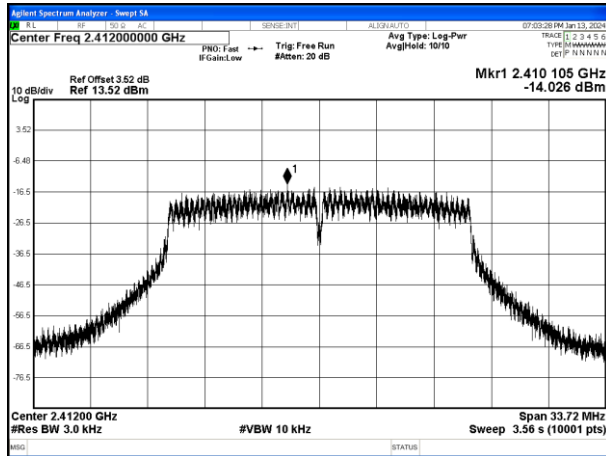


Test Mode: 802.11g CH11

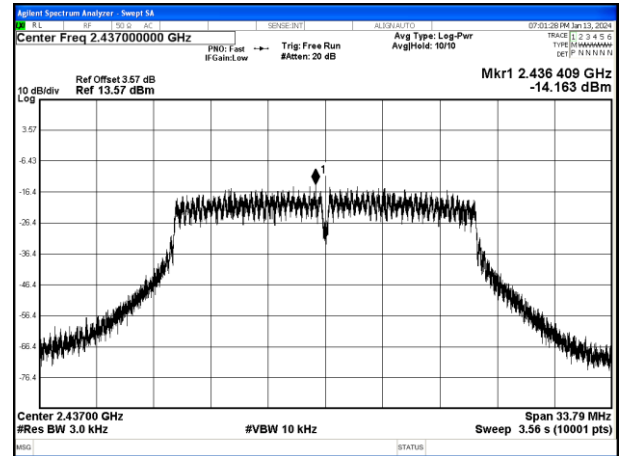




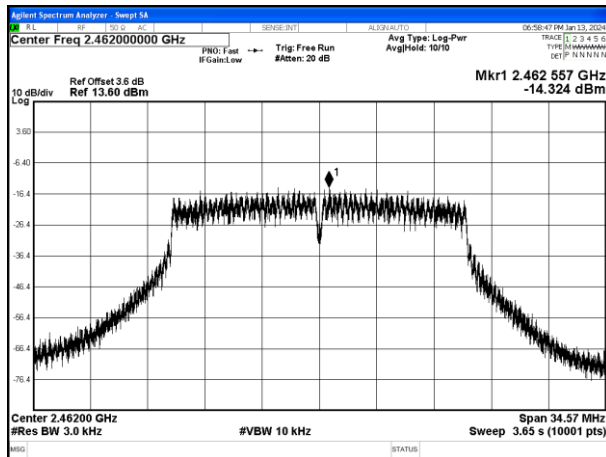
Test Mode: 802.11n20 CH01



Test Mode: 802.11n20 CH06

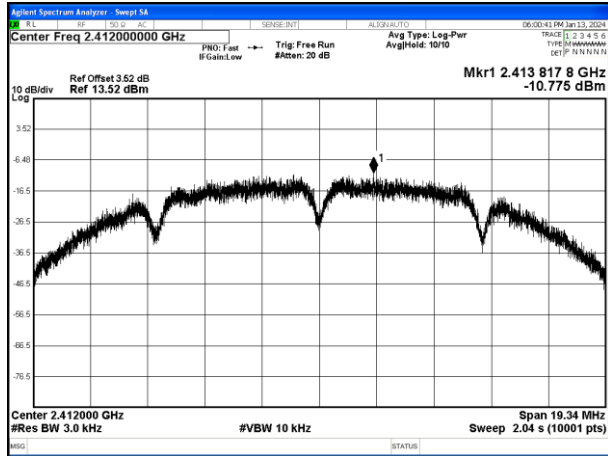


Test Mode: 802.11n20 CH11

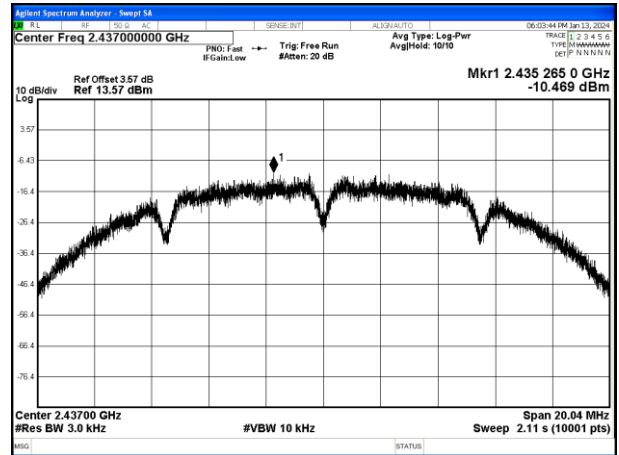


ANT2

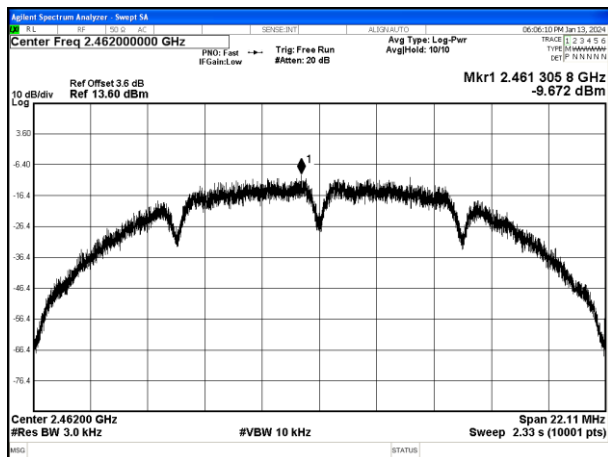
Test Mode: 802.11b CH01



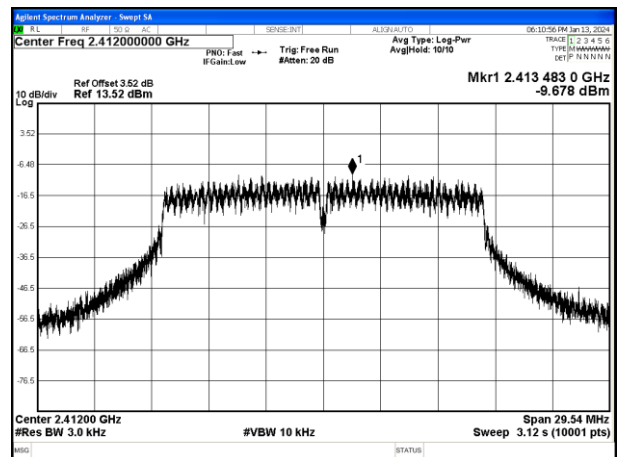
Test Mode: 802.11b CH06



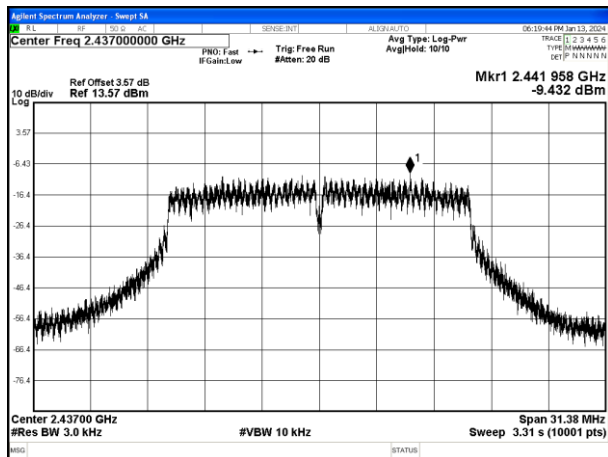
Test Mode: 802.11b CH11



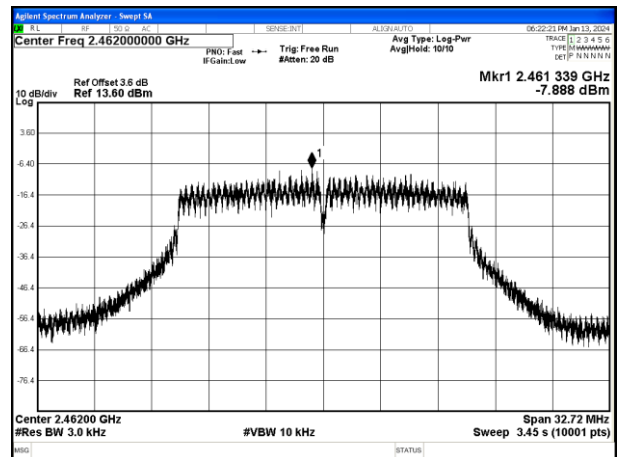
Test Mode: 802.11g CH01



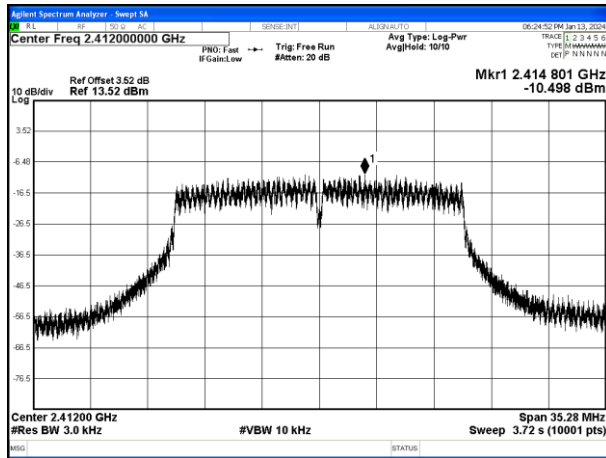
Test Mode: 802.11g CH06



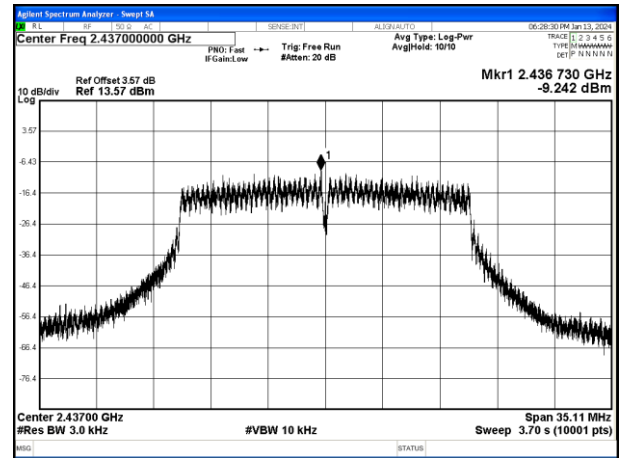
Test Mode: 802.11g CH11



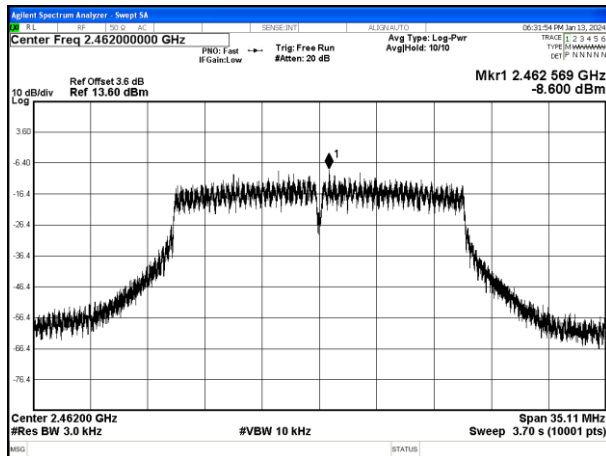
Test Mode: 802.11n20 CH01



Test Mode: 802.11n20 CH06



Test Mode: 802.11n20 CH11



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.

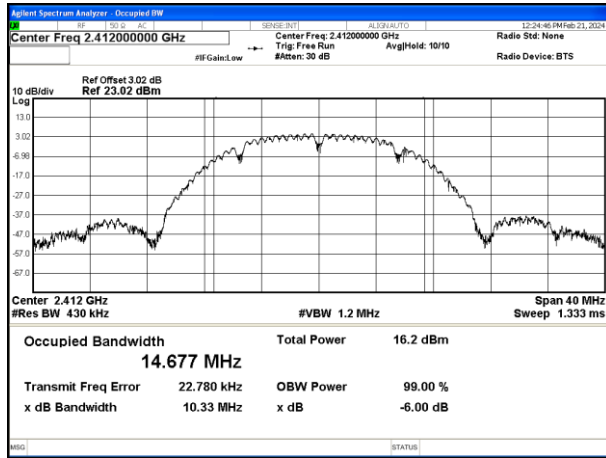
802.11b				
Frequency	Bandwidth (MHz)		6dB limit (KHz)	Result
	99%	6dB		
CH01	14.677	10.070	0.5	Pass
CH06	14.646	10.010	0.5	Pass
CH11	14.724	9.864	0.5	Pass

802.11g				
Frequency	Bandwidth (MHz)		6dB limit (KHz)	Result
	99%	6dB		
CH01	16.534	15.930	0.5	Pass
CH06	16.540	16.380	0.5	Pass
CH11	16.476	14.650	0.5	Pass

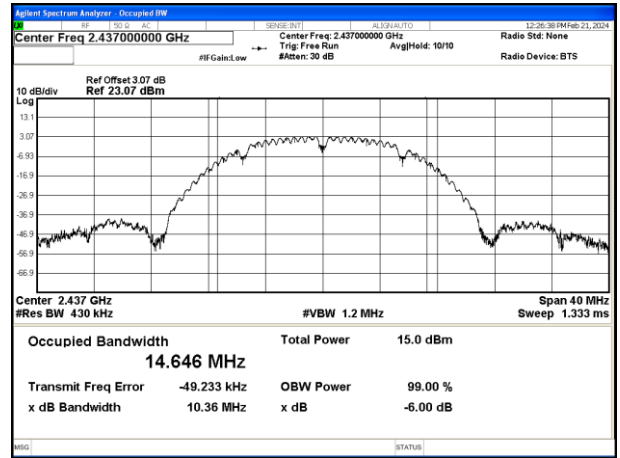
802.11n20				
Frequency	Bandwidth (MHz)		6dB limit (KHz)	Result
	99%	6dB		
CH01	17.640	16.860	0.5	Pass
CH06	17.681	16.900	0.5	Pass
CH11	17.671	17.280	0.5	Pass

99% Bandwidth

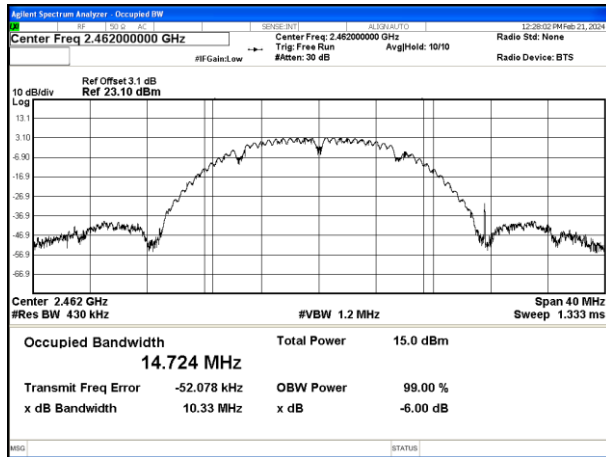
Test Mode: 802.11b CH01



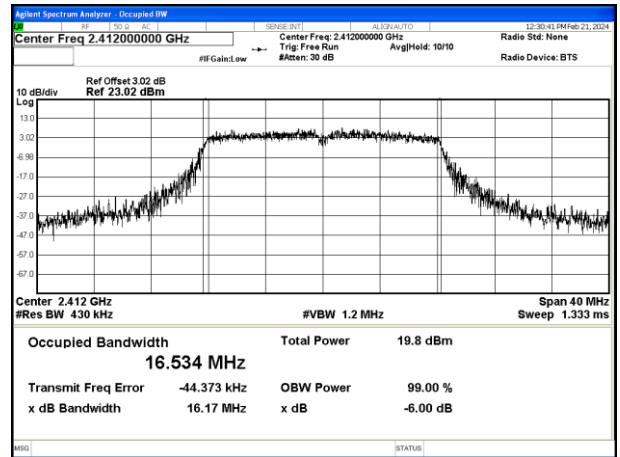
Test Mode: 802.11b CH06



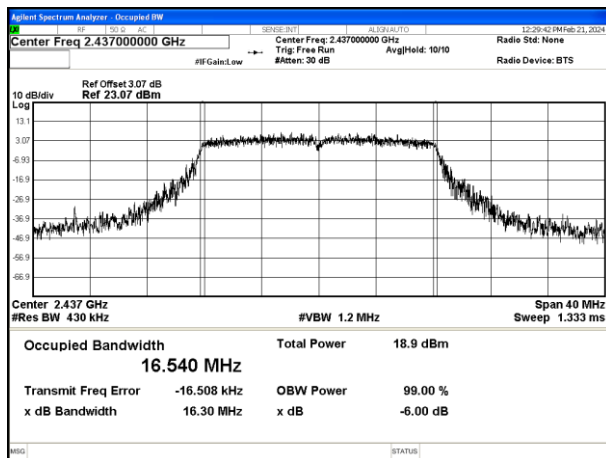
Test Mode: 802.11b CH11



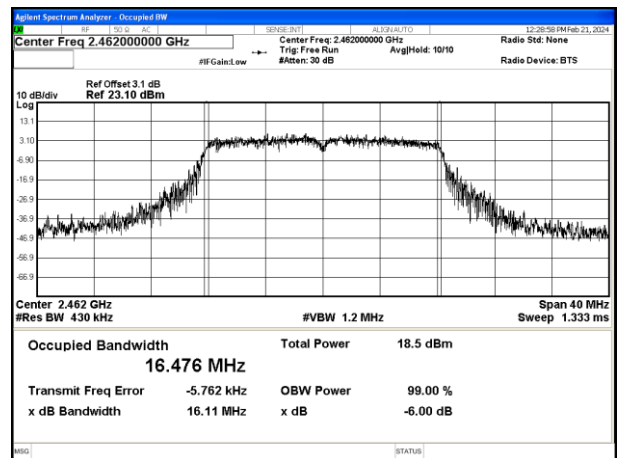
Test Mode: 802.11g CH01



Test Mode: 802.11g CH06

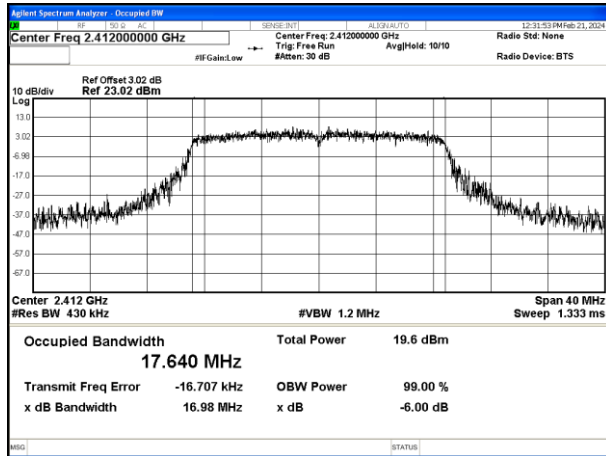


Test Mode: 802.11g CH11

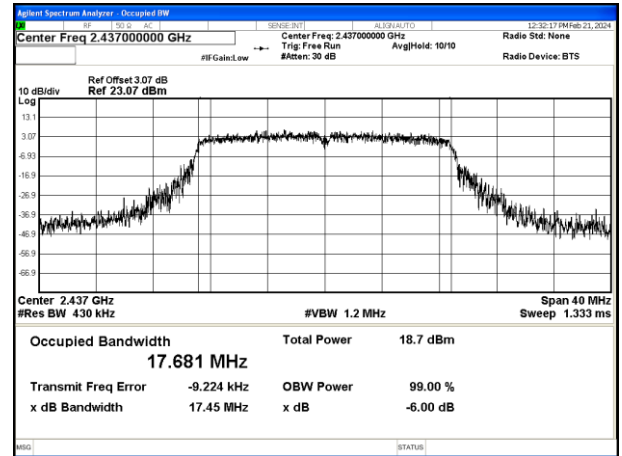




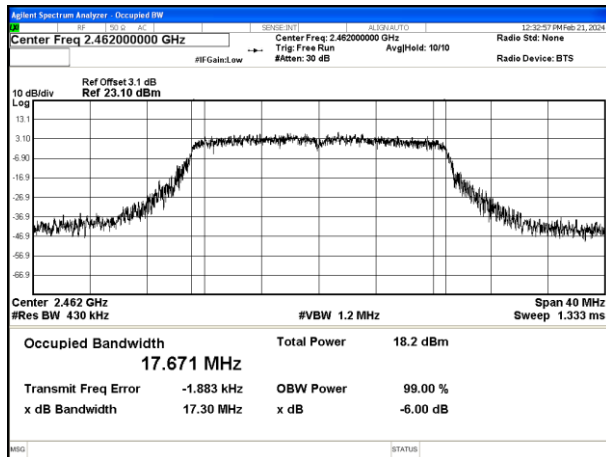
Test Mode: 802.11n20 CH01



Test Mode: 802.11n20 CH06



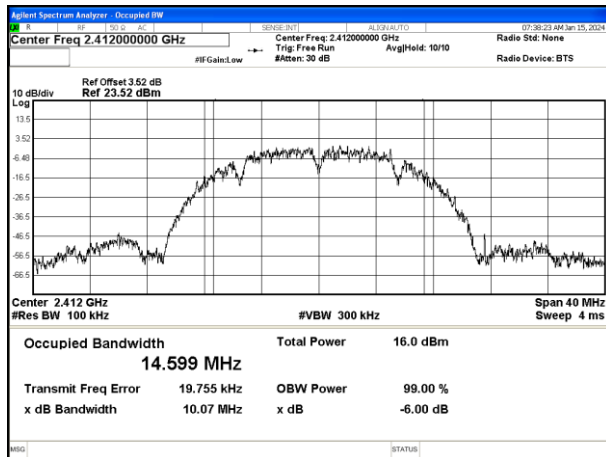
Test Mode: 802.11n20 CH11



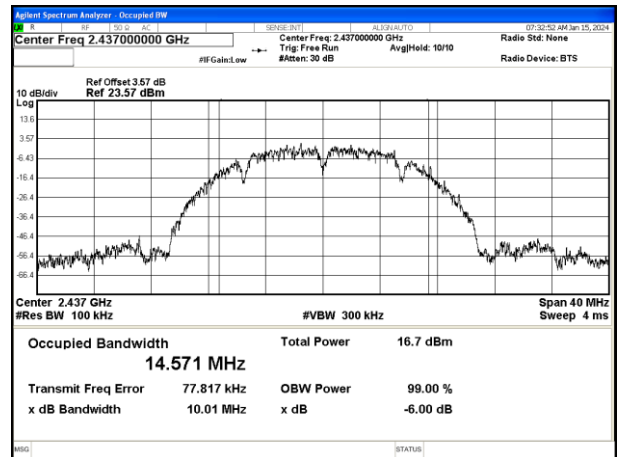


6dB Bandwidth

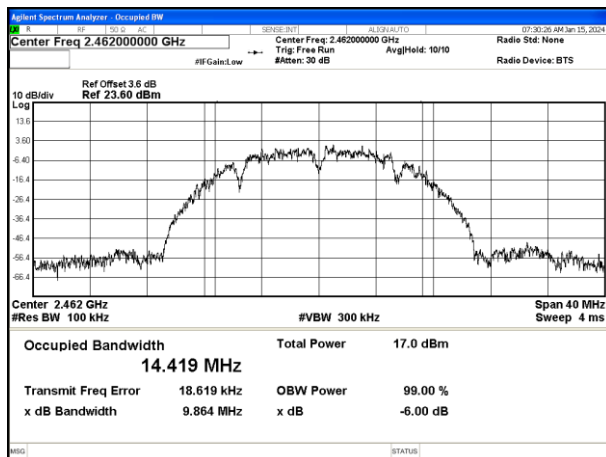
Test Mode: 802.11b CH01



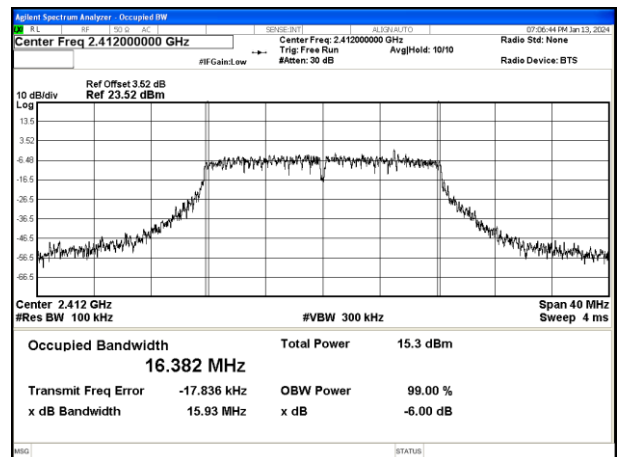
Test Mode: 802.11b CH06



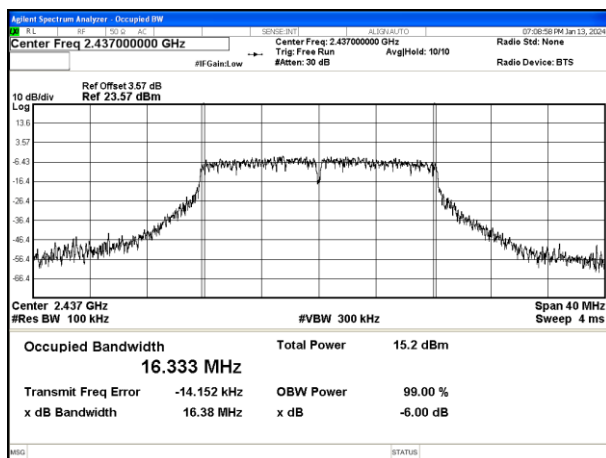
Test Mode: 802.11b CH11



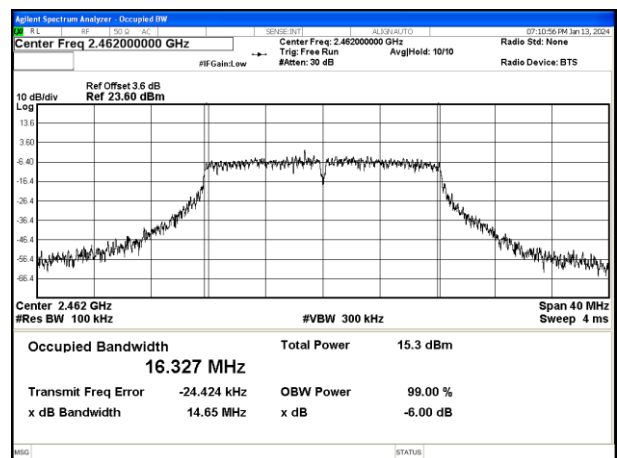
Test Mode: 802.11g CH01



Test Mode: 802.11g CH06

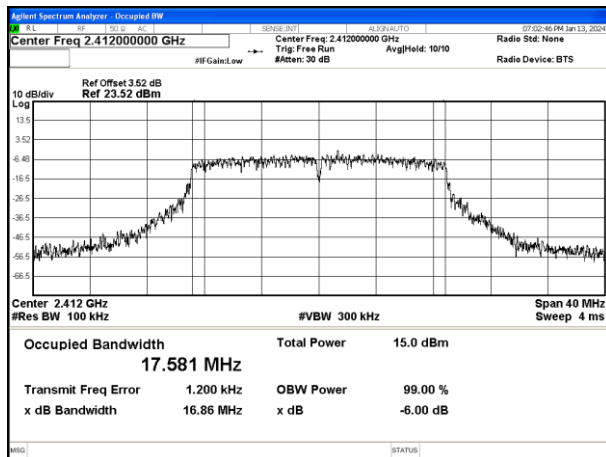


Test Mode: 802.11g CH11

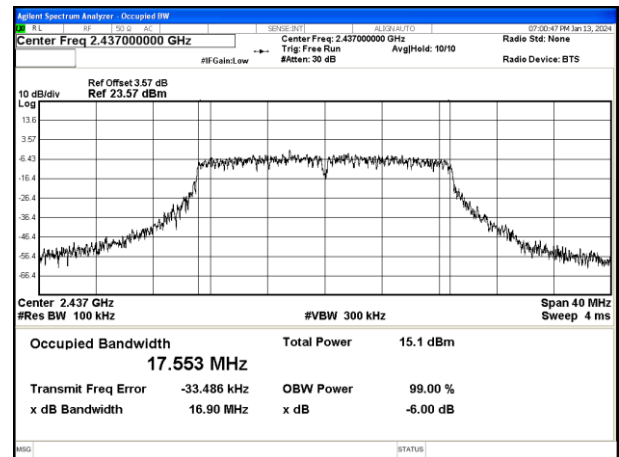




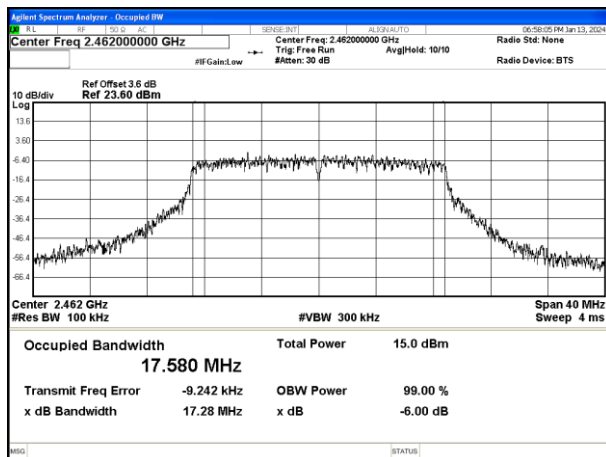
Test Mode: 802.11n20 CH01



Test Mode: 802.11n20 CH06



Test Mode: 802.11n20 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	12.690	12.576	/	0.02	0.02	1	Pass
CH06	2437	12.308	12.670	/	0.02	0.02	1	Pass
CH11	2462	12.493	12.509	/	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	14.442	15.034	/	0.03	0.03	1	Pass
CH06	2437	14.047	14.969	/	0.03	0.03	1	Pass
CH11	2462	13.089	14.272	/	0.02	0.03	1	Pass

802.11n20							
Test Channel	Frequency	Conducted Power (dBm)			Total [W]	Limit	Result
	(MHz)	Ant1	Ant2	Total		[W]	
CH01	2412	12.316	11.601	14.983	0.0319	1	Pass
CH06	2437	11.556	11.483	14.530	0.0280	1	Pass
CH11	2462	10.635	11.364	14.025	0.0250	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	12.690	12.576	/	15.66	15.55	36	Pass
CH06	2437	12.308	12.670	/	15.28	15.64	36	Pass
CH11	2462	12.493	12.509	/	15.46	15.48	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	14.442	15.034	/	17.41	18.00	36	Pass
CH06	2437	14.047	14.969	/	17.02	17.94	36	Pass
CH11	2462	13.089	14.272	/	16.06	17.24	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	12.316	11.601	14.983	17.95	36	Pass
CH06	2437	11.556	11.483	14.530	17.50	36	Pass
CH11	2462	10.635	11.364	14.025	17.00	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.