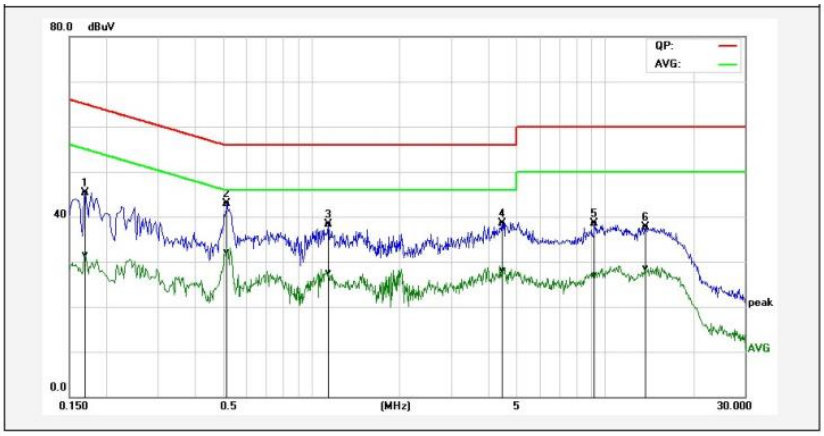
Appendix A: Test Results of Wi-Fi 802.11 ac

Table of Contents **Page**

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

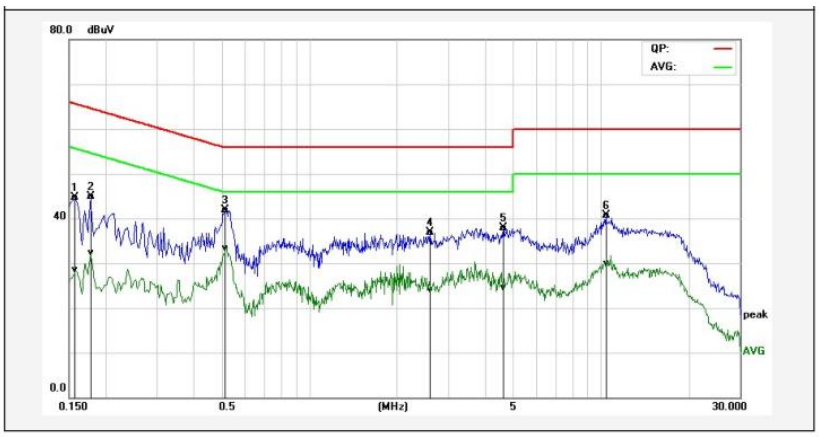
Test Mode:	Mode 5

L



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
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	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
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

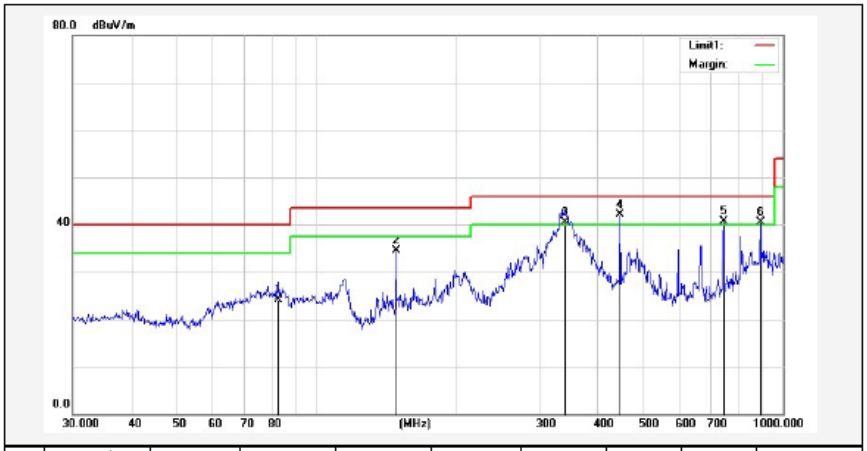
Appendix A.2 Test Results of Radiated Spurious Emission

Note: Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 40GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.
All the data rate and configurations have been tested and only the worst case mode (ac(VHT20)) reported.

Below 1GHz:

Test Mode:	Mode 1(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	82.9385	40.64	-16.49	24.15	40.00	-15.85			QP
2	148.4410	46.36	-11.76	34.60	43.50	-8.90			QP
3!	340.7817	49.41	-8.89	40.52	46.00	-5.48			QP
4*	446.4141	47.62	-5.48	42.14	46.00	-3.86			QP
5!	744.8660	41.58	-0.89	40.69	46.00	-5.31			QP
6!	893.8567	39.50	1.07	40.57	46.00	-5.43			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	37.5478	44.81	-12.66	32.15	40.00	-7.85			QP
2	78.1390	47.24	-15.65	31.59	40.00	-8.41			QP
3!	148.4410	51.31	-11.76	39.55	43.50	-3.95			QP
4*	446.4141	47.64	-5.48	42.16	46.00	-3.84			QP
5!	744.8660	42.65	-0.89	41.76	46.00	-4.24			QP
6!	815.9678	41.63	0.04	41.67	46.00	-4.33			QP

Above 1GHz：

Band I：

Note: All antennas and bandwidths are tested, and only the worst data (802.11ac(VHT20) MIMO) is reported in the report.

802.11 ac20-Low Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7682.150	57.35	-9.05	48.30	68.30	-20	peak
2	7682.150	41.72	-9.05	32.67	54.00	-21.33	AVG
3	8879.167	57.20	-7.81	49.39	68.30	-18.91	peak
4	8879.167	42.48	-7.81	34.67	54.00	-19.33	AVG
5	11324.692	54.96	-4.86	50.10	68.30	-18.2	peak
6	11324.692	38.53	-4.86	33.67	54.00	-20.33	AVG
7	12863.794	55.27	-3.04	52.23	68.30	-16.07	peak
8	12863.794	36.82	-3.04	33.78	54.00	-20.22	AVG
9	14194.951	54.31	-1.12	53.19	68.30	-15.11	peak
10	14194.951	36.21	-1.12	35.09	54.00	-18.91	AVG
11	16217.807	52.85	-0.68	52.17	68.30	-16.13	peak
12	16217.807	35.26	-0.68	34.58	54.00	-19.42	AVG

802.11 ac20-Low Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7419.751	57.14	-9.08	48.06	68.30	-20.24	peak
2	7419.751	41.64	-9.08	32.56	54.00	-21.44	AVG
3	8726.207	56.42	-8.20	48.22	68.30	-20.08	peak
4	8726.207	40.87	-8.20	32.67	54.00	-21.33	AVG
5	10203.426	55.61	-6.04	49.57	68.30	-18.73	peak
6	10203.426	38.71	-6.04	32.67	54.00	-21.33	AVG
7	12569.175	54.44	-2.72	51.72	68.30	-16.58	peak
8	12569.175	37.50	-2.72	34.78	54.00	-19.22	AVG
9	14194.951	53.75	-1.12	52.63	68.30	-15.67	peak
10	14194.951	37.01	-1.12	35.89	54.00	-18.11	AVG
11	16888.892	52.57	-0.40	52.17	68.30	-16.13	peak
12	16888.892	35.28	-0.40	34.88	54.00	-19.12	AVG

802.11 ac20-Middle Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	8000.034	54.93	-8.06	46.87	68.30	-21.43	peak
2	8000.034	40.52	-8.06	32.46	54.00	-21.54	AVG
3	9408.664	55.31	-6.22	49.09	68.30	-19.21	peak
4	9408.664	40.79	-6.22	34.57	54.00	-19.43	AVG
5	12496.581	53.56	-2.88	50.68	68.30	-17.62	peak
6	12496.581	37.22	-2.88	34.34	54.00	-19.66	AVG
7	13473.912	54.32	-2.48	51.84	68.30	-16.46	peak
8	13473.912	37.49	-2.48	35.01	54.00	-18.99	AVG
9	14277.411	53.55	-1.26	52.29	68.30	-16.01	peak
10	14277.411	37.28	-1.26	36.02	54.00	-17.98	AVG
11	16312.019	52.12	-0.54	51.58	68.30	-16.72	peak
12	16312.019	35.32	-0.54	34.78	54.00	-19.22	AVG

802.11 ac20-Middle Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7166.315	57.04	-9.77	47.27	68.30	-21.03	peak
2	7166.315	42.52	-9.77	32.75	54.00	-21.25	AVG
3	8428.146	56.37	-8.22	48.15	68.30	-20.15	peak
4	8428.146	42.69	-8.22	34.47	54.00	-19.53	AVG
5	10203.426	55.24	-6.04	49.20	68.30	-19.1	peak
6	10203.426	38.82	-6.04	32.78	54.00	-21.22	AVG
7	12424.406	54.22	-3.18	51.04	68.30	-17.26	peak
8	12424.406	38.96	-3.18	35.78	54.00	-18.22	AVG
9	14194.951	54.02	-1.12	52.90	68.30	-15.4	peak
10	14194.951	35.33	-1.12	34.21	54.00	-19.79	AVG
11	16312.019	52.82	-0.54	52.28	68.30	-16.02	peak
12	16312.019	35.14	-0.54	34.60	54.00	-19.4	AVG

802.11 ac20-High Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7334.292	56.93	-9.32	47.61	68.30	-20.69	peak
2	7334.292	41.88	-9.32	32.56	54.00	-21.44	AVG
3	8428.146	56.96	-8.22	48.74	68.30	-19.56	peak
4	8428.146	41.00	-8.22	32.78	54.00	-21.22	AVG
5	9518.294	55.61	-6.54	49.07	68.30	-19.23	peak
6	9518.294	41.19	-6.54	34.65	54.00	-19.35	AVG
7	12000.026	54.07	-2.95	51.12	68.30	-17.18	peak
8	12139.850	36.81	-3.21	33.60	54.00	-20.4	AVG
9	13165.319	54.42	-2.80	51.62	68.30	-16.68	peak
10	13165.319	34.97	-2.80	32.17	54.00	-21.83	AVG
11	14194.951	53.09	-1.12	51.97	68.30	-16.33	peak
12	14194.951	35.13	-1.12	34.01	54.00	-19.99	AVG

802.11 ac20-High Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7816.810	58.05	-9.13	48.92	68.30	-19.38	peak
2	7816.810	41.69	-9.13	32.56	54.00	-21.44	AVG
3	9087.293	57.21	-7.75	49.46	68.30	-18.84	peak
4	9087.293	41.32	-7.75	33.57	54.00	-20.43	AVG
5	10144.496	55.54	-6.06	49.48	68.30	-18.82	peak
6	10144.496	39.73	-6.06	33.67	54.00	-20.33	AVG
7	13165.319	54.68	-2.80	51.88	68.30	-16.42	peak
8	13165.319	37.53	-2.80	34.73	54.00	-19.27	AVG
9	14868.203	53.13	-0.98	52.15	68.30	-16.15	peak
10	14868.203	36.76	-0.98	35.78	54.00	-18.22	AVG
11	16312.019	52.83	-0.54	52.29	68.30	-16.01	peak
12	16312.019	35.28	-0.54	34.74	54.00	-19.26	AVG

Band IV：

Note: All antennas and bandwidths are tested, and only the worst data (802.11ac(VHT20) MIMO) is reported in the report.

802.11 ac20-Low Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1023.44	65.23	-23.62	41.61	68.30	-26.69	peak
2	1024.44	53.91	-23.66	30.25	54.00	-23.75	AVG
3	2410.894	50.77	-19.9	30.87	54.00	-23.13	AVG
4	2411.946	62.56	-19.9	42.66	68.30	-25.64	peak
5	5004.148	61.49	-15.59	45.9	68.30	-22.4	peak
6	5004.148	46.95	-15.59	31.36	54.00	-22.64	AVG
7	9408.664	55.31	-6.22	49.09	68.30	-19.21	peak
8	9410.085	43.78	-6.22	37.56	54.00	-16.44	AVG
9	14277.41	53.55	-1.26	52.29	68.30	-16.01	peak
10	14279.66	41.32	-1.27	40.05	54.00	-13.95	AVG
11	17995.96	35.83	4.44	40.27	54.00	-13.73	AVG
12	18000	50.26	4.46	54.72	68.30	-13.58	peak

802.11 ac20-Low Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1054.27	54.87	-5.69	49.18	68.30	-19.12	peak
2	1054.087	61.96	-24.72	37.24	54.00	-16.76	AVG
3	3576.241	60.94	-17.34	43.6	68.30	-24.7	peak
4	3576.241	45.99	-17.34	28.65	54.00	-25.35	AVG
5	5004.148	63.81	-15.59	48.22	68.30	-20.08	peak
6	5006.338	52.83	-15.59	37.24	54.00	-16.76	AVG
7	12787.66	43.81	-2.82	40.99	54.00	-13.01	AVG
8	12789.5	54.08	-2.82	51.26	68.30	-17.04	peak
9	14782.33	53.55	-0.99	52.56	68.30	-15.74	peak
10	14785.01	41.25	-0.98	40.27	54.00	-13.73	AVG
11	17996.81	36.37	4.44	40.81	54.00	-13.19	AVG
12	18000	51.36	4.46	55.82	68.30	-12.48	peak

802.11 ac20-Middle Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2398.016	63.07	-19.88	43.19	68.30	-25.11	peak
2	2398.016	46.46	-19.88	26.58	54.00	-27.42	AVG
3	4975.246	62.33	-15.6	46.73	68.30	-21.57	peak
4	4975.246	45.05	-15.6	29.45	54.00	-24.55	AVG
5	7124.925	57.28	-9.79	47.49	68.30	-20.81	peak
6	7124.925	39.93	-9.79	30.14	54.00	-23.86	AVG
7	8827.884	56.57	-7.96	48.61	68.30	-19.69	peak
8	8827.884	41.41	-7.96	33.45	54.00	-20.55	AVG
9	13473.91	54.86	-2.48	52.38	68.30	-15.92	peak
10	13473.91	39.26	-2.48	36.78	54.00	-17.22	AVG
11	14782.33	54.6	-0.99	53.61	68.30	-14.69	peak
12	14782.33	37.93	-0.99	36.94	54.00	-17.06	AVG

802.11 ac20-Middle Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1305.319	64.63	-24.47	40.16	68.30	-28.14	peak
2	1305.319	49.9	-24.47	25.43	54.00	-28.57	AVG
3	2398.016	64.3	-19.88	44.42	68.30	-23.88	peak
4	2398.016	50.08	-19.88	30.2	54.00	-23.8	AVG
5	5004.148	61.18	-15.59	45.59	68.30	-22.71	peak
6	5004.148	45.22	-15.59	29.63	54.00	-24.37	AVG
7	8827.884	57.35	-7.96	49.39	68.30	-18.91	peak
8	8827.884	40.07	-7.96	32.11	54.00	-21.89	AVG
9	12789.5	55.12	-2.82	52.3	68.30	-16	peak
10	12789.5	38.5	-2.82	35.68	54.00	-18.32	AVG
11	14782.33	55.01	-0.99	54.02	68.30	-14.28	peak
12	14782.33	40.11	-0.99	39.12	54.00	-14.88	AVG

802.11 ac20-High Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1023.44	67.11	-23.62	43.49	68.30	-24.81	peak
2	1025.991	56.93	-23.72	33.21	54.00	-20.79	AVG
3	2397.314	54.18	-19.89	34.29	54.00	-19.71	AVG
4	2398.016	65.41	-19.88	45.53	68.30	-22.77	peak
5	5004.148	62.51	-15.59	46.92	68.30	-21.38	peak
6	5004.148	51.71	-15.59	36.12	54.00	-17.88	AVG
7	8877.662	45.05	-7.81	37.24	54.00	-16.76	AVG
8	8879.167	57.2	-7.81	49.39	68.30	-18.91	peak
9	14192.66	41.8	-1.13	40.67	54.00	-13.33	AVG
10	14194.95	54.31	-1.12	53.19	68.30	-15.11	peak
11	17997.62	36.13	4.45	40.58	54.00	-13.42	AVG
12	18000	51.03	4.46	55.49	68.30	-12.81	peak

802.11 ac20-High Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5004.148	63.81	-15.59	48.22	68.30	-20.08	peak
2	5006.39	51.93	-15.59	36.34	54.00	-17.66	AVG
3	7953.829	56.2	-8.23	47.97	68.30	-20.33	peak
4	7953.829	39.81	-8.23	31.58	54.00	-22.42	AVG
5	12789.5	54.08	-2.82	51.26	68.30	-17.04	peak
6	12791.34	43.59	-2.82	40.77	54.00	-13.23	AVG
7	14782.33	53.55	-0.99	52.56	68.30	-15.74	peak
8	14782.6	41.67	-0.99	40.68	54.00	-13.32	AVG
9	16312.02	52.68	-0.54	52.14	68.30	-16.16	peak
10	16314.78	40.95	-0.55	40.4	54.00	-13.6	AVG
11	17995.6	36.13	4.44	40.57	54.00	-13.43	AVG
12	18000	51.36	4.46	55.82	68.30	-12.48	peak

Node:

1、Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 40GHz 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:

Since the distance of band IV exceeds 200 MHz and the distance limit is greater than 20 dB, only band I data is reflected in this document.

All antennas and bandwidths are tested, and only the worst data (802.11ac(VHT20) MIMO) is reported in the report.

Band I

802.11ac20-Low

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4932.545	44.39	2.76	47.15	68.30	-21.15	peak
2	4932.545	29.34	2.76	32.10	54.00	-21.9	AVG
3	5150.000	42.58	3.60	46.18	68.30	-22.12	peak
4	5150.000	27.66	3.60	31.26	54.00	-22.74	AVG

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4958.156	41.72	9.43	51.15	68.30	-17.15	peak
2	4958.156	24.58	9.43	34.01	54.00	-19.99	AVG
3	5150.000	45.06	10.26	55.32	68.30	-12.98	peak
4	5150.000	28.30	10.26	38.56	54.00	-15.44	AVG

802.11ac20-High

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	42.89	3.95	46.84	68.30	-21.46	peak
2	5350.000	30.21	3.95	34.16	54.00	-19.84	AVG
3	5411.403	45.38	3.93	49.31	68.30	-18.99	peak
4	5411.403	28.56	3.93	32.49	54.00	-21.51	AVG

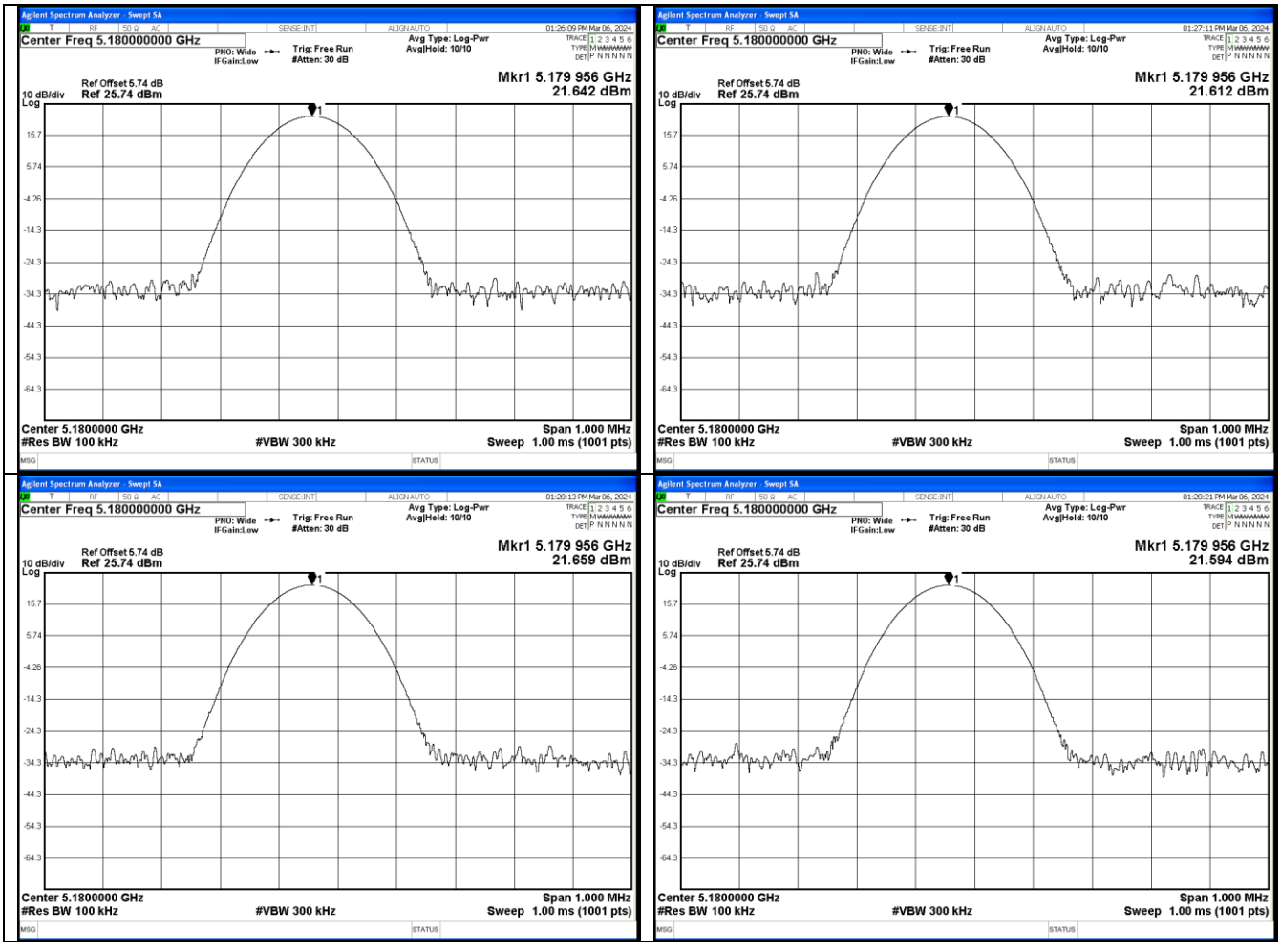
Vertical

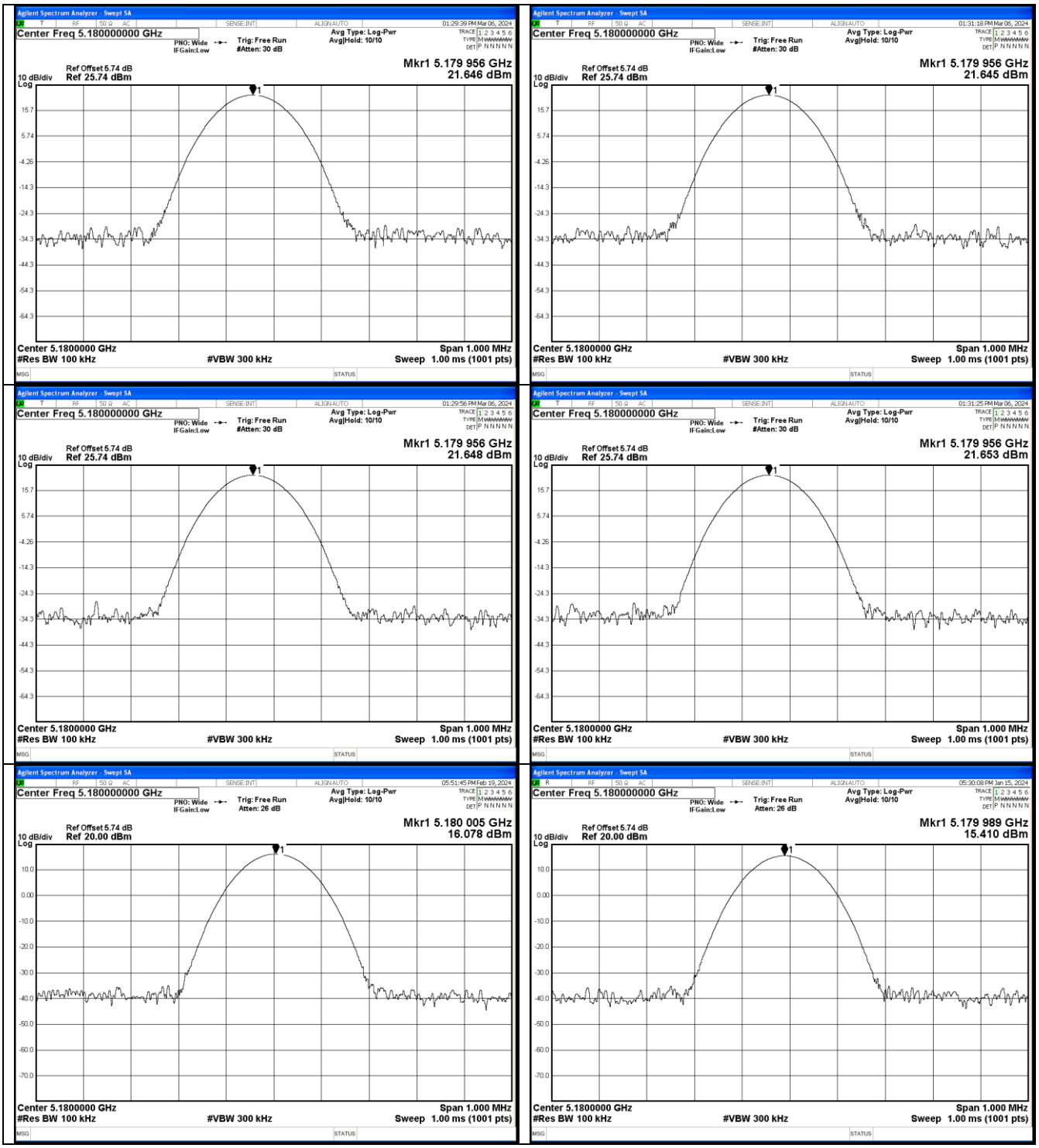
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5350.000	44.59	3.95	48.54	68.30	-19.76	peak
2	5350.000	30.21	3.95	34.16	54.00	-19.84	AVG
3	5368.317	46.11	3.97	50.08	68.30	-18.22	peak
4	5368.317	32.95	3.97	36.92	54.00	-17.08	AVG

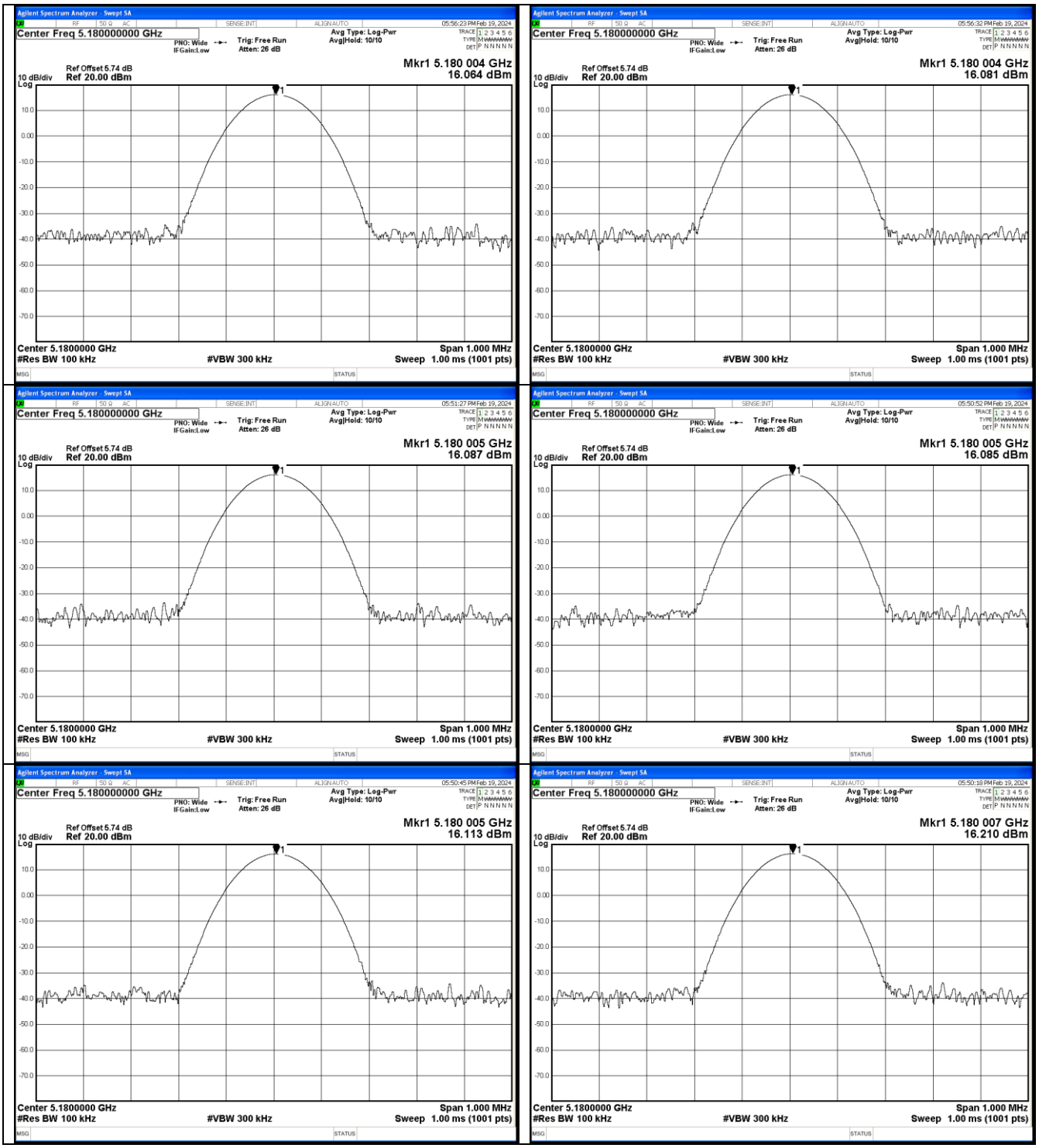
Appendix A.3 Test Results of Frequency Stability

Wi-Fi 802.11ac mode:

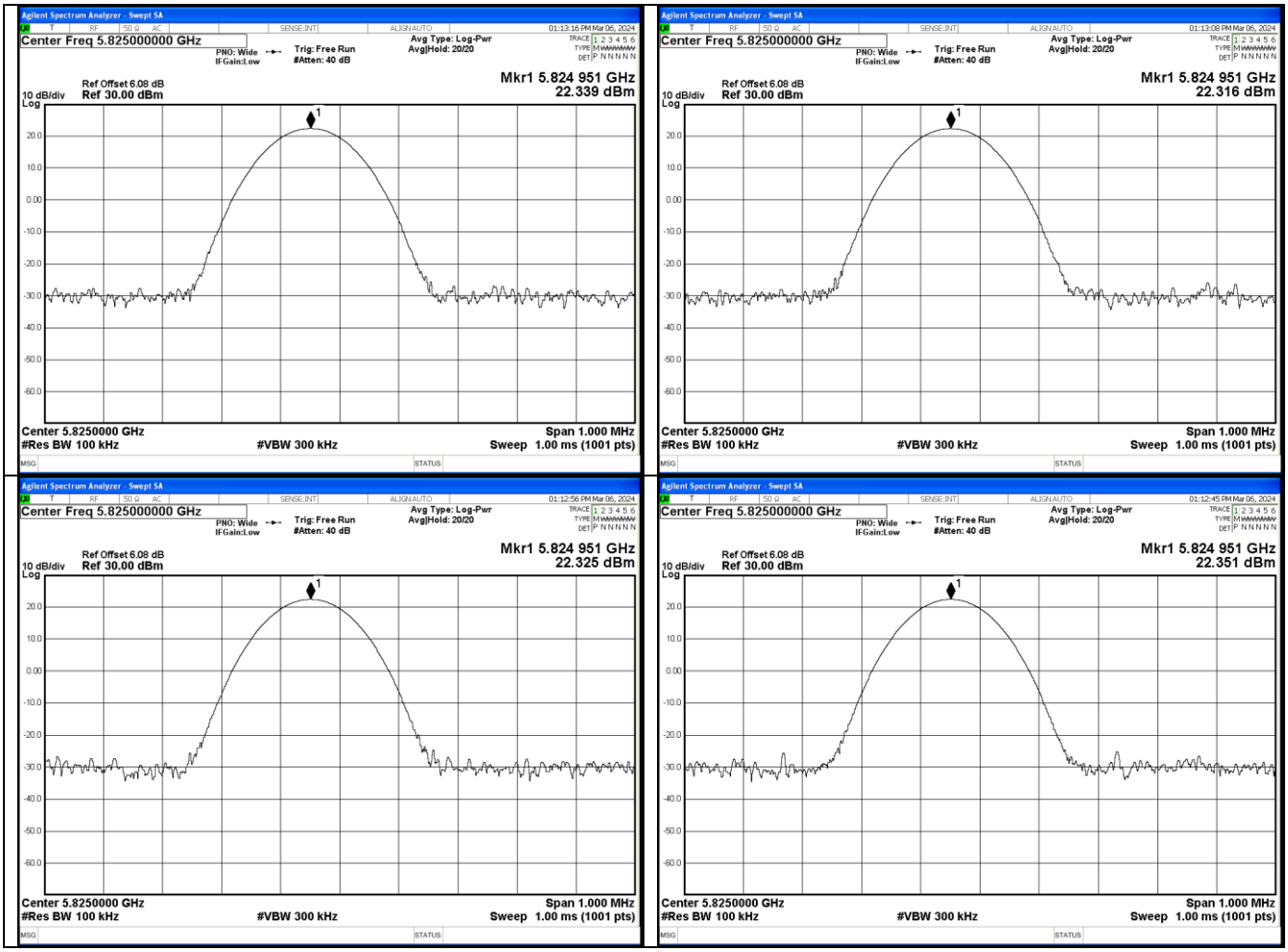
Frequency (MHz)	Voltage (V)	Temperature (℃)	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Result
5180	7.4 Vdc	-10	5179.956	8.49	25	Pass
		0	5179.956	8.49	25	Pass
		10	5179.956	8.49	25	Pass
		20	5179.956	8.49	25	Pass
		30	5179.956	8.49	25	Pass
		40	5179.956	8.49	25	Pass
	6 Vdc	25	5179.956	8.49	25	Pass
	16 Vdc	25	5179.956	8.49	25	Pass
	120 Vac	-10	5180.005	0.87	25	Pass
		0	5179.989	2.12	25	Pass
		10	5180.004	0.77	25	Pass
		20	5180.004	0.77	25	Pass
		30	5180.005	0.87	25	Pass
		40	5180.005	0.97	25	Pass
	85 Vac	25	5180.005	0.97	25	Pass
	240 Vac	25	5180.007	1.25	25	Pass

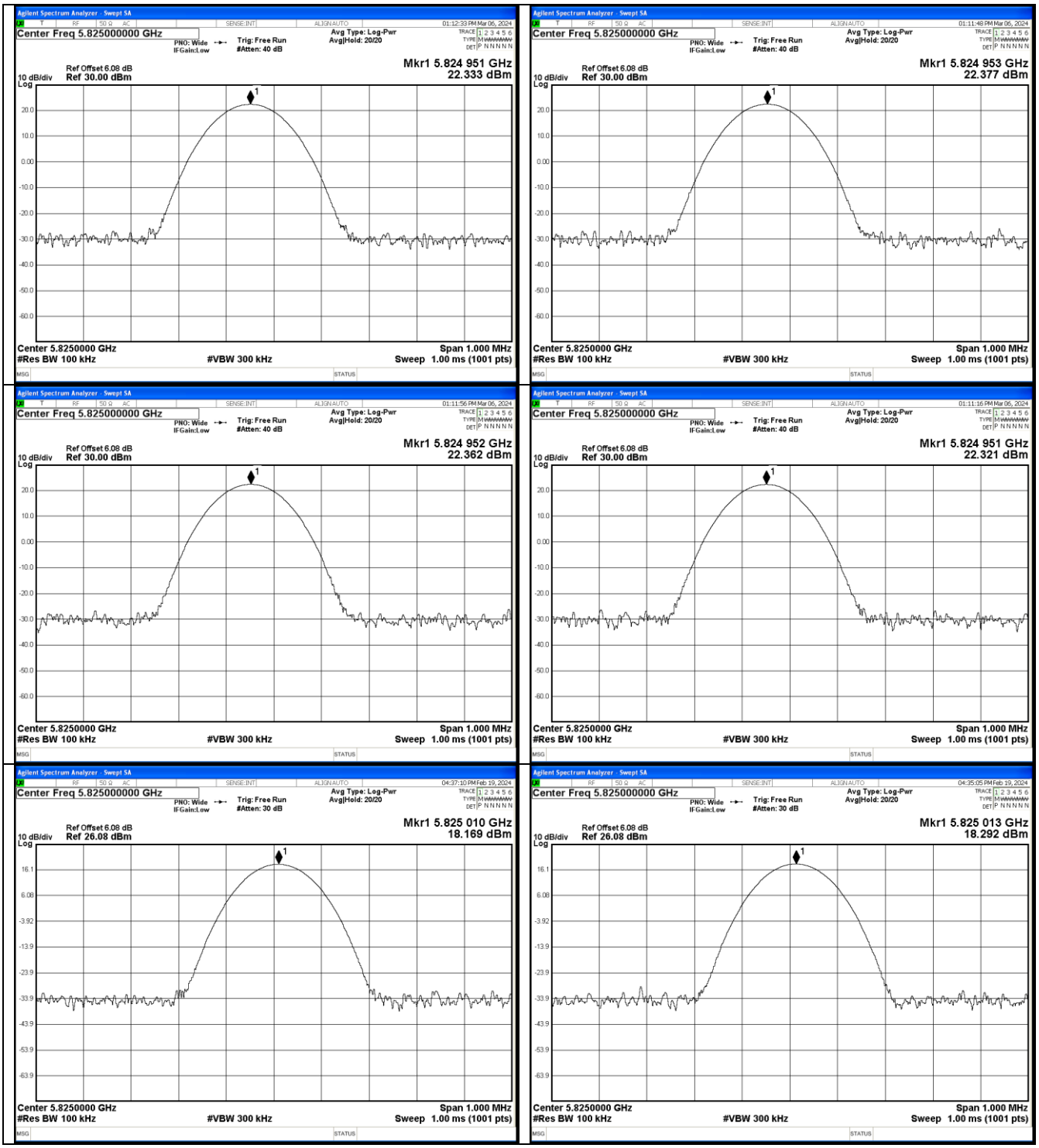


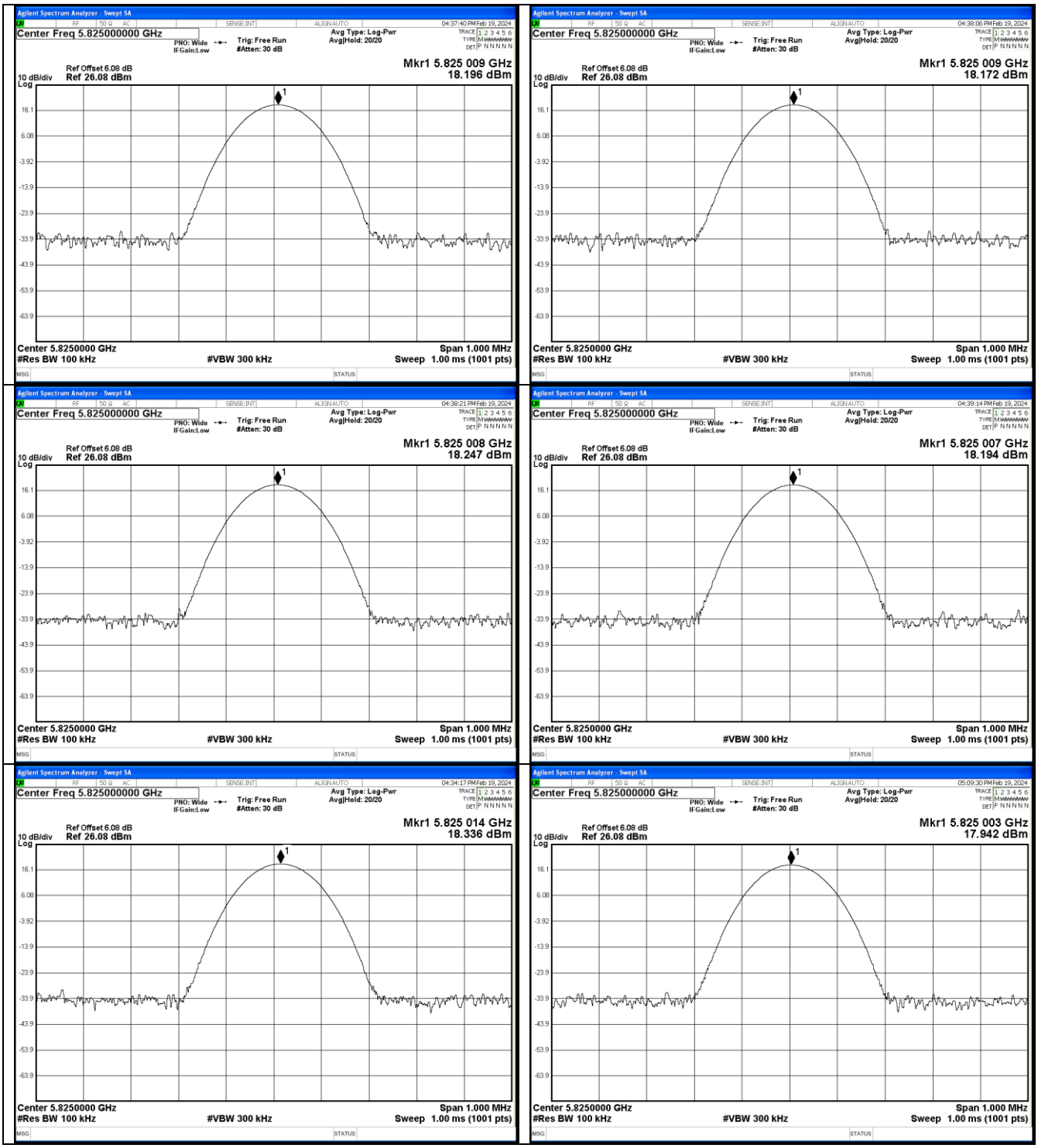

Agilent Spectrum Analyzer - Swept SA
Center Freq 5.180000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
01:29:39 PM Mar 06, 2024
Ref Offset 5.74 dB
10 dB/div
Ref 25.74 dBm
Log
Mkr1 5.179 956 GHz
21.646 dBm
Center 5.1800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.180000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
01:31:18 PM Mar 06, 2024
Ref Offset 5.74 dB
10 dB/div
Ref 25.74 dBm
Log
Mkr1 5.179 956 GHz
21.645 dBm
Center 5.1800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.180000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
01:29:56 PM Mar 06, 2024
Ref Offset 5.74 dB
10 dB/div
Ref 25.74 dBm
Log
Mkr1 5.179 956 GHz
21.648 dBm
Center 5.1800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.180000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
01:31:25 PM Mar 06, 2024
Ref Offset 5.74 dB
10 dB/div
Ref 25.74 dBm
Log
Mkr1 5.179 956 GHz
21.653 dBm
Center 5.1800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.180000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
05:51:45 PM Feb 19, 2024
Ref Offset 5.74 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 5.180 005 GHz
16.078 dBm
Center 5.1800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.180000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
05:30:08 PM Jan 15, 2024
Ref Offset 5.74 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 5.179 989 GHz
15.410 dBm
Center 5.1800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.180000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
05:56:23 PM Feb 19, 2024
Ref Offset 5.74 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 5.180 004 GHz
16.064 dBm
Center 5.1800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.180000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
05:56:32 PM Feb 19, 2024
Ref Offset 5.74 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 5.180 004 GHz
16.081 dBm
Center 5.1800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.180000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
05:51:27 PM Feb 19, 2024
Ref Offset 5.74 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 5.180 005 GHz
16.087 dBm
Center 5.1800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.180000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
05:50:52 PM Feb 19, 2024
Ref Offset 5.74 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 5.180 005 GHz
16.085 dBm
Center 5.1800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.180000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
05:50:45 PM Feb 19, 2024
Ref Offset 5.74 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 5.180 005 GHz
16.113 dBm
Center 5.1800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.180000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 26 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
05:50:18 PM Feb 19, 2024
Ref Offset 5.74 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 5.180 007 GHz
16.210 dBm
Center 5.1800000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)

Frequency (MHz)	Voltage (V)	Temperature (℃)	Measured Frequency (MHz)	Deviation (ppm)	Limit (ppm)	Result
5825	7.4 Vdc	-10	5824.951	8.41	25	Pass
		0	5824.951	8.41	25	Pass
		10	5824.951	8.41	25	Pass
		20	5824.951	8.41	25	Pass
		30	5824.951	8.41	25	Pass
		40	5824.953	8.07	25	Pass
	6 Vdc	25	5824.952	8.24	25	Pass
	16 Vdc	25	5824.951	8.50	25	Pass
	120 Vac	-10	5825.010	1.72	25	Pass
		0	5825.013	2.23	25	Pass
		10	5825.009	1.55	25	Pass
		20	5825.009	1.46	25	Pass
		30	5825.008	1.37	25	Pass
		40	5825.007	1.2	25	Pass
	85 Vac	25	5825.014	2.4	25	Pass
	240 Vac	25	5825.003	0.52	25	Pass




Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold: 20/20
01:12:33 PM Mar 06, 2024
Ref Offset 6.08 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr1 5.824 951 GHz
22.333 dBm
Center 5.8250000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold: 20/20
01:11:48 PM Mar 06, 2024
Ref Offset 6.08 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr1 5.824 953 GHz
22.377 dBm
Center 5.8250000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold: 20/20
01:11:56 PM Mar 06, 2024
Ref Offset 6.08 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr1 5.824 952 GHz
22.362 dBm
Center 5.8250000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold: 20/20
01:11:16 PM Mar 06, 2024
Ref Offset 6.08 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr1 5.824 951 GHz
22.321 dBm
Center 5.8250000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 20/20
04:37:10 PM Feb 19, 2024
Ref Offset 6.08 dB
10 dB/div
Log
Ref 26.08 dBm
Mkr1 5.825 010 GHz
18.169 dBm
Center 5.8250000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 20/20
04:35:05 PM Feb 19, 2024
Ref Offset 6.08 dB
10 dB/div
Log
Ref 26.08 dBm
Mkr1 5.825 013 GHz
18.292 dBm
Center 5.8250000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)


Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 20/20
04:37:40 PM Feb 19, 2024
Mkr1 5.825 009 GHz
18.196 dBm
Ref Offset 6.08 dB
10 dB/div
Ref 26.08 dBm
Log
Center 5.8250000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 20/20
04:38:05 PM Feb 19, 2024
Mkr1 5.825 009 GHz
18.172 dBm
Ref Offset 6.08 dB
10 dB/div
Ref 26.08 dBm
Log
Center 5.8250000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 20/20
04:38:21 PM Feb 19, 2024
Mkr1 5.825 008 GHz
18.247 dBm
Ref Offset 6.08 dB
10 dB/div
Ref 26.08 dBm
Log
Center 5.8250000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 20/20
04:39:14 PM Feb 19, 2024
Mkr1 5.825 007 GHz
18.194 dBm
Ref Offset 6.08 dB
10 dB/div
Ref 26.08 dBm
Log
Center 5.8250000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 20/20
04:34:17 PM Feb 19, 2024
Mkr1 5.825 014 GHz
18.336 dBm
Ref Offset 6.08 dB
10 dB/div
Ref 26.08 dBm
Log
Center 5.8250000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)
Agilent Spectrum Analyzer - Swept SA
Center Freq 5.825000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 20/20
05:09:30 PM Feb 19, 2024
Mkr1 5.825 003 GHz
17.942 dBm
Ref Offset 6.08 dB
10 dB/div
Ref 26.08 dBm
Log
Center 5.8250000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 1.000 MHz
Sweep 1.00 ms (1001 pts)

Appendix A.4 Test Results of Conducted Power Spectral Density

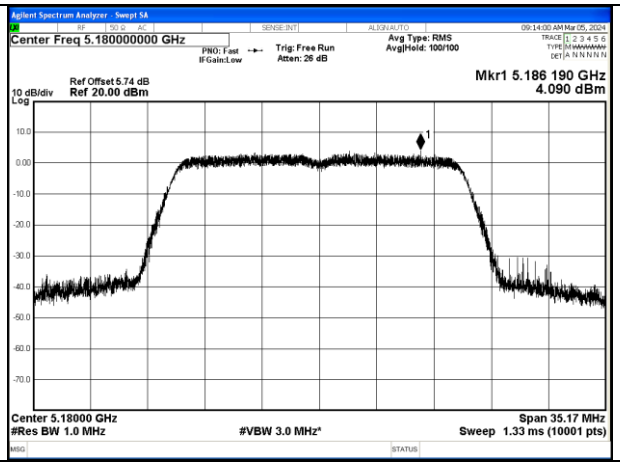
802.11ac20 mode:								
CH	Freq.	ANT1_Power Spectral Density (dBm/MHz)	ANT2_Power Spectral Density (dBm/MHz)	Total_Power Spectral Density (dBm/MHz)	IC_Power Spectral Density (dBm/MHz)	IC Limit (dBm/MHz)	FCC Limit (dBm/MHz)	Result
36	5180	4.090	3.438	6.787	9.127	10	11	Pass
44	5220	3.388	3.487	6.448	8.788	10	11	Pass
48	5240	2.954	3.067	6.021	8.361	10	11	Pass

Note:

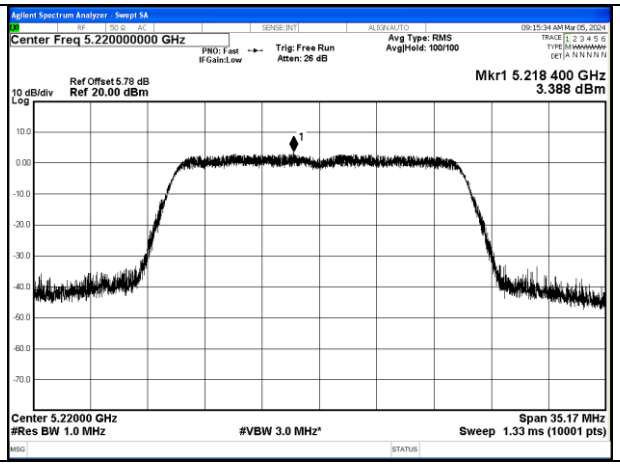
1) Antenna gain(G) of 802.11 ac: 2.34 dBi for 5150MHz-5250MHz, 3.14 dBi for 5725MHz-5850MHz.

CH	Freq.	ANT1_Power Spectral Density (dBm/500KHz)	ANT2_Power Spectral Density (dBm/500K Hz)	Total_Power Spectral Density (dBm/500K Hz)	Limit (dBm/500KHz)	Result
149	5745	1.731	3.411	5.662	30	Pass
157	5785	2.094	3.641	5.946	30	Pass
165	5825	1.889	2.304	5.112	30	Pass

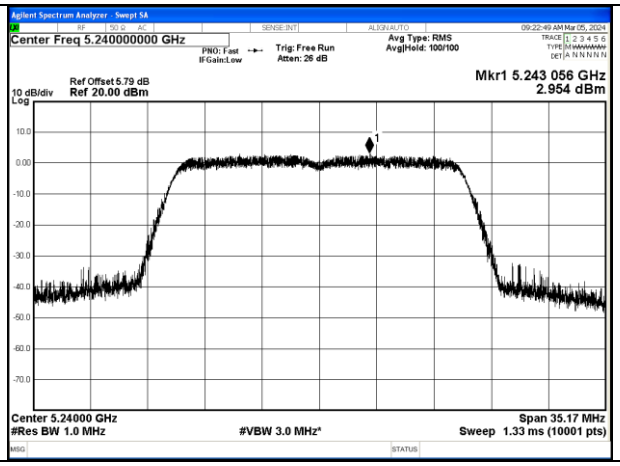
ANT1



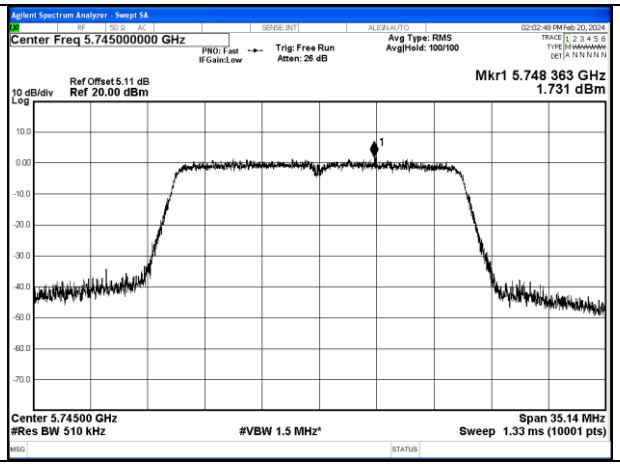
802.11ac20 5180



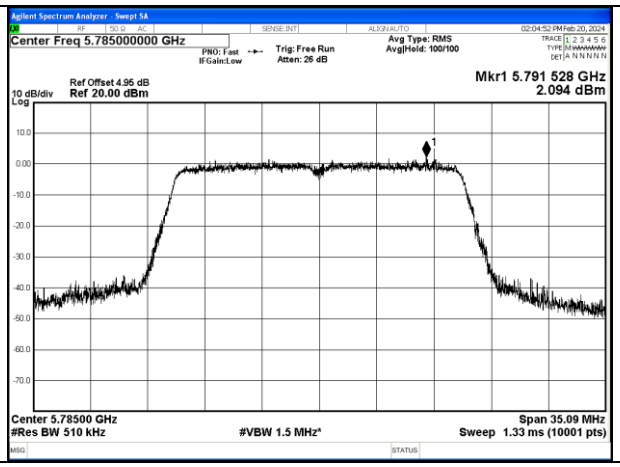
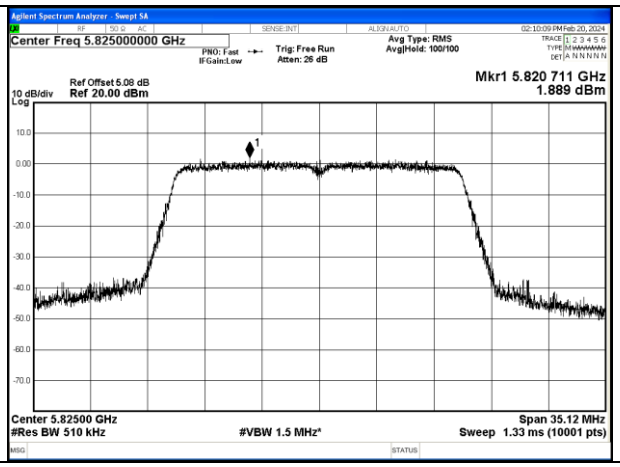
802.11ac20 5220



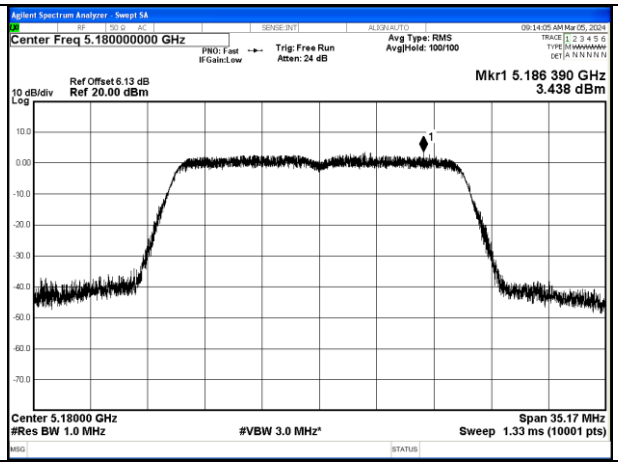
802.11ac20 5240



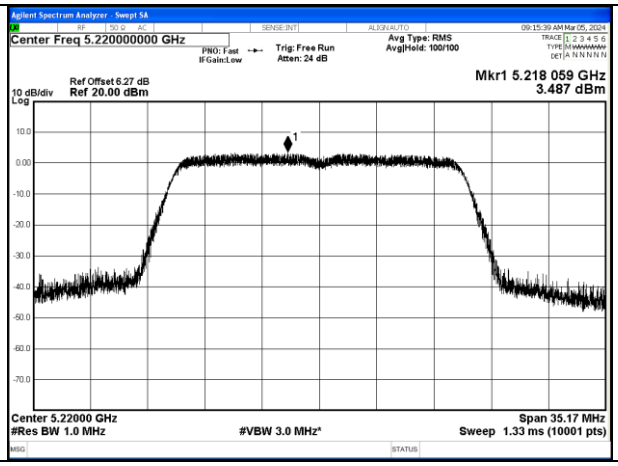
802.11ac20 5745

	
802.11ac20 5785	802.11ac20 5825

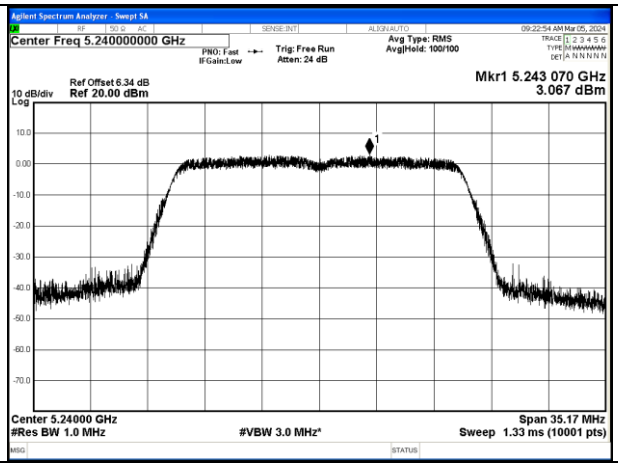
ANT2



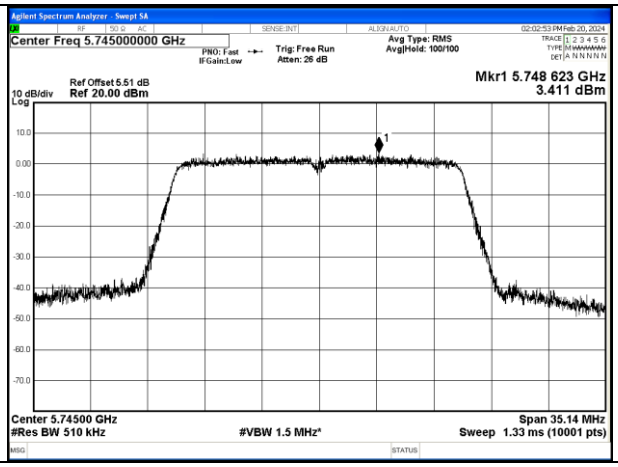
802.11ac20 5180



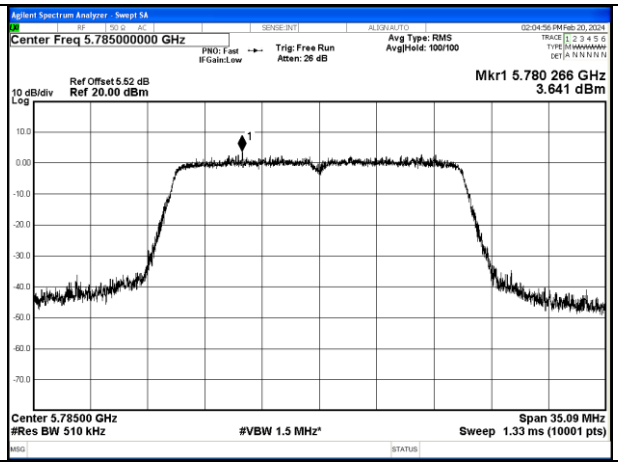
802.11ac20 5220



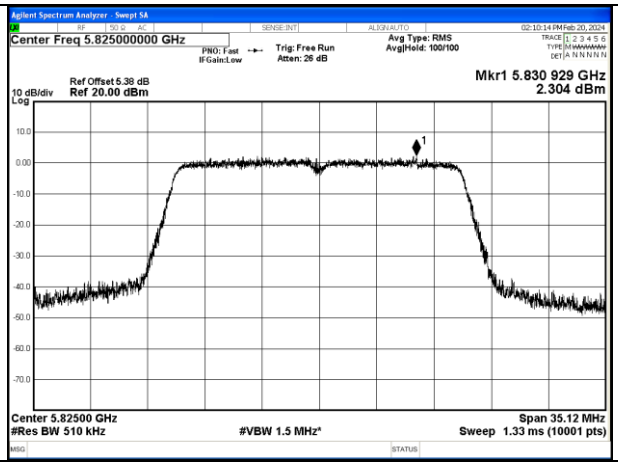
802.11ac20 5240



802.11ac20 5745



802.11ac20 5785



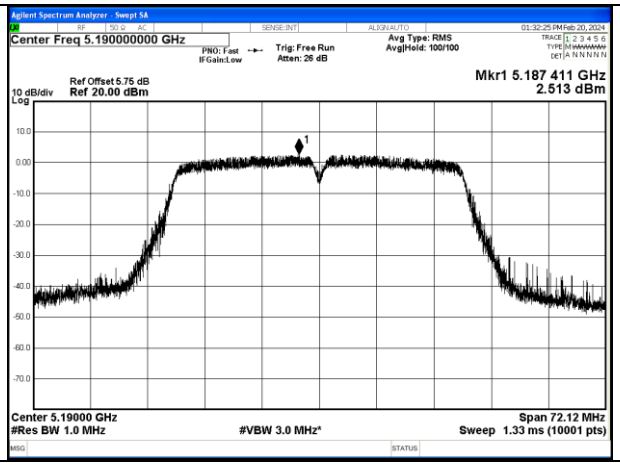
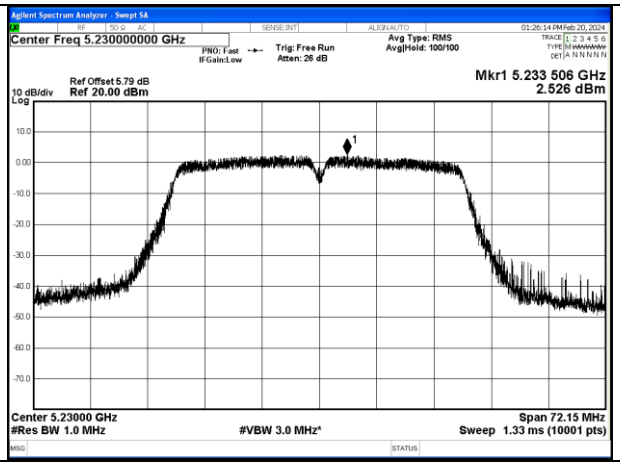
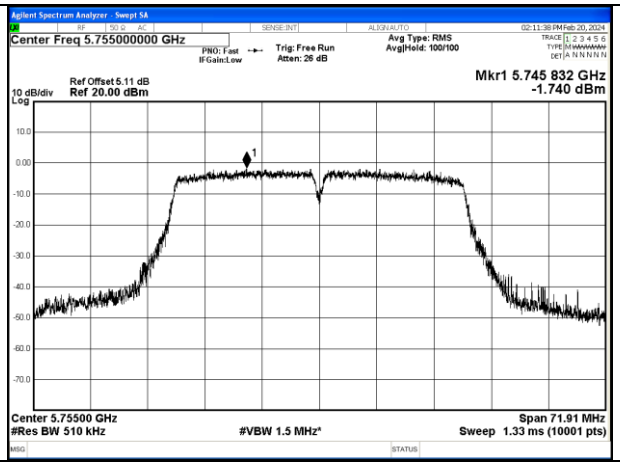
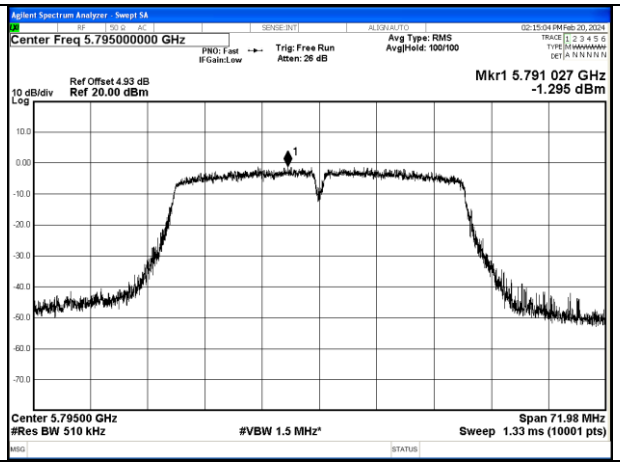
802.11ac20 5825

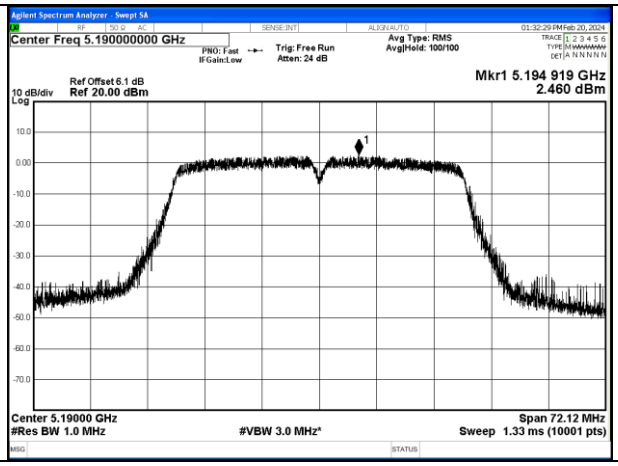
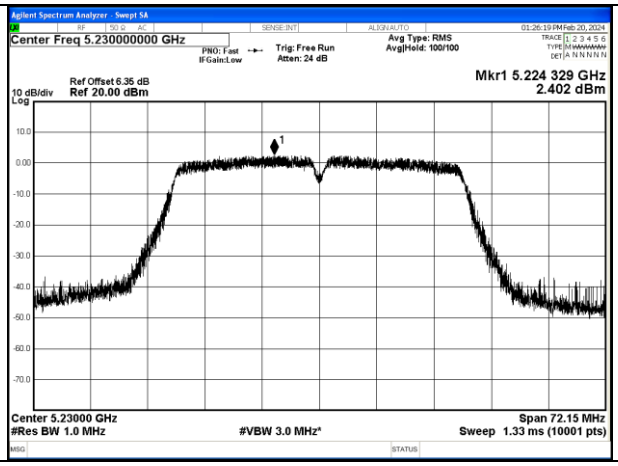
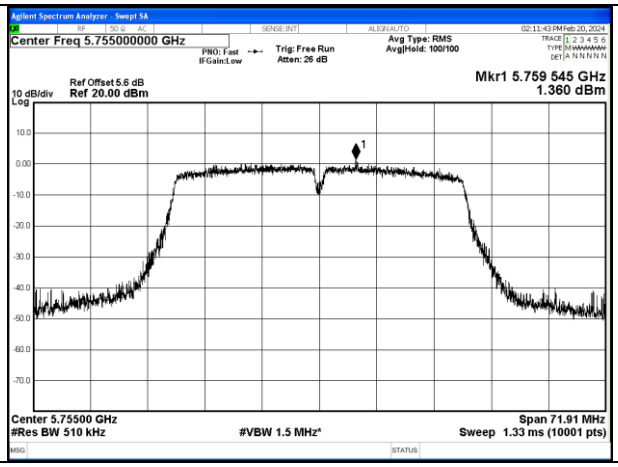
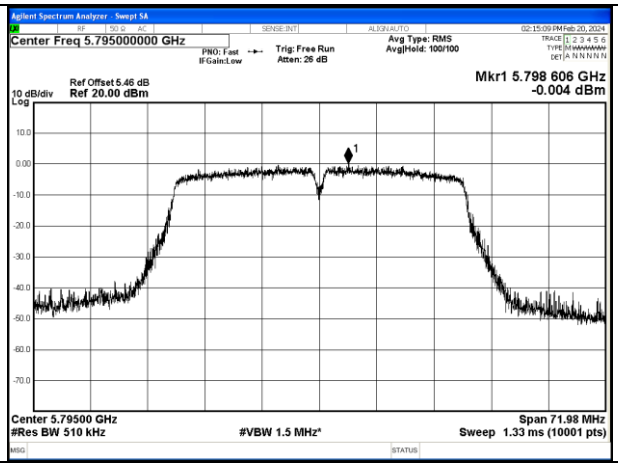
802.11ac40 mode:								
CH	Freq.	ANT1_Power Spectral Density (dBm/MHz)	ANT2_Power Spectral Density (dBm/MHz)	Total_Power Spectral Density (dBm/MHz)	IC_Power Spectral Density (dBm/MHz)	IC Limit (dBm/MHz)	FCC Limit (dBm/MHz)	Result
38	5190	2.513	2.46	5.497	7.837	10	11	Pass
46	5230	2.526	2.402	5.475	7.815	10	11	Pass

Note:

1) Antenna gain(G) of 802.11 ac: 2.34 dBi for 5150MHz-5250MHz, 3.14 dBi for 5725MHz-5850MHz.

CH	Freq.	ANT1_Power Spectral Density (dBm/500KHz)	ANT2_Power Spectral Density (dBm/500K Hz)	Total_Power Spectral Density (dBm/500K Hz)	Limit (dBm/500KHz)	Result
151	5755	-1.74	1.36	3.091	30	Pass
159	5795	-1.295	-0.004	2.409	30	Pass

ANT1	
	
802.11ac40 5190	802.11ac40 5230
	
802.11ac40 5755	802.11ac40 5795

ANT2	
	
802.11ac40 5190	802.11ac40 5230
	
802.11ac40 5755	802.11ac40 5795

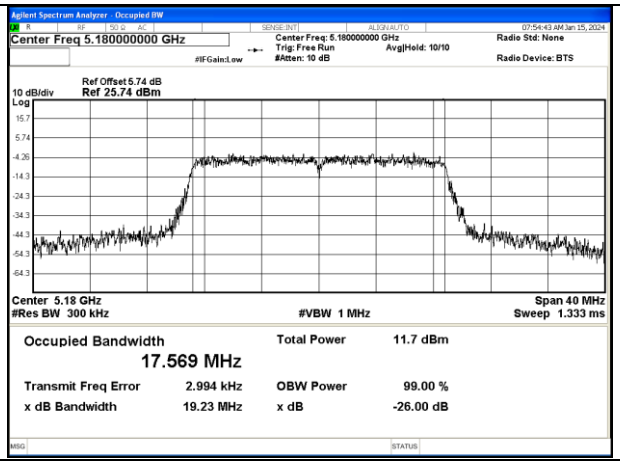
Appendix A.5 Test Results of 6dB & 26dB & 99% BANDWIDTH

802.11ac20 mode:					
Channel	Frequency (MHz)	ANT1_Emission Bandwidth		ANT2_Emission Bandwidth	
		26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
36	5180	19.23	17.569	19.49	17.595
44	5220	19.59	17.585	19.45	17.610
48	5240	19.28	17.615	19.55	17.603

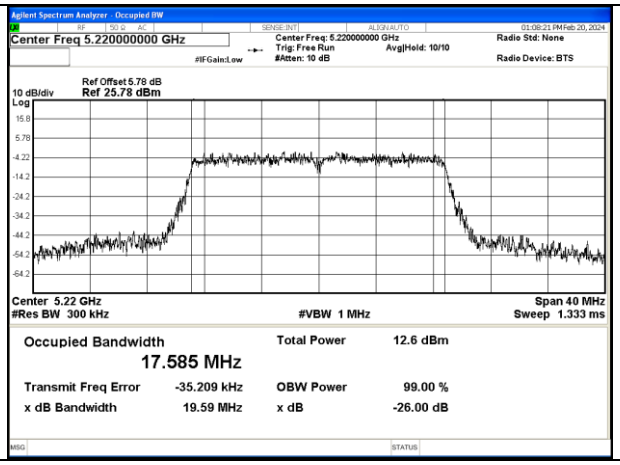
Channel	Frequency (MHz)	ANT1_Emission Bandwidth		ANT2_Emission Bandwidth	
		6dB Bandwidth (MHz)	99% Bandwidth (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
149	5745	17.68	17.565	17.67	17.647
157	5785	17.57	17.626	17.51	17.635
165	5825	17.61	17.607	17.55	17.613

ANT1

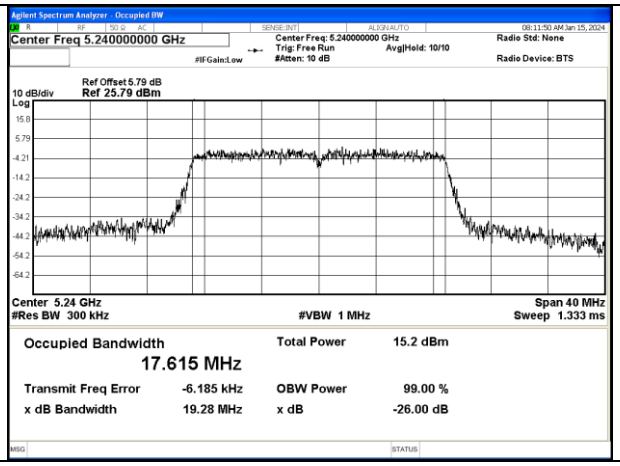
26dB Bandwidth & 99% Bandwidth



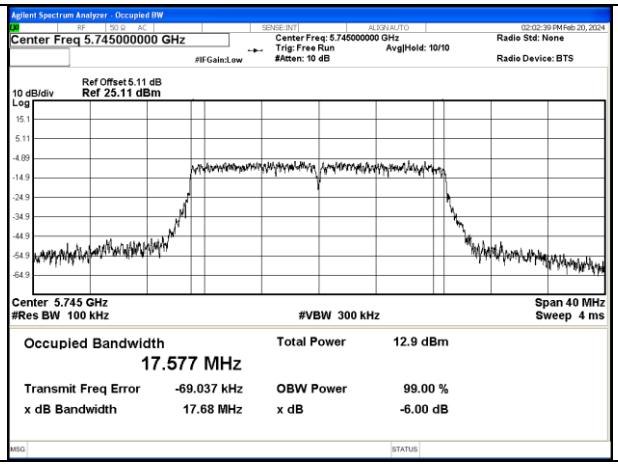
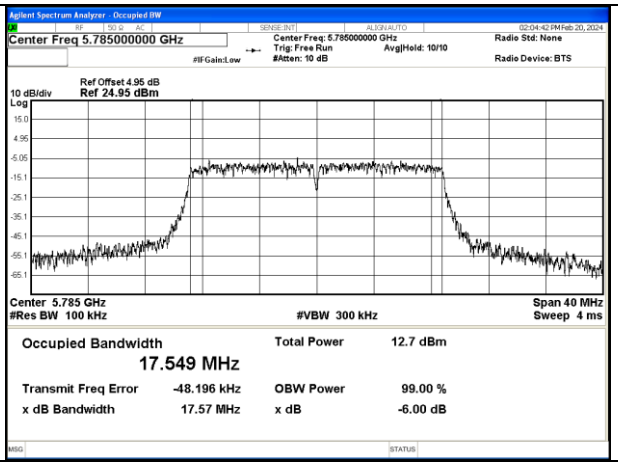
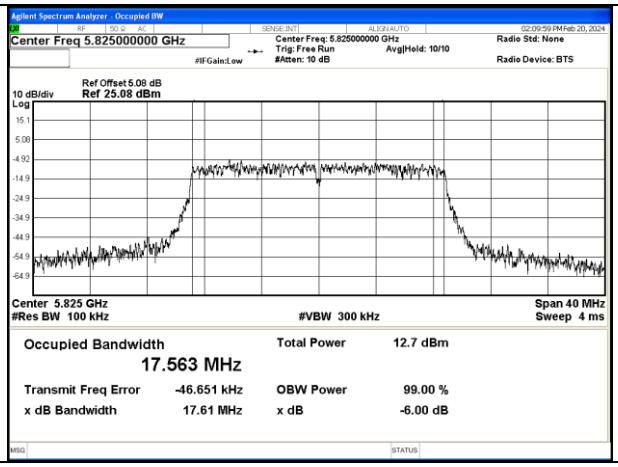
802.11ac20 5180

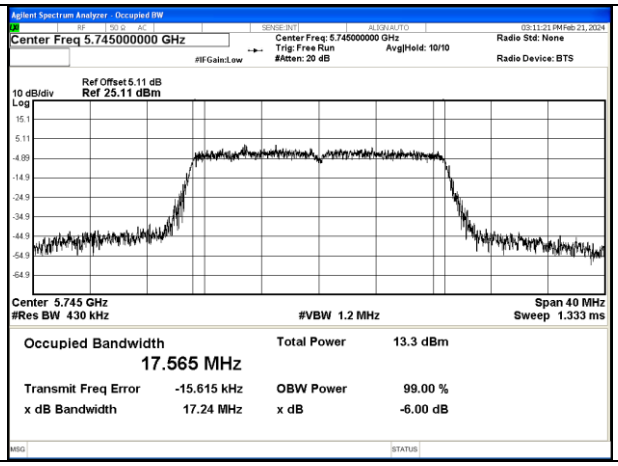
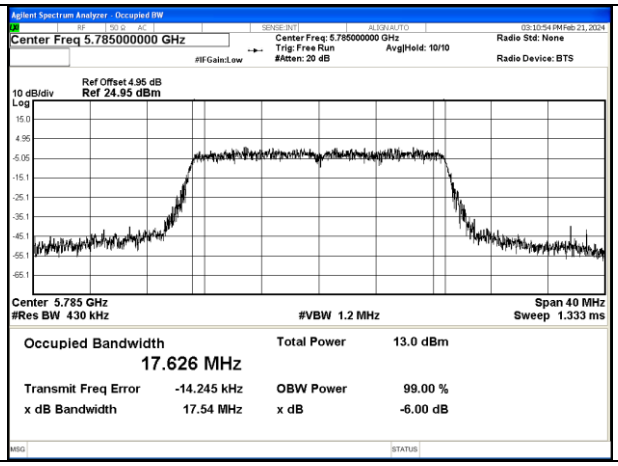
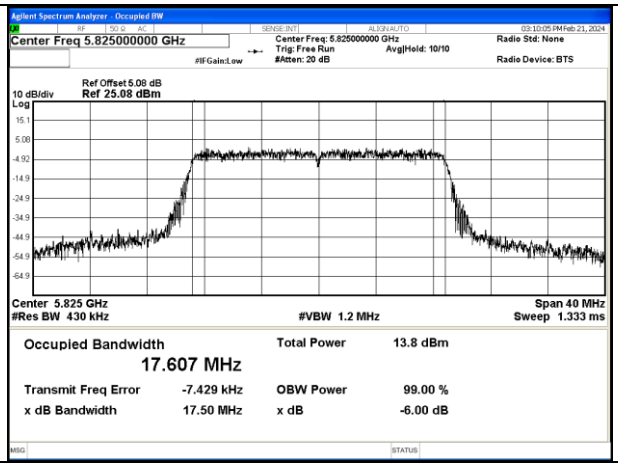


802.11ac20 5220



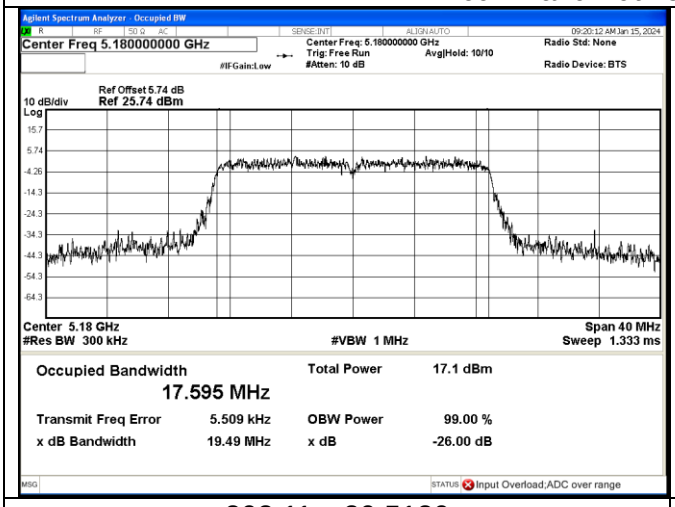
802.11ac20 5240

6dB Bandwidth	
	
802.11ac20 5745	802.11ac20 5785
	
802.11ac20 5825	

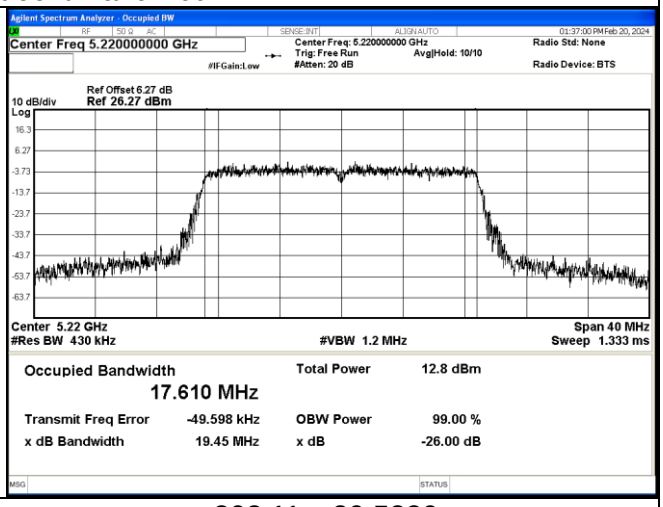
99% Bandwidth	
	
802.11ac20 5745	802.11ac20 5785
	
802.11ac20 5825	

ANT2

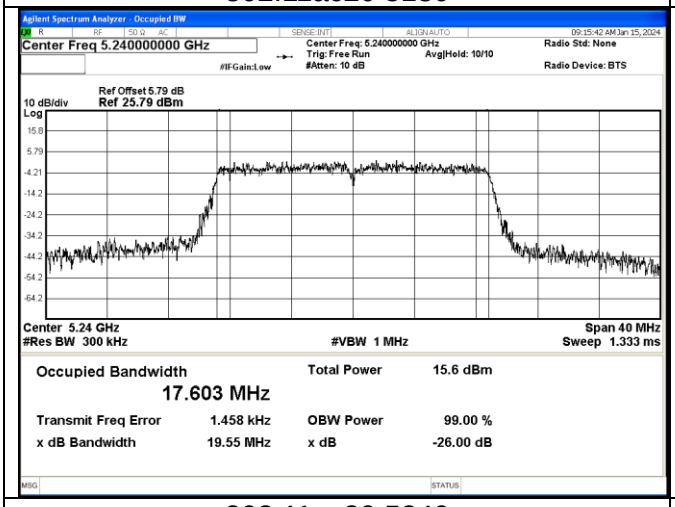
26dB Bandwidth & 99% Bandwidth



802.11ac20 5180

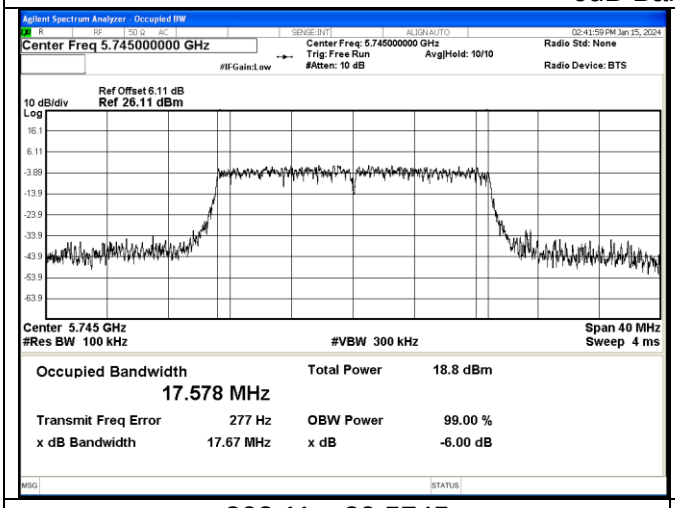


802.11ac20 5220

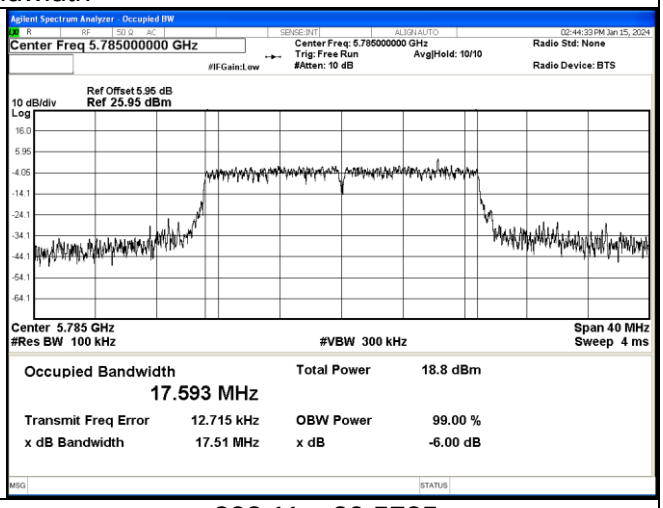


802.11ac20 5240

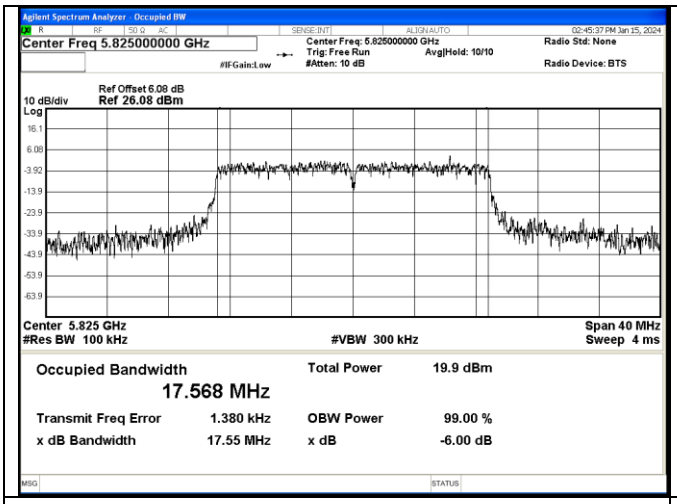
6dB Bandwidth



802.11ac20 5745

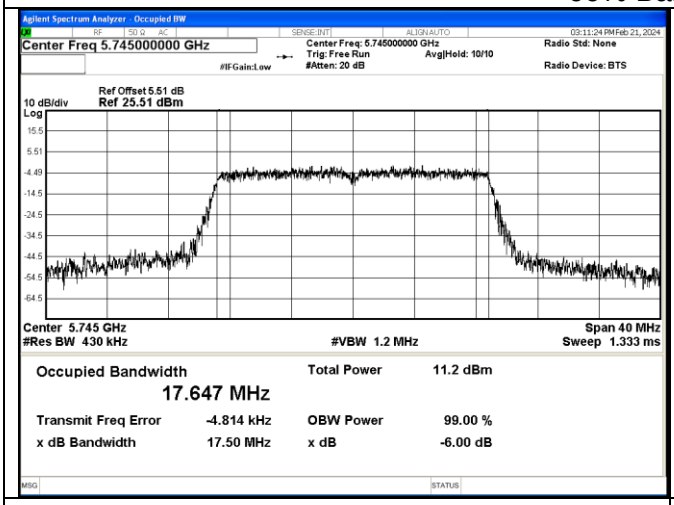


802.11ac20 5785

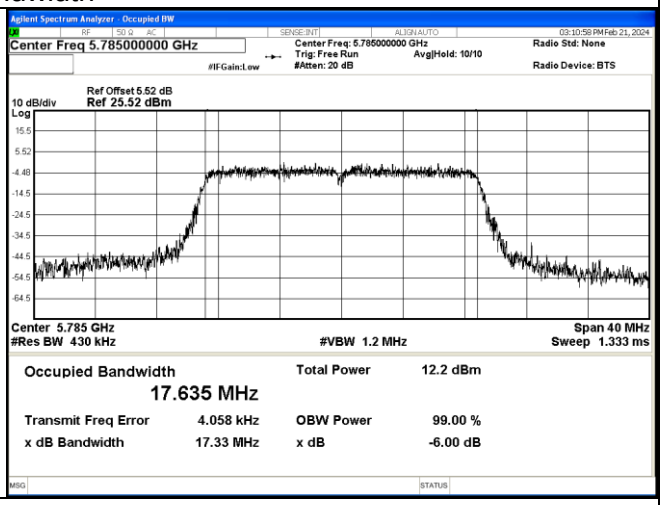


802.11ac20 5825

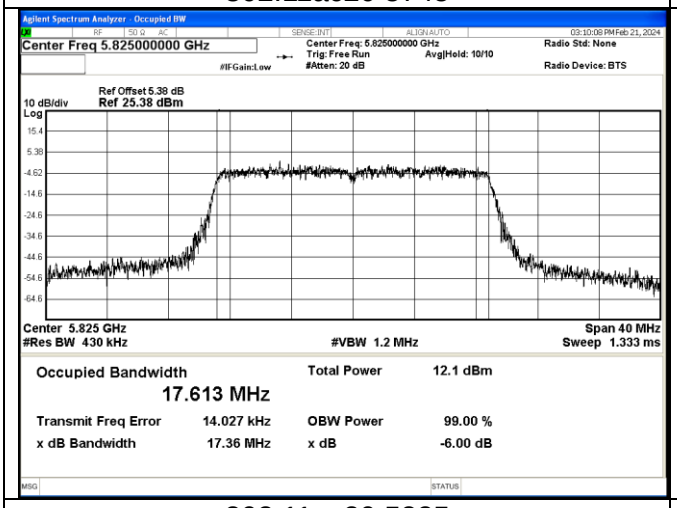
99% Bandwidth



802.11ac20 5745



802.11ac20 5785



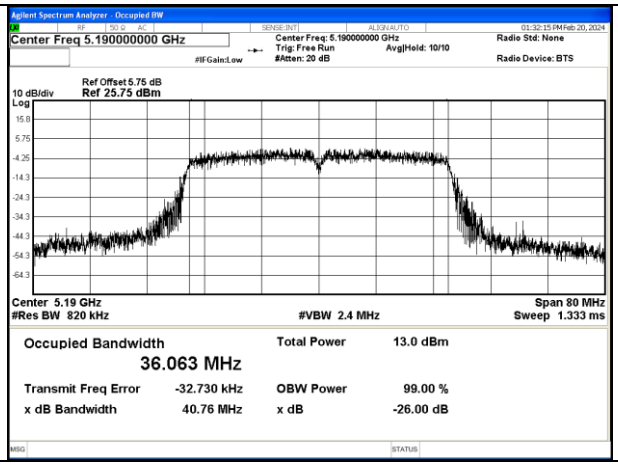
802.11ac20 5825

802.11ac40 mode:					
Channel	Frequency (MHz)	ANT1_Emission Bandwidth		ANT2_Emission Bandwidth	
		26dB Bandwidth (MHz)	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
38	5190	40.76	36.063	39.53	35.989
46	5230	41.63	36.060	39.94	36.053

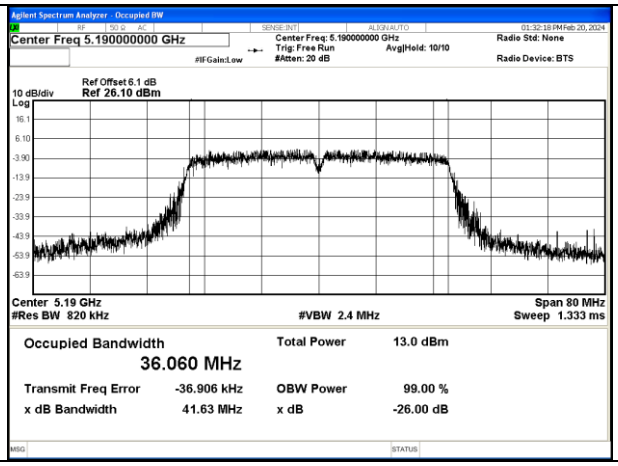
Channel	Frequency (MHz)	ANT1_Emission Bandwidth		ANT2_Emission Bandwidth	
		6dB Bandwidth (MHz)	99% Bandwidth (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
151	5755	35.39	36.084	32.08	36.129
159	5795	33.41	36.048	33.84	36.129

ANT1

26dB Bandwidth & 99% Bandwidth



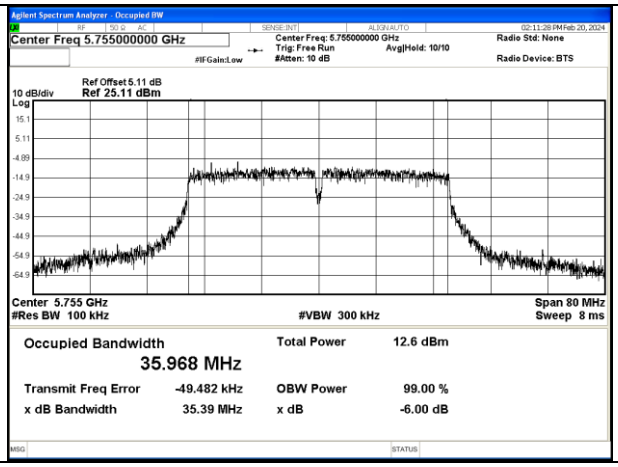
802.11ac40 5190



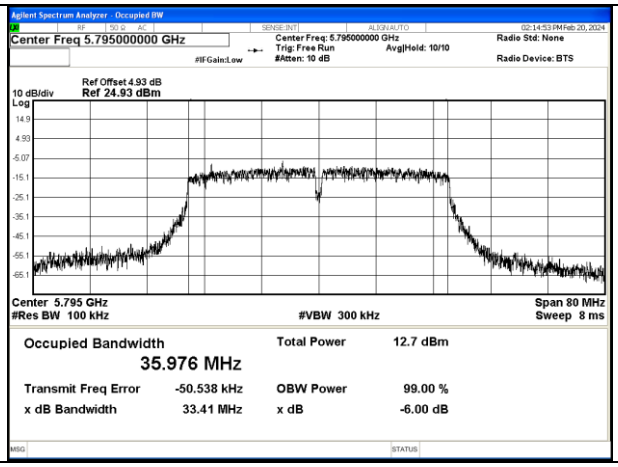
802.11ac40 5230

6dB Bandwidth

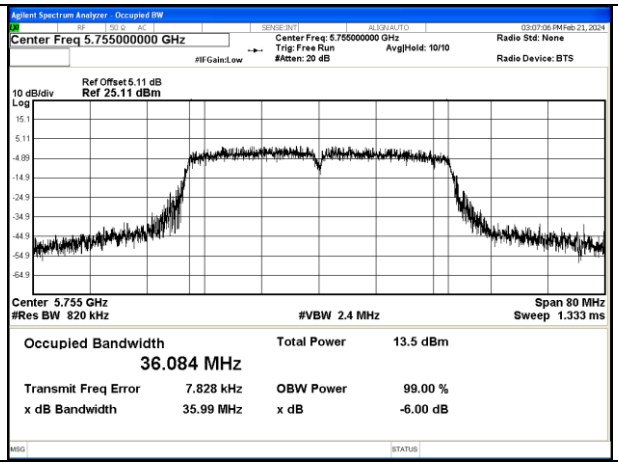
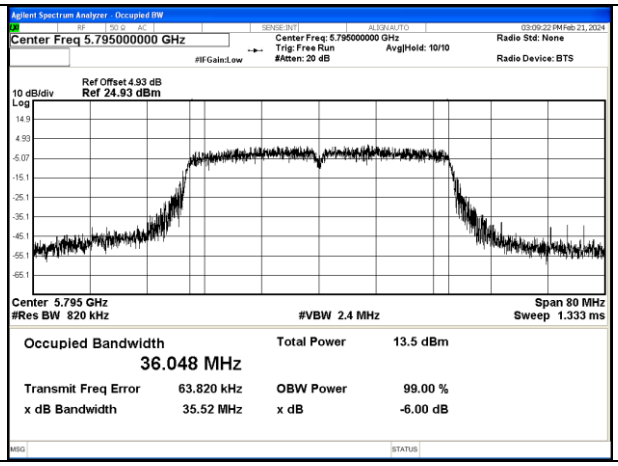
802.11ac40 5230

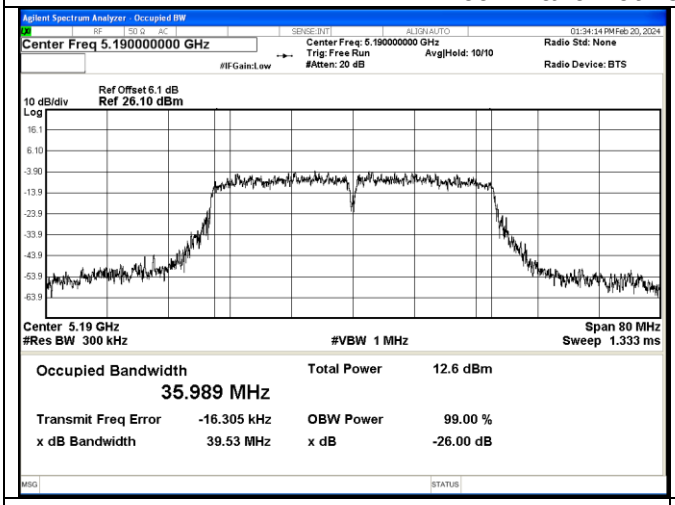
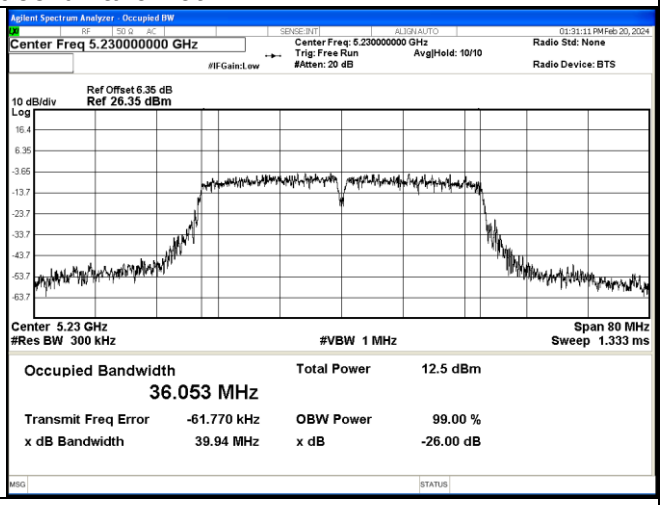
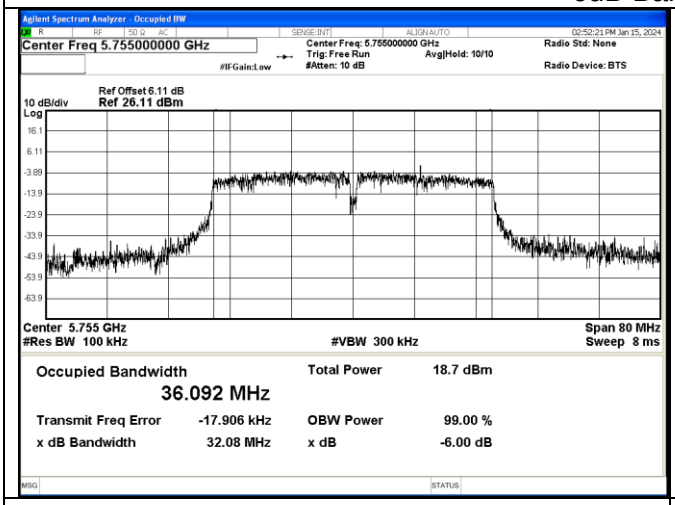
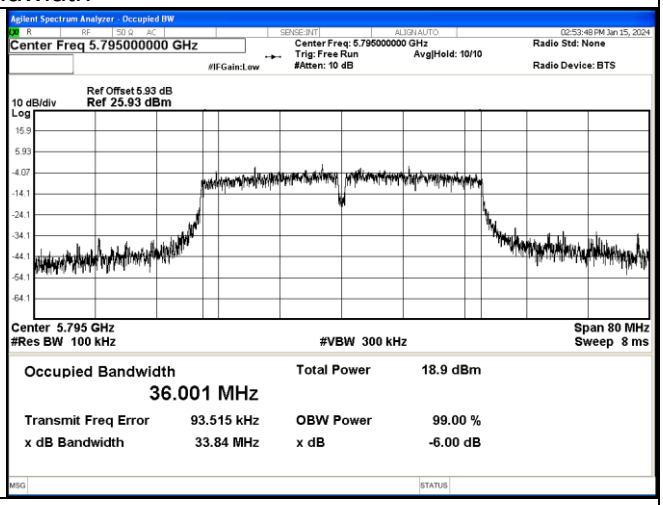
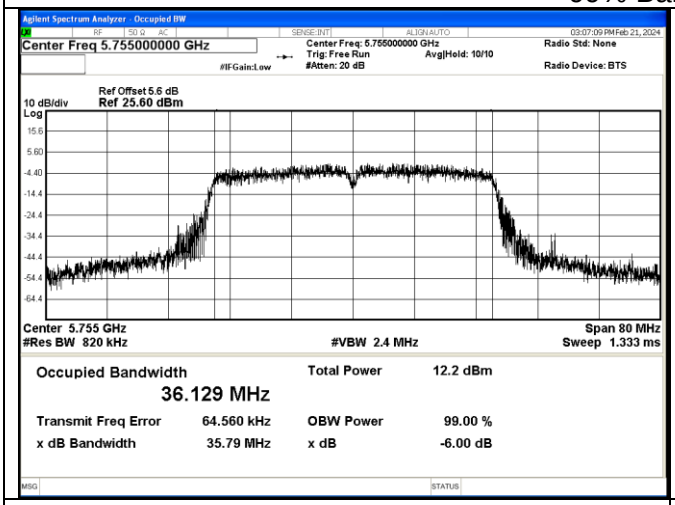
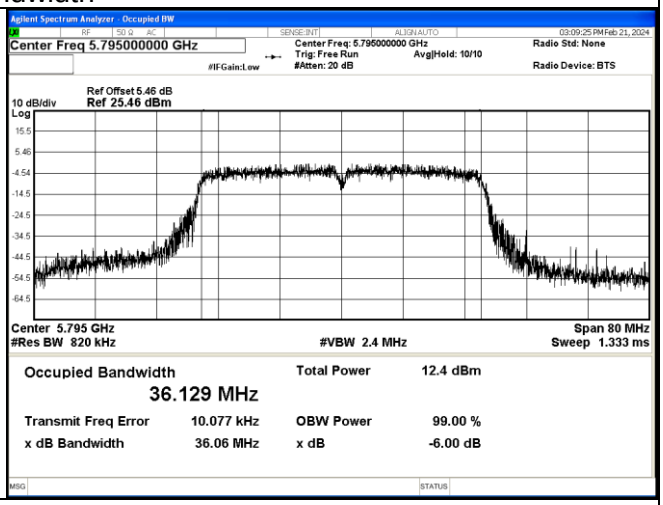


802.11ac40 5755



802.11ac40 5795

99% Bandwidth	
	
802.11ac40 5755	802.11ac40 5795

ANT2	
26dB Bandwidth & 99% Bandwidth	
	
802.11ac40 5190	802.11ac40 5230
6dB Bandwidth	
	
802.11ac40 5755	802.11ac40 5795
99% Bandwidth	
	
802.11ac40 5755	802.11ac40 5795

Appendix A.6 Test Results of Maximum Conducted Output Power

For FCC:

802.11ac20 mode						
CH	Freq.	ANT1_Conducted Power (dBm)	ANT2_Conducted Power (dBm)	Total (dBm) Conducted	Limit (dBm)	Result
36	5180	11.843	11.856	14.860	23.98	Pass
44	5220	11.956	12.348	15.167	23.98	Pass
48	5240	11.457	11.522	14.500	23.98	Pass
149	5745	13.121	14.838	17.074	30	Pass
157	5785	12.926	13.951	16.479	30	Pass
165	5825	13.133	13.814	16.497	30	Pass

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G) of 802.11 ac: 2.34 dBi for 5150MHz-5250MHz, 3.14 dBi for 5725MHz-5850MHz

802.11ac40 mode						
CH	Freq.	ANT1_Conducted Power (dBm)	ANT2_Conducted Power (dBm)	Total (dBm) Conducted	Limit (dBm)	Result
38	5190	13.386	13.25	16.329	23.98	Pass
46	5230	13.185	13.229	16.217	23.98	Pass
151	5755	12.951	14.705	16.926	30	Pass
159	5795	13.018	13.964	16.527	30	Pass

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G) of 802.11 ac: 2.34 dBi for 5150MHz-5250MHz, 3.14 dBi for 5725MHz-5850MHz

For IC:

802.11ac20 mode							
CH	Freq.	ANT1_Conducted Power (dBm)	ANT2_Conducted Power (dBm)	Total E.I.R.P (dBm)	Limit (dBm)		Result
36	5180	11.843	11.856	17.200	22.45[Note3]	23	Pass
44	5220	11.956	12.348	17.507	22.45 [Note3]	23	Pass
48	5240	11.457	11.522	16.840	22.46 [Note3]	23	Pass

802.11ac20 mode						
CH	Freq.	ANT1_Conducted Power (dBm)	ANT2_Conducted Power (dBm)	Total Conducted Power (dBm)	Limit (dBm)	Result
149	5745	13.121	14.838	17.074	30	Pass
157	5785	12.926	13.951	16.479	30	Pass
165	5825	13.133	13.814	16.497	30	Pass

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G) of 802.11 ac: 2.34 dBi for 5150MHz-5250MHz, 3.14 dBi for 5725MHz-5850MHz
3) the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less, where B is the 99% emission bandwidth in megahertz.

802.11ac40 mode						
CH	Freq.	ANT1_Conducted Power (dBm)	ANT2_Conducted Power (dBm)	Total E.I.R.P (dBm)	Limit (dBm)	Result
38	5190	13.386	13.250	18.669	23	Pass
46	5230	13.185	13.229	18.557	23	Pass

802.11ac40 mode						
CH	Freq.	ANT1_Conducted Power (dBm)	ANT2_Conducted Power (dBm)	Total Conducted Power (dBm)	Limit (dBm)	Result
151	5755	12.951	14.705	16.926	30	Pass
159	5795	13.018	13.964	16.527	30	Pass

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G) of 802.11 ac: 2.34 dBi for 5150MHz-5250MHz, 3.14 dBi for 5725MHz-5850MHz