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Appendix for 5GHz WIFI

Applicant: Matco Tools

Address: 4403 Allen Rd. Stow, OH 44224, USA

Product Name: Automotive Diagnostic Scan Tool

Model: MAXIMUSPLUS

FCC ID: 2AUKMMTMAXPLUS

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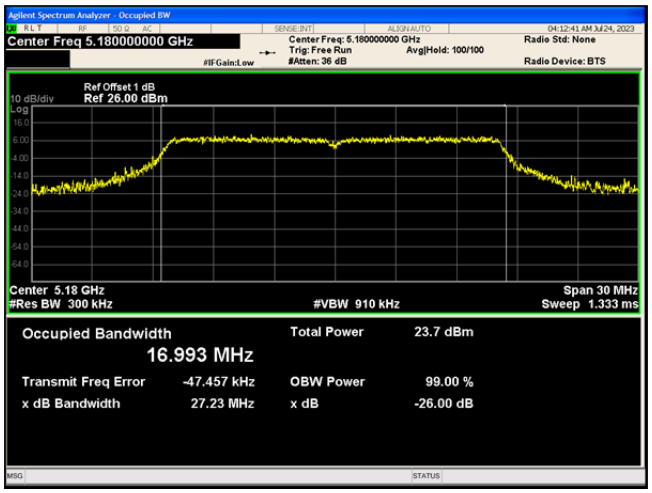
Appendix A1: Emission Bandwidth

Test Result

Test Mode	Channel	26db EBW [MHz]	Verdict
802.11a	5180	27.23	PASS
	5200	28.88	PASS
	5240	22.24	PASS
	5745	21.78	PASS
	5785	25.98	PASS
	5825	26.05	PASS
802.11n(HT20)	5180	22.53	PASS
	5200	22.33	PASS
	5240	22.92	PASS
	5745	24.66	PASS
	5785	22.36	PASS
	5825	28.36	PASS
802.11n(HT40)	5190	43.80	PASS
	5230	45.01	PASS
	5755	43.91	PASS
	5795	56.99	PASS
802.11ac(VHT20)	5180	22.31	PASS
	5200	21.78	PASS
	5240	22.15	PASS
	5745	22.23	PASS
	5785	22.39	PASS
	5825	22.61	PASS
802.11ac(VHT40)	5190	44.91	PASS
	5230	44.56	PASS
	5755	43.46	PASS
	5795	43.28	PASS
802.11ac(VHT80)	5210	83.90	PASS
	5775	83.64	PASS

Test Graphs

802.11a_5180

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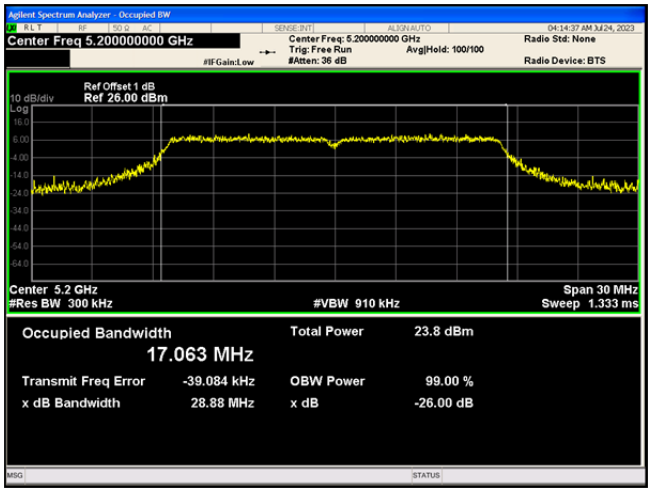
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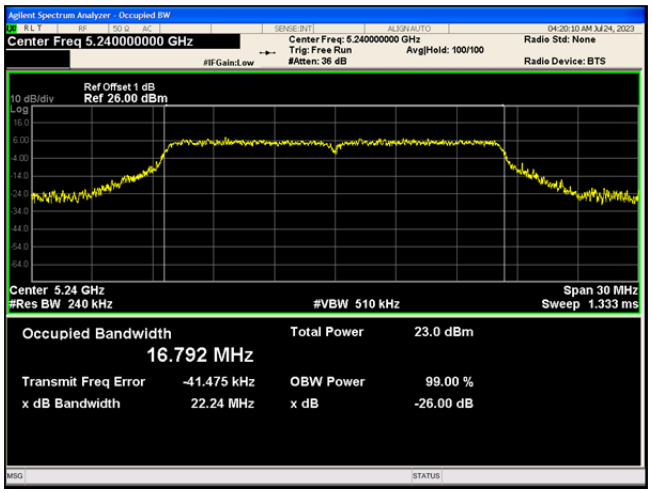
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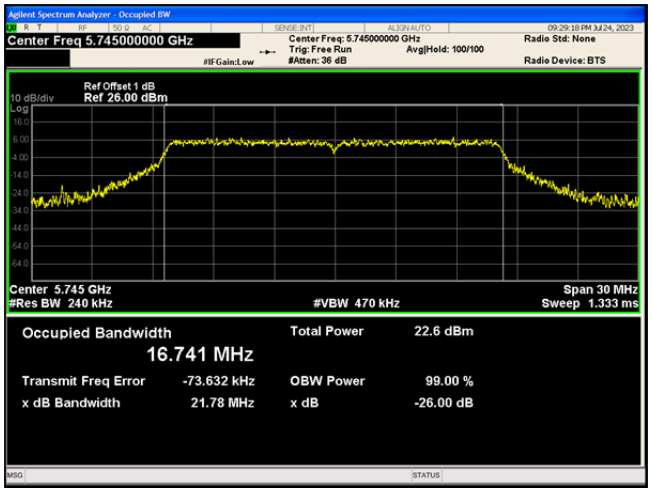
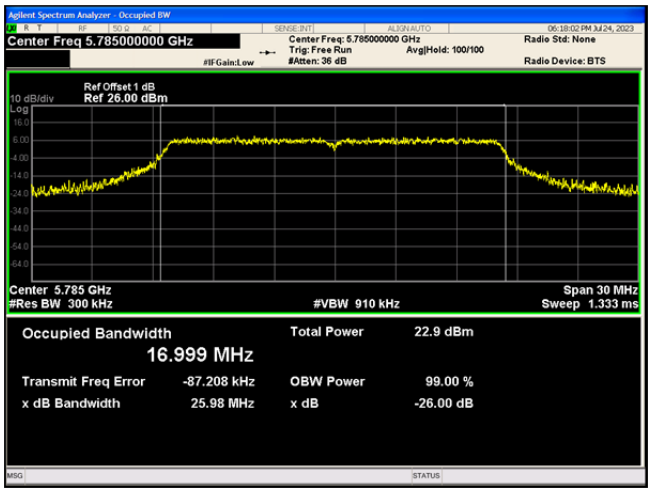


802.11a_5785



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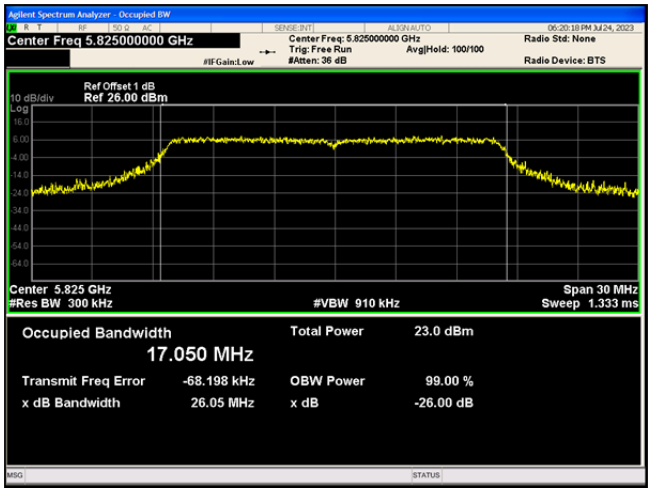

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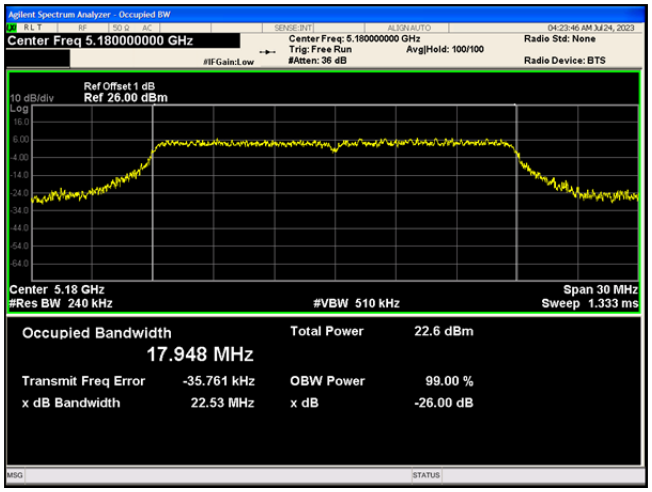

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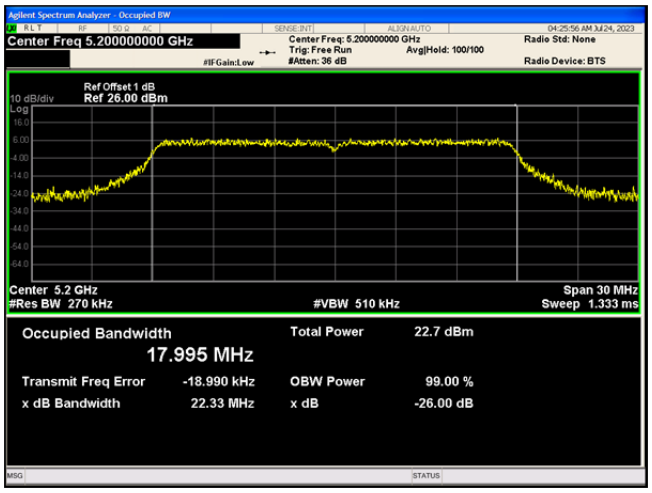

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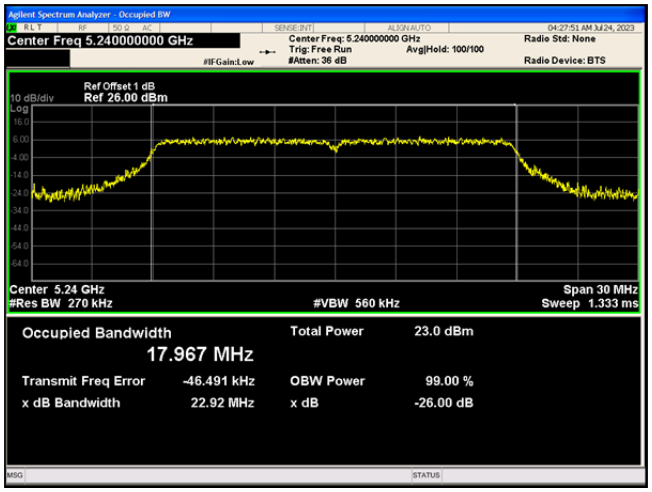

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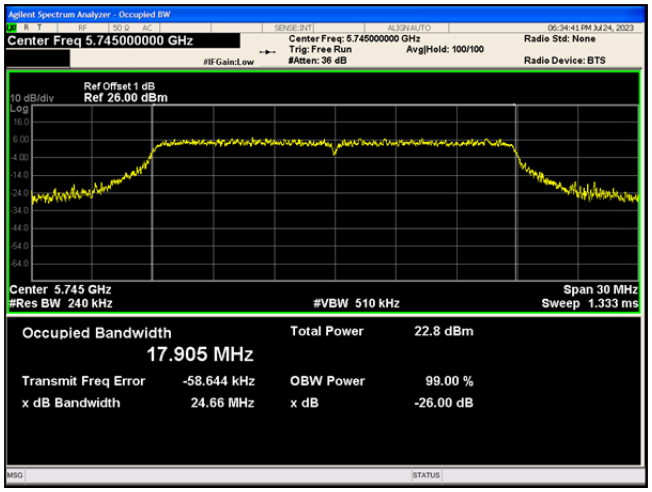

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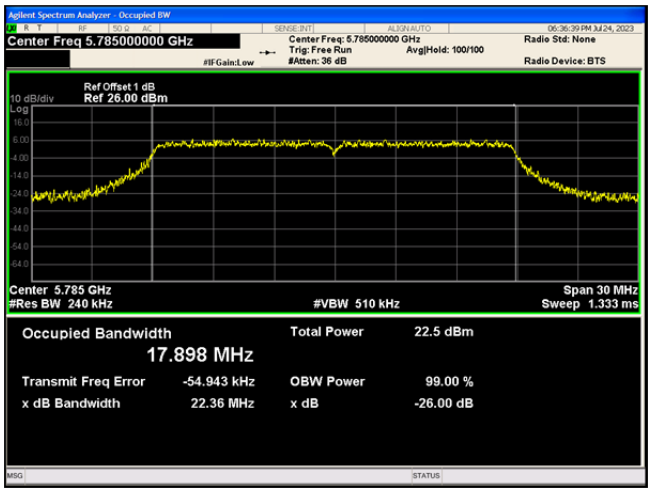

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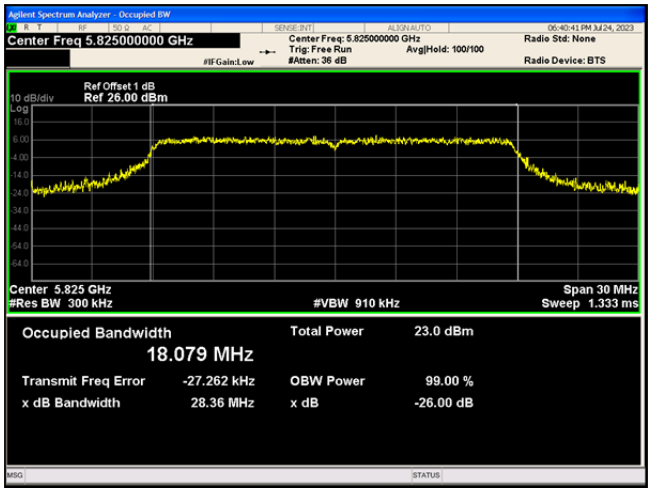

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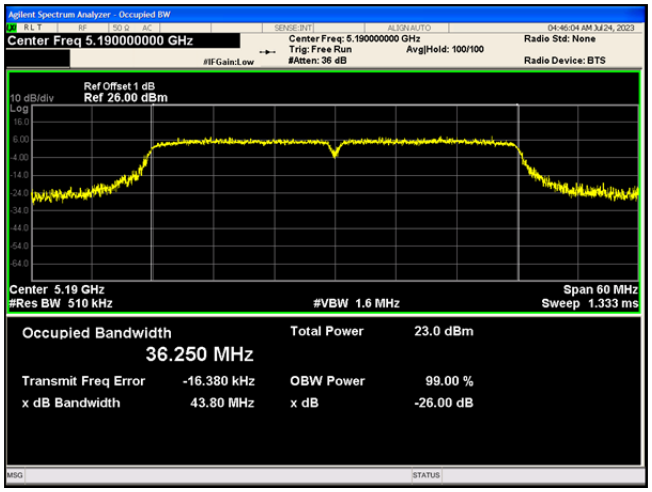

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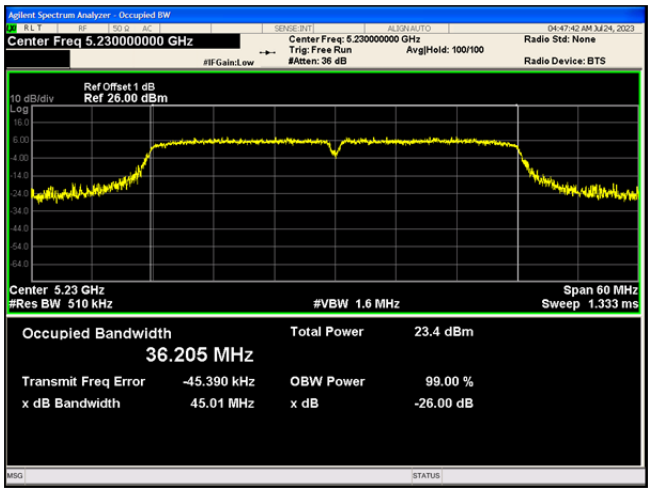

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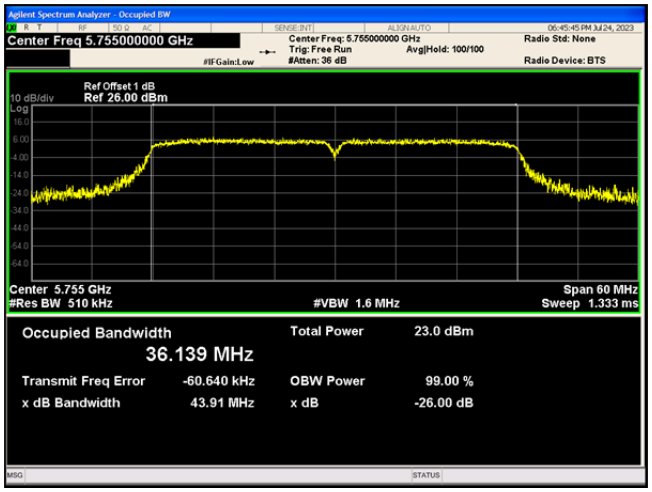

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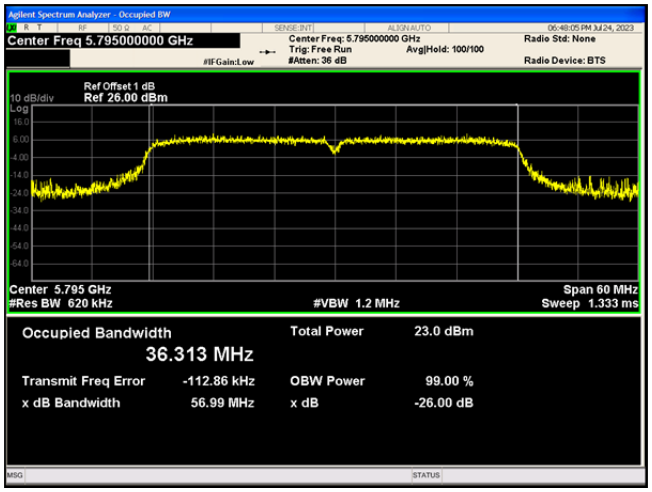

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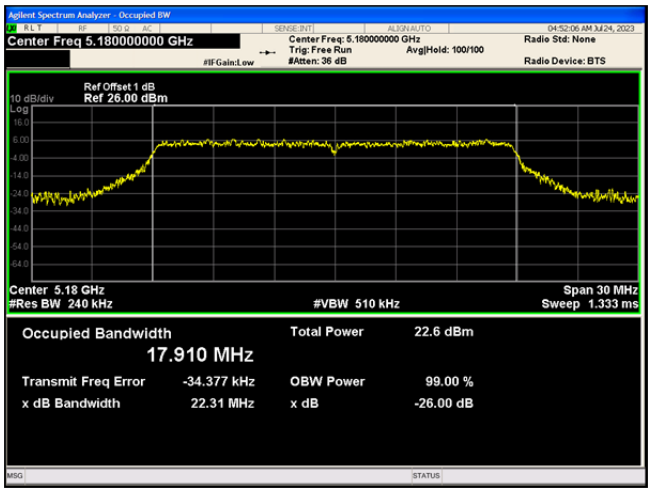

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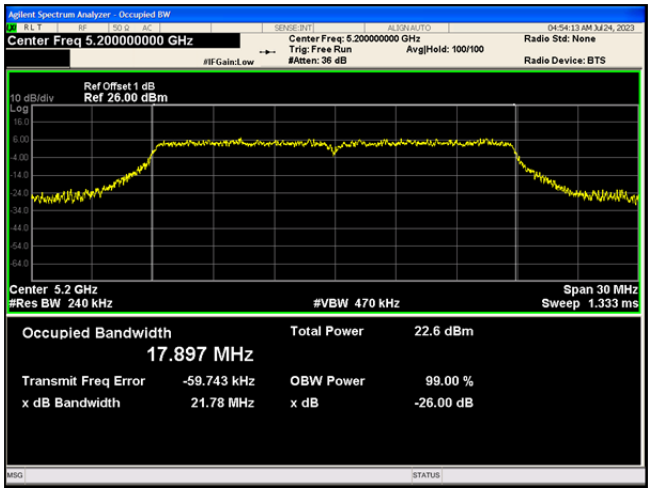

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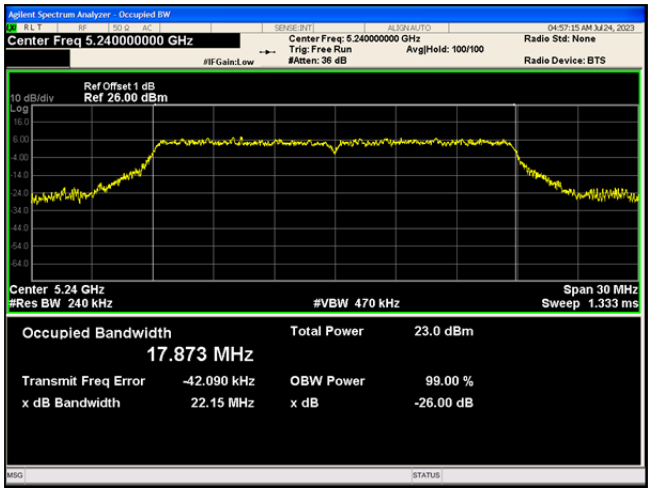

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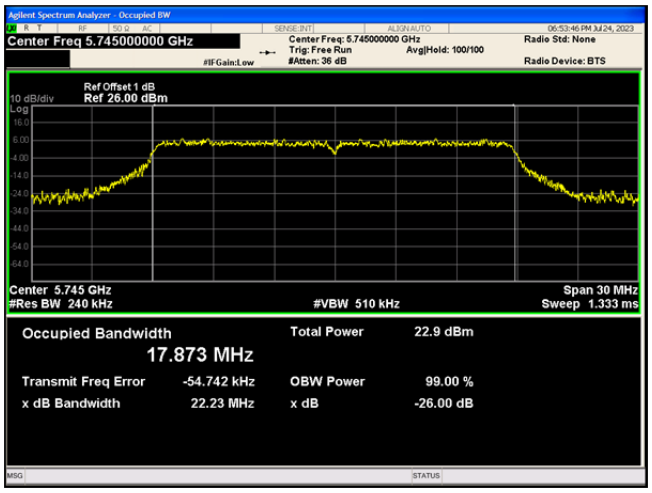

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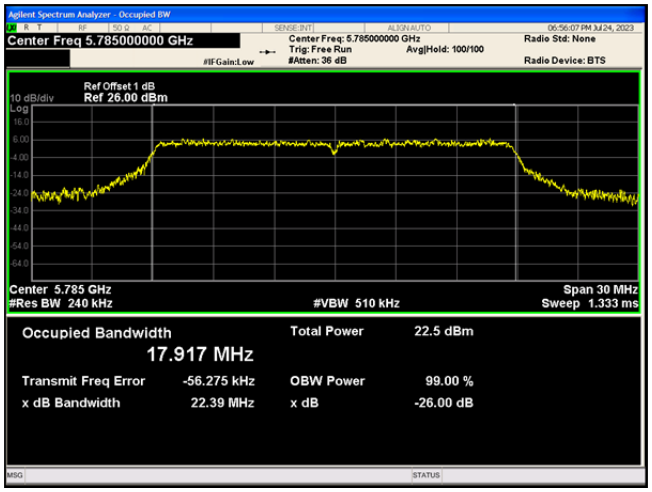

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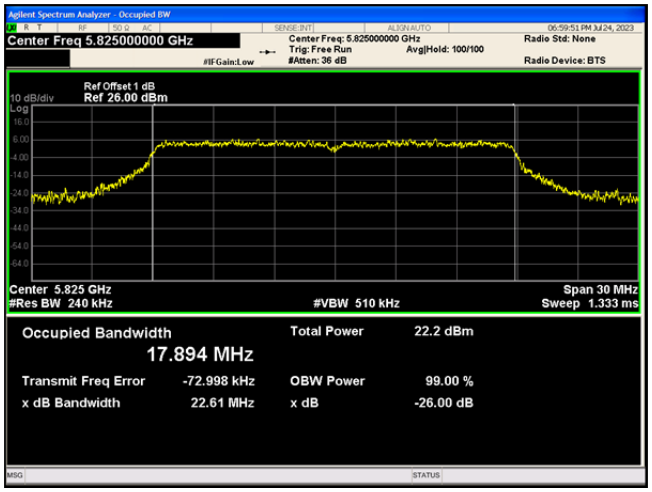

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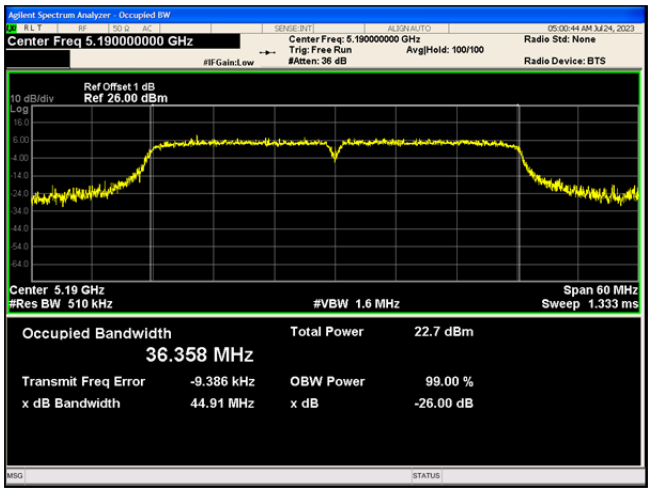

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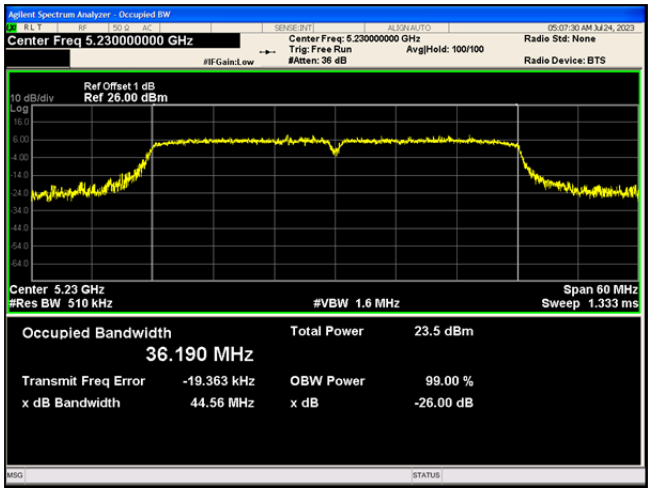

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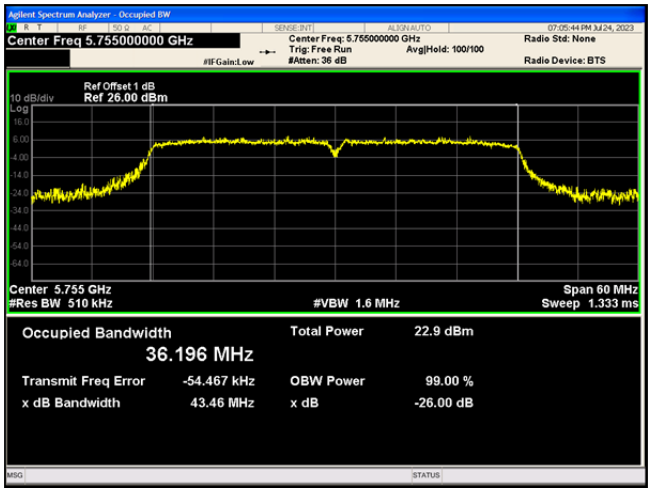

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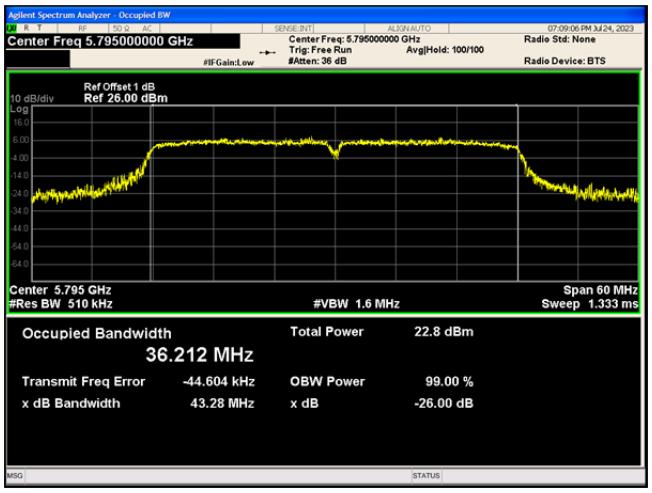

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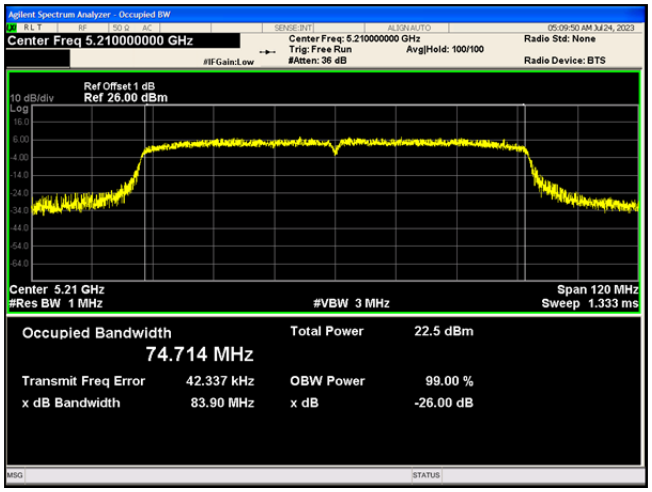

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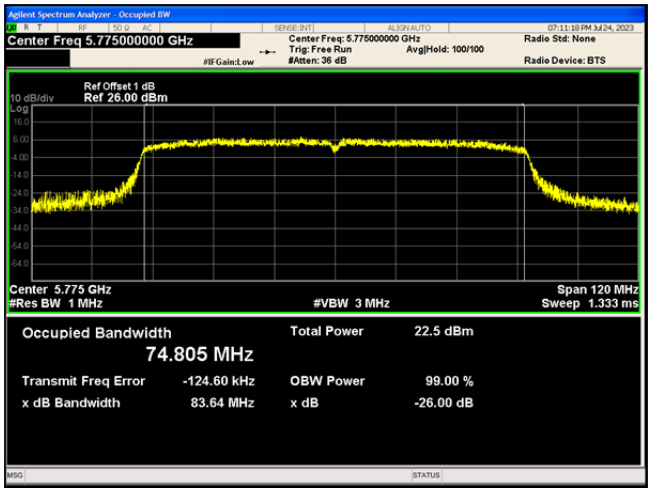

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.775000000 GHz
Center Freq: 5.775000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#IFGain:Low
#Atten: 36 dB
Radio Std: None
Radio Device: BTS
07:11:18 PM Jul 24, 2023
Ref Offset 1 dB
10 dB/div
Ref 26.00 dBm
Log
16.0
6.00
-4.00
-14.0
-24.0
-34.0
-44.0
-54.0
-64.0
Center 5.775 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 120 MHz
Sweep 1.333 ms
Occupied Bandwidth
74.805 MHz
Total Power
22.5 dBm
Transmit Freq Error
-124.60 kHz
OBW Power
99.00 %
x dB Bandwidth
83.64 MHz
x dB
-26.00 dB
MSG
STATUS

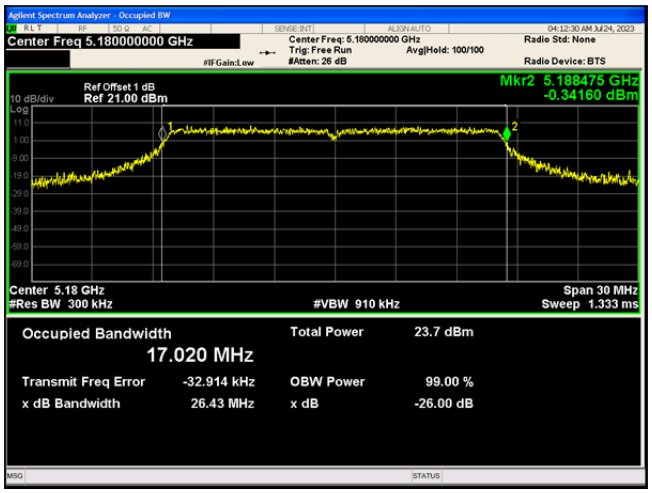
Appendix A2: Occupied channel bandwidth

Test Result

Test Mode	Channel	OCB [MHz]	Verdict
802.11a	5180	17.020	PASS
	5200	17.030	PASS
	5240	16.952	PASS
	5745	16.950	PASS
	5785	17.005	PASS
	5825	17.070	PASS
802.11n(HT20)	5180	18.065	PASS
	5200	18.029	PASS
	5240	18.016	PASS
	5745	18.026	PASS
	5785	17.986	PASS
	5825	18.059	PASS
802.11n(HT40)	5190	36.117	PASS
	5230	36.147	PASS
	5755	36.168	PASS
	5795	36.276	PASS
802.11ac(VHT20)	5180	18.034	PASS
	5200	18.034	PASS
	5240	18.039	PASS
	5745	18.042	PASS
	5785	18.040	PASS
	5825	18.002	PASS
802.11ac(VHT40)	5190	36.273	PASS
	5230	36.172	PASS
	5755	36.245	PASS
	5795	36.181	PASS
802.11ac(VHT80)	5210	74.745	PASS
	5775	74.743	PASS

Test Graphs

802.11a_5180



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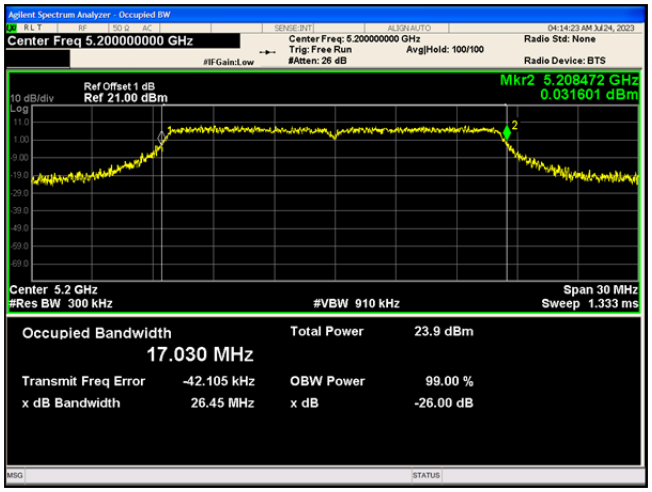
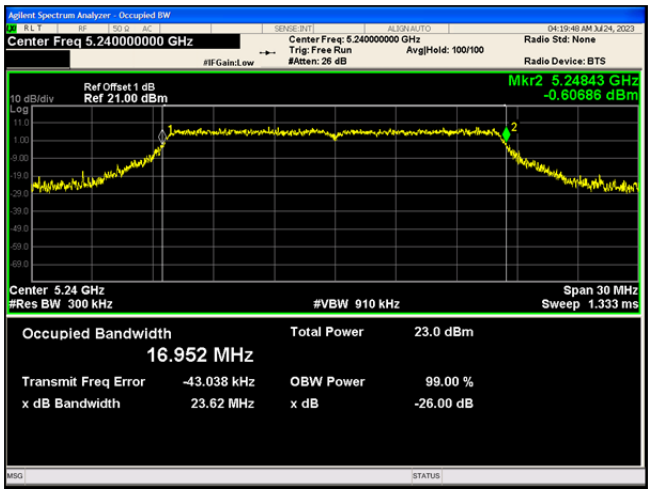


802.11a_5240



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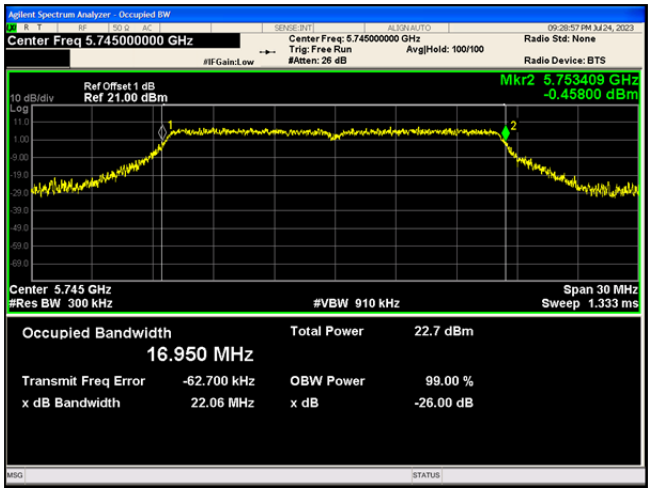

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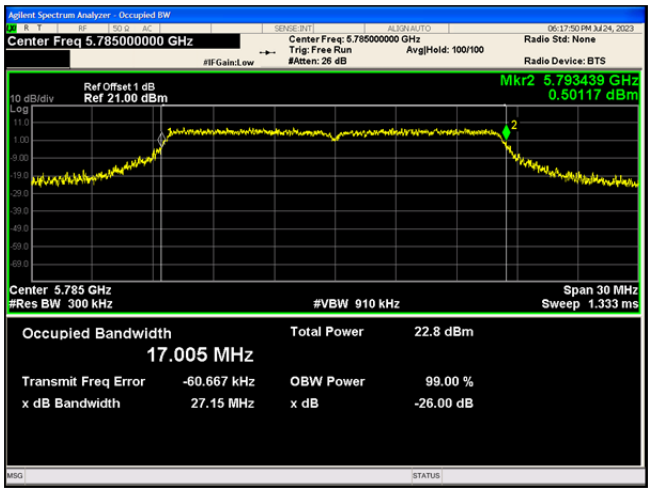

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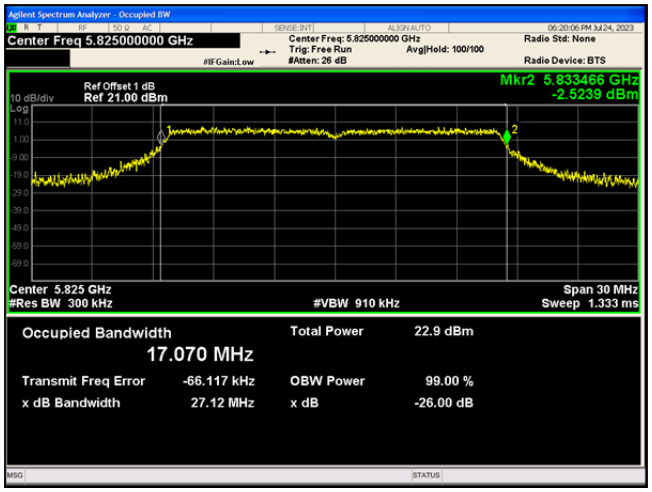

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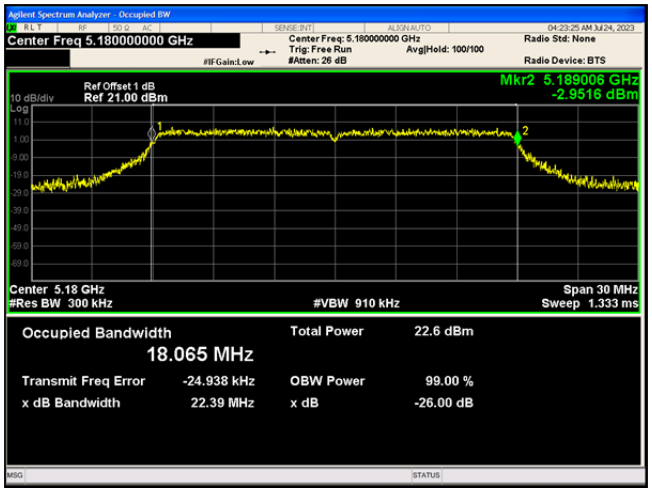

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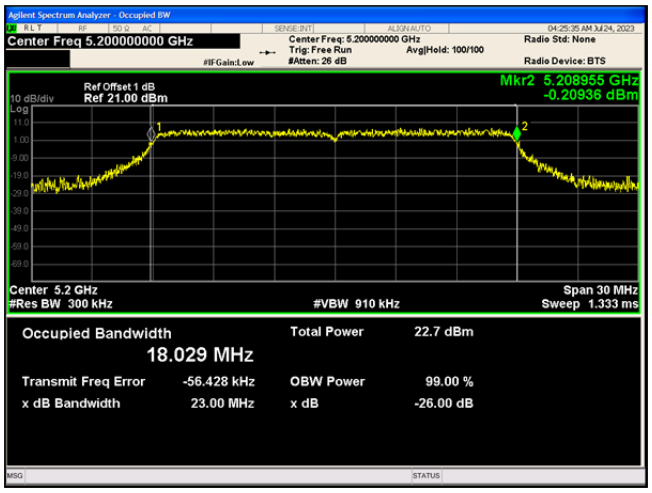

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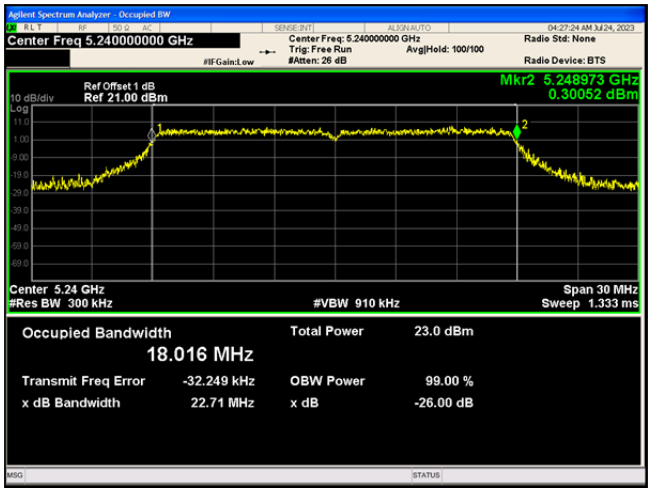

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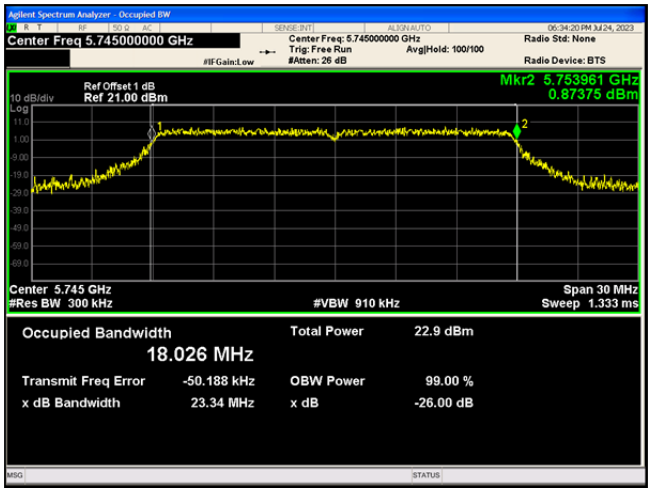
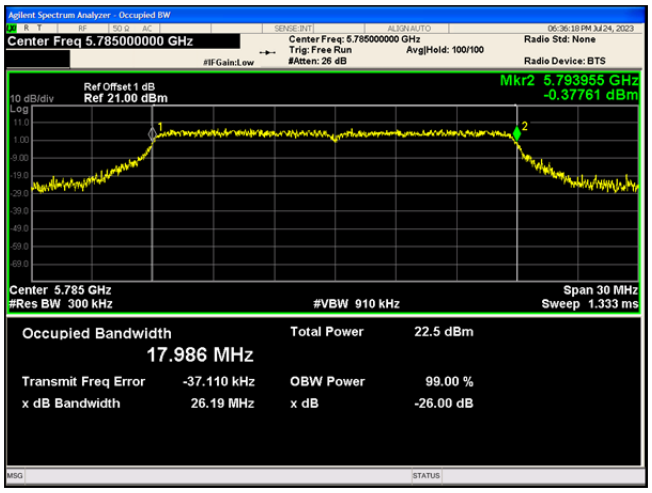


802.11n(HT20)_5785



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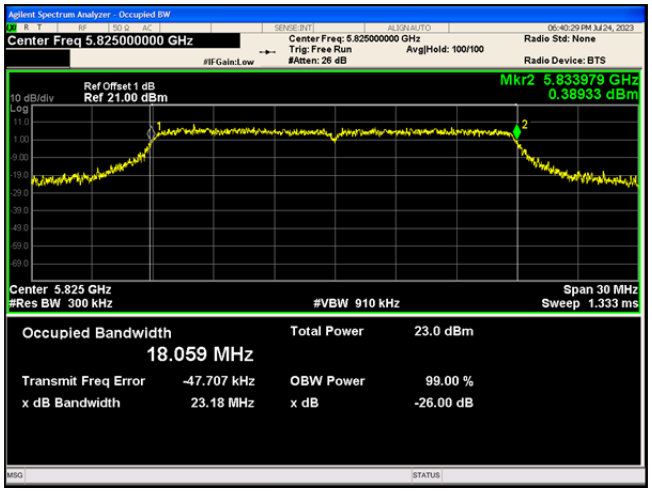

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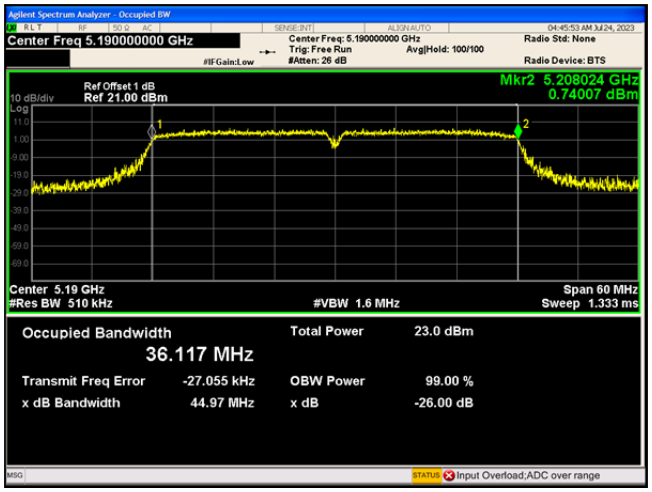

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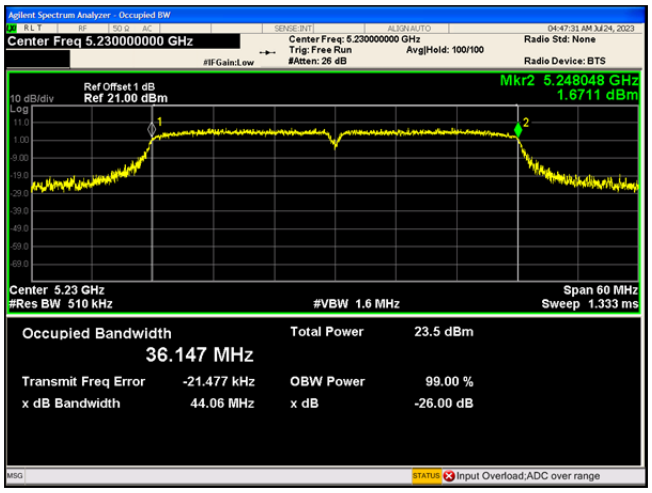

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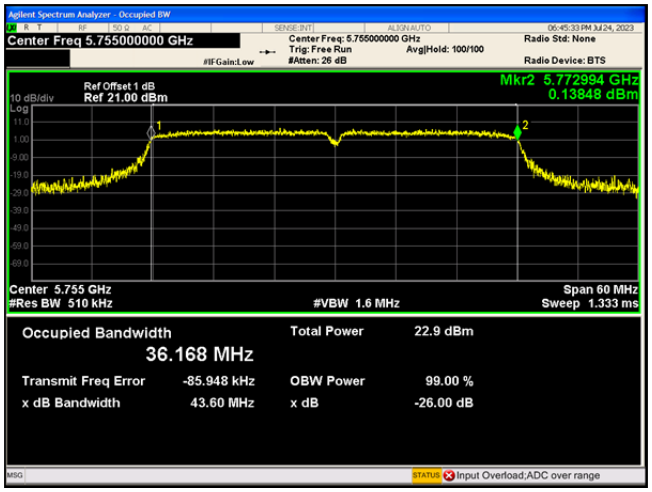

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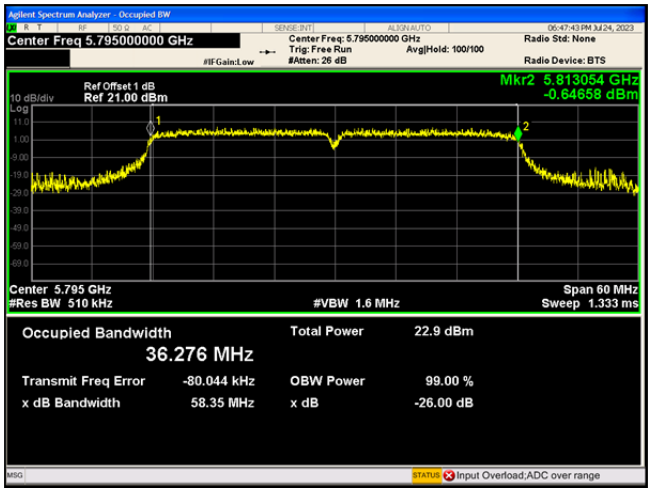

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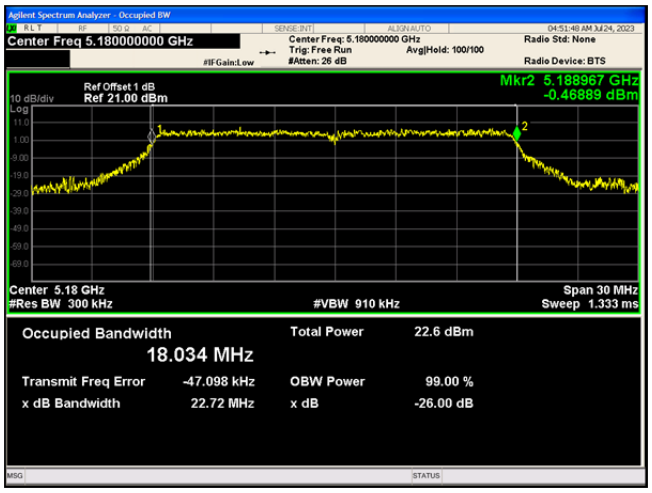

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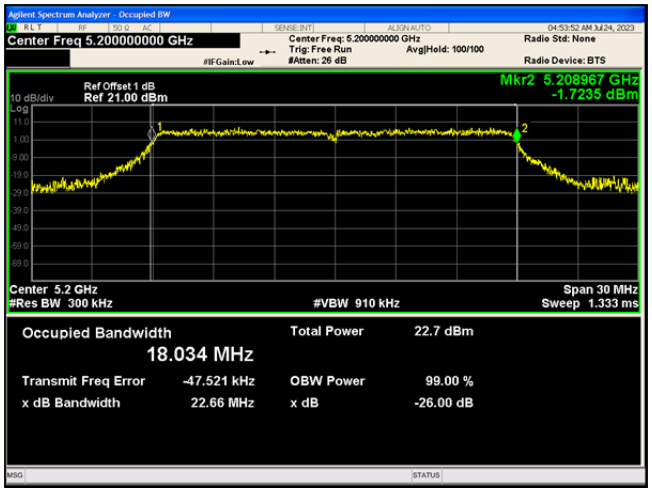

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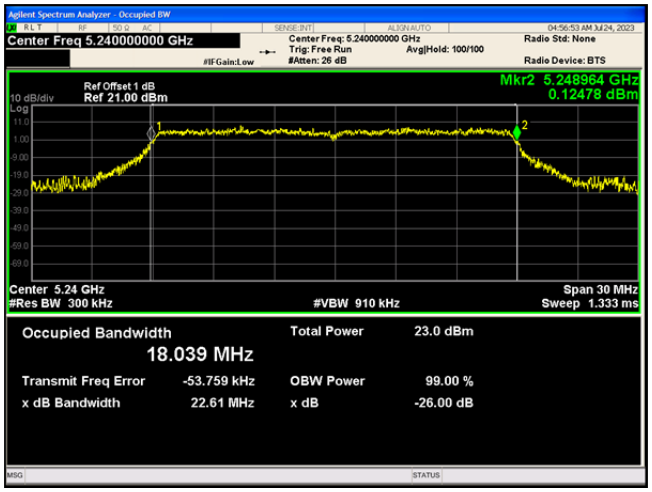

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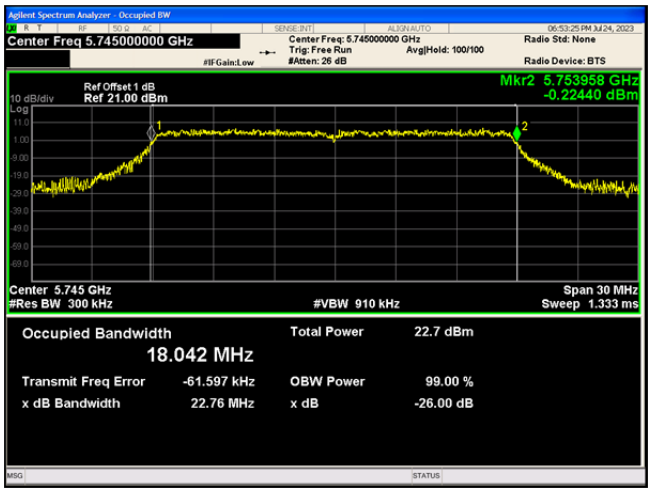

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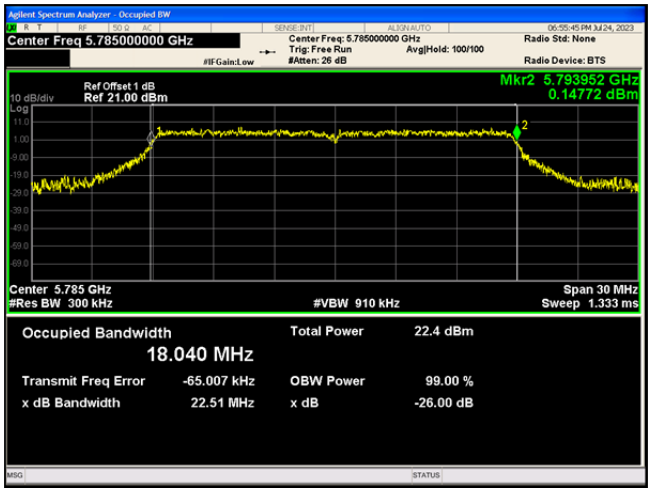
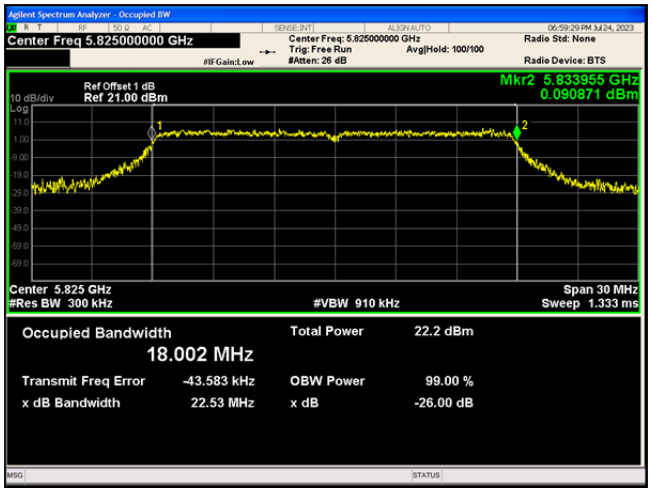
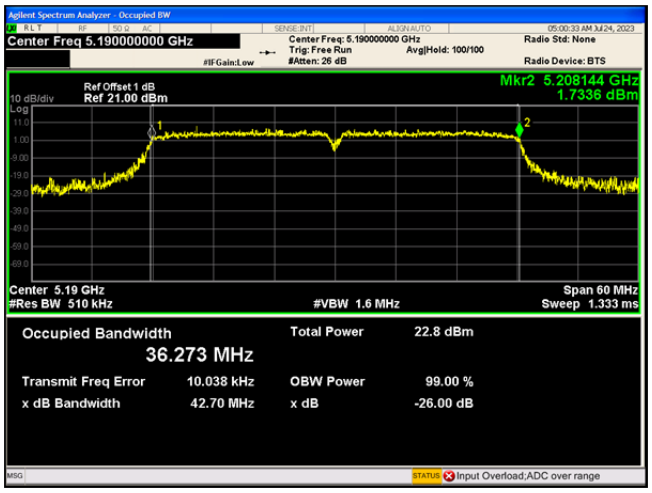


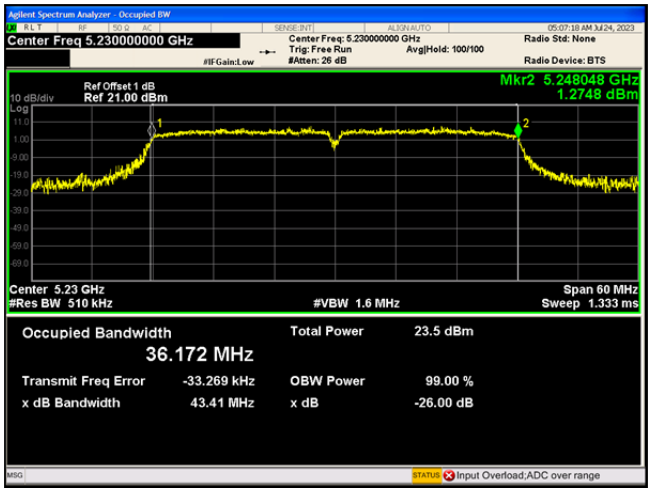
802.11ac(VHT20)_5825



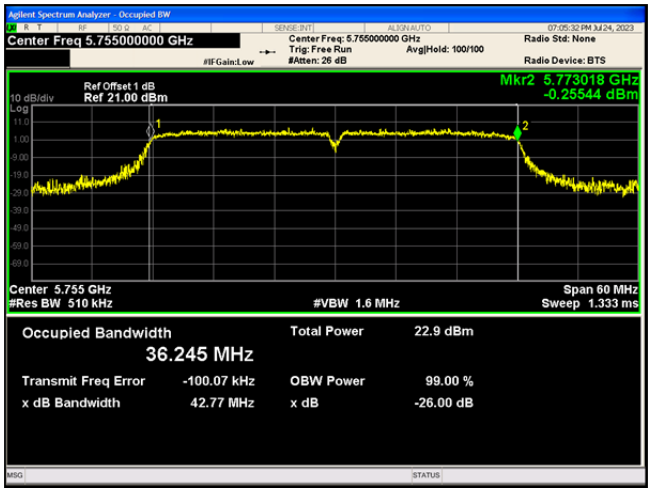
802.11ac(VHT40)_5190



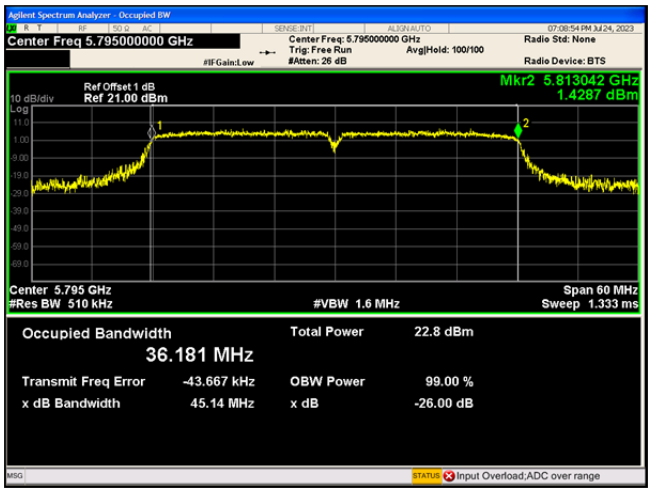
802.11ac(VHT40)_5230



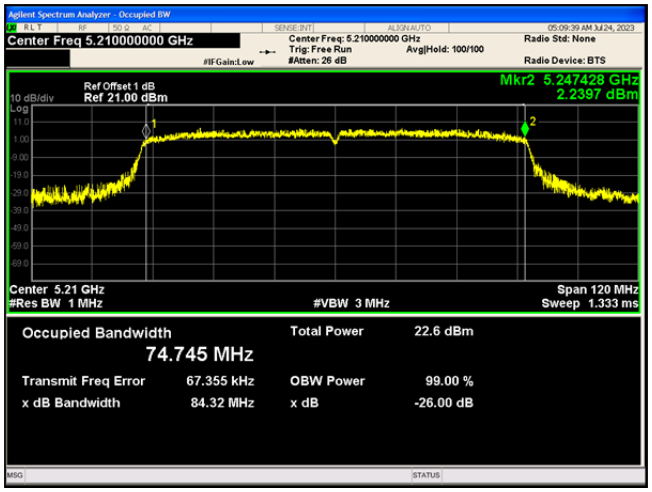
802.11ac(VHT40)_5755



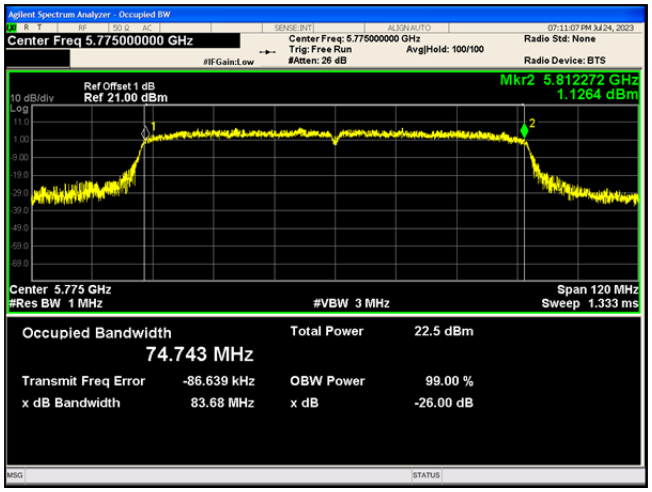
802.11ac(VHT40)_5795



802.11ac(VHT80)_5210



802.11ac(VHT80)_5775

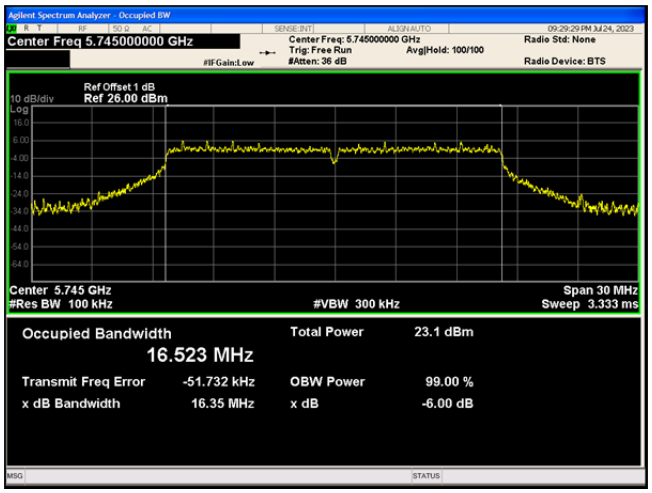
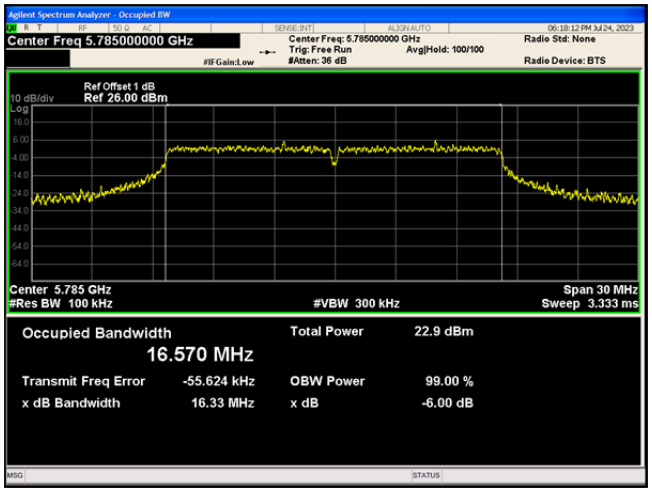
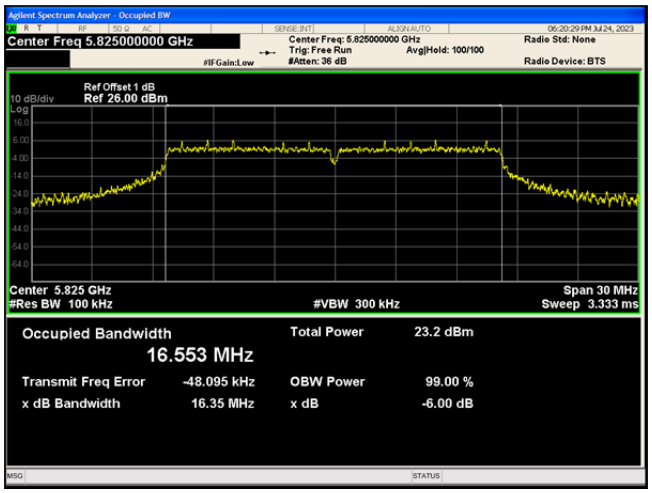

Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.775000000 GHz
Center Freq: 5.775000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#IFGain:Low
#Atten: 26 dB
07:11:07 PM Jul 24, 2023
Radio Std: None
Radio Device: BTS
Ref Offset 1 dB
10 dB/div
Ref 21.00 dBm
Log
Mkr2 5.812272 GHz
1.1264 dBm
Center 5.775 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 120 MHz
Sweep 1.333 ms
Occupied Bandwidth
74.743 MHz
Total Power 22.5 dBm
Transmit Freq Error -86.639 kHz
OBW Power 99.00 %
x dB Bandwidth 83.68 MHz
x dB -26.00 dB
MSG
STATUS

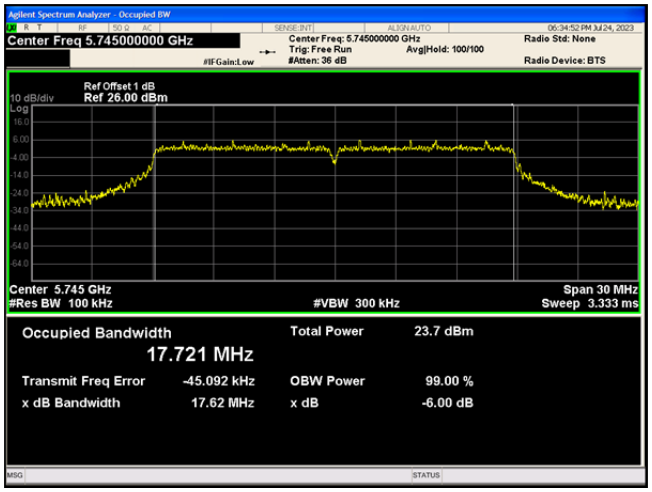
Appendix A3: Min emission bandwidth

Test Result

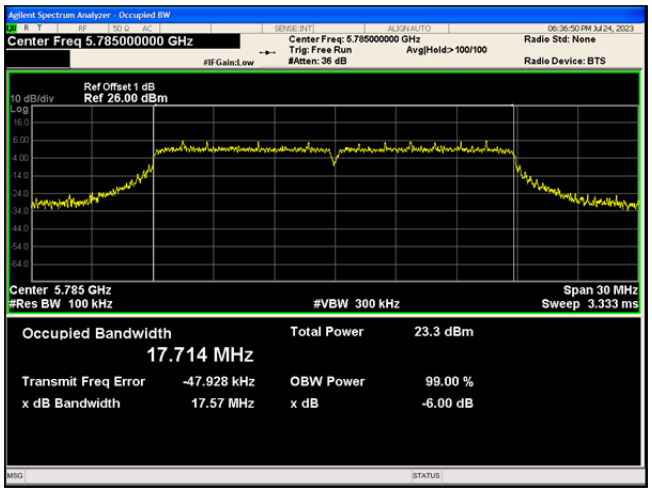
Test Mode	Channel	6db EBW [MHz]	Limit[MHz]	Verdict
802.11a	5745	16.35	>0.5	PASS
	5785	16.33	>0.5	PASS
	5825	16.35	>0.5	PASS
802.11n(HT20)	5745	17.62	>0.5	PASS
	5785	17.57	>0.5	PASS
	5825	17.55	>0.5	PASS
802.11n(HT40)	5755	35.15	>0.5	PASS
	5795	35.21	>0.5	PASS
802.11ac(VHT20)	5745	17.59	>0.5	PASS
	5785	17.58	>0.5	PASS
	5825	17.58	>0.5	PASS
802.11ac(VHT40)	5755	35.12	>0.5	PASS
	5795	35.14	>0.5	PASS
802.11ac(VHT80)	5775	74.98	>0.5	PASS

Test Graphs

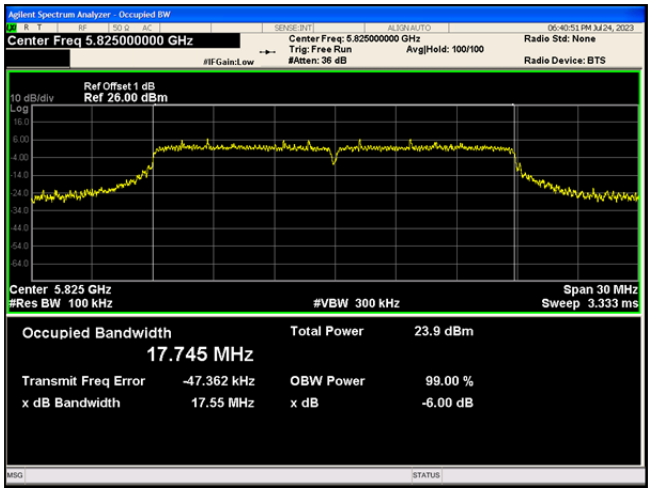
802.11a_5745

802.11a_5785

802.11a_5825

802.11n(HT20)_5745



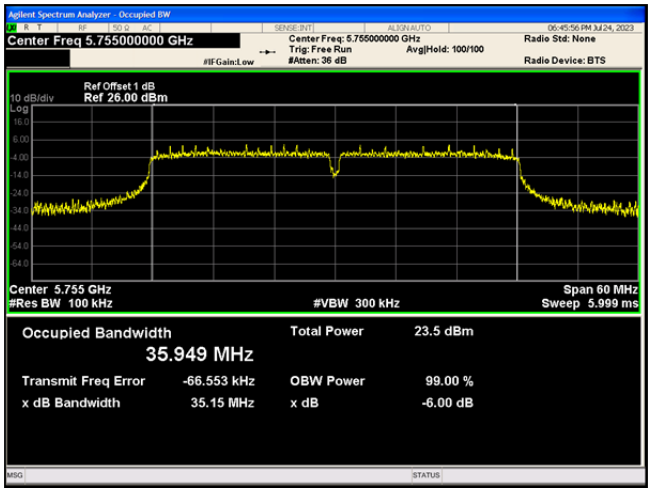
802.11n(HT20)_5785



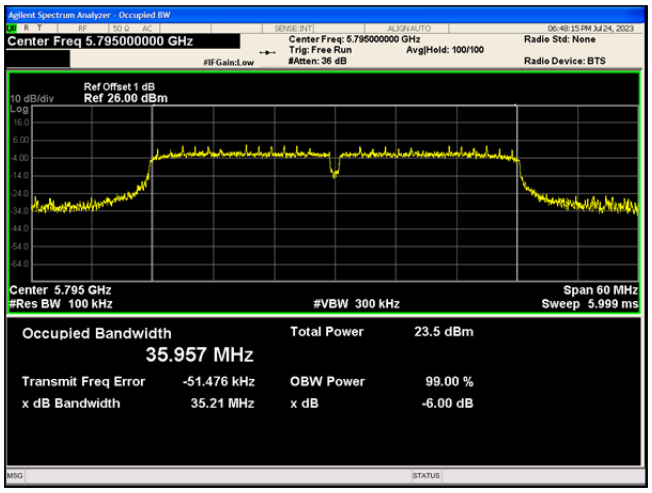
802.11n(HT20)_5825



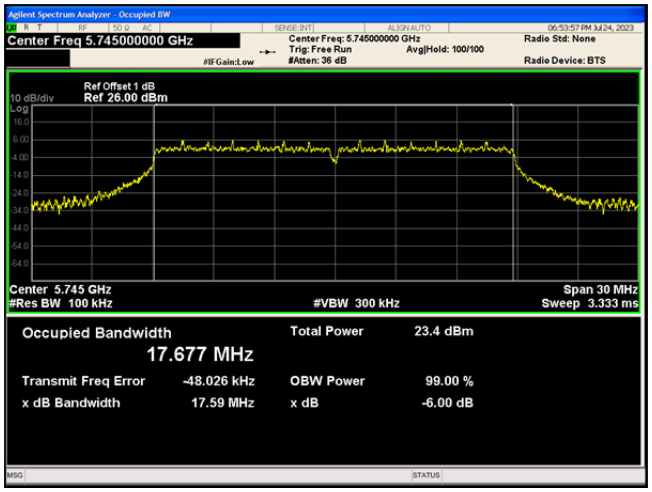
802.11n(HT40)_5755



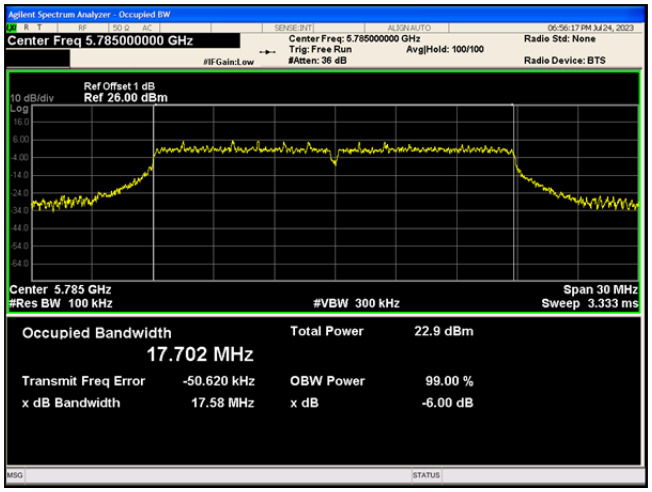
802.11n(HT40)_5795



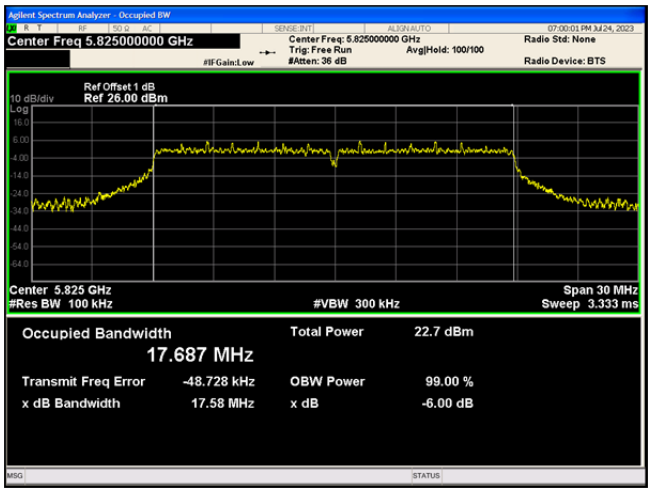
802.11ac(VHT20)_5745



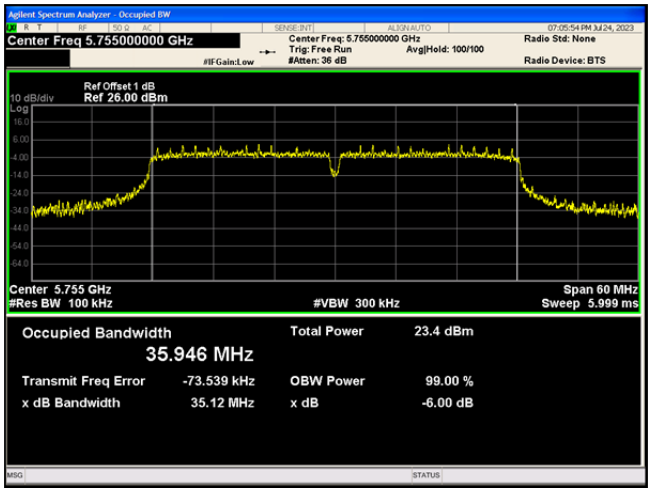
802.11ac(VHT20)_5785



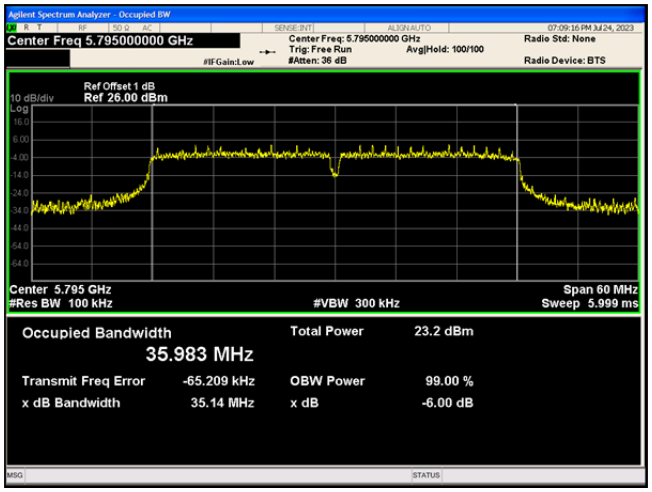
802.11ac(VHT20)_5825



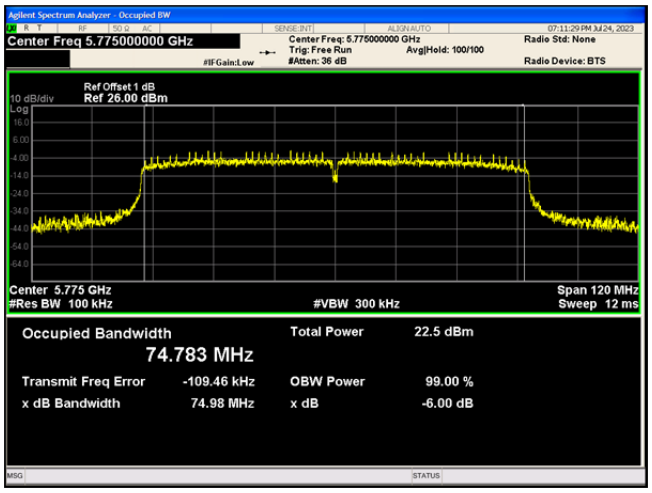
802.11ac(VHT40)_5755



802.11ac(VHT40)_5795



802.11ac(VHT80)_5775



Appendix B: Maximum conducted output power

Test Result

Test Mode	Channel	Result[dBm]	Limit[dBm]	Verdict
802.11a	5180	13.97	<=24	PASS
	5200	13.36	<=24	PASS
	5240	13.27	<=24	PASS
	5745	13.21	<=30	PASS
	5785	11.86	<=30	PASS
	5825	11.17	<=30	PASS
802.11n(HT20)	5180	13.57	<=24	PASS
	5200	13.37	<=24	PASS
	5240	13.58	<=24	PASS
	5745	13.06	<=30	PASS
	5785	11.91	<=30	PASS
	5825	11.49	<=30	PASS
802.11n(HT40)	5190	10.93	<=24	PASS
	5230	9.45	<=24	PASS
	5755	9.18	<=30	PASS
	5795	8.07	<=30	PASS
802.11ac(VHT20)	5180	13.82	<=24	PASS
	5200	13.52	<=24	PASS
	5240	13.37	<=24	PASS
	5745	13.28	<=30	PASS
	5785	12.95	<=30	PASS
	5825	12.58	<=30	PASS
802.11ac(VHT40)	5190	11.91	<=24	PASS
	5230	11.59	<=24	PASS
	5755	10.54	<=30	PASS
	5795	9.12	<=30	PASS
802.11ac(VHT80)	5210	10.04	<=24	PASS
	5775	10.04	<=30	PASS

Note: Test results increased RF cable loss by 1dB.

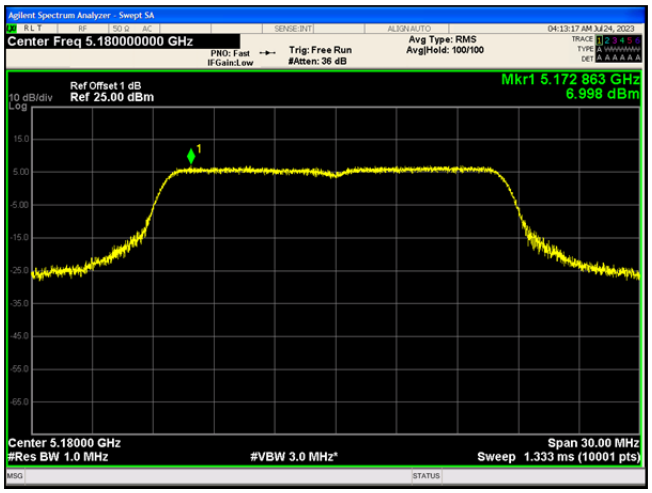
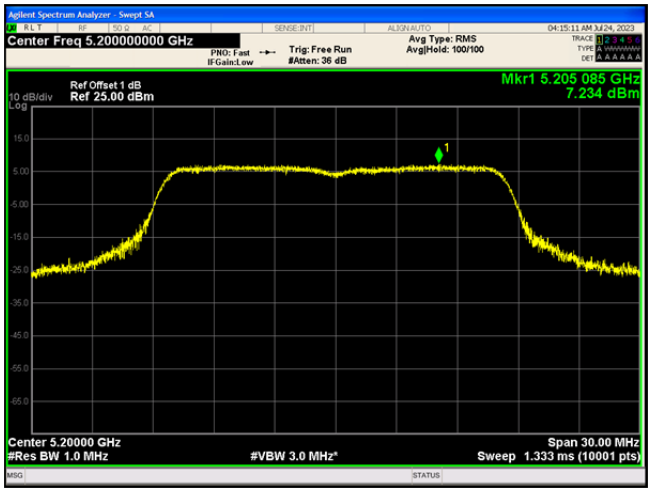
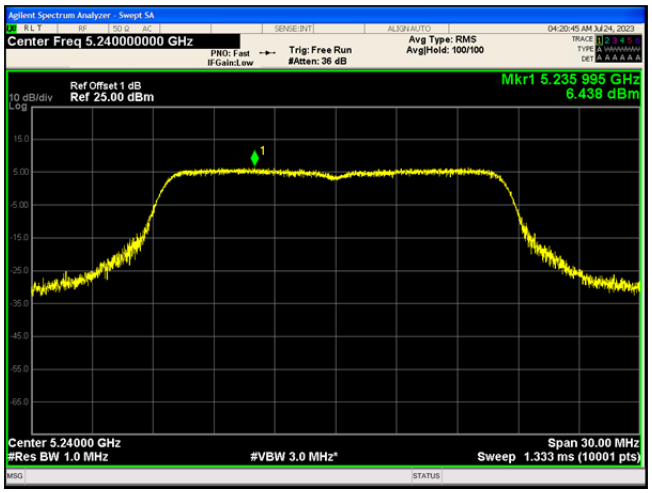
Appendix C: Maximum power spectral density

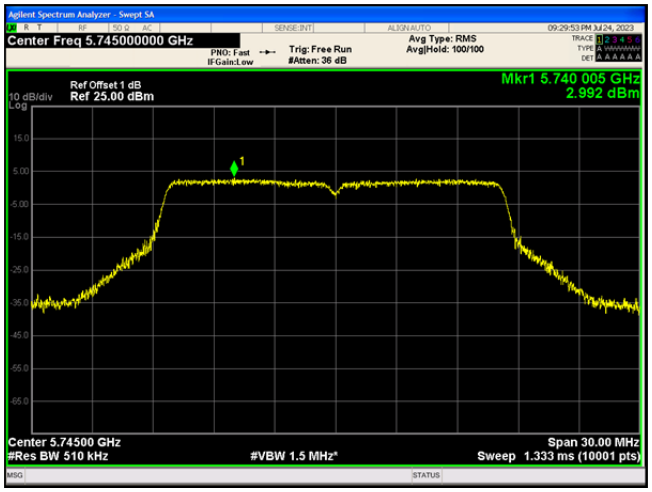
Test Result

Test Mode	Channel	Result [dBm/MHz]	Duty Cycle Factor	Fianl Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
802.11a	5180	6.998	0.58	7.578	<=11	PASS
	5200	7.234	0.58	7.814	<=11	PASS
	5240	6.438	0.58	7.018	<=11	PASS
	5745	2.992	0.75	3.742	<=30	PASS
	5785	3.242	0.58	3.822	<=30	PASS
	5825	3.387	0.58	3.967	<=30	PASS
802.11n(HT20)	5180	6.120	0.68	6.800	<=11	PASS
	5200	6.117	0.68	6.797	<=11	PASS
	5240	6.289	0.68	6.969	<=11	PASS
	5745	2.705	0.68	3.385	<=30	PASS
	5785	2.371	0.68	3.051	<=30	PASS
	5825	3.146	0.68	3.826	<=30	PASS
802.11n(HT40)	5190	2.623	1.18	3.803	<=11	PASS
	5230	3.359	1.18	4.539	<=11	PASS
	5755	-0.274	1.18	0.906	<=30	PASS
	5795	-0.457	1.29	0.833	<=30	PASS
802.11ac(VHT20)	5180	5.535	0.80	6.335	<=11	PASS
	5200	5.466	0.80	6.266	<=11	PASS
	5240	6.085	0.80	6.885	<=11	PASS
	5745	2.778	0.80	3.578	<=30	PASS
	5785	2.578	0.80	3.378	<=30	PASS
	5825	2.113	0.79	2.903	<=30	PASS
802.11ac(VHT40)	5190	2.139	1.46	3.599	<=11	PASS
	5230	2.928	1.46	4.388	<=11	PASS
	5755	-0.500	1.46	0.960	<=30	PASS
	5795	-0.655	1.46	0.805	<=30	PASS
802.11ac(VHT80)	5210	-2.402	2.54	0.138	<=11	PASS
	5775	-5.362	2.53	-2.832	<=30	PASS

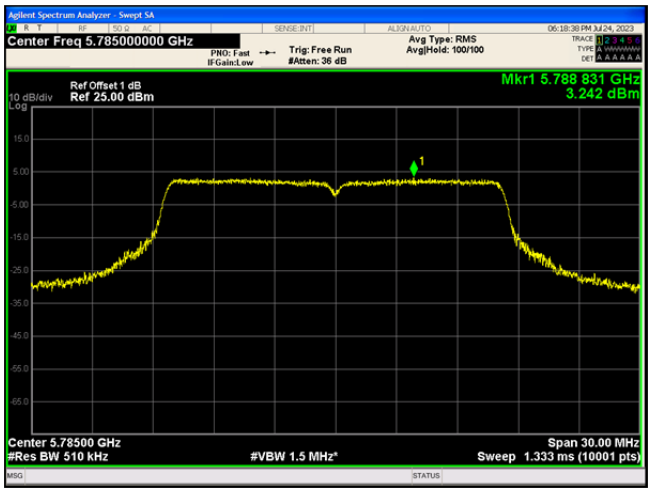
Note：1. Fianl Result = Result + Duty Cycle Factor.

Test Graphs

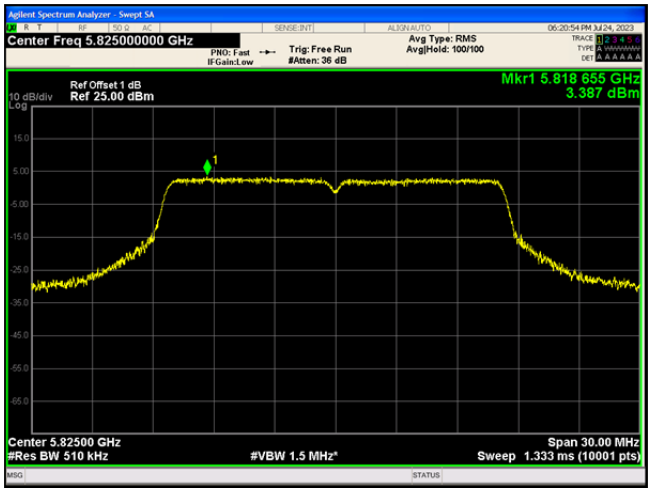
802.11a_5180

802.11a_5200

802.11a_5240

802.11a_5745



802.11a_5785



802.11a_5825



802.11n(HT20)_5180