



Appendix A SHEM190601387701

1. Emission Bandwidth Measurement

Test Mode	Test Channel	EBW[MHz]		Limit[MHz]	Verdict
		Ant1	Ant2		
11A	5180	19.48	19.43	---	PASS
11A	5220	19.55	19.47	---	PASS
11A	5240	19.64	19.38	---	PASS
11A	5745	19.96	19.45	---	PASS
11A	5785	19.52	19.99	---	PASS
11A	5825	19.93	19.54	---	PASS
11N20	5180	19.87	19.92	---	PASS
11N20	5220	19.88	19.98	---	PASS
11N20	5240	19.95	19.83	---	PASS
11N20	5745	19.87	19.64	---	PASS
11N20	5785	19.99	19.32	---	PASS
11N20	5825	19.99	19.95	---	PASS
11N40	5190	39.75	39.63	---	PASS
11N40	5230	39.82	39.89	---	PASS
11N40	5755	39.90	39.93	---	PASS
11N40	5795	39.83	39.66	---	PASS

(26dB)Emission Bandwidth Measurement_11A_5180_Ant1



(26dB)Emission Bandwidth Measurement_11A_5220_Ant1



(26dB)Emission Bandwidth Measurement_11A_5240_Ant1



(26dB)Emission Bandwidth Measurement_11A_5745_Ant1



(26dB)Emission Bandwidth Measurement_11A_5785_Ant1



(26dB)Emission Bandwidth Measurement_11A_5825_Ant1



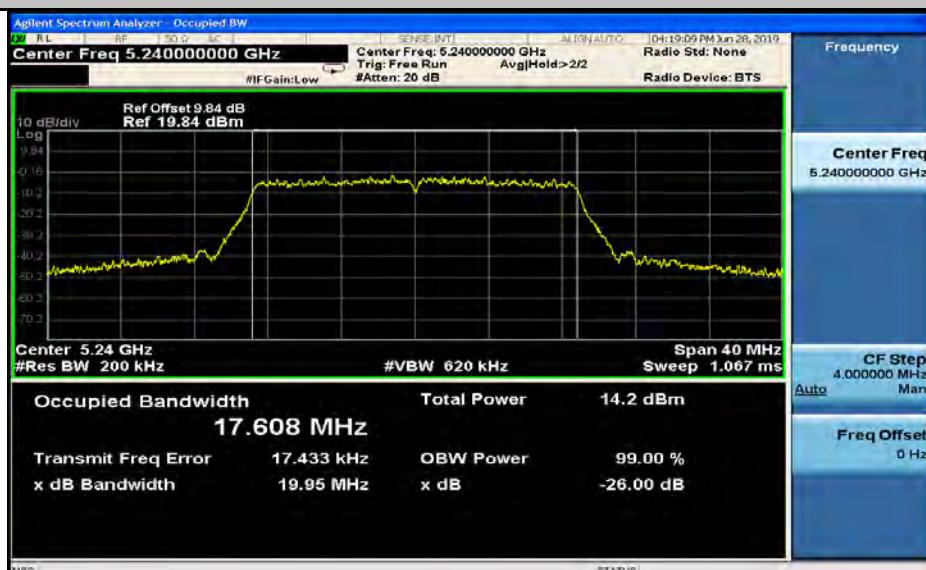
(26dB)Emission Bandwidth Measurement_11N20_5180_Ant1



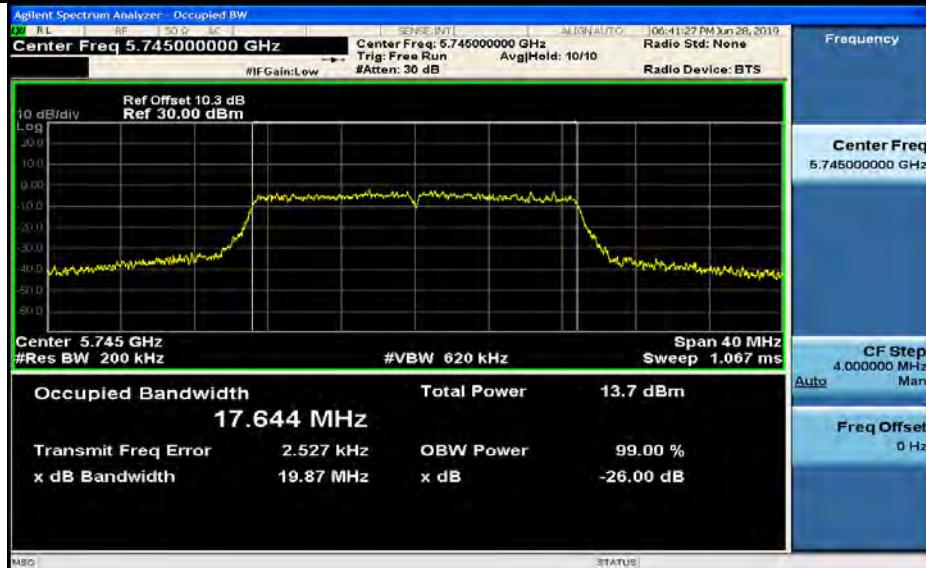
(26dB)Emission Bandwidth Measurement_11N20_5220_Ant1



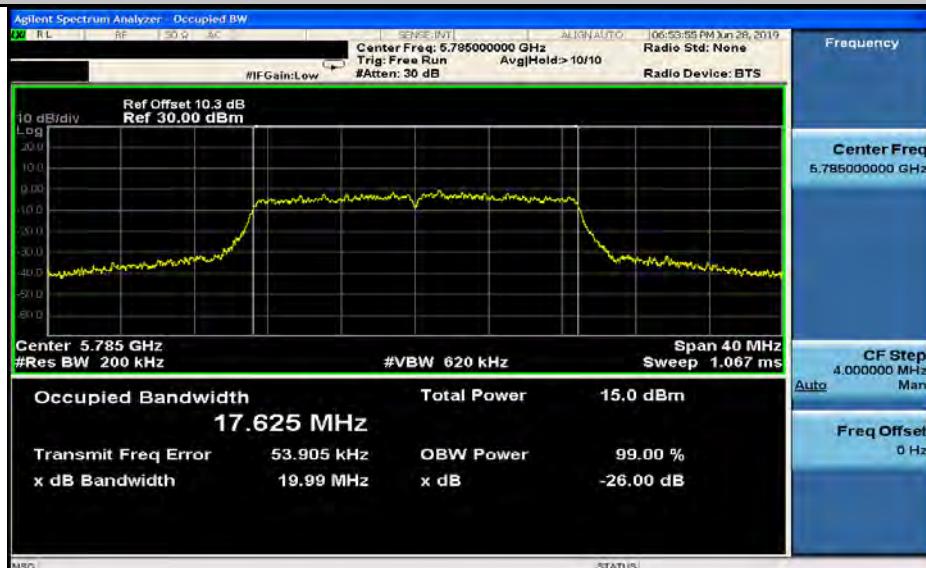
(26dB)Emission Bandwidth Measurement_11N20_5240_Ant1



(26dB)Emission Bandwidth Measurement_11N20_5745_Ant1



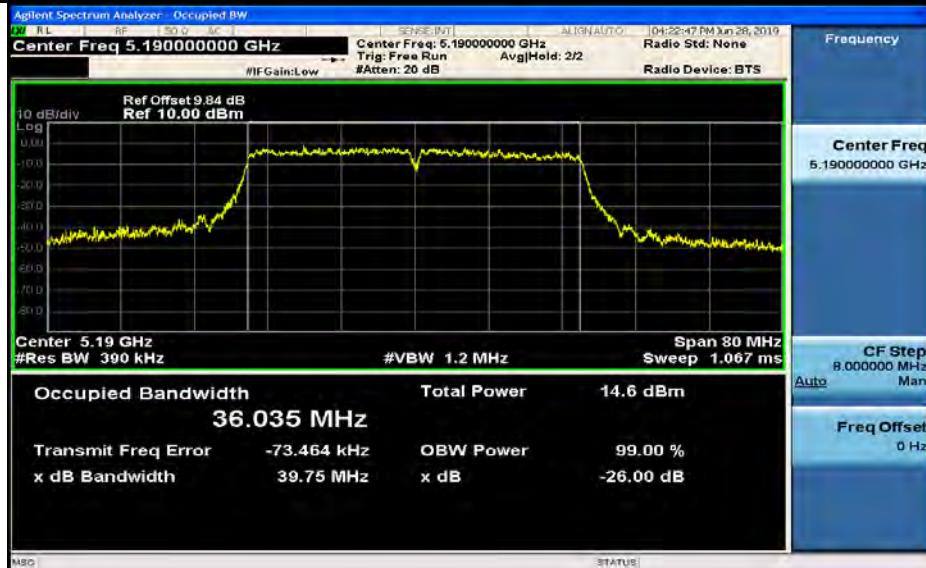
(26dB)Emission Bandwidth Measurement_11N20_5785_Ant1



(26dB)Emission Bandwidth Measurement_11N20_5825_Ant1



(26dB)Emission Bandwidth Measurement_11N40_5190_Ant1

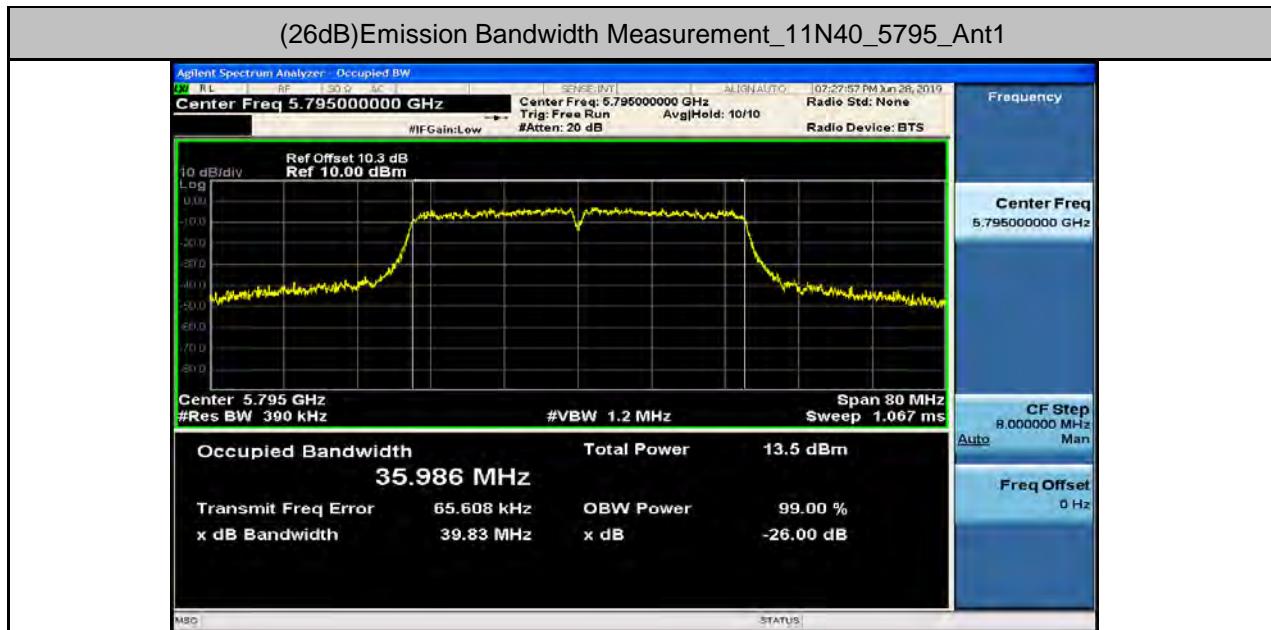


(26dB)Emission Bandwidth Measurement_11N40_5230_Ant1



(26dB)Emission Bandwidth Measurement_11N40_5755_Ant1





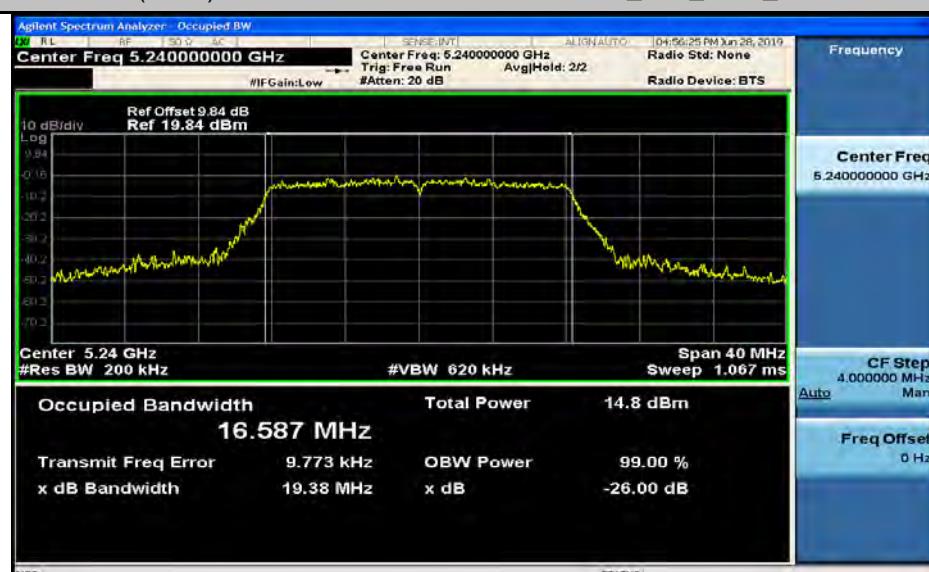
(26dB)Emission Bandwidth Measurement_11A_5180_Ant2

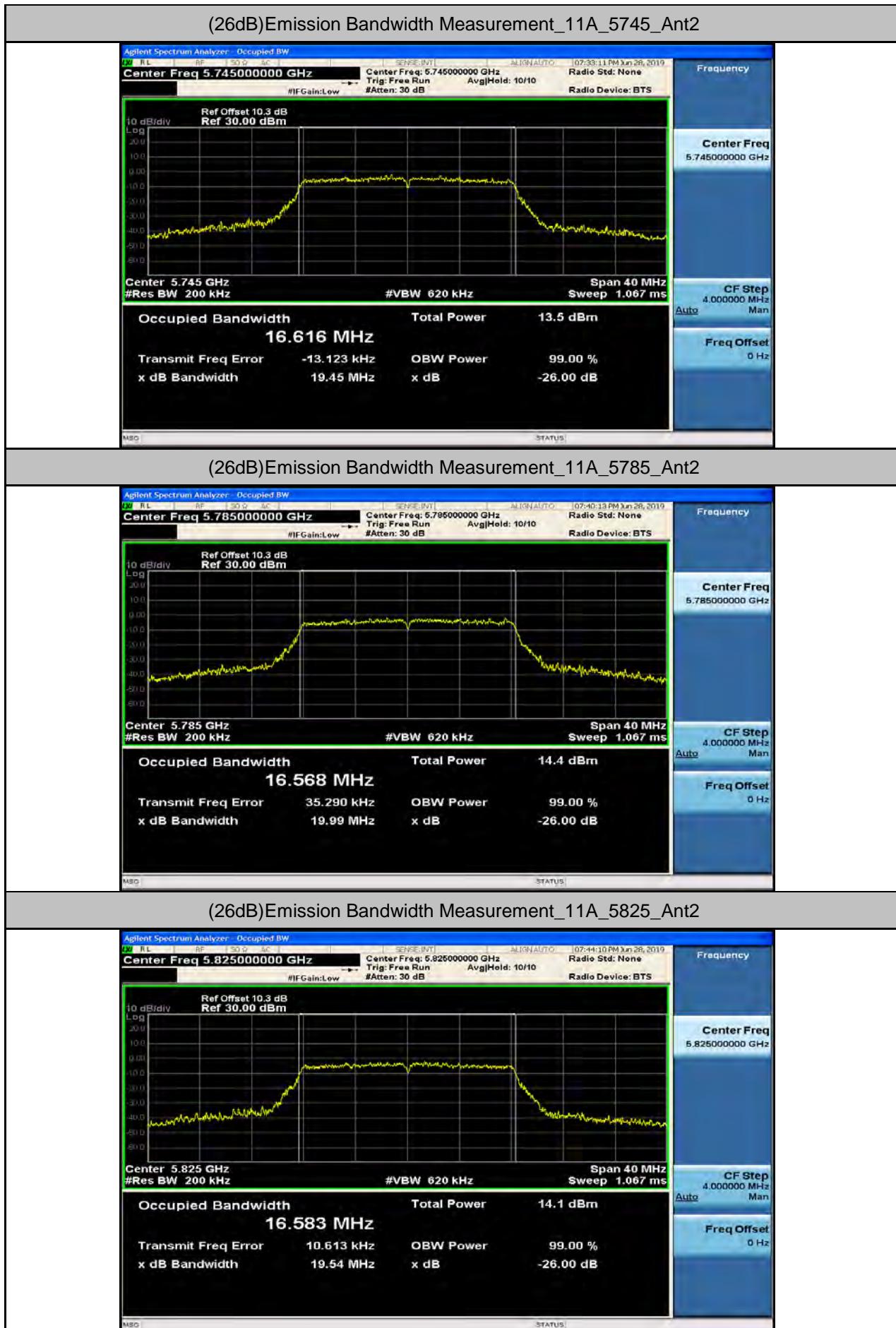


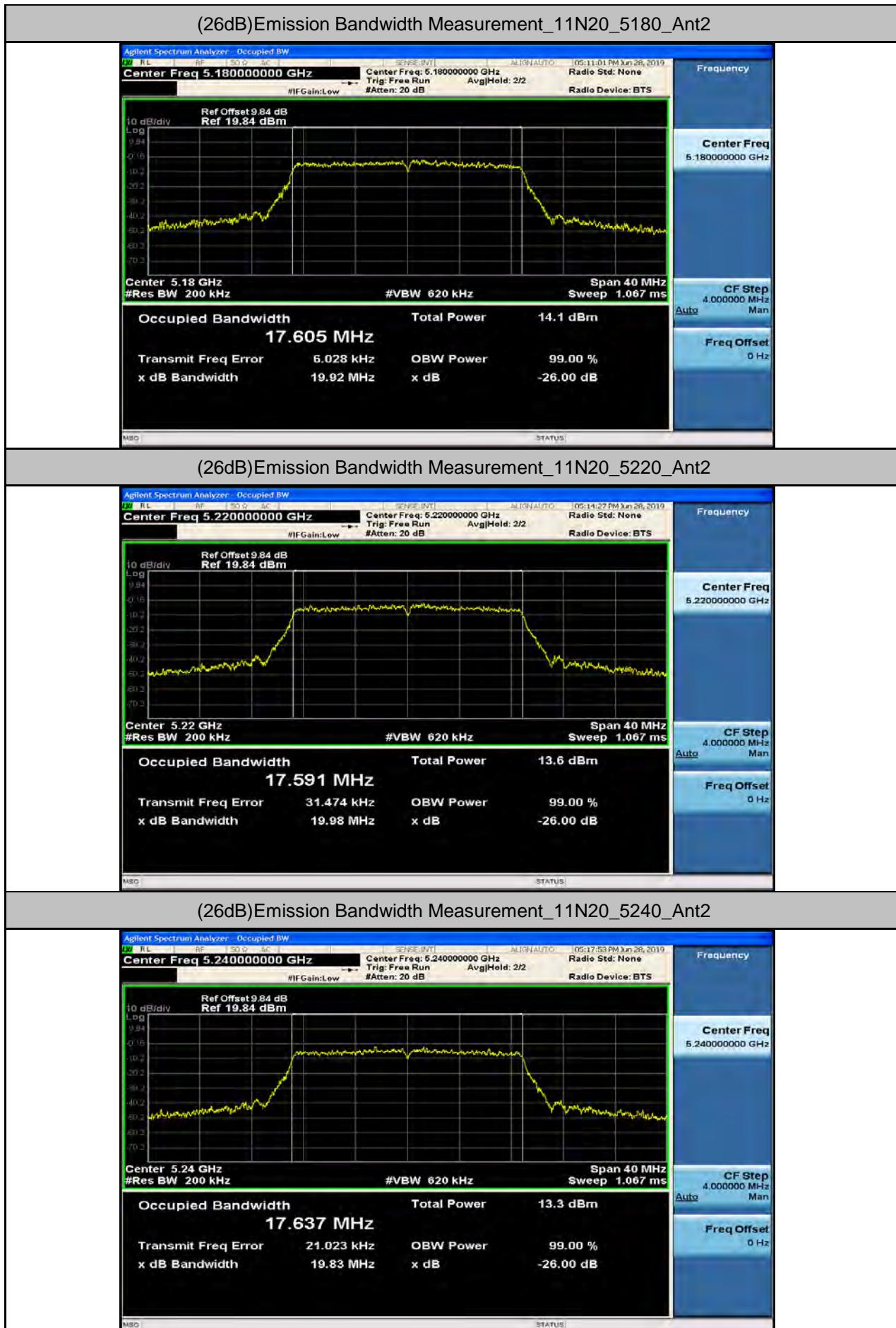
(26dB)Emission Bandwidth Measurement_11A_5220_Ant2

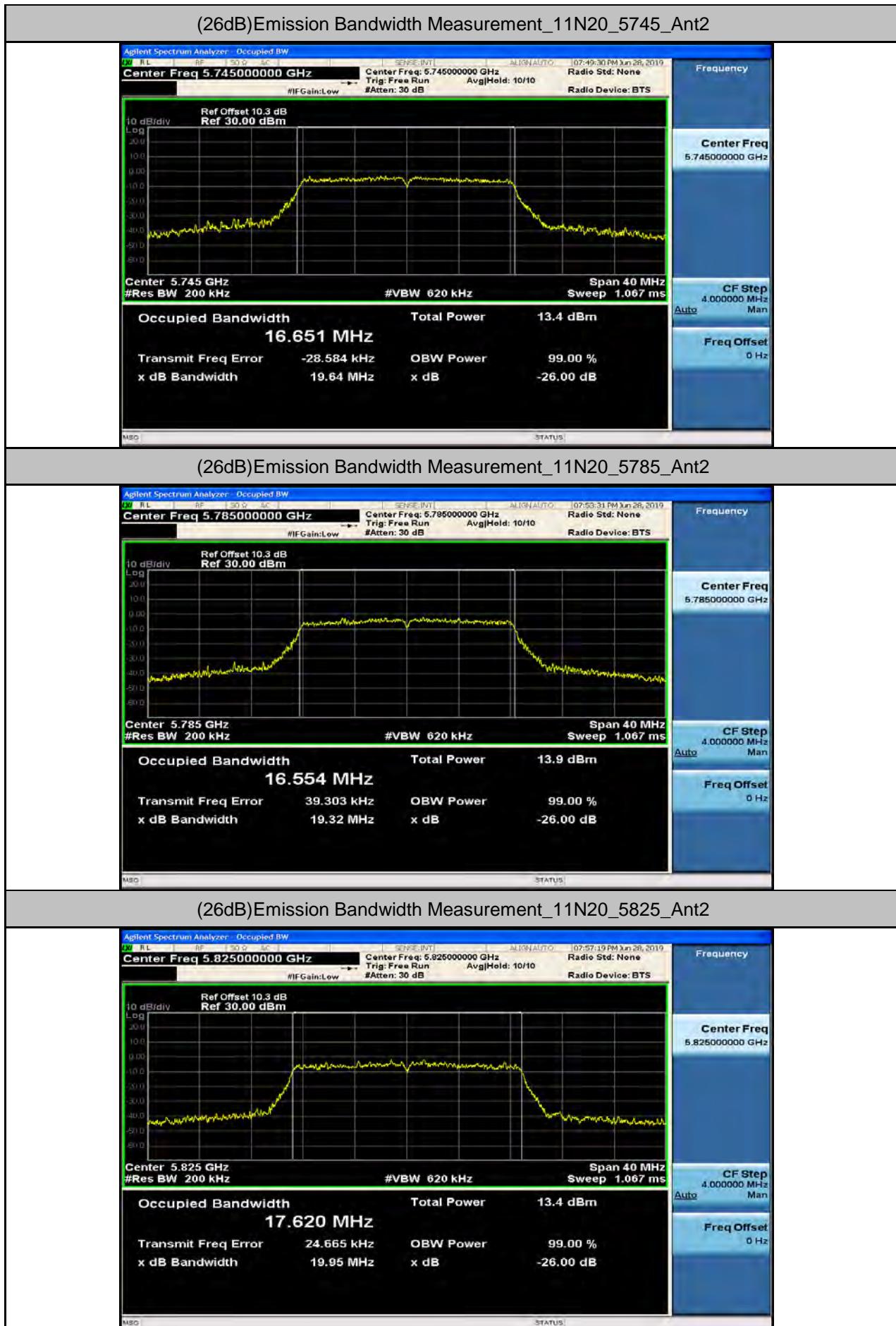


(26dB)Emission Bandwidth Measurement_11A_5240_Ant2

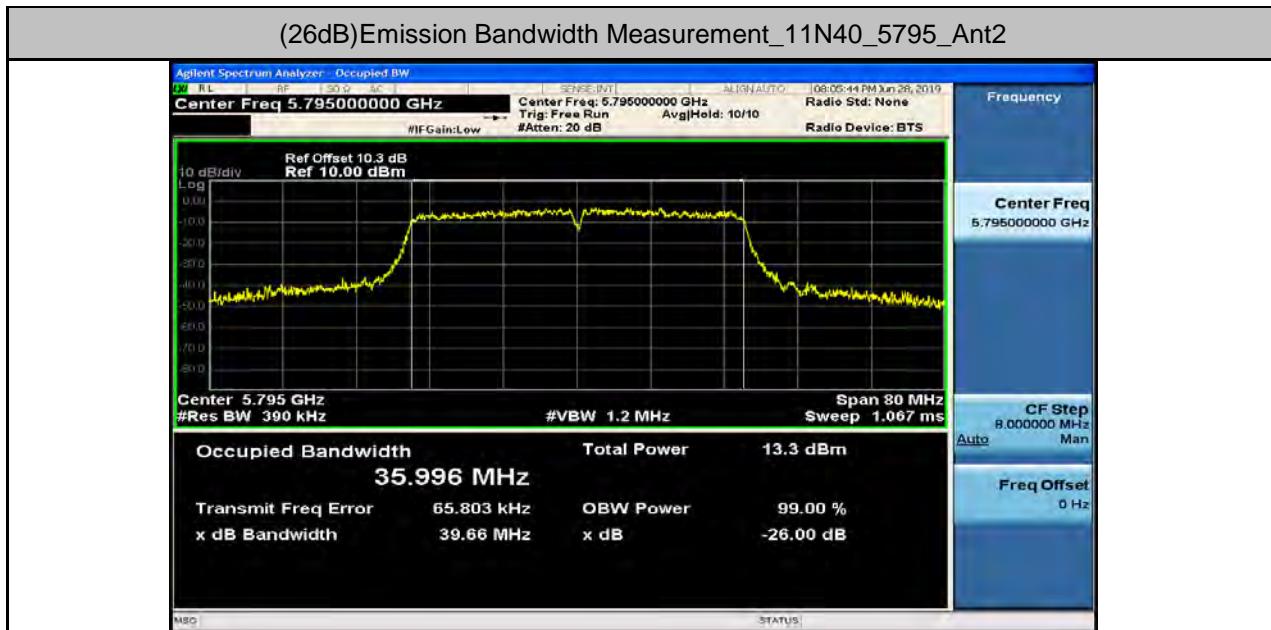








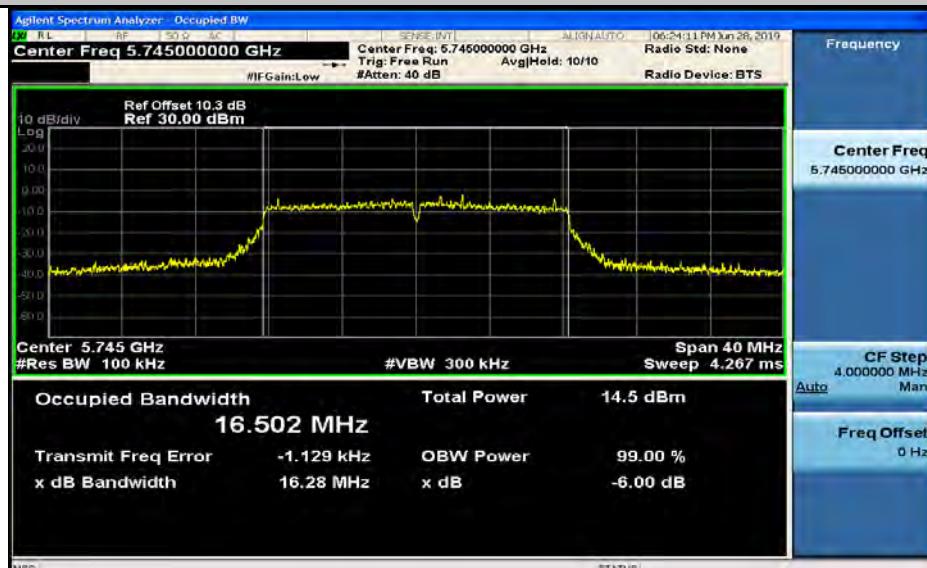




**2.Minimum Emission Bandwidth Measurement**

Test Mode	Test Channel	EBW[MHz]		Limit[MHz]	Verdict
		Ant1	Ant2		
11A	5745	16.28	16.30	---	PASS
11A	5785	16.32	13.30	---	PASS
11A	5825	16.28	15.77	---	PASS
11N20	5745	17.25	16.32	---	PASS
11N20	5785	17.29	16.37	---	PASS
11N20	5825	17.00	17.02	---	PASS
11N40	5755	35.41	35.05	---	PASS
11N40	5795	34.47	33.90	---	PASS

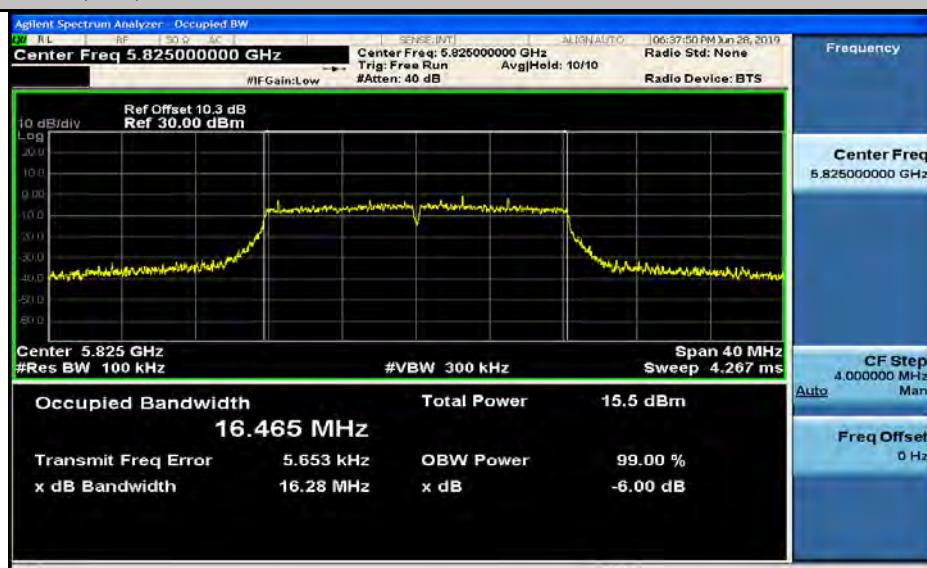
(6dB)Minimum Emission Bandwidth Measurement_11A_5745_Ant1

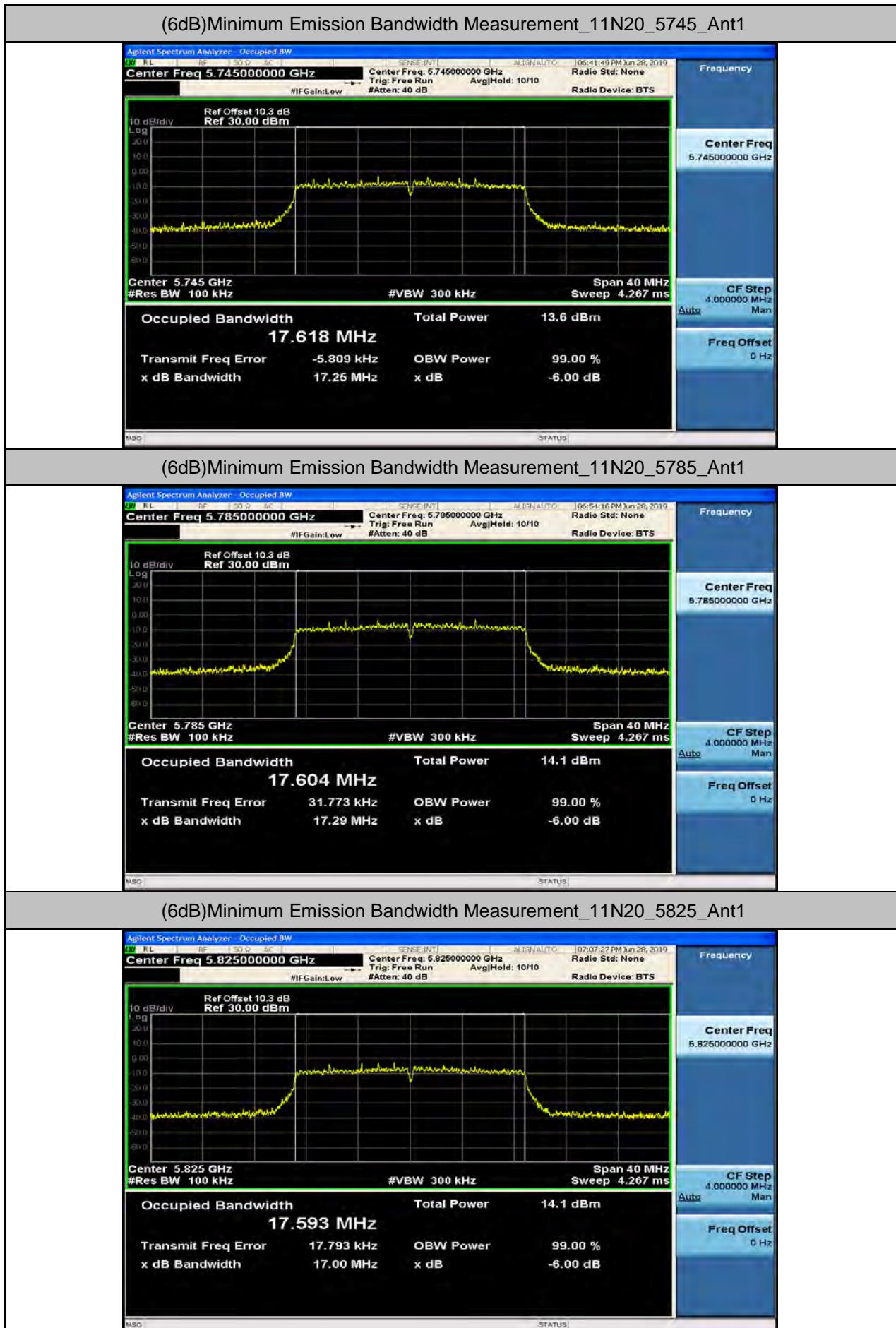


(6dB)Minimum Emission Bandwidth Measurement_11A_5785_Ant1



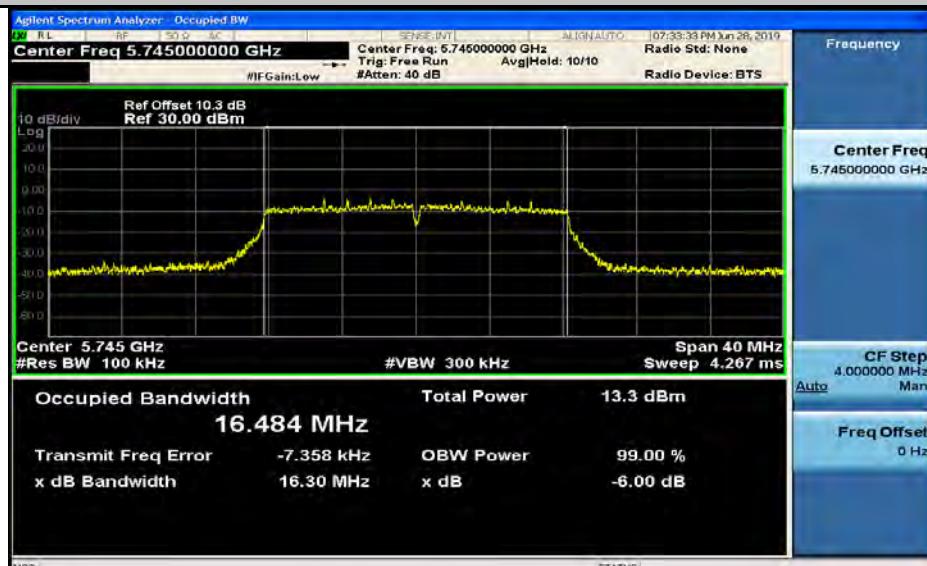
(6dB)Minimum Emission Bandwidth Measurement_11A_5825_Ant1







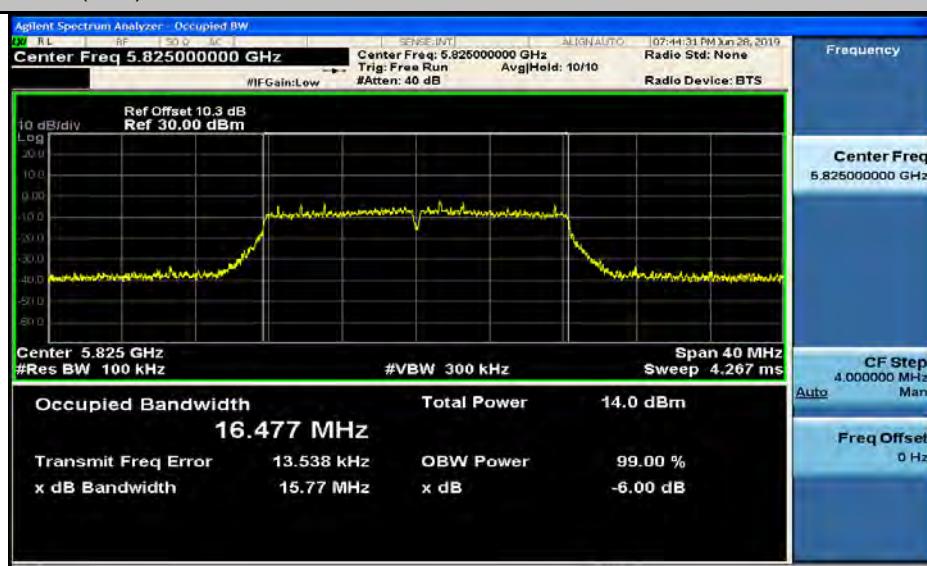
(6dB)Minimum Emission Bandwidth Measurement_11A_5745_Ant2



(6dB)Minimum Emission Bandwidth Measurement_11A_5785_Ant2



(6dB)Minimum Emission Bandwidth Measurement_11A_5825_Ant2



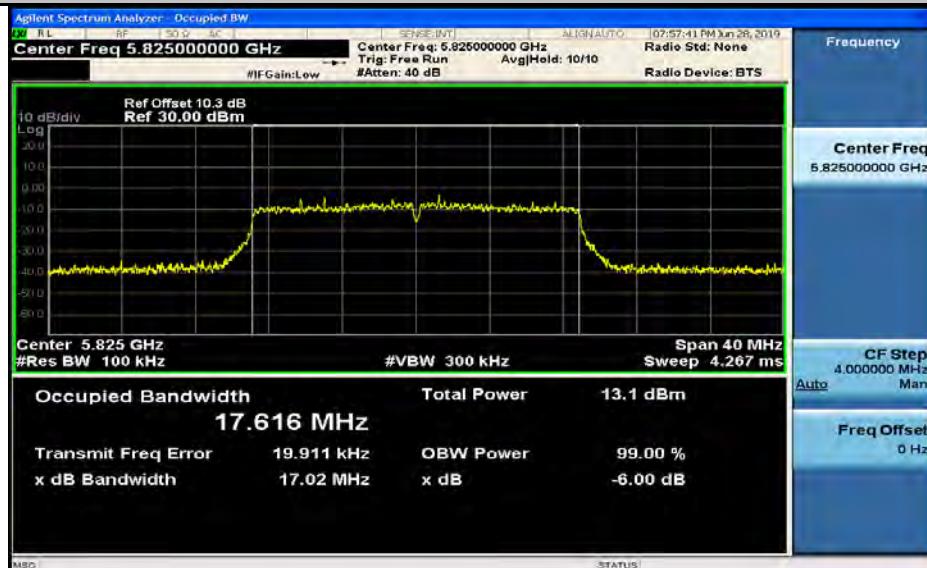
(6dB)Minimum Emission Bandwidth Measurement_11N20_5745_Ant2

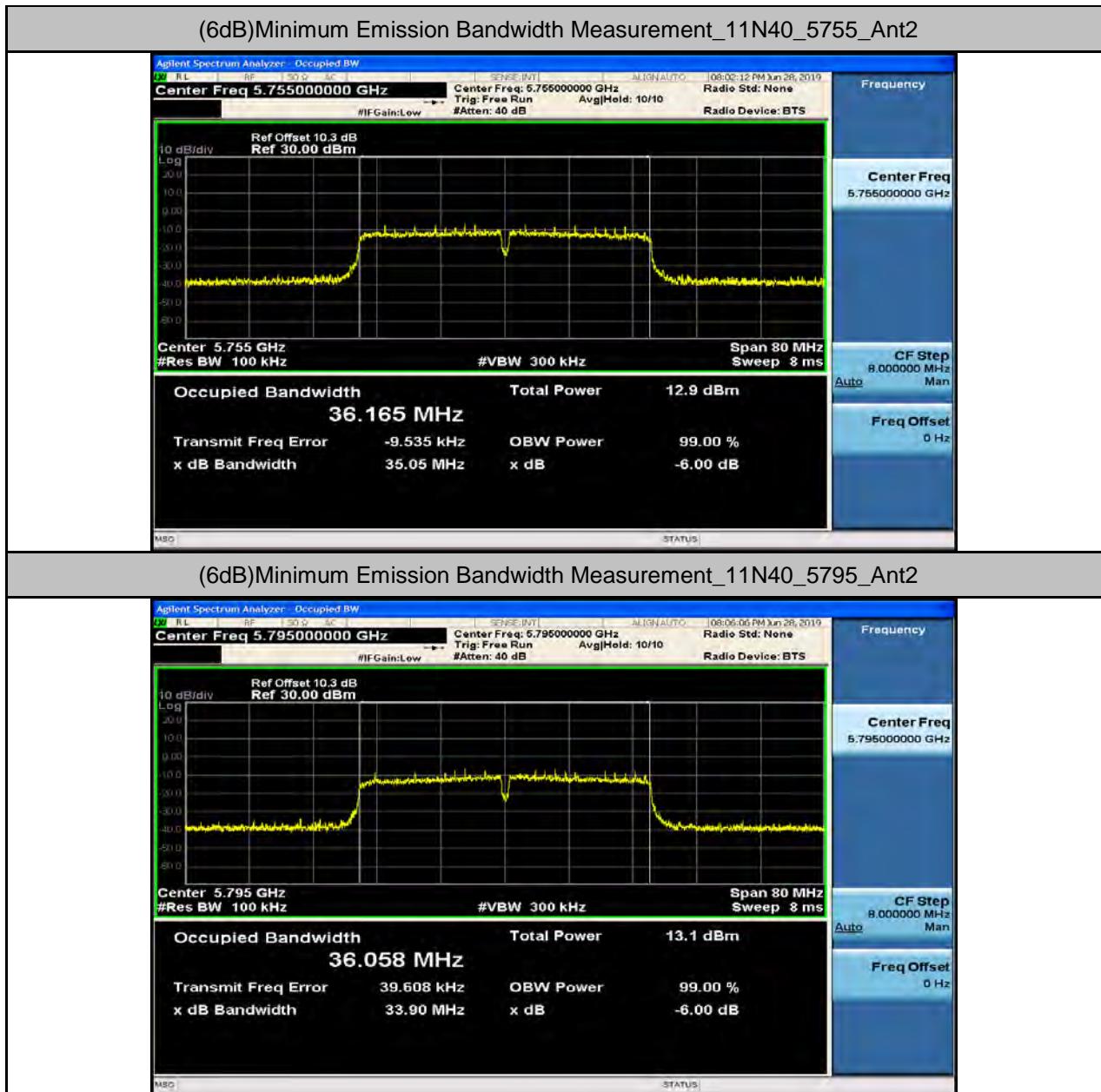


(6dB)Minimum Emission Bandwidth Measurement_11N20_5785_Ant2



(6dB)Minimum Emission Bandwidth Measurement_11N20_5825_Ant2

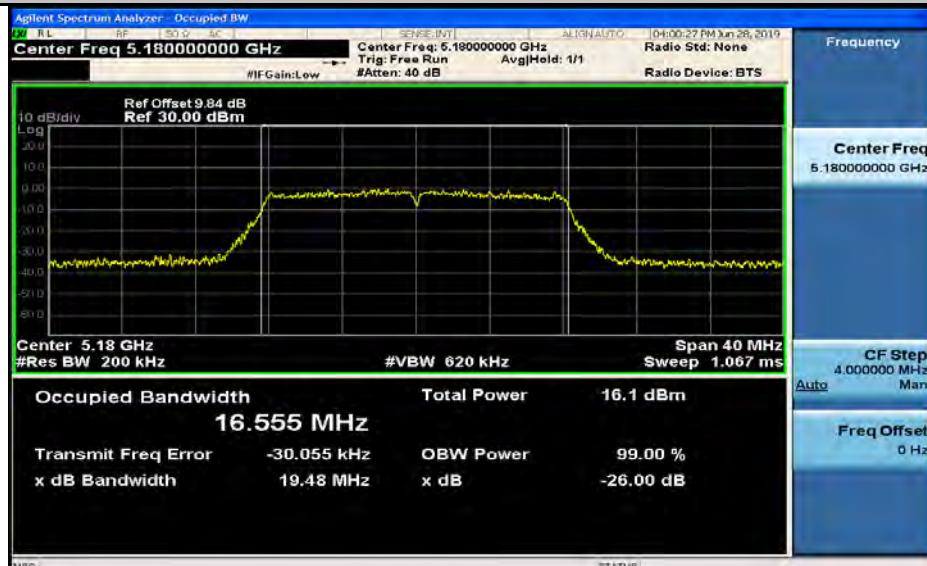




**3.Occupied Bandwidth Measurement**

Test Mode	Test Channel	OBW[MHz]		Limit[MHz]	Verdict
		Ant1	Ant2		
11A	5180	16.56	16.58	---	PASS
11A	5220	16.61	16.57	---	PASS
11A	5240	16.65	16.64	---	PASS
11A	5745	16.91	16.91	---	PASS
11A	5785	16.82	16.82	---	PASS
11A	5825	16.83	16.86	---	PASS
11N20	5180	17.66	17.64	---	PASS
11N20	5220	17.63	17.64	---	PASS
11N20	5240	17.66	17.65	---	PASS
11N20	5745	17.77	16.83	---	PASS
11N20	5785	17.76	16.84	---	PASS
11N20	5825	17.75	17.76	---	PASS
11N40	5190	36.10	36.16	---	PASS
11N40	5230	36.12	36.16	---	PASS
11N40	5755	36.43	36.46	---	PASS
11N40	5795	36.30	36.33	---	PASS

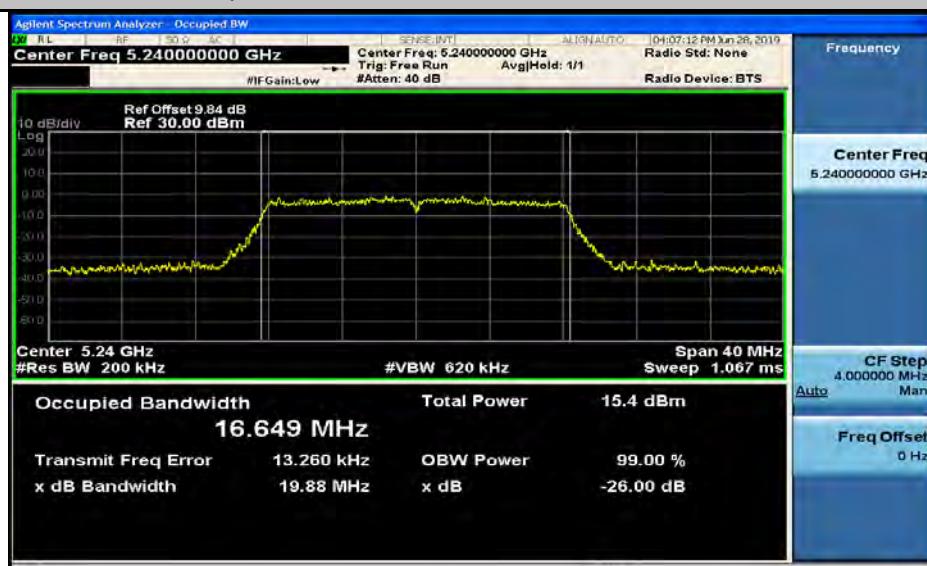
Occupied Bandwidth Measurement_11A_5180_Ant1

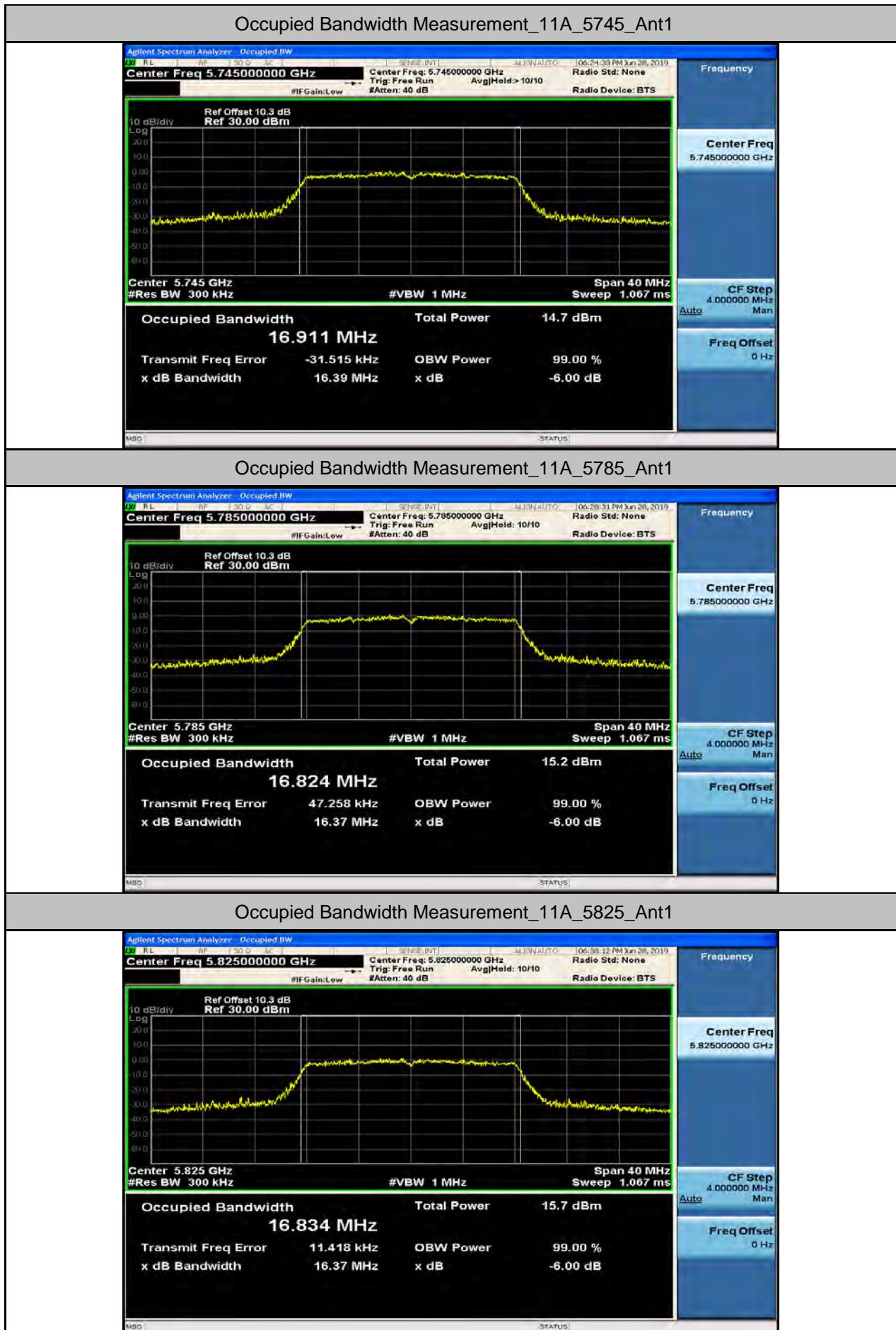


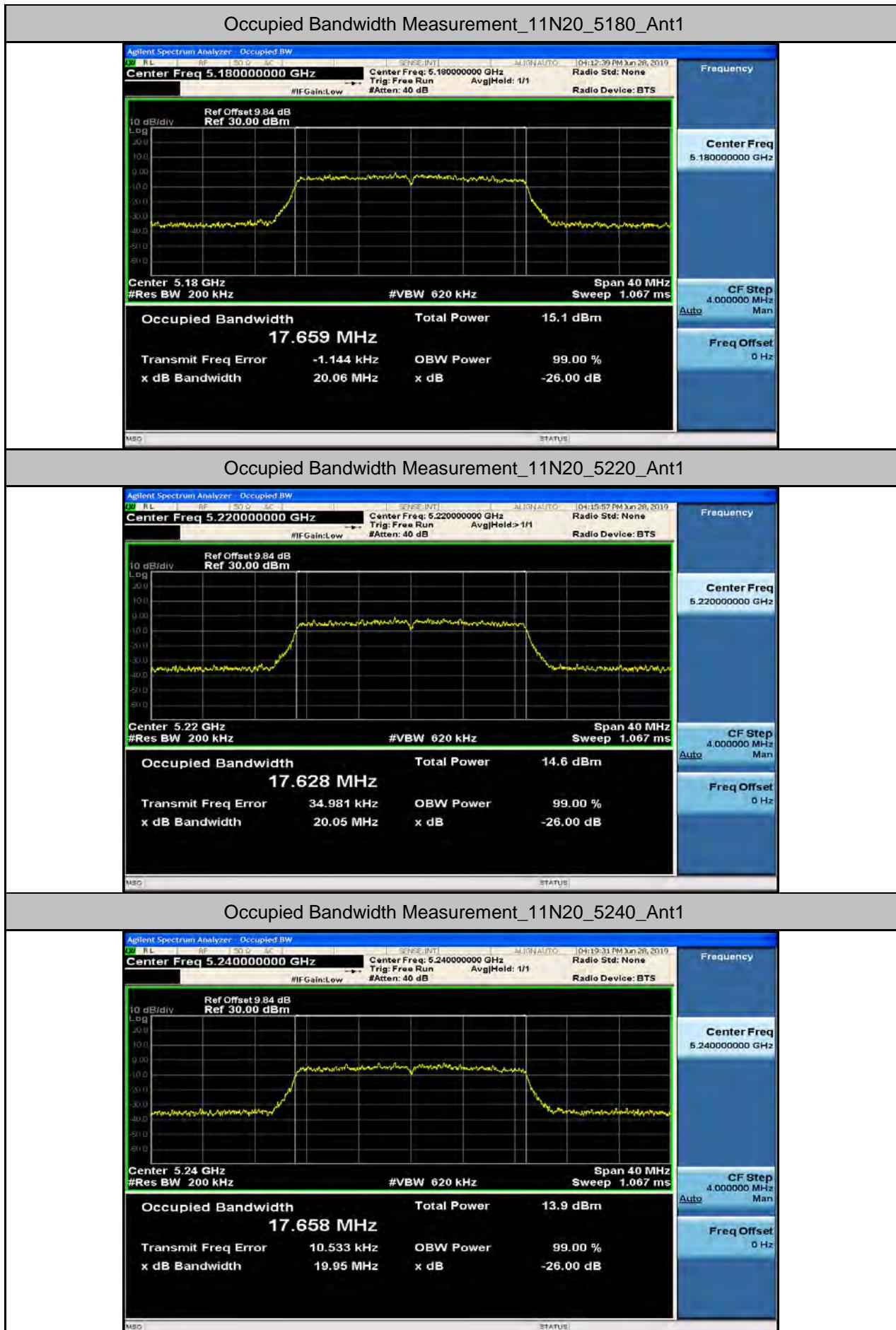
Occupied Bandwidth Measurement_11A_5220_Ant1

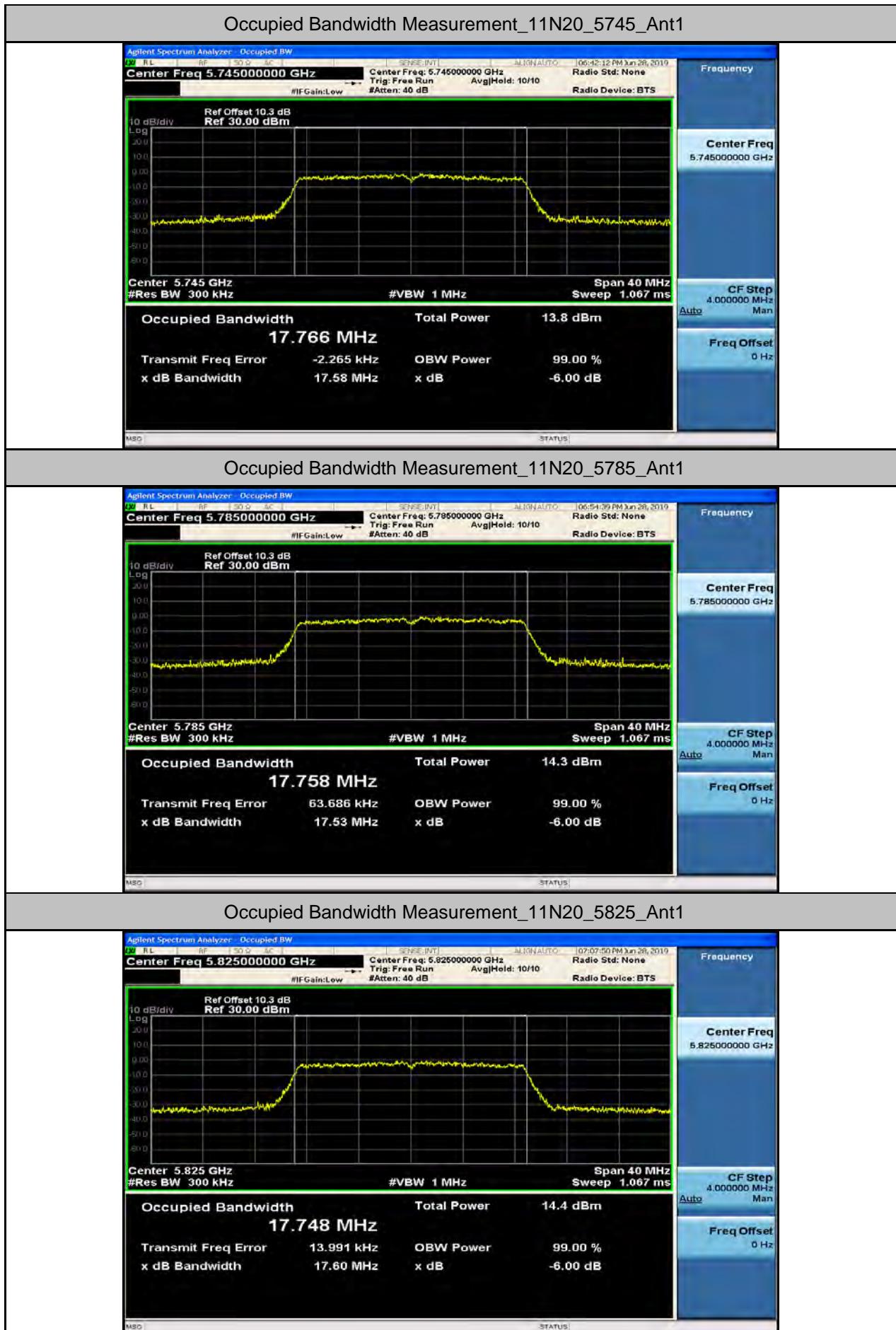


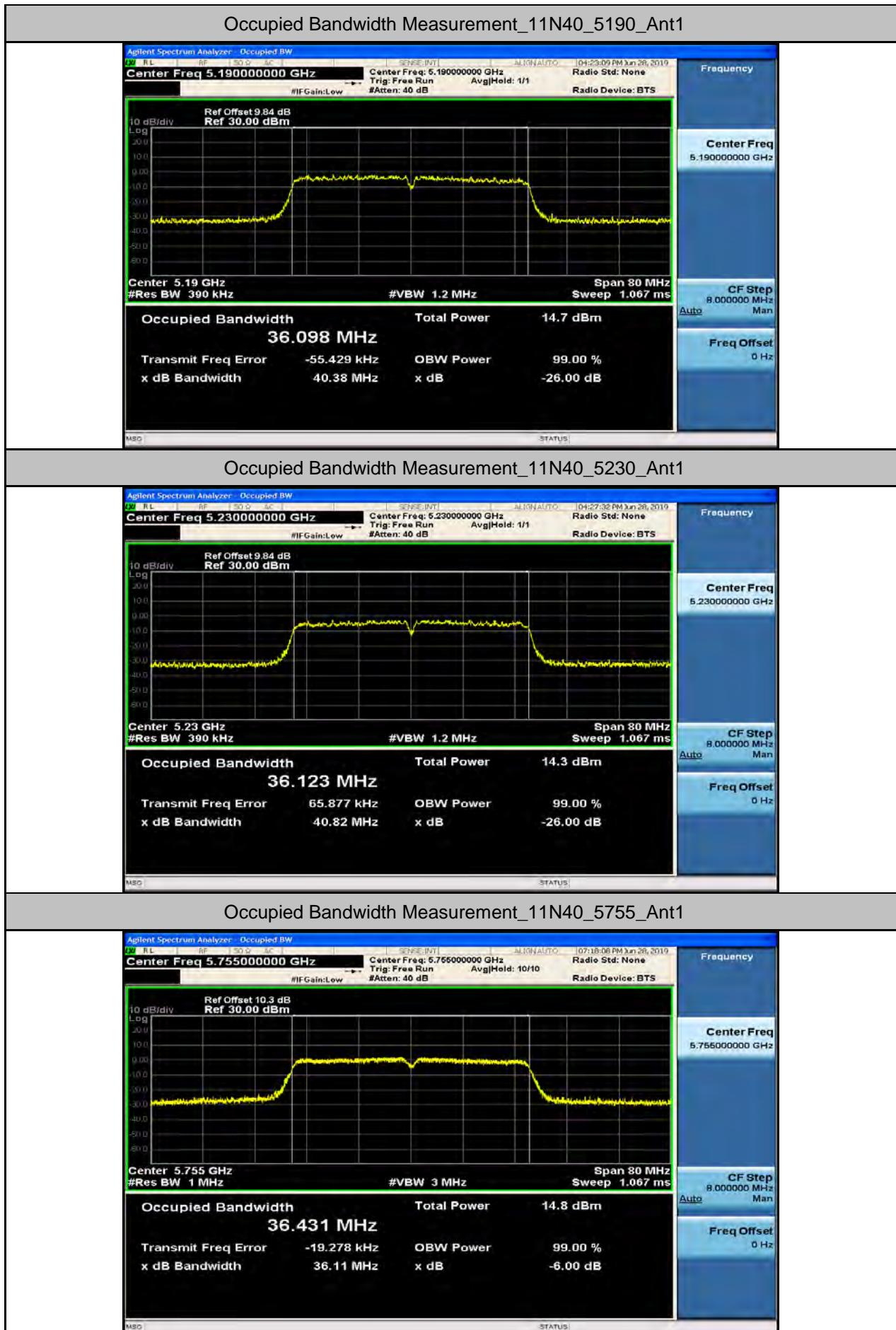
Occupied Bandwidth Measurement_11A_5240_Ant1

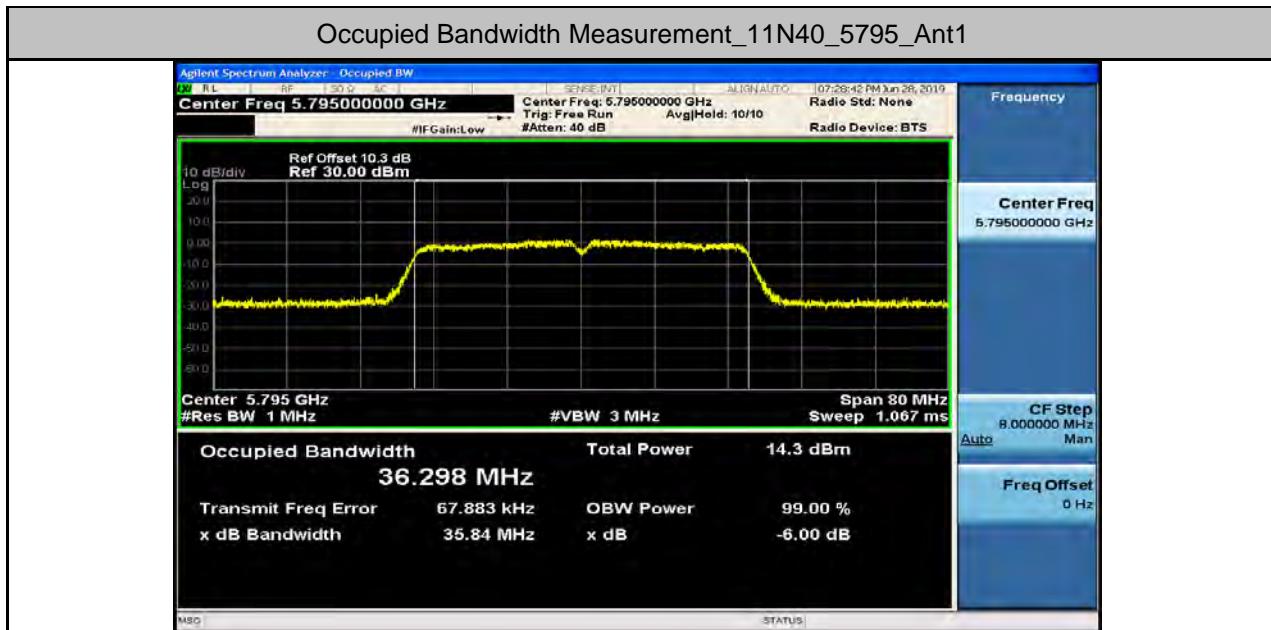




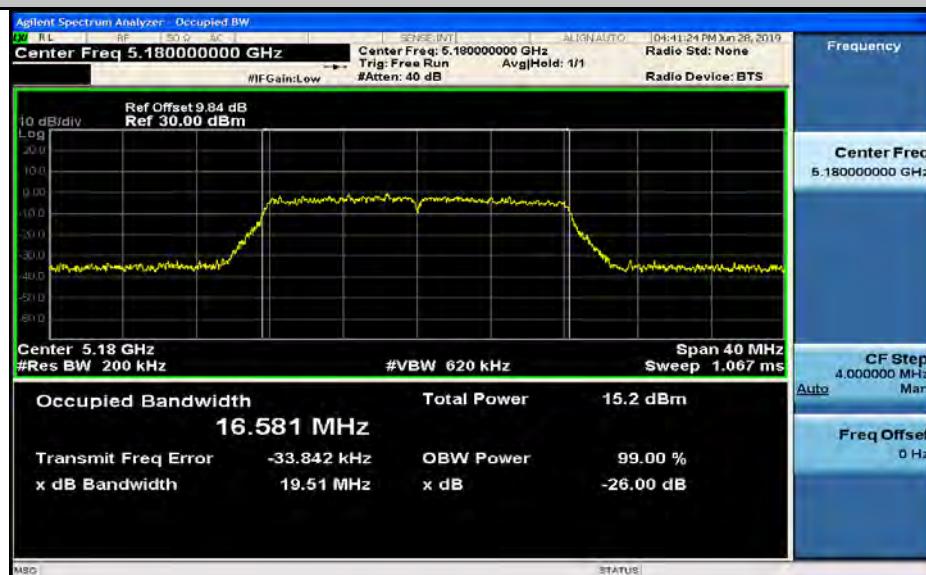




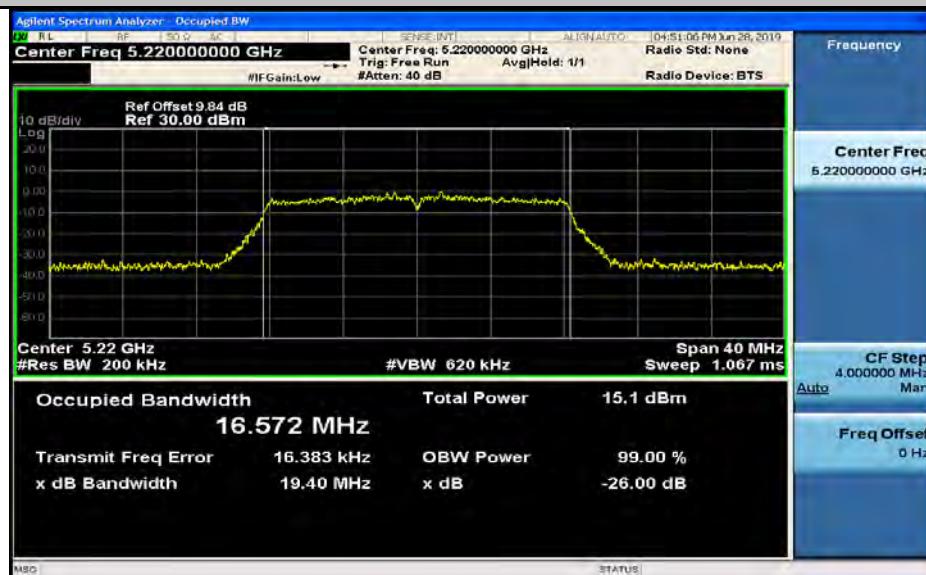




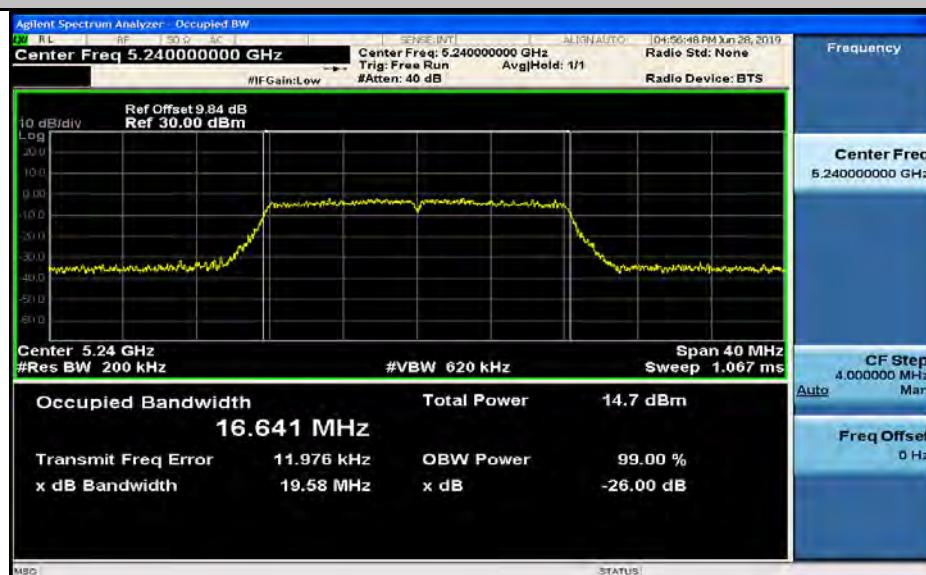
Occupied Bandwidth Measurement_11A_5180_Ant2



Occupied Bandwidth Measurement_11A_5220_Ant2



Occupied Bandwidth Measurement_11A_5240_Ant2



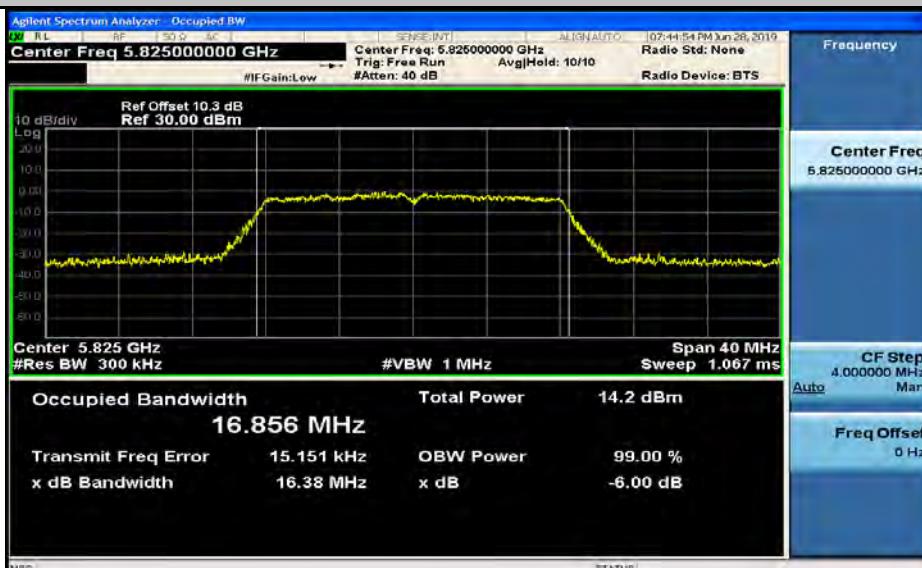
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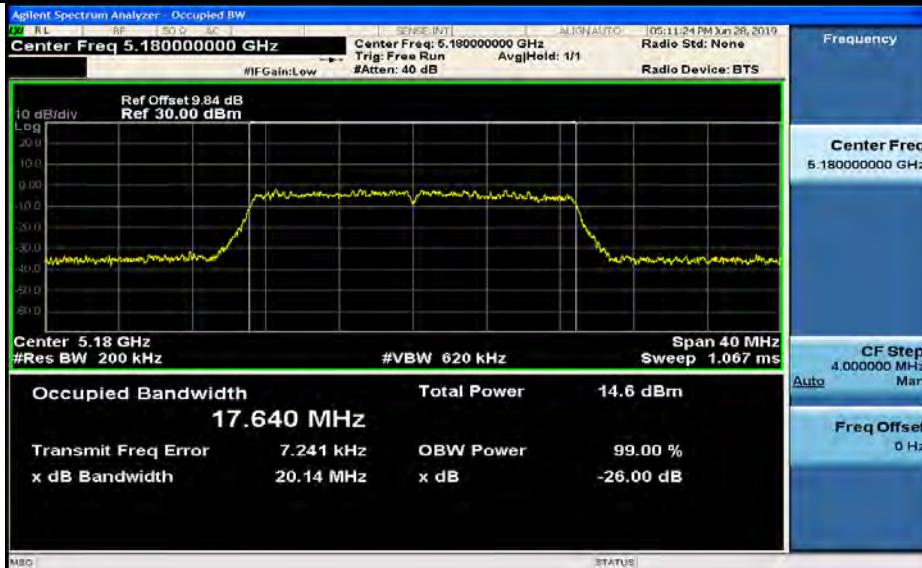
Occupied Bandwidth Measurement_11A_5785_Ant2



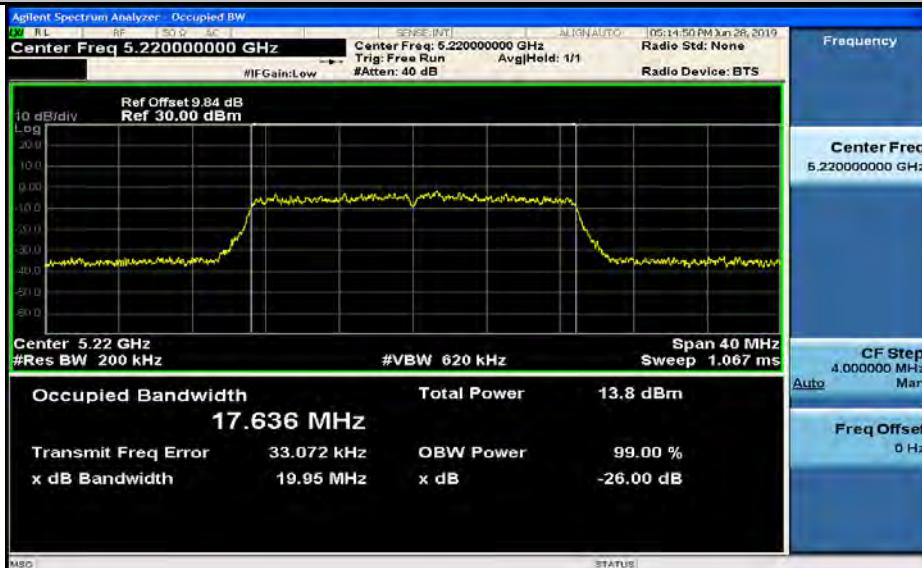
Occupied Bandwidth Measurement_11A_5825_Ant2



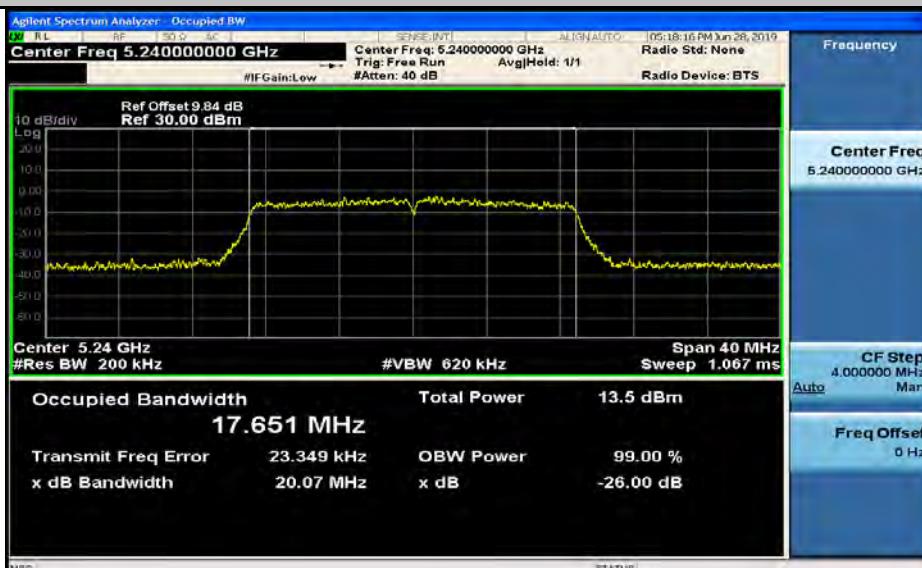
Occupied Bandwidth Measurement_11N20_5180_Ant2



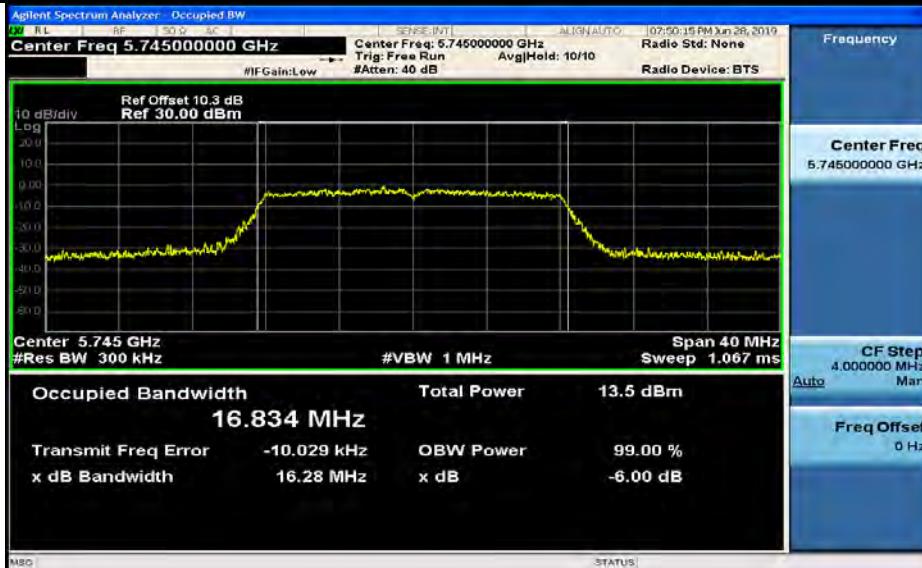
Occupied Bandwidth Measurement_11N20_5220_Ant2



Occupied Bandwidth Measurement_11N20_5240_Ant2



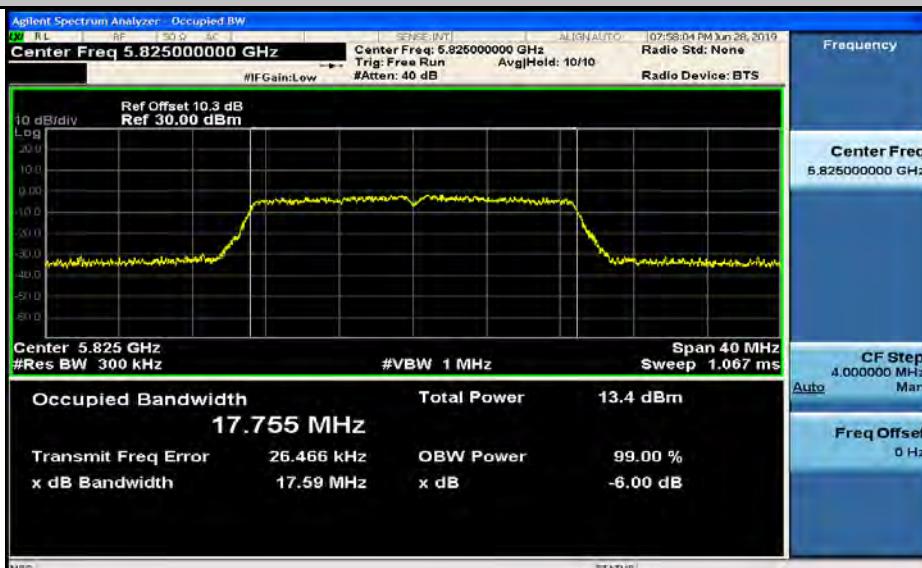
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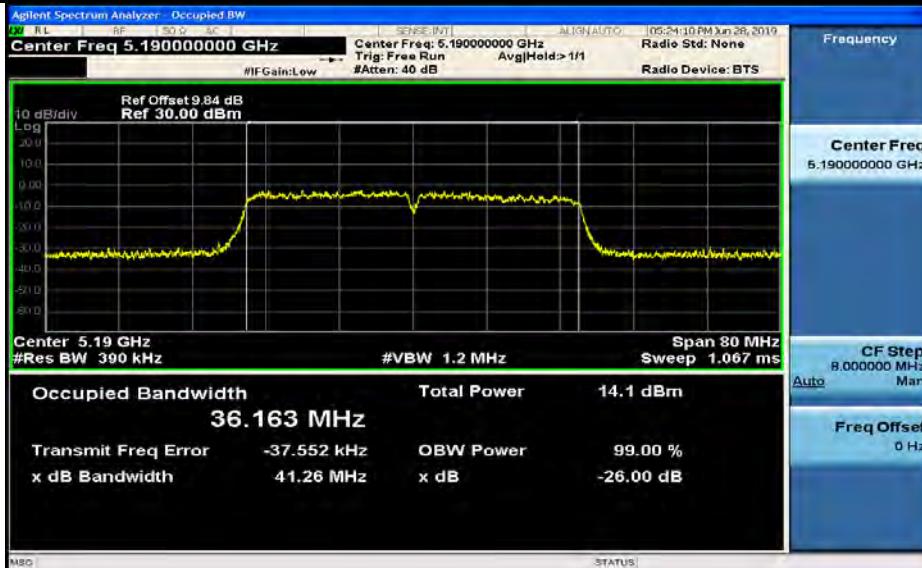
Occupied Bandwidth Measurement_11N20_5785_Ant2



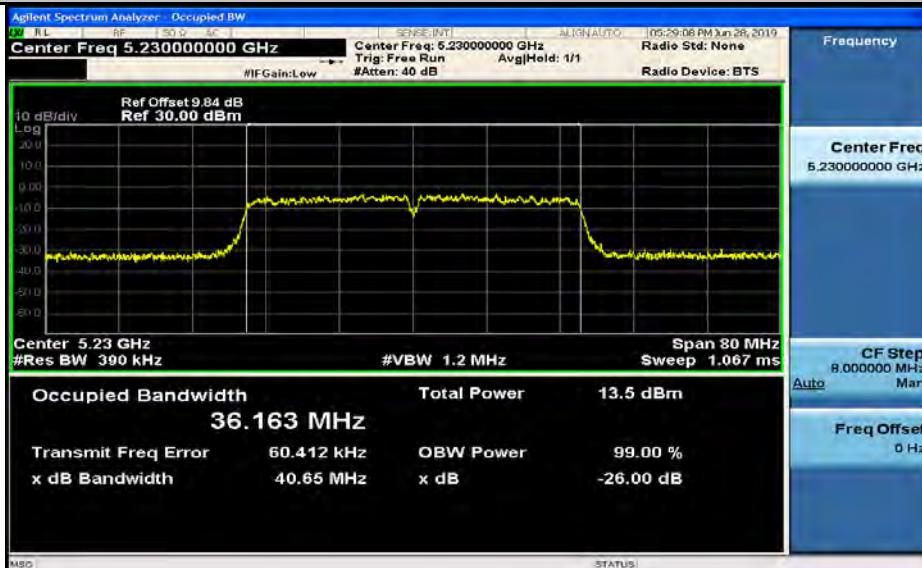
Occupied Bandwidth Measurement_11N20_5825_Ant2



Occupied Bandwidth Measurement_11N40_5190_Ant2

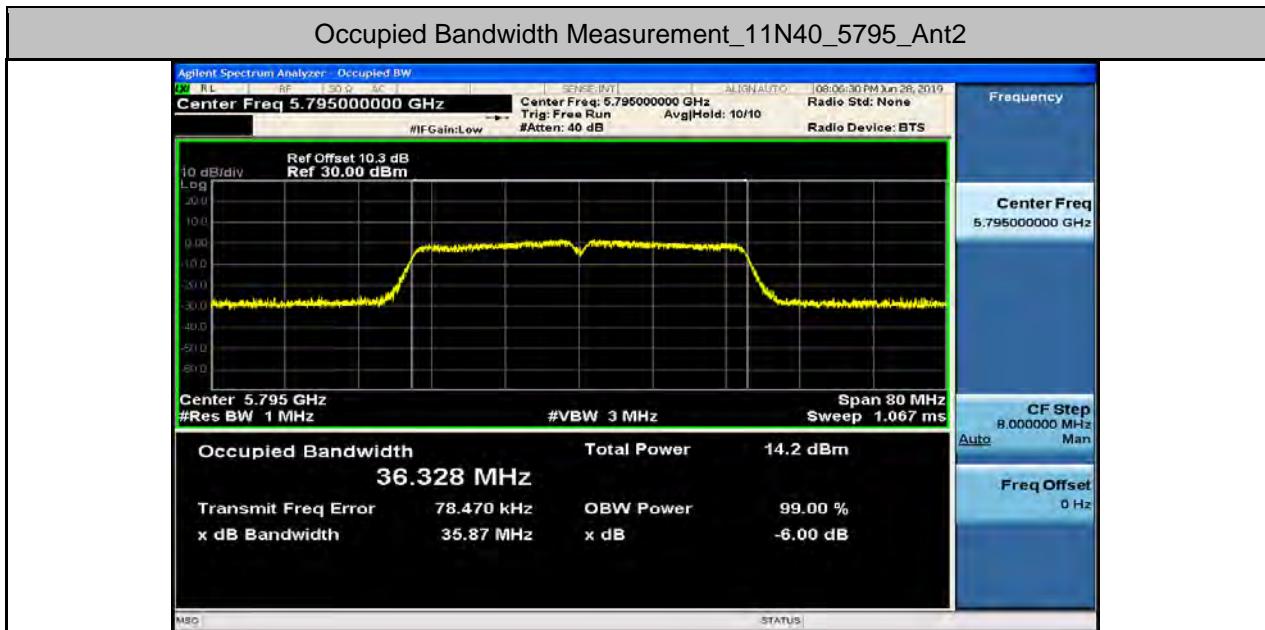


Occupied Bandwidth Measurement_11N40_5230_Ant2



Occupied Bandwidth Measurement_11N40_5755_Ant2





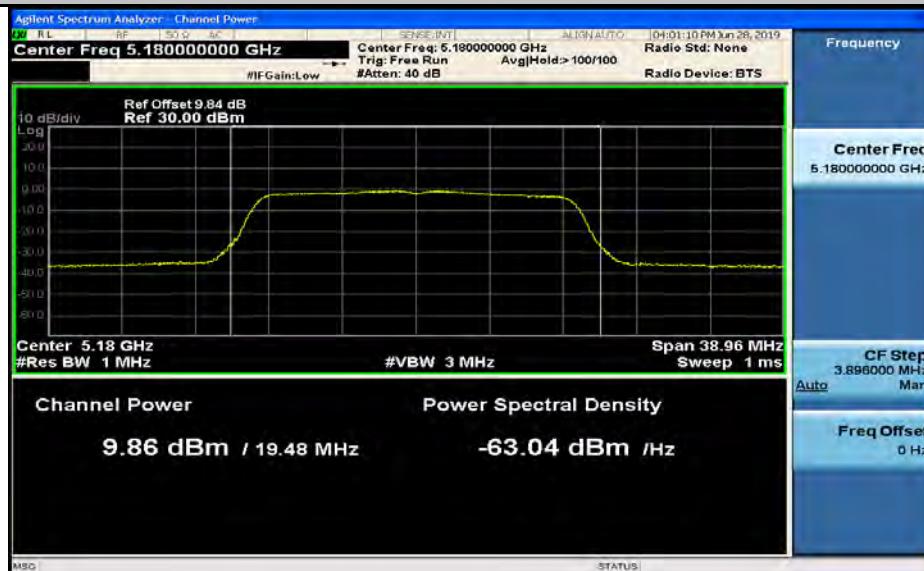
**4. Maximum Conduct Output Power**

Test Mode	Test Channel	Level [dBm]		10log(1/x) Factor [dB]		Power [dBm]			Limit [dBm]		Verdict
		Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	MIMO	Ant1	Ant2	
11A	5180	9.86	8.99	0.28	0.28	10.14	9.27	NA	26.00	26.00	PASS
11A	5220	9.22	8.84	0.28	0.29	9.5	9.13	NA	26.00	26.00	PASS
11A	5240	9.23	8.75	0.28	0.28	9.51	9.03	NA	26.00	26.00	PASS
11A	5745	8.55	7.27	0.28	0.28	8.83	7.55	NA	26.00	26.00	PASS
11A	5785	8.95	8.28	0.28	0.28	9.23	8.56	NA	26.00	26.00	PASS
11A	5825	9.47	7.91	0.28	0.28	9.75	8.19	NA	26.00	26.00	PASS
11N20	5180	8.88	8.04	0.31	0.31	9.19	8.35	11.80	23.00	23.00	PASS
11N20	5220	8.2	7.37	0.31	0.31	8.51	7.68	11.13	23.00	23.00	PASS
11N20	5240	7.64	7.27	0.31	0.31	7.95	7.58	10.78	23.00	23.00	PASS
11N20	5745	7.6	7.34	0.31	0.28	7.91	7.62	10.78	23.00	23.00	PASS
11N20	5785	8.05	7.84	0.31	0.28	8.36	8.12	11.25	23.00	23.00	PASS
11N20	5825	8.13	7.11	0.31	0.31	8.44	7.42	10.97	23.00	23.00	PASS
11N40	5190	8.25	7.66	0.61	0.60	8.86	8.26	11.58	23.00	23.00	PASS
11N40	5230	7.81	7	0.60	0.60	8.41	7.6	11.03	23.00	23.00	PASS
11N40	5755	7.65	6.67	0.60	0.60	8.25	7.27	10.80	23.00	23.00	PASS
11N40	5795	7	7.01	0.61	0.61	7.61	7.62	10.63	23.00	23.00	PASS

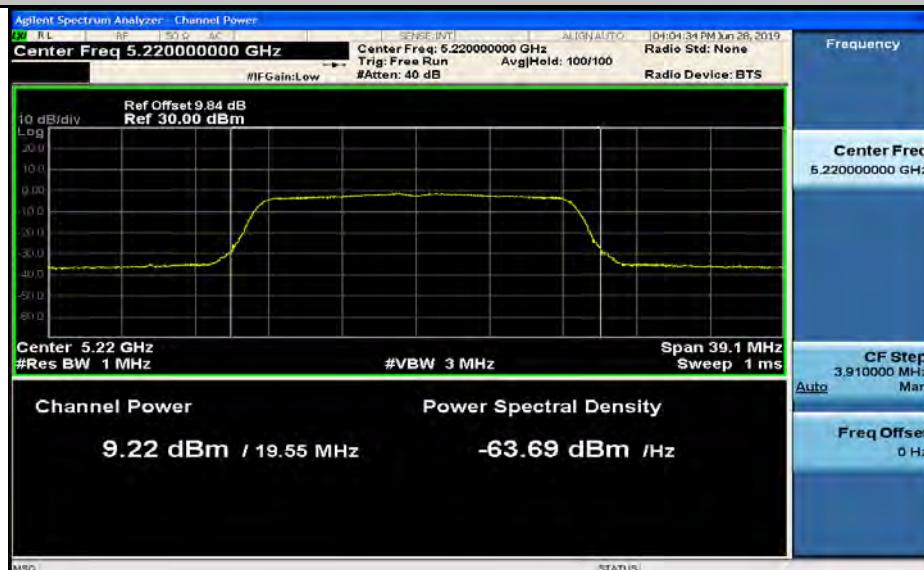
Remark:

- 1) Output Average Power = Reading Power + Duty Cycle Correction Factor
- 2) Per KDB 662911, the conducted powers at Antenna 1 and Antenna 2 were first measured separately during MIMO transmission as shown in section above. The measured values were then summed in linear power units then converted back to dBm.

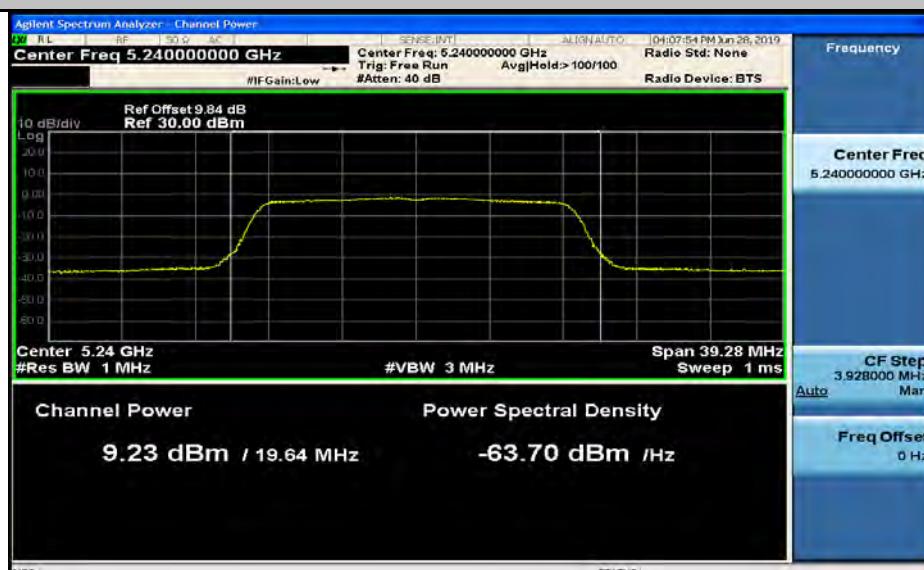
Maximum Conduct Output Power_11A_5180_Ant1



Maximum Conduct Output Power_11A_5220_Ant1

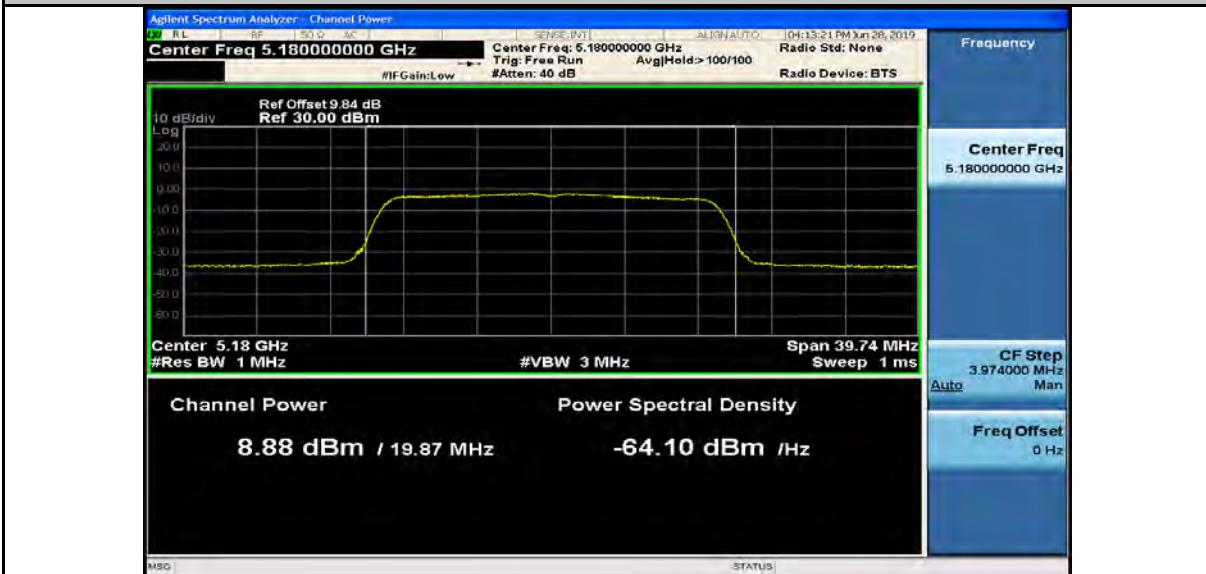


Maximum Conduct Output Power_11A_5240_Ant1

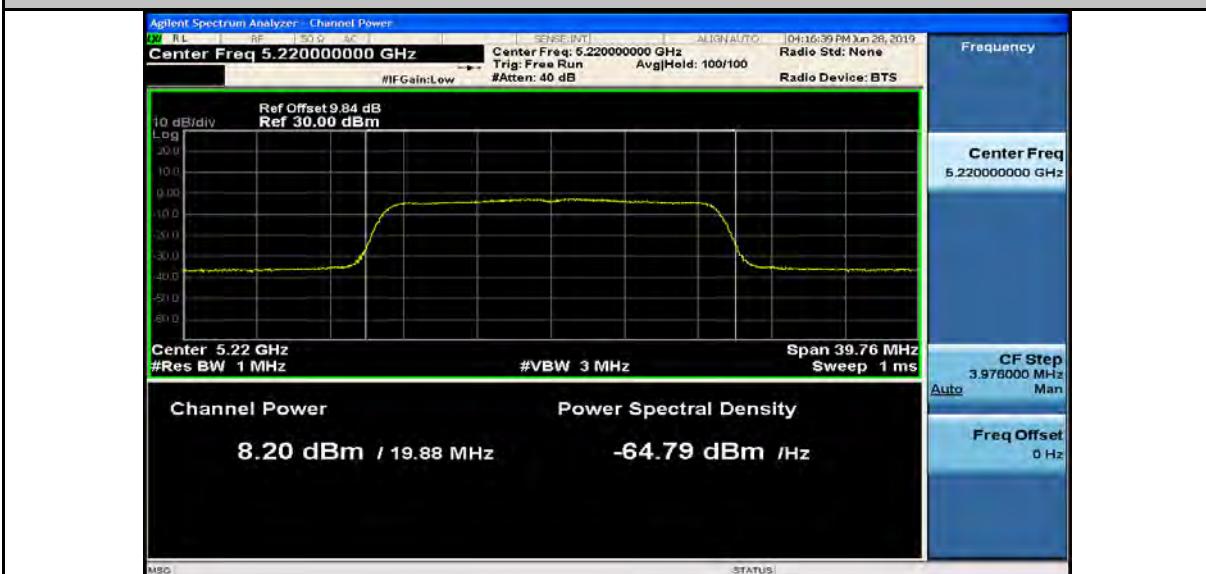




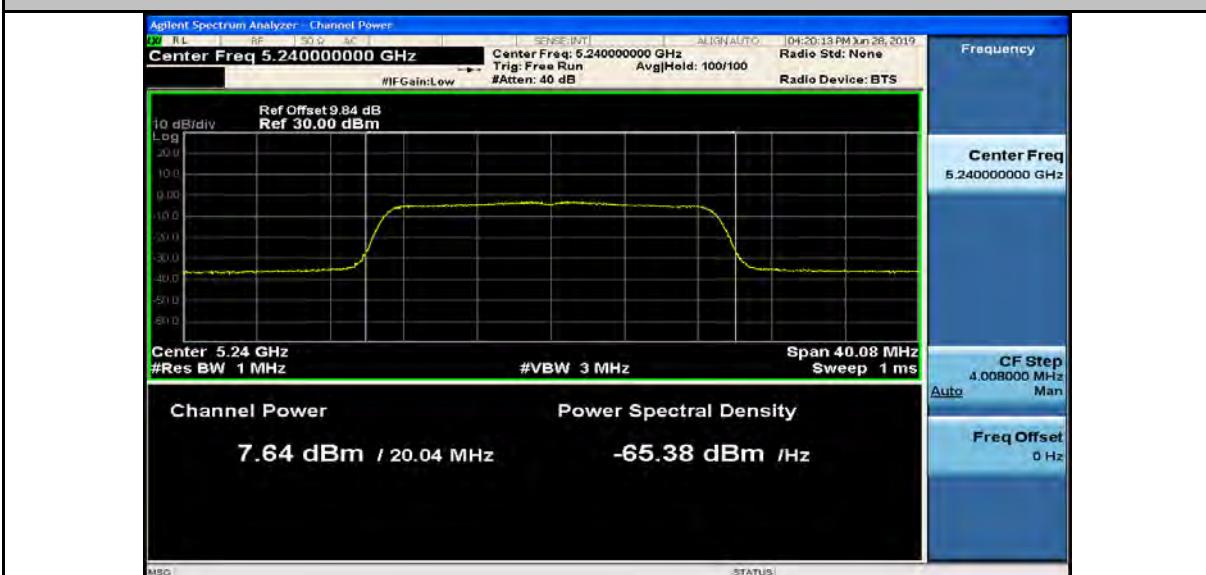
Maximum Conduct Output Power_11N20_5180_Ant1



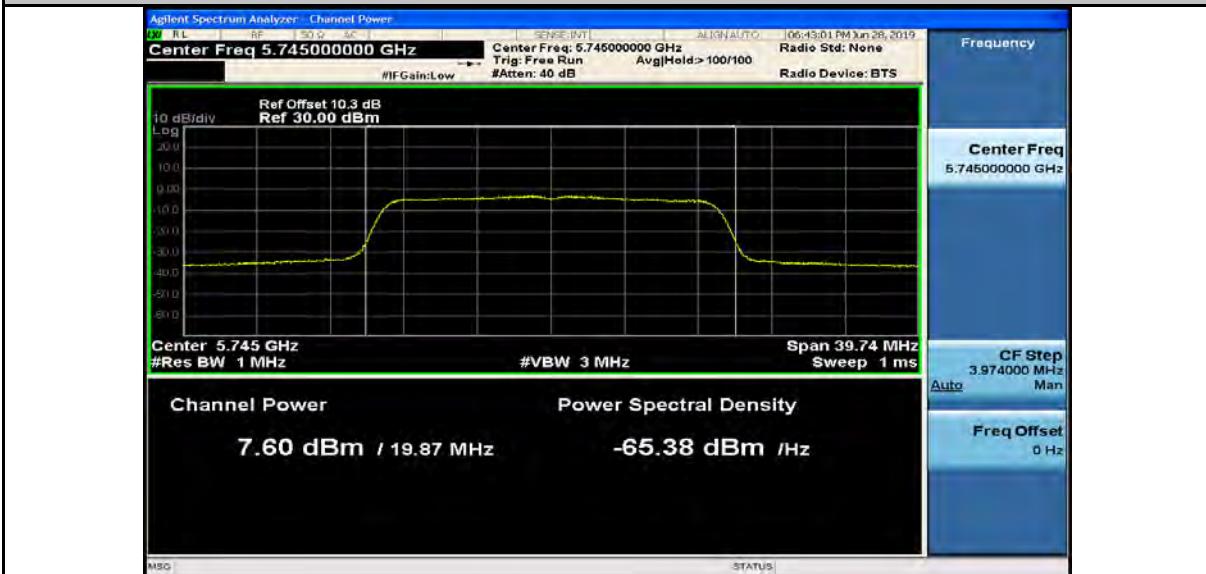
Maximum Conduct Output Power_11N20_5220_Ant1



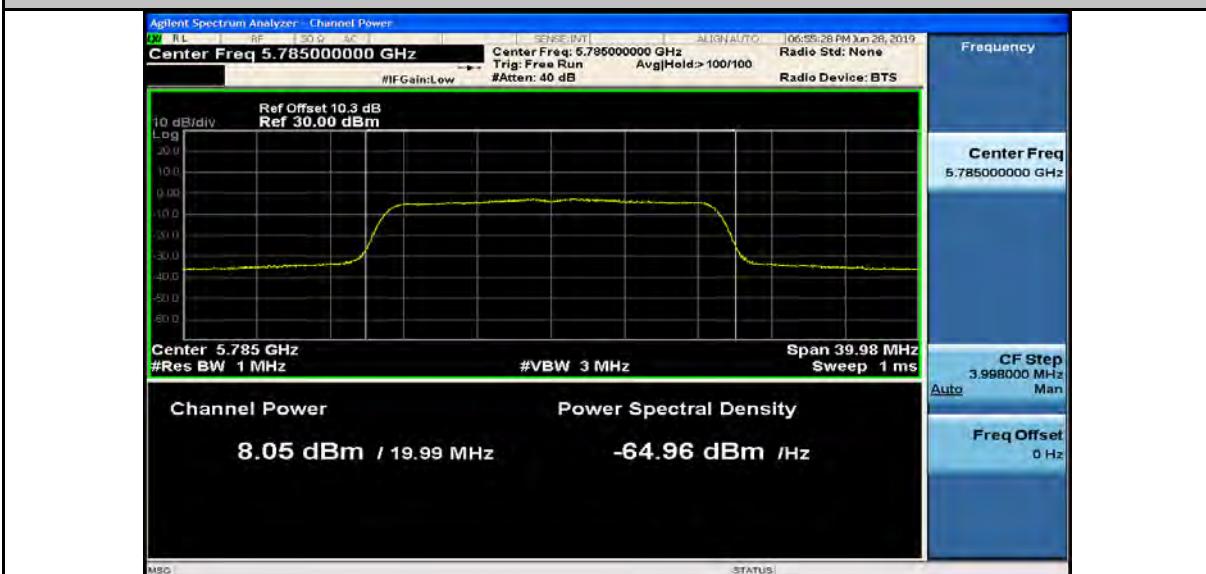
Maximum Conduct Output Power_11N20_5240_Ant1



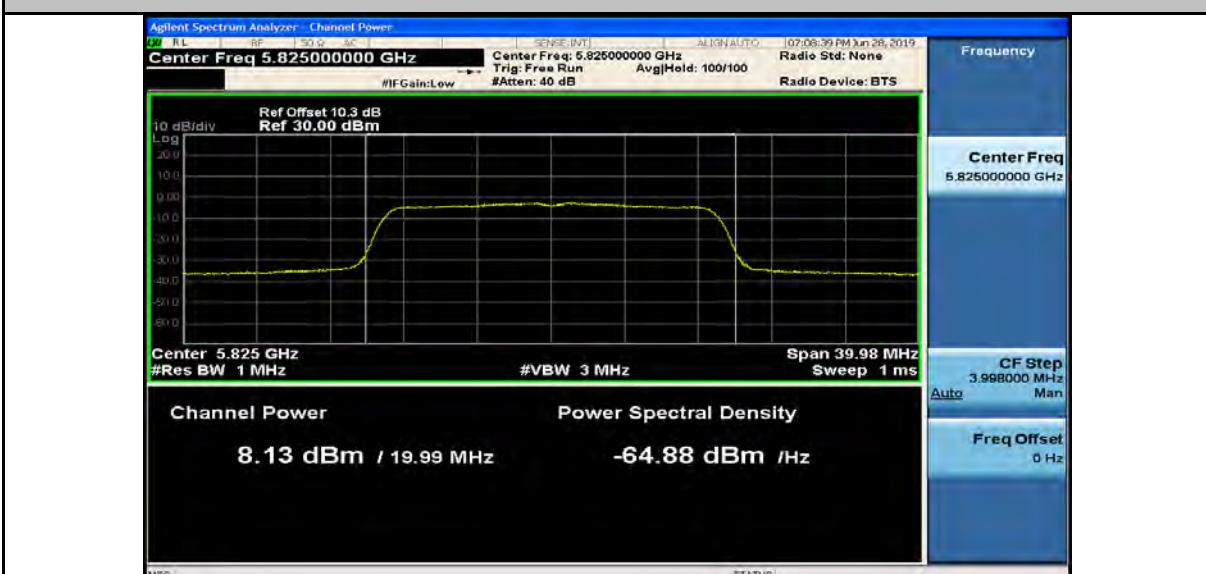
Maximum Conduct Output Power_11N20_5745_Ant1



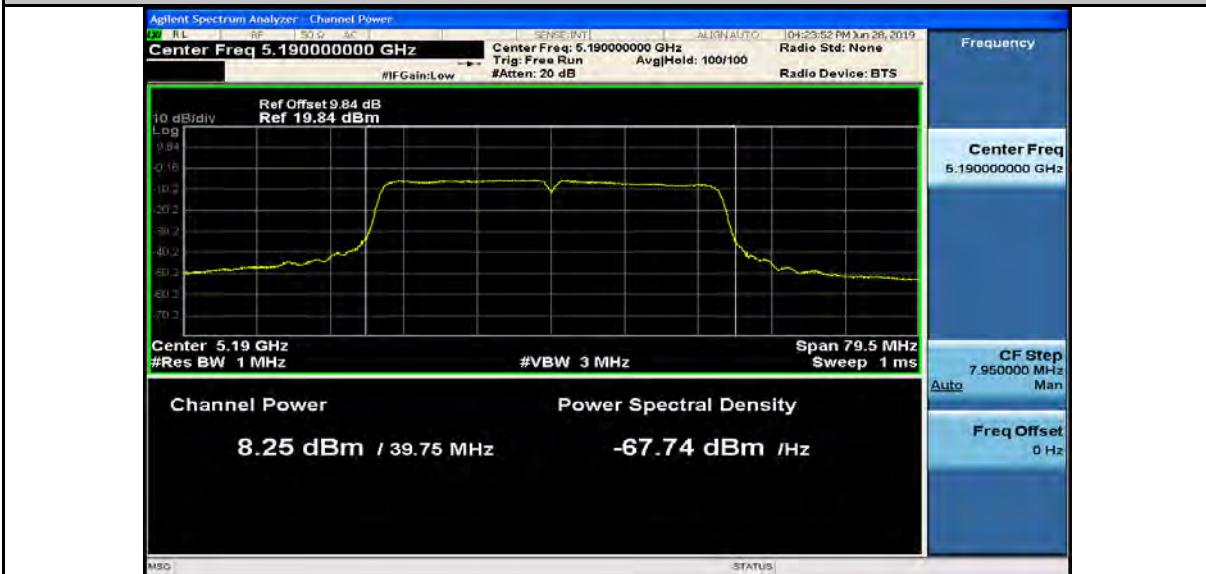
Maximum Conduct Output Power_11N20_5785_Ant1



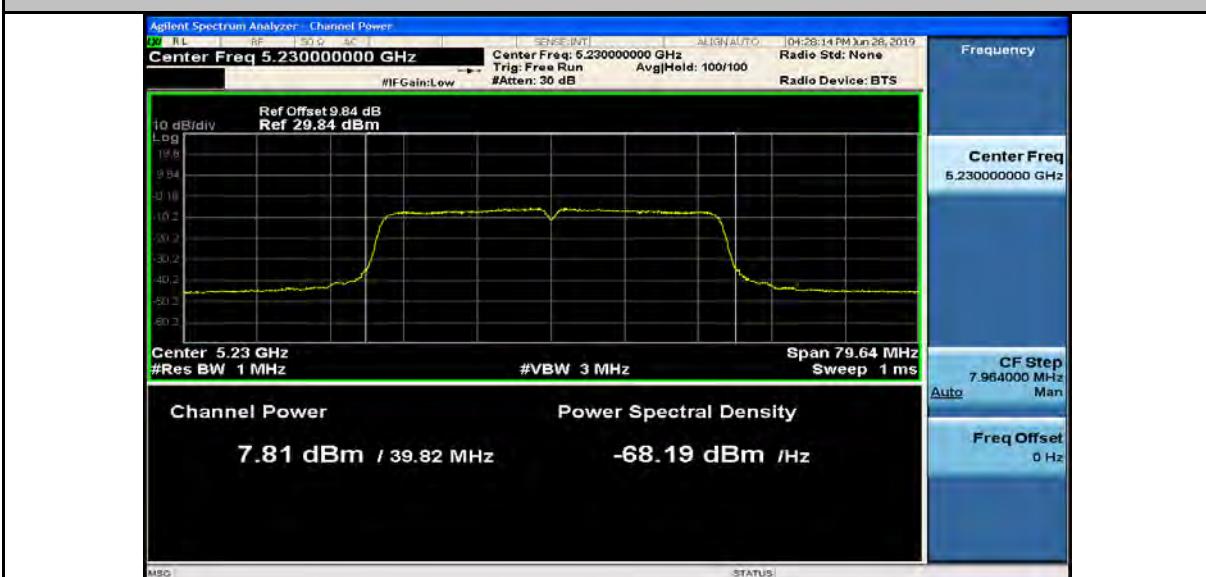
Maximum Conduct Output Power_11N20_5825_Ant1



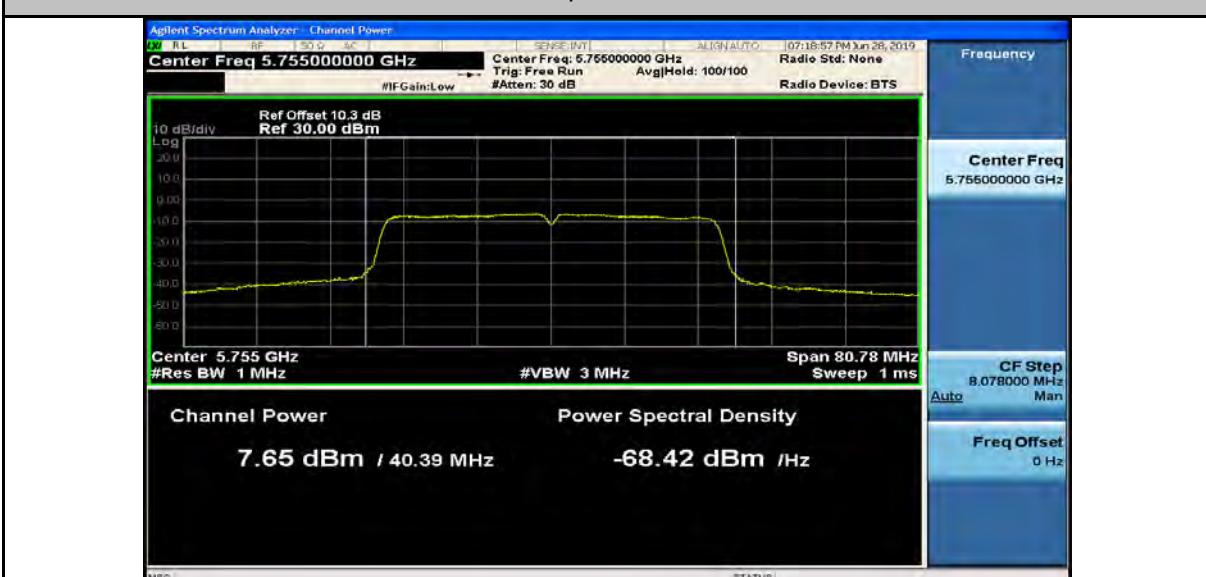
Maximum Conduct Output Power_11N40_5190_Ant1

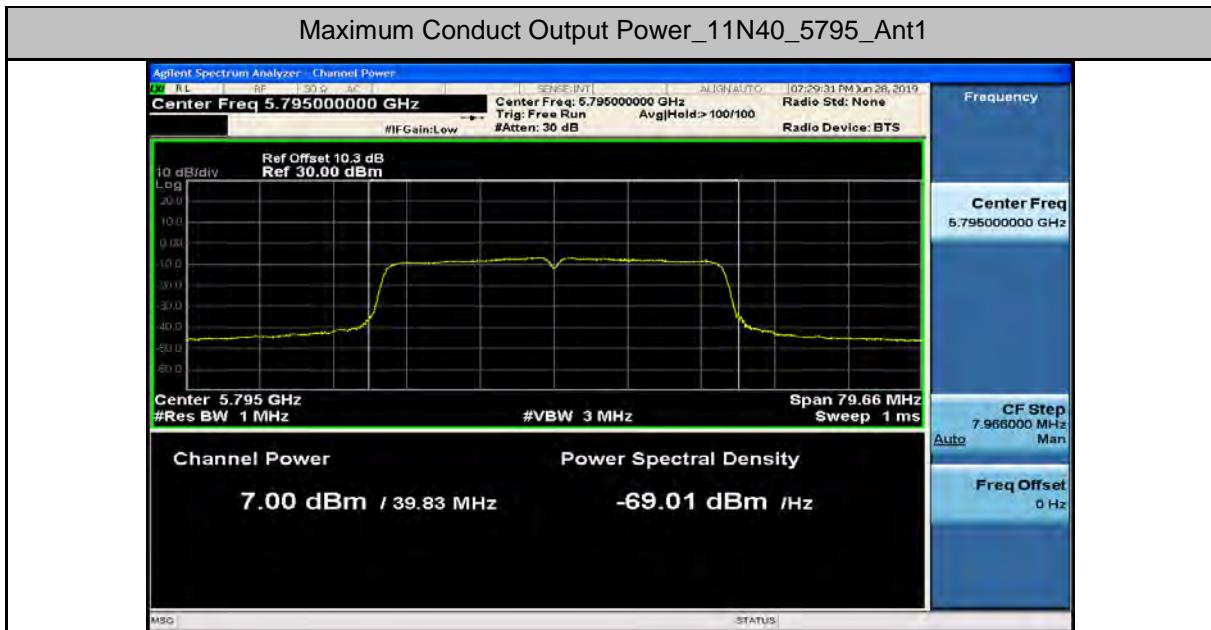


Maximum Conduct Output Power_11N40_5230_Ant1

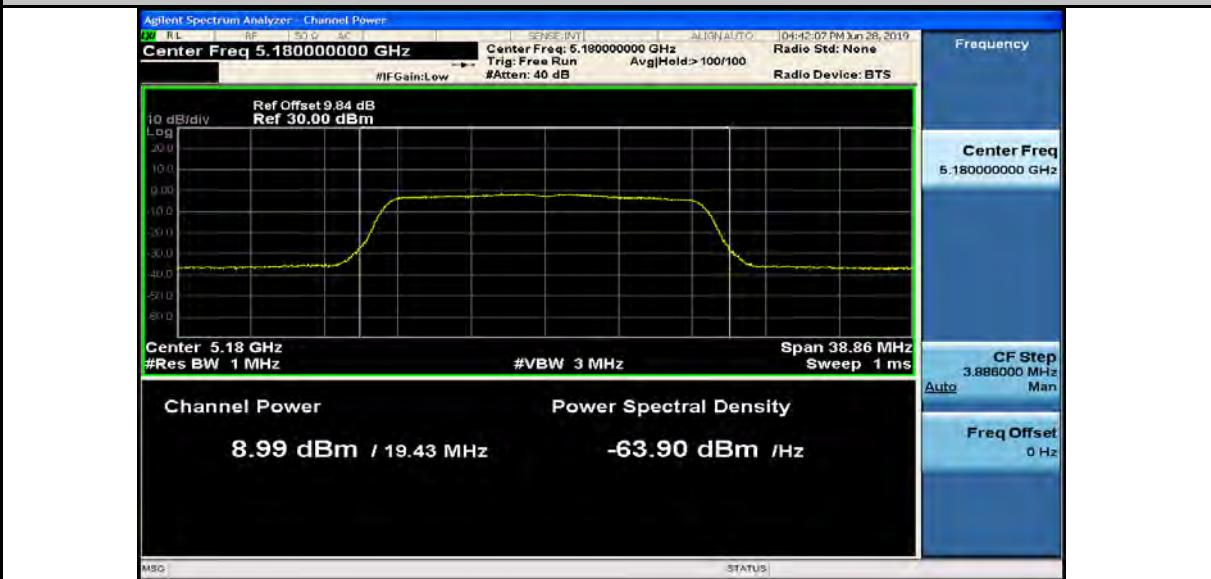


Maximum Conduct Output Power_11N40_5755_Ant1

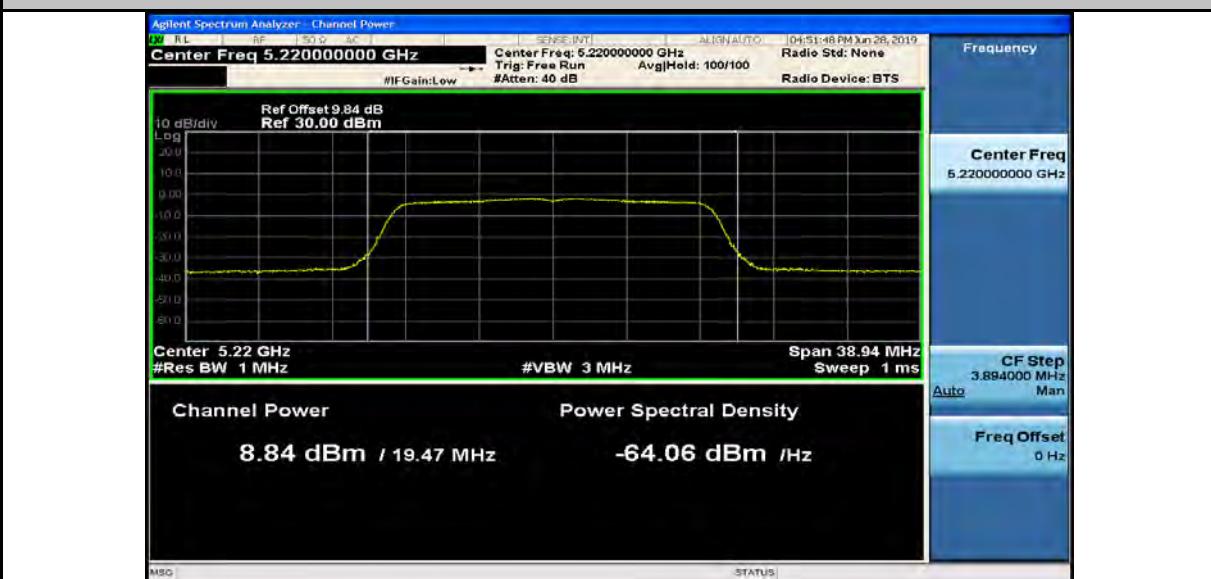




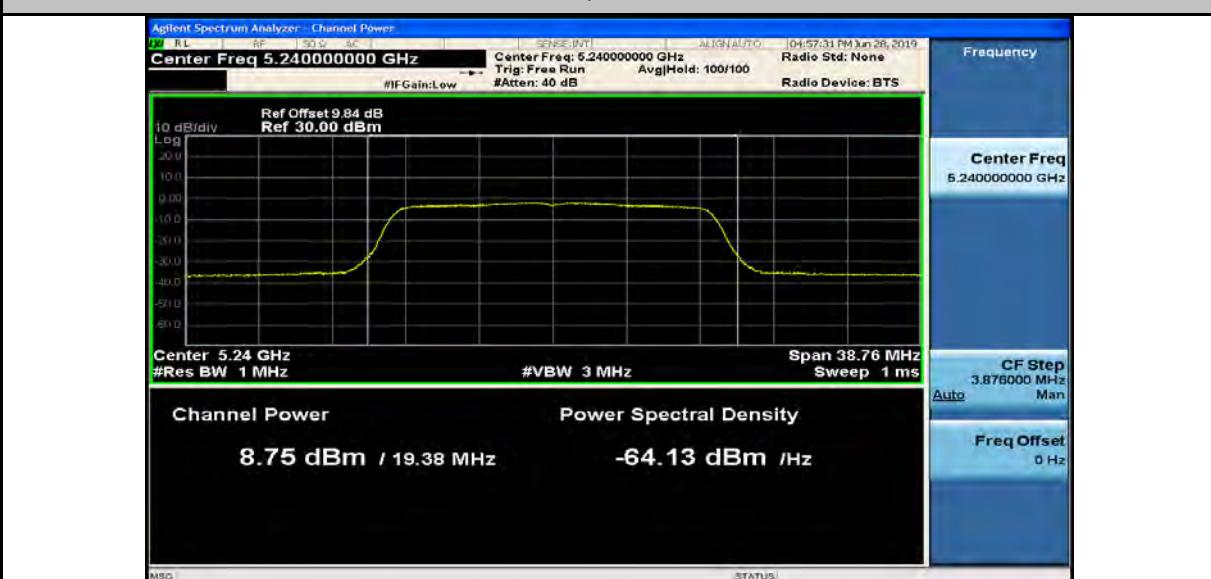
Maximum Conduct Output Power_11A_5180_Ant2



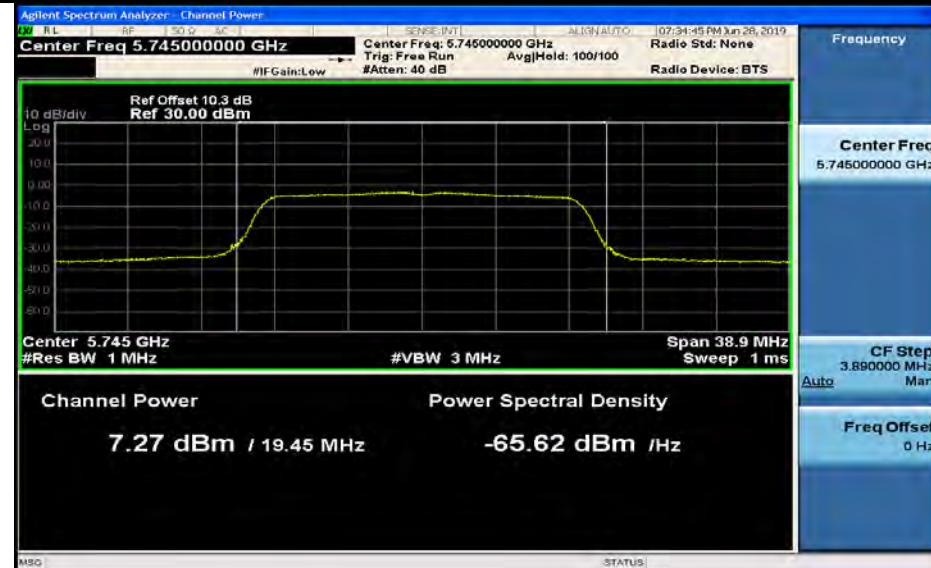
Maximum Conduct Output Power_11A_5220_Ant2



Maximum Conduct Output Power_11A_5240_Ant2



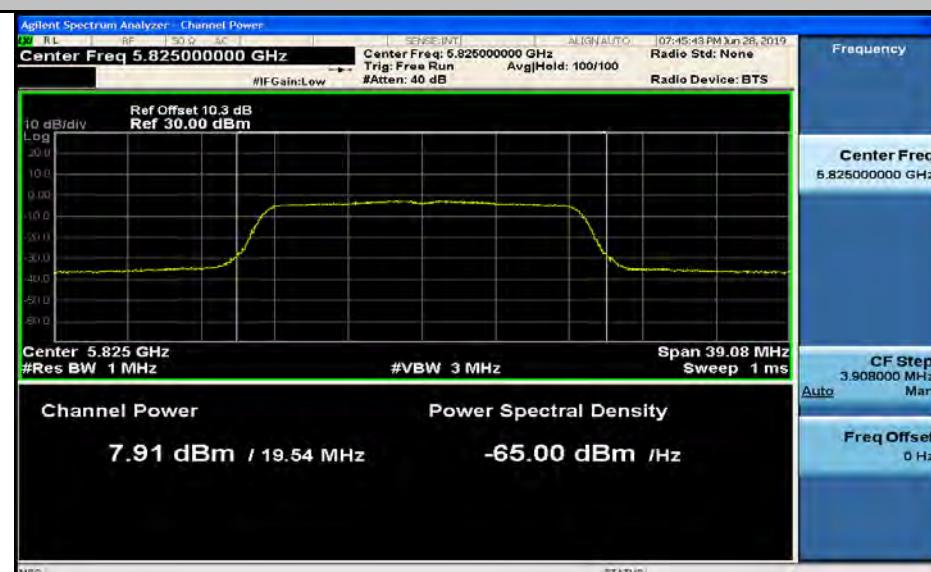
Maximum Conduct Output Power_11A_5745_Ant2



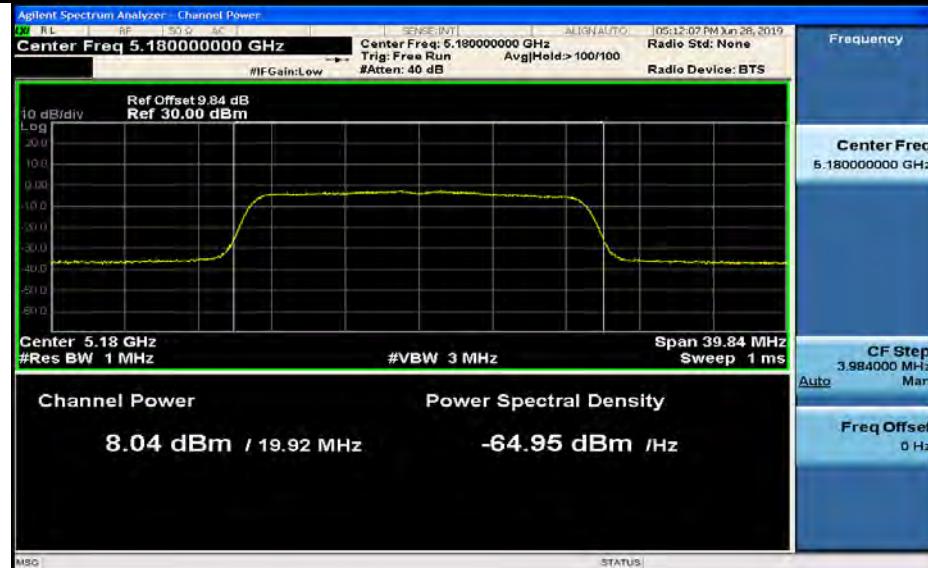
Maximum Conduct Output Power_11A_5785_Ant2



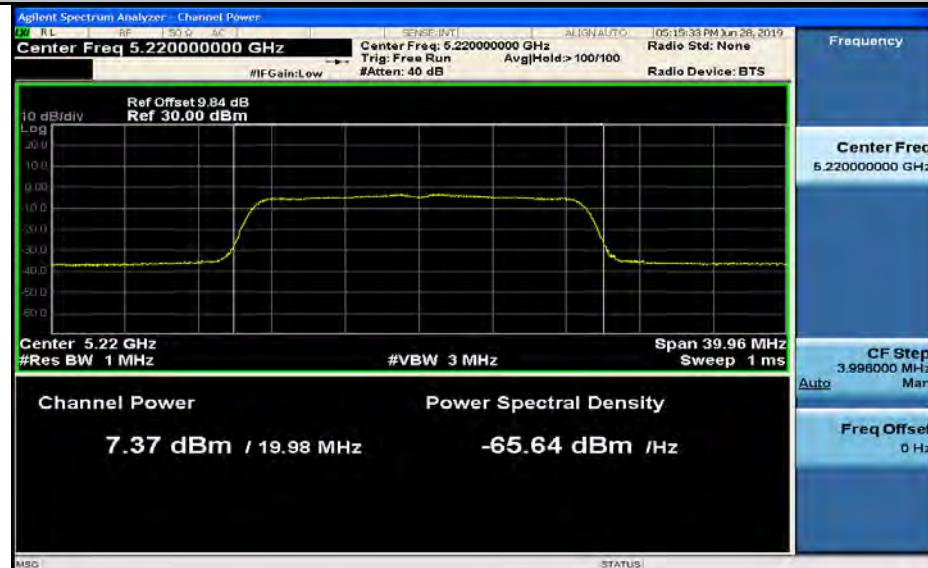
Maximum Conduct Output Power_11A_5825_Ant2



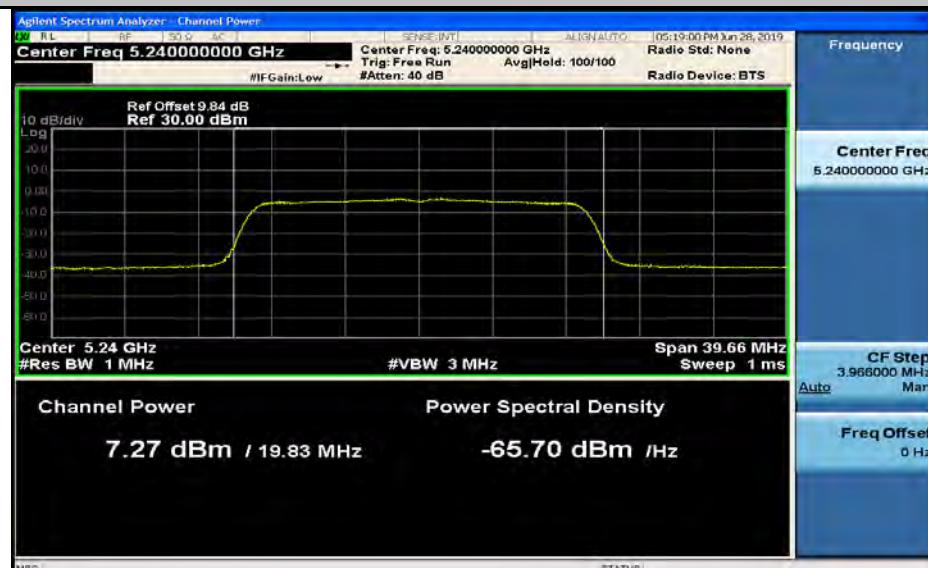
Maximum Conduct Output Power_11N20_5180_Ant2



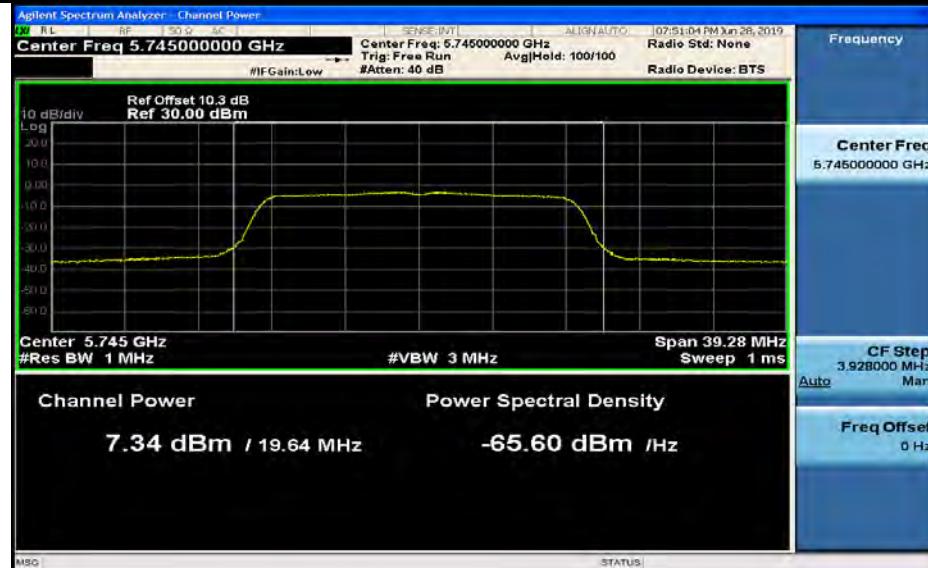
Maximum Conduct Output Power_11N20_5220_Ant2



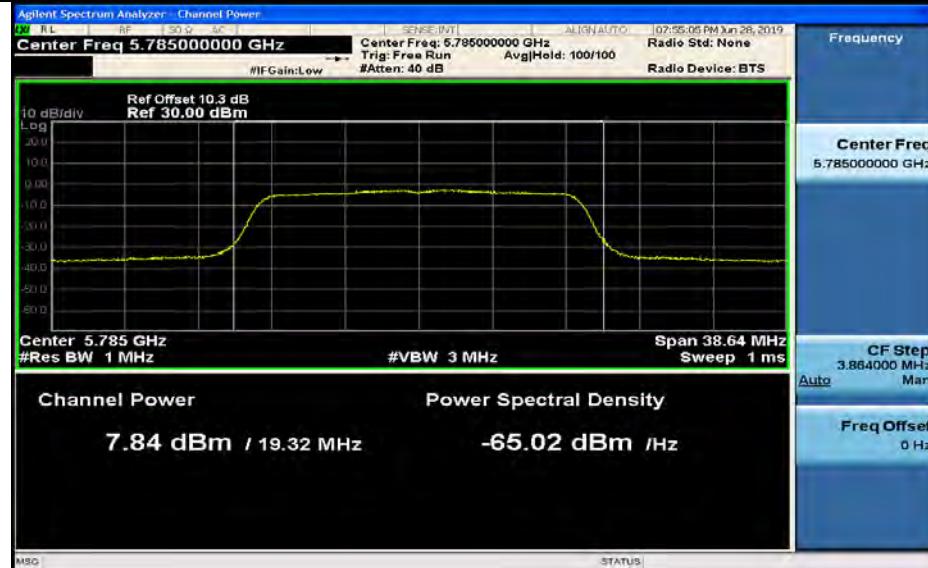
Maximum Conduct Output Power_11N20_5240_Ant2



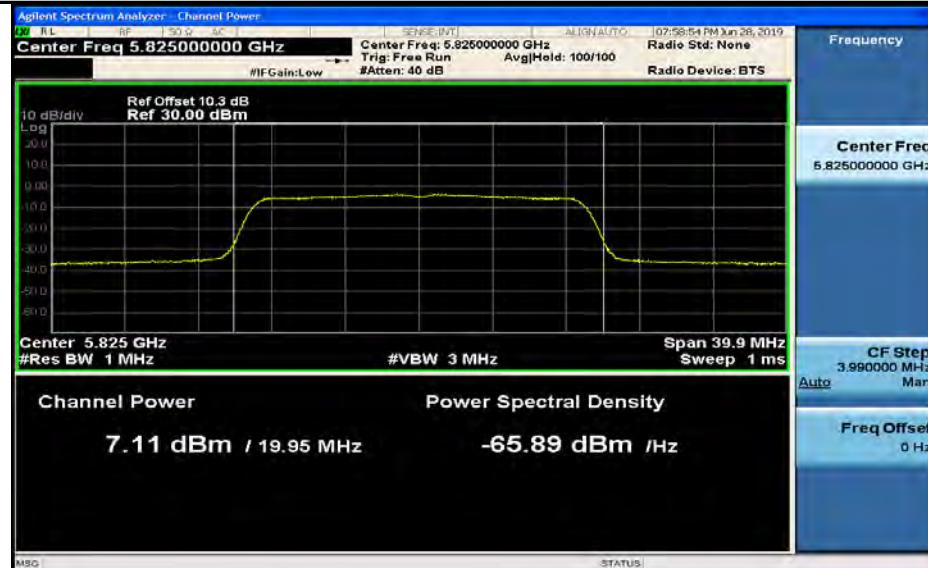
Maximum Conduct Output Power_11N20_5745_Ant2



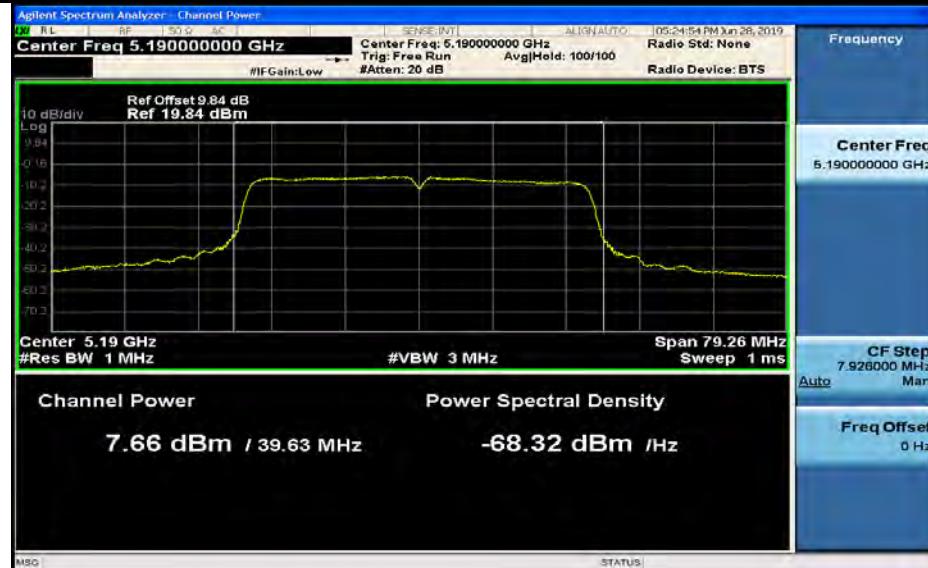
Maximum Conduct Output Power_11N20_5785_Ant2



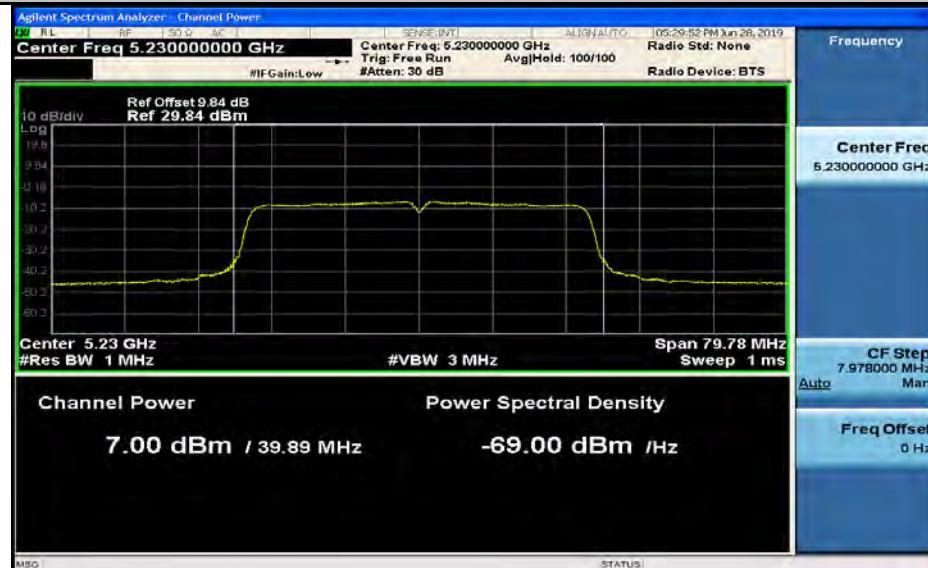
Maximum Conduct Output Power_11N20_5825_Ant2



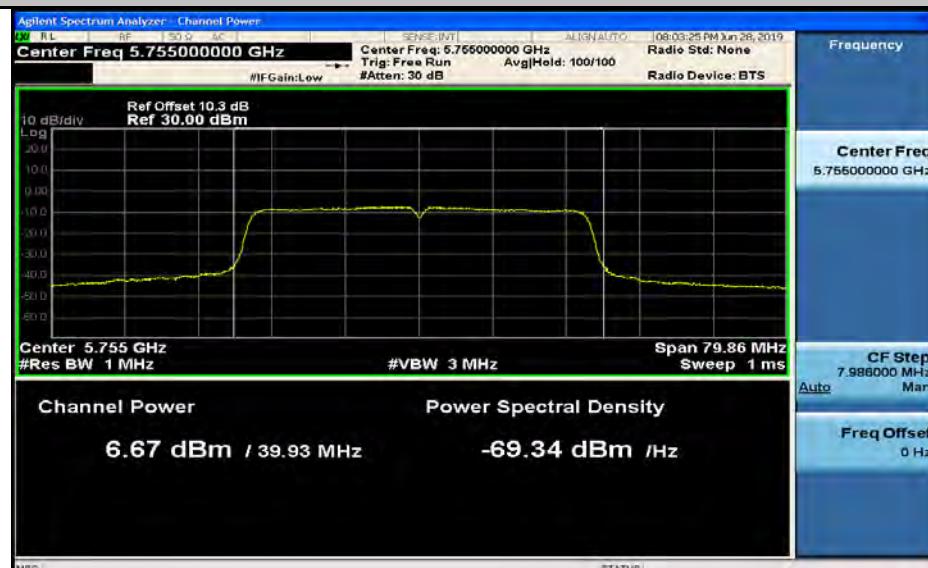
Maximum Conduct Output Power_11N40_5190_Ant2

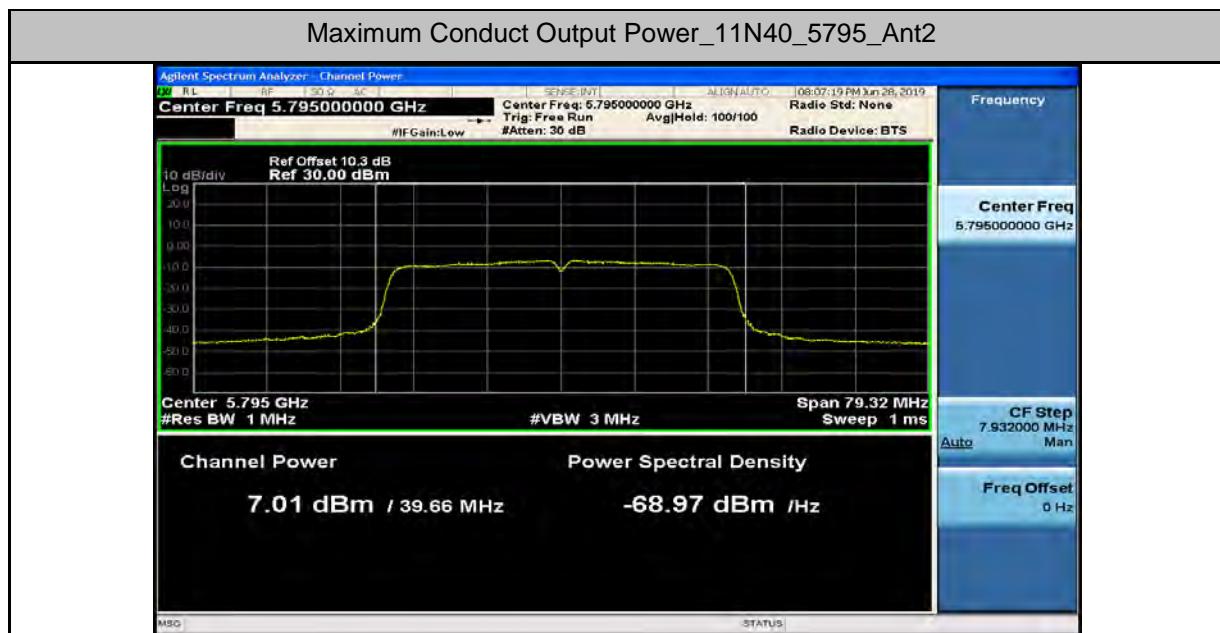


Maximum Conduct Output Power_11N40_5230_Ant2



Maximum Conduct Output Power_11N40_5755_Ant2





**5. Maximum Power Spectral Density**

Test Mode	Test Channel	Level [dBm/MHz]		10log(1/x) Factor [dB]		PSD [dBm/MHz]			Limit [dBm/MHz]	Verdict
		Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	MIMO		
11A	5180	-0.39	-1.09	0.28	0.28	-0.11	-0.81	NA	13.00	PASS
11A	5220	-1.19	-1.45	0.28	0.29	-0.91	-1.16	NA	13.00	PASS
11A	5240	-1.08	-1.59	0.28	0.28	-0.8	-1.31	NA	13.00	PASS
11N20	5180	-1.47	-2.34	0.31	0.31	-1.16	-2.03	1.44	10.00	PASS
11N20	5220	-2.2	-3.13	0.31	0.31	-1.89	-2.82	0.68	10.00	PASS
11N20	5240	-2.97	-3.48	0.31	0.31	-2.66	-3.17	0.10	10.00	PASS
11N40	5190	-5.47	-5.71	0.61	0.6	-4.86	-5.11	-1.97	10.00	PASS
11N40	5230	-5.62	-6.63	0.6	0.6	-5.02	-6.03	-2.49	10.00	PASS

Test Mode	Test Channel	Level [dBm/500kHz]		10log(1/x) Factor [dB]	10log(500kHz/RBW) Factor [dB]		PSD [dBm/500kHz]			Limit [dBm/500kHz]	Verdict	
		Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2			
11A	5745	-7	-8.19	0.28	0.28	2.22	2.22	-4.5	-5.69	NA	26.00	PASS
11A	5785	-6.44	-6.96	0.28	0.28	2.22	2.22	-3.94	-4.46	NA	26.00	PASS
11A	5825	-5.75	-7.57	0.28	0.28	2.22	2.22	-3.25	-5.07	NA	26.00	PASS
11N20	5745	-8.08	-8.03	0.31	0.28	2.22	2.22	-5.55	-5.53	-2.53	23.00	PASS
11N20	5785	-7.42	-7.32	0.31	0.28	2.22	2.22	-4.89	-4.82	-1.84	23.00	PASS
11N20	5825	-7.57	-8.74	0.31	0.31	2.22	2.22	-5.04	-6.21	-2.58	23.00	PASS
11N40	5755	-11.45	-12.5	0.6	0.6	2.22	2.22	-8.63	-9.68	-6.11	23.00	PASS
11N40	5795	-12.01	-11.8	0.61	0.61	2.22	2.22	-9.18	-8.97	-6.06	23.00	PASS



























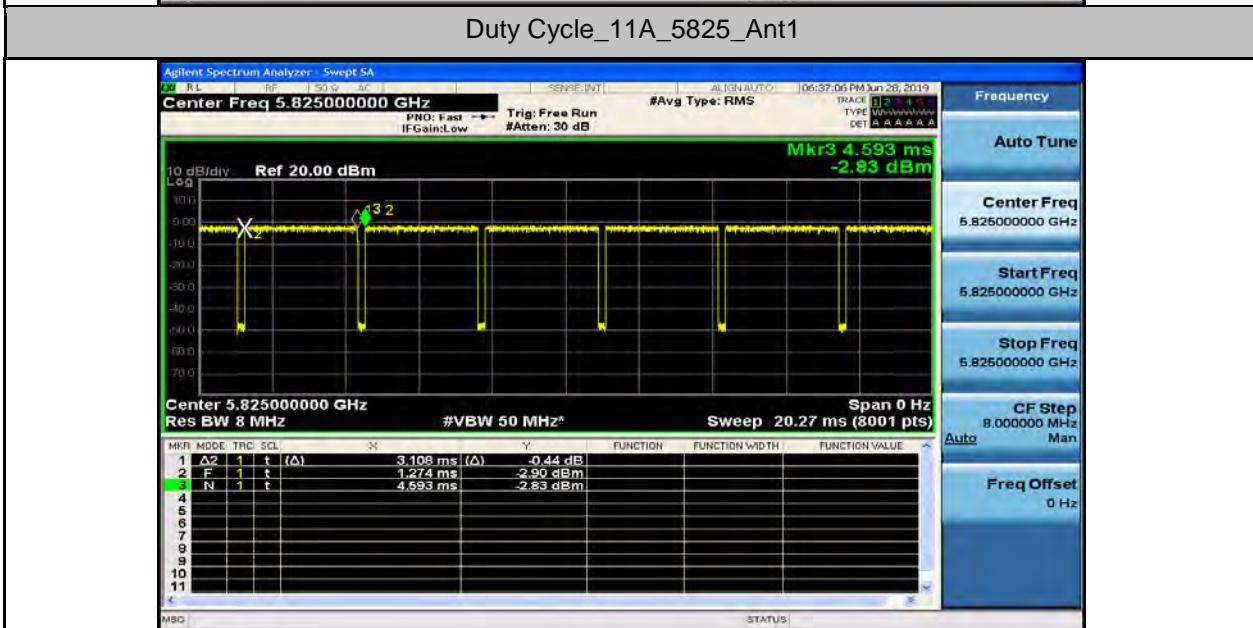
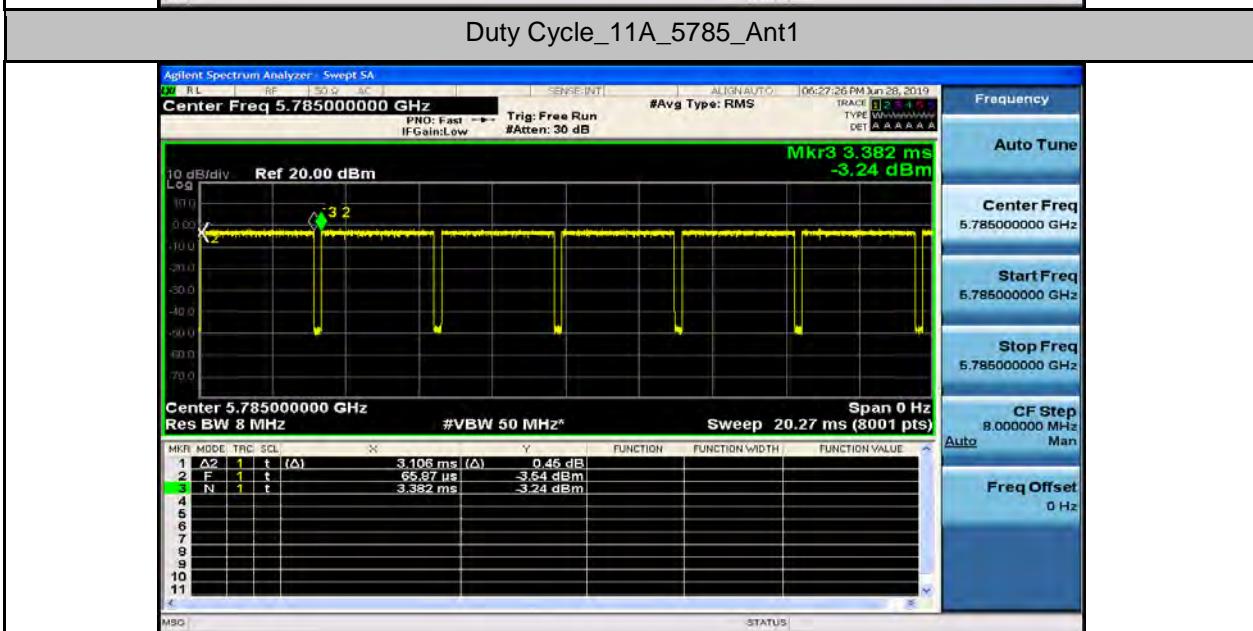
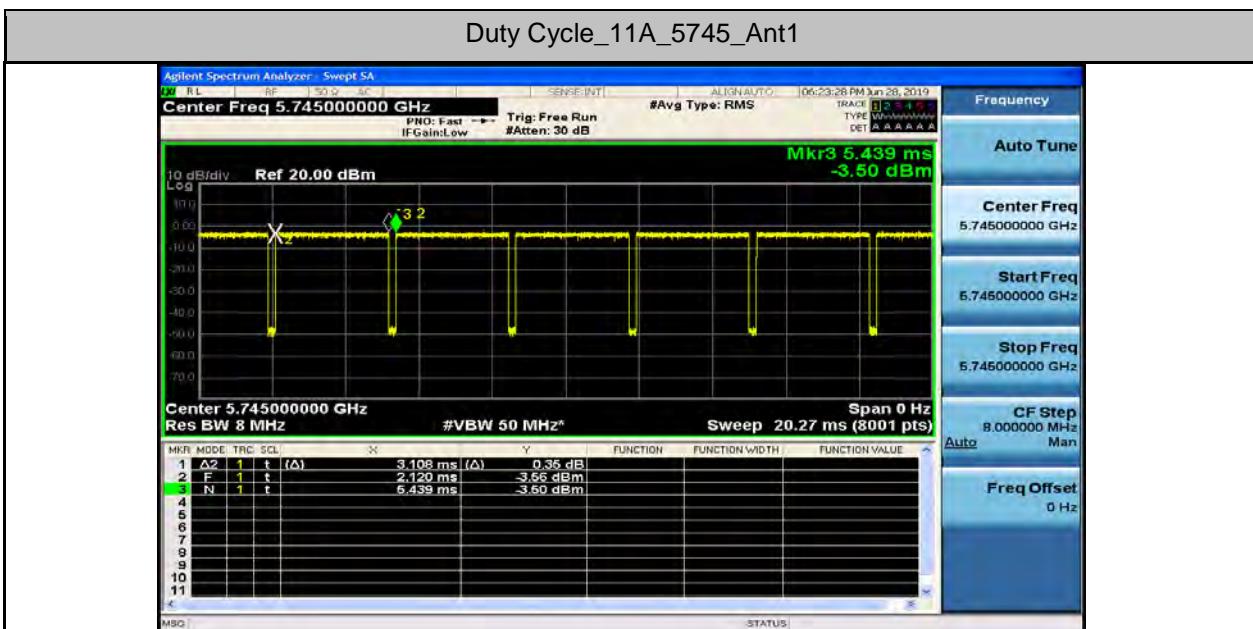
6. Frequency Stability

Band	Test Conditions		Operation Frequency (MHz)	Test Frequency (MHz)		Freq. Dev. (MHz)		Limit (GHz)	Result	
	Volt (V AC)	Temp (°C)		ANT1	ANT2	ANT1	ANT2			
Band U-NII 1	Normal(120)	Extreme(-20)	5180	5180.0241	5180.0243	0.0241	0.0243	5.15-5.25	Pass	
		Extreme(-10)		5180.0256	5180.0312	0.0256	0.0312		Pass	
		Extreme(0)		5180.0305	5180.0254	0.0305	0.0254		Pass	
		Extreme(+10)		5180.0328	5180.0246	0.0328	0.0246		Pass	
		Extreme(+20)		5180.0331	5180.0263	0.0331	0.0263		Pass	
		Extreme(+30)		5180.0327	5180.0199	0.0327	0.0199		Pass	
		Extreme(+40)		5180.0255	5180.0264	0.0255	0.0264		Pass	
		Extreme(+55)		5180.0421	5180.0215	0.0421	0.0215		Pass	
	Extreme(85)	Norma(+20)		5180.0124	5180.0443	0.0124	0.0443		Pass	
				5180.0363	5180.0157	0.0363	0.0157		Pass	
	Normal(120)	Extreme(-20)	5240	5240.0270	5240.0401	0.0270	0.0401	5.15-5.25	Pass	
		Extreme(-10)		5240.0252	5240.0255	0.0252	0.0255		Pass	
		Extreme(0)		5240.0334	5240.0345	0.0334	0.0345		Pass	
		Extreme(+10)		5240.0371	5240.0382	0.0371	0.0382		Pass	
		Extreme(+20)		5240.0423	5240.0443	0.0423	0.0443		Pass	
		Extreme(+30)		5240.0232	5240.0255	0.0232	0.0255		Pass	
		Extreme(+40)		5240.0245	5240.0268	0.0245	0.0268		Pass	
		Extreme(+55)		5240.0375	5240.0394	0.0375	0.0394		Pass	
	Extreme(85)	Norma(20)		5240.0411	5240.0426	0.0411	0.0426		Pass	
				5240.0353	5240.0387	0.0353	0.0387		Pass	
Band	Test Conditions		Operation Frequency (MHz)	Test Frequency (MHz)		Freq. Dev. (MHz)		Limit (GHz)	Result	
	Volt (V AC)	Temp (°C)		ANT1	ANT2	ANT1	ANT2			
Band U-NII 3	Normal(120)	Extreme(-20)	5745	5745.0411	5745.0435	0.0411	0.0435	5.725-5.85	Pass	
		Extreme(-10)		5745.0402	5745.0441	0.0402	0.0441		Pass	
		Extreme(0)		5745.0325	5745.0355	0.0325	0.0355		Pass	
		Extreme(+10)		5745.0312	5745.0346	0.0312	0.0346		Pass	
		Extreme(+20)		5745.0384	5745.0395	0.0384	0.0395		Pass	
		Extreme(+30)		5745.0421	5745.0452	0.0421	0.0452		Pass	
		Extreme(+40)		5745.0357	5745.0396	0.0357	0.0396		Pass	
		Extreme(+55)		5745.0393	5745.0375	0.0393	0.0375		Pass	
	Extreme(85)	Norma(+20)		5745.0421	5745.0424	0.0421	0.0424		Pass	
				5745.0432	5745.0481	0.0432	0.0481		Pass	
	Normal(120)	Extreme(-20)	5825	5825.0403	5825.0435	0.0403	0.0435	5.725-5.85	Pass	
		Extreme(-10)		5825.0431	5825.0487	0.0431	0.0487		Pass	
		Extreme(0)		5825.0365	5825.0385	0.0365	0.0385		Pass	
		Extreme(+10)		5825.0302	5825.0344	0.0302	0.0344		Pass	
		Extreme(+20)		5825.0296	5825.0302	0.0296	0.0302		Pass	
		Extreme(+30)		5825.0341	5825.0384	0.0341	0.0384		Pass	
		Extreme(+40)		5825.0315	5825.0364	0.0315	0.0364		Pass	
		Extreme(+55)		5825.0326	5825.0376	0.0326	0.0376		Pass	
	Extreme(85)	Norma(20)		5825.0414	5825.0435	0.0414	0.0435		Pass	
				5825.0352	5825.0384	0.0352	0.0384		Pass	

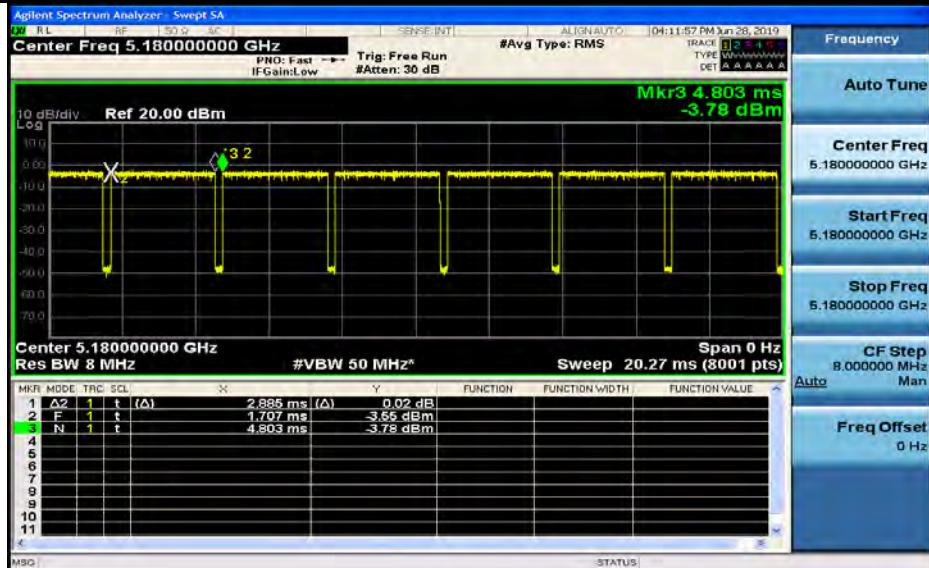
Remark: Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

**7.Duty Cycle**

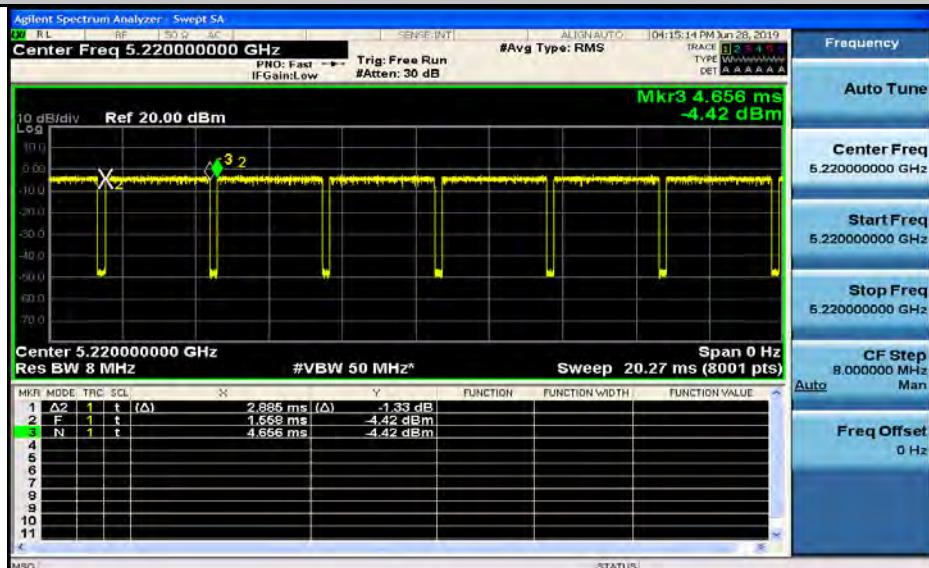
Test Mode	Test Channel	Duty Cycle[%]		10log(1/x) Factor[dB]	
		Ant1	Ant2	Ant1	Ant2
11A	5180	93.66	93.66	0.28	0.28
11A	5220	93.66	93.59	0.28	0.29
11A	5240	93.66	93.66	0.28	0.28
11A	5745	93.66	93.66	0.28	0.28
11A	5785	93.66	93.66	0.28	0.28
11A	5825	93.66	93.66	0.28	0.28
11N20	5180	93.21	93.21	0.31	0.31
11N20	5220	93.13	93.21	0.31	0.31
11N20	5240	93.21	93.13	0.31	0.31
11N20	5745	93.21	93.66	0.31	0.28
11N20	5785	93.21	93.66	0.31	0.28
11N20	5825	93.21	93.21	0.31	0.31
11N40	5190	86.99	87.15	0.61	0.60
11N40	5230	87.13	87.13	0.60	0.60
11N40	5755	87.13	87.15	0.60	0.60
11N40	5795	86.99	86.99	0.61	0.61



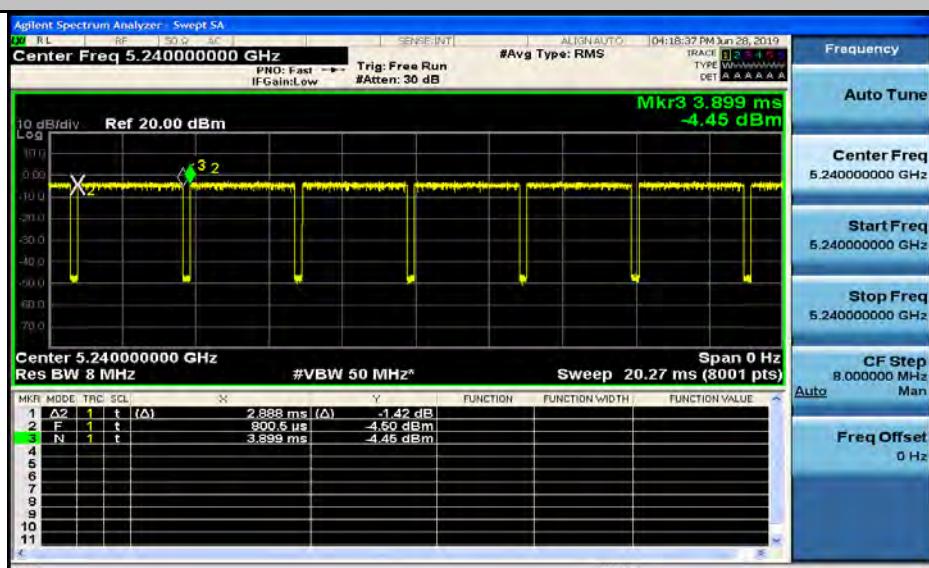
Duty Cycle_11N20_5180_Ant1

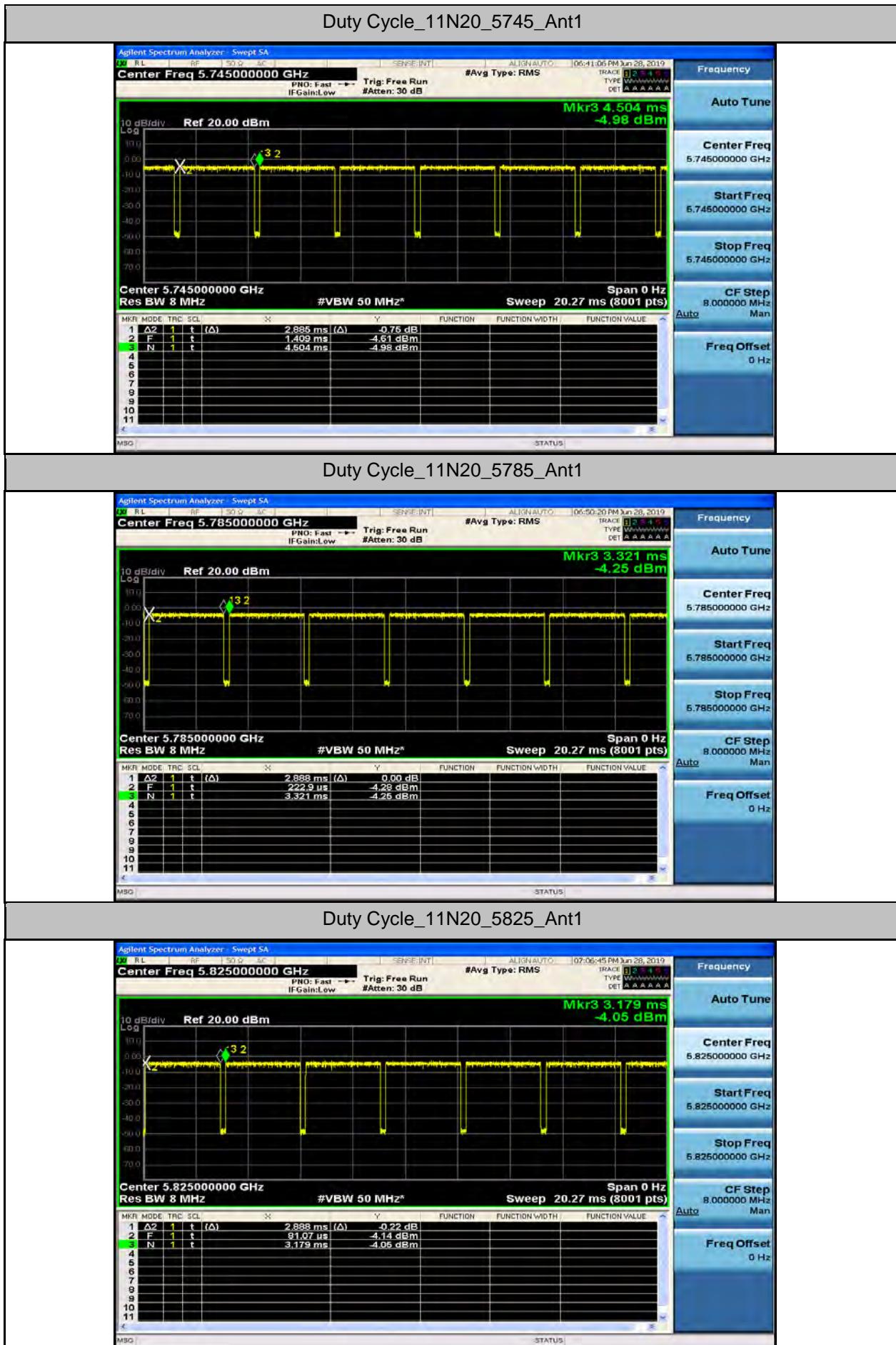


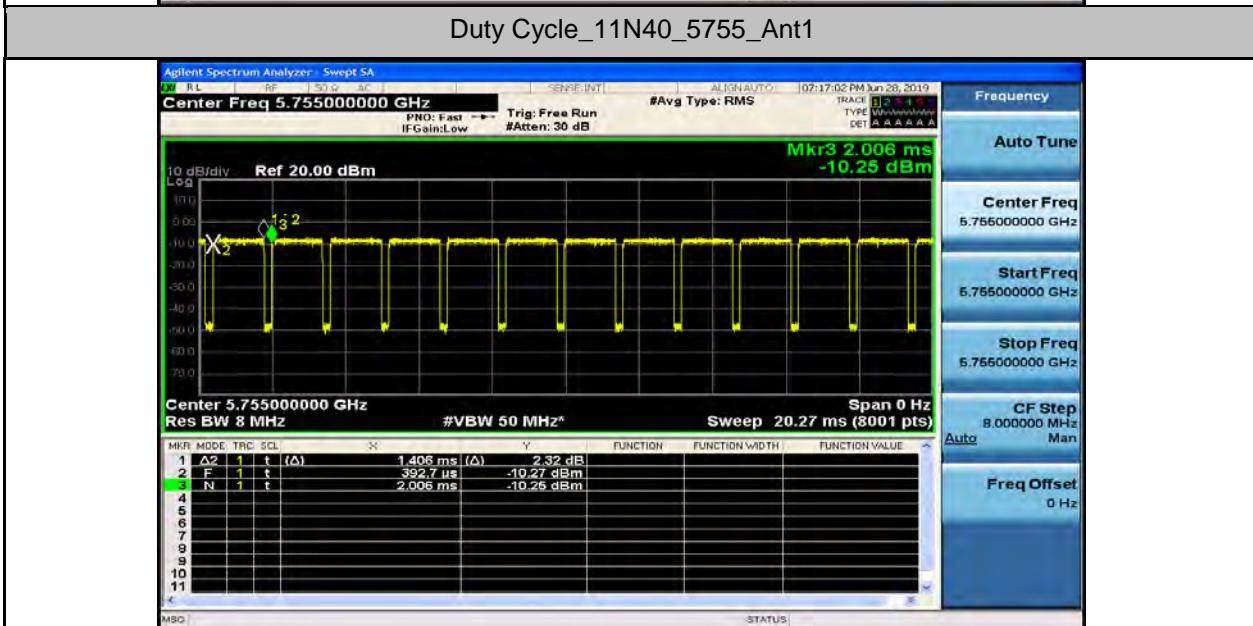
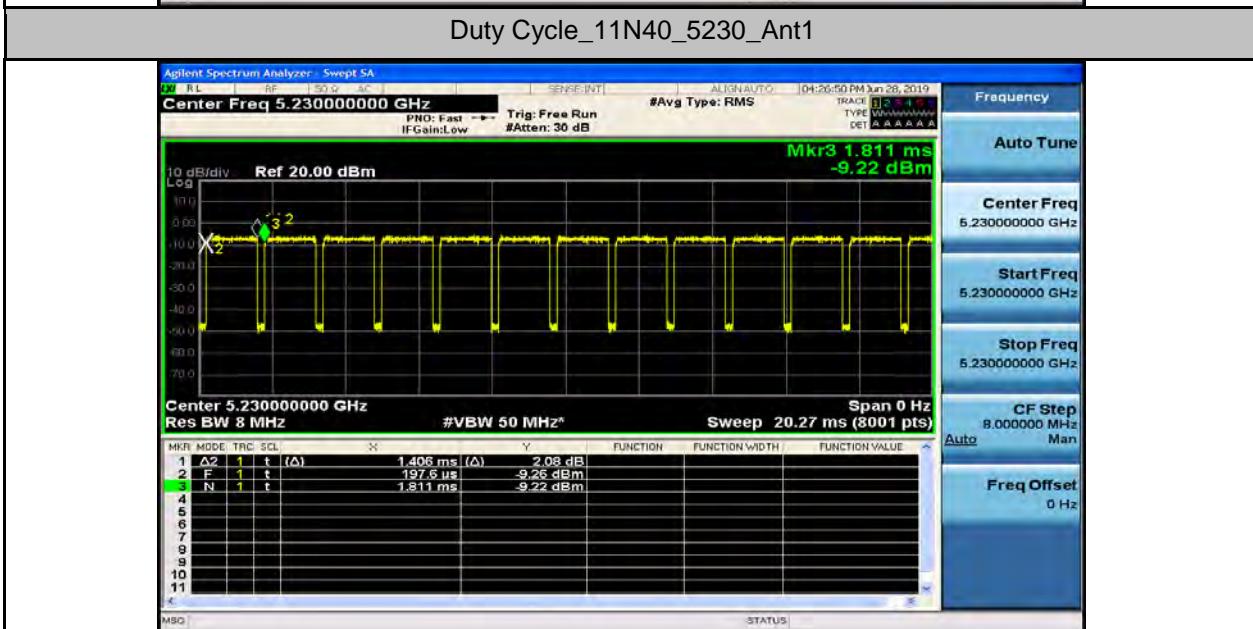
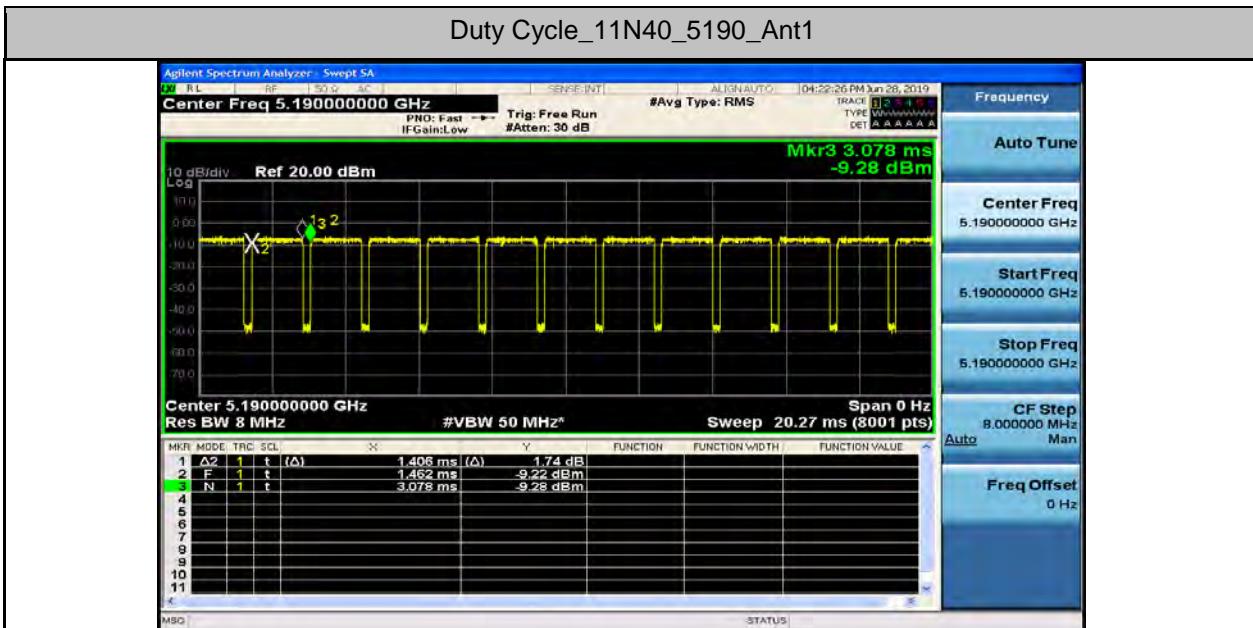
Duty Cycle_11N20_5220_Ant1



Duty Cycle 11N20 5240 Ant1







Duty Cycle_11N40_5795_Ant1



