

Appendix B for 5GWIFI Test Data

Product Name: ATOTO Car Navigation Multimedia Receiver

Test Model: F7G209WE

Environmental Conditions

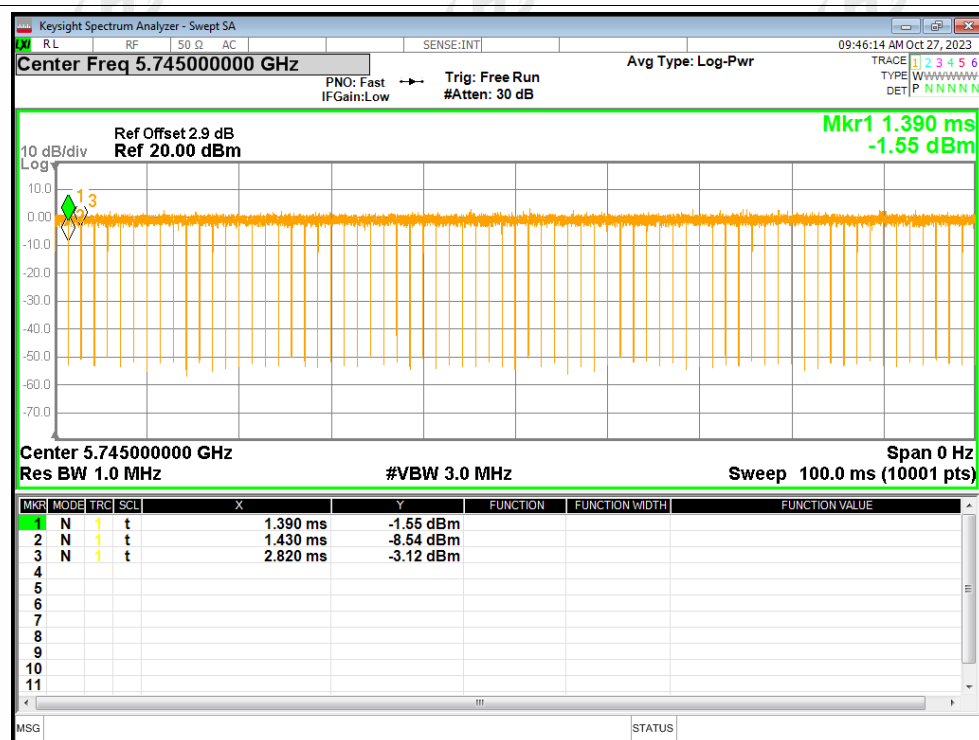
Temperature:	23.8℃
Relative Humidity:	52%
ATM Pressure:	101.0 kPa
Test Engineer:	Kimi Lu
Supervised by:	Baret Wu

B1.Duty Cycle

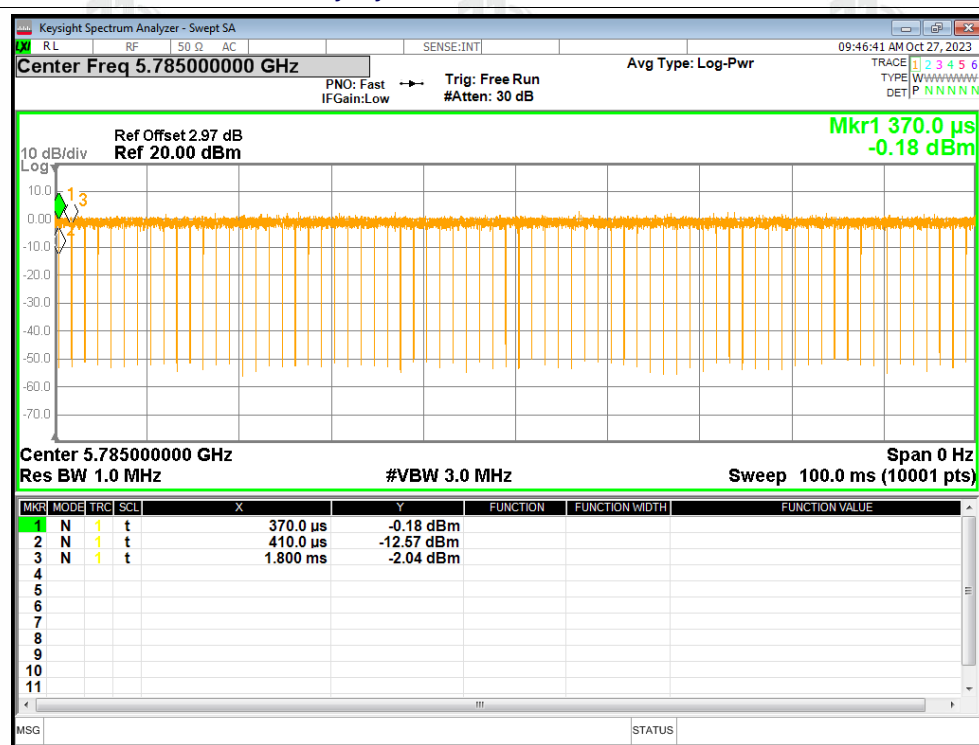
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5745	Ant1	97.2	0.12	0.72
NVNT	a	5785	Ant1	97.2	0.12	0.72
NVNT	a	5825	Ant1	97.2	0.12	0.72
NVNT	n20	5745	Ant1	97.89	0.09	0.72
NVNT	n20	5785	Ant1	97.2	0.12	0.72
NVNT	n20	5825	Ant1	97.2	0.12	0.72
NVNT	n40	5755	Ant1	96.08	0.17	1.02
NVNT	n40	5795	Ant1	97.9	0.09	0.71
NVNT	ac20	5745	Ant1	97.74	0.1	0.77
NVNT	ac20	5785	Ant1	97.01	0.13	0.77
NVNT	ac20	5825	Ant1	97.74	0.1	0.77
NVNT	ac40	5755	Ant1	94.2	0.26	1.54
NVNT	ac40	5795	Ant1	95.59	0.2	1.54
NVNT	ac80	5775	Ant1	83.64	0.78	2.17

Test Graphs

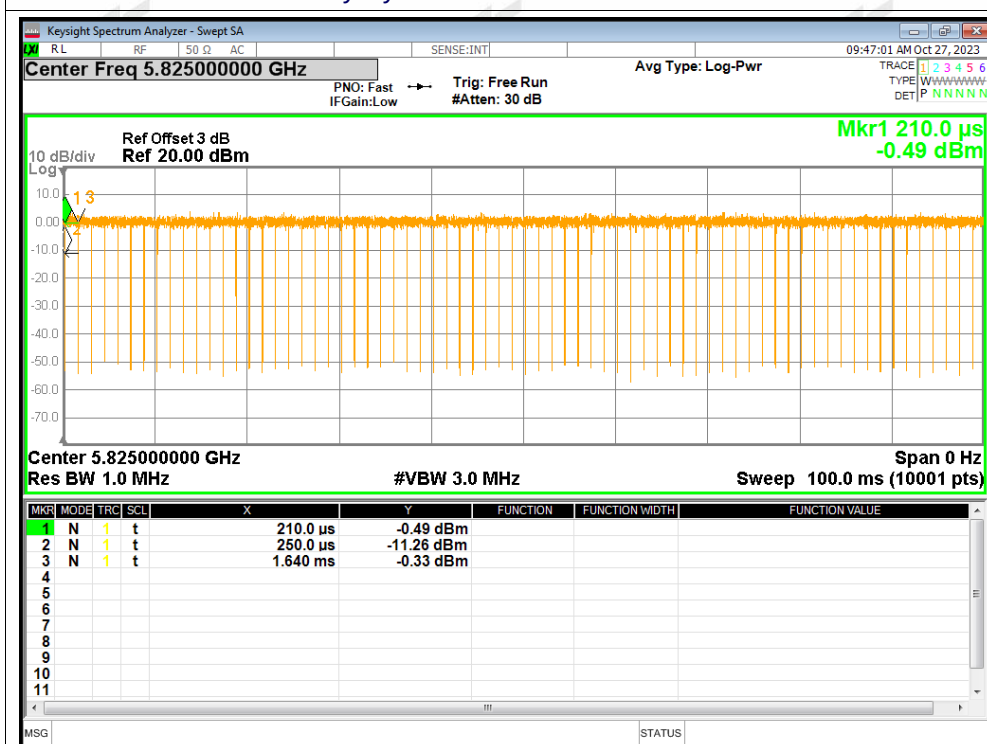
Duty Cycle NVNT a 5745MHz Ant1



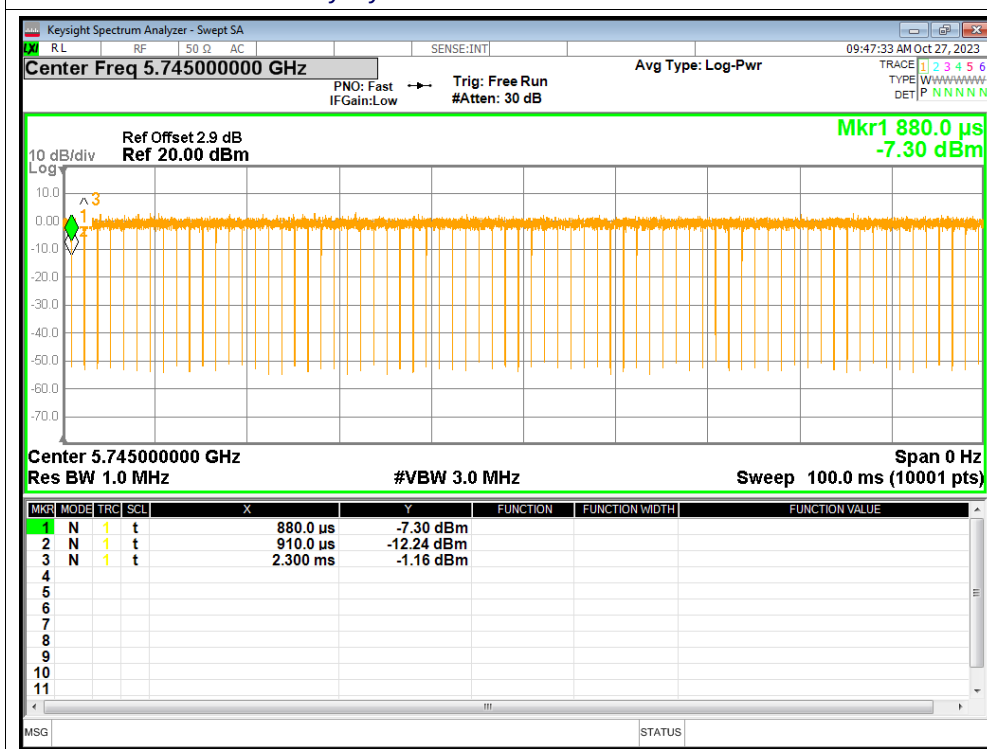
Duty Cycle NVNT a 5785MHz Ant1



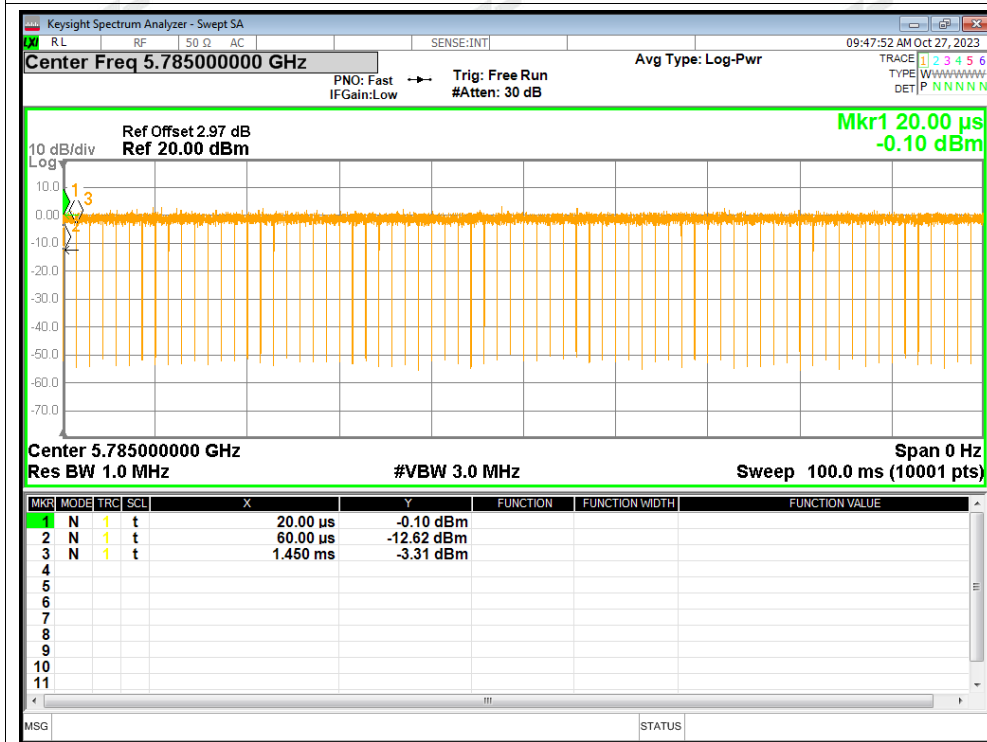
Duty Cycle NVNT a 5825MHz Ant1



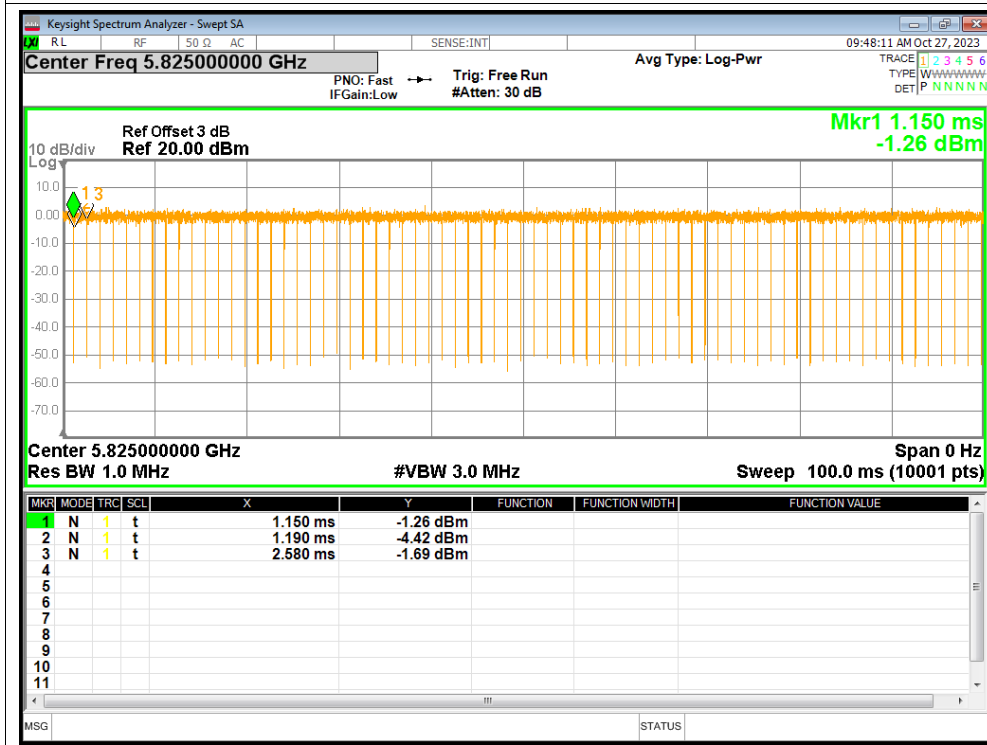
Duty Cycle NVNT n20 5745MHz Ant1



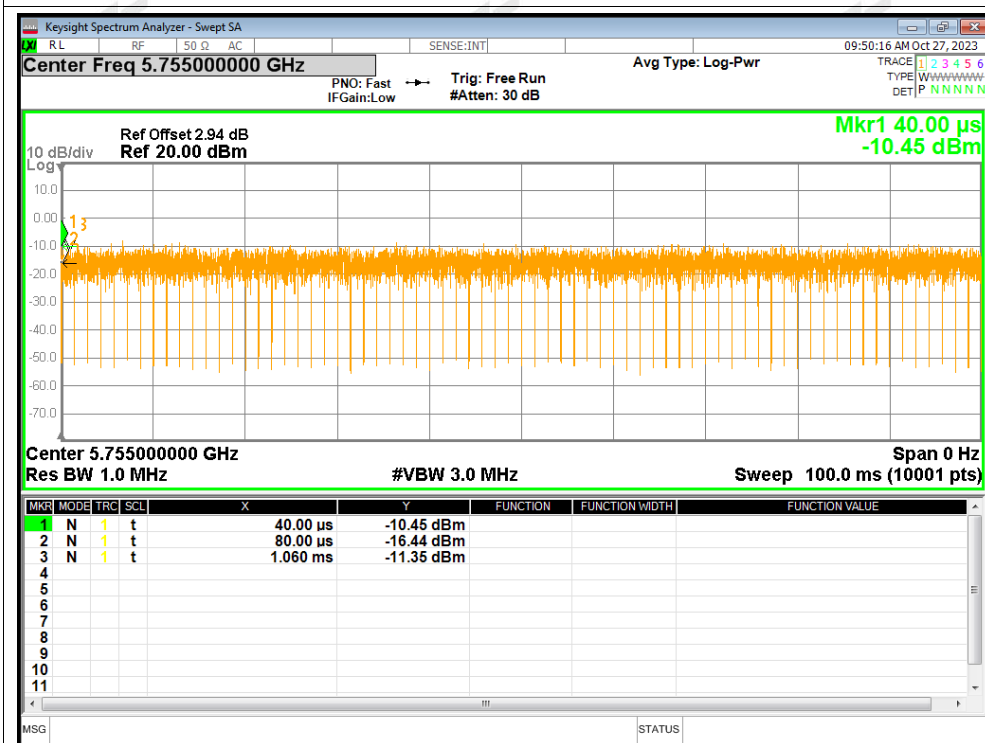
Duty Cycle NVNT n20 5785MHz Ant1



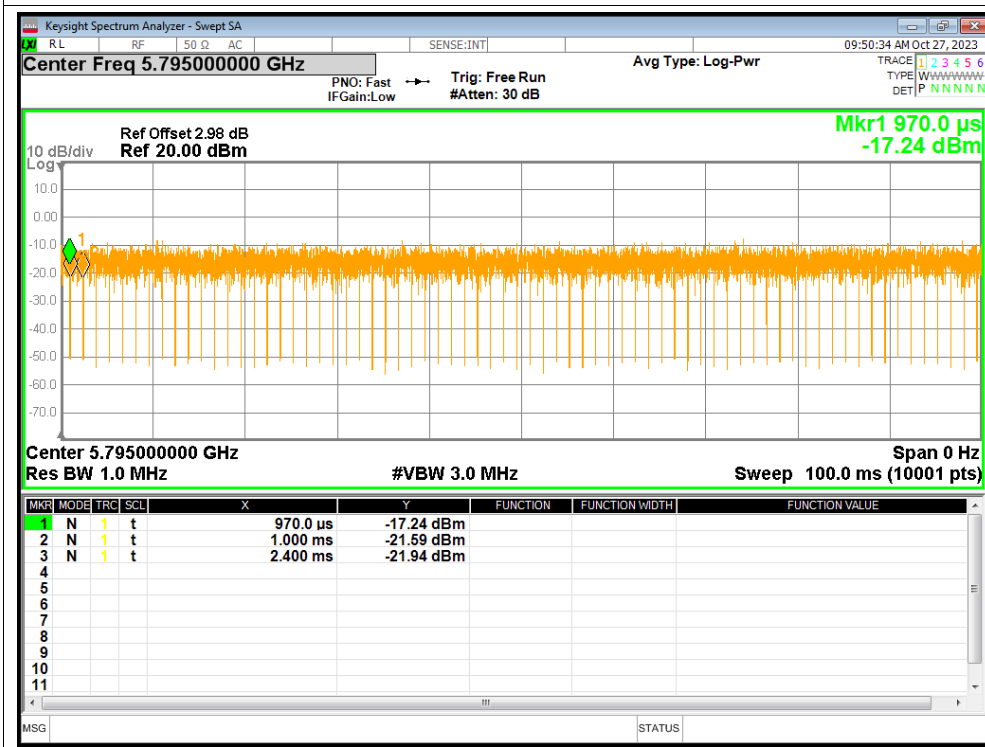
Duty Cycle NVNT n20 5825MHz Ant1



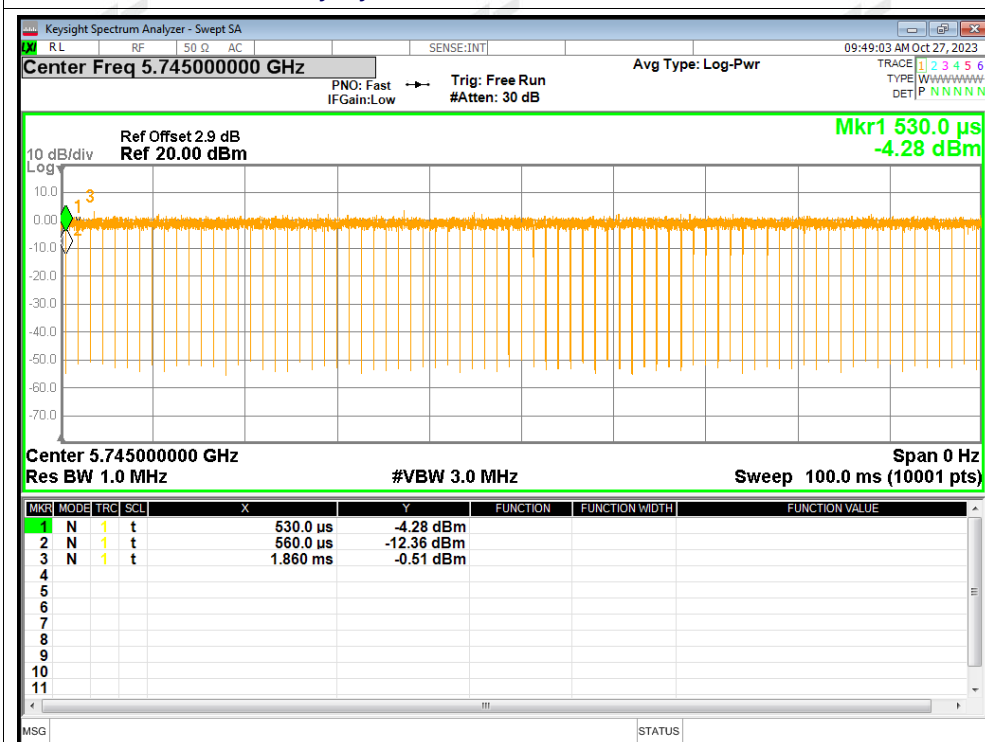
Duty Cycle NVNT n40 5755MHz Ant1



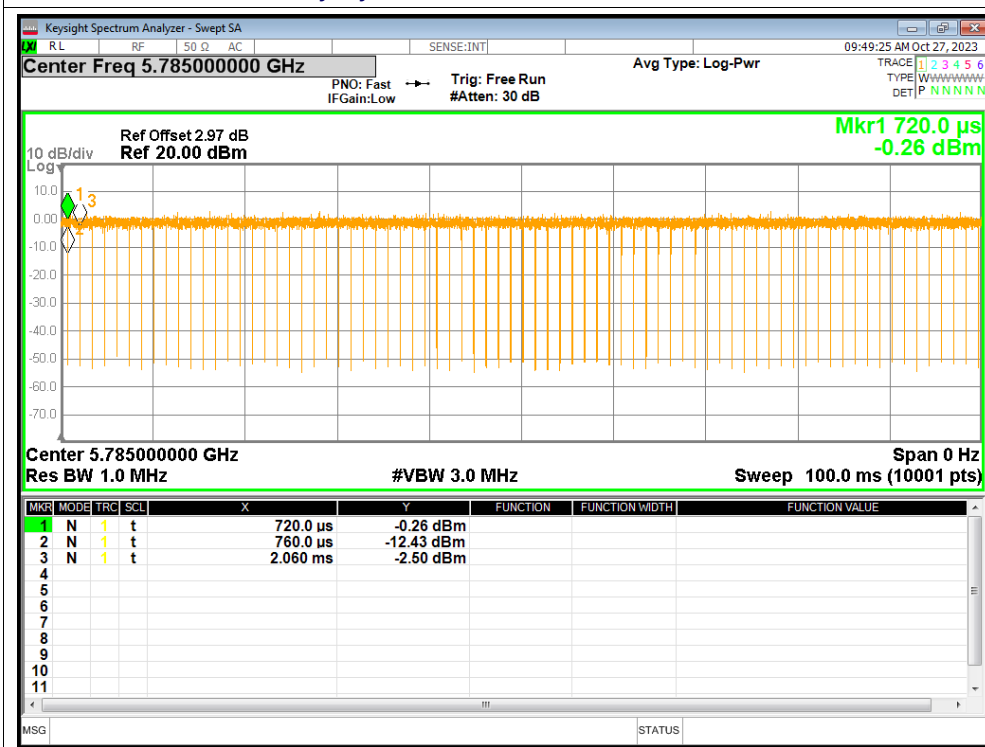
Duty Cycle NVNT n40 5795MHz Ant1



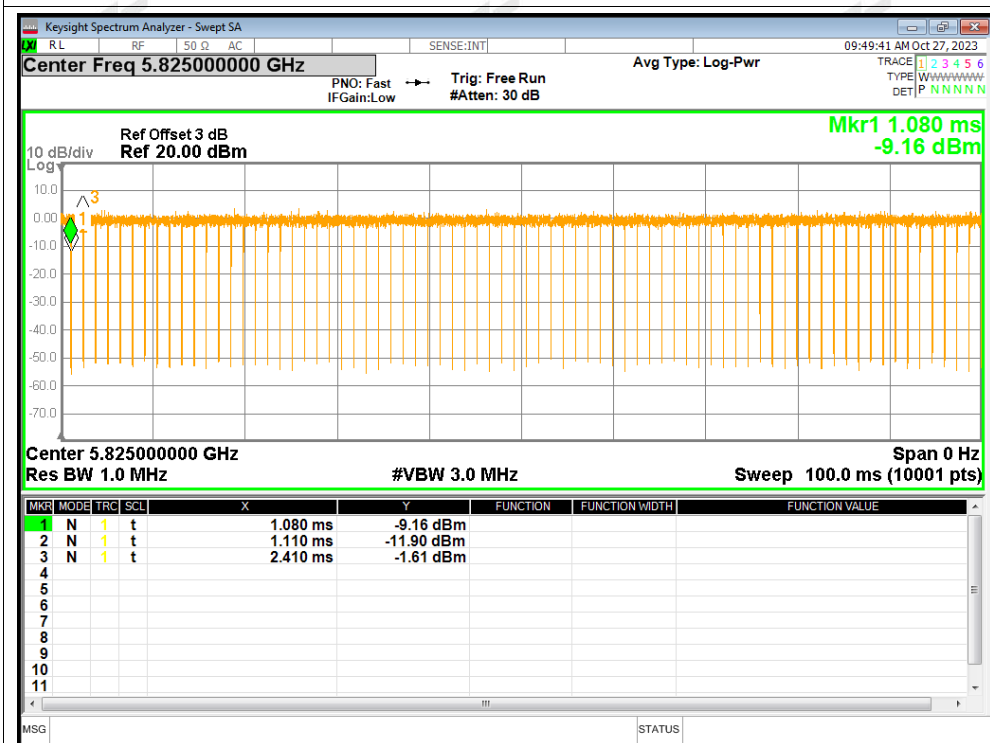
Duty Cycle NVNT ac20 5745MHz Ant1



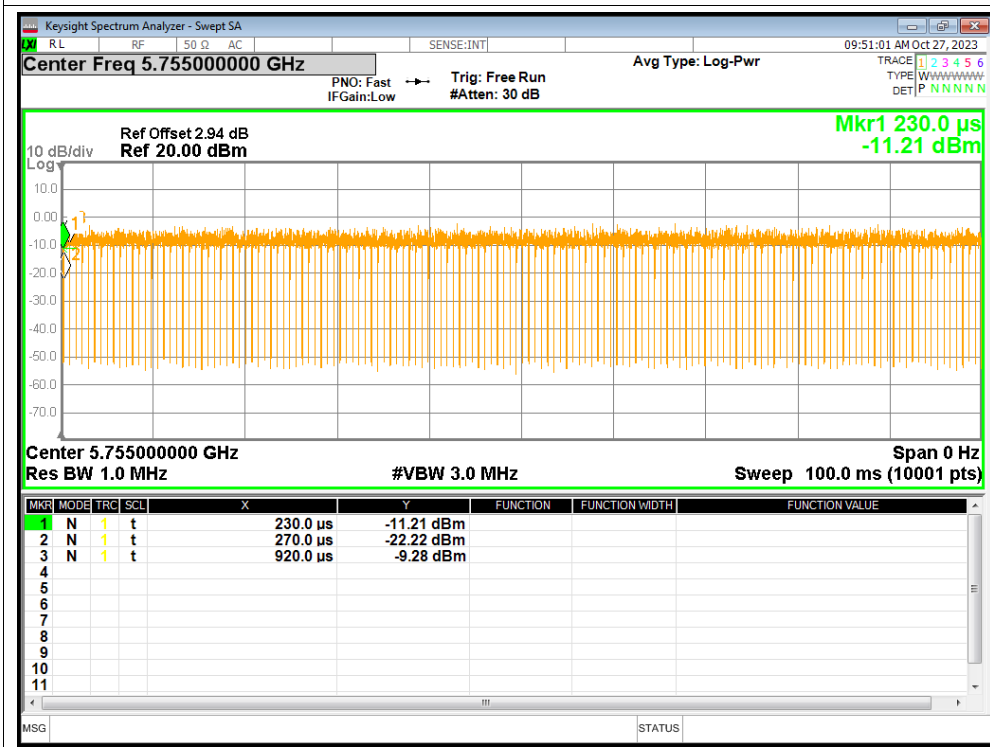
Duty Cycle NVNT ac20 5785MHz Ant1



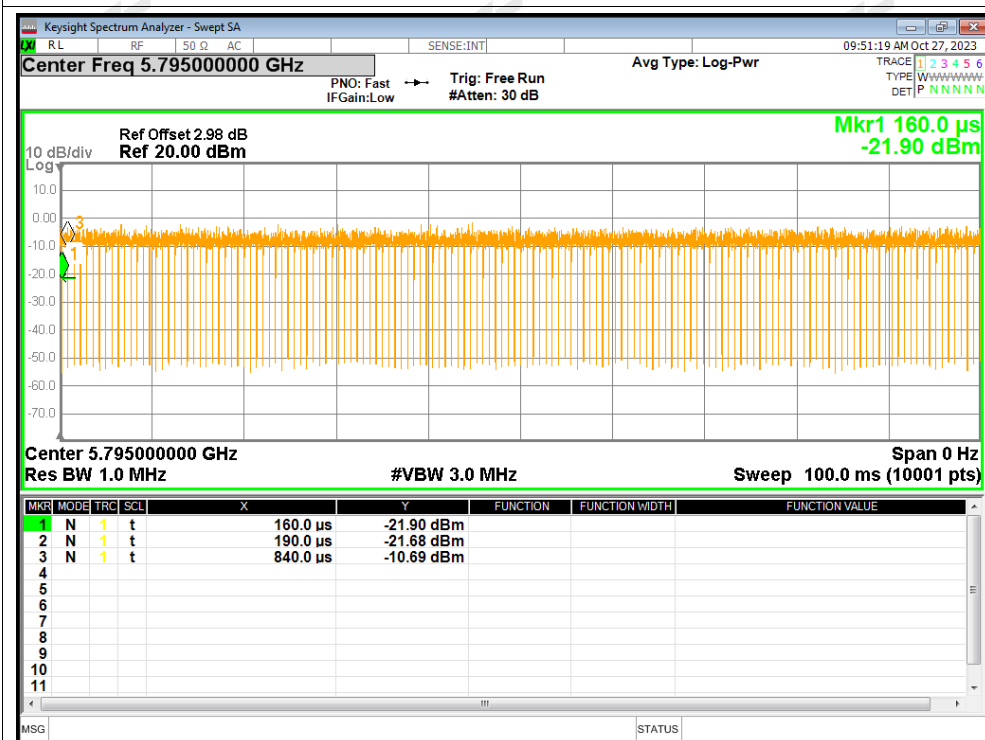
Duty Cycle NVNT ac20 5825MHz Ant1



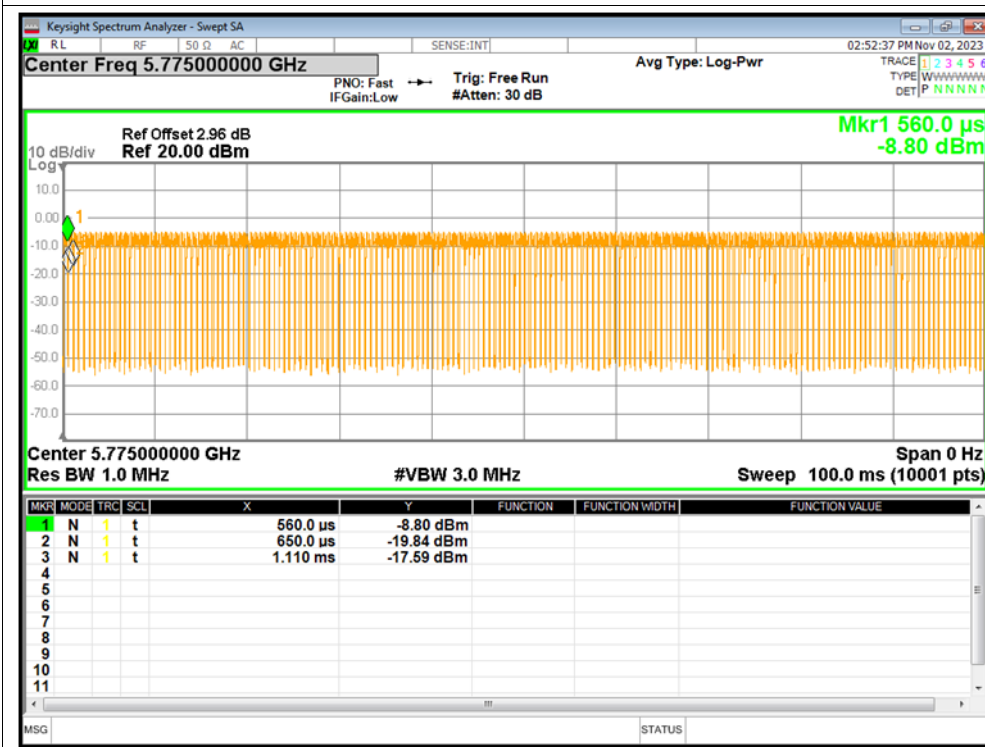
Duty Cycle NVNT ac40 5755MHz Ant1



Duty Cycle NVNT ac40 5795MHz Ant1



Duty Cycle NVNT ac80 5775MHz Ant1

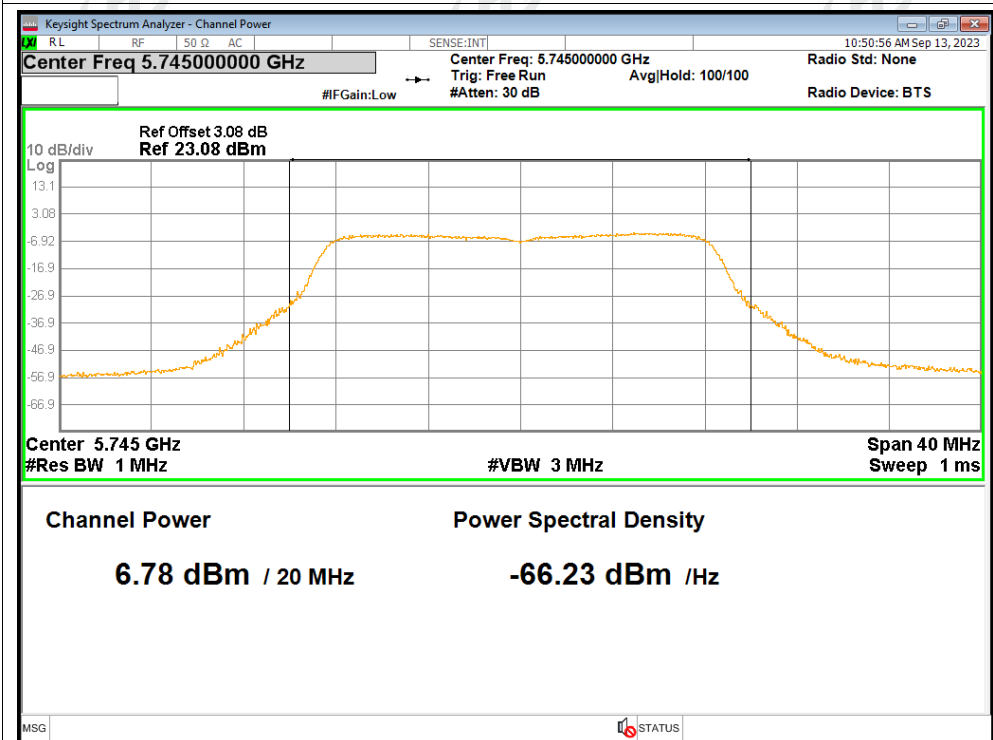


B2.Maximum Conducted Output Power

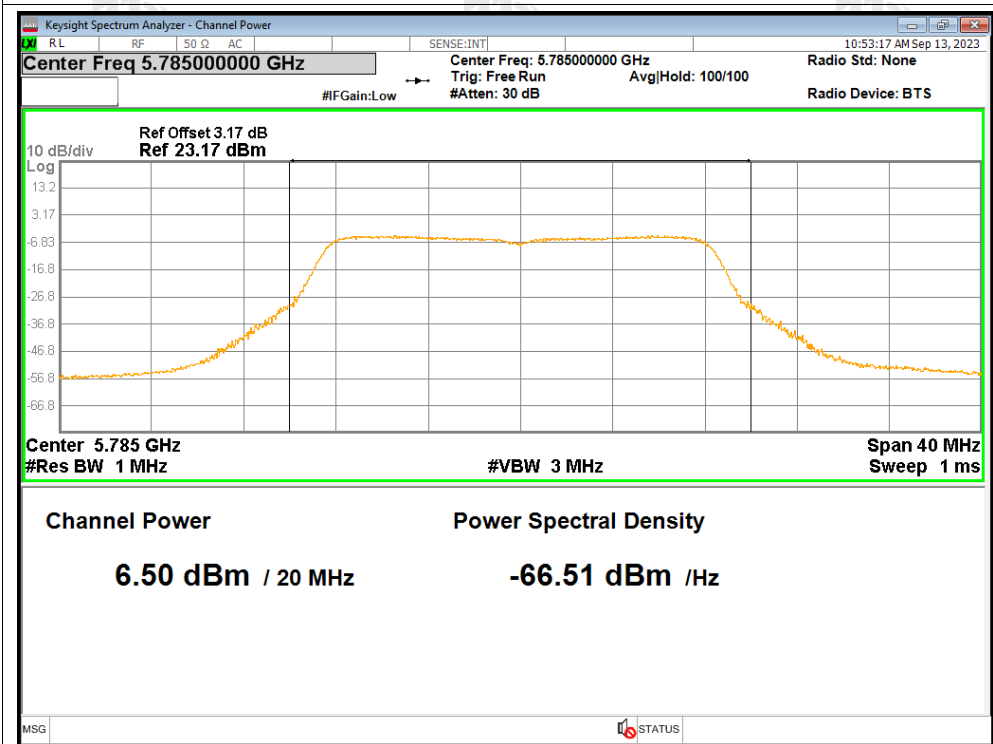
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	Ant1	6.78	0.12	6.9	30	Pass
NVNT	a	5785	Ant1	6.5	0.12	6.62	30	Pass
NVNT	a	5825	Ant1	6.04	0.12	6.16	30	Pass
NVNT	n20	5745	Ant1	5.7	0.09	5.79	30	Pass
NVNT	n20	5785	Ant1	5.76	0.12	5.88	30	Pass
NVNT	n20	5825	Ant1	5.5	0.12	5.62	30	Pass
NVNT	n40	5755	Ant1	6.93	0.17	7.1	30	Pass
NVNT	n40	5795	Ant1	5.84	0.09	5.93	30	Pass
NVNT	ac20	5745	Ant1	4.81	0.1	4.91	30	Pass
NVNT	ac20	5785	Ant1	5.01	0.13	5.14	30	Pass
NVNT	ac20	5825	Ant1	4.38	0.1	4.48	30	Pass
NVNT	ac40	5755	Ant1	5.69	0.26	5.95	30	Pass
NVNT	ac40	5795	Ant1	4.79	0.2	4.99	30	Pass
NVNT	ac80	5775	Ant1	4.91	0.78	5.69	30	Pass

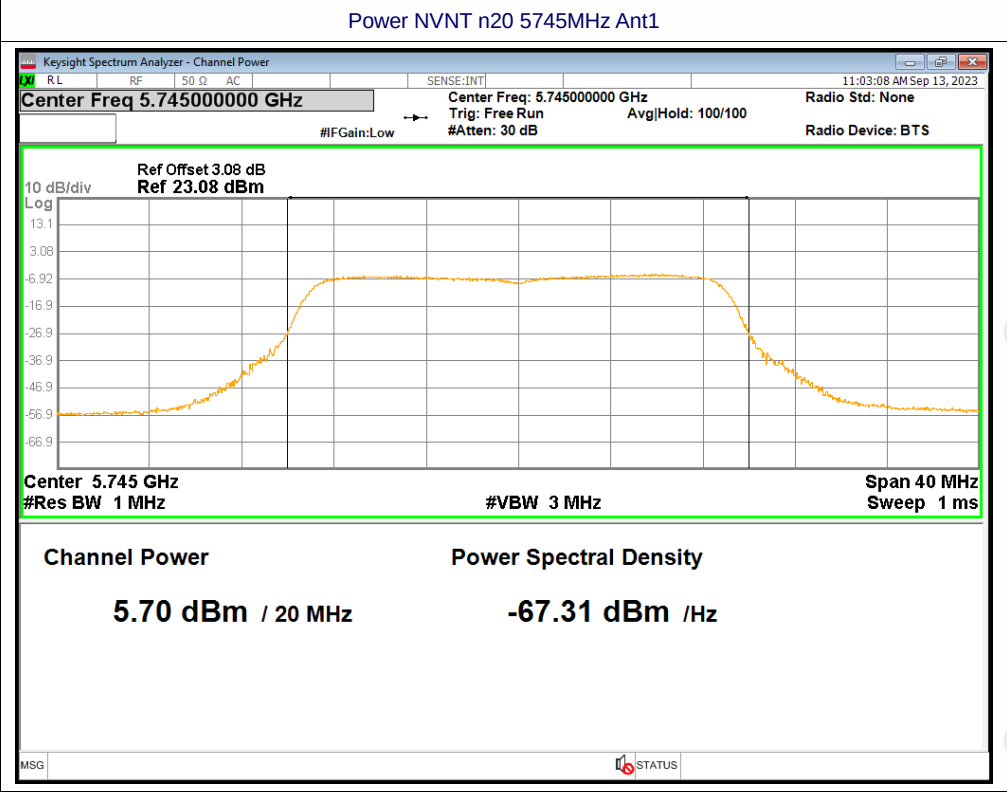
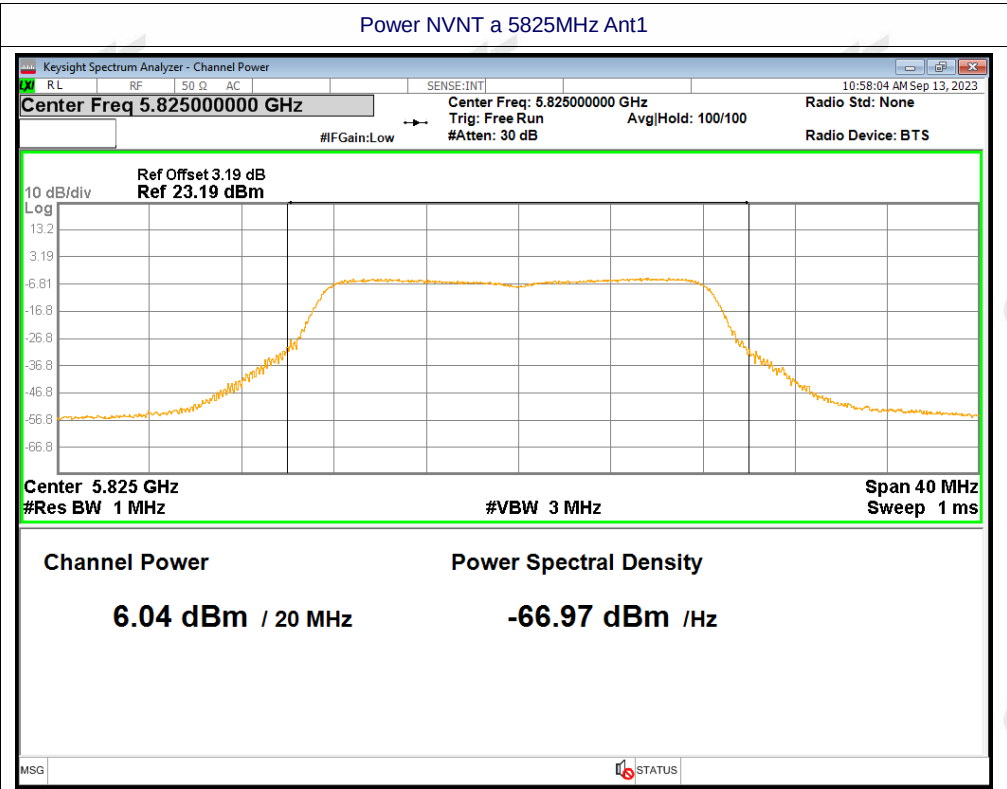
Test Graphs

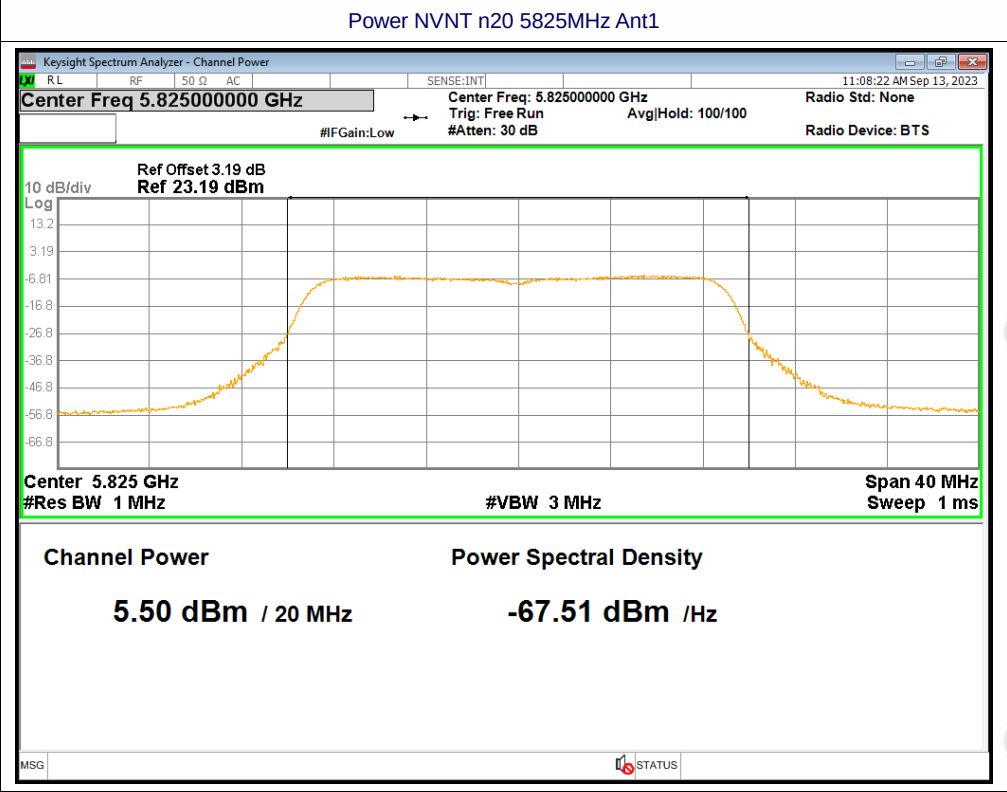
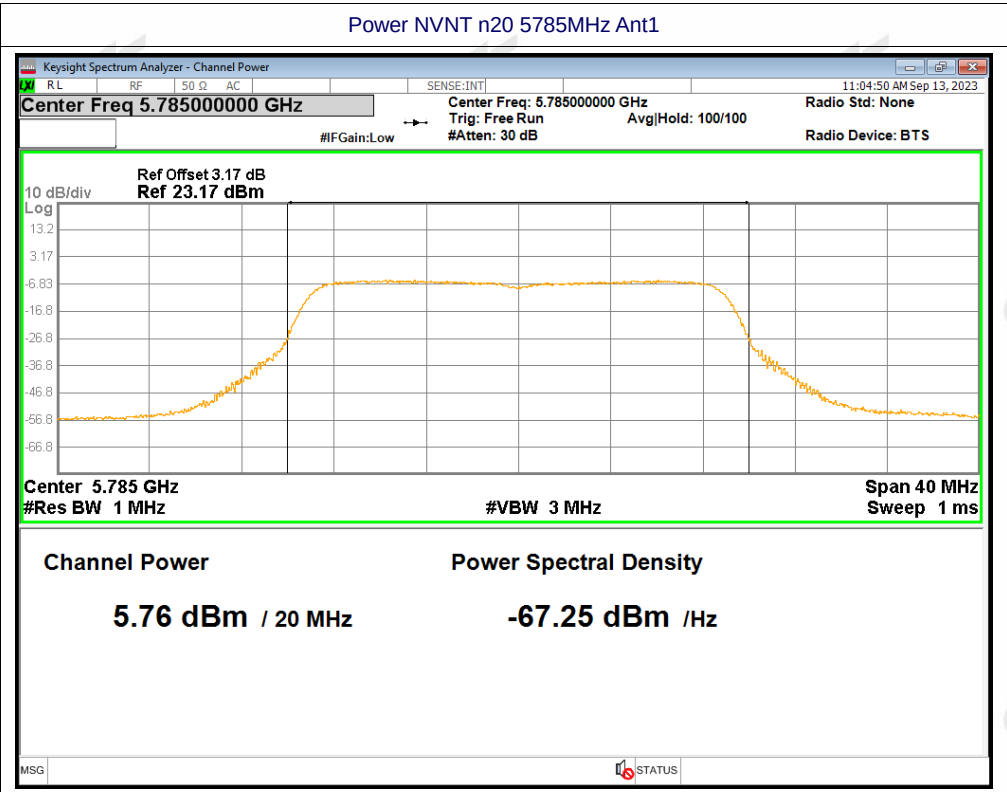
Power NVNT a 5745MHz Ant1

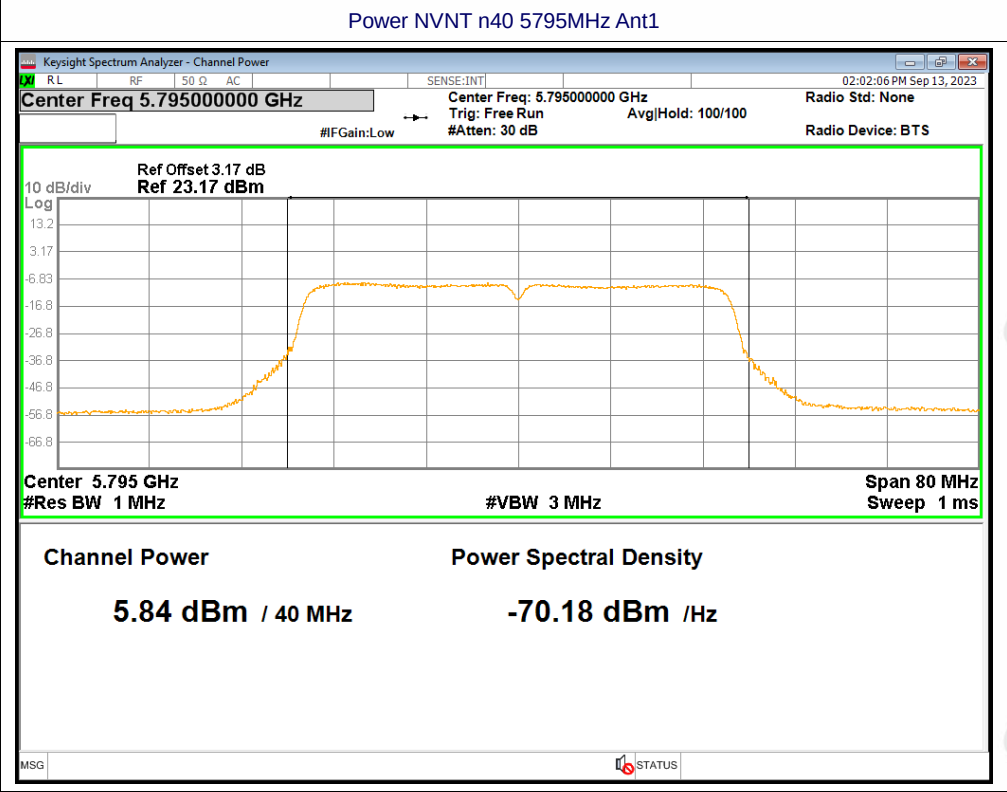
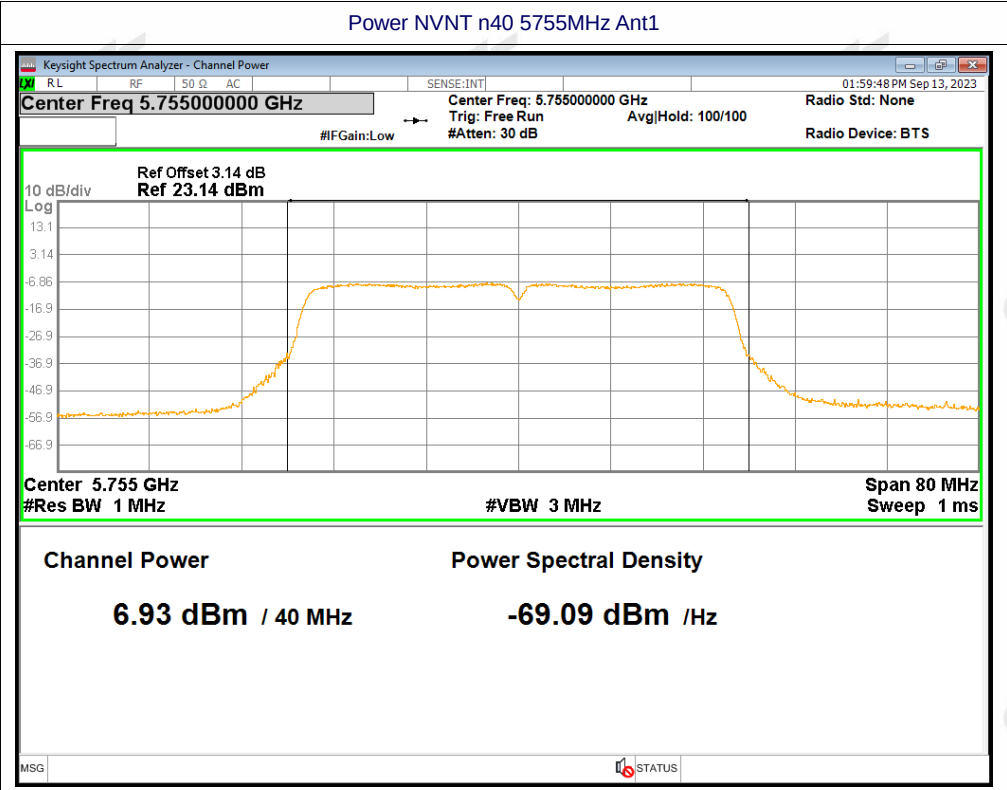


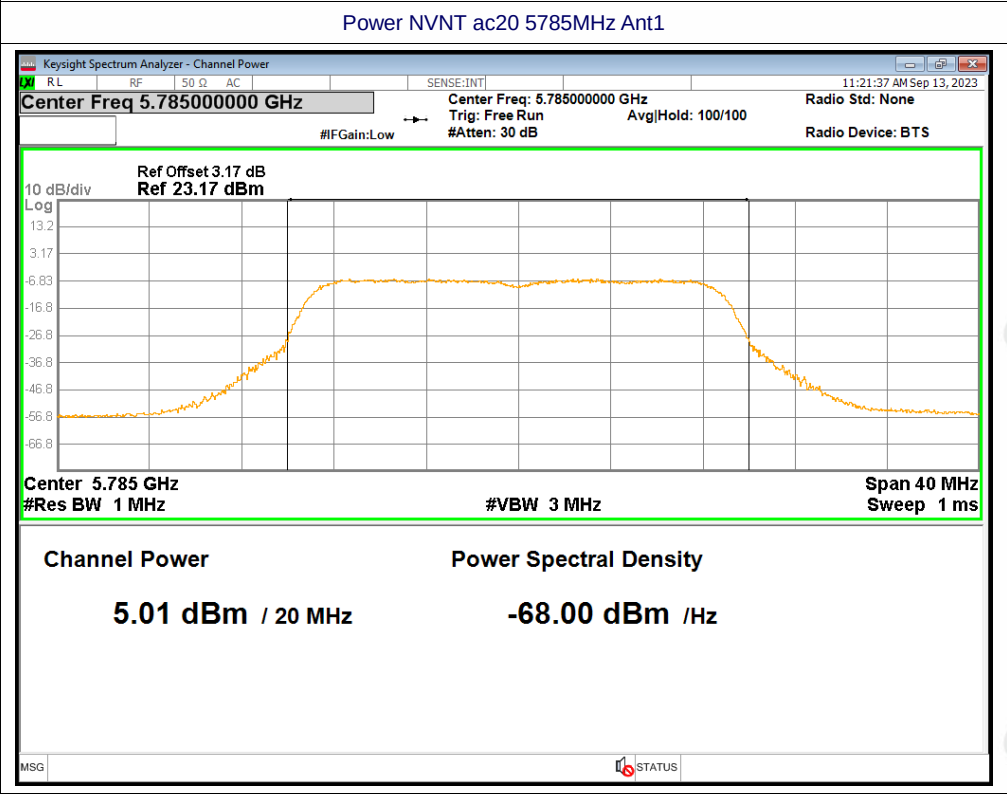
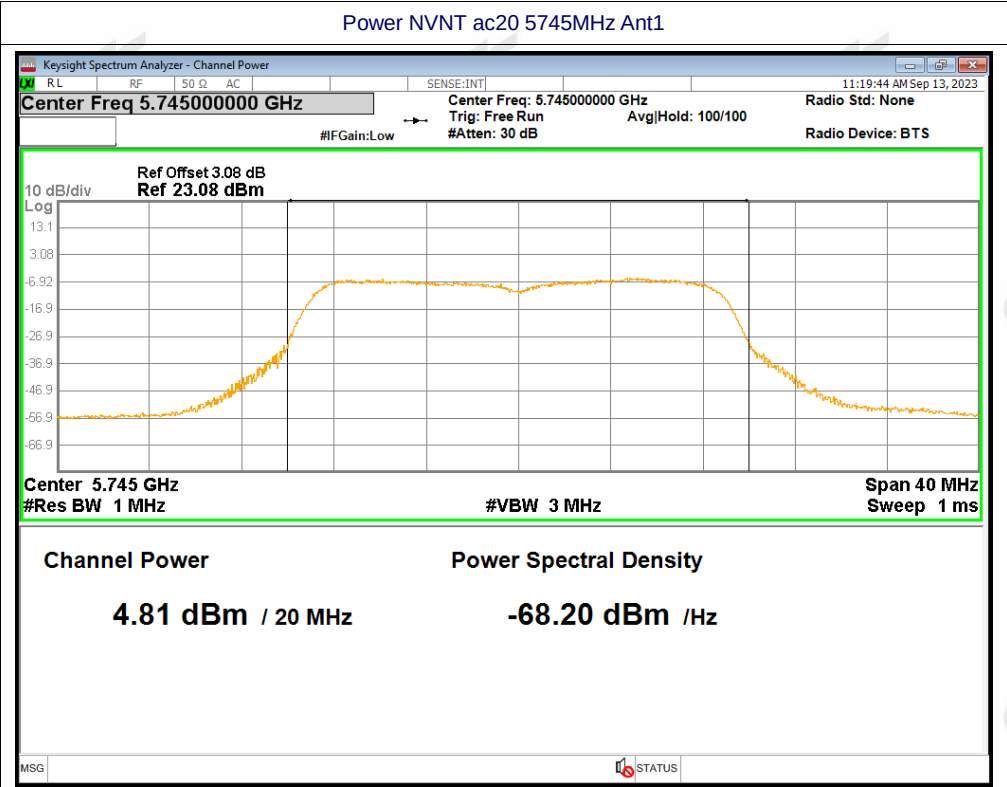
Power NVNT a 5785MHz Ant1

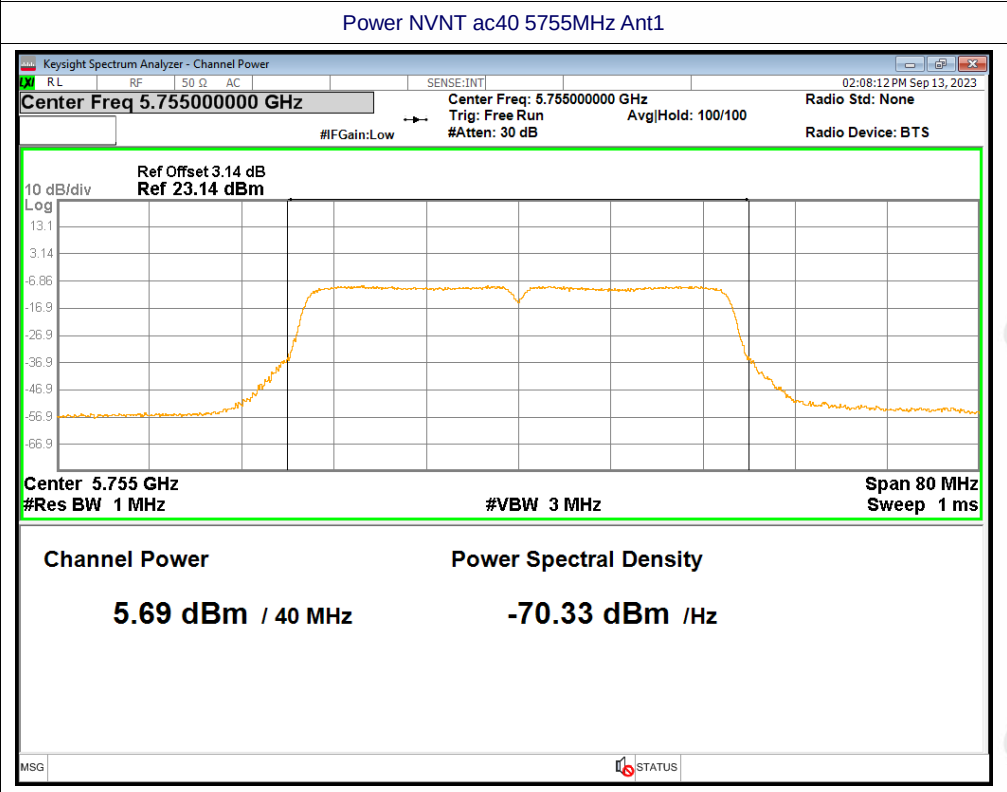
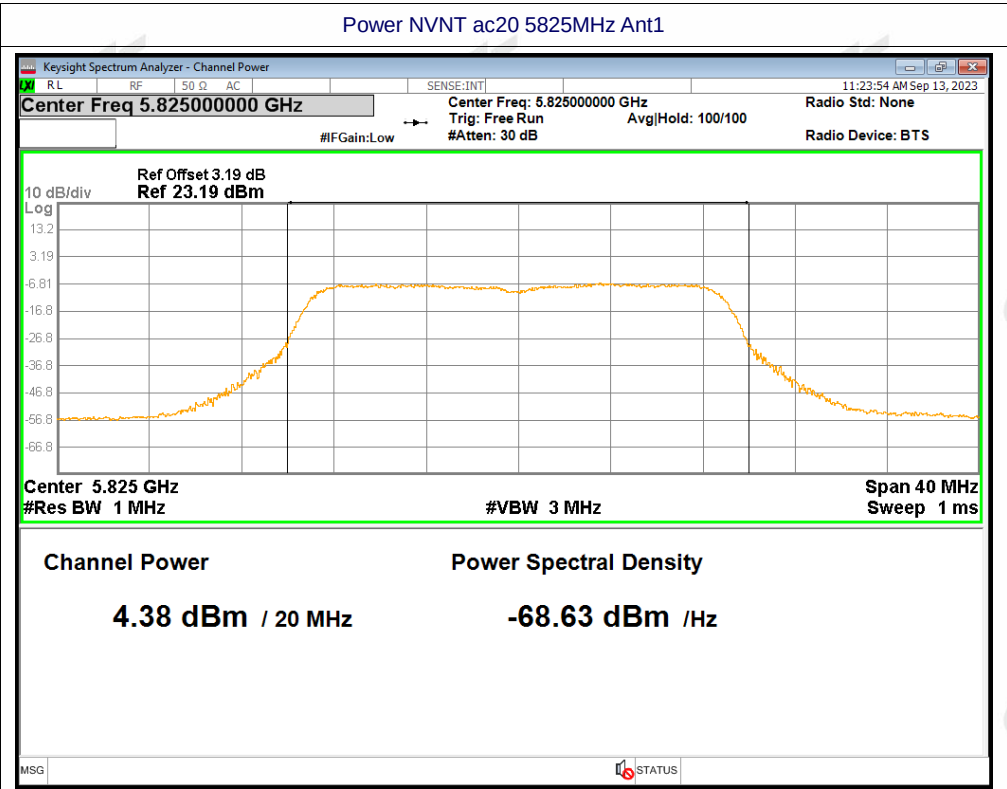


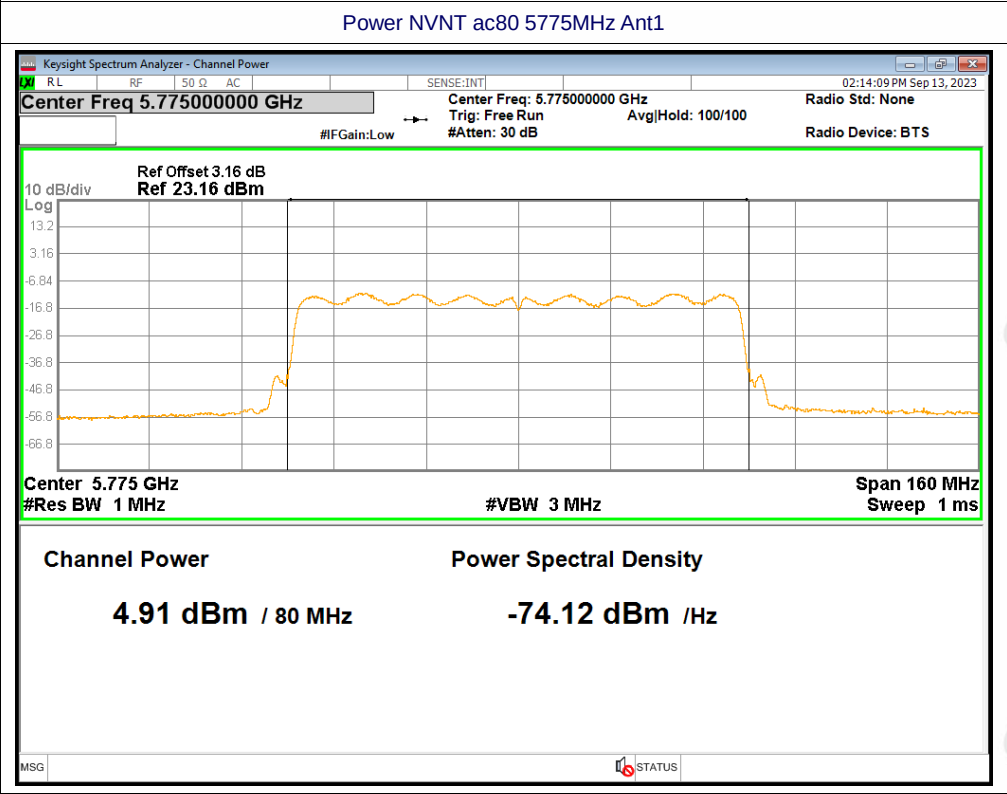
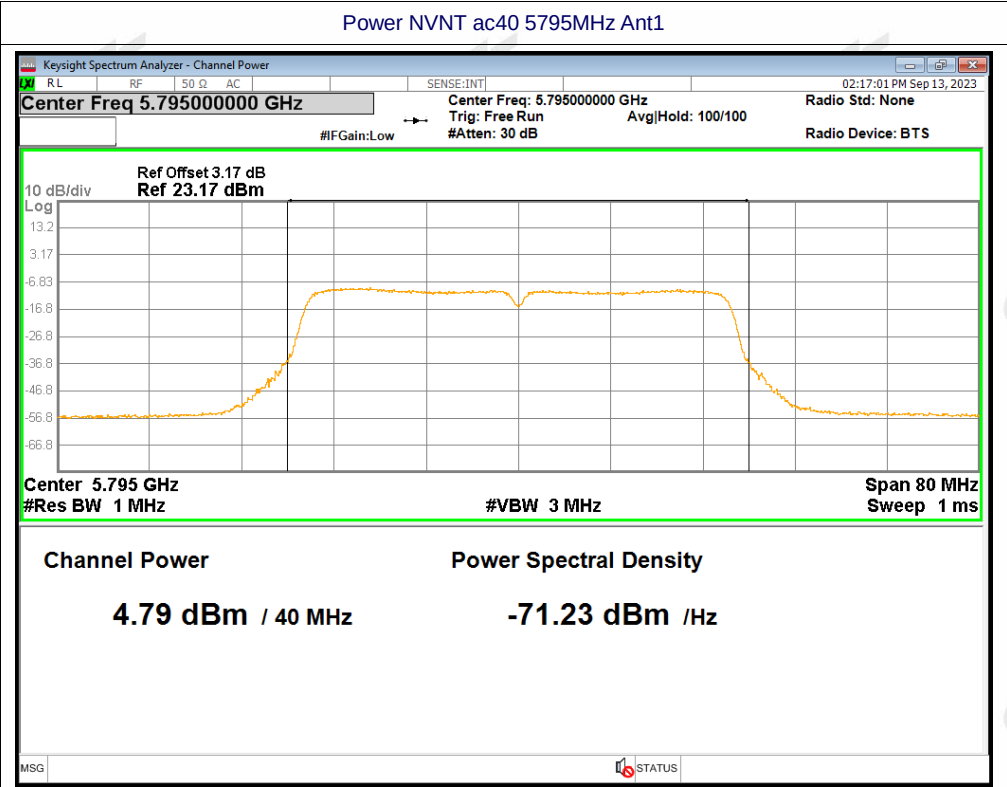










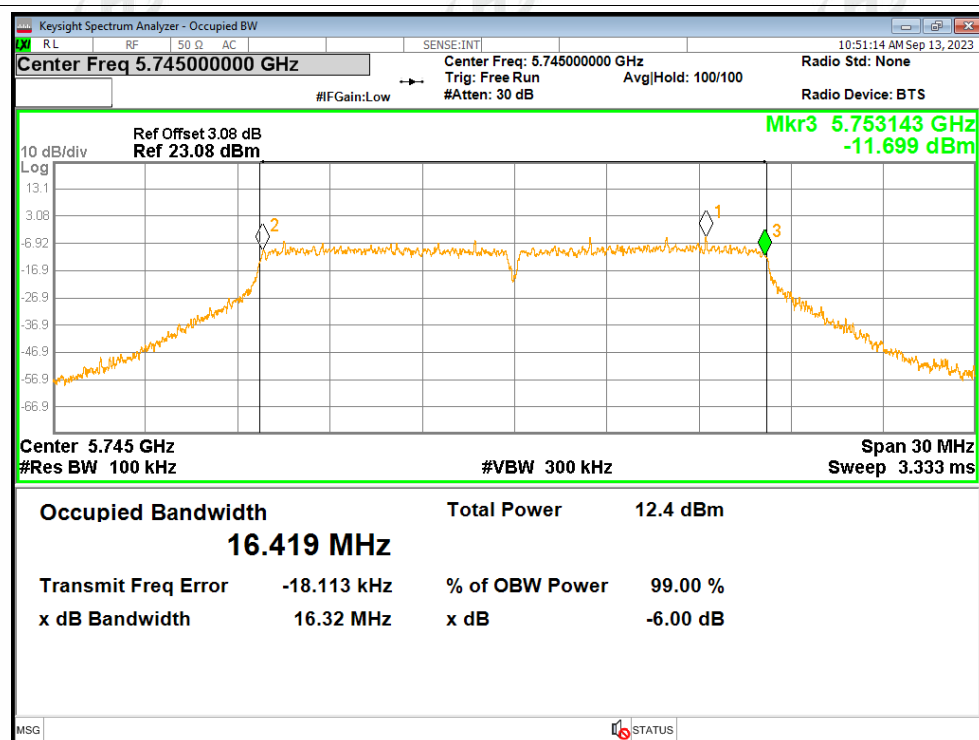


B3.-6dB Bandwidth

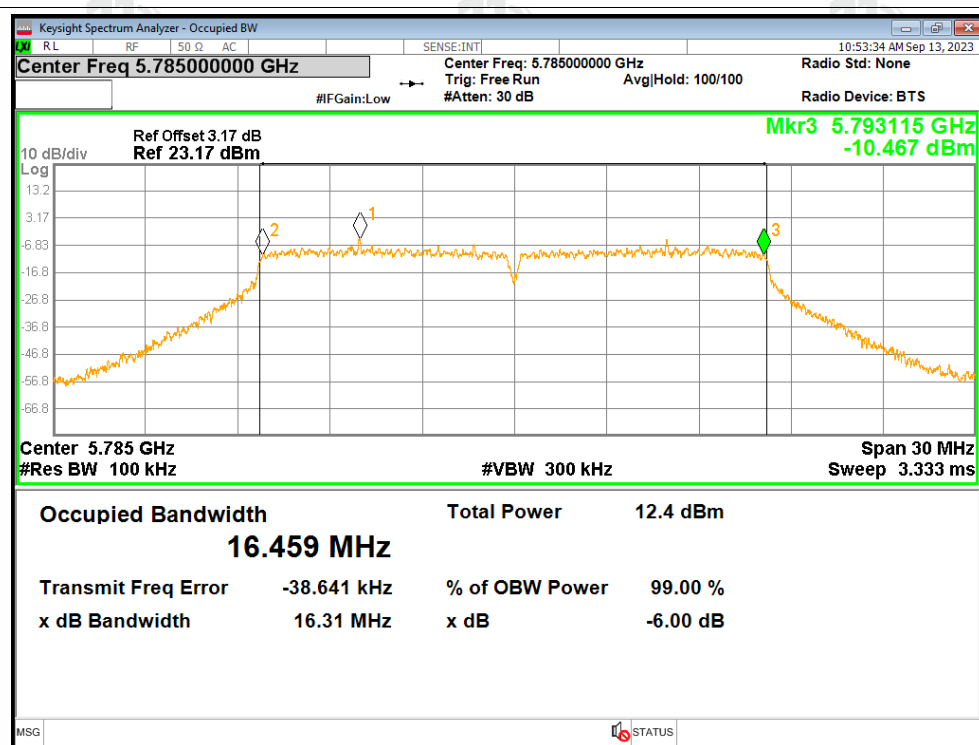
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	a	5745	Ant1	16.32	0.5	Pass
NVNT	a	5785	Ant1	16.31	0.5	Pass
NVNT	a	5825	Ant1	16.33	0.5	Pass
NVNT	n20	5745	Ant1	17.29	0.5	Pass
NVNT	n20	5785	Ant1	17.56	0.5	Pass
NVNT	n20	5825	Ant1	17.37	0.5	Pass
NVNT	n40	5755	Ant1	35.79	0.5	Pass
NVNT	n40	5795	Ant1	35.91	0.5	Pass
NVNT	ac20	5745	Ant1	17.44	0.5	Pass
NVNT	ac20	5785	Ant1	17.04	0.5	Pass
NVNT	ac20	5825	Ant1	16.90	0.5	Pass
NVNT	ac40	5755	Ant1	35.18	0.5	Pass
NVNT	ac40	5795	Ant1	35.76	0.5	Pass
NVNT	ac80	5775	Ant1	75.15	0.5	Pass

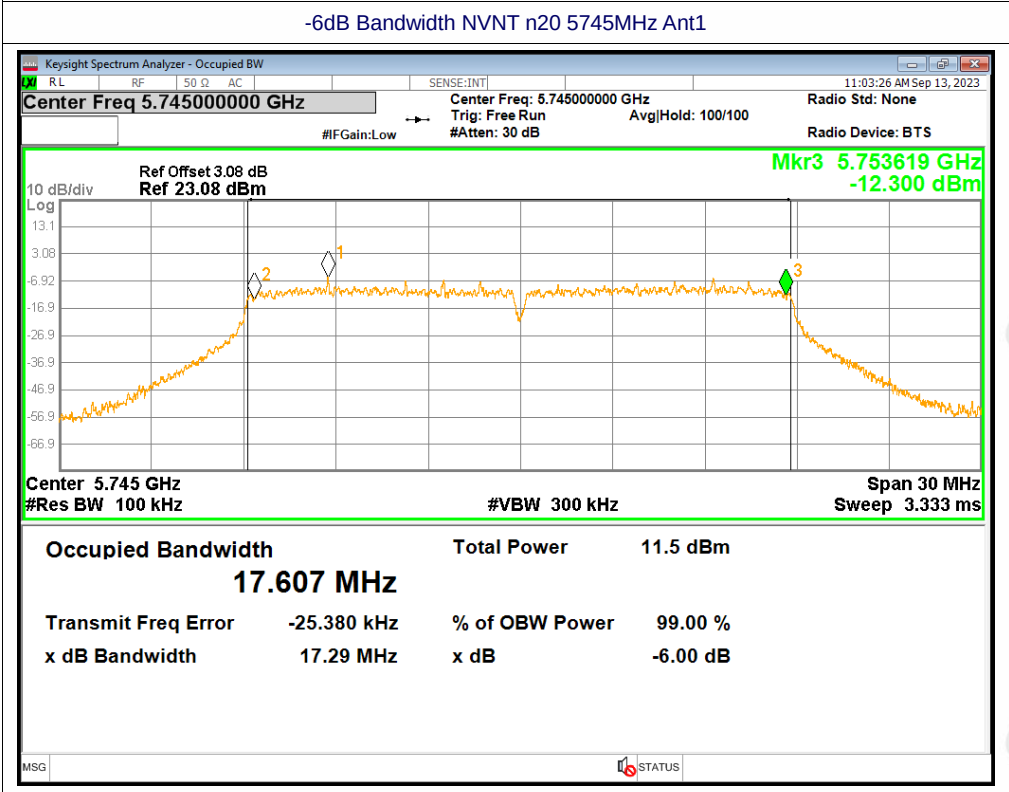
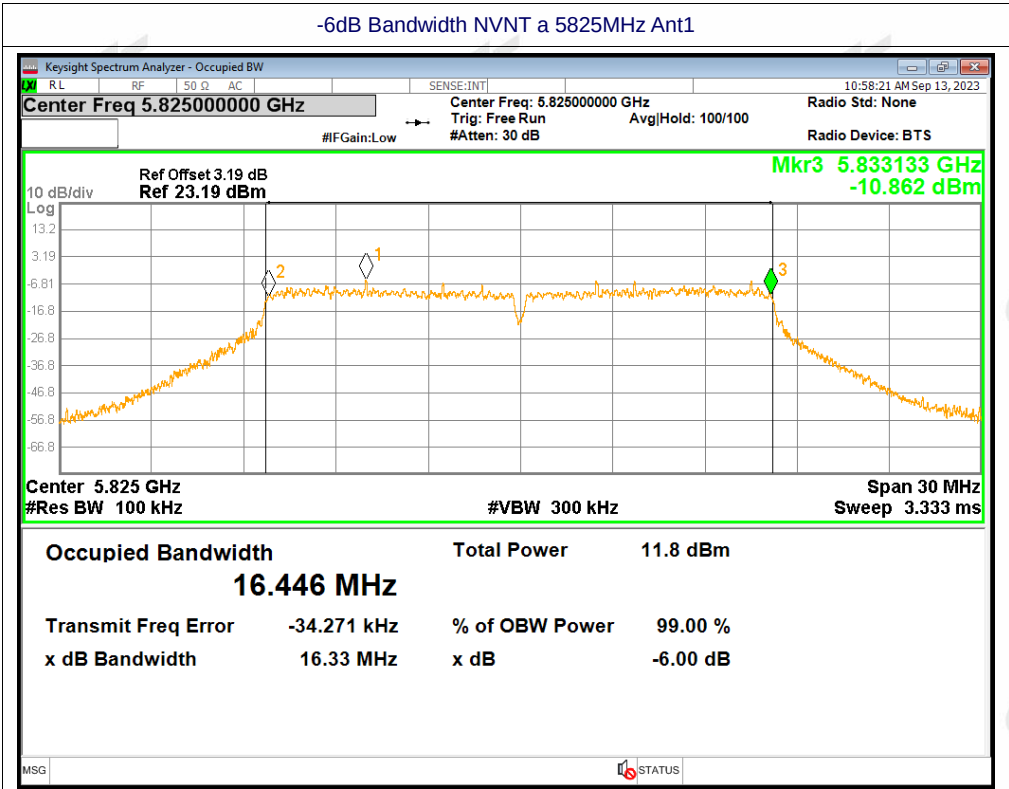
Test Graphs

-6dB Bandwidth NVNT a 5745MHz Ant1

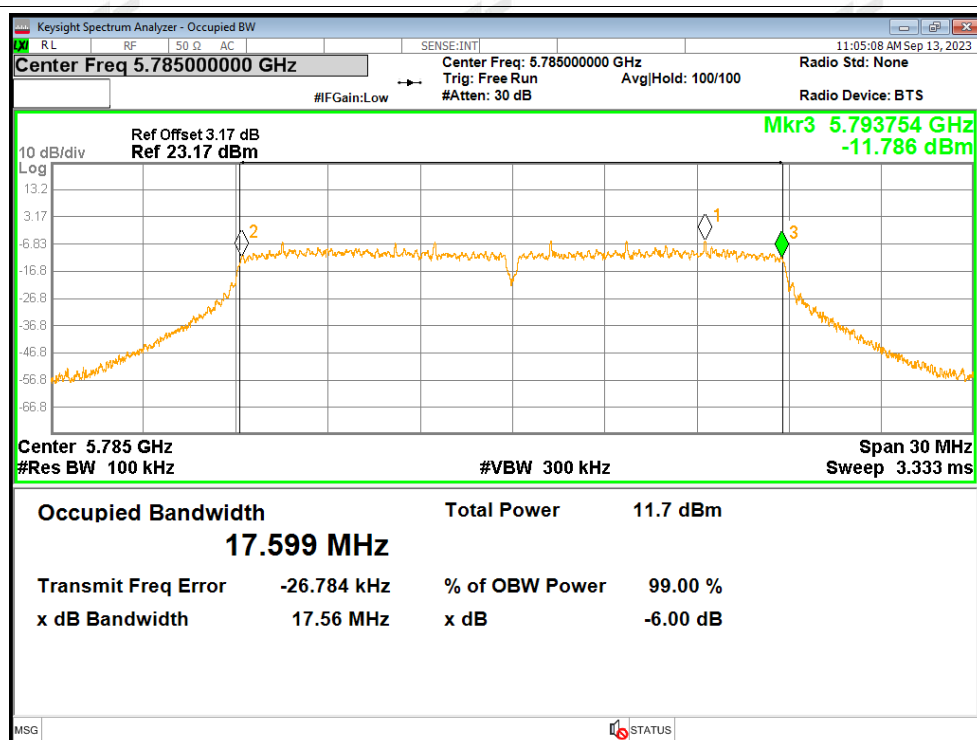


-6dB Bandwidth NVNT a 5785MHz Ant1

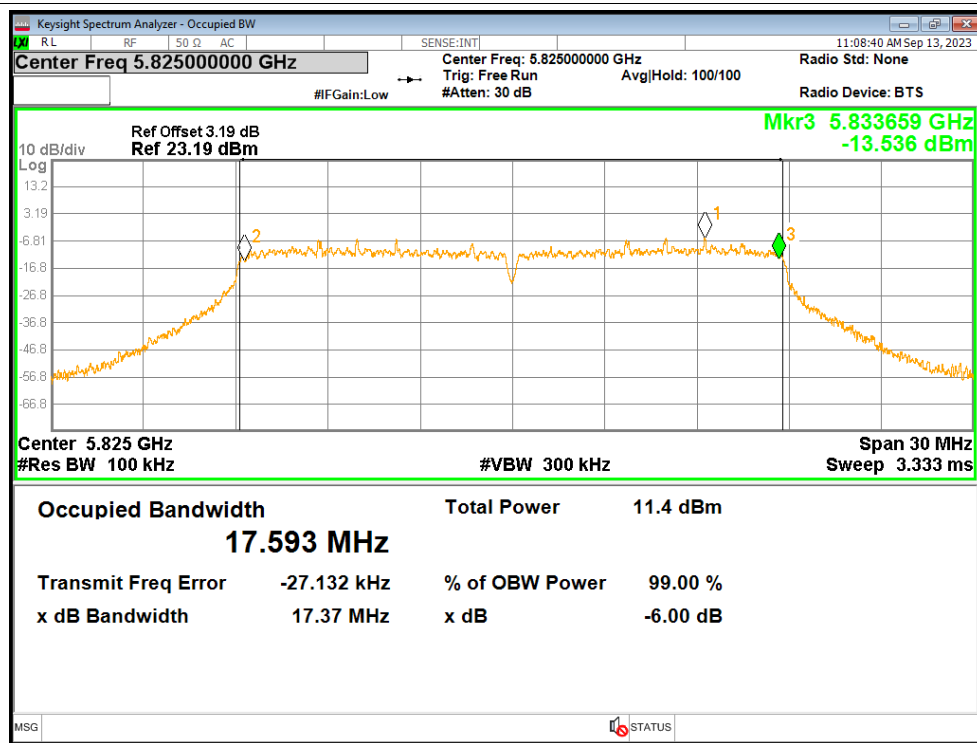


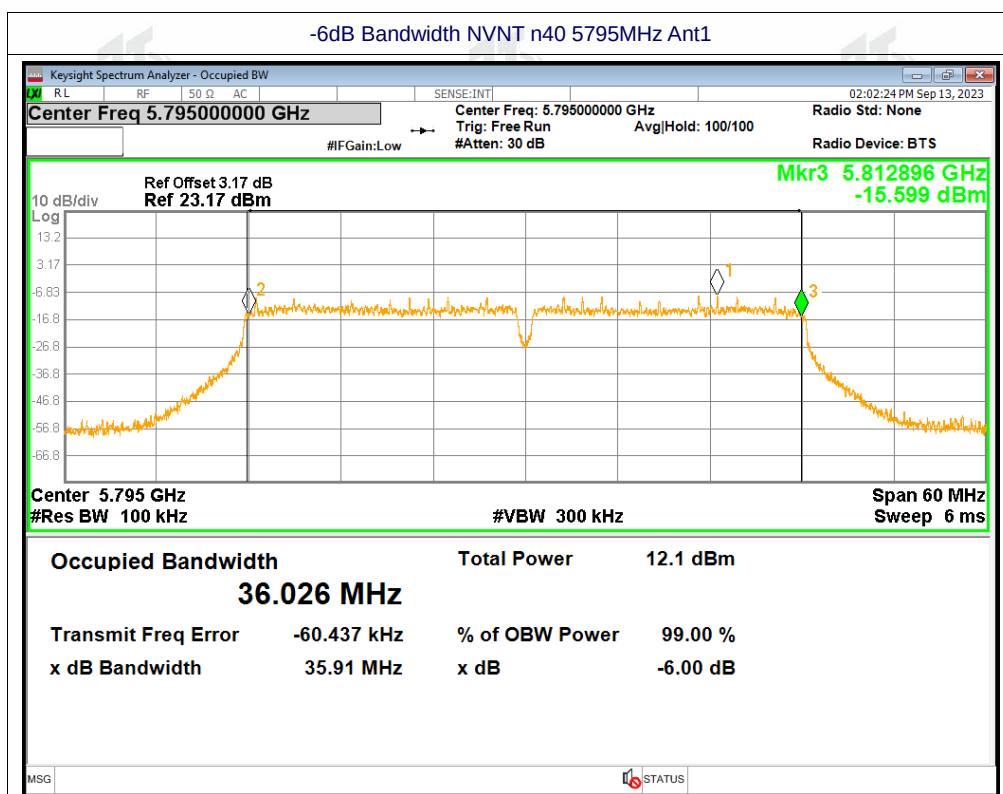
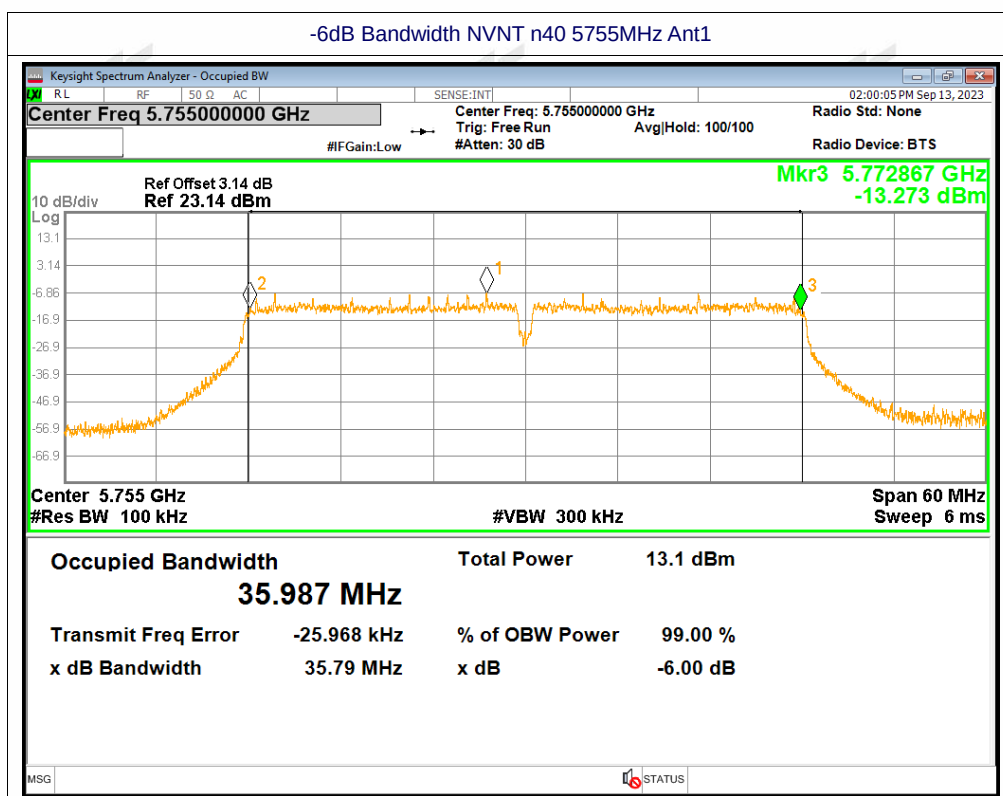


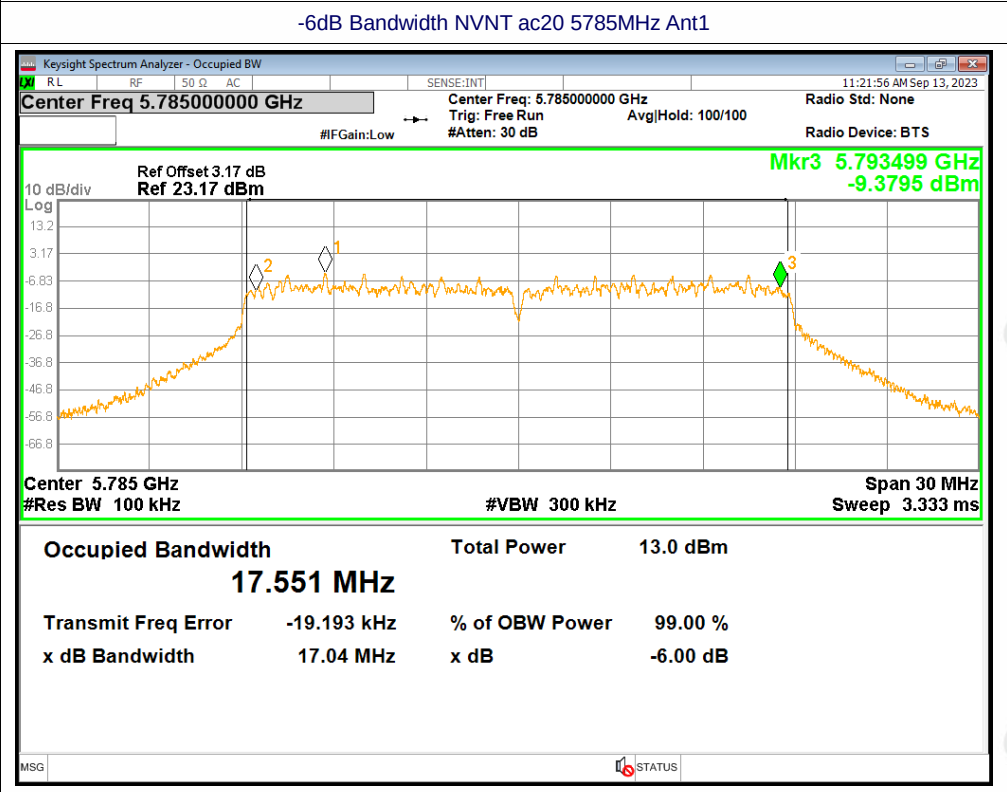
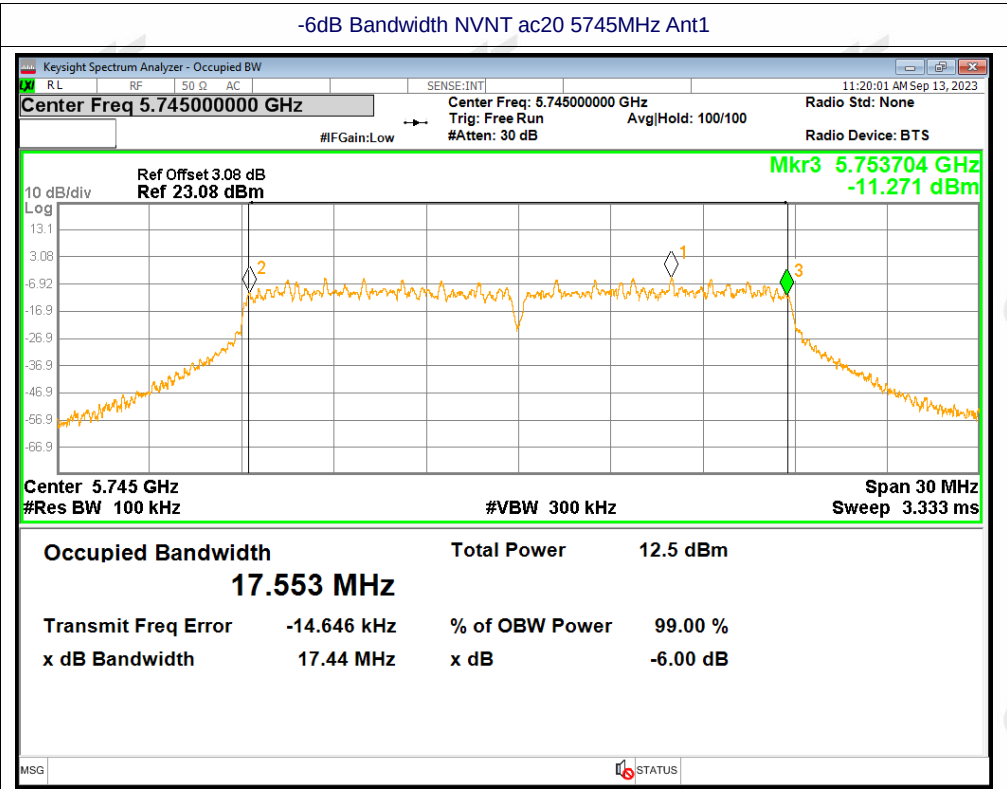
-6dB Bandwidth NVNT n20 5785MHz Ant1

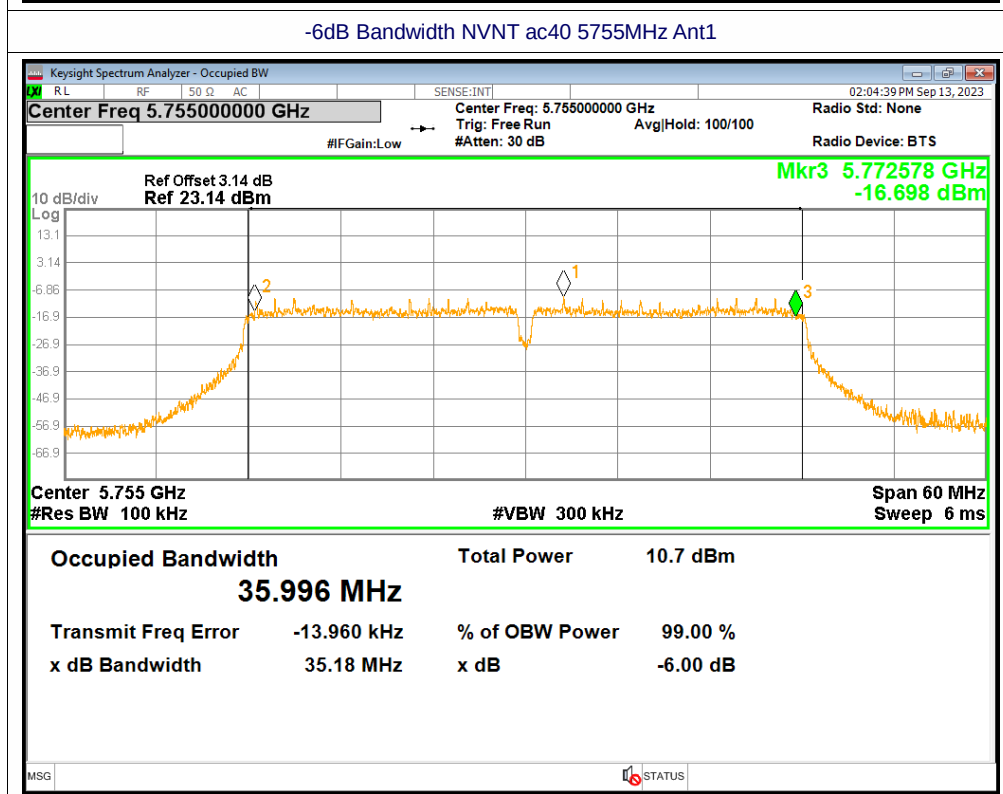
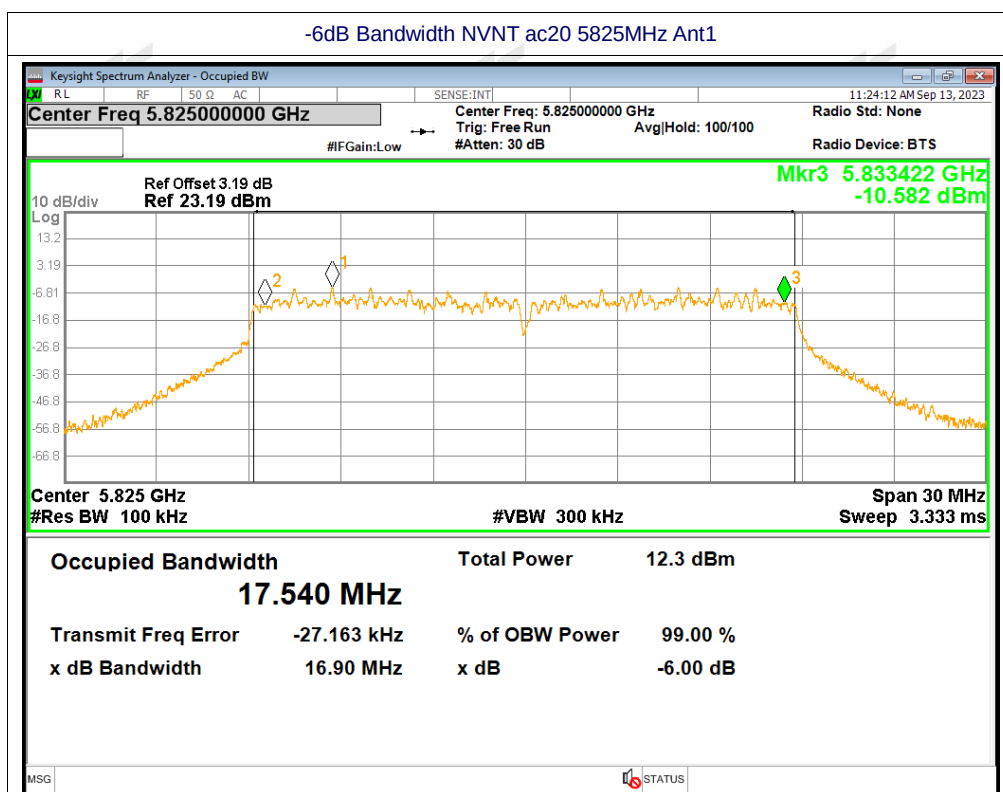


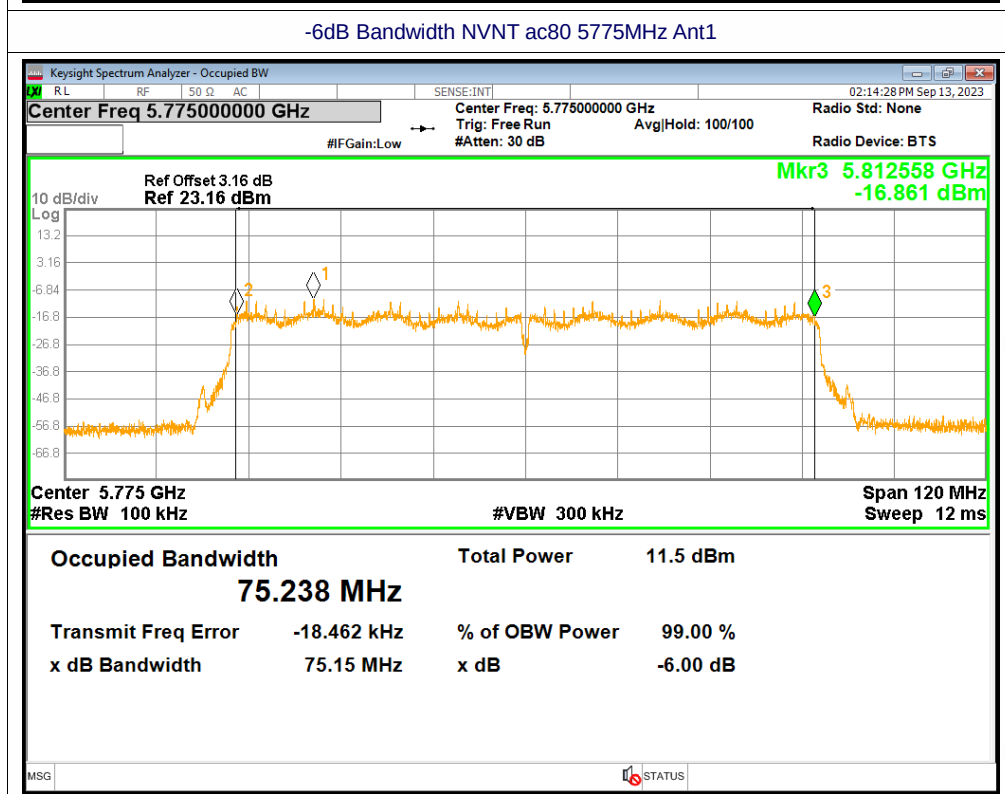
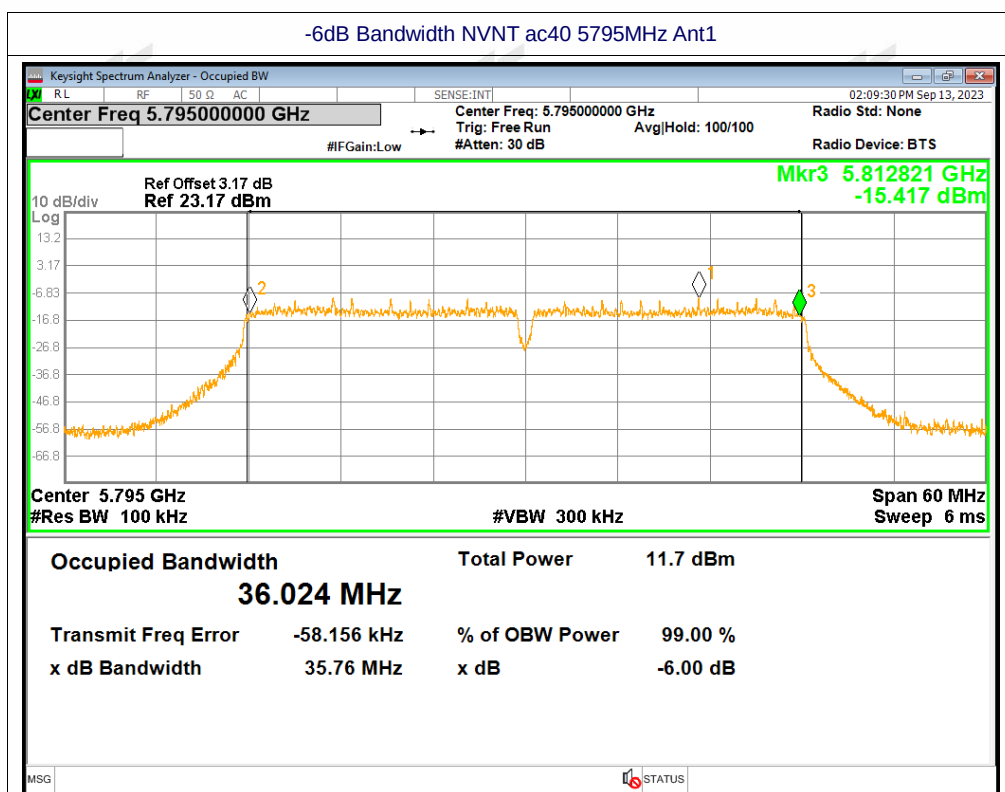
-6dB Bandwidth NVNT n20 5825MHz Ant1









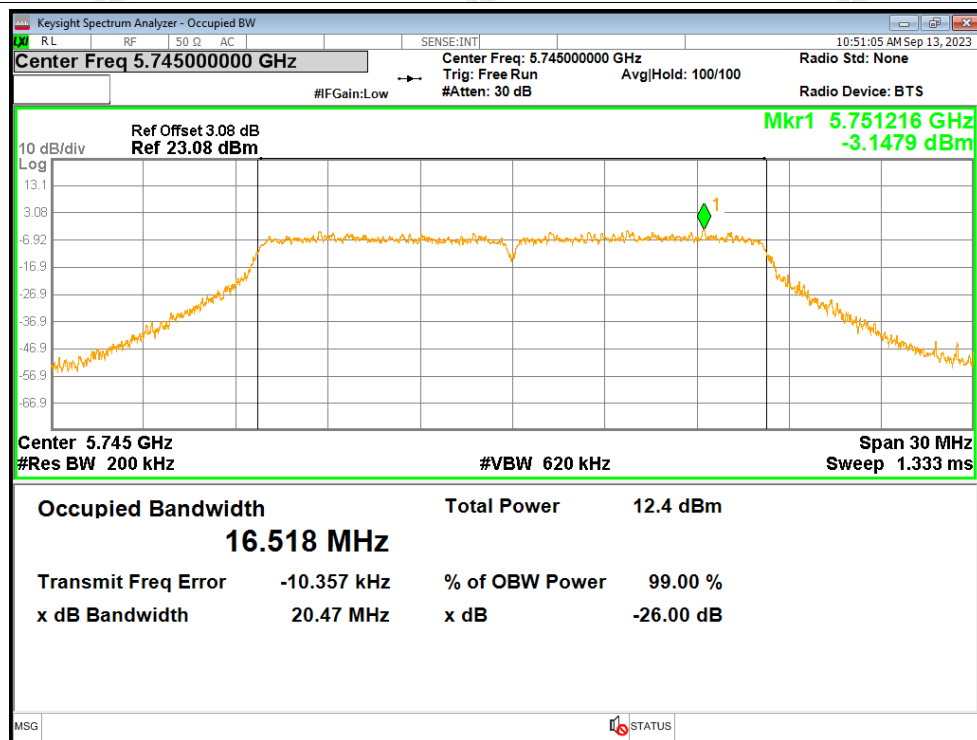


B4.Occupied Channel Bandwidth

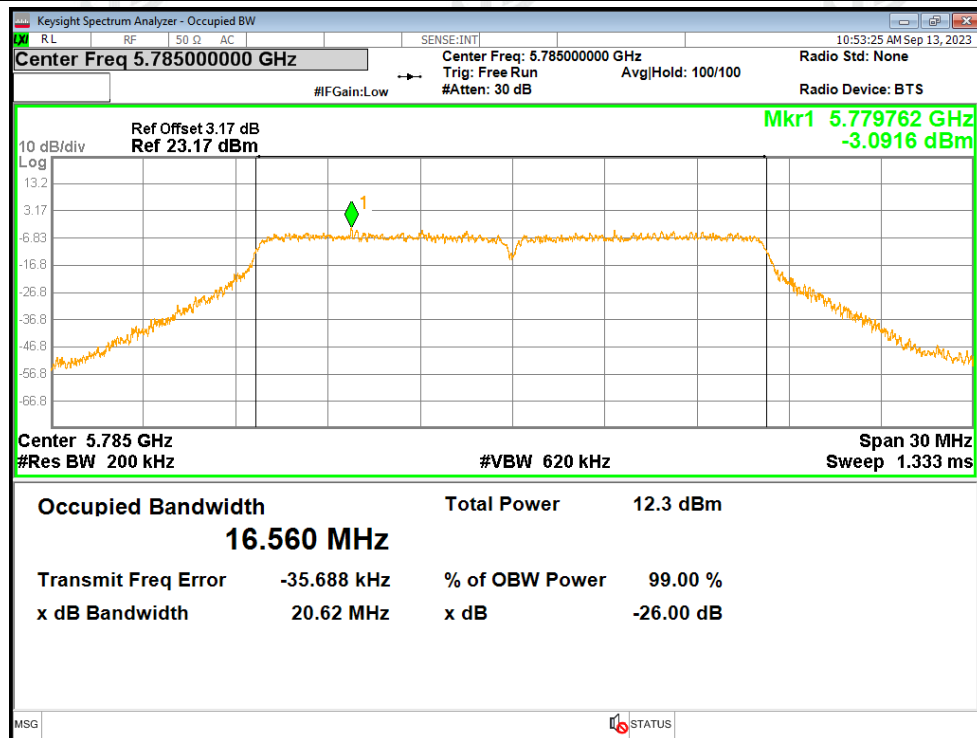
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	a	5745	Ant1	16.518
NVNT	a	5785	Ant1	16.56
NVNT	a	5825	Ant1	16.561
NVNT	n20	5745	Ant1	17.643
NVNT	n20	5785	Ant1	17.623
NVNT	n20	5825	Ant1	17.634
NVNT	n40	5755	Ant1	36.167
NVNT	n40	5795	Ant1	36.225
NVNT	ac20	5745	Ant1	17.555
NVNT	ac20	5785	Ant1	17.589
NVNT	ac20	5825	Ant1	17.575
NVNT	ac40	5755	Ant1	36.138
NVNT	ac40	5795	Ant1	36.147
NVNT	ac80	5775	Ant1	75.424

Test Graphs

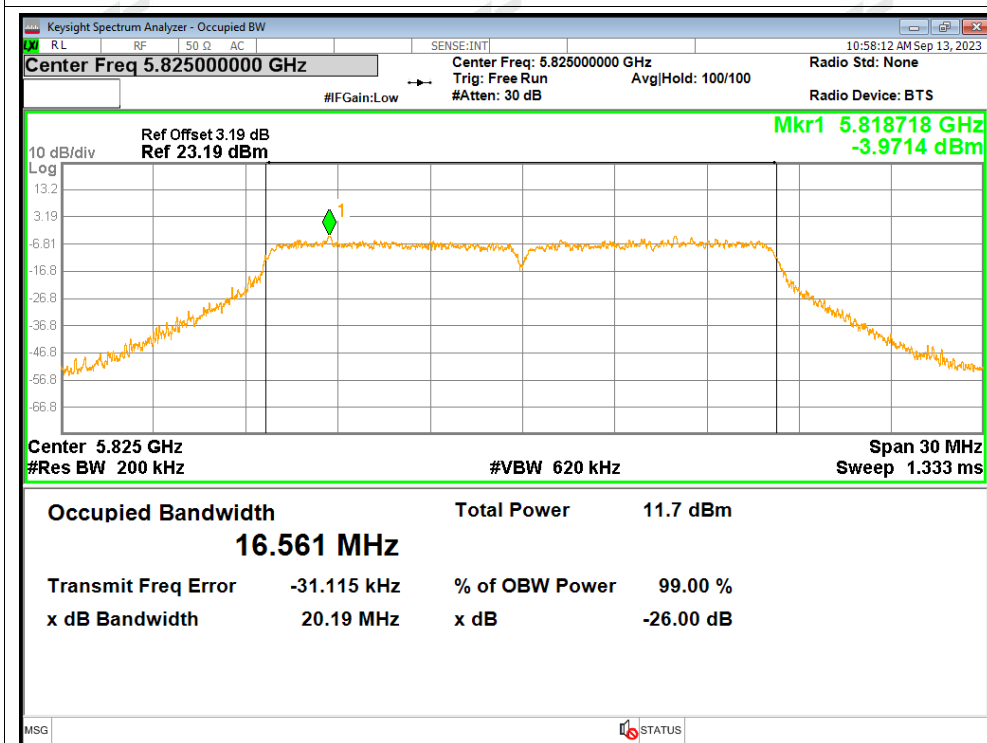
OBW NVNT a 5745MHz Ant1



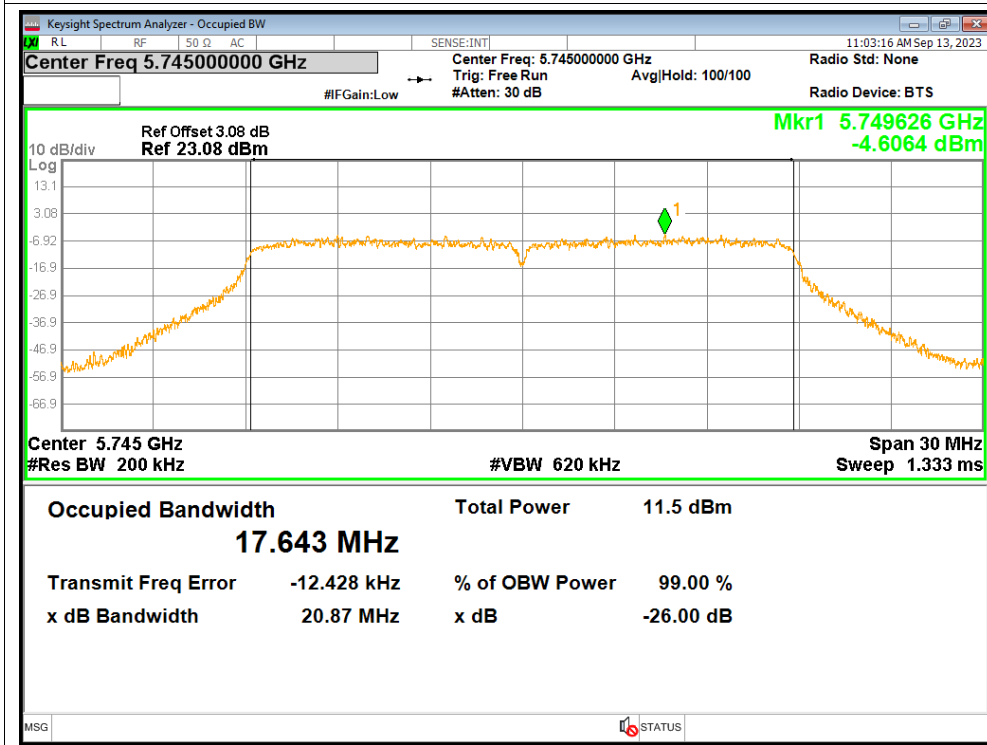
OBW NVNT a 5785MHz Ant1

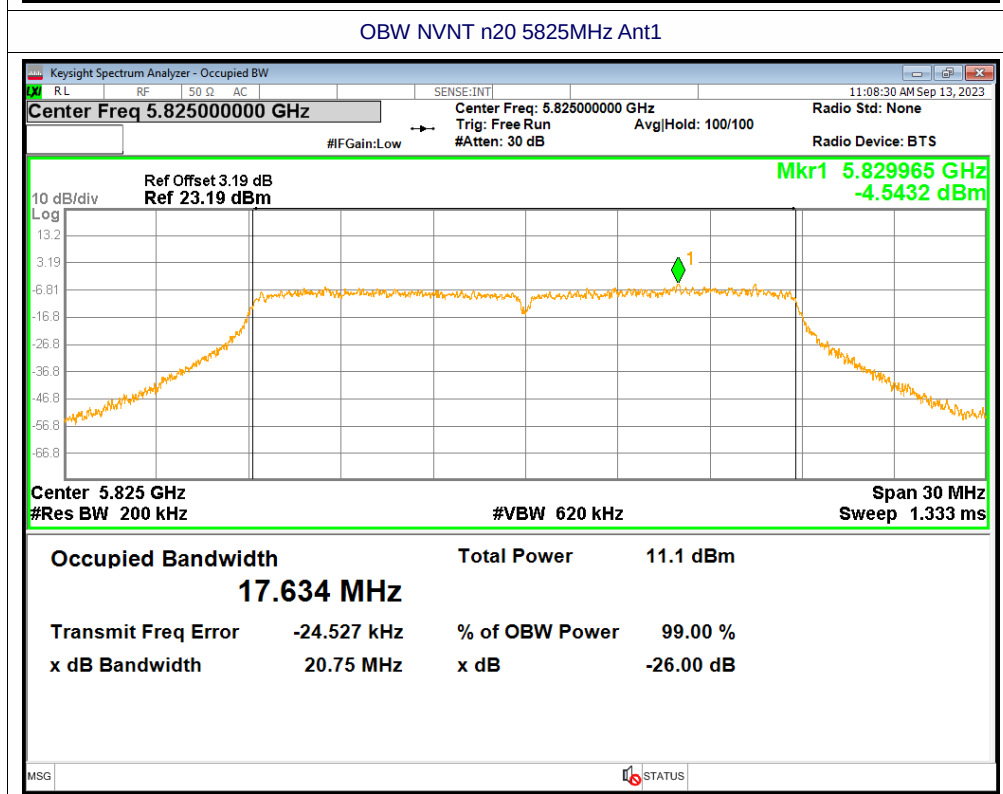
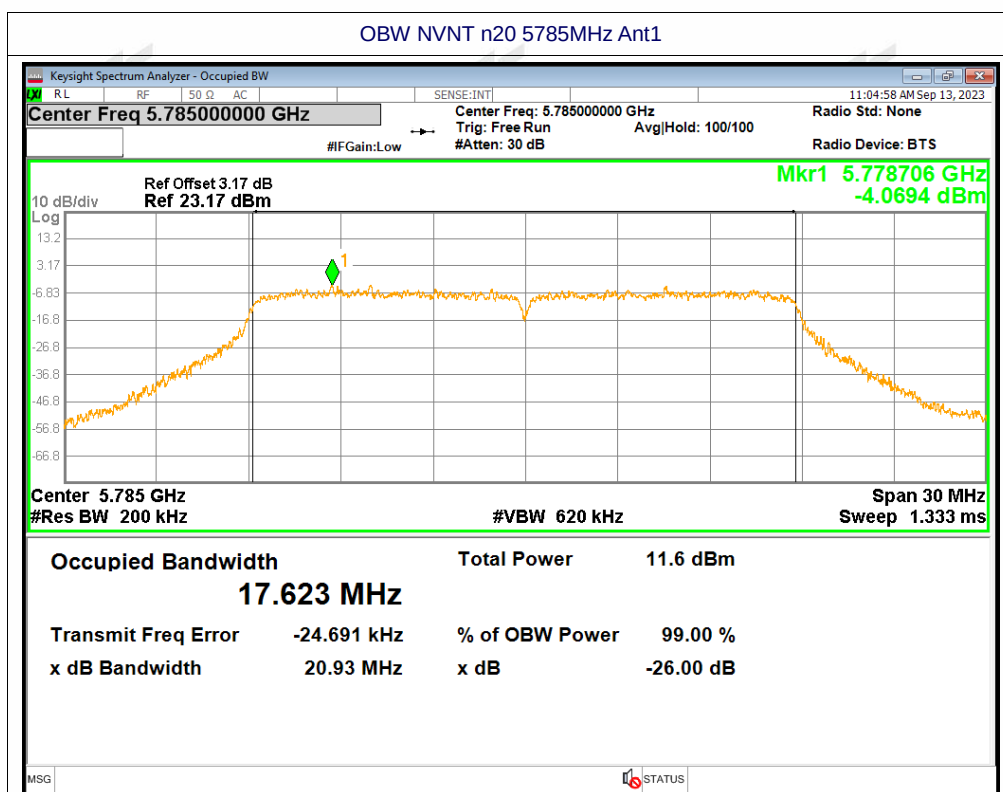


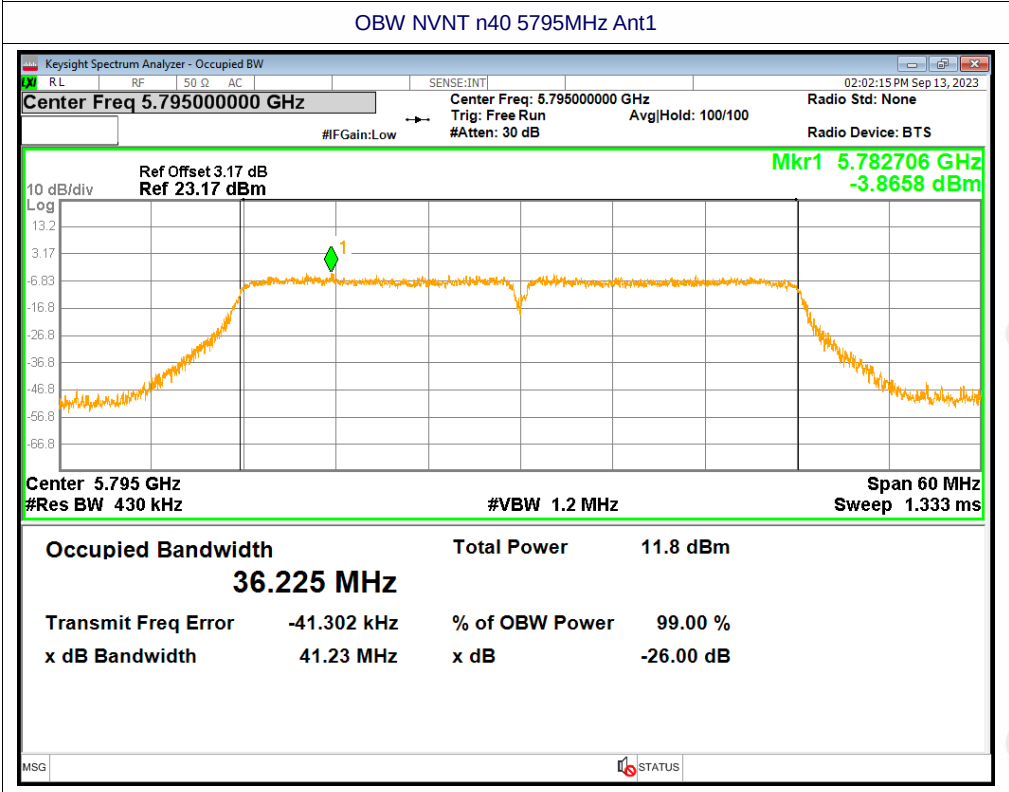
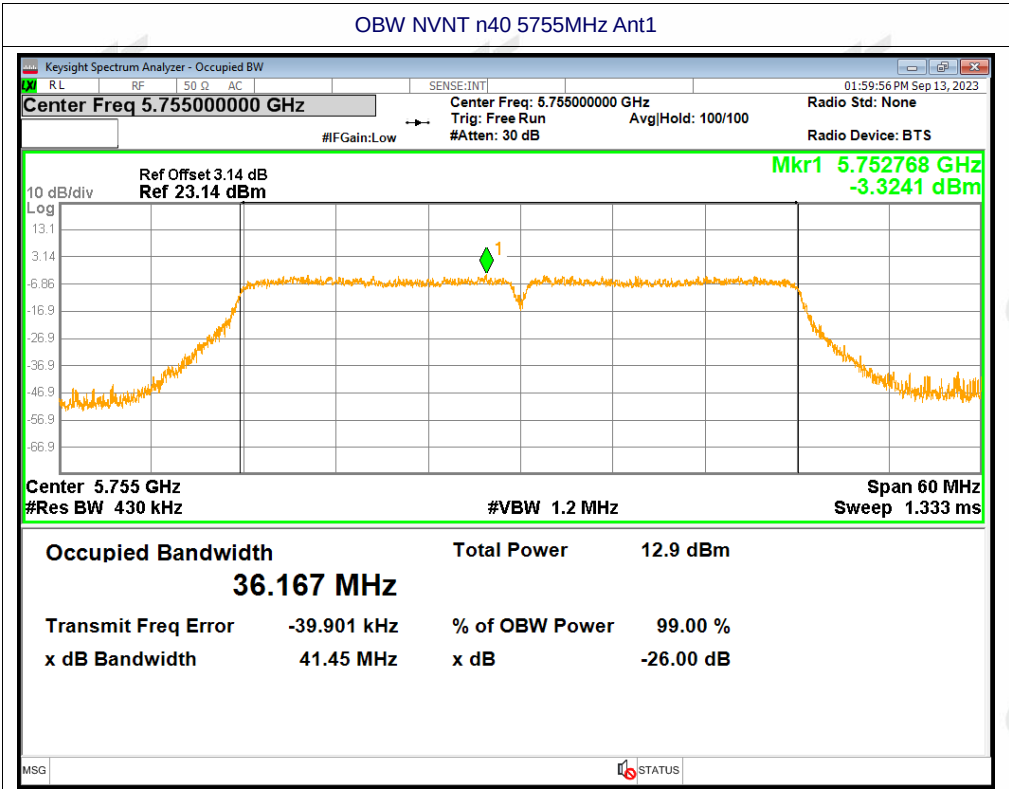
OBW NVNT a 5825MHz Ant1

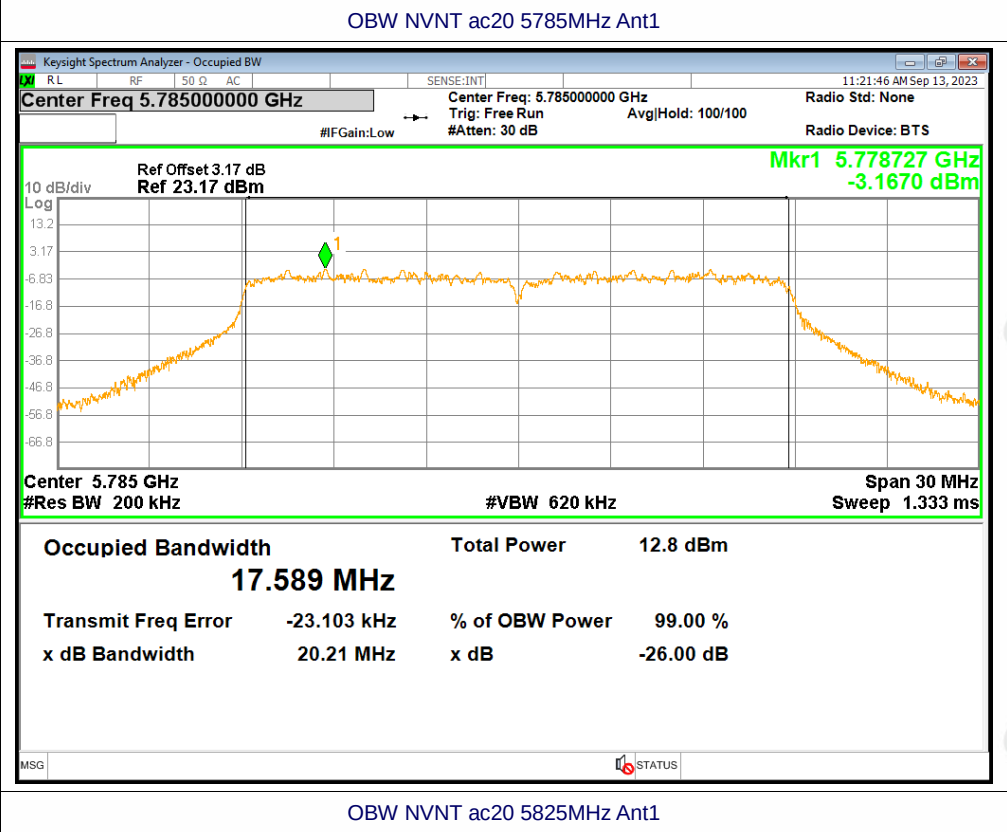
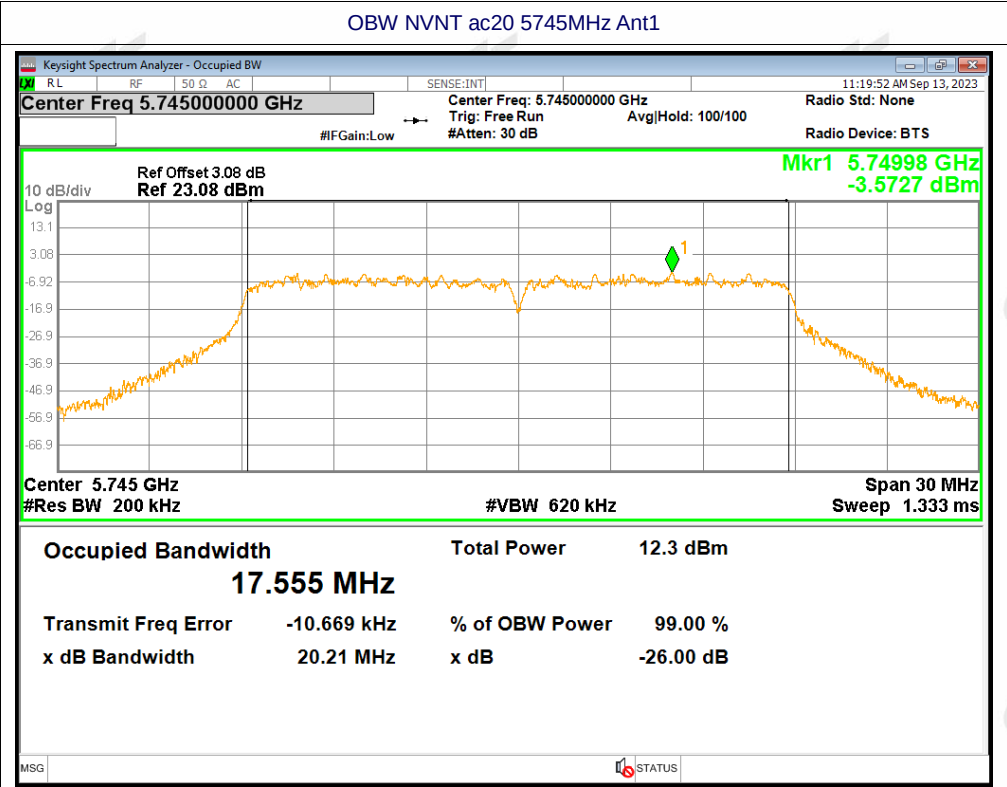


OBW NVNT n20 5745MHz Ant1

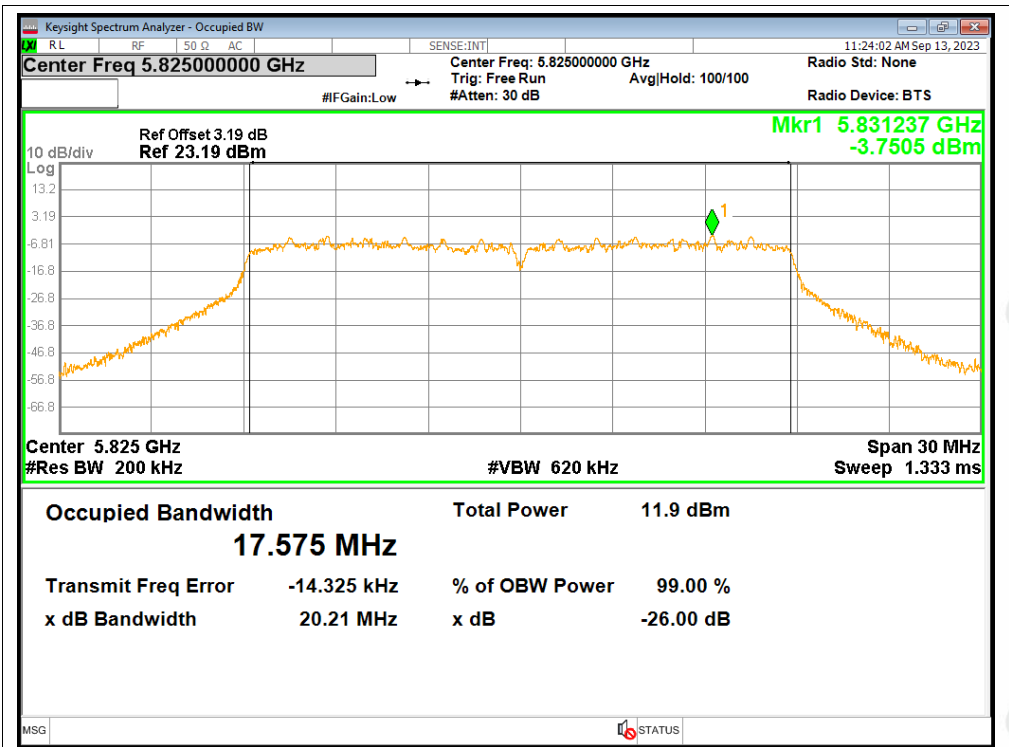




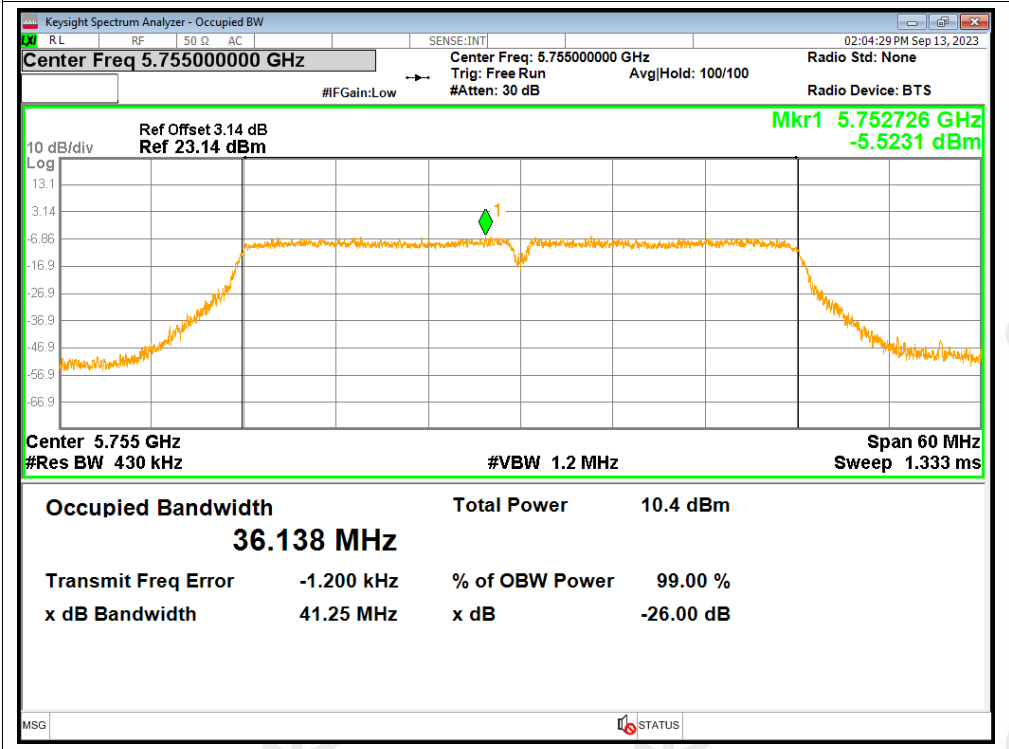


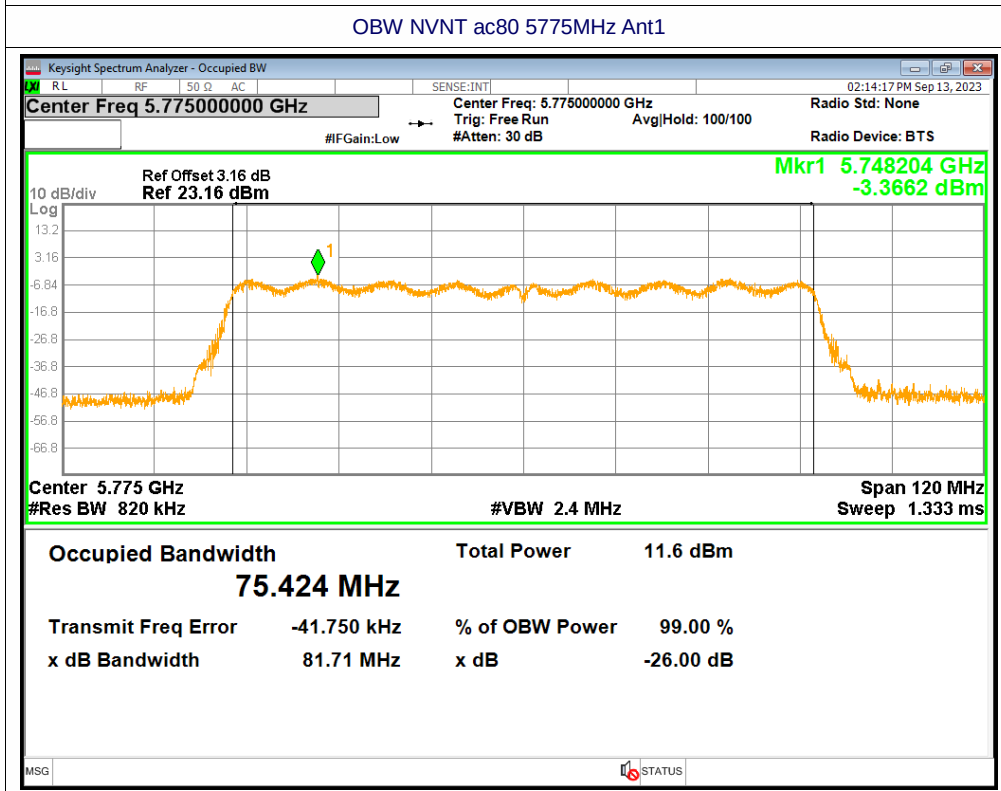
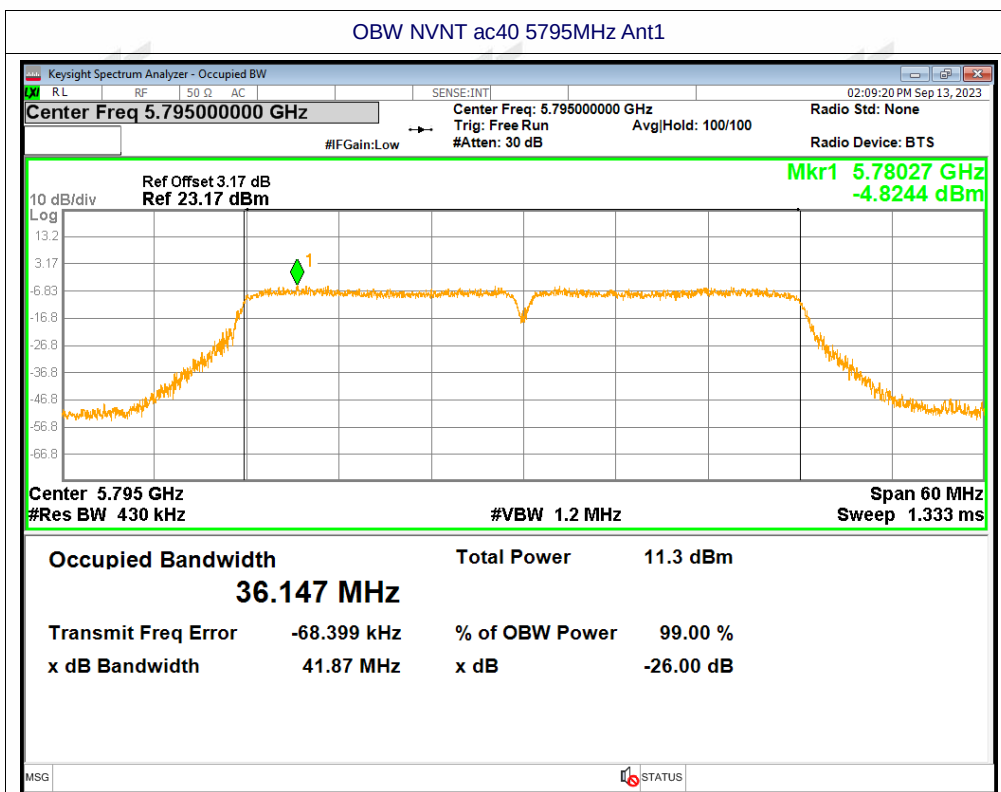


OBW NVNT ac20 5825MHz Ant1



OBW NVNT ac40 5755MHz Ant1



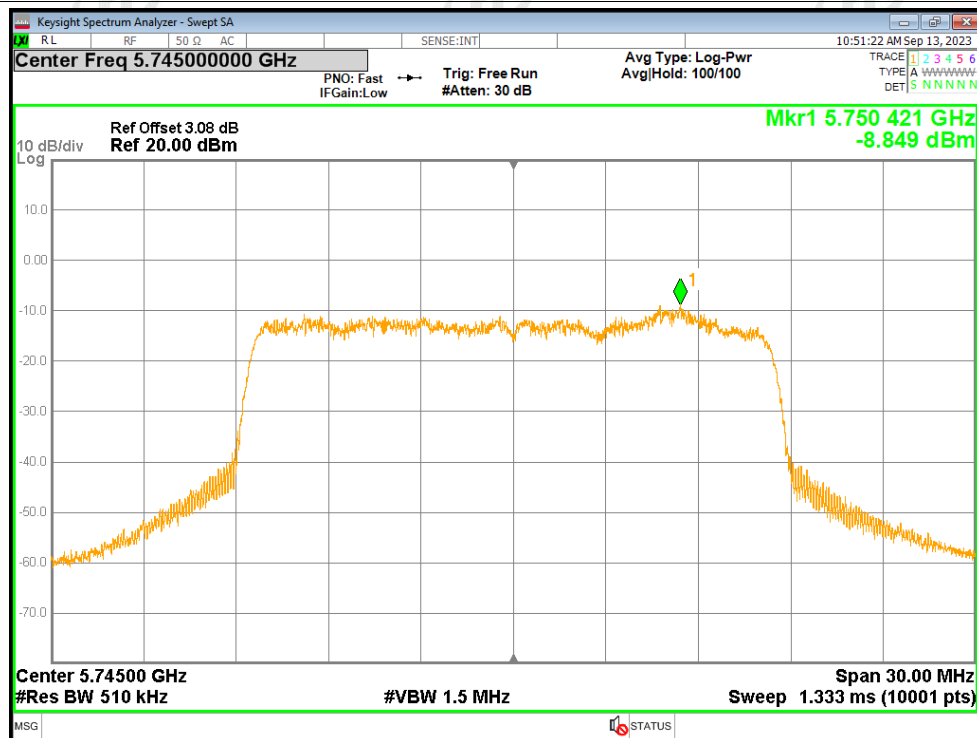


B5.Maximum Power Spectral Density Level

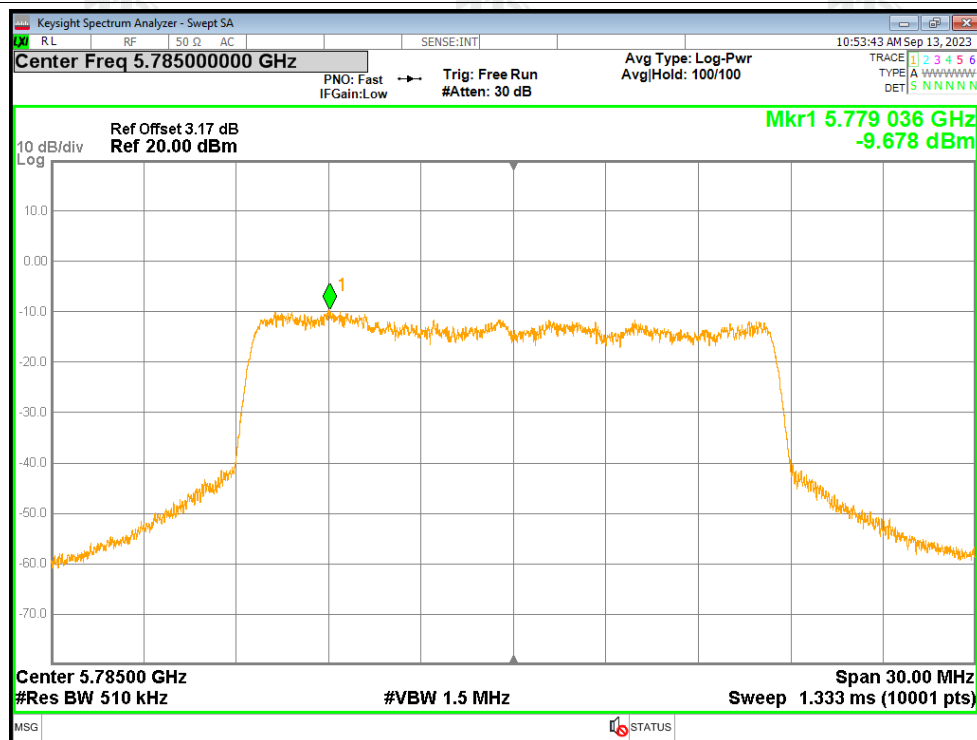
Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm)	Duty Factor (dB)	Total PSD (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	Ant1	-8.85	0.12	-8.73	30	Pass
NVNT	a	5785	Ant1	-9.68	0.12	-9.56	30	Pass
NVNT	a	5825	Ant1	-9.56	0.12	-9.44	30	Pass
NVNT	n20	5745	Ant1	-10.29	0.09	-10.2	30	Pass
NVNT	n20	5785	Ant1	-10.82	0.12	-10.7	30	Pass
NVNT	n20	5825	Ant1	-11.29	0.12	-11.17	30	Pass
NVNT	n40	5755	Ant1	-15.48	0.17	-15.31	30	Pass
NVNT	n40	5795	Ant1	-13.6	0.09	-13.51	30	Pass
NVNT	ac20	5745	Ant1	-23.02	0.1	-22.92	30	Pass
NVNT	ac20	5785	Ant1	-22.17	0.13	-22.04	30	Pass
NVNT	ac20	5825	Ant1	-19.51	0.1	-19.41	30	Pass
NVNT	ac40	5755	Ant1	-16.34	0.26	-16.08	30	Pass
NVNT	ac40	5795	Ant1	-16.22	0.2	-16.02	30	Pass
NVNT	ac80	5775	Ant1	-22.83	0.78	-22.05	30	Pass

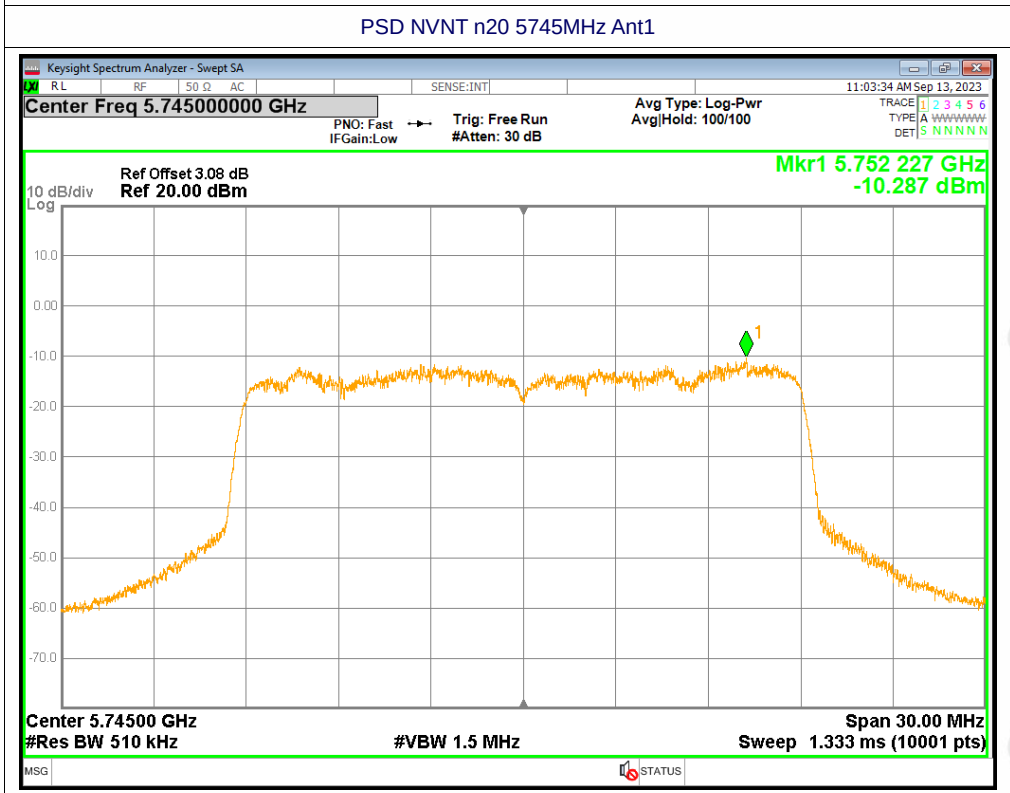
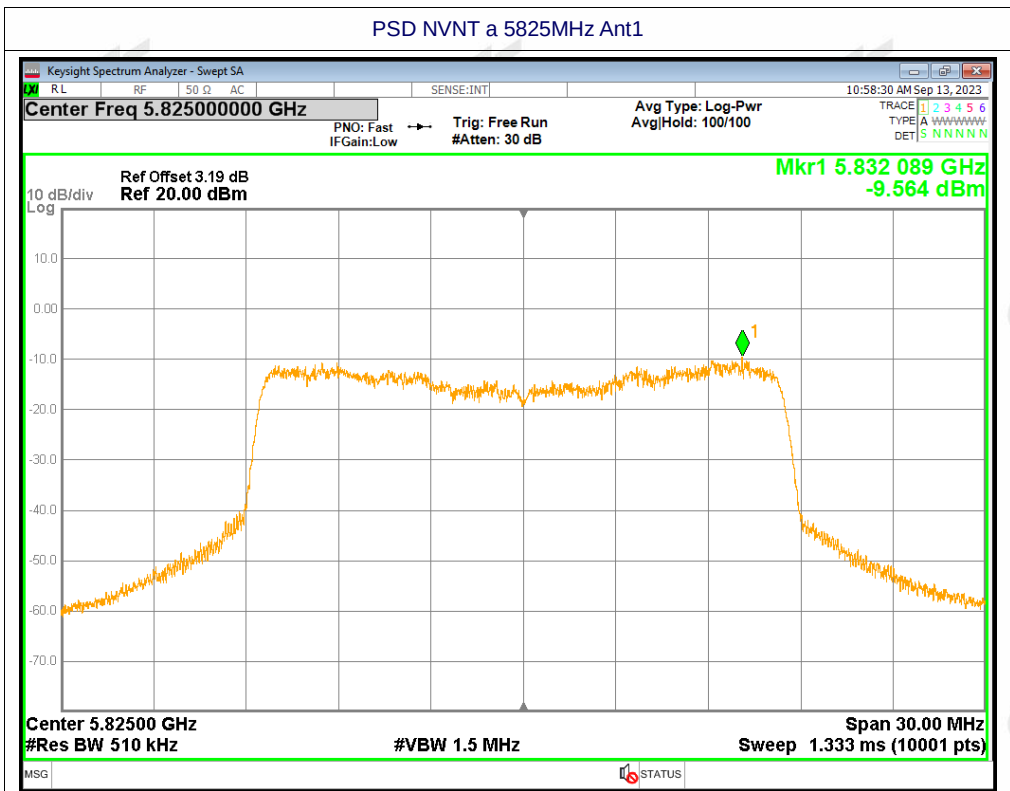
Test Graphs

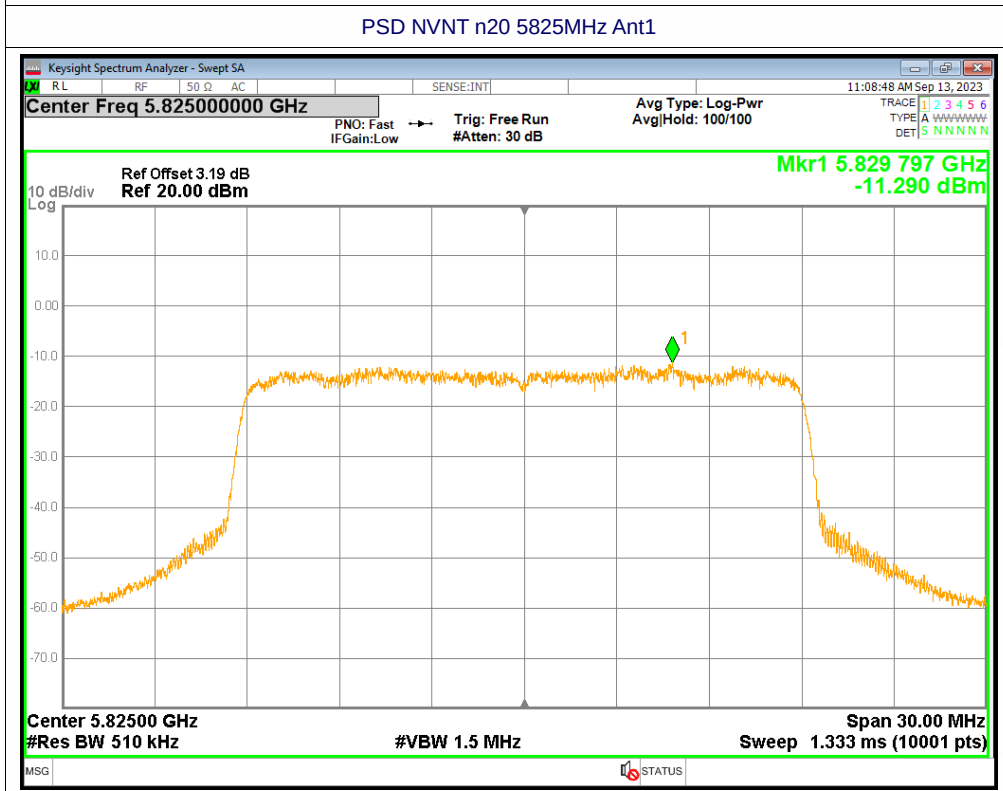
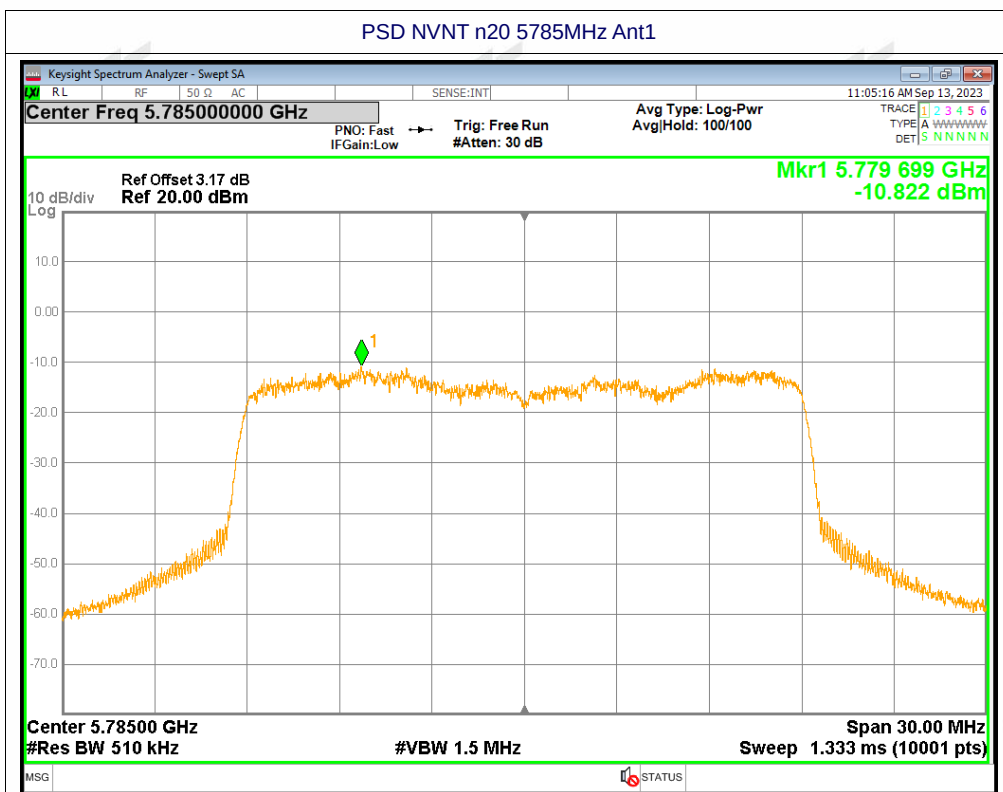
PSD NVNT a 5745MHz Ant1

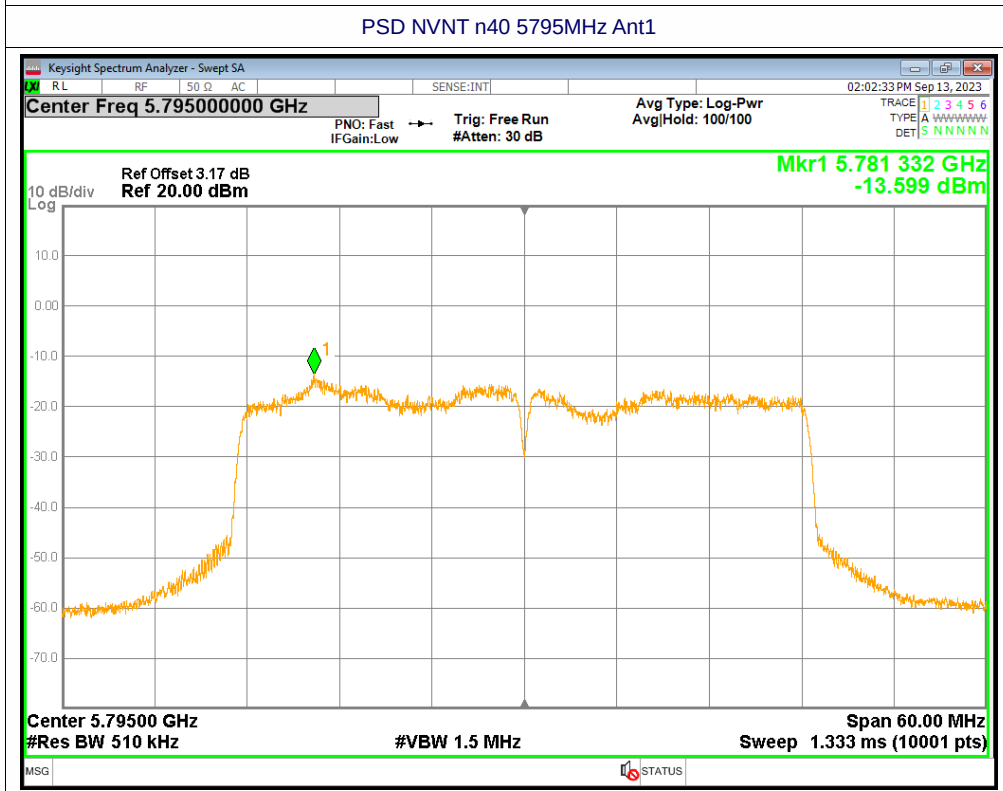
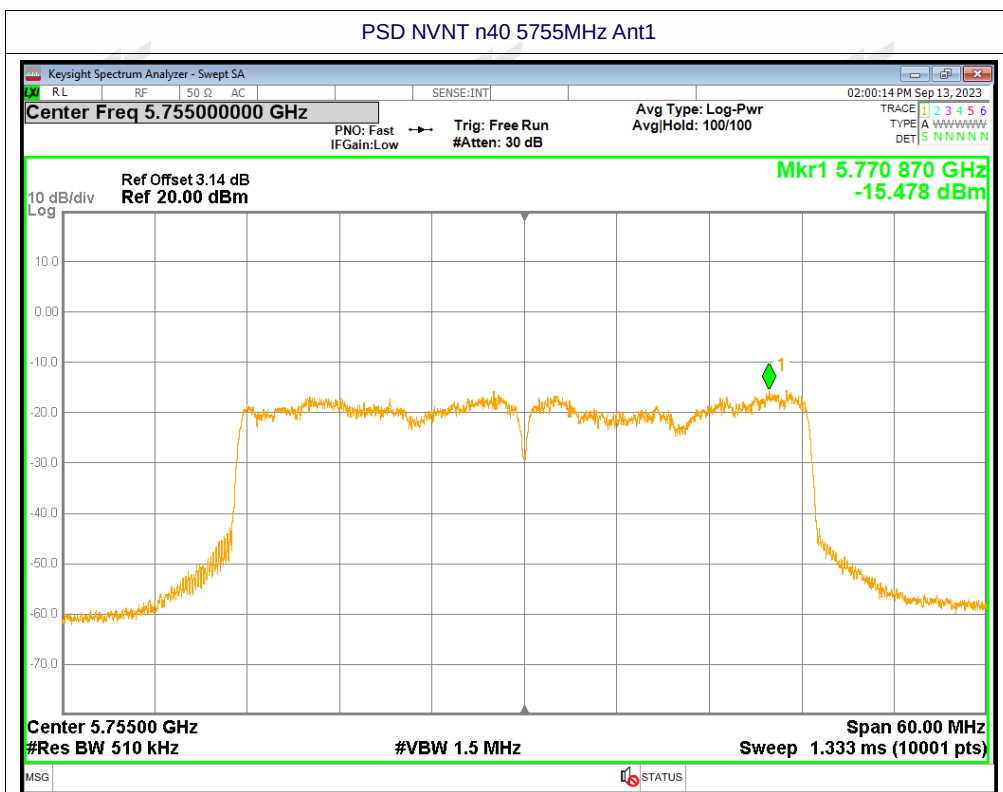


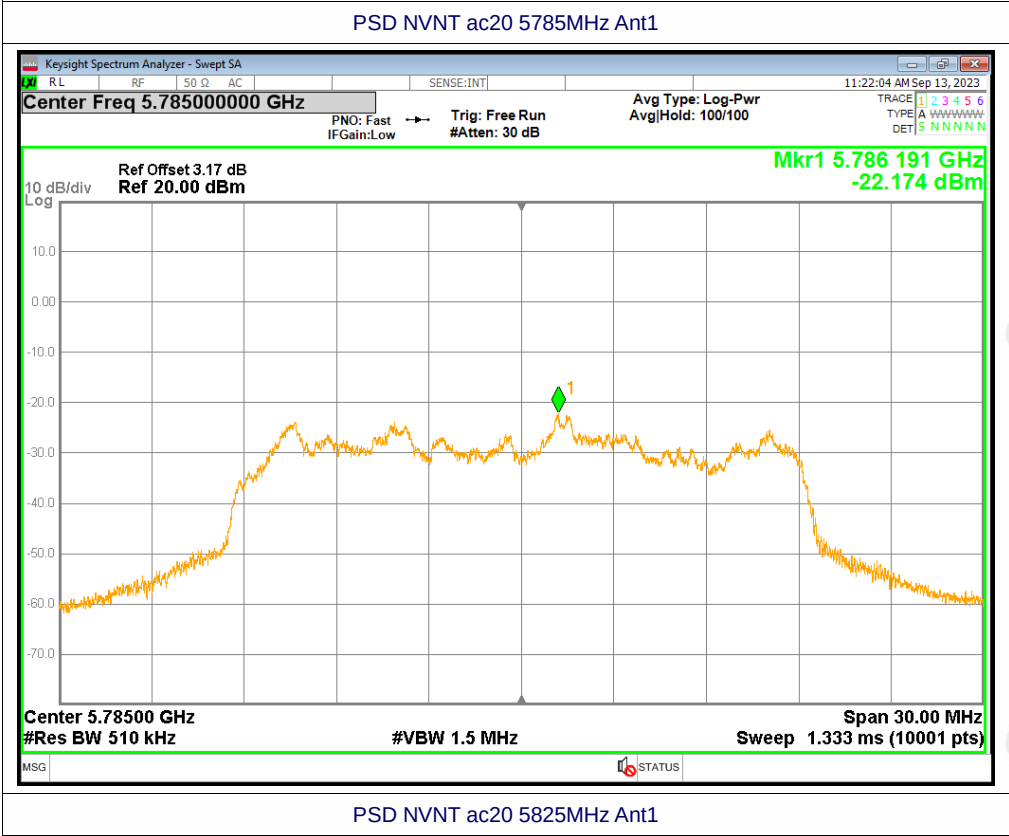
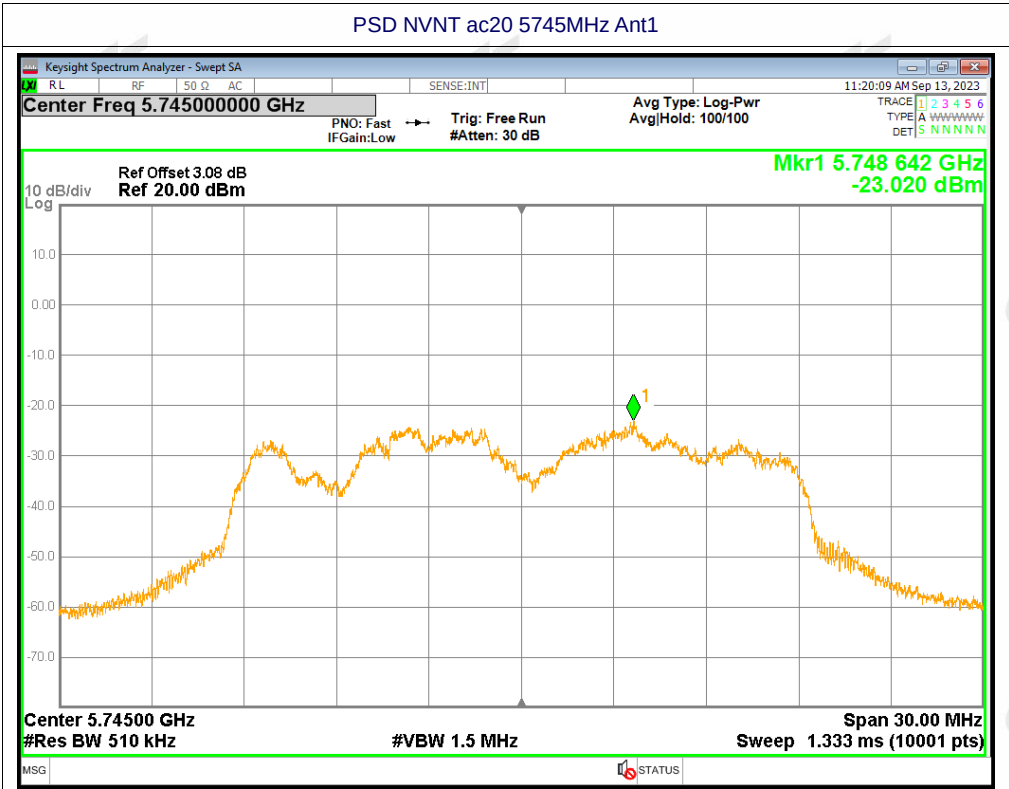
PSD NVNT a 5785MHz Ant1



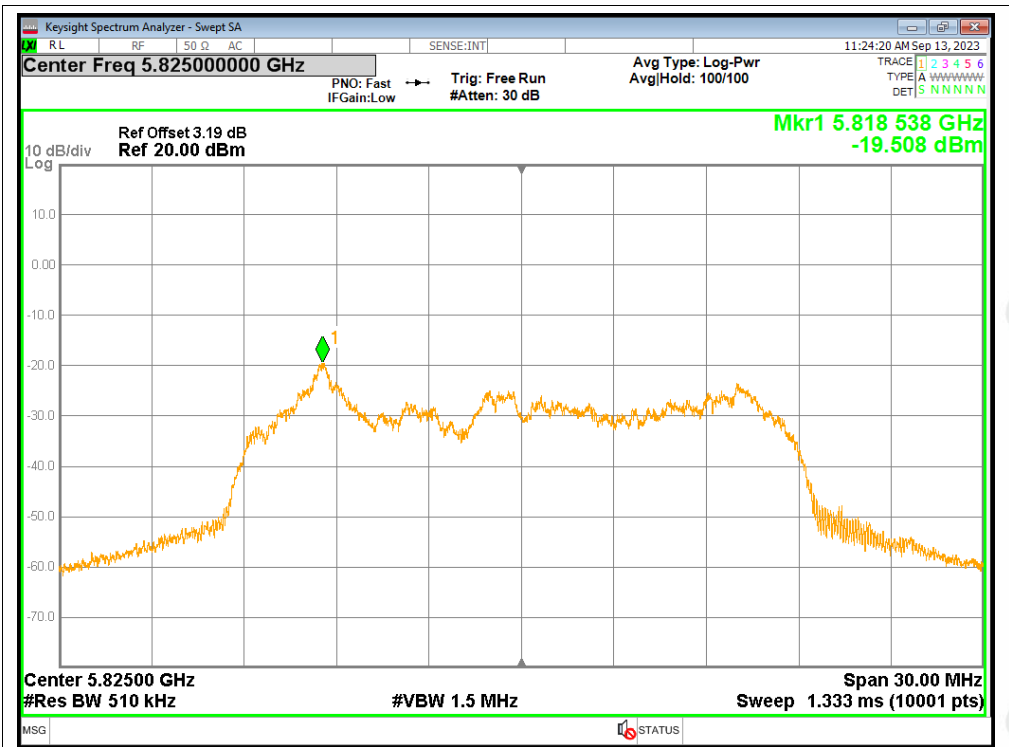




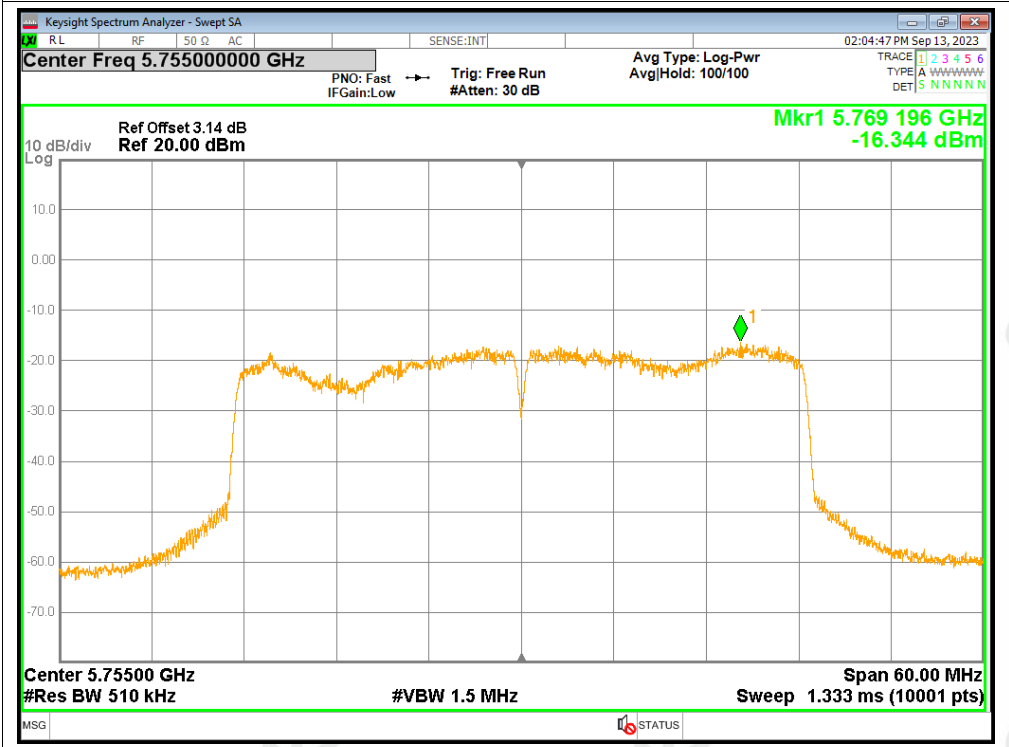


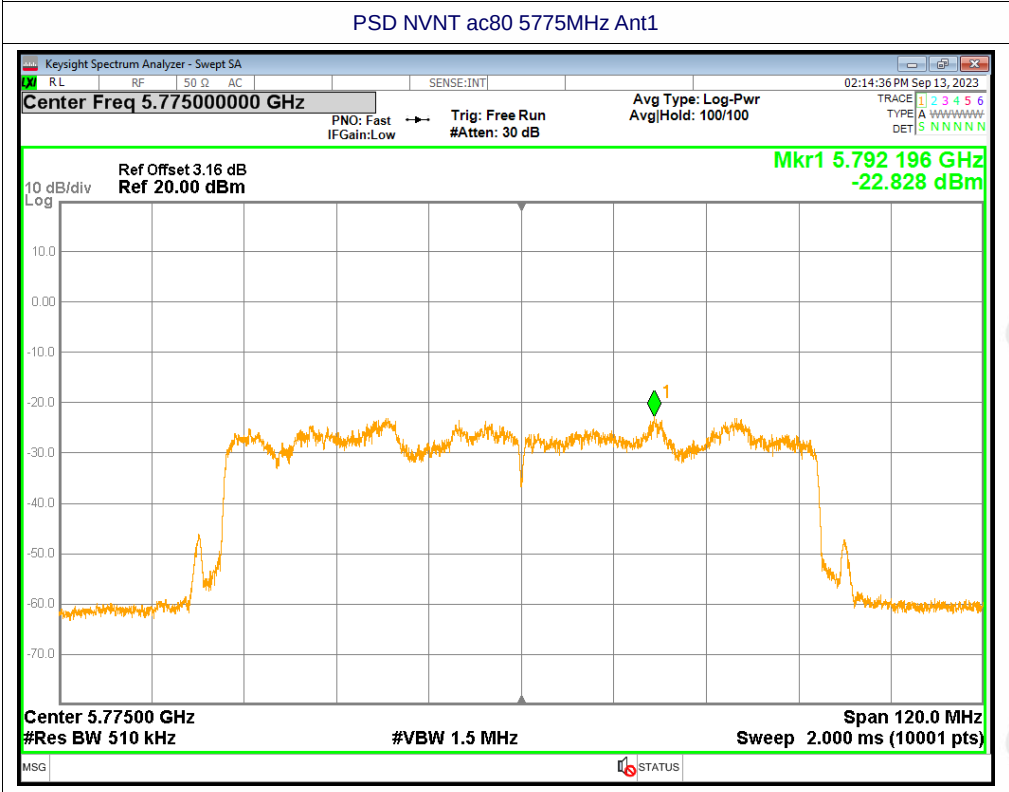
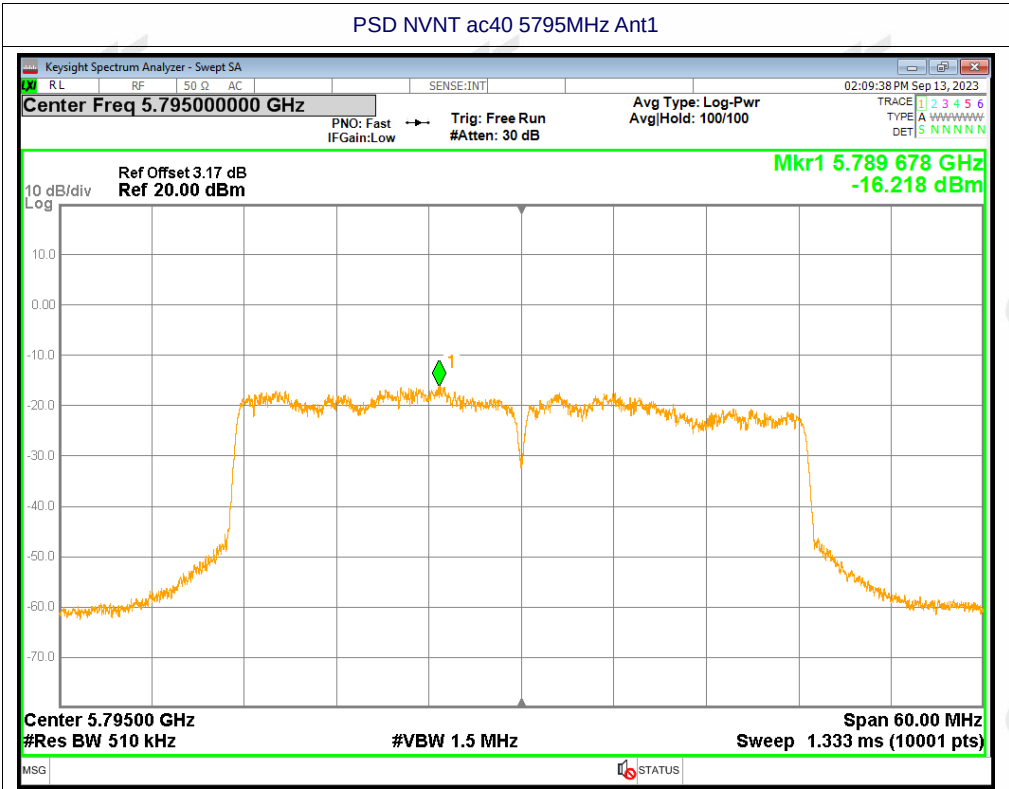


PSD NVNT ac20 5825MHz Ant1



PSD NVNT ac40 5755MHz Ant1



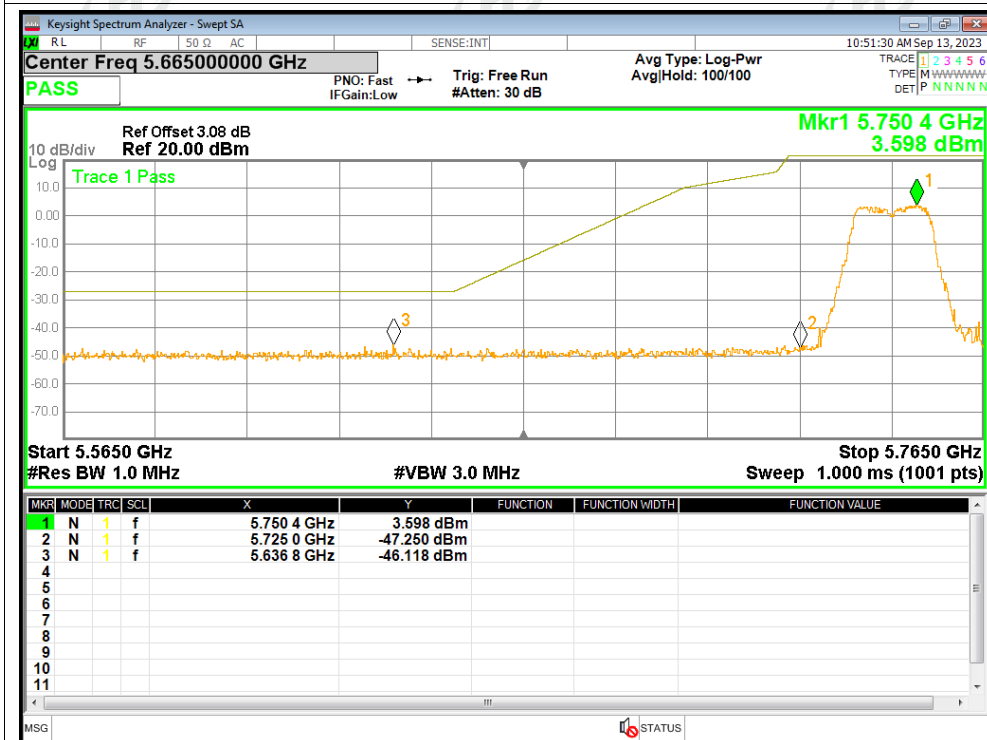


B6.Band Edge

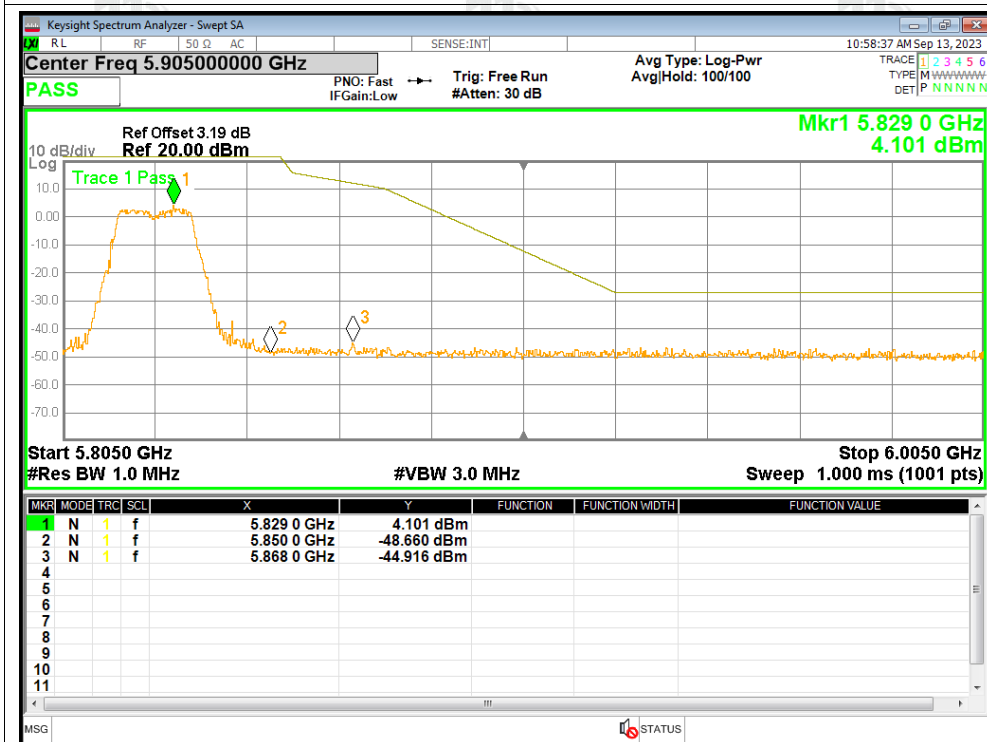
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	Ant1	-46.11	Refer to below test plot	Pass
NVNT	a	5825	Ant1	-44.91	Refer to below test plot	Pass
NVNT	n20	5745	Ant1	-46.63	Refer to below test plot	Pass
NVNT	n20	5825	Ant1	-46.08	Refer to below test plot	Pass
NVNT	n40	5755	Ant1	-42.31	Refer to below test plot	Pass
NVNT	ac20	5745	Ant1	-44.51	Refer to below test plot	Pass
NVNT	ac20	5825	Ant1	-45.66	Refer to below test plot	Pass
NVNT	ac40	5745	Ant1	-15.23	Refer to below test plot	Pass
NVNT	ac40	5755	Ant1	-45.28	Refer to below test plot	Pass
NVNT	ac80	5775	Ant1	-45.6	Refer to below test plot	Pass

Test Graphs

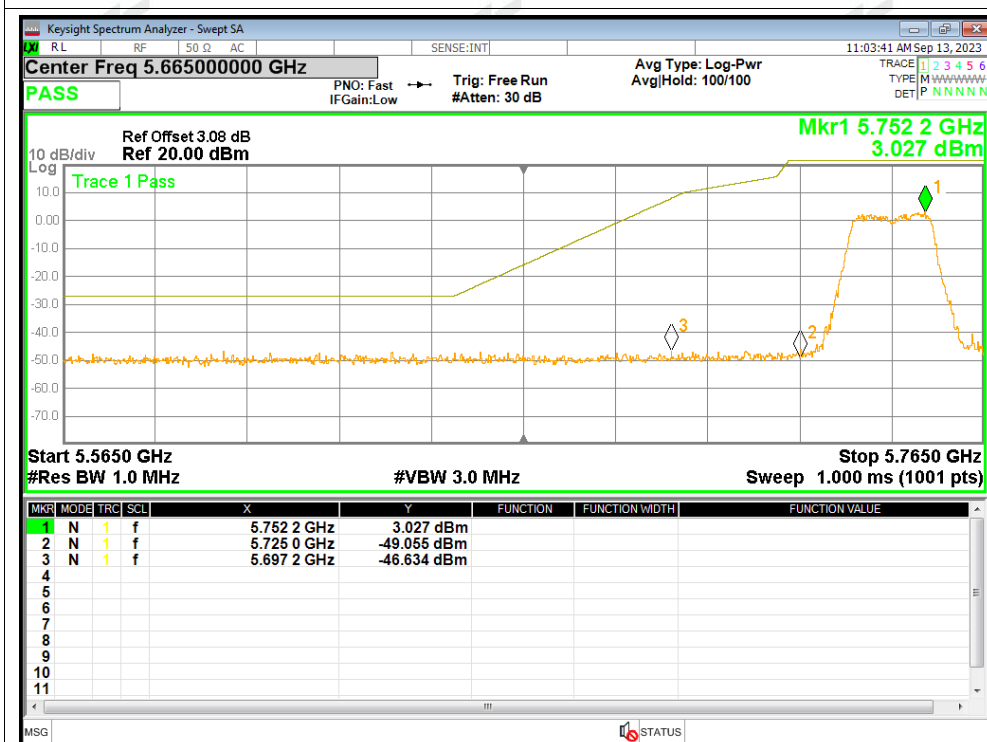
Band Edge NVNT a 5745MHz Low Ant1



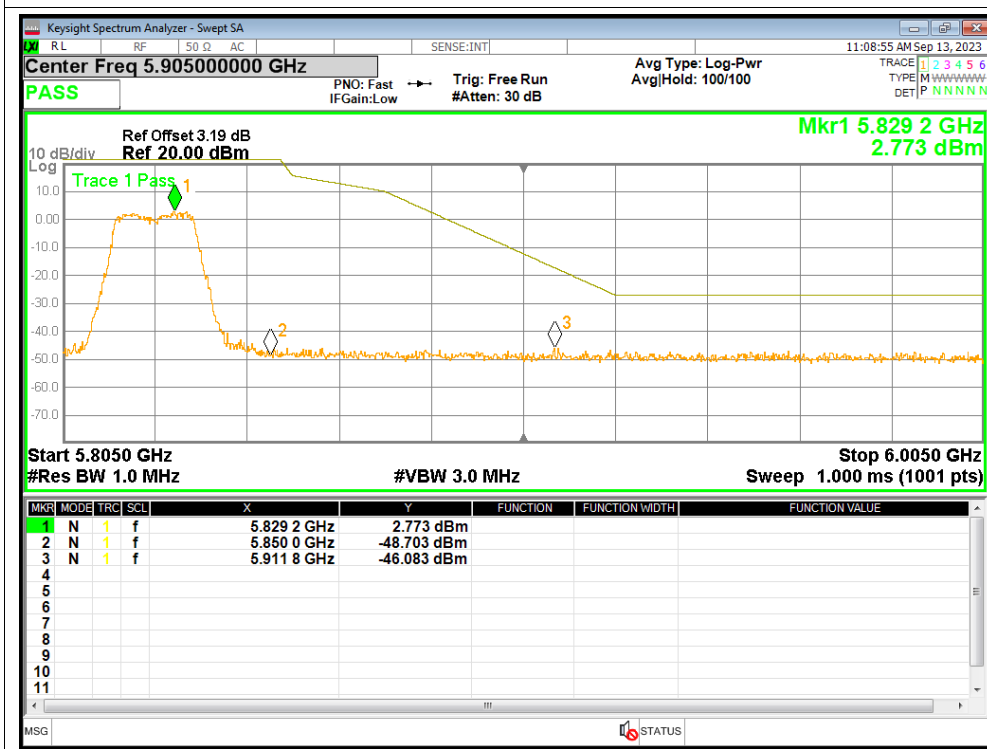
Band Edge NVNT a 5825MHz High Ant1



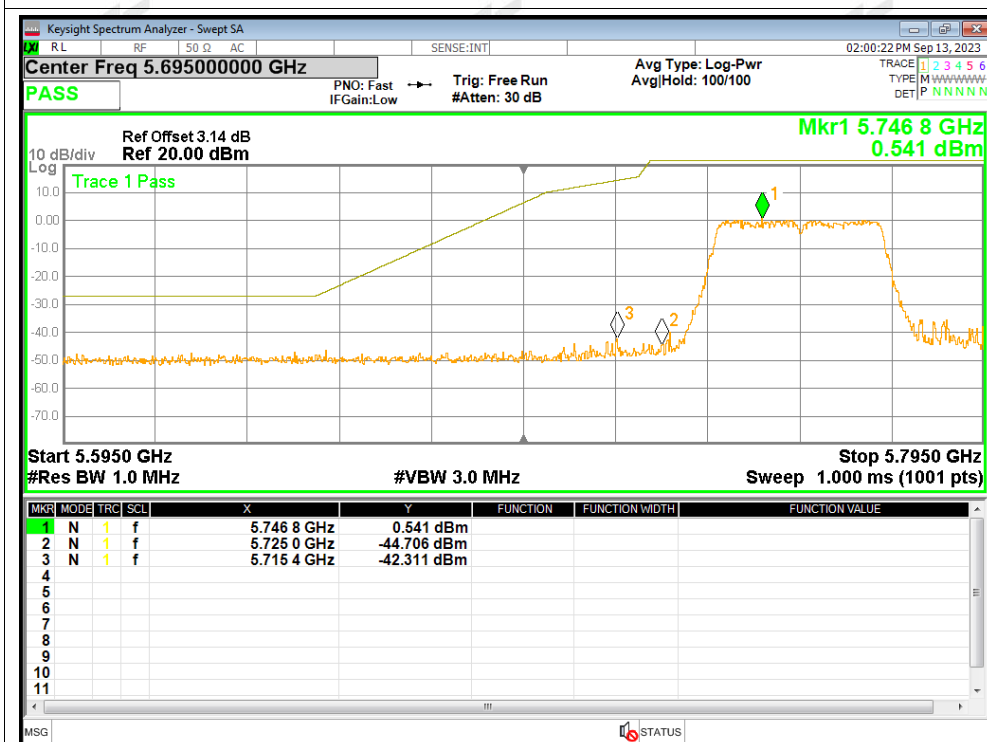
Band Edge NVNT n20 5745MHz Low Ant1



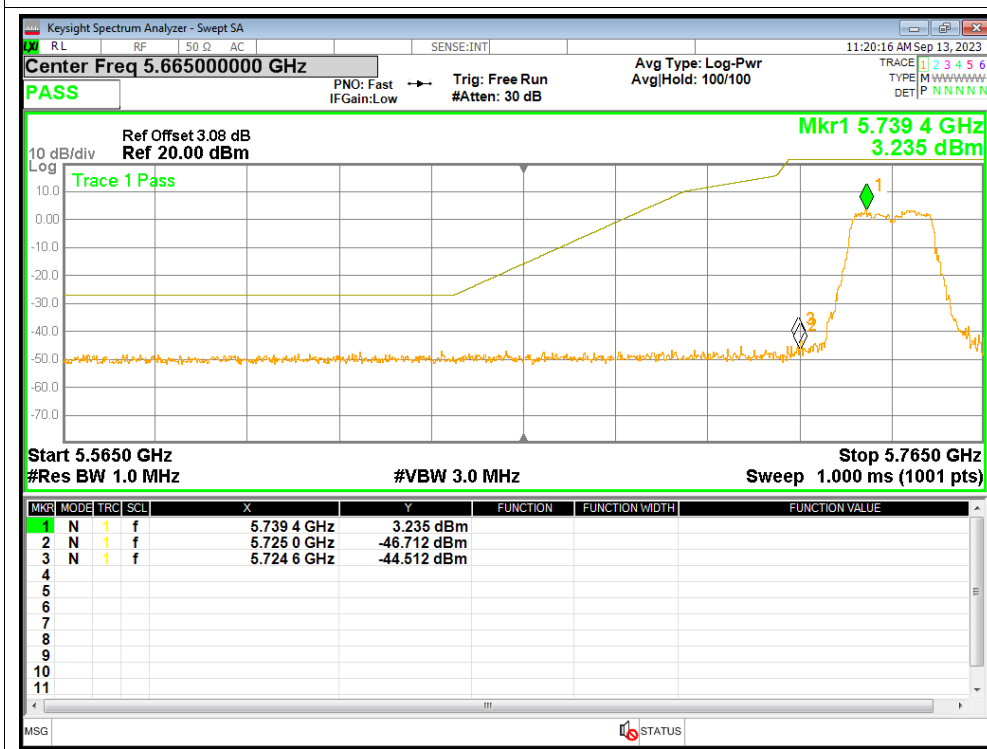
Band Edge NVNT n20 5825MHz High Ant1

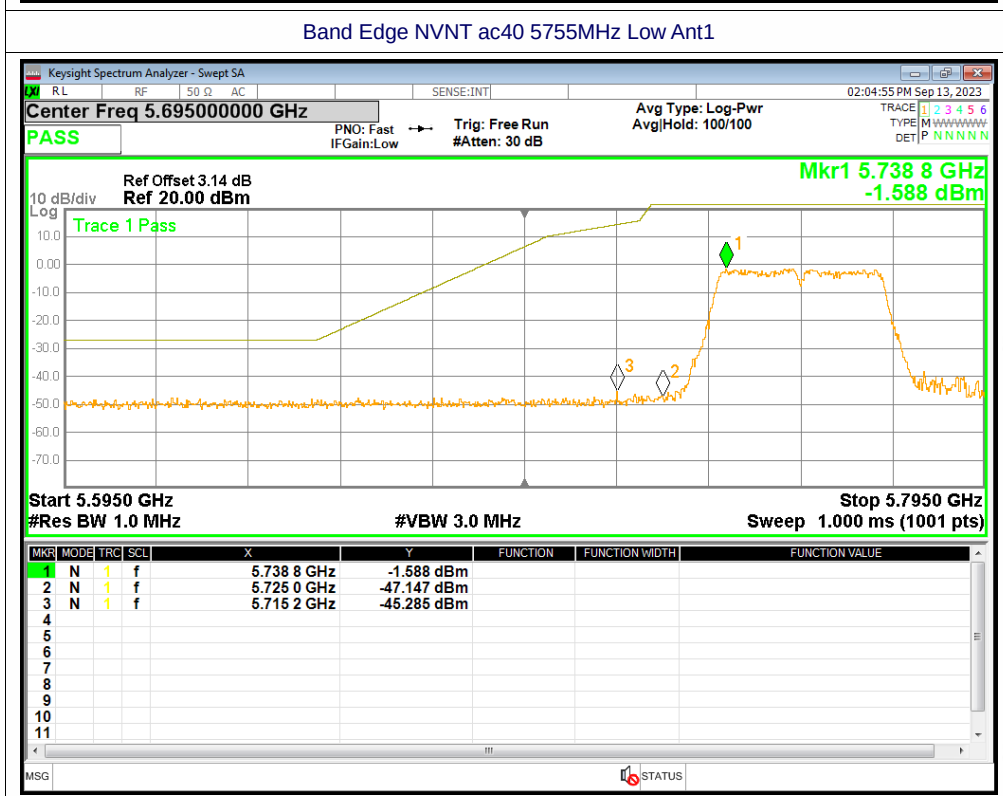
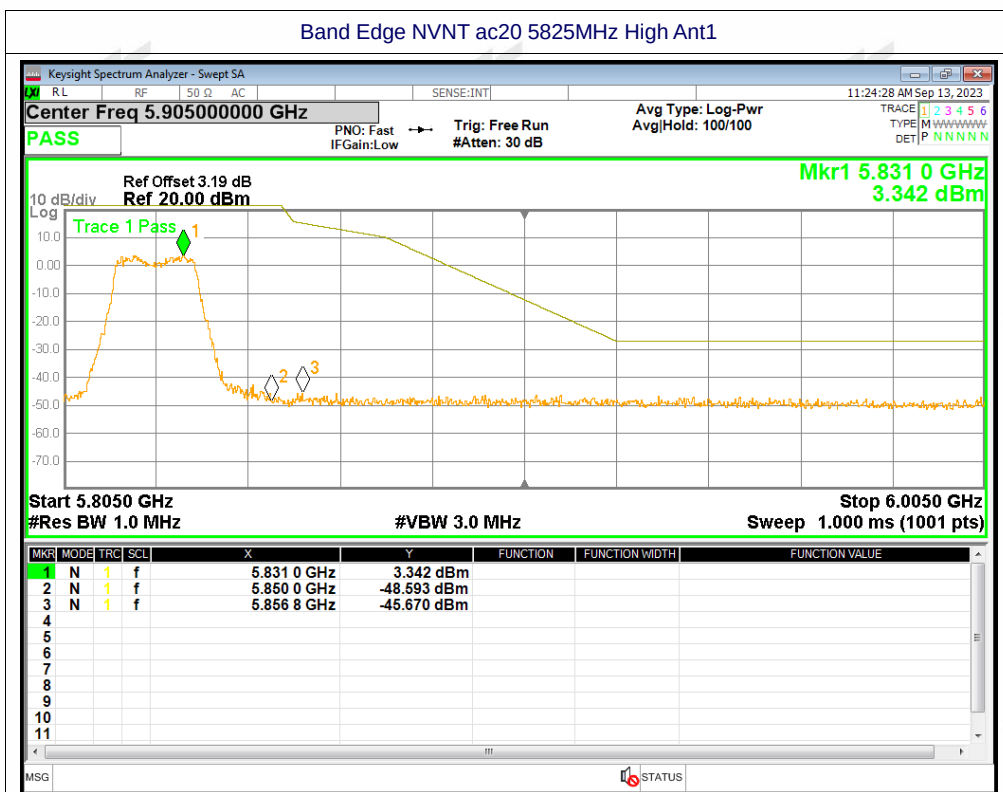


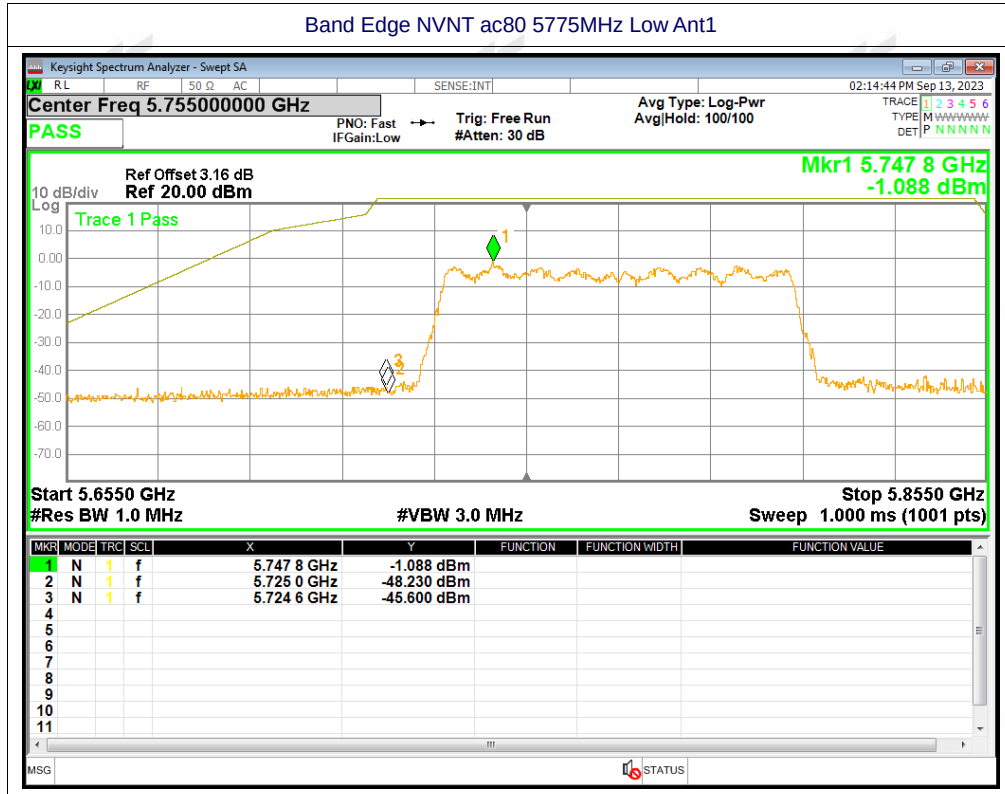
Band Edge NVNT n40 5755MHz Low Ant1



Band Edge NVNT ac20 5745MHz Low Ant1







B7.Frequency Stability

Voltage							
TestMode	Channel	Voltage [Vdc]	Temperature (°C)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
a	5745	NV	NT	-20000	-3.48	Within 5725-5850MH z	Pass
		LV	NT	-20000	-3.48		
		HV	NT	-20000	-3.48		
	5785	NV	NT	-40000	-6.91		
		LV	NT	-40000	-6.91		
		HV	NT	-40000	-6.91		
	5825	NV	NT	-20000	-3.43		
		LV	NT	-20000	-3.43		
		HV	NT	-20000	-3.43		
n20	5745	NV	NT	-40000	-6.96		
		LV	NT	-40000	-6.96		
		HV	NT	-40000	-6.96		
	5785	NV	NT	-20000	-3.46		
		LV	NT	-20000	-3.46		
		HV	NT	-20000	-3.46		
	5825	NV	NT	0	0		
		LV	NT	0	0		
		HV	NT	0	0		
ac20	5745	NV	NT	-40000	-6.96		
		LV	NT	-40000	-6.96		
		HV	NT	-40000	-6.96		
	5785	NV	NT	-40000	-6.91		
		LV	NT	-40000	-6.91		
		HV	NT	-40000	-6.91		
	5825	NV	NT	-20000	-3.43		
		LV	NT	-20000	-3.43		
		HV	NT	-20000	-3.43		

n40	5755	NV	NT	-40000	-6.95	Within 5725-5850MHz	Pass
		LV	NT	-40000	-6.95		
		HV	NT	-40000	-6.95		
	5795	NV	NT	0	0		
		LV	NT	0	0		
		HV	NT	0	0		
ac40	5755	NV	NT	-40000	-6.95		
		LV	NT	-40000	-6.95		
		HV	NT	-40000	-6.95		
	5795	NV	NT	-40000	-6.9		
		LV	NT	-40000	-6.9		
		HV	NT	-40000	-6.9		
ac80	5775	NV	NT	0	0		
		LV	NT	0	0		
		HV	NT	0	0		

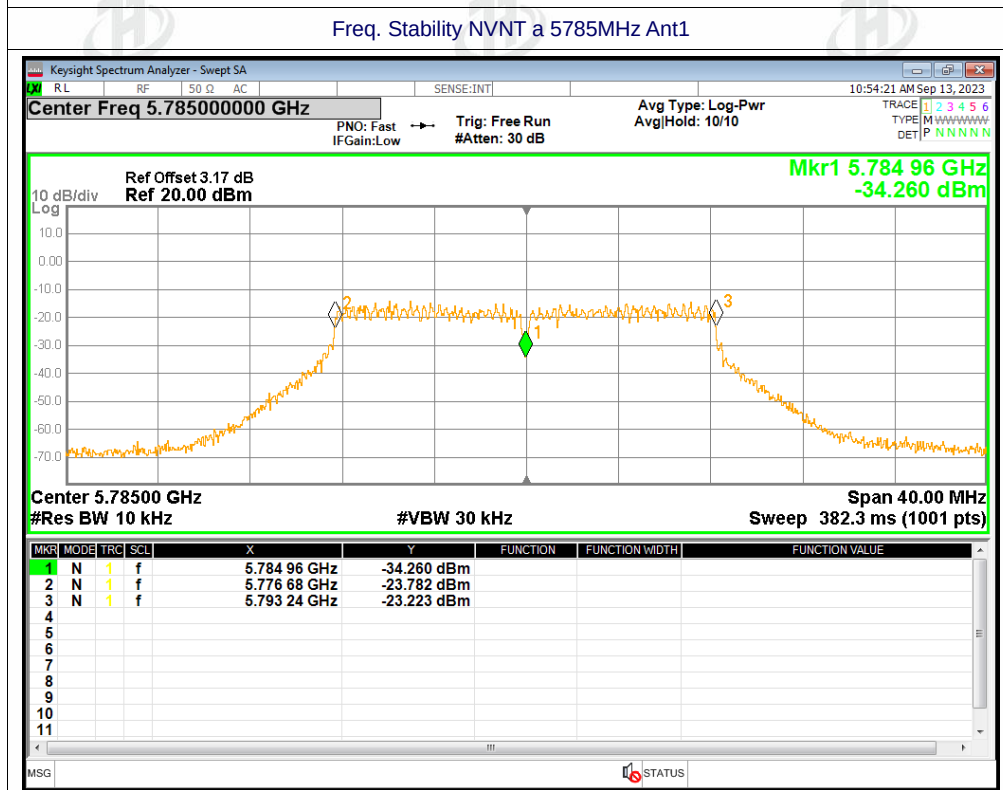
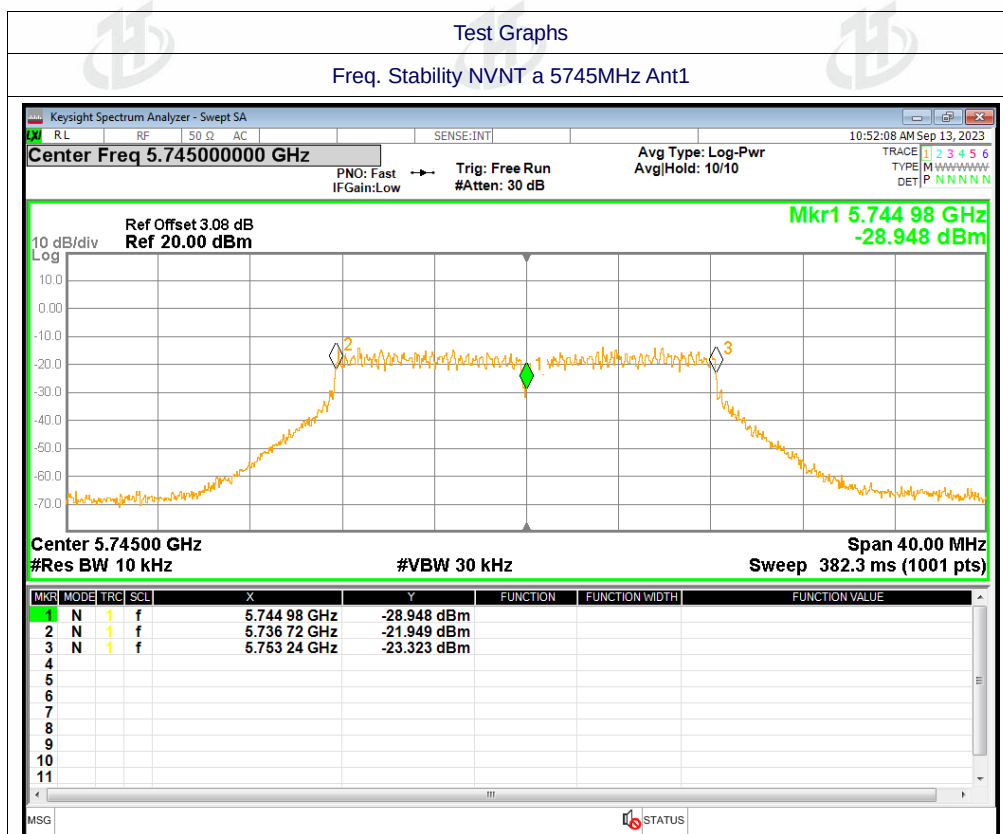
Temperature							
TestMode	Channel	Voltage [Vdc]	Temperature (°C)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
a	5745	NV	-20	-20000	-3.48	Within 5725-5850MHz	Pass
		NV	-10	-20000	-3.48		
		NV	0	-20000	-3.48		
		NV	20	-20000	-3.48		
		NV	30	-20000	-3.48		
		NV	50	-20000	-3.48		
		NV	60	-20000	-3.48		
	5785	NV	-20	-40000	-6.91		
		NV	-10	-40000	-6.91		
		NV	0	-40000	-6.91		
		NV	20	-40000	-6.91		
		NV	30	-40000	-6.91		
		NV	50	-40000	-6.91		
		NV	60	-40000	-6.91		
	5825	NV	-20	-20000	-3.43		
		NV	-10	-20000	-3.43		
		NV	0	-20000	-3.43		
		NV	20	-20000	-3.43		
		NV	30	-20000	-3.43		
		NV	50	-20000	-3.43		
		NV	60	-20000	-3.43		
N20	5745	NV	-20	-40000	-6.96		
		NV	-10	-40000	-6.96		
		NV	0	-40000	-6.96		
		NV	20	-40000	-6.96		
		NV	30	-40000	-6.96		
		NV	50	-40000	-6.96		
		NV	60	-40000	-6.96		
	5785	NV	-20	-20000	-3.46		
		NV	-10	-20000	-3.46		
		NV	0	-20000	-3.46		
		NV	20	-20000	-3.46		

		NV	30	-20000	-3.46		
		NV	50	-20000	-3.46		
		NV	60	-20000	-3.46		
	5825	NV	-20	0	0		
		NV	-10	0	0		
		NV	0	0	0		
		NV	20	0	0		
		NV	30	0	0		
		NV	50	0	0		
		NV	60	0	0		
ac20	5745	NV	-20	-40000	-6.96		
		NV	-10	-40000	-6.96		
		NV	0	-40000	-6.96		
		NV	20	-40000	-6.96		
		NV	30	-40000	-6.96		
		NV	50	-40000	-6.96		
		NV	60	-40000	-6.96		
	5785	NV	-20	-40000	-6.91	Within 5725-5850MHz	Pass
		NV	-10	-40000	-6.91		
		NV	0	-40000	-6.91		
		NV	20	-40000	-6.91		
		NV	30	-40000	-6.91		
		NV	50	-40000	-6.91		
		NV	60	-40000	-6.91		
	5825	NV	-20	-20000	-3.43		
		NV	-10	-20000	-3.43		
		NV	0	-20000	-3.43		
		NV	20	-20000	-3.43		
		NV	30	-20000	-3.43		
		NV	50	-20000	-3.43		
		NV	60	-20000	-3.43		
N40	5755	NV	-20	-40000	-6.95		
		NV	-10	-40000	-6.95		
		NV	0	-40000	-6.95		
		NV	20	-40000	-6.95		
		NV	30	-40000	-6.95		

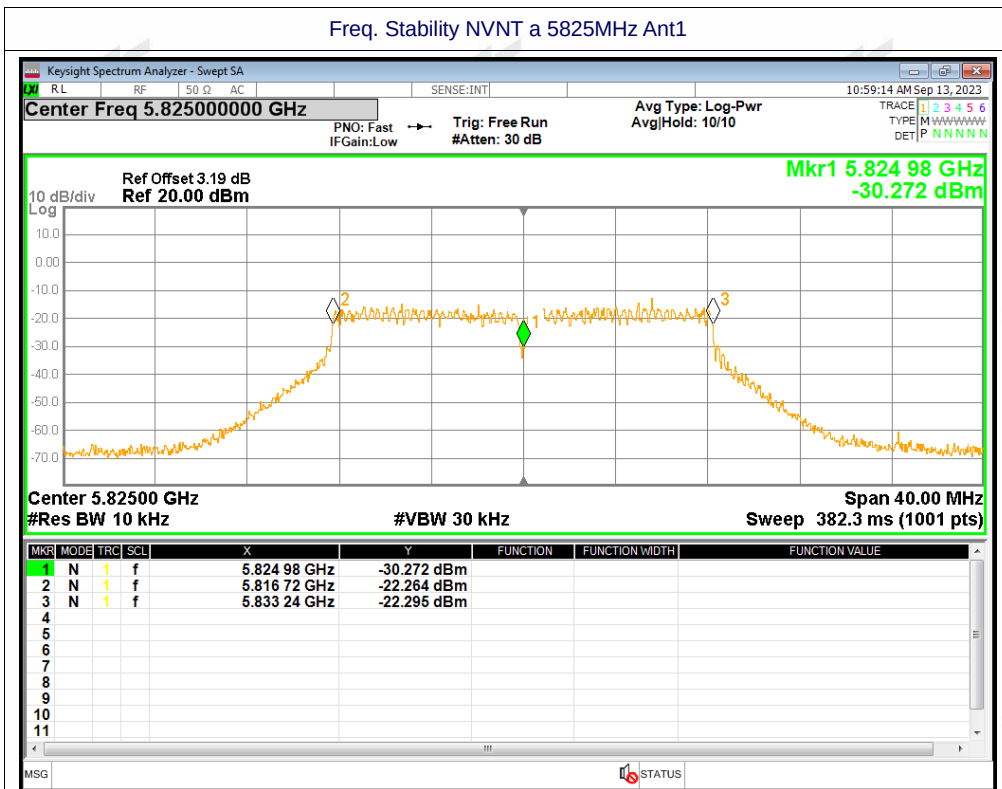
		NV	50	-40000	-6.95		
		NV	60	-40000	-6.95		
N40	5795	NV	-20	-40000	-6.9	Within 5725-5850MHz	Pass
		NV	-10	-40000	-6.9		
		NV	0	-40000	-6.9		
		NV	20	-40000	-6.9		
		NV	30	-40000	-6.9		
		NV	50	-40000	-6.9		
		NV	60	-40000	-6.9		
		NV	-20	-40000	-6.95		
		NV	-10	-40000	-6.95		
ac40	5755	NV	0	-40000	-6.95		
		NV	20	-40000	-6.95		
		NV	30	-40000	-6.95		
		NV	50	-40000	-6.95		
		NV	60	-40000	-6.95		
	5795	NV	-20	-40000	-6.9		
		NV	-10	-40000	-6.9		
		NV	0	-40000	-6.9		
		NV	20	-40000	-6.9		
		NV	30	-40000	-6.9		
		NV	50	-40000	-6.9		
		NV	60	-40000	-6.9		
ac80	5775	NV	-20	0	0		
		NV	-10	0	0		
		NV	0	0	0		
		NV	20	0	0		
		NV	30	0	0		
		NV	50	0	0		
		NV	60	0	0		

Note:Test temperature:-20° to + 60°

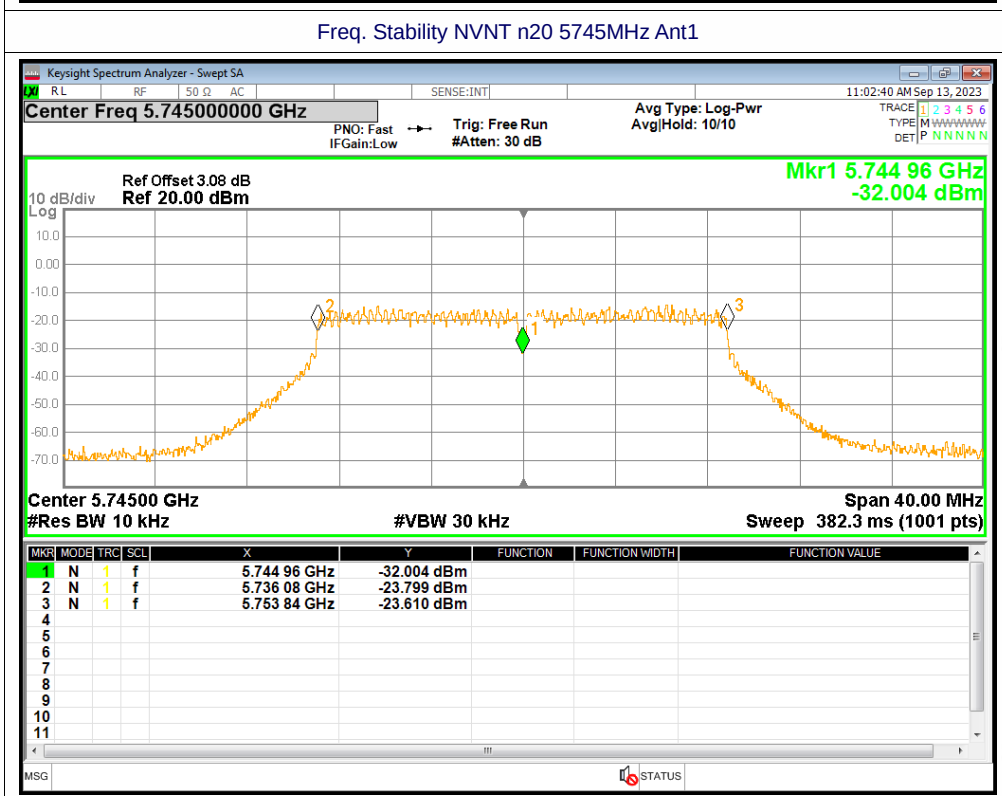
At room temperature, the test results are the worst, only reflecting the test results at room temperature.



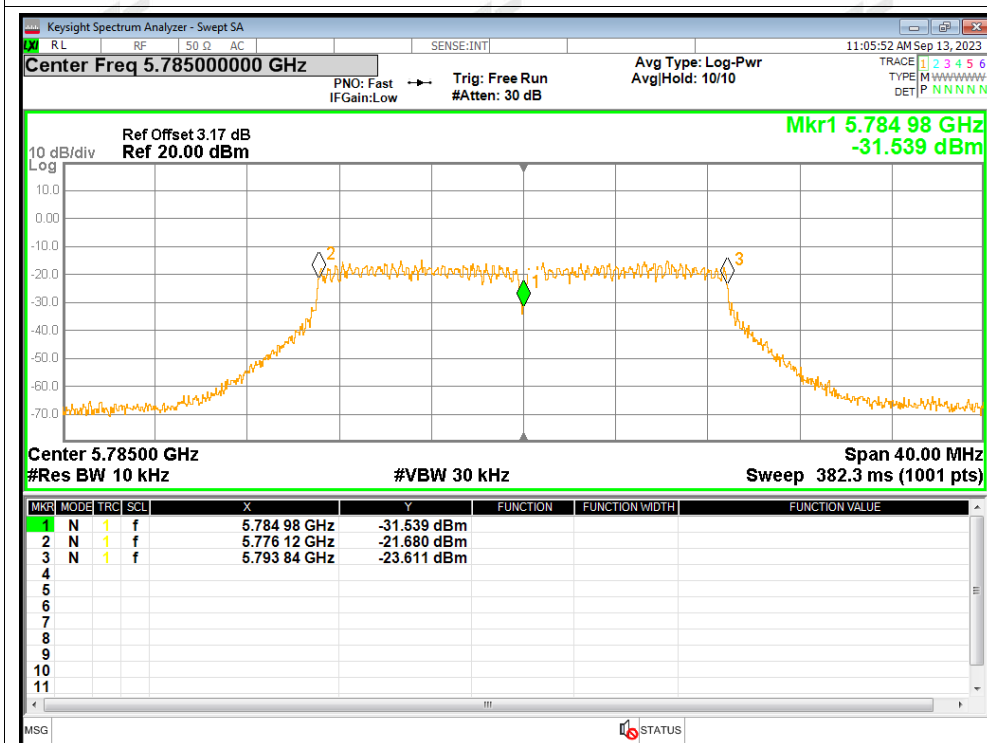
Freq. Stability NVNT a 5825MHz Ant1



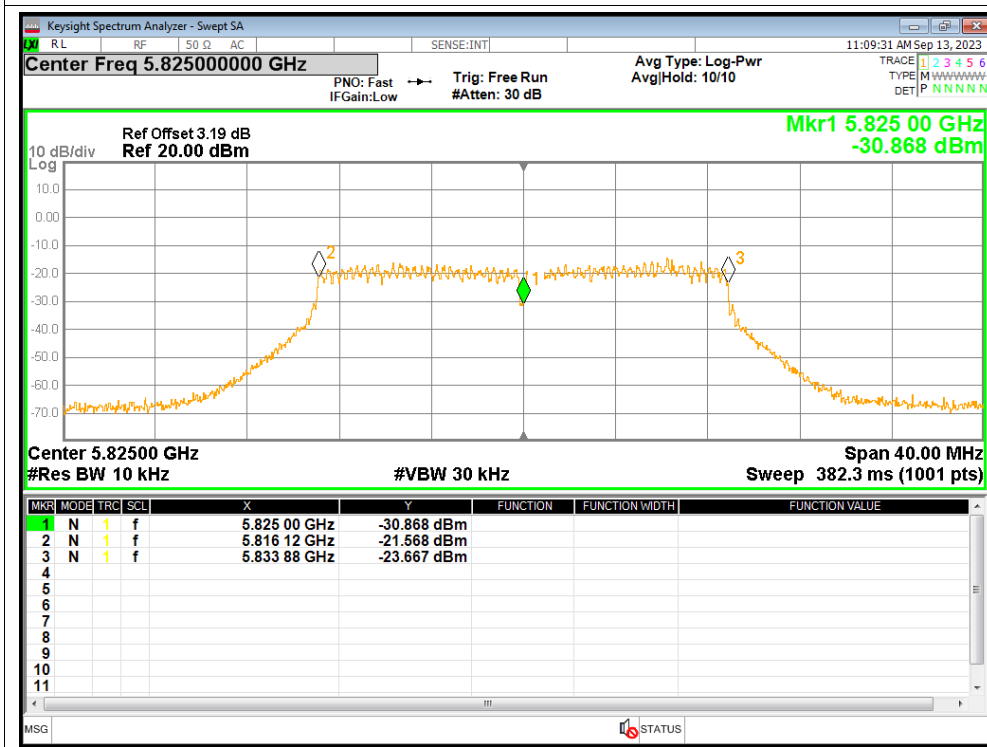
Freq. Stability NVNT n20 5745MHz Ant1



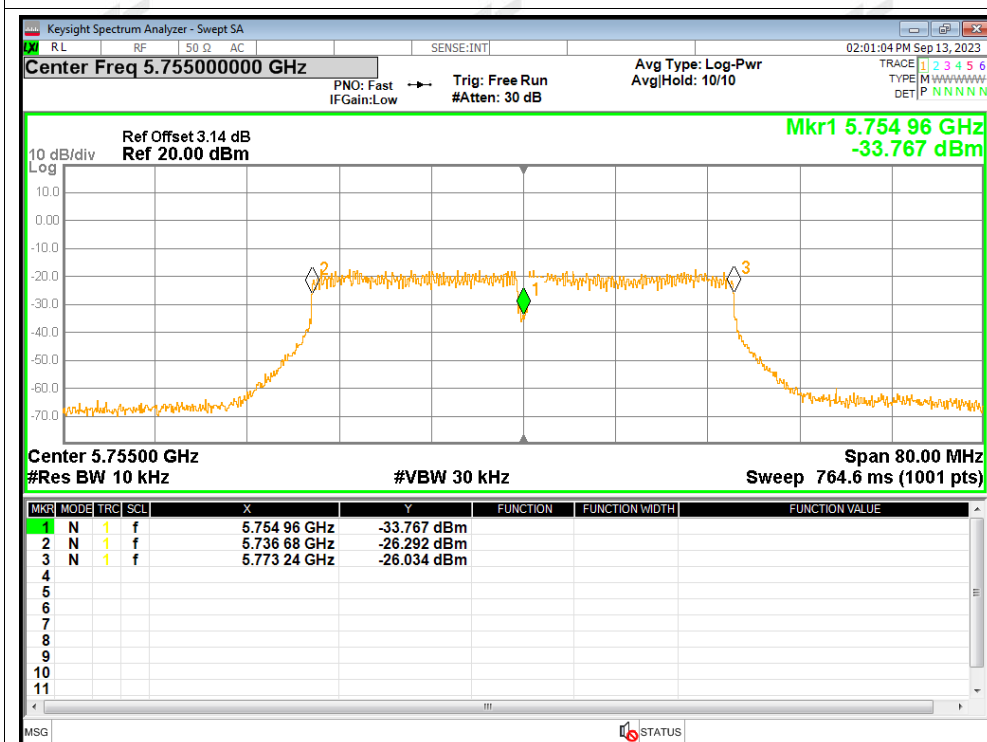
Freq. Stability NVNT n20 5785MHz Ant1



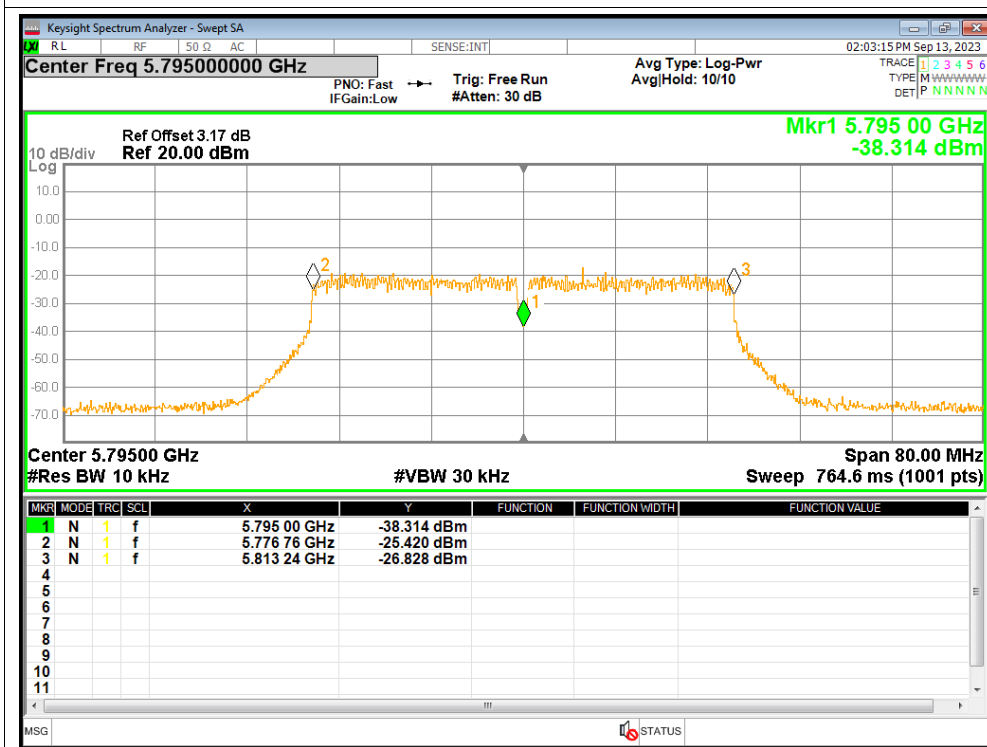
Freq. Stability NVNT n20 5825MHz Ant1



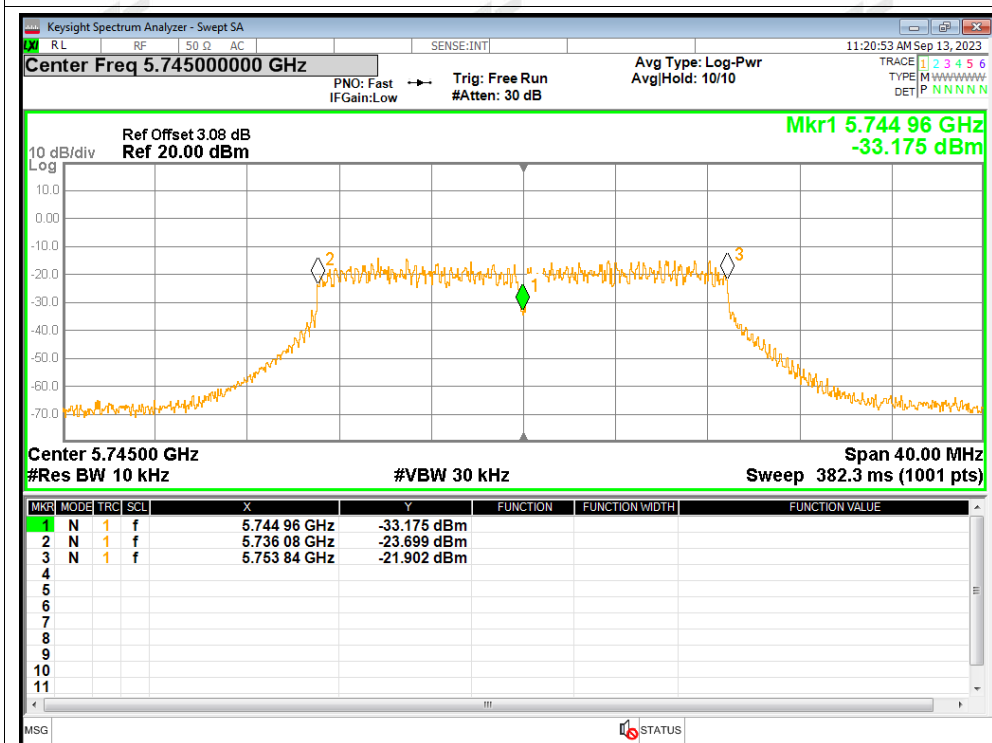
Freq. Stability NVNT n40 5755MHz Ant1



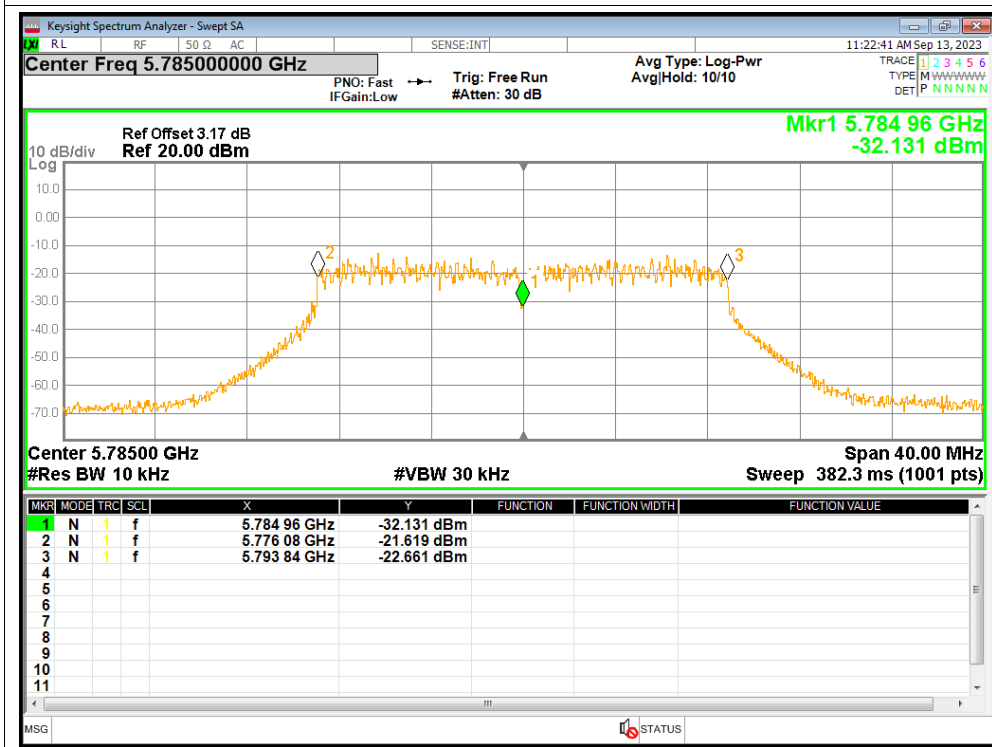
Freq. Stability NVNT n40 5795MHz Ant1



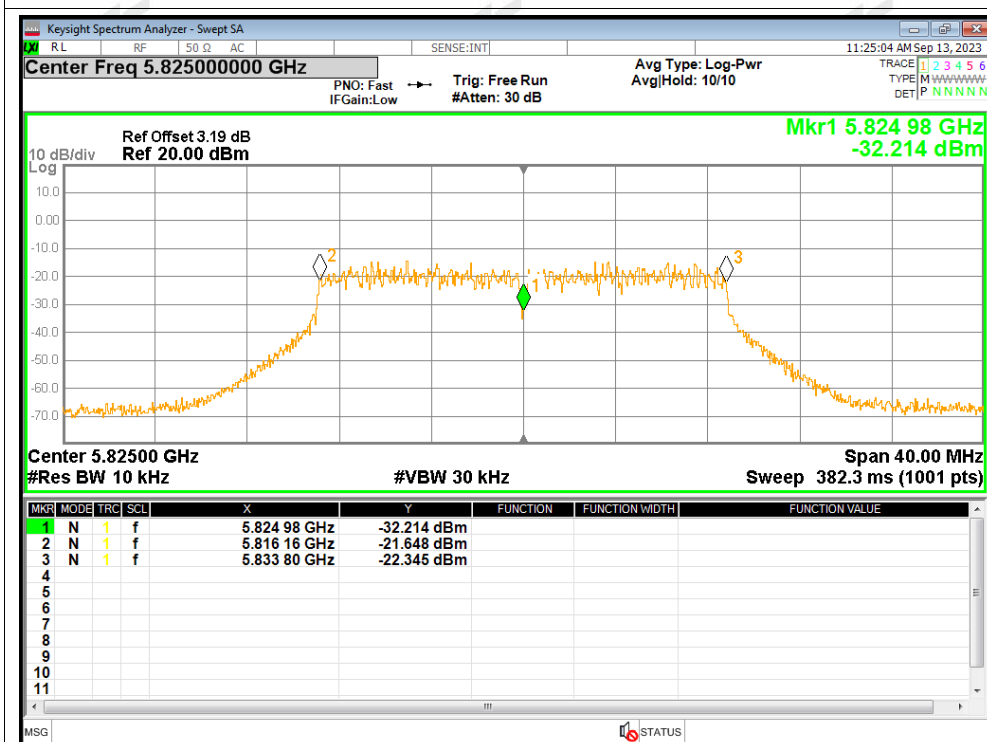
Freq. Stability NVNT ac20 5745MHz Ant1



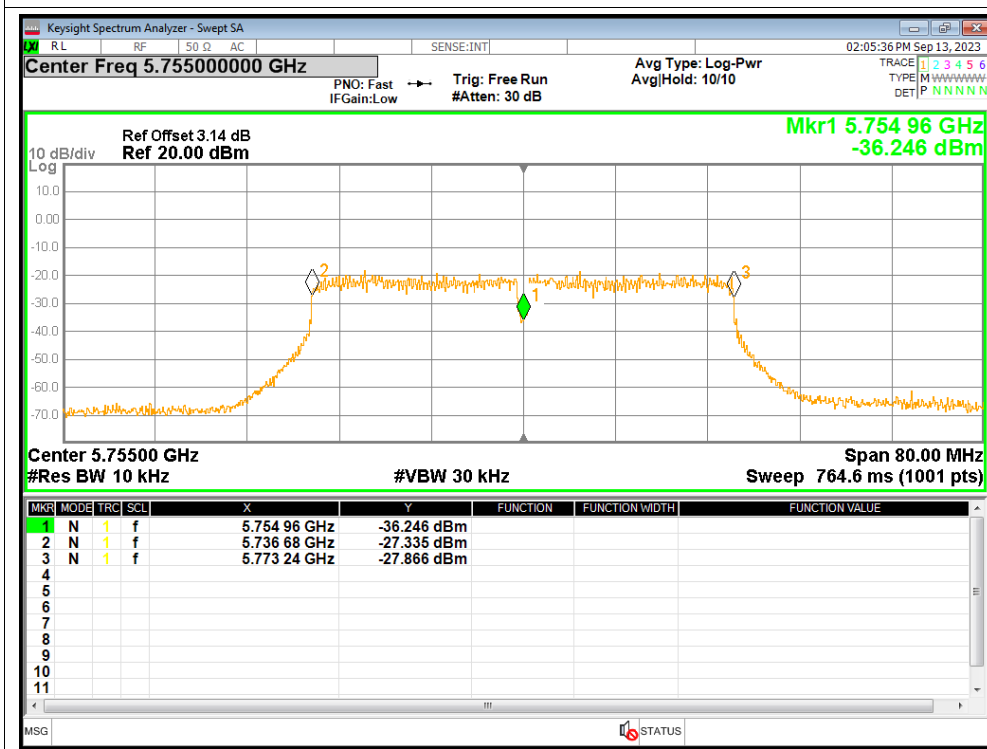
Freq. Stability NVNT ac20 5785MHz Ant1

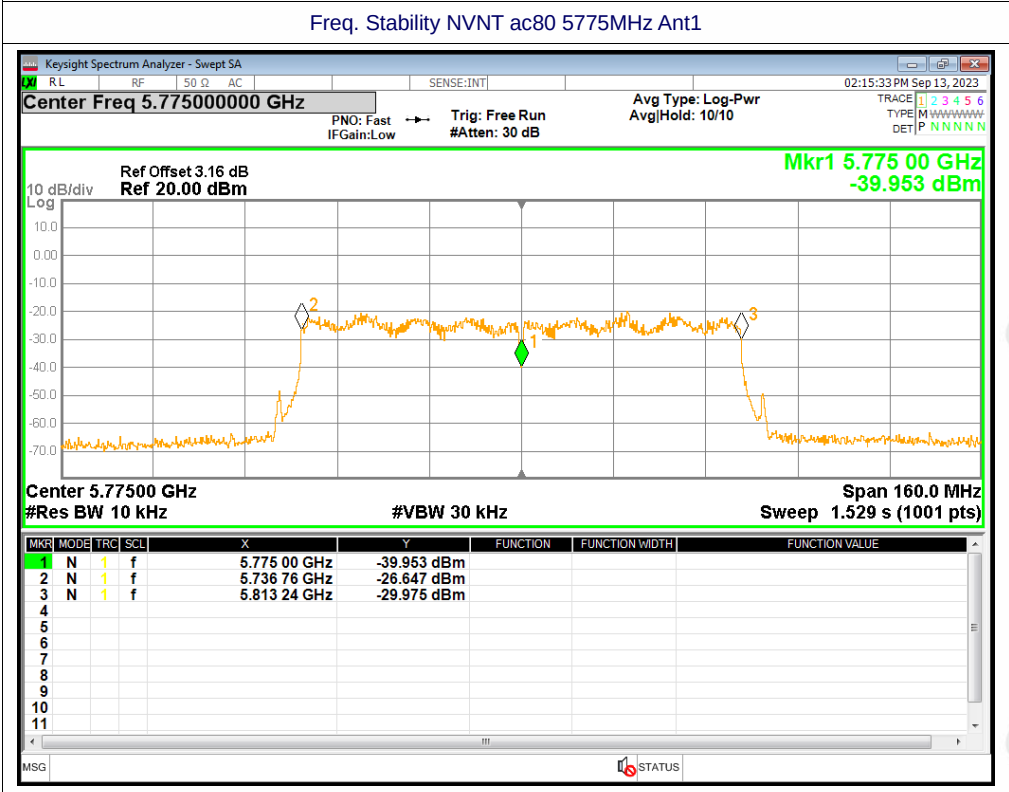
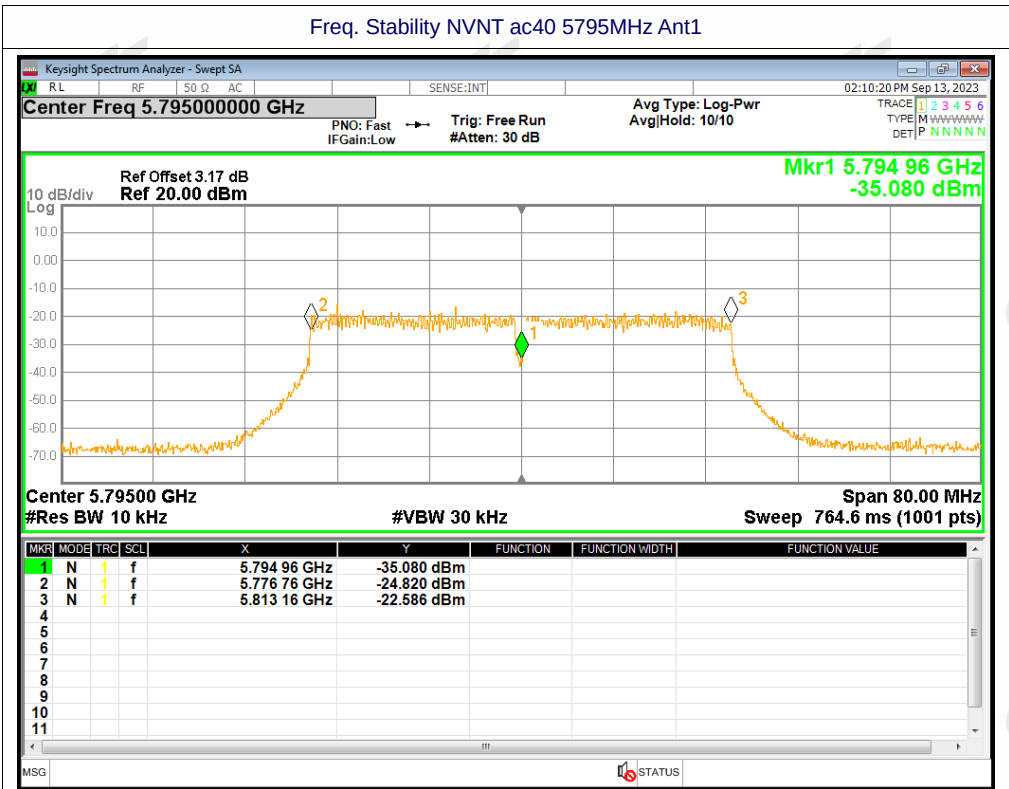


Freq. Stability NVNT ac20 5825MHz Ant1



Freq. Stability NVNT ac40 5755MHz Ant1





B8.Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Frequency (GHz)	Max Value (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	0.3-1	-35.32	-27	pass
			1-5.575	-35.52	-27	pass
			5.575-5.625	-34.19	-27 to 10	pass
			5.625-5.645	-33.65	10 to 15.6	pass
			5.645-5.650	-30.41	15.6 to 27	pass
			5.850-5.855	-30.21	27 to15.6	pass
			5.855-5.875	-34.19	15.6 to 10	pass
			5.875-5.925	-34.43	10 to -27	pass
			5.925-27G	-36.54	-27	pass
		5825	0.3-1	-36.19	-27	pass
			1-5.575	-35.61	-27	pass
			5.575-5.625	-34.50	-27 to 10	pass
			5.625-5.645	-34.29	10 to 15.6	pass
			5.645-5.650	-31.06	15.6 to 27	pass
			5.850-5.855	-31.31	27 to15.6	pass
			5.855-5.875	-34.20	15.6 to 10	pass
			5.875-5.925	-35.06	10 to -27	pass
			5.925-27G	-36.19	-27	pass

NOTE: All the modes had been tested, just worst case(802.11 a) recorded in the report.