

## Appendix B for 5GWIFI Test Data

Product Name: ATOTO Car Navigation Multimedia Receiver

Test Model: C9

### Environmental Conditions

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

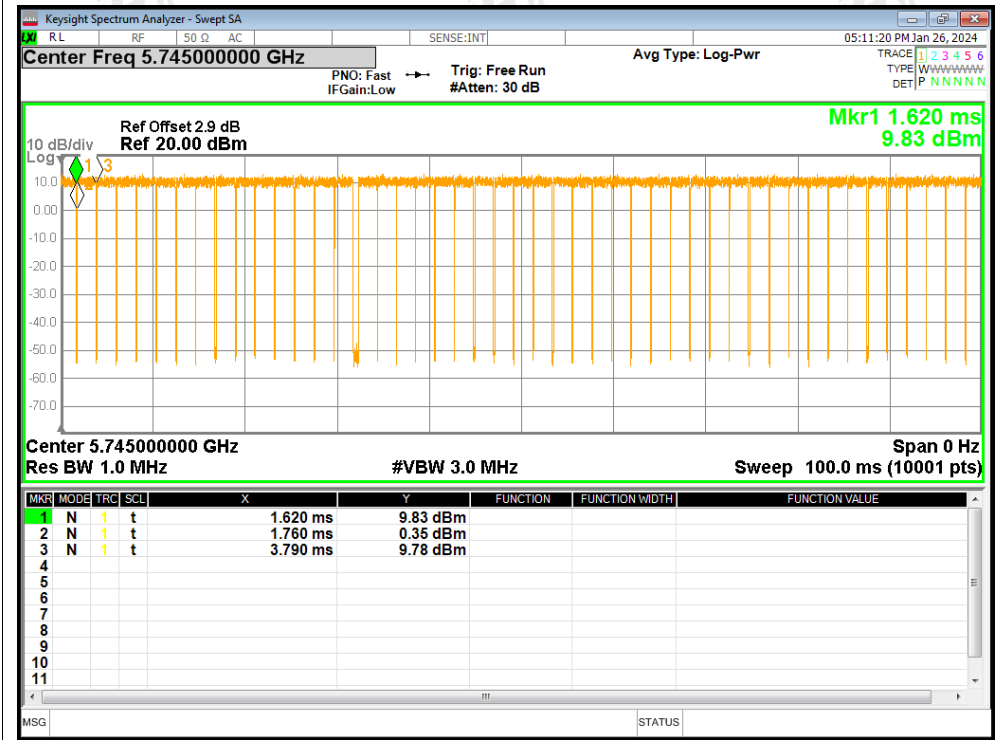


### B1. Duty Cycle

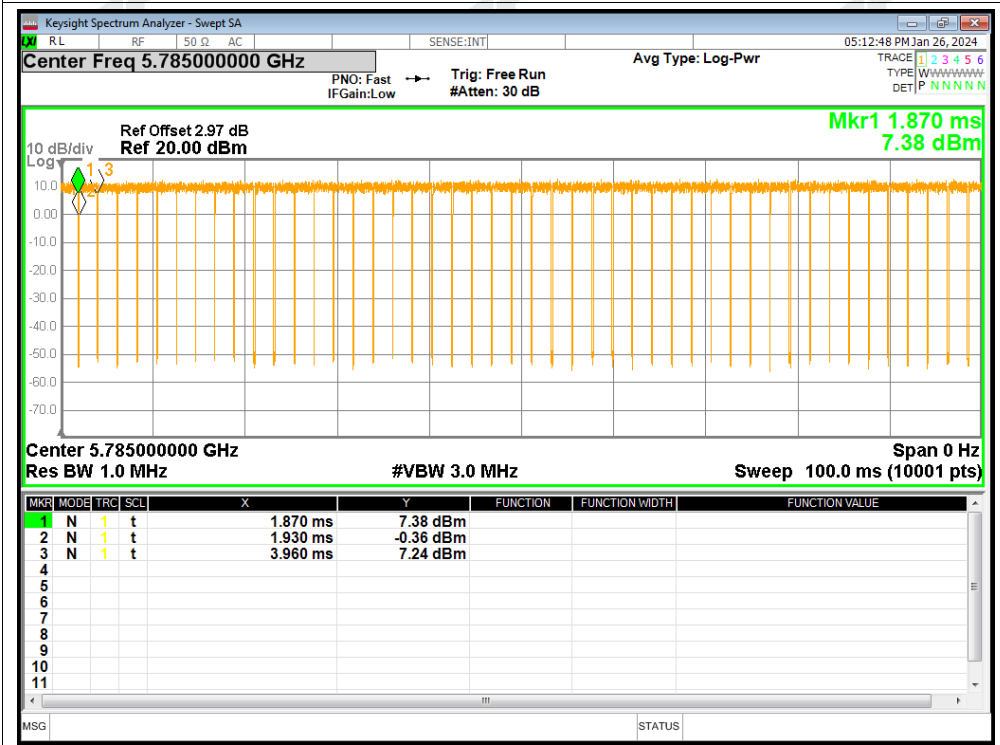
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)
NVNT	a	5745	Ant1	93.55	0.29
NVNT	a	5785	Ant1	97.13	0.13
NVNT	a	5825	Ant1	95.31	0.21
NVNT	n20	5745	Ant1	94.06	0.27
NVNT	n20	5785	Ant1	97.42	0.11
NVNT	n20	5825	Ant1	95.45	0.2
NVNT	n40	5755	Ant1	95.88	0.18
NVNT	n40	5795	Ant1	92.08	0.36
NVNT	ac20	5745	Ant1	95.96	0.18
NVNT	ac20	5785	Ant1	94.06	0.27
NVNT	ac20	5825	Ant1	90.48	0.43
NVNT	ac40	5755	Ant1	87.85	0.56
NVNT	ac40	5795	Ant1	91.18	0.4

Test Graphs

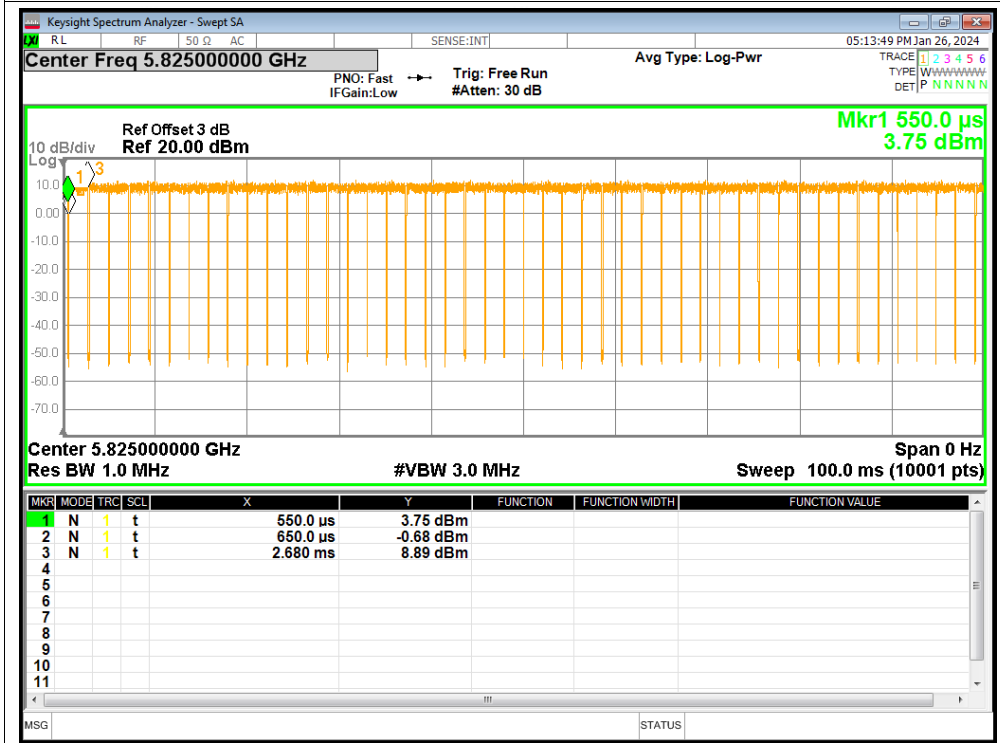
Duty Cycle NVNT a 5745MHz Ant1



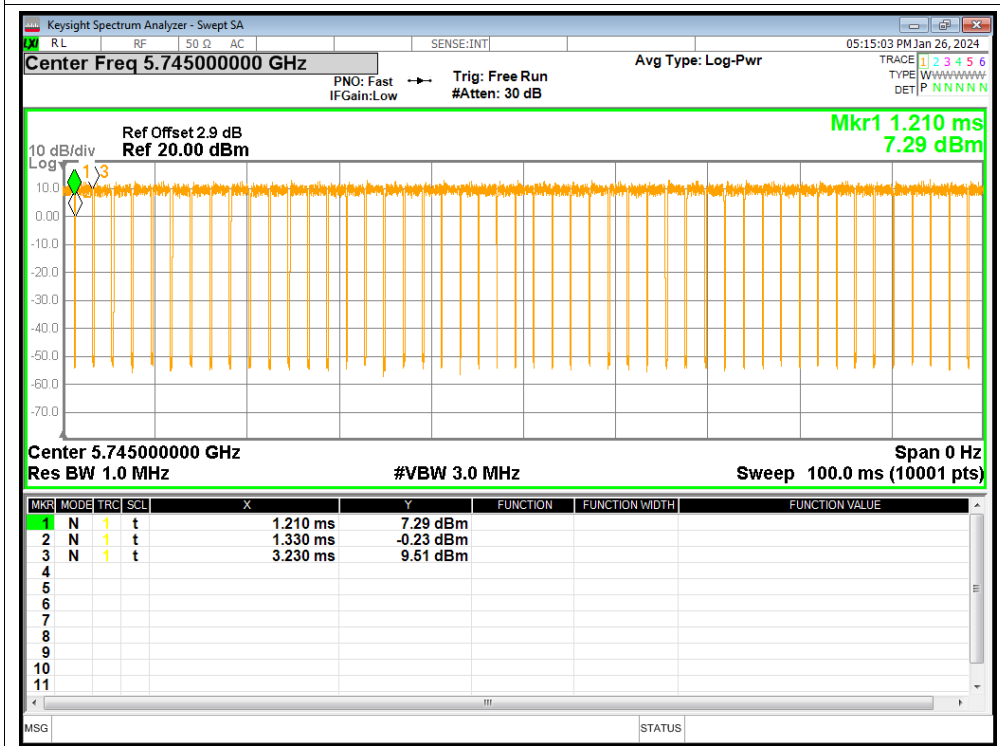
Duty Cycle NVNT a 5785MHz Ant1

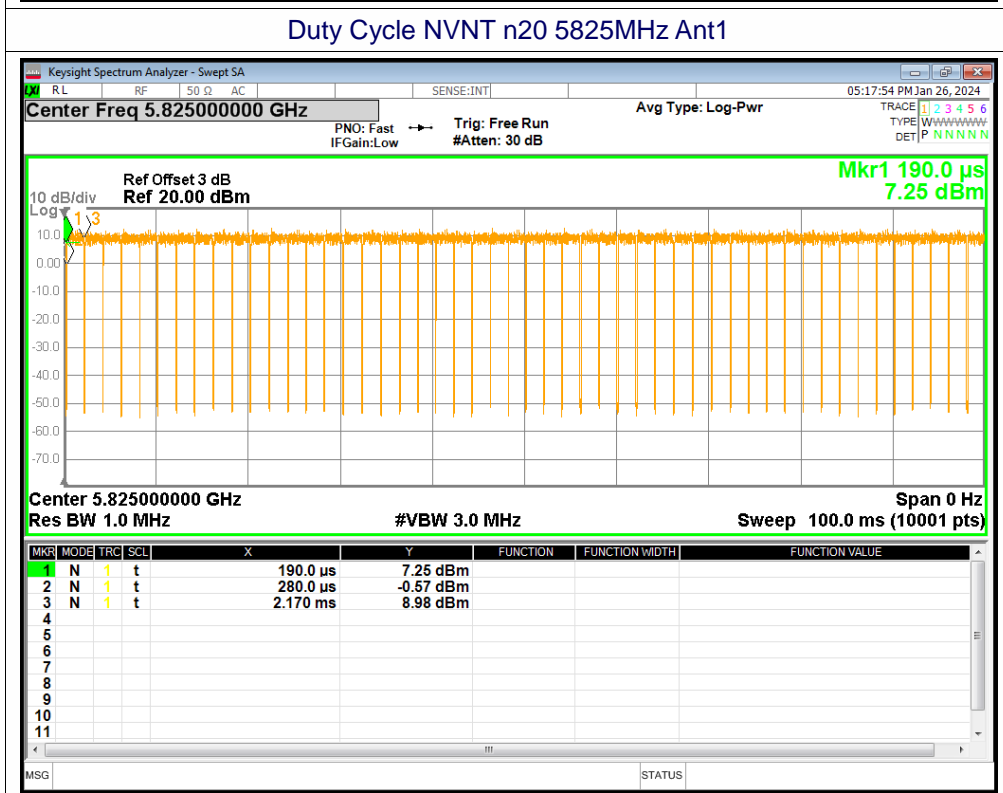
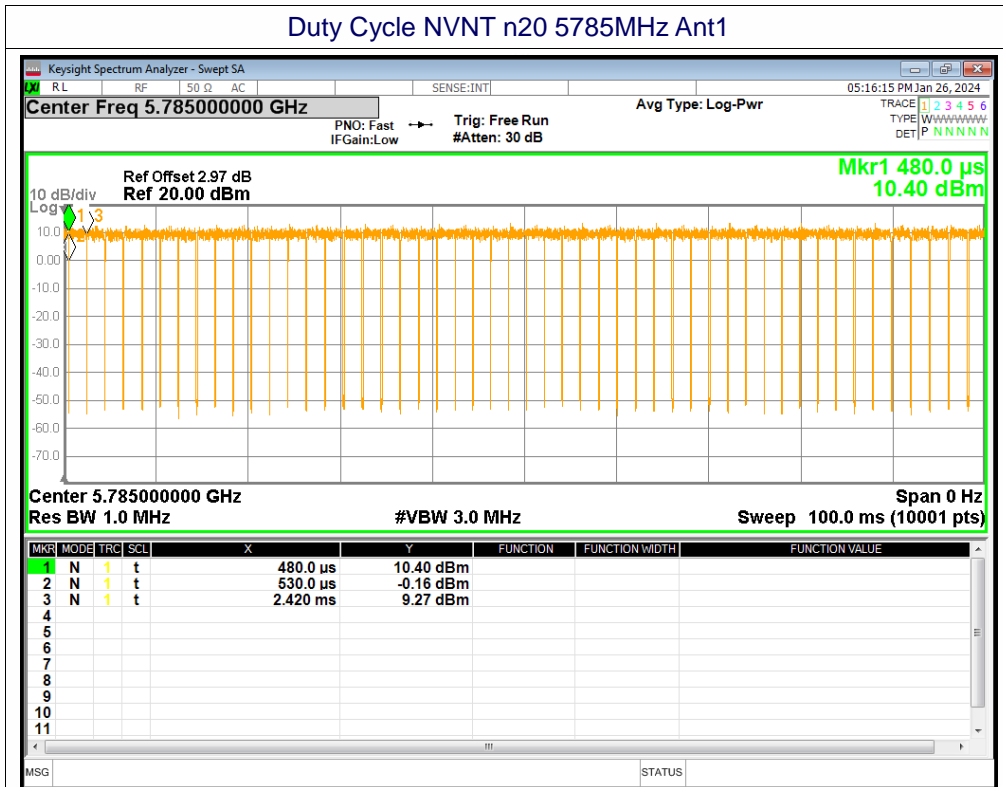


Duty Cycle NVNT a 5825MHz Ant1

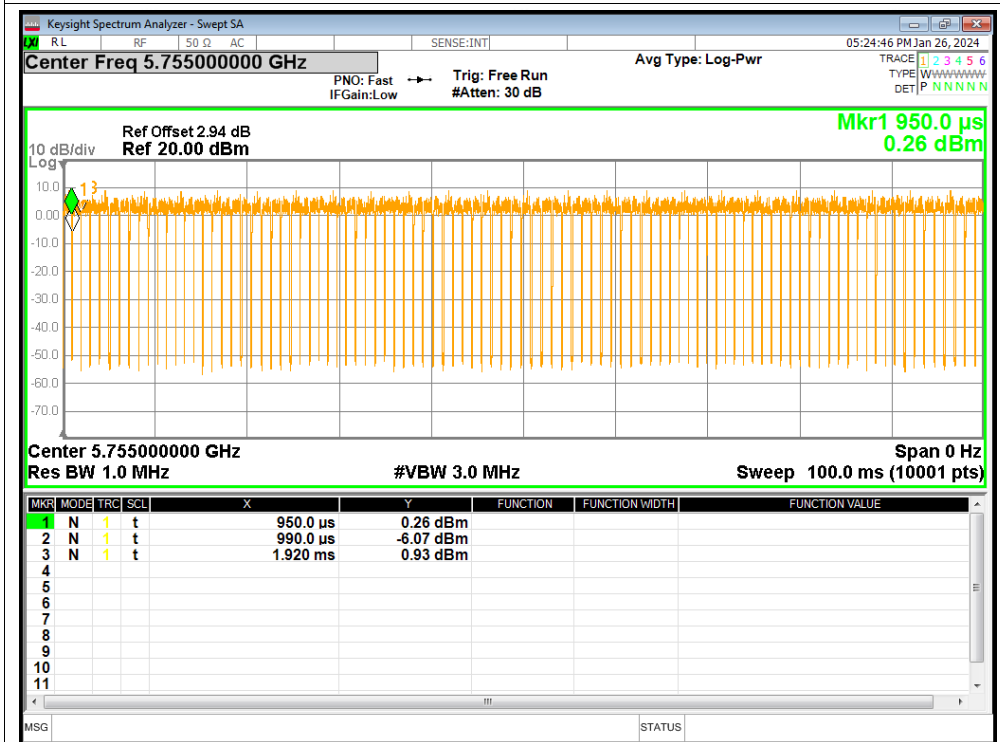


Duty Cycle NVNT n20 5745MHz Ant1

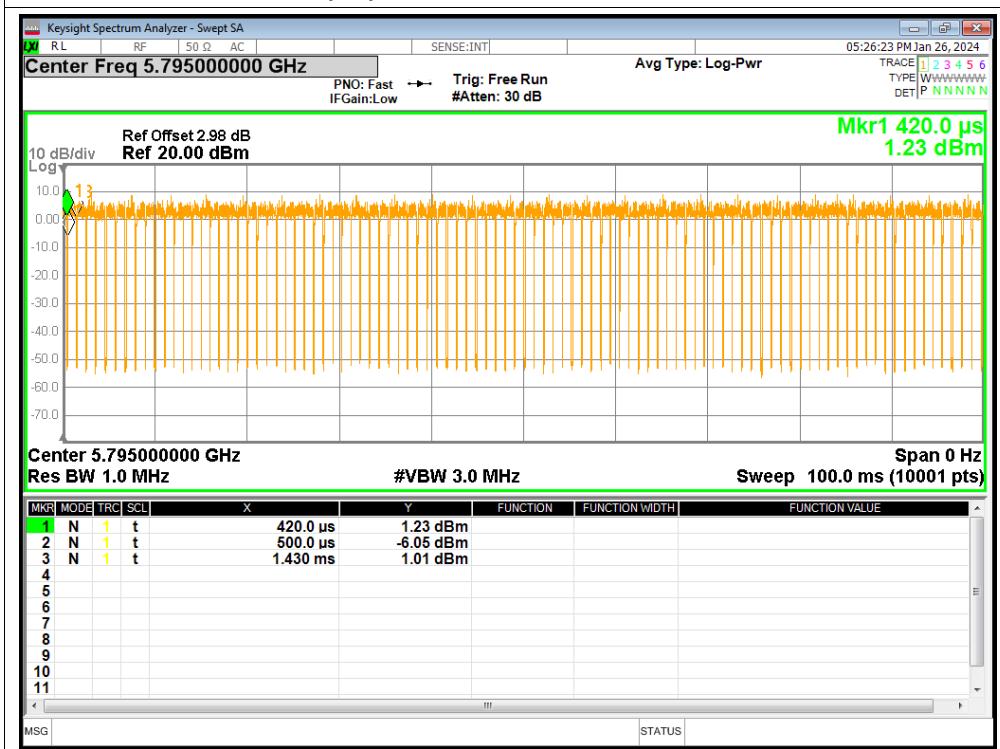


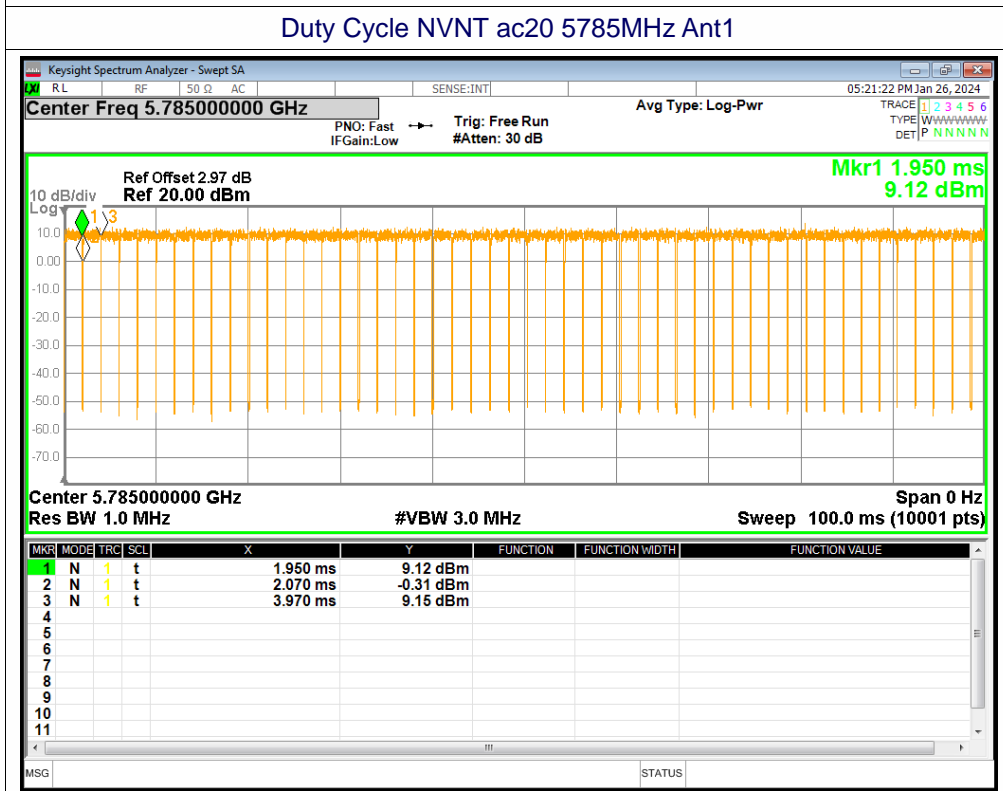
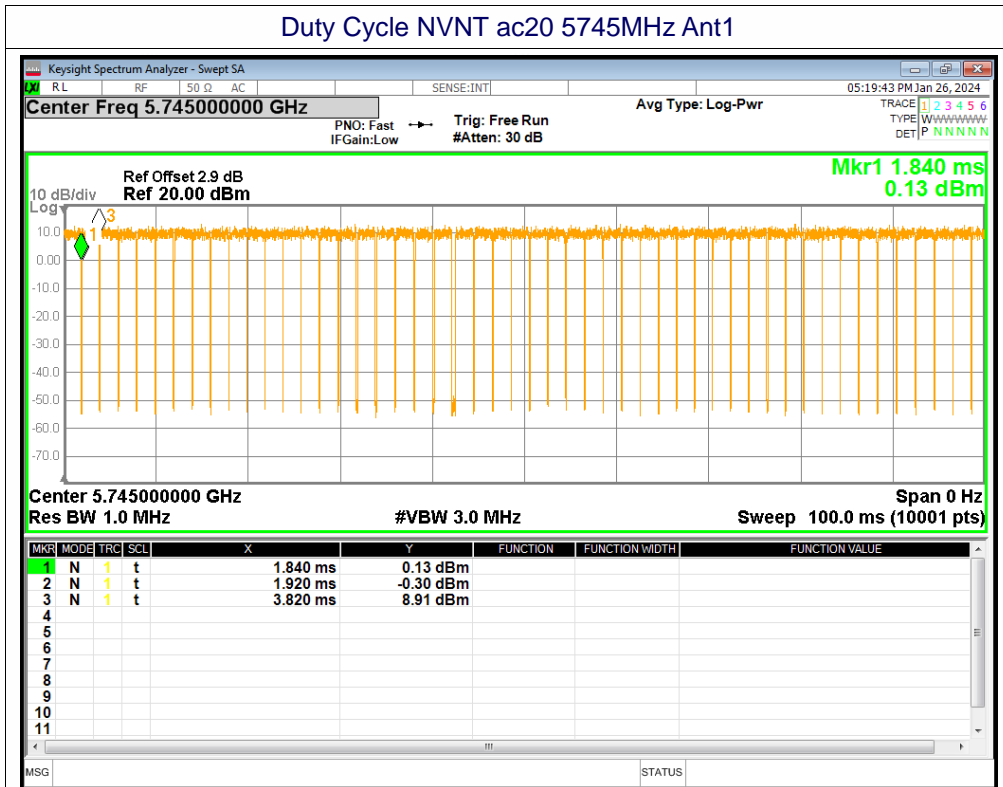


### Duty Cycle NVNT n40 5755MHz Ant1

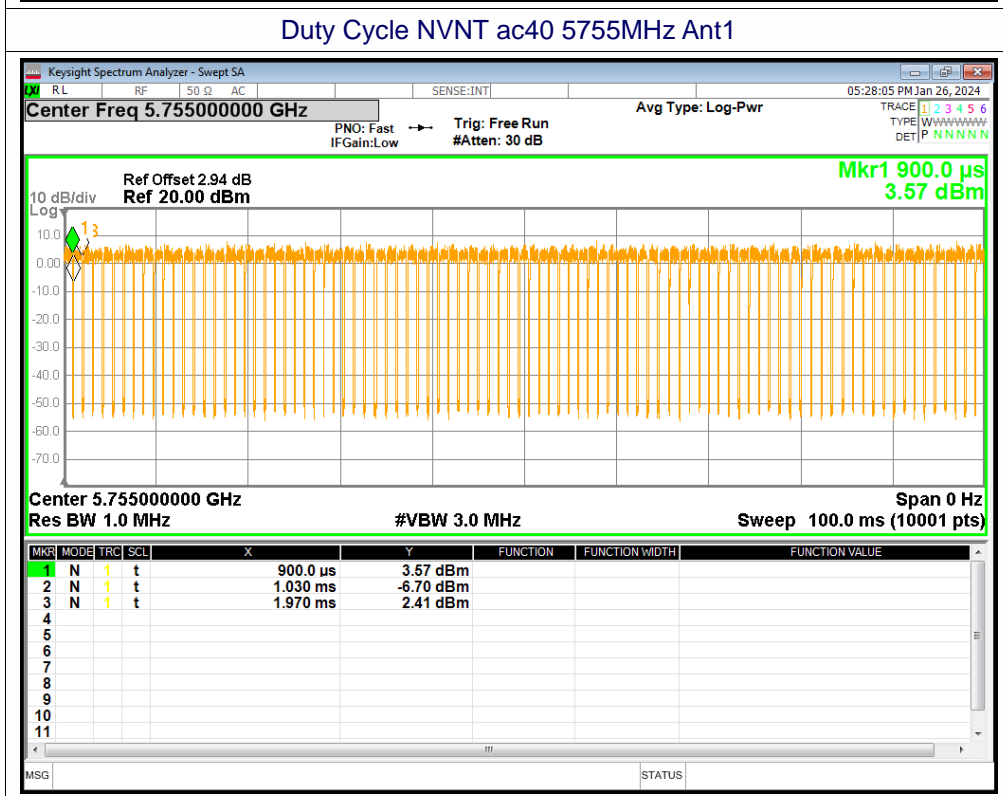
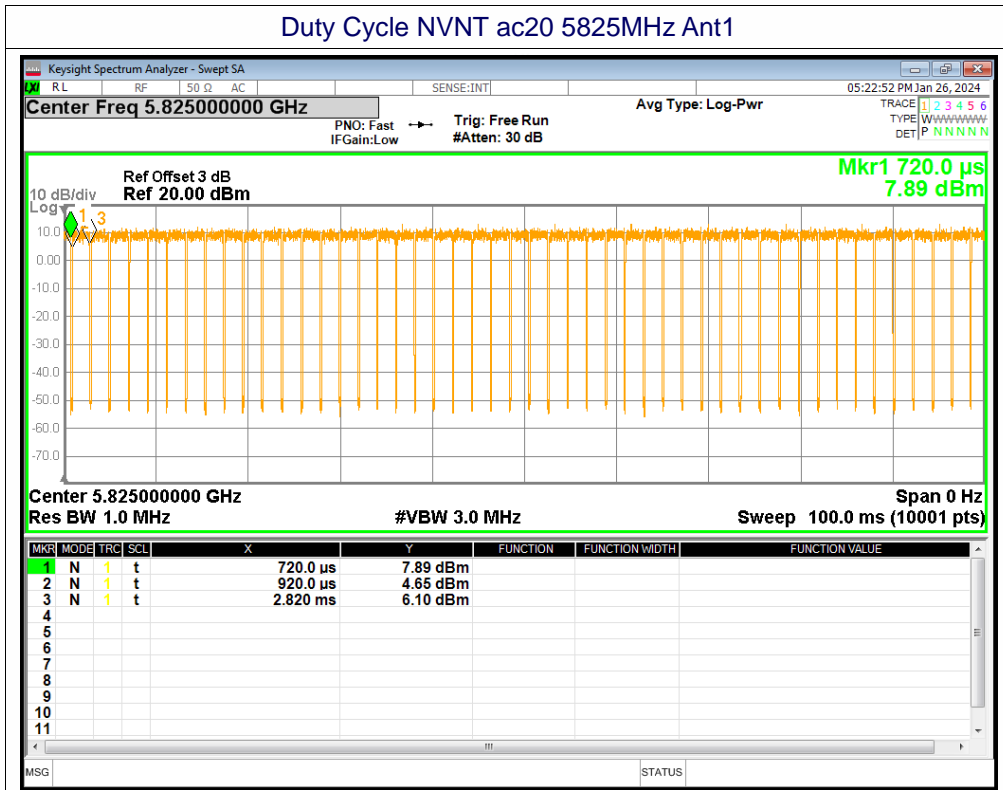


### Duty Cycle NVNT n40 5795MHz Ant1

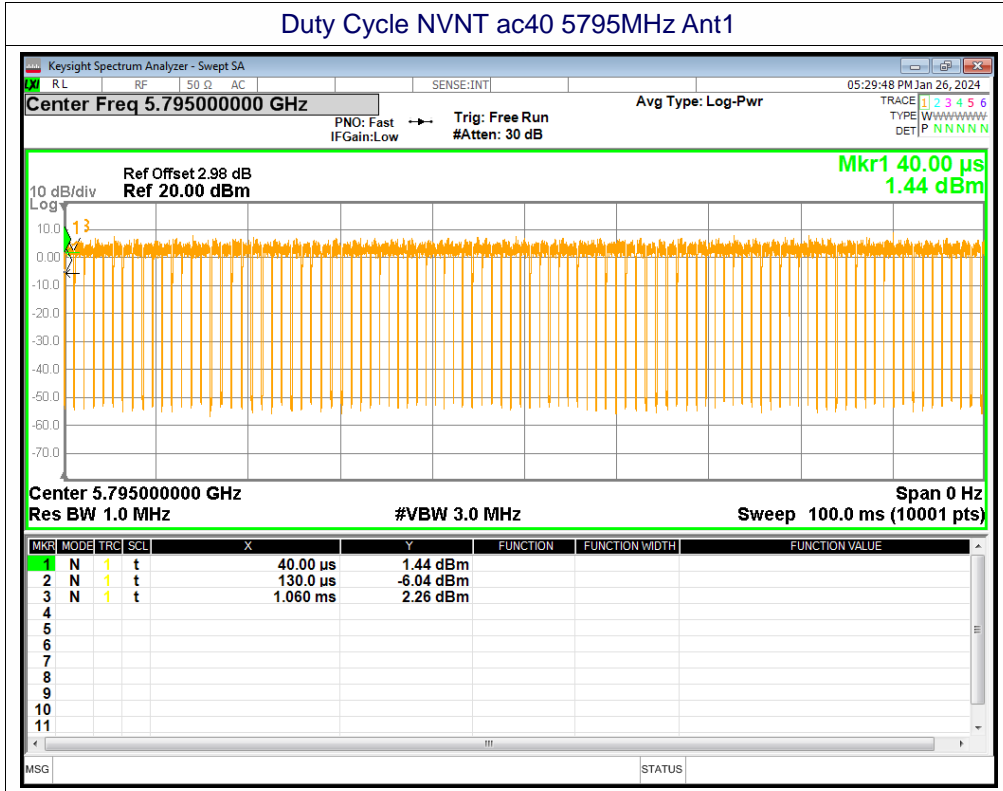












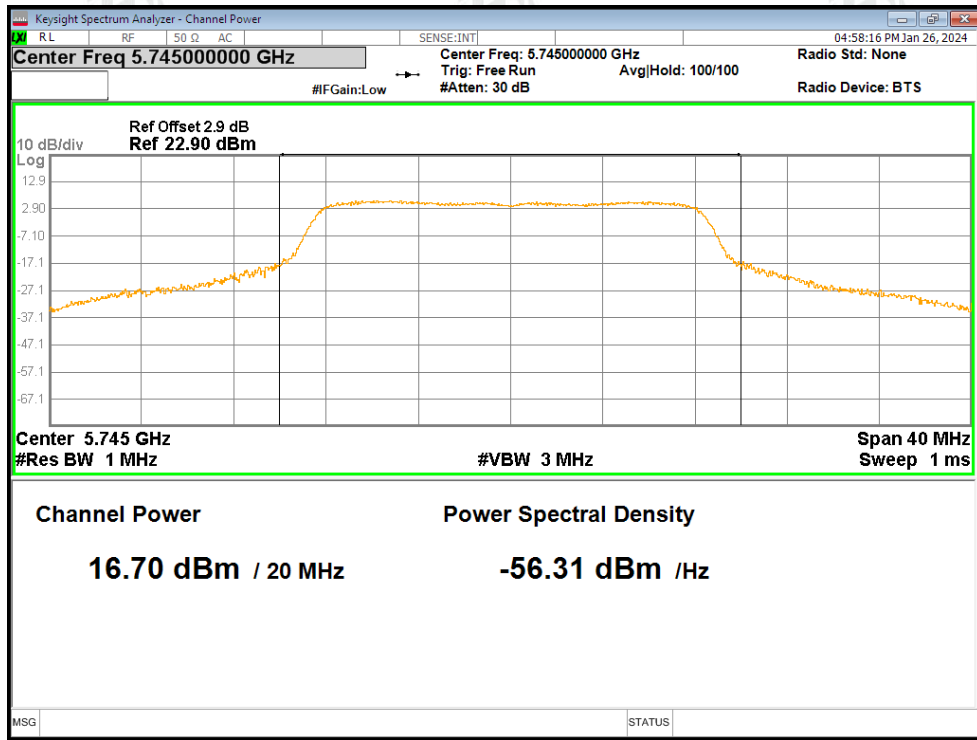


## B2. Maximum Conducted Output Power

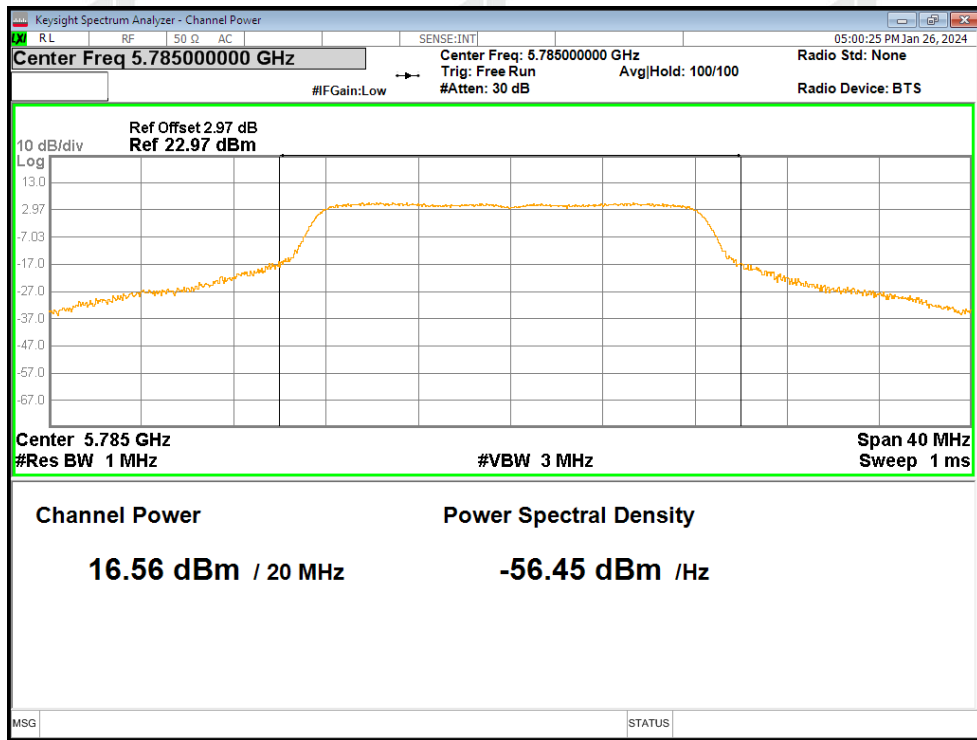
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	Ant1	16.7	30	Pass
NVNT	a	5785	Ant1	16.56	30	Pass
NVNT	a	5825	Ant1	16.27	30	Pass
NVNT	n20	5745	Ant1	16.56	30	Pass
NVNT	n20	5785	Ant1	16.52	30	Pass
NVNT	n20	5825	Ant1	16.15	30	Pass
NVNT	n40	5755	Ant1	16.43	30	Pass
NVNT	n40	5795	Ant1	16.18	30	Pass
NVNT	ac20	5745	Ant1	16.68	30	Pass
NVNT	ac20	5785	Ant1	16.51	30	Pass
NVNT	ac20	5825	Ant1	16.14	30	Pass
NVNT	ac40	5755	Ant1	16.29	30	Pass
NVNT	ac40	5795	Ant1	16.08	30	Pass

Test Graphs

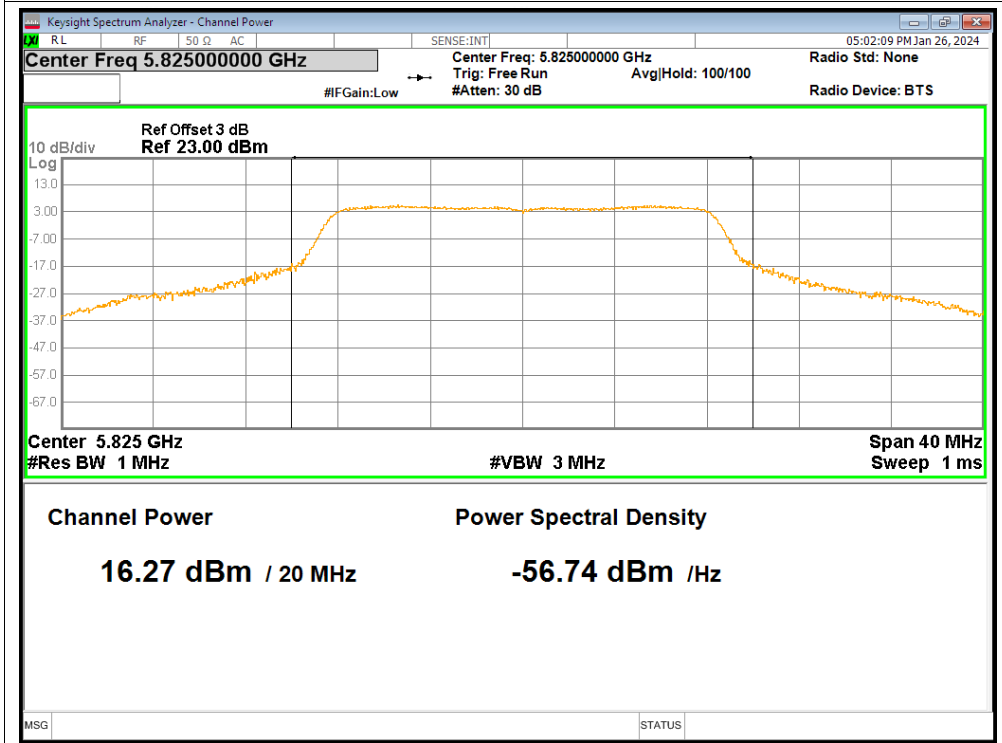
Power NVNT a 5745MHz Ant1



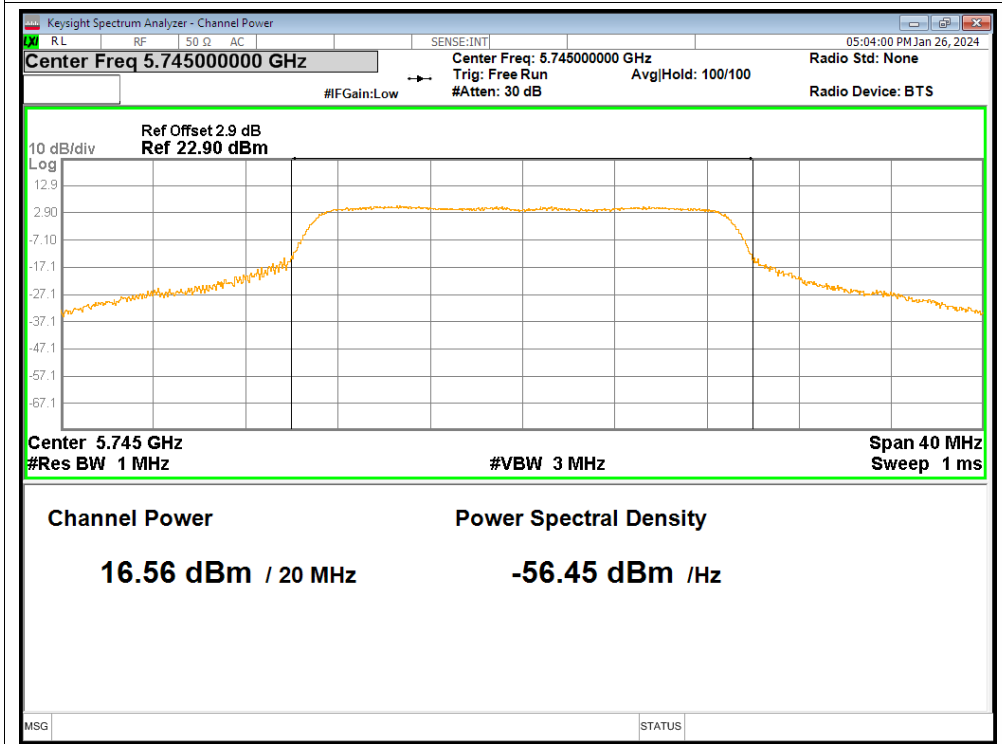
Power NVNT a 5785MHz Ant1



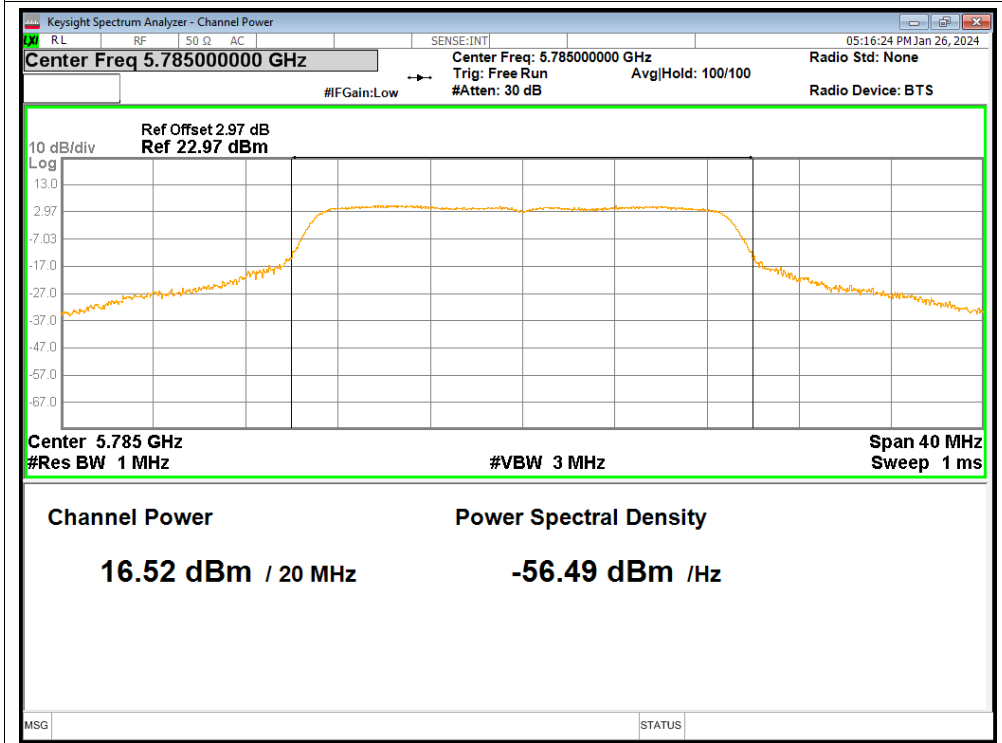
Power NVNT a 5825MHz Ant1



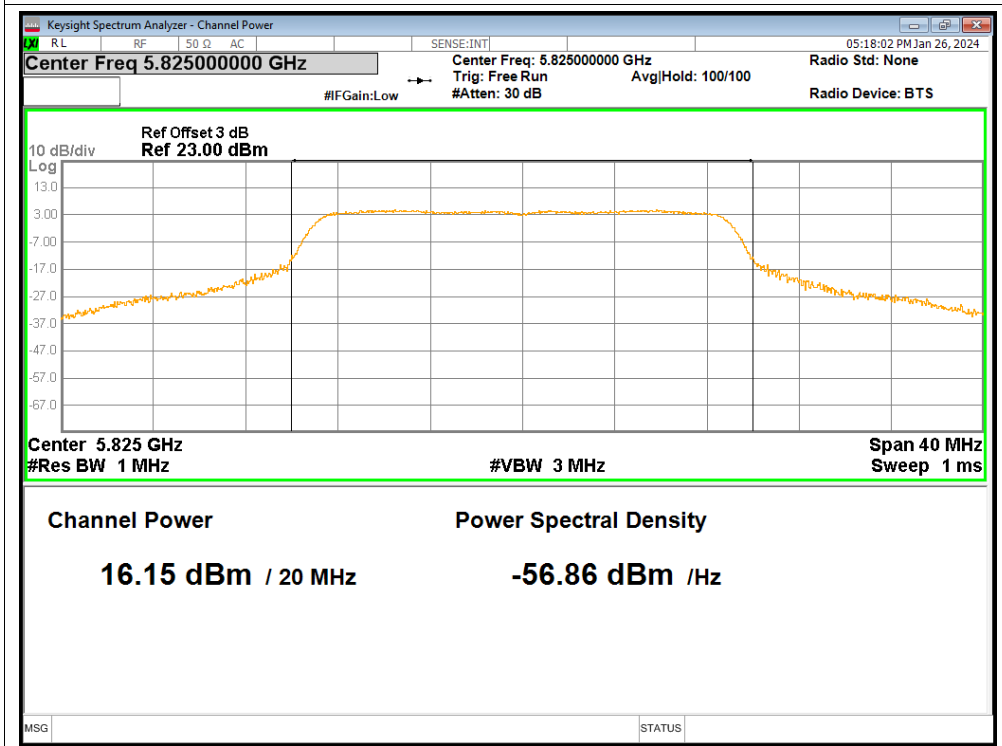
Power NVNT n20 5745MHz Ant1



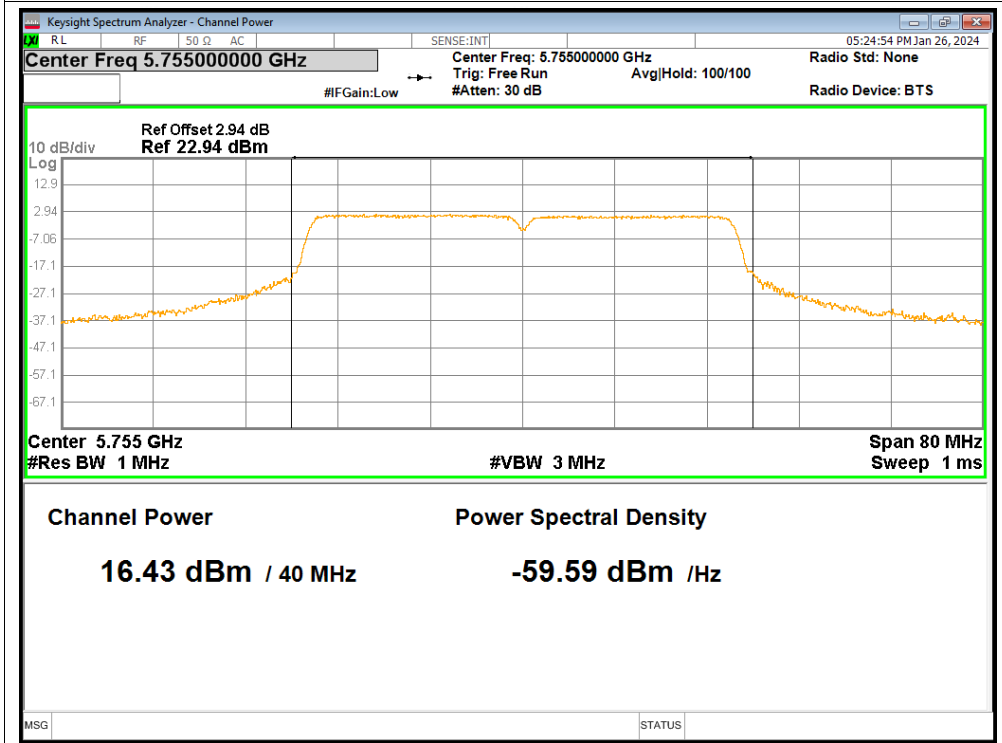
Power NVNT n20 5785MHz Ant1



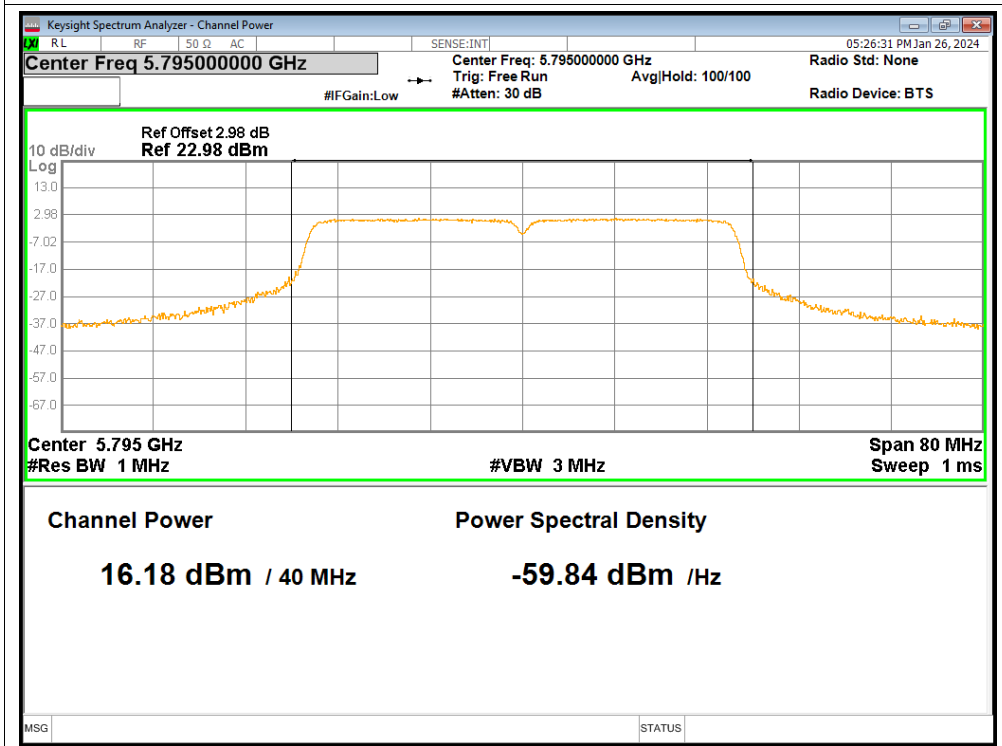
Power NVNT n20 5825MHz Ant1



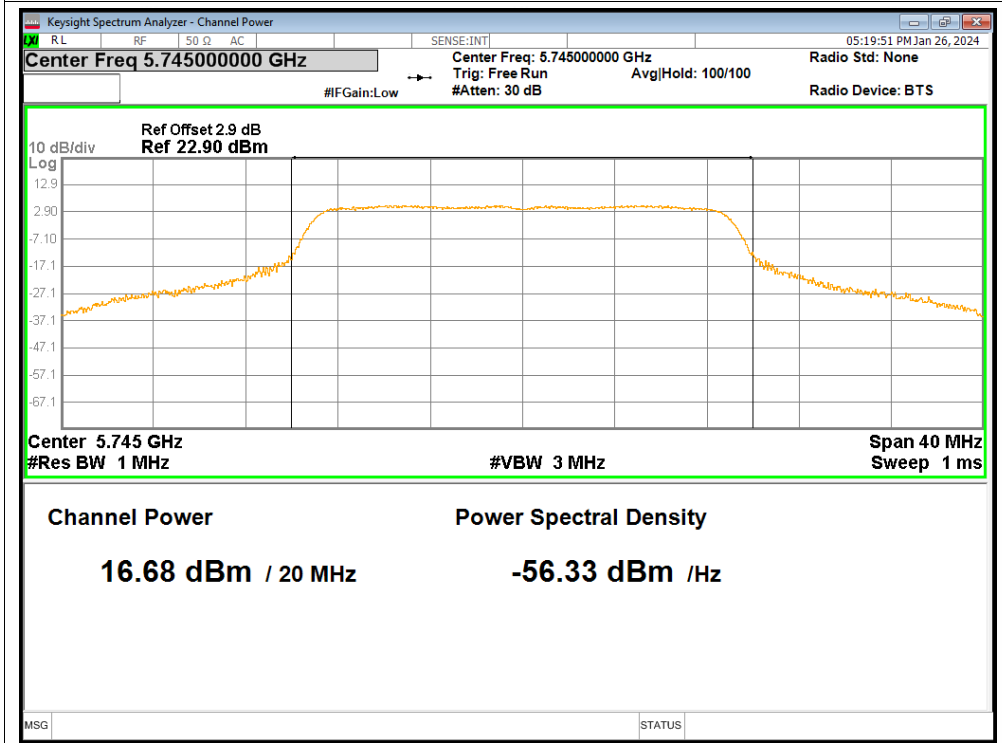
Power NVNT n40 5755MHz Ant1



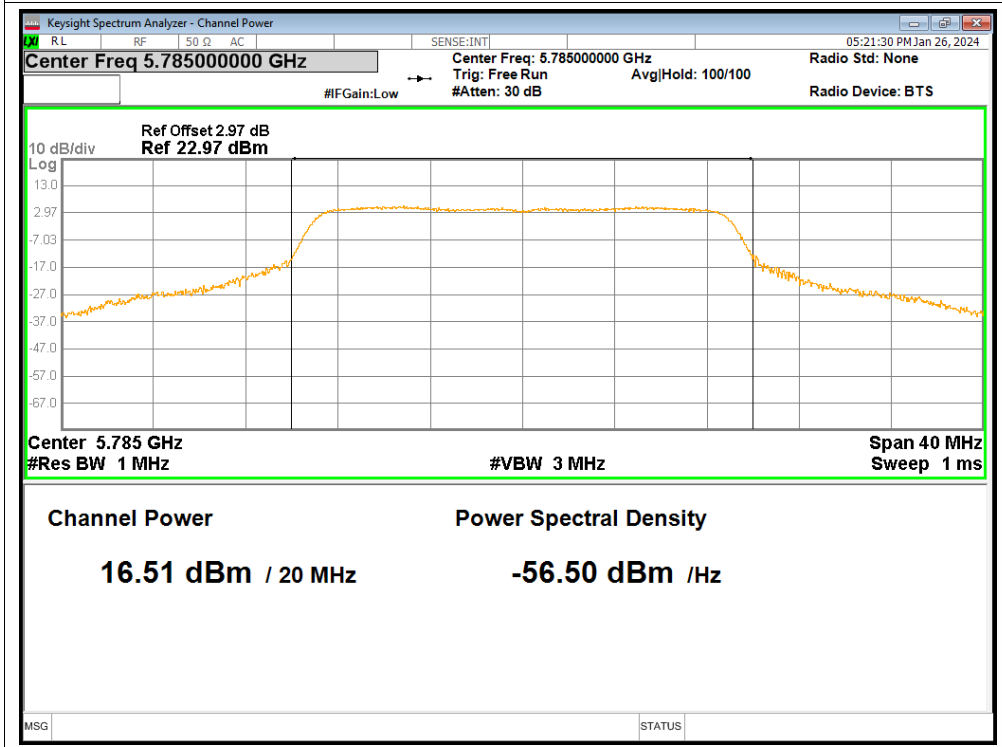
Power NVNT n40 5795MHz Ant1



Power NVNT ac20 5745MHz Ant1

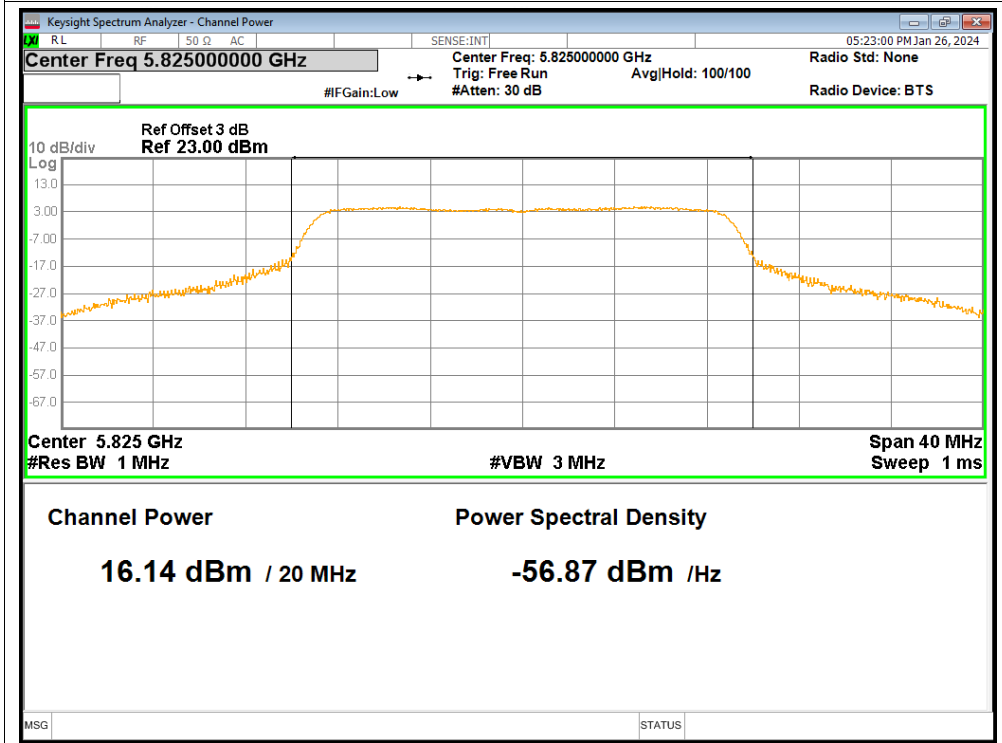


Power NVNT ac20 5785MHz Ant1

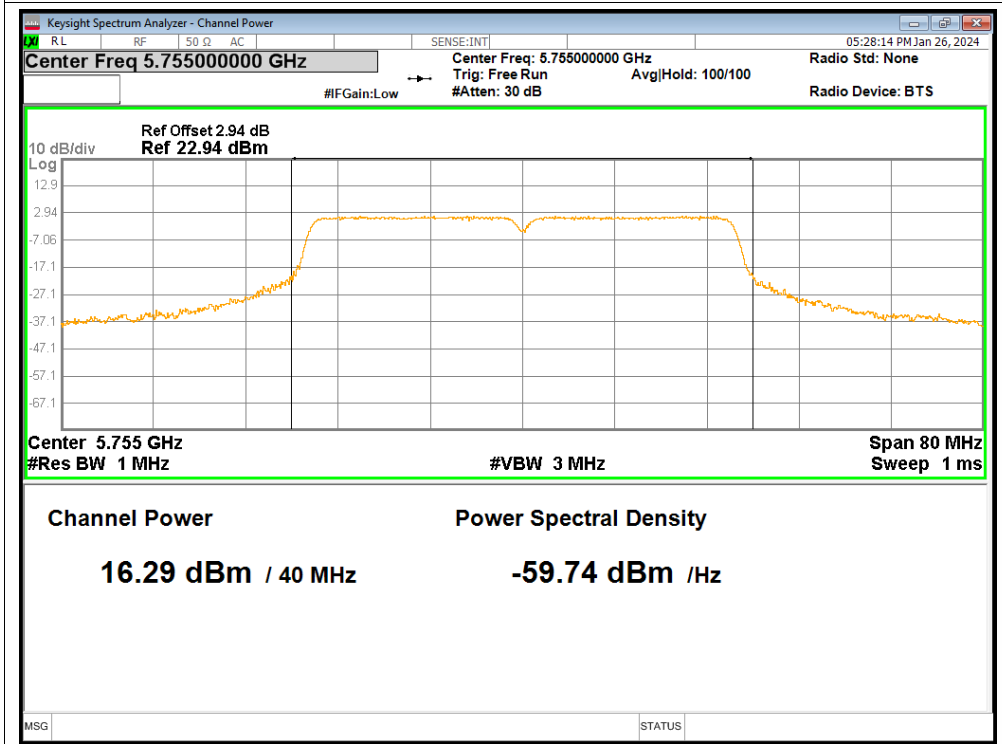


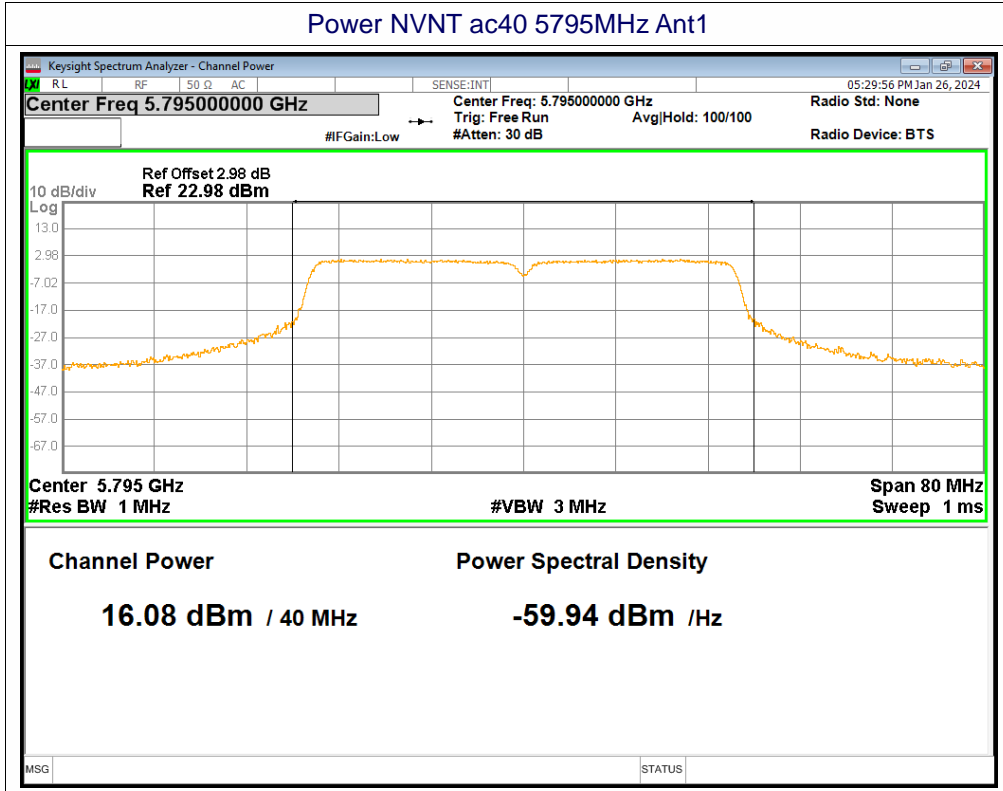


Power NVNT ac20 5825MHz Ant1



Power NVNT ac40 5755MHz Ant1





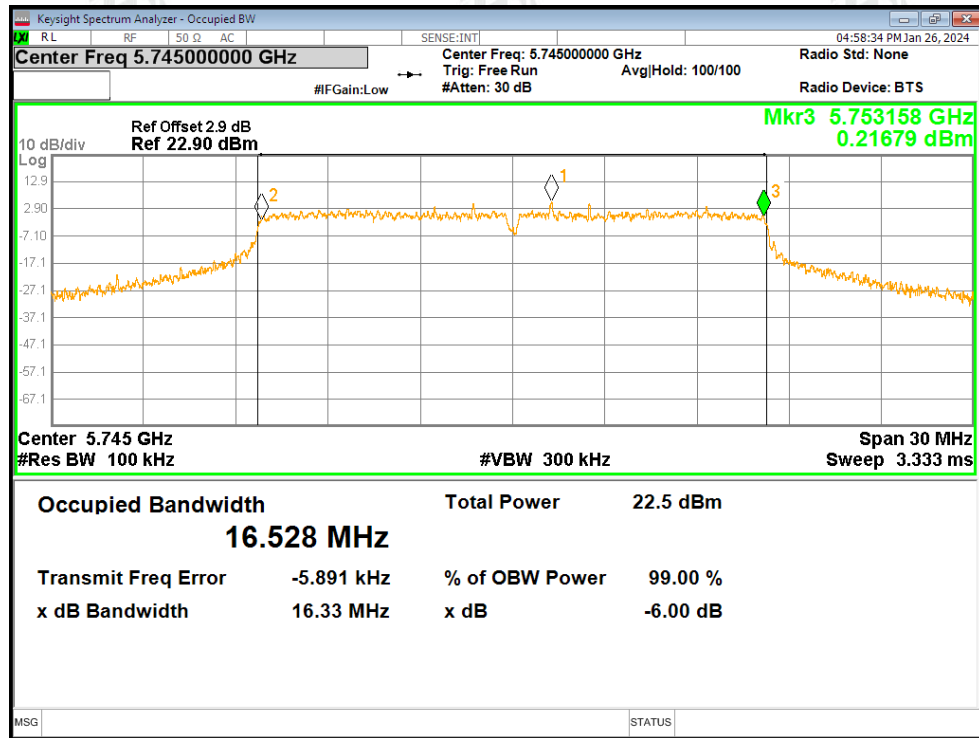


### B3. -6dB Bandwidth

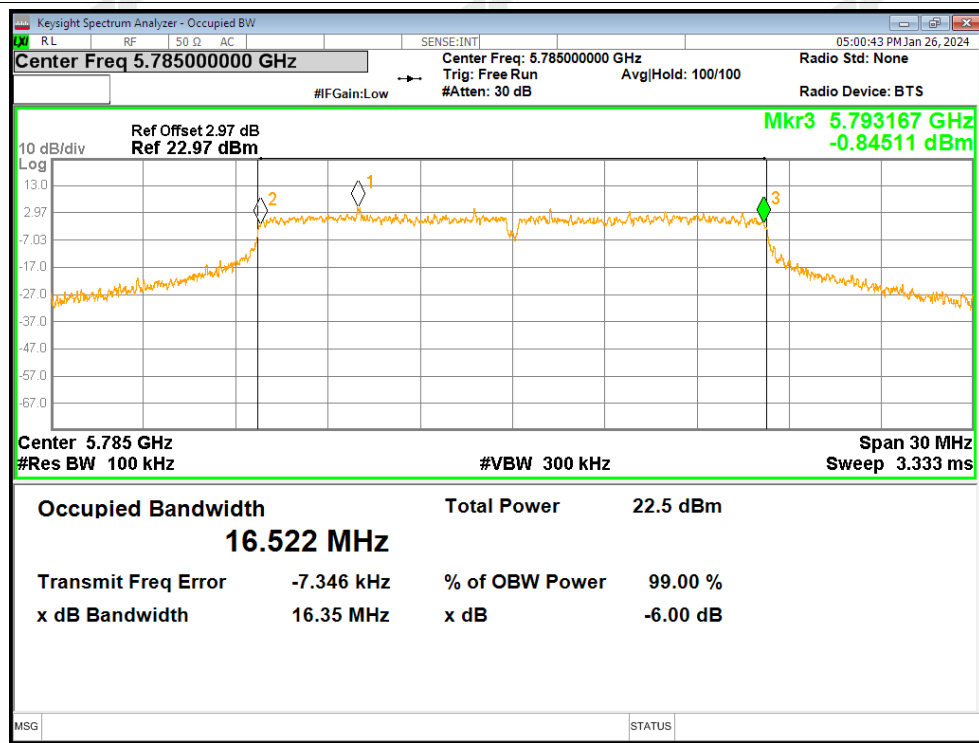
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	a	5745	Ant1	16.328	0.5	Pass
NVNT	a	5785	Ant1	16.348	0.5	Pass
NVNT	a	5825	Ant1	16.354	0.5	Pass
NVNT	n20	5745	Ant1	17.53	0.5	Pass
NVNT	n20	5785	Ant1	17.568	0.5	Pass
NVNT	n20	5825	Ant1	17.585	0.5	Pass
NVNT	n40	5755	Ant1	36.331	0.5	Pass
NVNT	n40	5795	Ant1	36.306	0.5	Pass
NVNT	ac20	5745	Ant1	17.602	0.5	Pass
NVNT	ac20	5785	Ant1	17.604	0.5	Pass
NVNT	ac20	5825	Ant1	17.583	0.5	Pass
NVNT	ac40	5755	Ant1	36.306	0.5	Pass
NVNT	ac40	5795	Ant1	36.292	0.5	Pass

Test Graphs

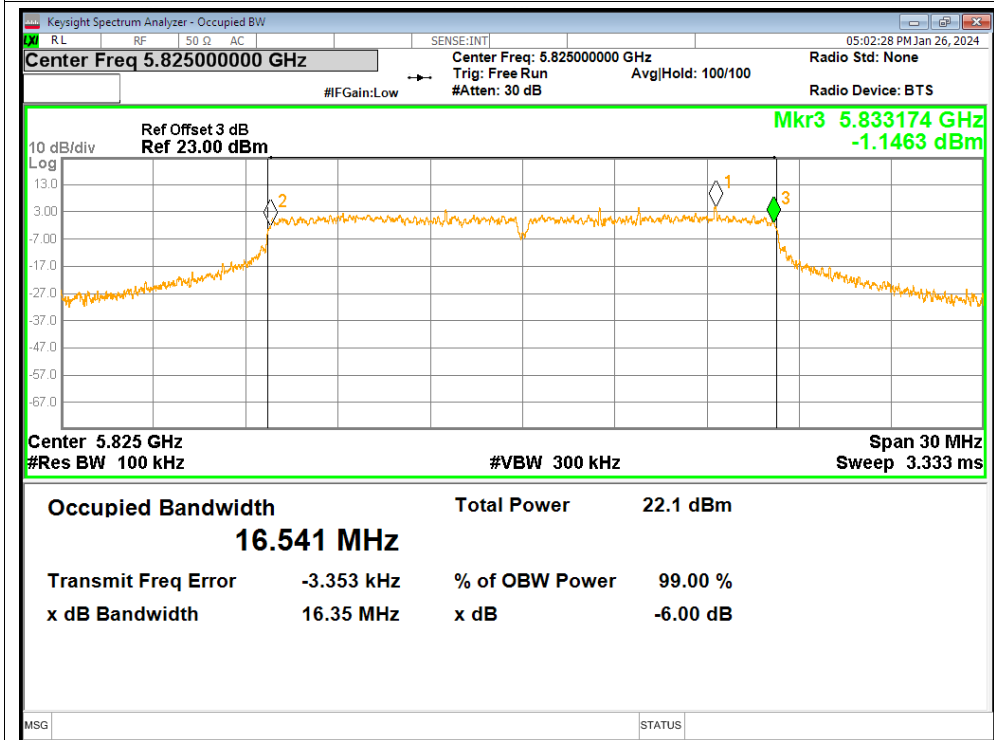
-6dB Bandwidth NVNT a 5745MHz Ant1



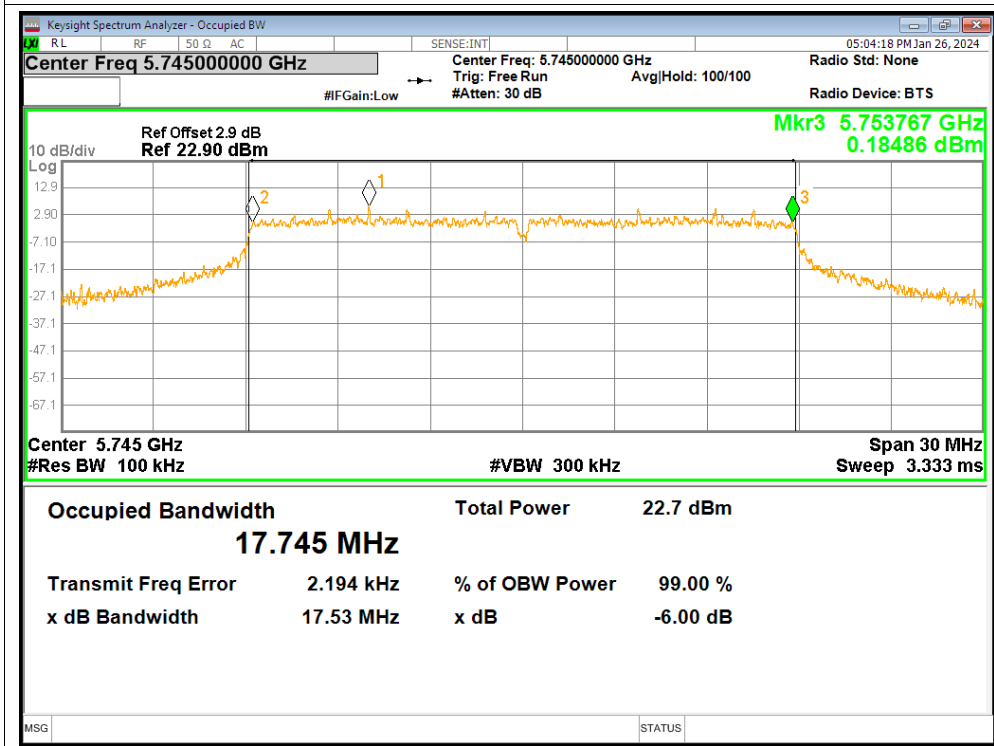
-6dB Bandwidth NVNT a 5785MHz Ant1



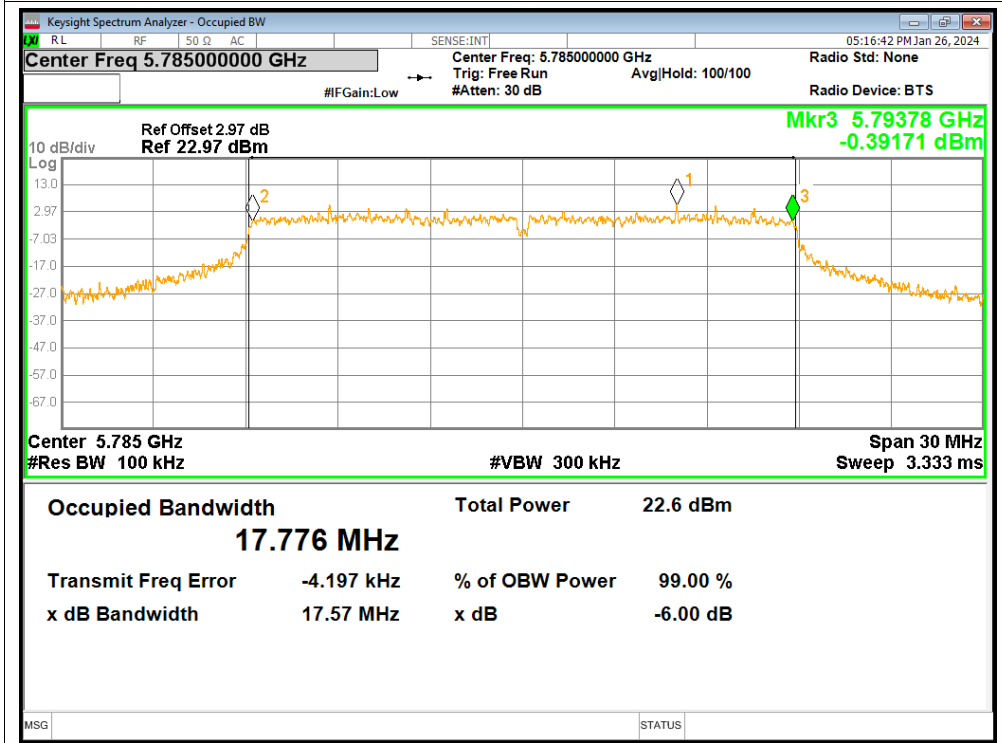
-6dB Bandwidth NVNT a 5825MHz Ant1



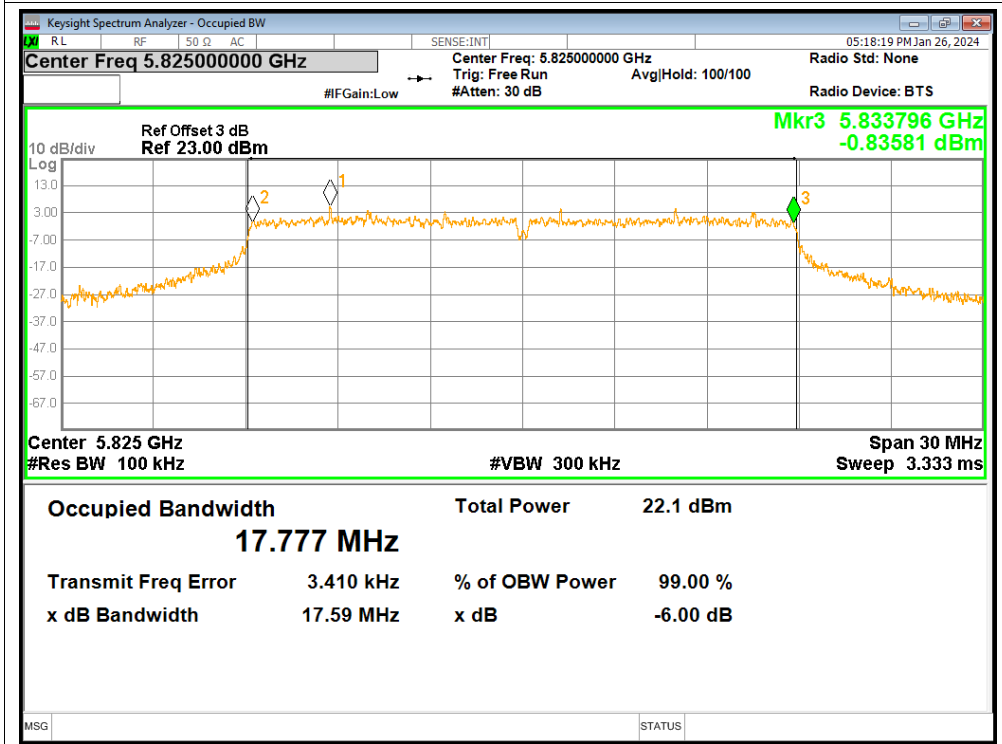
-6dB Bandwidth NVNT n20 5745MHz Ant1



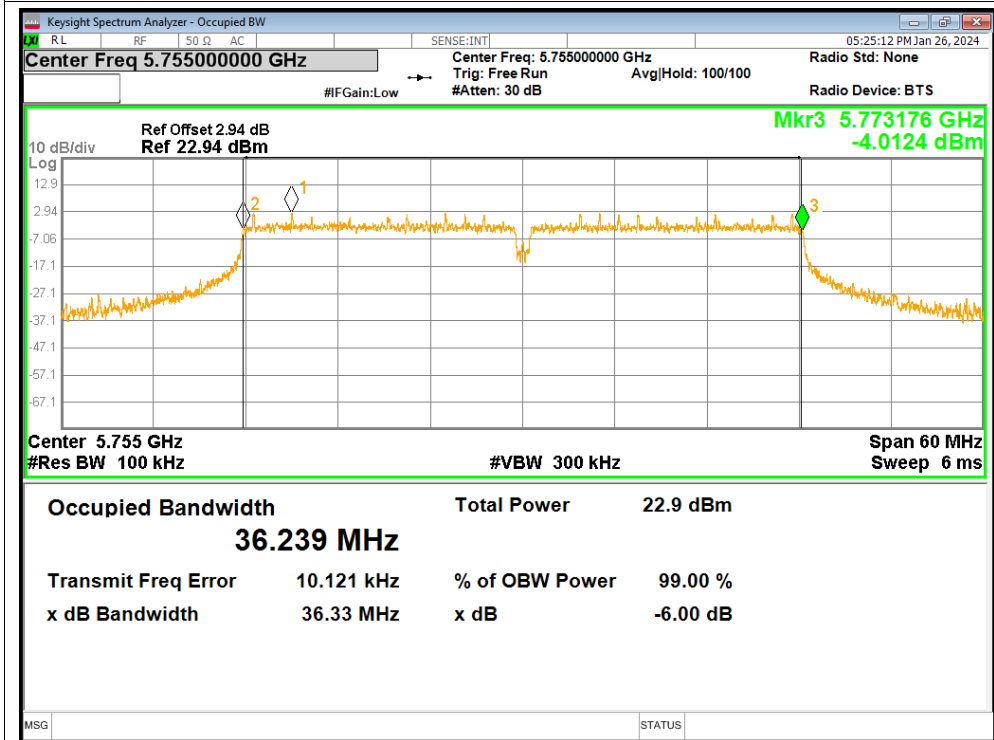
**-6dB Bandwidth NVNT n20 5785MHz Ant1**



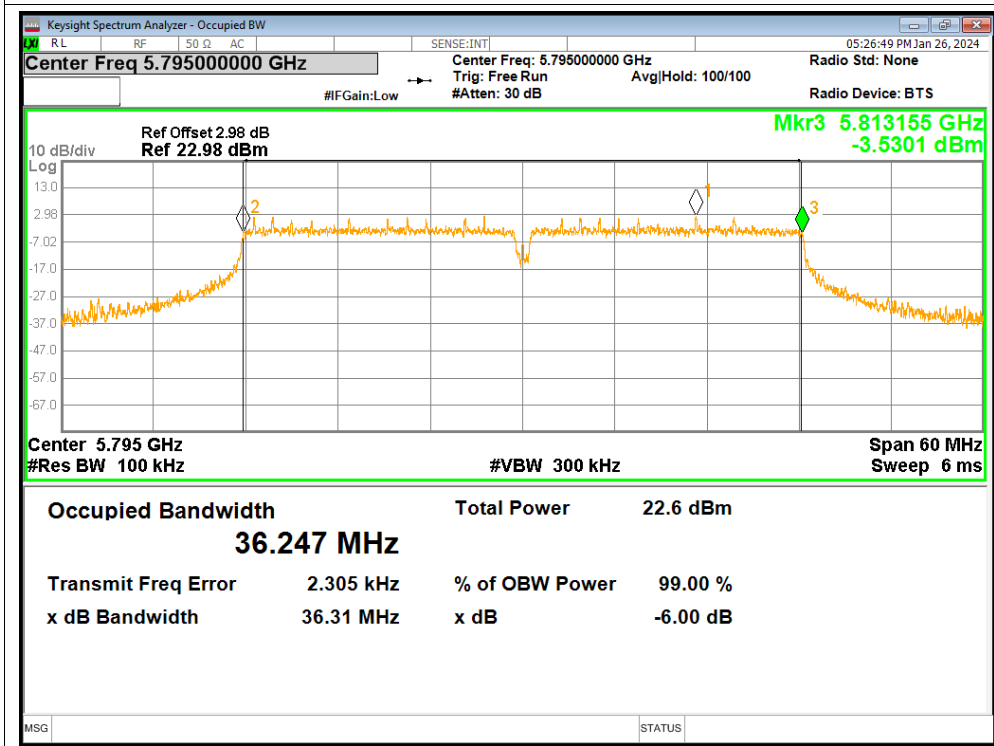
**-6dB Bandwidth NVNT n20 5825MHz Ant1**



-6dB Bandwidth NVNT n40 5755MHz Ant1

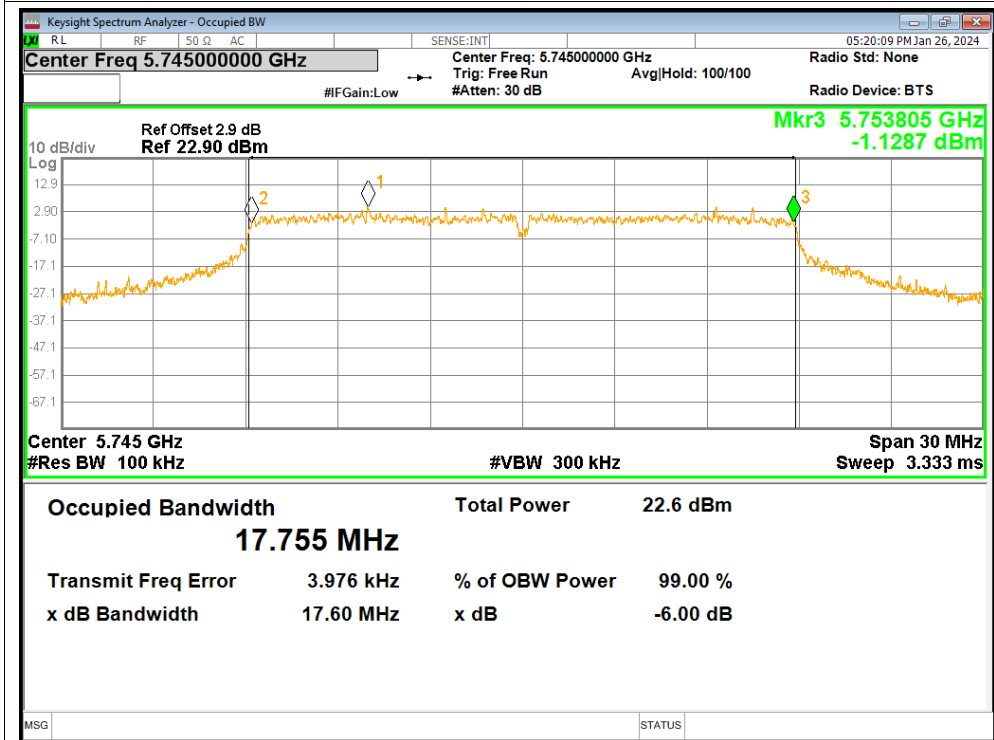


-6dB Bandwidth NVNT n40 5795MHz Ant1

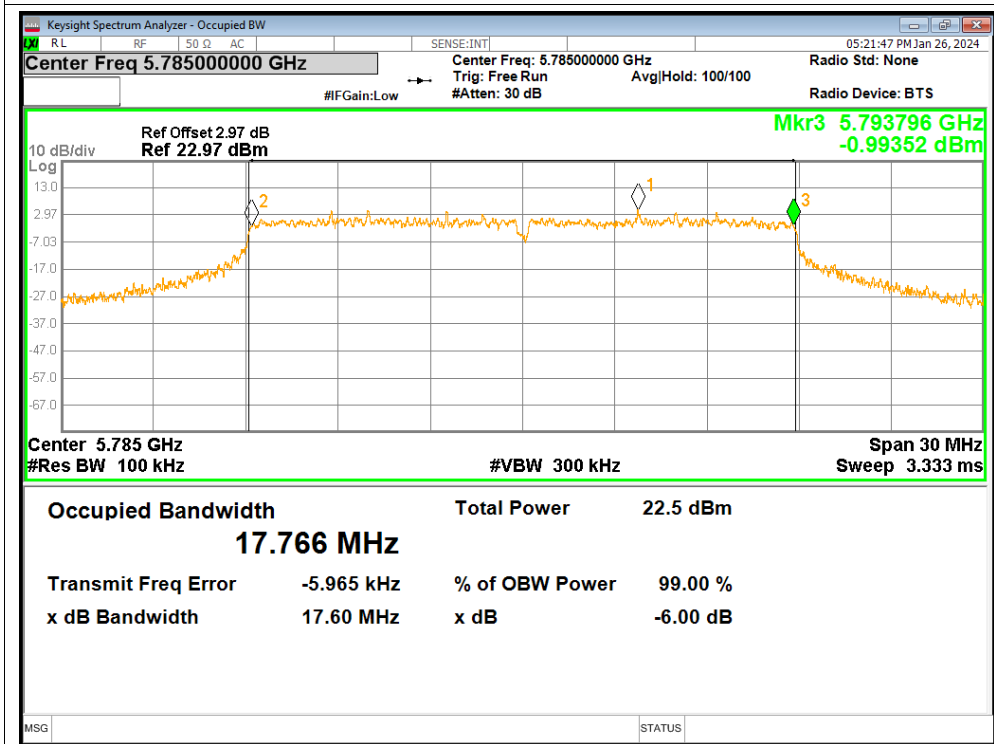




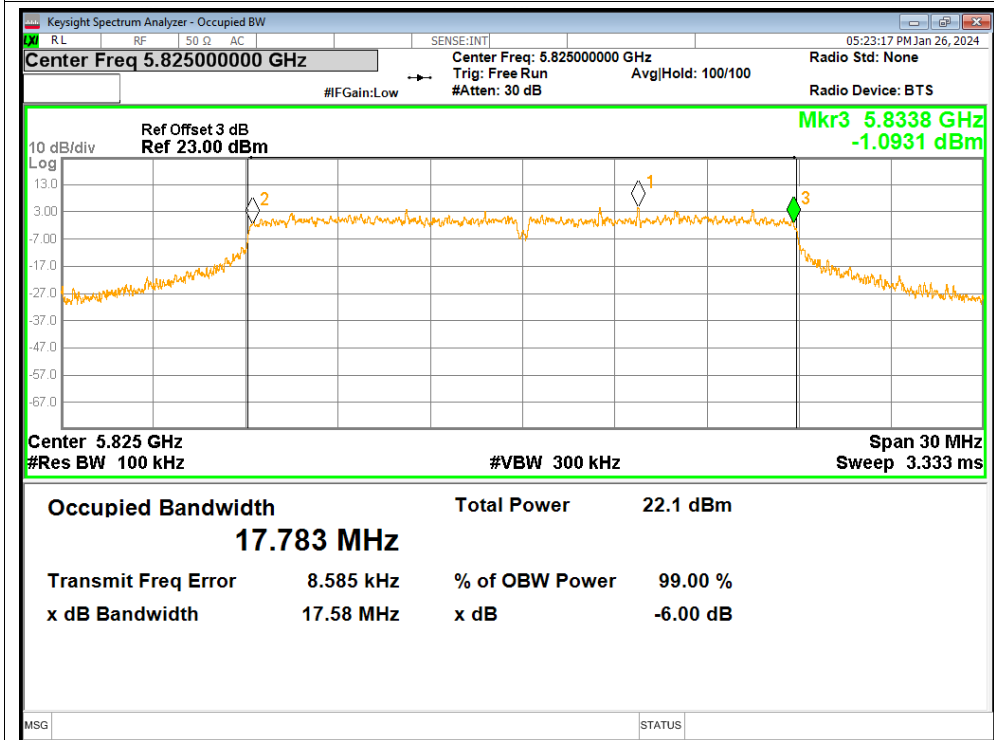
-6dB Bandwidth NVNT ac20 5745MHz Ant1



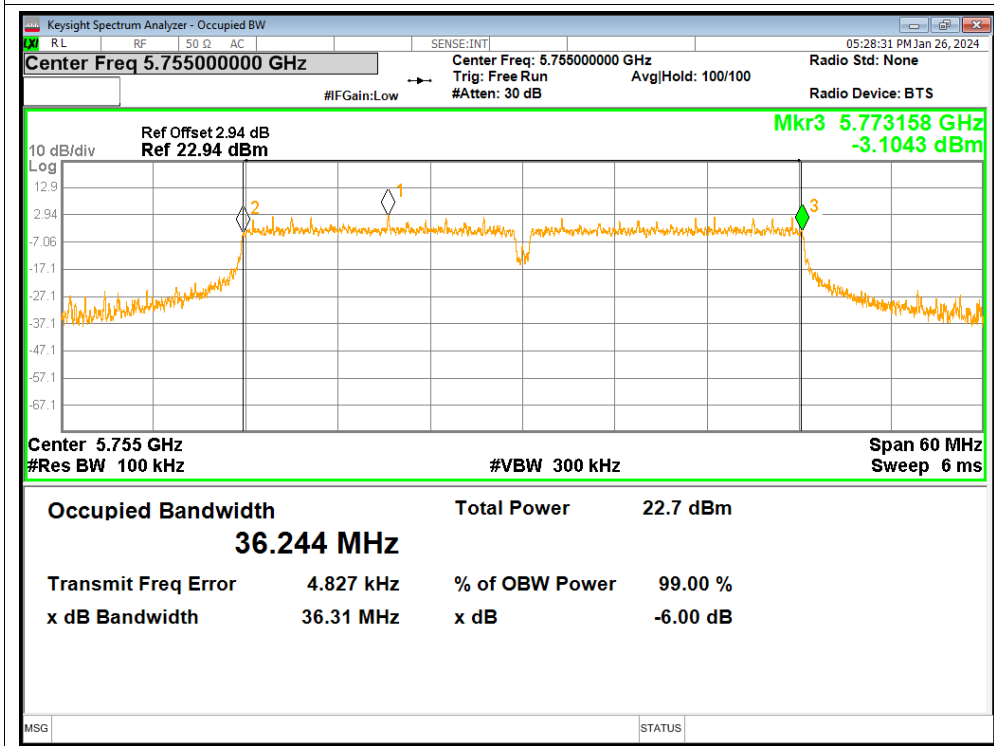
-6dB Bandwidth NVNT ac20 5785MHz Ant1

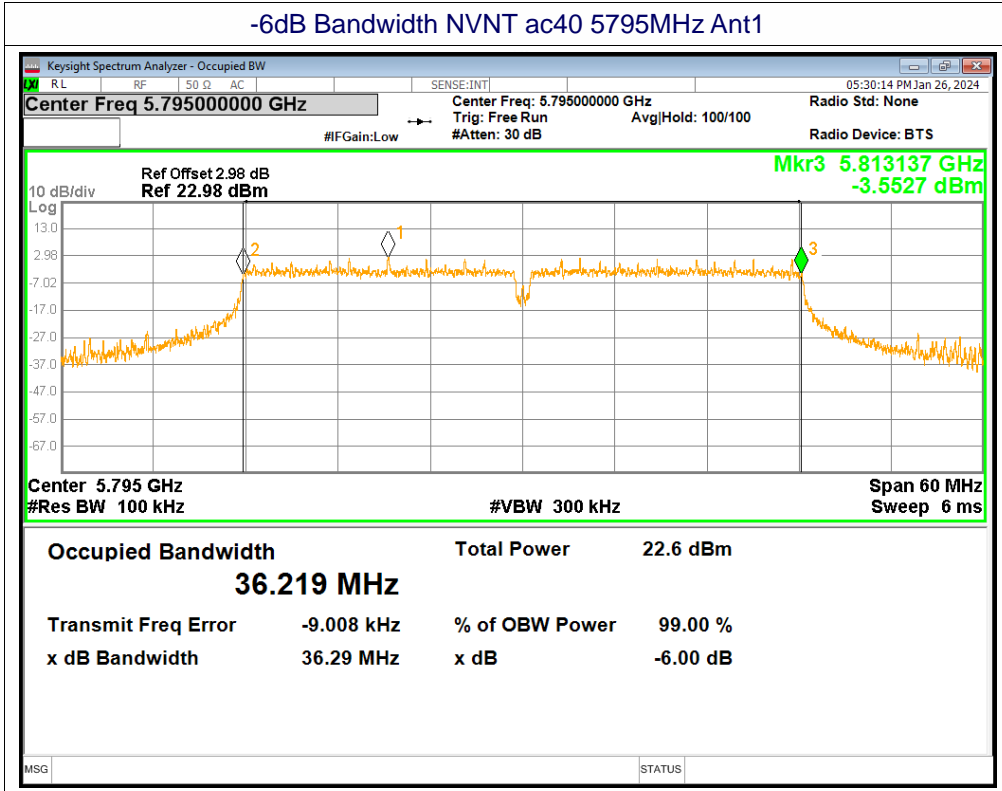


-6dB Bandwidth NVNT ac20 5825MHz Ant1



-6dB Bandwidth NVNT ac40 5755MHz Ant1

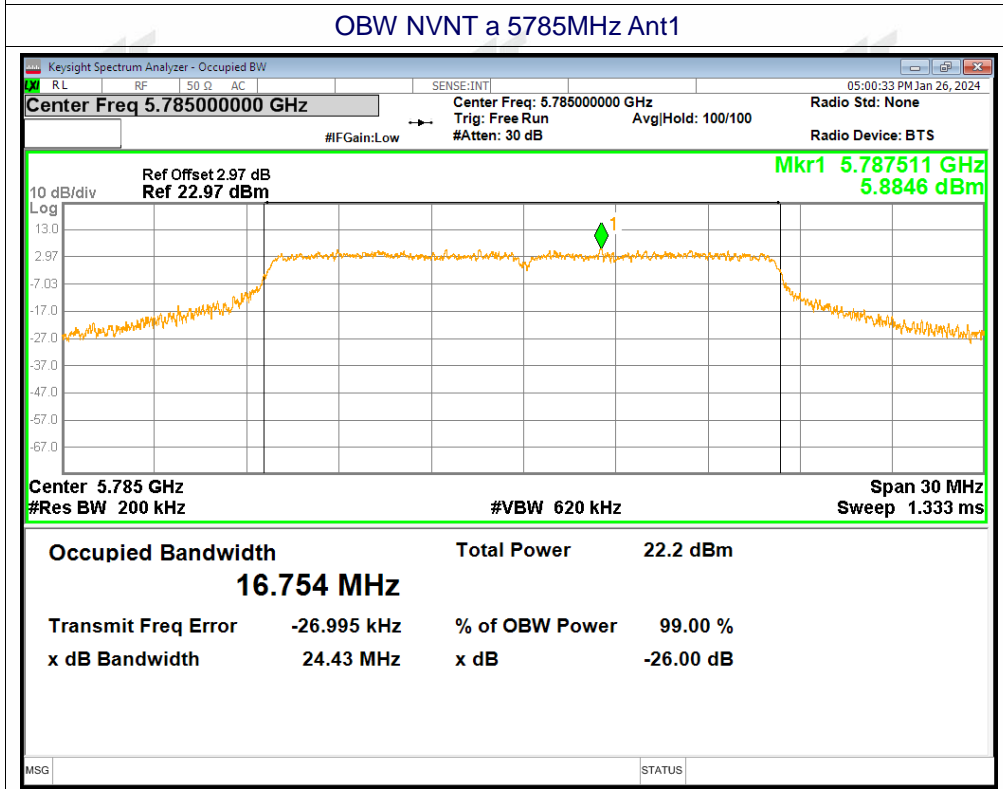
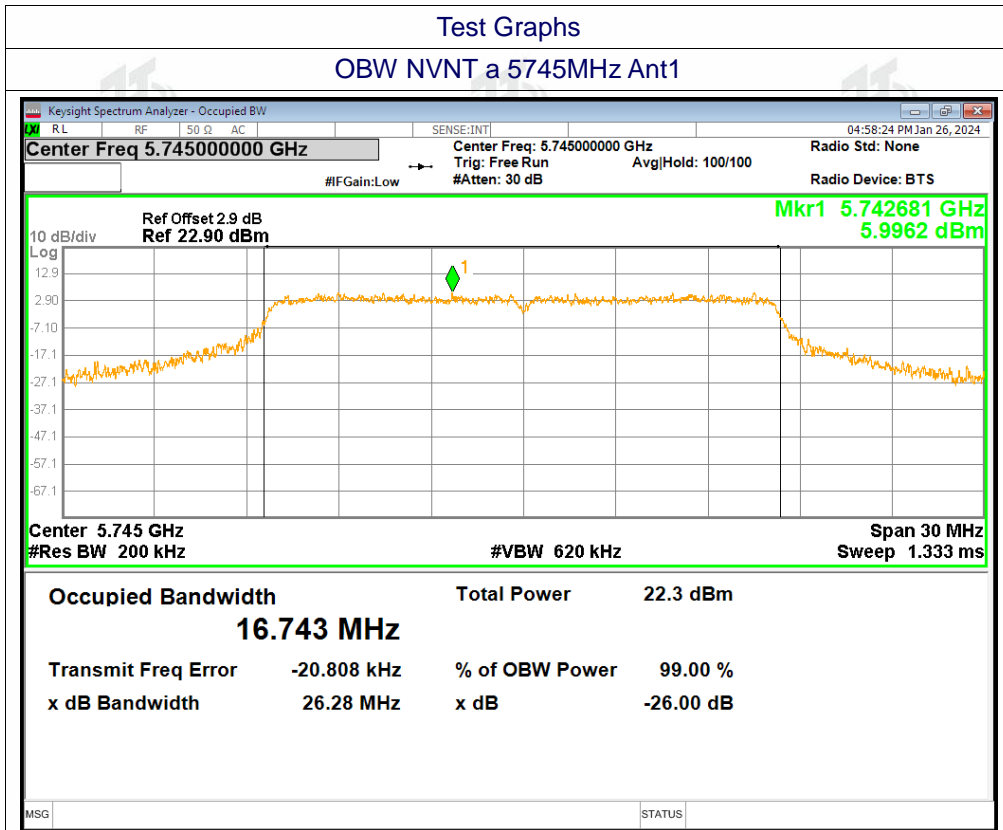






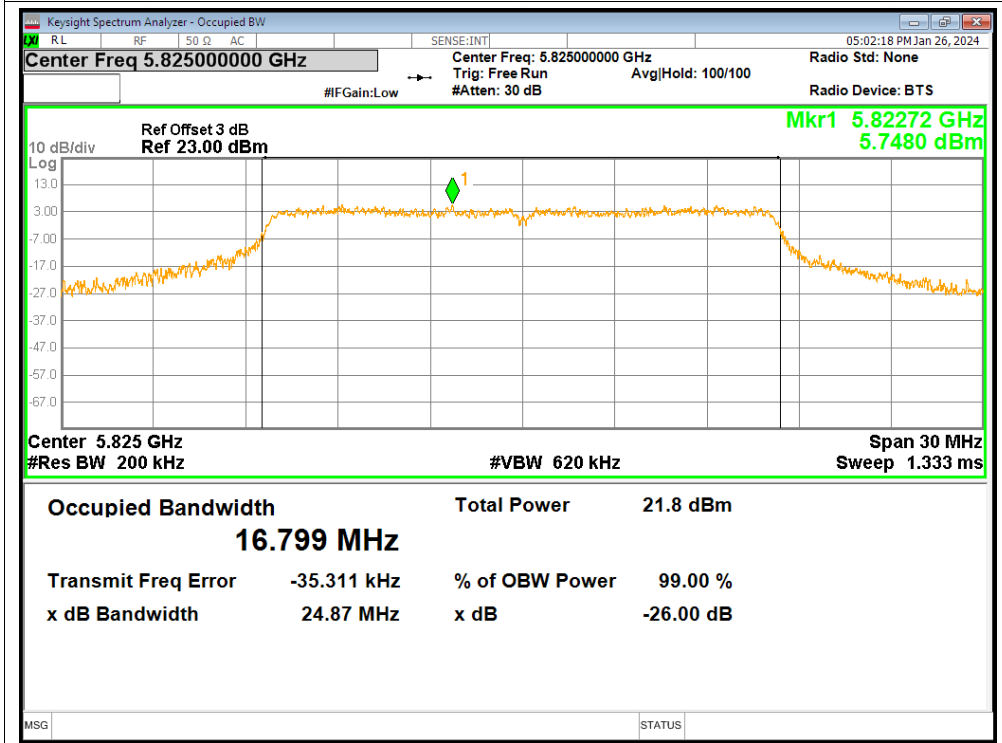
### B4. Occupied Channel Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	a	5745	Ant1	16.743
NVNT	a	5785	Ant1	16.754
NVNT	a	5825	Ant1	16.799
NVNT	n20	5745	Ant1	17.887
NVNT	n20	5785	Ant1	17.957
NVNT	n20	5825	Ant1	17.933
NVNT	n40	5755	Ant1	36.569
NVNT	n40	5795	Ant1	36.606
NVNT	ac20	5745	Ant1	17.937
NVNT	ac20	5785	Ant1	17.963
NVNT	ac20	5825	Ant1	17.94
NVNT	ac40	5755	Ant1	36.577
NVNT	ac40	5795	Ant1	36.479

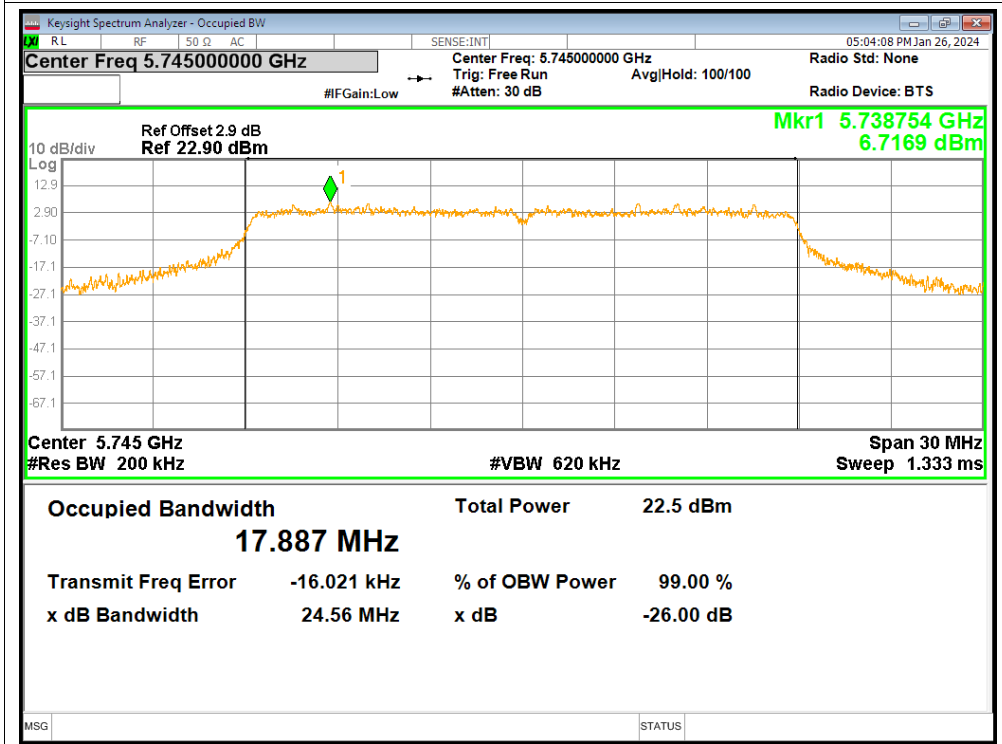




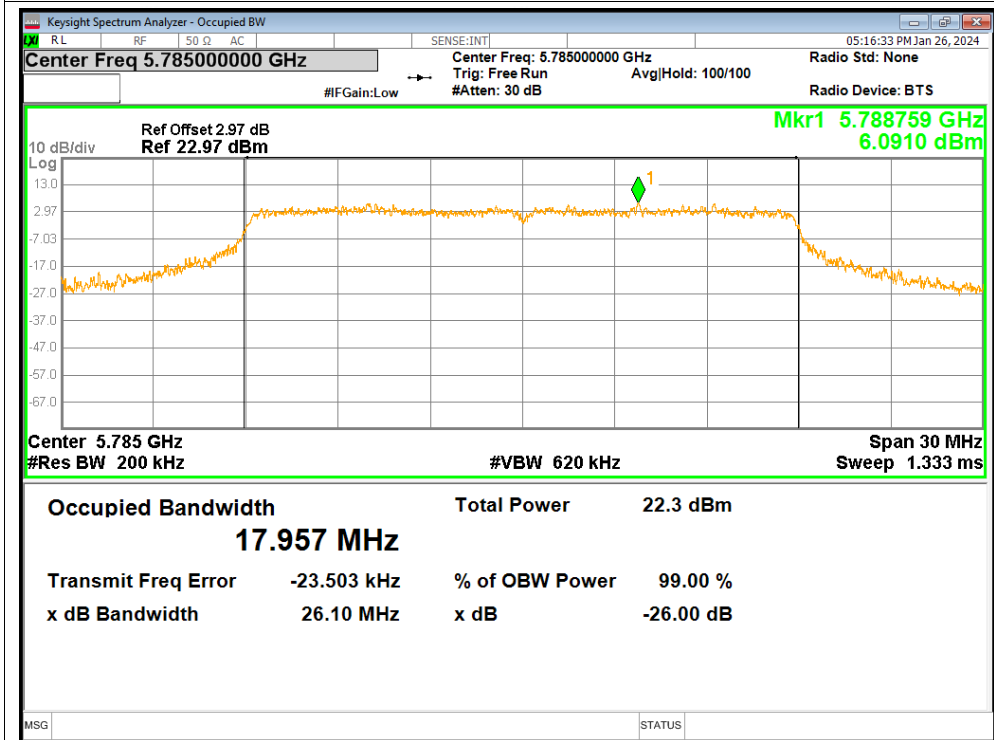
OBW NVNT a 5825MHz Ant1



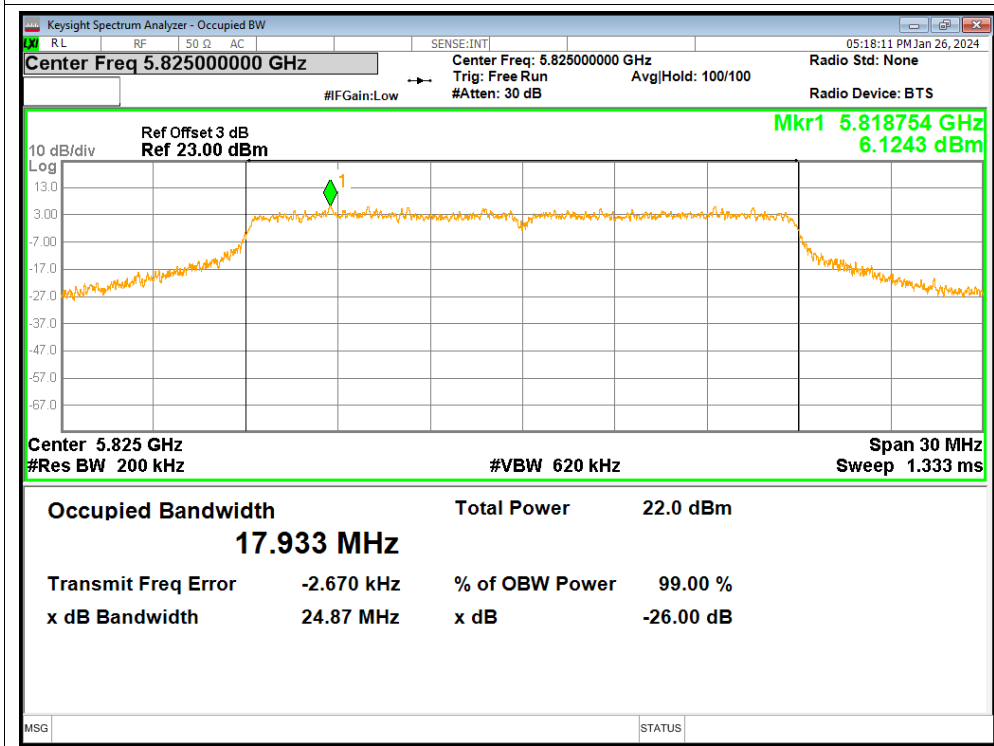
OBW NVNT n20 5745MHz Ant1



OBW NVNT n20 5785MHz Ant1

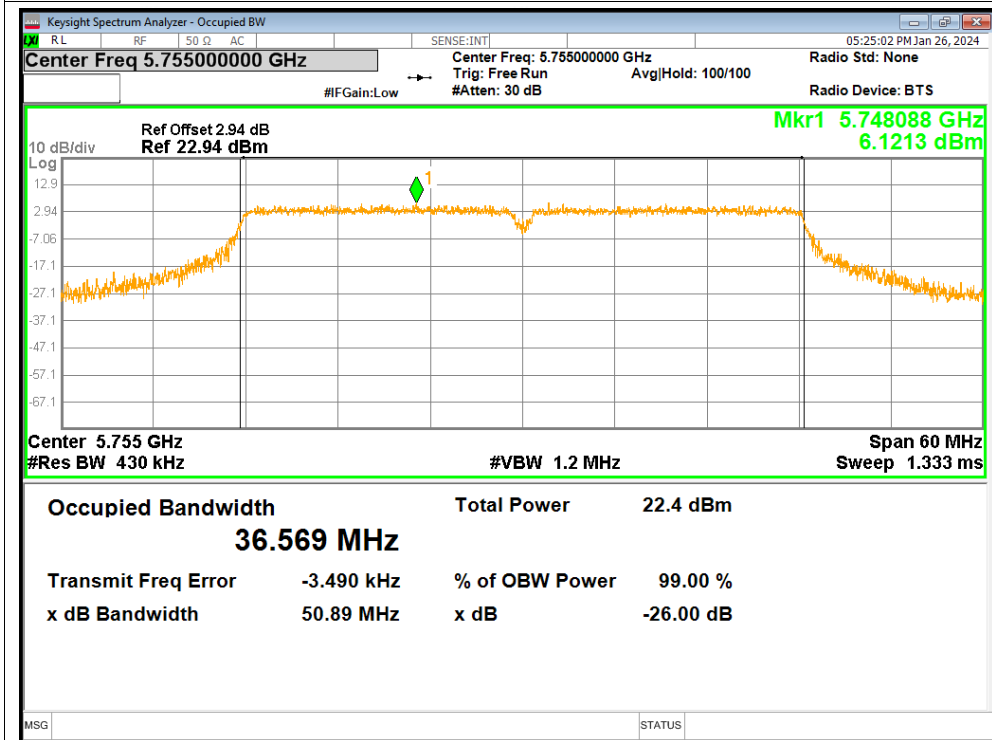


OBW NVNT n20 5825MHz Ant1

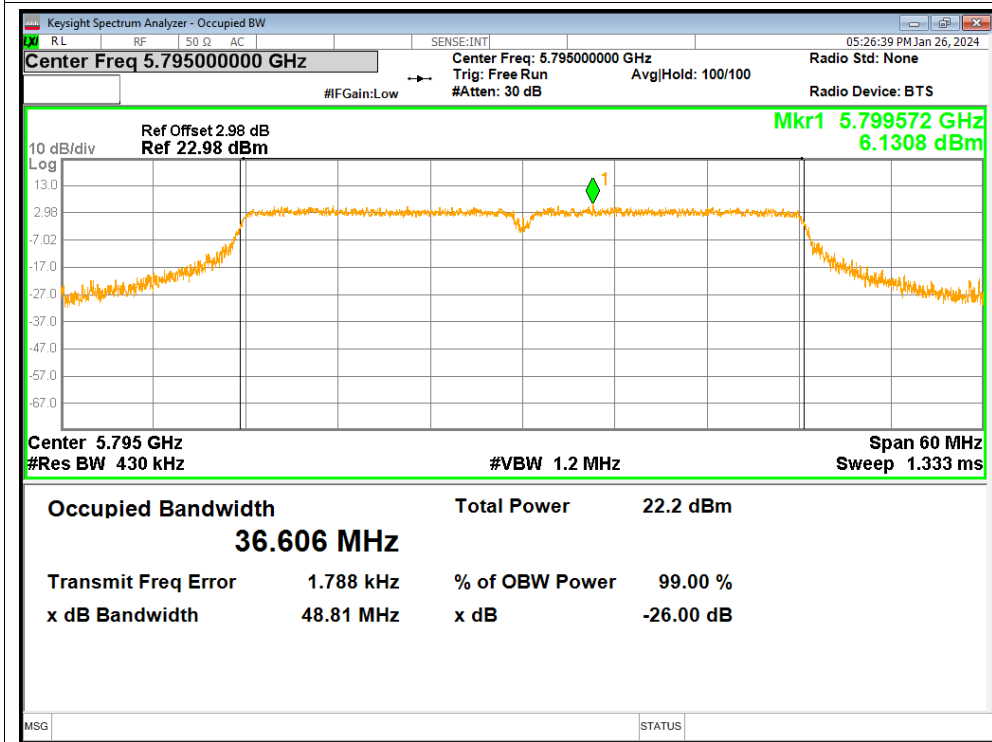




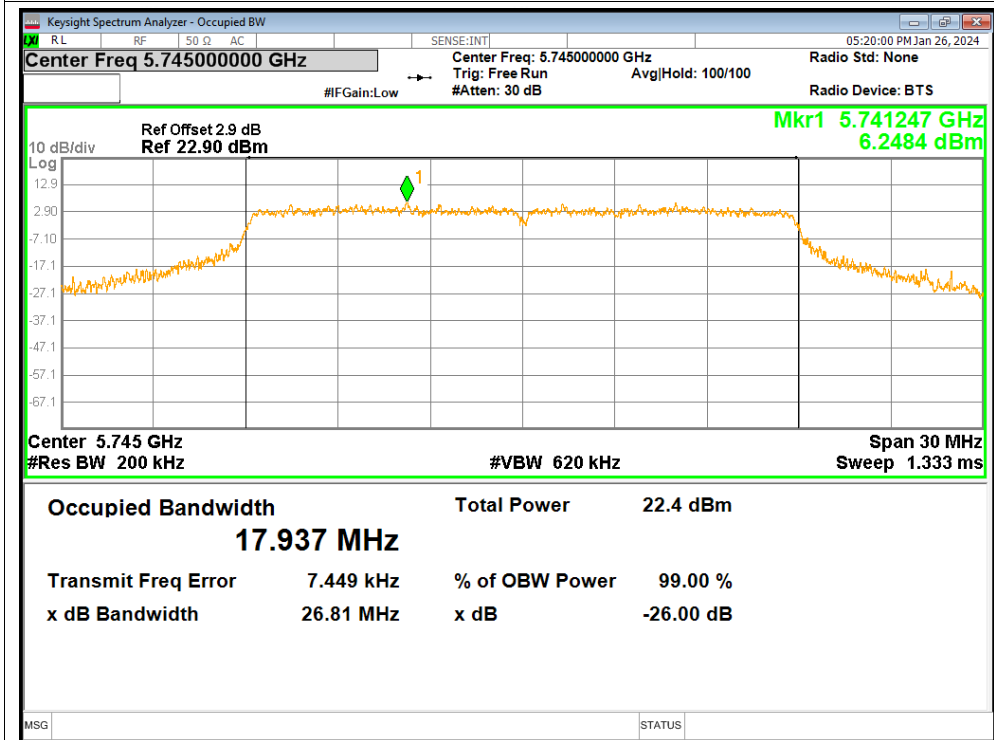
OBW NVNT n40 5755MHz Ant1



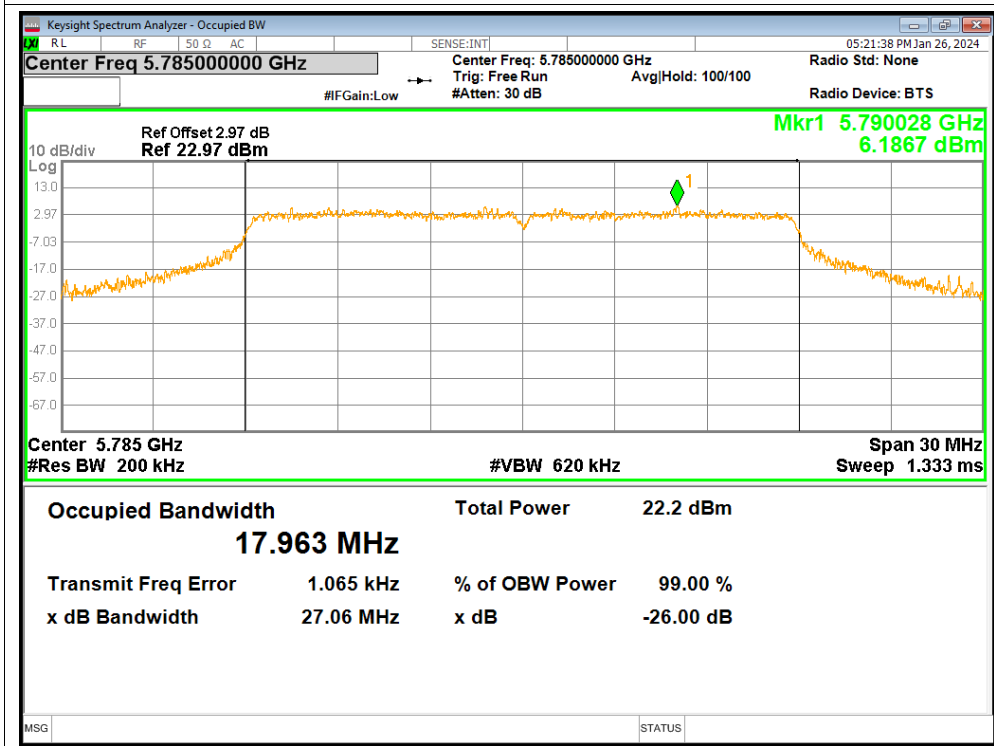
OBW NVNT n40 5795MHz Ant1



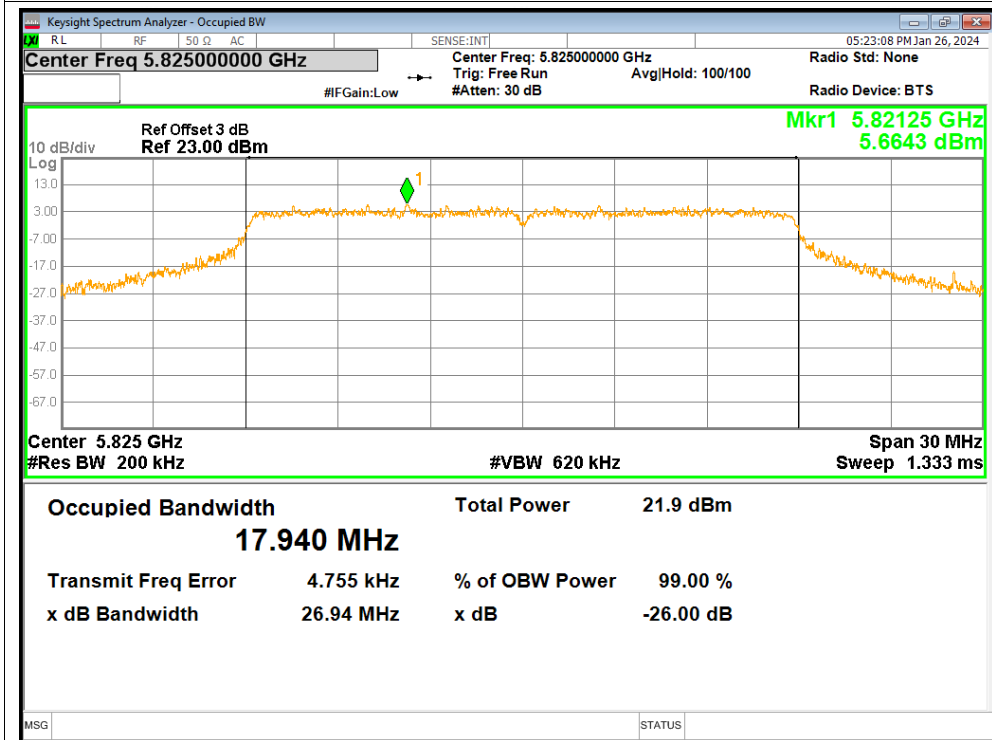
OBW NVNT ac20 5745MHz Ant1



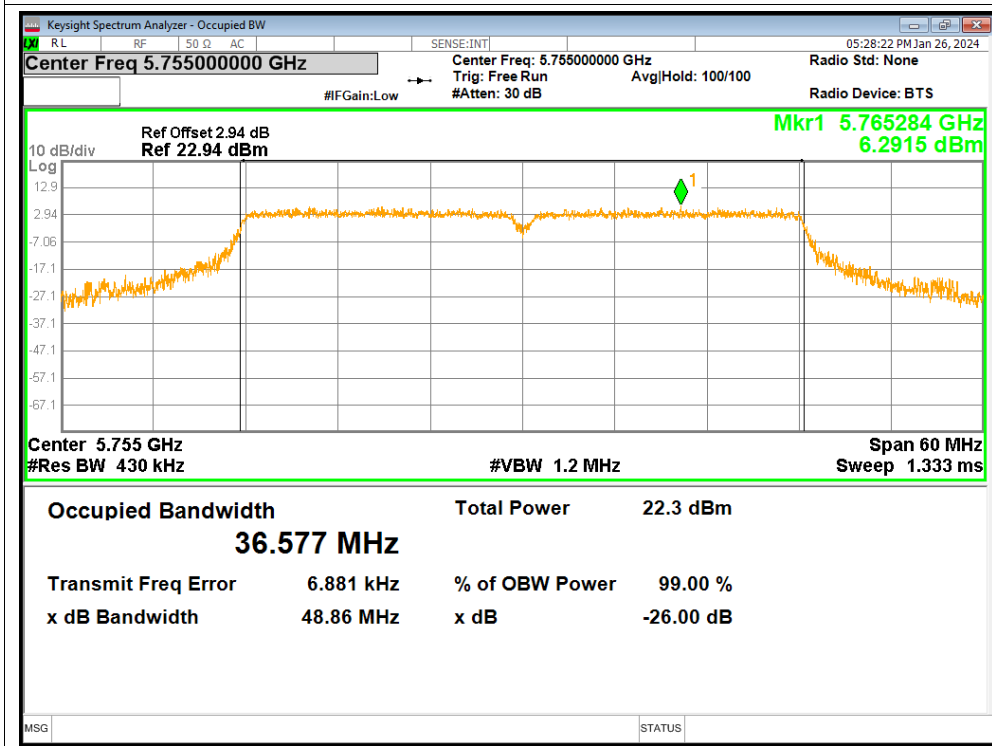
OBW NVNT ac20 5785MHz Ant1

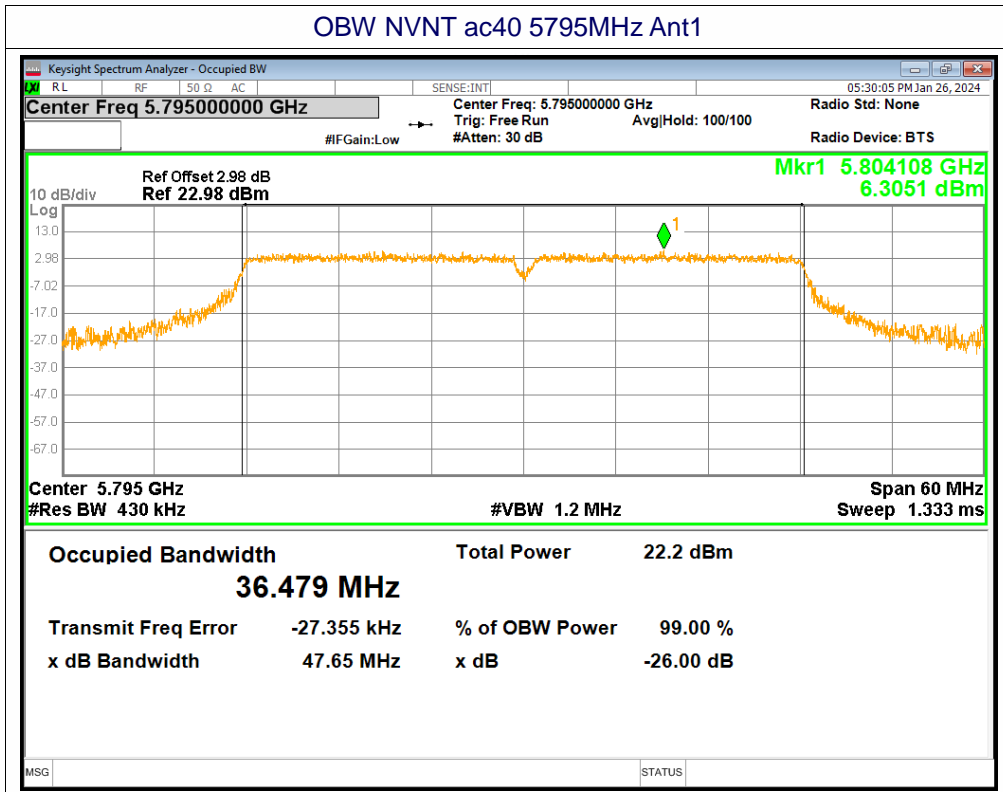


OBW NVNT ac20 5825MHz Ant1



OBW NVNT ac40 5755MHz Ant1





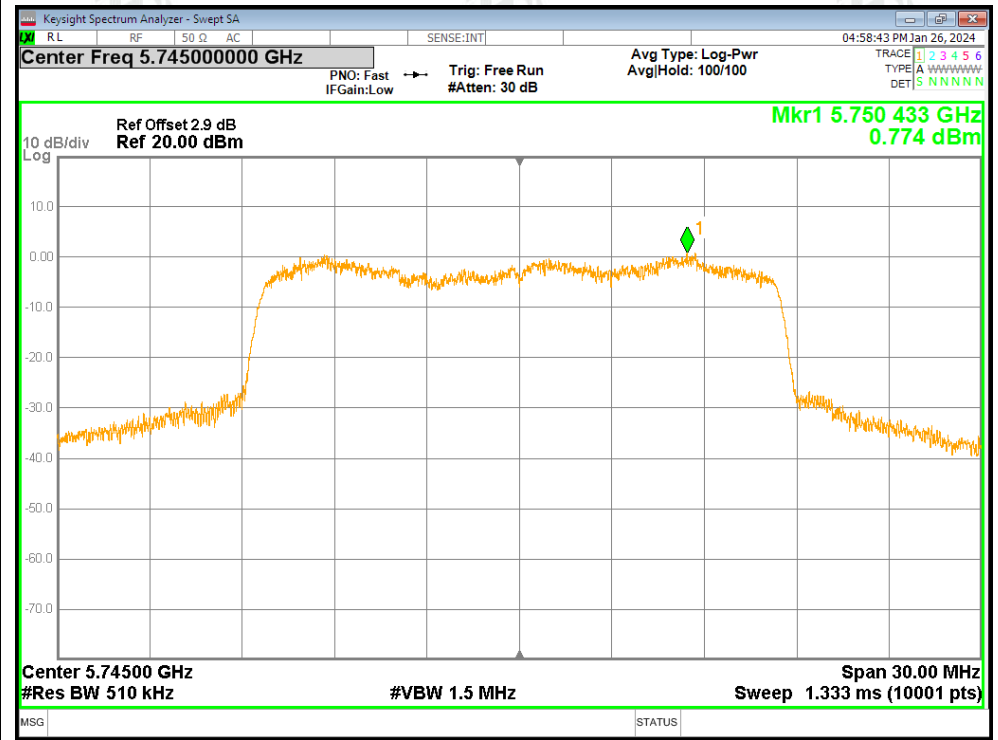
**B5. Maximum Power Spectral Density Level**

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm)	Duty Factor (dB)	Total PSD (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	Ant1	0.77	0.13	0.9	30	Pass
NVNT	a	5785	Ant1	0.04	0.13	0.17	30	Pass
NVNT	a	5825	Ant1	-1.25	0.25	-1	30	Pass
NVNT	n20	5745	Ant1	-0.53	0.33	-0.2	30	Pass
NVNT	n20	5785	Ant1	0.23	0.11	0.34	30	Pass
NVNT	n20	5825	Ant1	-0.72	0.2	-0.52	30	Pass
NVNT	n40	5755	Ant1	-8.07	0.18	-7.89	30	Pass
NVNT	n40	5795	Ant1	-5.86	0.36	-5.5	30	Pass
NVNT	ac20	5745	Ant1	-0.2	0.18	-0.02	30	Pass
NVNT	ac20	5785	Ant1	-0.53	0.27	-0.26	30	Pass
NVNT	ac20	5825	Ant1	-0.64	0.43	-0.21	30	Pass
NVNT	ac40	5755	Ant1	-7.63	0.56	-7.07	30	Pass
NVNT	ac40	5795	Ant1	-4.16	0.4	-3.76	30	Pass

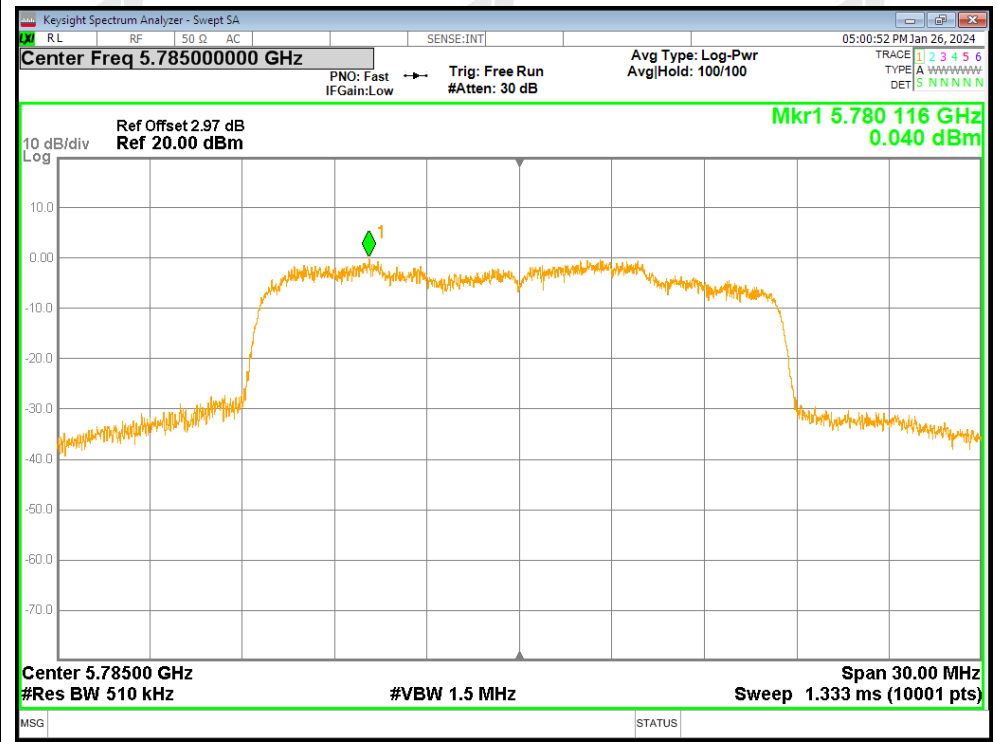


Test Graphs

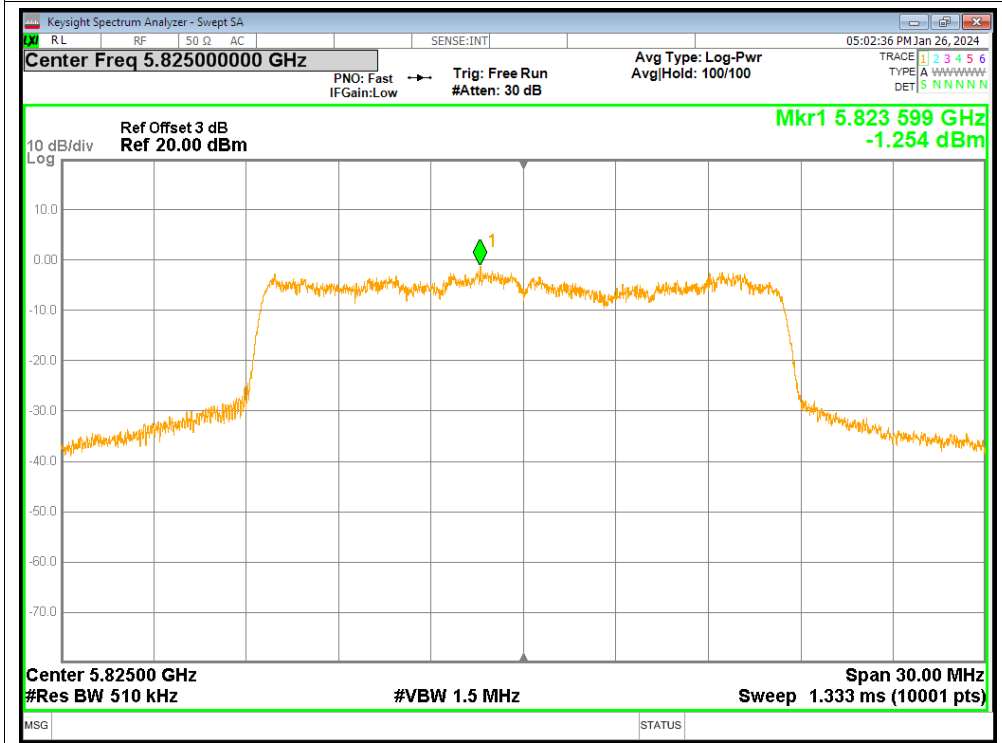
PSD NVNT a 5745MHz Ant1



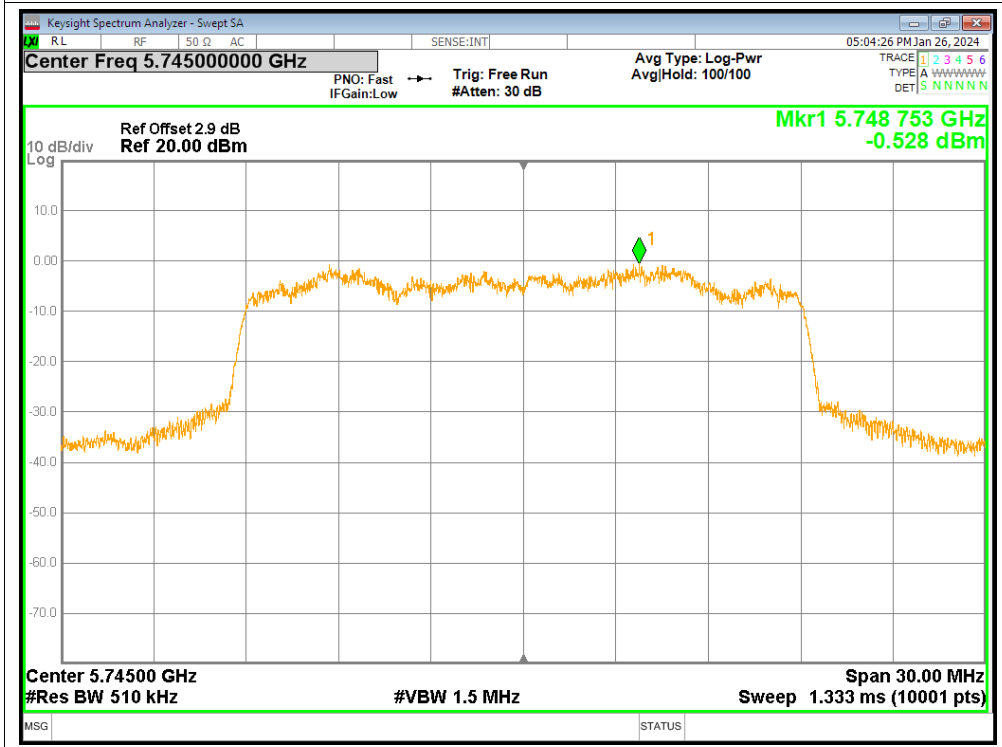
PSD NVNT a 5785MHz Ant1



PSD NVNT a 5825MHz Ant1

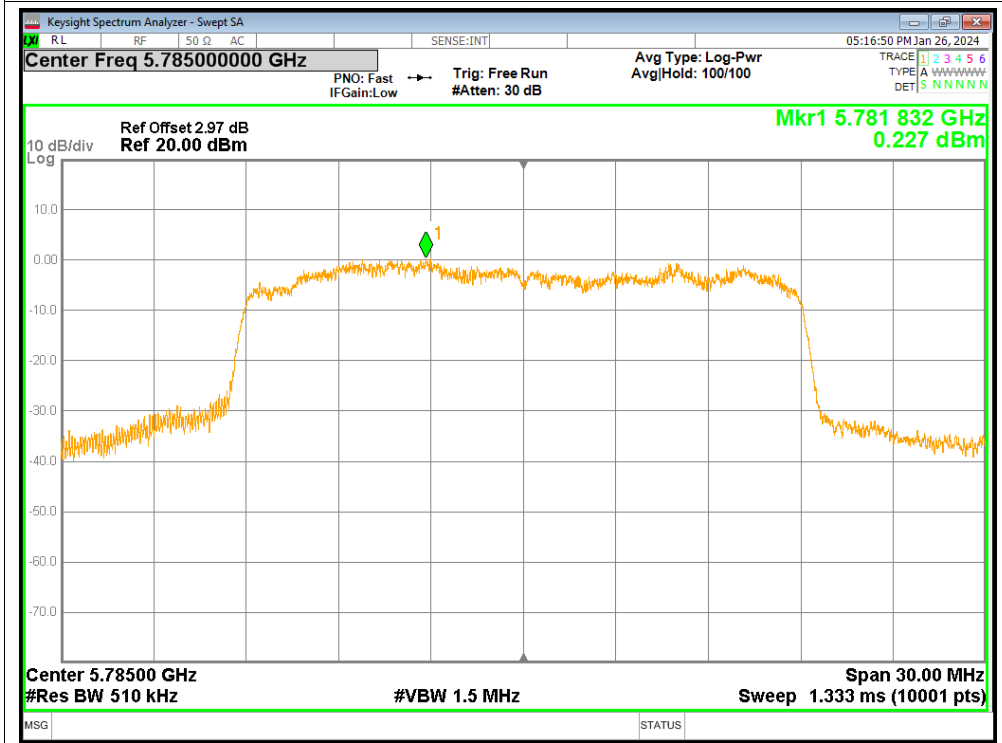


PSD NVNT n20 5745MHz Ant1

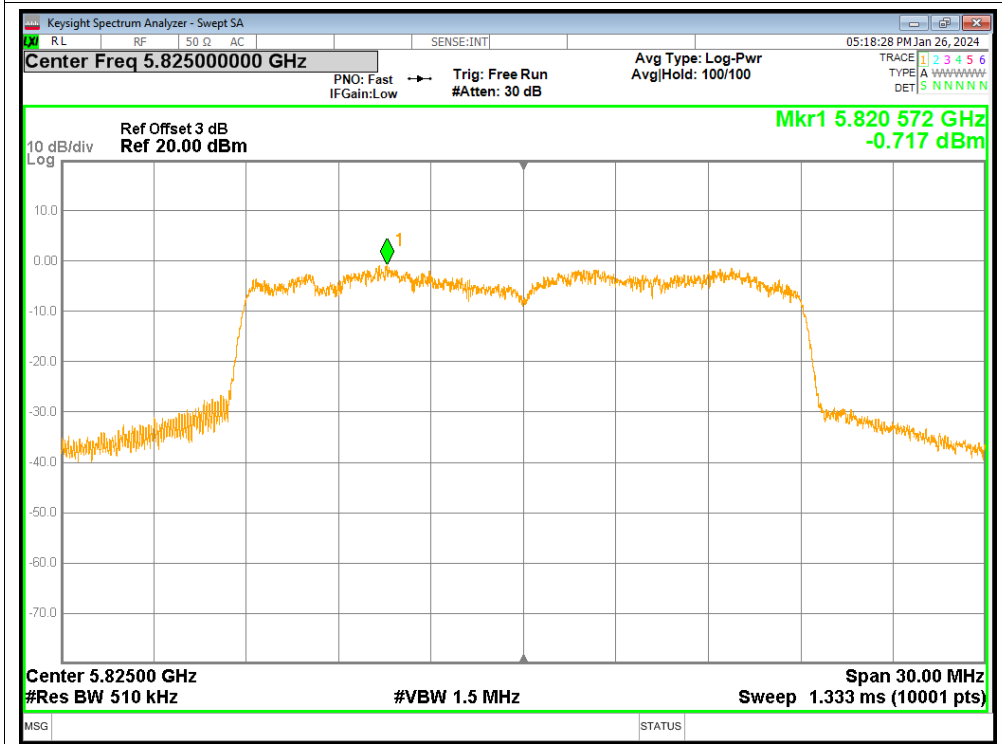




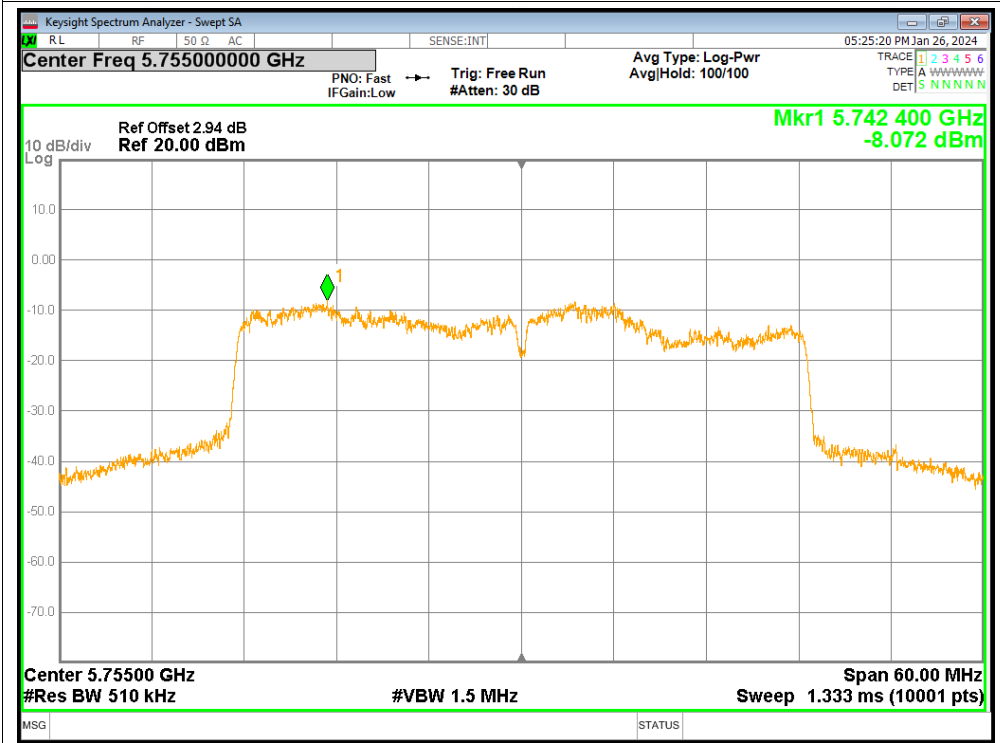
PSD NVNT n20 5785MHz Ant1



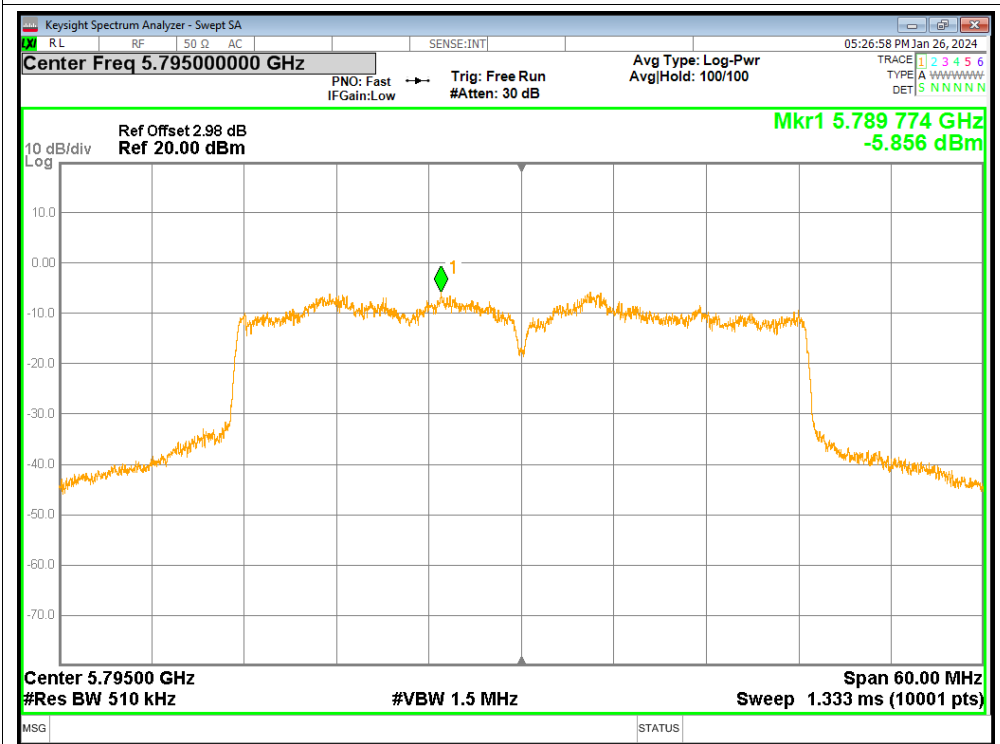
PSD NVNT n20 5825MHz Ant1



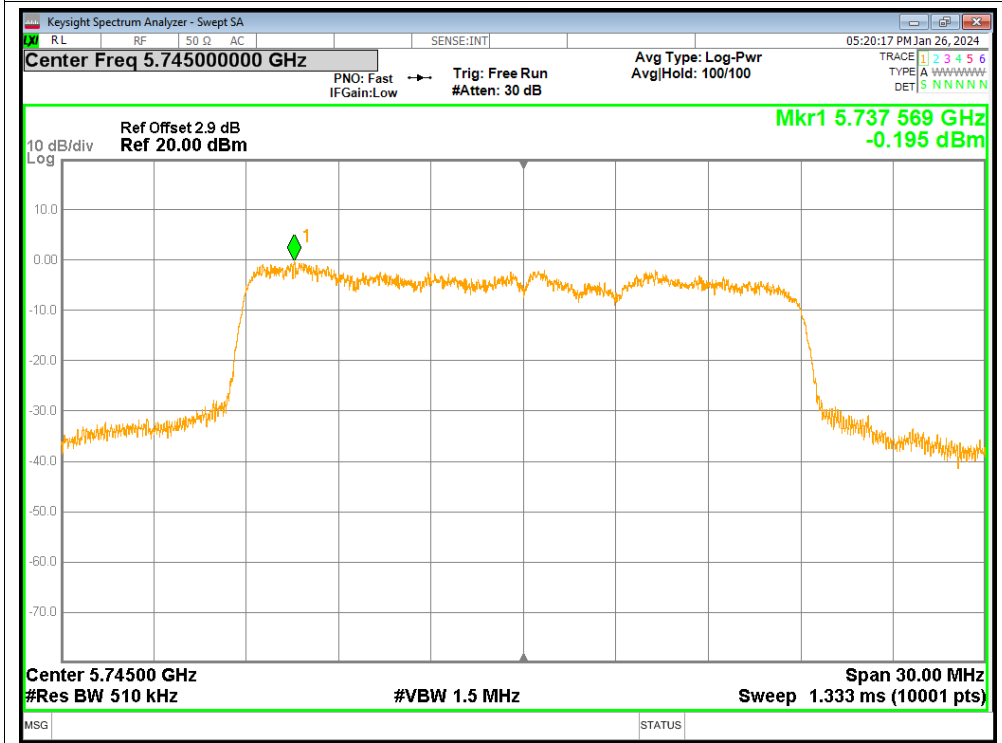
PSD NVNT n40 5755MHz Ant1



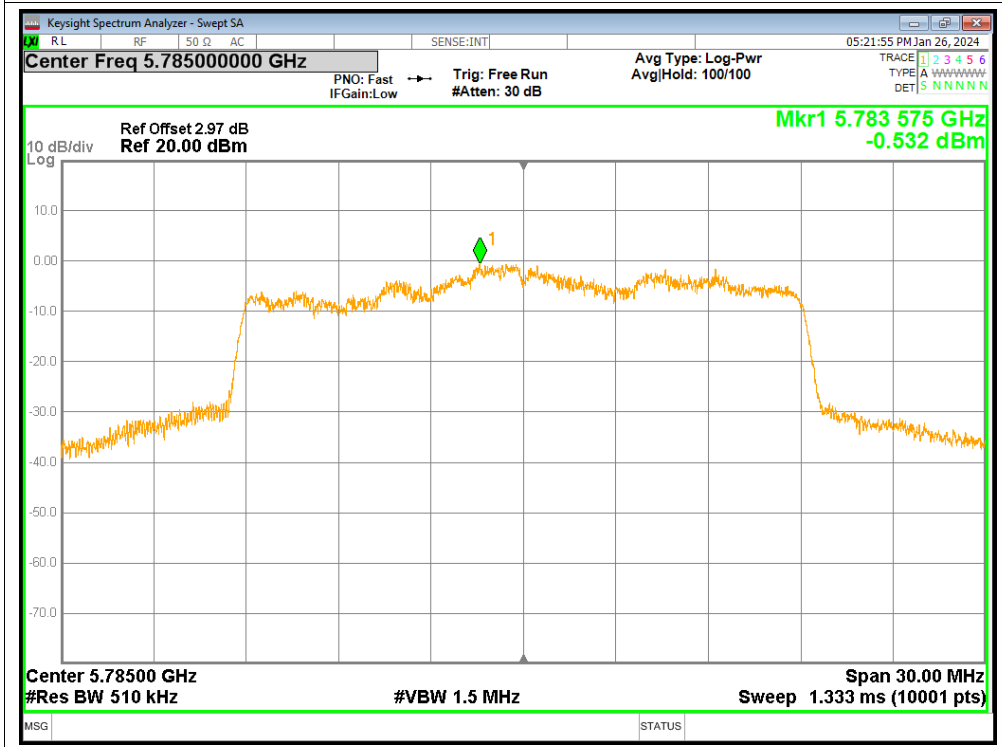
PSD NVNT n40 5795MHz Ant1



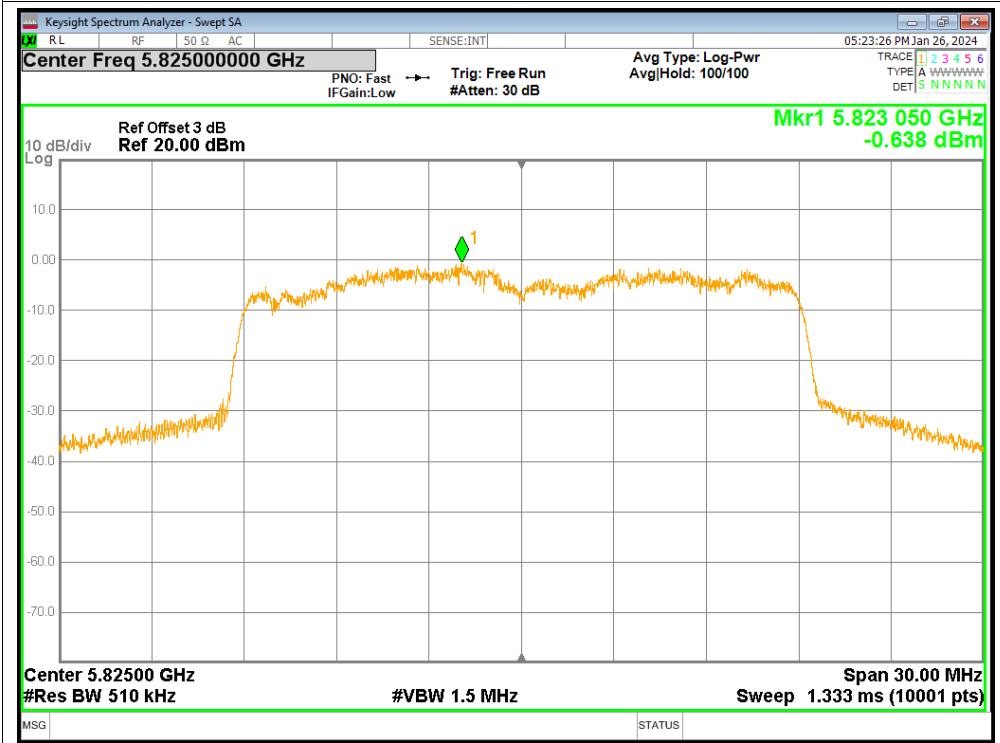
PSD NVNT ac20 5745MHz Ant1



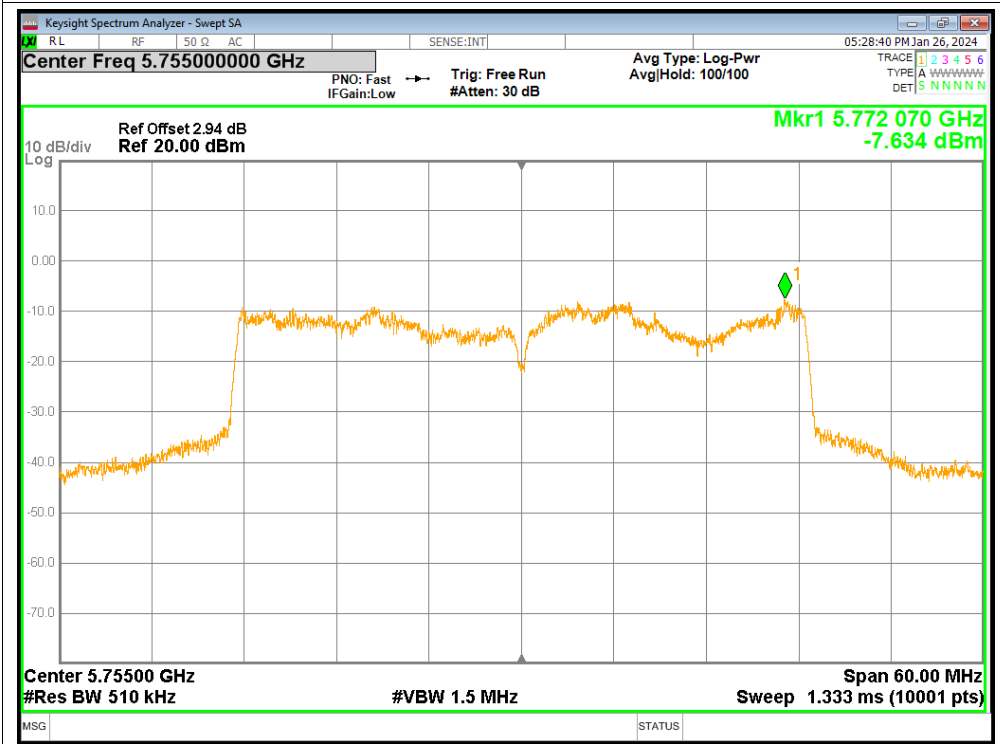
PSD NVNT ac20 5785MHz Ant1

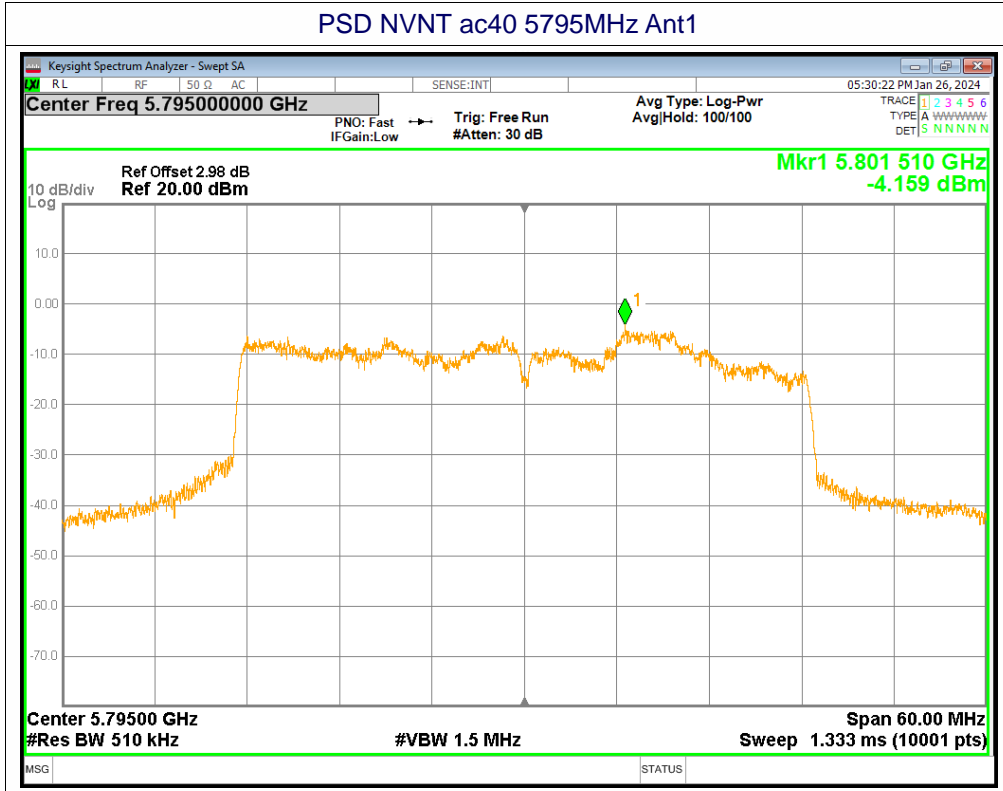


PSD NVNT ac20 5825MHz Ant1



PSD NVNT ac40 5755MHz Ant1





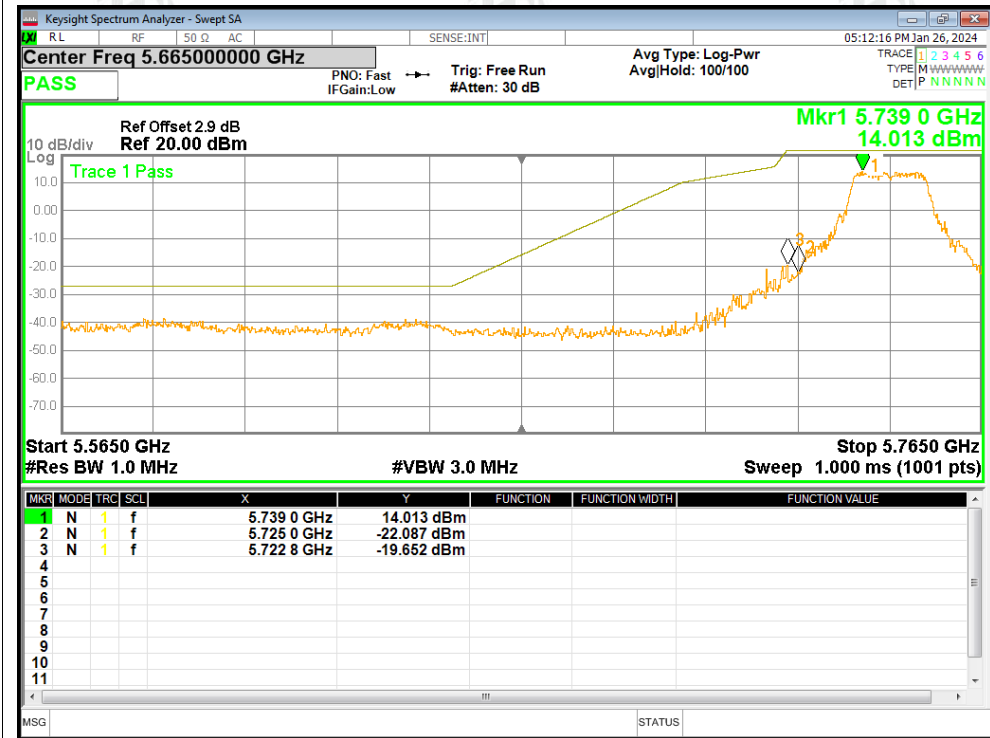


### B6. Band Edge

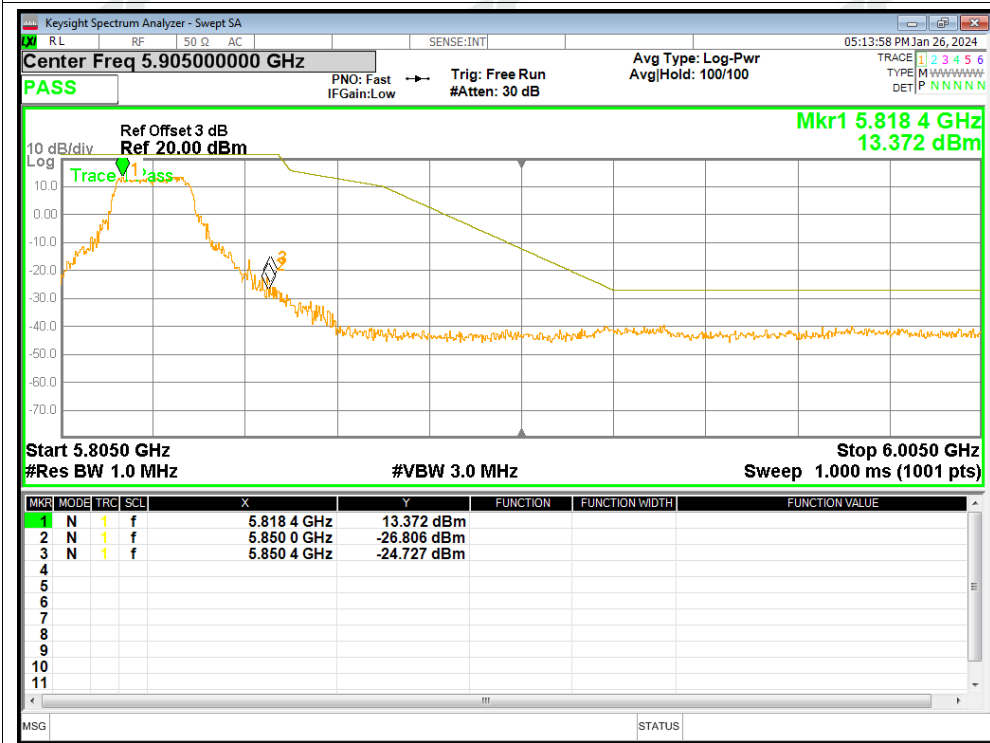
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	Ant1	-19.65	Refer to test Graphs	Pass
NVNT	a	5825	Ant1	-24.72	Refer to test Graphs	Pass
NVNT	n20	5745	Ant1	-18.49	Refer to test Graphs	Pass
NVNT	n20	5825	Ant1	-25.67	Refer to test Graphs	Pass
NVNT	n40	5755	Ant1	-16.42	Refer to test Graphs	Pass
NVNT	n40	5795	Ant1	-29.41	Refer to test Graphs	Pass
NVNT	ac20	5745	Ant1	-16.64	Refer to test Graphs	Pass
NVNT	ac20	5825	Ant1	-23.85	Refer to test Graphs	Pass
NVNT	ac40	5755	Ant1	-16.47	Refer to test Graphs	Pass
NVNT	ac40	5795	Ant1	-27.73	Refer to test Graphs	Pass

Test Graphs

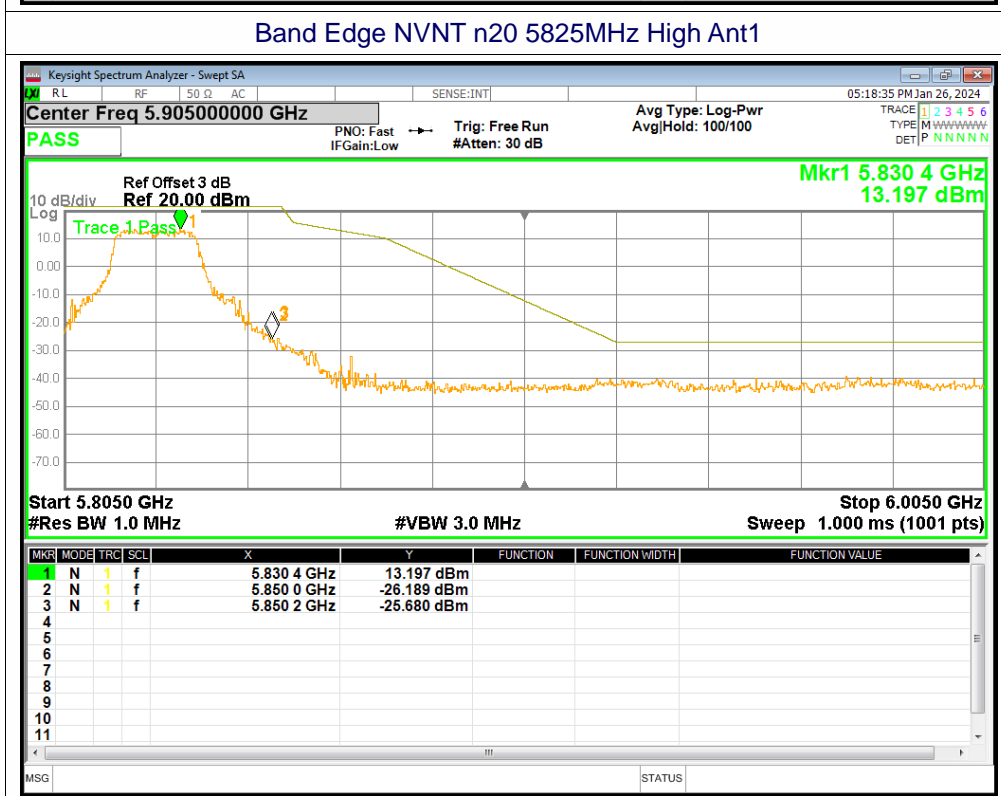
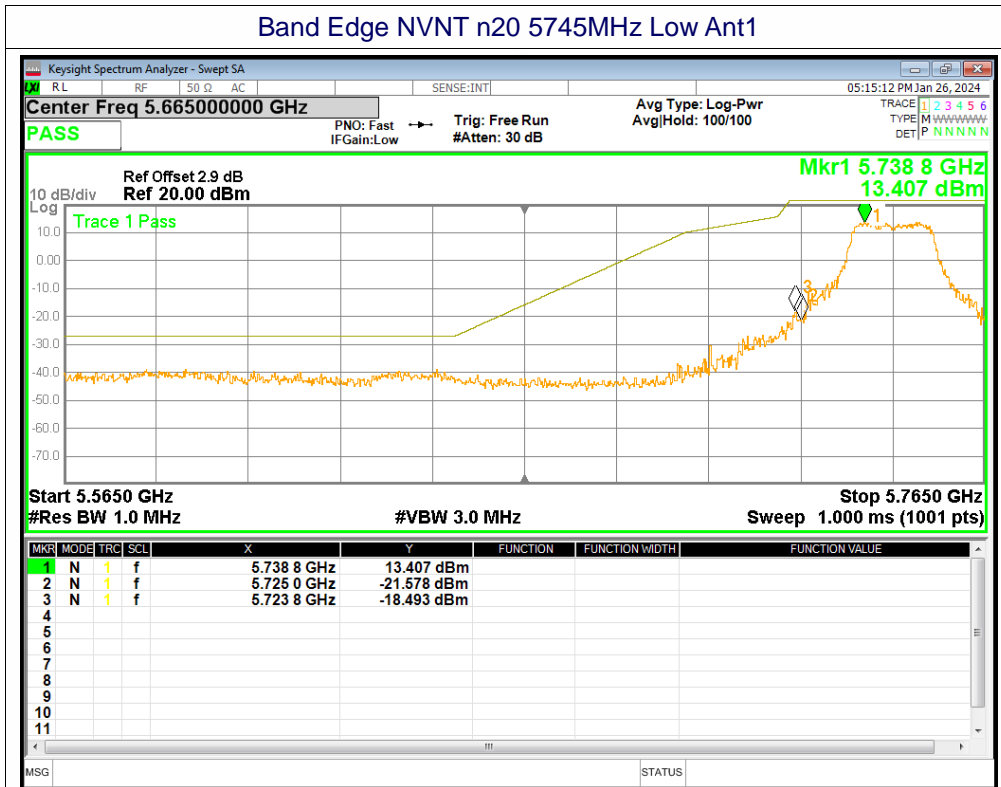
Band Edge NVNT a 5745MHz Low Ant1



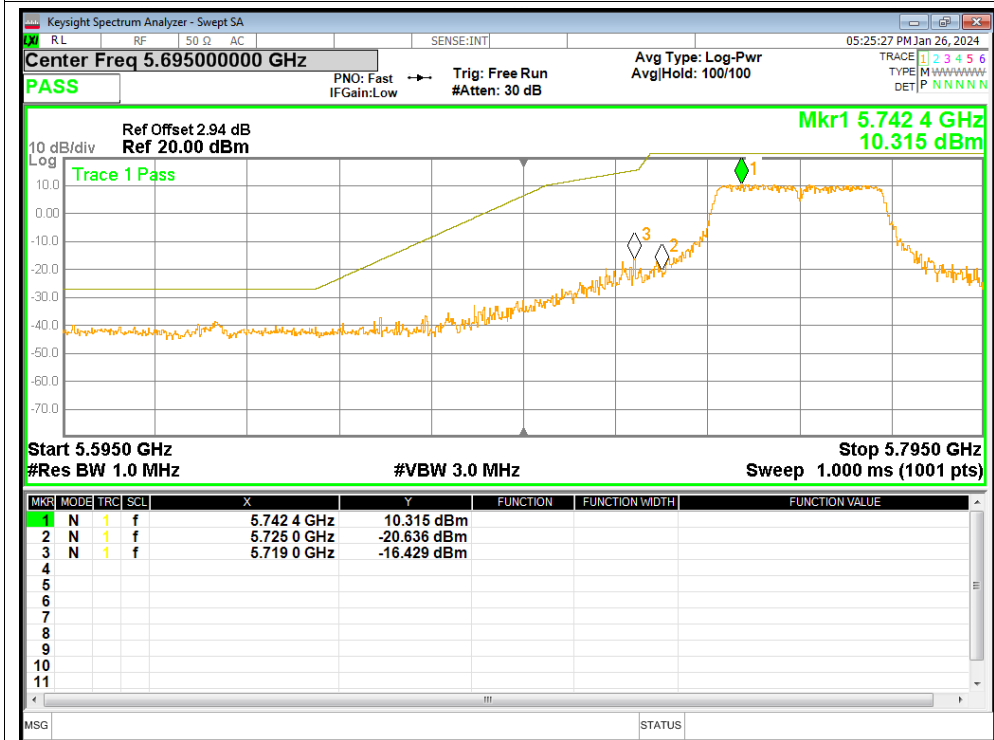
Band Edge NVNT a 5825MHz High Ant1



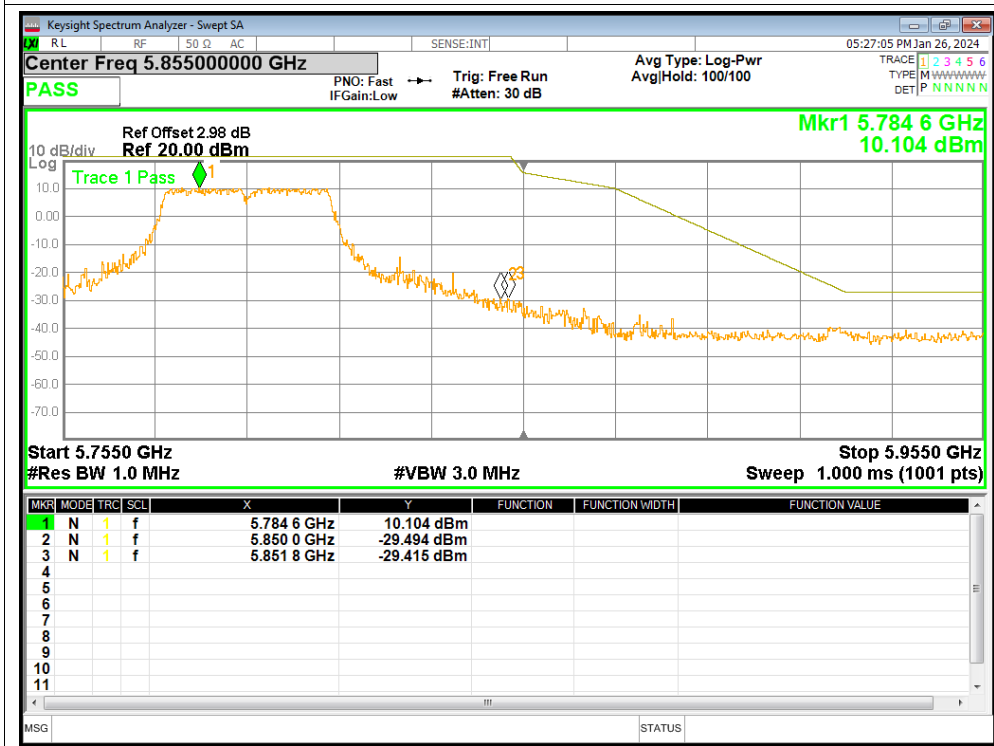




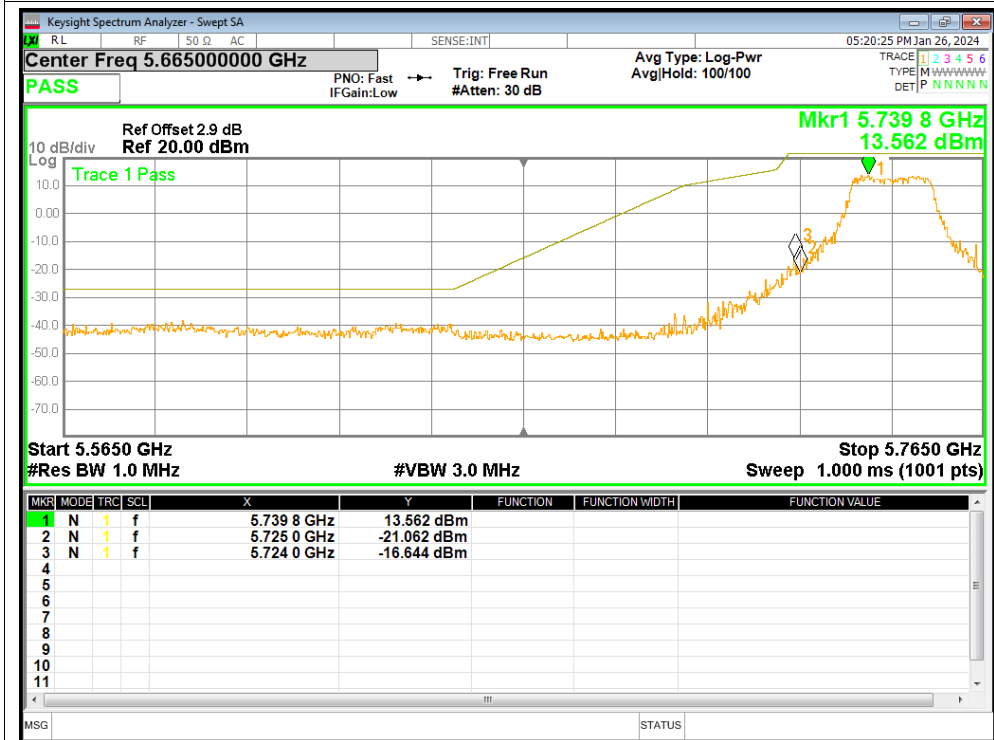
Band Edge NVNT n40 5755MHz Low Ant1



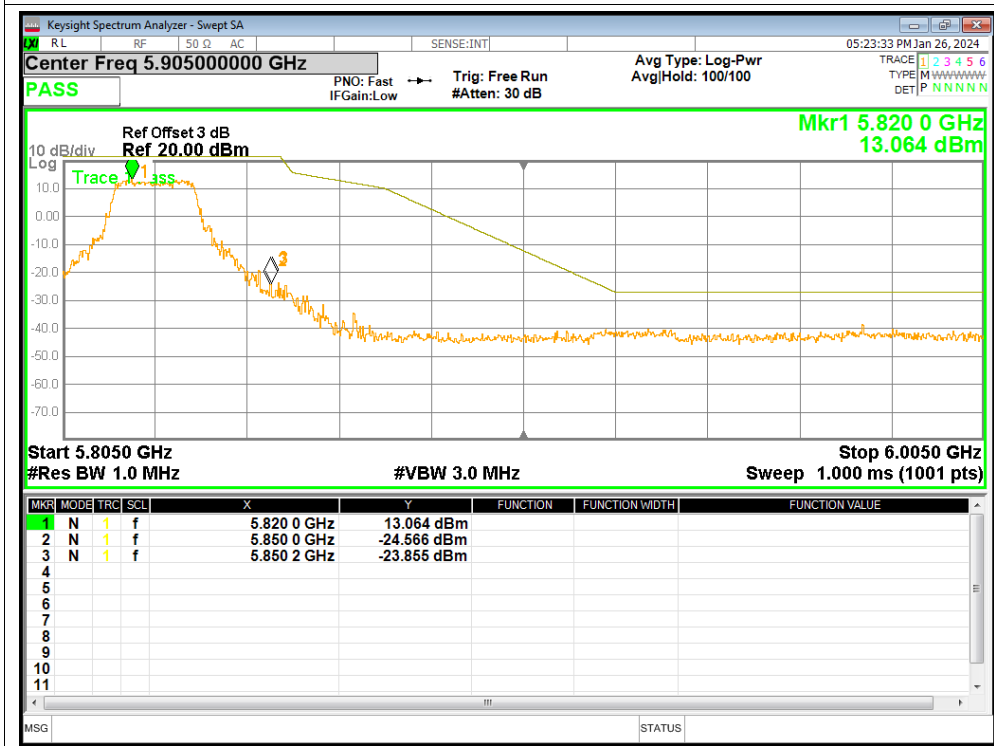
Band Edge NVNT n40 5795MHz High Ant1



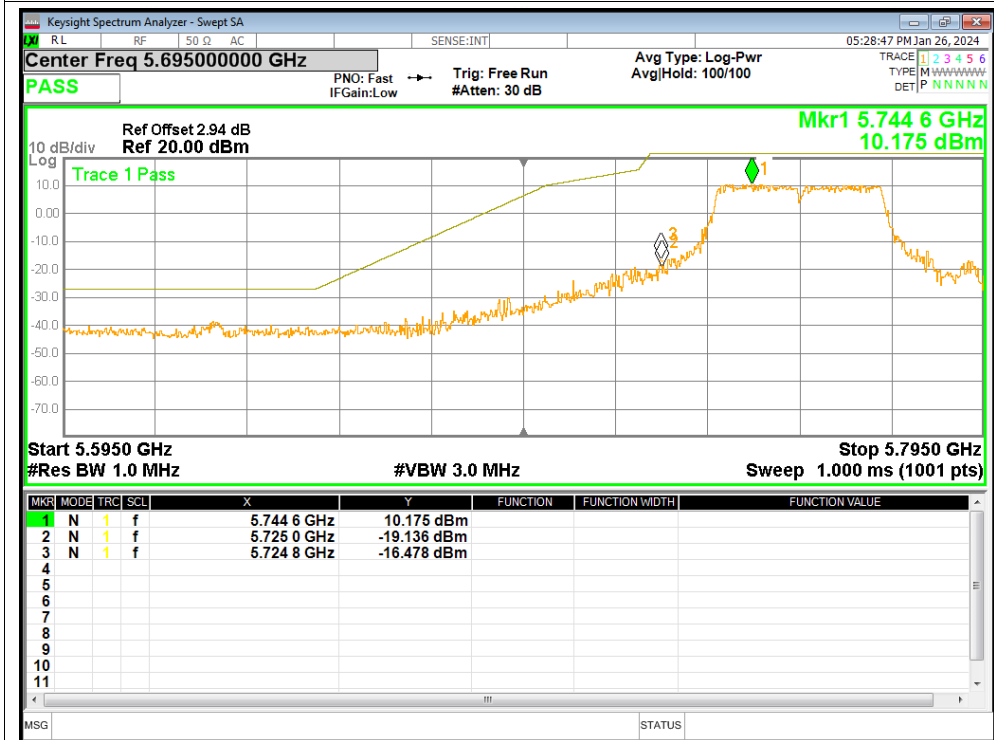
Band Edge NVNT ac20 5745MHz Low Ant1



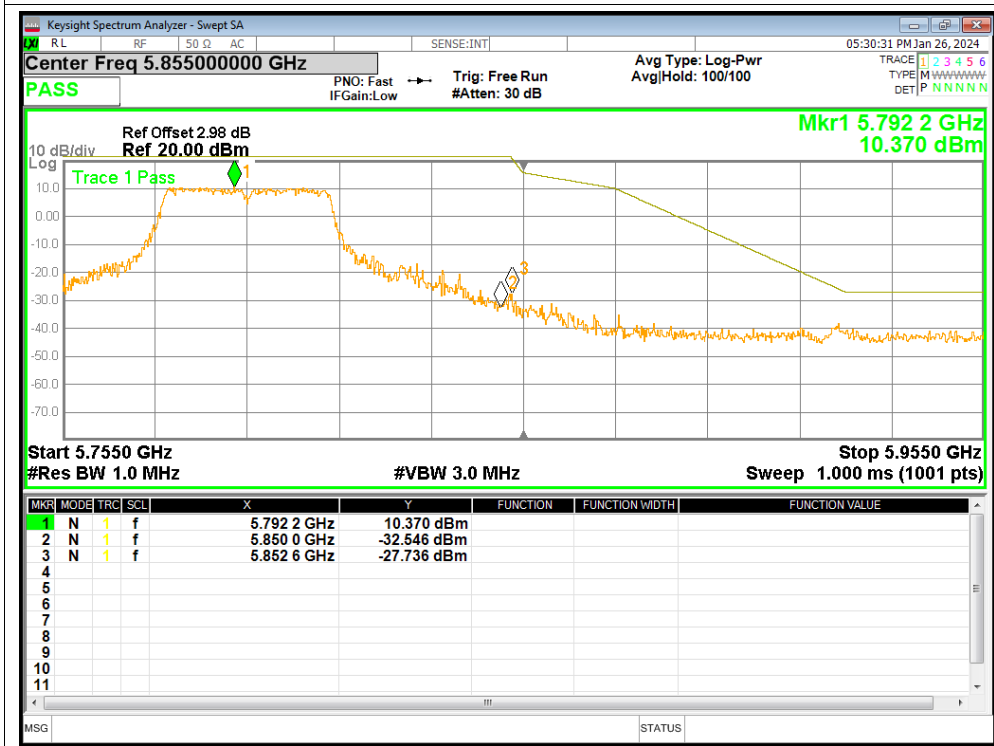
Band Edge NVNT ac20 5825MHz High Ant1



**Band Edge NVNT ac40 5755MHz Low Ant1**



**Band Edge NVNT ac40 5795MHz High Ant1**





### B7. Frequency Stability

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



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



Temperature							
TestMode	Channel	Voltage [Vdc]	Temperature (°C)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
a	5745	NV	-20	0	0	Within 5725-5850MHz	Pass
		NV	-10	0	0		
		NV	0	0	0		
		NV	20	0	0		
		NV	30	0	0		
		NV	50	0	0		
		NV	60	0	0		
	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		
N20	5745	NV	-20	-20000	-3.48		
		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	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			
		NV	60	0	0			
ac20	5745	NV	-20	0	0	Within 5725-5850MHz	Pass	
		NV	-10	0	0			
		NV	0	0	0			
		NV	20	0	0			
		NV	30	0	0			
		NV	50	0	0			
		NV	60	0	0			
	5785	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			
	5825	NV	-20	-20000	-3.48			
		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			
	N40	5755	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		
N40	5795	NV	-20	0	0	Within 5725-5850MHz	Pass
		NV	-10	0	0		
		NV	0	0	0		
		NV	20	0	0		
		NV	30	0	0		
		NV	50	0	0		
		NV	60	0	0		
		NV	-20	0	0		
ac40	5755	NV	-10	0	0		
		NV	0	0	0		
		NV	20	0	0		
		NV	30	0	0		
		NV	50	0	0		
		NV	60	0	0		
		NV	-20	40000	6.9		
	5795	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	60	40000	6.9		

Note:Test temperature:-20° to + 60°

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



ZHONGHAN



FCC ID:2BEET-C9

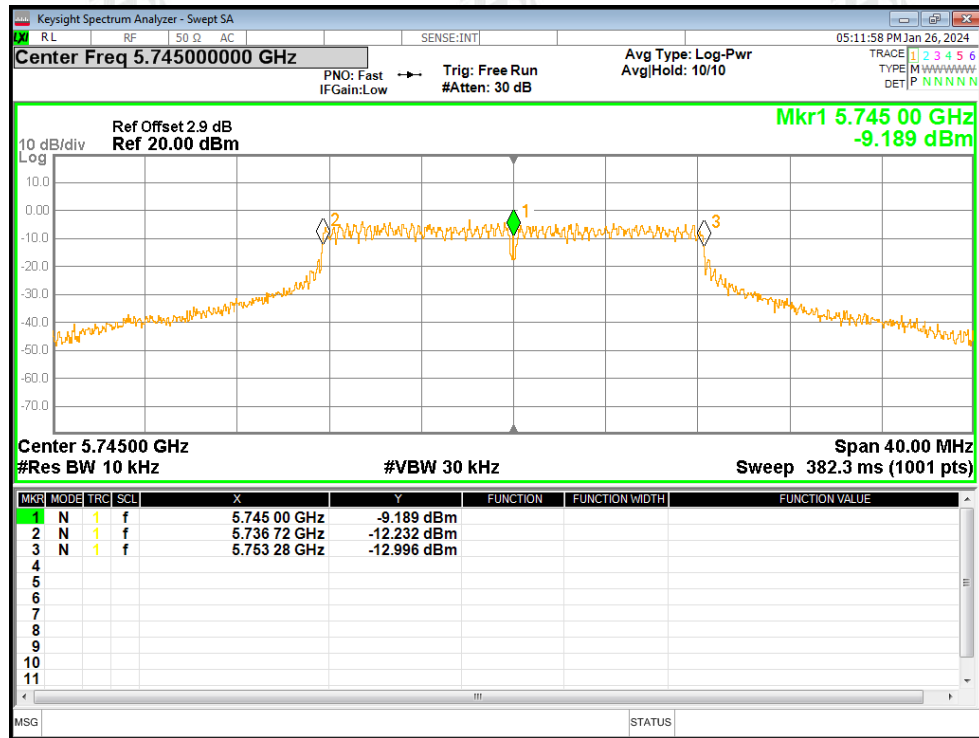


Page 53 of 61

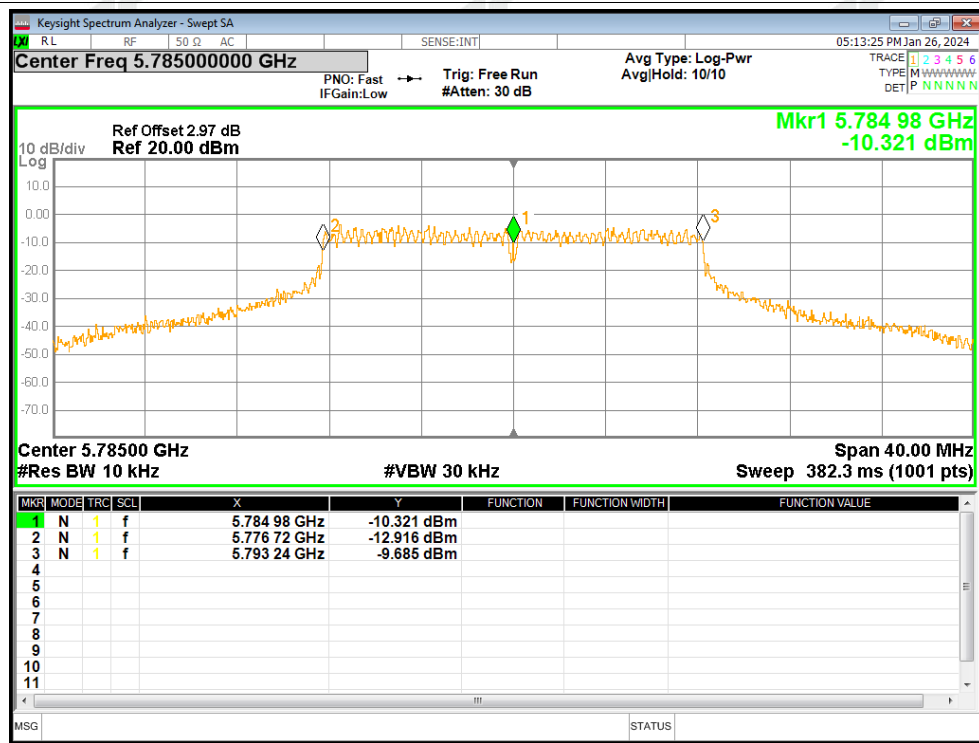


Test Graphs

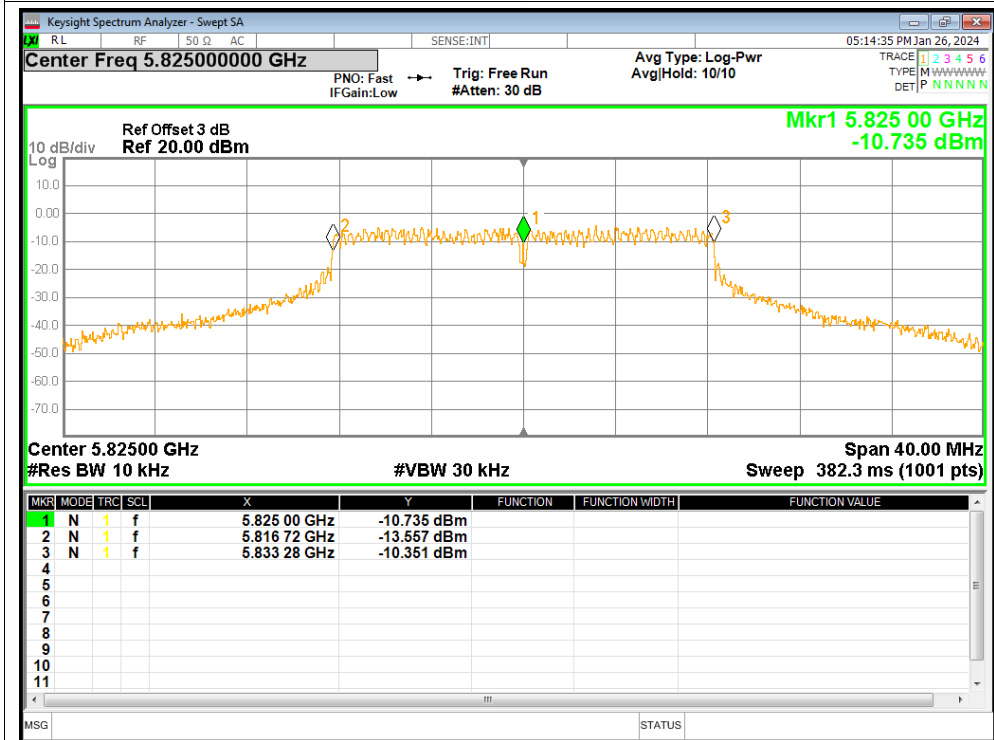
Freq. Stability NVNT a 5745MHz Ant1



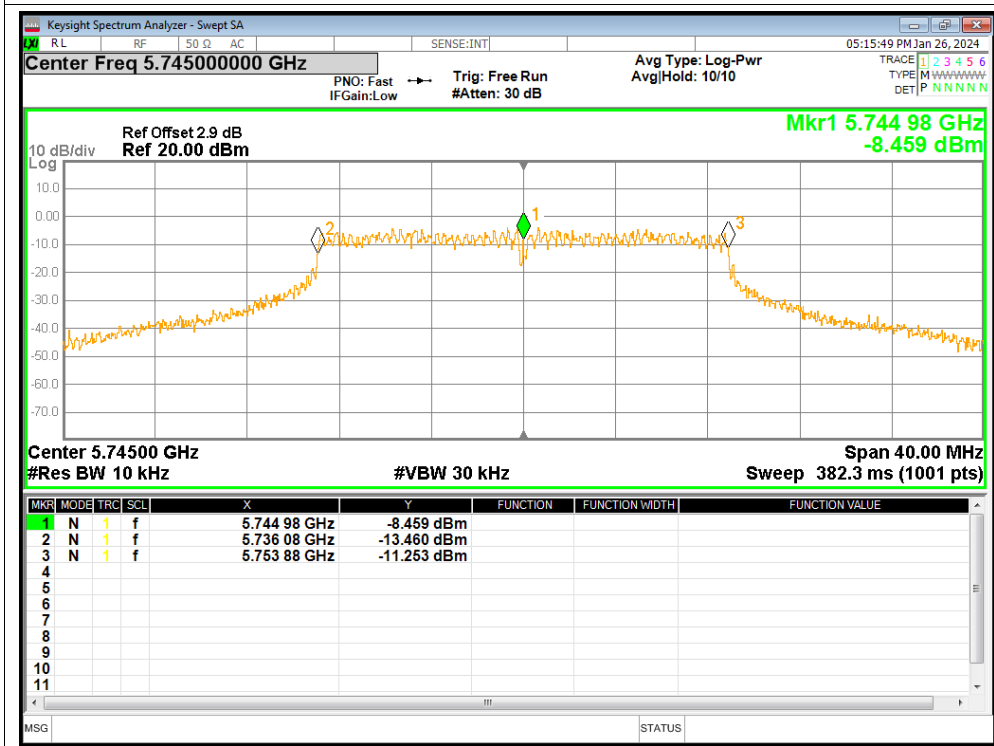
Freq. Stability NVNT a 5785MHz Ant1

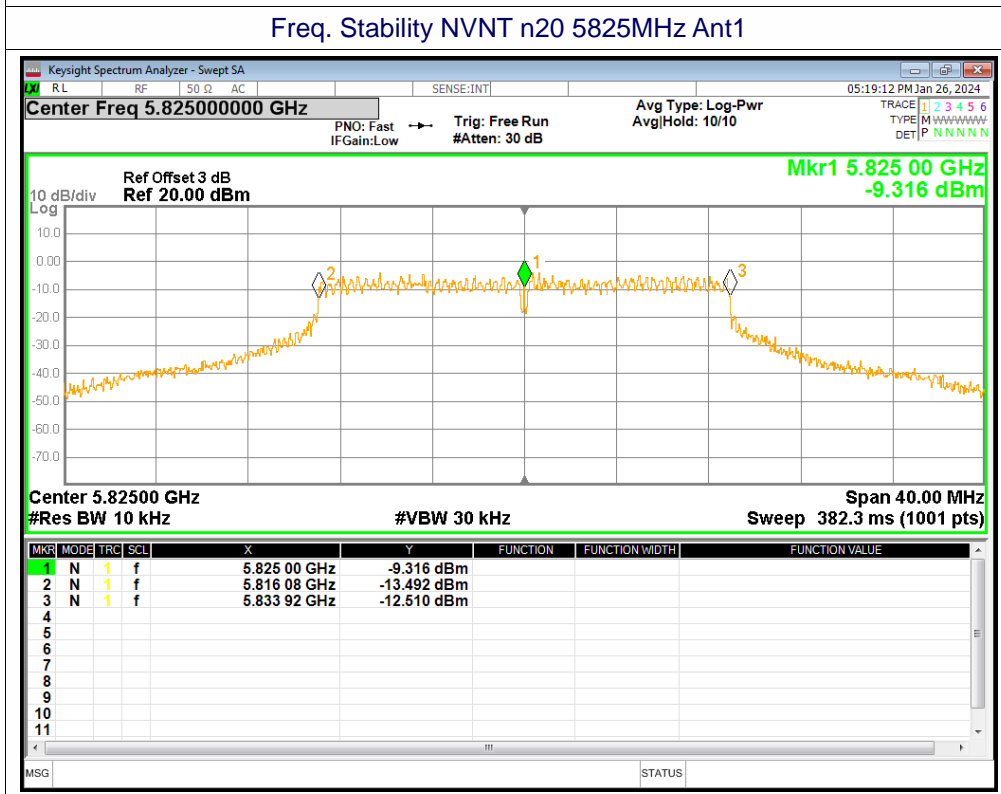
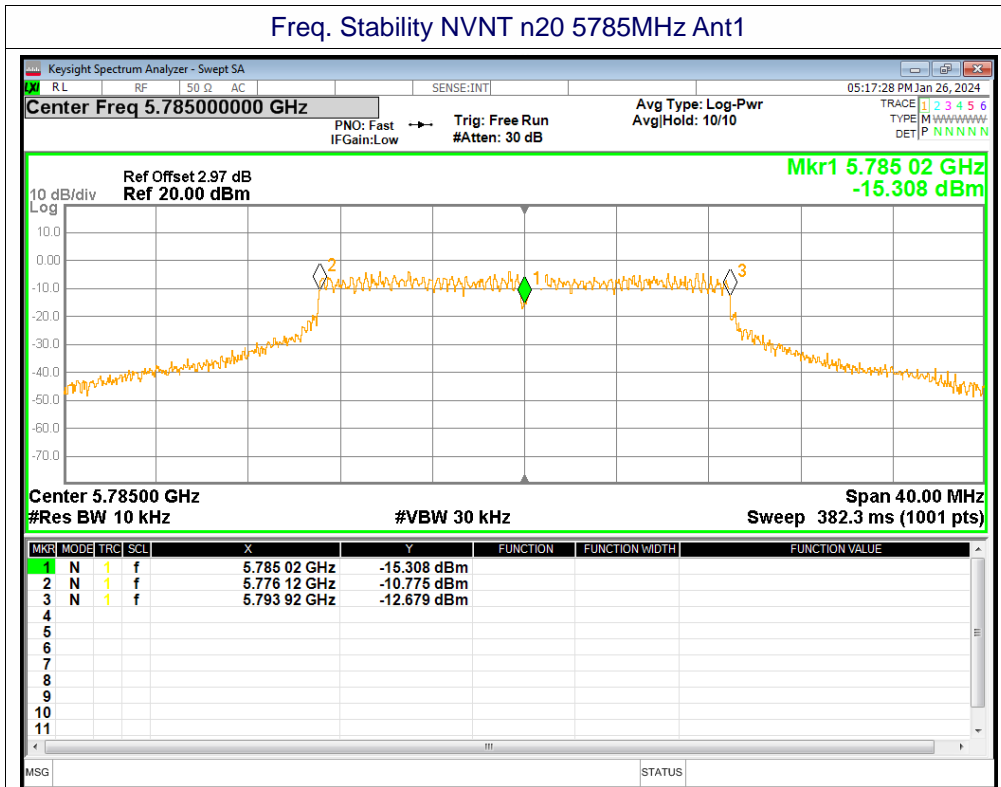


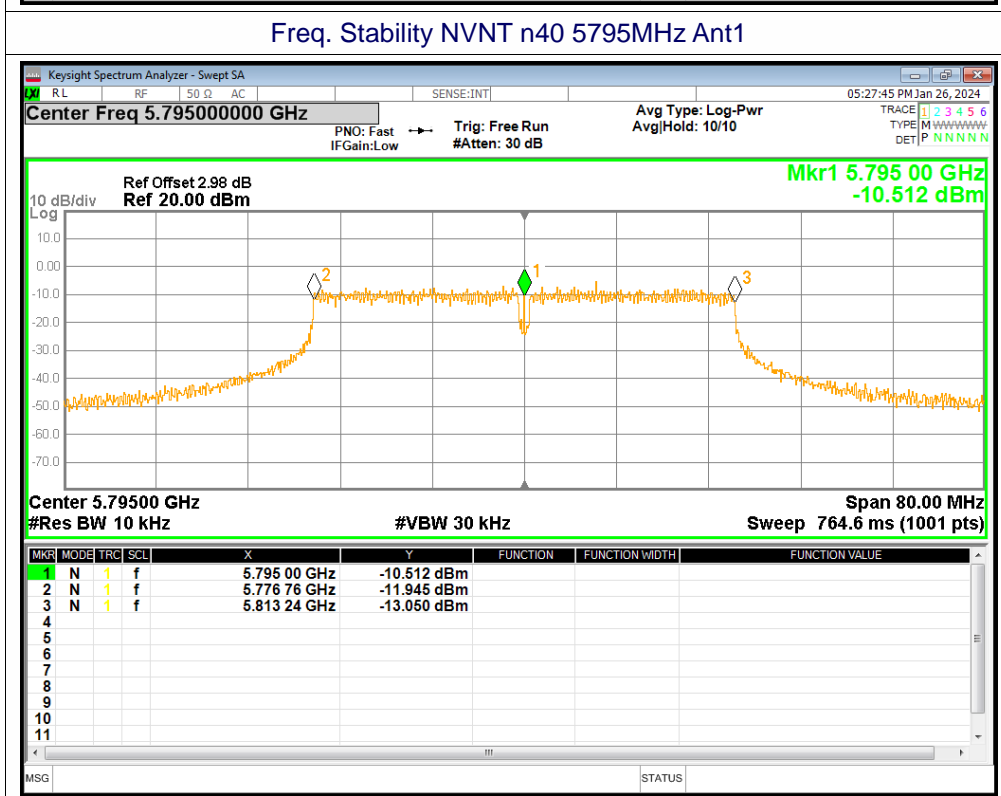
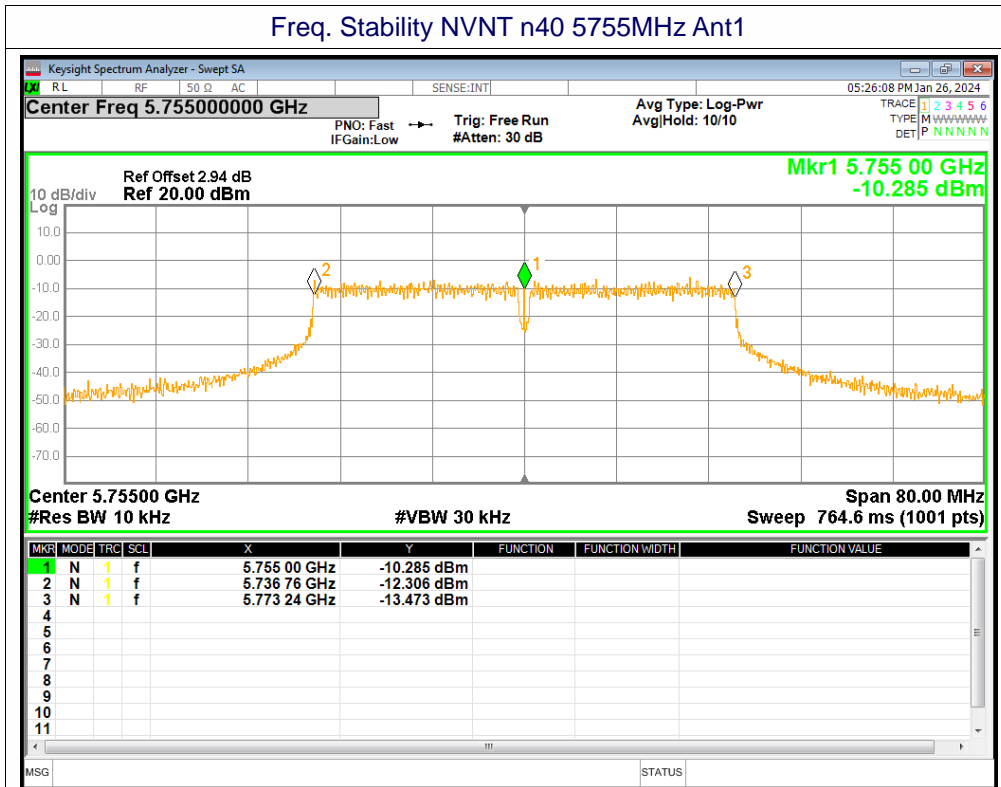
Freq. Stability NVNT a 5825MHz Ant1



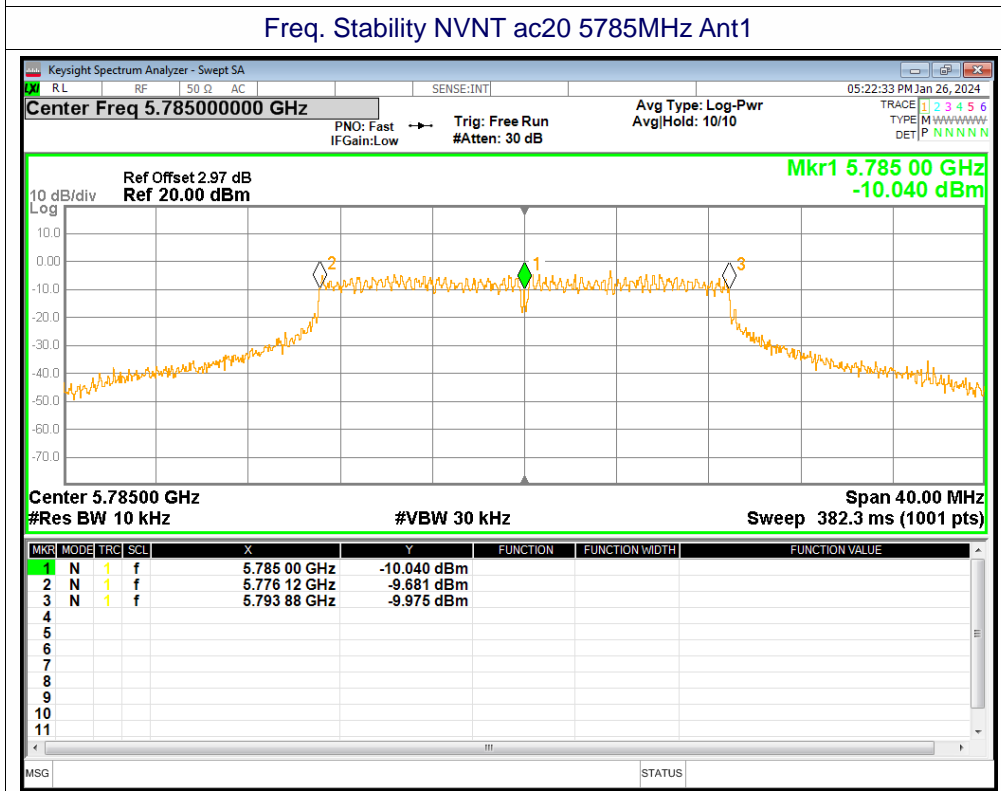
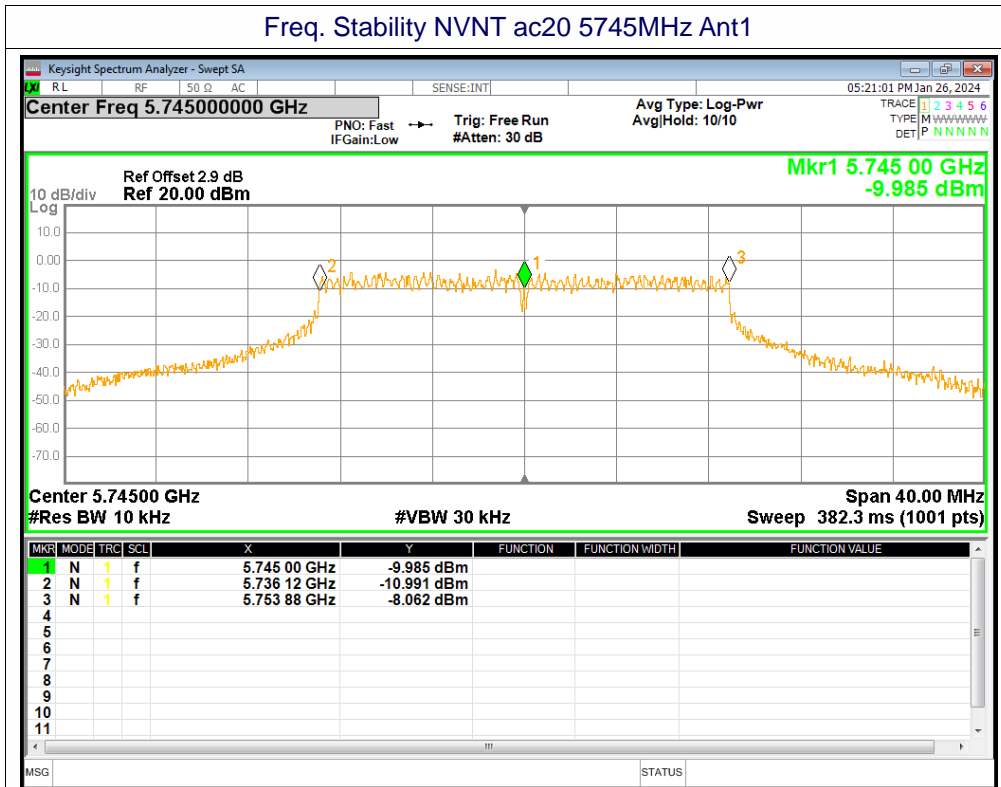
Freq. Stability NVNT n20 5745MHz Ant1

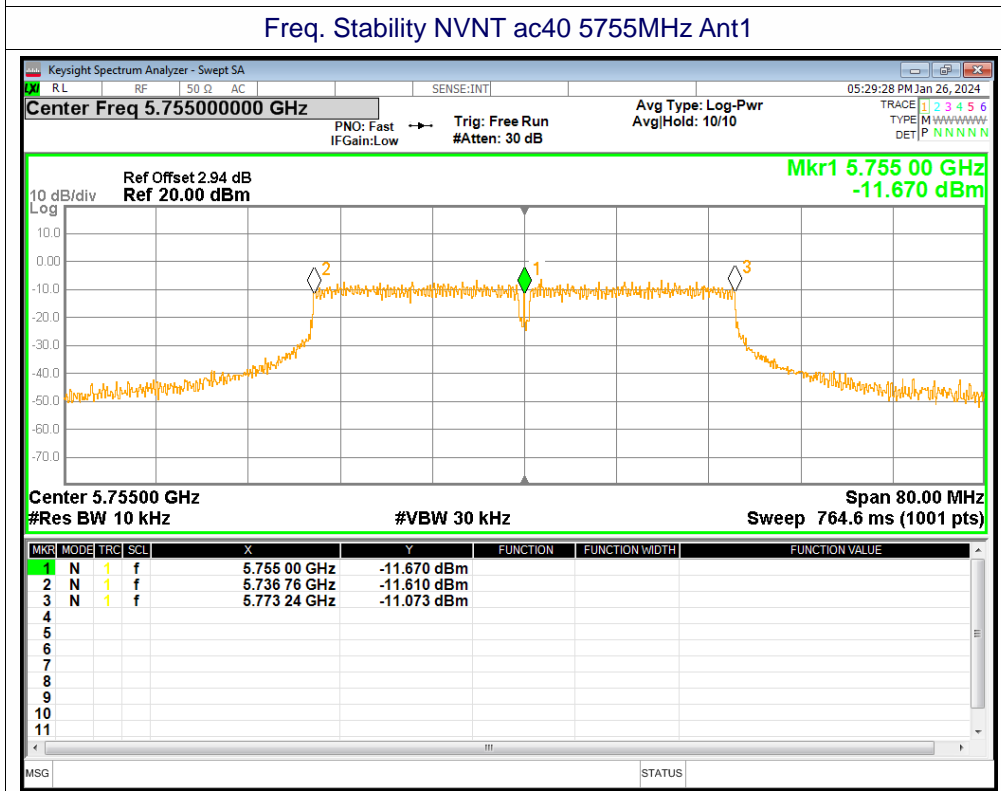
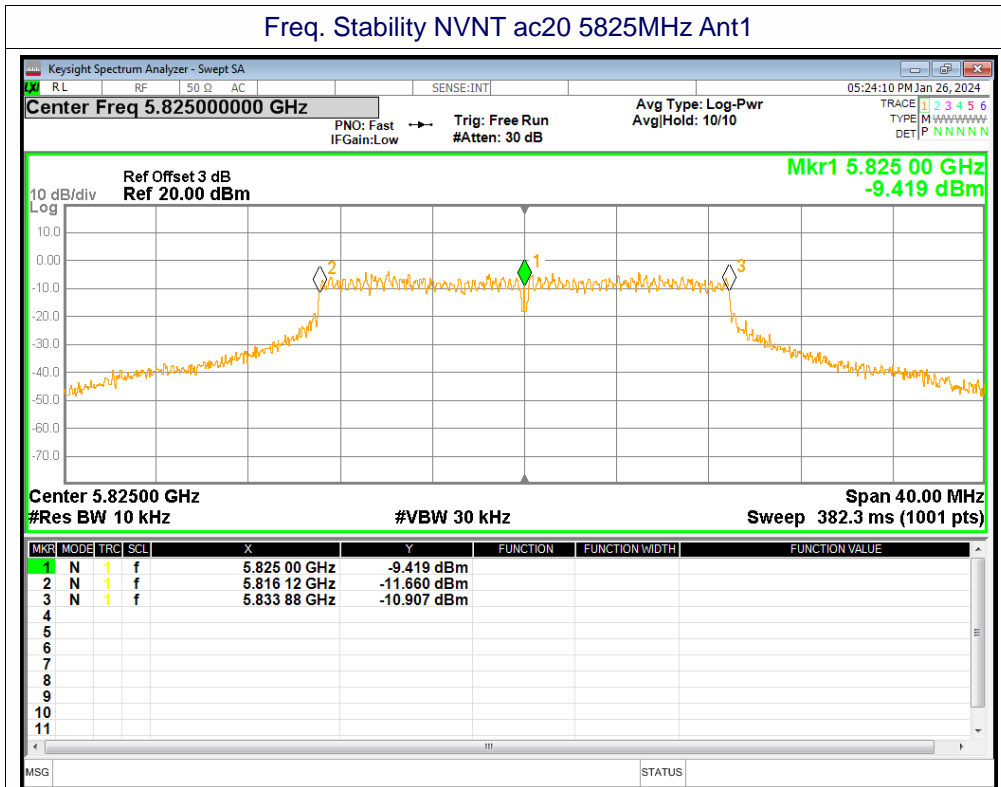


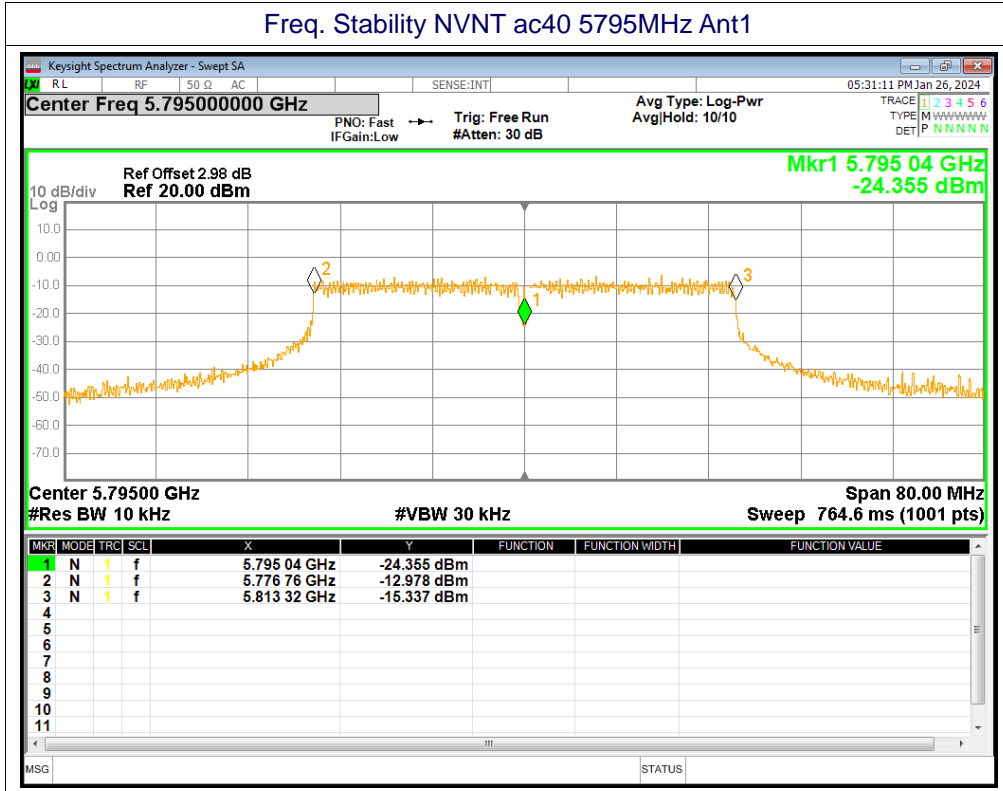














### B8. Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Frequency (GHz)	Max Value (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	0.3-1	-31.47	-27	pass
			1-5.575	-32.29	-27	pass
			5.575-5.625	-31.89	-27 to 10	pass
			5.625-5.645	-31.63	10 to 15.6	pass
			5.645-5.650	-30.21	15.6 to 27	pass
			5.850-5.855	-30.42	27 to15.6	pass
			5.855-5.875	-31.14	15.6 to 10	pass
			5.875-5.925	-31.19	10 to -27	pass
			5.925-27G	-31.33	-27	pass
		5825	0.3-1	-31.25	-27	pass
			1-5.575	-30.29	-27	pass
			5.575-5.625	-31.04	-27 to 10	pass
			5.625-5.645	-32.66	10 to 15.6	pass
			5.645-5.650	-29.34	15.6 to 27	pass
			5.850-5.855	-29.79	27 to15.6	pass
			5.855-5.875	-31.47	15.6 to 10	pass
			5.875-5.925	-31.47	10 to -27	pass
			5.925-27G	-31.08	-27	pass

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