Appendix A for 5GWIFI Test Data

Product Name: ATOTO Car Navigation Multimedia Receiver

Test Model: P807SD

Environmental Conditions

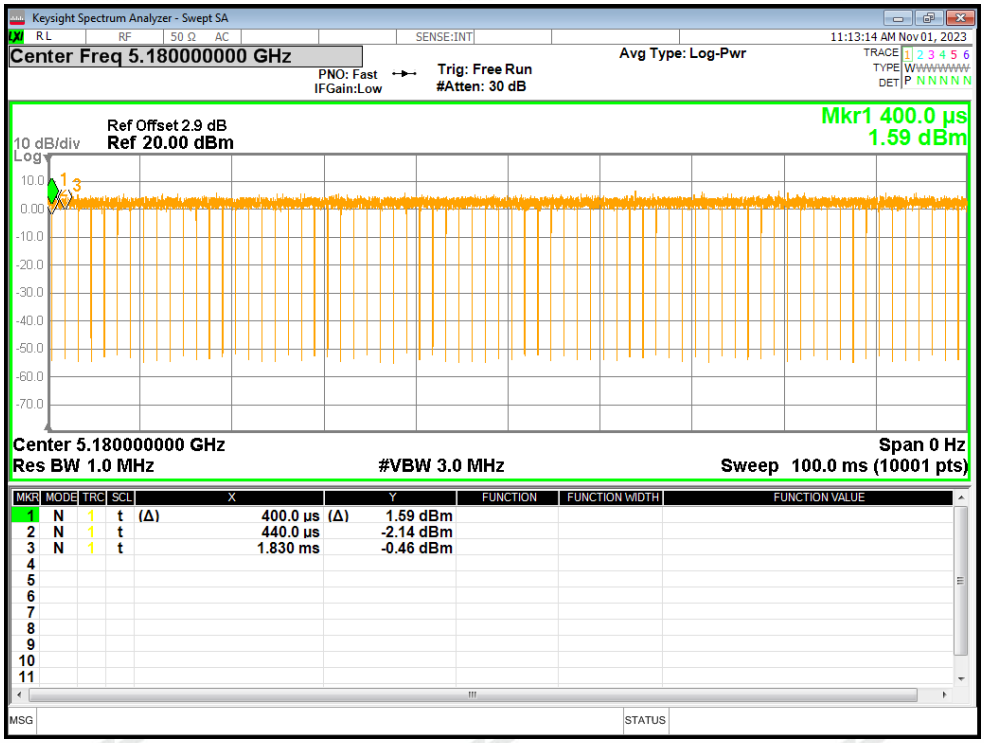
Temperature:	24.2℃
Relative Humidity:	53%
ATM Pressure:	101.0 kPa
Test Engineer:	Kimi Lu
Supervised by:	Baret Wu

A1.Duty Cycle

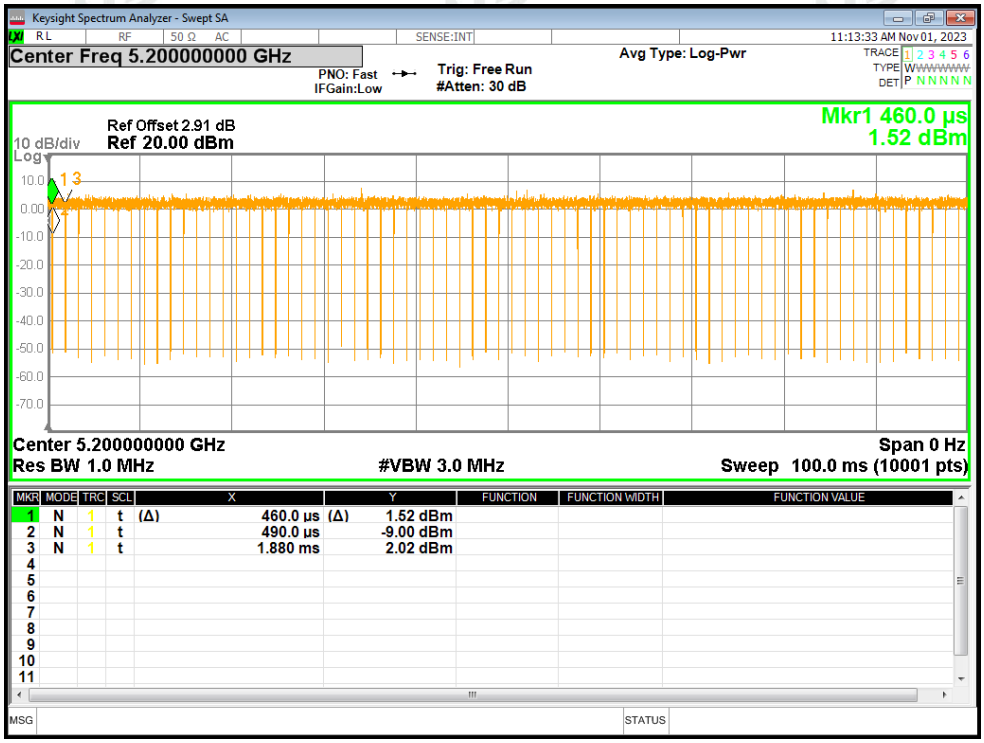
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	Ant1	97.2	0.12	0.48
NVNT	a	5200	Ant1	97.89	0.09	0.48
NVNT	a	5240	Ant1	97.2	0.12	0.48
NVNT	n20	5180	Ant1	97.74	0.1	0.52
NVNT	n20	5200	Ant1	97.74	0.1	0.52
NVNT	n20	5240	Ant1	97.74	0.1	0.52
NVNT	n40	5190	Ant1	94.2	0.26	0.48
NVNT	n40	5230	Ant1	94.12	0.26	0.52
NVNT	ac20	5180	Ant1	97.74	0.1	0.52
NVNT	ac20	5200	Ant1	97.74	0.1	0.52
NVNT	ac20	5240	Ant1	97.01	0.13	0.52
NVNT	ac40	5190	Ant1	95.59	0.2	0.52
NVNT	ac40	5230	Ant1	94.2	0.26	0.52
NVNT	ac80	5210	Ant1	82.69	0.83	0.52

Test Graphs

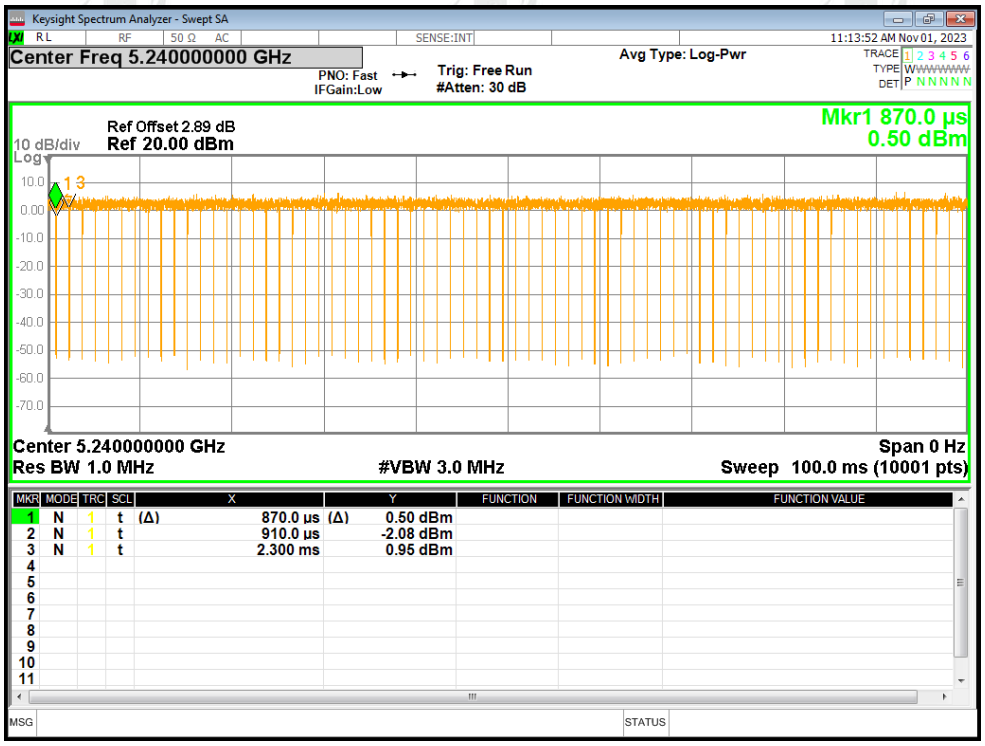
Duty Cycle NVNT a 5180MHz Ant1



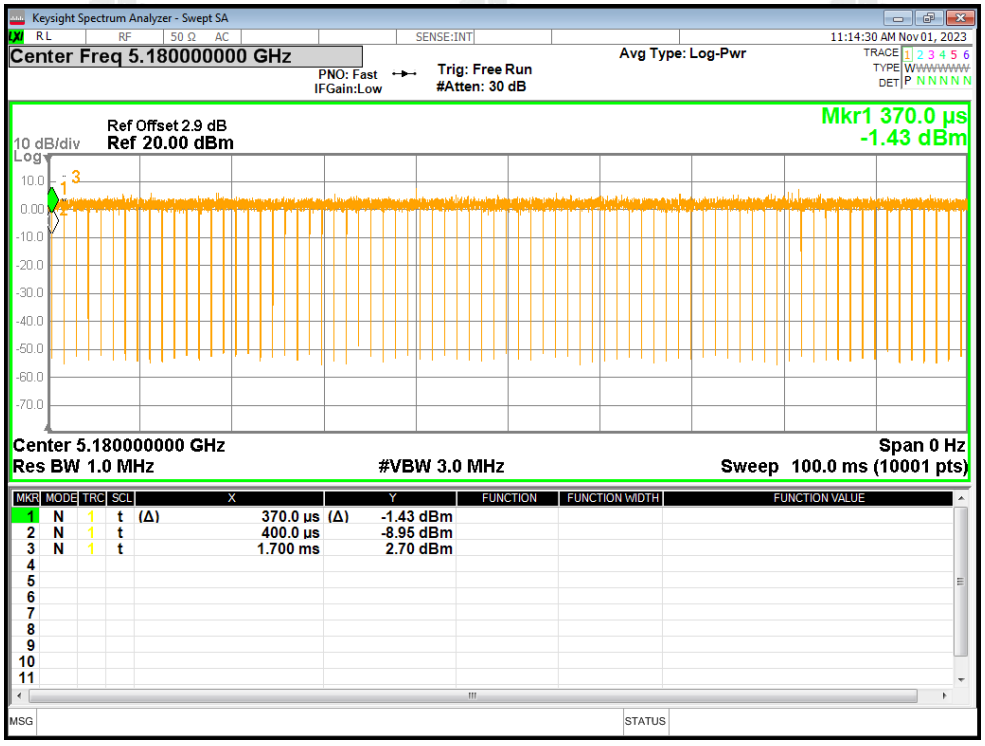
Duty Cycle NVNT a 5200MHz Ant1



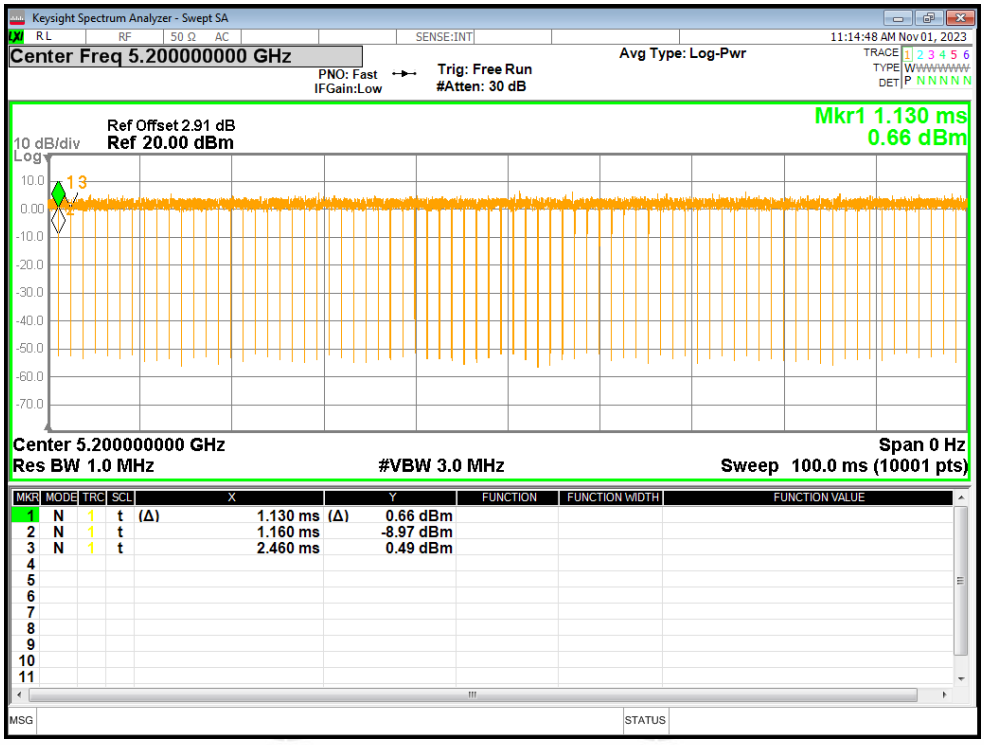
Duty Cycle NVNT a 5240MHz Ant1



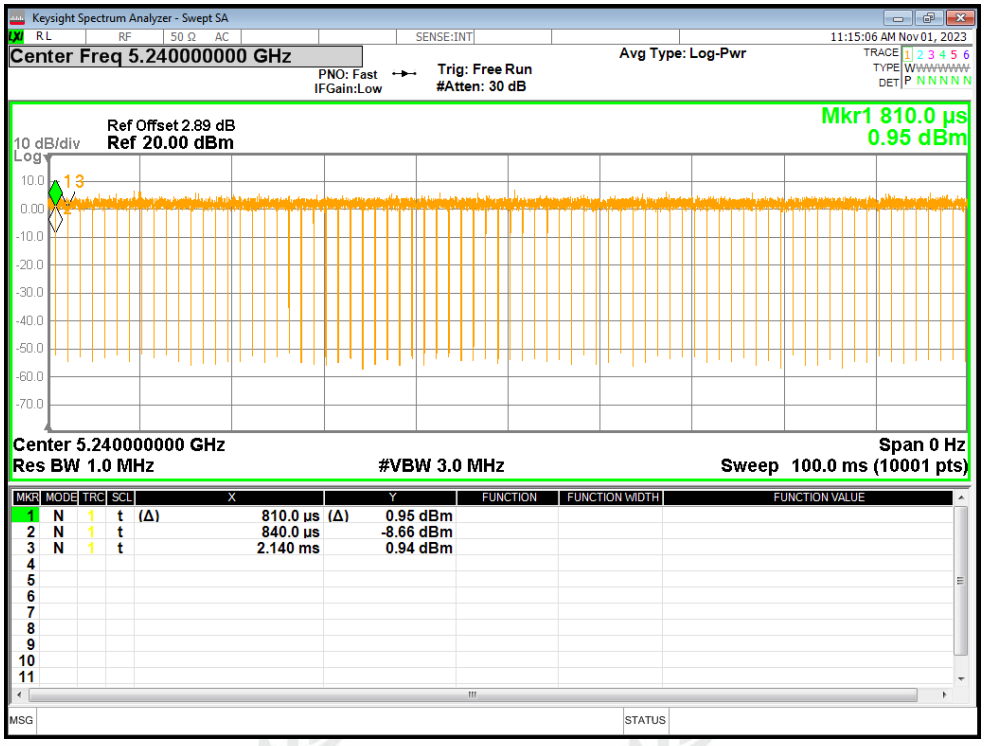
Duty Cycle NVNT n20 5180MHz Ant1



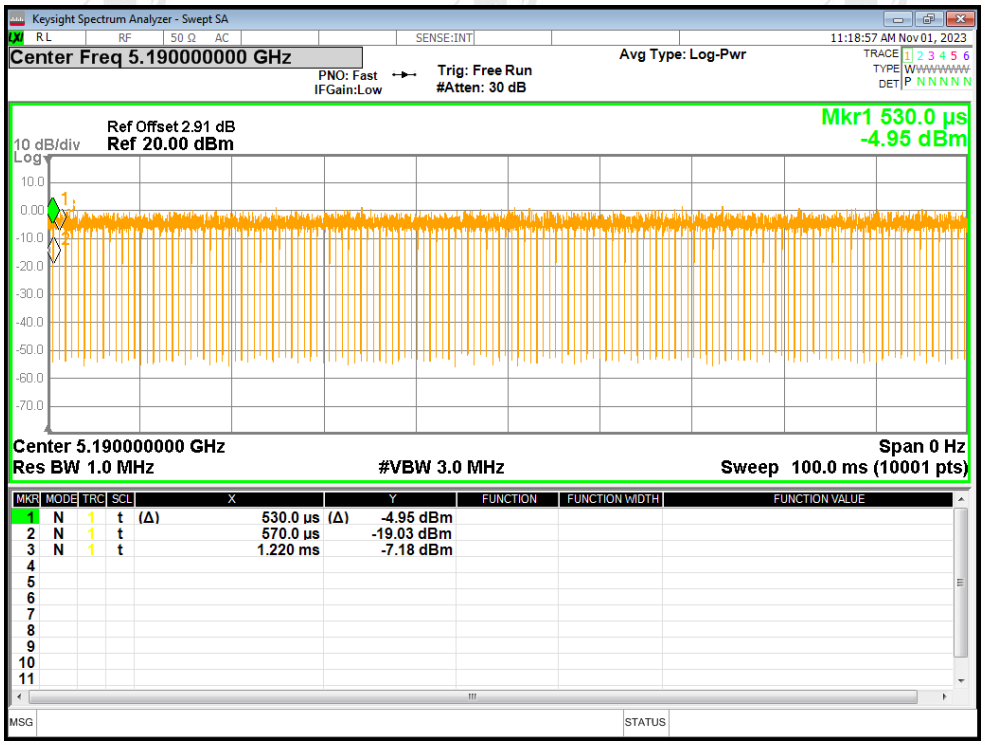
Duty Cycle NVNT n20 5200MHz Ant1



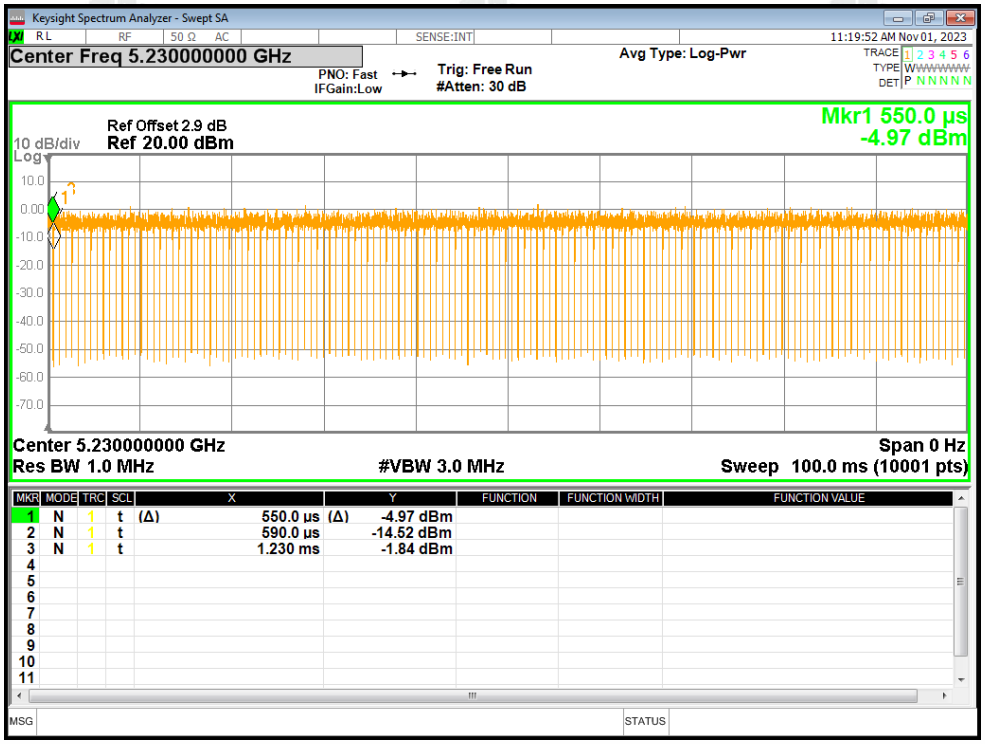
Duty Cycle NVNT n20 5240MHz Ant1



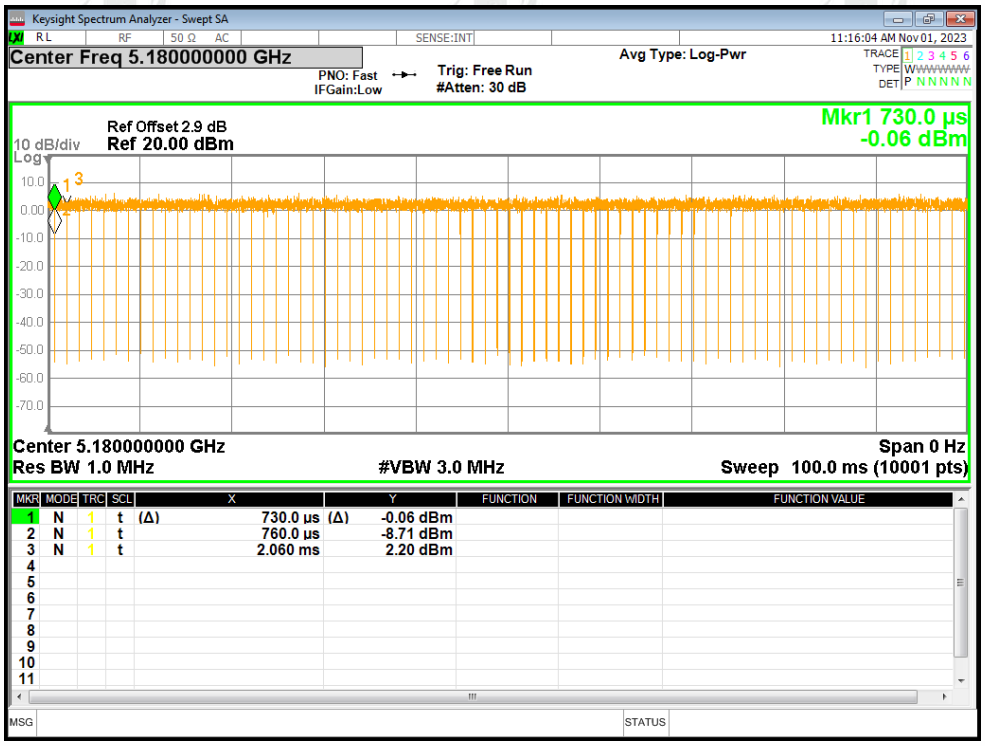
Duty Cycle NVNT n40 5190MHz Ant1



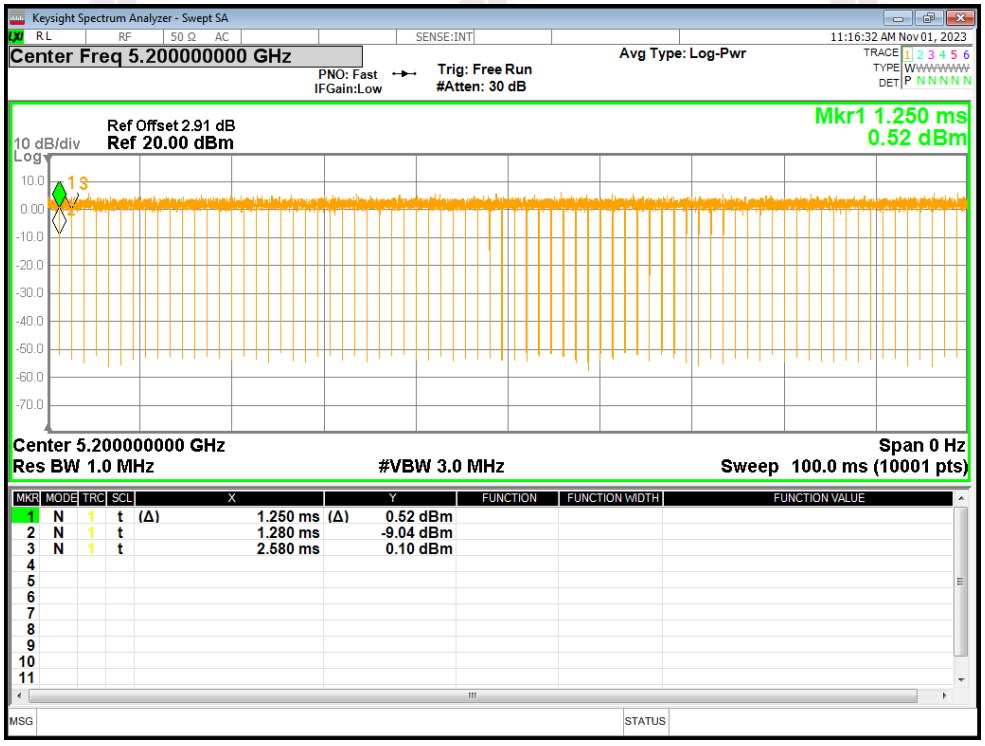
Duty Cycle NVNT n40 5230MHz Ant1



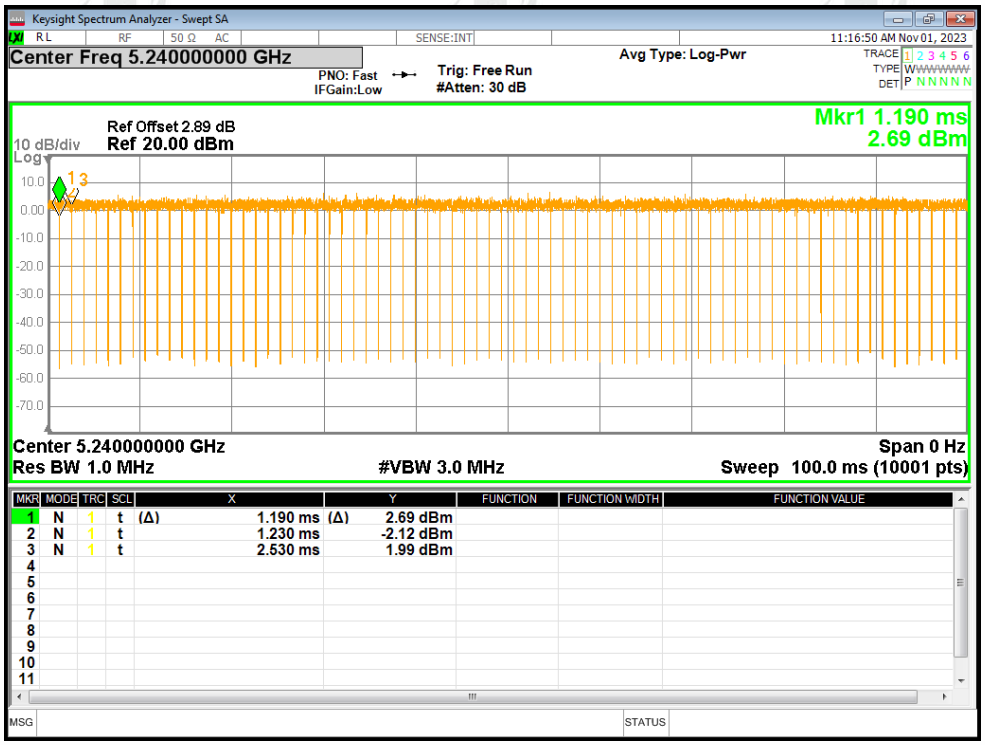
Duty Cycle NVNT ac20 5180MHz Ant1



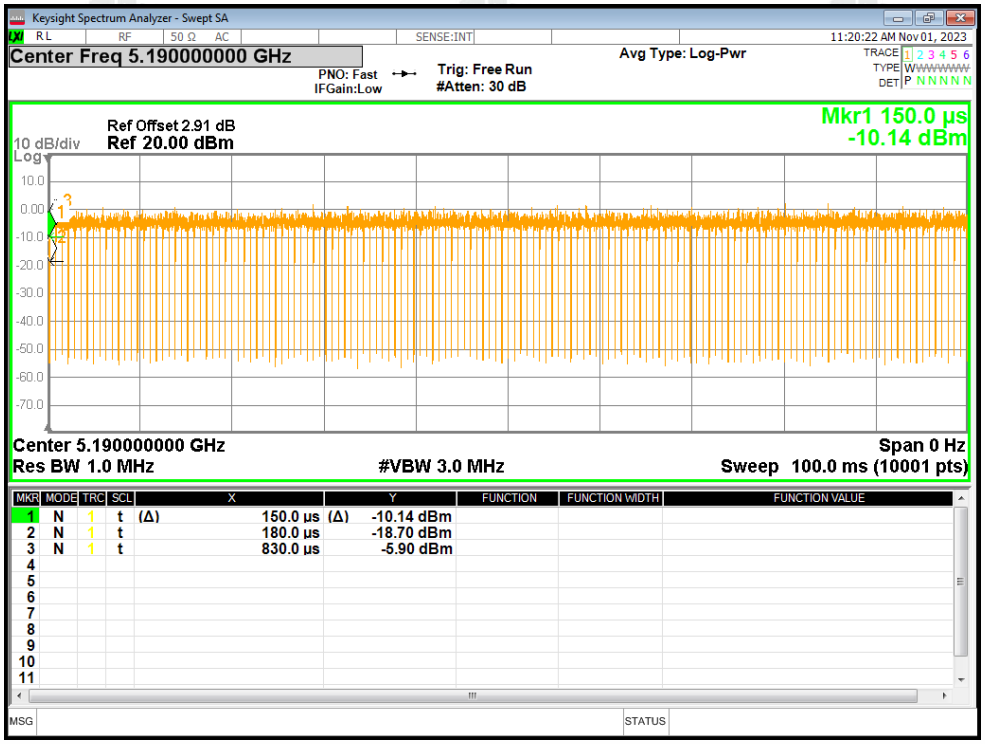
Duty Cycle NVNT ac20 5200MHz Ant1



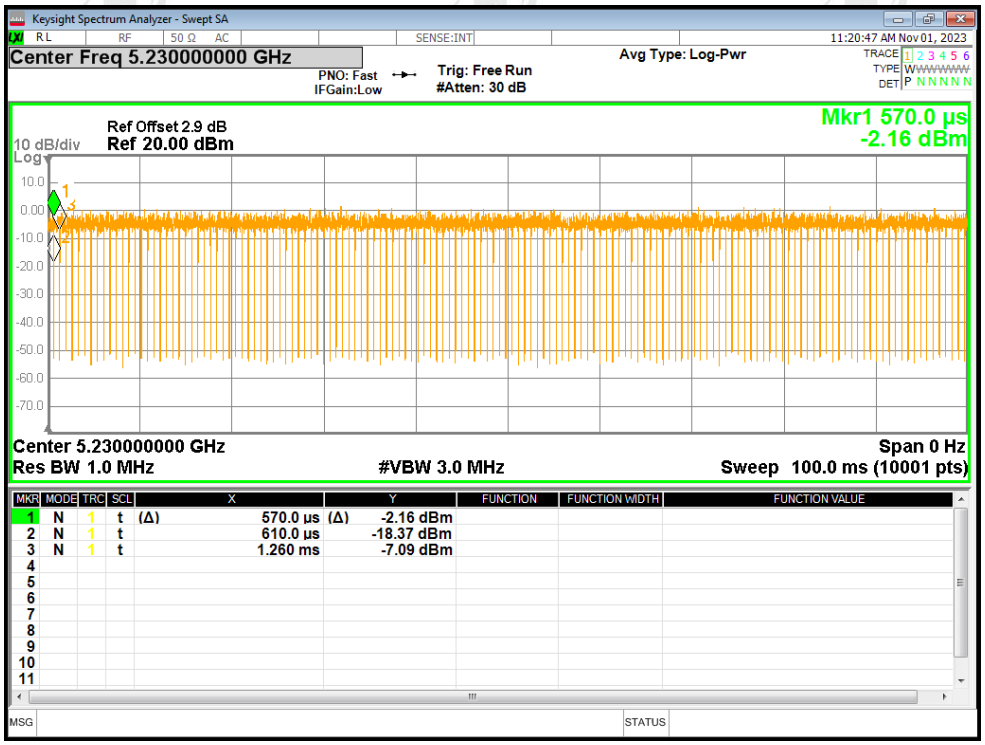
Duty Cycle NVNT ac20 5240MHz Ant1



Duty Cycle NVNT ac40 5190MHz Ant1



Duty Cycle NVNT ac40 5230MHz Ant1



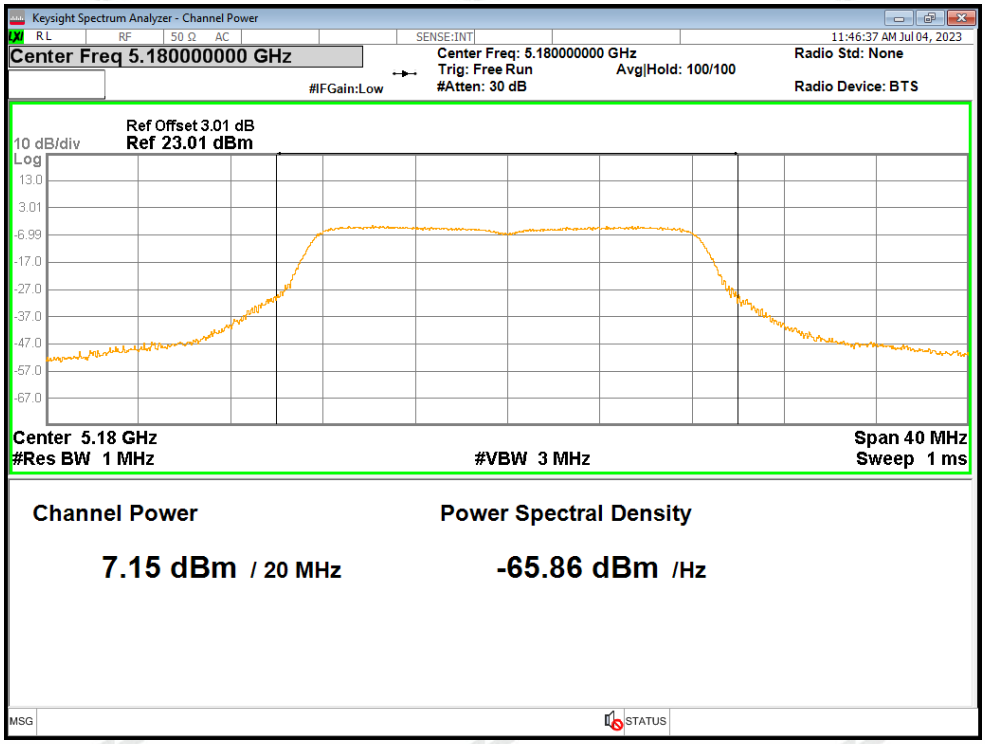
Duty Cycle NVNT ac80 5210MHz Ant1

A2.Maximum Conducted Output Power

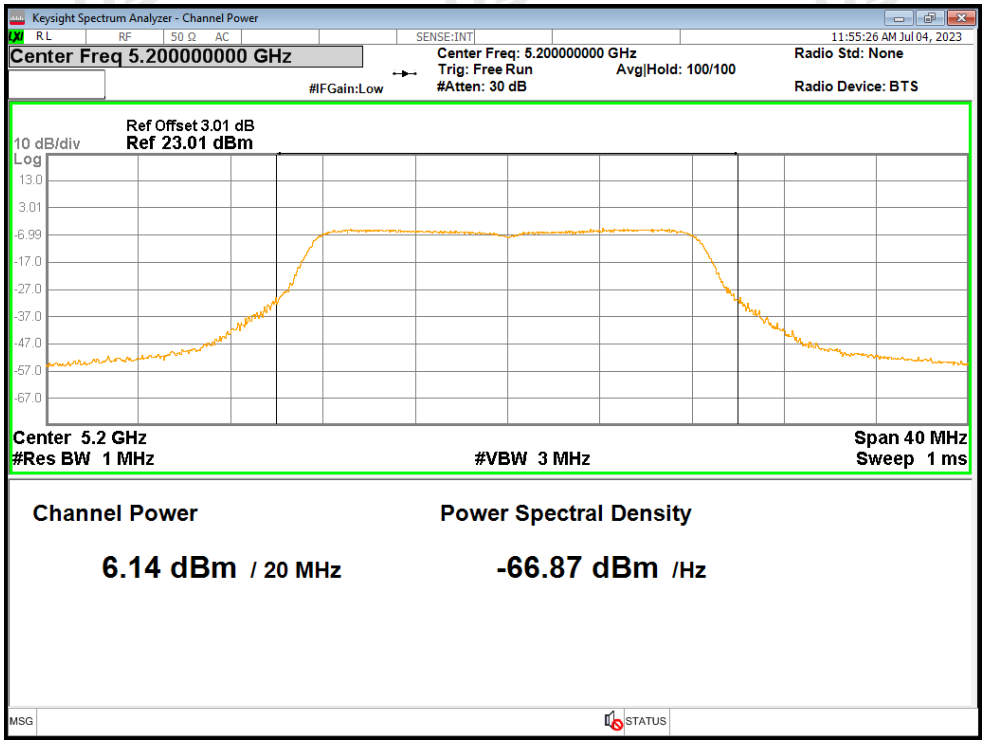
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	Ant1	7.15	0.12	7.27	24	Pass
NVNT	a	5200	Ant1	6.14	0.09	6.23	24	Pass
NVNT	a	5240	Ant1	5.64	0.12	5.76	24	Pass
NVNT	n20	5180	Ant1	7.31	0.1	7.41	24	Pass
NVNT	n20	5200	Ant1	5.11	0.1	5.21	24	Pass
NVNT	n20	5240	Ant1	3.51	0.1	3.61	24	Pass
NVNT	n40	5190	Ant1	5.84	0.26	6.1	24	Pass
NVNT	n40	5230	Ant1	3.65	0.26	3.91	24	Pass
NVNT	ac20	5180	Ant1	5.31	0.1	5.41	24	Pass
NVNT	ac20	5200	Ant1	4.58	0.1	4.68	24	Pass
NVNT	ac20	5240	Ant1	5.11	0.13	5.24	24	Pass
NVNT	ac40	5190	Ant1	4.36	0.2	4.56	24	Pass
NVNT	ac40	5230	Ant1	3.34	0.26	3.6	24	Pass
NVNT	ac80	5210	Ant1	5.06	0.83	5.89	24	Pass

Test Graphs

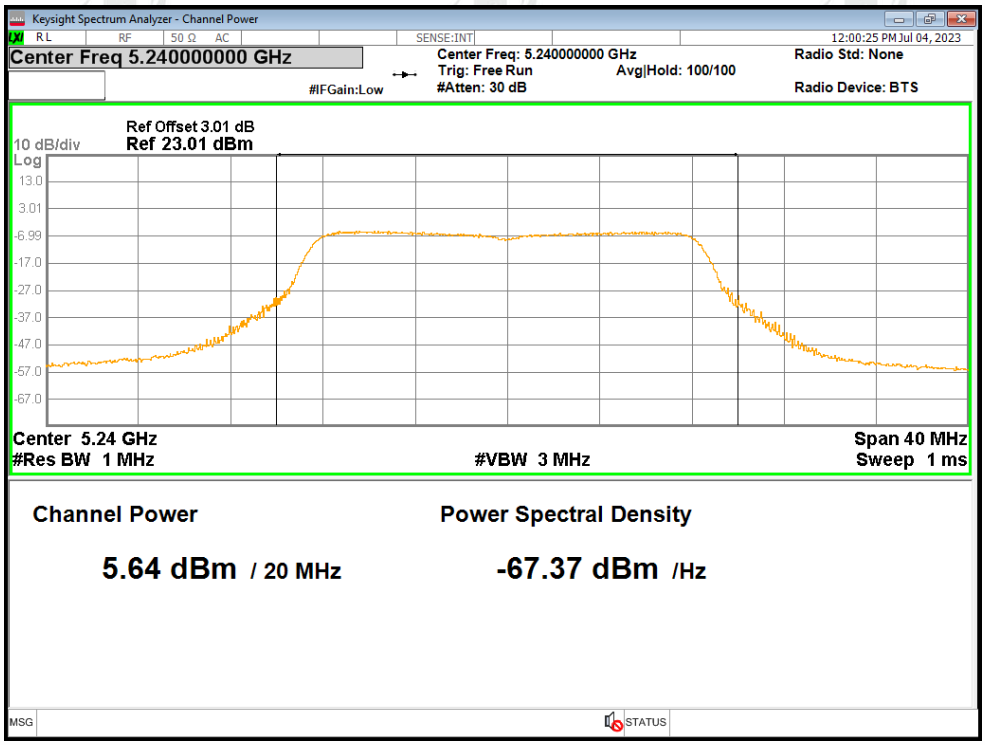
Power NVNT a 5180MHz Ant1



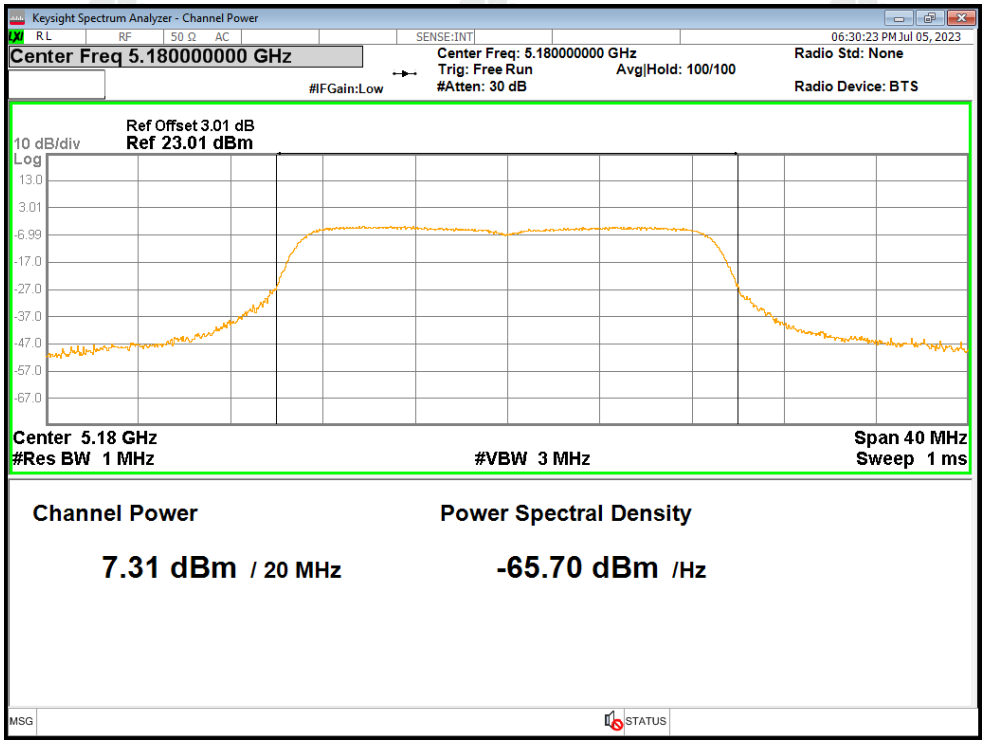
Power NVNT a 5200MHz Ant1



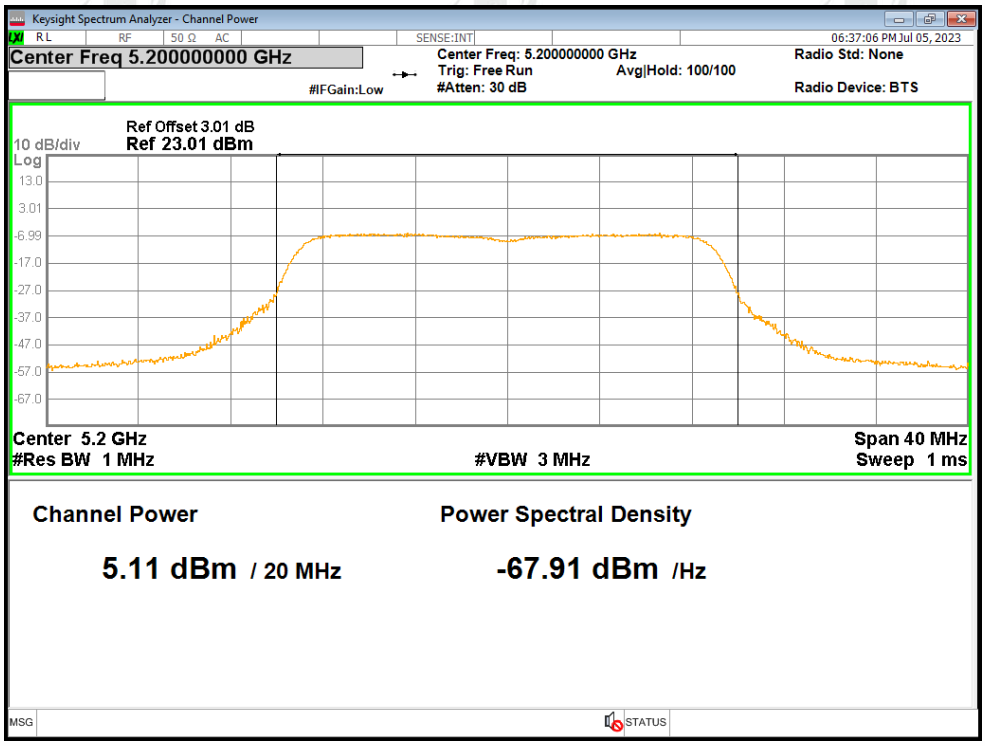
Power NVNT a 5240MHz Ant1



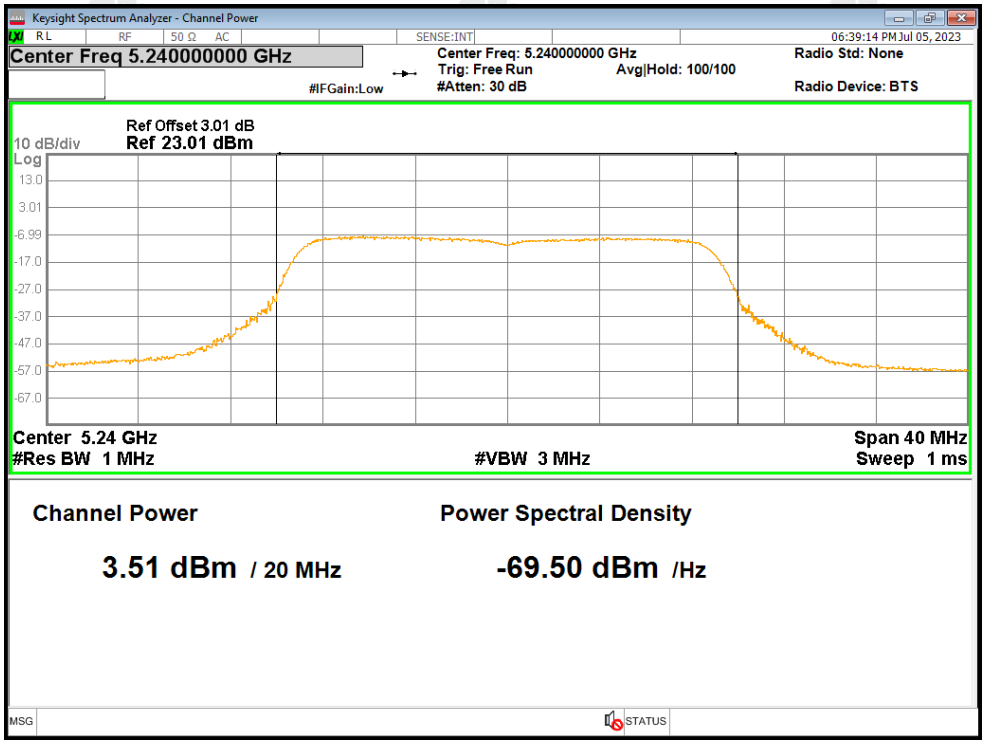
Power NVNT n20 5180MHz Ant1



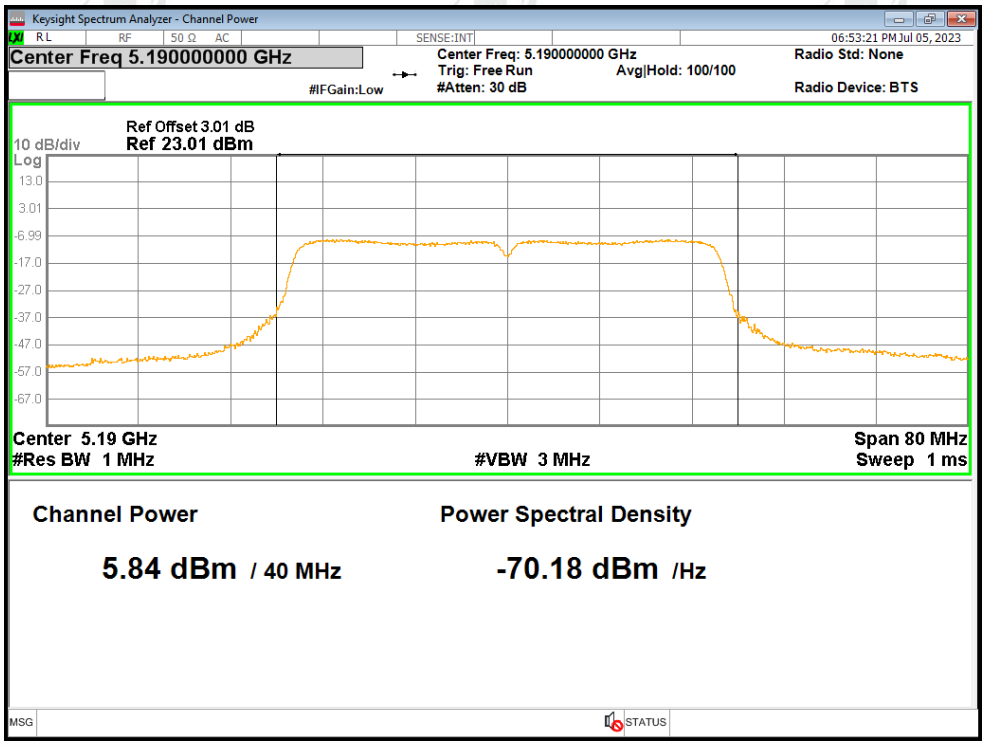
Power NVNT n20 5200MHz Ant1



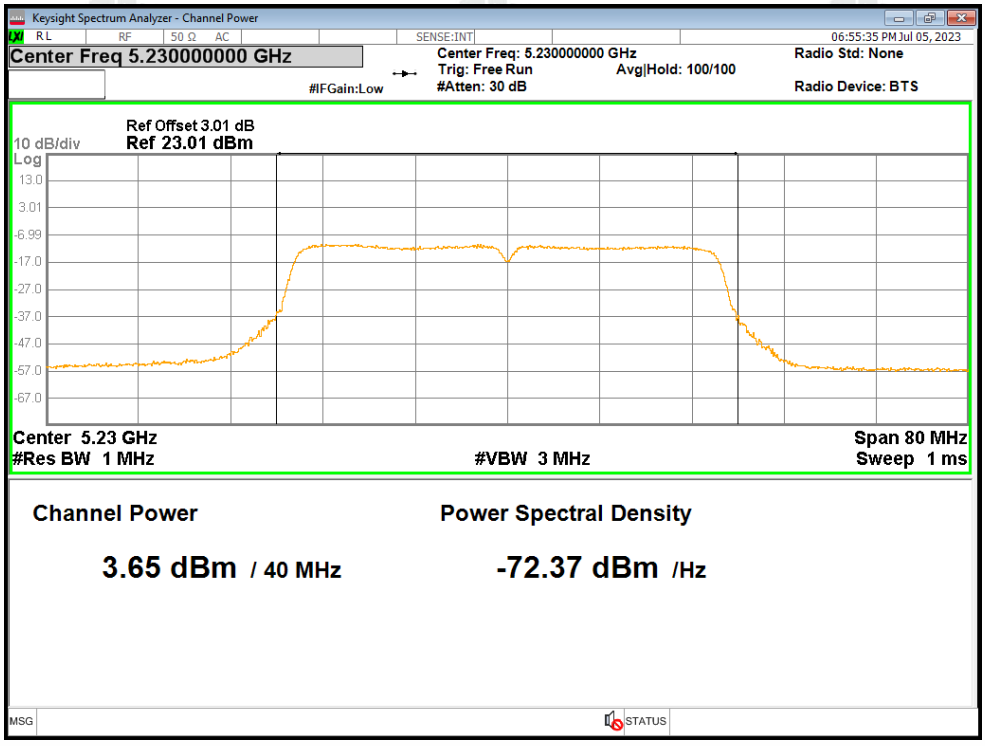
Power NVNT n20 5240MHz Ant1



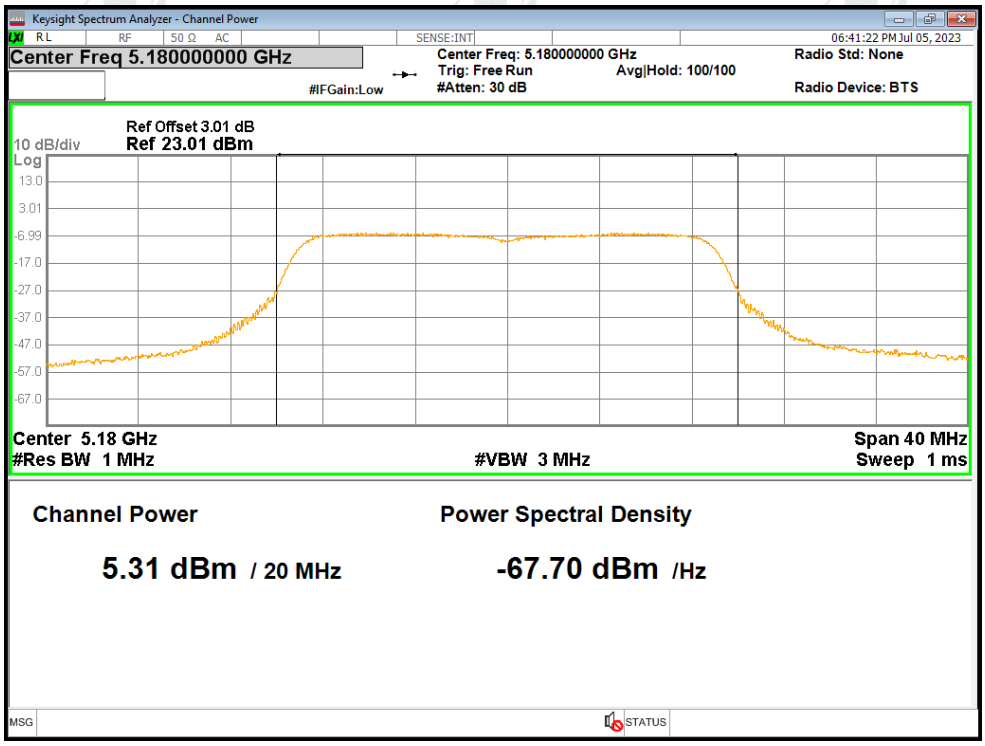
Power NVNT n40 5190MHz Ant1



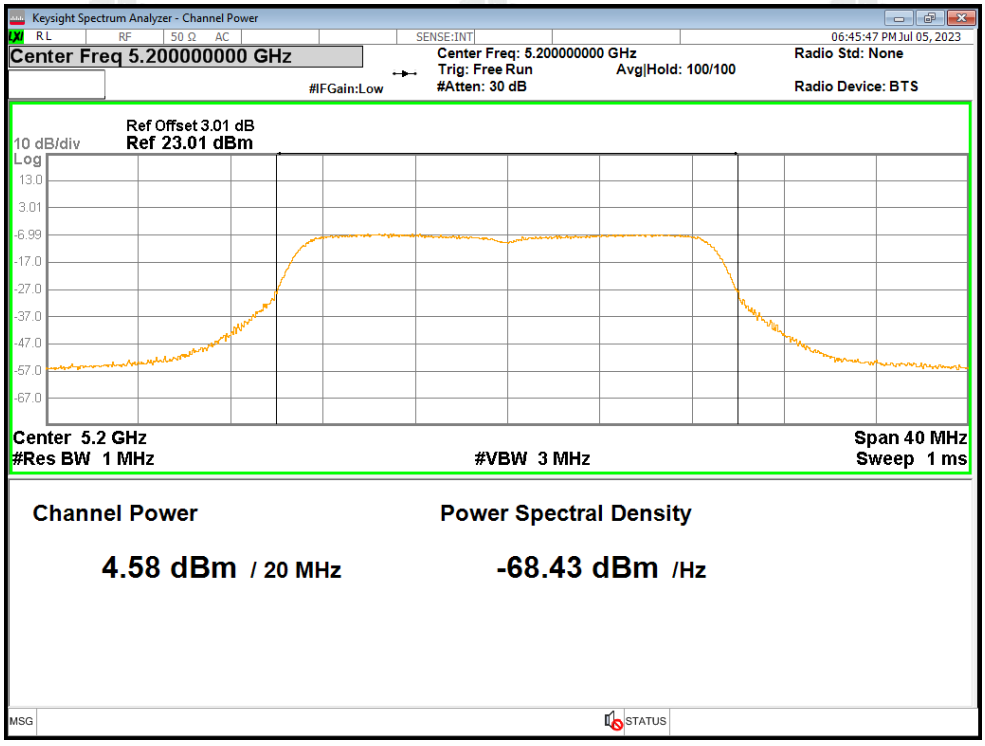
Power NVNT n40 5230MHz Ant1



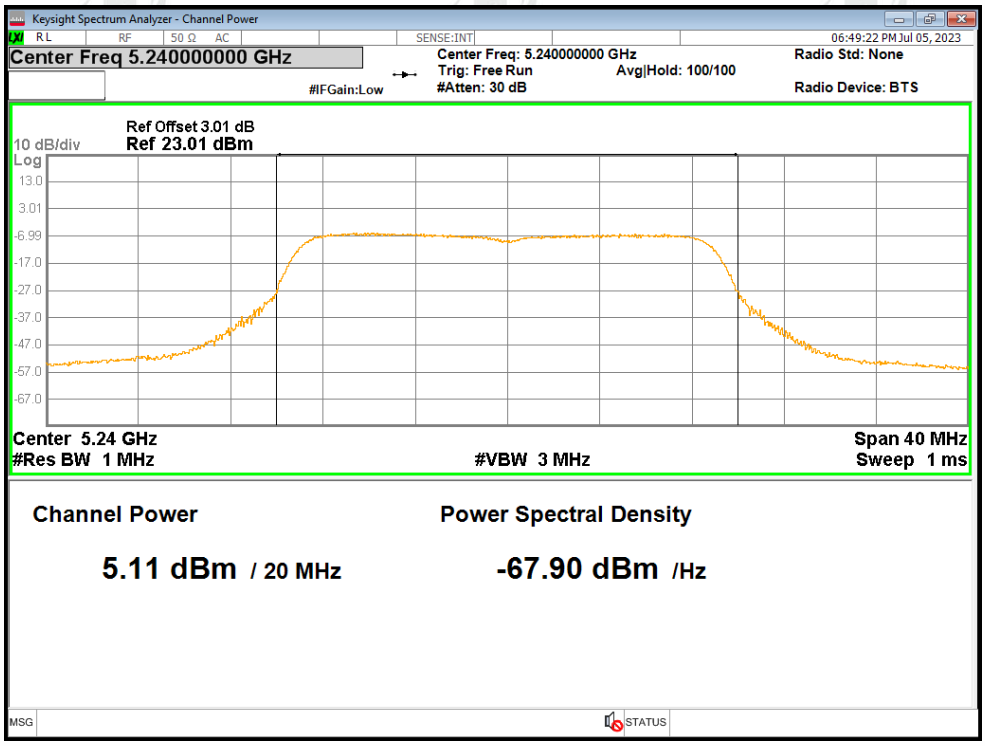
Power NVNT ac20 5180MHz Ant1



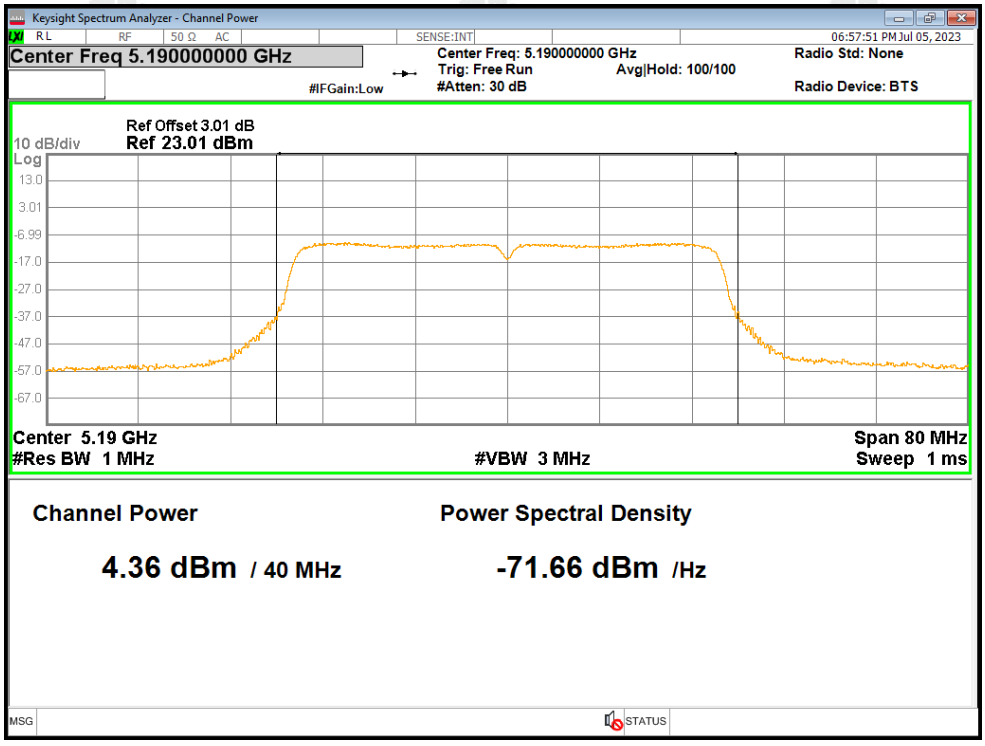
Power NVNT ac20 5200MHz Ant1



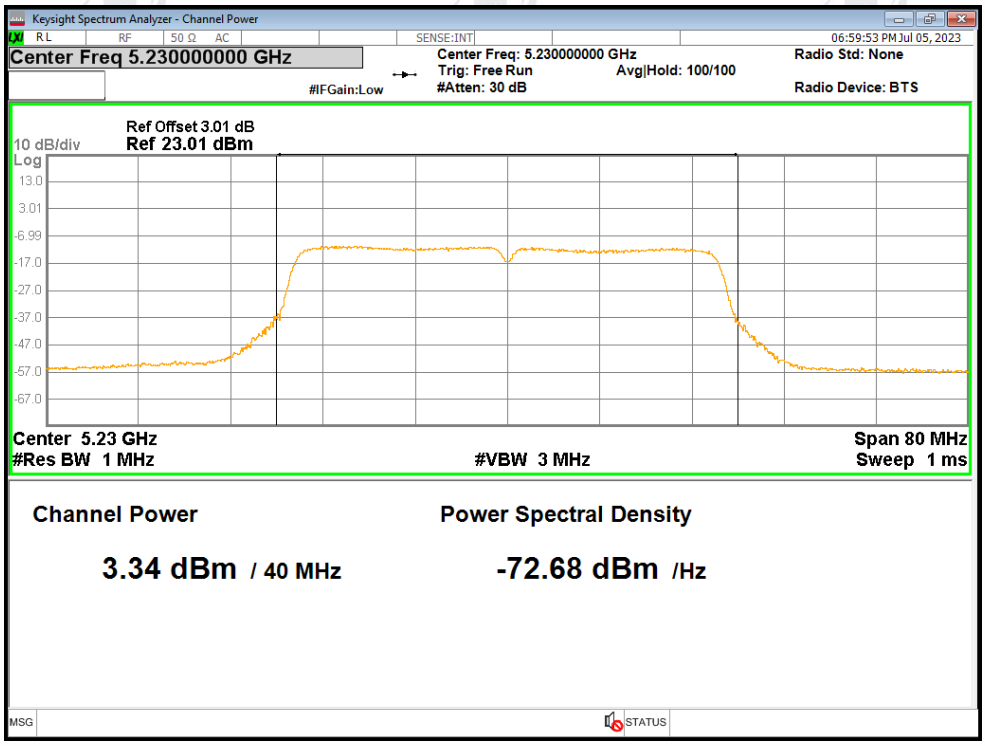
Power NVNT ac20 5240MHz Ant1



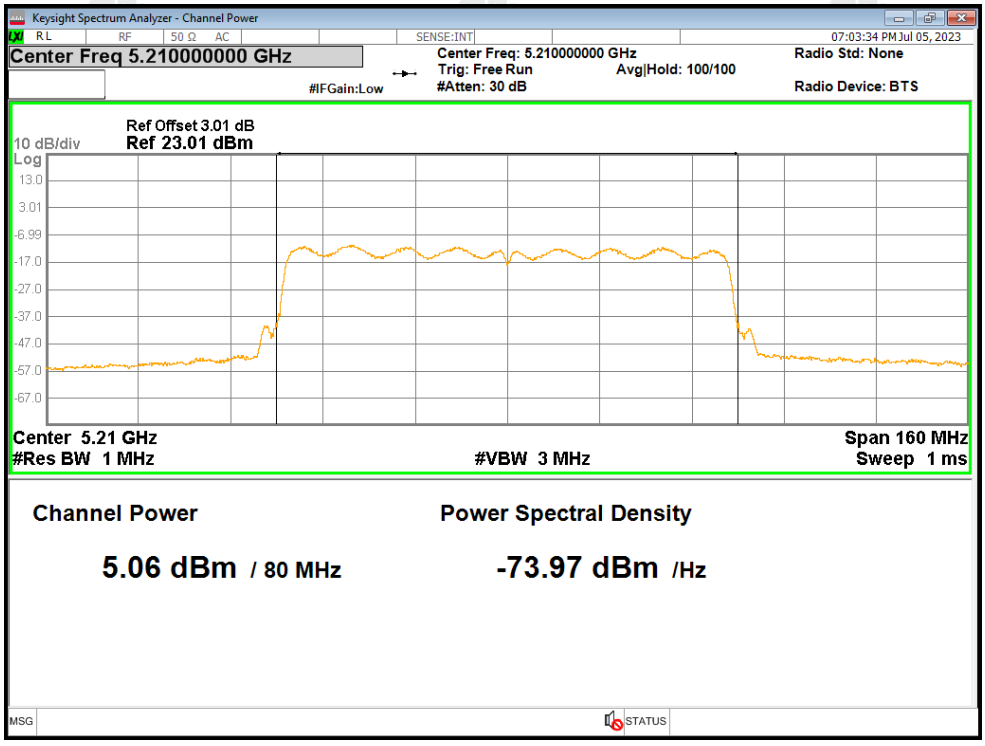
Power NVNT ac40 5190MHz Ant1



Power NVNT ac40 5230MHz Ant1



Power NVNT ac80 5210MHz Ant1

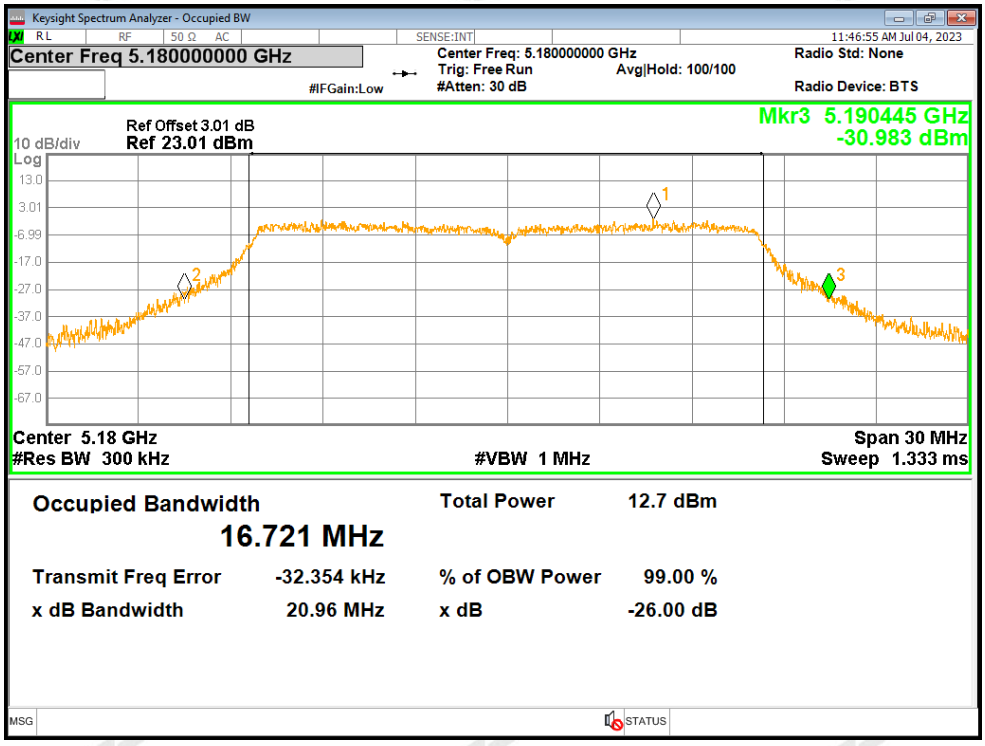


A3.-26dB Bandwidth

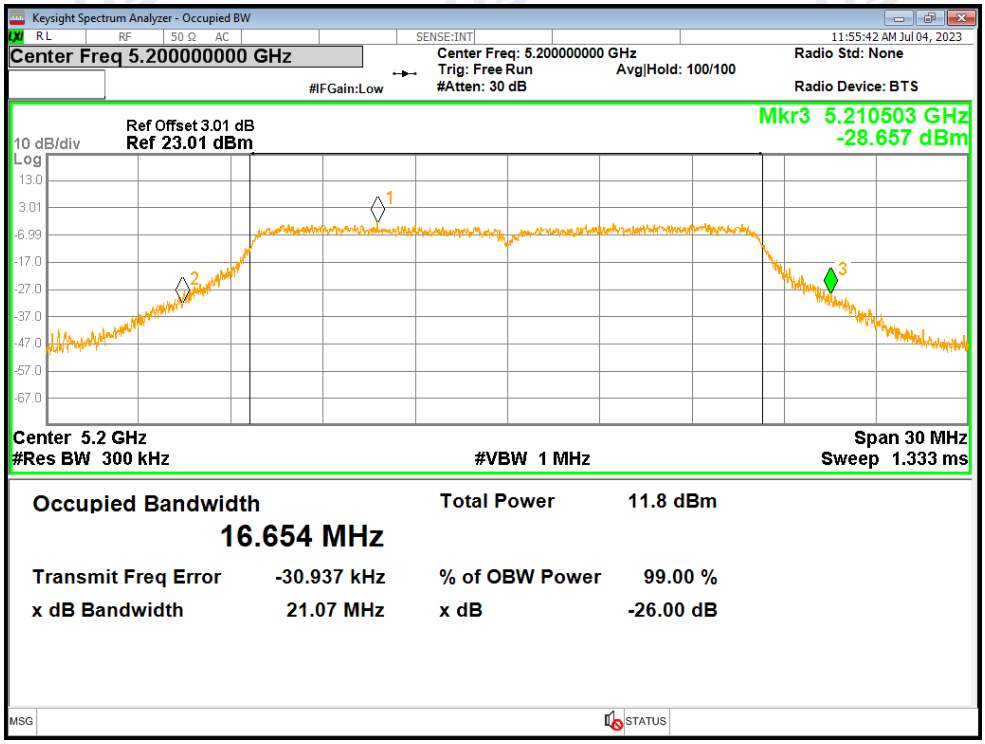
Condition	Mode	Frequency (MHz)	Antenna	-26 dB Bandwidth (MHz)	Verdict
NVNT	a	5180	Ant1	20.955	Pass
NVNT	a	5200	Ant1	21.068	Pass
NVNT	a	5240	Ant1	21.166	Pass
NVNT	n20	5180	Ant1	21.994	Pass
NVNT	n20	5200	Ant1	21.453	Pass
NVNT	n20	5240	Ant1	21.391	Pass
NVNT	n40	5190	Ant1	41.795	Pass
NVNT	n40	5230	Ant1	40.567	Pass
NVNT	ac20	5180	Ant1	21.799	Pass
NVNT	ac20	5200	Ant1	21.354	Pass
NVNT	ac20	5240	Ant1	21.344	Pass
NVNT	ac40	5190	Ant1	41.179	Pass
NVNT	ac40	5230	Ant1	41.181	Pass
NVNT	ac80	5210	Ant1	80.457	Pass

Test Graphs

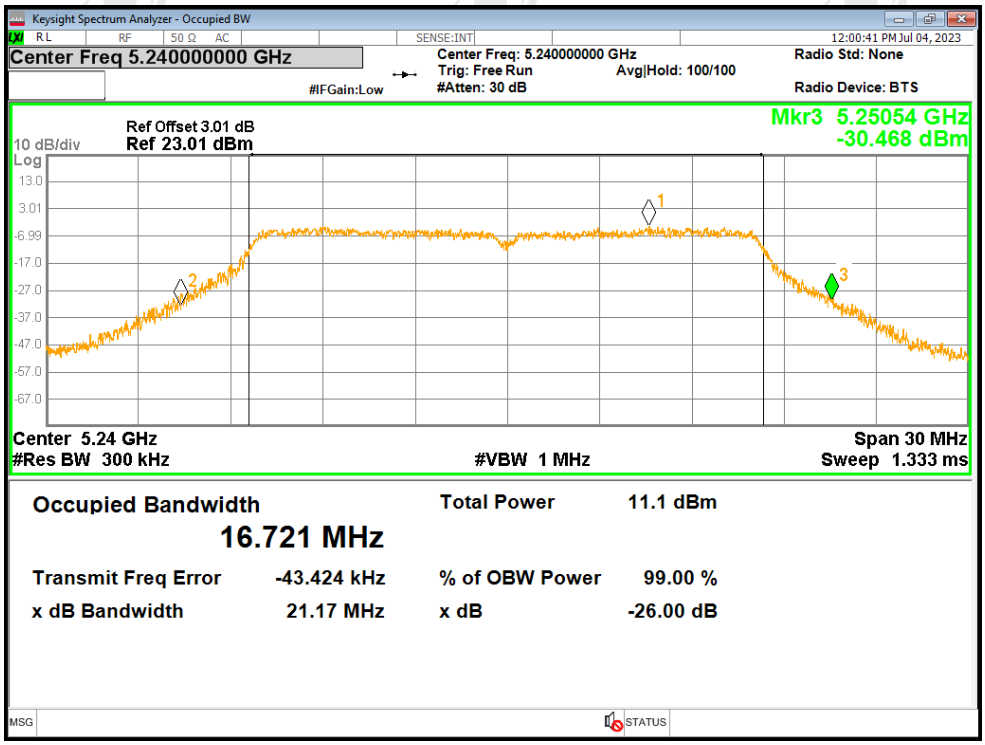
-26dB Bandwidth NVNT a 5180MHz Ant1



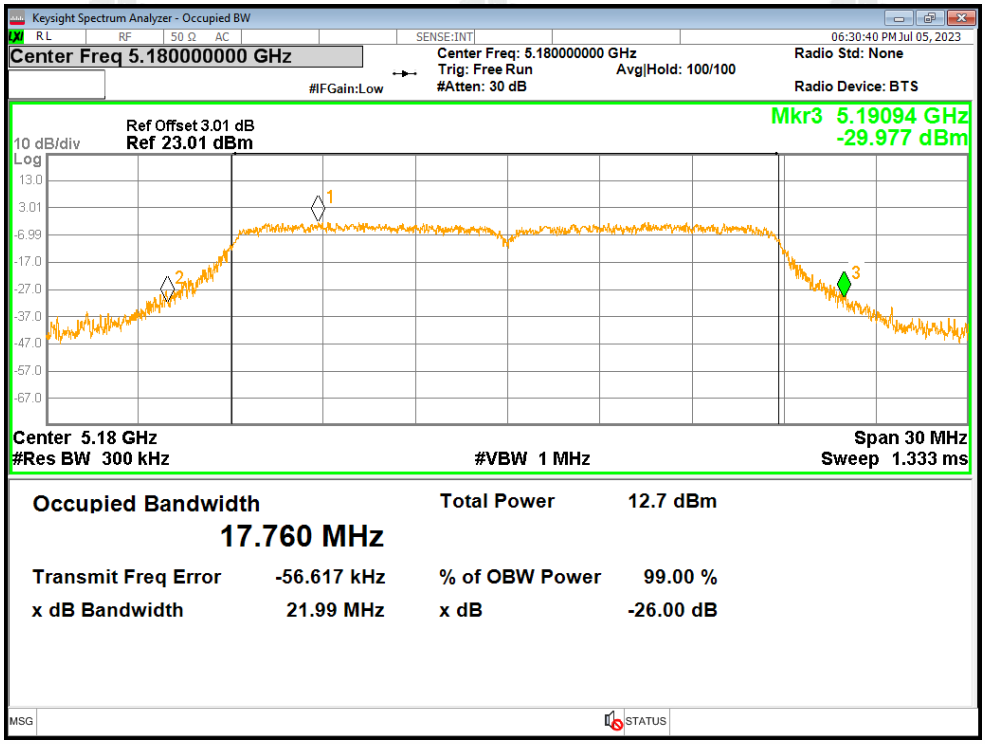
-26dB Bandwidth NVNT a 5200MHz Ant1



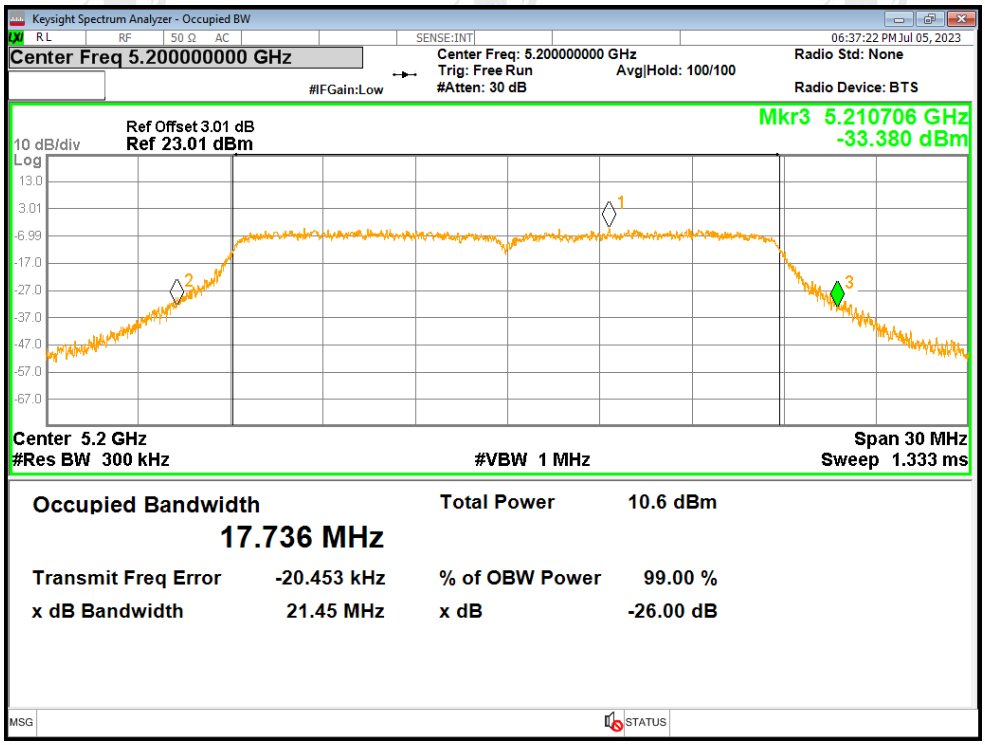
-26dB Bandwidth NVNT a 5240MHz Ant1



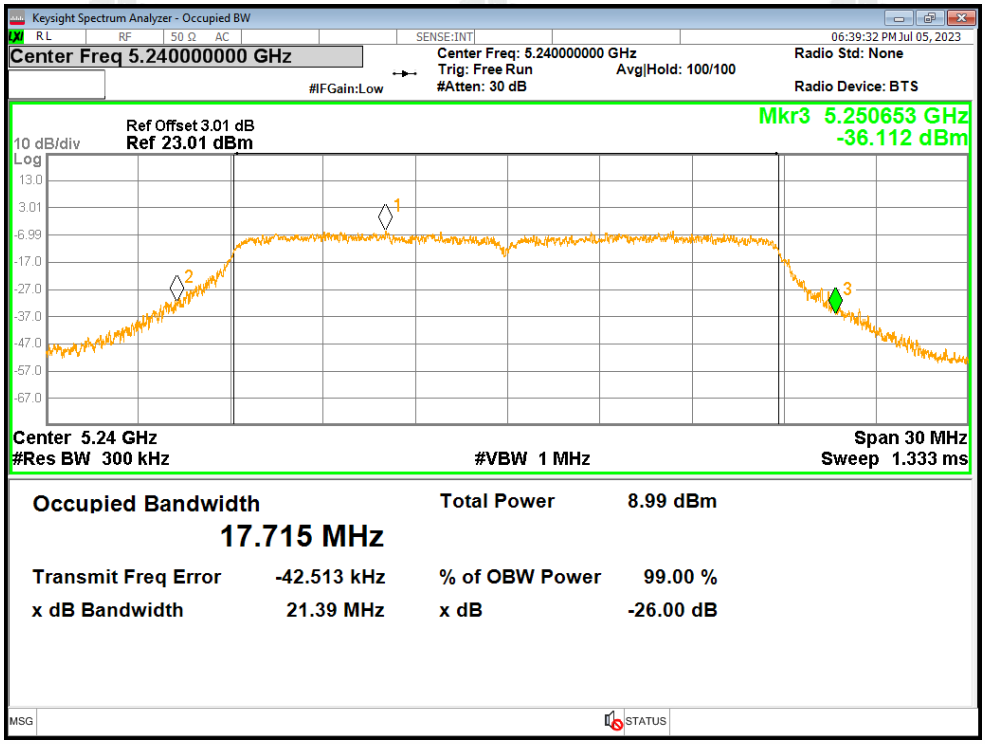
-26dB Bandwidth NVNT n20 5180MHz Ant1



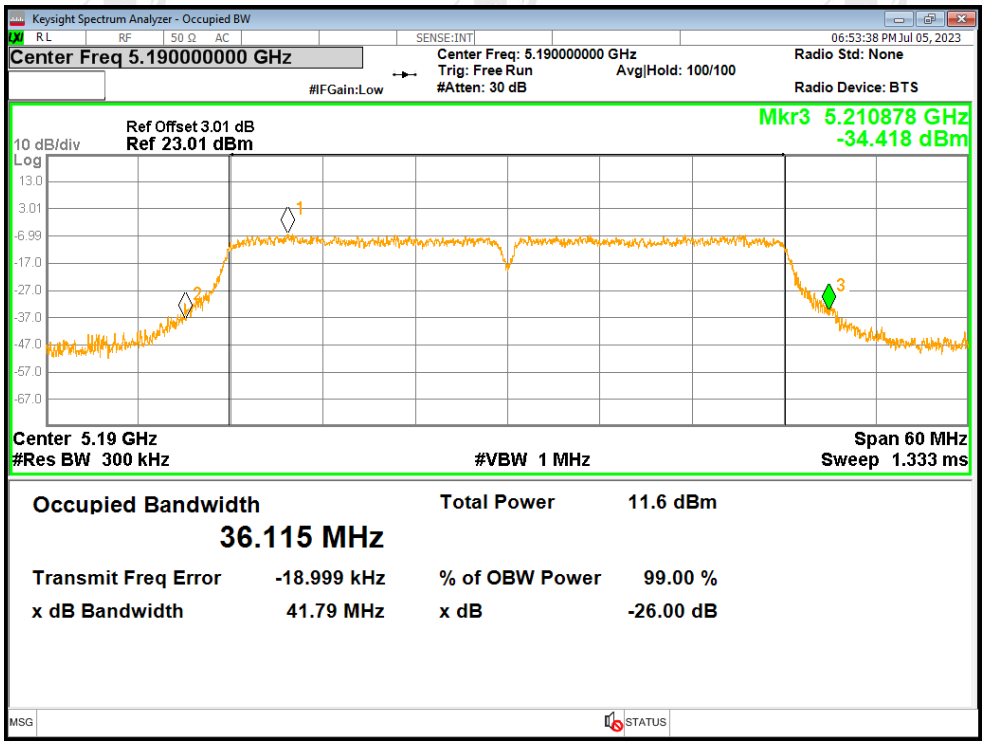
-26dB Bandwidth NVNT n20 5200MHz Ant1



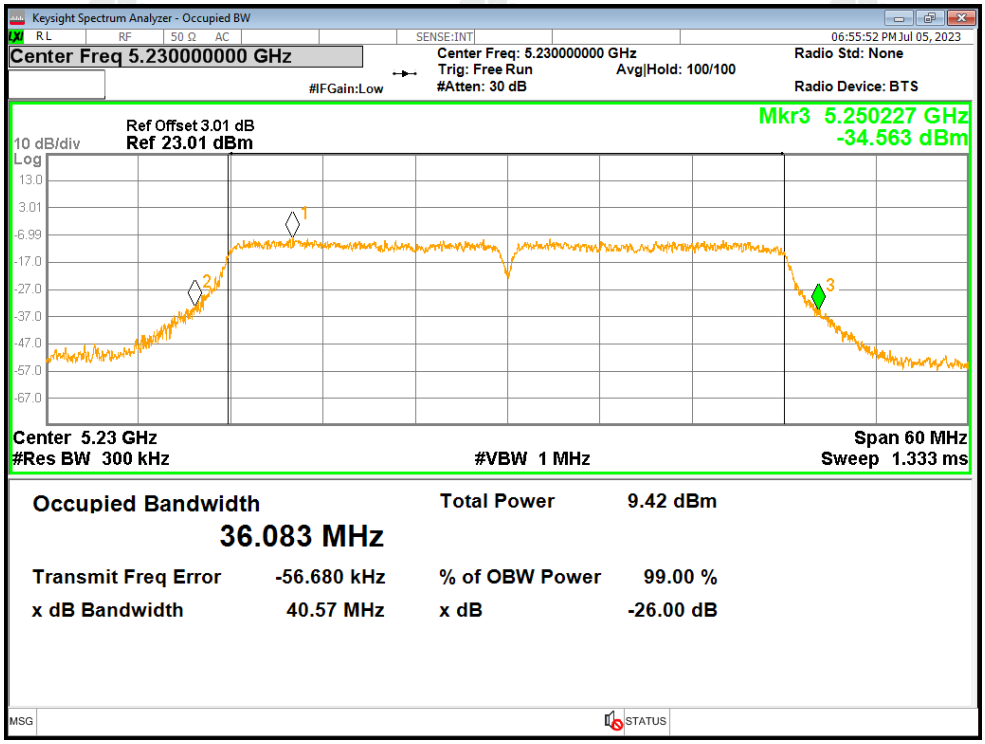
-26dB Bandwidth NVNT n20 5240MHz Ant1



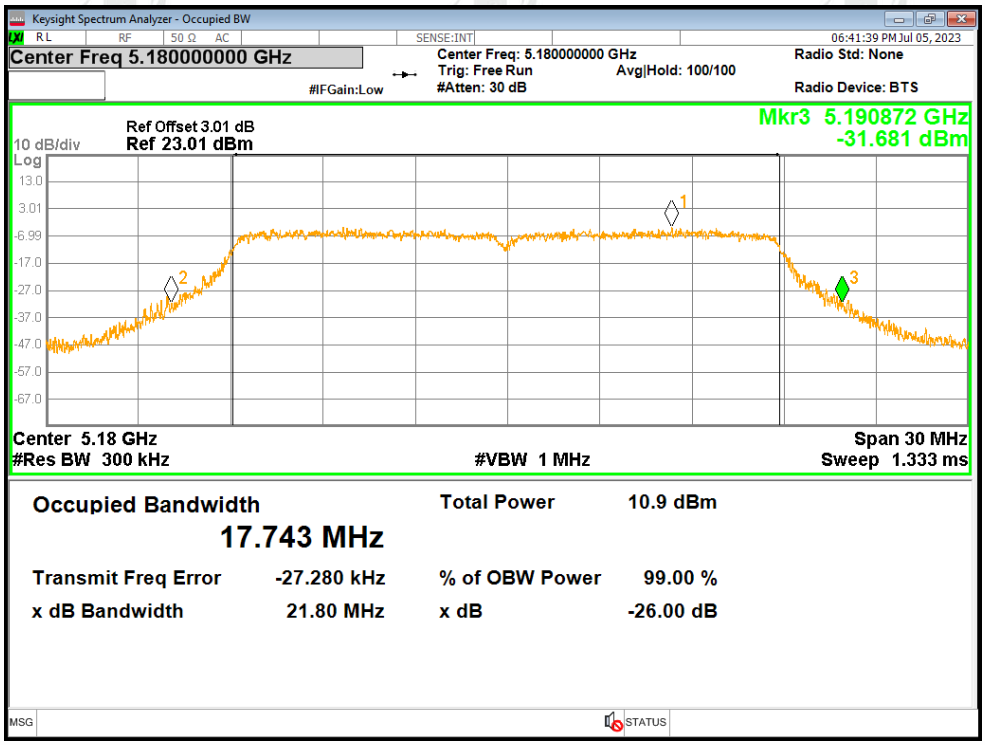
-26dB Bandwidth NVNT n40 5190MHz Ant1



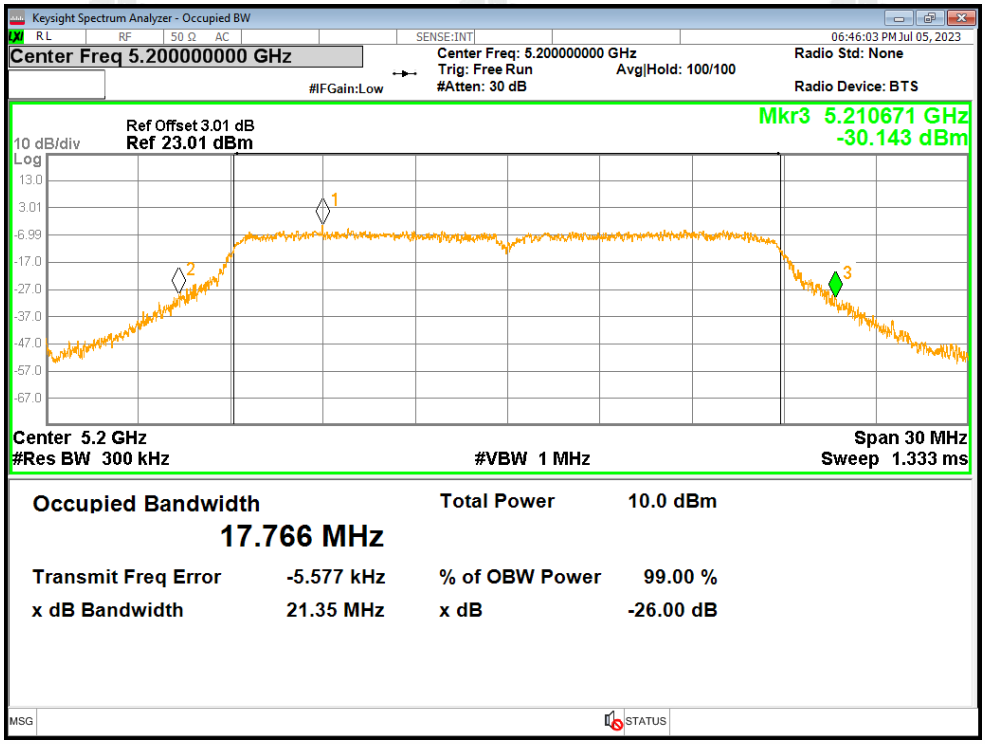
-26dB Bandwidth NVNT n40 5230MHz Ant1



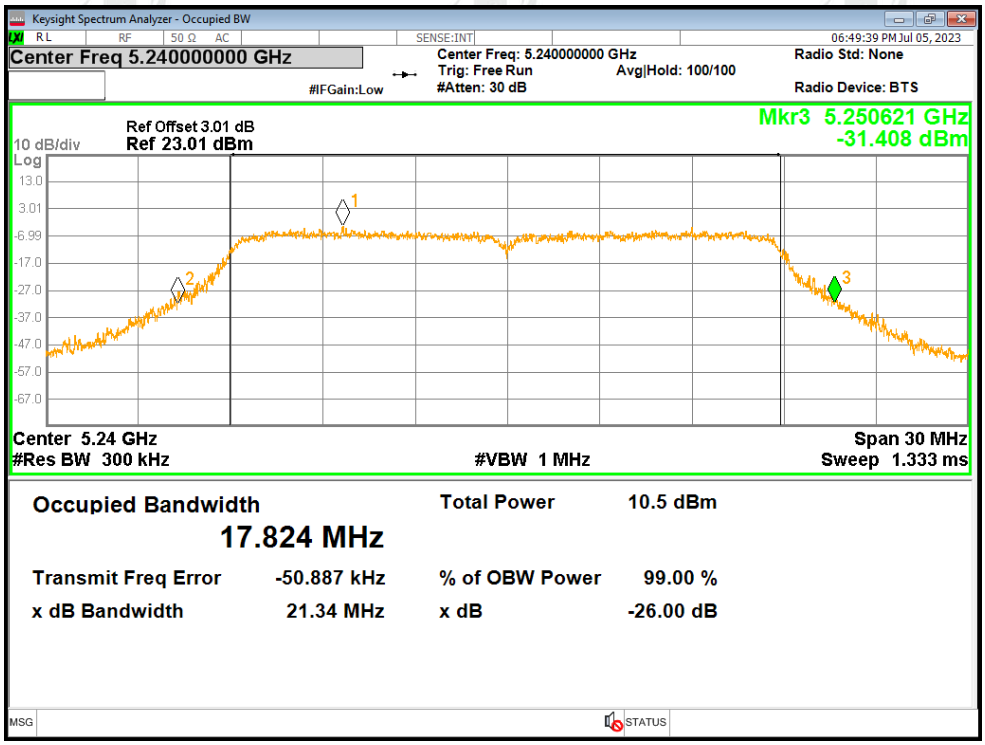
-26dB Bandwidth NVNT ac20 5180MHz Ant1



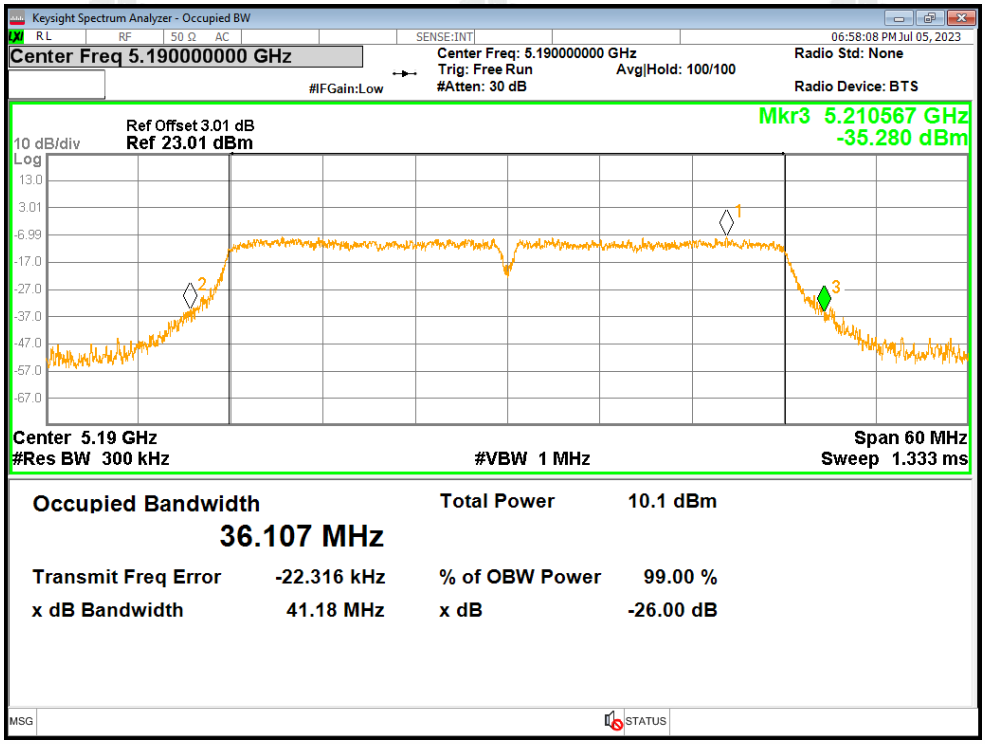
-26dB Bandwidth NVNT ac20 5200MHz Ant1



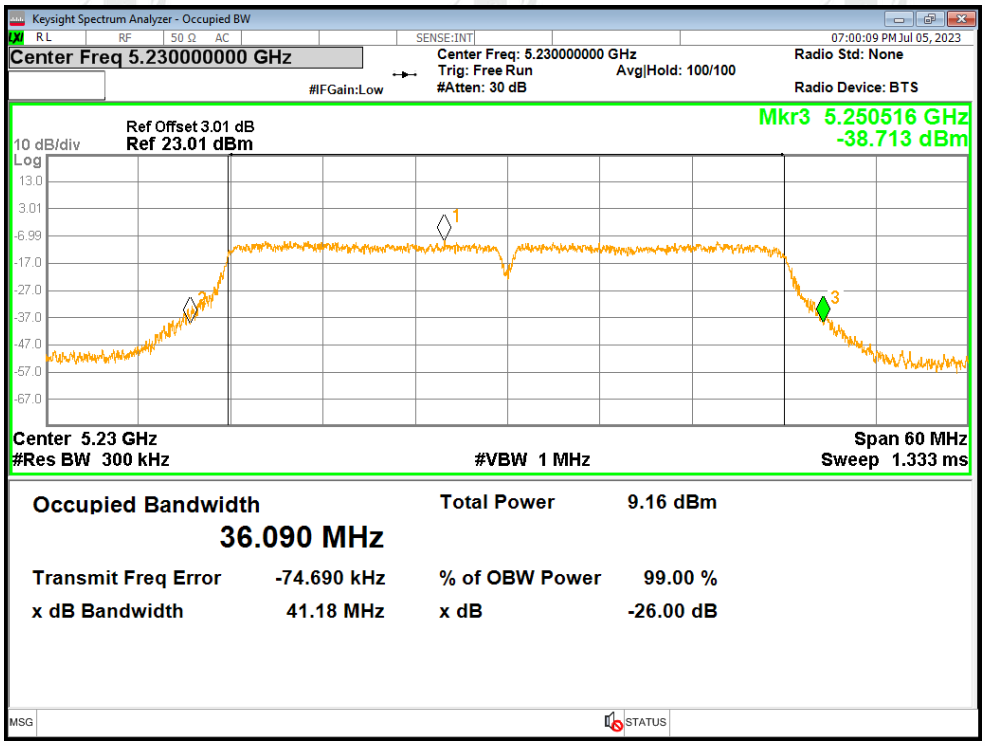
-26dB Bandwidth NVNT ac20 5240MHz Ant1



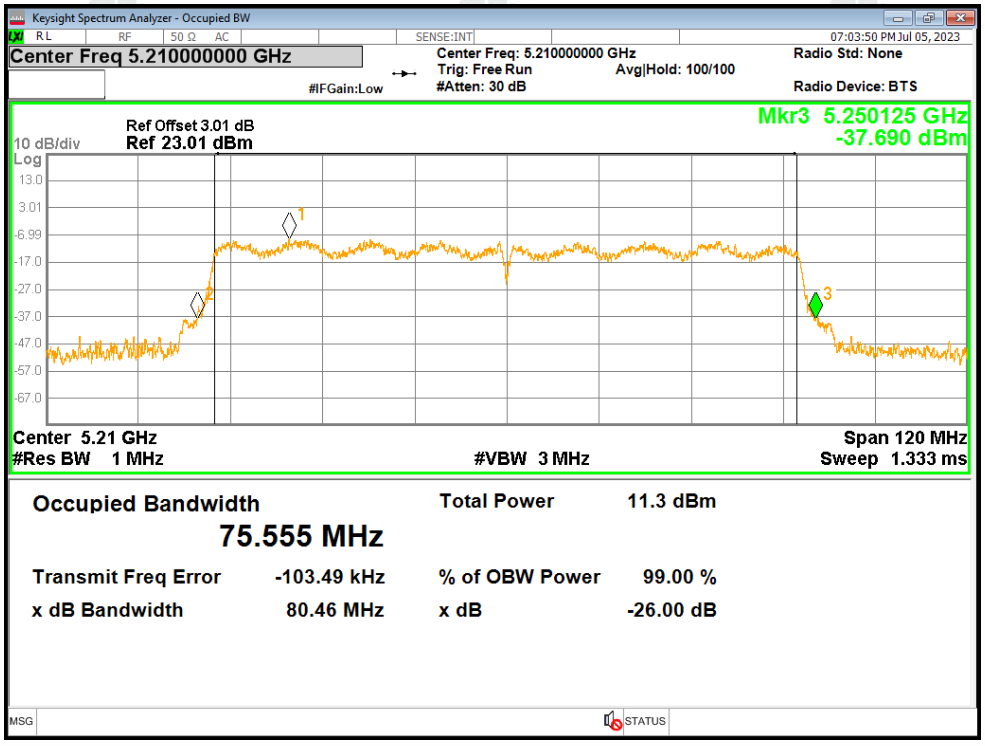
-26dB Bandwidth NVNT ac40 5190MHz Ant1



-26dB Bandwidth NVNT ac40 5230MHz Ant1



-26dB Bandwidth NVNT ac80 5210MHz Ant1

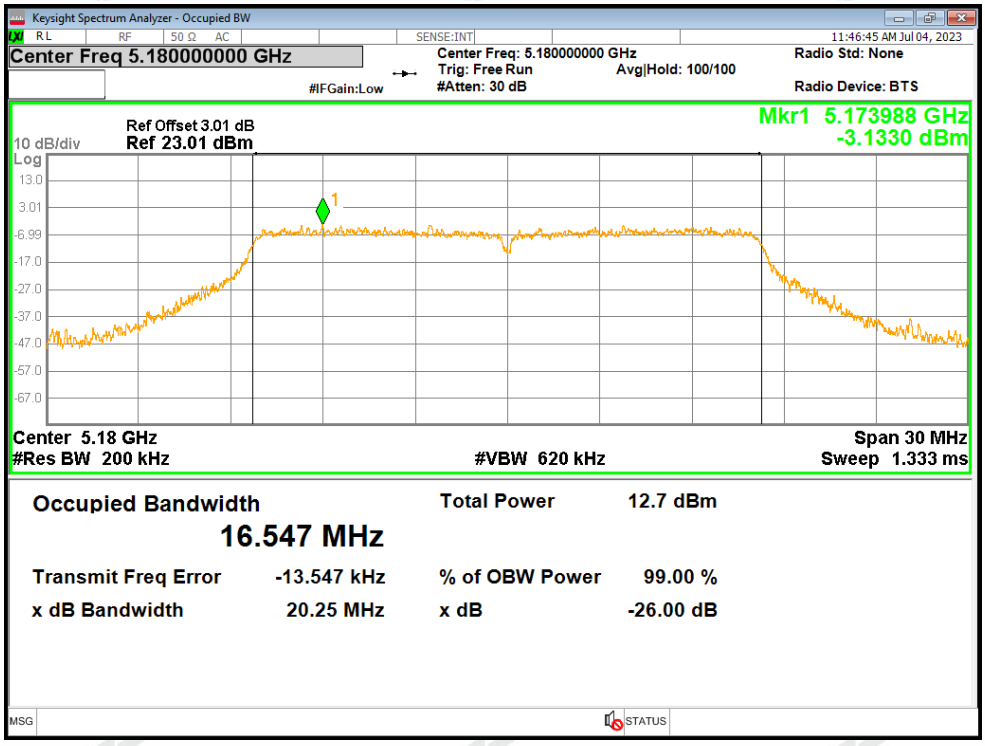


A4.Occupied Channel Bandwidth

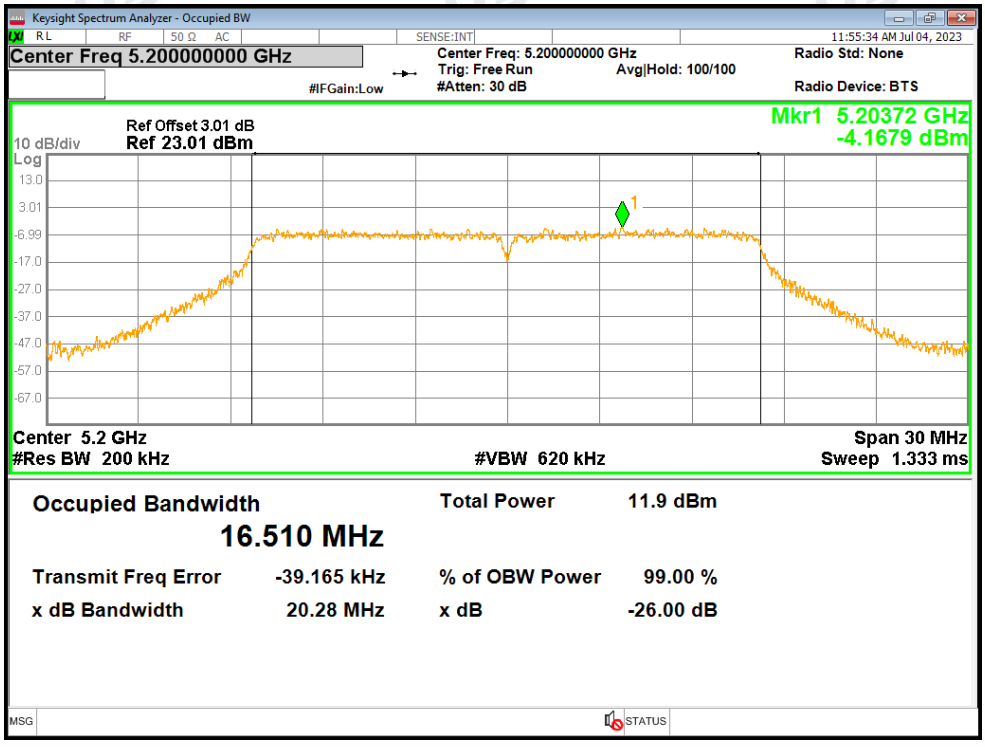
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	a	5180	Ant1	16.547
NVNT	a	5200	Ant1	16.51
NVNT	a	5240	Ant1	16.533
NVNT	n20	5180	Ant1	17.668
NVNT	n20	5200	Ant1	17.623
NVNT	n20	5240	Ant1	17.642
NVNT	n40	5190	Ant1	36.203
NVNT	n40	5230	Ant1	36.232
NVNT	ac20	5180	Ant1	17.661
NVNT	ac20	5200	Ant1	17.654
NVNT	ac20	5240	Ant1	17.666
NVNT	ac40	5190	Ant1	36.203
NVNT	ac40	5230	Ant1	36.17
NVNT	ac80	5210	Ant1	75.547

Test Graphs

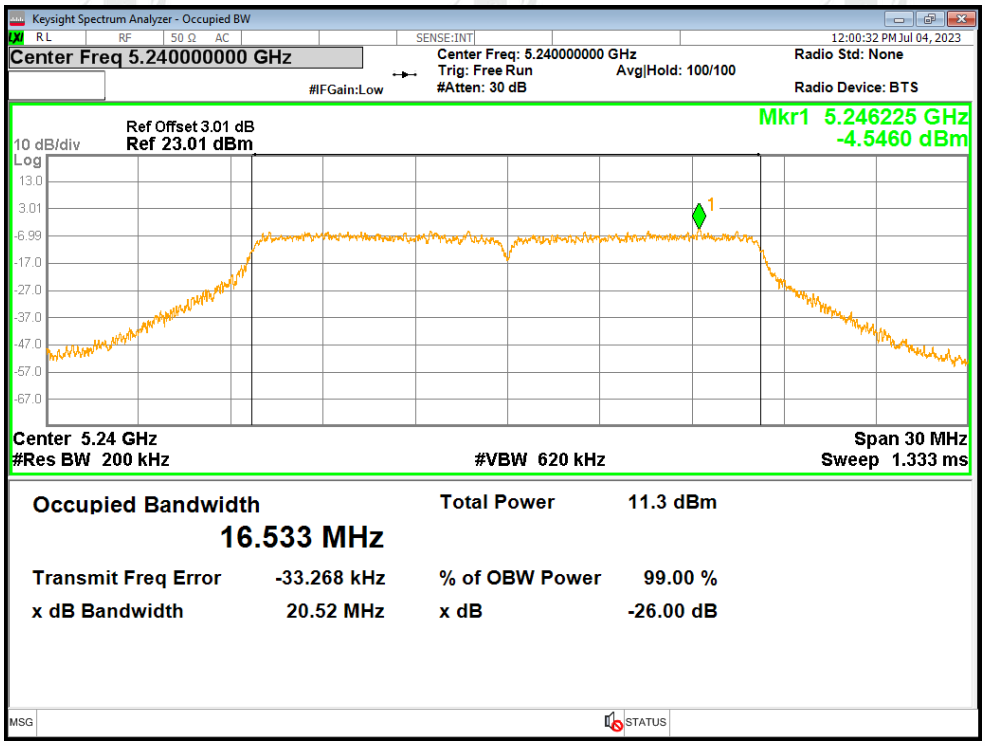
OBW NVNT a 5180MHz Ant1



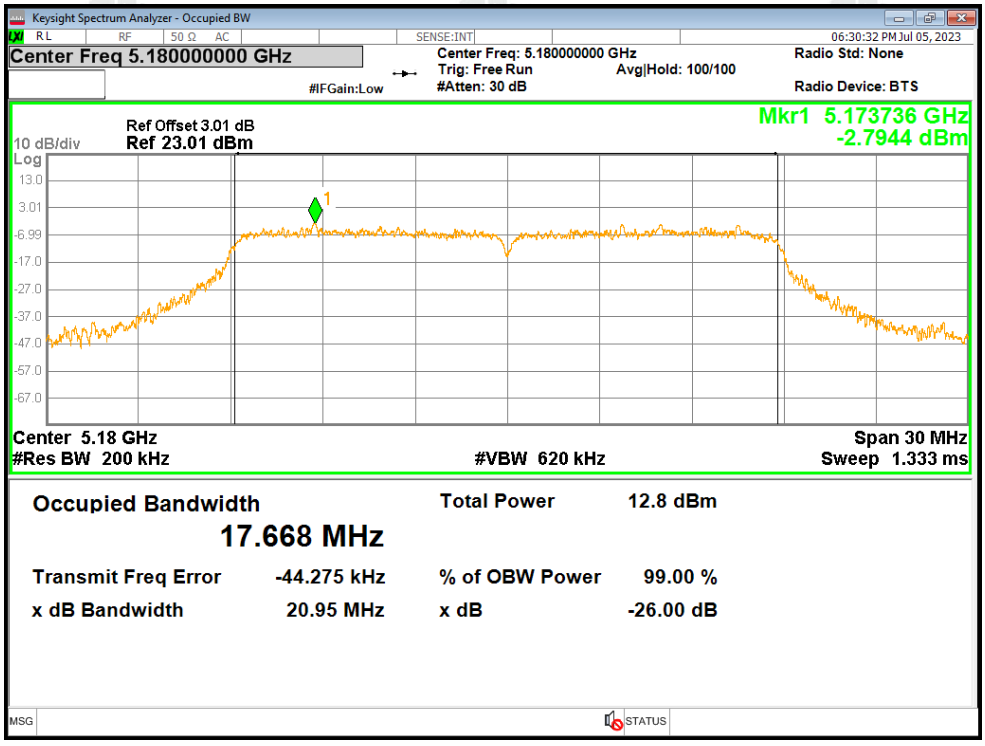
OBW NVNT a 5200MHz Ant1



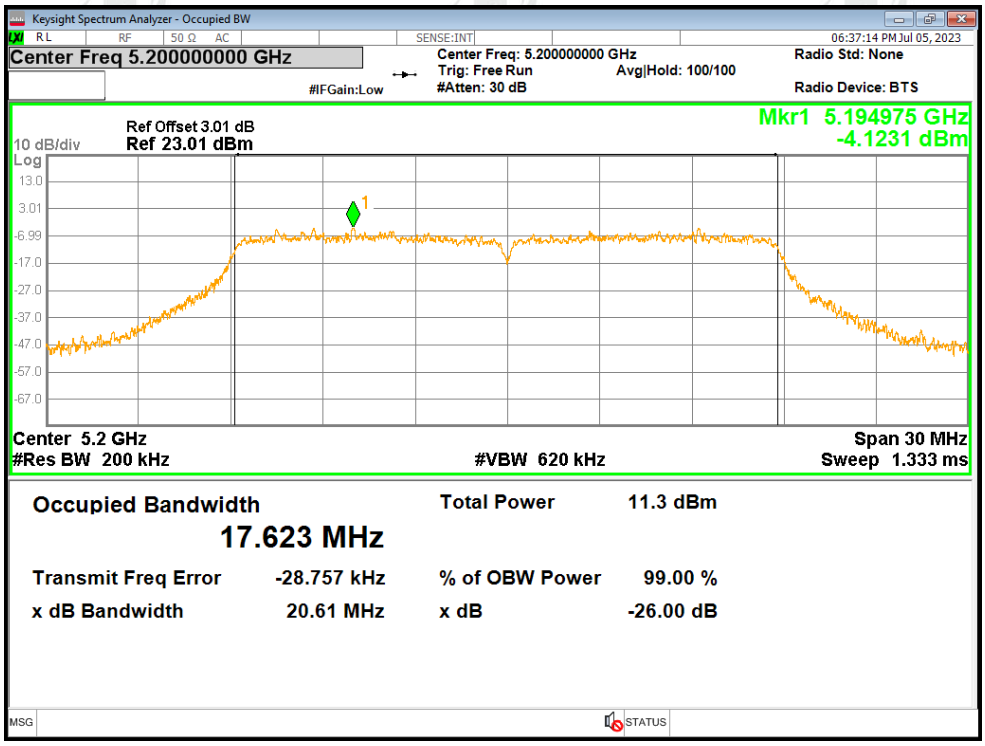
OBW NVNT a 5240MHz Ant1



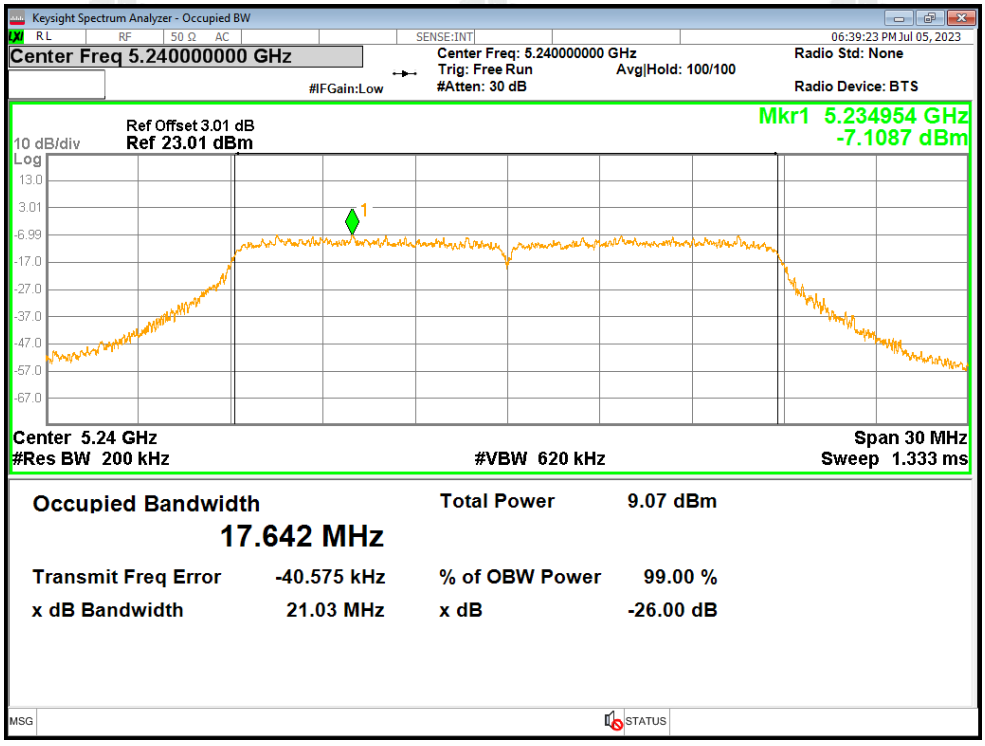
OBW NVNT n20 5180MHz Ant1



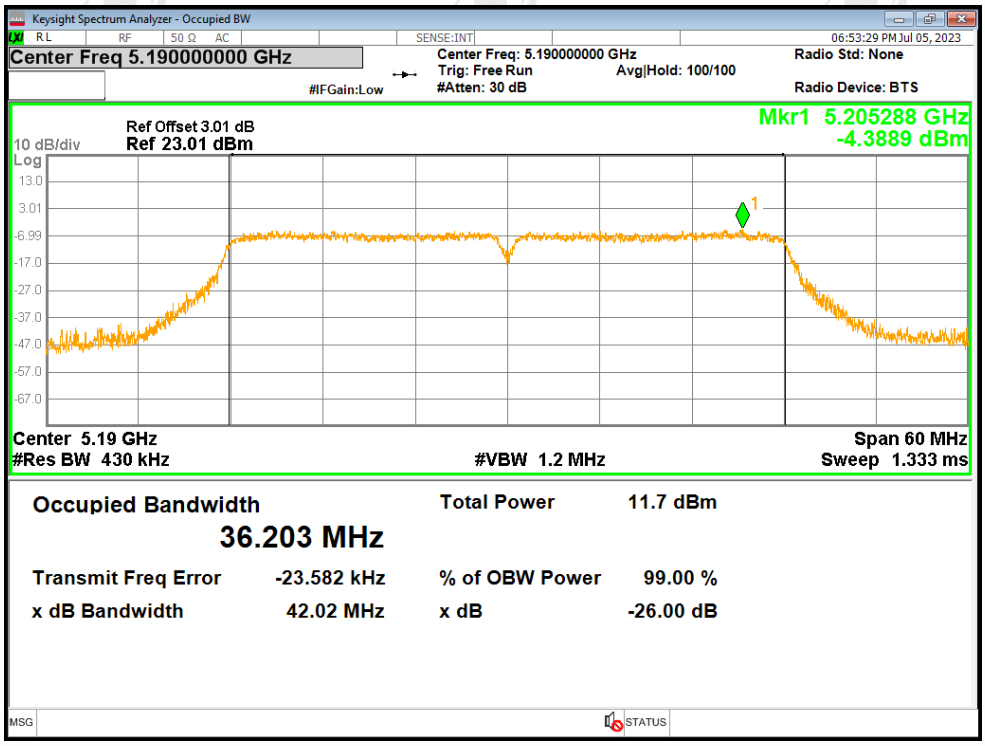
OBW NVNT n20 5200MHz Ant1



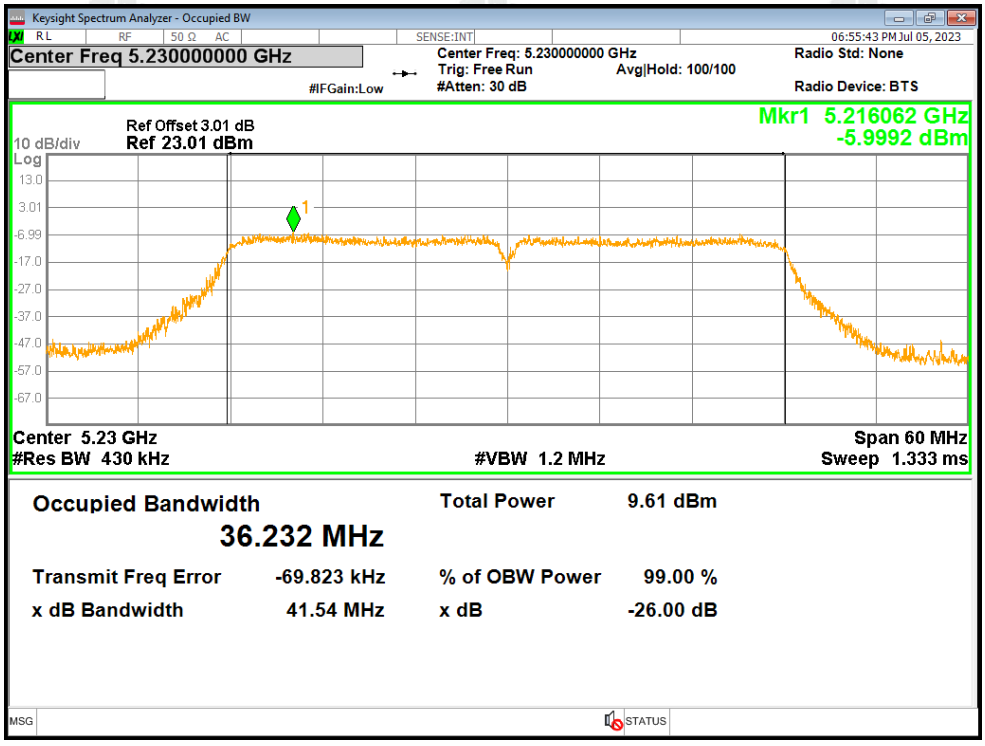
OBW NVNT n20 5240MHz Ant1



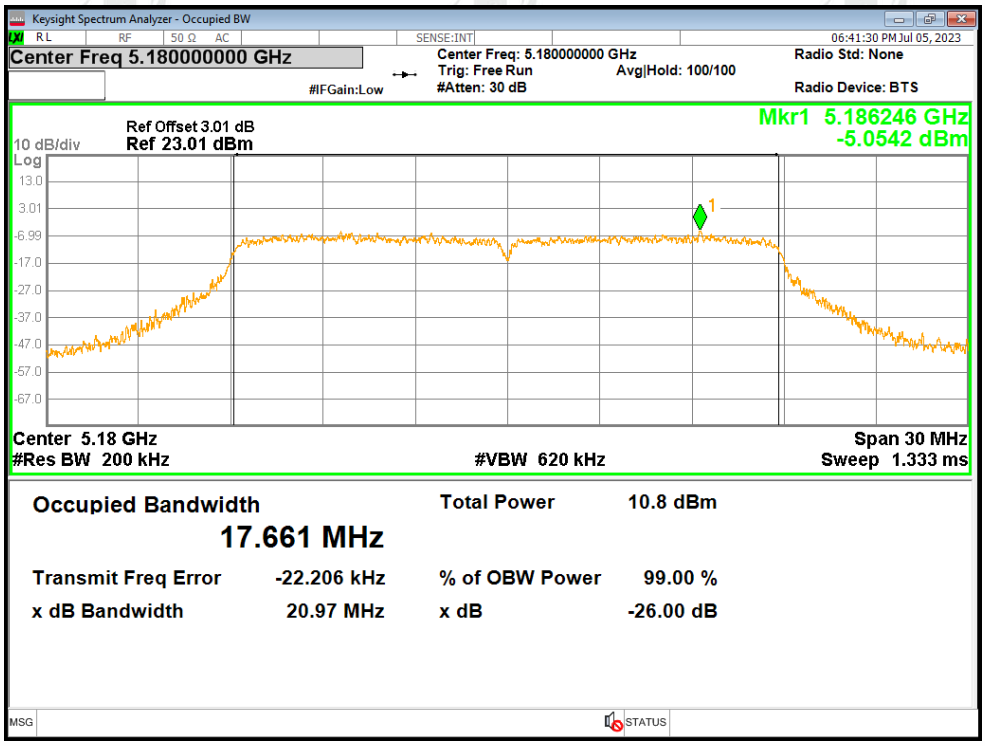
OBW NVNT n40 5190MHz Ant1



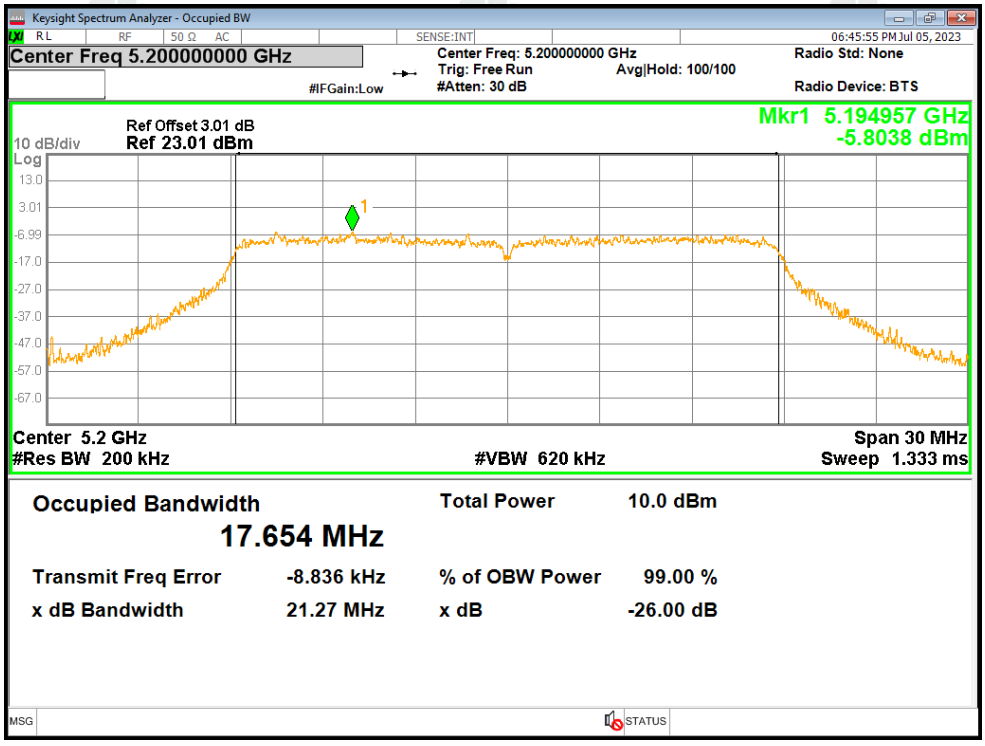
OBW NVNT n40 5230MHz Ant1



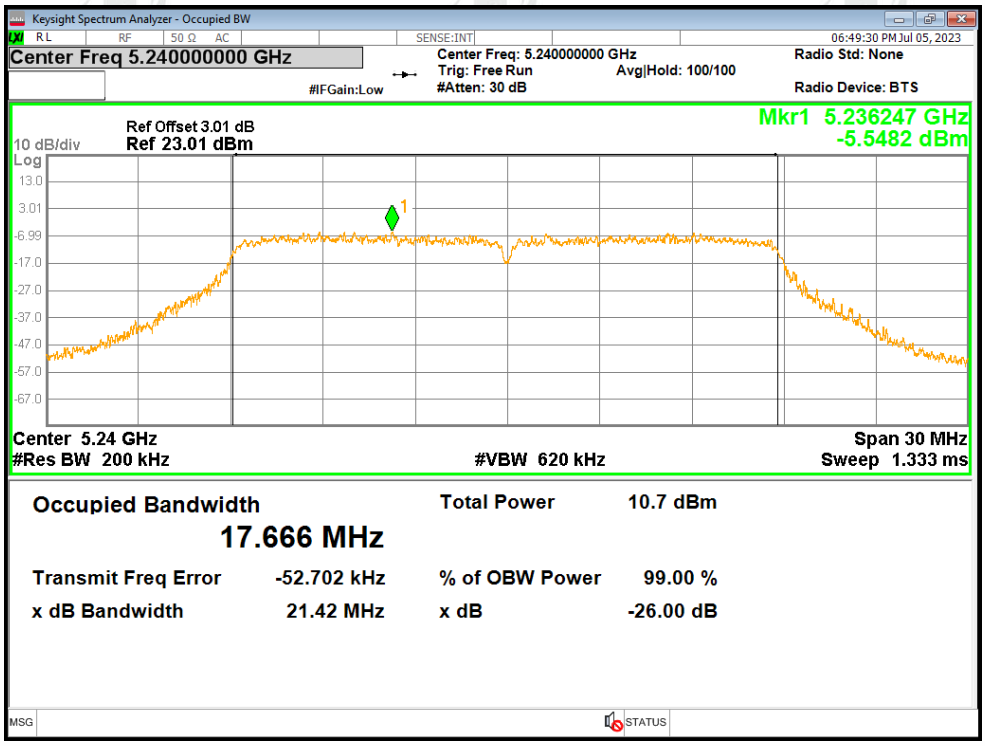
OBW NVNT ac20 5180MHz Ant1



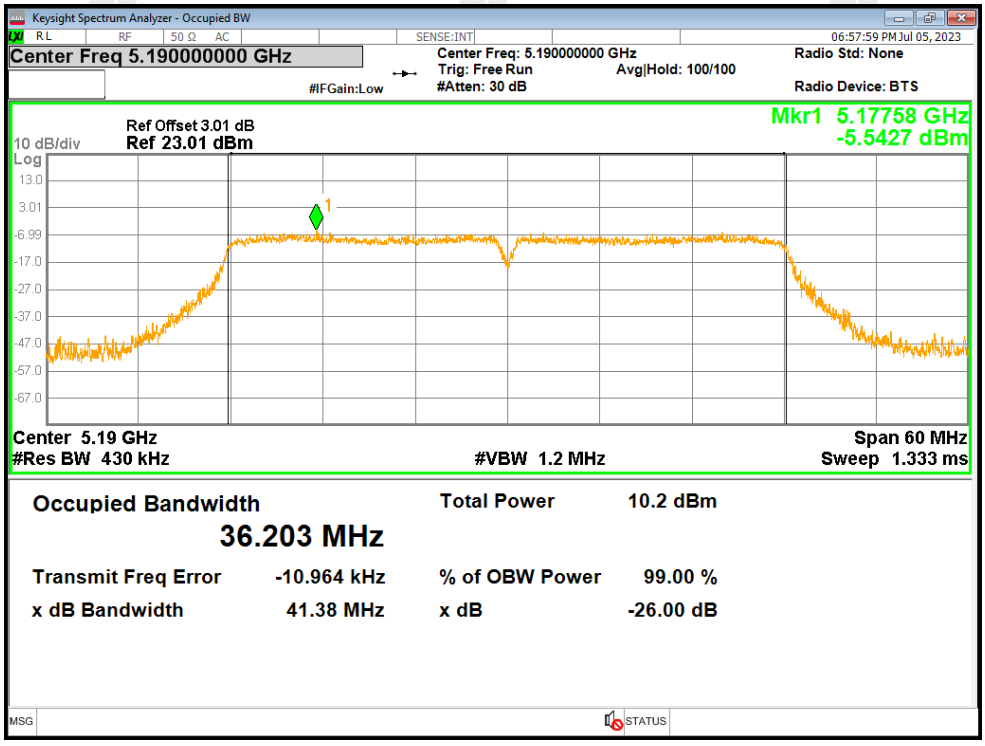
OBW NVNT ac20 5200MHz Ant1



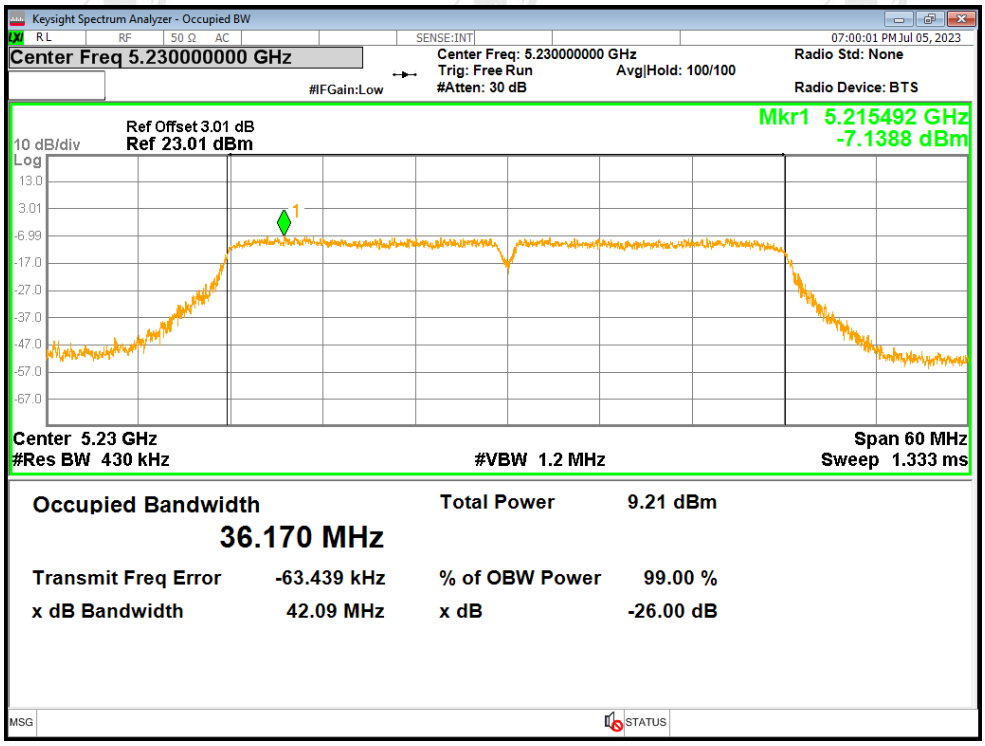
OBW NVNT ac20 5240MHz Ant1



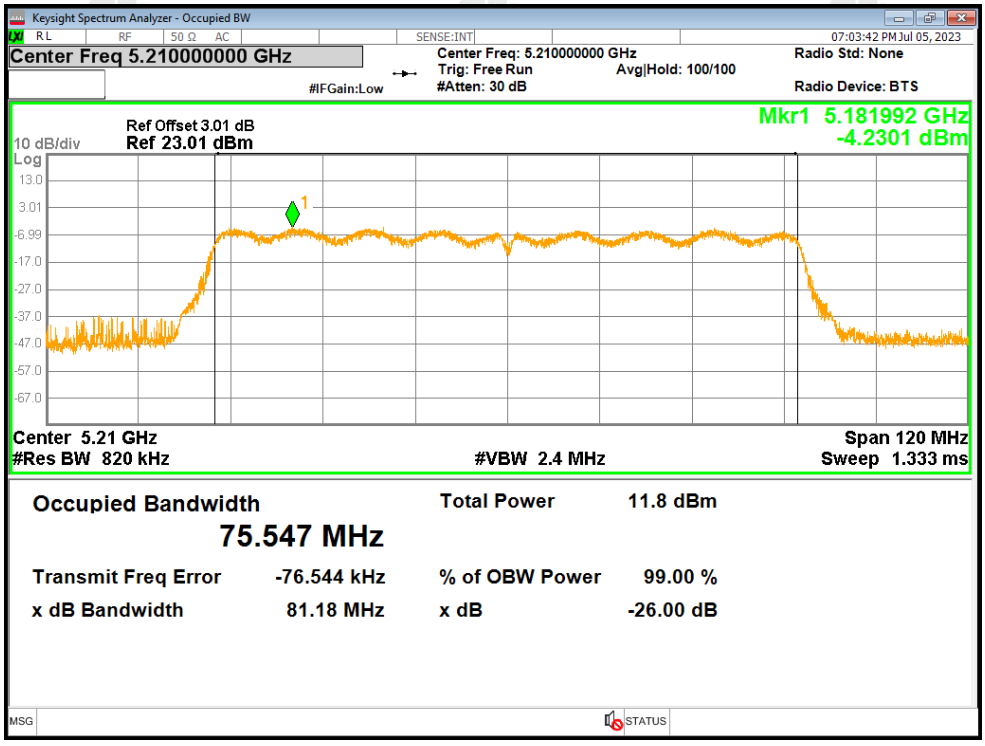
OBW NVNT ac40 5190MHz Ant1



OBW NVNT ac40 5230MHz Ant1



OBW NVNT ac80 5210MHz Ant1

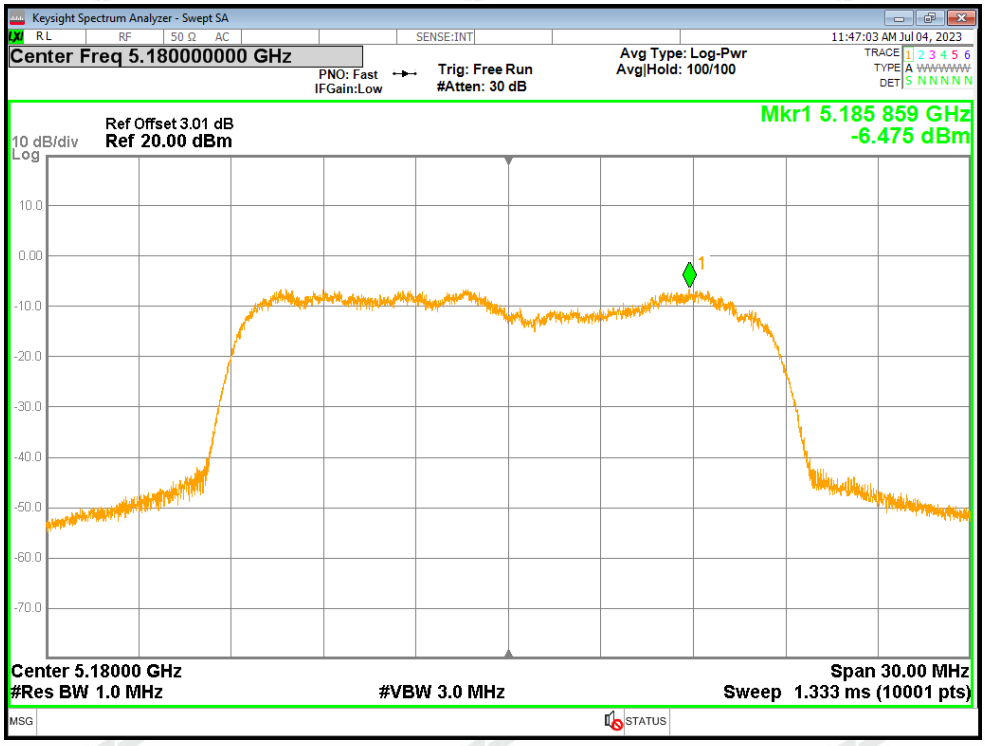


A5.Maximum Power Spectral Density Level

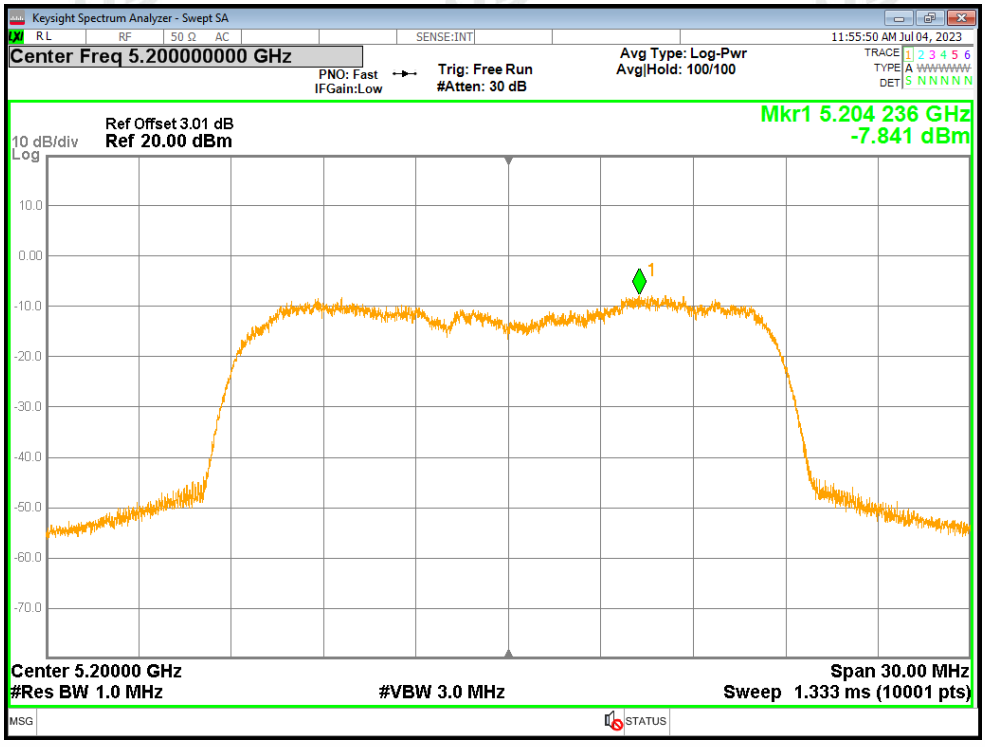
Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm)	Duty Factor (dB)	Total PSD (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	Ant1	-6.48	0.12	-6.36	10	Pass
NVNT	a	5200	Ant1	-7.84	0.09	-7.75	10	Pass
NVNT	a	5240	Ant1	-8.24	0.12	-8.12	10	Pass
NVNT	n20	5180	Ant1	-8.1	0.1	-8	10	Pass
NVNT	n20	5200	Ant1	-8.05	0.1	-7.95	10	Pass
NVNT	n20	5240	Ant1	-10.45	0.1	-10.35	10	Pass
NVNT	n40	5190	Ant1	-12.36	0.26	-12.1	10	Pass
NVNT	n40	5230	Ant1	-13.51	0.26	-13.25	10	Pass
NVNT	ac20	5180	Ant1	-8.53	0.1	-8.43	10	Pass
NVNT	ac20	5200	Ant1	-9.3	0.1	-9.2	10	Pass
NVNT	ac20	5240	Ant1	-9.63	0.13	-9.5	10	Pass
NVNT	ac40	5190	Ant1	-12.31	0.2	-12.11	10	Pass
NVNT	ac40	5230	Ant1	-15.62	0.26	-15.36	10	Pass
NVNT	ac80	5210	Ant1	-17.08	0.83	-16.25	10	Pass

Test Graphs

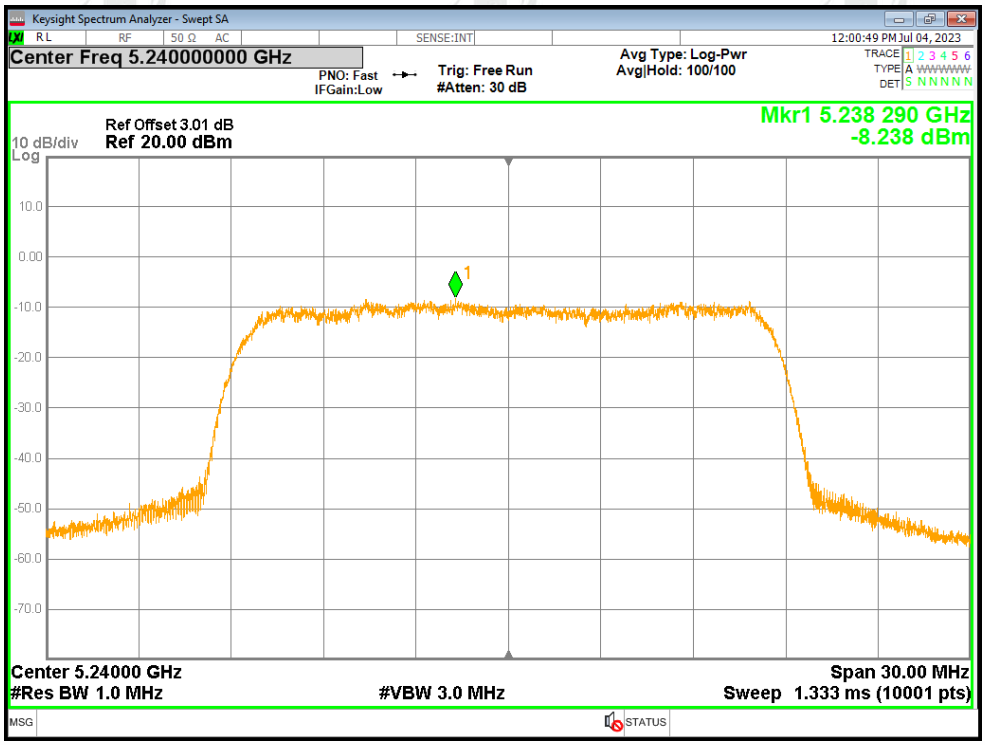
PSD NVNT a 5180MHz Ant1



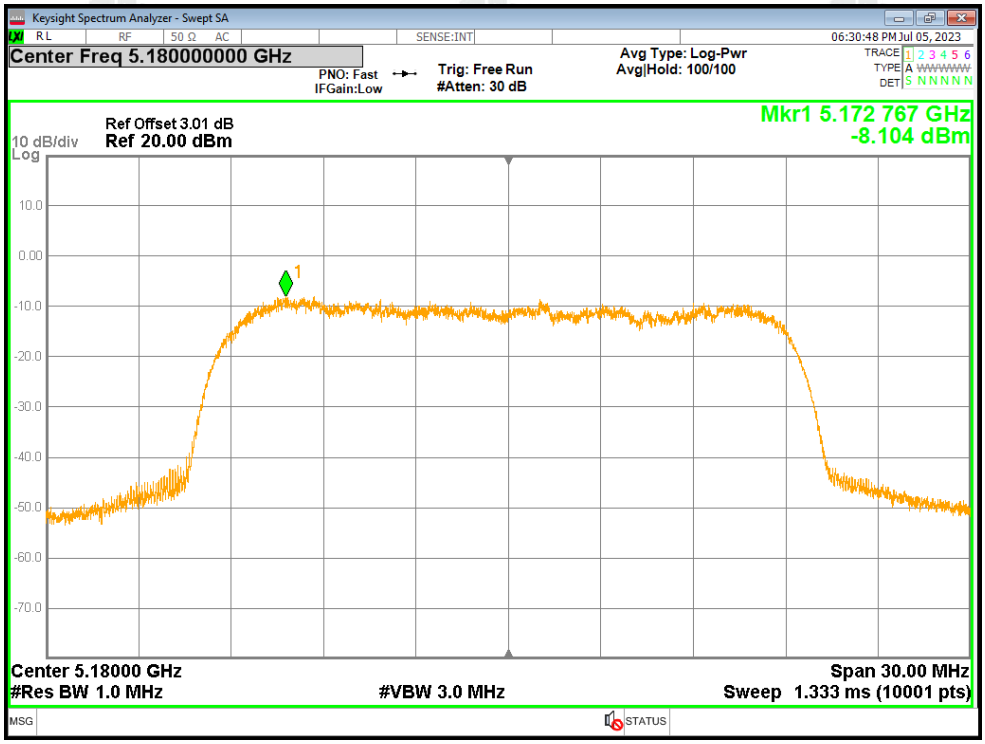
PSD NVNT a 5200MHz Ant1



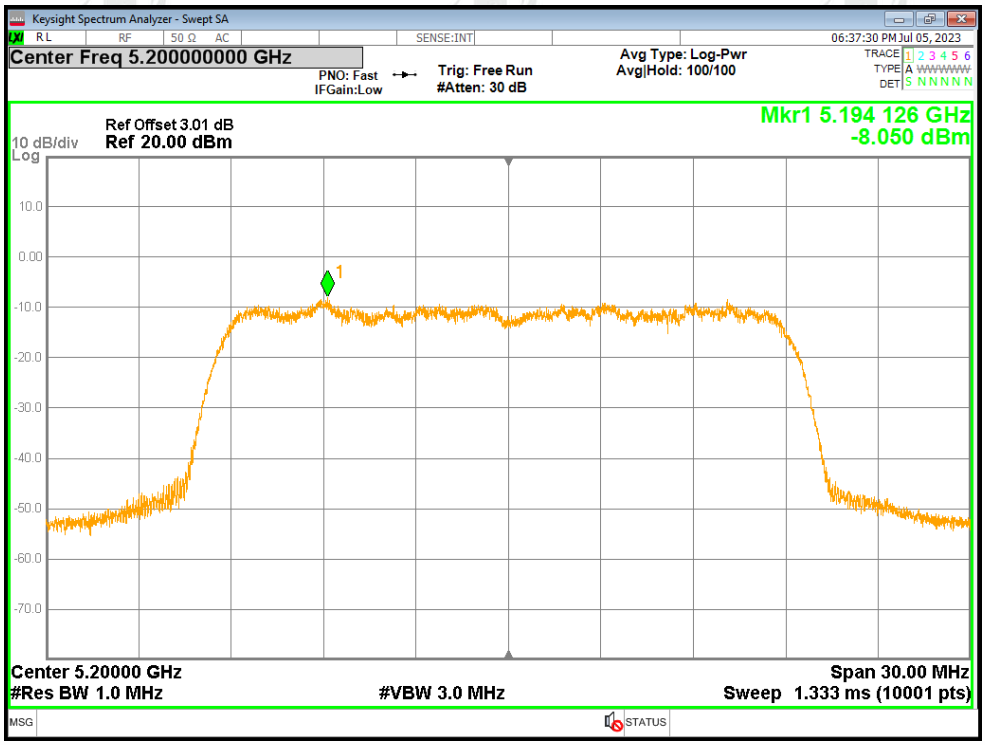
PSD NVNT a 5240MHz Ant1



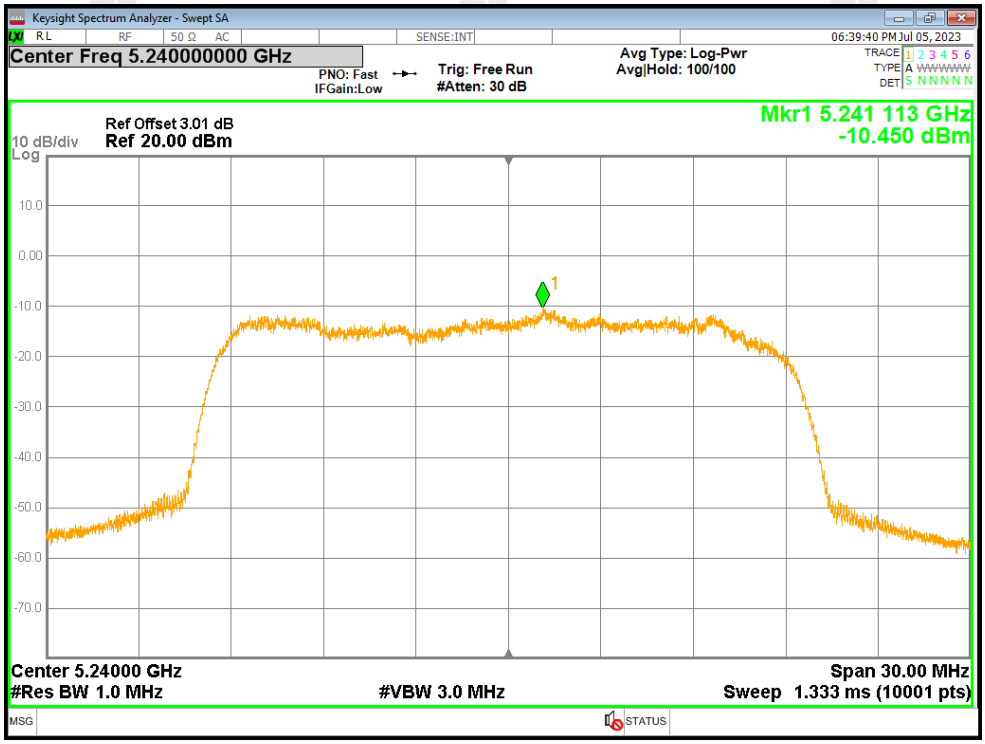
PSD NVNT n20 5180MHz Ant1



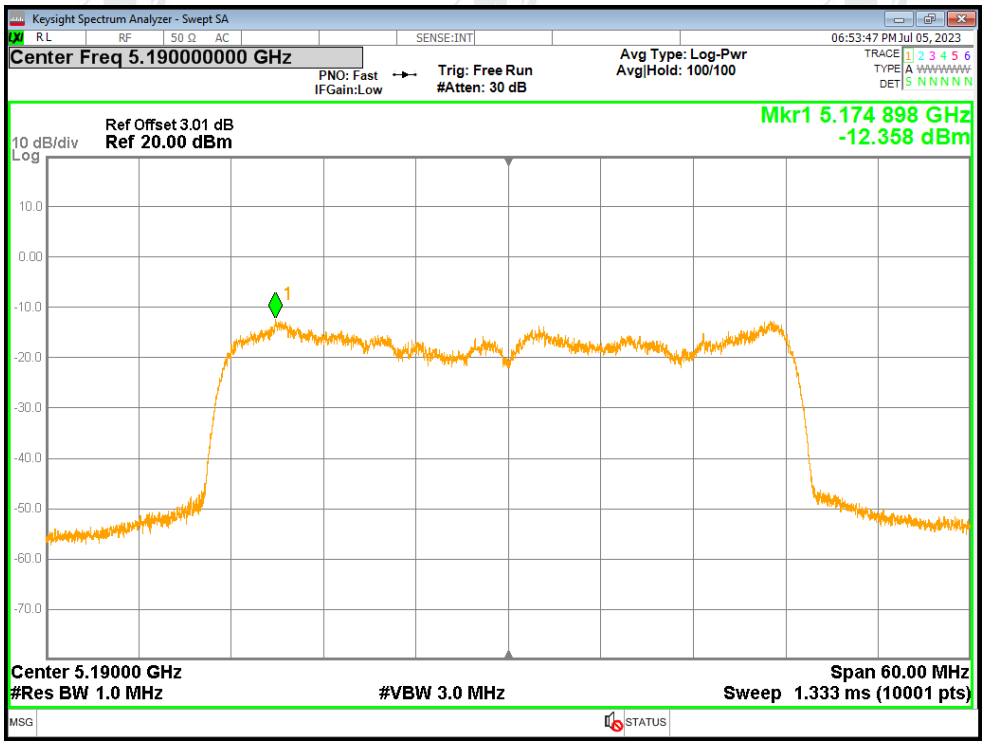
PSD NVNT n20 5200MHz Ant1



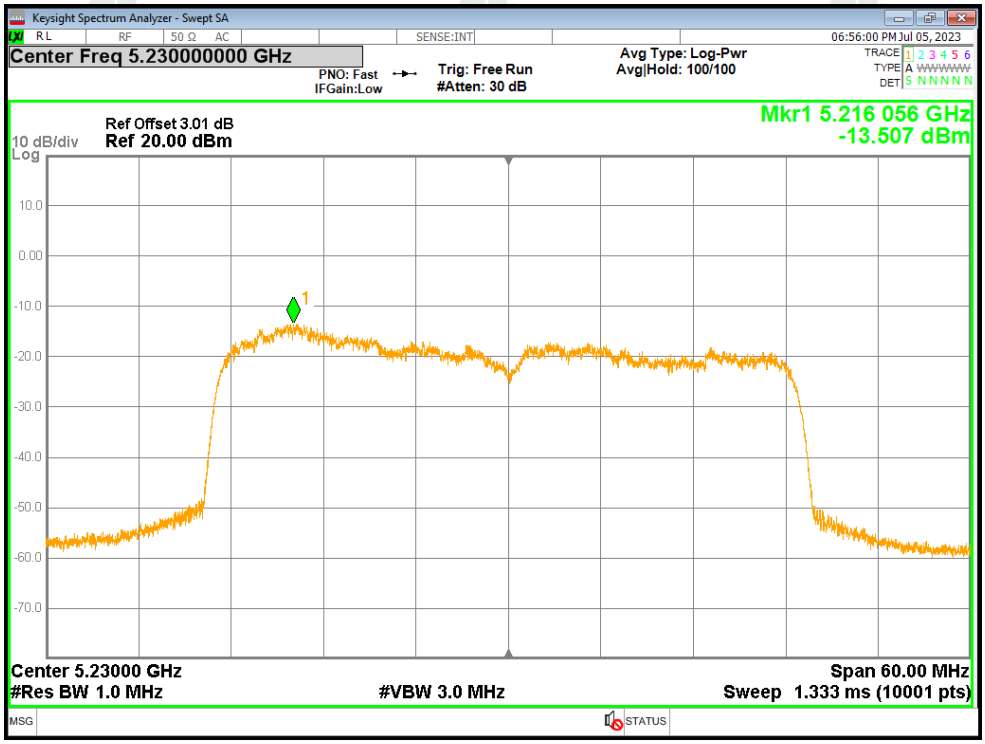
PSD NVNT n20 5240MHz Ant1



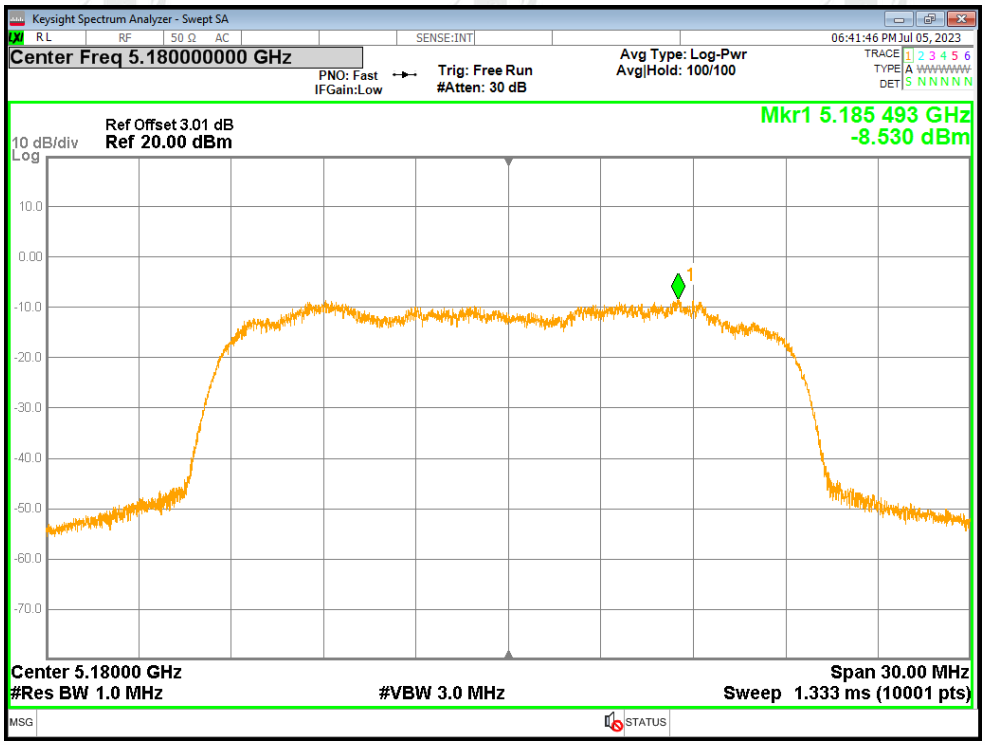
PSD NVNT n40 5190MHz Ant1



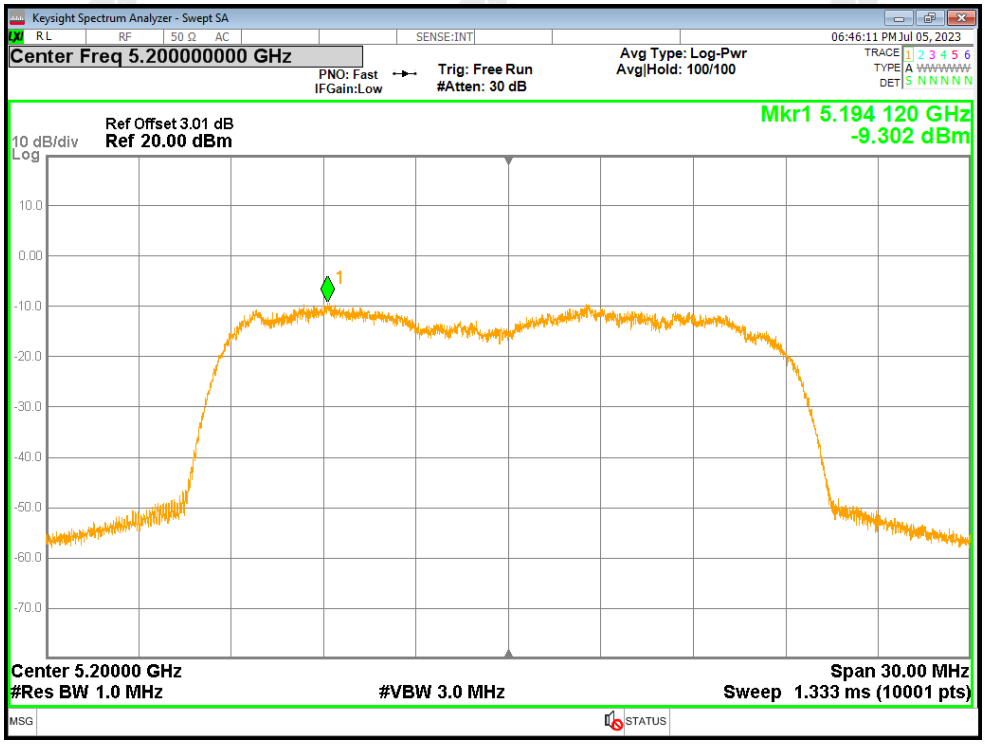
PSD NVNT n40 5230MHz Ant1



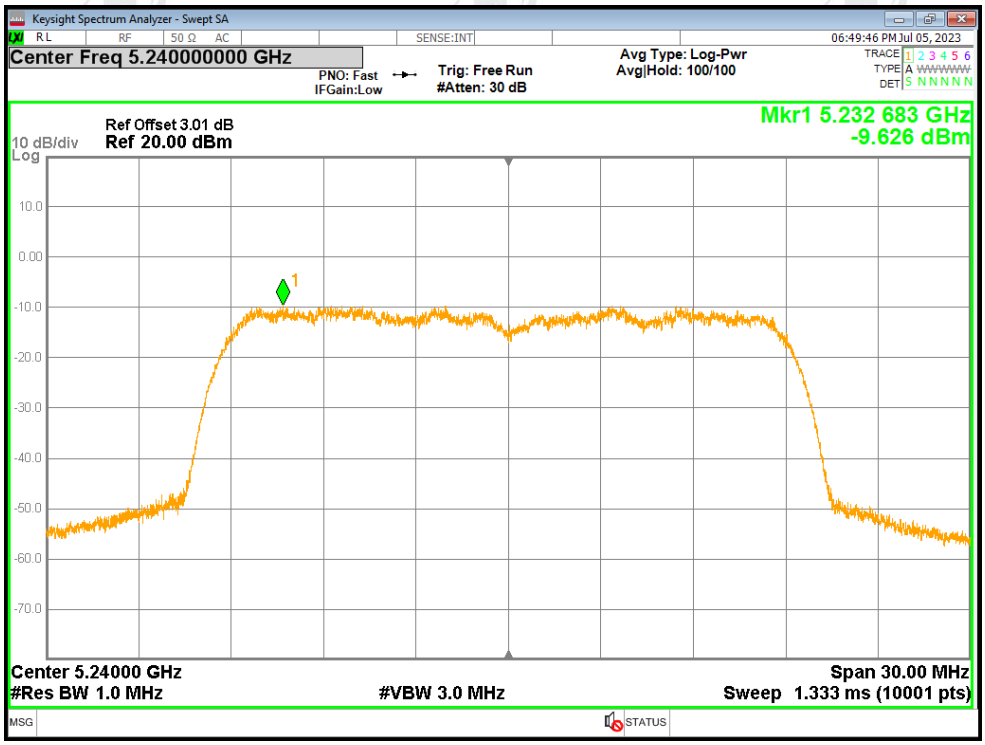
PSD NVNT ac20 5180MHz Ant1



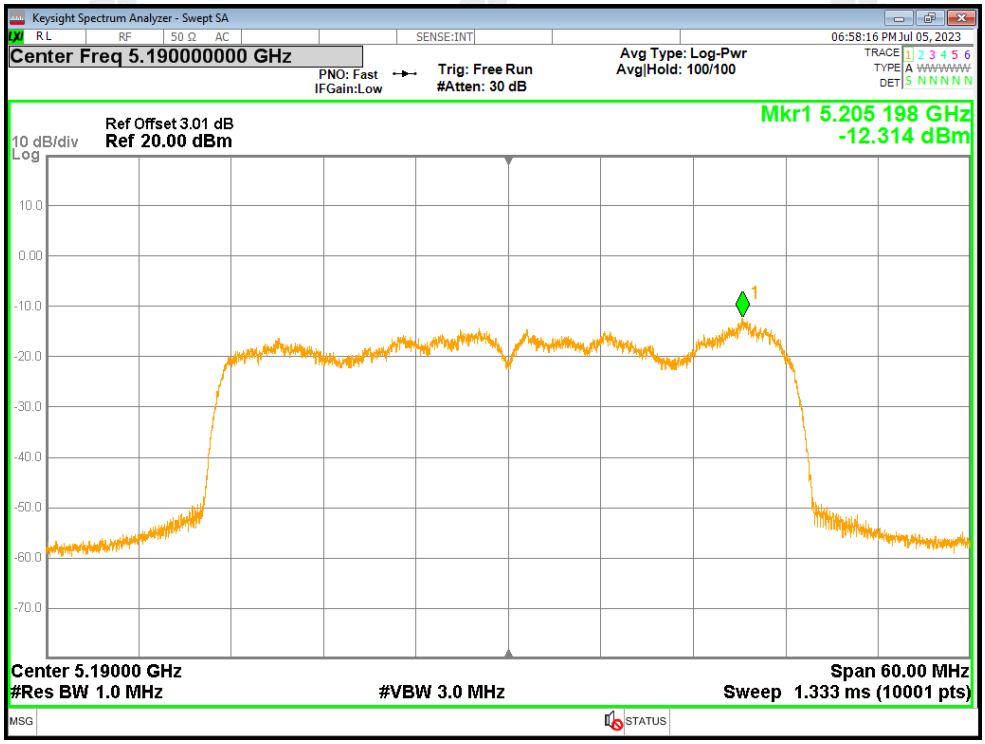
PSD NVNT ac20 5200MHz Ant1



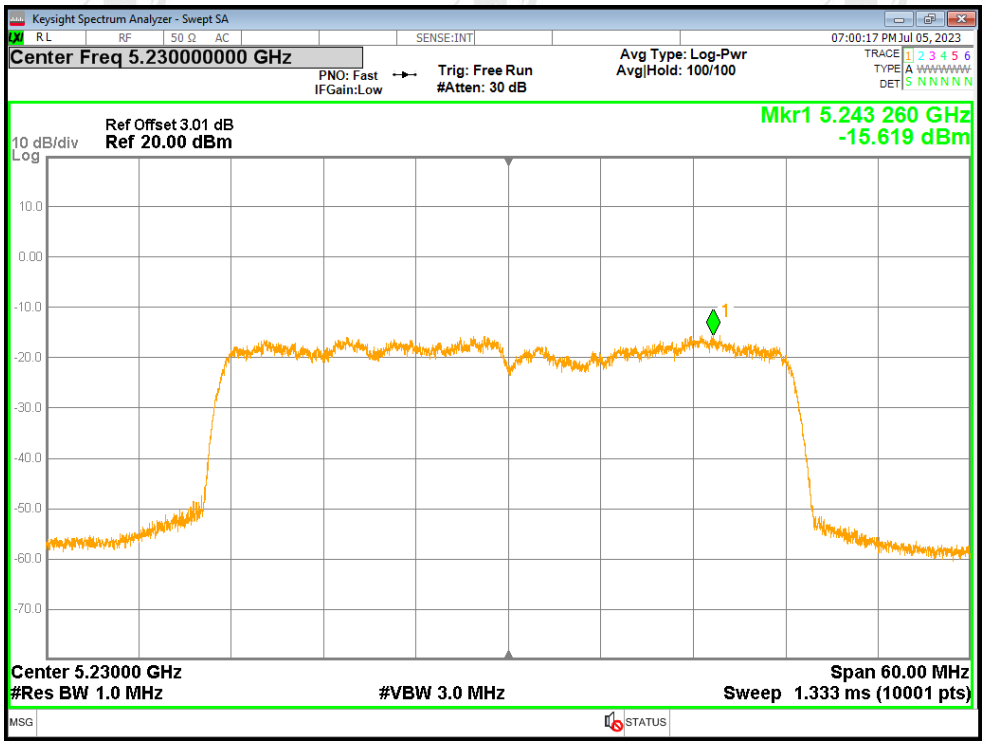
PSD NVNT ac20 5240MHz Ant1



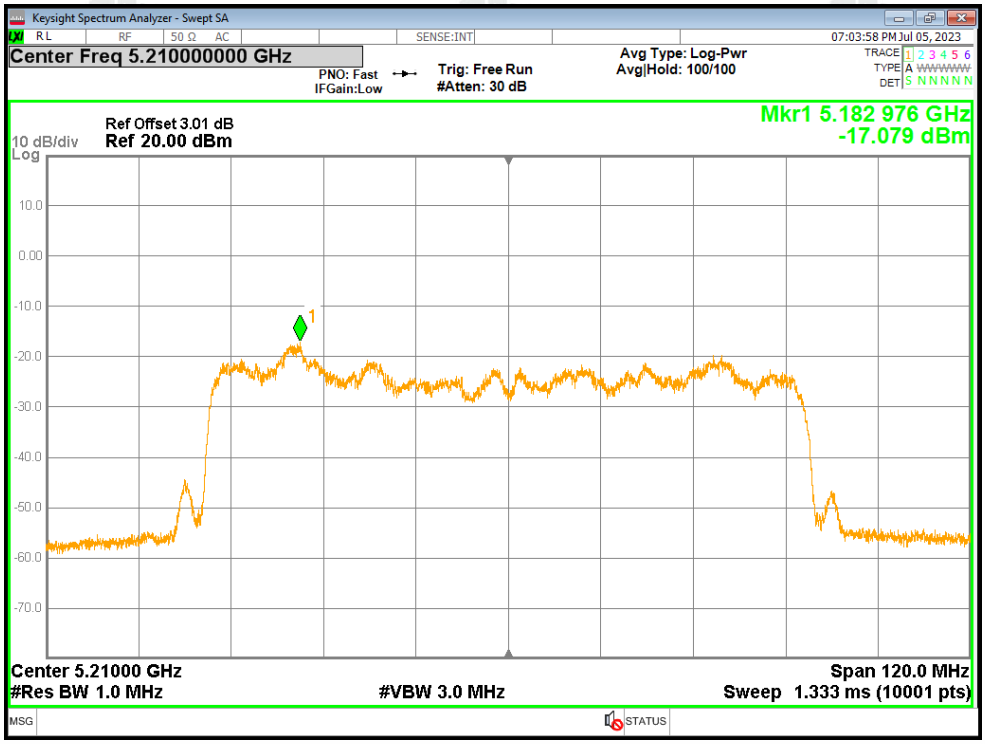
PSD NVNT ac40 5190MHz Ant1



PSD NVNT ac40 5230MHz Ant1



PSD NVNT ac80 5210MHz Ant1

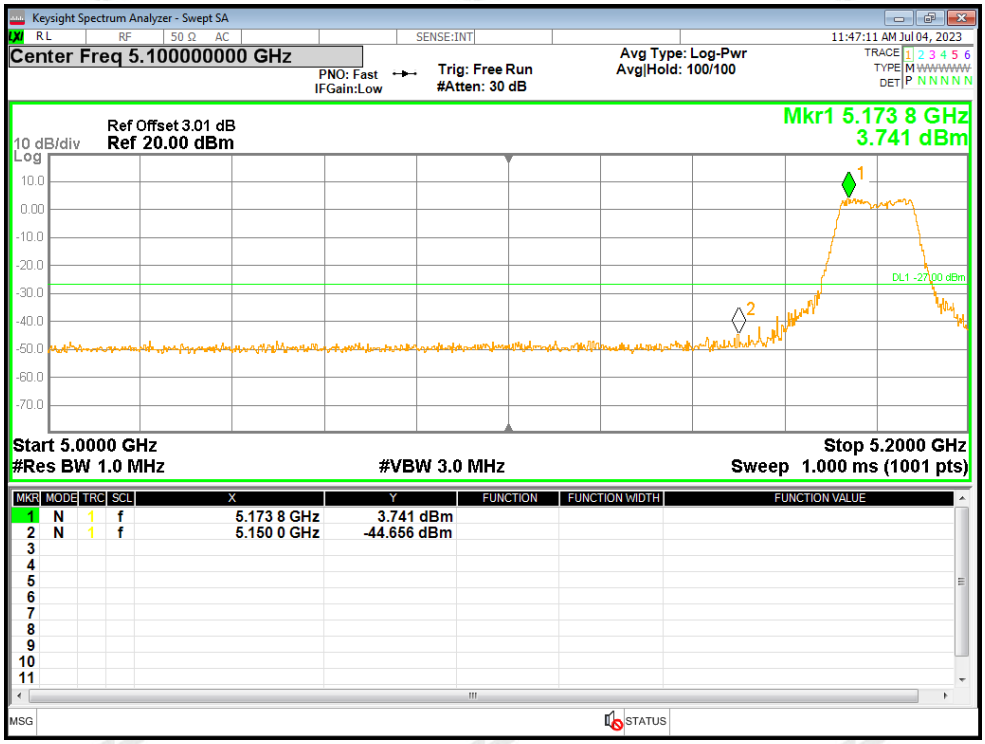


A6.Band Edge

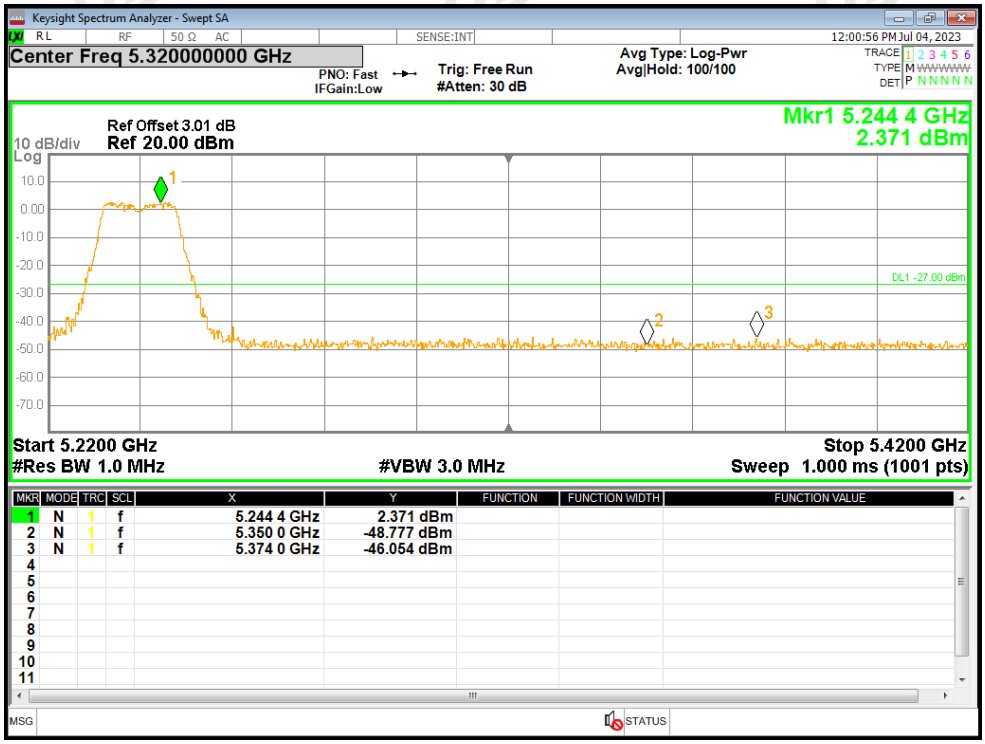
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	a	5180	Ant1	-44.65	-27	Pass
NVNT	a	5240	Ant1	-46.05	-27	Pass
NVNT	n20	5180	Ant1	-44.3	-27	Pass
NVNT	n20	5240	Ant1	-44.94	-27	Pass
NVNT	n40	5190	Ant1	-40.89	-27	Pass
NVNT	n40	5230	Ant1	-45.43	-27	Pass
NVNT	ac20	5180	Ant1	-46.09	-27	Pass
NVNT	ac20	5240	Ant1	-45.84	-27	Pass
NVNT	ac40	5190	Ant1	-43.34	-27	Pass
NVNT	ac40	5230	Ant1	-45.85	-27	Pass

Test Graphs

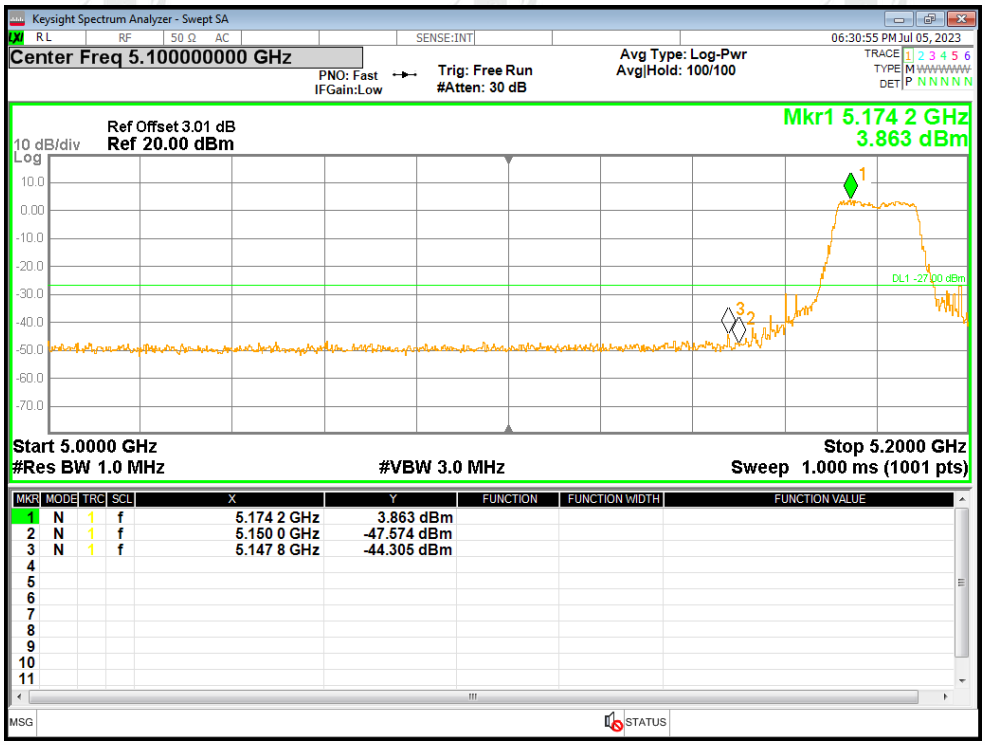
Band Edge NVNT a 5180MHz Low Ant1



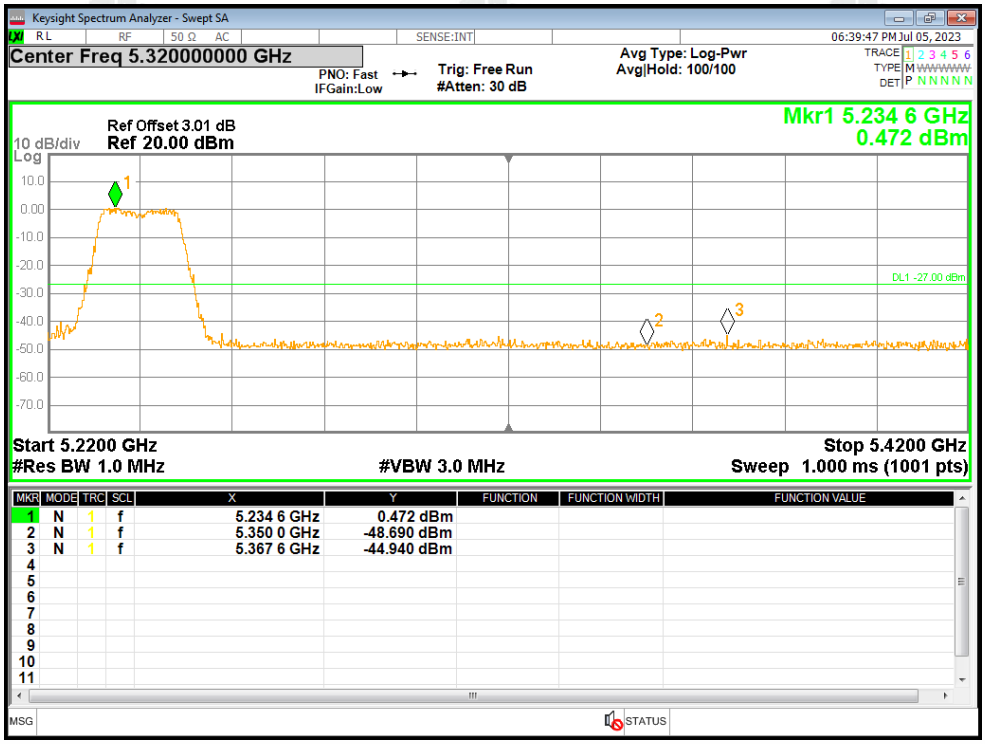
Band Edge NVNT a 5240MHz High Ant1



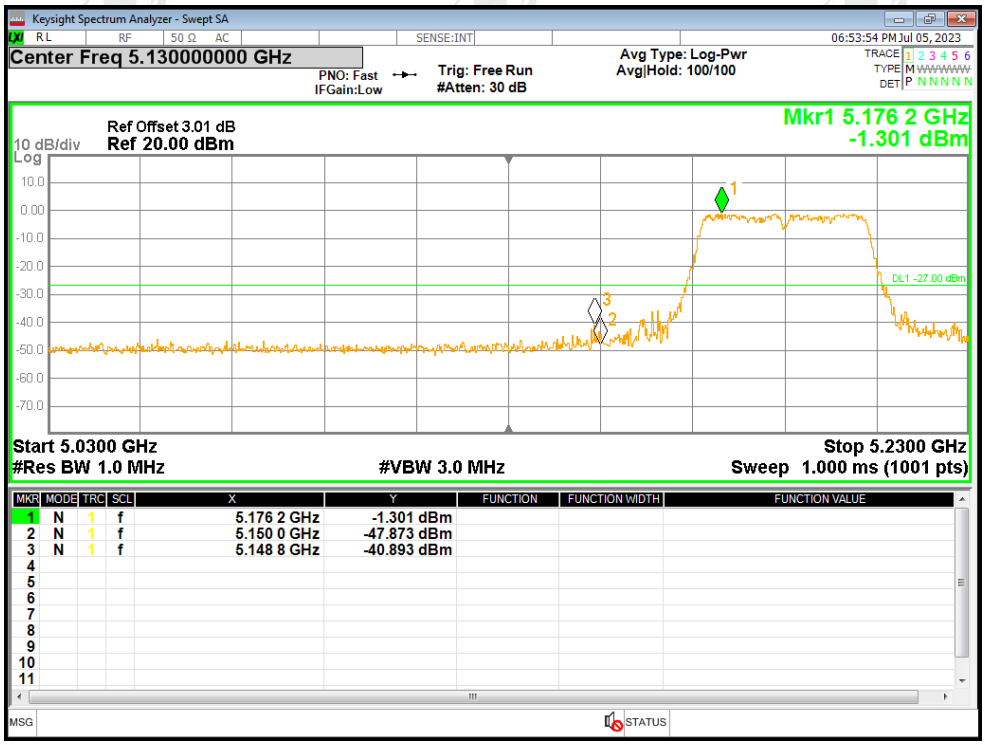
Band Edge NVNT n20 5180MHz Low Ant1



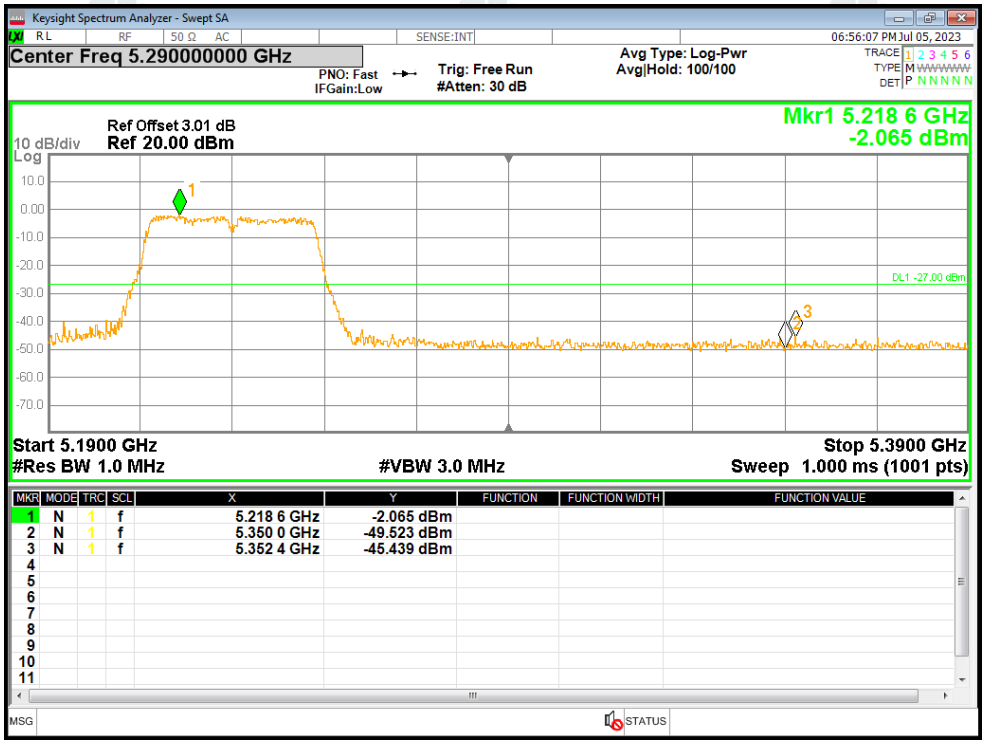
Band Edge NVNT n20 5240MHz High Ant1



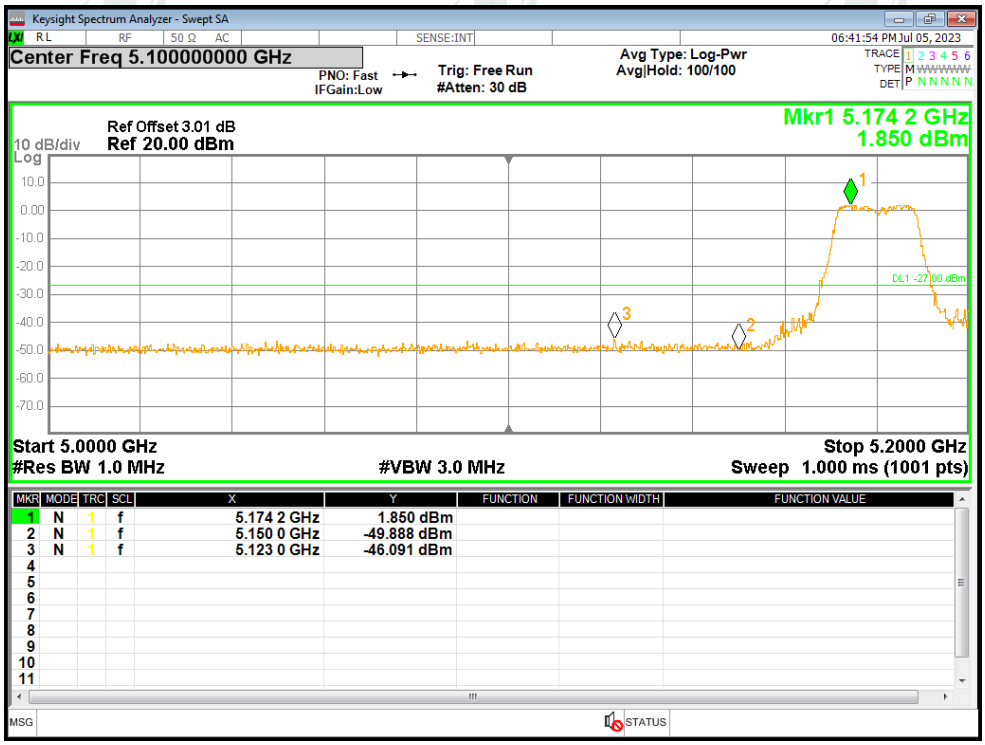
Band Edge NVNT n40 5190MHz Low Ant1



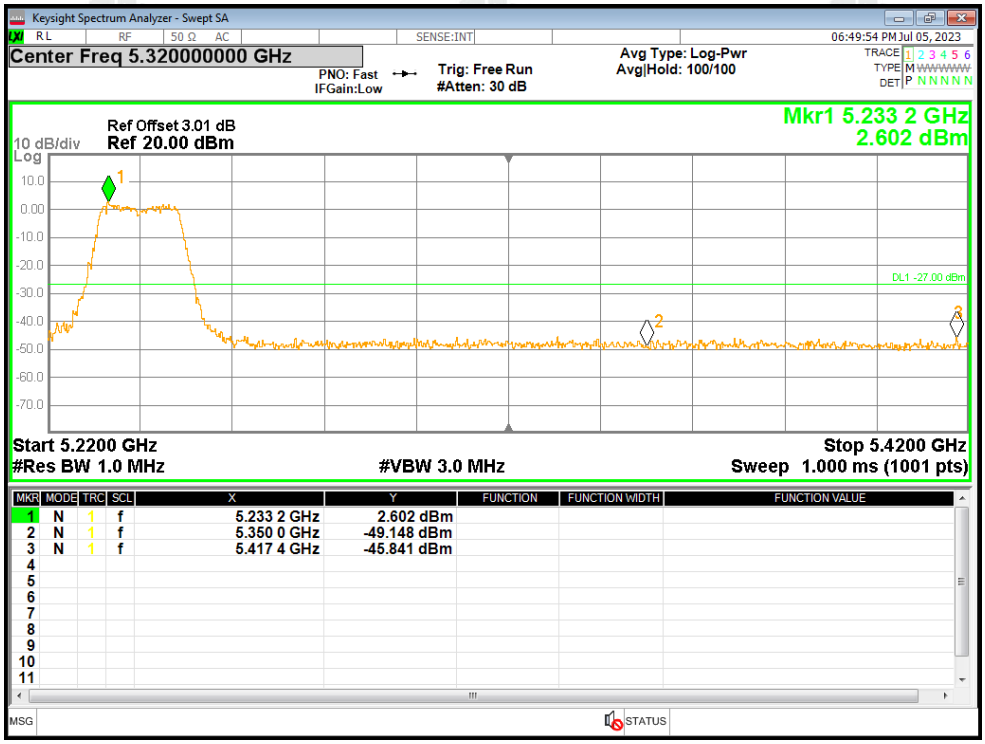
Band Edge NVNT n40 5230MHz High Ant1



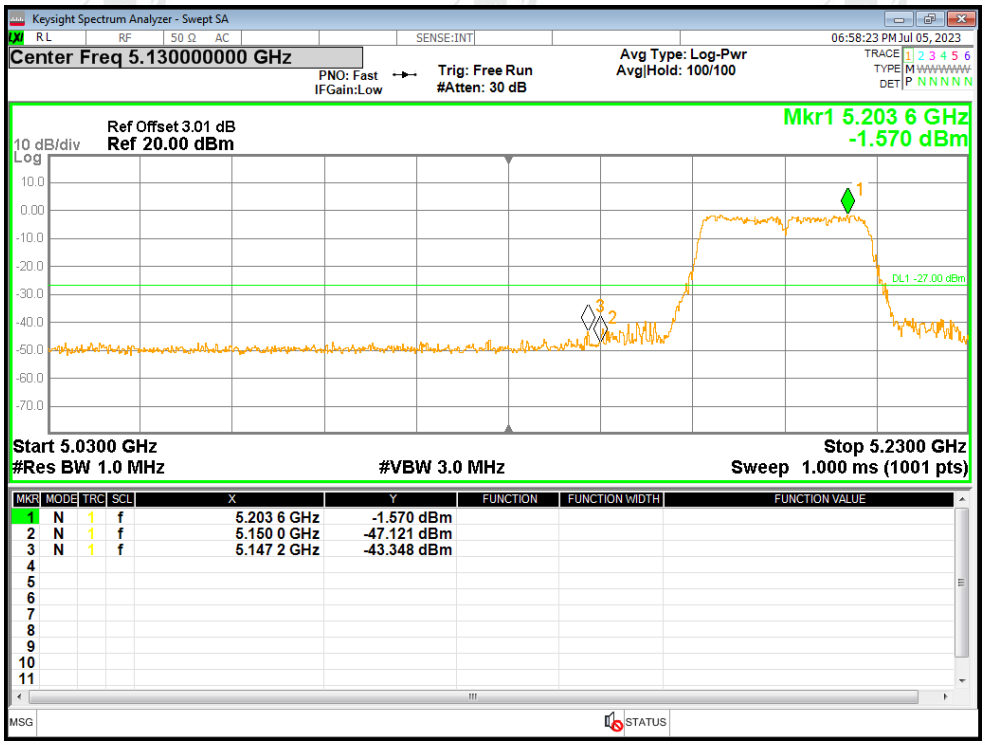
Band Edge NVNT ac20 5180MHz Low Ant1



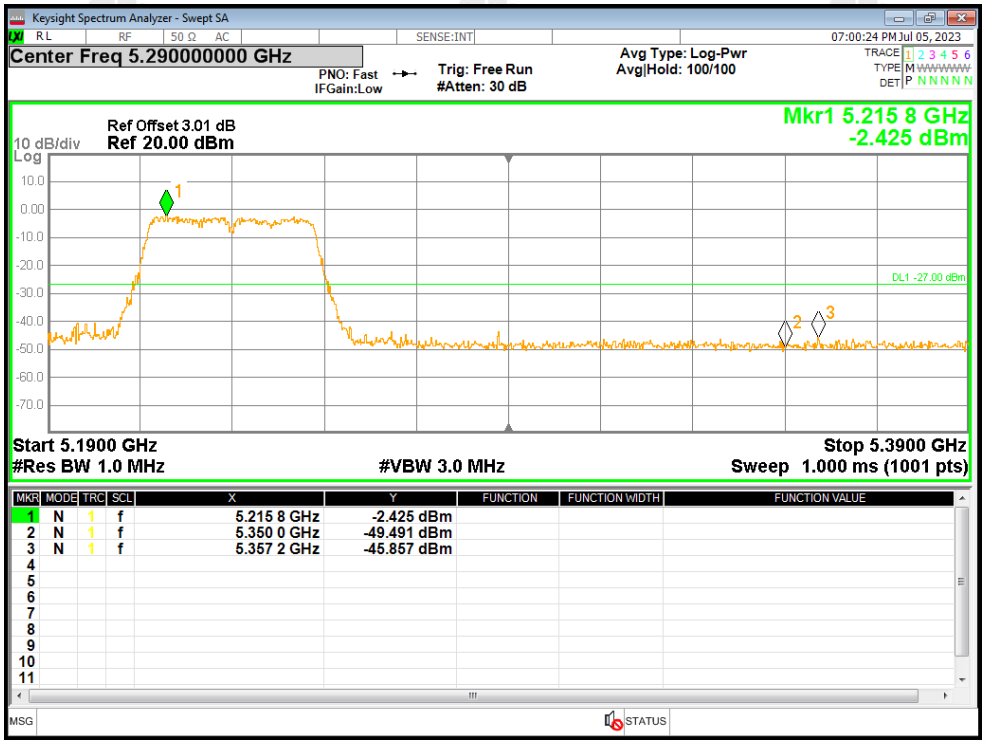
Band Edge NVNT ac20 5240MHz High Ant1



Band Edge NVNT ac40 5190MHz Low Ant1



Band Edge NVNT ac40 5230MHz High Ant1



A7.Frequency Stability

Voltage							
Test Mode	Channel	Voltage [Vdc]	Temperature (℃)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
a	5180	NV	NT	-40000	-7.72	Within 5150-5250MHz	Pass
		LV	NT	-40000	-7.72		
		HV	NT	-40000	-7.72		
	5200	NV	NT	-20000	-3.85		
		LV	NT	-20000	-3.85		
		HV	NT	-20000	-3.85		
	5240	NV	NT	-20000	-3.82		
		LV	NT	-20000	-3.82		
		HV	NT	-20000	-3.82		
n20	5180	NV	NT	-20000	-3.86		
		LV	NT	-20000	-3.86		
		HV	NT	-20000	-3.86		
	5200	NV	NT	-60000	-11.54		
		LV	NT	-60000	-11.54		
		HV	NT	-60000	-11.54		
	5240	NV	NT	-40000	-7.63		
		LV	NT	-40000	-7.63		
		HV	NT	-40000	-7.63		
ac20	5180	NV	NT	-40000	-7.72		
		LV	NT	-40000	-7.72		
		HV	NT	-40000	-7.72		
	5200	NV	NT	-40000	-7.69		
		LV	NT	-40000	-7.69		
		HV	NT	-40000	-7.69		
	5240	NV	NT	-20000	-3.82		
		LV	NT	-20000	-3.82		
		HV	NT	-20000	-3.82		

n40	5200	NV	NT	-40000	-7.71	Within 5150-5250MHz	Pass
		LV	NT	-40000	-7.71		
		HV	NT	-40000	-7.71		
	5240	NV	NT	-40000	-7.65		
		LV	NT	-40000	-7.65		
		HV	NT	-40000	-7.65		
ac40	5200	NV	NT	0	0		
		LV	NT	0	0		
		HV	NT	0	0		
	5240	NV	NT	-40000	-7.65		
		LV	NT	-40000	-7.65		
		HV	NT	-40000	-7.65		
ac80	5210	NV	NT	80000	15.36		
		LV	NT	80000	15.36		
		HV	NT	80000	15.36		

Temperature							
Test Mode	Channel	Voltage [Vdc]	Temperature (℃)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
a	5180	NV	-20	-40000	-7.72	Within 5150-5250MHz	Pass
		NV	-10	-40000	-7.72		
		NV	0	-40000	-7.72		
		NV	20	-40000	-7.72		
		NV	30	-40000	-7.72		
		NV	50	-40000	-7.72		
		NV	60	-40000	-7.72		
	5200	NV	-20	-20000	-3.85		
		NV	-10	-20000	-3.85		
		NV	0	-20000	-3.85		
		NV	20	-20000	-3.85		
		NV	30	-20000	-3.85		
		NV	50	-20000	-3.85		
		NV	60	-20000	-3.85		
	5240	NV	-20	-20000	-3.82		
		NV	-10	-20000	-3.82		
		NV	0	-20000	-3.82		
		NV	20	-20000	-3.82		
		NV	30	-20000	-3.82		
		NV	50	-20000	-3.82		
		NV	60	-20000	-3.82		
N20	5180	NV	-20	-20000	-3.86		
		NV	-10	-20000	-3.86		
		NV	0	-20000	-3.86		
		NV	20	-20000	-3.86		
		NV	30	-20000	-3.86		
		NV	50	-20000	-3.86		
		NV	60	-20000	-3.86		
	5200	NV	-20	-60000	-11.54		
		NV	-10	-60000	-11.54		
		NV	0	-60000	-11.54		
		NV	20	-60000	-11.54		
		NV	30	-60000	-11.54		

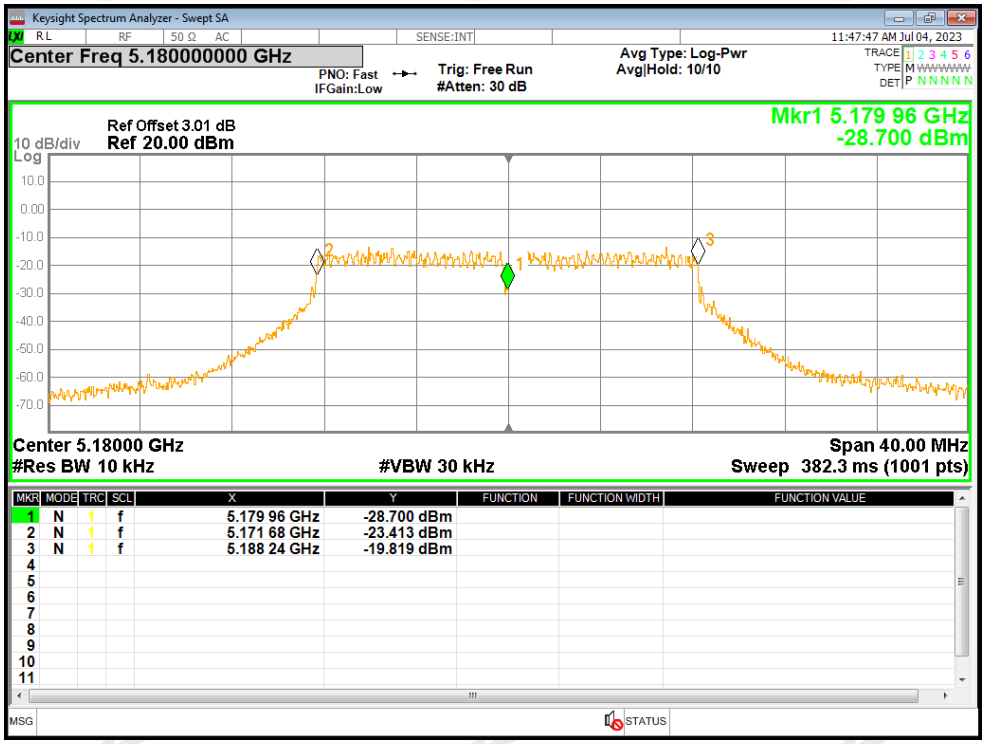
		NV	50	-60000	-11.54		
		NV	60	-60000	-11.54		
	5240	NV	-20	-40000	-7.63		
		NV	-10	-40000	-7.63		
		NV	0	-40000	-7.63		
		NV	20	-40000	-7.63		
		NV	30	-40000	-7.63		
		NV	50	-40000	-7.63		
		NV	60	-40000	-7.63		
ac20	5180	NV	-20	-40000	-7.72	Within 5150-5250MHz	Pass
		NV	-10	-40000	-7.72		
		NV	0	-40000	-7.72		
		NV	20	-40000	-7.72		
		NV	30	-40000	-7.72		
		NV	50	-40000	-7.72		
		NV	60	-40000	-7.72		
	5200	NV	-20	-40000	-7.69		
		NV	-10	-40000	-7.69		
		NV	0	-40000	-7.69		
		NV	20	-40000	-7.69		
		NV	30	-40000	-7.69		
		NV	50	-40000	-7.69		
		NV	60	-40000	-7.69		
	5240	NV	-20	-20000	-3.82		
		NV	-10	-20000	-3.82		
		NV	0	-20000	-3.82		
		NV	20	-20000	-3.82		
		NV	30	-20000	-3.82		
		NV	50	-20000	-3.82		
		NV	60	-20000	-3.82		
N40	5190	NV	-20	-40000	-7.71		
		NV	-10	-40000	-7.71		
		NV	0	-40000	-7.71		
		NV	20	-40000	-7.71		
		NV	30	-40000	-7.71		
		NV	50	-40000	-7.71		
		NV	60	-40000	-7.71		

N40	5230	NV	-20	-40000	-7.65	Within 5150-5250MHz	Pass
		NV	-10	-40000	-7.65		
		NV	0	-40000	-7.65		
		NV	20	-40000	-7.65		
		NV	30	-40000	-7.65		
		NV	50	-40000	-7.65		
		NV	60	-40000	-7.65		
ac40	5190	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		
	5230	NV	-20	-40000	-7.65		
		NV	-10	-40000	-7.65		
		NV	0	-40000	-7.65		
		NV	20	-40000	-7.65		
		NV	30	-40000	-7.65		
		NV	50	-40000	-7.65		
		NV	60	-40000	-7.65		
ac80	5210	NV	-20	-80000	-15.36		
		NV	-10	-80000	-15.36		
		NV	0	-80000	-15.36		
		NV	20	-80000	-15.36		
		NV	30	-80000	-15.36		
		NV	50	-80000	-15.36		
		NV	60	-80000	-15.36		

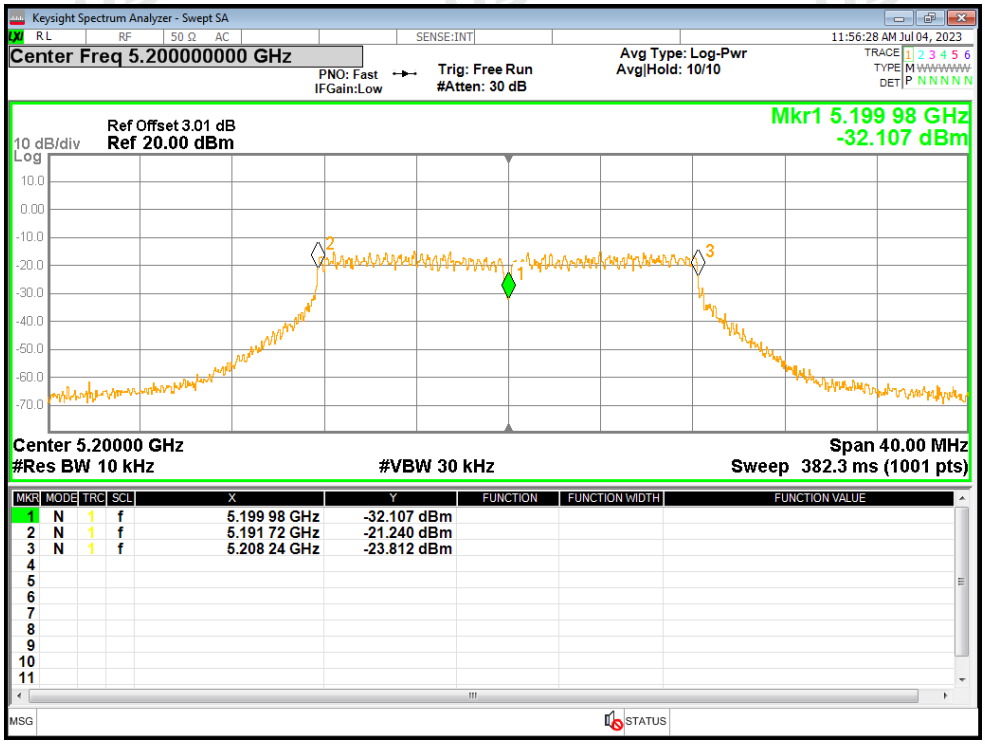
Note:Test temperature:–20° to + 60°, At room temperature, the test results are the worst, only reflecting the test results at room temperature.

Test Graphs

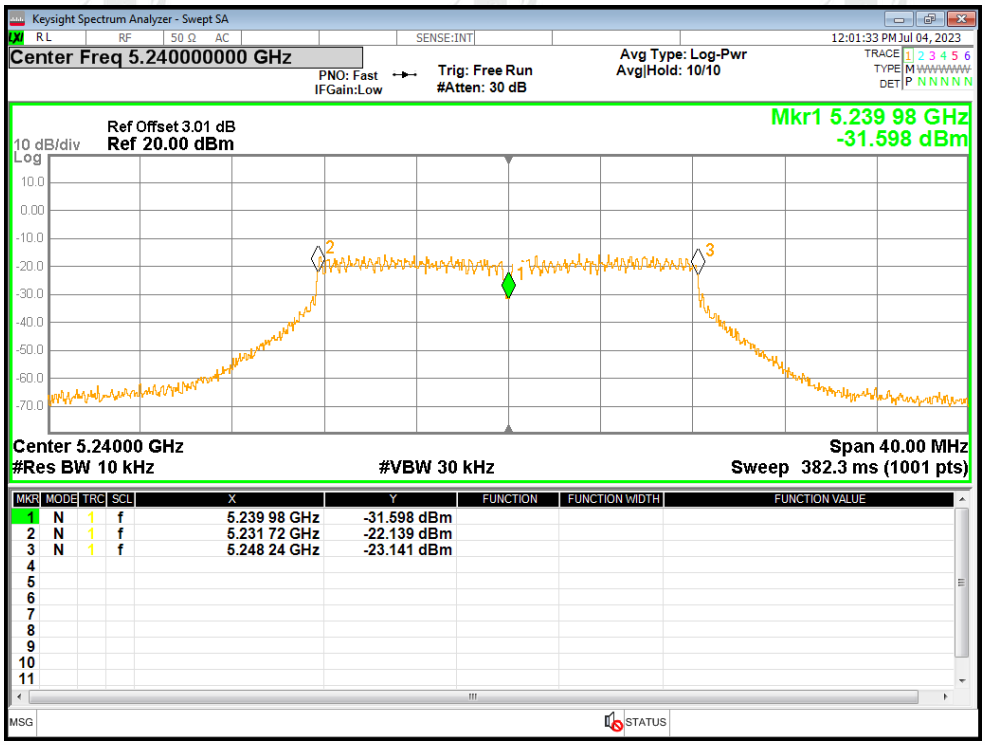
Freq. Stability NVNT a 5180MHz Ant1



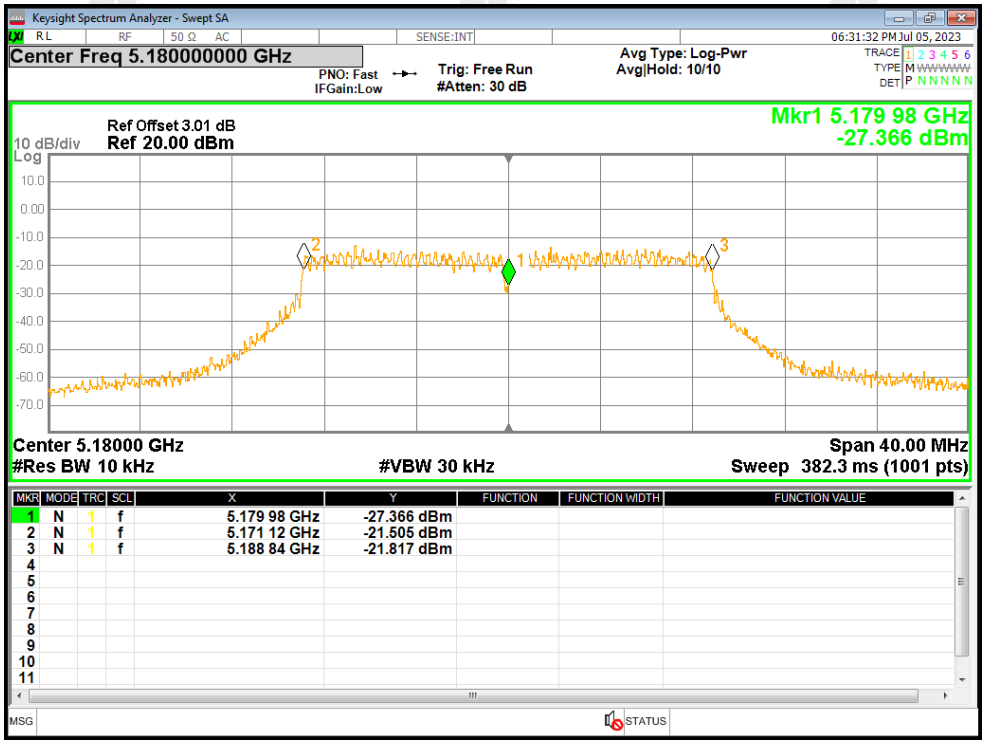
Freq. Stability NVNT a 5200MHz Ant1



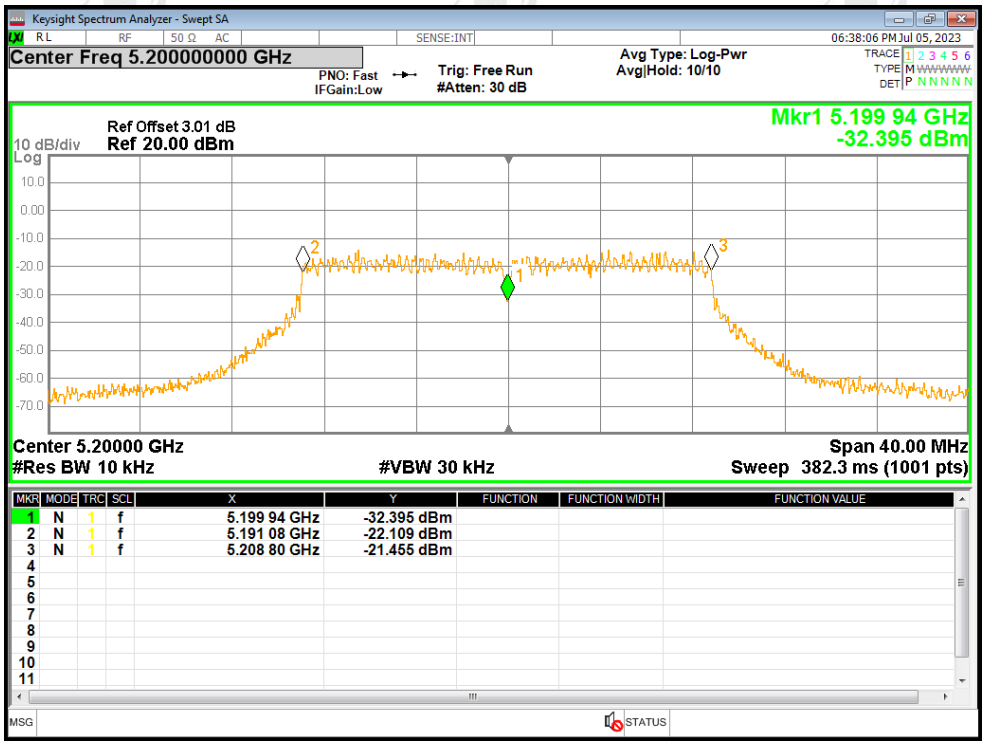
Freq. Stability NVNT a 5240MHz Ant1



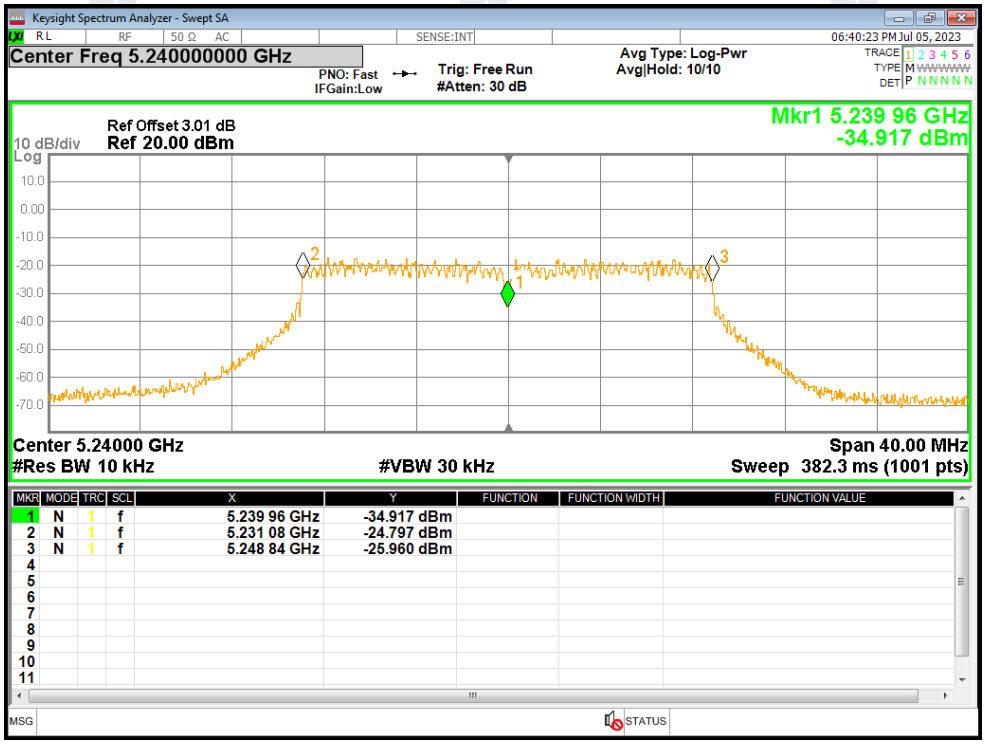
Freq. Stability NVNT n20 5180MHz Ant1



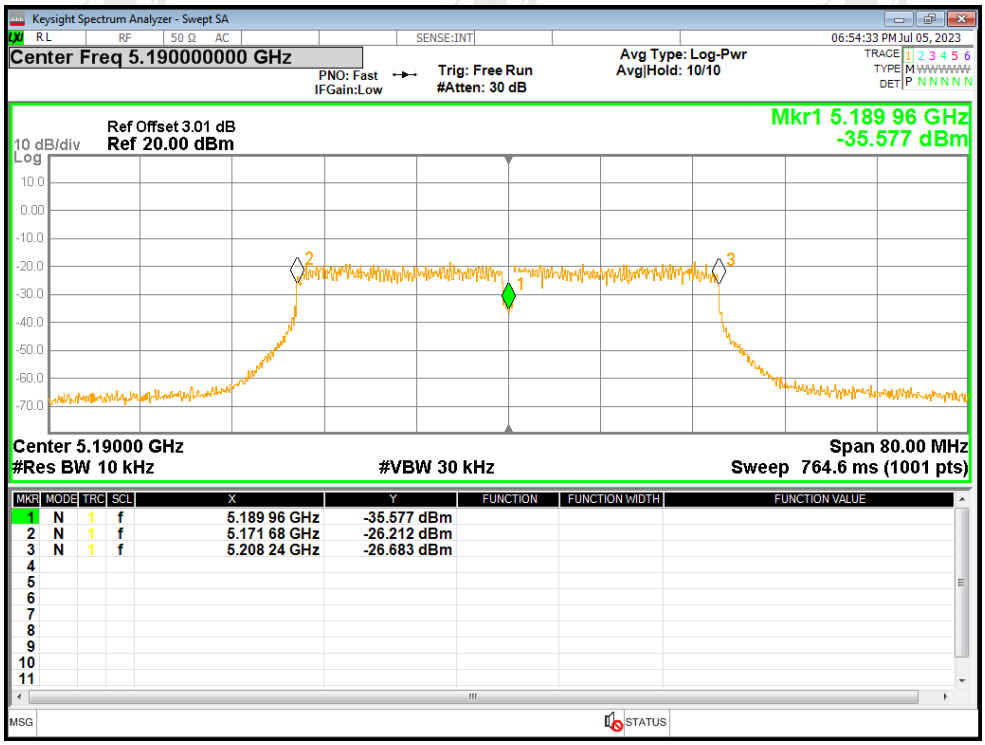
Freq. Stability NVNT n20 5200MHz Ant1



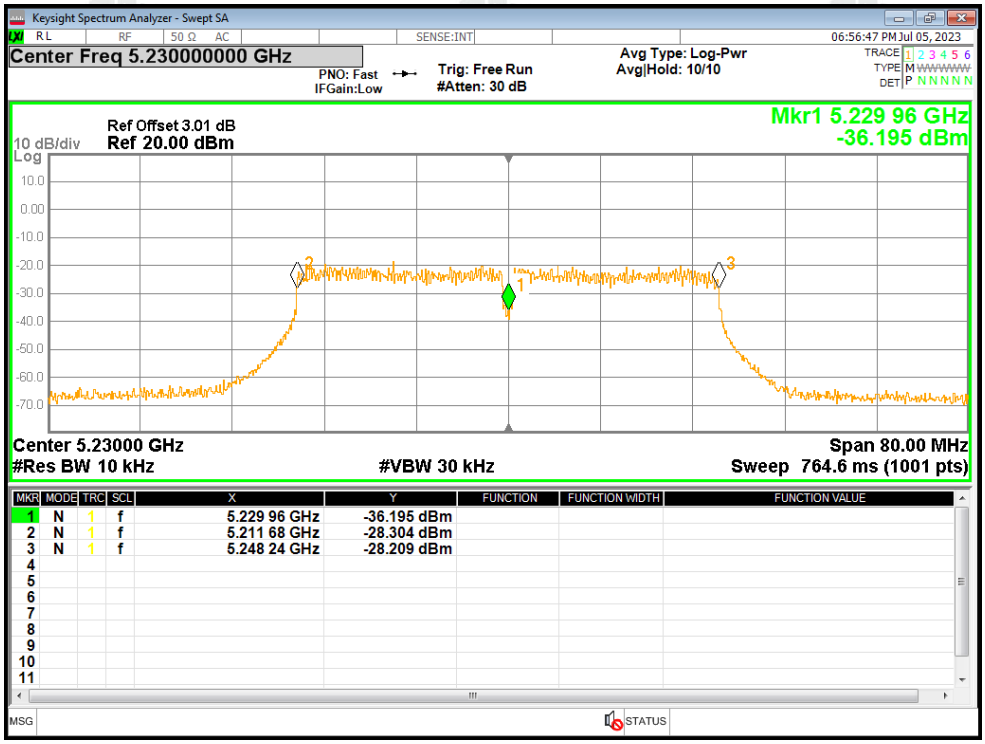
Freq. Stability NVNT n20 5240MHz Ant1



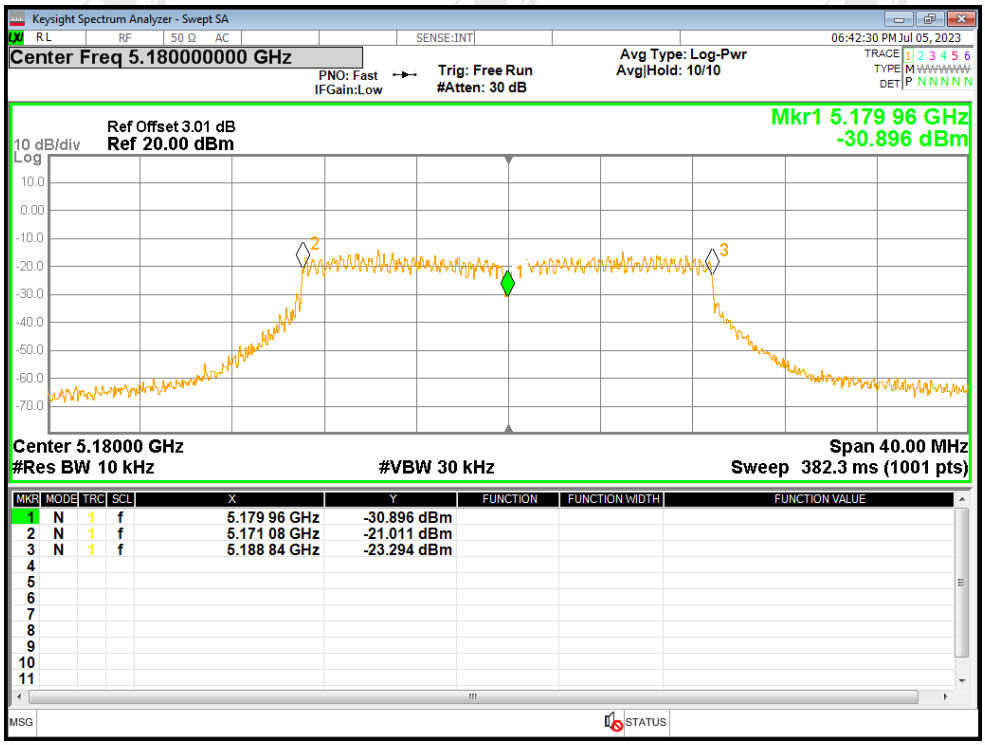
Freq. Stability NVNT n40 5190MHz Ant1



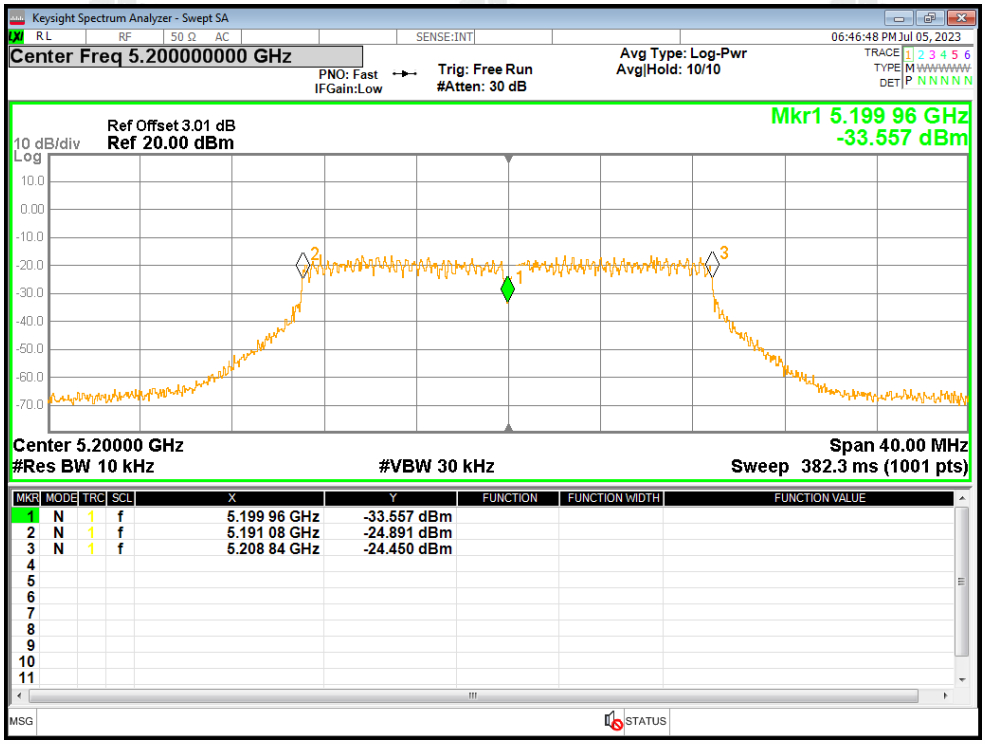
Freq. Stability NVNT n40 5230MHz Ant1



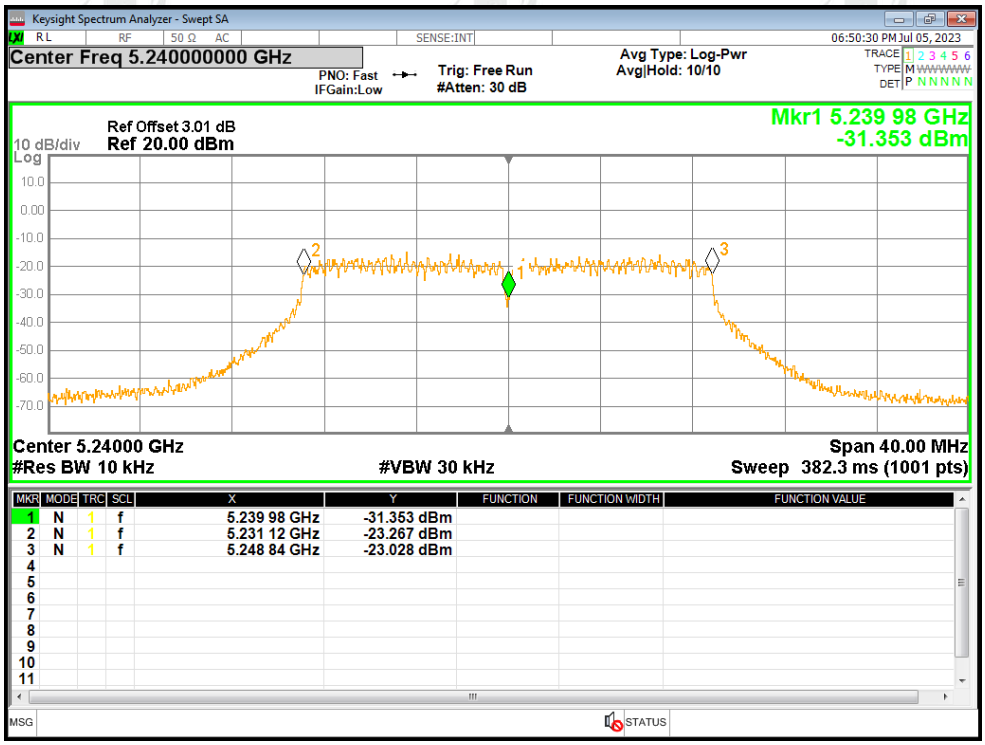
Freq. Stability NVNT ac20 5180MHz Ant1



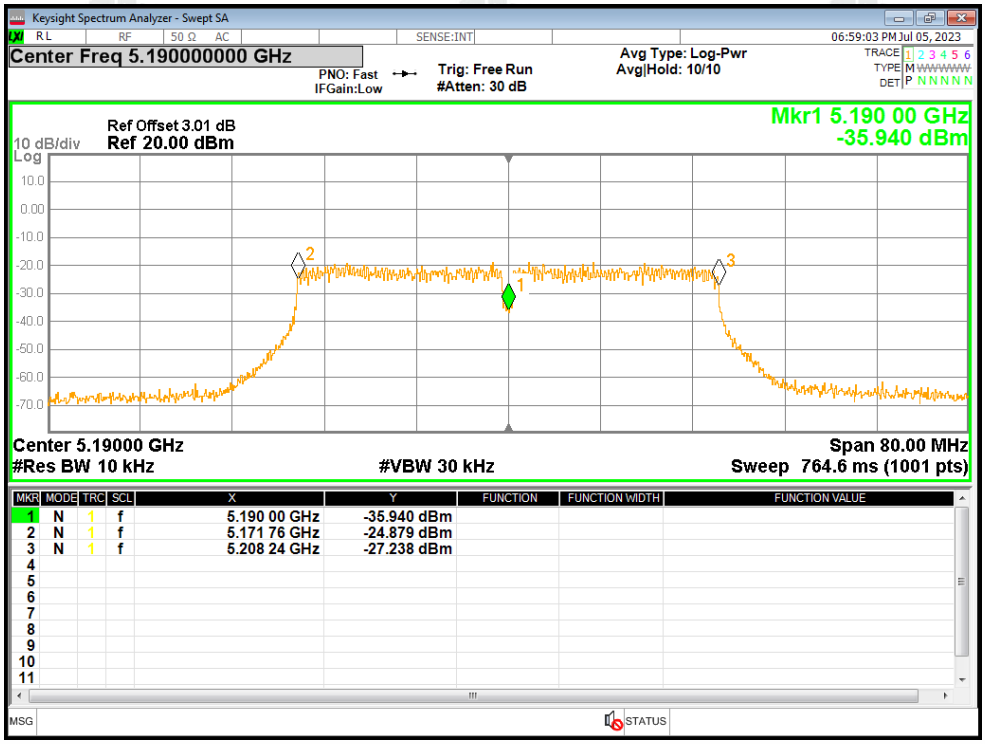
Freq. Stability NVNT ac20 5200MHz Ant1



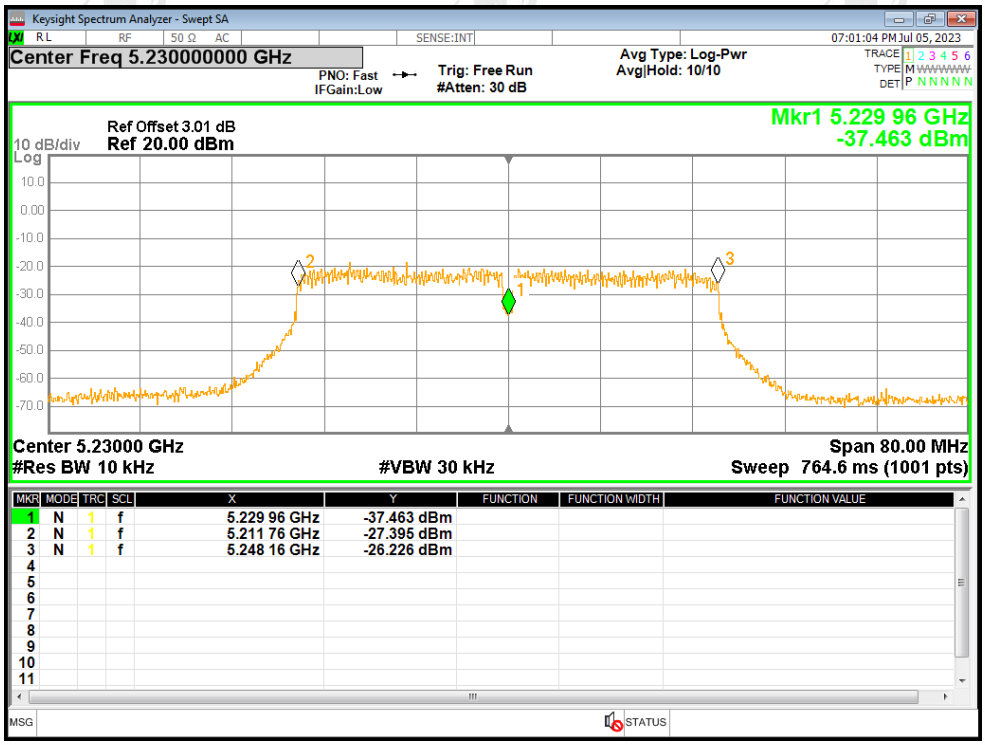
Freq. Stability NVNT ac20 5240MHz Ant1



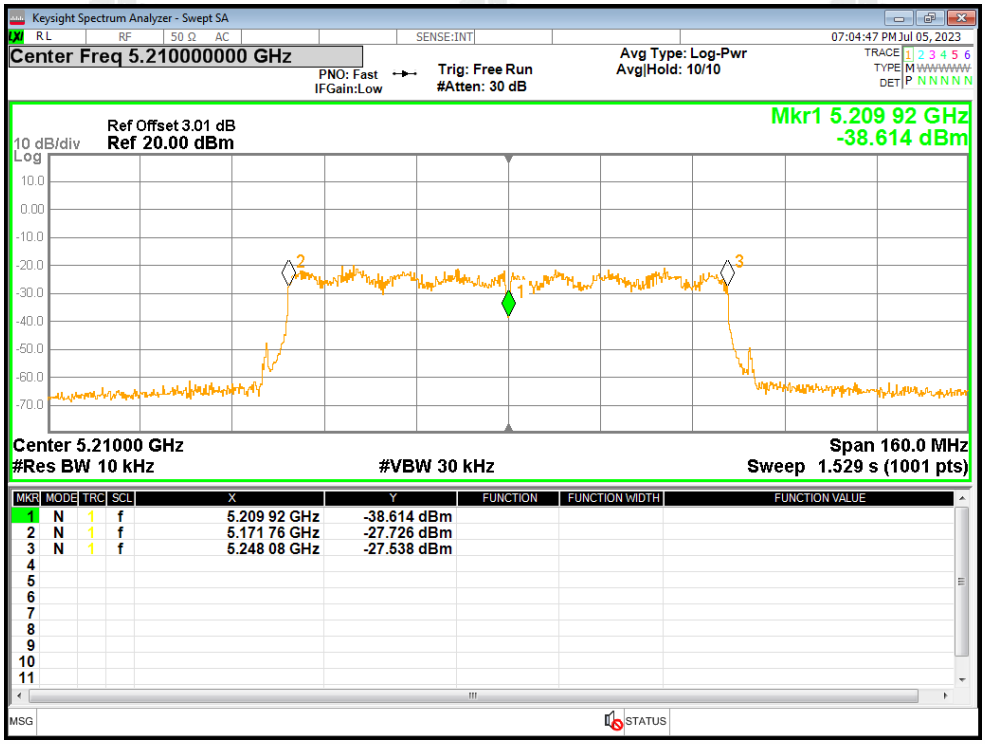
Freq. Stability NVNT ac40 5190MHz Ant1



Freq. Stability NVNT ac40 5230MHz Ant1



Freq. Stability NVNT ac80 5210MHz Ant1

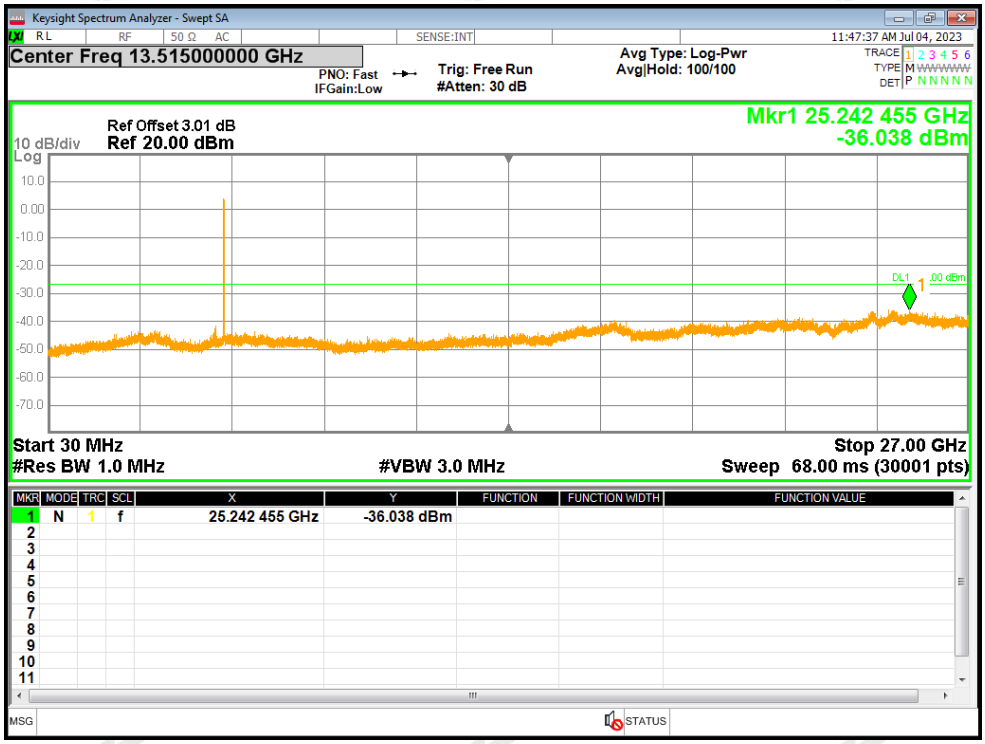


A8.Conducted RF Spurious Emission

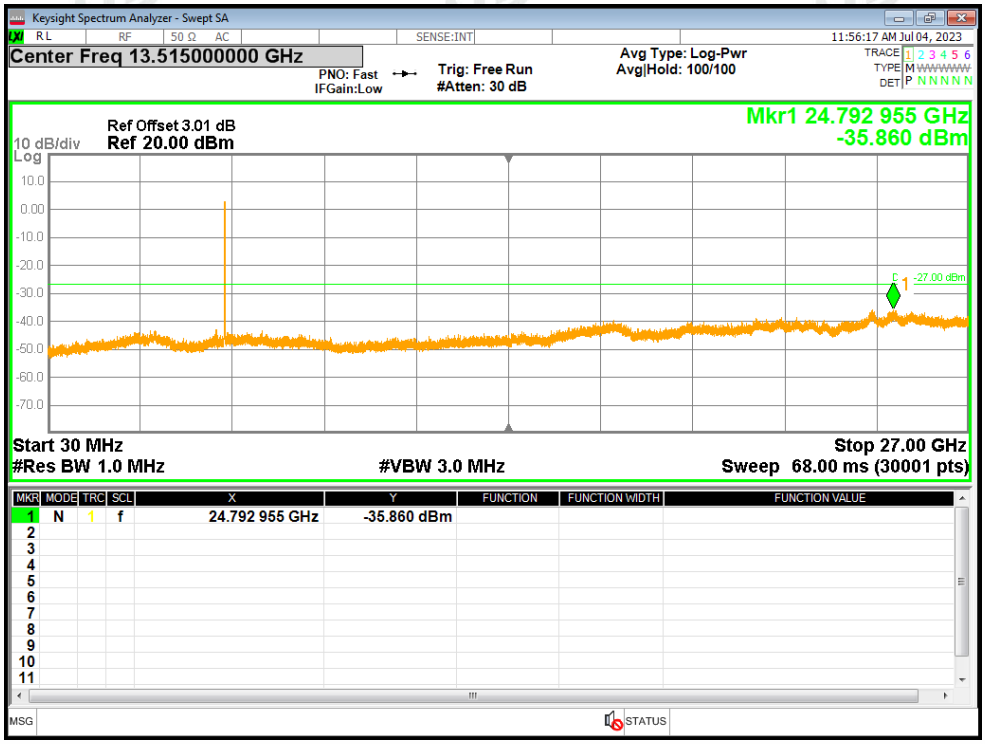
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	a	5180	Ant1	-36.03	-27	Pass
NVNT	a	5200	Ant1	-35.86	-27	Pass
NVNT	a	5240	Ant1	-35.89	-27	Pass
NVNT	n20	5180	Ant1	-34.75	-27	Pass
NVNT	n20	5200	Ant1	-35.59	-27	Pass
NVNT	n20	5240	Ant1	-35.22	-27	Pass
NVNT	n40	5190	Ant1	-35.3	-27	Pass
NVNT	n40	5230	Ant1	-35.34	-27	Pass
NVNT	ac20	5180	Ant1	-35.57	-27	Pass
NVNT	ac20	5200	Ant1	-35.64	-27	Pass
NVNT	ac20	5240	Ant1	-35.21	-27	Pass
NVNT	ac40	5190	Ant1	-34.76	-27	Pass
NVNT	ac40	5230	Ant1	-35.1	-27	Pass
NVNT	ac80	5210	Ant1	-36.06	-27	Pass

Test Graphs

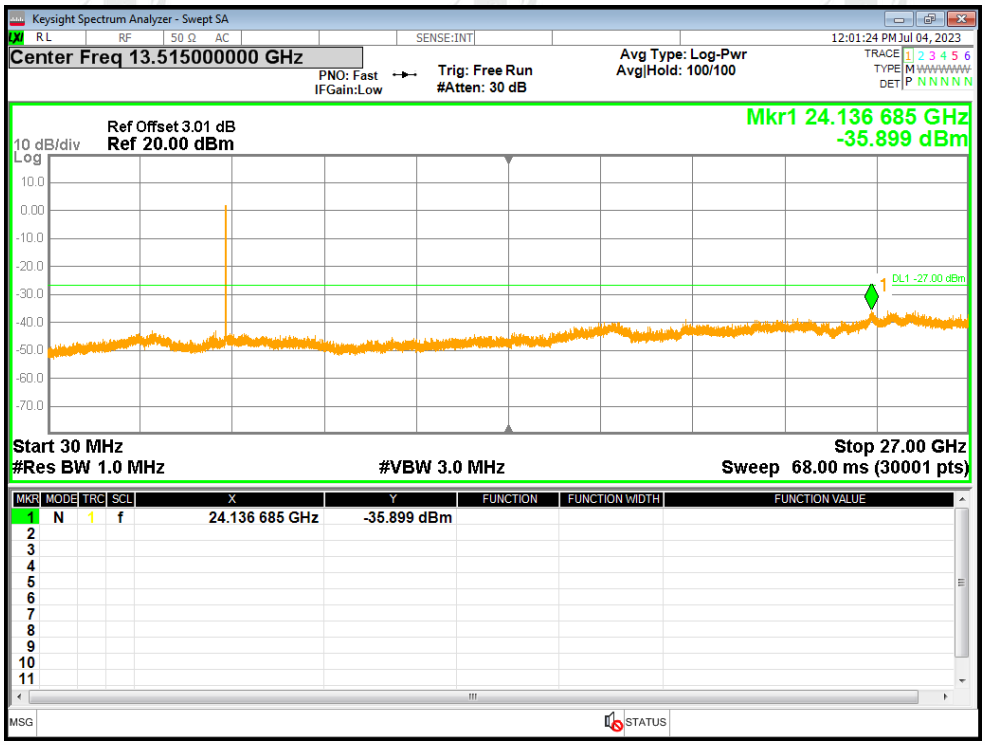
Tx. Spurious NVNT a 5180MHz Ant1 Emission



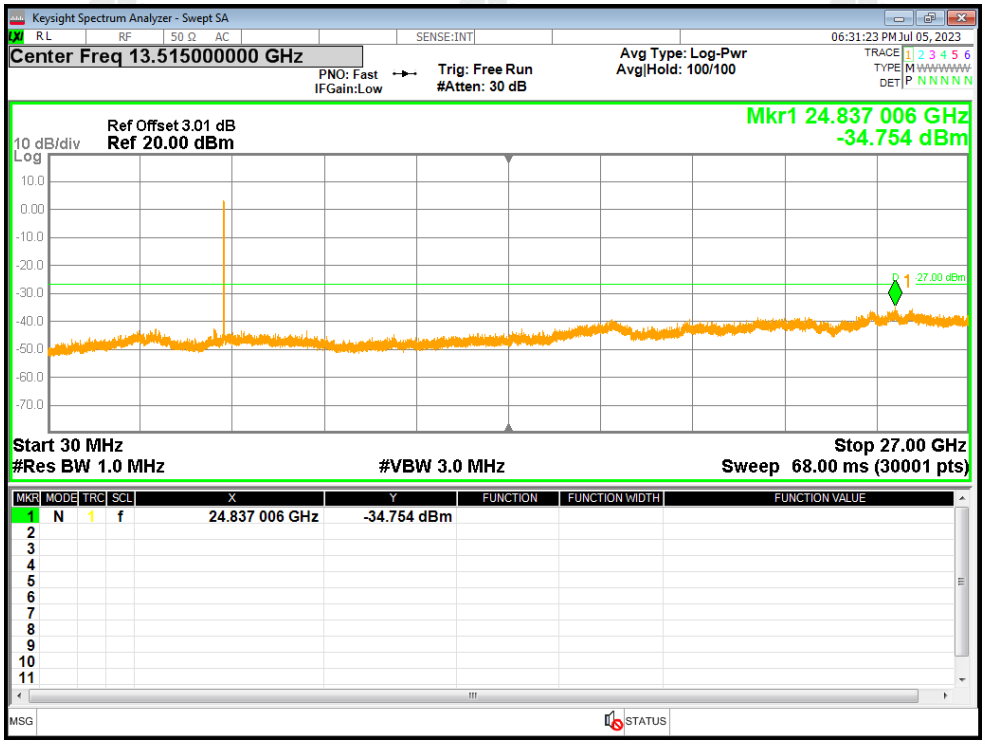
Tx. Spurious NVNT a 5200MHz Ant1 Emission



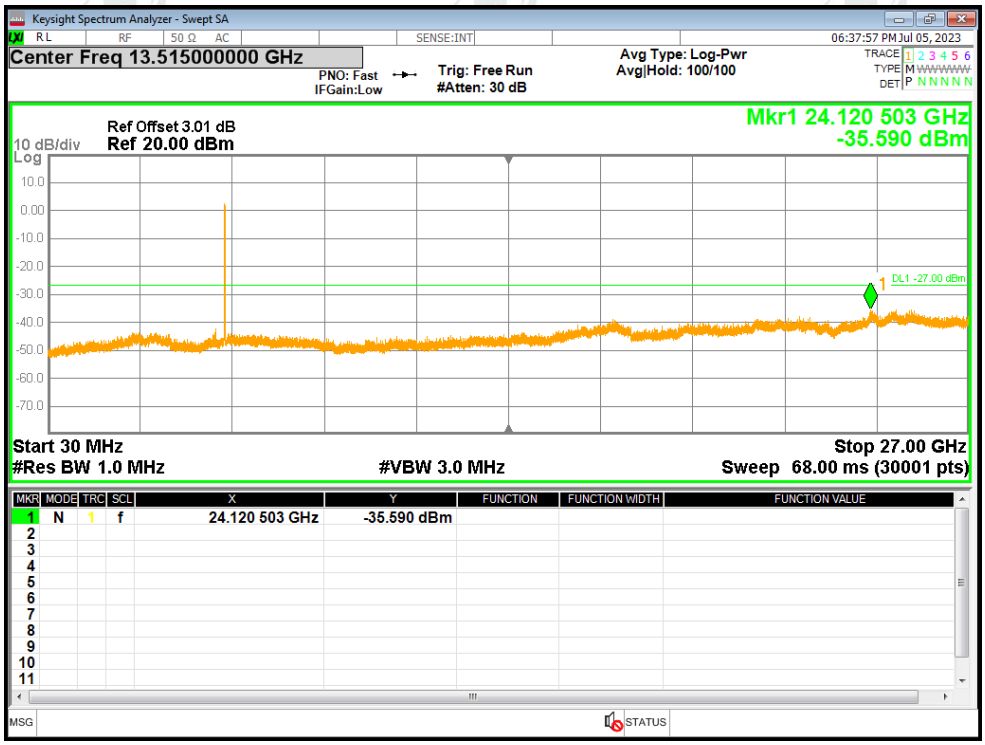
Tx. Spurious NVNT a 5240MHz Ant1 Emission



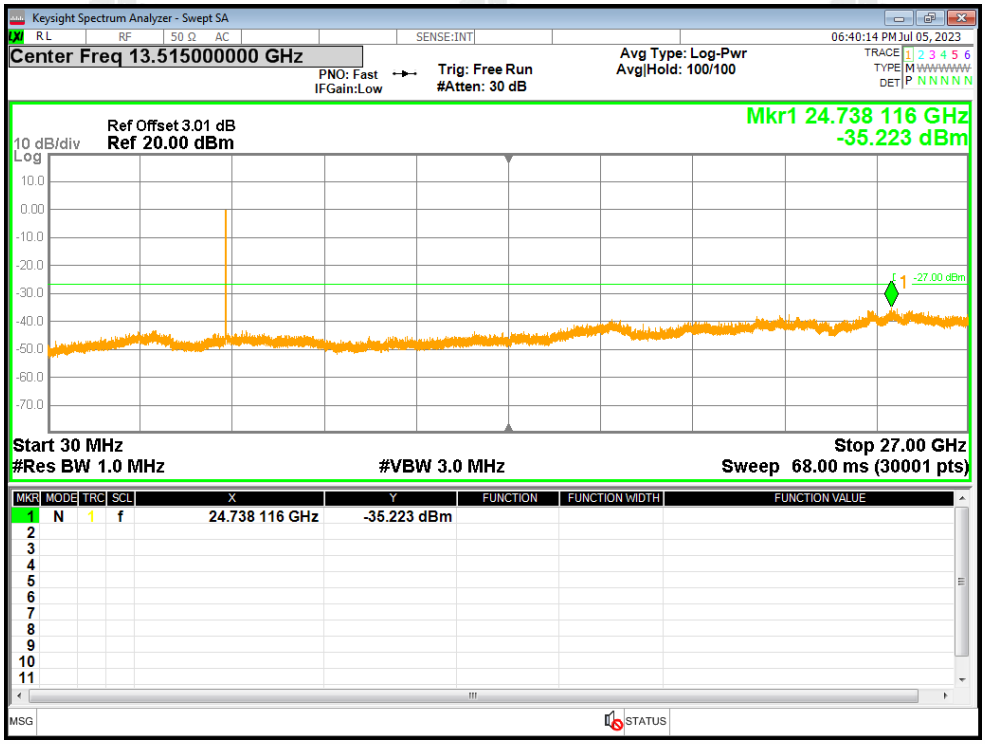
Tx. Spurious NVNT n20 5180MHz Ant1 Emission



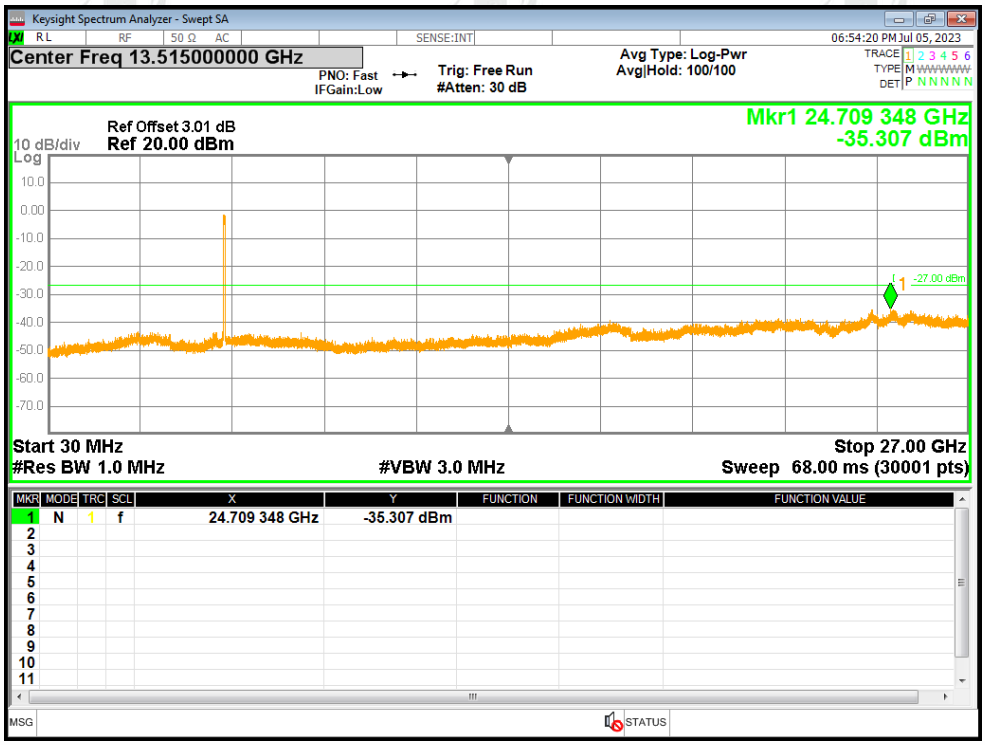
Tx. Spurious NVNT n20 5200MHz Ant1 Emission



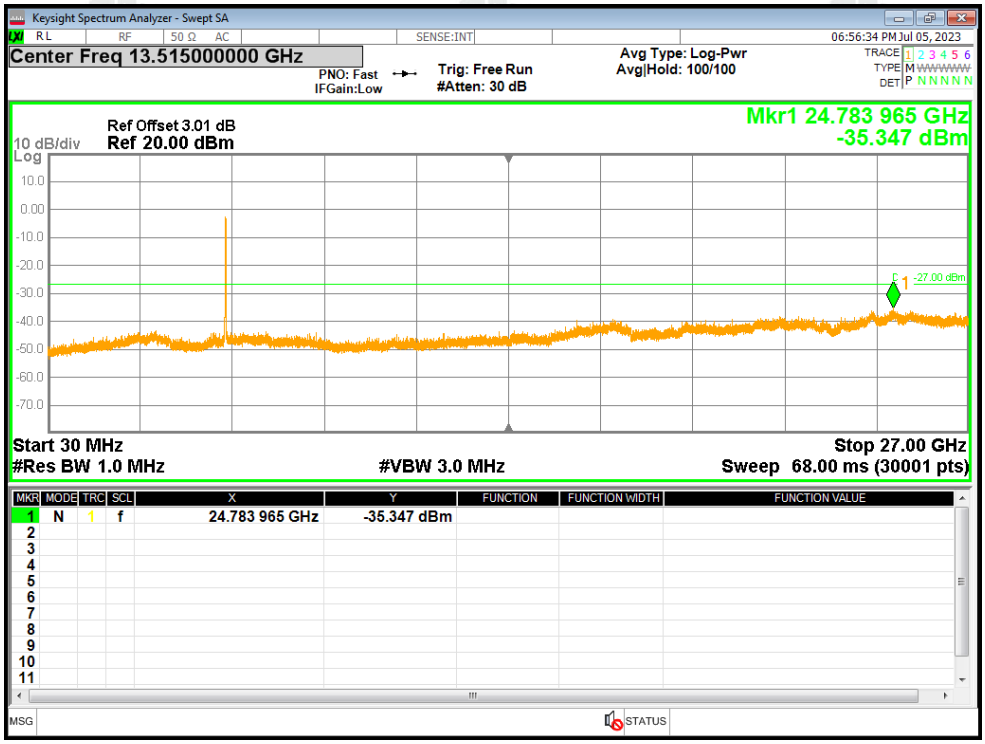
Tx. Spurious NVNT n20 5240MHz Ant1 Emission



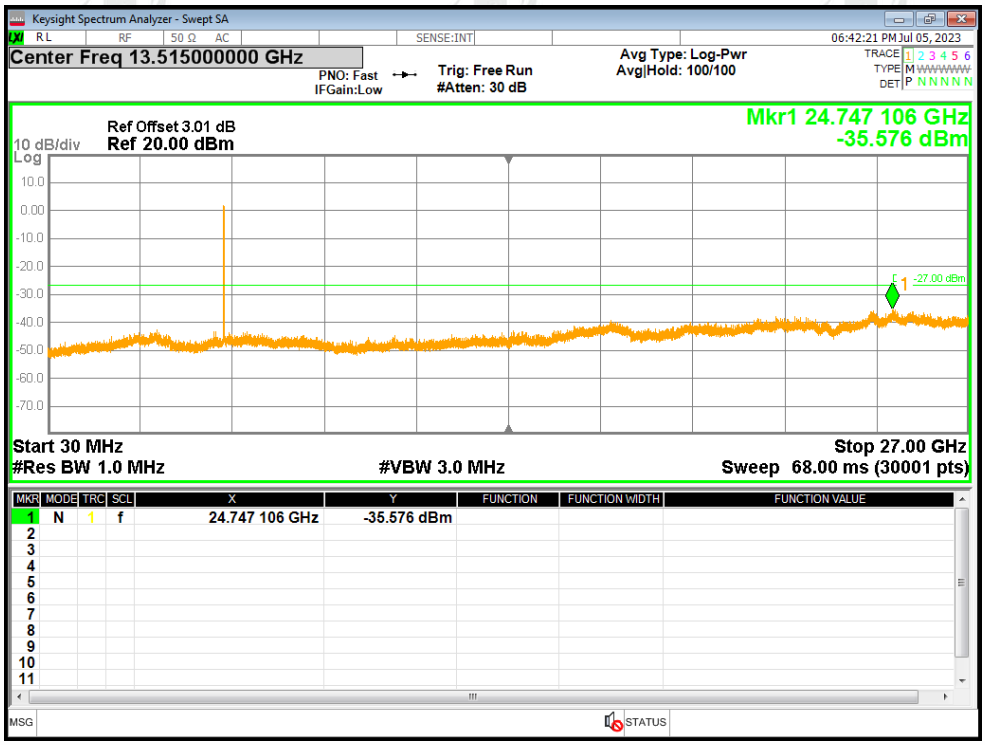
Tx. Spurious NVNT n40 5190MHz Ant1 Emission



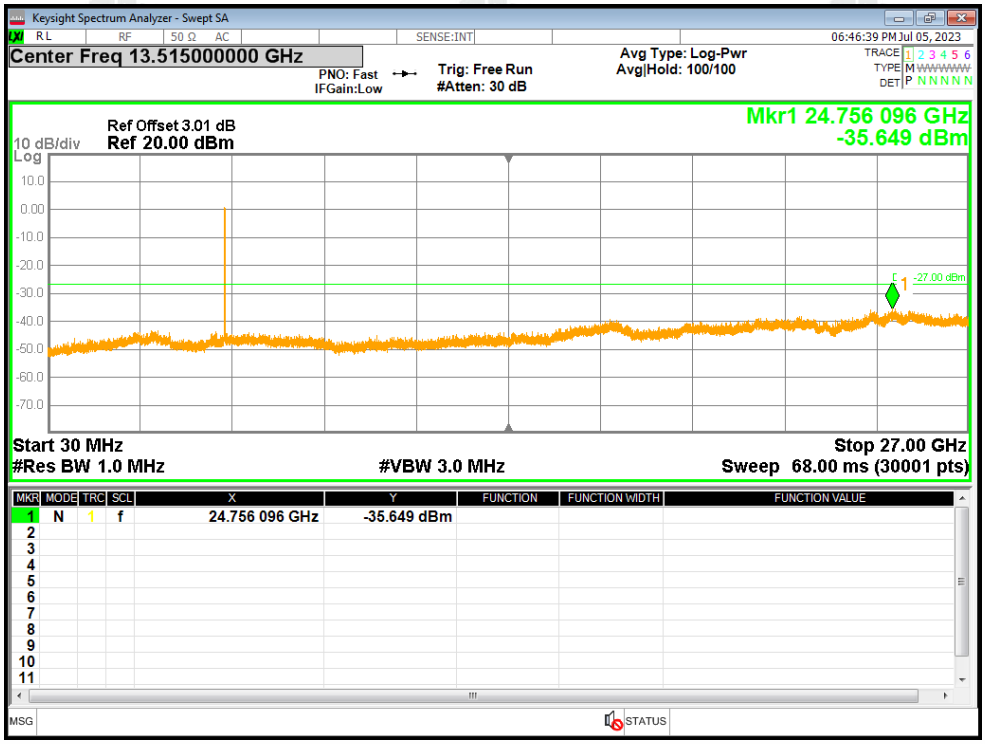
Tx. Spurious NVNT n40 5230MHz Ant1 Emission



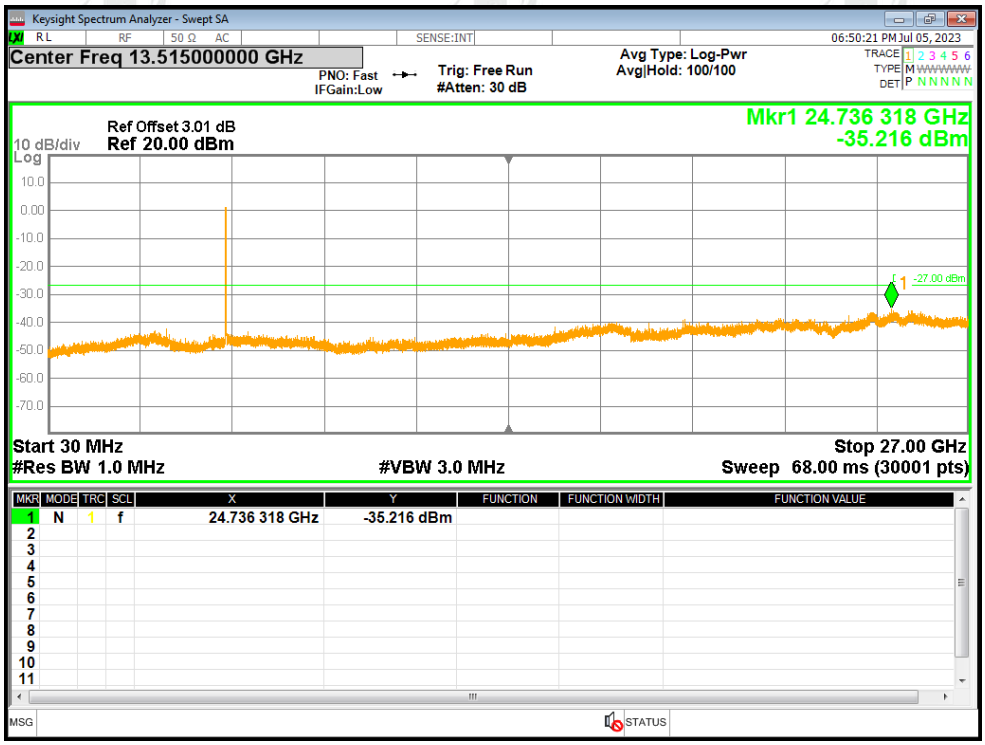
Tx. Spurious NVNT ac20 5180MHz Ant1 Emission



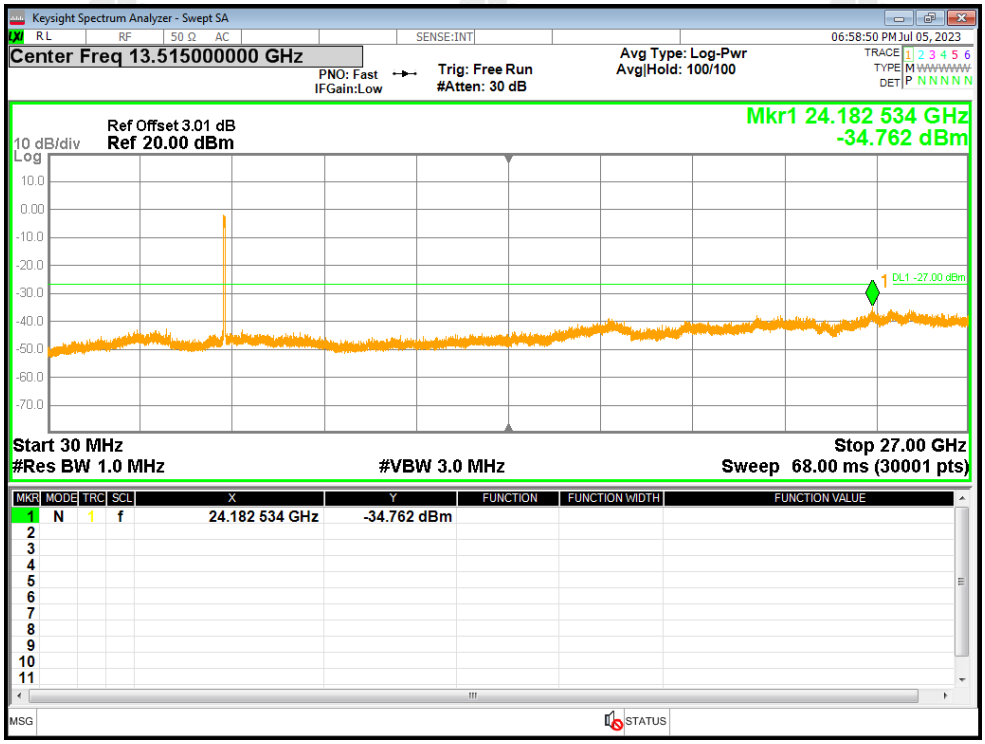
Tx. Spurious NVNT ac20 5200MHz Ant1 Emission



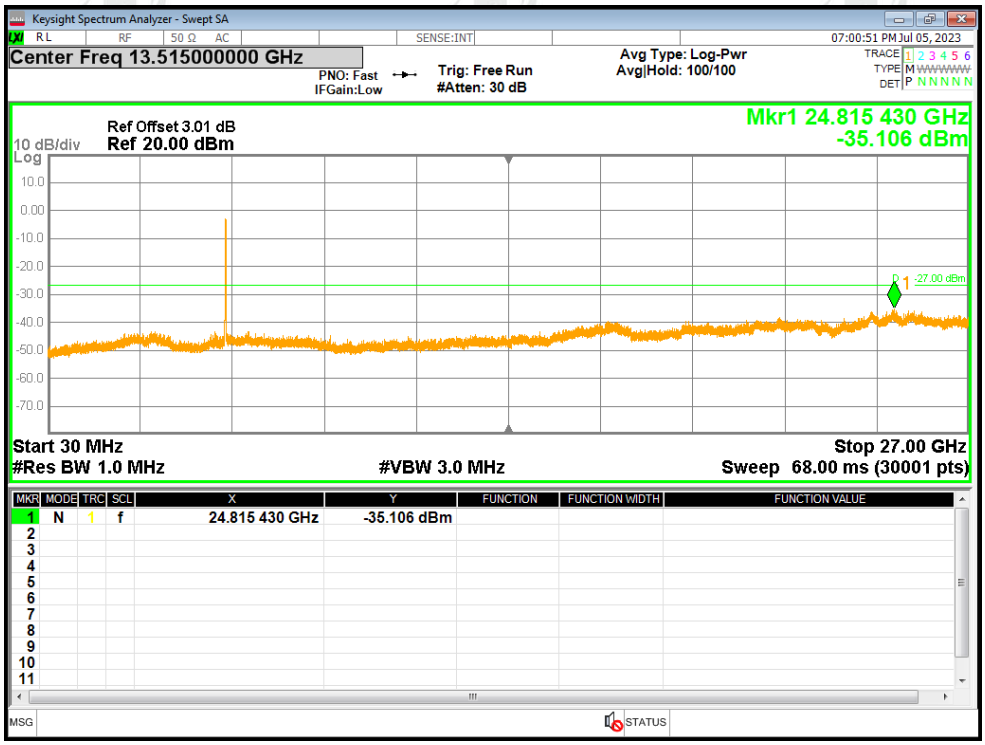
Tx. Spurious NVNT ac20 5240MHz Ant1 Emission



Tx. Spurious NVNT ac40 5190MHz Ant1 Emission



Tx. Spurious NVNT ac40 5230MHz Ant1 Emission



Tx. Spurious NVNT ac80 5210MHz Ant1 Emission