

Appendix B for 5GWIFI Test Data

Product Name: iSmart-Automotive Diagnostic System

Test Model: iSmart810

Environmental Conditions

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



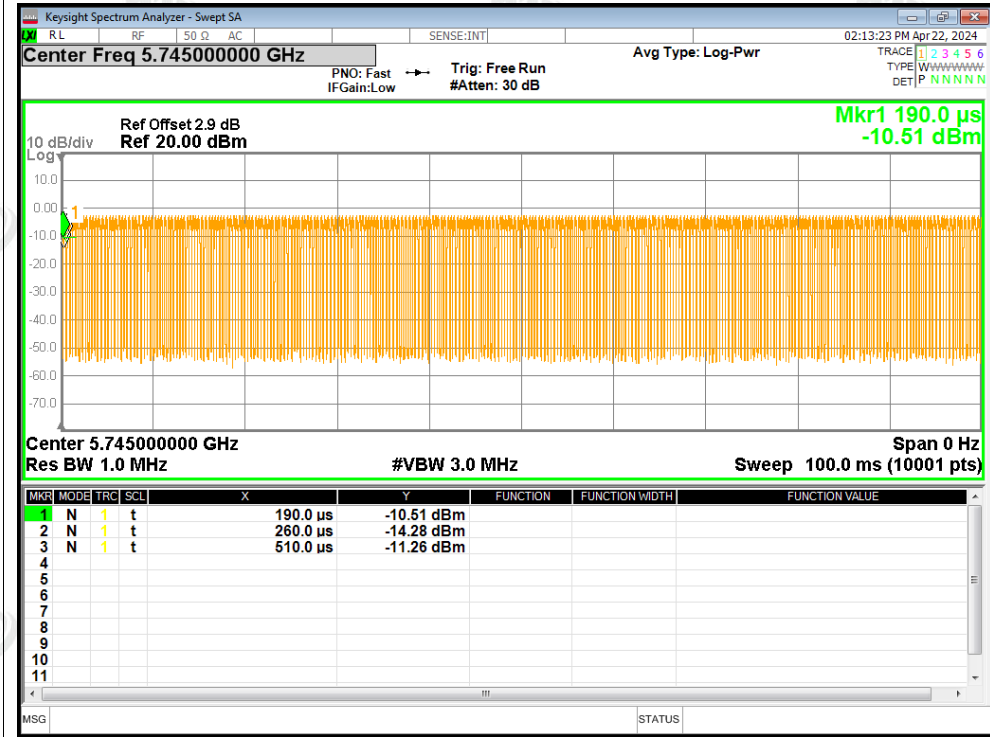
B1. Duty Cycle

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5745	Ant1	78.13	1.07	4
NVNT	a	5785	Ant1	73.53	1.34	4
NVNT	a	5825	Ant1	80	0.97	4.17
NVNT	n20	5745	Ant1	91.87	0.37	0.52
NVNT	n20	5785	Ant1	96.97	0.13	0.52
NVNT	n20	5825	Ant1	97.46	0.11	0.52
NVNT	n40	5755	Ant1	60	2.22	8.33
NVNT	n40	5795	Ant1	68.42	1.65	7.69
NVNT	ac20	5745	Ant1	76.92	1.14	5
NVNT	ac20	5785	Ant1	76.92	1.14	5
NVNT	ac20	5825	Ant1	68.97	1.61	5
NVNT	ac40	5755	Ant1	64.71	1.89	9.09
NVNT	ac40	5795	Ant1	66.67	1.76	10
NVNT	ac80	5775	Ant1	27.78	5.56	20

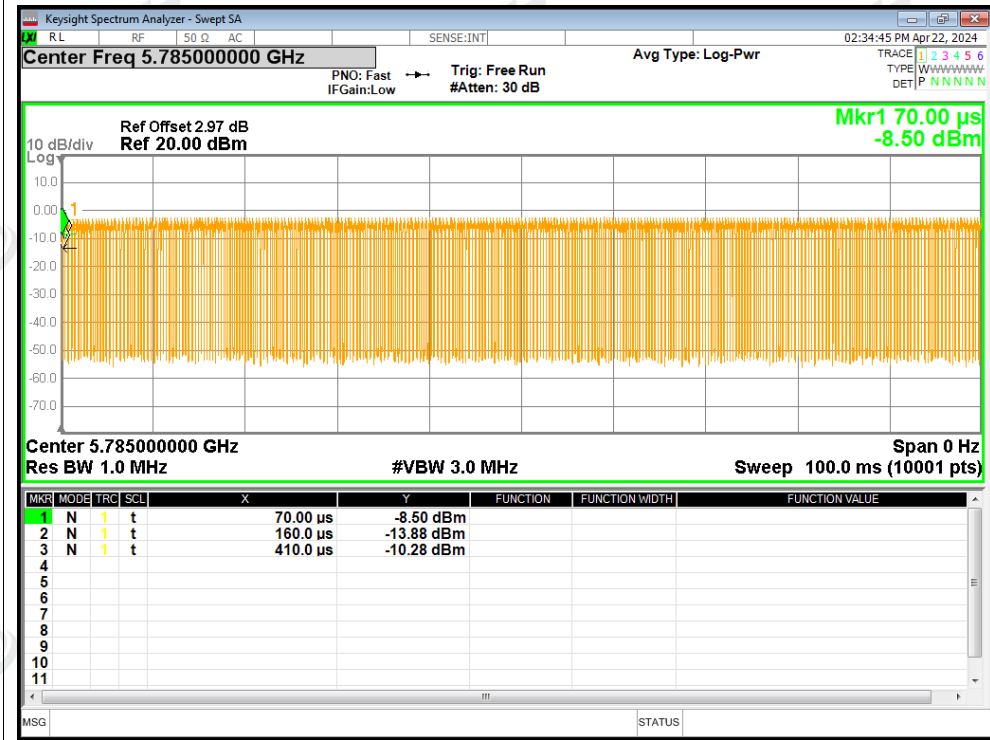


Test Graphs

Duty Cycle NVNT a 5745MHz Ant1

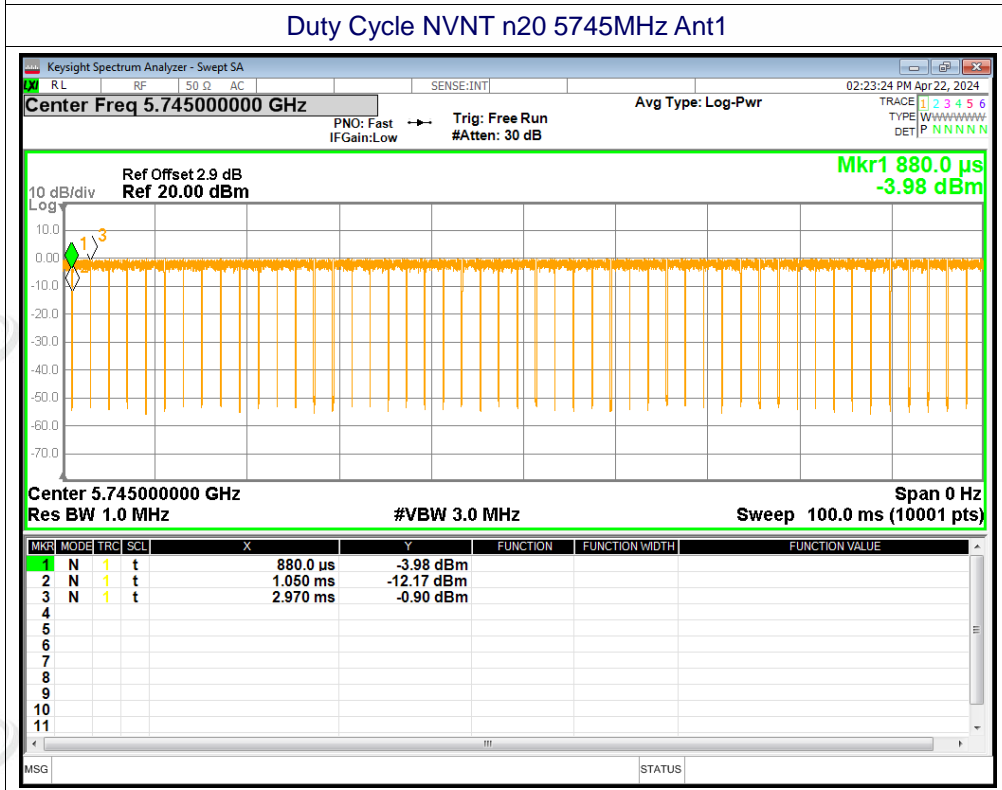
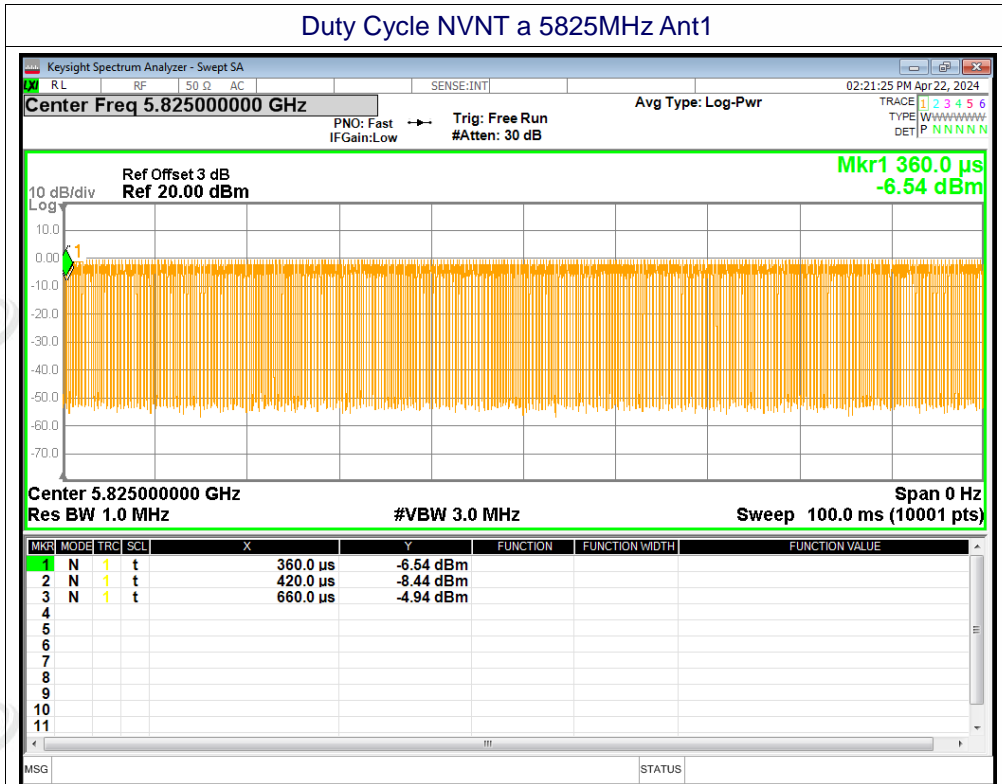


Duty Cycle NVNT a 5785MHz Ant1





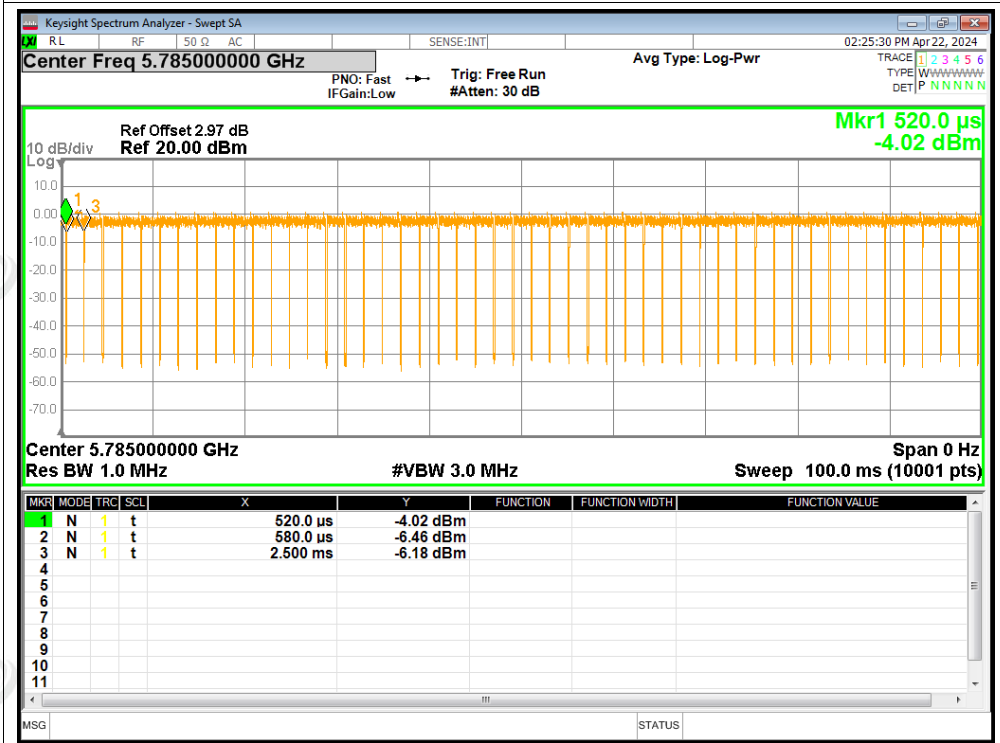
ZHONGHAN



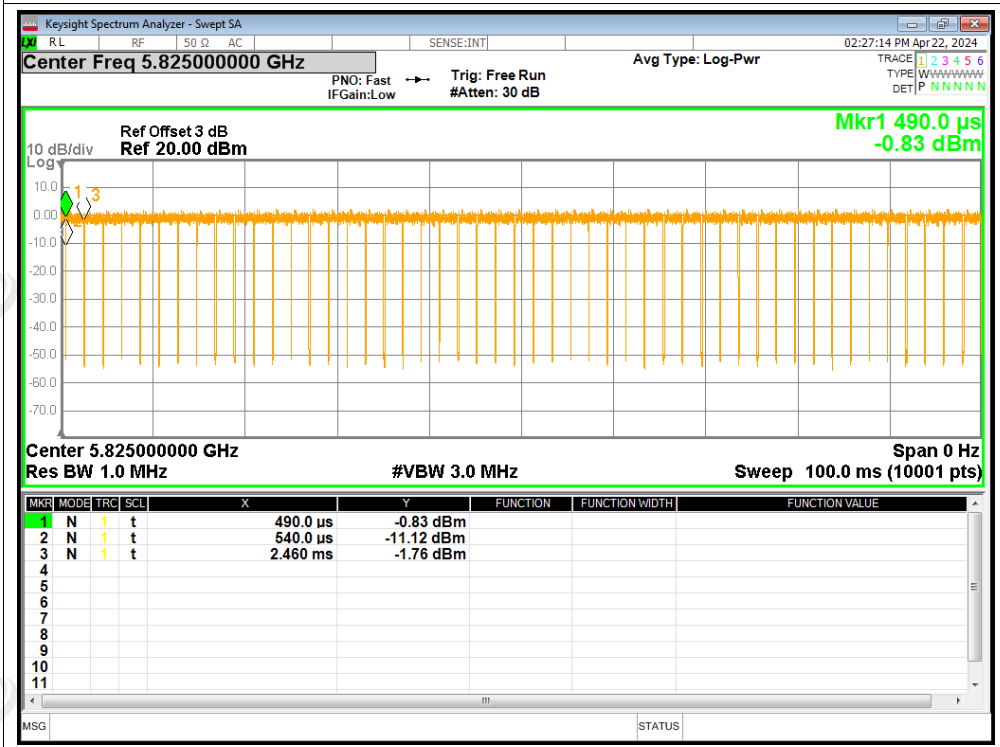


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Duty Cycle NVNT n20 5785MHz Ant1



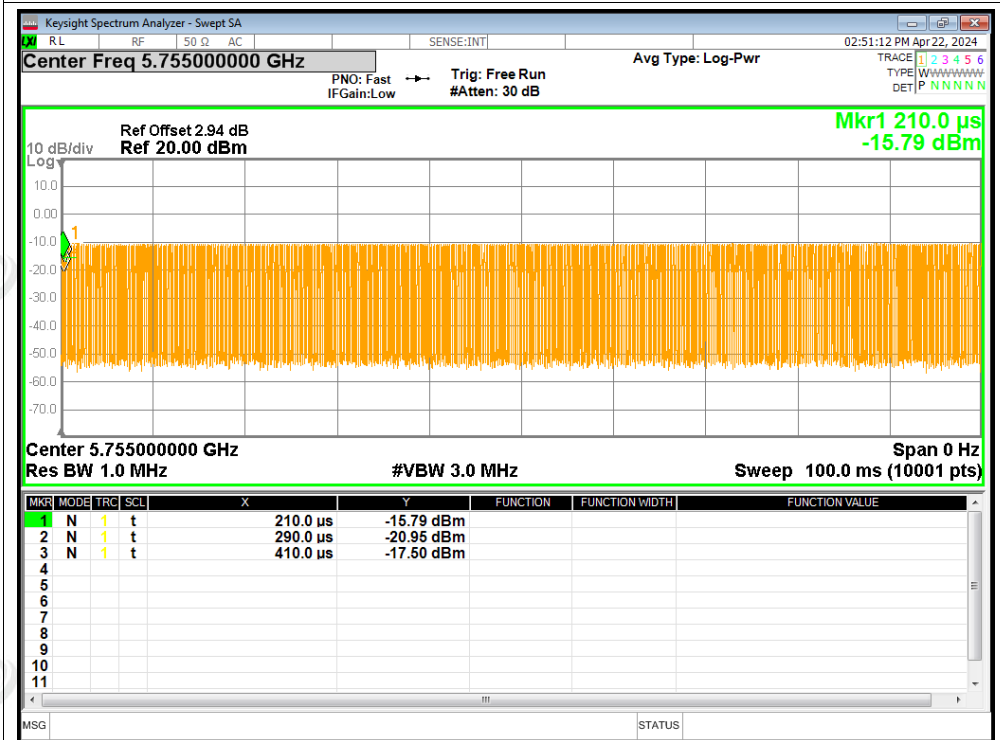
Duty Cycle NVNT n20 5825MHz Ant1



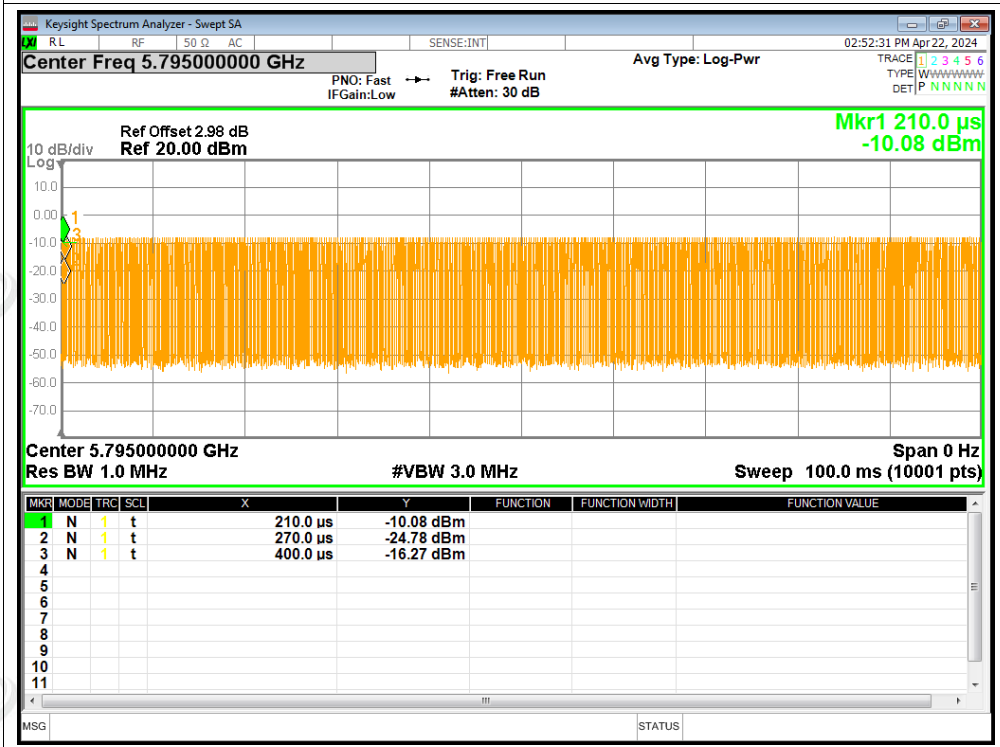


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Duty Cycle NVNT n40 5755MHz Ant1

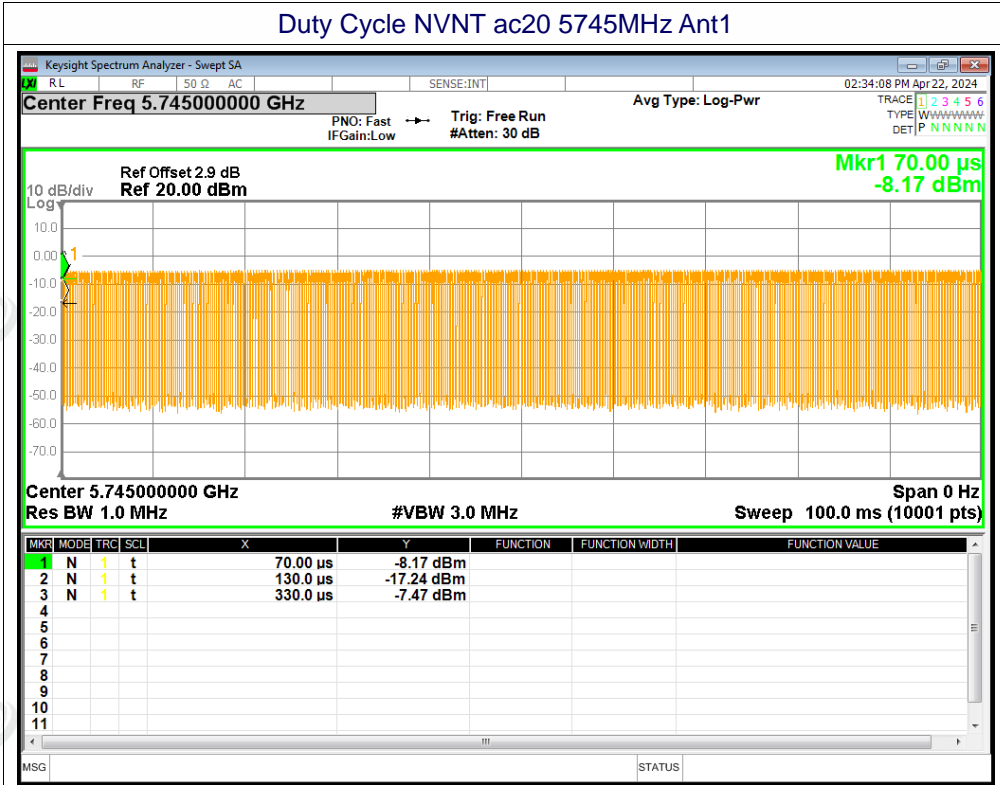


Duty Cycle NVNT n40 5795MHz Ant1

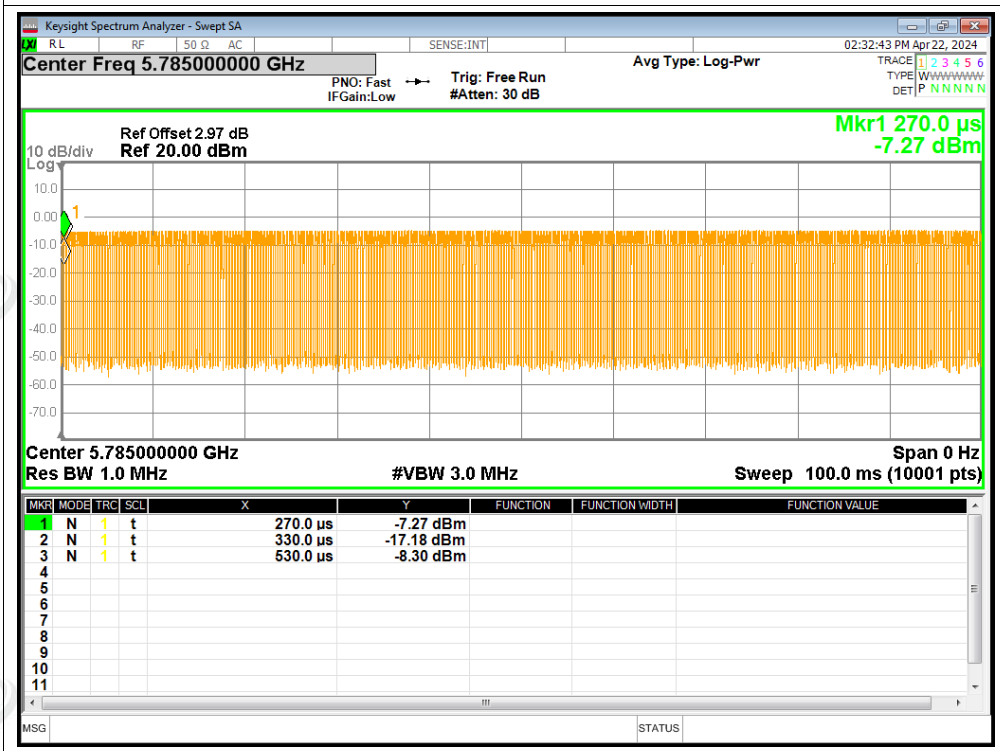




Duty Cycle NVNT ac20 5745MHz Ant1

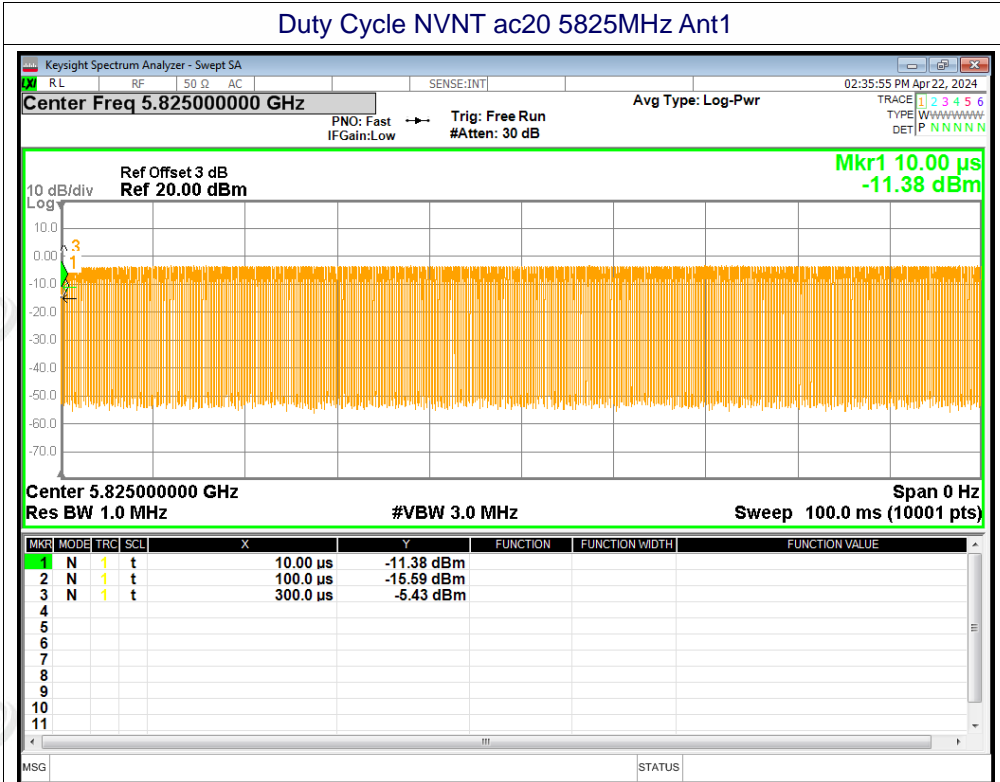


Duty Cycle NVNT ac20 5785MHz Ant1

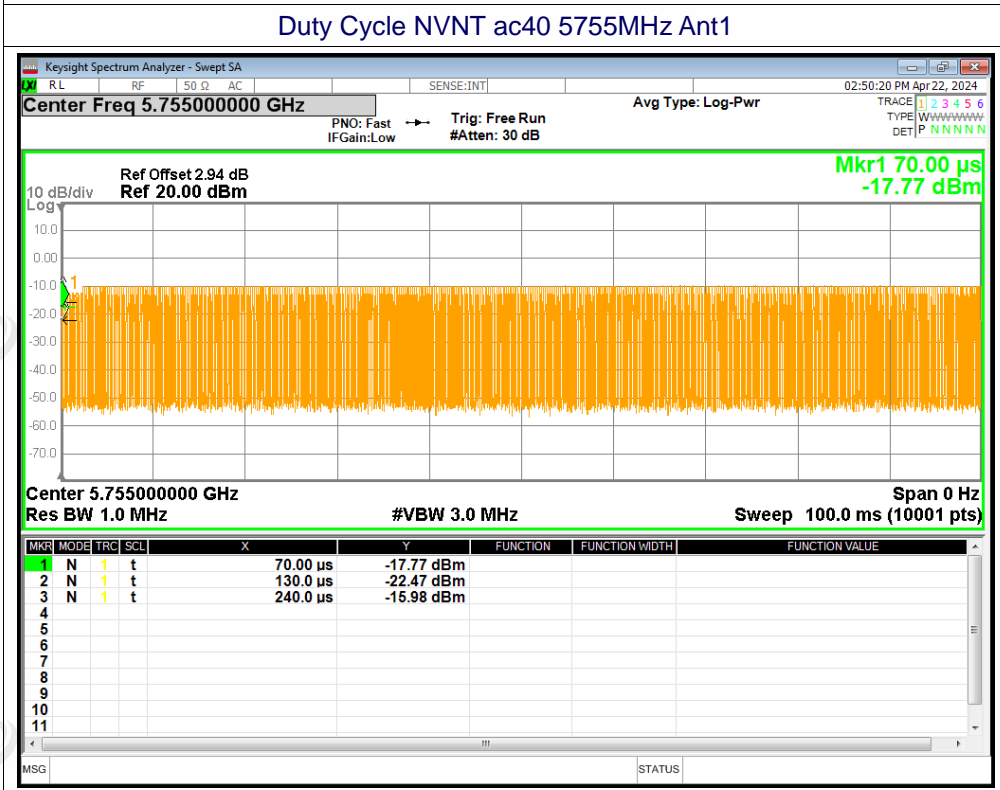




Duty Cycle NVNT ac20 5825MHz Ant1

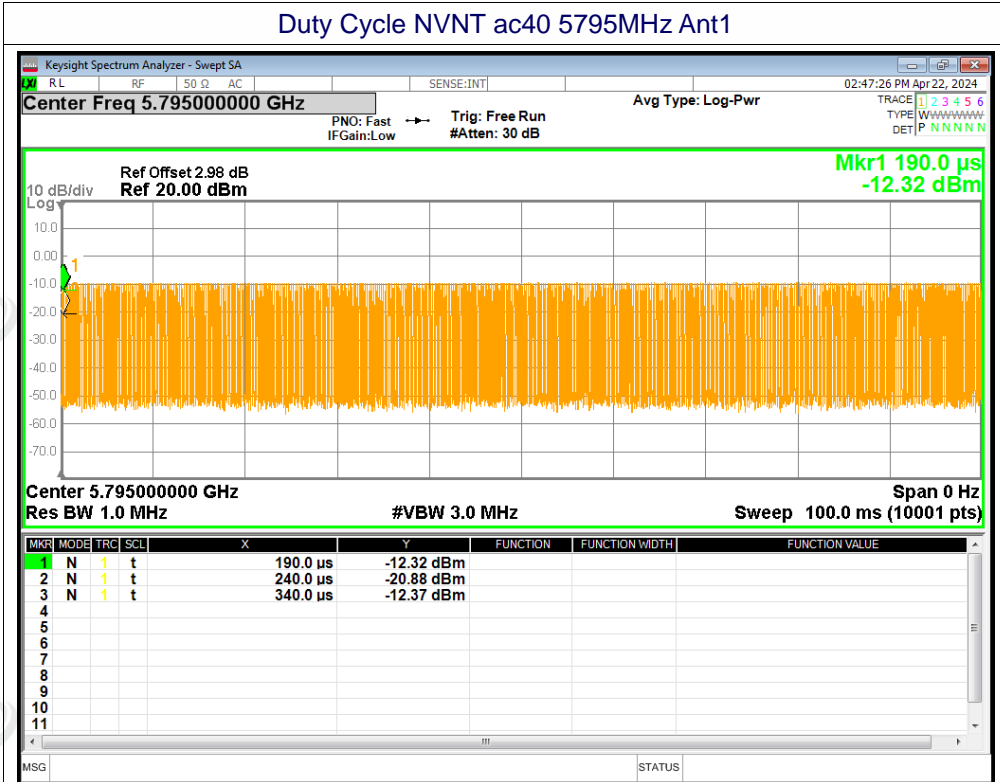


Duty Cycle NVNT ac40 5755MHz Ant1

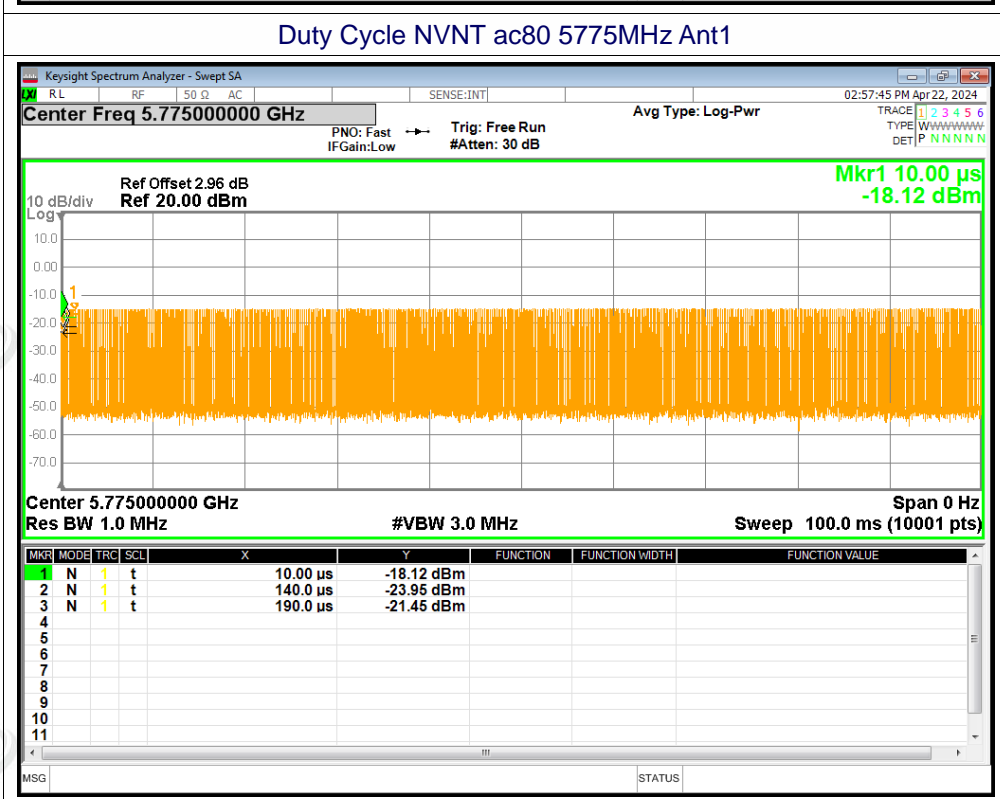




Duty Cycle NVNT ac40 5795MHz Ant1



Duty Cycle NVNT ac80 5775MHz Ant1



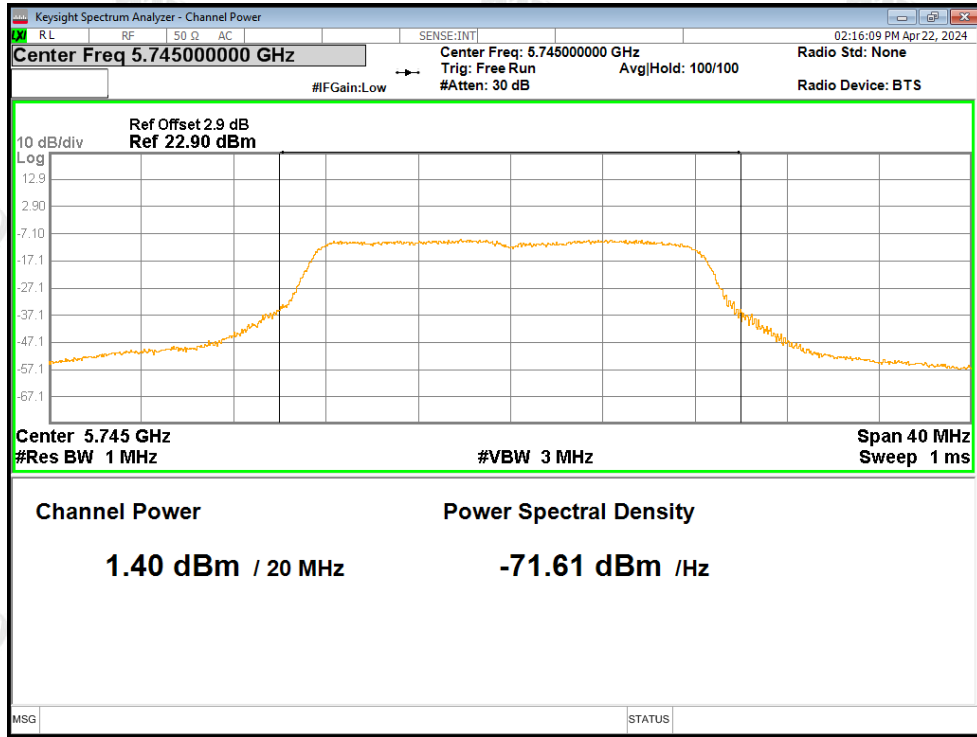
**ZHONGHAN****B2. Maximum Conducted Output Power**

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	Ant1	1.4	1.07	2.47	30	Pass
NVNT	a	5785	Ant1	1.77	1.93	3.7	30	Pass
NVNT	a	5825	Ant1	2.77	0.97	3.74	30	Pass
NVNT	n20	5745	Ant1	5.75	0.37	6.12	30	Pass
NVNT	n20	5785	Ant1	5.76	0.13	5.89	30	Pass
NVNT	n20	5825	Ant1	6.88	0.11	6.99	30	Pass
NVNT	n40	5755	Ant1	0.01	3.98	3.99	30	Pass
NVNT	n40	5795	Ant1	0.61	0.35	0.96	30	Pass
NVNT	ac20	5745	Ant1	-1.12	1.76	0.64	30	Pass
NVNT	ac20	5785	Ant1	-0.68	2.43	1.75	30	Pass
NVNT	ac20	5825	Ant1	0.62	1.61	2.23	30	Pass
NVNT	ac40	5755	Ant1	-2.24	3.9	1.66	30	Pass
NVNT	ac40	5795	Ant1	-1.67	1.76	0.09	30	Pass
NVNT	ac80	5775	Ant1	-3.56	5.56	2	30	Pass

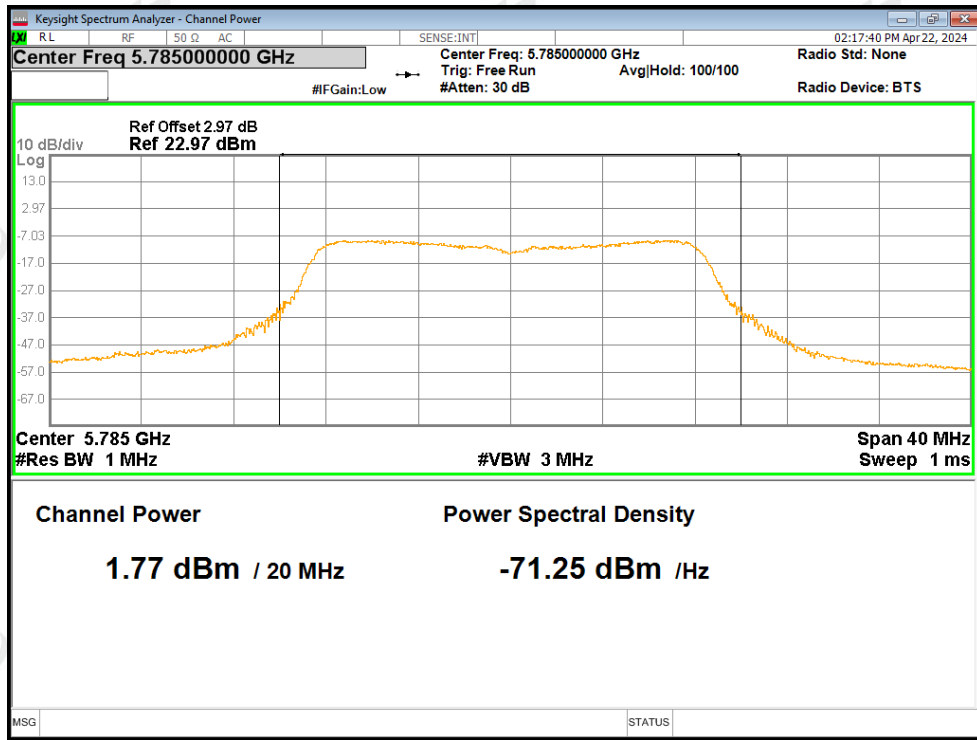


Test Graphs

Power NVNT a 5745MHz Ant1

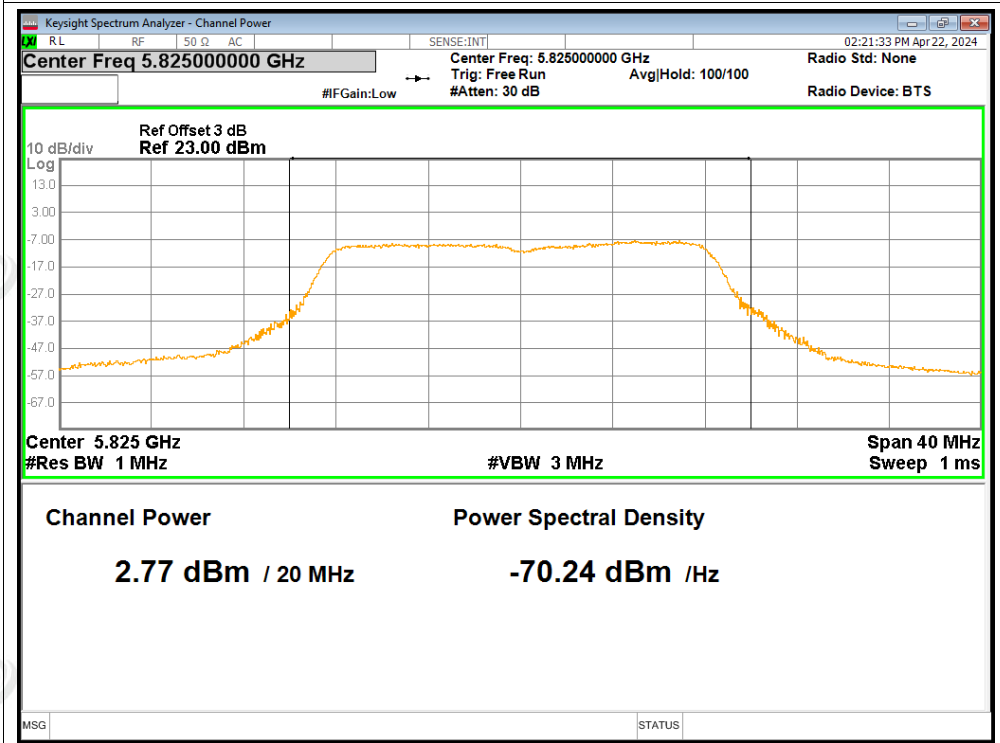


Power NVNT a 5785MHz Ant1

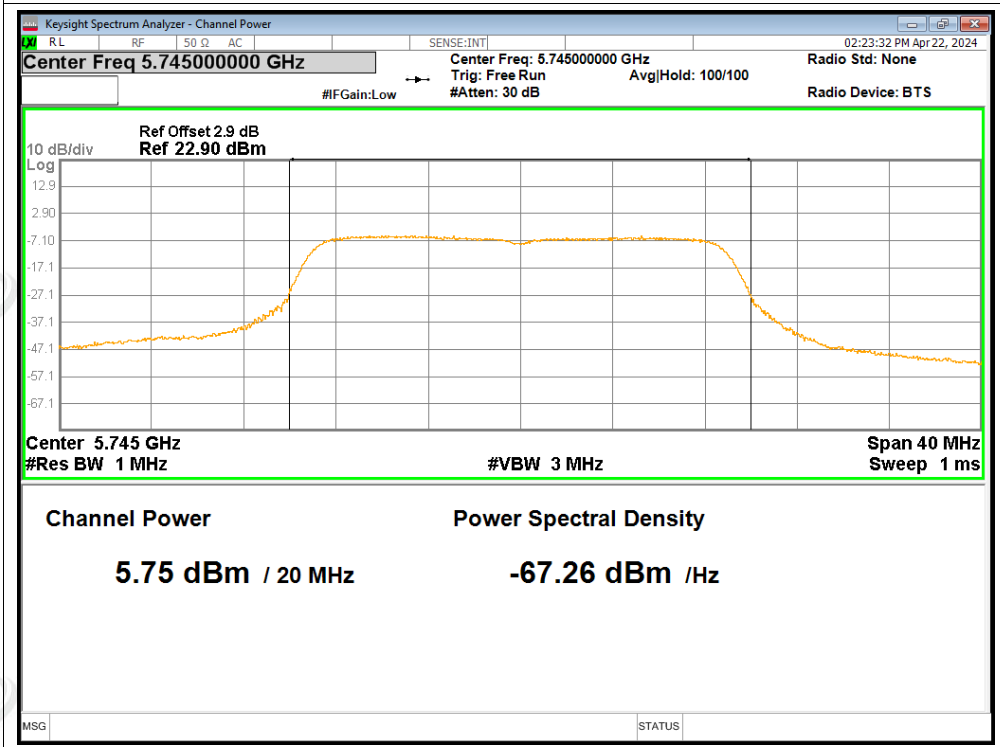




Power NVNT a 5825MHz Ant1

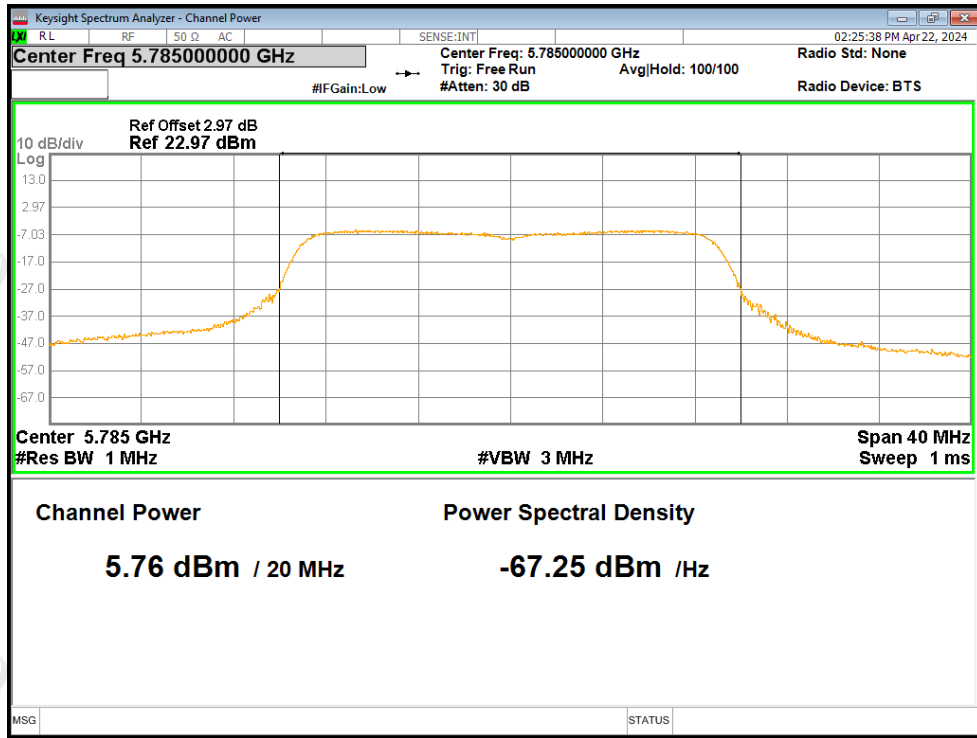


Power NVNT n20 5745MHz Ant1

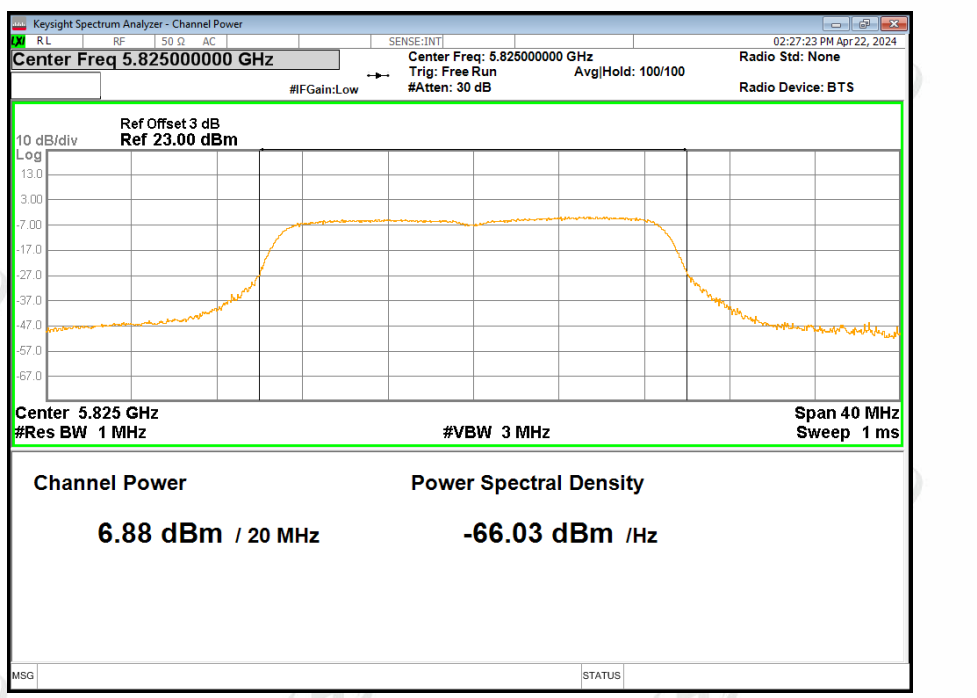




Power NVNT n20 5785MHz Ant1

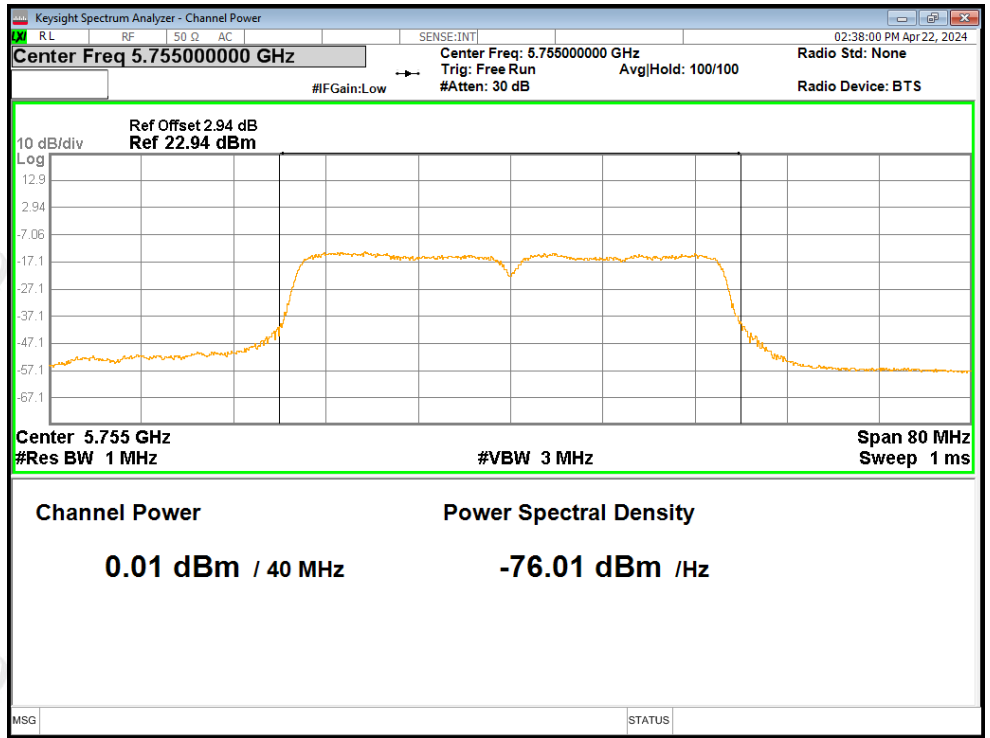


Power NVNT n20 5825MHz Ant1

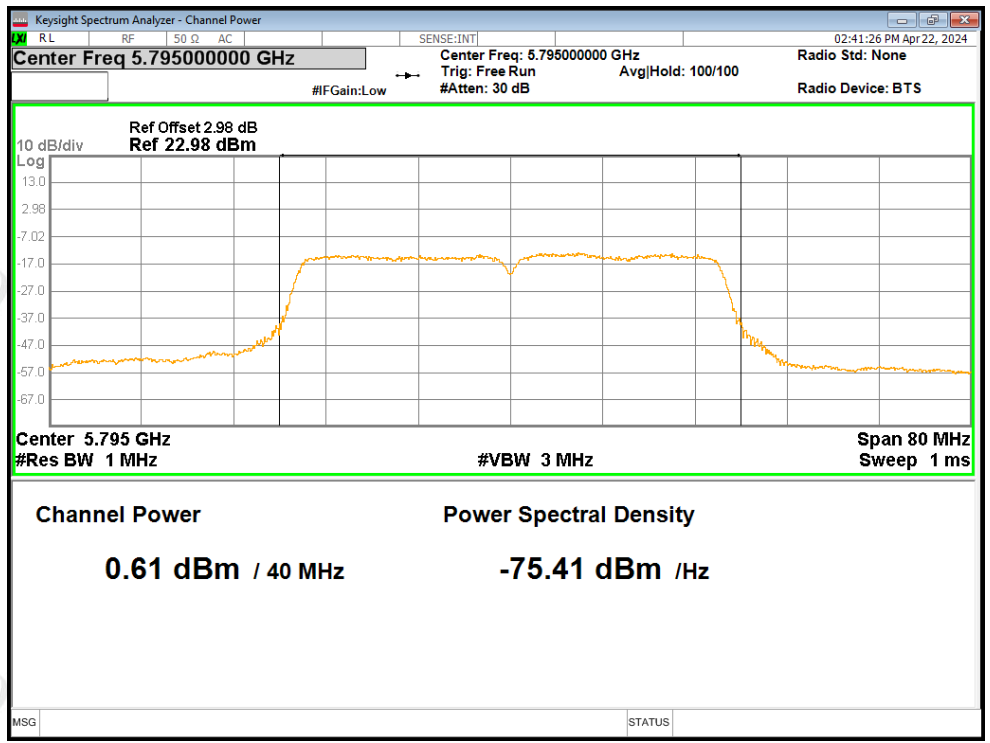




Power NVNT n40 5755MHz Ant1

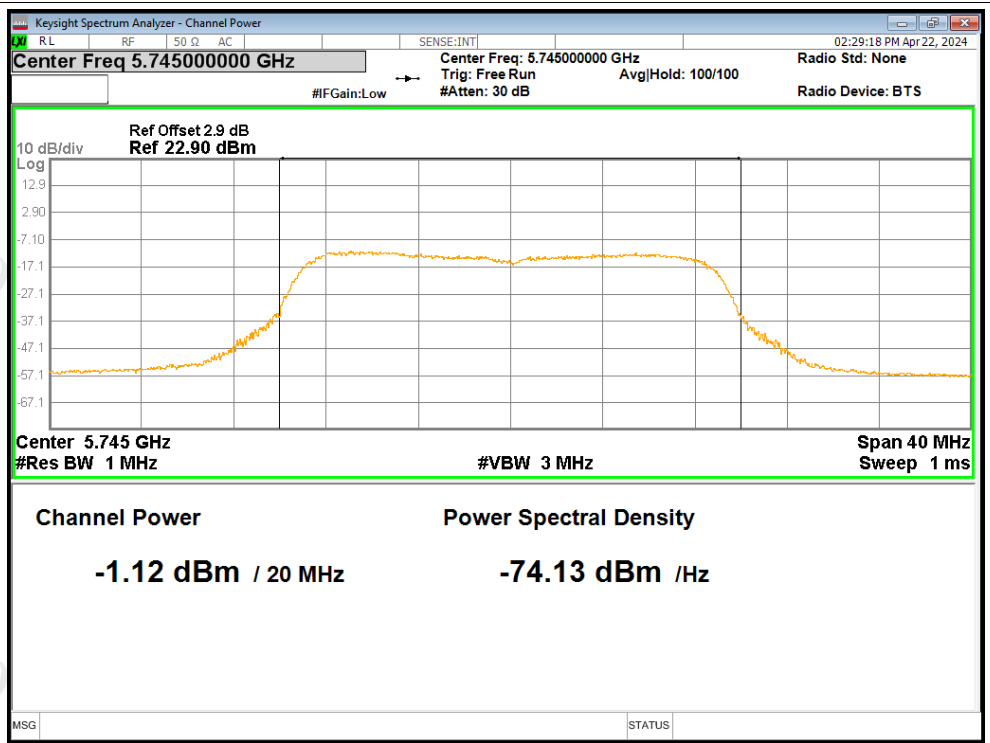


Power NVNT n40 5795MHz Ant1

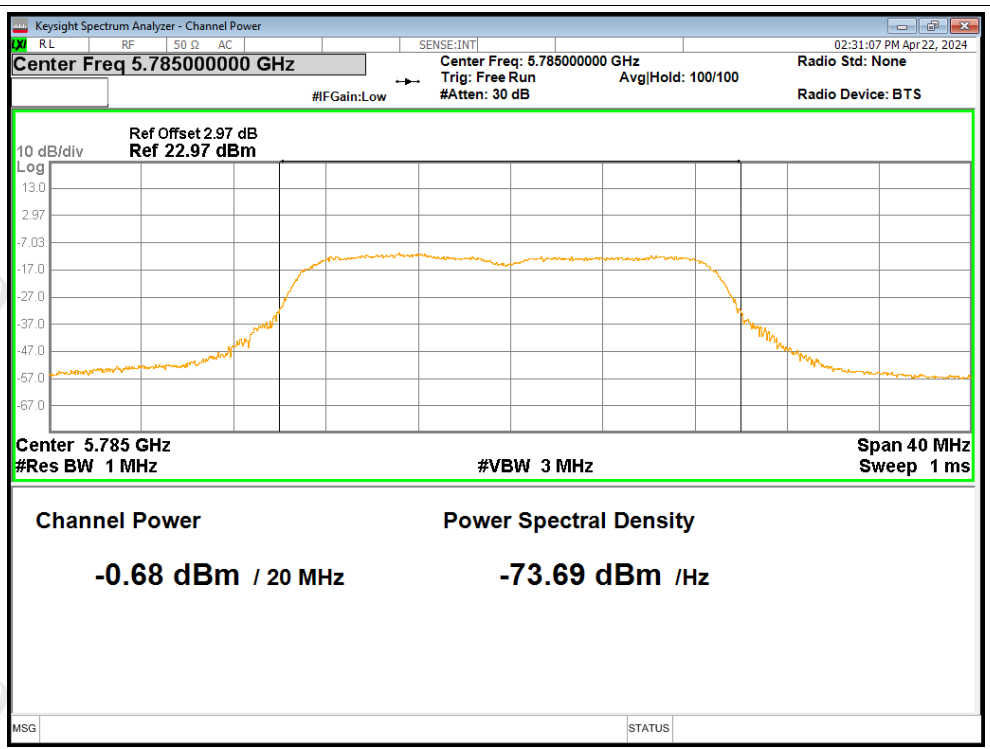




Power NVNT ac20 5745MHz Ant1

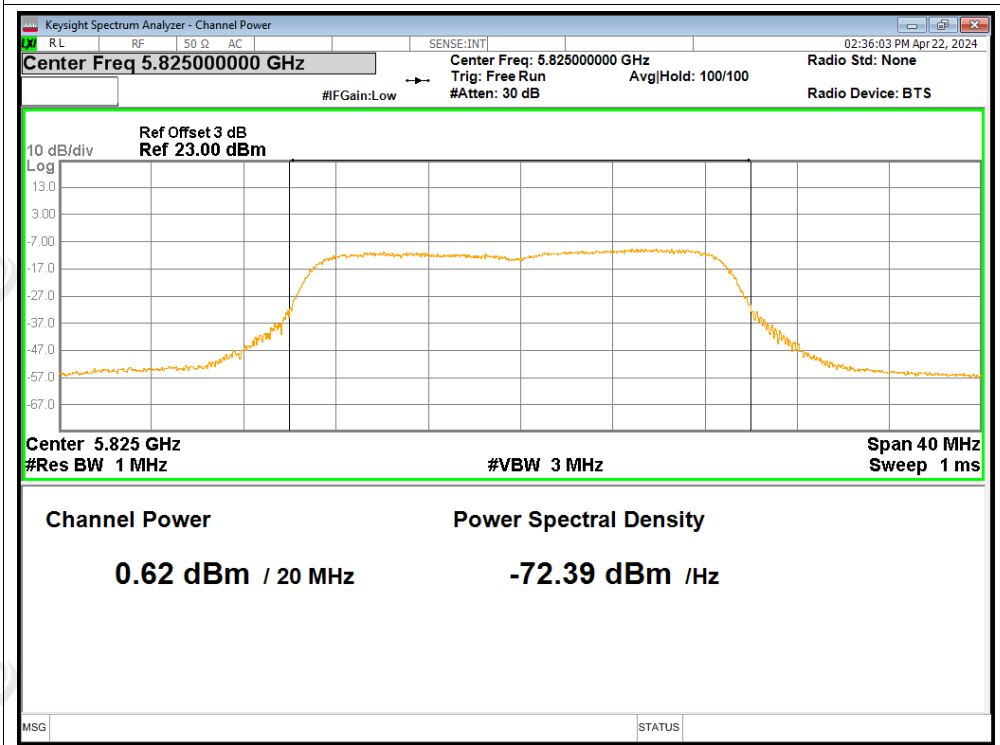


Power NVNT ac20 5785MHz Ant1

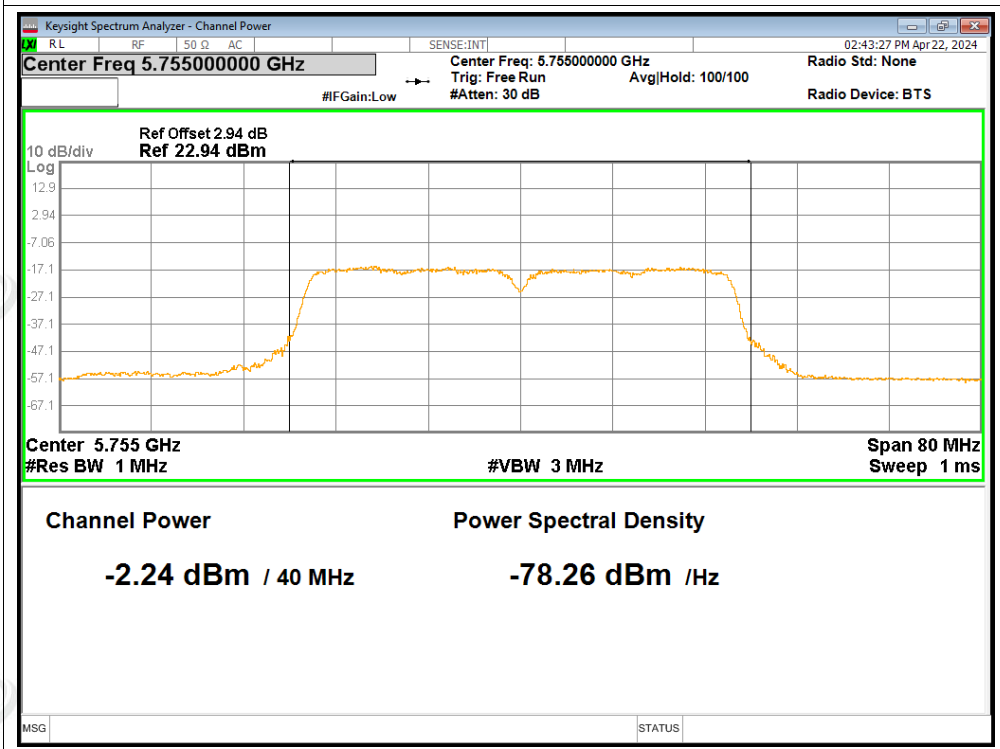




Power NVNT ac20 5825MHz Ant1

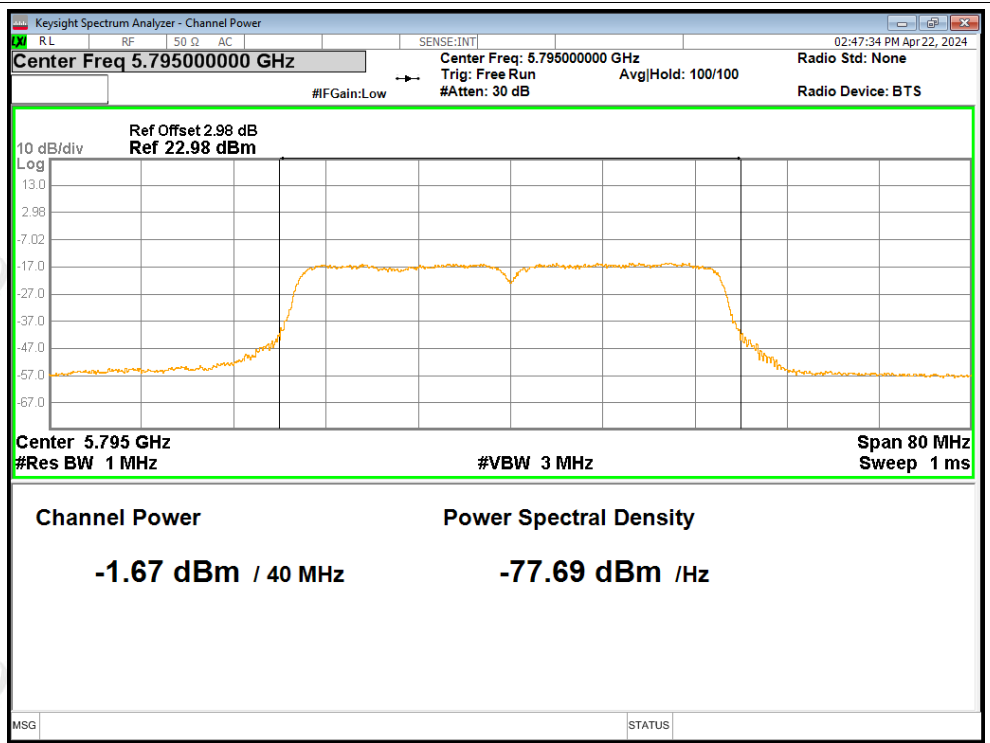


Power NVNT ac40 5755MHz Ant1

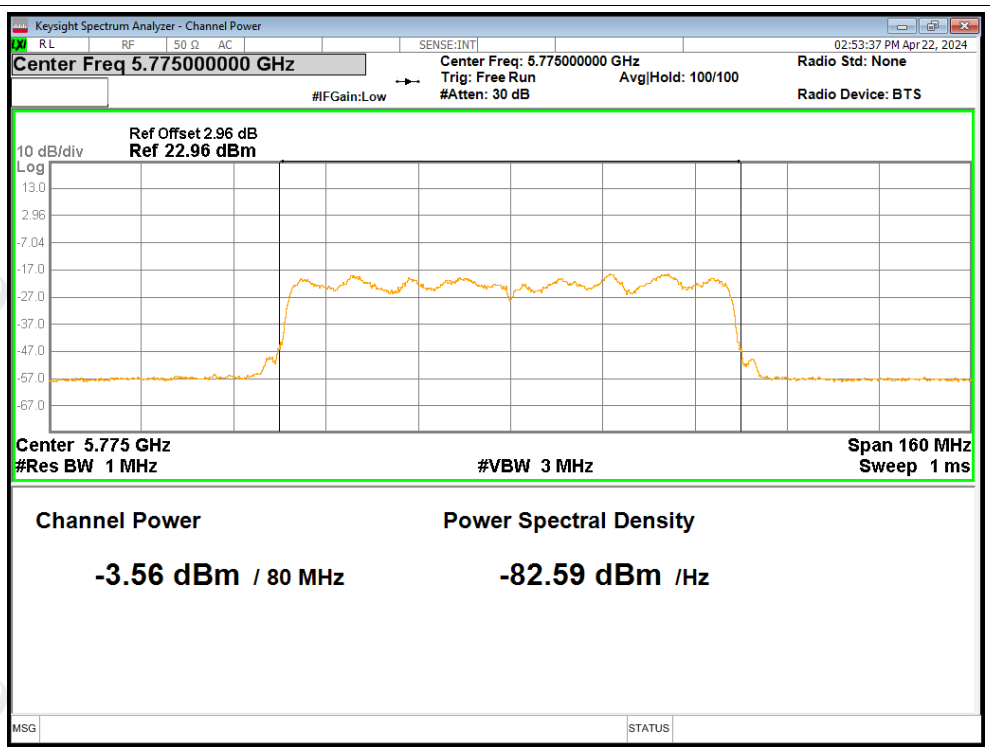




Power NVNT ac40 5795MHz Ant1



Power NVNT ac80 5775MHz Ant1



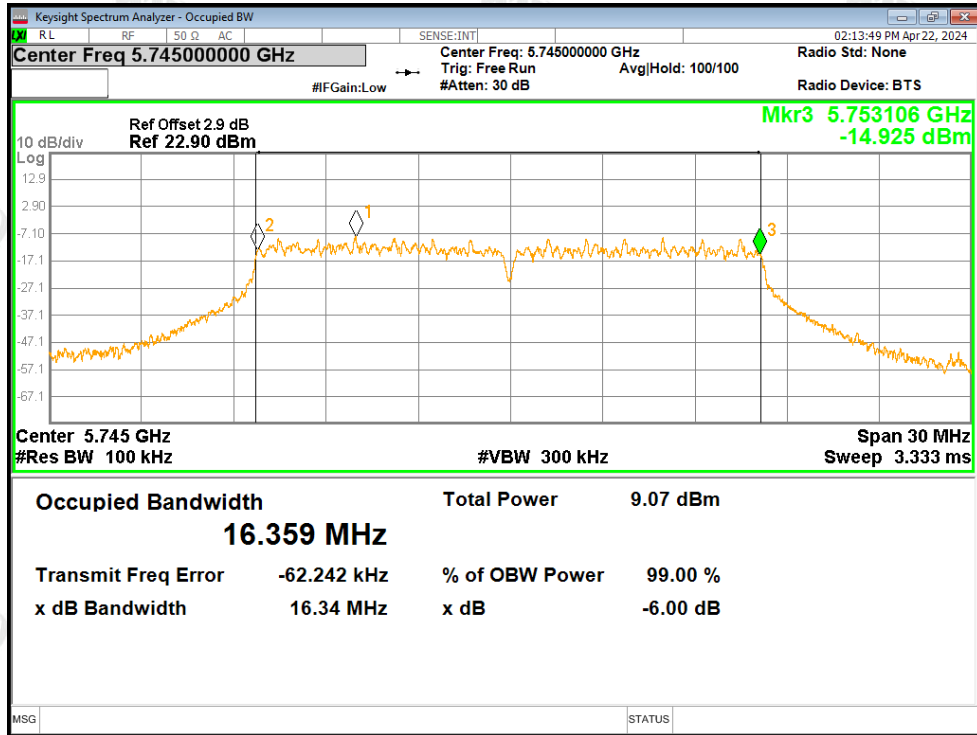
**ZHONGHAN****B3. -6dB Bandwidth**

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	a	5745	Ant1	16.336	0.5	Pass
NVNT	a	5785	Ant1	16.408	0.5	Pass
NVNT	a	5825	Ant1	16.29	0.5	Pass
NVNT	n20	5745	Ant1	17.281	0.5	Pass
NVNT	n20	5785	Ant1	17.075	0.5	Pass
NVNT	n20	5825	Ant1	17.266	0.5	Pass
NVNT	n40	5755	Ant1	35.763	0.5	Pass
NVNT	n40	5795	Ant1	35.422	0.5	Pass
NVNT	ac20	5745	Ant1	16.685	0.5	Pass
NVNT	ac20	5785	Ant1	17.326	0.5	Pass
NVNT	ac20	5825	Ant1	17.524	0.5	Pass
NVNT	ac40	5755	Ant1	35.221	0.5	Pass
NVNT	ac40	5795	Ant1	35.5	0.5	Pass
NVNT	ac80	5775	Ant1	75.158	0.5	Pass

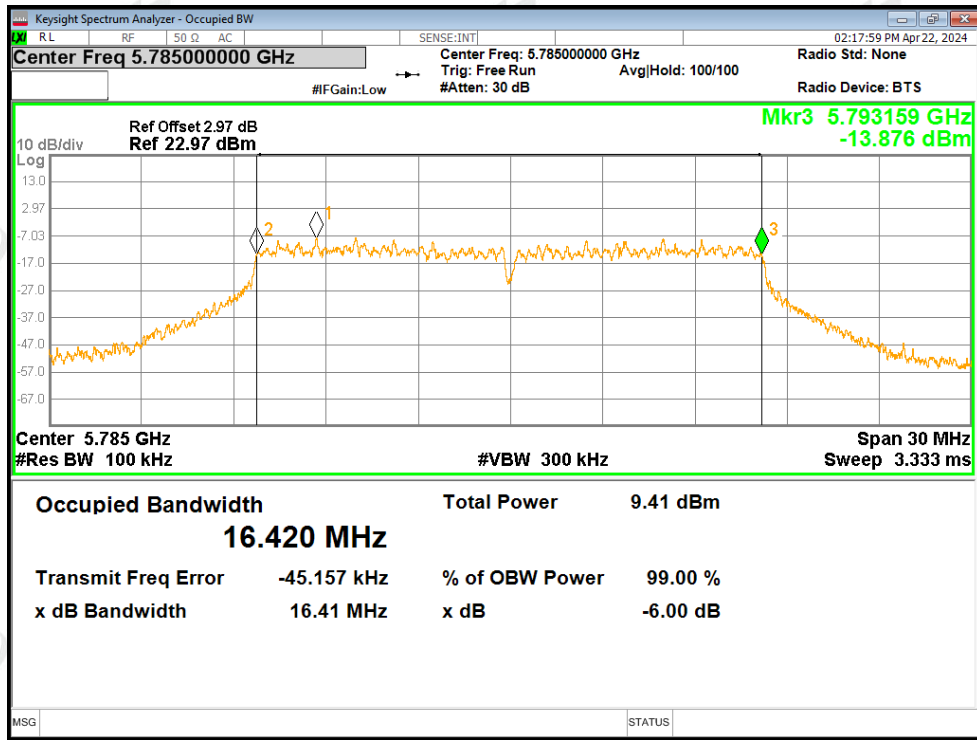


Test Graphs

-6dB Bandwidth NVNT a 5745MHz Ant1

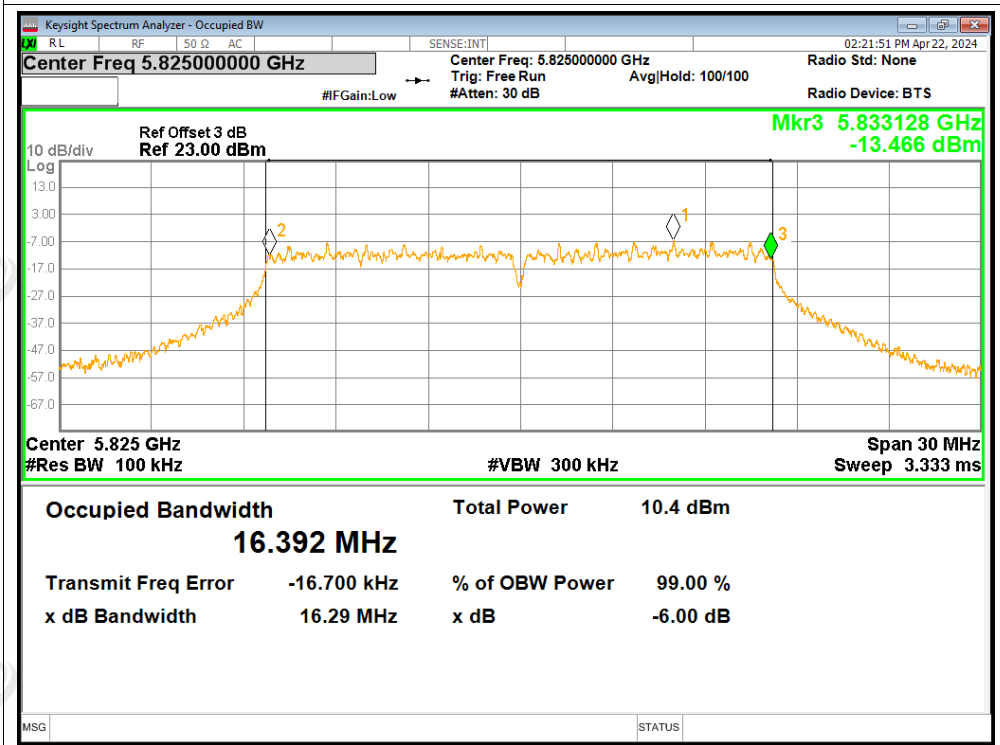


-6dB Bandwidth NVNT a 5785MHz Ant1

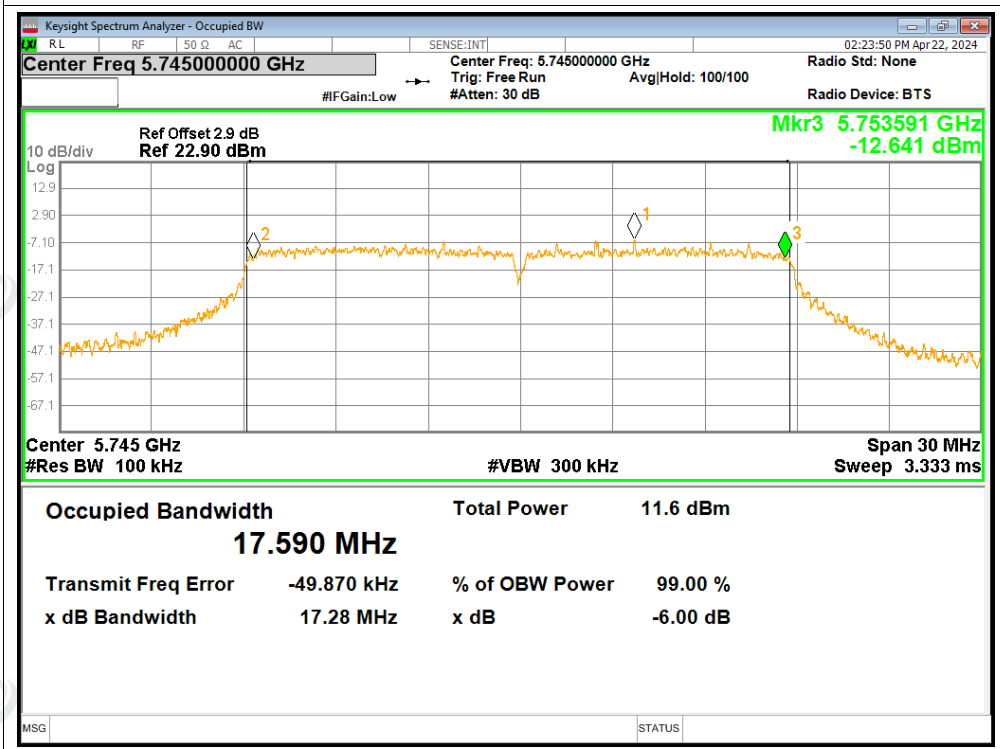




-6dB Bandwidth NVNT a 5825MHz Ant1



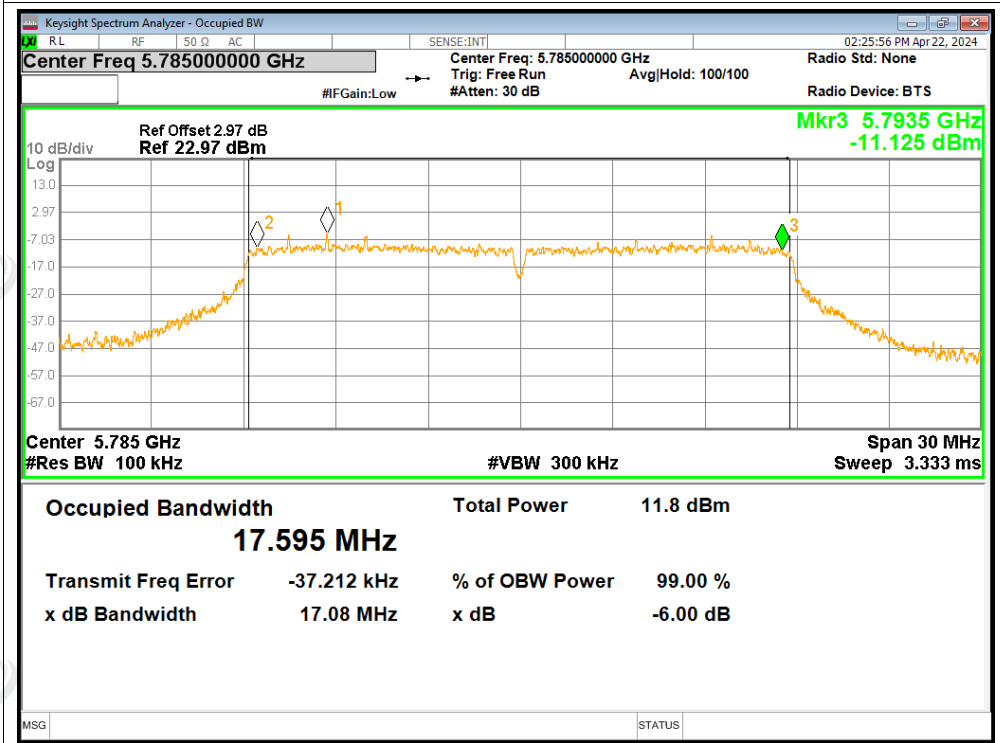
-6dB Bandwidth NVNT n20 5745MHz Ant1



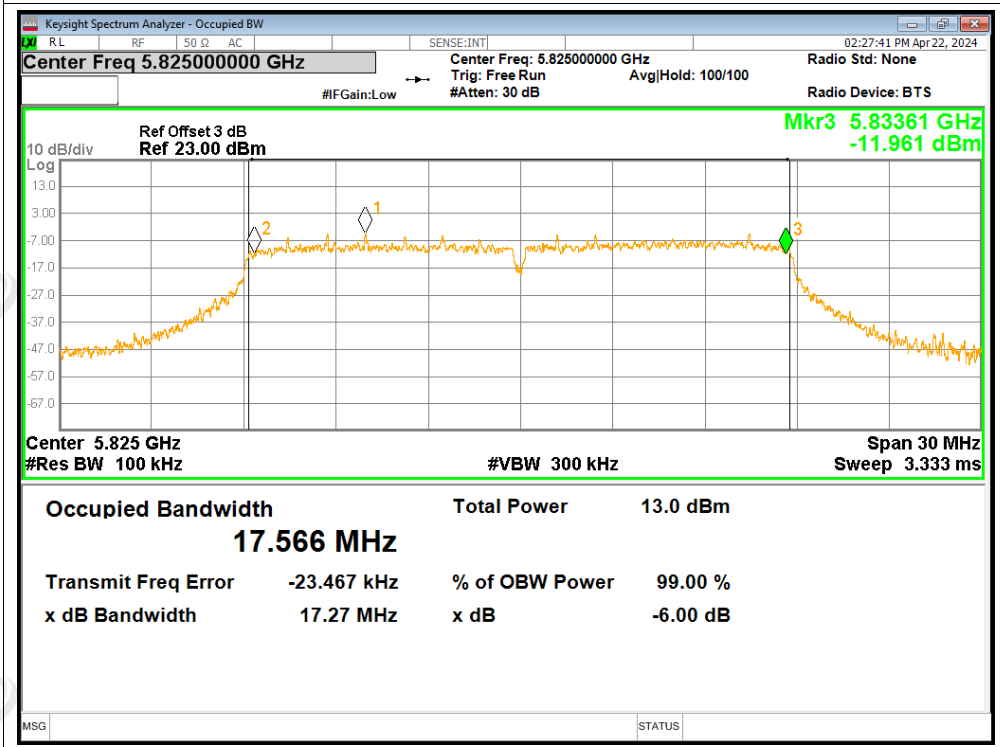


ZHONGHAN

-6dB Bandwidth NVNT n20 5785MHz Ant1



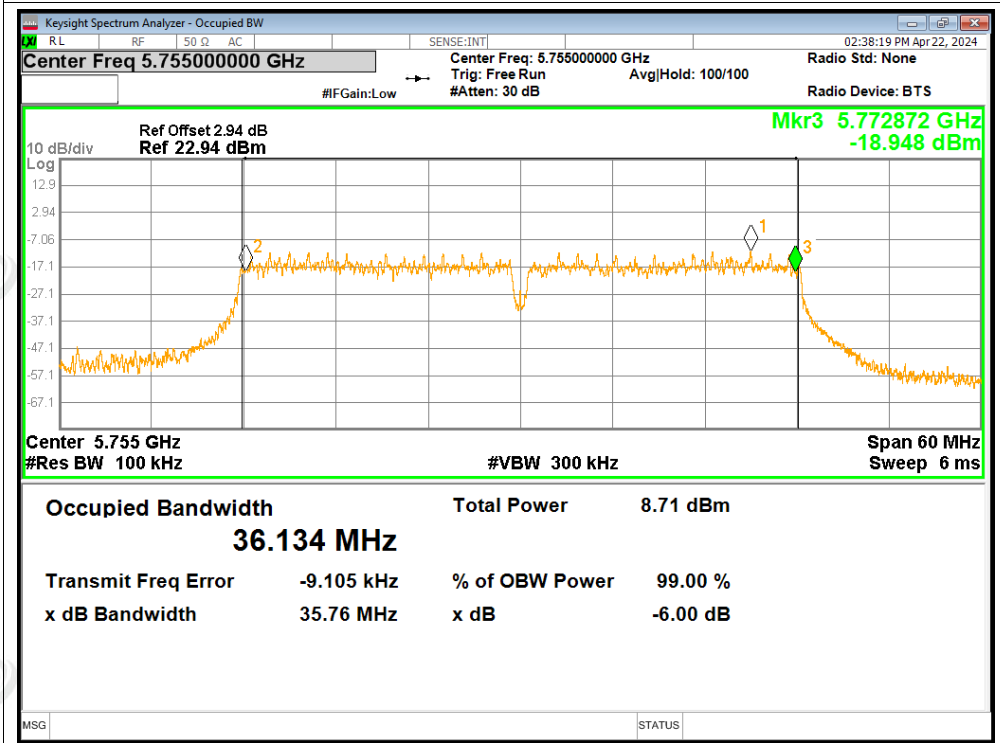
-6dB Bandwidth NVNT n20 5825MHz Ant1



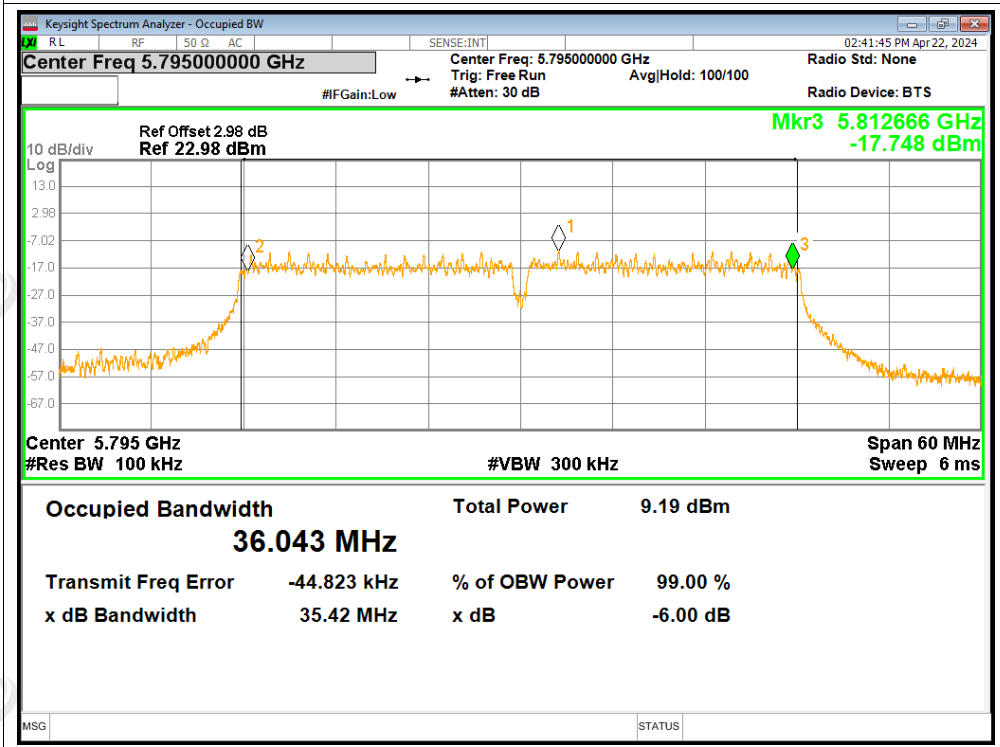


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-6dB Bandwidth NVNT n40 5755MHz Ant1



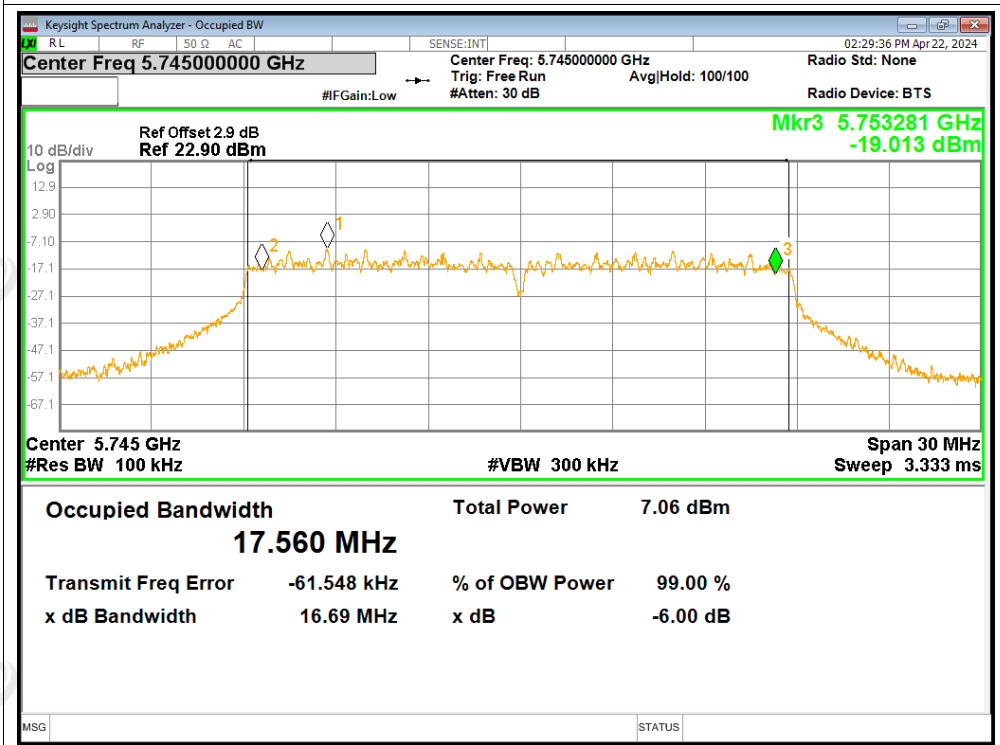
-6dB Bandwidth NVNT n40 5795MHz Ant1



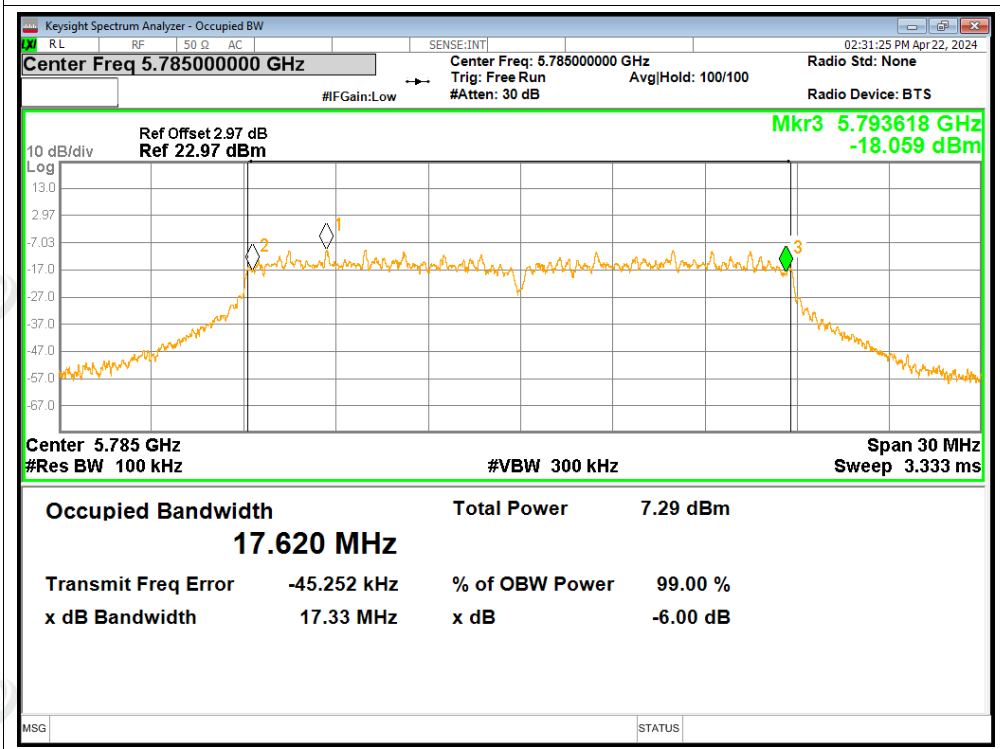


ZHONGHAN

-6dB Bandwidth NVNT ac20 5745MHz Ant1



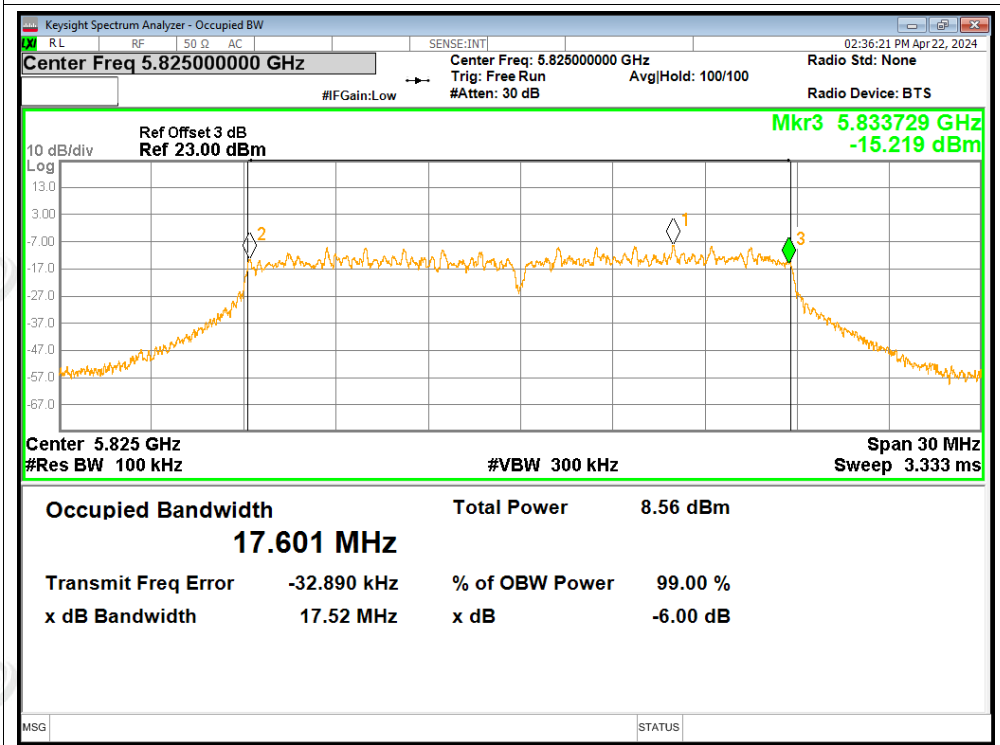
-6dB Bandwidth NVNT ac20 5785MHz Ant1



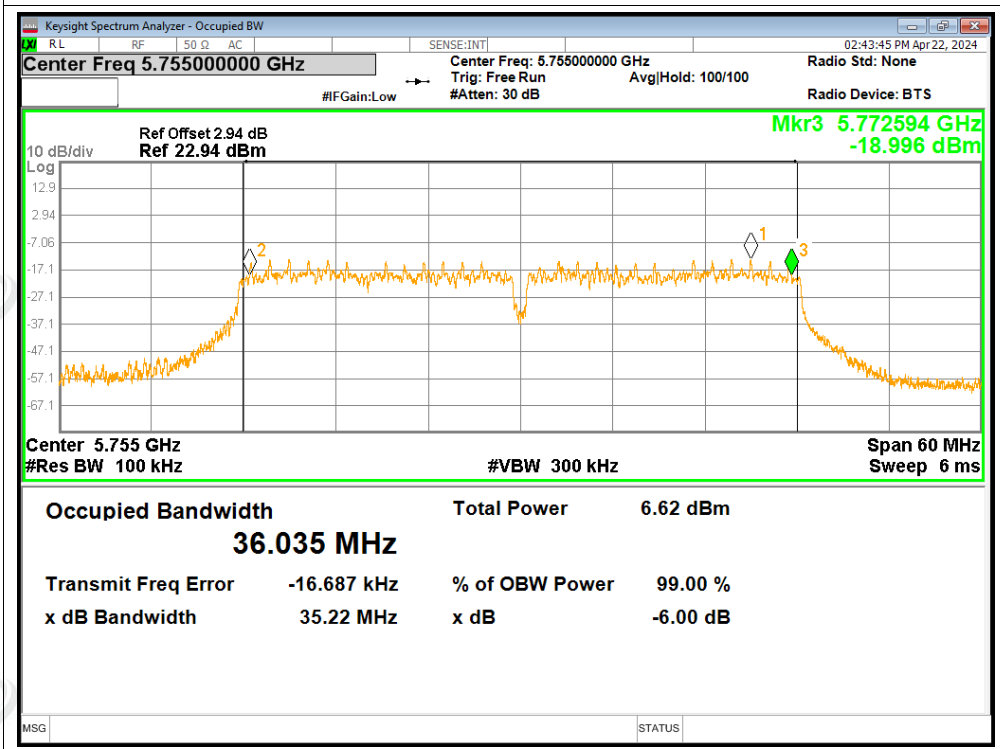


ZHONGHAN

-6dB Bandwidth NVNT ac20 5825MHz Ant1

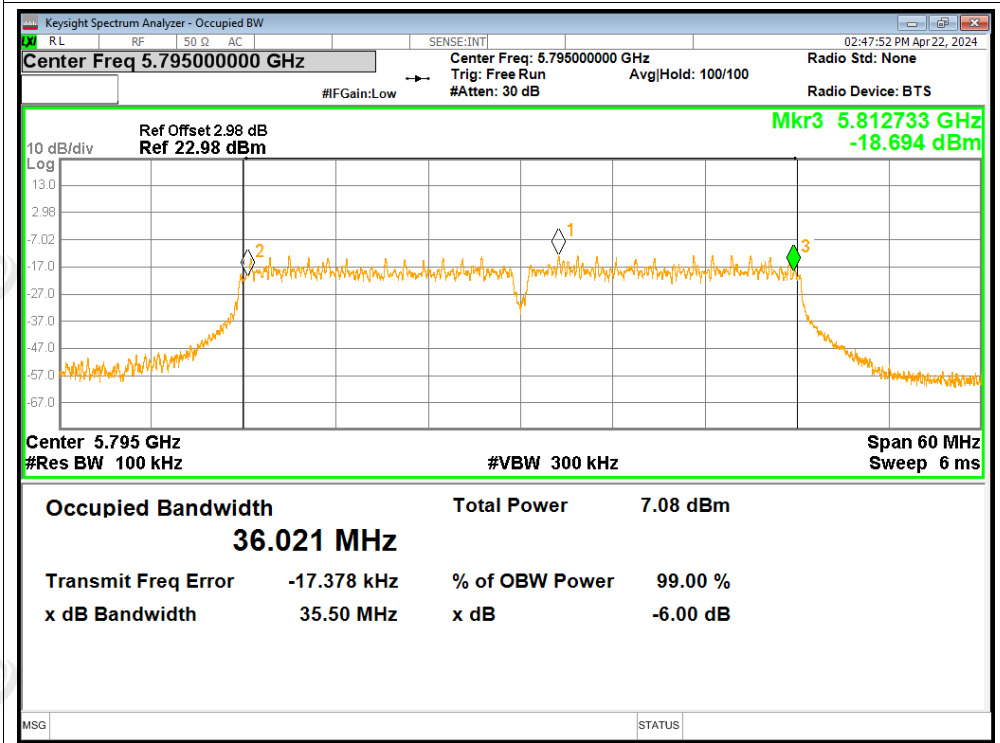


-6dB Bandwidth NVNT ac40 5755MHz Ant1

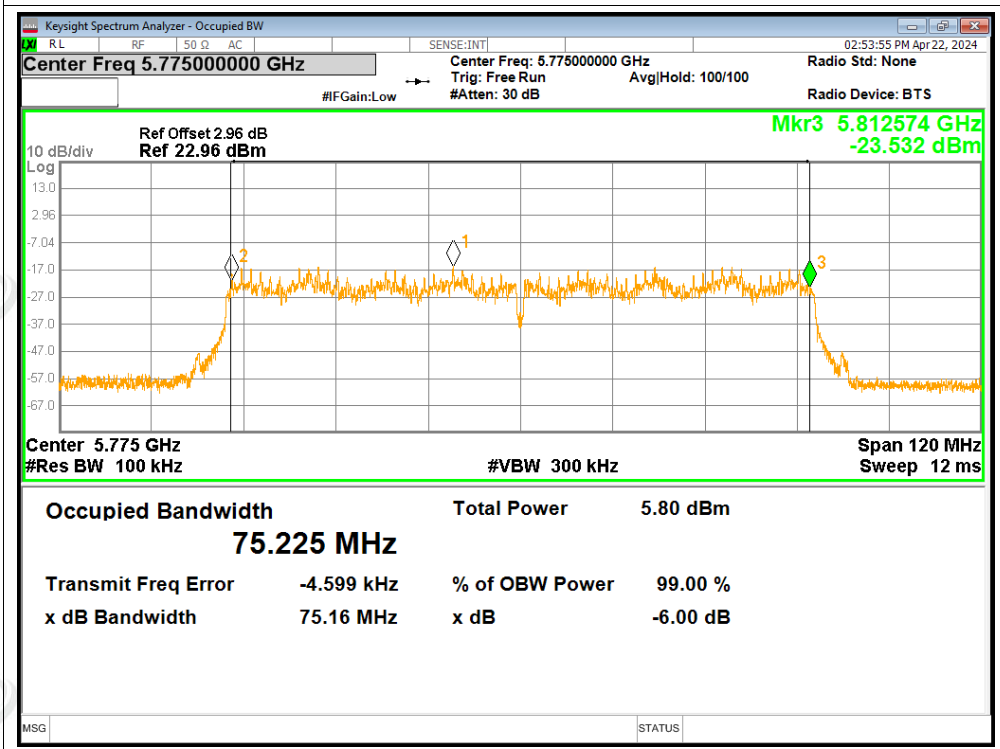




-6dB Bandwidth NVNT ac40 5795MHz Ant1



-6dB Bandwidth NVNT ac80 5775MHz Ant1



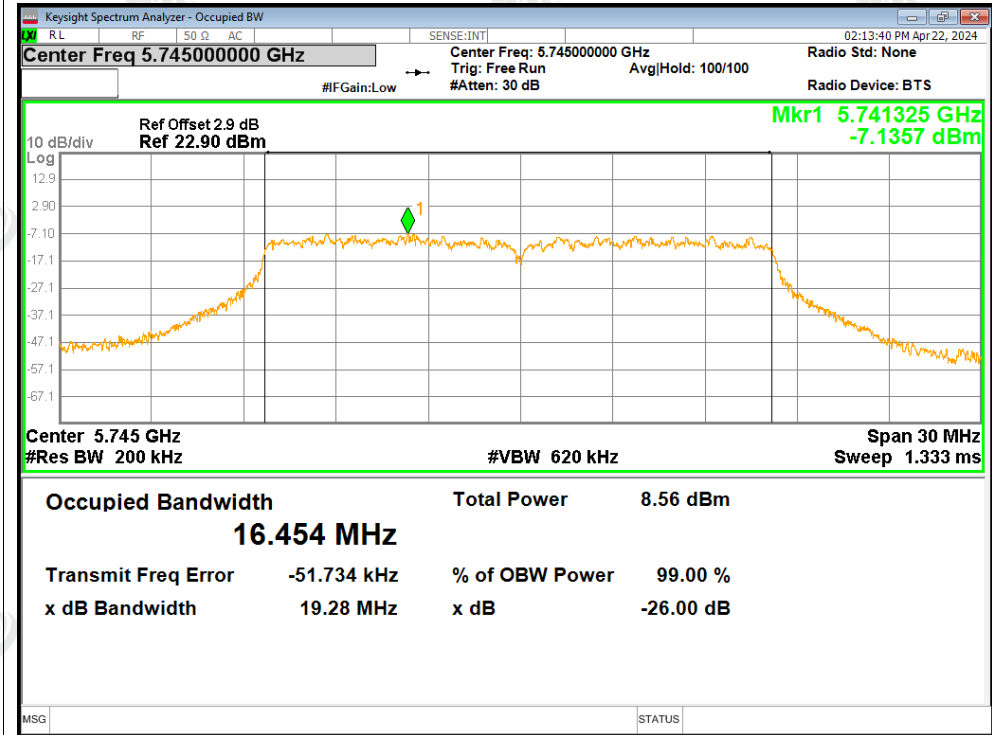
**ZHONGHAN****B4. Occupied Channel Bandwidth**

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	a	5745	Ant1	16.454
NVNT	a	5785	Ant1	16.482
NVNT	a	5825	Ant1	16.458
NVNT	n20	5745	Ant1	17.665
NVNT	n20	5785	Ant1	17.647
NVNT	n20	5825	Ant1	17.639
NVNT	n40	5755	Ant1	36.141
NVNT	n40	5795	Ant1	36.16
NVNT	ac20	5745	Ant1	17.57
NVNT	ac20	5785	Ant1	17.645
NVNT	ac20	5825	Ant1	17.647
NVNT	ac40	5755	Ant1	36.132
NVNT	ac40	5795	Ant1	36.154
NVNT	ac80	5775	Ant1	75.457

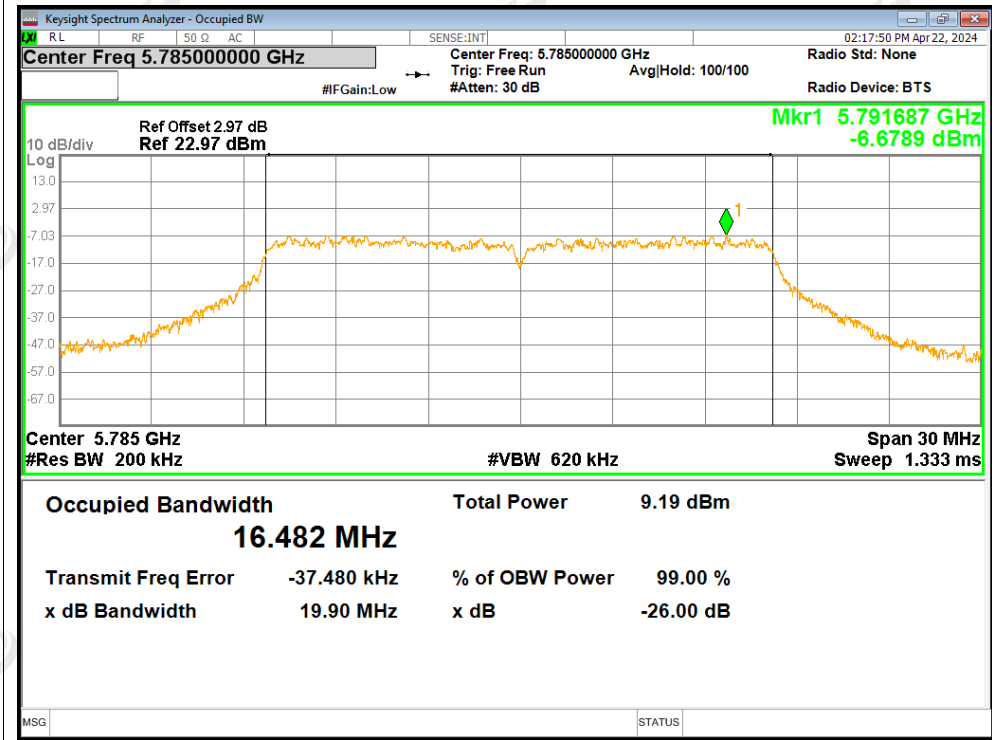


Test Graphs

OBW NVNT a 5745MHz Ant1

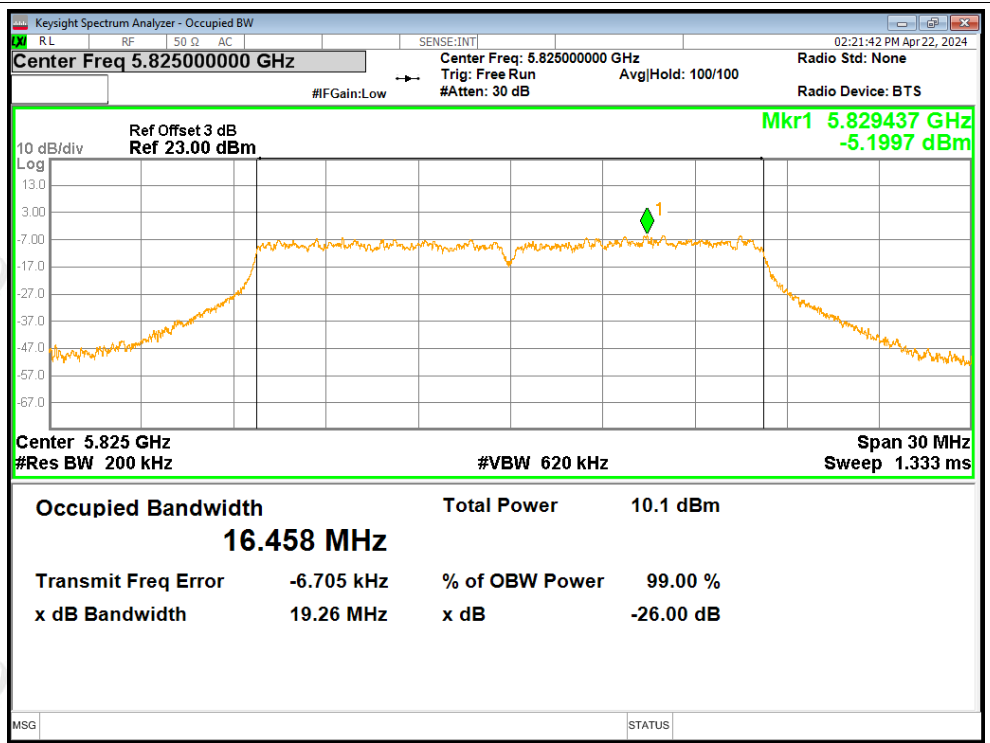


OBW NVNT a 5785MHz Ant1

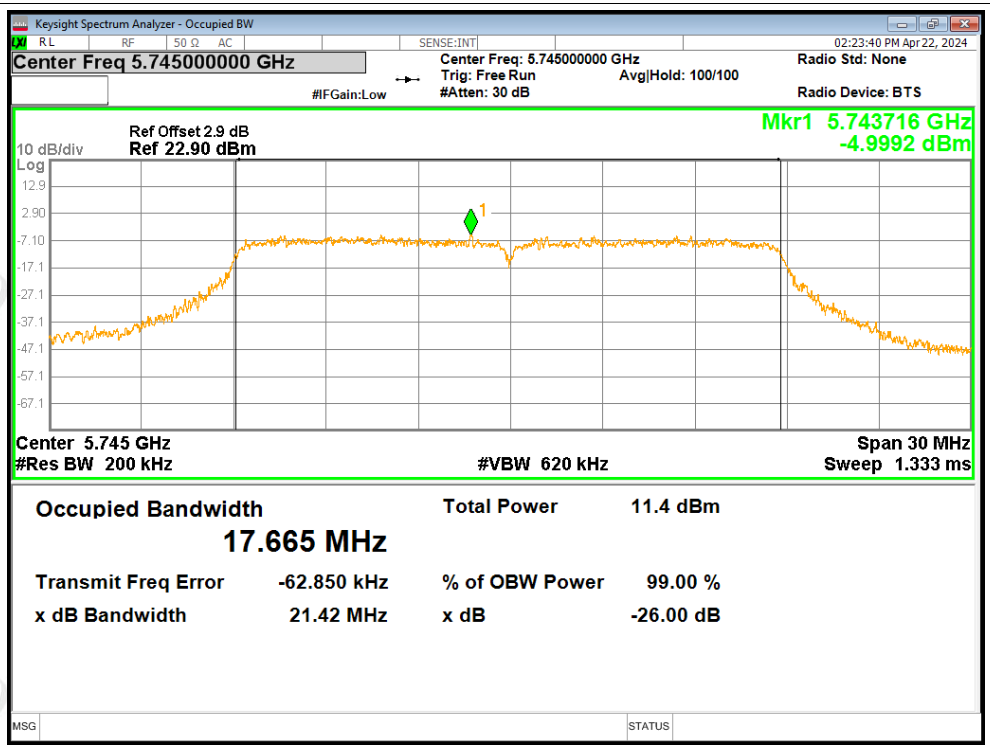




OBW NVNT a 5825MHz Ant1

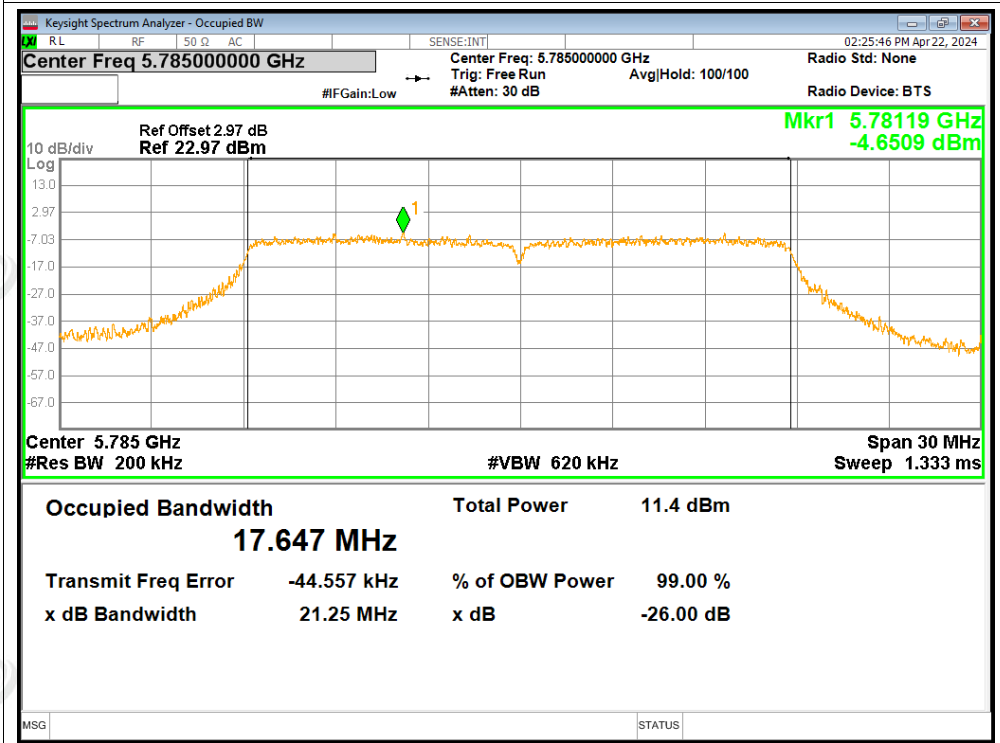


OBW NVNT n20 5745MHz Ant1

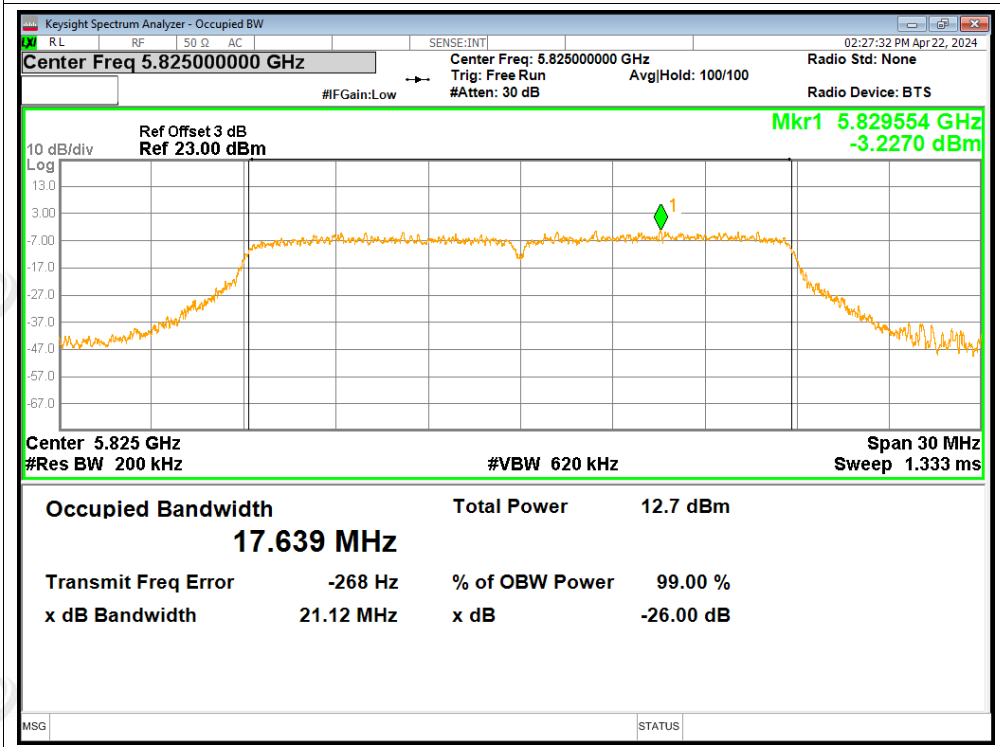




OBW NVNT n20 5785MHz Ant1

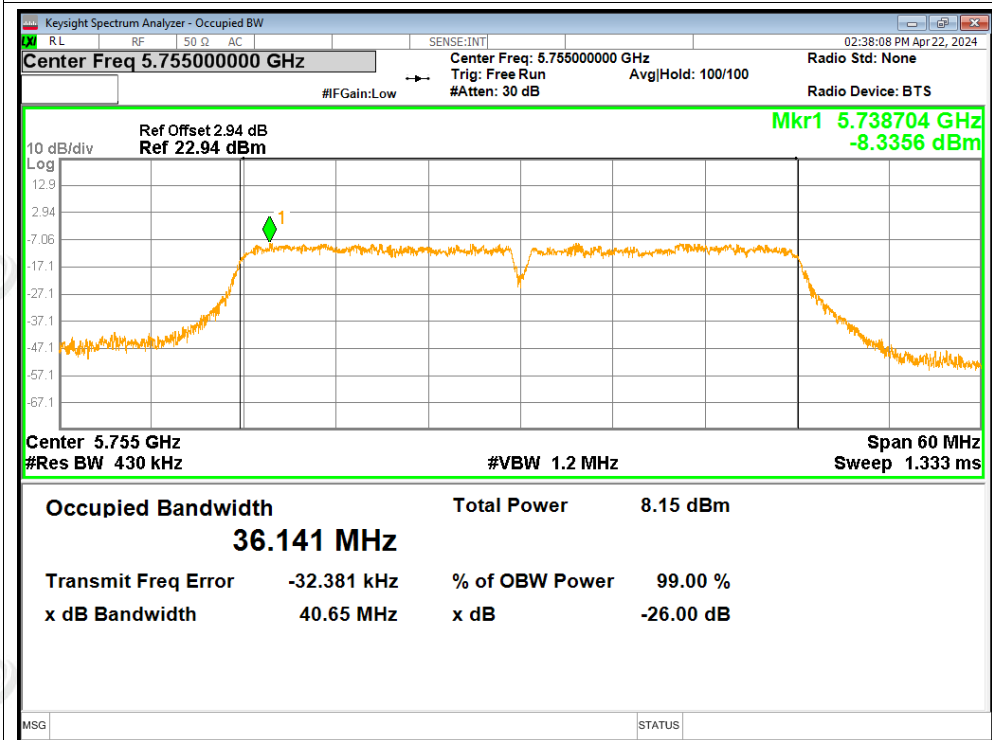


OBW NVNT n20 5825MHz Ant1

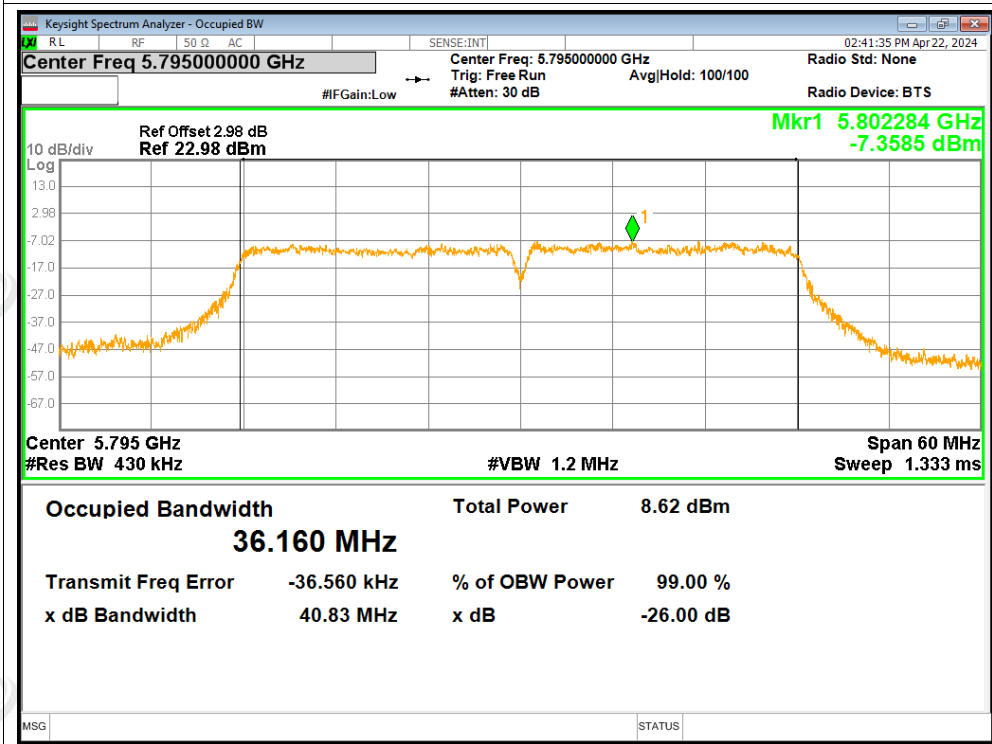




OBW NVNT n40 5755MHz Ant1

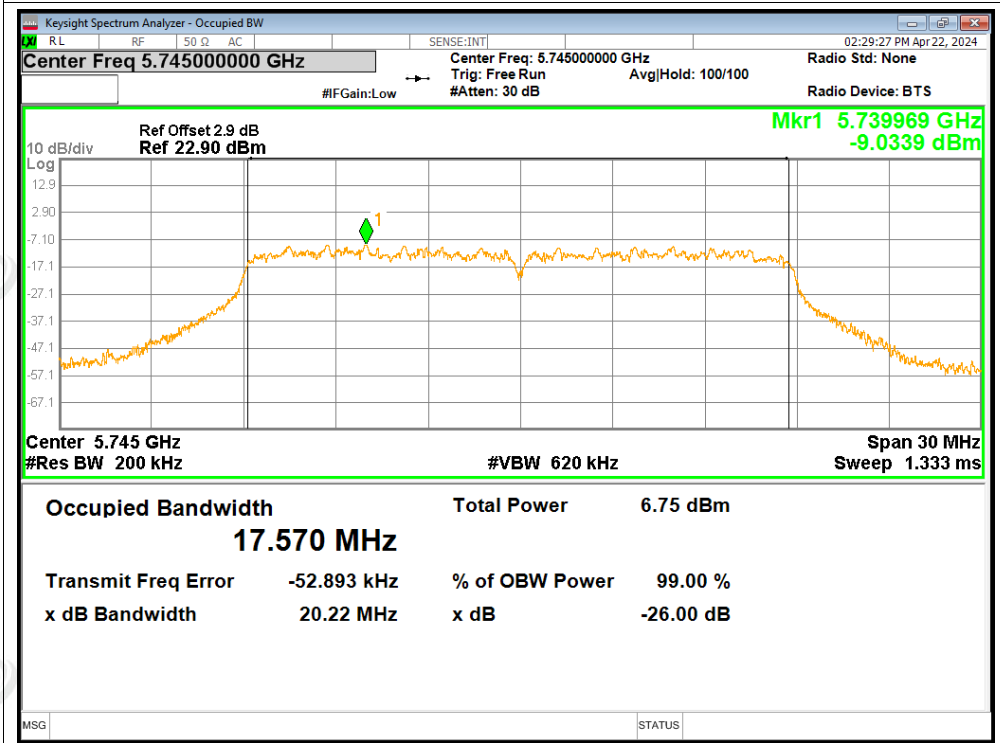


OBW NVNT n40 5795MHz Ant1

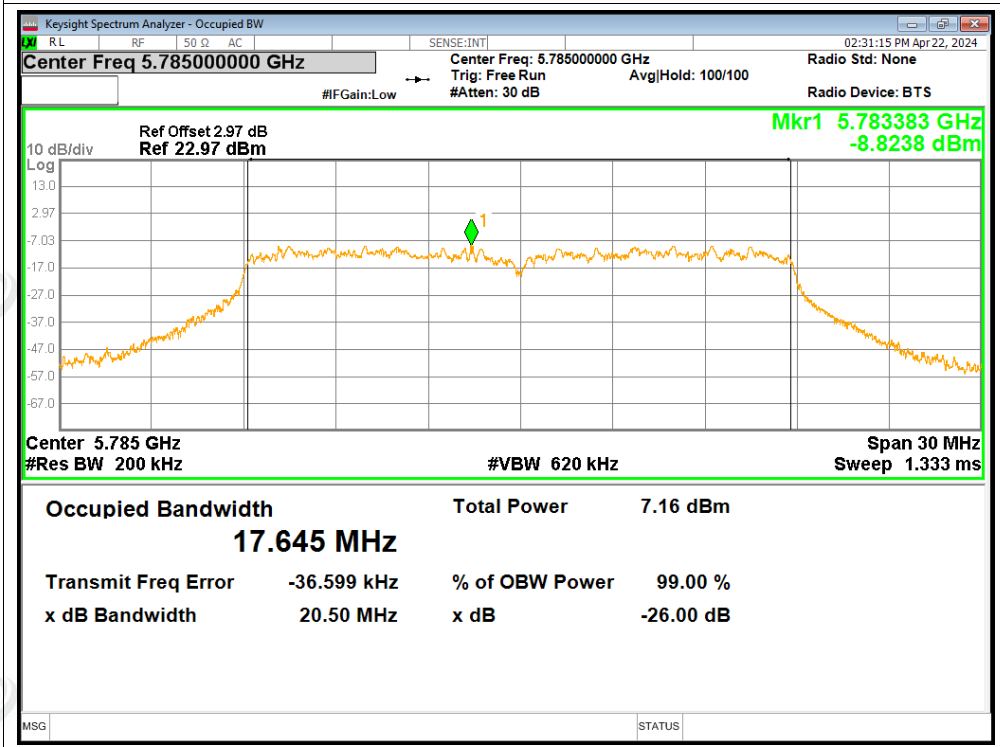




OBW NVNT ac20 5745MHz Ant1

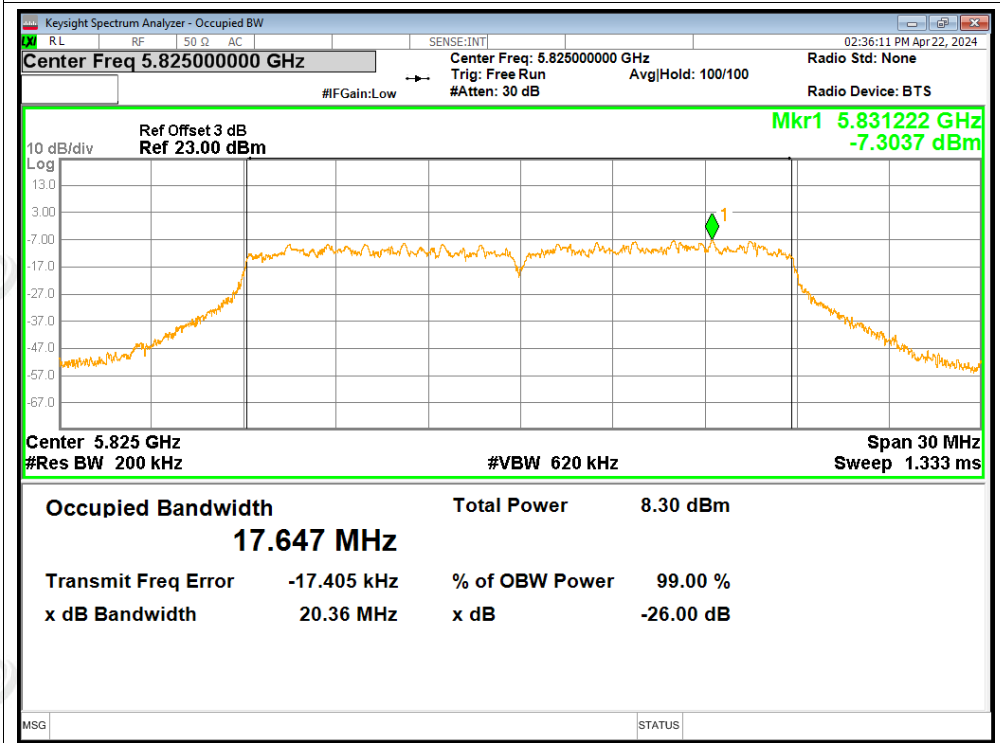


OBW NVNT ac20 5785MHz Ant1

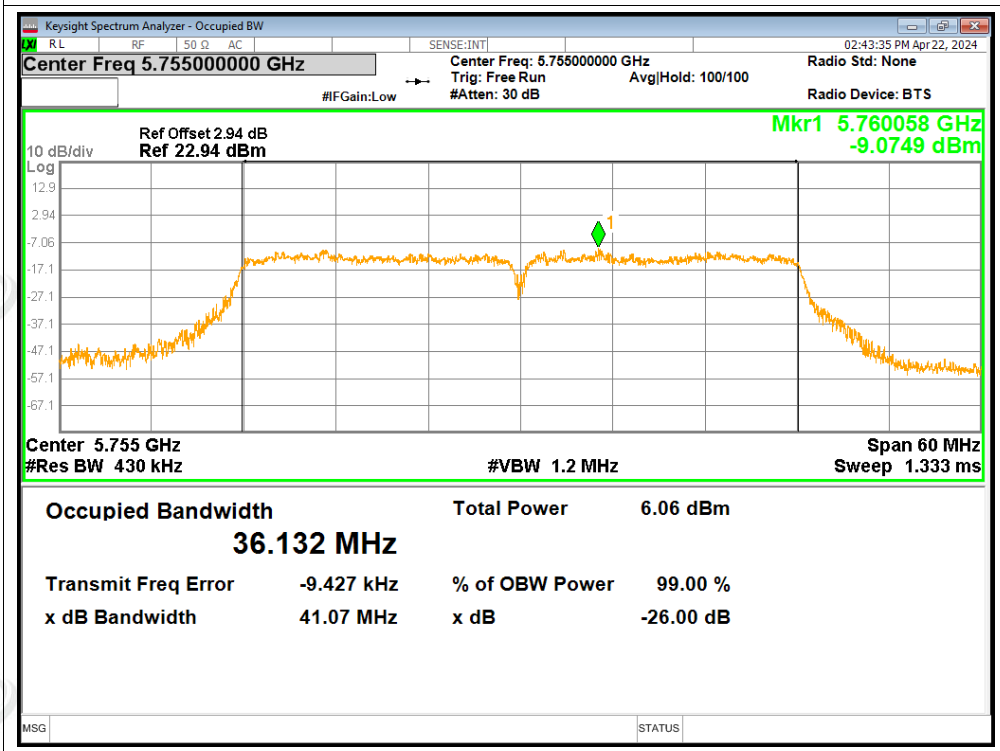




OBW NVNT ac20 5825MHz Ant1

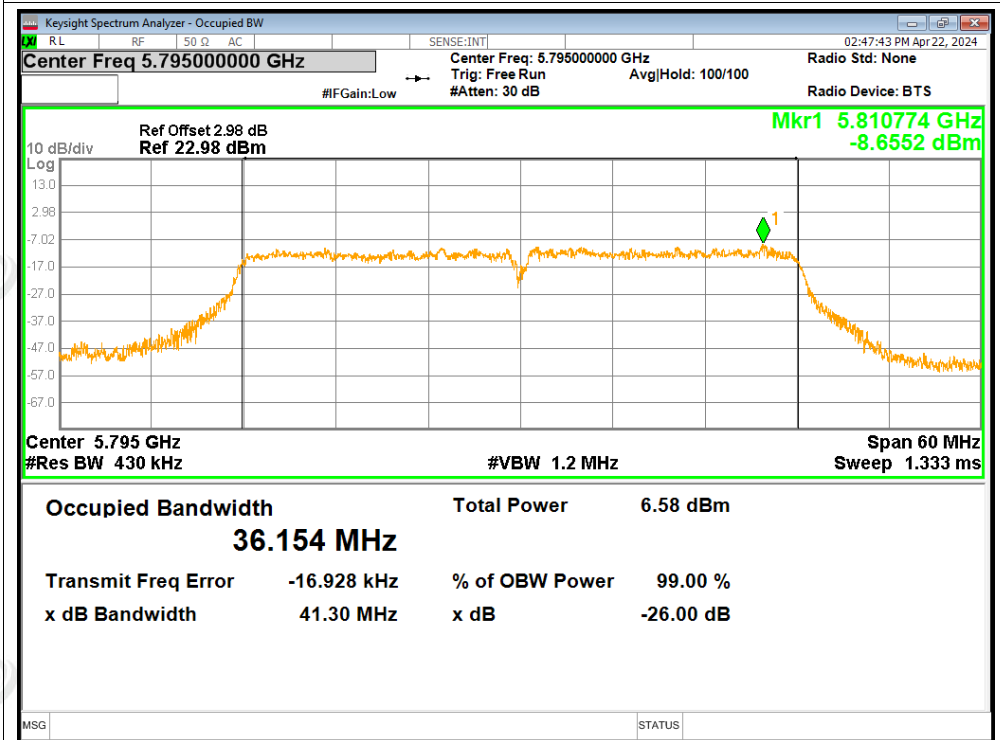


OBW NVNT ac40 5755MHz Ant1

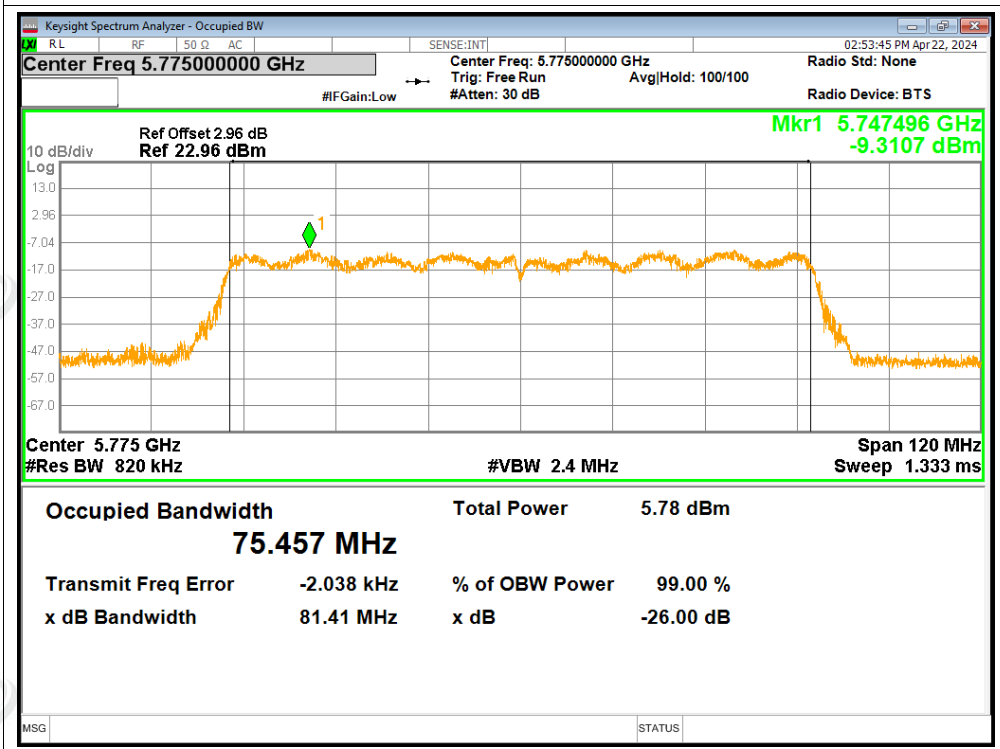




OBW NVNT ac40 5795MHz Ant1



OBW NVNT ac80 5775MHz Ant1





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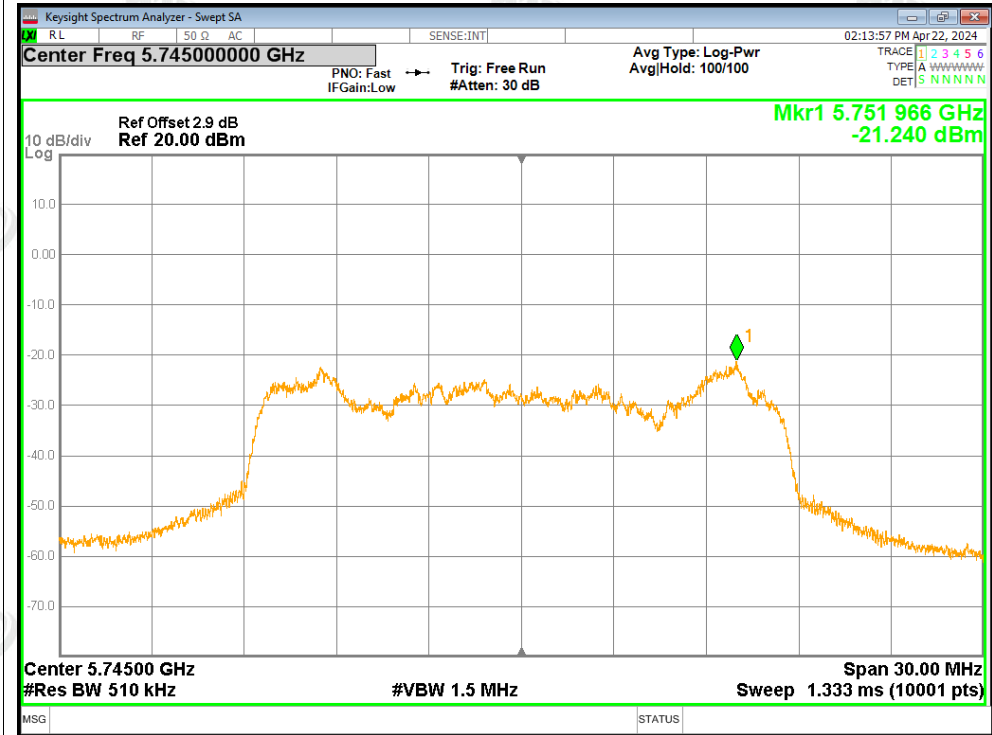
B5. Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm)	Duty Factor (dB)	Total PSD (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	Ant1	-21.24	1.07	-20.17	30	Pass
NVNT	a	5785	Ant1	-20.9	1.93	-18.97	30	Pass
NVNT	a	5825	Ant1	-21.38	0.97	-20.41	30	Pass
NVNT	n20	5745	Ant1	-11.15	0.37	-10.78	30	Pass
NVNT	n20	5785	Ant1	-10.48	0.13	-10.35	30	Pass
NVNT	n20	5825	Ant1	-7.93	0.11	-7.82	30	Pass
NVNT	n40	5755	Ant1	-30.59	3.98	-26.61	30	Pass
NVNT	n40	5795	Ant1	-29.84	0.35	-29.49	30	Pass
NVNT	ac20	5745	Ant1	-25.56	1.76	-23.8	30	Pass
NVNT	ac20	5785	Ant1	-25.63	2.43	-23.2	30	Pass
NVNT	ac20	5825	Ant1	-24.93	1.61	-23.32	30	Pass
NVNT	ac40	5755	Ant1	-33.09	3.9	-29.19	30	Pass
NVNT	ac40	5795	Ant1	-34.45	1.76	-32.69	30	Pass
NVNT	ac80	5775	Ant1	-42.12	5.56	-36.56	30	Pass

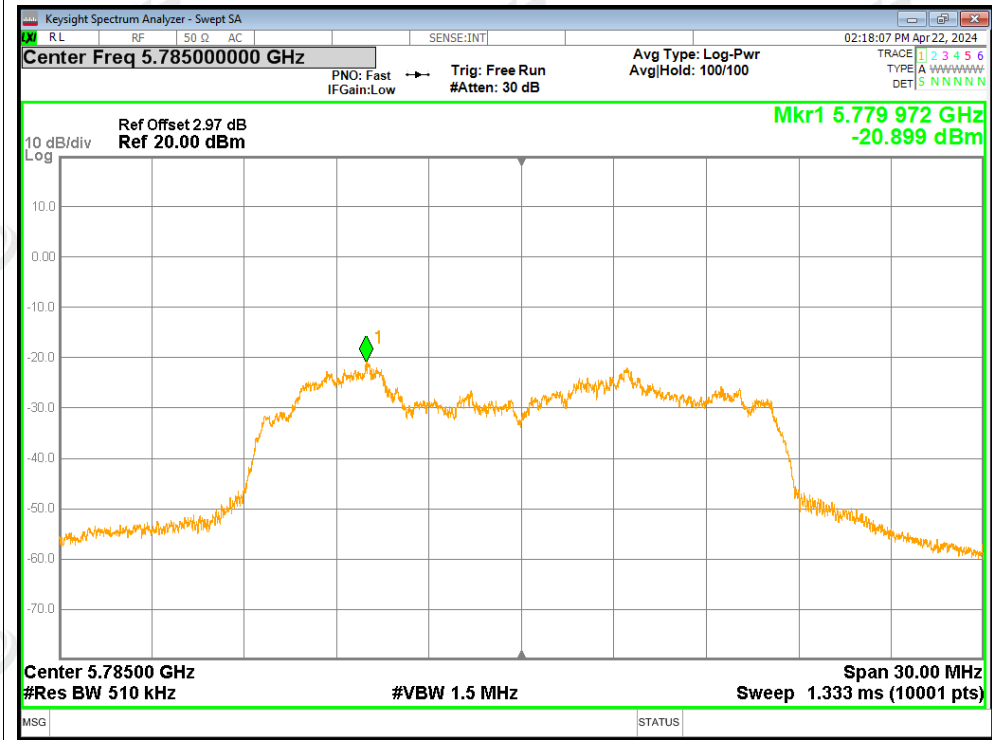


Test Graphs

PSD NVNT a 5745MHz Ant1

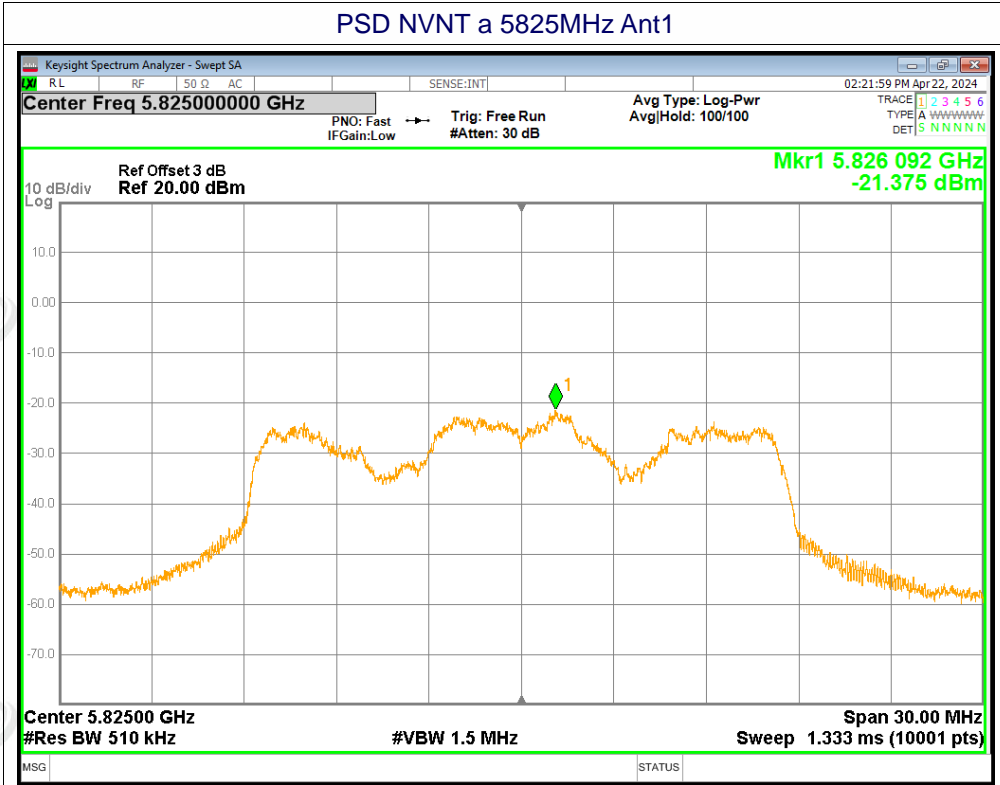


PSD NVNT a 5785MHz Ant1

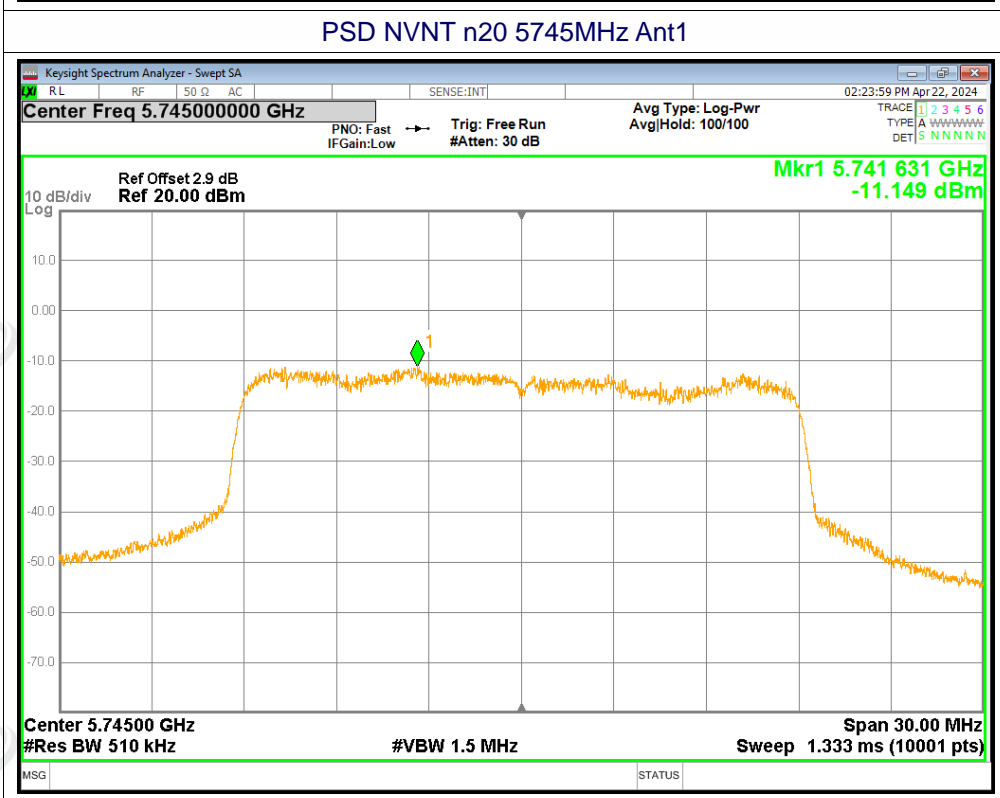




PSD NVNT a 5825MHz Ant1

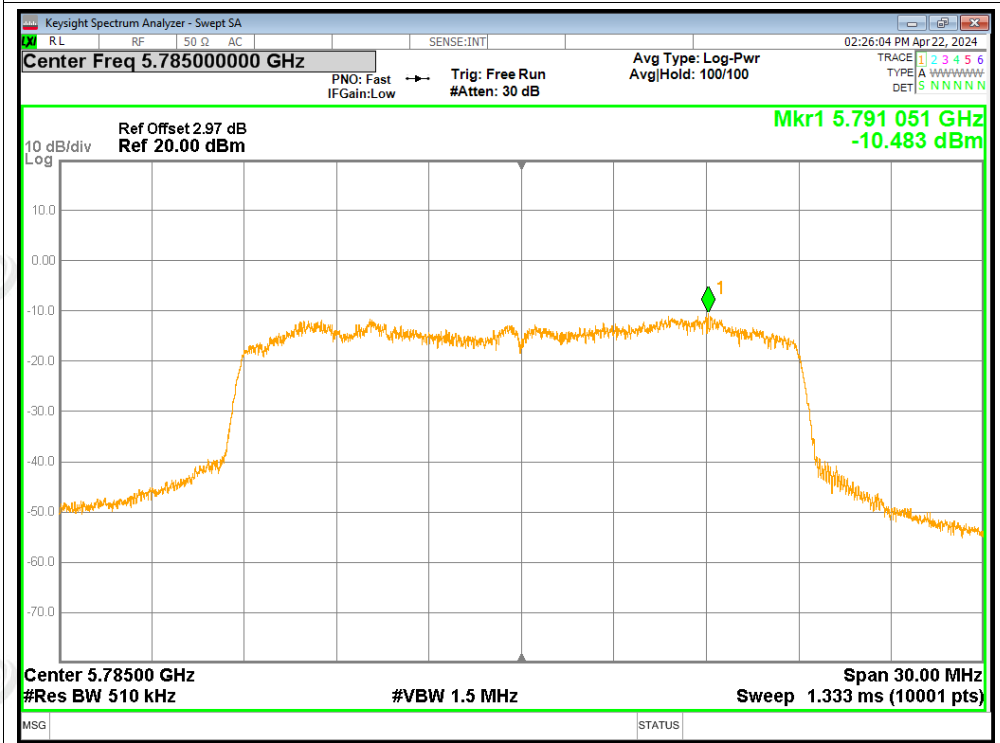


PSD NVNT n20 5745MHz Ant1

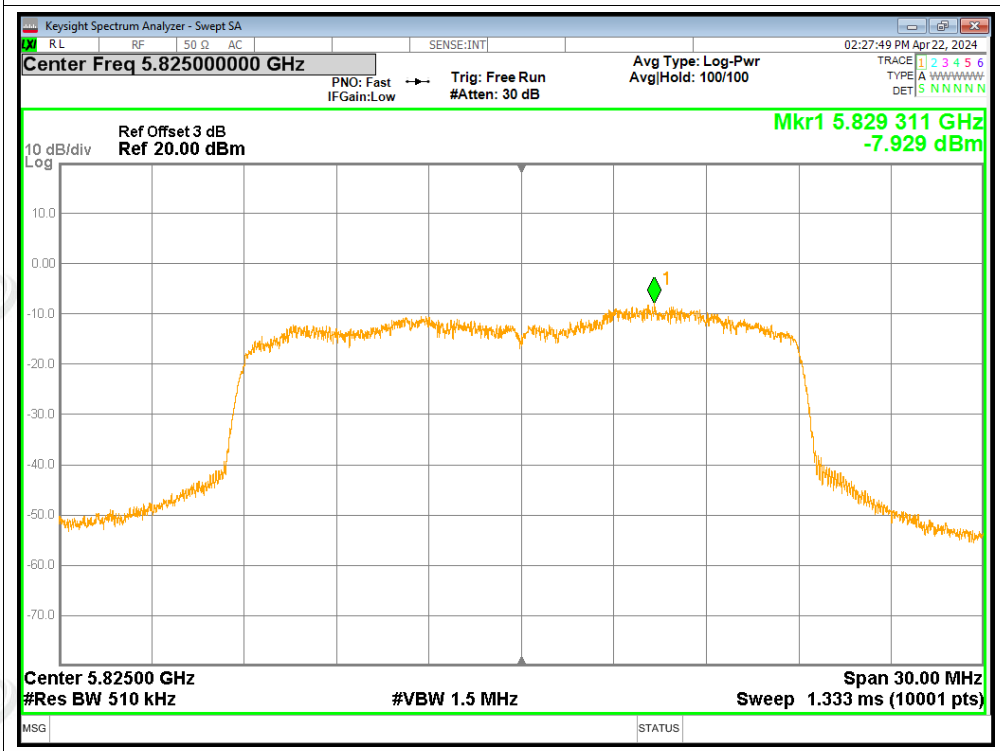




PSD NVNT n20 5785MHz Ant1



PSD NVNT n20 5825MHz Ant1

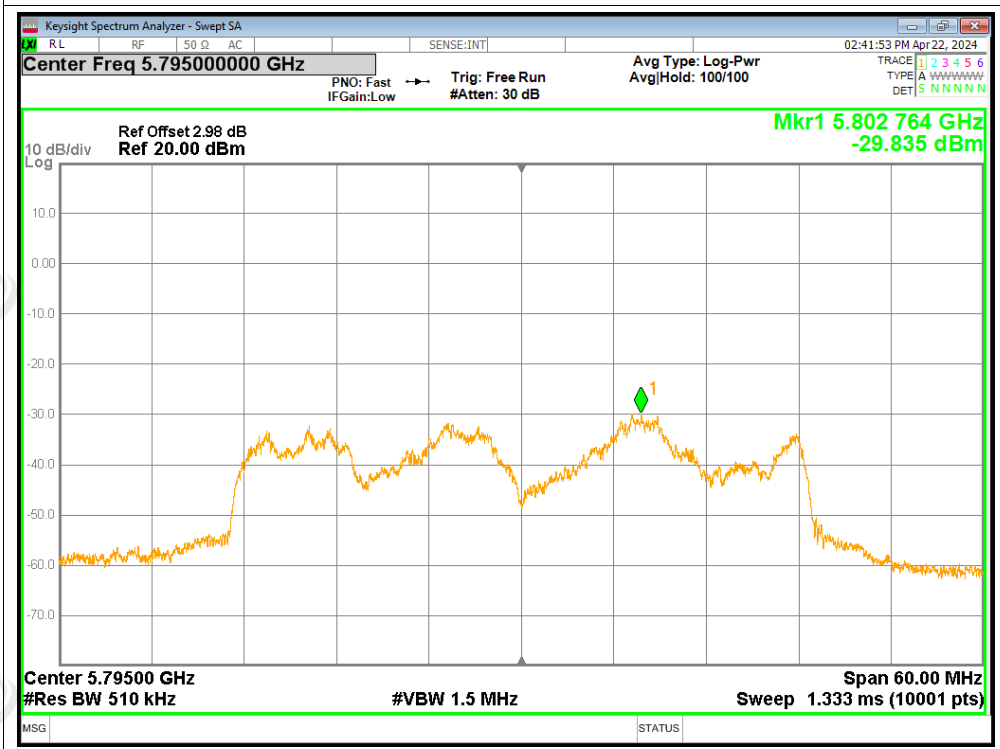




PSD NVNT n40 5755MHz Ant1

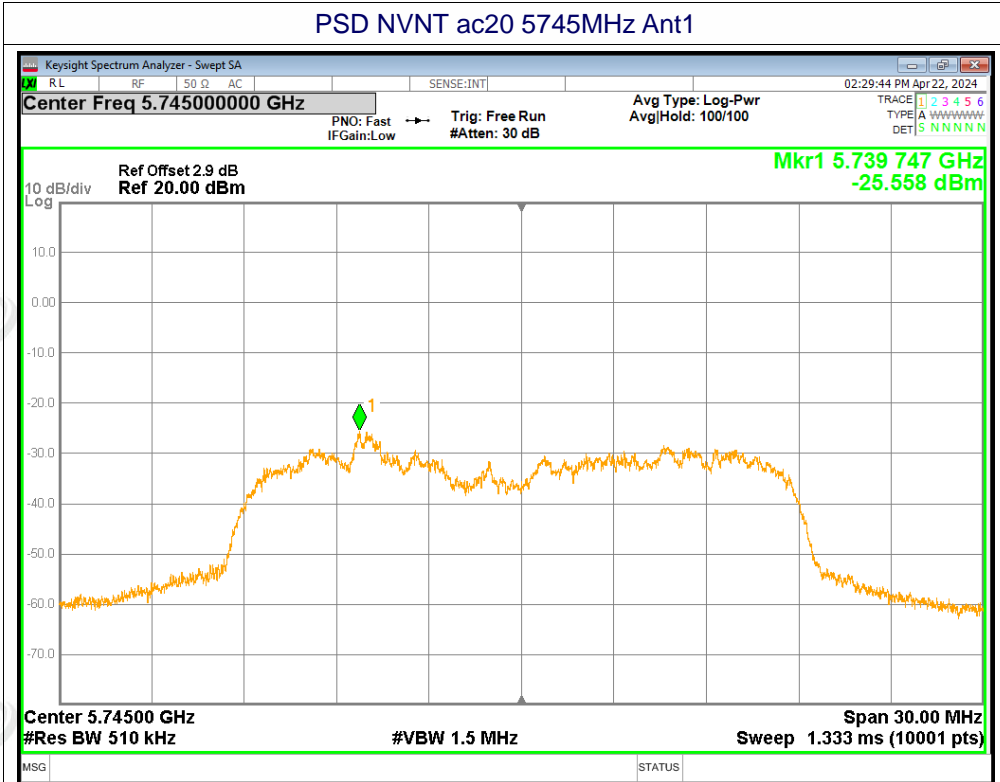


PSD NVNT n40 5795MHz Ant1

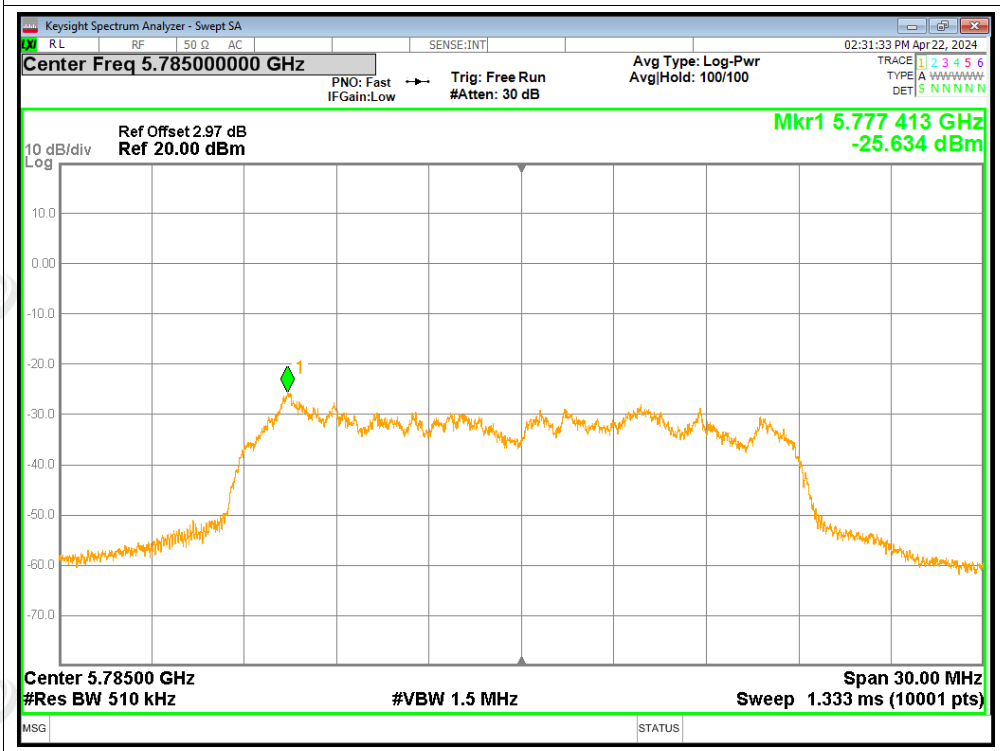




PSD NVNT ac20 5745MHz Ant1

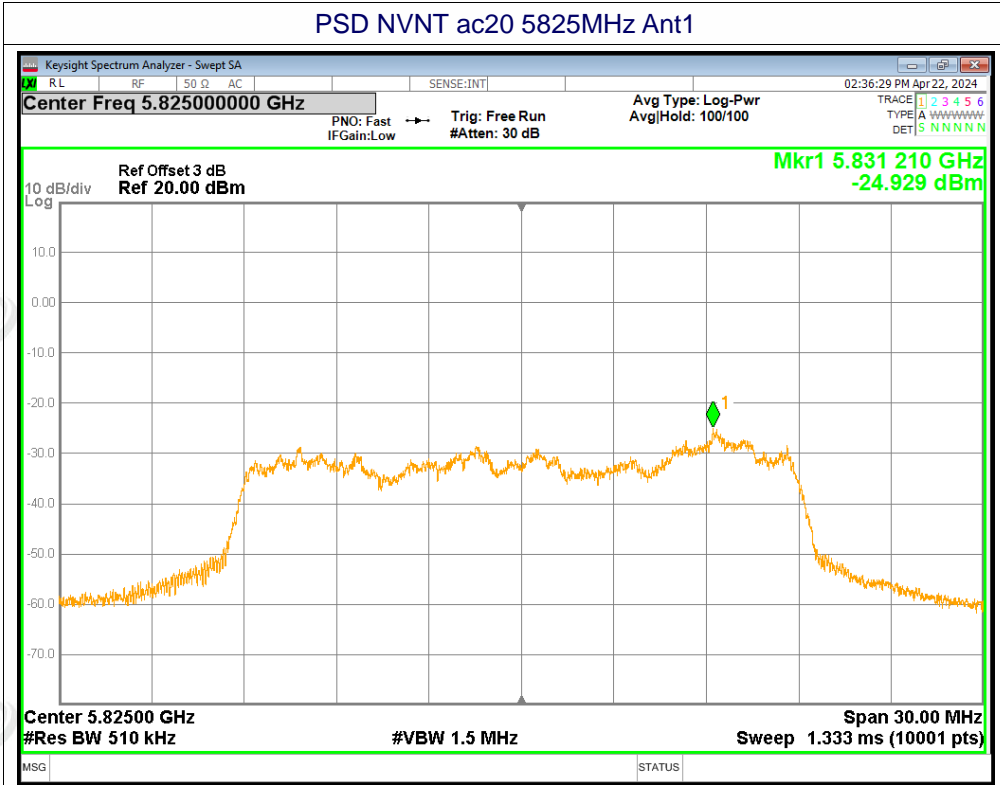


PSD NVNT ac20 5785MHz Ant1

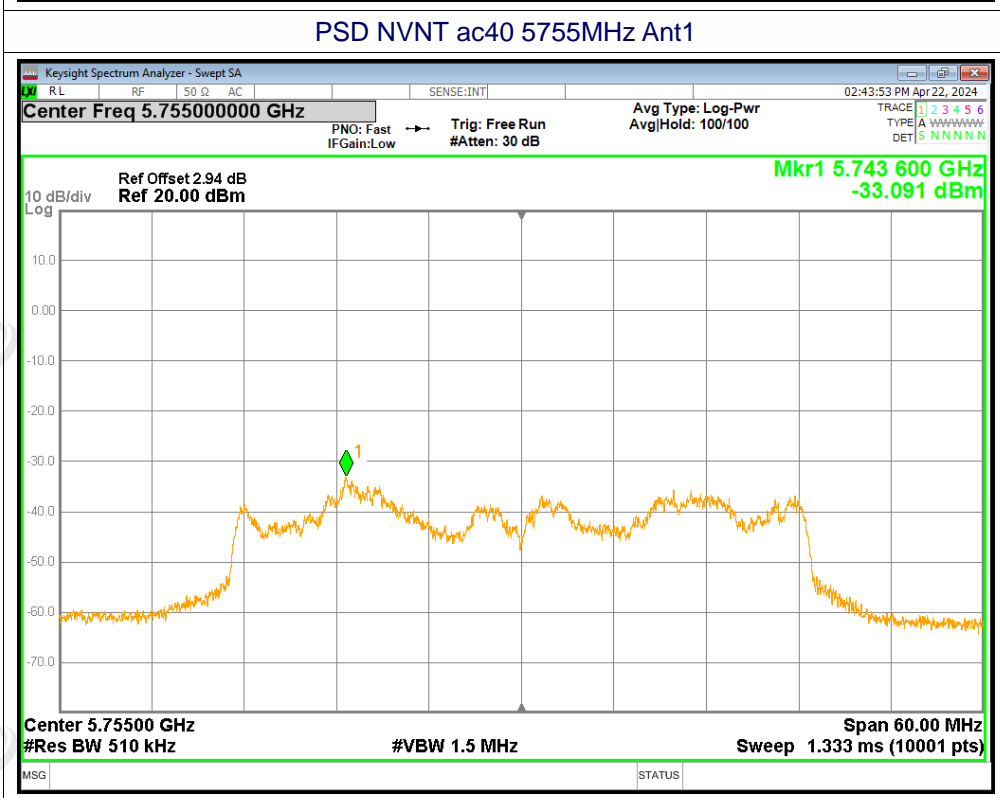




PSD NVNT ac20 5825MHz Ant1

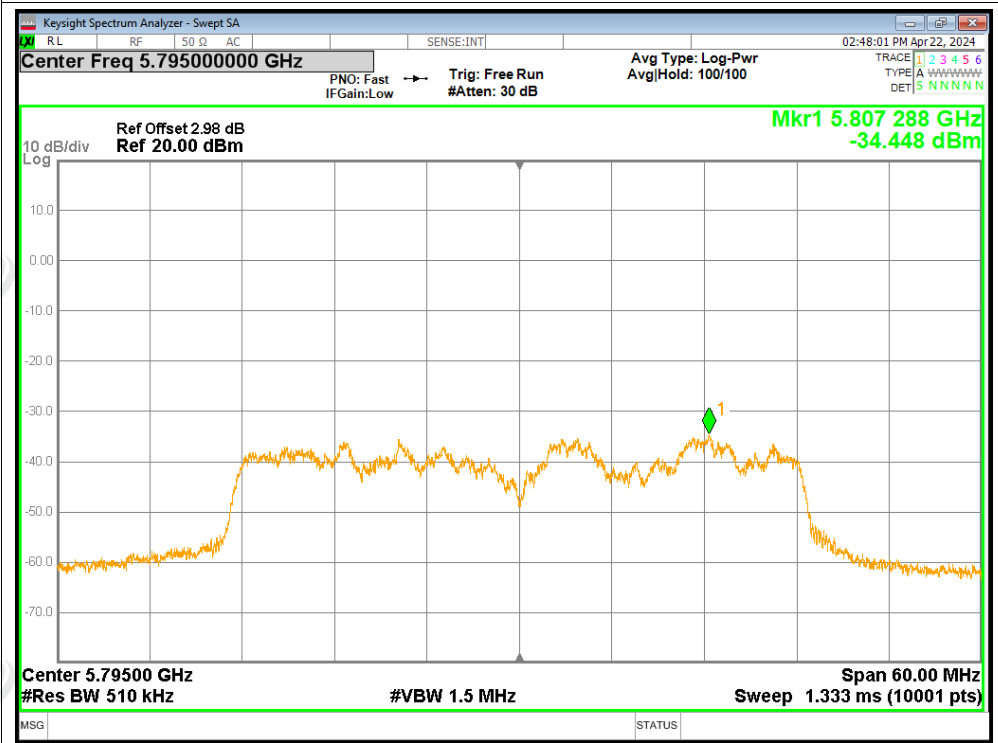


PSD NVNT ac40 5755MHz Ant1

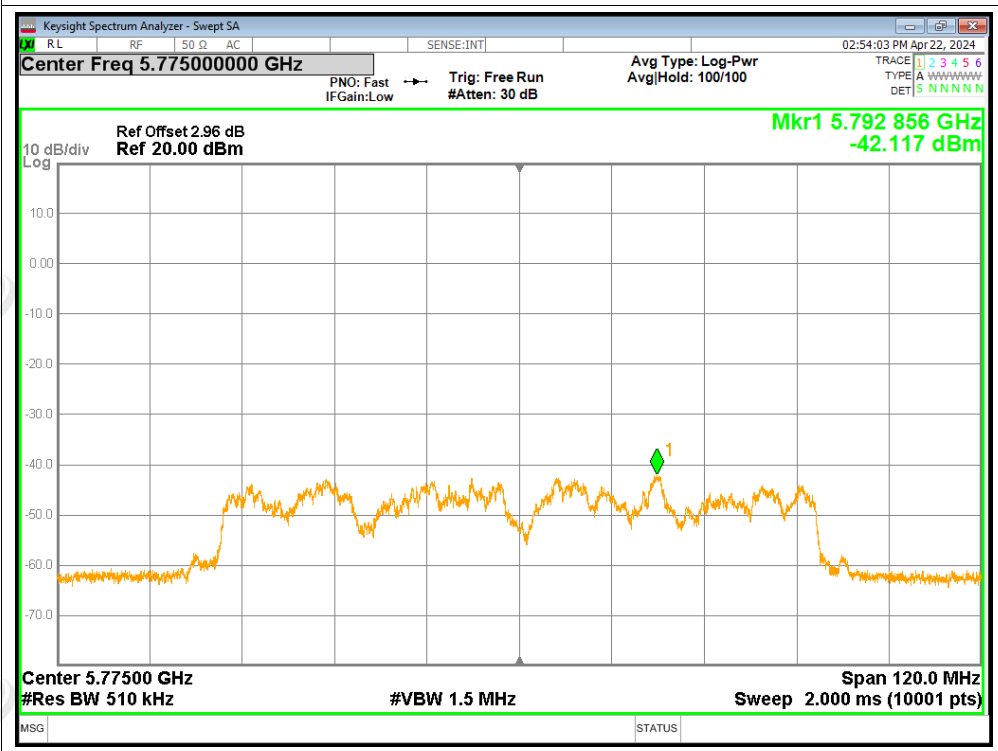




PSD NVNT ac40 5795MHz Ant1



PSD NVNT ac80 5775MHz Ant1





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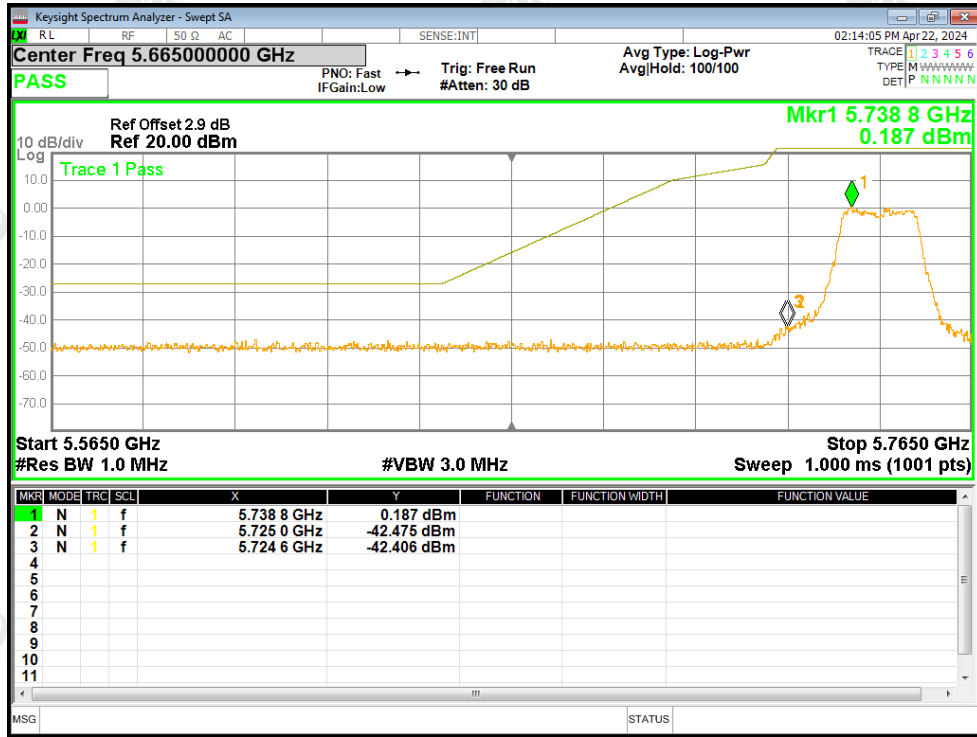
B6. Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBm)	Verdict
NVNT	a	5745	Ant1	-42.4	Pass
NVNT	a	5825	Ant1	-46.15	Pass
NVNT	n20	5745	Ant1	-32.09	Pass
NVNT	n20	5825	Ant1	-33.98	Pass
NVNT	n40	5755	Ant1	-36.63	Pass
NVNT	n40	5795	Ant1	-46.3	Pass
NVNT	ac20	5745	Ant1	-43.17	Pass
NVNT	ac20	5825	Ant1	-45.23	Pass
NVNT	ac40	5755	Ant1	-40.79	Pass
NVNT	ac40	5795	Ant1	-46.31	Pass
NVNT	ac80	5775	Ant1	-43.23	Pass

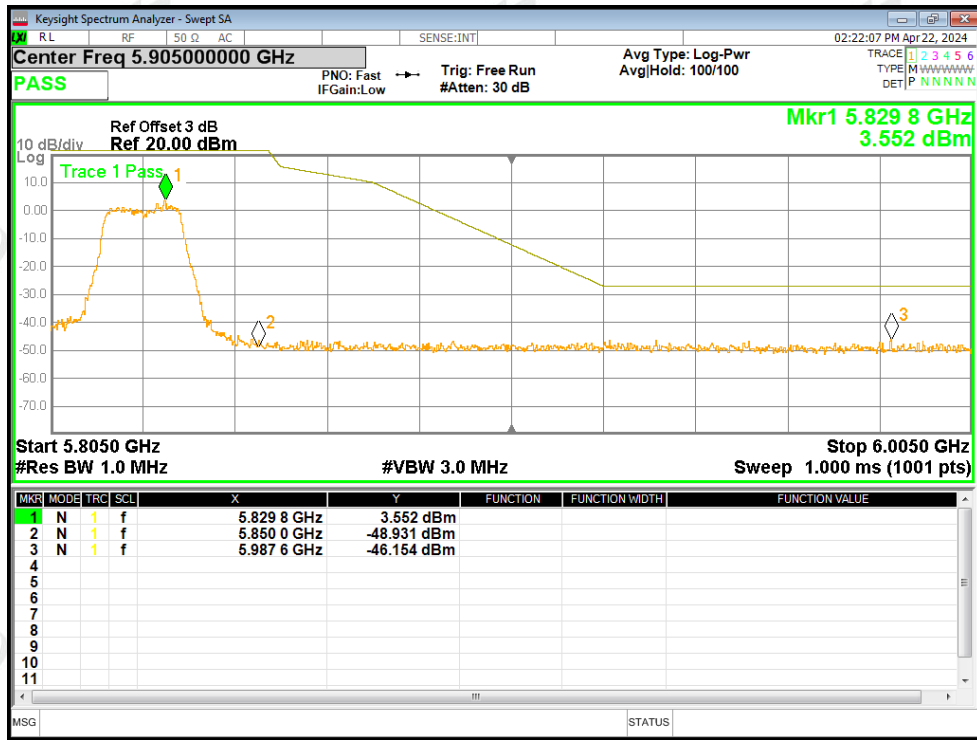


Test Graphs

Band Edge NVNT a 5745MHz Low Ant1



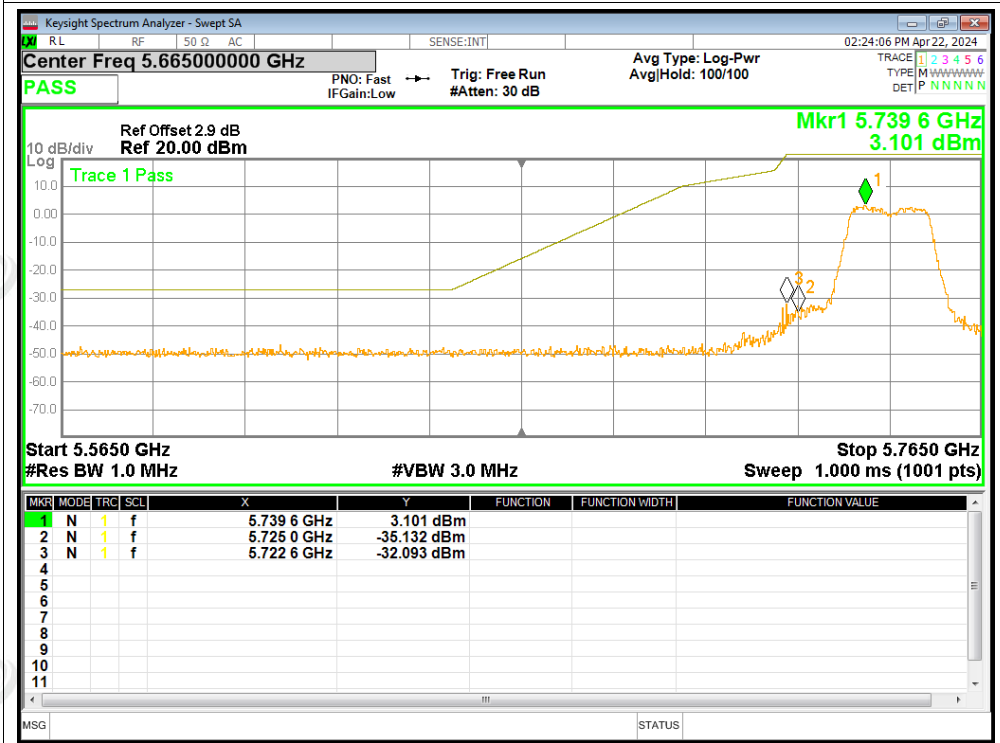
Band Edge NVNT a 5825MHz High Ant1



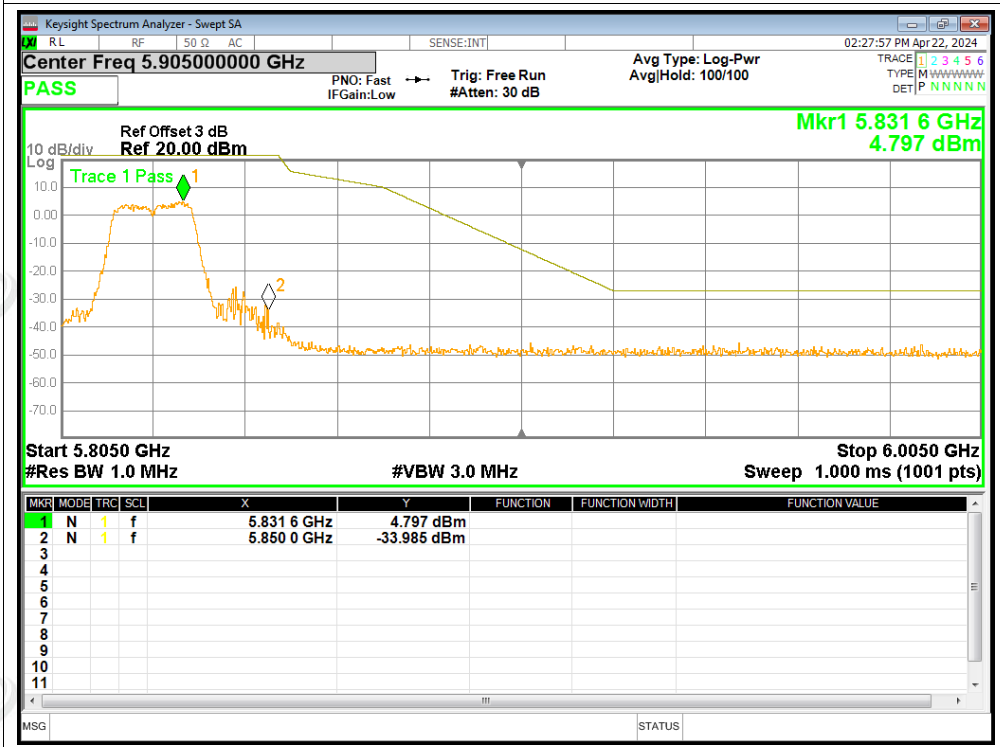


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Band Edge NVNT n20 5745MHz Low Ant1

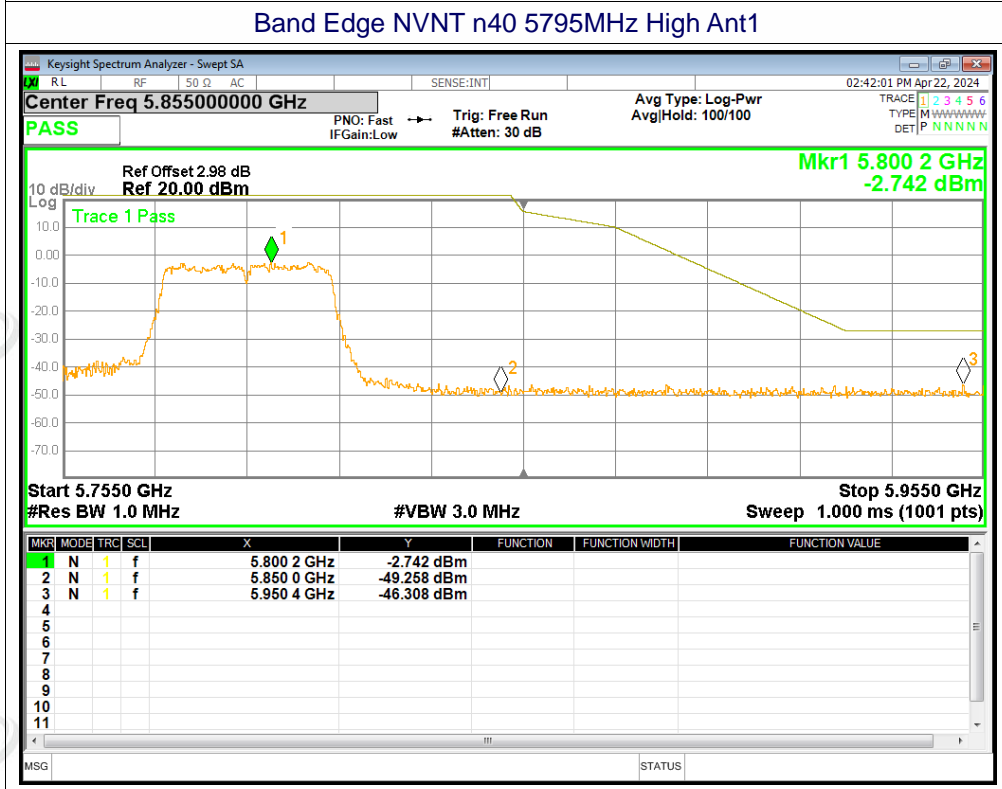
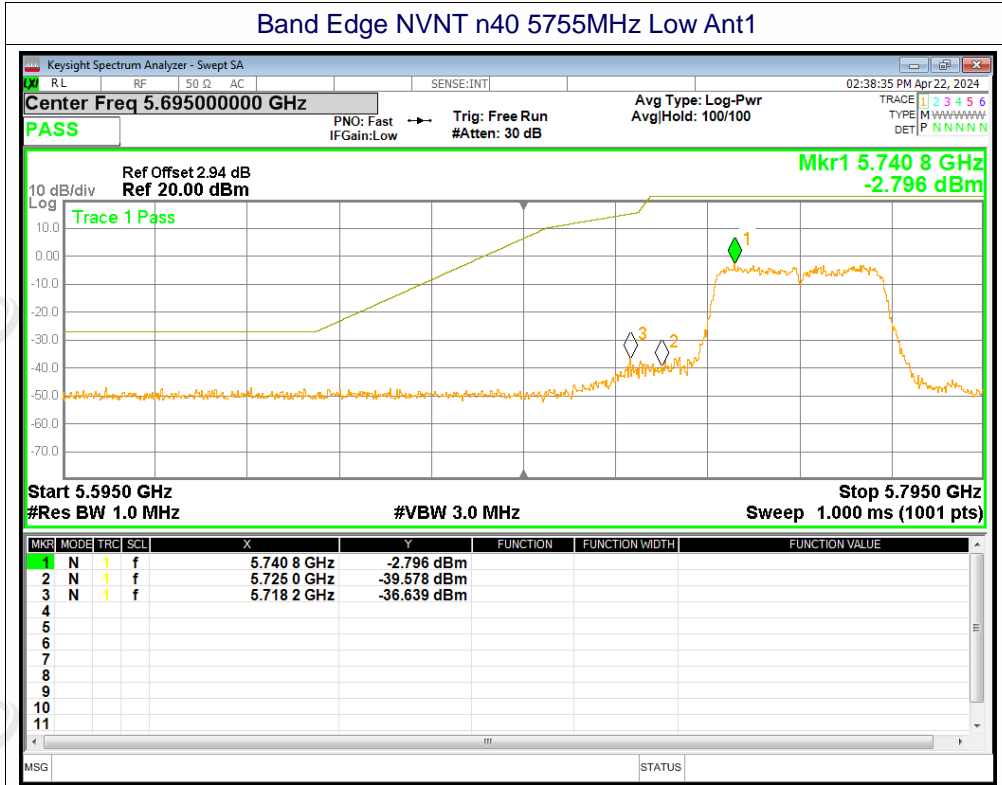


Band Edge NVNT n20 5825MHz High Ant1





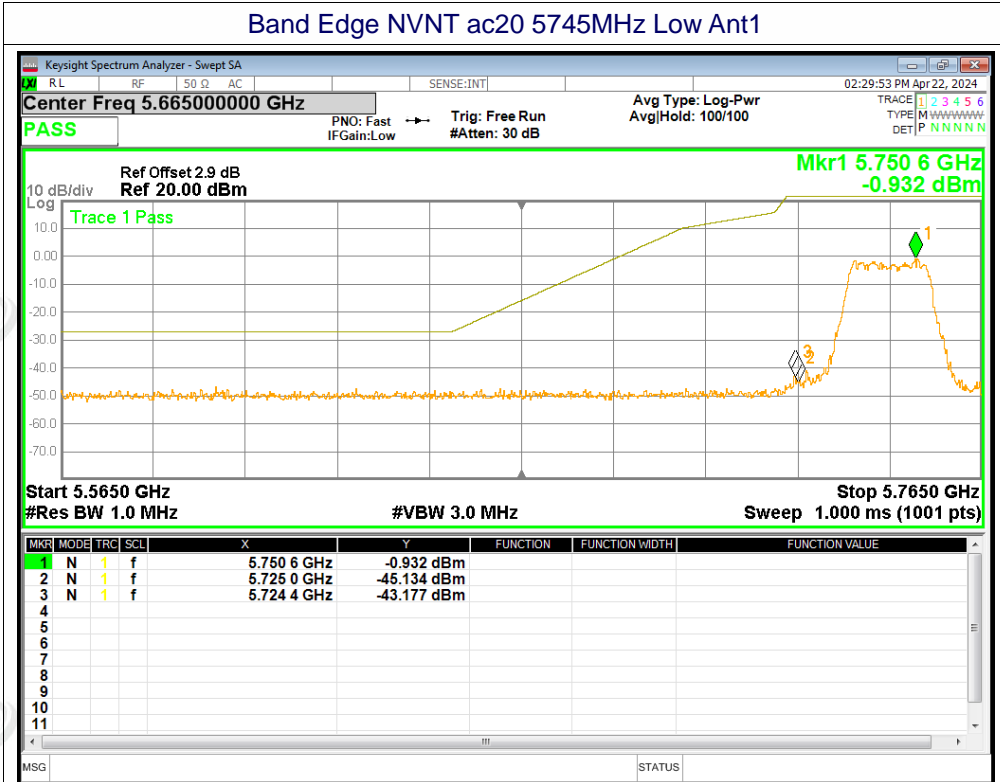
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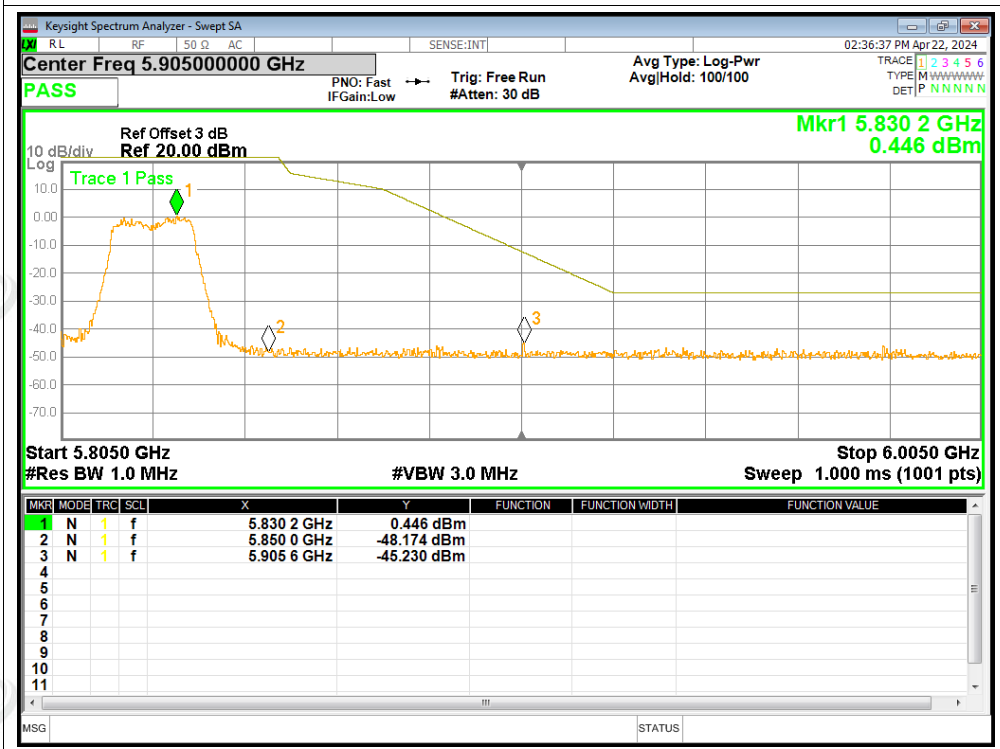


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Band Edge NVNT ac20 5745MHz Low Ant1



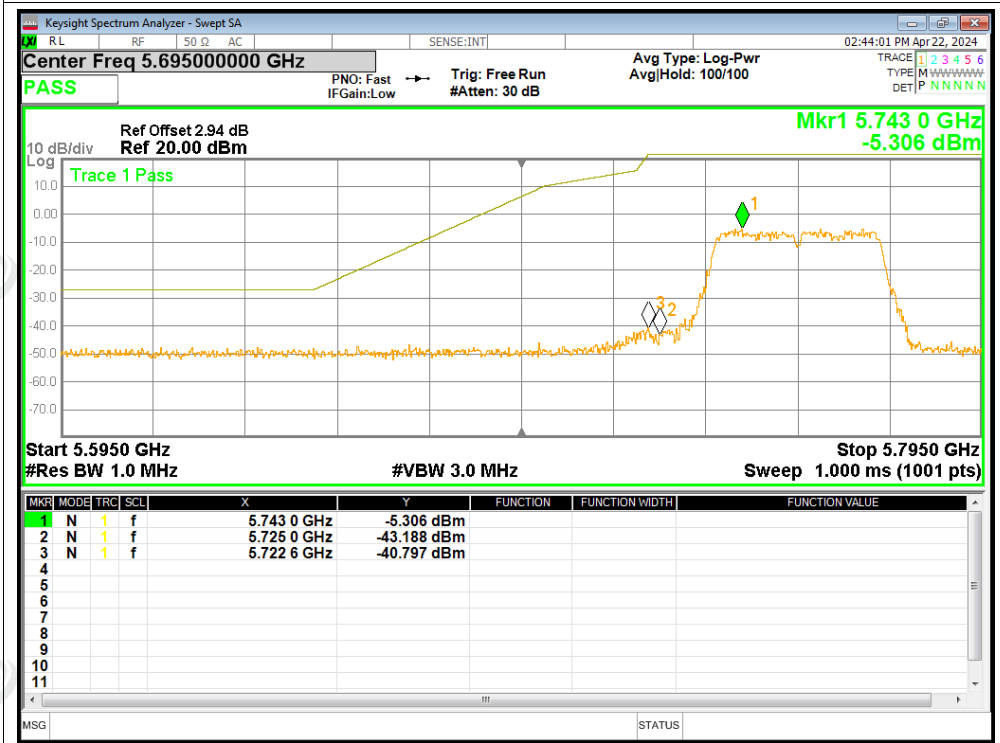
Band Edge NVNT ac20 5825MHz High Ant1



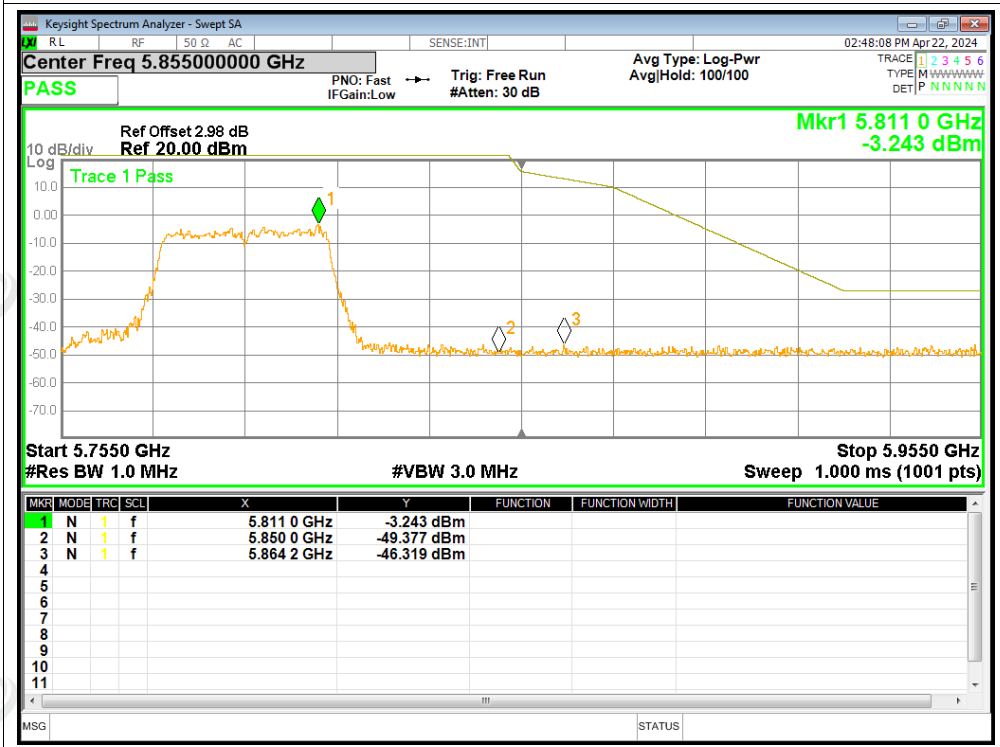


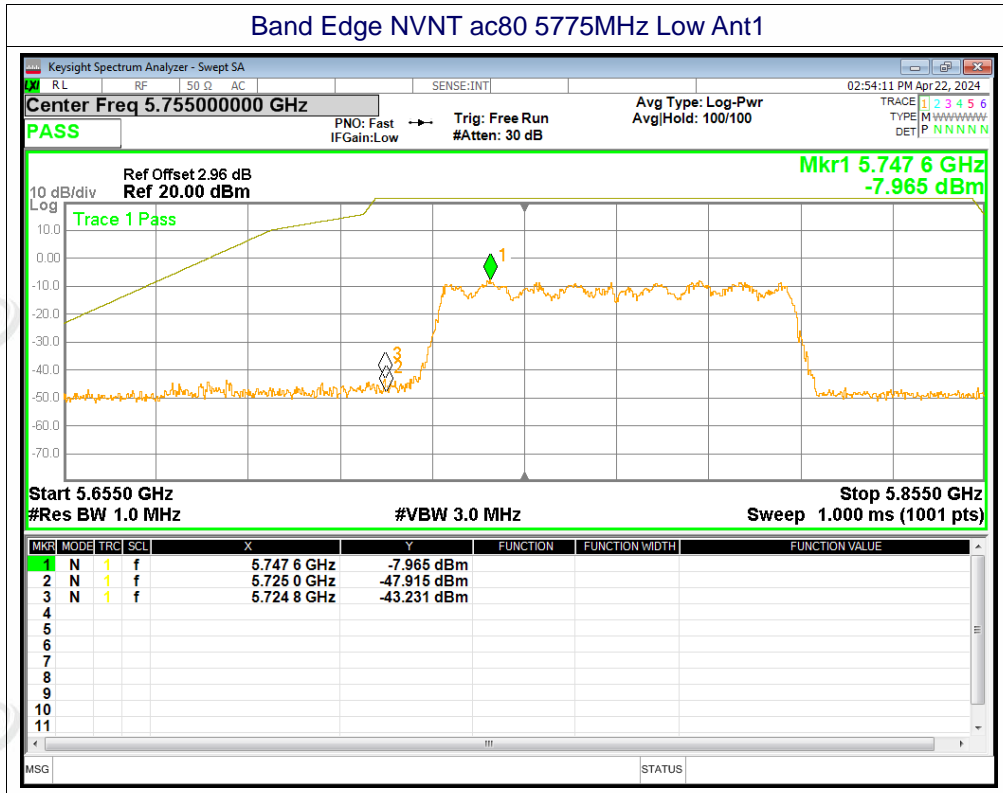
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Band Edge NVNT ac40 5755MHz Low Ant1



Band Edge NVNT ac40 5795MHz High Ant1







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B7. Frequency Stability

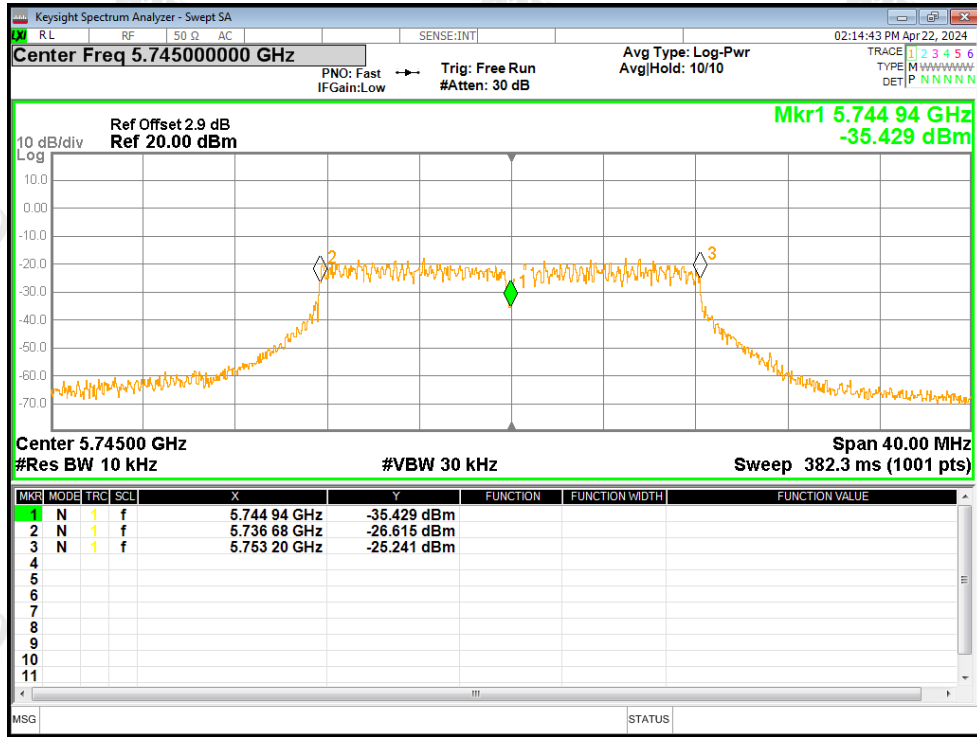
Mode	Frequency (MHz)	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
a	5745	5744.94	-60000	-10.44	Within 5745-5825MHz	Pass
a	5785	5784.98	-20000	-3.46		Pass
a	5825	5824.98	-20000	-3.43		Pass
n20	5745	5744.94	-60000	-10.44		Pass
n20	5785	5784.96	-40000	-6.91		Pass
n20	5825	5824.96	-40000	-6.87		Pass
n40	5755	5754.96	-40000	-6.95	Within 5755-5795MHz	Pass
n40	5795	5794.96	-40000	-6.9		Pass
ac20	5745	5744.94	-60000	-10.44	Within 5745-5825MHz	Pass
ac20	5785	5784.98	-20000	-3.46		Pass
ac20	5825	5824.98	-20000	-3.43		Pass
ac40	5755	5754.92	-80000	-13.9	Within 5755-5795MHz	Pass
ac40	5795	5794.96	-40000	-6.9		Pass
ac80	5775	5775	0	0	Within 5775MHz	Pass

Note: Test temperature: -20° to + 70°. At room temperature, the test results are the worst, only reflecting the test results graphs at room temperature.

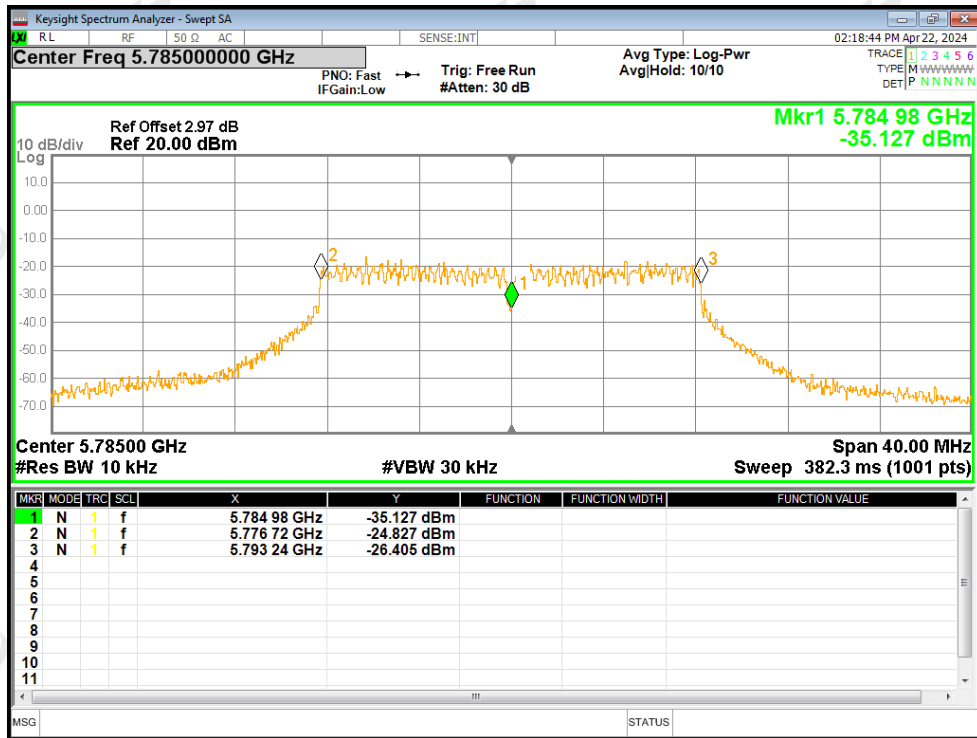


Test Graphs

Freq. Stability NVNT a 5745MHz Ant1



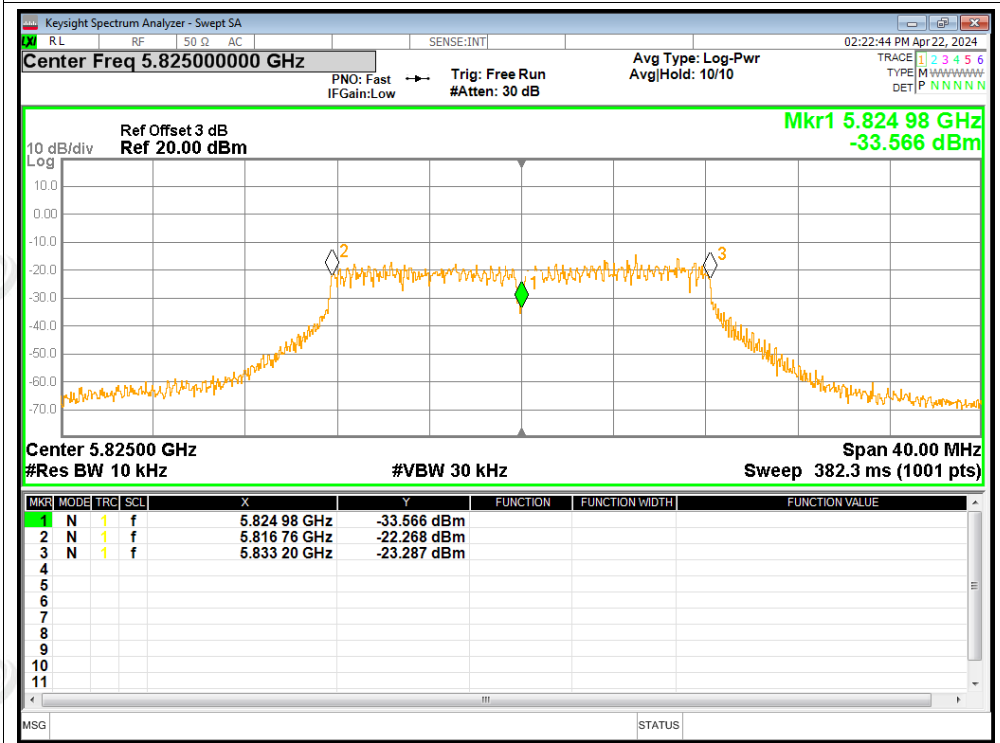
Freq. Stability NVNT a 5785MHz Ant1



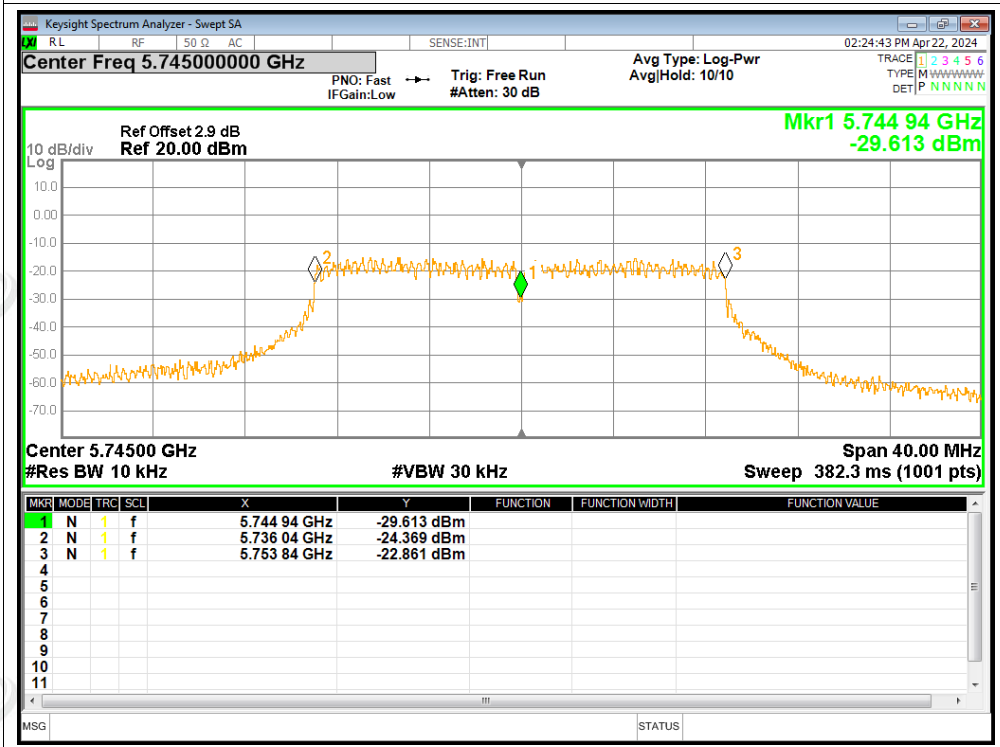


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Freq. Stability NVNT a 5825MHz Ant1



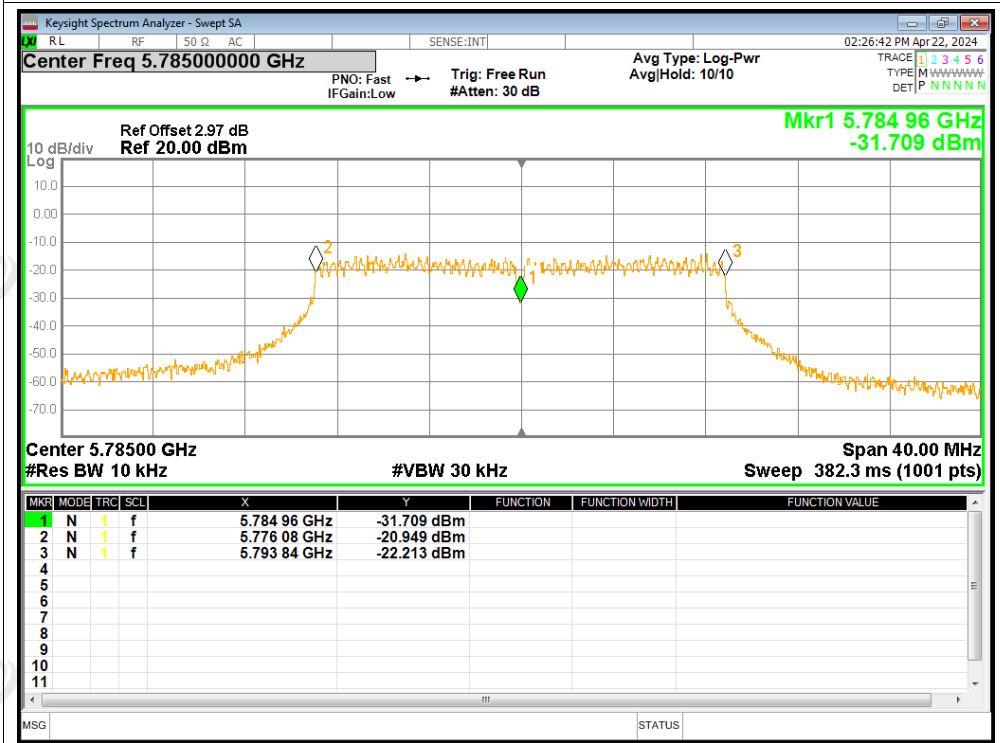
Freq. Stability NVNT n20 5745MHz Ant1



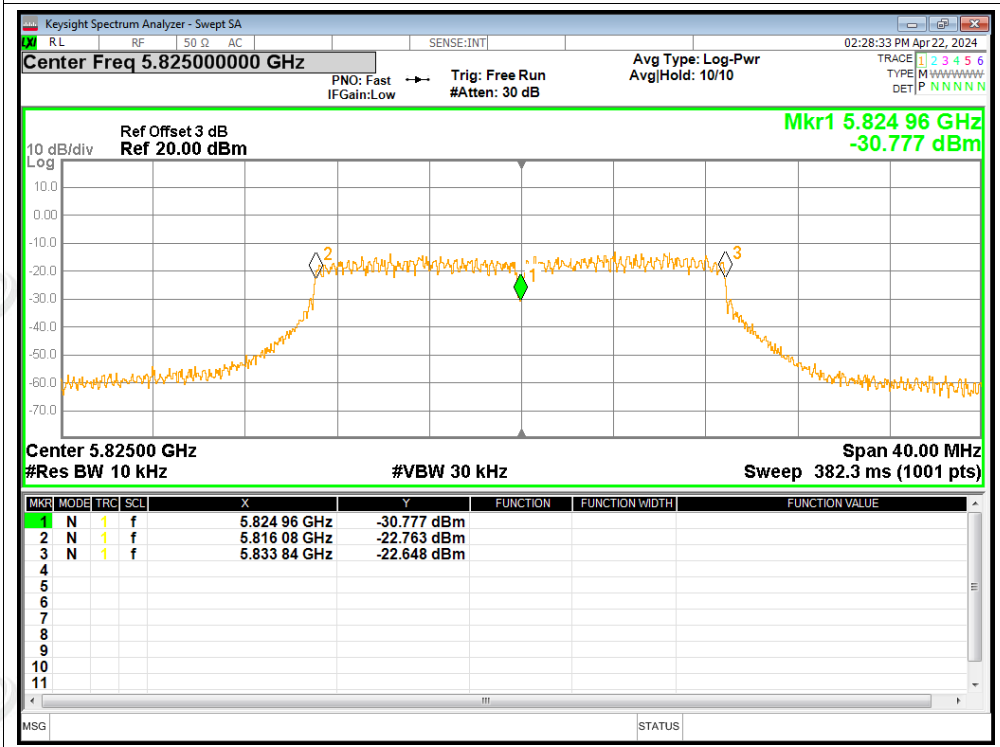


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Freq. Stability NVNT n20 5785MHz Ant1

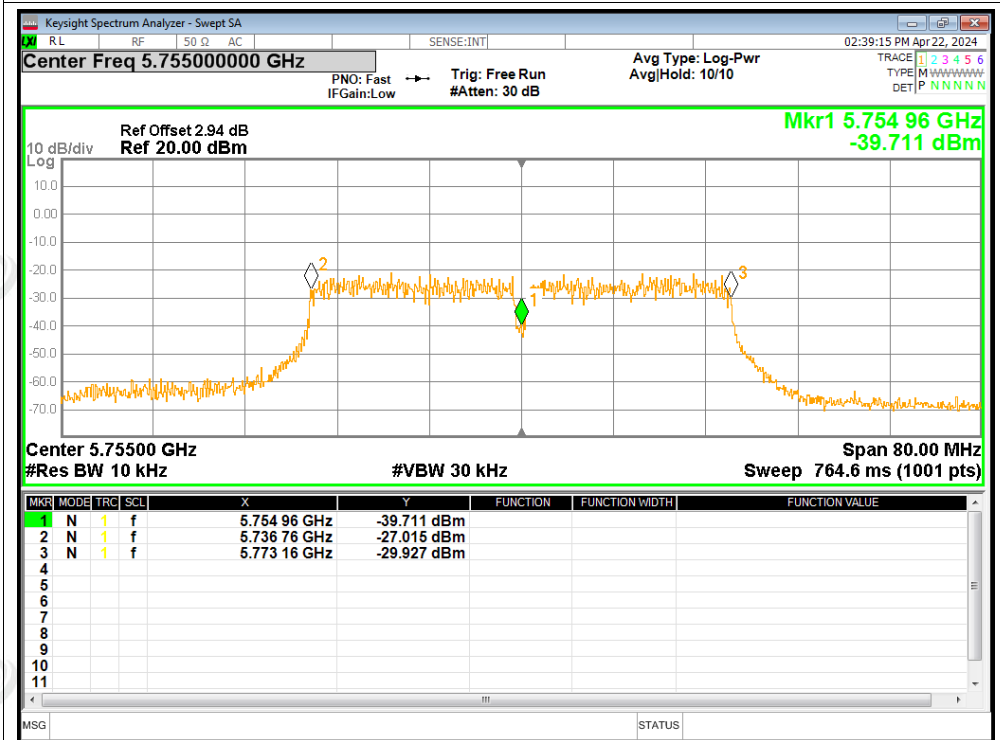


Freq. Stability NVNT n20 5825MHz Ant1

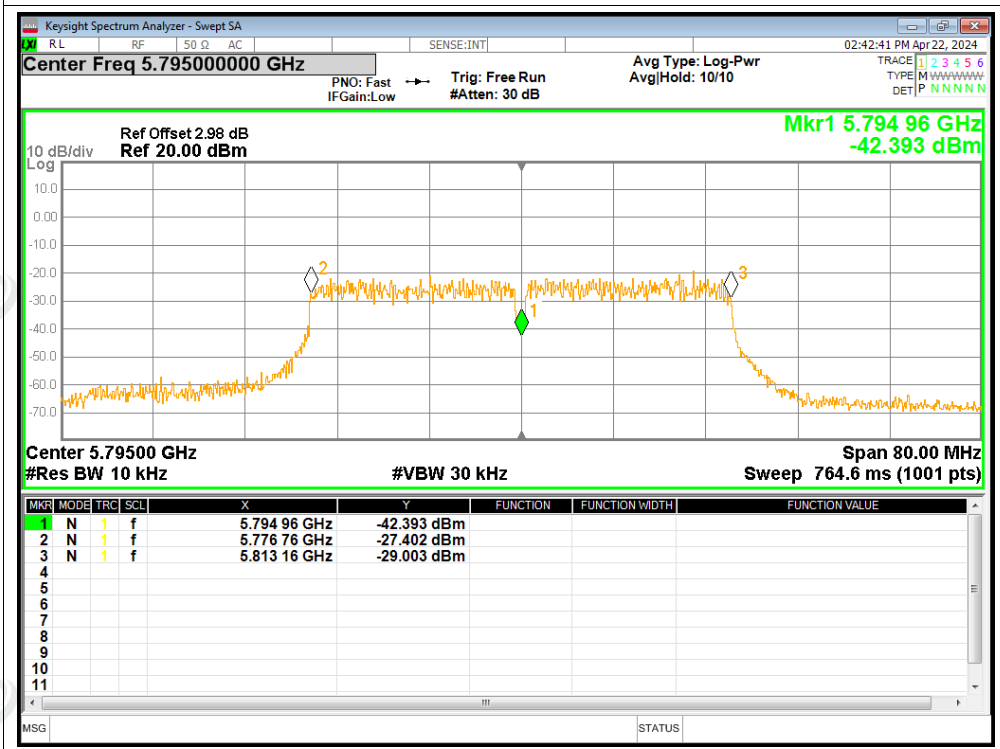




Freq. Stability NVNT n40 5755MHz Ant1

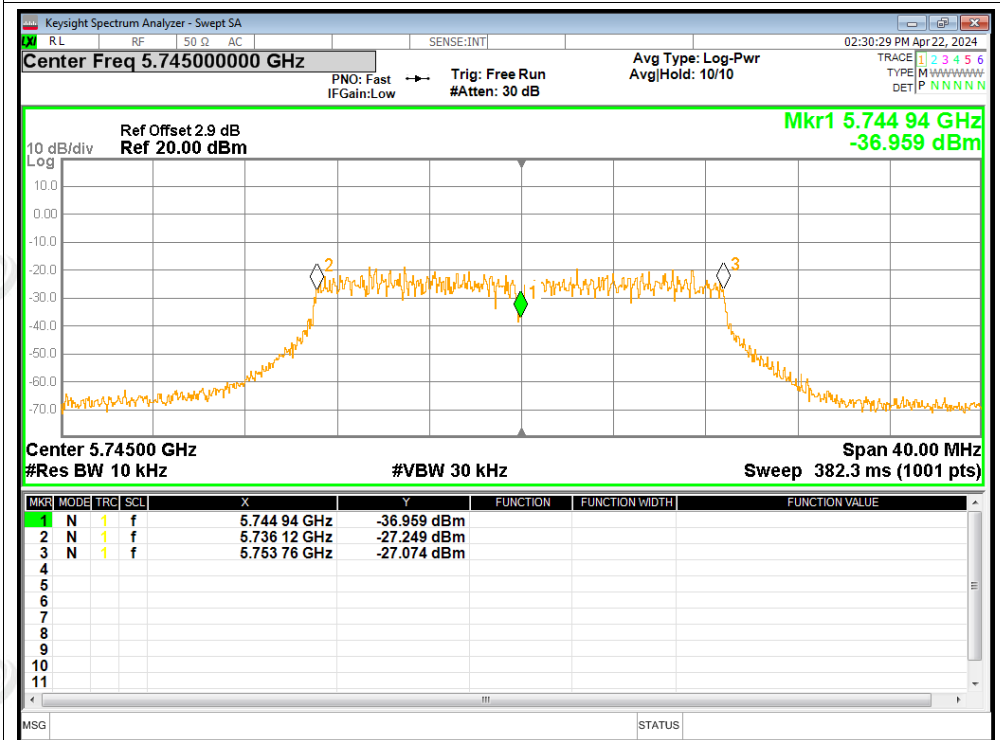


Freq. Stability NVNT n40 5795MHz Ant1

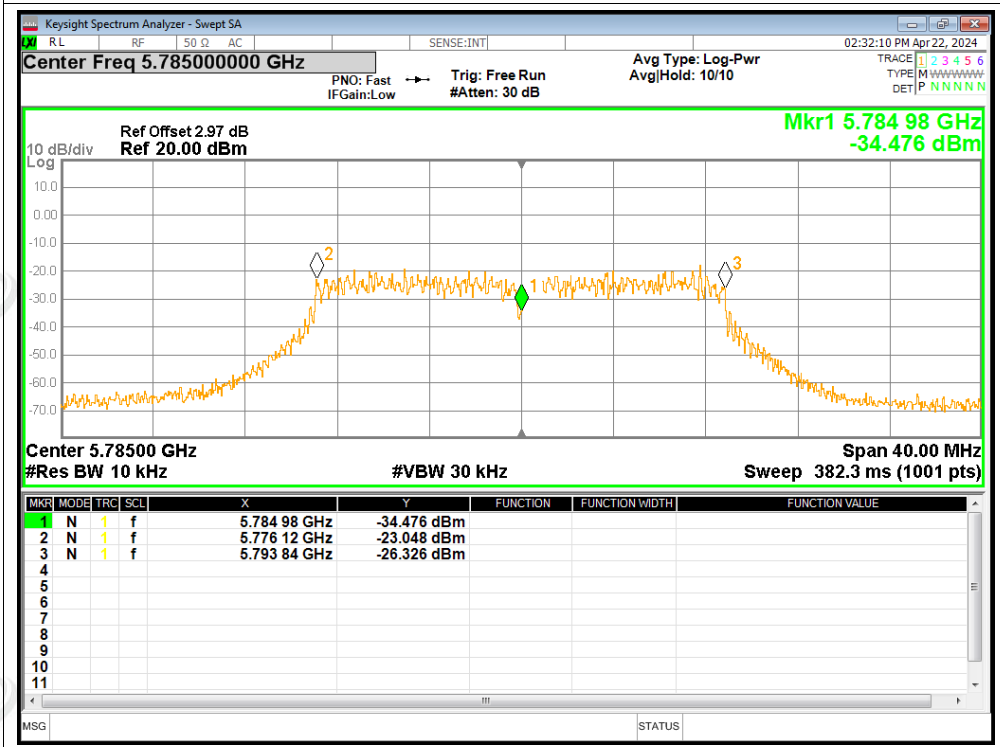




Freq. Stability NVNT ac20 5745MHz Ant1



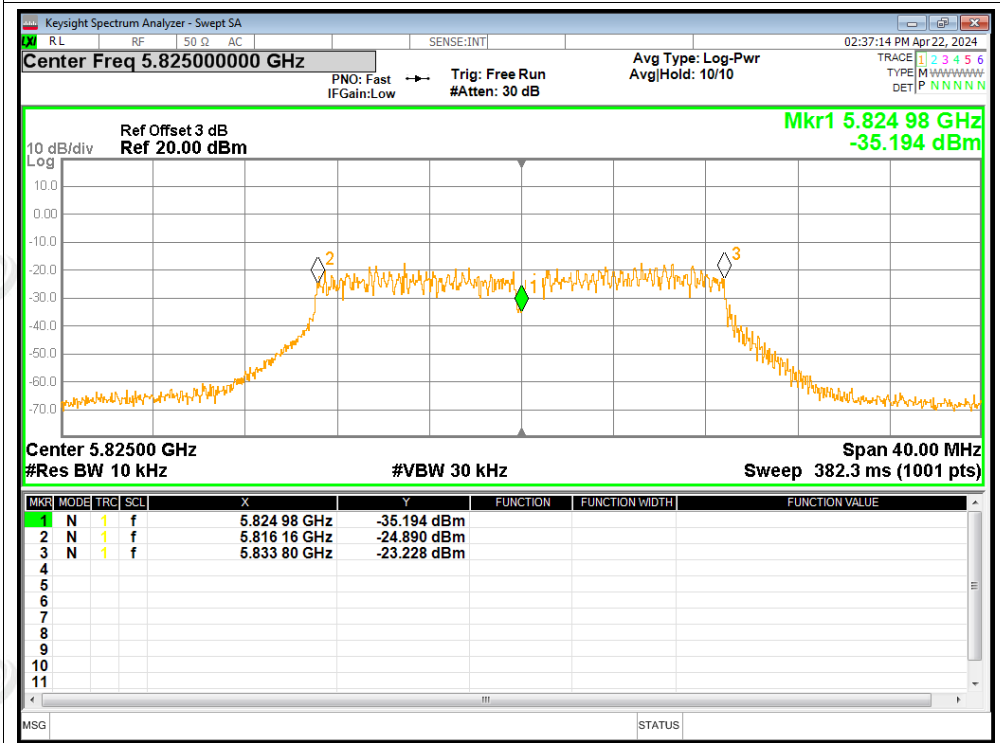
Freq. Stability NVNT ac20 5785MHz Ant1



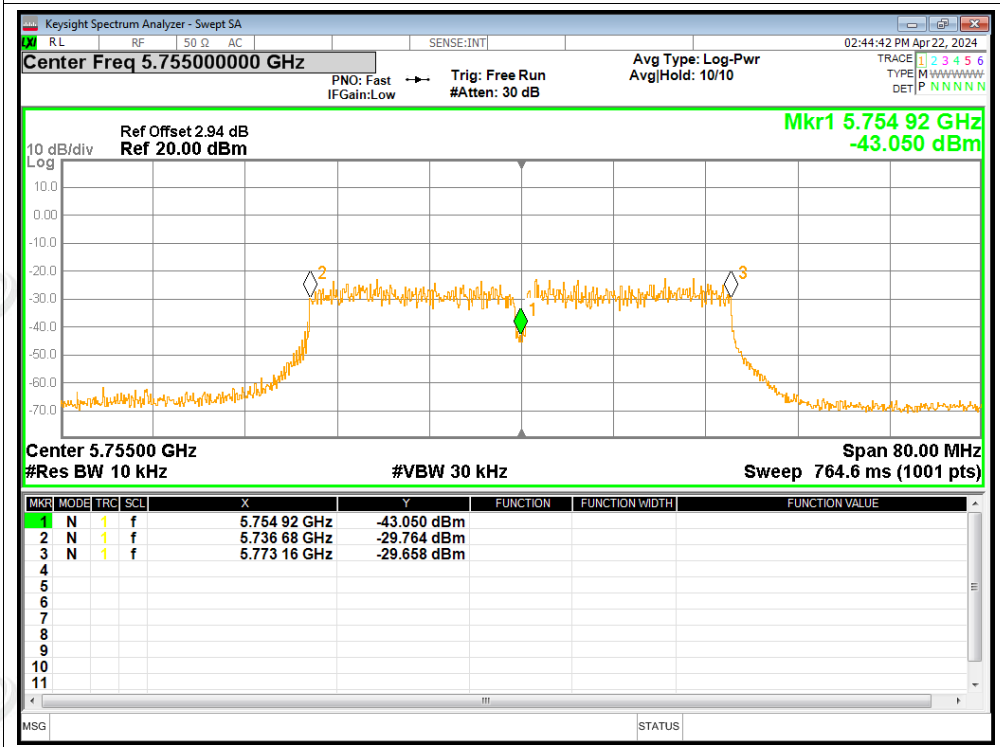


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Freq. Stability NVNT ac20 5825MHz Ant1



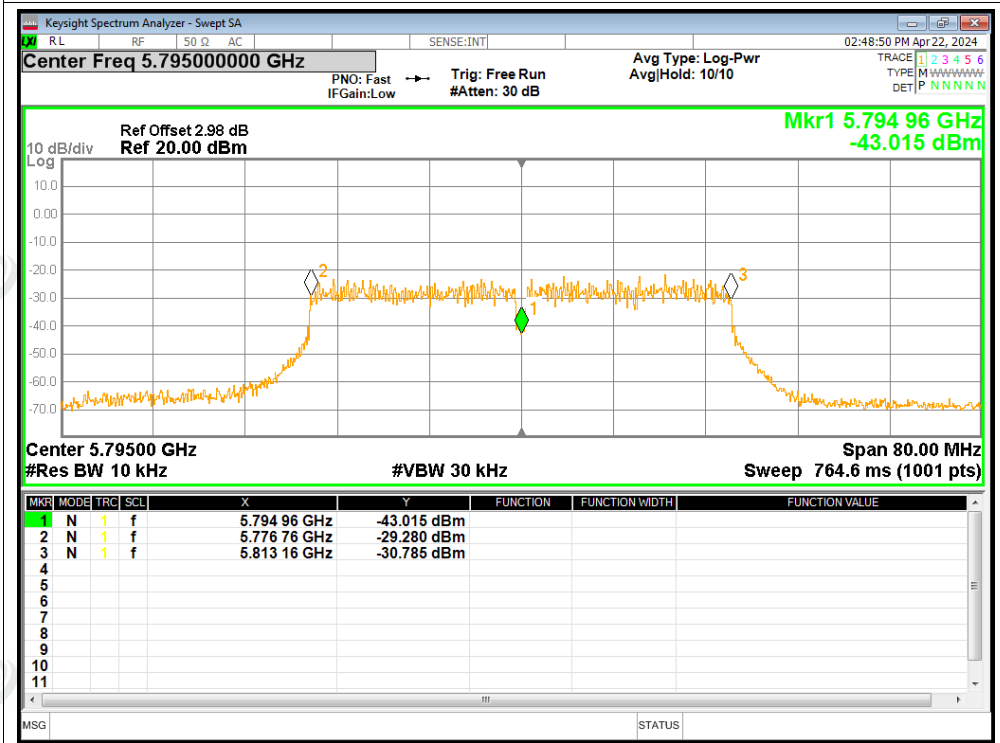
Freq. Stability NVNT ac40 5755MHz Ant1



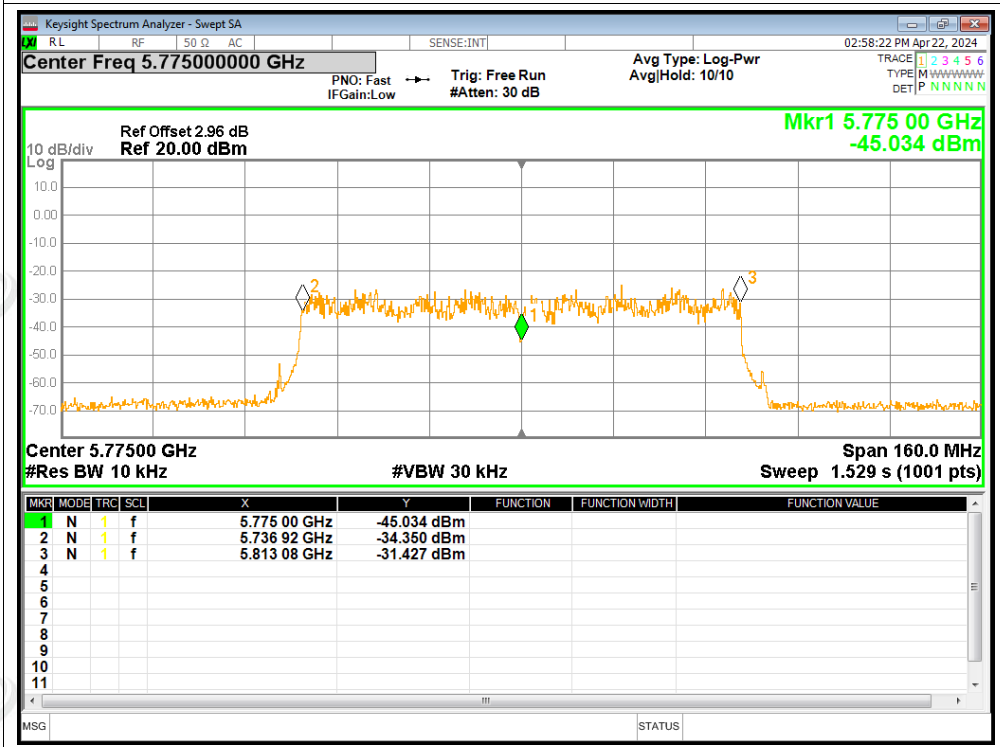


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Freq. Stability NVNT ac40 5795MHz Ant1



Freq. Stability NVNT ac80 5775MHz Ant1





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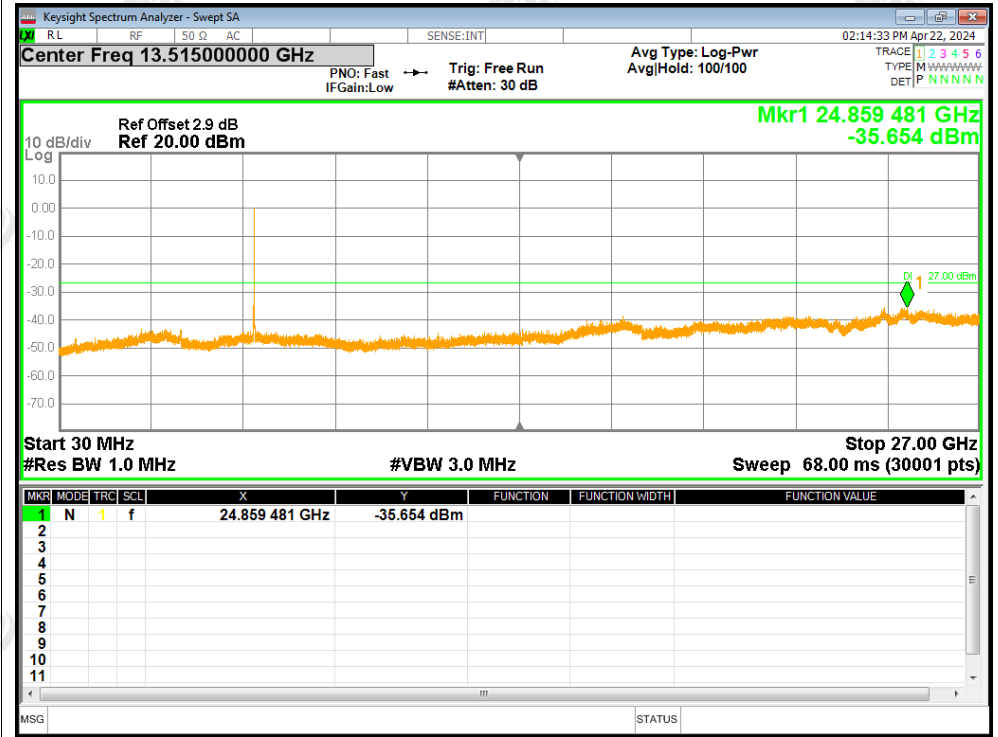
B8. Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	a	5745	Ant1	-35.65	-27	Pass
NVNT	a	5785	Ant1	-34.87	-27	Pass
NVNT	a	5825	Ant1	-35.82	-27	Pass
NVNT	n20	5745	Ant1	-35.68	-27	Pass
NVNT	n20	5785	Ant1	-35.81	-27	Pass
NVNT	n20	5825	Ant1	-35.55	-27	Pass
NVNT	n40	5755	Ant1	-35.18	-27	Pass
NVNT	n40	5795	Ant1	-35.1	-27	Pass
NVNT	ac20	5745	Ant1	-34.84	-27	Pass
NVNT	ac20	5785	Ant1	-35.47	-27	Pass
NVNT	ac20	5825	Ant1	-35.58	-27	Pass
NVNT	ac40	5755	Ant1	-35.31	-27	Pass
NVNT	ac40	5795	Ant1	-35.46	-27	Pass
NVNT	ac80	5775	Ant1	-35	-27	Pass

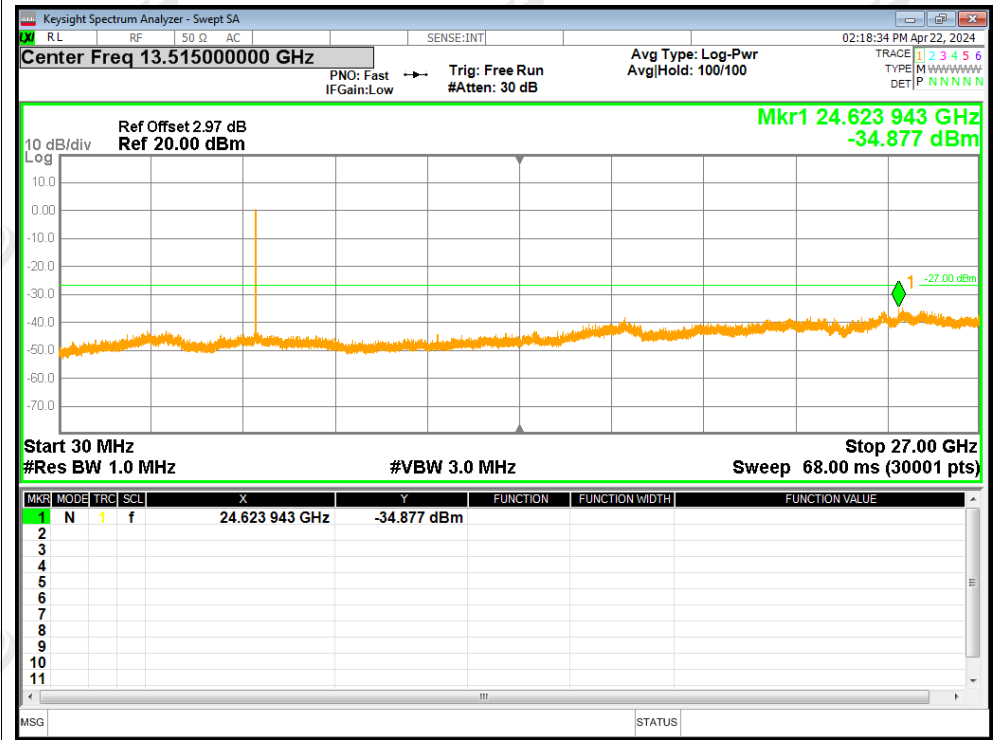


Test Graphs

Tx. Spurious NVNT a 5745MHz Ant1 Emission



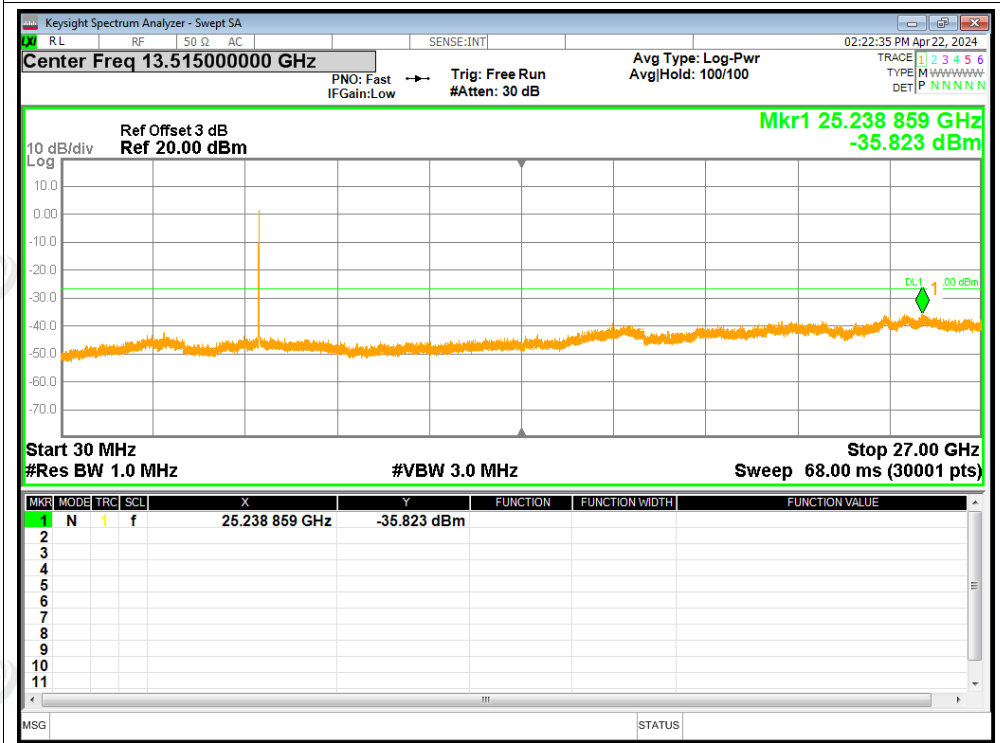
Tx. Spurious NVNT a 5785MHz Ant1 Emission



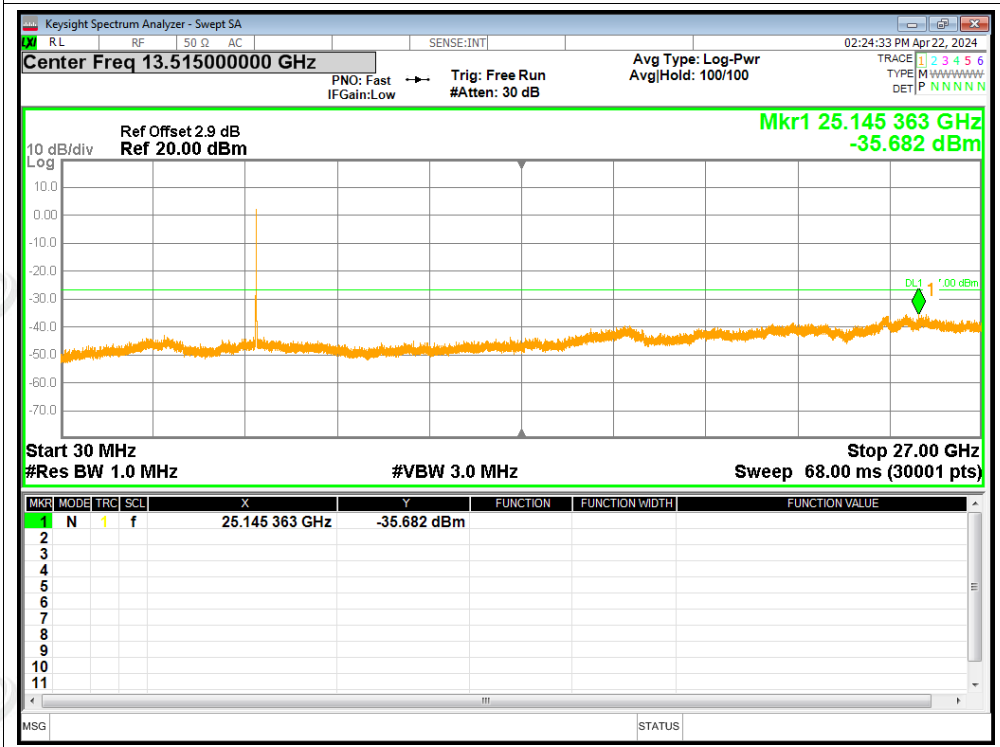


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Tx. Spurious NVNT a 5825MHz Ant1 Emission

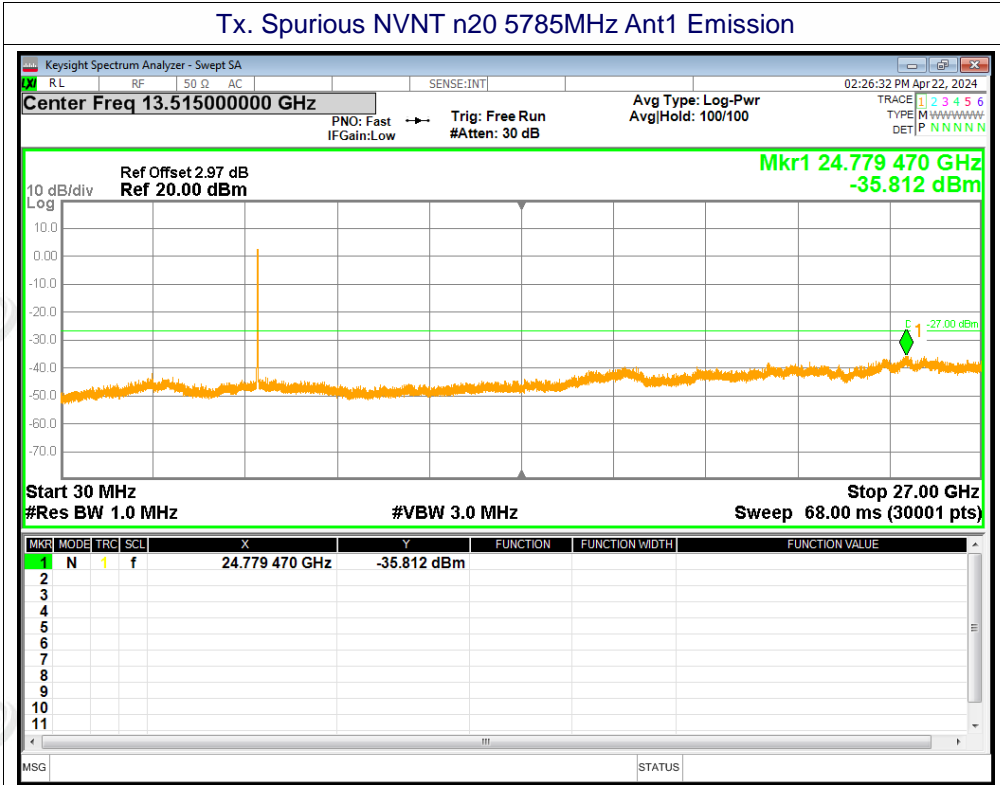


Tx. Spurious NVNT n20 5745MHz Ant1 Emission

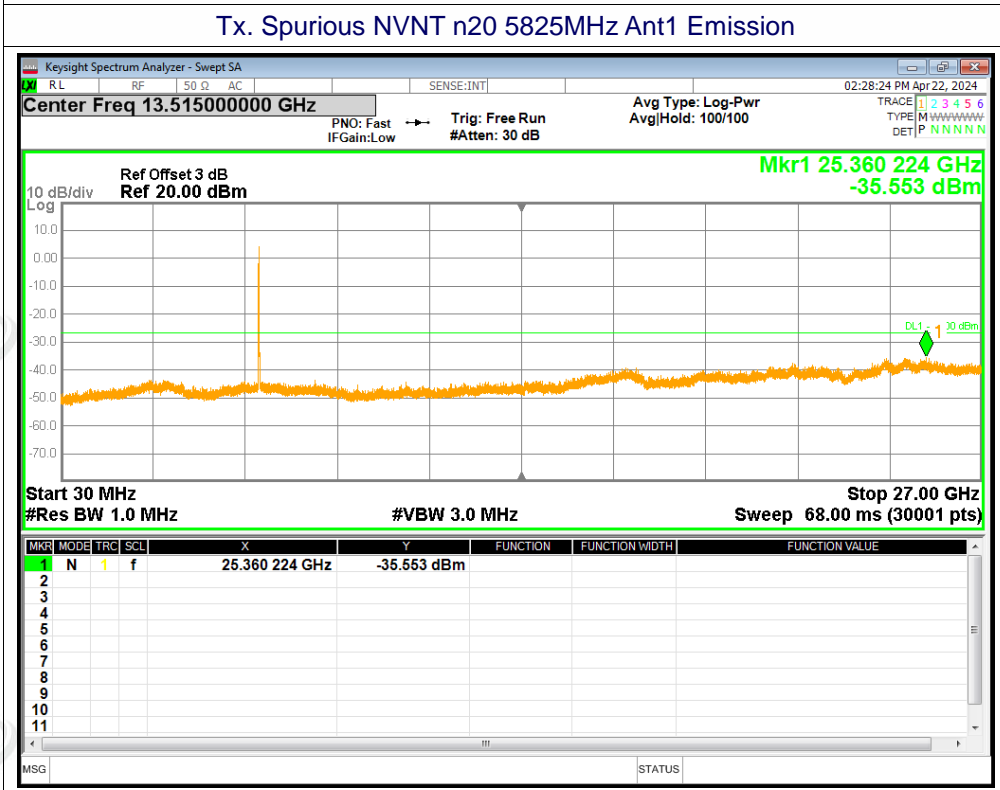




Tx. Spurious NVNT n20 5785MHz Ant1 Emission



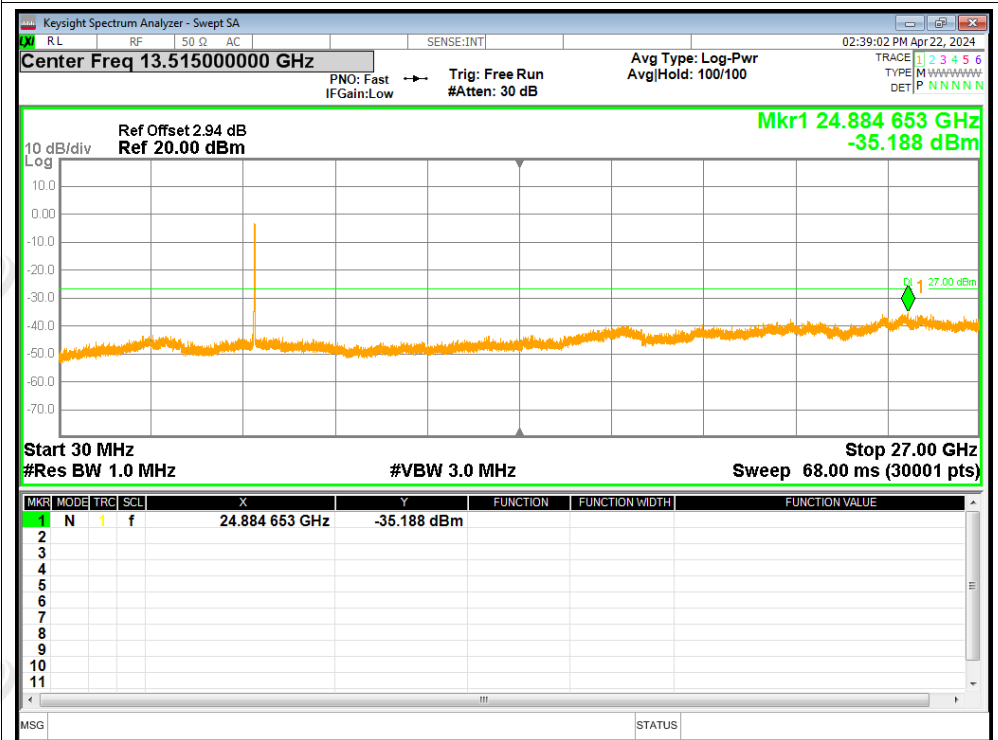
Tx. Spurious NVNT n20 5825MHz Ant1 Emission



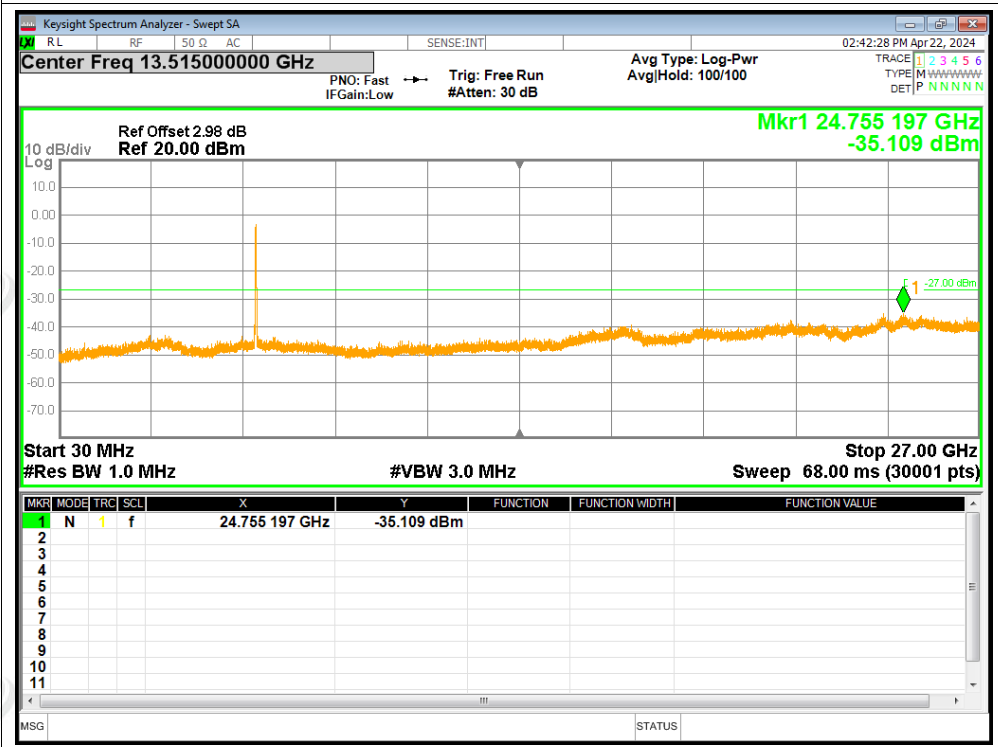


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Tx. Spurious NVNT n40 5755MHz Ant1 Emission

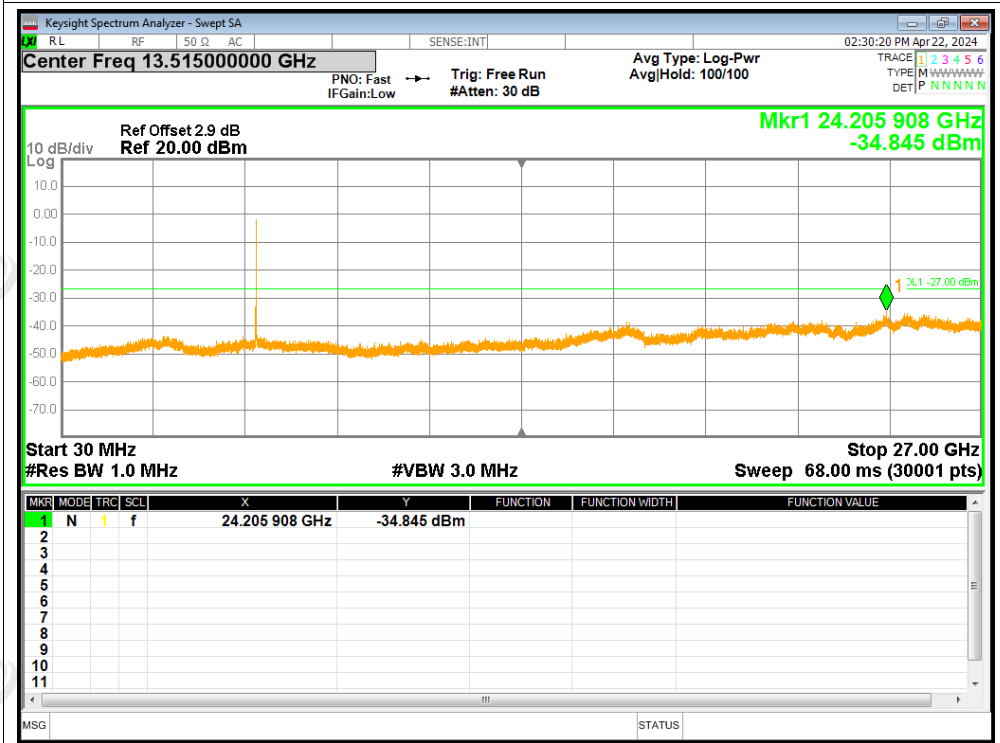


Tx. Spurious NVNT n40 5795MHz Ant1 Emission

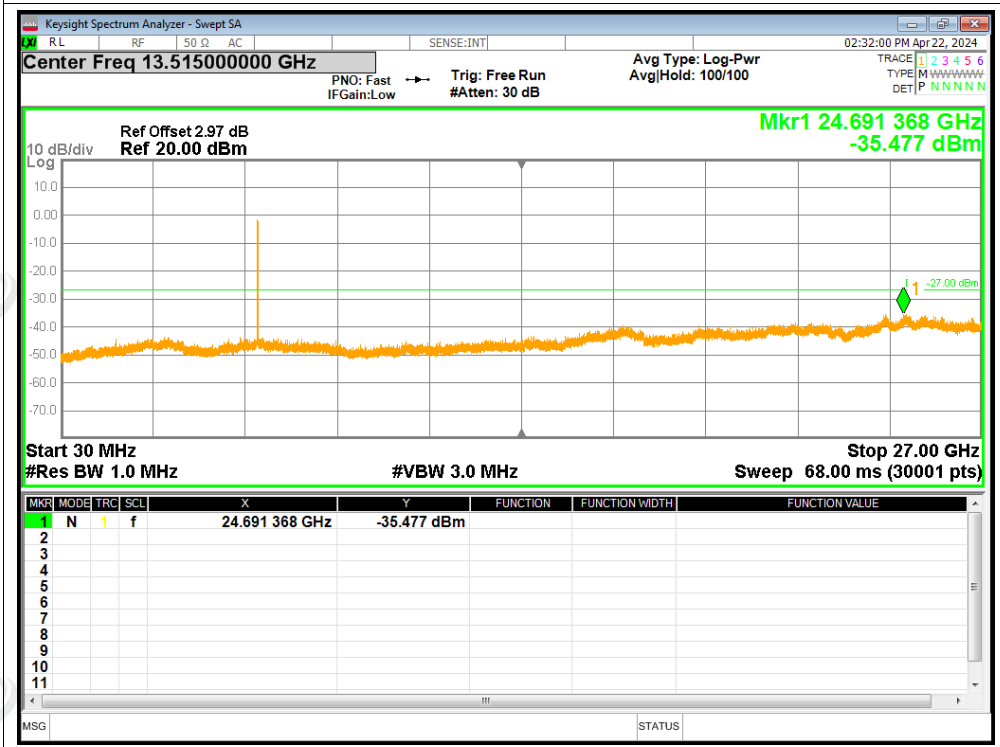




Tx. Spurious NVNT ac20 5745MHz Ant1 Emission

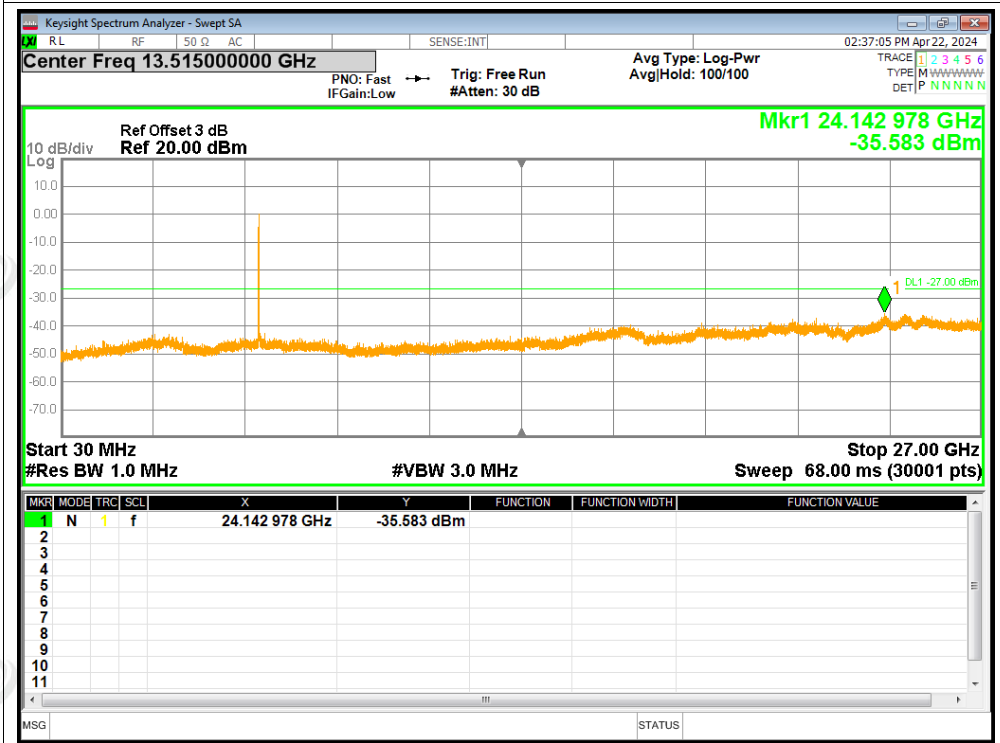


Tx. Spurious NVNT ac20 5785MHz Ant1 Emission

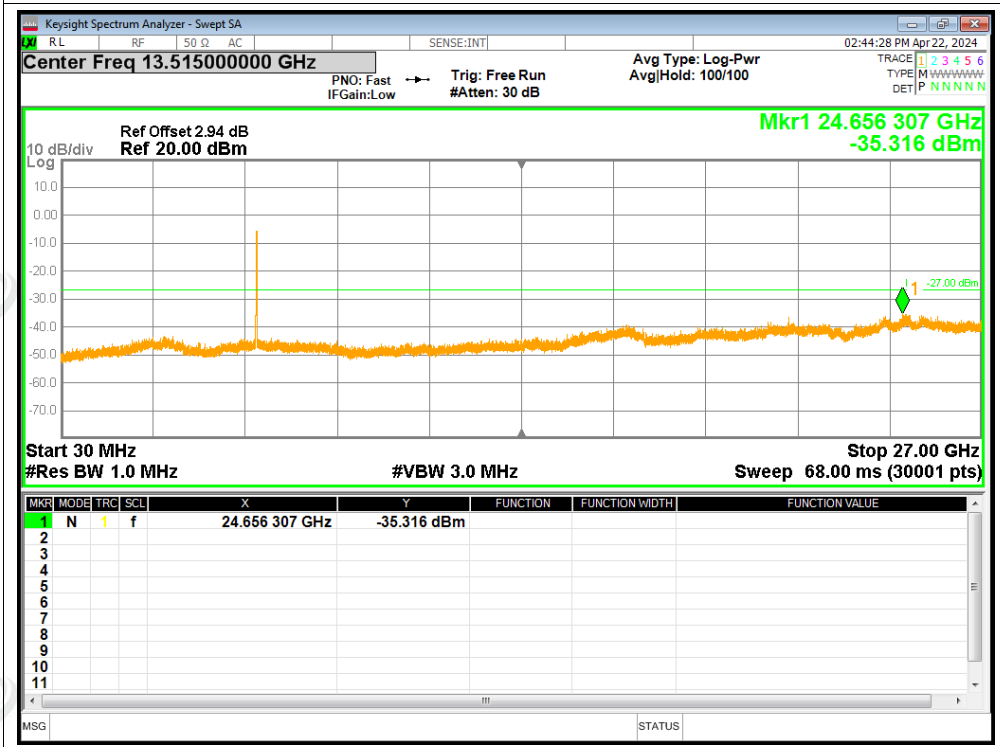




Tx. Spurious NVNT ac20 5825MHz Ant1 Emission

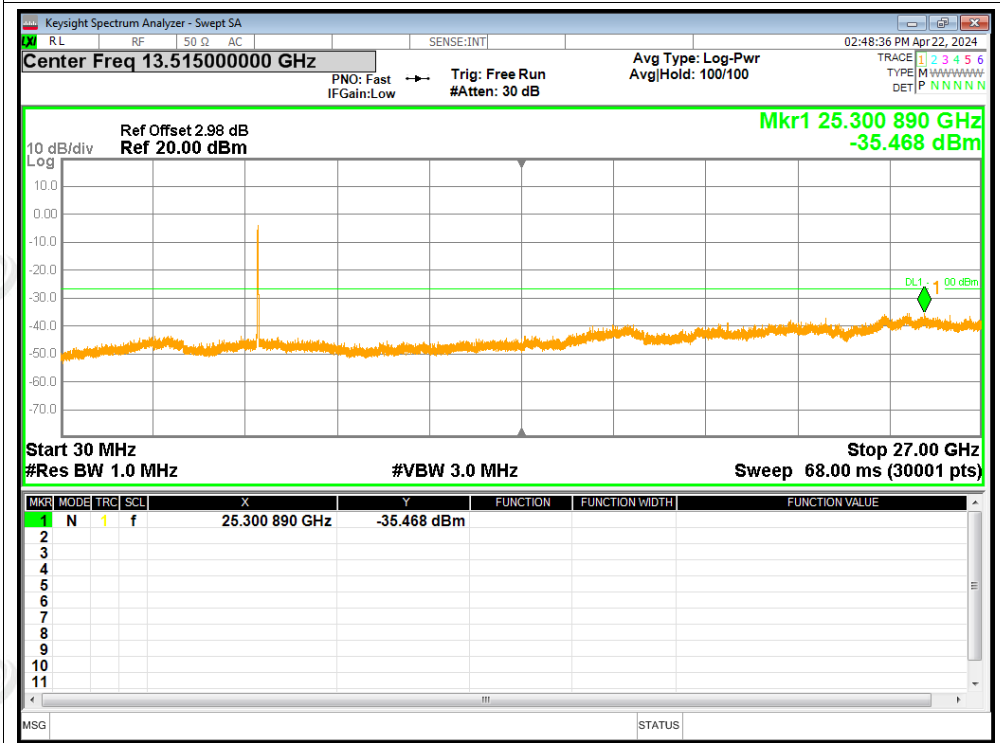


Tx. Spurious NVNT ac40 5755MHz Ant1 Emission





Tx. Spurious NVNT ac40 5795MHz Ant1 Emission



Tx. Spurious NVNT ac80 5775MHz Ant1 Emission

