

Appendix B for 5.3GWIFI Test Data
Product Name: CR-S1 Handheld Mapping System
Test Model: CR-S1

Environmental Conditions

Temperature:	25.4℃
Relative Humidity:	54.3%
ATM Pressure:	101.0 kPa
Test Engineer:	Kimi Lu
Supervised by:	Baret Wu

B.1 Duty Cycle

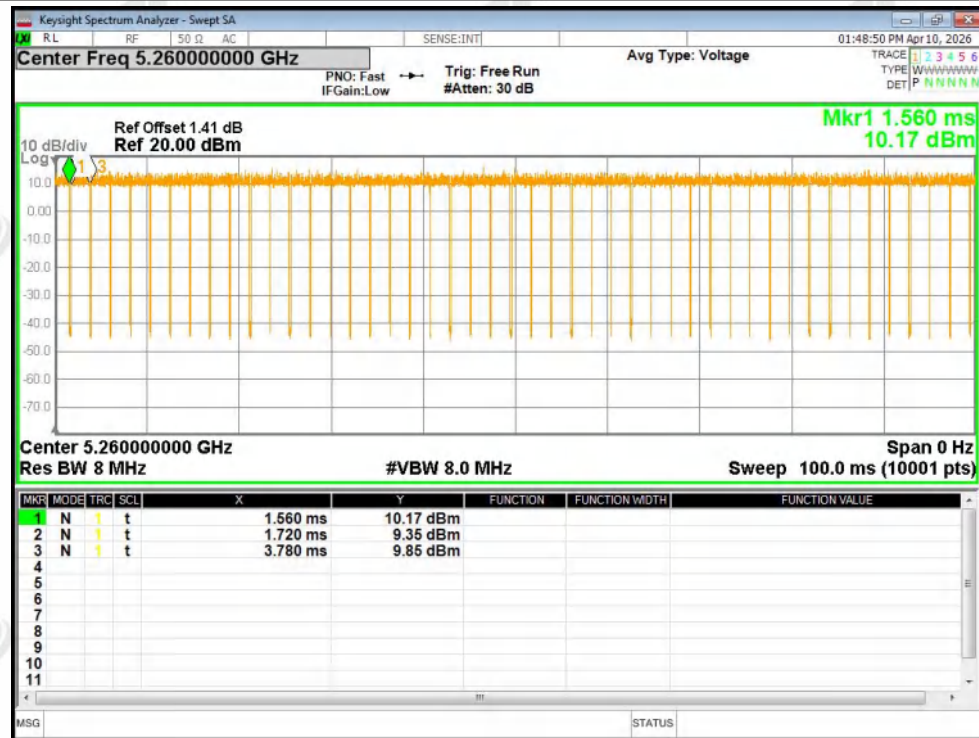
Mode	Frequency (MHz)	Antenna	T _{on} ms	T _{total} ms	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
a	5260	Ant1	2.06	2.22	92.79	0.32	0.49
a	5280	Ant1	2.07	2.22	93.24	0.3	0.48
a	5320	Ant1	2.07	2.10	98.57	0	0.48
n20	5260	Ant1	1.92	2.06	93.2	0.31	0.52
n20	5280	Ant1	1.92	1.98	96.97	0.13	0.52
n20	5320	Ant1	1.92	1.97	97.46	0.11	0.52
n40	5270	Ant1	0.94	1.05	89.52	0.48	1.06
n40	5310	Ant1	0.95	1.10	86.36	0.64	1.05
ac20	5260	Ant1	1.94	2.07	93.72	0.28	0.52
ac20	5280	Ant1	1.93	1.99	96.98	0.13	0.52
ac20	5320	Ant1	1.93	2.06	93.69	0.28	0.52
ac40	5270	Ant1	0.96	1.13	84.96	0.71	1.04
ac40	5310	Ant1	0.95	1.12	84.82	0.72	1.05
ac80	5290	Ant1	0.46	0.54	85.19	0.7	2.17

Note:

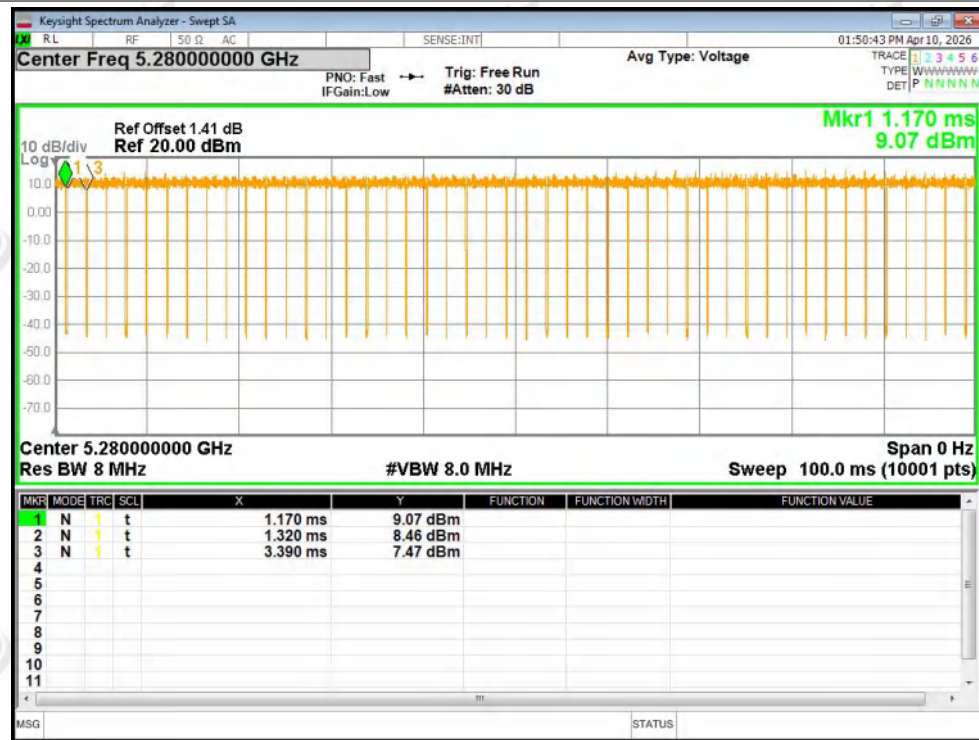
1. Duty Cycle = T_{on} / T_{total}
2. Correction Factor = $10 \log (1 / \text{Duty Cycle})$.
3. $1/T = 1/T_{on}$

Test Graphs

Duty Cycle NVNT a 5260MHz Ant1

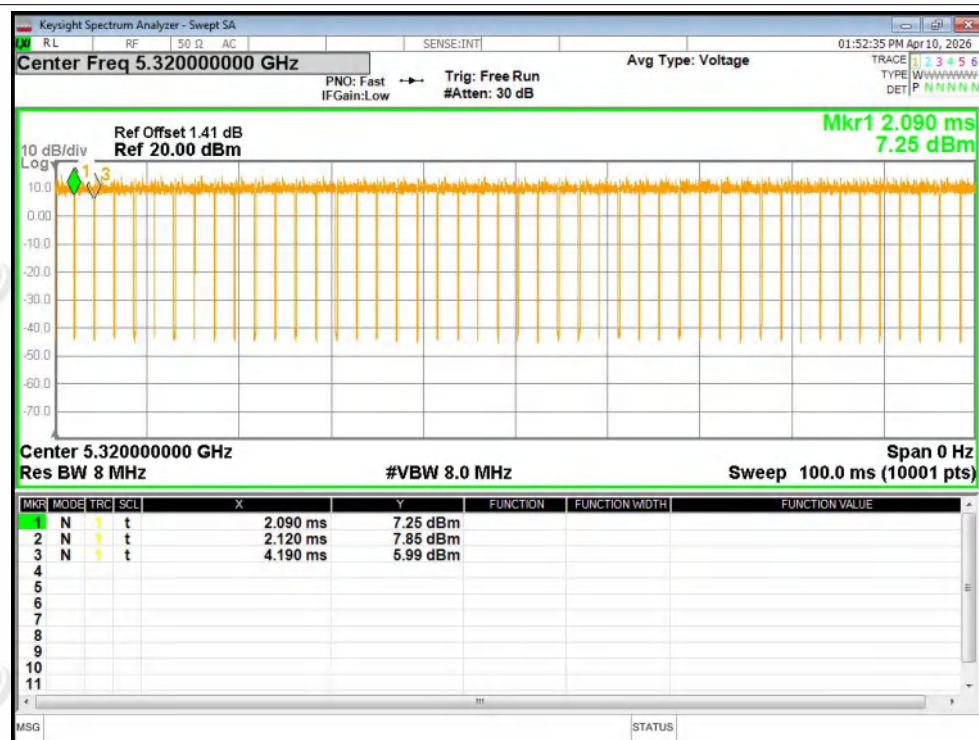


Duty Cycle NVNT a 5280MHz Ant1

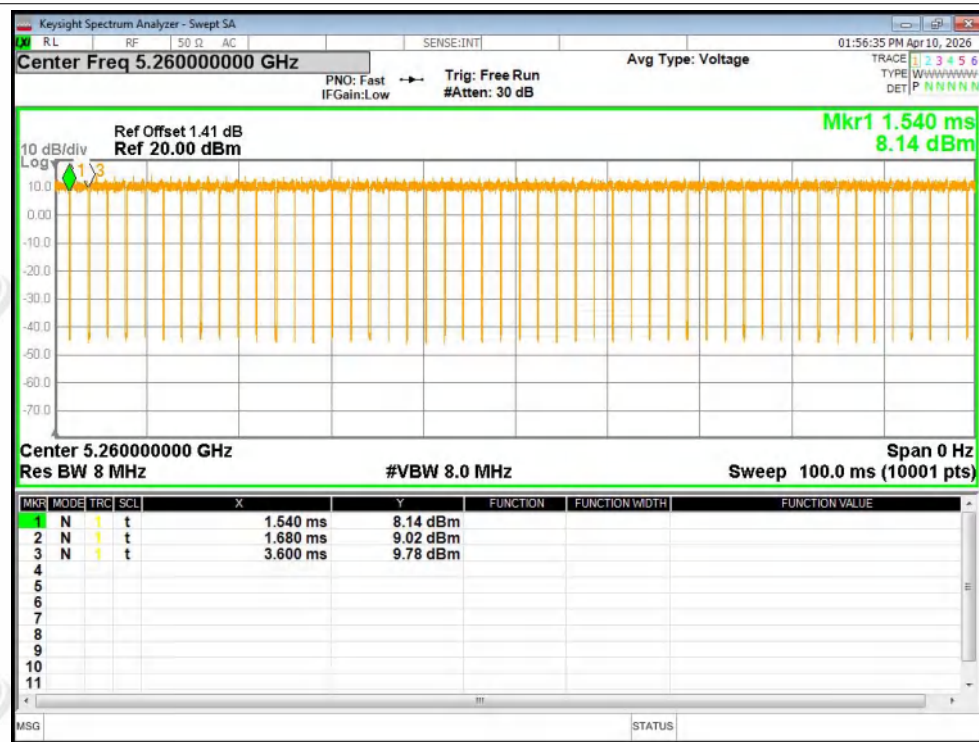




Duty Cycle NVNT a 5320MHz Ant1

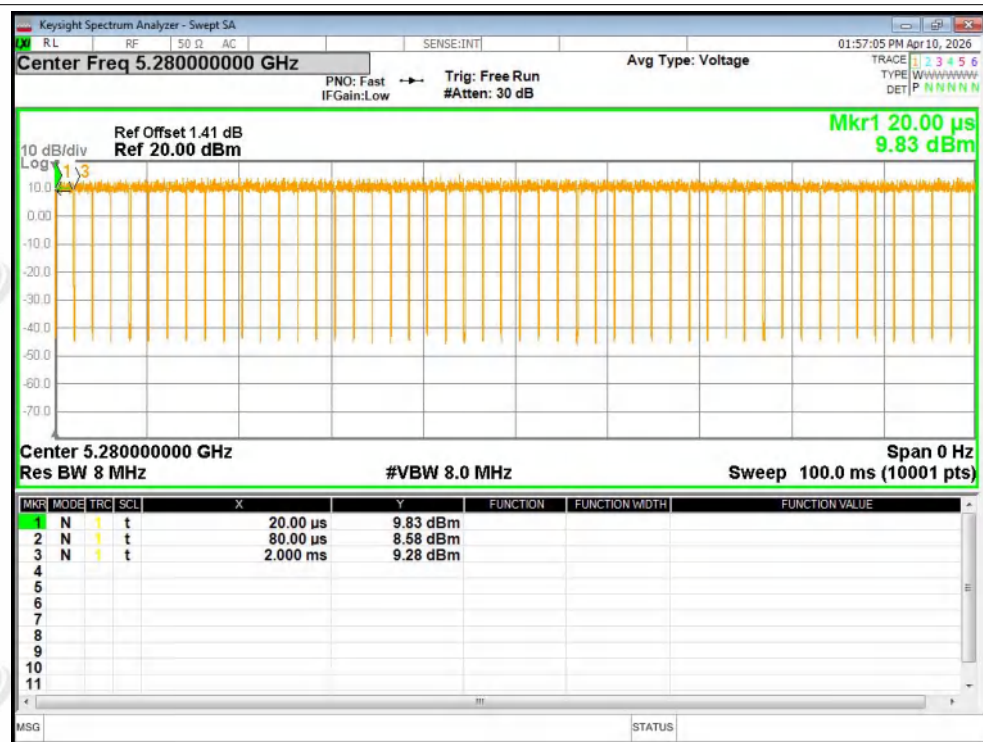


Duty Cycle NVNT n20 5260MHz Ant1

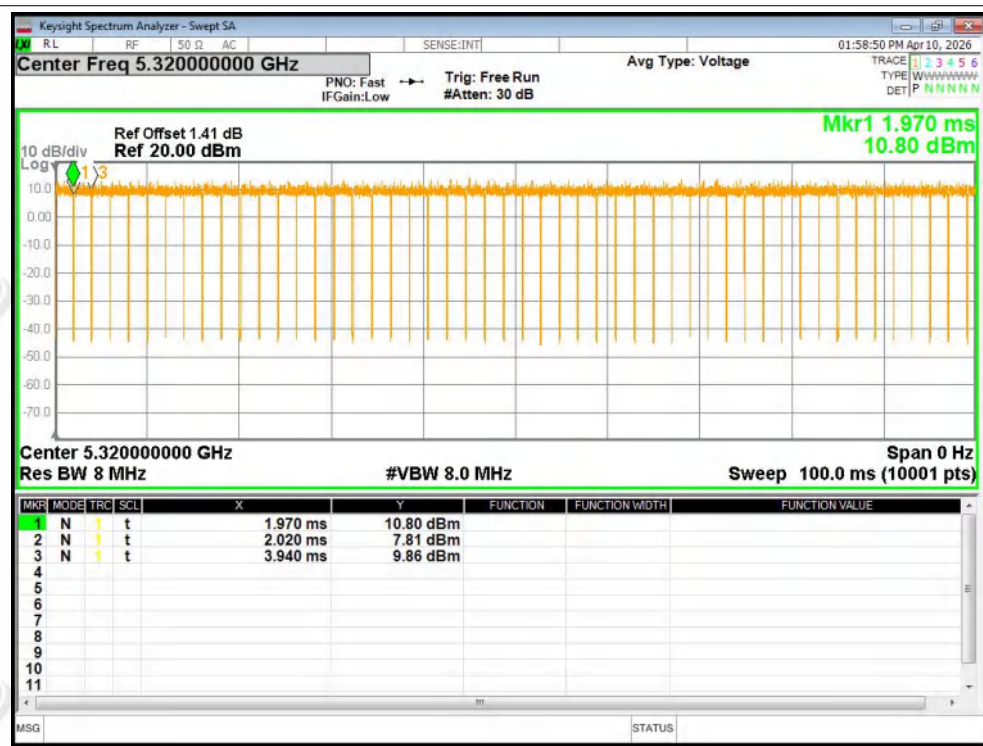




Duty Cycle NVNT n20 5280MHz Ant1

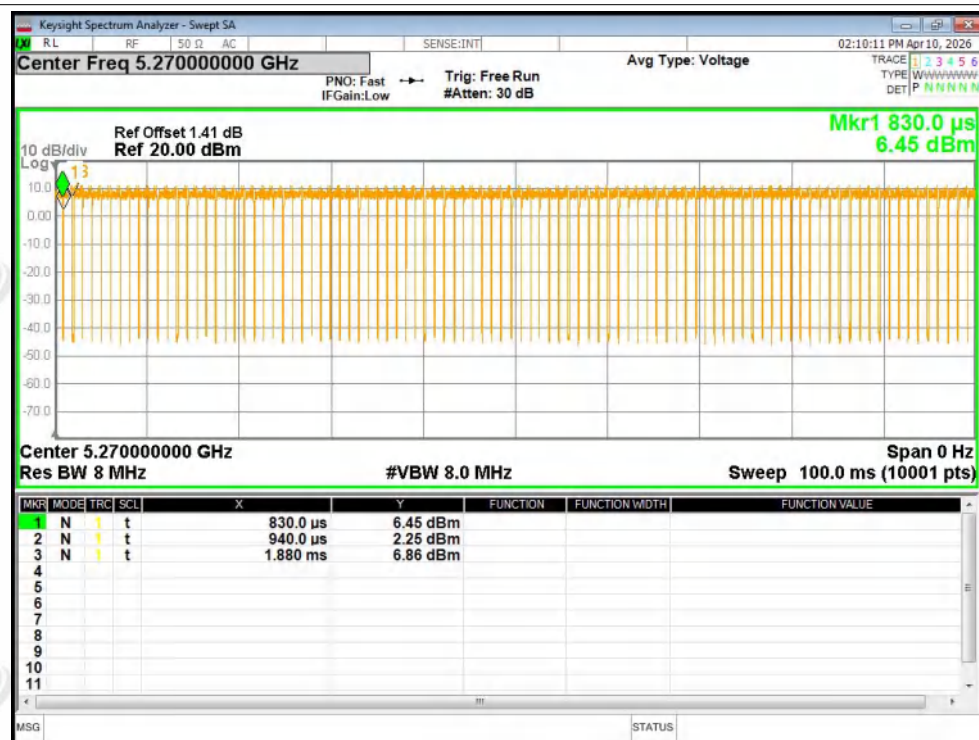


Duty Cycle NVNT n20 5320MHz Ant1

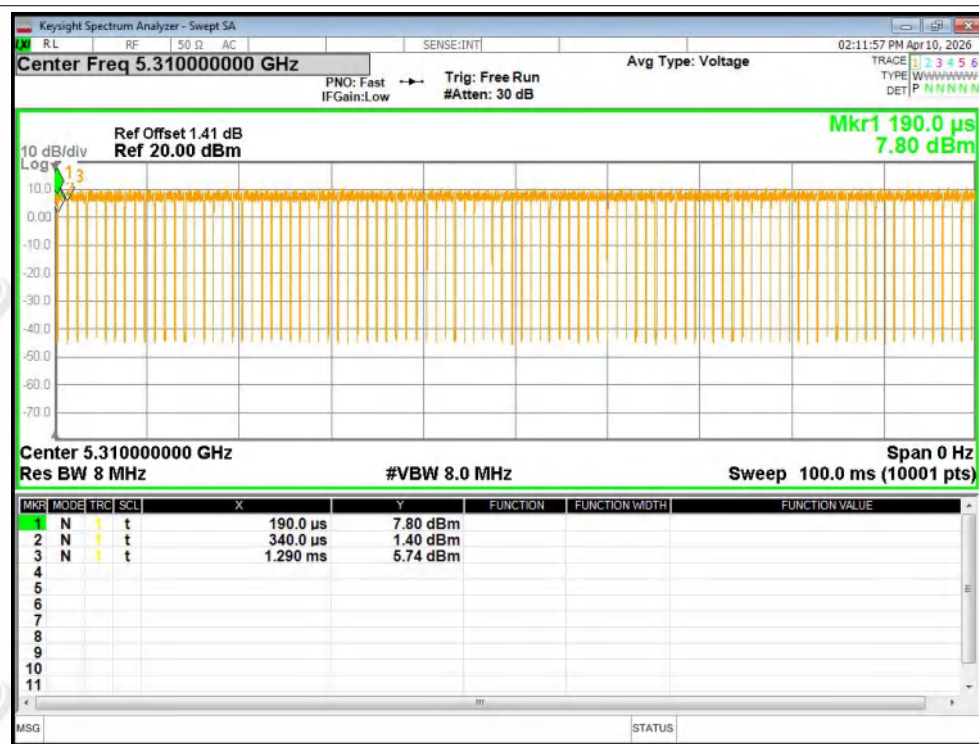




Duty Cycle NVNT n40 5270MHz Ant1

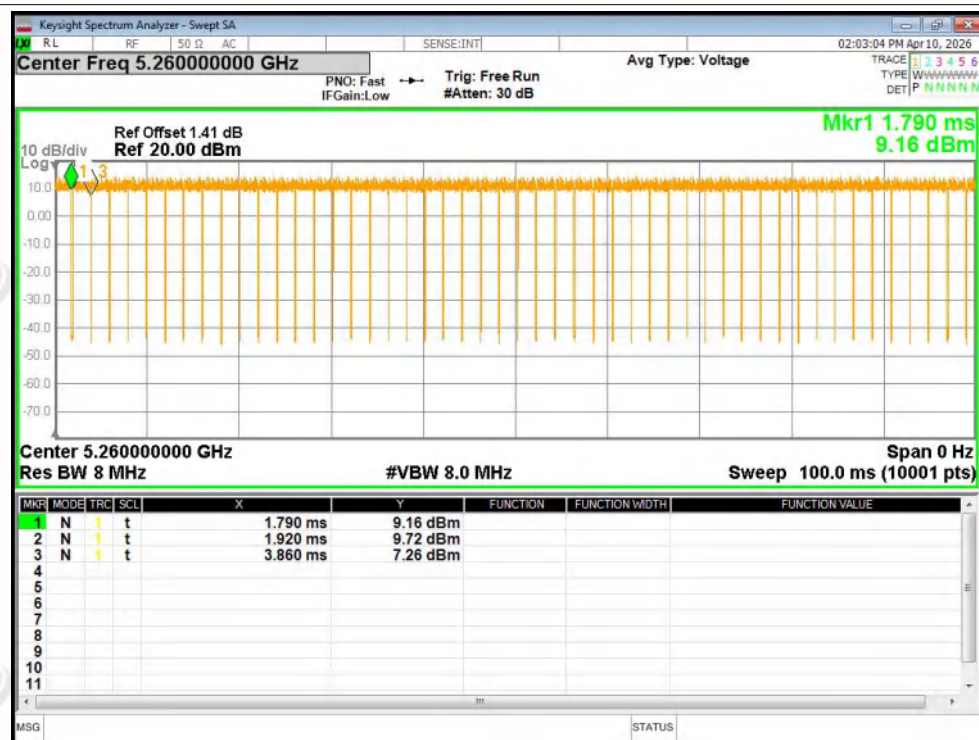


Duty Cycle NVNT n40 5310MHz Ant1

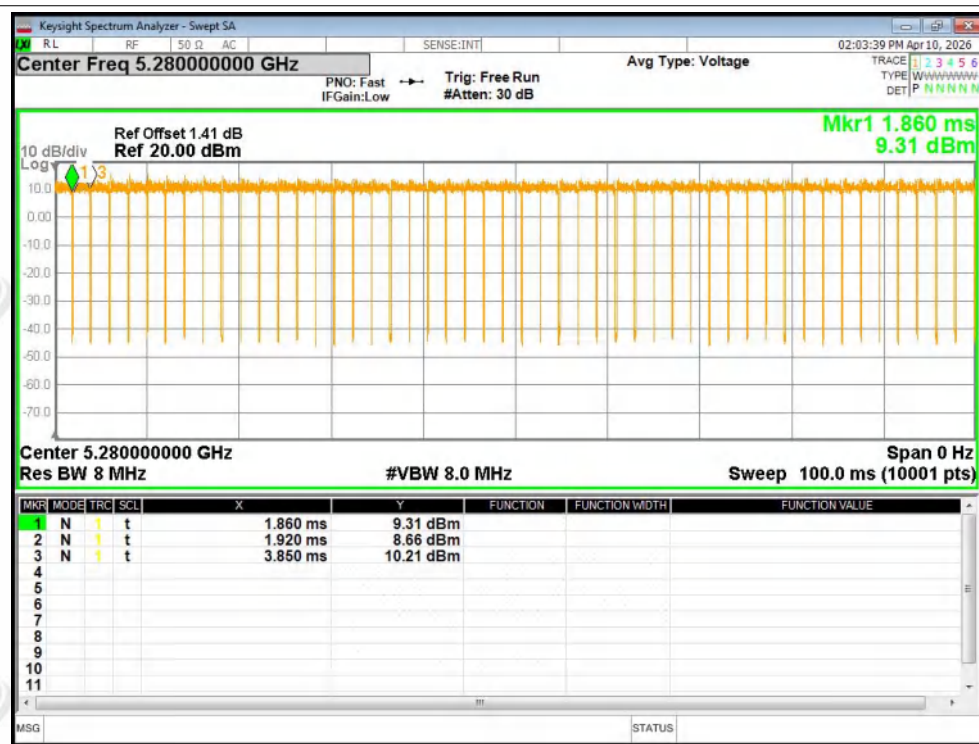




Duty Cycle NVNT ac20 5260MHz Ant1

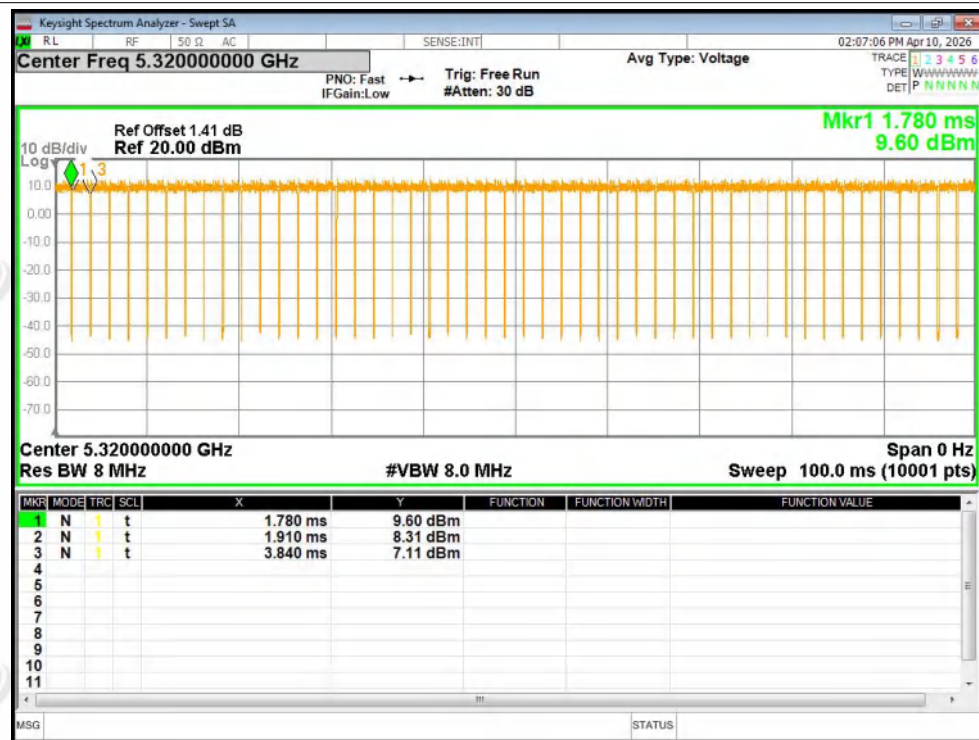


Duty Cycle NVNT ac20 5280MHz Ant1

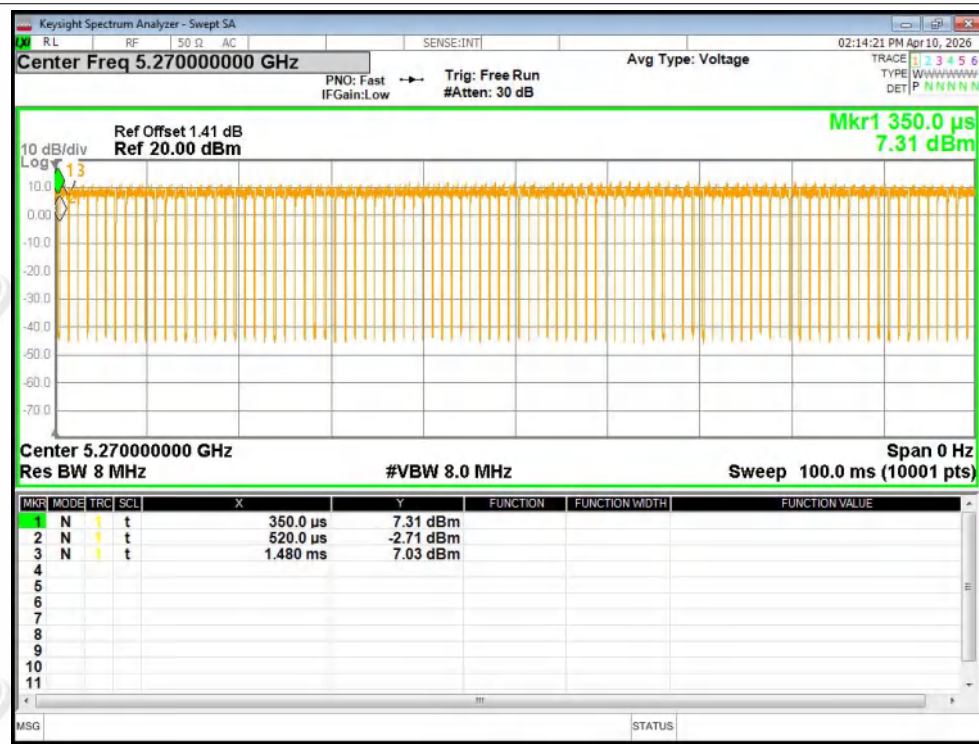




Duty Cycle NVNT ac20 5320MHz Ant1

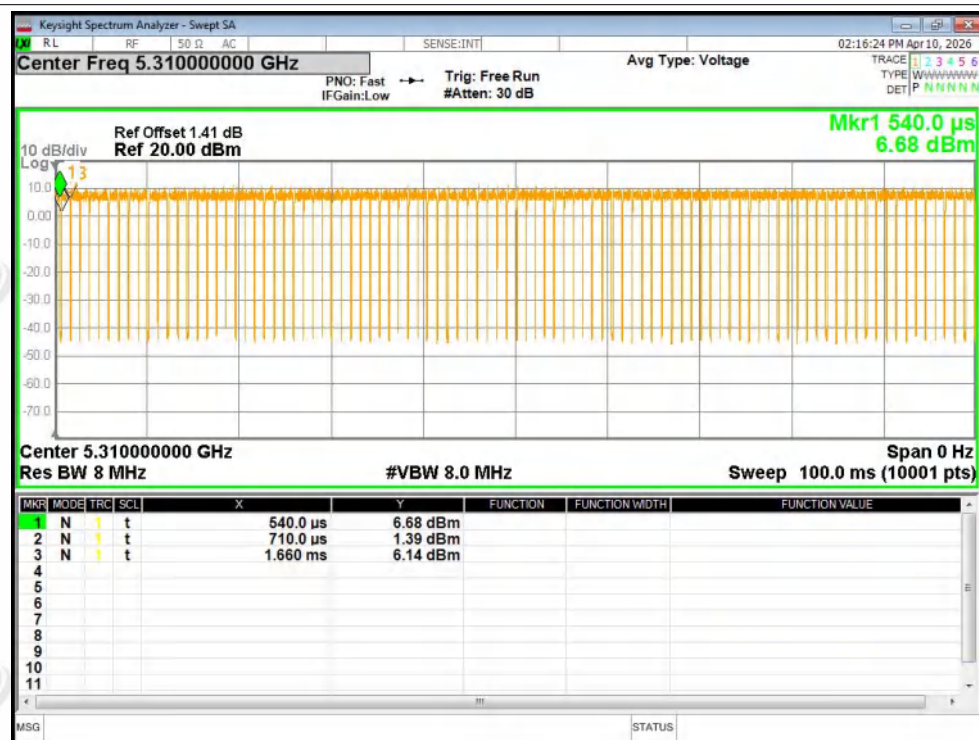


Duty Cycle NVNT ac40 5270MHz Ant1

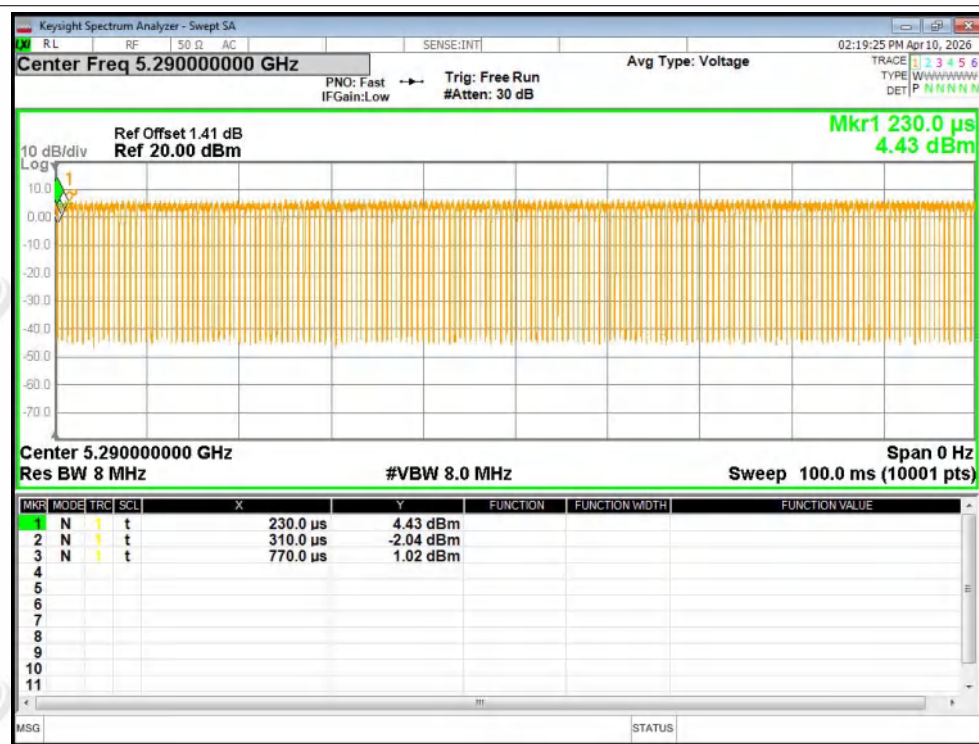




Duty Cycle NVNT ac40 5310MHz Ant1



Duty Cycle NVNT ac80 5290MHz Ant1



**ZHONGHAN****B.2 Maximum Conducted Output Power**

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5260	Ant1	6.56	0.32	6.88	24	Pass
NVNT	a	5280	Ant1	6.59	0.3	6.89	24	Pass
NVNT	a	5320	Ant1	6.58	0	6.58	24	Pass
NVNT	n20	5260	Ant1	6.58	0.31	6.89	24	Pass
NVNT	n20	5280	Ant1	6.59	0.13	6.72	24	Pass
NVNT	n20	5320	Ant1	6.34	0.11	6.45	24	Pass
NVNT	n40	5270	Ant1	6.90	0.48	7.38	24	Pass
NVNT	n40	5310	Ant1	5.94	0.64	6.58	24	Pass
NVNT	ac20	5260	Ant1	7.07	0.28	7.35	24	Pass
NVNT	ac20	5280	Ant1	7.06	0.13	7.19	24	Pass
NVNT	ac20	5320	Ant1	6.04	0.28	6.32	24	Pass
NVNT	ac40	5270	Ant1	6.62	0.71	7.33	24	Pass
NVNT	ac40	5310	Ant1	5.87	0.72	6.59	24	Pass
NVNT	ac80	5290	Ant1	6.31	0.7	7.01	24	Pass

Note: Total Power = Output Power + Duty cycle factor.

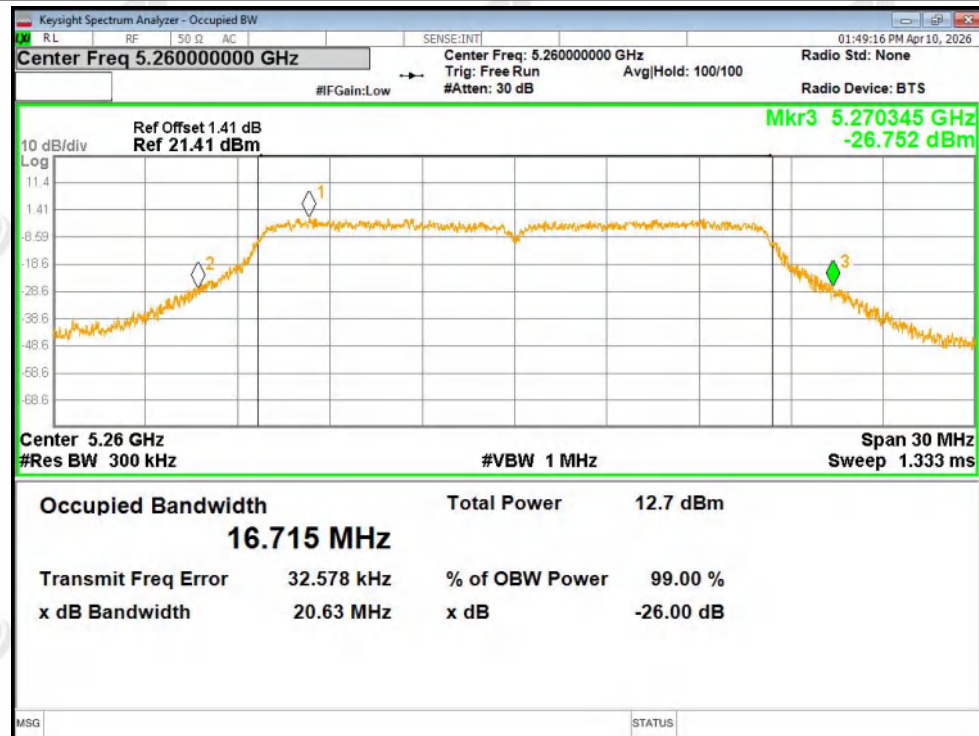
**ZHONGHAN****B.3 -26dB Bandwidth**

Condition	Mode	Frequency (MHz)	Antenna	-26 dB Bandwidth (MHz)	Verdict
NVNT	a	5260	Ant1	20.626	Pass
NVNT	a	5280	Ant1	20.954	Pass
NVNT	a	5320	Ant1	21.098	Pass
NVNT	n20	5260	Ant1	21.424	Pass
NVNT	n20	5280	Ant1	21.602	Pass
NVNT	n20	5320	Ant1	21.552	Pass
NVNT	n40	5270	Ant1	41.980	Pass
NVNT	n40	5310	Ant1	41.912	Pass
NVNT	ac20	5260	Ant1	21.118	Pass
NVNT	ac20	5280	Ant1	21.463	Pass
NVNT	ac20	5320	Ant1	21.858	Pass
NVNT	ac40	5270	Ant1	41.303	Pass
NVNT	ac40	5310	Ant1	40.820	Pass
NVNT	ac80	5290	Ant1	81.339	Pass

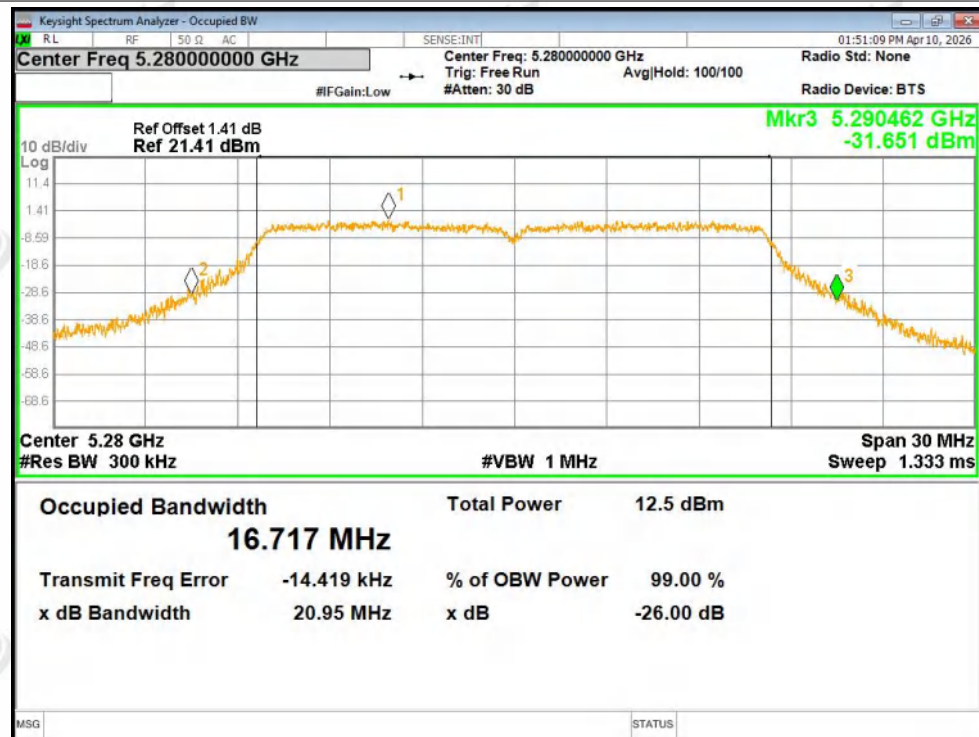


Test Graphs

-26dB Bandwidth NVNT a 5260MHz Ant1

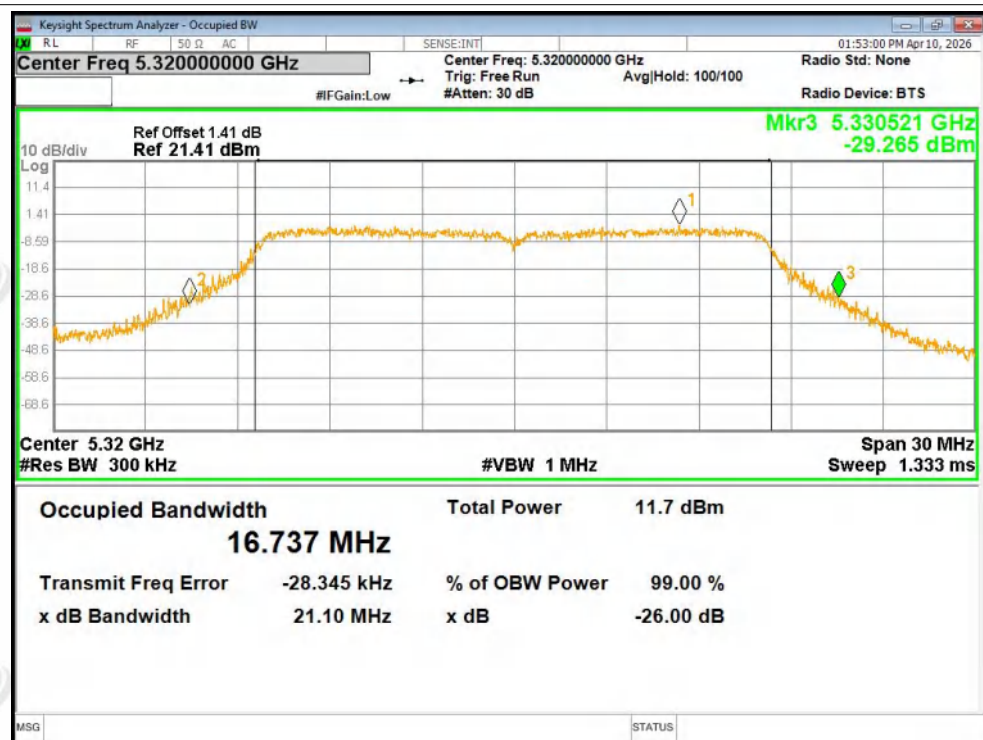


-26dB Bandwidth NVNT a 5280MHz Ant1

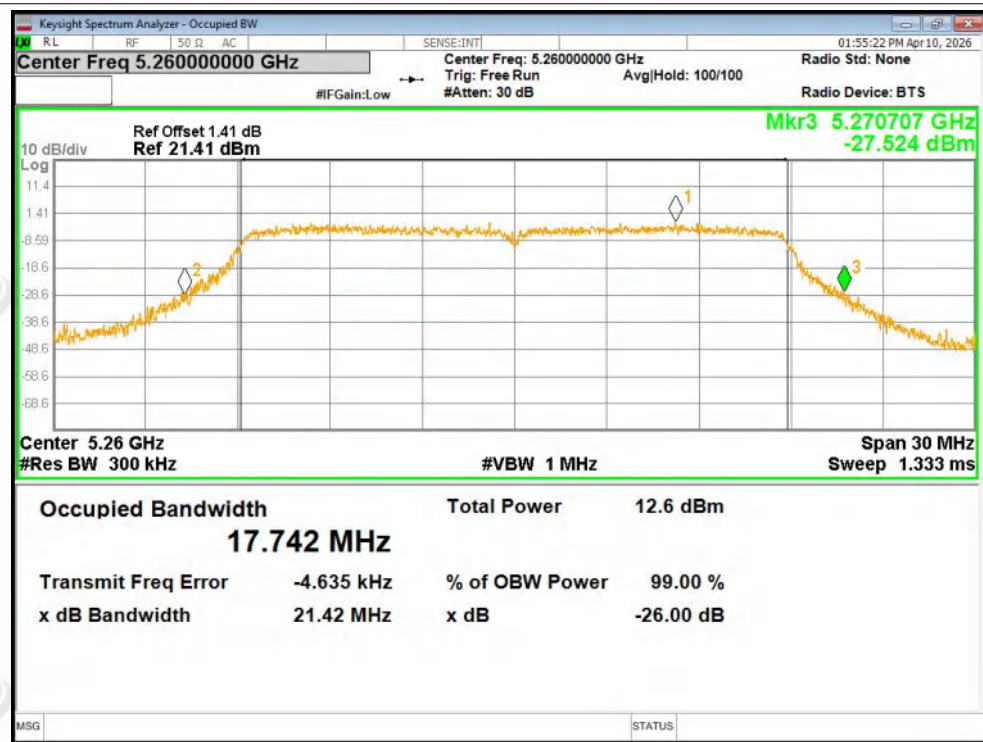




-26dB Bandwidth NVNT a 5320MHz Ant1

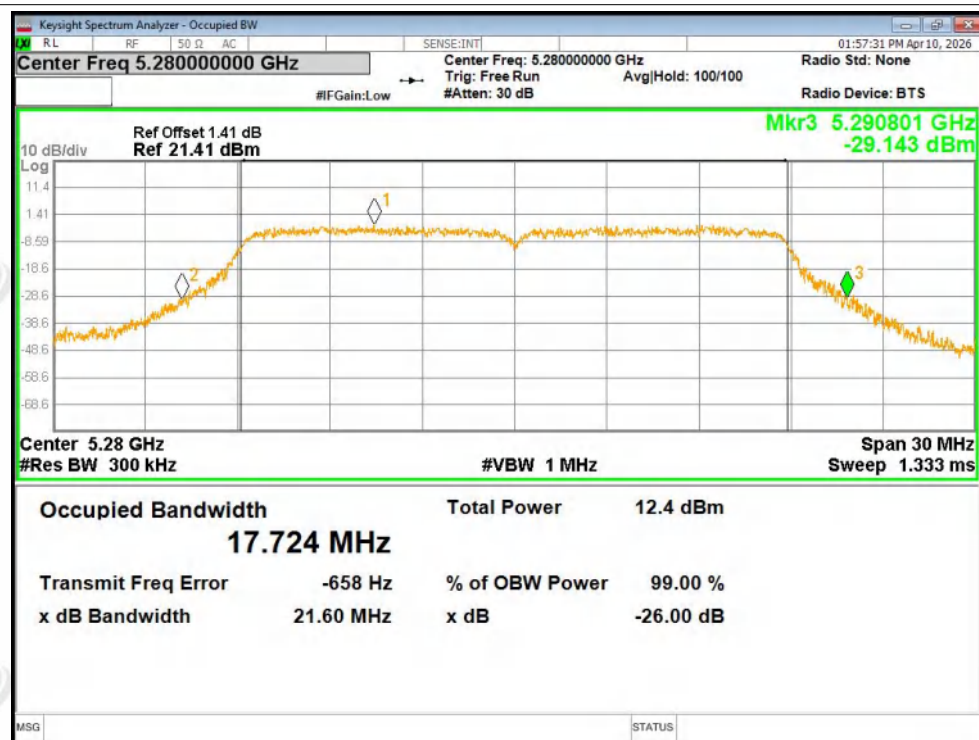


-26dB Bandwidth NVNT n20 5260MHz Ant1

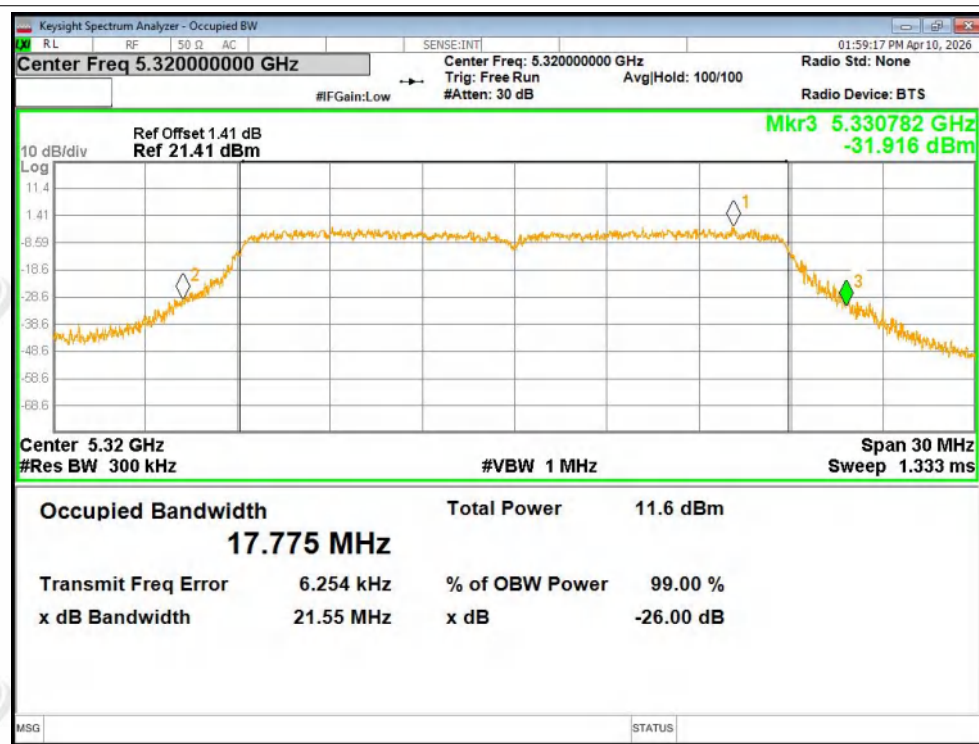




-26dB Bandwidth NVNT n20 5280MHz Ant1

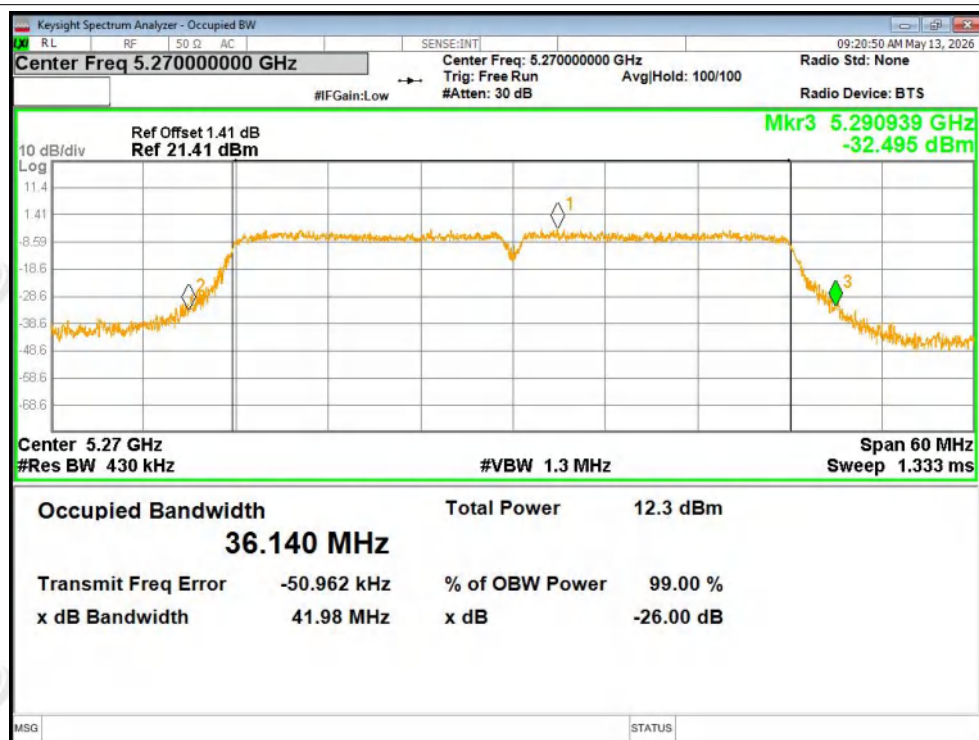


-26dB Bandwidth NVNT n20 5320MHz Ant1

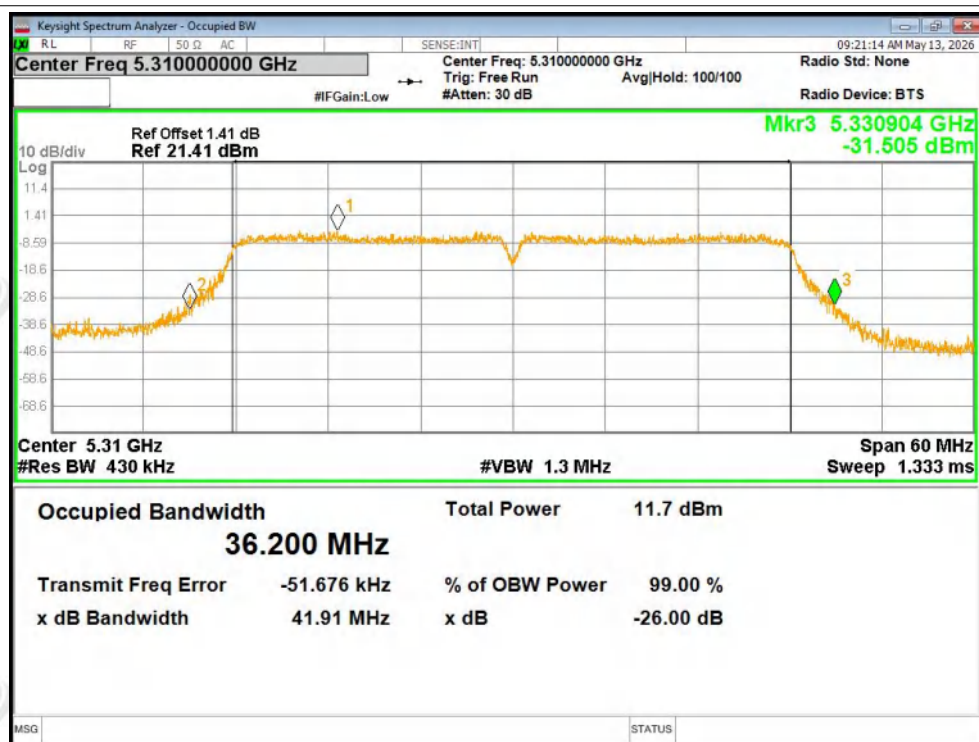




-26dB Bandwidth NVNT n40 5270MHz Ant1

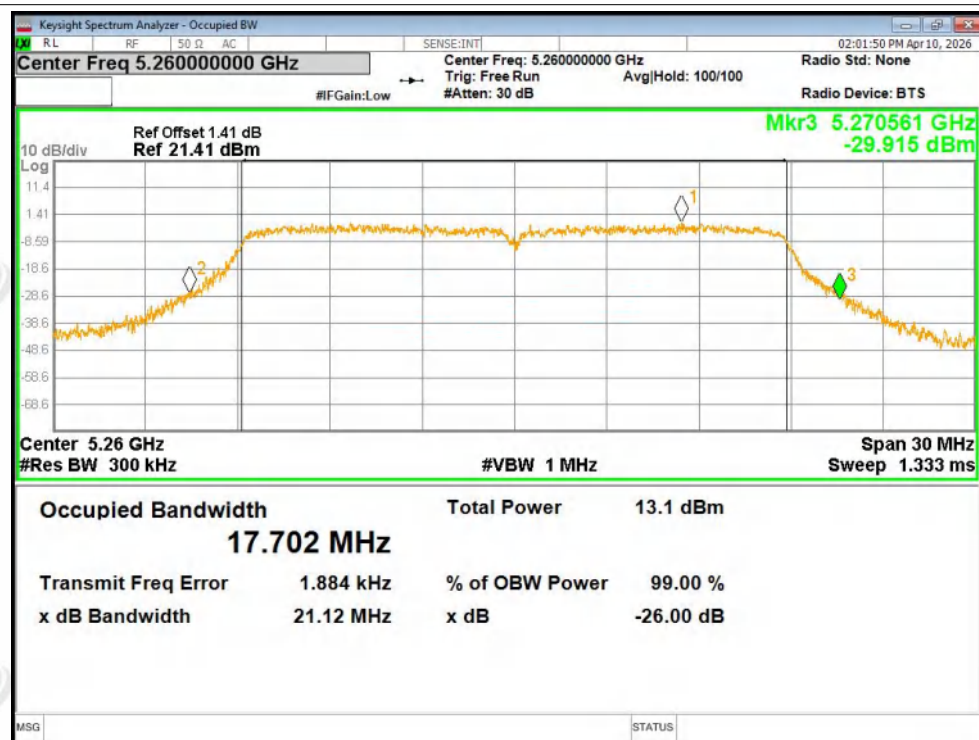


-26dB Bandwidth NVNT n40 5310MHz Ant1

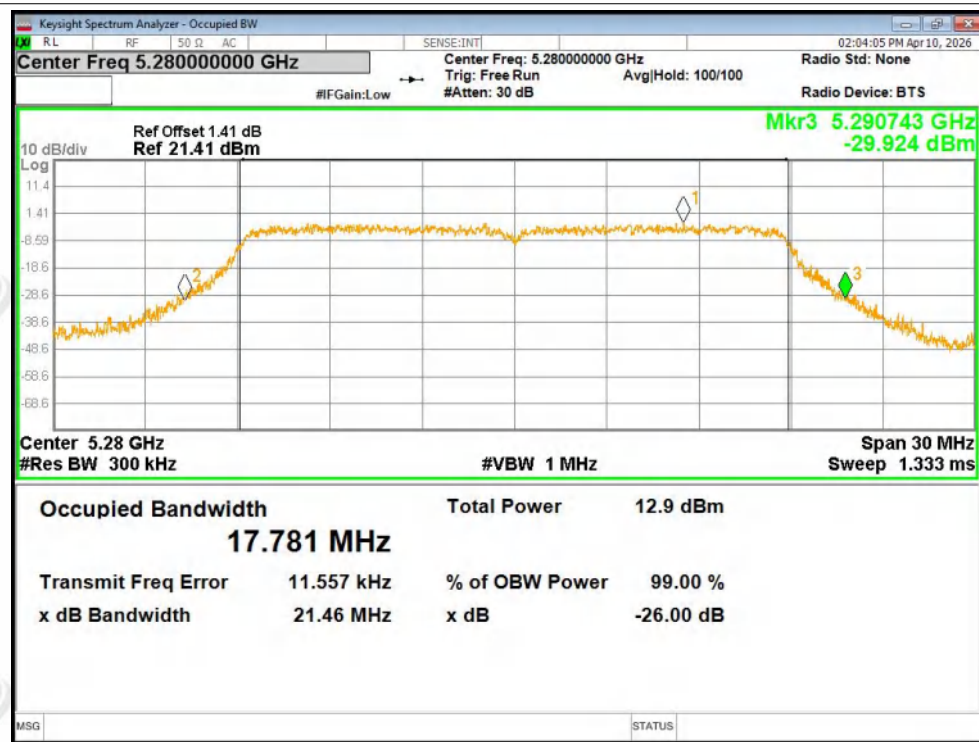




-26dB Bandwidth NVNT ac20 5260MHz Ant1

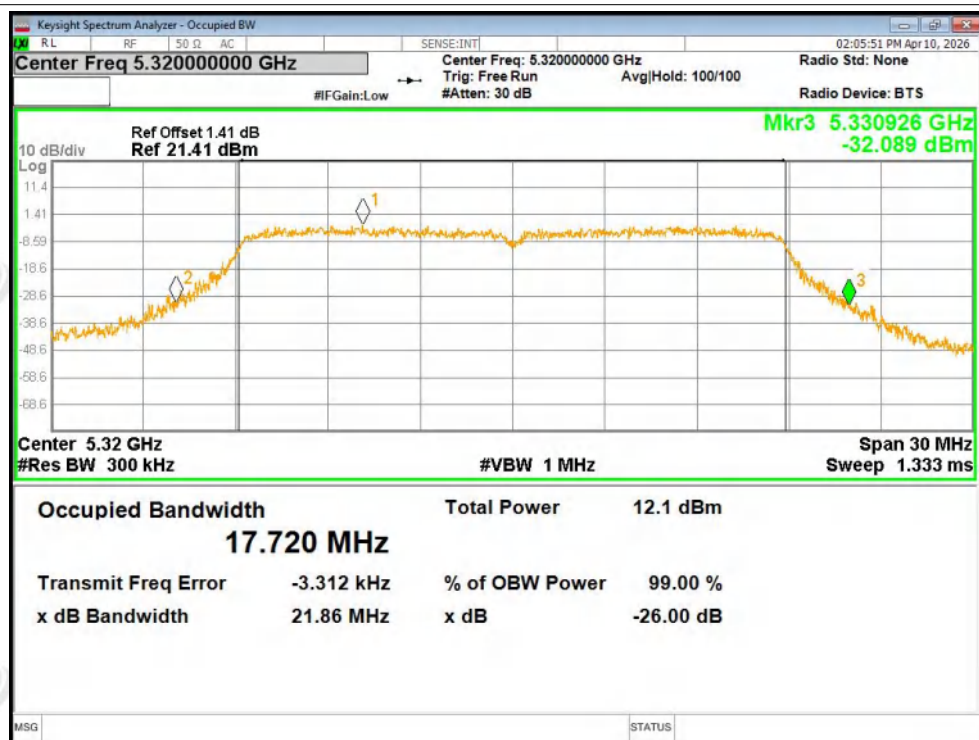


-26dB Bandwidth NVNT ac20 5280MHz Ant1

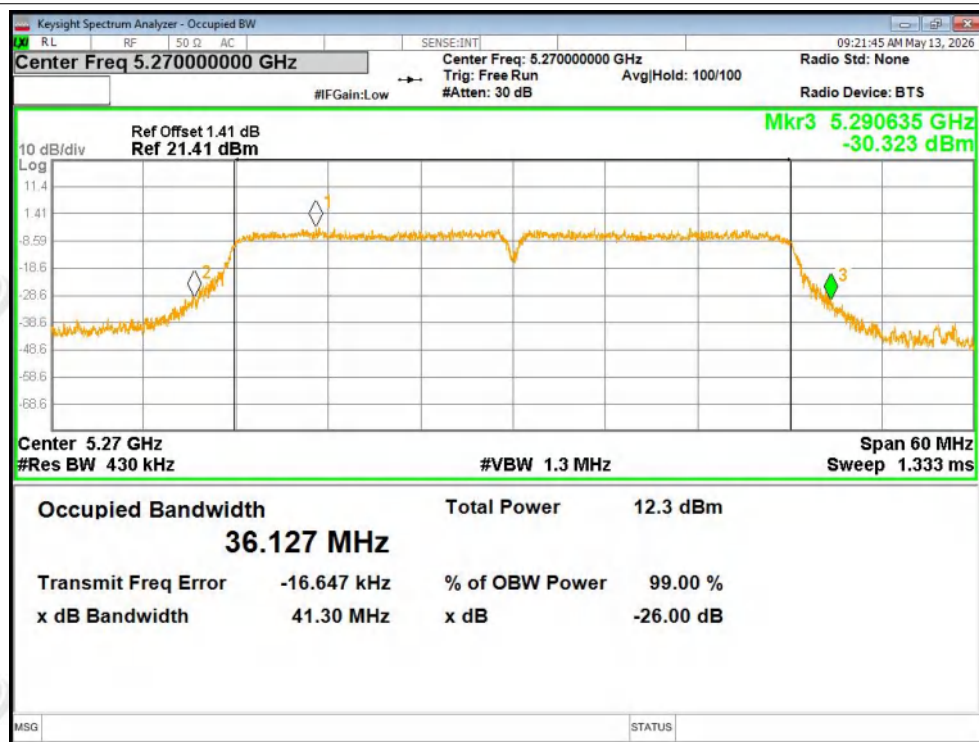




-26dB Bandwidth NVNT ac20 5320MHz Ant1

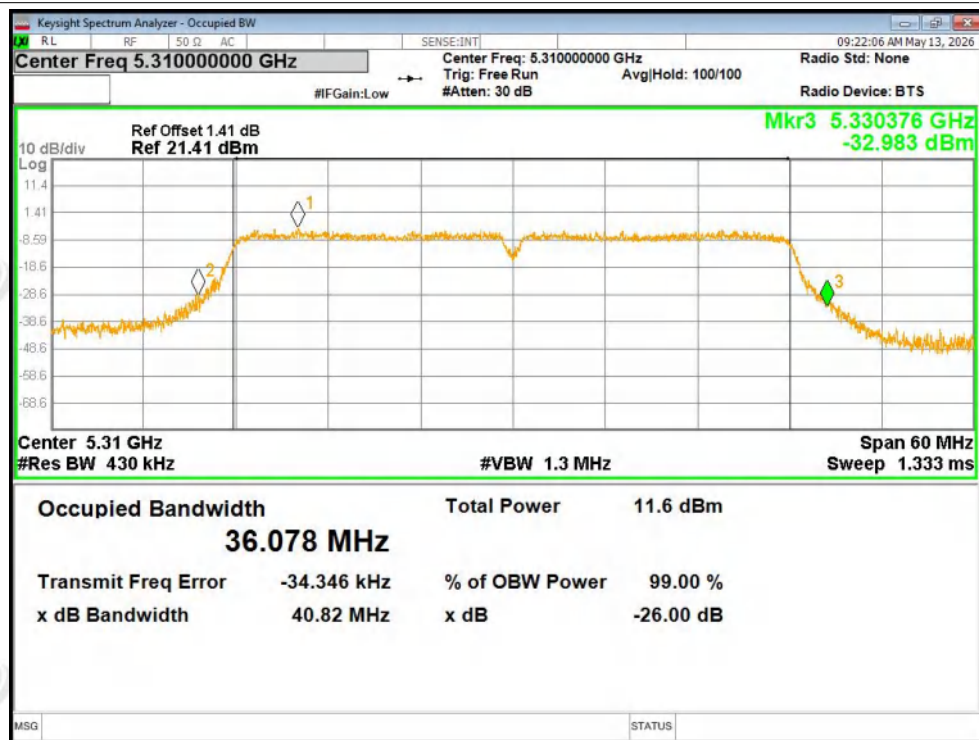


-26dB Bandwidth NVNT ac40 5270MHz Ant1

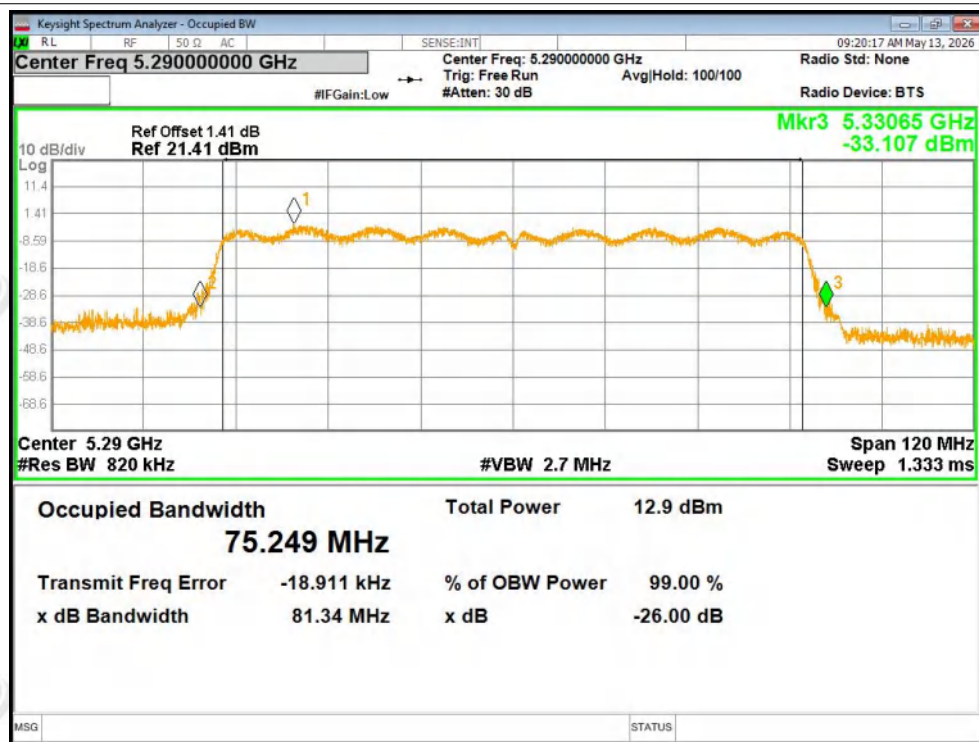




-26dB Bandwidth NVNT ac40 5310MHz Ant1



-26dB Bandwidth NVNT ac80 5290MHz Ant1



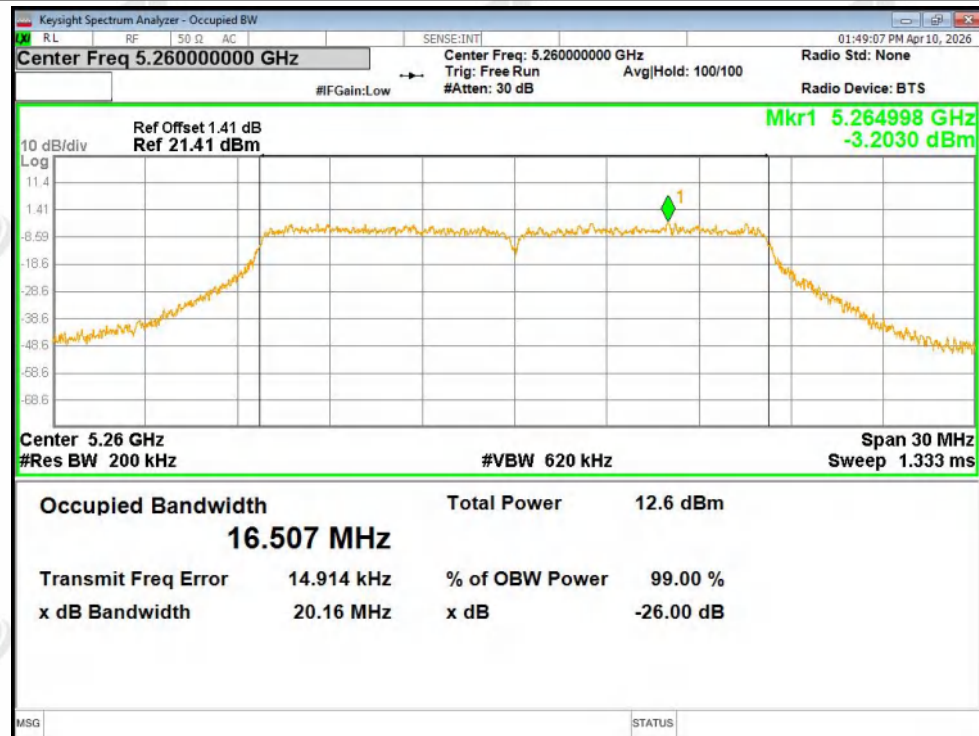
**ZHONGHAN****B.4 Occupied Channel Bandwidth**

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	a	5260	Ant1	16.507
NVNT	a	5280	Ant1	16.548
NVNT	a	5320	Ant1	16.582
NVNT	n20	5260	Ant1	17.639
NVNT	n20	5280	Ant1	17.622
NVNT	n20	5320	Ant1	17.659
NVNT	n40	5270	Ant1	36.151
NVNT	n40	5310	Ant1	36.139
NVNT	ac20	5260	Ant1	17.61
NVNT	ac20	5280	Ant1	17.646
NVNT	ac20	5320	Ant1	17.646
NVNT	ac40	5270	Ant1	36.179
NVNT	ac40	5310	Ant1	36.181
NVNT	ac80	5290	Ant1	75.232

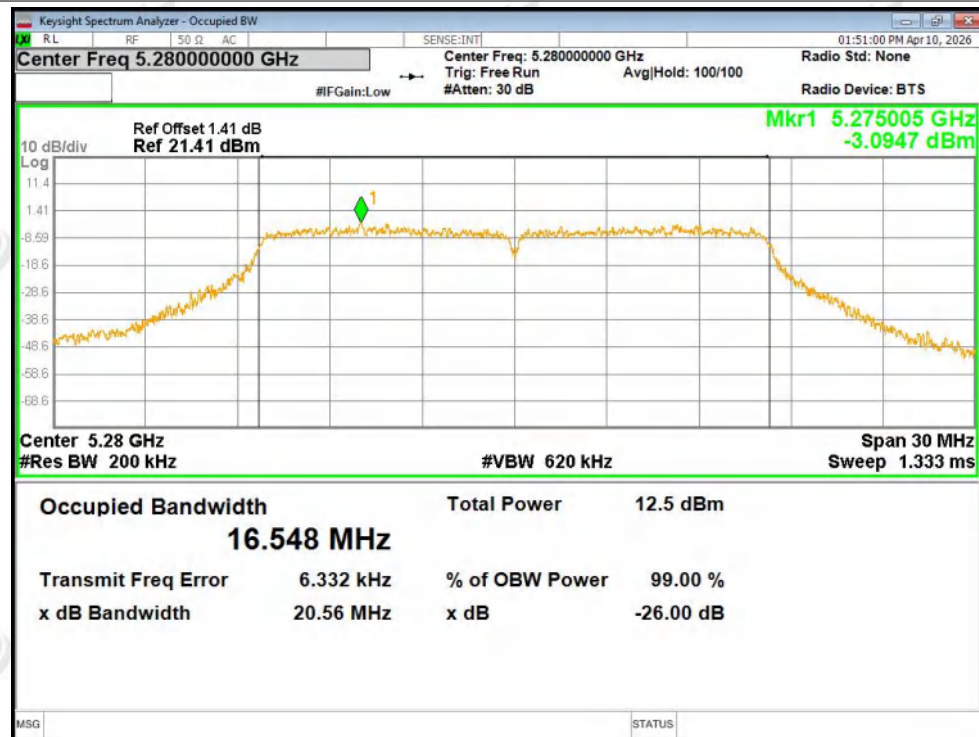


Test Graphs

OBW NVNT a 5260MHz Ant1

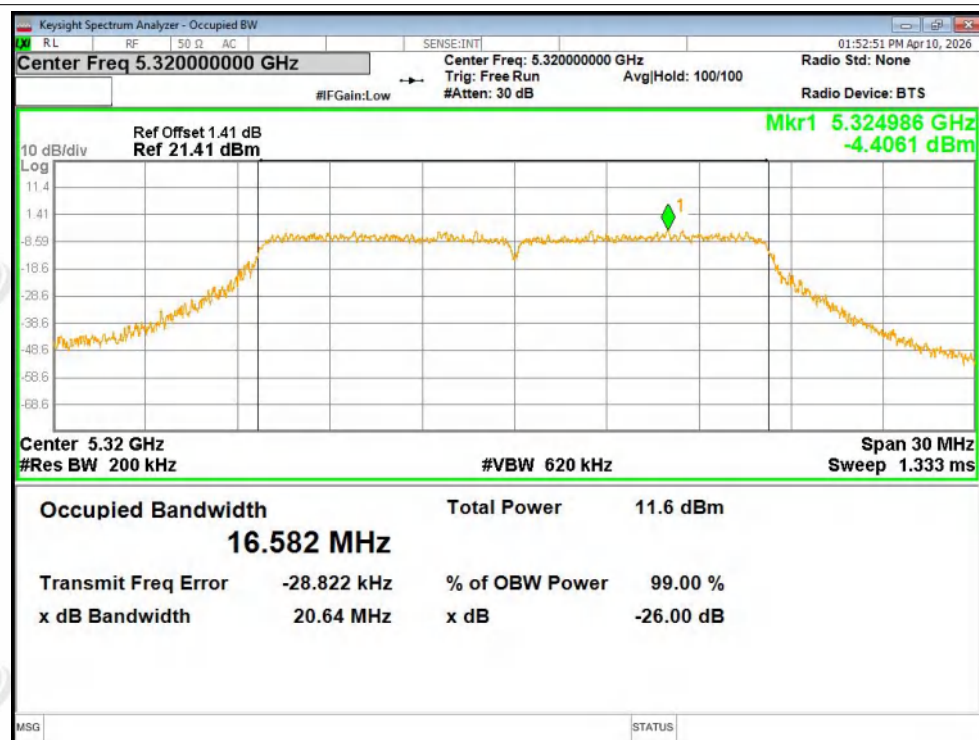


OBW NVNT a 5280MHz Ant1

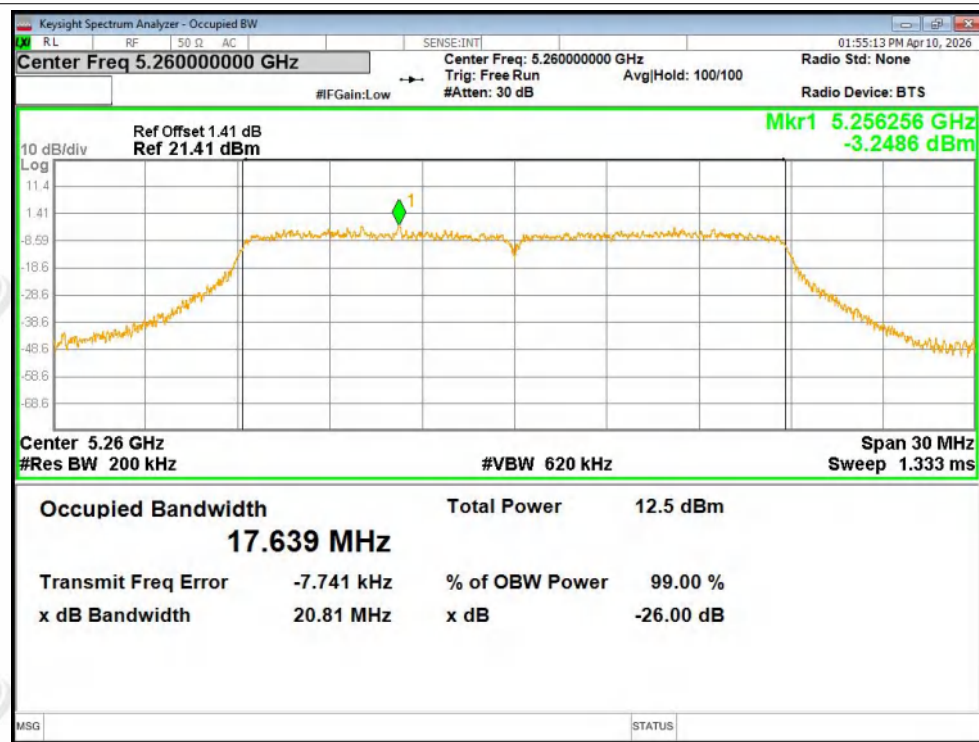




OBW NVNT a 5320MHz Ant1

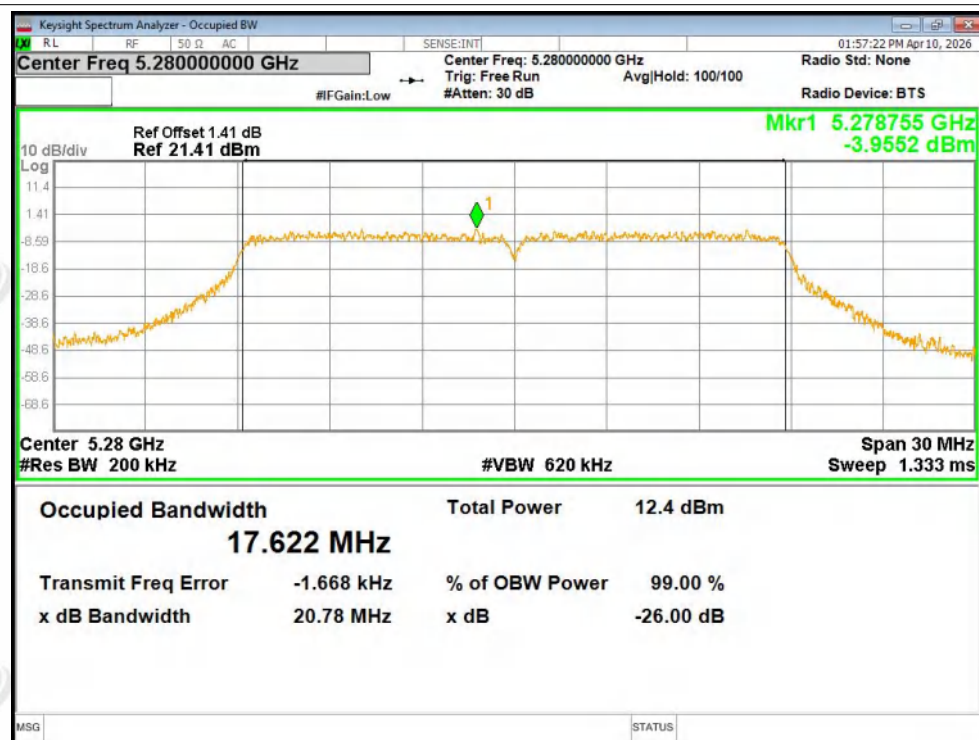


OBW NVNT n20 5260MHz Ant1

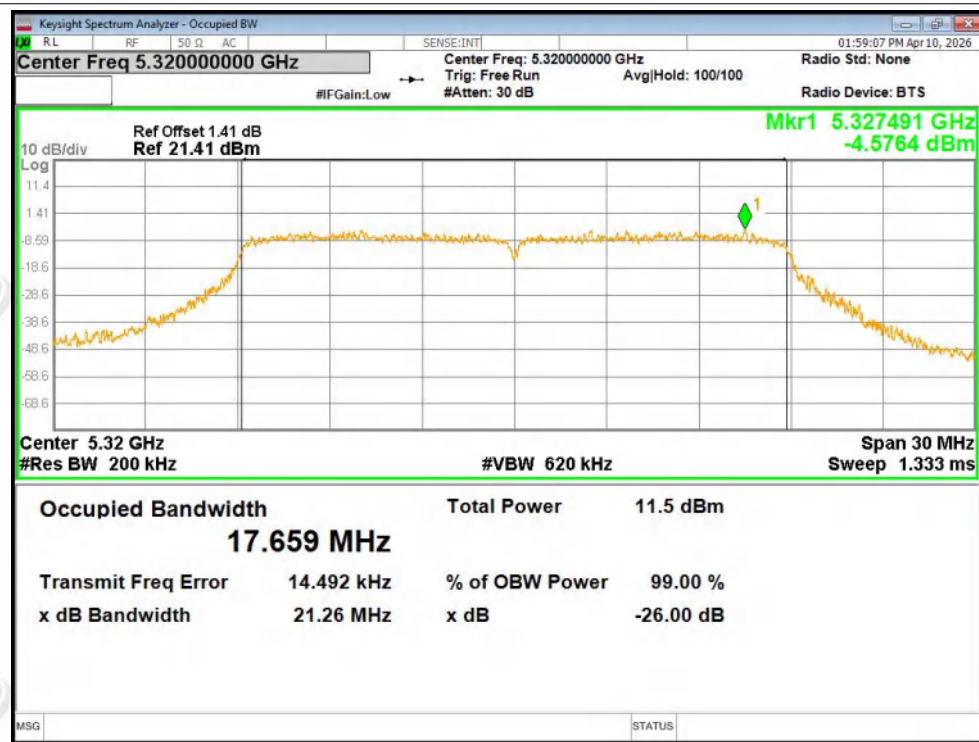




OBW NVNT n20 5280MHz Ant1

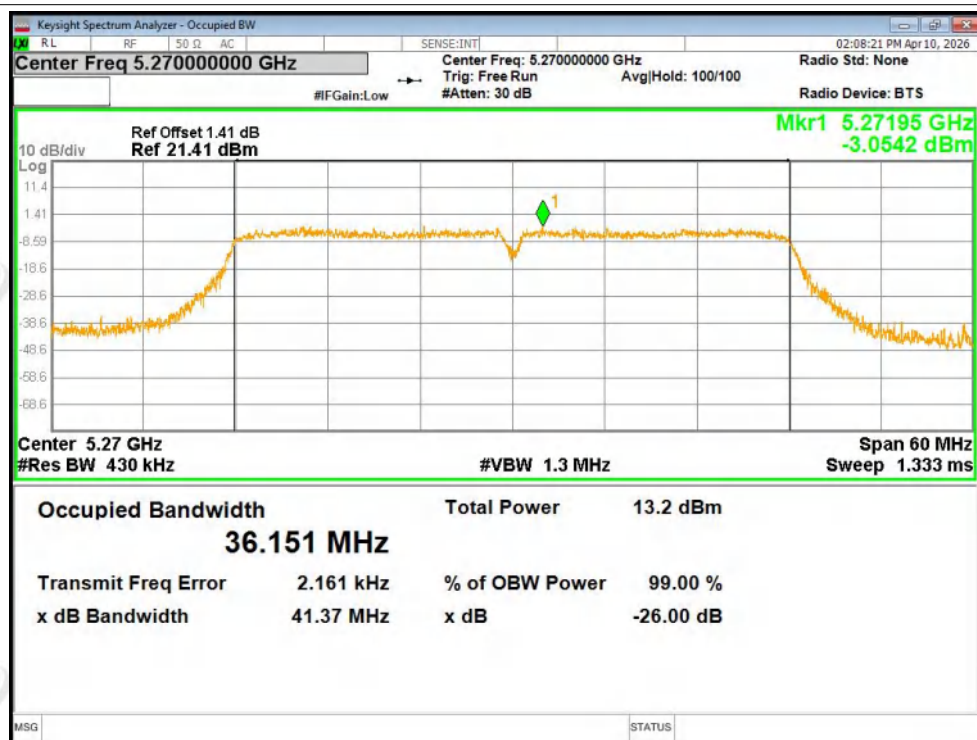


OBW NVNT n20 5320MHz Ant1

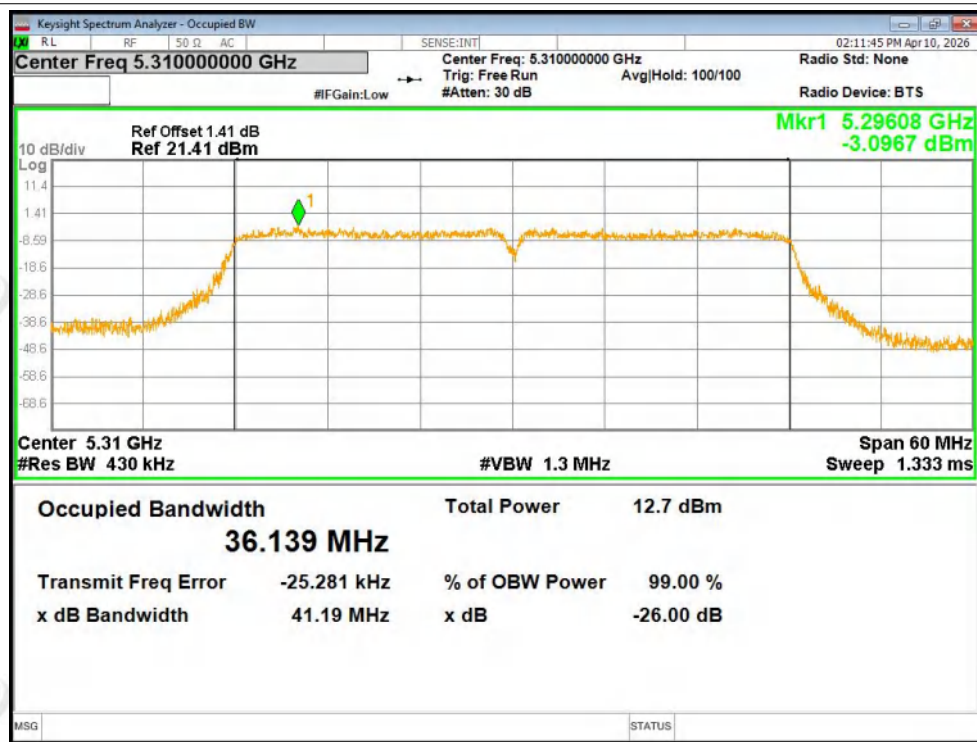




OBW NVNT n40 5270MHz Ant1

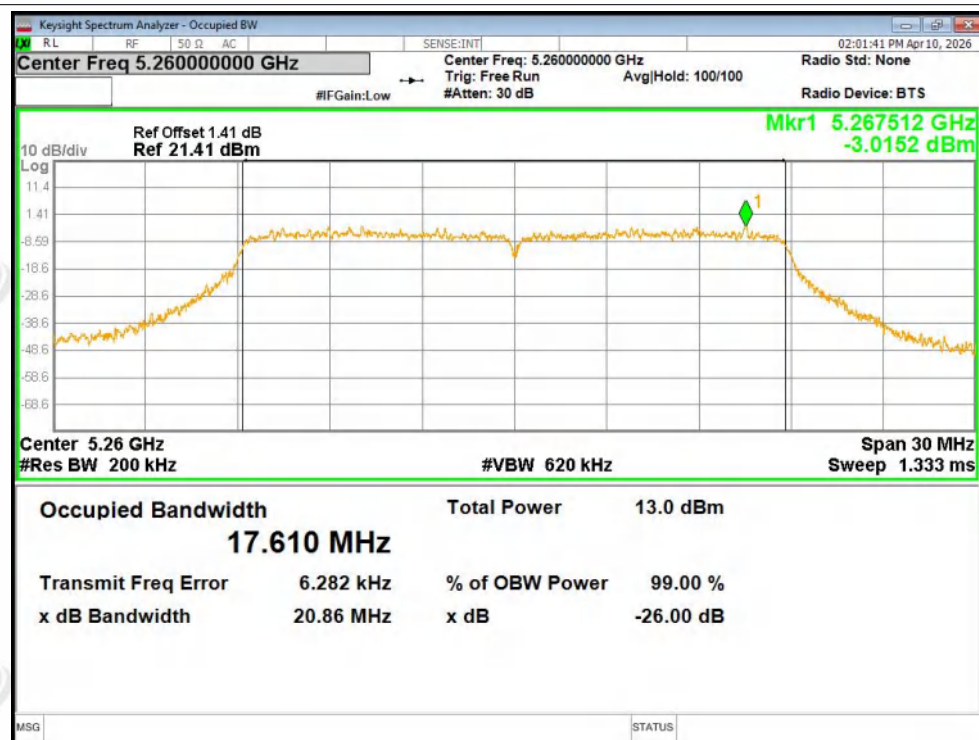


OBW NVNT n40 5310MHz Ant1

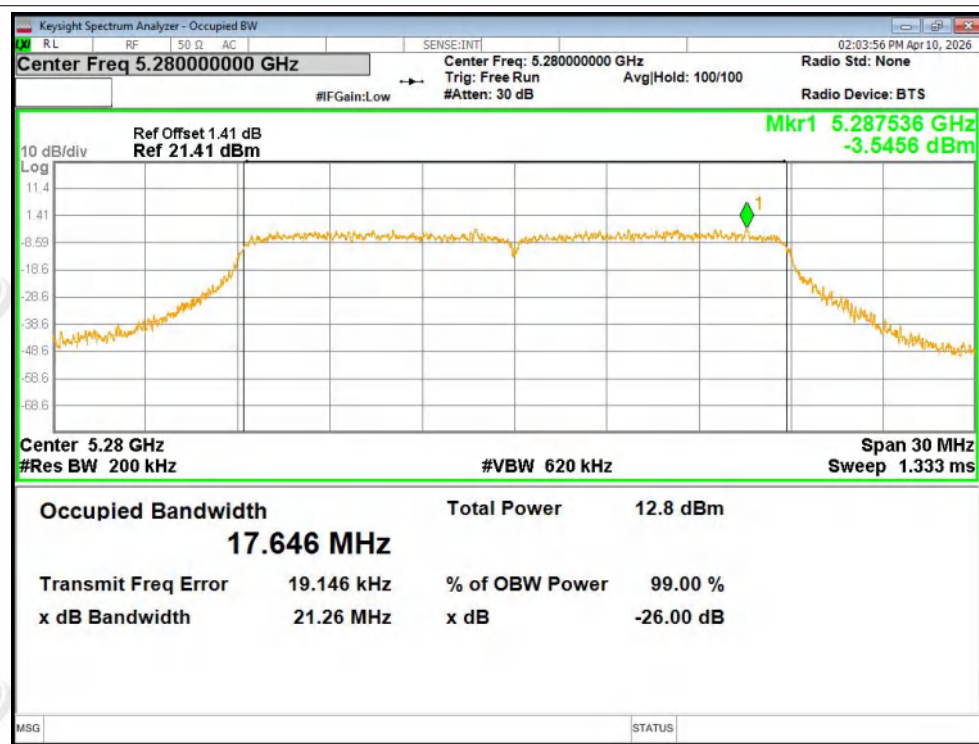




OBW NVNT ac20 5260MHz Ant1

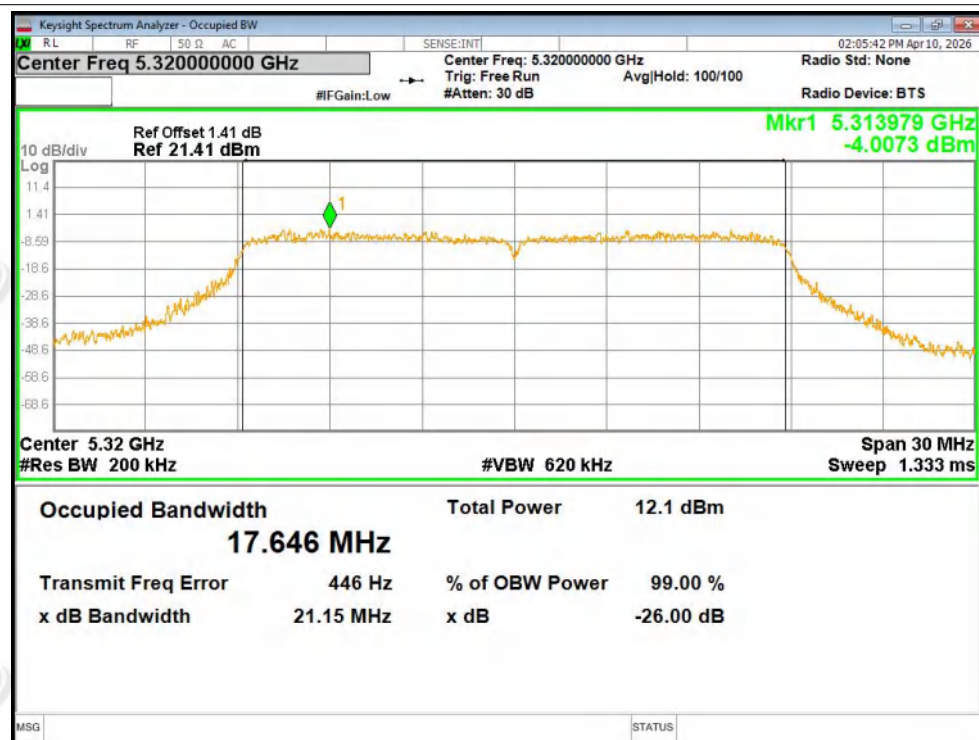


OBW NVNT ac20 5280MHz Ant1

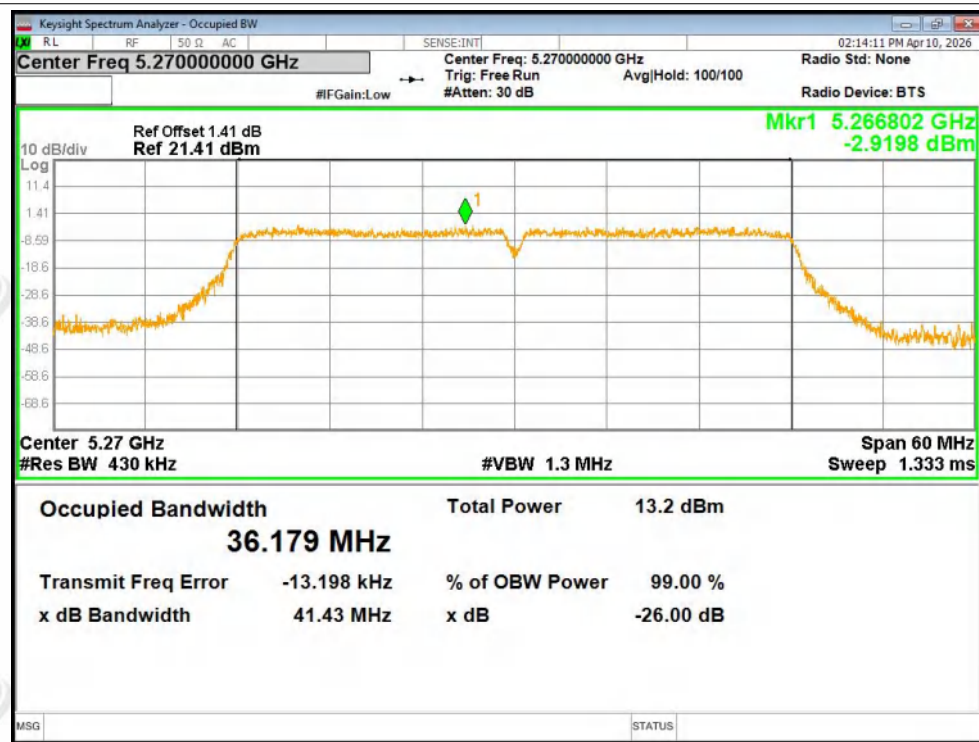




OBW NVNT ac20 5320MHz Ant1

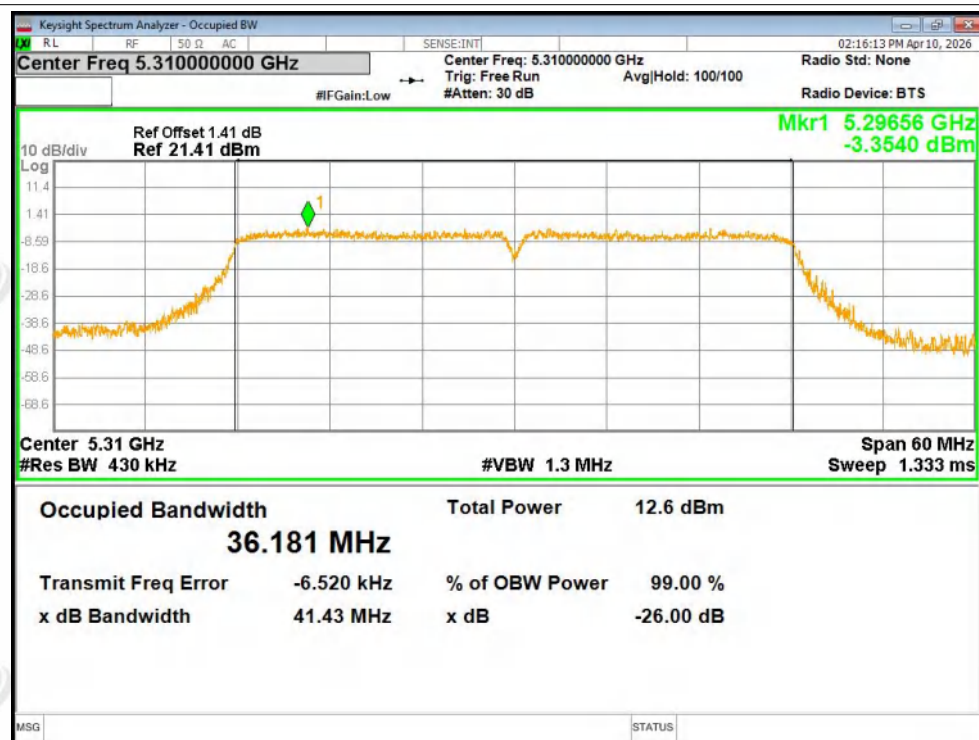


OBW NVNT ac40 5270MHz Ant1

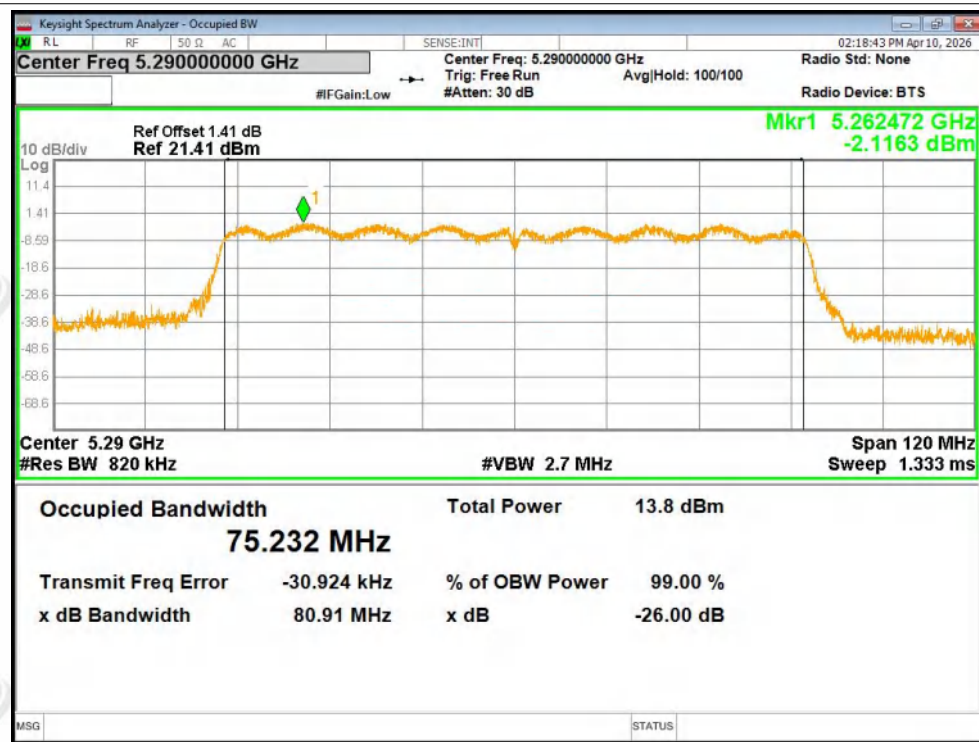




OBW NVNT ac40 5310MHz Ant1



OBW NVNT ac80 5290MHz Ant1



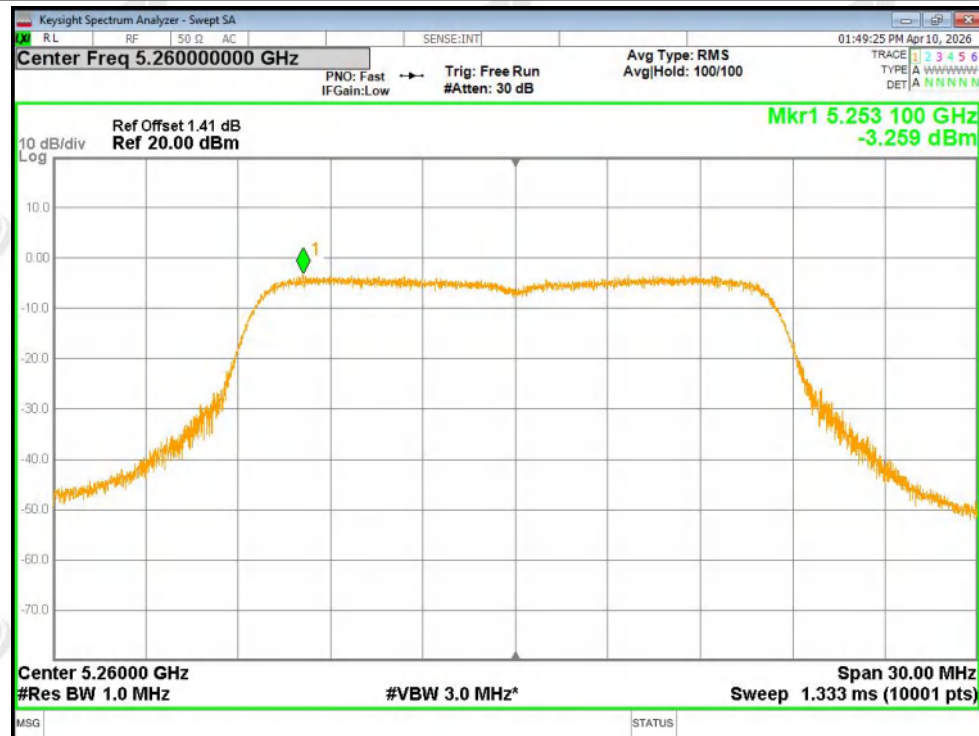
**ZHONGHAN****B.5 Maximum Power Spectral Density Level**

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm)	Duty Factor (dB)	Total PSD (dBm)	Limit (dBm)	Verdict
NVNT	a	5260	Ant1	-3.26	0.32	-2.94	11	Pass
NVNT	a	5280	Ant1	-3.72	0.3	-3.42	11	Pass
NVNT	a	5320	Ant1	-4.3	0	-4.3	11	Pass
NVNT	n20	5260	Ant1	-3.52	0.31	-3.21	11	Pass
NVNT	n20	5280	Ant1	-3.82	0.13	-3.69	11	Pass
NVNT	n20	5320	Ant1	-4.67	0.11	-4.56	11	Pass
NVNT	n40	5270	Ant1	-6.41	0.48	-5.93	11	Pass
NVNT	n40	5310	Ant1	-6.61	0.64	-5.97	11	Pass
NVNT	ac20	5260	Ant1	-3.29	0.28	-3.01	11	Pass
NVNT	ac20	5280	Ant1	-3.46	0.13	-3.33	11	Pass
NVNT	ac20	5320	Ant1	-4.12	0.28	-3.84	11	Pass
NVNT	ac40	5270	Ant1	-6.43	0.71	-5.72	11	Pass
NVNT	ac40	5310	Ant1	-6.98	0.72	-6.26	11	Pass
NVNT	ac80	5290	Ant1	-7.56	0.7	-6.86	11	Pass

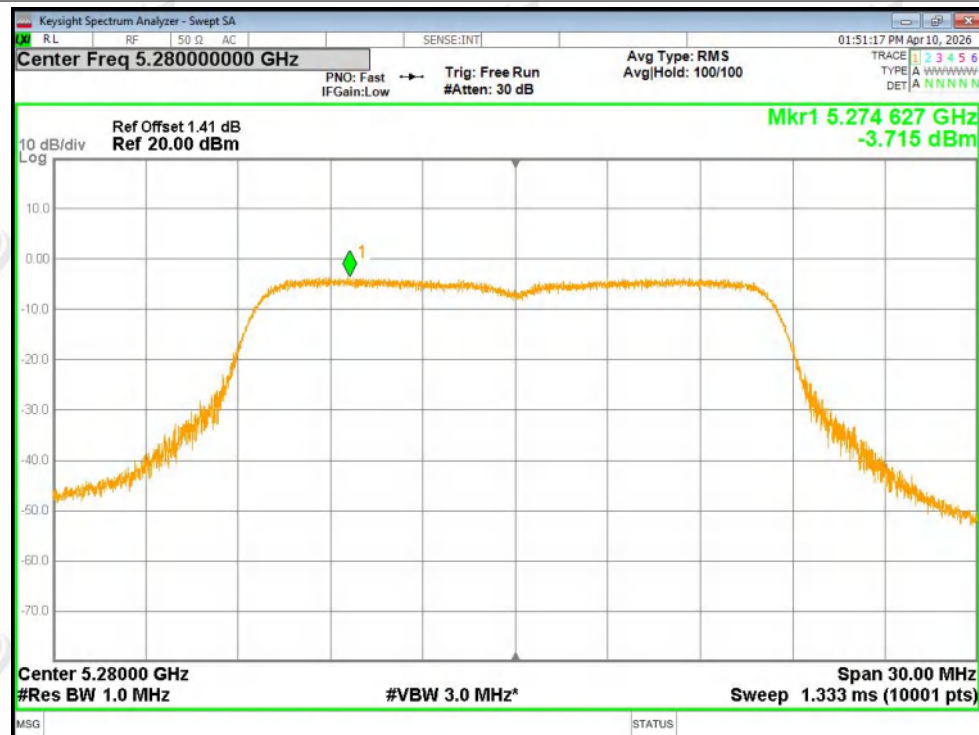


Test Graphs

PSD NVNT a 5260MHz Ant1

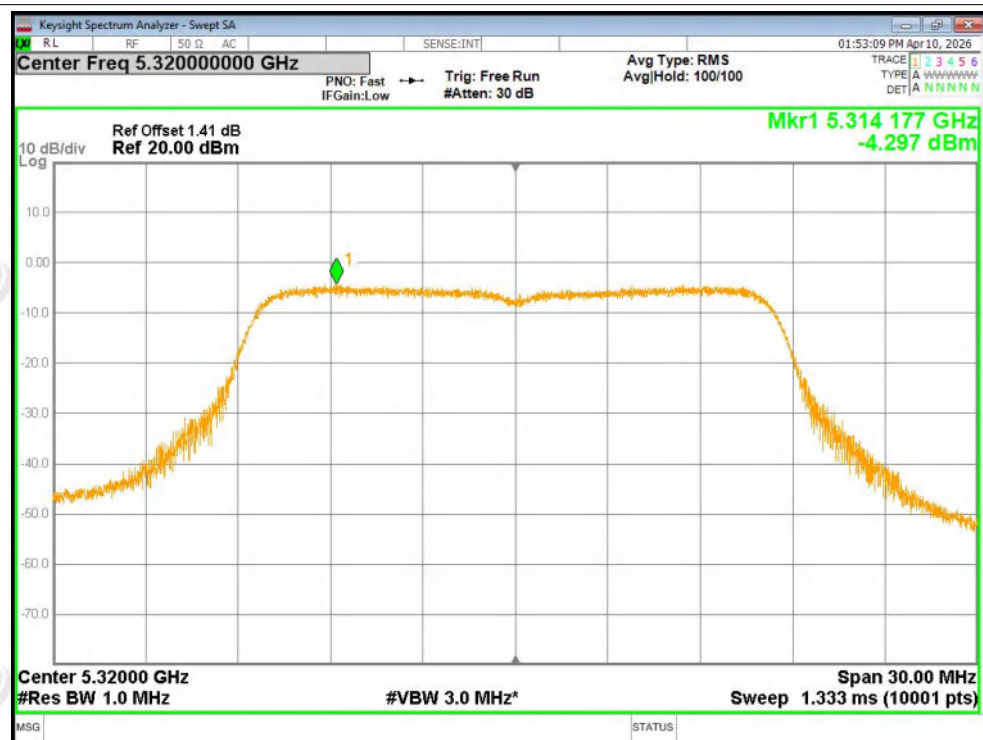


PSD NVNT a 5280MHz Ant1

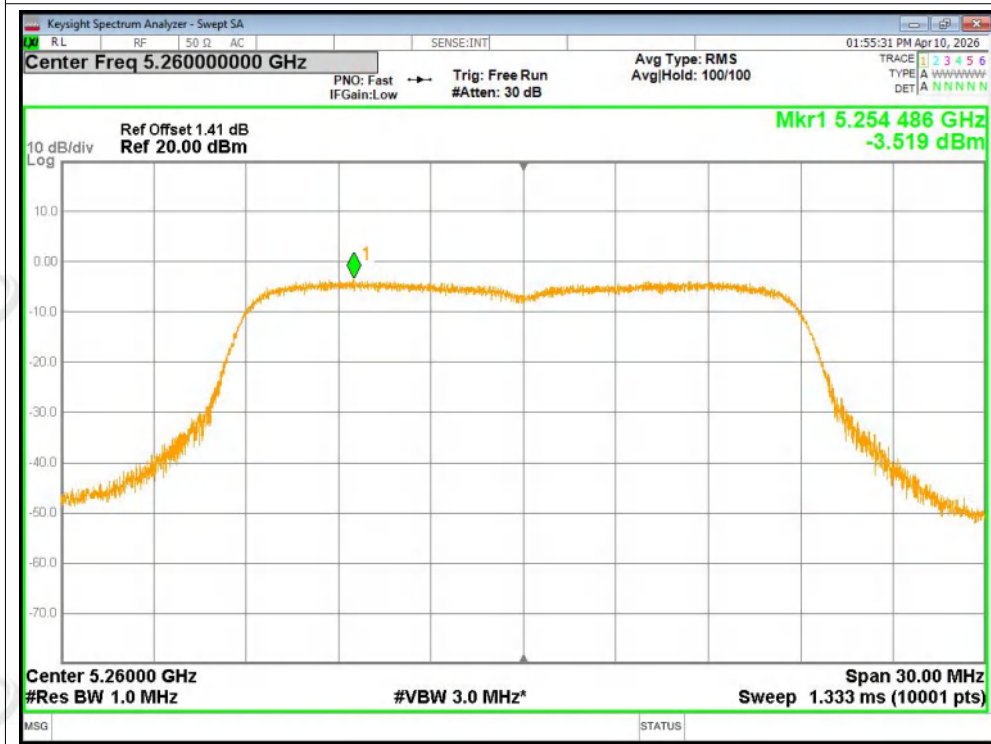




PSD NVNT a 5320MHz Ant1

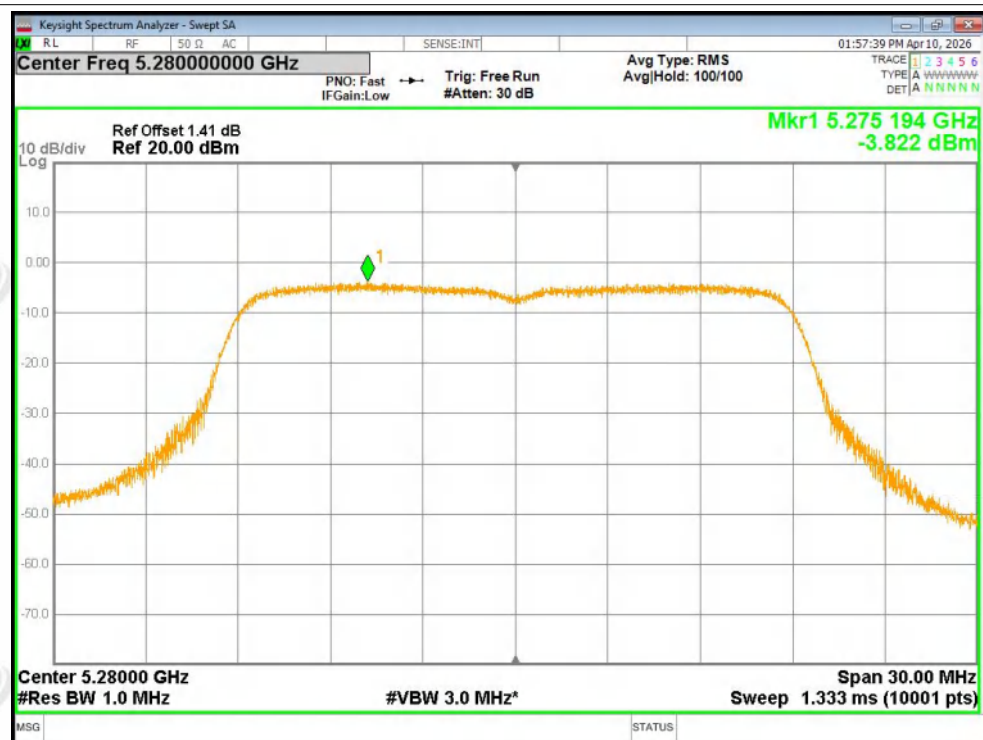


PSD NVNT n20 5260MHz Ant1

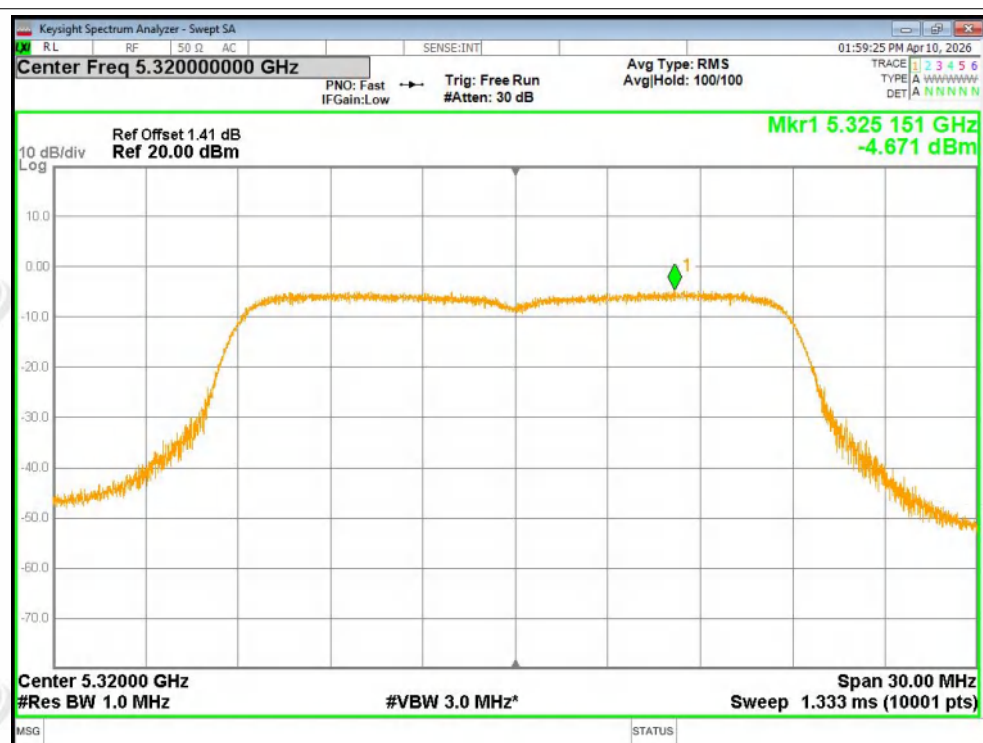


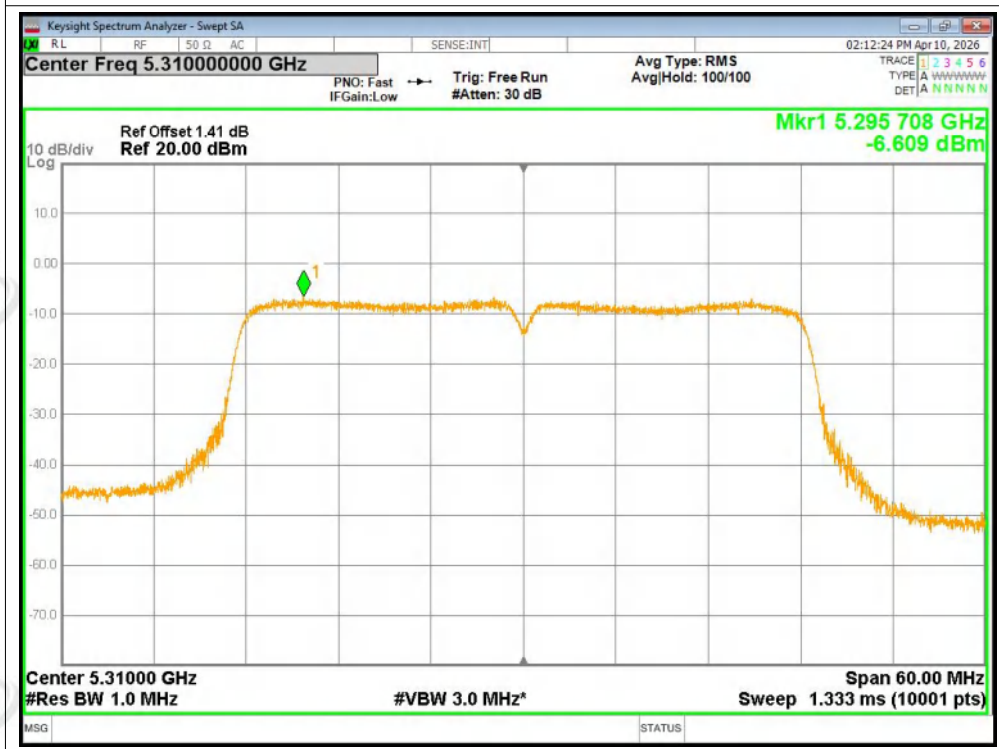


PSD NVNT n20 5280MHz Ant1



PSD NVNT n20 5320MHz Ant1



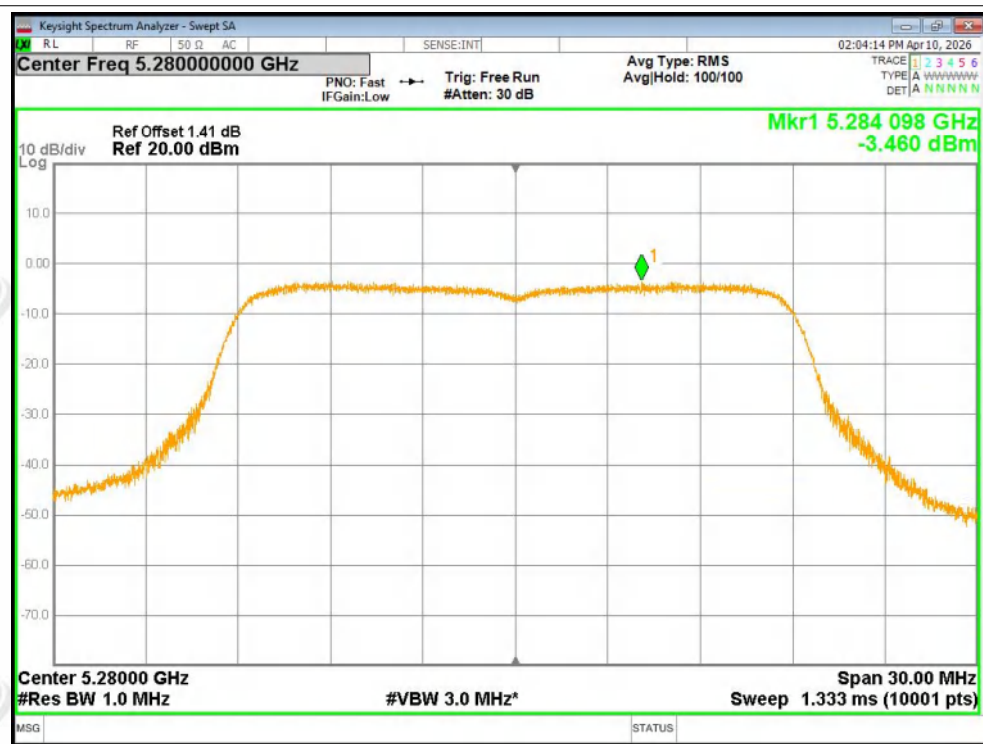




PSD NVNT ac20 5260MHz Ant1

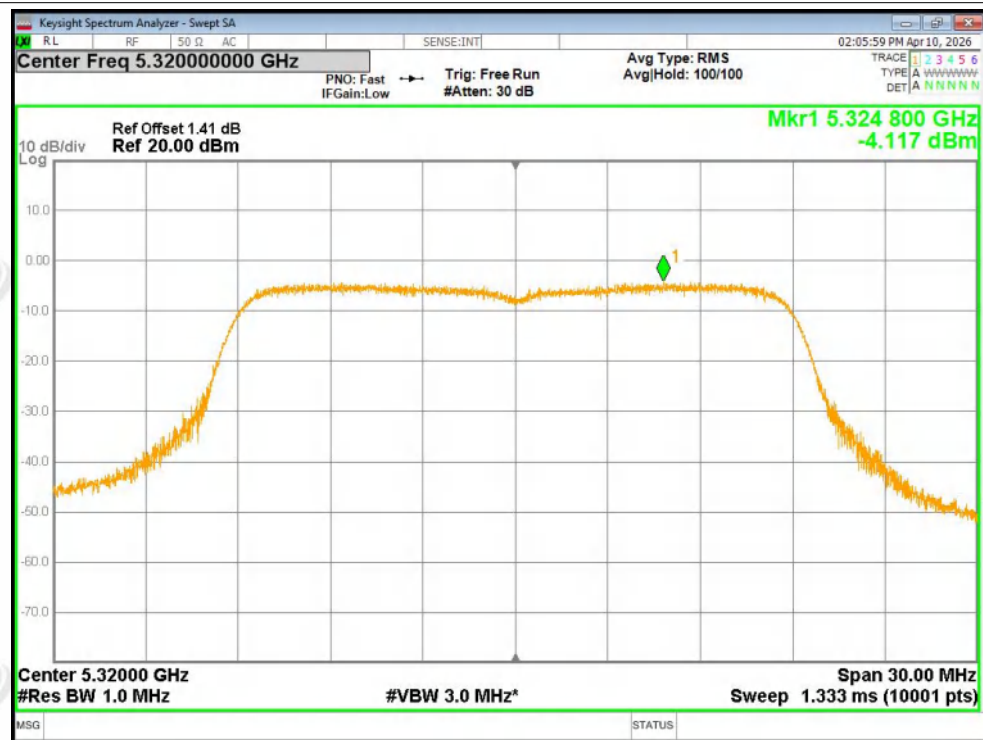


PSD NVNT ac20 5280MHz Ant1

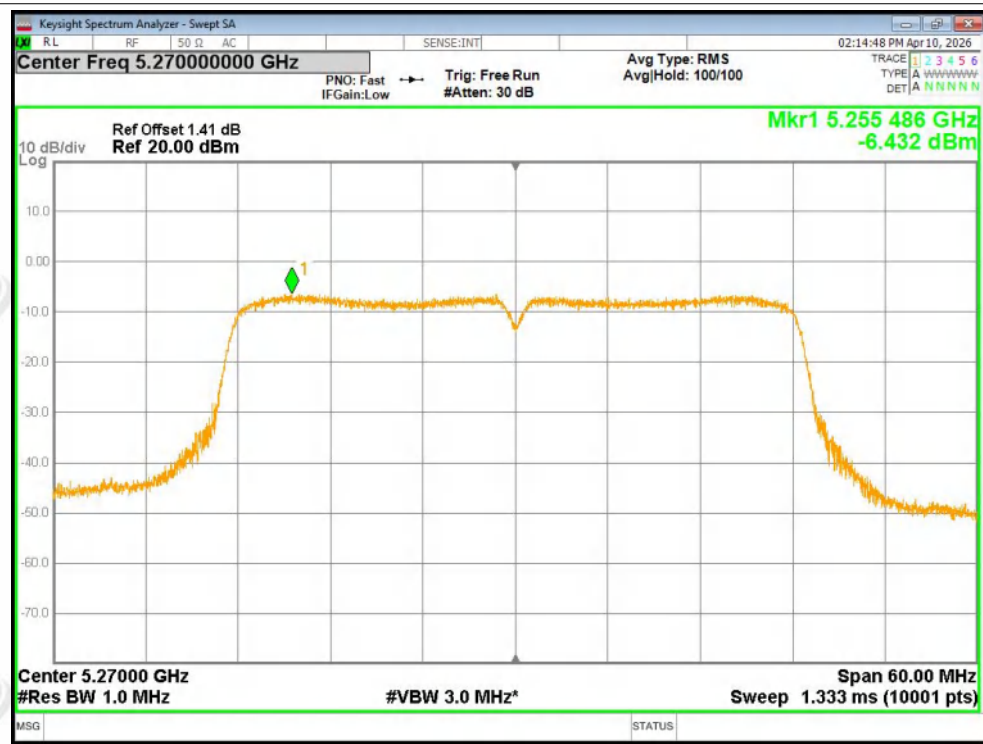




PSD NVNT ac20 5320MHz Ant1

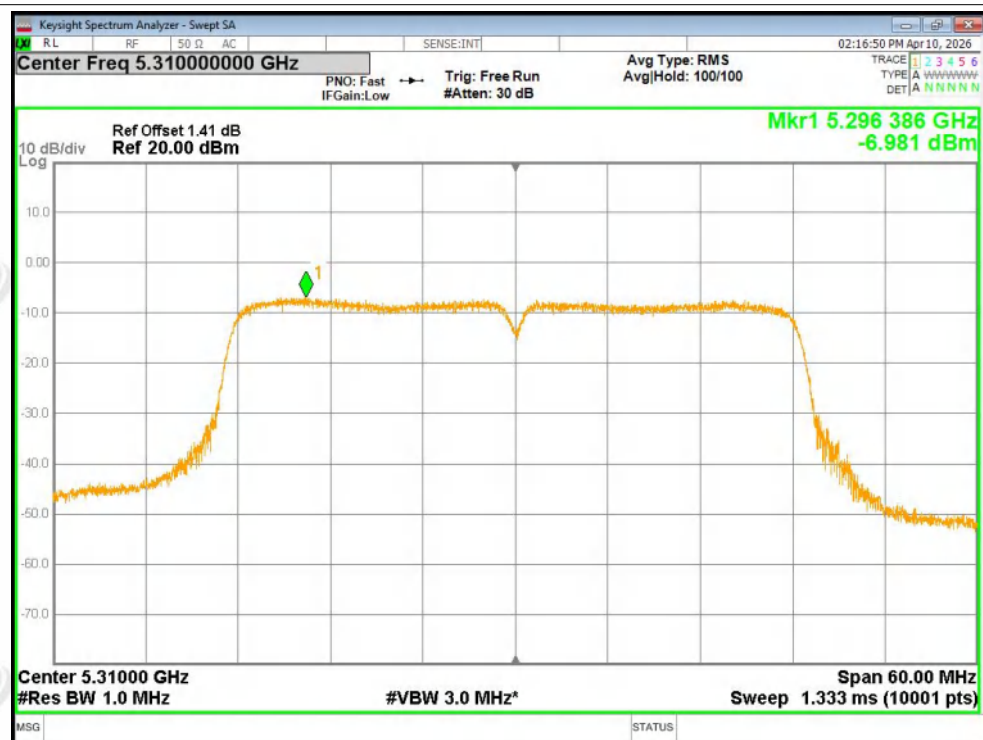


PSD NVNT ac40 5270MHz Ant1

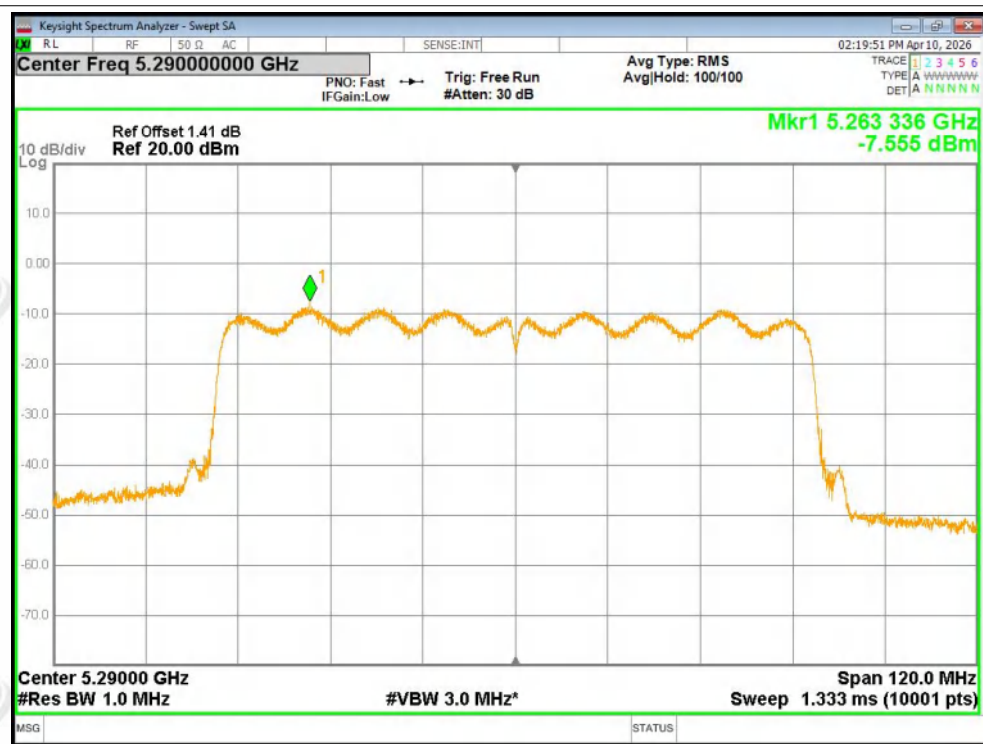




PSD NVNT ac40 5310MHz Ant1



PSD NVNT ac80 5290MHz Ant1





ZHONGHAN
B.6 Band Edge



FCC ID:WR4-CRS1



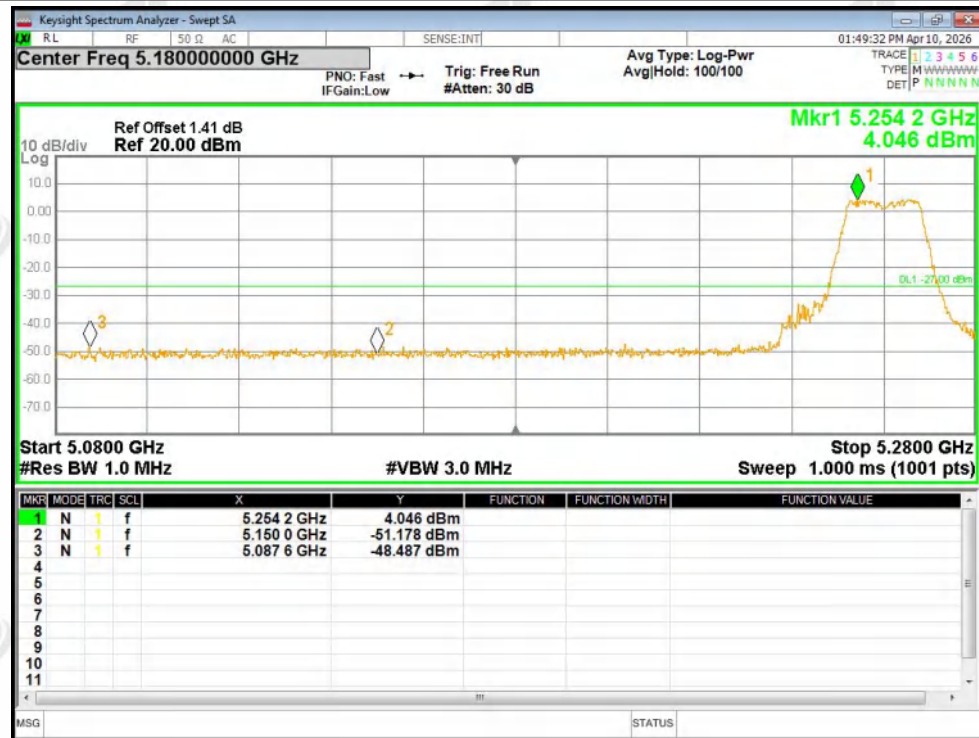
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Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBm)	Antenna gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Verdict
NVNT	a	5260	Ant1	-48.48	4.2	-44.28	-27	Pass
NVNT	a	5320	Ant1	-47.47	4.2	-43.27	-27	Pass
NVNT	n20	5260	Ant1	-48.72	4.2	-44.52	-27	Pass
NVNT	n20	5320	Ant1	-47.08	4.2	-42.88	-27	Pass
NVNT	n40	5270	Ant1	-48.43	4.2	-44.23	-27	Pass
NVNT	n40	5310	Ant1	-34.58	4.2	-30.38	-27	Pass
NVNT	ac20	5260	Ant1	-48.64	4.2	-44.44	-27	Pass
NVNT	ac20	5320	Ant1	-47.78	4.2	-43.58	-27	Pass
NVNT	ac40	5270	Ant1	-48.4	4.2	-44.2	-27	Pass
NVNT	ac40	5310	Ant1	-38.08	4.2	-33.88	-27	Pass
NVNT	ac80	5290	Ant1	-37.32	4.2	-33.12	-27	Pass

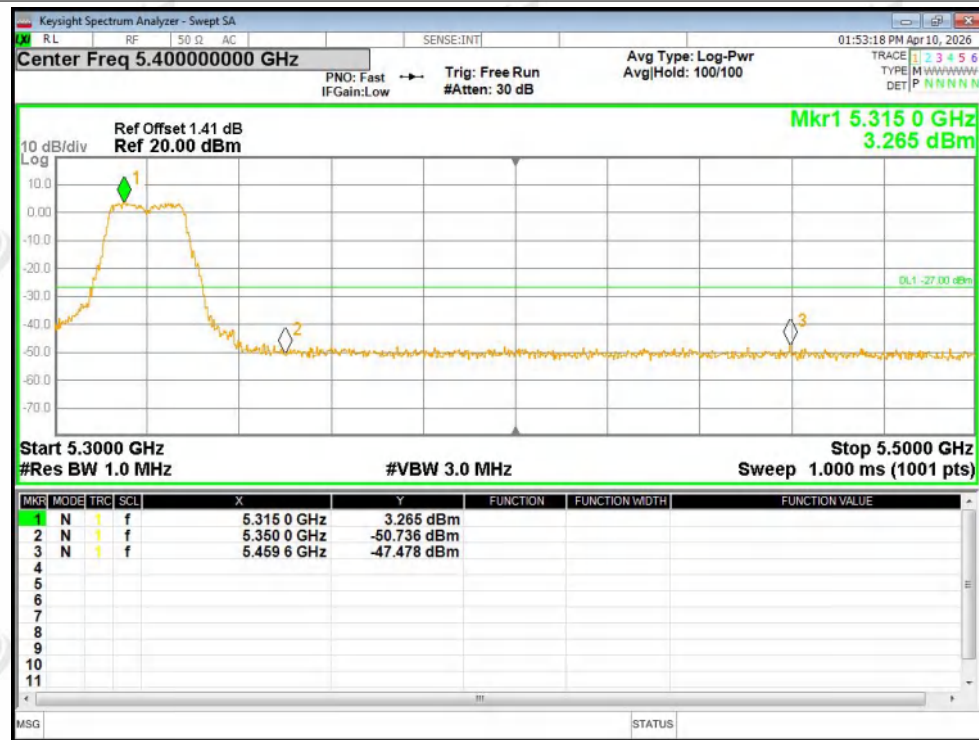


Test Graphs

Band Edge NVNT a 5260MHz Low Ant1

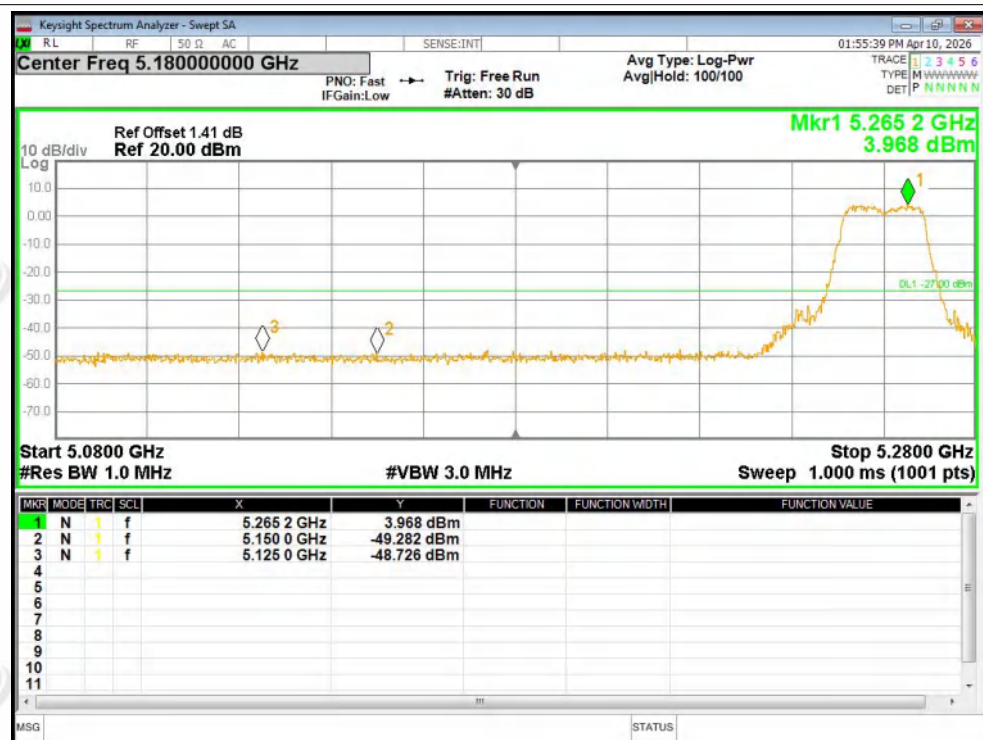


Band Edge NVNT a 5320MHz High Ant1

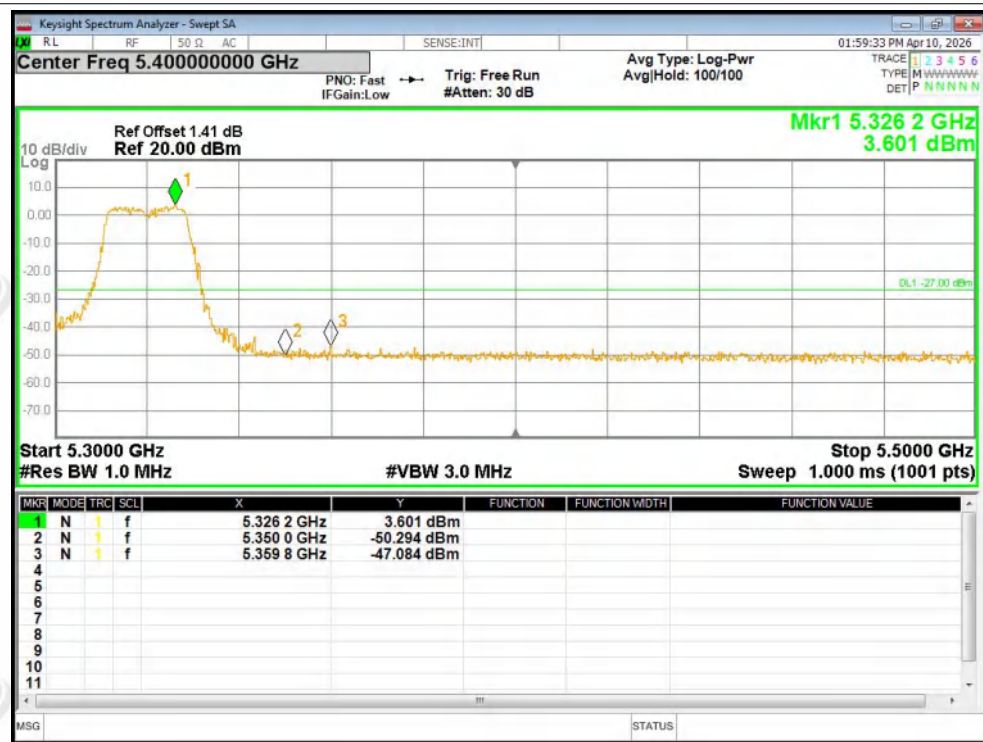




Band Edge NVNT n20 5260MHz Low Ant1

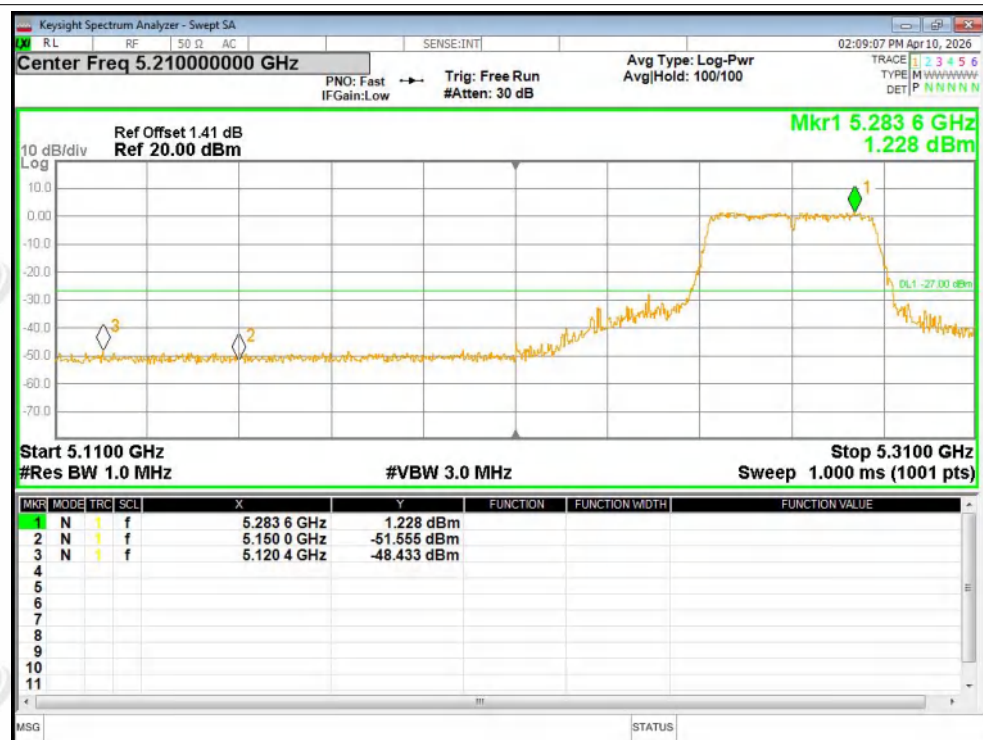


Band Edge NVNT n20 5320MHz High Ant1

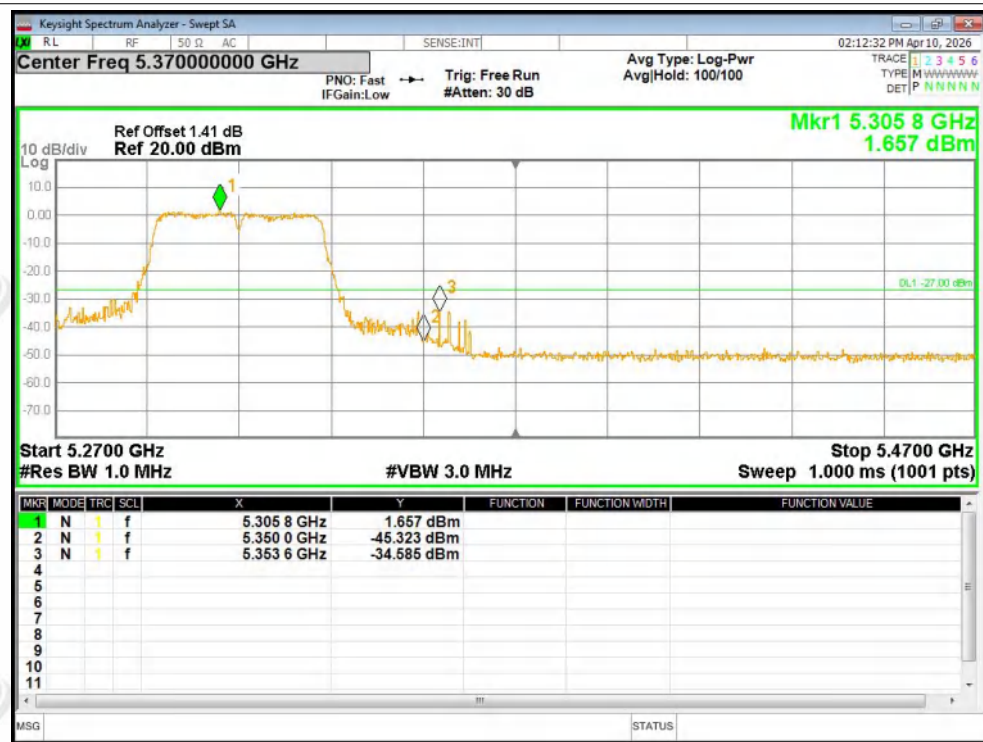




Band Edge NVNT n40 5270MHz Low Ant1

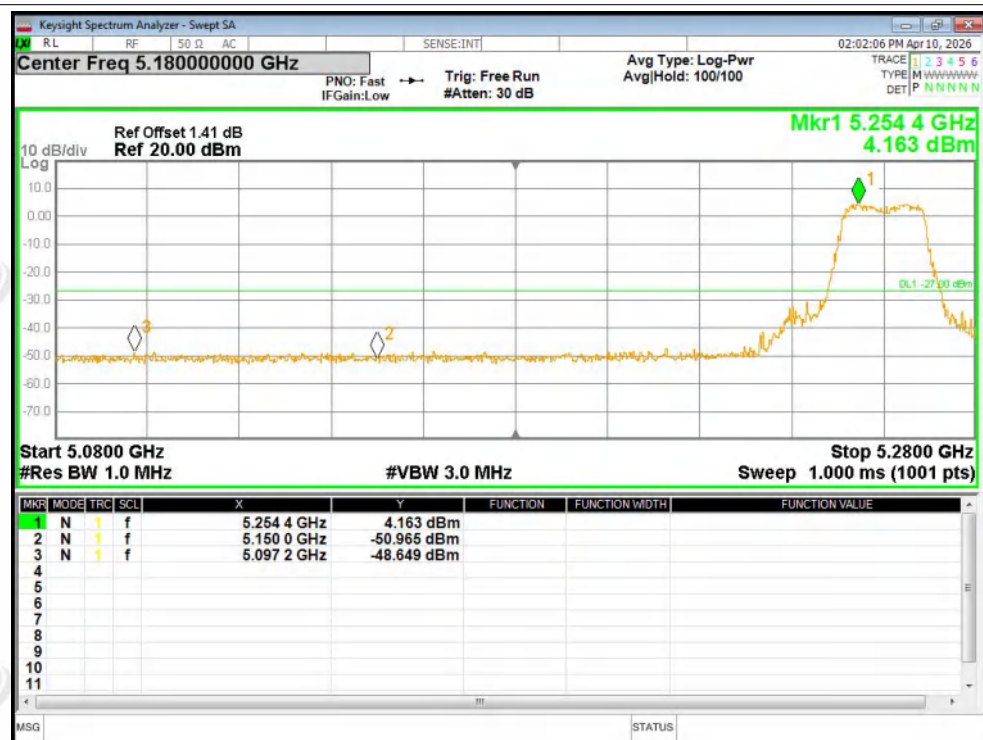


Band Edge NVNT n40 5310MHz High Ant1

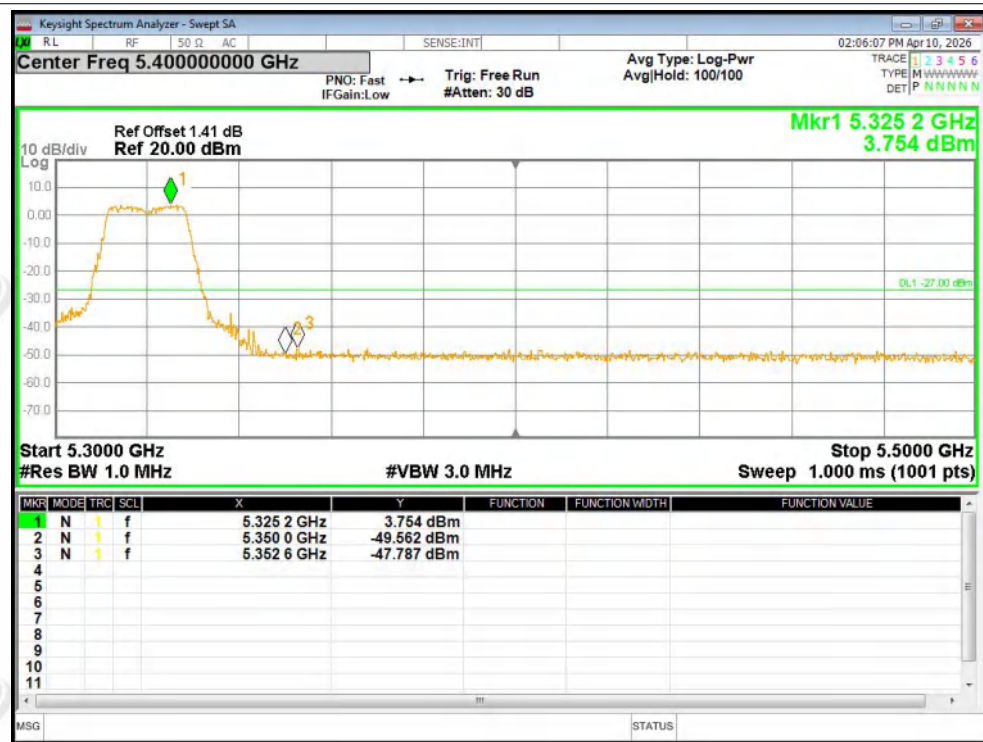




Band Edge NVNT ac20 5260MHz Low Ant1

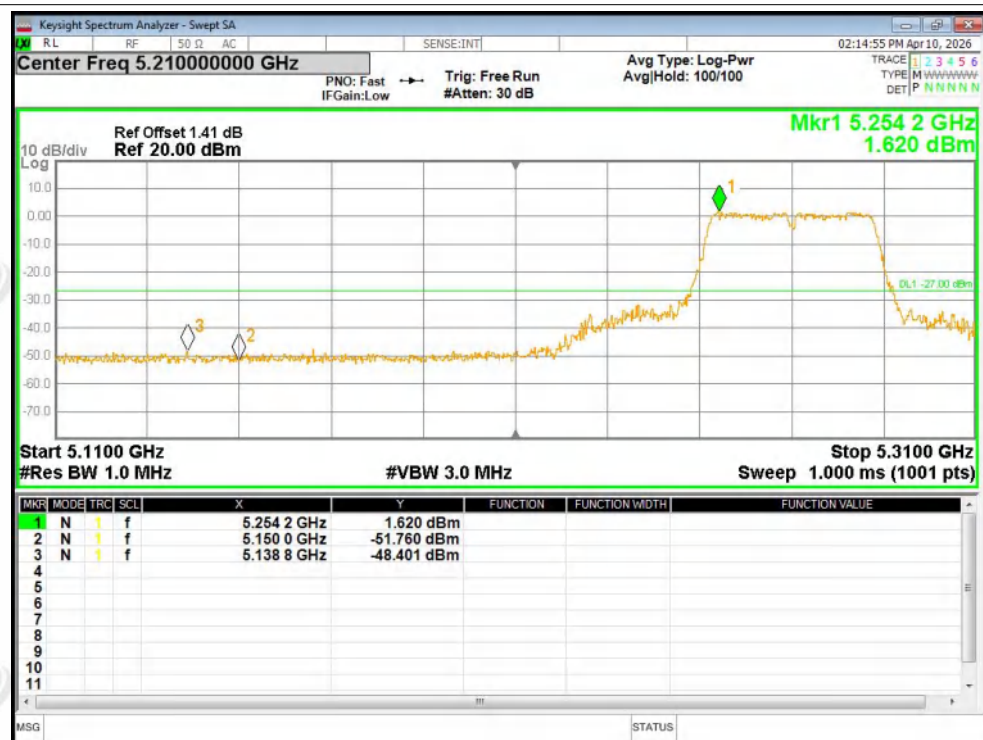


Band Edge NVNT ac20 5320MHz High Ant1

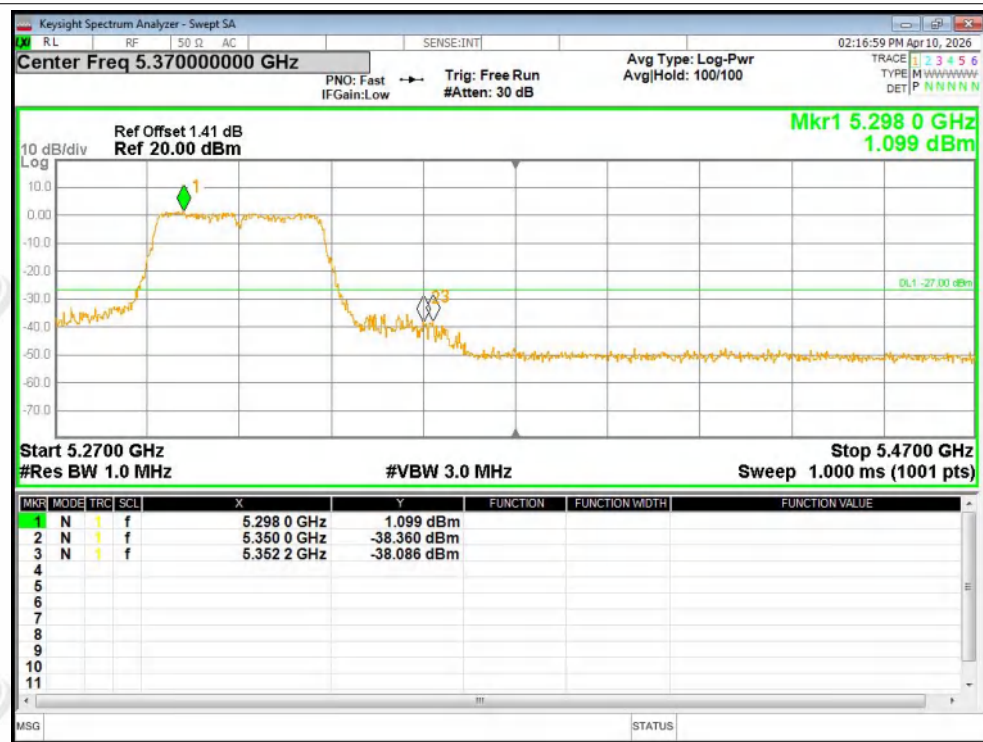


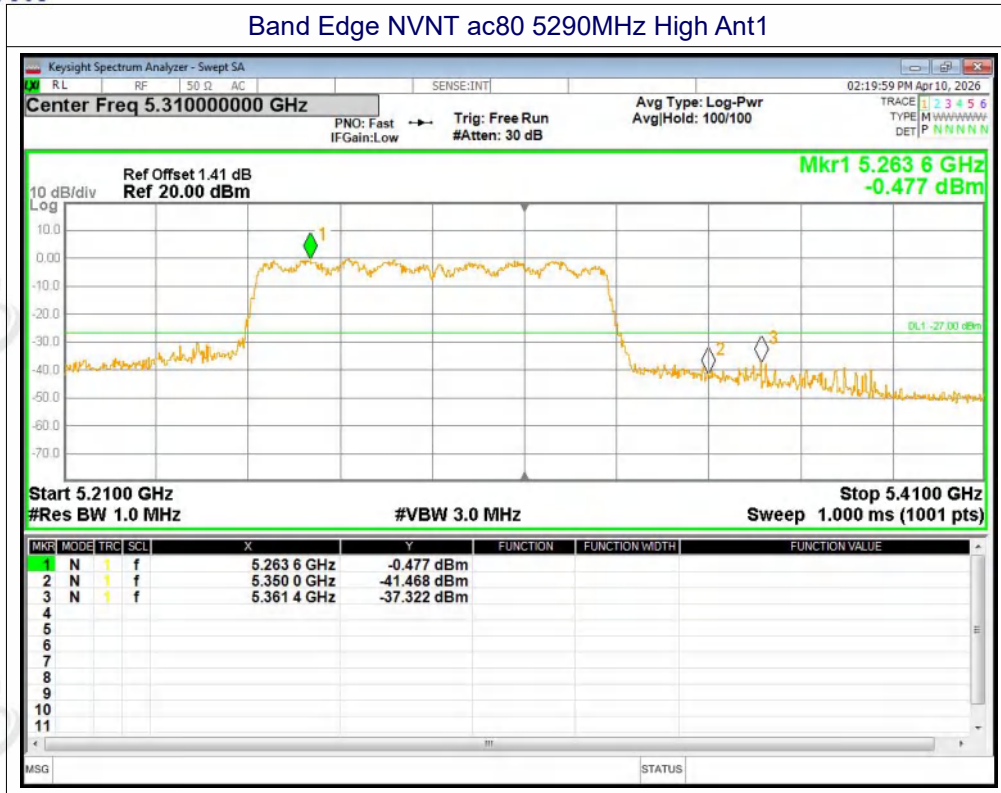


Band Edge NVNT ac40 5270MHz Low Ant1



Band Edge NVNT ac40 5310MHz High Ant1



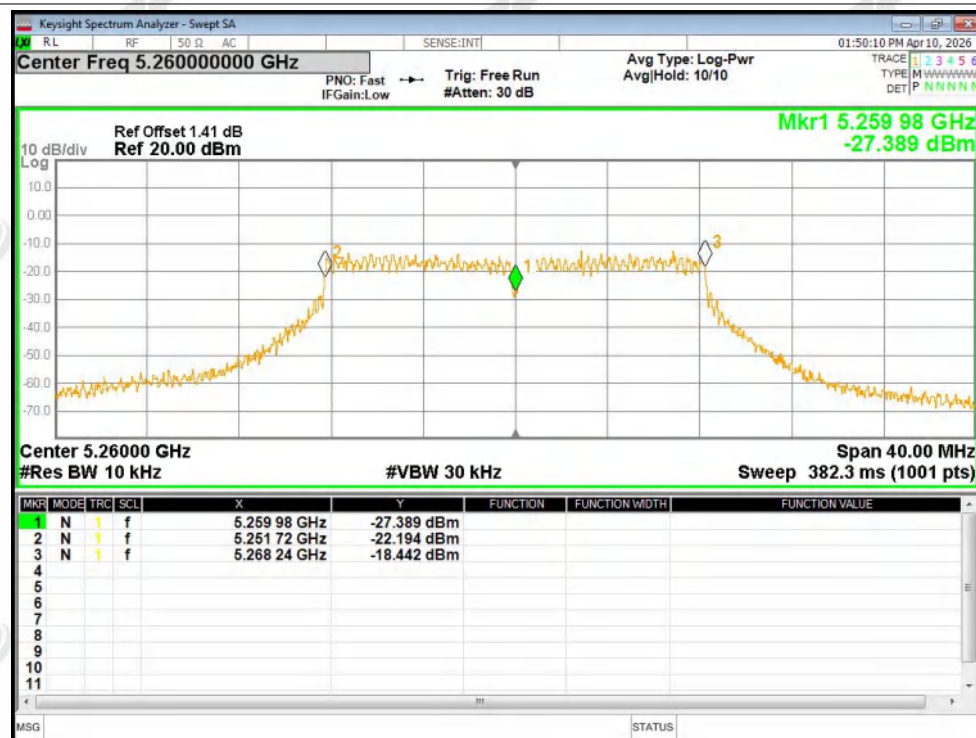


**ZHONGHAN****B.7 Frequency Stability**

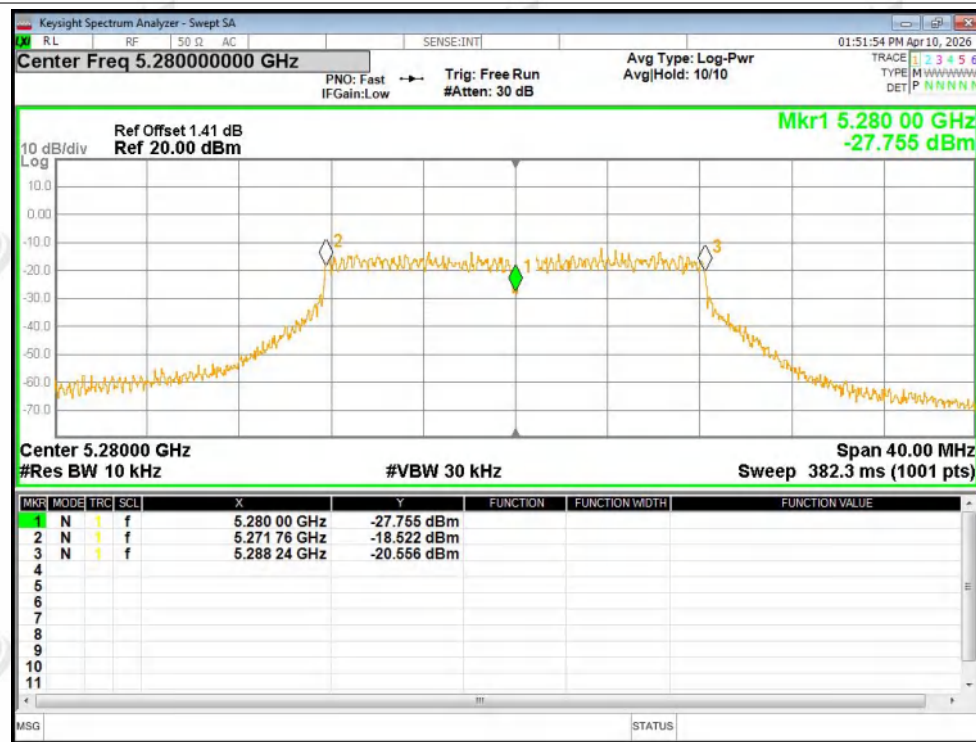
Condition	Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
NVNT	a	5260	Ant1	5259.98	-20000	-3.8	Within 5260-5320MHz	Pass
NVNT	a	5280	Ant1	5280	0	0		Pass
NVNT	a	5320	Ant1	5319.98	-20000	-3.76		Pass
NVNT	n20	5260	Ant1	5260.02	20000	3.8		Pass
NVNT	n20	5280	Ant1	5280	0	0		Pass
NVNT	n20	5320	Ant1	5320	0	0		Pass
NVNT	n40	5270	Ant1	5270	0	0		Pass
NVNT	n40	5310	Ant1	5310	0	0		Pass
NVNT	ac20	5260	Ant1	5260.02	20000	3.8		Pass
NVNT	ac20	5280	Ant1	5280	0	0		Pass
NVNT	ac20	5320	Ant1	5320	0	0		Pass
NVNT	ac40	5270	Ant1	5270	0	0		Pass
NVNT	ac40	5310	Ant1	5310	0	0		Pass
NVNT	ac80	5290	Ant1	5289.92	-80000	-15.12		Pass

Test Graphs

Freq. Stability NVNT a 5260MHz Ant1

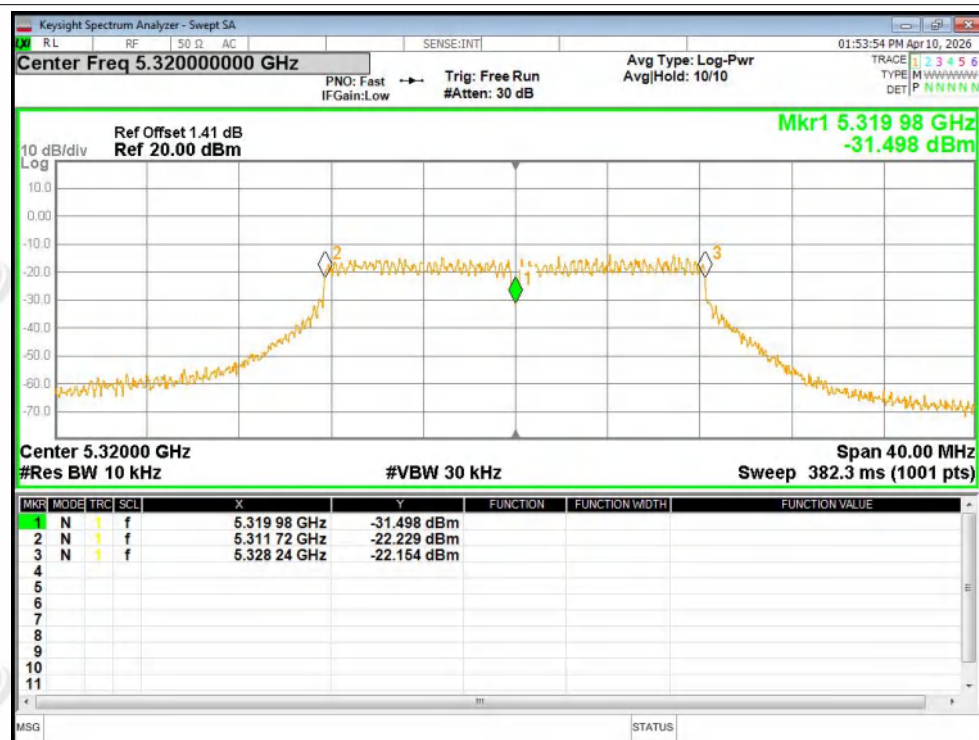


Freq. Stability NVNT a 5280MHz Ant1

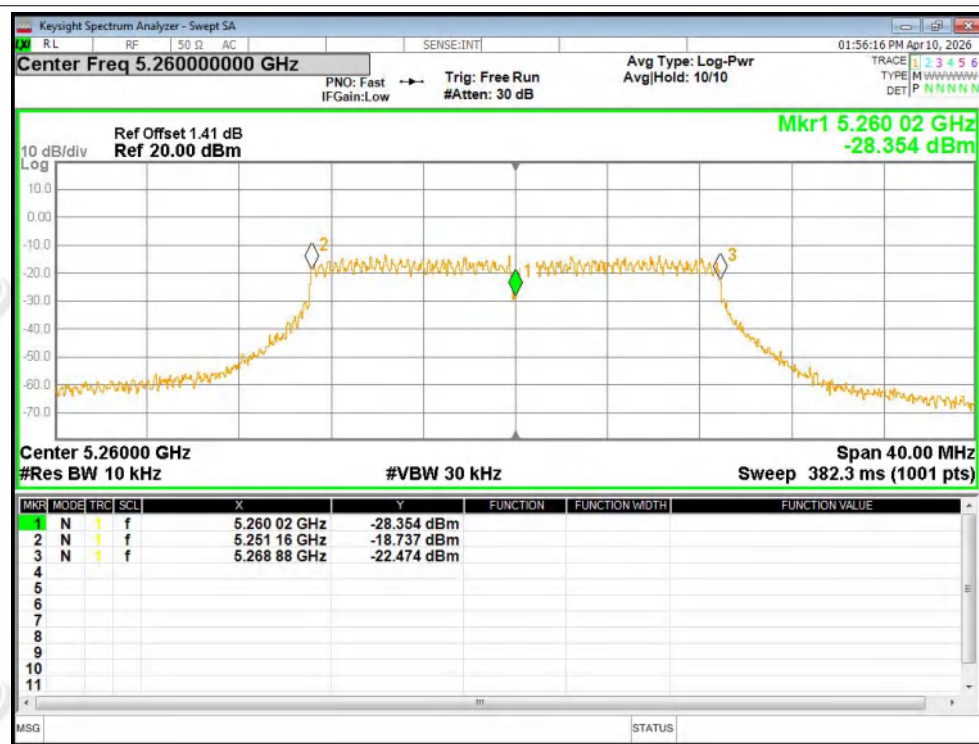




Freq. Stability NVNT a 5320MHz Ant1

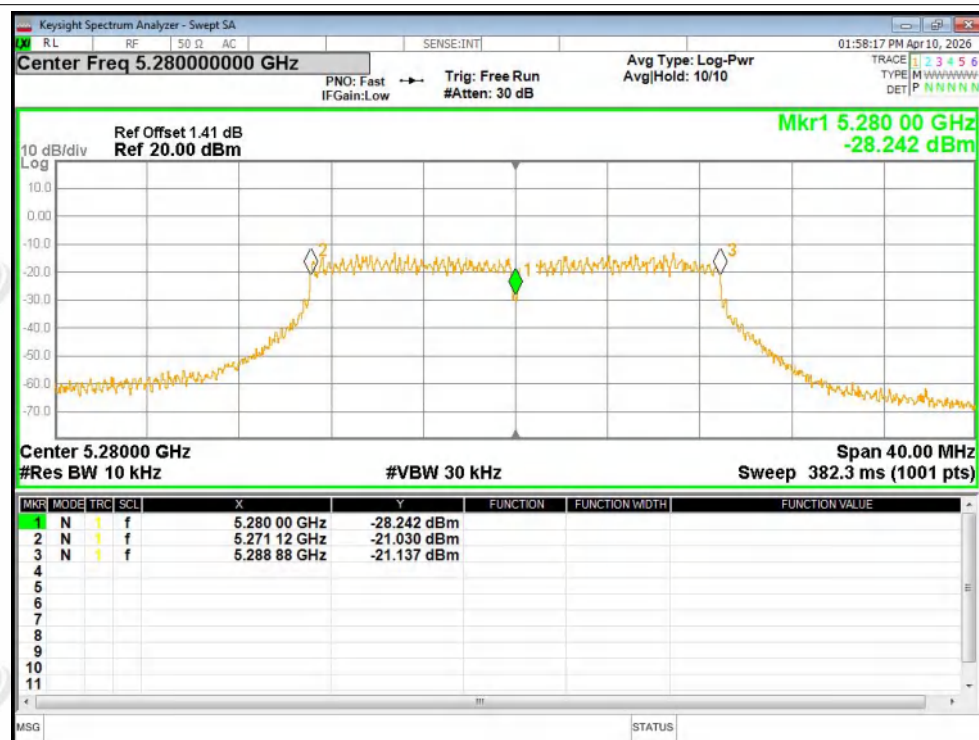


Freq. Stability NVNT n20 5260MHz Ant1

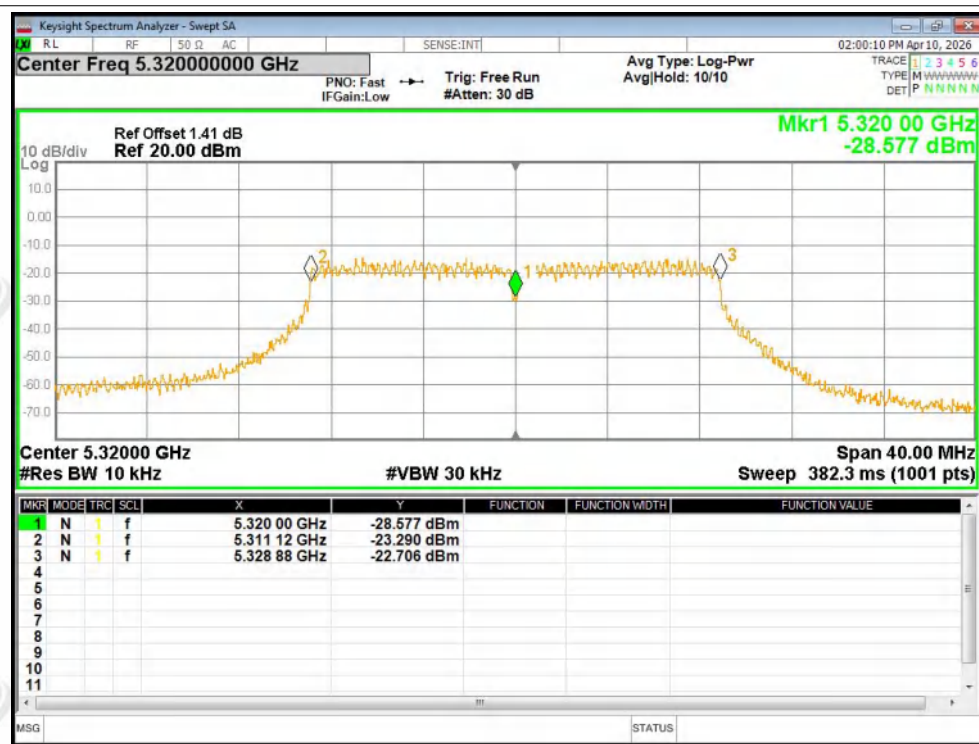




Freq. Stability NVNT n20 5280MHz Ant1



Freq. Stability NVNT n20 5320MHz Ant1

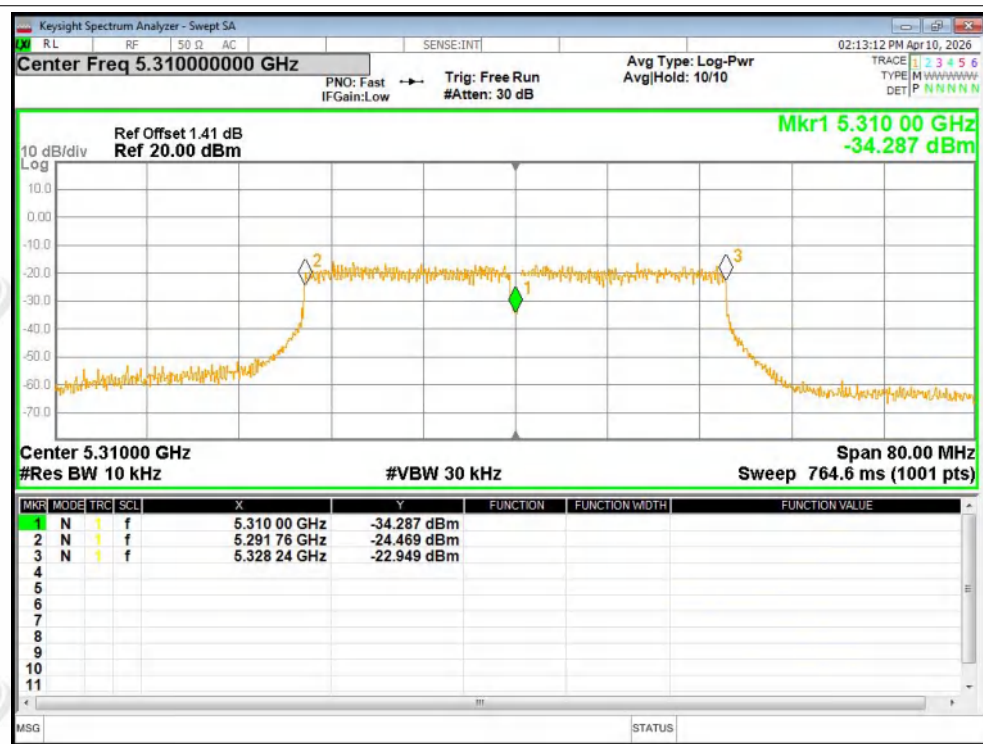




Freq. Stability NVNT n40 5270MHz Ant1

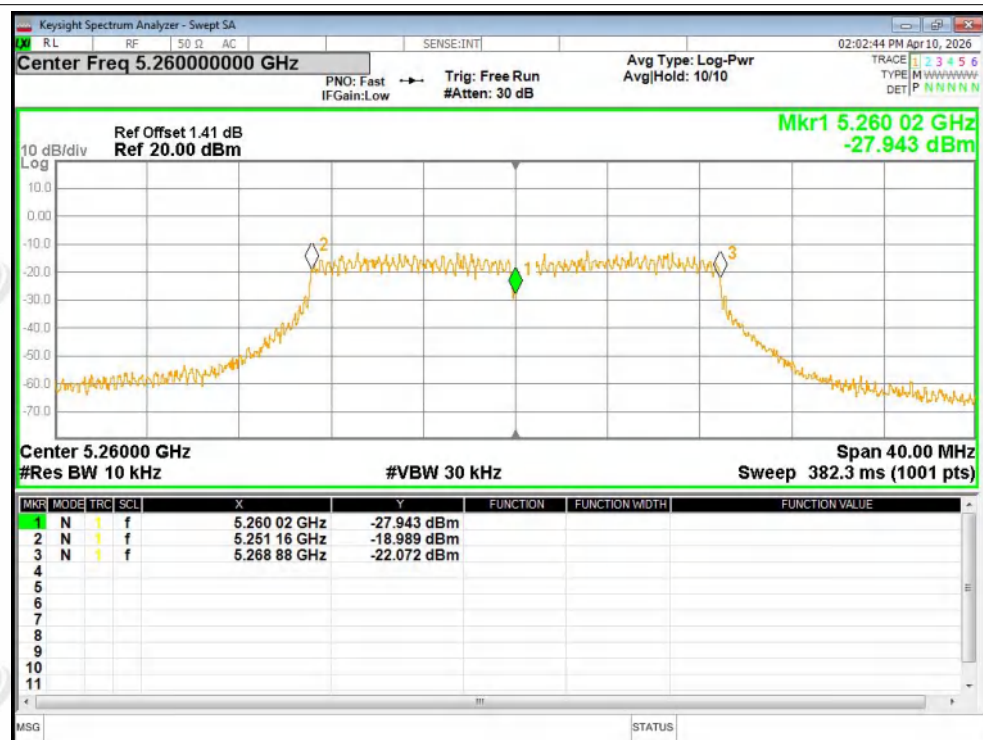


Freq. Stability NVNT n40 5310MHz Ant1

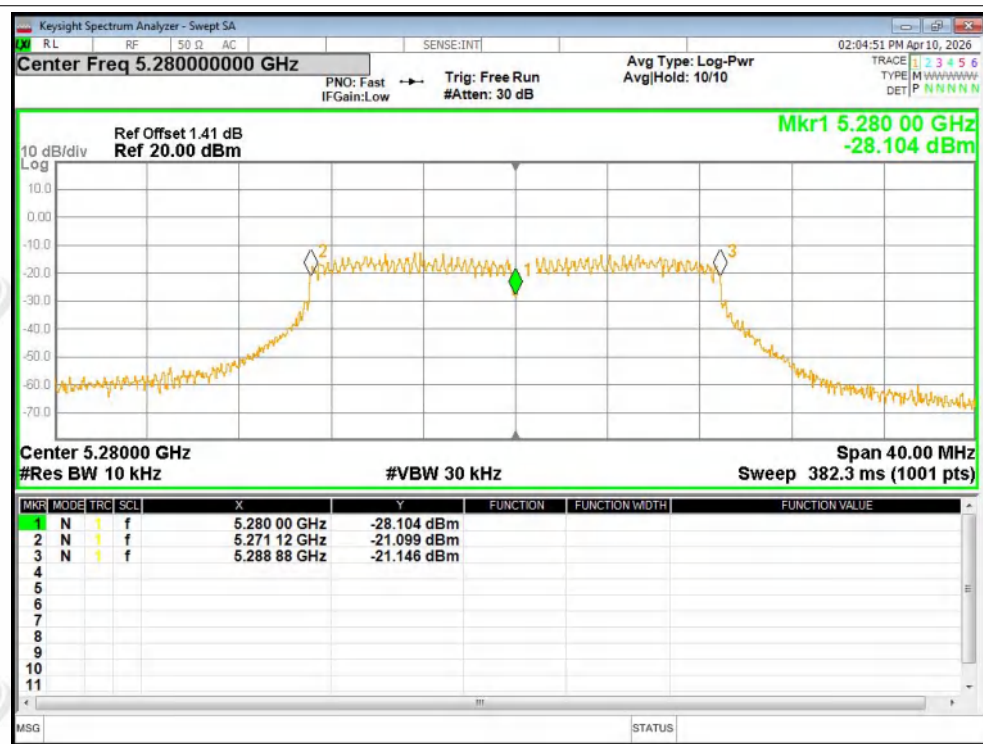




Freq. Stability NVNT ac20 5260MHz Ant1

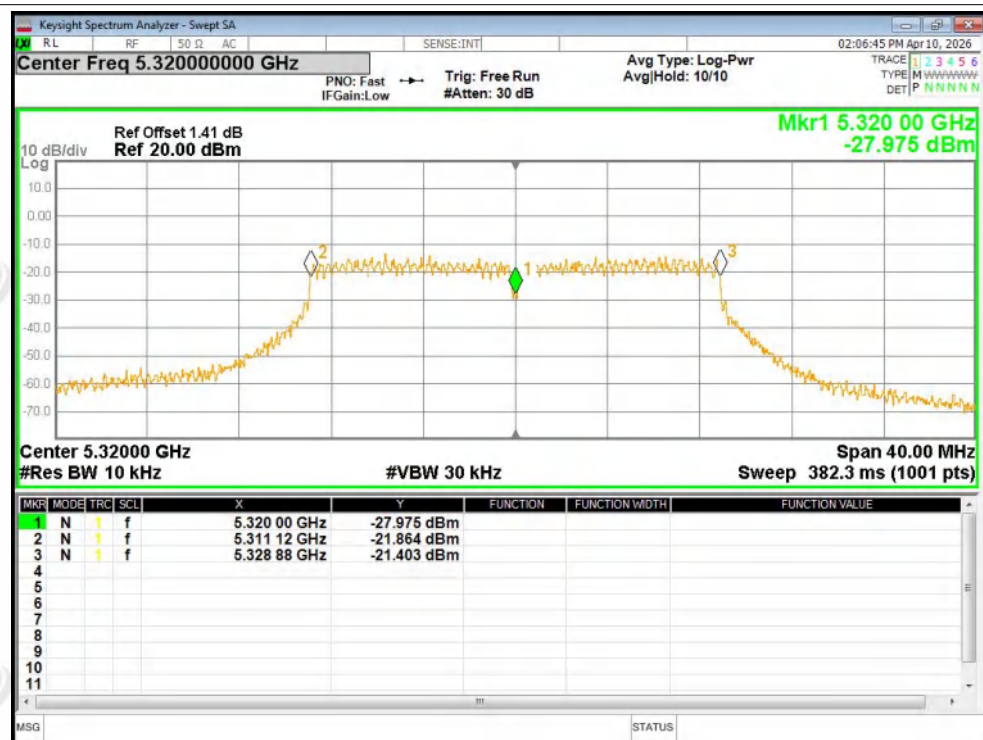


Freq. Stability NVNT ac20 5280MHz Ant1

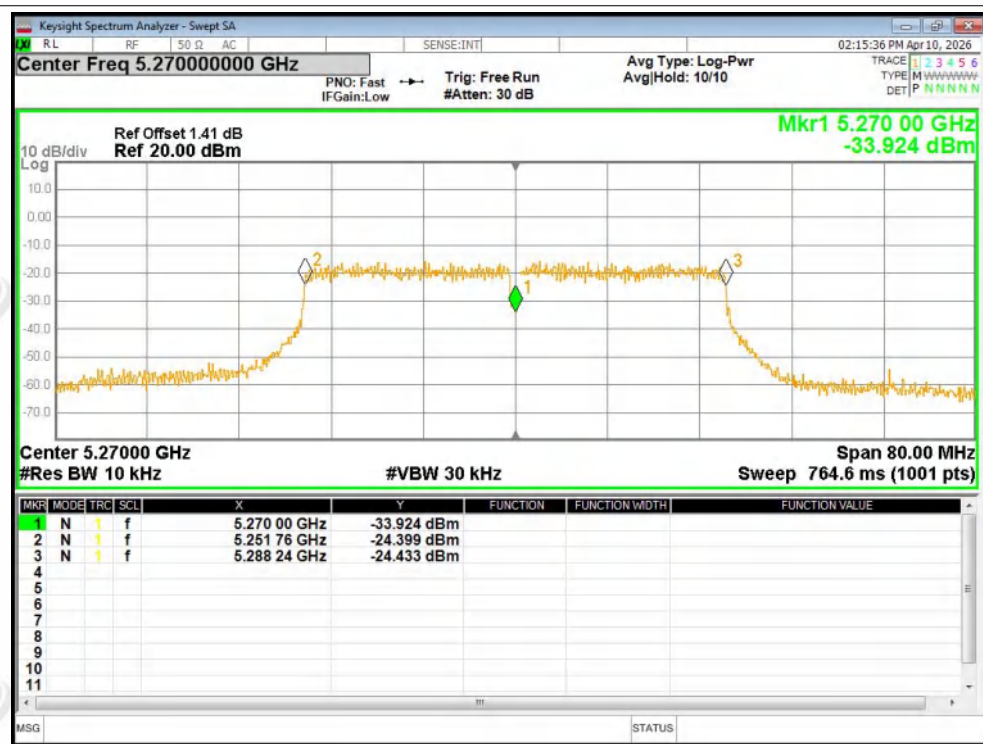




Freq. Stability NVNT ac20 5320MHz Ant1

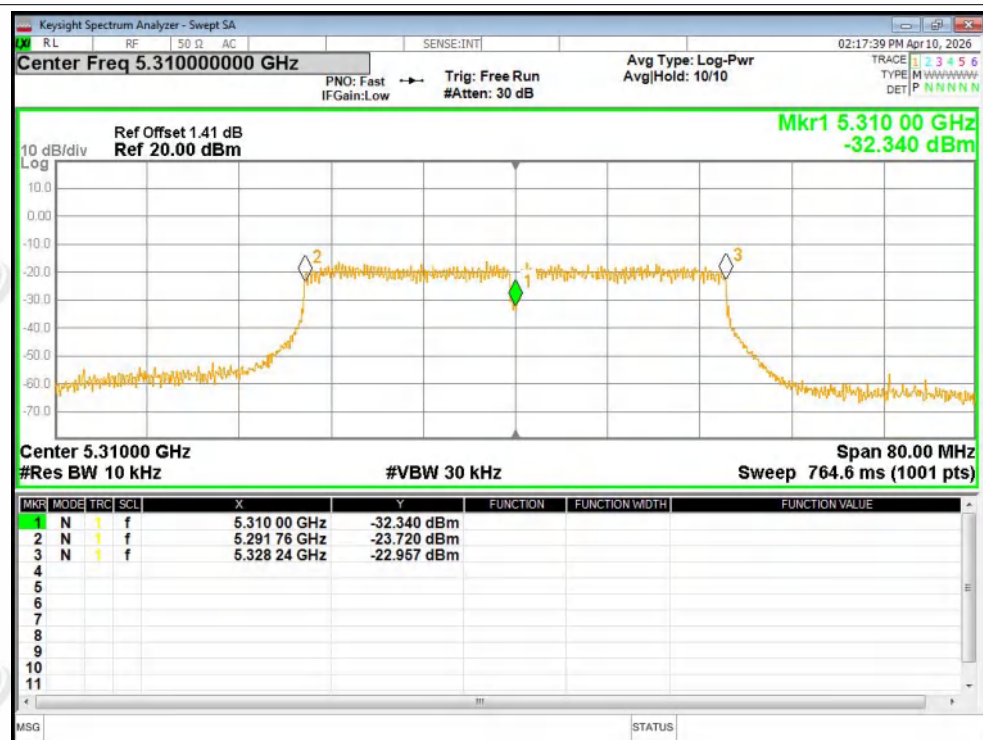


Freq. Stability NVNT ac40 5270MHz Ant1

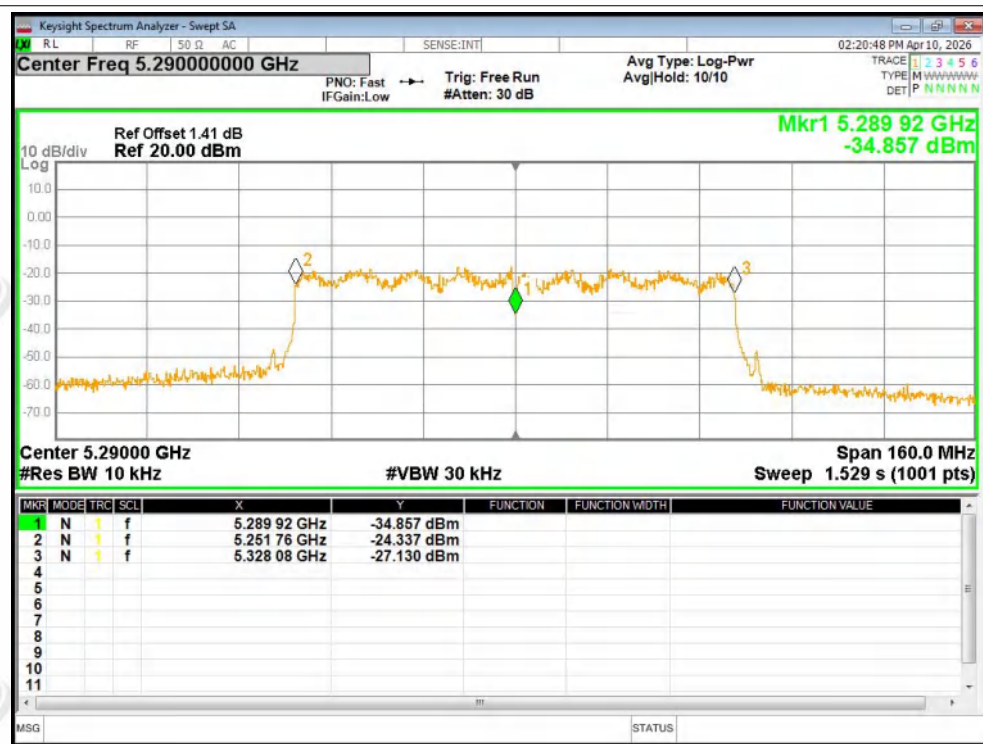




Freq. Stability NVNT ac40 5310MHz Ant1



Freq. Stability NVNT ac80 5290MHz Ant1

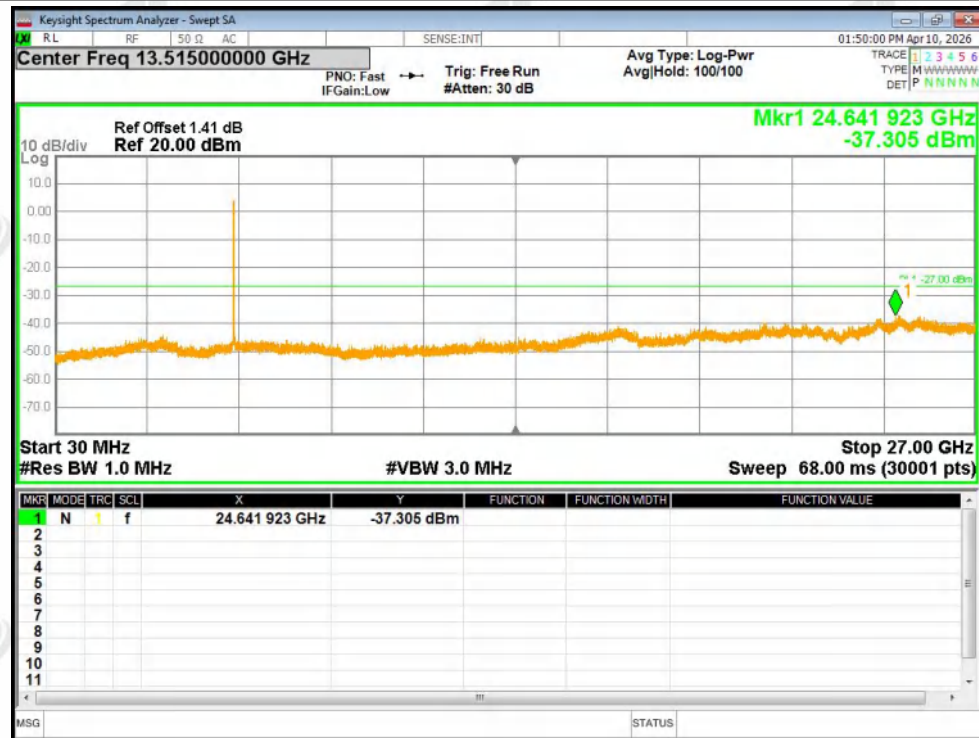


**ZHONGHAN****B.8 Conducted RF Spurious Emission**

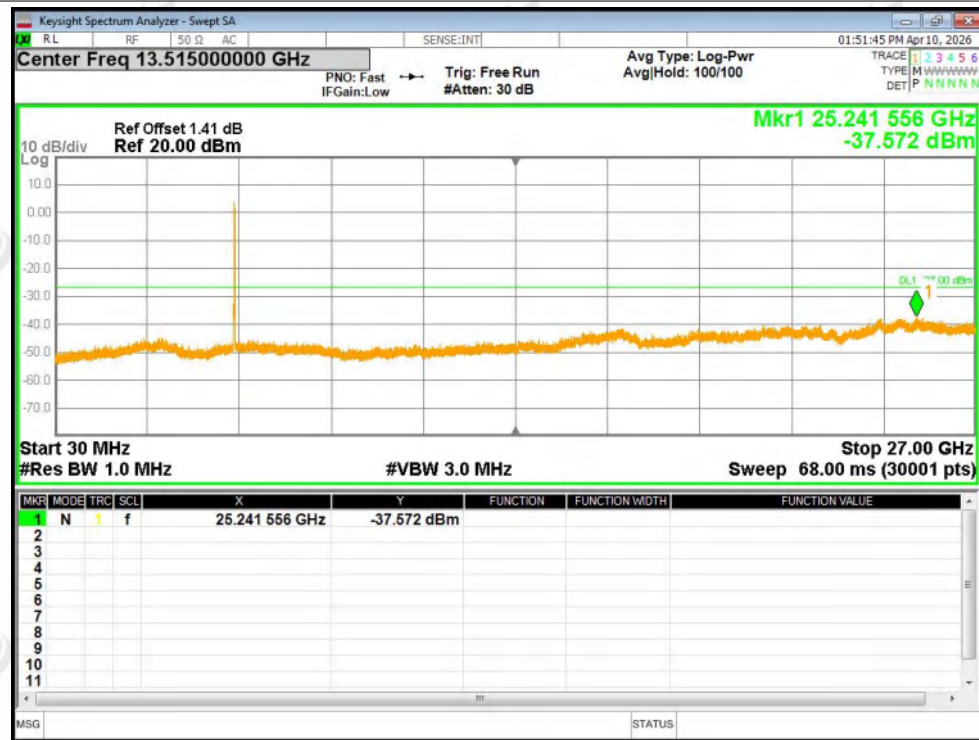
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBm)	ANT Gain (dBi)	EIRP Value (dBm)	Limit (dBm)	Verdict
NVNT	a	5260	Ant1	-37.3	4.2	-33.1	-27	Pass
NVNT	a	5280	Ant1	-37.57	4.2	-33.37	-27	Pass
NVNT	a	5320	Ant1	-37.4	4.2	-33.2	-27	Pass
NVNT	n20	5260	Ant1	-36.89	4.2	-32.69	-27	Pass
NVNT	n20	5280	Ant1	-37.65	4.2	-33.45	-27	Pass
NVNT	n20	5320	Ant1	-37.11	4.2	-32.91	-27	Pass
NVNT	n40	5270	Ant1	-37.75	4.2	-33.55	-27	Pass
NVNT	n40	5310	Ant1	-36.89	4.2	-32.69	-27	Pass
NVNT	ac20	5260	Ant1	-37.68	4.2	-33.48	-27	Pass
NVNT	ac20	5280	Ant1	-36.82	4.2	-32.62	-27	Pass
NVNT	ac20	5320	Ant1	-36.88	4.2	-32.68	-27	Pass
NVNT	ac40	5270	Ant1	-37.36	4.2	-33.16	-27	Pass
NVNT	ac40	5310	Ant1	-37.77	4.2	-33.57	-27	Pass
NVNT	ac80	5290	Ant1	-37.44	4.2	-33.24	-27	Pass

Test Graphs

Tx. Spurious NVNT a 5260MHz Ant1 Emission

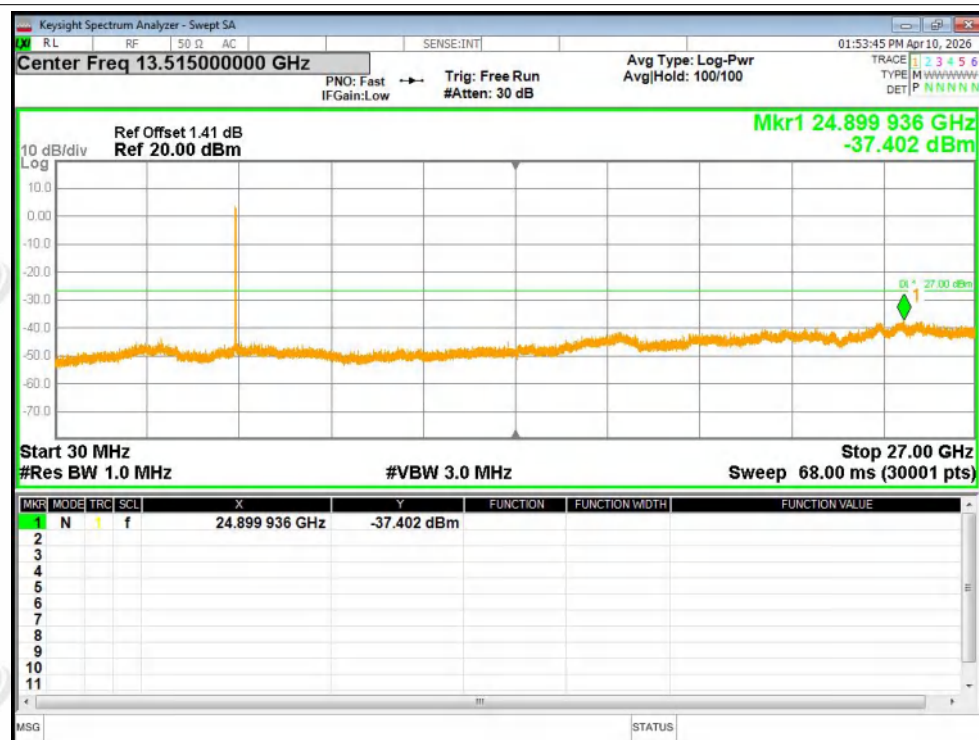


Tx. Spurious NVNT a 5280MHz Ant1 Emission

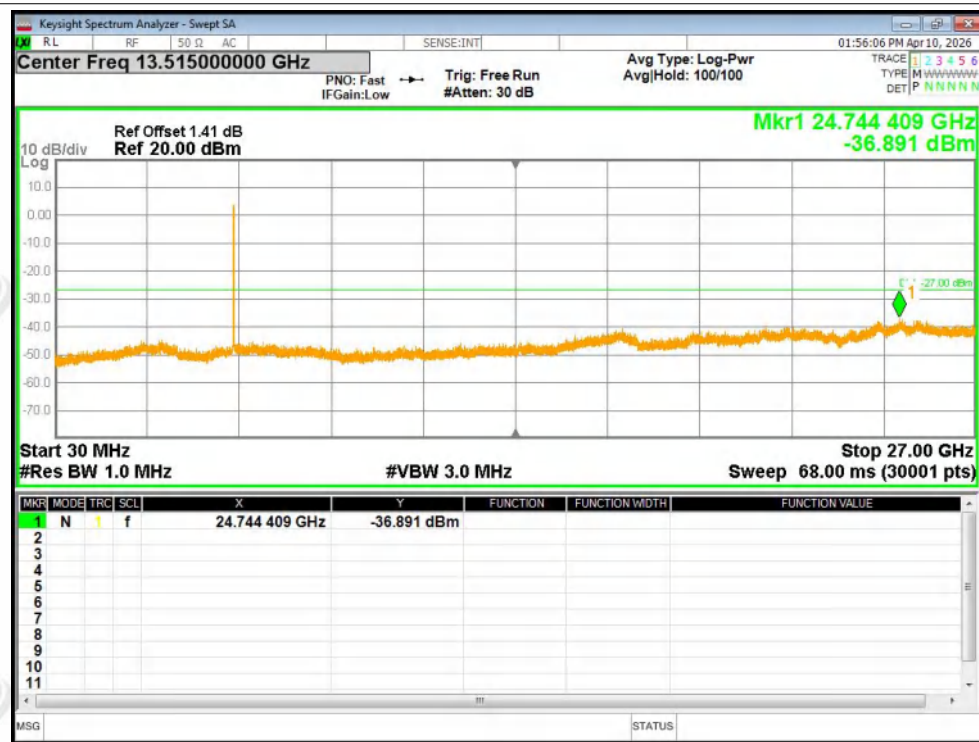




Tx. Spurious NVNT a 5320MHz Ant1 Emission

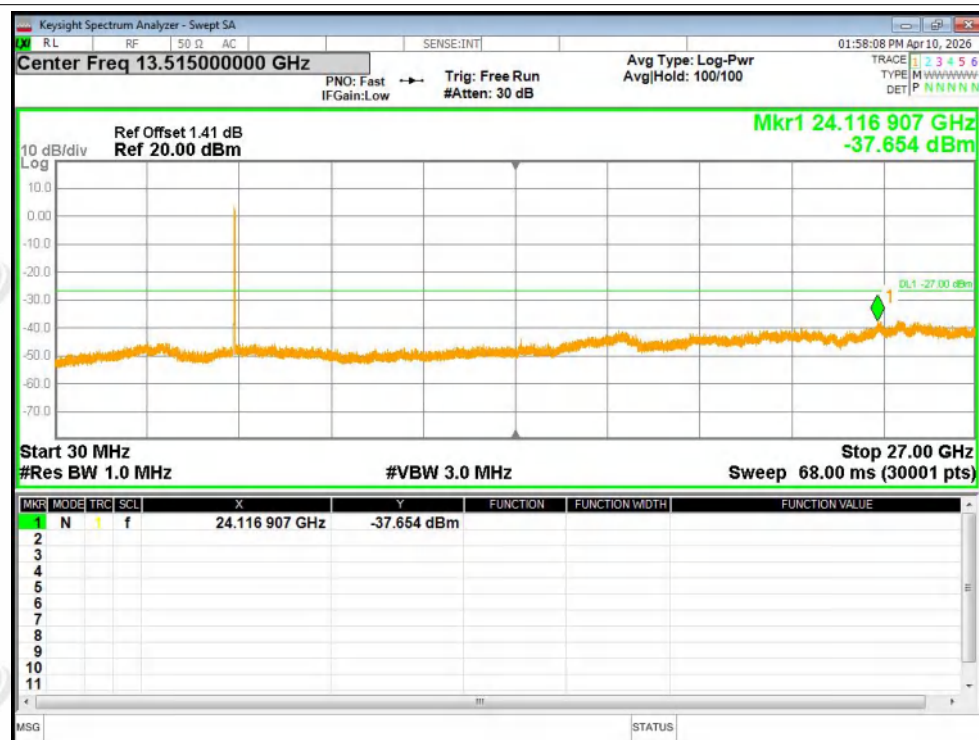


Tx. Spurious NVNT n20 5260MHz Ant1 Emission





Tx. Spurious NVNT n20 5280MHz Ant1 Emission

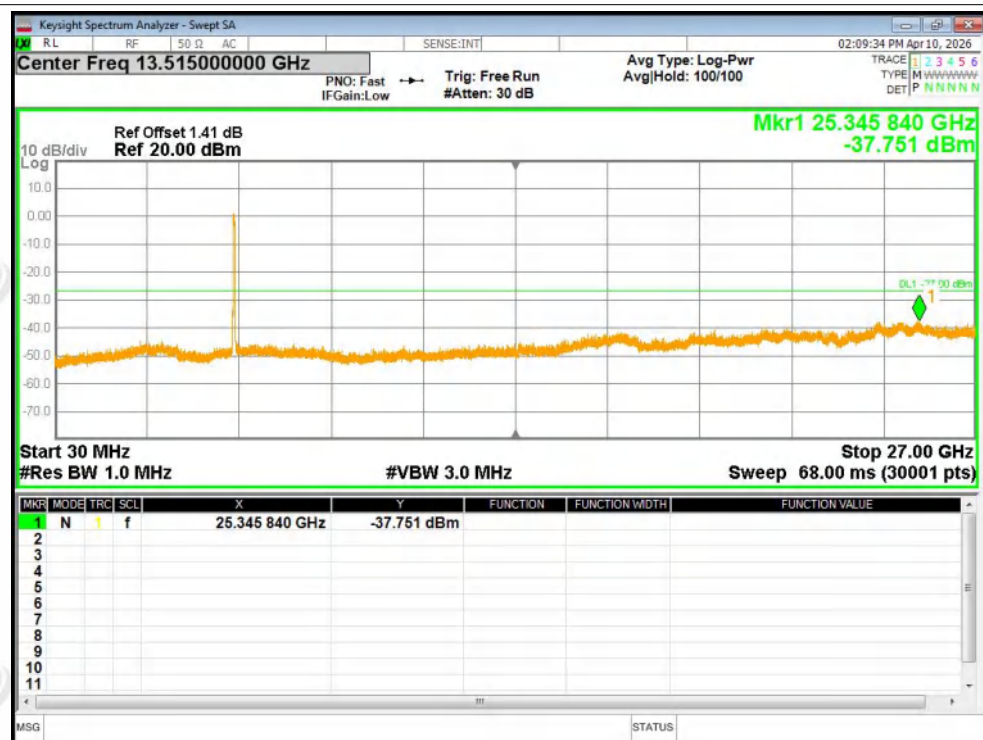


Tx. Spurious NVNT n20 5320MHz Ant1 Emission





Tx. Spurious NVNT n40 5270MHz Ant1 Emission

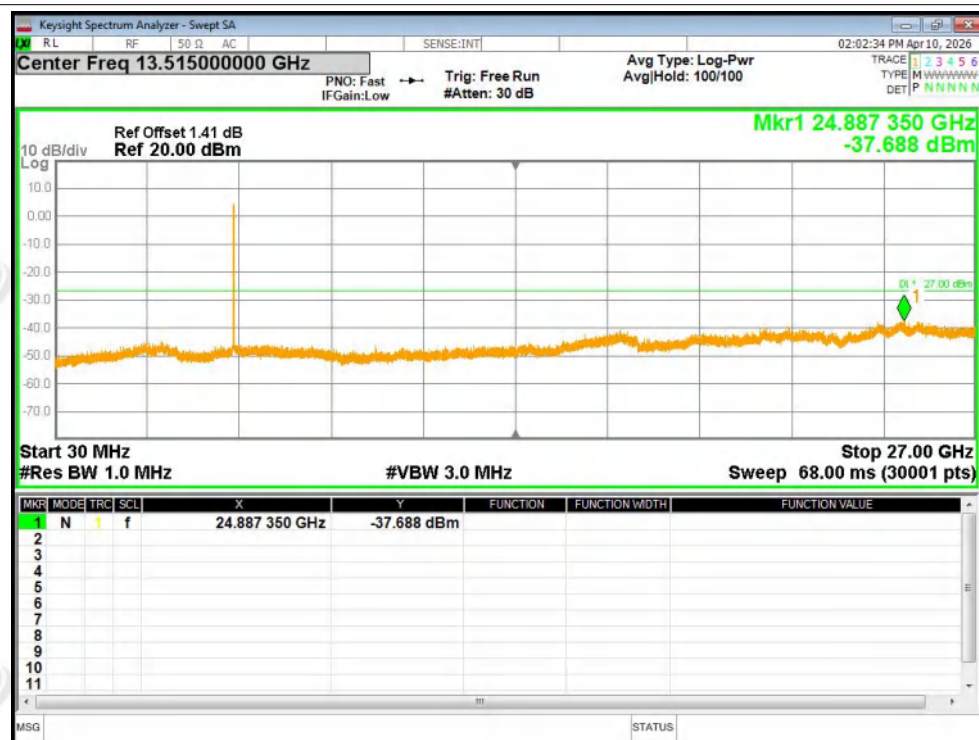


Tx. Spurious NVNT n40 5310MHz Ant1 Emission





Tx. Spurious NVNT ac20 5260MHz Ant1 Emission

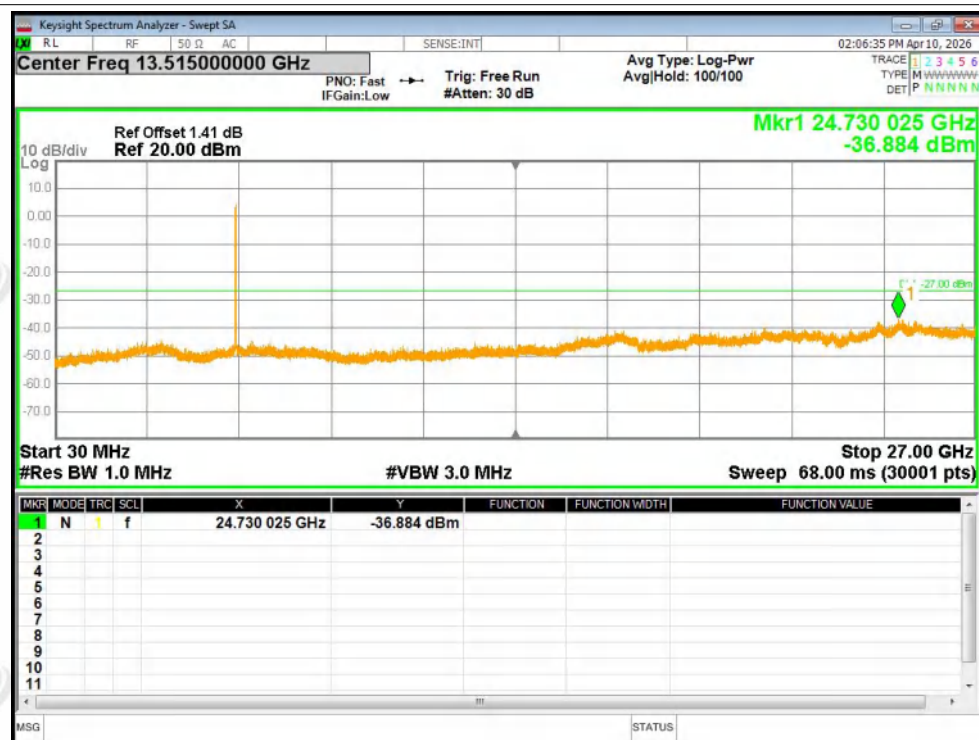


Tx. Spurious NVNT ac20 5280MHz Ant1 Emission





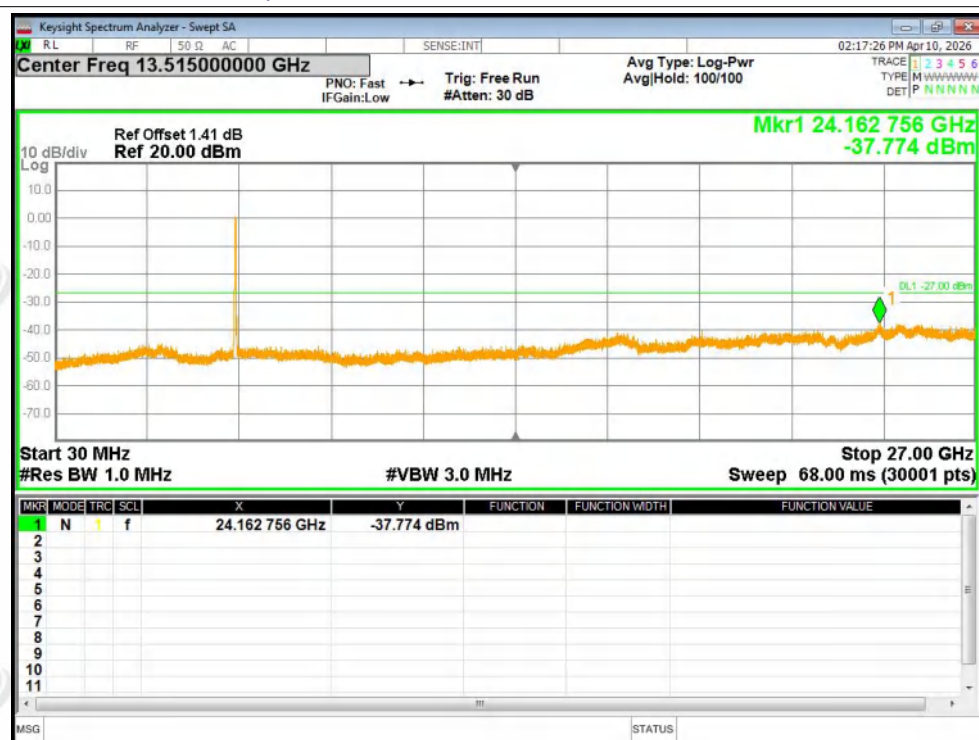
Tx. Spurious NVNT ac20 5320MHz Ant1 Emission



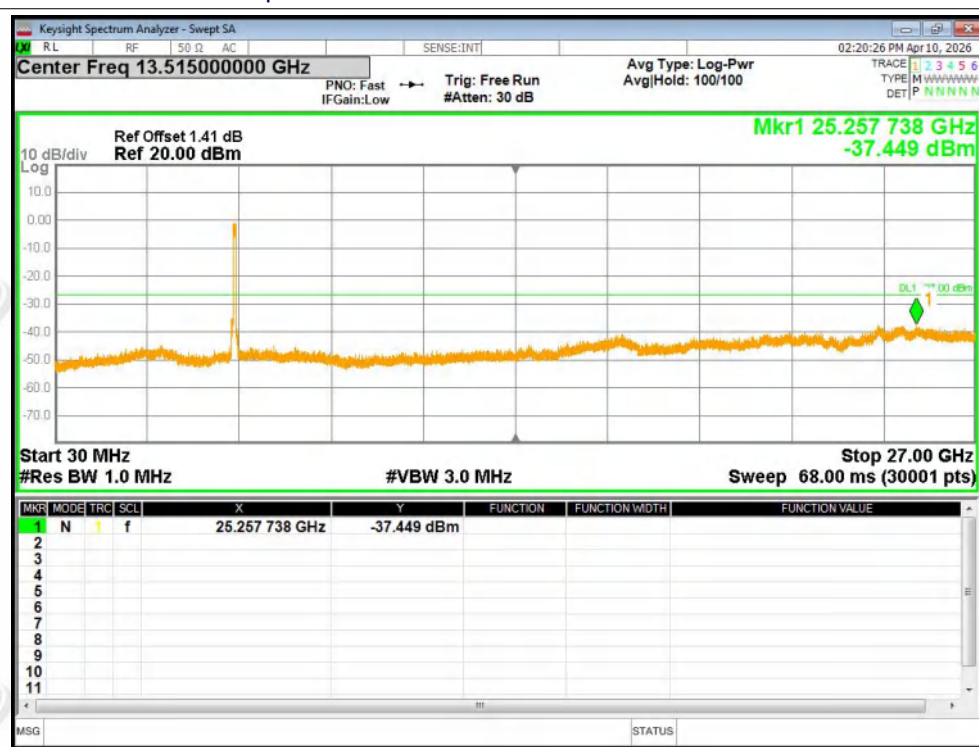
Tx. Spurious NVNT ac40 5270MHz Ant1 Emission



Tx. Spurious NVNT ac40 5310MHz Ant1 Emission



Tx. Spurious NVNT ac80 5290MHz Ant1 Emission



Remark1: From 26.5GHz to 40GHz,the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.