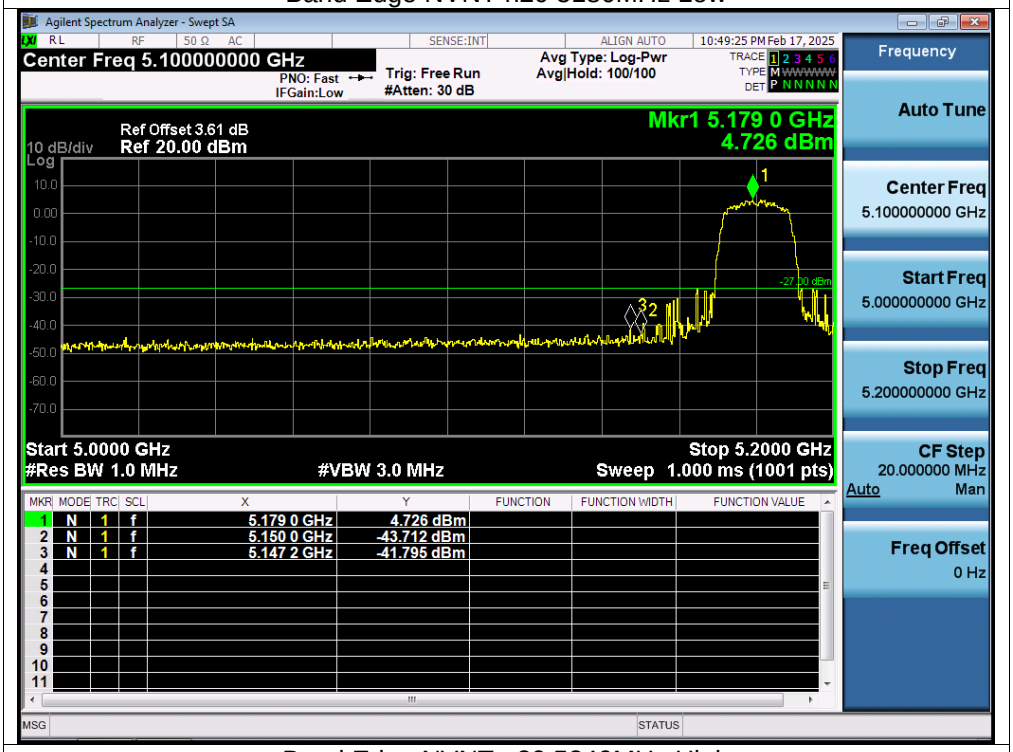
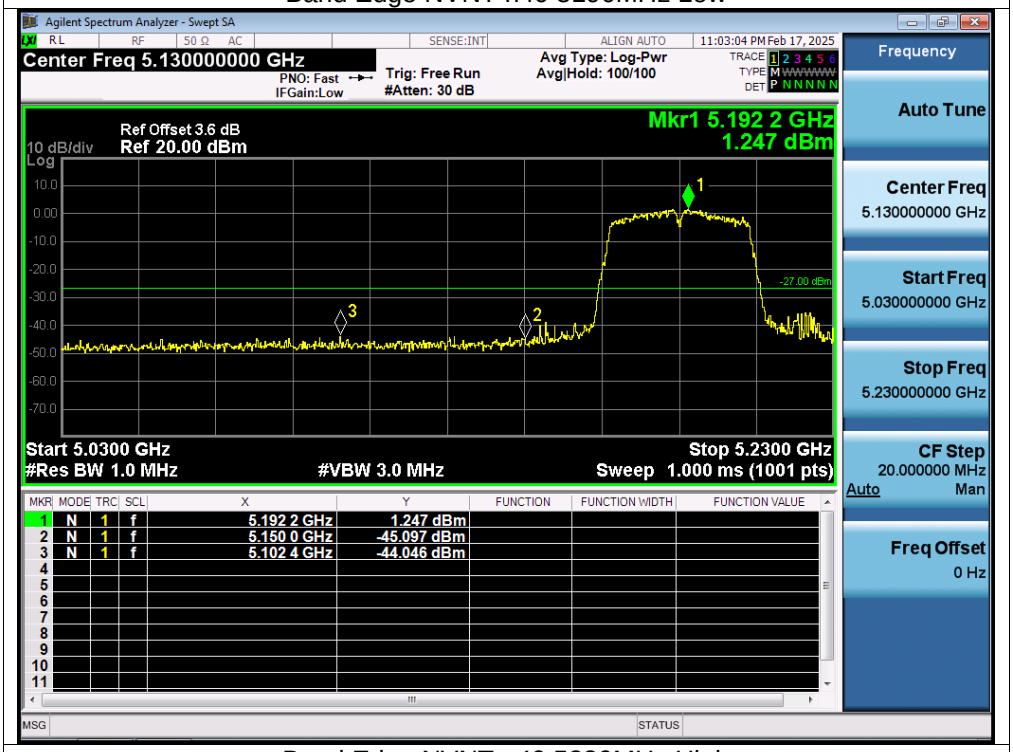
Band Edge NVNT n20 5180MHz Low

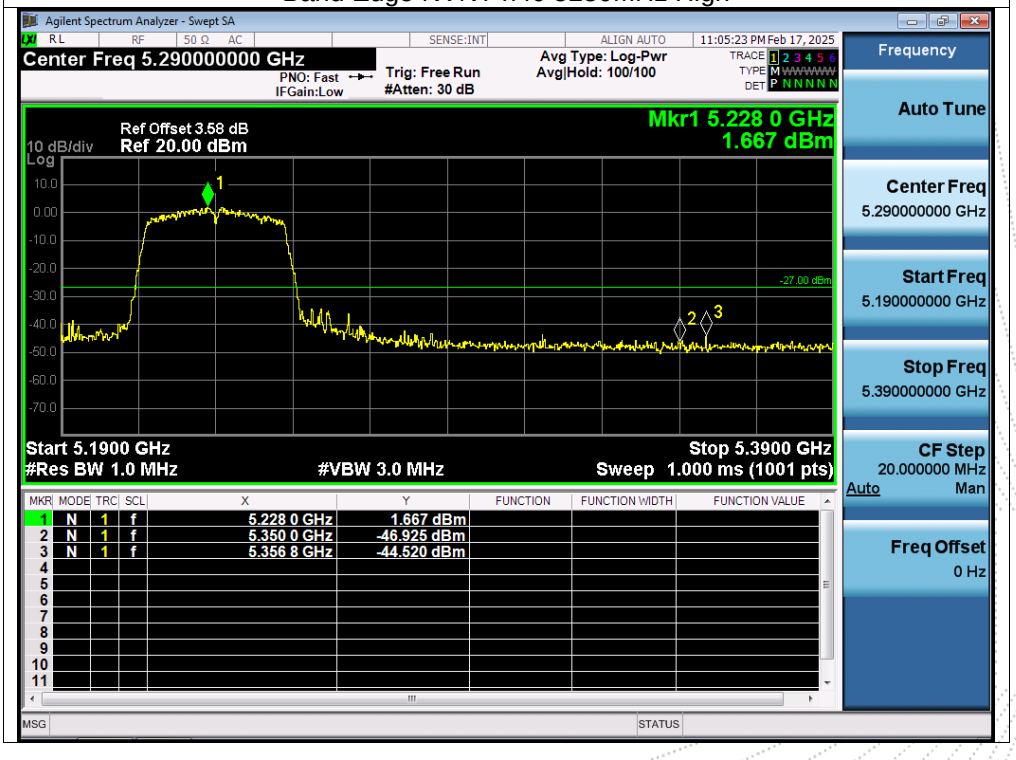


Band Edge NVNT n20 5240MHz High

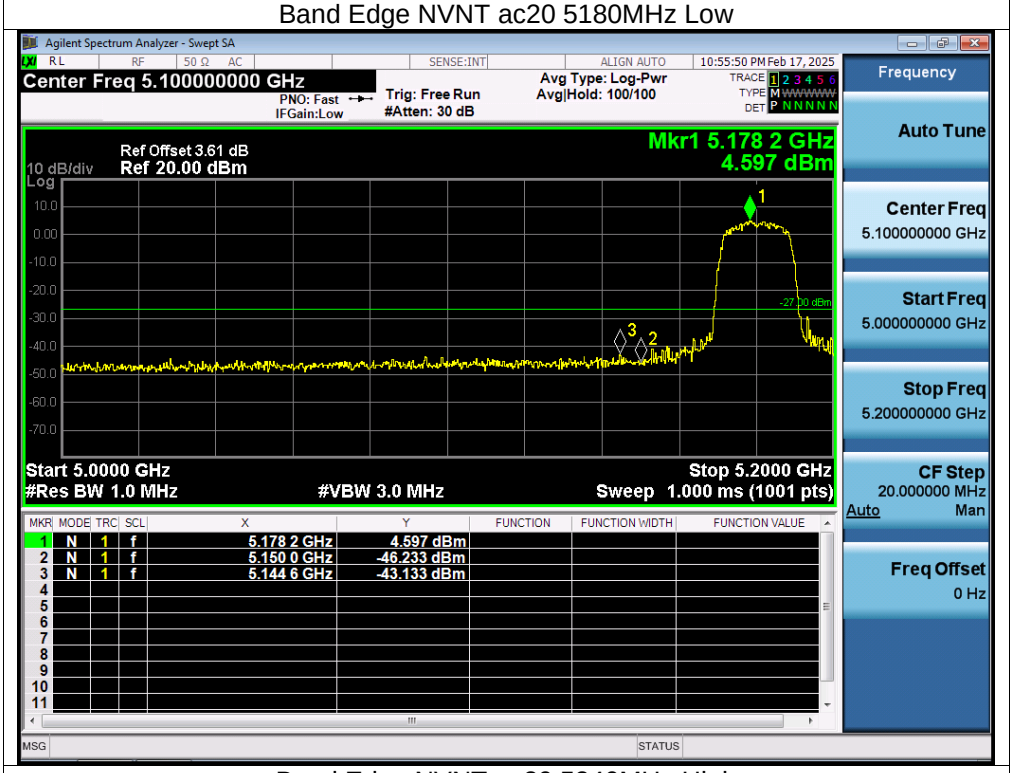
Band Edge NVNT n40 5190MHz Low



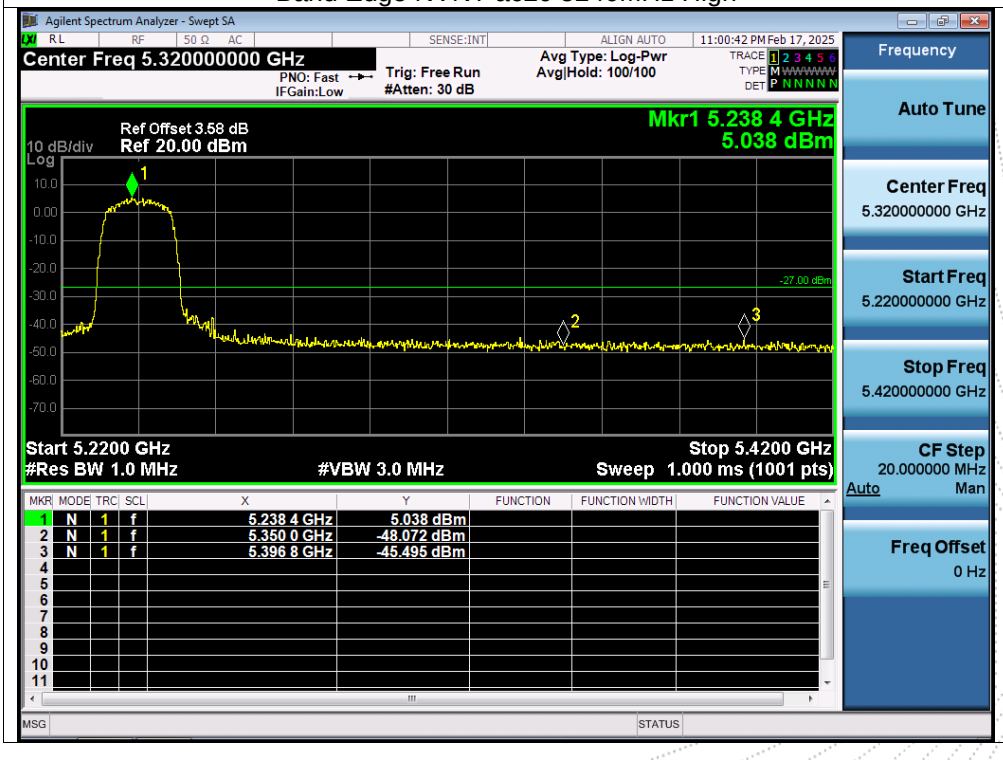
Band Edge NVNT n40 5230MHz High



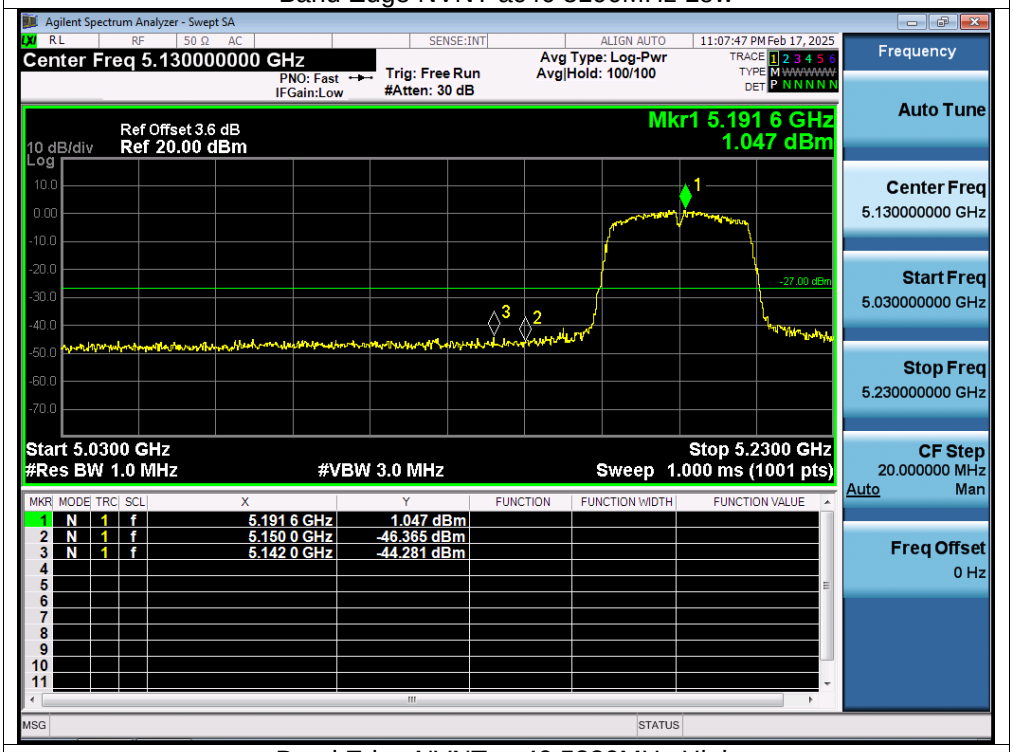
Band Edge NVNT ac20 5180MHz Low



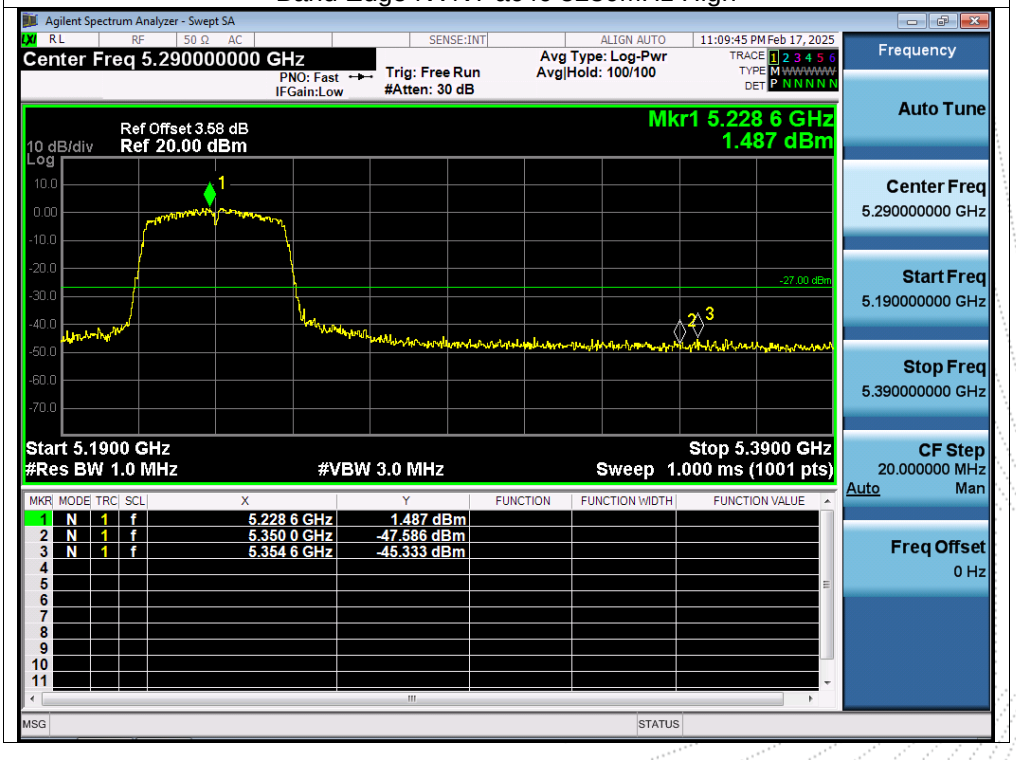
Band Edge NVNT ac20 5240MHz High



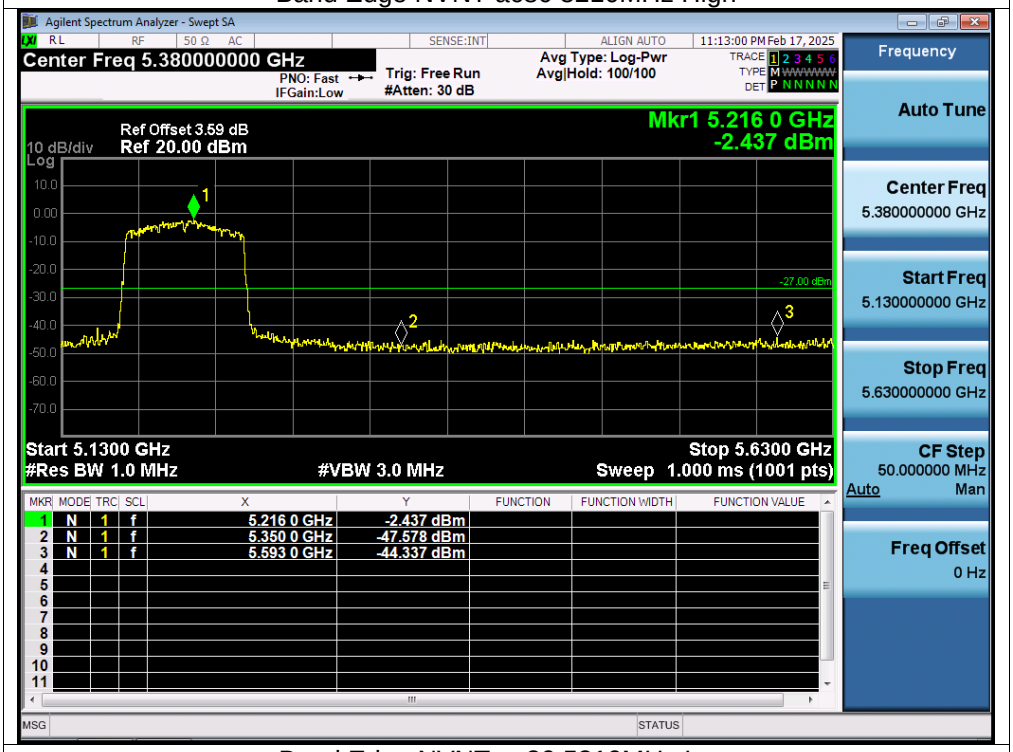
Band Edge NVNT ac40 5190MHz Low



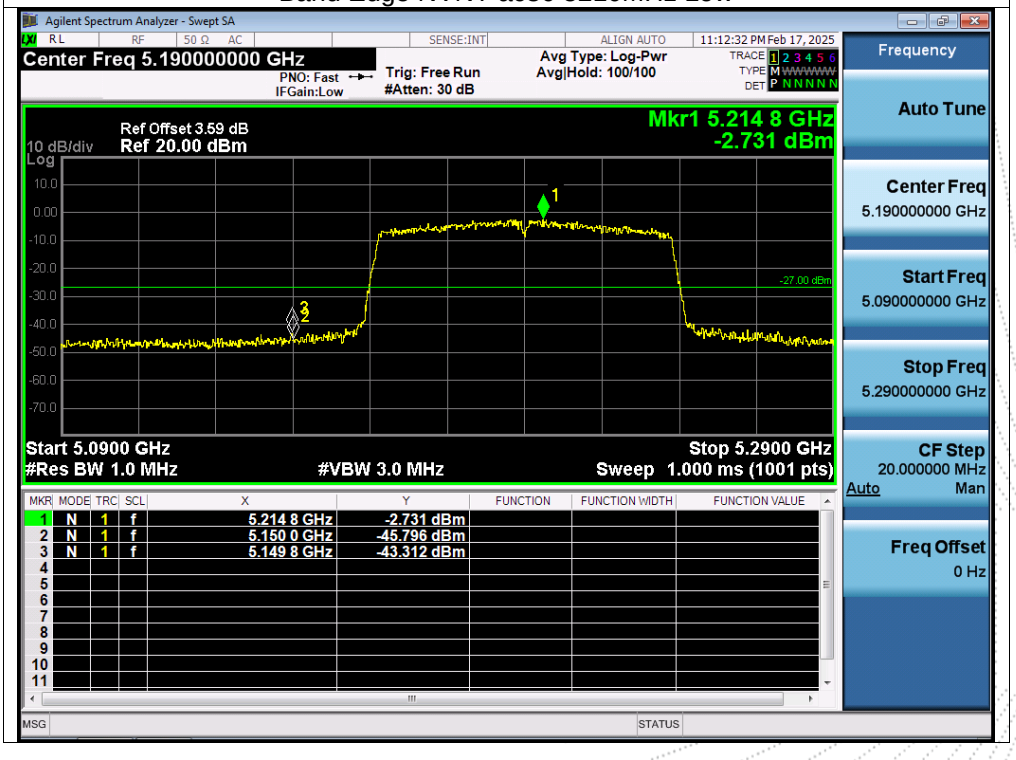
Band Edge NVNT ac40 5230MHz High



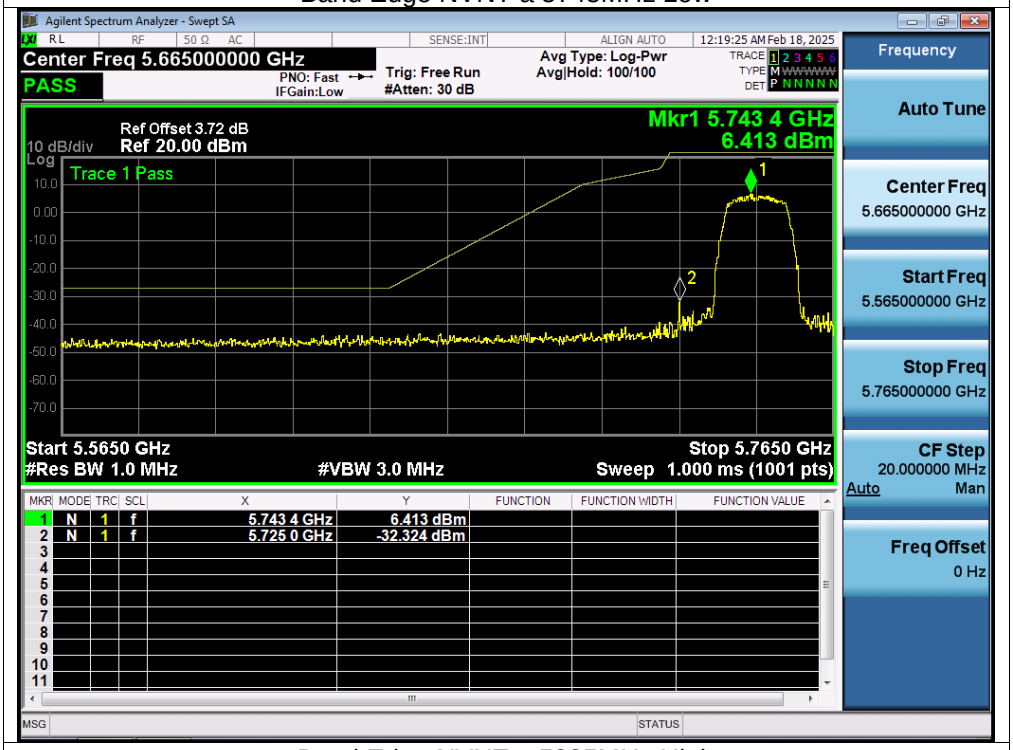
Band Edge NVNT ac80 5210MHz High



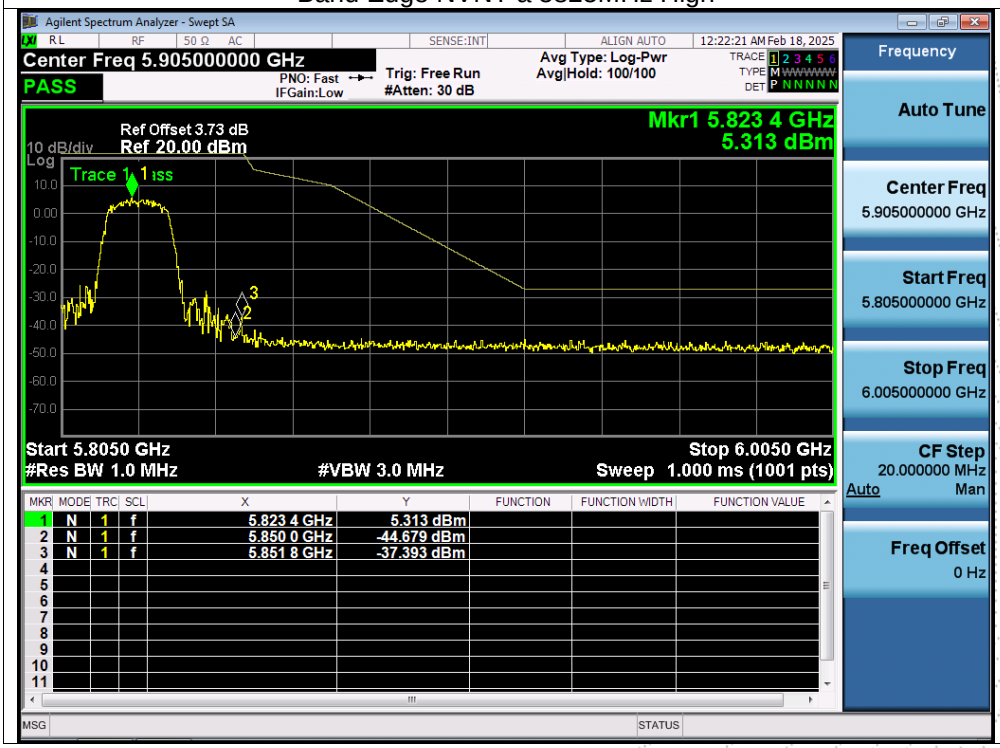
Band Edge NVNT ac80 5210MHz Low



Test Graphs
Band Edge NVNT a 5745MHz Low

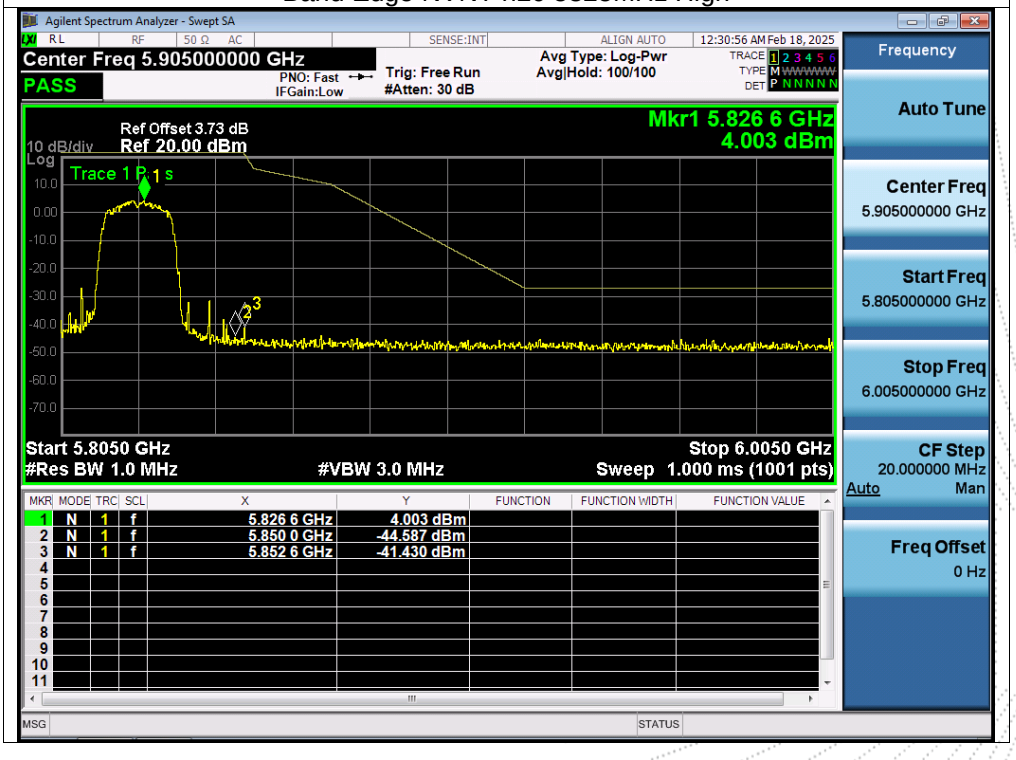


Band Edge NVNT a 5825MHz High

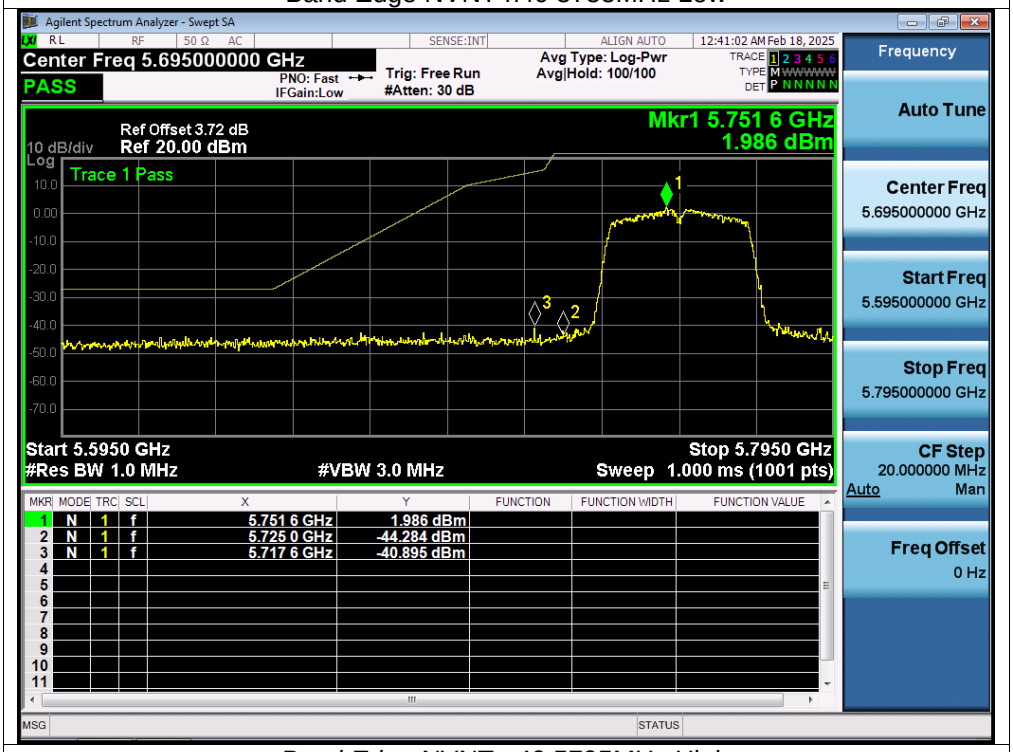


Band Edge NVNT n20 5745MHz Low

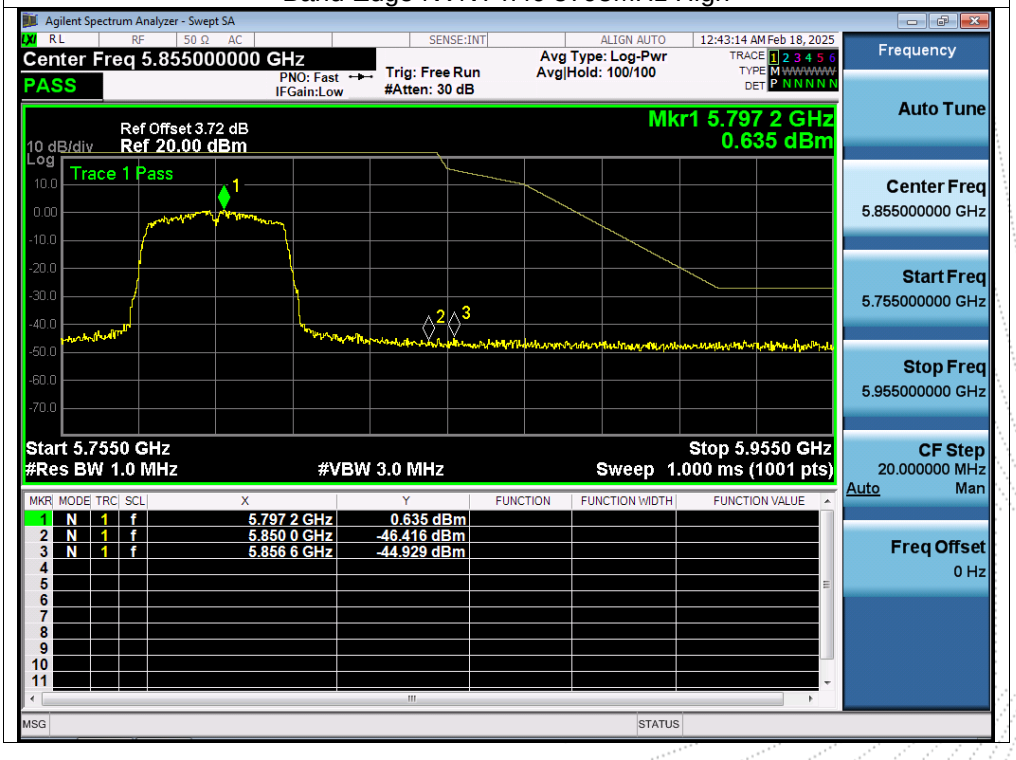
Band Edge NVNT n20 5825MHz High



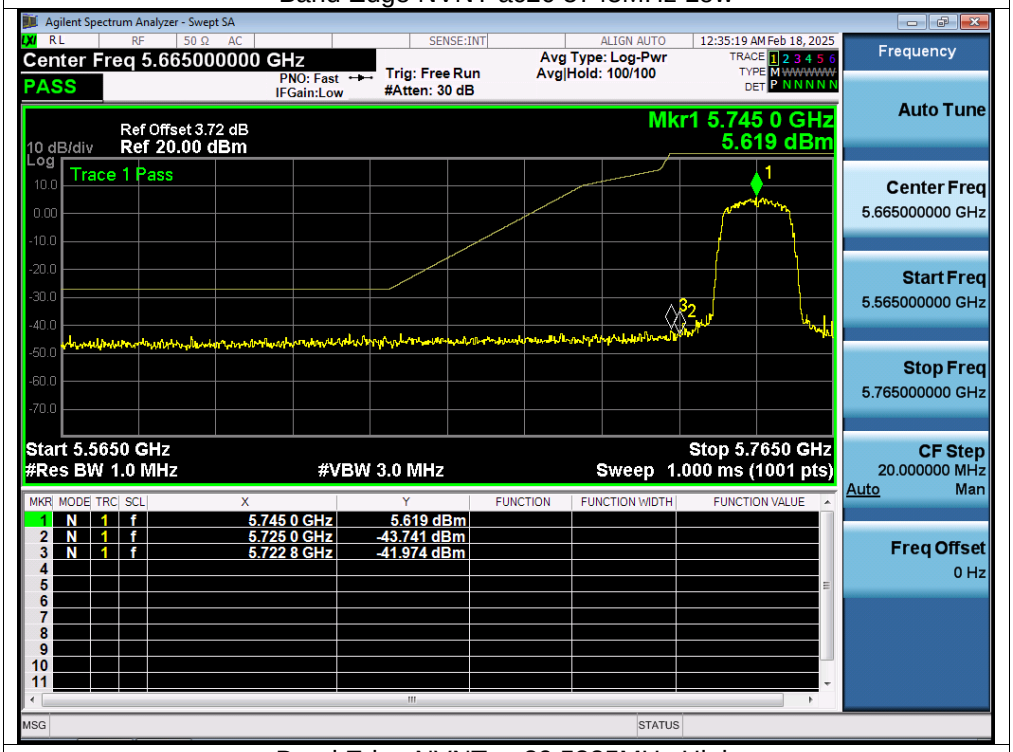
Band Edge NVNT n40 5755MHz Low



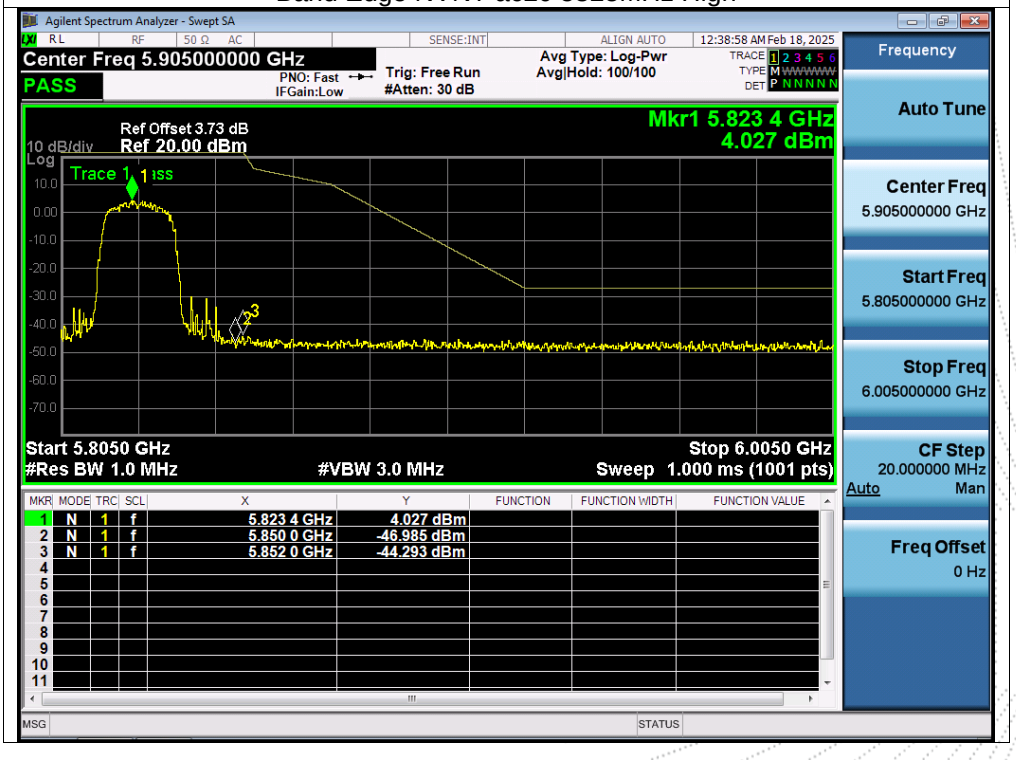
Band Edge NVNT n40 5795MHz High



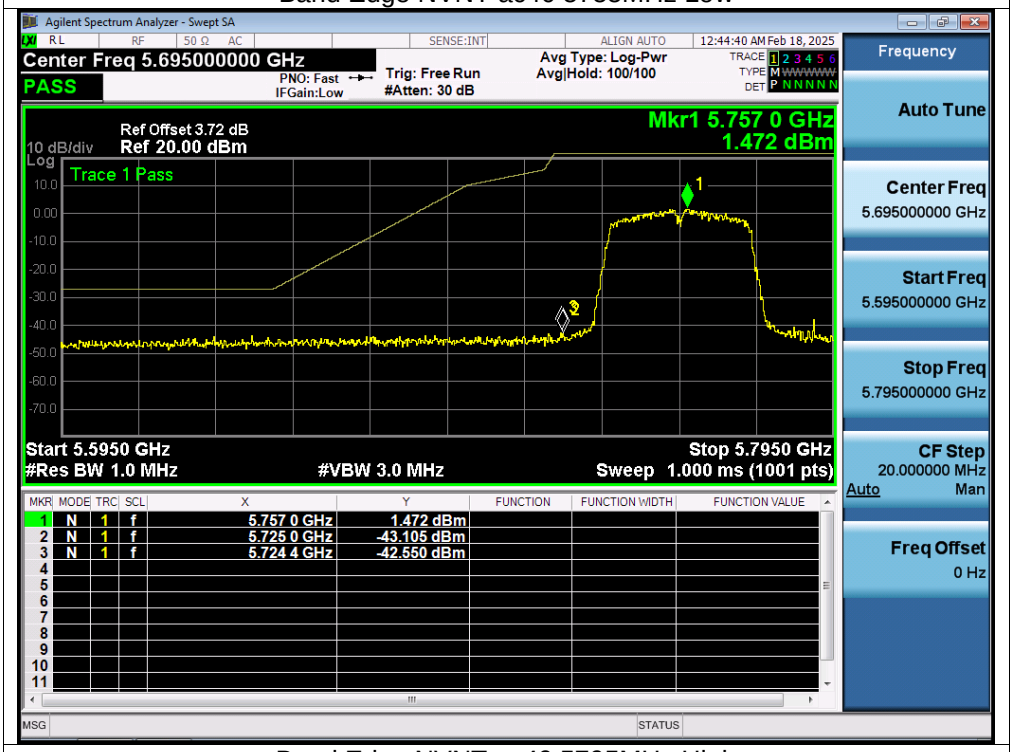
Band Edge NVNT ac20 5745MHz Low



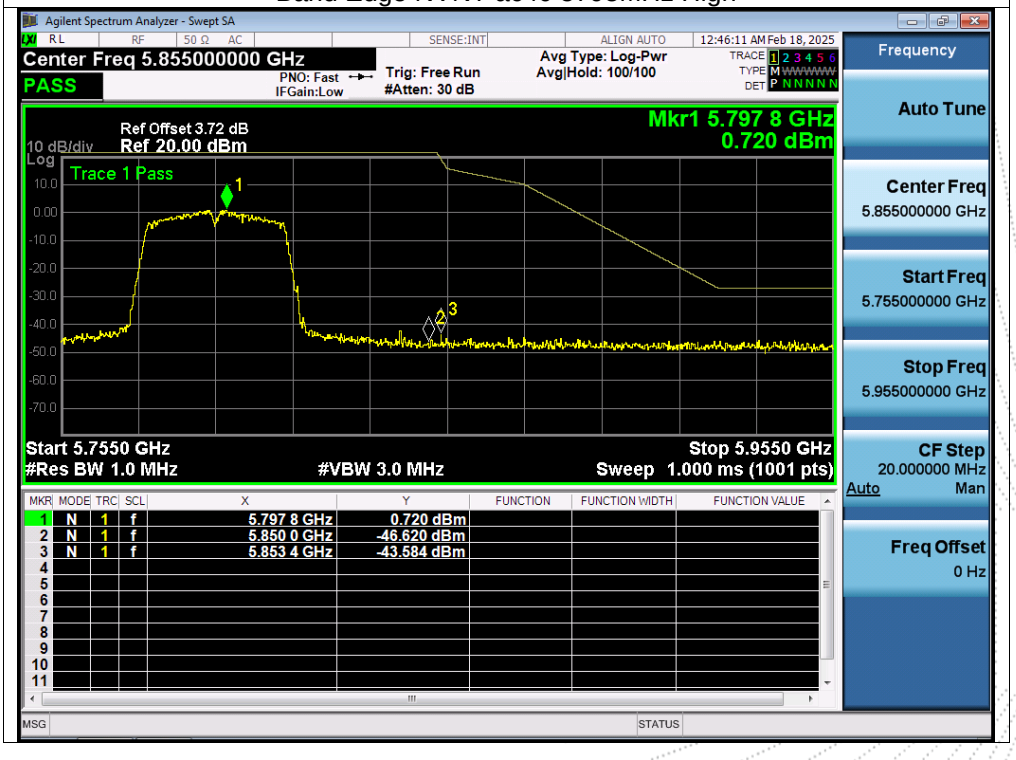
Band Edge NVNT ac20 5825MHz High



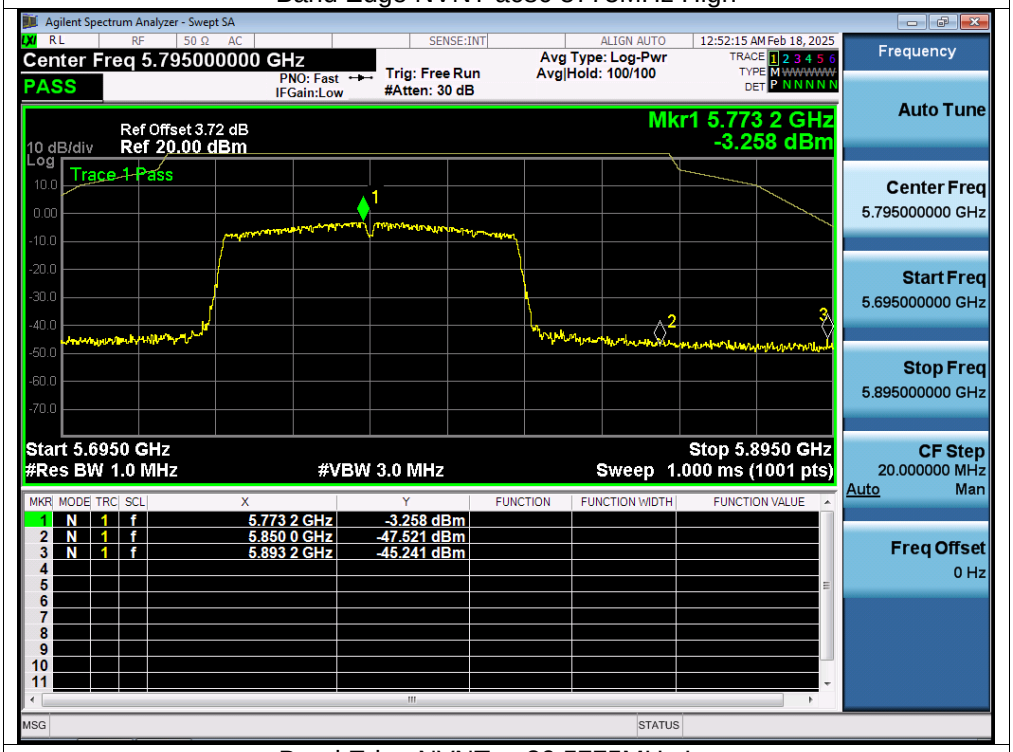
Band Edge NVNT ac40 5755MHz Low



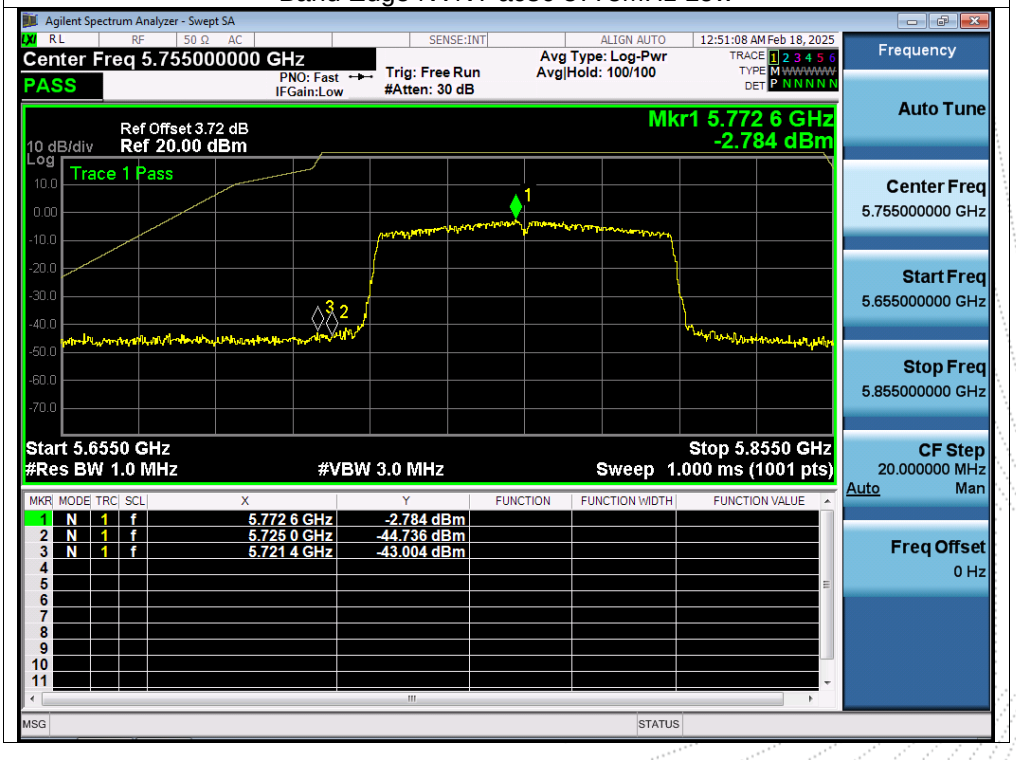
Band Edge NVNT ac40 5795MHz High



Band Edge NVNT ac80 5775MHz High

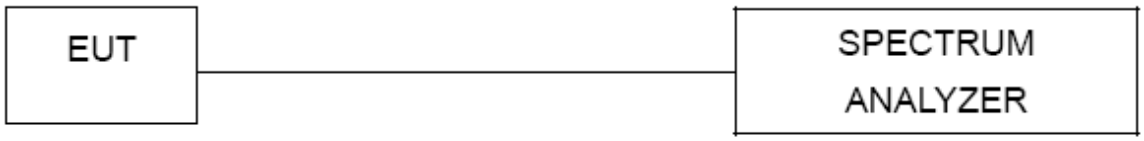


Band Edge NVNT ac80 5775MHz Low



12. Spurious RF Conducted Emissions

12.1 Block Diagram Of Test Setup



12.2 Limit

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1)For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
(2)For transmitters operating in the 5.725-5.85 GHz band(i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge..

12.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

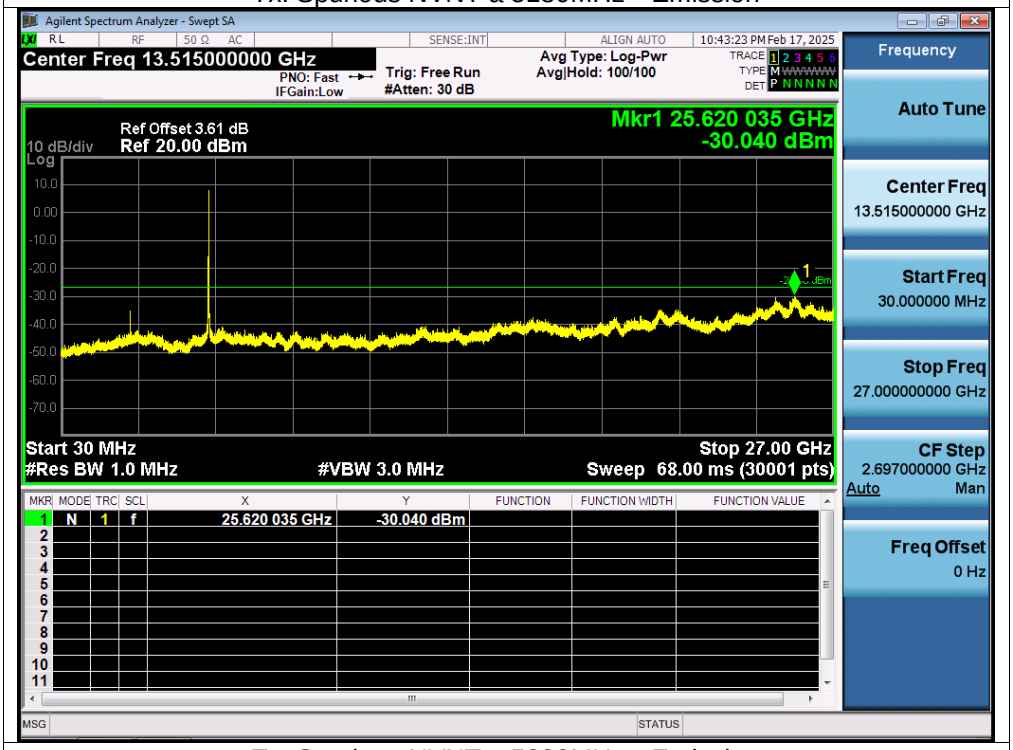
12.4 Test Result

Remark: The measurement frequency range is from 9KHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandege measurement data.

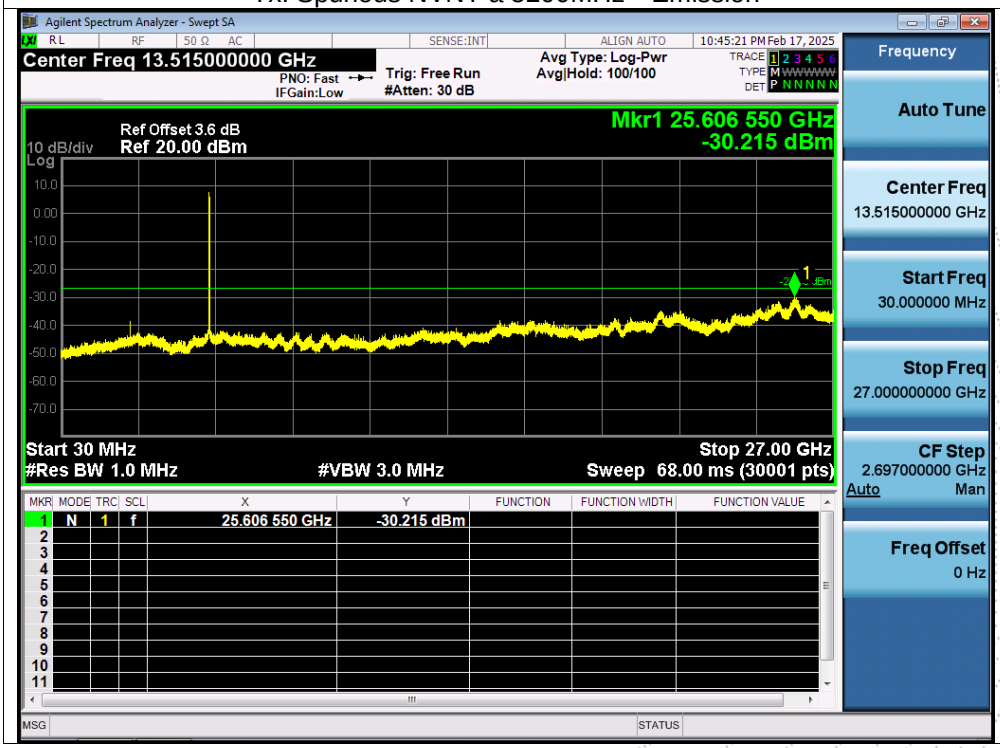
About:26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Test Graphs

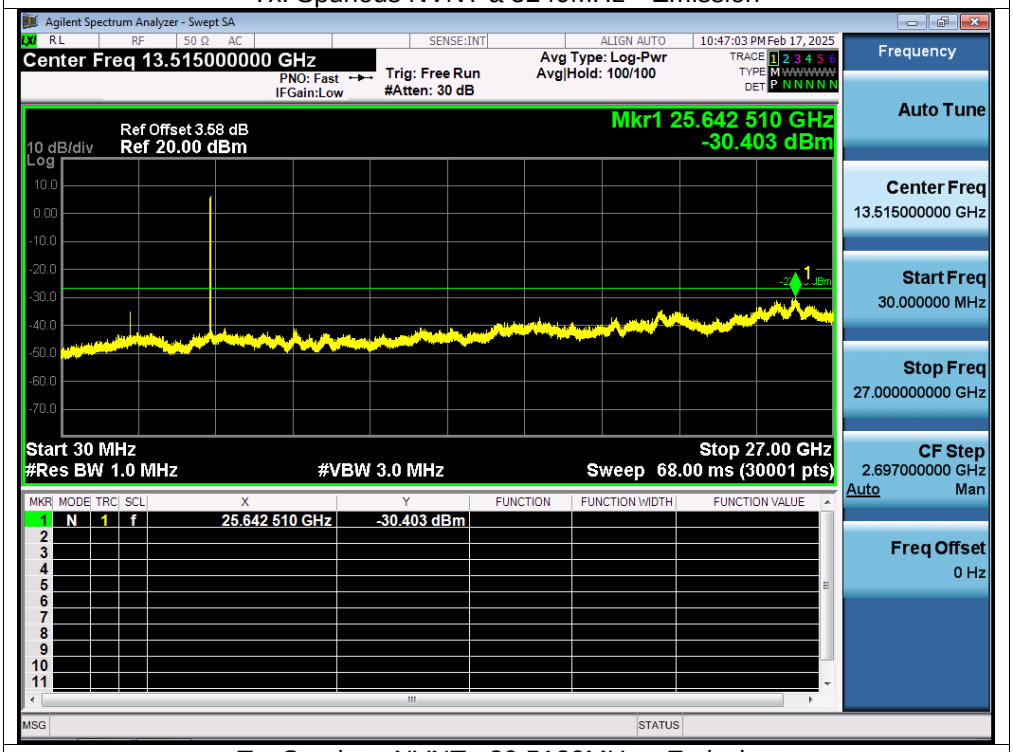
Tx. Spurious NVNT a 5180MHz Emission



Tx. Spurious NVNT a 5200MHz Emission

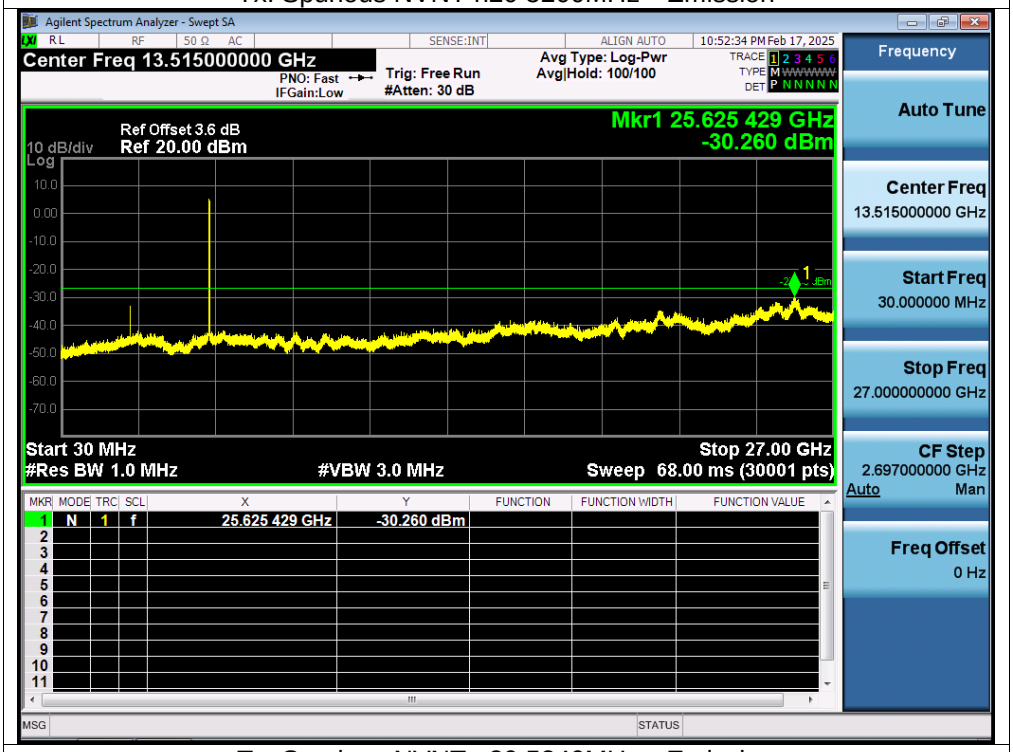


Tx. Spurious NVNT a 5240MHz Emission

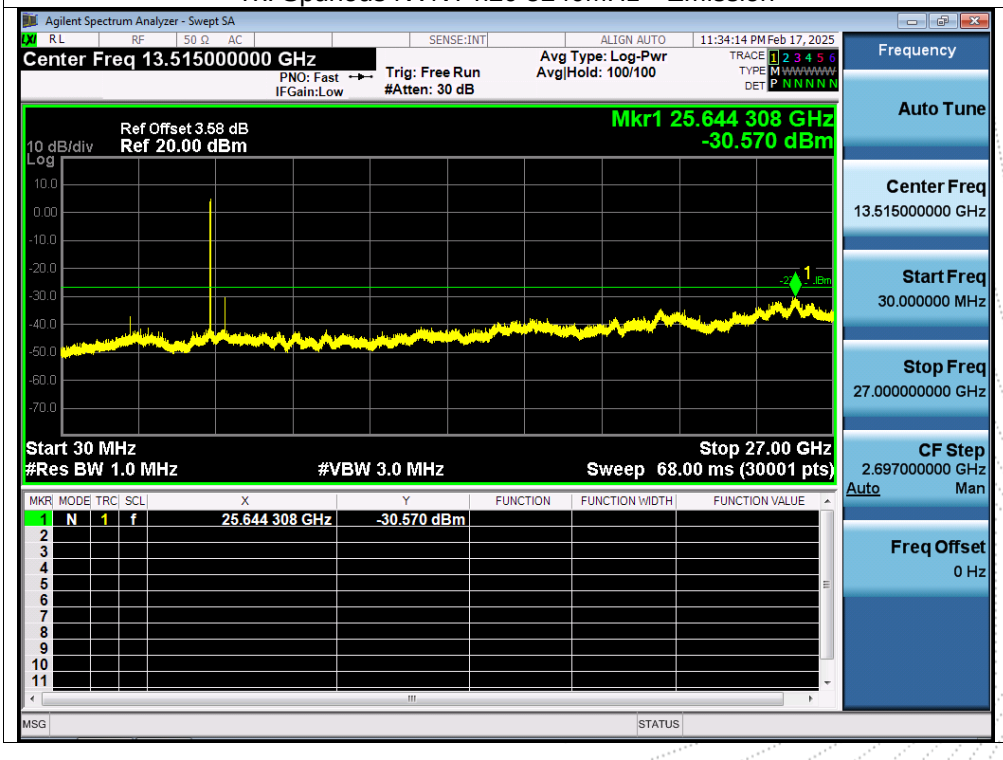


Tx. Spurious NVNT n20 5180MHz Emission

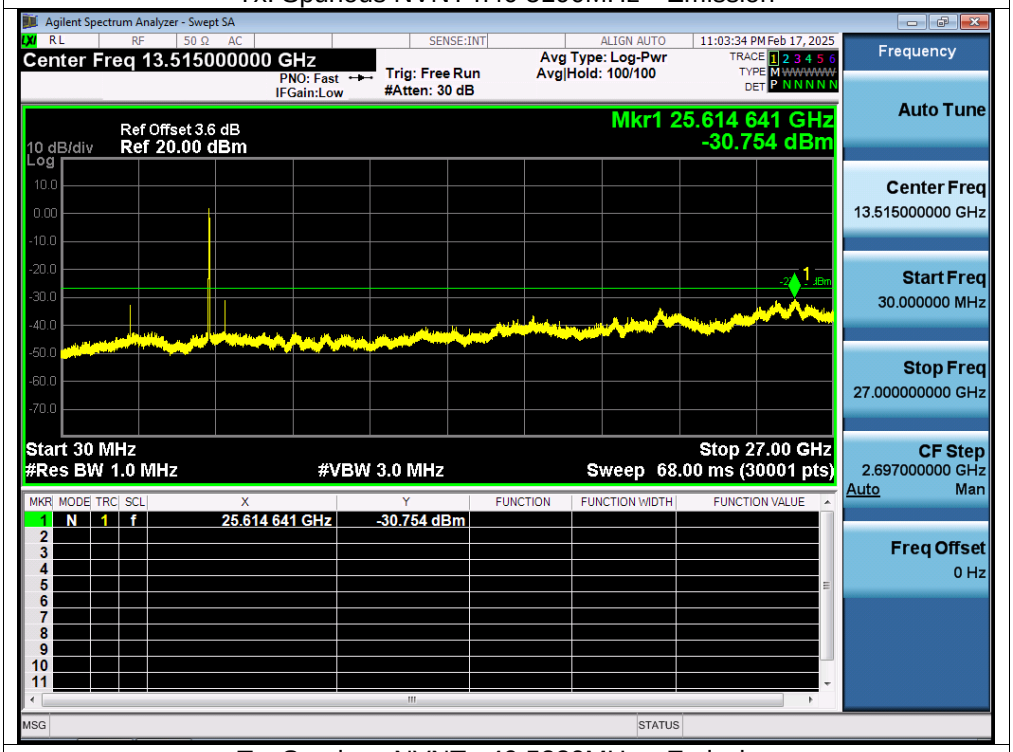
Tx. Spurious NVNT n20 5200MHz Emission



Tx. Spurious NVNT n20 5240MHz Emission

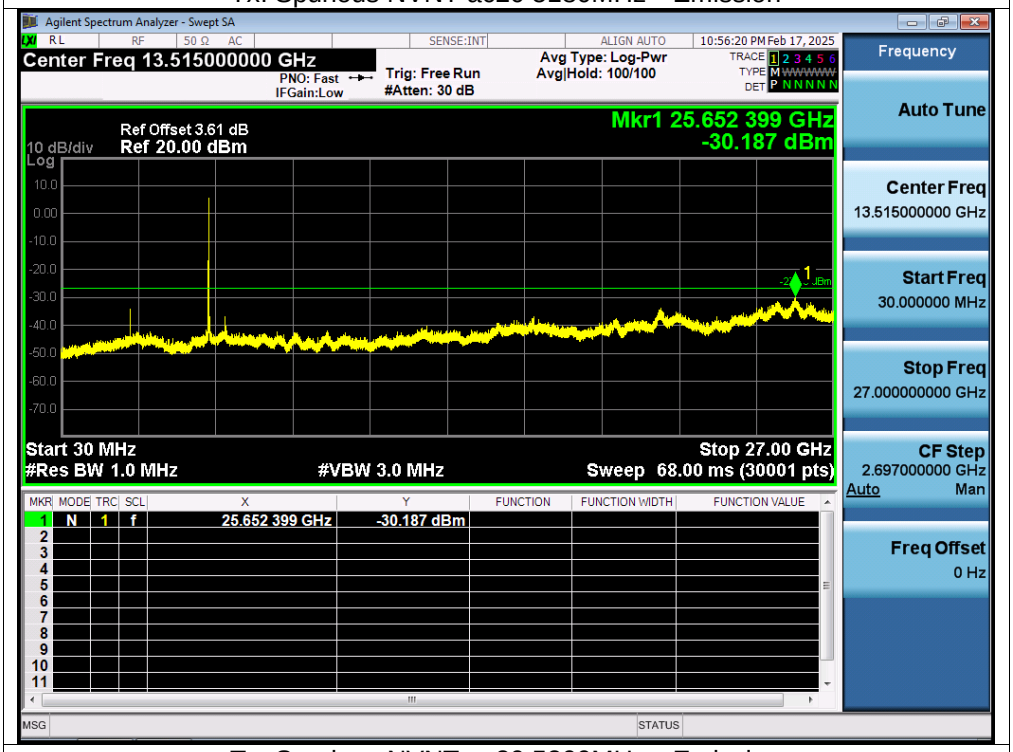


Tx. Spurious NVNT n40 5190MHz Emission



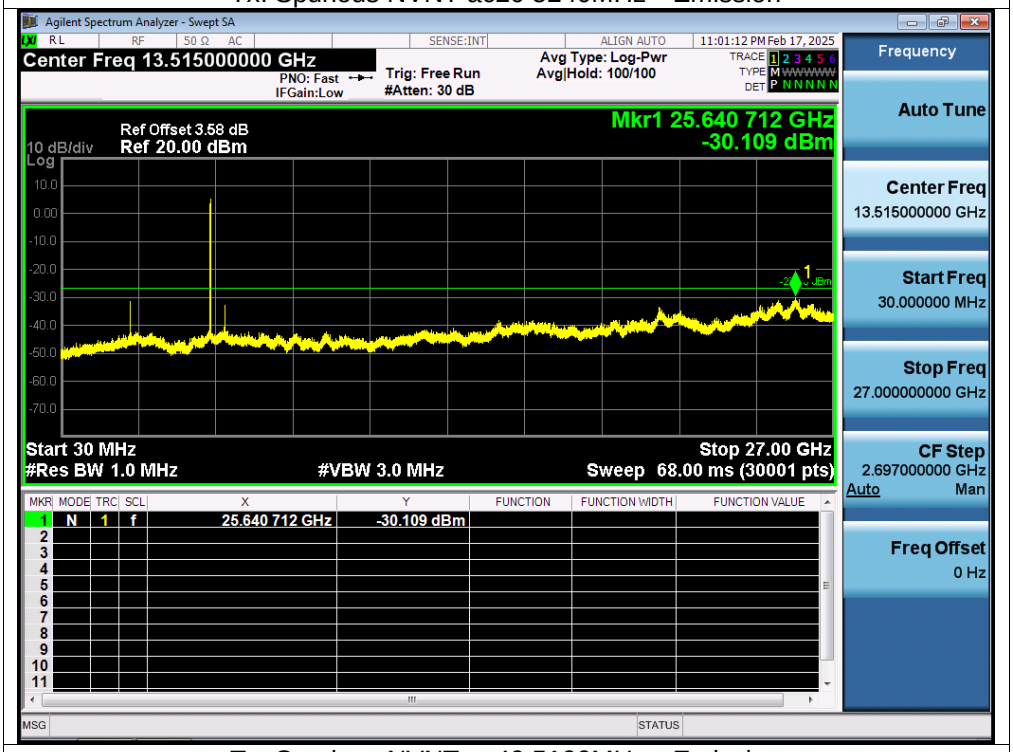
Tx. Spurious NVNT n40 5230MHz Emission

Tx. Spurious NVNT ac20 5180MHz Emission

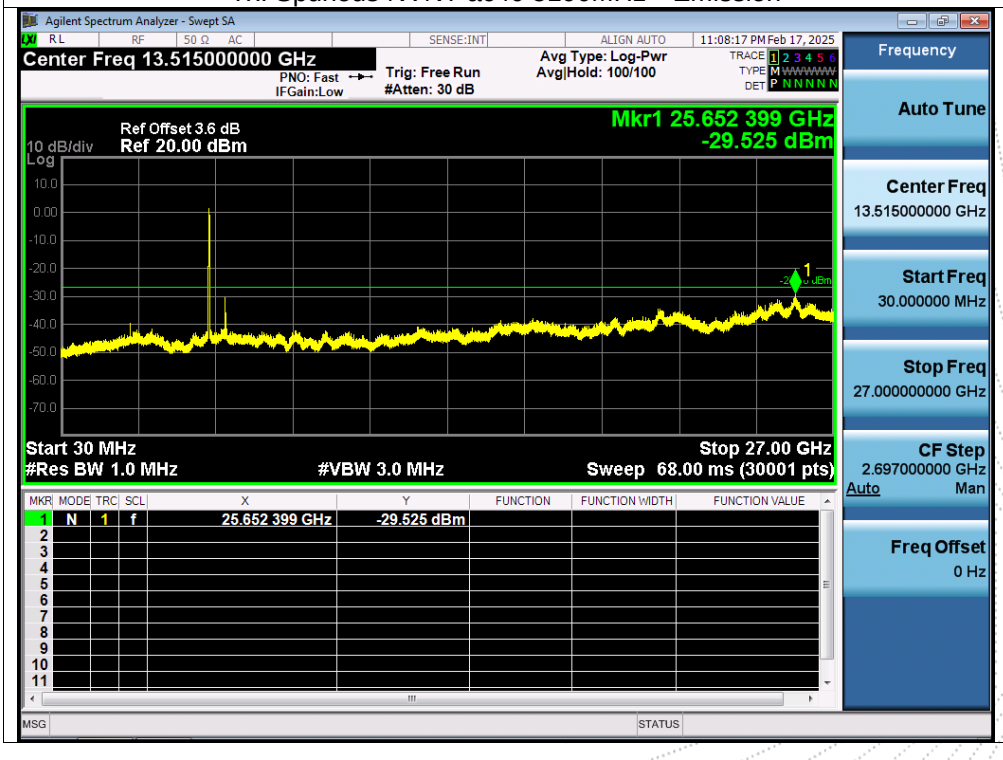


Tx. Spurious NVNT ac20 5200MHz Emission

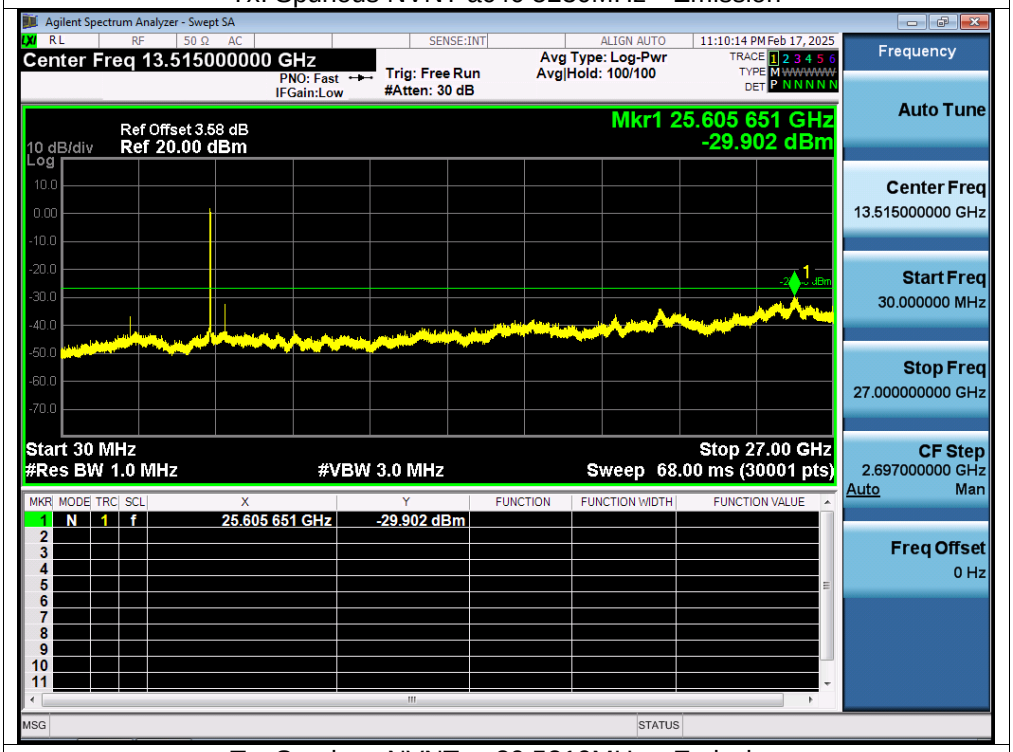
Tx. Spurious NVNT ac20 5240MHz Emission



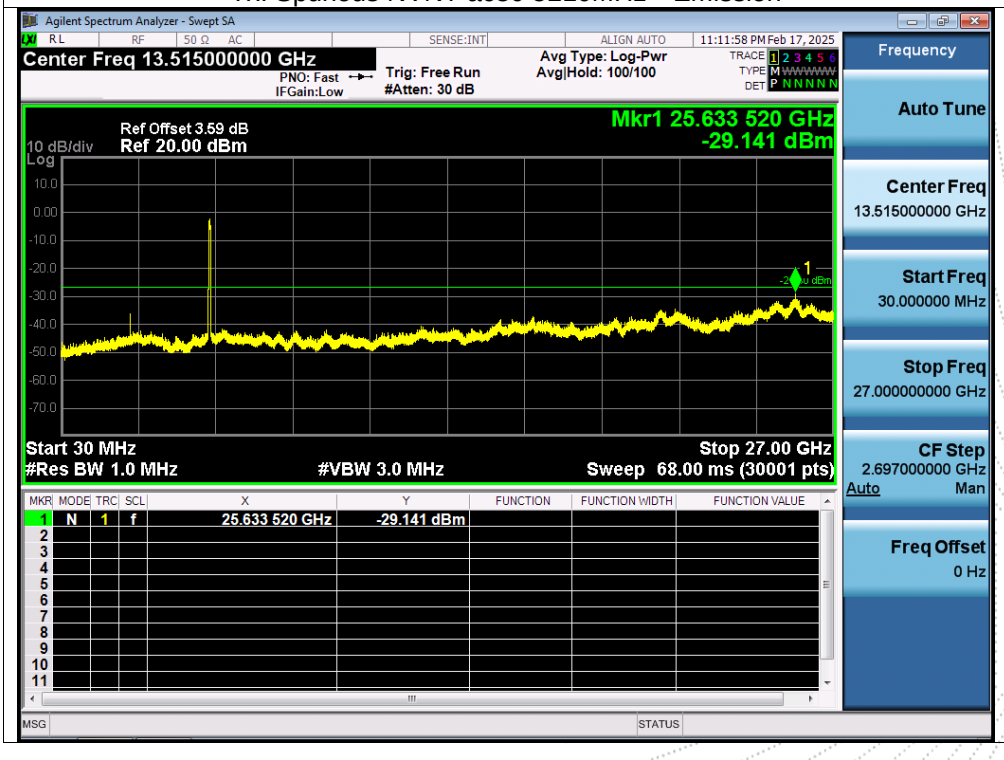
Tx. Spurious NVNT ac40 5190MHz Emission



Tx. Spurious NVNT ac40 5230MHz Emission



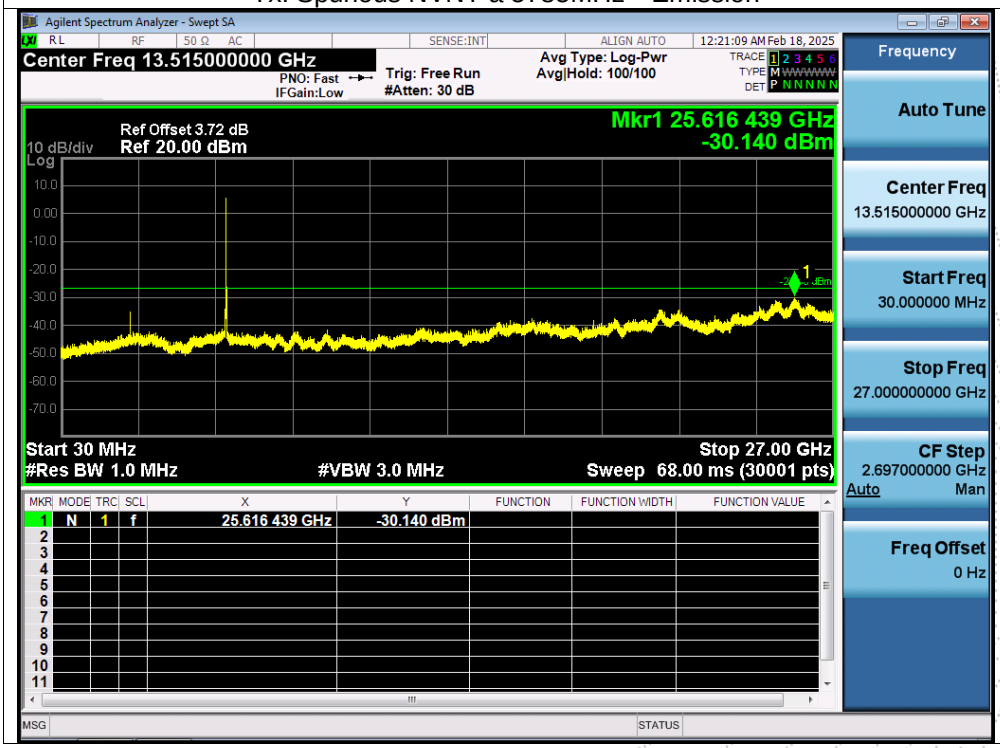
Tx. Spurious NVNT ac80 5210MHz Emission



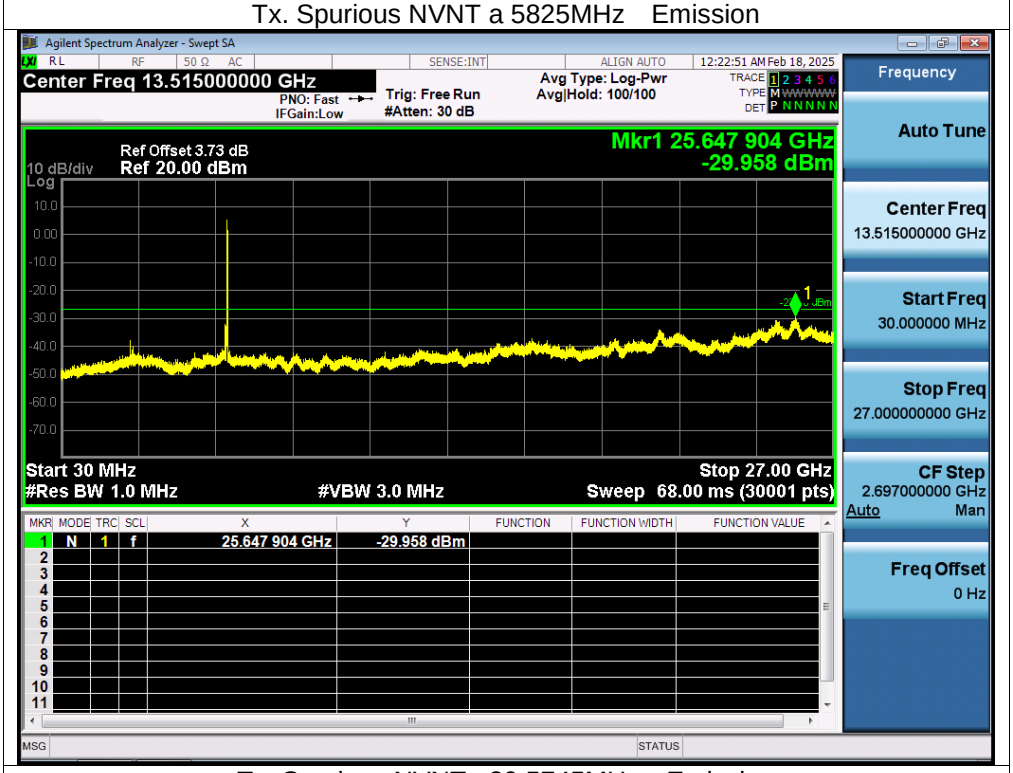
Test Graphs

Tx. Spurious NVNT a 5745MHz Emission

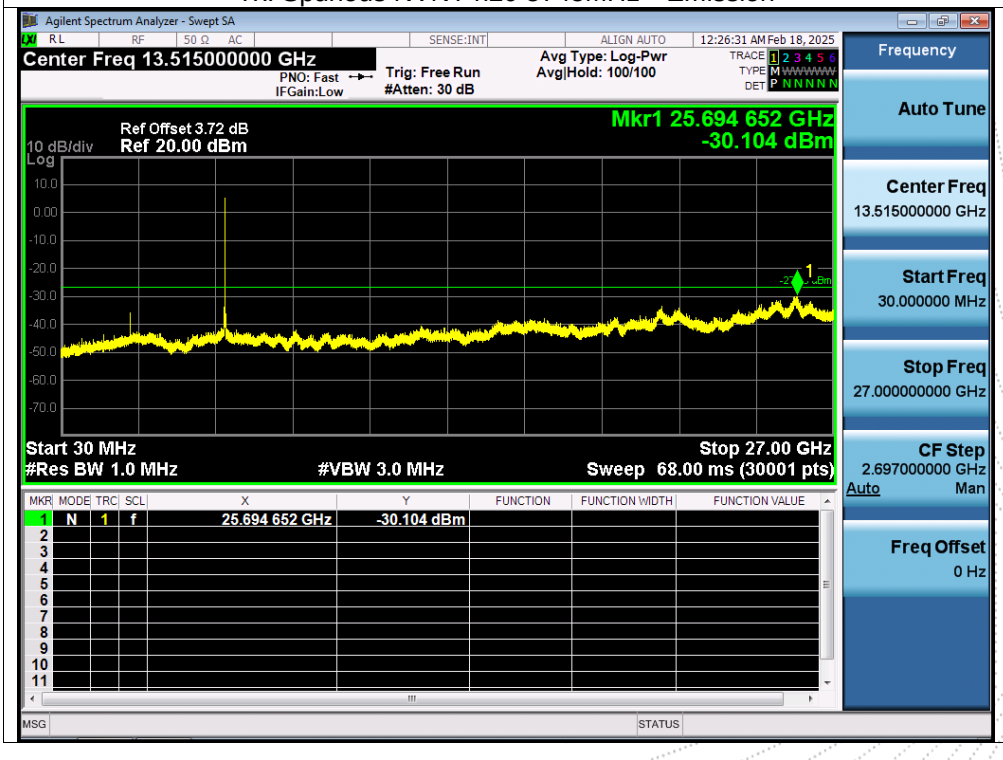
Tx. Spurious NVNT a 5785MHz Emission



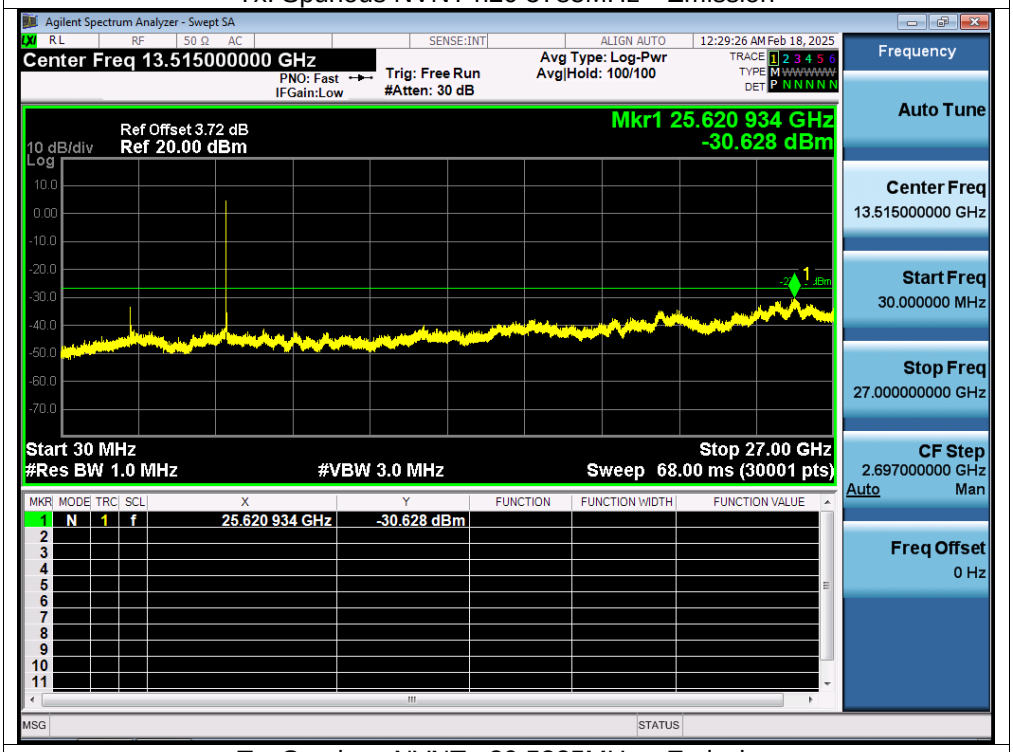
Tx. Spurious NVNT a 5825MHz Emission



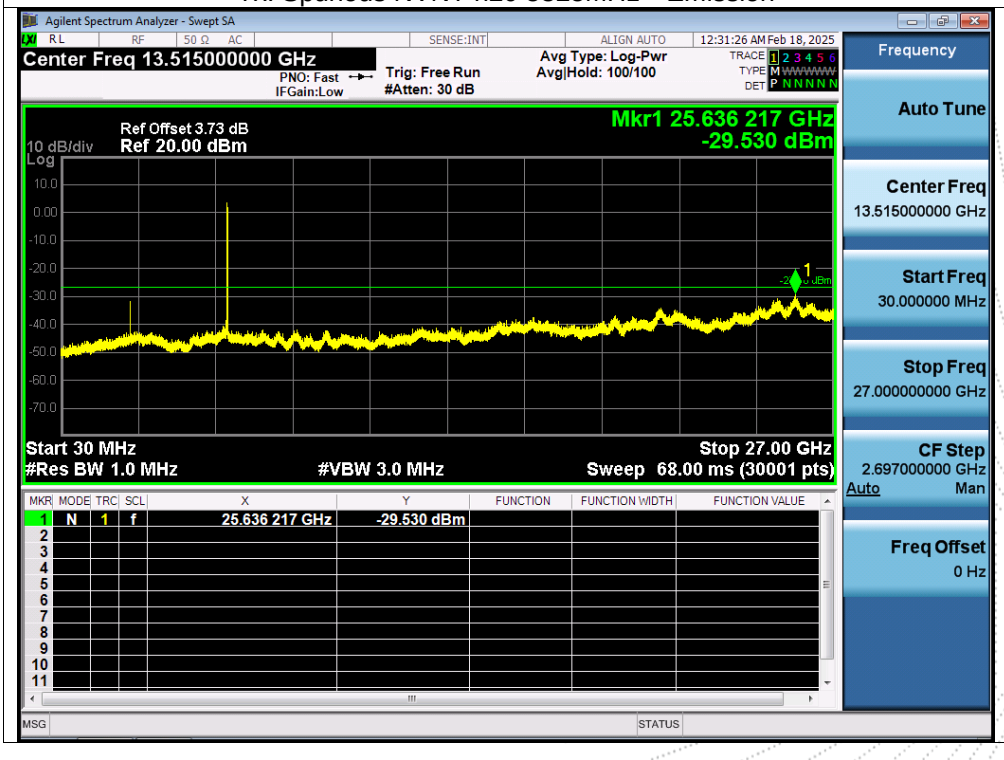
Tx. Spurious NVNT n20 5745MHz Emission



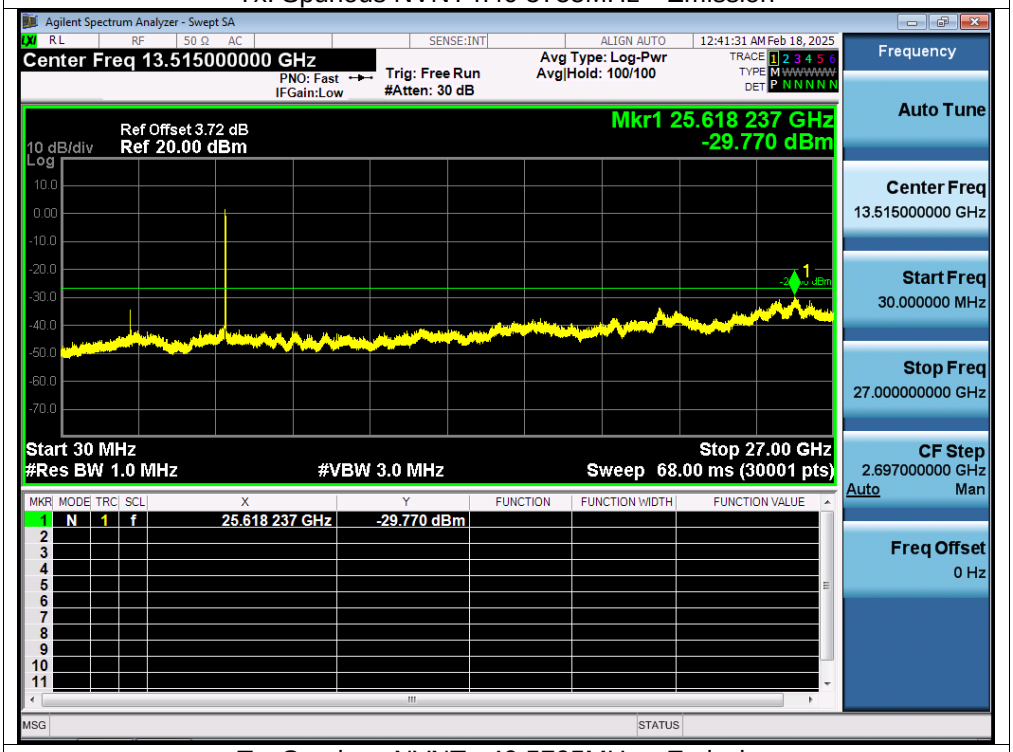
Tx. Spurious NVNT n20 5785MHz Emission



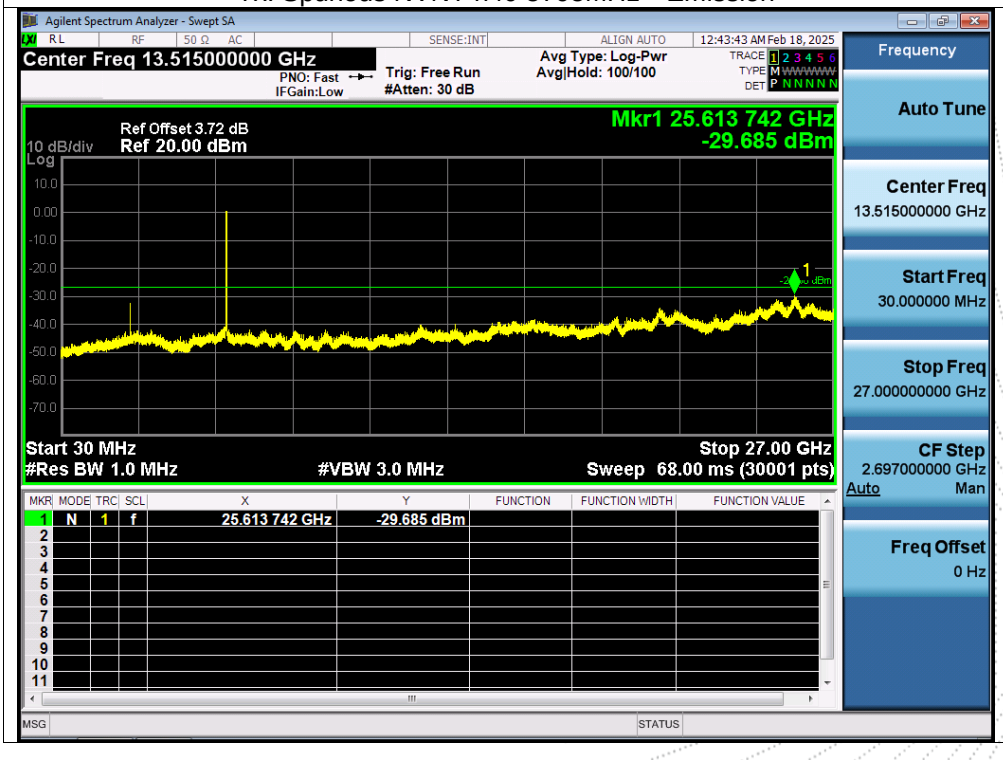
Tx. Spurious NVNT n20 5825MHz Emission



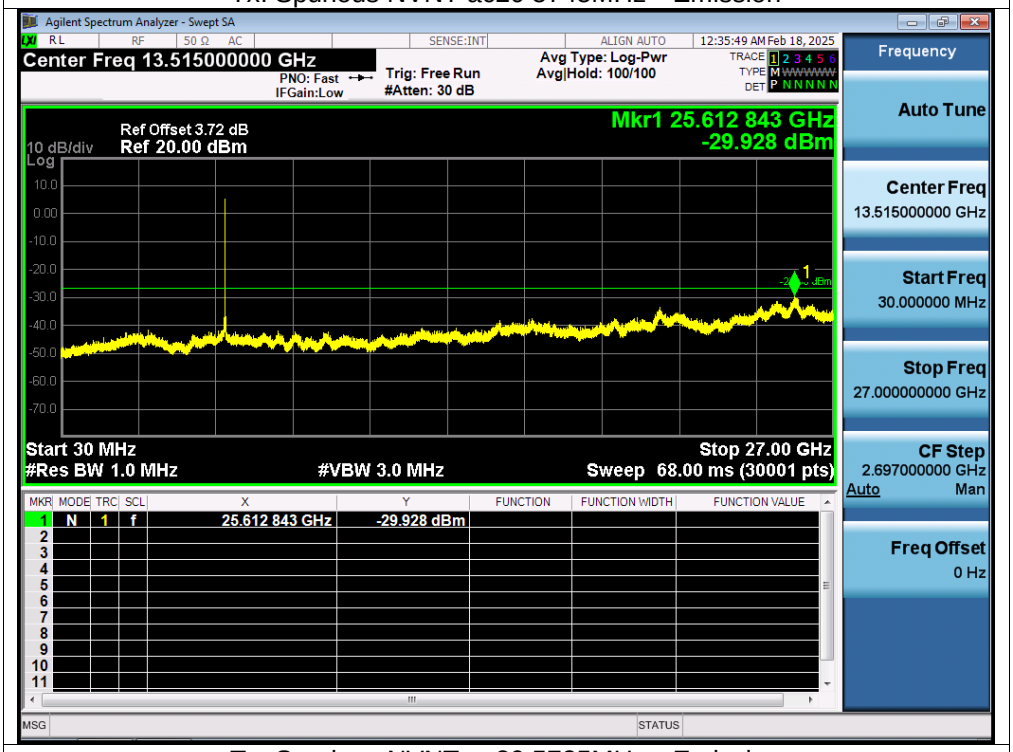
Tx. Spurious NVNT n40 5755MHz Emission



Tx. Spurious NVNT n40 5795MHz Emission

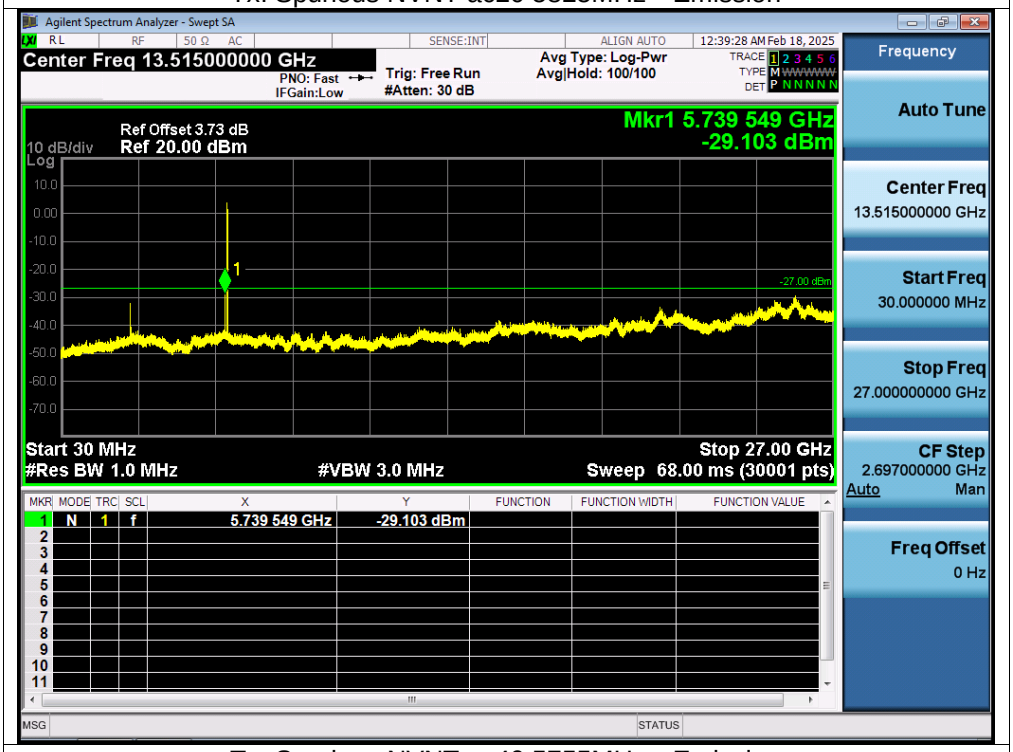


Tx. Spurious NVNT ac20 5745MHz Emission



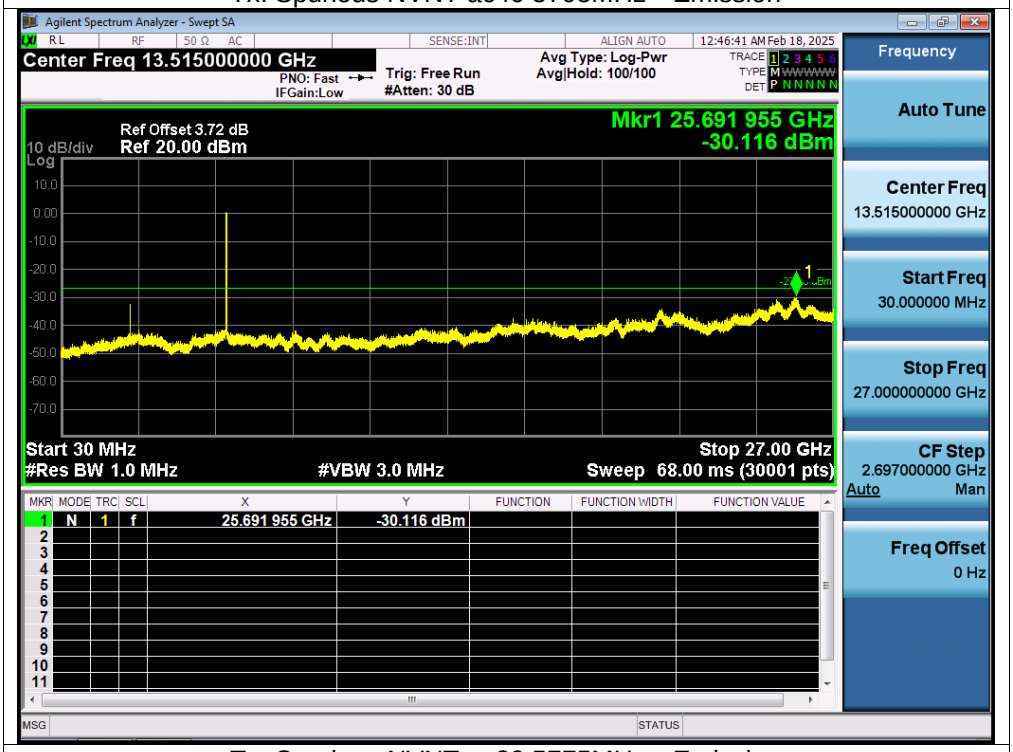
Tx. Spurious NVNT ac20 5785MHz Emission

Tx. Spurious NVNT ac20 5825MHz Emission

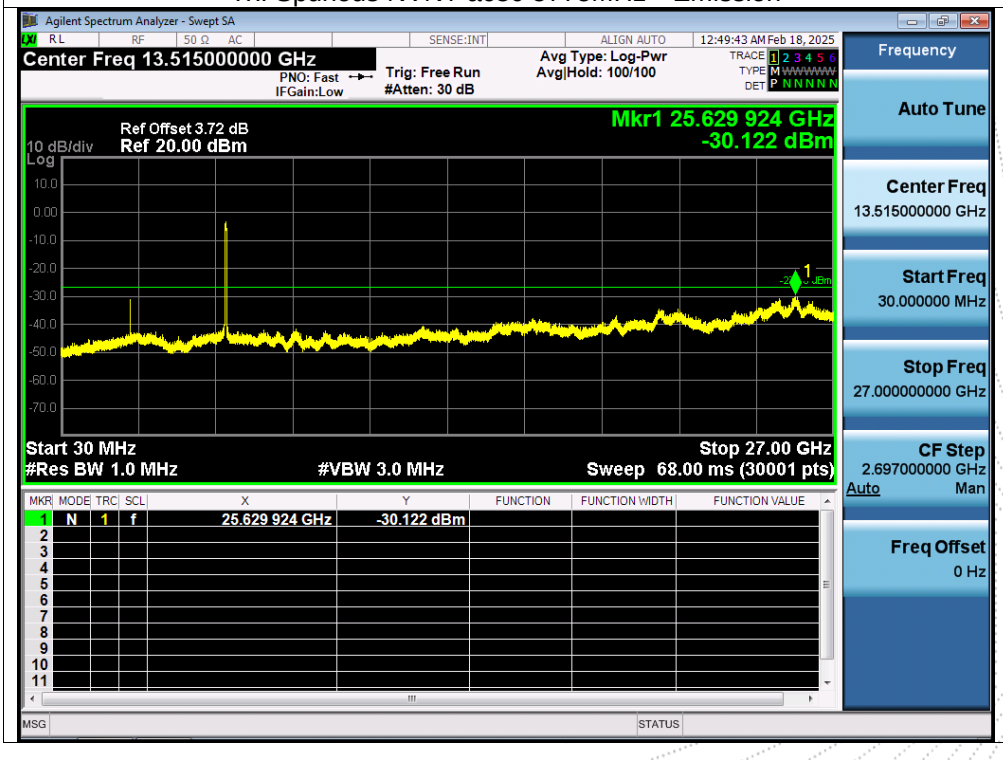


Tx. Spurious NVNT ac40 5755MHz Emission

Tx. Spurious NVNT ac40 5795MHz Emission

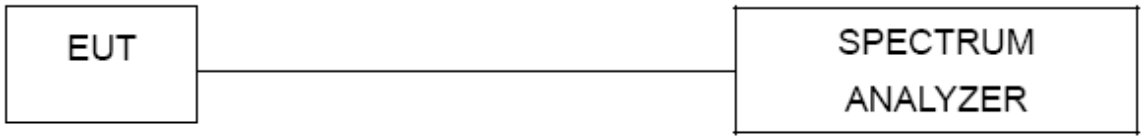


Tx. Spurious NVNT ac80 5775MHz Emission



13. Frequency Stability Measurement

13.1 Block Diagram Of Test Setup



13.2 Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.
The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification)..

13.3 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and he limit is less than ±20ppm (IEEE 802.11nspecification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is -20°C~70°C.

13.4 Test Result

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage:	DC 3.91V
Test Mode:	TX Frequency U-NII-1 (5180-5240MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.91	5180.0016	5180	0.0016	0.3089
		V max (V)	4.50	5180.0011	5180	0.0011	0.2124
		V min (V)	3.32	5180.0088	5180	0.0088	1.6988
Limits				5150-5250 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.91	T (°C)	-20	5180.0120	5180	0.0120	2.3166
		T (°C)	-10	5180.0015	5180	0.0015	0.2896
		T (°C)	0	5180.0131	5180	0.0131	2.5290
		T (°C)	10	5180.0032	5180	0.0032	0.6178
		T (°C)	20	5180.0082	5180	0.0082	1.5830
		T (°C)	30	5180.0027	5180	0.0027	0.5212
		T (°C)	40	5180.0009	5180	0.0009	0.1737
		T (°C)	50	5180.0005	5180	0.0005	0.0965
		T (°C)	60	5180.0064	5180	0.0064	1.2355
		T (°C)	70	5180.0089	5180	0.0089	1.7181
Limits				5150-5250 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.91	5200.0100	5200	0.0100	1.9231
		V max (V)	4.50	5200.0025	5200	0.0025	0.4808
		V min (V)	3.32	5200.0002	5200	0.0002	0.0385
Limits				5150-5250 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.91	T (°C)	-20	5200.00550	5200	0.00550	1.0577
		T (°C)	-10	5200.00520	5200	0.00520	1.0000
		T (°C)	0	5200.00940	5200	0.00940	1.8077
		T (°C)	10	5200.01030	5200	0.01030	1.9808
		T (°C)	20	5200.01240	5200	0.01240	2.3846
		T (°C)	30	5200.00060	5200	0.00060	0.1154
		T (°C)	40	5200.00600	5200	0.00600	1.1538
		T (°C)	50	5200.01170	5200	0.01170	2.2500
		T (°C)	60	5200.00870	5200	0.00870	1.6731
		T (°C)	70	5200.01050	5200	0.01050	2.0192
Limits				5150-5250 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.91	5240.0069	5240	0.0069	1.3168
		V max (V)	4.50	5240.0126	5240	0.0126	2.4046
		V min (V)	3.32	5240.0041	5240	0.0041	0.7824
Limits				5150-5250 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.91	T (°C)	-20	5240.0011	5240	0.0011	0.2099
		T (°C)	-10	5240.0044	5240	0.0044	0.8397
		T (°C)	0	5240.0077	5240	0.0077	1.4695
		T (°C)	10	5240.0120	5240	0.0120	2.2901
		T (°C)	20	5240.0061	5240	0.0061	1.1641
		T (°C)	30	5240.0064	5240	0.0064	1.2214
		T (°C)	40	5240.0109	5240	0.0109	2.0802
		T (°C)	50	5240.0117	5240	0.0117	2.2328
		T (°C)	60	5240.0050	5240	0.0050	0.9542
		T (°C)	70	5240.0054	5240	0.0054	1.0305
Limits				5150-5250 MHz			
Result				Complies			

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage:	DC 3.91V
Test Mode:	TX Frequency(5745-5825MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.91	5745.01020	5745	0.01020	1.7755
		V max (V)	4.50	5745.01200	5745	0.01200	2.0888
		V min (V)	3.32	5745.01260	5745	0.01260	2.1932
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.91	T (°C)	-20	5745.00180	5745	0.00180	0.3133
		T (°C)	-10	5745.00940	5745	0.00940	1.6362
		T (°C)	0	5745.00720	5745	0.00720	1.2533
		T (°C)	10	5745.00610	5745	0.00610	1.0618
		T (°C)	20	5745.00640	5745	0.00640	1.1140
		T (°C)	30	5745.01310	5745	0.01310	2.2802
		T (°C)	40	5745.00140	5745	0.00140	0.2437
		T (°C)	50	5745.01310	5745	0.01310	2.2802
		T (°C)	60	5745.00930	5745	0.00930	1.6188
		T (°C)	70	5745.00620	5745	0.00620	1.0792
Limits				5725-5850 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.91	5785.00900	5785	0.00900	1.5557
		V max (V)	4.50	5785.00100	5785	0.00100	0.1729
		V min (V)	3.32	5785.01210	5785	0.01210	2.0916
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.91	T (°C)	-20	5785.00980	5785	0.00980	1.6940
		T (°C)	-10	5785.00890	5785	0.00890	1.5385
		T (°C)	0	5785.00060	5785	0.00060	0.1037
		T (°C)	10	5785.01120	5785	0.01120	1.9360
		T (°C)	20	5785.00260	5785	0.00260	0.4494
		T (°C)	30	5785.00470	5785	0.00470	0.8124
		T (°C)	40	5785.00840	5785	0.00840	1.4520
		T (°C)	50	5785.01270	5785	0.01270	2.1953
		T (°C)	60	5785.00030	5785	0.00030	0.0519
		T (°C)	70	5785.00780	5785	0.00780	1.3483
Limits				5725-5850 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.91	5825.00790	5825	0.00790	1.3562
		V max (V)	4.50	5825.00030	5825	0.00030	0.0515
		V min (V)	3.32	5825.01150	5825	0.01150	1.9742
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.91	T (°C)	-20	5825.00400	5825	0.00400	0.6867
		T (°C)	-10	5825.00020	5825	0.00020	0.0343
		T (°C)	0	5825.00420	5825	0.00420	0.7210
		T (°C)	10	5825.00490	5825	0.00490	0.8412
		T (°C)	20	5825.01230	5825	0.01230	2.1116
		T (°C)	30	5825.00790	5825	0.00790	1.3562
		T (°C)	40	5825.01070	5825	0.01070	1.8369
		T (°C)	50	5825.00330	5825	0.00330	0.5665
		T (°C)	60	5825.00120	5825	0.00120	0.2060
		T (°C)	70	5825.00620	5825	0.00620	1.0644
Limits				5725-5850 MHz			
Result				Complies			

14. Duty Cycle Of Test Signal

14.1 Standard Requirement

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

14.2 Formula

Duty Cycle = Ton / (Ton+Toff)

14.3 Test Procedure

1.Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

14.4 Test Result

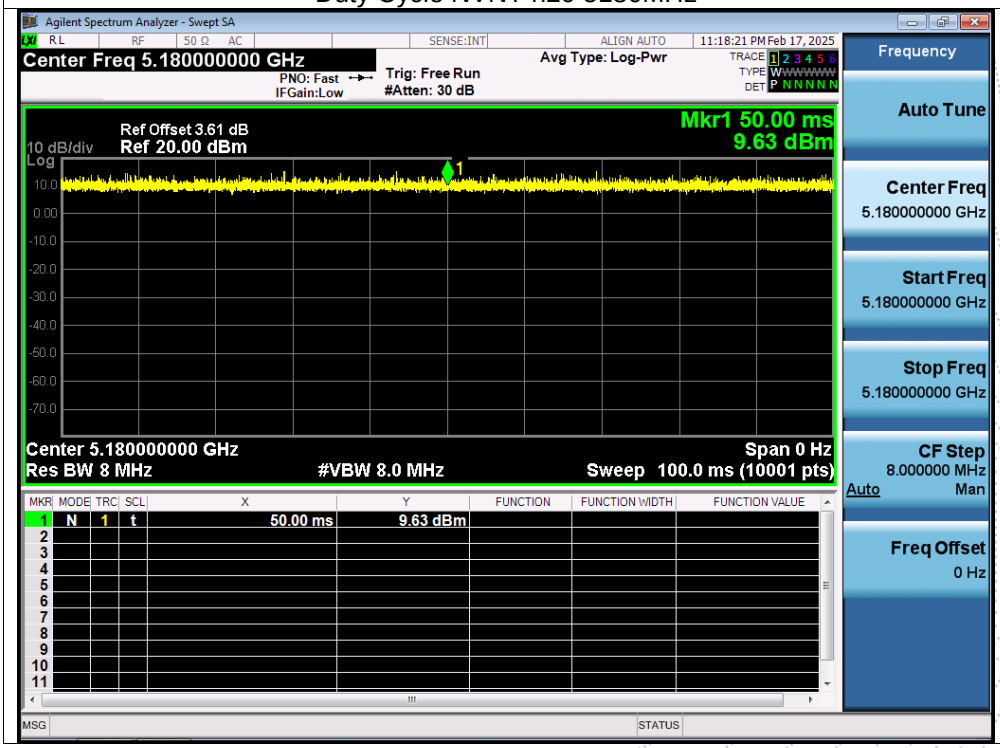
5.1G

Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	100	0	0
NVNT	n20	5180	100	0	0
NVNT	n40	5190	100	0	0
NVNT	ac20	5180	100	0	0
NVNT	ac40	5190	100	0	0
NVNT	ac80	5210	100	0	0

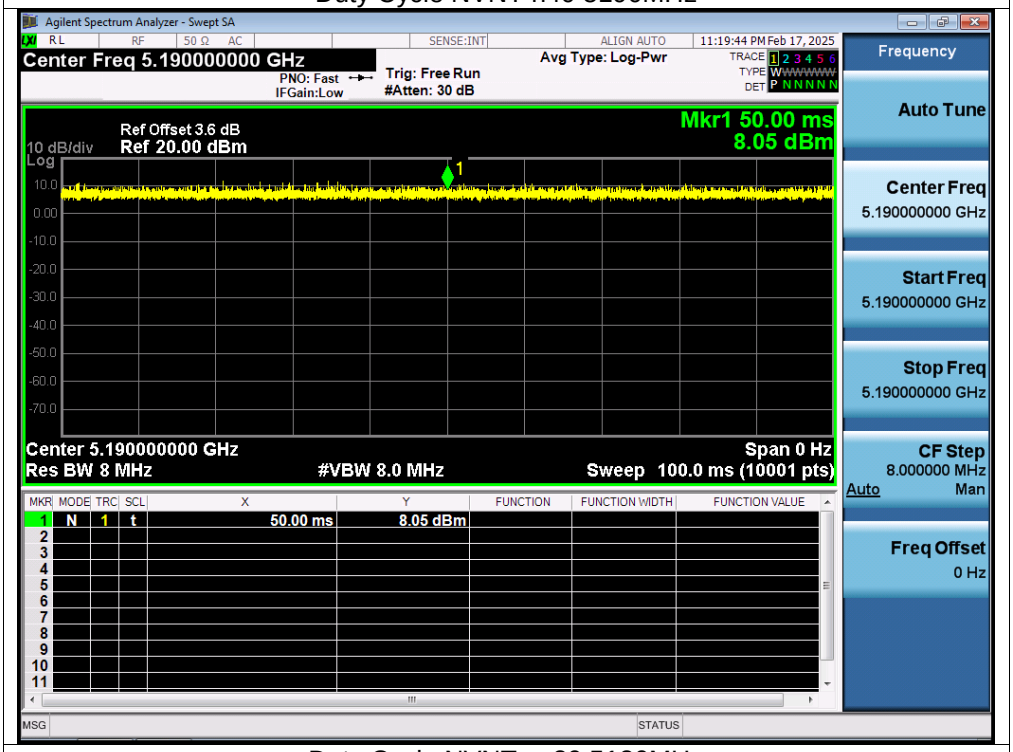
Test Graphs

Duty Cycle NVNT a 5180MHz

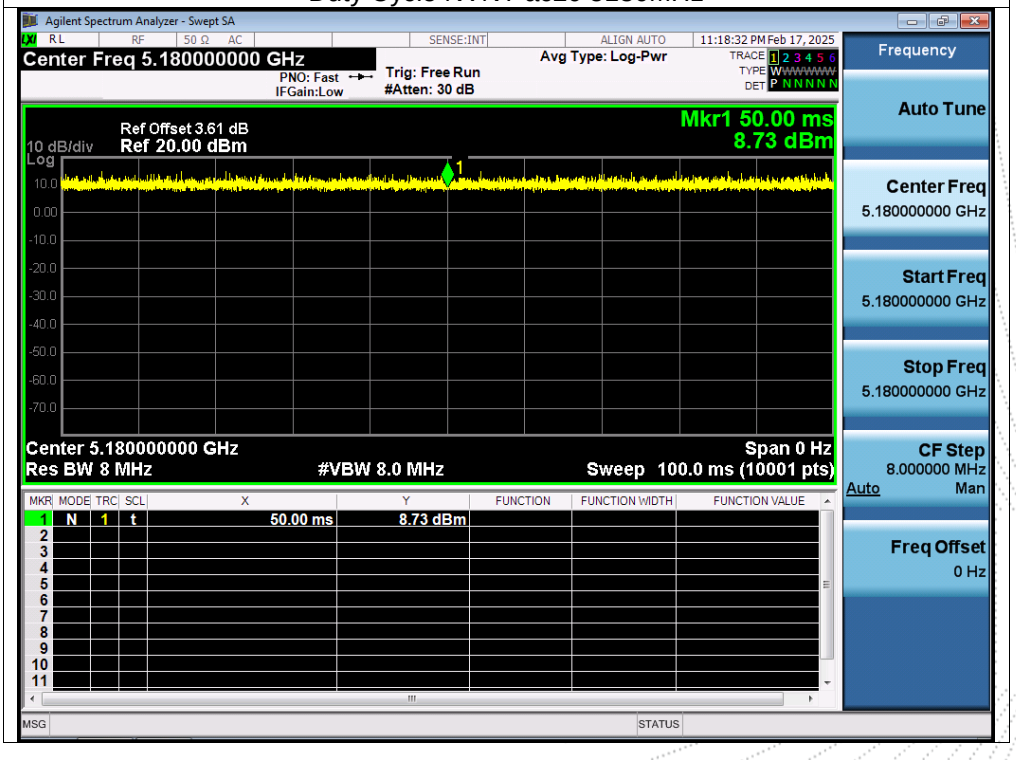
Duty Cycle NVNT n20 5180MHz



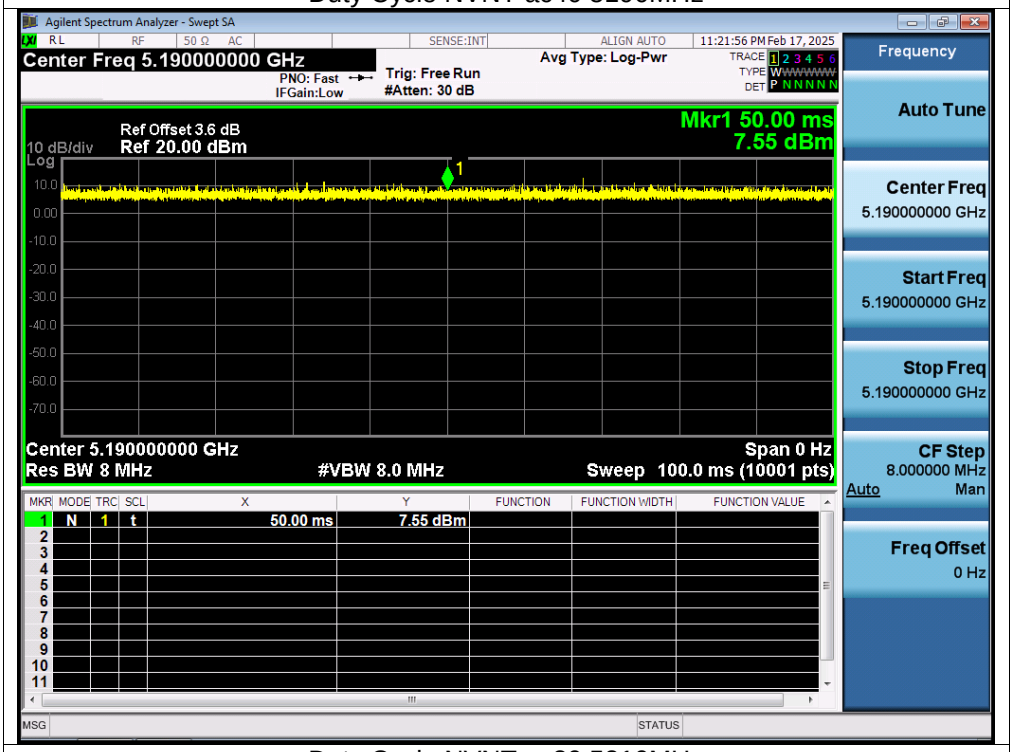
Duty Cycle NVNT n40 5190MHz



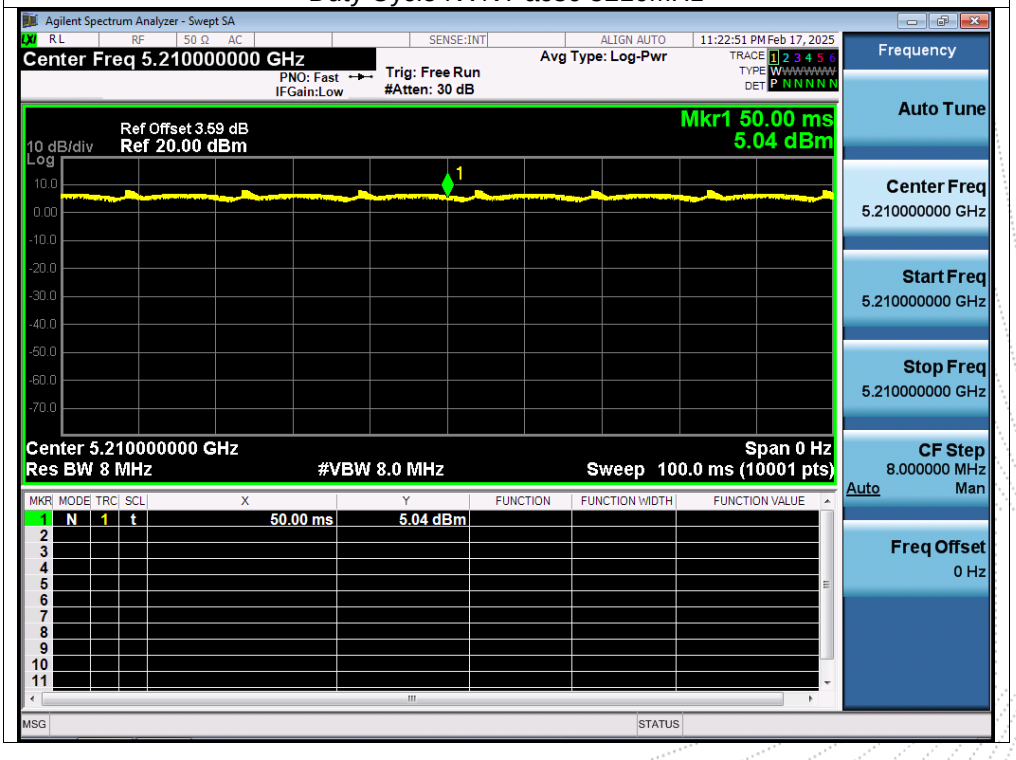
Duty Cycle NVNT ac20 5180MHz



Duty Cycle NVNT ac40 5190MHz



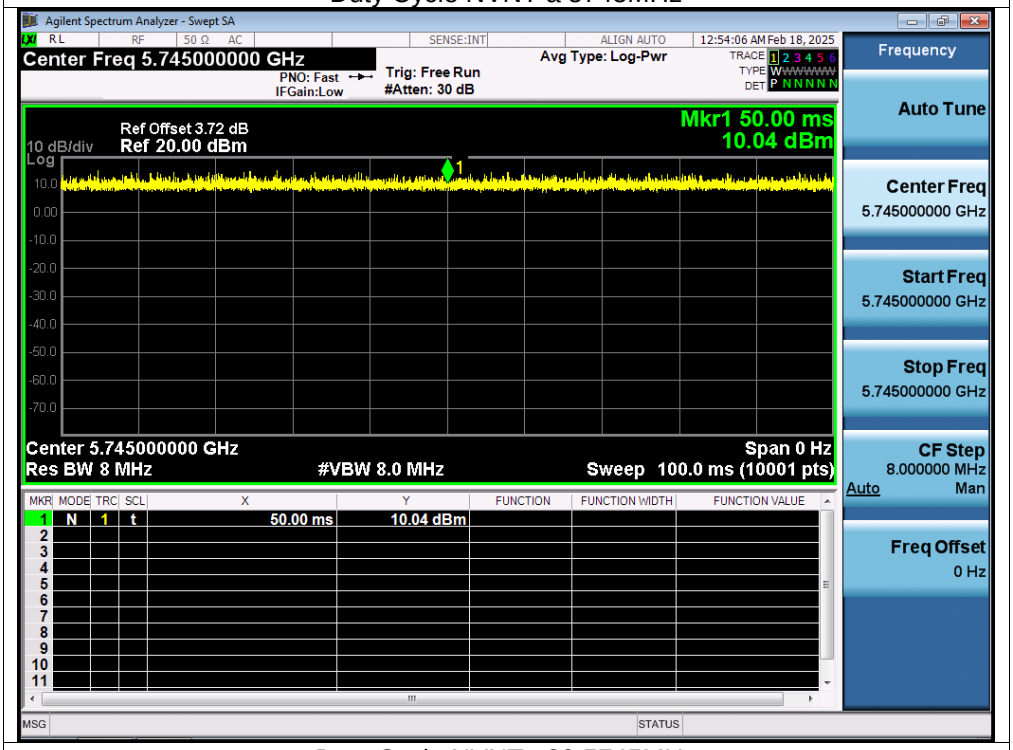
Duty Cycle NVNT ac80 5210MHz



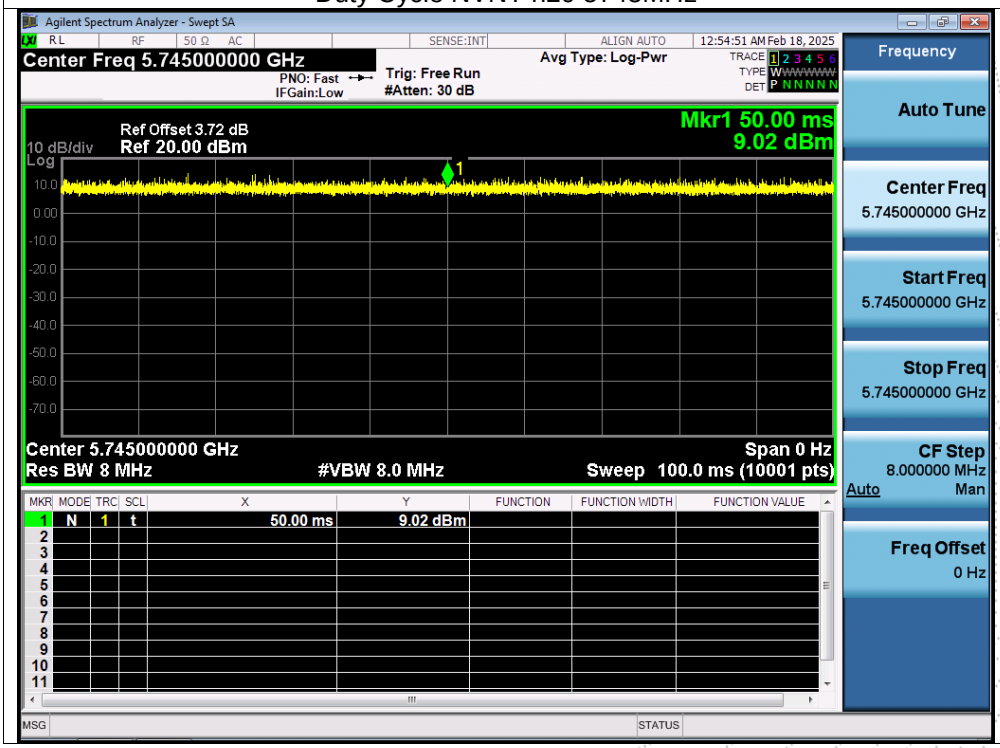
5.8G

Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5745	100	0	0
NVNT	n20	5745	100	0	0
NVNT	n40	5755	100	0	0
NVNT	ac20	5745	100	0	0
NVNT	ac40	5755	100	0	0
NVNT	ac80	5775	100	0	0

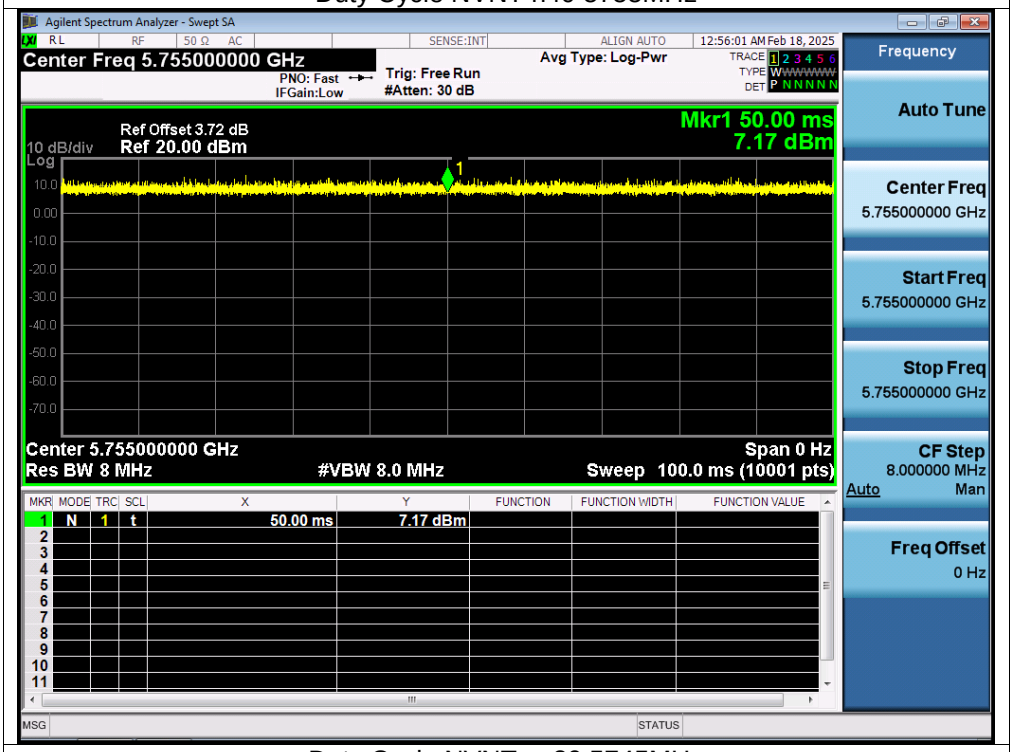
Test Graphs
Duty Cycle NVNT a 5745MHz



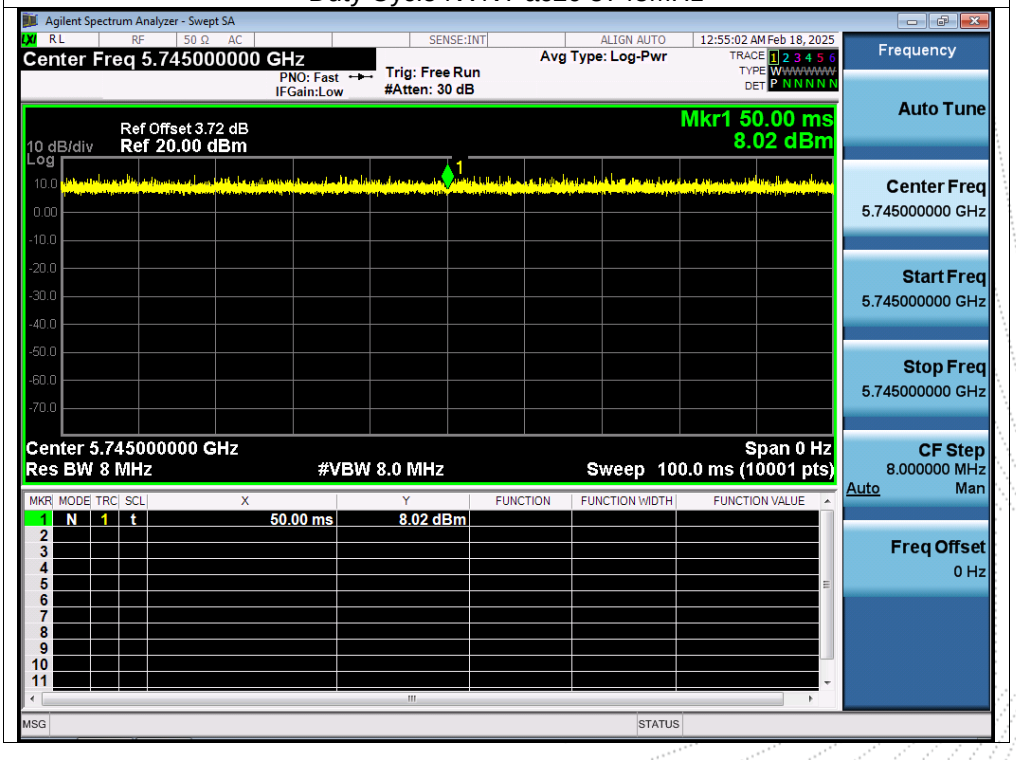
Duty Cycle NVNT n20 5745MHz



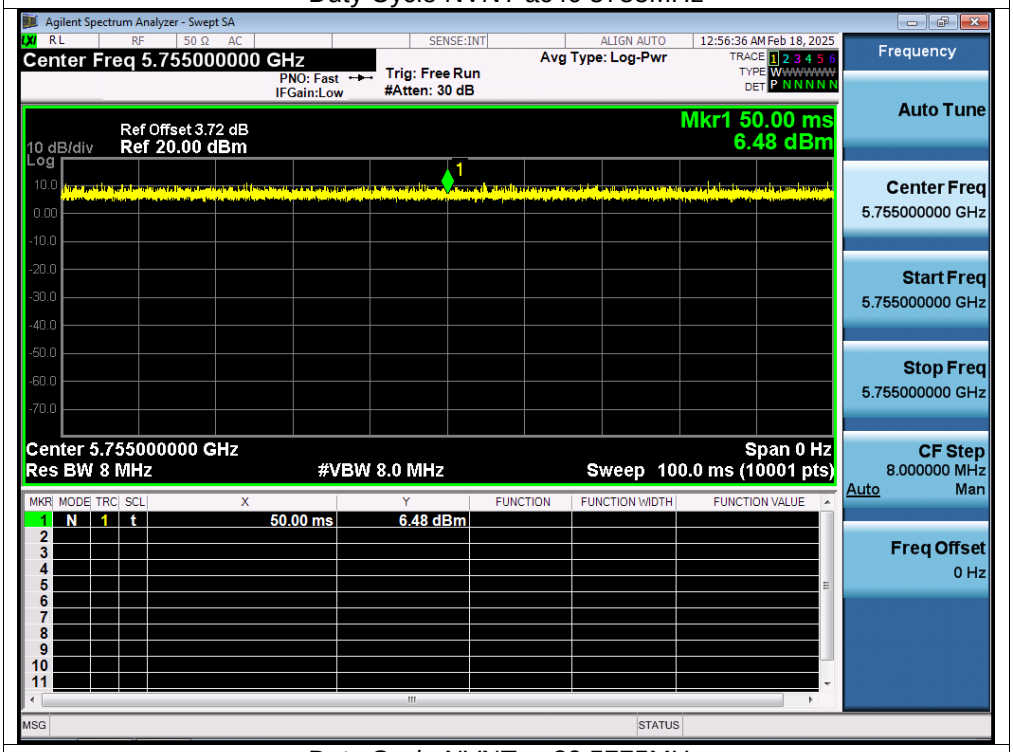
Duty Cycle NVNT n40 5755MHz



Duty Cycle NVNT ac20 5745MHz



Duty Cycle NVNT ac40 5755MHz



Duty Cycle NVNT ac80 5775MHz