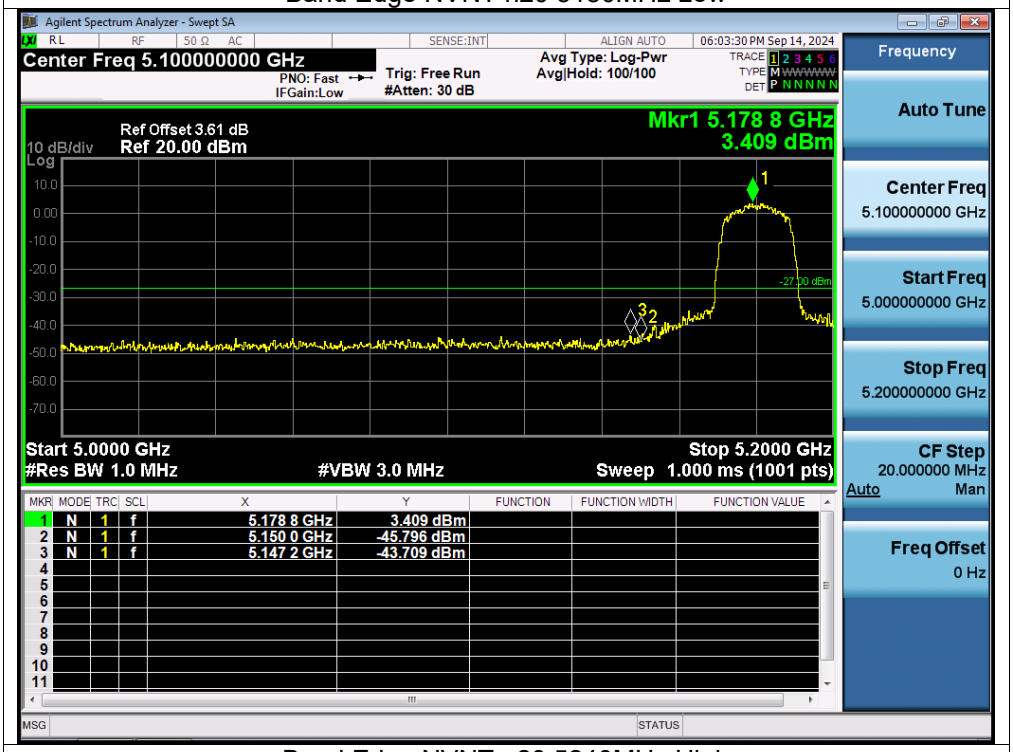
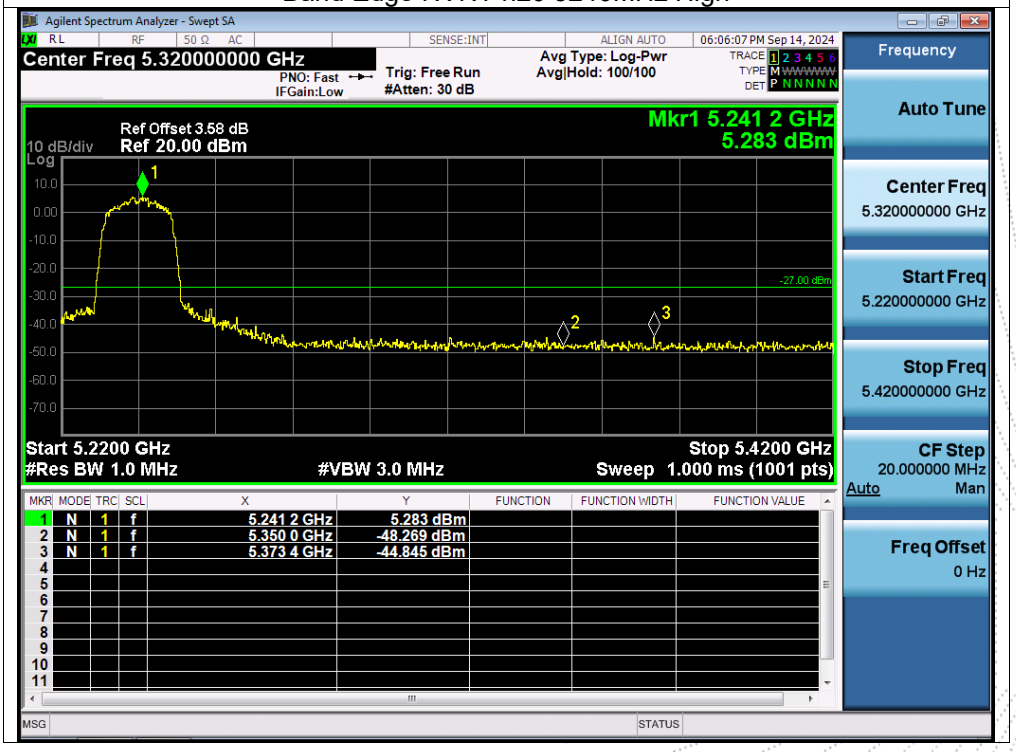
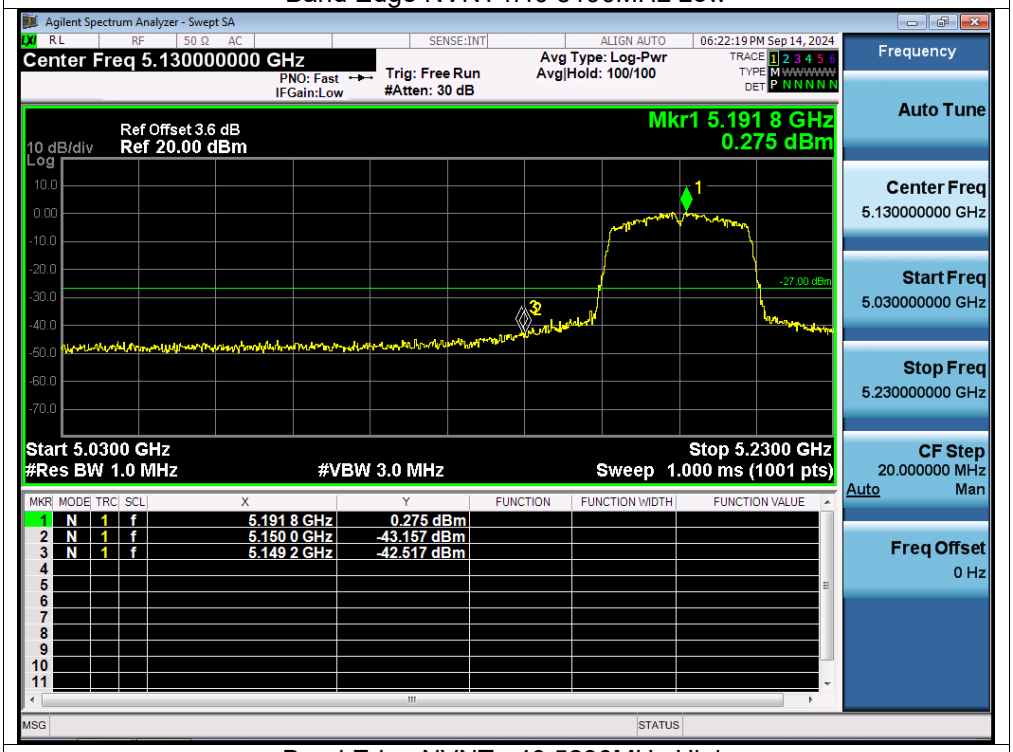
Band Edge NVNT n20 5180MHz Low



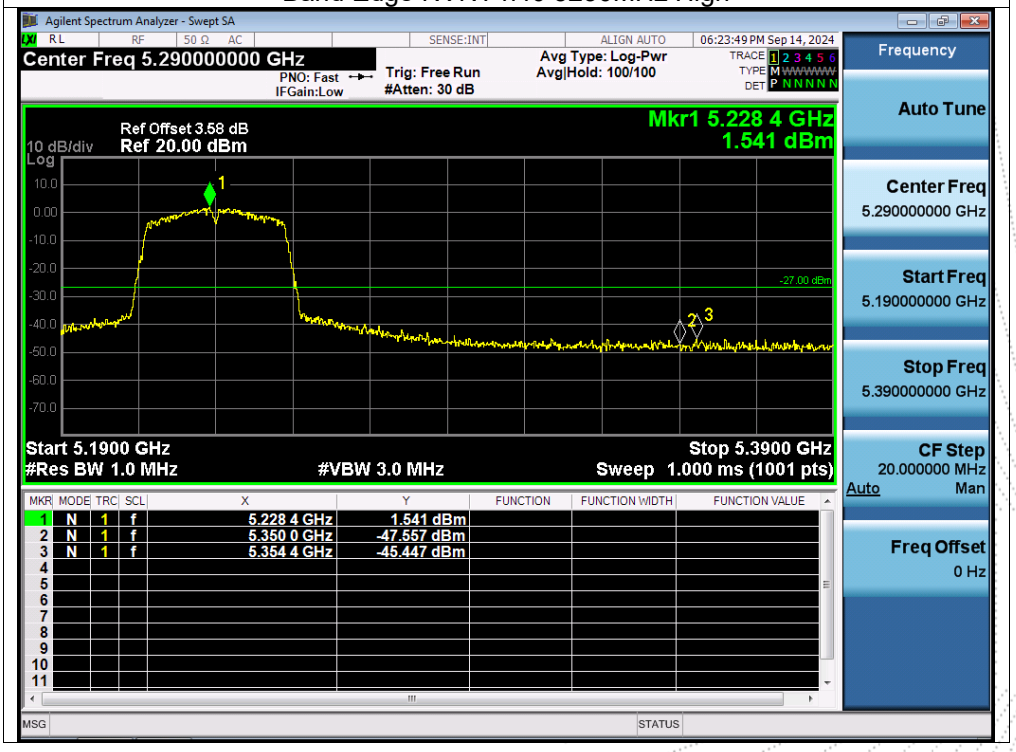
Band Edge NVNT n20 5240MHz High



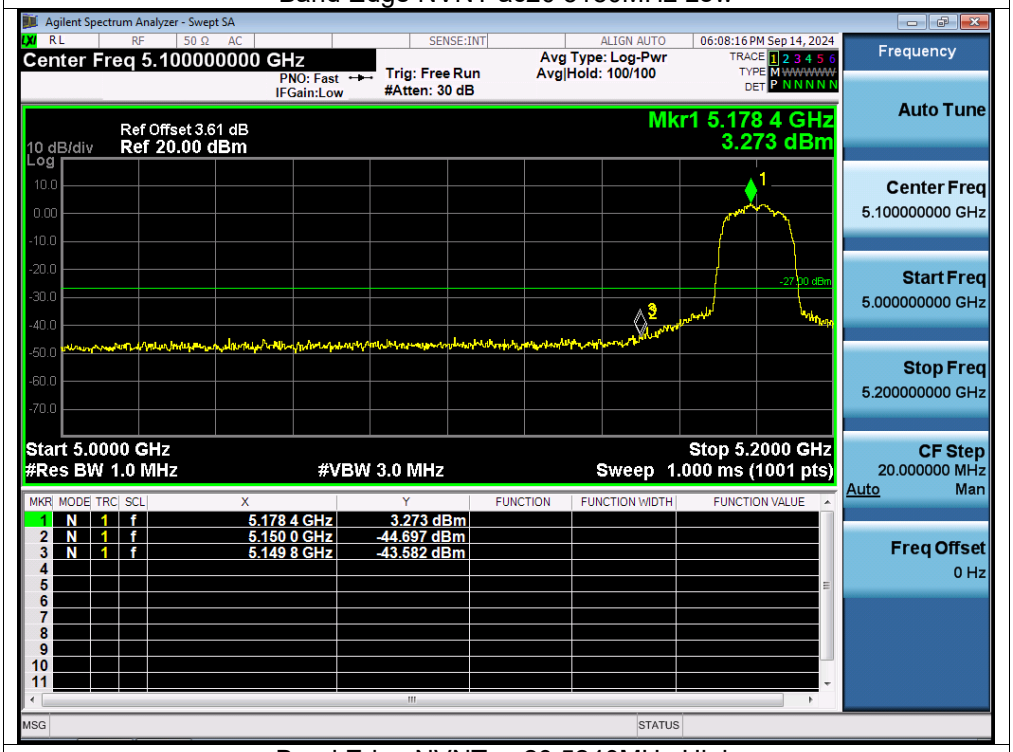
Band Edge NVNT n40 5190MHz Low



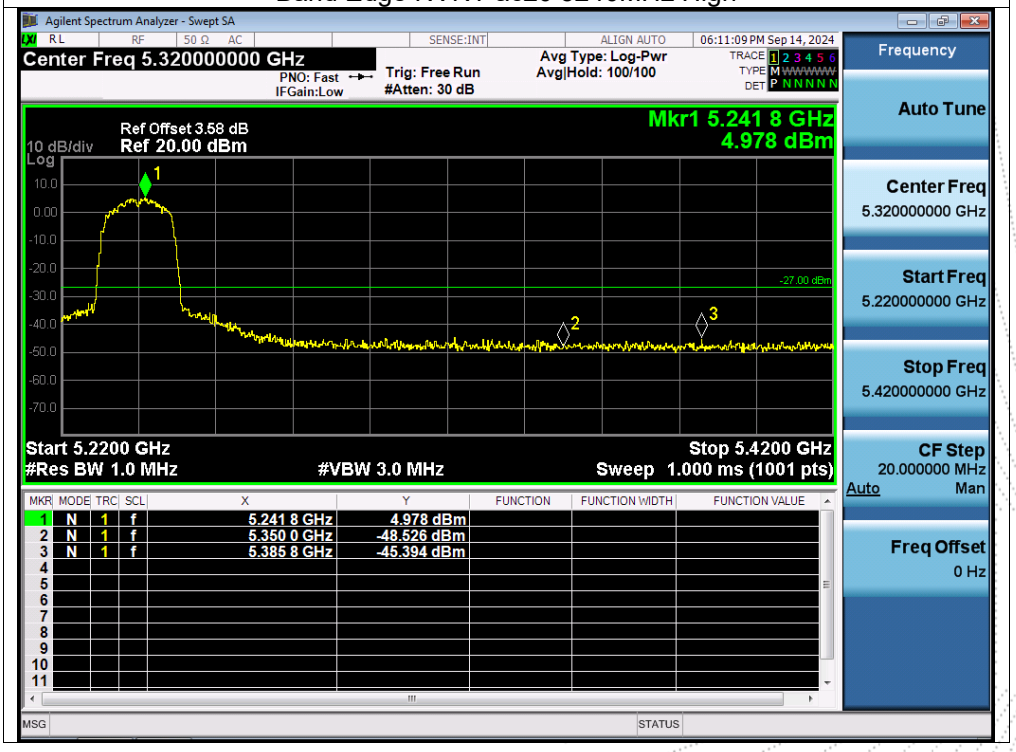
Band Edge NVNT n40 5230MHz High



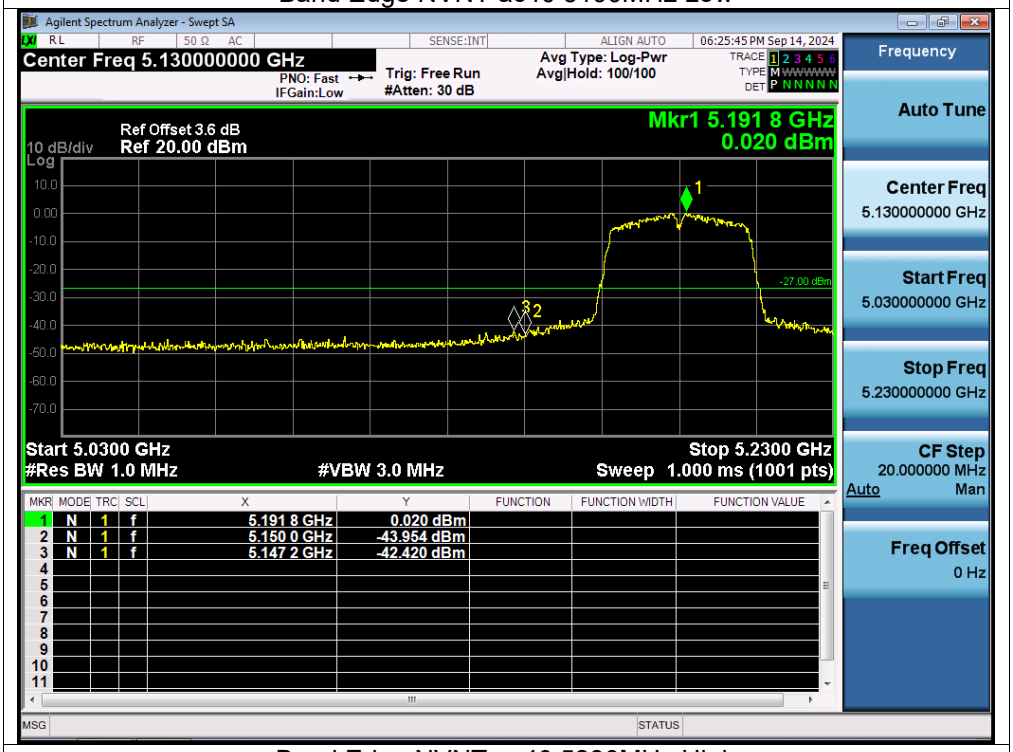
Band Edge NVNT ac20 5180MHz Low



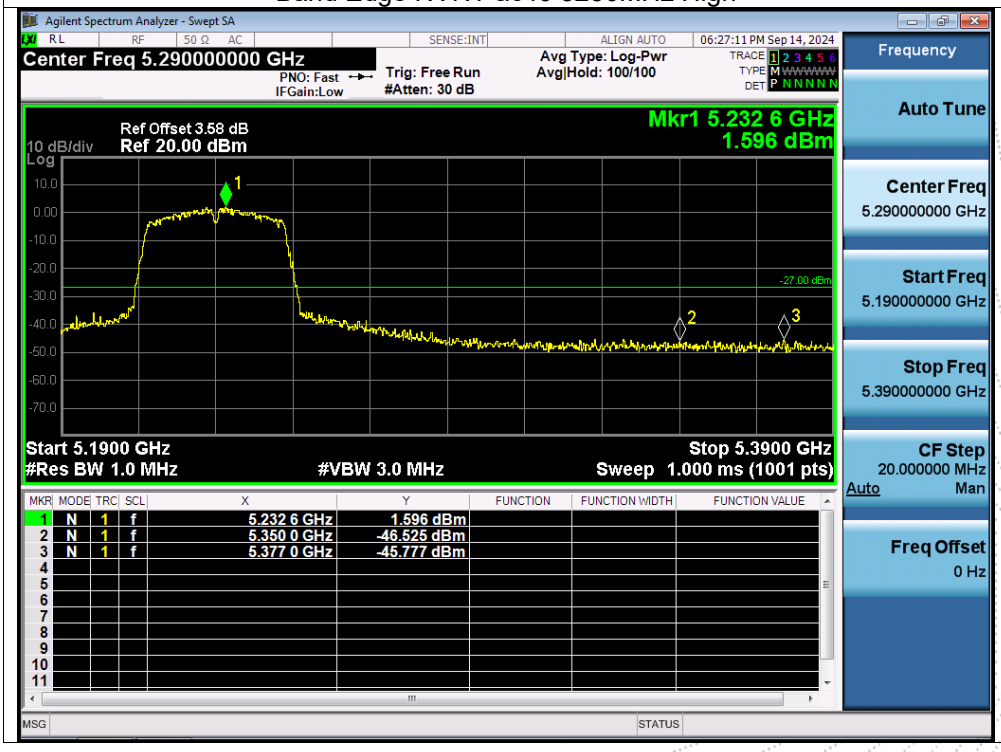
Band Edge NVNT ac20 5240MHz High



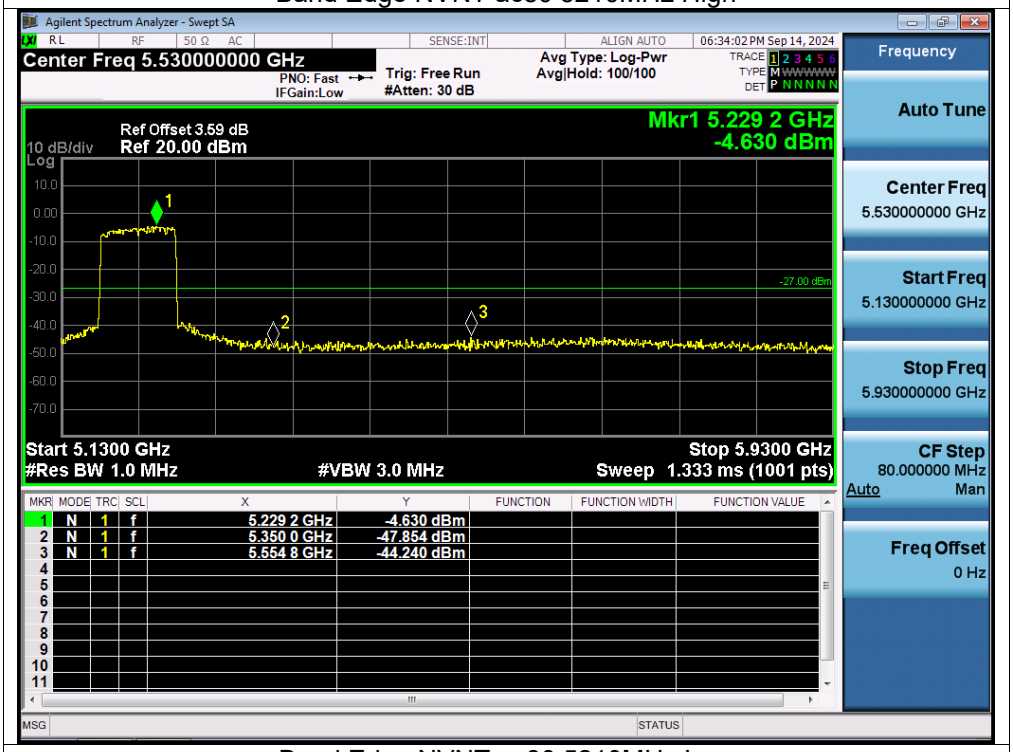
Band Edge NVNT ac40 5190MHz Low



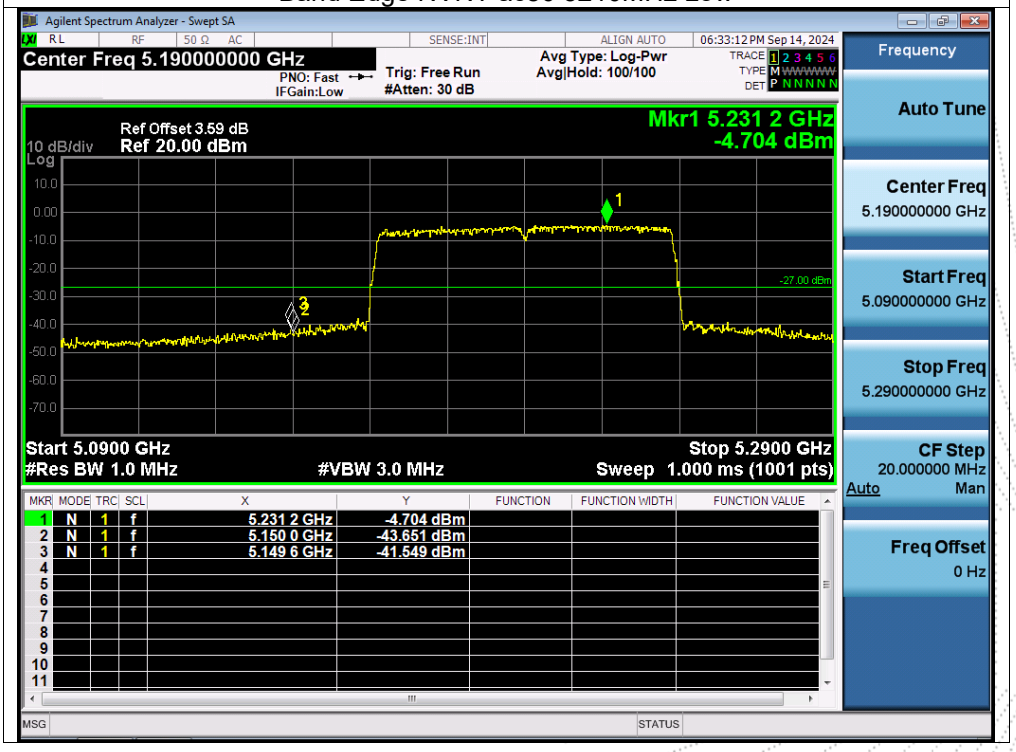
Band Edge NVNT ac40 5230MHz High



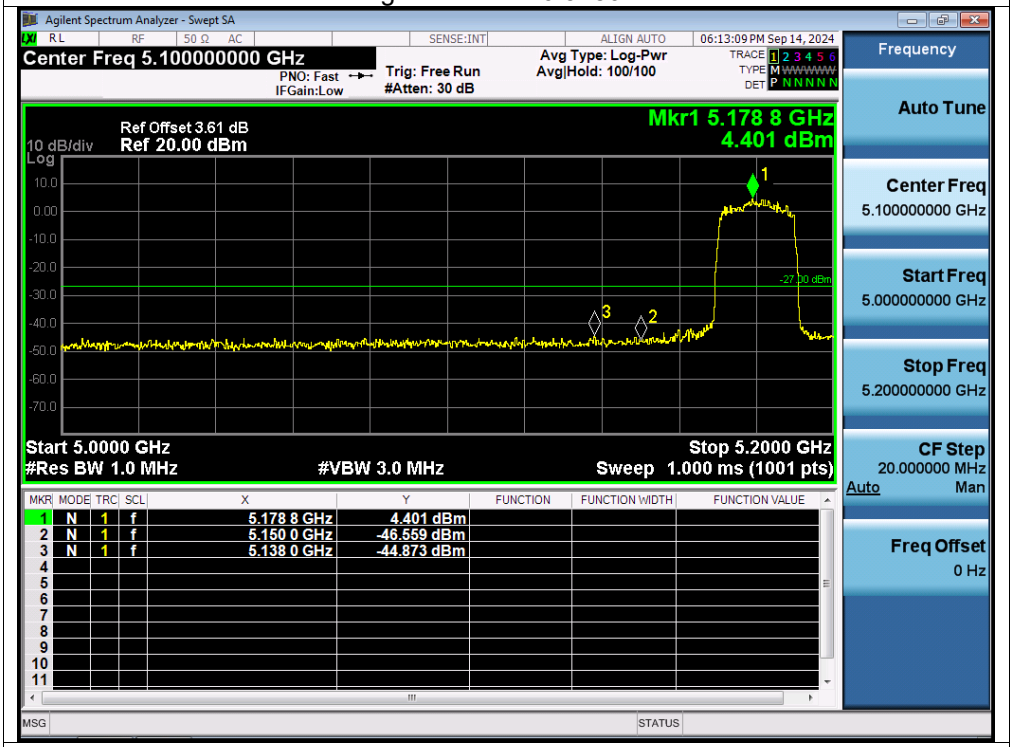
Band Edge NVNT ac80 5210MHz High



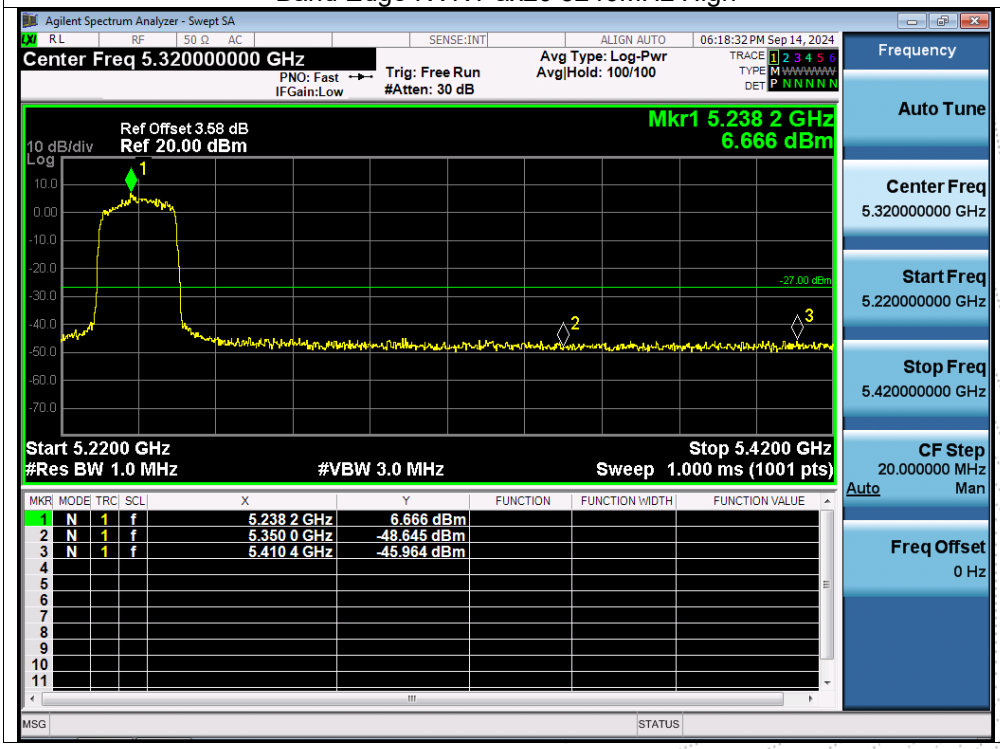
Band Edge NVNT ac80 5210MHz Low



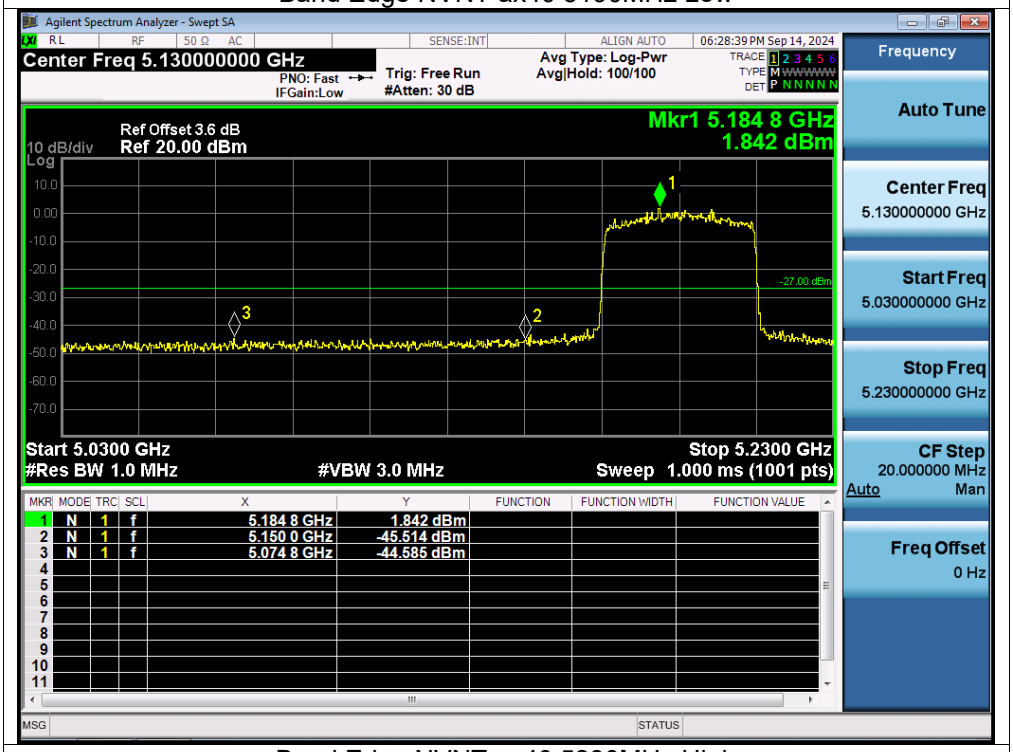
Band Edge NVNT ax20 5180MHz Low



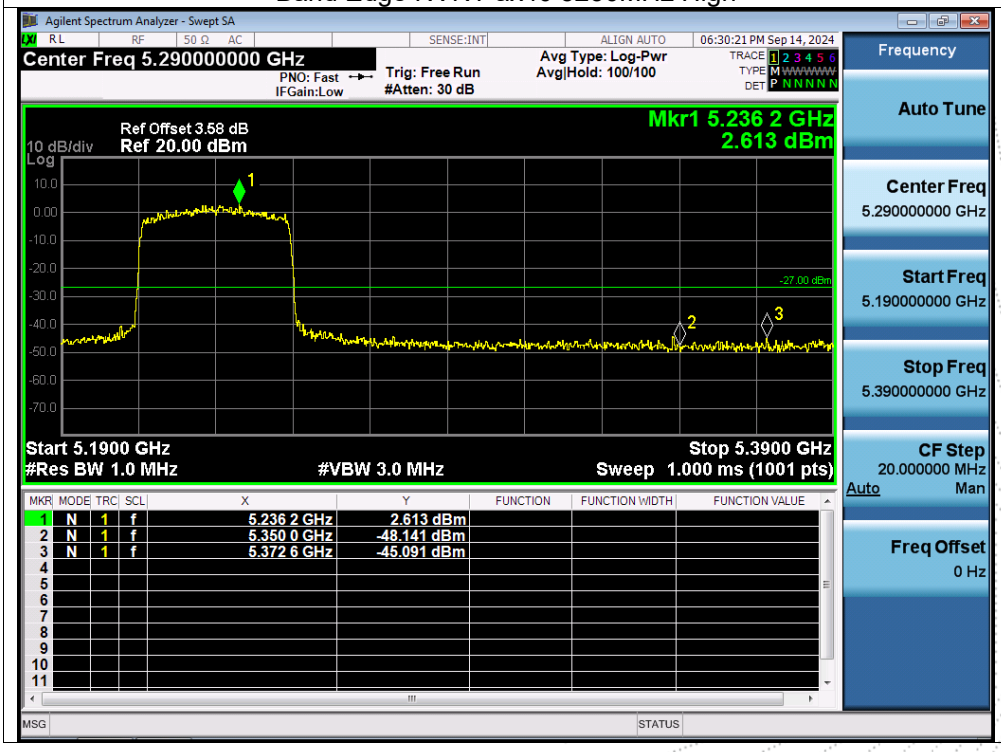
Band Edge NVNT ax20 5240MHz High



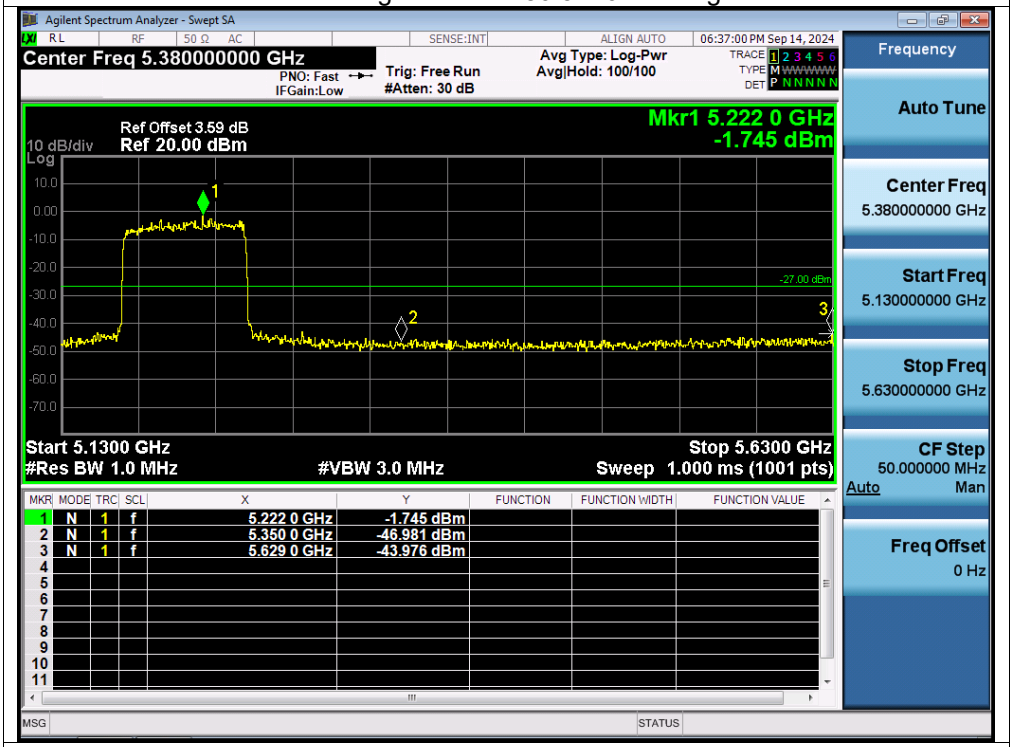
Band Edge NVNT ax40 5190MHz Low



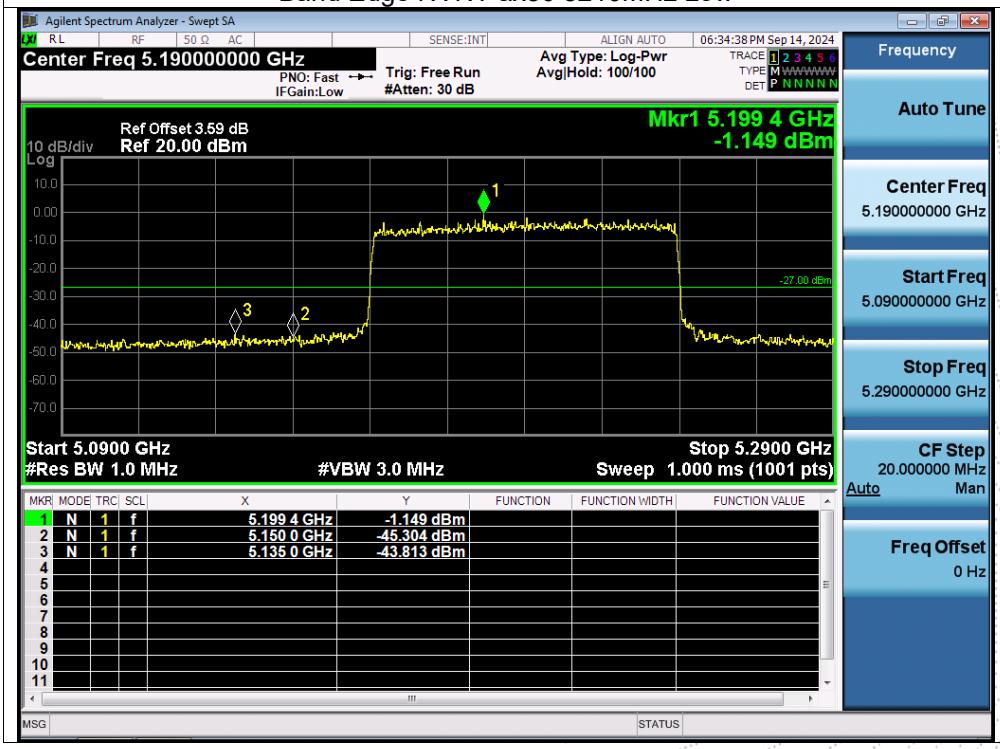
Band Edge NVNT ax40 5230MHz High



Band Edge NVNT ax80 5210MHz High

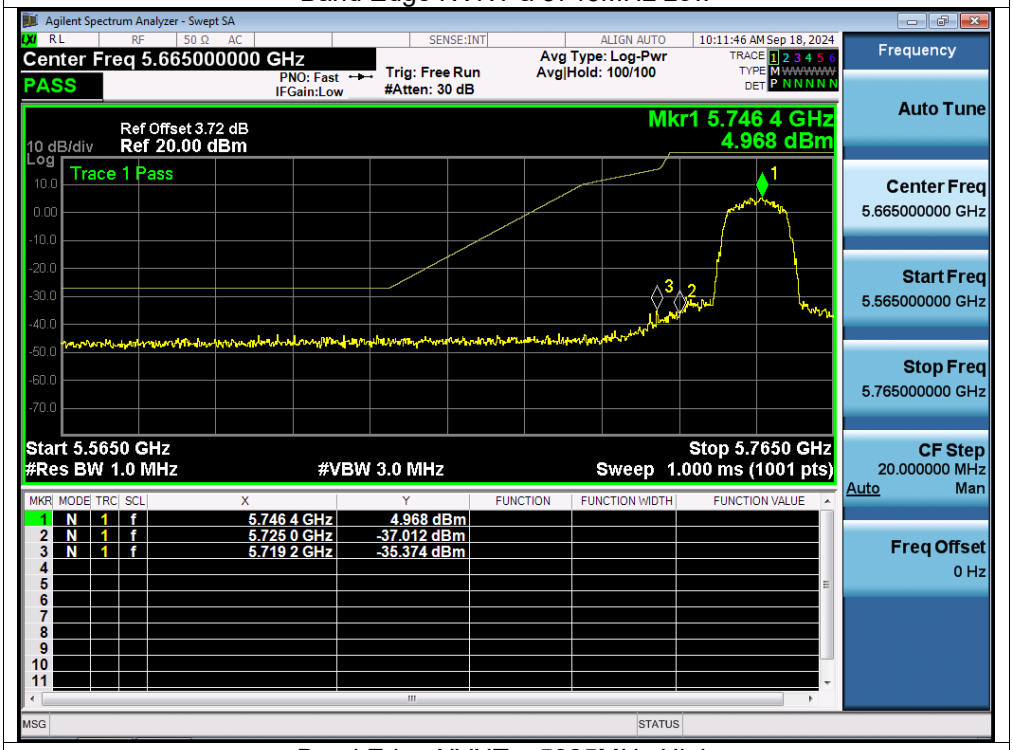


Band Edge NVNT ax80 5210MHz Low

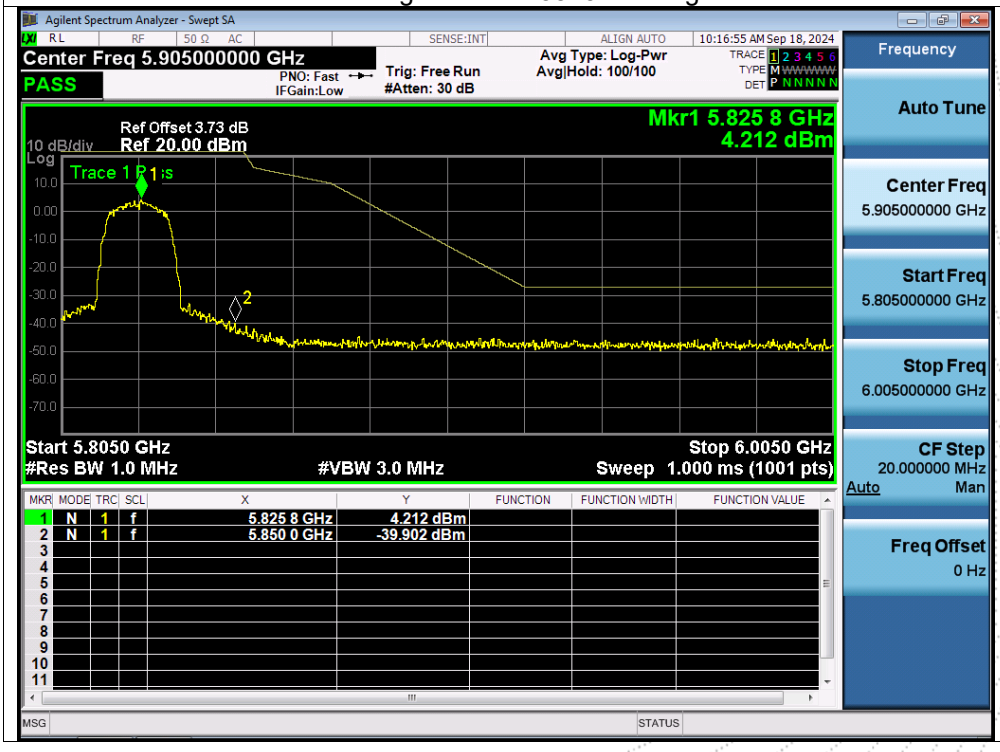


Test Graphs

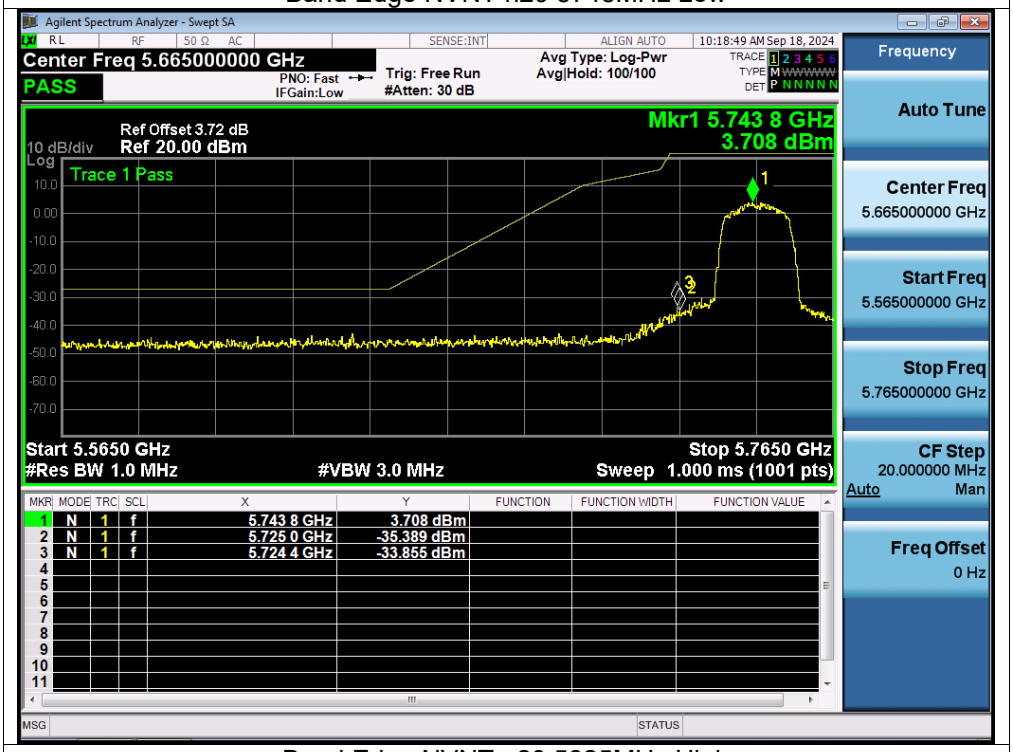
Band Edge NVNT a 5745MHz Low



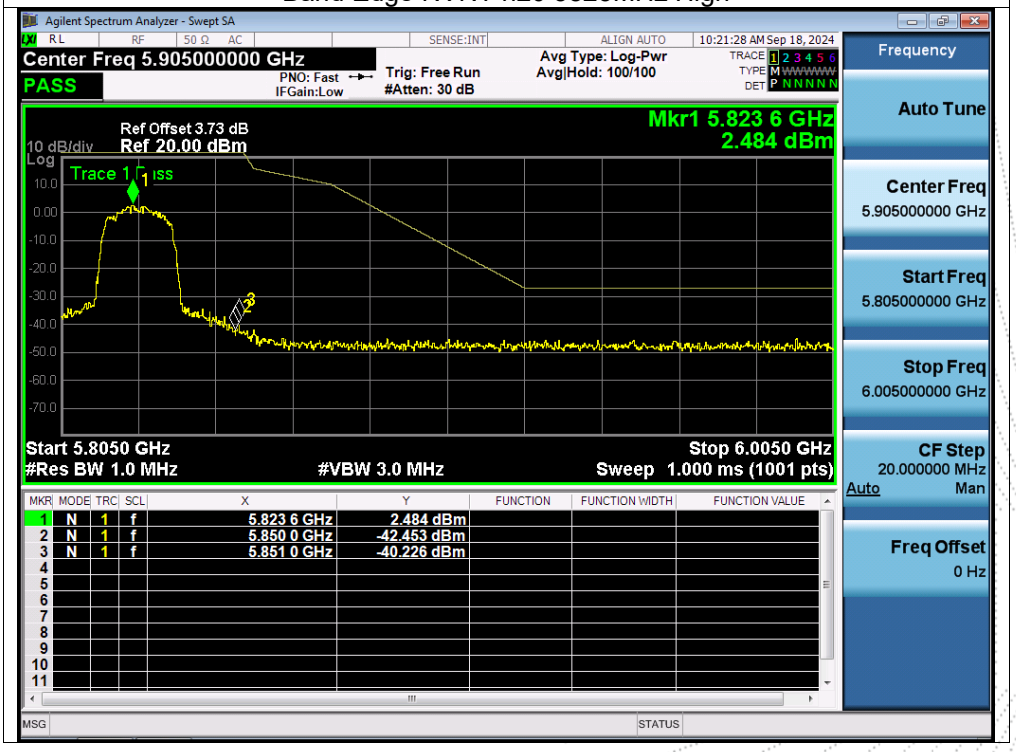
Band Edge NVNT a 5825MHz High



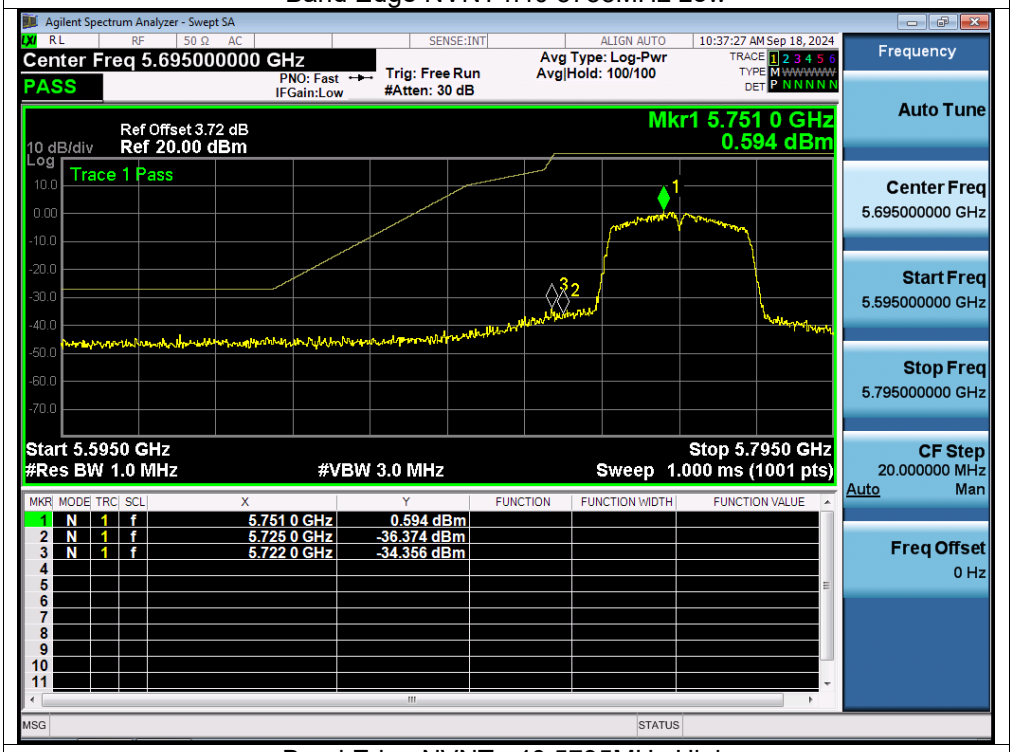
Band Edge NVNT n20 5745MHz Low



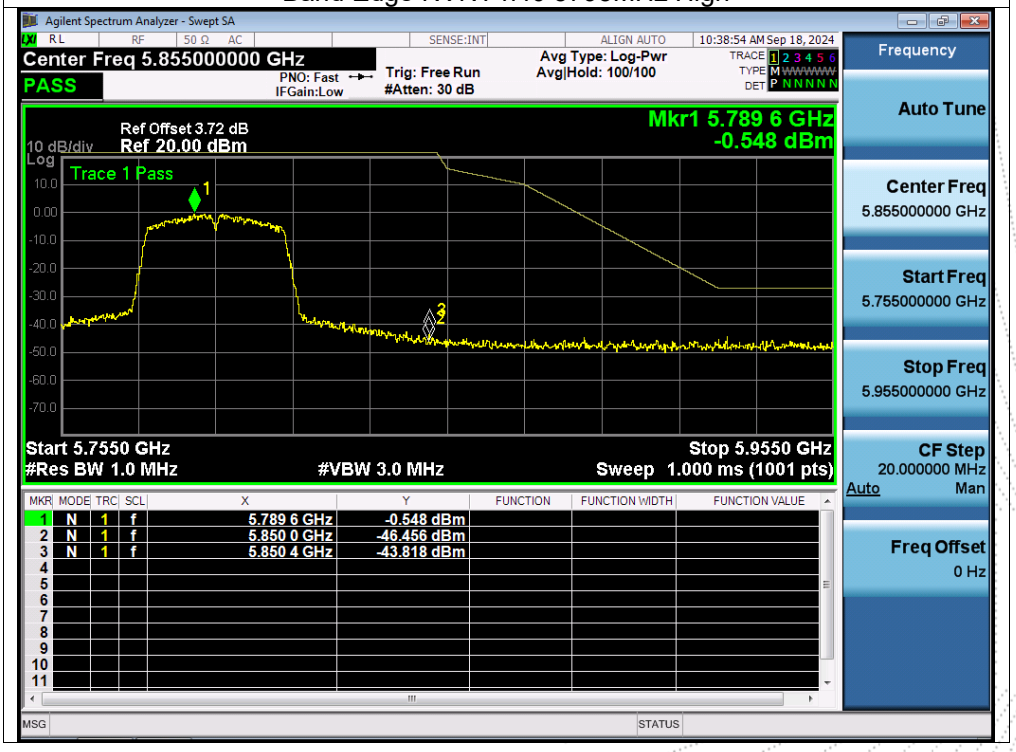
Band Edge NVNT n20 5825MHz High



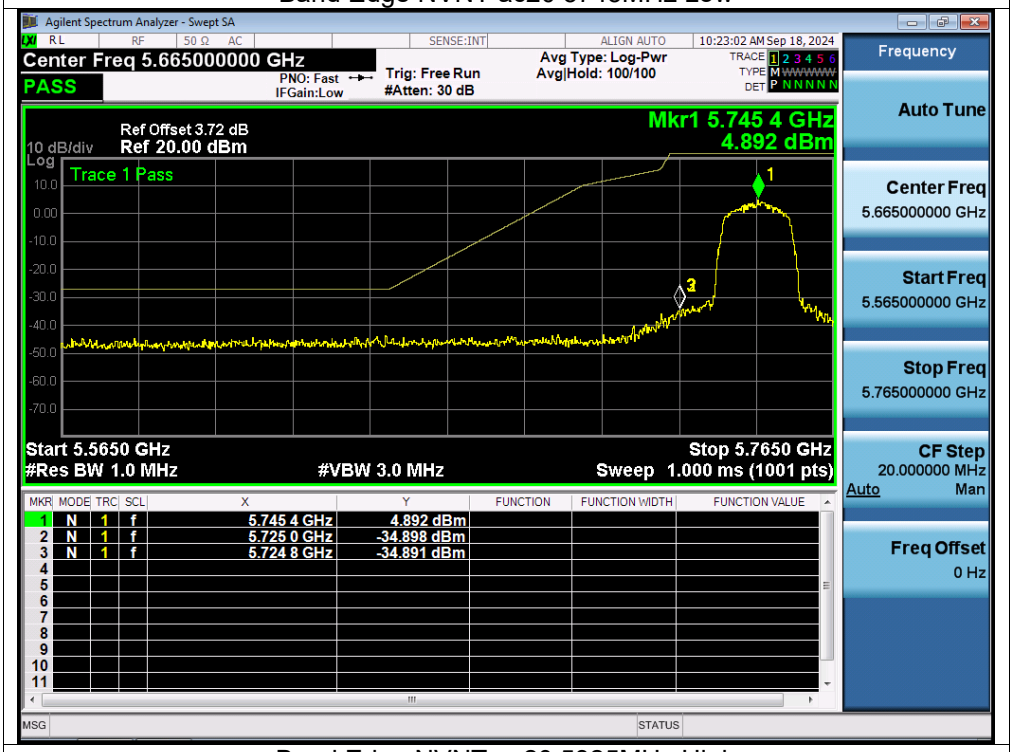
Band Edge NVNT n40 5755MHz Low



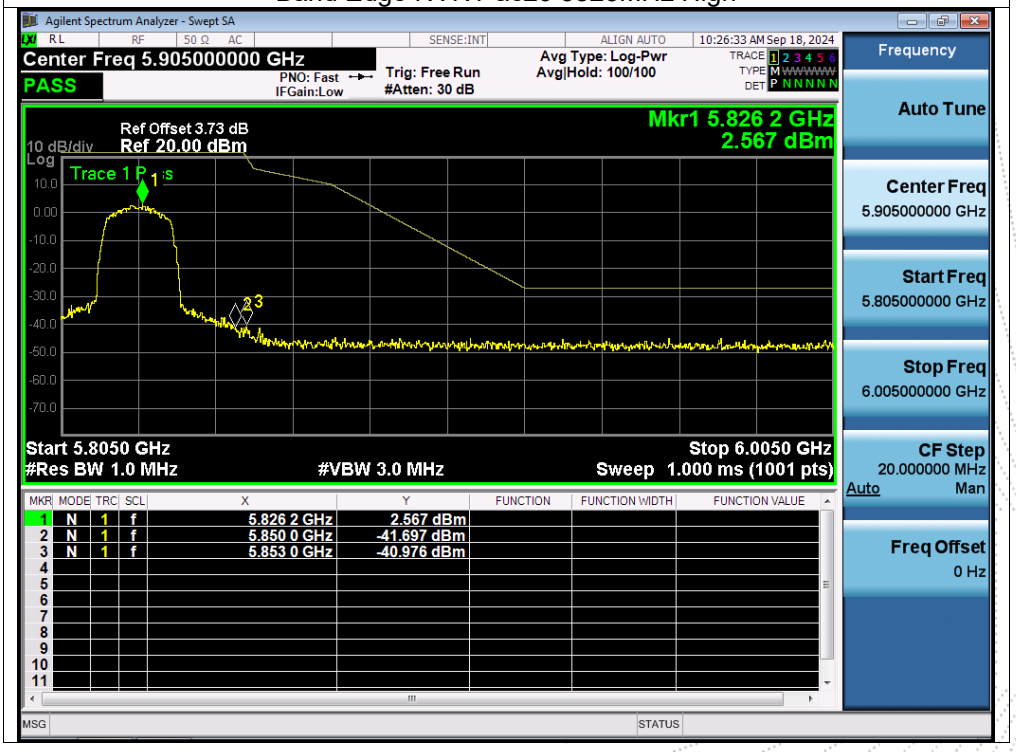
Band Edge NVNT n40 5795MHz High



Band Edge NVNT ac20 5745MHz Low

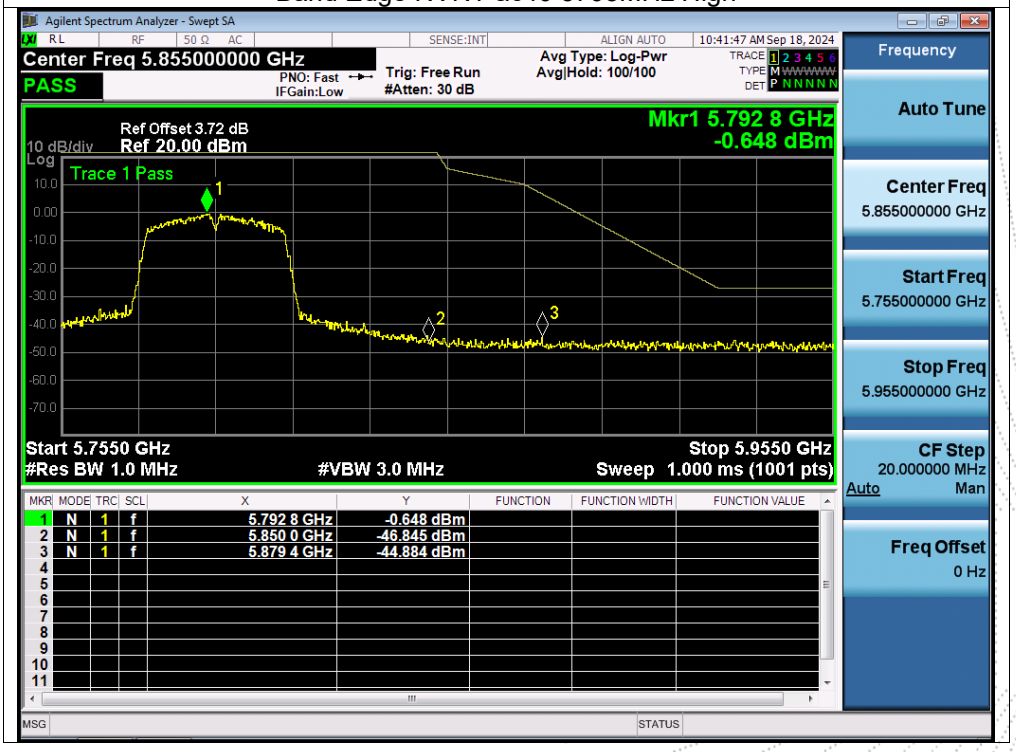


Band Edge NVNT ac20 5825MHz High

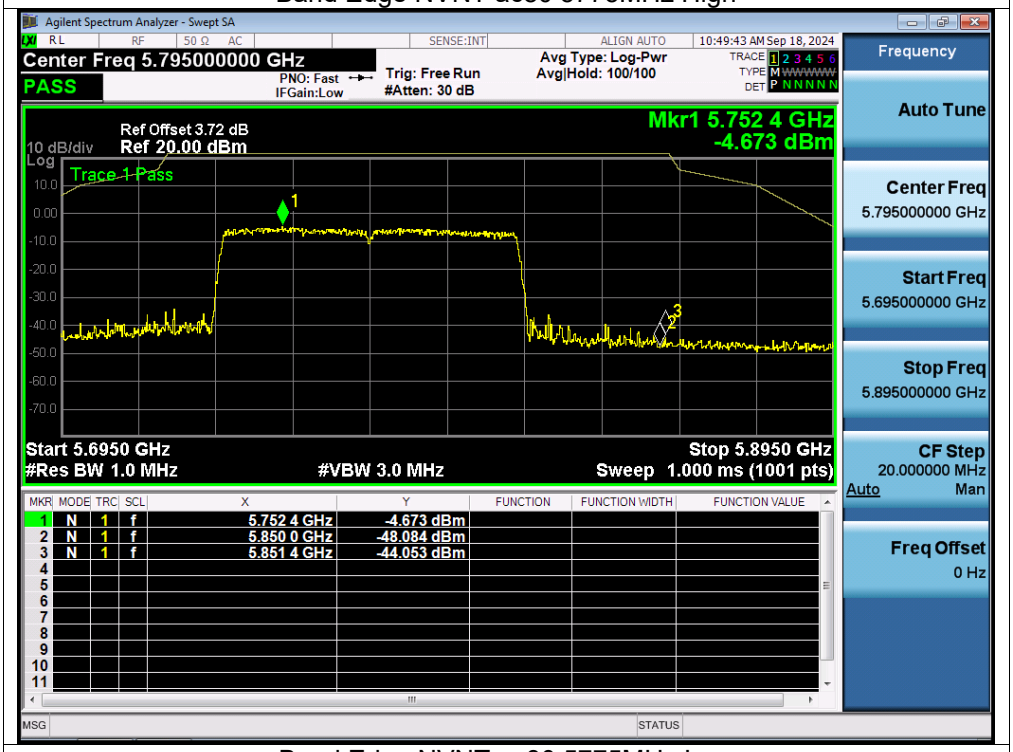


Band Edge NVNT ac40 5755MHz Low

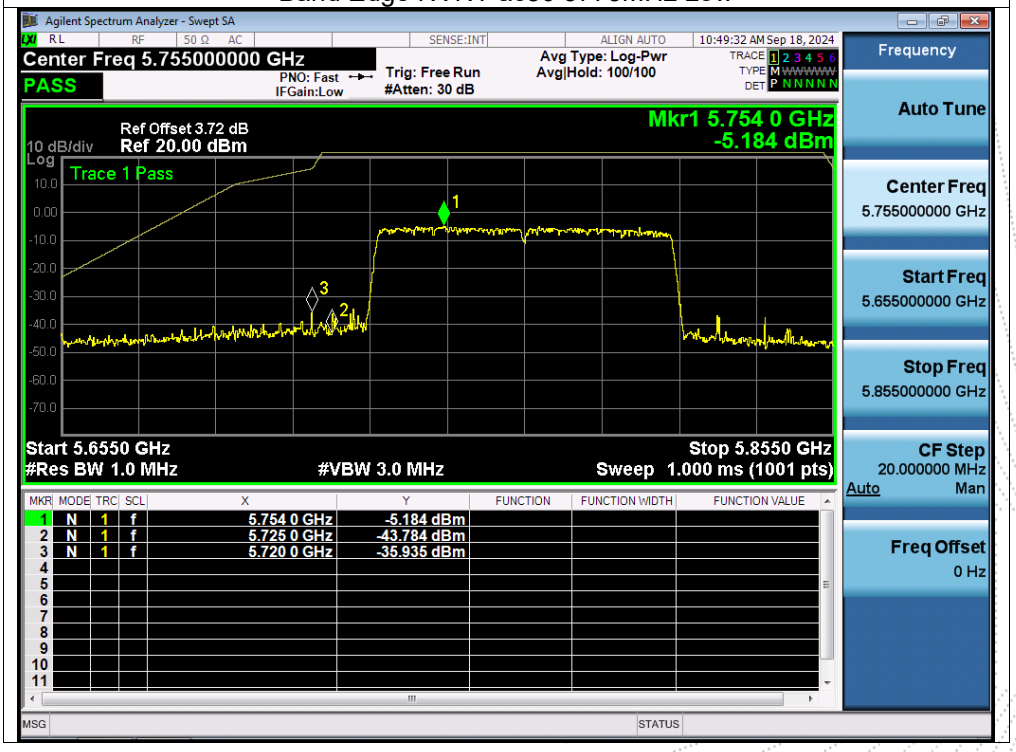
Band Edge NVNT ac40 5795MHz High



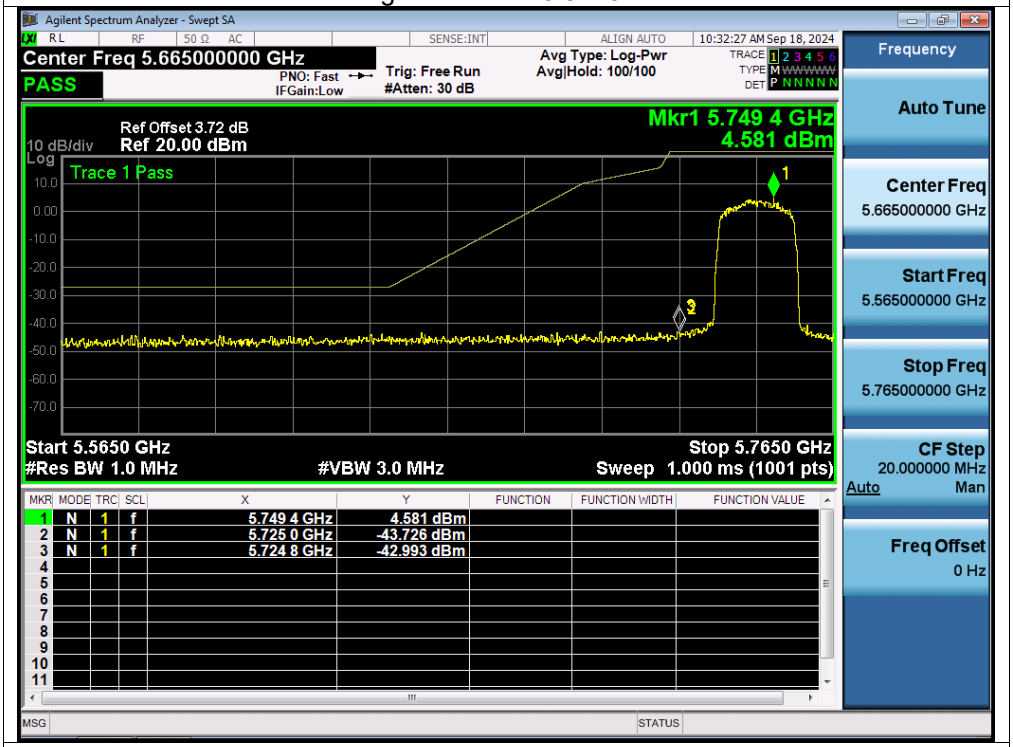
Band Edge NVNT ac80 5775MHz High



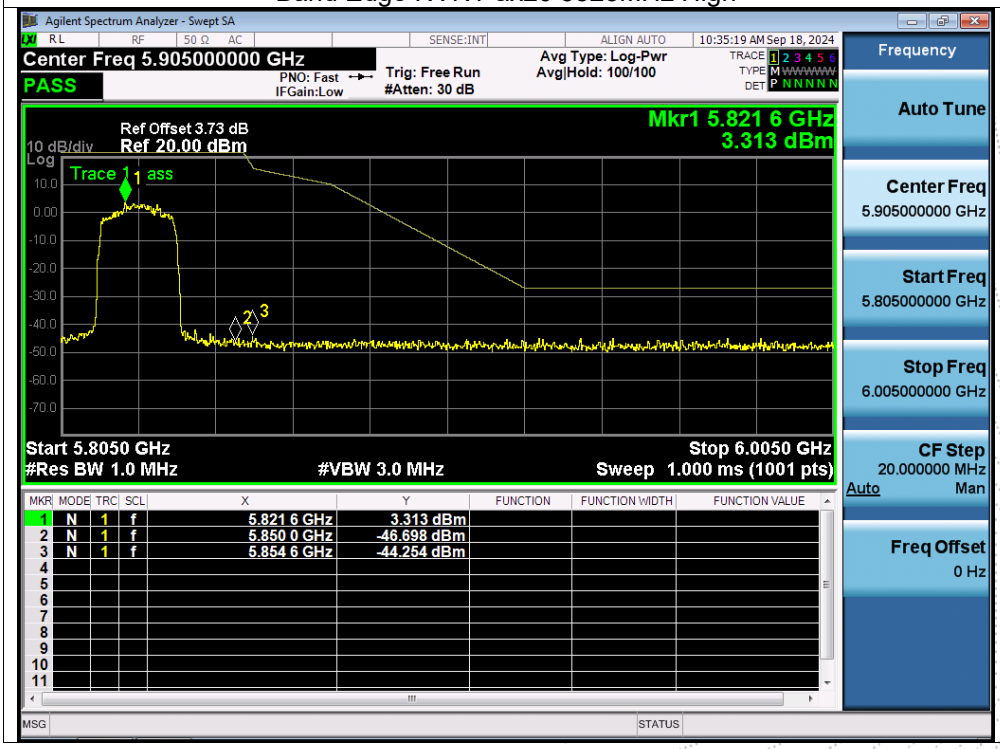
Band Edge NVNT ac80 5775MHz Low



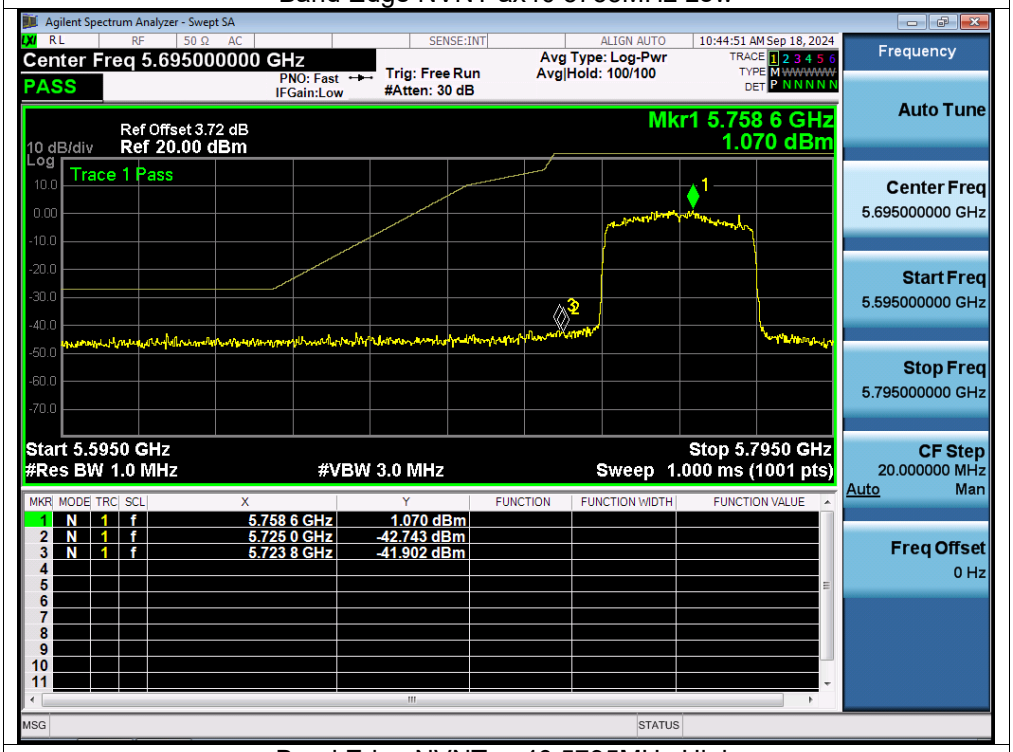
Band Edge NVNT ax20 5745MHz Low



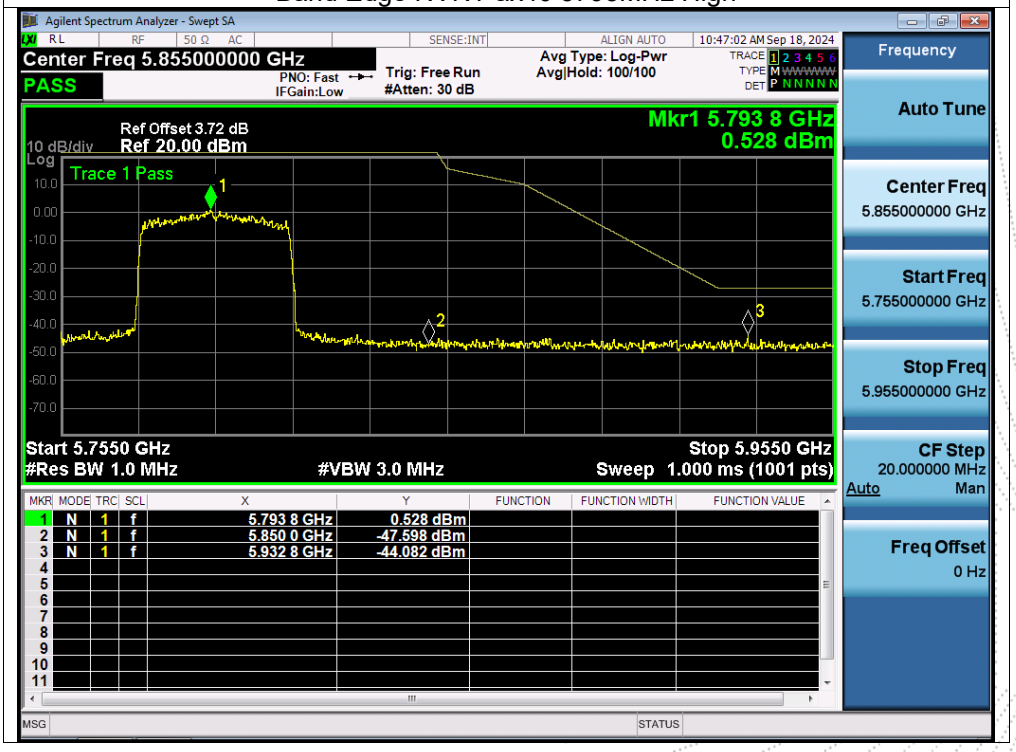
Band Edge NVNT ax20 5825MHz High



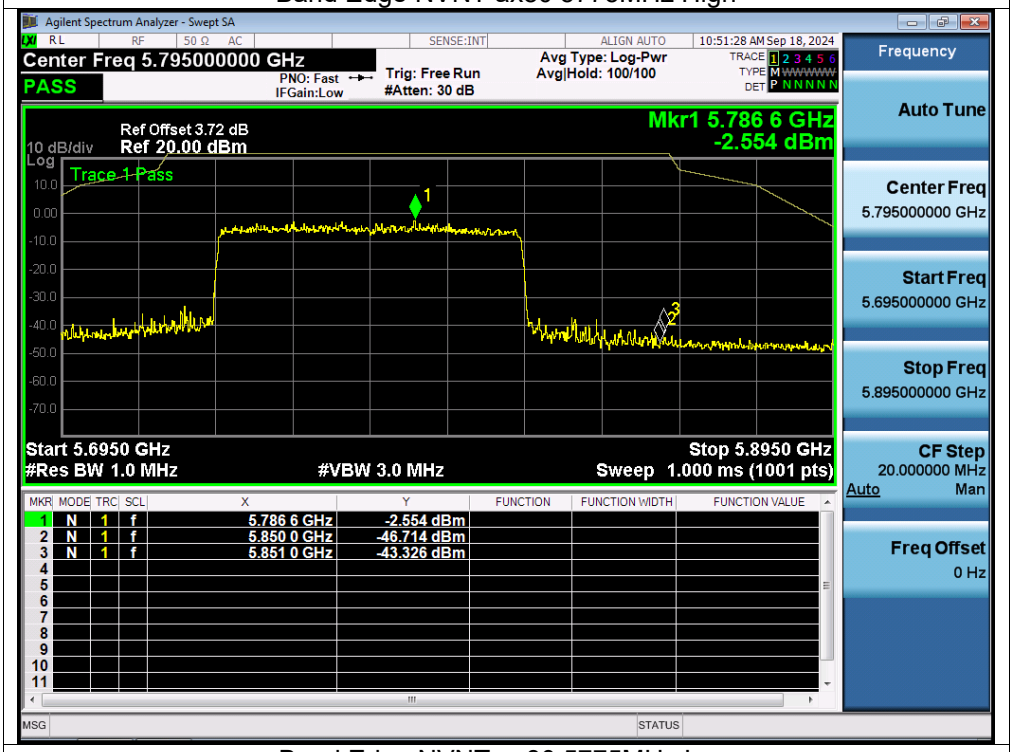
Band Edge NVNT ax40 5755MHz Low



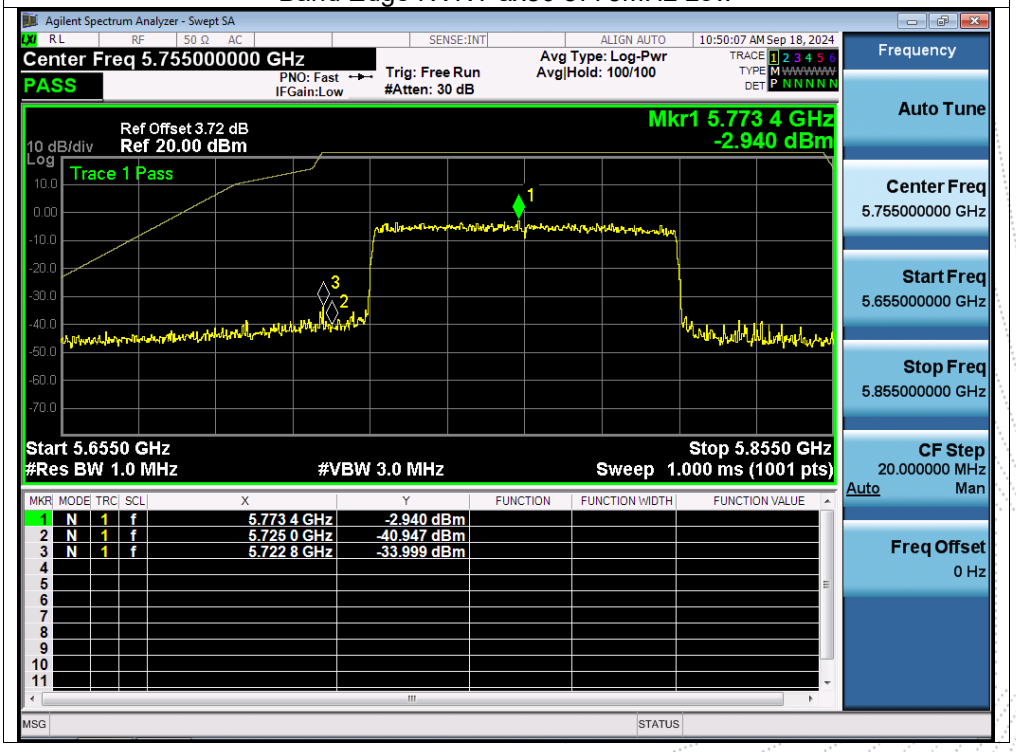
Band Edge NVNT ax40 5795MHz High



Band Edge NVNT ax80 5775MHz High

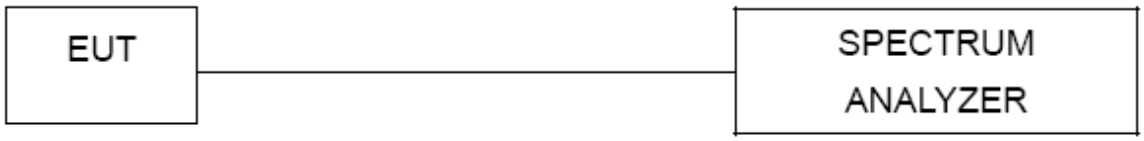


Band Edge NVNT ax80 5775MHz Low



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.

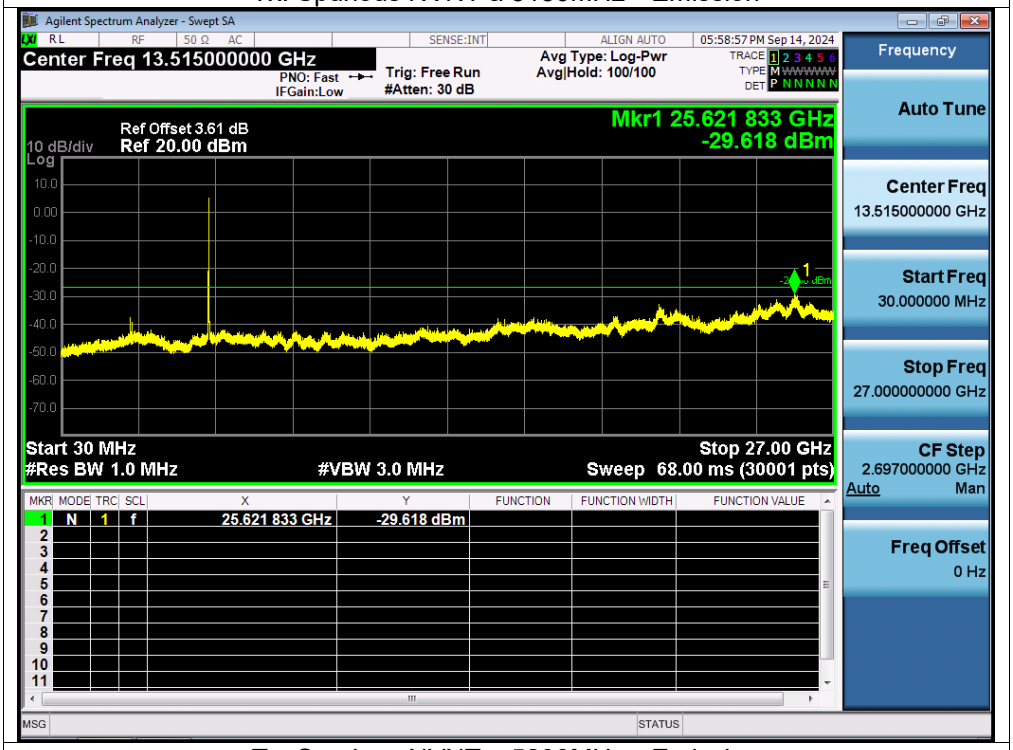
12.4 Test Result

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.

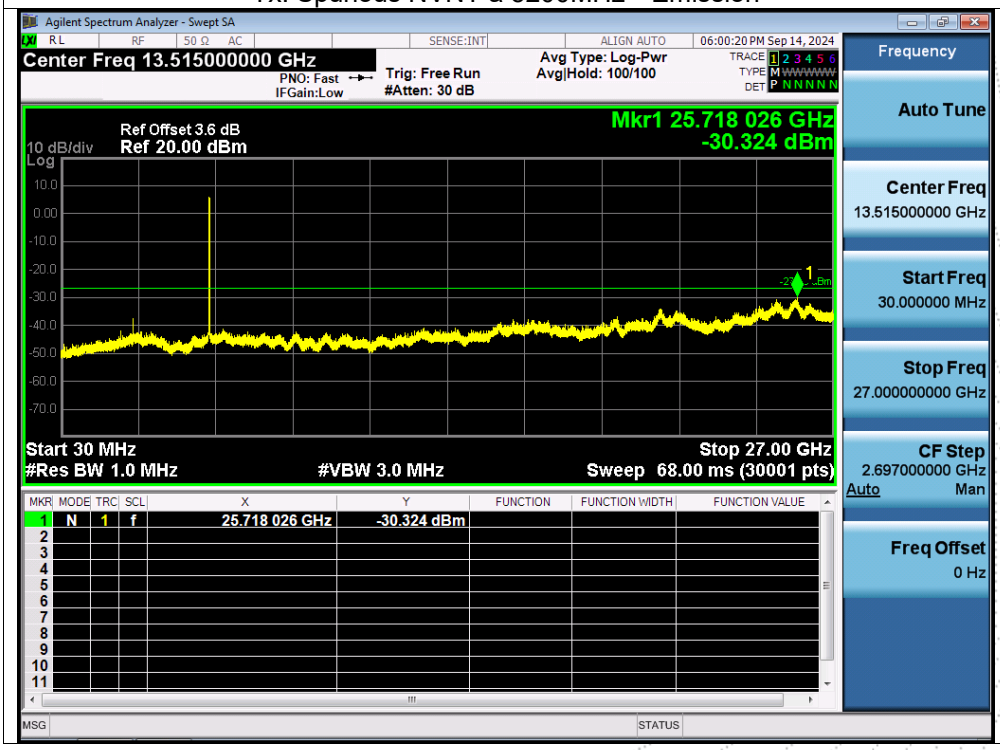
About:26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Test Graphs

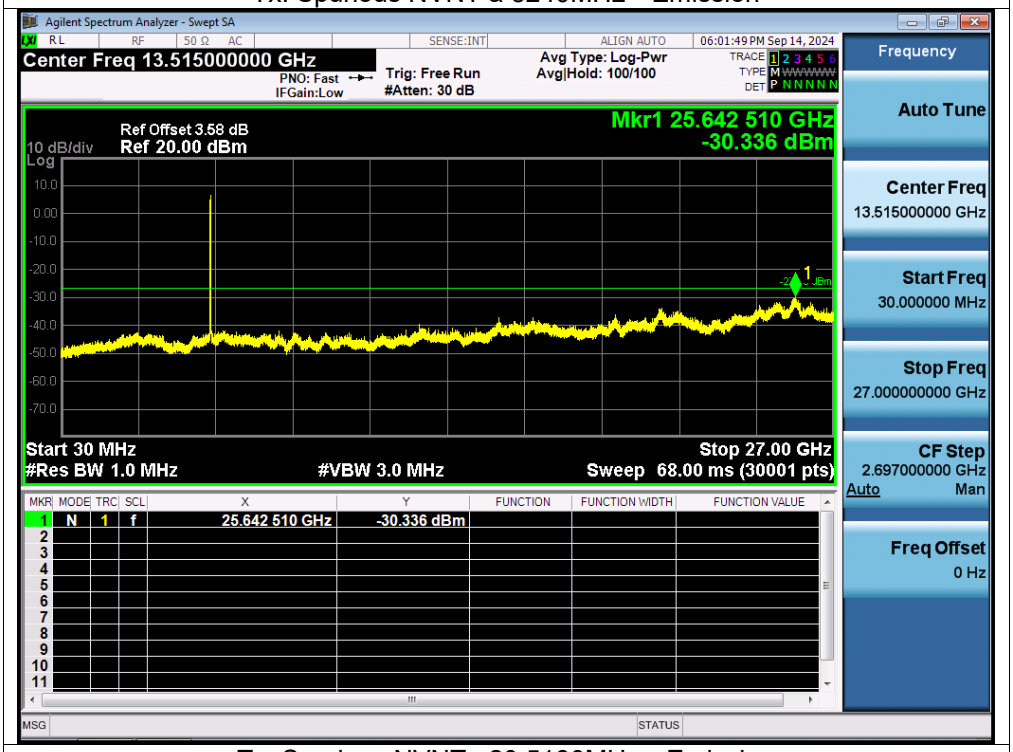
Tx. Spurious NVNT a 5180MHz Emission



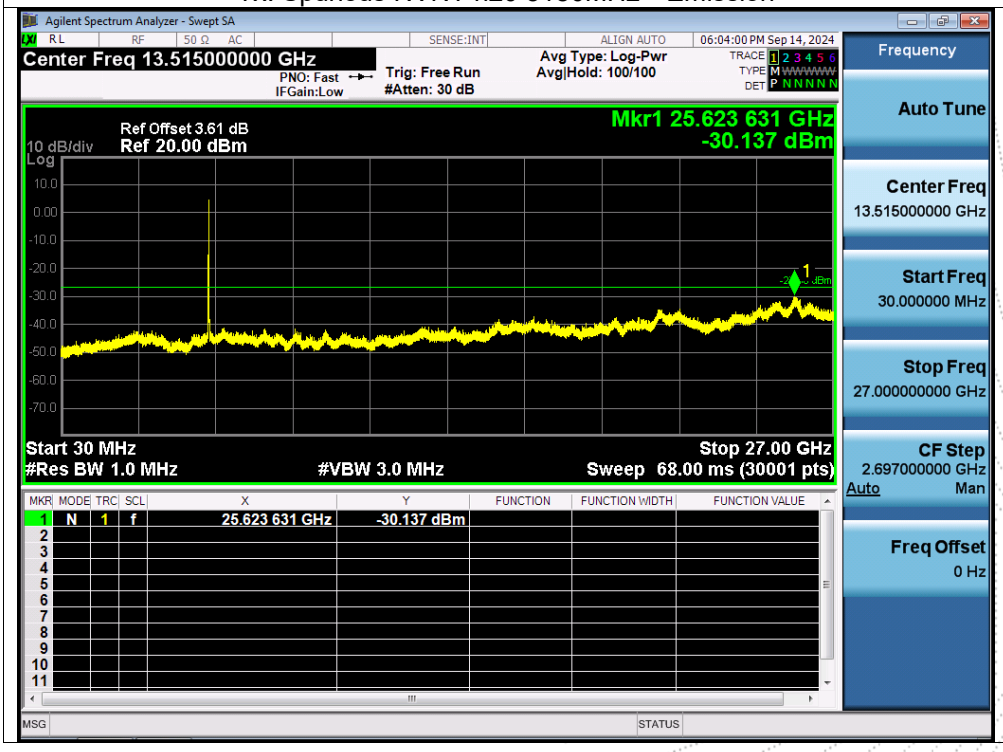
Tx. Spurious NVNT a 5200MHz Emission



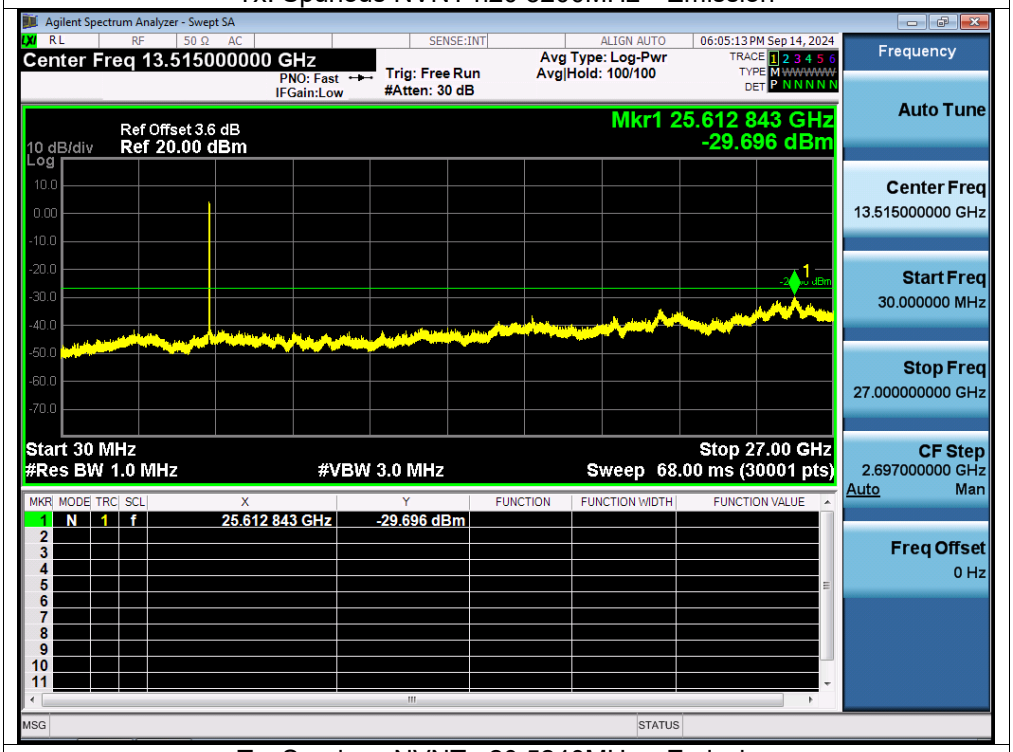
Tx. Spurious NVNT a 5240MHz Emission



Tx. Spurious NVNT n20 5180MHz Emission

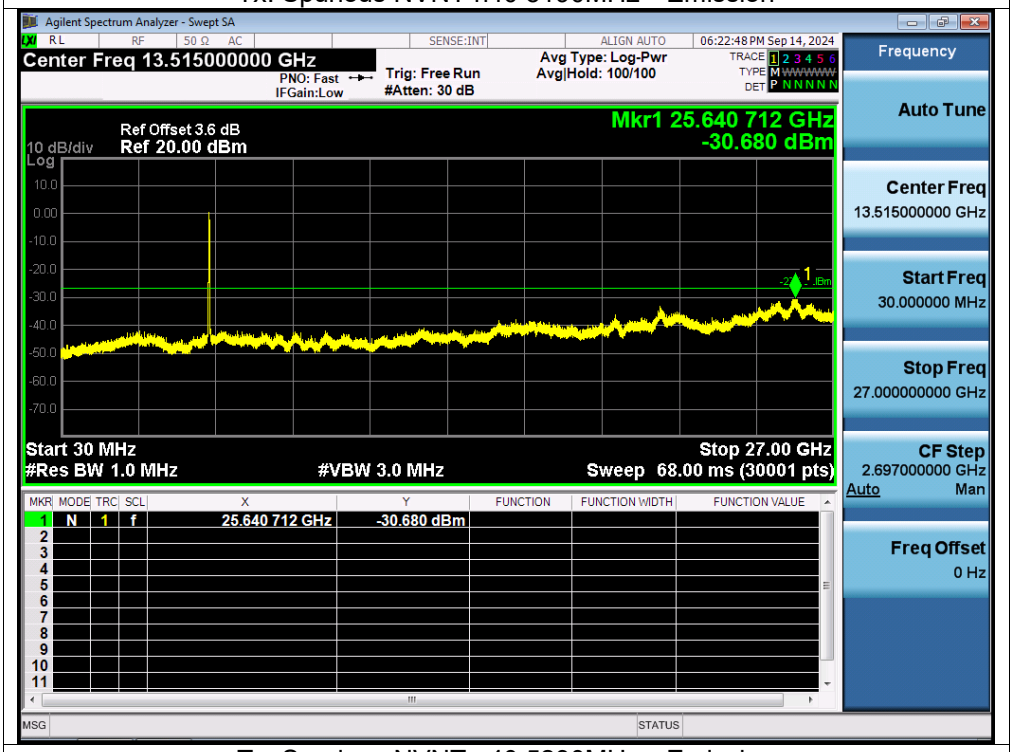


Tx. Spurious NVNT n20 5200MHz Emission

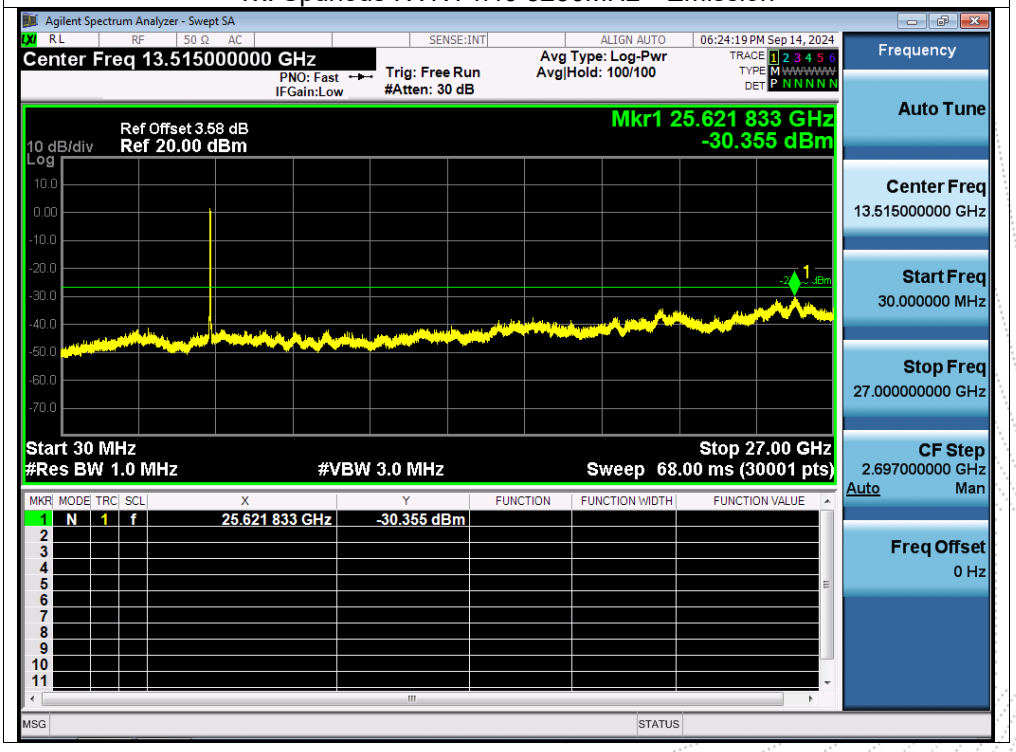


Tx. Spurious NVNT n20 5240MHz Emission

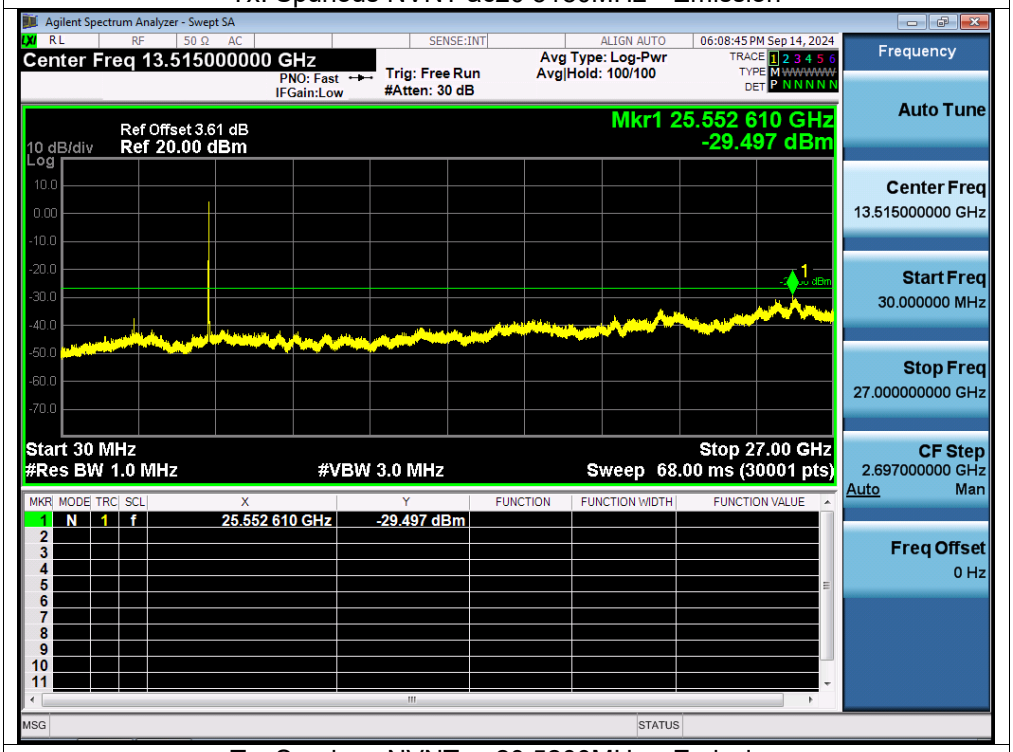
Tx. Spurious NVNT n40 5190MHz Emission



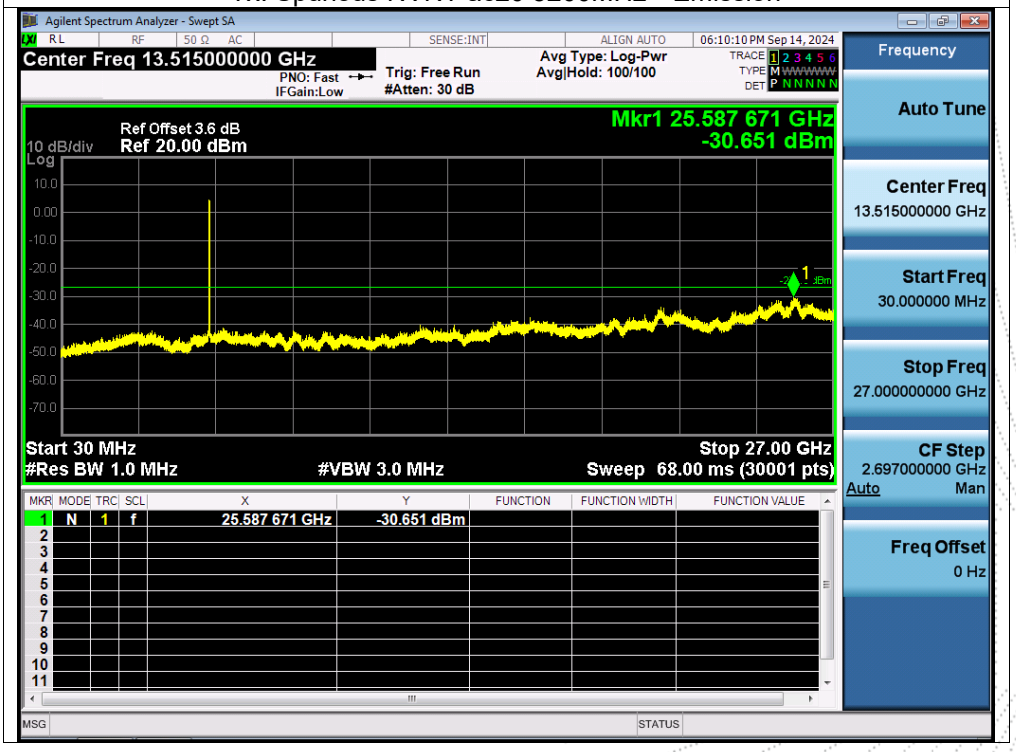
Tx. Spurious NVNT n40 5230MHz Emission



Tx. Spurious NVNT ac20 5180MHz Emission

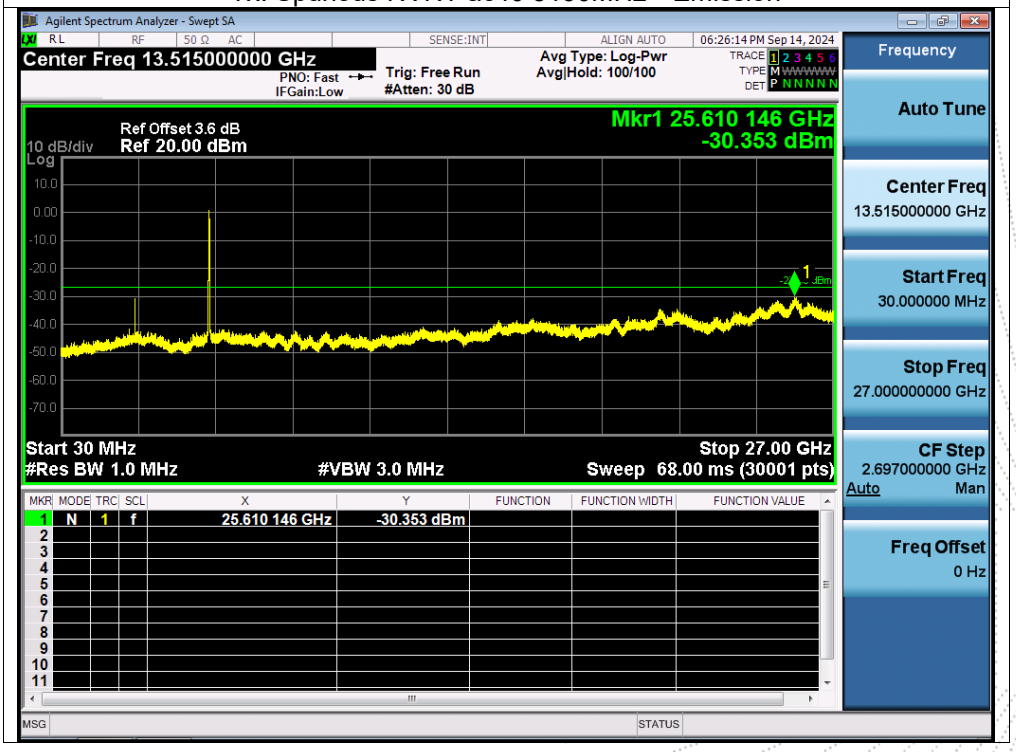


Tx. Spurious NVNT ac20 5200MHz Emission

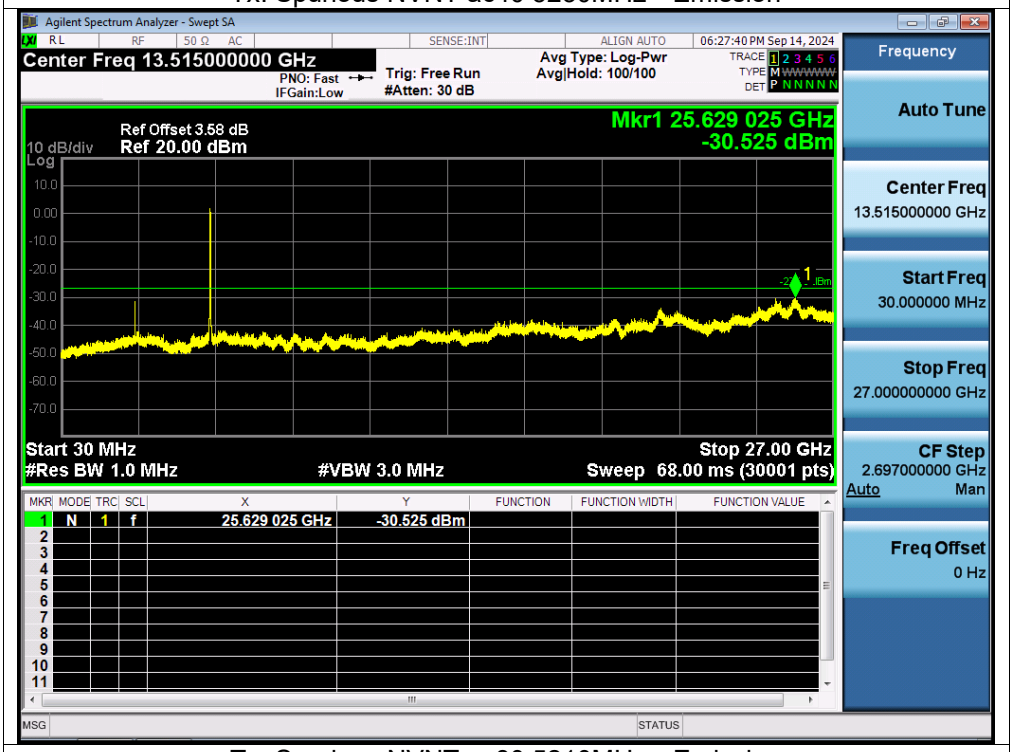


Tx. Spurious NVNT ac20 5240MHz Emission

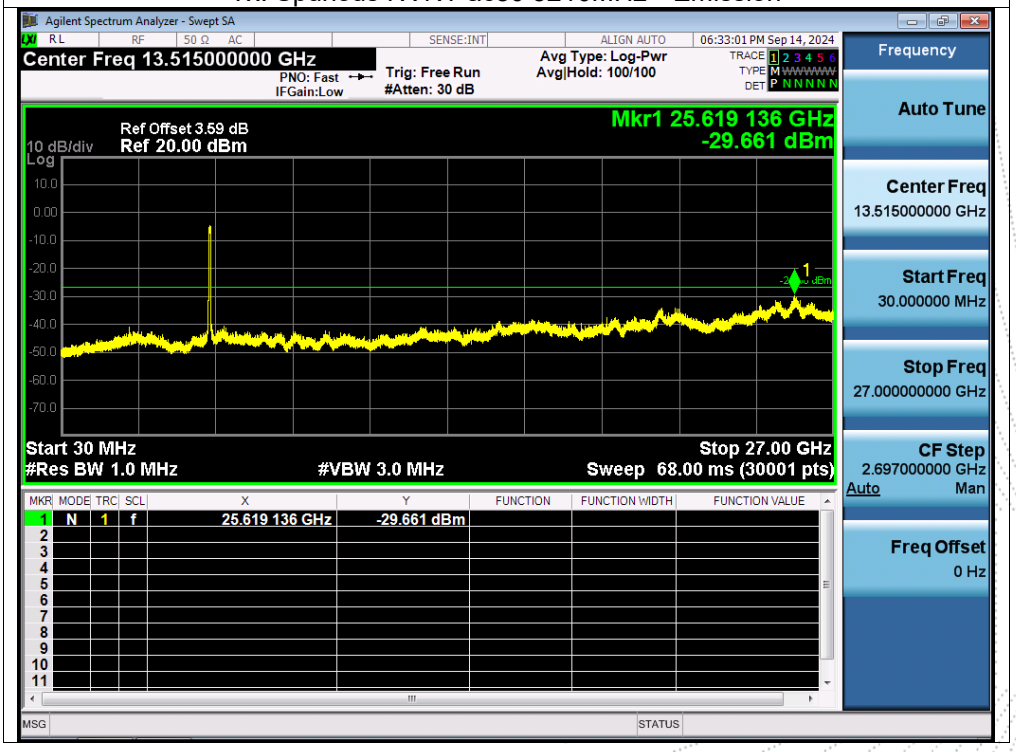
Tx. Spurious NVNT ac40 5190MHz Emission



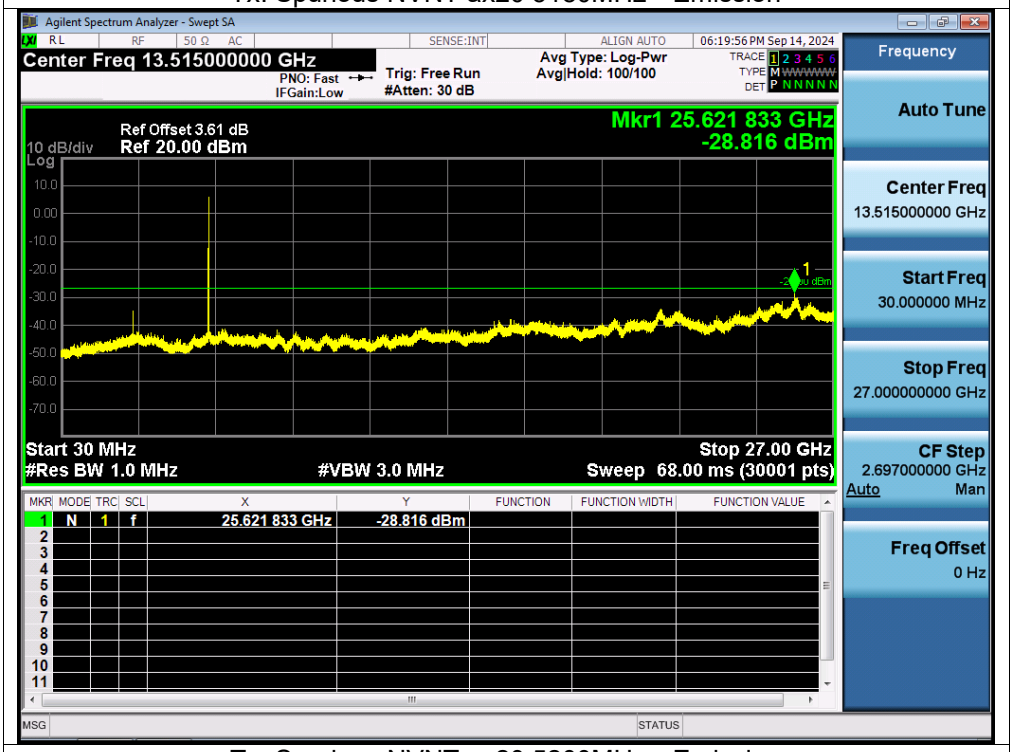
Tx. Spurious NVNT ac40 5230MHz Emission



Tx. Spurious NVNT ac80 5210MHz Emission

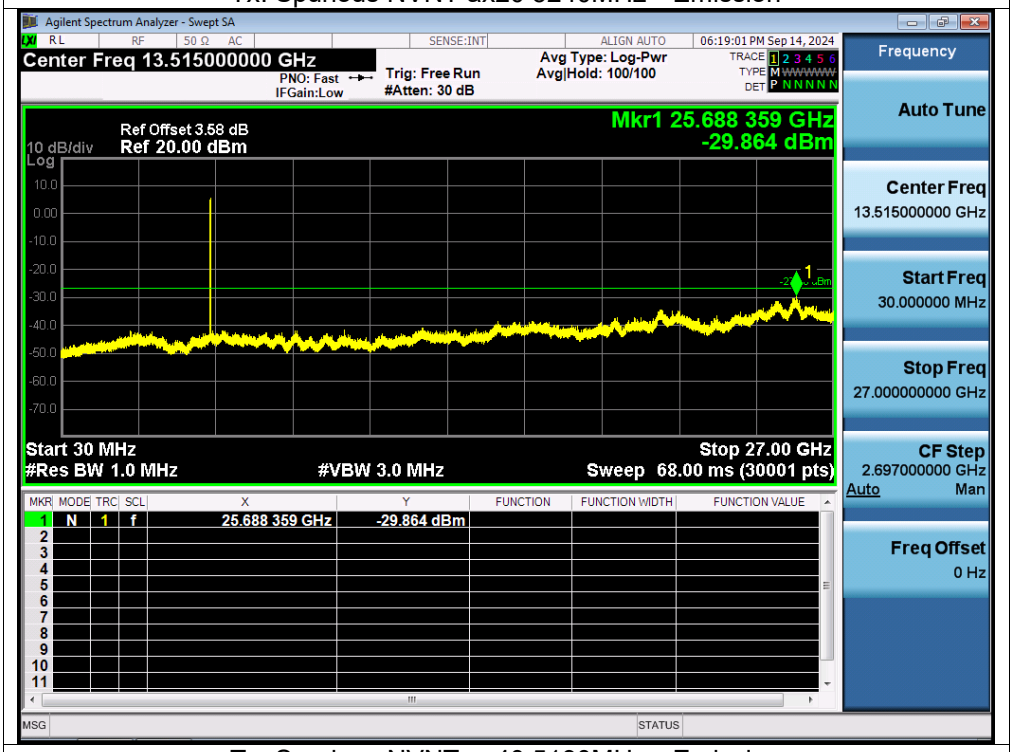


Tx. Spurious NVNT ax20 5180MHz Emission

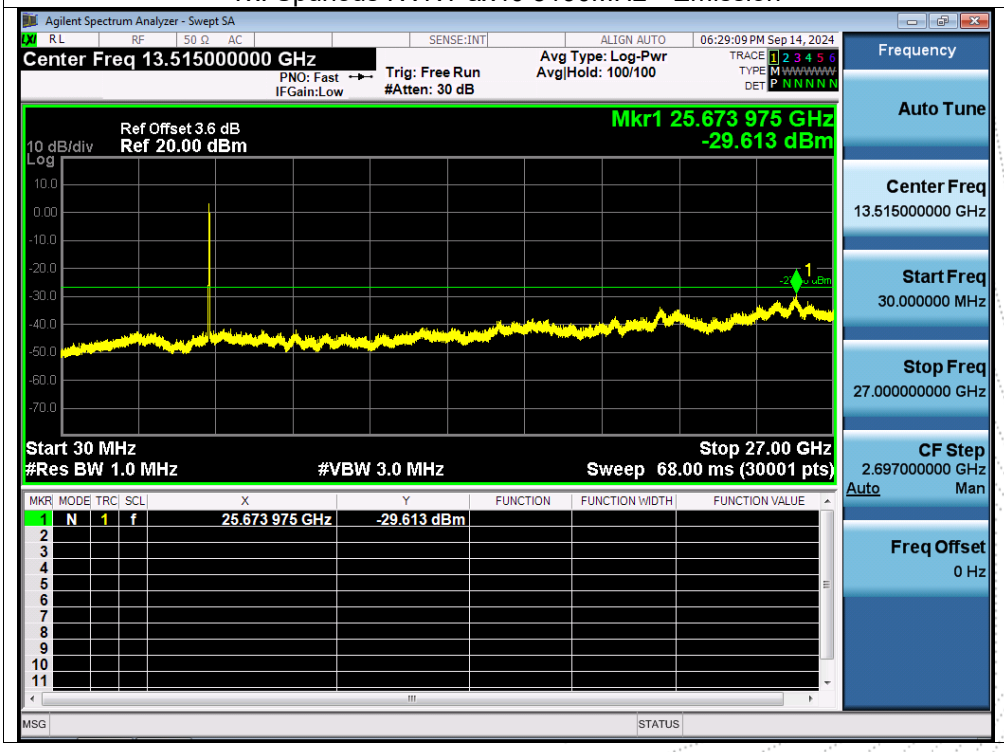


Tx. Spurious NVNT ax20 5200MHz Emission

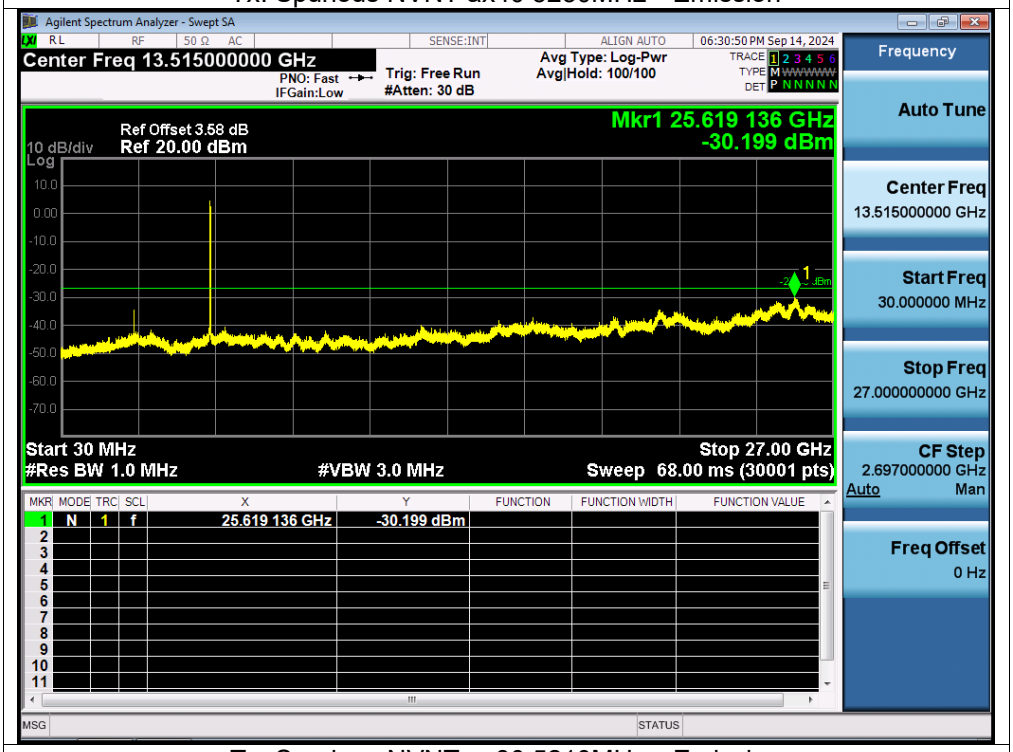
Tx. Spurious NVNT ax20 5240MHz Emission



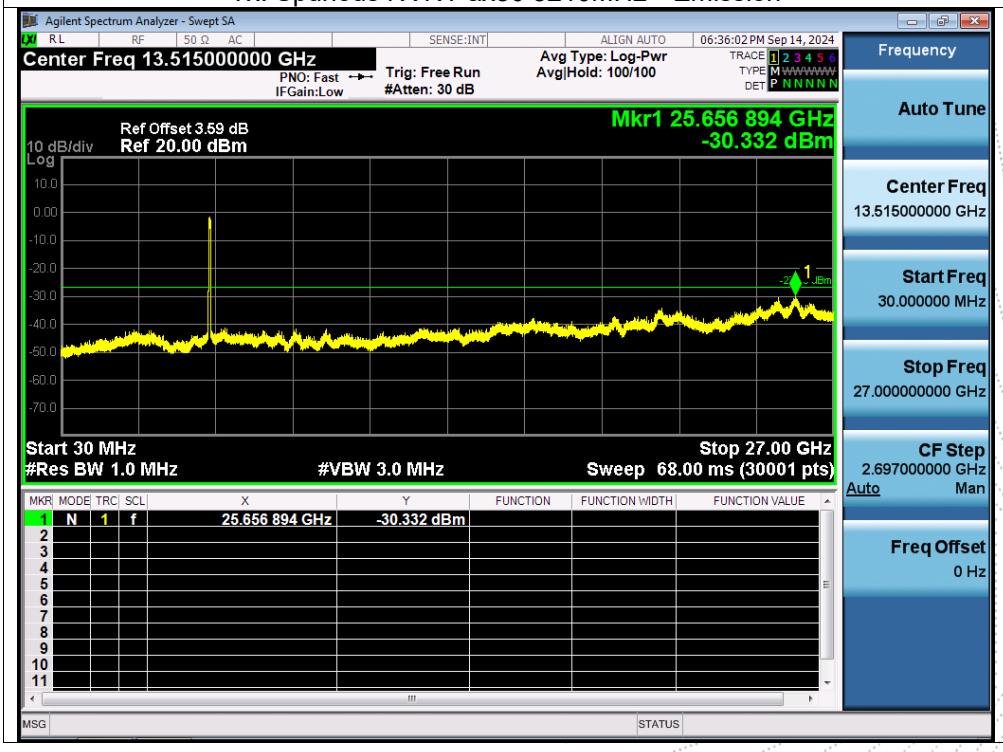
Tx. Spurious NVNT ax40 5190MHz Emission



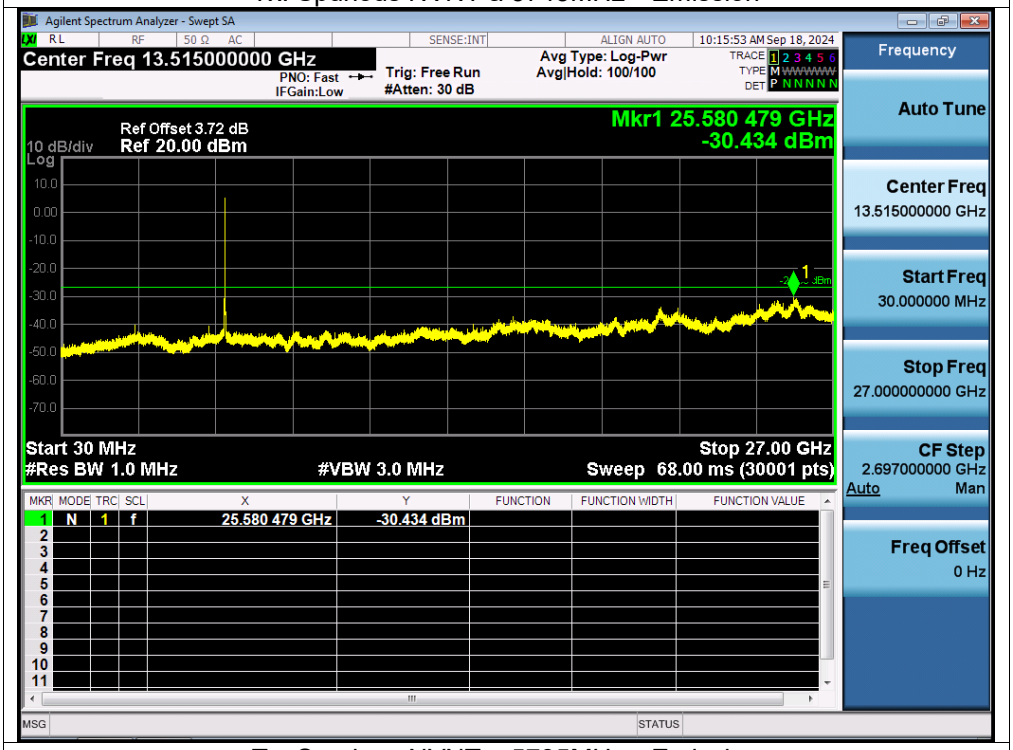
Tx. Spurious NVNT ax40 5230MHz Emission



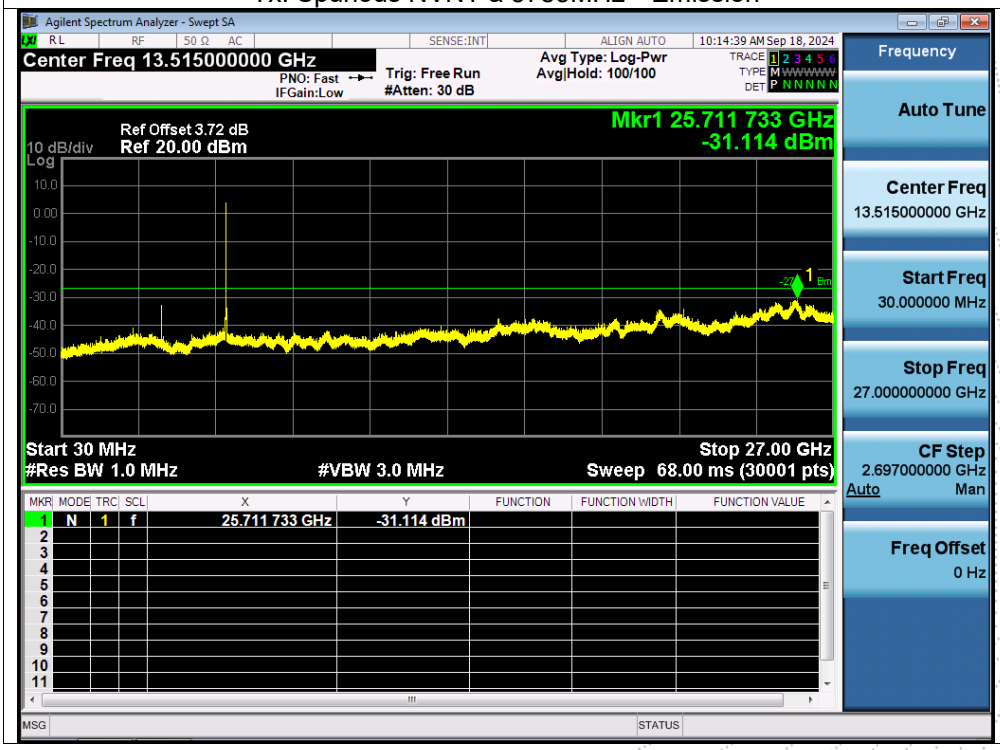
Tx. Spurious NVNT ax80 5210MHz Emission



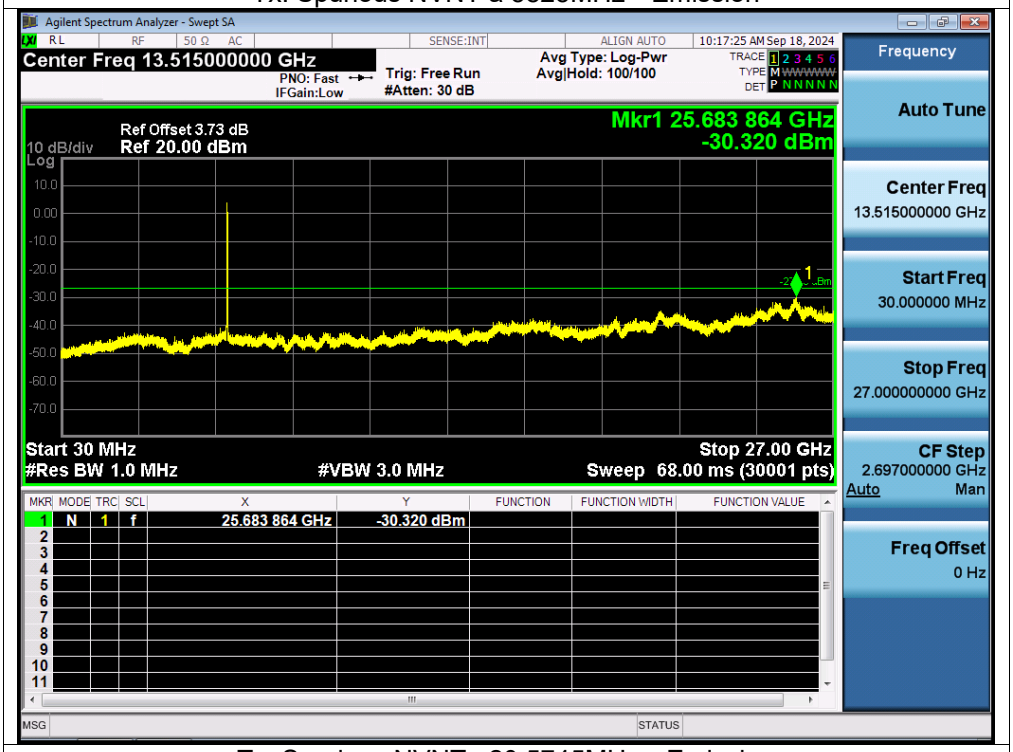
Test Graphs
Tx. Spurious NVNT a 5745MHz Emission



Tx. Spurious NVNT a 5785MHz Emission

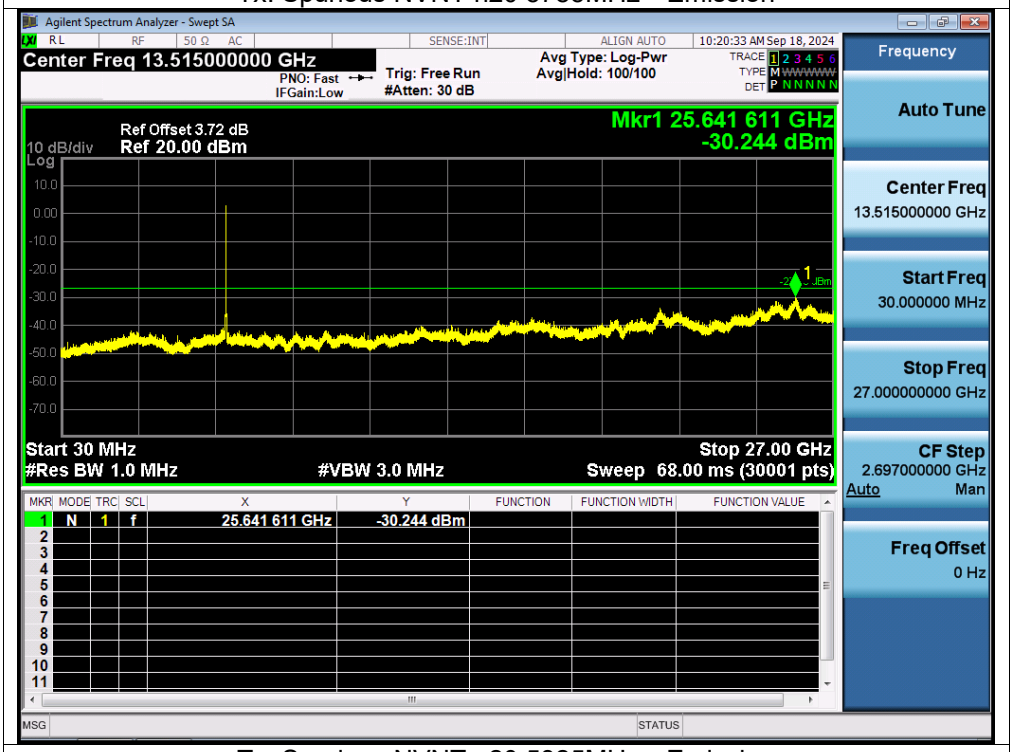


Tx. Spurious NVNT a 5825MHz Emission



Tx. Spurious NVNT n20 5745MHz Emission

Tx. Spurious NVNT n20 5785MHz Emission



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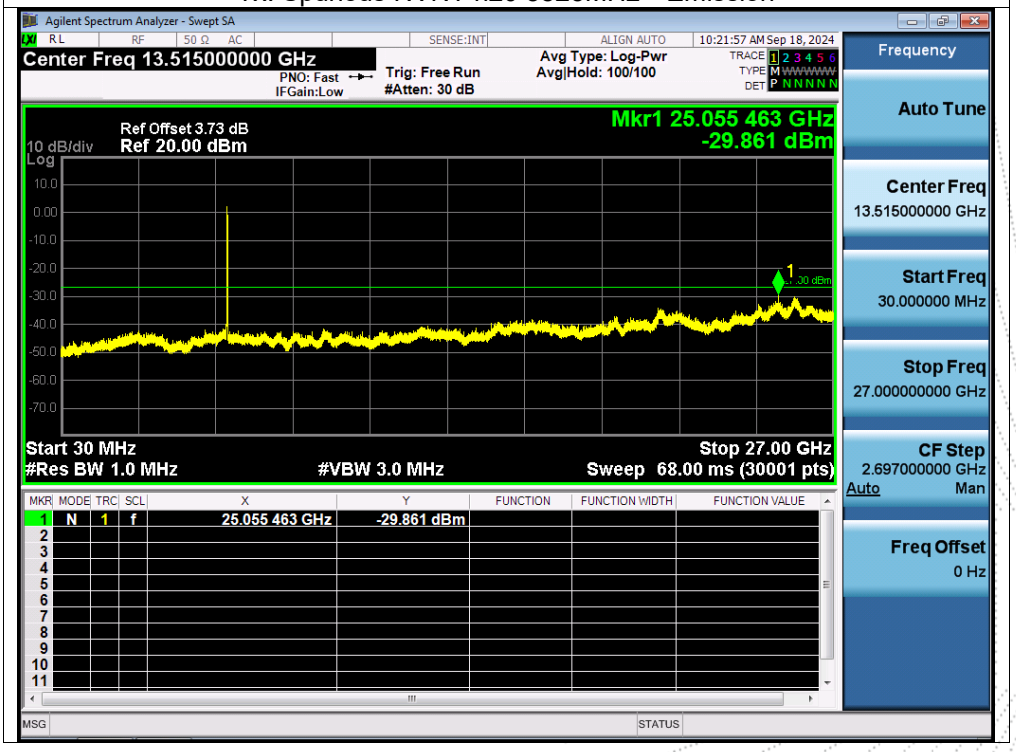
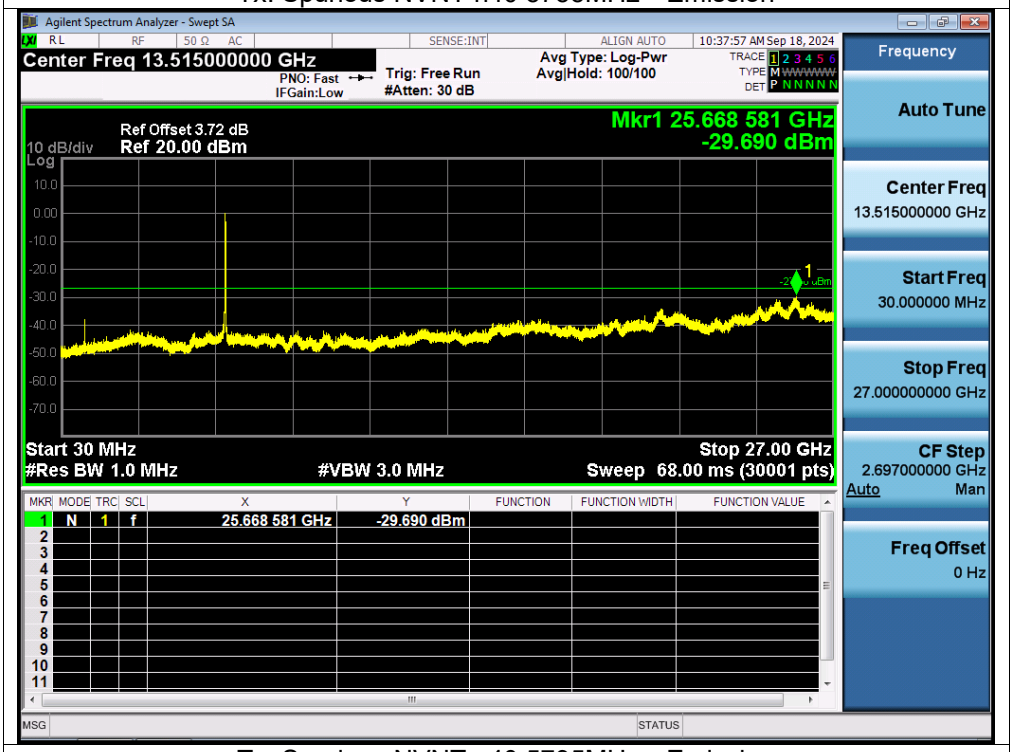
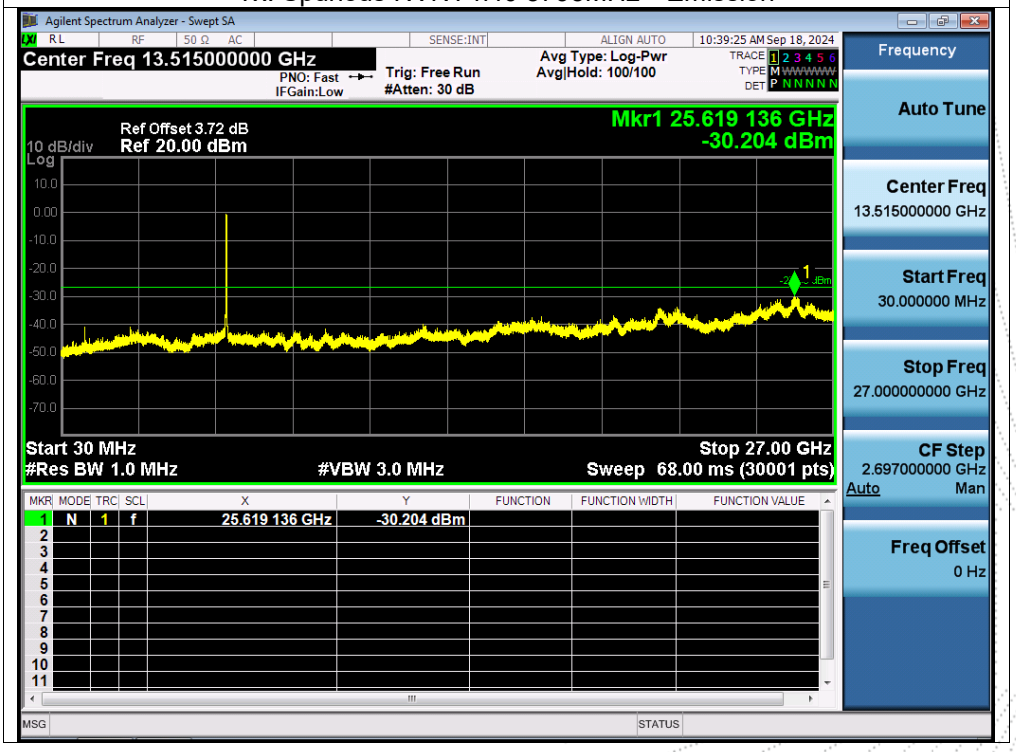


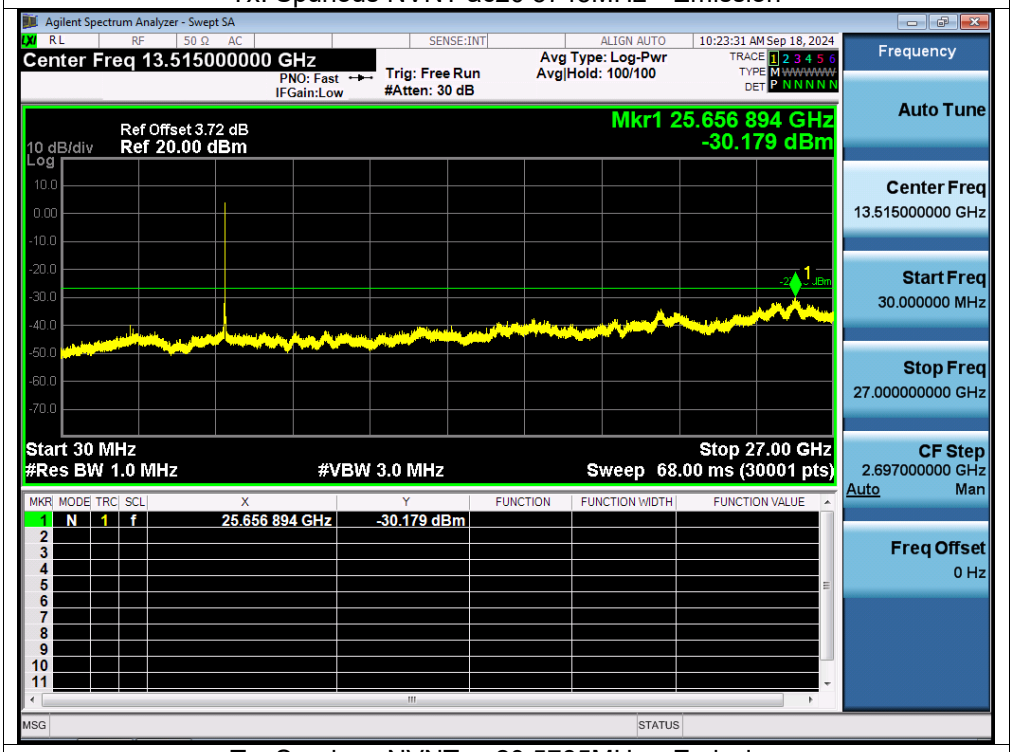
Tx. Spurious NVNT n40 5755MHz Emission



Tx. Spurious NVNT n40 5795MHz Emission

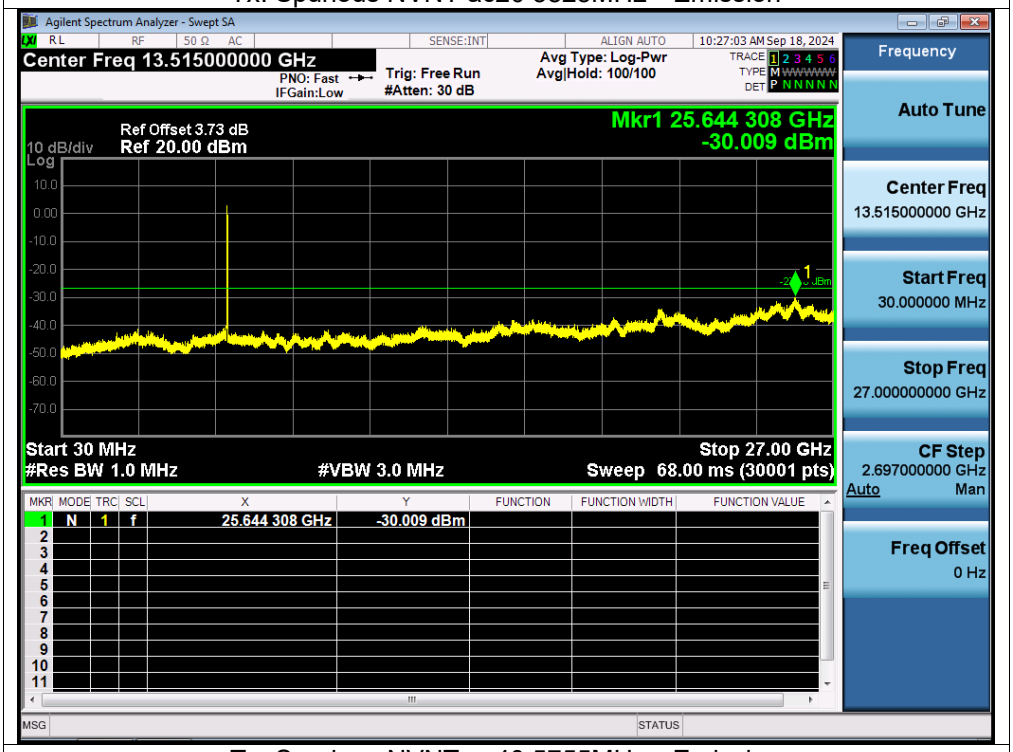


Tx. Spurious NVNT ac20 5745MHz Emission



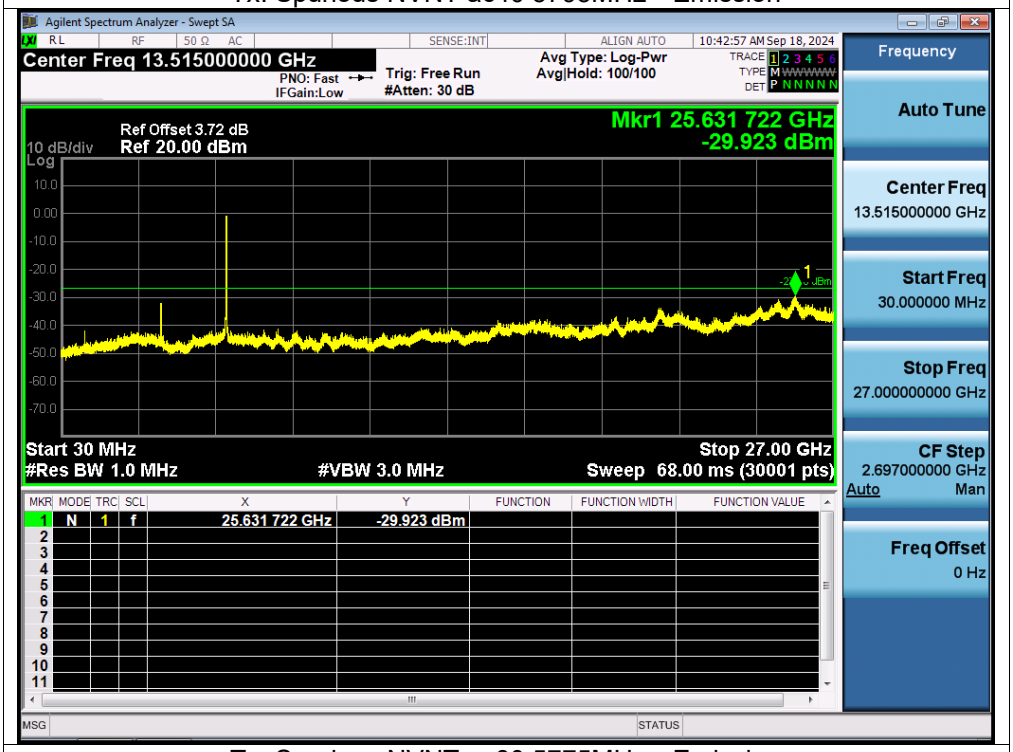
Tx. Spurious NVNT ac20 5785MHz Emission

Tx. Spurious NVNT ac20 5825MHz Emission



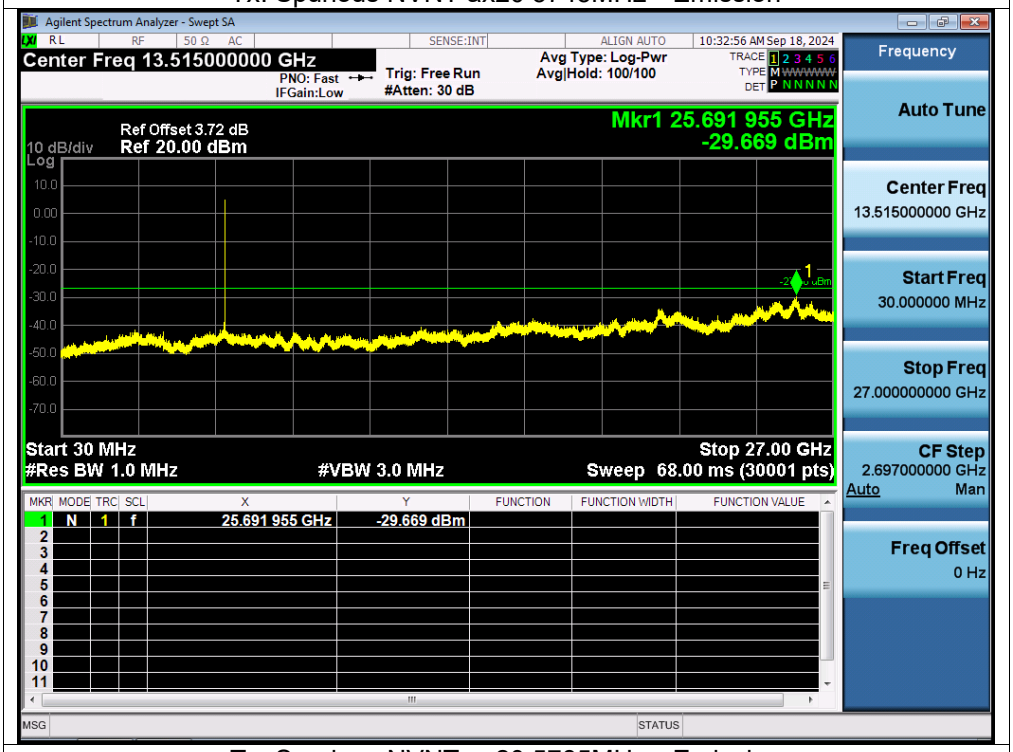
Tx. Spurious NVNT ac40 5755MHz Emission

Tx. Spurious NVNT ac40 5795MHz Emission



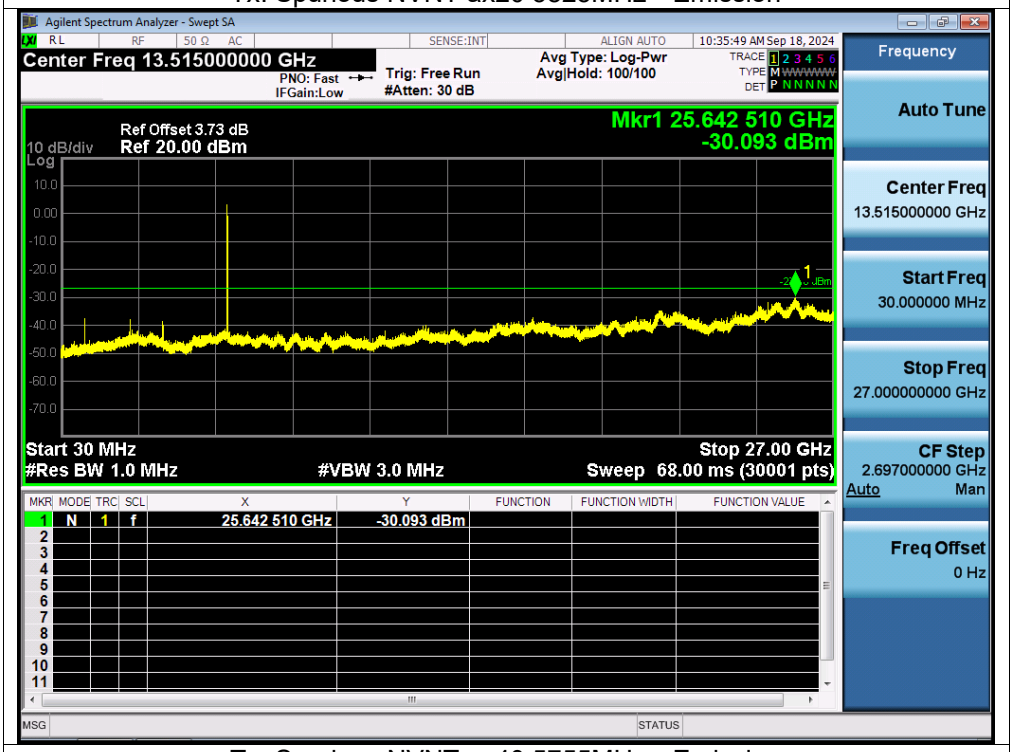
Tx. Spurious NVNT ac80 5775MHz Emission

Tx. Spurious NVNT ax20 5745MHz Emission



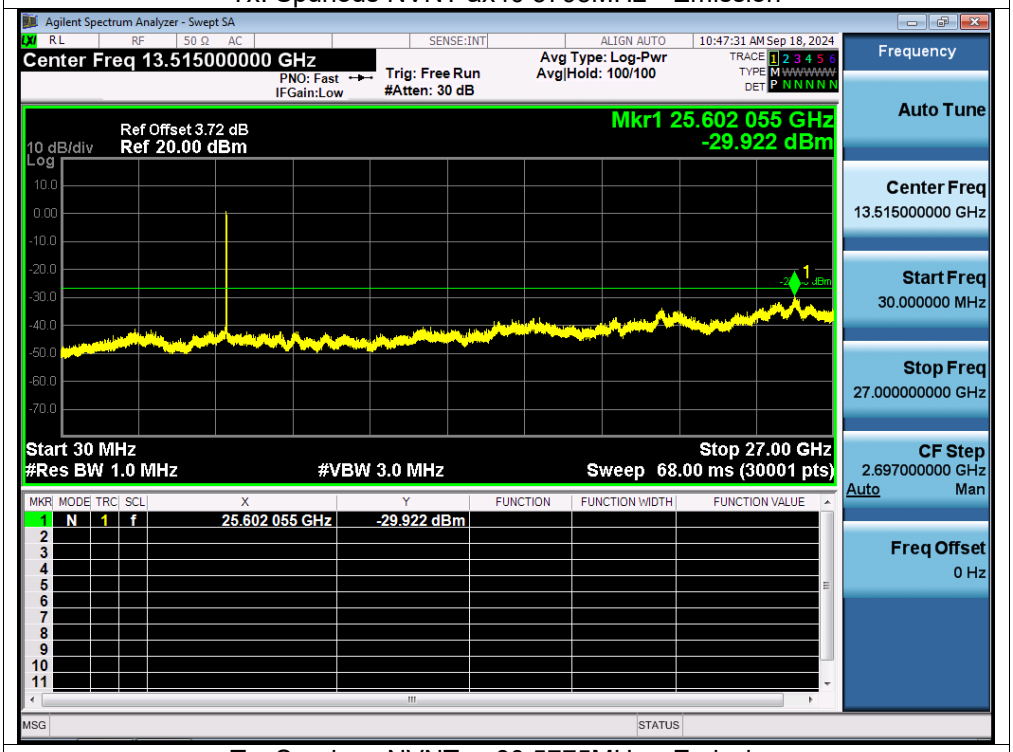
Tx. Spurious NVNT ax20 5785MHz Emission

Tx. Spurious NVNT ax20 5825MHz Emission

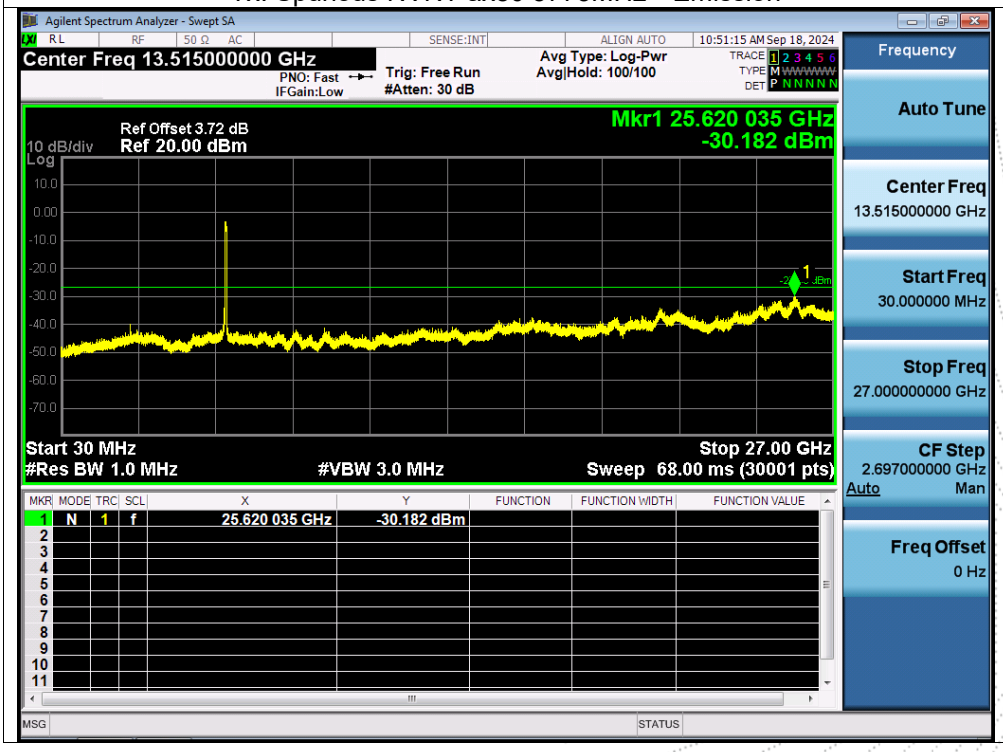


Tx. Spurious NVNT ax40 5755MHz Emission

Tx. Spurious NVNT ax40 5795MHz Emission

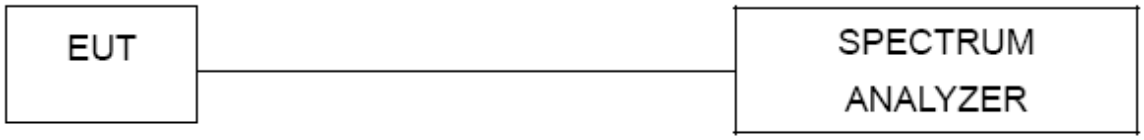


Tx. Spurious NVNT ax80 5775MHz Emission



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 3.87V
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)	3.87	5180.0021	5180	0.0021	0.4054
		V max (V)	4.45	5180.0057	5180	0.0057	1.1004
		V min (V)	3.29	5180.0018	5180	0.0018	0.3475
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)	3.87	T (°C)	-20	5180.0059	5180	0.0059	1.1390
		T (°C)	-10	5180.0044	5180	0.0044	0.8494
		T (°C)	0	5180.0135	5180	0.0135	2.6062
		T (°C)	10	5180.0122	5180	0.0122	2.3552
		T (°C)	20	5180.0060	5180	0.0060	1.1583
		T (°C)	30	5180.0040	5180	0.0040	0.7722
		T (°C)	40	5180.0007	5180	0.0007	0.1351
		T (°C)	50	5180.0093	5180	0.0093	1.7954
		T (°C)	60	5180.0079	5180	0.0079	1.5251
		T (°C)	70	5180.0092	5180	0.0092	1.7761
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)	3.87	5200.0120	5200	0.0120	2.3077
		V max (V)	4.45	5200.0037	5200	0.0037	0.7115
		V min (V)	3.29	5200.0108	5200	0.0108	2.0769
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)	3.87	T (°C)	-20	5200.00840	5200	0.00840	1.6154
		T (°C)	-10	5200.00740	5200	0.00740	1.4231
		T (°C)	0	5200.01280	5200	0.01280	2.4615
		T (°C)	10	5200.01120	5200	0.01120	2.1538
		T (°C)	20	5200.01240	5200	0.01240	2.3846
		T (°C)	30	5200.00290	5200	0.00290	0.5577
		T (°C)	40	5200.00340	5200	0.00340	0.6538
		T (°C)	50	5200.00440	5200	0.00440	0.8462
		T (°C)	60	5200.01270	5200	0.01270	2.4423
		T (°C)	70	5200.00150	5200	0.00150	0.2885
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)	3.87	5240.0091	5240	0.0091	1.7366
		V max (V)	4.45	5240.0070	5240	0.0070	1.3359
		V min (V)	3.29	5240.0084	5240	0.0084	1.6031
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)	3.87	T (°C)	-20	5240.0013	5240	0.0013	0.2481
		T (°C)	-10	5240.0059	5240	0.0059	1.1260
		T (°C)	0	5240.0018	5240	0.0018	0.3435
		T (°C)	10	5240.0111	5240	0.0111	2.1183
		T (°C)	20	5240.0036	5240	0.0036	0.6870
		T (°C)	30	5240.0111	5240	0.0111	2.1183
		T (°C)	40	5240.0033	5240	0.0033	0.6298
		T (°C)	50	5240.0054	5240	0.0054	1.0305
		T (°C)	60	5240.0056	5240	0.0056	1.0687
		T (°C)	70	5240.0043	5240	0.0043	0.8206
Limits				5150-5250 MHz			
Result				Complies			

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage:	DC 3.87V
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)	3.87	5745.00700	5745	0.00700	1.2185
		V max (V)	4.45	5745.01020	5745	0.01020	1.7755
		V min (V)	3.29	5745.00890	5745	0.00890	1.5492
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)	3.87	T (°C)	-20	5745.00270	5745	0.00270	0.4700
		T (°C)	-10	5745.00410	5745	0.00410	0.7137
		T (°C)	0	5745.00860	5745	0.00860	1.4970
		T (°C)	10	5745.01260	5745	0.01260	2.1932
		T (°C)	20	5745.00700	5745	0.00700	1.2185
		T (°C)	30	5745.01190	5745	0.01190	2.0714
		T (°C)	40	5745.00940	5745	0.00940	1.6362
		T (°C)	50	5745.00010	5745	0.00010	0.0174
		T (°C)	60	5745.01330	5745	0.01330	2.3151
		T (°C)	70	5745.00490	5745	0.00490	0.8529
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)	3.87	5785.01030	5785	0.01030	1.7805
		V max (V)	4.45	5785.00210	5785	0.00210	0.3630
		V min (V)	3.29	5785.00320	5785	0.00320	0.5532
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)	3.87	T (°C)	-20	5785.00380	5785	0.00380	0.6569
		T (°C)	-10	5785.00680	5785	0.00680	1.1755
		T (°C)	0	5785.00970	5785	0.00970	1.6768
		T (°C)	10	5785.00940	5785	0.00940	1.6249
		T (°C)	20	5785.00440	5785	0.00440	0.7606
		T (°C)	30	5785.00510	5785	0.00510	0.8816
		T (°C)	40	5785.01020	5785	0.01020	1.7632
		T (°C)	50	5785.00010	5785	0.00010	0.0173
		T (°C)	60	5785.00850	5785	0.00850	1.4693
		T (°C)	70	5785.00680	5785	0.00680	1.1755
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)	3.87	5825.00980	5825	0.00980	1.6824
		V max (V)	4.45	5825.00230	5825	0.00230	0.3948
		V min (V)	3.29	5825.00390	5825	0.00390	0.6695
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)	3.87	T (°C)	-20	5825.00550	5825	0.00550	0.9442
		T (°C)	-10	5825.00740	5825	0.00740	1.2704
		T (°C)	0	5825.01060	5825	0.01060	1.8197
		T (°C)	10	5825.01250	5825	0.01250	2.1459
		T (°C)	20	5825.00550	5825	0.00550	0.9442
		T (°C)	30	5825.00890	5825	0.00890	1.5279
		T (°C)	40	5825.01240	5825	0.01240	2.1288
		T (°C)	50	5825.00790	5825	0.00790	1.3562
		T (°C)	60	5825.01080	5825	0.01080	1.8541
		T (°C)	70	5825.01280	5825	0.01280	2.1974
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

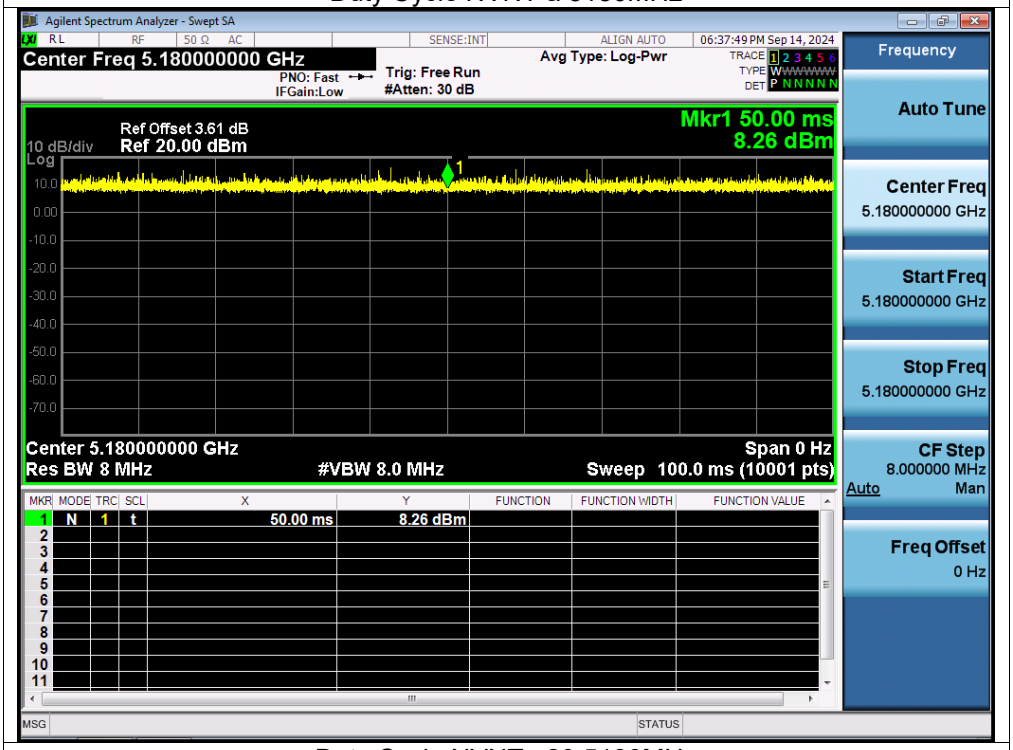
14.4 Test Result

5.1G

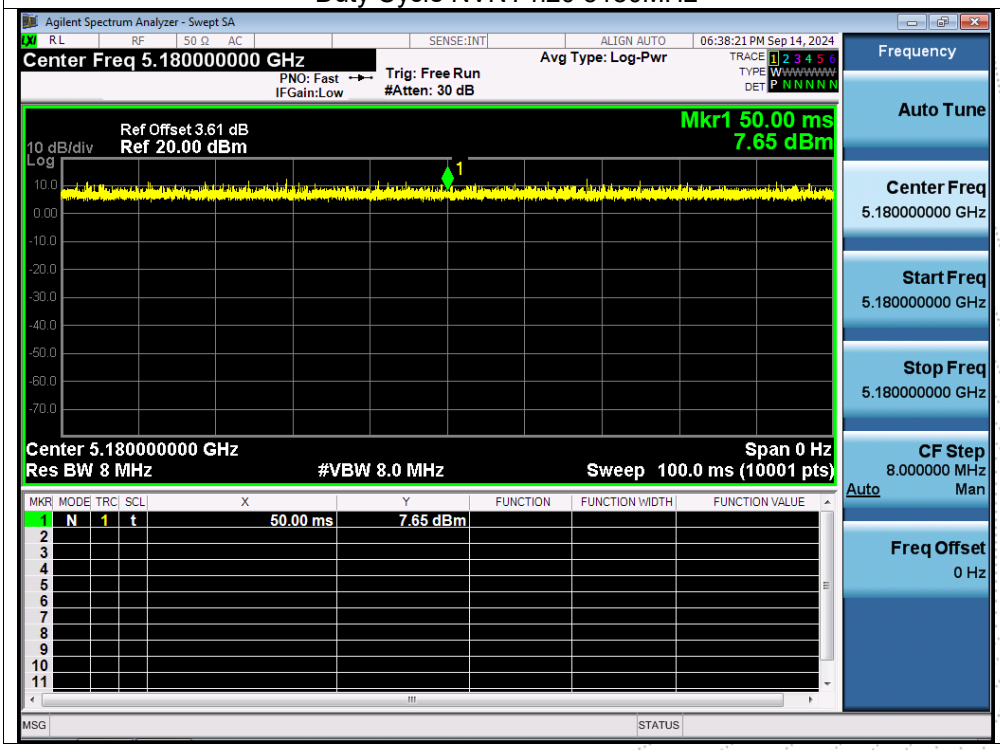
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)
NVNT	a	5180	100	0
NVNT	n20	5180	100	0
NVNT	n40	5190	100	0
NVNT	ac20	5180	100	0
NVNT	ac40	5190	100	0
NVNT	ac80	5210	100	0
NVNT	ax20	5180	100	0
NVNT	ax40	5190	100	0
NVNT	ax80	5210	100	0

Test Graphs

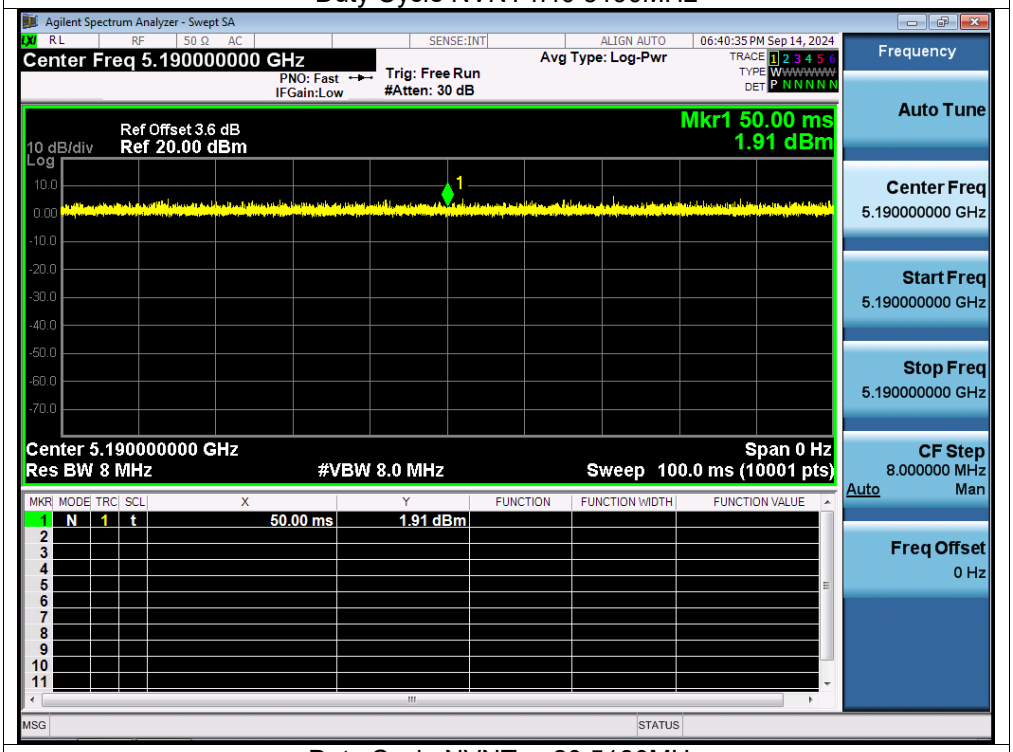
Duty Cycle NVNT a 5180MHz



Duty Cycle NVNT n20 5180MHz



Duty Cycle NVNT n40 5190MHz



Duty Cycle NVNT ac20 5180MHz