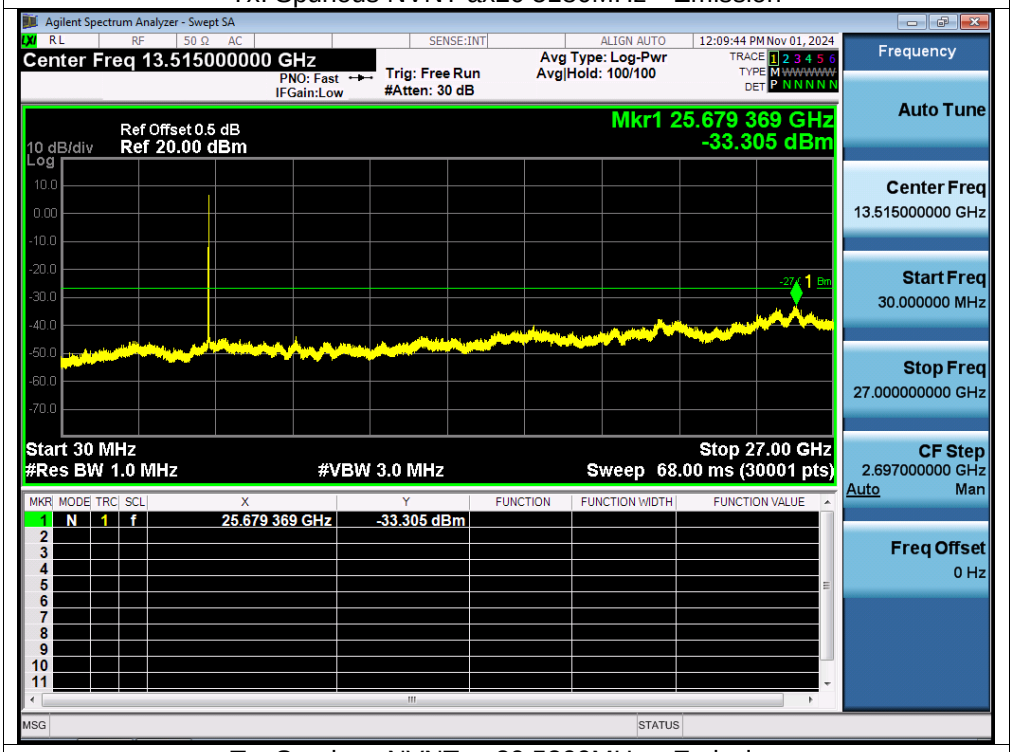
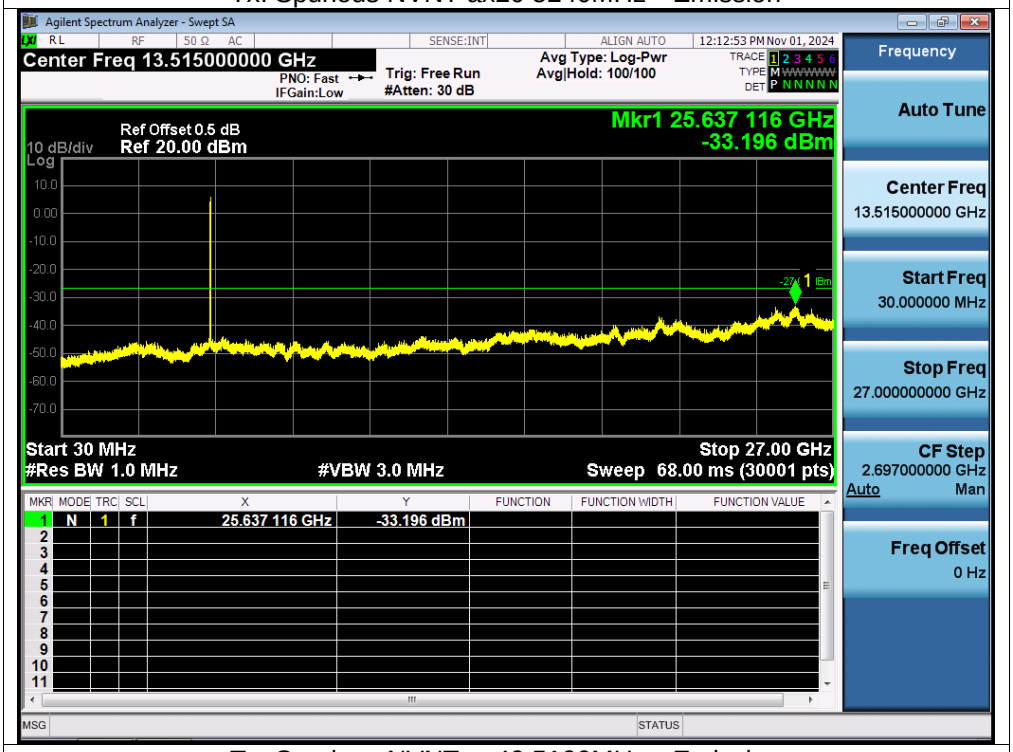
Tx. Spurious NVNT ax20 5180MHz Emission



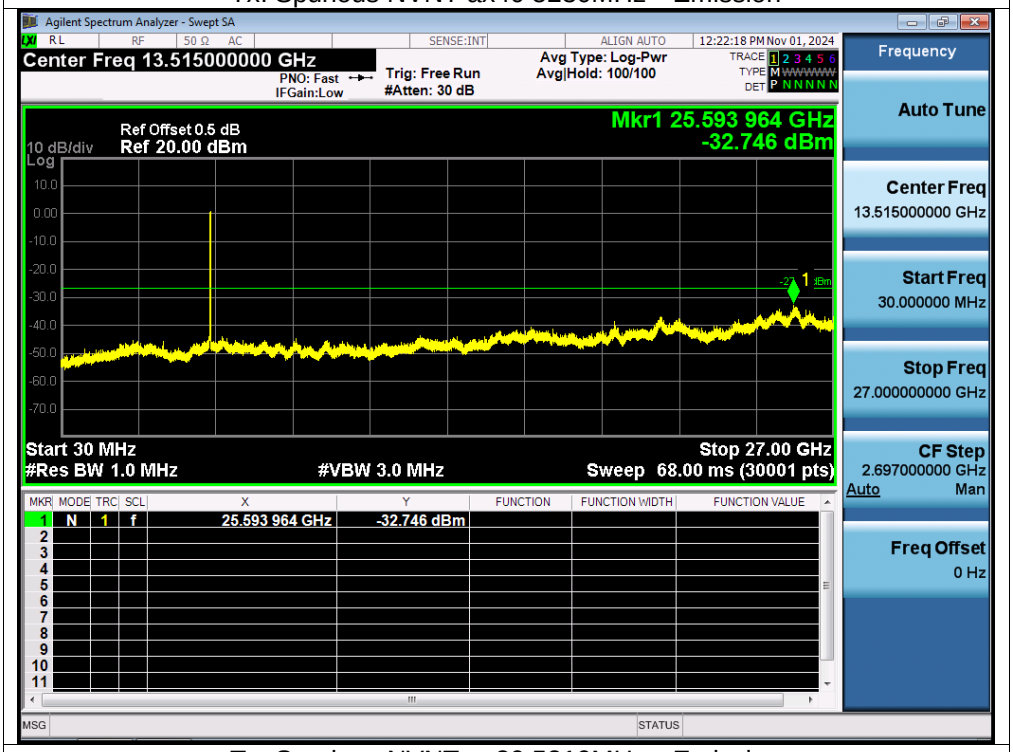
Tx. Spurious NVNT ax20 5200MHz Emission

Tx. Spurious NVNT ax20 5240MHz Emission

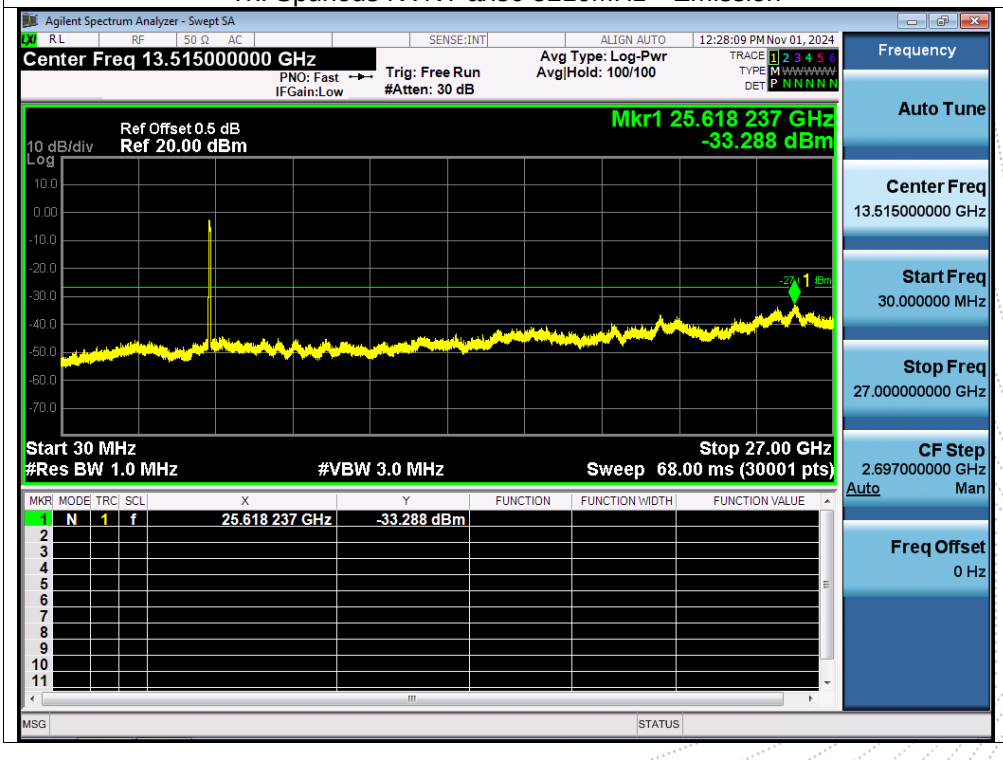


Tx. Spurious NVNT ax40 5190MHz Emission

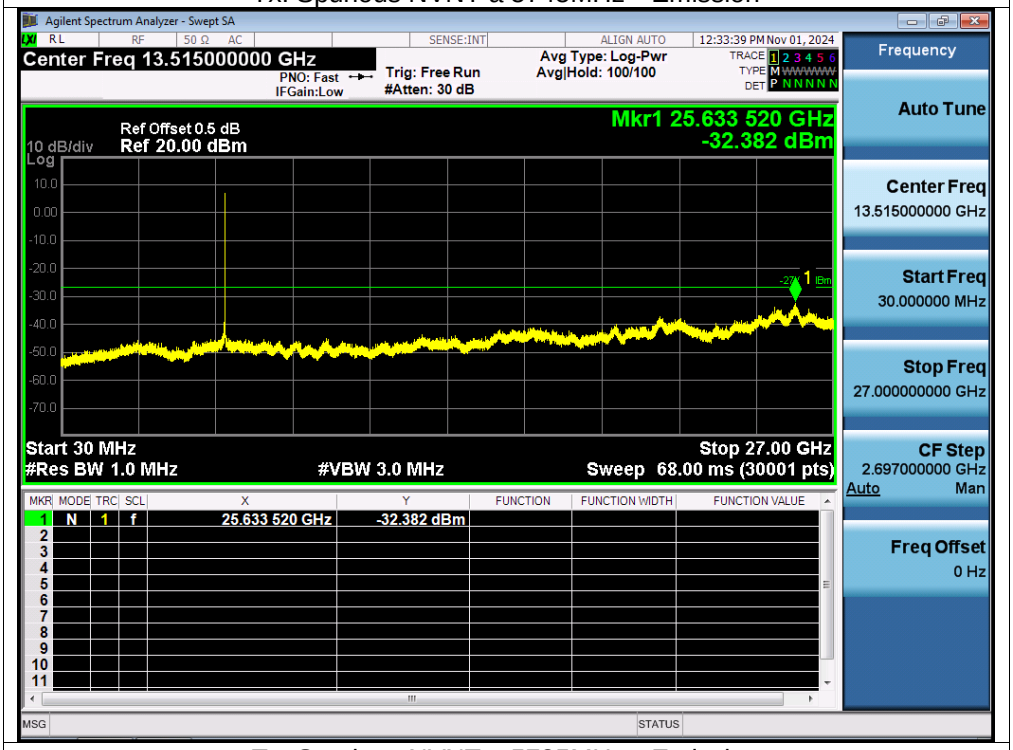
Tx. Spurious NVNT ax40 5230MHz Emission



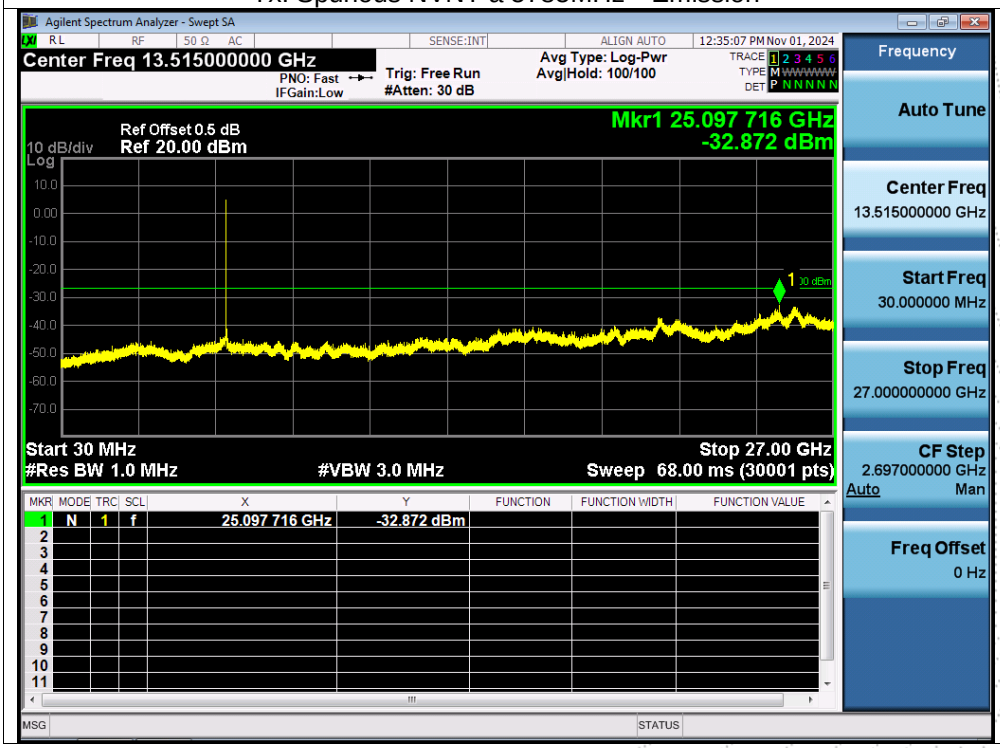
Tx. Spurious NVNT ax80 5210MHz Emission



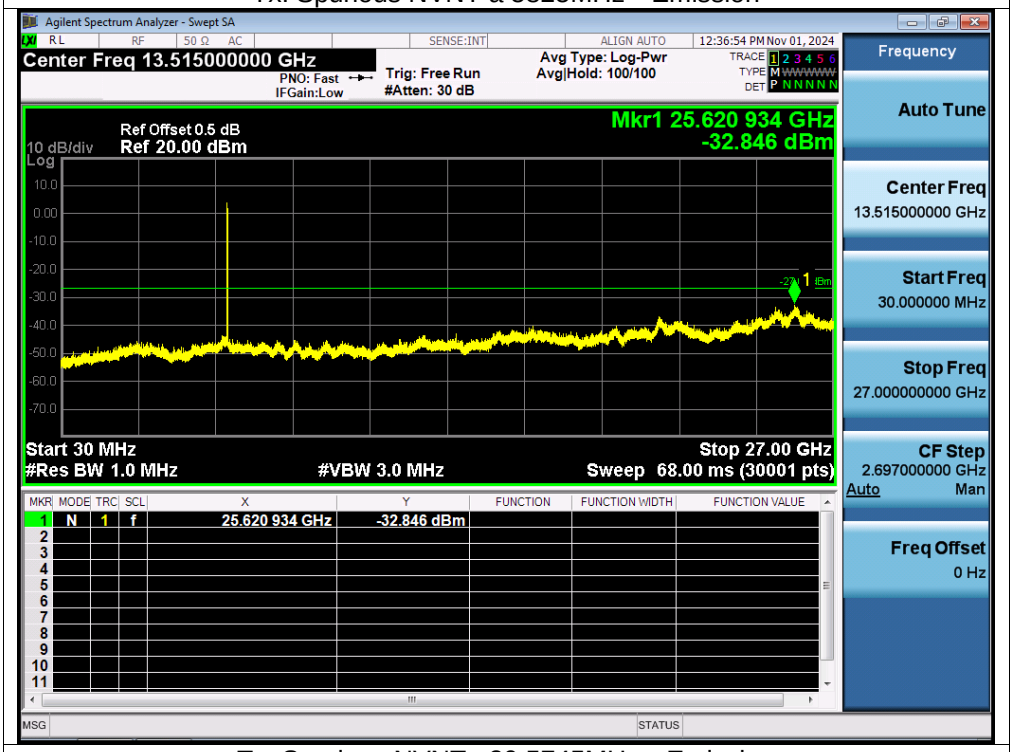
Test Graphs
Tx. Spurious NVNT a 5745MHz Emission



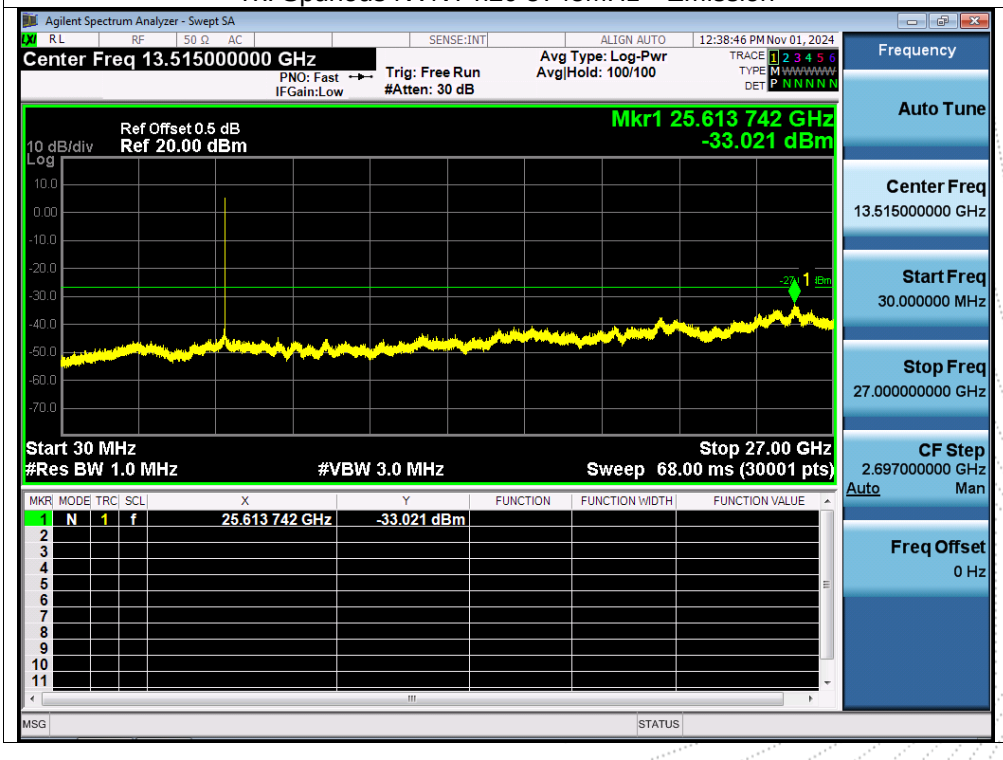
Tx. Spurious NVNT a 5785MHz Emission



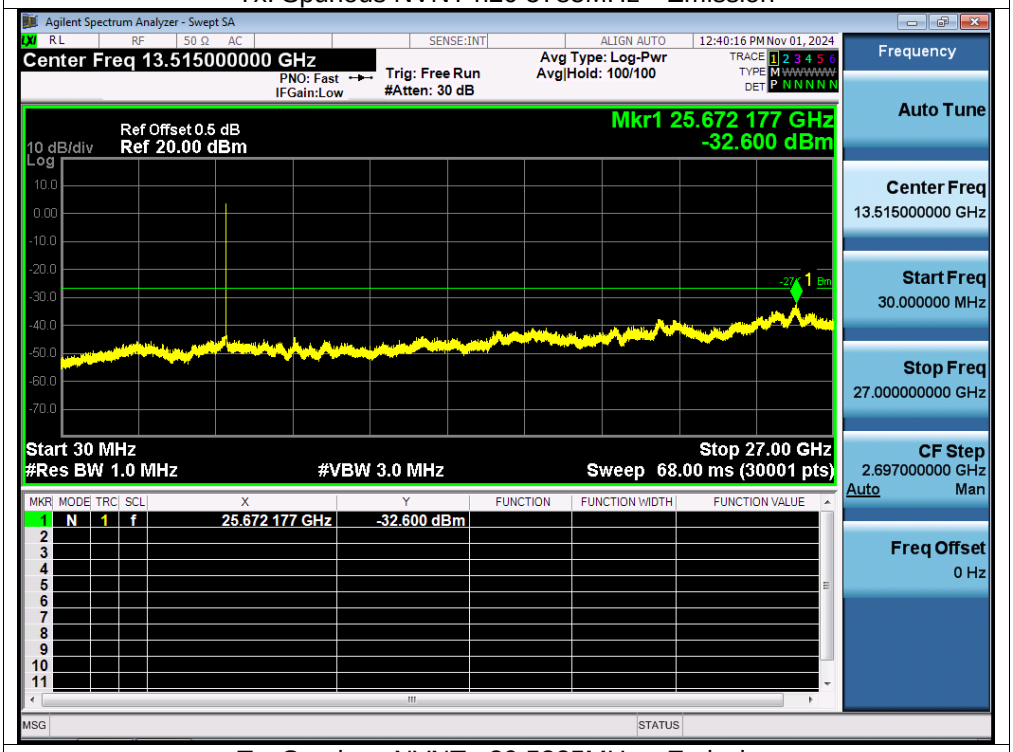
Tx. Spurious NVNT a 5825MHz Emission



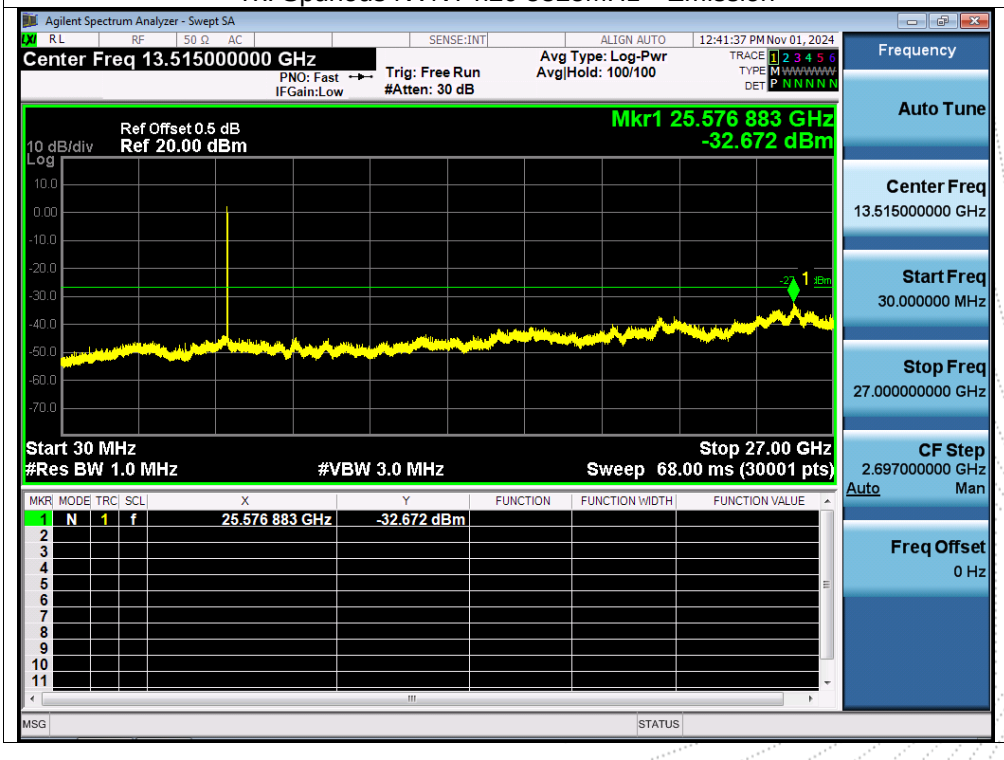
Tx. Spurious NVNT n20 5745MHz Emission



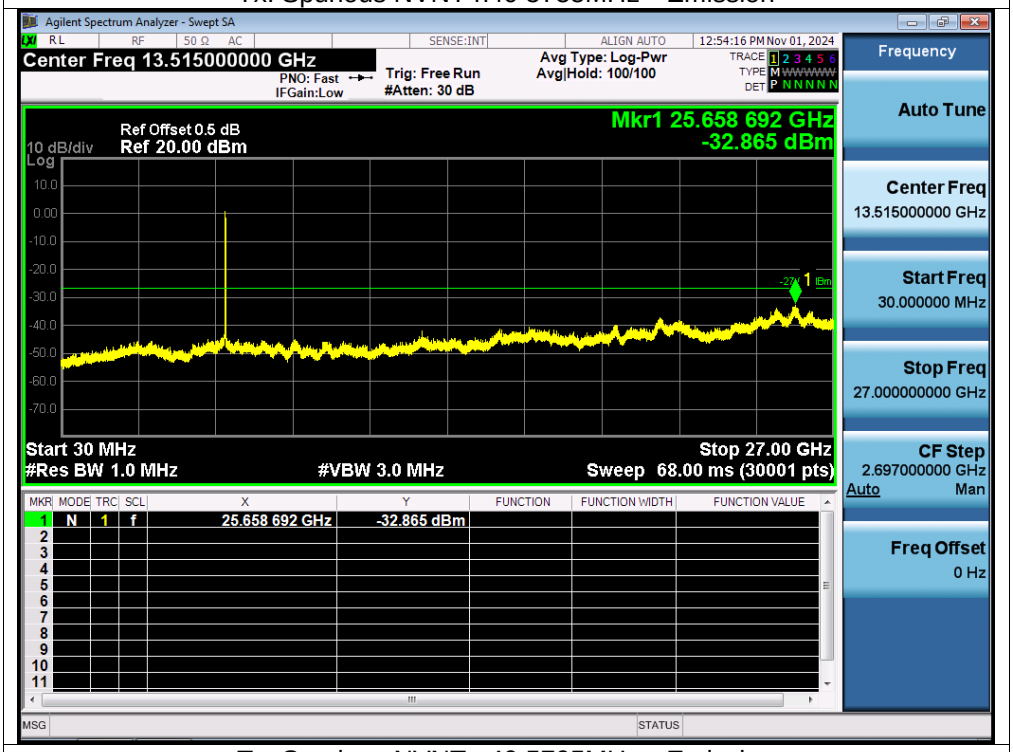
Tx. Spurious NVNT n20 5785MHz Emission



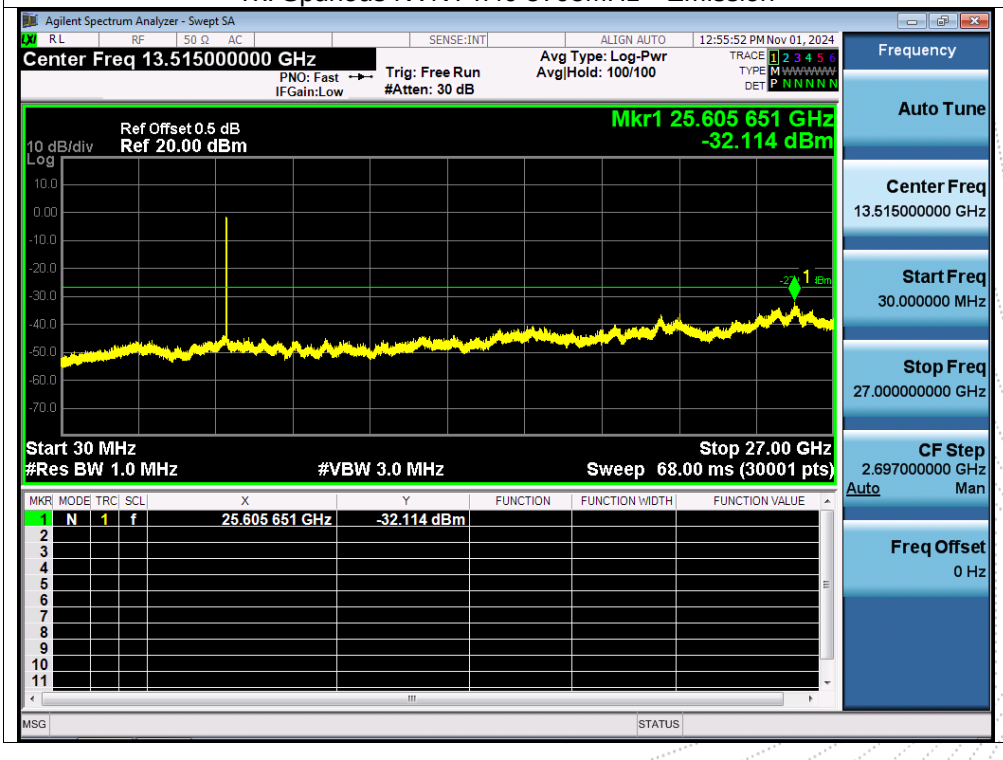
Tx. Spurious NVNT n20 5825MHz Emission



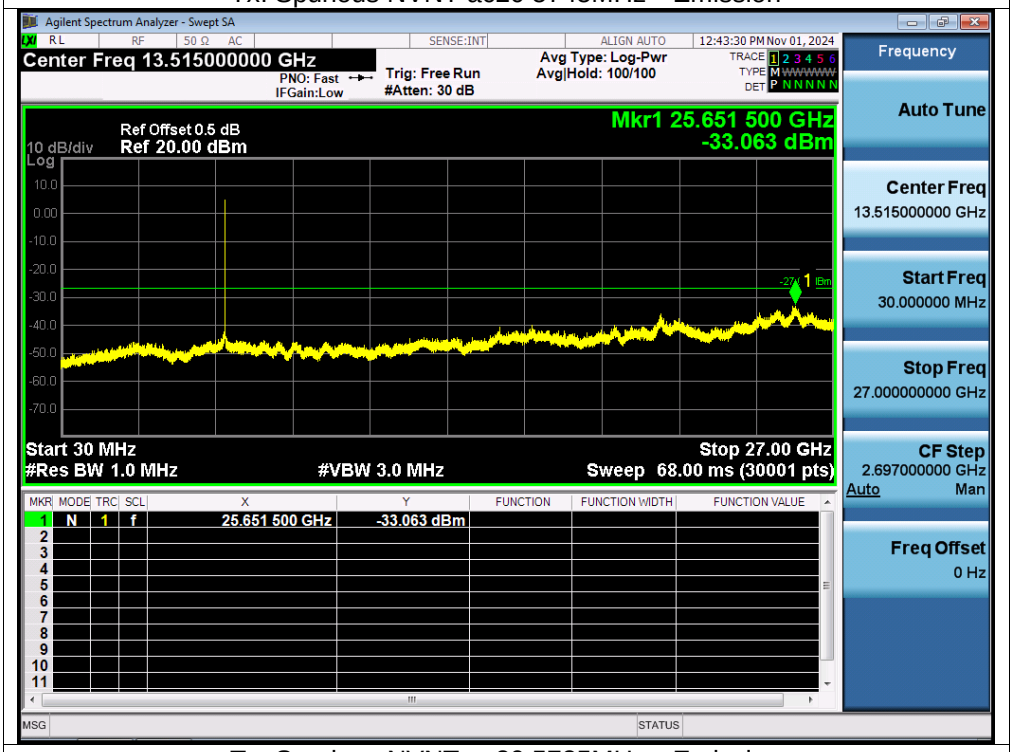
Tx. Spurious NVNT n40 5755MHz Emission



Tx. Spurious NVNT n40 5795MHz Emission

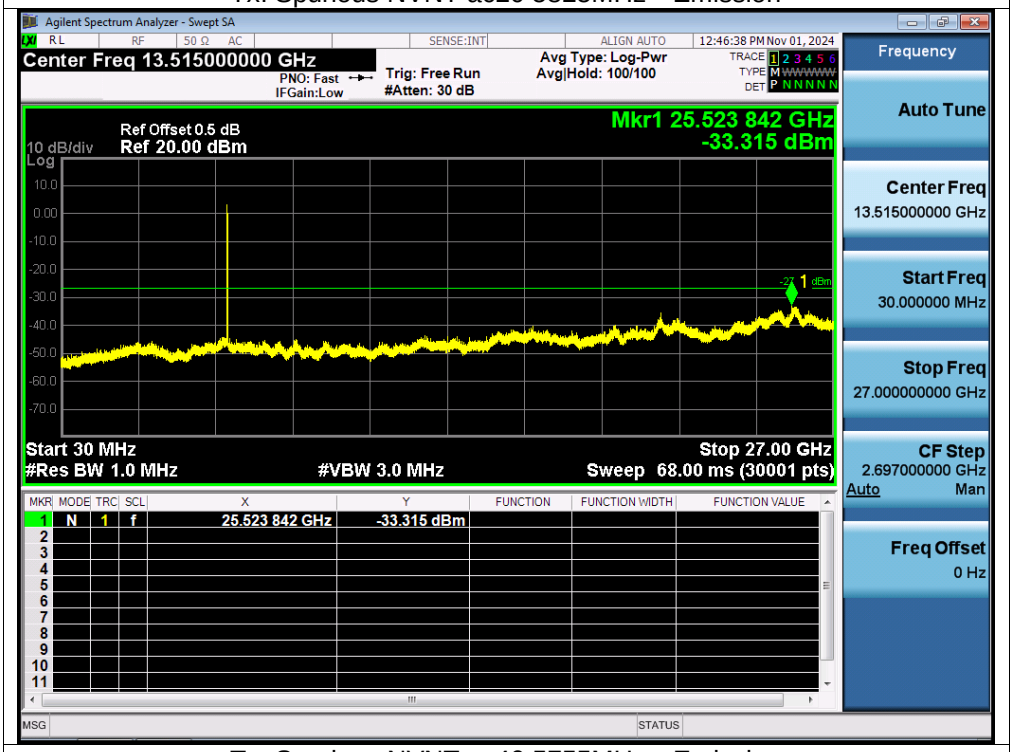


Tx. Spurious NVNT ac20 5745MHz Emission



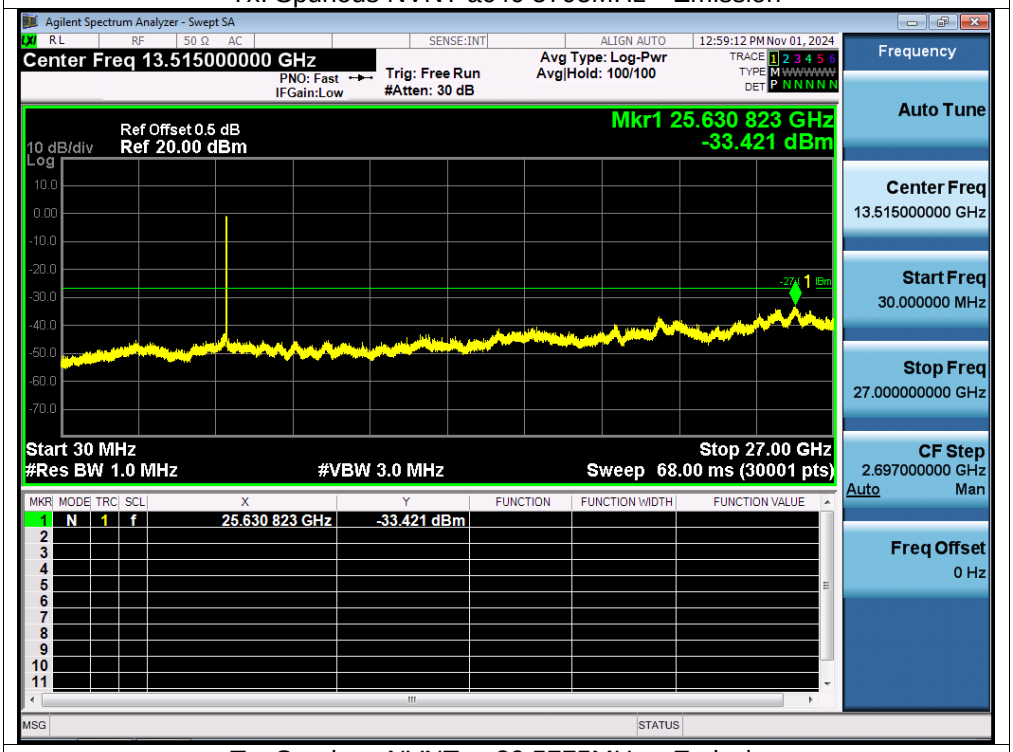
Tx. Spurious NVNT ac20 5785MHz Emission

Tx. Spurious NVNT ac20 5825MHz Emission



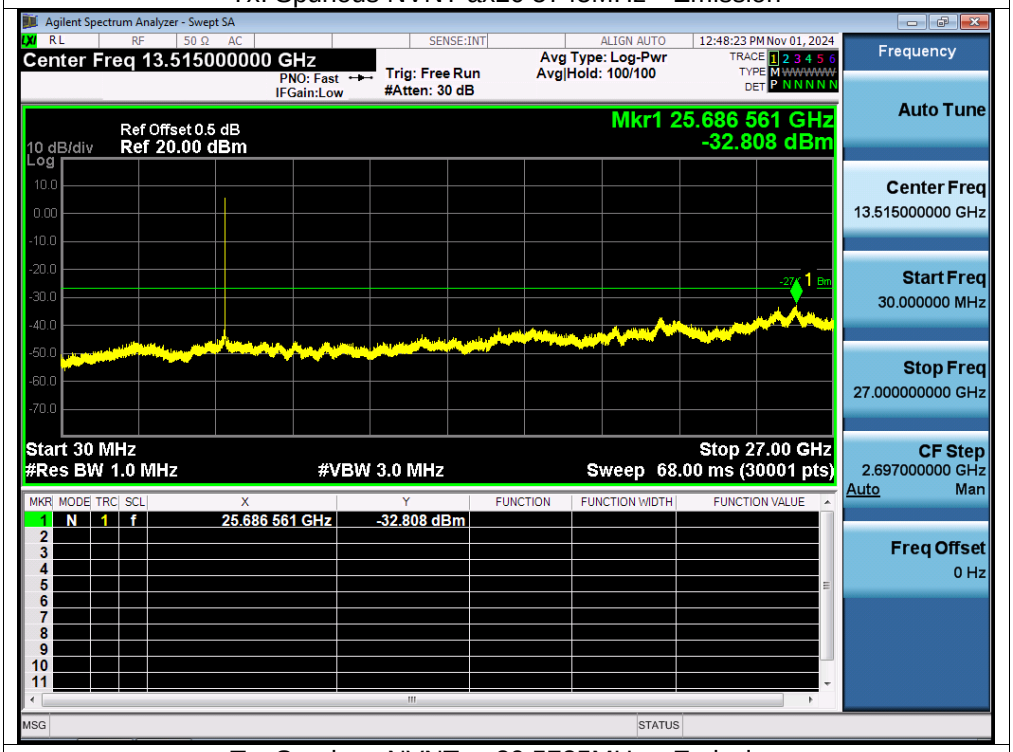
Tx. Spurious NVNT ac40 5755MHz Emission

Tx. Spurious NVNT ac40 5795MHz Emission



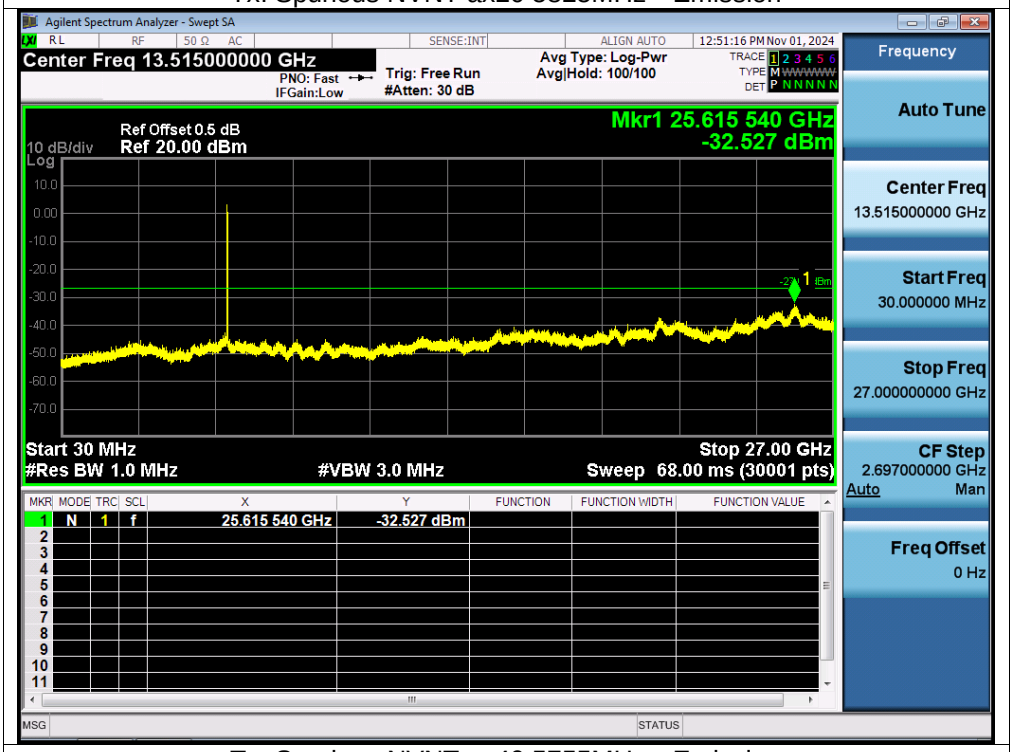
Tx. Spurious NVNT ac80 5775MHz Emission

Tx. Spurious NVNT ax20 5745MHz Emission



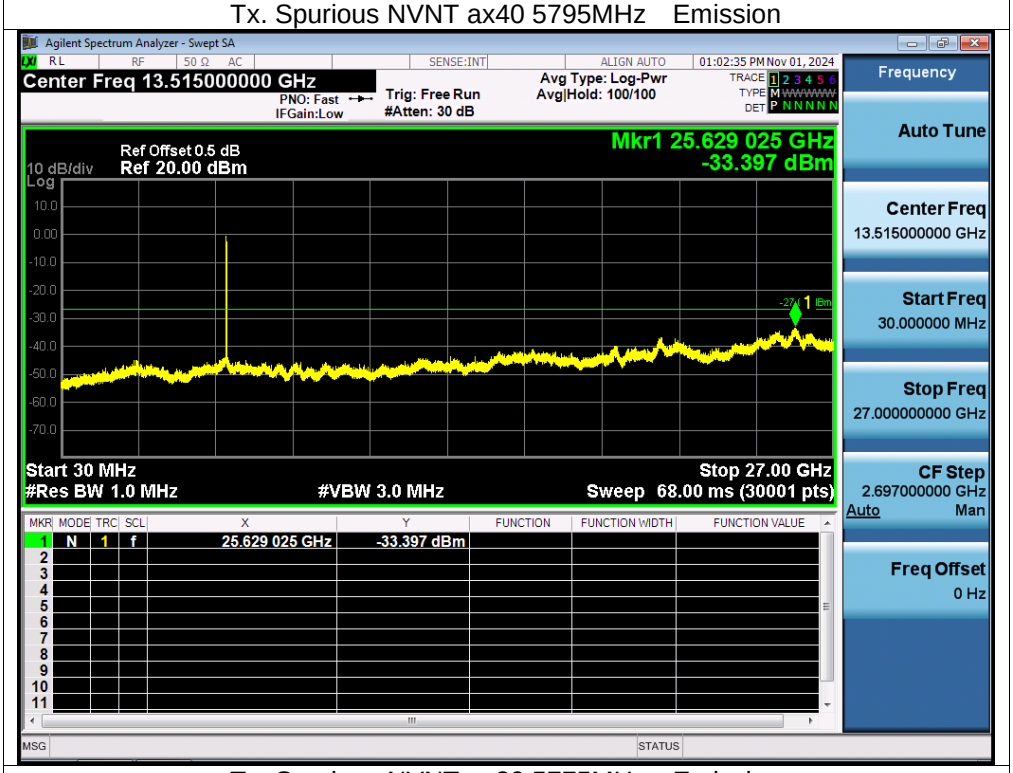
Tx. Spurious NVNT ax20 5785MHz Emission

Tx. Spurious NVNT ax20 5825MHz Emission

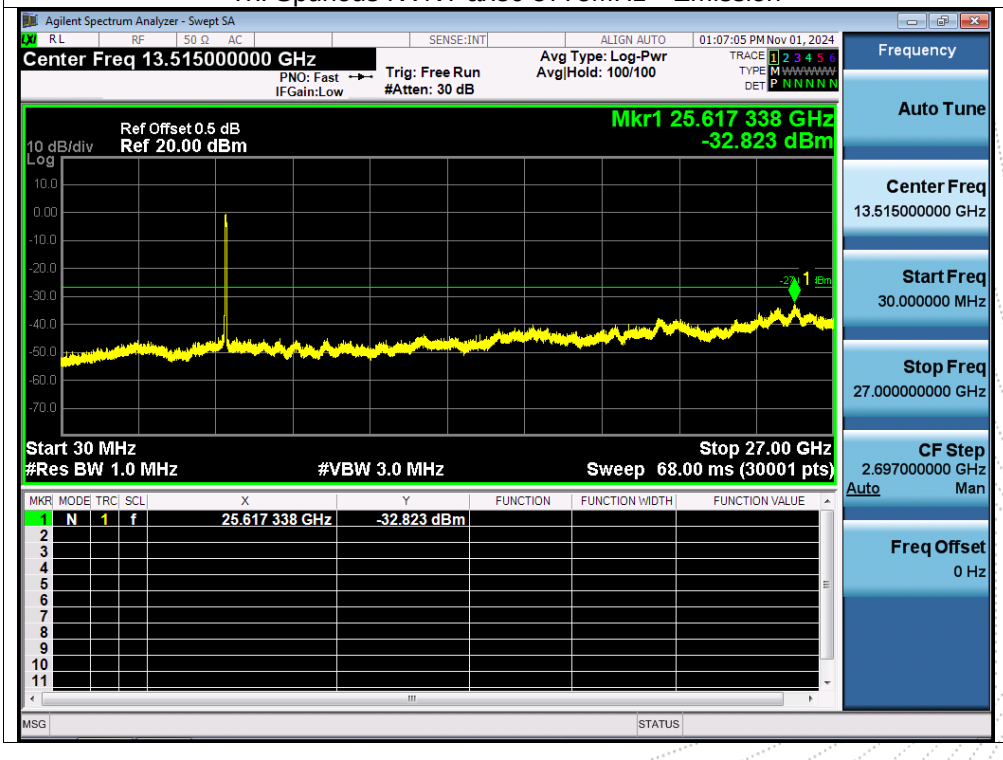


Tx. Spurious NVNT ax40 5755MHz Emission

Tx. Spurious NVNT ax40 5795MHz Emission

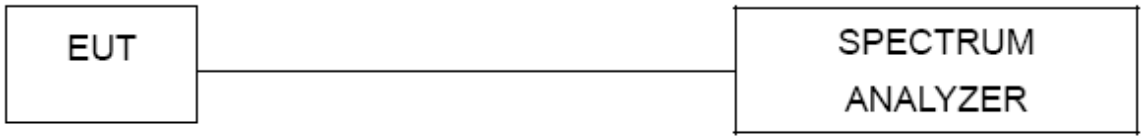


Tx. Spurious NVNT ax80 5775MHz Emission



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 7.6V
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)	7.60	5180.0064	5180	0.0064	1.2355
		V max (V)	8.74	5180.0003	5180	0.0003	0.0579
		V min (V)	6.46	5180.0002	5180	0.0002	0.0386
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)	7.6	T (°C)	-20	5180.0031	5180	0.0031	0.5985
		T (°C)	-10	5180.0043	5180	0.0043	0.8301
		T (°C)	0	5180.0081	5180	0.0081	1.5637
		T (°C)	10	5180.0131	5180	0.0131	2.5290
		T (°C)	20	5180.0086	5180	0.0086	1.6602
		T (°C)	30	5180.0060	5180	0.0060	1.1583
		T (°C)	40	5180.0010	5180	0.0010	0.1931
		T (°C)	50	5180.0113	5180	0.0113	2.1815
		T (°C)	60	5180.0010	5180	0.0010	0.1931
		T (°C)	70	5180.0079	5180	0.0079	1.5251
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)	7.60	5200.0134	5200	0.0134	2.5769
		V max (V)	8.74	5200.0012	5200	0.0012	0.2308
		V min (V)	6.46	5200.0039	5200	0.0039	0.7500
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	-20	5200.01080	5200	0.01080	2.0769
		T (°C)	-10	5200.01150	5200	0.01150	2.2115
		T (°C)	0	5200.00530	5200	0.00530	1.0192
		T (°C)	10	5200.00520	5200	0.00520	1.0000
		T (°C)	20	5200.01060	5200	0.01060	2.0385
		T (°C)	30	5200.00590	5200	0.00590	1.1346
		T (°C)	40	5200.01140	5200	0.01140	2.1923
		T (°C)	50	5200.01010	5200	0.01010	1.9423
		T (°C)	60	5200.01150	5200	0.01150	2.2115
		T (°C)	70	5200.00500	5200	0.00500	0.9615
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)	7.60	5240.0028	5240	0.0028	0.5344
		V max (V)	8.74	5240.0005	5240	0.0005	0.0954
		V min (V)	6.46	5240.0037	5240	0.0037	0.7061
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)	7.6	T (°C)	-20	5240.0065	5240	0.0065	1.2405
		T (°C)	-10	5240.0039	5240	0.0039	0.7443
		T (°C)	0	5240.0103	5240	0.0103	1.9656
		T (°C)	10	5240.0005	5240	0.0005	0.0954
		T (°C)	20	5240.0086	5240	0.0086	1.6412
		T (°C)	30	5240.0124	5240	0.0124	2.3664
		T (°C)	40	5240.0028	5240	0.0028	0.5344
		T (°C)	50	5240.0013	5240	0.0013	0.2481
		T (°C)	60	5240.0077	5240	0.0077	1.4695
		T (°C)	70	5240.0016	5240	0.0016	0.3053
Limits				5150-5250 MHz			
Result				Complies			

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 7.6V
Test Mode:	TX (5.8G) Mode Frequency U-NII-3 (5745-5825MHz)		

Voltage vs. Frequency Stabilit

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	7.60	5745.00030	5745	0.00030	0.0522
		V max (V)	8.74	5745.00160	5745	0.00160	0.2785
		V min (V)	6.46	5745.01350	5745	0.01350	2.3499
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)	7.6	T (°C)	-20	5745.00890	5745	0.00890	1.5492
		T (°C)	-10	5745.01240	5745	0.01240	2.1584
		T (°C)	0	5745.00080	5745	0.00080	0.1393
		T (°C)	10	5745.01160	5745	0.01160	2.0191
		T (°C)	20	5745.00060	5745	0.00060	0.1044
		T (°C)	30	5745.00830	5745	0.00830	1.4447
		T (°C)	40	5745.01090	5745	0.01090	1.8973
		T (°C)	50	5745.01330	5745	0.01330	2.3151
		T (°C)	60	5745.00060	5745	0.00060	0.1044
		T (°C)	70	5745.01050	5745	0.01050	1.8277
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)	7.60	5785.00810	5785	0.00810	1.4002
		V max (V)	8.74	5785.00480	5785	0.00480	0.8297
		V min (V)	6.46	5785.00680	5785	0.00680	1.1755
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)	7.6	T (°C)	-20	5785.00280	5785	0.00280	0.4840
		T (°C)	-10	5785.00590	5785	0.00590	1.0199
		T (°C)	0	5785.00240	5785	0.00240	0.4149
		T (°C)	10	5785.00240	5785	0.00240	0.4149
		T (°C)	20	5785.01100	5785	0.01100	1.9015
		T (°C)	30	5785.00400	5785	0.00400	0.6914
		T (°C)	40	5785.00820	5785	0.00820	1.4175
		T (°C)	50	5785.01050	5785	0.01050	1.8150
		T (°C)	60	5785.00320	5785	0.00320	0.5532
		T (°C)	70	5785.01210	5785	0.01210	2.0916
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)	7.60	5825.00740	5825	0.00740	1.2704
		V max (V)	8.74	5825.01170	5825	0.01170	2.0086
		V min (V)	6.46	5825.00450	5825	0.00450	0.7725
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)	7.6	T (°C)	-20	5825.00010	5825	0.00010	0.0172
		T (°C)	-10	5825.00570	5825	0.00570	0.9785
		T (°C)	0	5825.00090	5825	0.00090	0.1545
		T (°C)	10	5825.00470	5825	0.00470	0.8069
		T (°C)	20	5825.01290	5825	0.01290	2.2146
		T (°C)	30	5825.00590	5825	0.00590	1.0129
		T (°C)	40	5825.00390	5825	0.00390	0.6695
		T (°C)	50	5825.00370	5825	0.00370	0.6352
		T (°C)	60	5825.00850	5825	0.00850	1.4592
		T (°C)	70	5825.00020	5825	0.00020	0.0343
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

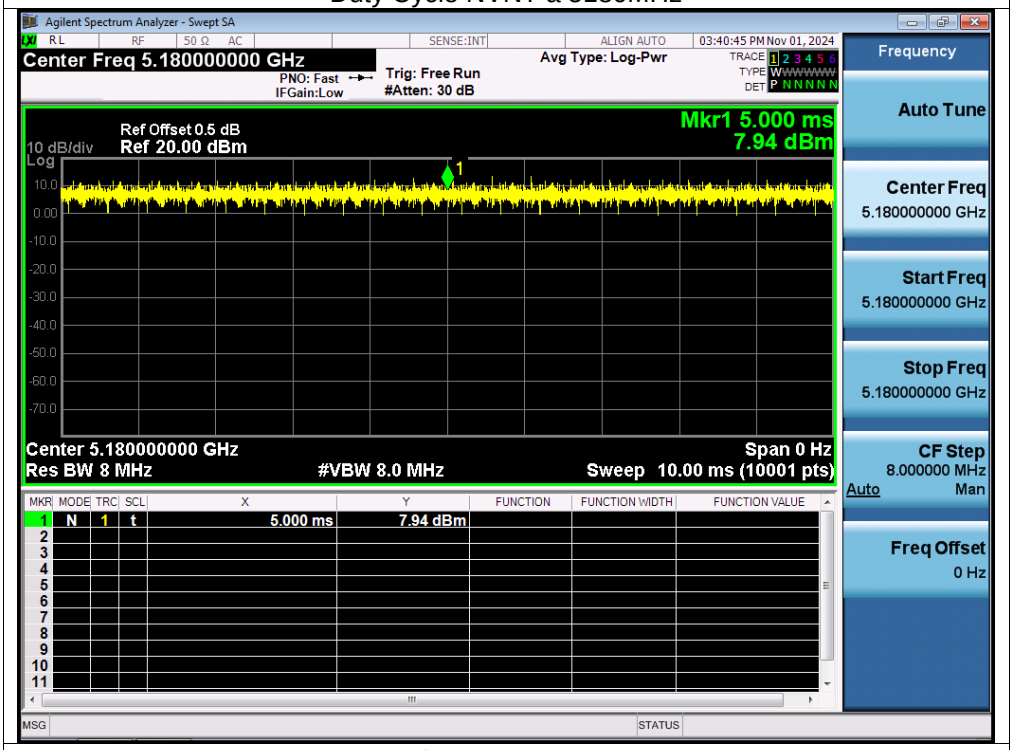
14.4 Test Result

ANT A

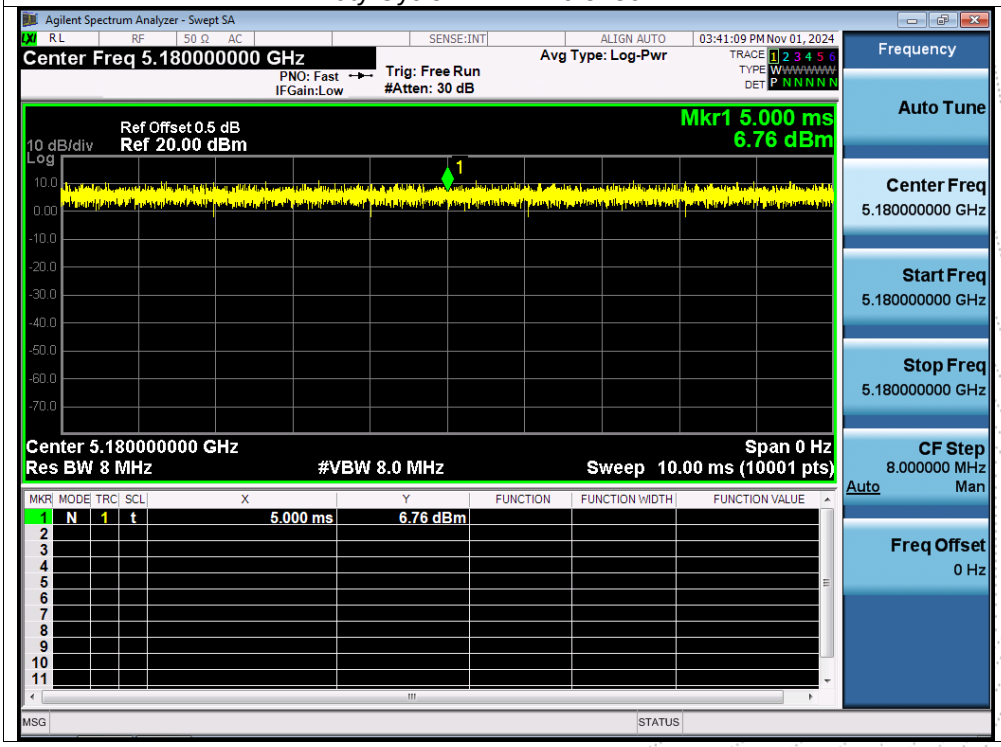
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	100	0	0
NVNT	n20	5180	100	0	0
NVNT	n40	5190	100	0	0
NVNT	ac20	5180	100	0	0
NVNT	ac40	5190	100	0	0
NVNT	ac80	5210	100	0	0
NVNT	ax20	5180	100	0	0
NVNT	ax40	5190	100	0	0
NVNT	ax80	5210	100	0	0

Test Graphs

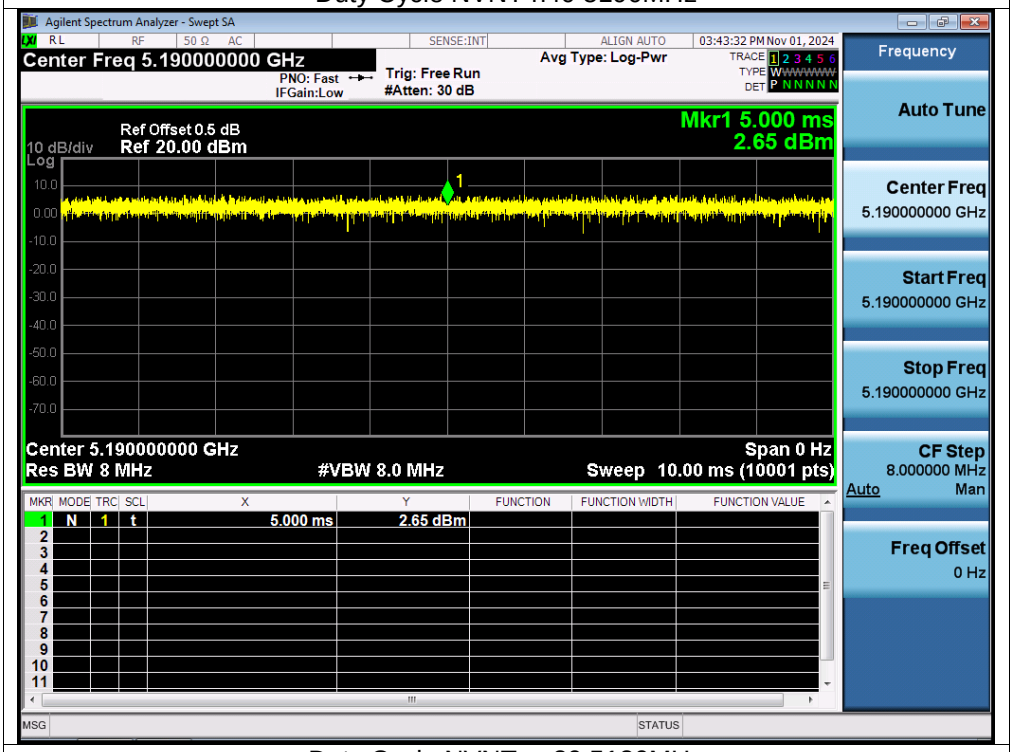
Duty Cycle NVNT a 5180MHz



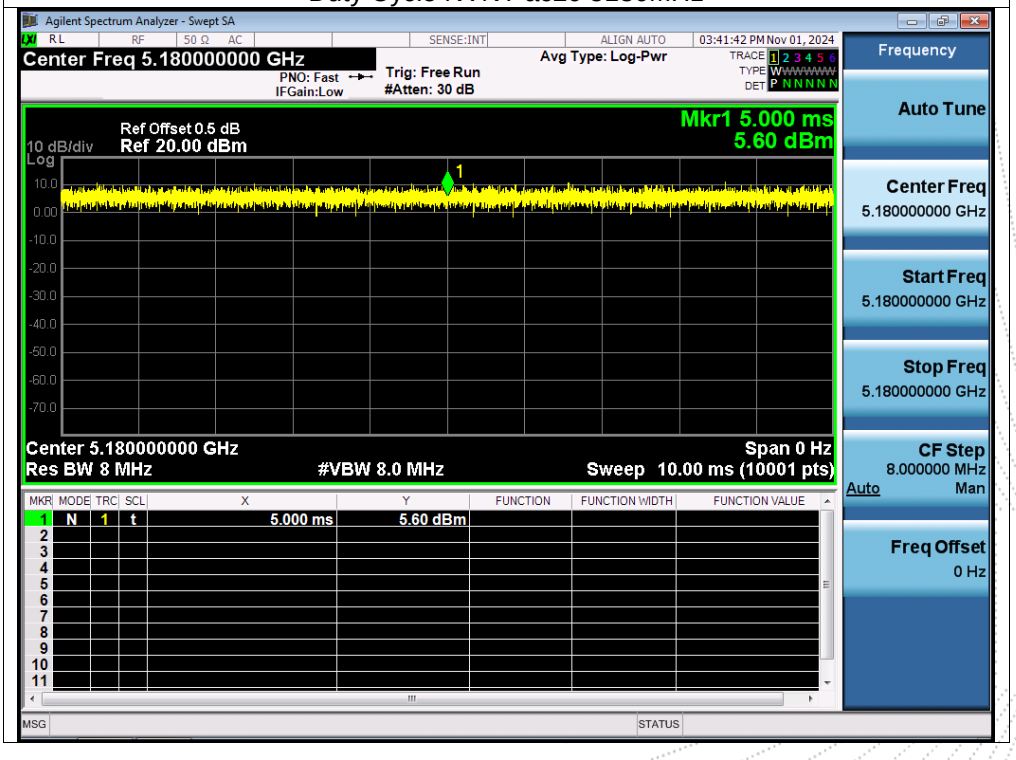
Duty Cycle NVNT n20 5180MHz



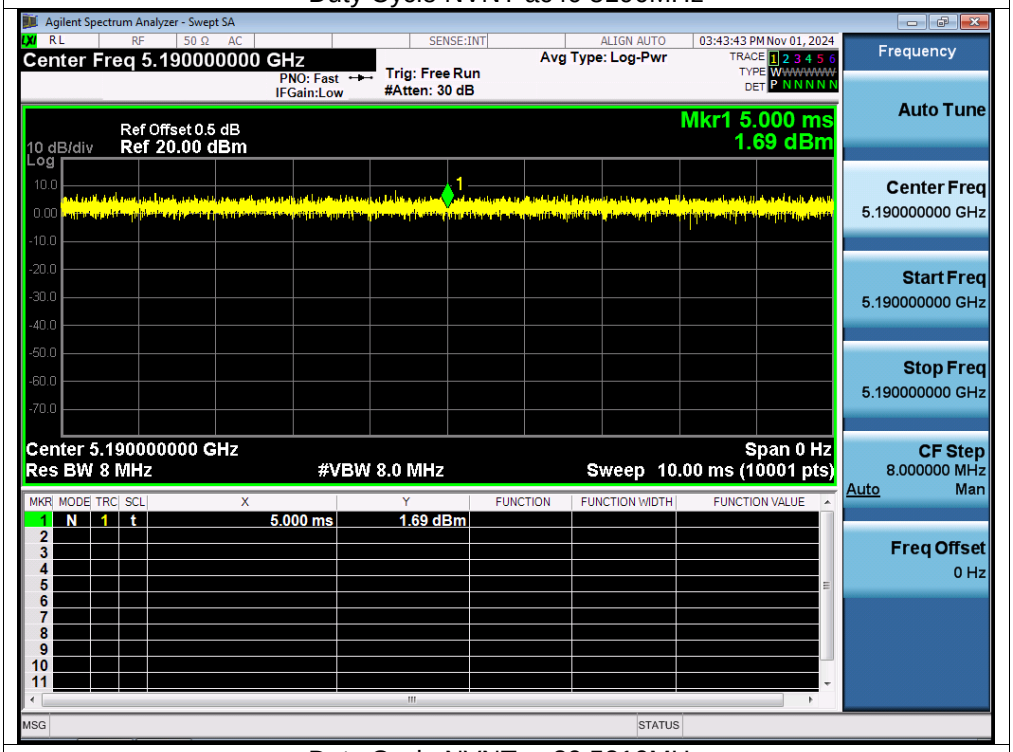
Duty Cycle NVNT n40 5190MHz



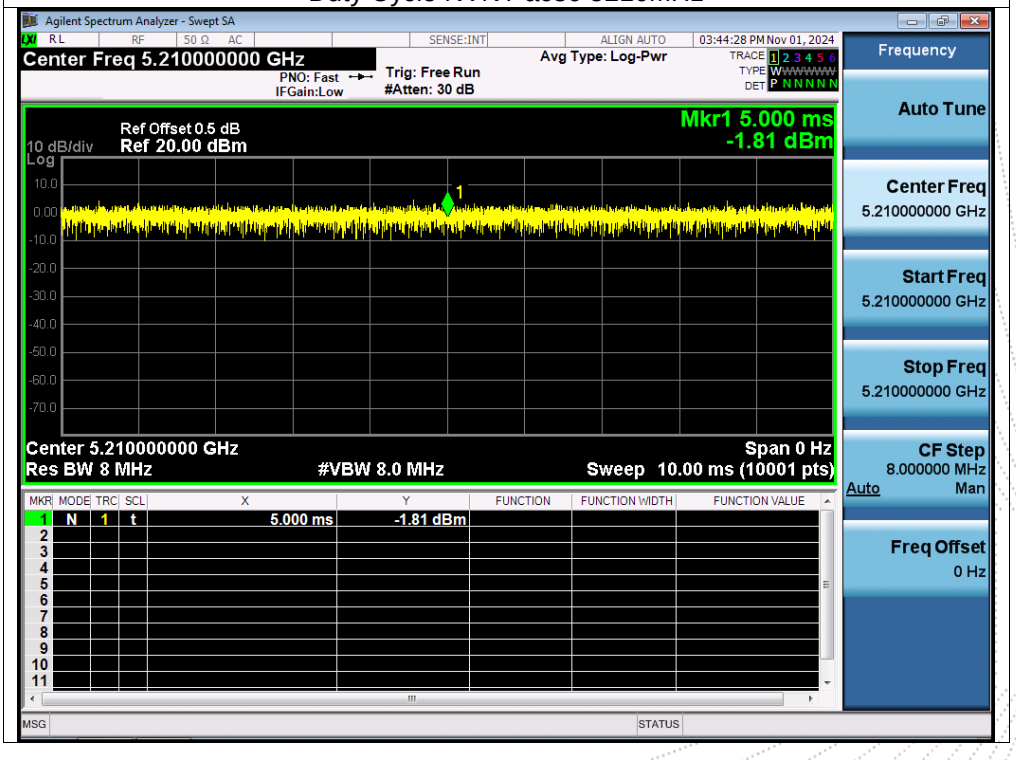
Duty Cycle NVNT ac20 5180MHz



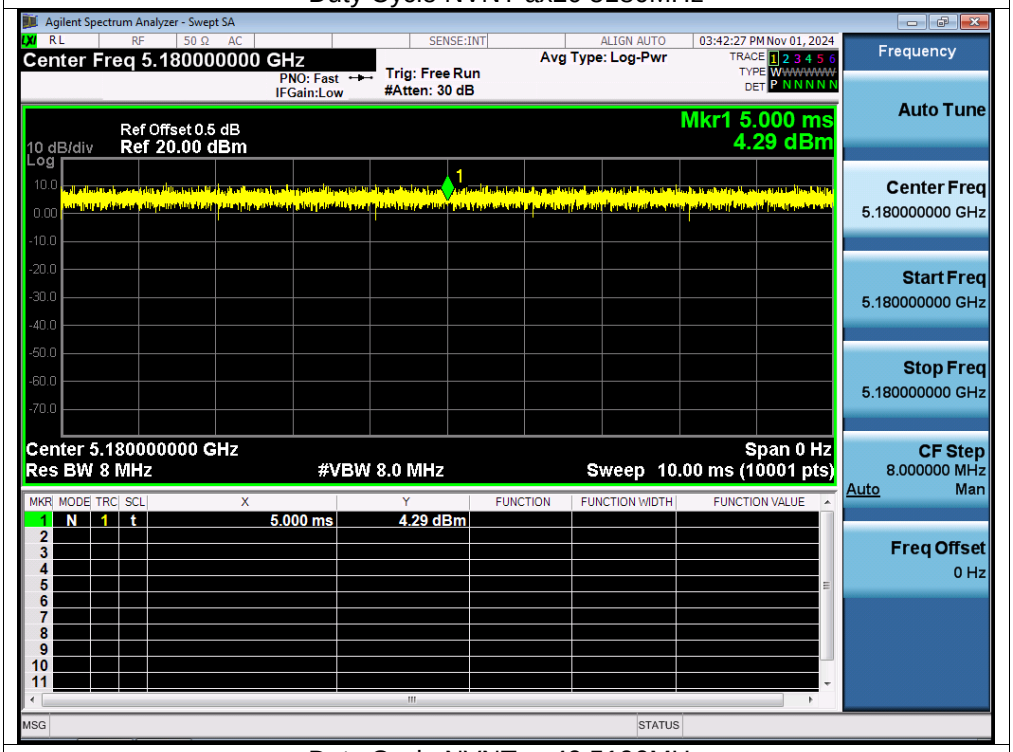
Duty Cycle NVNT ac40 5190MHz



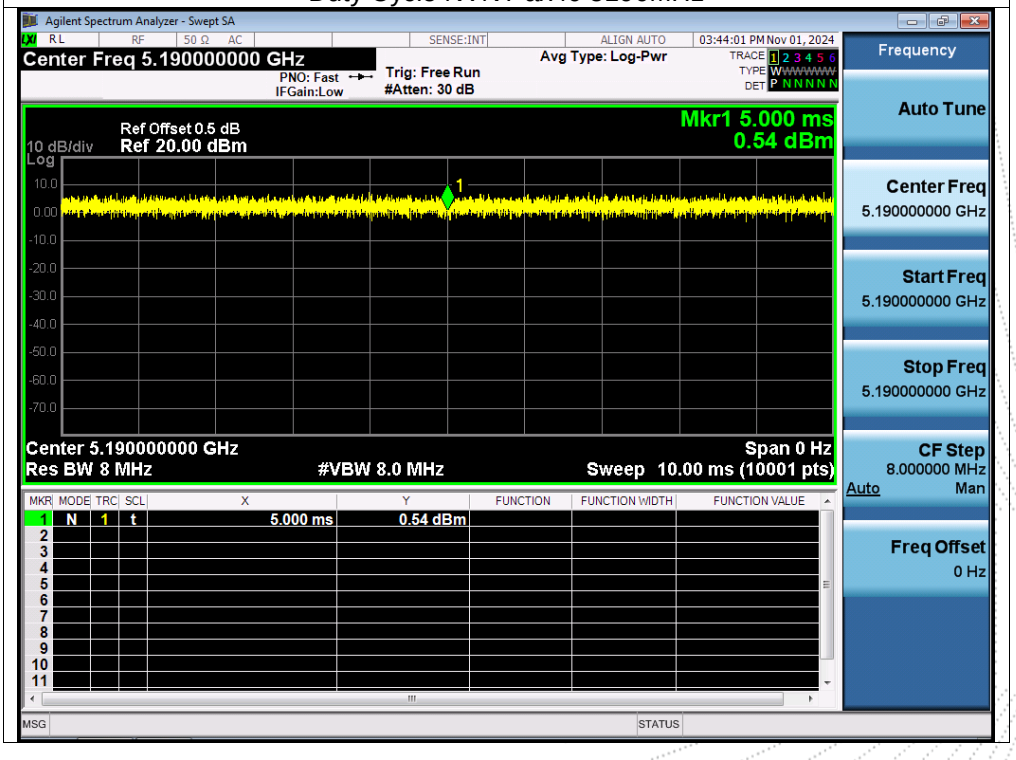
Duty Cycle NVNT ac80 5210MHz



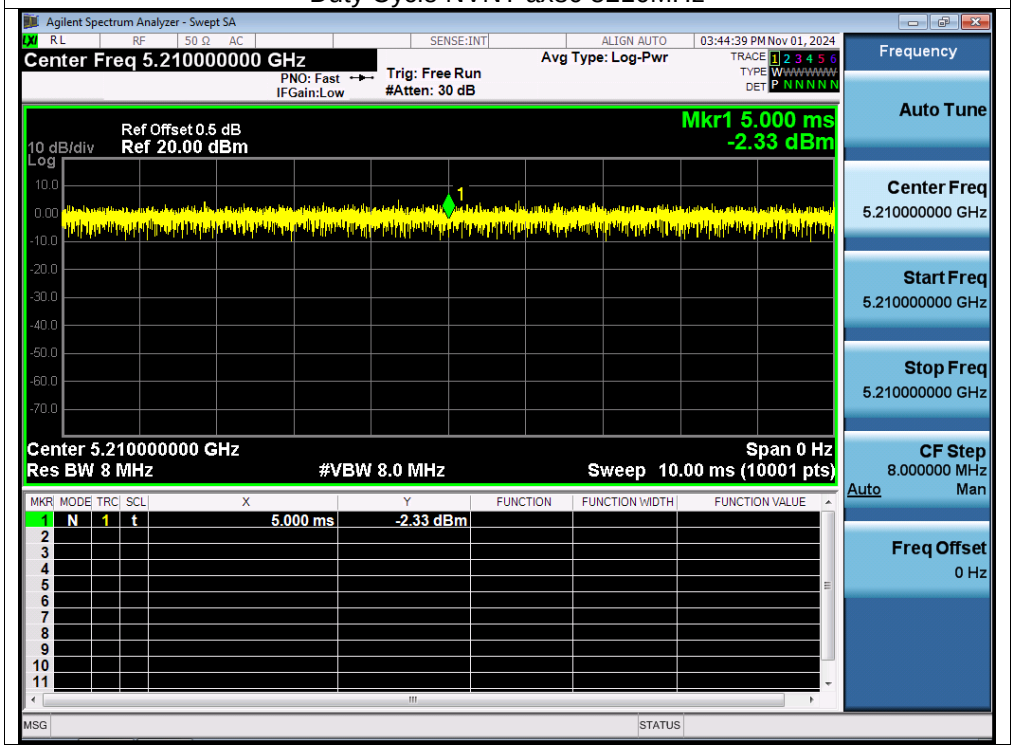
Duty Cycle NVNT ax20 5180MHz



Duty Cycle NVNT ax40 5190MHz



Duty Cycle NVNT ax80 5210MHz

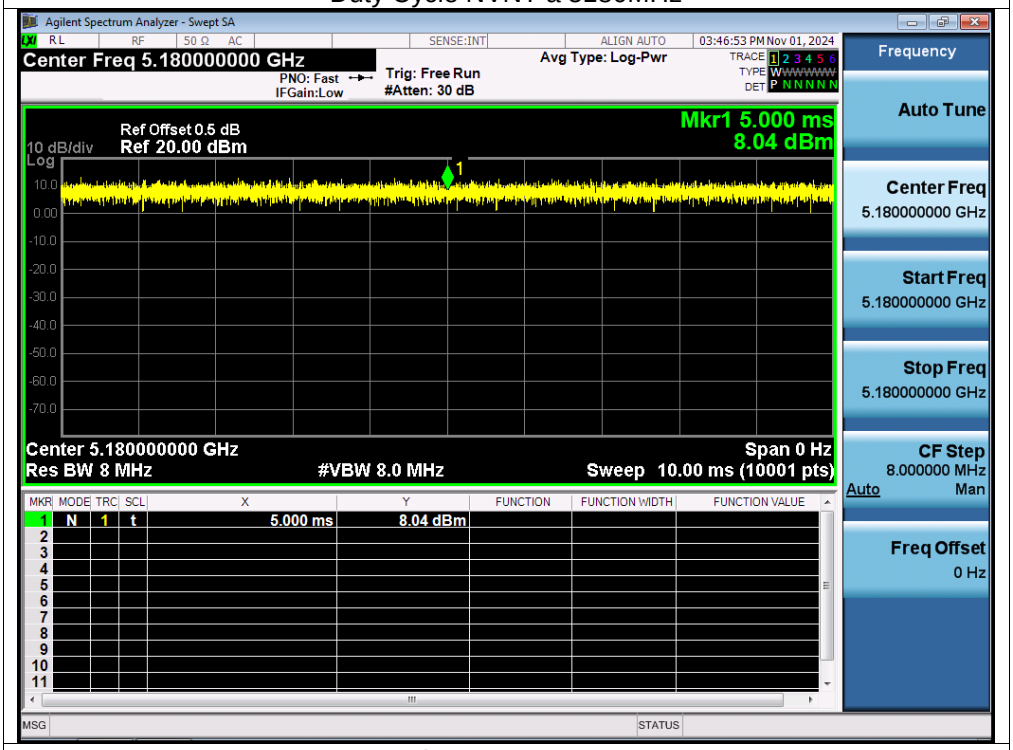


ANT B

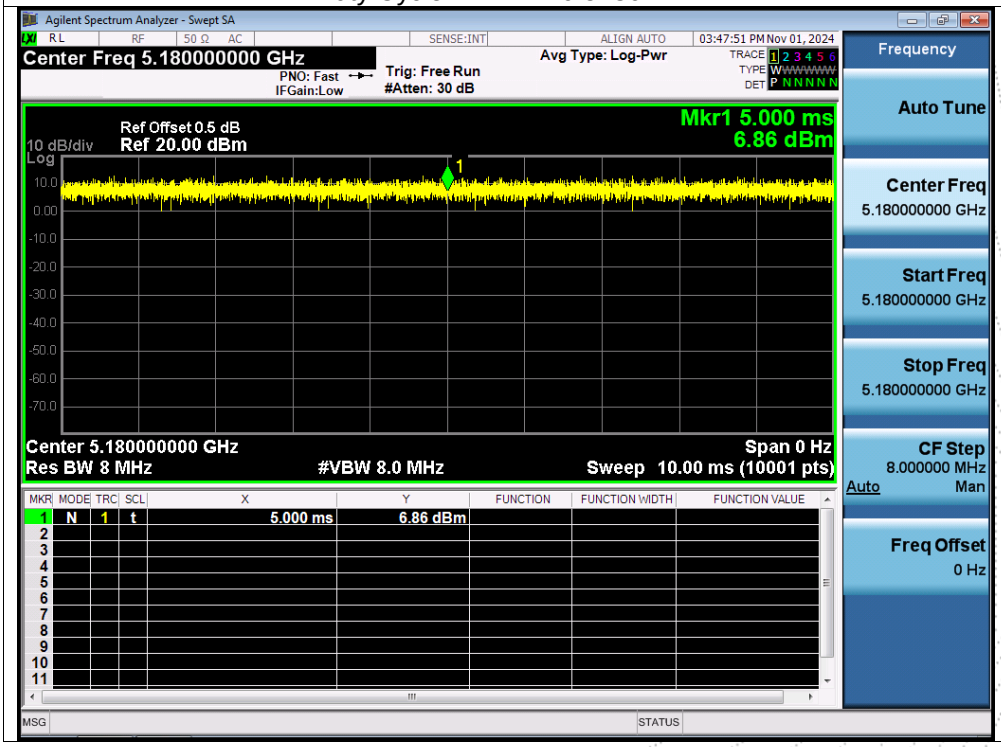
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	100	0	0
NVNT	n20	5180	100	0	0
NVNT	n40	5190	100	0	0
NVNT	ac20	5180	100	0	0
NVNT	ac40	5190	100	0	0
NVNT	ac80	5210	100	0	0
NVNT	ax20	5180	100	0	0
NVNT	ax40	5190	100	0	0
NVNT	ax80	5210	100	0	0

Test Graphs

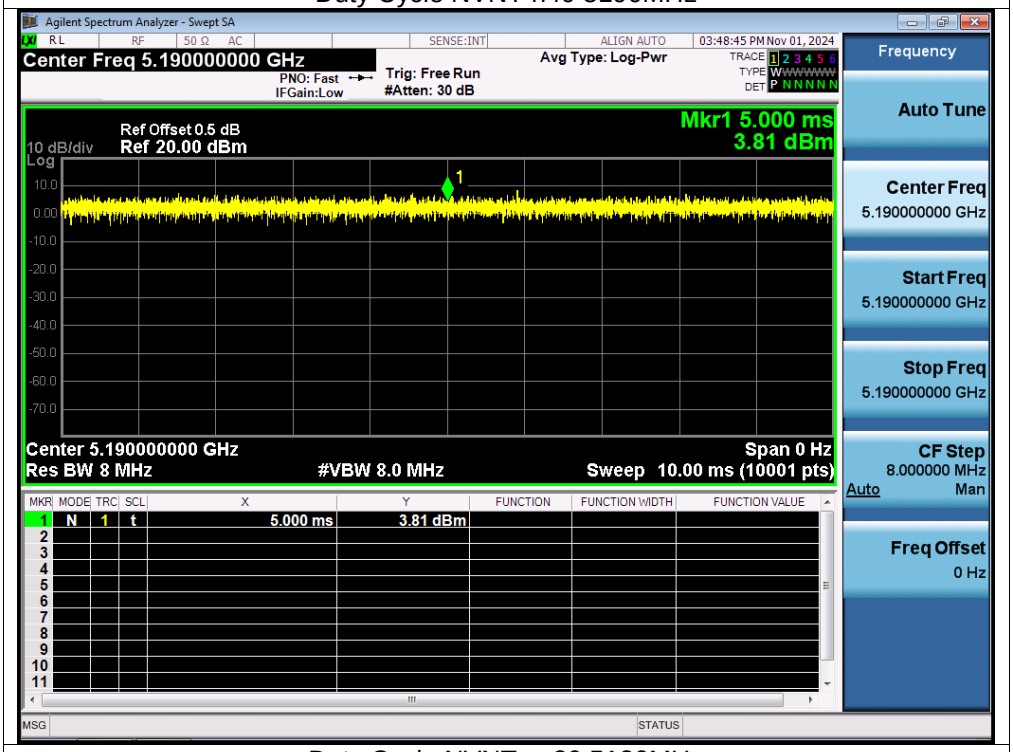
Duty Cycle NVNT a 5180MHz



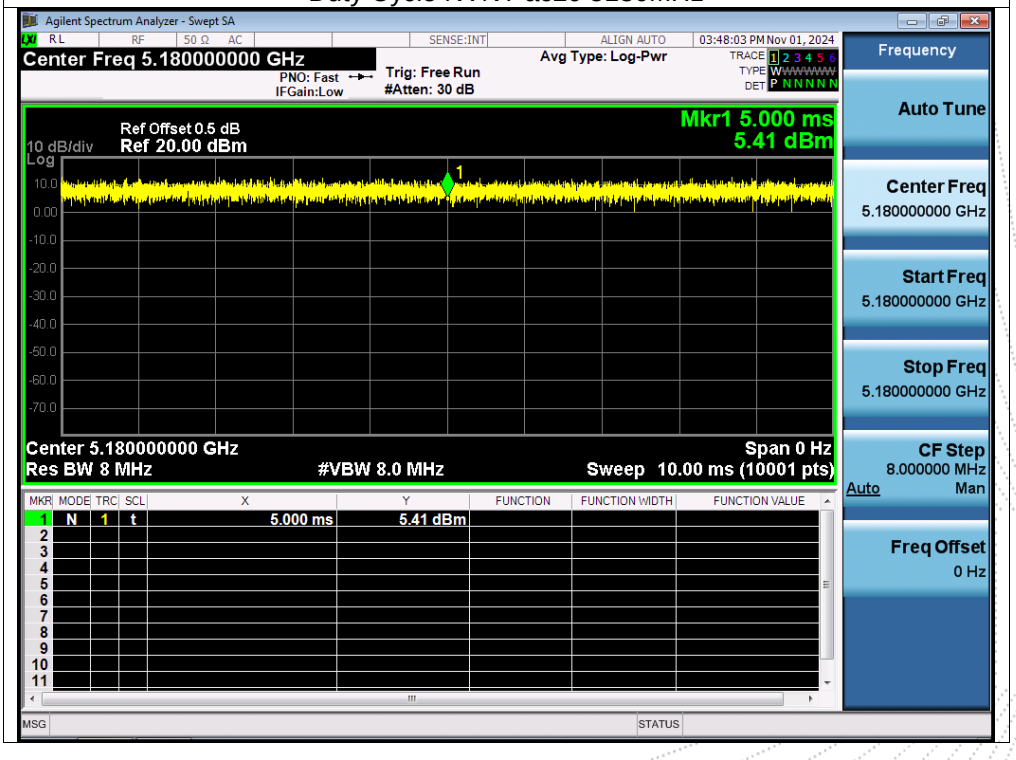
Duty Cycle NVNT n20 5180MHz



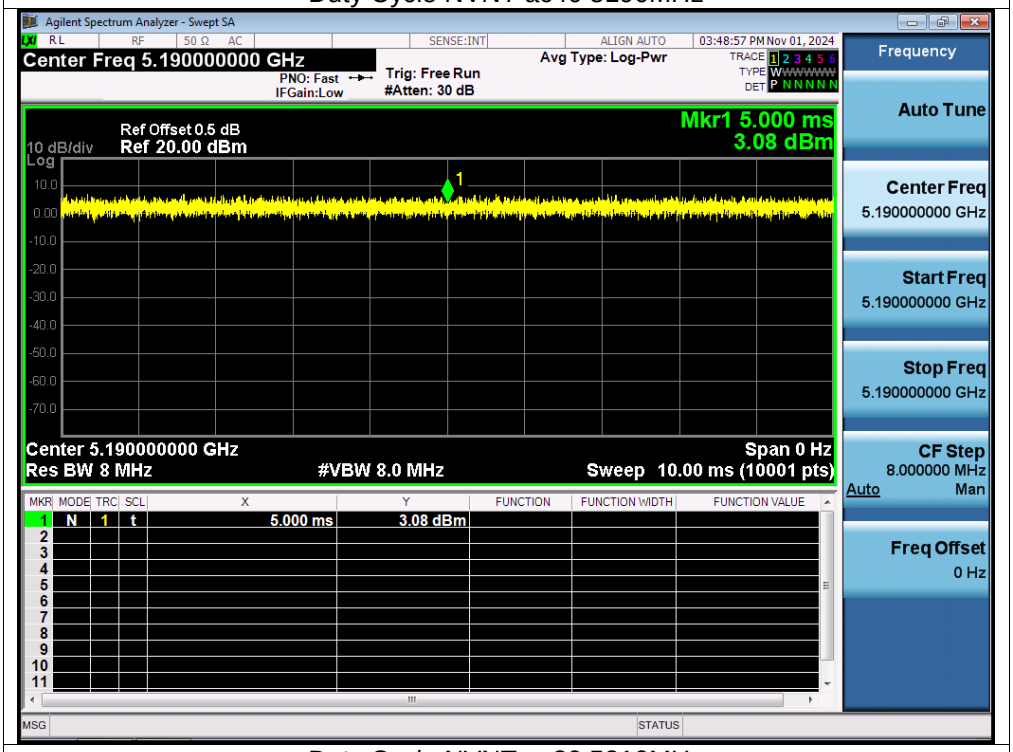
Duty Cycle NVNT n40 5190MHz



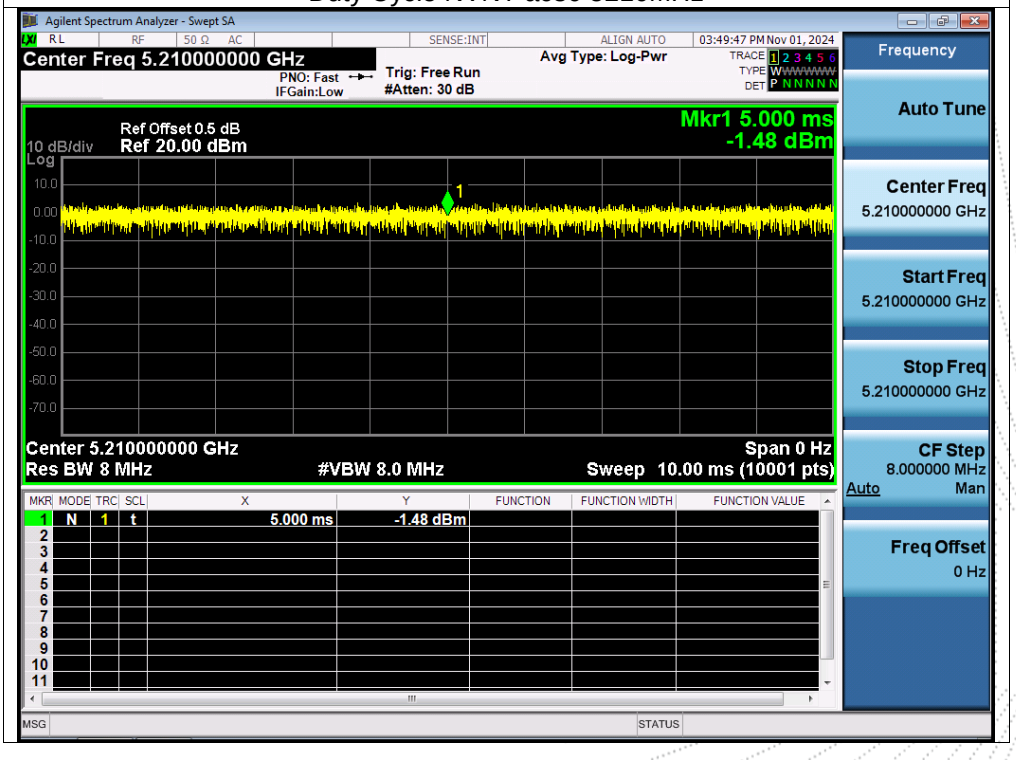
Duty Cycle NVNT ac20 5180MHz



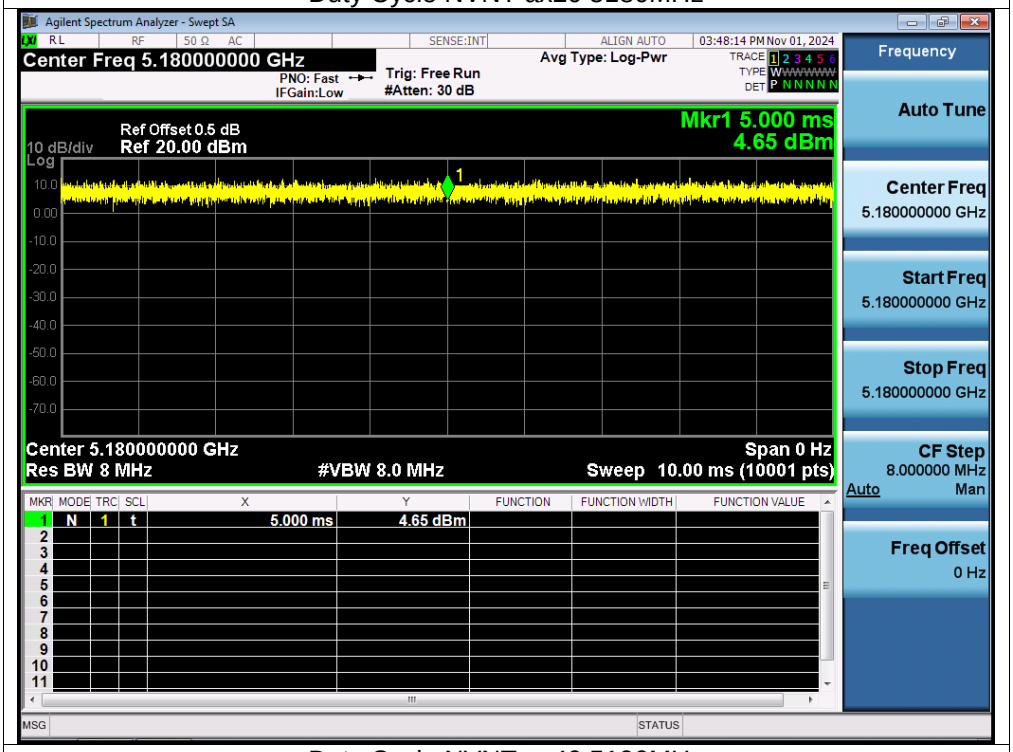
Duty Cycle NVNT ac40 5190MHz



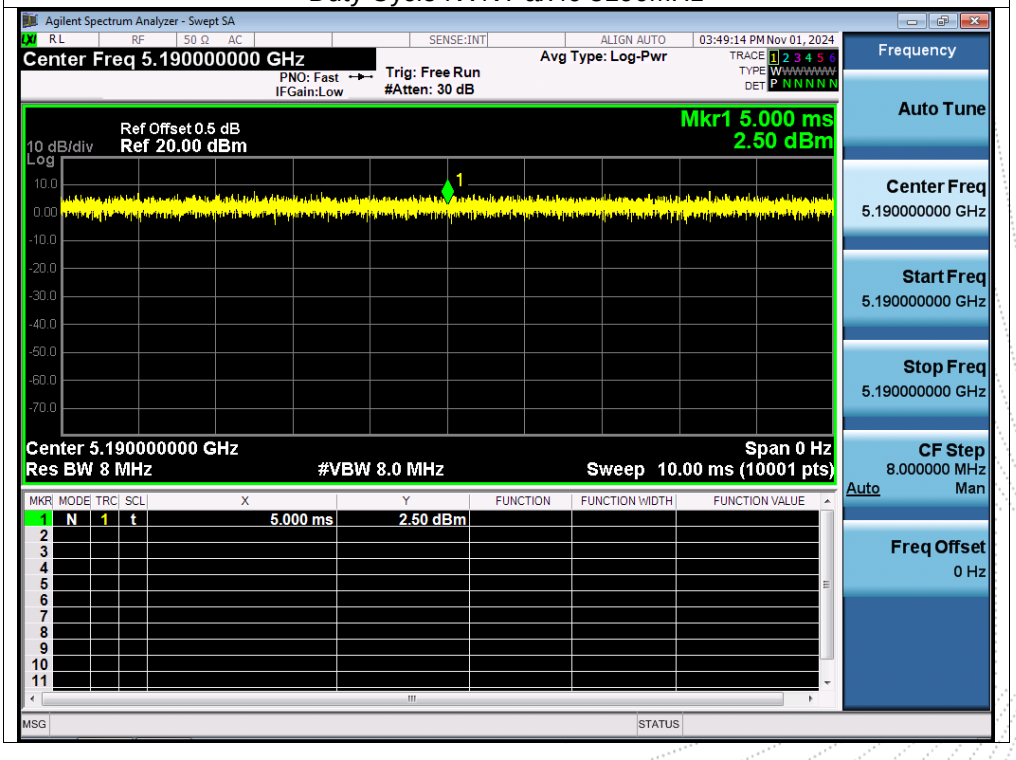
Duty Cycle NVNT ac80 5210MHz



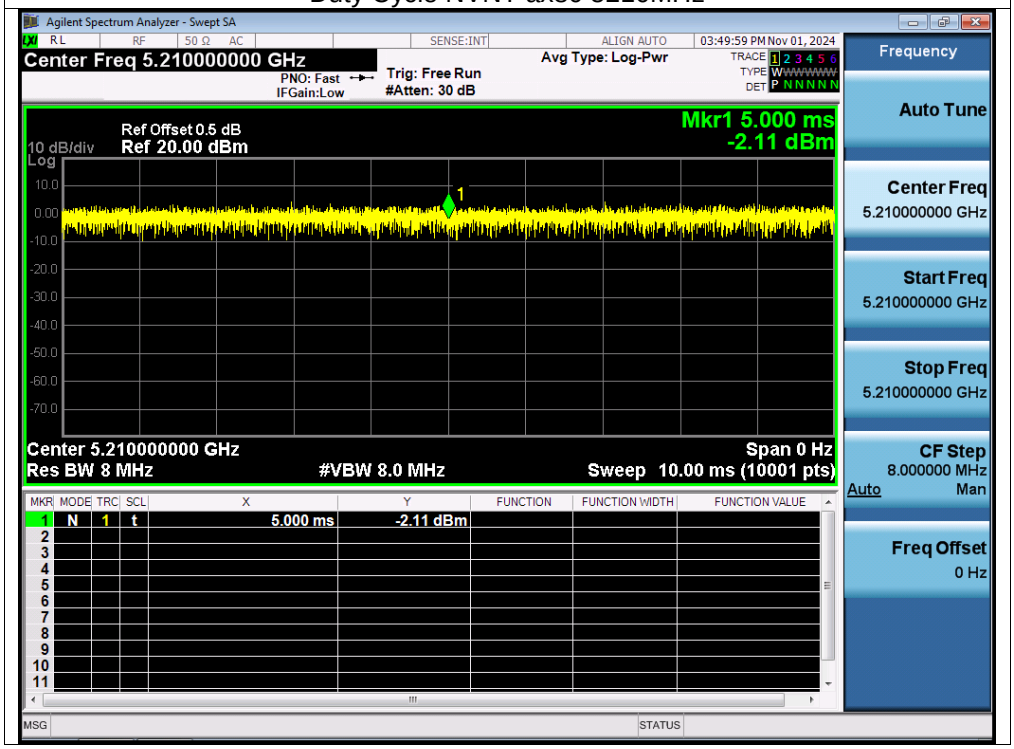
Duty Cycle NVNT ax20 5180MHz



Duty Cycle NVNT ax40 5190MHz



Duty Cycle NVNT ax80 5210MHz

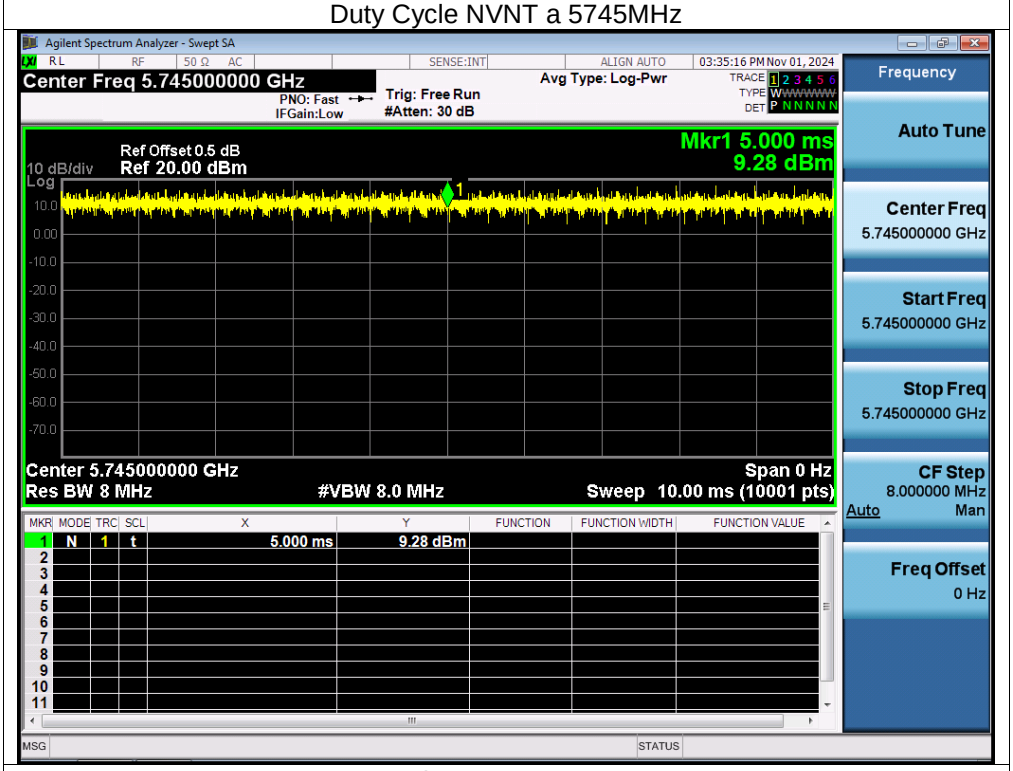


ANT A

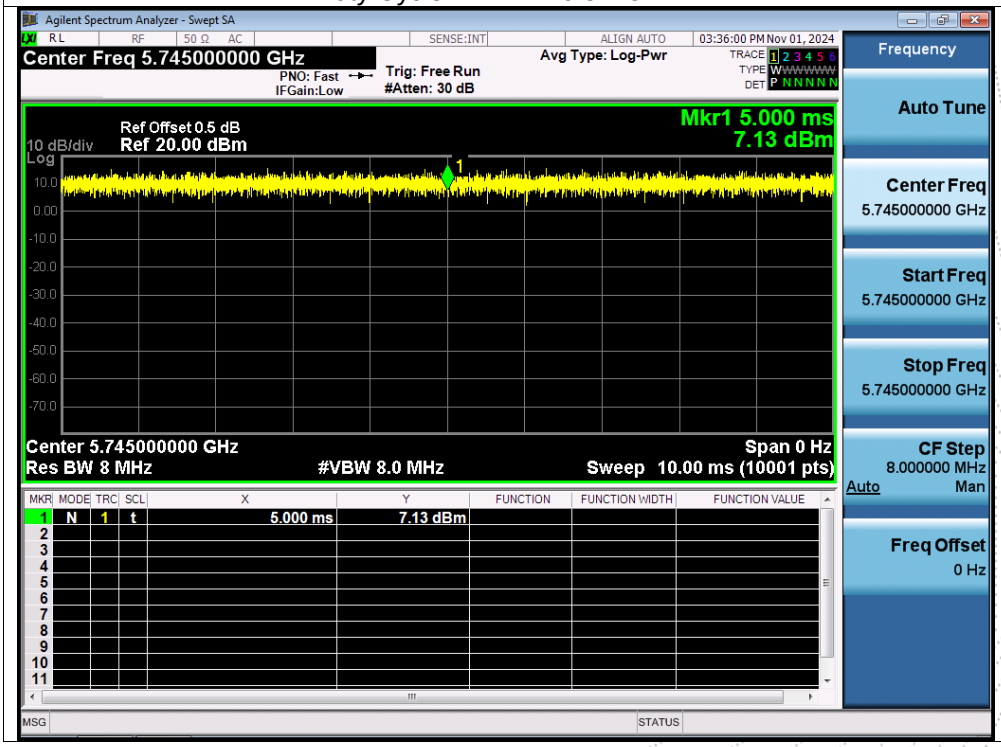
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5745	100	0	0
NVNT	n20	5745	100	0	0
NVNT	n40	5755	100	0	0
NVNT	ac20	5745	100	0	0
NVNT	ac40	5755	100	0	0
NVNT	ac80	5775	100	0	0
NVNT	ax20	5745	100	0	0
NVNT	ax40	5755	100	0	0
NVNT	ax80	5775	100	0	0

Test Graphs

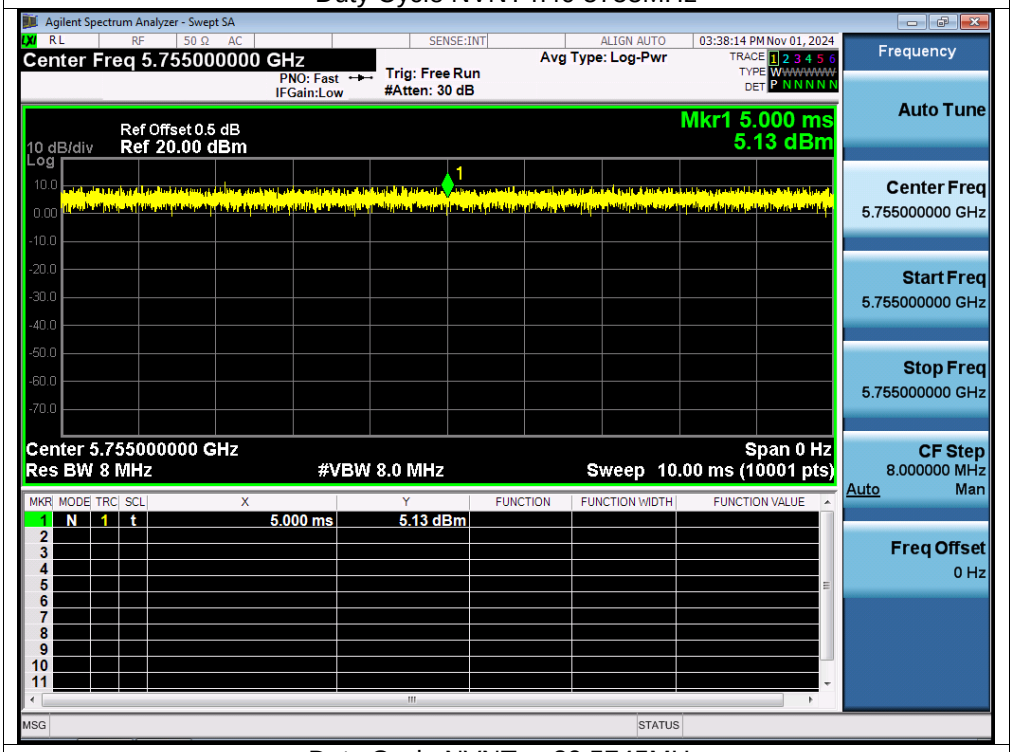
Duty Cycle NVNT a 5745MHz



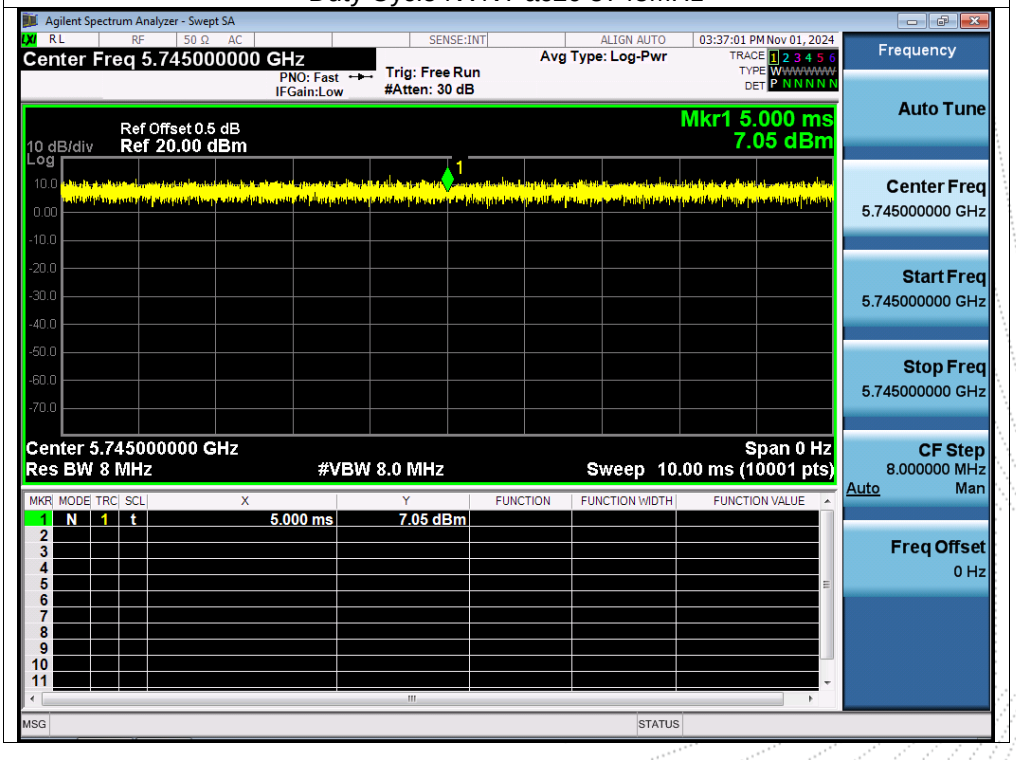
Duty Cycle NVNT n20 5745MHz



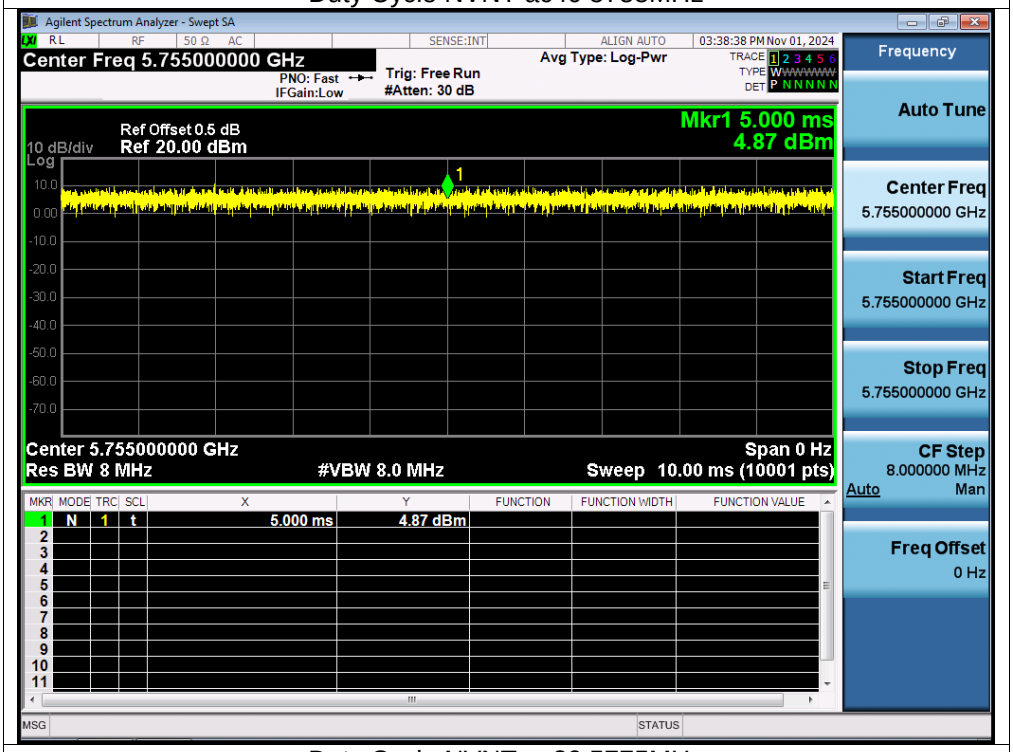
Duty Cycle NVNT n40 5755MHz



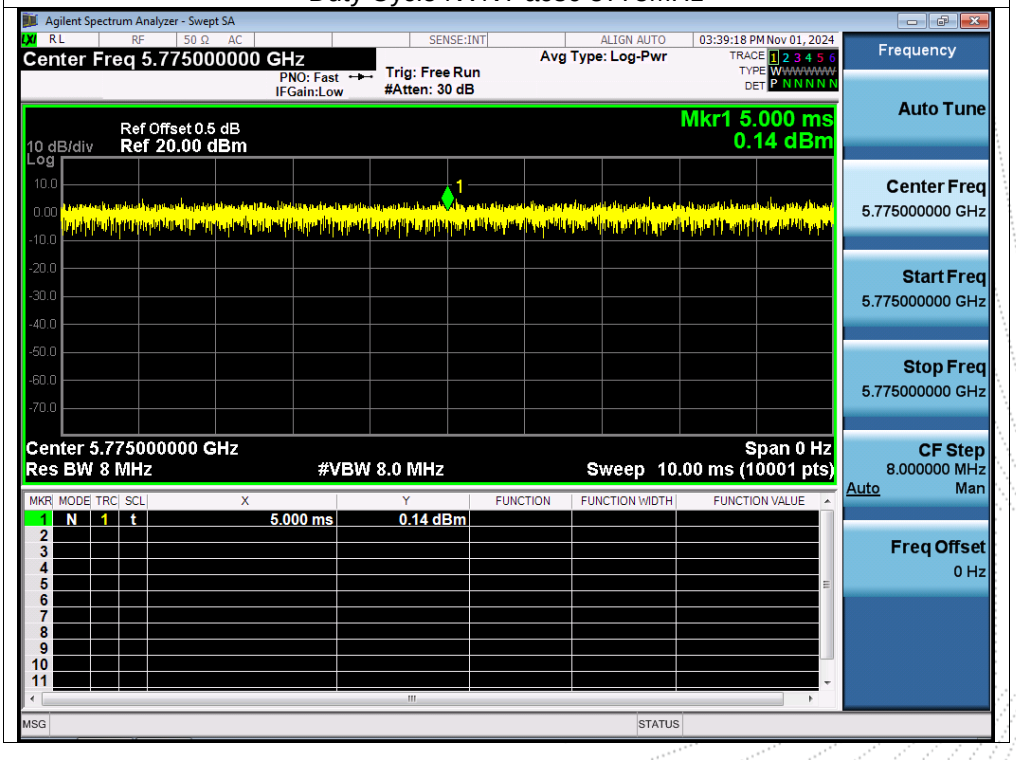
Duty Cycle NVNT ac20 5745MHz



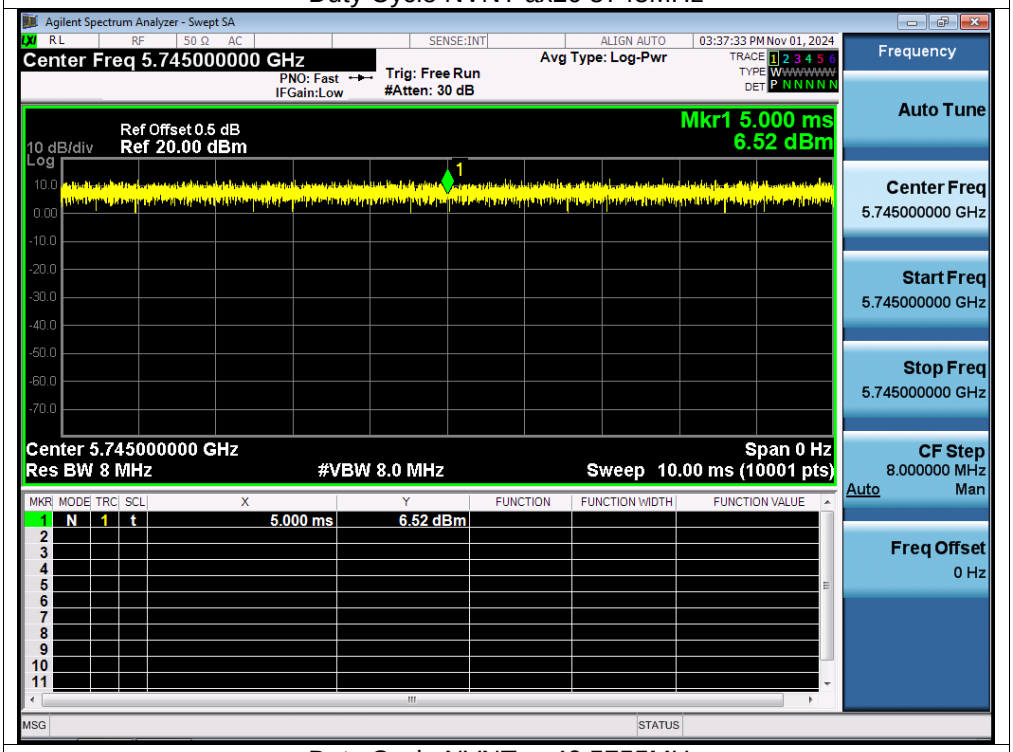
Duty Cycle NVNT ac40 5755MHz



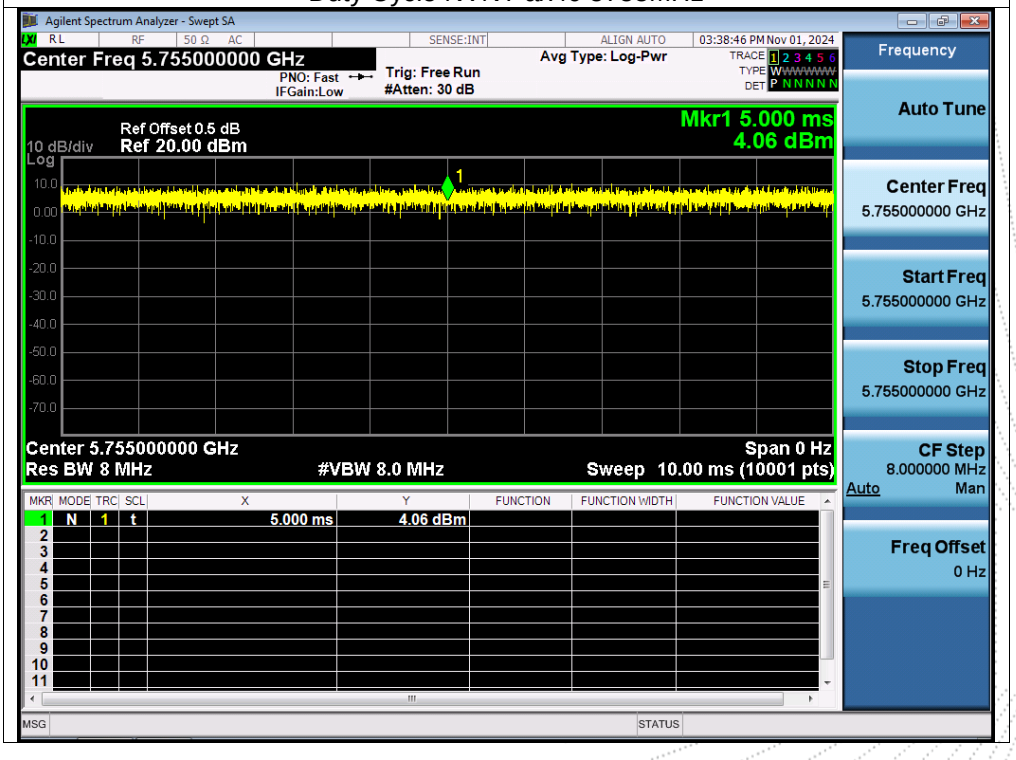
Duty Cycle NVNT ac80 5775MHz



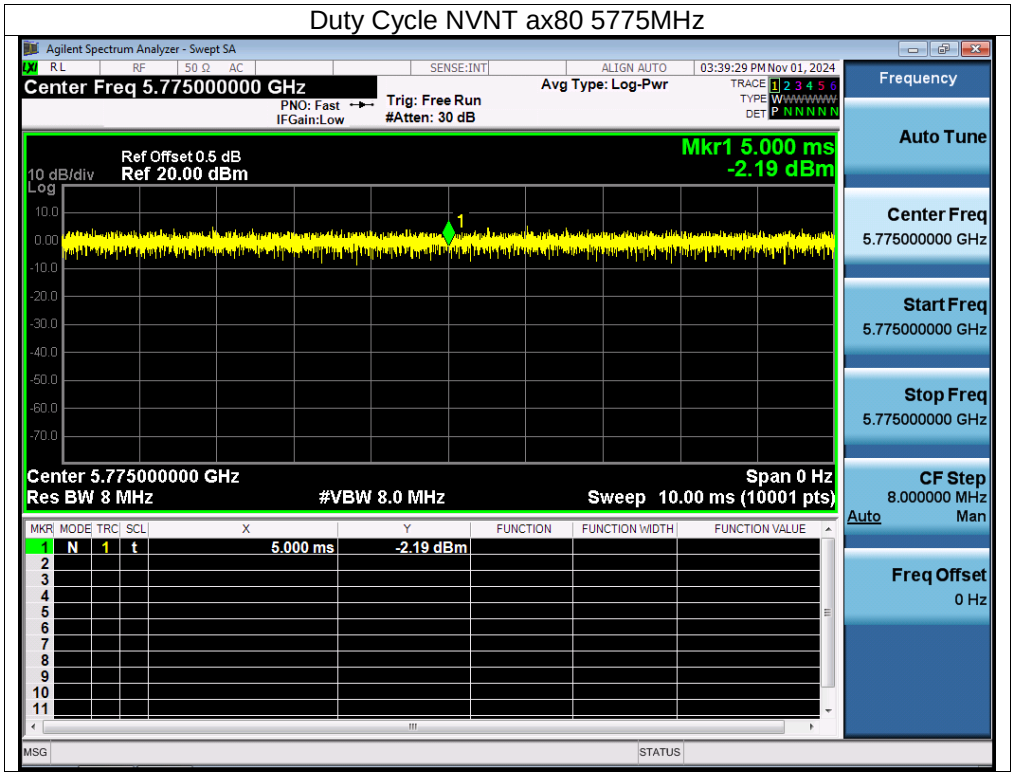
Duty Cycle NVNT ax20 5745MHz



Duty Cycle NVNT ax40 5755MHz



Duty Cycle NVNT ax80 5775MHz

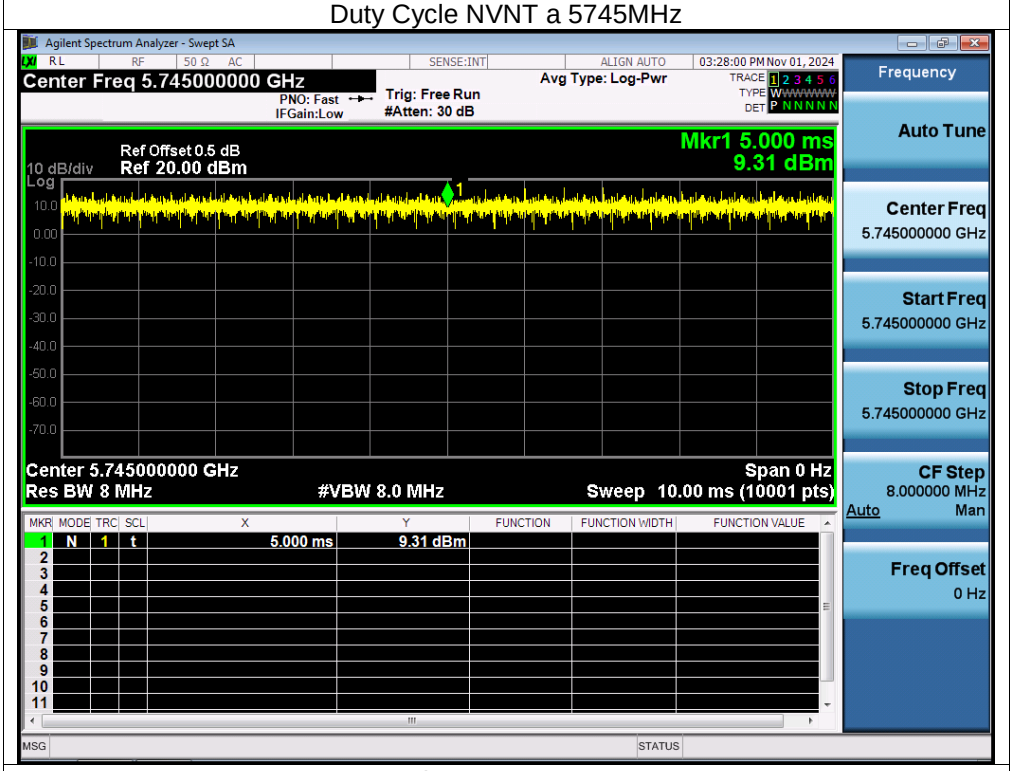


ANT B

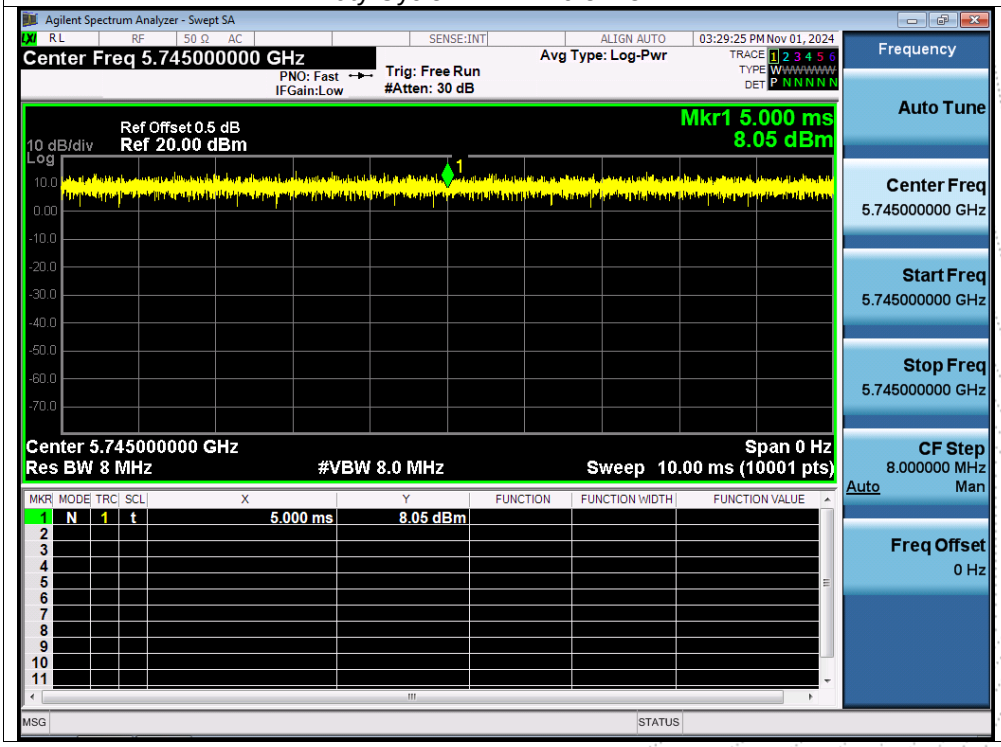
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5745	100	0	0
NVNT	n20	5745	100	0	0
NVNT	n40	5755	100	0	0
NVNT	ac20	5745	100	0	0
NVNT	ac40	5755	100	0	0
NVNT	ac80	5775	100	0	0
NVNT	ax20	5745	100	0	0
NVNT	ax40	5755	100	0	0
NVNT	ax80	5775	100	0	0

Test Graphs

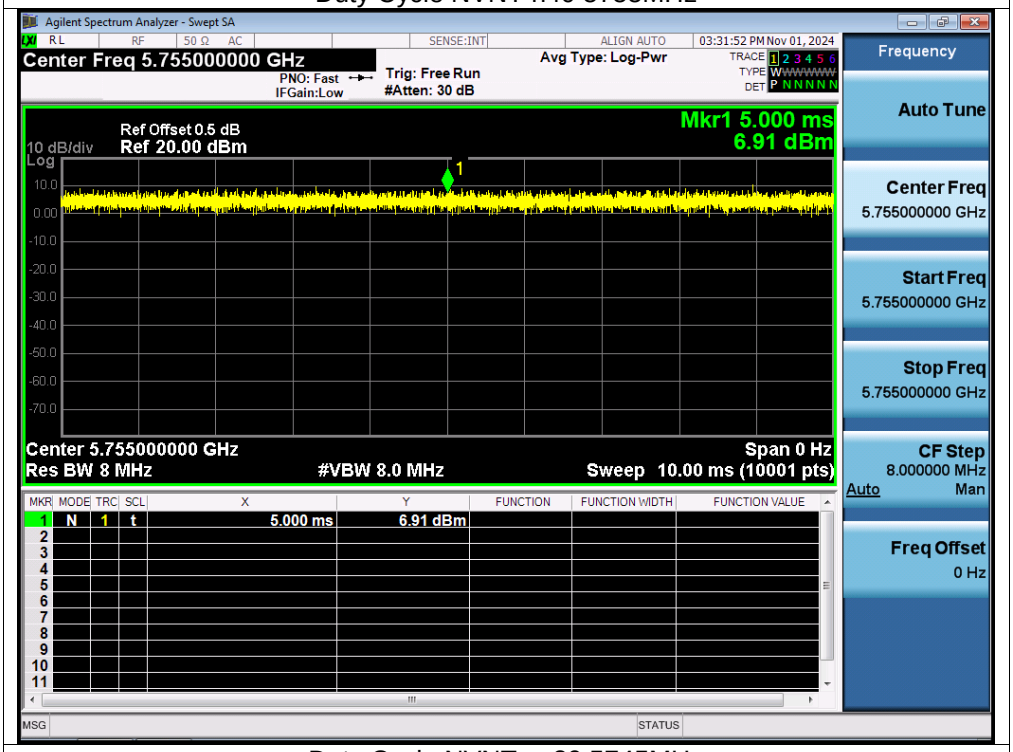
Duty Cycle NVNT a 5745MHz



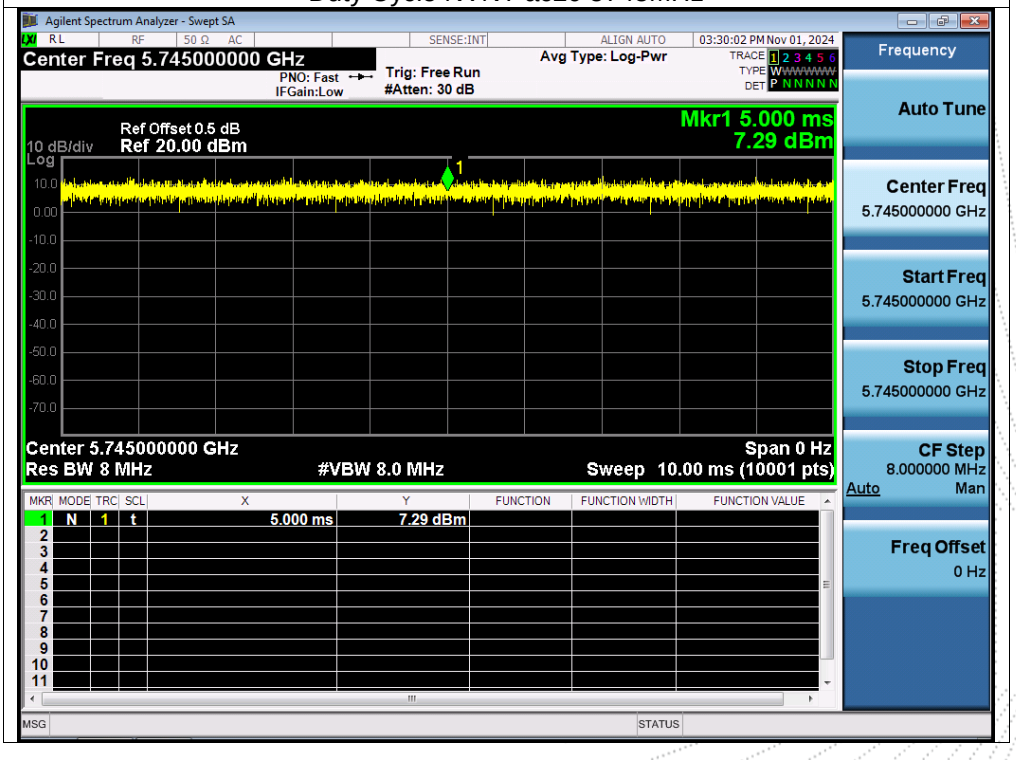
Duty Cycle NVNT n20 5745MHz



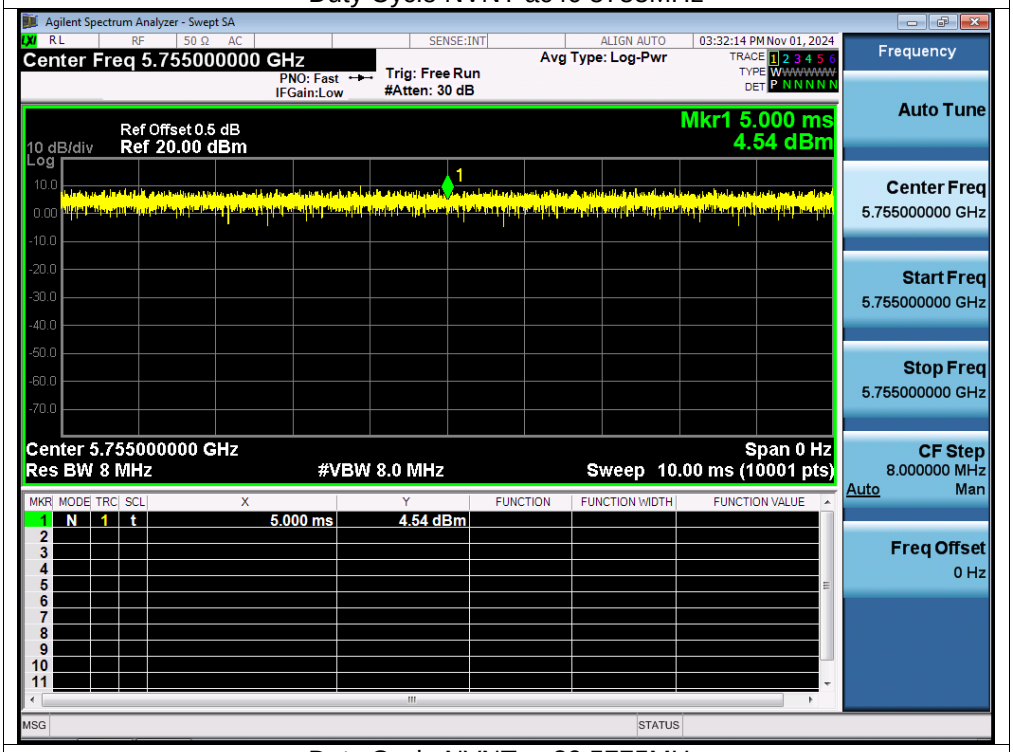
Duty Cycle NVNT n40 5755MHz



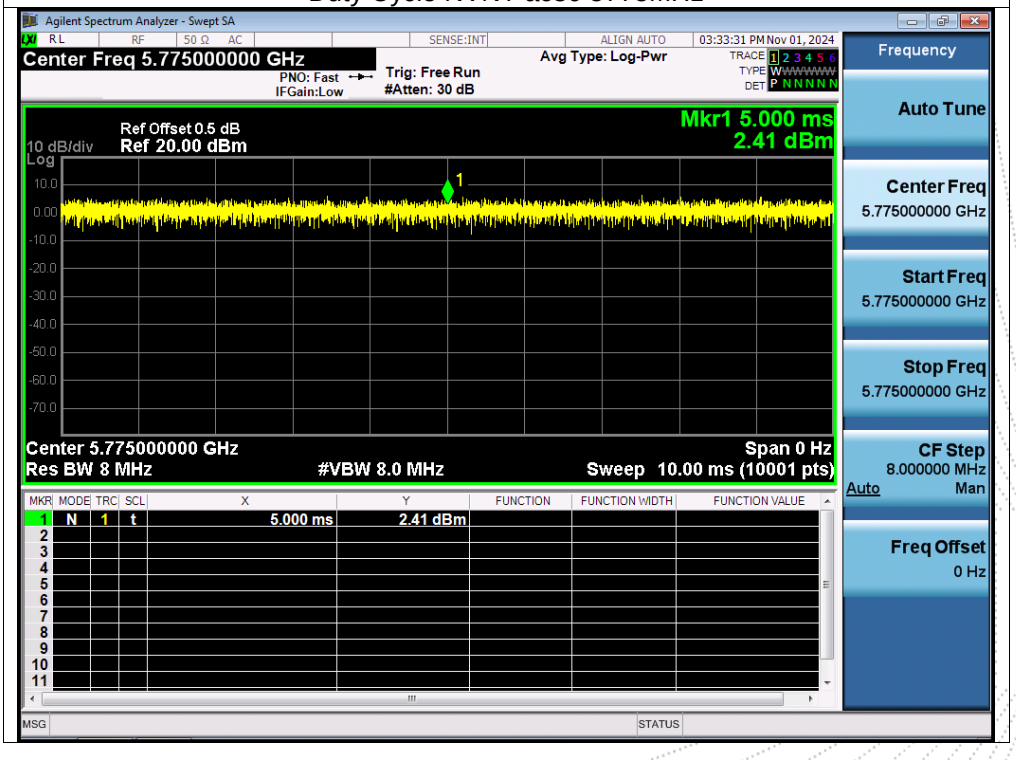
Duty Cycle NVNT ac20 5745MHz



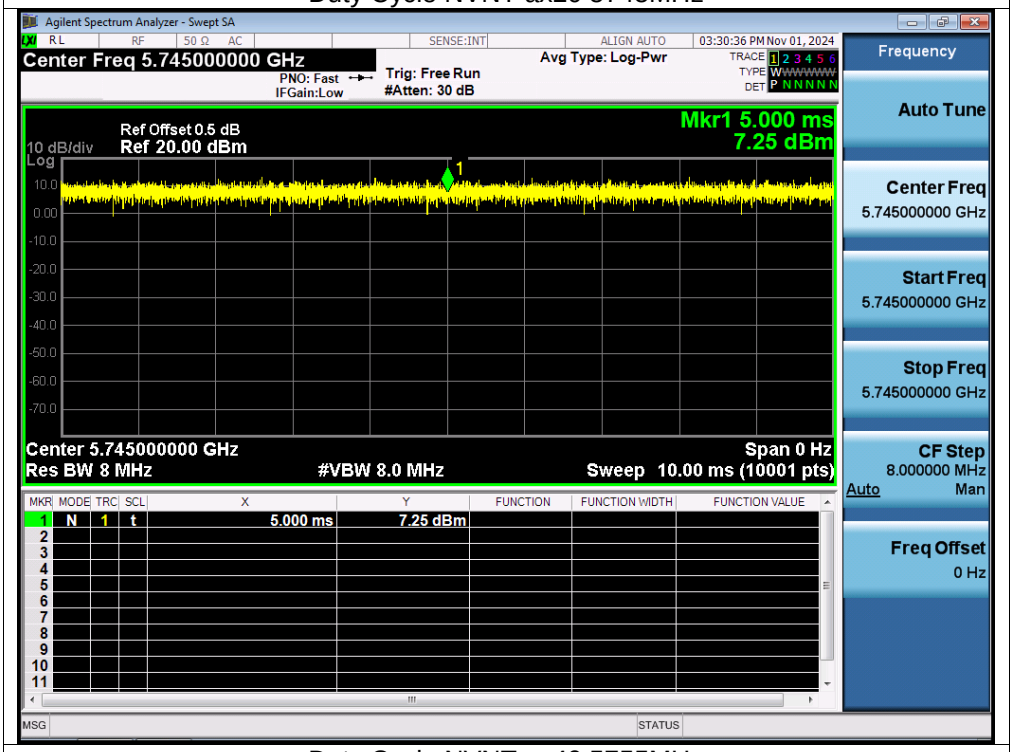
Duty Cycle NVNT ac40 5755MHz



Duty Cycle NVNT ac80 5775MHz



Duty Cycle NVNT ax20 5745MHz



Duty Cycle NVNT ax40 5755MHz