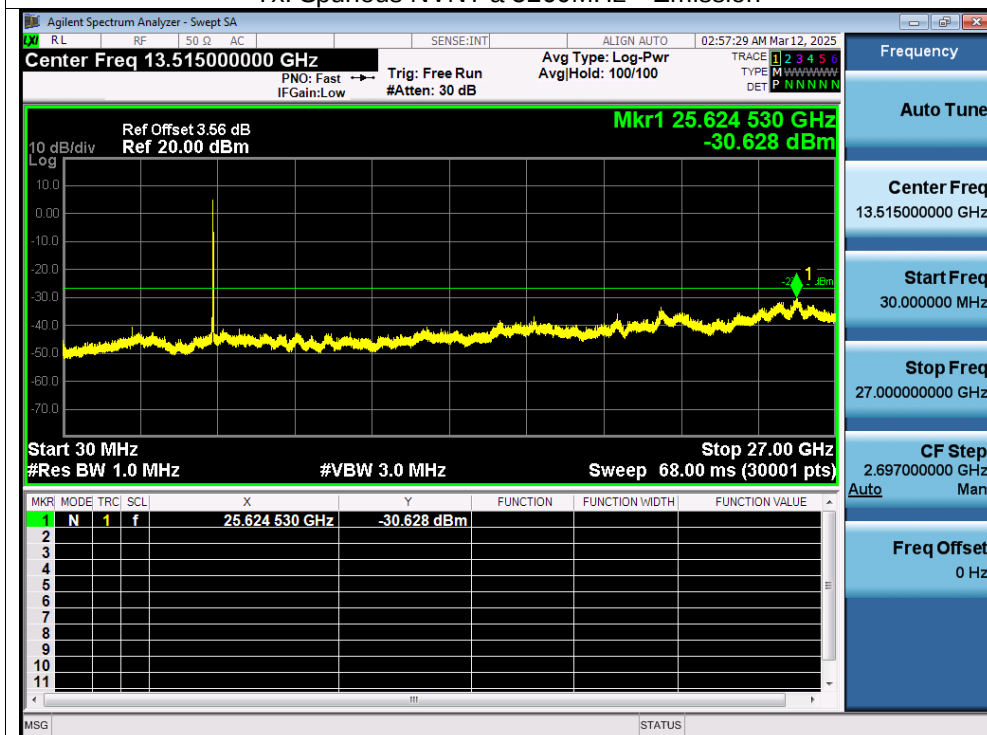
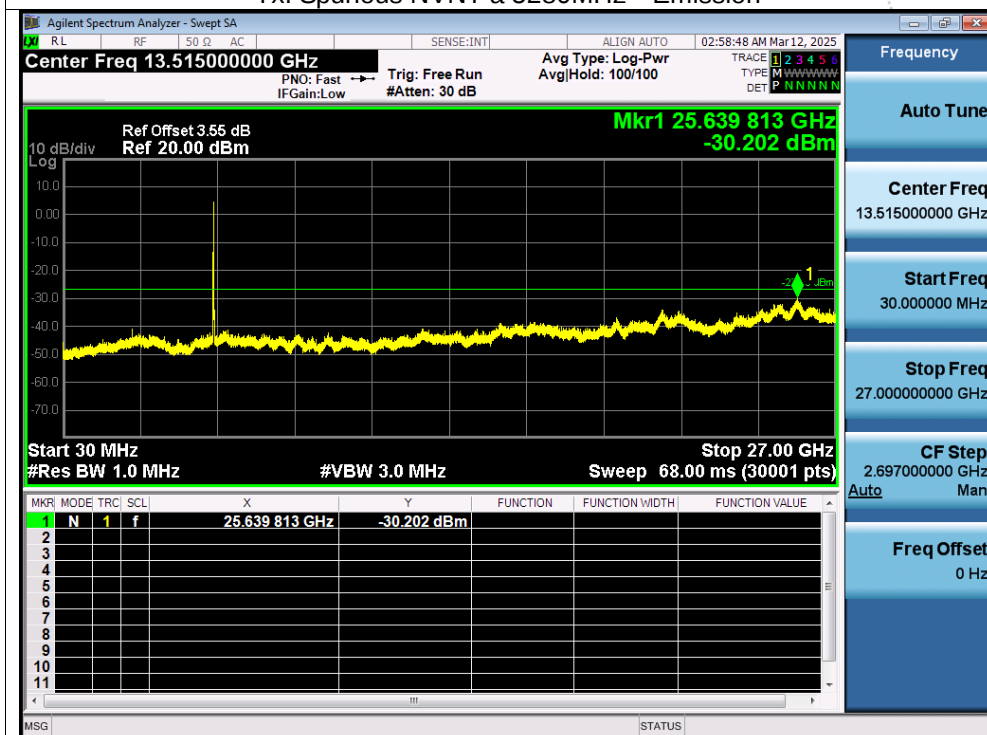


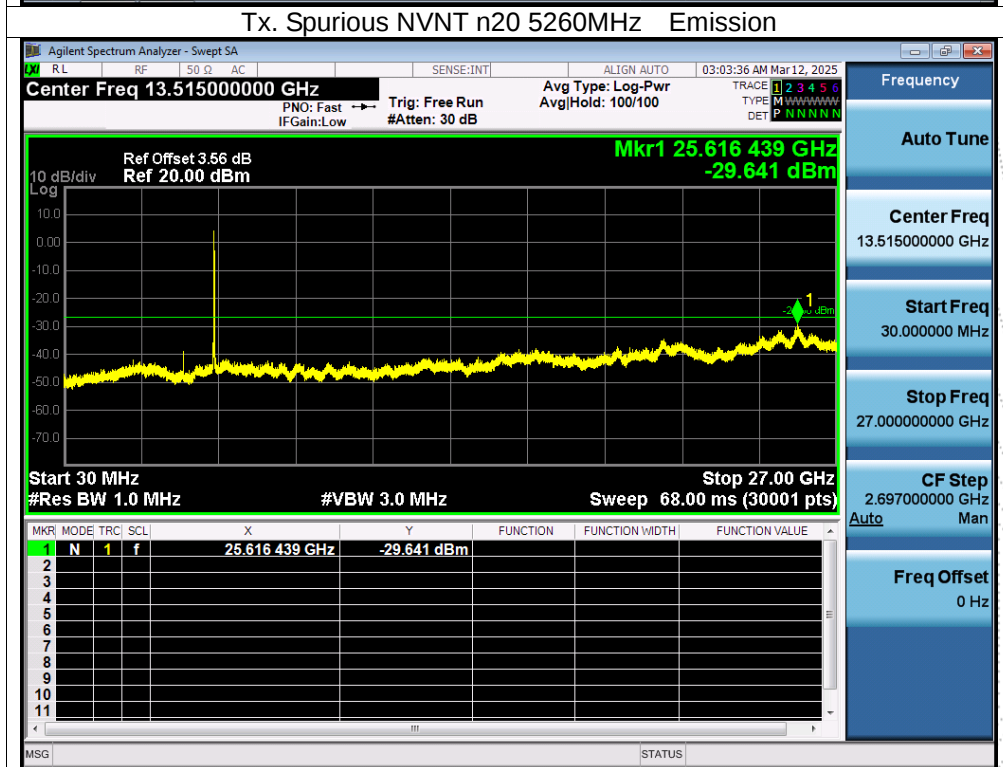
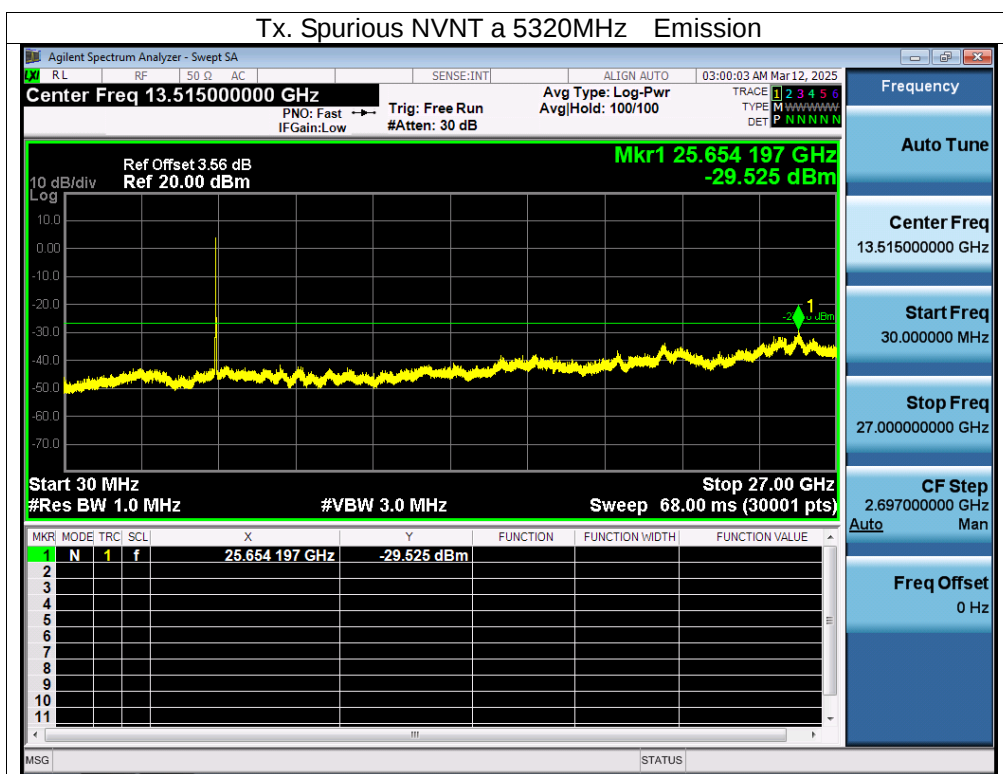
Test Graphs

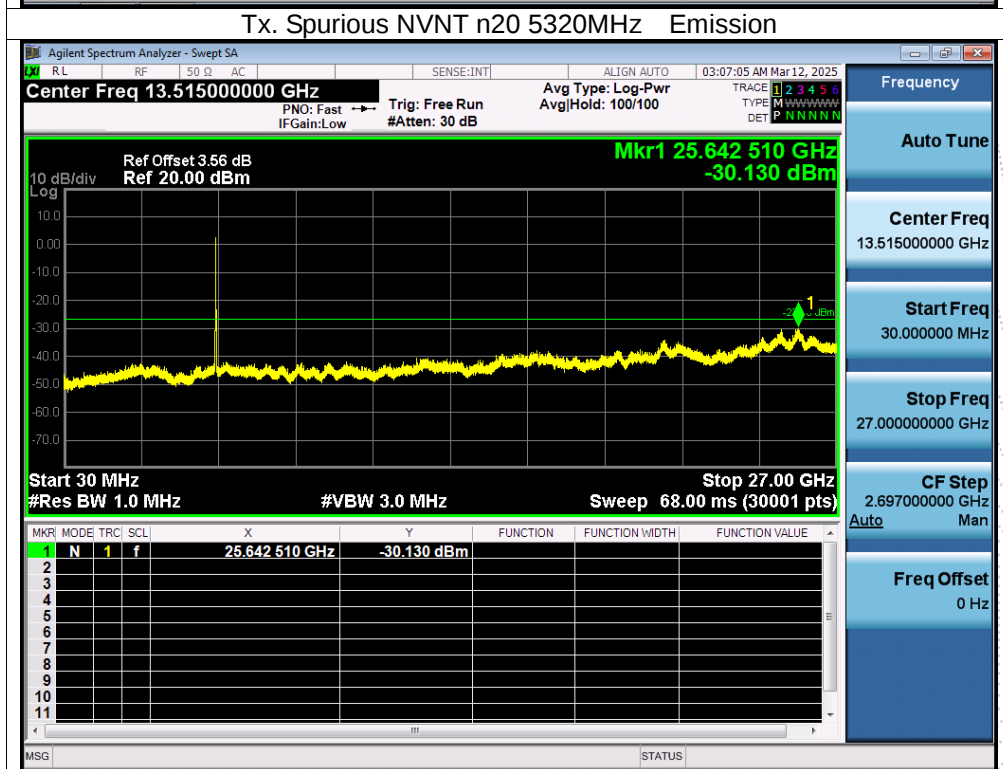
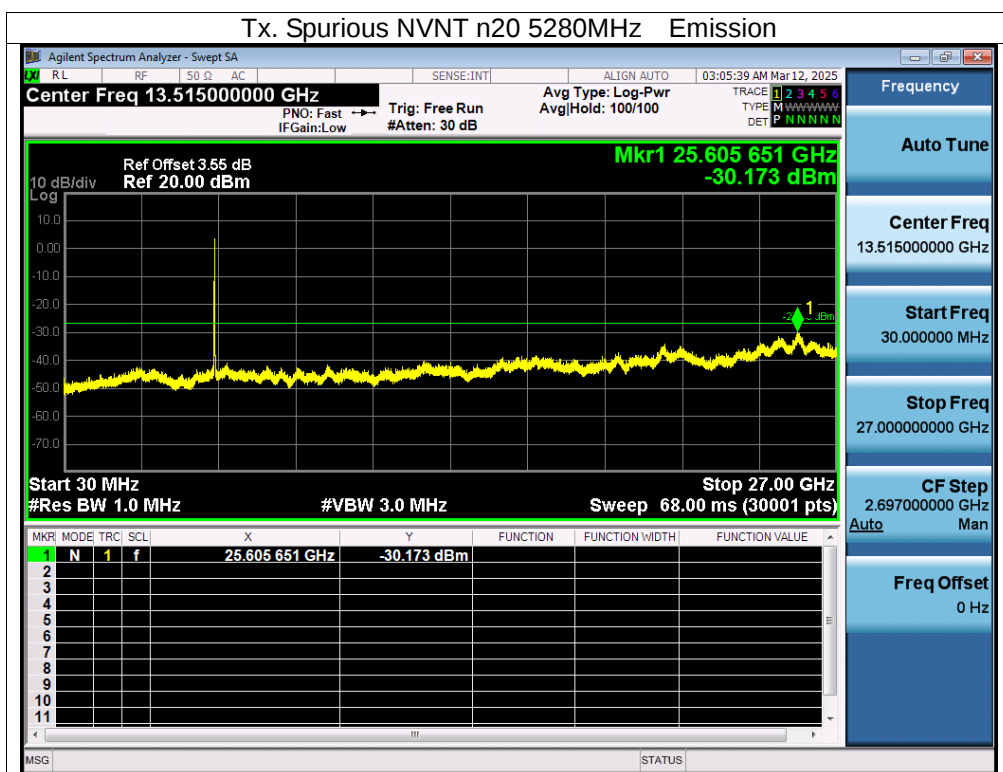
Tx. Spurious NVNT a 5260MHz Emission

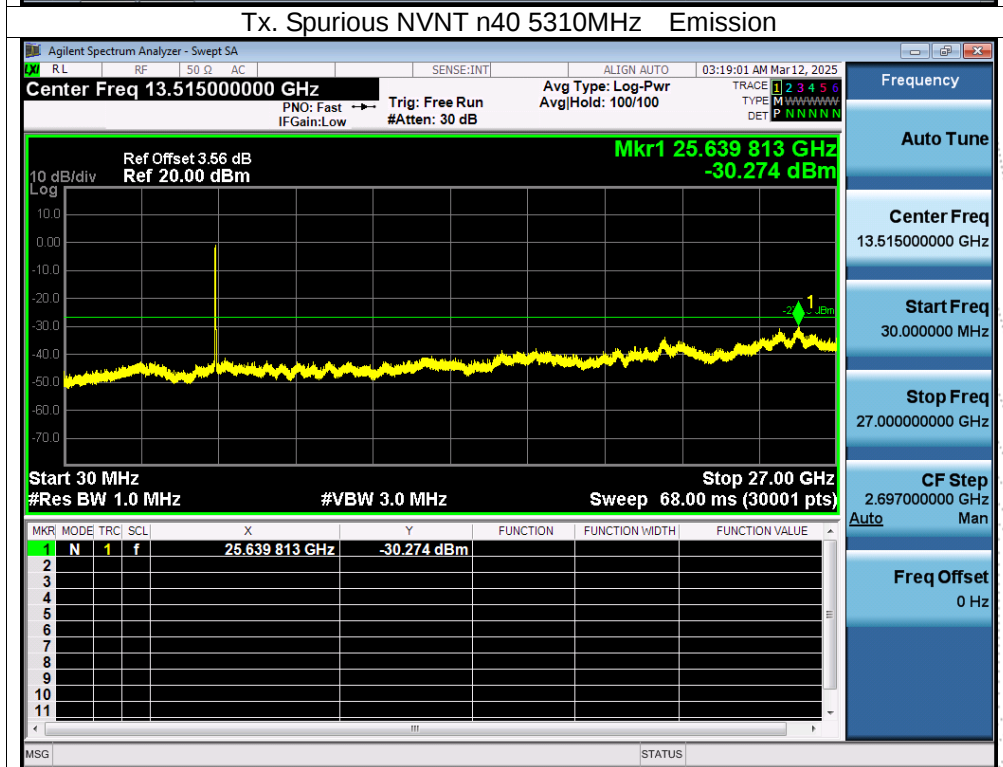
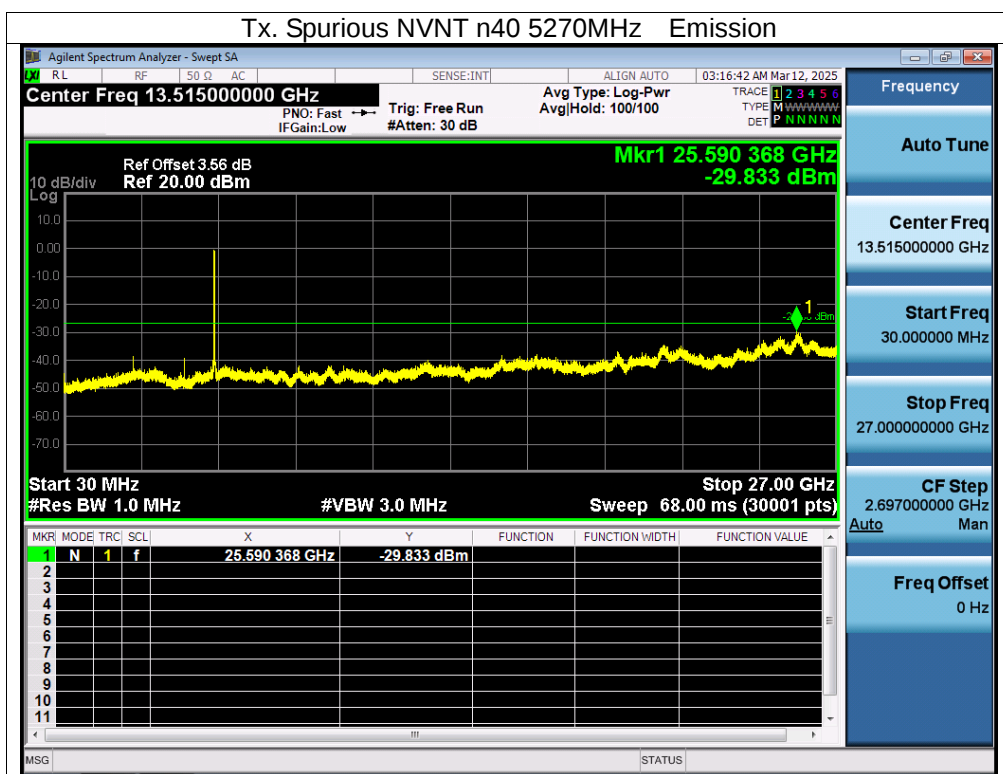


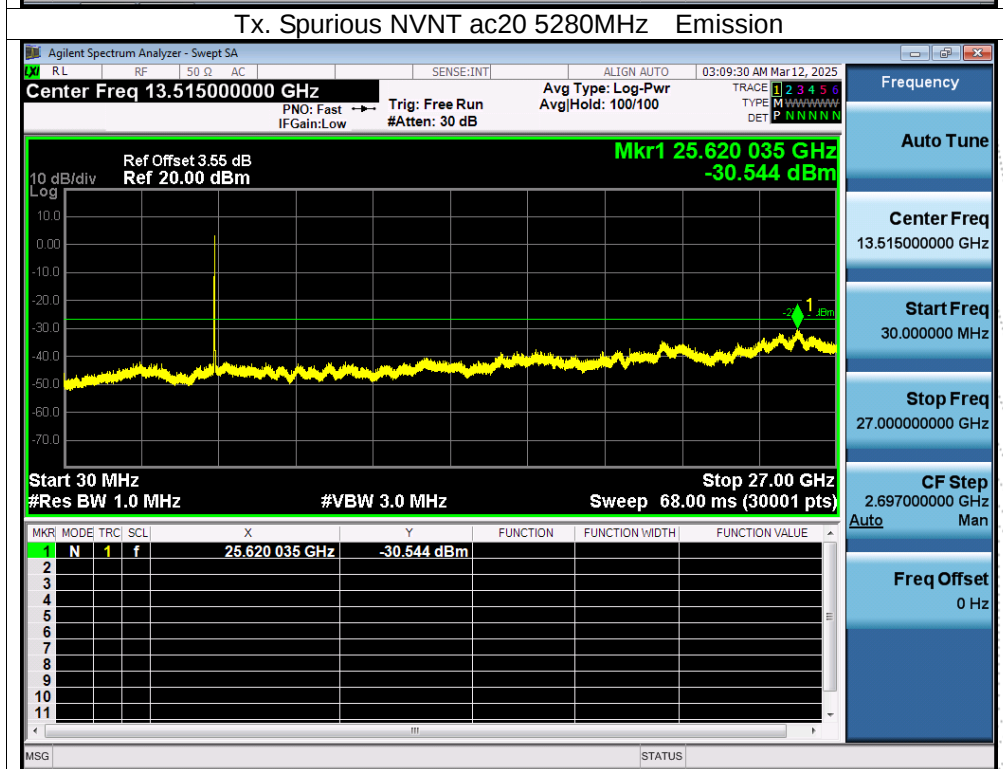
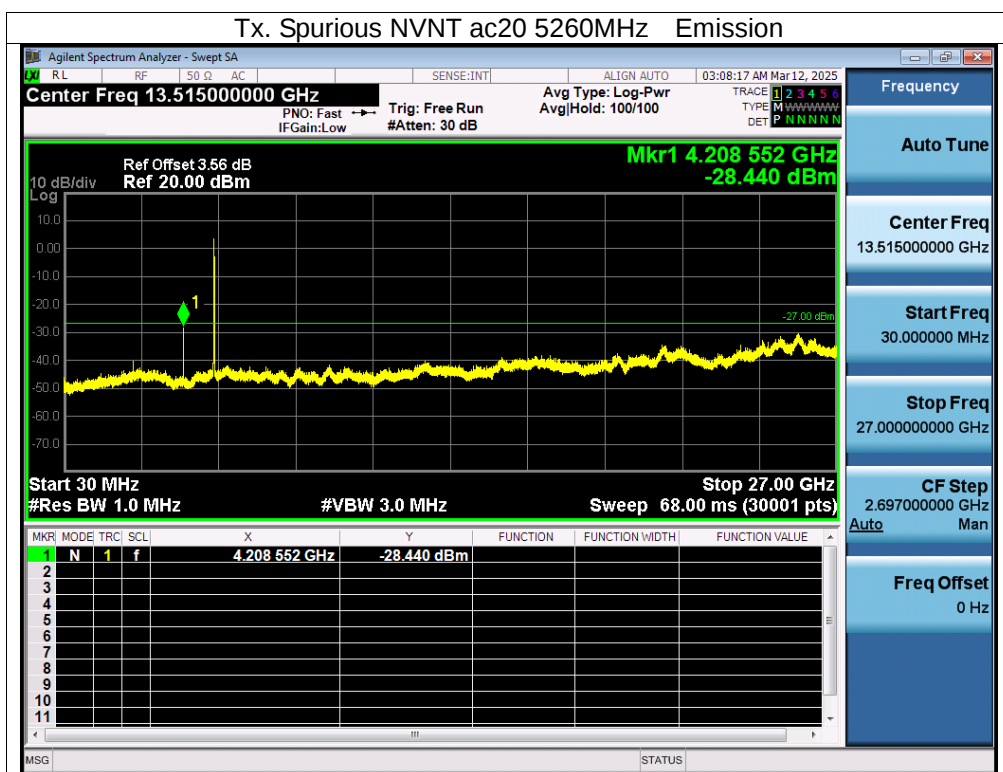
Tx. Spurious NVNT a 5280MHz Emission

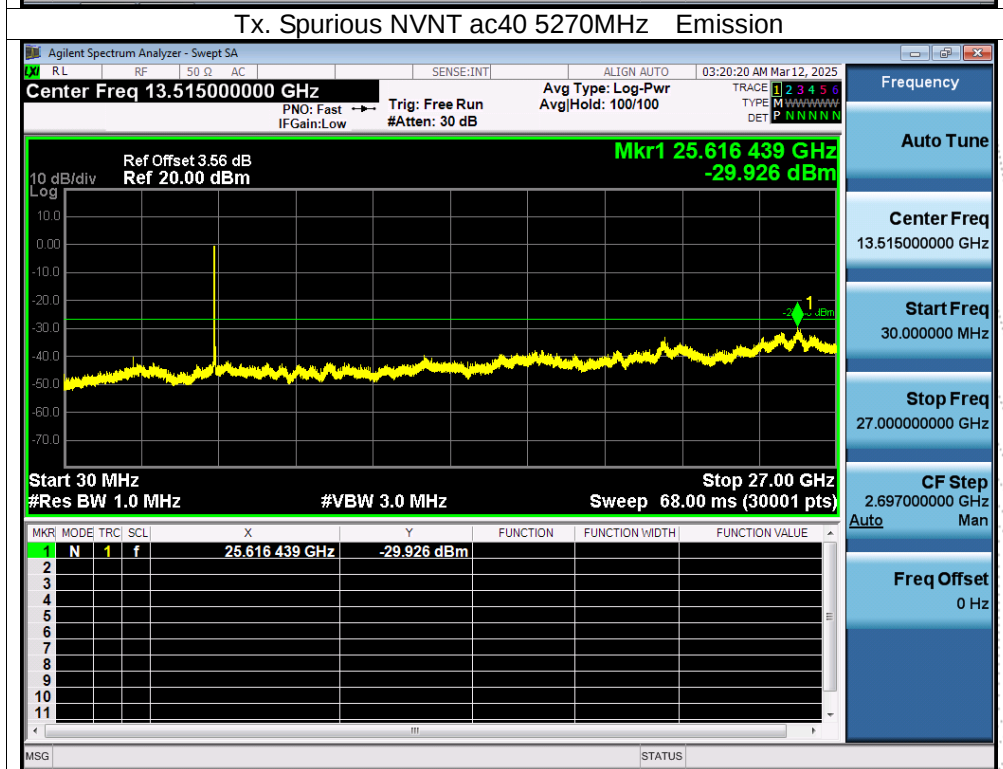
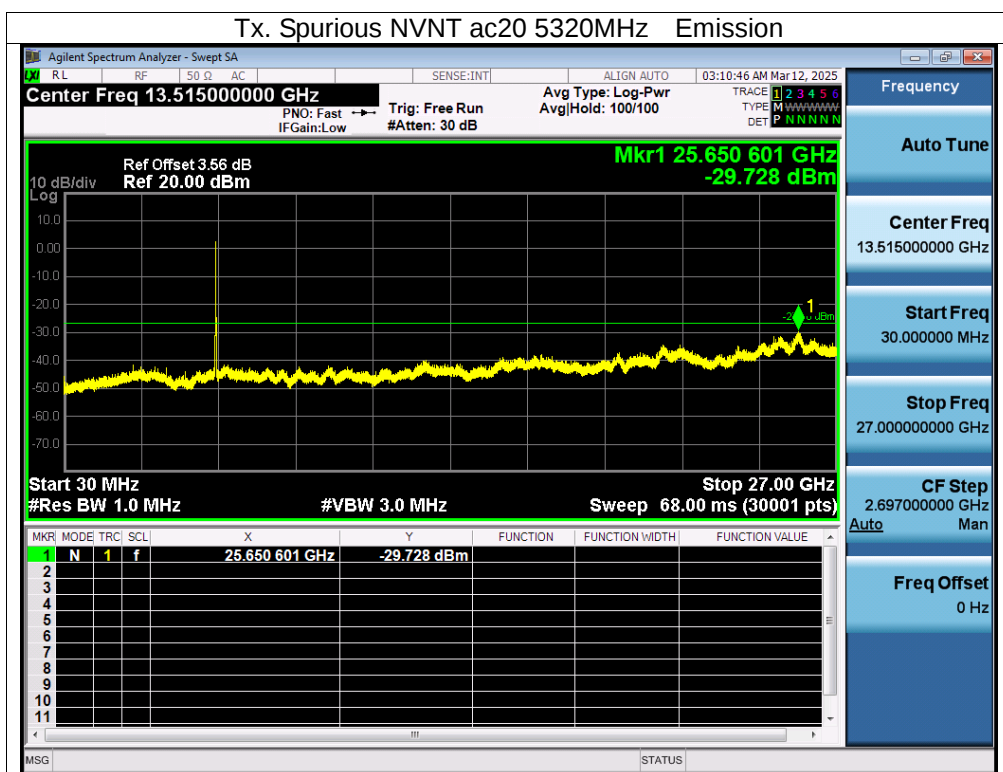


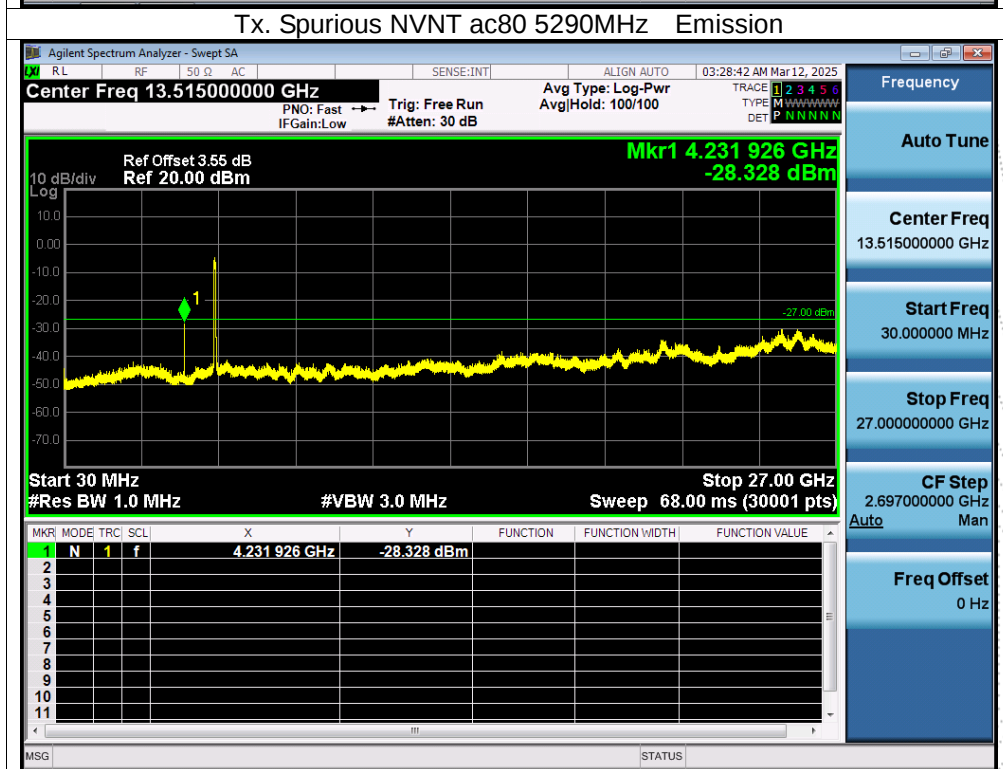
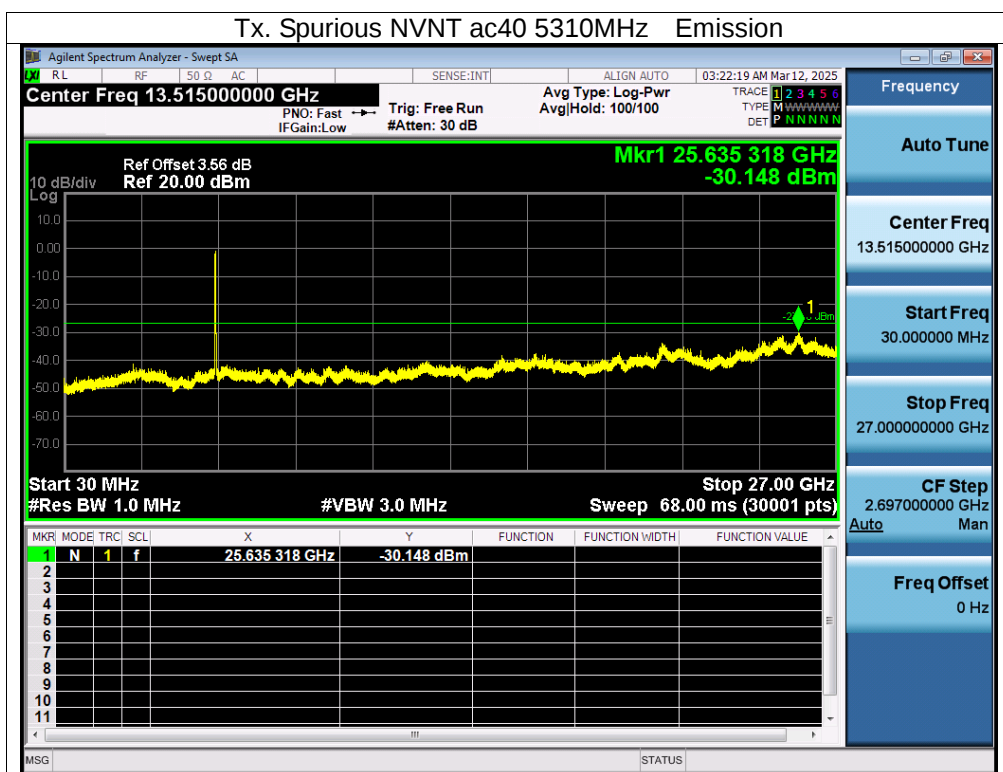


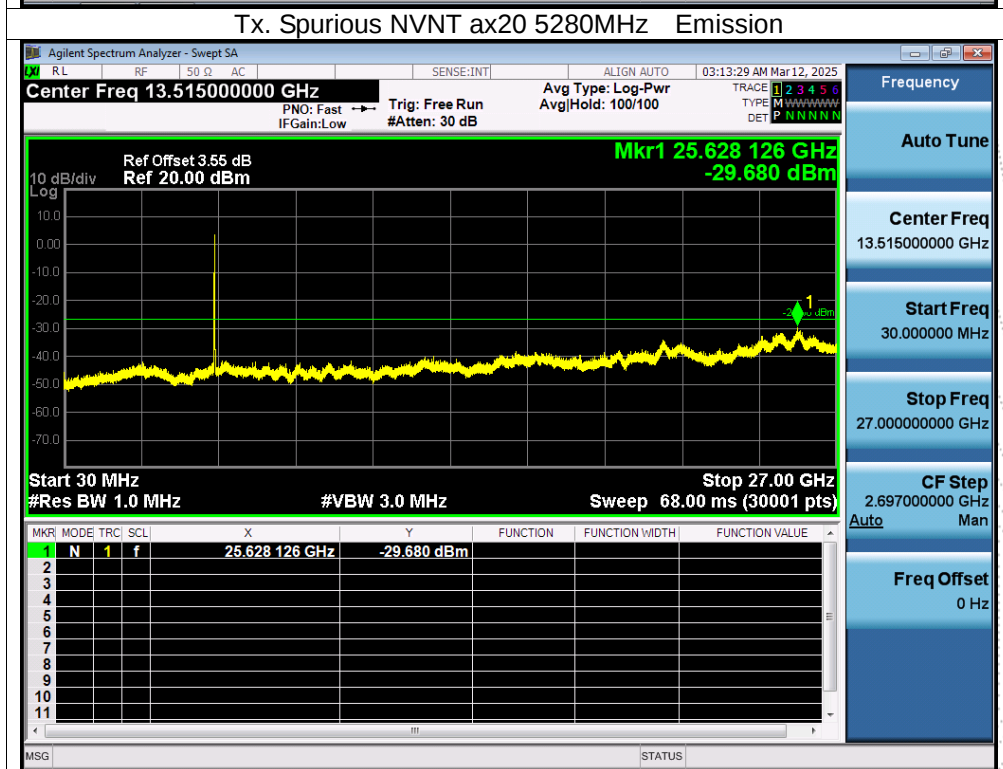
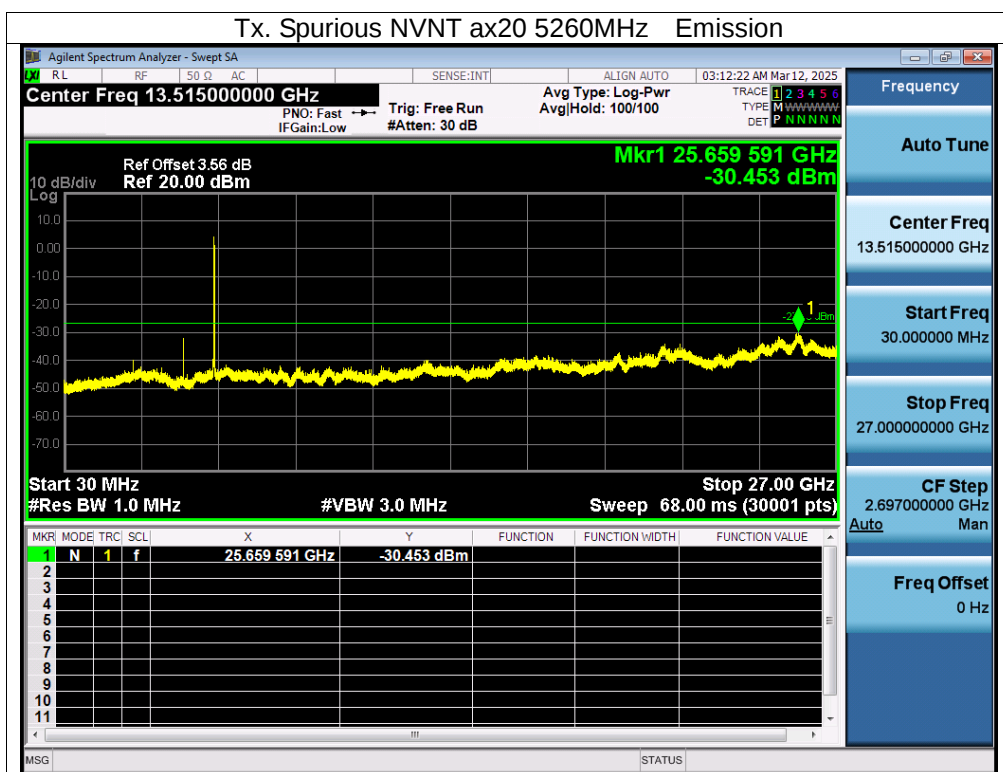


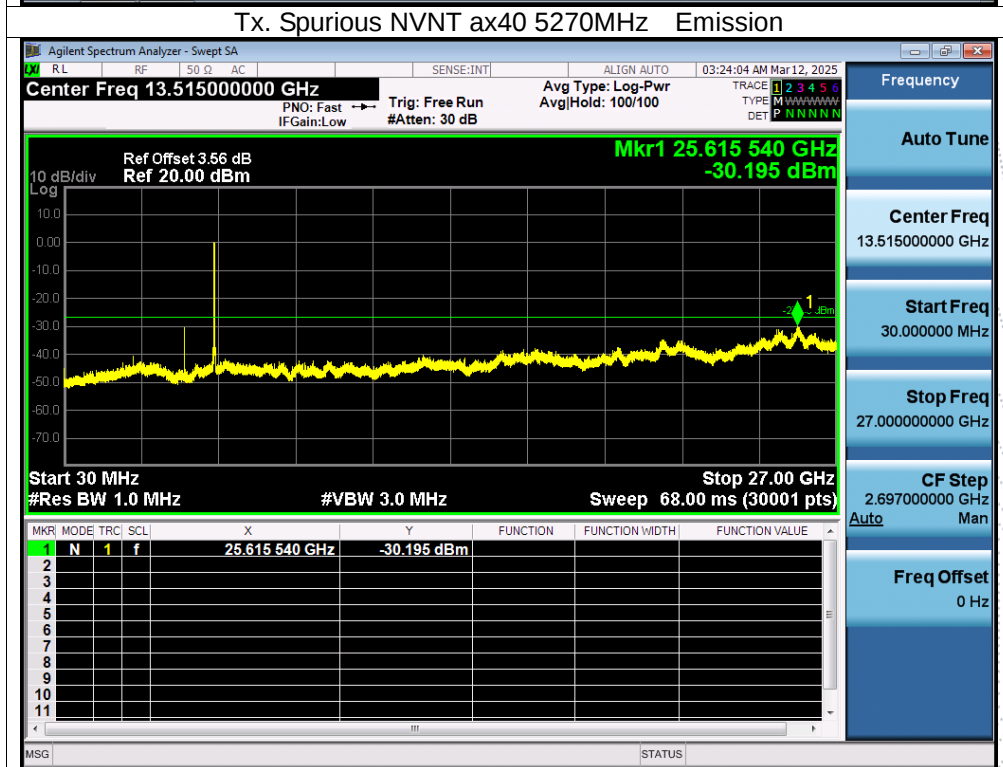
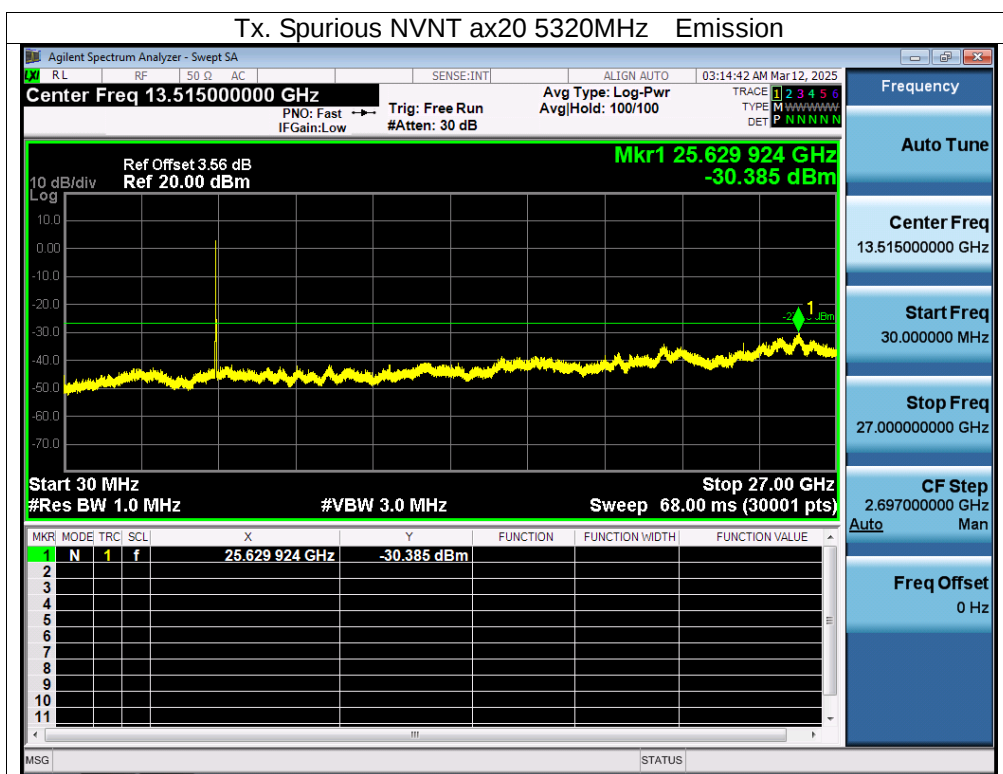


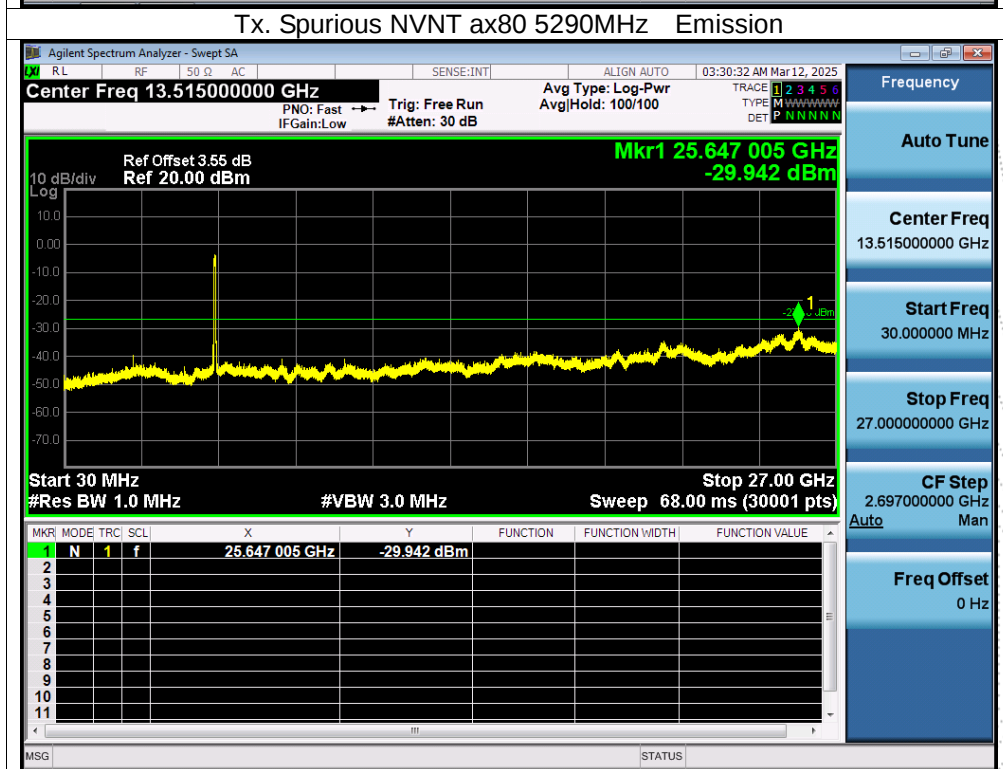
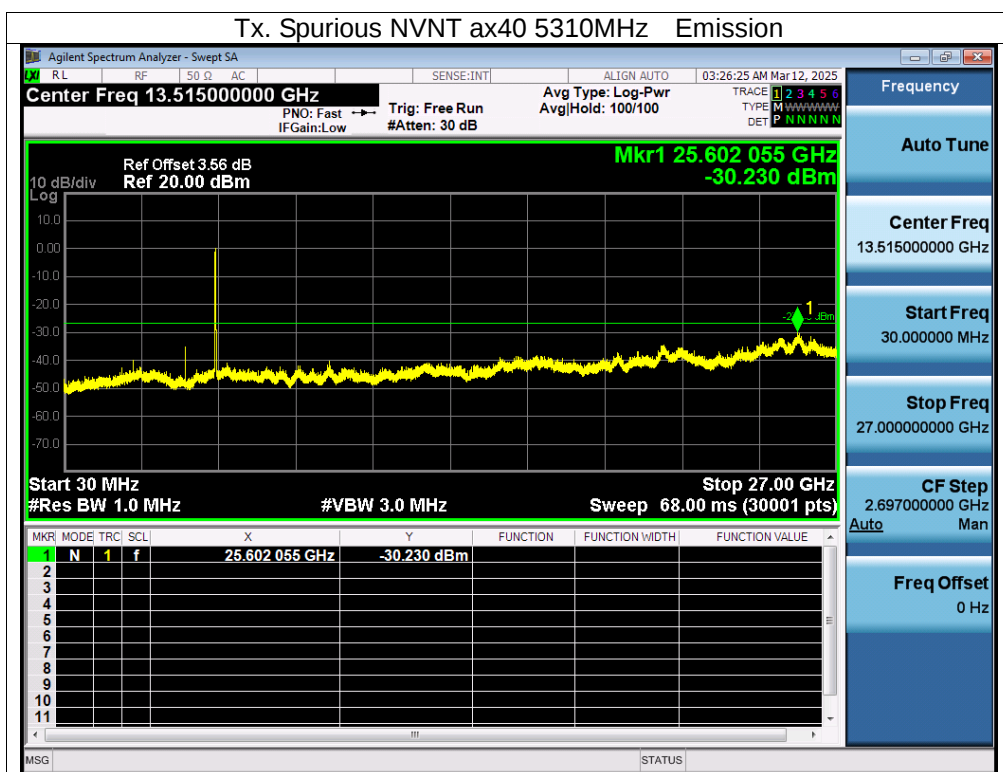






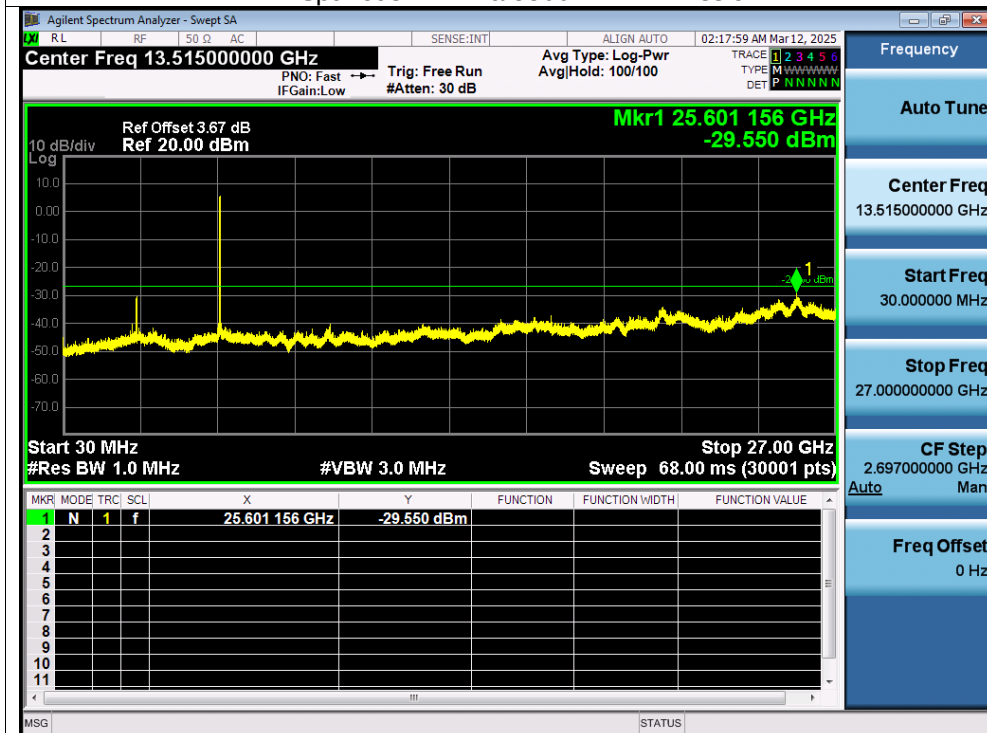




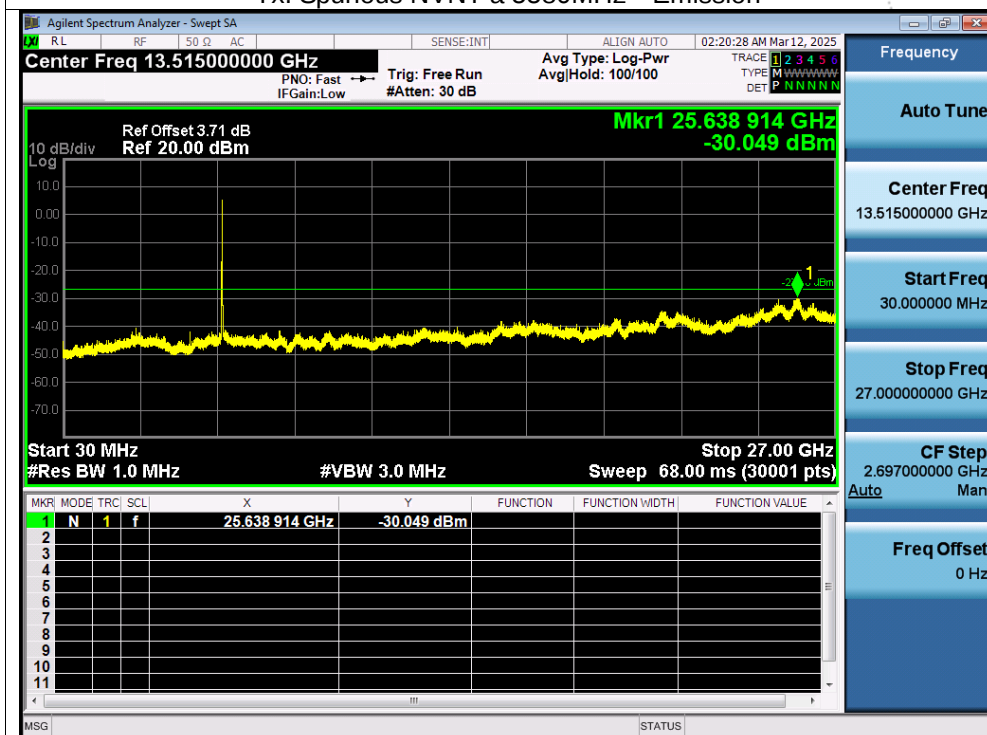


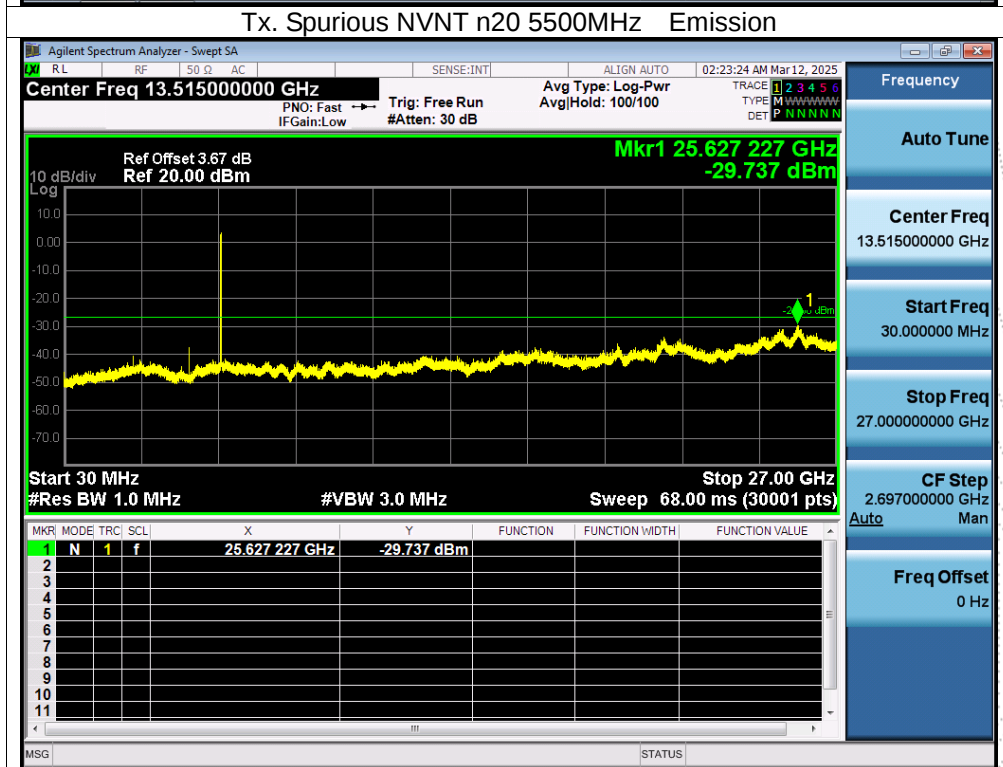
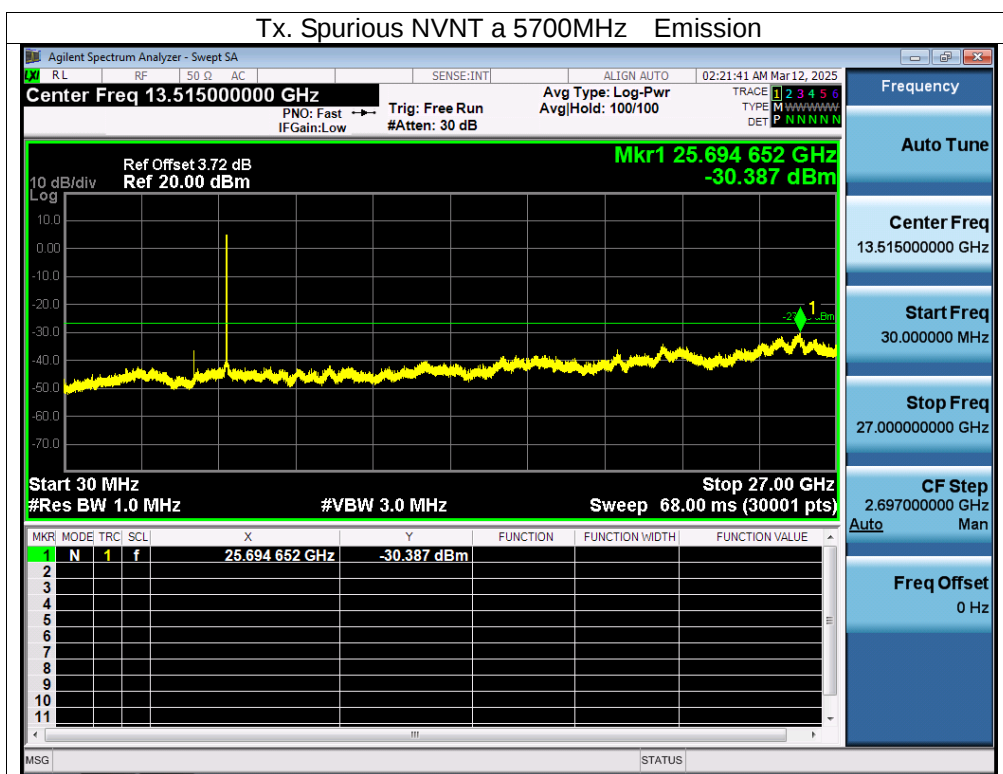
Test Graphs

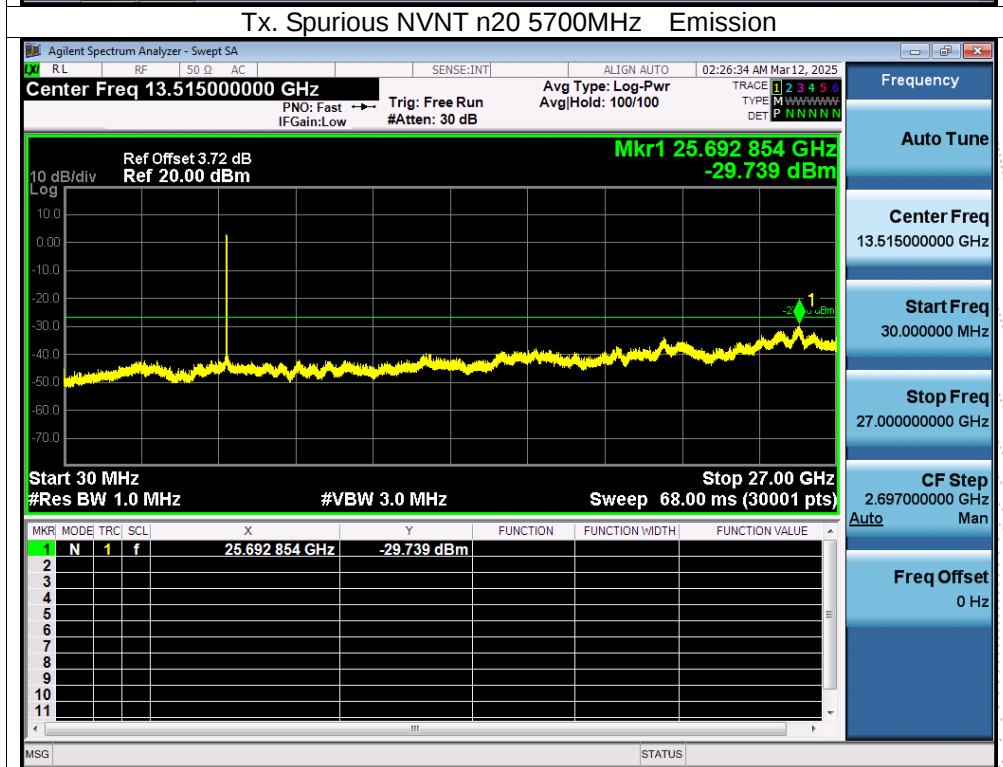
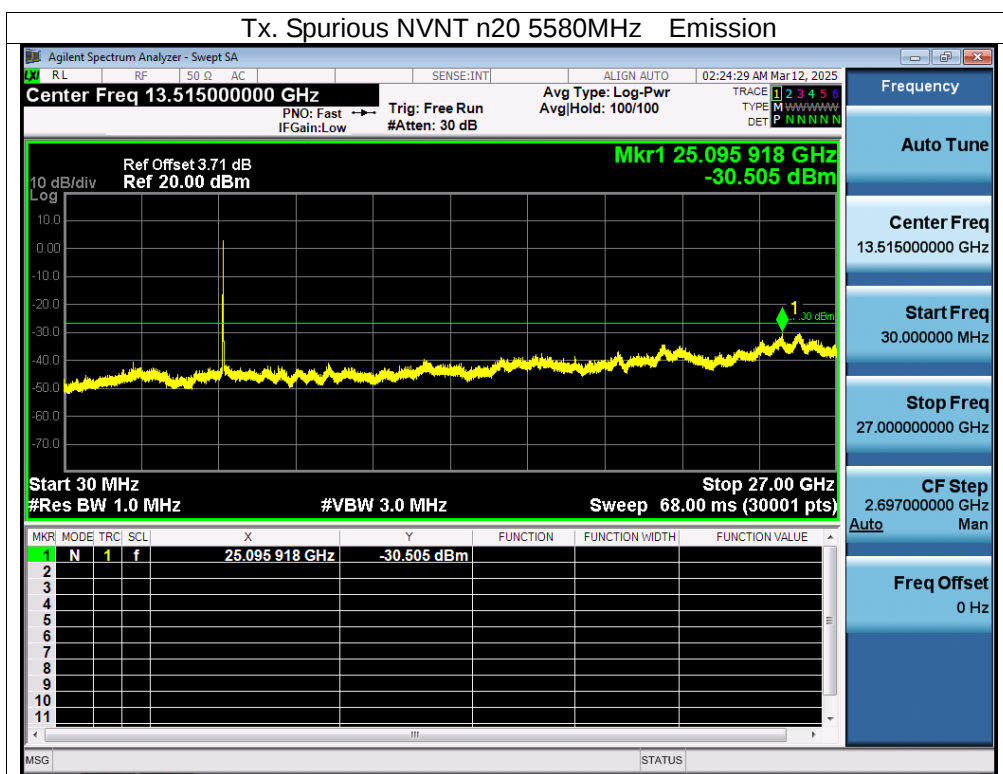
Tx. Spurious NVNT a 5500MHz Emission

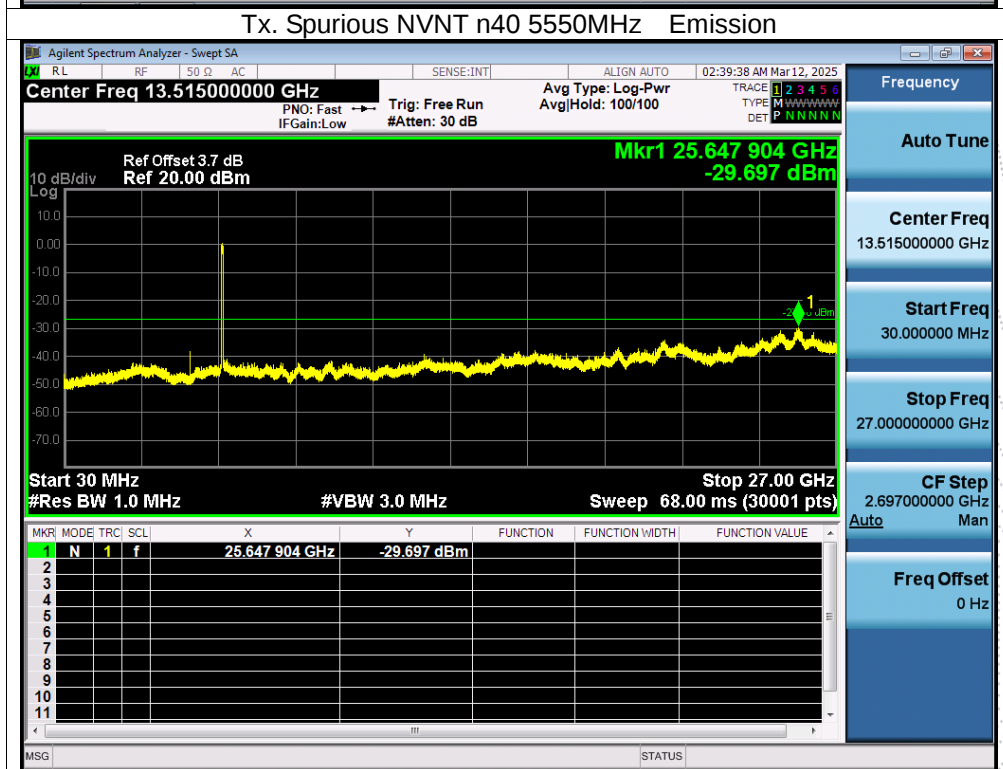
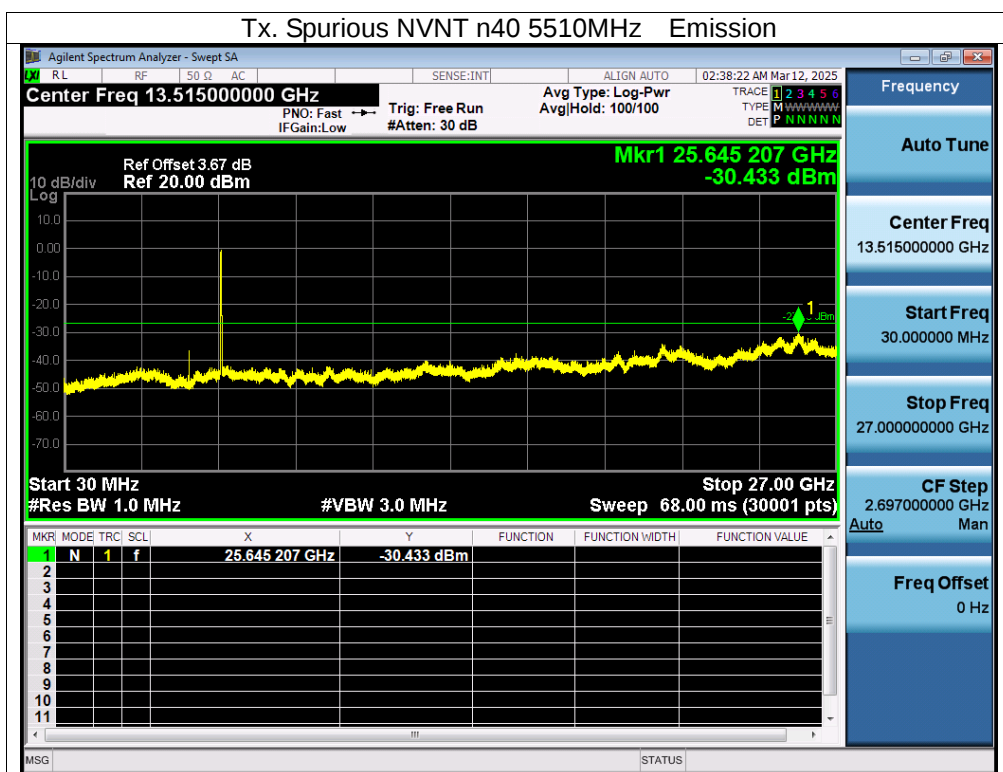


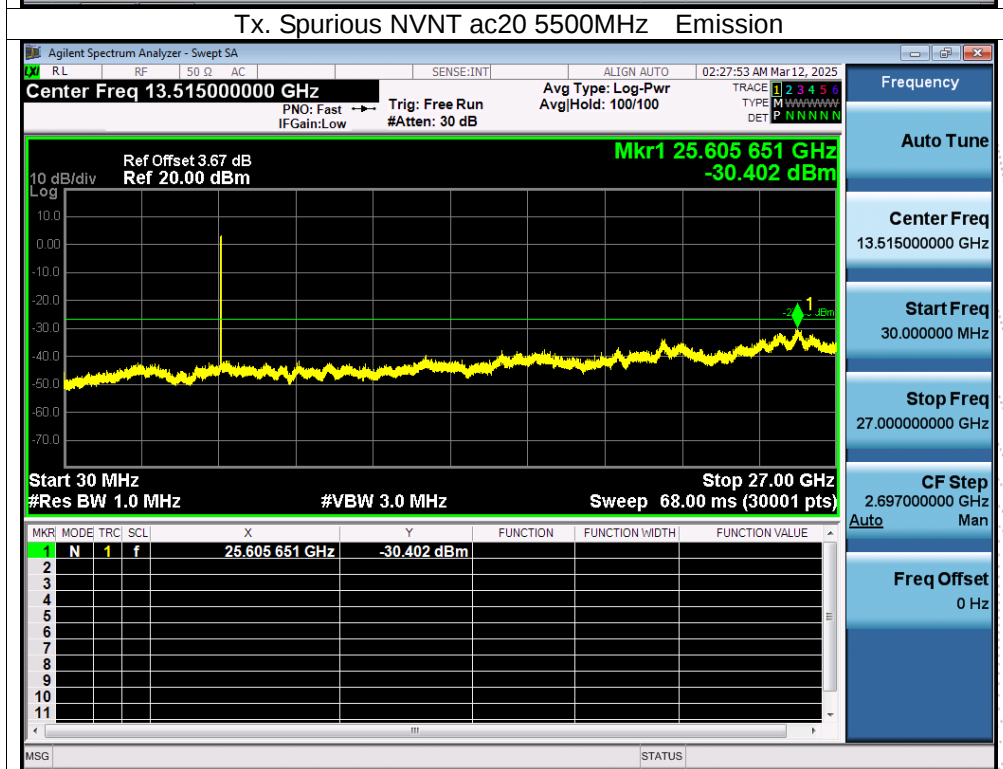
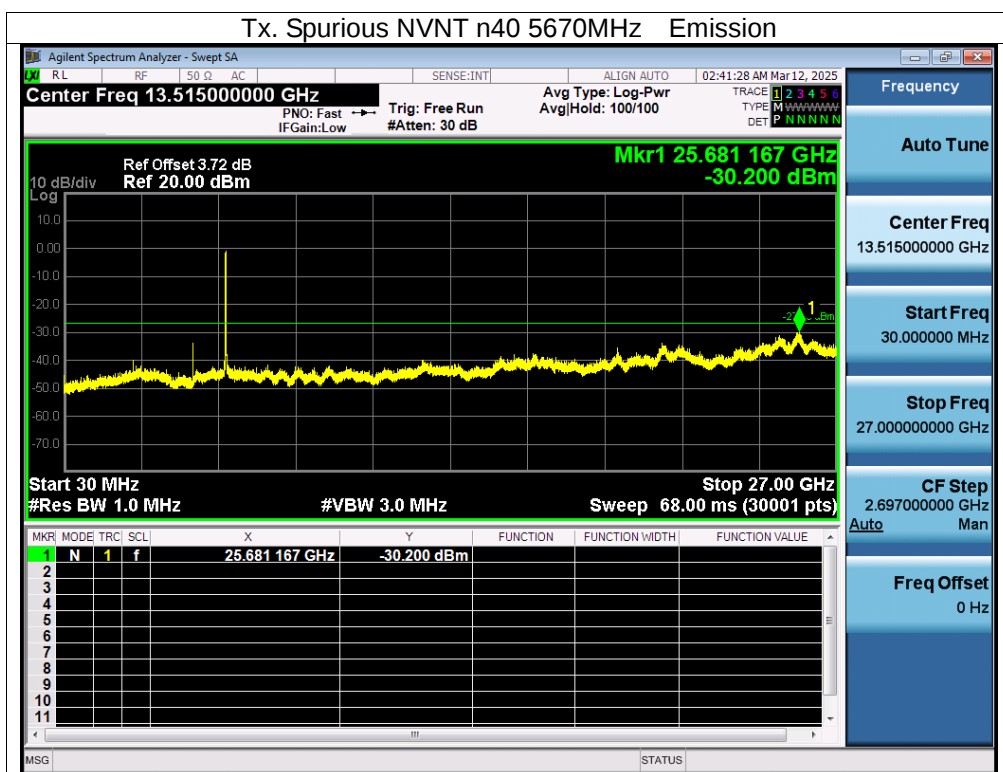
Tx. Spurious NVNT a 5580MHz Emission

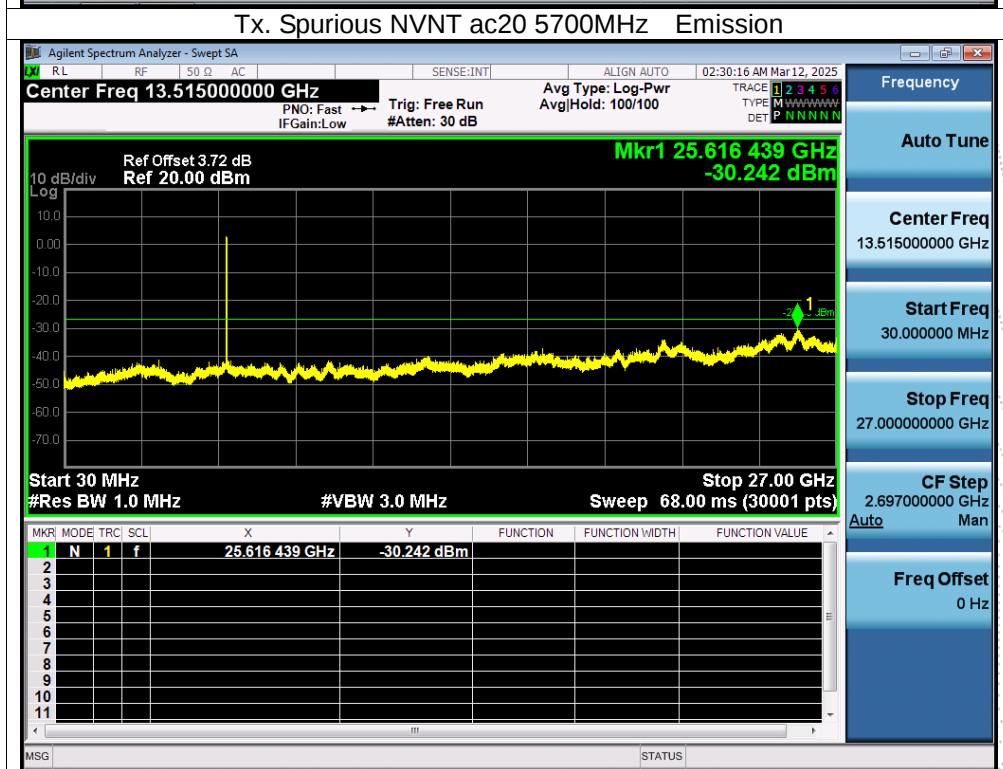
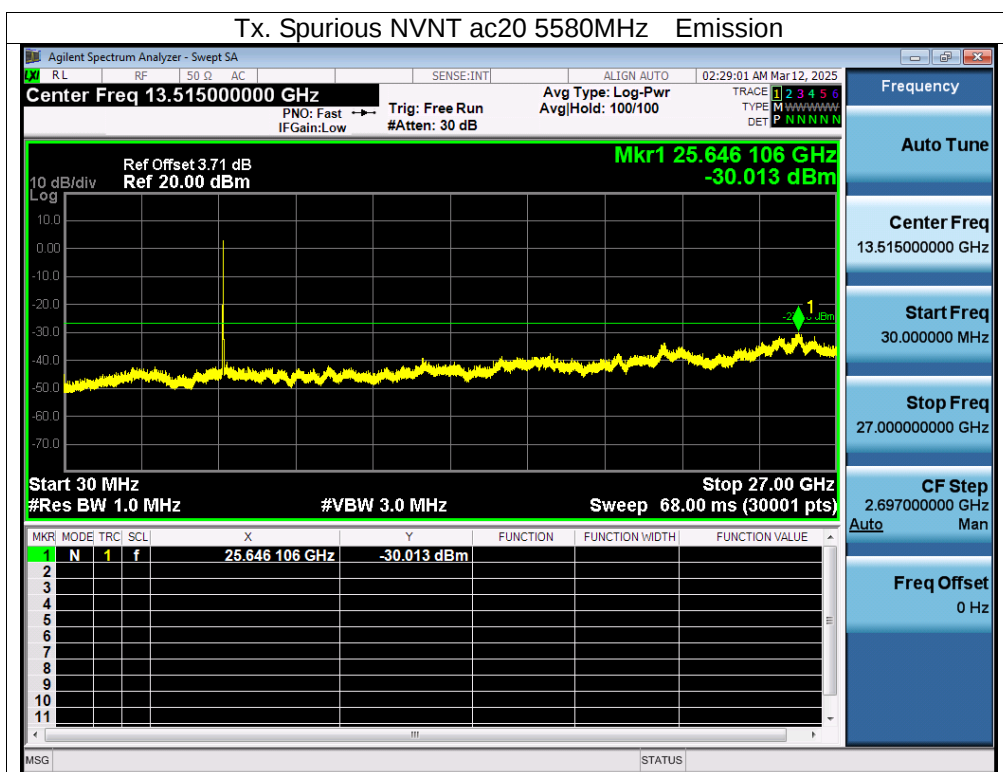


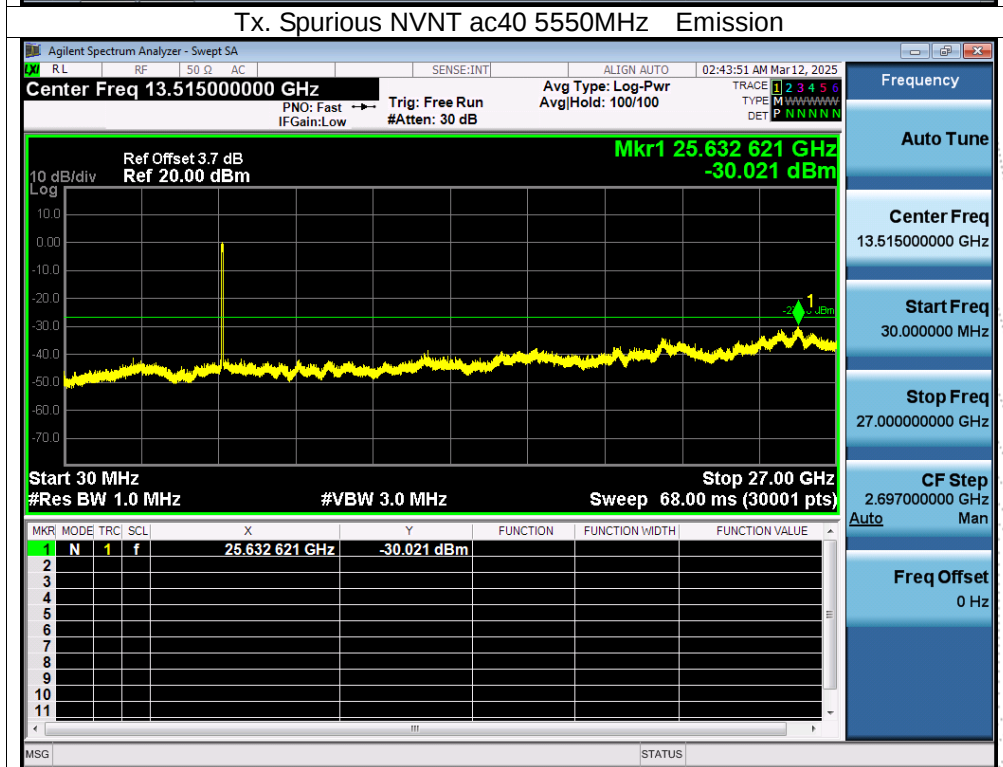
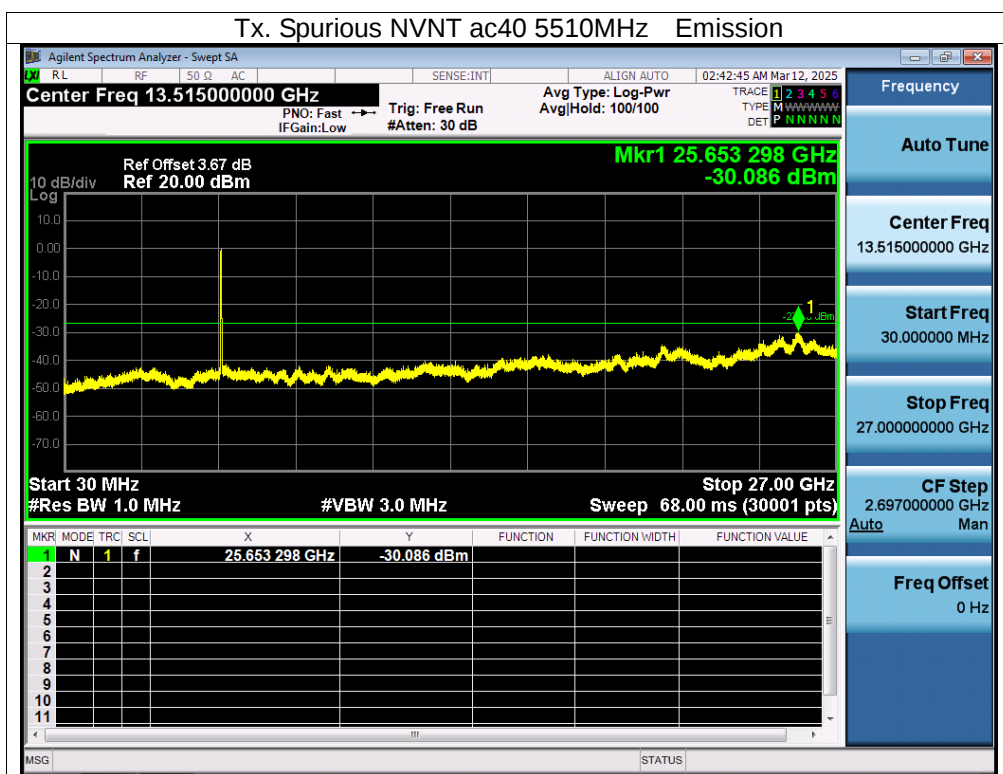


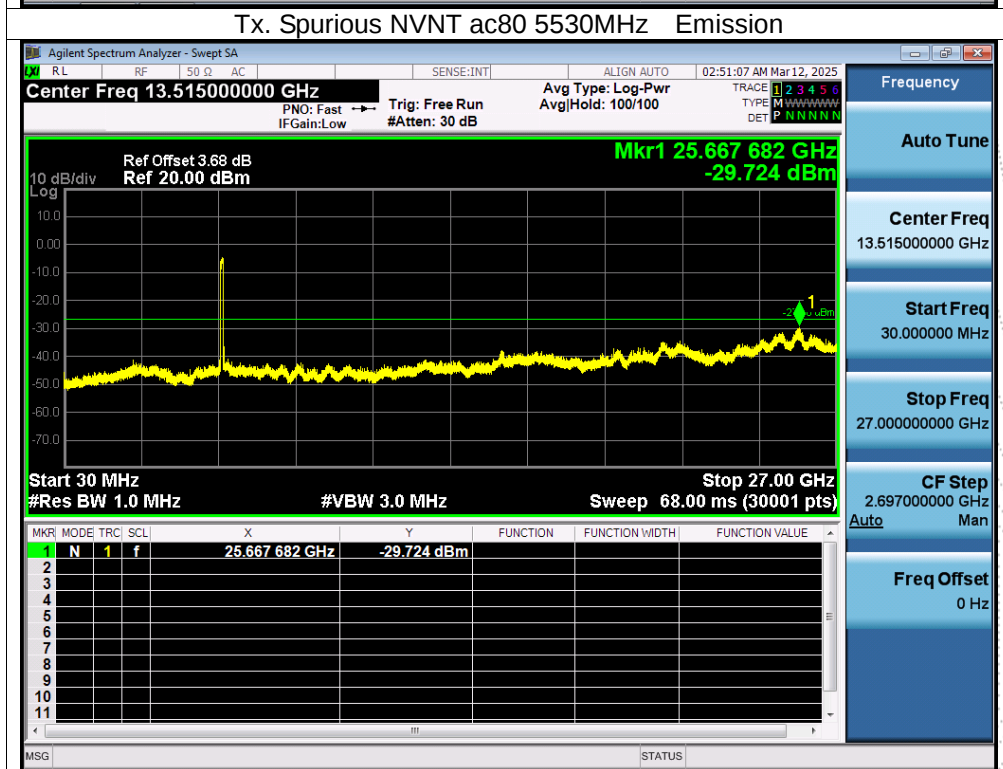
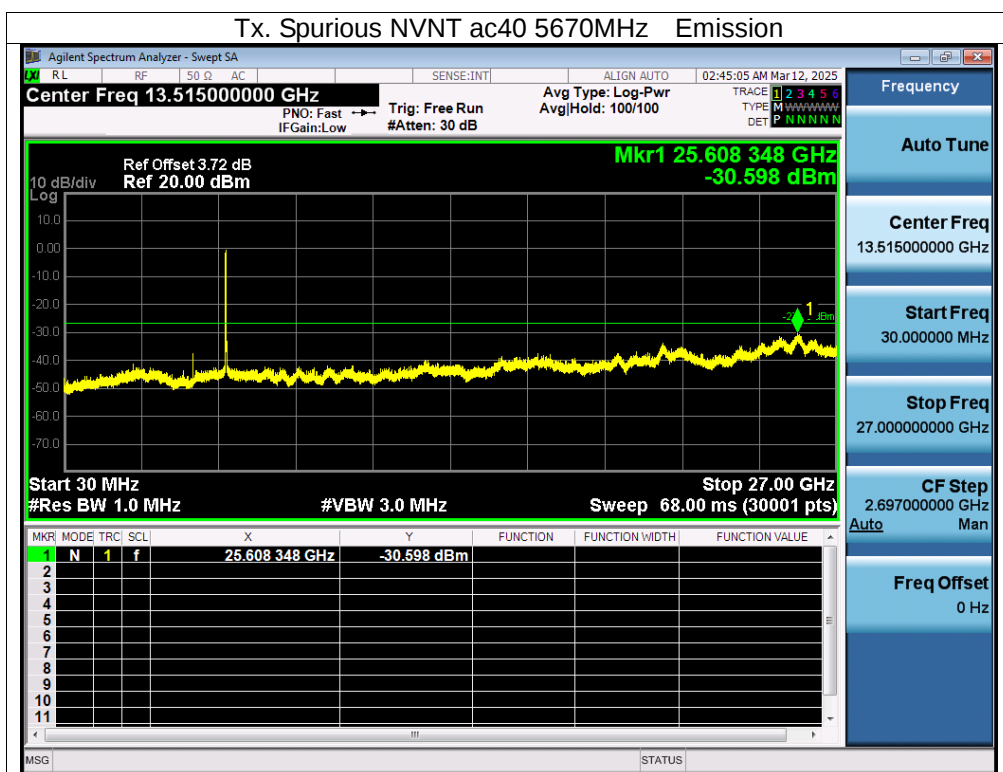


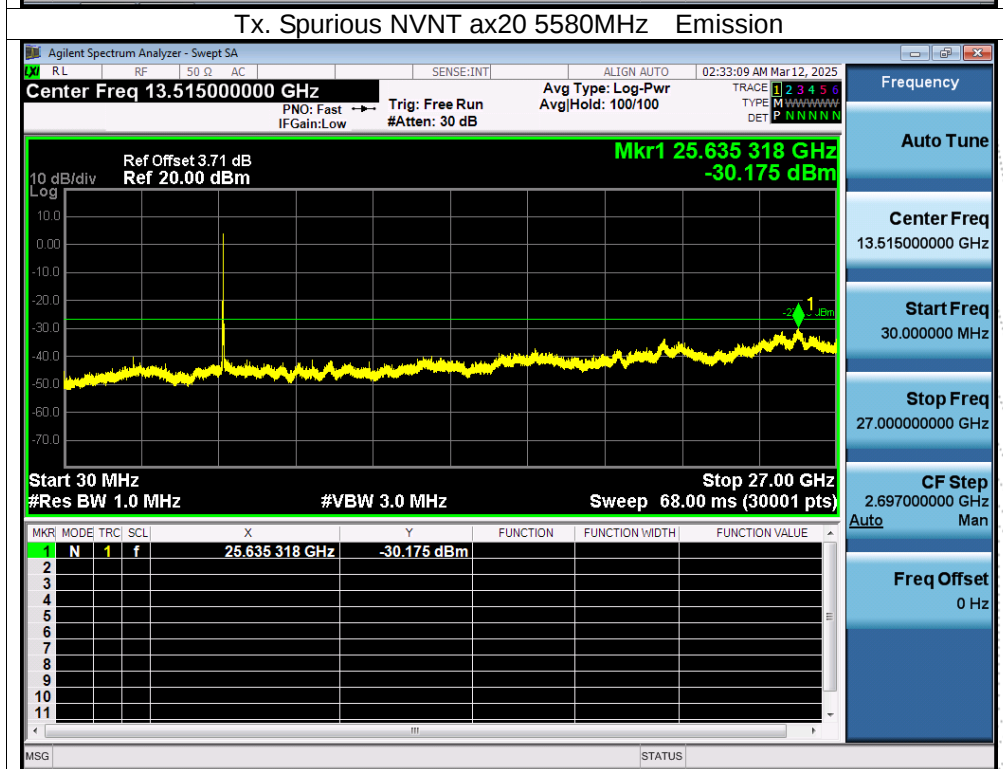
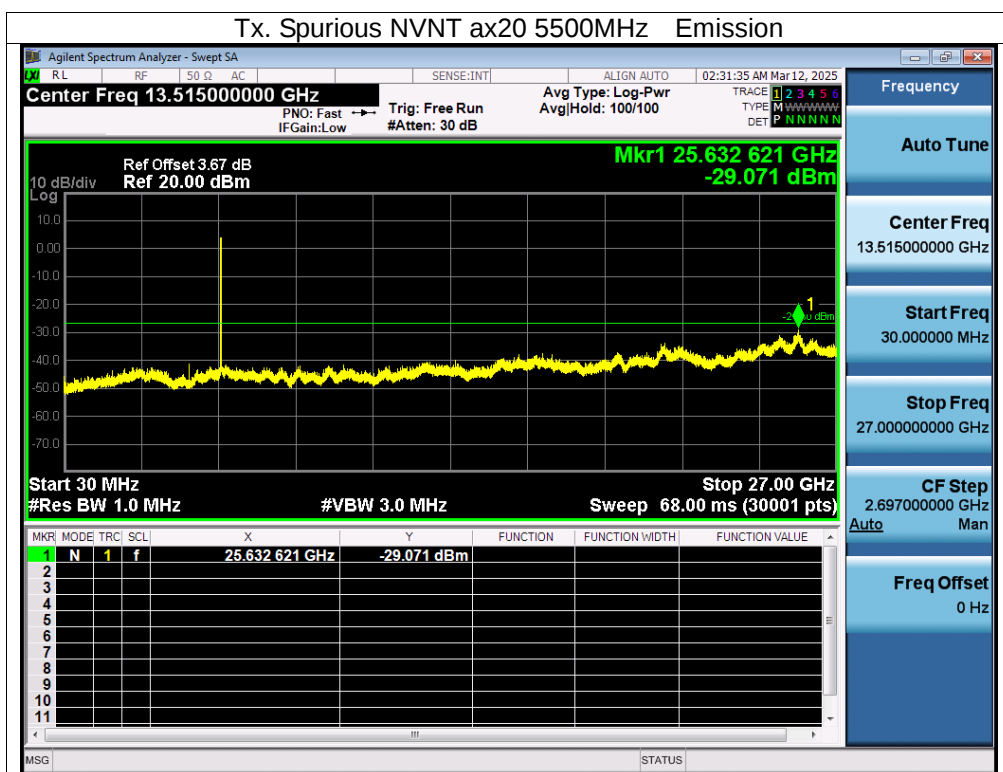


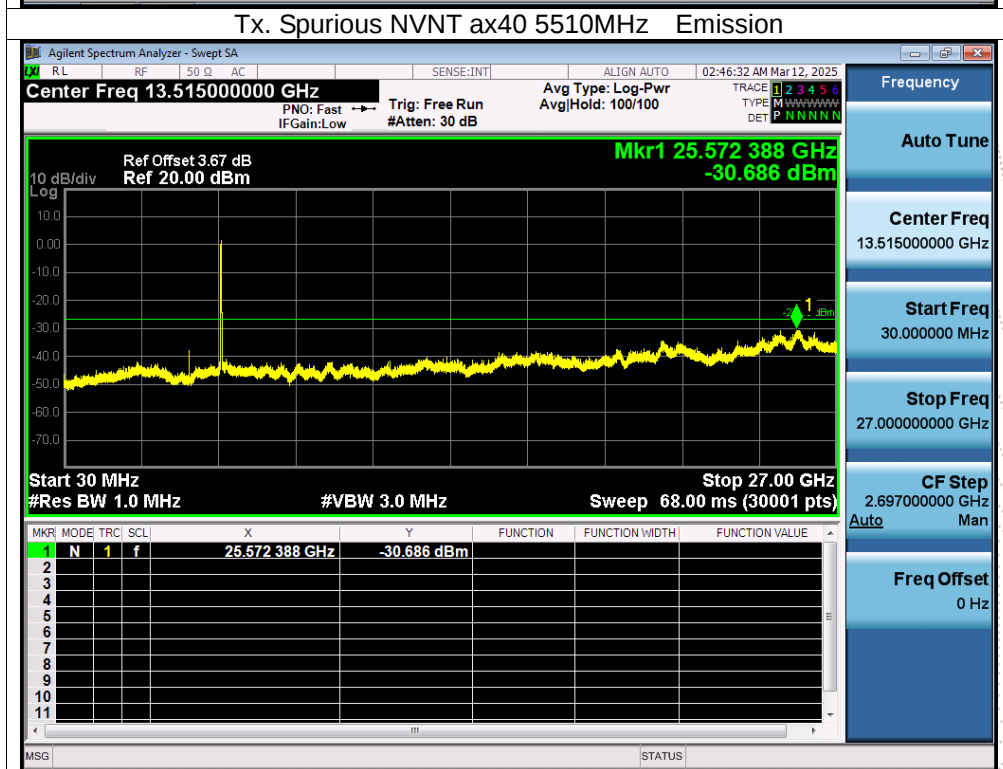
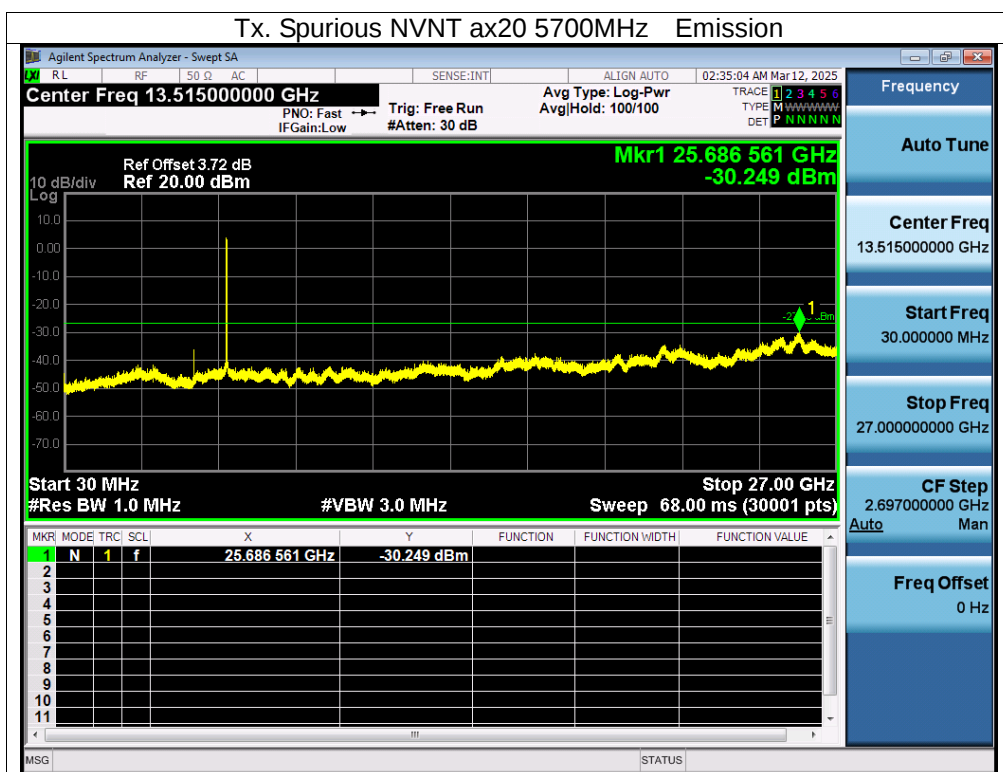


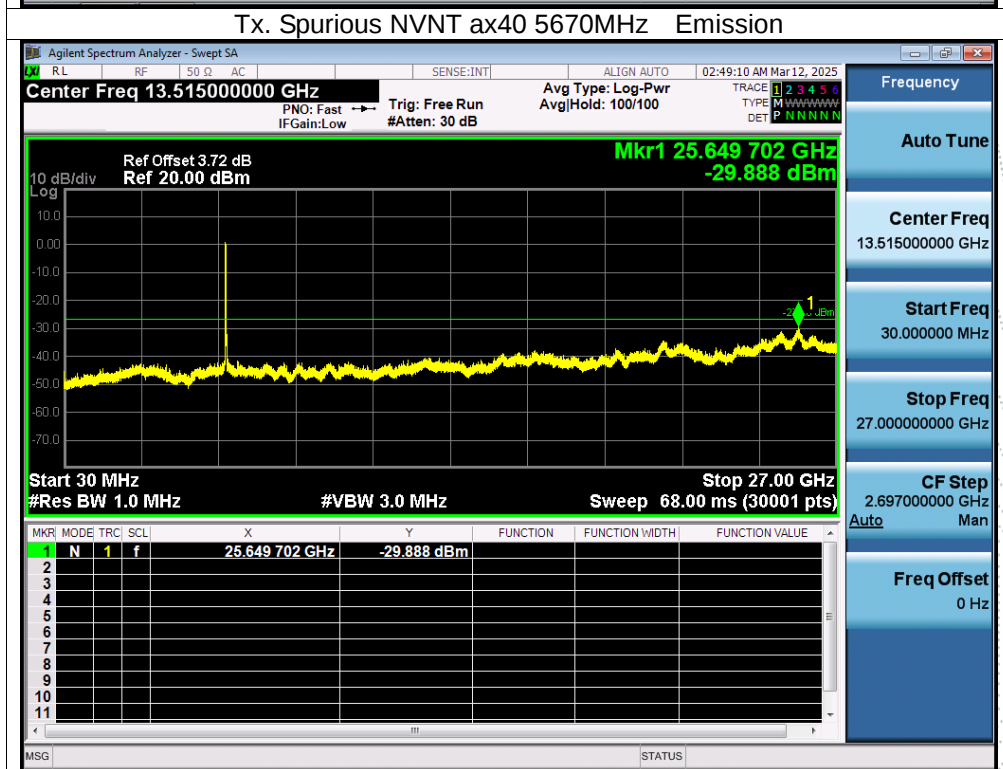
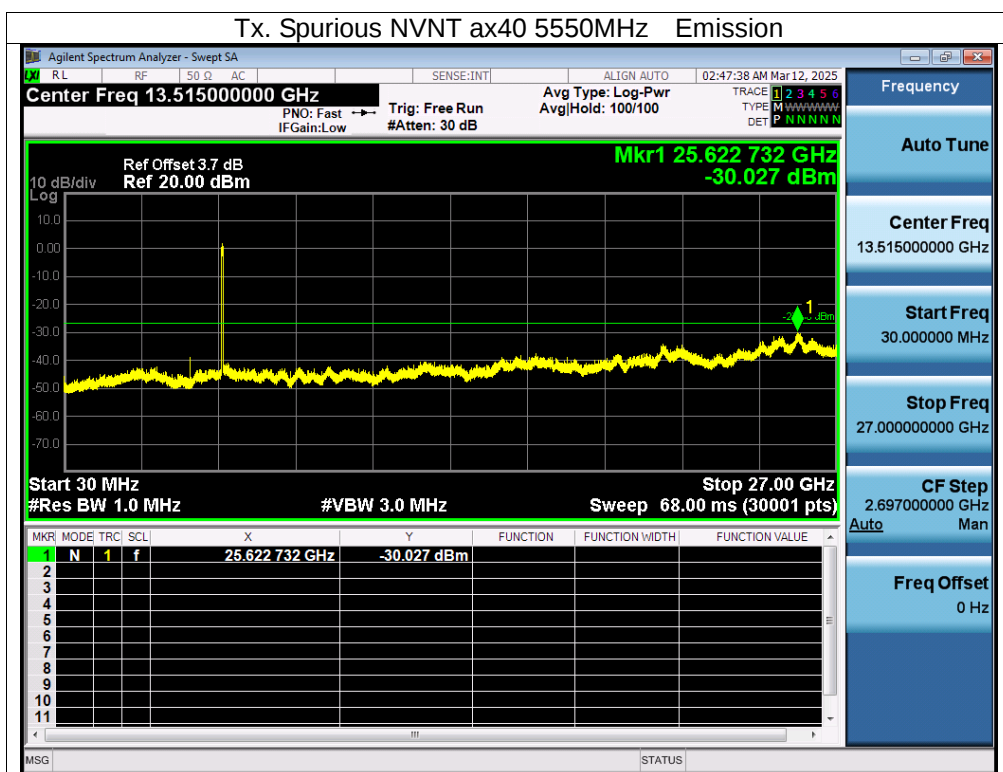


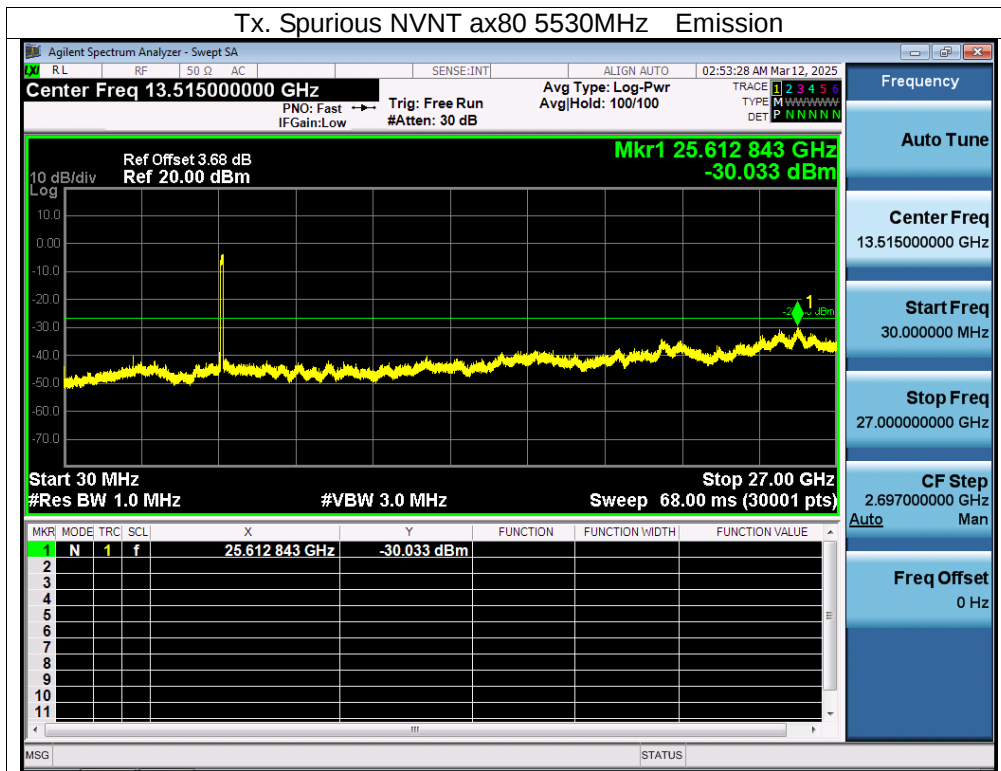






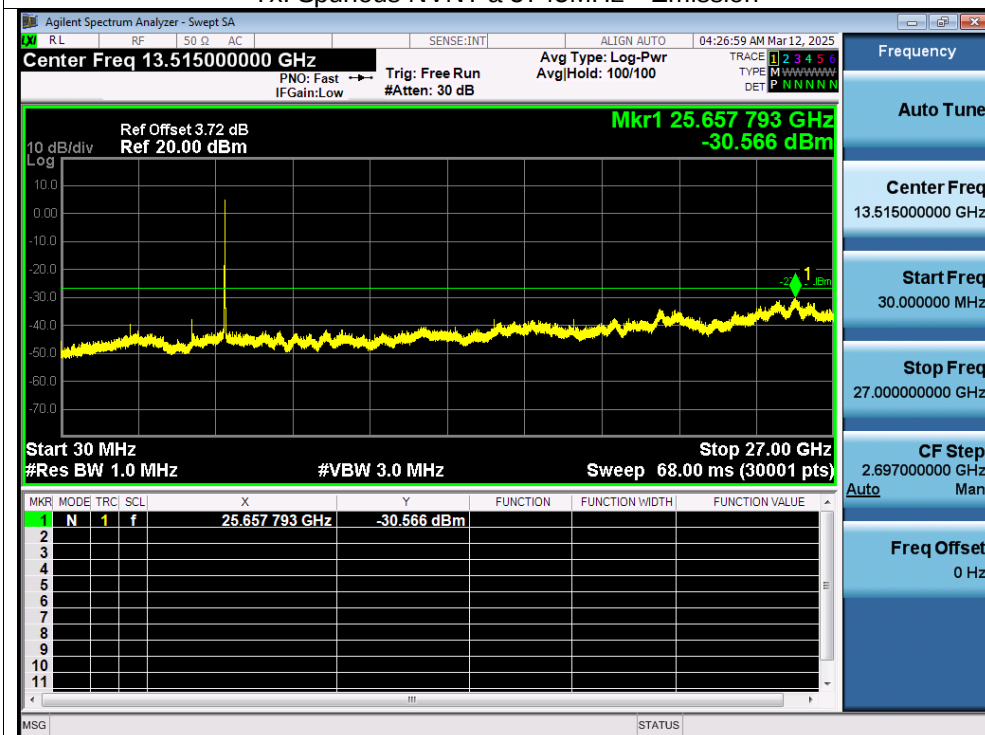




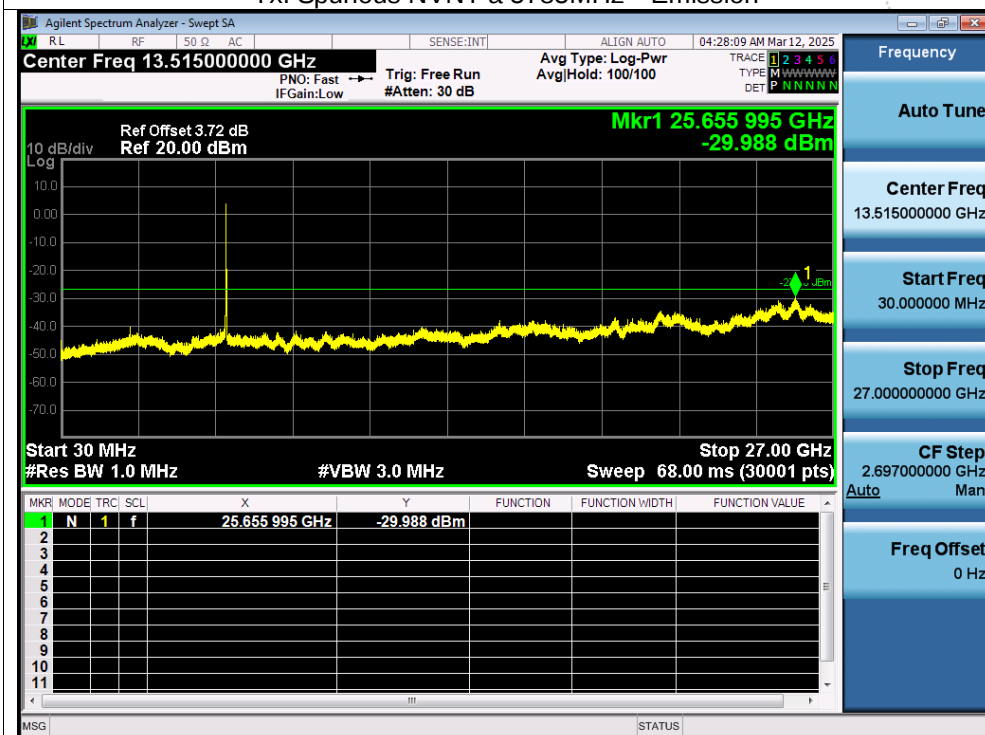


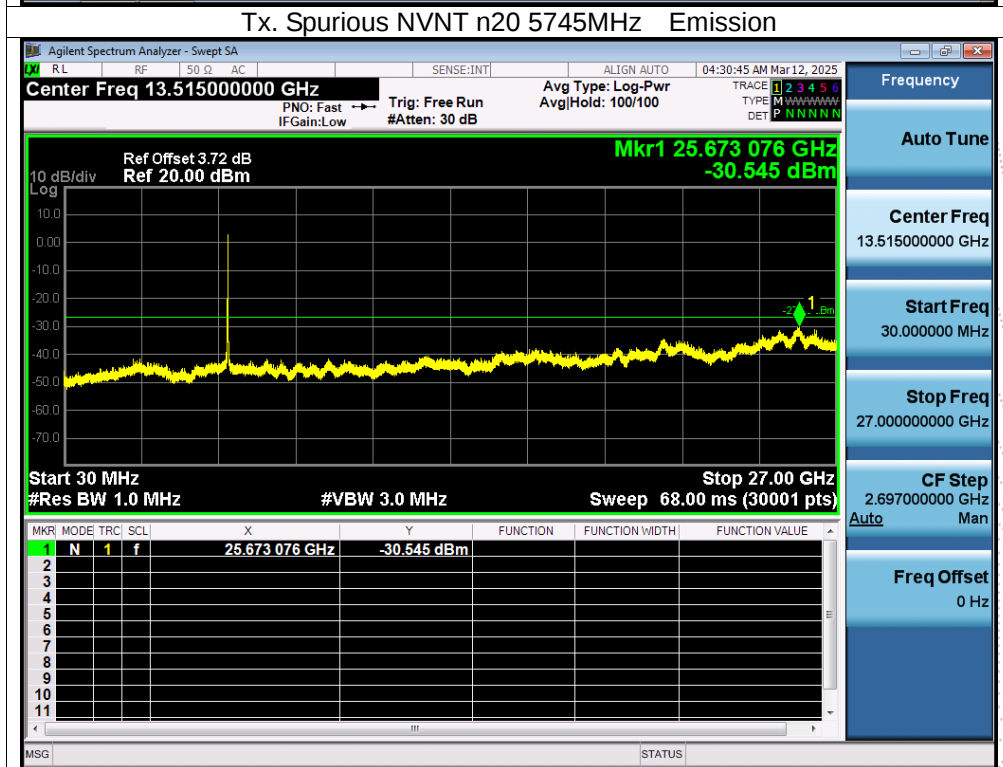
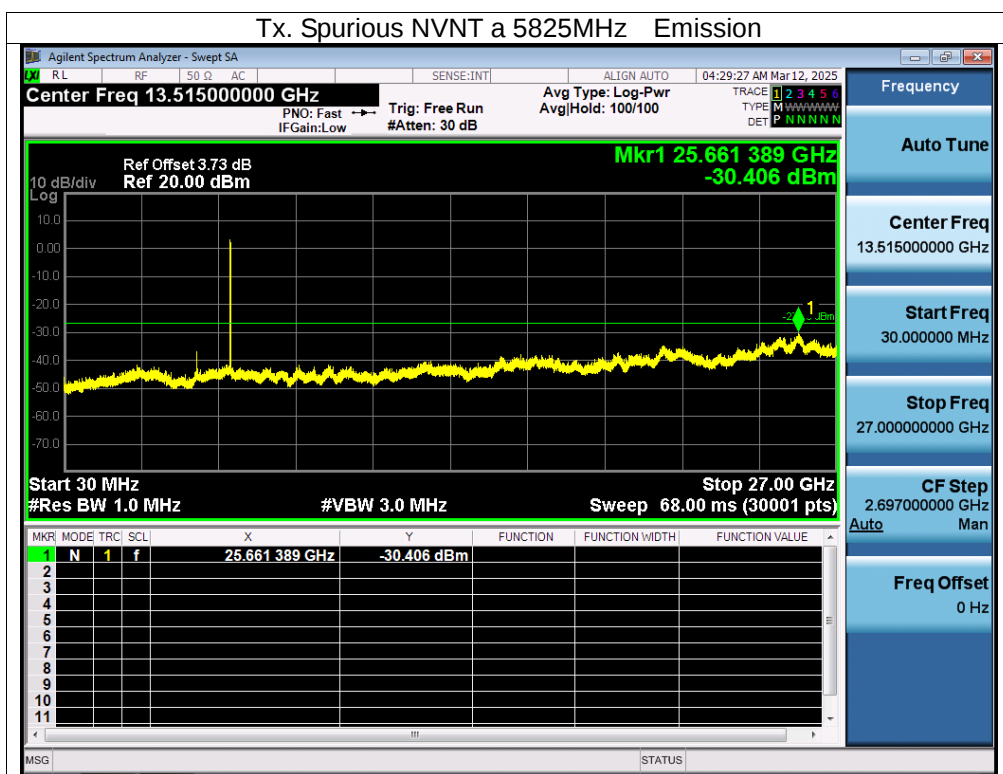
Test Graphs

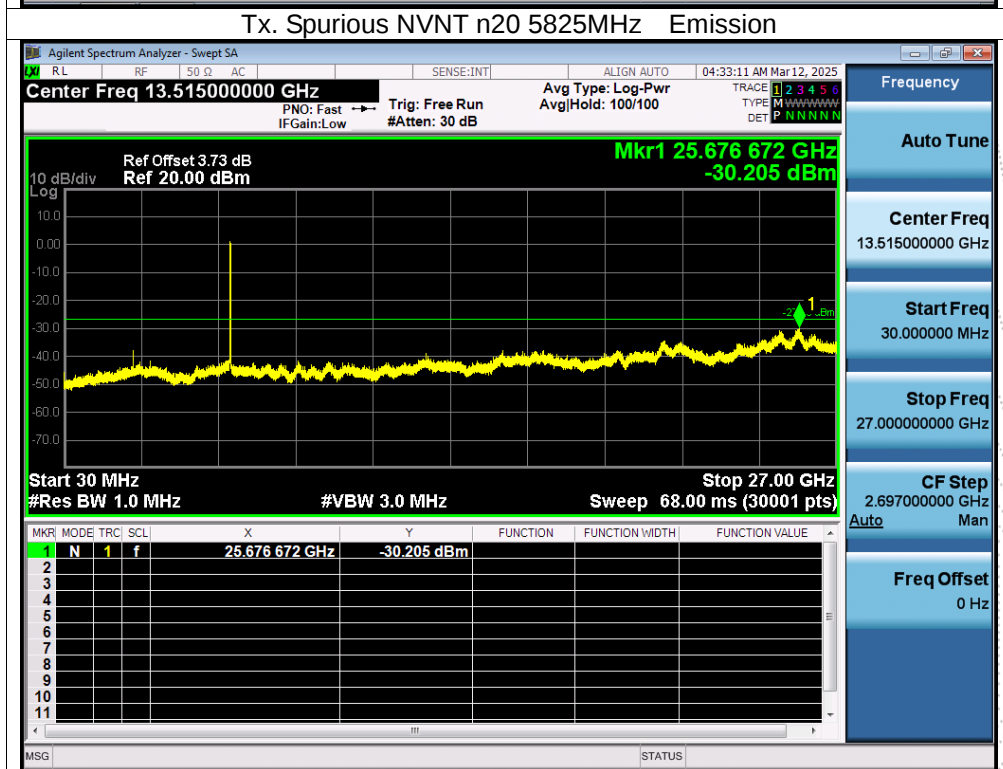
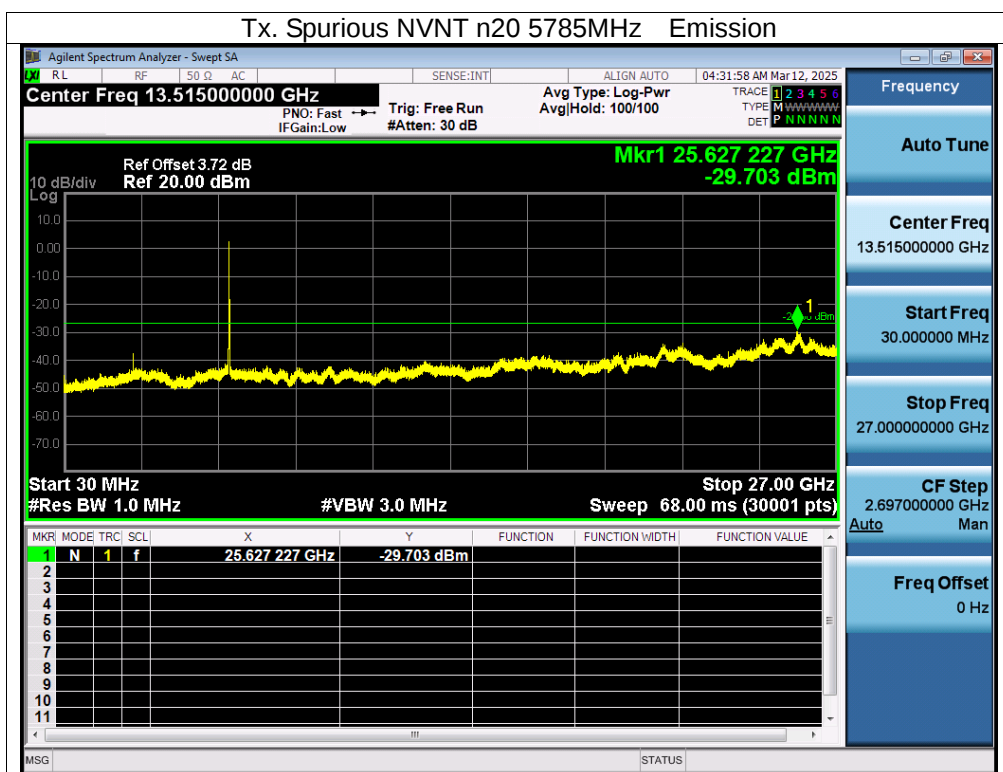
Tx. Spurious NVNT a 5745MHz Emission

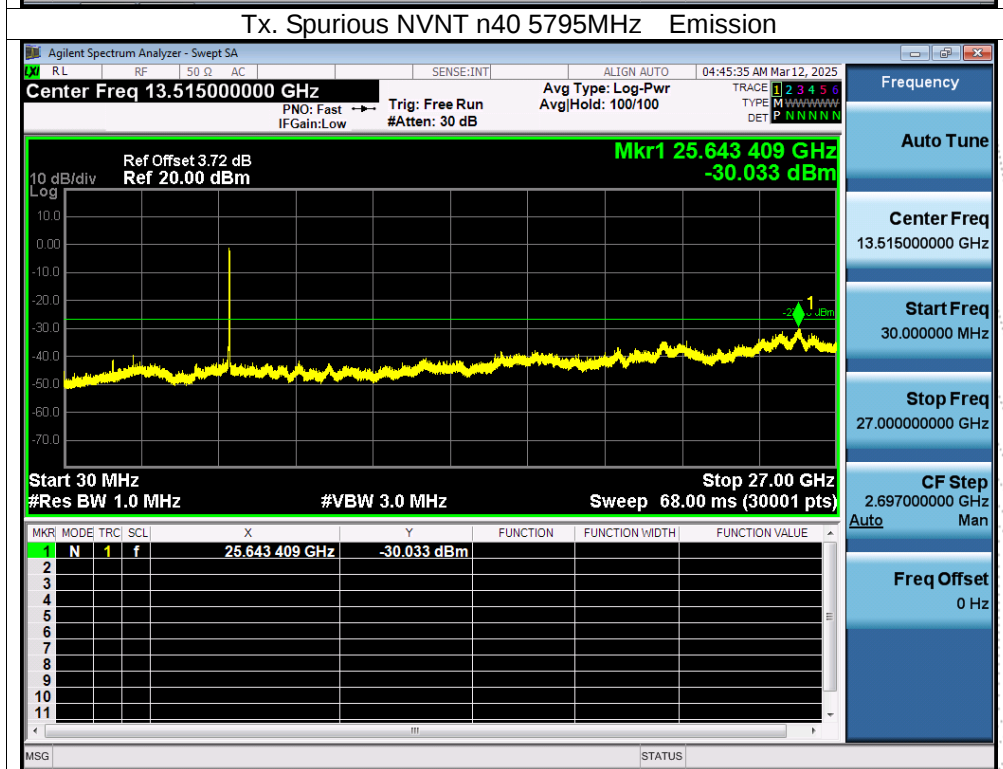
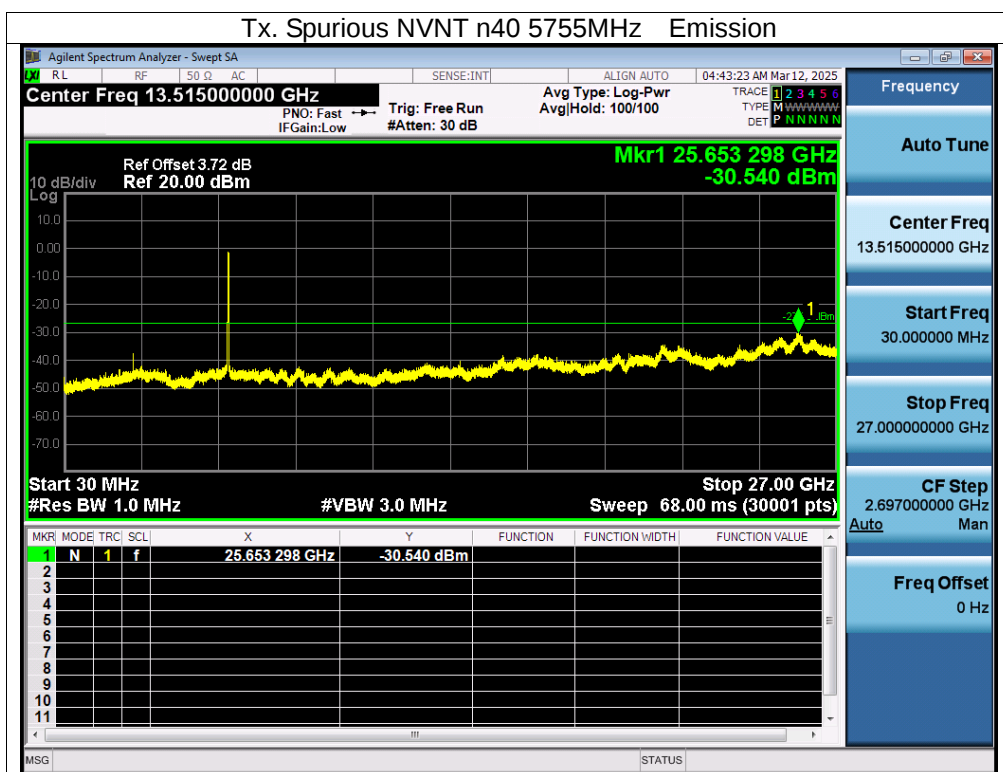


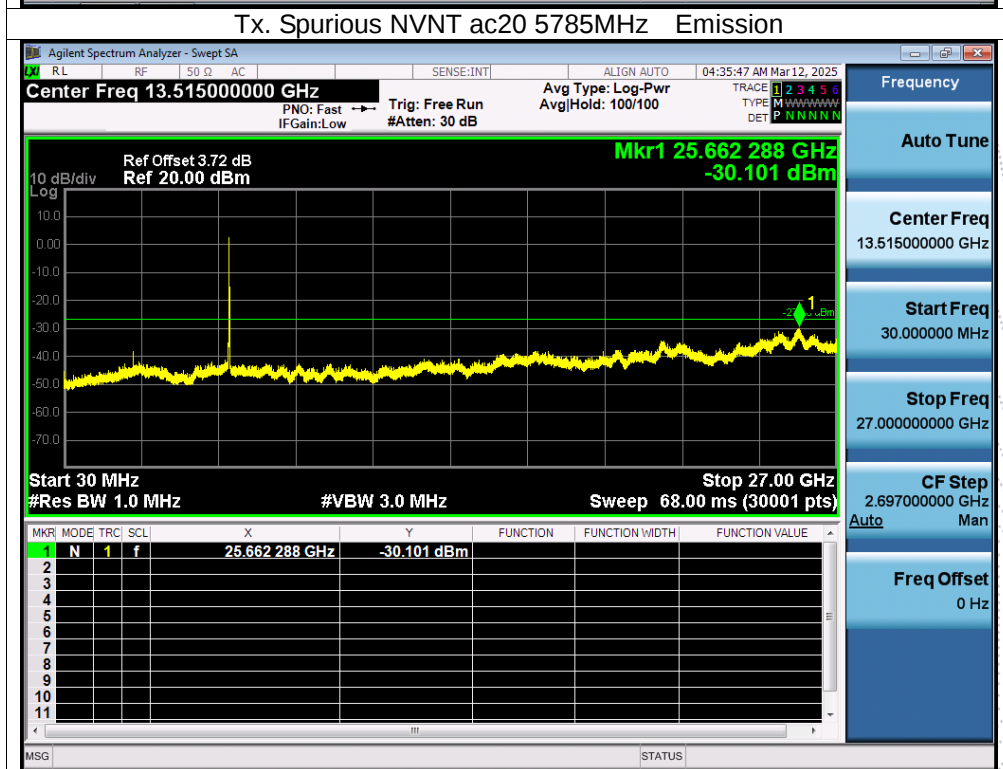
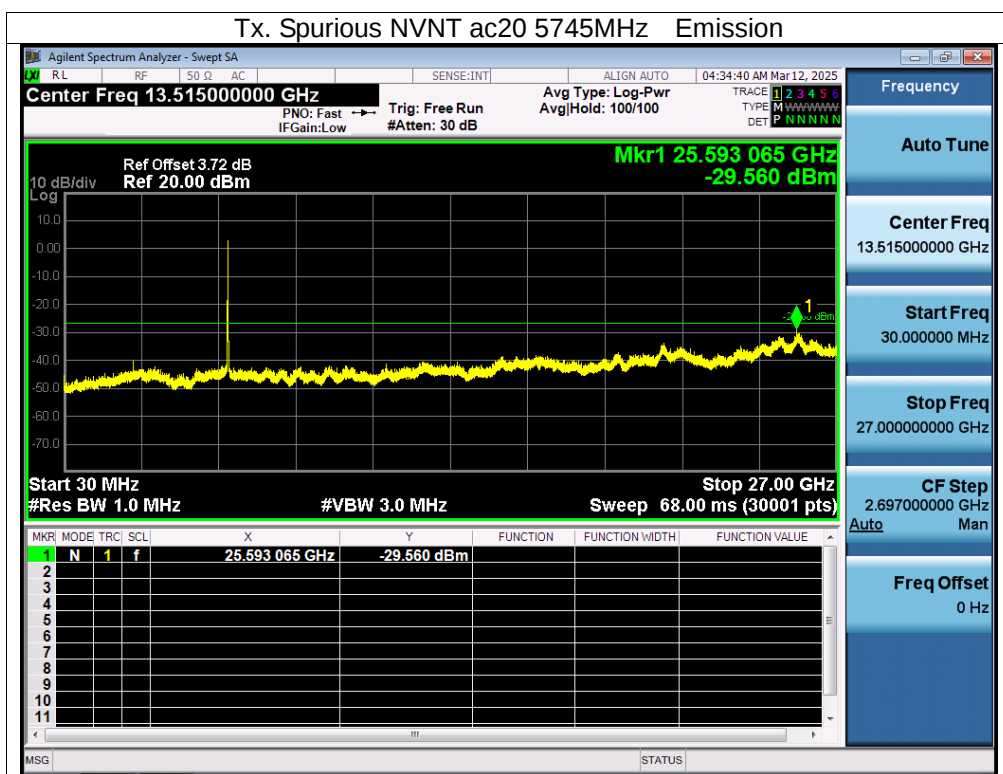
Tx. Spurious NVNT a 5785MHz Emission

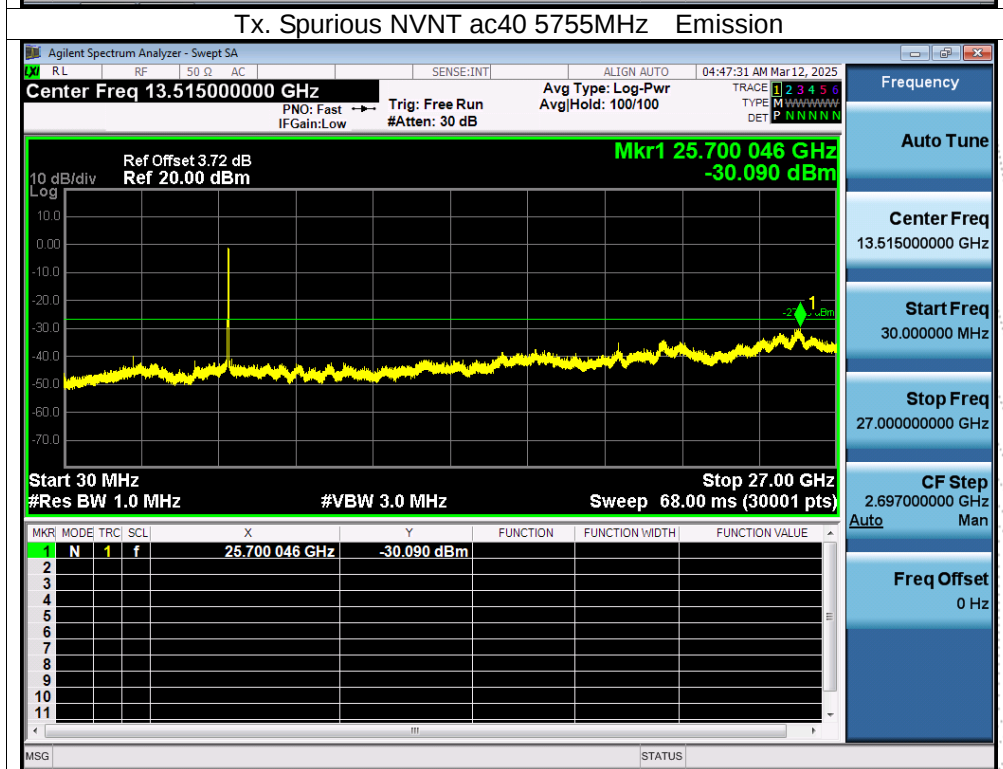
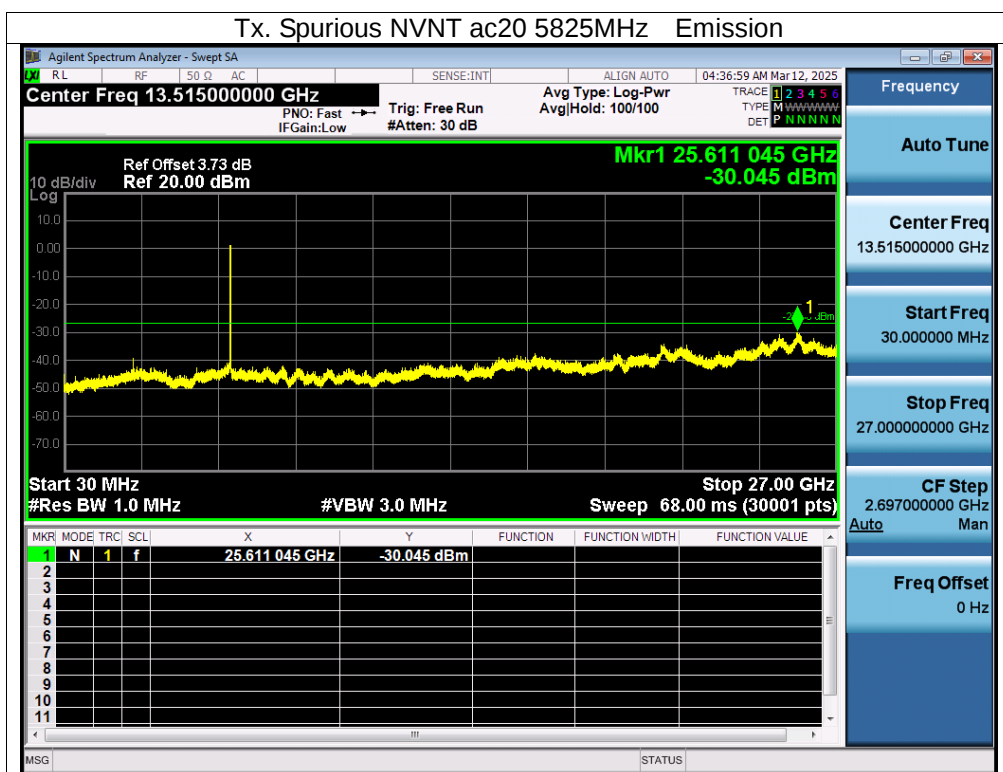


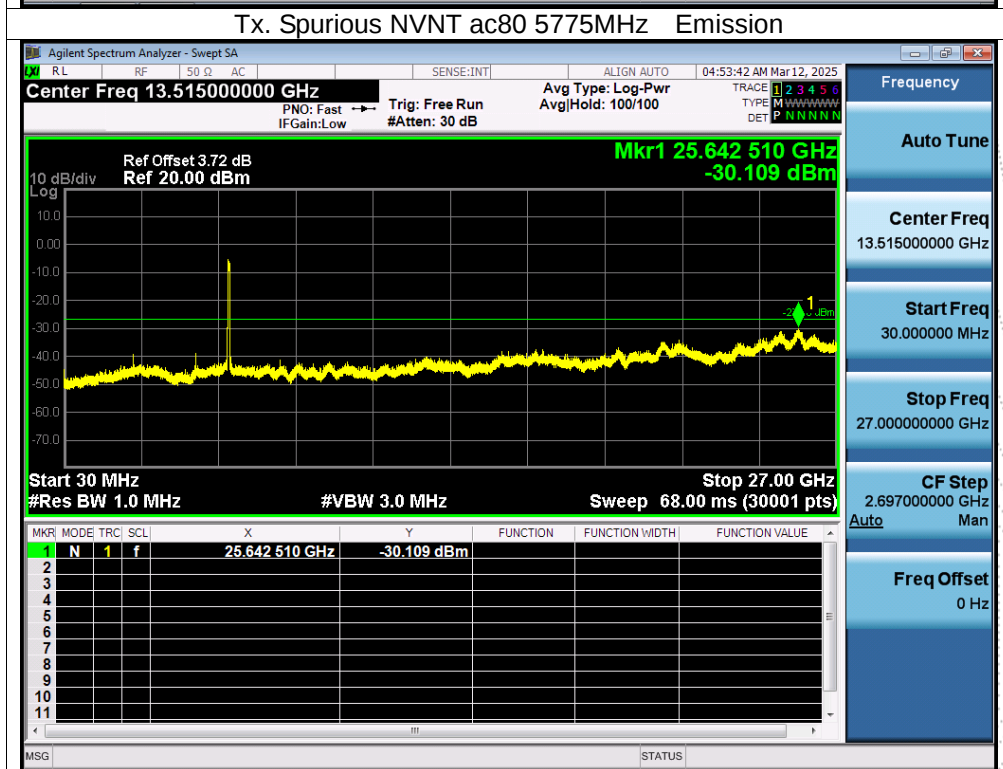
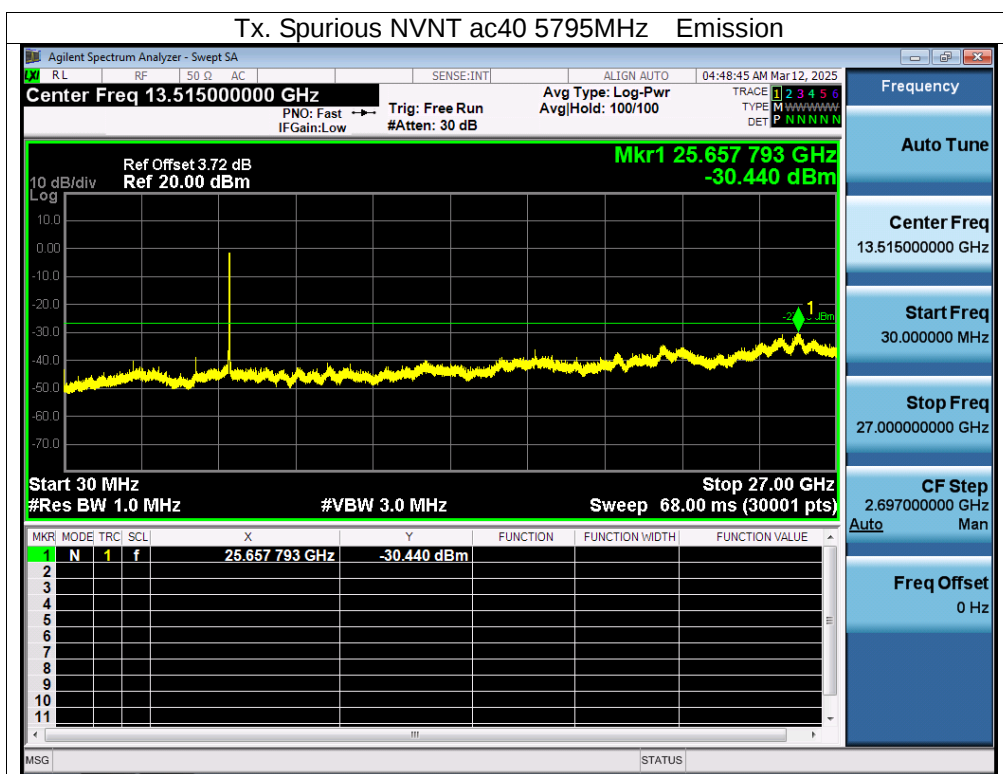


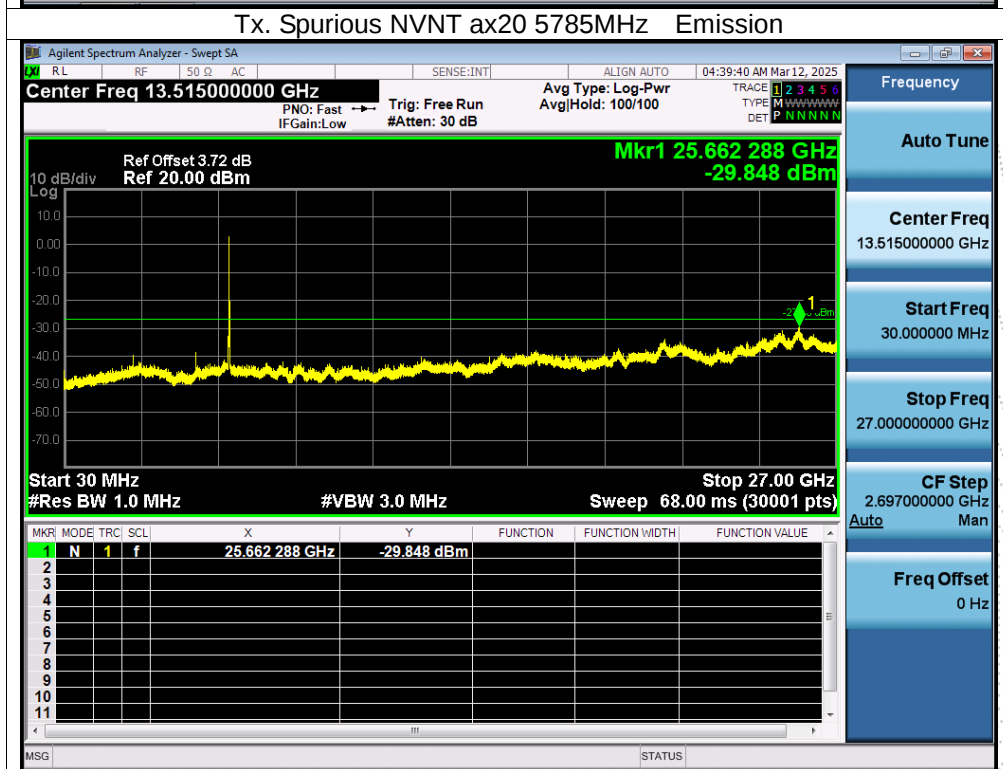
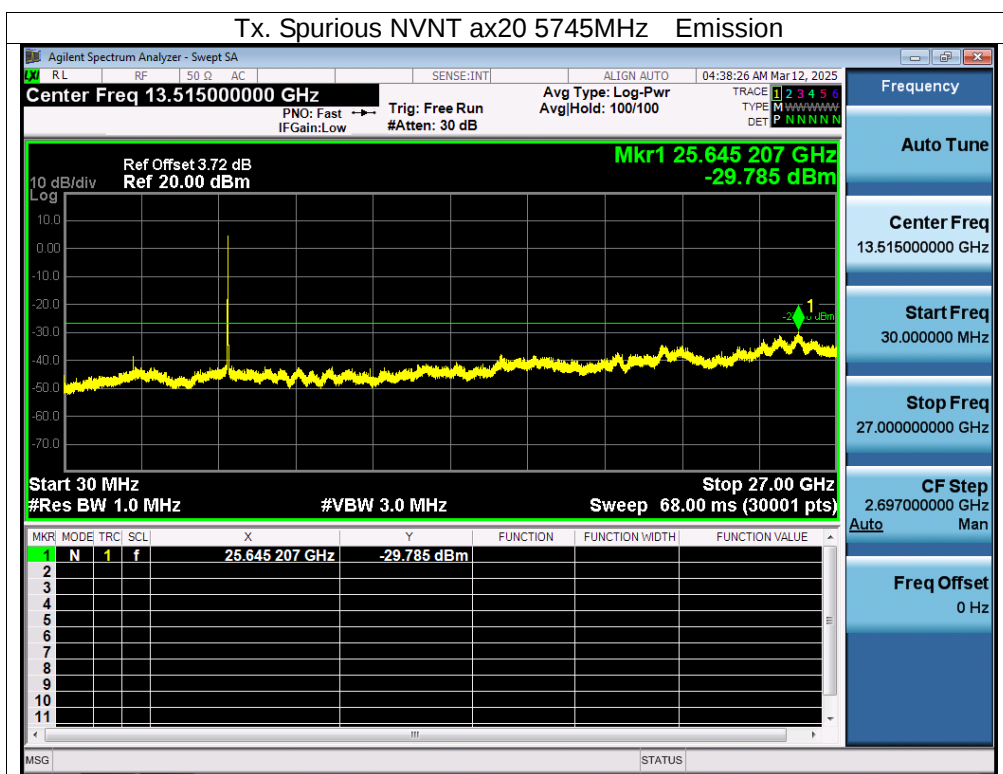


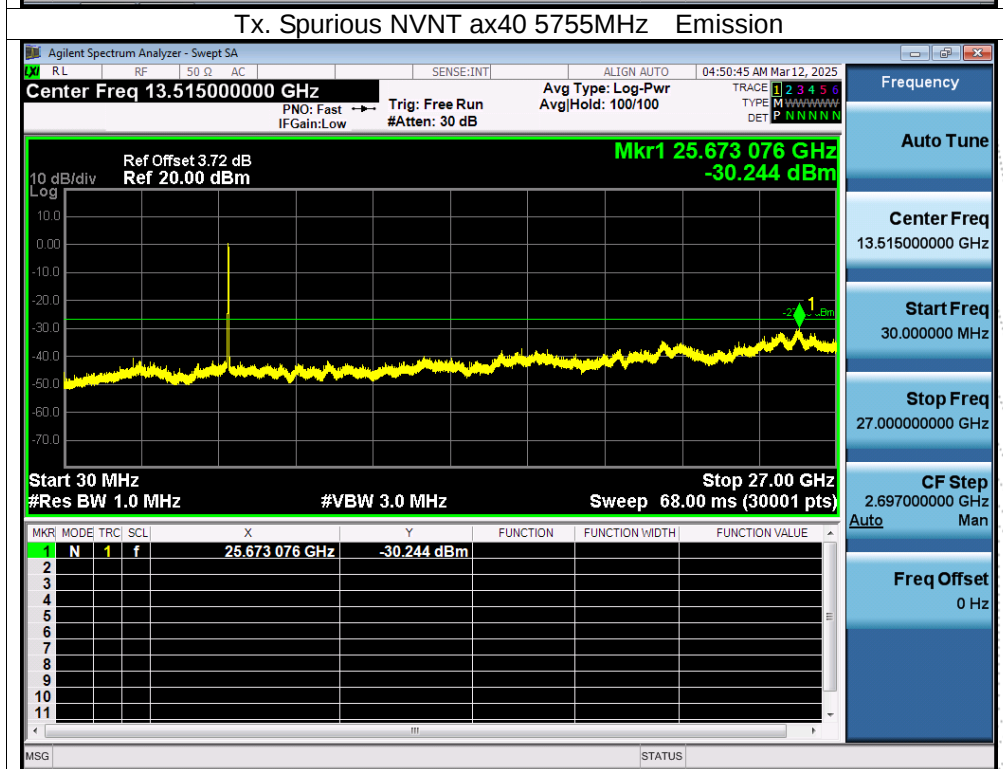
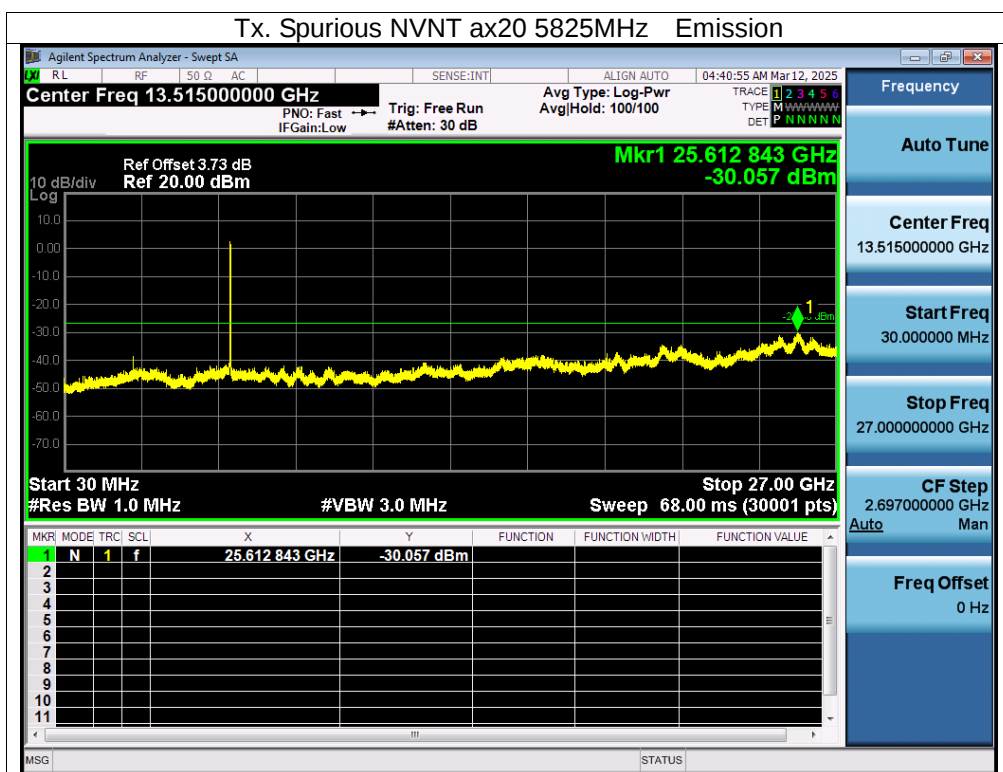


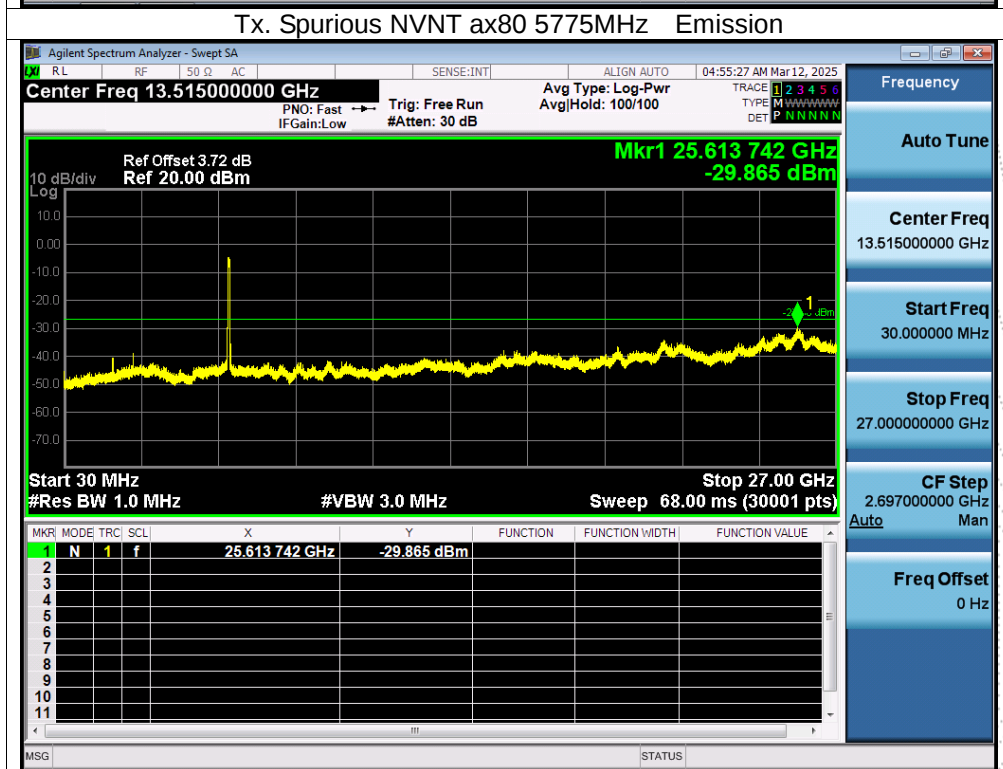
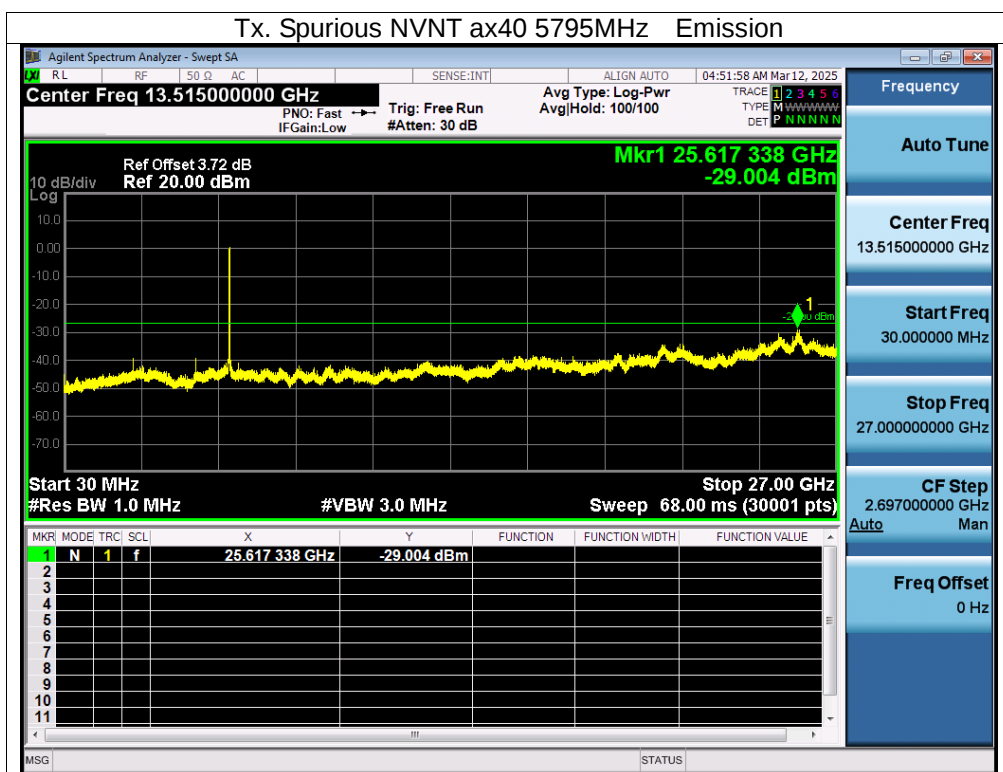












13. Frequency Stability Measurement

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. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and he limit is less than ± 20 ppm (IEEE 802.11n specification).
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 $-20^\circ\text{C} \sim 70^\circ\text{C}$.

13.4 Test Result

Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
Test Mode:	TX (5.1G) Mode 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)	120.00	5180.0007	5180	0.0007	0.1351
		V max (V)	138.00	5180.0081	5180	0.0081	1.5637
		V min (V)	102.00	5180.0086	5180	0.0086	1.6602
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)	3.3	T (°C)	-20	5180.0097	5180	0.0097	1.8726
		T (°C)	-10	5180.0120	5180	0.0120	2.3166
		T (°C)	0	5180.0107	5180	0.0107	2.0656
		T (°C)	10	5180.0060	5180	0.0060	1.1583
		T (°C)	20	5180.0069	5180	0.0069	1.3320
		T (°C)	30	5180.0112	5180	0.0112	2.1622
		T (°C)	40	5180.0131	5180	0.0131	2.5290
		T (°C)	50	5180.0010	5180	0.0010	0.1931
		T (°C)	60	5180.0113	5180	0.0113	2.1815
		T (°C)	70	5180.0088	5180	0.0088	1.6988
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)	120.00	5200.0102	5200	0.0102	1.9615
		V max (V)	138.00	5200.0117	5200	0.0117	2.2500
		V min (V)	102.00	5200.0077	5200	0.0077	1.4808
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)	3.3	T (°C)	-20	5200.01120	5200	0.01120	2.1538
		T (°C)	-10	5200.00340	5200	0.00340	0.6538
		T (°C)	0	5200.00430	5200	0.00430	0.8269
		T (°C)	10	5200.00440	5200	0.00440	0.8462
		T (°C)	20	5200.00820	5200	0.00820	1.5769
		T (°C)	30	5200.01090	5200	0.01090	2.0962
		T (°C)	40	5200.00280	5200	0.00280	0.5385
		T (°C)	50	5200.00820	5200	0.00820	1.5769
		T (°C)	60	5200.01320	5200	0.01320	2.5385
		T (°C)	70	5200.01050	5200	0.01050	2.0192
Limits				5150-5250 MHz			
Result				Complies			

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Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5240.0079	5240	0.0079	1.5076
		V max (V)	138.00	5240.0088	5240	0.0088	1.6794
		V min (V)	102.00	5240.0086	5240	0.0086	1.6412
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)	3.3	T (°C)	-20	5240.0037	5240	0.0037	0.7061
		T (°C)	-10	5240.0130	5240	0.0130	2.4809
		T (°C)	0	5240.0055	5240	0.0055	1.0496
		T (°C)	10	5240.0061	5240	0.0061	1.1641
		T (°C)	20	5240.0022	5240	0.0022	0.4198
		T (°C)	30	5240.0073	5240	0.0073	1.3931
		T (°C)	40	5240.0037	5240	0.0037	0.7061
		T (°C)	50	5240.0011	5240	0.0011	0.2099
		T (°C)	60	5240.0108	5240	0.0108	2.0611
		T (°C)	70	5240.0001	5240	0.0001	0.0191
Limits				5150-5250 MHz			
Result				Complies			

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Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
Test Mode:	TX (5.3G) Mode Frequency U-NII-2A (5260-5320MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5260MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5260.0073	5260	0.0073	1.3878
		V max (V)	138.00	5260.0101	5260	0.0101	1.9202
		V min (V)	102.00	5260.0067	5260	0.0067	1.2738
Limits				5260-5320 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5260MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5260.0123	5260	0.0123	2.3384
		T (°C)	-10	5260.0073	5260	0.0073	1.3878
		T (°C)	0	5260.0113	5260	0.0113	2.1483
		T (°C)	10	5260.0048	5260	0.0048	0.9125
		T (°C)	20	5260.0083	5260	0.0083	1.5779
		T (°C)	30	5260.0014	5260	0.0014	0.2662
		T (°C)	40	5260.0034	5260	0.0034	0.6464
		T (°C)	50	5260.0061	5260	0.0061	1.1597
		T (°C)	60	5260.0123	5260	0.0123	2.3384
		T (°C)	70	5260.0072	5260	0.0072	1.3688
Limits				5260-5320 MHz			
Result				Complies			



Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5280MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5280.0035	5280	0.0035	0.6629
		V max (V)	138.00	5280.0062	5280	0.0062	1.1742
		V min (V)	102.00	5280.0017	5280	0.0017	0.3220
Limits				5260-5320 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5280MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5280.00120	5280	0.00120	0.2273
		T (°C)	-10	5280.00060	5280	0.00060	0.1136
		T (°C)	0	5280.00920	5280	0.00920	1.7424
		T (°C)	10	5280.00290	5280	0.00290	0.5492
		T (°C)	20	5280.00430	5280	0.00430	0.8144
		T (°C)	30	5280.00750	5280	0.00750	1.4205
		T (°C)	40	5280.00600	5280	0.00600	1.1364
		T (°C)	50	5280.01280	5280	0.01280	2.4242
		T (°C)	60	5280.00300	5280	0.00300	0.5682
		T (°C)	70	5280.00710	5280	0.00710	1.3447
Limits				5260-5320 MHz			
Result				Complies			

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Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5320MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5320.0050	5320	0.0050	0.9398
		V max (V)	138.00	5320.0133	5320	0.0133	2.5000
		V min (V)	102.00	5320.0122	5320	0.0122	2.2932
Limits				5260-5320 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5320MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5320.0014	5320	0.0014	0.2632
		T (°C)	-10	5320.0093	5320	0.0093	1.7481
		T (°C)	0	5320.0013	5320	0.0013	0.2444
		T (°C)	10	5320.0106	5320	0.0106	1.9925
		T (°C)	20	5320.0001	5320	0.0001	0.0188
		T (°C)	30	5320.0079	5320	0.0079	1.4850
		T (°C)	40	5320.0067	5320	0.0067	1.2594
		T (°C)	50	5320.0130	5320	0.0130	2.4436
		T (°C)	60	5320.0039	5320	0.0039	0.7331
		T (°C)	70	5320.0134	5320	0.0134	2.5188
Limits				5260-5320 MHz			
Result				Complies			

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Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
Test Mode:	TX (5.6G) Mode Frequency U-NII-2C (5500-5700MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5500MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5500.0071	5500	0.0071	1.2909
		V max (V)	138.00	5500.0053	5500	0.0053	0.9636
		V min (V)	102.00	5500.0081	5500	0.0081	1.4727
Limits				5500-5700 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5500MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5500.0002	5500	0.0002	0.0364
		T (°C)	-10	5500.0060	5500	0.0060	1.0909
		T (°C)	0	5500.0107	5500	0.0107	1.9455
		T (°C)	10	5500.0135	5500	0.0135	2.4545
		T (°C)	20	5500.0018	5500	0.0018	0.3273
		T (°C)	30	5500.0103	5500	0.0103	1.8727
		T (°C)	40	5500.0102	5500	0.0102	1.8545
		T (°C)	50	5500.0094	5500	0.0094	1.7091
		T (°C)	60	5500.0080	5500	0.0080	1.4545
		T (°C)	70	5500.0020	5500	0.0020	0.3636
Limits				5500-5700 MHz			
Result				Complies			

