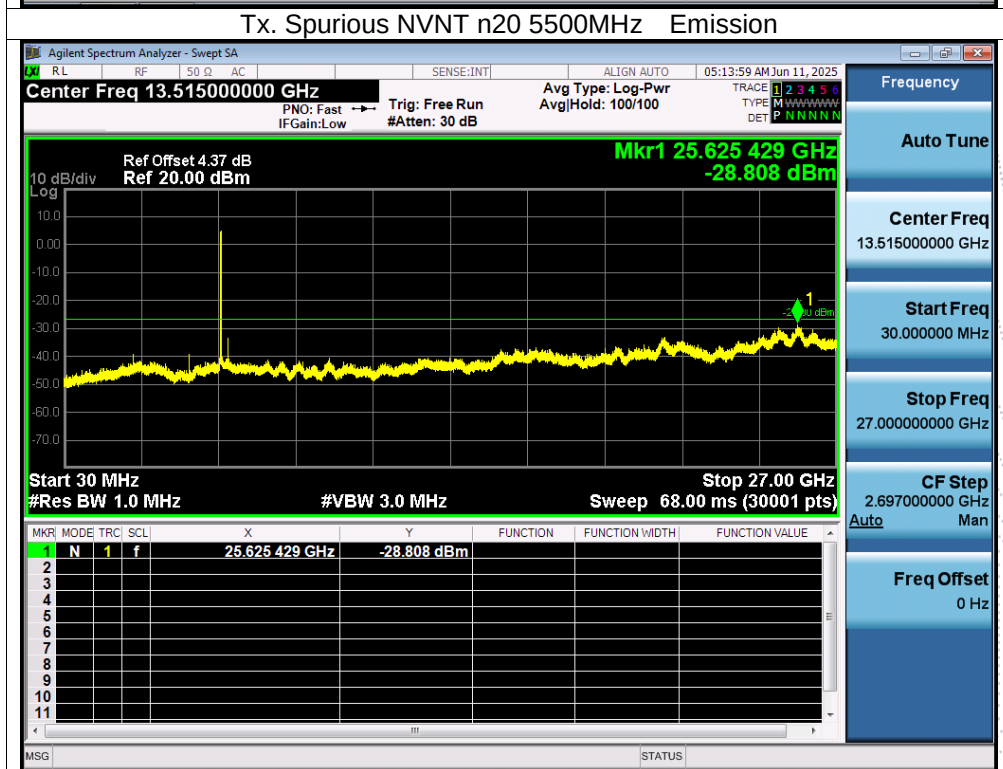
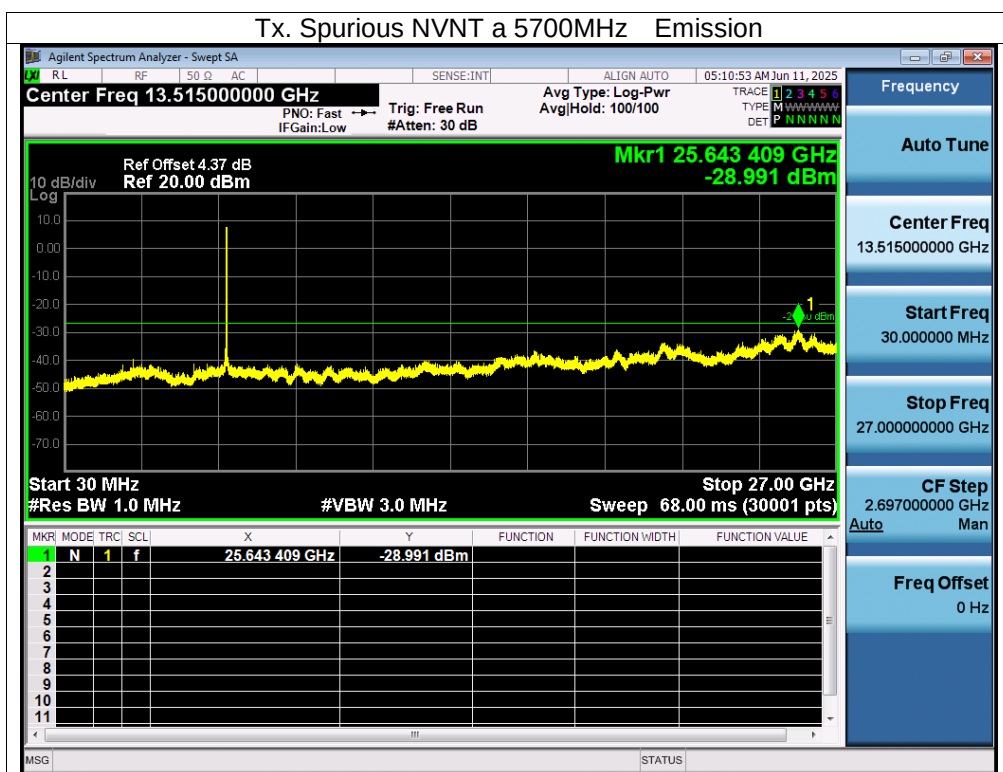
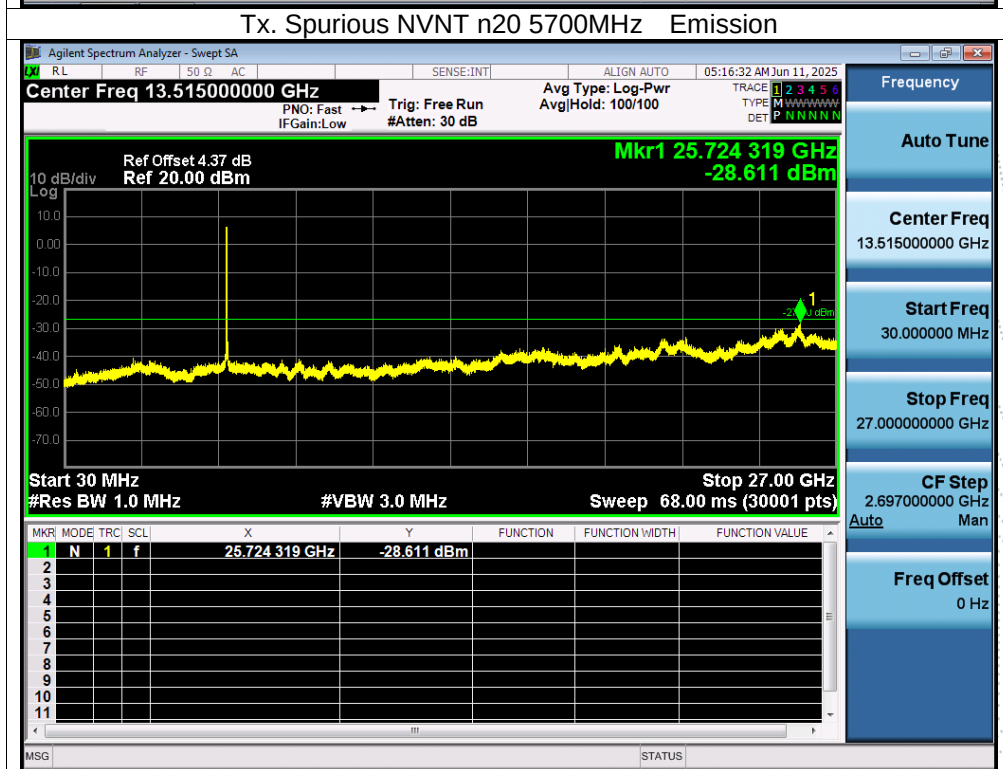
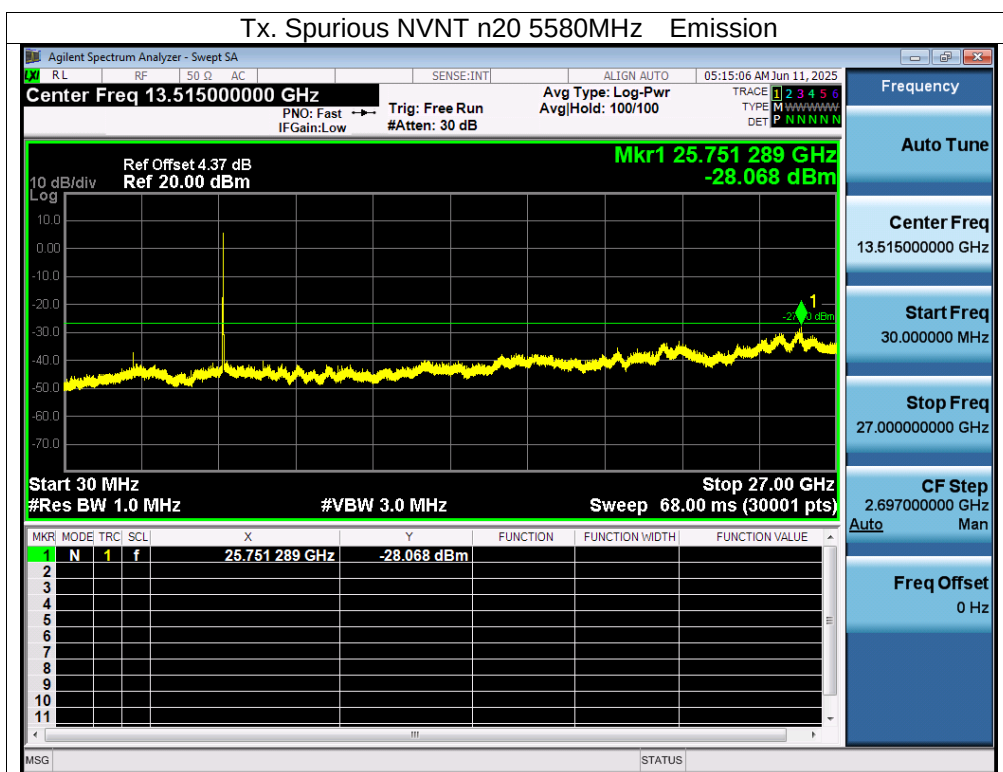
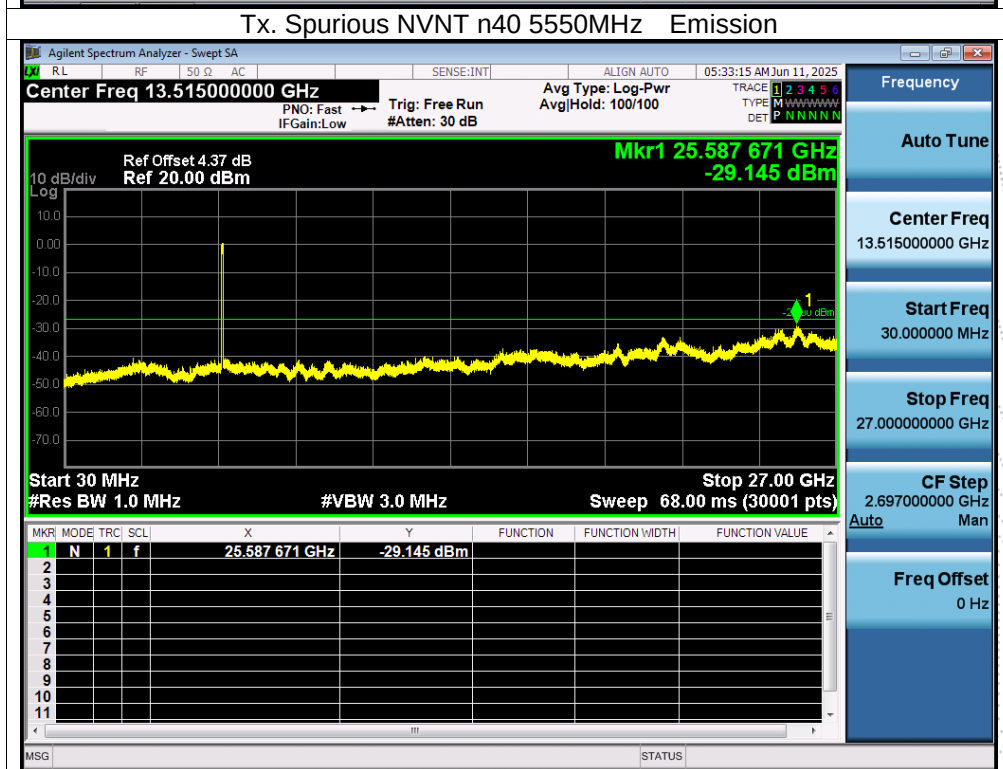
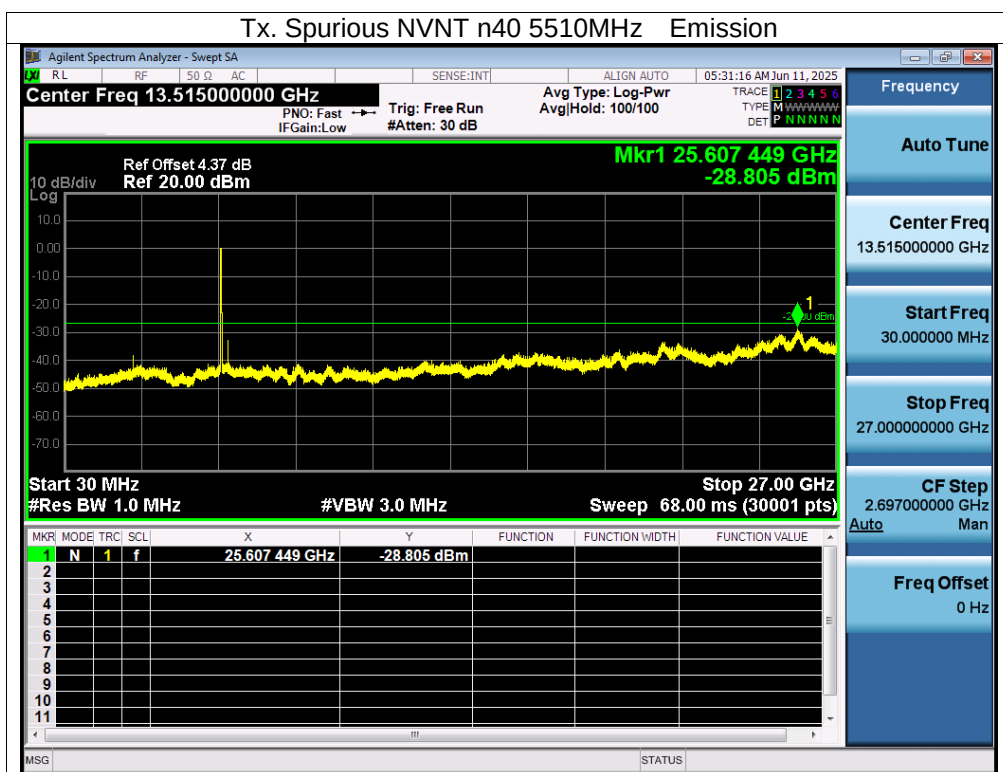
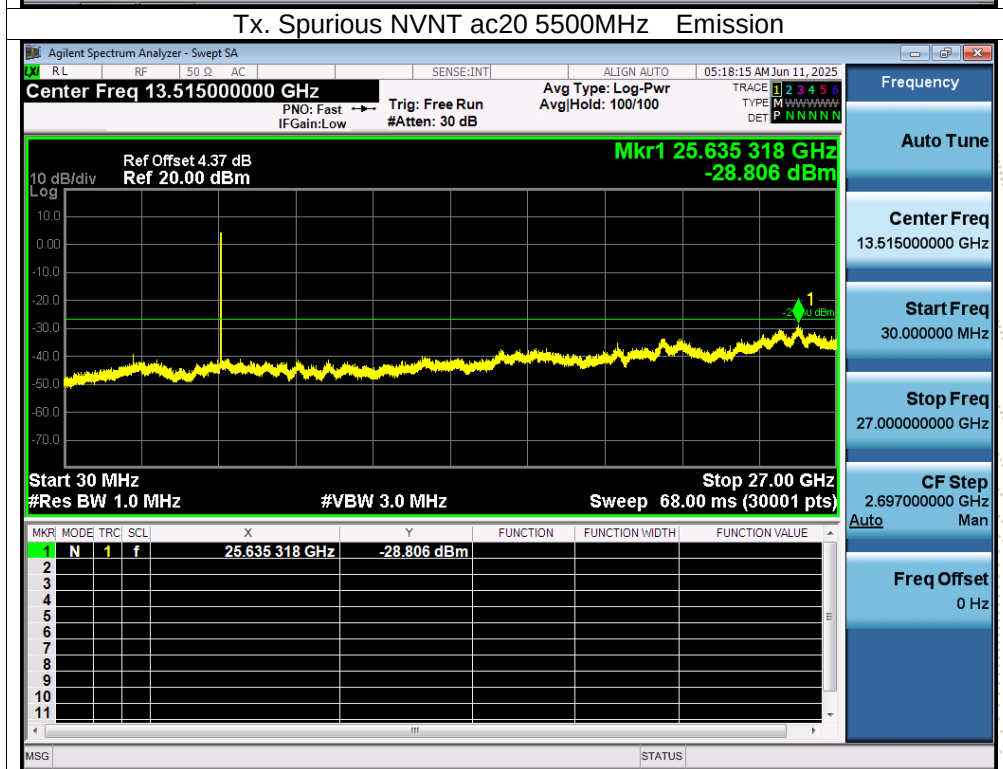
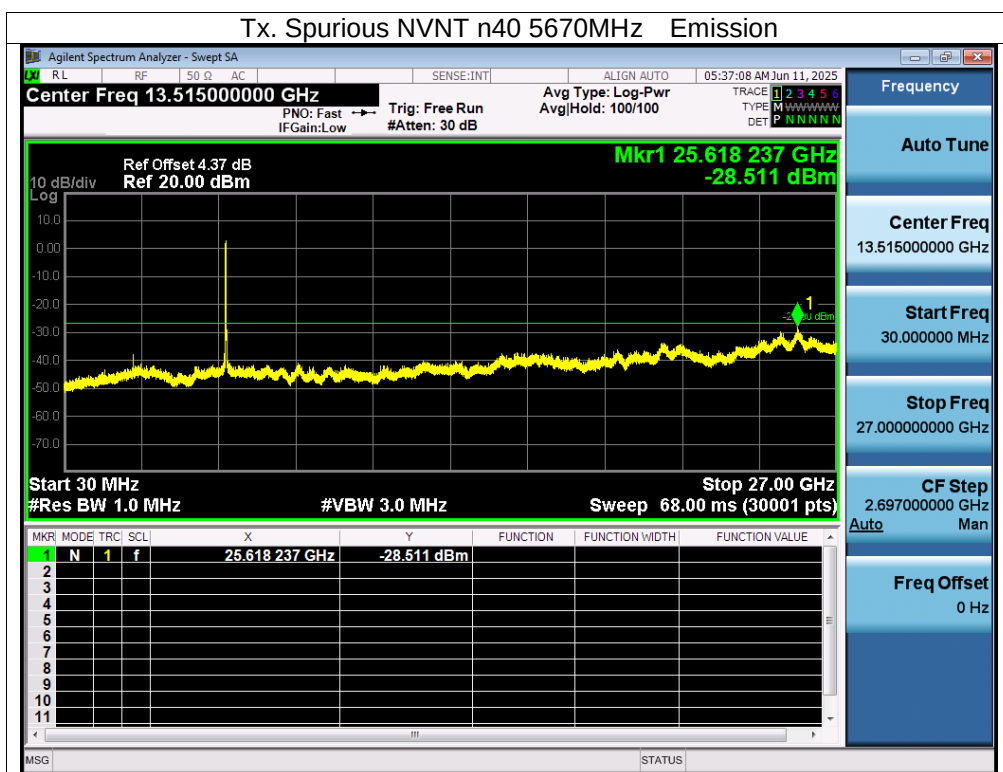
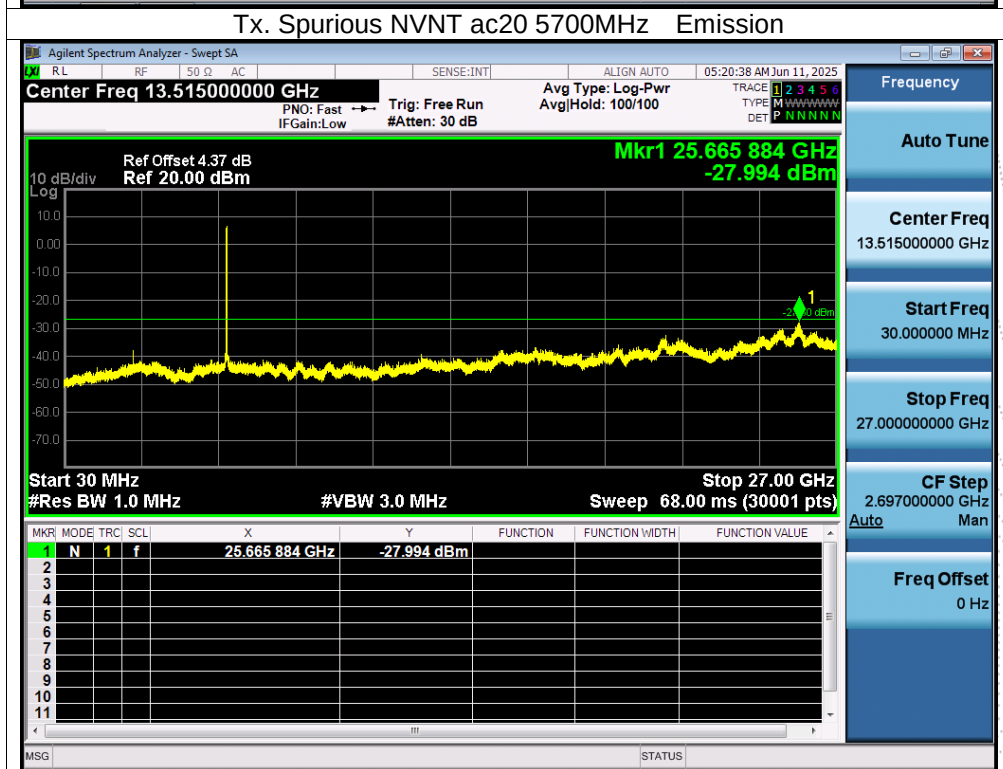
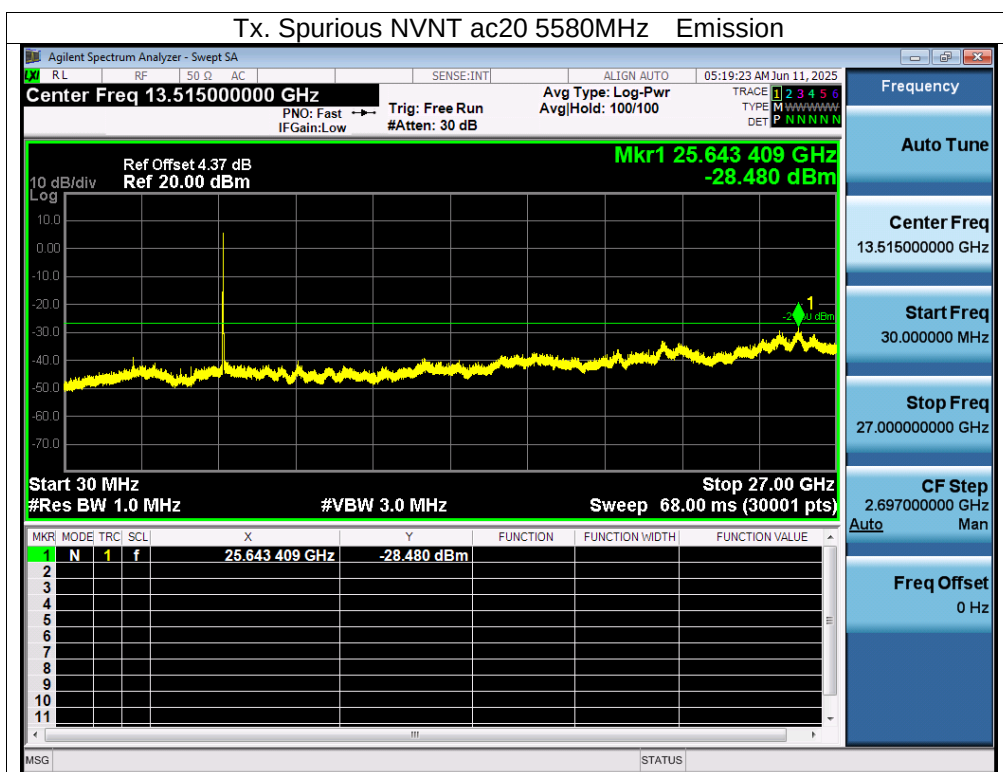


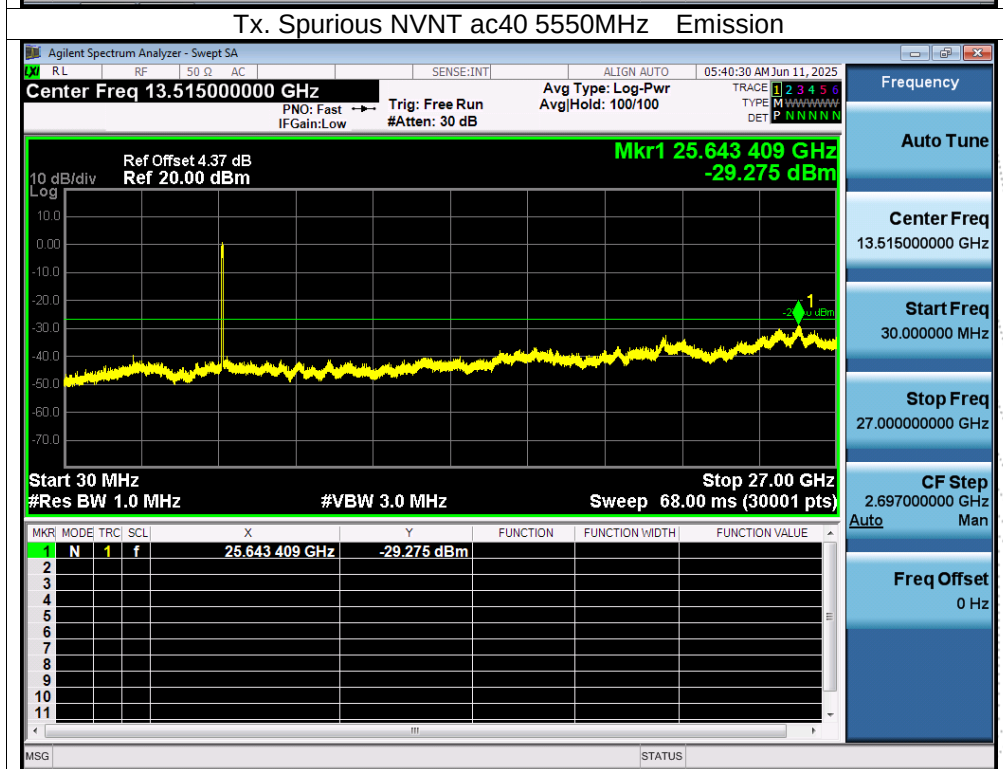
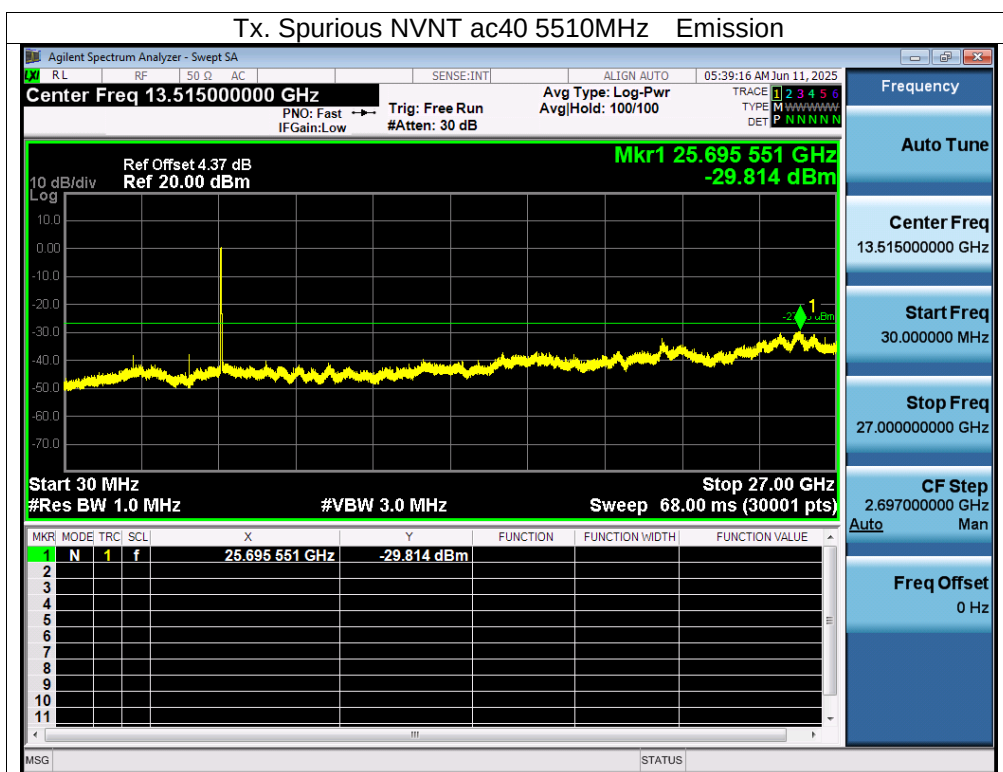


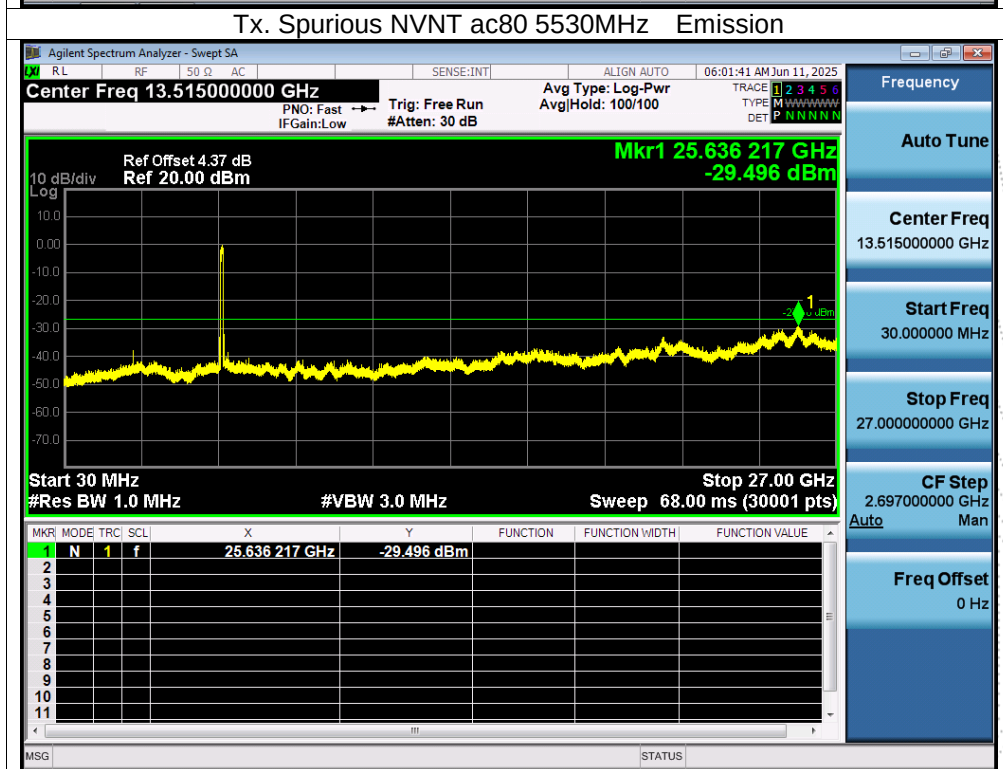
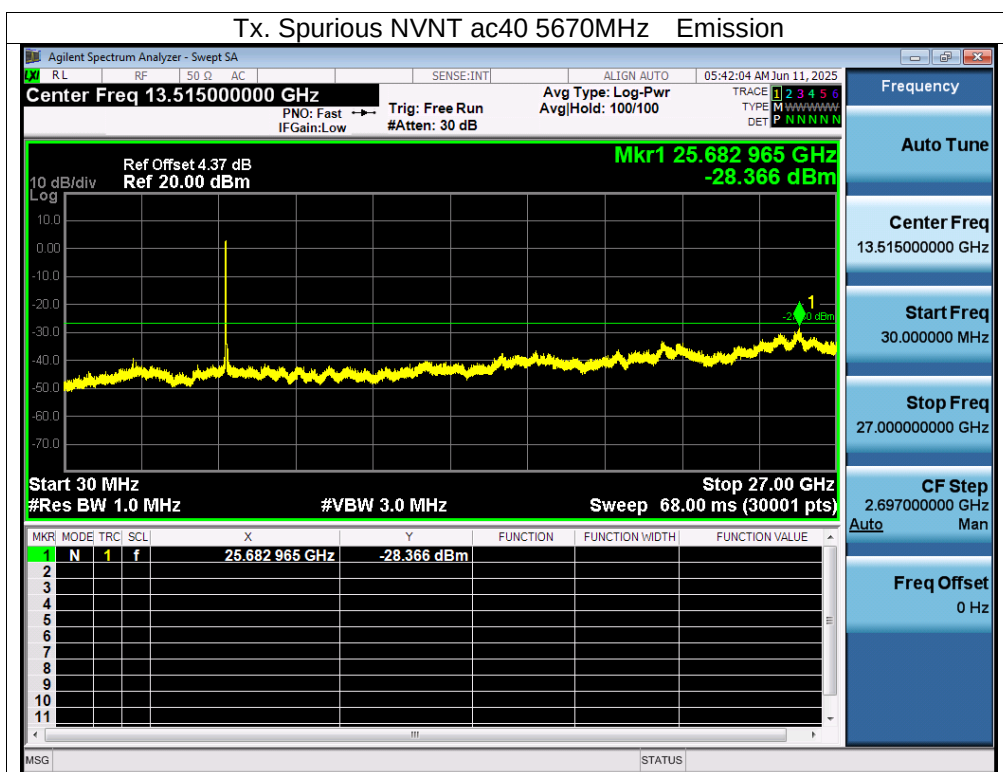


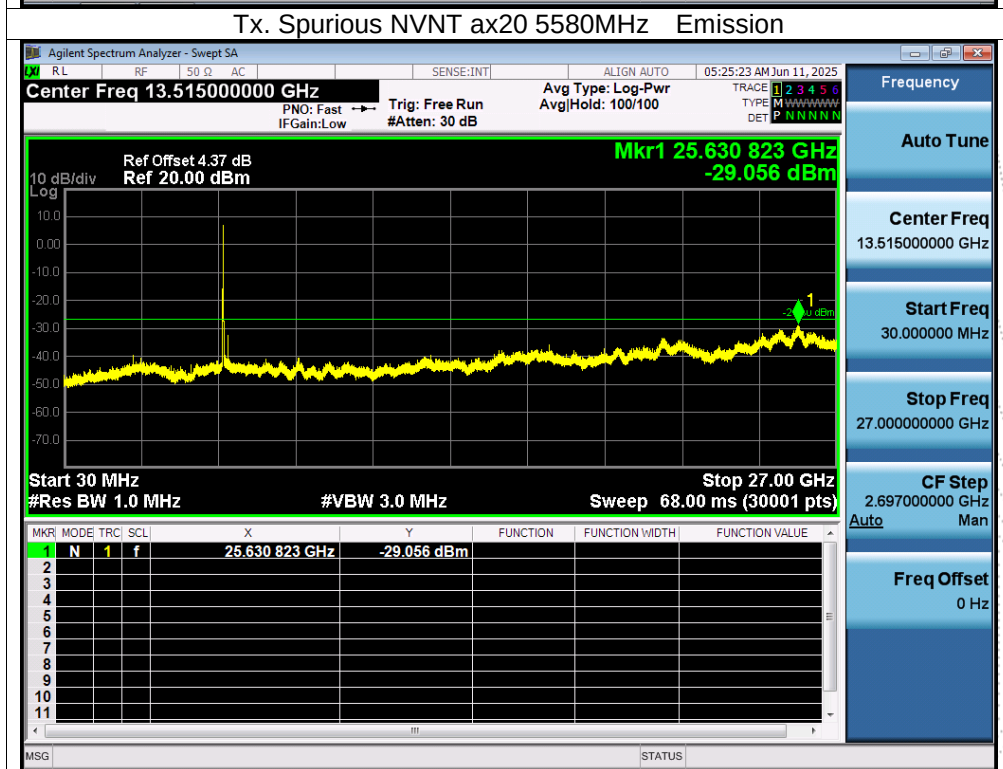
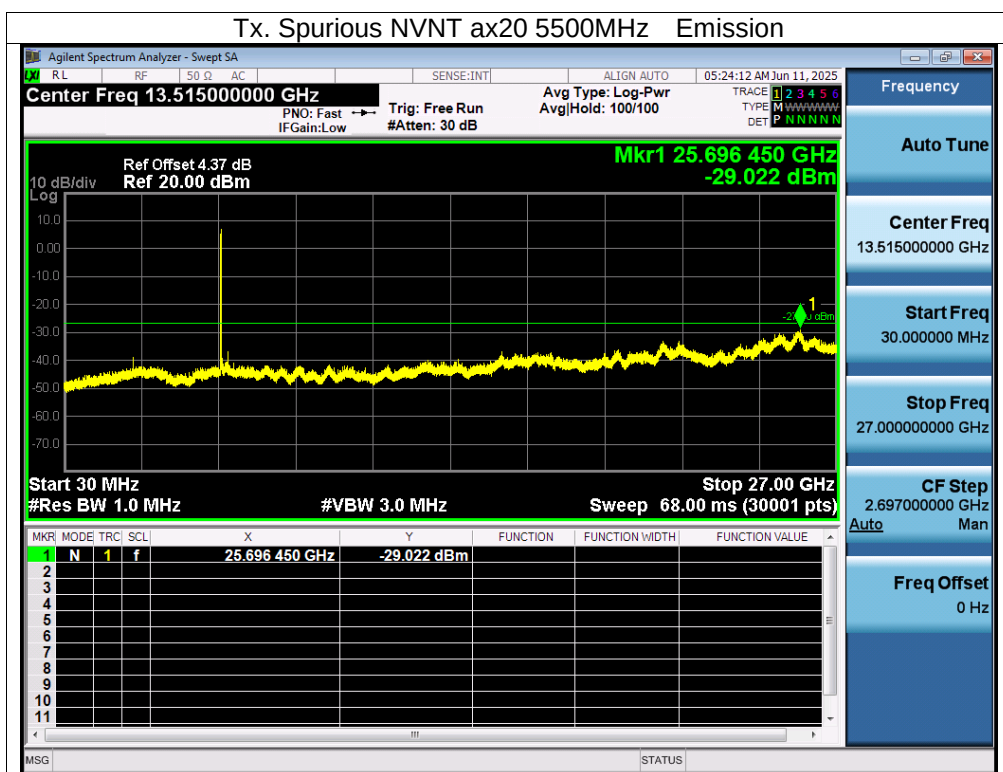


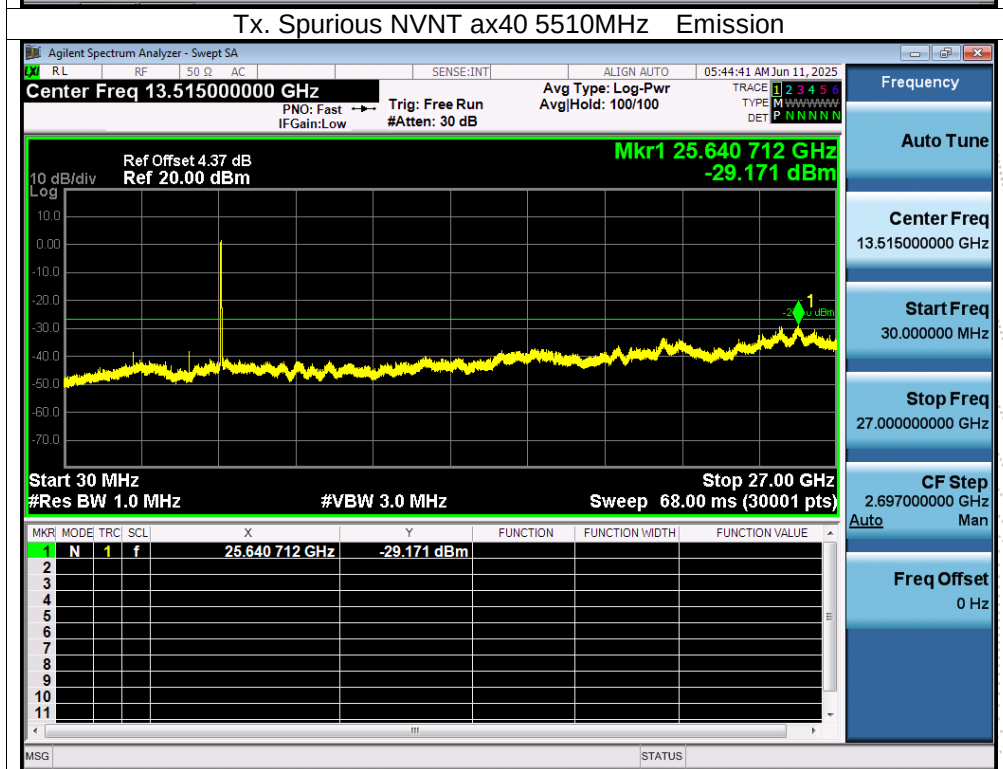
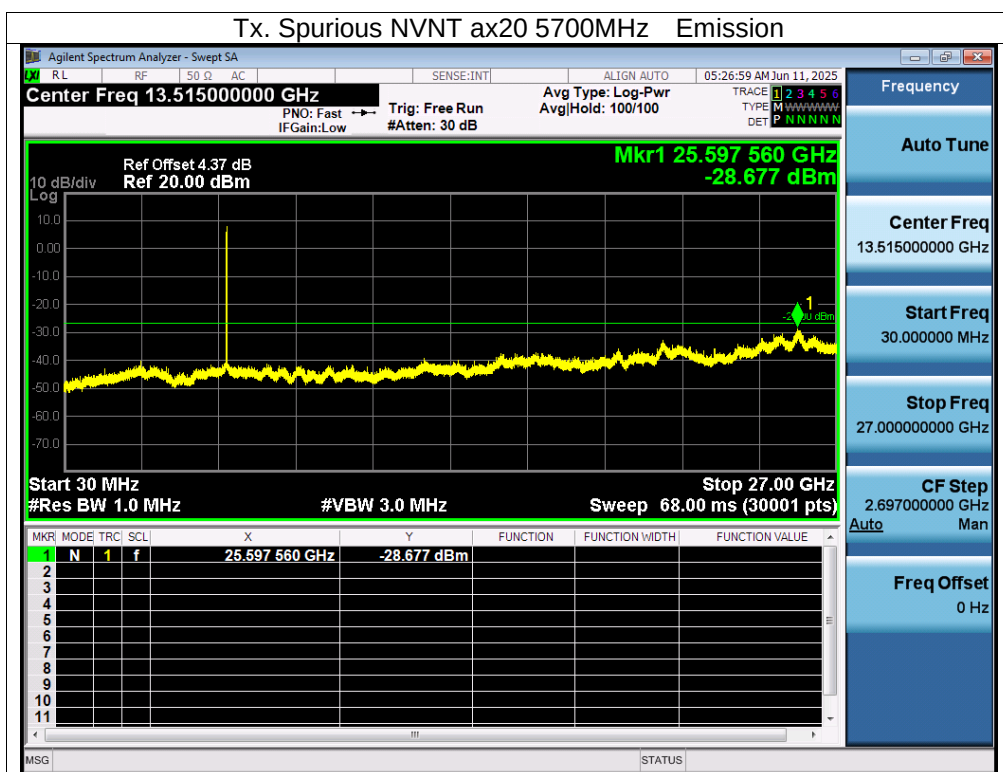


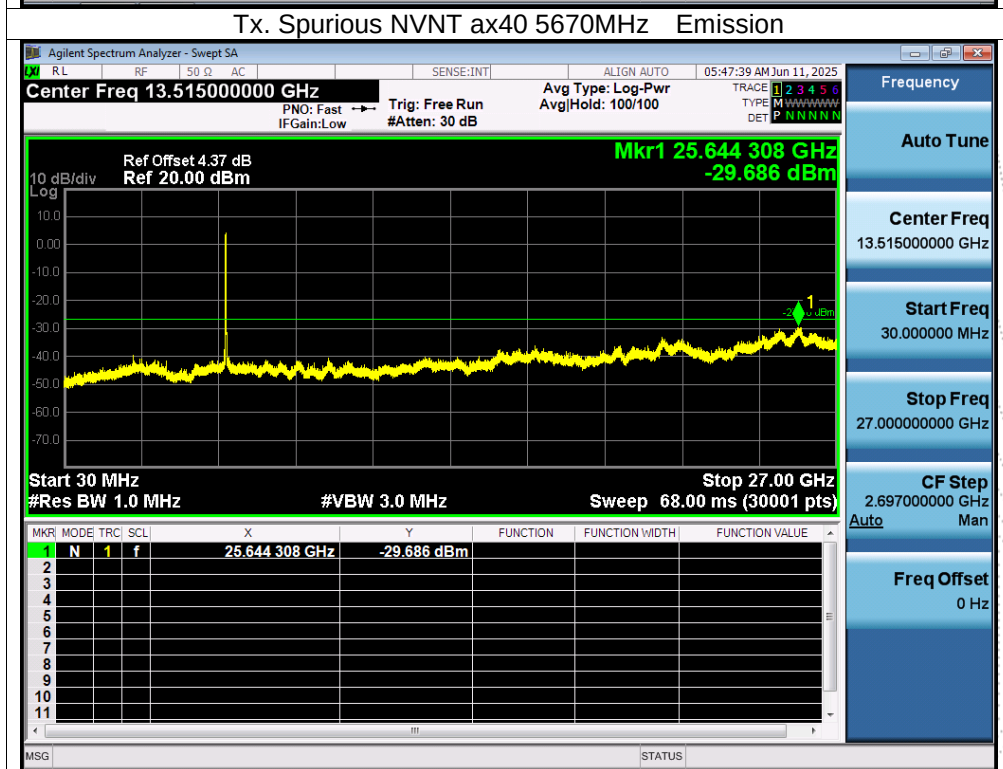
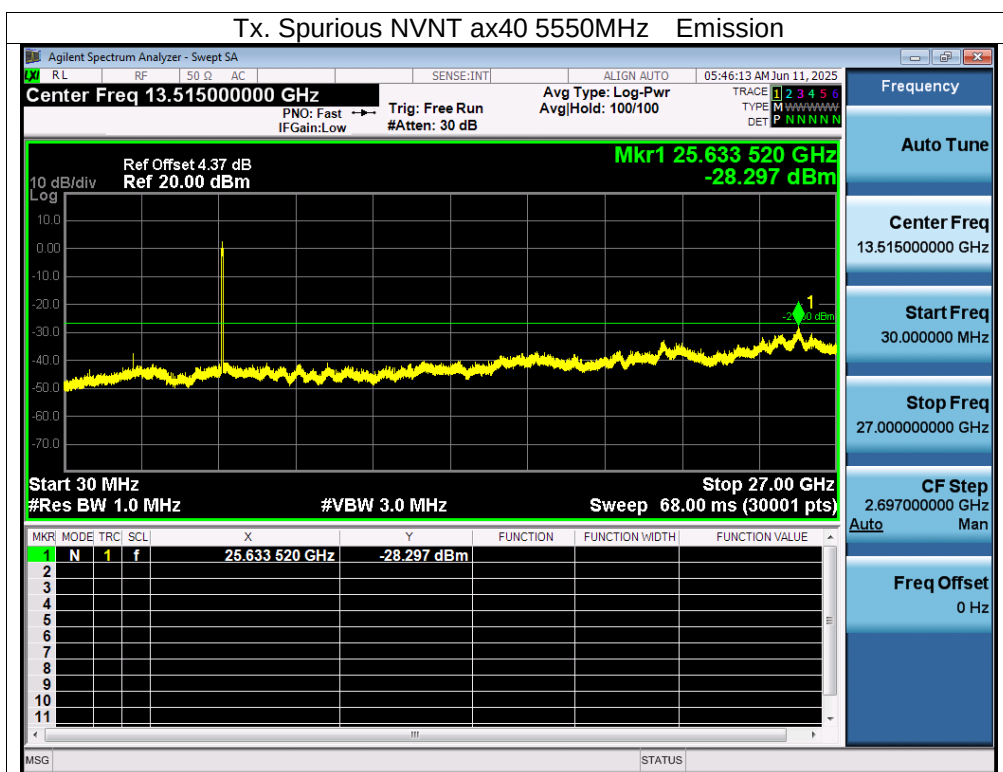


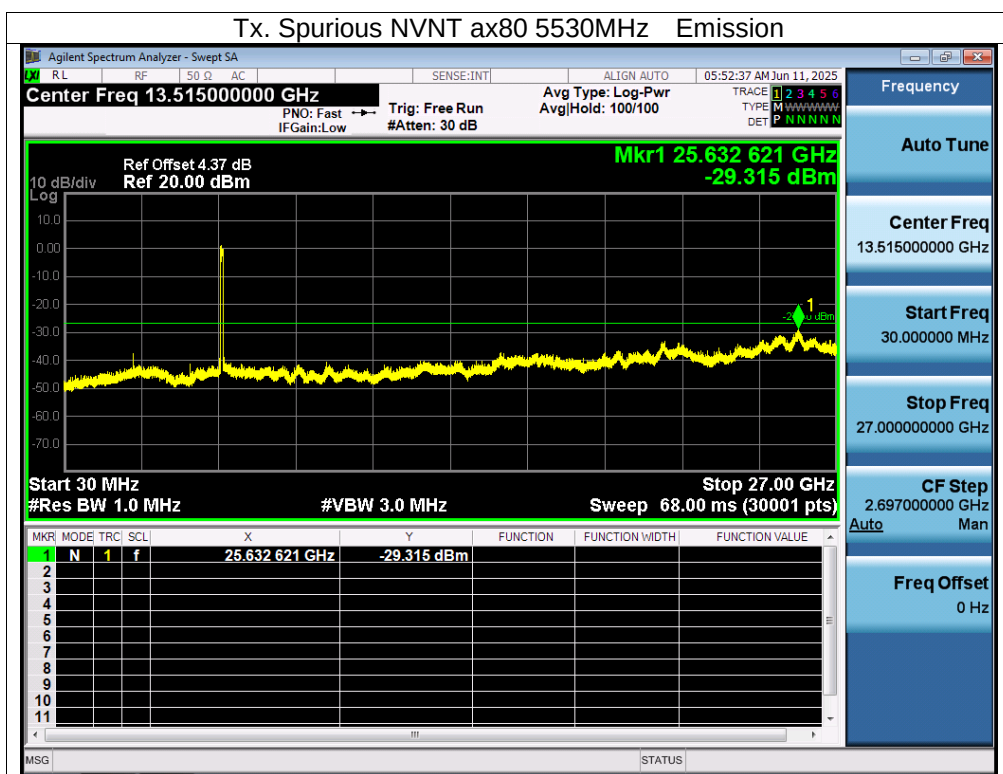


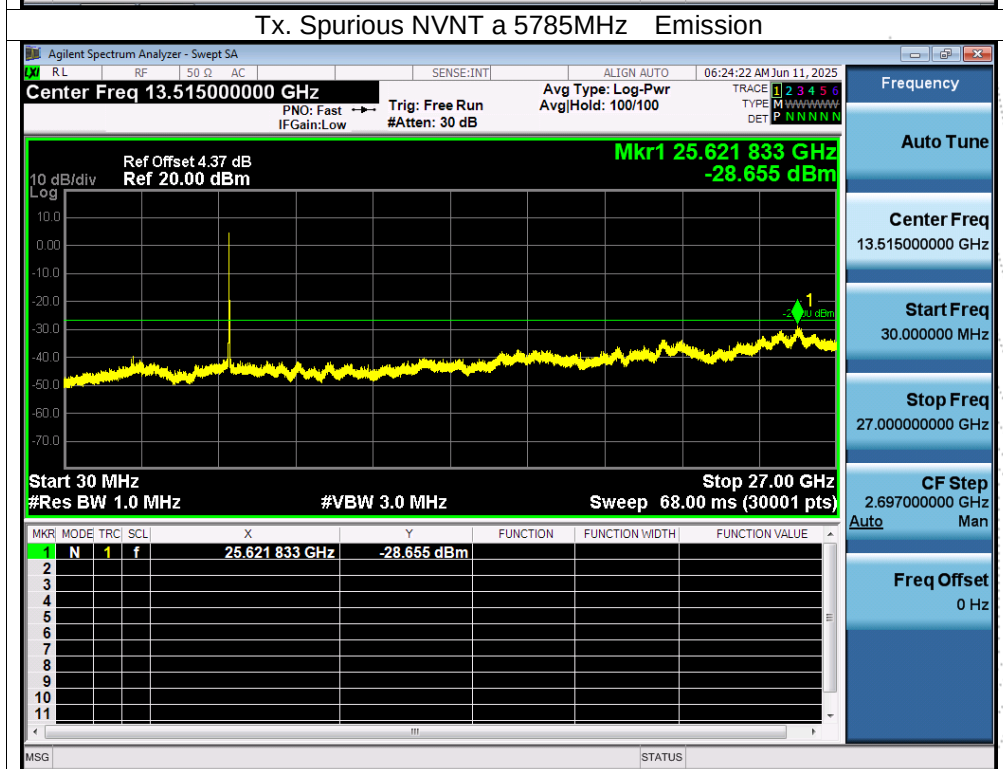
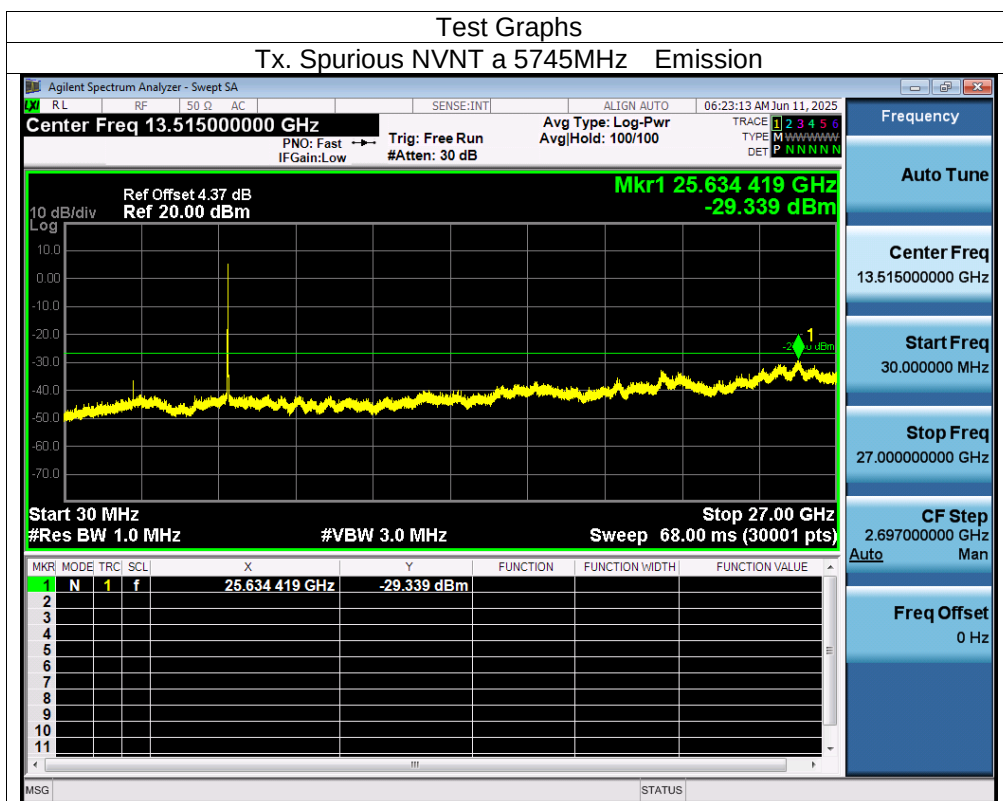


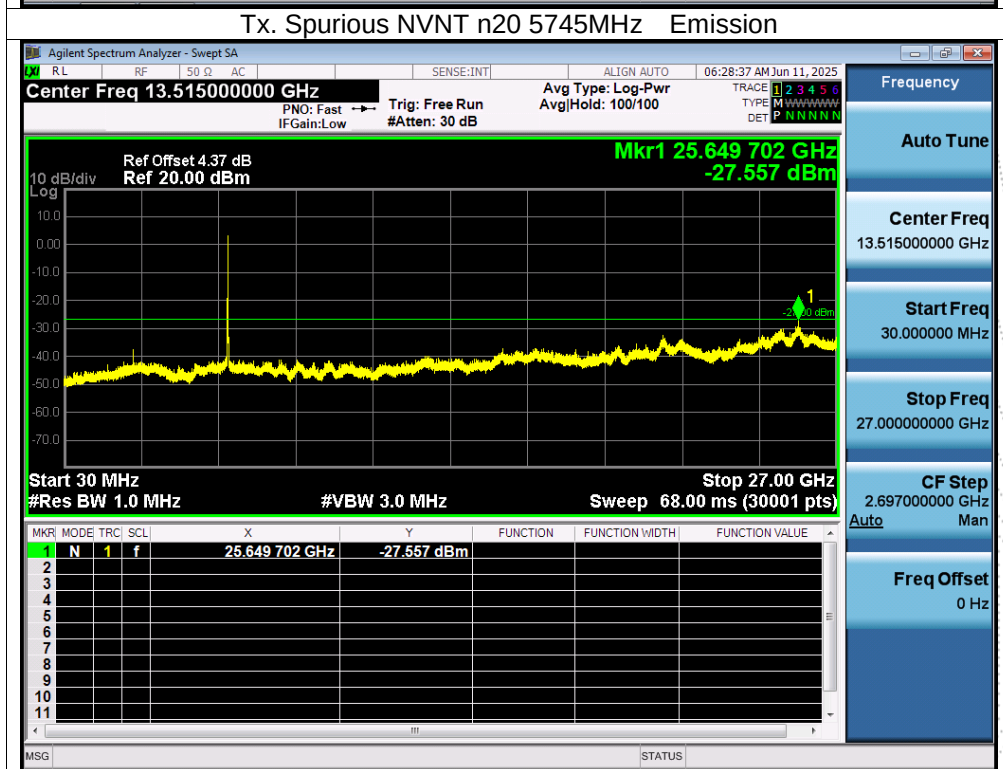
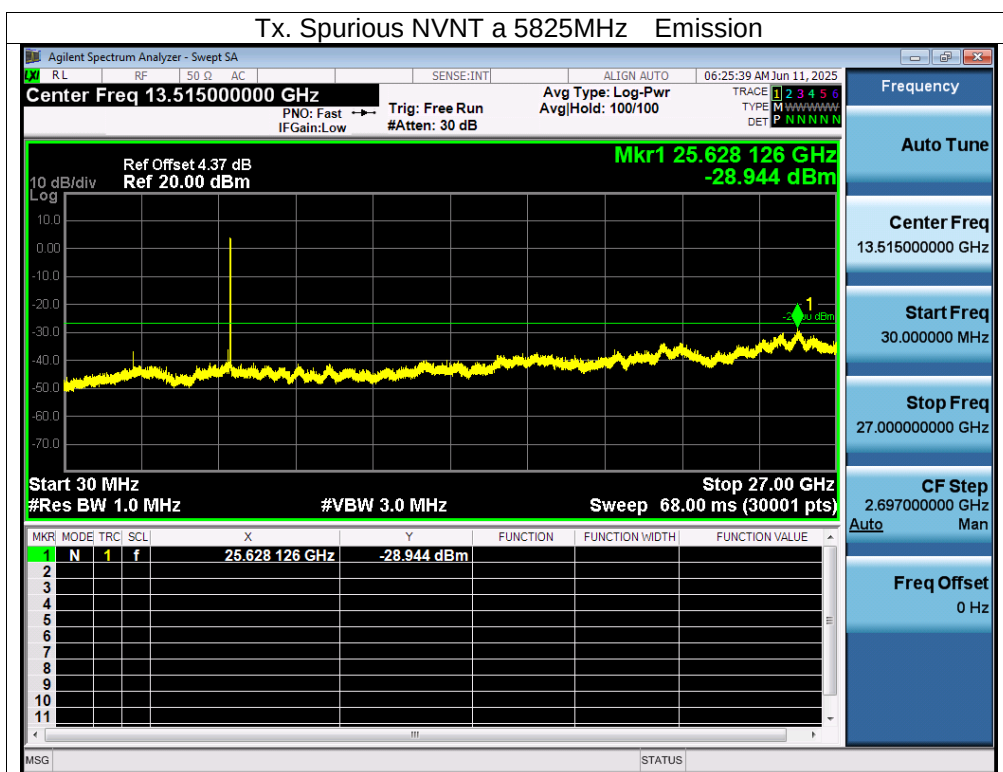


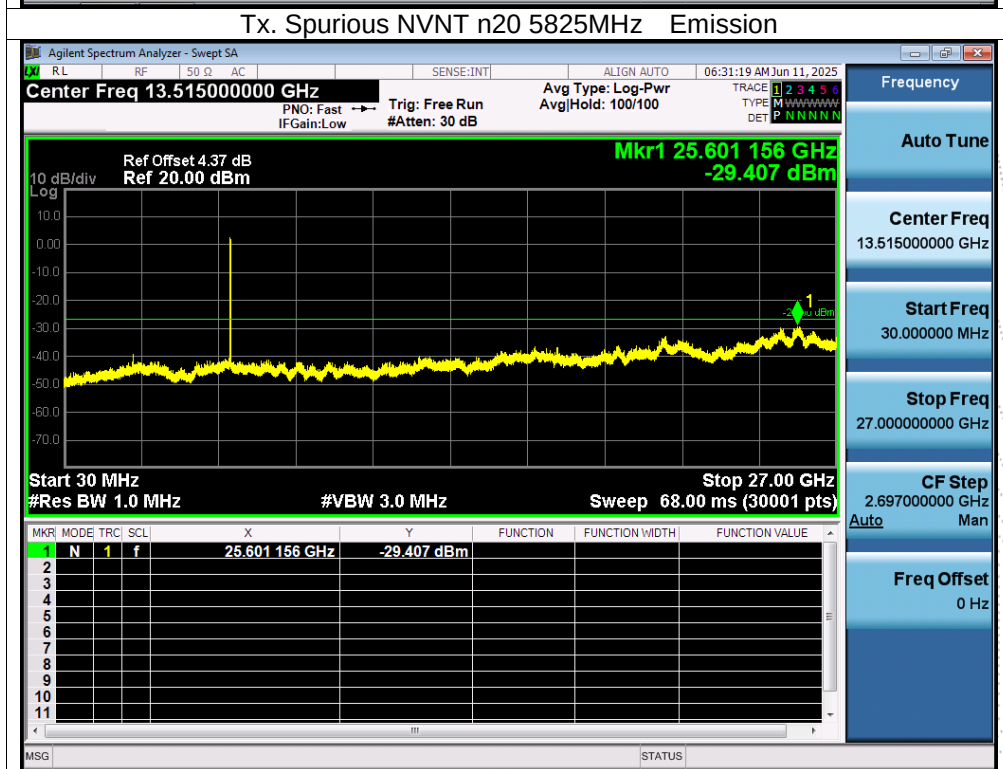
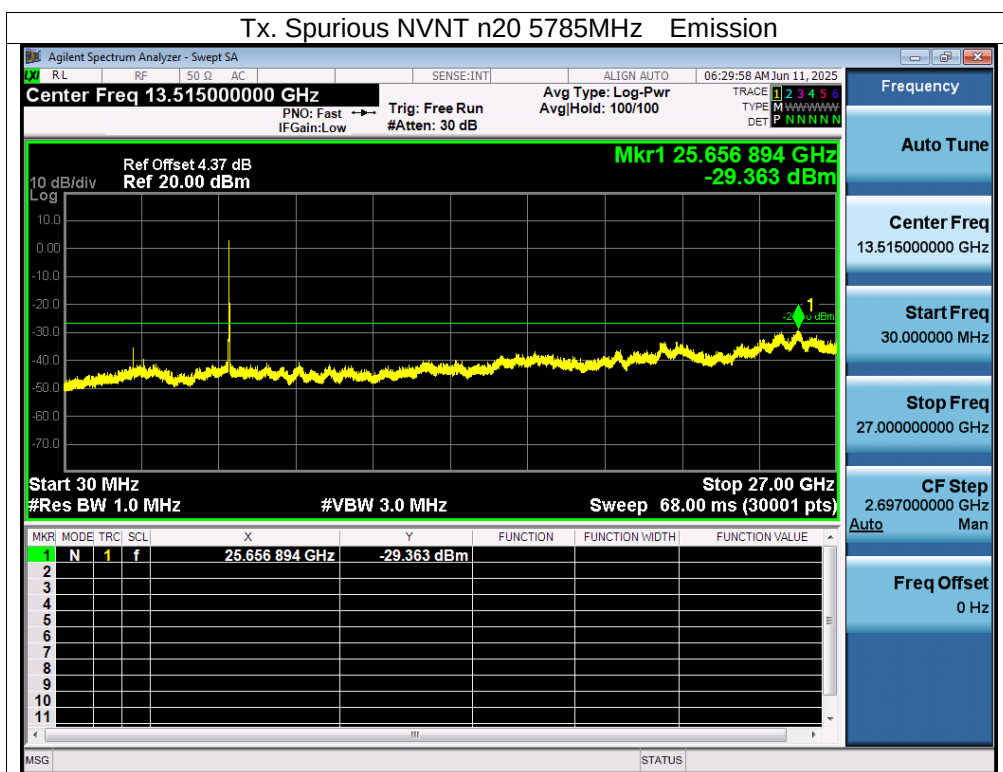


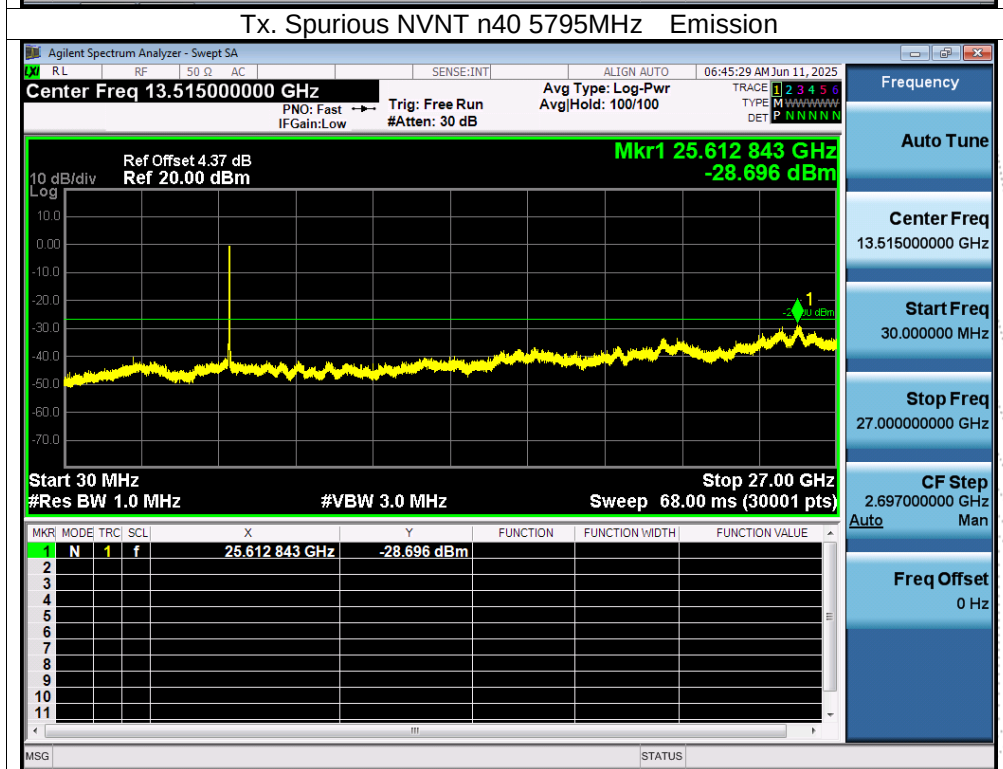
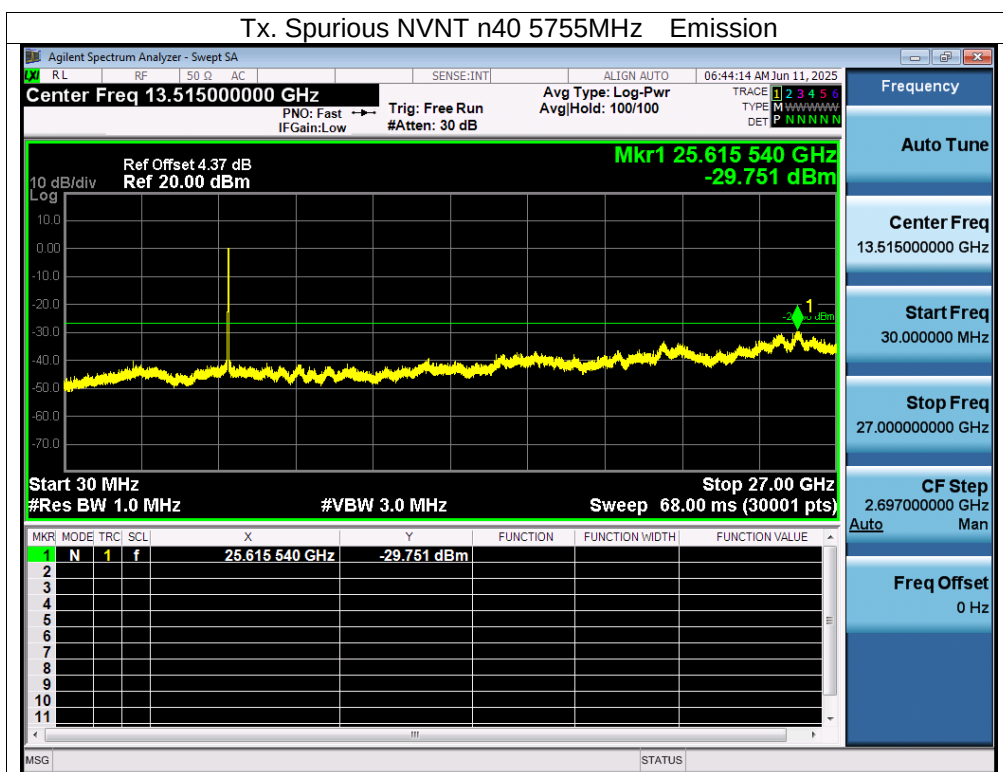


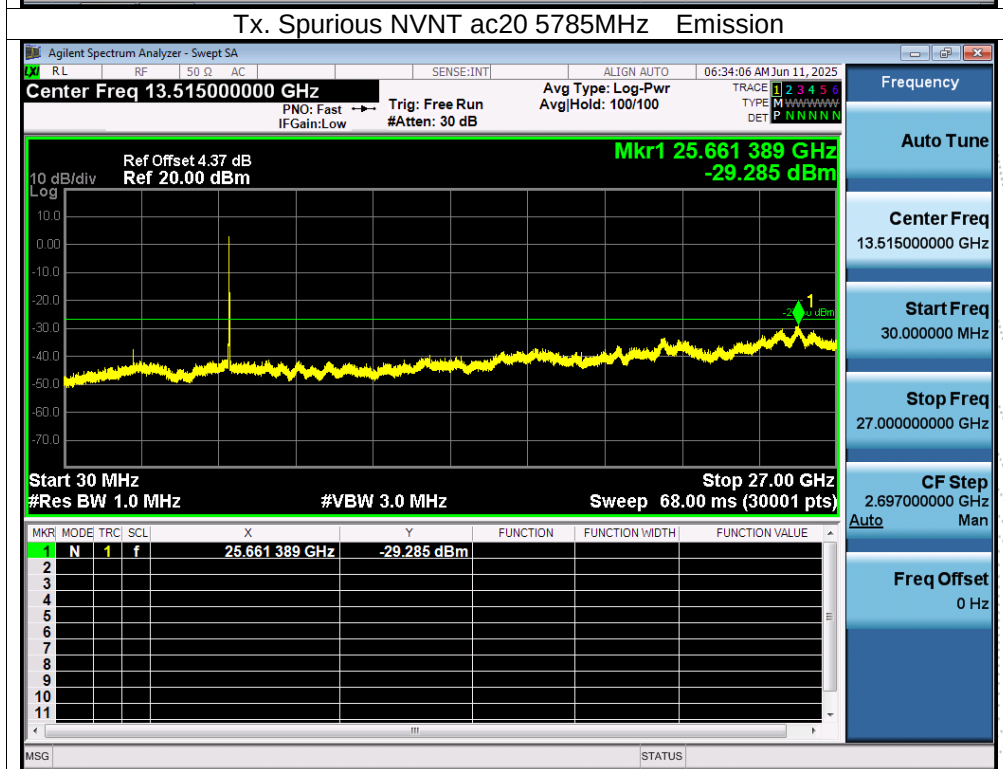
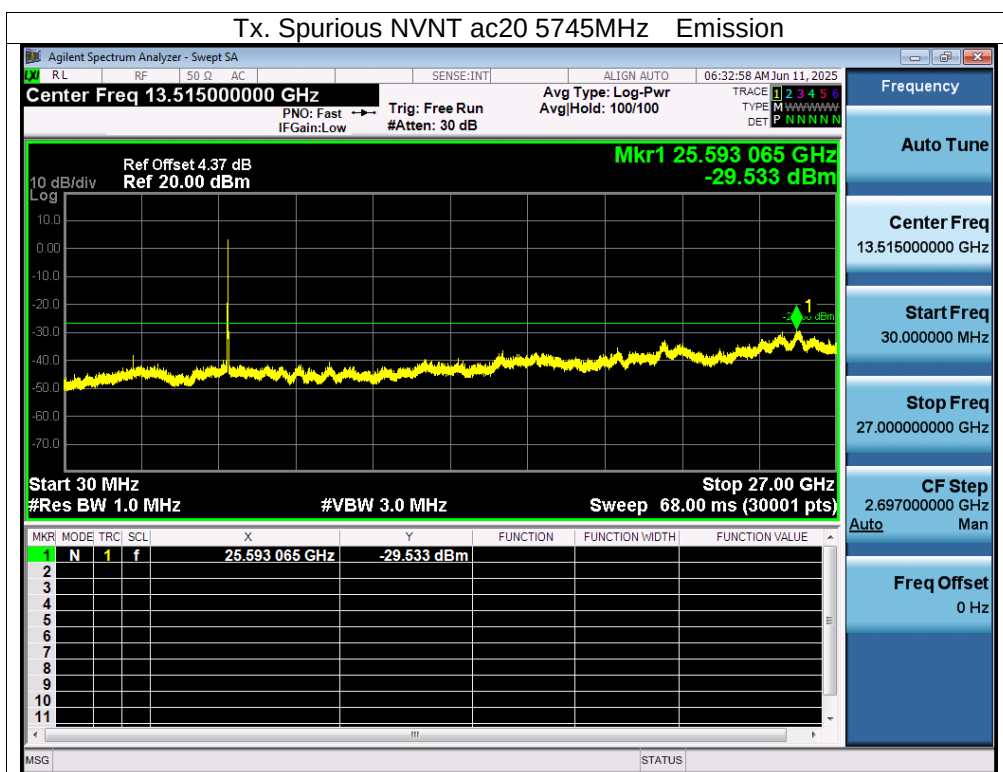


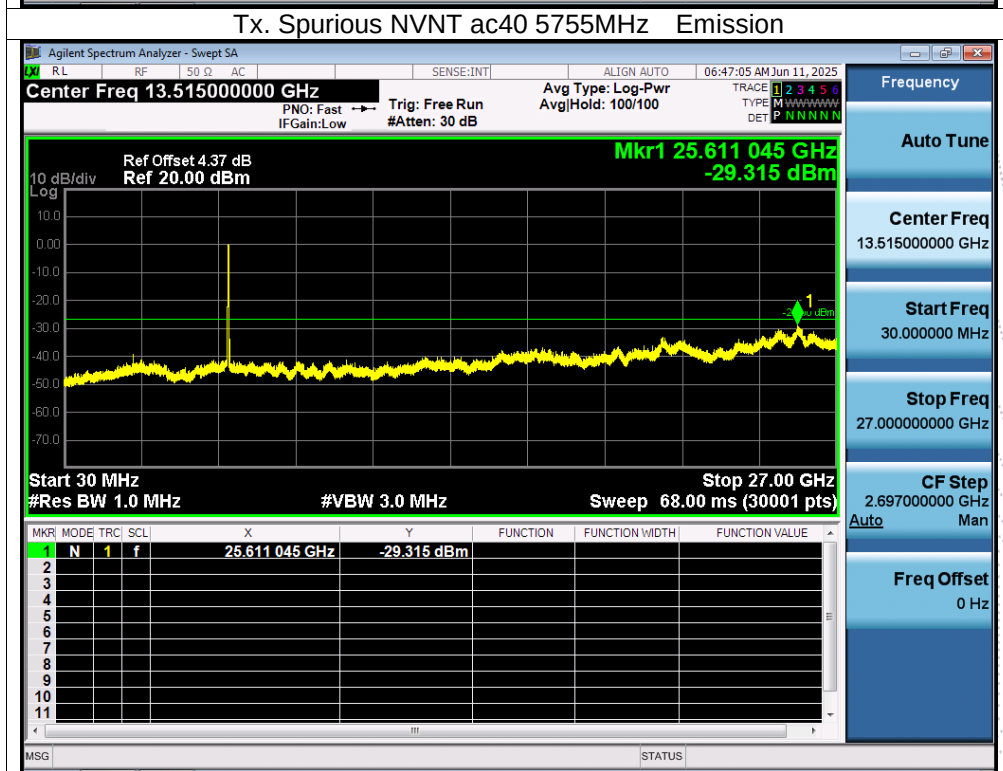
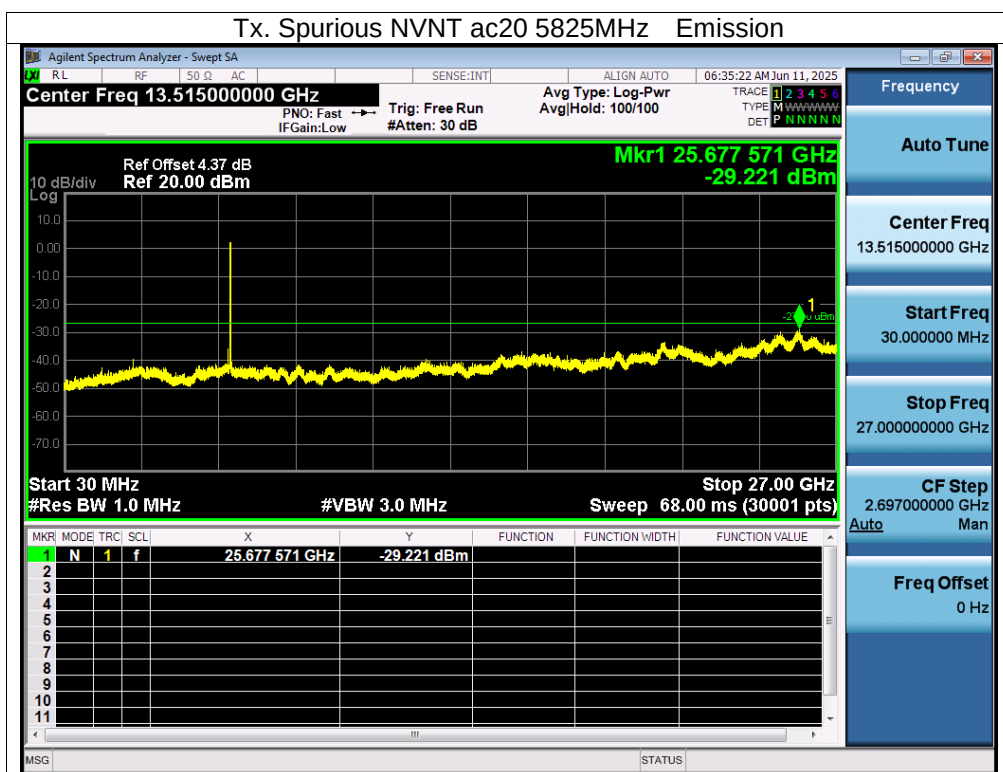


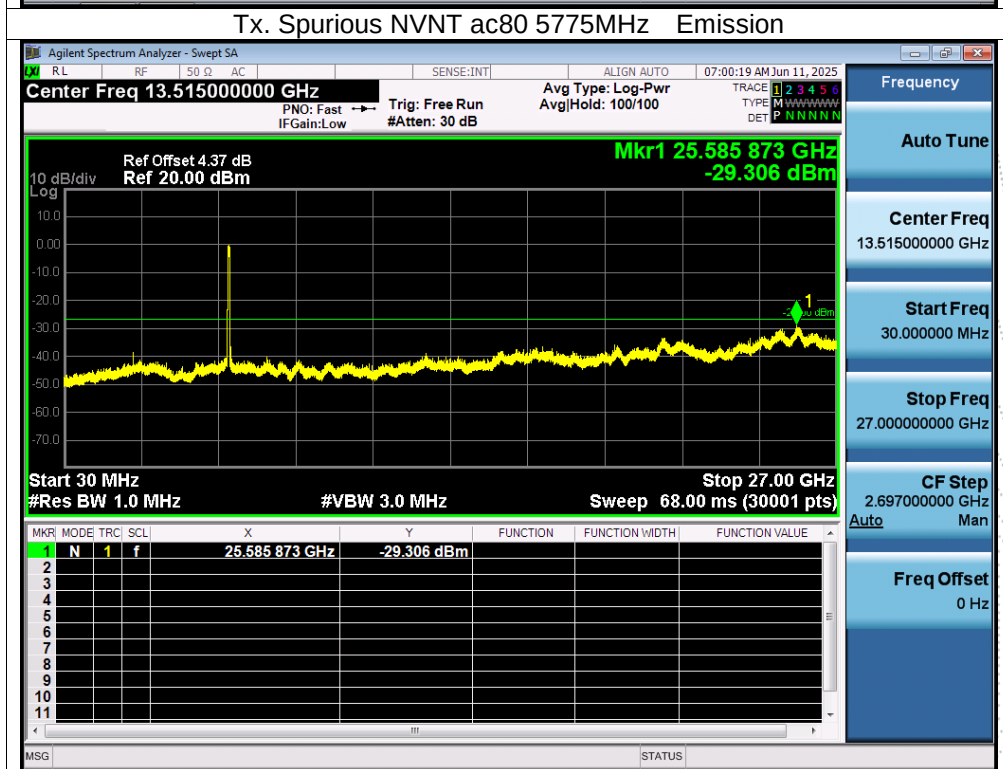
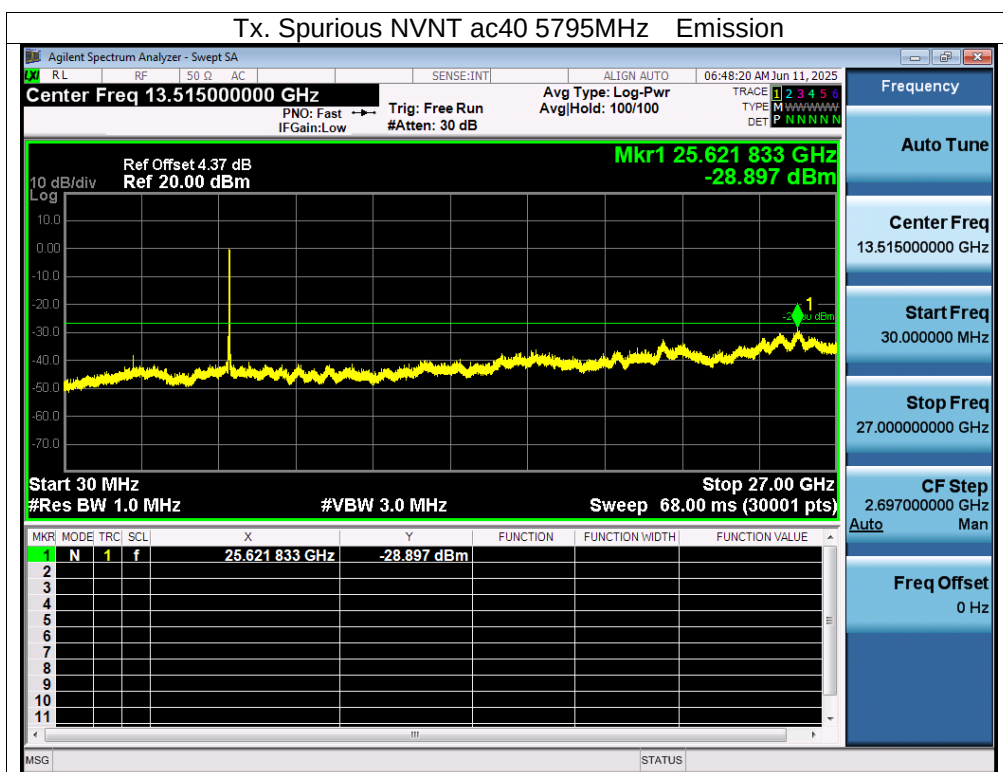


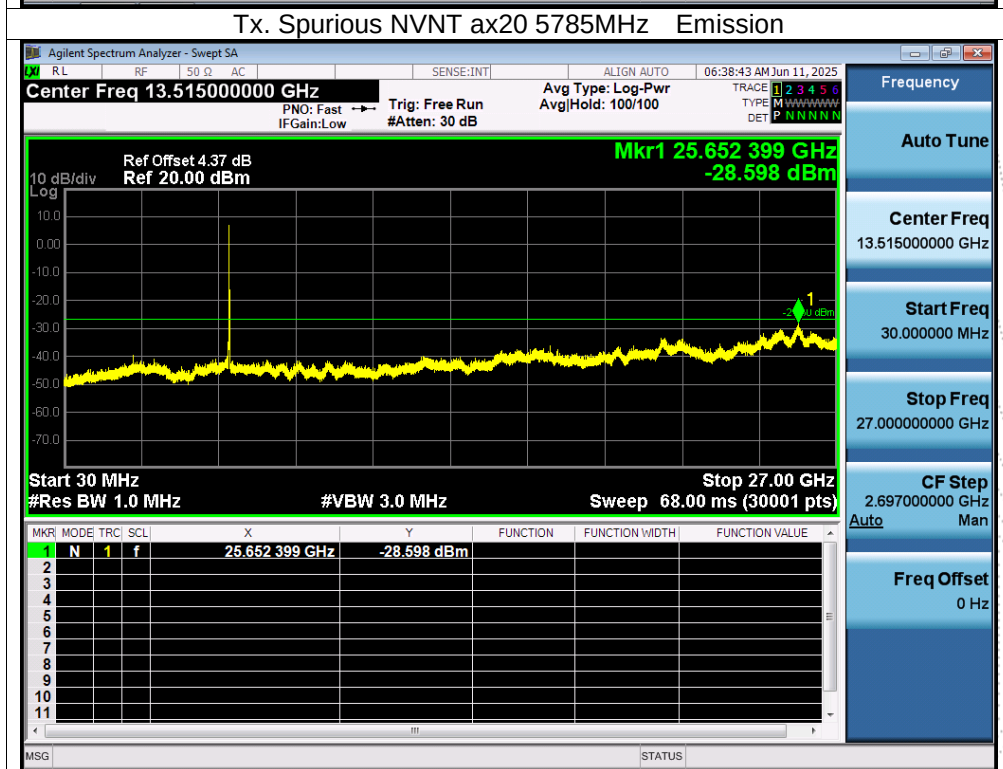
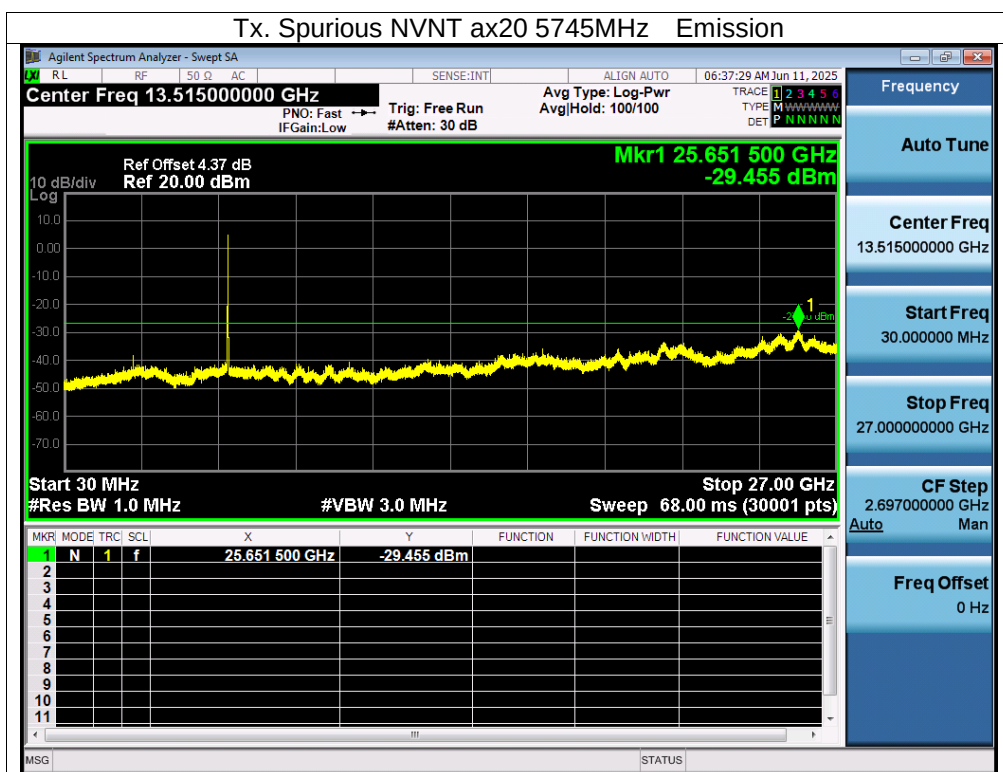


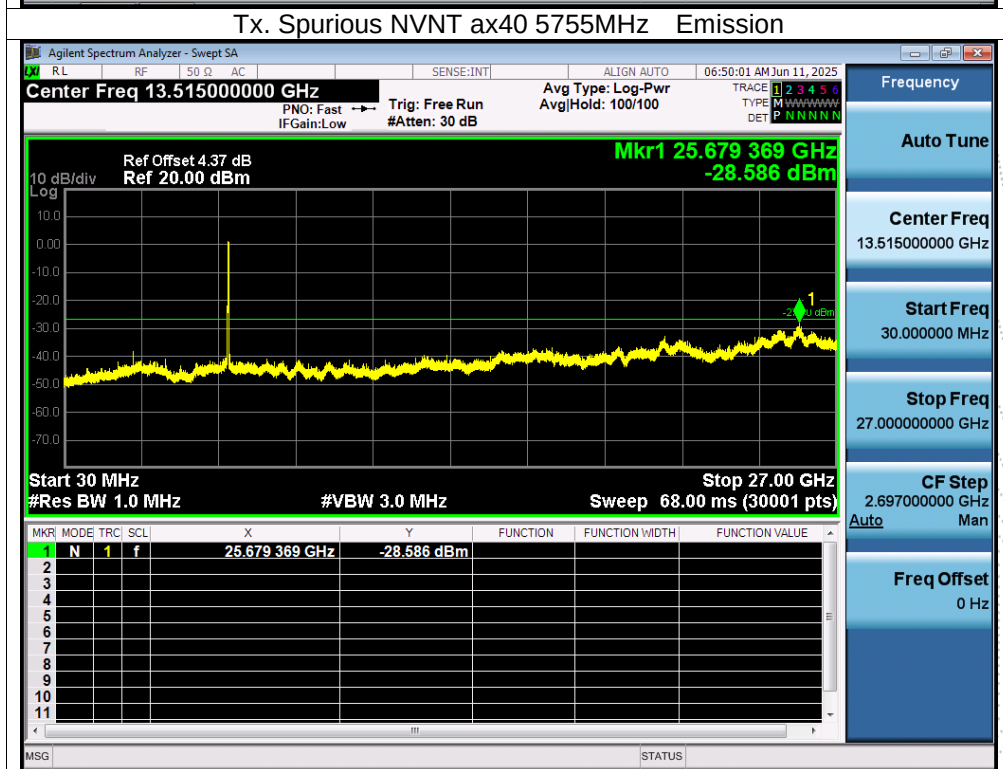
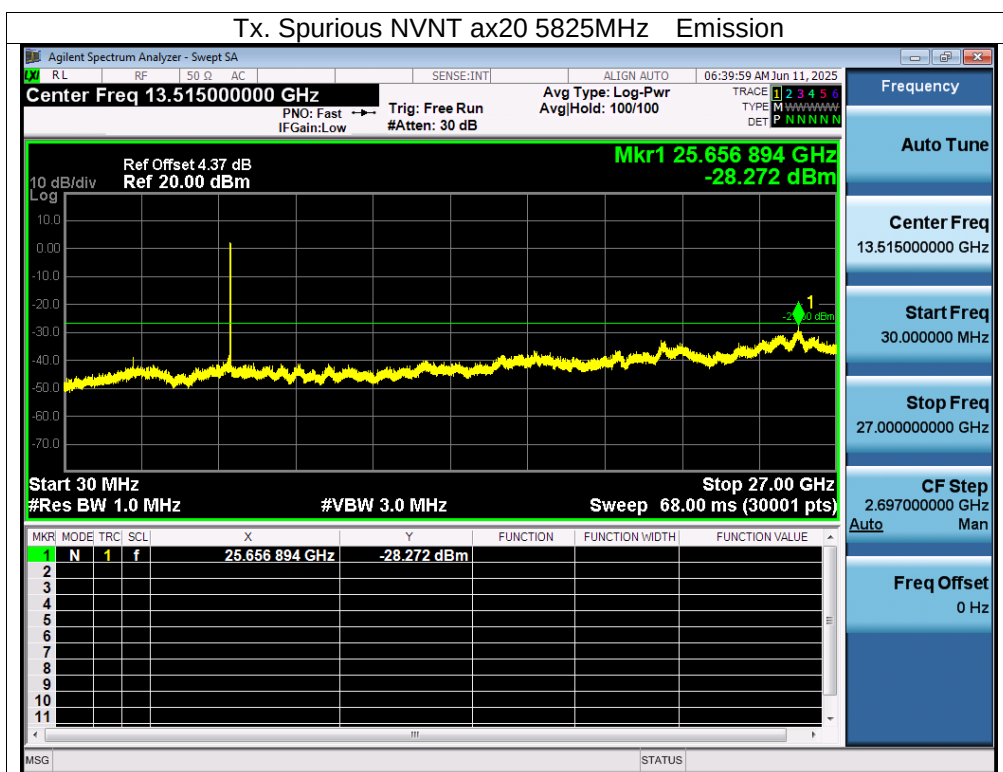


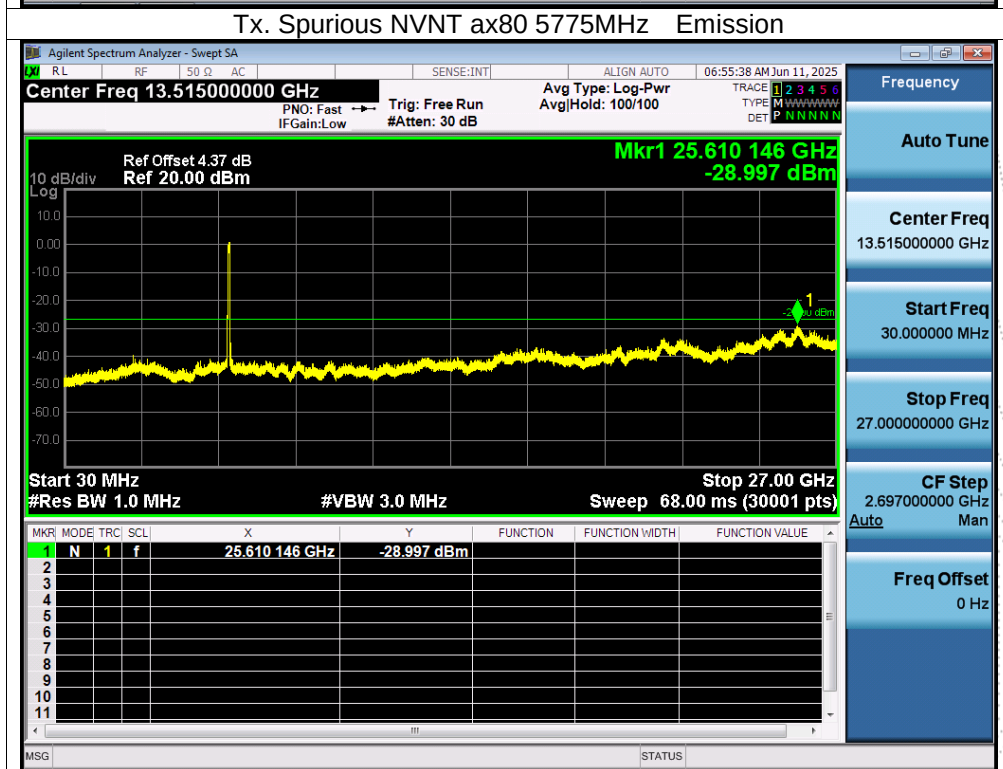
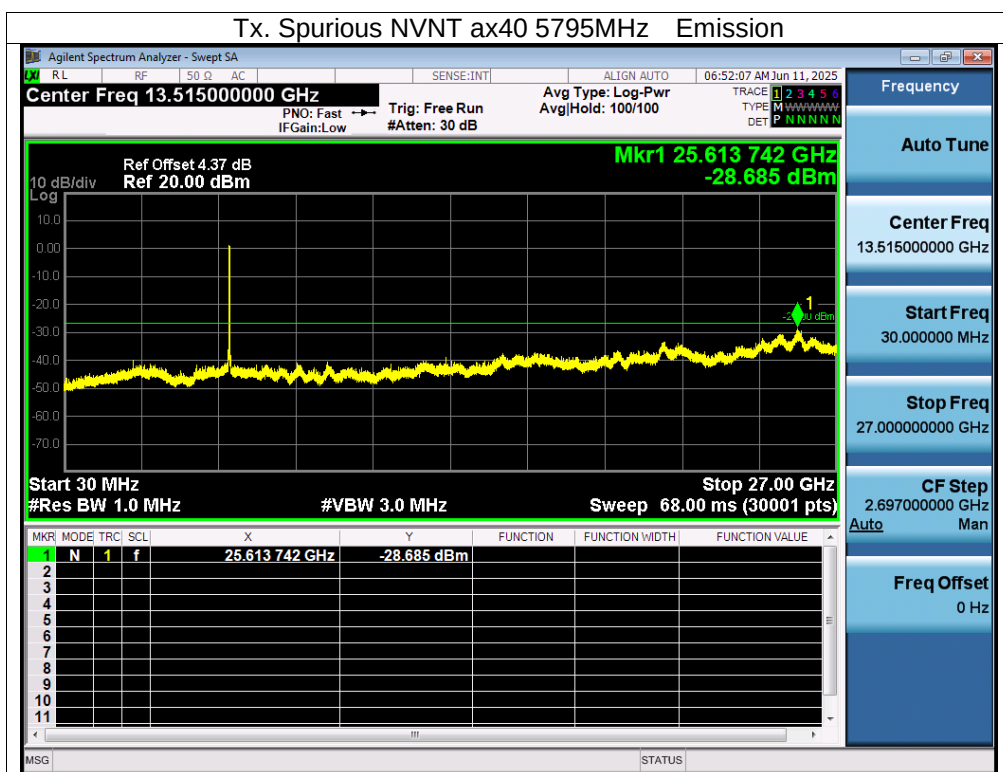












13. Frequency Stability Measurement

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 802.11nspecification).
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 $-20^{\circ}\text{C} \sim 70^{\circ}\text{C}$.

13.4 Test Result

Temperature:	26 °C	Relative Humidity:	54 %
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	5180.0094	5180	0.0094	1.8147
		V max (V)	138.00	5180.0110	5180	0.0110	2.1236
		V min (V)	102.00	5180.0101	5180	0.0101	1.9498
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)	120	T (°C)	-20	5180.0092	5180	0.0092	1.7761
		T (°C)	-10	5180.0132	5180	0.0132	2.5483
		T (°C)	0	5180.0047	5180	0.0047	0.9073
		T (°C)	10	5180.0025	5180	0.0025	0.4826
		T (°C)	20	5180.0090	5180	0.0090	1.7375
		T (°C)	30	5180.0073	5180	0.0073	1.4093
		T (°C)	40	5180.0001	5180	0.0001	0.0193
		T (°C)	50	5180.0018	5180	0.0018	0.3475
		T (°C)	60	5180.0012	5180	0.0012	0.2317
		T (°C)	70	5180.0032	5180	0.0032	0.6178
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	5200.0133	5200	0.0133	2.5577
		V max (V)	138.00	5200.0009	5200	0.0009	0.1731
		V min (V)	102.00	5200.0123	5200	0.0123	2.3654
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)	120	T (°C)	-20	5200.00970	5200	0.00970	1.8654
		T (°C)	-10	5200.01010	5200	0.01010	1.9423
		T (°C)	0	5200.00460	5200	0.00460	0.8846
		T (°C)	10	5200.00170	5200	0.00170	0.3269
		T (°C)	20	5200.00230	5200	0.00230	0.4423
		T (°C)	30	5200.00510	5200	0.00510	0.9808
		T (°C)	40	5200.00950	5200	0.00950	1.8269
		T (°C)	50	5200.00440	5200	0.00440	0.8462
		T (°C)	60	5200.01140	5200	0.01140	2.1923
		T (°C)	70	5200.00980	5200	0.00980	1.8846
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)	120.00	5240.0031	5240	0.0031	0.5916
		V max (V)	138.00	5240.0124	5240	0.0124	2.3664
		V min (V)	102.00	5240.0121	5240	0.0121	2.3092
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)	120	T (°C)	-20	5240.0099	5240	0.0099	1.8893
		T (°C)	-10	5240.0014	5240	0.0014	0.2672
		T (°C)	0	5240.0117	5240	0.0117	2.2328
		T (°C)	10	5240.0127	5240	0.0127	2.4237
		T (°C)	20	5240.0067	5240	0.0067	1.2786
		T (°C)	30	5240.0056	5240	0.0056	1.0687
		T (°C)	40	5240.0096	5240	0.0096	1.8321
		T (°C)	50	5240.0065	5240	0.0065	1.2405
		T (°C)	60	5240.0038	5240	0.0038	0.7252
		T (°C)	70	5240.0006	5240	0.0006	0.1145
Limits				5150-5250 MHz			
Result				Complies			

Temperature:	26 °C	Relative Humidity:	54 %
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: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5260.0116	5260	0.0116	2.2053
		V max (V)	138.00	5260.0049	5260	0.0049	0.9316
		V min (V)	102.00	5260.0096	5260	0.0096	1.8251
Limits				5260-5320 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5260.0070	5260	0.0070	1.3308
		T (°C)	-10	5260.0070	5260	0.0070	1.3308
		T (°C)	0	5260.0123	5260	0.0123	2.3384
		T (°C)	10	5260.0121	5260	0.0121	2.3004
		T (°C)	20	5260.0109	5260	0.0109	2.0722
		T (°C)	30	5260.0095	5260	0.0095	1.8061
		T (°C)	40	5260.0047	5260	0.0047	0.8935
		T (°C)	50	5260.0121	5260	0.0121	2.3004
		T (°C)	60	5260.0088	5260	0.0088	1.6730
		T (°C)	70	5260.0075	5260	0.0075	1.4259
Limits				5260-5320 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	5280.0068	5280	0.0068	1.2879
		V max (V)	138.00	5280.0089	5280	0.0089	1.6856
		V min (V)	102.00	5280.0058	5280	0.0058	1.0985
Limits				5260-5320 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5280.00410	5280	0.00410	0.7765
		T (°C)	-10	5280.00990	5280	0.00990	1.8750
		T (°C)	0	5280.00510	5280	0.00510	0.9659
		T (°C)	10	5280.00110	5280	0.00110	0.2083
		T (°C)	20	5280.01130	5280	0.01130	2.1402
		T (°C)	30	5280.01040	5280	0.01040	1.9697
		T (°C)	40	5280.01270	5280	0.01270	2.4053
		T (°C)	50	5280.01070	5280	0.01070	2.0265
		T (°C)	60	5280.01030	5280	0.01030	1.9508
		T (°C)	70	5280.01280	5280	0.01280	2.4242
Limits				5260-5320 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)	120.00	5320.0023	5320	0.0023	0.4323
		V max (V)	138.00	5320.0081	5320	0.0081	1.5226
		V min (V)	102.00	5320.0072	5320	0.0072	1.3534
Limits				5260-5320 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency : 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5320.0075	5320	0.0075	1.4098
		T (°C)	-10	5320.0004	5320	0.0004	0.0752
		T (°C)	0	5320.0017	5320	0.0017	0.3195
		T (°C)	10	5320.0053	5320	0.0053	0.9962
		T (°C)	20	5320.0046	5320	0.0046	0.8647
		T (°C)	30	5320.0123	5320	0.0123	2.3120
		T (°C)	40	5320.0135	5320	0.0135	2.5376
		T (°C)	50	5320.0117	5320	0.0117	2.1992
		T (°C)	60	5320.0086	5320	0.0086	1.6165
		T (°C)	70	5320.0076	5320	0.0076	1.4286
Limits				5260-5320 MHz			
Result				Complies			

Temperature:	26 °C	Relative Humidity:	54 %
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	5500.0080	5500	0.0080	1.4545
		V max (V)	138.00	5500.0076	5500	0.0076	1.3818
		V min (V)	102.00	5500.0114	5500	0.0114	2.0727
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)	120	T (°C)	-20	5500.0061	5500	0.0061	1.1091
		T (°C)	-10	5500.0135	5500	0.0135	2.4545
		T (°C)	0	5500.0105	5500	0.0105	1.9091
		T (°C)	10	5500.0124	5500	0.0124	2.2545
		T (°C)	20	5500.0030	5500	0.0030	0.5455
		T (°C)	30	5500.0127	5500	0.0127	2.3091
		T (°C)	40	5500.0043	5500	0.0043	0.7818
		T (°C)	50	5500.0123	5500	0.0123	2.2364
		T (°C)	60	5500.0008	5500	0.0008	0.1455
		T (°C)	70	5500.0135	5500	0.0135	2.4545
Limits				5500-5700 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5580MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5580.0022	5580	0.0022	0.3943
		V max (V)	138.00	5580.0122	5580	0.0122	2.1864
		V min (V)	102.00	5580.0071	5580	0.0071	1.2724
Limits				5500-5700 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5580MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5580.00730	5580	0.00730	1.3082
		T (°C)	-10	5580.01090	5580	0.01090	1.9534
		T (°C)	0	5580.00880	5580	0.00880	1.5771
		T (°C)	10	5580.00630	5580	0.00630	1.1290
		T (°C)	20	5580.00900	5580	0.00900	1.6129
		T (°C)	30	5580.00280	5580	0.00280	0.5018
		T (°C)	40	5580.00470	5580	0.00470	0.8423
		T (°C)	50	5580.01030	5580	0.01030	1.8459
		T (°C)	60	5580.00720	5580	0.00720	1.2903
		T (°C)	70	5580.00750	5580	0.00750	1.3441
Limits				5500-5700 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5700MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120.00	5700.0038	5700	0.0038	0.6667
		V max (V)	138.00	5700.0030	5700	0.0030	0.5263
		V min (V)	102.00	5700.0129	5700	0.0129	2.2632
Limits				5500-5700 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5700MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5700.0066	5700	0.0066	1.1579
		T (°C)	-10	5700.0049	5700	0.0049	0.8596
		T (°C)	0	5700.0076	5700	0.0076	1.3333
		T (°C)	10	5700.0109	5700	0.0109	1.9123
		T (°C)	20	5700.0115	5700	0.0115	2.0175
		T (°C)	30	5700.0028	5700	0.0028	0.4912
		T (°C)	40	5700.0098	5700	0.0098	1.7193
		T (°C)	50	5700.0126	5700	0.0126	2.2105
		T (°C)	60	5700.0008	5700	0.0008	0.1404
		T (°C)	70	5700.0135	5700	0.0135	2.3684
Limits				5500-5700 MHz			
Result				Complies			

Temperature:	26 °C	Relative Humidity:	54 %
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
Test Mode:	TX (5.8G) Mode Frequency U-NII-3 (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)	120.00	5745.00940	5745	0.00940	1.6362
		V max (V)	138.00	5745.00260	5745	0.00260	0.4526
		V min (V)	102.00	5745.00010	5745	0.00010	0.0174
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)	120	T (°C)	-20	5745.01040	5745	0.01040	1.8103
		T (°C)	-10	5745.00210	5745	0.00210	0.3655
		T (°C)	0	5745.01020	5745	0.01020	1.7755
		T (°C)	10	5745.01130	5745	0.01130	1.9669
		T (°C)	20	5745.00680	5745	0.00680	1.1836
		T (°C)	30	5745.00180	5745	0.00180	0.3133
		T (°C)	40	5745.00650	5745	0.00650	1.1314
		T (°C)	50	5745.00990	5745	0.00990	1.7232
		T (°C)	60	5745.00110	5745	0.00110	0.1915
		T (°C)	70	5745.00900	5745	0.00900	1.5666
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)	120.00	5785.00690	5785	0.00690	1.1927
		V max (V)	138.00	5785.00530	5785	0.00530	0.9162
		V min (V)	102.00	5785.00510	5785	0.00510	0.8816
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)	120	T (°C)	-20	5785.01080	5785	0.01080	1.8669
		T (°C)	-10	5785.00440	5785	0.00440	0.7606
		T (°C)	0	5785.00220	5785	0.00220	0.3803
		T (°C)	10	5785.00180	5785	0.00180	0.3111
		T (°C)	20	5785.00130	5785	0.00130	0.2247
		T (°C)	30	5785.00740	5785	0.00740	1.2792
		T (°C)	40	5785.00960	5785	0.00960	1.6595
		T (°C)	50	5785.00590	5785	0.00590	1.0199
		T (°C)	60	5785.00560	5785	0.00560	0.9680
		T (°C)	70	5785.01110	5785	0.01110	1.9188
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)	120.00	5825.00820	5825	0.00820	1.4077
		V max (V)	138.00	5825.01030	5825	0.01030	1.7682
		V min (V)	102.00	5825.01080	5825	0.01080	1.8541
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)	120	T (°C)	-20	5825.00080	5825	0.00080	0.1373
		T (°C)	-10	5825.00670	5825	0.00670	1.1502
		T (°C)	0	5825.00920	5825	0.00920	1.5794
		T (°C)	10	5825.00160	5825	0.00160	0.2747
		T (°C)	20	5825.01170	5825	0.01170	2.0086
		T (°C)	30	5825.00280	5825	0.00280	0.4807
		T (°C)	40	5825.01220	5825	0.01220	2.0944
		T (°C)	50	5825.00580	5825	0.00580	0.9957
		T (°C)	60	5825.01050	5825	0.01050	1.8026
		T (°C)	70	5825.01180	5825	0.01180	2.0258
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

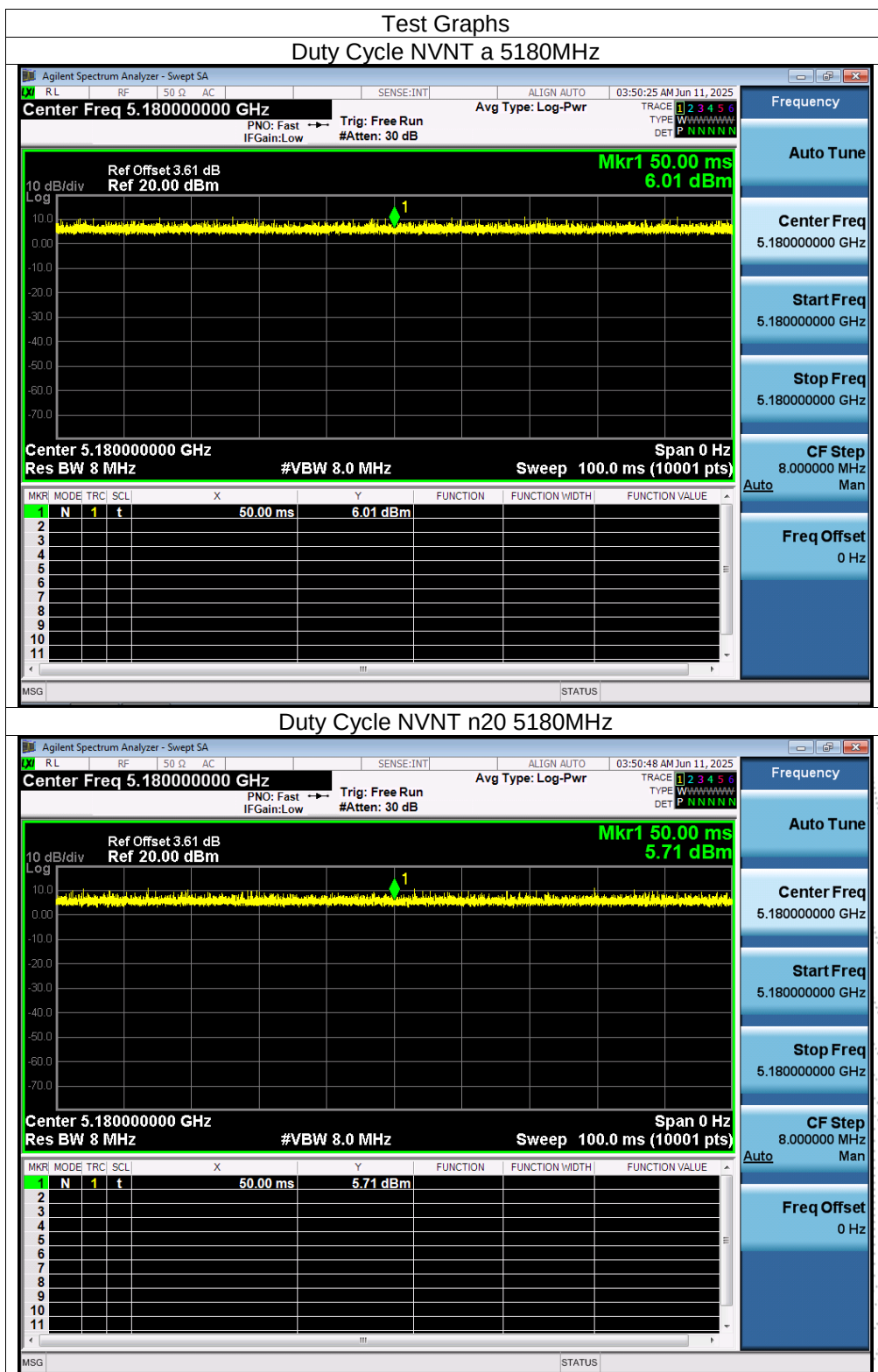
Duty Cycle = $T_{on} / (T_{on} + T_{off})$

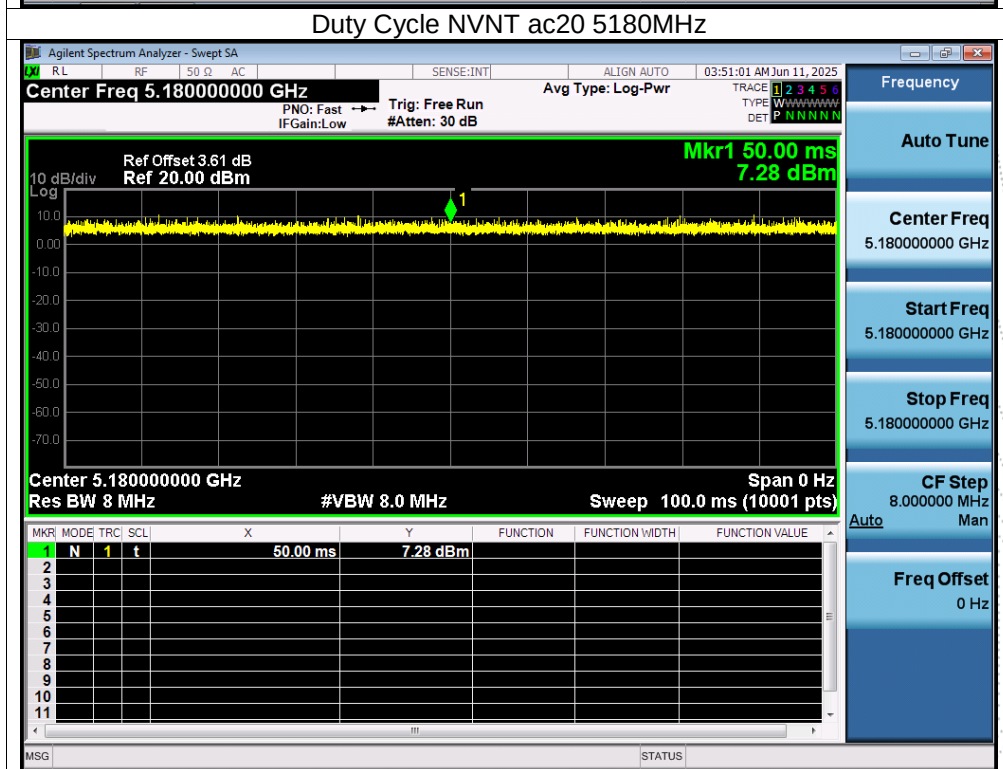
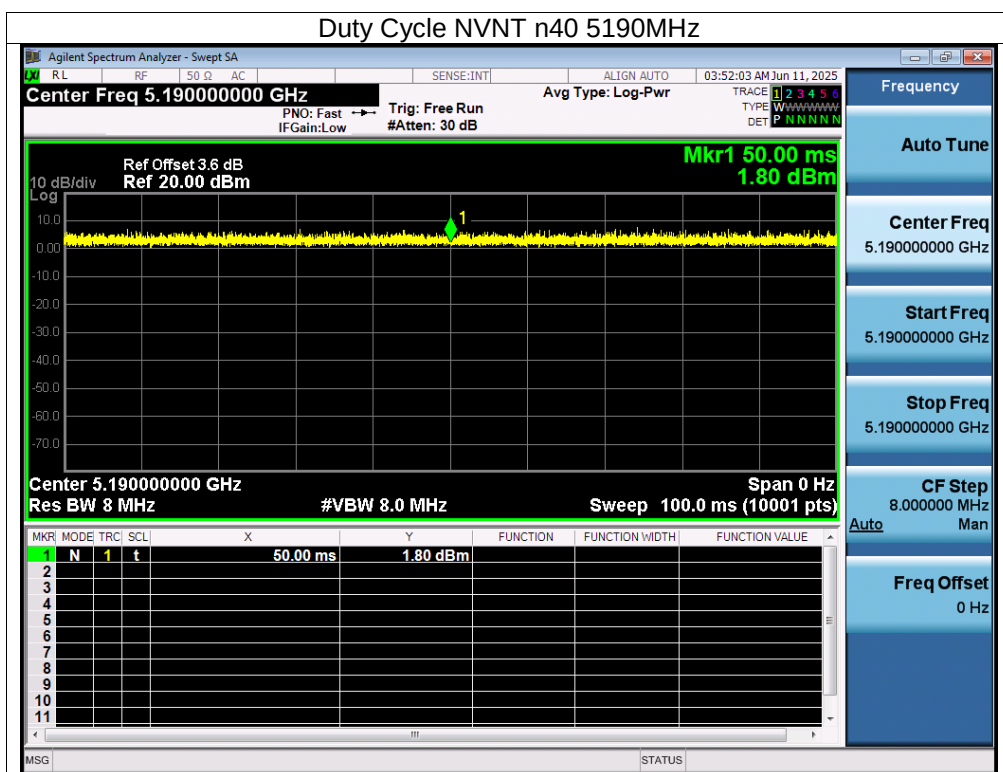
14.3 Test Procedure

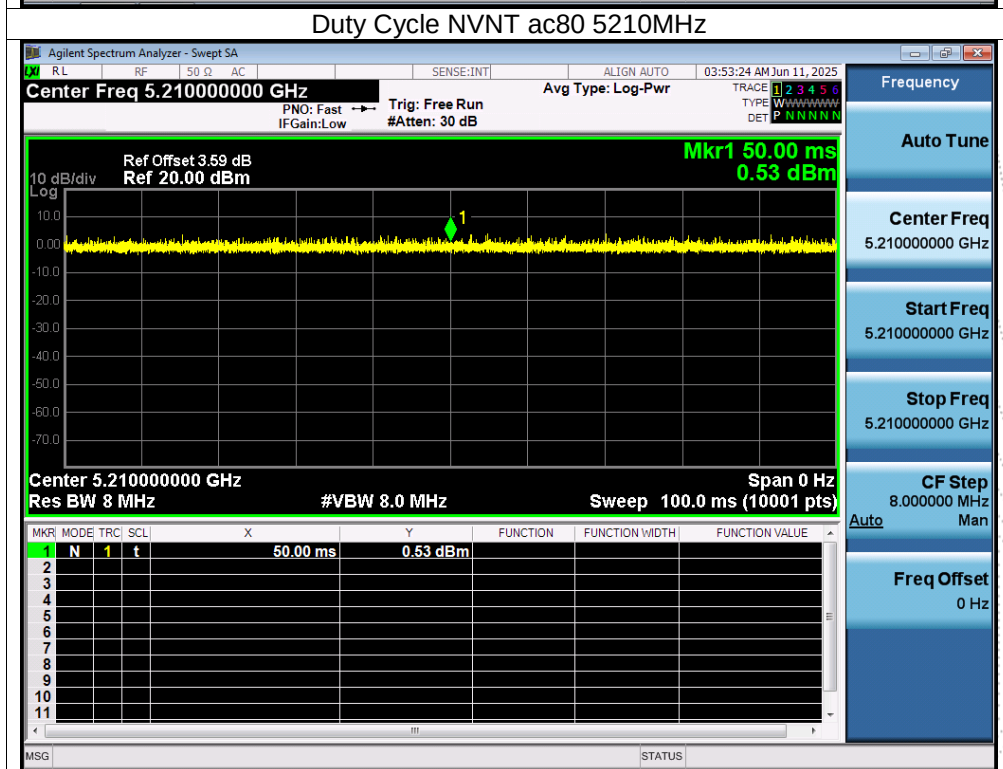
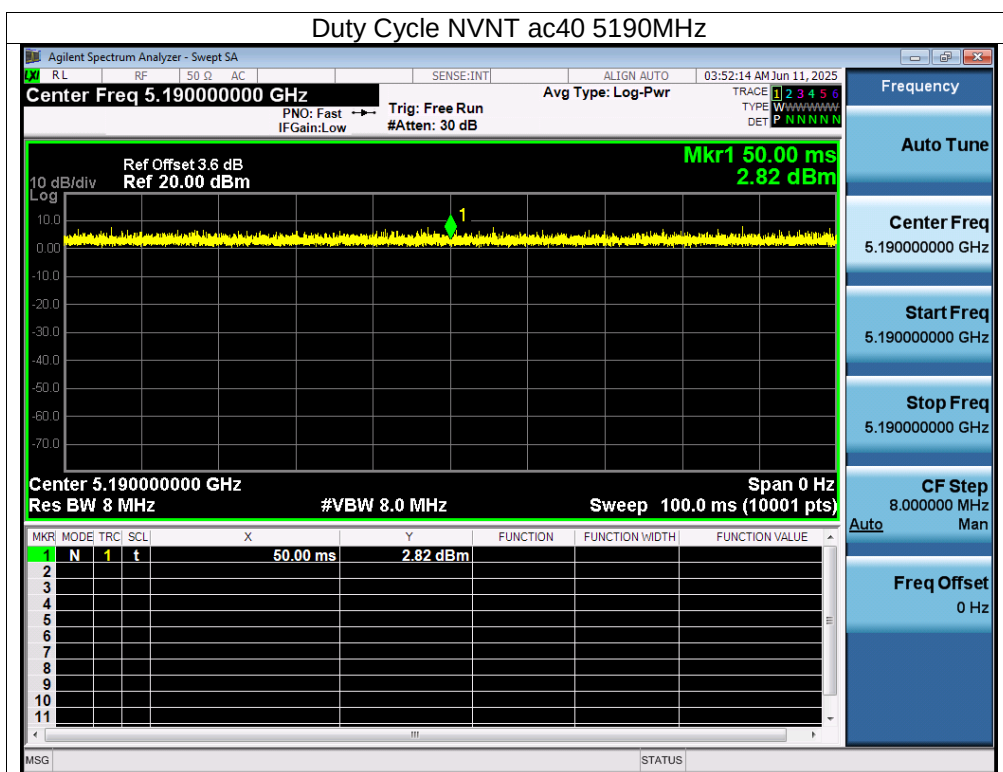
1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

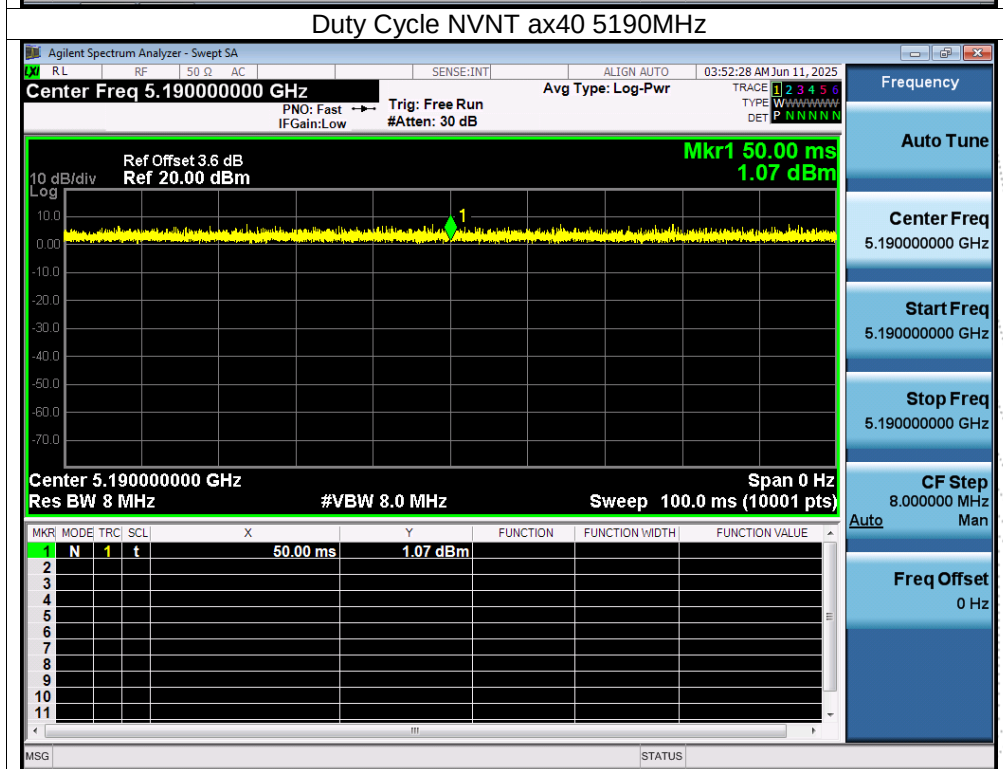
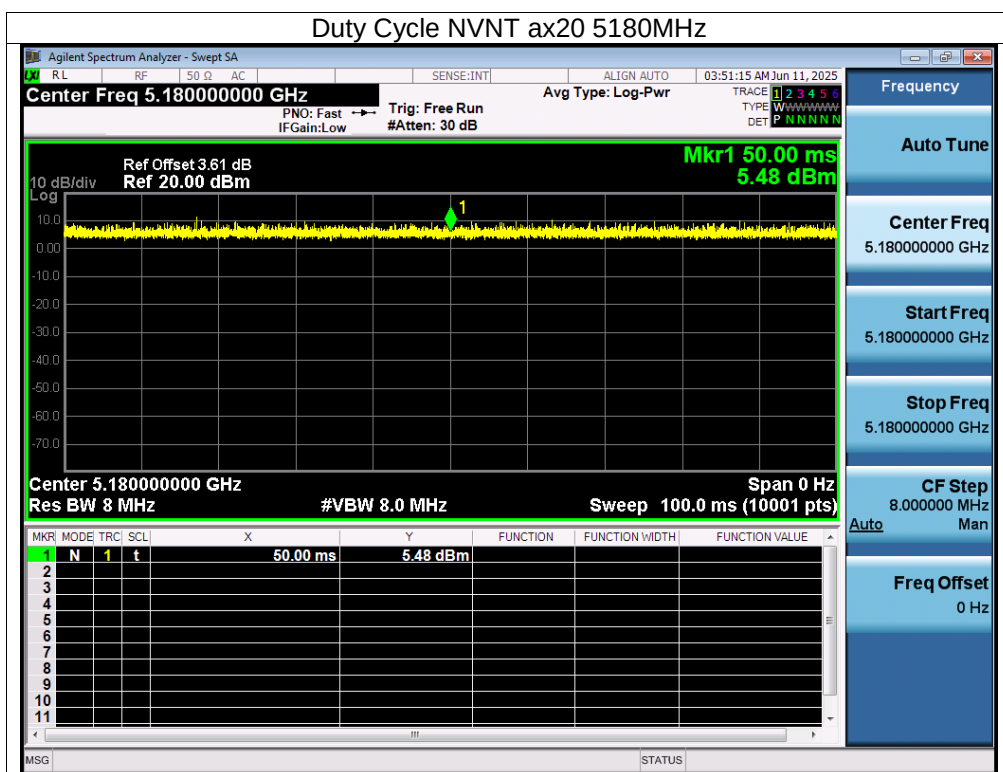
14.4 Test Result

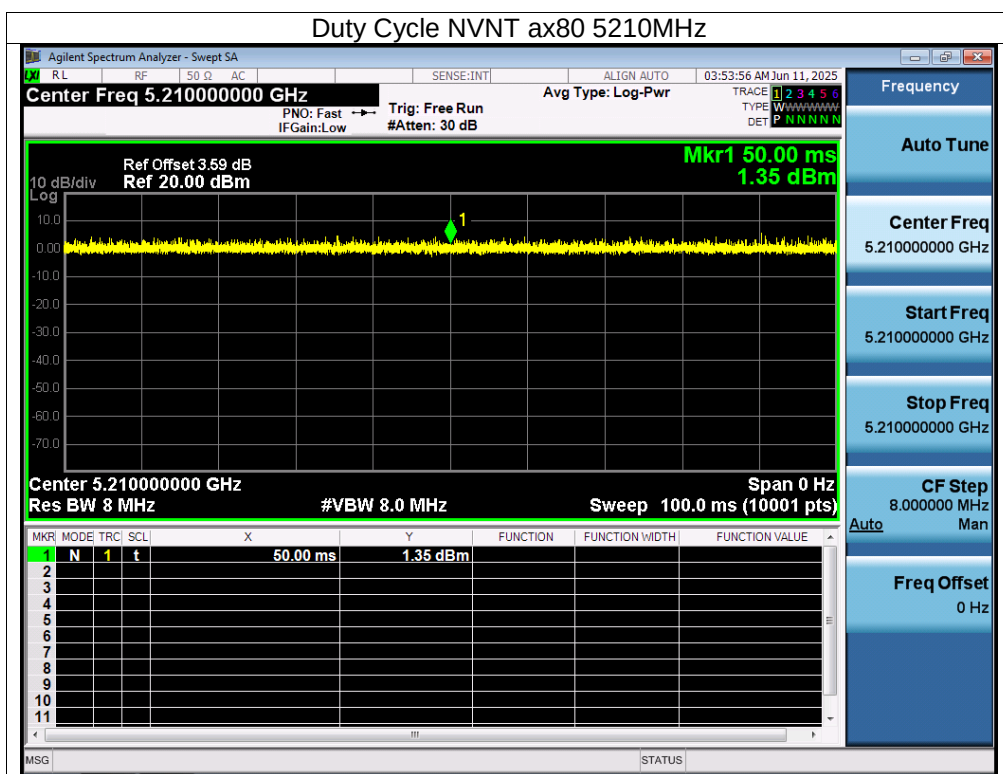
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)
NVNT	a	5180	100	0
NVNT	n20	5180	100	0
NVNT	n40	5190	100	0
NVNT	ac20	5180	100	0
NVNT	ac40	5190	100	0
NVNT	ac80	5210	100	0
NVNT	ax20	5180	100	0
NVNT	ax40	5190	100	0
NVNT	ax80	5210	100	0











Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)
NVNT	a	5260	100	0
NVNT	n20	5260	100	0
NVNT	n40	5270	100	0
NVNT	ac20	5260	100	0
NVNT	ac40	5270	100	0
NVNT	ac80	5290	100	0
NVNT	ax20	5260	100	0
NVNT	ax40	5270	100	0
NVNT	ax80	5290	100	0

