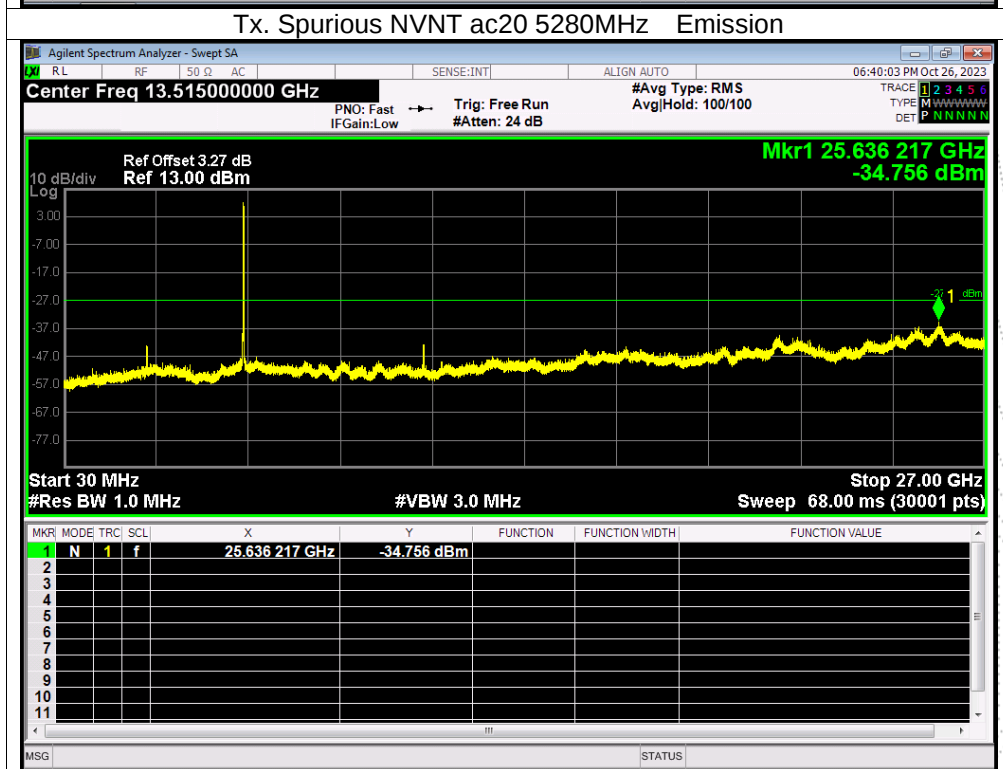
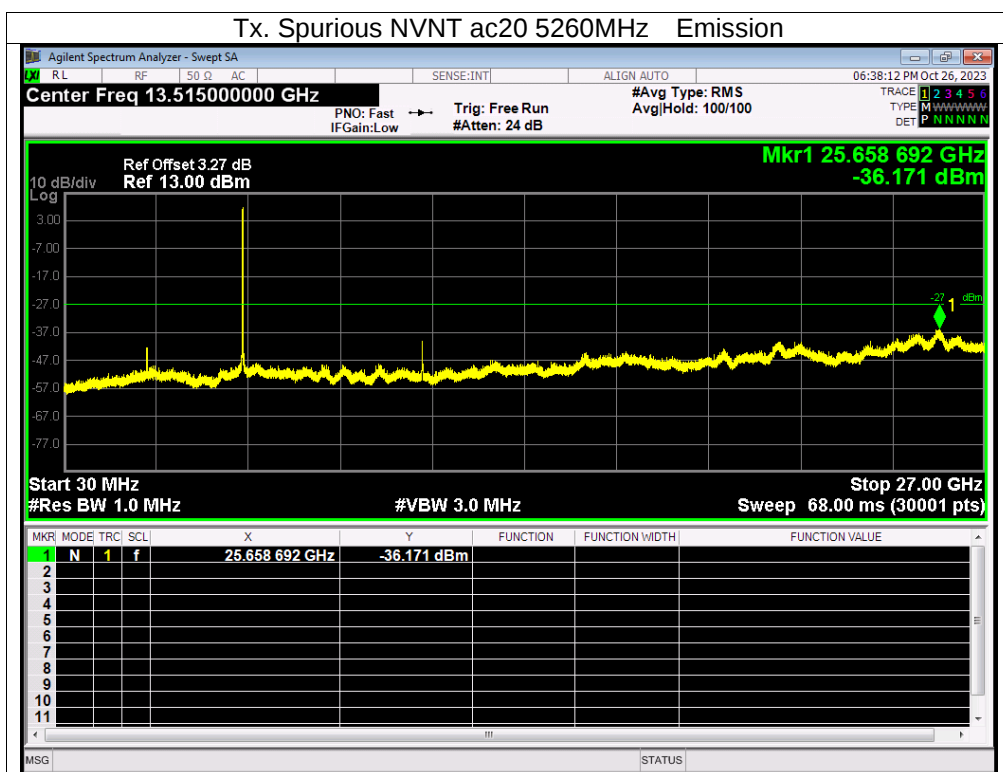
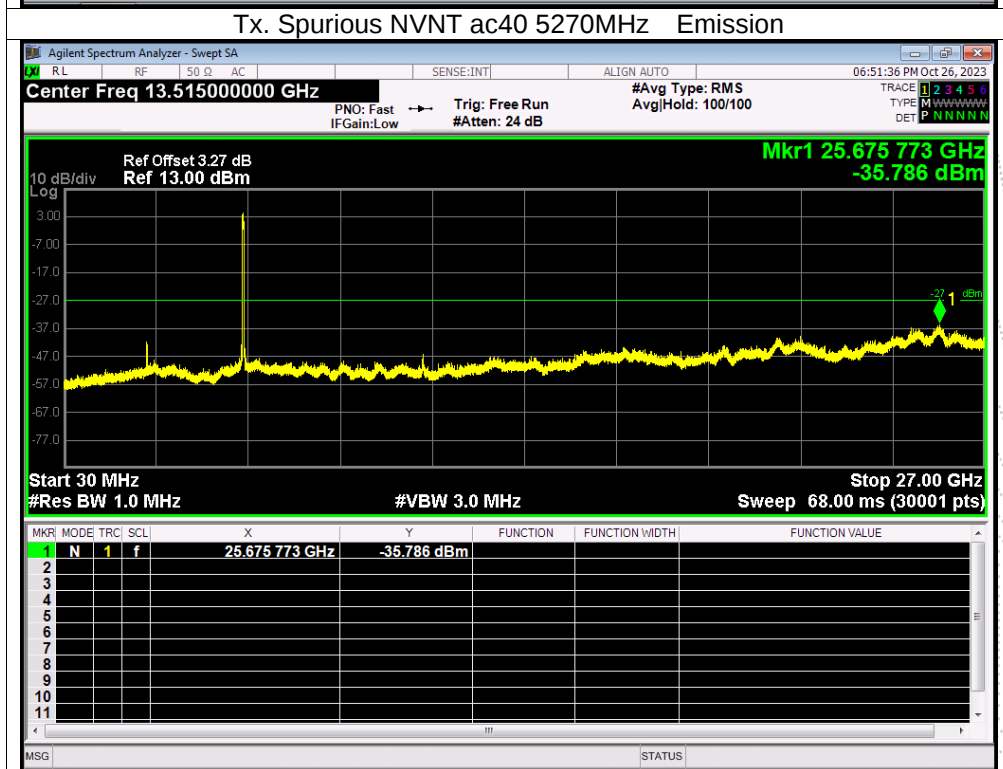
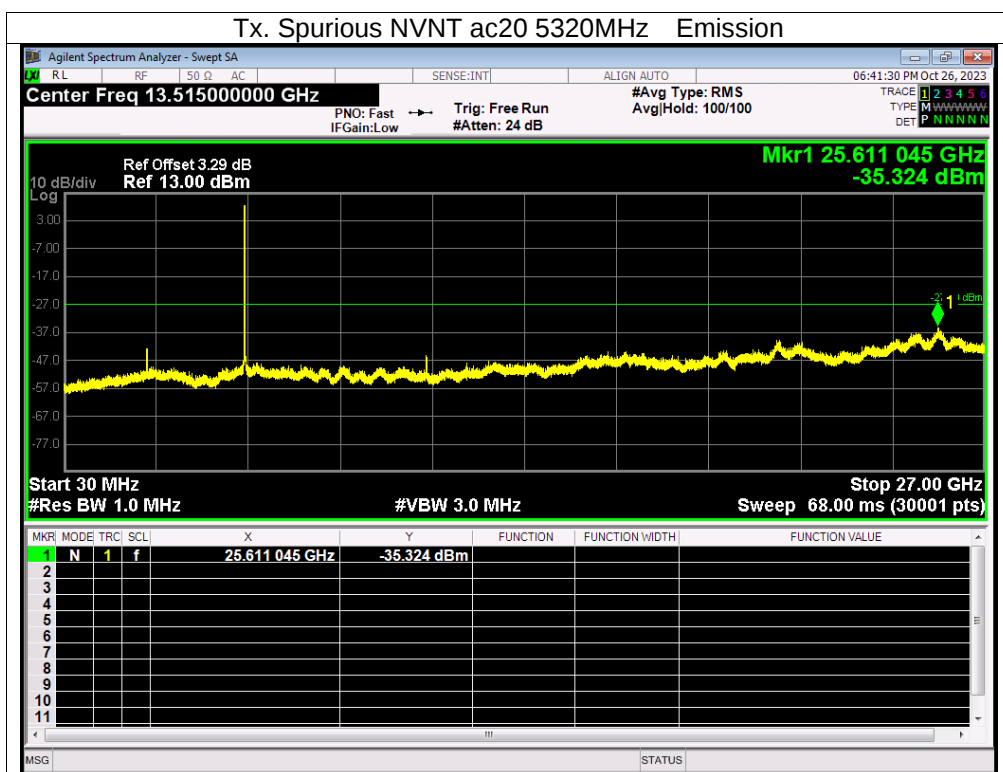
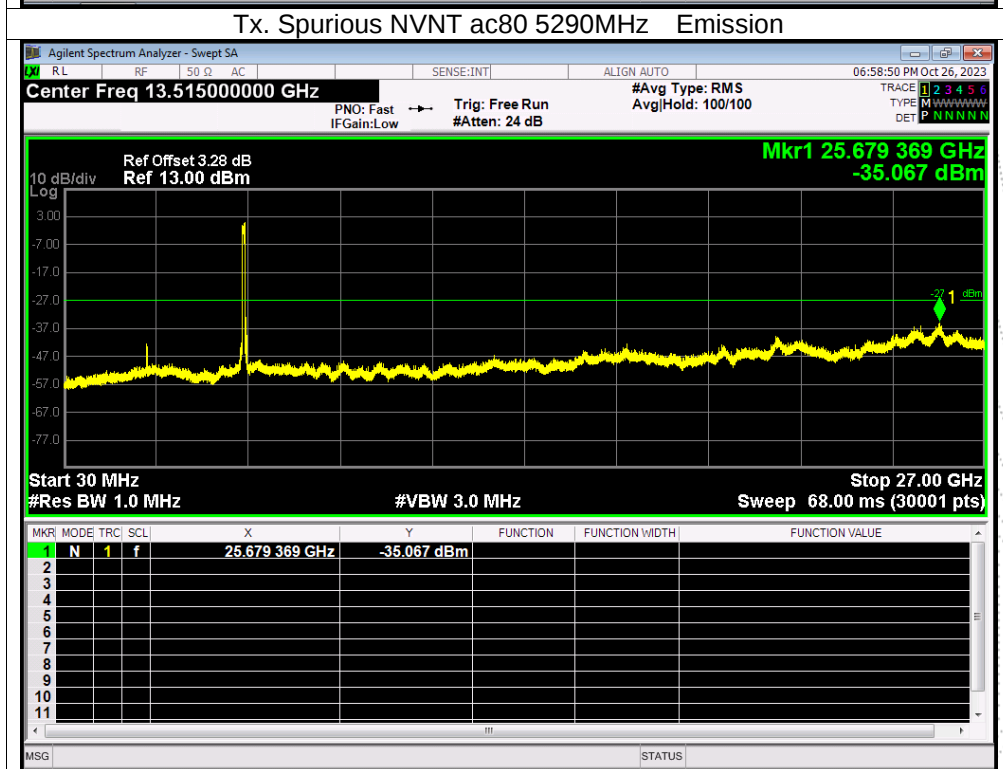
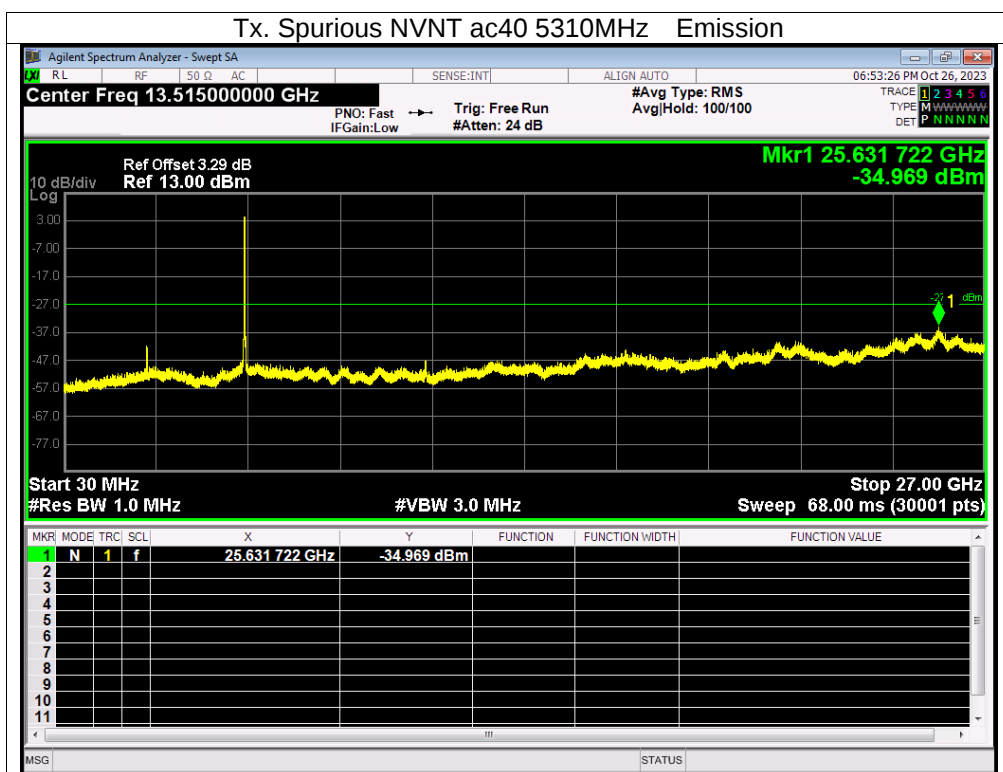
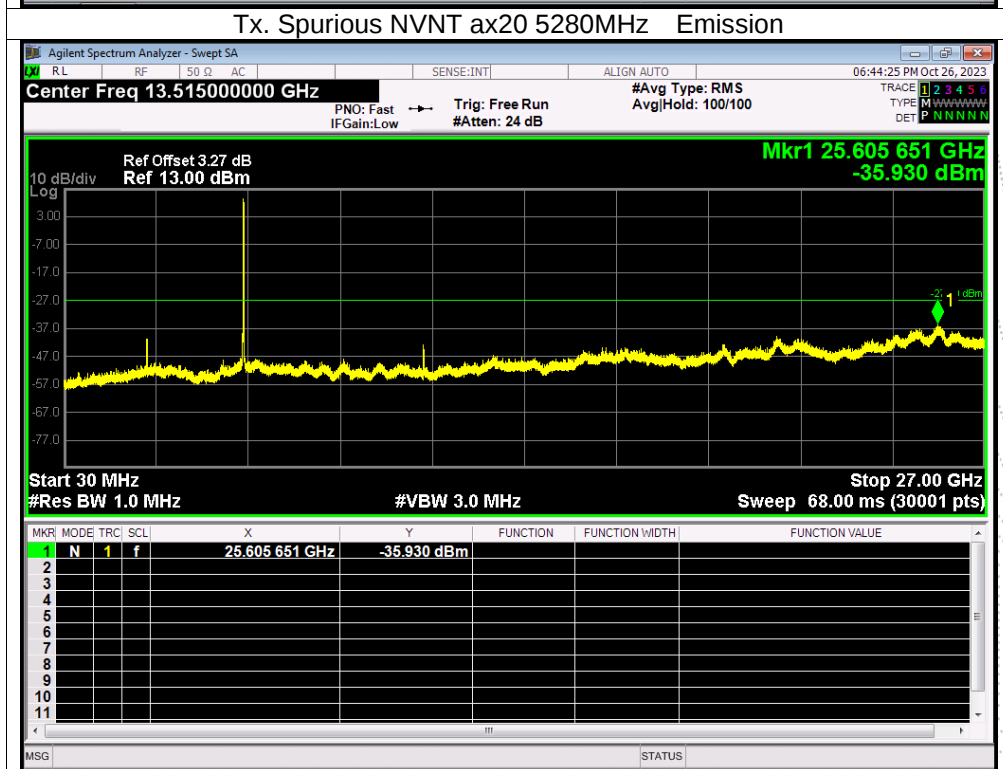
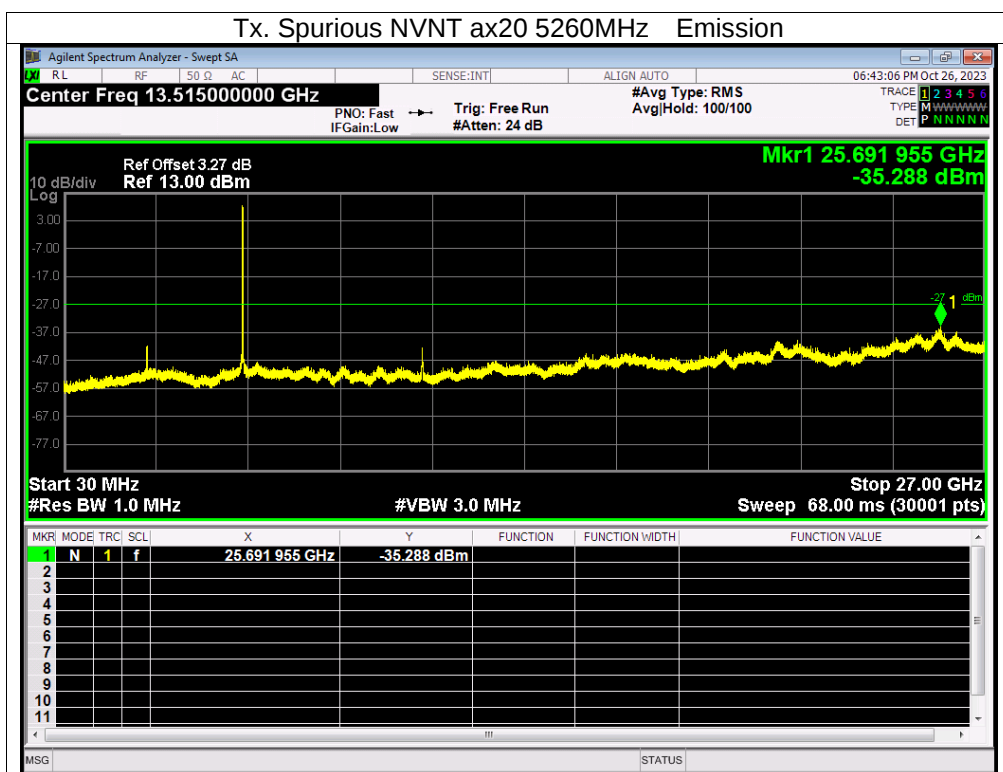
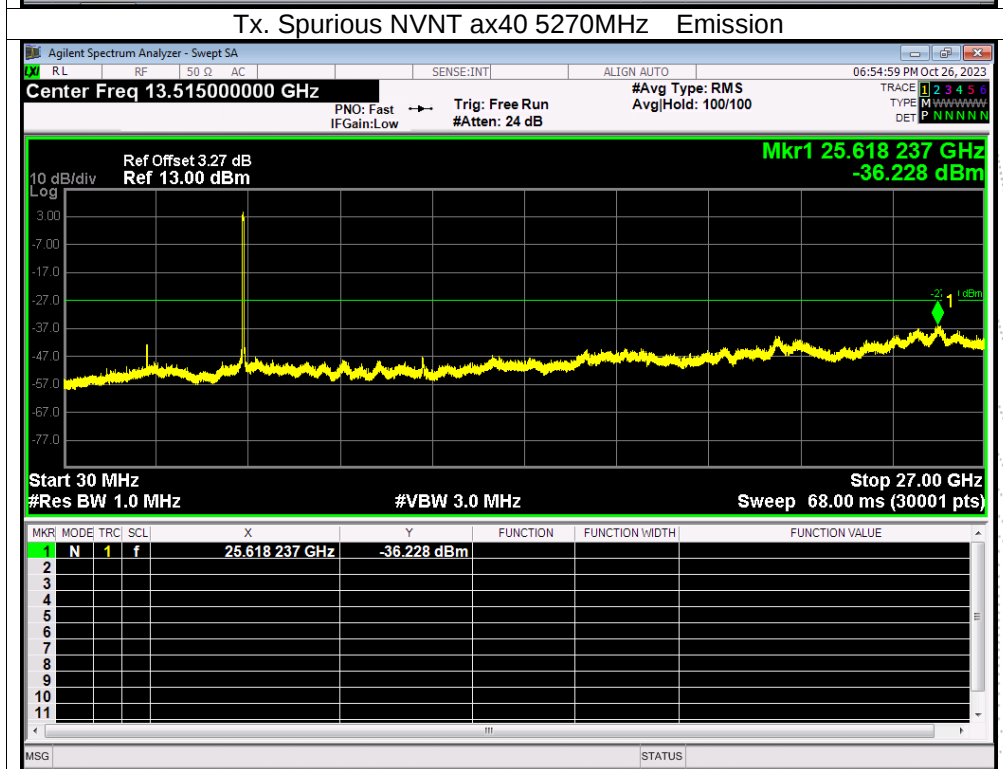
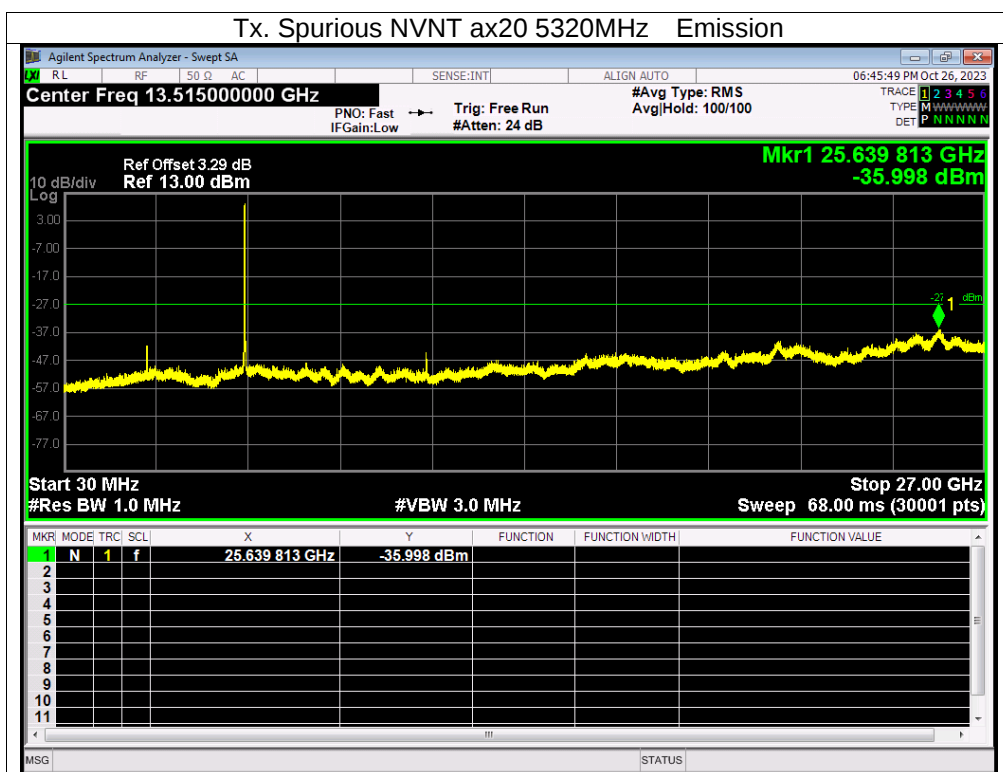


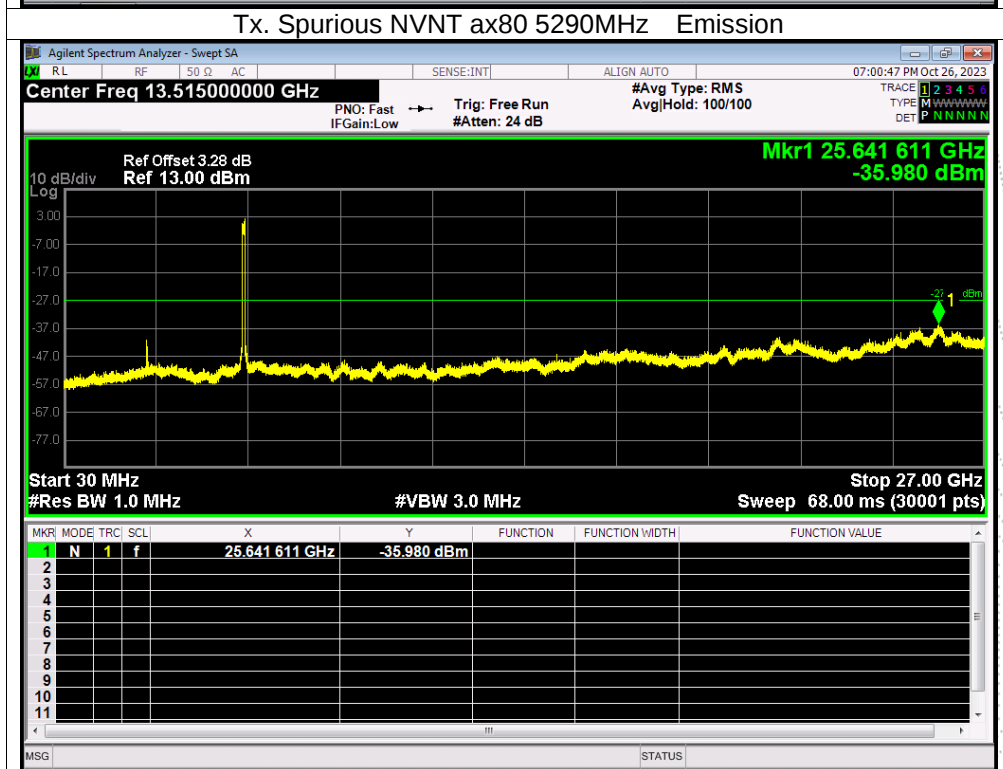
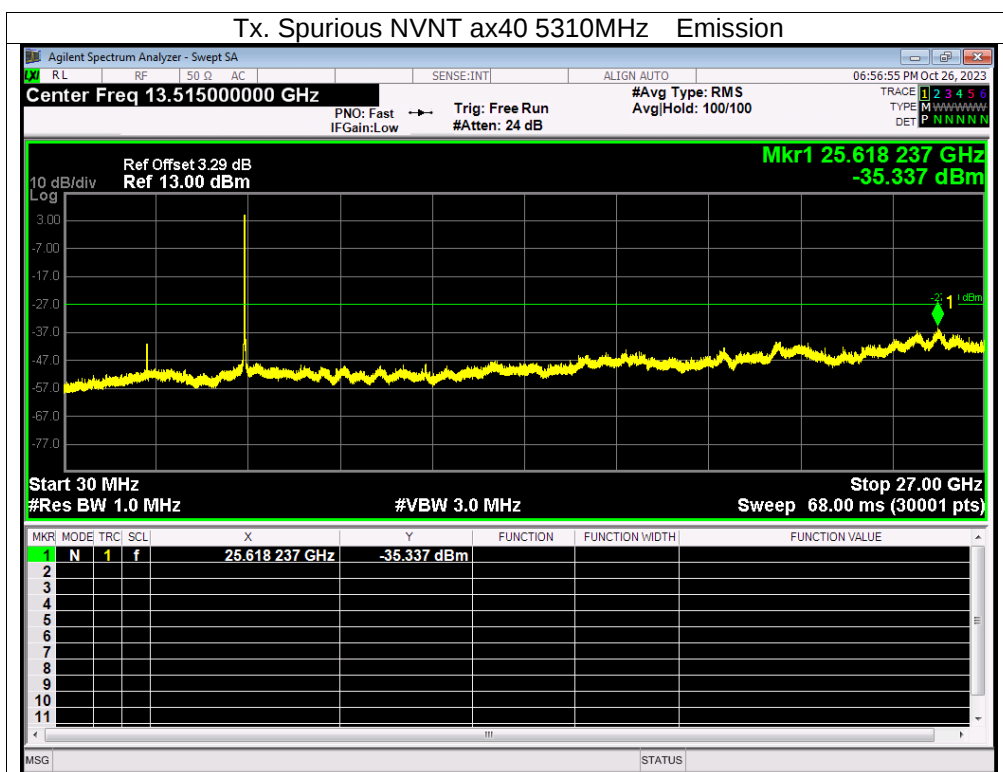


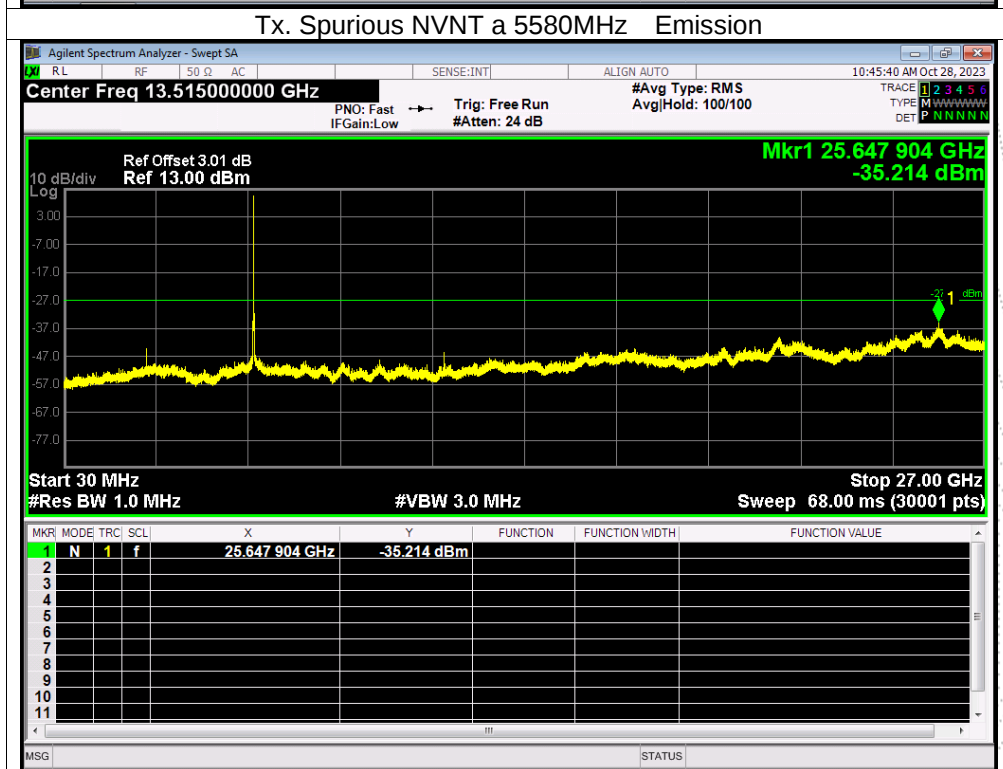
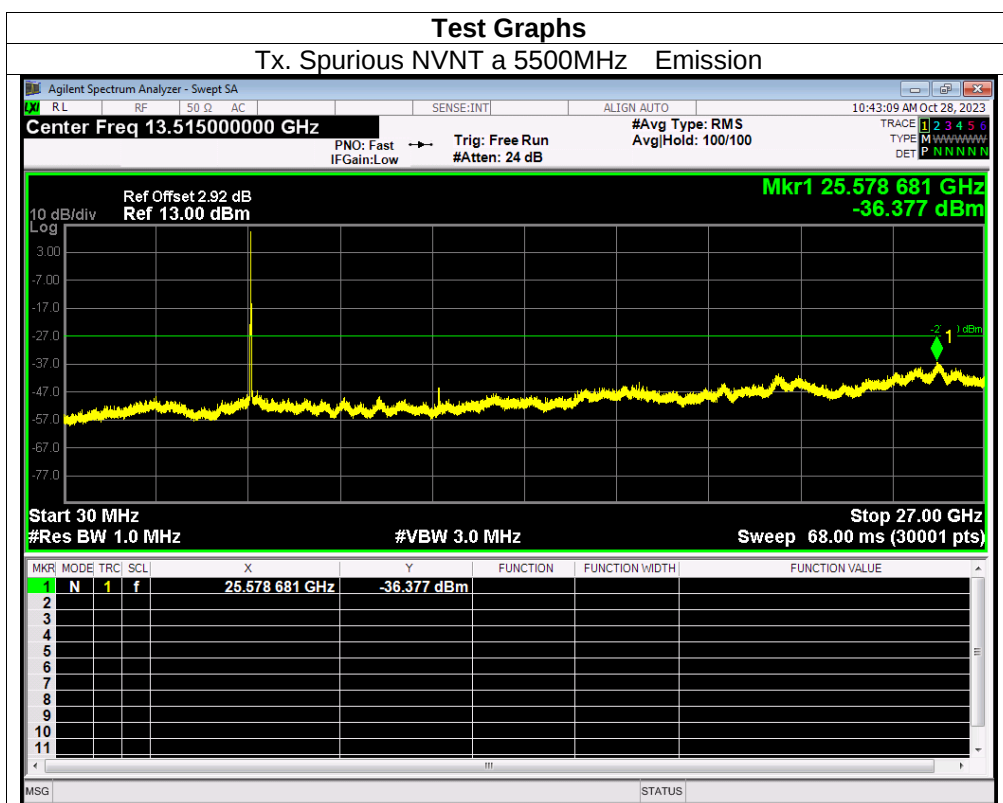


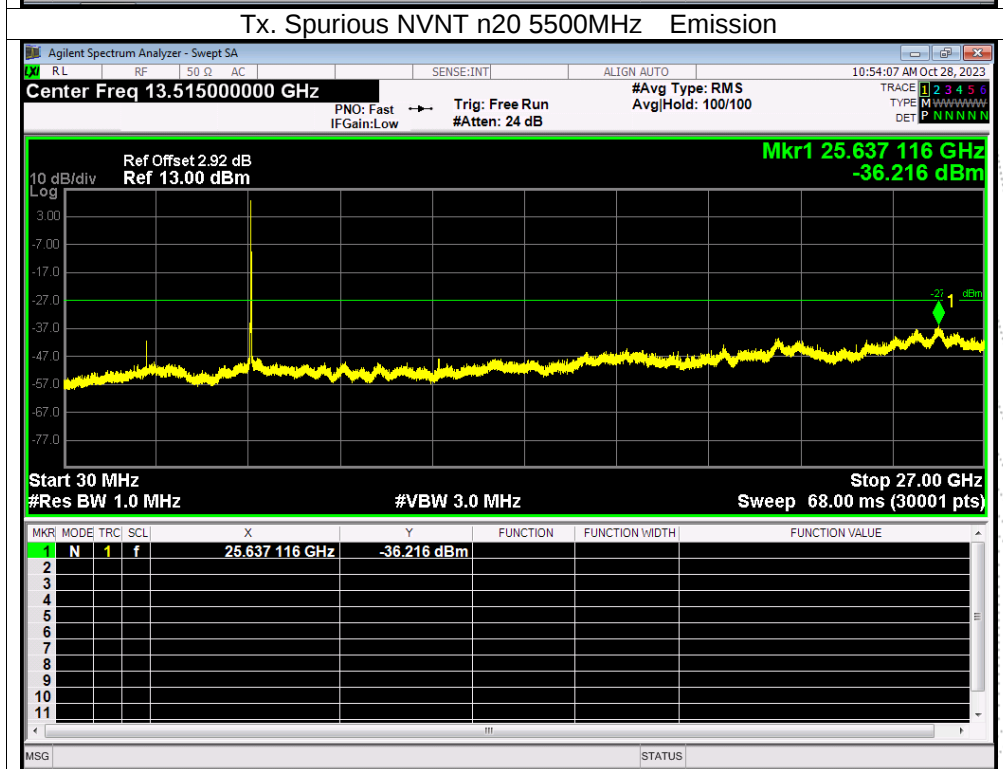
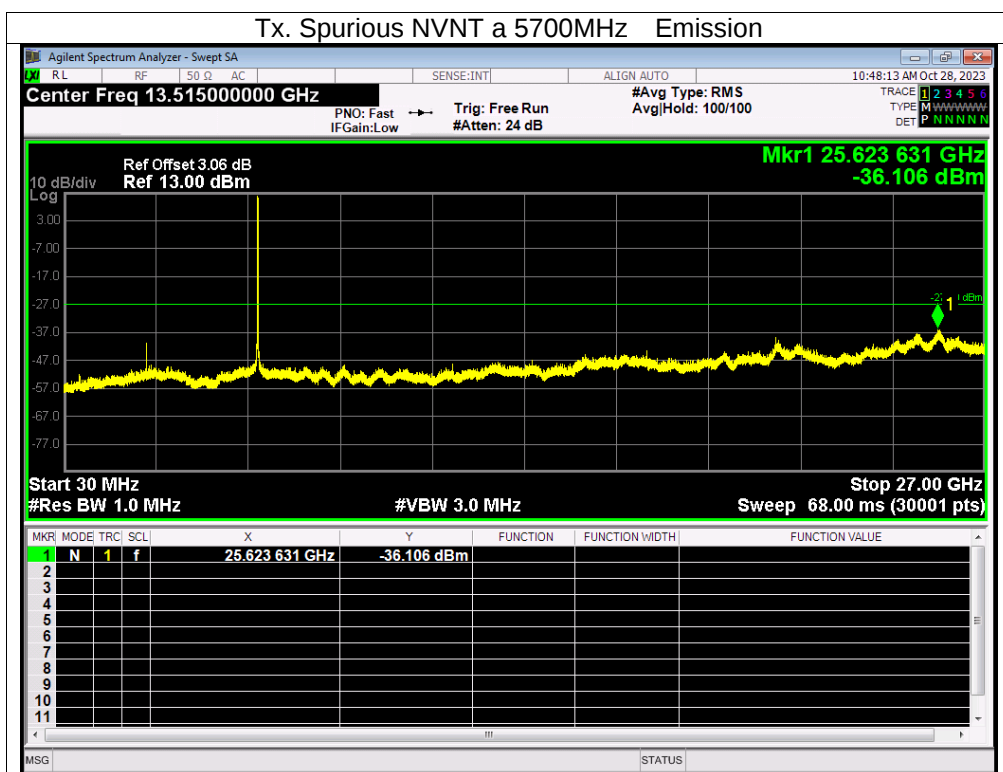


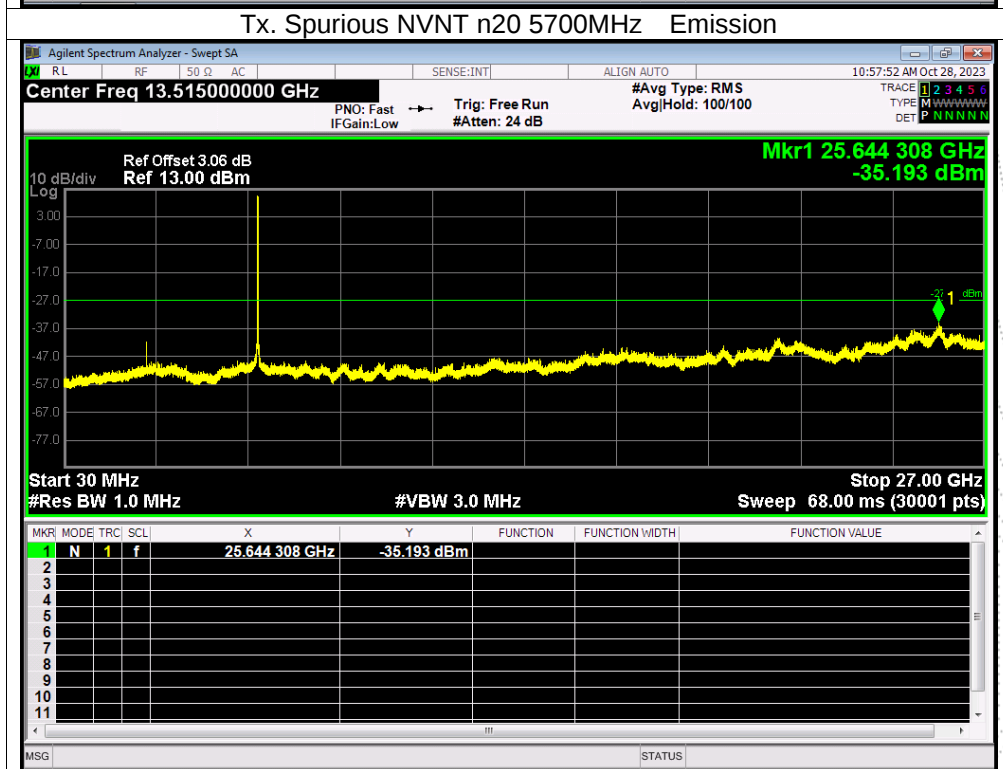
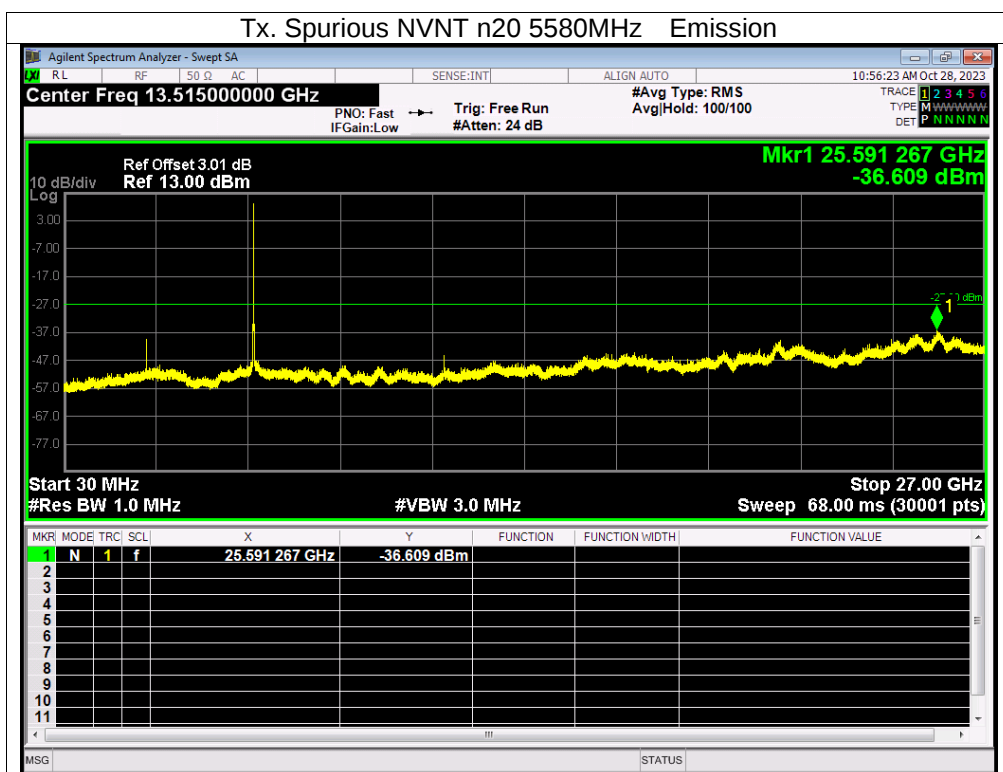


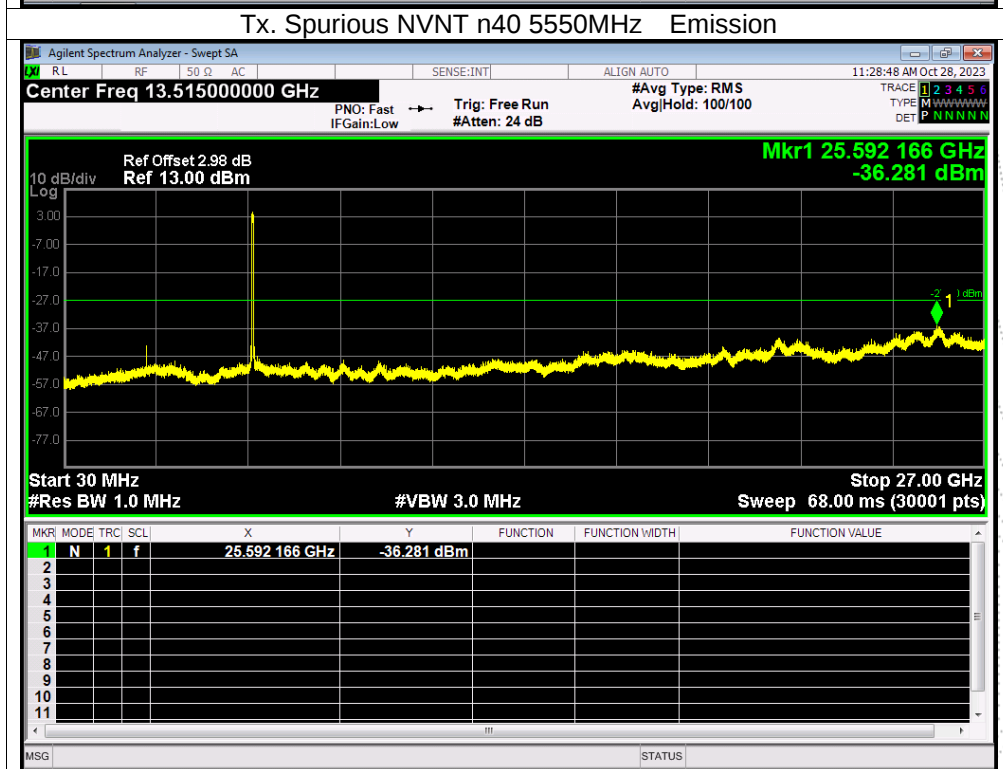
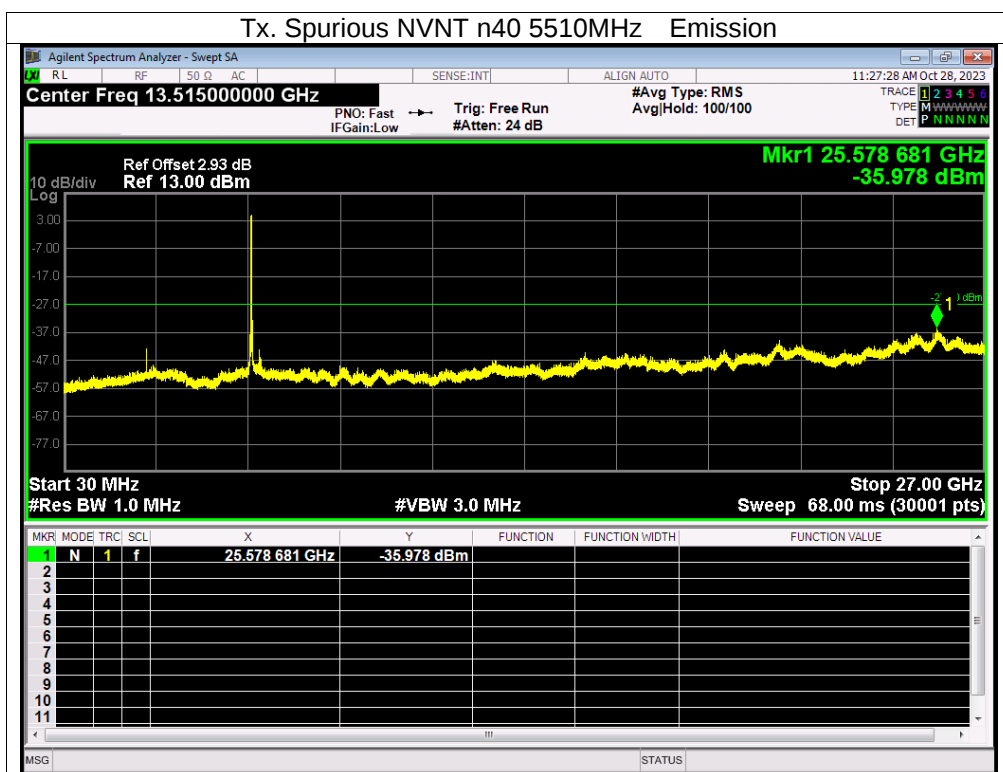


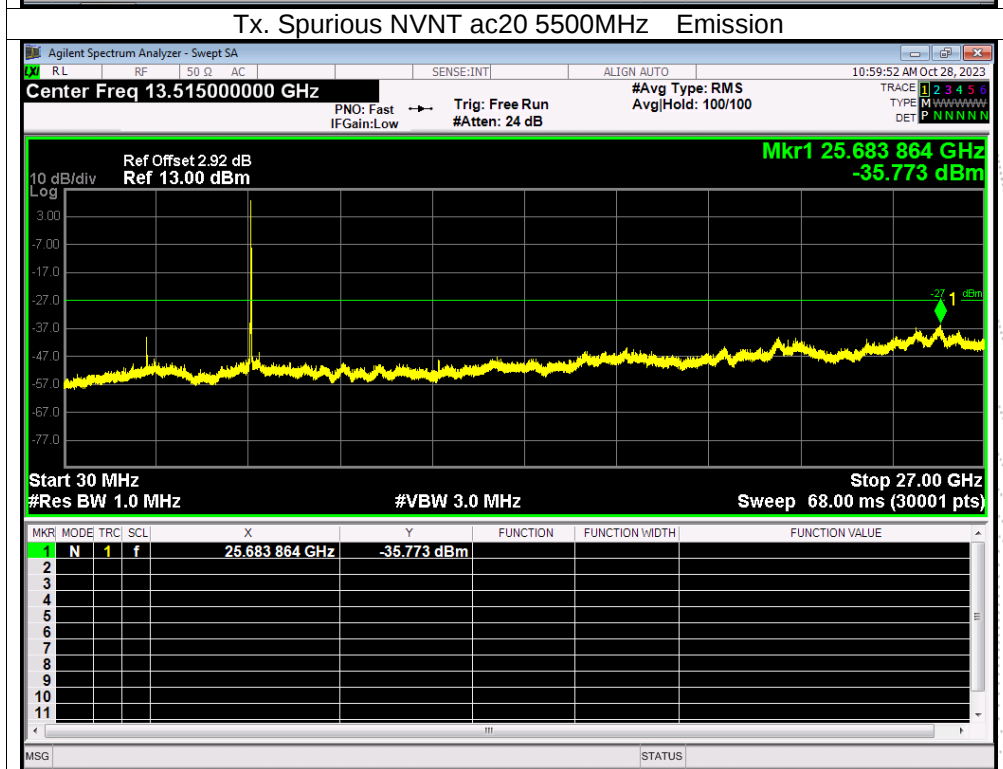
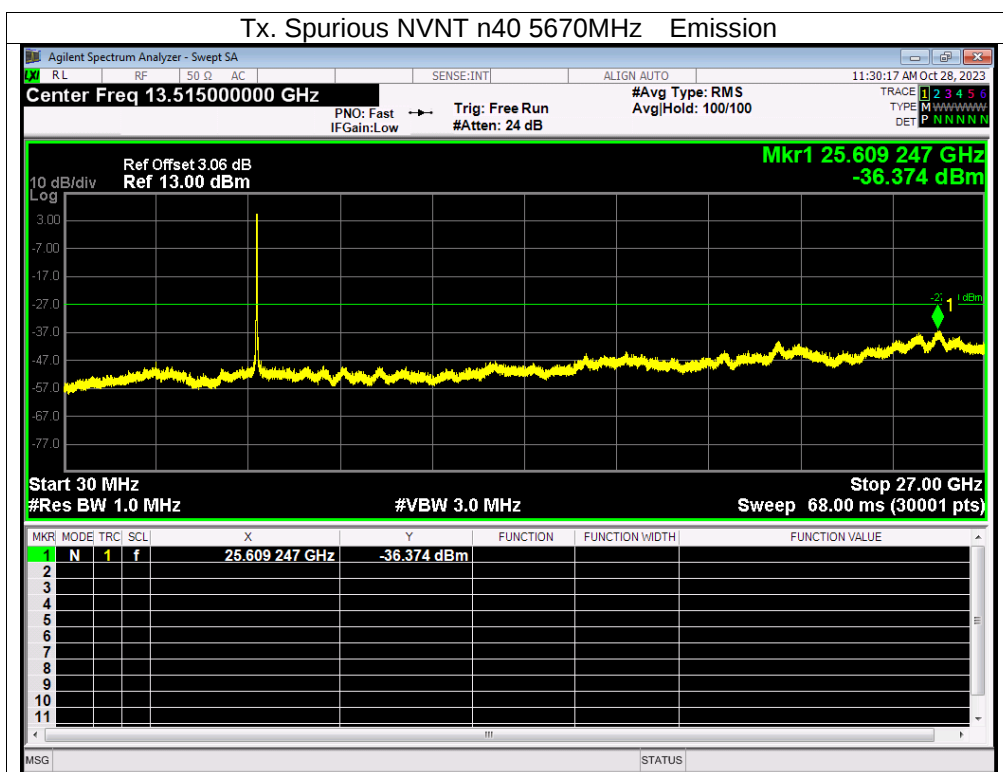


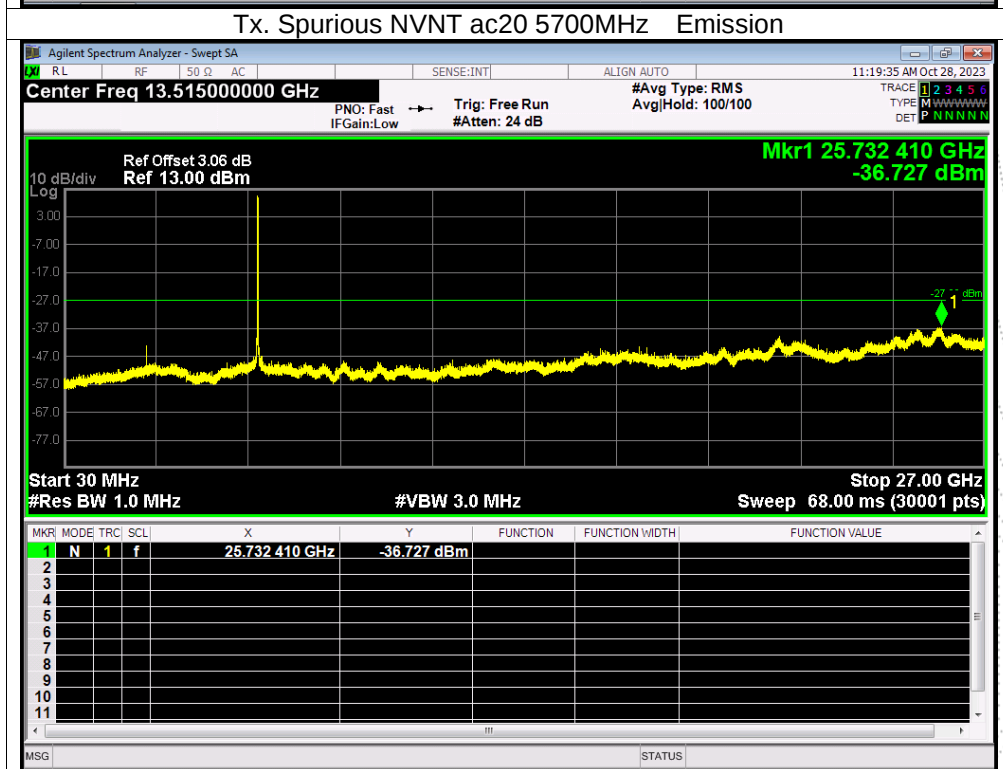
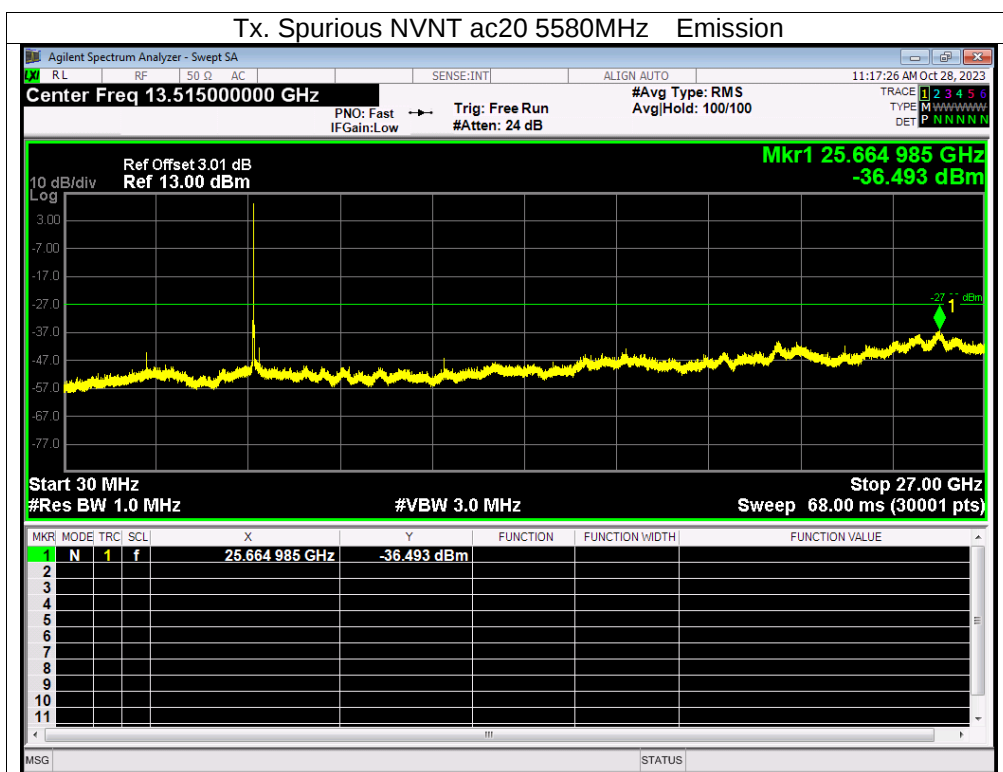


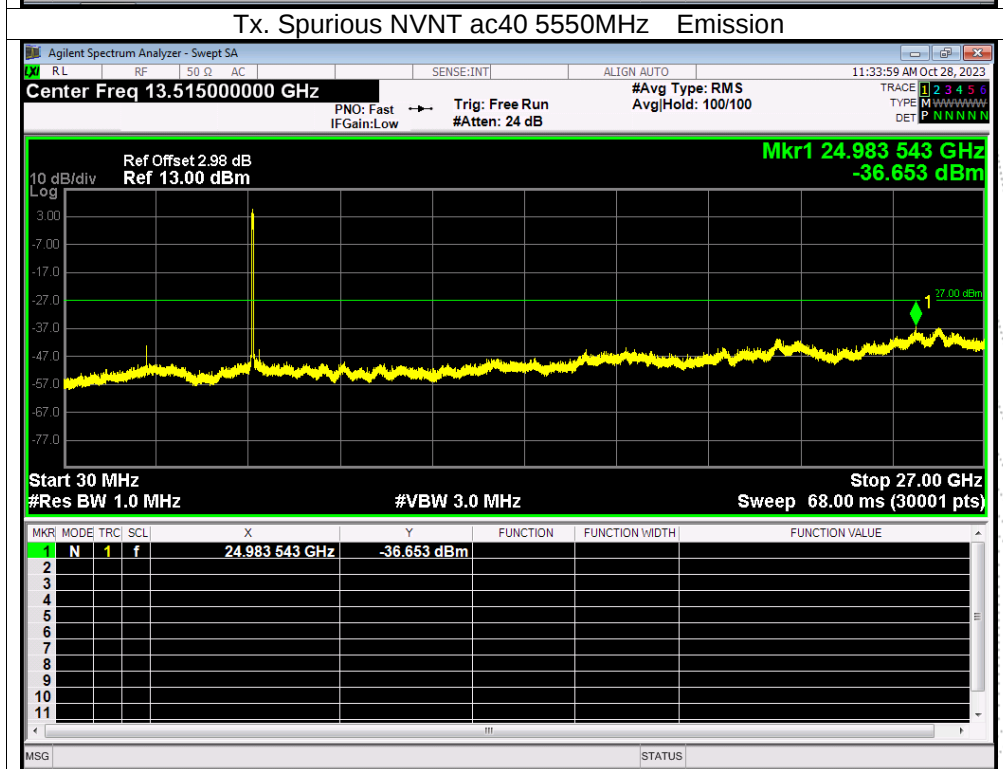
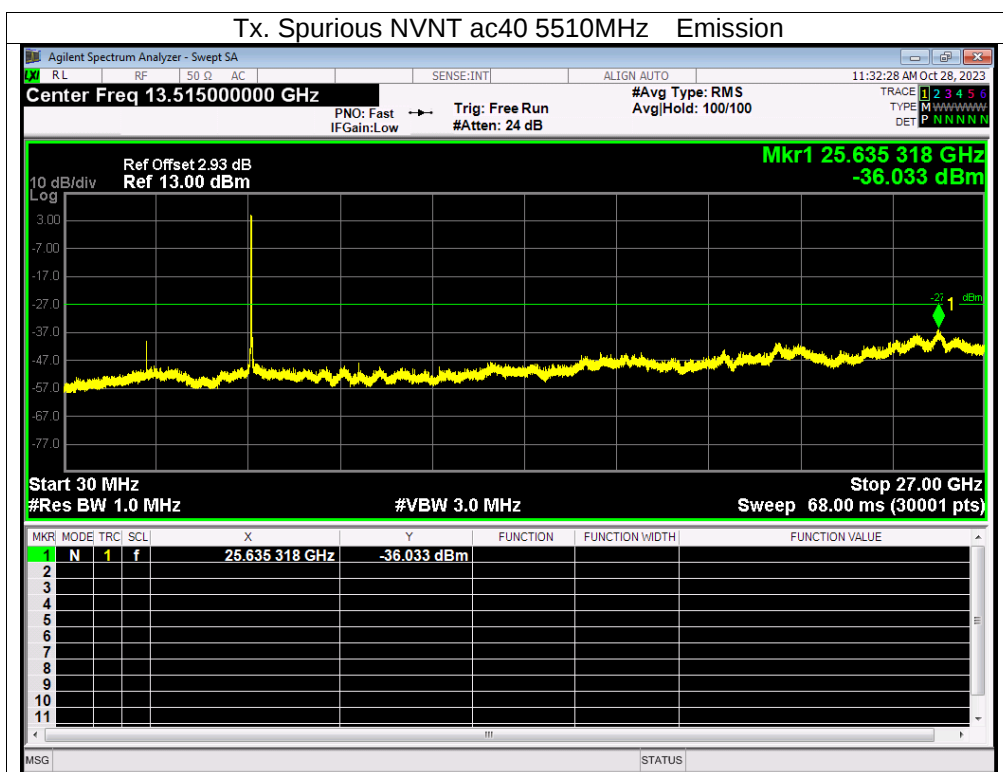


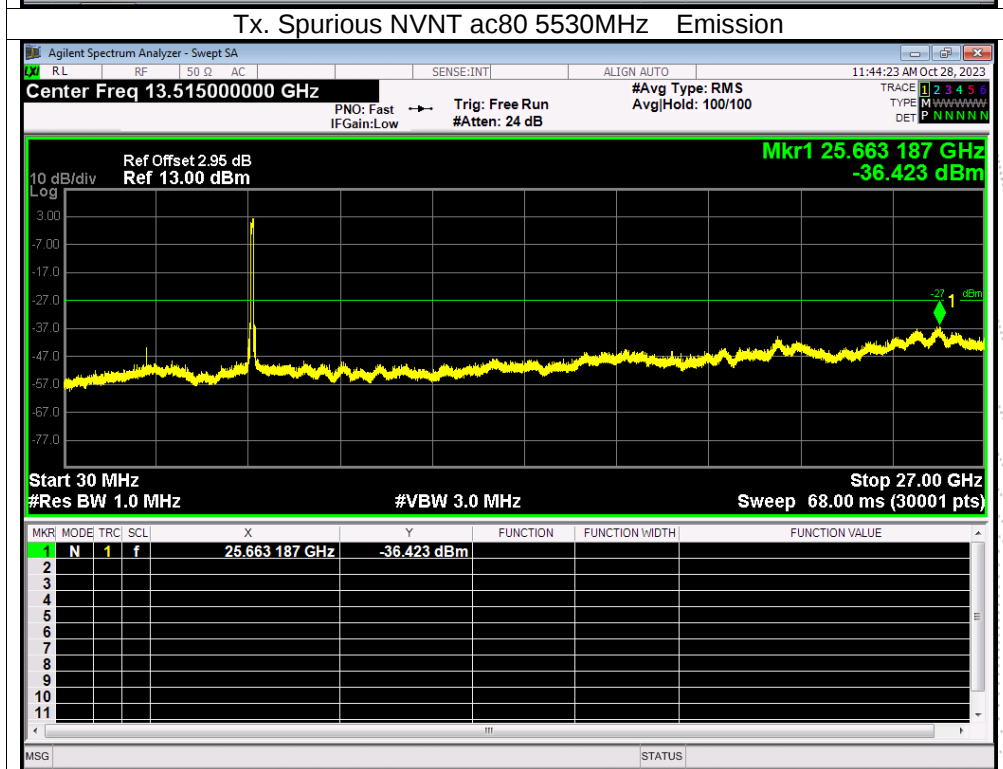
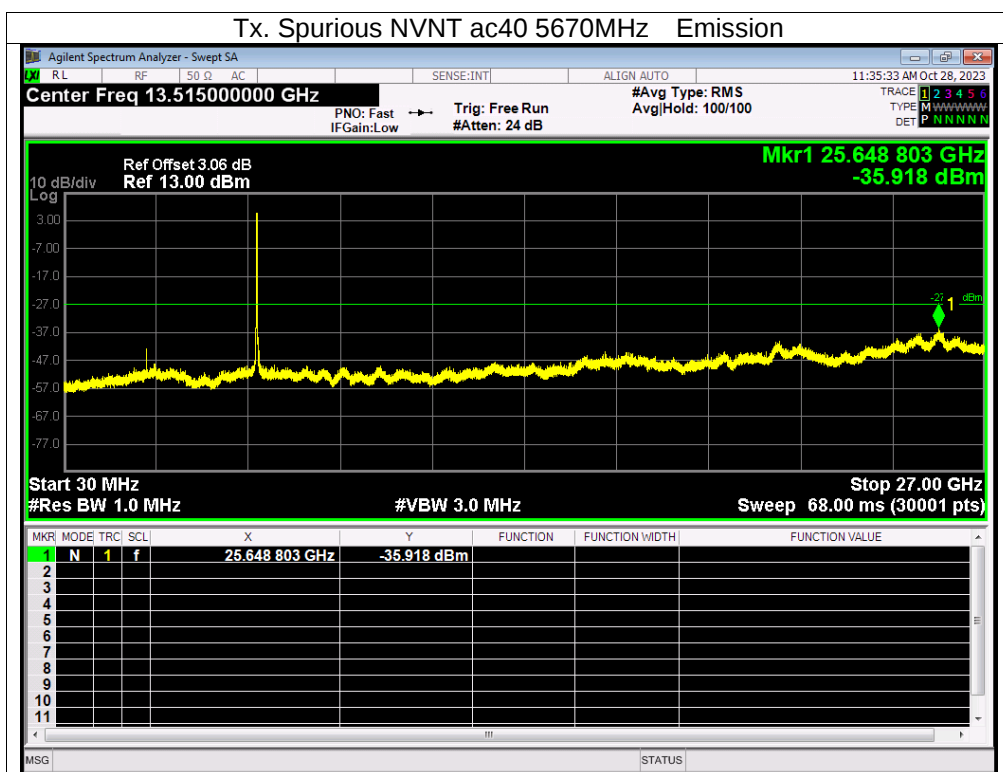


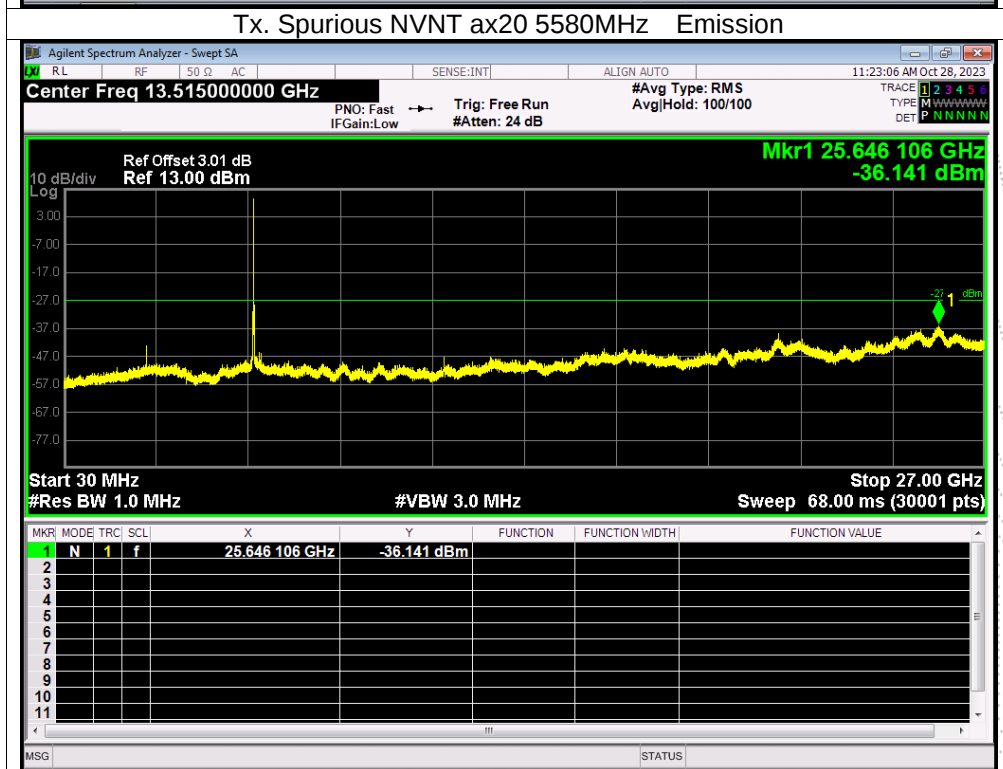
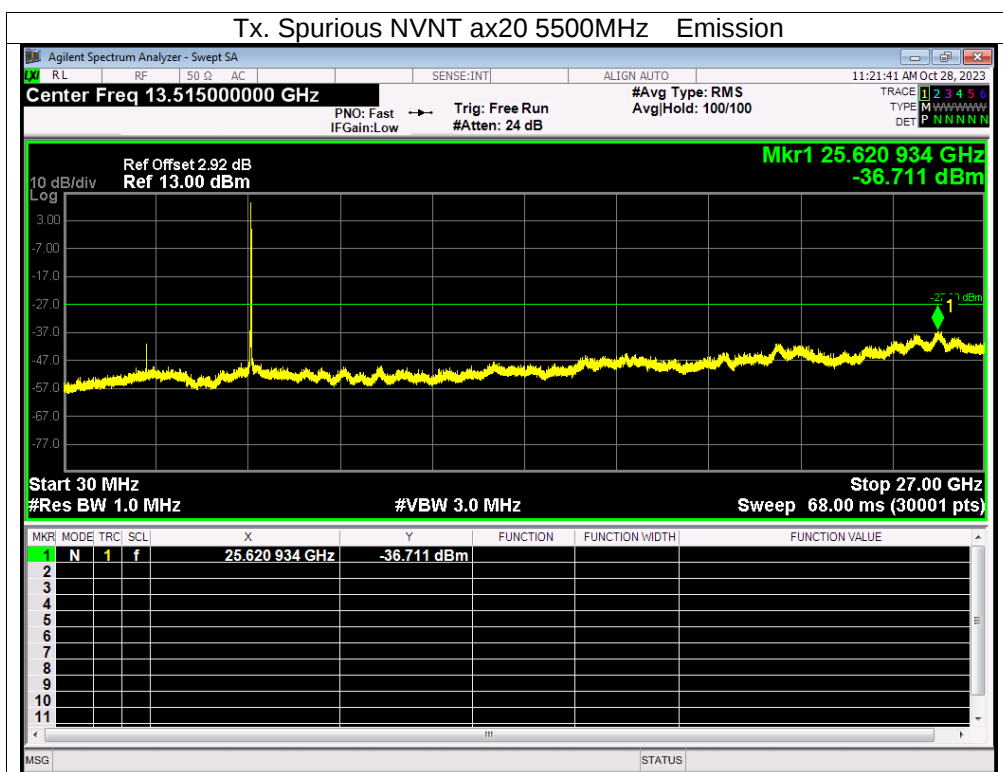


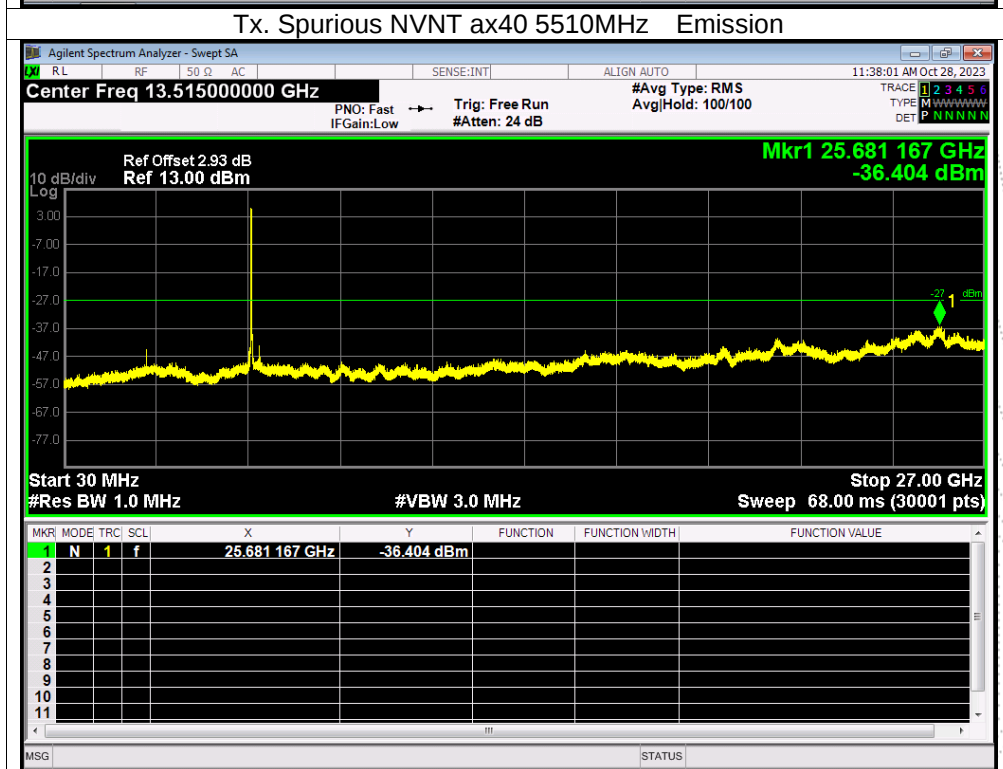
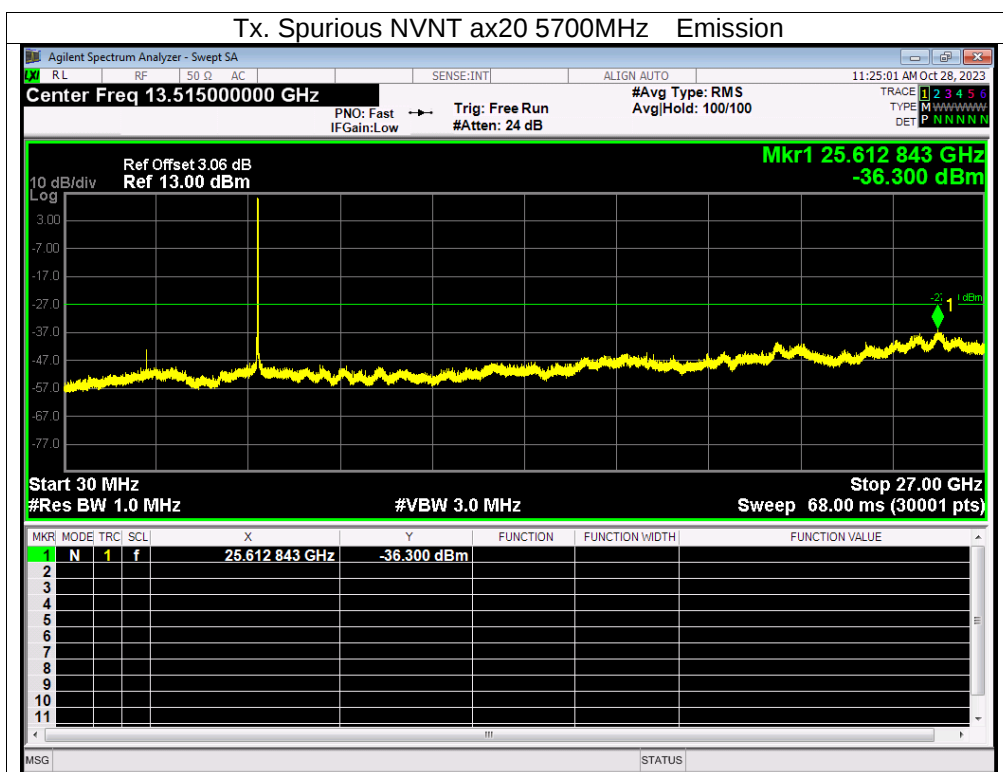


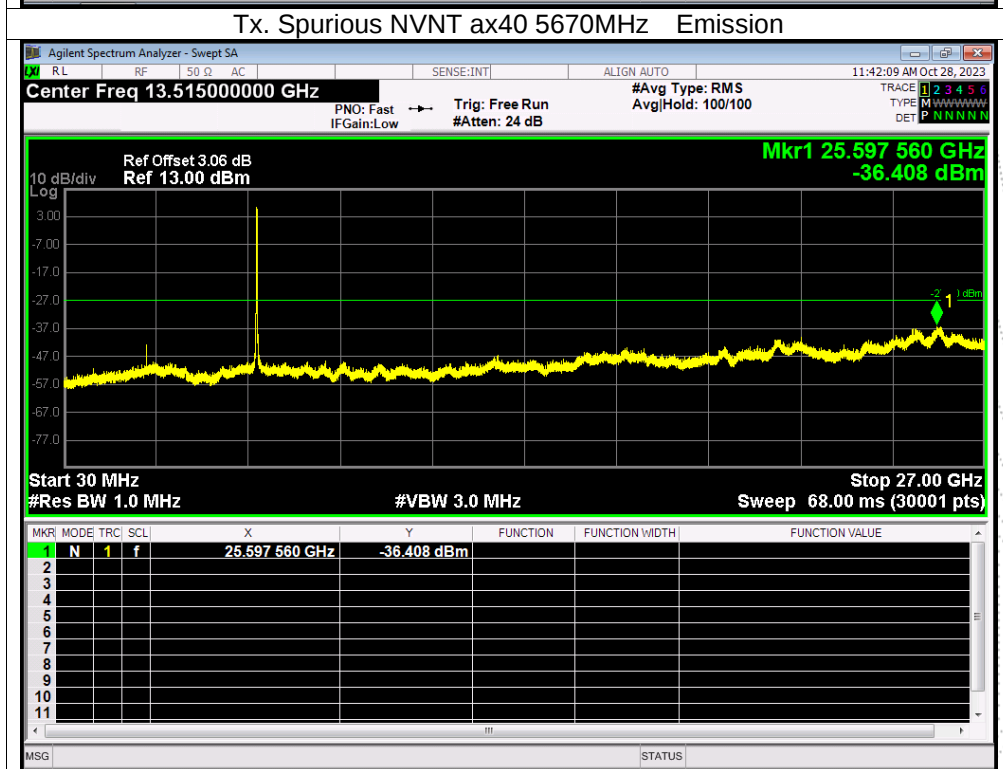
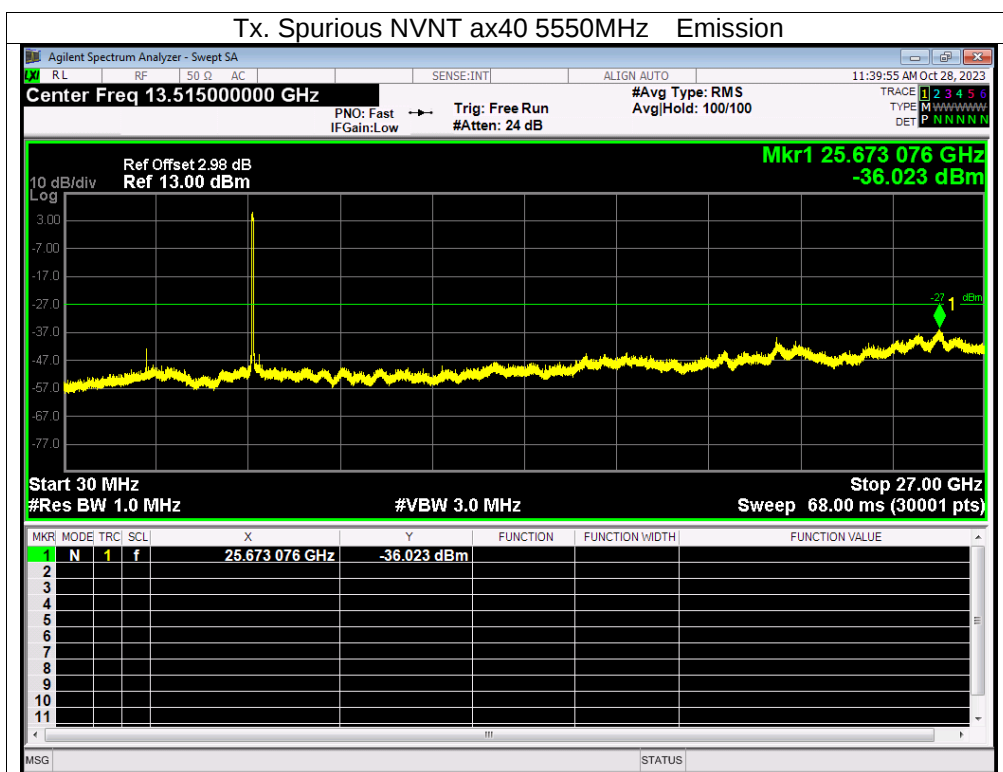


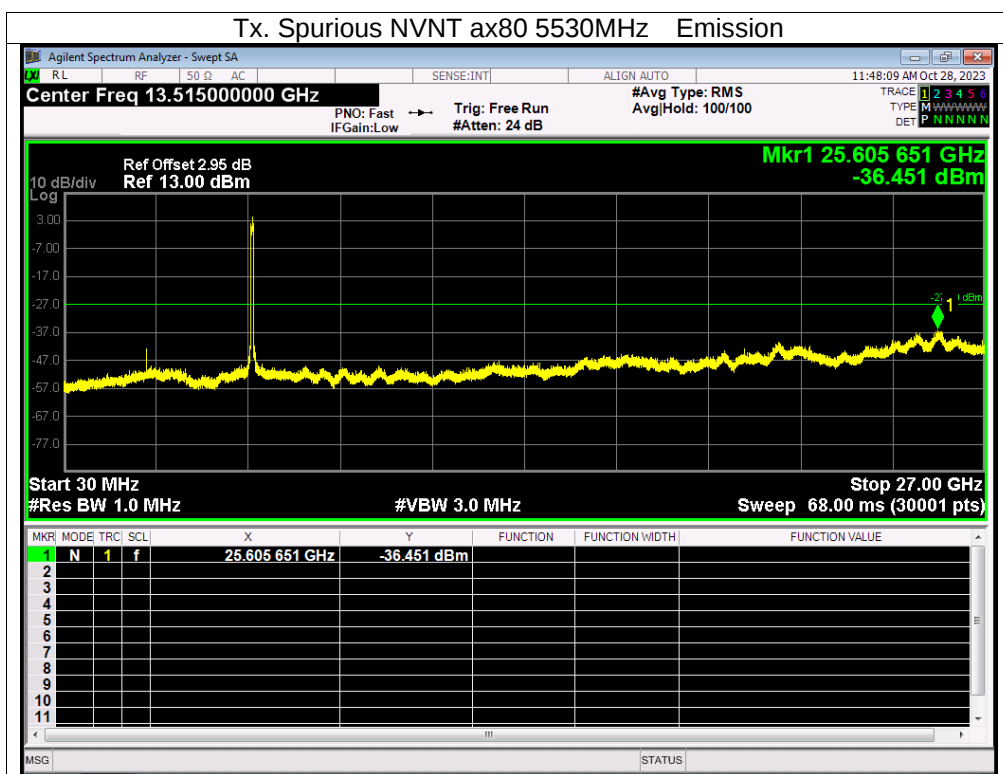


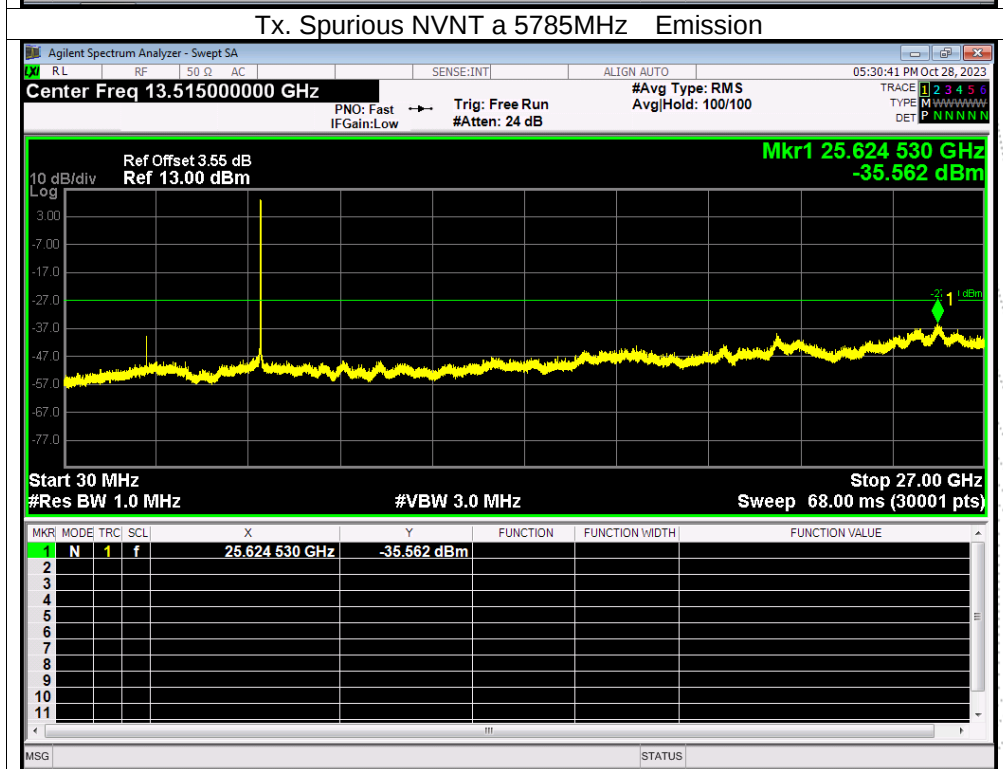
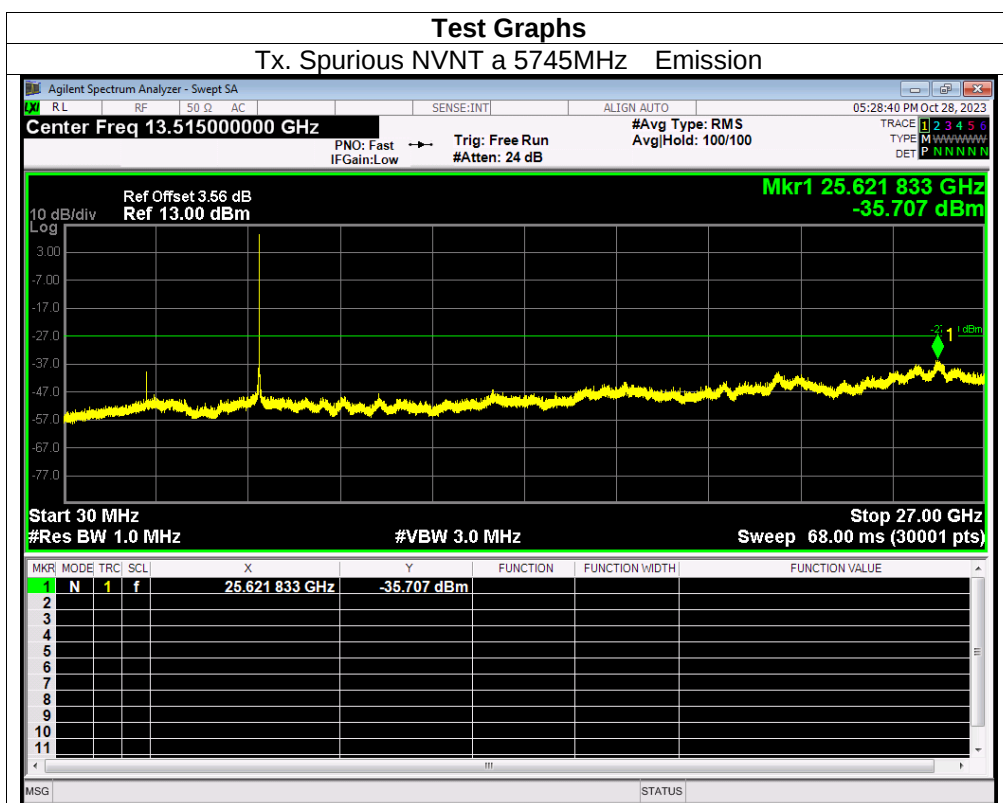


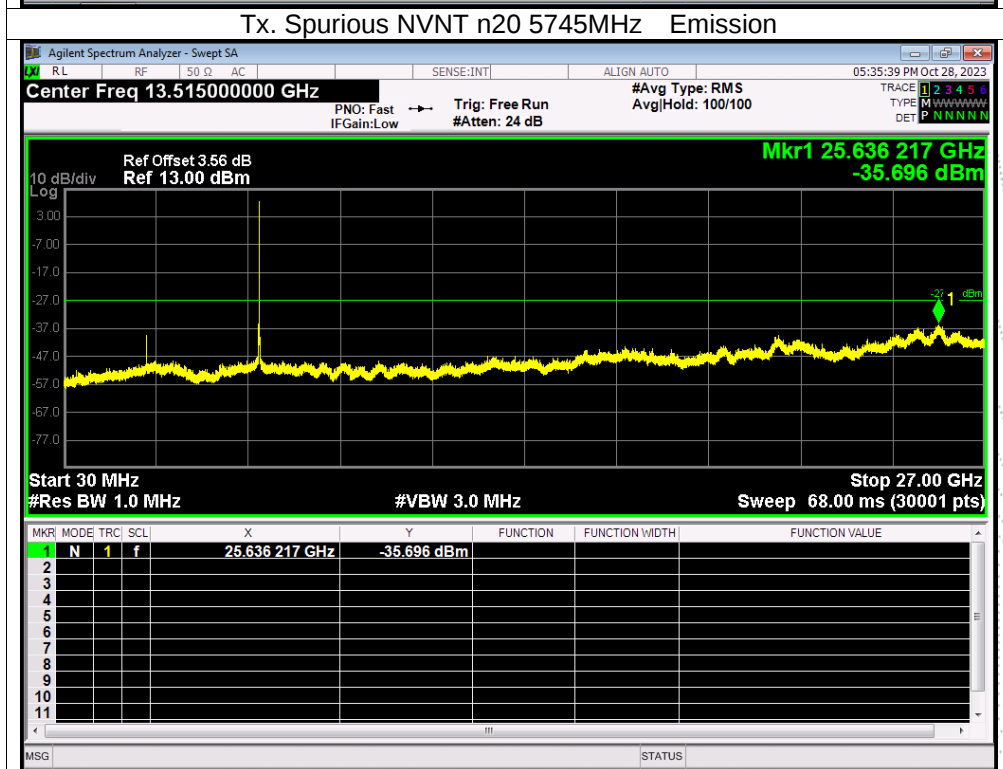
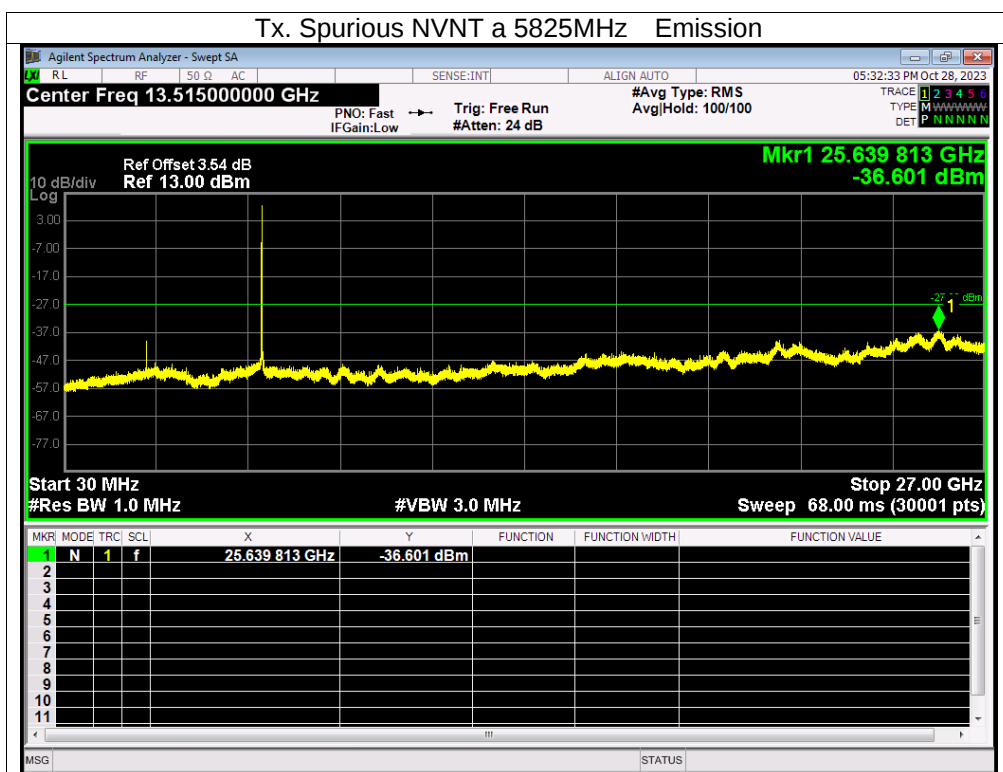


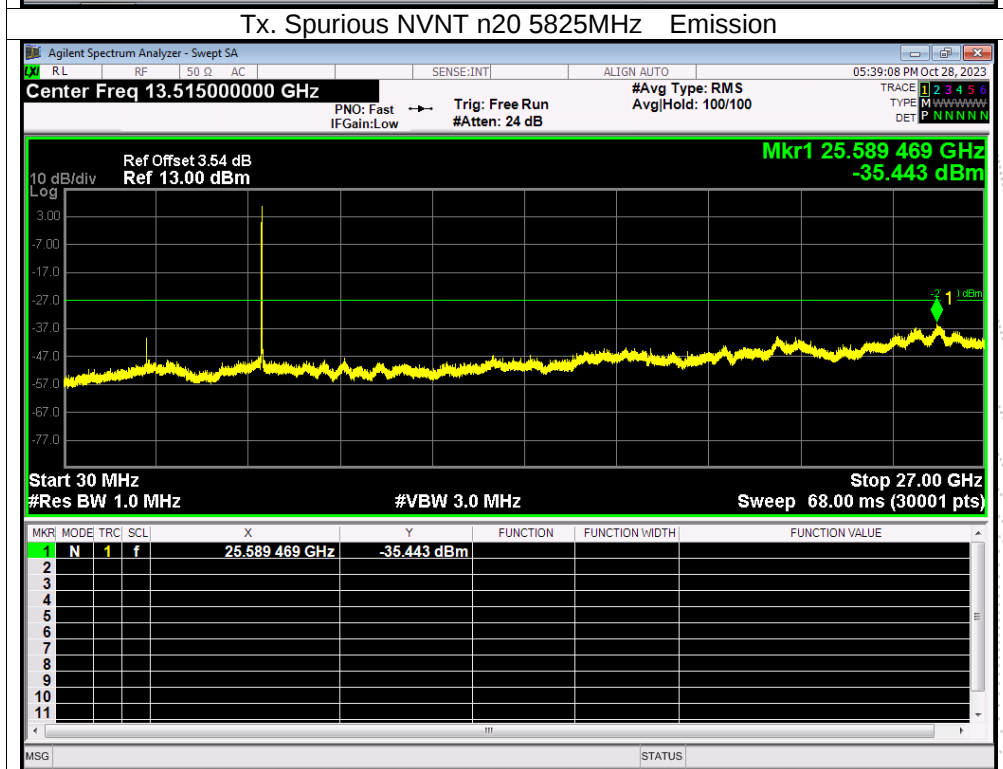
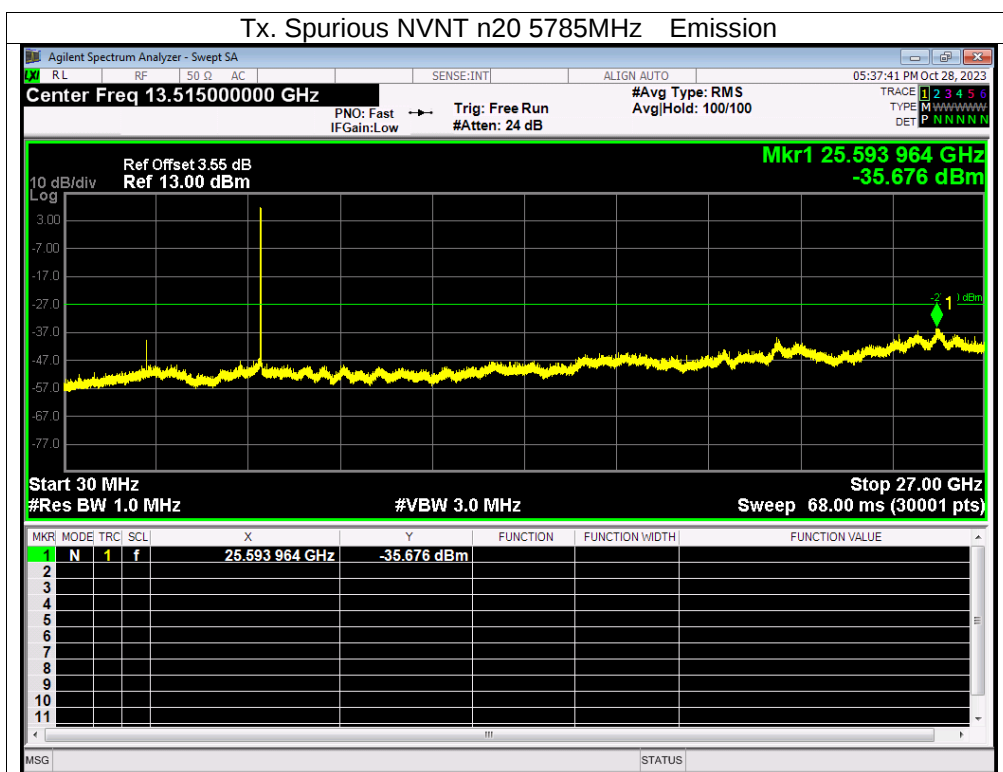


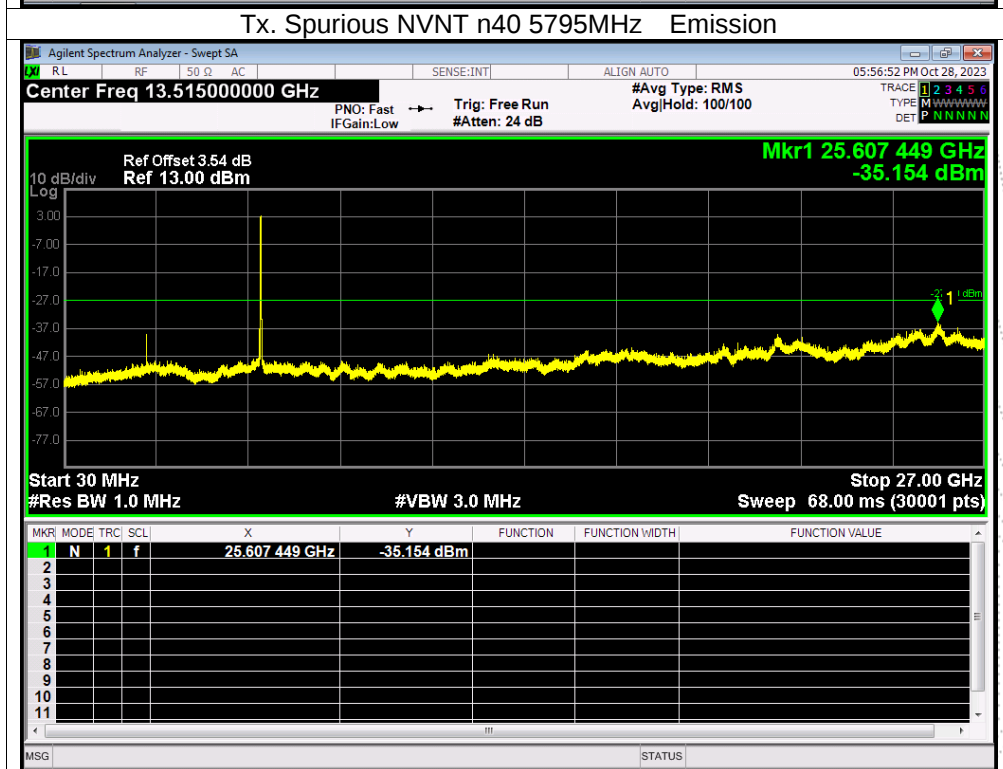
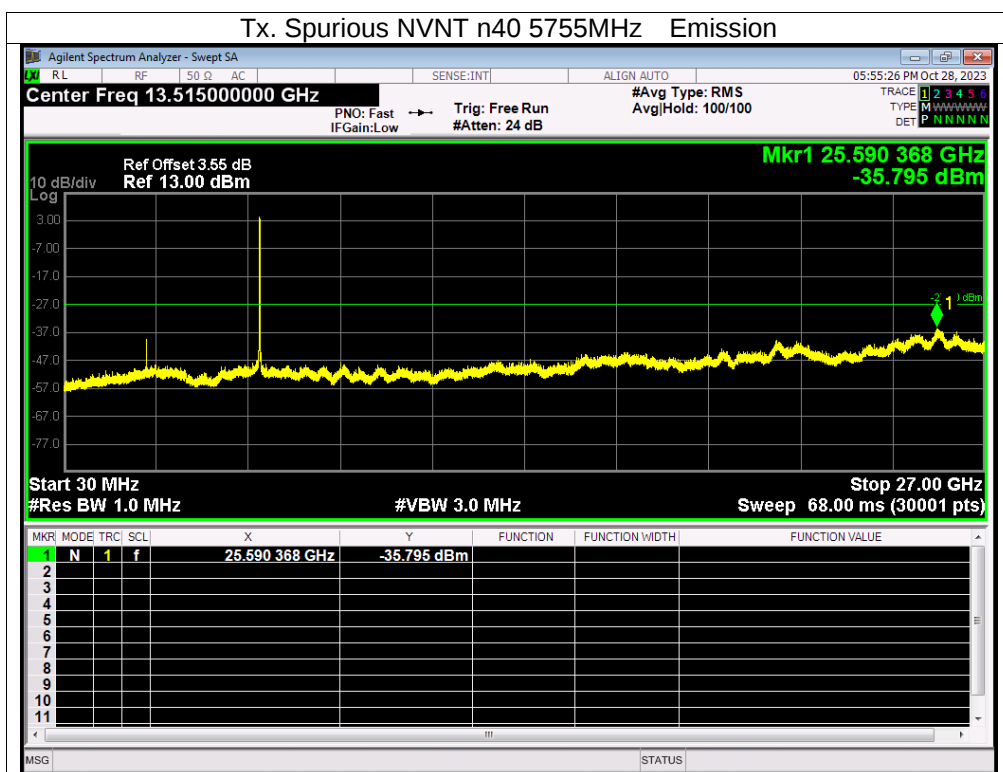


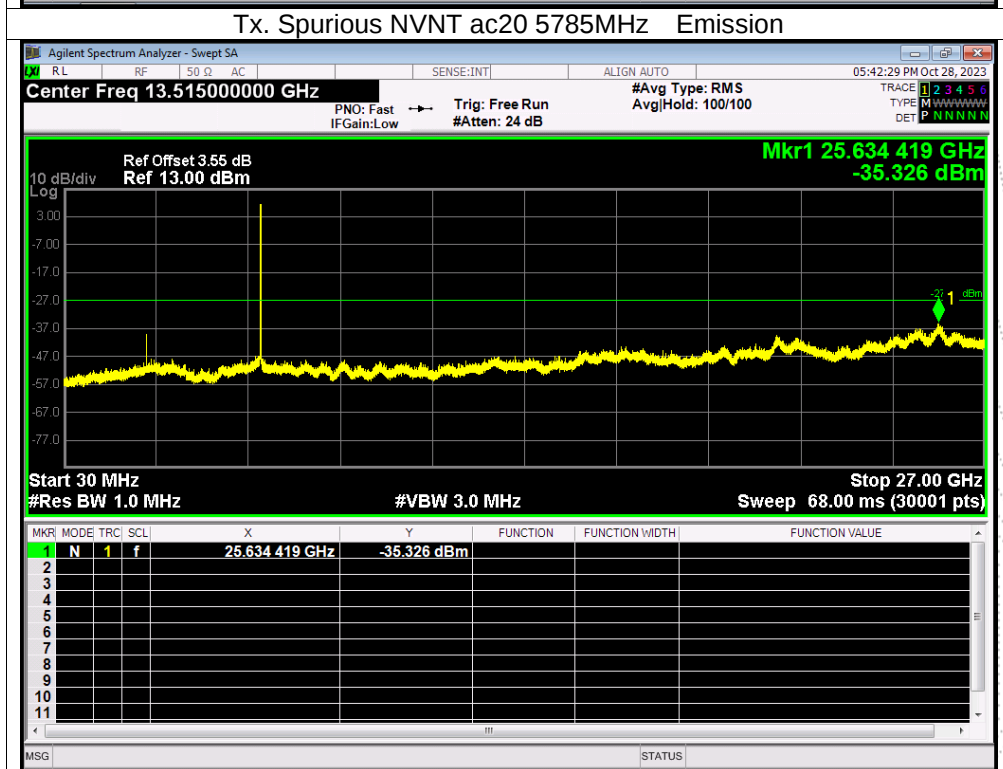
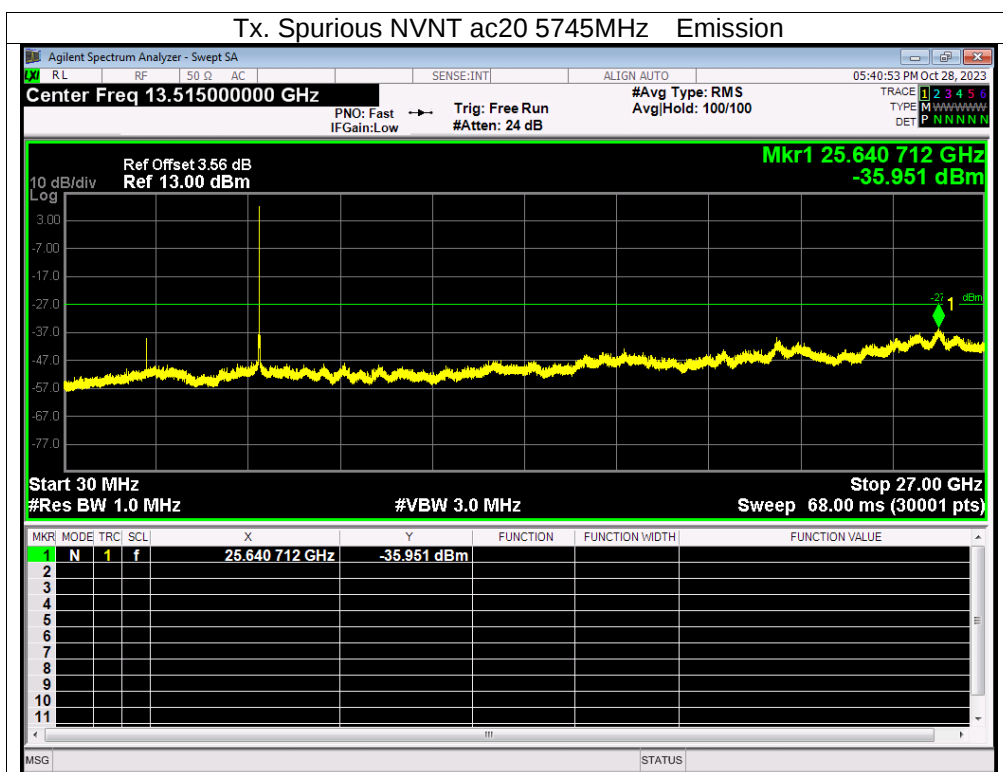


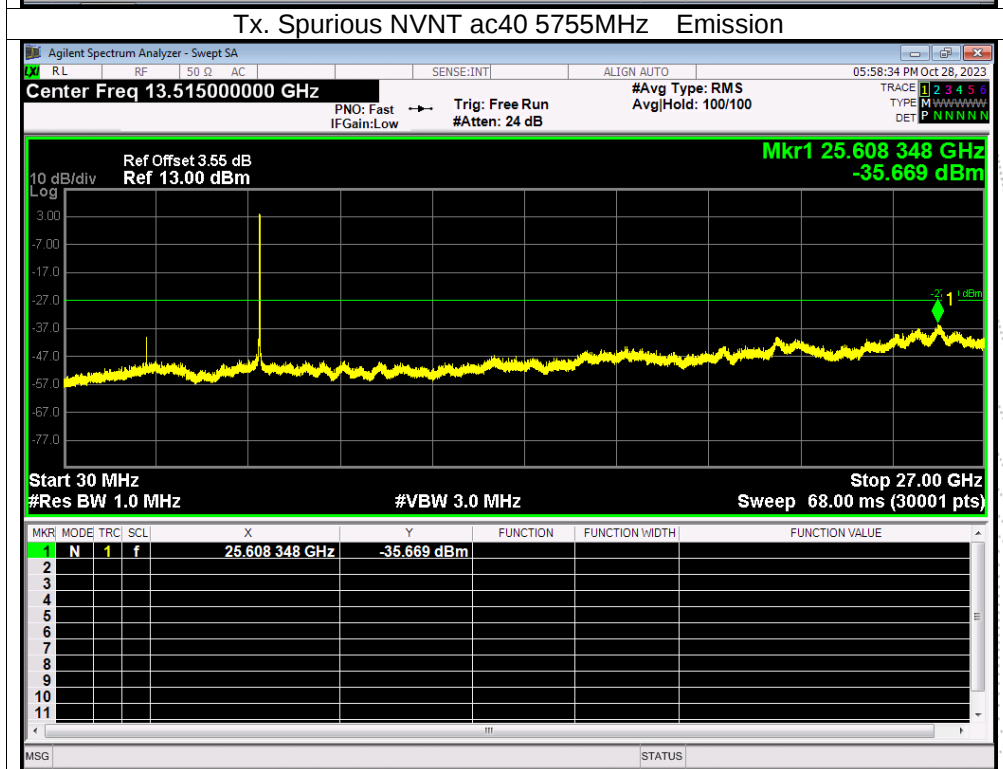
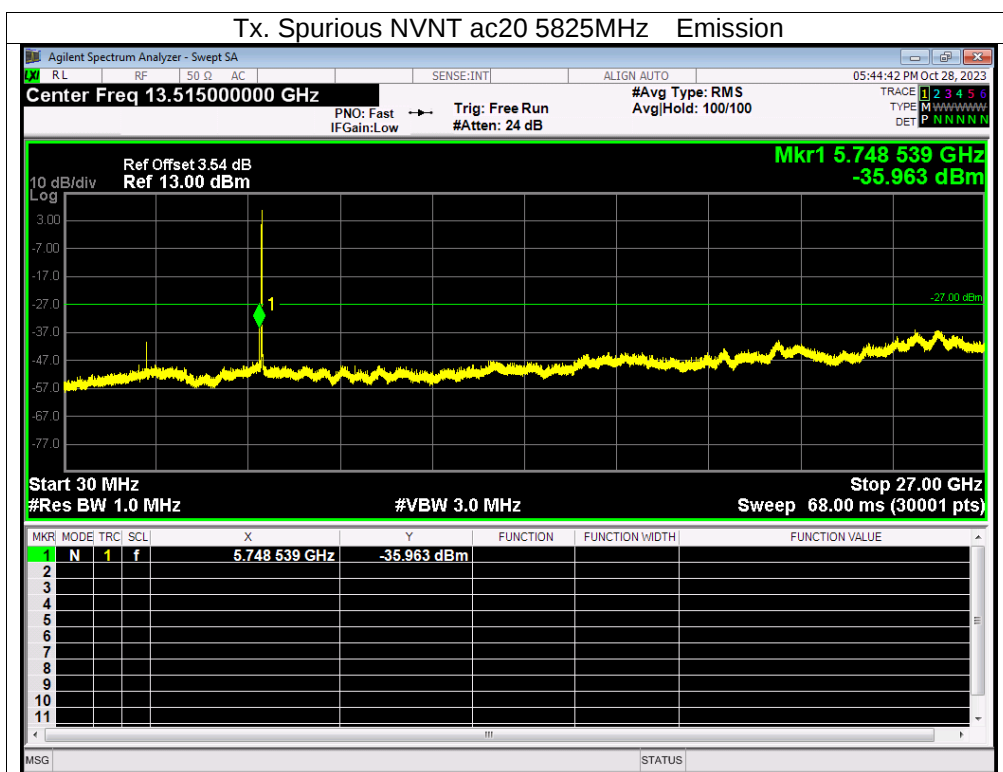


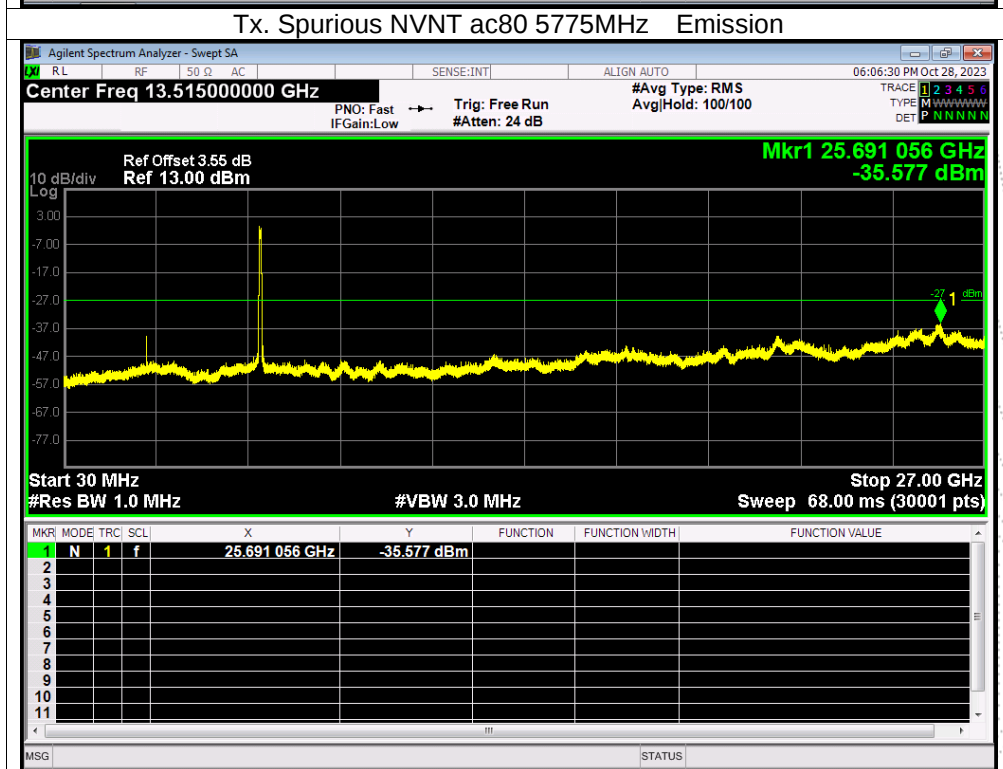
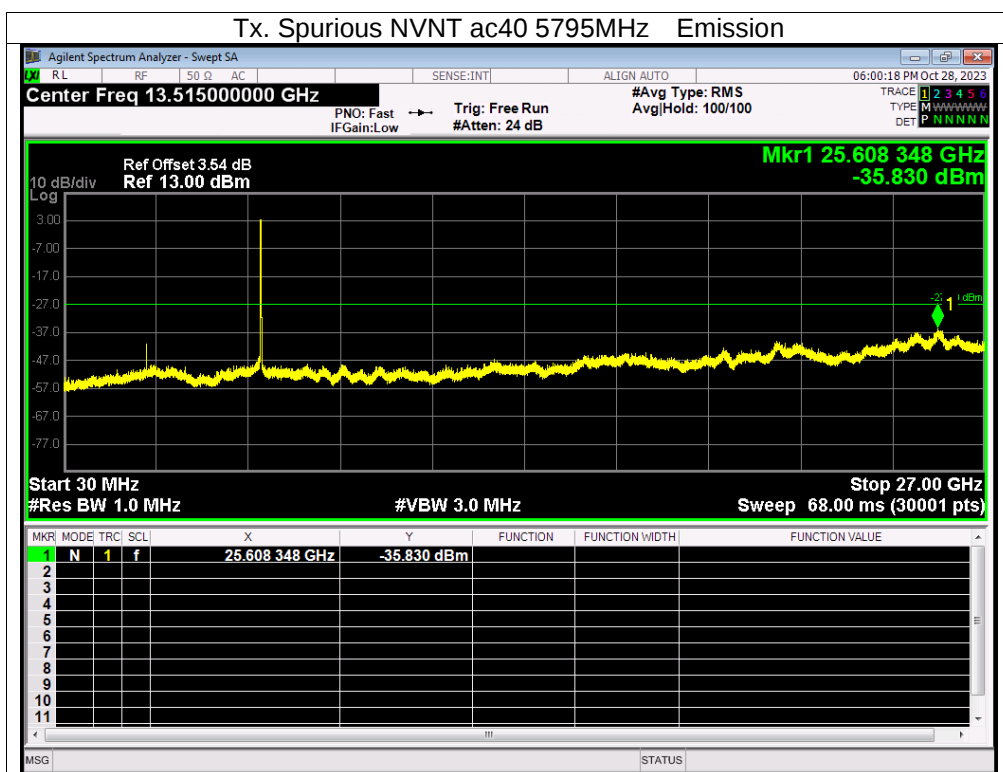


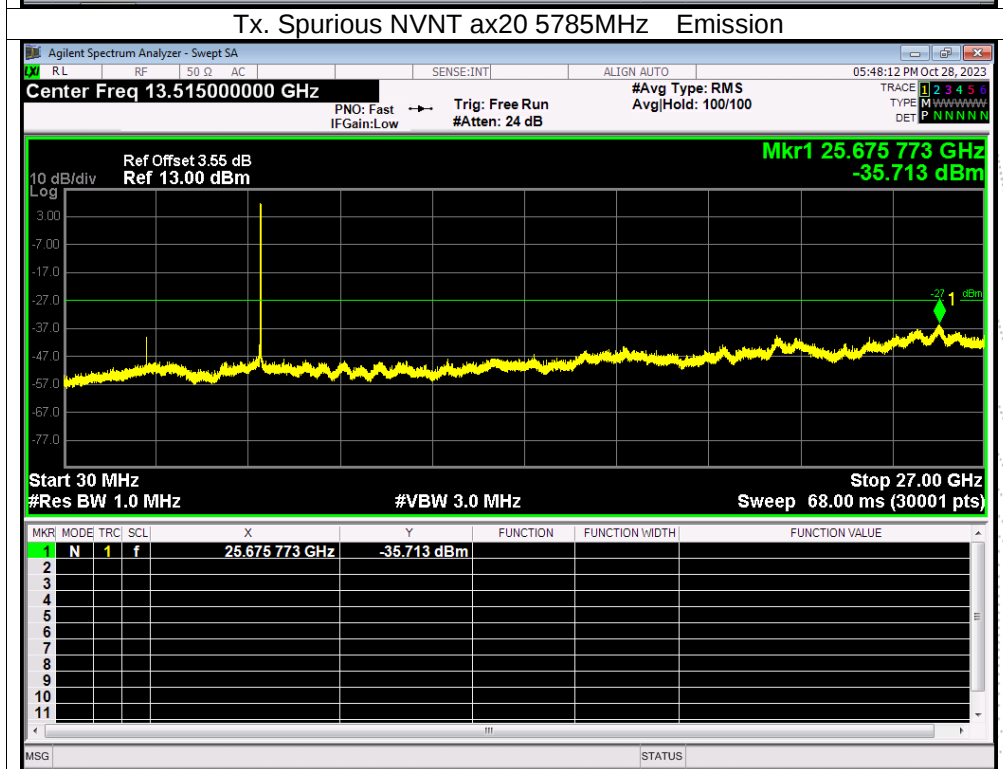
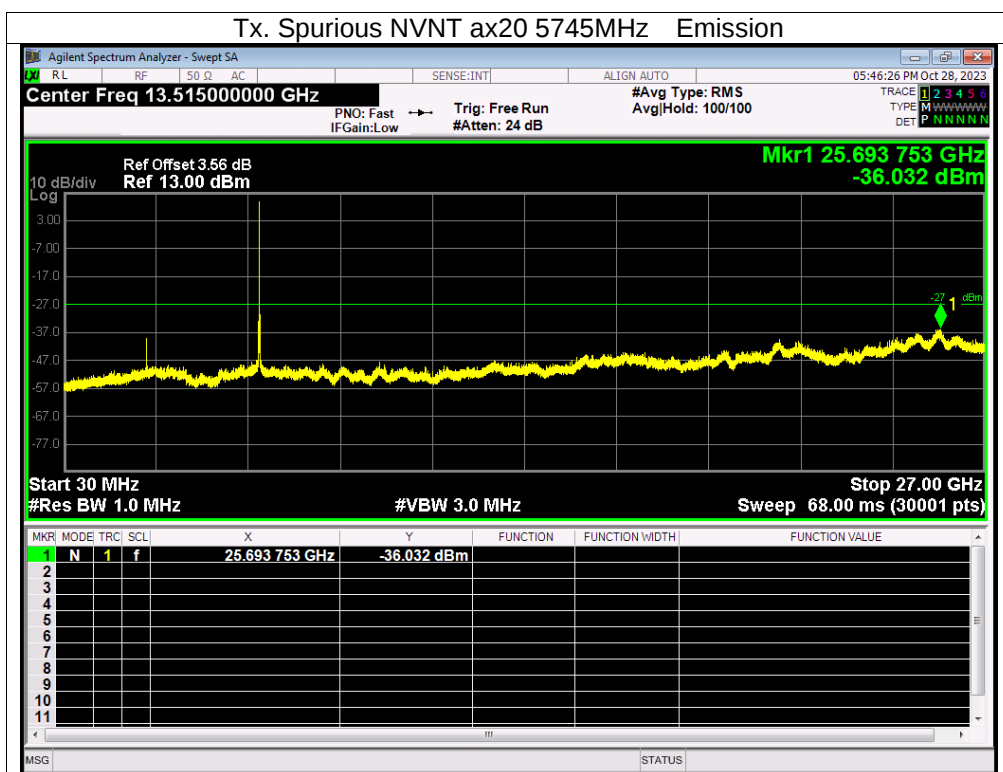


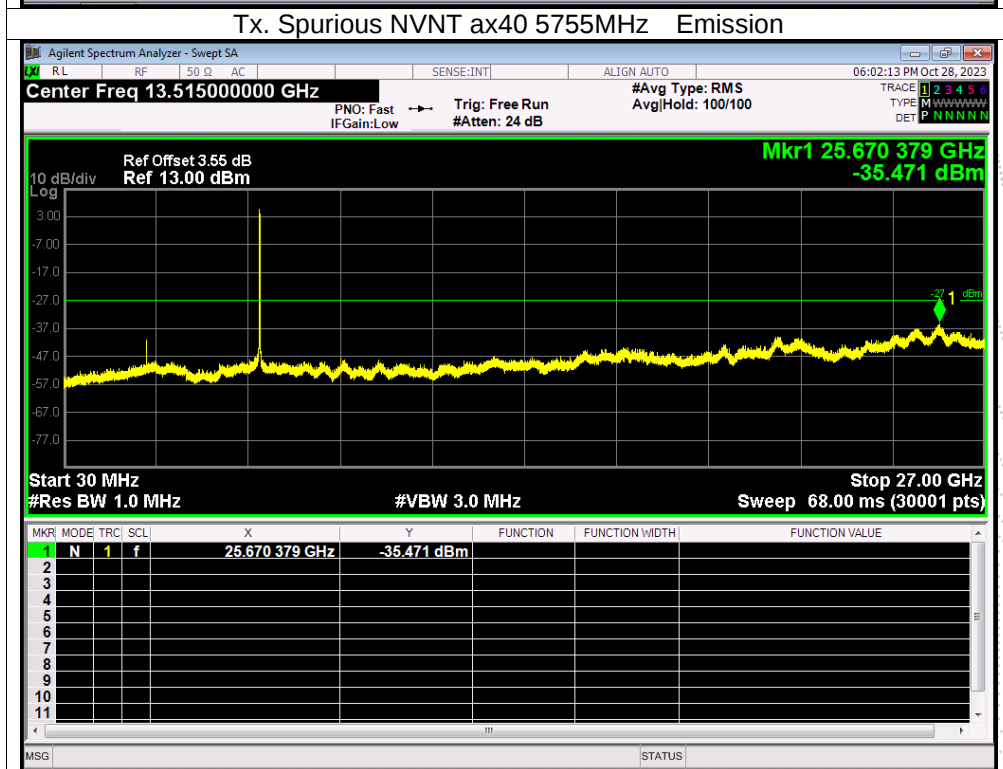
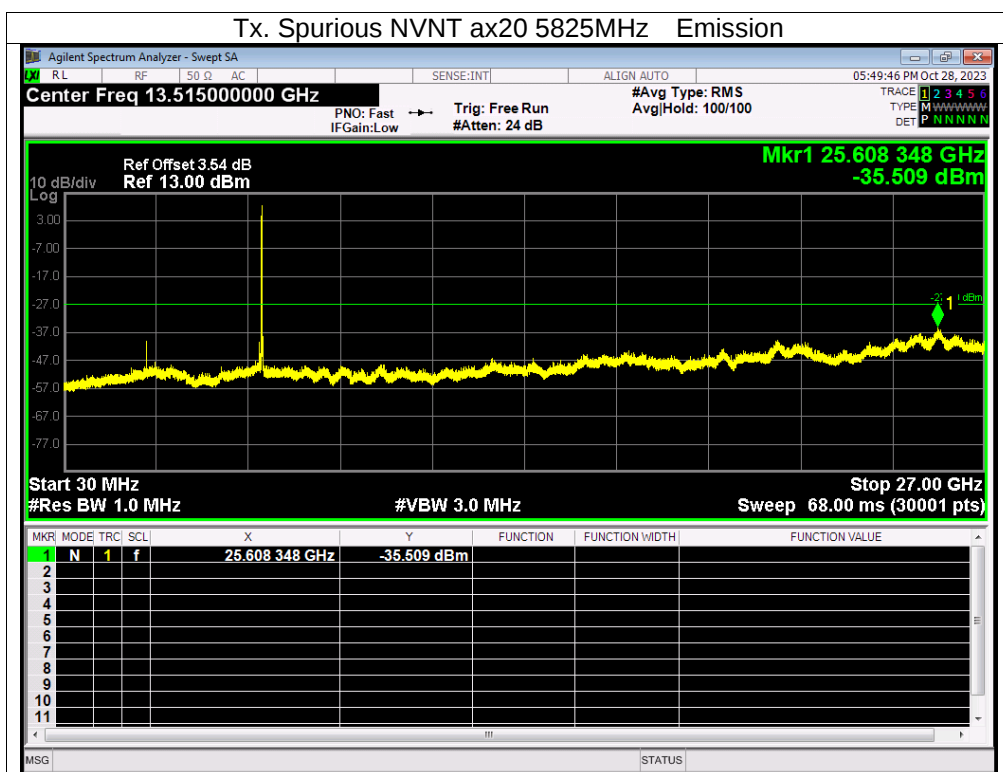


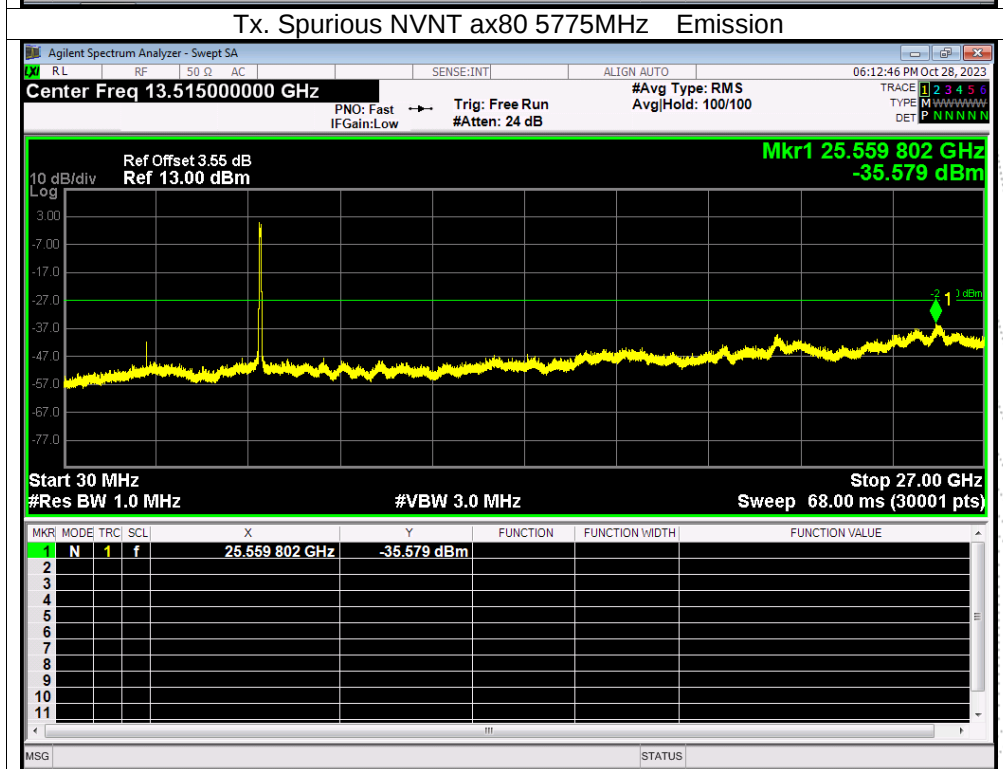
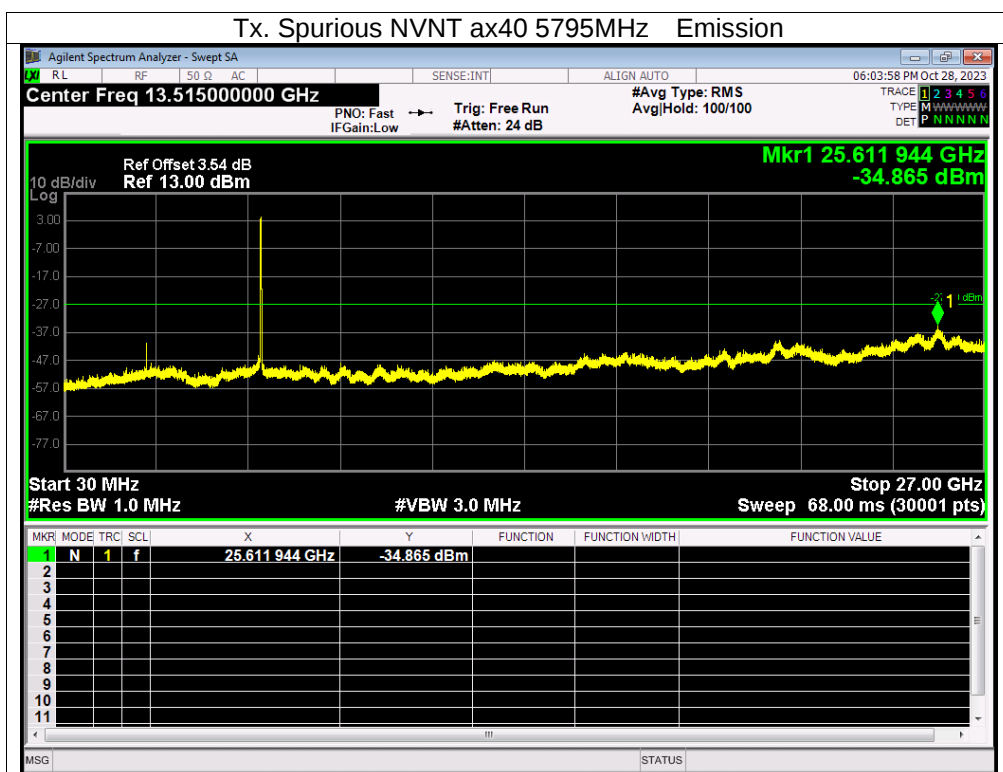












13. Frequency Stability Measurement

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%
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)	AC 120	5180.0066	5180	0.0066	1.2663
		V max (V)	AC 138	5180.0067	5180	0.0067	1.2985
		V min (V)	AC 102	5180.0131	5180	0.0131	2.5376
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	5180.0072	5180	0.0072	1.3864
		T (°C)	-10	5180.0011	5180	0.0011	0.2155
		T (°C)	0	5180.0082	5180	0.0082	1.5835
		T (°C)	10	5180.0073	5180	0.0073	1.4103
		T (°C)	20	5180.0122	5180	0.0122	2.3488
		T (°C)	30	5180.0122	5180	0.0122	2.3626
		T (°C)	40	5180.0043	5180	0.0043	0.8304
		T (°C)	50	5180.0032	5180	0.0032	0.6256
		T (°C)	60	5180.0044	5180	0.0044	0.8566
		T (°C)	70	5180.0122	5180	0.0122	2.3460
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)	AC 120	5200.0019	5200	0.0019	0.3652
		V max (V)	AC 138	5200.0085	5200	0.0085	1.6369
		V min (V)	AC 102	5200.0015	5200	0.0015	0.2809
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)	120	T (°C)	-20	5200.01293	5200	0.01293	2.4857
		T (°C)	-10	5200.00129	5200	0.00129	0.2485
		T (°C)	0	5200.01254	5200	0.01254	2.4115
		T (°C)	10	5200.01026	5200	0.01026	1.9736
		T (°C)	20	5200.00828	5200	0.00828	1.5917
		T (°C)	30	5200.00876	5200	0.00876	1.6842
		T (°C)	40	5200.01066	5200	0.01066	2.0498
		T (°C)	50	5200.00785	5200	0.00785	1.5104
		T (°C)	60	5200.01118	5200	0.01118	2.1507
		T (°C)	70	5200.00178	5200	0.00178	0.3429
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)	AC 120	5240.0092	5240	0.0092	1.7603
		V max (V)	AC 138	5240.0093	5240	0.0093	1.7686
		V min (V)	AC 102	5240.0032	5240	0.0032	0.6066
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	5240.0003	5240	0.0003	0.0502
		T (°C)	-10	5240.0077	5240	0.0077	1.4627
		T (°C)	0	5240.0020	5240	0.0020	0.3773
		T (°C)	10	5240.0083	5240	0.0083	1.5908
		T (°C)	20	5240.0009	5240	0.0009	0.1633
		T (°C)	30	5240.0011	5240	0.0011	0.2052
		T (°C)	40	5240.0130	5240	0.0130	2.4726
		T (°C)	50	5240.0094	5240	0.0094	1.8005
		T (°C)	60	5240.0110	5240	0.0110	2.0996
		T (°C)	70	5240.0116	5240	0.0116	2.2230
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 : 5260MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	AC 120	5260.0063	5260	0.0063	1.1983
		V max (V)	AC 138	5260.0067	5260	0.0067	1.2752
		V min (V)	AC 102	5260.0135	5260	0.0135	2.5639
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)	120	T (°C)	-20	5260.0116	5260	0.0116	2.2093
		T (°C)	-10	5260.0102	5260	0.0102	1.9457
		T (°C)	0	5260.0052	5260	0.0052	0.9892
		T (°C)	10	5260.0040	5260	0.0040	0.7550
		T (°C)	20	5260.0006	5260	0.0006	0.1072
		T (°C)	30	5260.0008	5260	0.0008	0.1497
		T (°C)	40	5260.0125	5260	0.0125	2.3710
		T (°C)	50	5260.0030	5260	0.0030	0.5702
		T (°C)	60	5260.0017	5260	0.0017	0.3236
		T (°C)	70	5260.0096	5260	0.0096	1.8308
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)	AC 120	5280.0073	5280	0.0073	1.3807
		V max (V)	AC 138	5280.0123	5280	0.0123	2.3386
		V min (V)	AC 102	5280.0124	5280	0.0124	2.3523
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)	120	T (°C)	-20	5280.00307	5280	0.00307	0.5810
		T (°C)	-10	5280.00660	5280	0.00660	1.2508
		T (°C)	0	5280.00221	5280	0.00221	0.4194
		T (°C)	10	5280.00470	5280	0.00470	0.8894
		T (°C)	20	5280.01144	5280	0.01144	2.1659
		T (°C)	30	5280.00007	5280	0.00007	0.0134
		T (°C)	40	5280.00258	5280	0.00258	0.4883
		T (°C)	50	5280.00064	5280	0.00064	0.1215
		T (°C)	60	5280.01197	5280	0.01197	2.2668
		T (°C)	70	5280.00834	5280	0.00834	1.5803
Limits				5260-5320 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency : 5320MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	AC 120	5320.0102	5320	0.0102	1.9231
		V max (V)	AC 138	5320.0077	5320	0.0077	1.4390
		V min (V)	AC 102	5320.0042	5320	0.0042	0.7950
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)	120	T (°C)	-20	5320.0036	5320	0.0036	0.6799
		T (°C)	-10	5320.0017	5320	0.0017	0.3283
		T (°C)	0	5320.0128	5320	0.0128	2.4082
		T (°C)	10	5320.0057	5320	0.0057	1.0756
		T (°C)	20	5320.0051	5320	0.0051	0.9644
		T (°C)	30	5320.0027	5320	0.0027	0.5044
		T (°C)	40	5320.0107	5320	0.0107	2.0045
		T (°C)	50	5320.0082	5320	0.0082	1.5351
		T (°C)	60	5320.0018	5320	0.0018	0.3385
		T (°C)	70	5320.0072	5320	0.0072	1.3494
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)	AC 120	5500.0173	5500	0.0173	3.1440
		V max (V)	AC 138	5500.0027	5500	0.0027	0.4991
		V min (V)	AC 102	5500.0171	5500	0.0171	3.1093
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	5500.0101	5500	0.0101	1.8364
		T (°C)	-10	5500.0091	5500	0.0091	1.6506
		T (°C)	0	5500.0125	5500	0.0125	2.2789
		T (°C)	10	5500.0109	5500	0.0109	1.9905
		T (°C)	20	5500.0075	5500	0.0075	1.3689
		T (°C)	30	5500.0036	5500	0.0036	0.6536
		T (°C)	40	5500.0049	5500	0.0049	0.8874
		T (°C)	50	5500.0116	5500	0.0116	2.1152
		T (°C)	60	5500.0021	5500	0.0021	0.3758
		T (°C)	70	5500.0109	5500	0.0109	1.9779
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)	AC 120	5580.0054	5580	0.0054	0.9756
		V max (V)	AC 138	5580.0125	5580	0.0125	2.2481
		V min (V)	AC 102	5580.0128	5580	0.0128	2.2896
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	5580.00550	5580	0.00550	0.9857
		T (°C)	-10	5580.00534	5580	0.00534	0.9577
		T (°C)	0	5580.00406	5580	0.00406	0.7274
		T (°C)	10	5580.01180	5580	0.01180	2.1142
		T (°C)	20	5580.01223	5580	0.01223	2.1923
		T (°C)	30	5580.00432	5580	0.00432	0.7746
		T (°C)	40	5580.00183	5580	0.00183	0.3271
		T (°C)	50	5580.00462	5580	0.00462	0.8277
		T (°C)	60	5580.01184	5580	0.01184	2.1224
		T (°C)	70	5580.01137	5580	0.01137	2.0380
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)	AC 120	5700.0124	5700	0.0124	2.1735
		V max (V)	AC 138	5700.0041	5700	0.0041	0.7163
		V min (V)	AC 102	5700.0012	5700	0.0012	0.2161
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	5700.0111	5700	0.0111	1.9557
		T (°C)	-10	5700.0041	5700	0.0041	0.7246
		T (°C)	0	5700.0075	5700	0.0075	1.3156
		T (°C)	10	5700.0025	5700	0.0025	0.4451
		T (°C)	20	5700.0035	5700	0.0035	0.6079
		T (°C)	30	5700.0122	5700	0.0122	2.1413
		T (°C)	40	5700.0068	5700	0.0068	1.1933
		T (°C)	50	5700.0069	5700	0.0069	1.2073
		T (°C)	60	5700.0128	5700	0.0128	2.2476
		T (°C)	70	5700.0098	5700	0.0098	1.7269
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 Stabilit

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	AC 120	5745.00900	5745	0.00900	1.5666
		V max (V)	AC 138	5745.00514	5745	0.00514	0.8947
		V min (V)	AC 102	5745.00753	5745	0.00753	1.3107
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	5745.00133	5745	0.00133	0.2320
		T (°C)	-10	5745.00354	5745	0.00354	0.6166
		T (°C)	0	5745.01197	5745	0.01197	2.0831
		T (°C)	10	5745.00689	5745	0.00689	1.1987
		T (°C)	20	5745.00378	5745	0.00378	0.6588
		T (°C)	30	5745.00926	5745	0.00926	1.6127
		T (°C)	40	5745.00848	5745	0.00848	1.4759
		T (°C)	50	5745.01343	5745	0.01343	2.3380
		T (°C)	60	5745.00509	5745	0.00509	0.8855
		T (°C)	70	5745.01314	5745	0.01314	2.2871
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)	AC 120	5785.00206	5785	0.00206	0.3555
		V max (V)	AC 138	5785.00342	5785	0.00342	0.5909
		V min (V)	AC 102	5785.00509	5785	0.00509	0.8794
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	5785.00685	5785	0.00685	1.1839
		T (°C)	-10	5785.00010	5785	0.00010	0.0173
		T (°C)	0	5785.00387	5785	0.00387	0.6690
		T (°C)	10	5785.00801	5785	0.00801	1.3851
		T (°C)	20	5785.01170	5785	0.01170	2.0225
		T (°C)	30	5785.01192	5785	0.01192	2.0598
		T (°C)	40	5785.00979	5785	0.00979	1.6915
		T (°C)	50	5785.00280	5785	0.00280	0.4838
		T (°C)	60	5785.00251	5785	0.00251	0.4331
		T (°C)	70	5785.00131	5785	0.00131	0.2256
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)	AC 120	5825.01237	5825	0.01237	2.1230
		V max (V)	AC 138	5825.00276	5825	0.00276	0.4735
		V min (V)	AC 102	5825.00796	5825	0.00796	1.3665
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	5825.01021	5825	0.01021	1.7519
		T (°C)	-10	5825.00891	5825	0.00891	1.5301
		T (°C)	0	5825.00356	5825	0.00356	0.6112
		T (°C)	10	5825.00552	5825	0.00552	0.9469
		T (°C)	20	5825.01174	5825	0.01174	2.0152
		T (°C)	30	5825.01094	5825	0.01094	1.8784
		T (°C)	40	5825.00035	5825	0.00035	0.0596
		T (°C)	50	5825.01212	5825	0.01212	2.0815
		T (°C)	60	5825.01157	5825	0.01157	1.9857
		T (°C)	70	5825.01350	5825	0.01350	2.3179
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)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	AntA	100	0	0
NVNT	a	5200	AntA	100	0	0
NVNT	a	5240	AntA	100	0	0
NVNT	n20	5180	AntA	100	0	0
NVNT	n20	5200	AntA	100	0	0
NVNT	n20	5240	AntA	100	0	0
NVNT	n40	5190	AntA	100	0	0
NVNT	n40	5230	AntA	100	0	0
NVNT	ac20	5180	AntA	100	0	0
NVNT	ac20	5200	AntA	100	0	0
NVNT	ac20	5240	AntA	100	0	0
NVNT	ac40	5190	AntA	100	0	0
NVNT	ac40	5230	AntA	100	0	0
NVNT	ac80	5210	AntA	100	0	0
NVNT	ax20	5180	AntA	100	0	0
NVNT	ax20	5200	AntA	100	0	0
NVNT	ax20	5240	AntA	100	0	0
NVNT	ax40	5190	AntA	100	0	0
NVNT	ax40	5230	AntA	100	0	0
NVNT	ax80	5210	AntA	100	0	0

