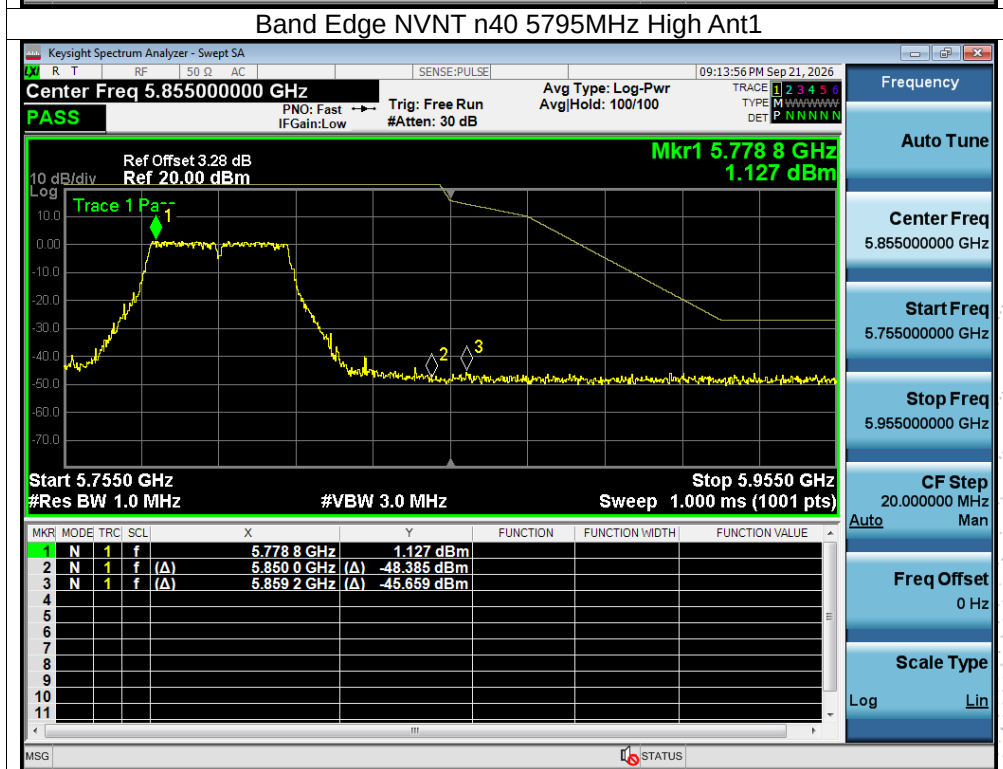
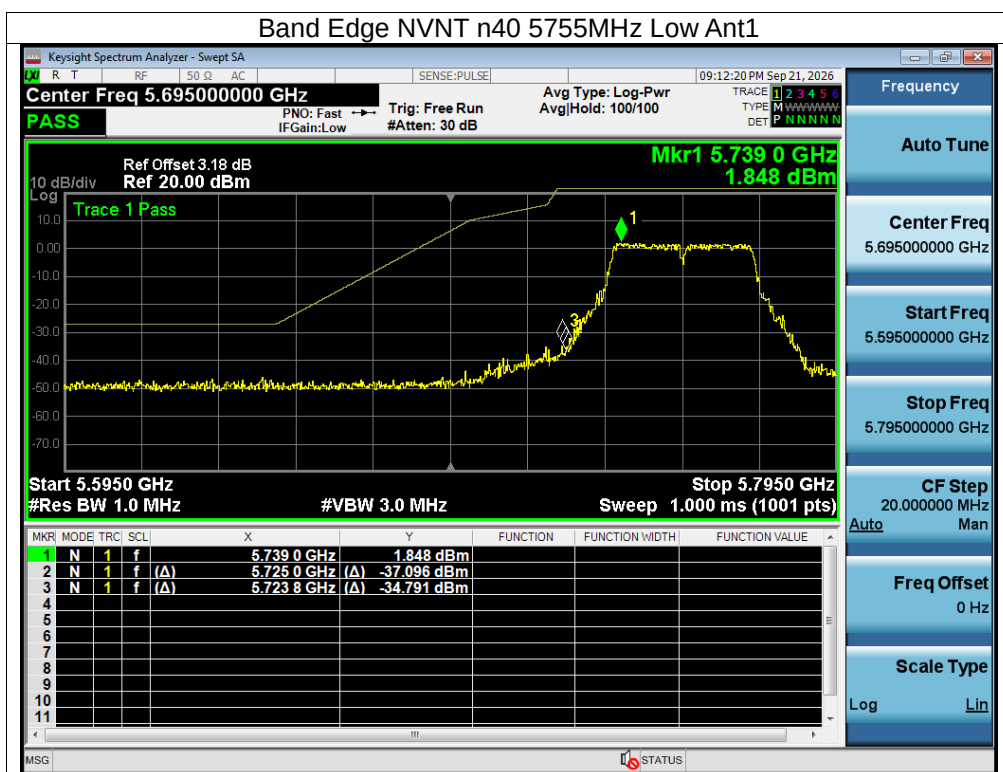
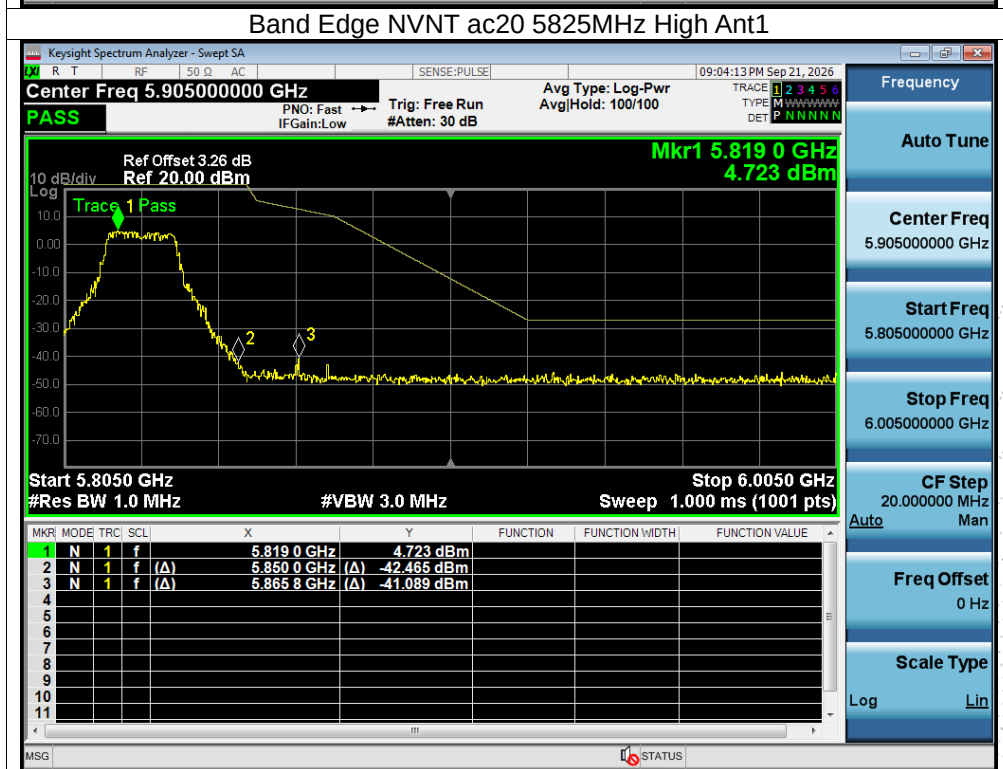
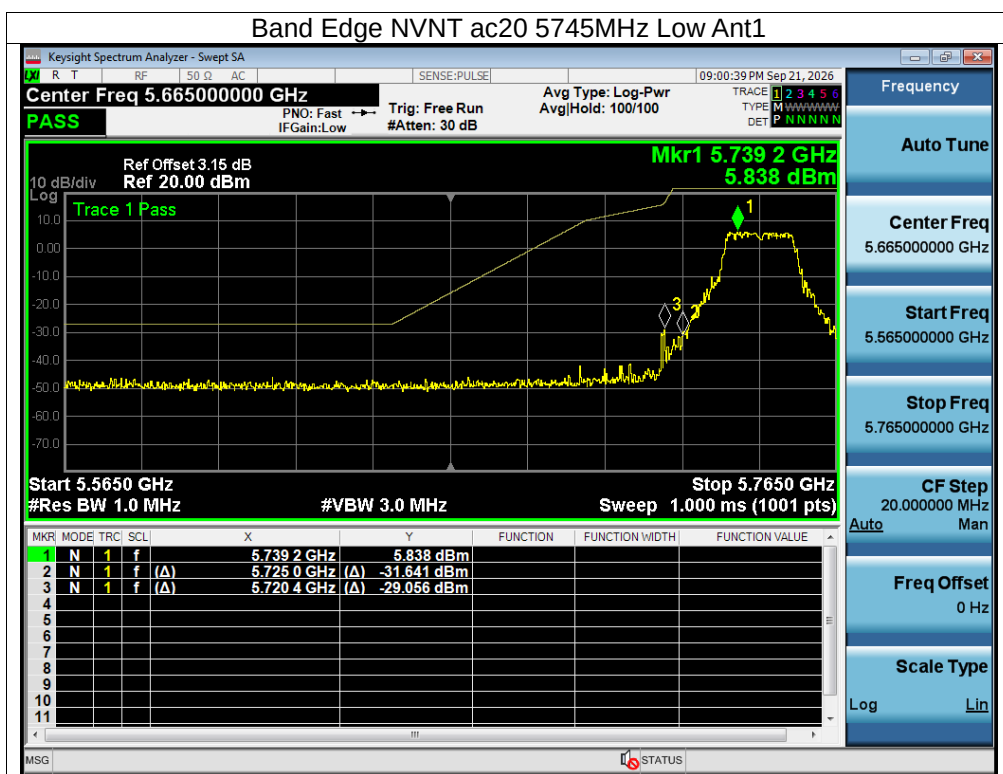
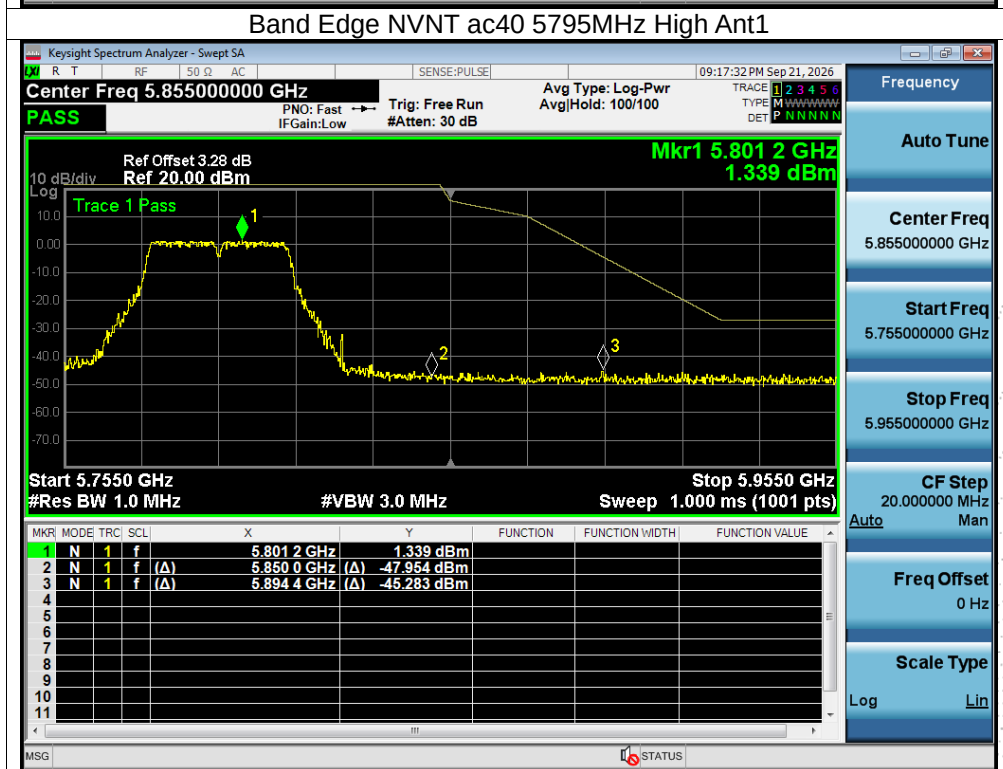
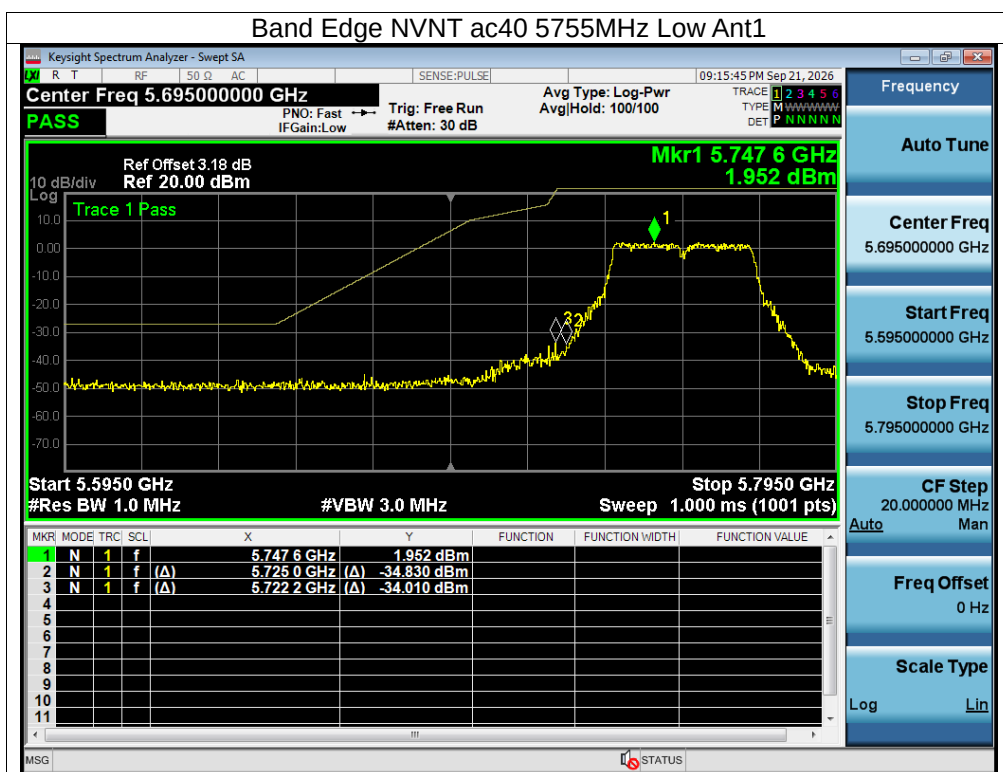
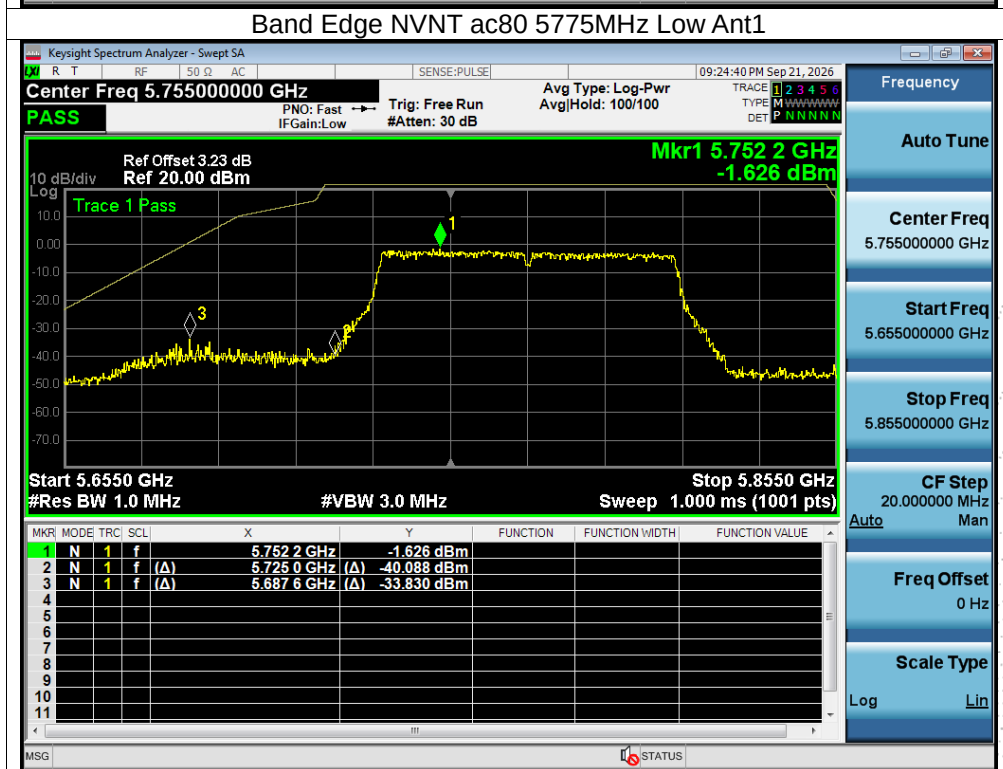
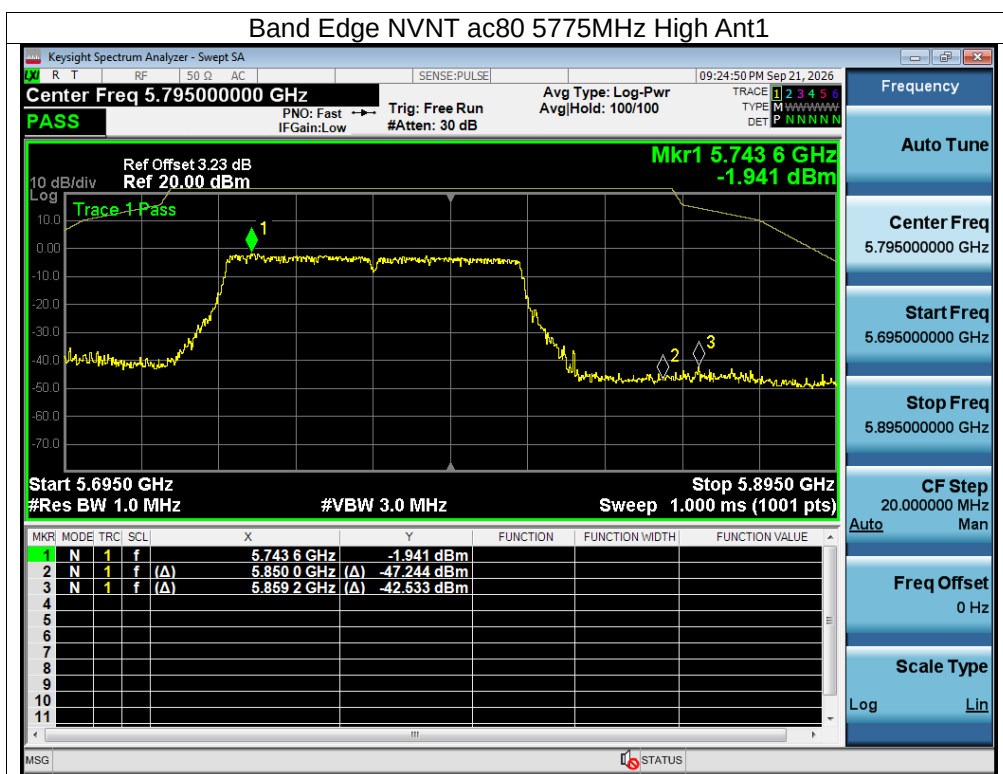
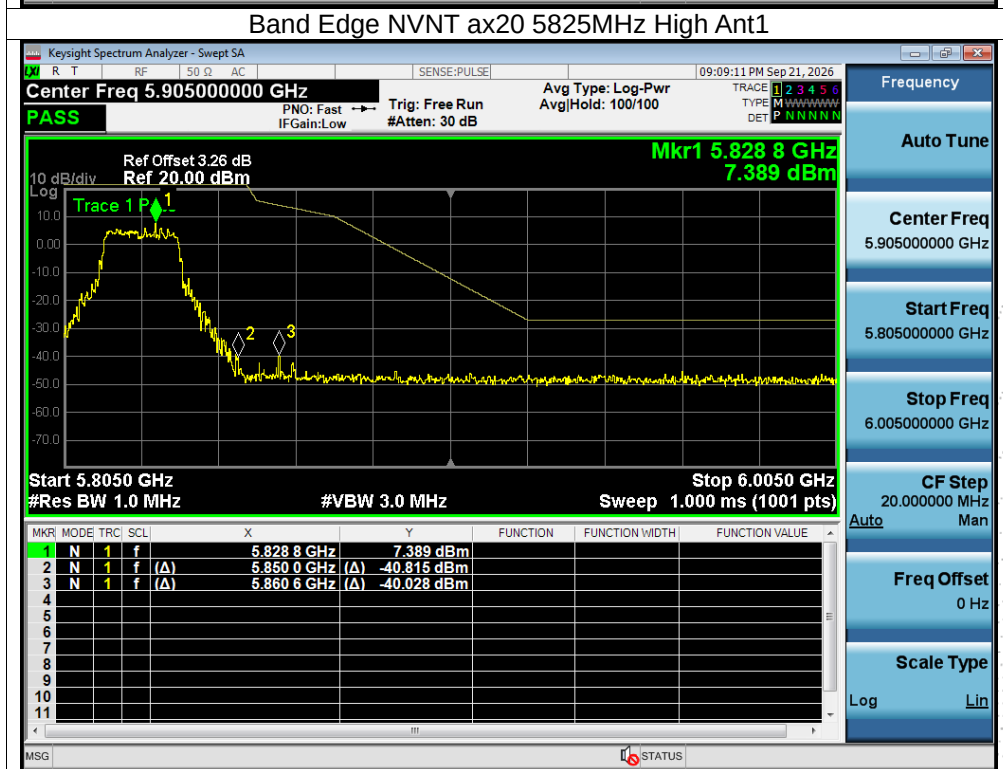
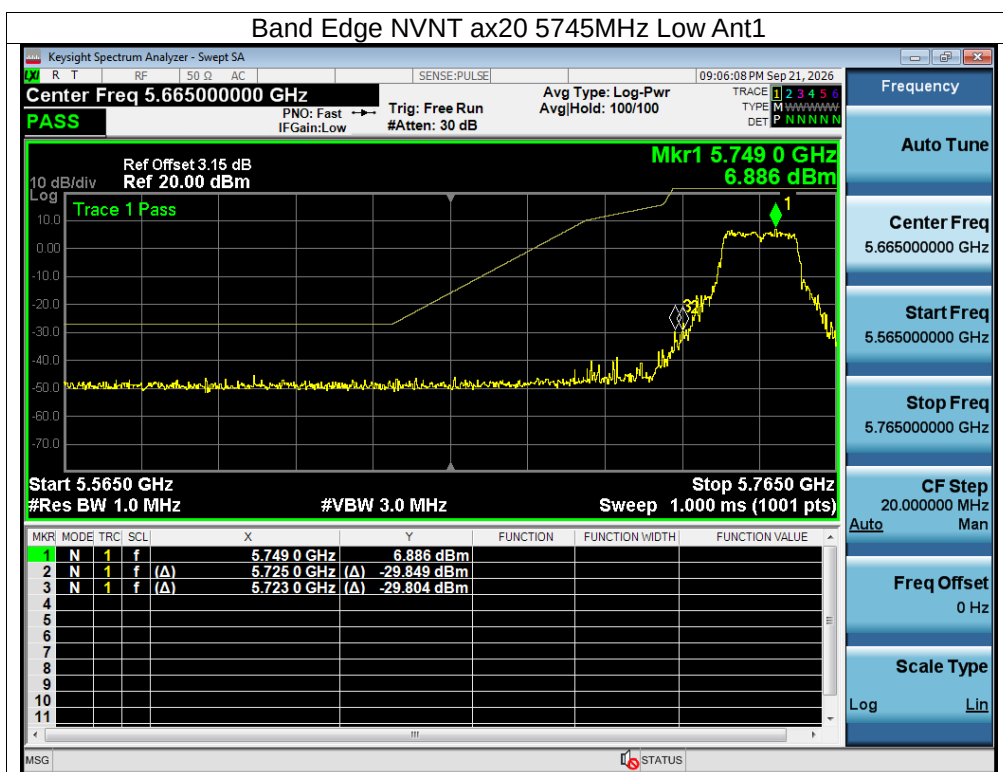


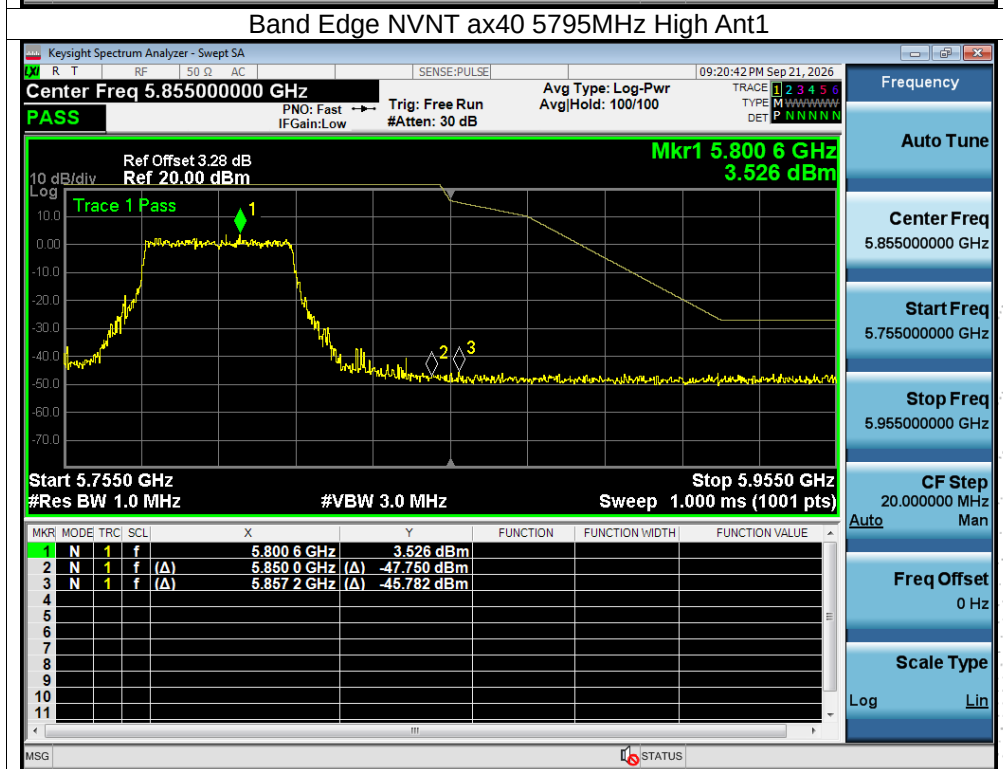
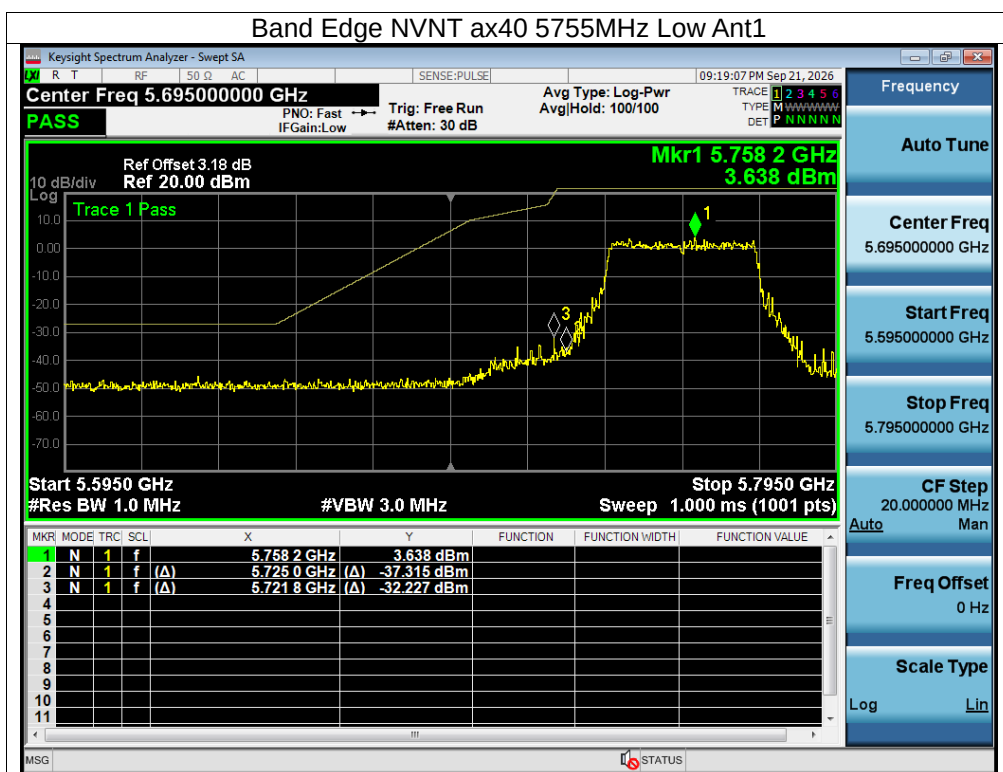


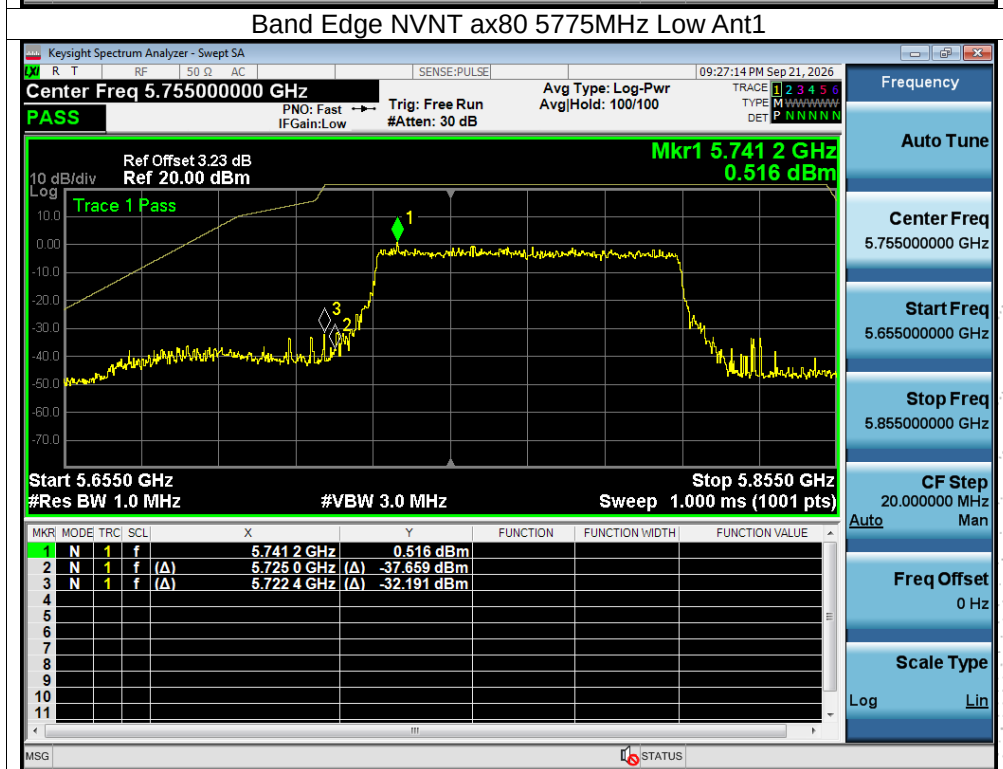
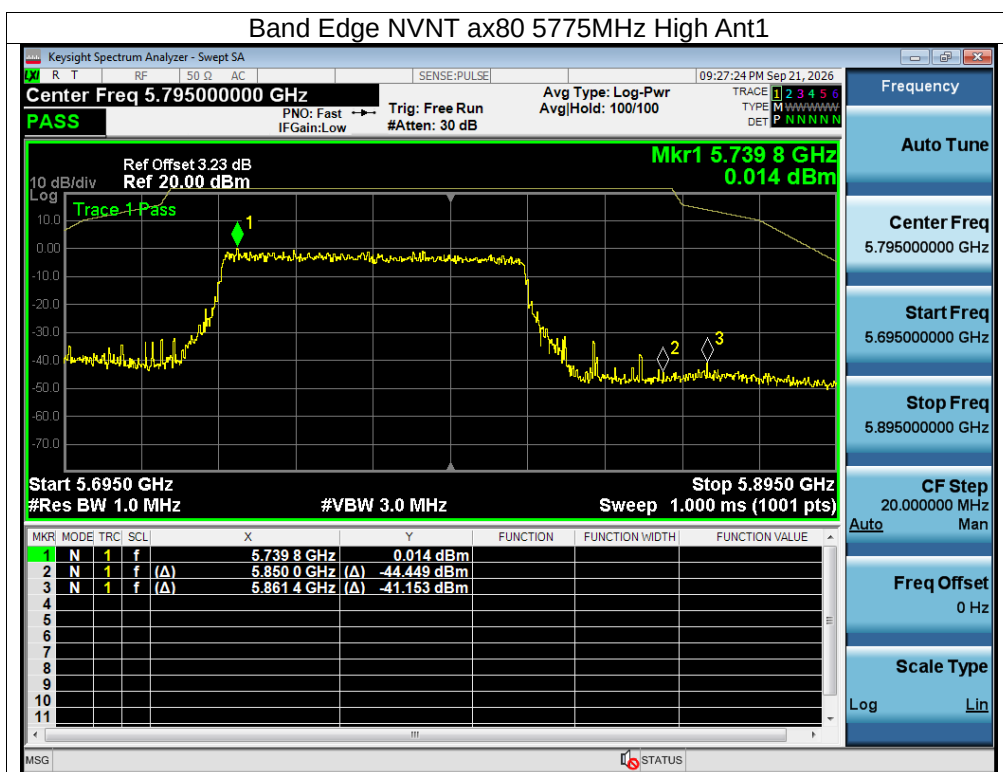












12. Spurious RF Conducted Emissions

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..

(3)For transmitters operating in the 5.25-5.35 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.

(4)For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

12.3 Test Procedure

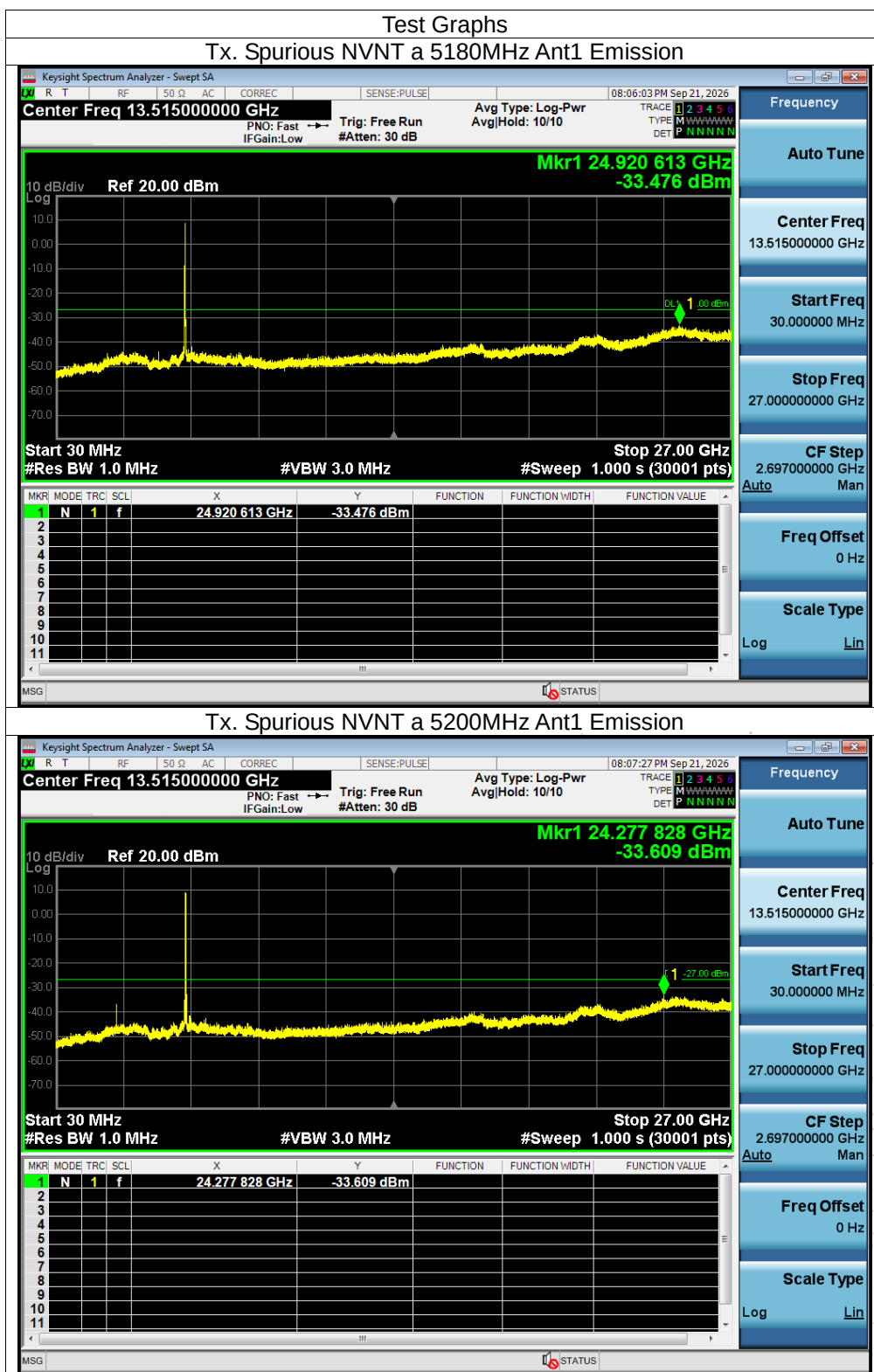
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then 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.

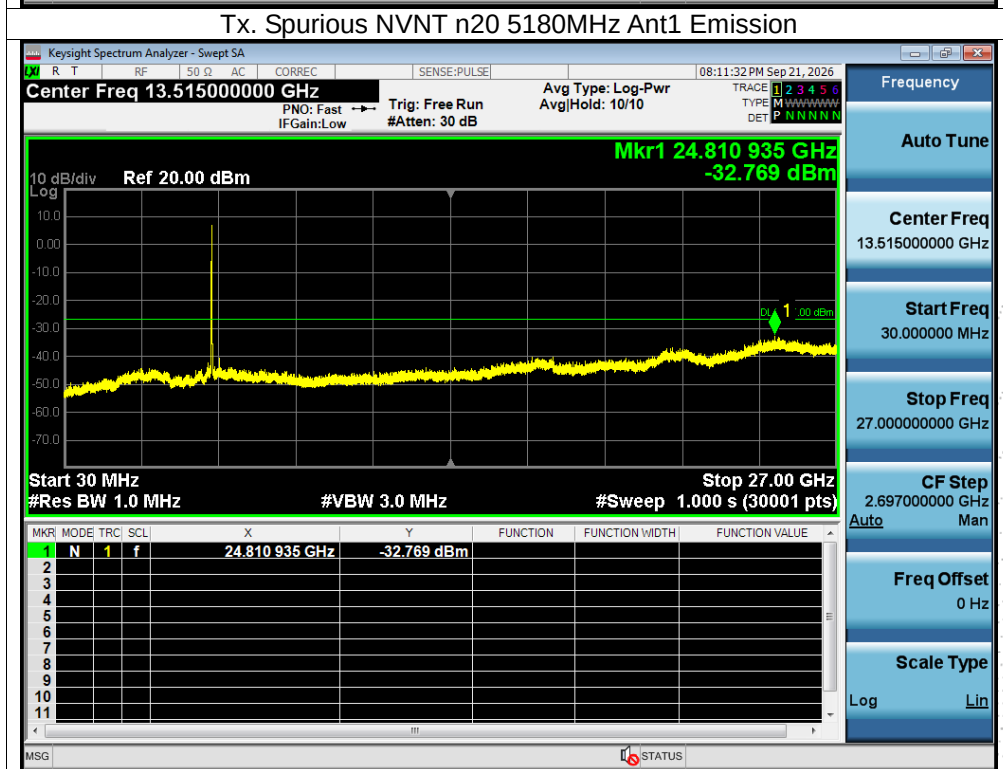
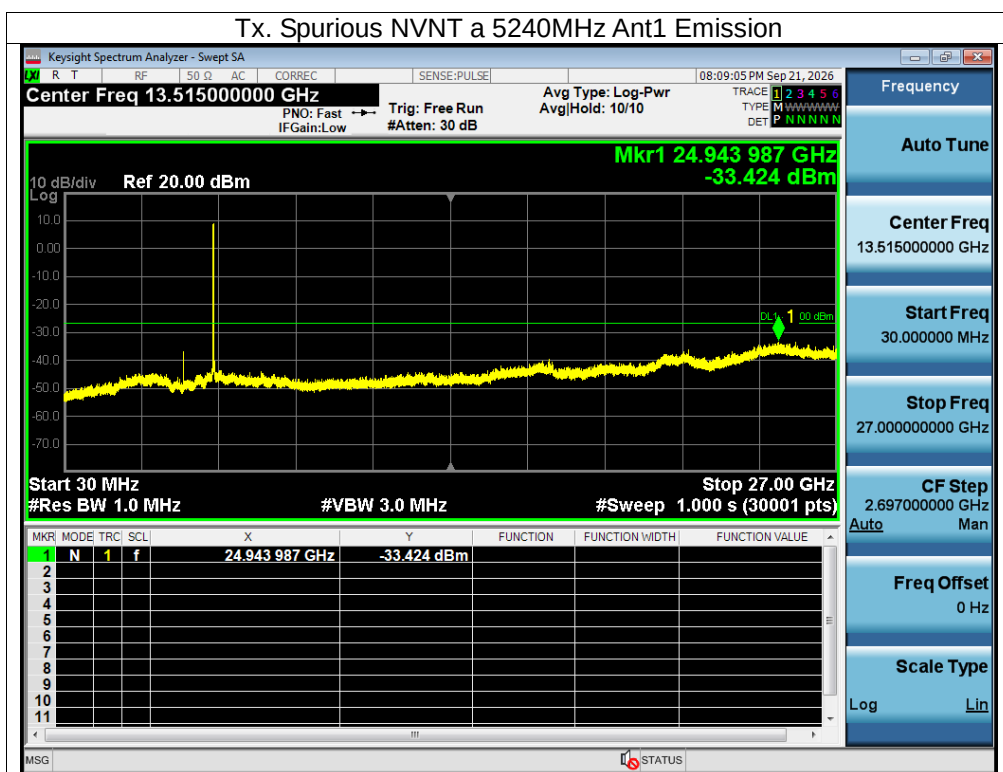
12.4 Test Result

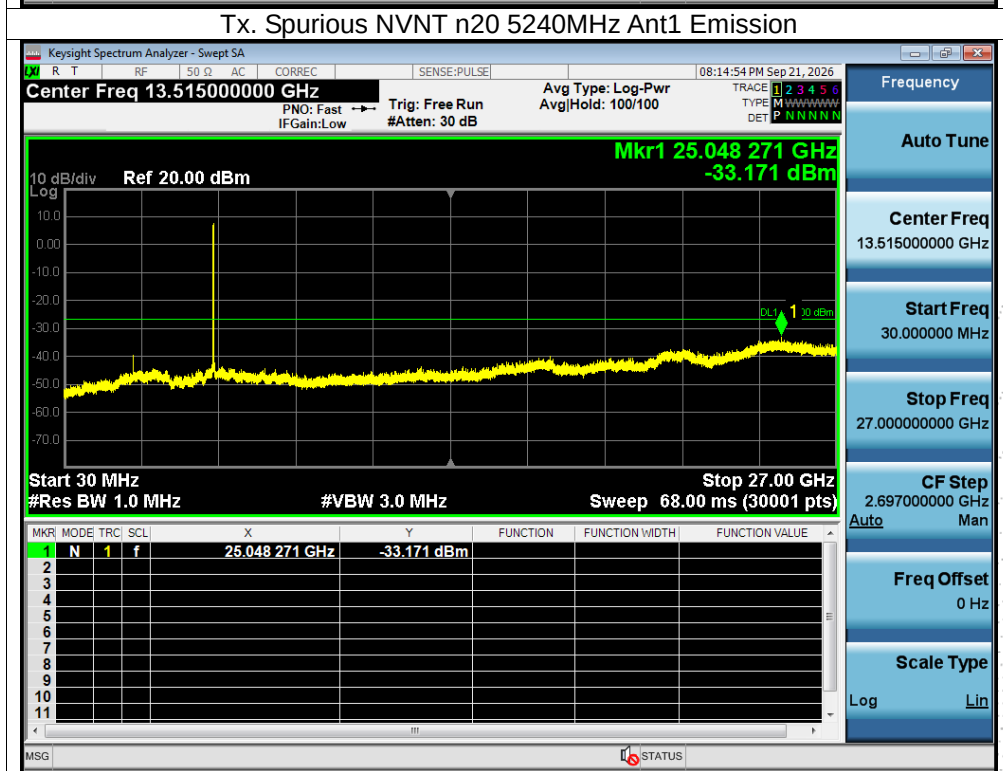
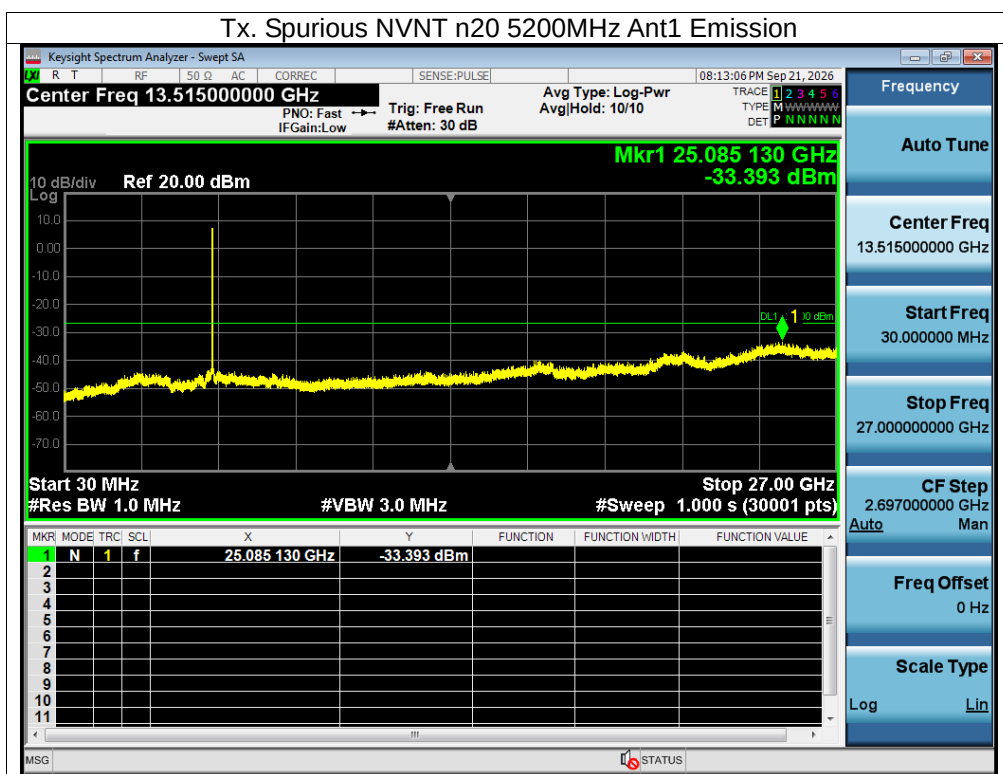
Remark: The measurement frequency range is from 9KHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandge measurement data.

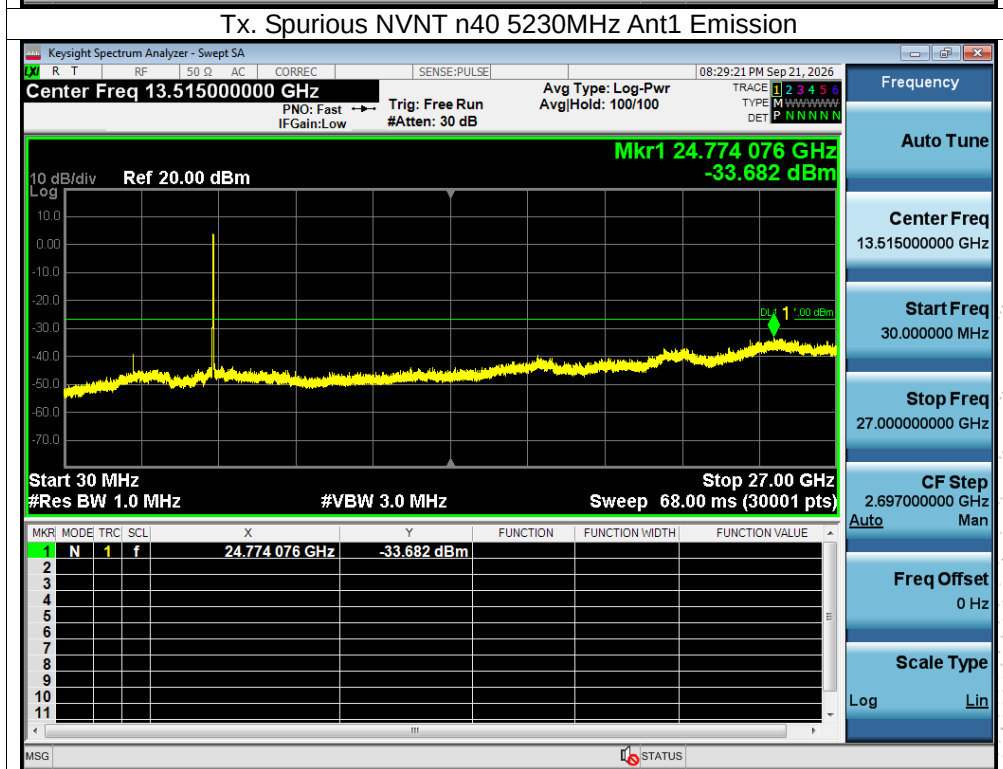
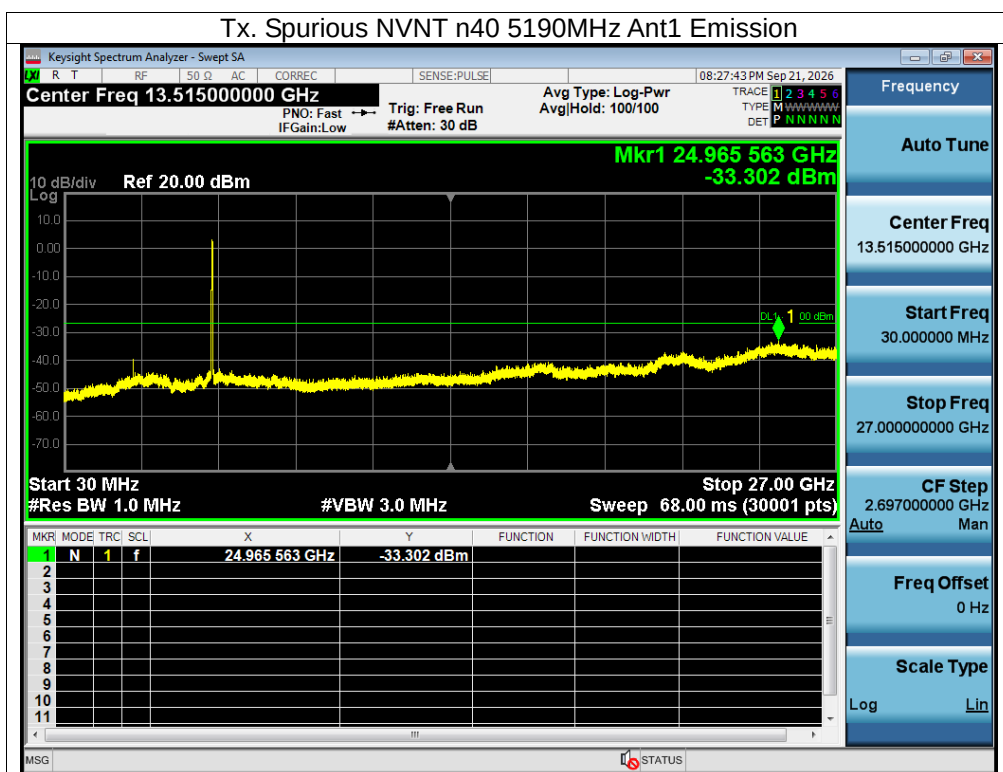
About:26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Test Mode:	5180-5240MHz
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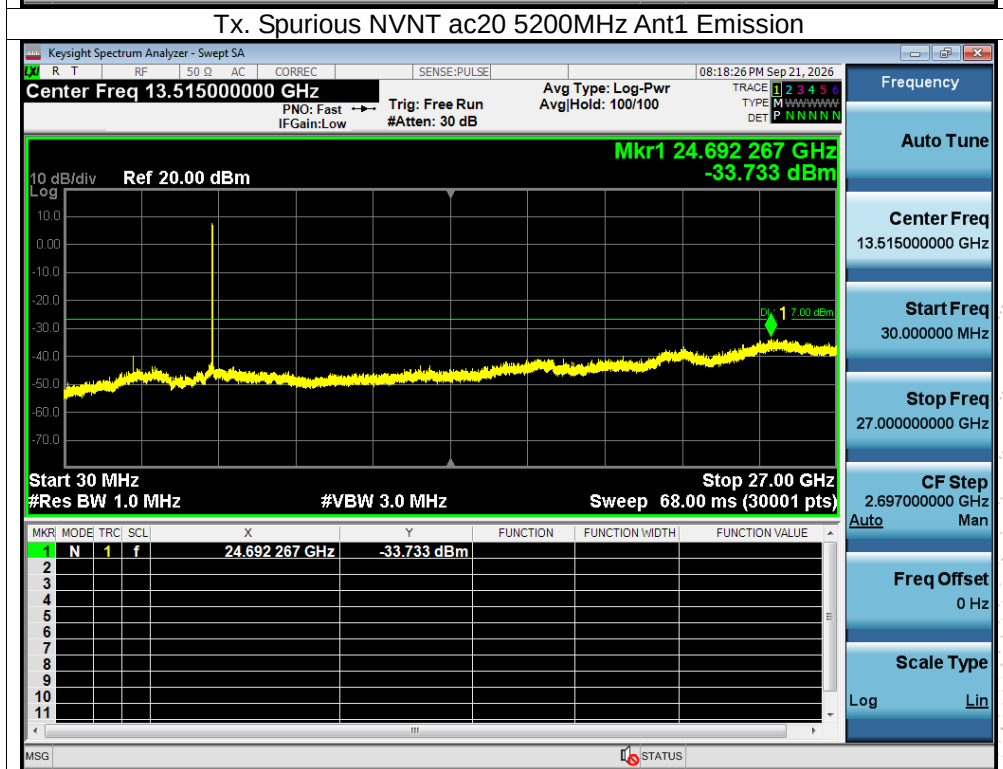
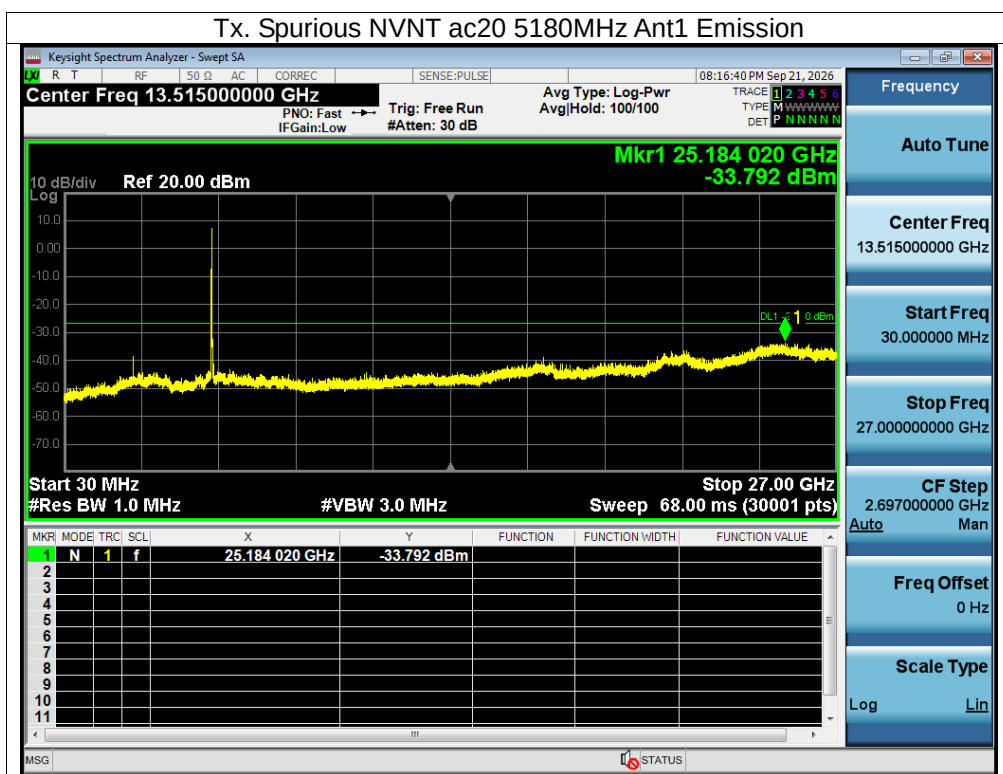


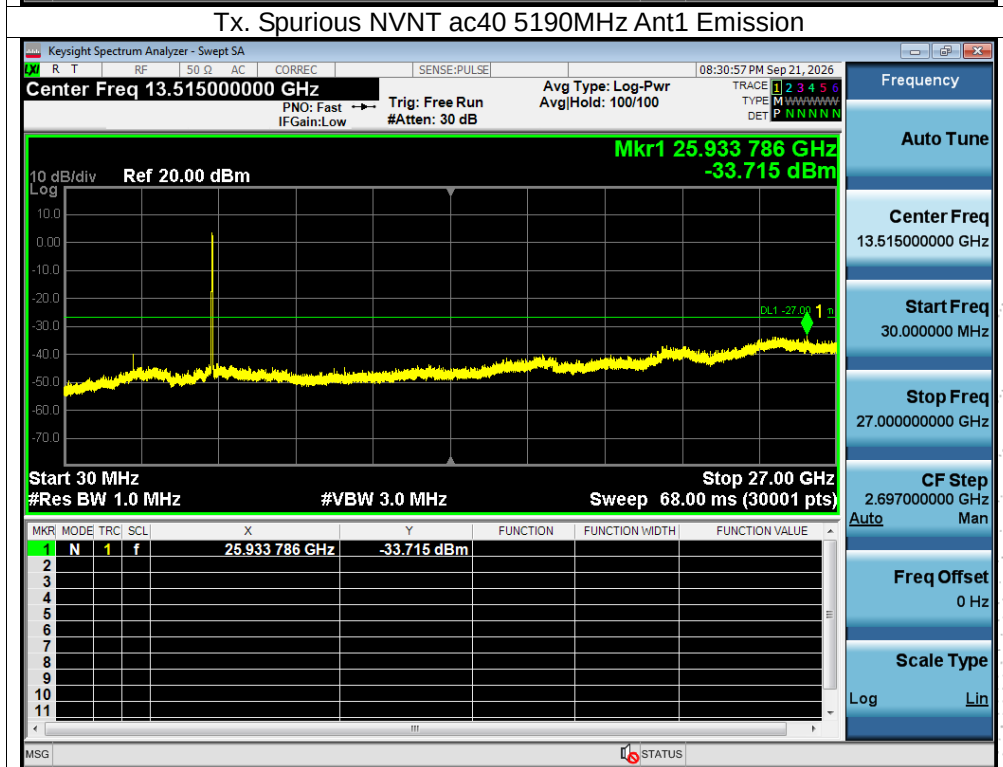
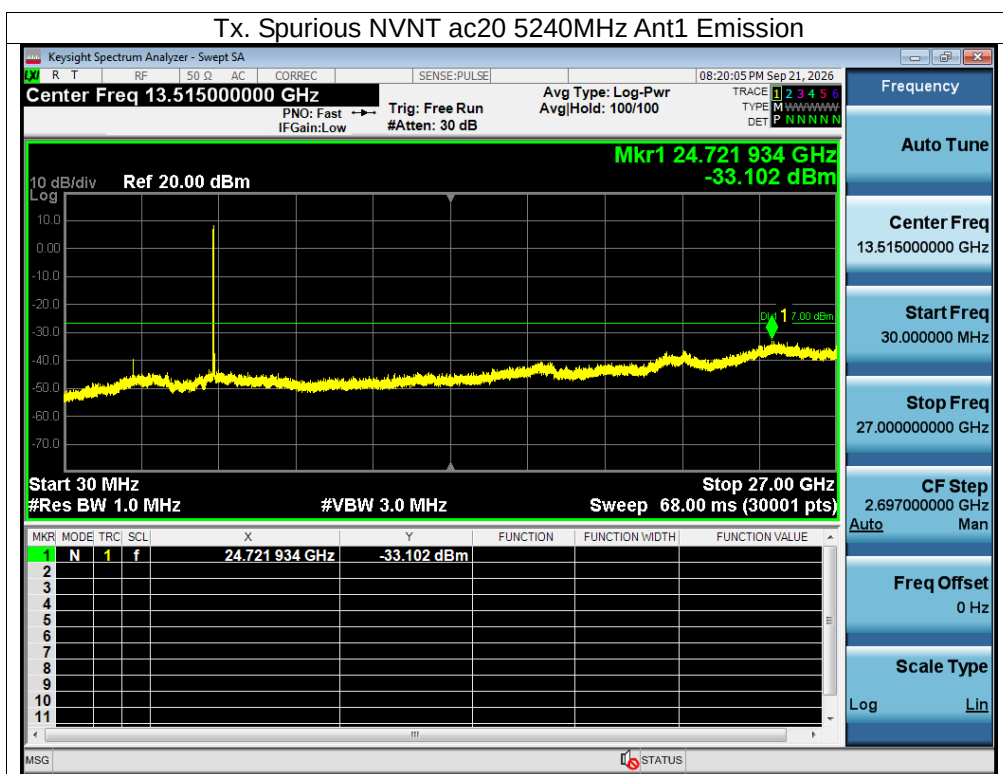


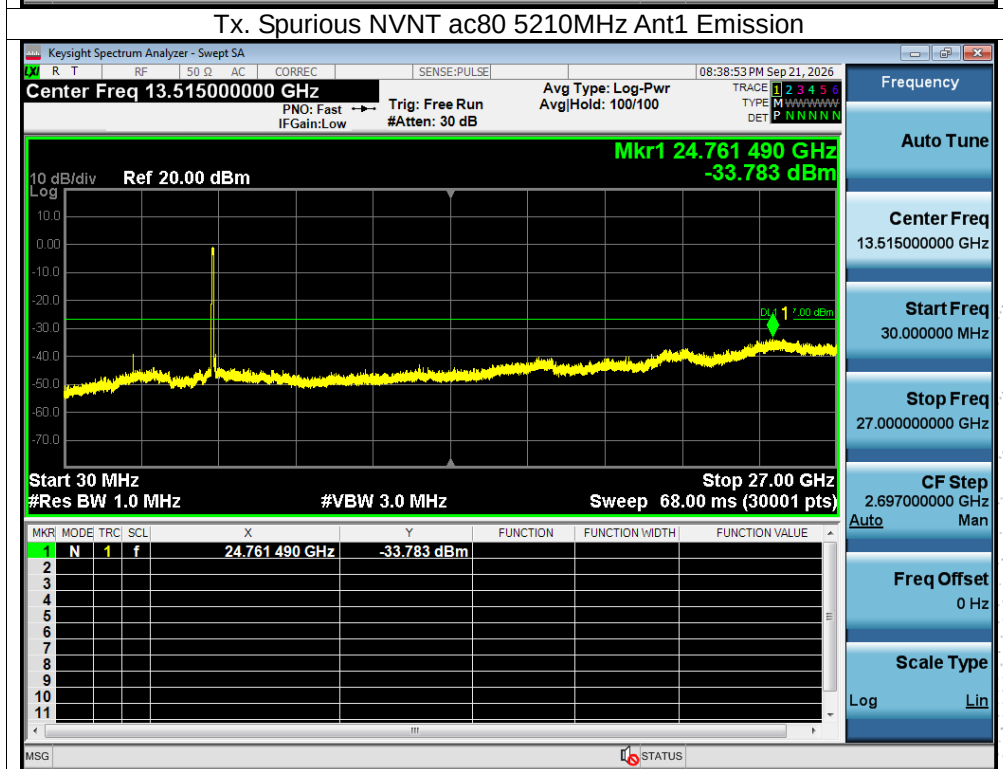
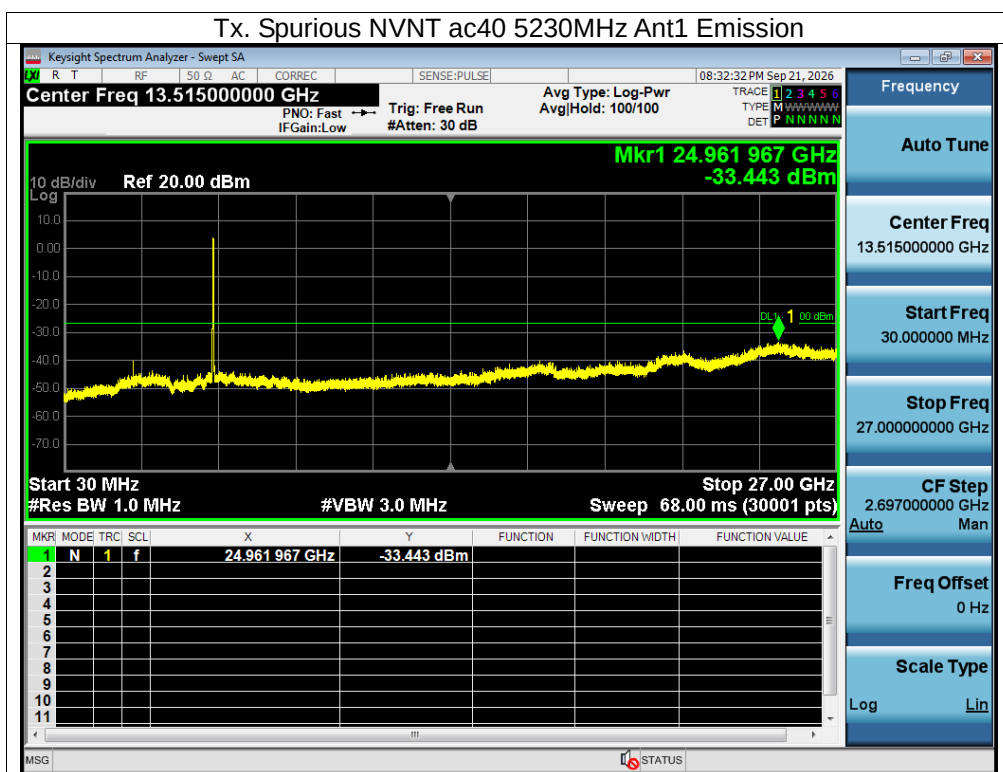


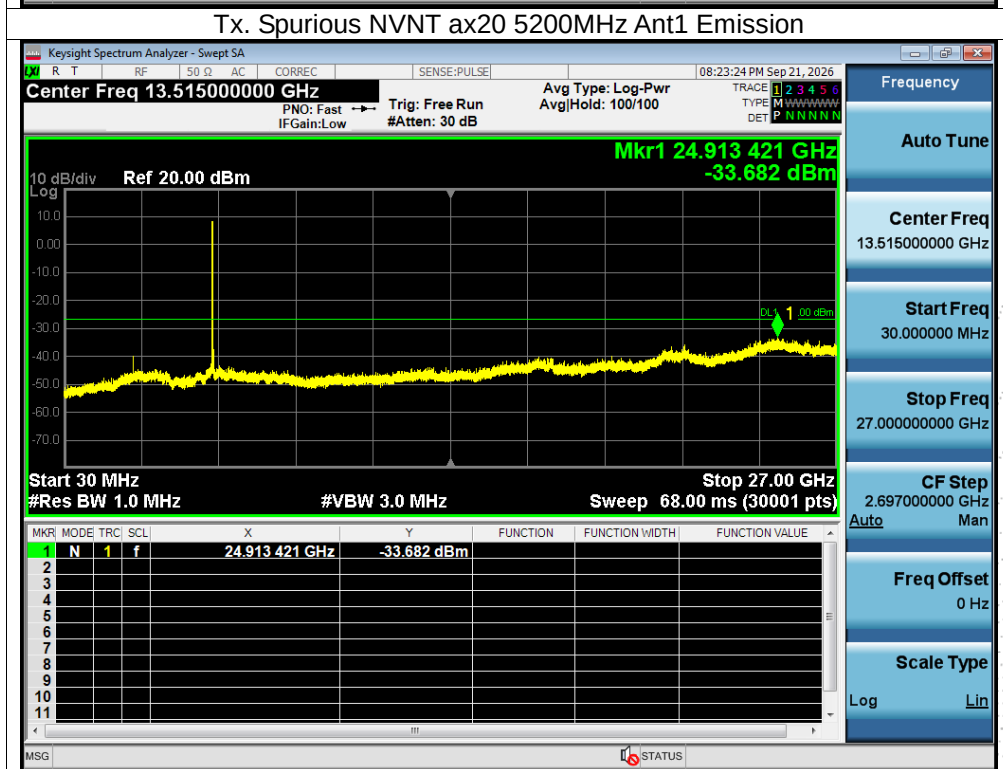
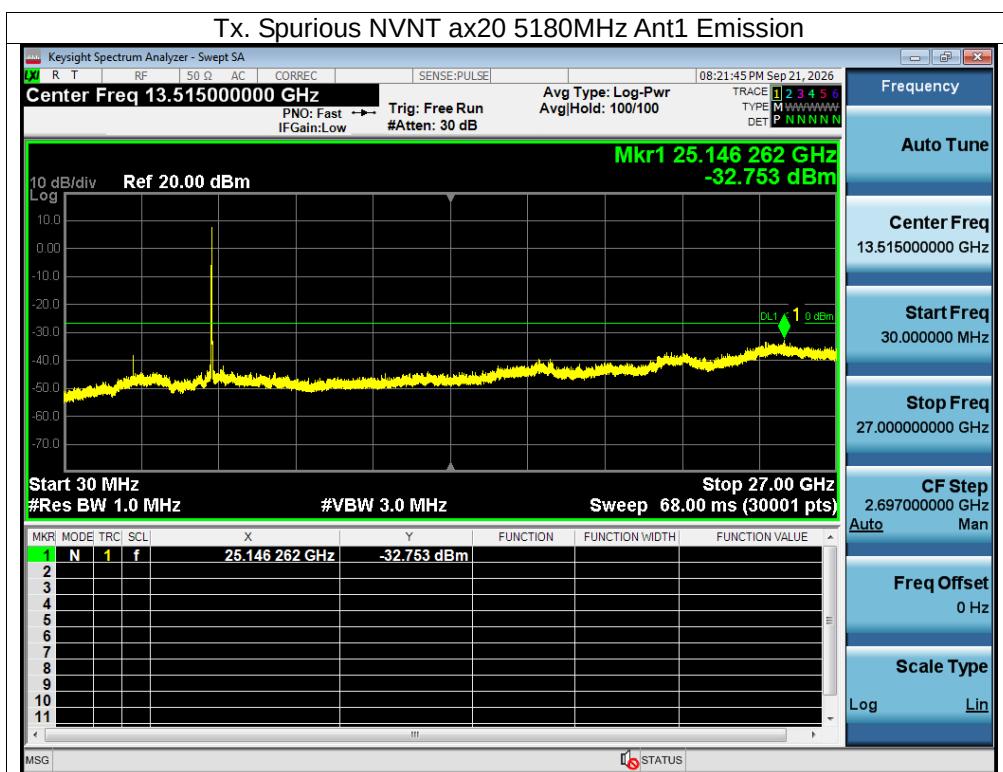


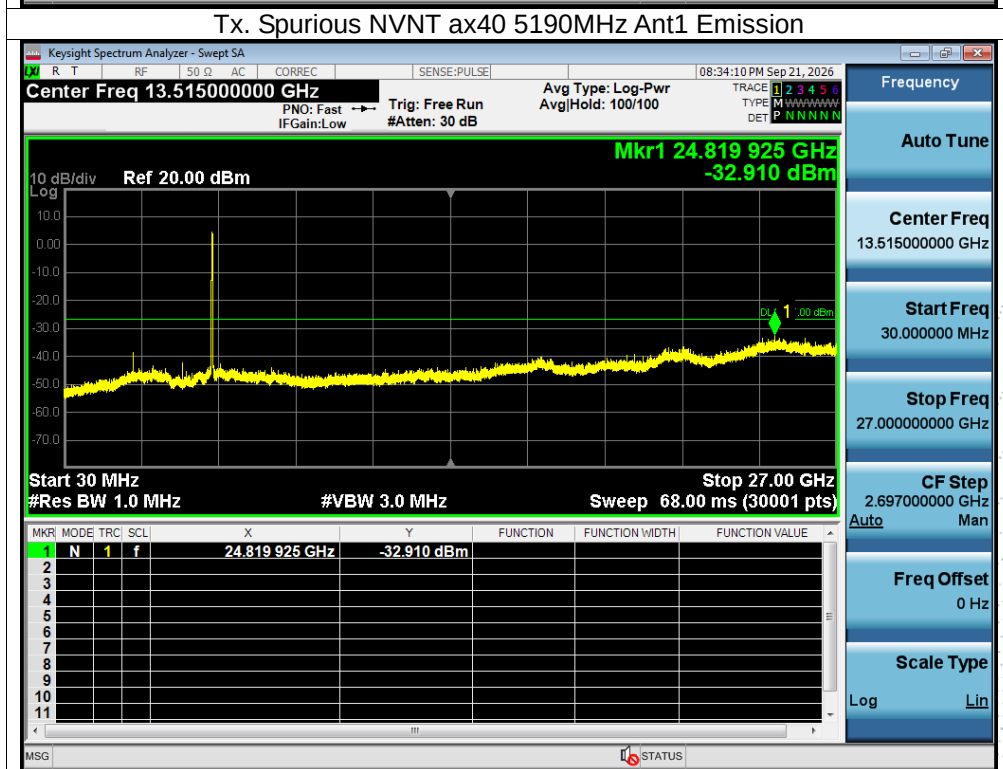
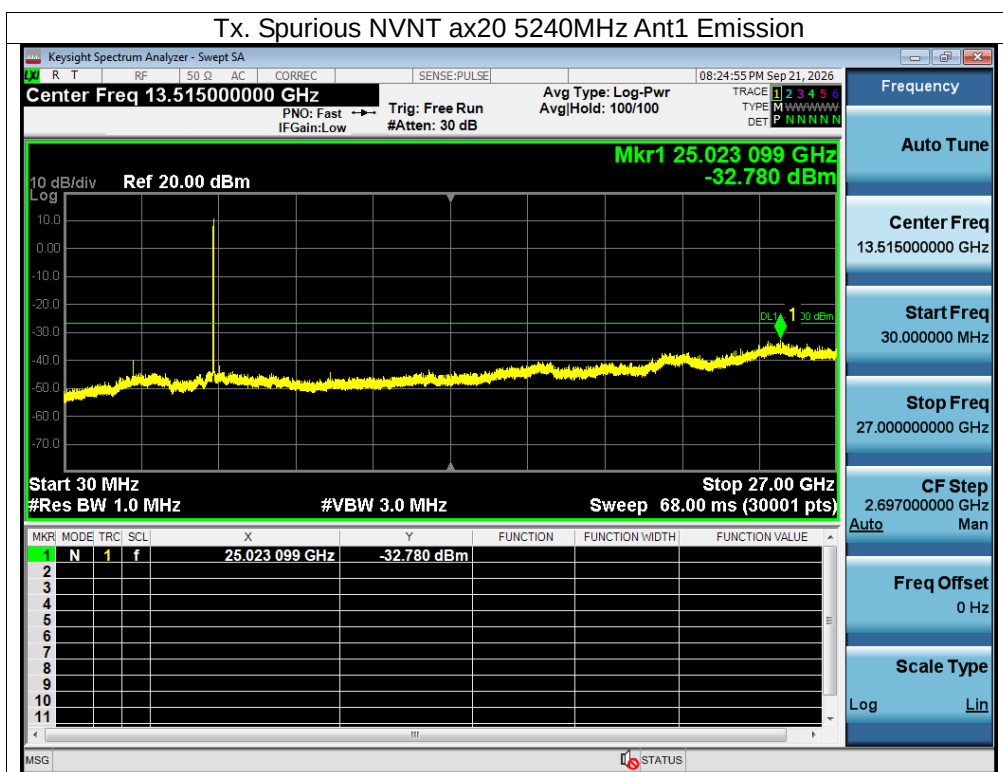
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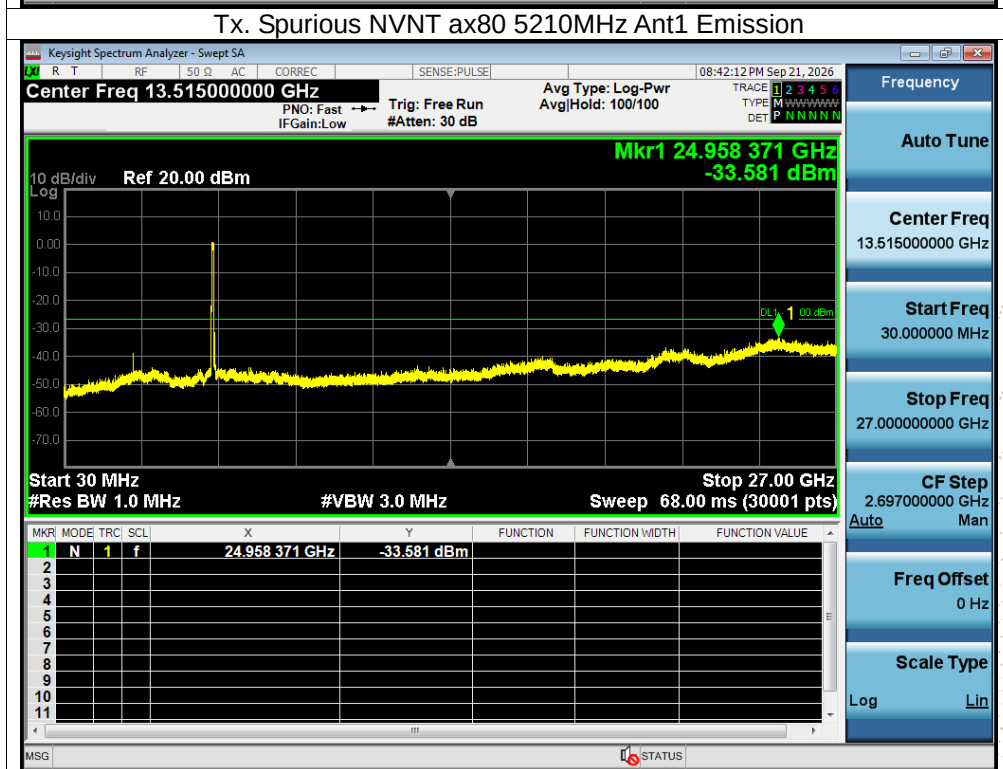
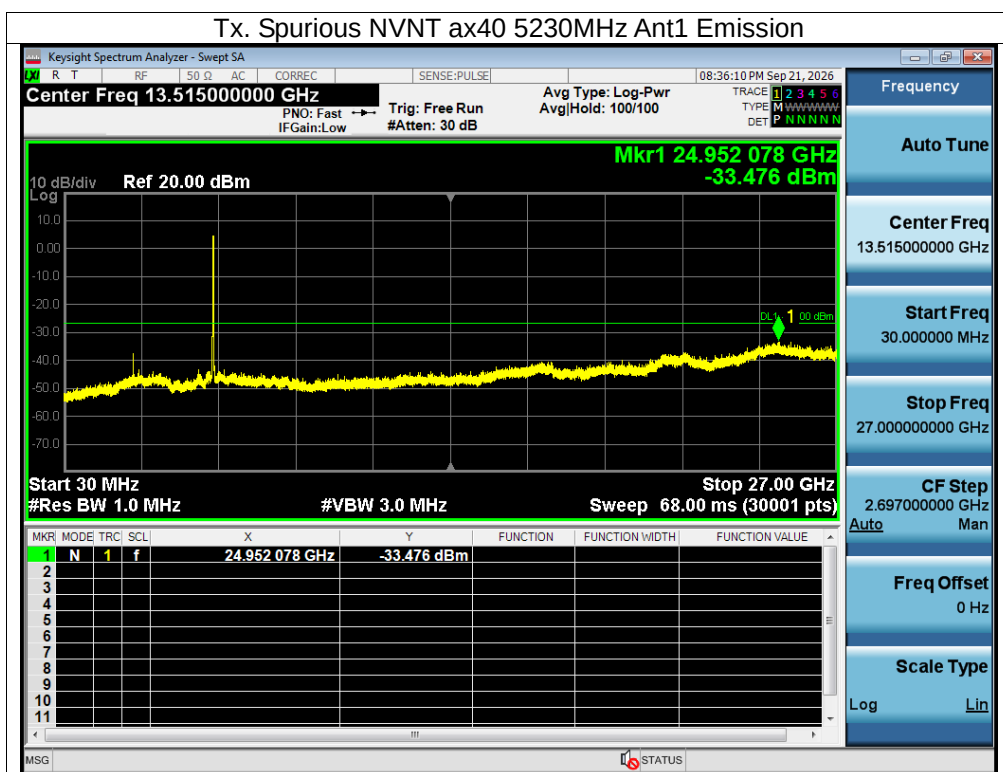






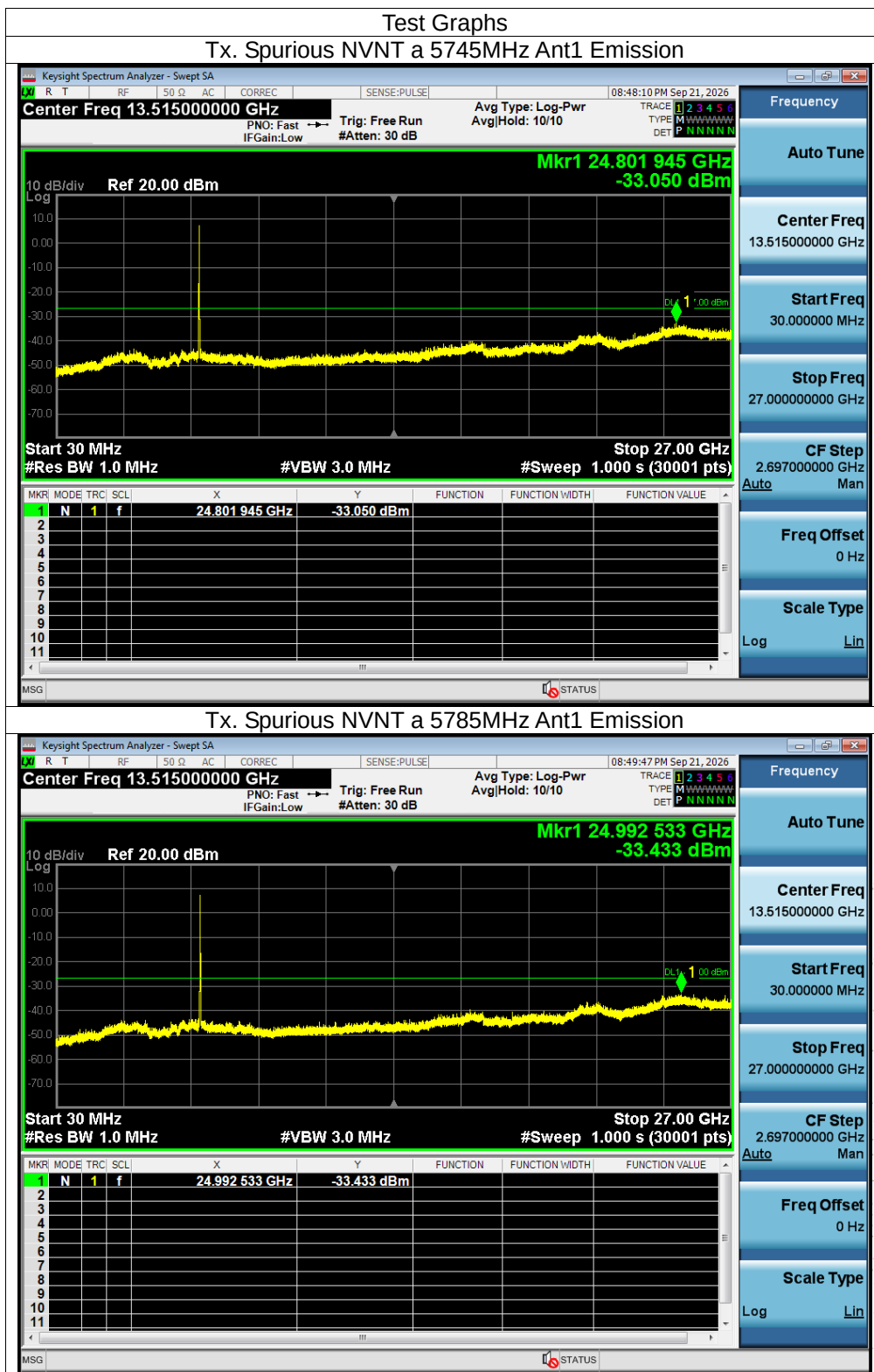


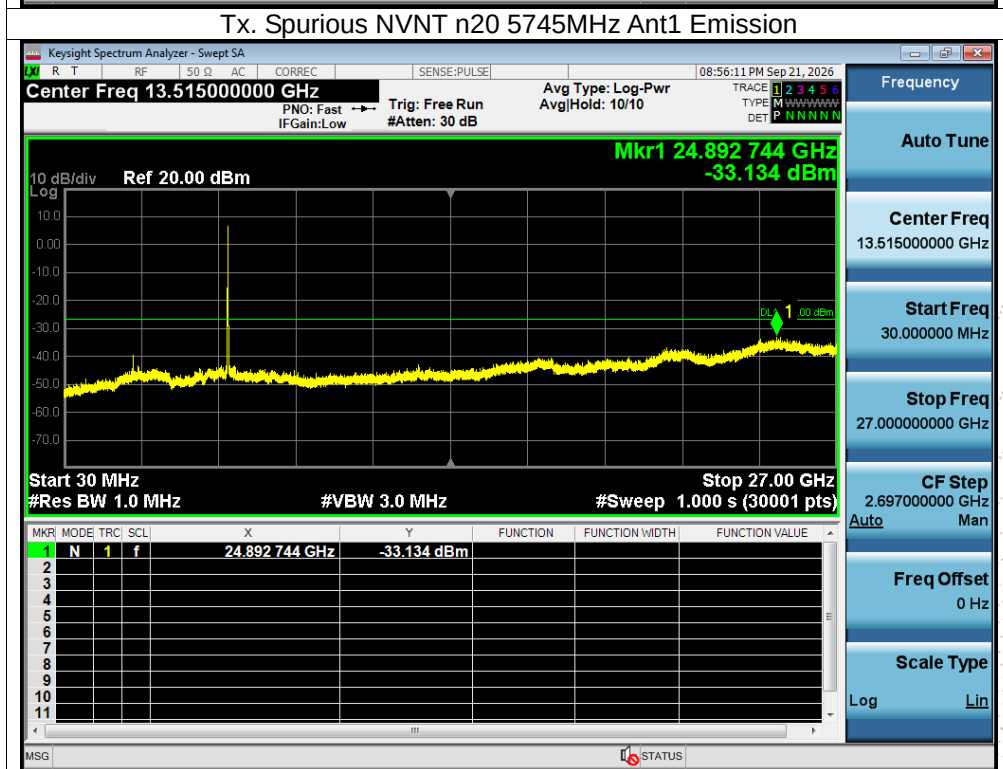
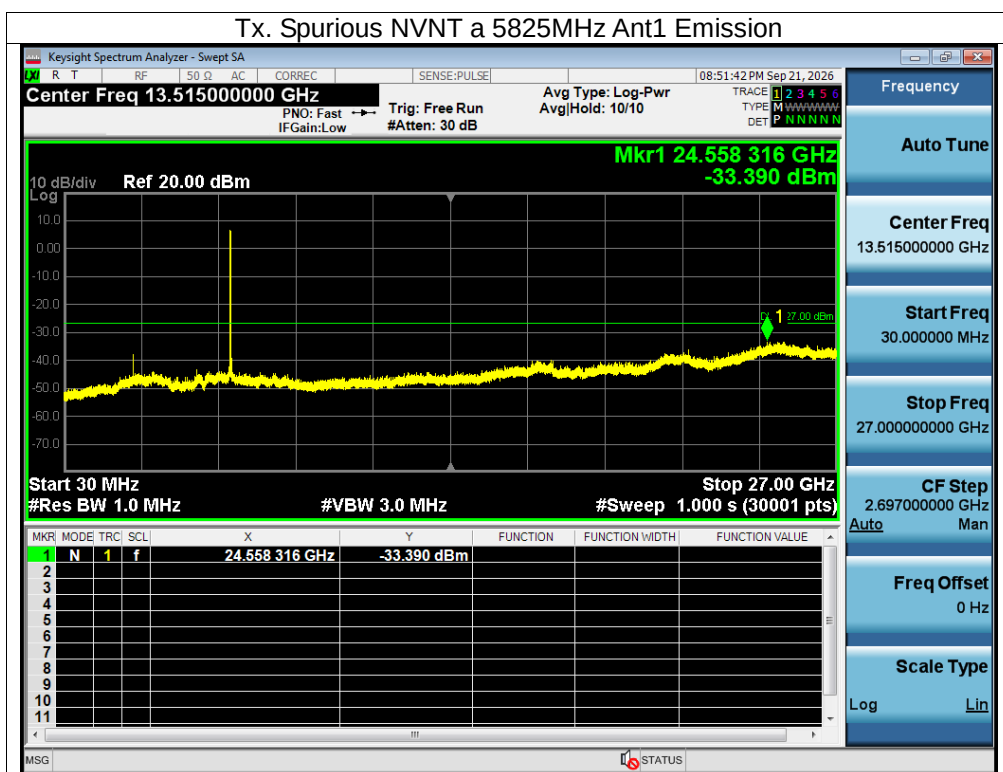


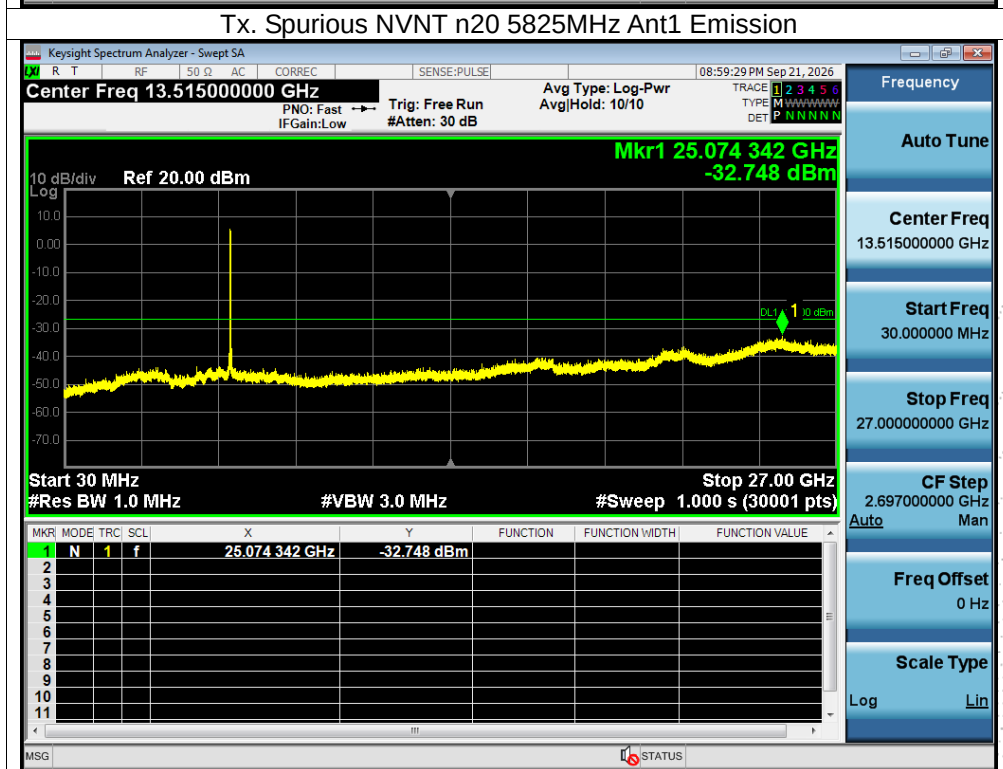
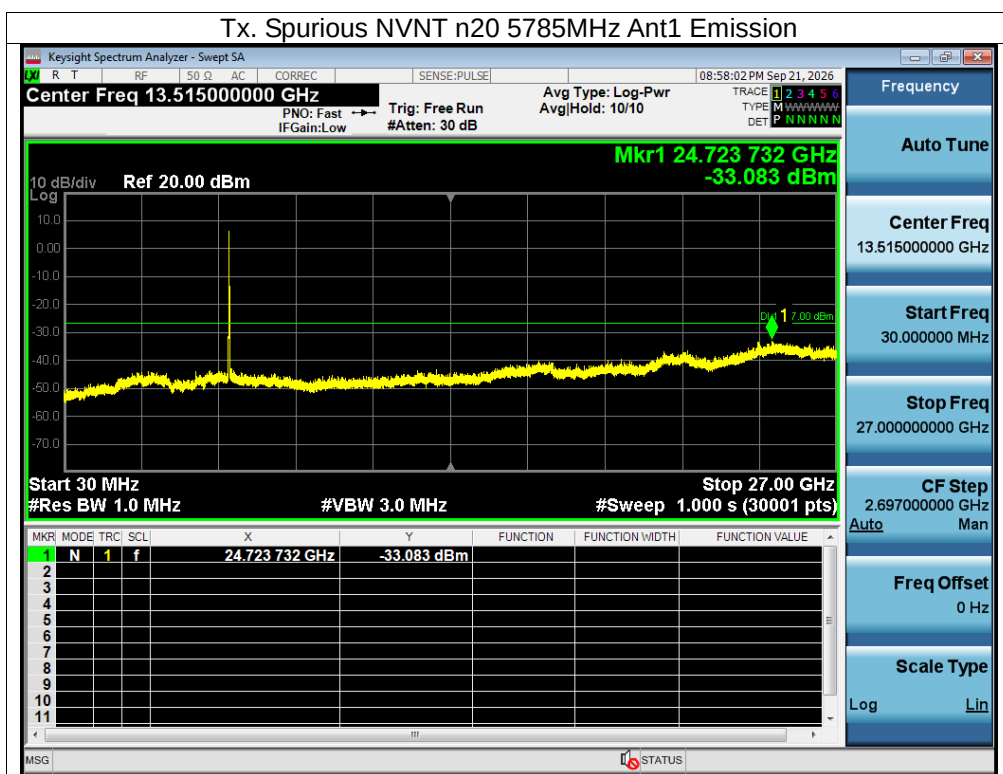


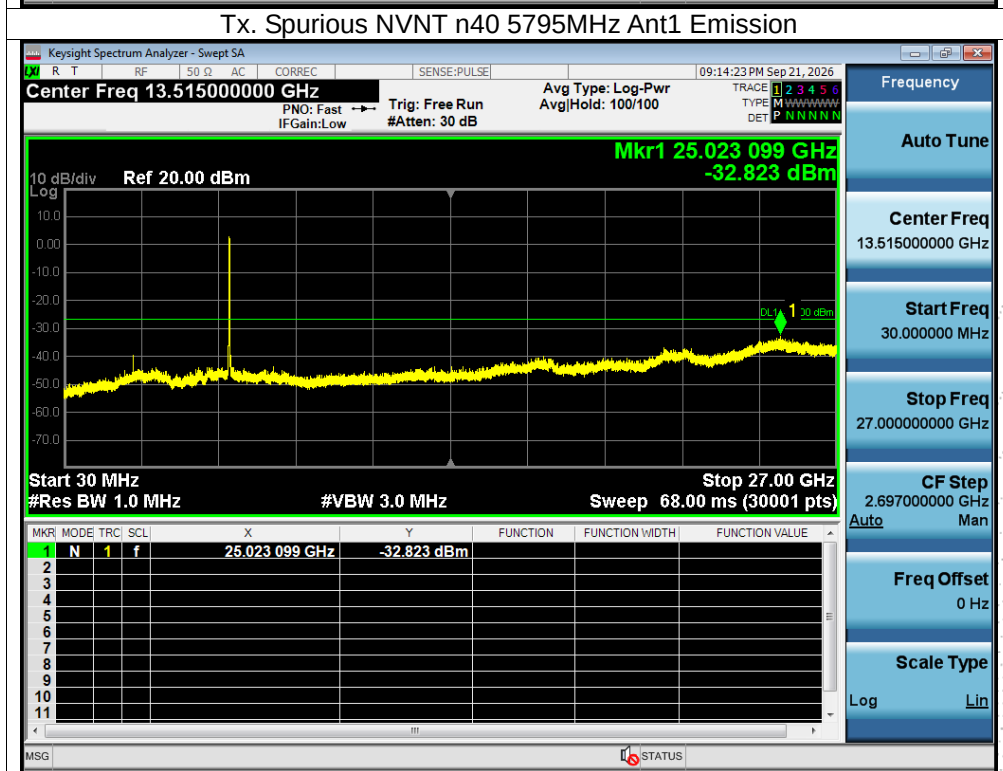
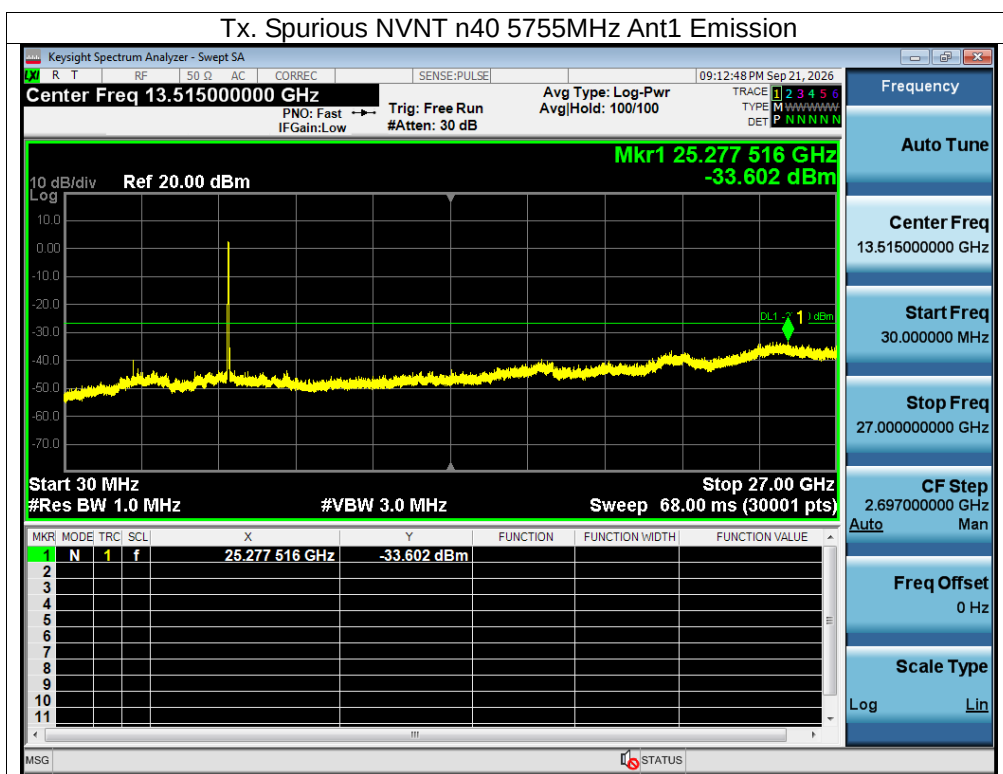
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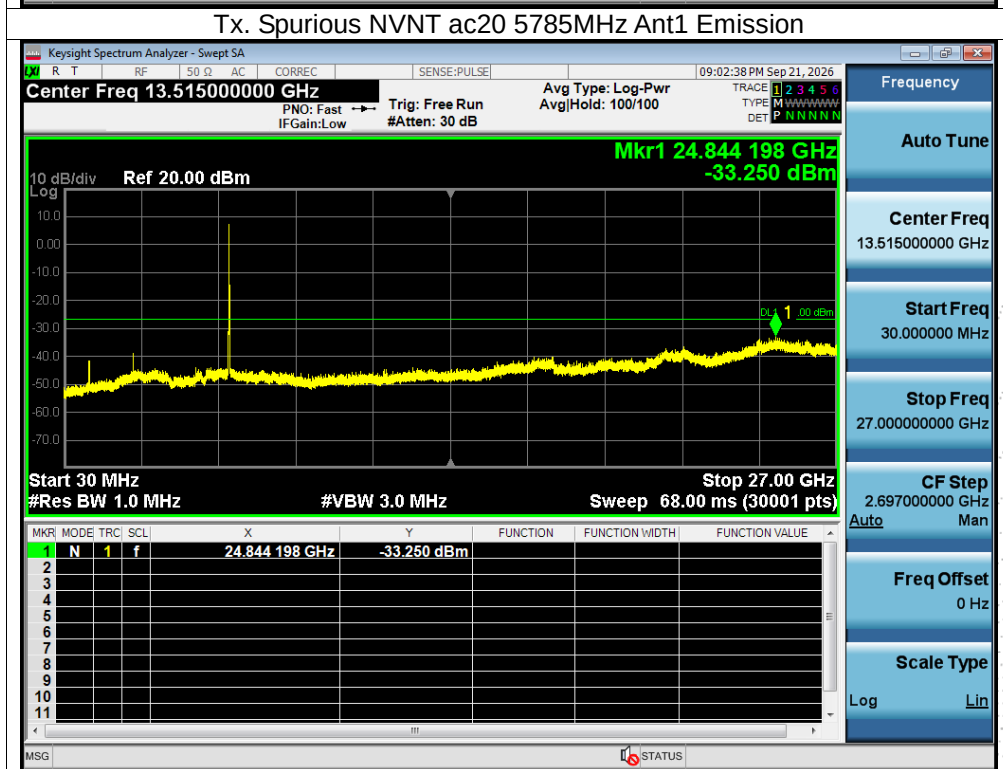
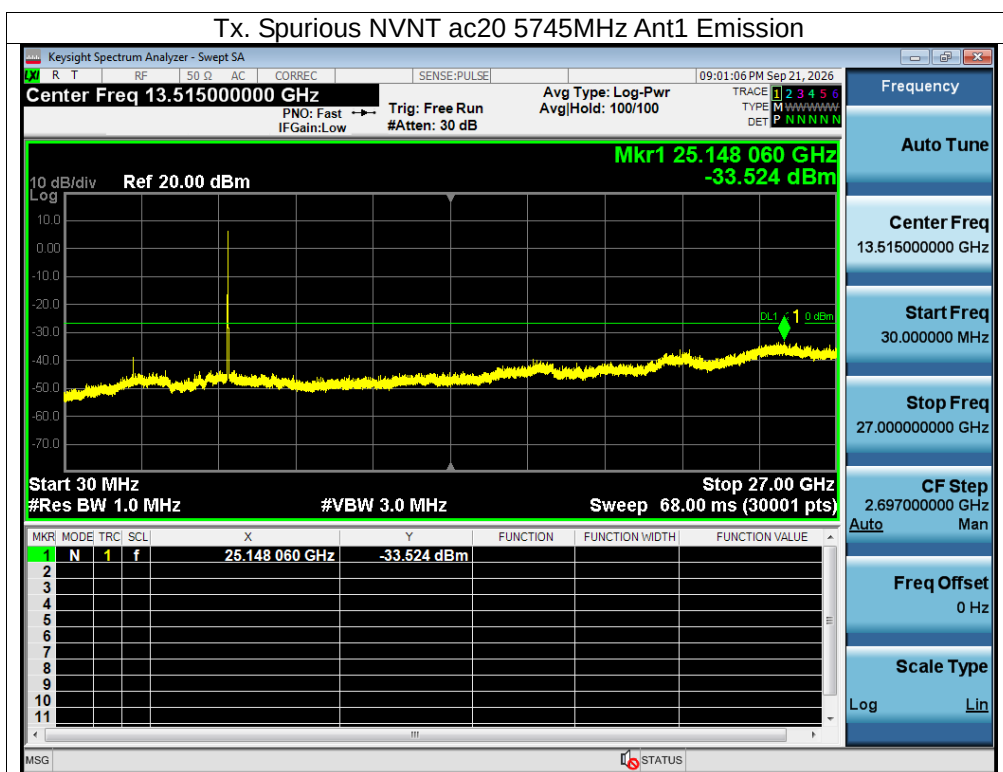
Test Mode:	5745-5825MHz
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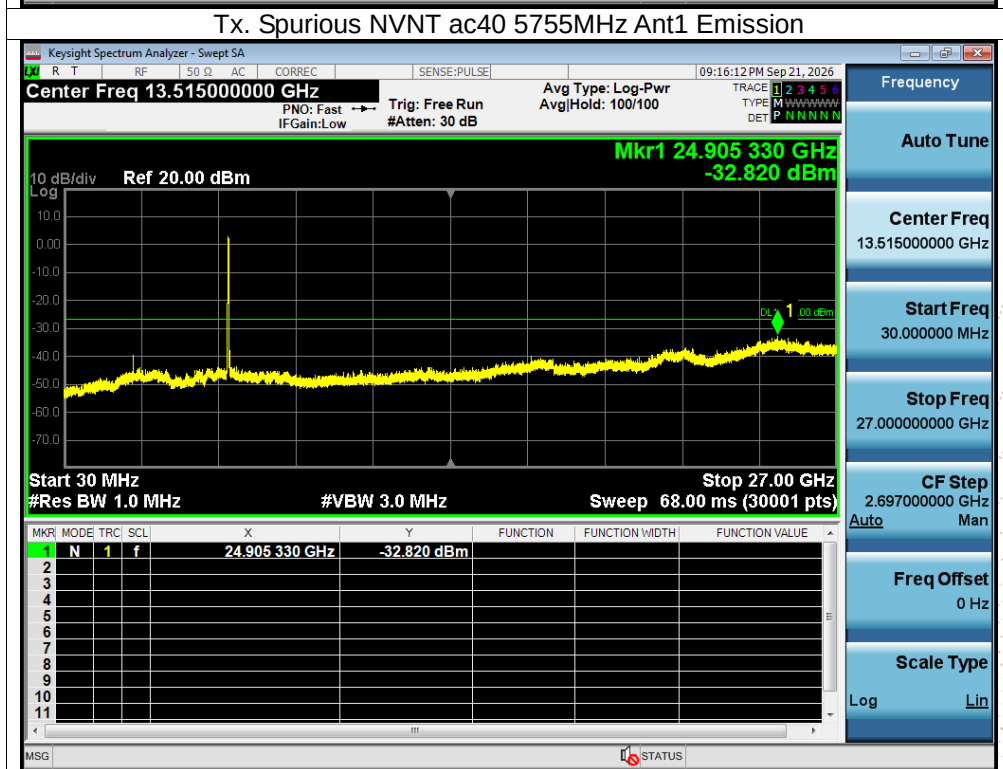
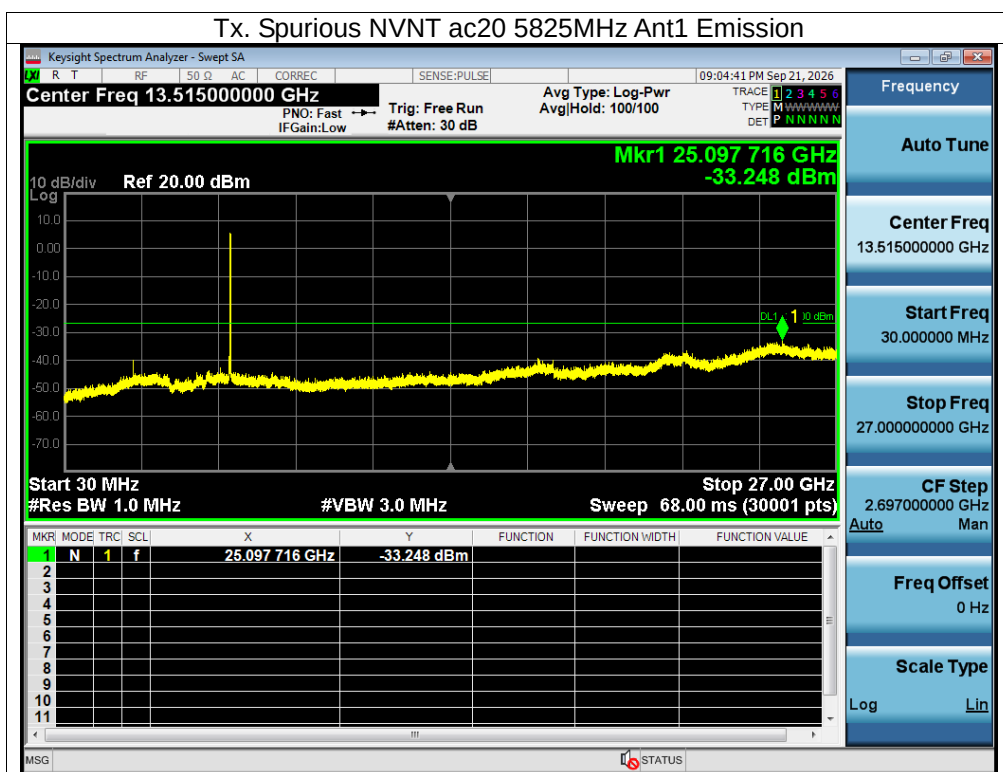




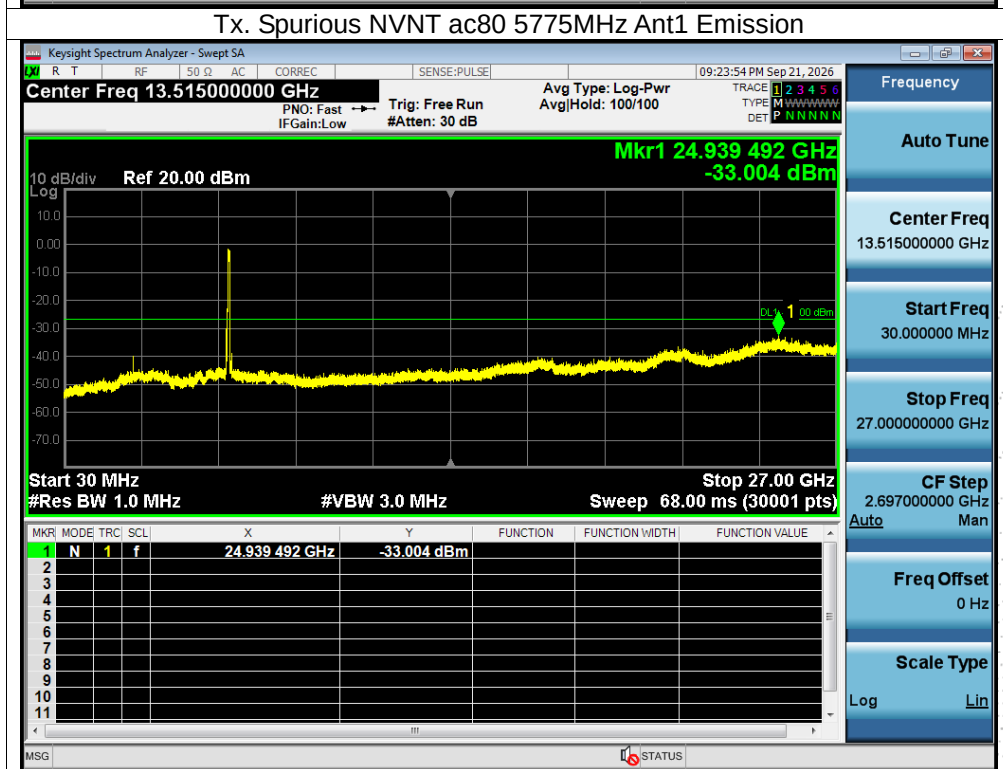
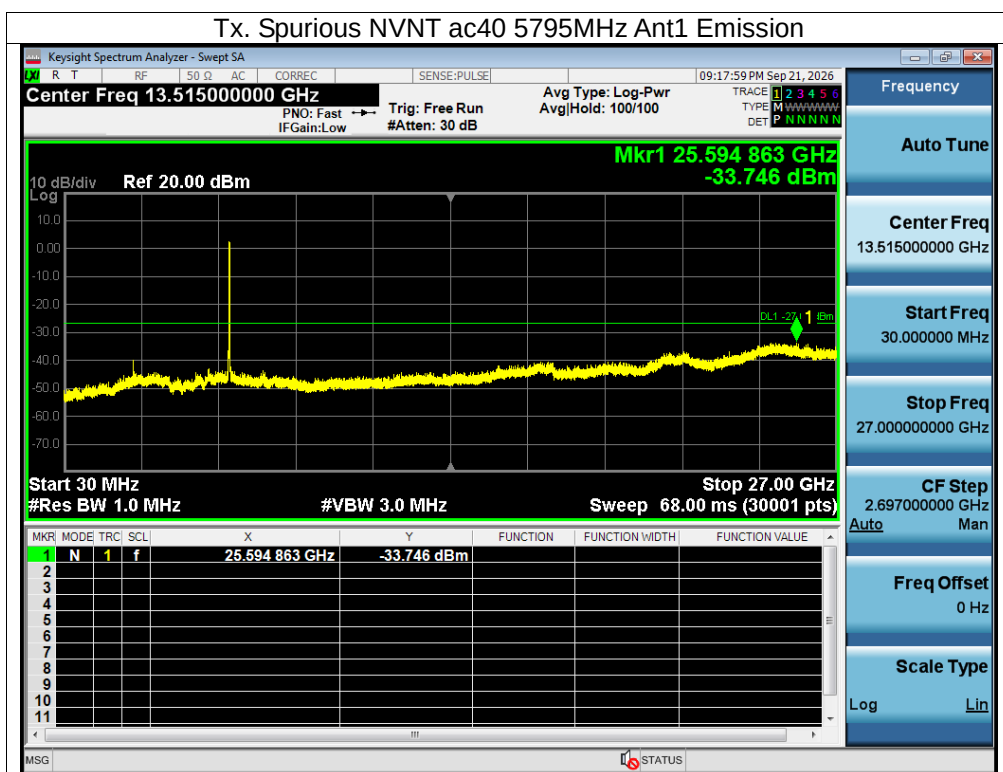


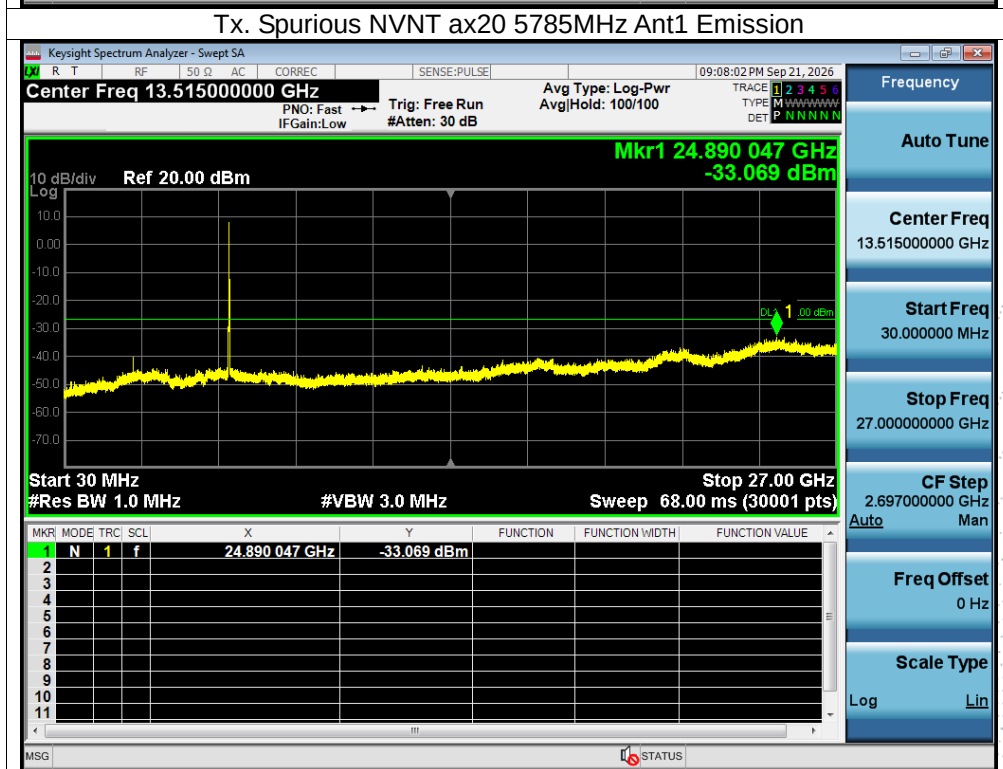
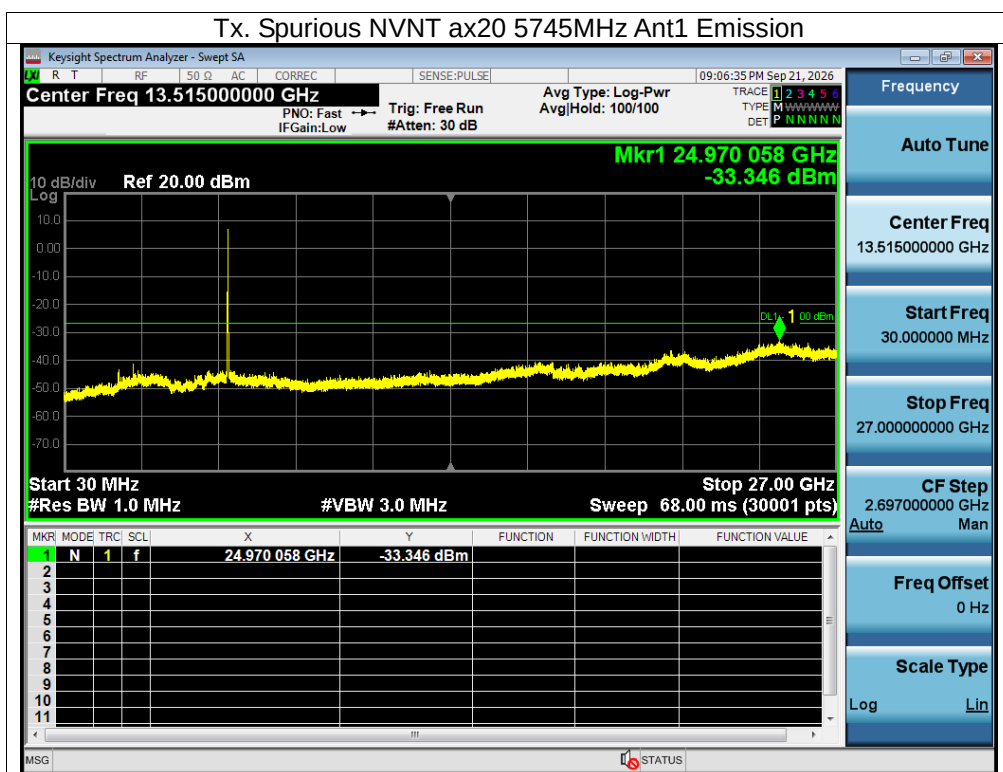


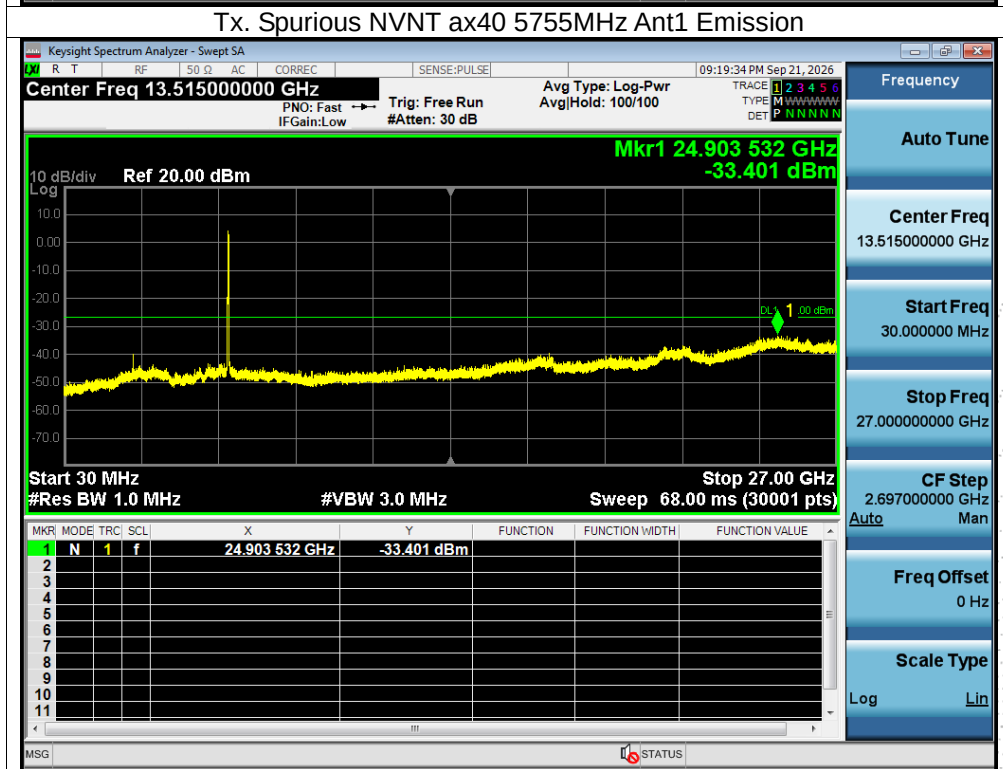
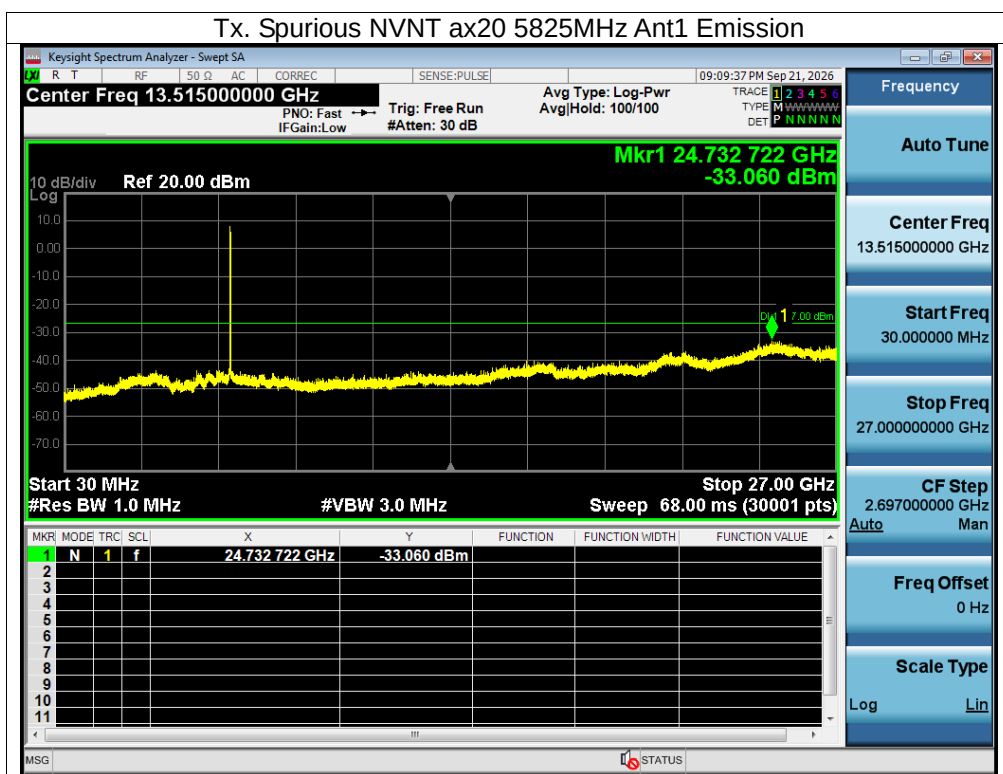


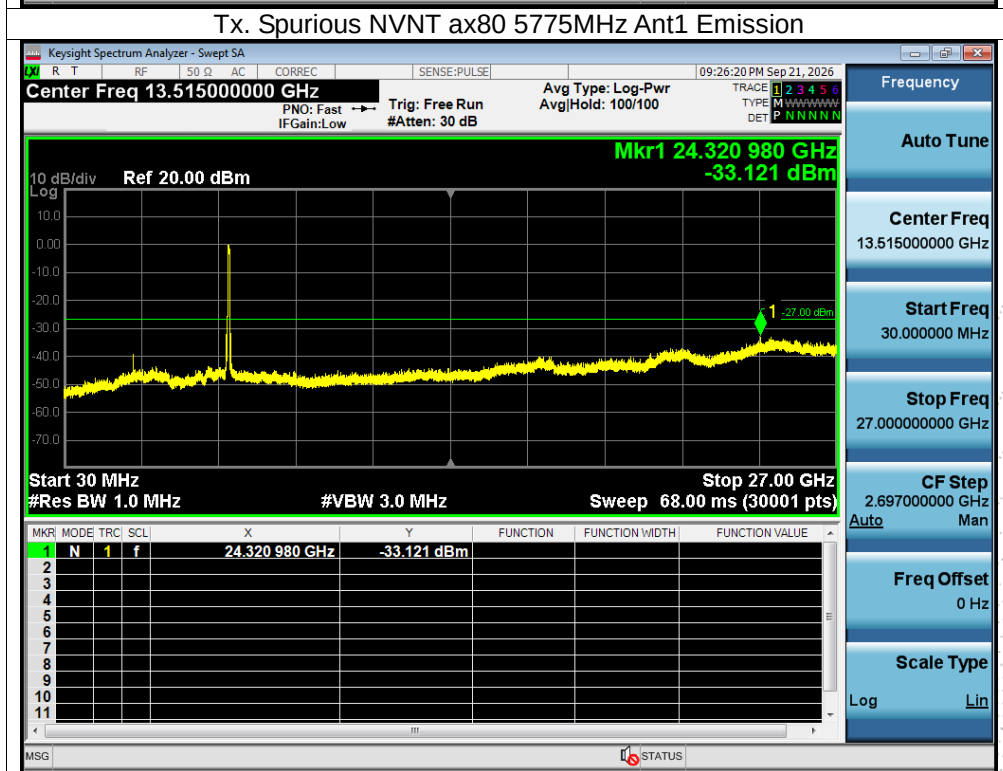
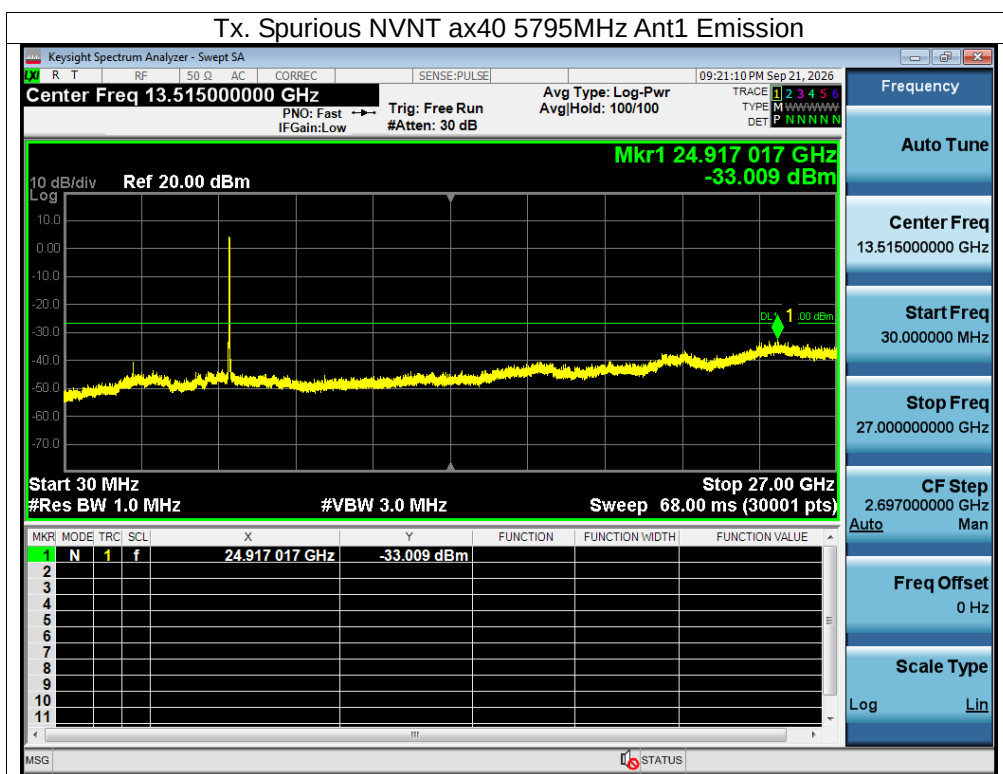


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13. Frequency Stability Measurement

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°C ~ 70°C .

13.4 Test Result

Temperature:	23 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	DC 12V
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)	12.00	5180.0084	5180	0.0084	1.6162
		V max (V)	13.80	5180.0051	5180	0.0051	0.9883
		V min (V)	10.20	5180.0036	5180	0.0036	0.6961
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 (DV)	12	T (°C)	-20	5180.0014	5180	0.0014	0.2690
		T (°C)	-10	5180.0107	5180	0.0107	2.0751
		T (°C)	0	5180.0078	5180	0.0078	1.5029
		T (°C)	10	5180.0131	5180	0.0131	2.5204
		T (°C)	20	5180.0083	5180	0.0083	1.6025
		T (°C)	30	5180.0045	5180	0.0045	0.8623
		T (°C)	40	5180.0021	5180	0.0021	0.4046
		T (°C)	50	5180.0007	5180	0.0007	0.1285
		T (°C)	60	5180.0018	5180	0.0018	0.3457
		T (°C)	70	5180.0031	5180	0.0031	0.6064
Limits				5150-5250 MHz			
Result				Complies			

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Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5200.0129	5200	0.0129	2.4815
		V max (V)	13.80	5200.0032	5200	0.0032	0.6225
		V min (V)	10.20	5200.0107	5200	0.0107	2.0620
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 (DV)	12	T (°C)	-20	5200.00592	5200	0.00592	1.1382
		T (°C)	-10	5200.01231	5200	0.01231	2.3666
		T (°C)	0	5200.01113	5200	0.01113	2.1411
		T (°C)	10	5200.01329	5200	0.01329	2.5562
		T (°C)	20	5200.00806	5200	0.00806	1.5508
		T (°C)	30	5200.00576	5200	0.00576	1.1081
		T (°C)	40	5200.00674	5200	0.00674	1.2959
		T (°C)	50	5200.00942	5200	0.00942	1.8121
		T (°C)	60	5200.00961	5200	0.00961	1.8479
		T (°C)	70	5200.00785	5200	0.00785	1.5102
Limits				5150-5250 MHz			
Result				Complies			

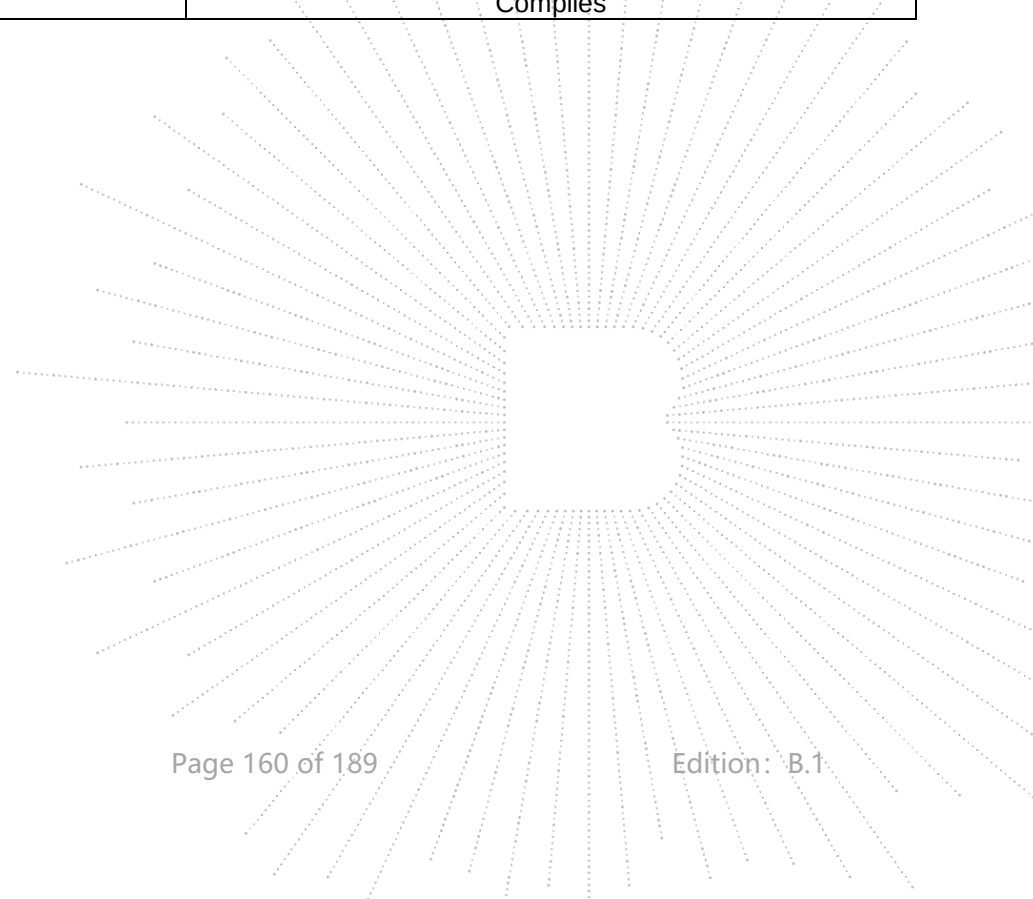
SHENZHEN

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	12.00	5240.0130	5240	0.0130	2.4871
		V max (V)	13.80	5240.0098	5240	0.0098	1.8746
		V min (V)	10.20	5240.0054	5240	0.0054	1.0254
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 (DV)	12	T (°C)	-20	5240.0111	5240	0.0111	2.1162
		T (°C)	-10	5240.0076	5240	0.0076	1.4478
		T (°C)	0	5240.0003	5240	0.0003	0.0494
		T (°C)	10	5240.0069	5240	0.0069	1.3190
		T (°C)	20	5240.0115	5240	0.0115	2.1918
		T (°C)	30	5240.0103	5240	0.0103	1.9686
		T (°C)	40	5240.0009	5240	0.0009	0.1660
		T (°C)	50	5240.0058	5240	0.0058	1.1064
		T (°C)	60	5240.0079	5240	0.0079	1.5067
		T (°C)	70	5240.0017	5240	0.0017	0.3335
Limits				5150-5250 MHz			
Result				Complies			



Temperature:	23 °C	Relative Humidity:	50%
Pressure:	101KPa	Test Voltage:	DC 12V
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)	12.00	5745.01094	5745	0.01094	1.9047
		V max (V)	13.80	5745.01063	5745	0.01063	1.8501
		V min (V)	10.20	5745.00670	5745	0.00670	1.1666
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 (DV)	12	T (°C)	-20	5745.00364	5745	0.00364	0.6335
		T (°C)	-10	5745.01071	5745	0.01071	1.8645
		T (°C)	0	5745.00664	5745	0.00664	1.1558
		T (°C)	10	5745.01242	5745	0.01242	2.1620
		T (°C)	20	5745.00071	5745	0.00071	0.1238
		T (°C)	30	5745.00911	5745	0.00911	1.5853
		T (°C)	40	5745.00361	5745	0.00361	0.6286
		T (°C)	50	5745.01115	5745	0.01115	1.9412
		T (°C)	60	5745.00373	5745	0.00373	0.6487
		T (°C)	70	5745.01047	5745	0.01047	1.8217
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)	12.00	5785.00171	5785	0.00171	0.2954
		V max (V)	13.80	5785.00375	5785	0.00375	0.6490
		V min (V)	10.20	5785.00374	5785	0.00374	0.6466
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

Temperature vs. Frequency Stability				Reference Frequency: 5785MHz			
TEST CONDITIONS				f	fc	Max.	Max.
						Deviation	Deviation
				(MHz)	(ppm)		
V nom (DV)	12	T (°C)	-20	5785.00101	5785	0.00101	0.1738
		T (°C)	-10	5785.00997	5785	0.00997	1.7229
		T (°C)	0	5785.00103	5785	0.00103	0.1787
		T (°C)	10	5785.00591	5785	0.00591	1.0211
		T (°C)	20	5785.01228	5785	0.01228	2.1219
		T (°C)	30	5785.00020	5785	0.00020	0.0352
		T (°C)	40	5785.01013	5785	0.01013	1.7509
		T (°C)	50	5785.00902	5785	0.00902	1.5592
		T (°C)	60	5785.00851	5785	0.00851	1.4715
		T (°C)	70	5785.00919	5785	0.00919	1.5885
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)	12.00	5825.00228	5825	0.00228	0.3919
		V max (V)	13.80	5825.00811	5825	0.00811	1.3931
		V min (V)	10.20	5825.01191	5825	0.01191	2.0440
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 (DV)	12	T (°C)	-20	5825.01315	5825	0.01315	2.2575
		T (°C)	-10	5825.00086	5825	0.00086	0.1475
		T (°C)	0	5825.00592	5825	0.00592	1.0160
		T (°C)	10	5825.00253	5825	0.00253	0.4337
		T (°C)	20	5825.01021	5825	0.01021	1.7533
		T (°C)	30	5825.01142	5825	0.01142	1.9602
		T (°C)	40	5825.00327	5825	0.00327	0.5618
		T (°C)	50	5825.00729	5825	0.00729	1.2514
		T (°C)	60	5825.01292	5825	0.01292	2.2180
		T (°C)	70	5825.00904	5825	0.00904	1.5523
Limits				5725-5850 MHz			
Result				Complies			

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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

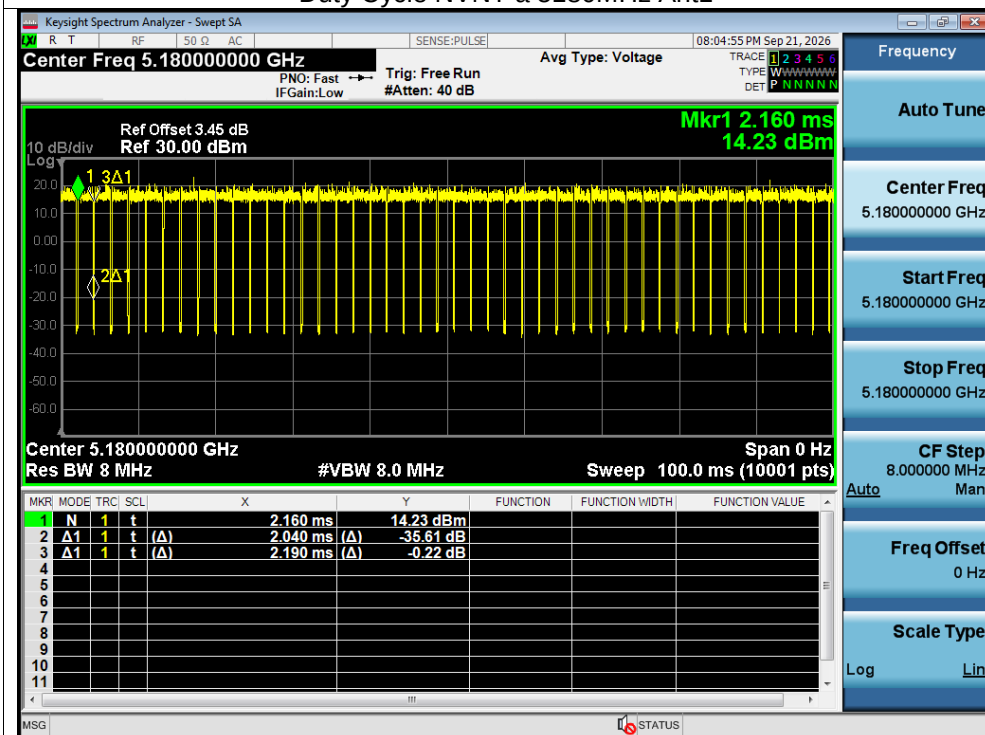
14.4 Test Result

5.1G

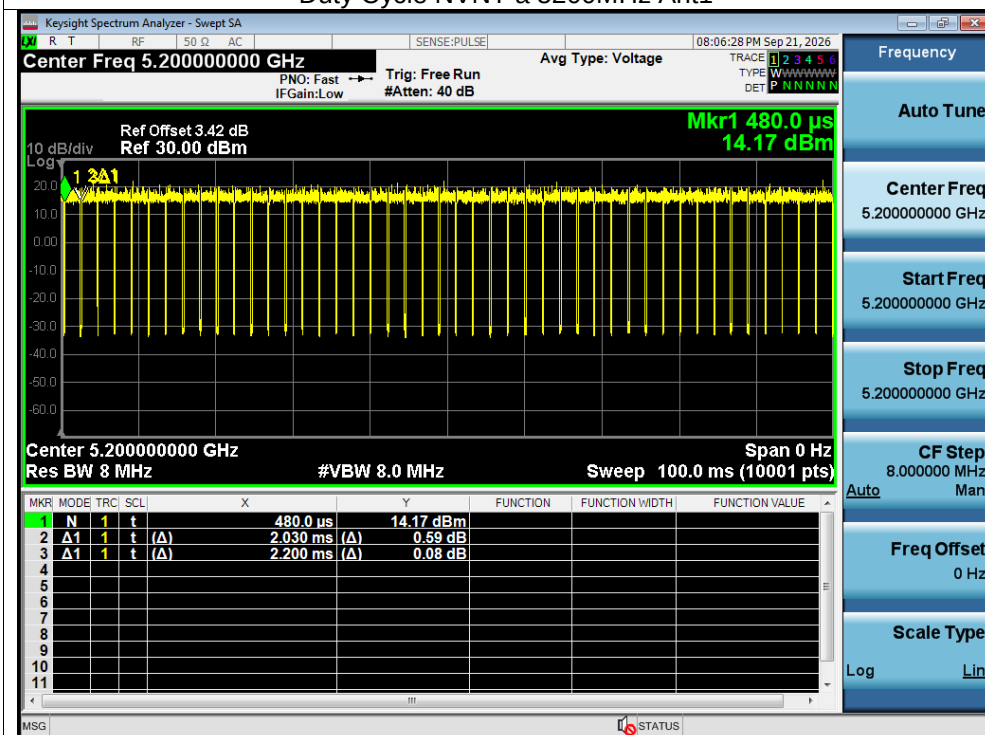
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	93.15	0.31	0.49
NVNT	a	5200	92.27	0.35	0.49
NVNT	a	5240	94.44	0.25	0.49
NVNT	n20	5180	95.86	0.18	0.2
NVNT	n20	5200	97.32	0.12	0.2
NVNT	n20	5240	96.77	0.14	0.2
NVNT	n40	5190	97.22	0.12	0.2
NVNT	n40	5230	97.6	0.11	0.2
NVNT	ac20	5180	96.77	0.14	0.2
NVNT	ac20	5200	97.7	0.1	0.2
NVNT	ac20	5240	97.14	0.13	0.2
NVNT	ac40	5190	97.61	0.11	0.2
NVNT	ac40	5230	97.61	0.11	0.2
NVNT	ac80	5210	96.38	0.16	0.22
NVNT	ax20	5180	96.76	0.14	0.26
NVNT	ax20	5200	94.4	0.25	0.26
NVNT	ax20	5240	95.57	0.2	0.26
NVNT	ax40	5190	97.24	0.12	0.26
NVNT	ax40	5230	95.79	0.19	0.26
NVNT	ax80	5210	97.11	0.13	0.27

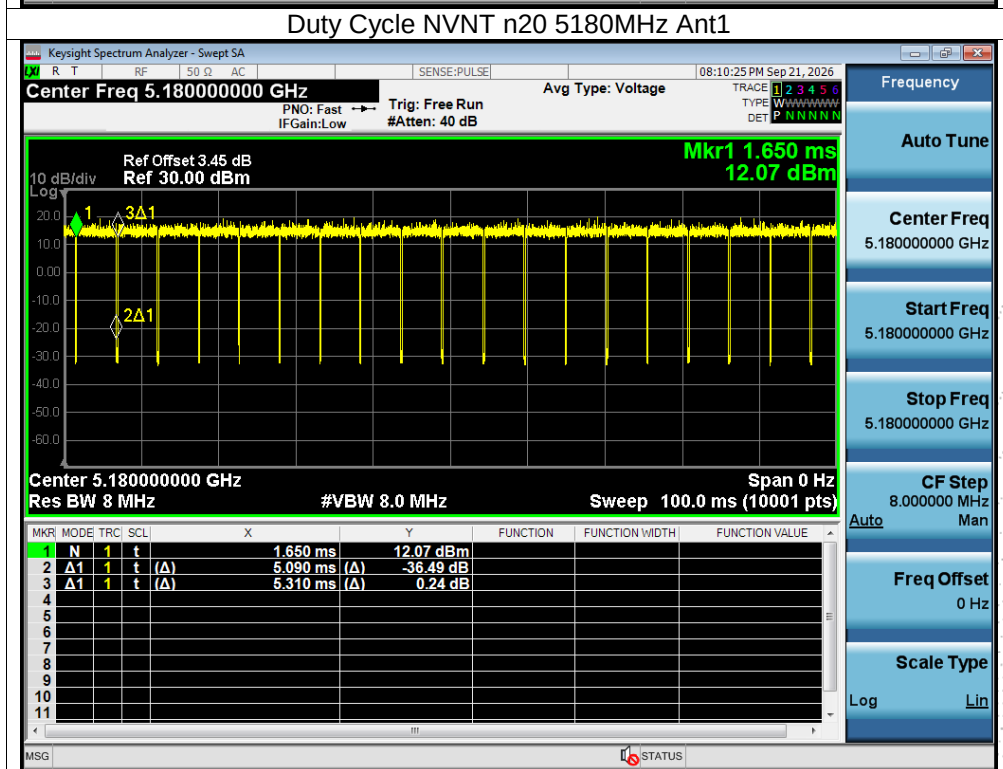
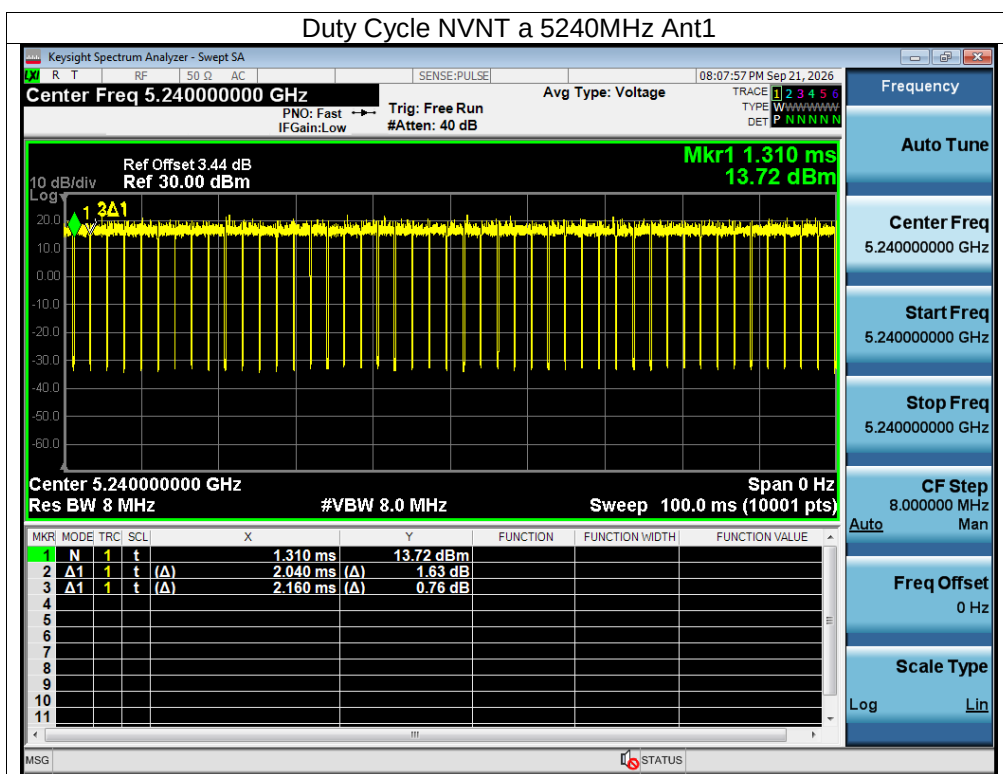
Test Graphs

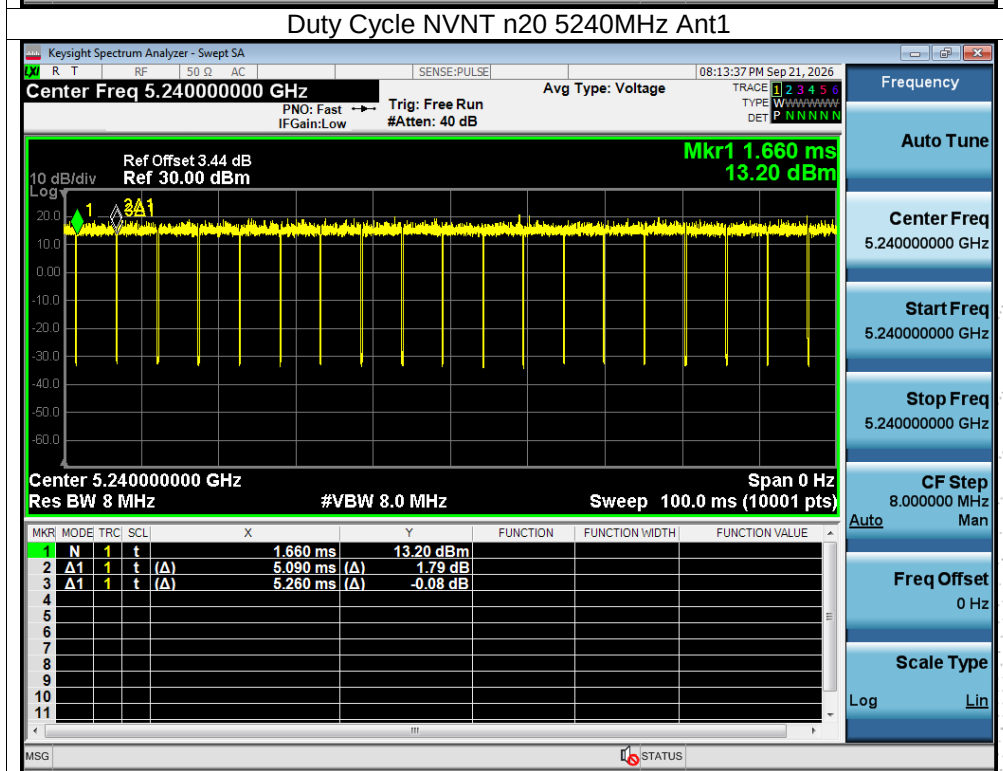
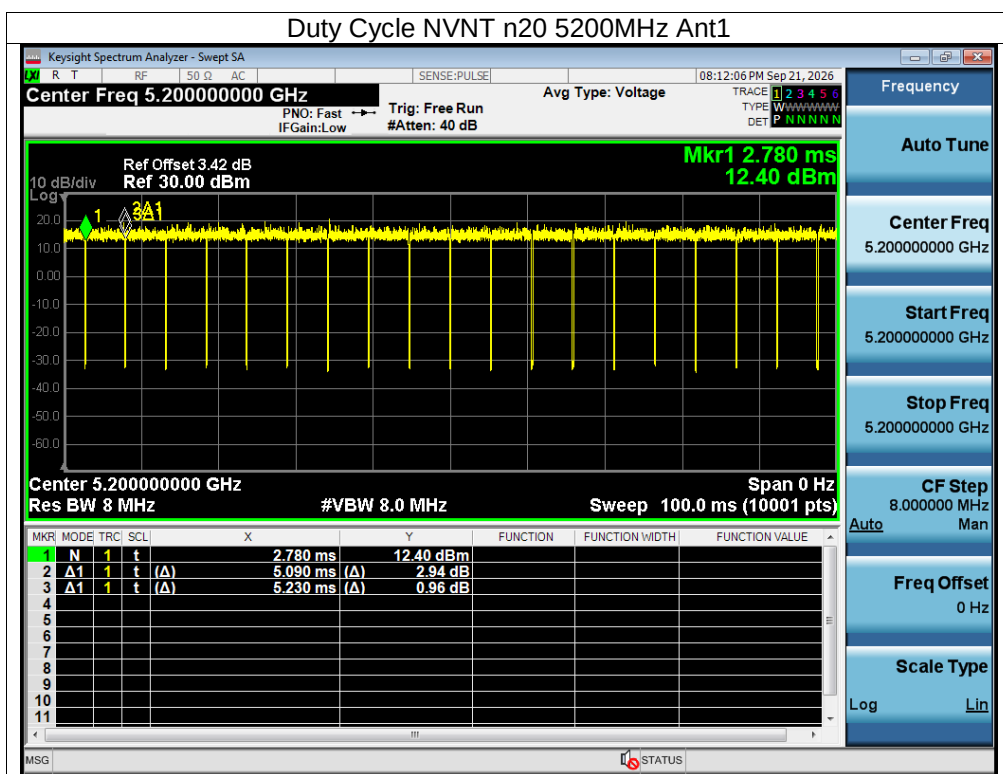
Duty Cycle NVNT a 5180MHz Ant1

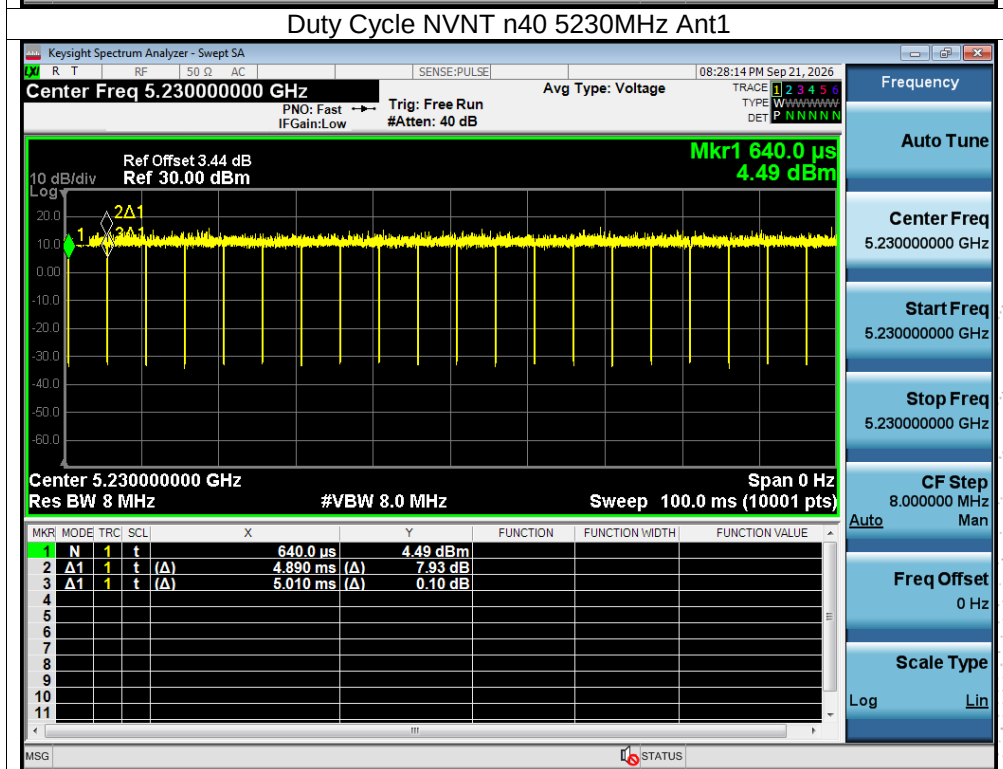
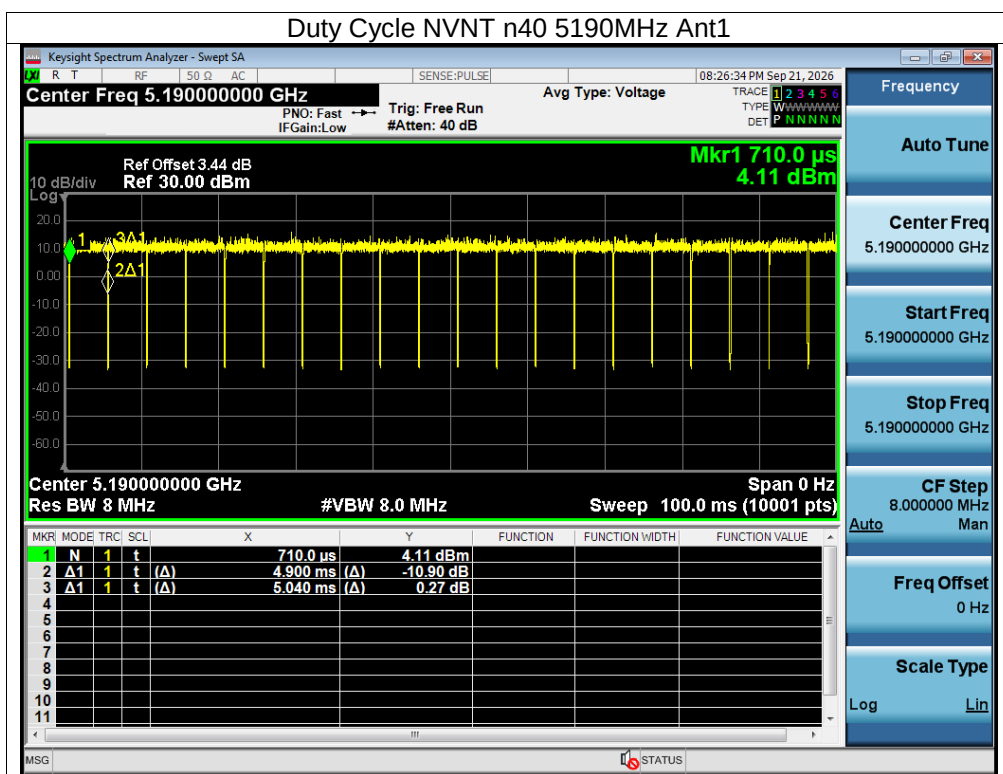


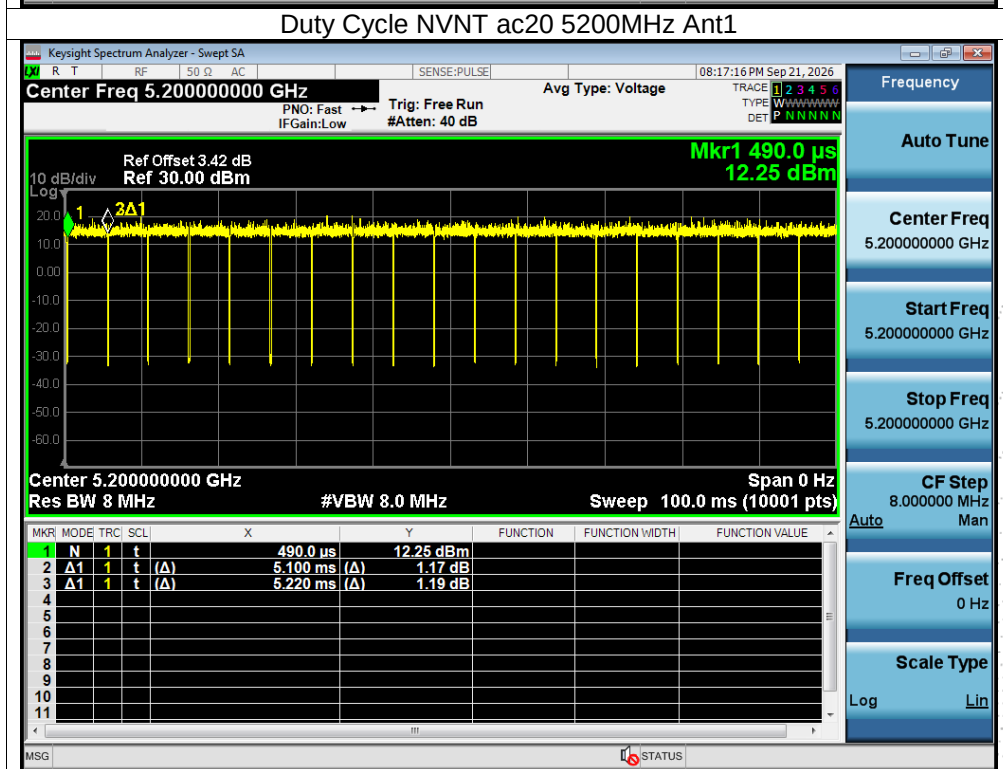
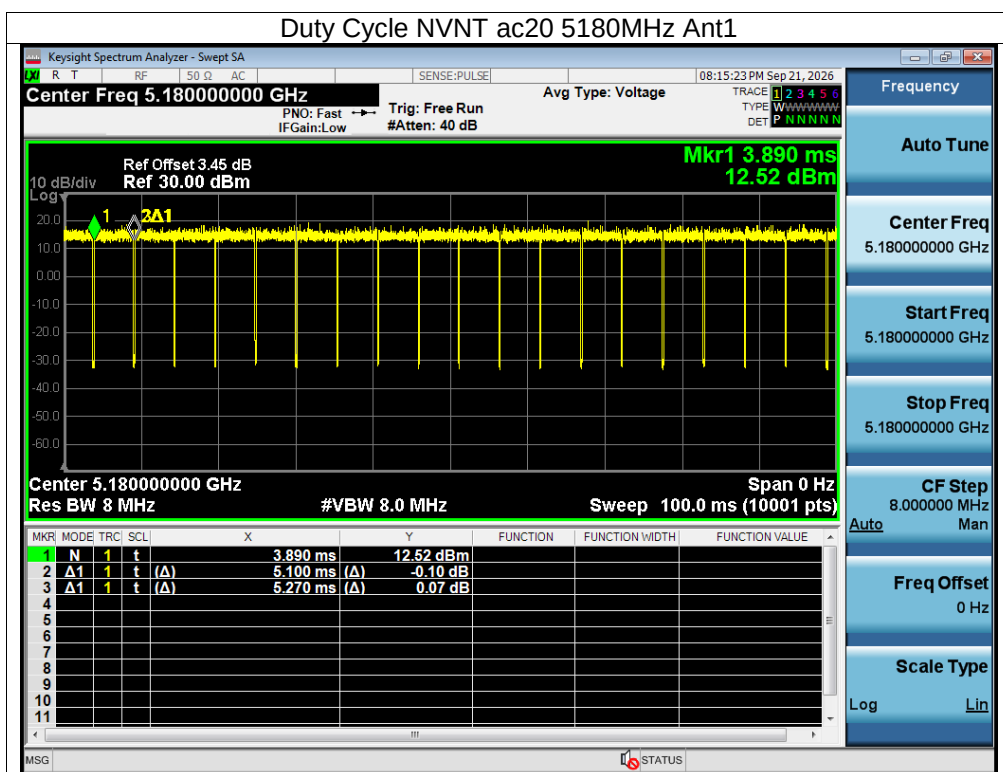
Duty Cycle NVNT a 5200MHz Ant1

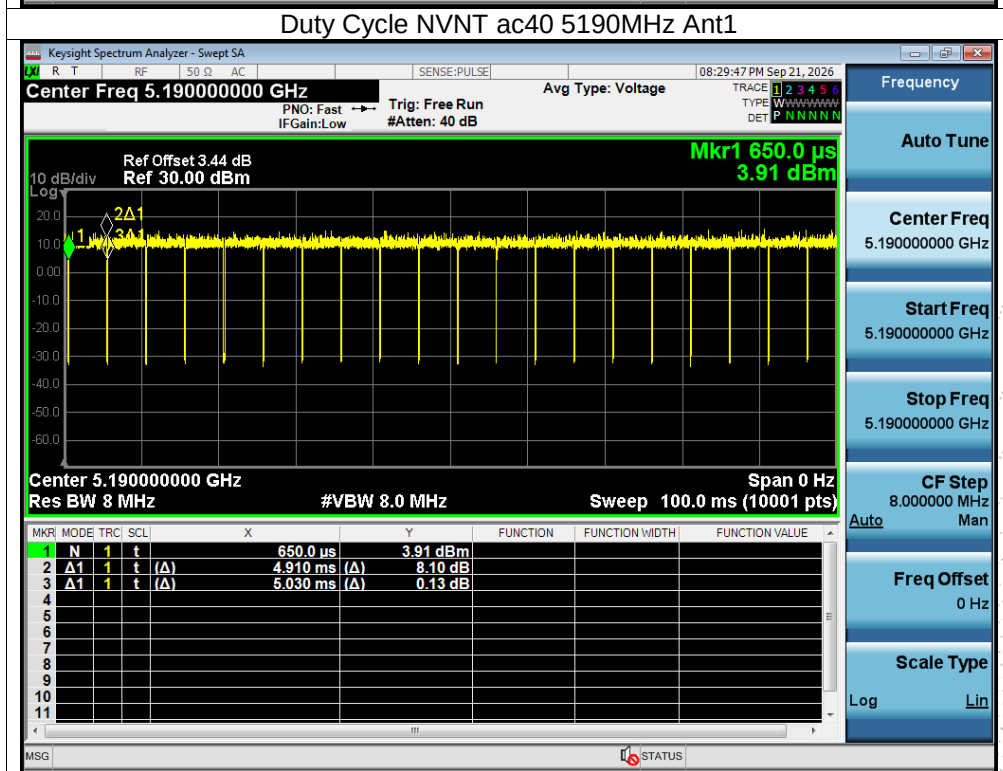
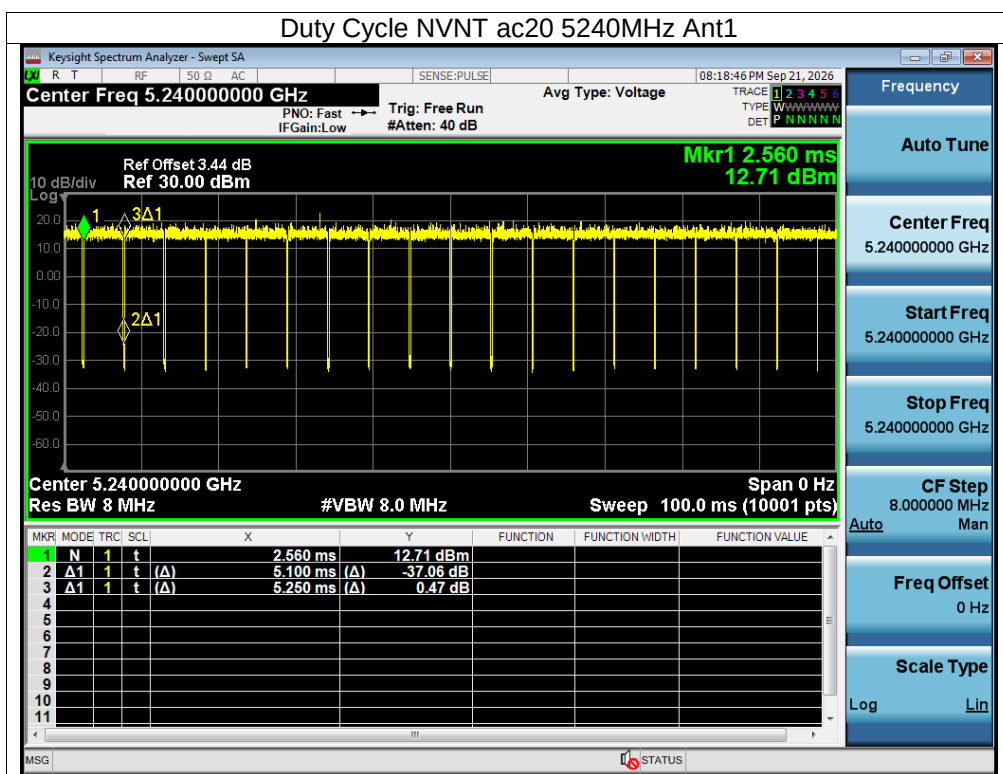




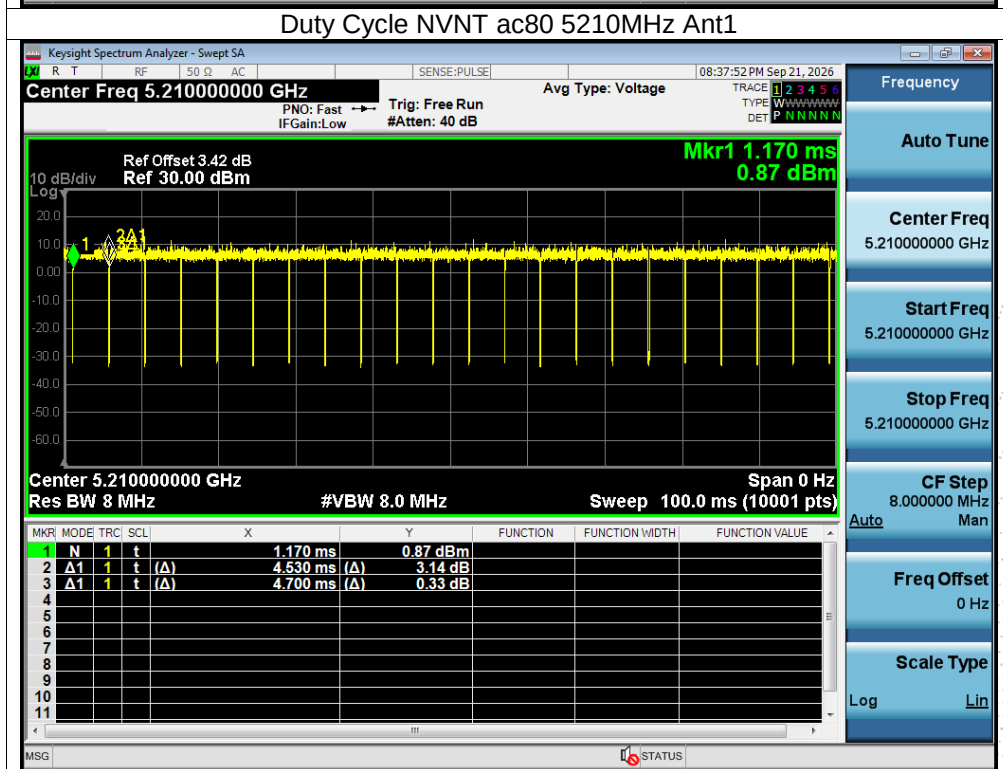
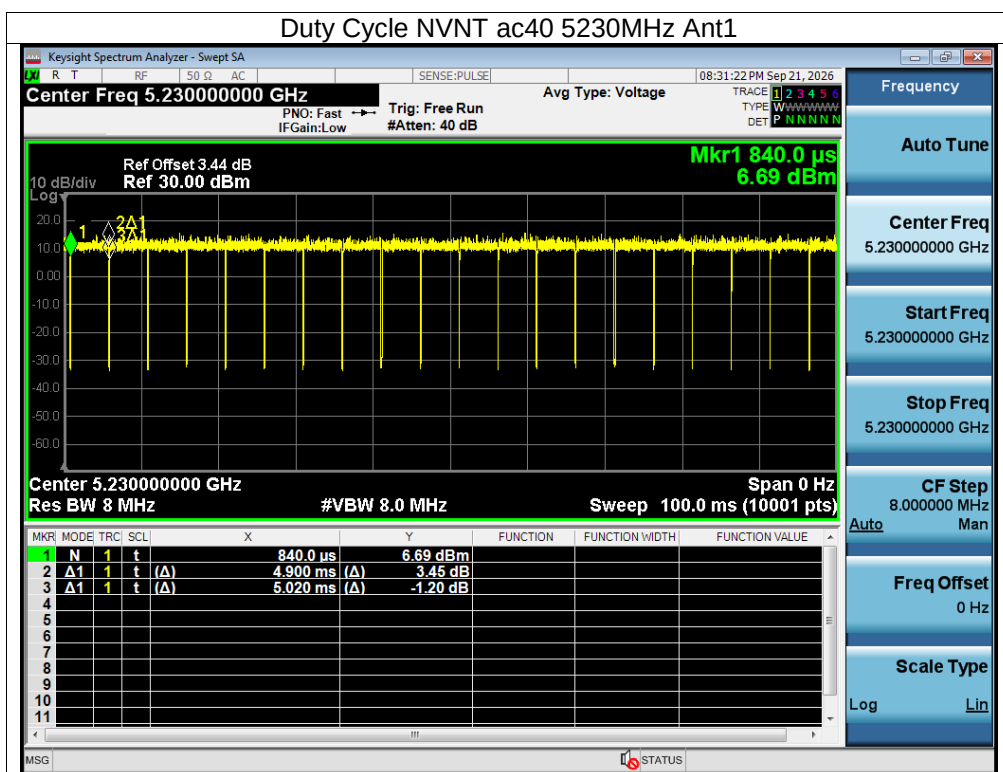


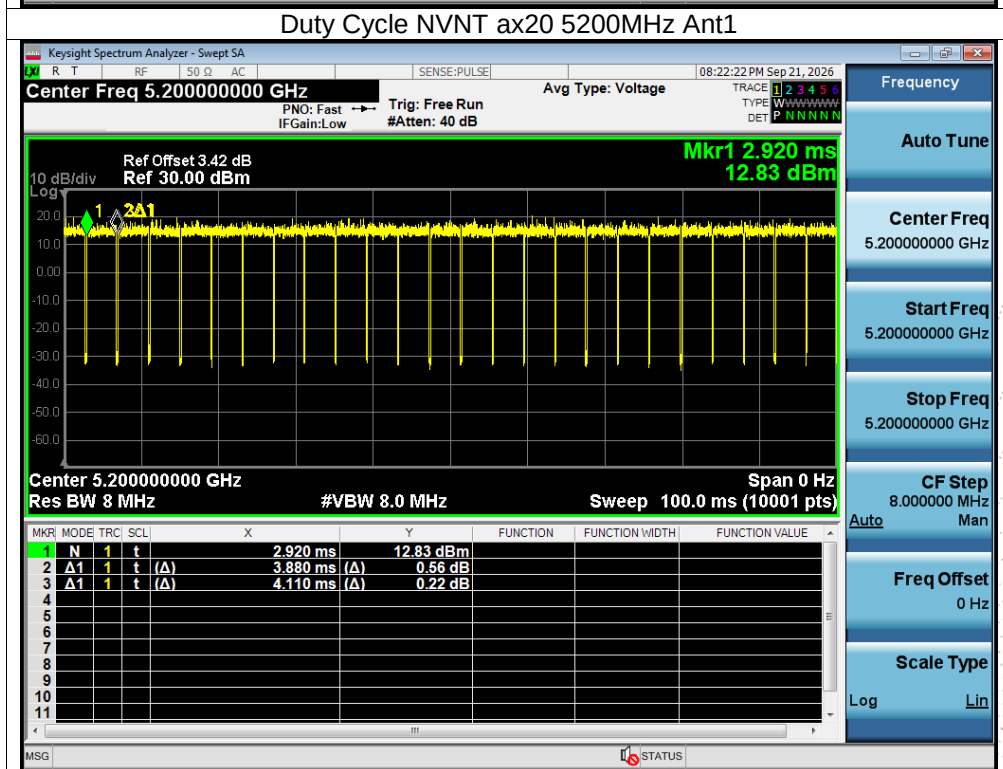
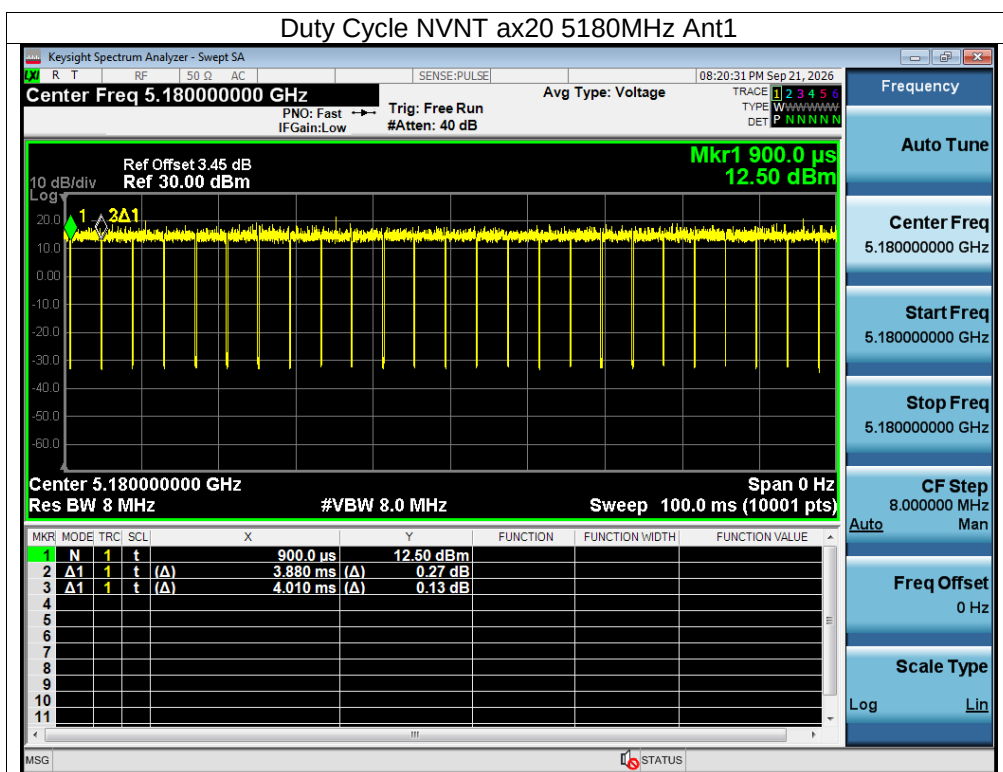


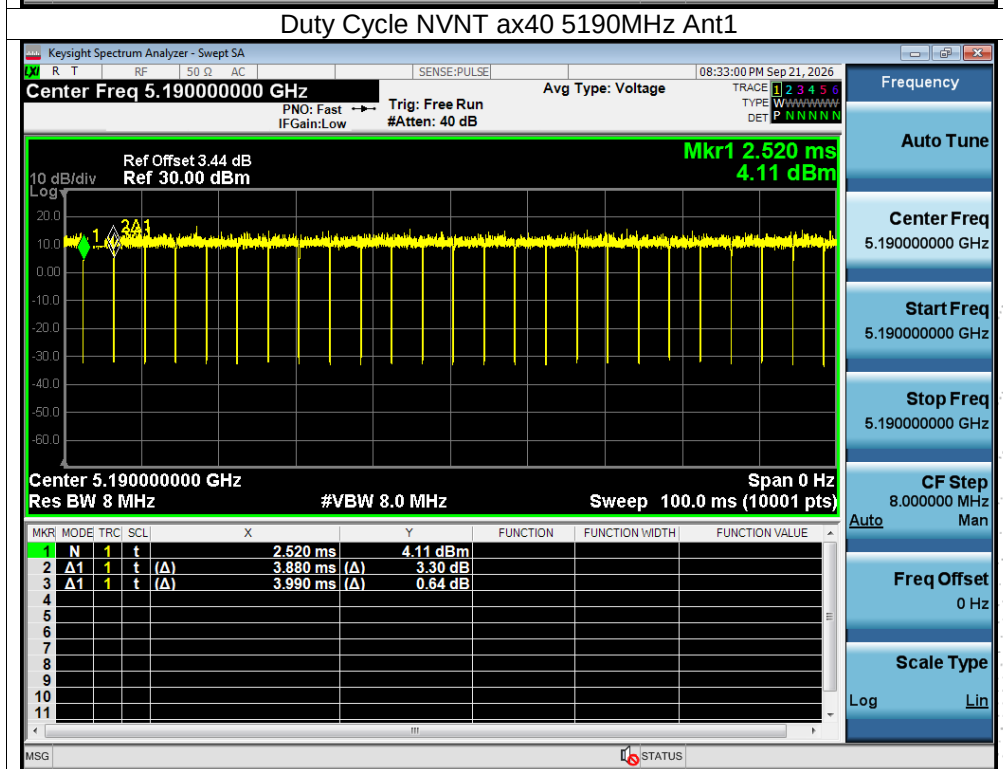
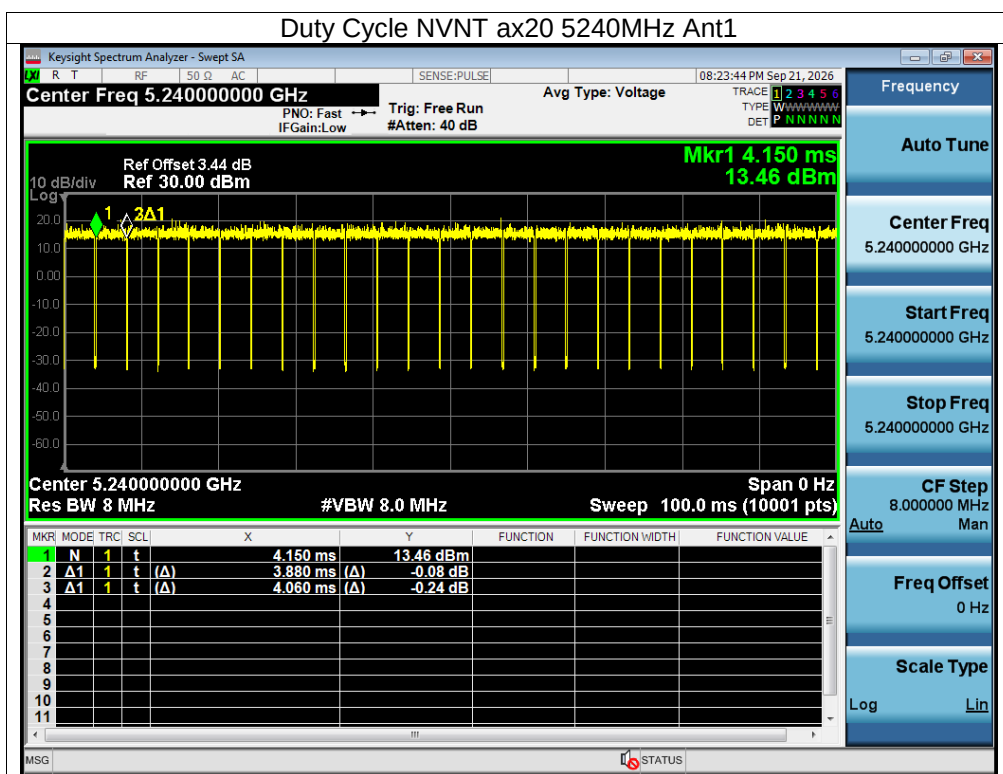


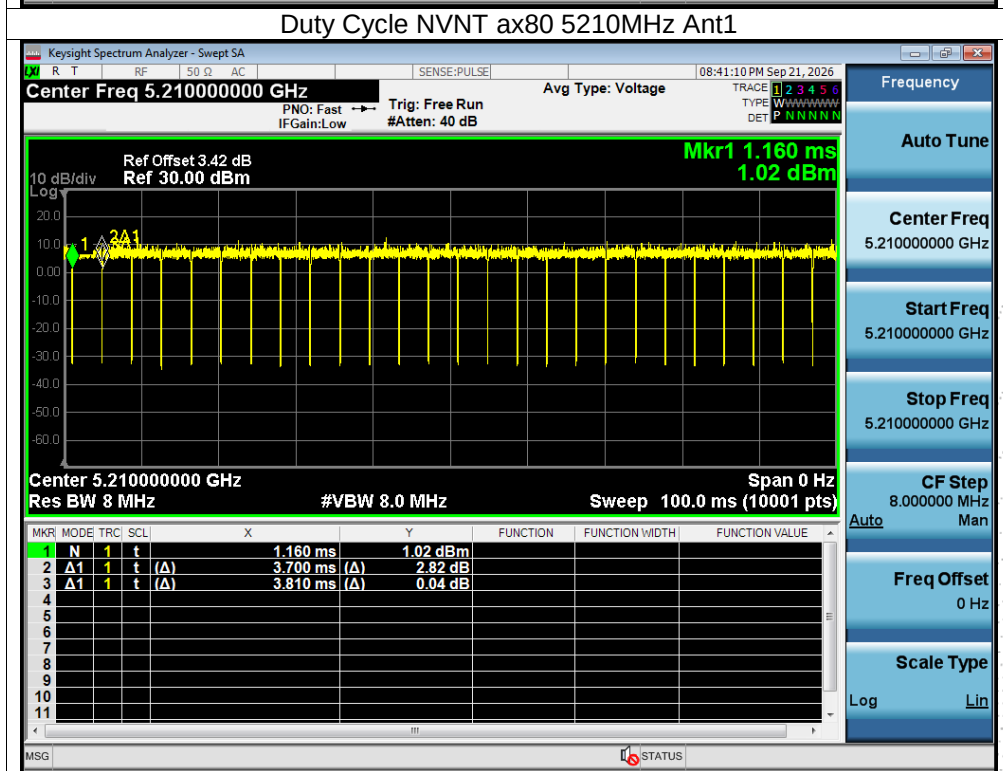
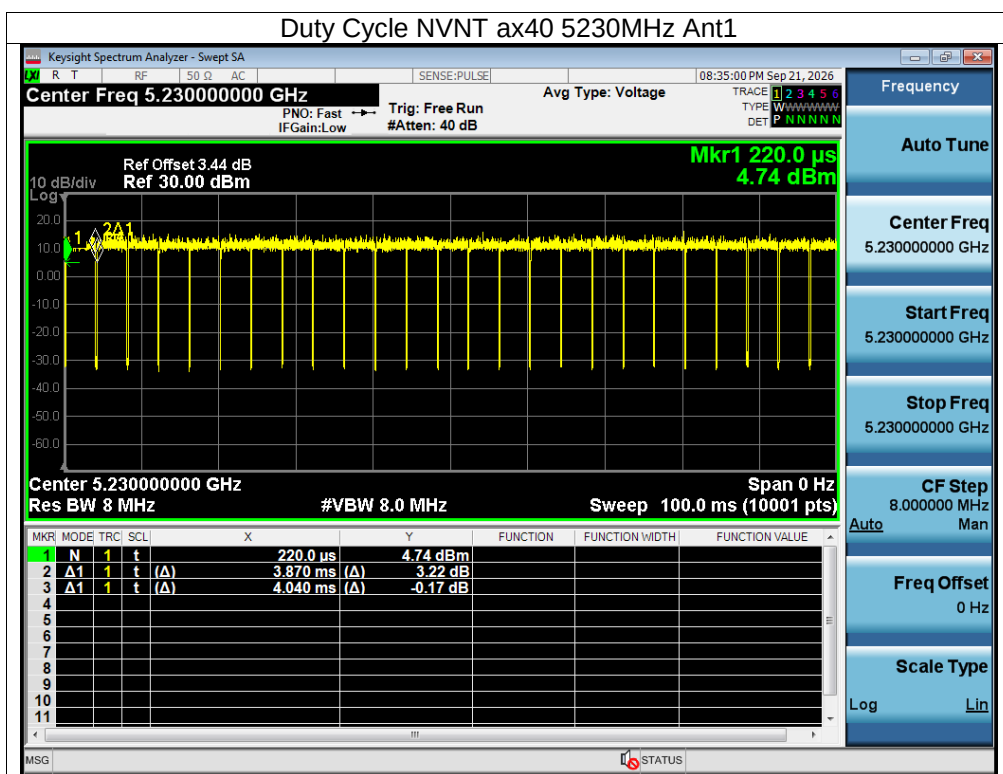


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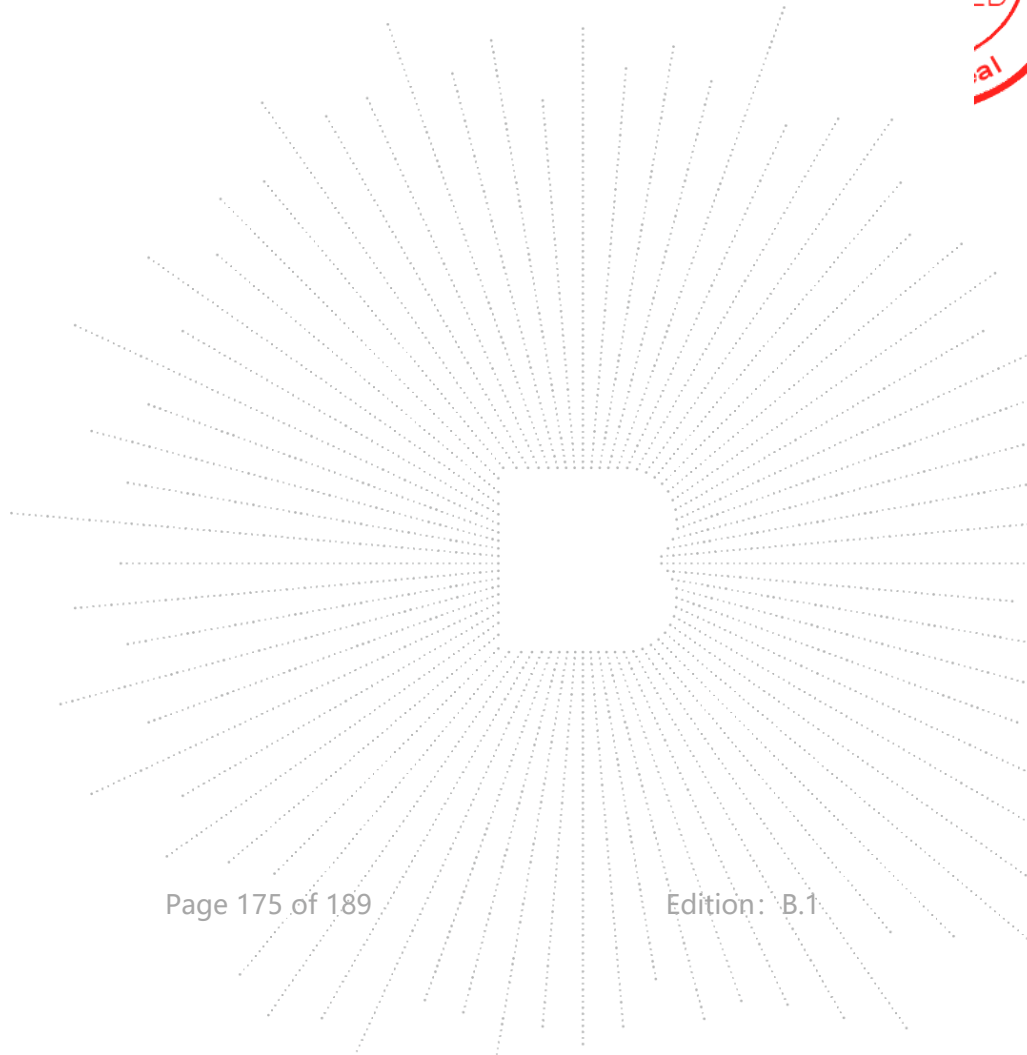






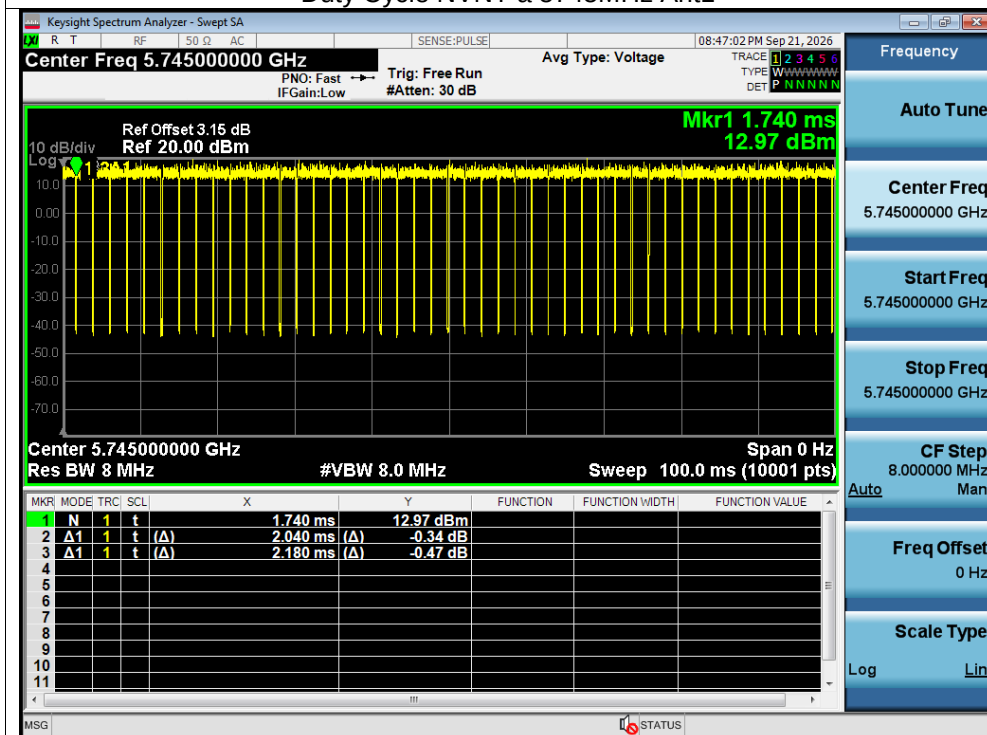
5.8G

Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5745	93.58	0.29	0.49
NVNT	a	5785	94.42	0.25	0.49
NVNT	a	5825	93.55	0.29	0.49
NVNT	n20	5745	96.4	0.16	0.2
NVNT	n20	5785	97.51	0.11	0.2
NVNT	n20	5825	96.04	0.18	0.2
NVNT	n40	5755	95.89	0.18	0.2
NVNT	n40	5795	97.22	0.12	0.2
NVNT	ac20	5745	97.32	0.12	0.2
NVNT	ac20	5785	97.7	0.1	0.2
NVNT	ac20	5825	95.5	0.2	0.2
NVNT	ac40	5755	97.61	0.11	0.2
NVNT	ac40	5795	97.61	0.11	0.2
NVNT	ac80	5775	97.63	0.1	0.22
NVNT	ax20	5745	97	0.13	0.26
NVNT	ax20	5785	95.8	0.19	0.26
NVNT	ax20	5825	96.04	0.18	0.26
NVNT	ax40	5755	96.99	0.13	0.26
NVNT	ax40	5795	95.1	0.22	0.26
NVNT	ax80	5775	96.86	0.14	0.27

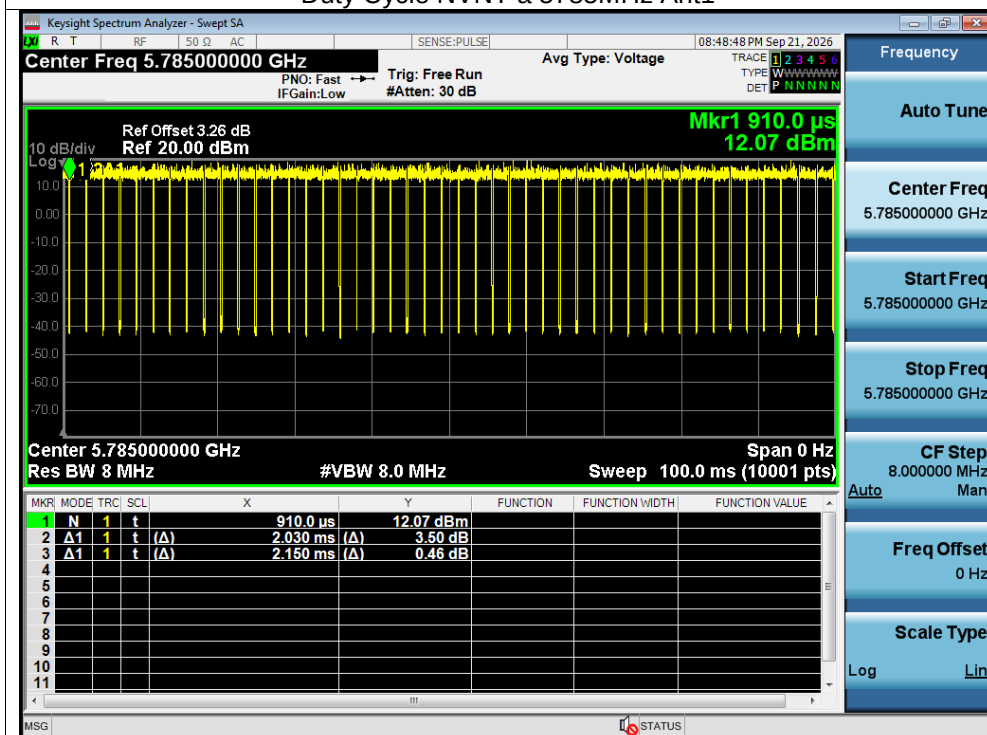


Test Graphs

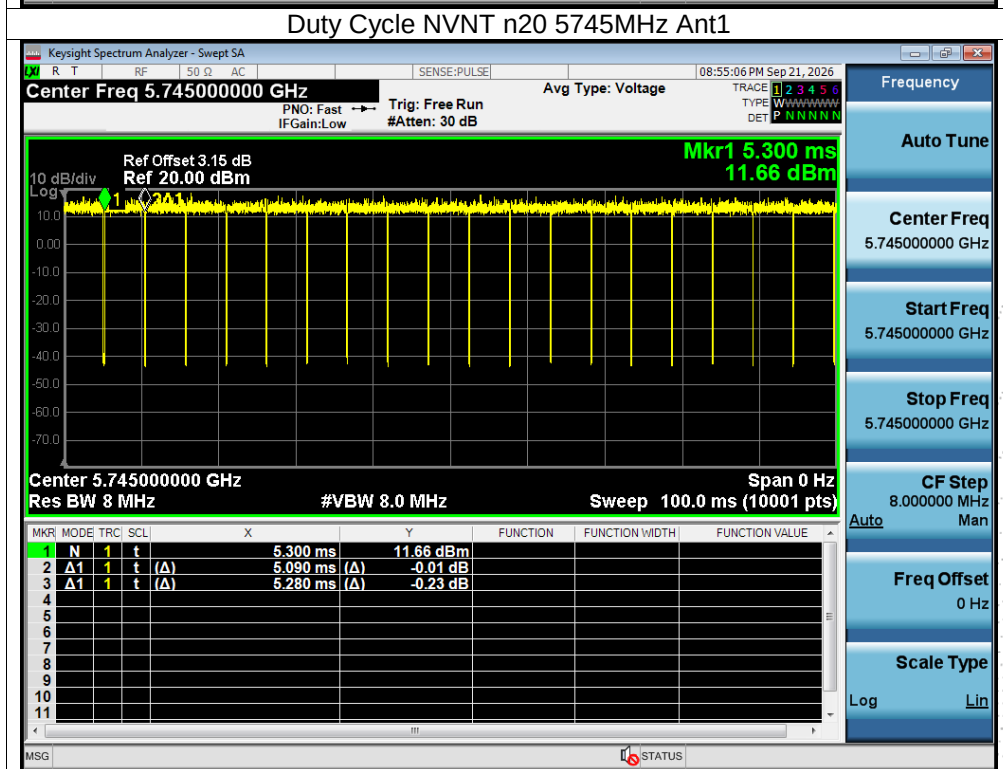
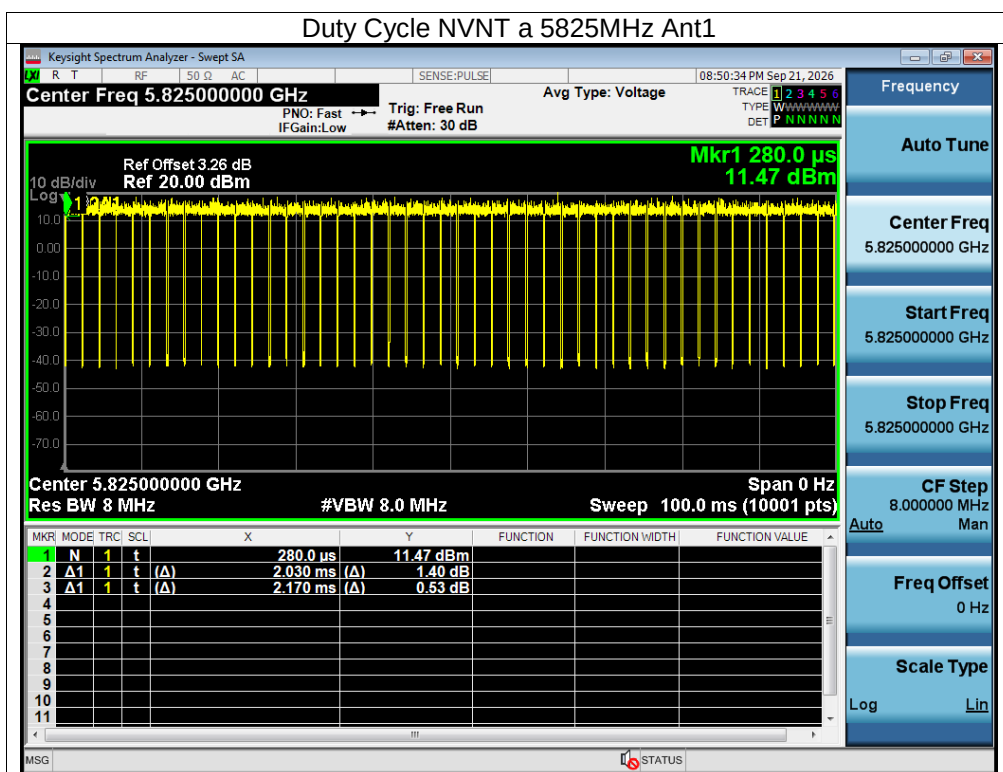
Duty Cycle NVNT a 5745MHz Ant1

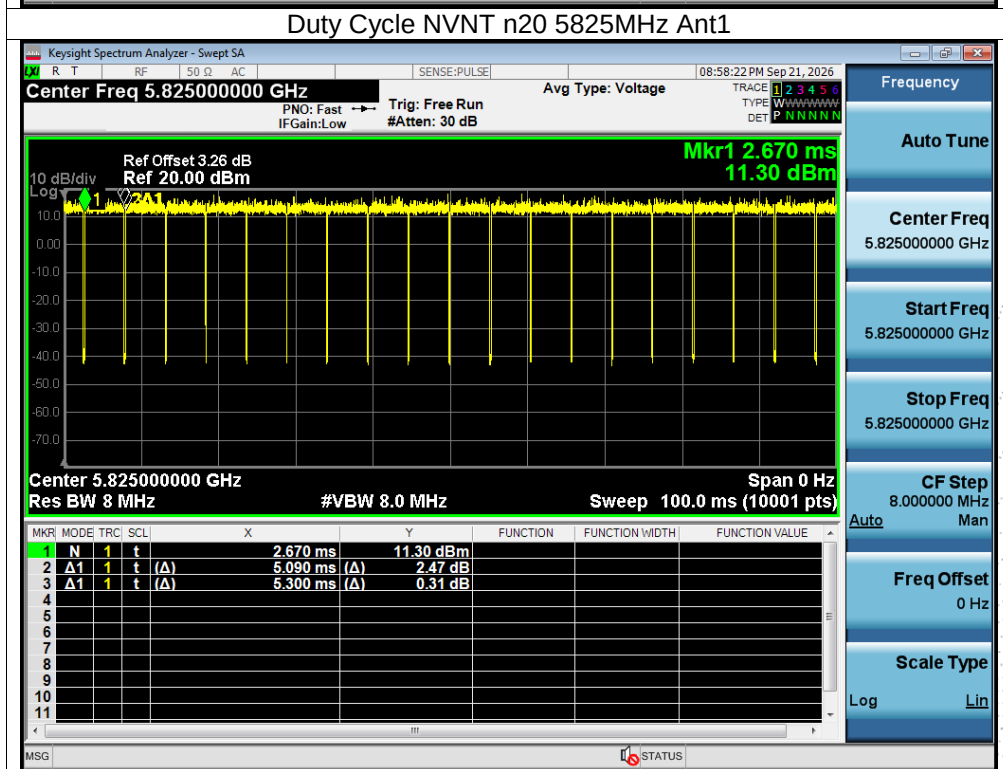
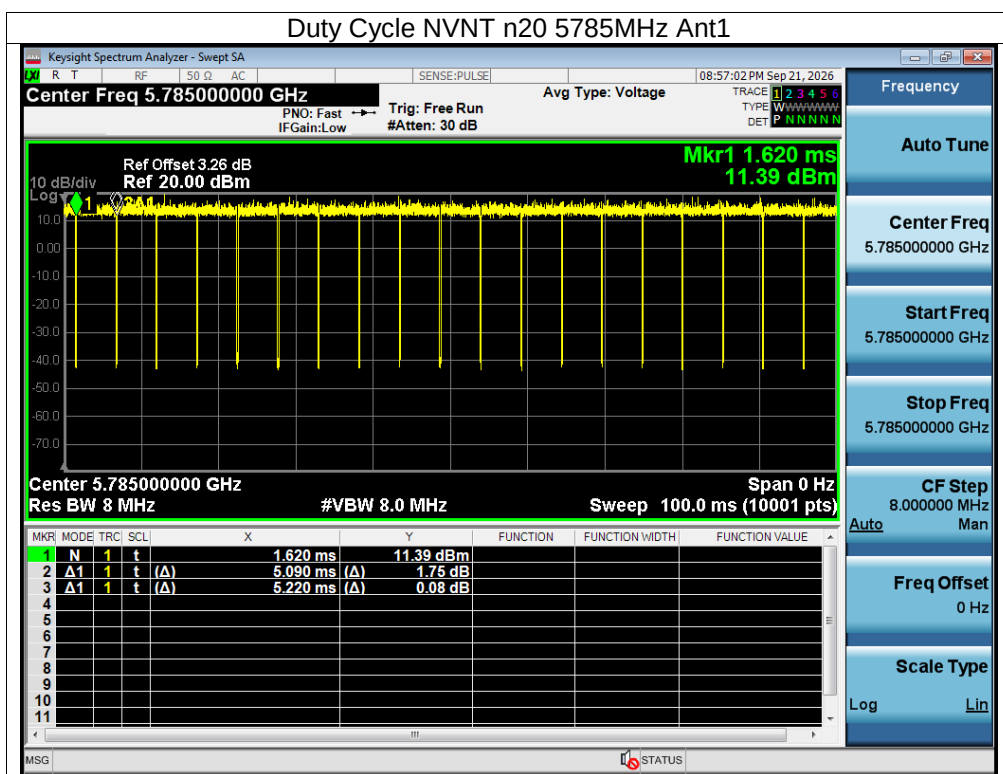


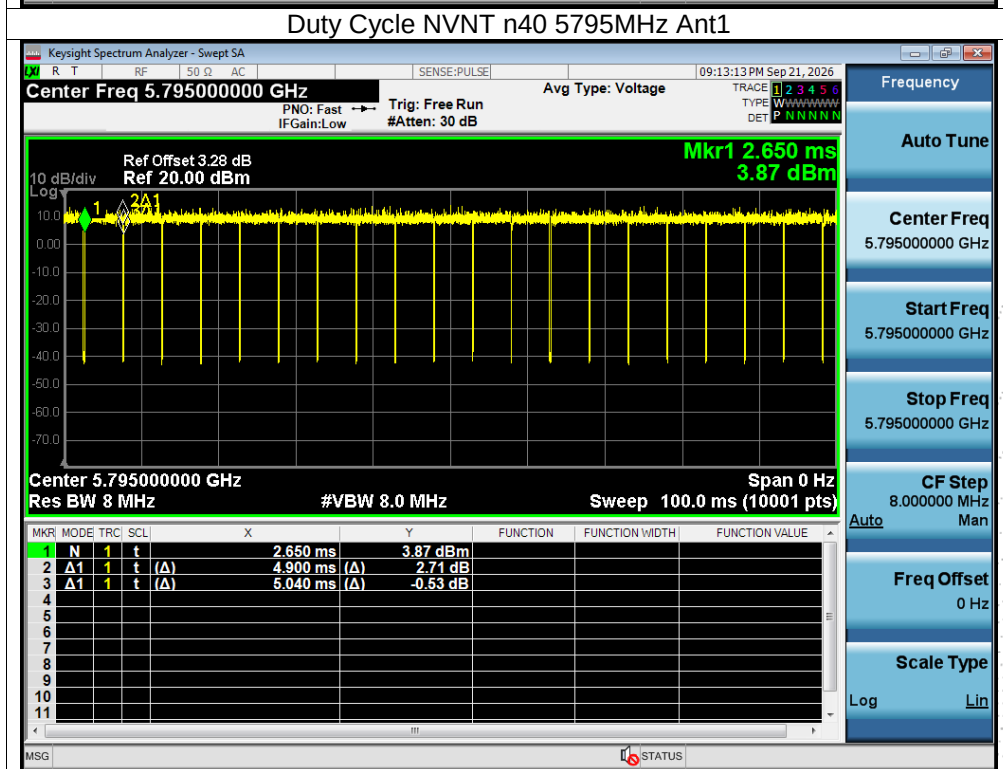
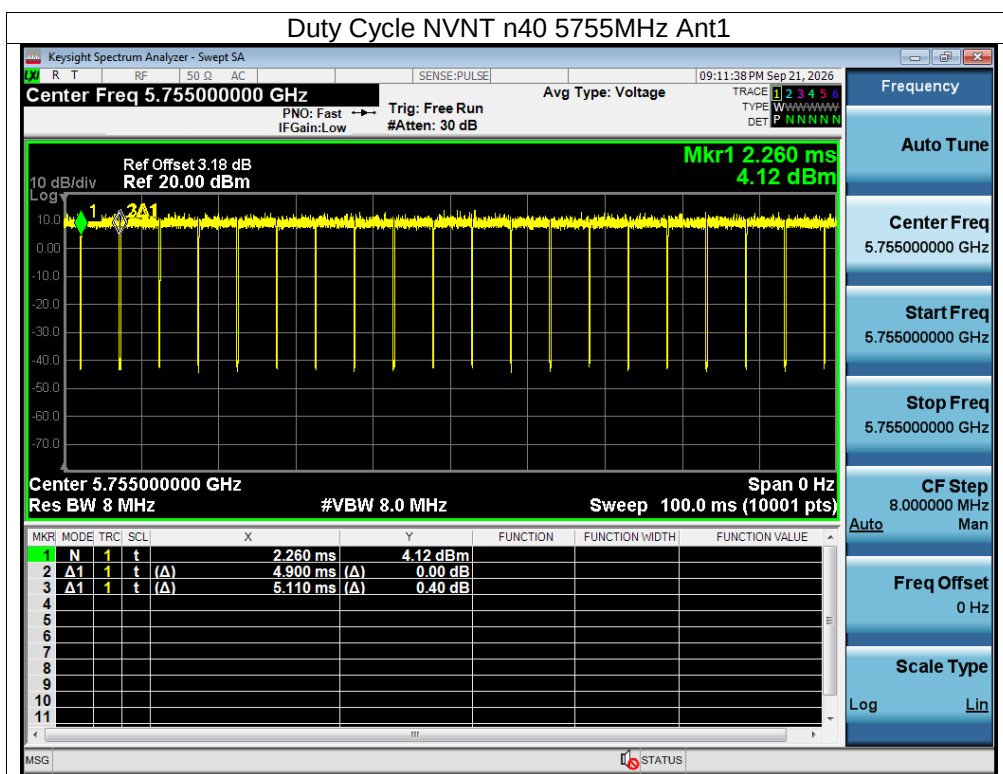
Duty Cycle NVNT a 5785MHz Ant1

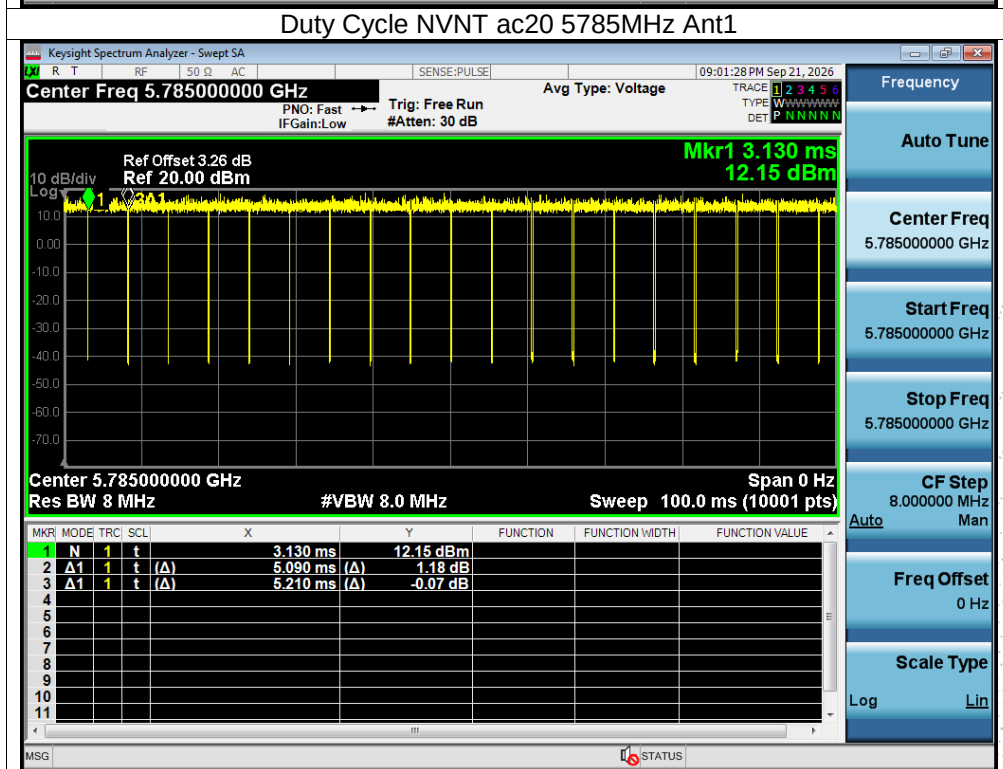
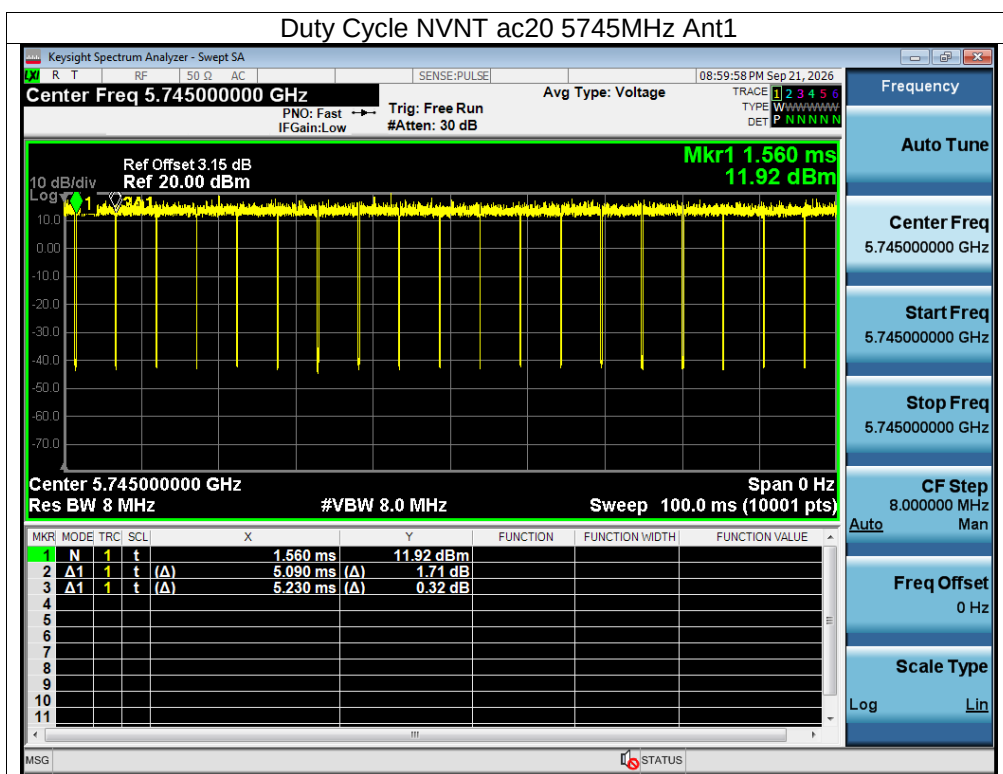


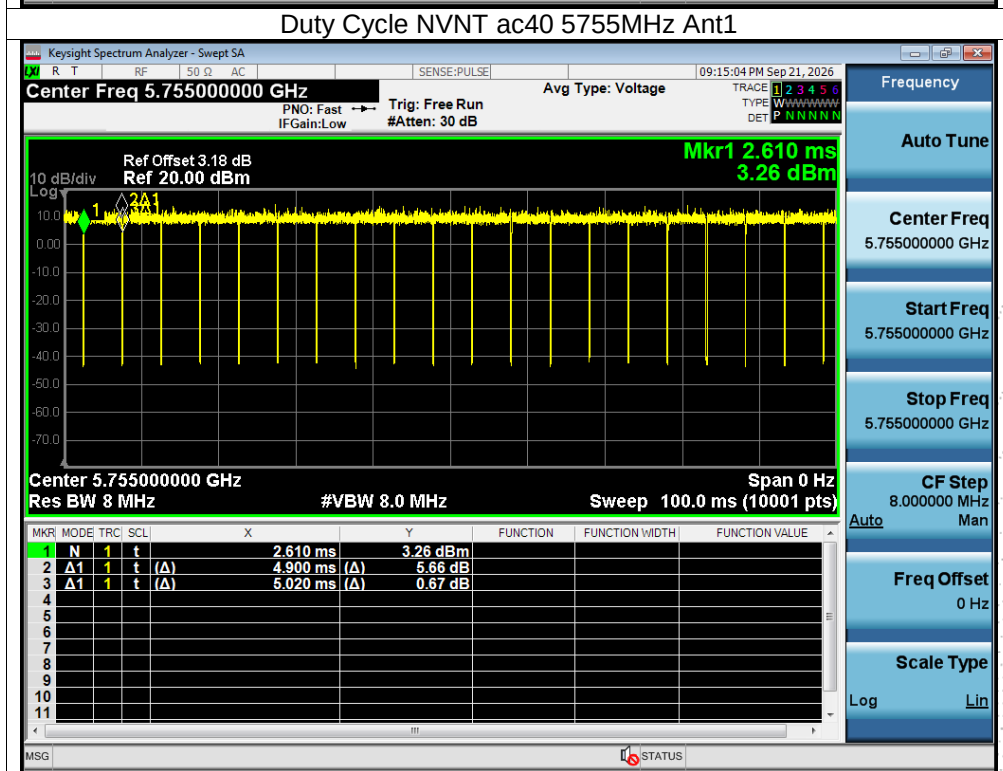
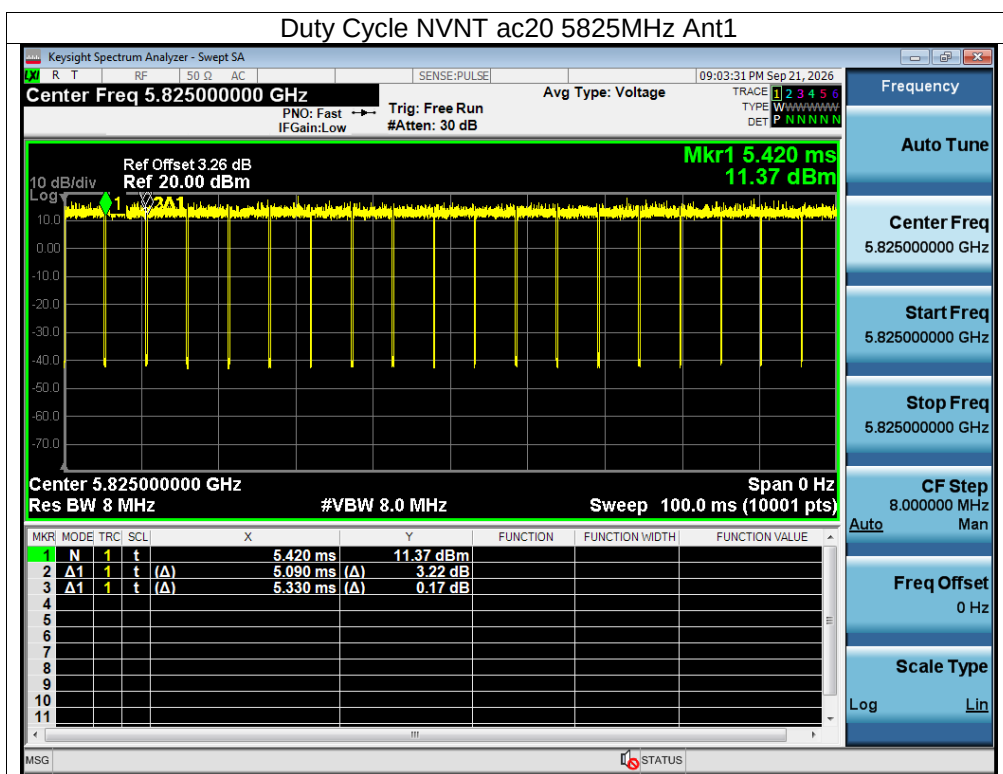
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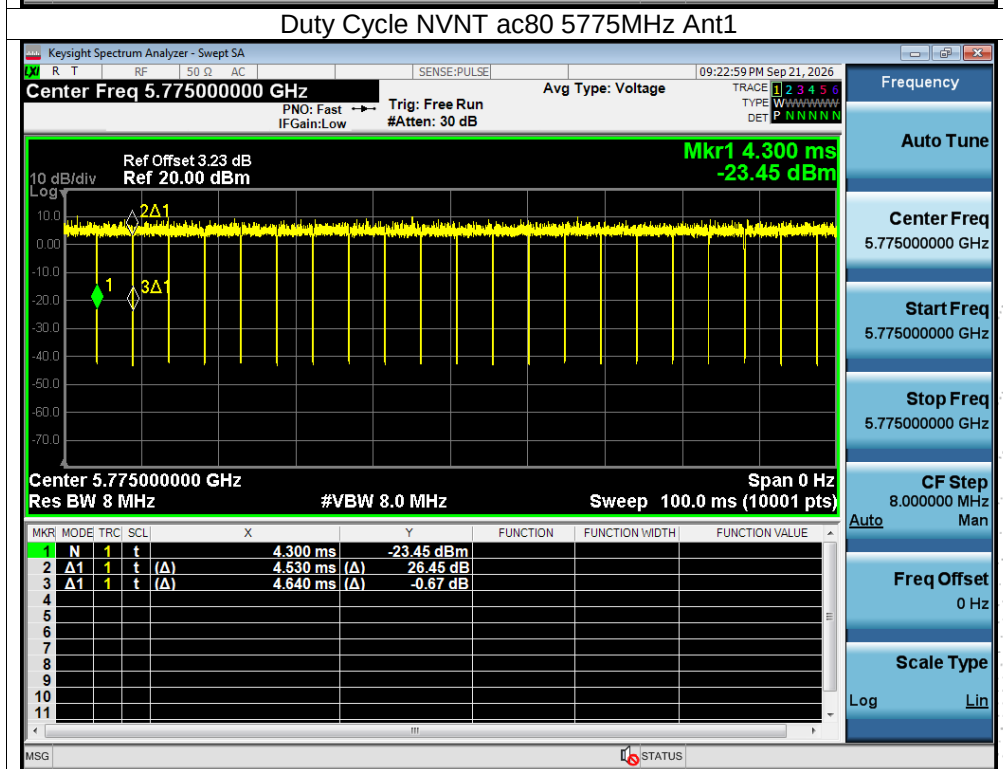
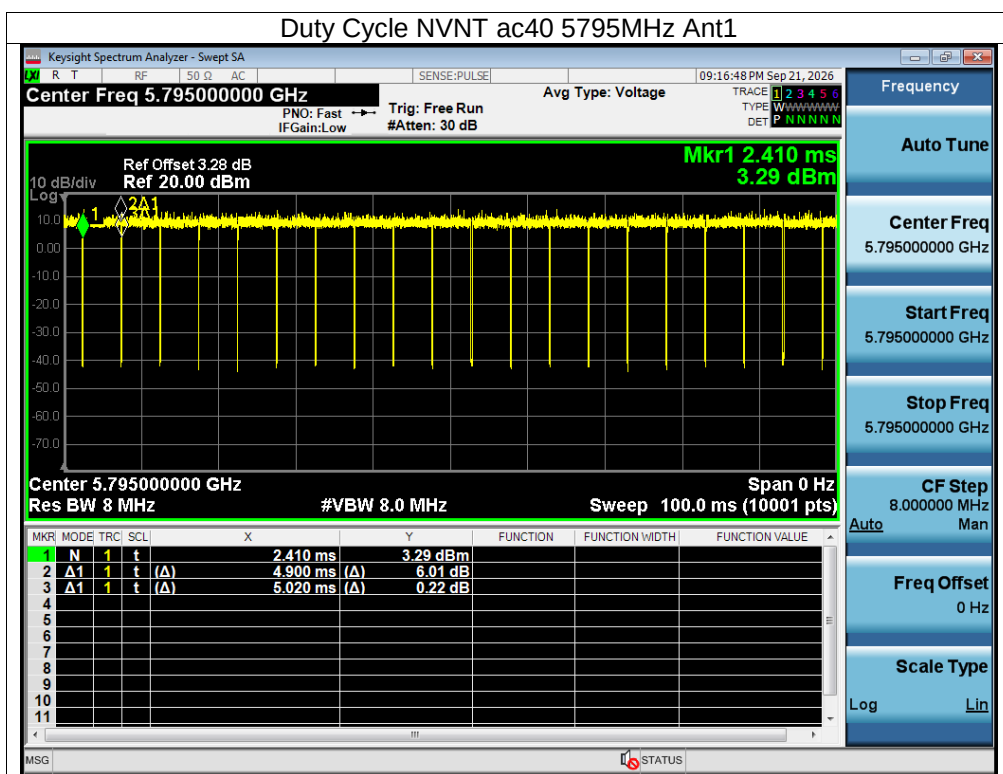












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