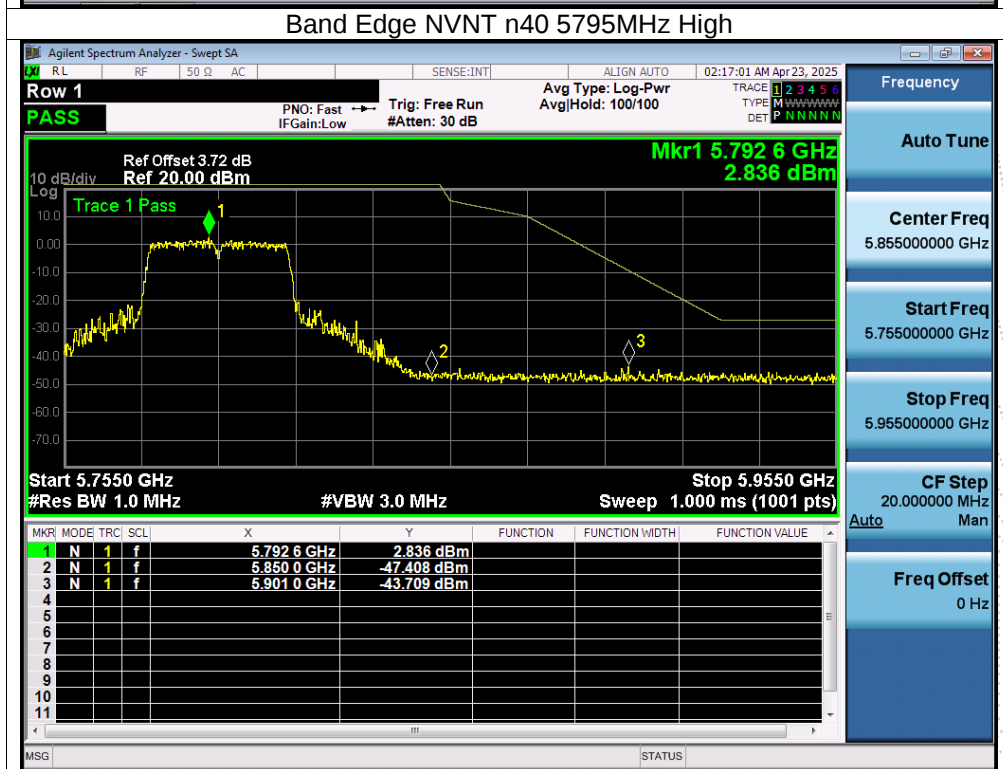
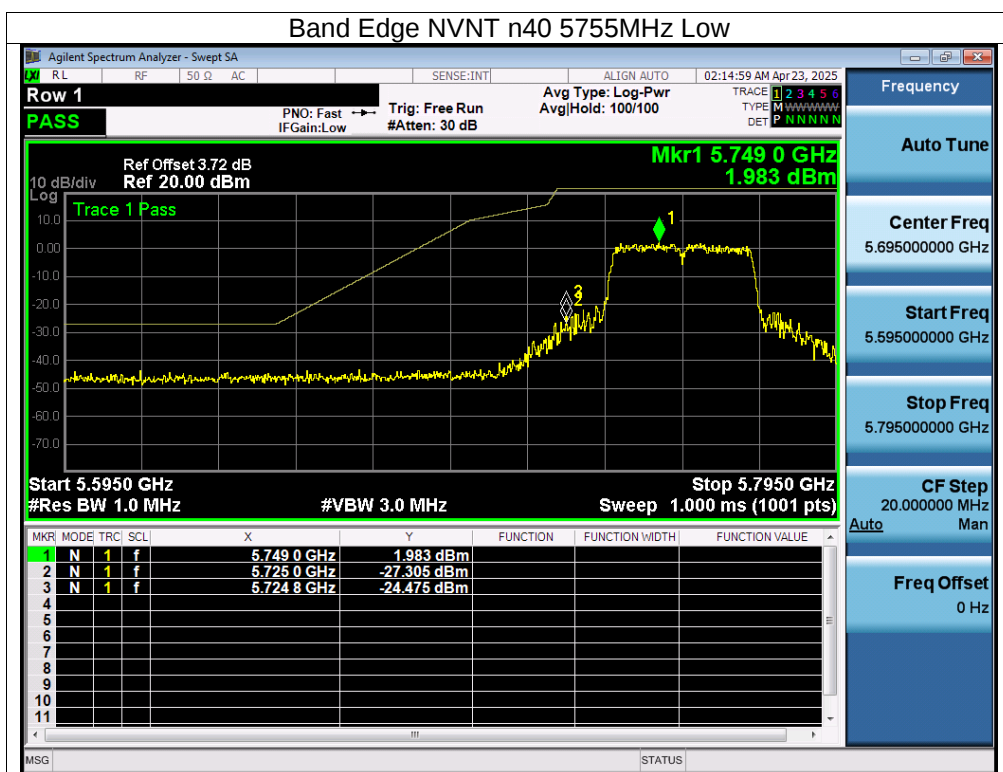
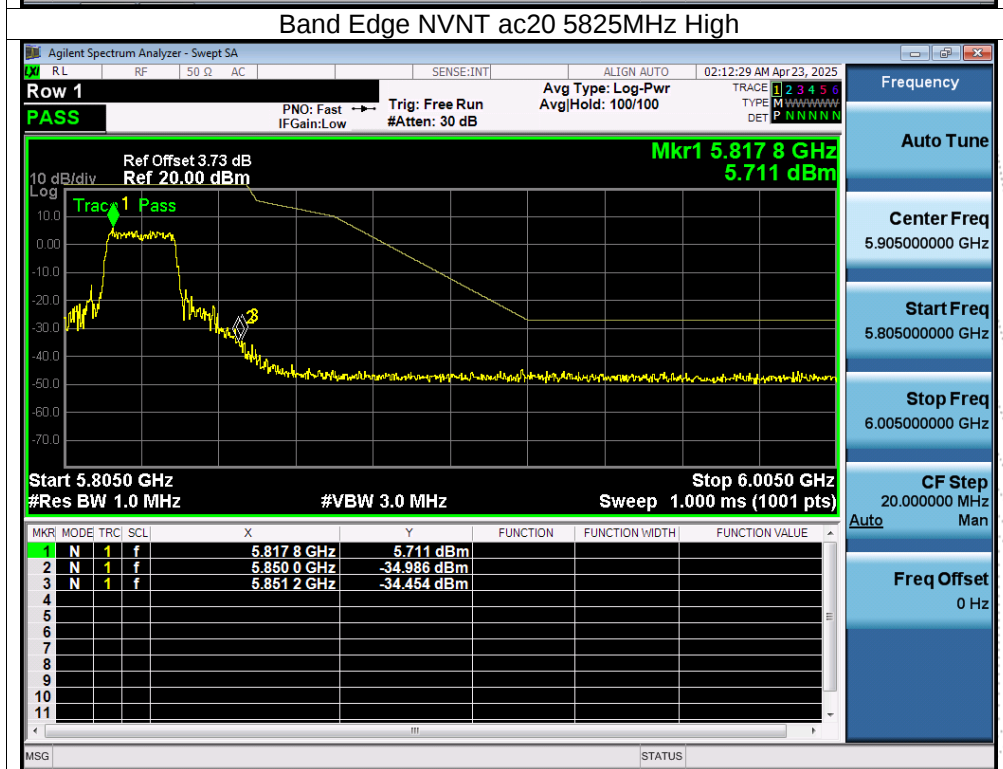
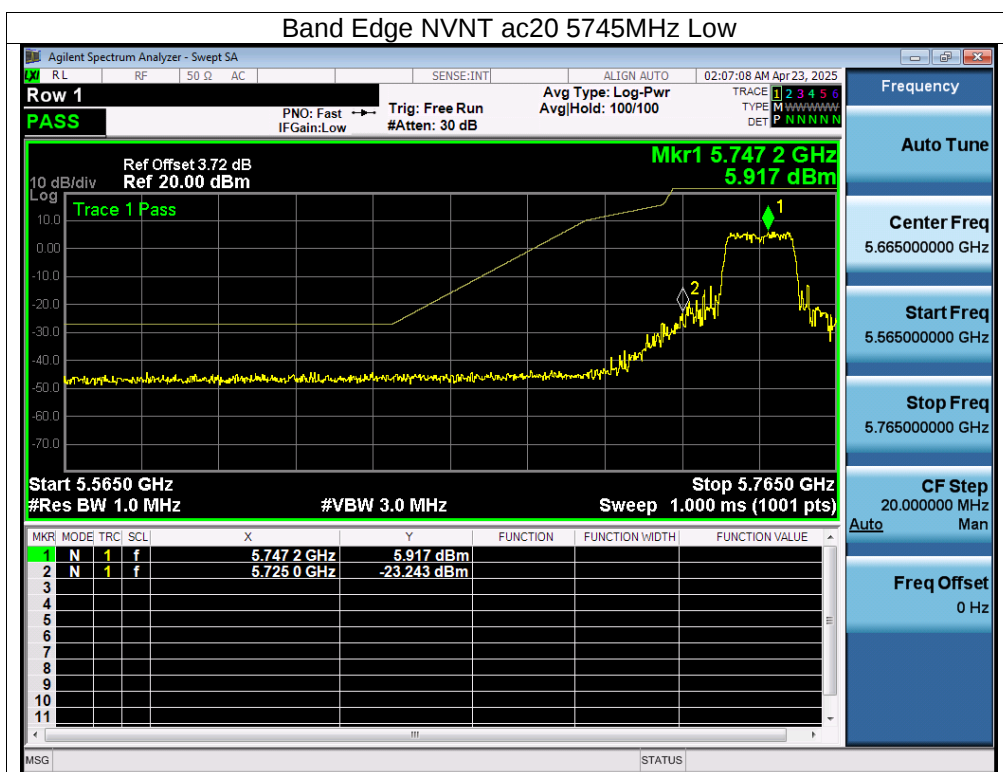
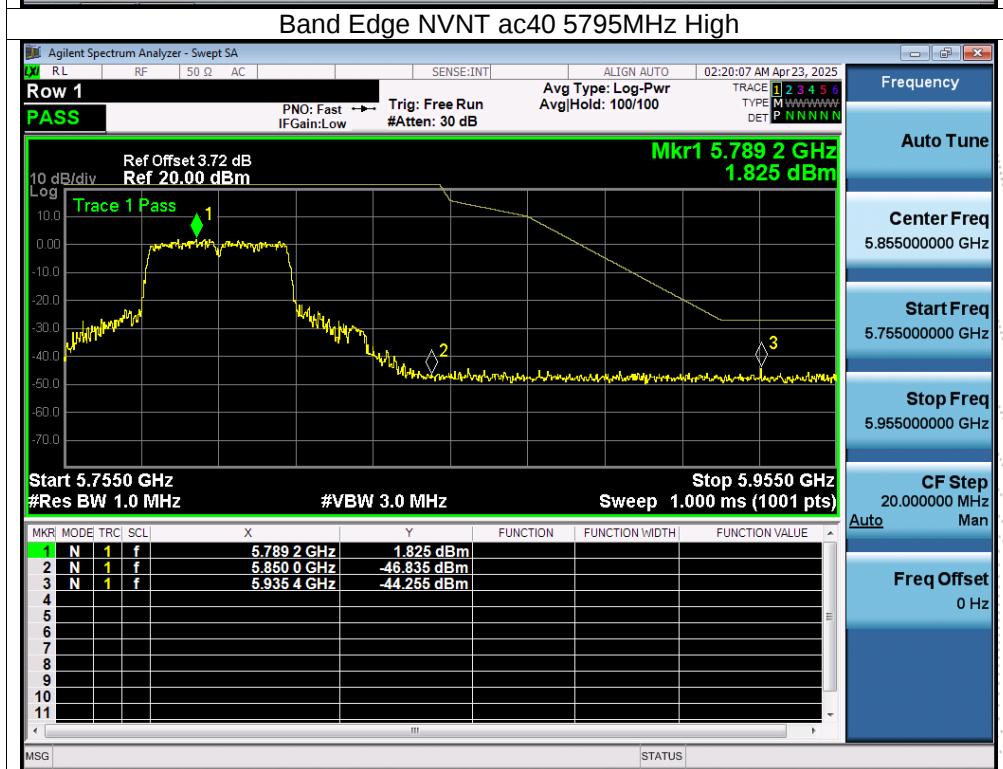
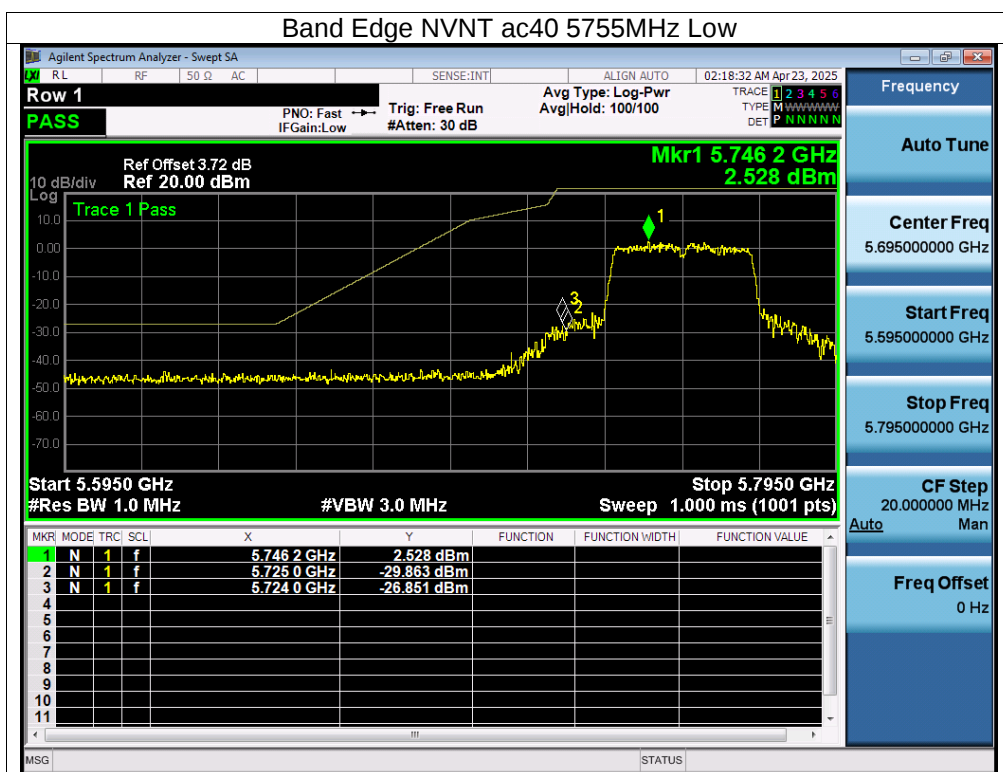
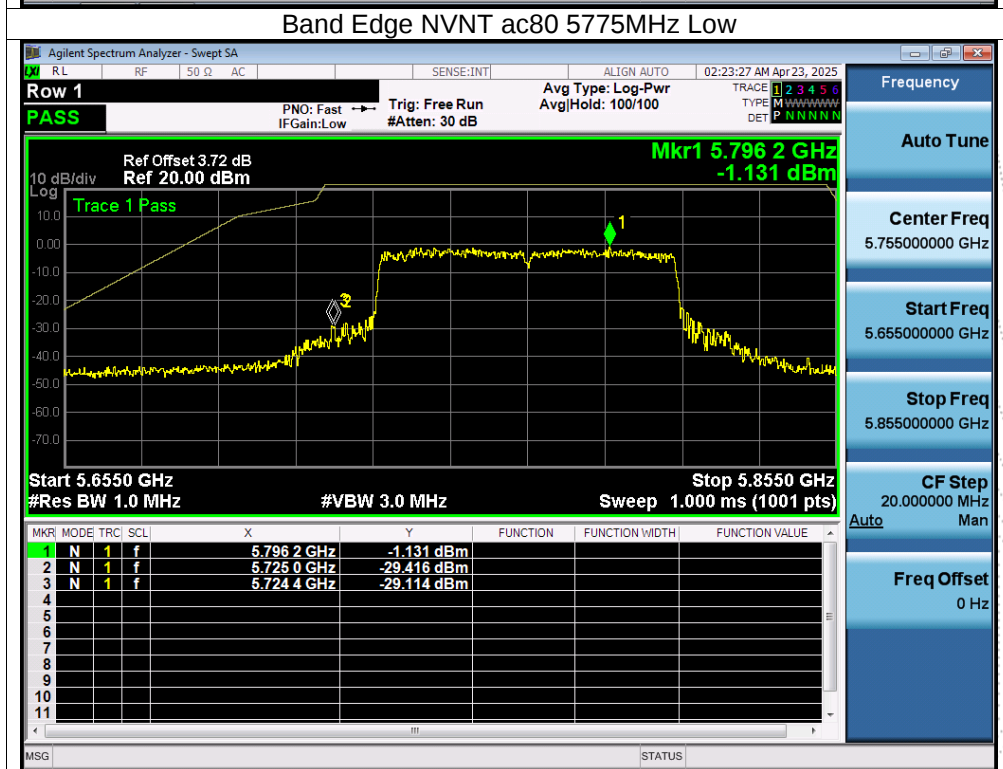
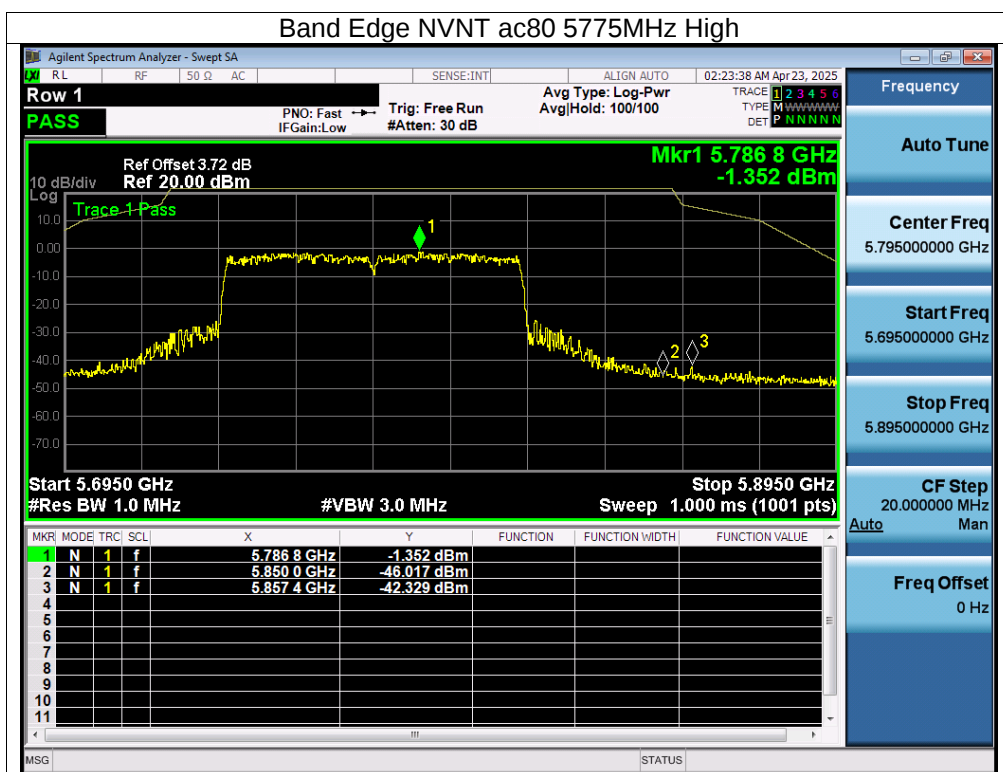










12. Spurious RF Conducted Emissions

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..

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.

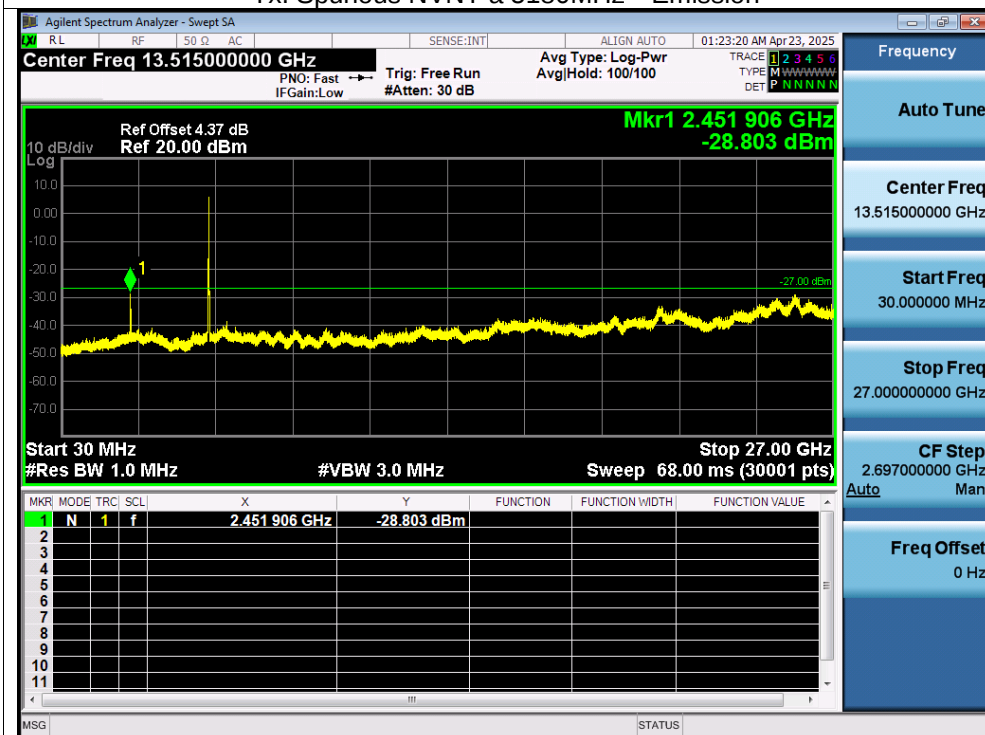
12.4 Test Result

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 band edge measurement data.

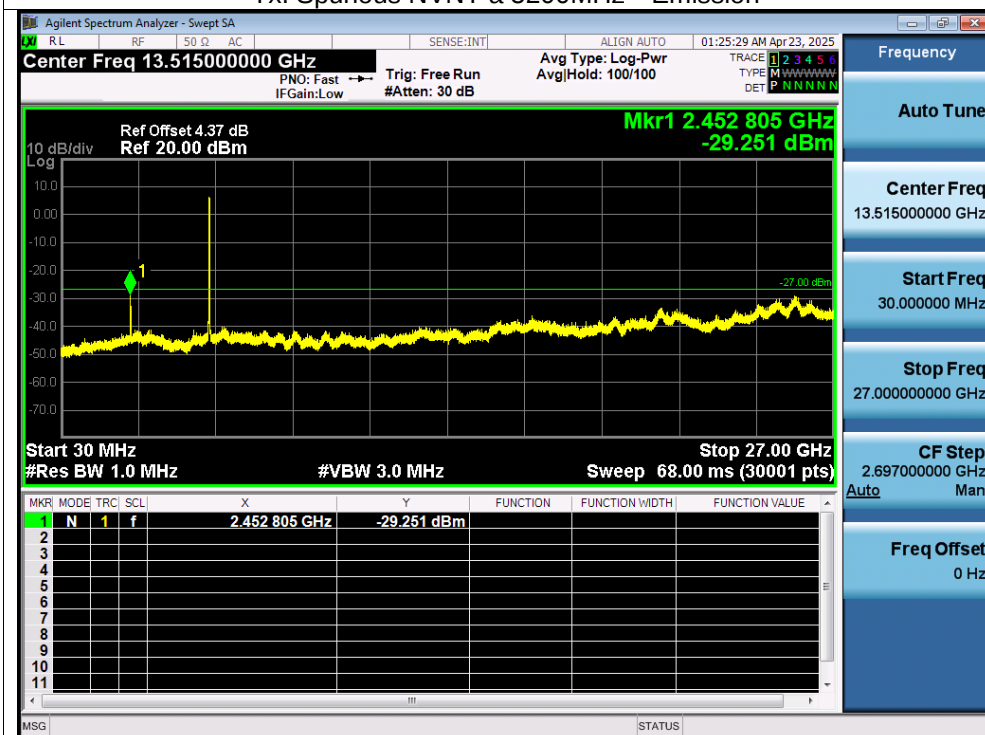
About: 26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

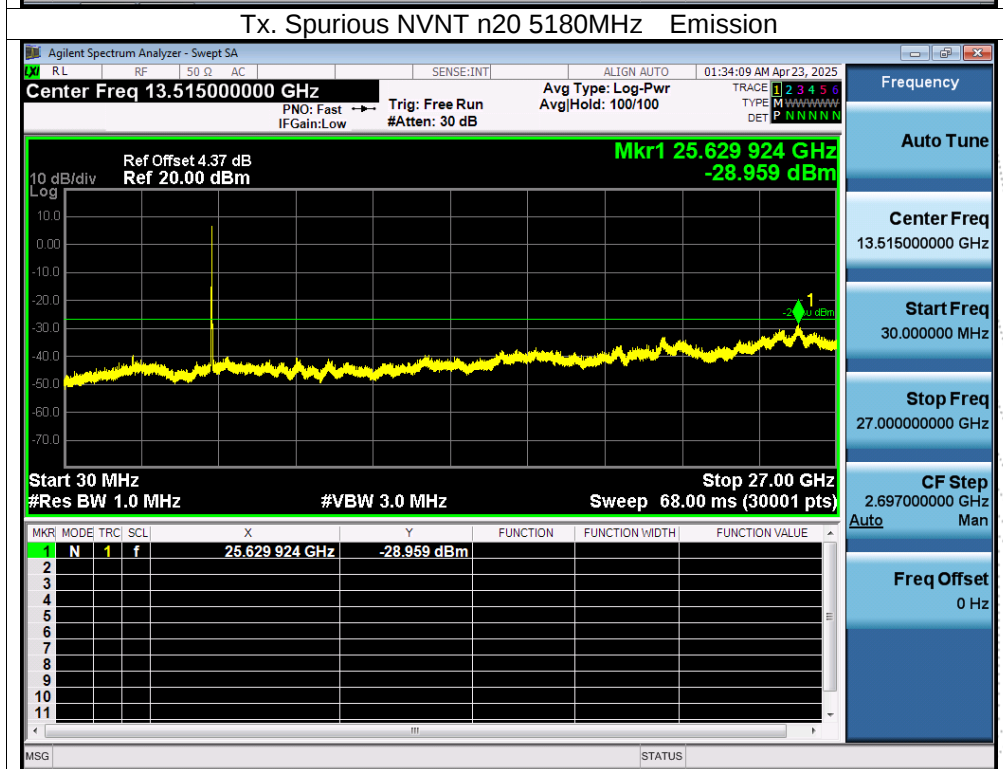
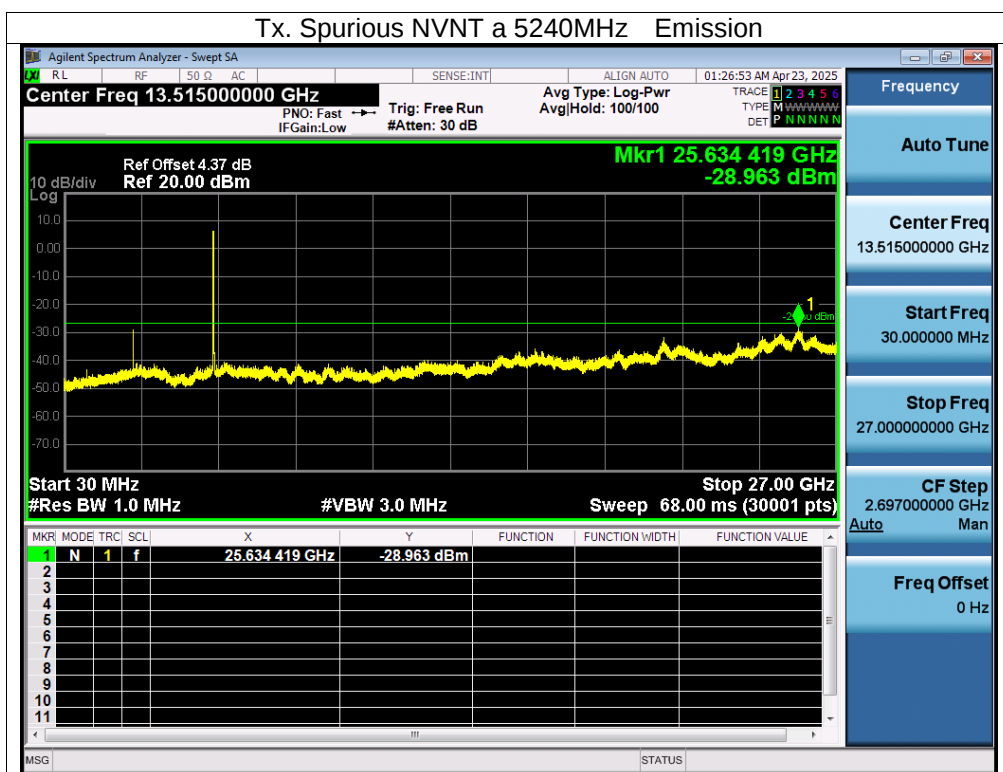
Test Graphs

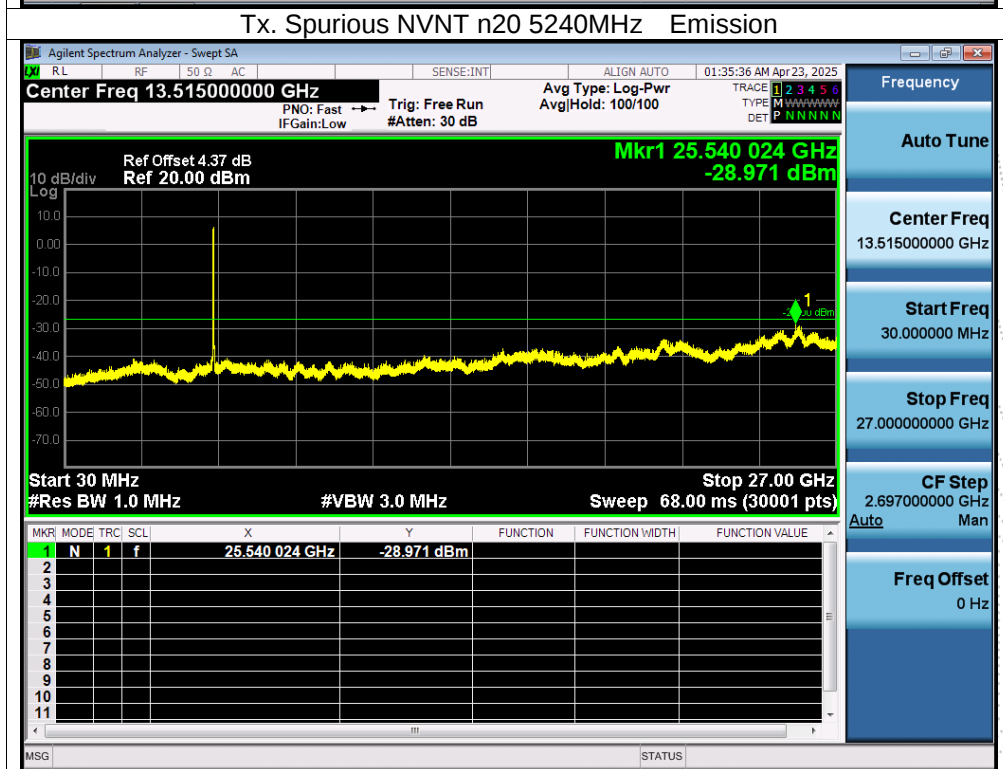
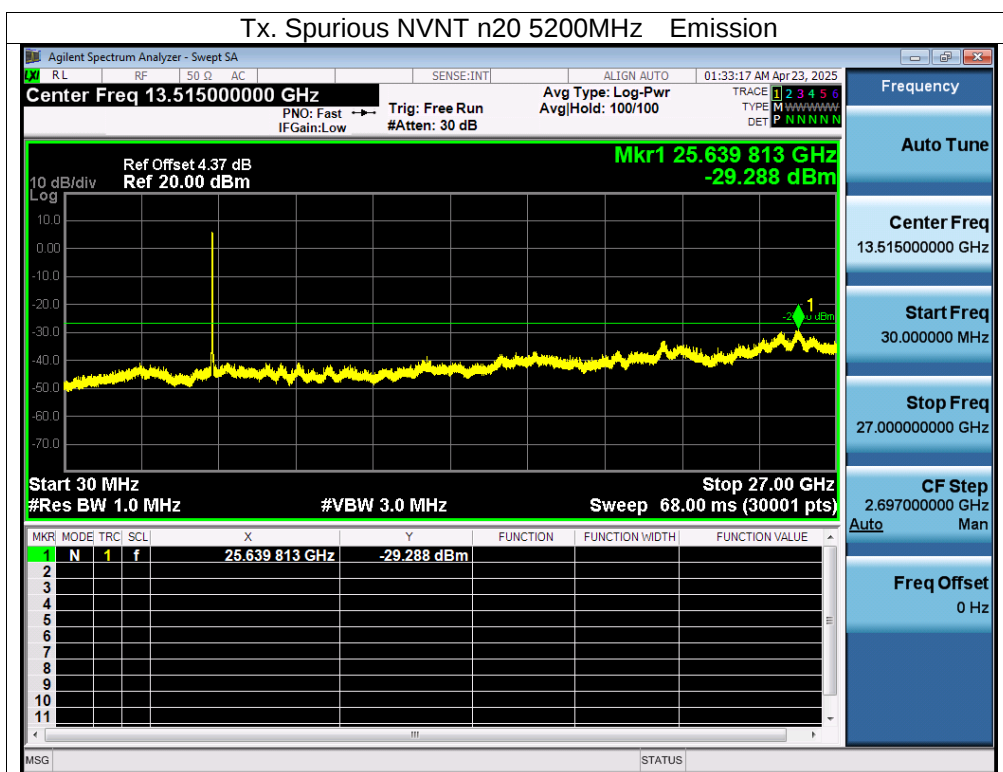
Tx. Spurious NVNT a 5180MHz Emission

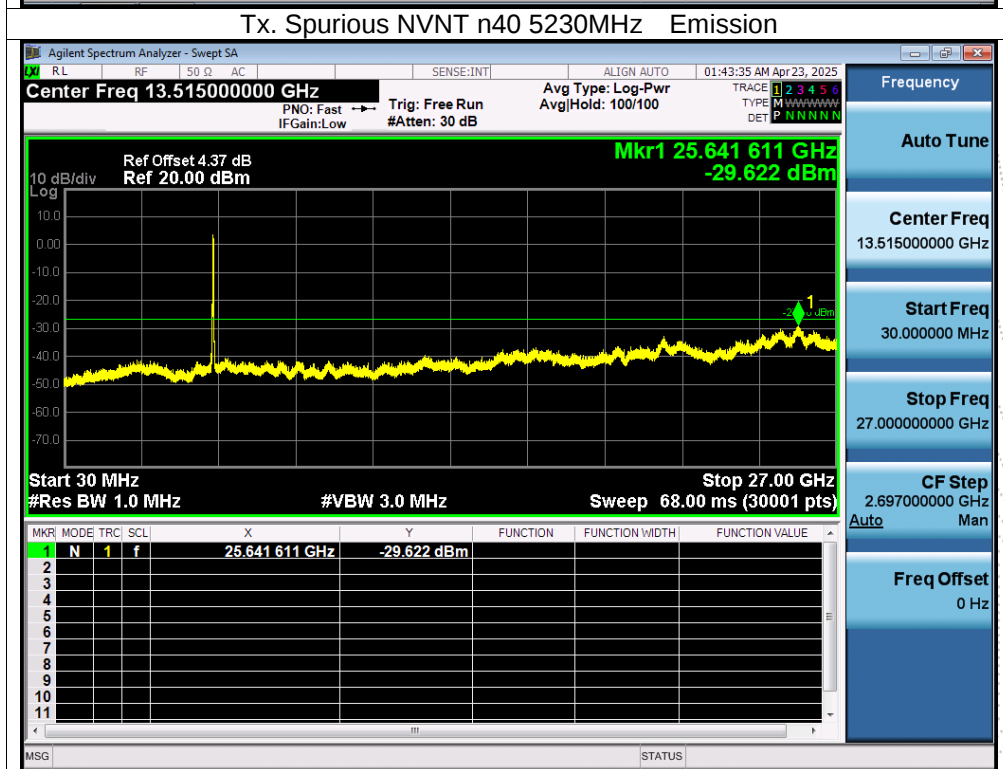
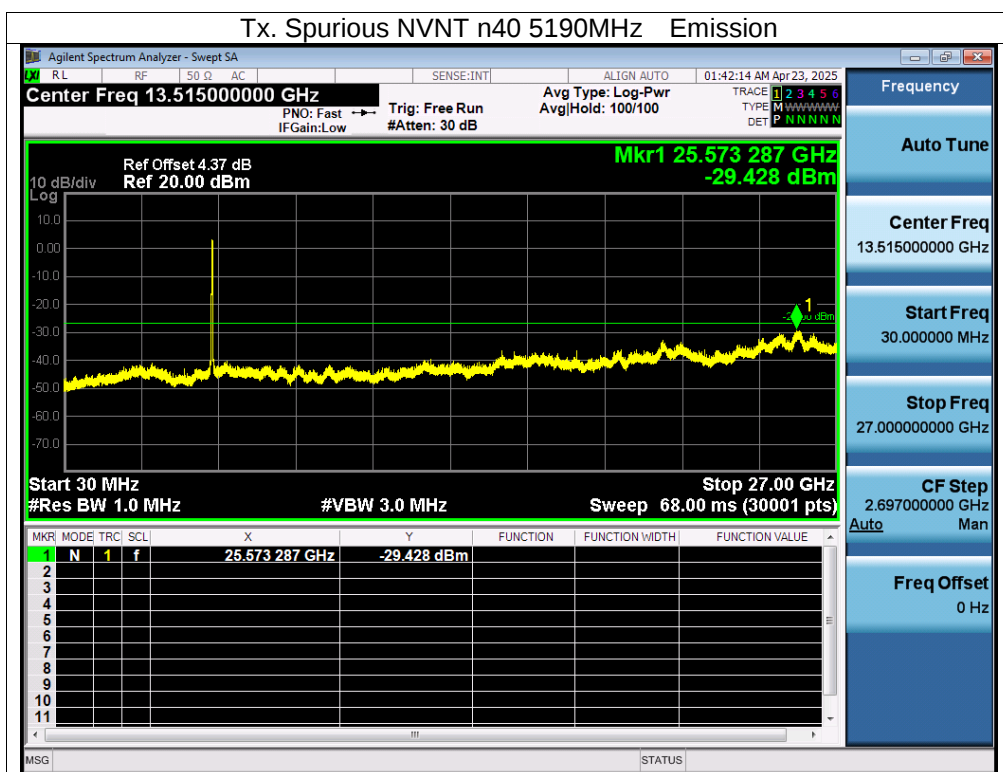


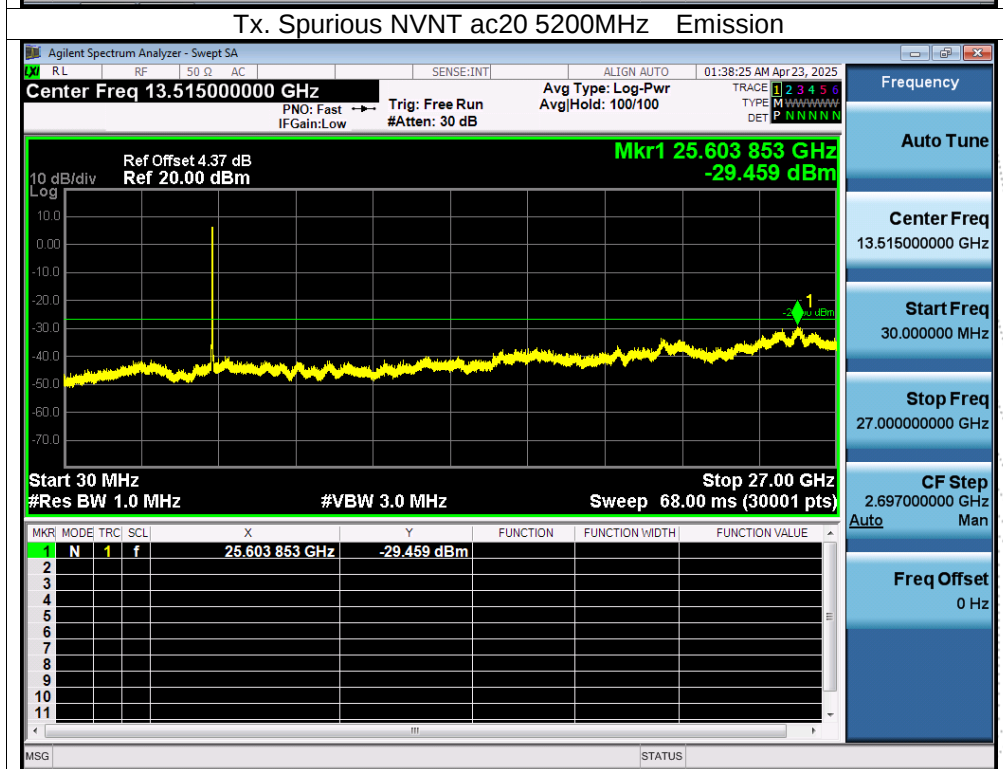
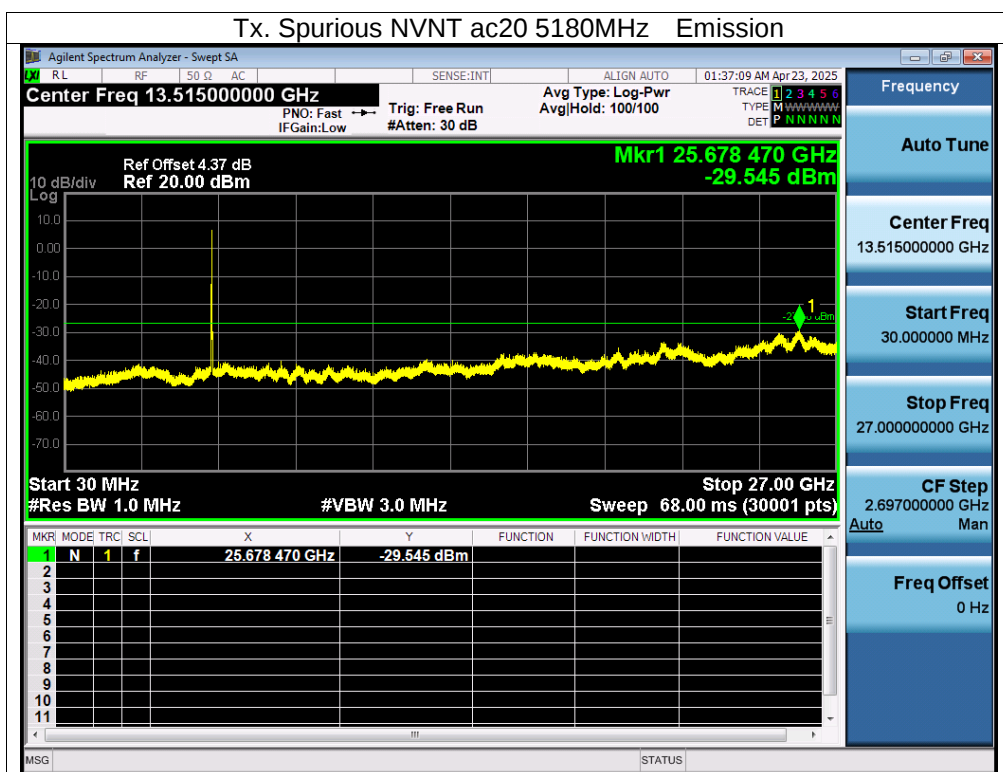
Tx. Spurious NVNT a 5200MHz Emission

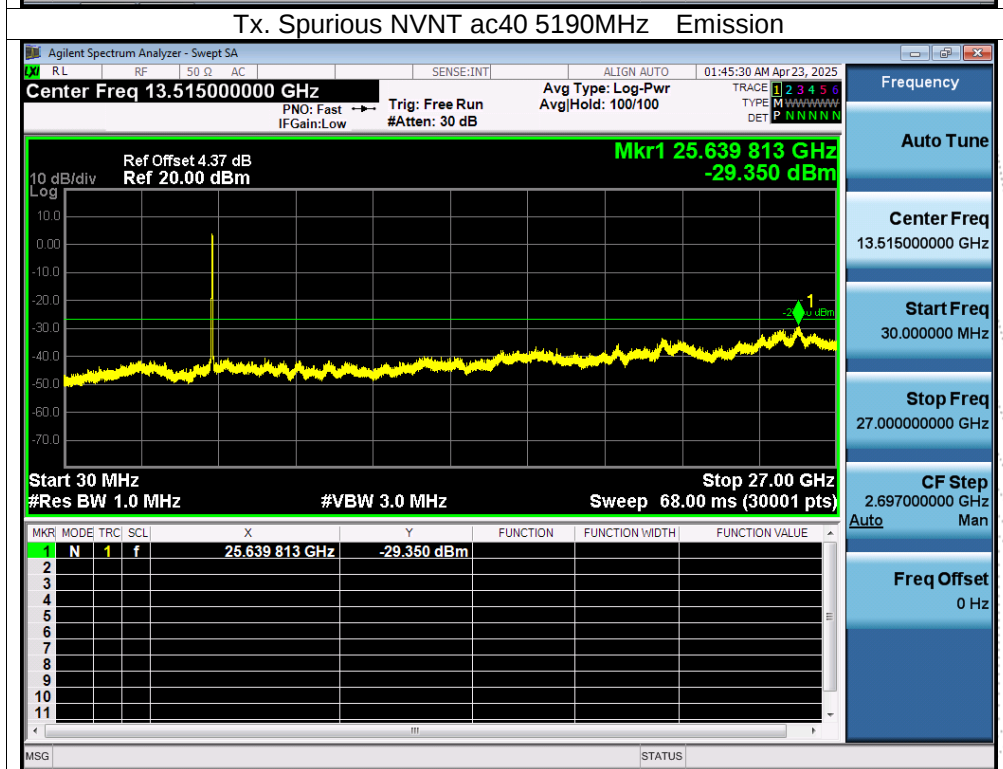
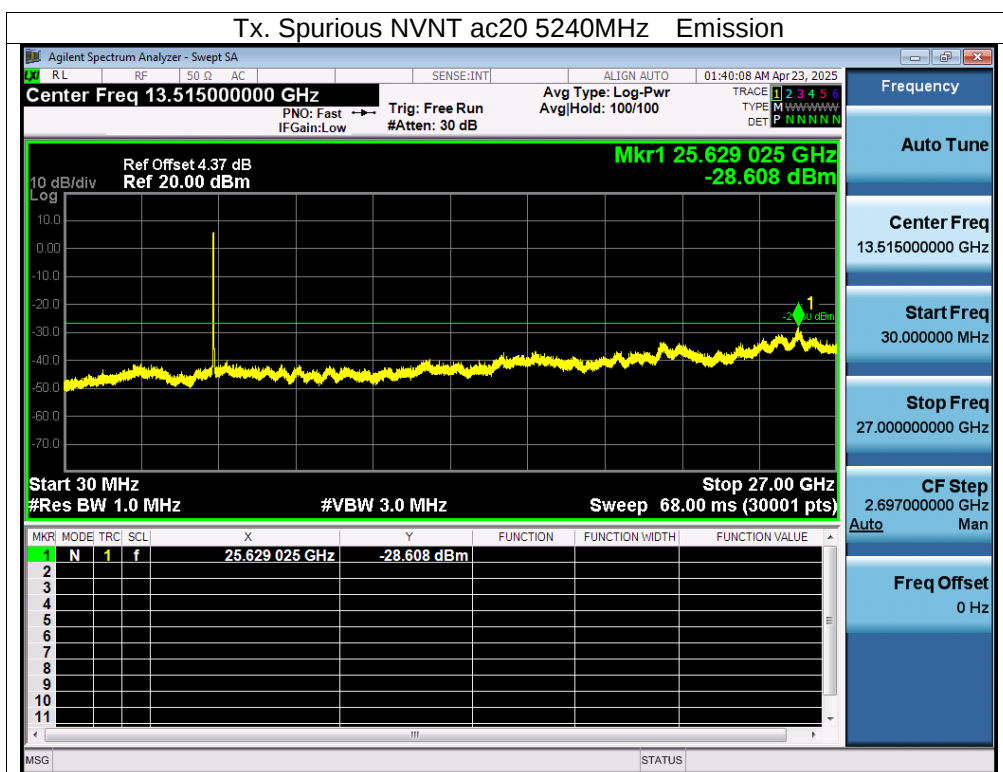


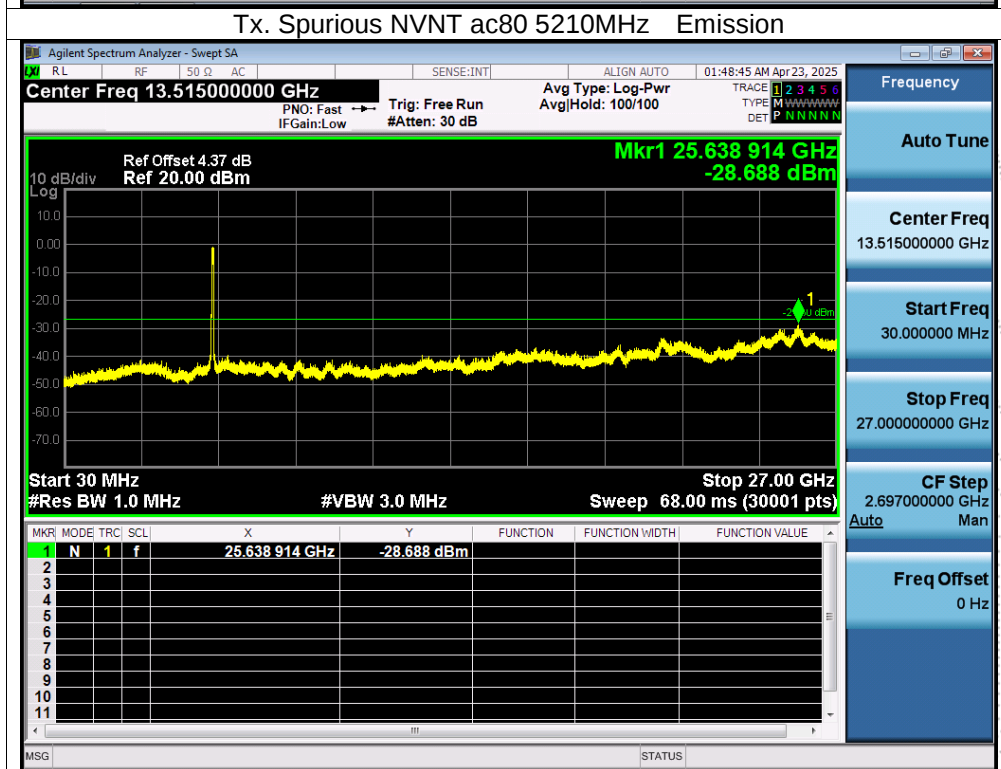
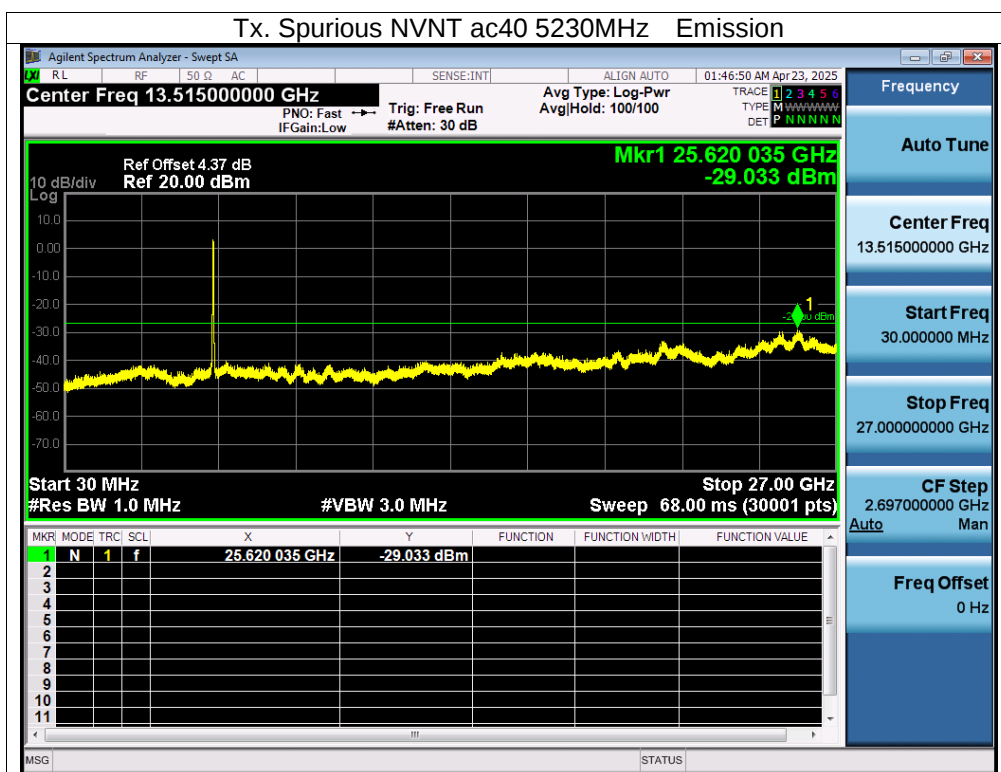






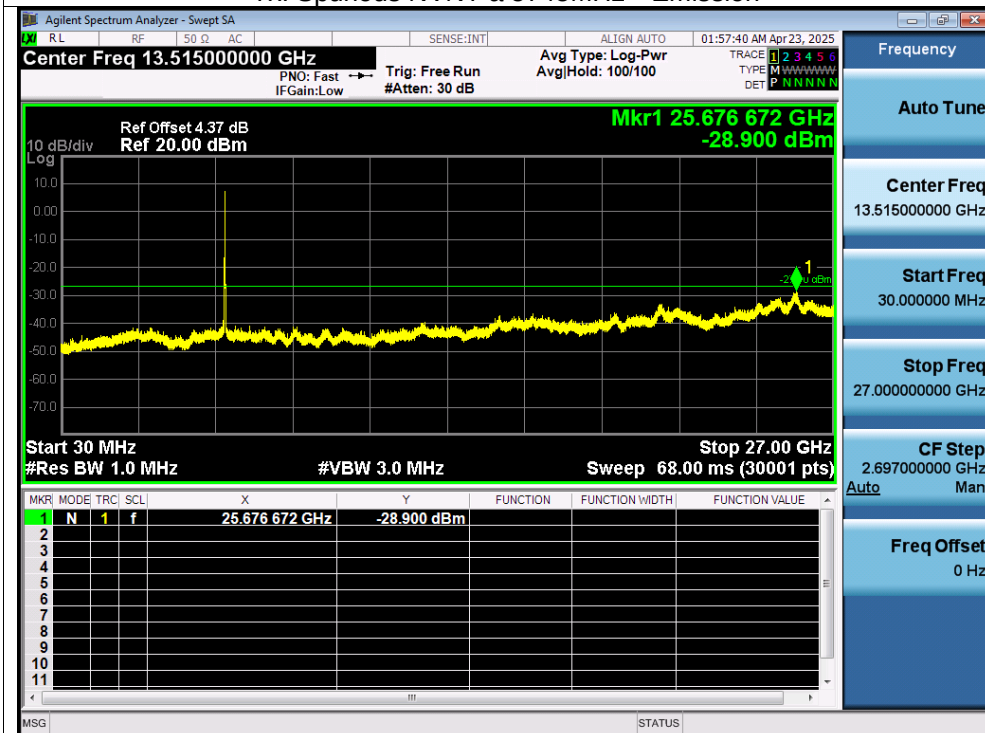




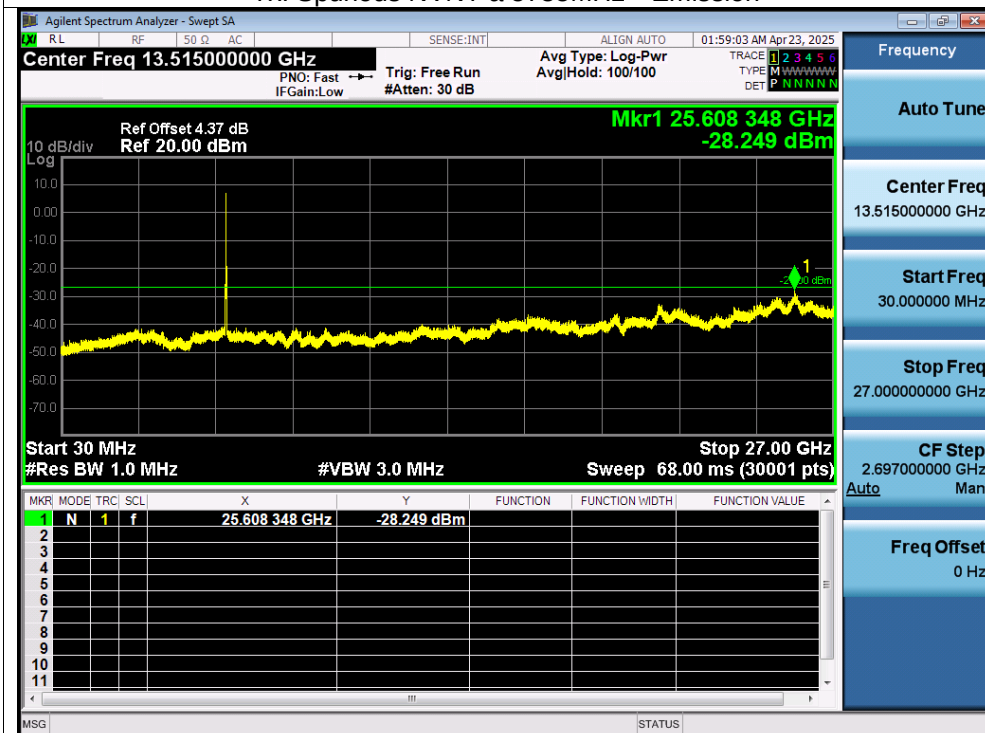


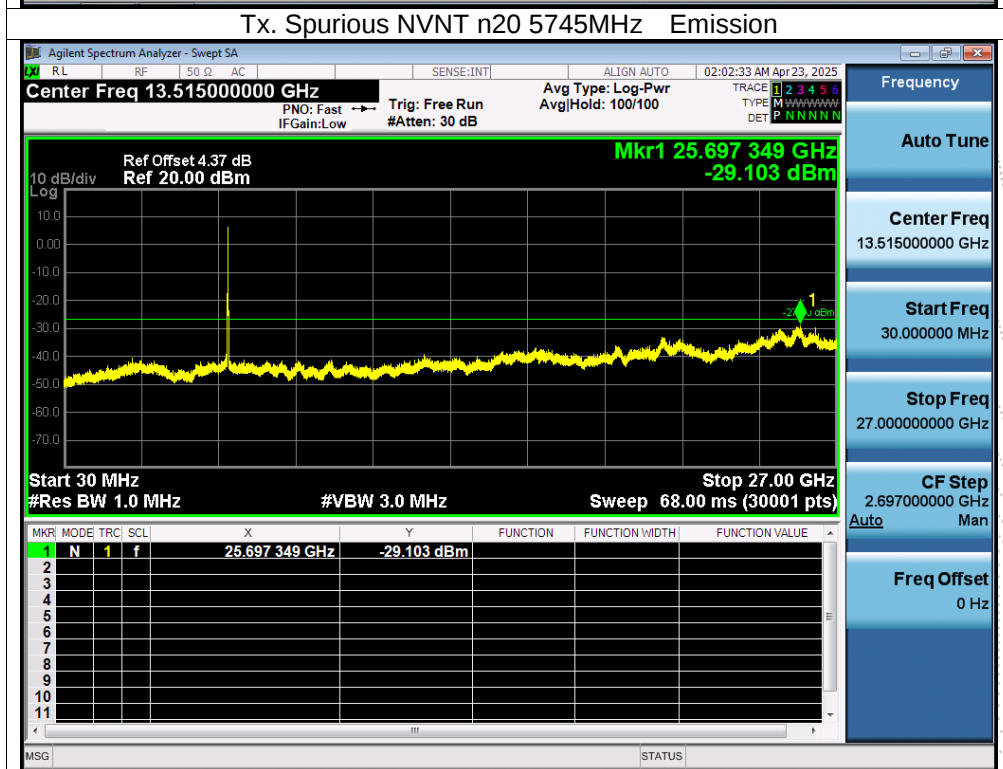
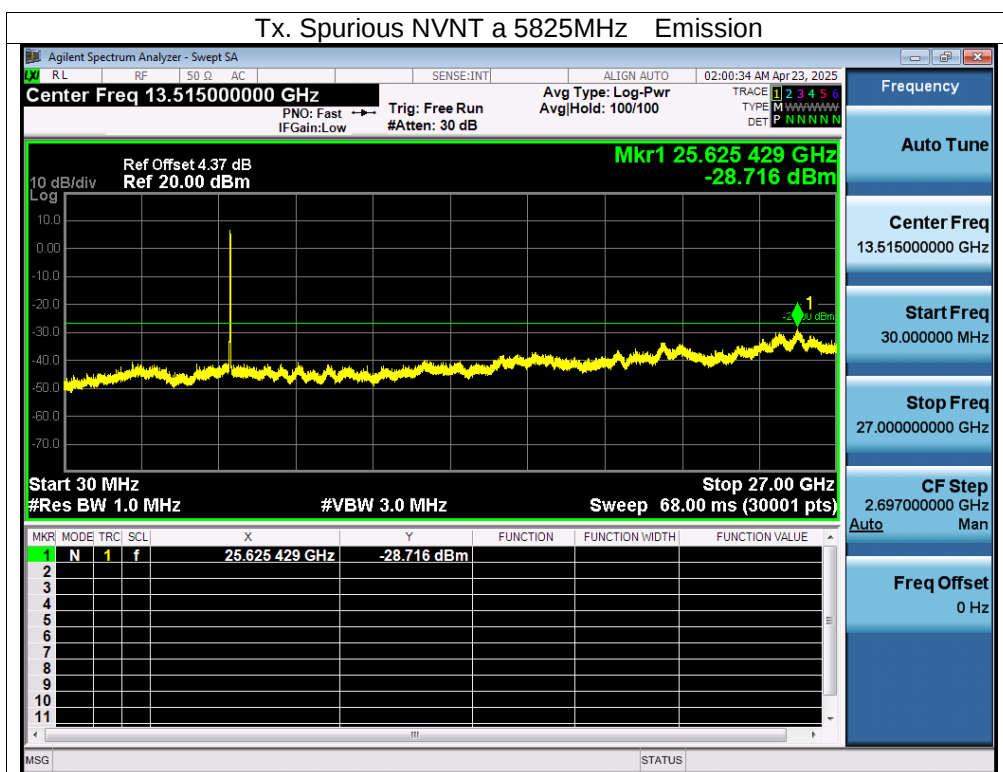
Test Graphs

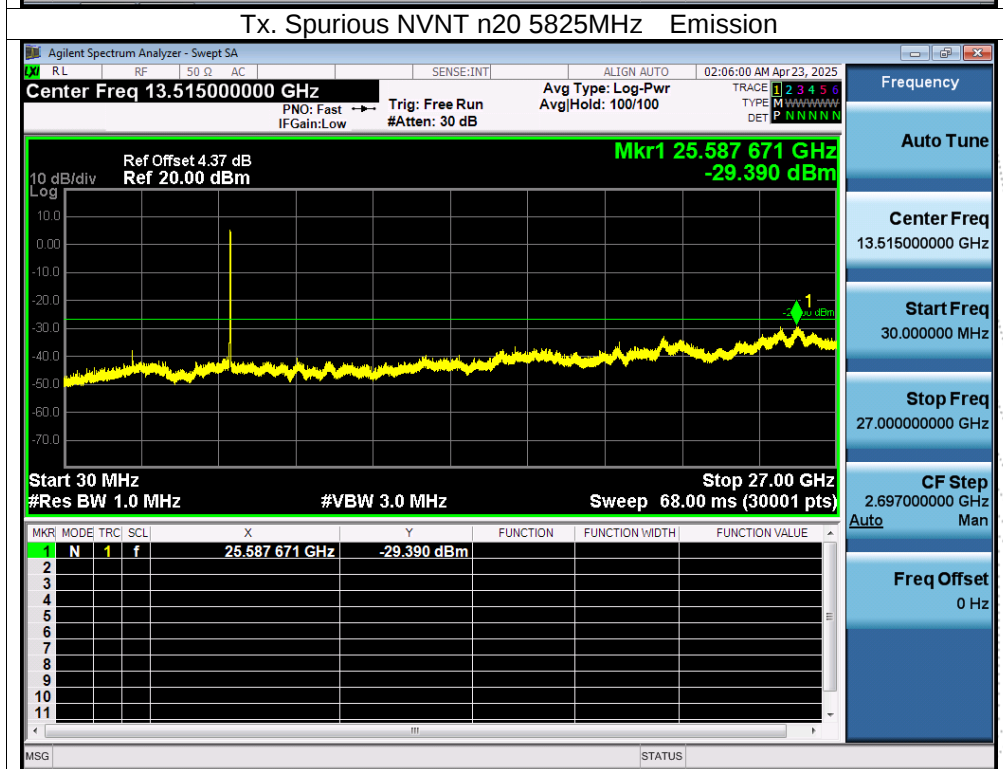
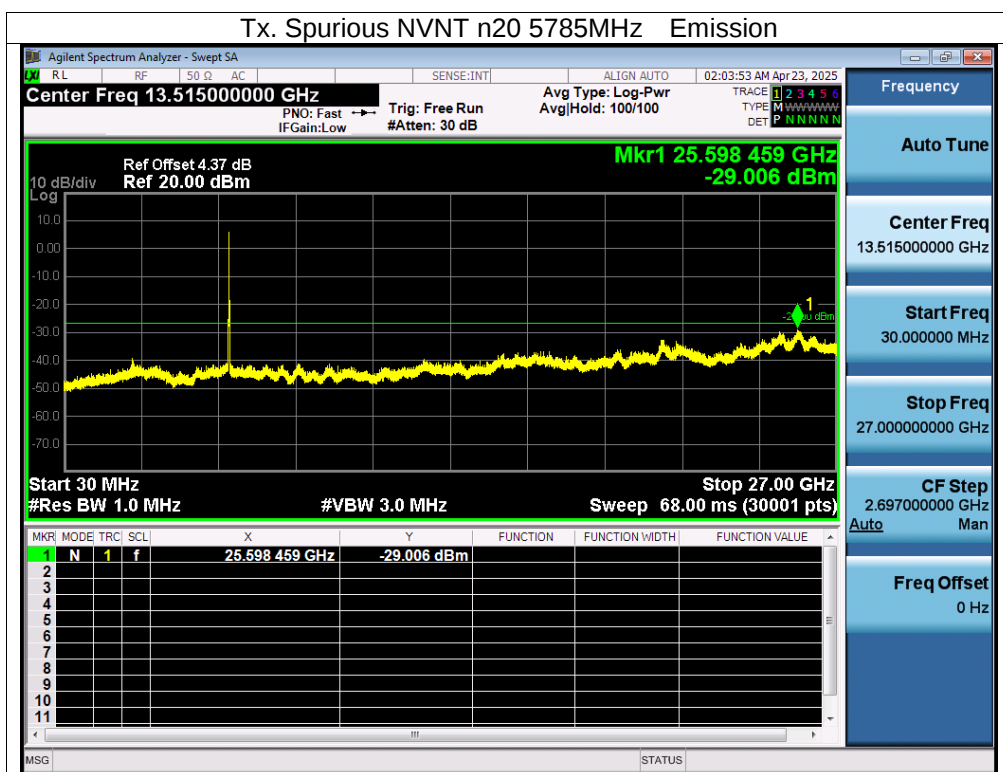
Tx. Spurious NVNT a 5745MHz Emission

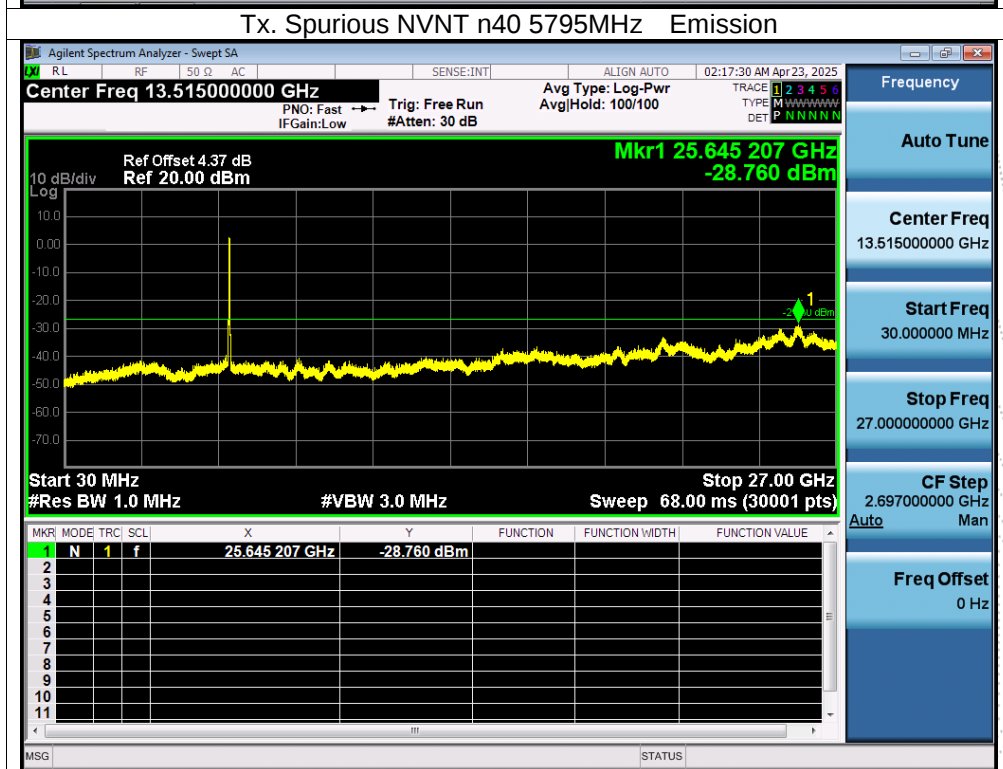
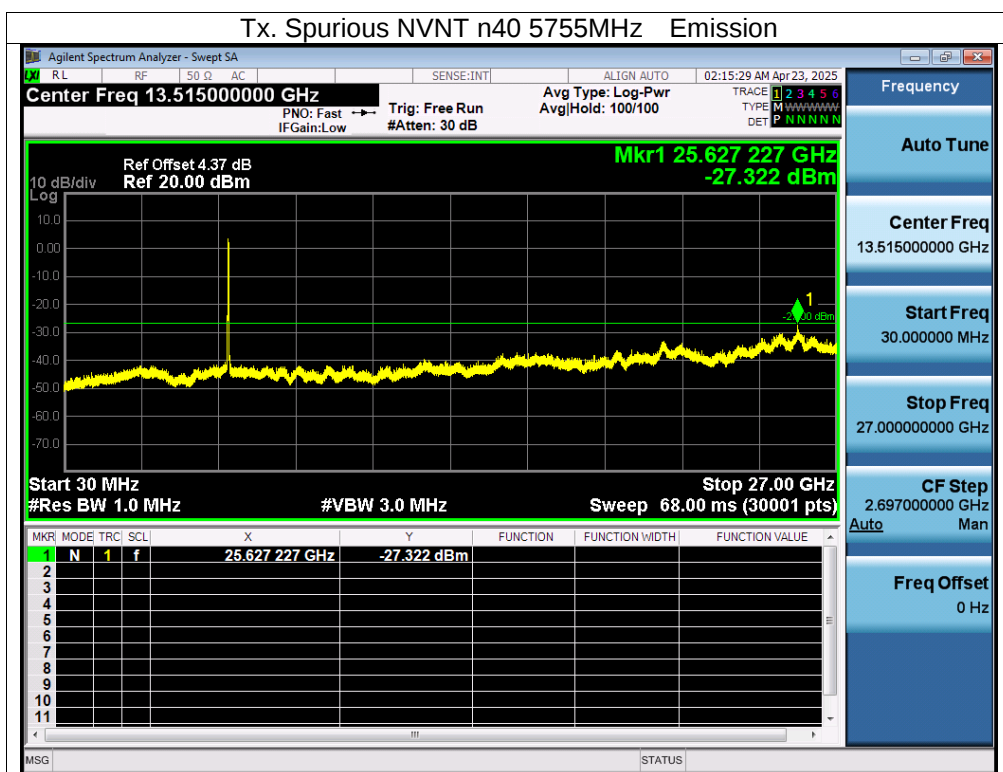


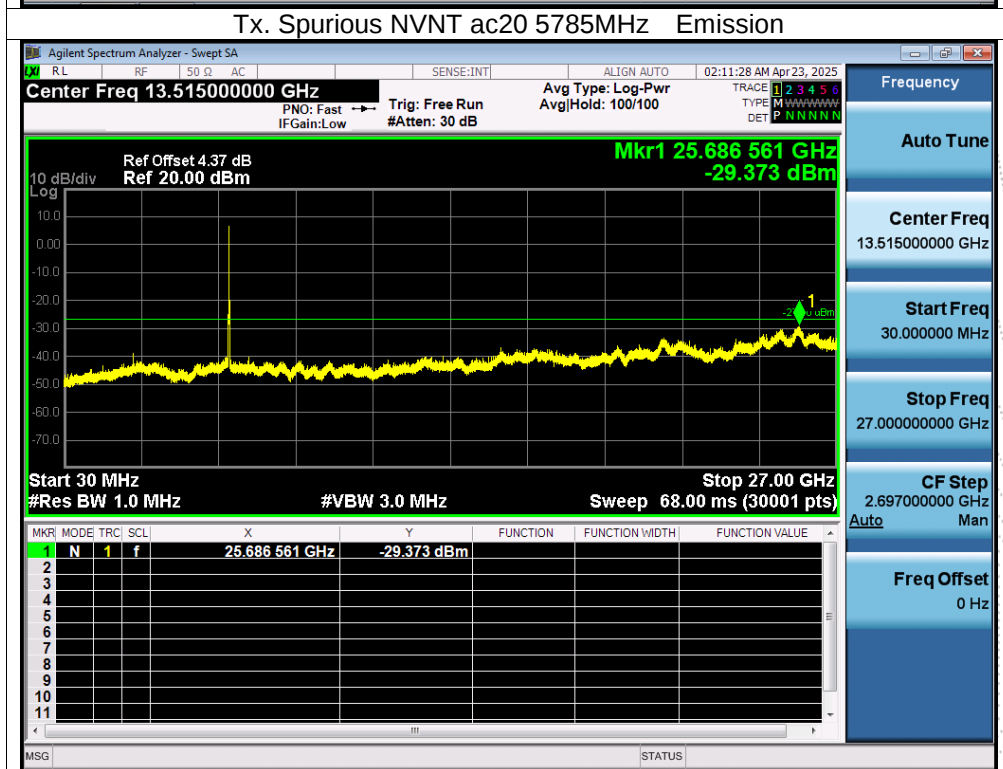
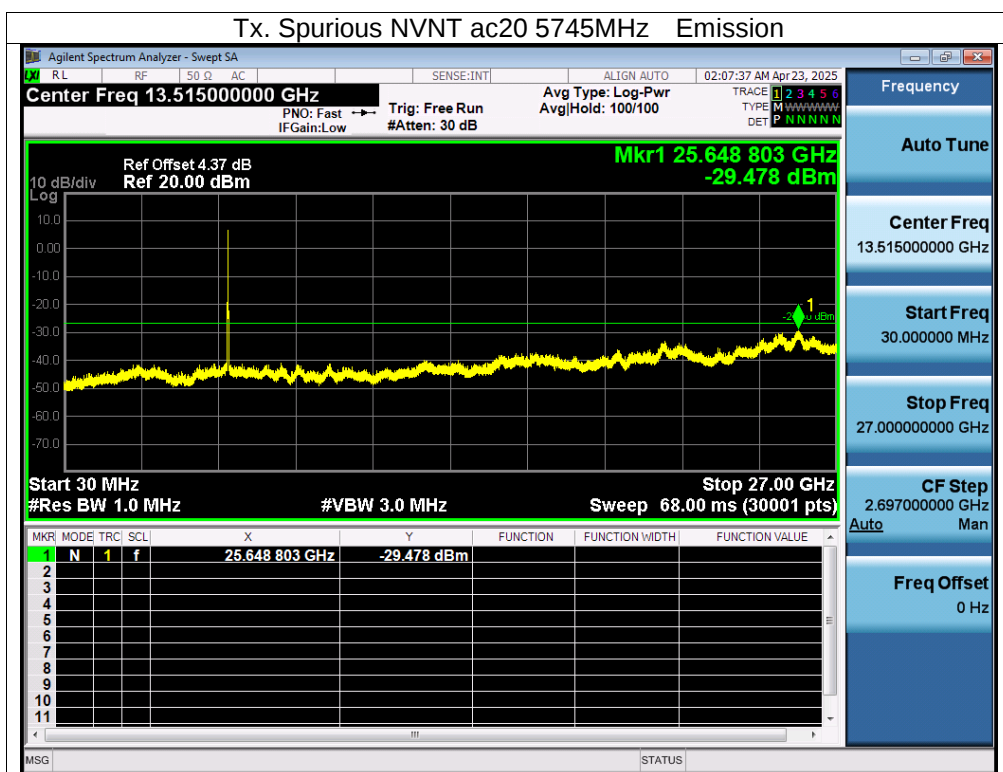
Tx. Spurious NVNT a 5785MHz Emission

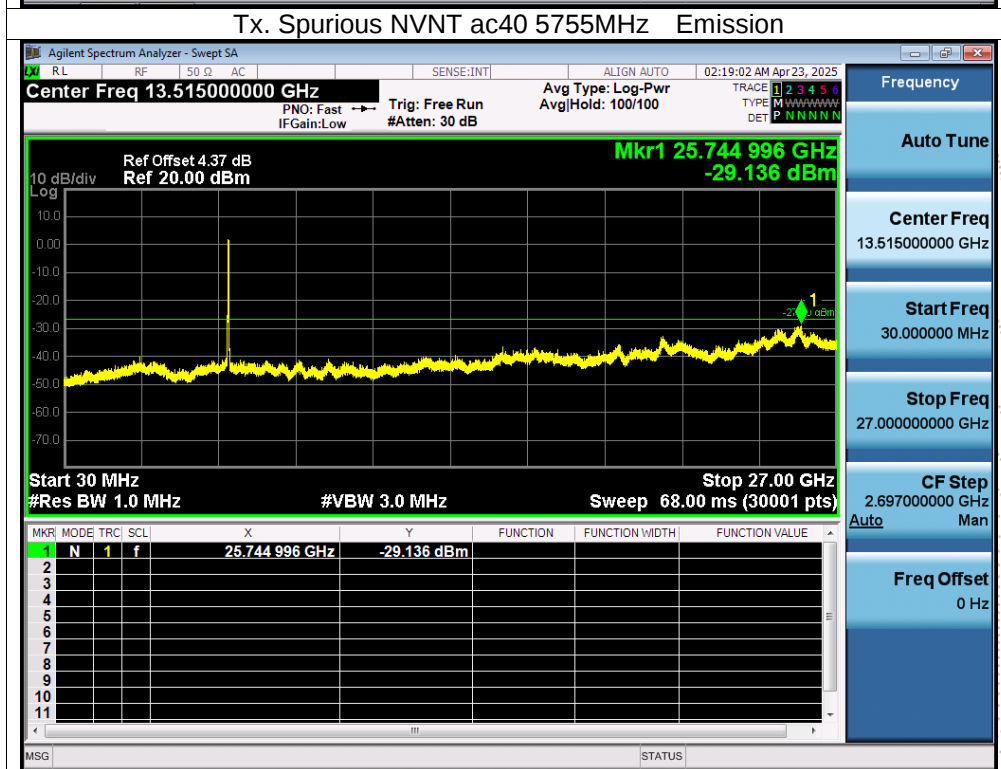
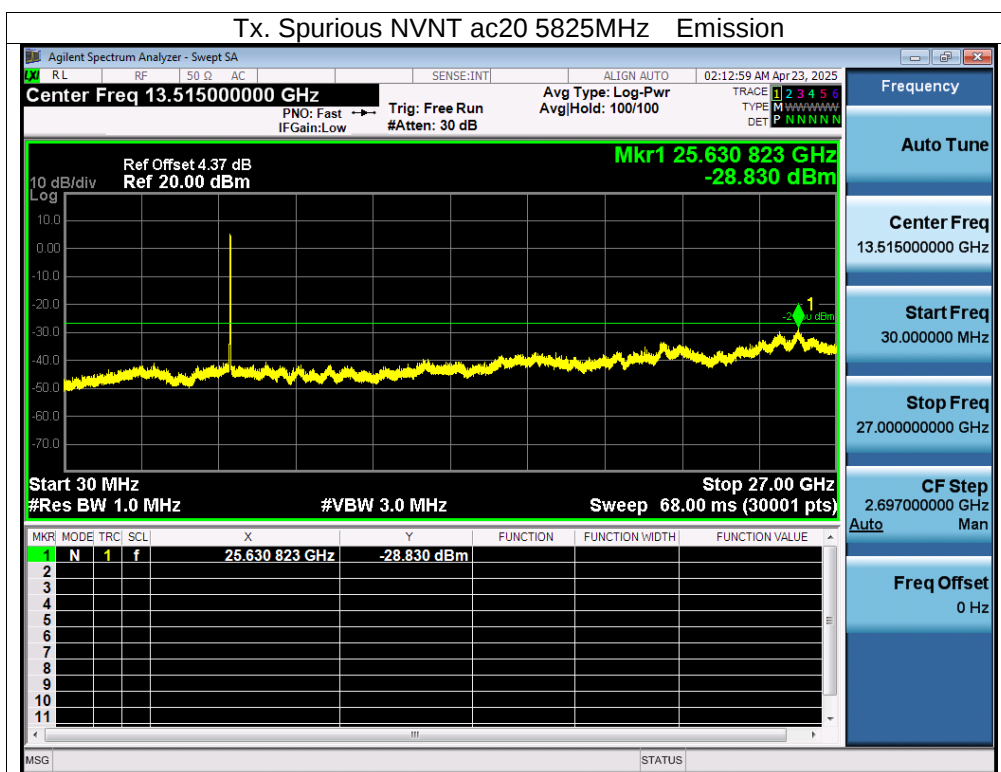


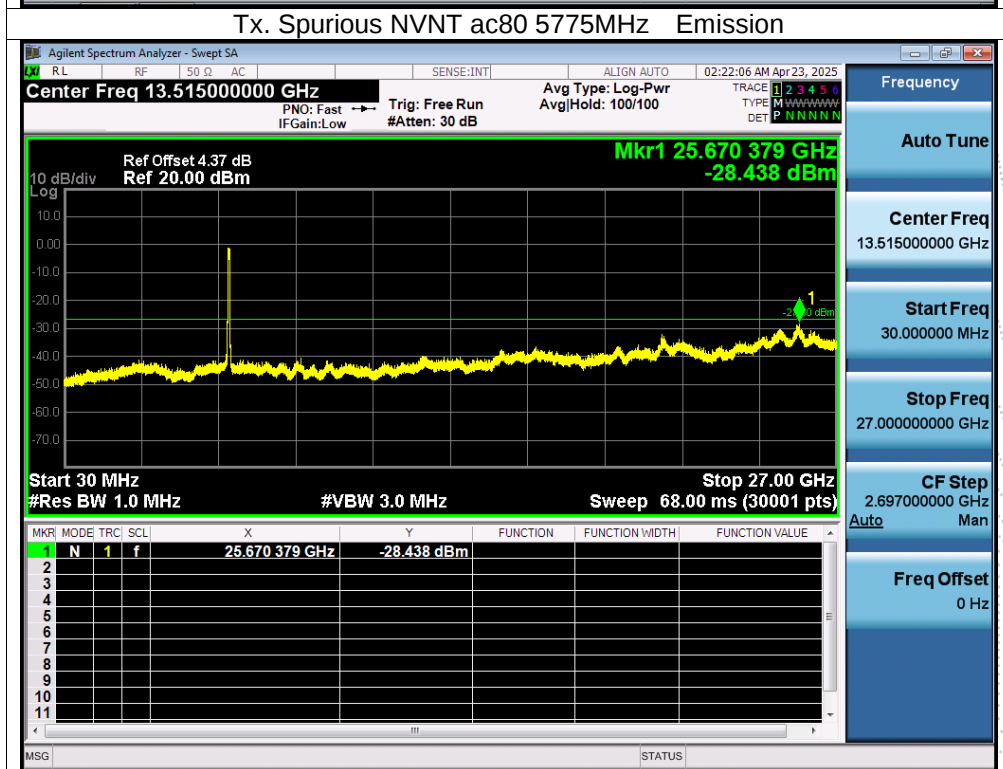
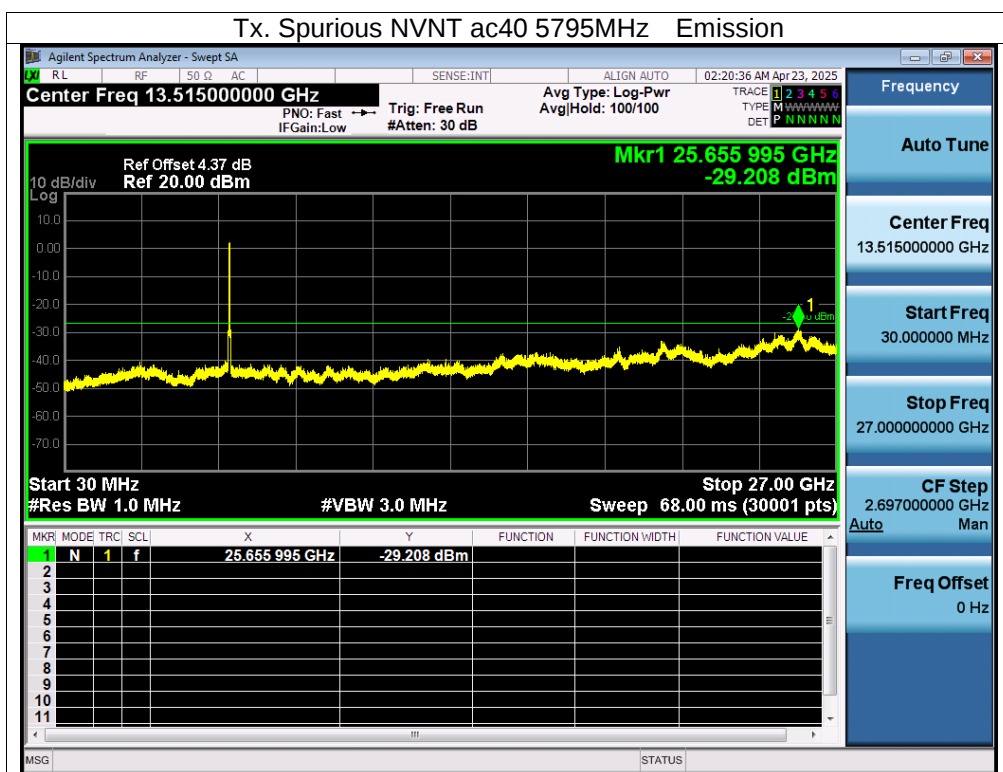












13. Frequency Stability Measurement

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 802.11nspecification).
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:	DC 3.87V
Test Mode:	TX Frequency U-NII-1 (5180-5240MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency : 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.87	5180.0021	5180	0.0021	0.4054
		V max (V)	4.45	5180.0014	5180	0.0014	0.2703
		V min (V)	3.29	5180.0129	5180	0.0129	2.4903
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)	3.87	T (°C)	-20	5180.0091	5180	0.0091	1.7568
		T (°C)	-10	5180.0006	5180	0.0006	0.1158
		T (°C)	0	5180.0120	5180	0.0120	2.3166
		T (°C)	10	5180.0011	5180	0.0011	0.2124
		T (°C)	20	5180.0049	5180	0.0049	0.9459
		T (°C)	30	5180.0055	5180	0.0055	1.0618
		T (°C)	40	5180.0062	5180	0.0062	1.1969
		T (°C)	50	5180.0064	5180	0.0064	1.2355
		T (°C)	60	5180.0094	5180	0.0094	1.8147
		T (°C)	70	5180.0134	5180	0.0134	2.5869
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)	3.87	5200.0057	5200	0.0057	1.0962
		V max (V)	4.45	5200.0014	5200	0.0014	0.2692
		V min (V)	3.29	5200.0055	5200	0.0055	1.0577
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)	3.87	T (°C)	-20	5200.01090	5200	0.01090	2.0962
		T (°C)	-10	5200.01330	5200	0.01330	2.5577
		T (°C)	0	5200.00470	5200	0.00470	0.9038
		T (°C)	10	5200.00470	5200	0.00470	0.9038
		T (°C)	20	5200.00950	5200	0.00950	1.8269
		T (°C)	30	5200.00950	5200	0.00950	1.8269
		T (°C)	40	5200.01100	5200	0.01100	2.1154
		T (°C)	50	5200.01340	5200	0.01340	2.5769
		T (°C)	60	5200.01280	5200	0.01280	2.4615
		T (°C)	70	5200.00970	5200	0.00970	1.8654
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)	3.87	5240.0034	5240	0.0034	0.6489
		V max (V)	4.45	5240.0050	5240	0.0050	0.9542
		V min (V)	3.29	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)	3.87	T (°C)	-20	5240.0046	5240	0.0046	0.8779
		T (°C)	-10	5240.0077	5240	0.0077	1.4695
		T (°C)	0	5240.0040	5240	0.0040	0.7634
		T (°C)	10	5240.0111	5240	0.0111	2.1183
		T (°C)	20	5240.0063	5240	0.0063	1.2023
		T (°C)	30	5240.0090	5240	0.0090	1.7176
		T (°C)	40	5240.0037	5240	0.0037	0.7061
		T (°C)	50	5240.0086	5240	0.0086	1.6412
		T (°C)	60	5240.0040	5240	0.0040	0.7634
		T (°C)	70	5240.0121	5240	0.0121	2.3092
Limits				5150-5250 MHz			
Result				Complies			

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage:	DC 3.87V
Test Mode:	TX Frequency(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)	3.87	5745.00970	5745	0.00970	1.6884
		V max (V)	4.45	5745.00390	5745	0.00390	0.6789
		V min (V)	3.29	5745.00340	5745	0.00340	0.5918
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)	3.87	T (°C)	-20	5745.00390	5745	0.00390	0.6789
		T (°C)	-10	5745.00620	5745	0.00620	1.0792
		T (°C)	0	5745.01260	5745	0.01260	2.1932
		T (°C)	10	5745.00200	5745	0.00200	0.3481
		T (°C)	20	5745.00660	5745	0.00660	1.1488
		T (°C)	30	5745.00210	5745	0.00210	0.3655
		T (°C)	40	5745.01140	5745	0.01140	1.9843
		T (°C)	50	5745.00510	5745	0.00510	0.8877
		T (°C)	60	5745.00390	5745	0.00390	0.6789
		T (°C)	70	5745.00060	5745	0.00060	0.1044
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)	3.87	5785.00360	5785	0.00360	0.6223
		V max (V)	4.45	5785.00530	5785	0.00530	0.9162
		V min (V)	3.29	5785.01340	5785	0.01340	2.3163
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)	3.87	T (°C)	-20	5785.00770	5785	0.00770	1.3310
		T (°C)	-10	5785.00900	5785	0.00900	1.5557
		T (°C)	0	5785.01110	5785	0.01110	1.9188
		T (°C)	10	5785.00820	5785	0.00820	1.4175
		T (°C)	20	5785.00310	5785	0.00310	0.5359
		T (°C)	30	5785.01070	5785	0.01070	1.8496
		T (°C)	40	5785.01140	5785	0.01140	1.9706
		T (°C)	50	5785.00220	5785	0.00220	0.3803
		T (°C)	60	5785.00980	5785	0.00980	1.6940
		T (°C)	70	5785.00490	5785	0.00490	0.8470
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)	3.87	5825.01060	5825	0.01060	1.8197
		V max (V)	4.45	5825.00810	5825	0.00810	1.3906
		V min (V)	3.29	5825.00810	5825	0.00810	1.3906
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)	3.87	T (°C)	-20	5825.01260	5825	0.01260	2.1631
		T (°C)	-10	5825.01050	5825	0.01050	1.8026
		T (°C)	0	5825.00470	5825	0.00470	0.8069
		T (°C)	10	5825.01310	5825	0.01310	2.2489
		T (°C)	20	5825.01170	5825	0.01170	2.0086
		T (°C)	30	5825.00290	5825	0.00290	0.4979
		T (°C)	40	5825.00930	5825	0.00930	1.5966
		T (°C)	50	5825.00660	5825	0.00660	1.1330
		T (°C)	60	5825.00500	5825	0.00500	0.8584
		T (°C)	70	5825.00500	5825	0.00500	0.8584
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 = $T_{on} / (T_{on} + T_{off})$

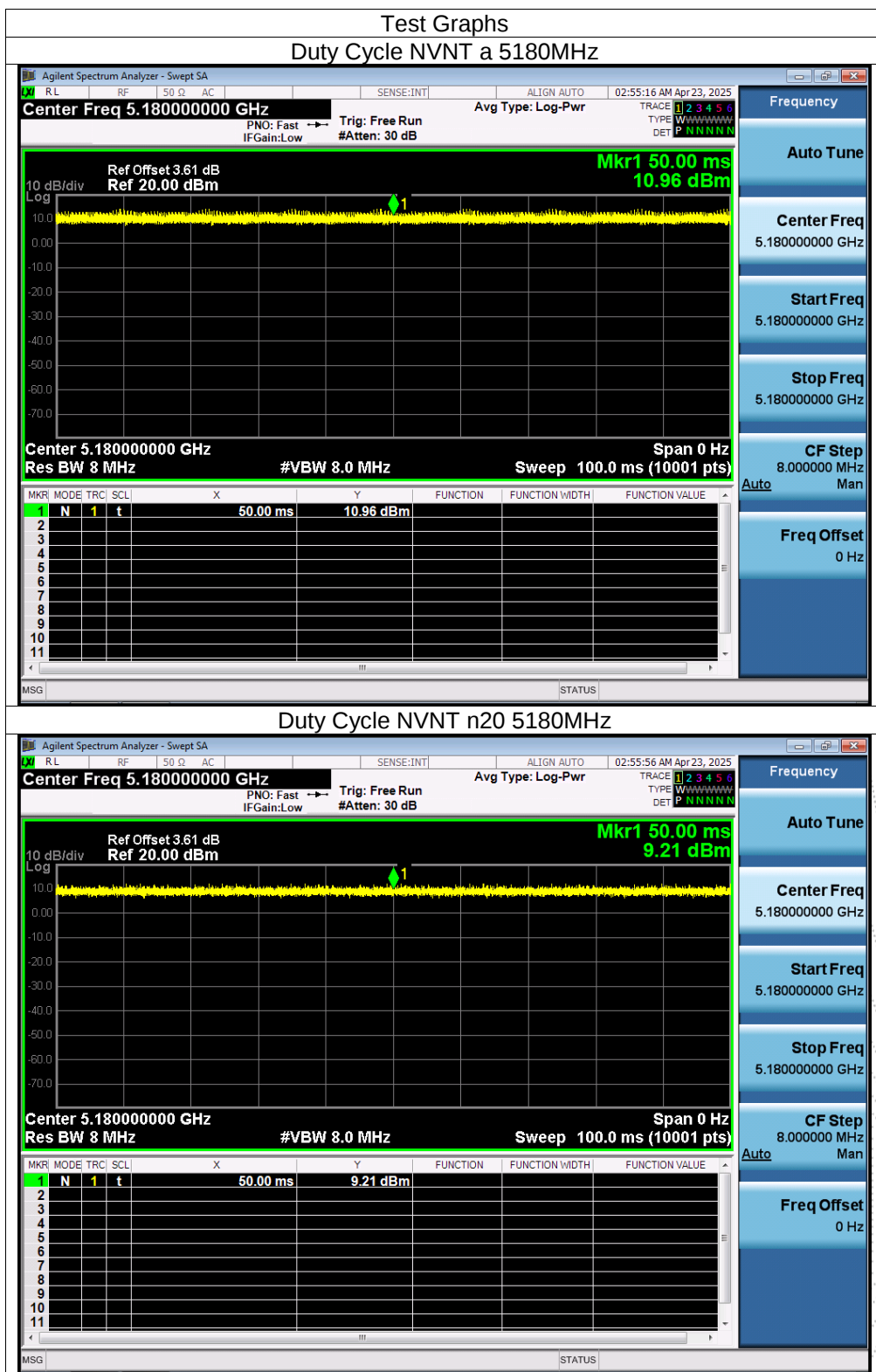
14.3 Test Procedure

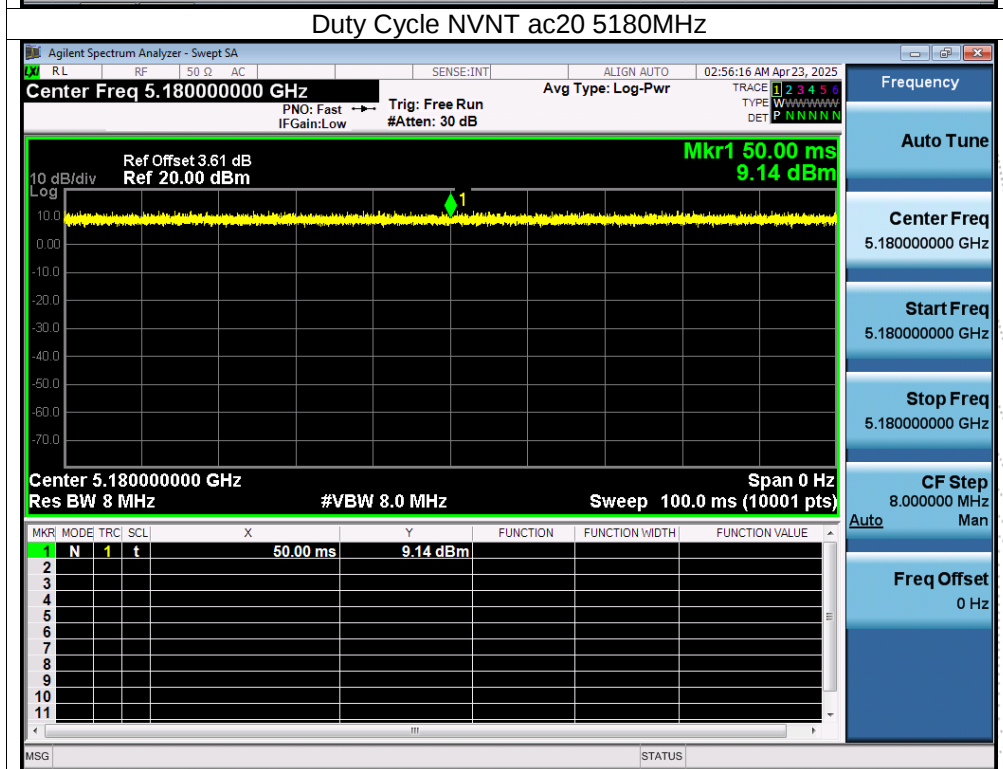
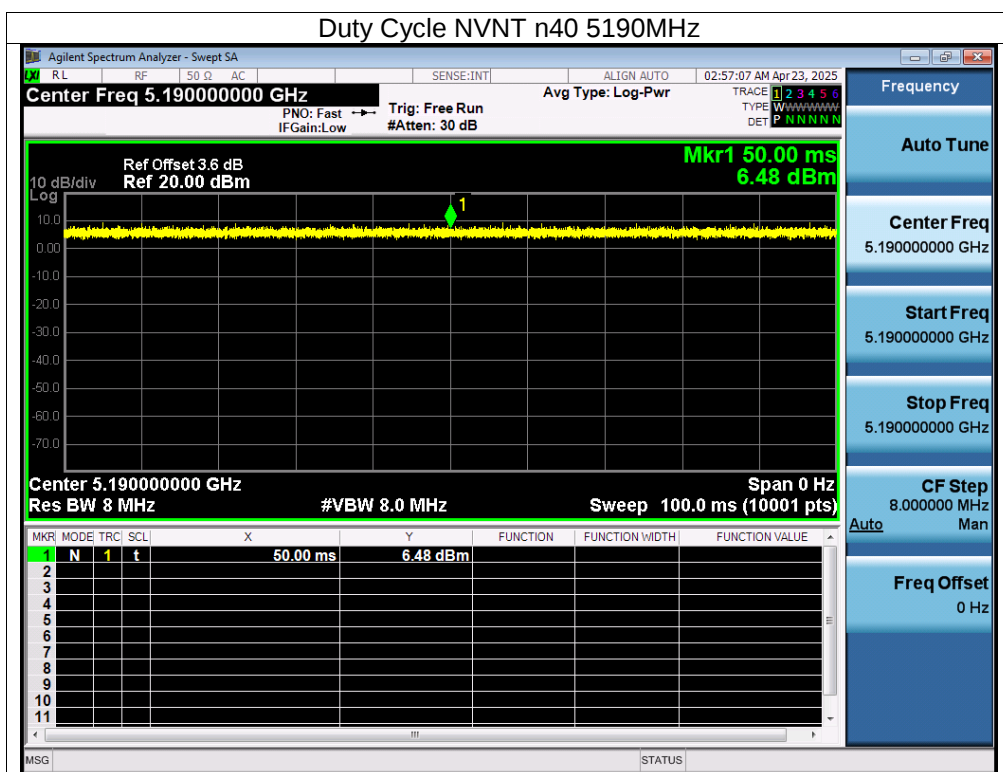
1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

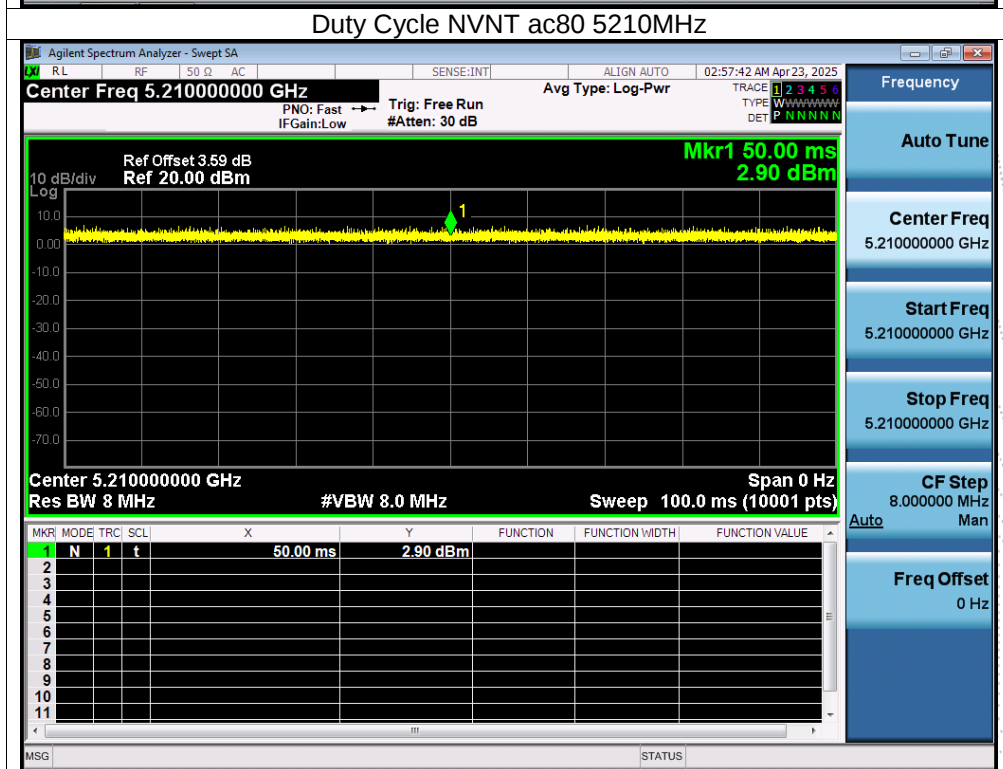
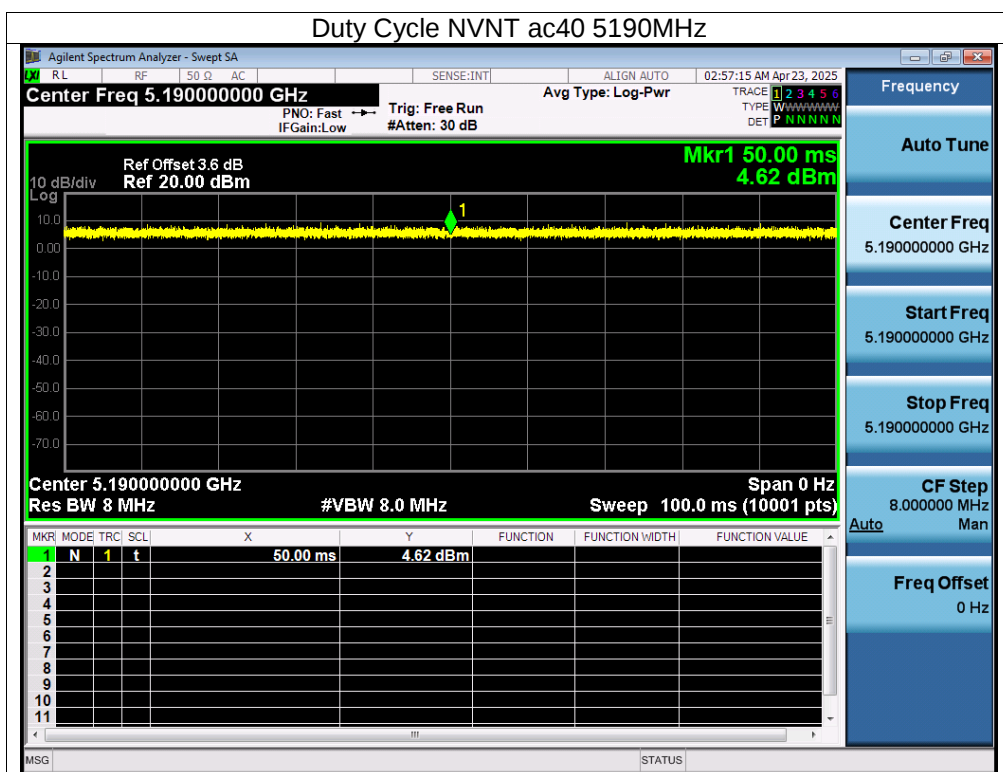
14.4 Test Result

5.1G

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

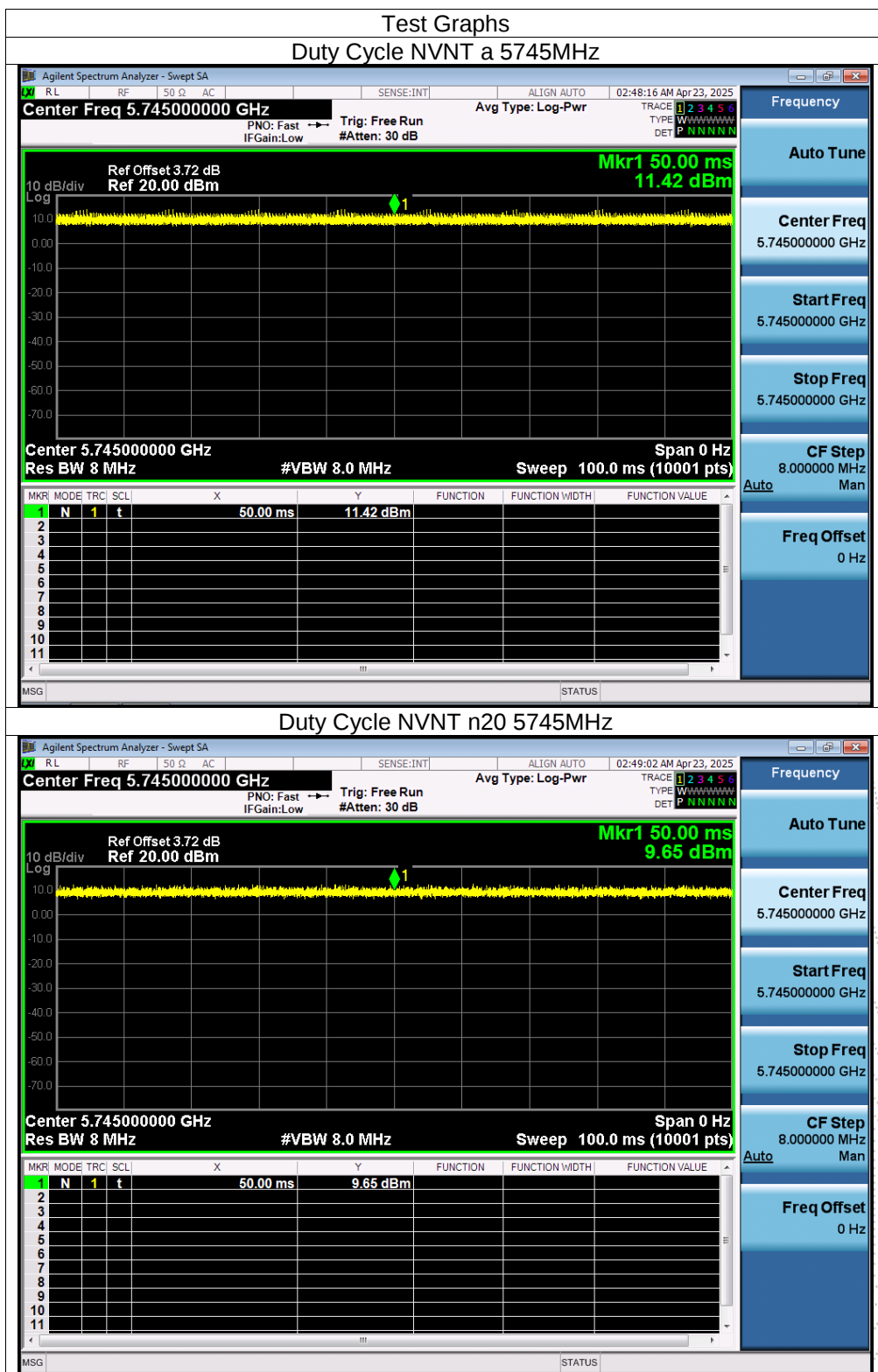


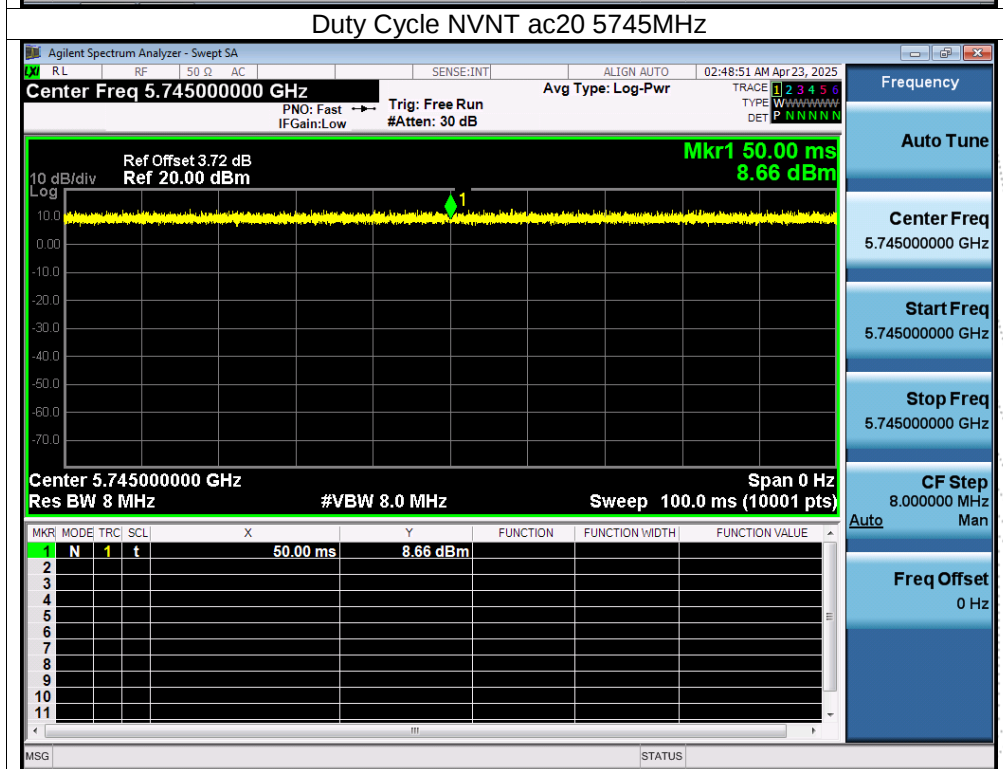
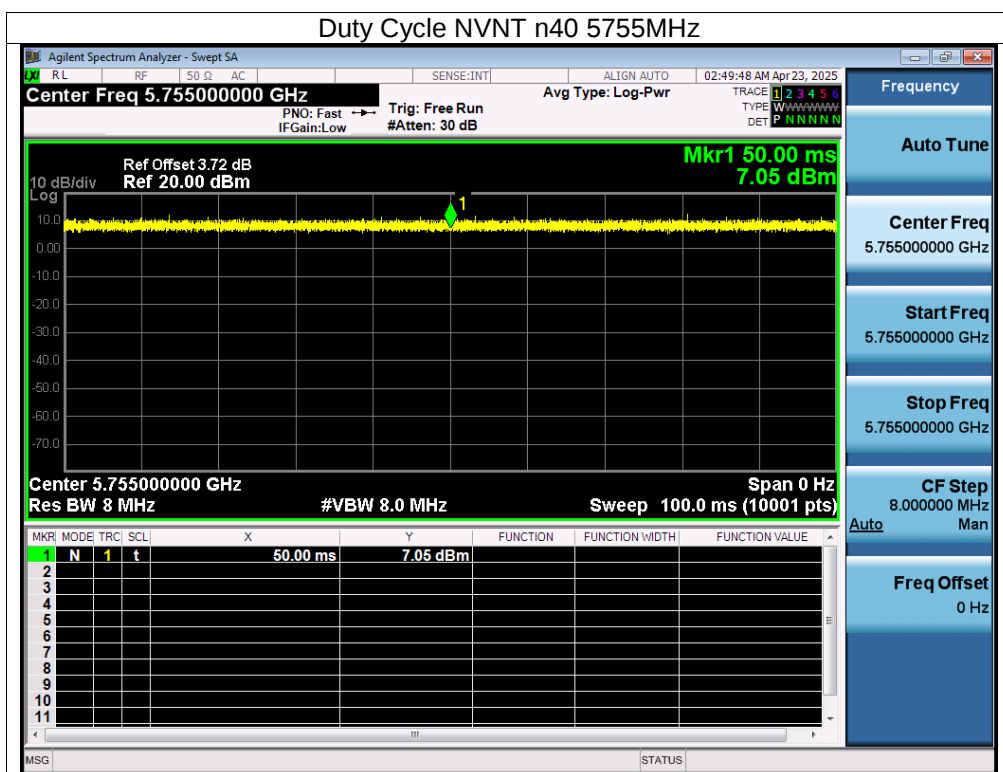


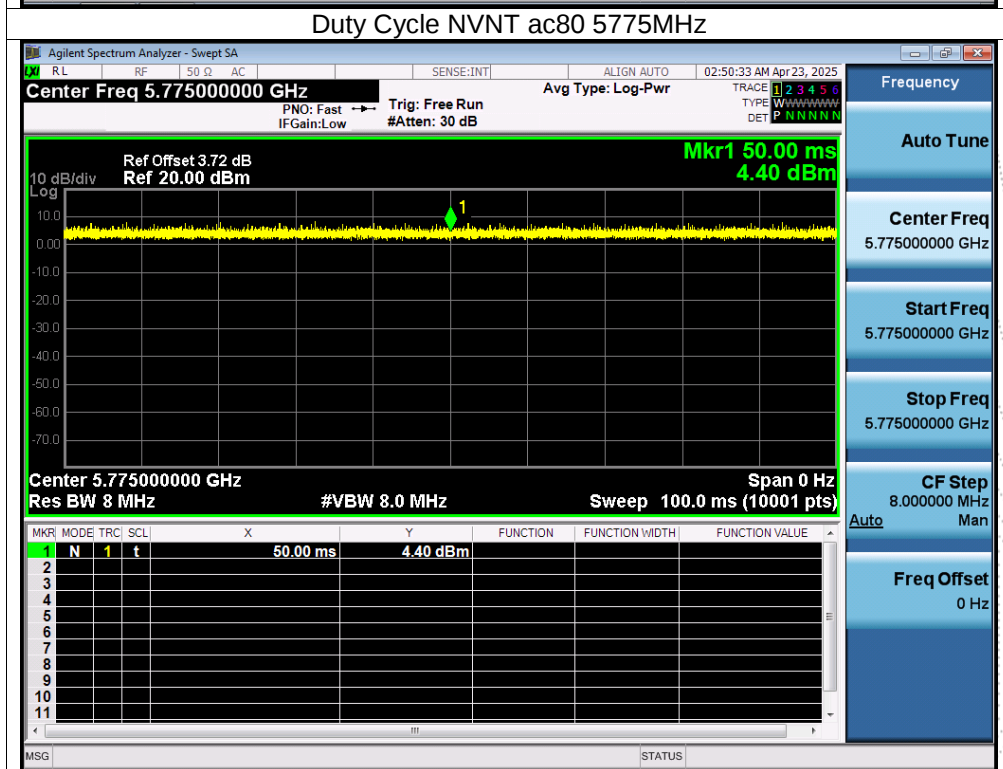
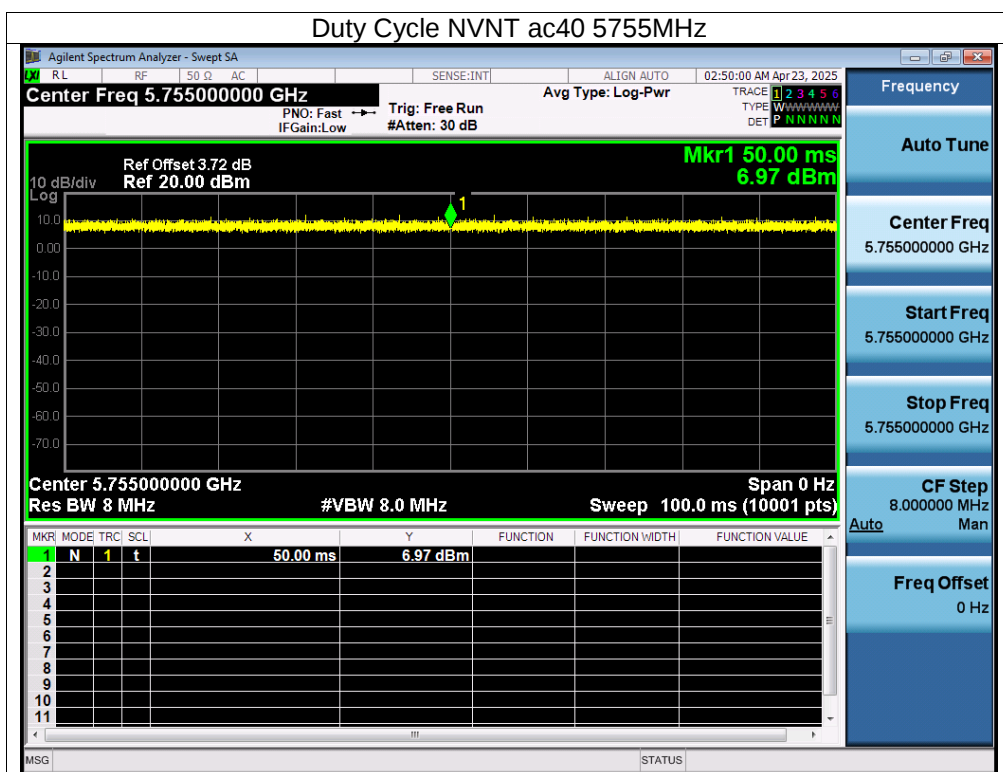


5.8G

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







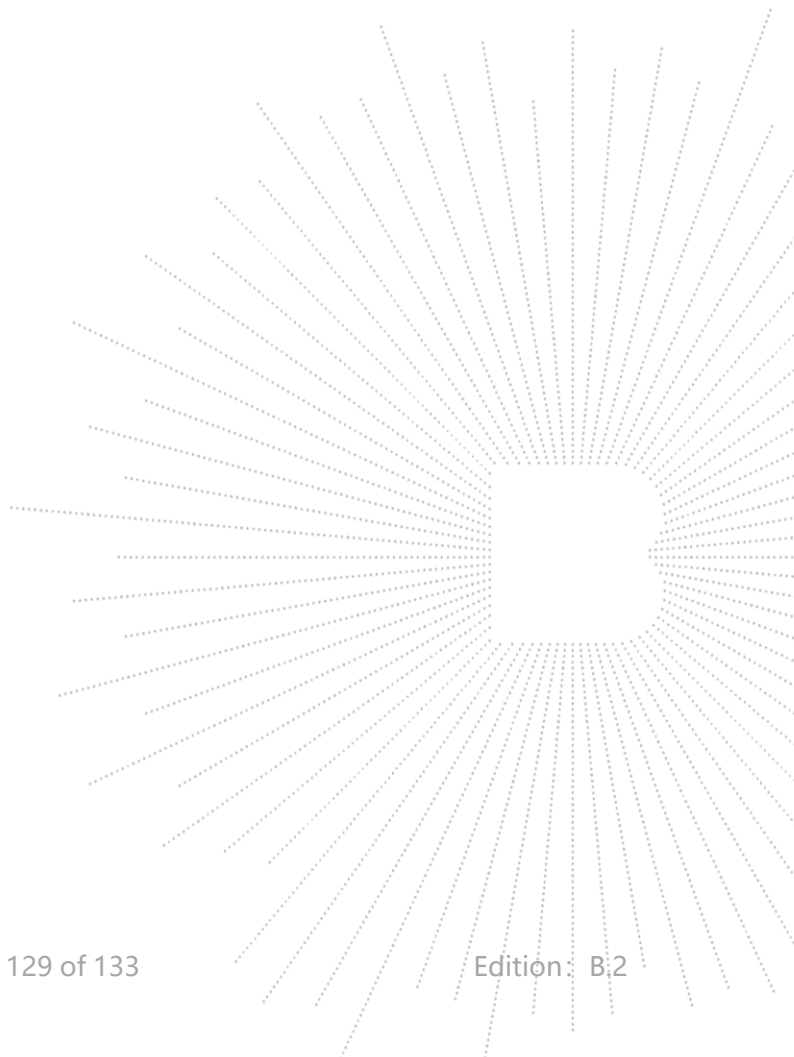
15. Antenna Requirement

15.1 Limit

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

15.2 Test Result

The EUT antenna is Internal antenna (antenna gain: -0.57 dBi). It comply with the standard requirement.



16. EUT Photographs

EUT Photo 1



EUT Photo 2



NOTE: Appendix-Photographs Of EUT Constructional Details.

17. EUT Test Setup Photographs

Conducted Measurement Photos



Radiated Measurement Photos





STATEMENT

1. The equipment lists are traceable to the national reference standards.
2. The test report can not be partially copied unless prior written approval is issued from our lab.
3. The test report is invalid without the "special seal for inspection and testing".
4. The test report is invalid without the signature of the approver.
5. The test process and test result is only related to the Unit Under Test.
6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.
7. The quality system of our laboratory is in accordance with ISO/IEC17025.
8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

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***** END *****