10.5 Test Result

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC120V/60Hz
Test Mode:	(5180-5240MHz)		

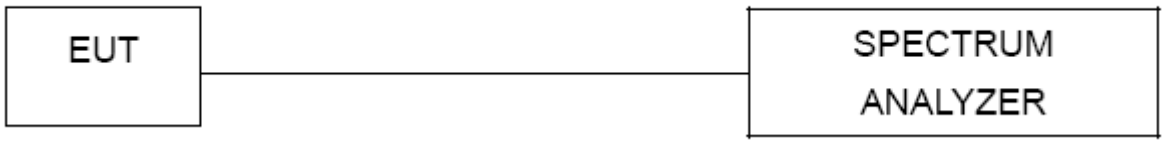
Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	9.43	24	Pass
NVNT	a	5200	9.31	24	Pass
NVNT	a	5240	8.96	24	Pass
NVNT	n20	5180	7.67	24	Pass
NVNT	n20	5200	7.61	24	Pass
NVNT	n20	5240	7.02	24	Pass
NVNT	n40	5190	4.69	24	Pass
NVNT	n40	5230	3.24	24	Pass
NVNT	ac20	5180	7.75	24	Pass
NVNT	ac20	5200	7.68	24	Pass
NVNT	ac20	5240	7.15	24	Pass
NVNT	ac40	5190	4.73	24	Pass
NVNT	ac40	5230	3.52	24	Pass
NVNT	ax20	5180	7.77	24	Pass
NVNT	ax20	5200	7.64	24	Pass
NVNT	ax20	5240	6.91	24	Pass
NVNT	ax40	5190	9.22	24	Pass
NVNT	ax40	5230	8.34	24	Pass

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC120V/60Hz
Test Mode:	(5745-5825MHz)		

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	9.24	30	Pass
NVNT	a	5785	6.92	30	Pass
NVNT	a	5825	4.94	30	Pass
NVNT	n20	5745	8.73	30	Pass
NVNT	n20	5785	6.91	30	Pass
NVNT	n20	5825	4.97	30	Pass
NVNT	n40	5755	4.24	30	Pass
NVNT	n40	5795	1.97	30	Pass
NVNT	ac20	5745	6.61	30	Pass
NVNT	ac20	5785	4.75	30	Pass
NVNT	ac20	5825	2.79	30	Pass
NVNT	ac40	5755	3.99	30	Pass
NVNT	ac40	5795	2.08	30	Pass
NVNT	ax20	5745	6.53	30	Pass
NVNT	ax20	5785	4.68	30	Pass
NVNT	ax20	5825	2.67	30	Pass
NVNT	ax40	5755	3.94	30	Pass
NVNT	ax40	5795	1.94	30	Pass

11. Out Of Band Emissions

11.1 Block Diagram Of Test Setup



11.2 Limit

According to FCC §15.407(b)
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) 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.

11.3 Test procedure

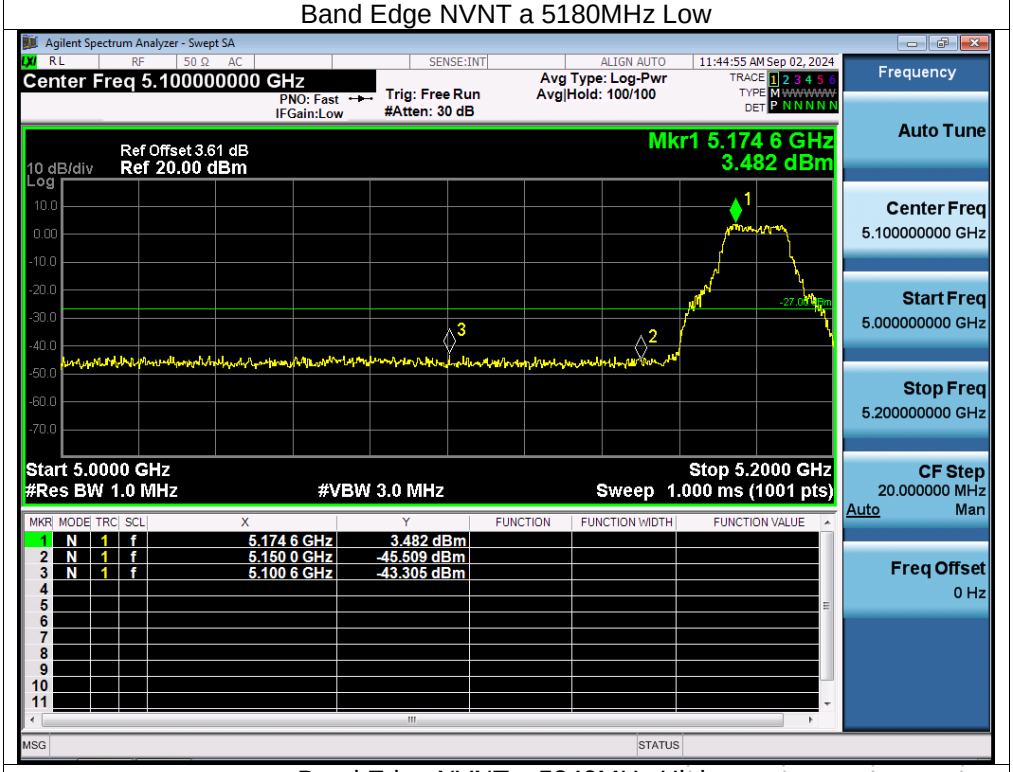
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then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

11.4 EUT operating Conditions

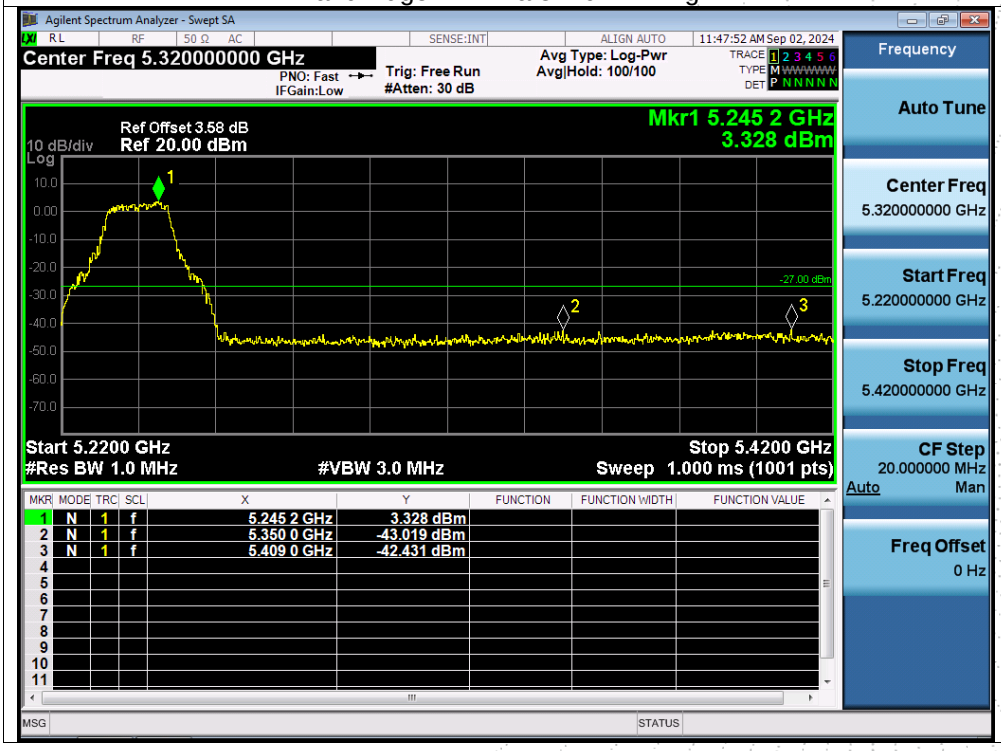
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data

11.5 Test Result

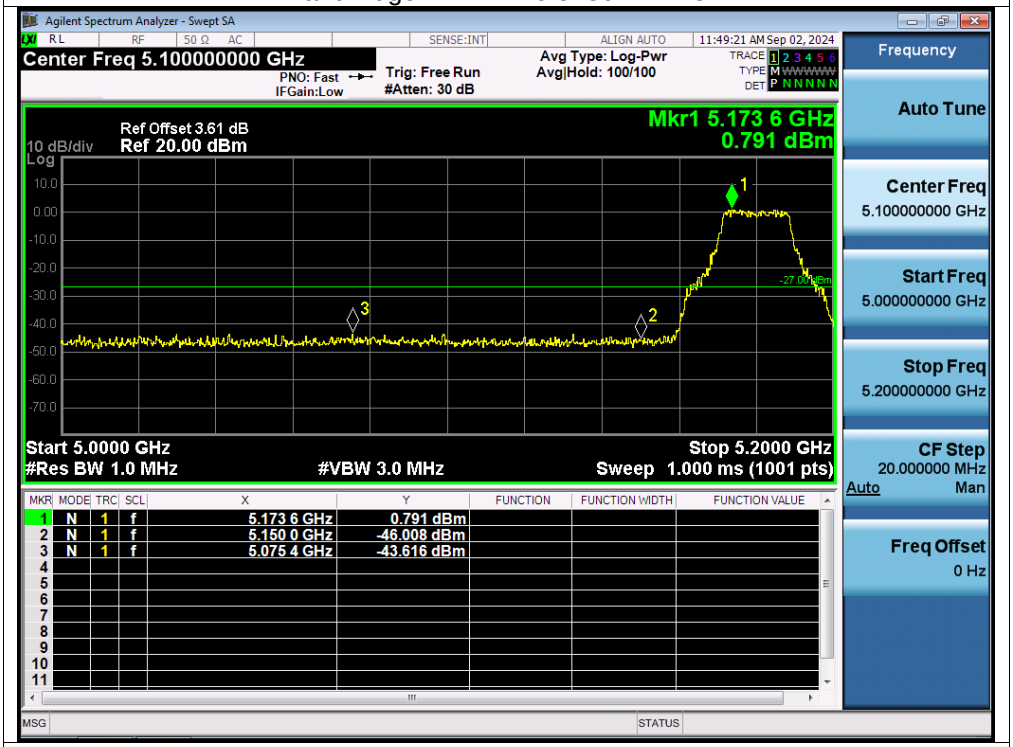
Test Graphs
Band Edge NVNT a 5180MHz Low



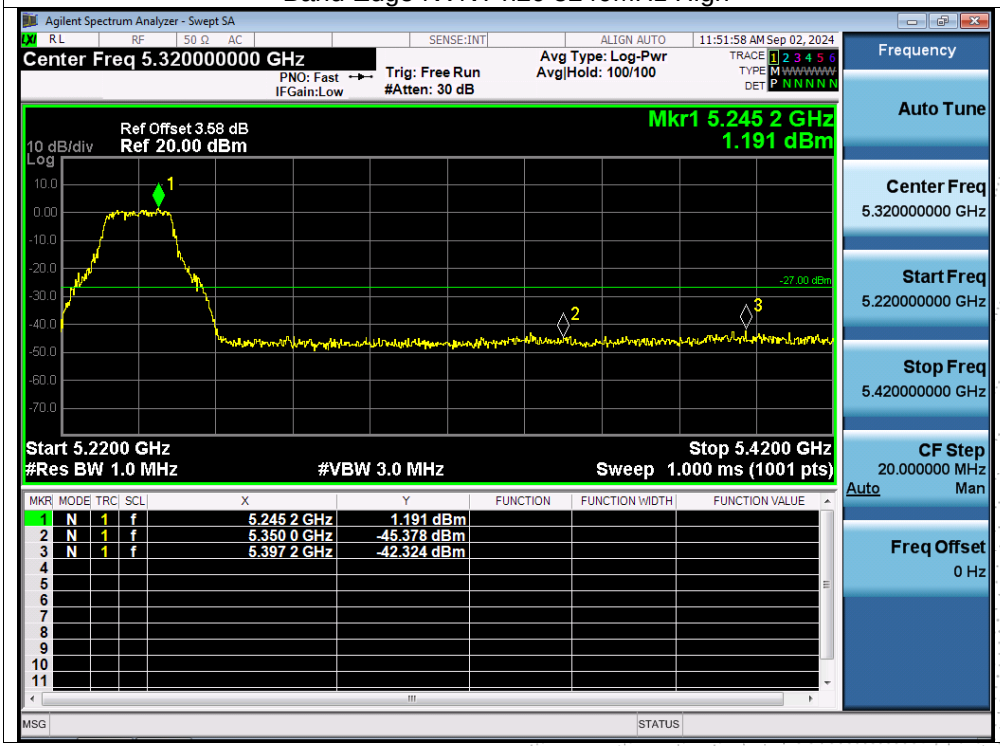
Band Edge NVNT a 5240MHz High



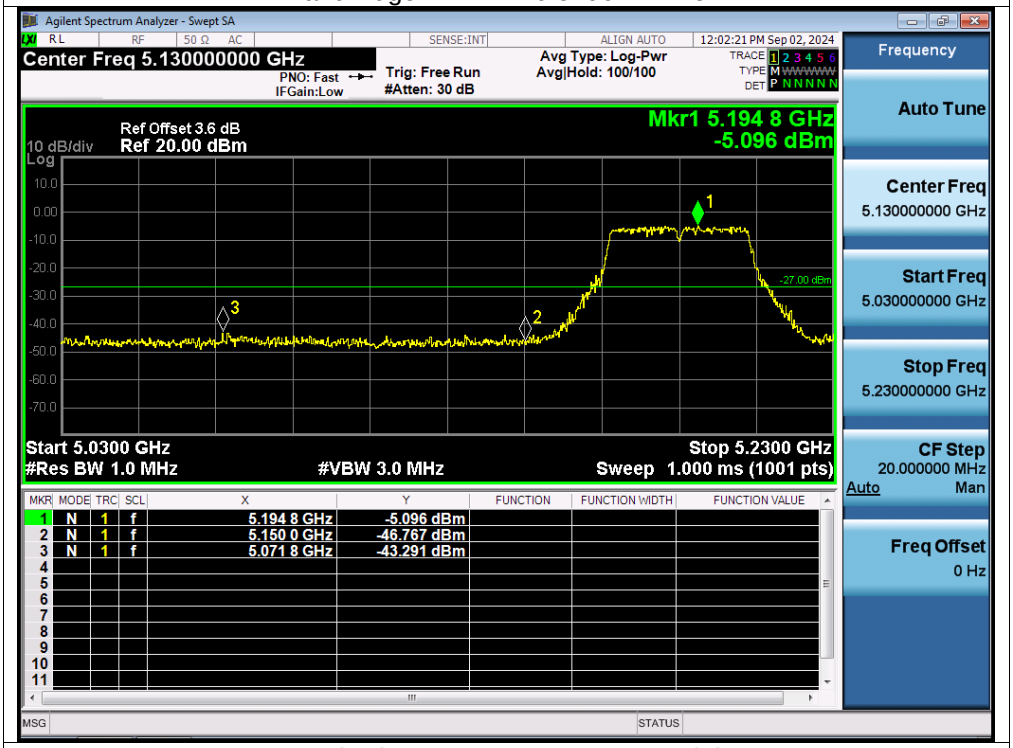
Band Edge NVNT n20 5180MHz Low



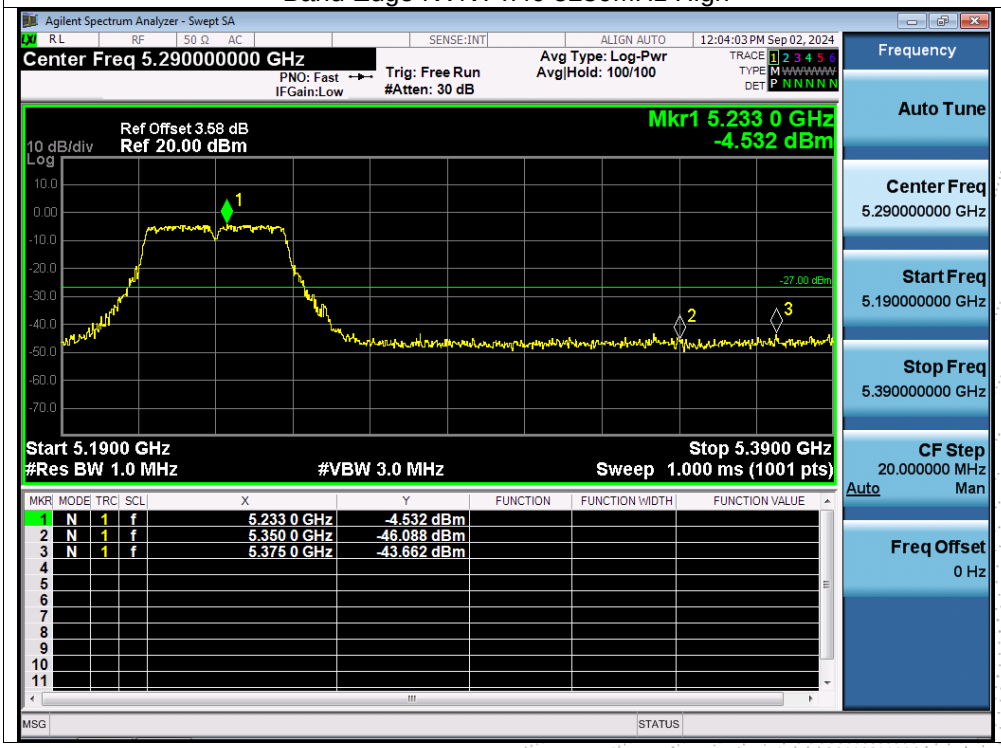
Band Edge NVNT n20 5240MHz High



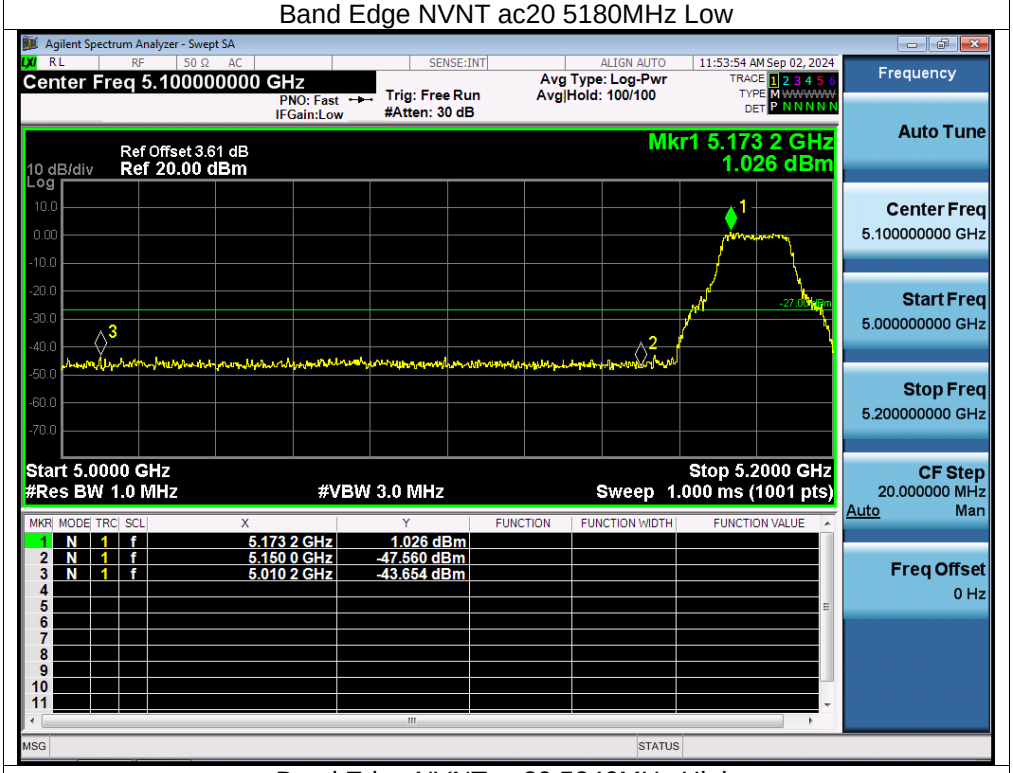
Band Edge NVNT n40 5190MHz Low



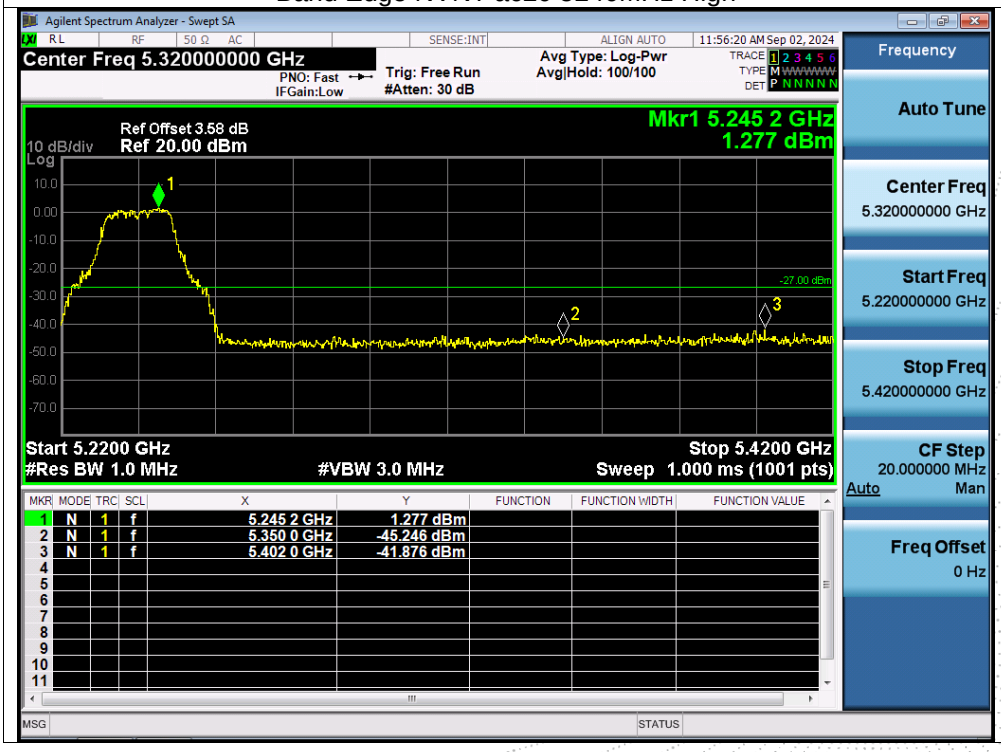
Band Edge NVNT n40 5230MHz High



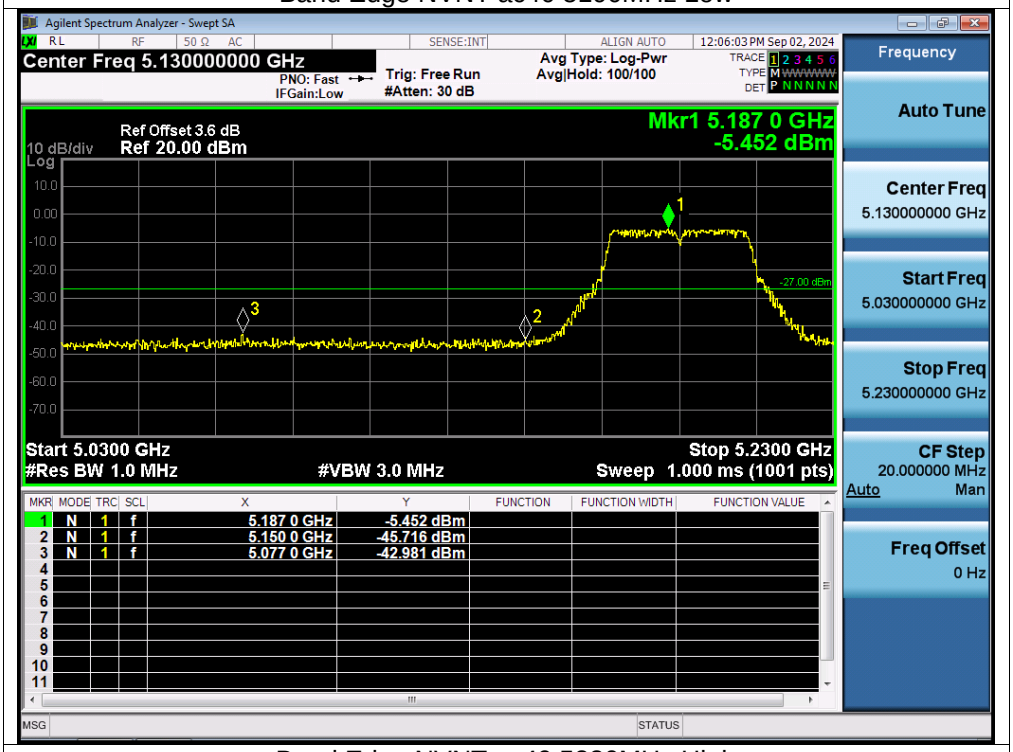
Band Edge NVNT ac20 5180MHz Low



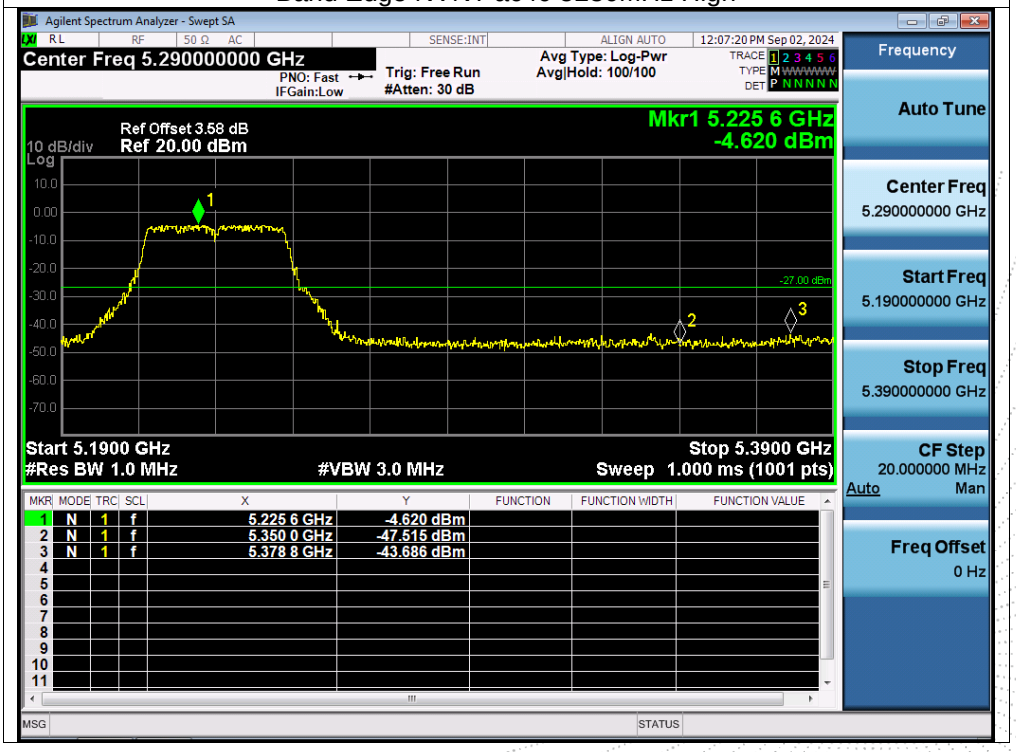
Band Edge NVNT ac20 5240MHz High



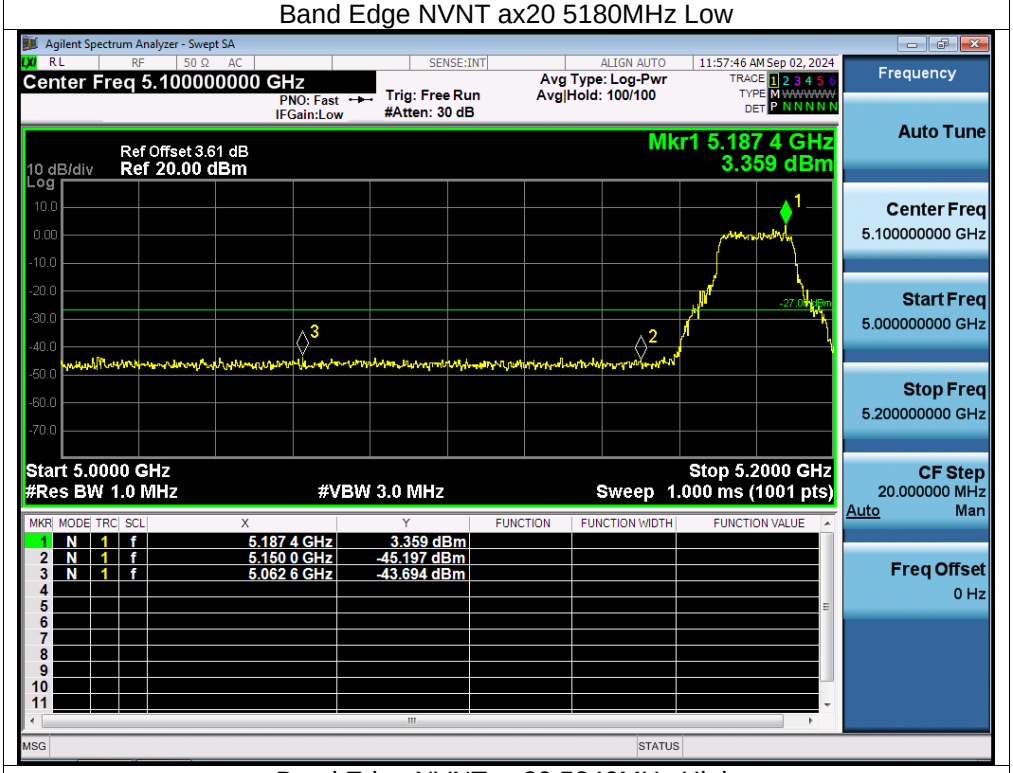
Band Edge NVNT ac40 5190MHz Low



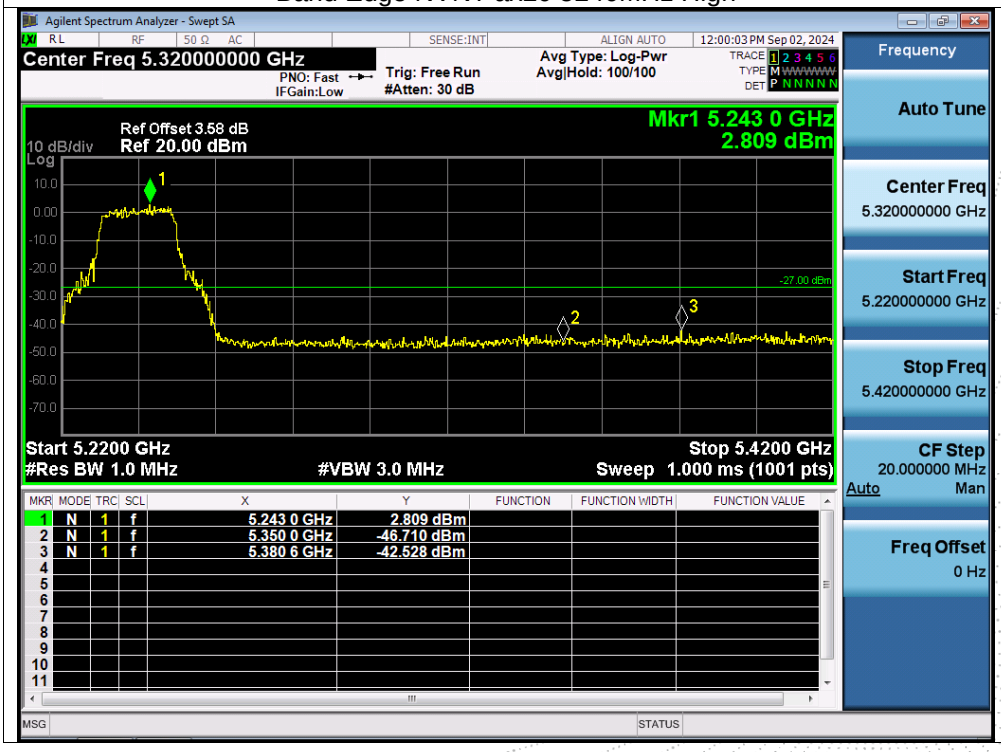
Band Edge NVNT ac40 5230MHz High



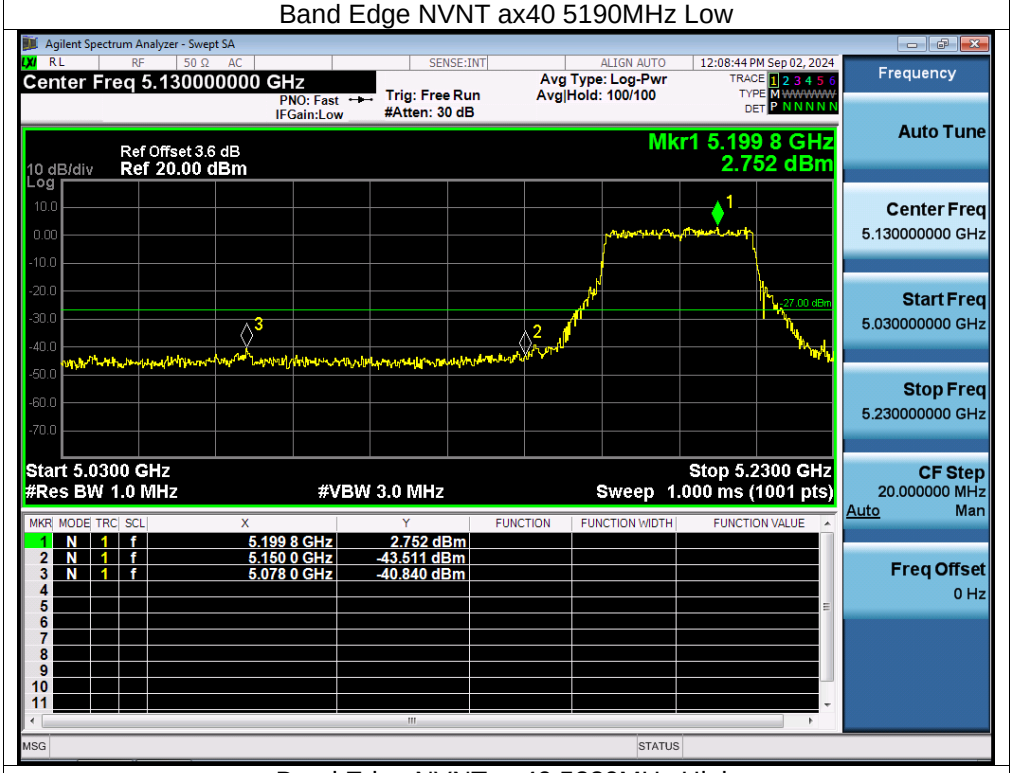
Band Edge NVNT ax20 5180MHz Low



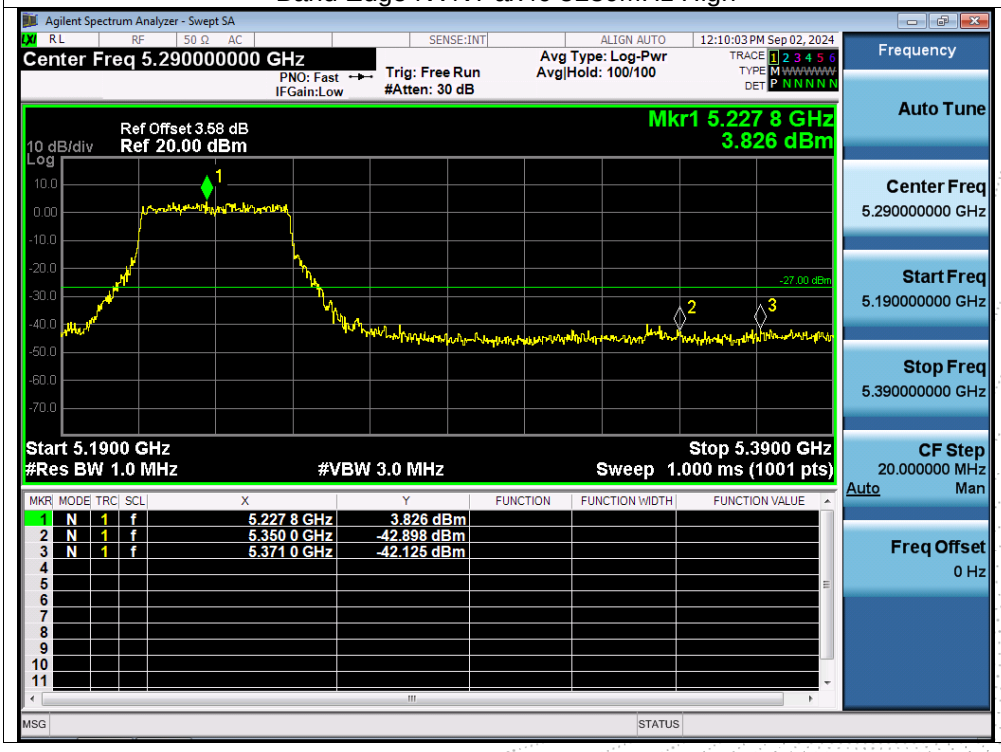
Band Edge NVNT ax20 5240MHz High



Band Edge NVNT ax40 5190MHz Low

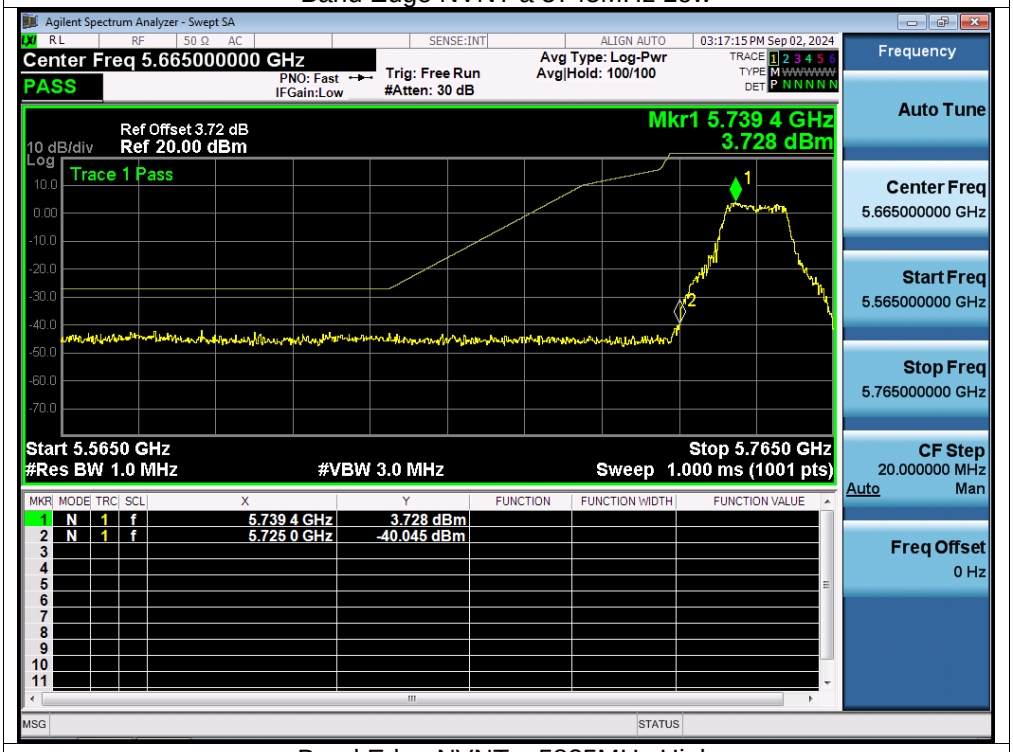


Band Edge NVNT ax40 5230MHz High

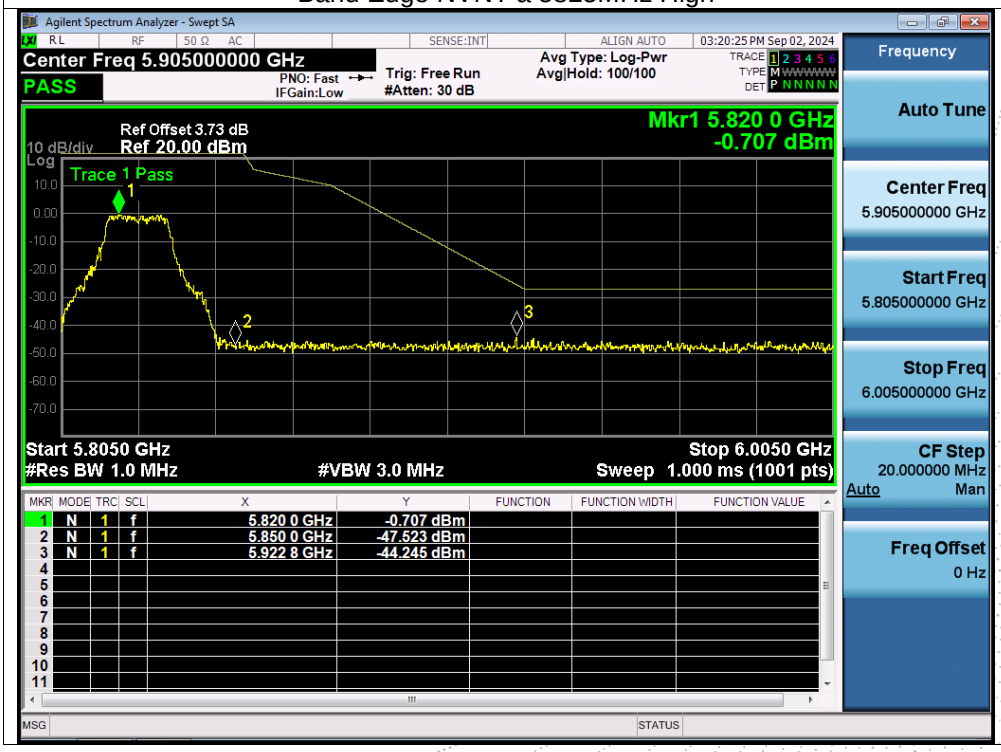


Test Graphs

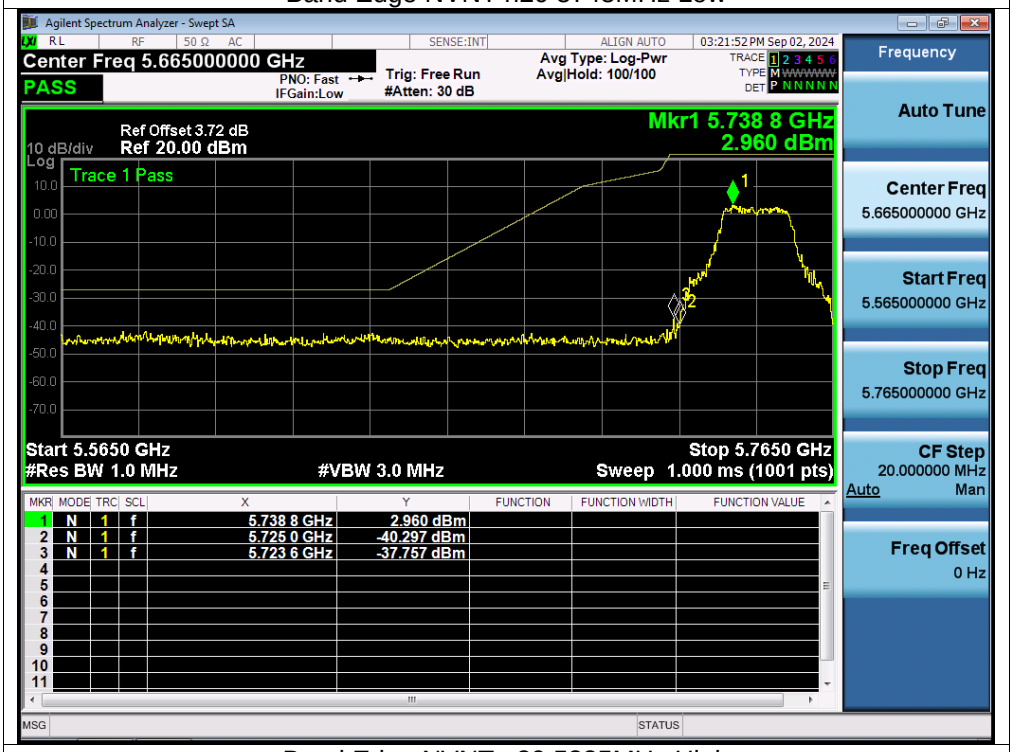
Band Edge NVNT a 5745MHz Low



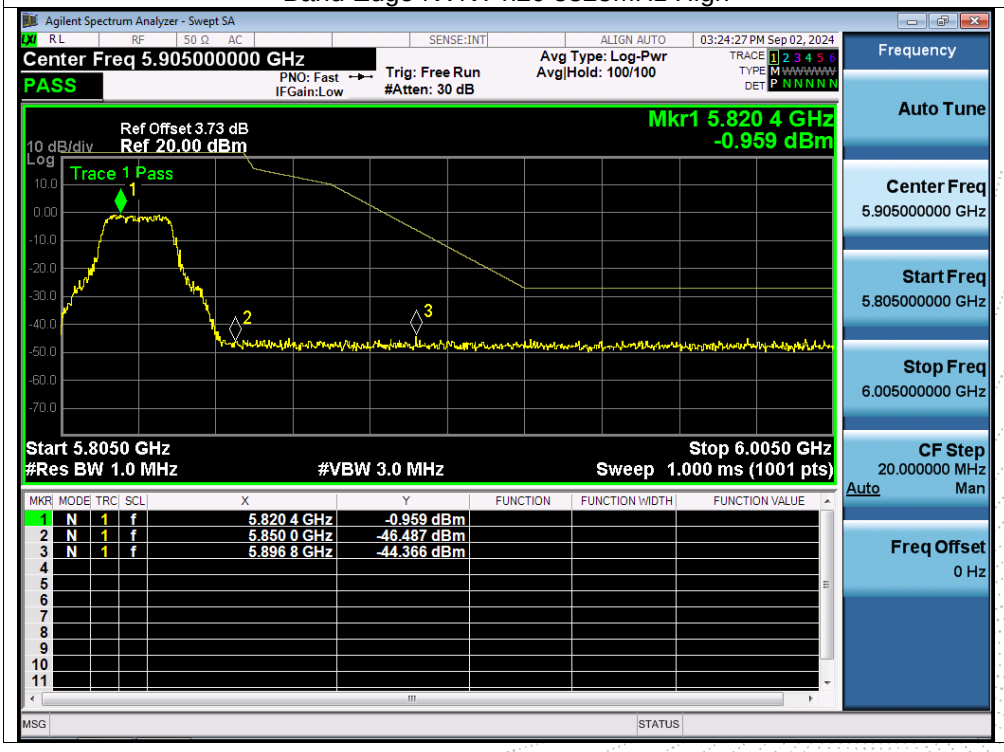
Band Edge NVNT a 5825MHz High



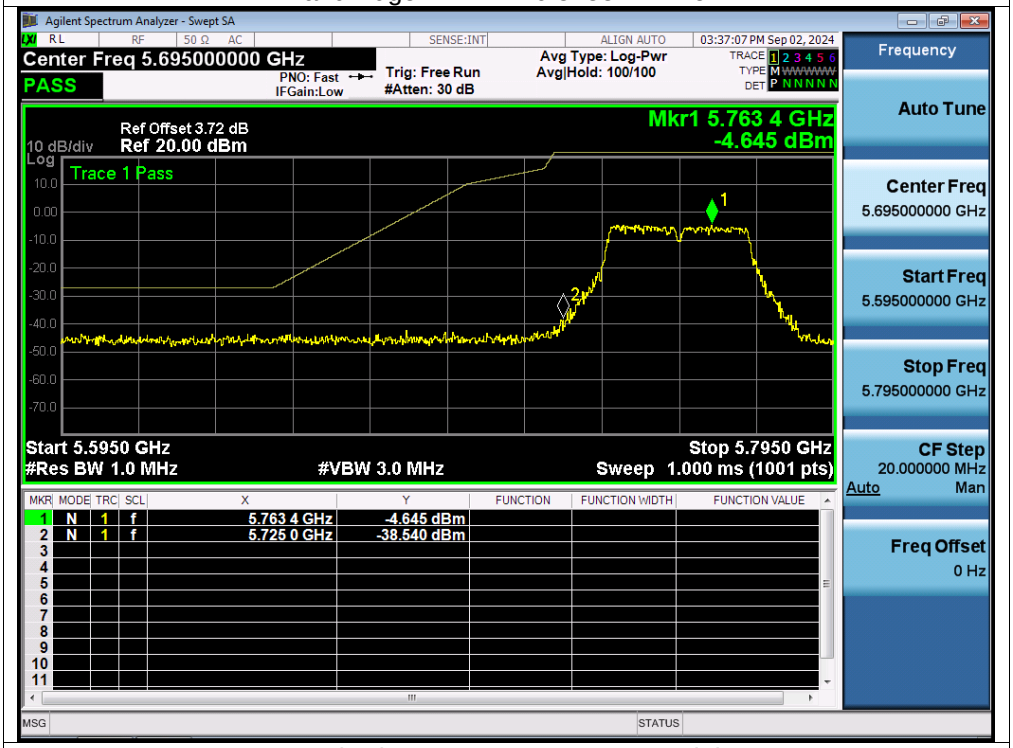
Band Edge NVNT n20 5745MHz Low



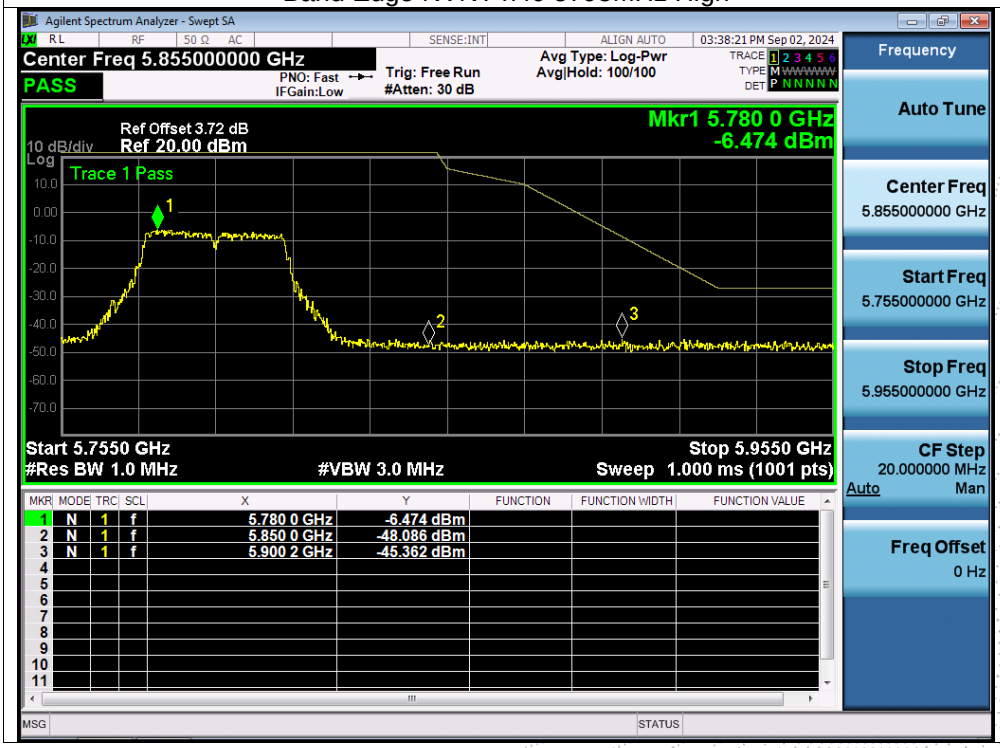
Band Edge NVNT n20 5825MHz High



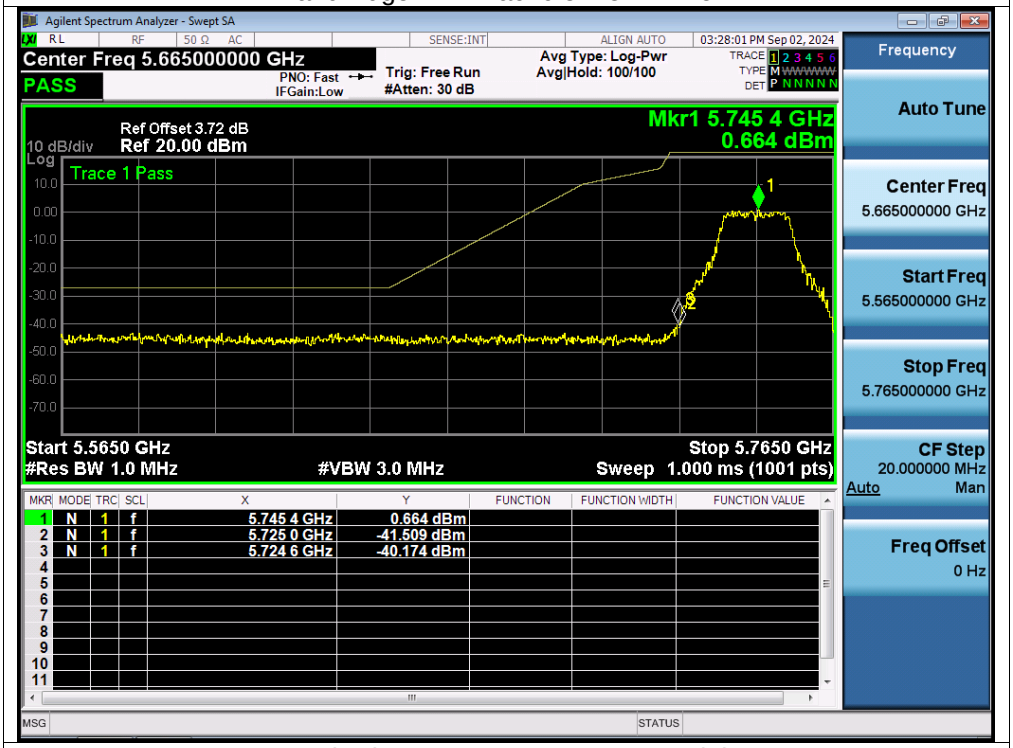
Band Edge NVNT n40 5755MHz Low



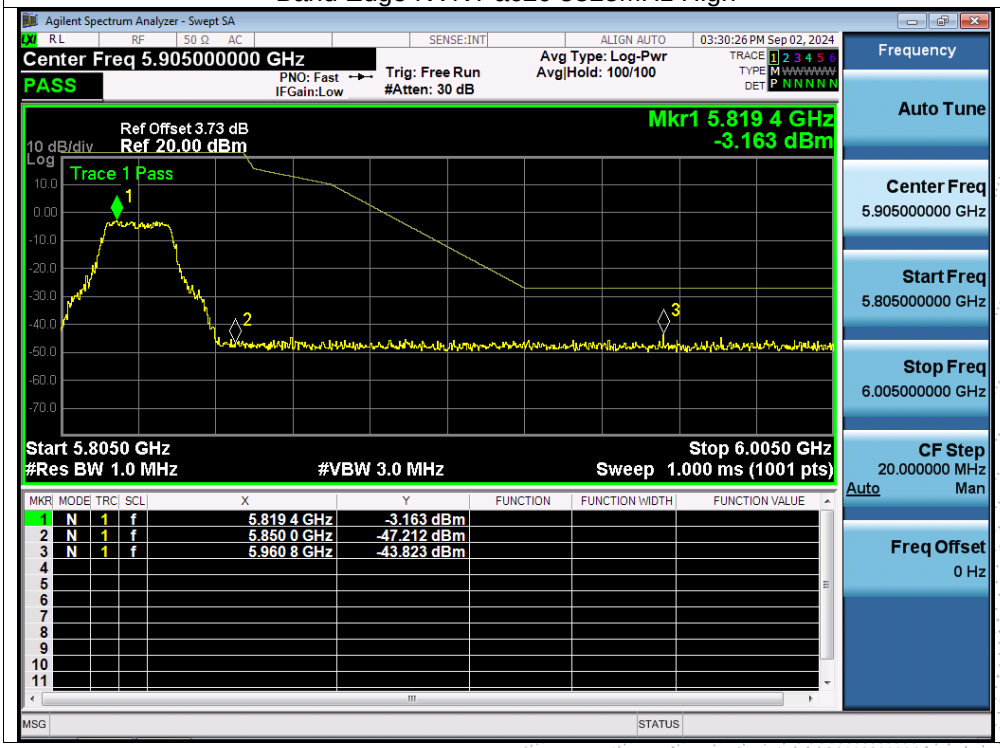
Band Edge NVNT n40 5795MHz High



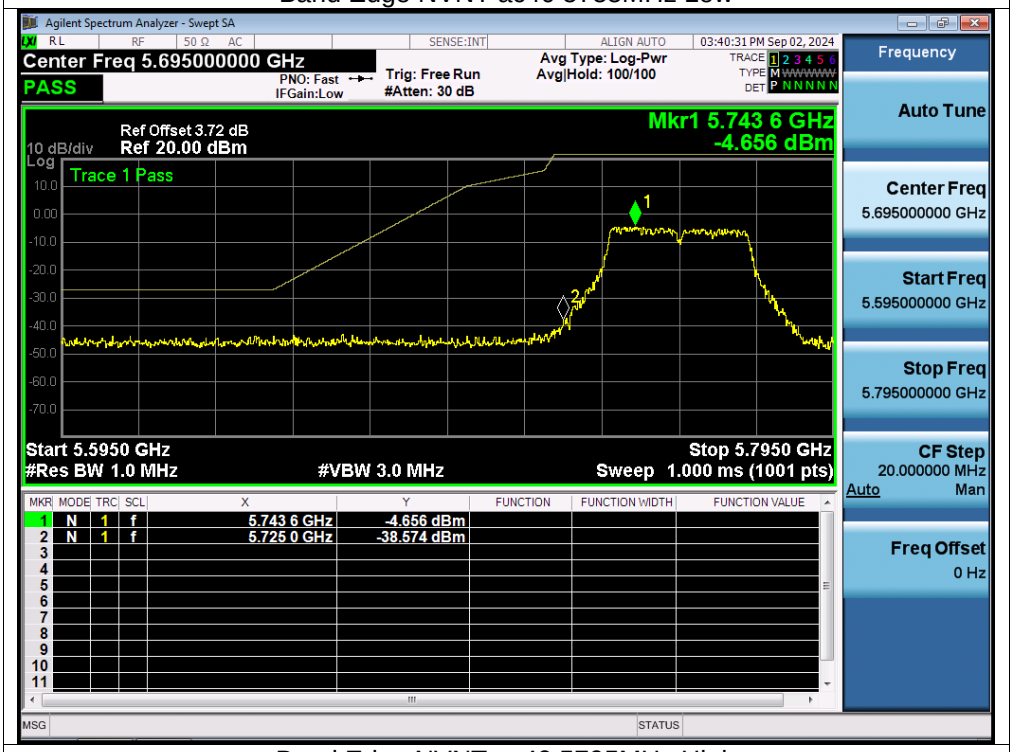
Band Edge NVNT ac20 5745MHz Low



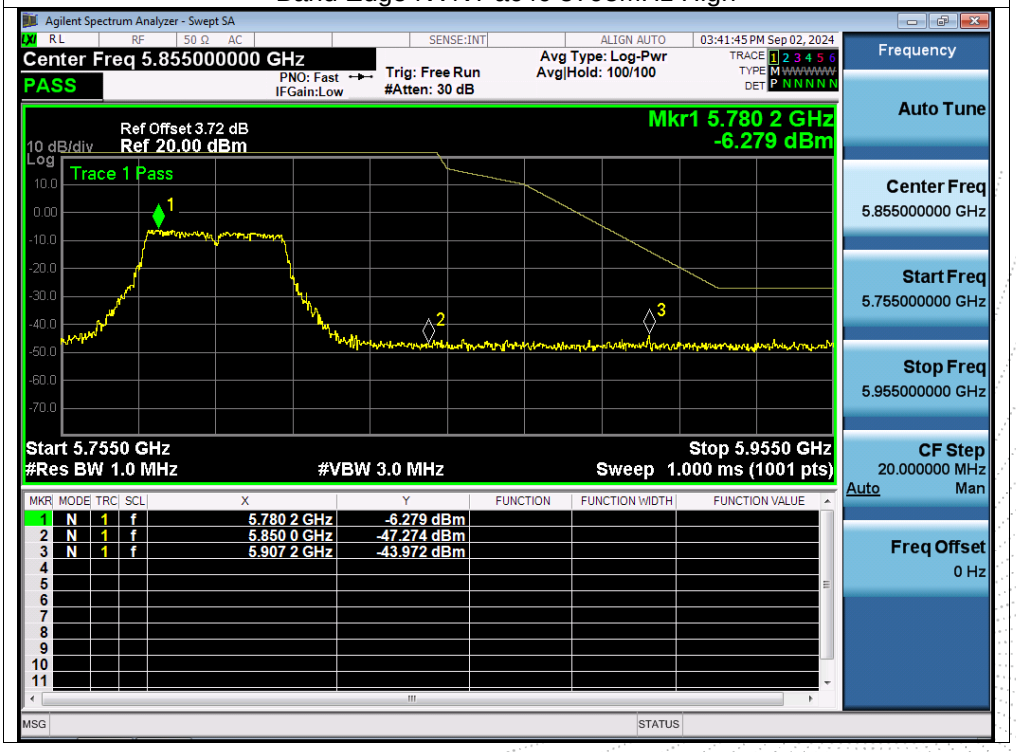
Band Edge NVNT ac20 5825MHz High



Band Edge NVNT ac40 5755MHz Low

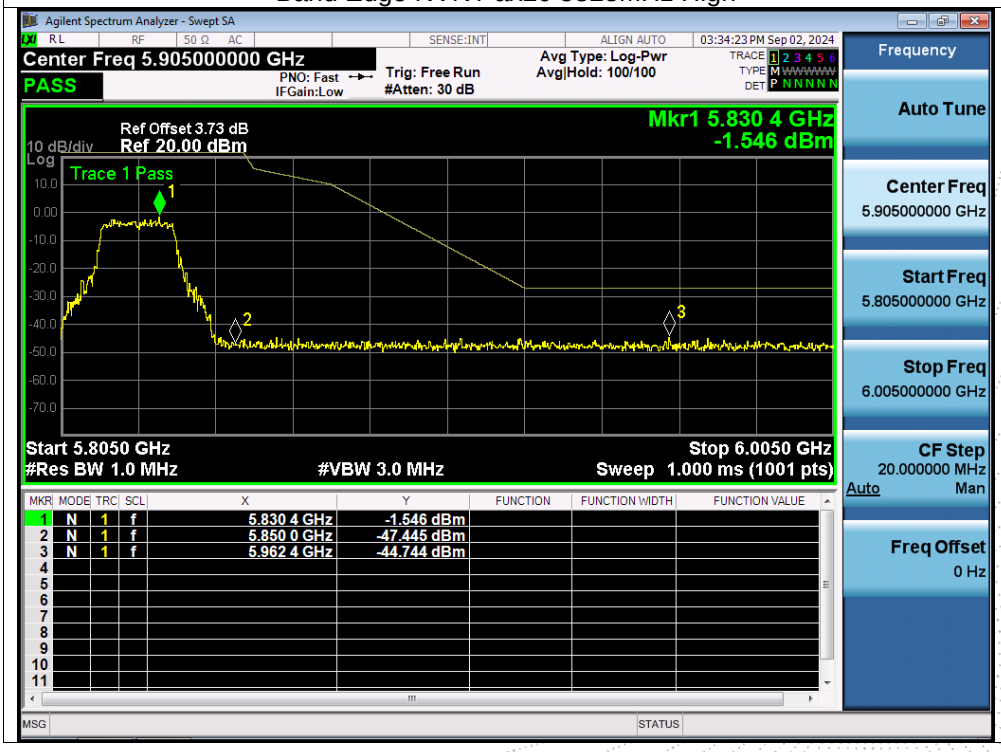


Band Edge NVNT ac40 5795MHz High



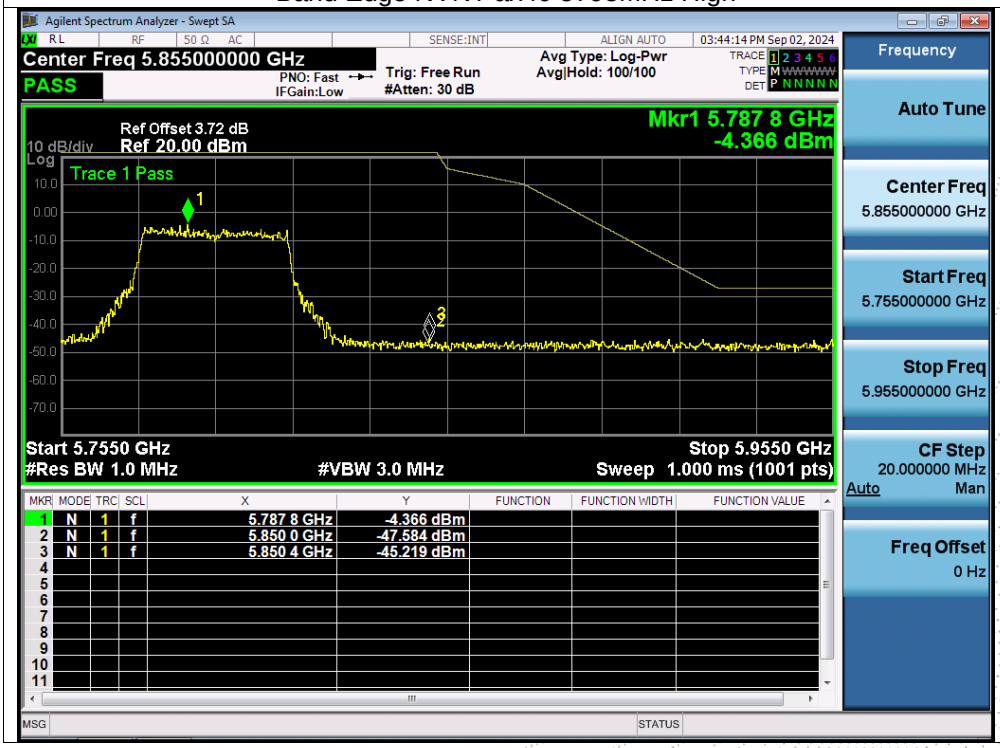
Band Edge NVNT ax20 5745MHz Low

Band Edge NVNT ax20 5825MHz High



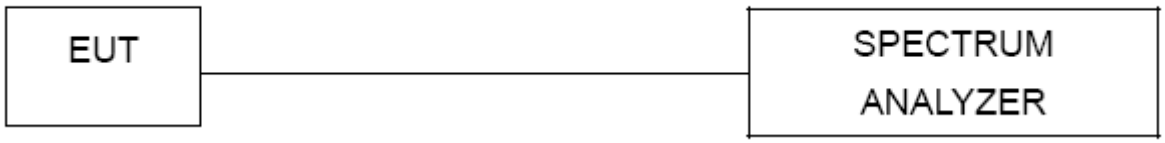
Band Edge NVNT ax40 5755MHz Low

Band Edge NVNT ax40 5795MHz High



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

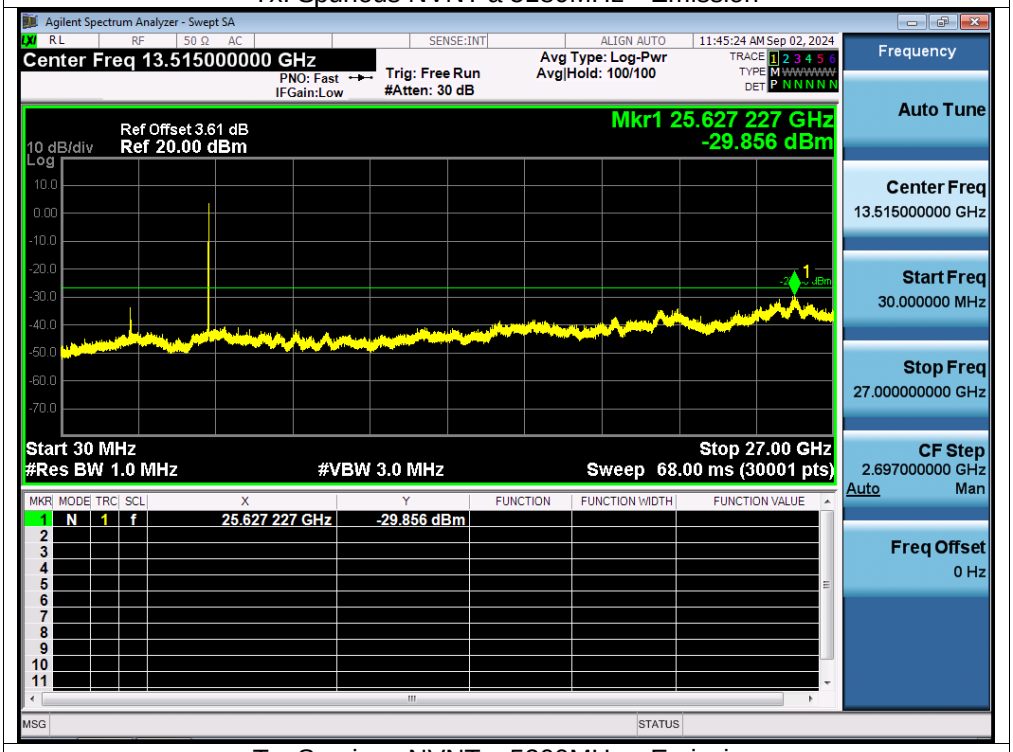
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then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

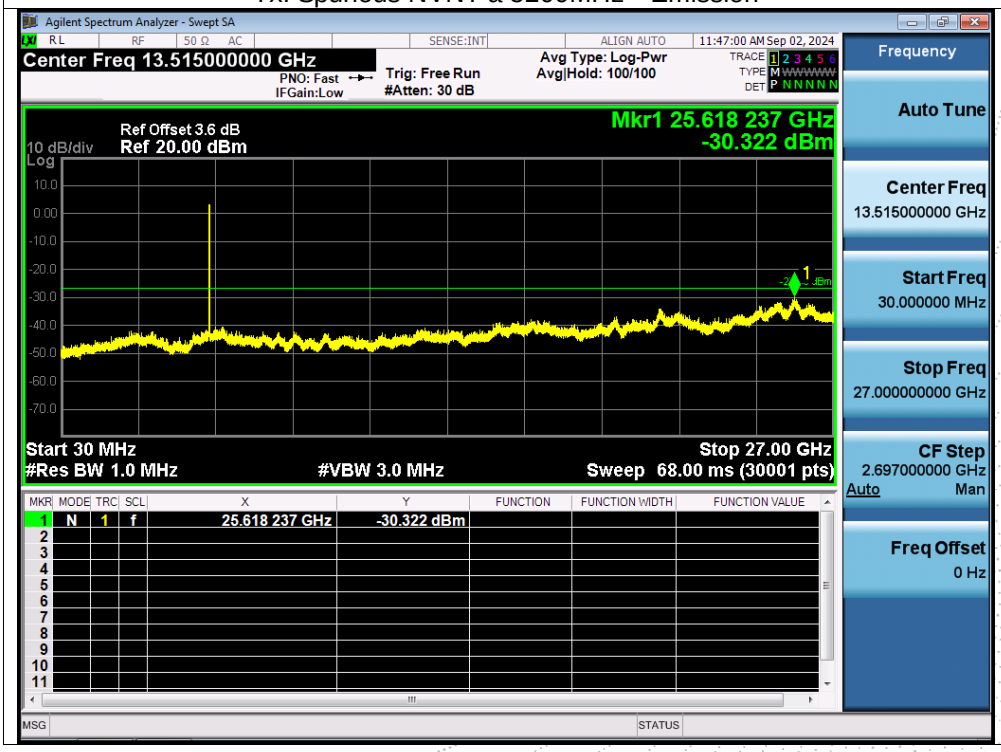
Remark: The measurement frequency range is from 9KHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandege measurement data.

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.

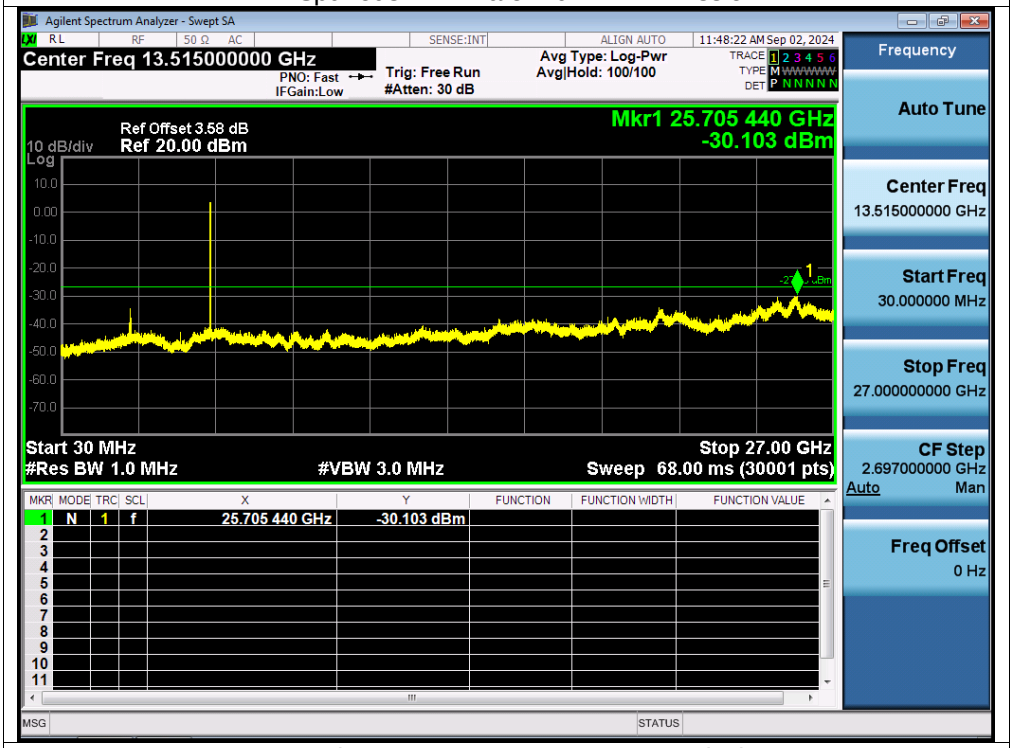
Test Graphs
Tx. Spurious NVNT a 5180MHz Emission



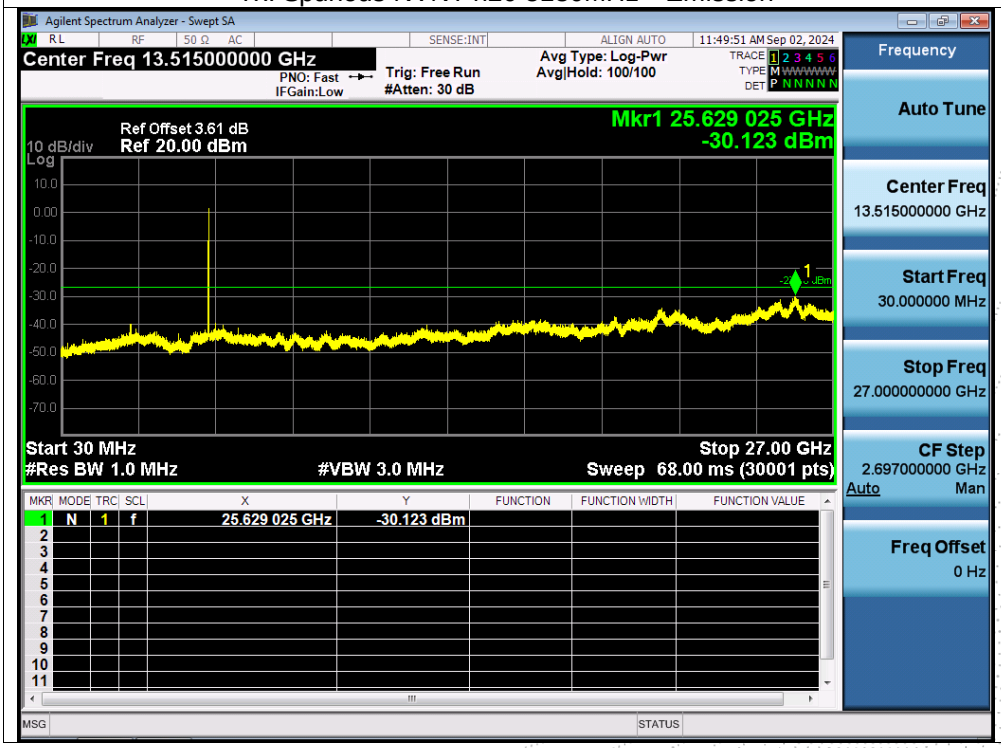
Tx. Spurious NVNT a 5200MHz Emission



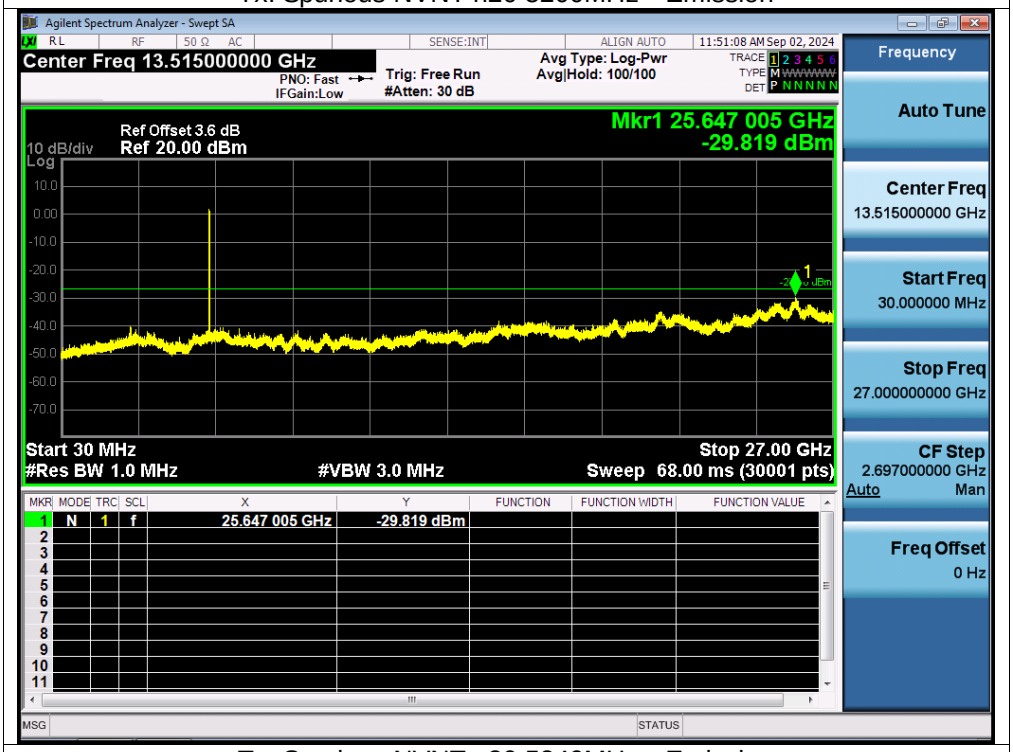
Tx. Spurious NVNT a 5240MHz Emission



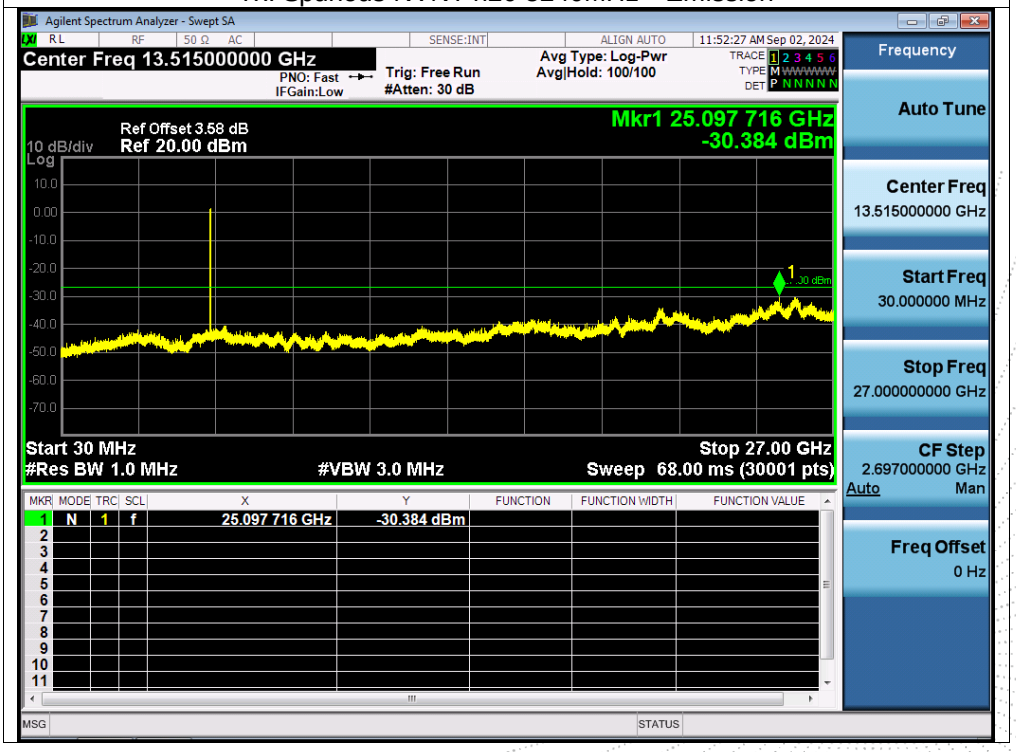
Tx. Spurious NVNT n20 5180MHz Emission



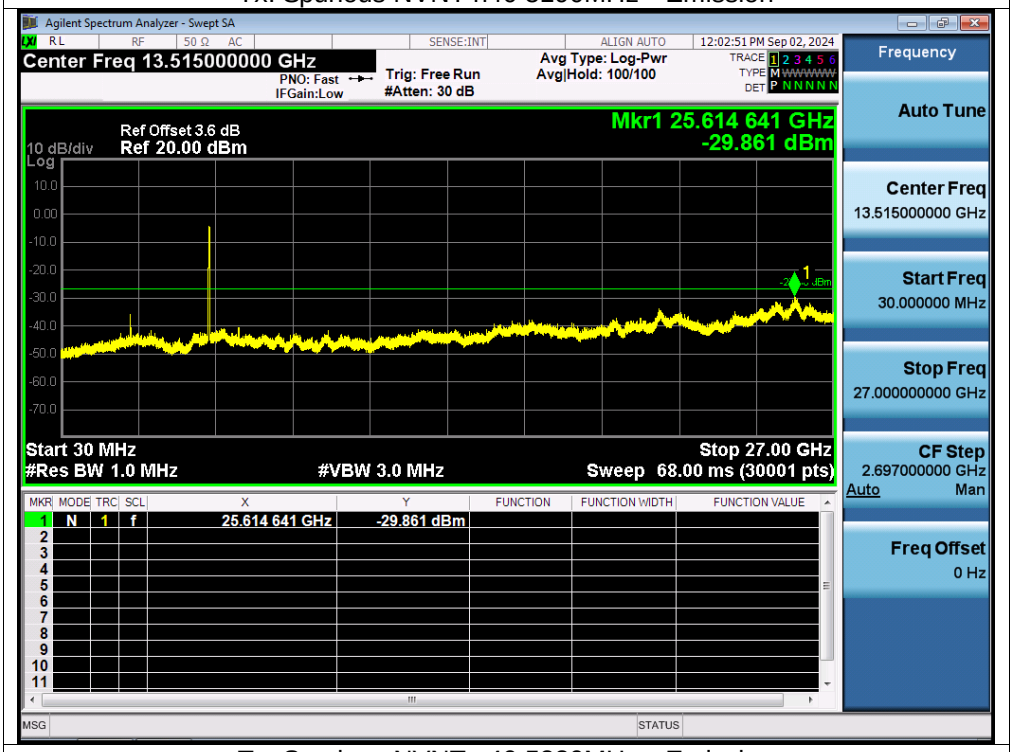
Tx. Spurious NVNT n20 5200MHz Emission



Tx. Spurious NVNT n20 5240MHz Emission

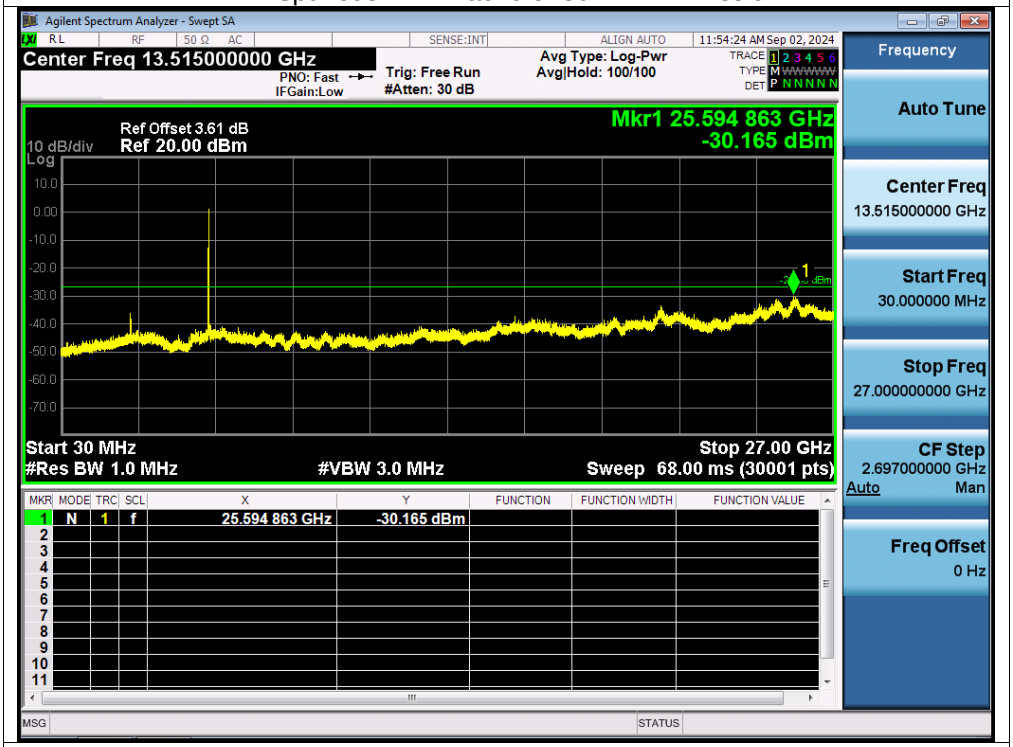


Tx. Spurious NVNT n40 5190MHz Emission

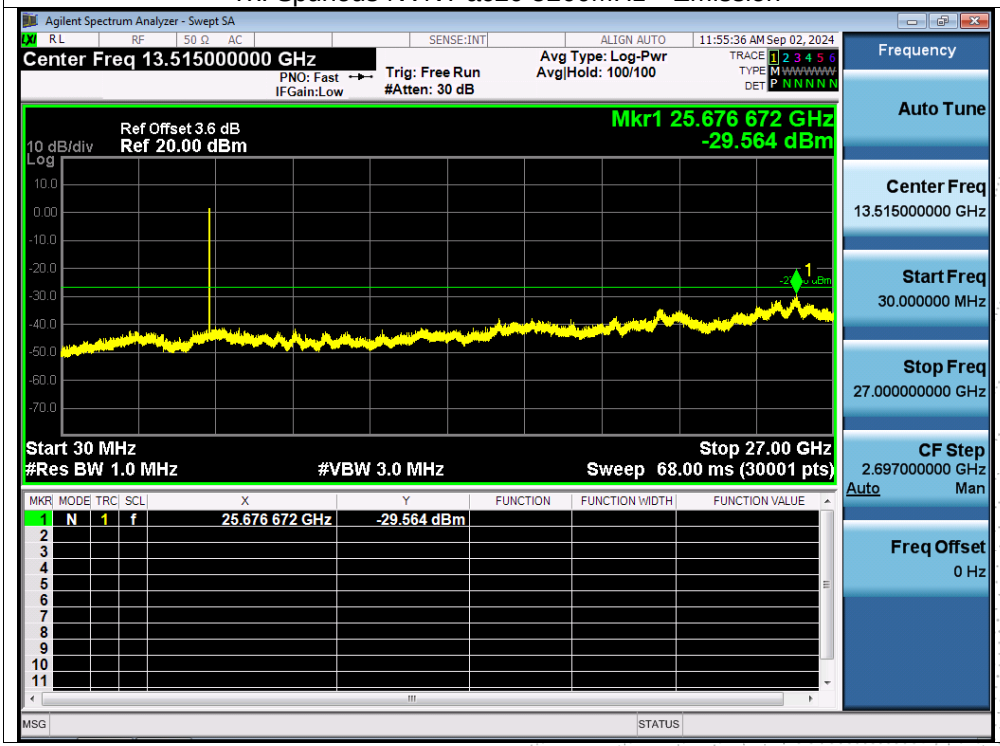


Tx. Spurious NVNT n40 5230MHz Emission

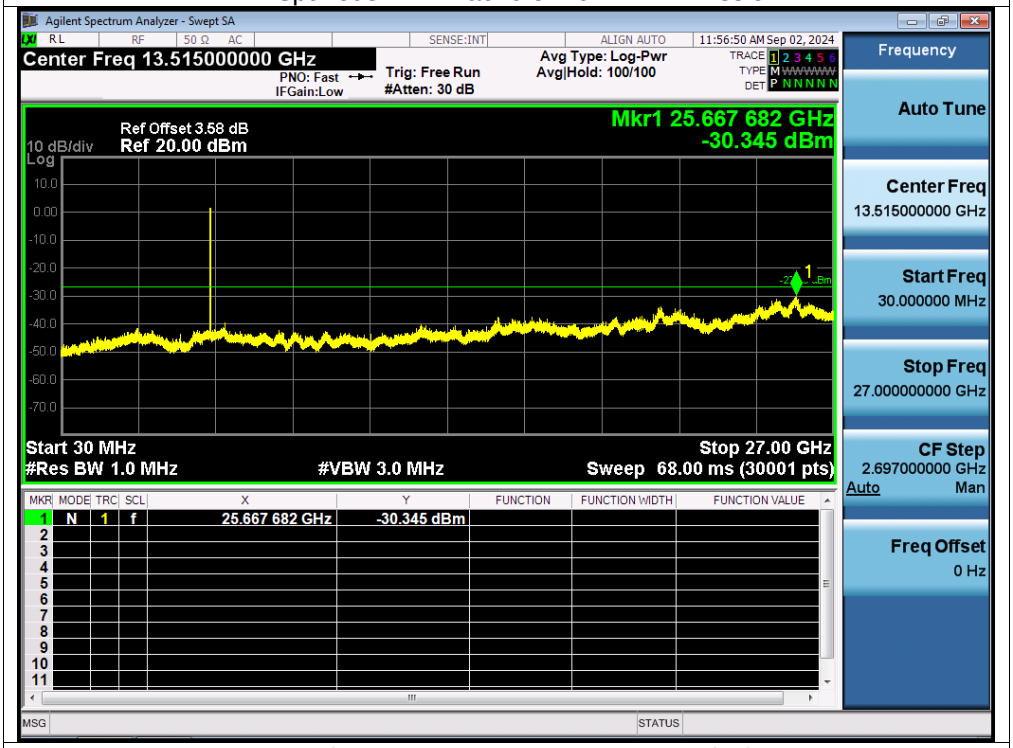
Tx. Spurious NVNT ac20 5180MHz Emission



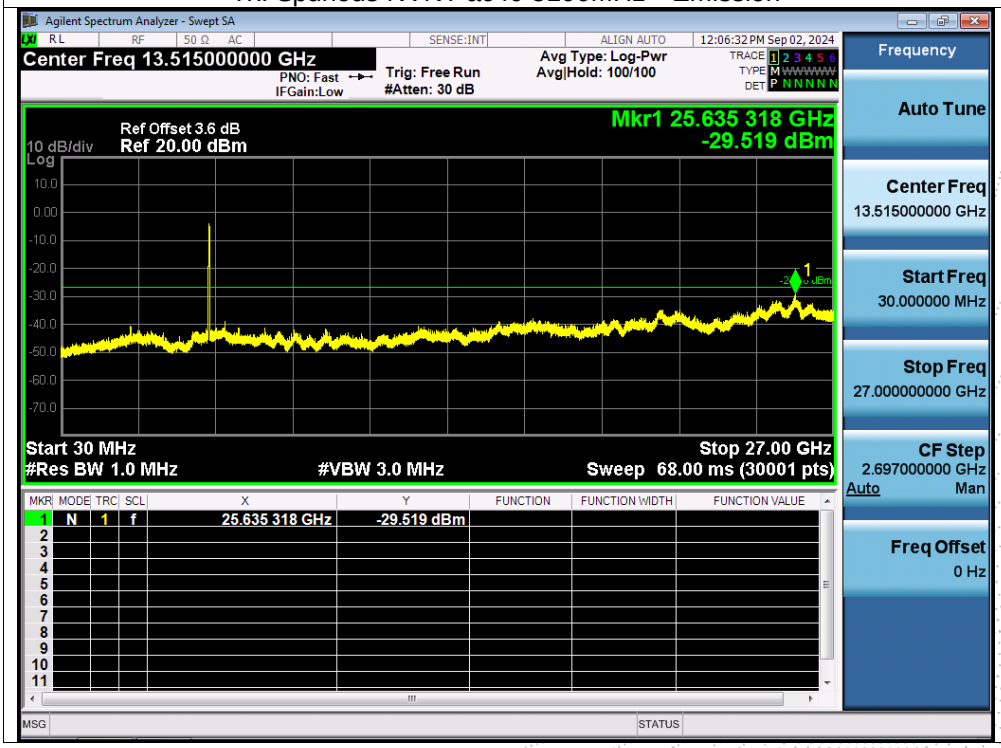
Tx. Spurious NVNT ac20 5200MHz Emission



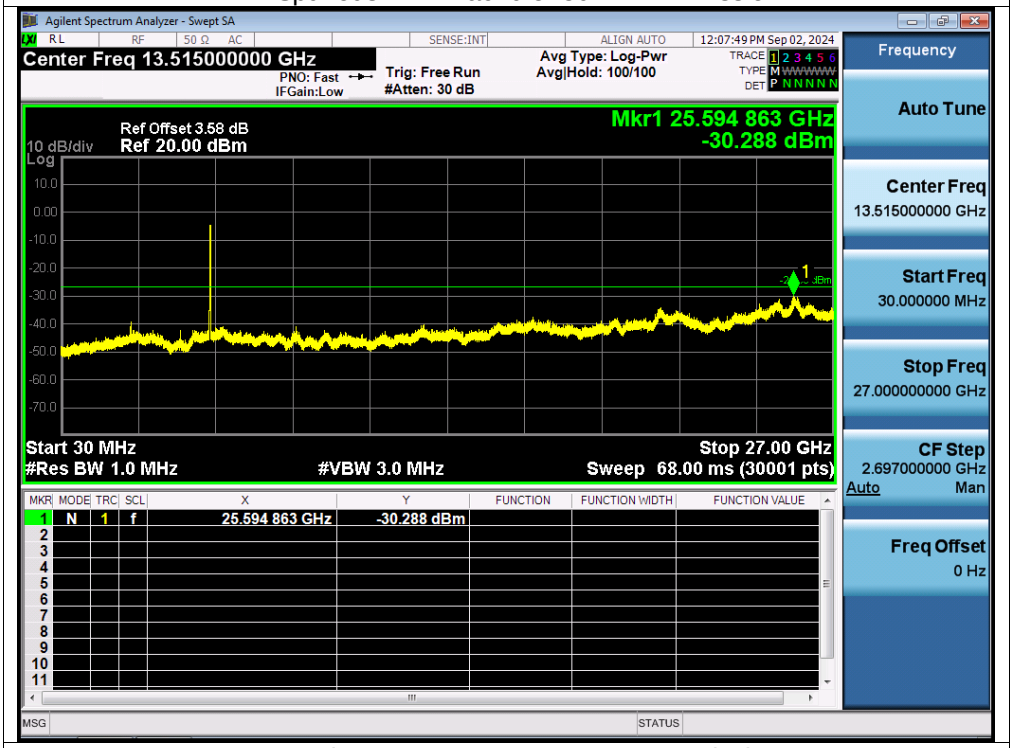
Tx. Spurious NVNT ac20 5240MHz Emission



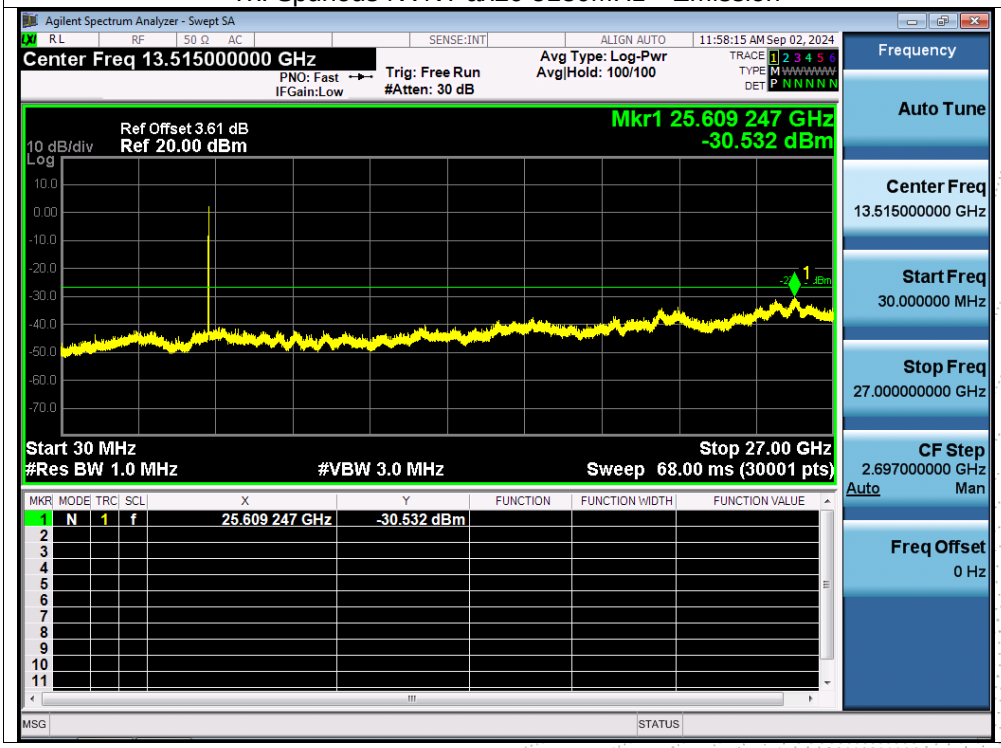
Tx. Spurious NVNT ac40 5190MHz Emission



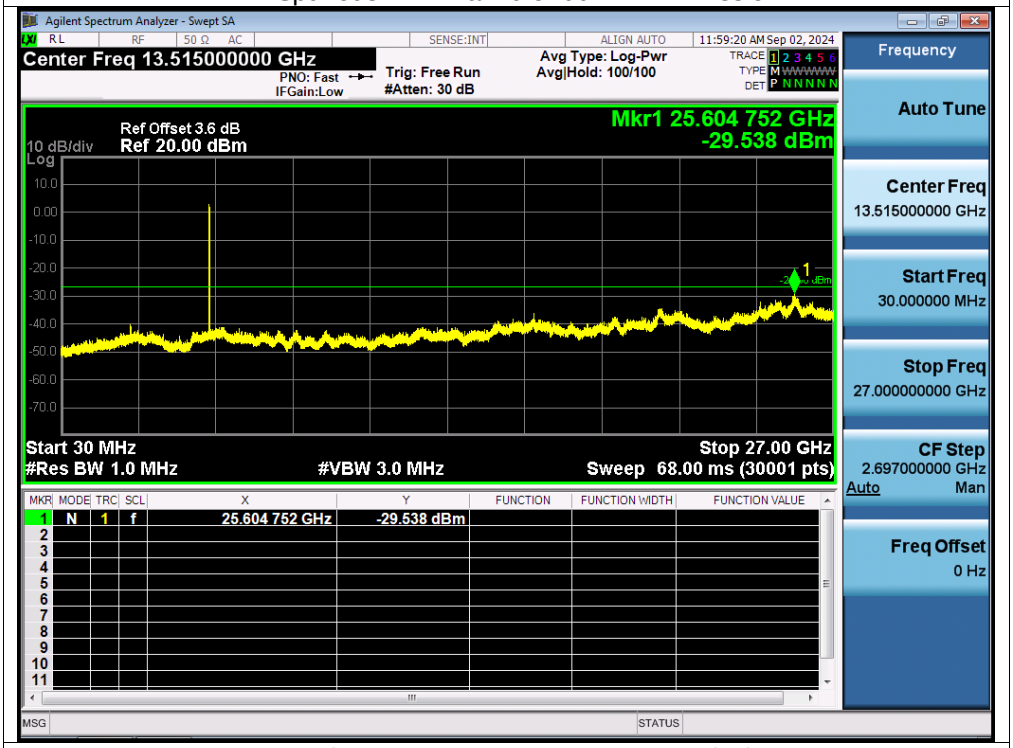
Tx. Spurious NVNT ac40 5230MHz Emission



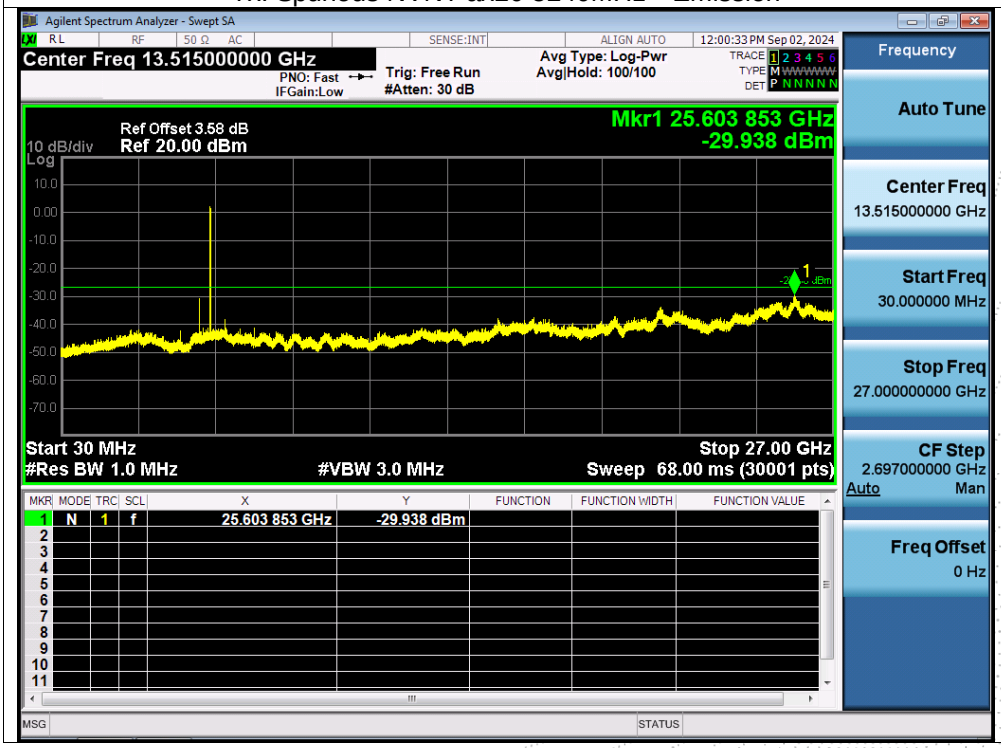
Tx. Spurious NVNT ax20 5180MHz Emission



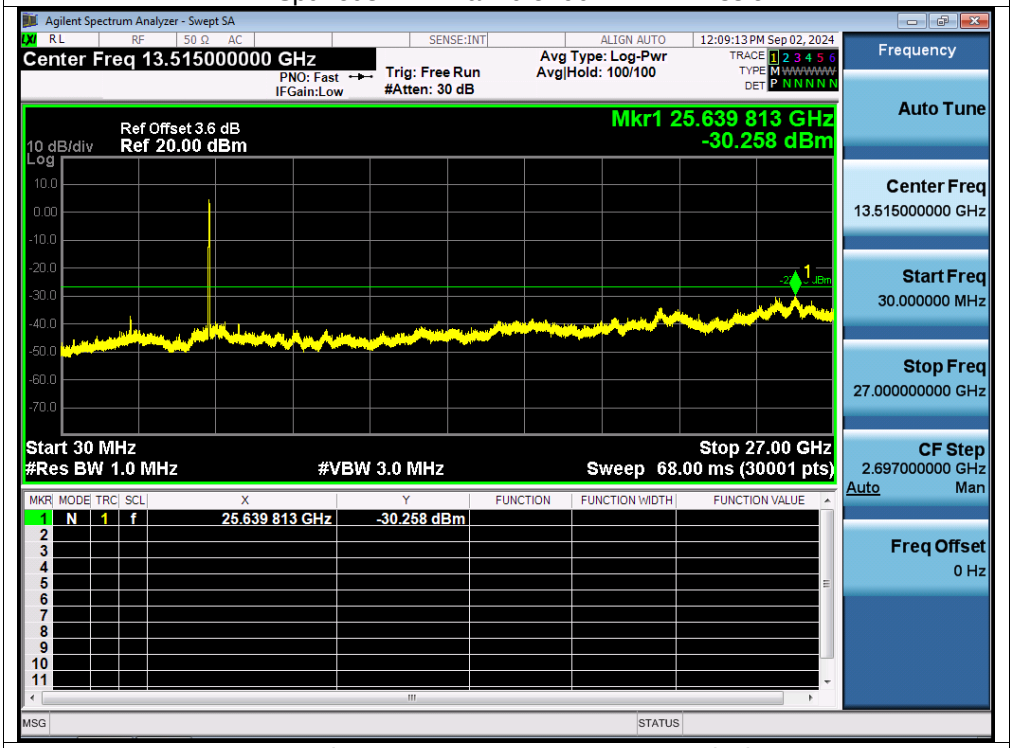
Tx. Spurious NVNT ax20 5200MHz Emission



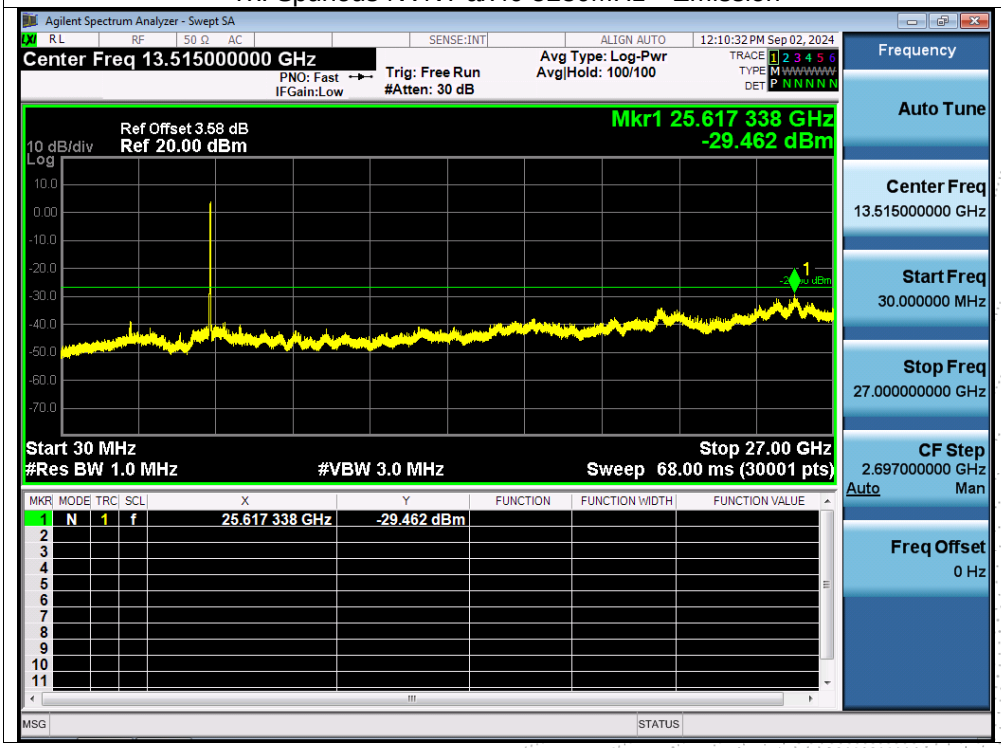
Tx. Spurious NVNT ax20 5240MHz Emission



Tx. Spurious NVNT ax40 5190MHz Emission

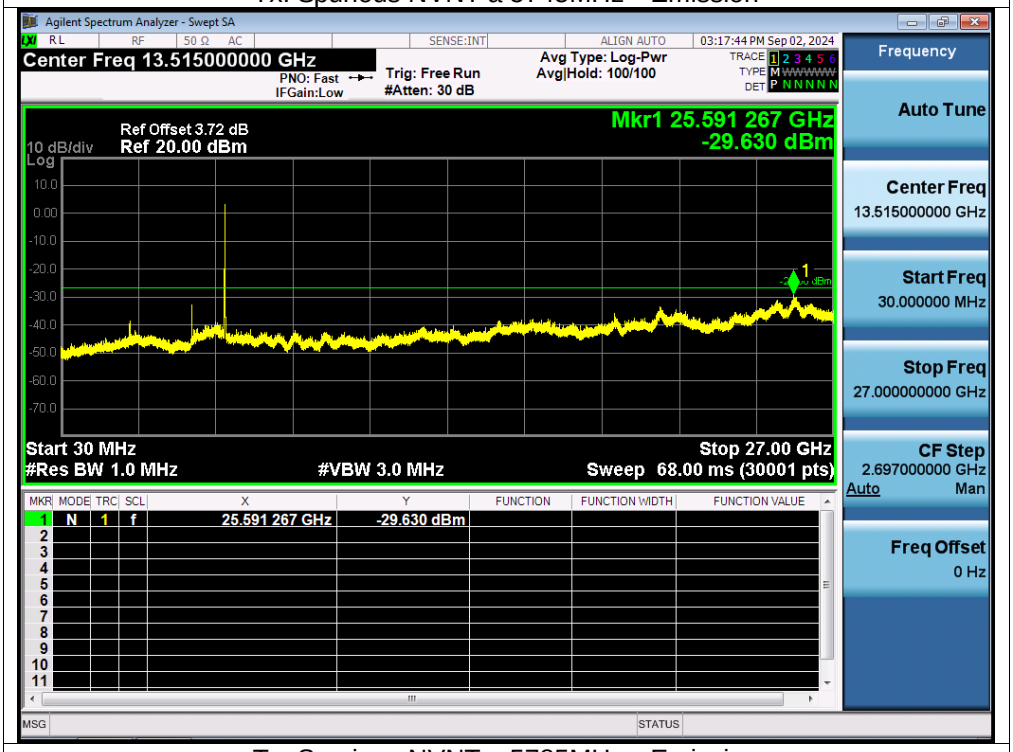


Tx. Spurious NVNT ax40 5230MHz Emission

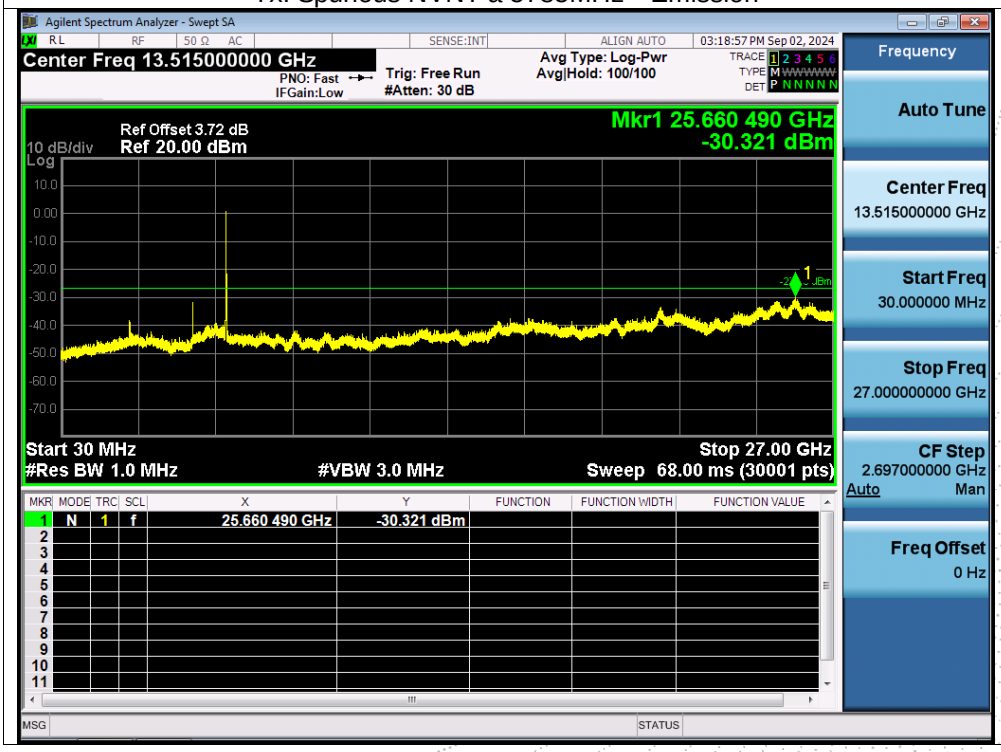


Test Graphs

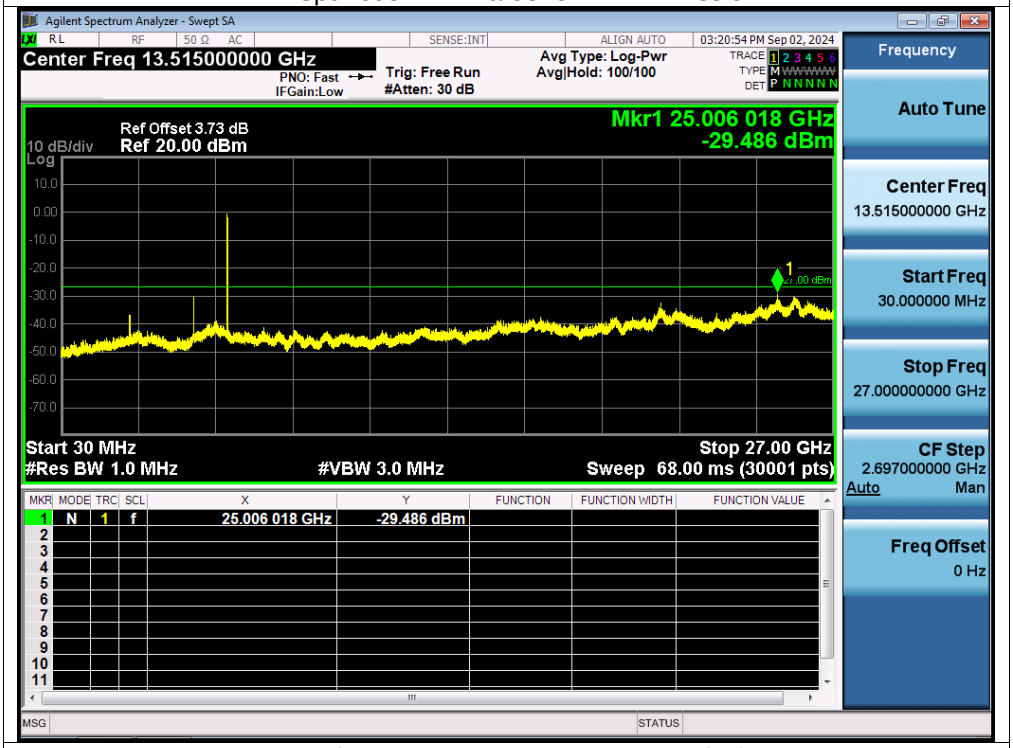
Tx. Spurious NVNT a 5745MHz Emission



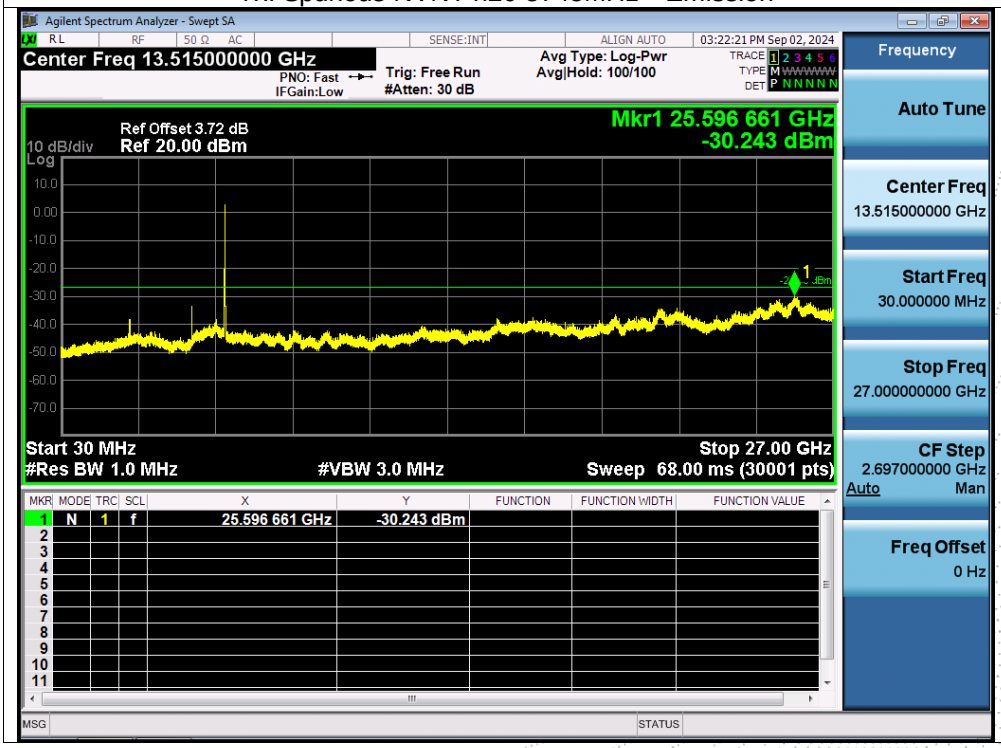
Tx. Spurious NVNT a 5785MHz Emission



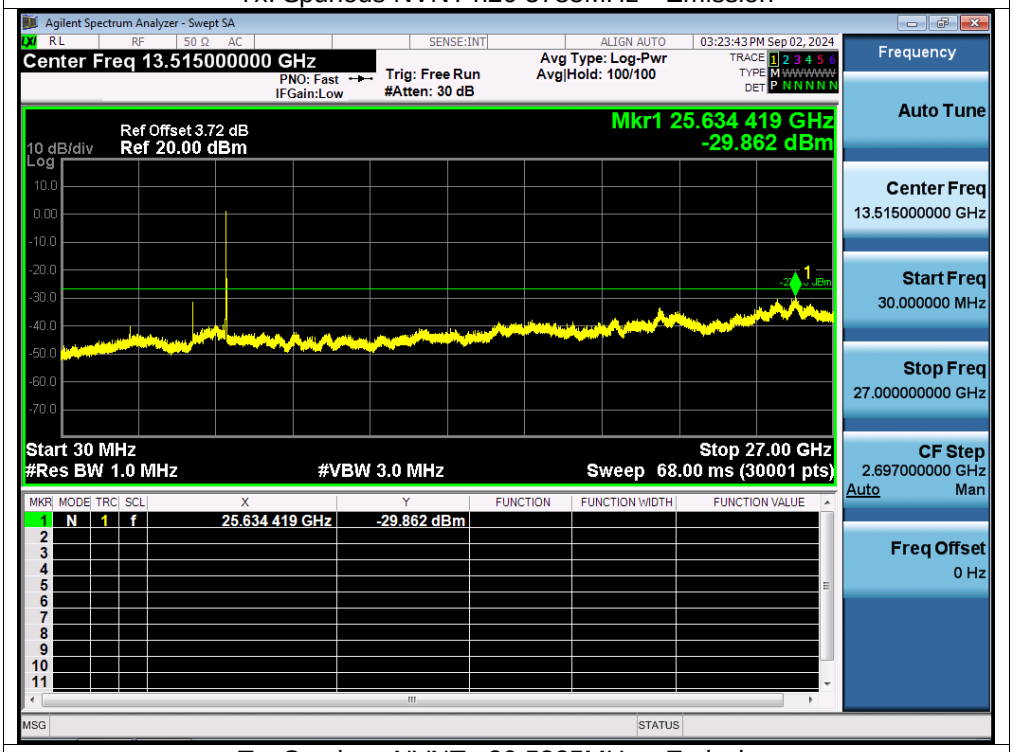
Tx. Spurious NVNT a 5825MHz Emission



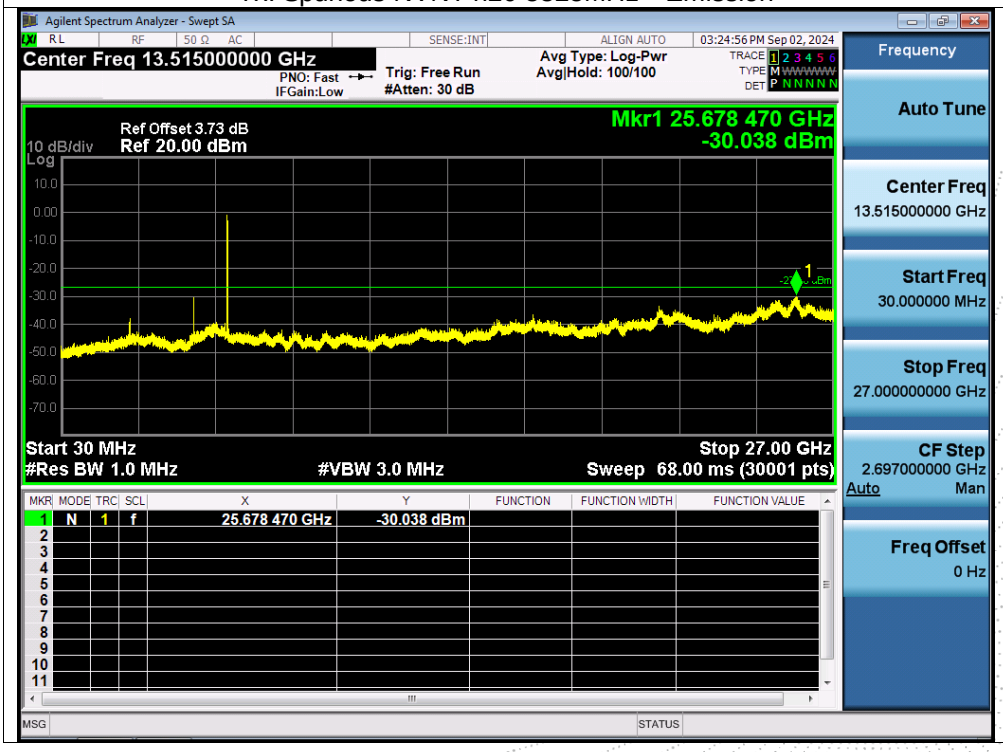
Tx. Spurious NVNT n20 5745MHz Emission



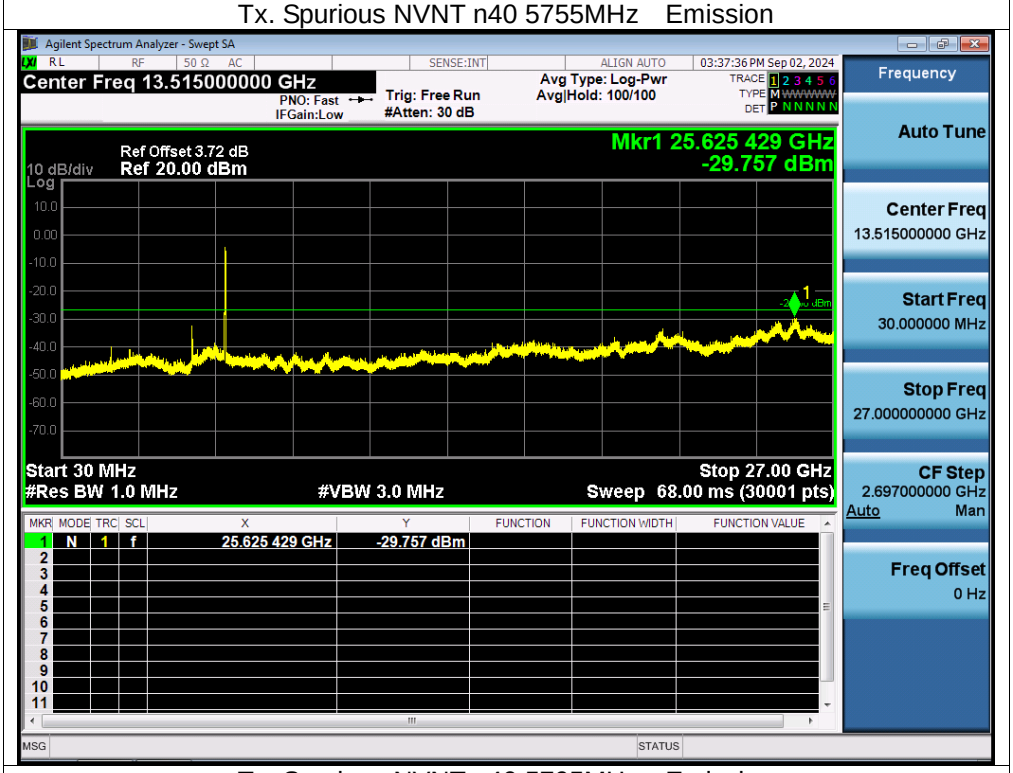
Tx. Spurious NVNT n20 5785MHz Emission



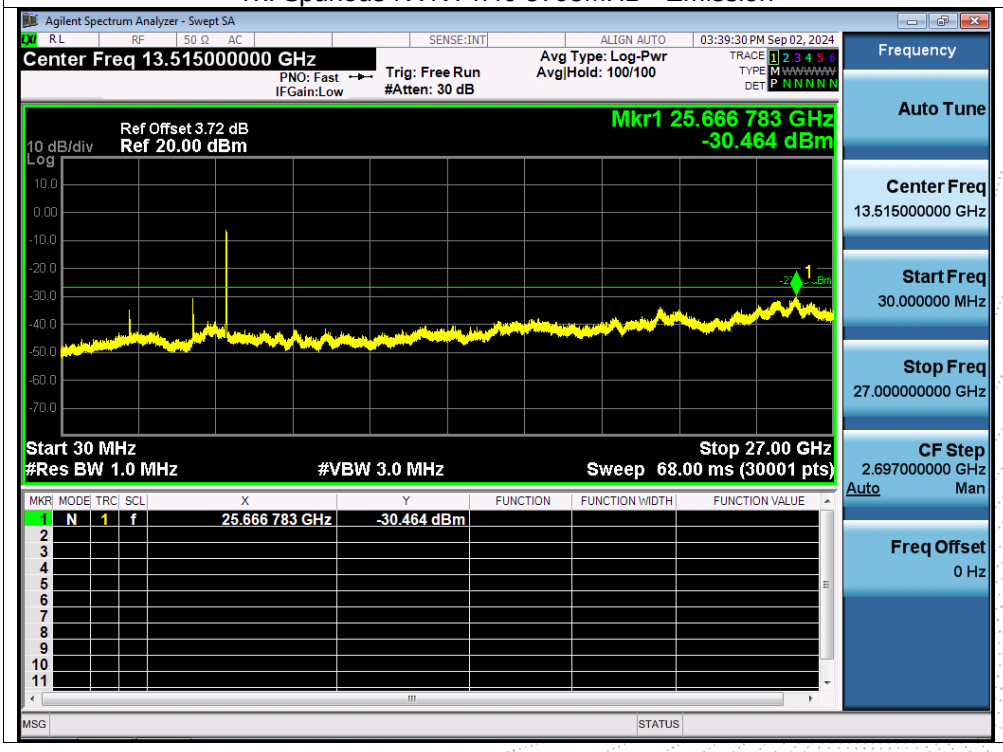
Tx. Spurious NVNT n20 5825MHz Emission



Tx. Spurious NVNT n40 5755MHz Emission

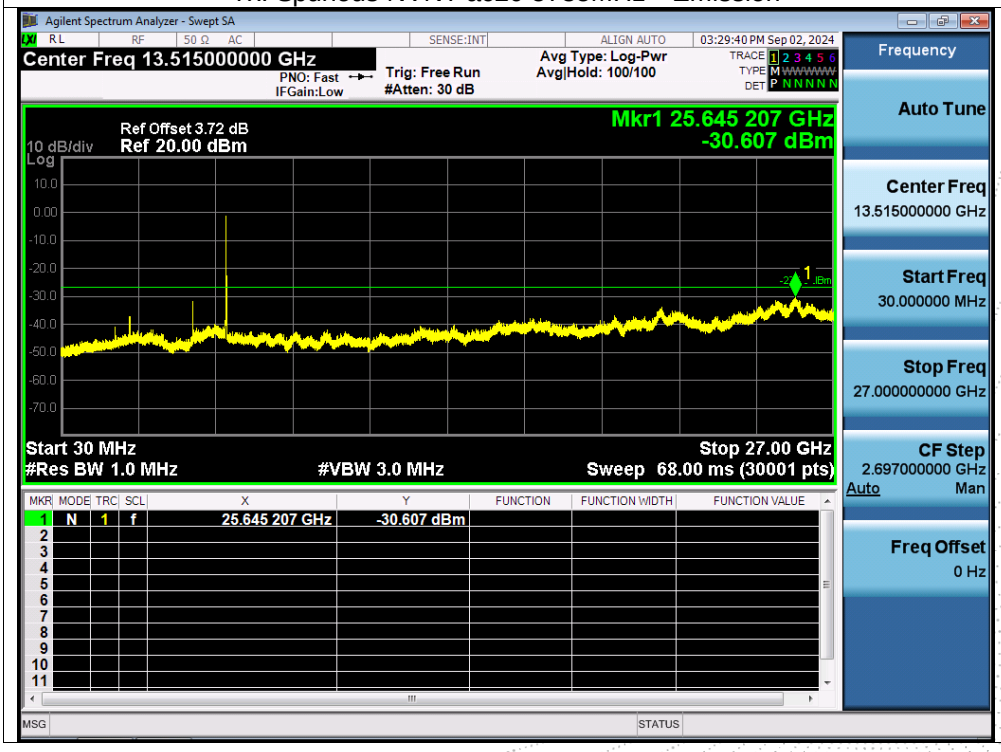


Tx. Spurious NVNT n40 5795MHz Emission

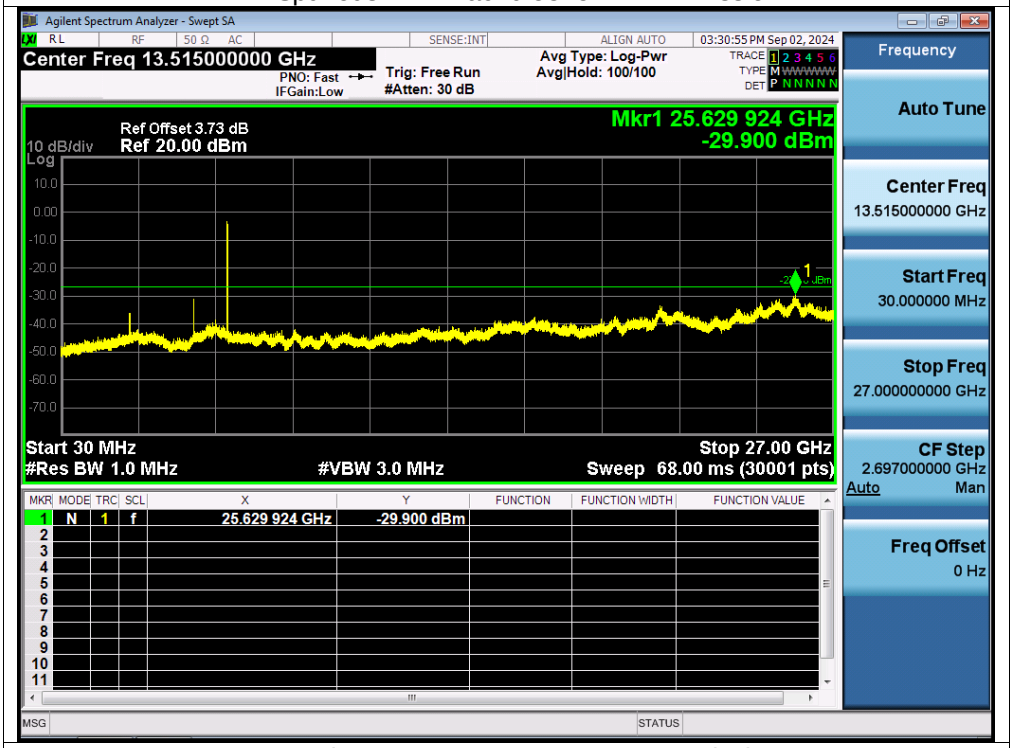


Tx. Spurious NVNT ac20 5745MHz Emission

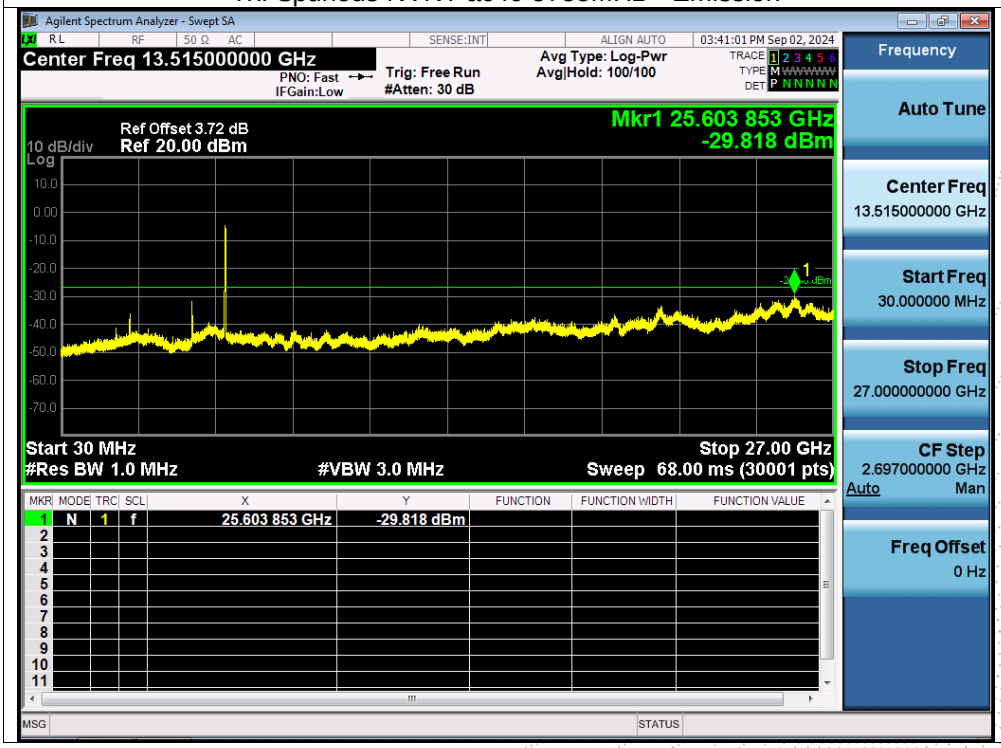
Tx. Spurious NVNT ac20 5785MHz Emission



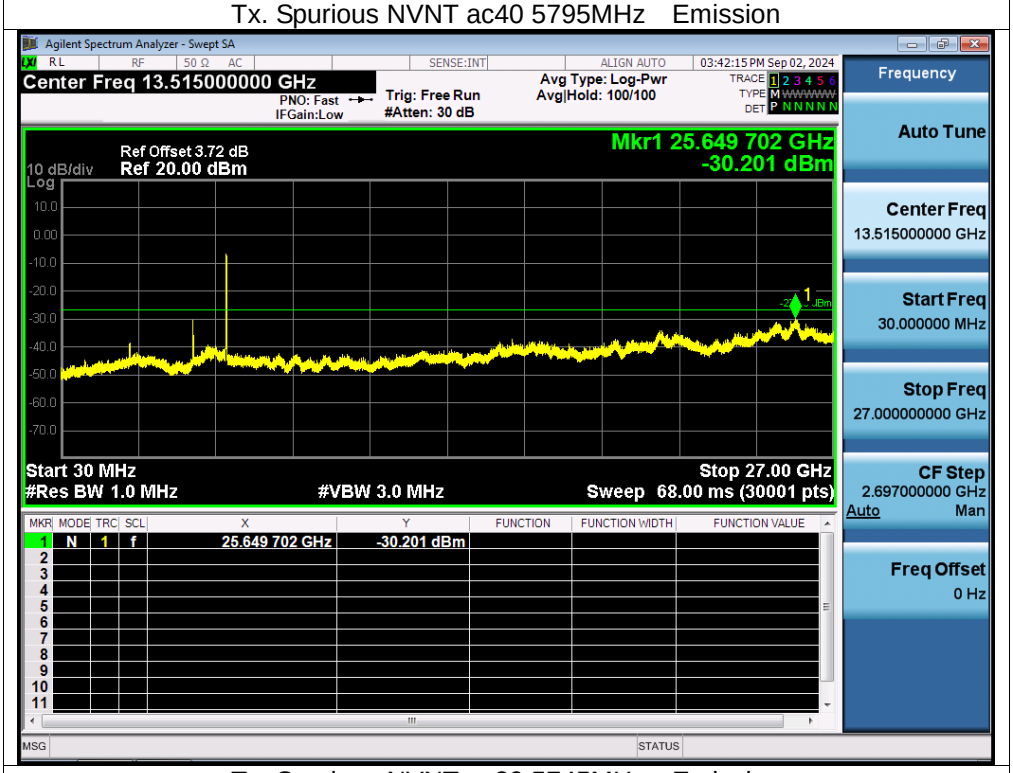
Tx. Spurious NVNT ac20 5825MHz Emission



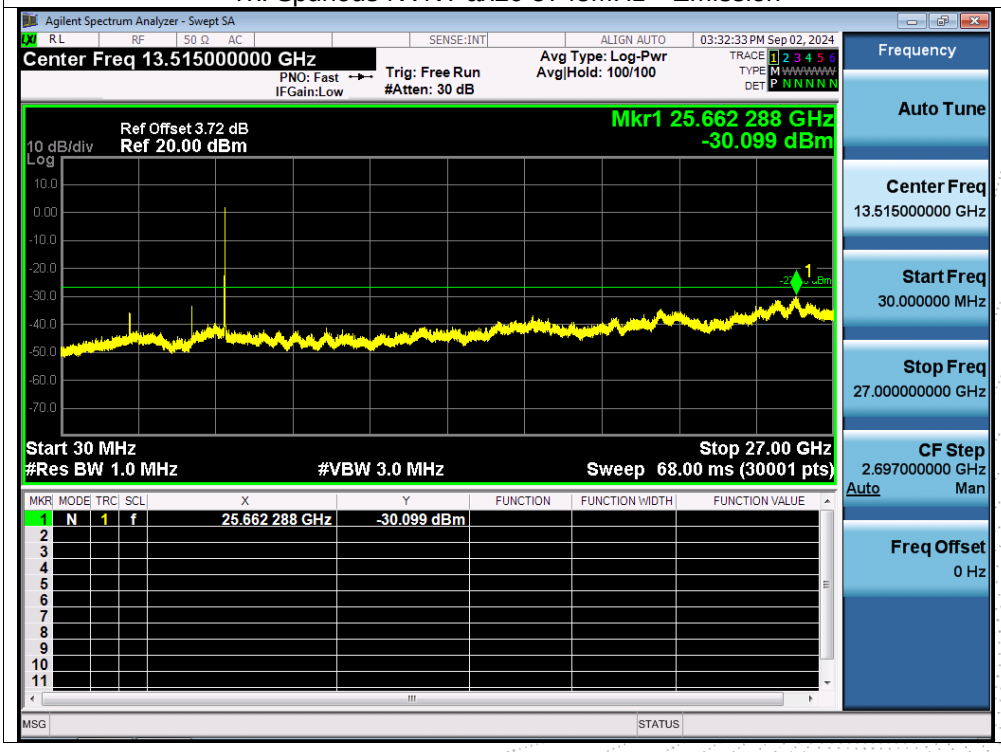
Tx. Spurious NVNT ac40 5755MHz Emission



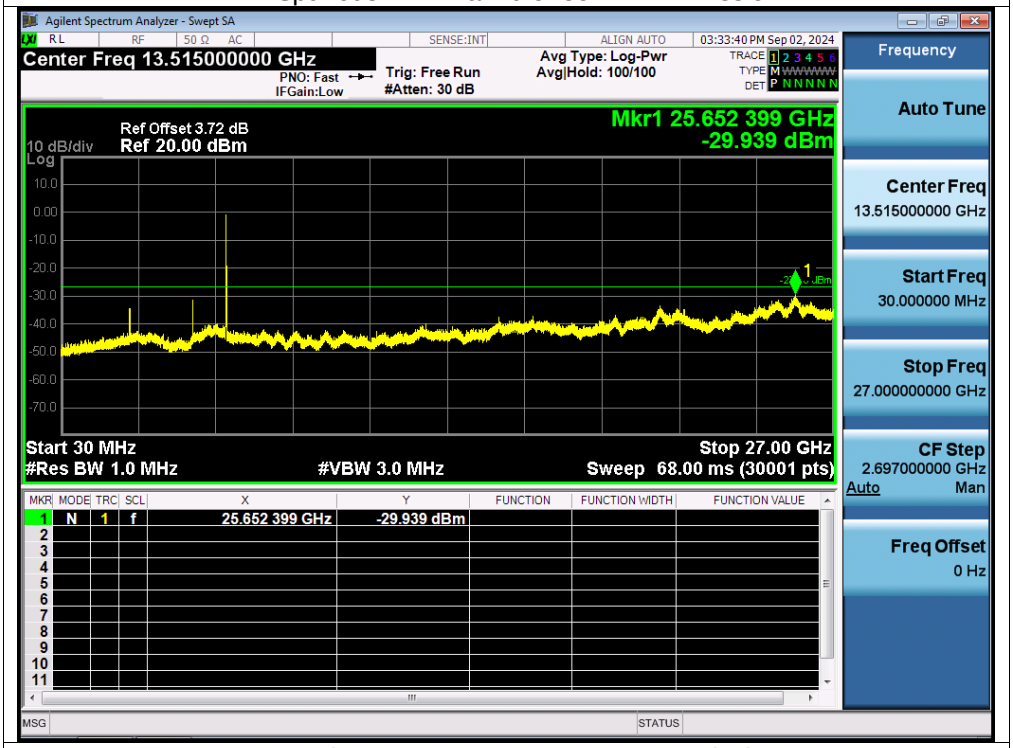
Tx. Spurious NVNT ac40 5795MHz Emission



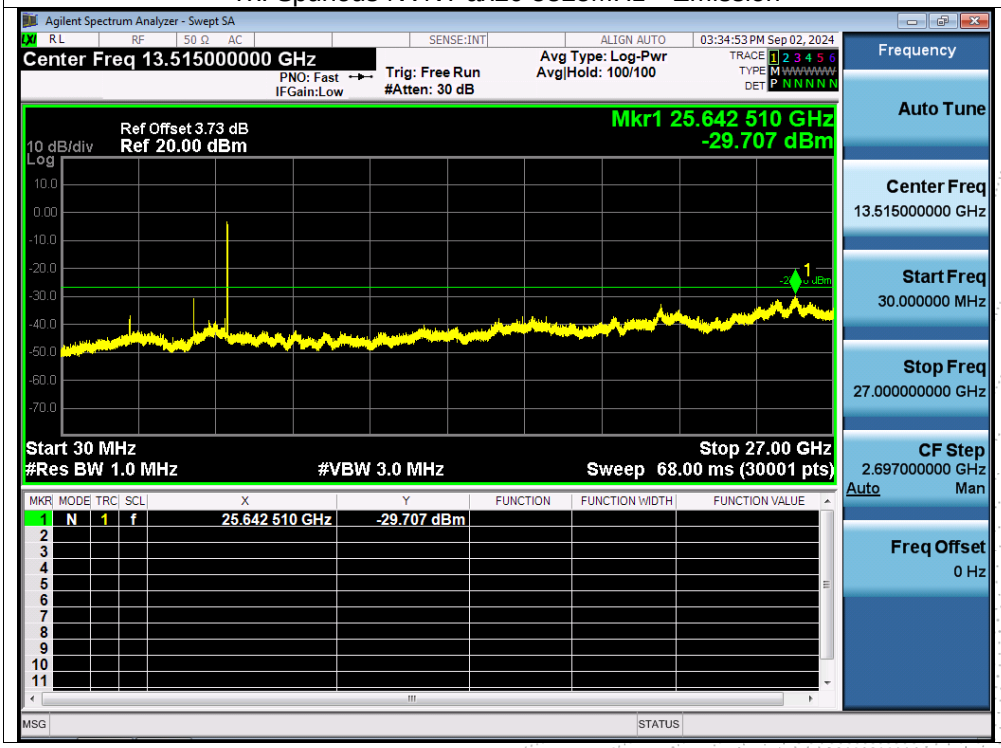
Tx. Spurious NVNT ax20 5745MHz Emission



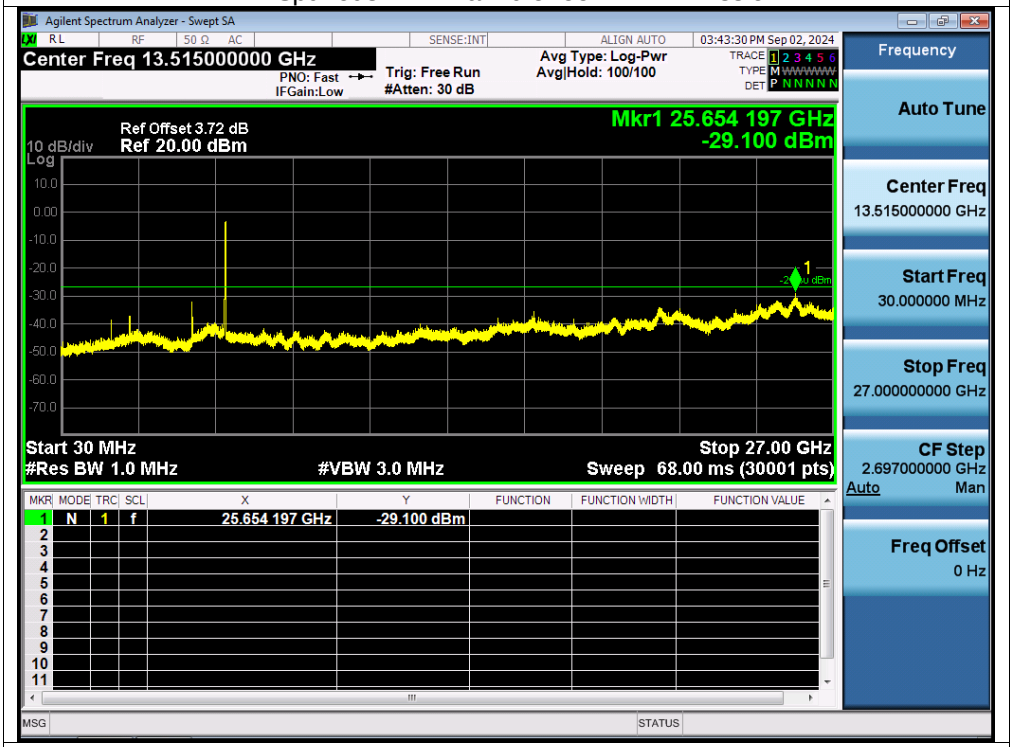
Tx. Spurious NVNT ax20 5785MHz Emission



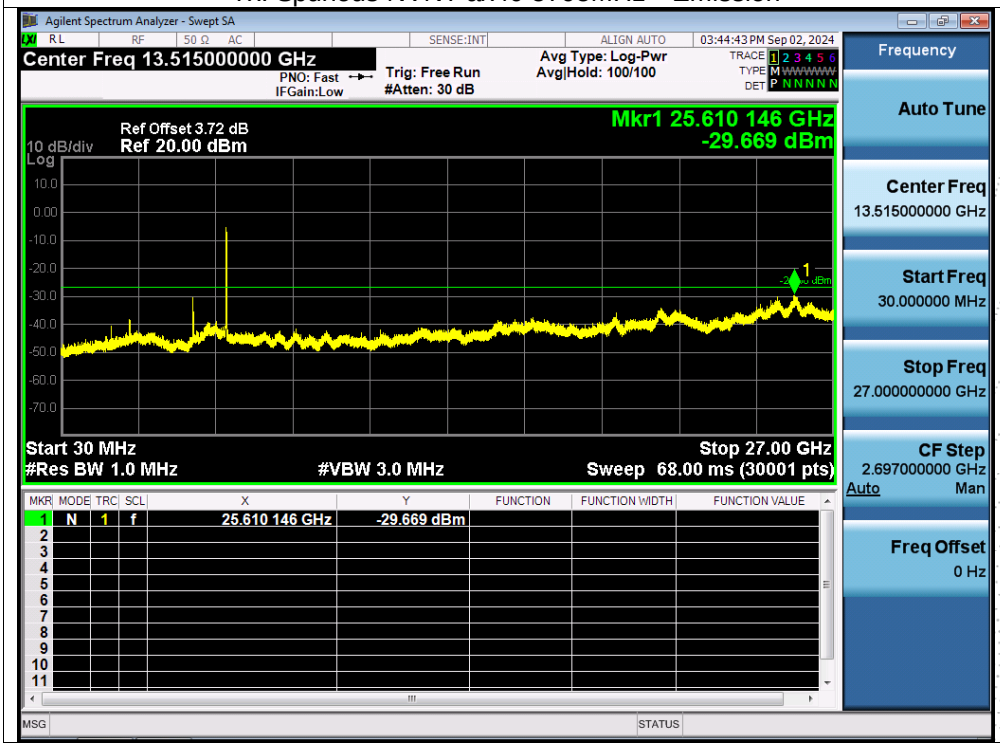
Tx. Spurious NVNT ax20 5825MHz Emission



Tx. Spurious NVNT ax40 5755MHz Emission

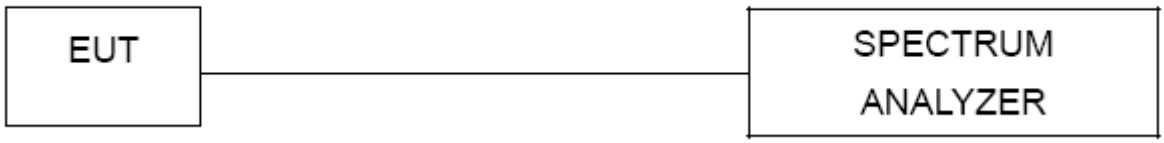


Tx. Spurious NVNT ax40 5795MHz Emission



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. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and he limit is less than ±20ppm (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°C~70°C.

13.4 Test Result

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC120V/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	5180.0127	5180	0.0127	2.4517
		V max (V)	138.00	5180.0099	5180	0.0099	1.9112
		V min (V)	102.00	5180.0123	5180	0.0123	2.3745
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	5180.0126	5180	0.0126	2.4324
		T (°C)	-10	5180.0099	5180	0.0099	1.9112
		T (°C)	0	5180.0028	5180	0.0028	0.5405
		T (°C)	10	5180.0048	5180	0.0048	0.9266
		T (°C)	20	5180.0039	5180	0.0039	0.7529
		T (°C)	30	5180.0071	5180	0.0071	1.3707
		T (°C)	40	5180.0075	5180	0.0075	1.4479
		T (°C)	50	5180.0101	5180	0.0101	1.9498
		T (°C)	60	5180.0115	5180	0.0115	2.2201
		T (°C)	70	5180.0093	5180	0.0093	1.7954
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	5200.0134	5200	0.0134	2.5769
		V max (V)	138.00	5200.0040	5200	0.0040	0.7692
		V min (V)	102.00	5200.0046	5200	0.0046	0.8846
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	5200.00100	5200	0.00100	0.1923
		T (°C)	-10	5200.00770	5200	0.00770	1.4808
		T (°C)	0	5200.01300	5200	0.01300	2.5000
		T (°C)	10	5200.01040	5200	0.01040	2.0000
		T (°C)	20	5200.01080	5200	0.01080	2.0769
		T (°C)	30	5200.01270	5200	0.01270	2.4423
		T (°C)	40	5200.00700	5200	0.00700	1.3462
		T (°C)	50	5200.00830	5200	0.00830	1.5962
		T (°C)	60	5200.00500	5200	0.00500	0.9615
		T (°C)	70	5200.00810	5200	0.00810	1.5577
Limits				5150-5250 MHz			
Result				Complies			