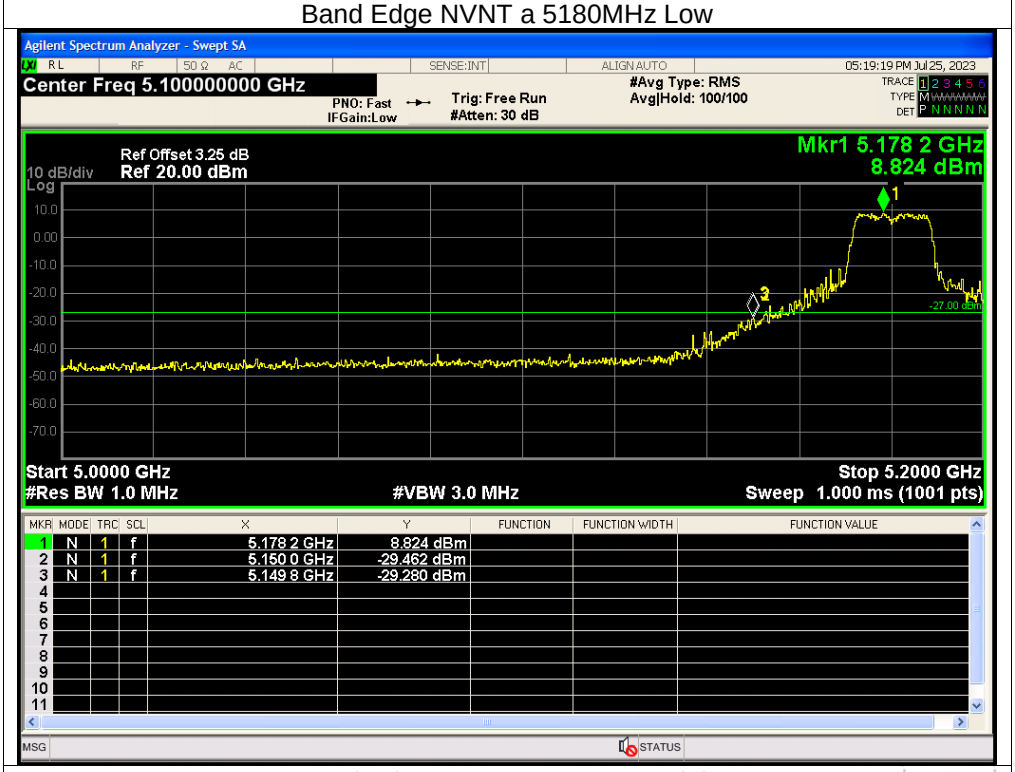
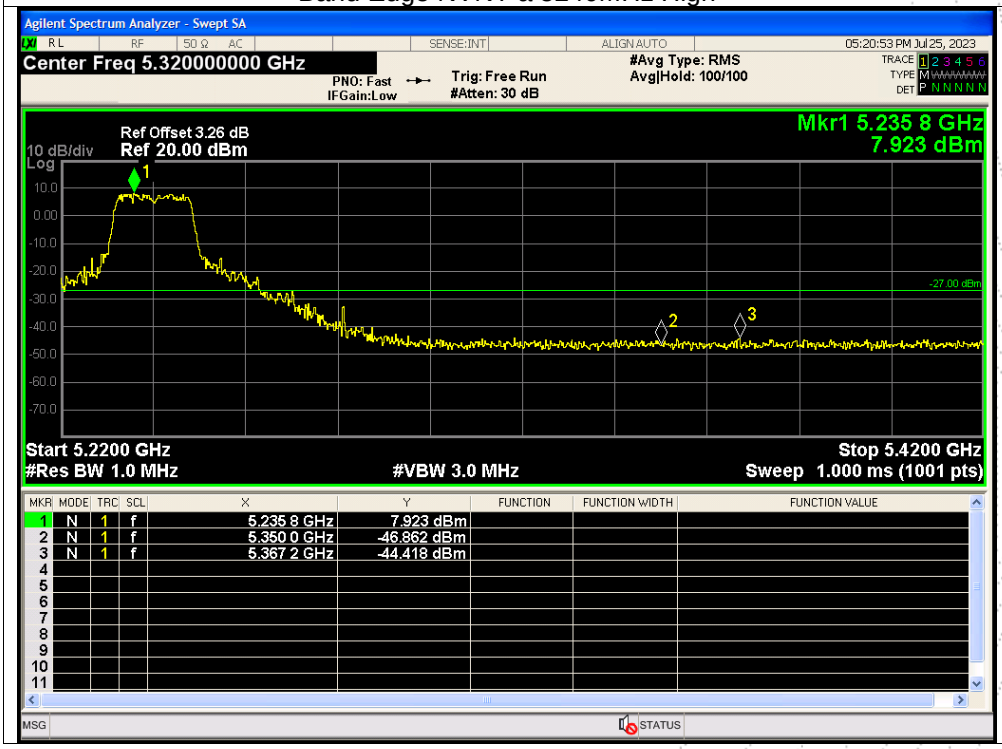
11.5 Test Result

Test Graphs

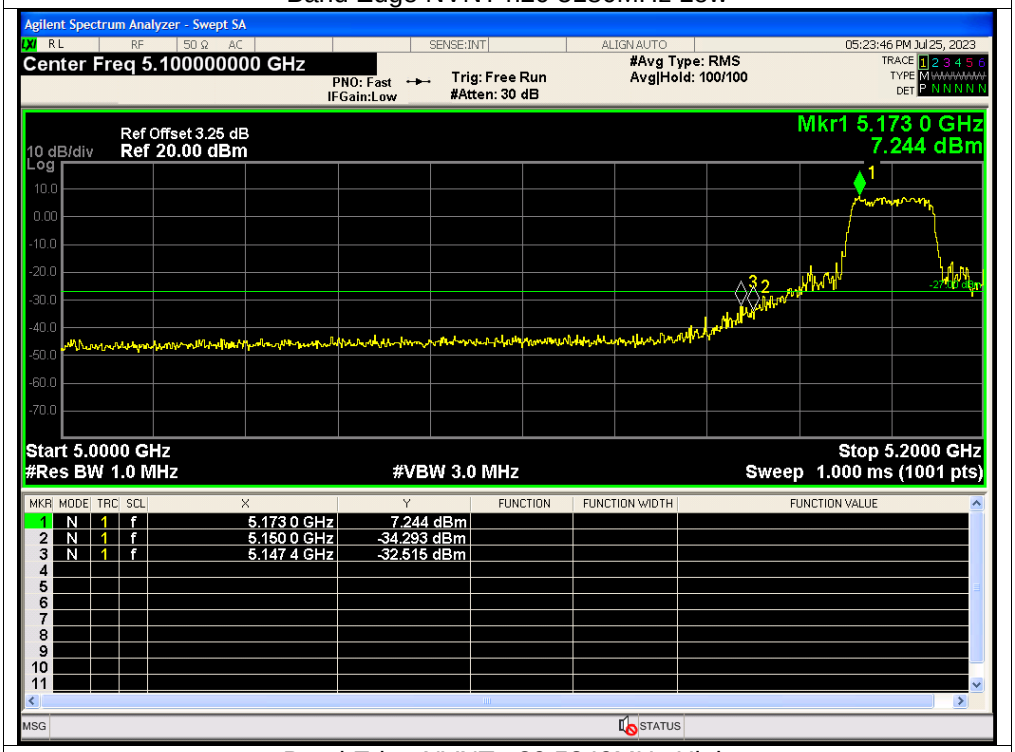
Band Edge NVNT a 5180MHz Low



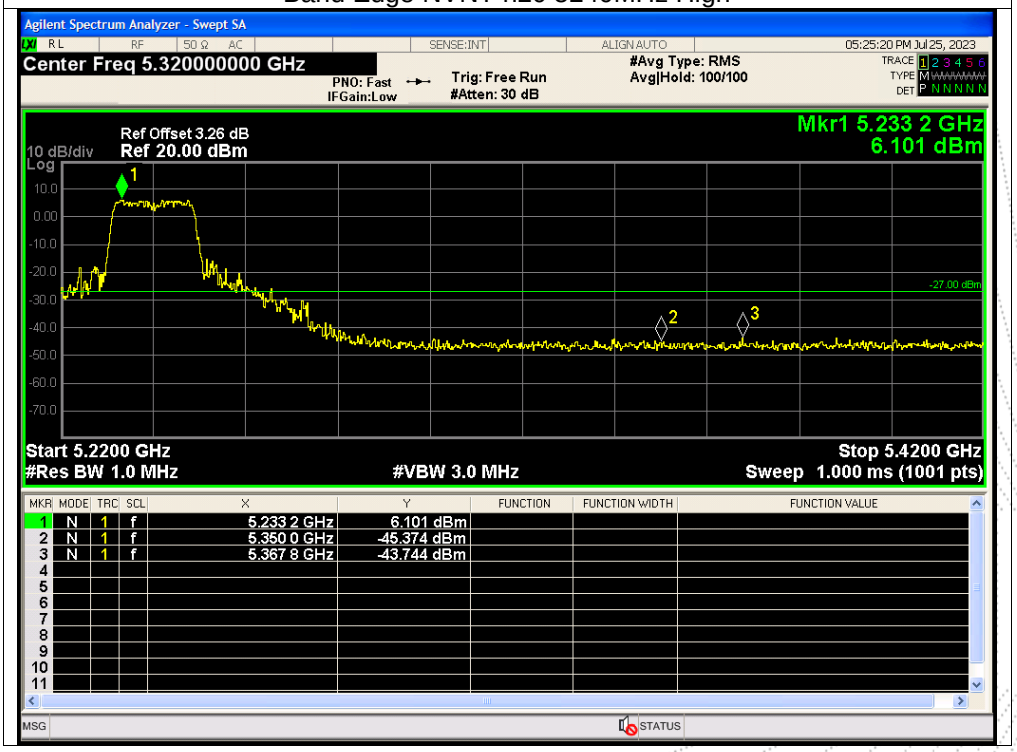
Band Edge NVNT a 5240MHz High



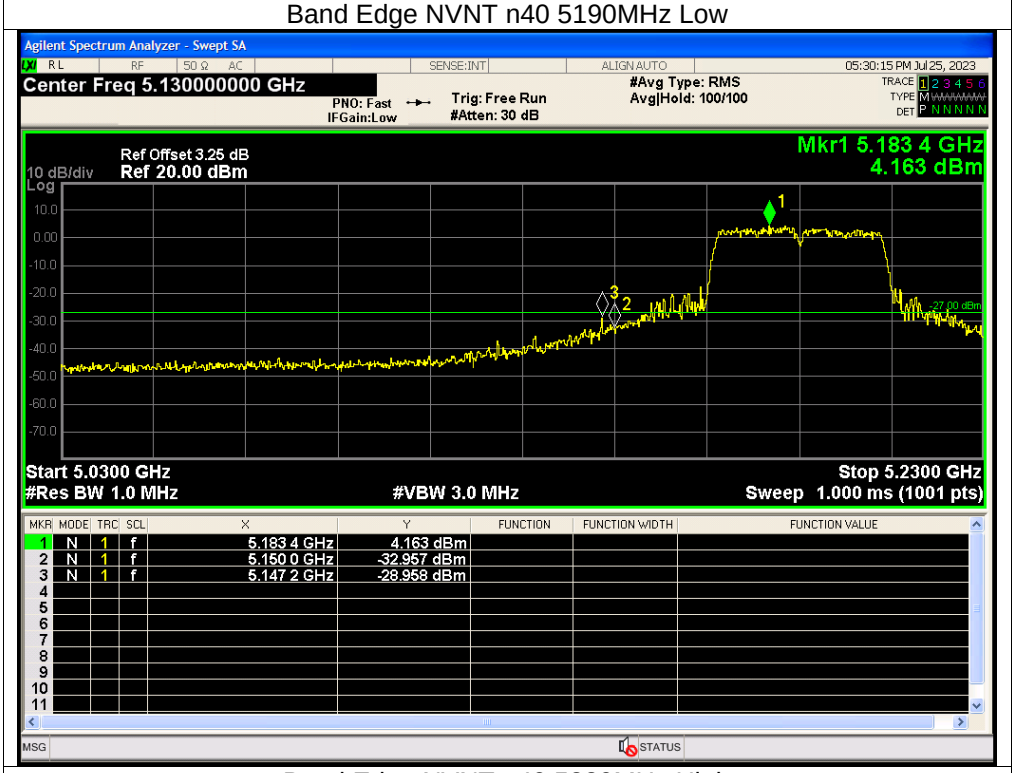
Band Edge NVNT n20 5180MHz Low



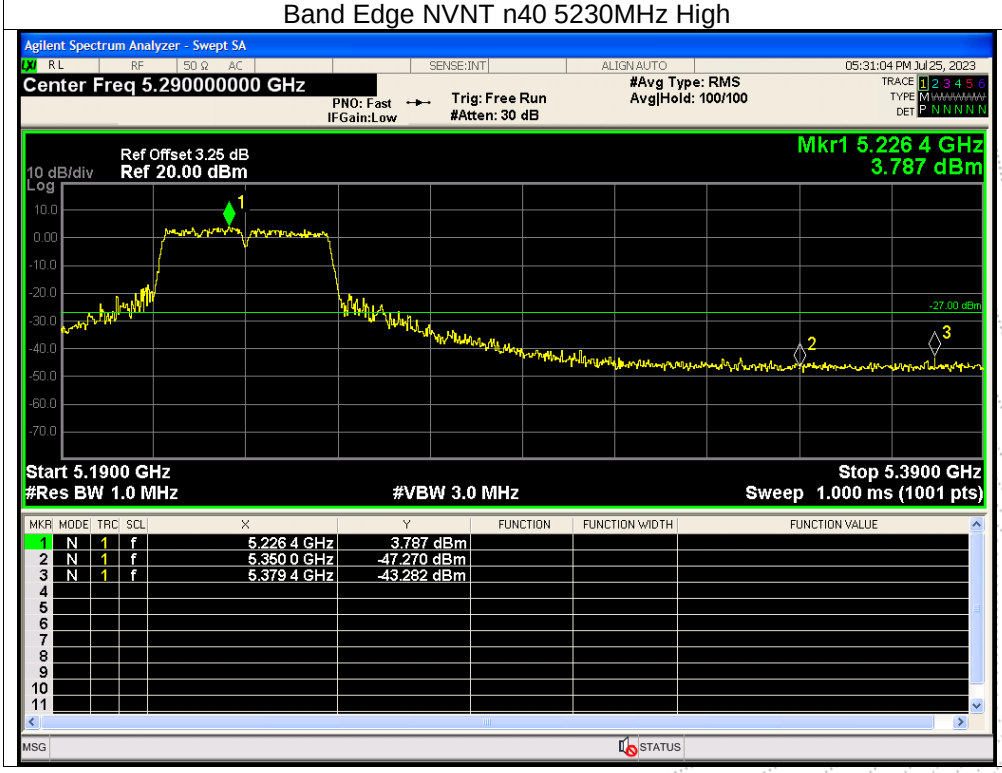
Band Edge NVNT n20 5240MHz High



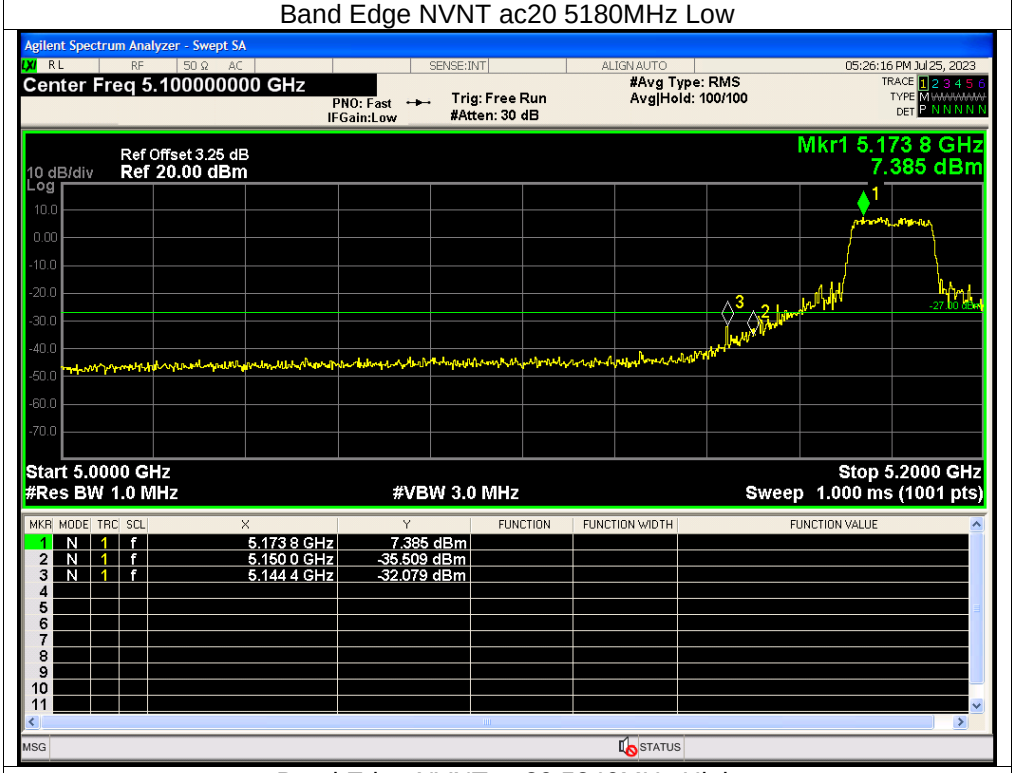
Band Edge NVNT n40 5190MHz Low



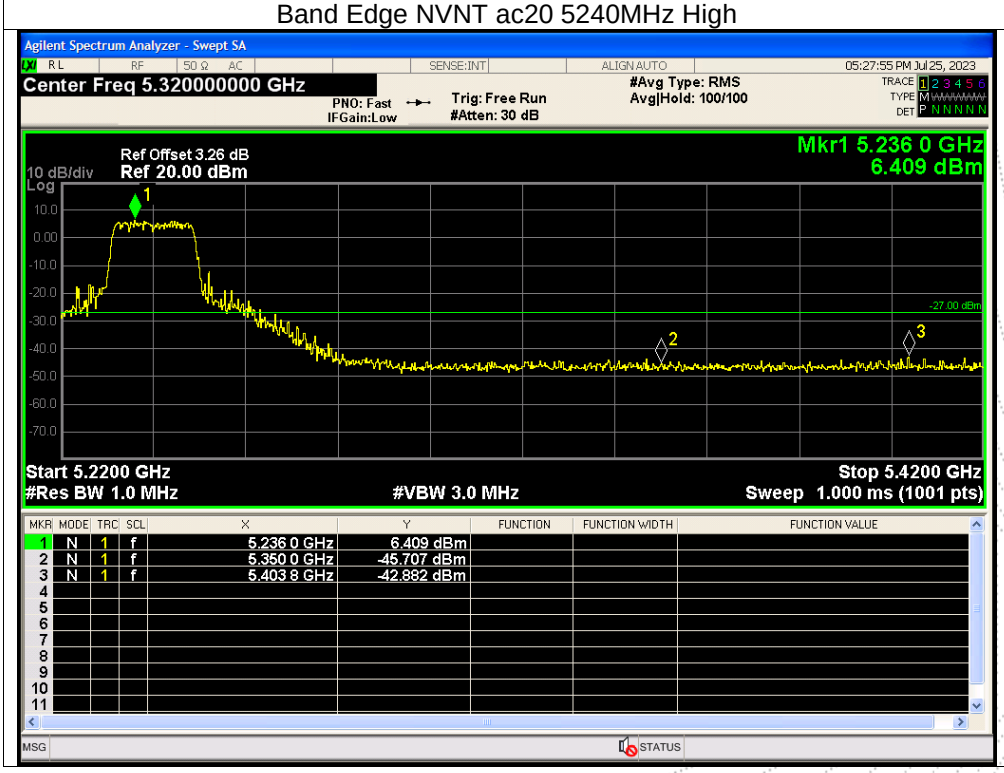
Band Edge NVNT n40 5230MHz High



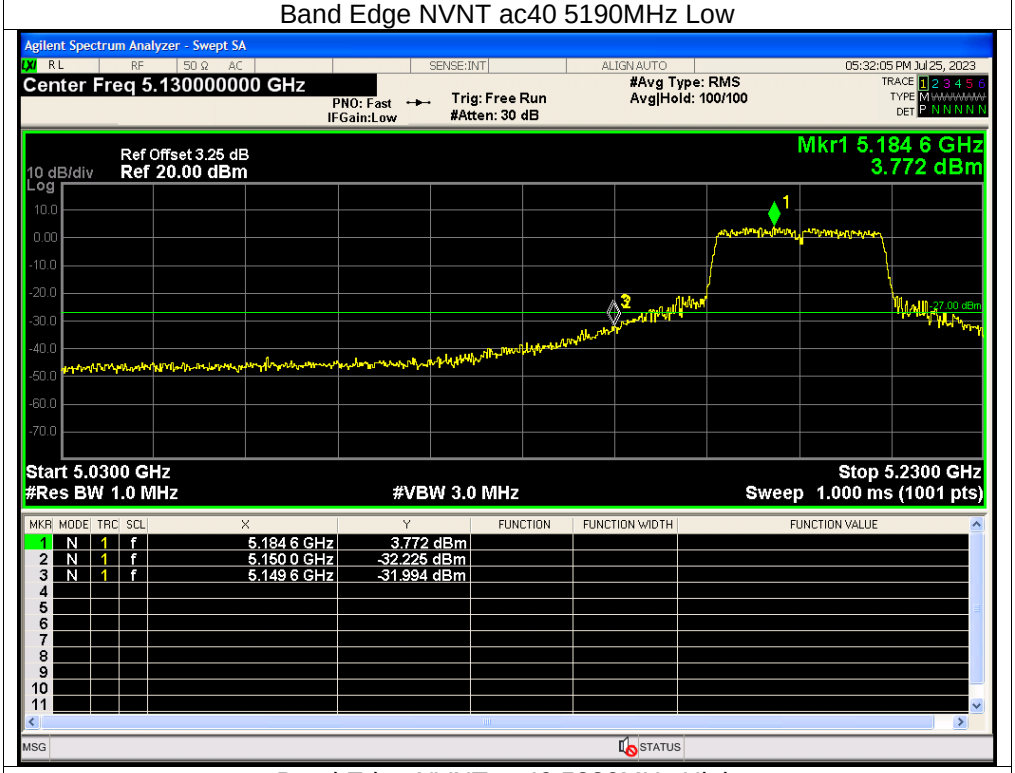
Band Edge NVNT ac20 5180MHz Low



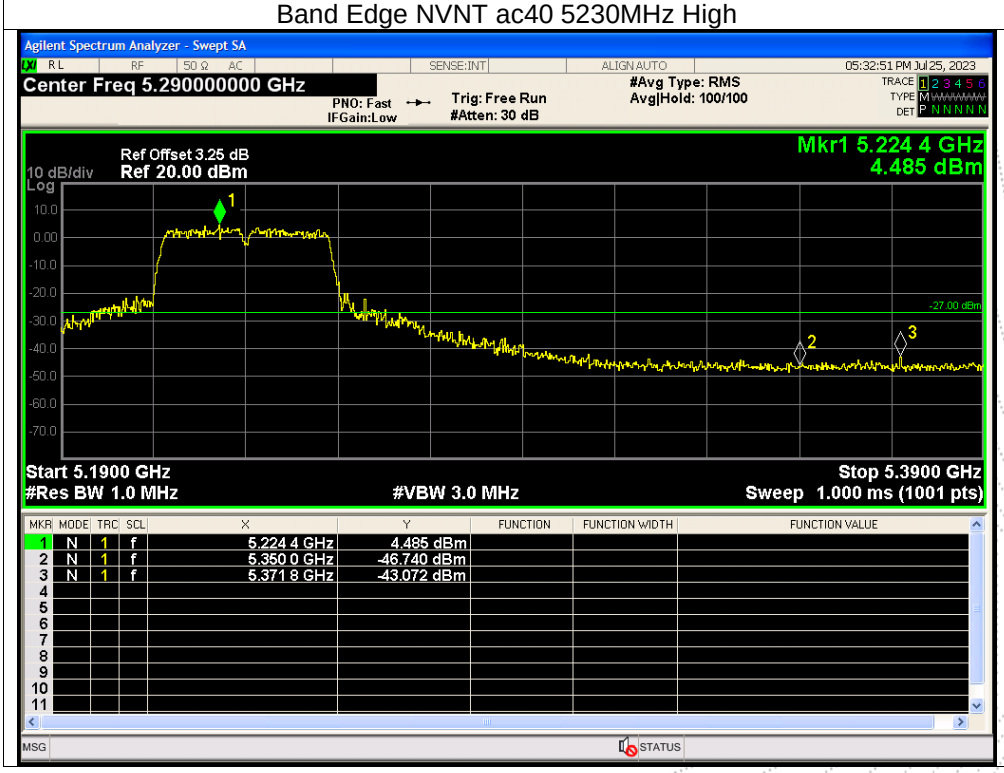
Band Edge NVNT ac20 5240MHz High



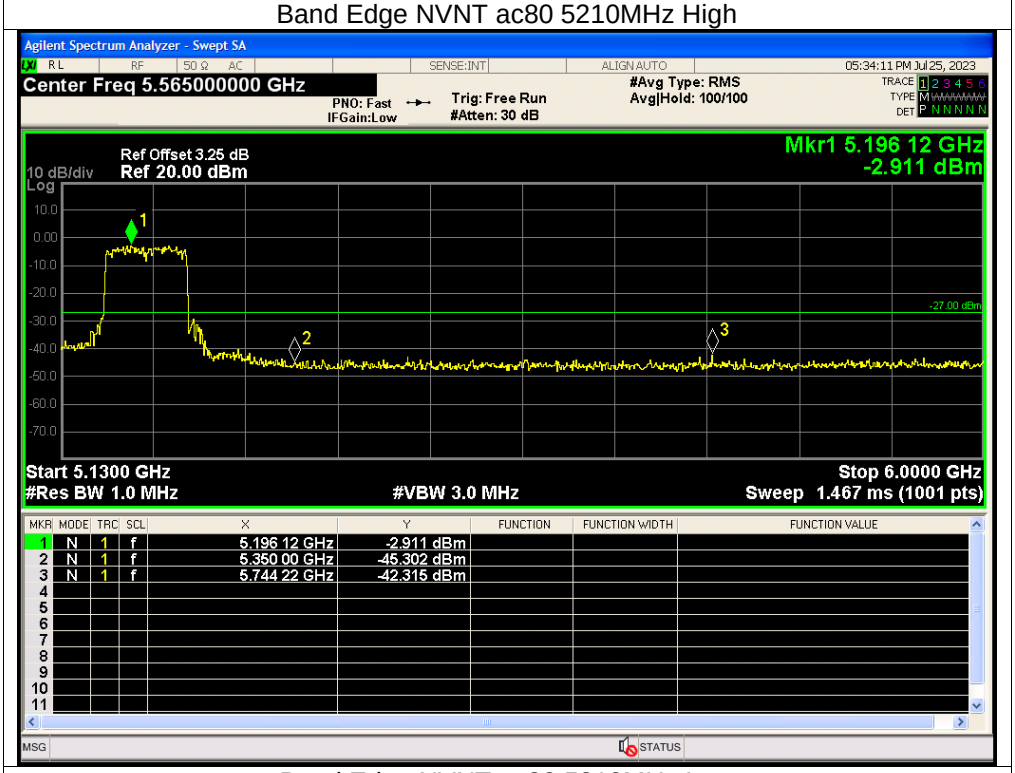
Band Edge NVNT ac40 5190MHz Low



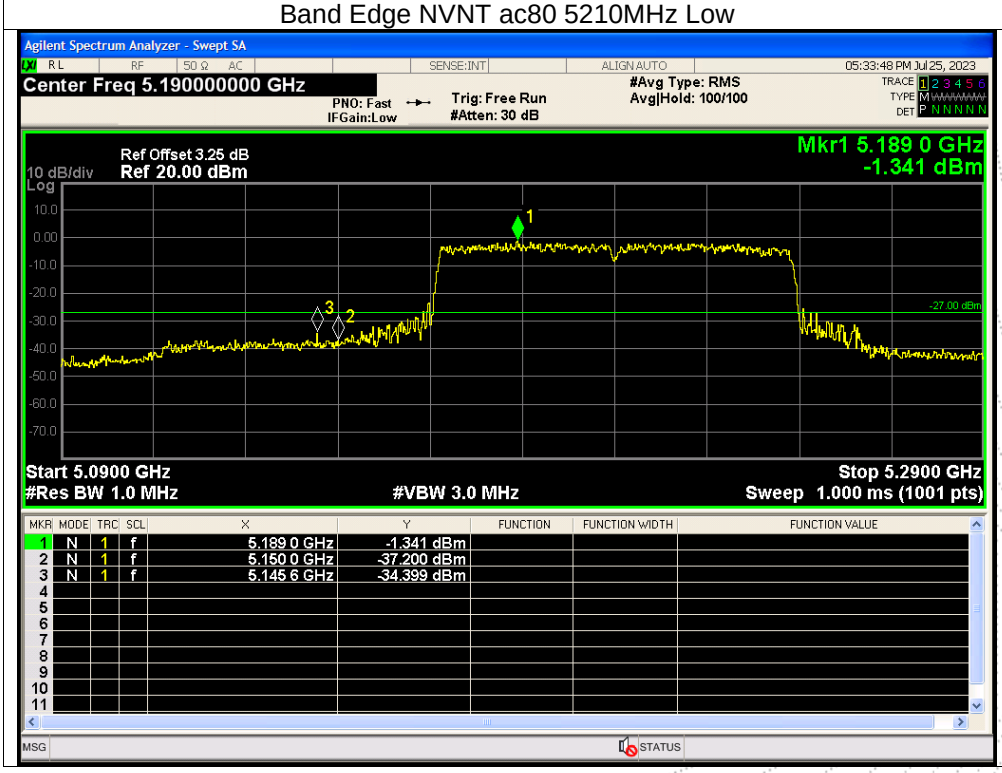
Band Edge NVNT ac40 5230MHz High



Band Edge NVNT ac80 5210MHz High



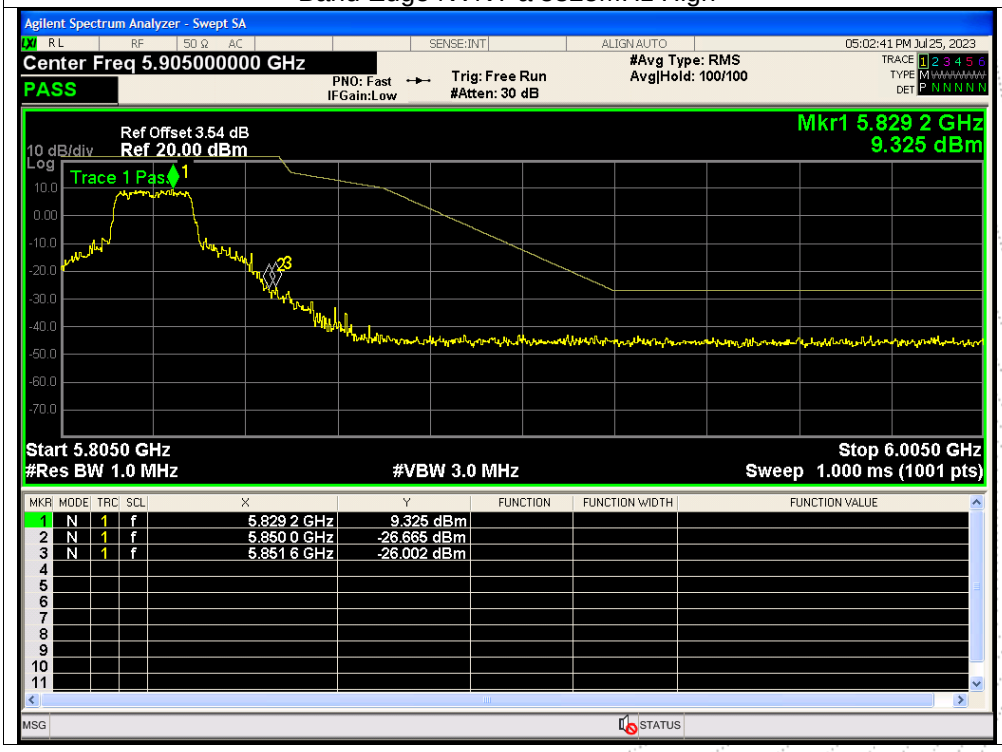
Band Edge NVNT ac80 5210MHz Low



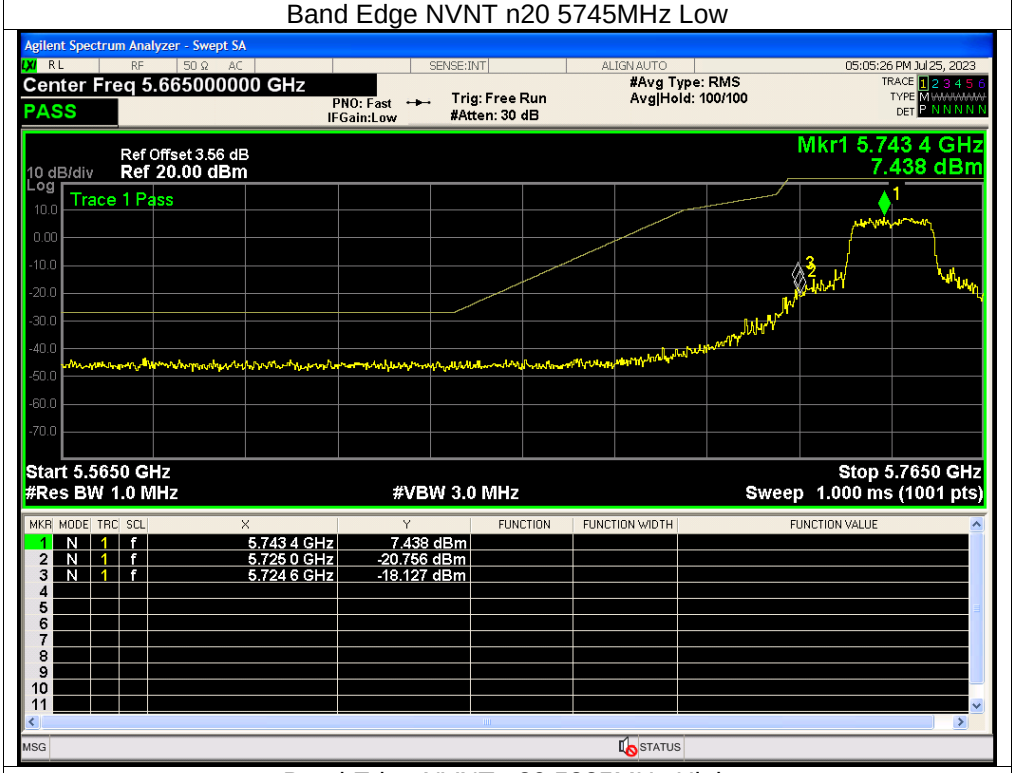
Test Graphs

Band Edge NVNT a 5745MHz Low

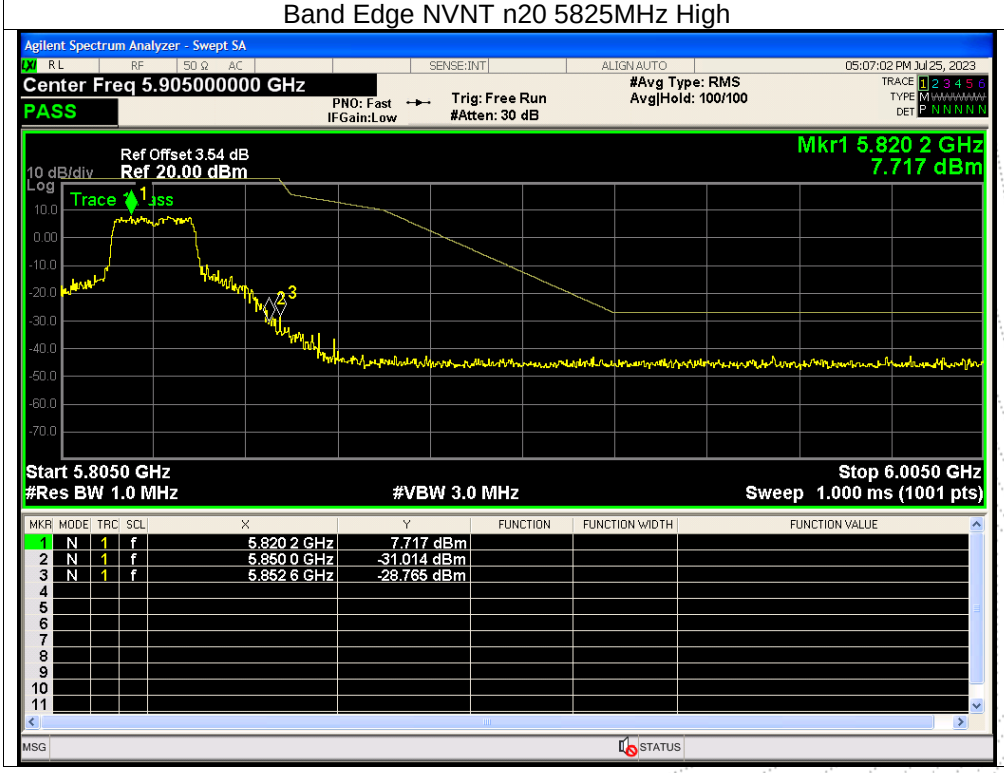
Band Edge NVNT a 5825MHz High



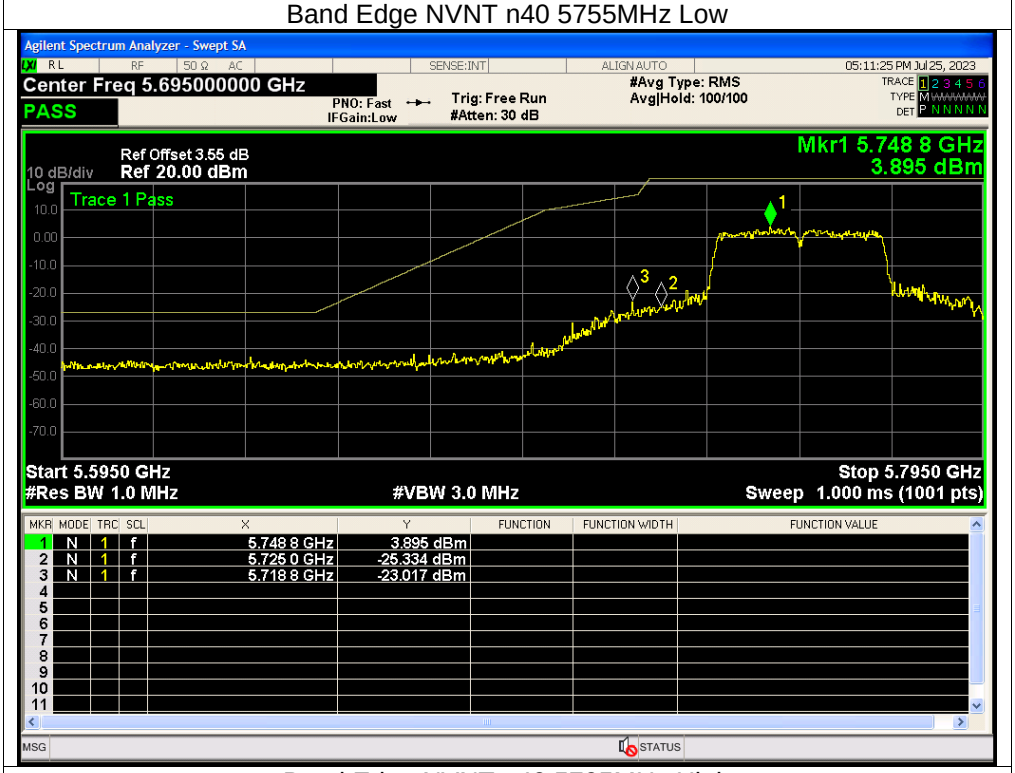
Band Edge NVNT n20 5745MHz Low



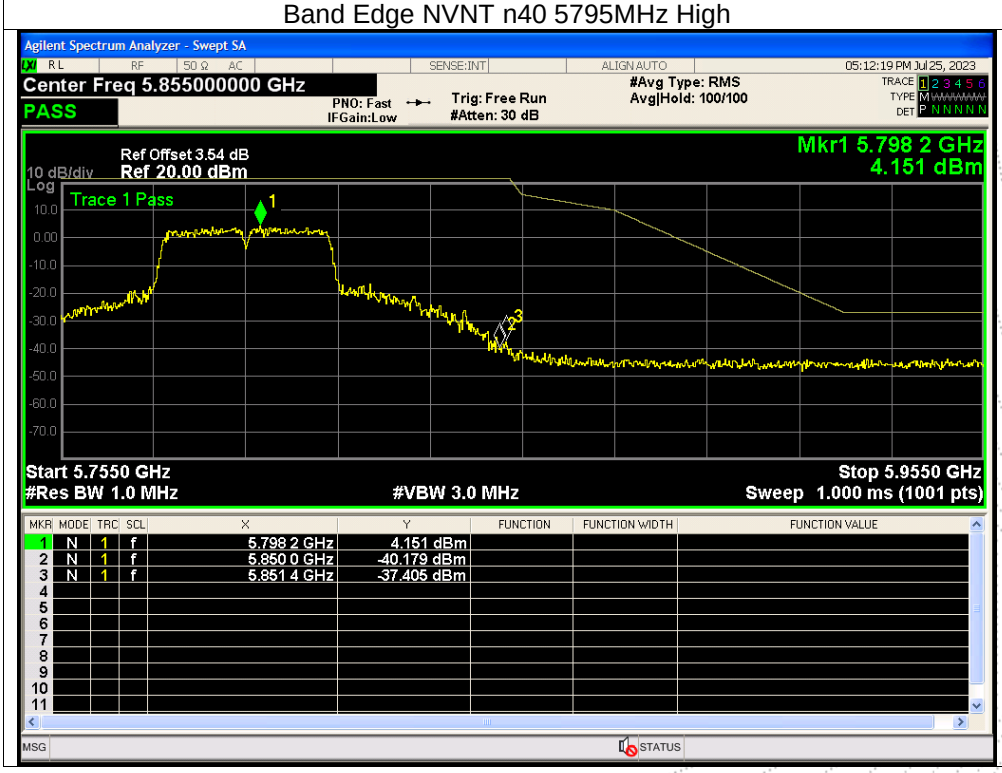
Band Edge NVNT n20 5825MHz High



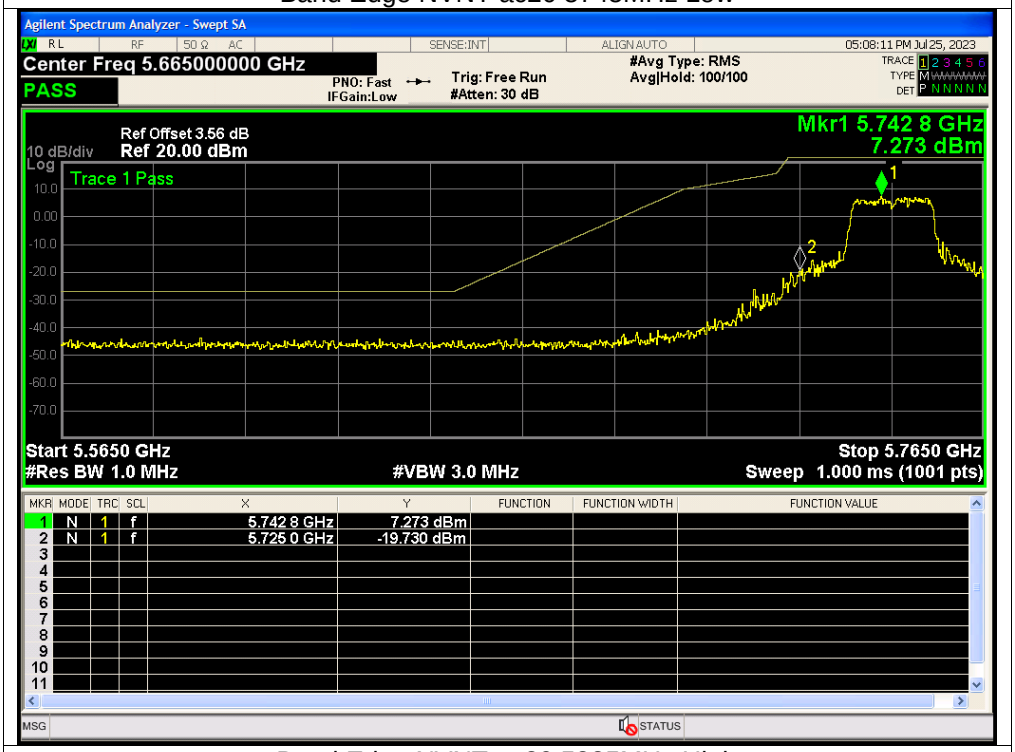
Band Edge NVNT n40 5755MHz Low



Band Edge NVNT n40 5795MHz High

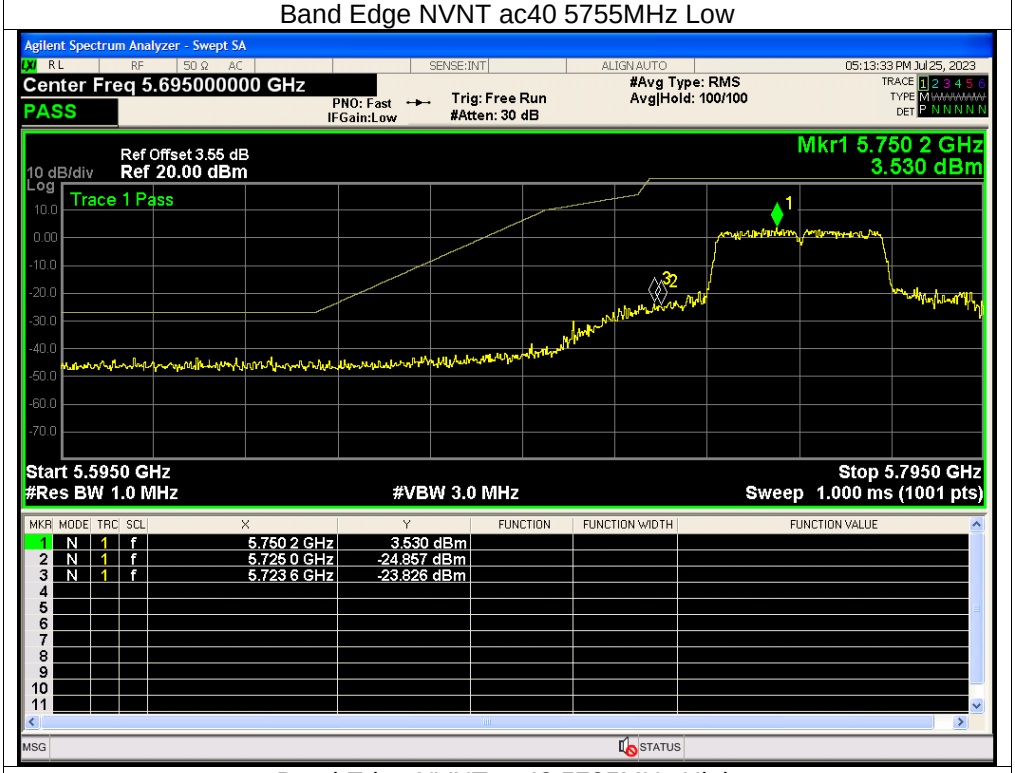


Band Edge NVNT ac20 5745MHz Low

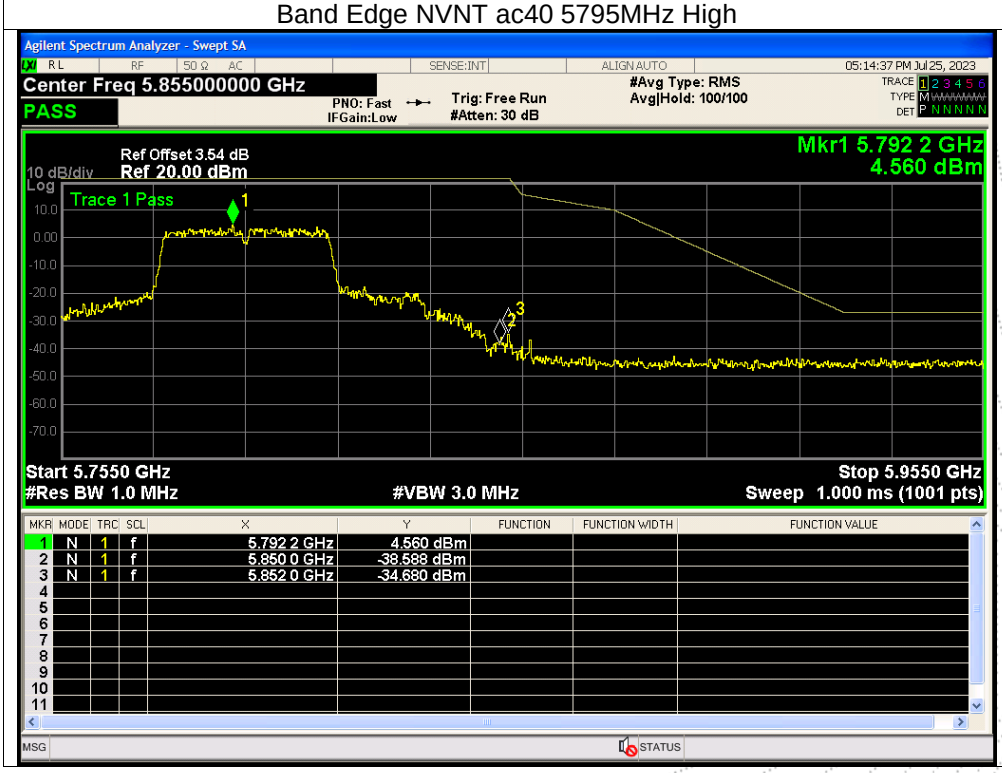


Band Edge NVNT ac20 5825MHz High

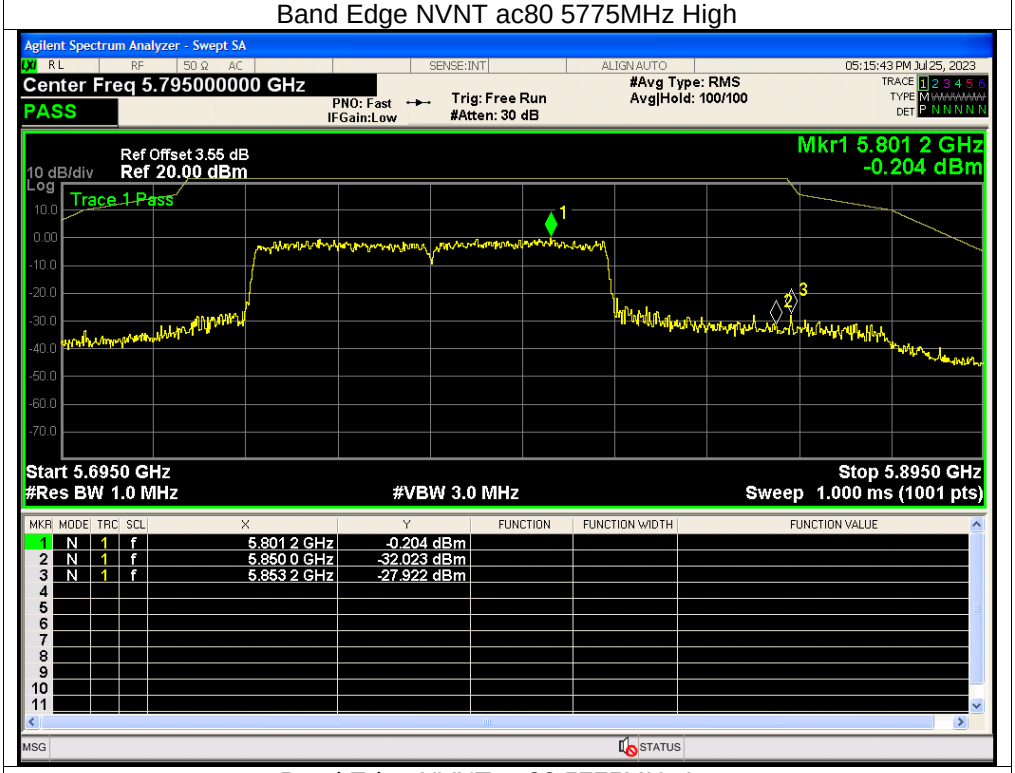
Band Edge NVNT ac40 5755MHz Low



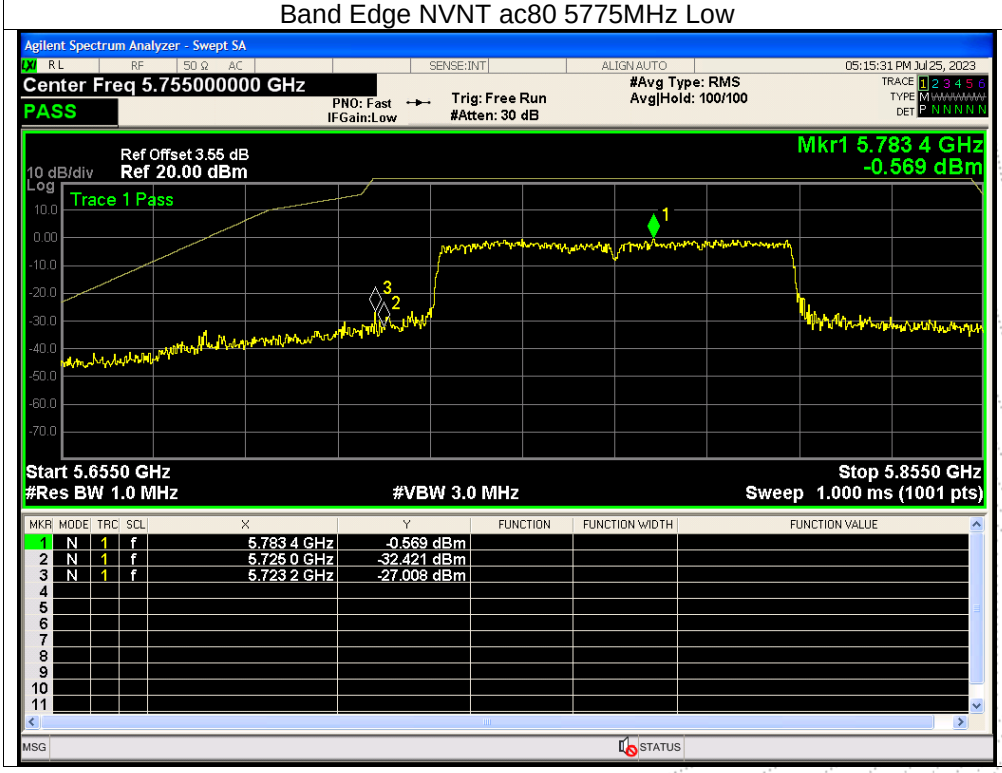
Band Edge NVNT ac40 5795MHz High



Band Edge NVNT ac80 5775MHz High

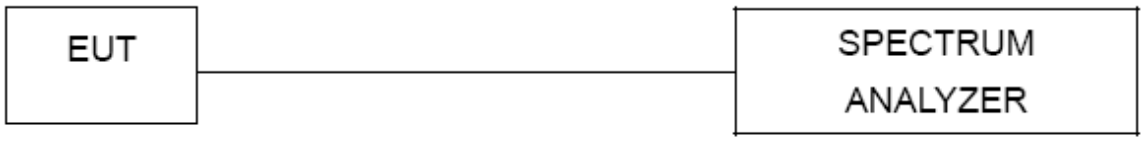


Band Edge NVNT ac80 5775MHz Low



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.

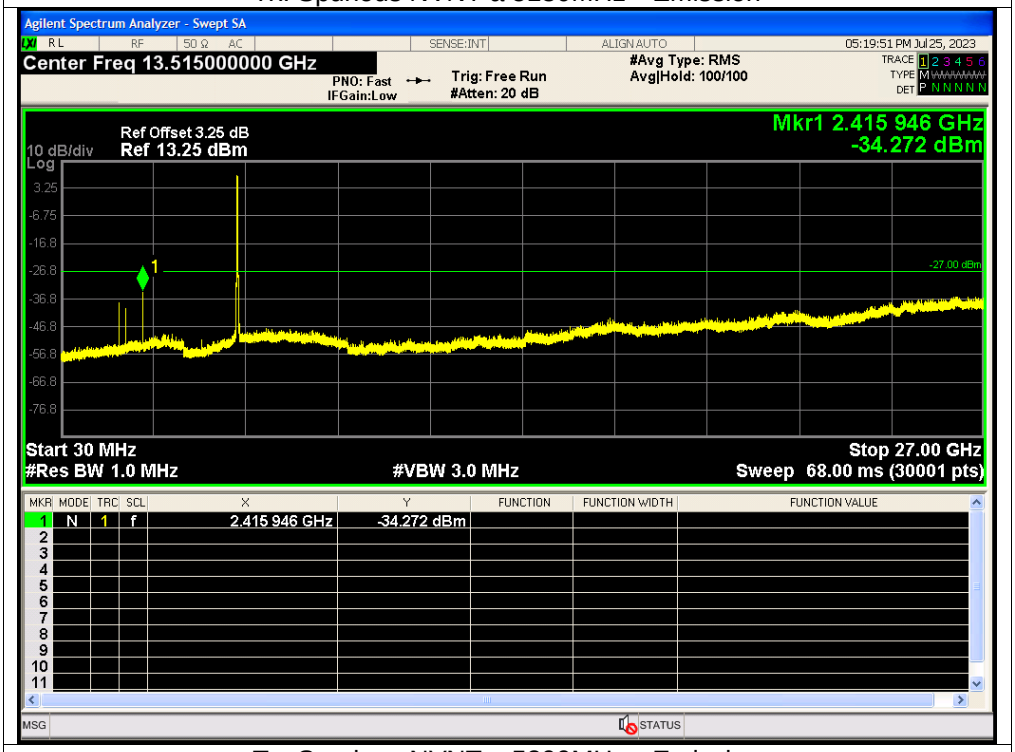
12.4 Test Result

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.

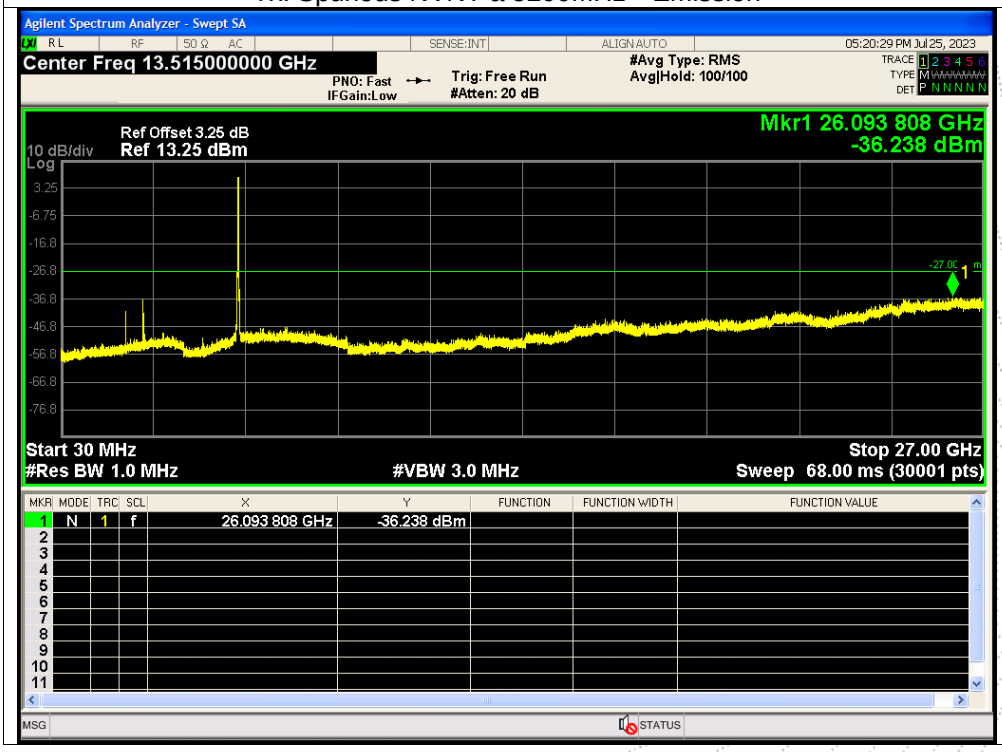
About:26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Test Graphs

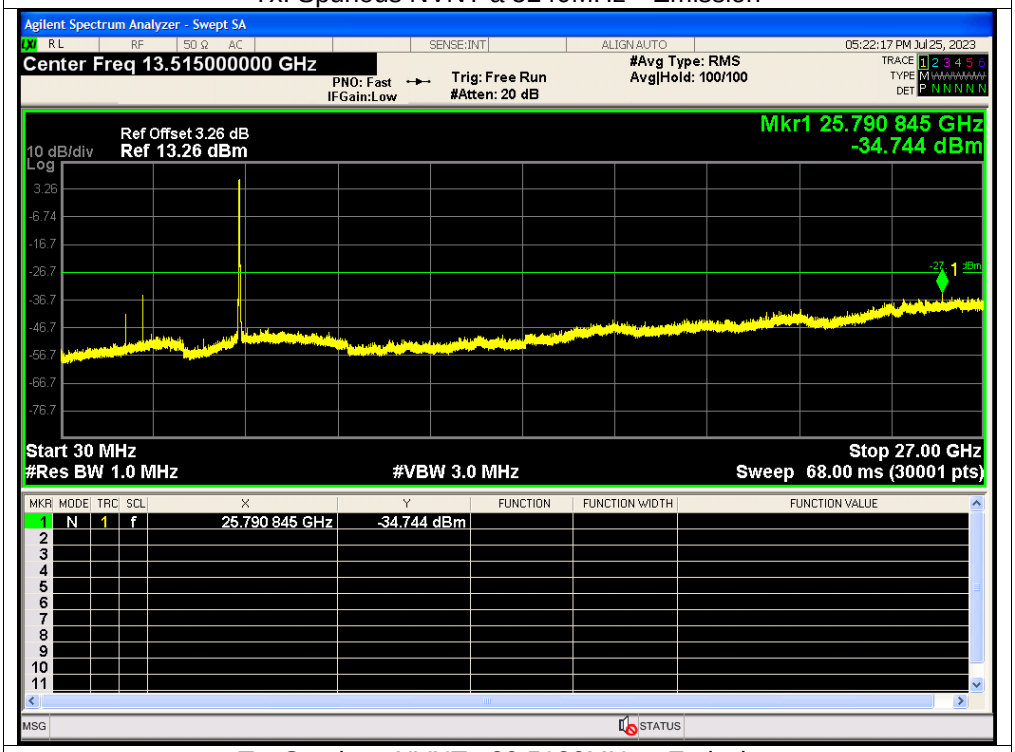
Tx. Spurious NVNT a 5180MHz Emission



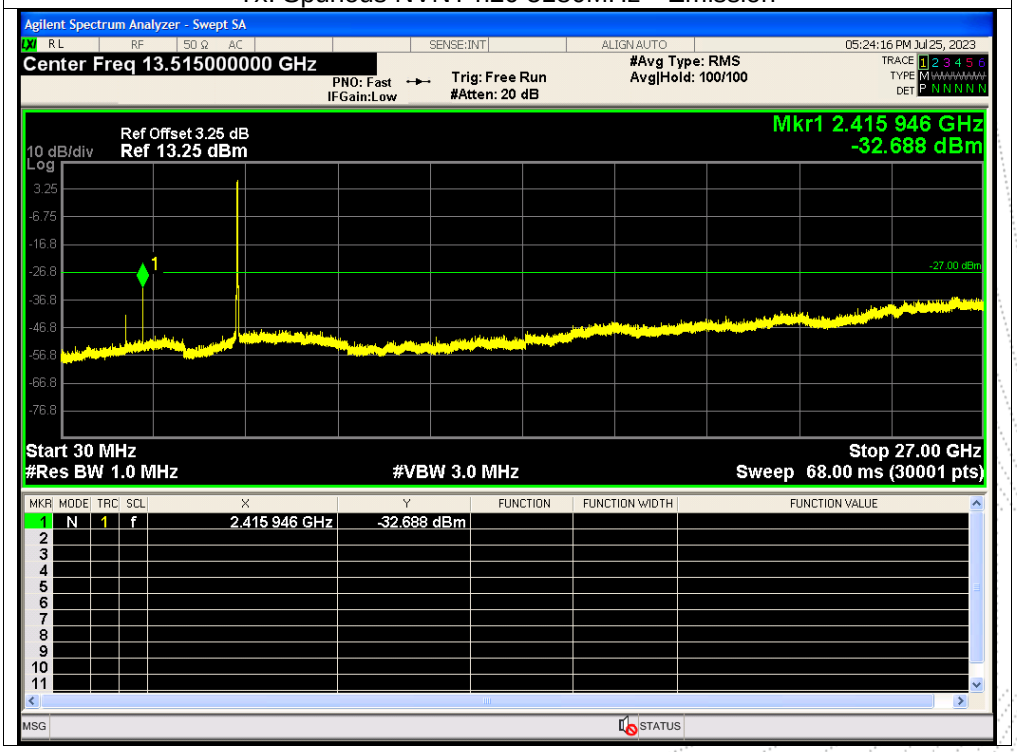
Tx. Spurious NVNT a 5200MHz Emission



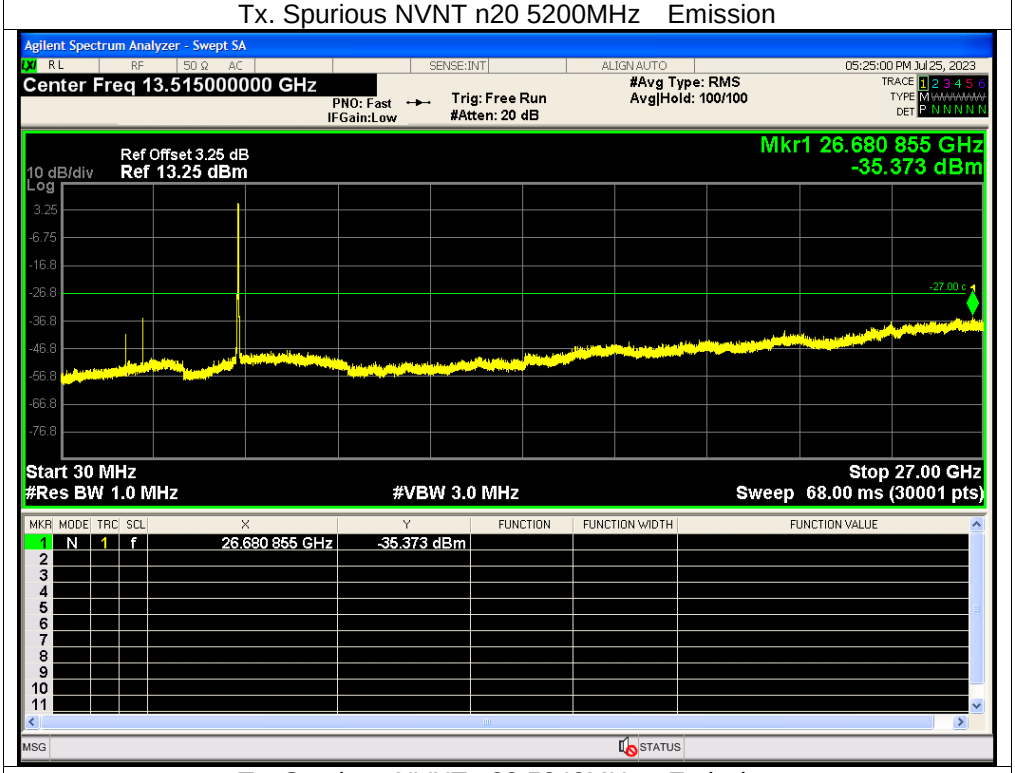
Tx. Spurious NVNT a 5240MHz Emission



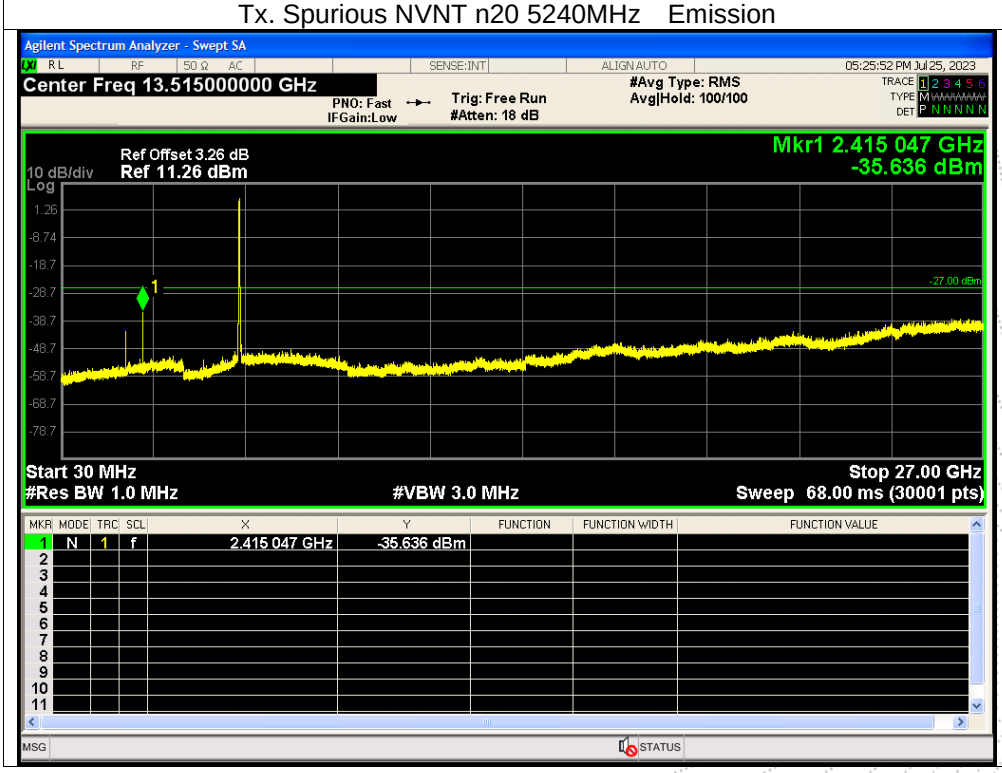
Tx. Spurious NVNT n20 5180MHz Emission



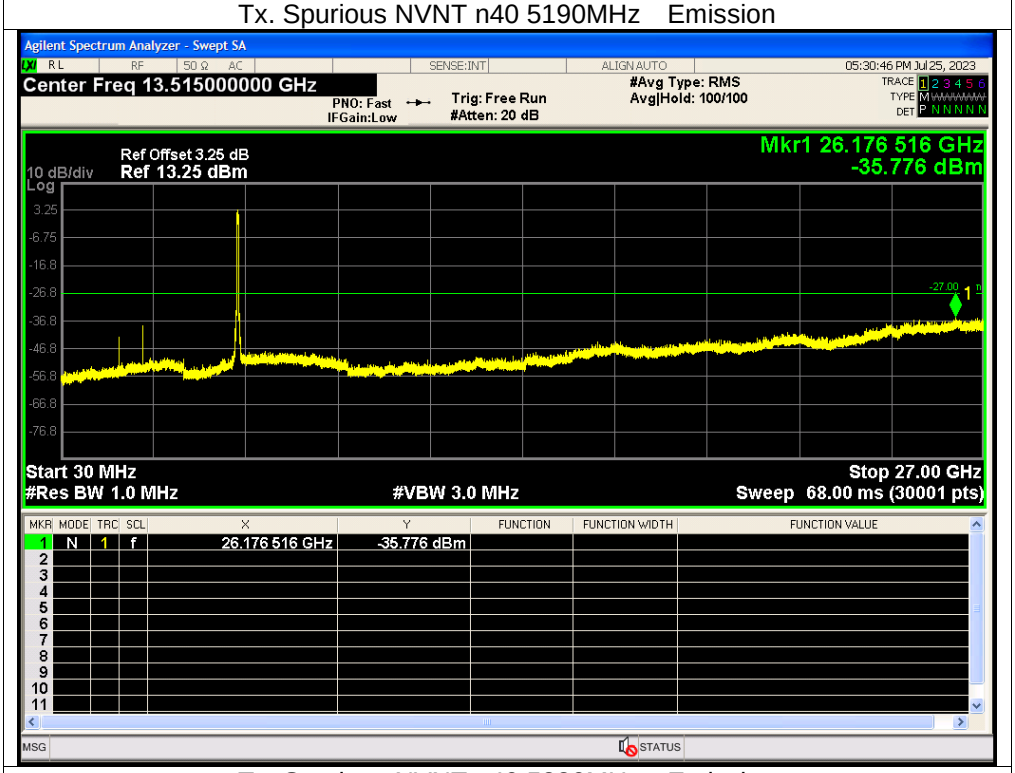
Tx. Spurious NVNT n20 5200MHz Emission



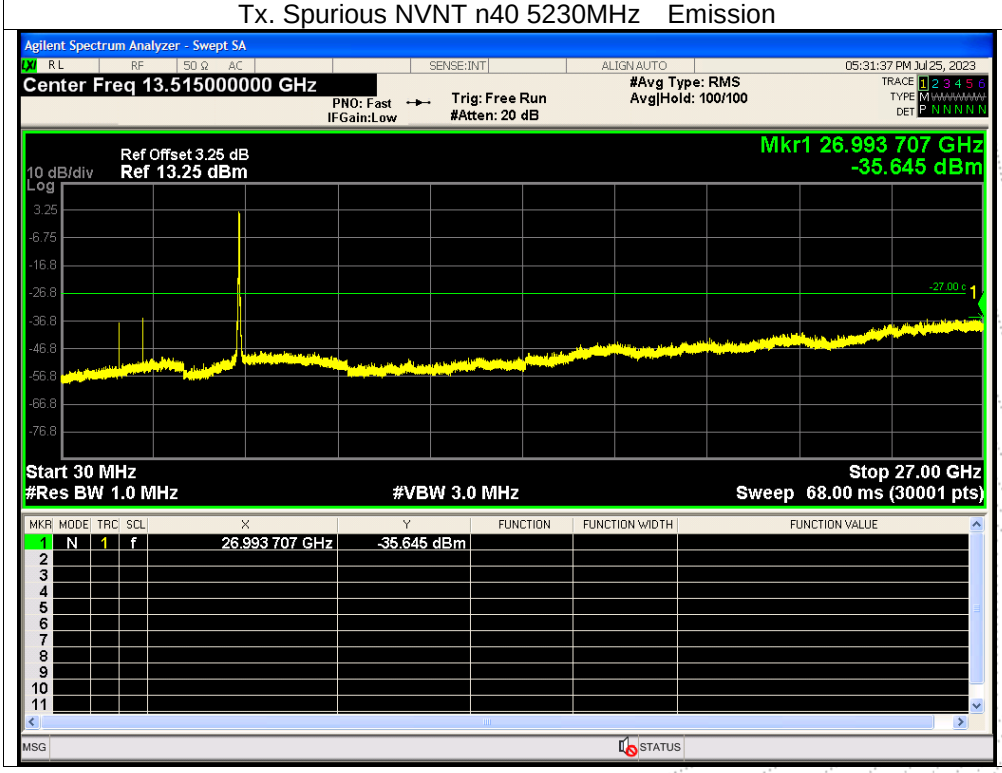
Tx. Spurious NVNT n20 5240MHz Emission



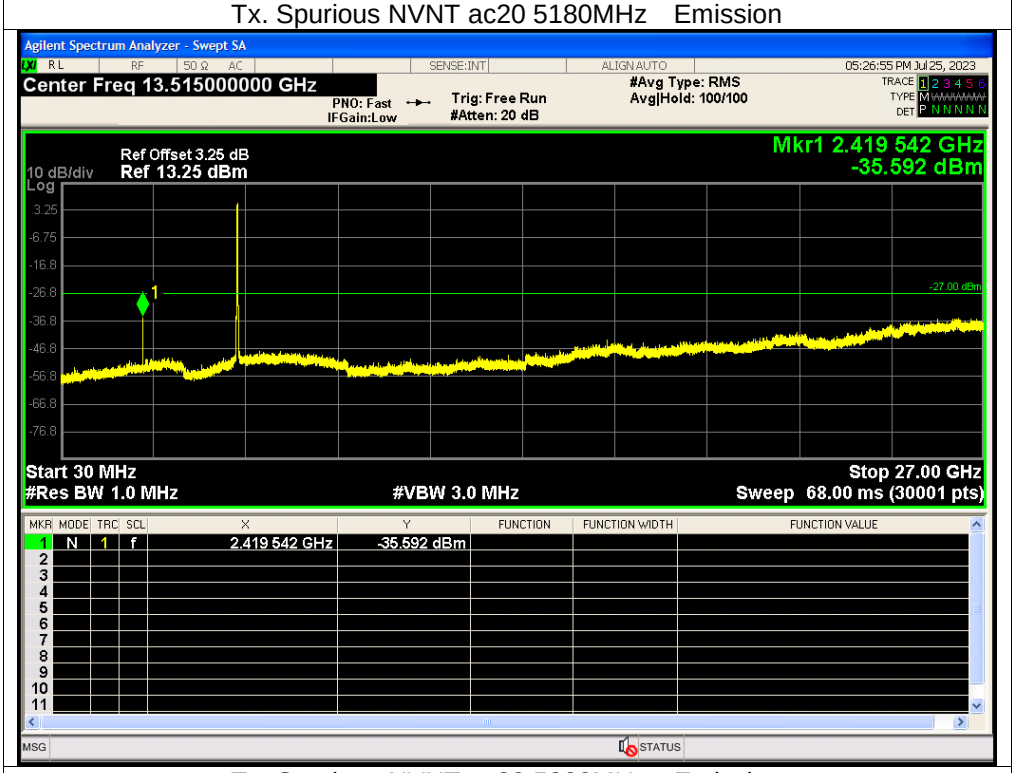
Tx. Spurious NVNT n40 5190MHz Emission



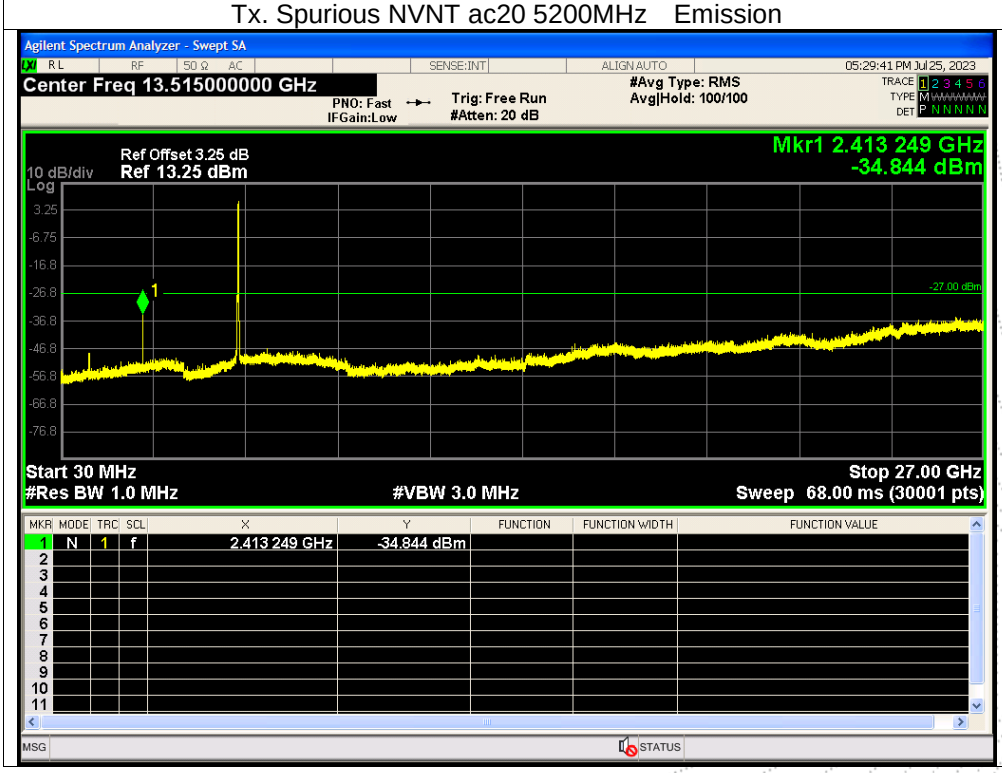
Tx. Spurious NVNT n40 5230MHz Emission



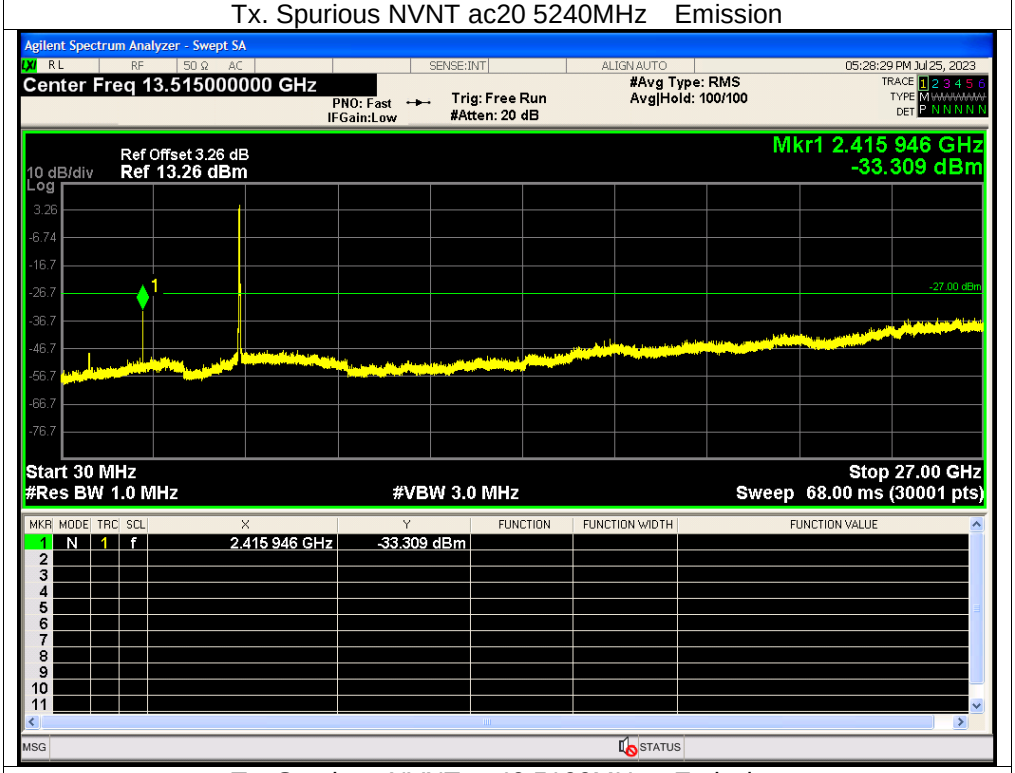
Tx. Spurious NVNT ac20 5180MHz Emission



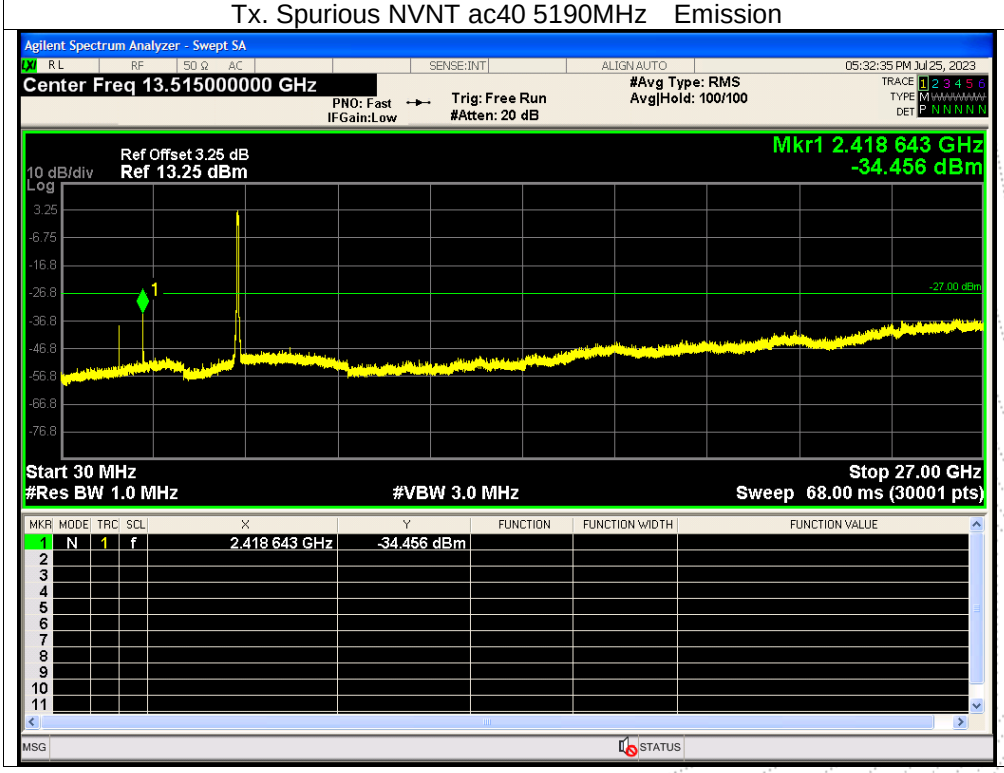
Tx. Spurious NVNT ac20 5200MHz Emission



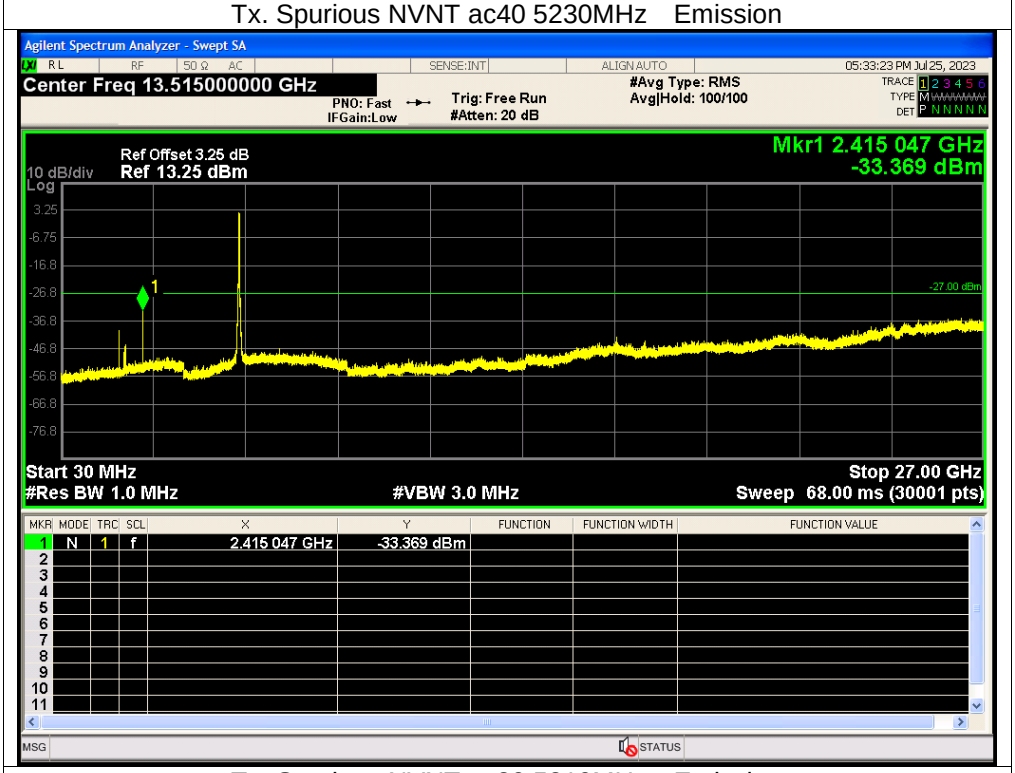
Tx. Spurious NVNT ac20 5240MHz Emission



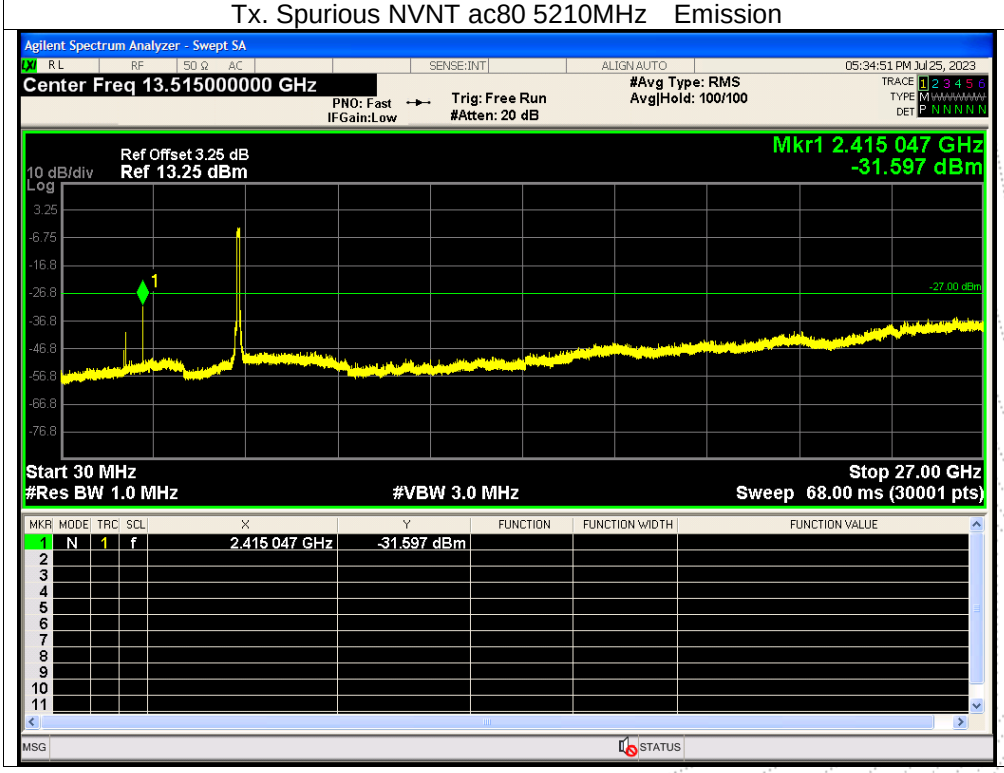
Tx. Spurious NVNT ac40 5190MHz Emission



Tx. Spurious NVNT ac40 5230MHz Emission

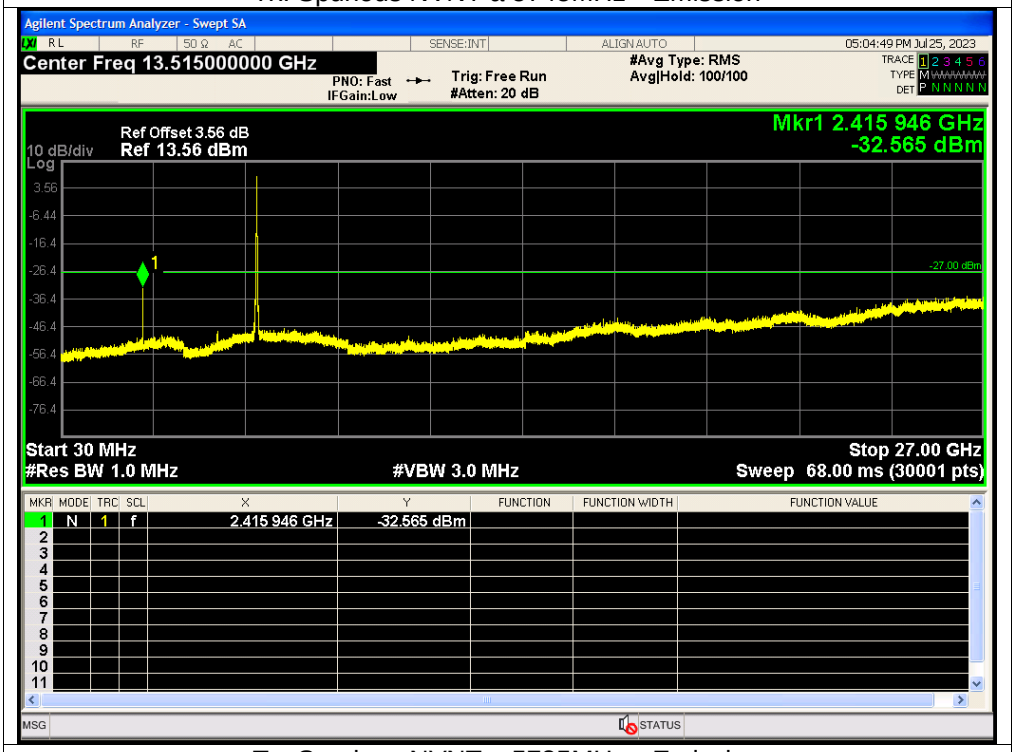


Tx. Spurious NVNT ac80 5210MHz Emission

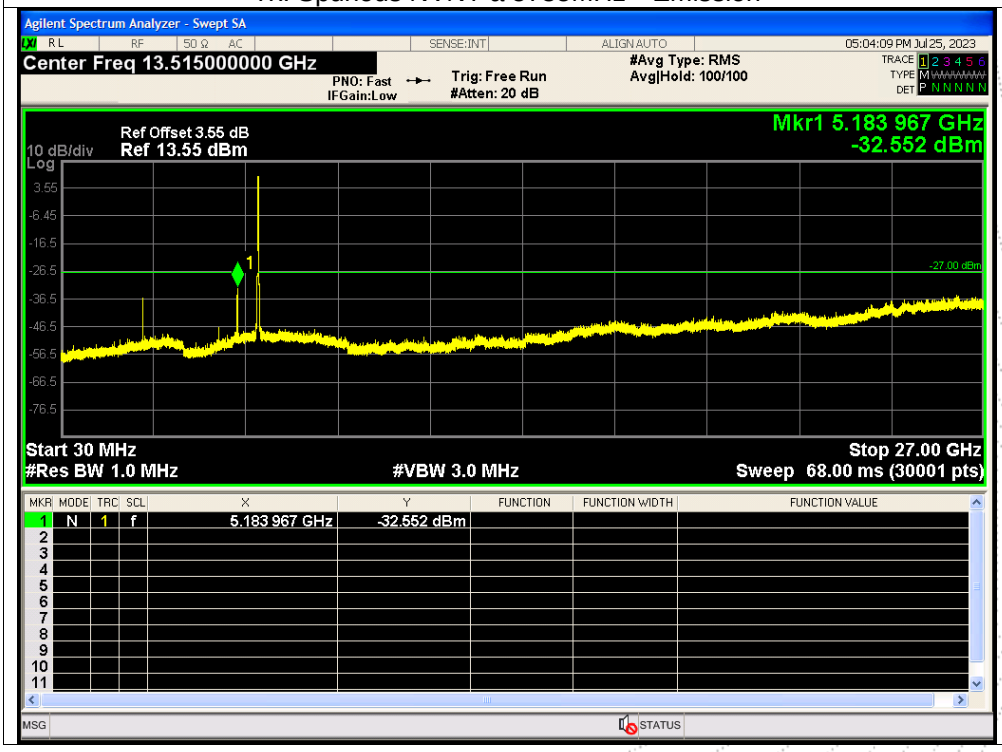


Test Graphs

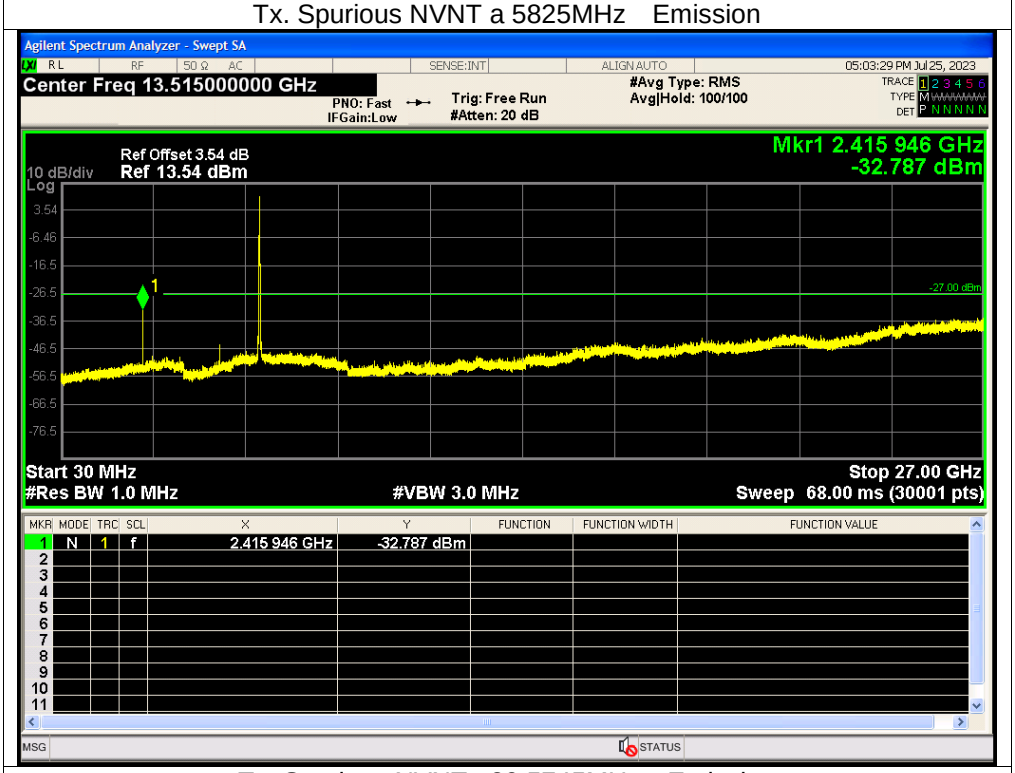
Tx. Spurious NVNT a 5745MHz Emission



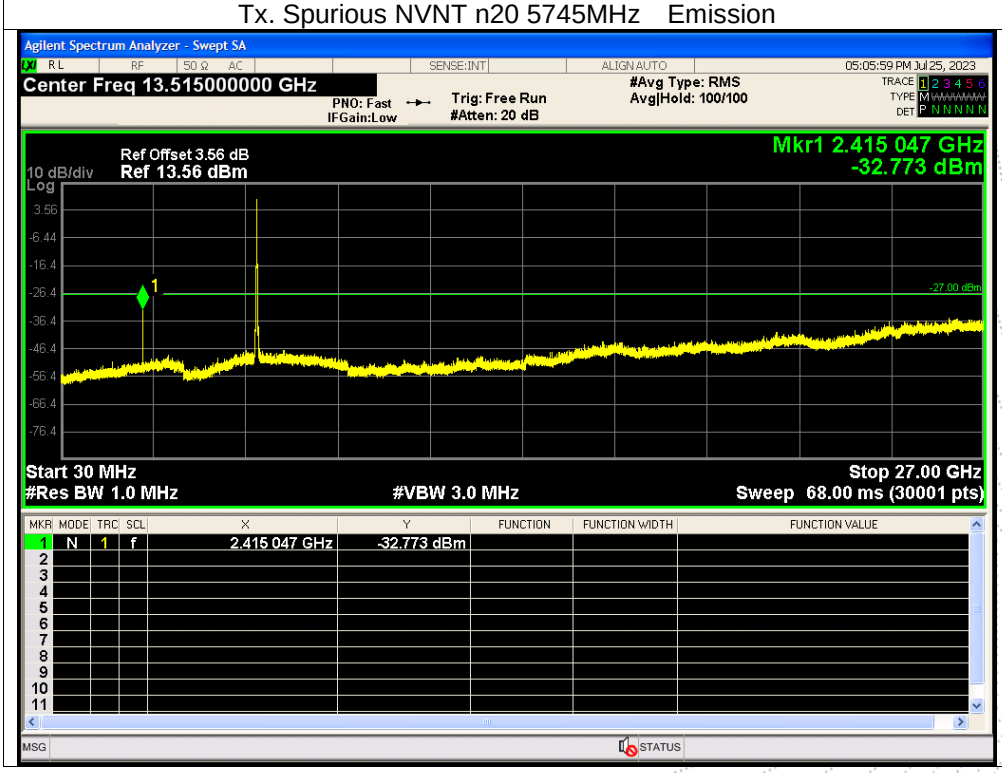
Tx. Spurious NVNT a 5785MHz Emission



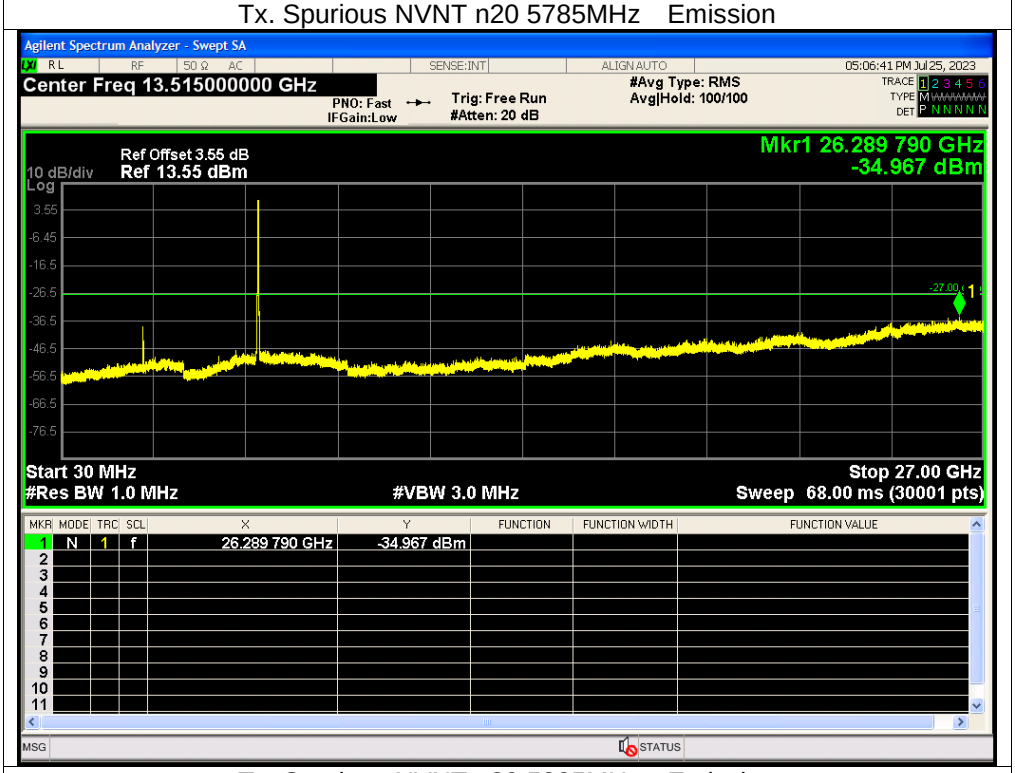
Tx. Spurious NVNT a 5825MHz Emission



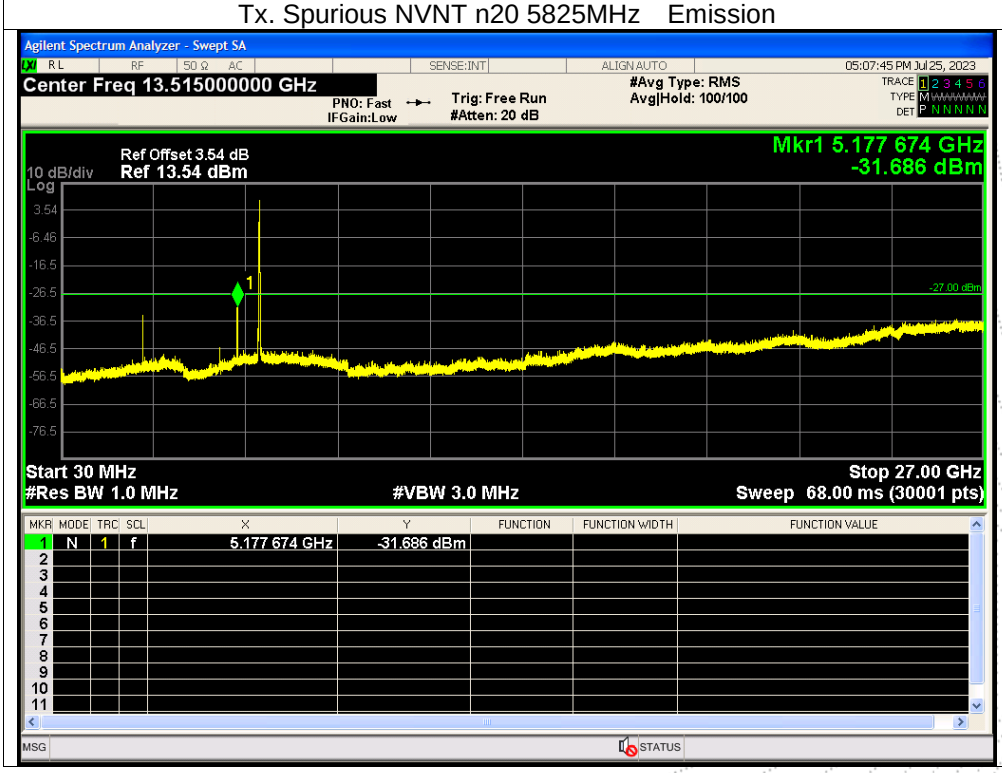
Tx. Spurious NVNT n20 5745MHz Emission



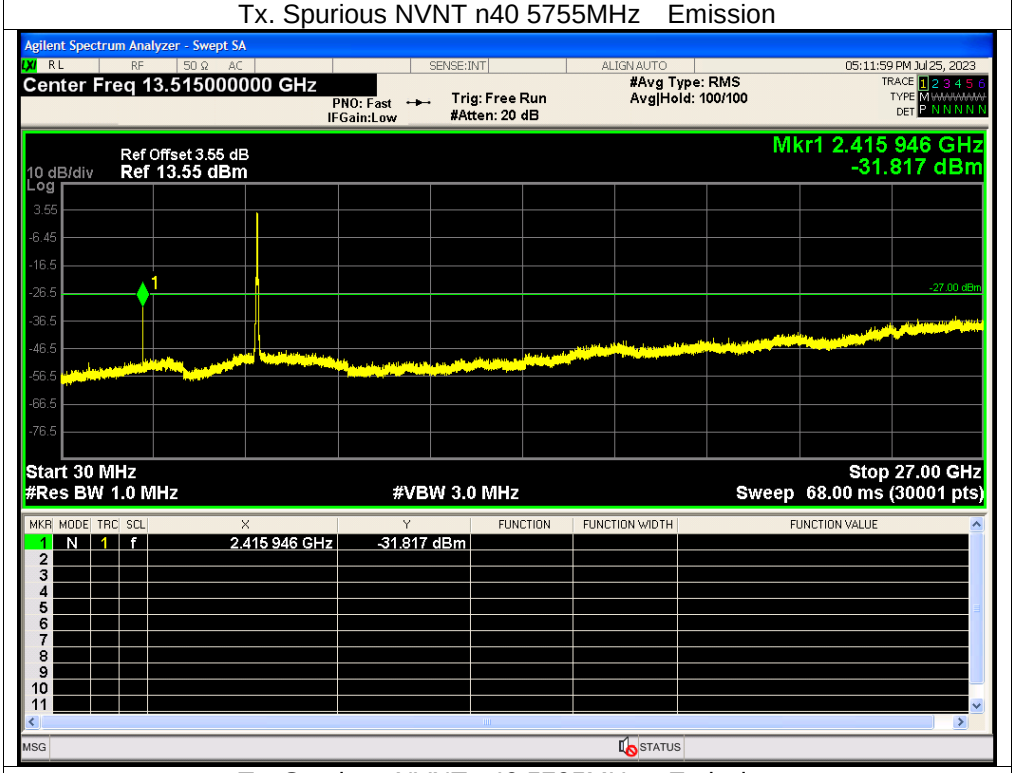
Tx. Spurious NVNT n20 5785MHz Emission



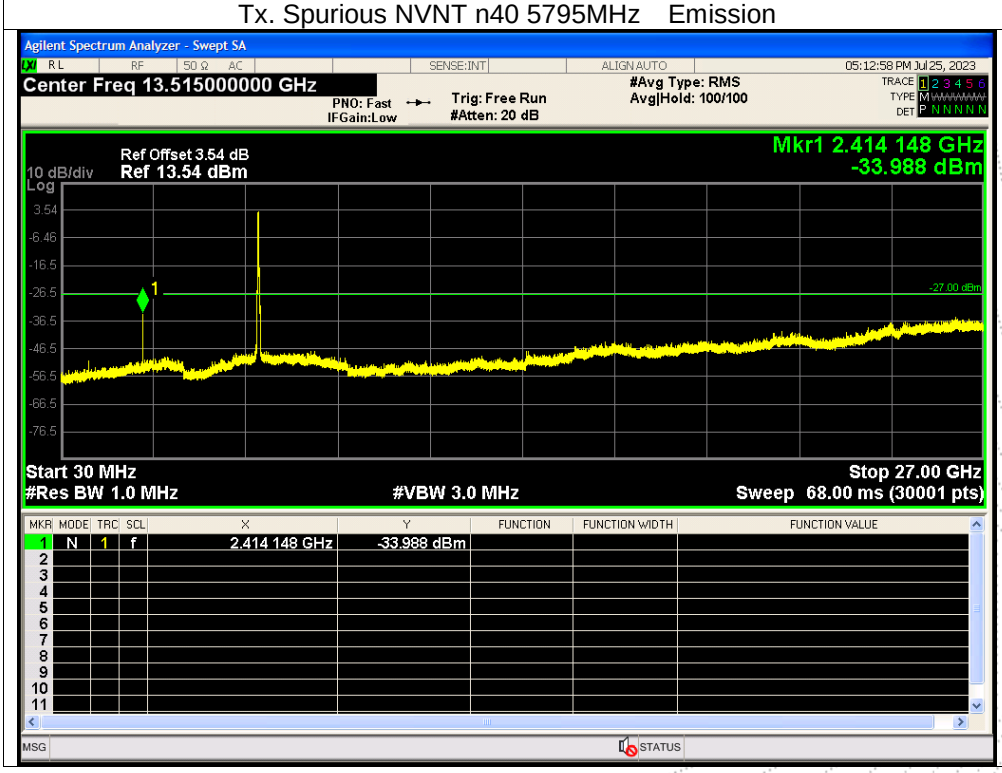
Tx. Spurious NVNT n20 5825MHz Emission



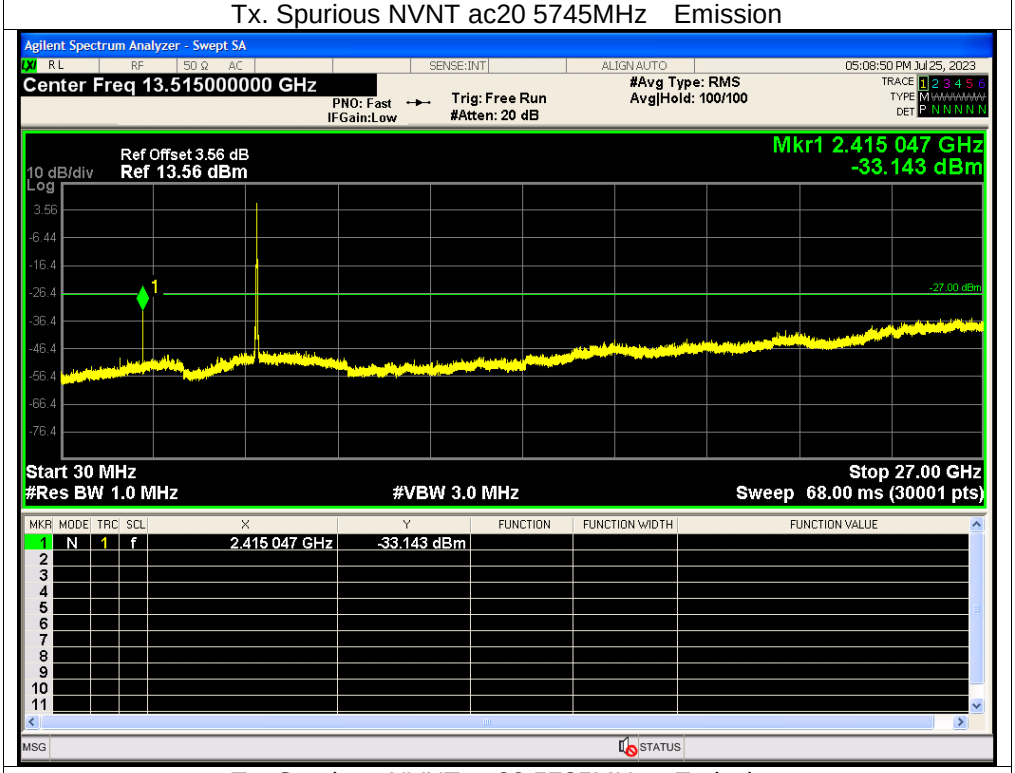
Tx. Spurious NVNT n40 5755MHz Emission



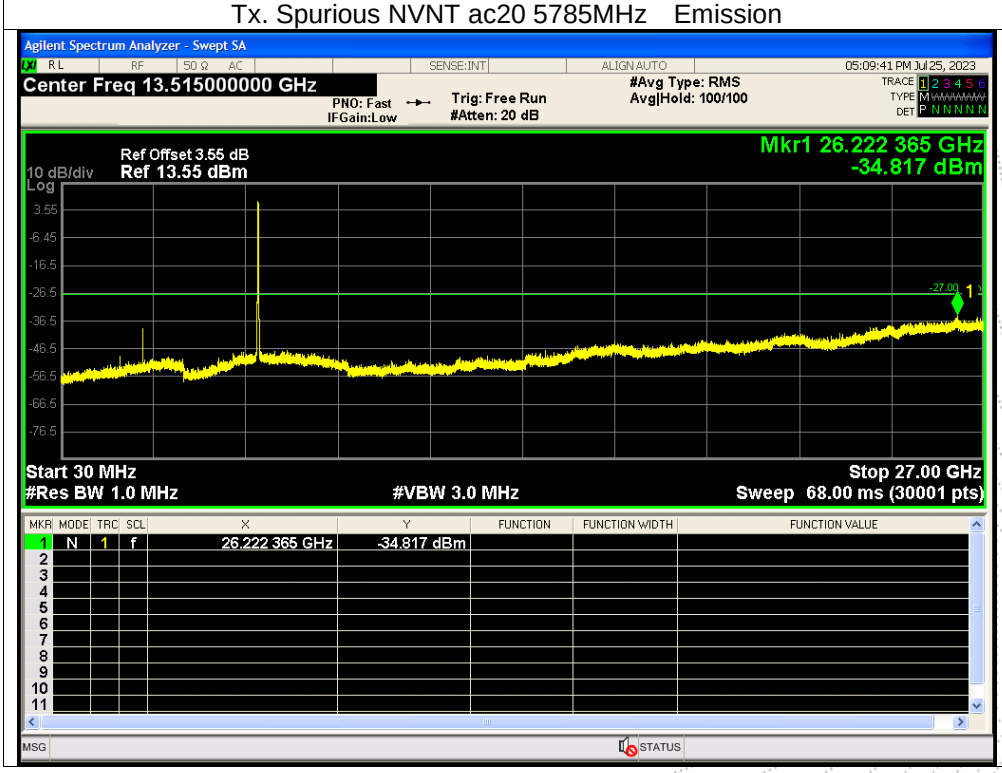
Tx. Spurious NVNT n40 5795MHz Emission



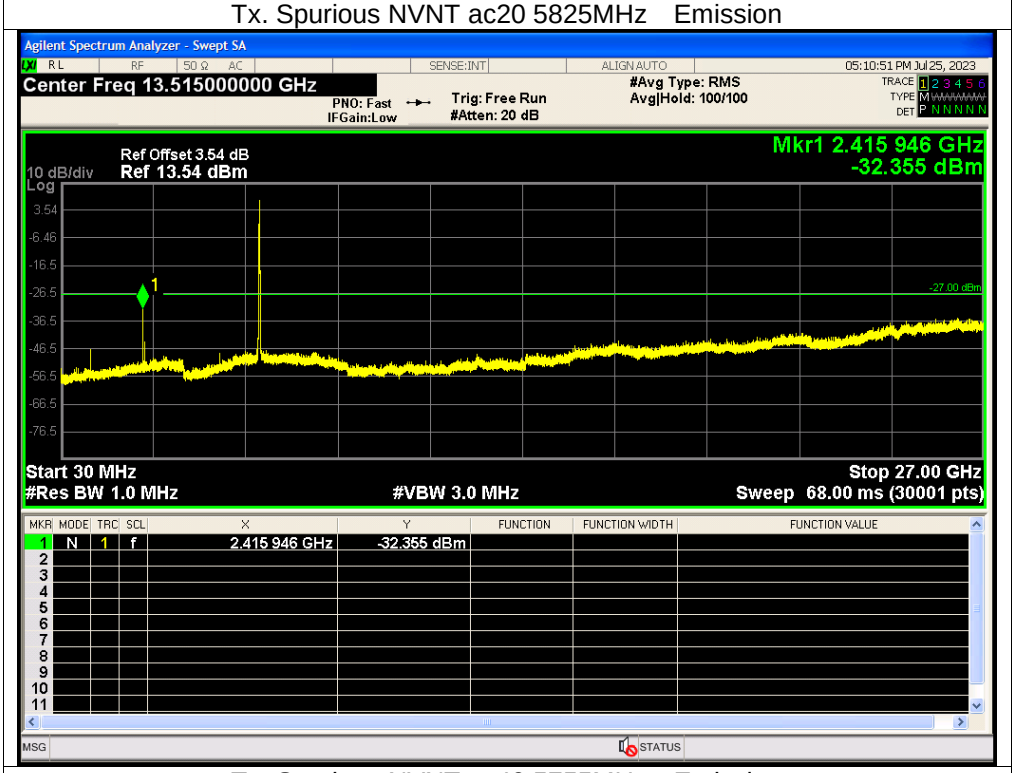
Tx. Spurious NVNT ac20 5745MHz Emission



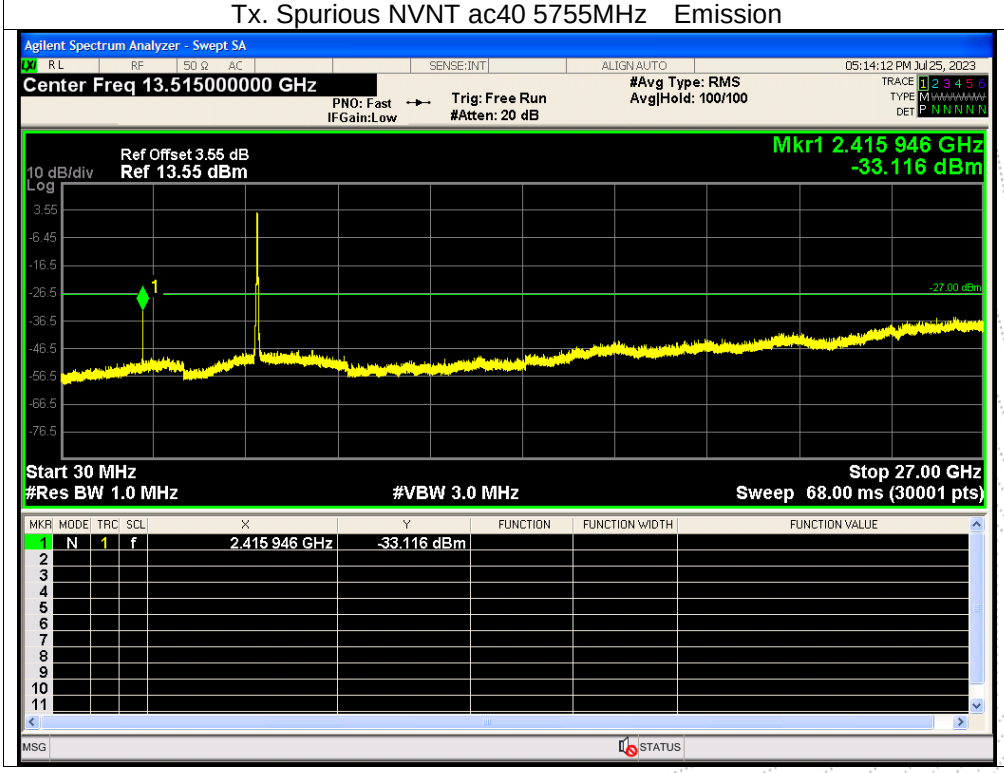
Tx. Spurious NVNT ac20 5785MHz Emission



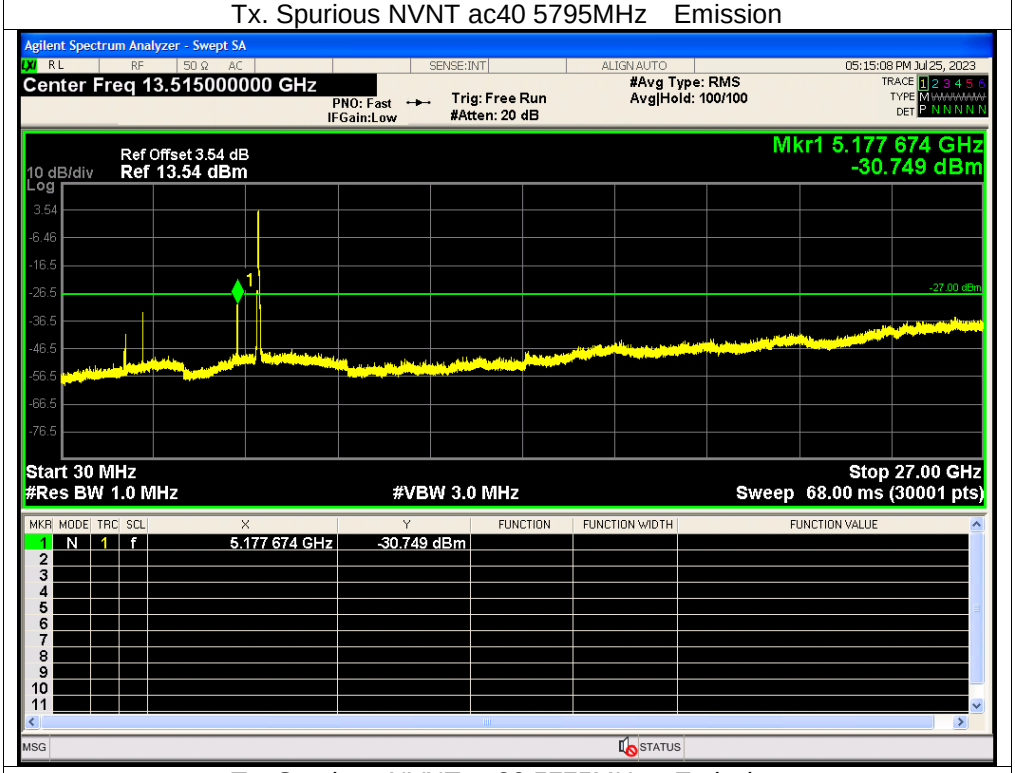
Tx. Spurious NVNT ac20 5825MHz Emission



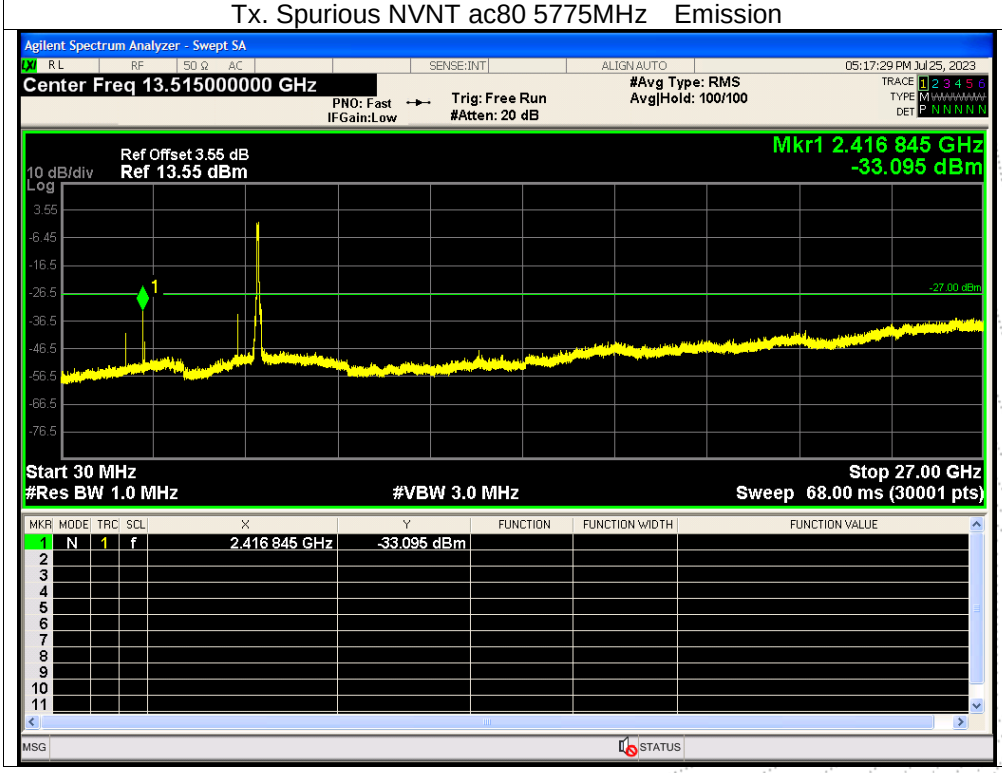
Tx. Spurious NVNT ac40 5755MHz Emission



Tx. Spurious NVNT ac40 5795MHz Emission

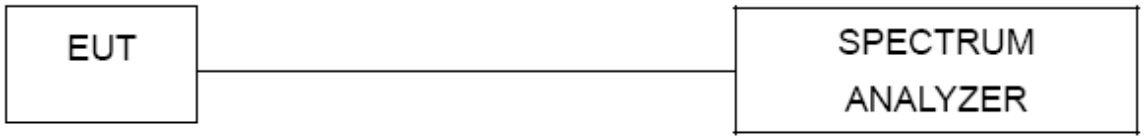


Tx. Spurious NVNT ac80 5775MHz Emission



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%
Pressure：	101kPa	Test Voltage ：	DC 5V
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)	5.00	5180.0171	5180	0.0171	3.3009
		V max (V)	5.75	5180.0098	5180	0.0098	1.8965
		V min (V)	4.25	5180.0191	5180	0.0191	3.6815
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)	5	T (°C)	-20	5180.0019	5180	0.0019	0.3646
		T (°C)	-10	5180.0007	5180	0.0007	0.1318
		T (°C)	0	5180.0026	5180	0.0026	0.5035
		T (°C)	10	5180.0074	5180	0.0074	1.4317
		T (°C)	20	5180.0128	5180	0.0128	2.4640
		T (°C)	30	5180.0066	5180	0.0066	1.2742
		T (°C)	40	5180.0046	5180	0.0046	0.8797
		T (°C)	50	5180.0083	5180	0.0083	1.6113
		T (°C)	60	5180.0122	5180	0.0122	2.3466
		T (°C)	70	5180.0067	5180	0.0067	1.2910
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)	5.00	5200.0043	5200	0.0043	0.8257
		V max (V)	5.75	5200.0084	5200	0.0084	1.6092
		V min (V)	4.25	5200.0013	5200	0.0013	0.2594
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)	5	T (°C)	-20	5200.01246	5200	0.01246	2.3965
		T (°C)	-10	5200.00414	5200	0.00414	0.7969
		T (°C)	0	5200.00542	5200	0.00542	1.0417
		T (°C)	10	5200.00448	5200	0.00448	0.8615
		T (°C)	20	5200.00428	5200	0.00428	0.8234
		T (°C)	30	5200.00711	5200	0.00711	1.3668
		T (°C)	40	5200.01001	5200	0.01001	1.9245
		T (°C)	50	5200.01297	5200	0.01297	2.4940
		T (°C)	60	5200.01191	5200	0.01191	2.2902
		T (°C)	70	5200.00240	5200	0.00240	0.4623
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)	5.00	5240.0114	5240	0.0114	2.1768
		V max (V)	5.75	5240.0128	5240	0.0128	2.4342
		V min (V)	4.25	5240.0073	5240	0.0073	1.3912
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)	5	T (°C)	-20	5240.0025	5240	0.0025	0.4833
		T (°C)	-10	5240.0095	5240	0.0095	1.8095
		T (°C)	0	5240.0056	5240	0.0056	1.0654
		T (°C)	10	5240.0042	5240	0.0042	0.8030
		T (°C)	20	5240.0025	5240	0.0025	0.4677
		T (°C)	30	5240.0072	5240	0.0072	1.3669
		T (°C)	40	5240.0092	5240	0.0092	1.7578
		T (°C)	50	5240.0115	5240	0.0115	2.1871
		T (°C)	60	5240.0029	5240	0.0029	0.5461
		T (°C)	70	5240.0002	5240	0.0002	0.0332
Limits				5150-5250 MHz			
Result				Complies			

Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 5V
Hzst Mode ：	TX Frequency(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)	5.00	5745.00917	5745	0.00917	1.5968
		V max (V)	5.75	5745.00759	5745	0.00759	1.3215
		V min (V)	4.25	5745.00438	5745	0.00438	0.7629
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)	5	T (°C)	-20	5745.01193	5745	0.01193	2.0761
		T (°C)	-10	5745.01042	5745	0.01042	1.8145
		T (°C)	0	5745.00352	5745	0.00352	0.6122
		T (°C)	10	5745.00767	5745	0.00767	1.3347
		T (°C)	20	5745.01160	5745	0.01160	2.0184
		T (°C)	30	5745.00843	5745	0.00843	1.4671
		T (°C)	40	5745.00073	5745	0.00073	0.1276
		T (°C)	50	5745.00211	5745	0.00211	0.3669
		T (°C)	60	5745.00851	5745	0.00851	1.4817
		T (°C)	70	5745.00971	5745	0.00971	1.6895
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)	5.00	5785.01018	5785	0.01018	1.7589
		V max (V)	5.75	5785.01028	5785	0.01028	1.7770
		V min (V)	4.25	5785.00679	5785	0.00679	1.1730
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)	5	T (°C)	-20	5785.00654	5785	0.00654	1.1306
		T (°C)	-10	5785.01241	5785	0.01241	2.1453
		T (°C)	0	5785.00705	5785	0.00705	1.2182
		T (°C)	10	5785.00549	5785	0.00549	0.9485
		T (°C)	20	5785.00522	5785	0.00522	0.9016
		T (°C)	30	5785.00273	5785	0.00273	0.4719
		T (°C)	40	5785.01270	5785	0.01270	2.1949
		T (°C)	50	5785.00604	5785	0.00604	1.0444
		T (°C)	60	5785.01331	5785	0.01331	2.3000
		T (°C)	70	5785.01046	5785	0.01046	1.8085
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)	5.00	5825.00616	5825	0.00616	1.0581
		V max (V)	5.75	5825.01056	5825	0.01056	1.8125
		V min (V)	4.25	5825.01262	5825	0.01262	2.1664
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)	5	T (°C)	-20	5825.00352	5825	0.00352	0.6045
		T (°C)	-10	5825.00216	5825	0.00216	0.3716
		T (°C)	0	5825.00367	5825	0.00367	0.6309
		T (°C)	10	5825.00381	5825	0.00381	0.6544
		T (°C)	20	5825.00753	5825	0.00753	1.2922
		T (°C)	30	5825.00343	5825	0.00343	0.5887
		T (°C)	40	5825.01245	5825	0.01245	2.1377
		T (°C)	50	5825.00791	5825	0.00791	1.3572
		T (°C)	60	5825.01241	5825	0.01241	2.1302
		T (°C)	70	5825.00210	5825	0.00210	0.3613
Limits				5725-5850 MHz			
Result				Complies			

14. Antenna Requirement

14.1 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.

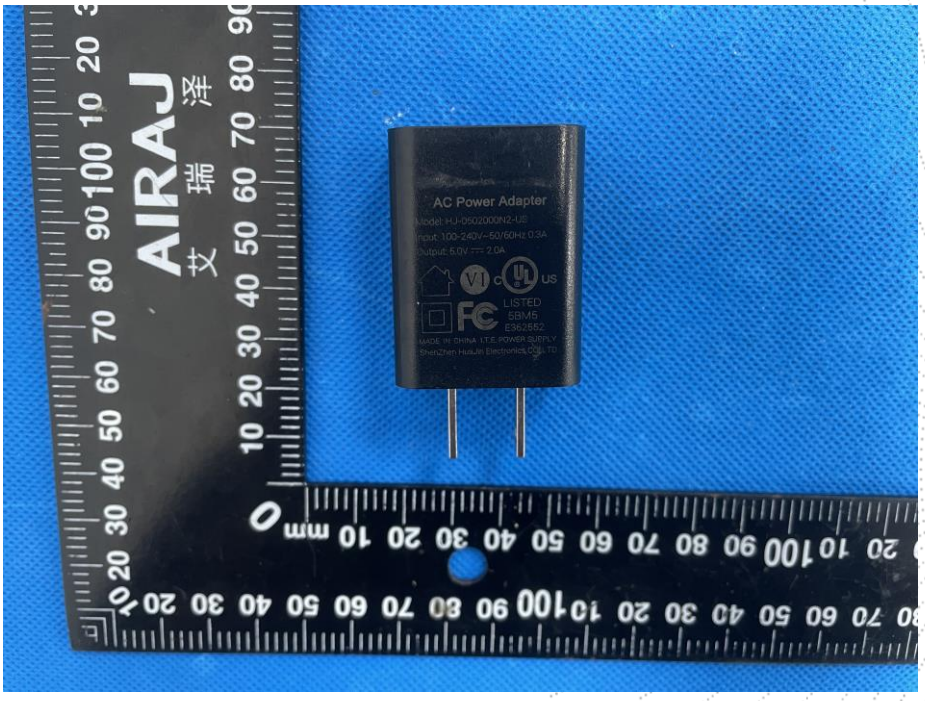
14.2 Test Result

The EUT antenna is Internal antenna (antenna gain: 0.05 dBi). It comply with the standard requirement.

15. EUT Photographs

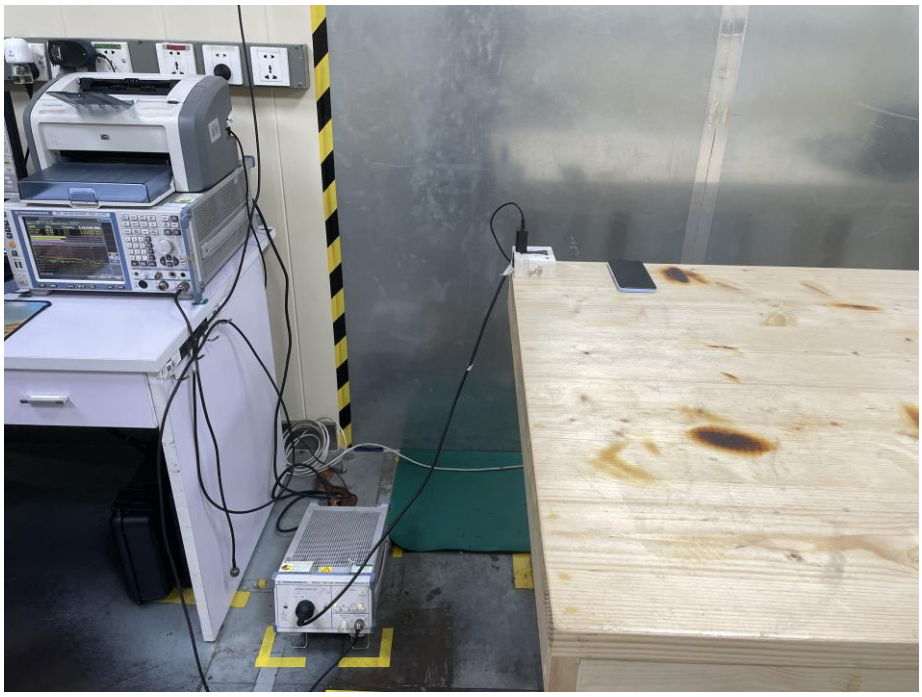
EUT Photo 1

EUT Photo 2

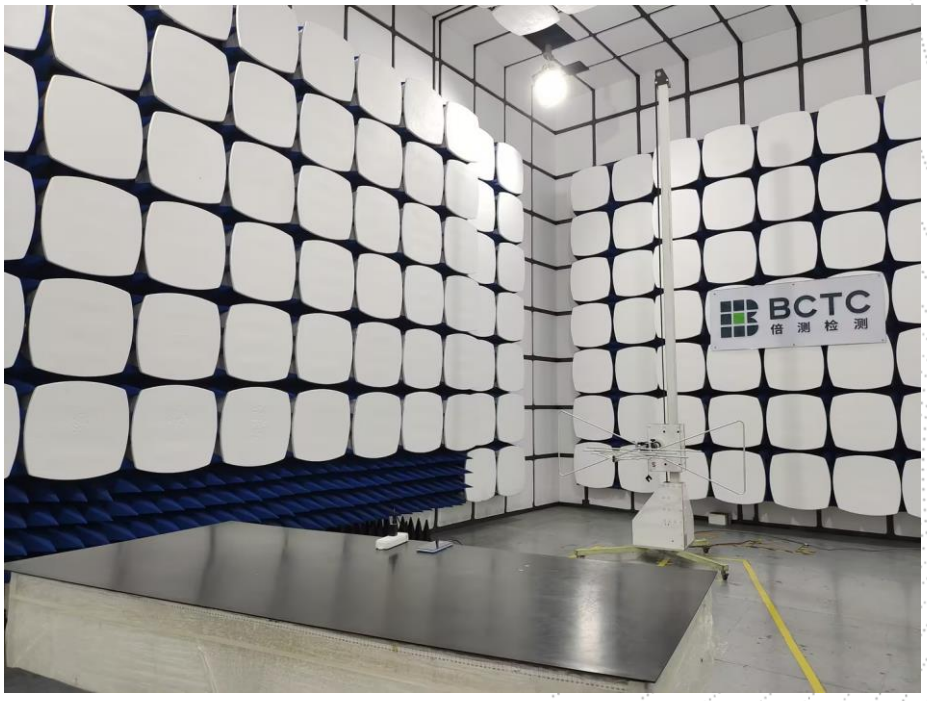


16. EUT Test Setup Photographs

Conducted Measurement Photo



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** ※※※※※