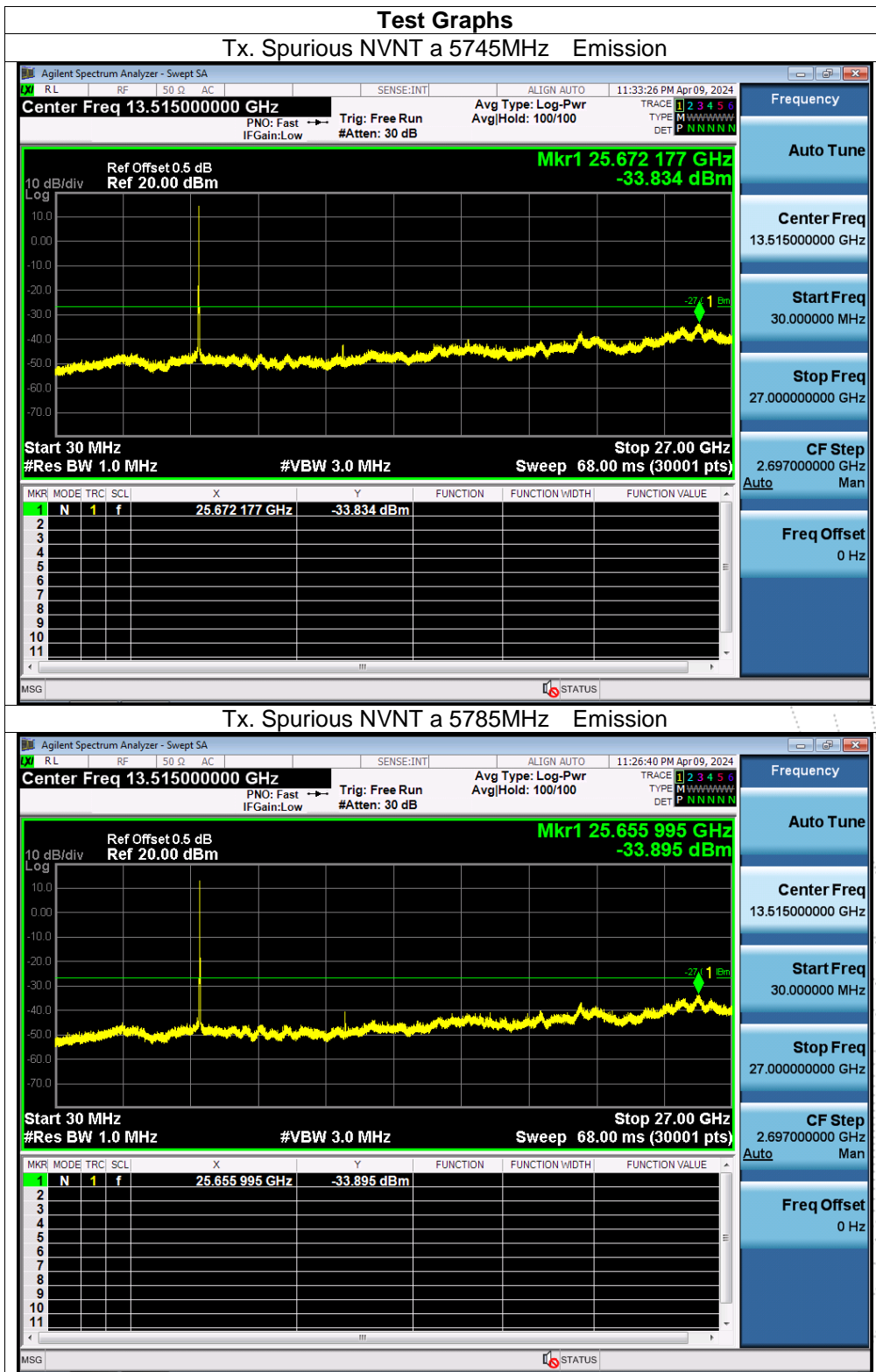
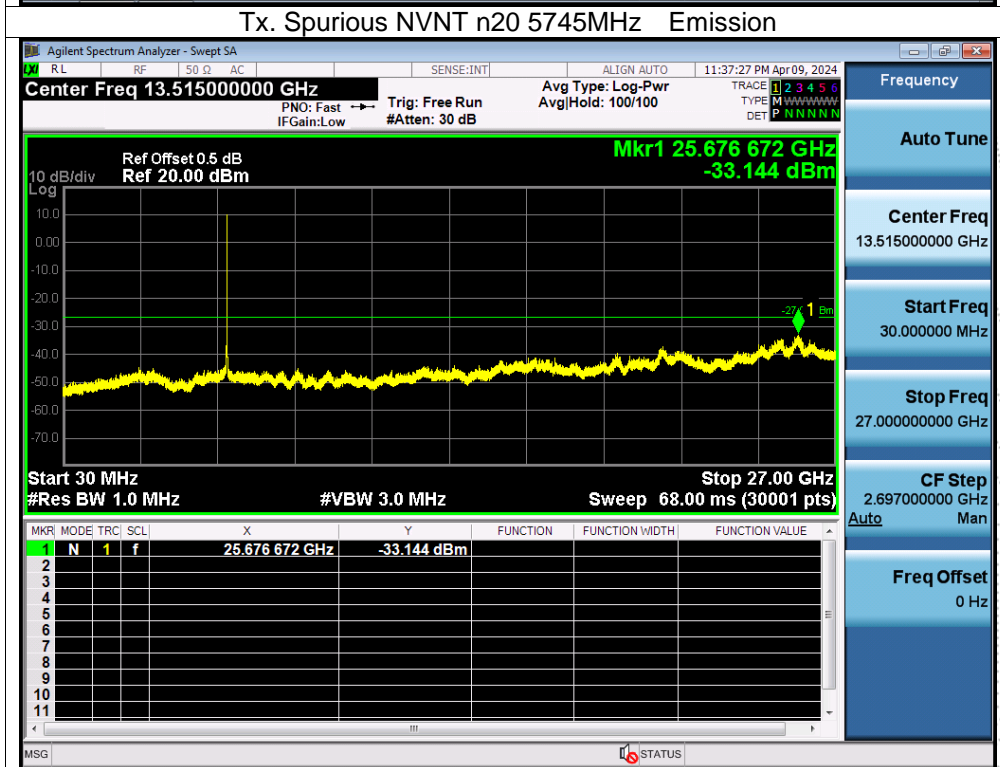
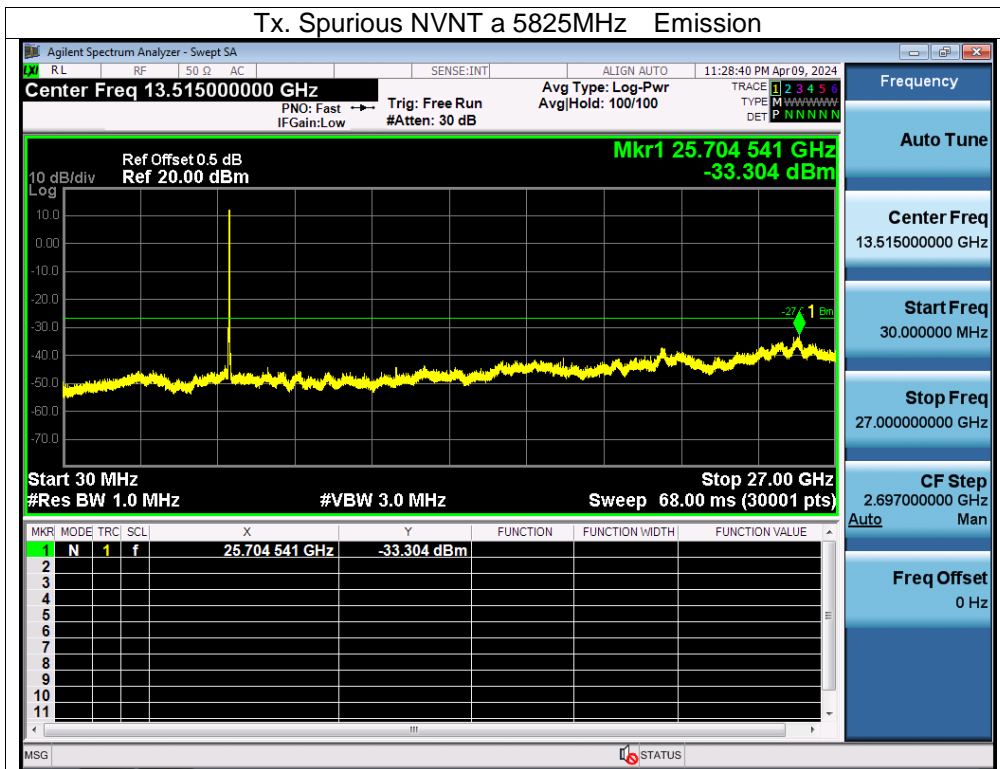
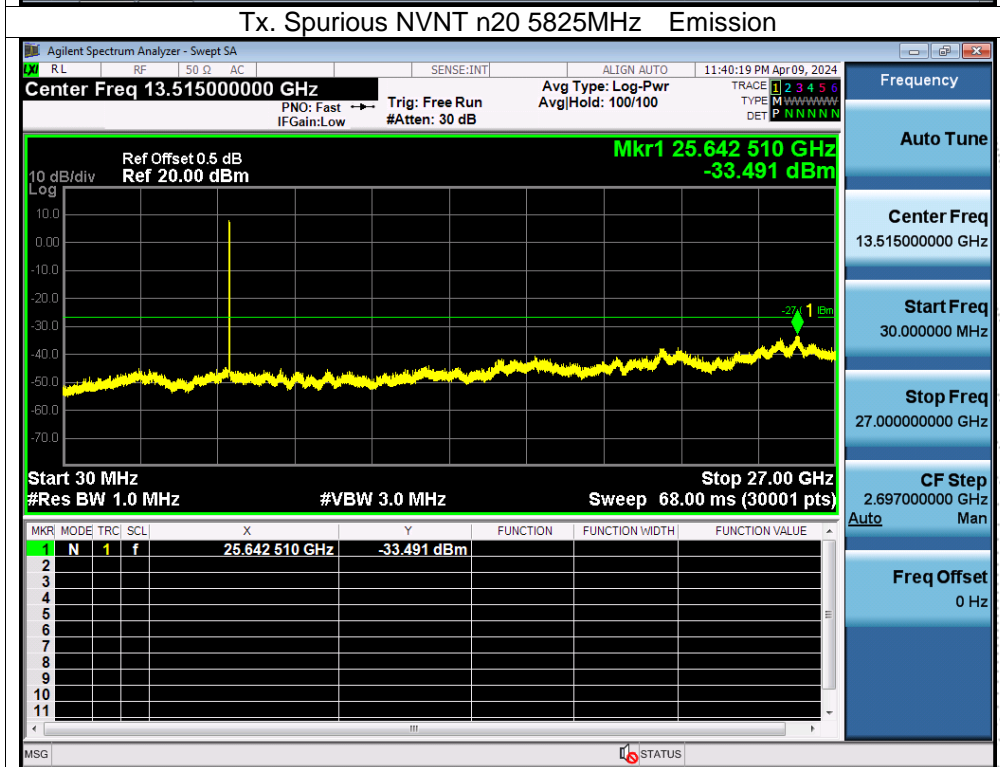
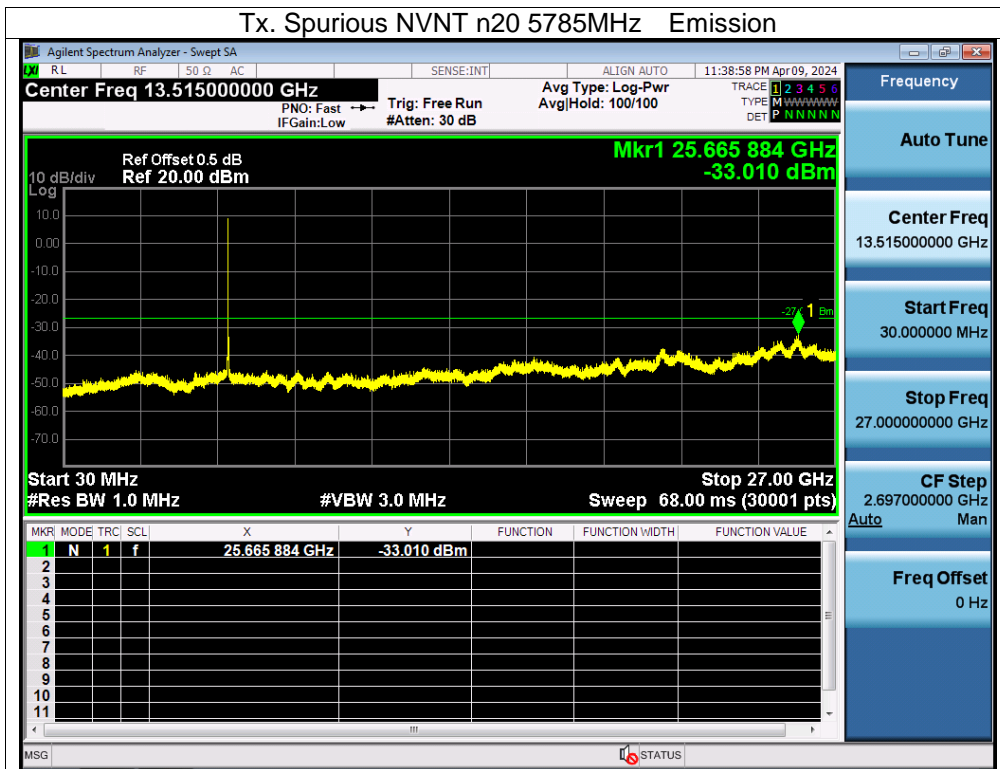


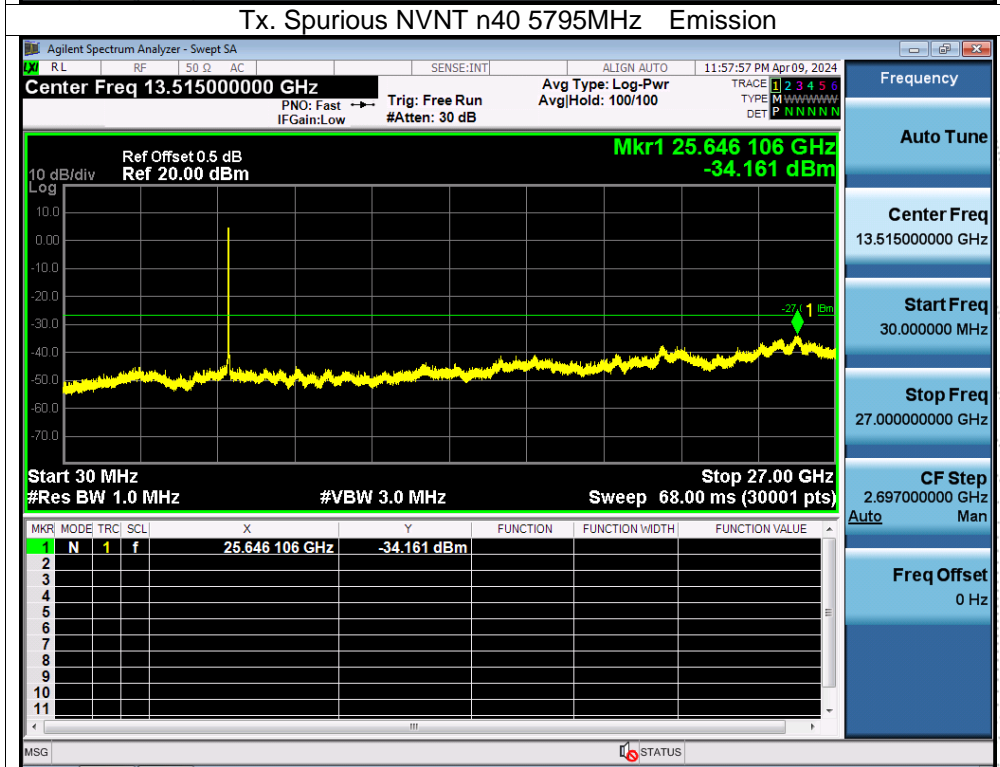
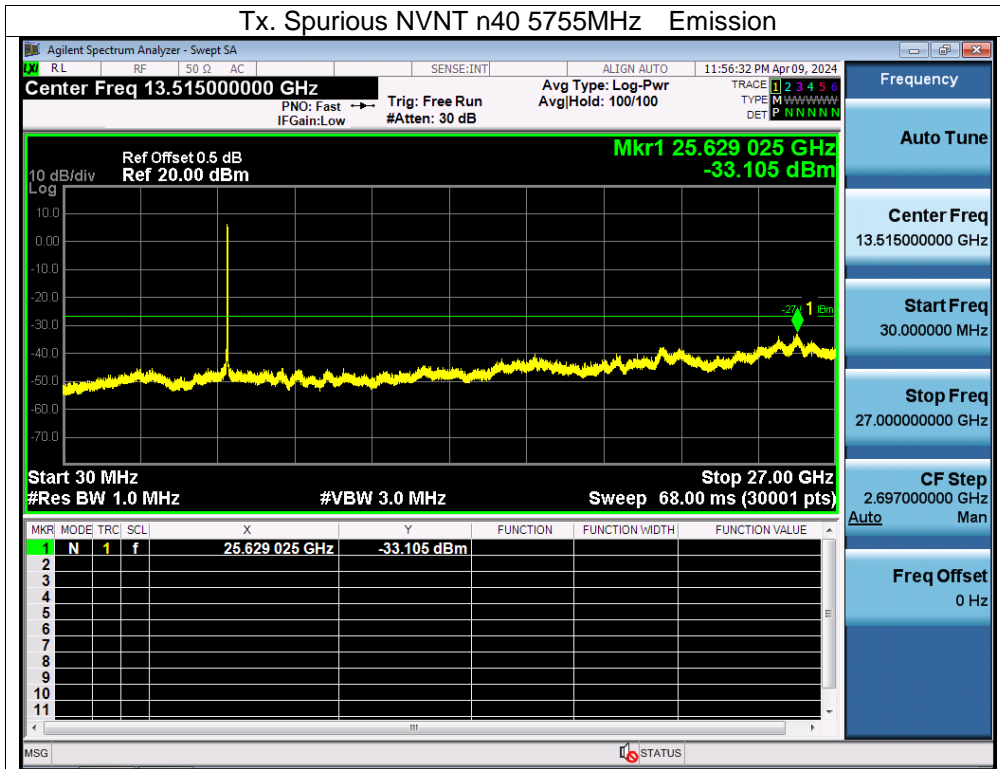
Note: A(B) Represent the value of antenna A and B, The worst data is Antenna A, only shown Antenna A.  
 Antenna A: 5745-58250MHz

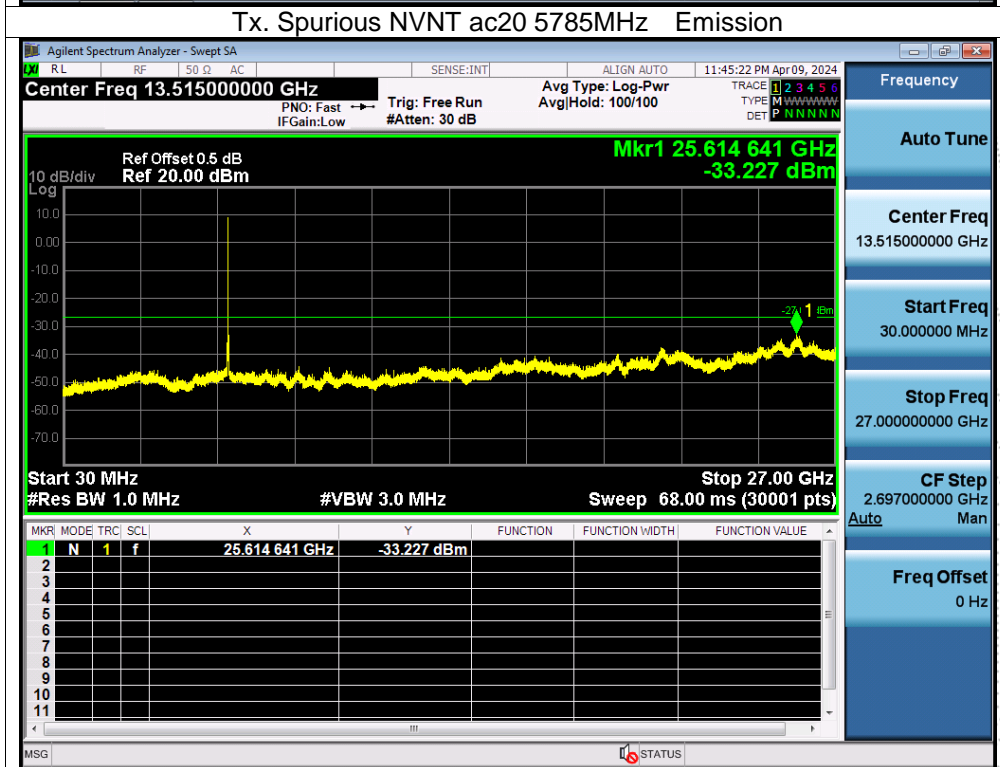
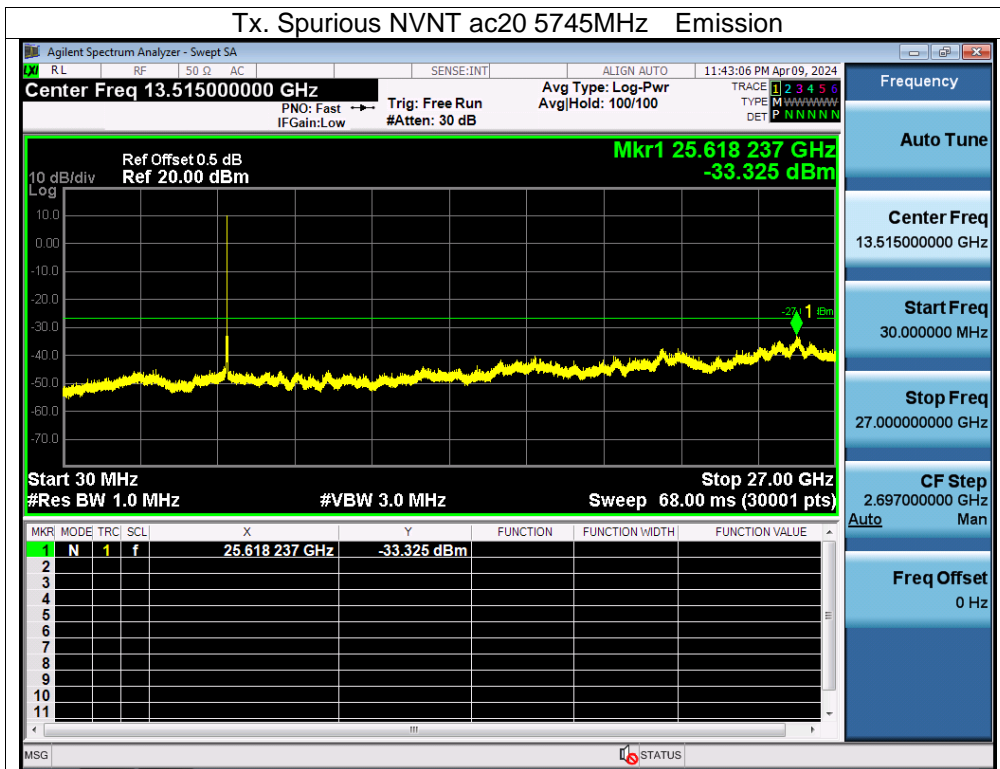


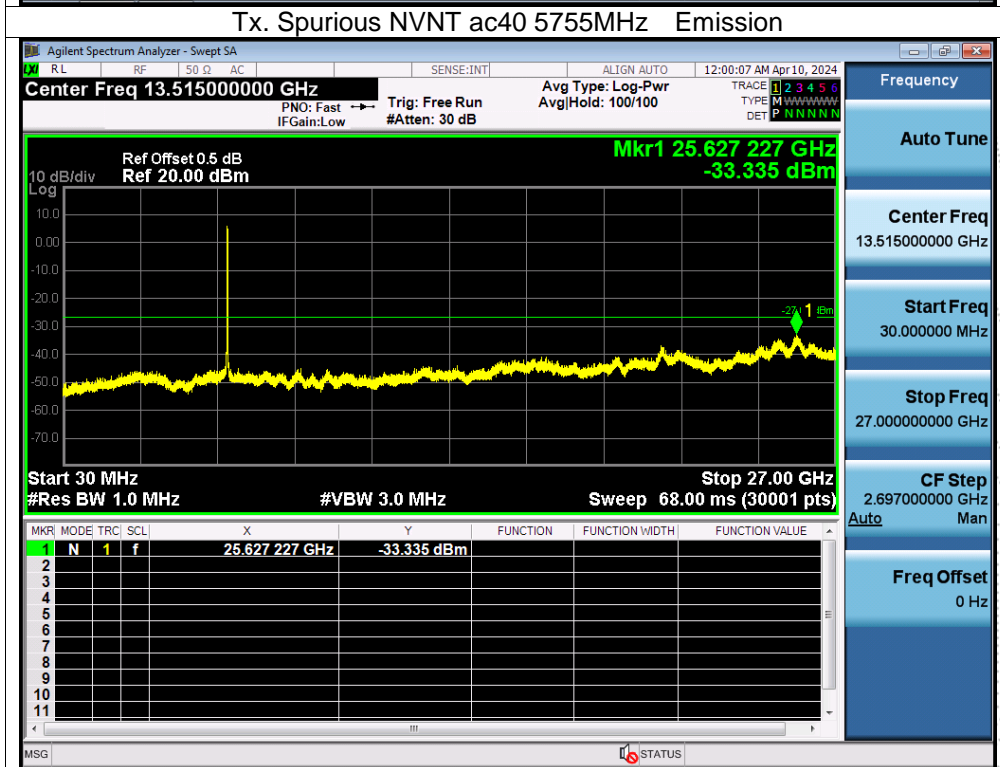
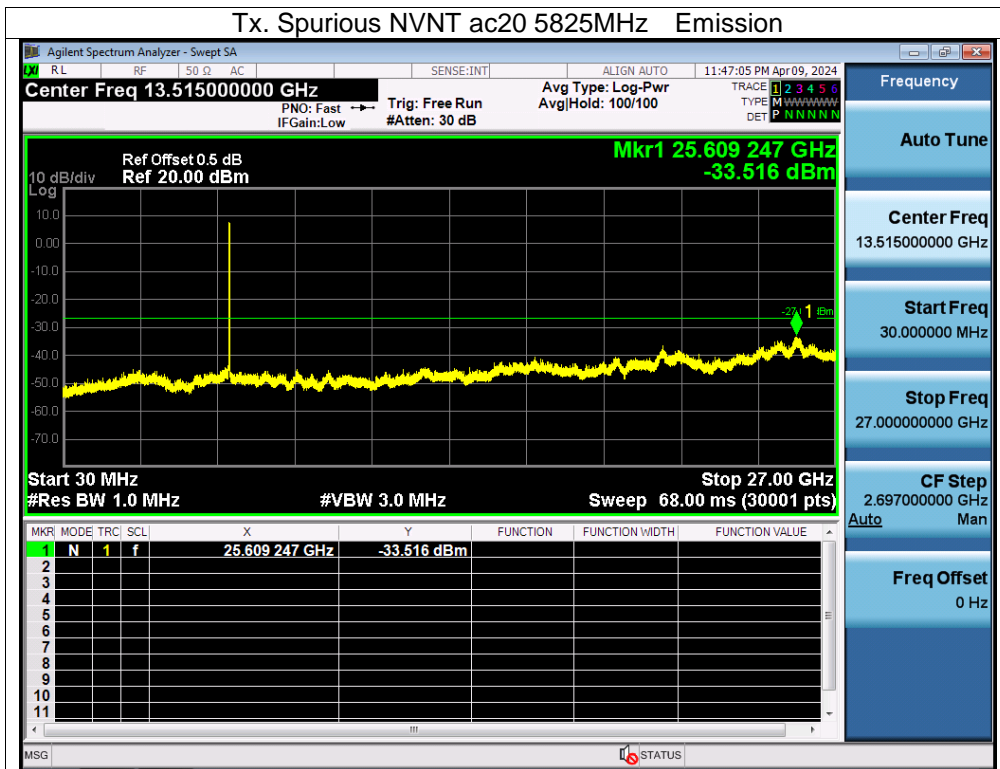




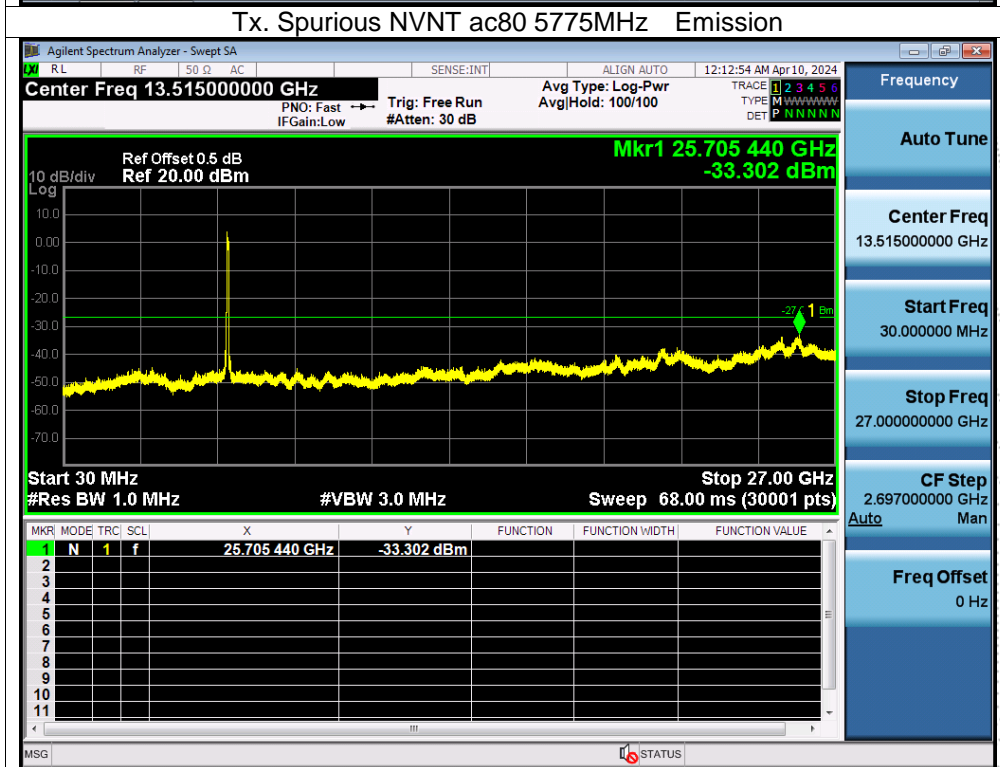
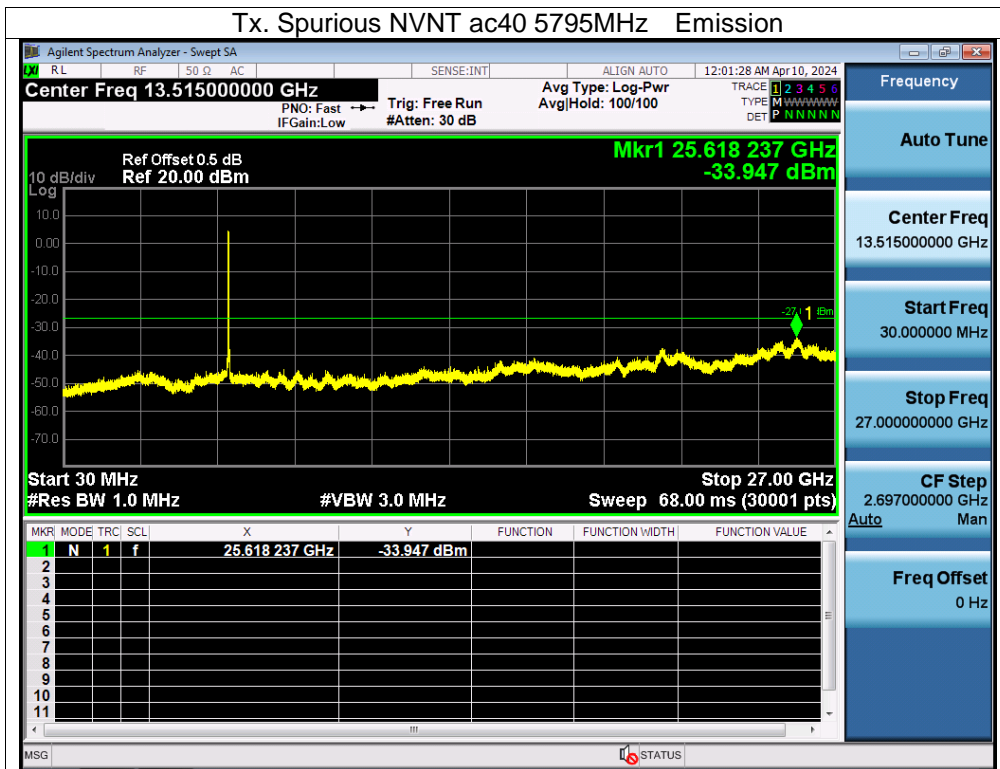




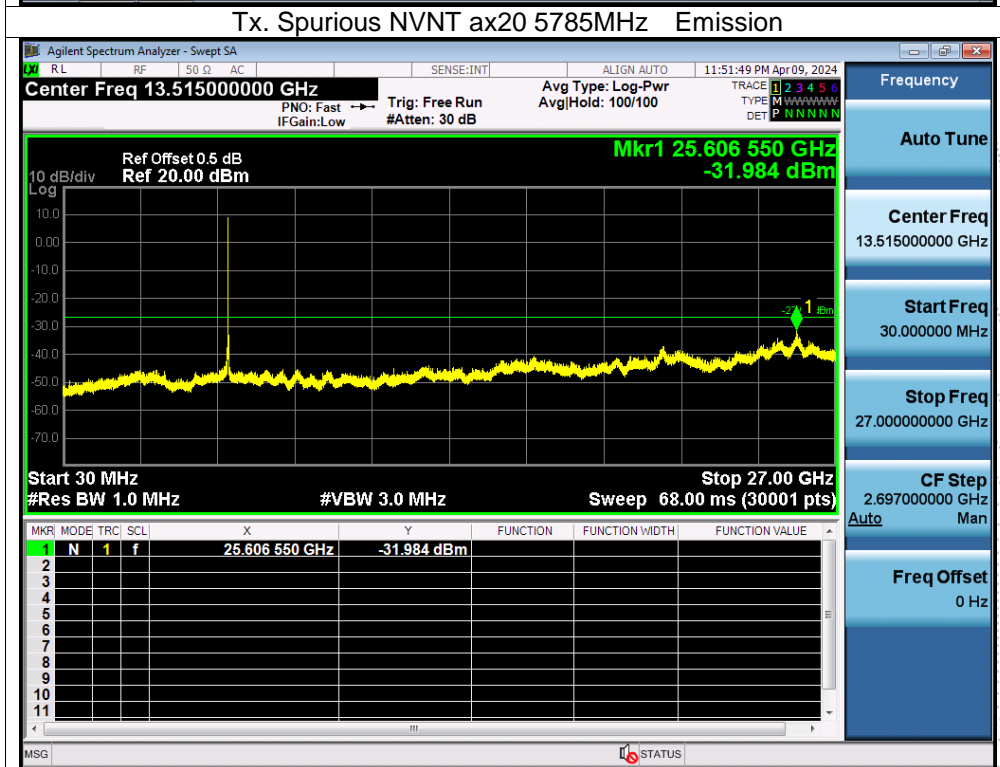
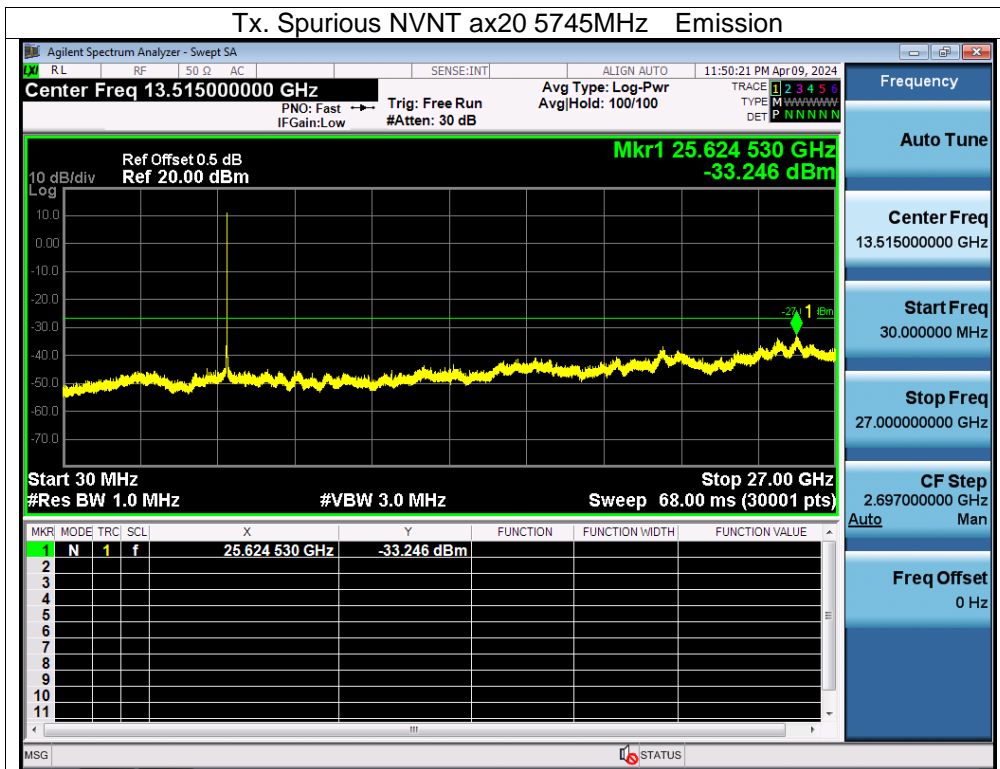


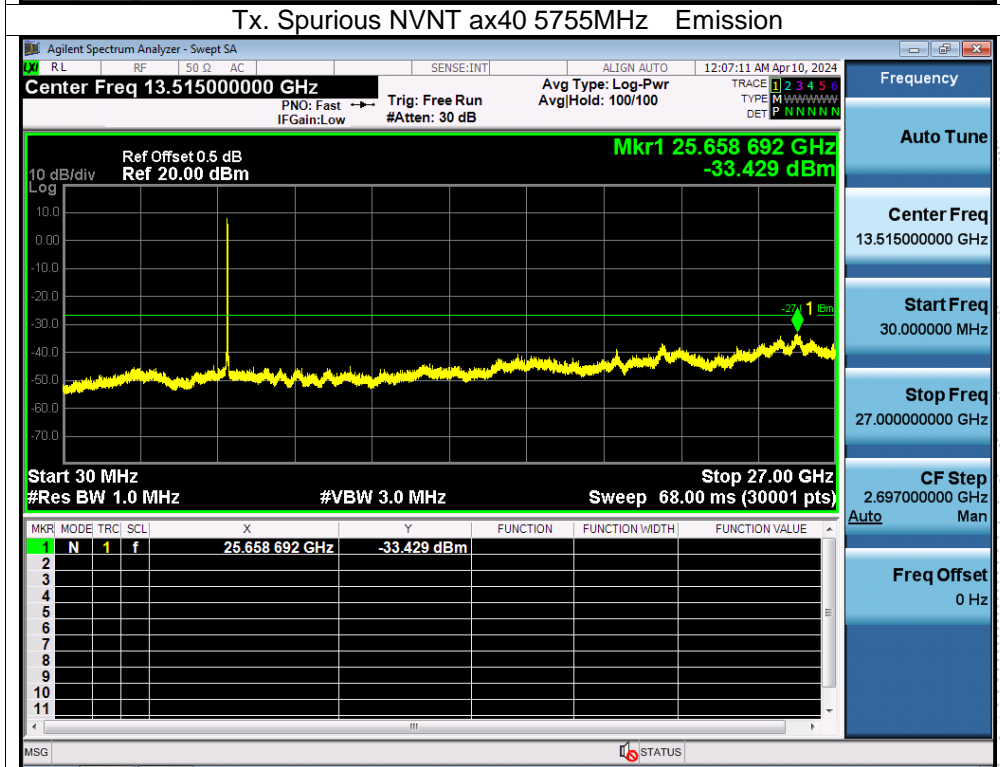
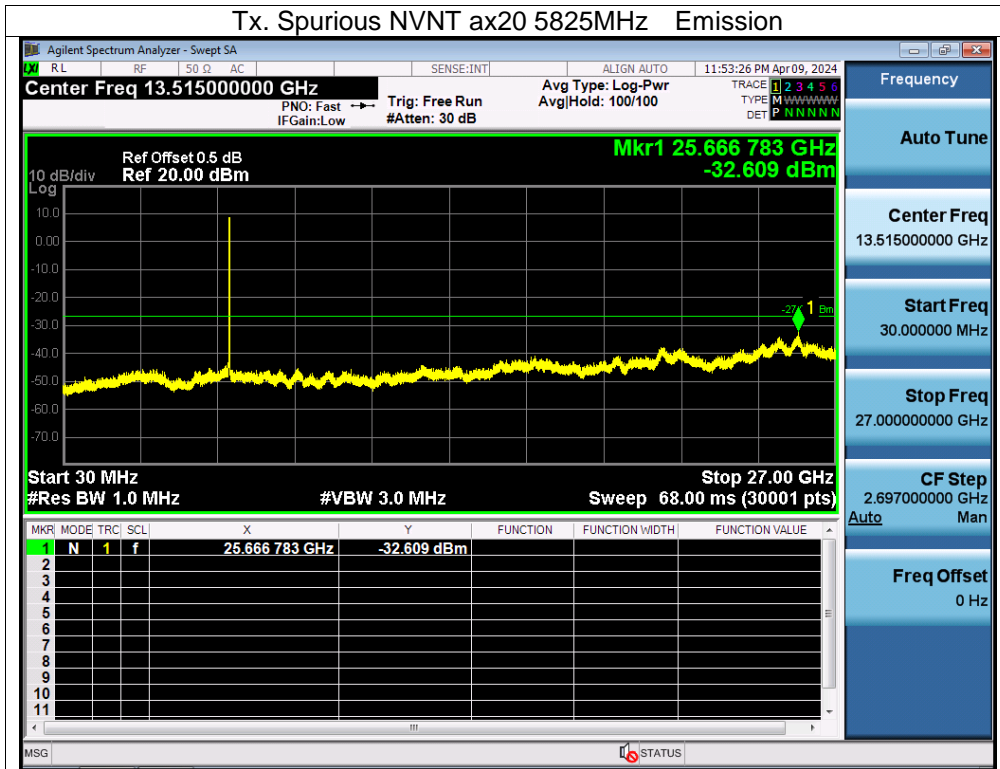


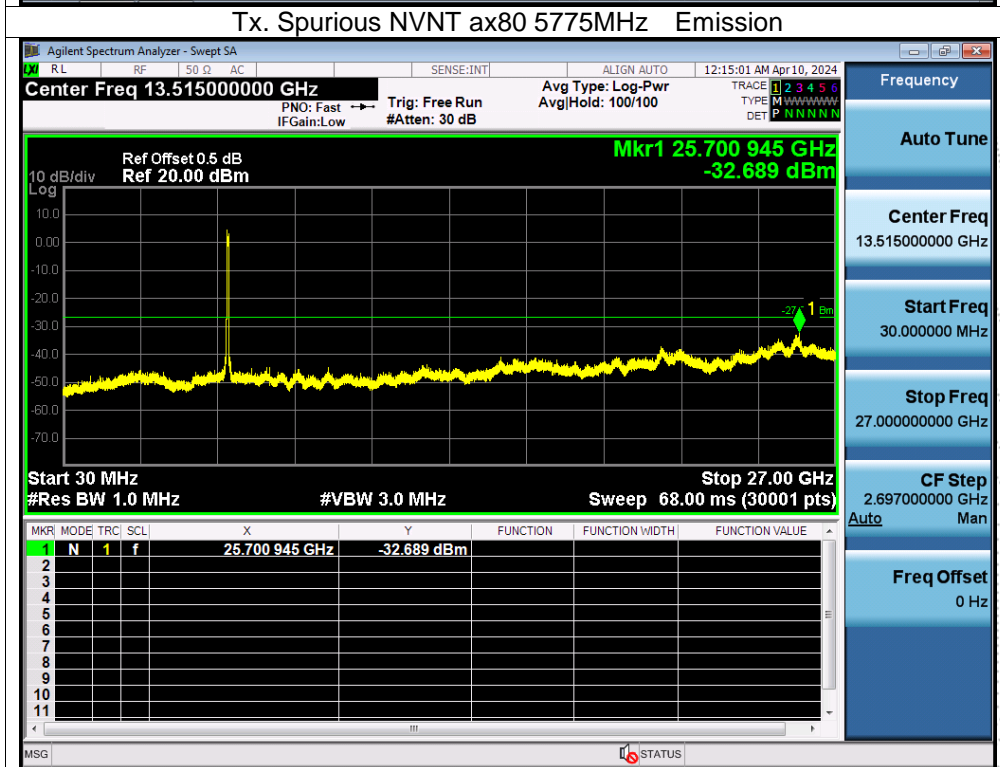
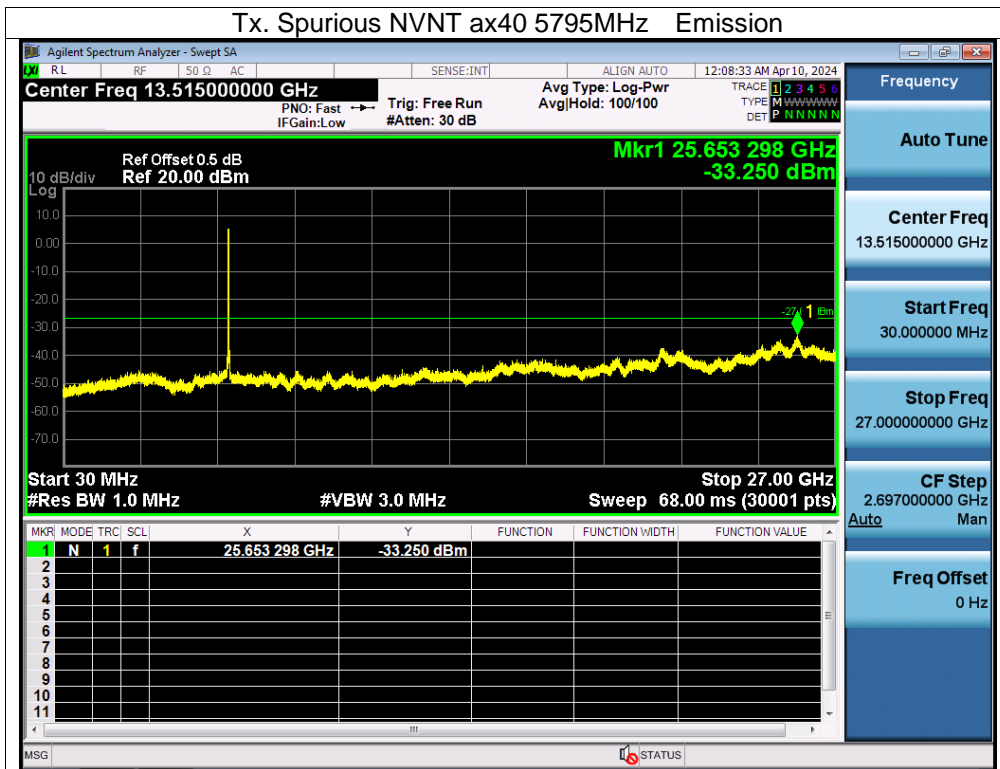






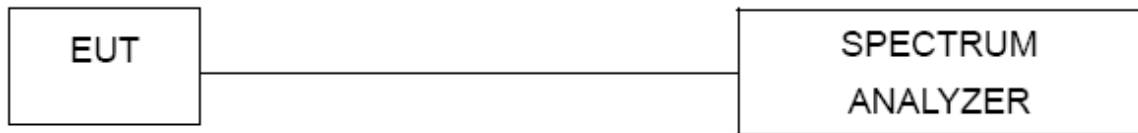






## 13. Frequency Stability Measurement

### 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  $\pm 20$  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  $\pm 20$  ppm (IEEE 802.11n specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is  $-20^\circ\text{C} \sim 70^\circ\text{C}$ .

## 13.4 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage:	DC 3.3V
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)	3.30	5180.0002	5180	0.0002	0.0386
		V max (V)	3.80	5180.0124	5180	0.0124	2.3938
		V min (V)	2.81	5180.0098	5180	0.0098	1.8919
Limits				5150-5250 MHz			
Result				Complies			

## Temperature vs. Frequency Stability

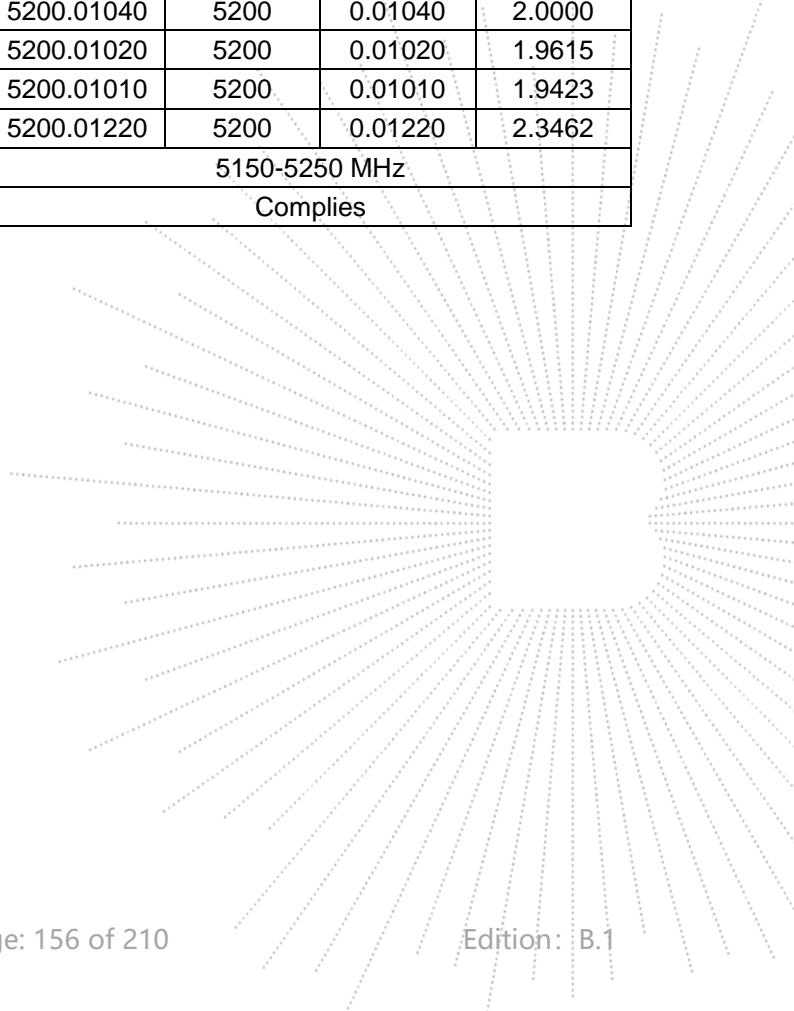
TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5180.0013	5180	0.0013	0.2510
		T (°C)	-10	5180.0082	5180	0.0082	1.5830
		T (°C)	0	5180.0078	5180	0.0078	1.5058
		T (°C)	10	5180.0005	5180	0.0005	0.0965
		T (°C)	20	5180.0036	5180	0.0036	0.6950
		T (°C)	30	5180.0083	5180	0.0083	1.6023
		T (°C)	40	5180.0028	5180	0.0028	0.5405
		T (°C)	50	5180.0010	5180	0.0010	0.1931
		T (°C)	60	5180.0072	5180	0.0072	1.3900
		T (°C)	70	5180.0132	5180	0.0132	2.5483
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)	3.30	5200.0026	5200	0.0026	0.5000
		V max (V)	3.80	5200.0033	5200	0.0033	0.6346
		V min (V)	2.81	5200.0128	5200	0.0128	2.4615
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)	3.3	T (°C)	-20	5200.00110	5200	0.00110	0.2115
		T (°C)	-10	5200.00940	5200	0.00940	1.8077
		T (°C)	0	5200.00320	5200	0.00320	0.6154
		T (°C)	10	5200.00300	5200	0.00300	0.5769
		T (°C)	20	5200.00270	5200	0.00270	0.5192
		T (°C)	30	5200.00200	5200	0.00200	0.3846
		T (°C)	40	5200.01040	5200	0.01040	2.0000
		T (°C)	50	5200.01020	5200	0.01020	1.9615
		T (°C)	60	5200.01010	5200	0.01010	1.9423
		T (°C)	70	5200.01220	5200	0.01220	2.3462
Limits				5150-5250 MHz			
Result				Complies			



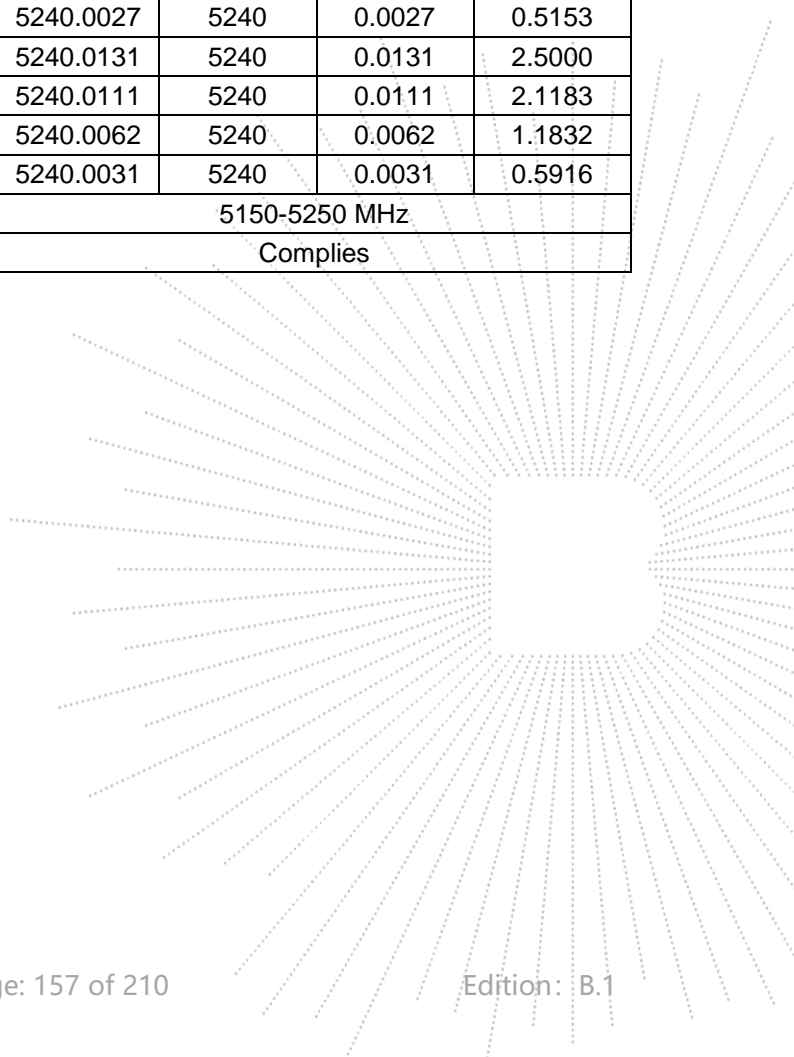


## Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.30	5240.0094	5240	0.0094	1.7939
		V max (V)	3.80	5240.0121	5240	0.0121	2.3092
		V min (V)	2.81	5240.0043	5240	0.0043	0.8206
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)	3.3	T (°C)	-20	5240.0098	5240	0.0098	1.8702
		T (°C)	-10	5240.0113	5240	0.0113	2.1565
		T (°C)	0	5240.0043	5240	0.0043	0.8206
		T (°C)	10	5240.0094	5240	0.0094	1.7939
		T (°C)	20	5240.0106	5240	0.0106	2.0229
		T (°C)	30	5240.0027	5240	0.0027	0.5153
		T (°C)	40	5240.0131	5240	0.0131	2.5000
		T (°C)	50	5240.0111	5240	0.0111	2.1183
		T (°C)	60	5240.0062	5240	0.0062	1.1832
		T (°C)	70	5240.0031	5240	0.0031	0.5916
Limits				5150-5250 MHz			
Result				Complies			



Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage:	DC 3.3V
Test Mode:	TX 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)	3.30	5745.00210	5745	0.00210	0.3655
		V max (V)	3.80	5745.00060	5745	0.00060	0.1044
		V min (V)	2.81	5745.00580	5745	0.00580	1.0096
Limits				5725-5850 MHz			
Result				Complies			

## Temperature vs. Frequency Stability

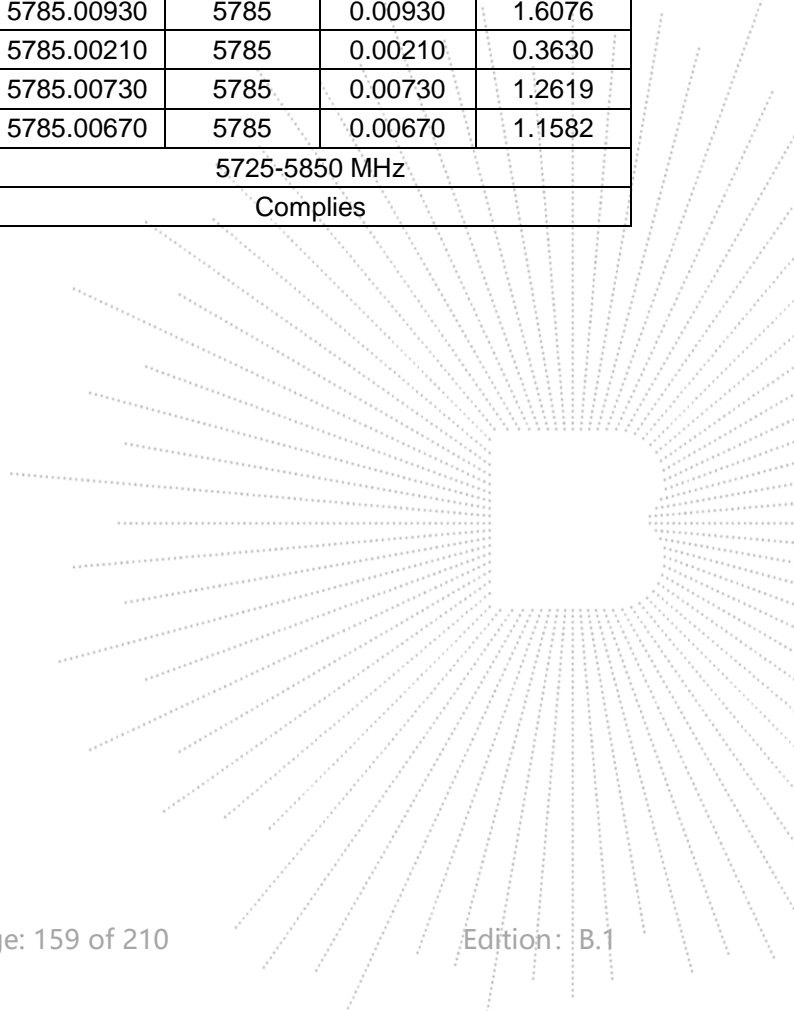
TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5745.01150	5745	0.01150	2.0017
		T (°C)	-10	5745.00130	5745	0.00130	0.2263
		T (°C)	0	5745.01110	5745	0.01110	1.9321
		T (°C)	10	5745.00810	5745	0.00810	1.4099
		T (°C)	20	5745.00960	5745	0.00960	1.6710
		T (°C)	30	5745.00590	5745	0.00590	1.0270
		T (°C)	40	5745.00750	5745	0.00750	1.3055
		T (°C)	50	5745.00500	5745	0.00500	0.8703
		T (°C)	60	5745.00650	5745	0.00650	1.1314
		T (°C)	70	5745.01030	5745	0.01030	1.7929
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)	3.30	5785.00390	5785	0.00390	0.6742
		V max (V)	3.80	5785.00080	5785	0.00080	0.1383
		V min (V)	2.81	5785.01060	5785	0.01060	1.8323
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)	3.3	T (°C)	-20	5785.00020	5785	0.00020	0.0346
		T (°C)	-10	5785.00350	5785	0.00350	0.6050
		T (°C)	0	5785.00470	5785	0.00470	0.8124
		T (°C)	10	5785.00050	5785	0.00050	0.0864
		T (°C)	20	5785.00930	5785	0.00930	1.6076
		T (°C)	30	5785.00080	5785	0.00080	0.1383
		T (°C)	40	5785.00930	5785	0.00930	1.6076
		T (°C)	50	5785.00210	5785	0.00210	0.3630
		T (°C)	60	5785.00730	5785	0.00730	1.2619
		T (°C)	70	5785.00670	5785	0.00670	1.1582
Limits				5725-5850 MHz			
Result				Complies			

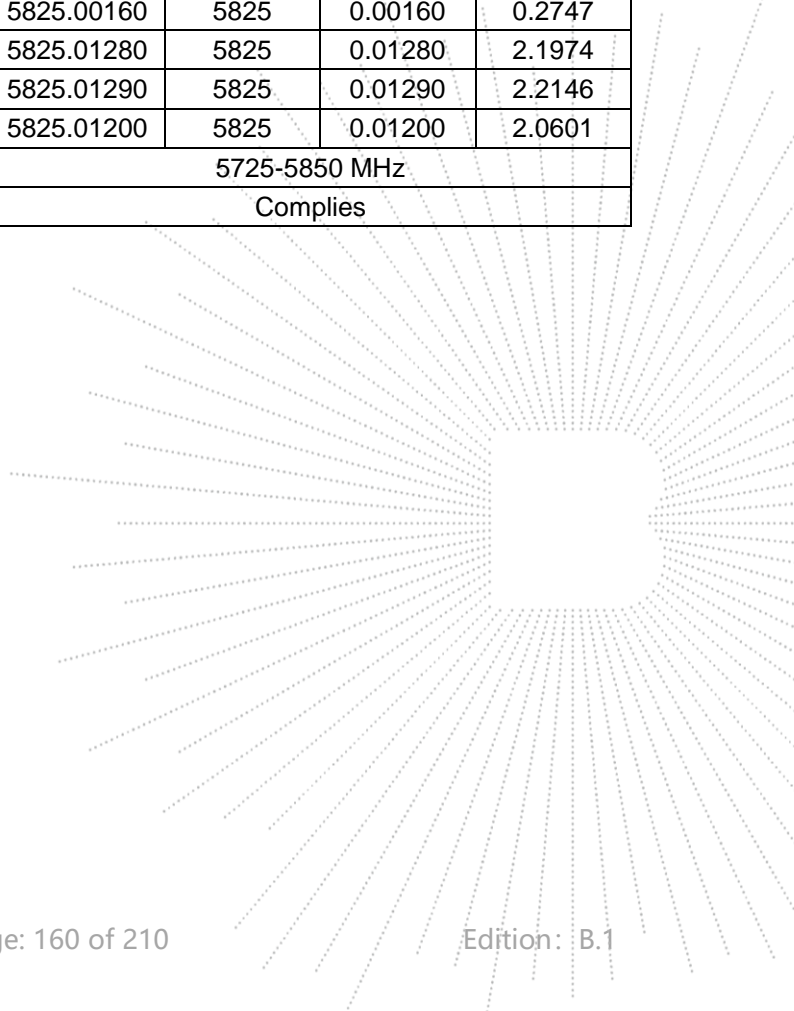


## Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.30	5825.01250	5825	0.01250	2.1459
		V max (V)	3.80	5825.00350	5825	0.00350	0.6009
		V min (V)	2.81	5825.00770	5825	0.00770	1.3219
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)	3.3	T (°C)	-20	5825.00620	5825	0.00620	1.0644
		T (°C)	-10	5825.00360	5825	0.00360	0.6180
		T (°C)	0	5825.01090	5825	0.01090	1.8712
		T (°C)	10	5825.00970	5825	0.00970	1.6652
		T (°C)	20	5825.00380	5825	0.00380	0.6524
		T (°C)	30	5825.00460	5825	0.00460	0.7897
		T (°C)	40	5825.00160	5825	0.00160	0.2747
		T (°C)	50	5825.01280	5825	0.01280	2.1974
		T (°C)	60	5825.01290	5825	0.01290	2.2146
		T (°C)	70	5825.01200	5825	0.01200	2.0601
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

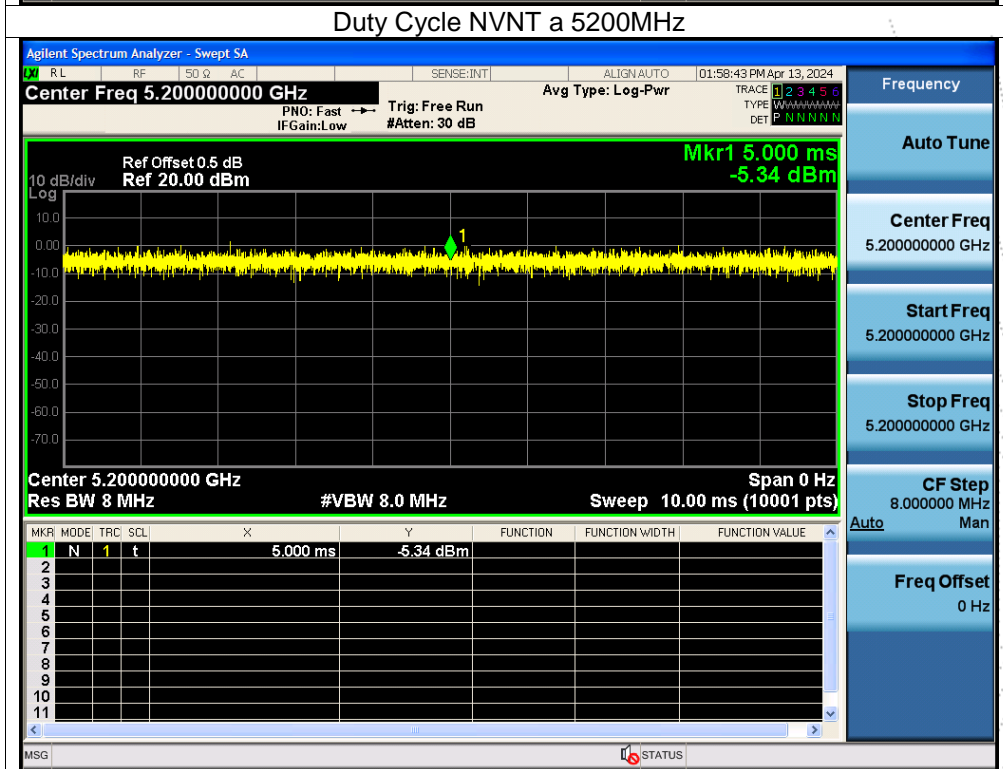
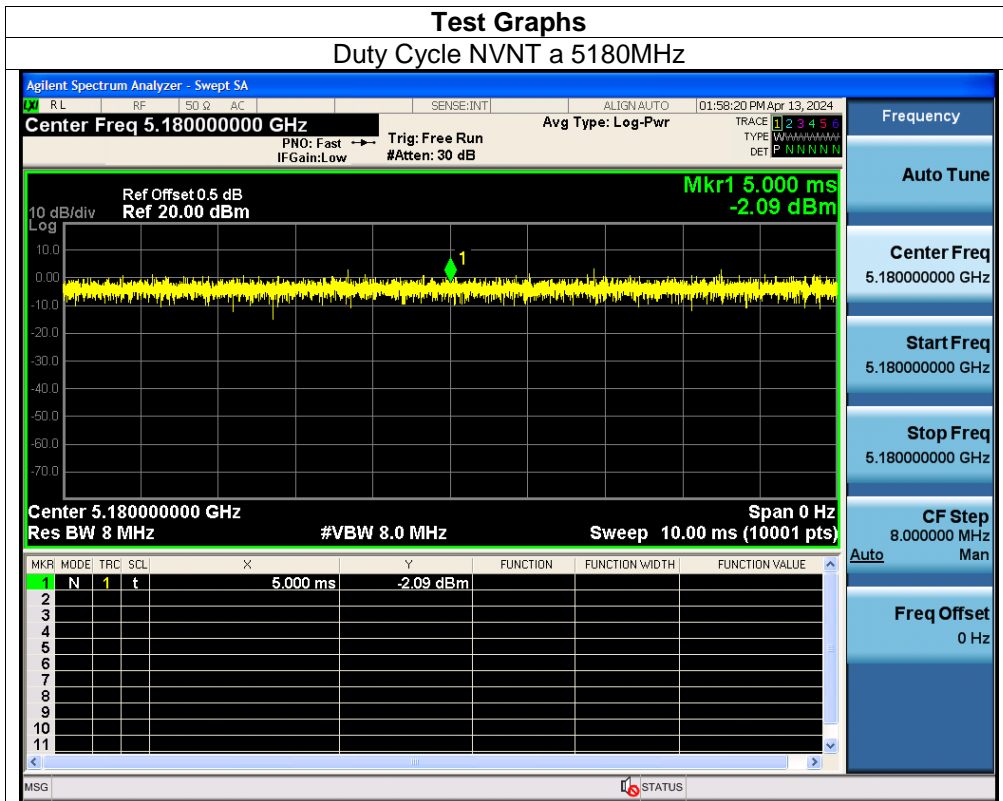
1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

### 14.4 Test Result

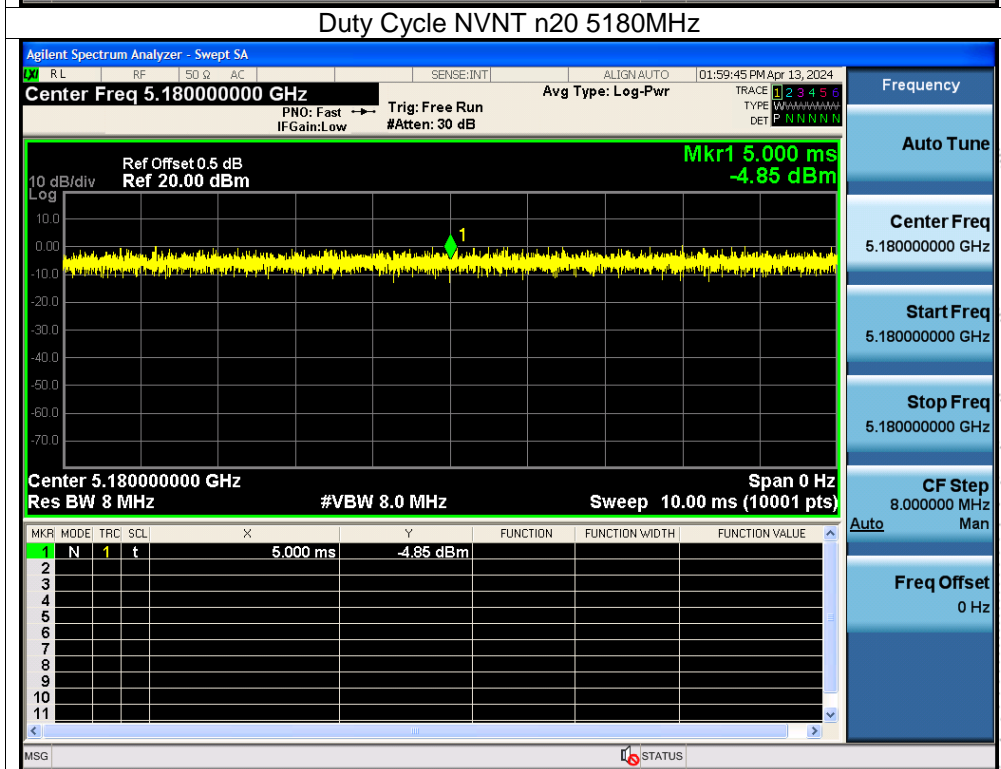
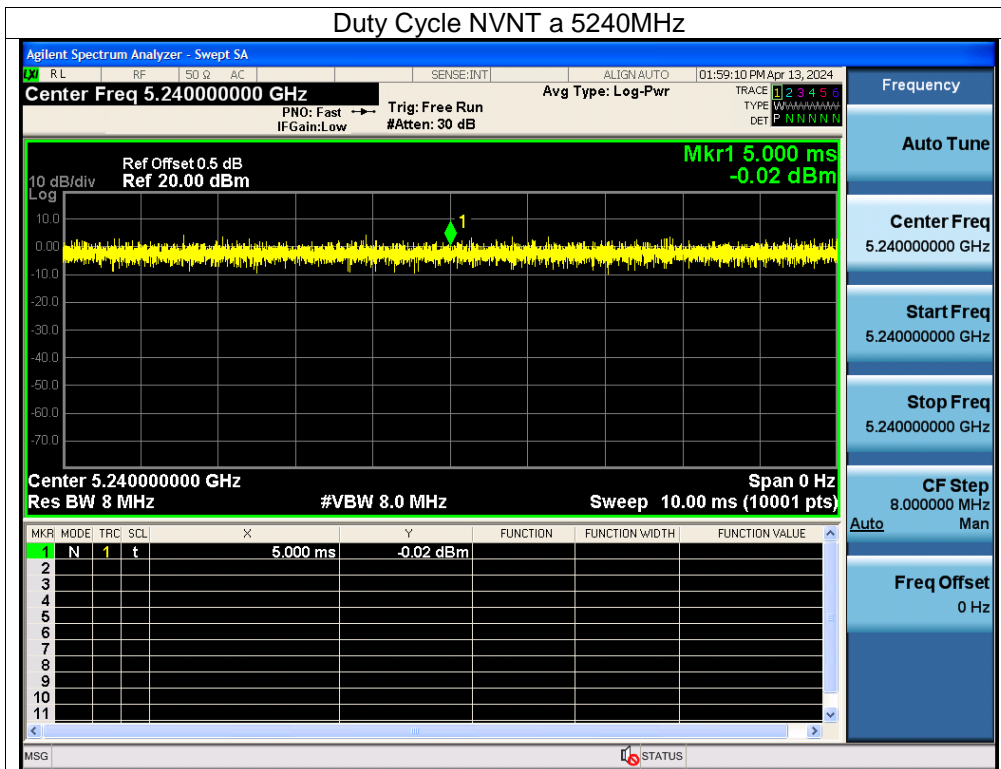
ANT A

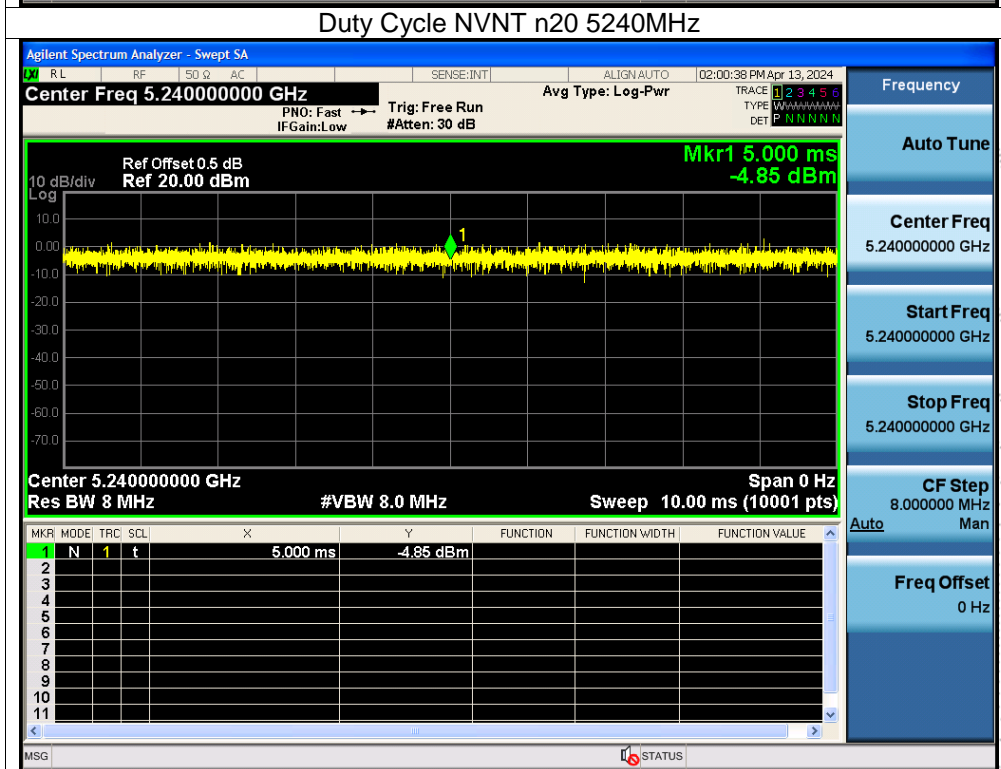
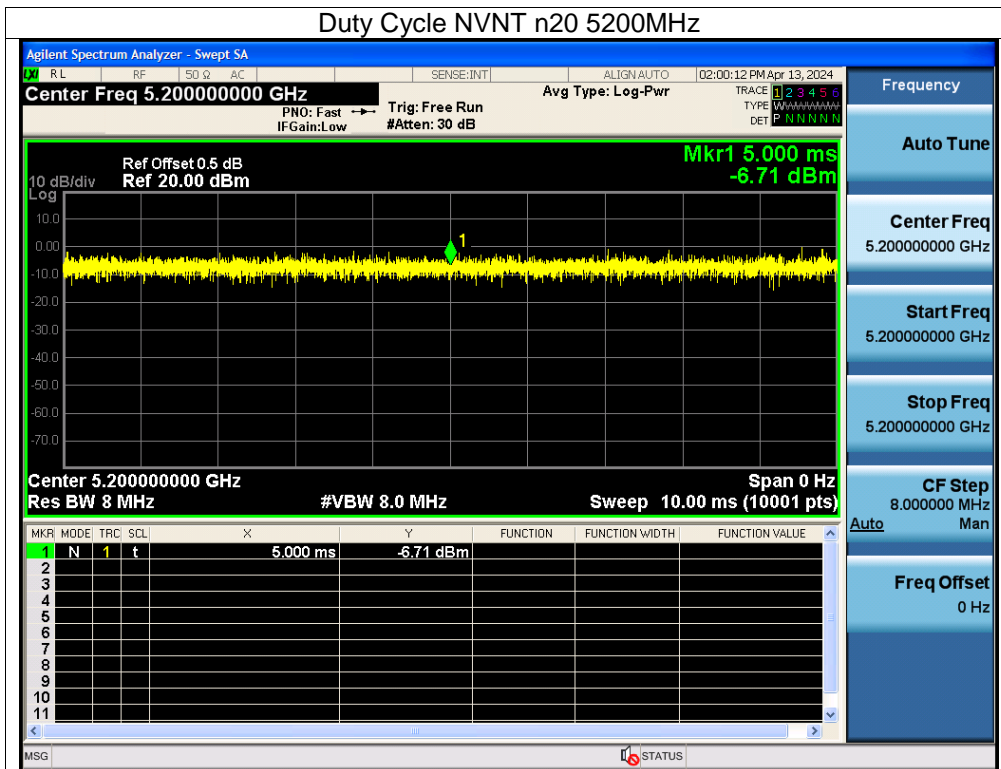
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	100	0	0
NVNT	a	5200	100	0	0
NVNT	a	5240	100	0	0
NVNT	n20	5180	100	0	0
NVNT	n20	5200	100	0	0
NVNT	n20	5240	100	0	0
NVNT	n40	5190	100	0	0
NVNT	n40	5230	100	0	0
NVNT	ac20	5180	100	0	0
NVNT	ac20	5200	100	0	0
NVNT	ac20	5240	100	0	0
NVNT	ac40	5190	100	0	0
NVNT	ac40	5230	100	0	0
NVNT	ac80	5210	100	0	0
NVNT	ax20	5180	100	0	0
NVNT	ax20	5200	100	0	0
NVNT	ax20	5240	100	0	0
NVNT	ax40	5190	100	0	0
NVNT	ax40	5230	100	0	0

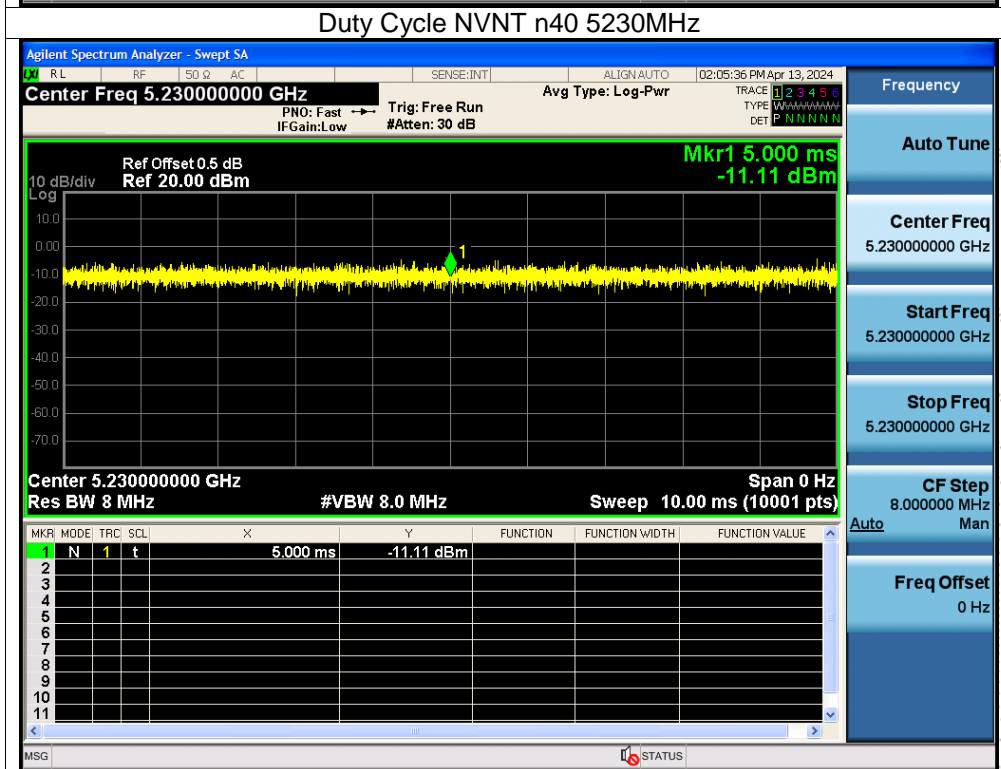
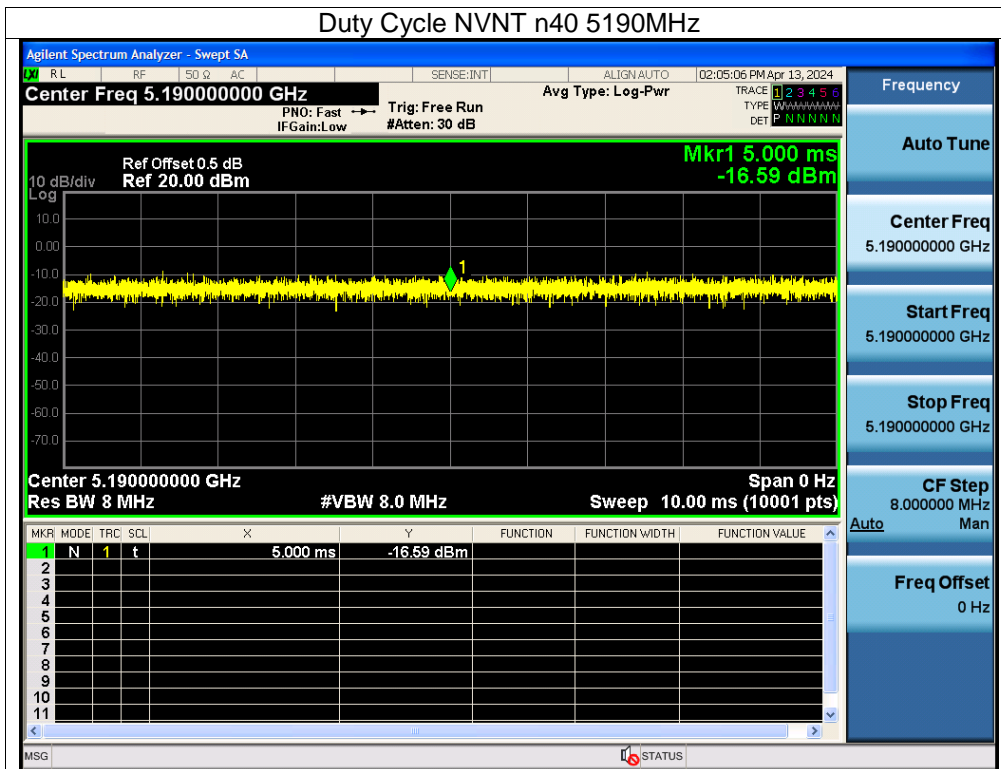
NVNT	ax80	5210	100	0	0
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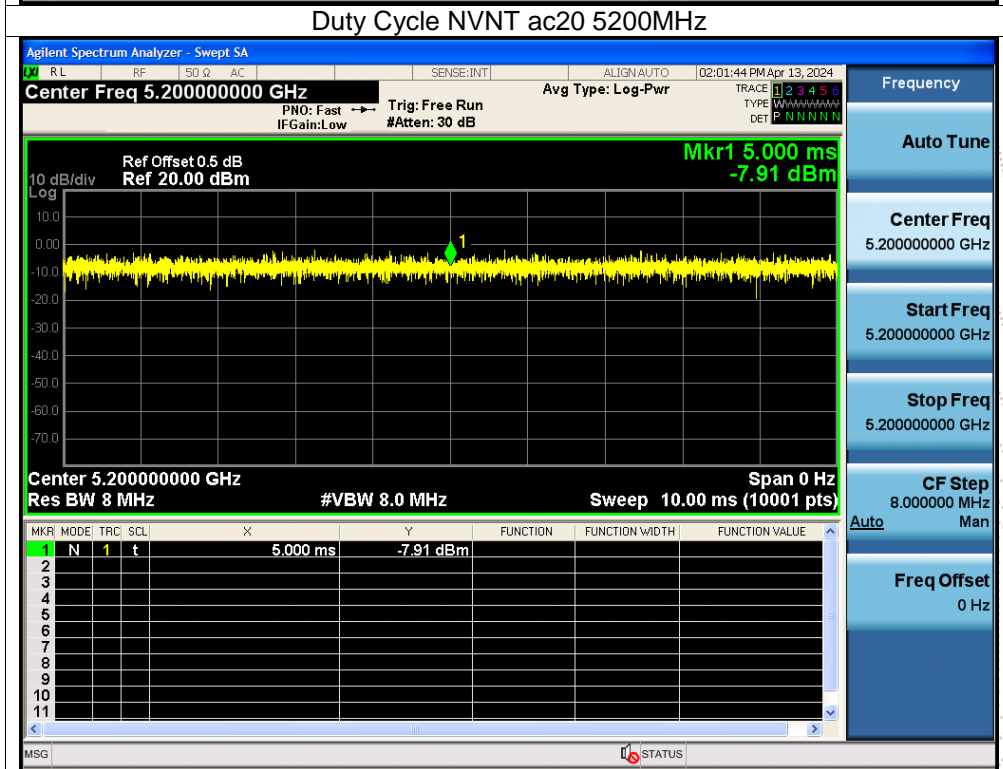
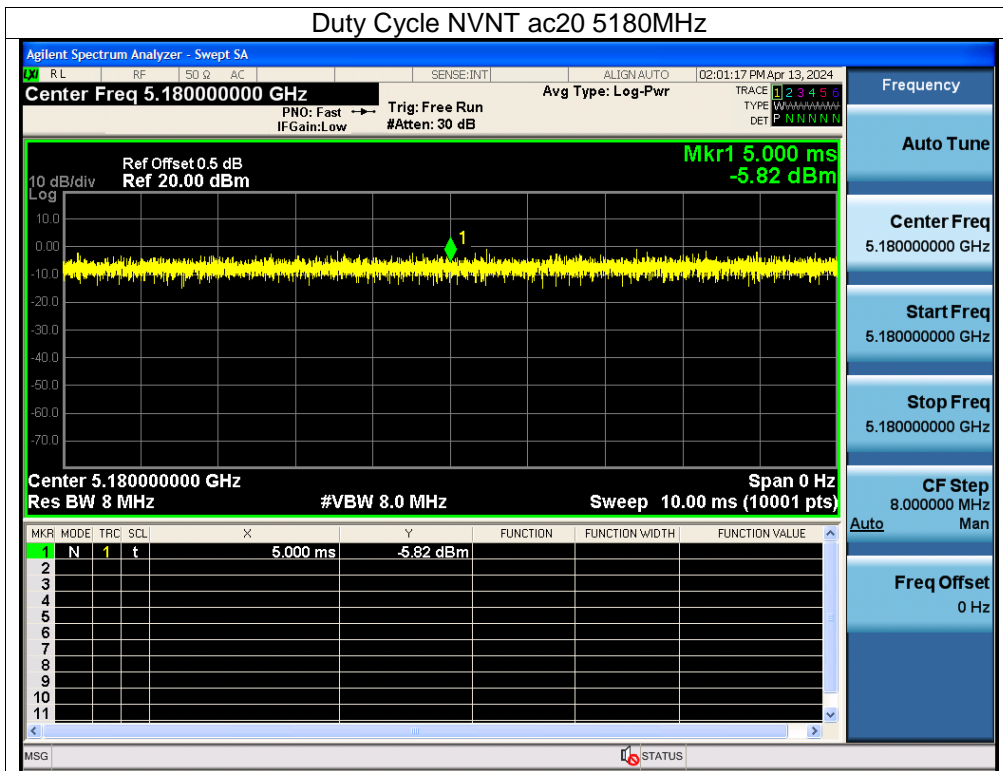


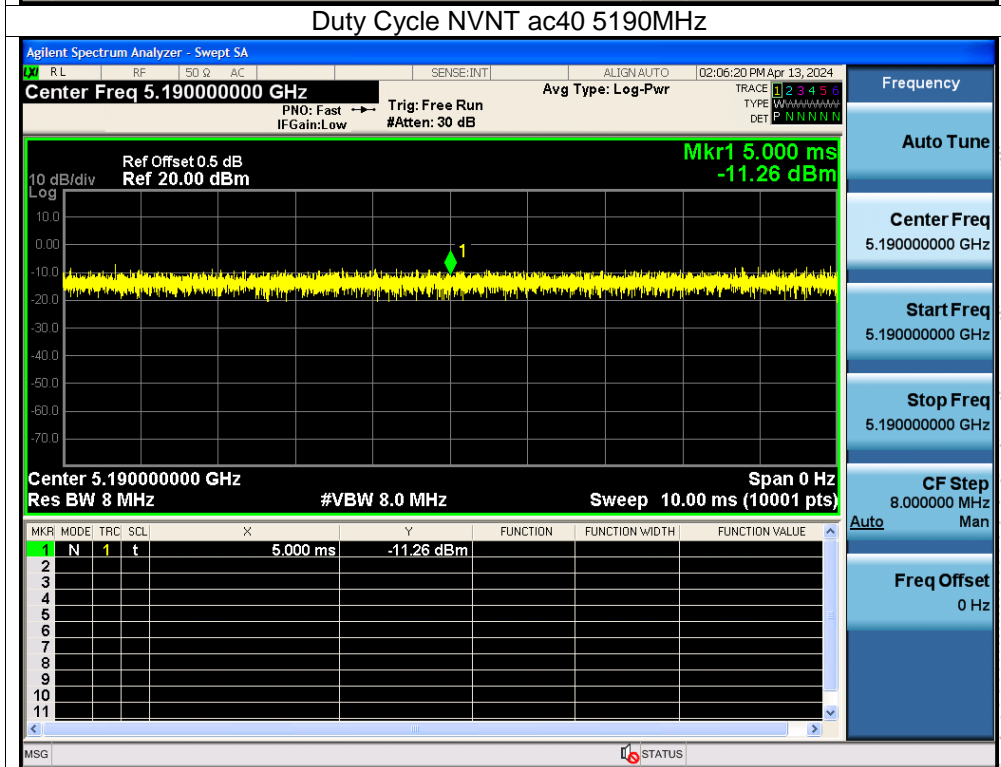
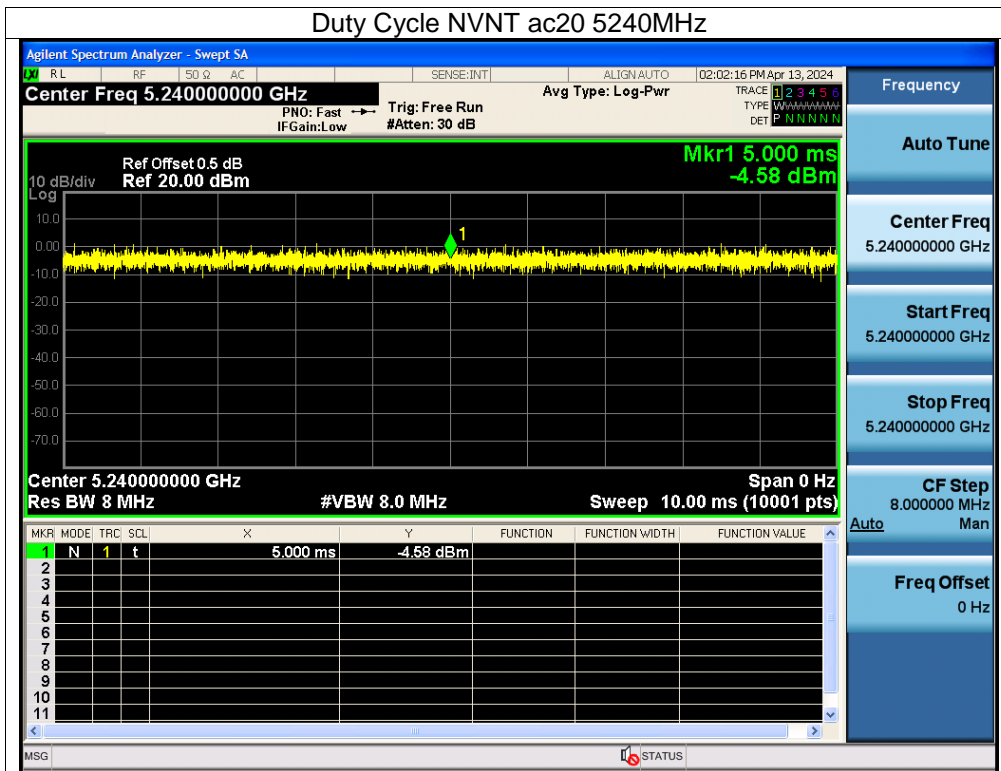


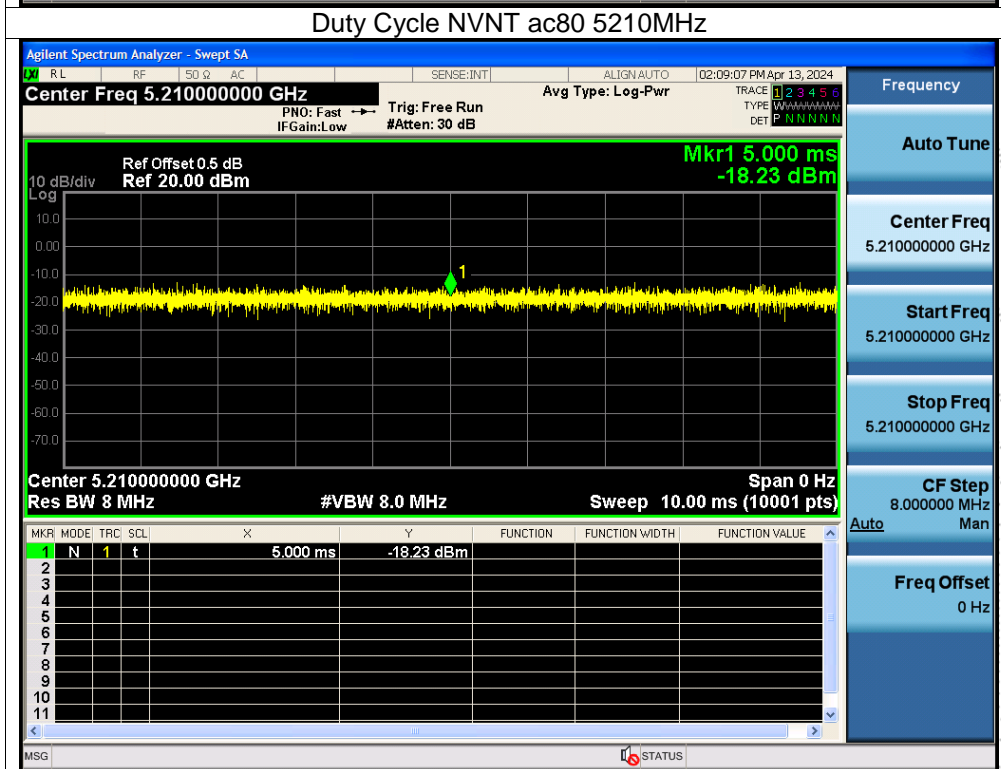
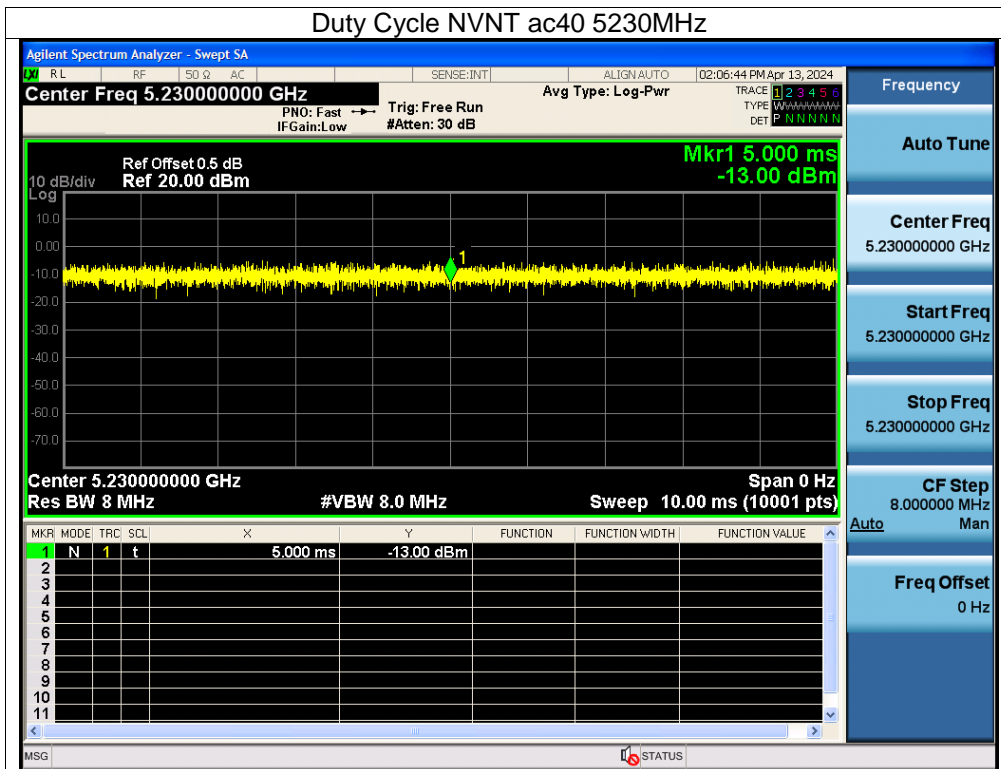




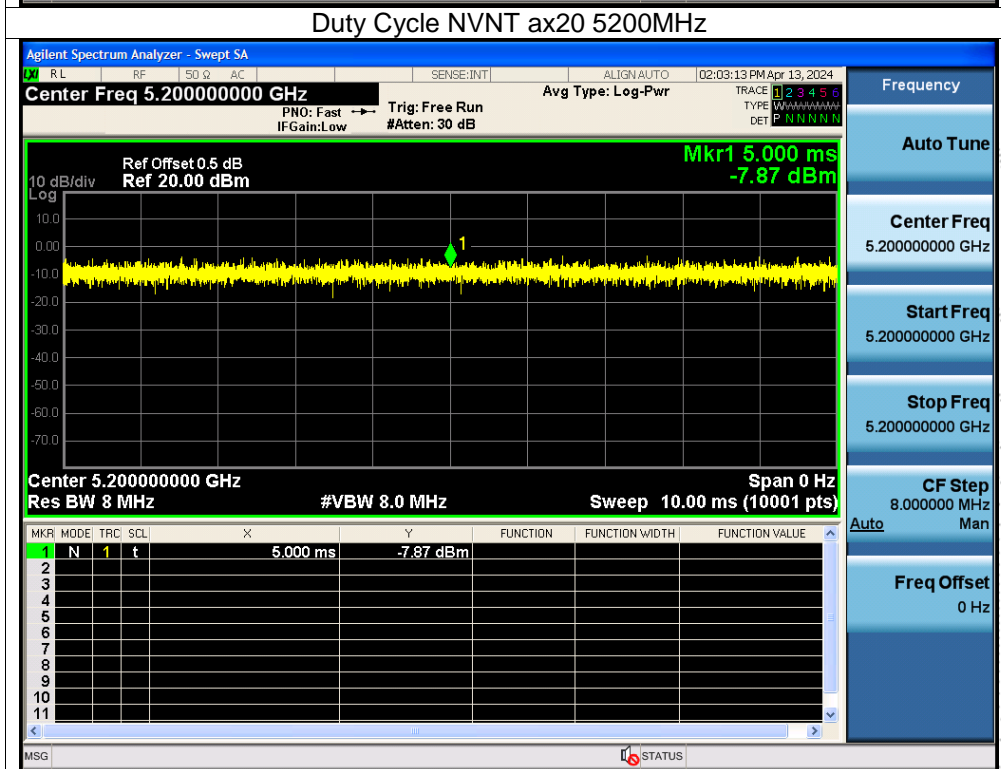
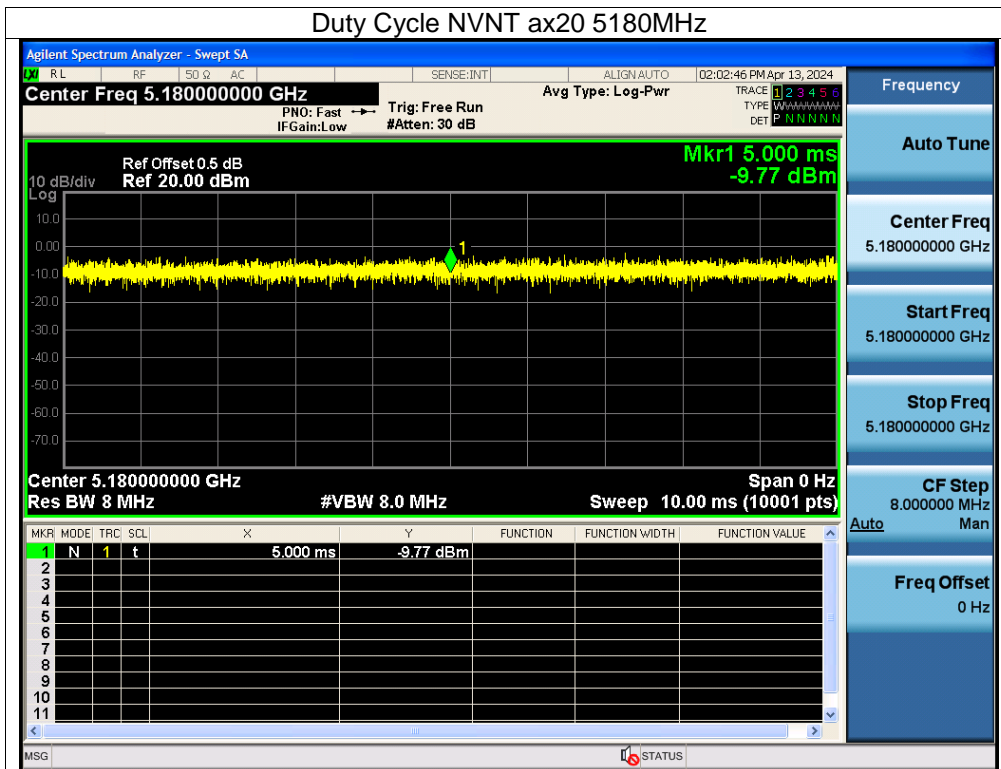


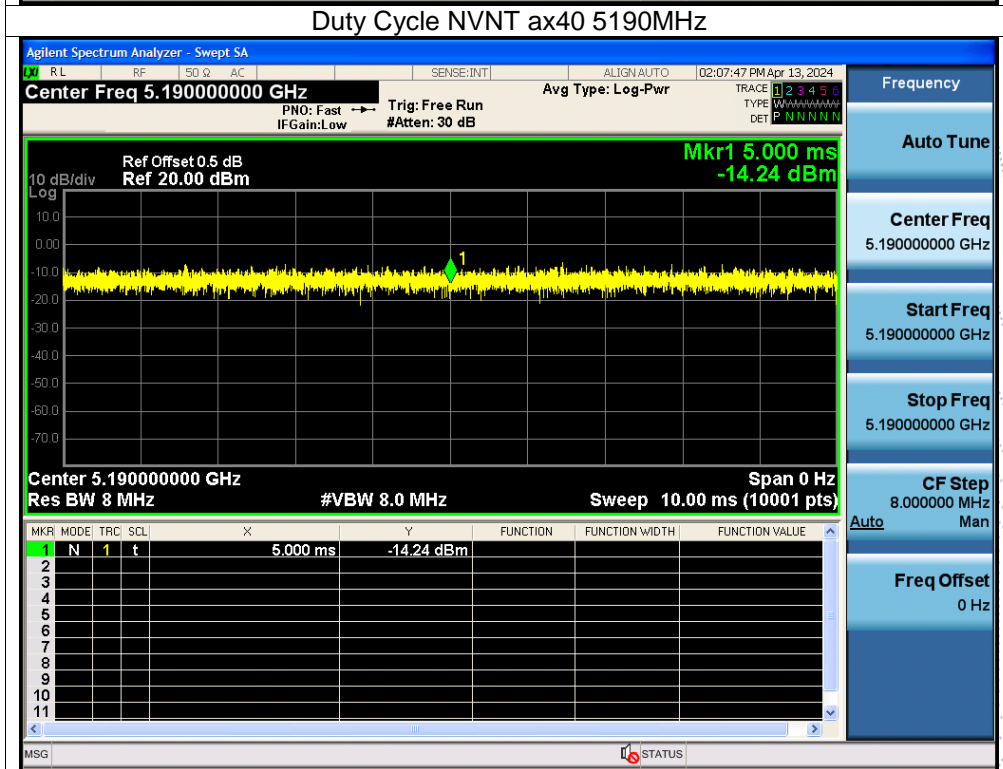
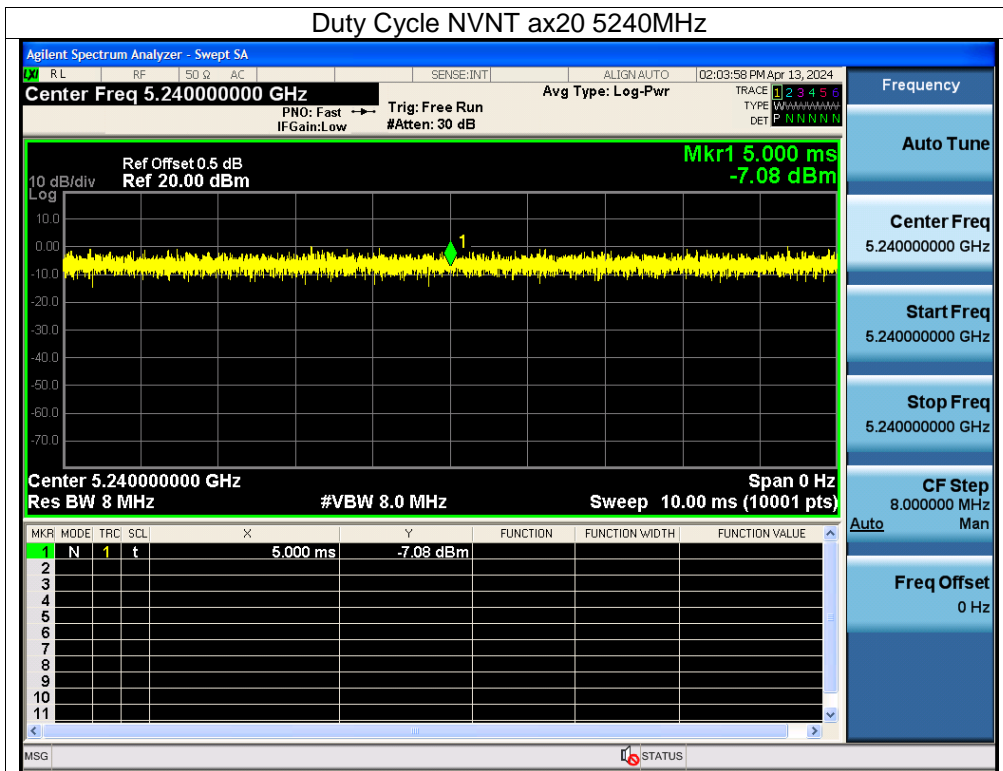


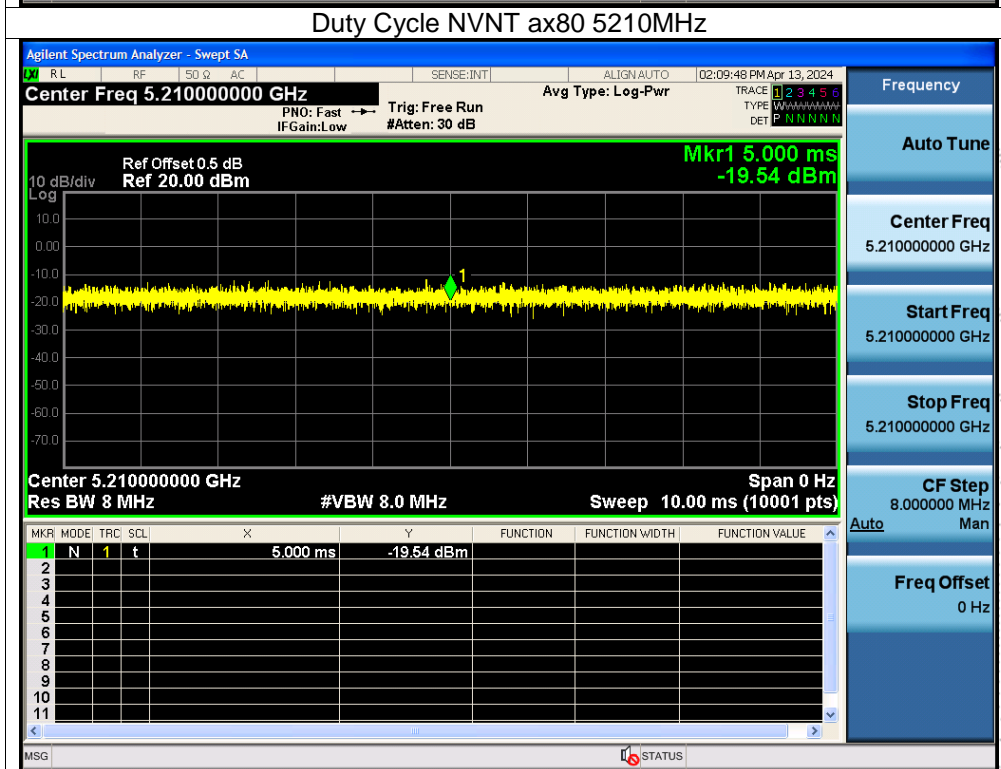
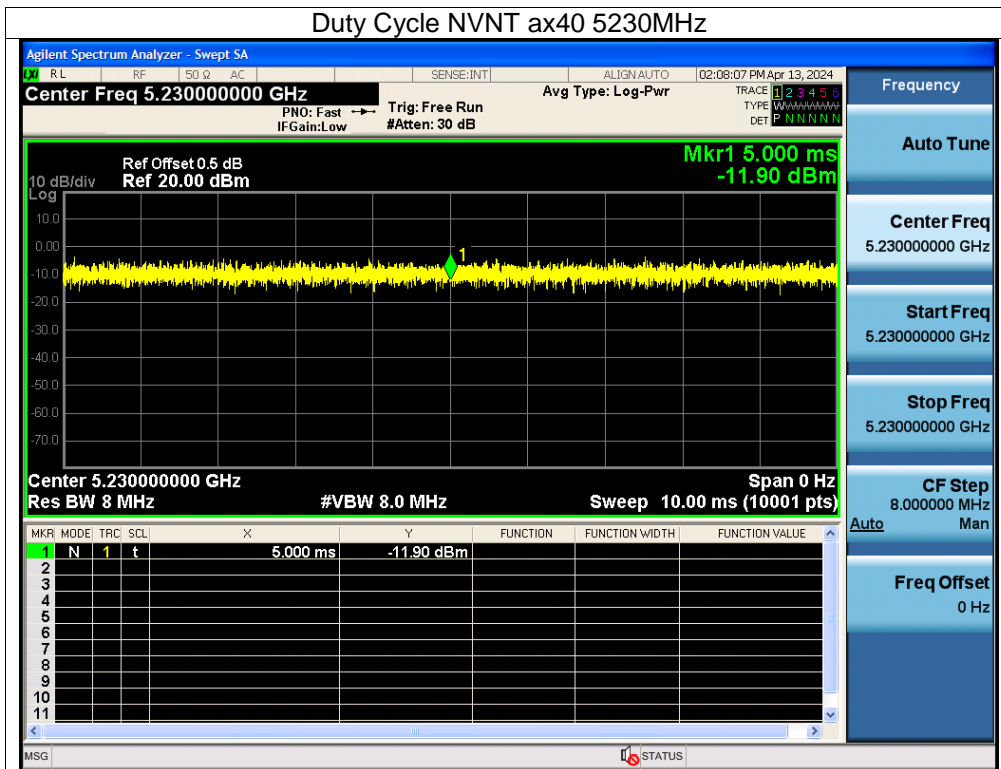












## ANT B

Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	100	0	0
NVNT	a	5200	100	0	0
NVNT	a	5240	100	0	0
NVNT	n20	5180	100	0	0
NVNT	n20	5200	100	0	0
NVNT	n20	5240	100	0	0
NVNT	n40	5190	100	0	0
NVNT	n40	5230	100	0	0
NVNT	ac20	5180	100	0	0
NVNT	ac20	5200	100	0	0
NVNT	ac20	5240	100	0	0
NVNT	ac40	5190	100	0	0
NVNT	ac40	5230	100	0	0
NVNT	ac80	5210	100	0	0
NVNT	ax20	5180	100	0	0
NVNT	ax20	5200	100	0	0
NVNT	ax20	5240	100	0	0
NVNT	ax40	5190	100	0	0
NVNT	ax40	5230	100	0	0
NVNT	ax80	5210	100	0	0

