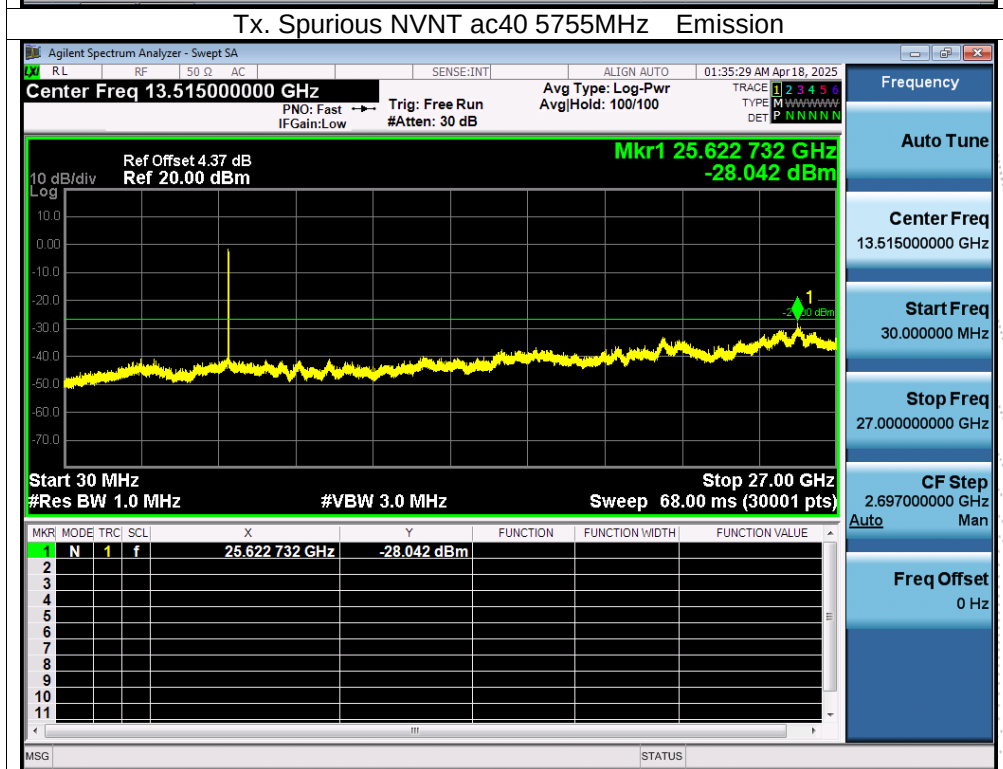
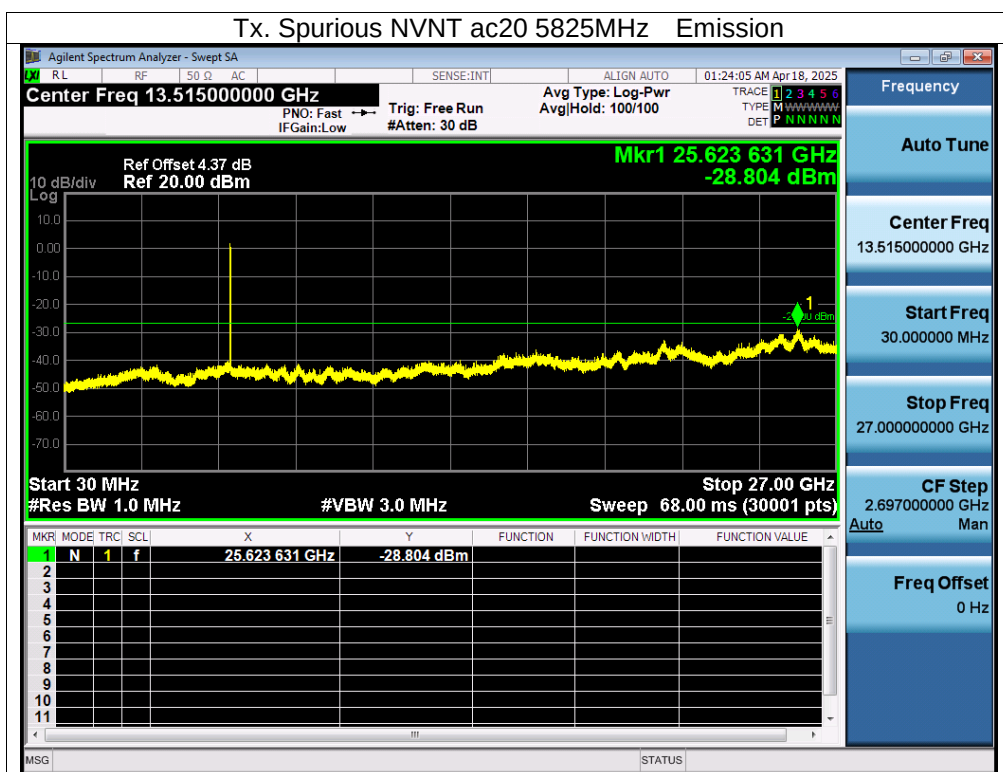
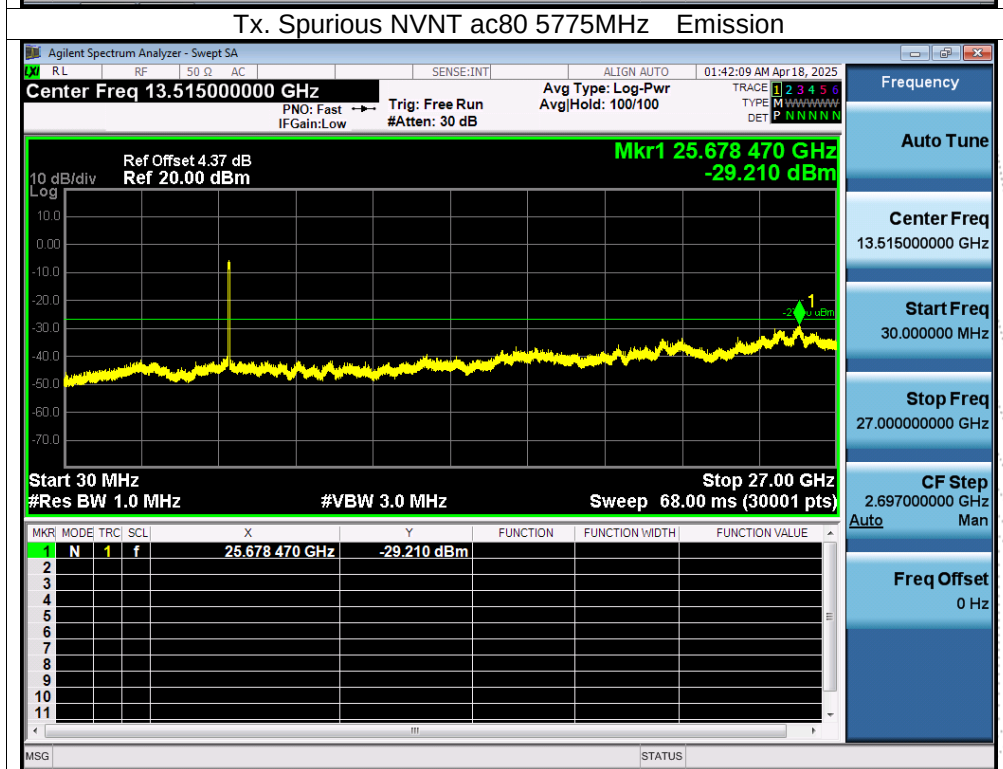
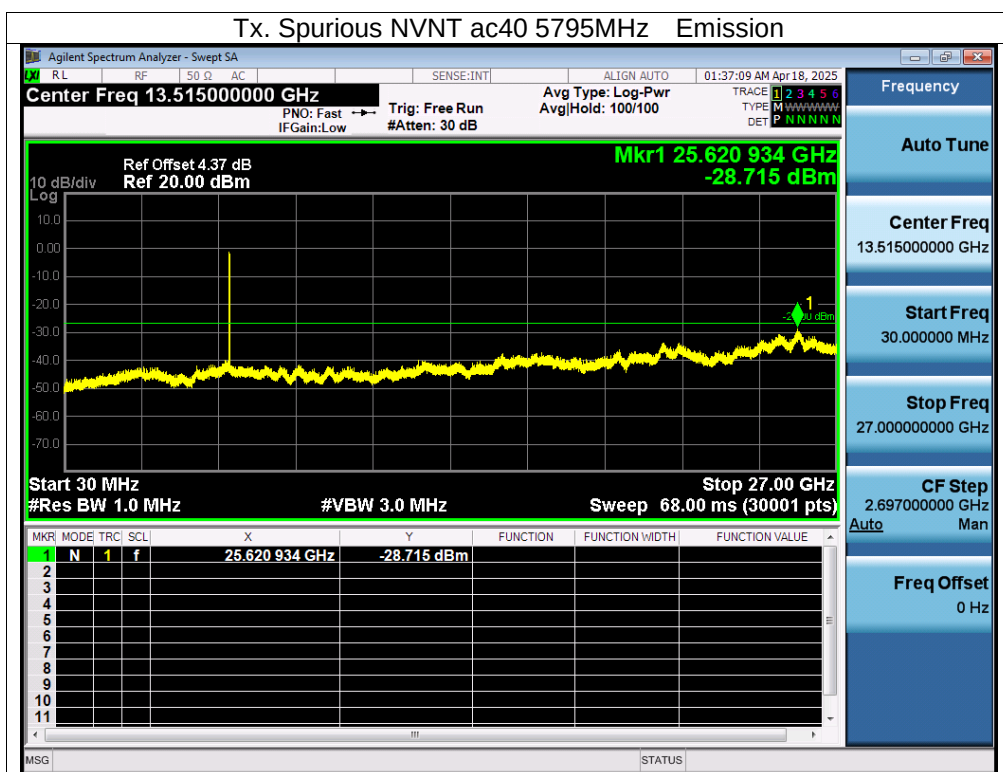
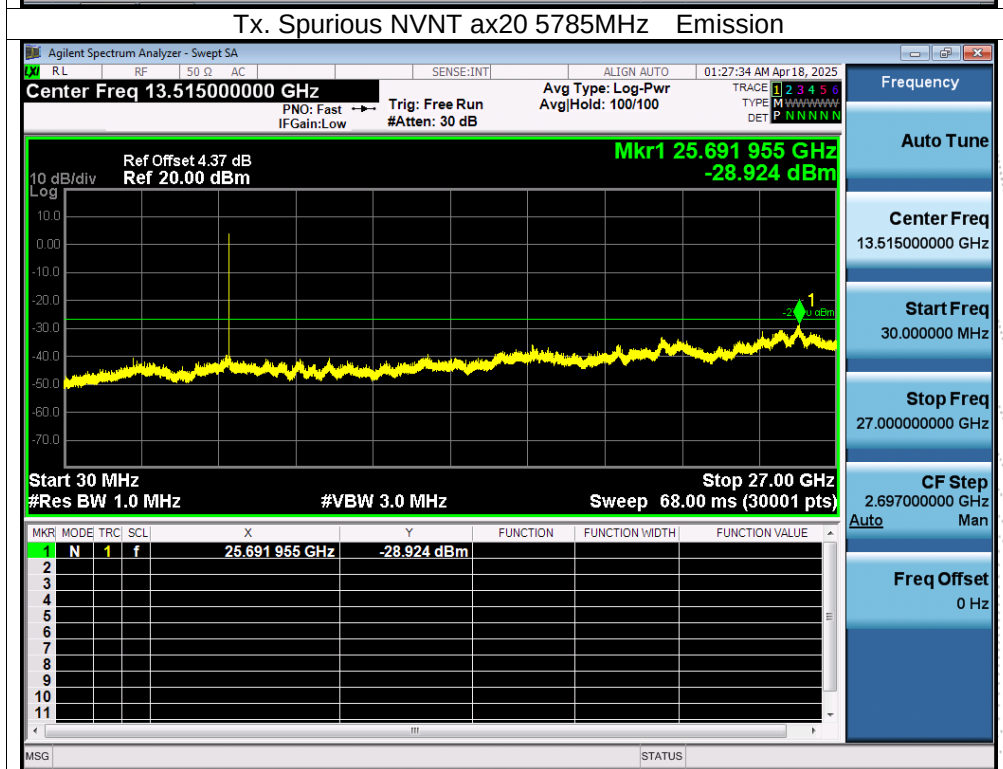
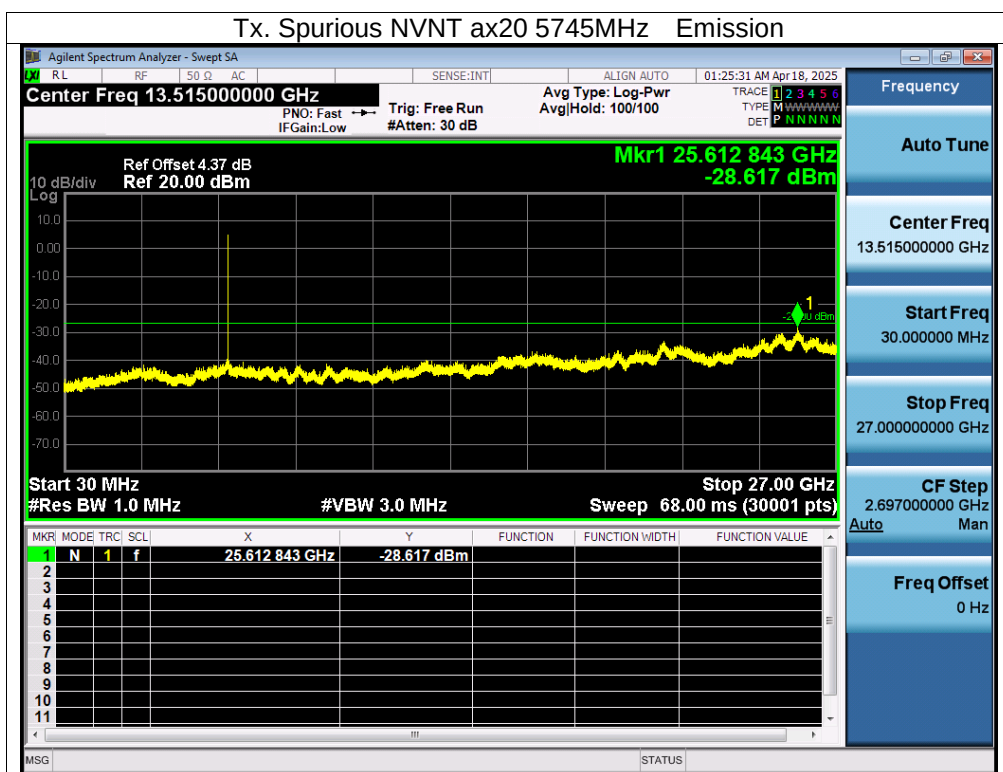
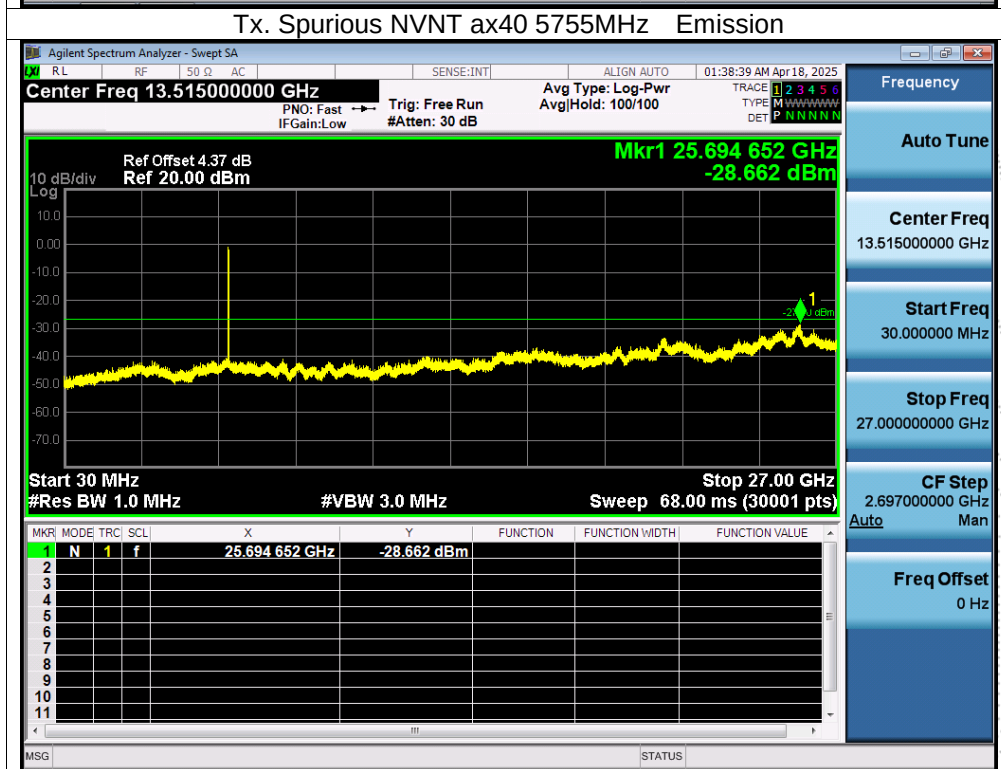
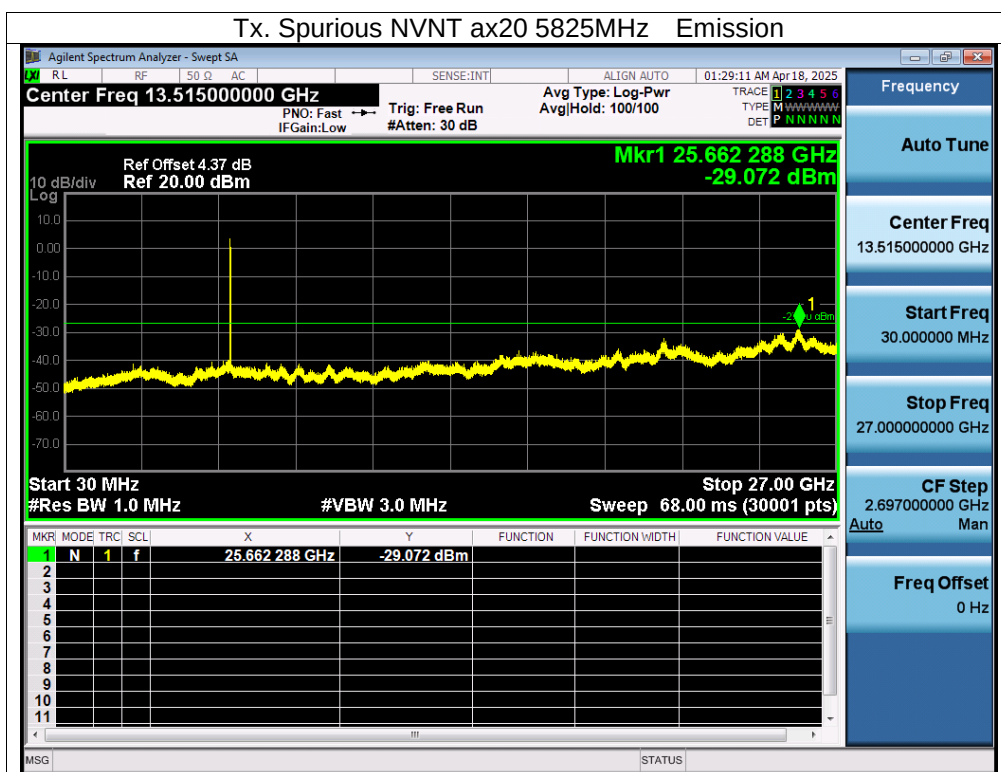
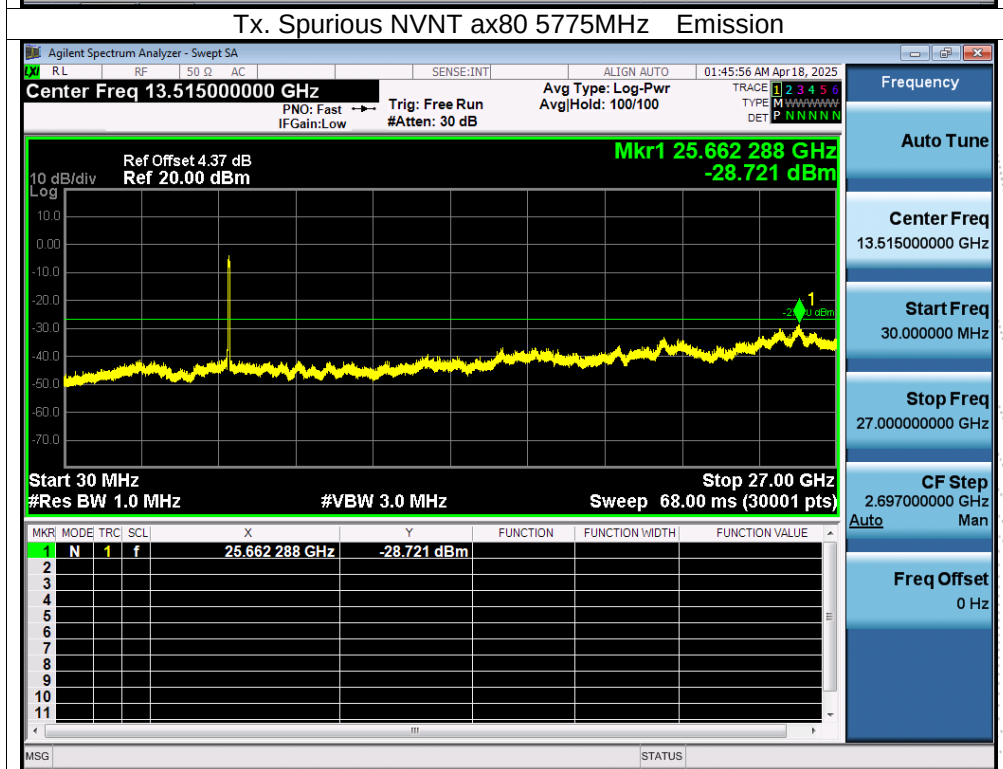
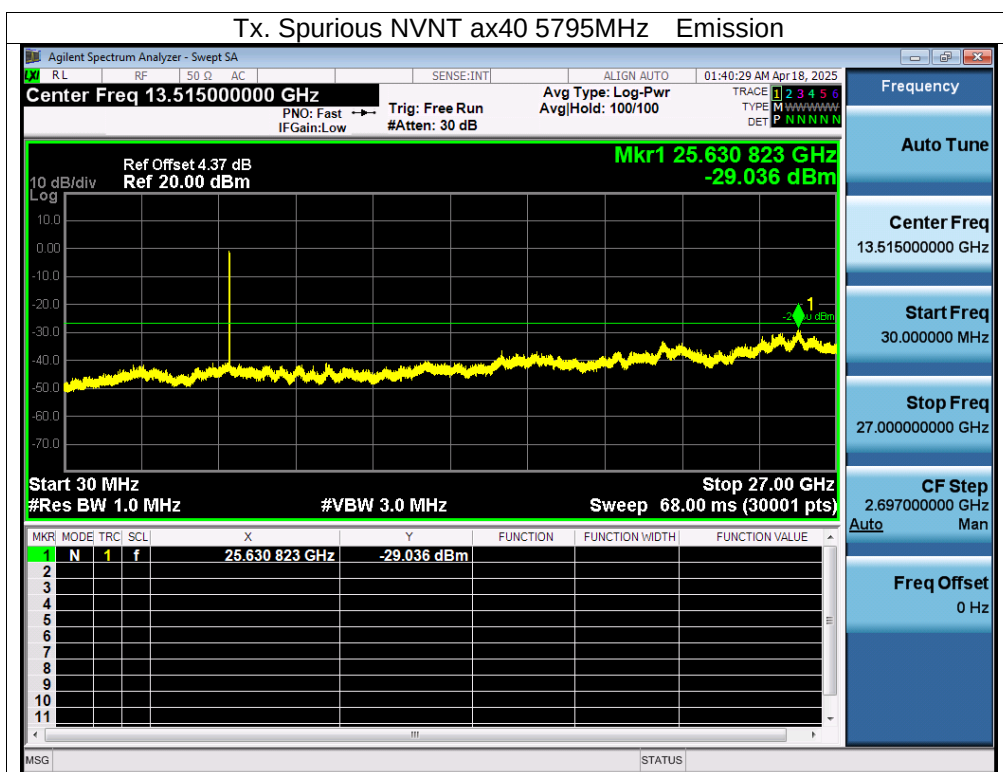












13. Frequency Stability Measurement

13.1 Block Diagram Of Test Setup



13.2 Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification)..

13.3 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and he limit is less than ± 20 ppm (IEEE 802.11n specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is $-20^\circ\text{C} \sim 70^\circ\text{C}$.

13.4 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 3.3V
Test Mode:	TX (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)	3.3	5180.0122	5180	0.0122	2.3552
		V max (V)	3.80	5180.0002	5180	0.0002	0.0386
		V min (V)	2.81	5180.0127	5180	0.0127	2.4517
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	5180.0021	5180	0.0021	0.4054
		T (°C)	-10	5180.0085	5180	0.0085	1.6409
		T (°C)	0	5180.0116	5180	0.0116	2.2394
		T (°C)	10	5180.0035	5180	0.0035	0.6757
		T (°C)	20	5180.0113	5180	0.0113	2.1815
		T (°C)	30	5180.0014	5180	0.0014	0.2703
		T (°C)	40	5180.0016	5180	0.0016	0.3089
		T (°C)	50	5180.0031	5180	0.0031	0.5985
		T (°C)	60	5180.0059	5180	0.0059	1.1390
		T (°C)	70	5180.0112	5180	0.0112	2.1622
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)	3.3	5200.0109	5200	0.0109	2.0962
		V max (V)	3.80	5200.0068	5200	0.0068	1.3077
		V min (V)	2.81	5200.0119	5200	0.0119	2.2885
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)	3.3	T (°C)	-20	5200.00530	5200	0.00530	1.0192
		T (°C)	-10	5200.01260	5200	0.01260	2.4231
		T (°C)	0	5200.01240	5200	0.01240	2.3846
		T (°C)	10	5200.00210	5200	0.00210	0.4038
		T (°C)	20	5200.00510	5200	0.00510	0.9808
		T (°C)	30	5200.00910	5200	0.00910	1.7500
		T (°C)	40	5200.00310	5200	0.00310	0.5962
		T (°C)	50	5200.01010	5200	0.01010	1.9423
		T (°C)	60	5200.00610	5200	0.00610	1.1731
		T (°C)	70	5200.00850	5200	0.00850	1.6346
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)	3.3	5240.0047	5240	0.0047	0.8969
		V max (V)	3.80	5240.0067	5240	0.0067	1.2786
		V min (V)	2.81	5240.0077	5240	0.0077	1.4695
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	5240.0033	5240	0.0033	0.6298
		T (°C)	-10	5240.0000	5240	0.0000	0.0000
		T (°C)	0	5240.0014	5240	0.0014	0.2672
		T (°C)	10	5240.0062	5240	0.0062	1.1832
		T (°C)	20	5240.0098	5240	0.0098	1.8702
		T (°C)	30	5240.0058	5240	0.0058	1.1069
		T (°C)	40	5240.0090	5240	0.0090	1.7176
		T (°C)	50	5240.0020	5240	0.0020	0.3817
		T (°C)	60	5240.0098	5240	0.0098	1.8702
		T (°C)	70	5240.0039	5240	0.0039	0.7443
Limits				5150-5250 MHz			
Result				Complies			

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 3.3V
Test Mode:	TX (5.3G) Mode Frequency U-NII-2A (5260-5320MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.3	5260.0131	5260	0.0131	2.4905
		V max (V)	3.80	5260.0052	5260	0.0052	0.9886
		V min (V)	2.81	5260.0025	5260	0.0025	0.4753
Limits				5250-5350 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	5260.0036	5260	0.0036	0.6844
		T (°C)	-10	5260.0105	5260	0.0105	1.9962
		T (°C)	0	5260.0133	5260	0.0133	2.5285
		T (°C)	10	5260.0004	5260	0.0004	0.0760
		T (°C)	20	5260.0042	5260	0.0042	0.7985
		T (°C)	30	5260.0100	5260	0.0100	1.9011
		T (°C)	40	5260.0080	5260	0.0080	1.5209
		T (°C)	50	5260.0038	5260	0.0038	0.7224
		T (°C)	60	5260.0098	5260	0.0098	1.8631
		T (°C)	70	5260.0127	5260	0.0127	2.4144
Limits				5250-5350 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)	3.3	5280.0051	5280	0.0051	0.9659
		V max (V)	3.80	5280.0031	5280	0.0031	0.5871
		V min (V)	2.81	5280.0091	5280	0.0091	1.7235
Limits				5250-5350 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	5280.00990	5280	0.00990	1.8750
		T (°C)	-10	5280.01270	5280	0.01270	2.4053
		T (°C)	0	5280.00570	5280	0.00570	1.0795
		T (°C)	10	5280.00740	5280	0.00740	1.4015
		T (°C)	20	5280.01210	5280	0.01210	2.2917
		T (°C)	30	5280.00790	5280	0.00790	1.4962
		T (°C)	40	5280.01060	5280	0.01060	2.0076
		T (°C)	50	5280.00030	5280	0.00030	0.0568
		T (°C)	60	5280.00170	5280	0.00170	0.3220
		T (°C)	70	5280.01160	5280	0.01160	2.1970
Limits				5250-5350 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)	3.3	5320.0067	5320	0.0067	1.2594
		V max (V)	3.80	5320.0071	5320	0.0071	1.3346
		V min (V)	2.81	5320.0065	5320	0.0065	1.2218
Limits				5250-5350 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	5320.0015	5320	0.0015	0.2820
		T (°C)	-10	5320.0130	5320	0.0130	2.4436
		T (°C)	0	5320.0052	5320	0.0052	0.9774
		T (°C)	10	5320.0088	5320	0.0088	1.6541
		T (°C)	20	5320.0043	5320	0.0043	0.8083
		T (°C)	30	5320.0101	5320	0.0101	1.8985
		T (°C)	40	5320.0079	5320	0.0079	1.4850
		T (°C)	50	5320.0091	5320	0.0091	1.7105
		T (°C)	60	5320.0109	5320	0.0109	2.0489
		T (°C)	70	5320.0053	5320	0.0053	0.9962
Limits				5250-5350 MHz			
Result				Complies			

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 3.3V
Test Mode:	TX (5.6G) Mode Frequency U-NII-2C (5500-5700MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5500MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.3	5500.0064	5500	0.0064	1.1636
		V max (V)	3.80	5500.0054	5500	0.0054	0.9818
		V min (V)	2.81	5500.0111	5500	0.0111	2.0182
Limits				5470-5725 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5500MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5500.0052	5500	0.0052	0.9455
		T (°C)	-10	5500.0134	5500	0.0134	2.4364
		T (°C)	0	5500.0069	5500	0.0069	1.2545
		T (°C)	10	5500.0025	5500	0.0025	0.4545
		T (°C)	20	5500.0130	5500	0.0130	2.3636
		T (°C)	30	5500.0050	5500	0.0050	0.9091
		T (°C)	40	5500.0040	5500	0.0040	0.7273
		T (°C)	50	5500.0084	5500	0.0084	1.5273
		T (°C)	60	5500.0057	5500	0.0057	1.0364
		T (°C)	70	5500.0131	5500	0.0131	2.3818
Limits				5470-5725 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5580MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.3	5580.0082	5580	0.0082	1.4695
		V max (V)	3.80	5580.0082	5580	0.0082	1.4695
		V min (V)	2.81	5580.0113	5580	0.0113	2.0251
Limits				5470-5725 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5580MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5580.00730	5580	0.00730	1.3082
		T (°C)	-10	5580.00840	5580	0.00840	1.5054
		T (°C)	0	5580.00700	5580	0.00700	1.2545
		T (°C)	10	5580.00470	5580	0.00470	0.8423
		T (°C)	20	5580.00030	5580	0.00030	0.0538
		T (°C)	30	5580.01160	5580	0.01160	2.0789
		T (°C)	40	5580.00810	5580	0.00810	1.4516
		T (°C)	50	5580.01000	5580	0.01000	1.7921
		T (°C)	60	5580.00660	5580	0.00660	1.1828
		T (°C)	70	5580.00120	5580	0.00120	0.2151
Limits				5470-5725 MHz			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5700MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.3	5700.0095	5700	0.0095	1.6667
		V max (V)	3.80	5700.0013	5700	0.0013	0.2281
		V min (V)	2.81	5700.0076	5700	0.0076	1.3333
Limits				5470-5725 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency : 5700MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	3.3	T (°C)	-20	5700.0033	5700	0.0033	0.5789
		T (°C)	-10	5700.0082	5700	0.0082	1.4386
		T (°C)	0	5700.0018	5700	0.0018	0.3158
		T (°C)	10	5700.0048	5700	0.0048	0.8421
		T (°C)	20	5700.0083	5700	0.0083	1.4561
		T (°C)	30	5700.0082	5700	0.0082	1.4386
		T (°C)	40	5700.0115	5700	0.0115	2.0175
		T (°C)	50	5700.0004	5700	0.0004	0.0702
		T (°C)	60	5700.0120	5700	0.0120	2.1053
		T (°C)	70	5700.0068	5700	0.0068	1.1930
Limits				5470-5725 MHz			
Result				Complies			

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 3.3V
Test Mode:	TX (5.8G) Mode Frequency U-NII-3 (5745-5825MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.3	5745.00350	5745	0.00350	0.6092
		V max (V)	3.80	5745.00700	5745	0.00700	1.2185
		V min (V)	2.81	5745.00530	5745	0.00530	0.9225
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	5745.01310	5745	0.01310	2.2802
		T (°C)	-10	5745.00980	5745	0.00980	1.7058
		T (°C)	0	5745.00990	5745	0.00990	1.7232
		T (°C)	10	5745.00590	5745	0.00590	1.0270
		T (°C)	20	5745.00150	5745	0.00150	0.2611
		T (°C)	30	5745.00150	5745	0.00150	0.2611
		T (°C)	40	5745.00240	5745	0.00240	0.4178
		T (°C)	50	5745.01050	5745	0.01050	1.8277
		T (°C)	60	5745.00530	5745	0.00530	0.9225
		T (°C)	70	5745.00240	5745	0.00240	0.4178
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)	3.3	5785.01300	5785	0.01300	2.2472
		V max (V)	3.80	5785.01210	5785	0.01210	2.0916
		V min (V)	2.81	5785.00330	5785	0.00330	0.5704
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	5785.00800	5785	0.00800	1.3829
		T (°C)	-10	5785.00920	5785	0.00920	1.5903
		T (°C)	0	5785.00830	5785	0.00830	1.4347
		T (°C)	10	5785.01260	5785	0.01260	2.1780
		T (°C)	20	5785.00170	5785	0.00170	0.2939
		T (°C)	30	5785.01030	5785	0.01030	1.7805
		T (°C)	40	5785.00670	5785	0.00670	1.1582
		T (°C)	50	5785.00280	5785	0.00280	0.4840
		T (°C)	60	5785.00300	5785	0.00300	0.5186
		T (°C)	70	5785.01210	5785	0.01210	2.0916
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)	3.3	5825.00920	5825	0.00920	1.5794
		V max (V)	3.80	5825.00090	5825	0.00090	0.1545
		V min (V)	2.81	5825.00870	5825	0.00870	1.4936
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	5825.01250	5825	0.01250	2.1459
		T (°C)	-10	5825.01150	5825	0.01150	1.9742
		T (°C)	0	5825.00310	5825	0.00310	0.5322
		T (°C)	10	5825.00270	5825	0.00270	0.4635
		T (°C)	20	5825.00130	5825	0.00130	0.2232
		T (°C)	30	5825.00300	5825	0.00300	0.5150
		T (°C)	40	5825.01320	5825	0.01320	2.2661
		T (°C)	50	5825.00470	5825	0.00470	0.8069
		T (°C)	60	5825.00400	5825	0.00400	0.6867
		T (°C)	70	5825.00540	5825	0.00540	0.9270
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

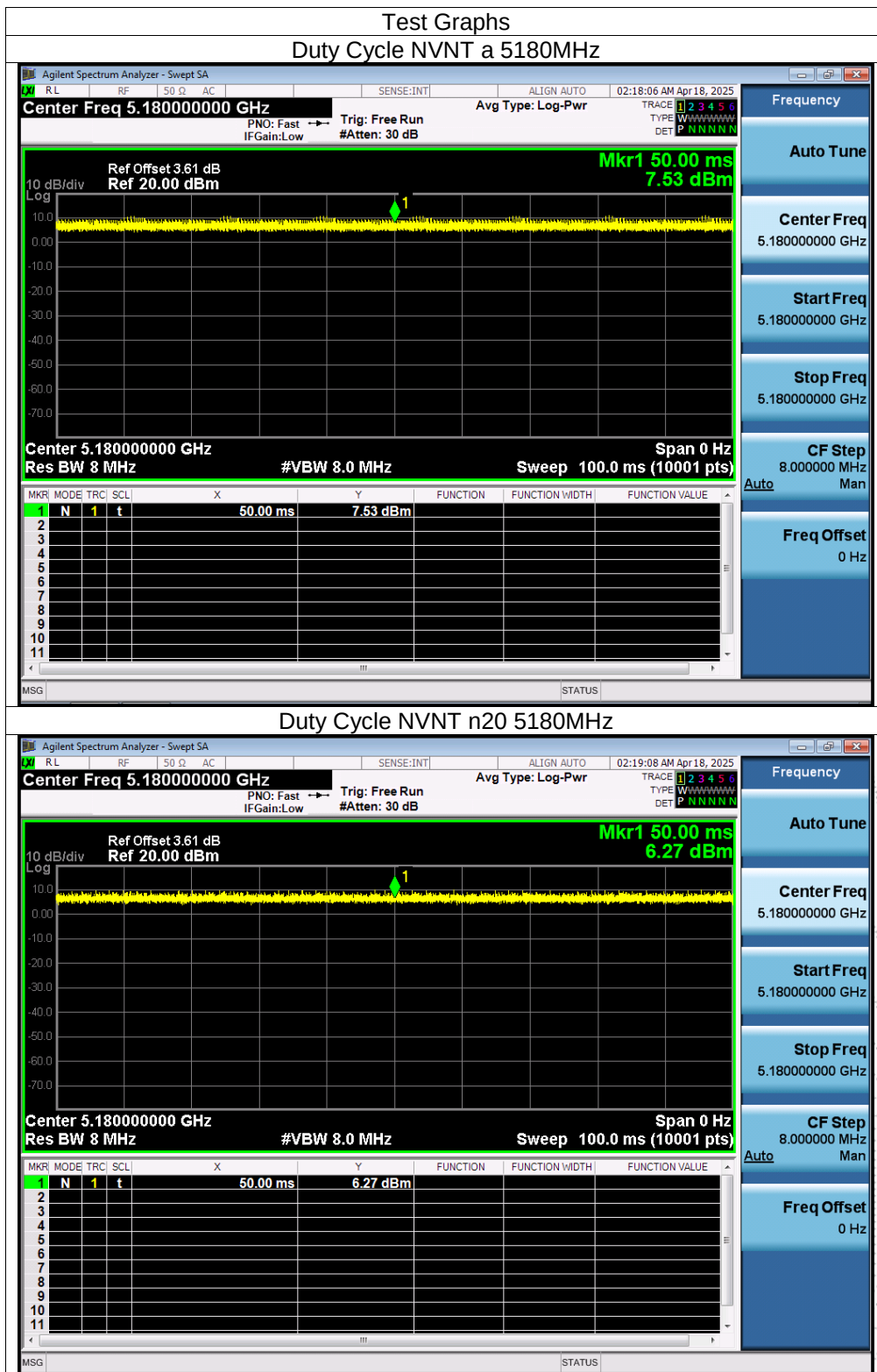
Duty Cycle = $T_{on} / (T_{on} + T_{off})$

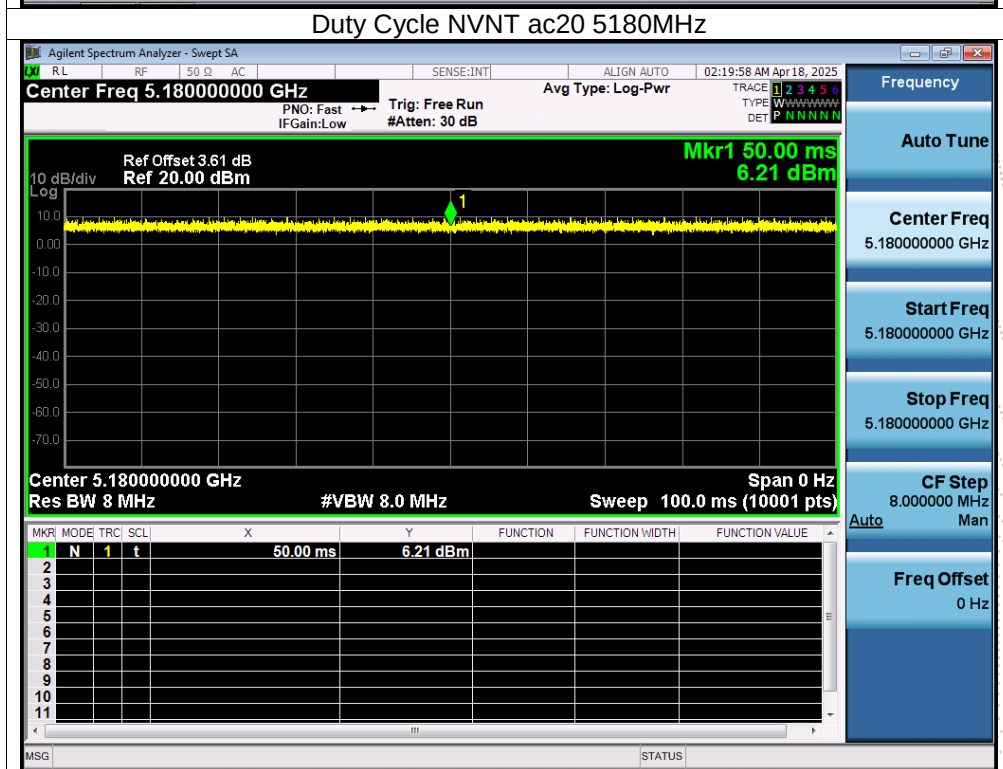
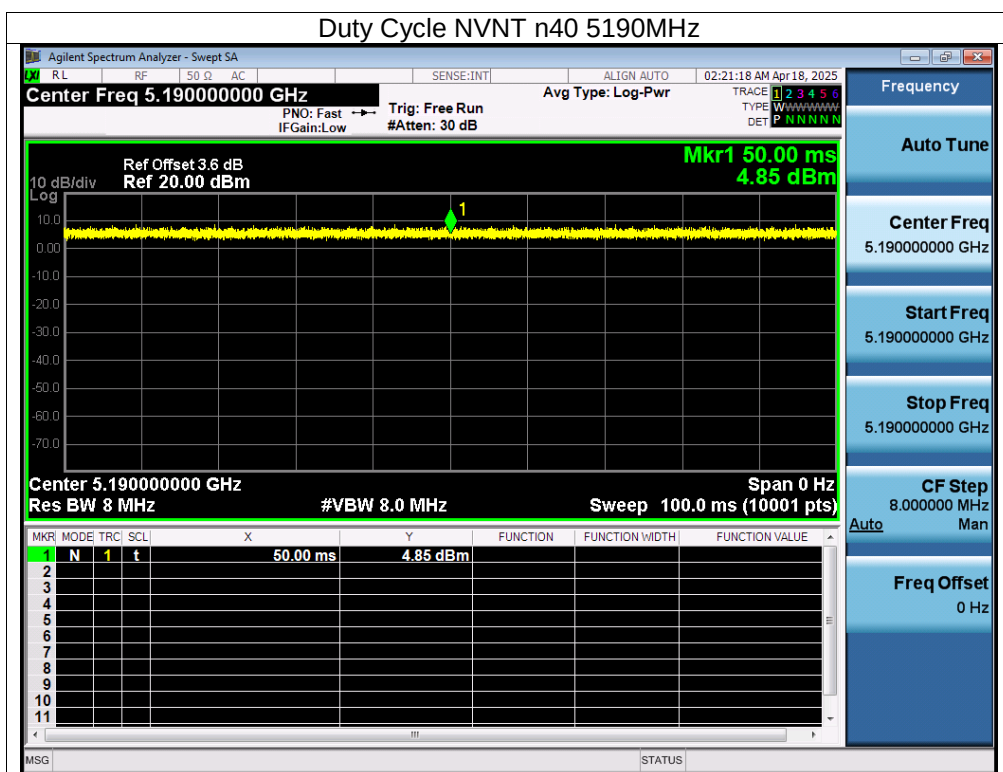
14.3 Test Procedure

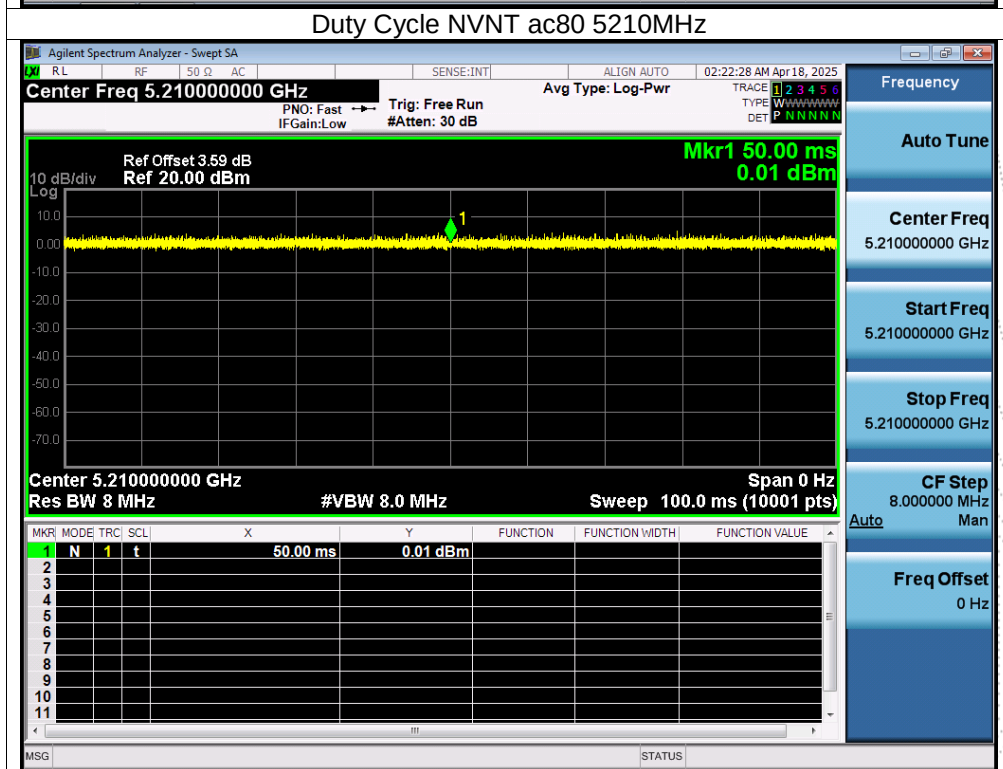
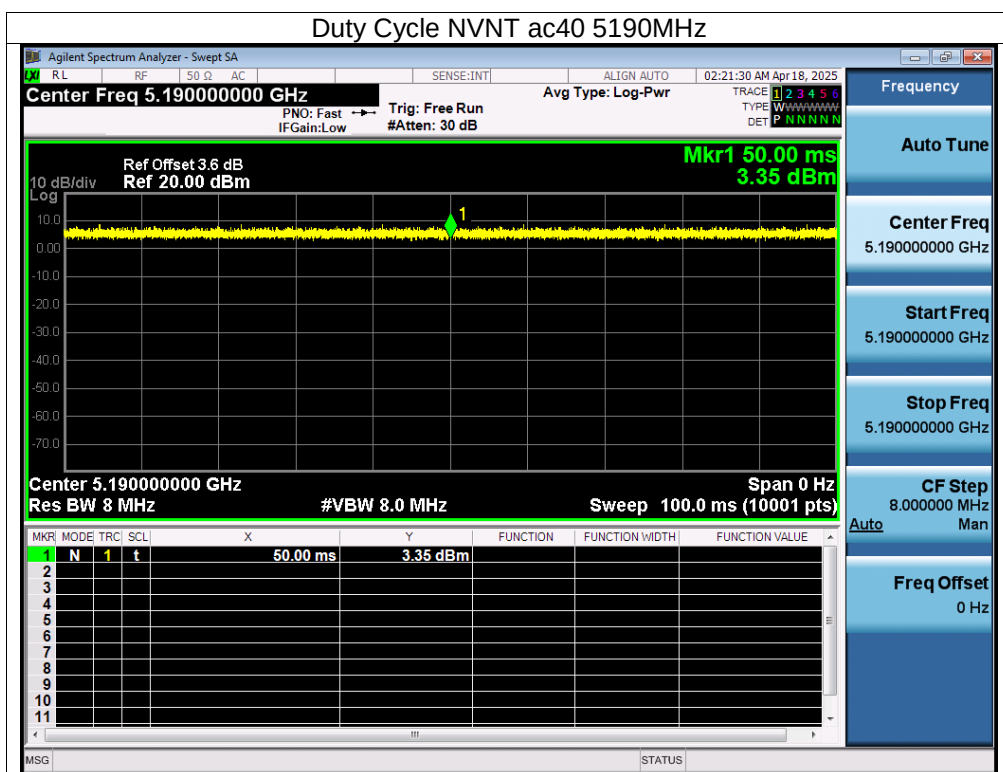
1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

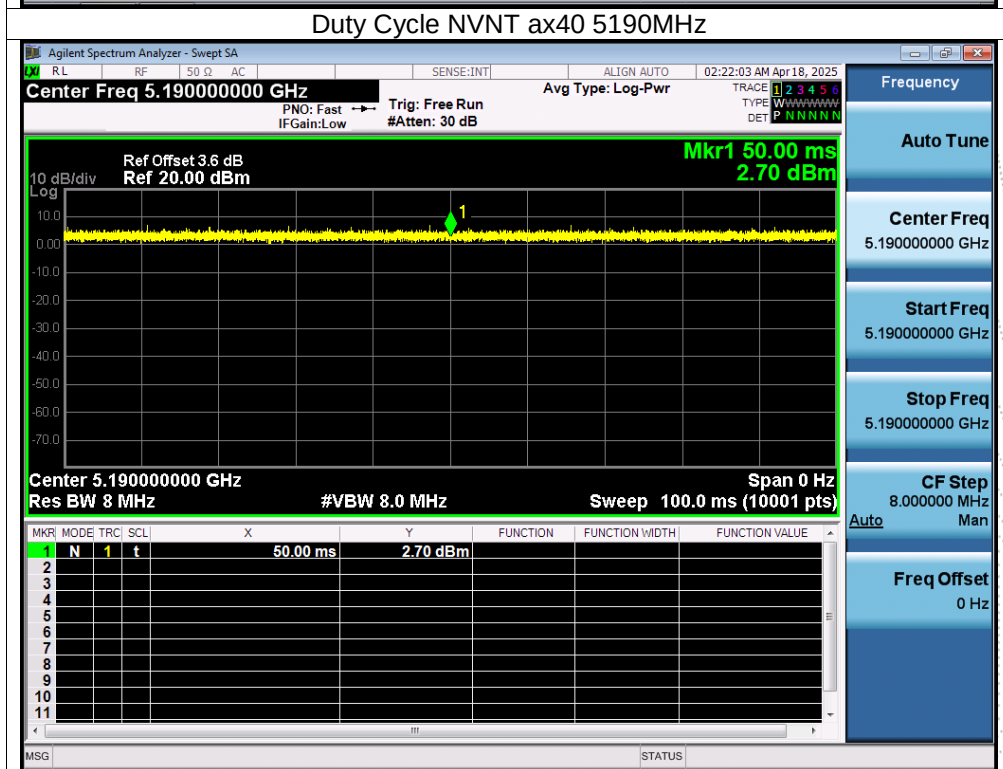
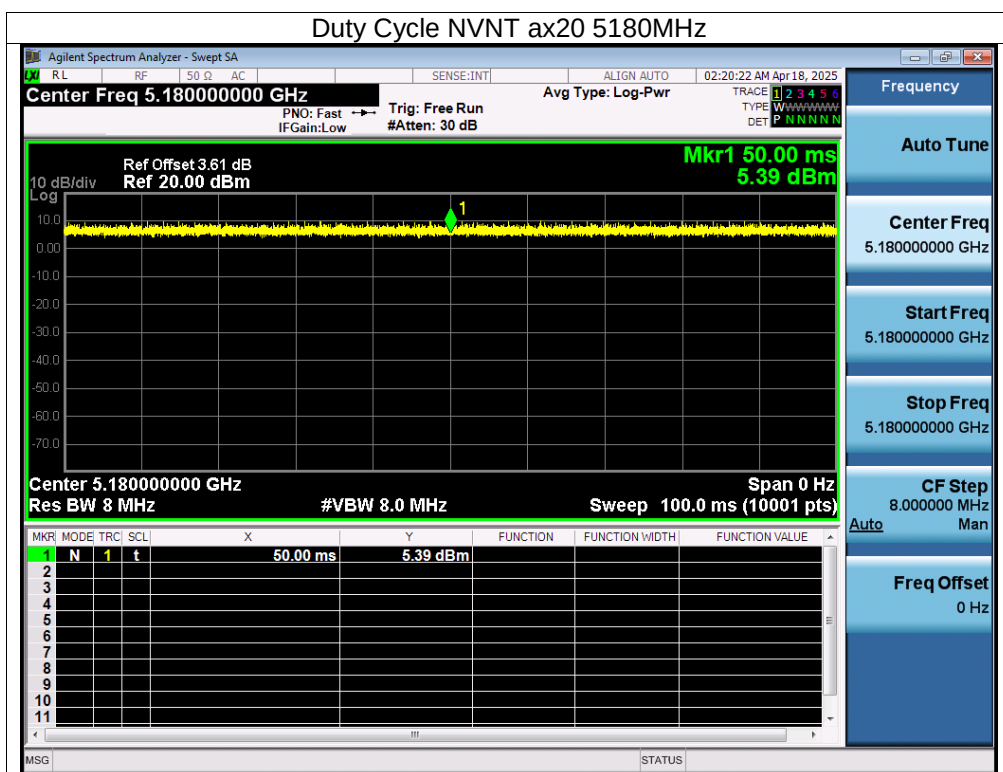
14.4 Test Result

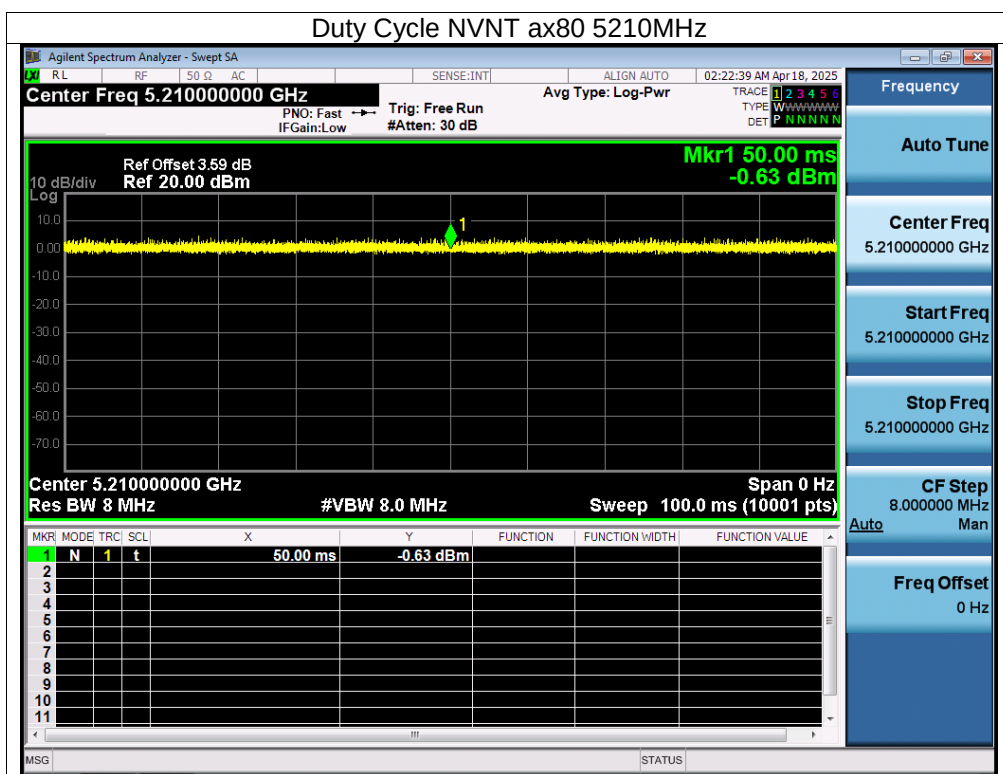
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)
NVNT	a	5180	100	0
NVNT	n20	5180	100	0
NVNT	n40	5190	100	0
NVNT	ac20	5180	100	0
NVNT	ac40	5190	100	0
NVNT	ac80	5210	100	0
NVNT	ax20	5180	100	0
NVNT	ax40	5190	100	0
NVNT	ax80	5210	100	0



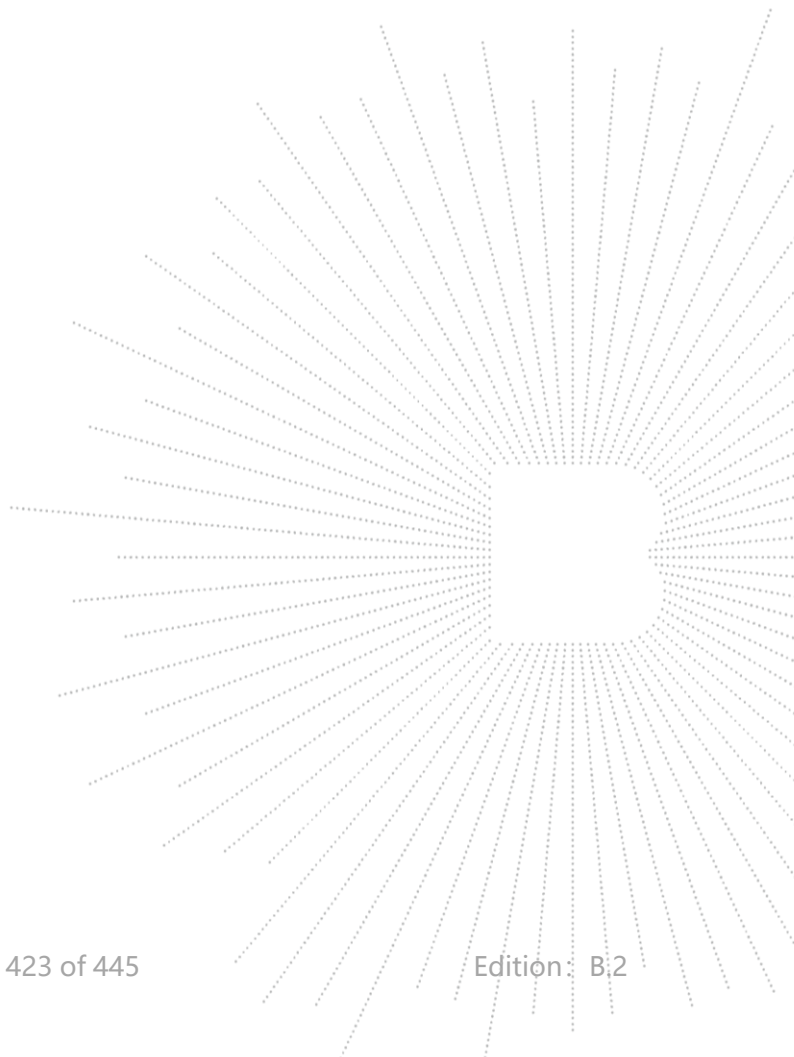


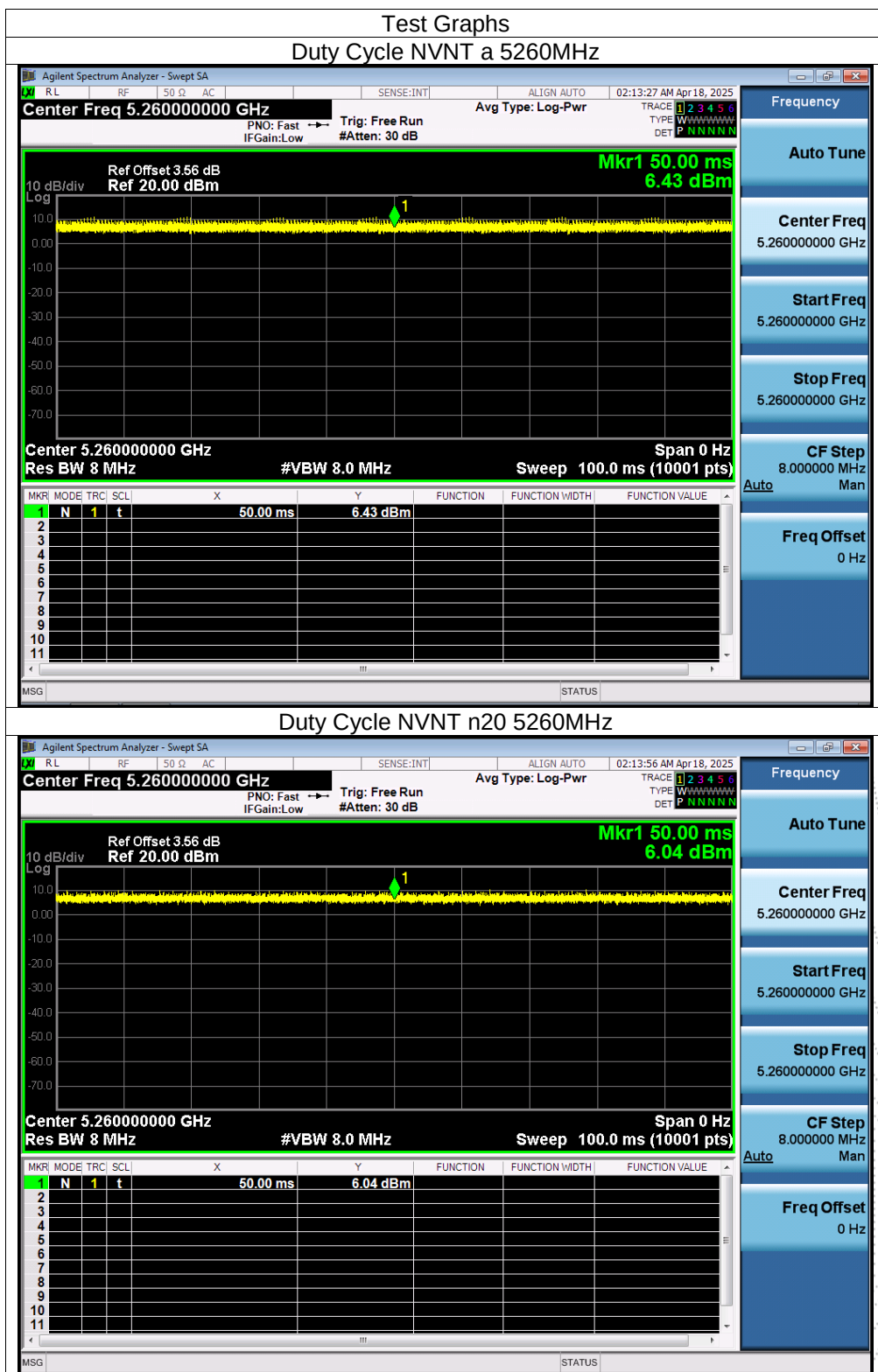


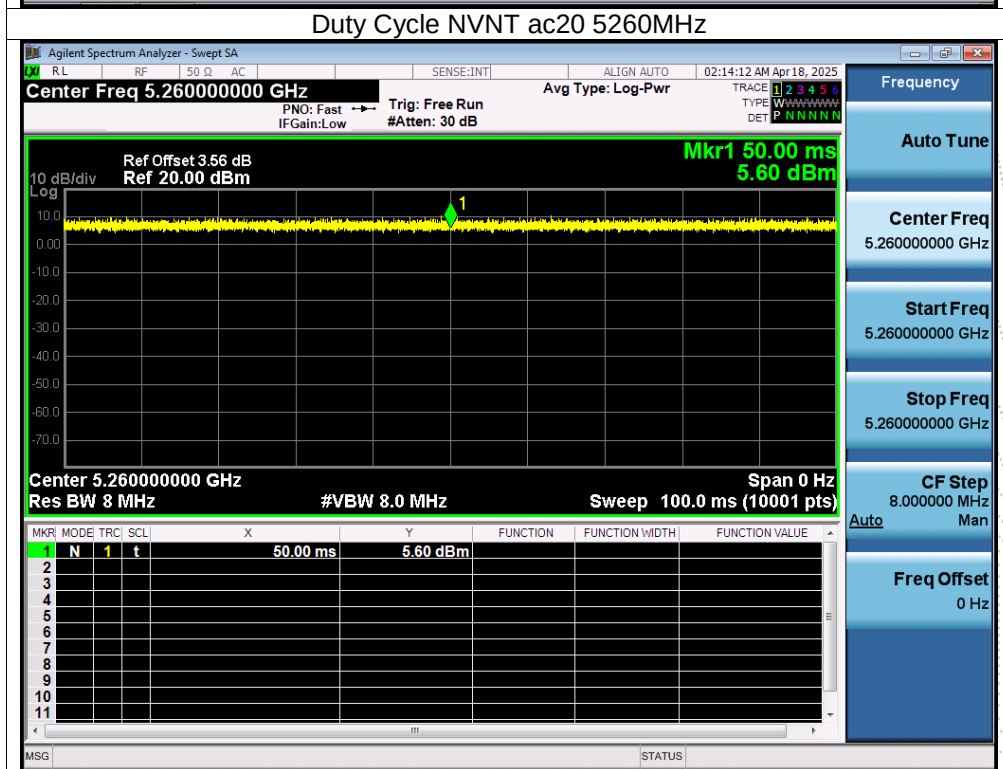
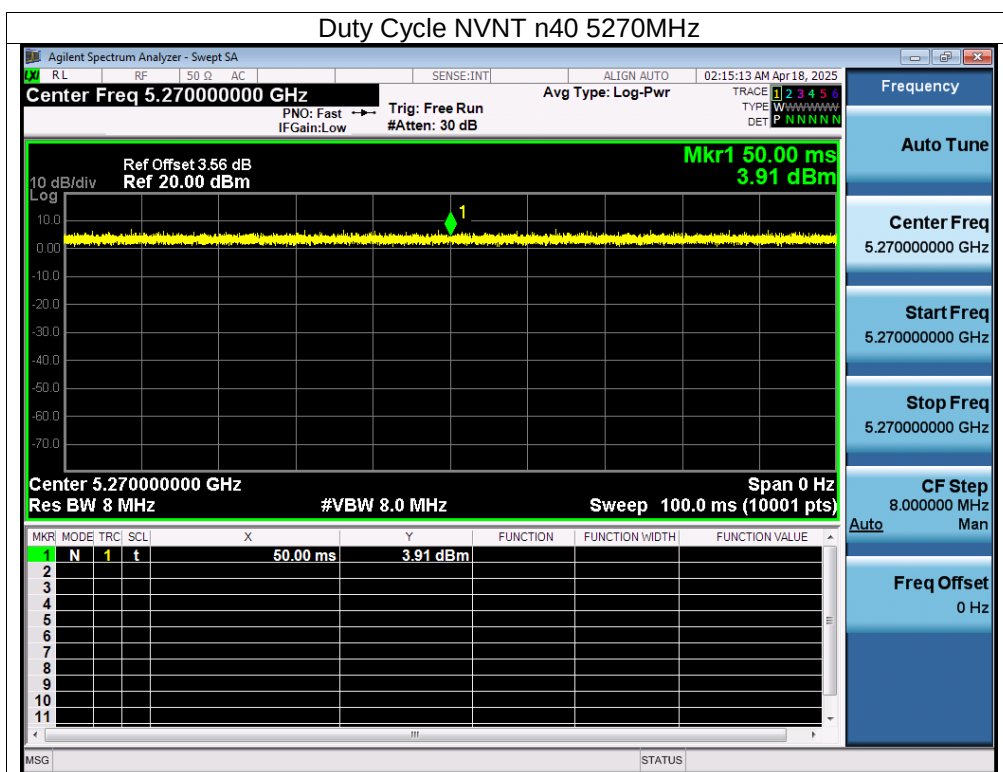


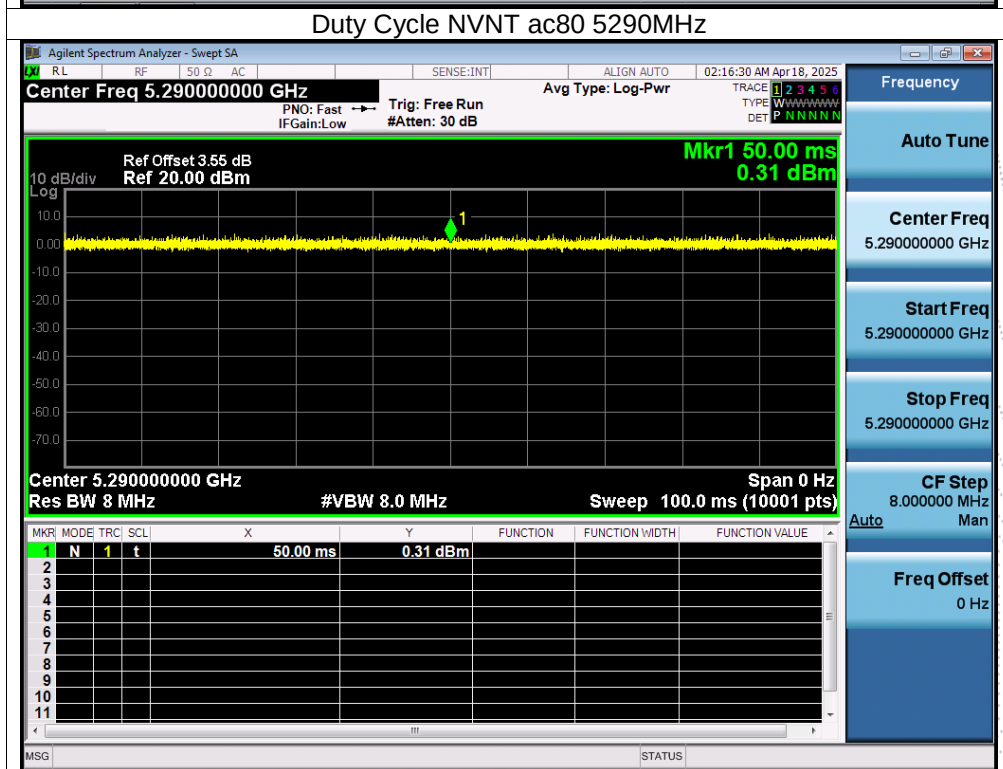
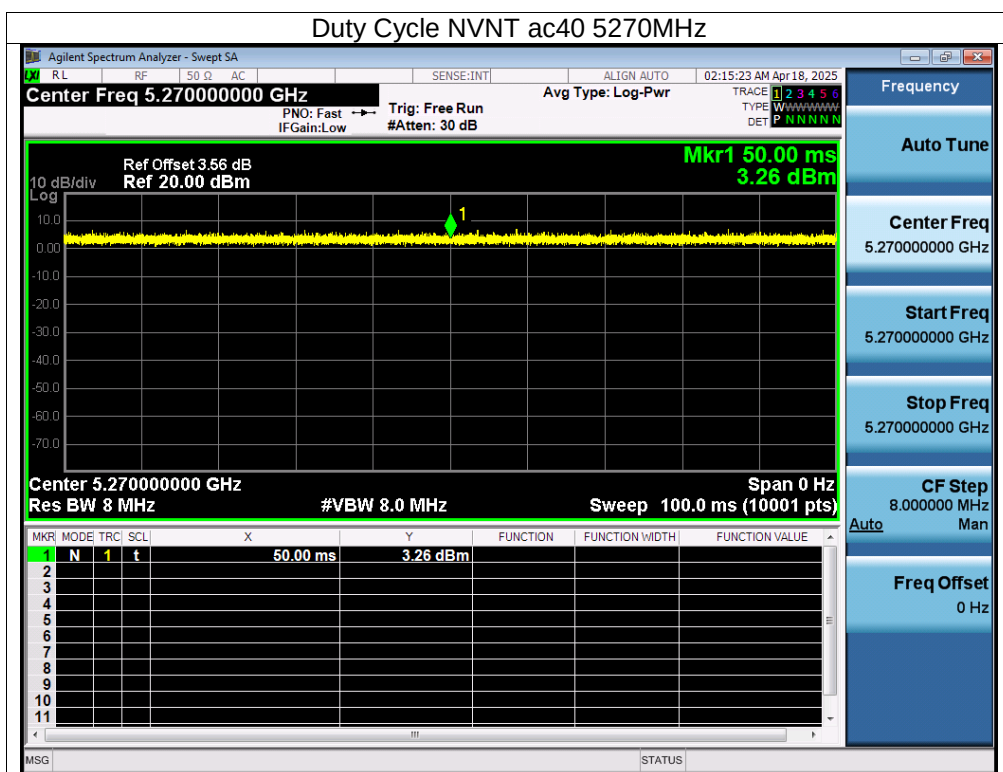


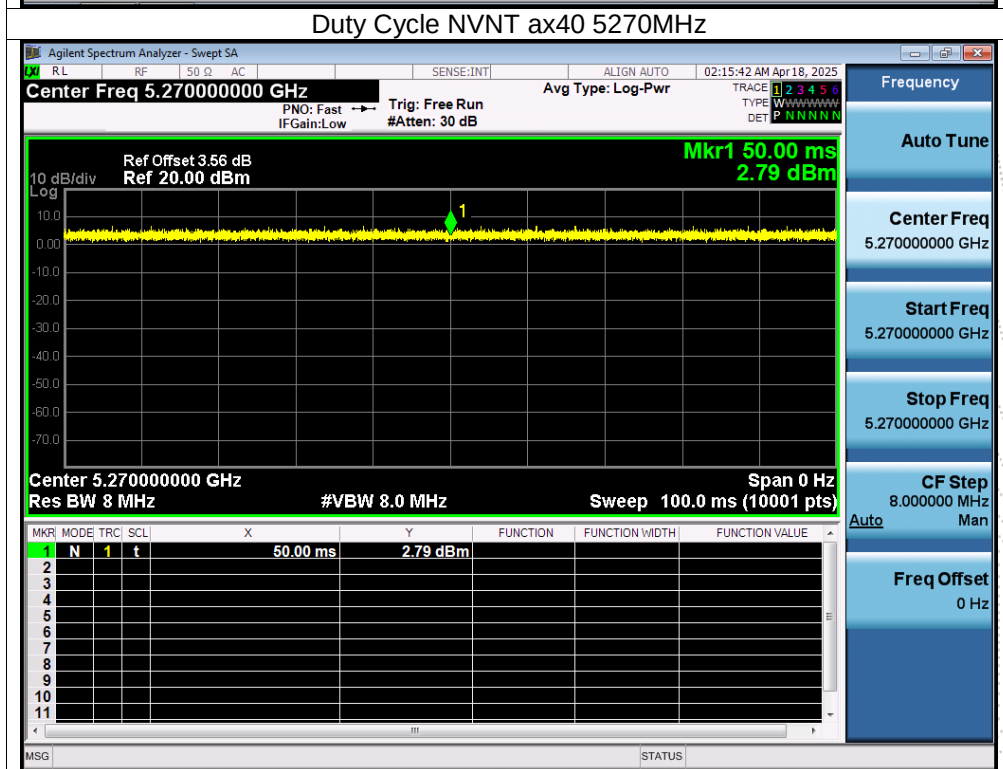
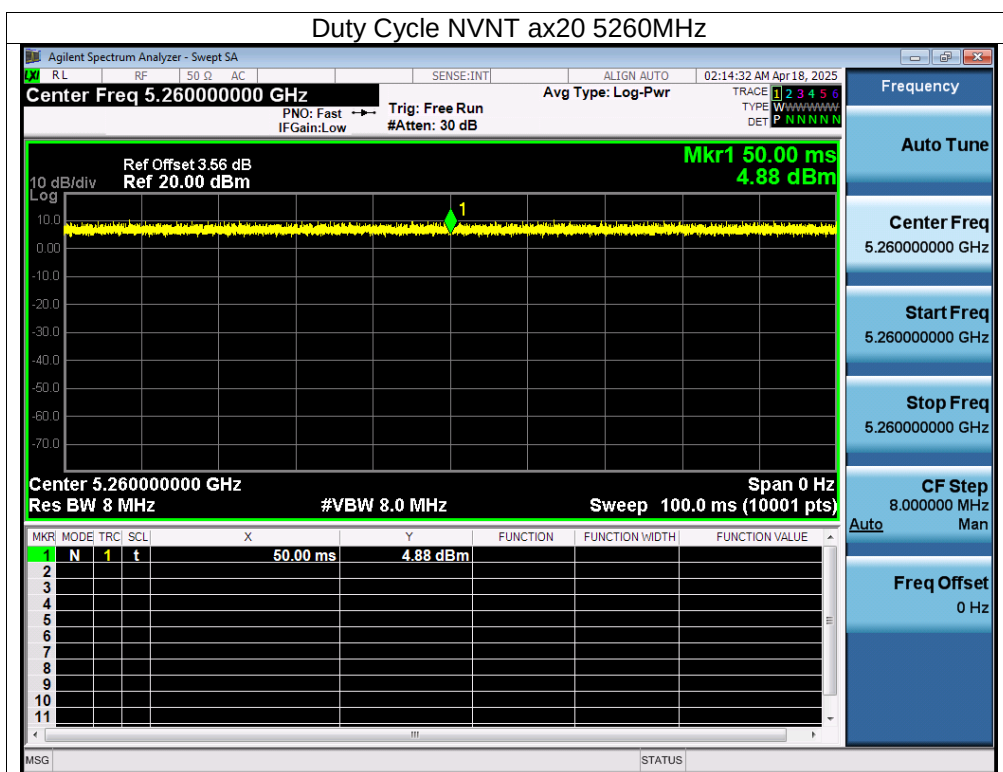
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)
NVNT	a	5260	100	0
NVNT	n20	5260	100	0
NVNT	n40	5270	100	0
NVNT	ac20	5260	100	0
NVNT	ac40	5270	100	0
NVNT	ac80	5290	100	0
NVNT	ax20	5260	100	0
NVNT	ax40	5270	100	0
NVNT	ax80	5290	100	0

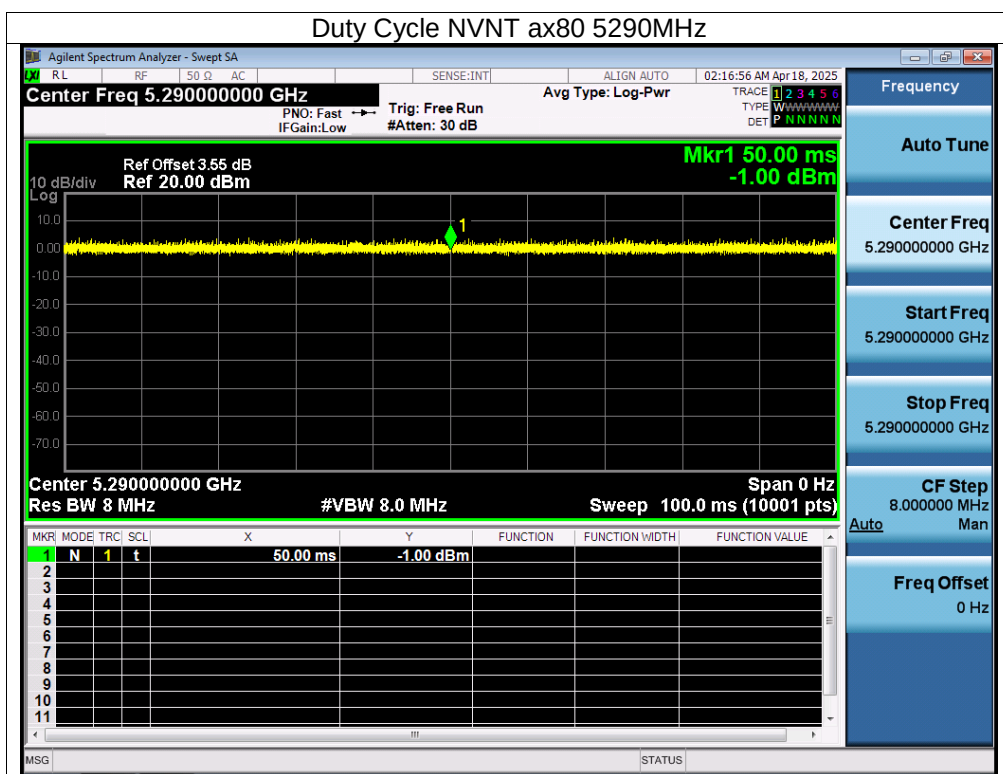




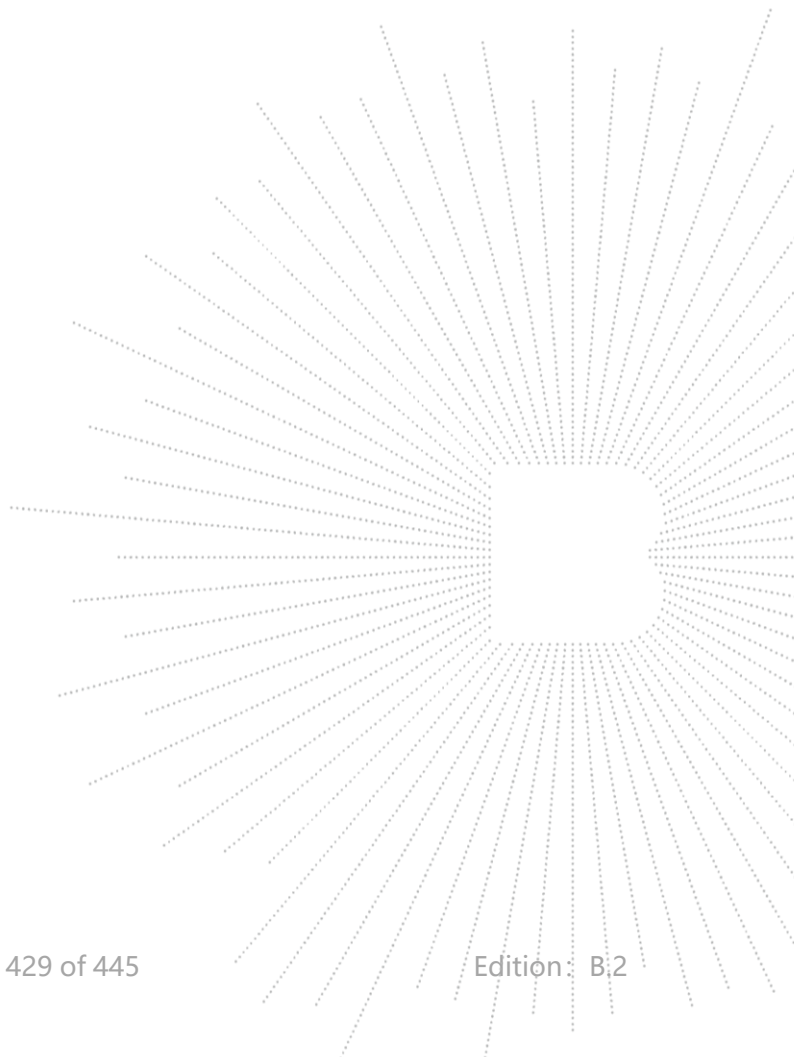


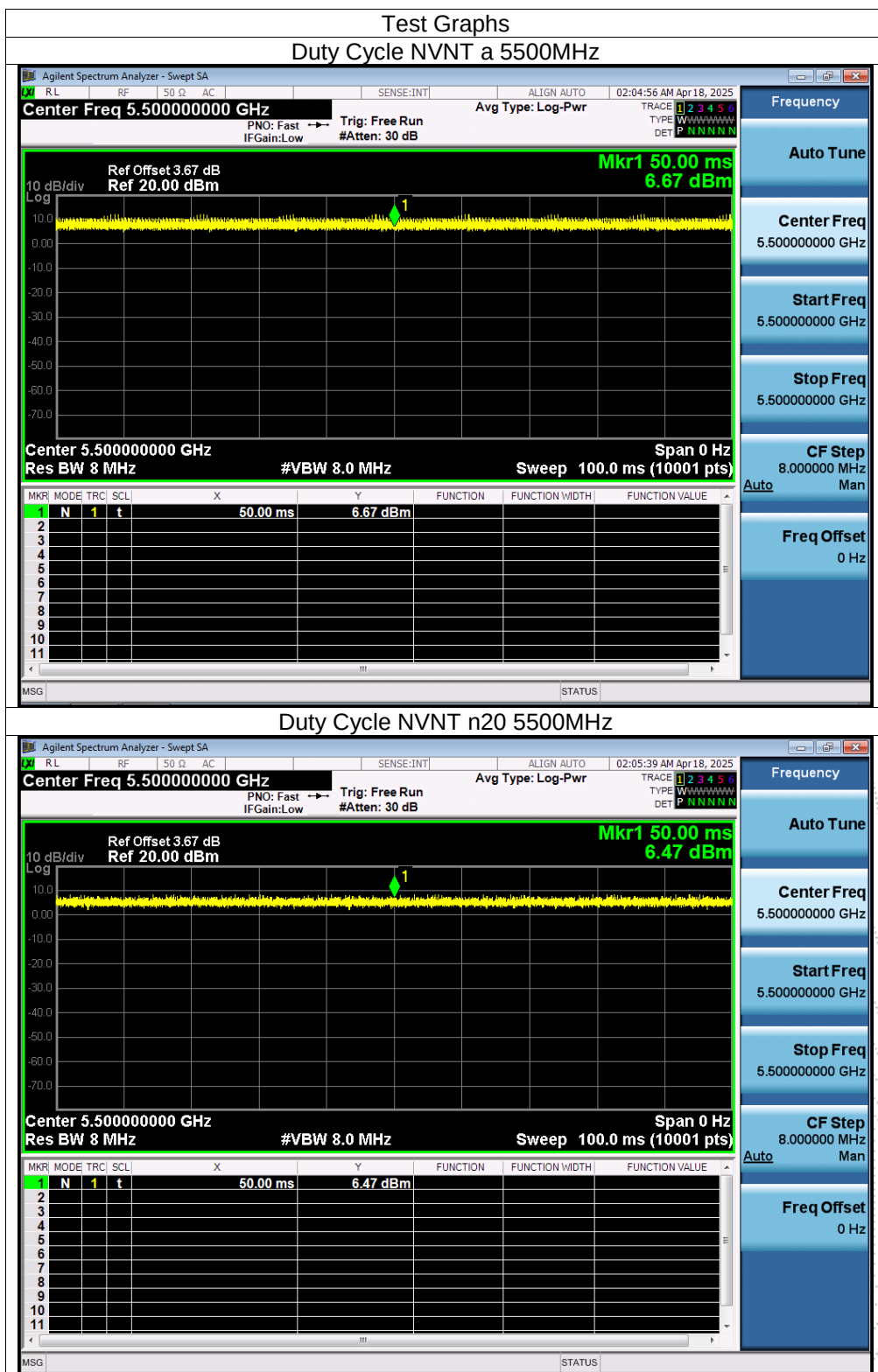


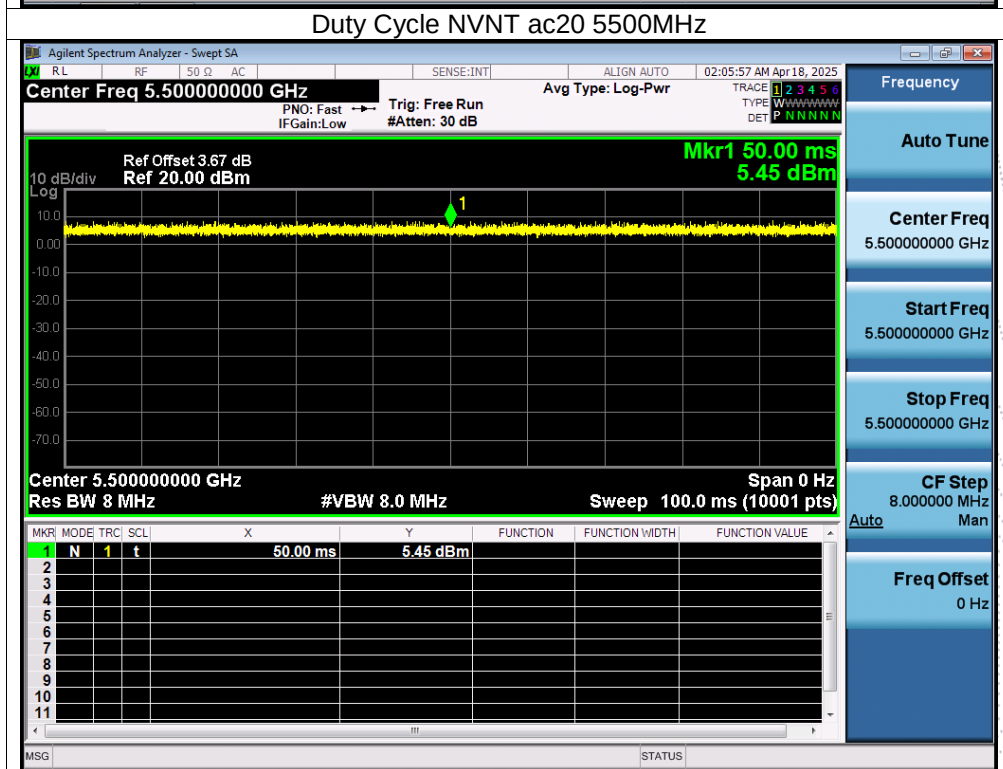
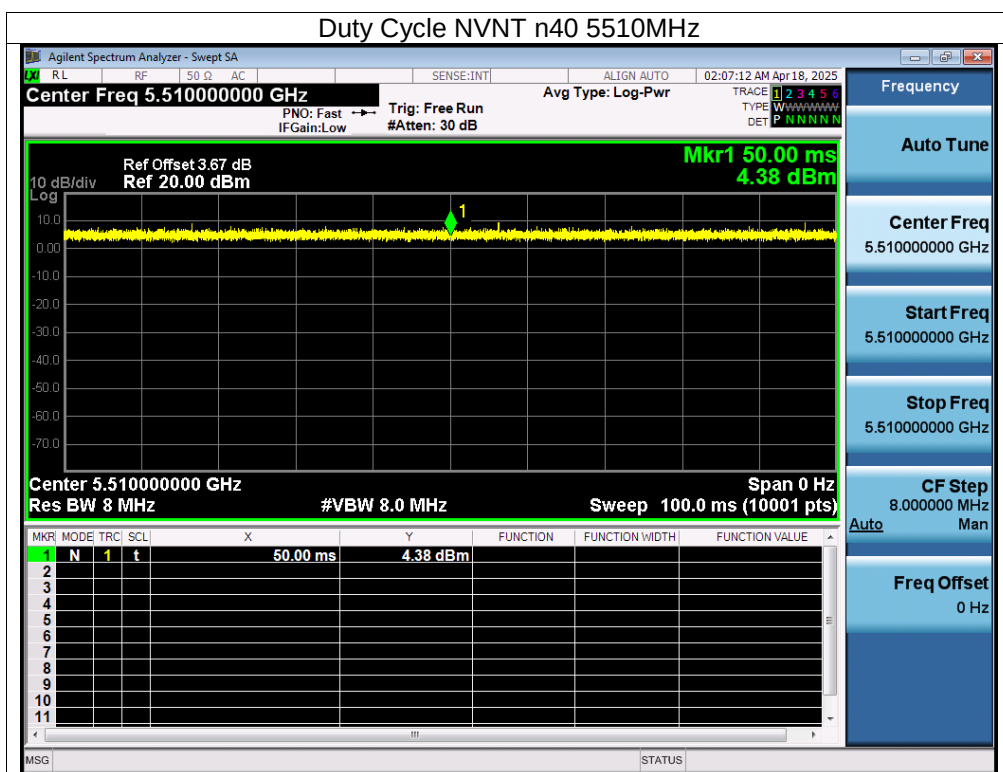


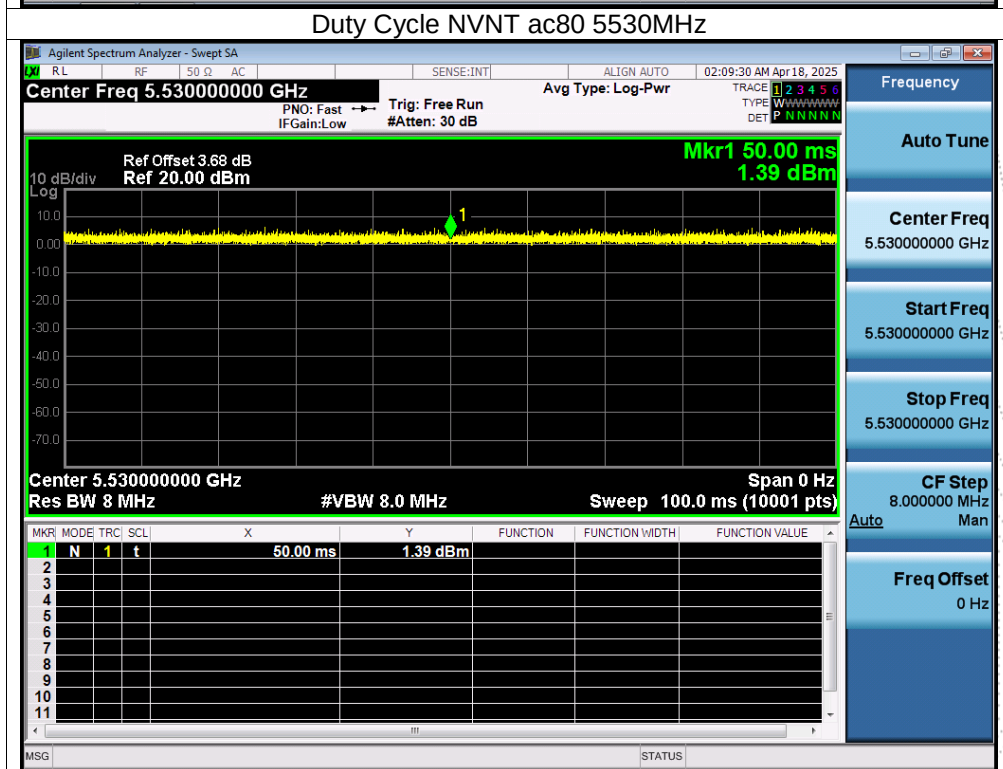
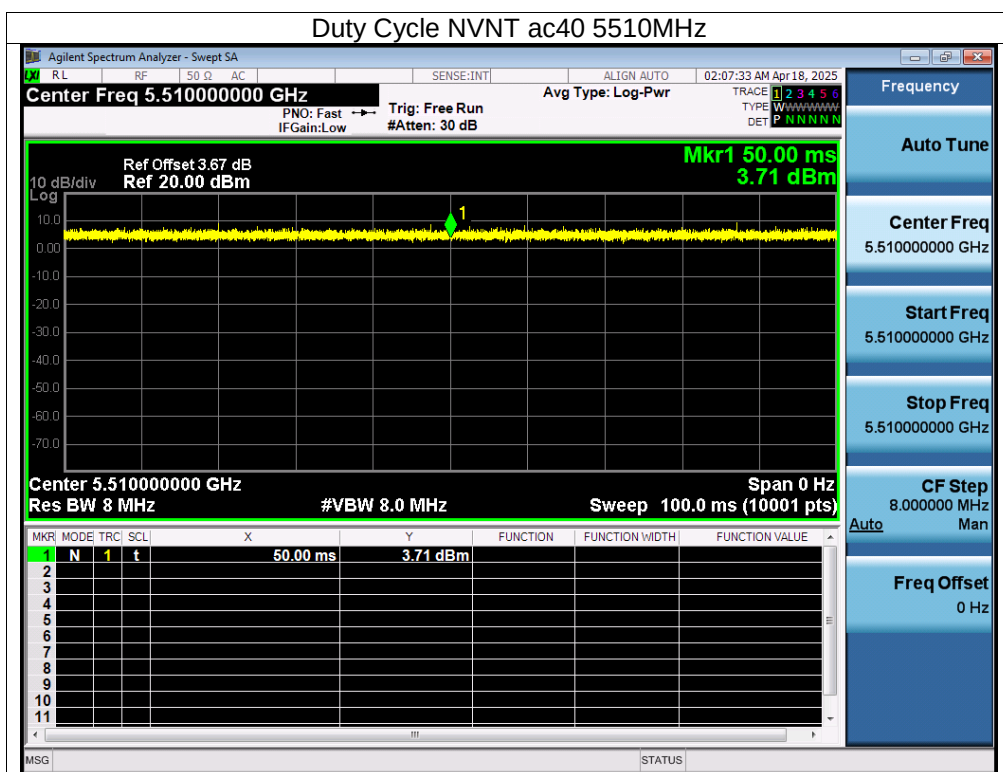


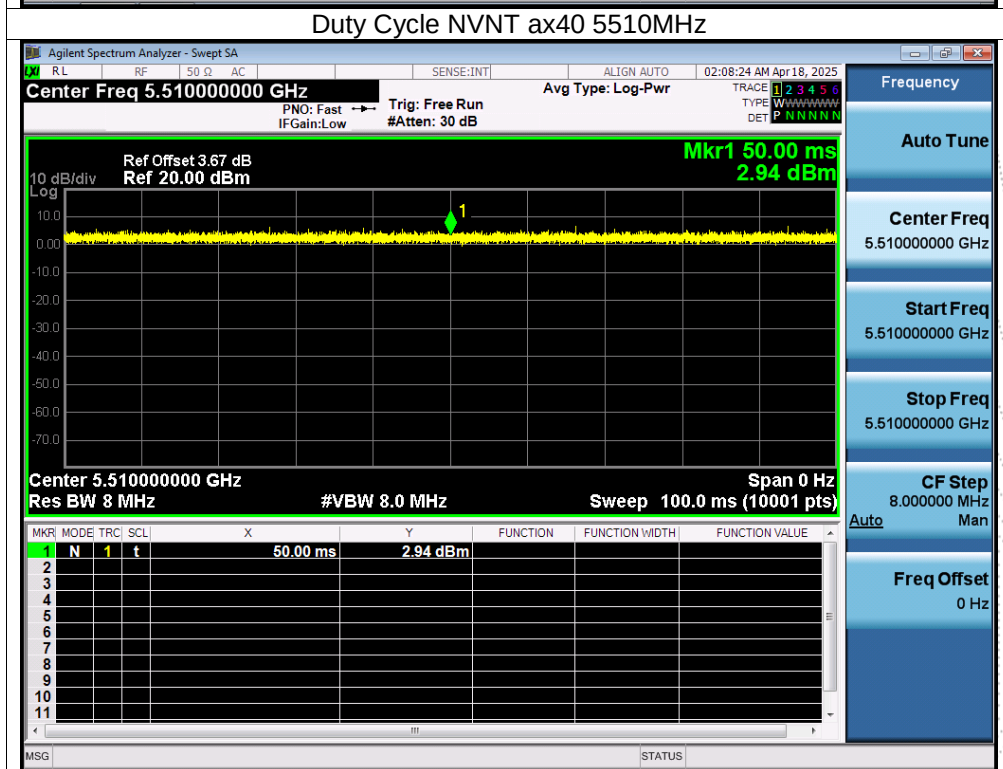
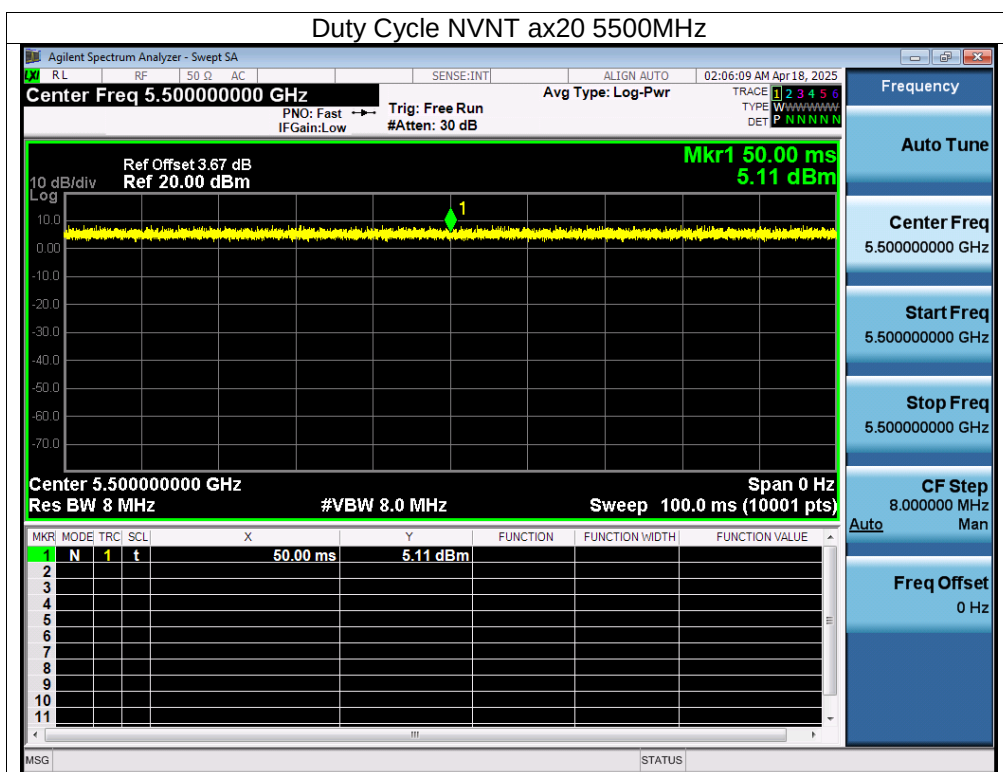
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)
NVNT	a	5500	100	0
NVNT	n20	5500	100	0
NVNT	n40	5510	100	0
NVNT	ac20	5500	100	0
NVNT	ac40	5510	100	0
NVNT	ac80	5530	100	0
NVNT	ax20	5500	100	0
NVNT	ax40	5510	100	0
NVNT	ax80	5530	100	0

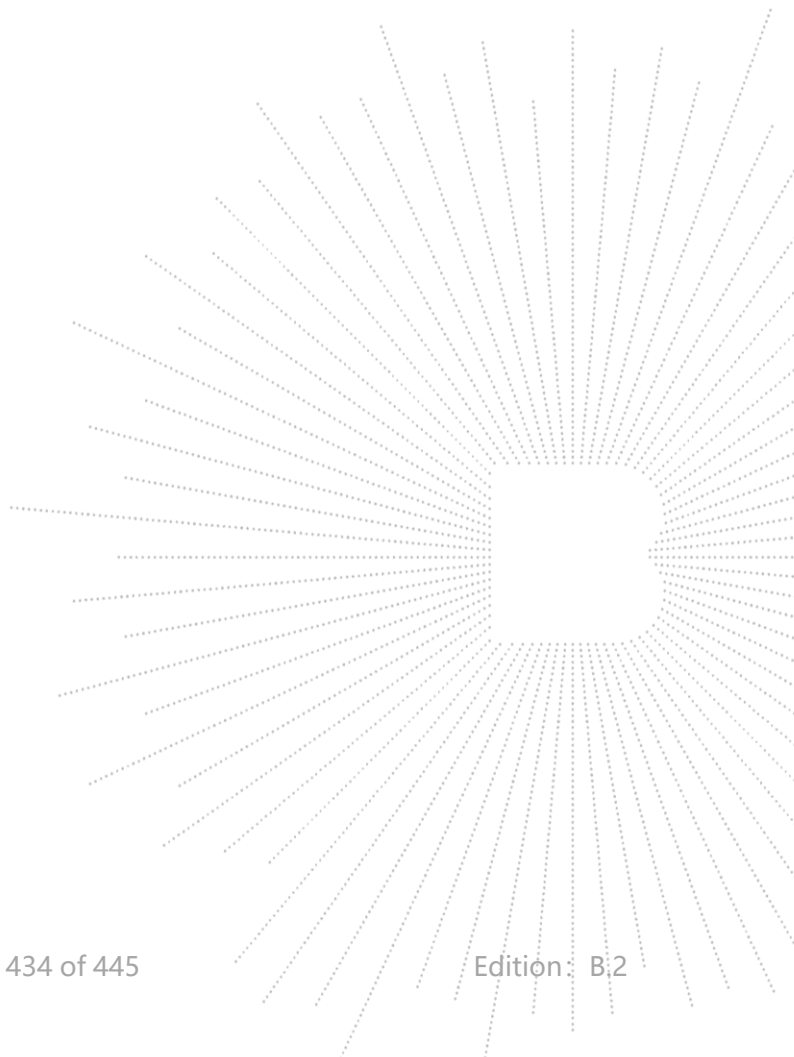
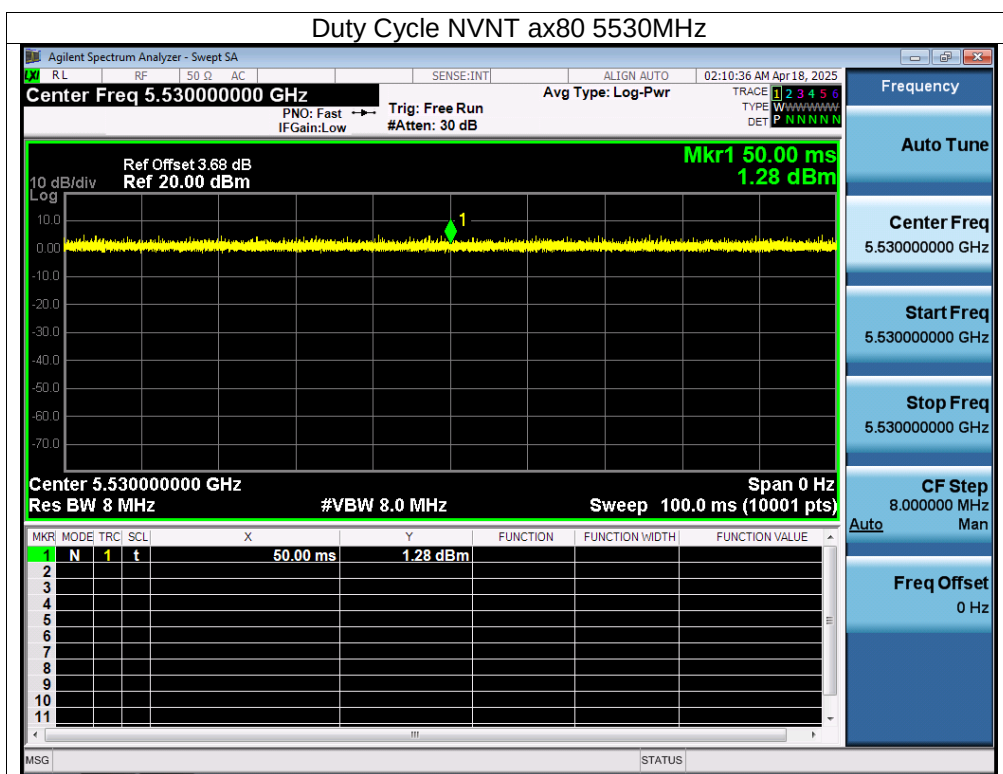




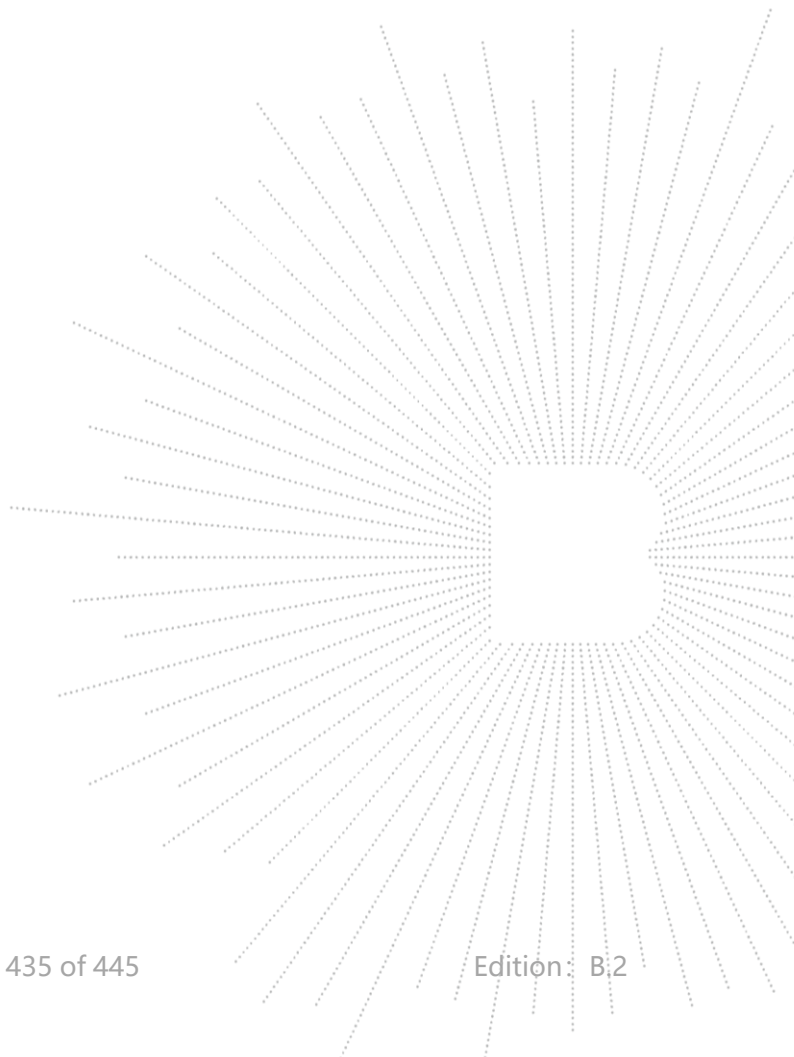


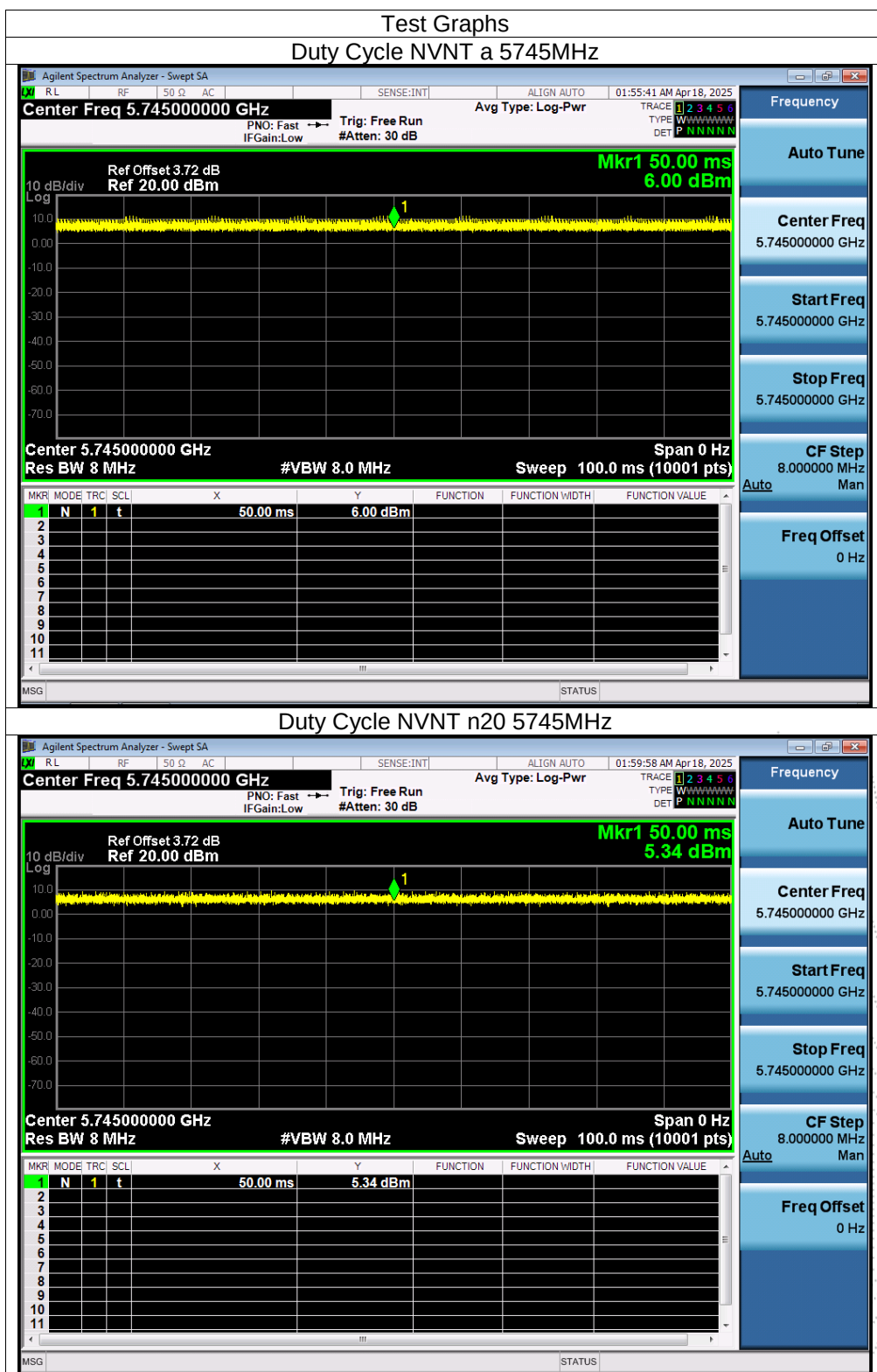


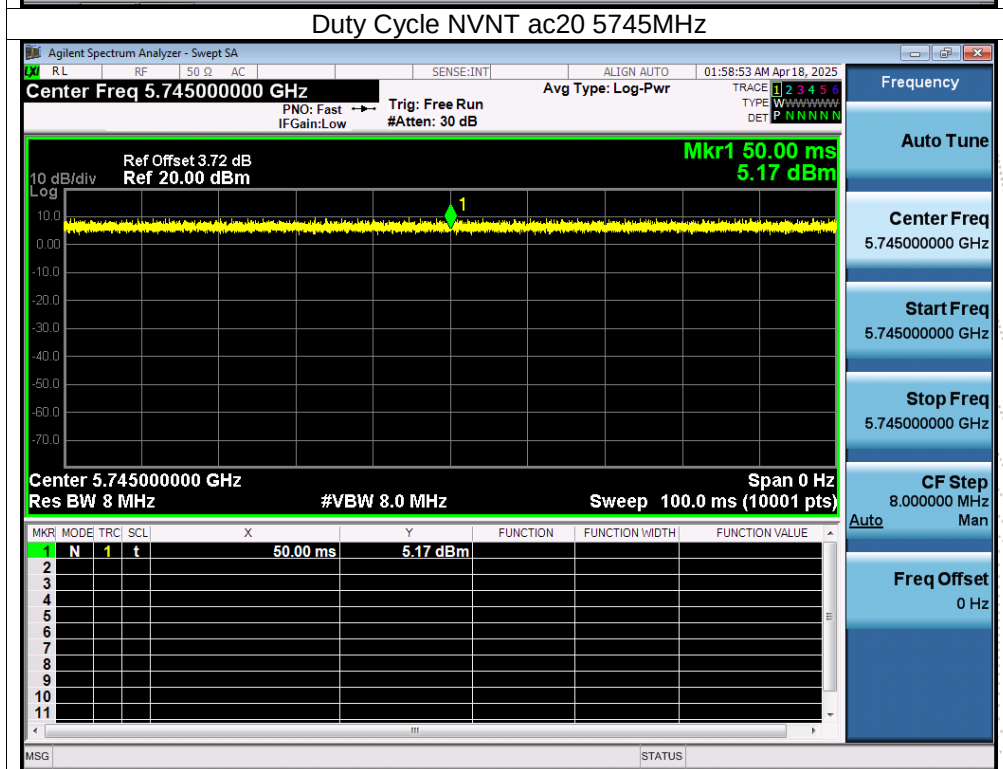
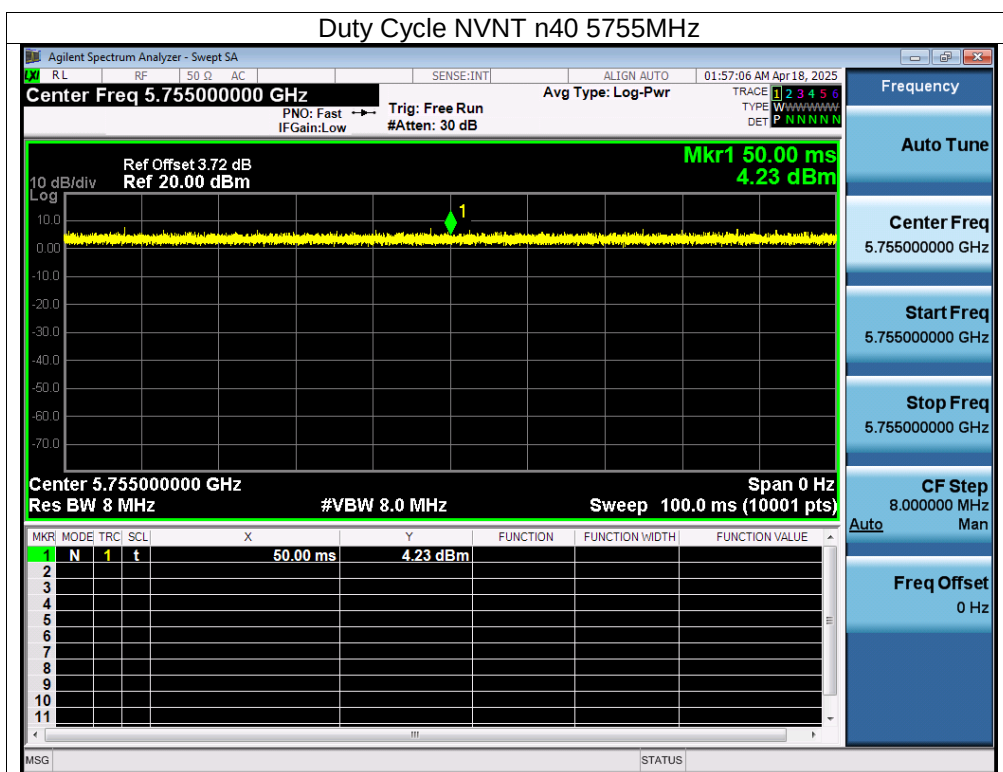


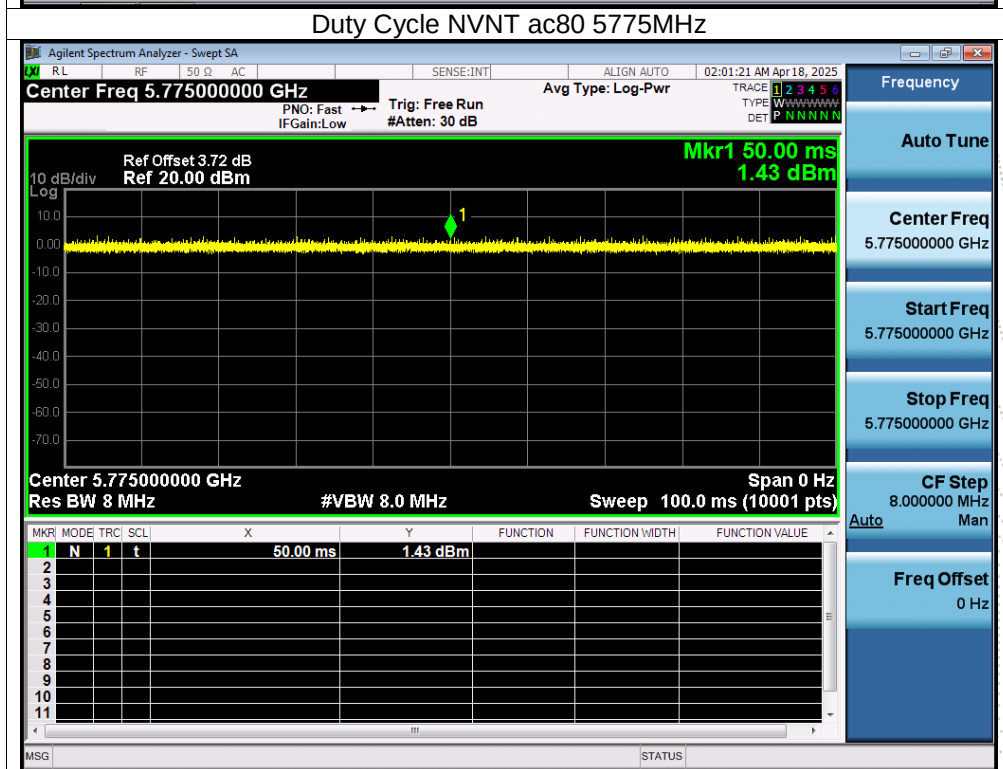
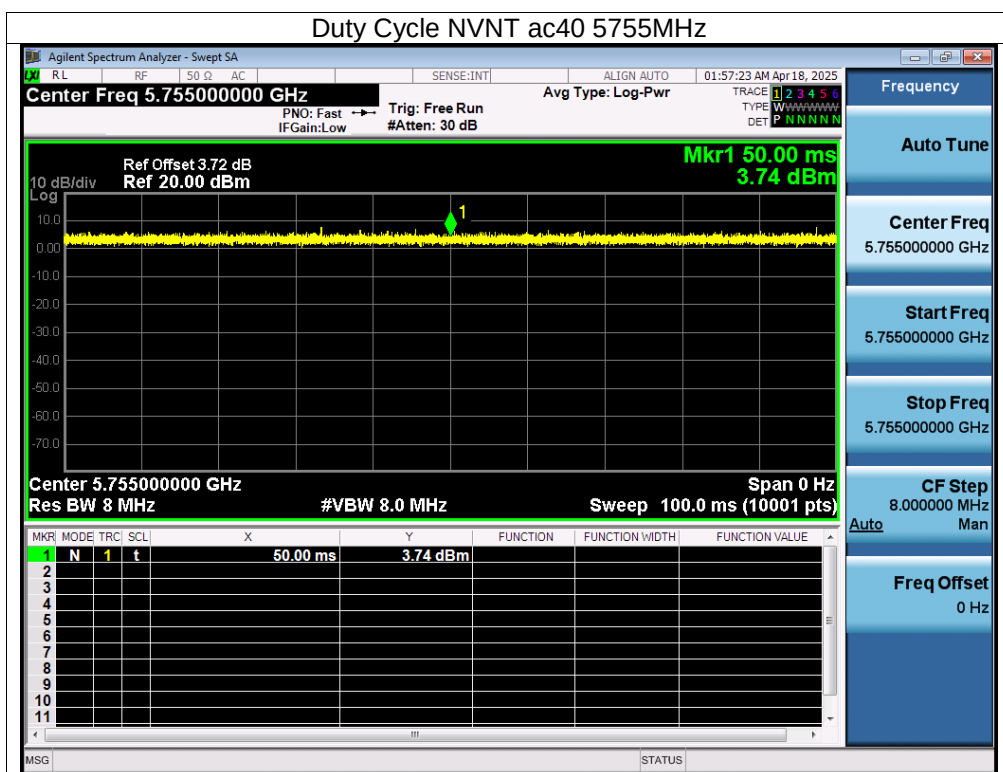


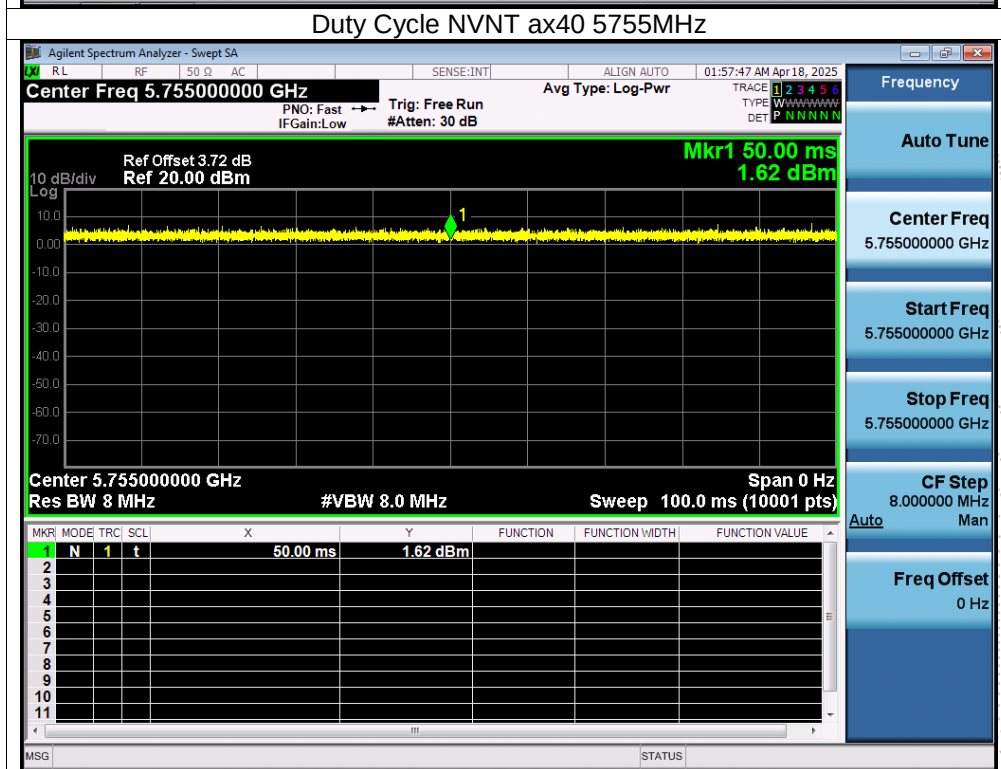
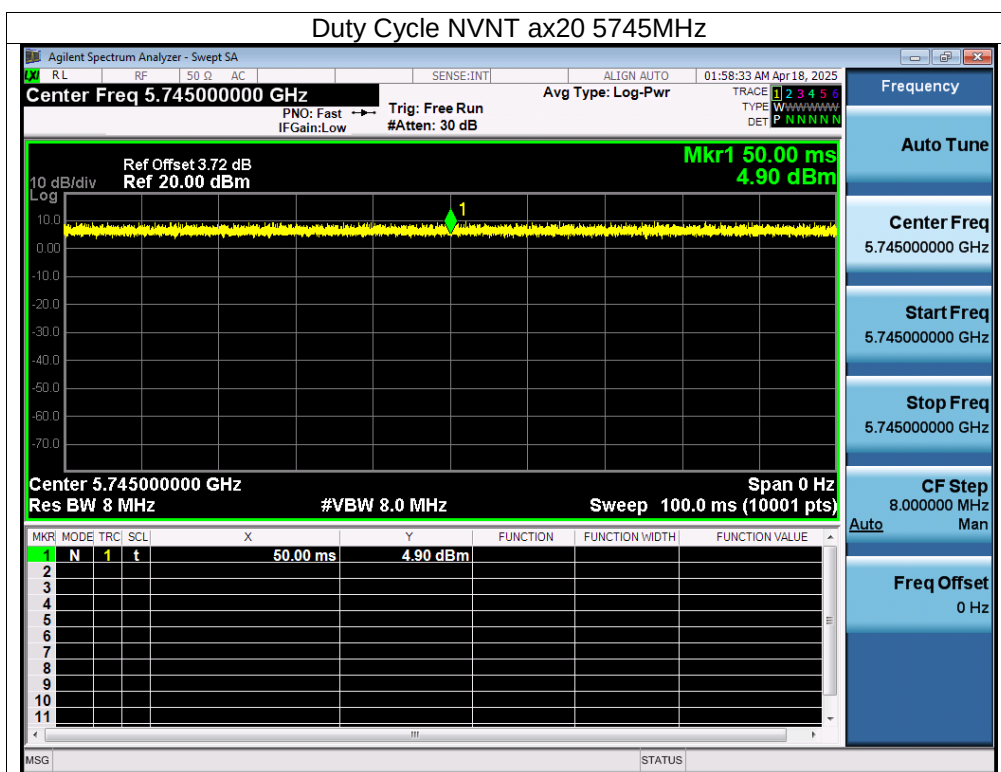
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)
NVNT	a	5745	100	0
NVNT	n20	5745	100	0
NVNT	n40	5755	100	0
NVNT	ac20	5745	100	0
NVNT	ac40	5755	100	0
NVNT	ac80	5775	100	0
NVNT	ax20	5745	100	0
NVNT	ax40	5755	100	0
NVNT	ax80	5775	100	0

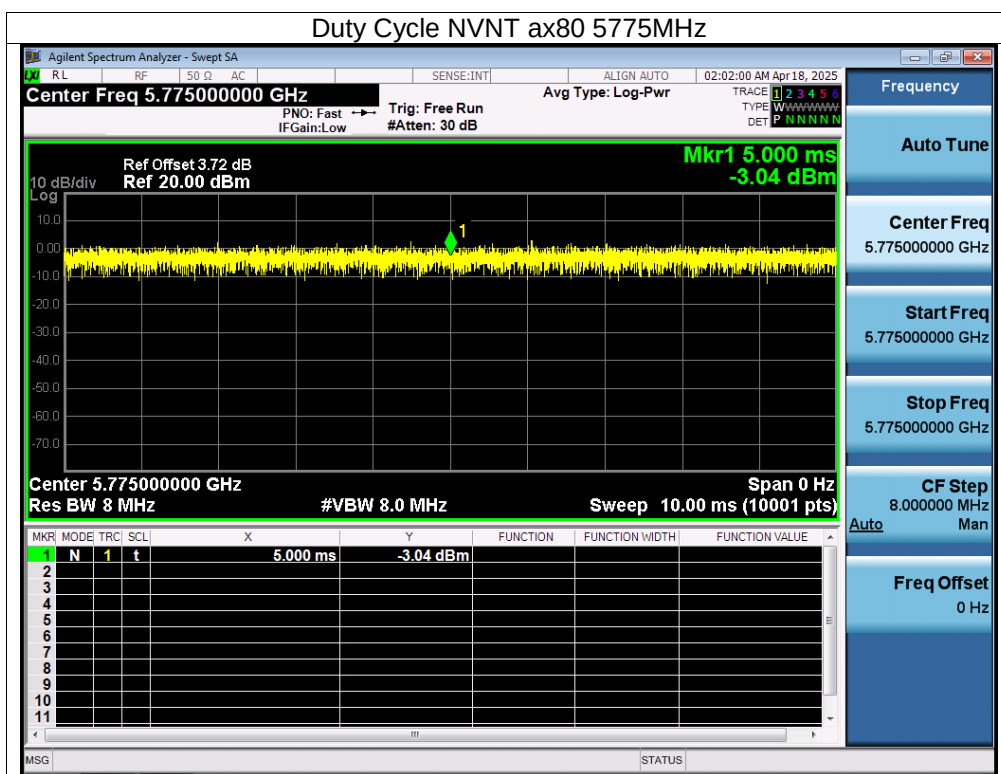












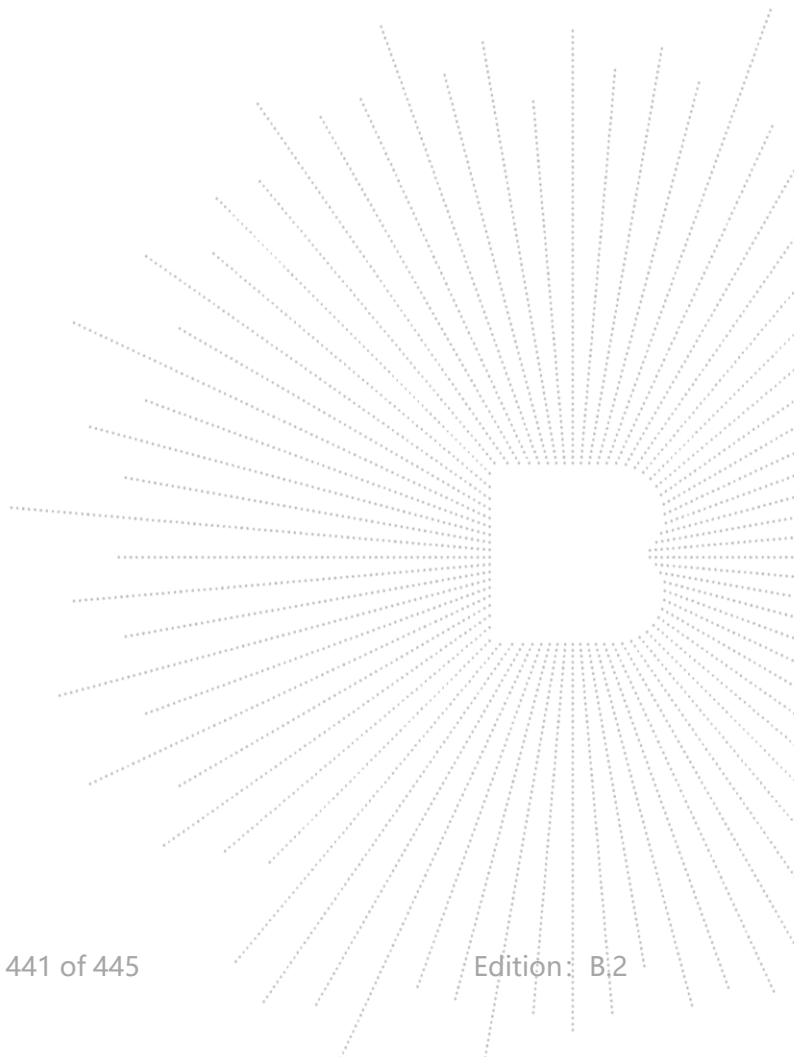
15. Antenna Requirement

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.

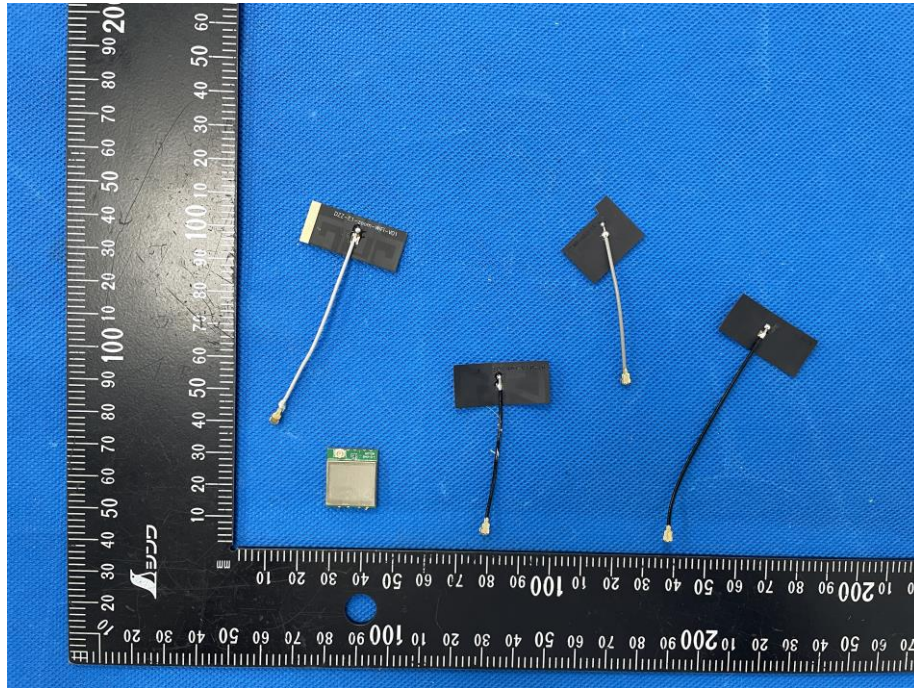
15.2 Test Result

The EUT antenna is FPC antenna. It comply with the standard requirement.



16. EUT Photographs

EUT Photo 1



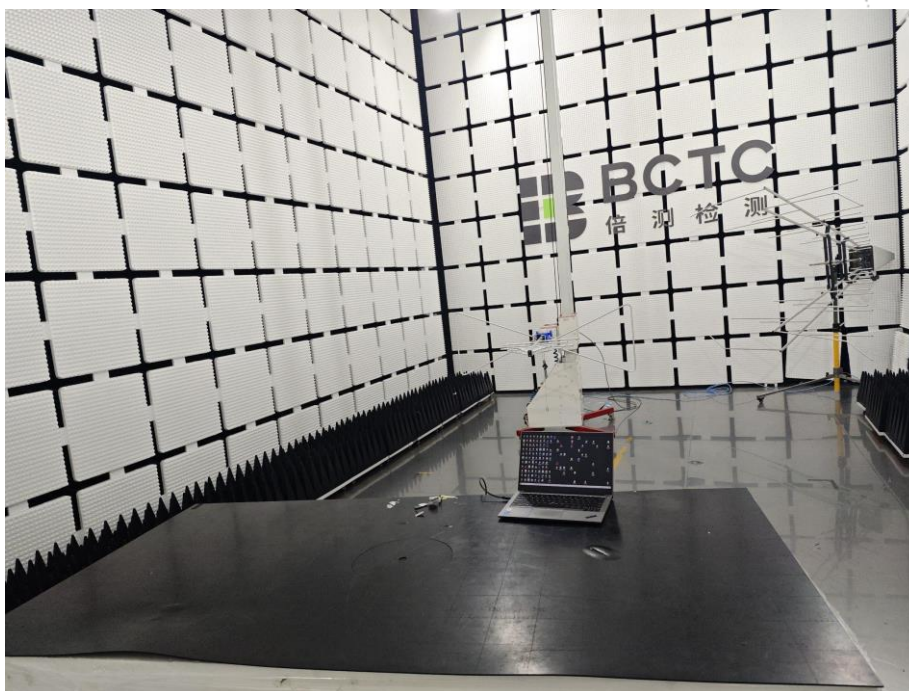
NOTE: Appendix-Photographs Of EUT Constructional Details.

17. EUT Test Setup Photographs

Conducted Emissions 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.

Address:

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FAX: 0755-33229357

Website: <http://www.chnbctc.com>

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Complaint/Advice E-mail: advice@bctc-lab.com.cn

***** END *****