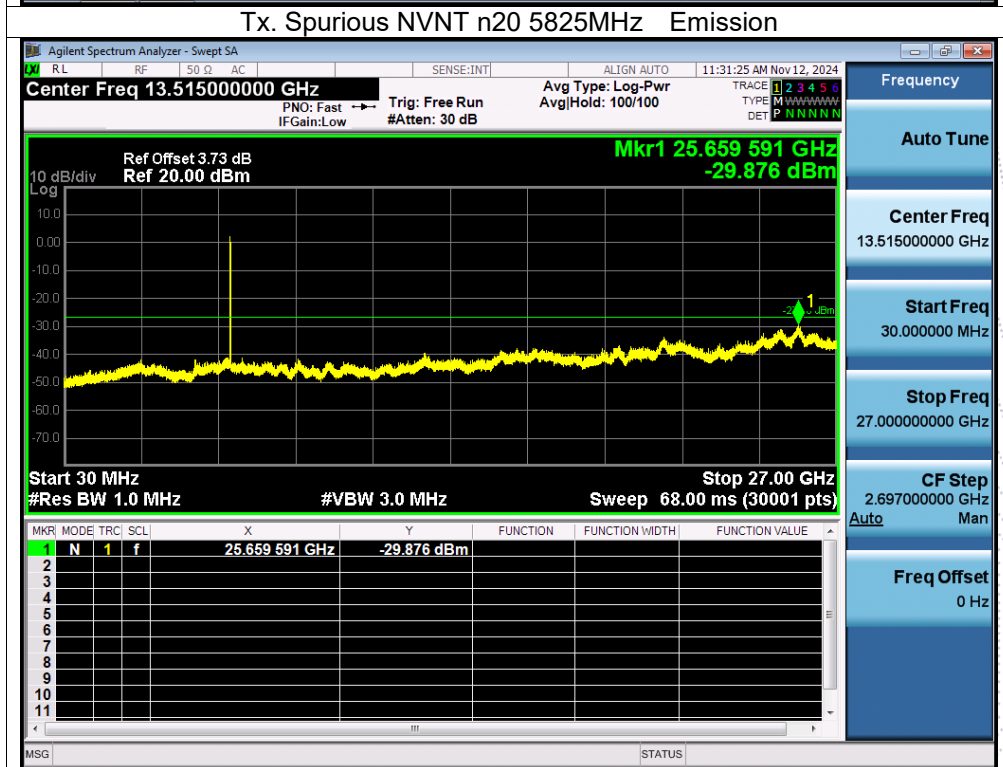
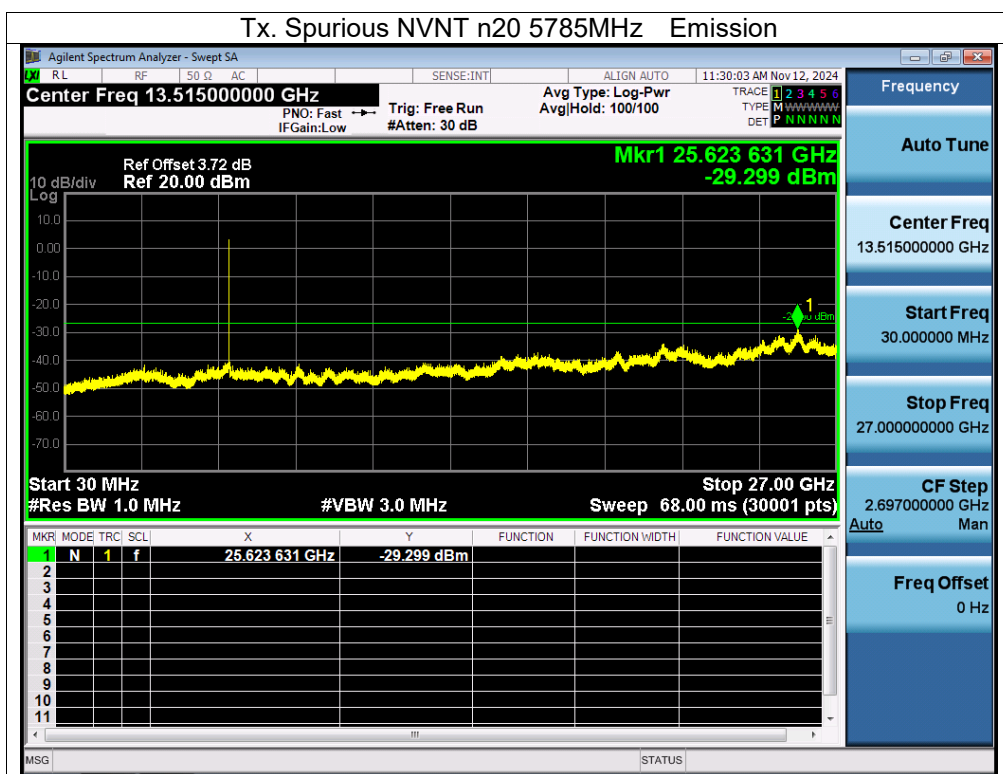
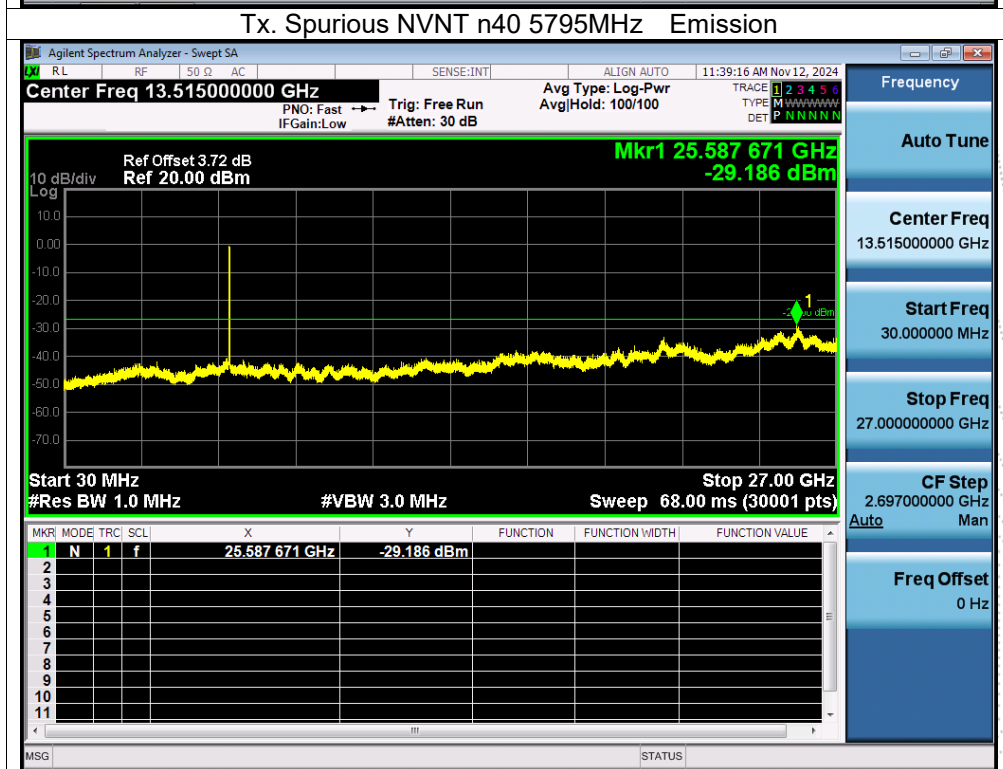
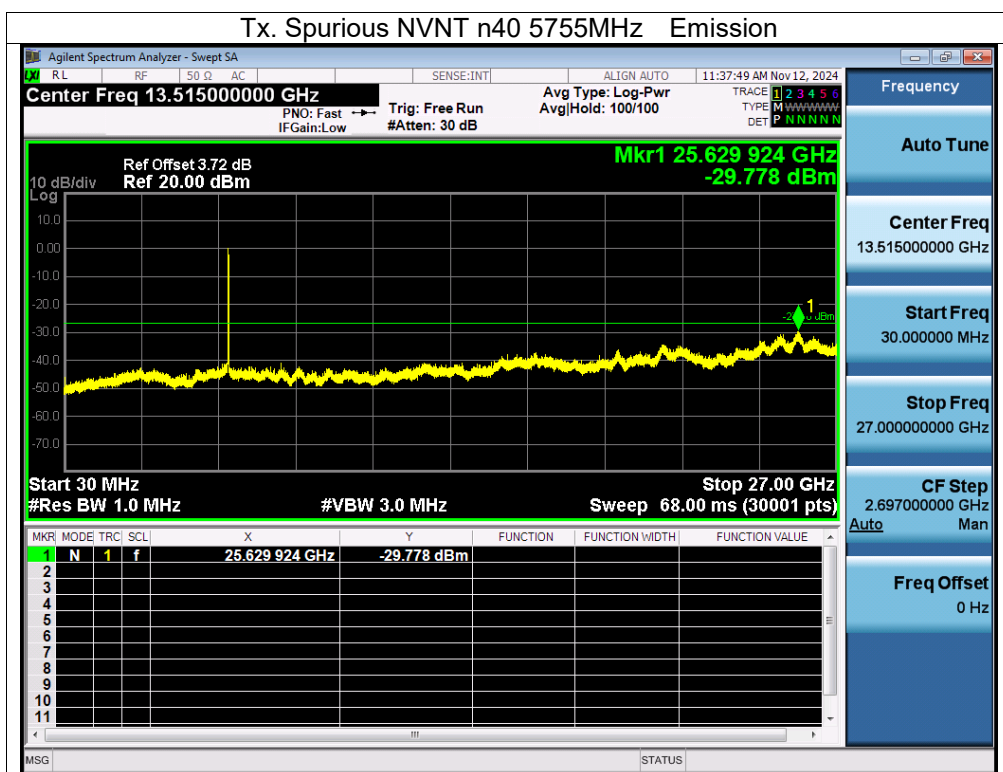
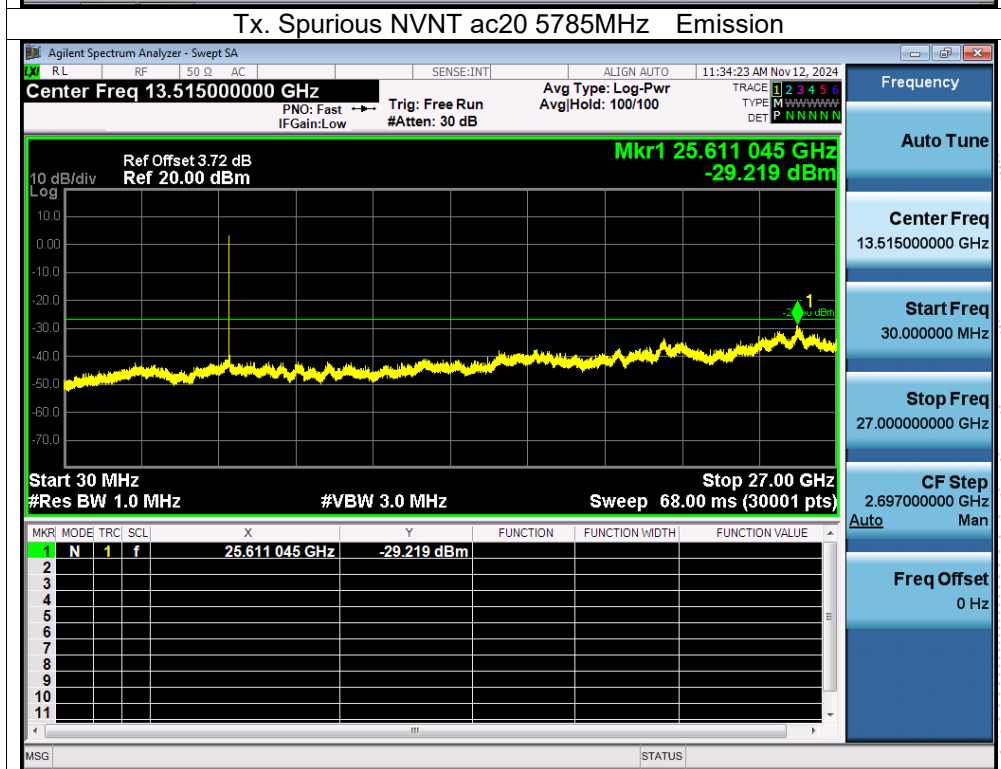
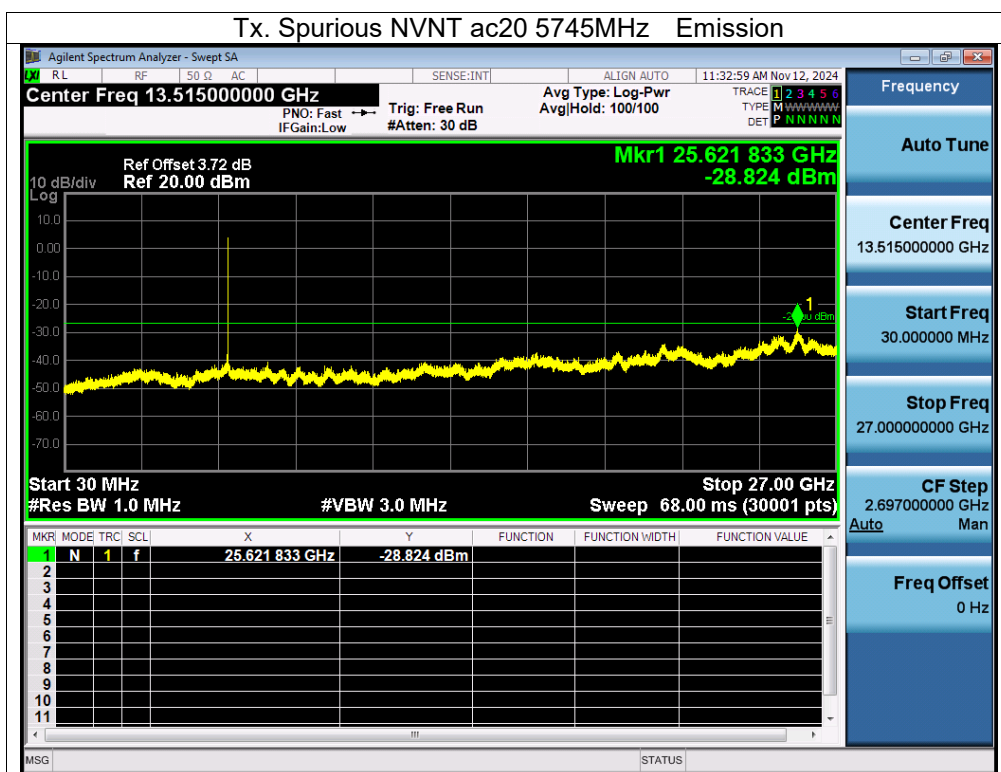
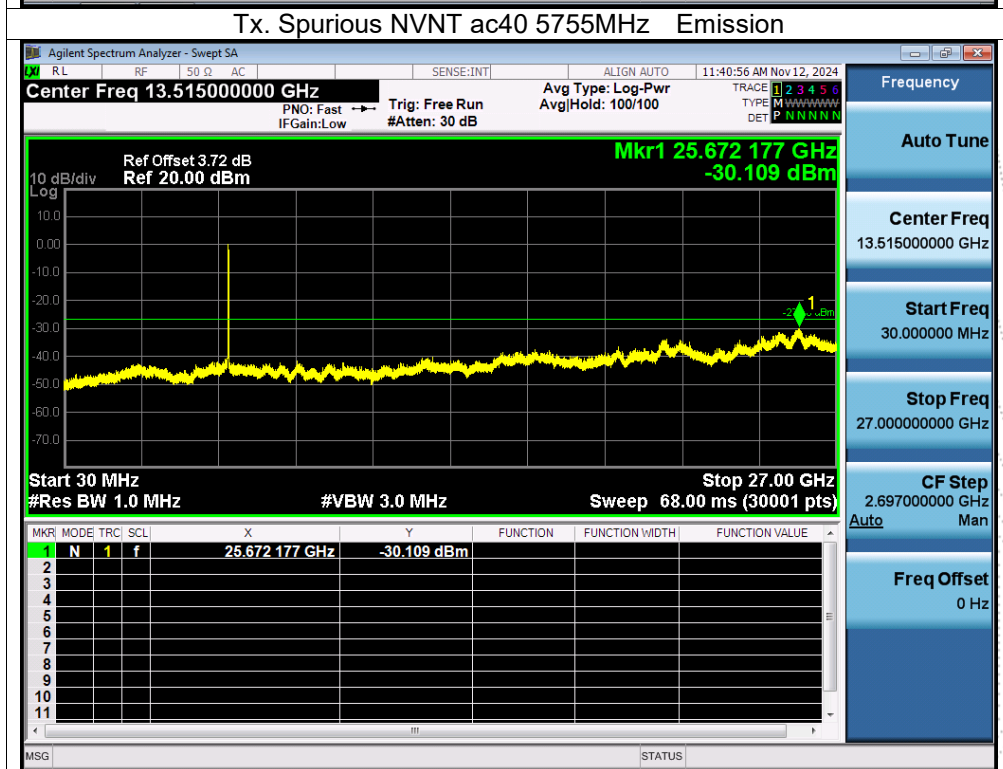
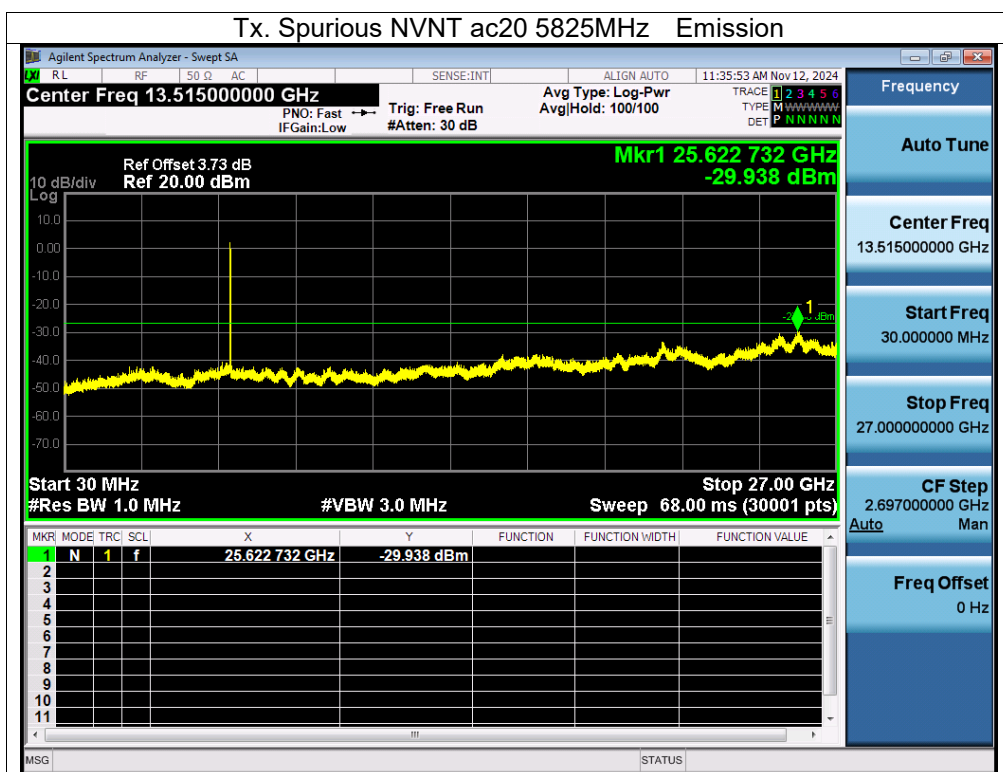
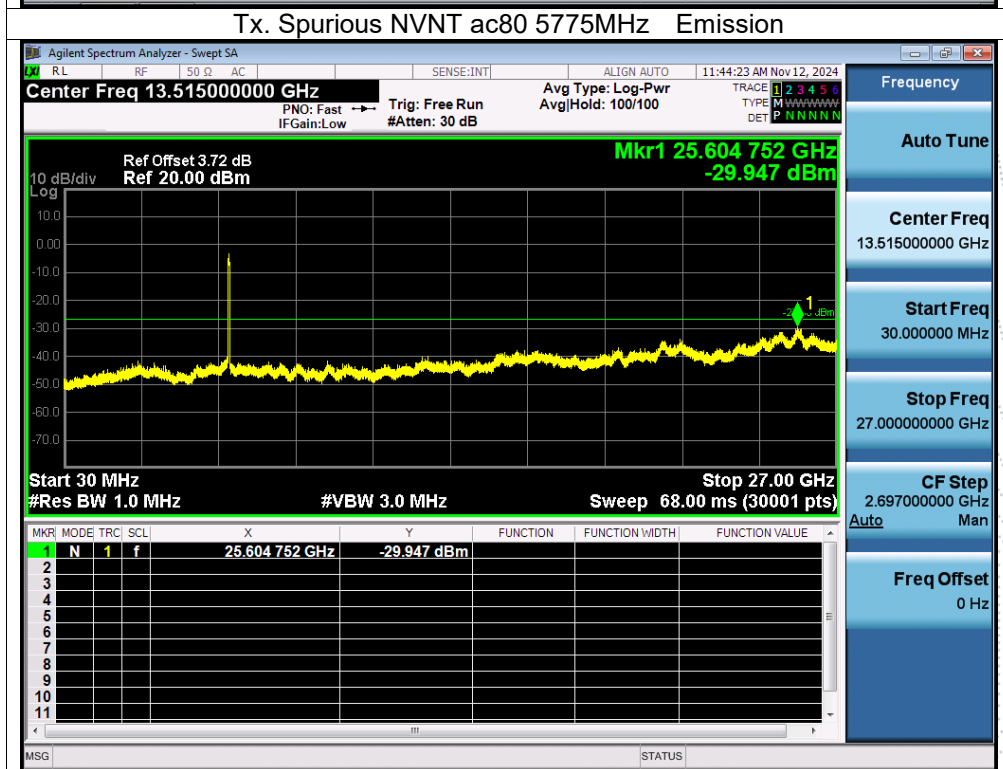
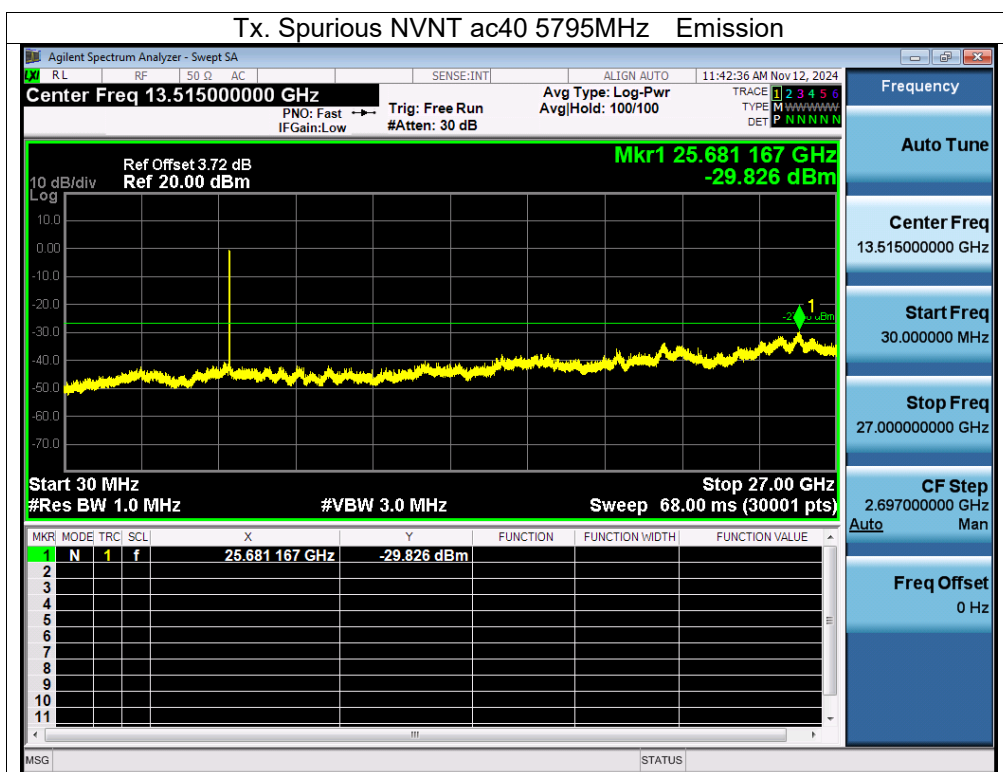












13. Frequency Stability Measurement

13.1 Block Diagram Of Test Setup



13.2 Limit

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

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

13.3 Test Procedure

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

13.4 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage:	DC 3.8V
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)	3.8	5180.0019	5180	0.0019	0.3668
		V max (V)	4.37	5180.0025	5180	0.0025	0.4826
		V min (V)	3.23	5180.0088	5180	0.0088	1.6988
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)	3.8	T (°C)	-20	5180.0006	5180	0.0006	0.1158
		T (°C)	-10	5180.0022	5180	0.0022	0.4247
		T (°C)	0	5180.0087	5180	0.0087	1.6795
		T (°C)	10	5180.0077	5180	0.0077	1.4865
		T (°C)	20	5180.0034	5180	0.0034	0.6564
		T (°C)	30	5180.0027	5180	0.0027	0.5212
		T (°C)	40	5180.0017	5180	0.0017	0.3282
		T (°C)	50	5180.0022	5180	0.0022	0.4247
		T (°C)	60	5180.0047	5180	0.0047	0.9073
		T (°C)	70	5180.0106	5180	0.0106	2.0463
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)	3.8	5200.0125	5200	0.0125	2.4038
		V max (V)	4.37	5200.0002	5200	0.0002	0.0385
		V min (V)	3.23	5200.0101	5200	0.0101	1.9423
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)	3.8	T (°C)	-20	5200.00920	5200	0.00920	1.7692
		T (°C)	-10	5200.00150	5200	0.00150	0.2885
		T (°C)	0	5200.01160	5200	0.01160	2.2308
		T (°C)	10	5200.00160	5200	0.00160	0.3077
		T (°C)	20	5200.00980	5200	0.00980	1.8846
		T (°C)	30	5200.00260	5200	0.00260	0.5000
		T (°C)	40	5200.00750	5200	0.00750	1.4423
		T (°C)	50	5200.01060	5200	0.01060	2.0385
		T (°C)	60	5200.01020	5200	0.01020	1.9615
		T (°C)	70	5200.00390	5200	0.00390	0.7500
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)	3.8	5240.0011	5240	0.0011	0.2099
		V max (V)	4.37	5240.0113	5240	0.0113	2.1565
		V min (V)	3.23	5240.0021	5240	0.0021	0.4008
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)	3.8	T (°C)	-20	5240.0127	5240	0.0127	2.4237
		T (°C)	-10	5240.0026	5240	0.0026	0.4962
		T (°C)	0	5240.0110	5240	0.0110	2.0992
		T (°C)	10	5240.0112	5240	0.0112	2.1374
		T (°C)	20	5240.0118	5240	0.0118	2.2519
		T (°C)	30	5240.0037	5240	0.0037	0.7061
		T (°C)	40	5240.0133	5240	0.0133	2.5382
		T (°C)	50	5240.0103	5240	0.0103	1.9656
		T (°C)	60	5240.0113	5240	0.0113	2.1565
		T (°C)	70	5240.0086	5240	0.0086	1.6412
Limits				5150-5250 MHz			
Result				Complies			

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage:	DC 3.8V
Test Mode:	TX Frequency(5745-5825MHz)		

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	3.8	5745.01220	5745	0.01220	2.1236
		V max (V)	4.37	5745.01080	5745	0.01080	1.8799
		V min (V)	3.23	5745.00280	5745	0.00280	0.4874
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)	3.8	T (°C)	-20	5745.00150	5745	0.00150	0.2611
		T (°C)	-10	5745.01170	5745	0.01170	2.0366
		T (°C)	0	5745.00500	5745	0.00500	0.8703
		T (°C)	10	5745.00380	5745	0.00380	0.6614
		T (°C)	20	5745.01350	5745	0.01350	2.3499
		T (°C)	30	5745.00550	5745	0.00550	0.9574
		T (°C)	40	5745.01210	5745	0.01210	2.1062
		T (°C)	50	5745.00680	5745	0.00680	1.1836
		T (°C)	60	5745.00040	5745	0.00040	0.0696
		T (°C)	70	5745.00100	5745	0.00100	0.1741
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)	3.8	5785.00660	5785	0.00660	1.1409
		V max (V)	4.37	5785.00370	5785	0.00370	0.6396
		V min (V)	3.23	5785.00870	5785	0.00870	1.5039
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)	3.8	T (°C)	-20	5785.00460	5785	0.00460	0.7952
		T (°C)	-10	5785.00310	5785	0.00310	0.5359
		T (°C)	0	5785.00940	5785	0.00940	1.6249
		T (°C)	10	5785.00750	5785	0.00750	1.2965
		T (°C)	20	5785.00430	5785	0.00430	0.7433
		T (°C)	30	5785.01320	5785	0.01320	2.2818
		T (°C)	40	5785.01200	5785	0.01200	2.0743
		T (°C)	50	5785.00120	5785	0.00120	0.2074
		T (°C)	60	5785.00870	5785	0.00870	1.5039
		T (°C)	70	5785.00990	5785	0.00990	1.7113
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)	3.8	5825.01020	5825	0.01020	1.7511
		V max (V)	4.37	5825.01270	5825	0.01270	2.1803
		V min (V)	3.23	5825.01050	5825	0.01050	1.8026
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)	3.8	T (°C)	-20	5825.00760	5825	0.00760	1.3047
		T (°C)	-10	5825.00320	5825	0.00320	0.5494
		T (°C)	0	5825.00970	5825	0.00970	1.6652
		T (°C)	10	5825.01040	5825	0.01040	1.7854
		T (°C)	20	5825.00510	5825	0.00510	0.8755
		T (°C)	30	5825.00530	5825	0.00530	0.9099
		T (°C)	40	5825.01010	5825	0.01010	1.7339
		T (°C)	50	5825.00400	5825	0.00400	0.6867
		T (°C)	60	5825.00550	5825	0.00550	0.9442
		T (°C)	70	5825.00260	5825	0.00260	0.4464
Limits				5725-5850 MHz			
Result				Complies			

14. Duty Cycle Of Test Signal

14.1 Standard Requirement

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

14.2 Formula

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

14.3 Test Procedure

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

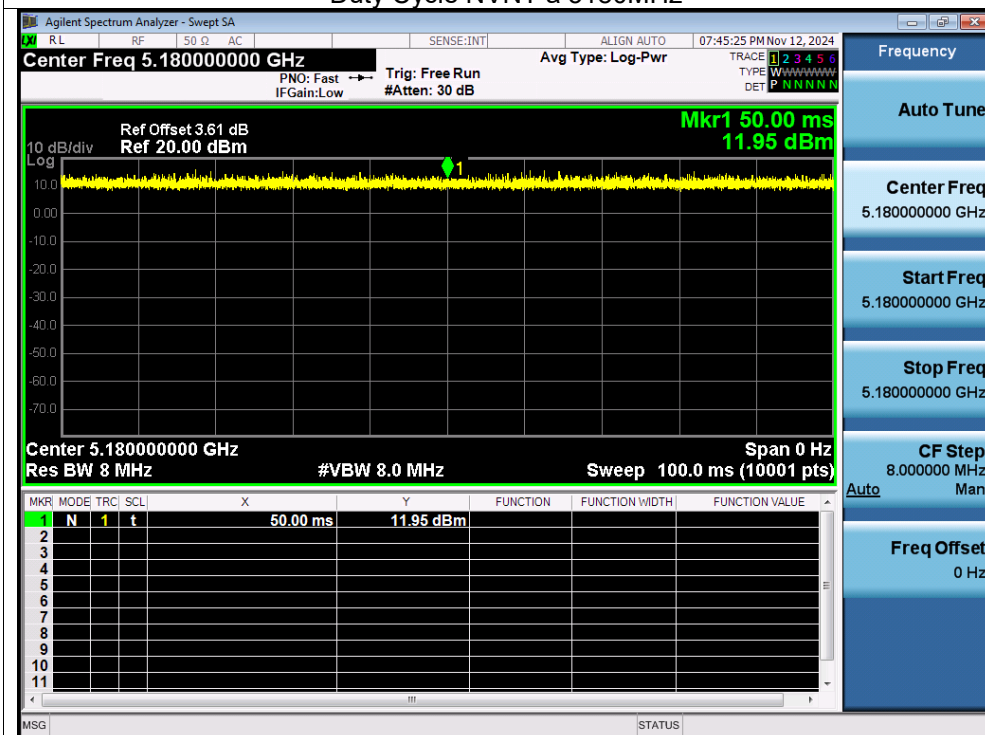
14.4 Test Result

5.1G

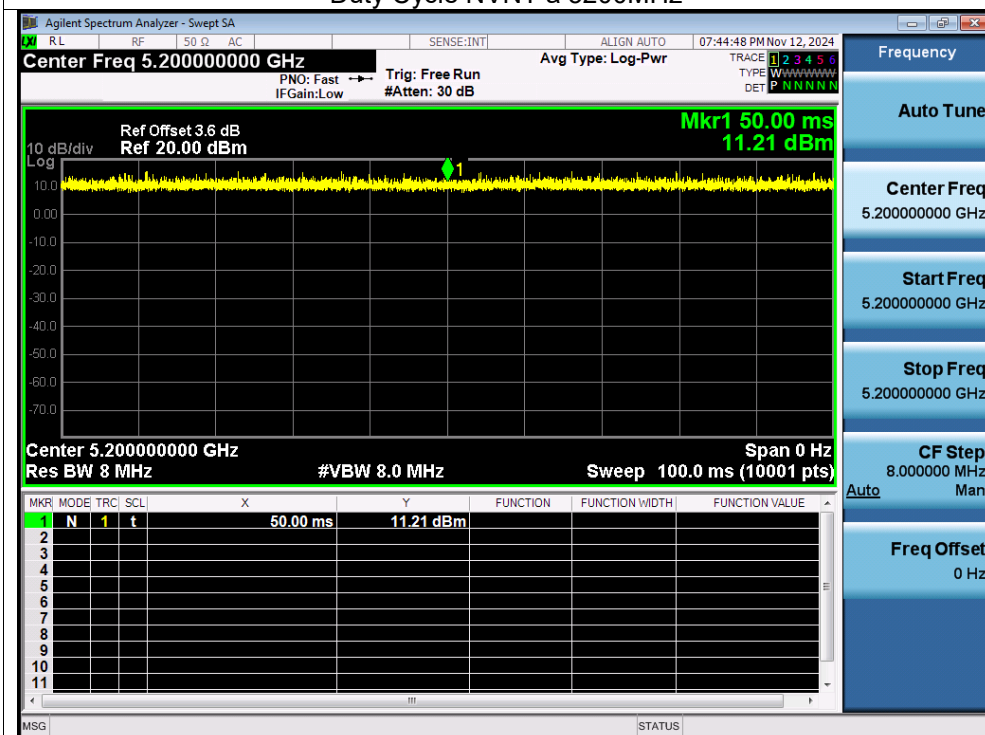
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5180	100	0	0
NVNT	a	5200	100	0	0
NVNT	a	5240	100	0	0
NVNT	n20	5180	100	0	0
NVNT	n20	5200	100	0	0
NVNT	n20	5240	100	0	0
NVNT	n40	5190	100	0	0
NVNT	n40	5230	100	0	0
NVNT	ac20	5180	100	0	0
NVNT	ac20	5200	100	0	0
NVNT	ac20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

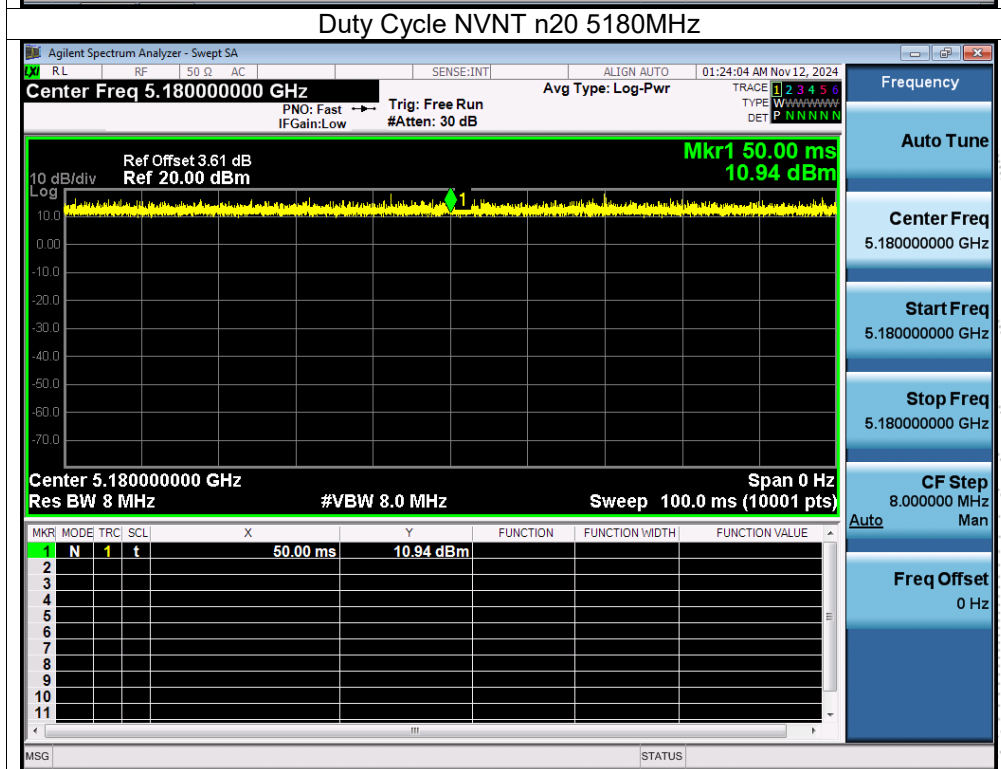
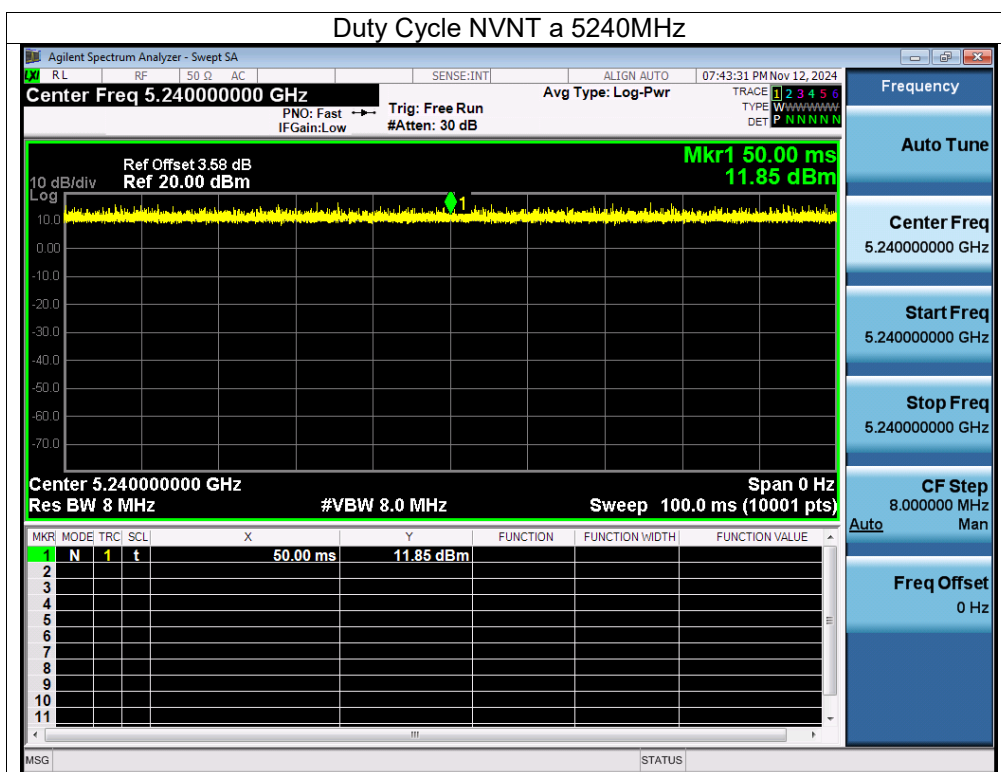
Test Graphs

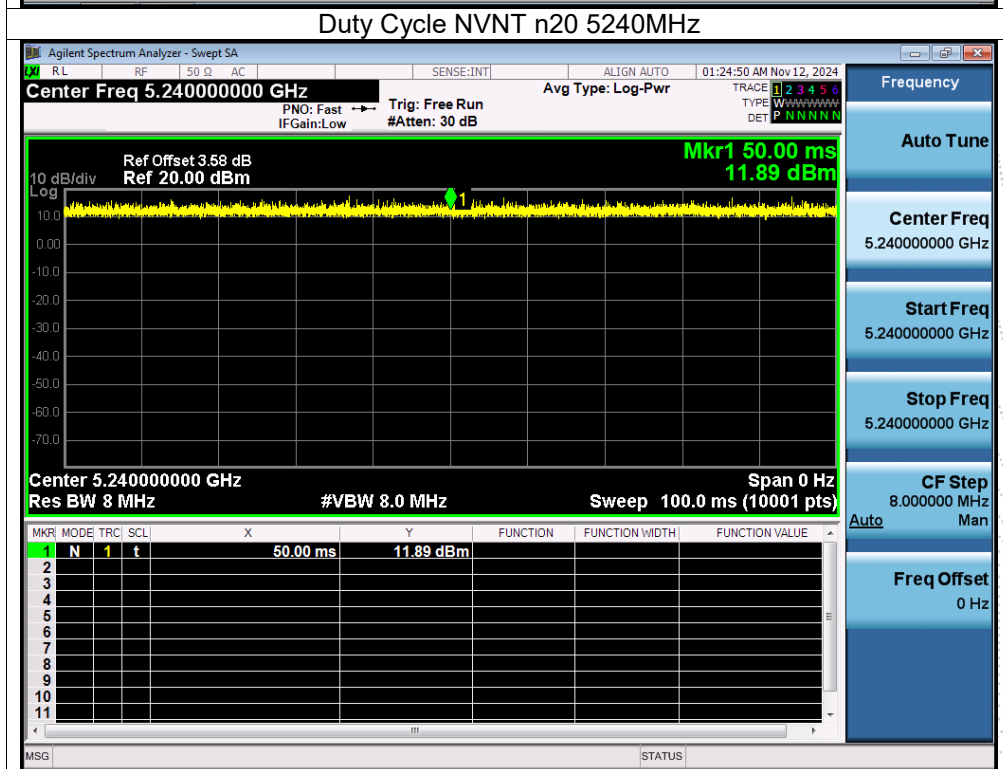
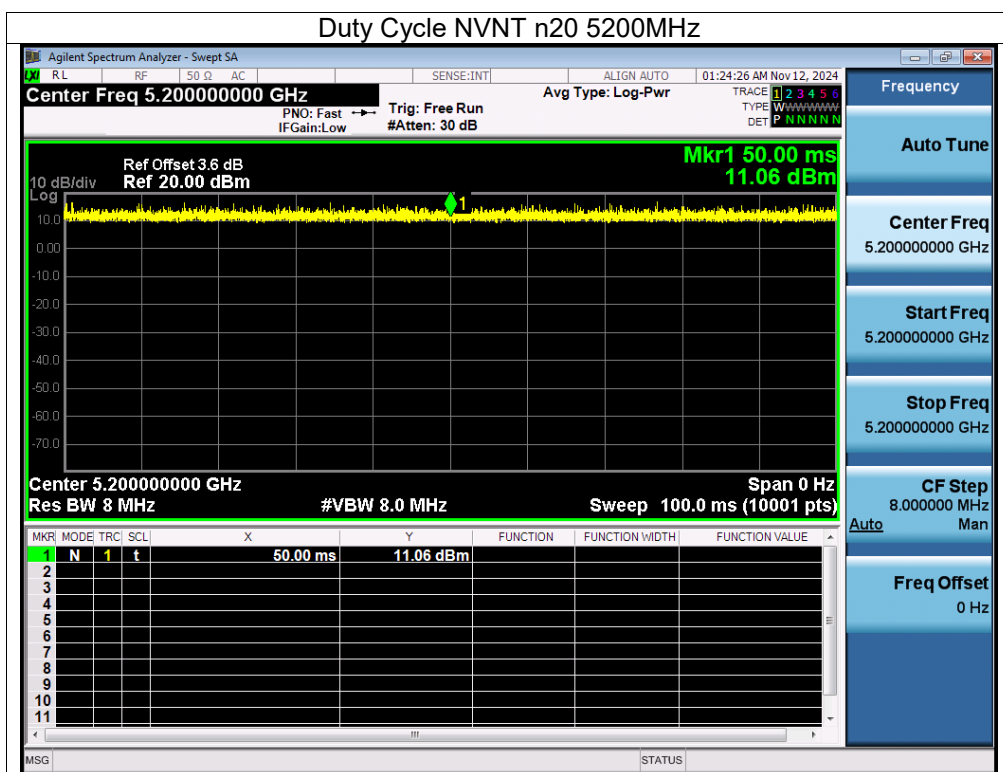
Duty Cycle NVNT a 5180MHz

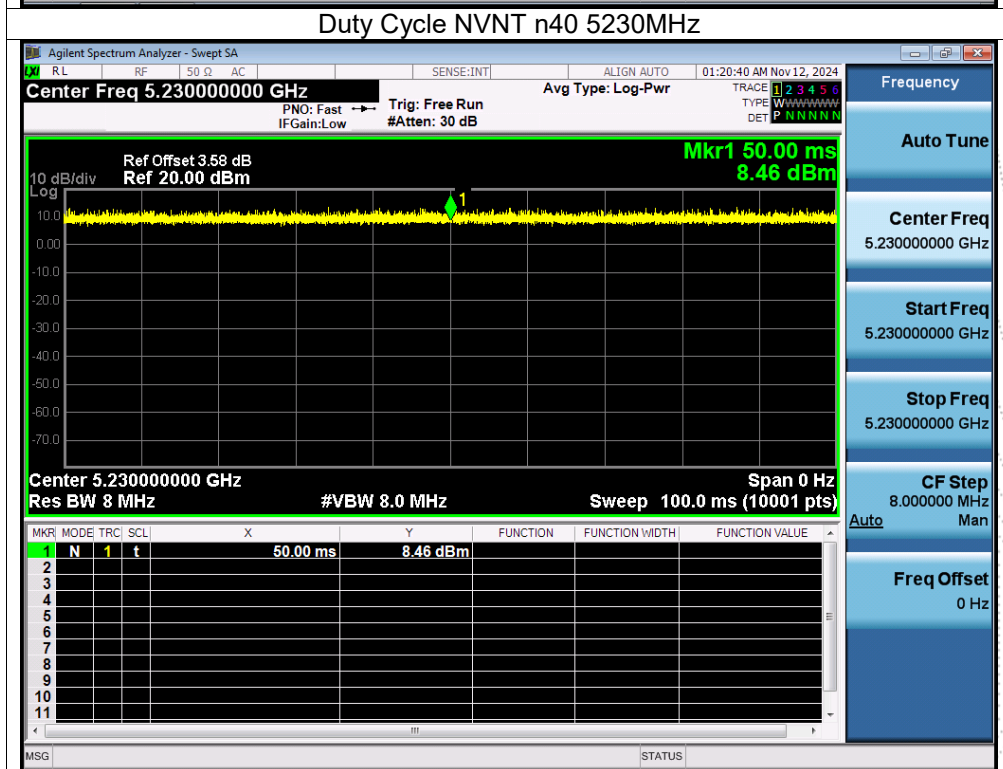
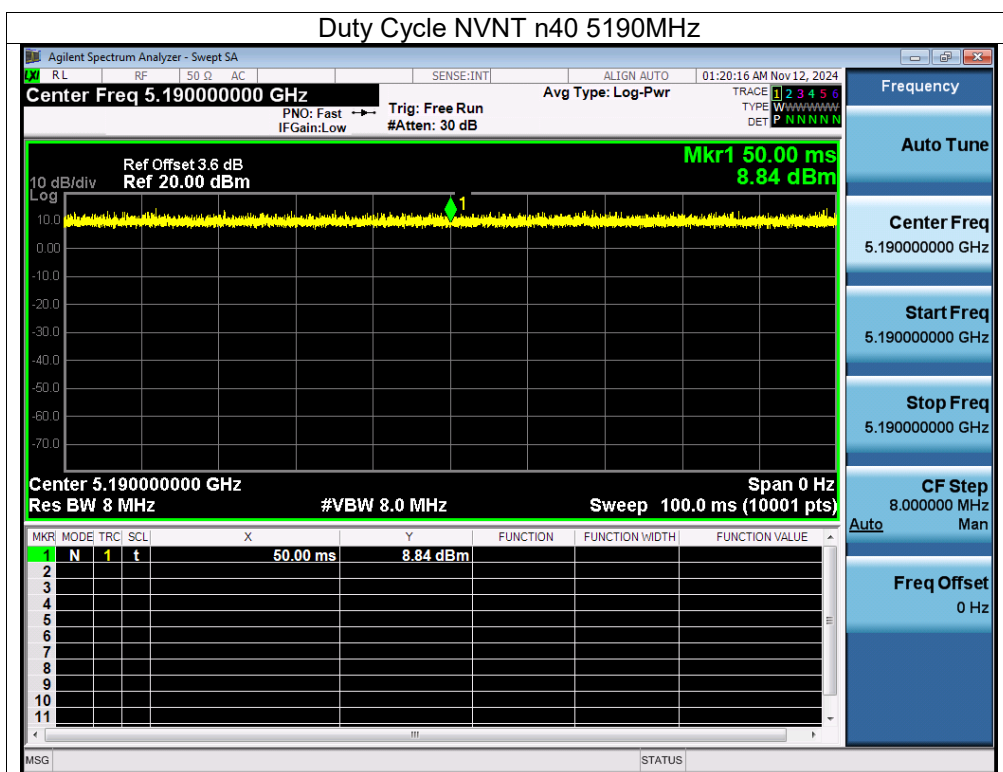


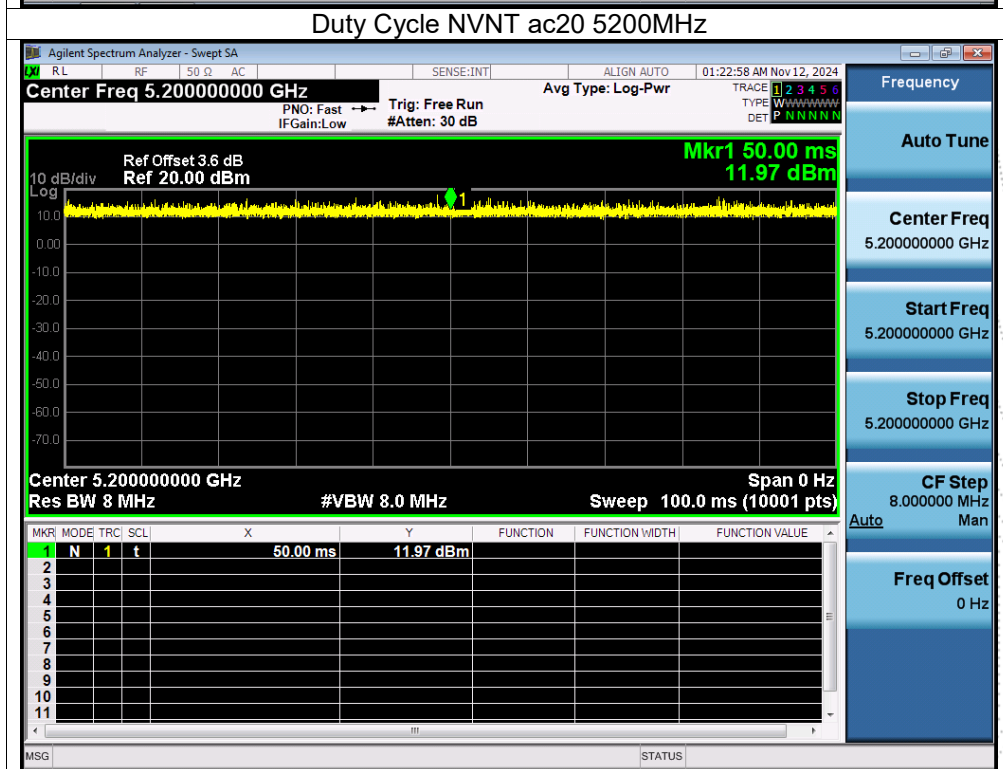
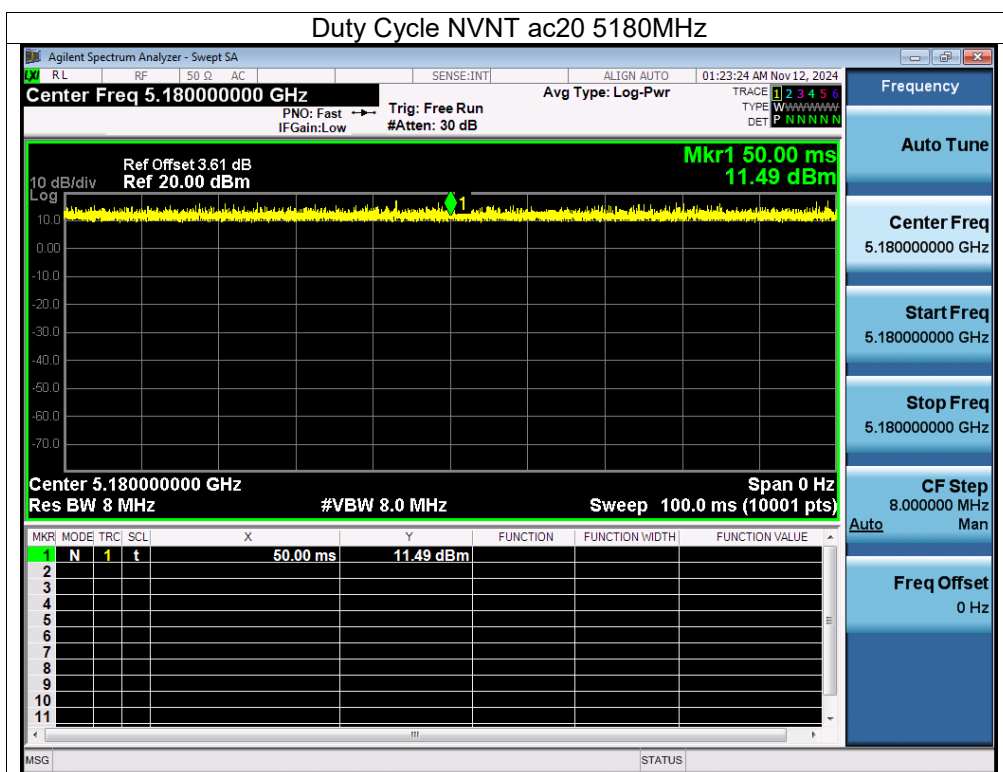
Duty Cycle NVNT a 5200MHz

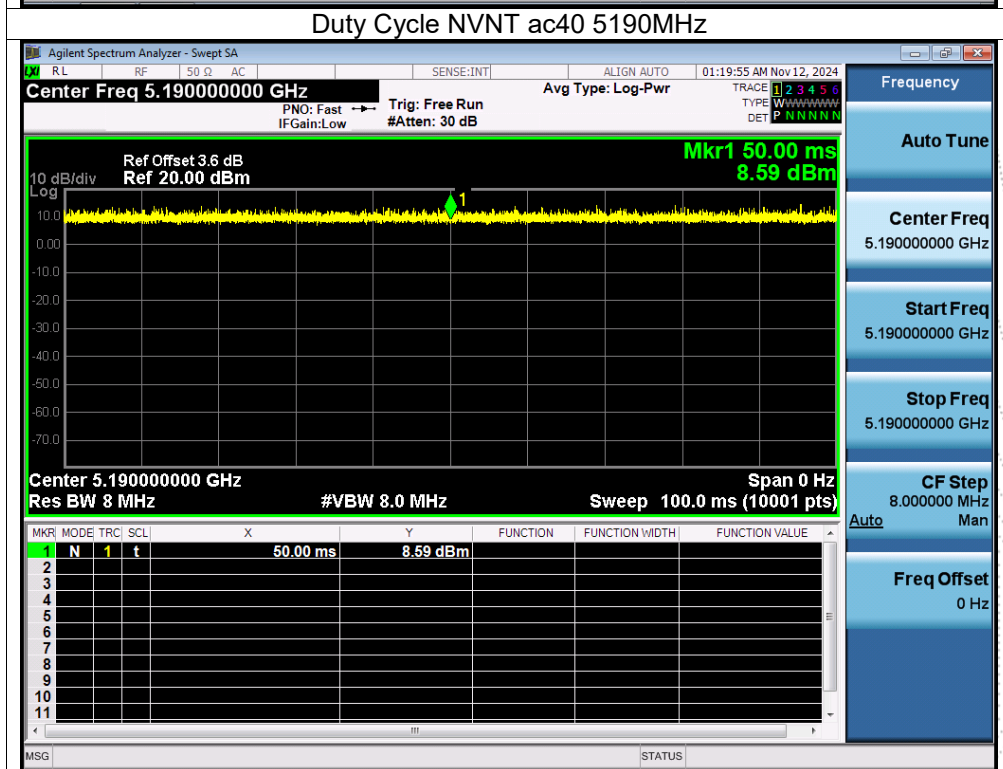
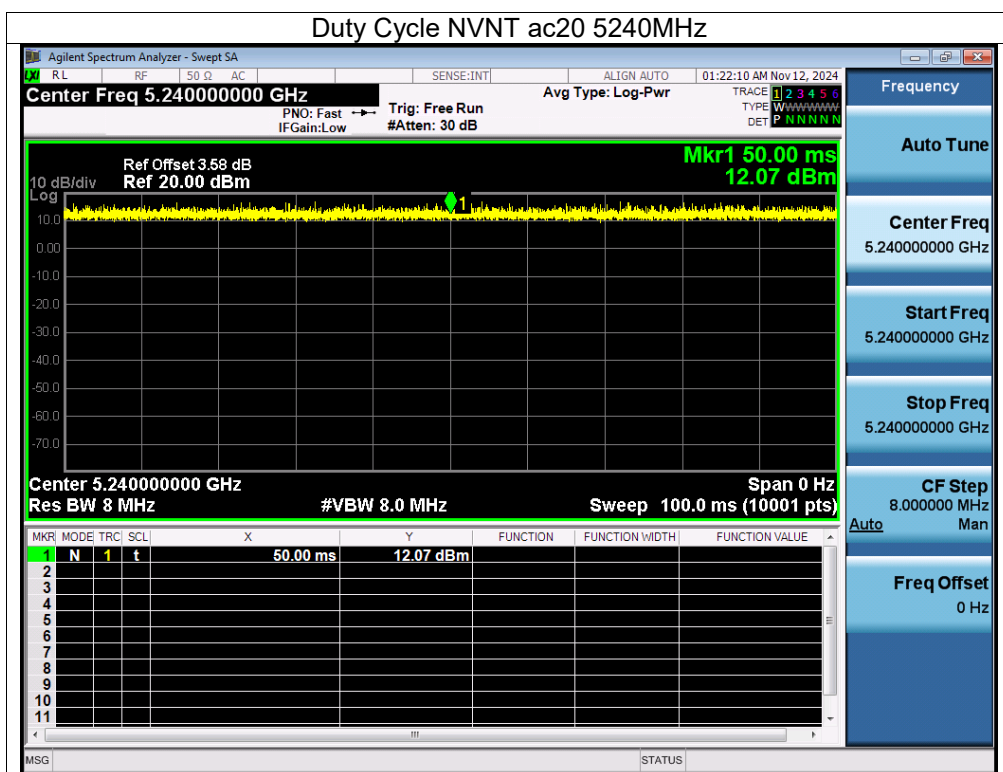


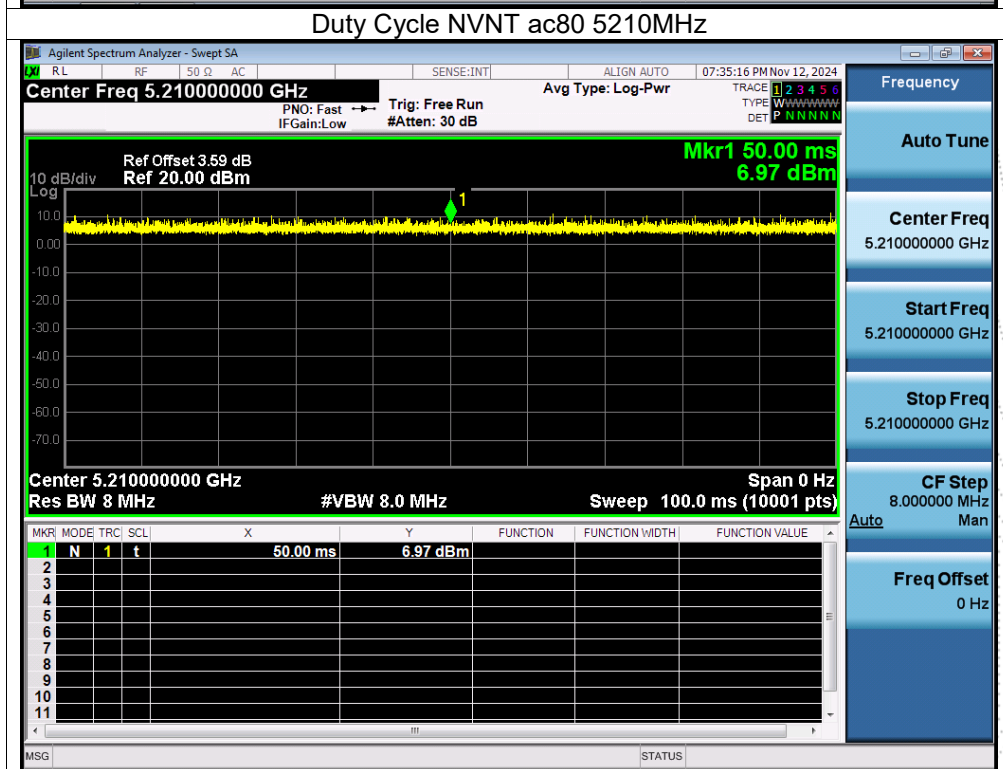
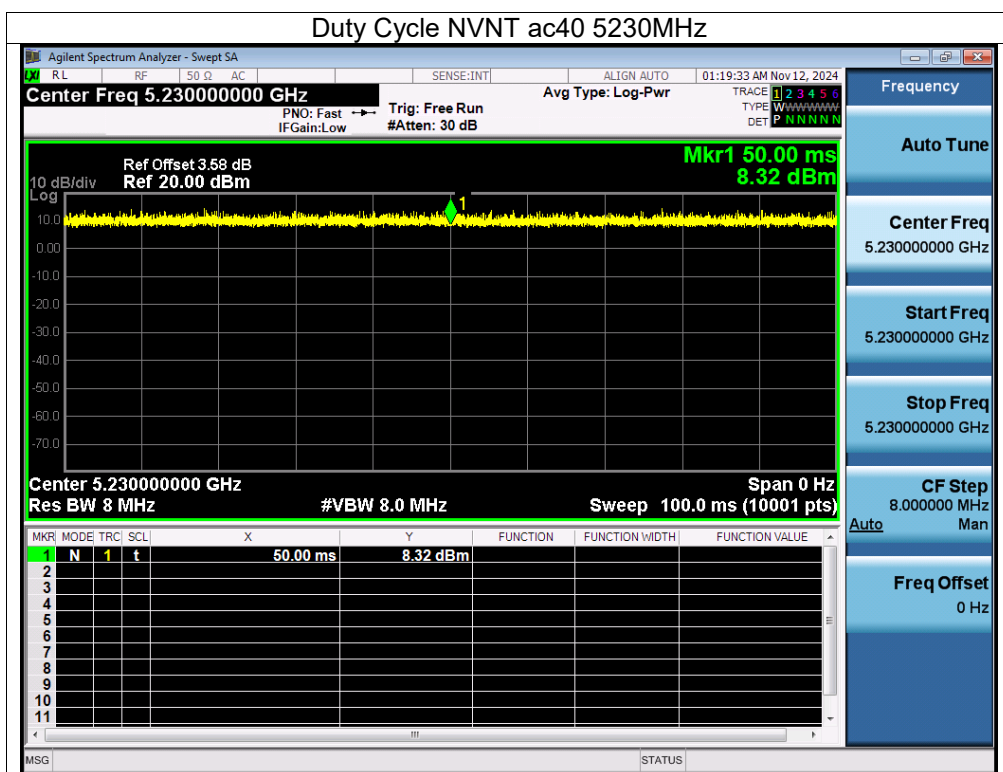






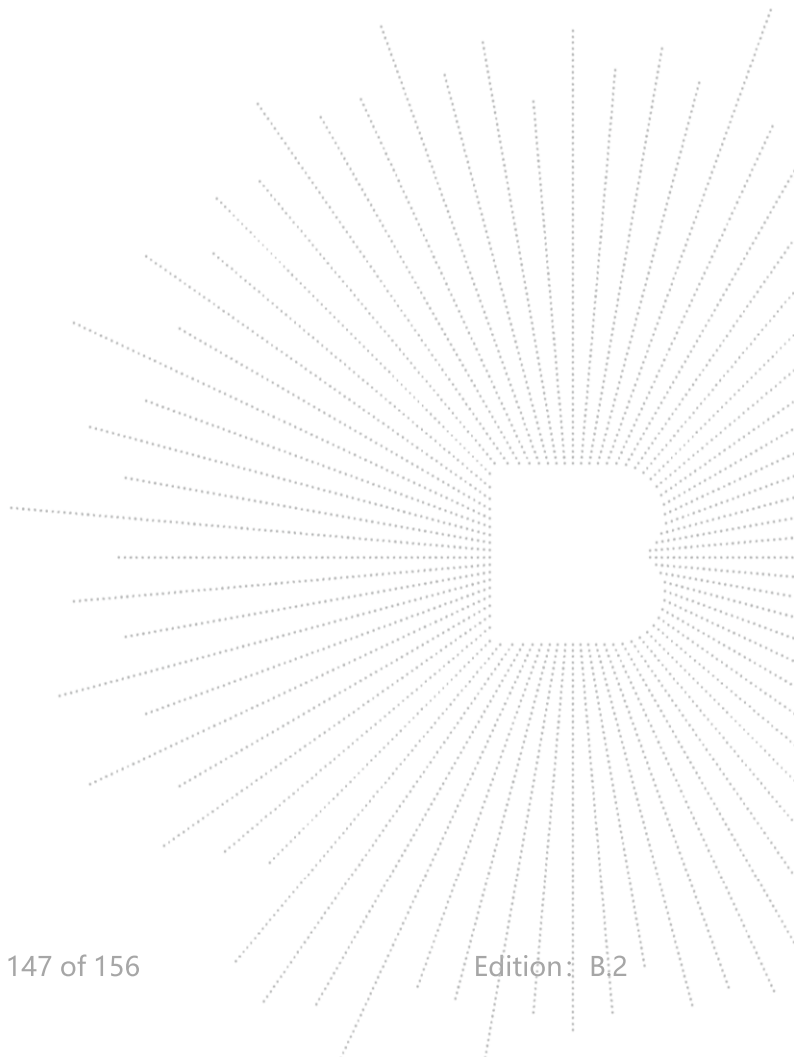


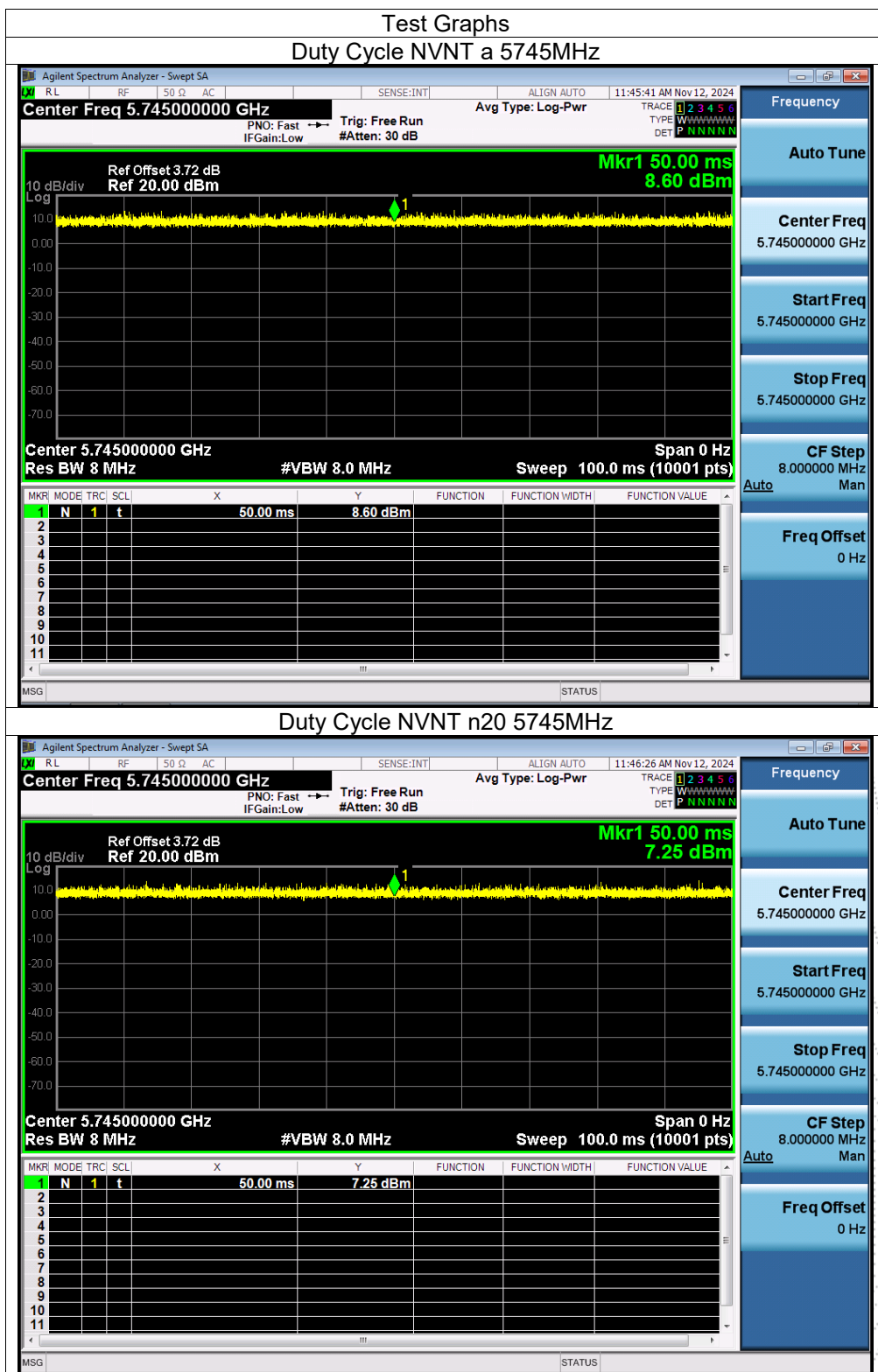


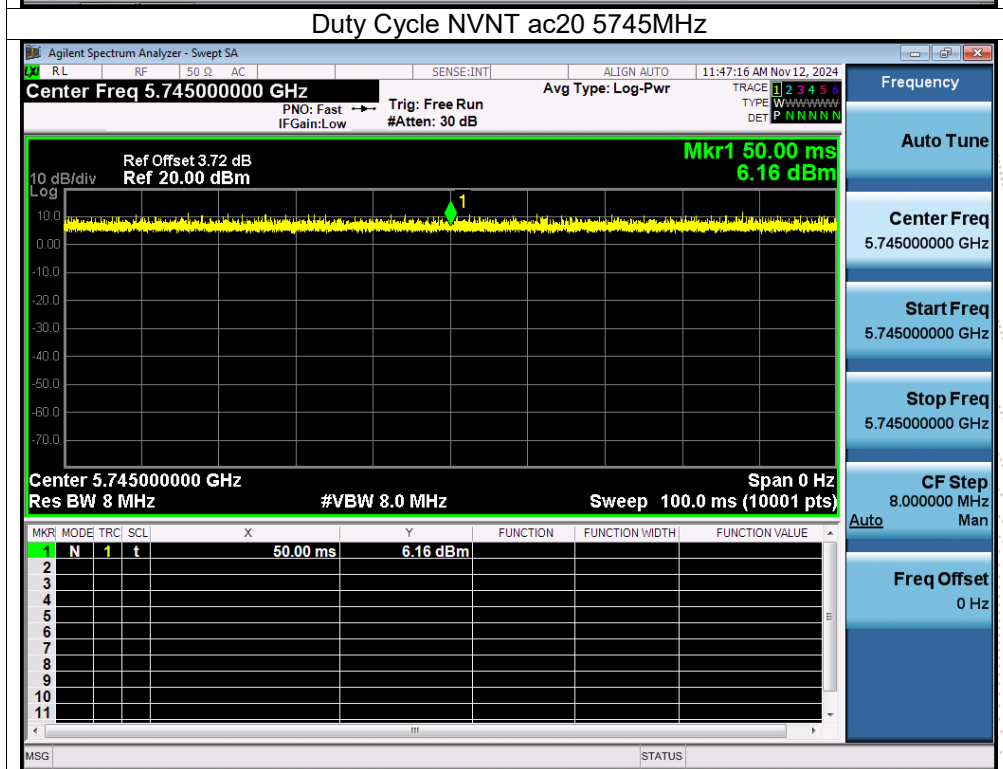
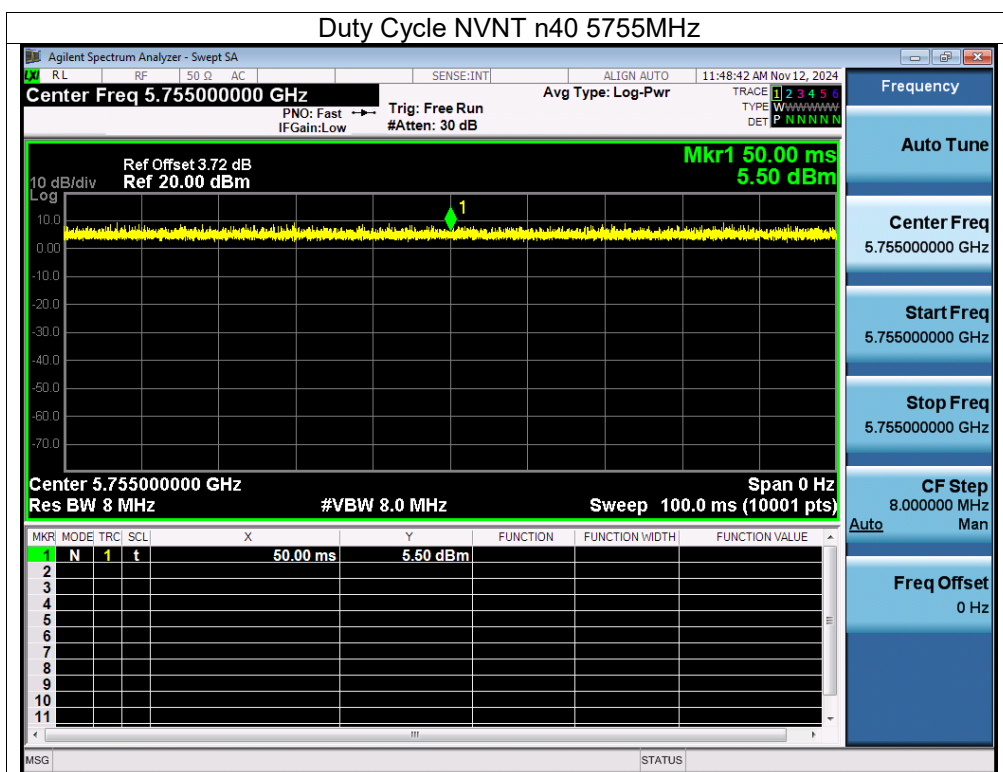


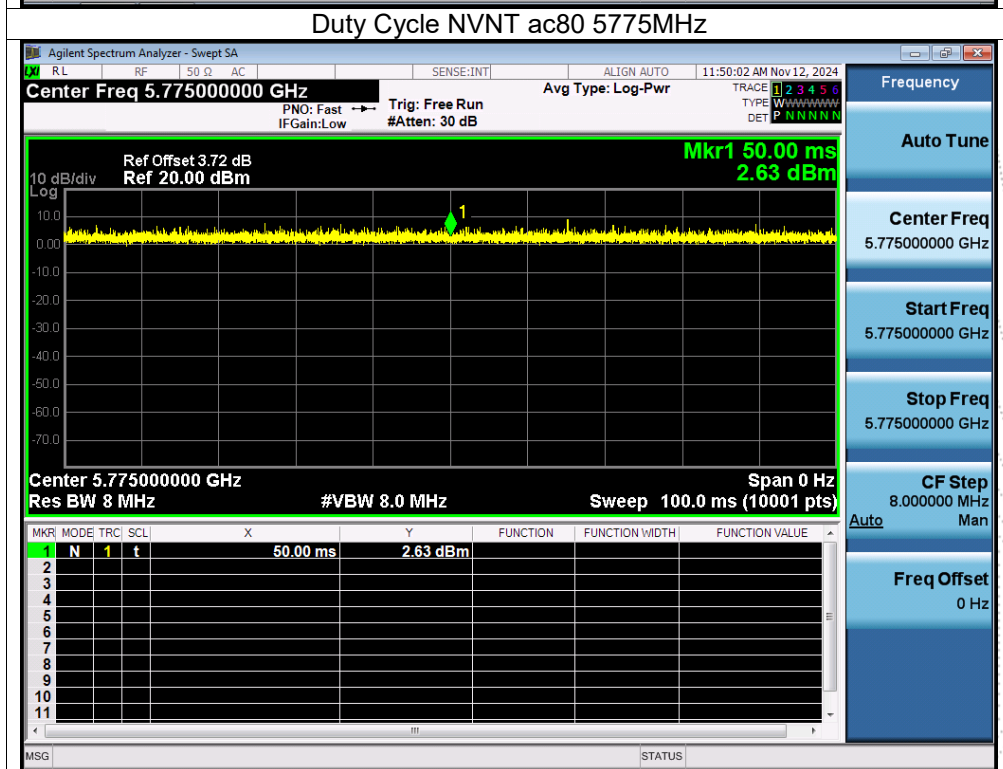
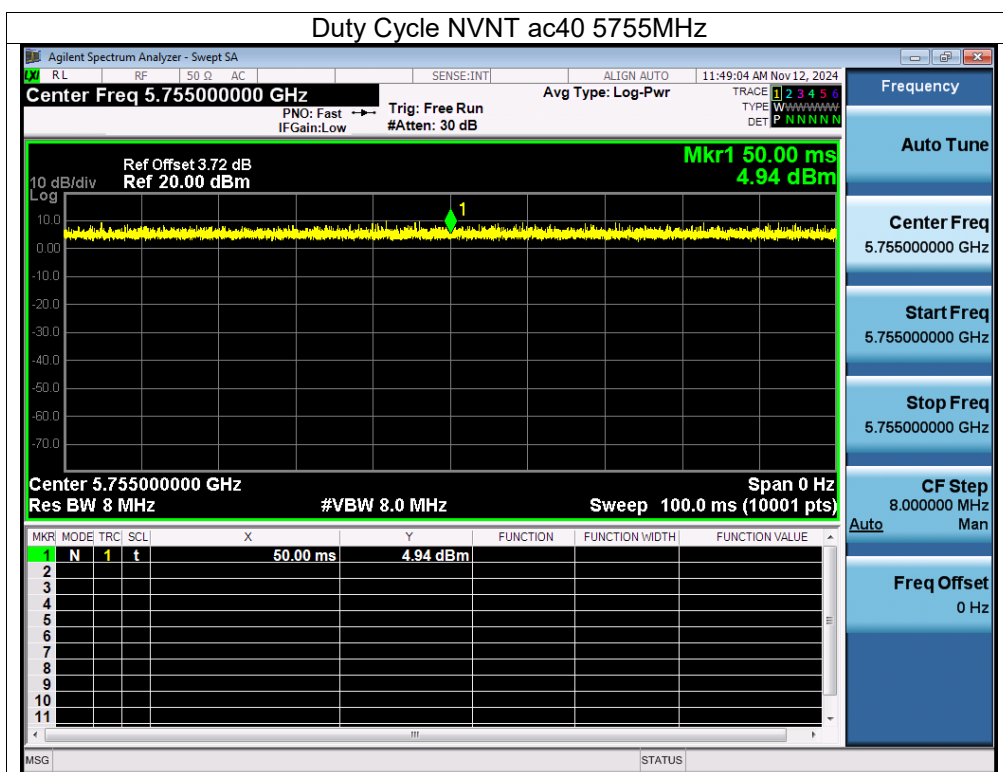
5.8G

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









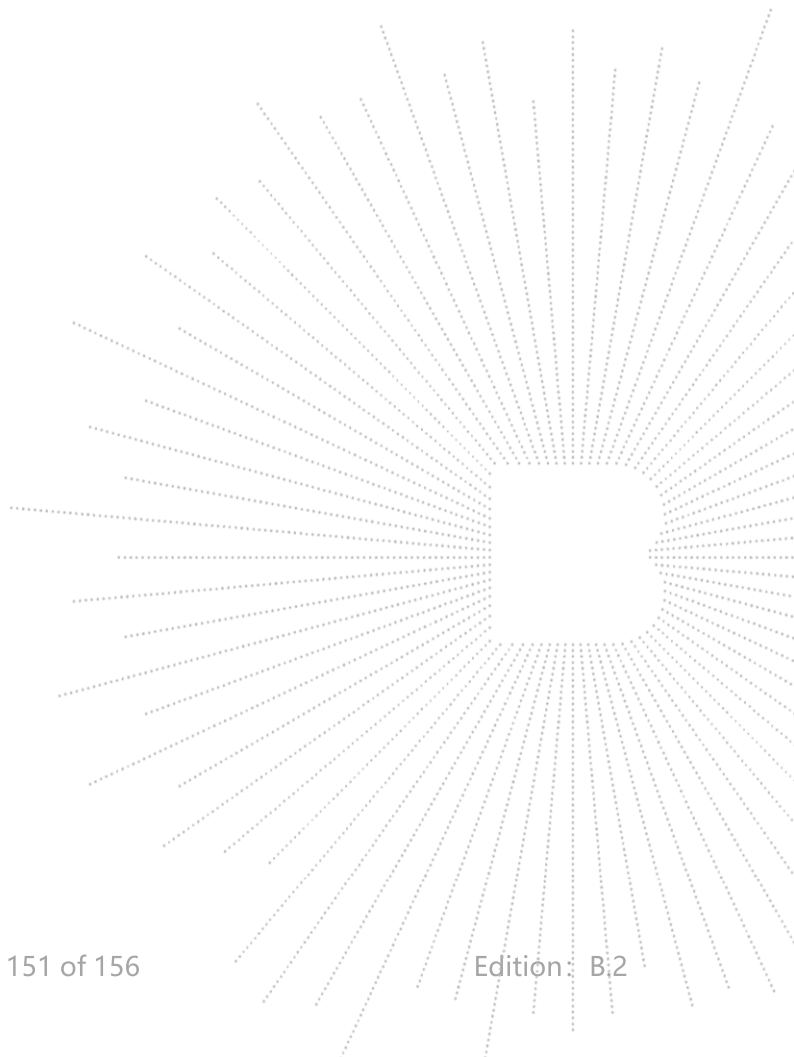
15. Antenna Requirement

15.1 Limit

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

15.2 Test Result

The EUT antenna is Internal antenna (antenna gain: 2.78 dBi). It comply with the standard requirement.



16. EUT Photographs

EUT Photo 1



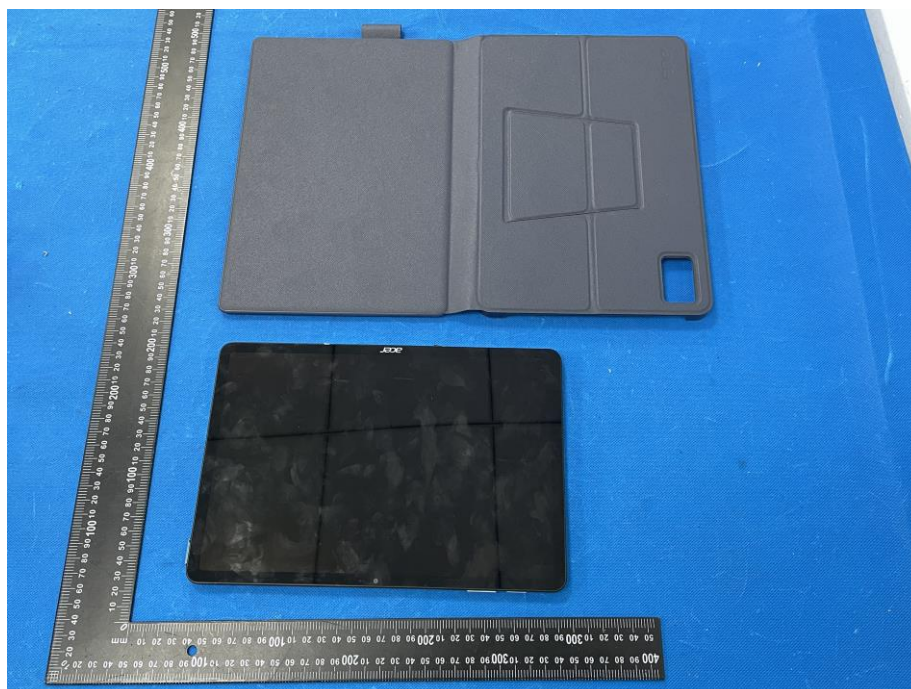
EUT Photo 2



EUT Photo 3



EUT Photo 4



NOTE: Appendix-Photographs Of EUT Constructional Details.

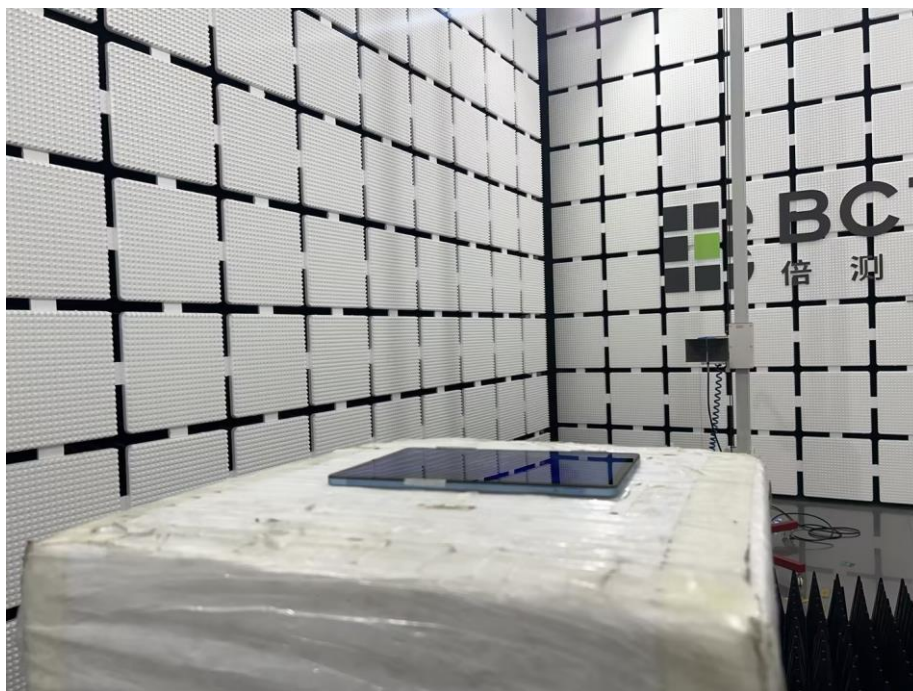
17. EUT Test Setup Photographs

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:

1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: 400-788-9558

P.C.: 518103

FAX: 0755-33229357

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

Consultation E-mail: bctc@bctc-lab.com.cn

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

※※※※※ END ※※※※※