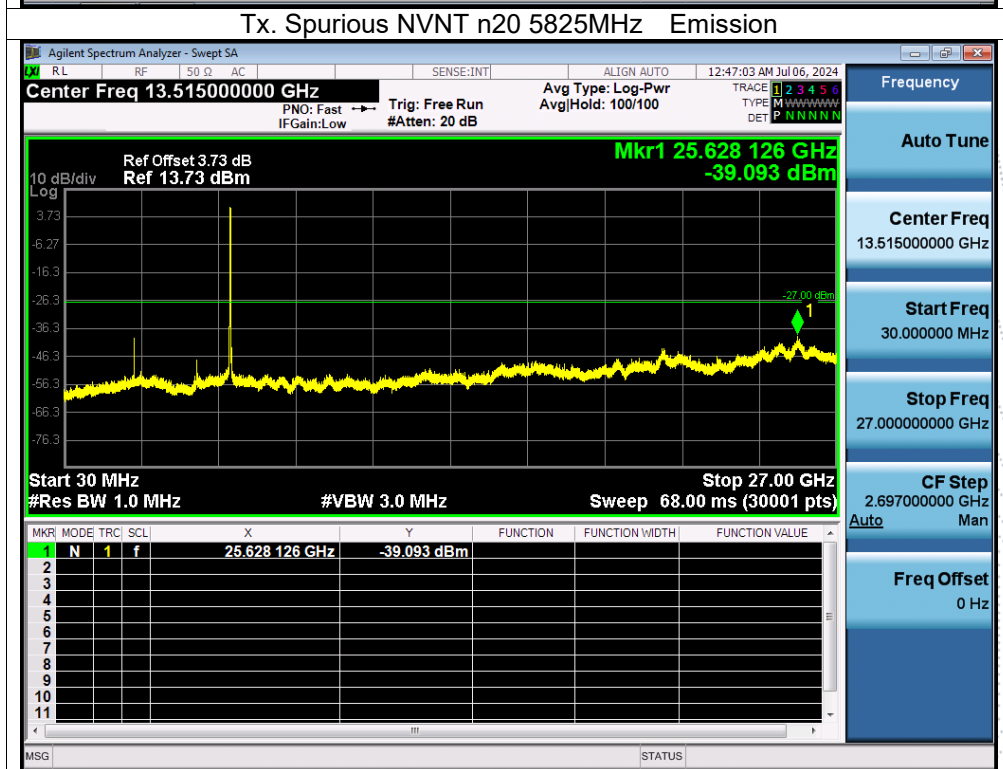
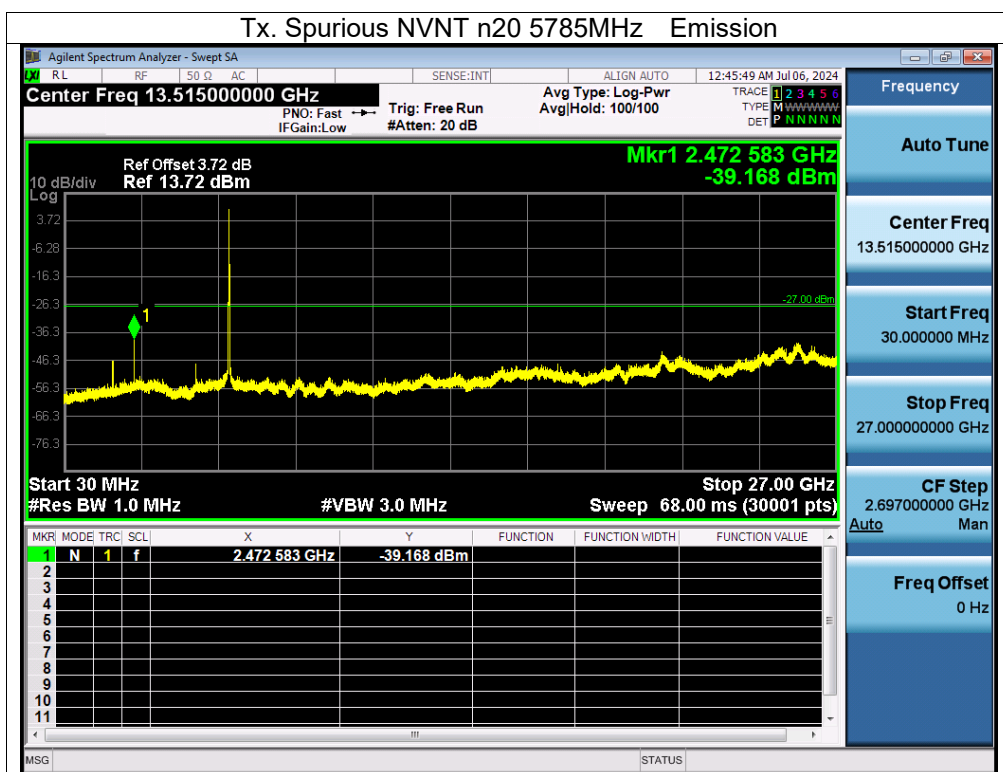
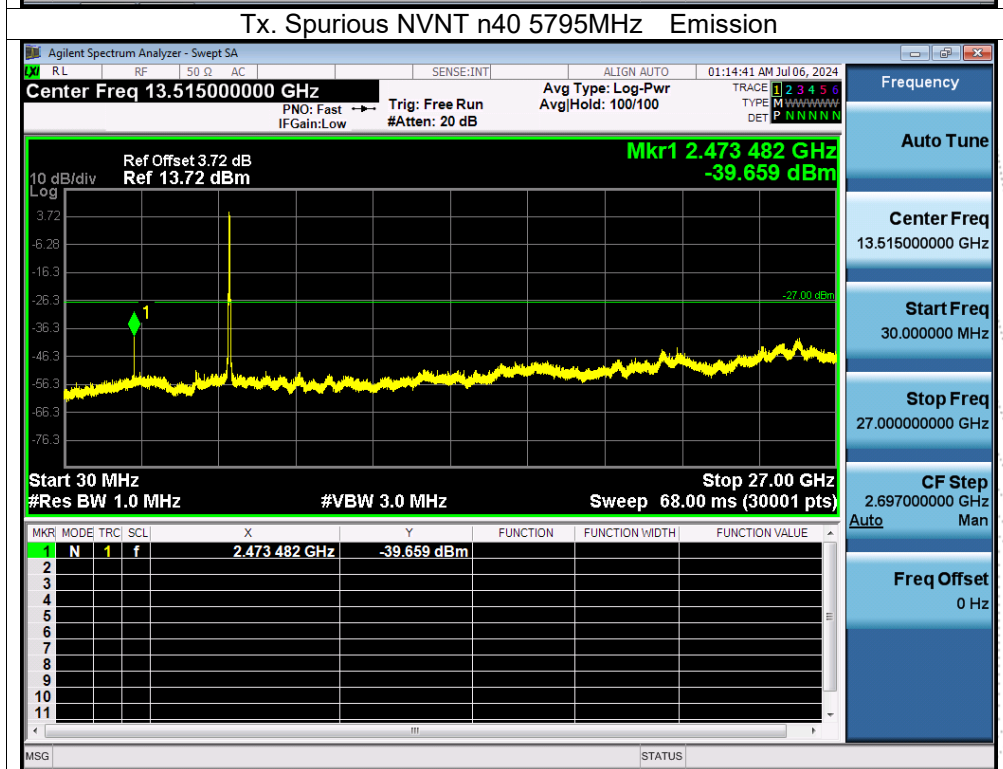
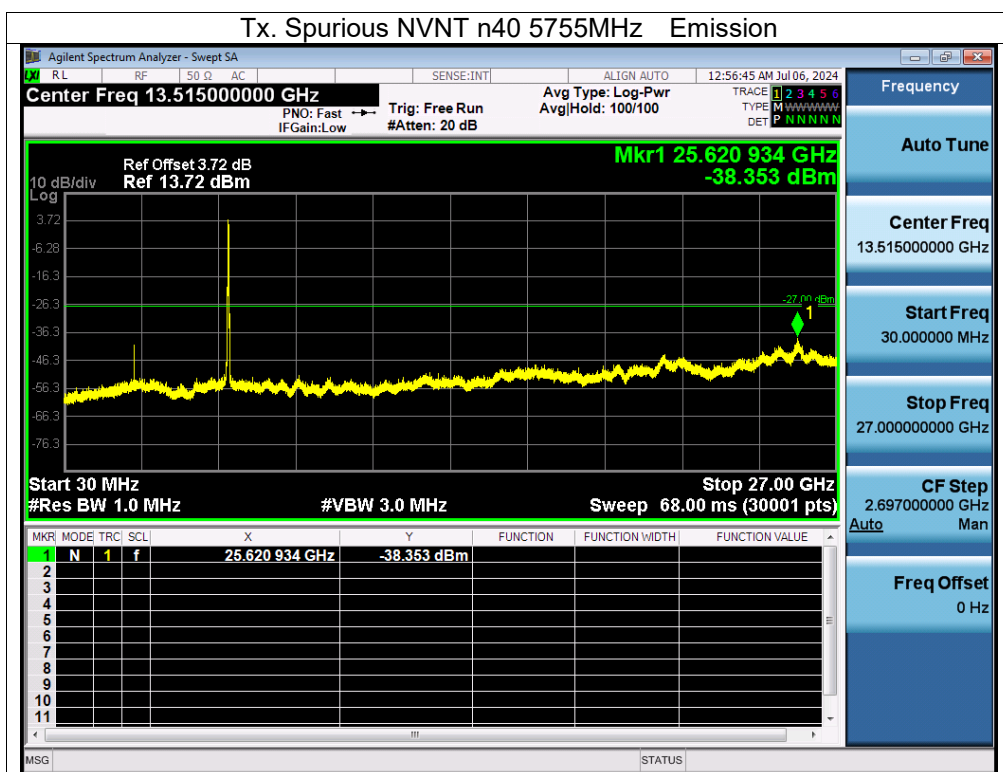
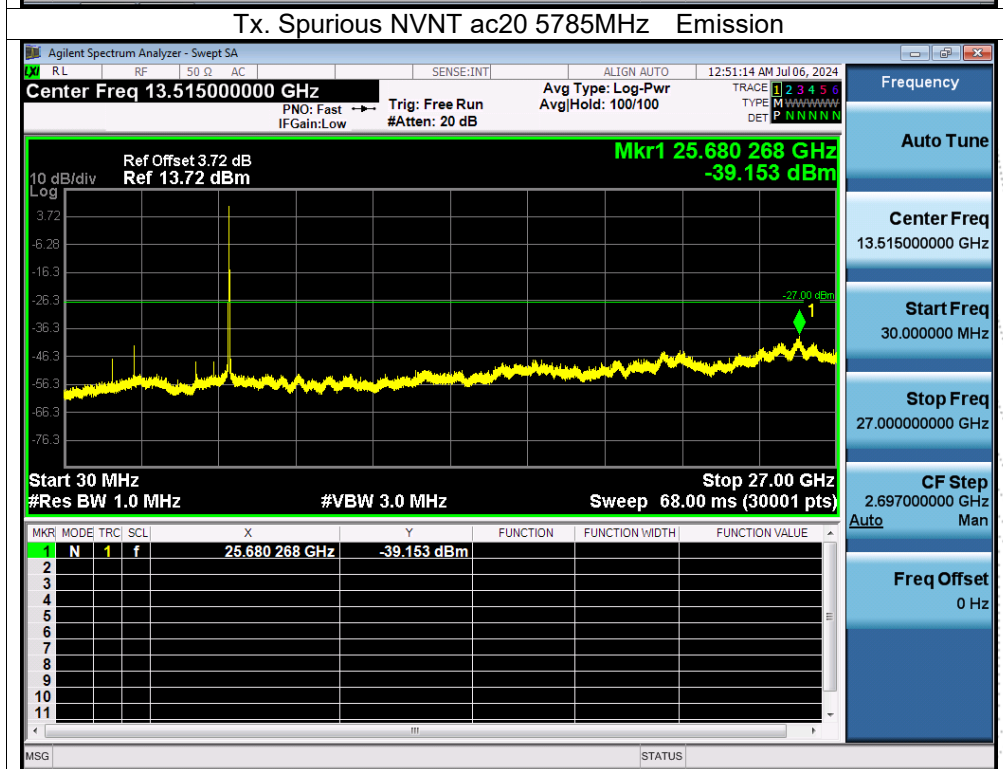
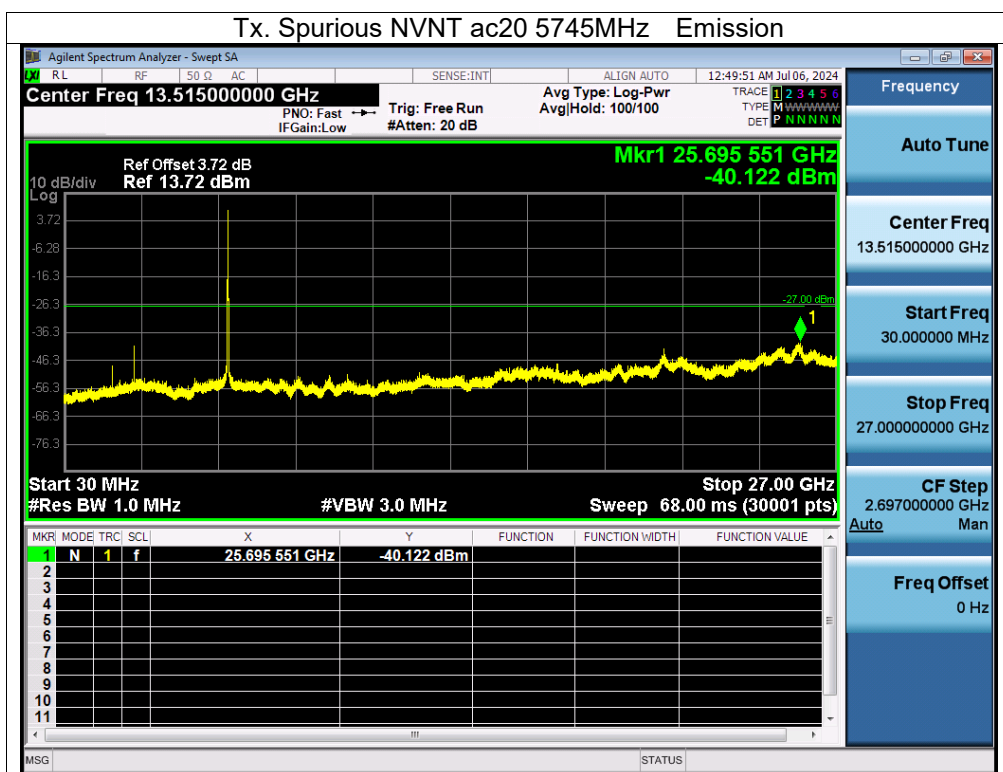
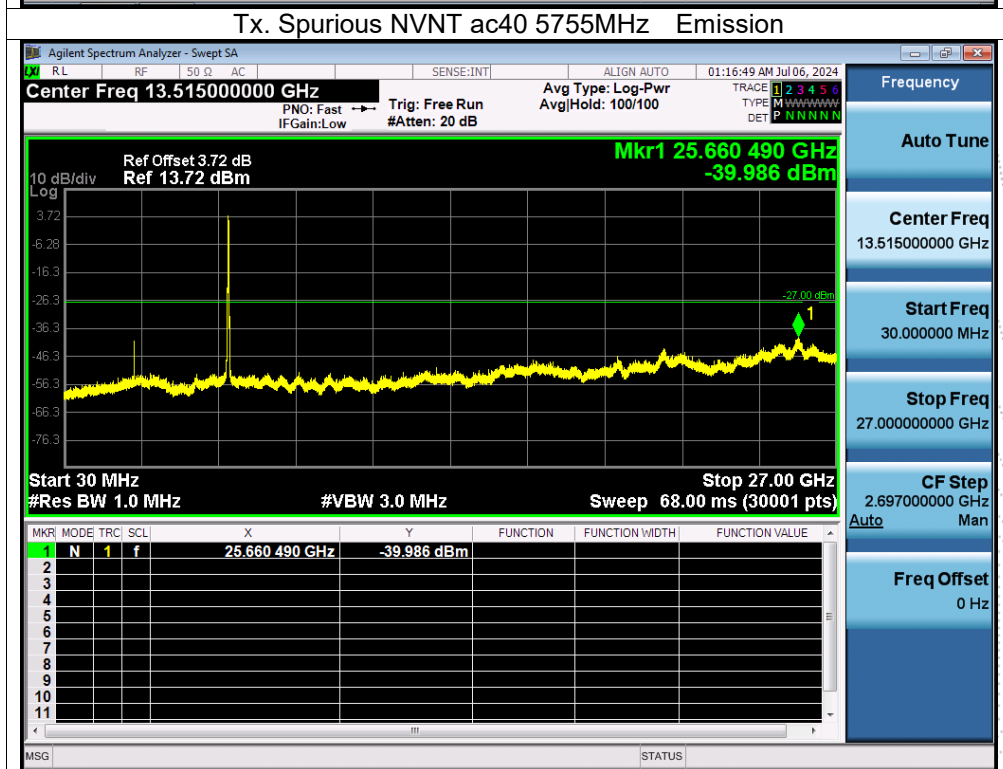
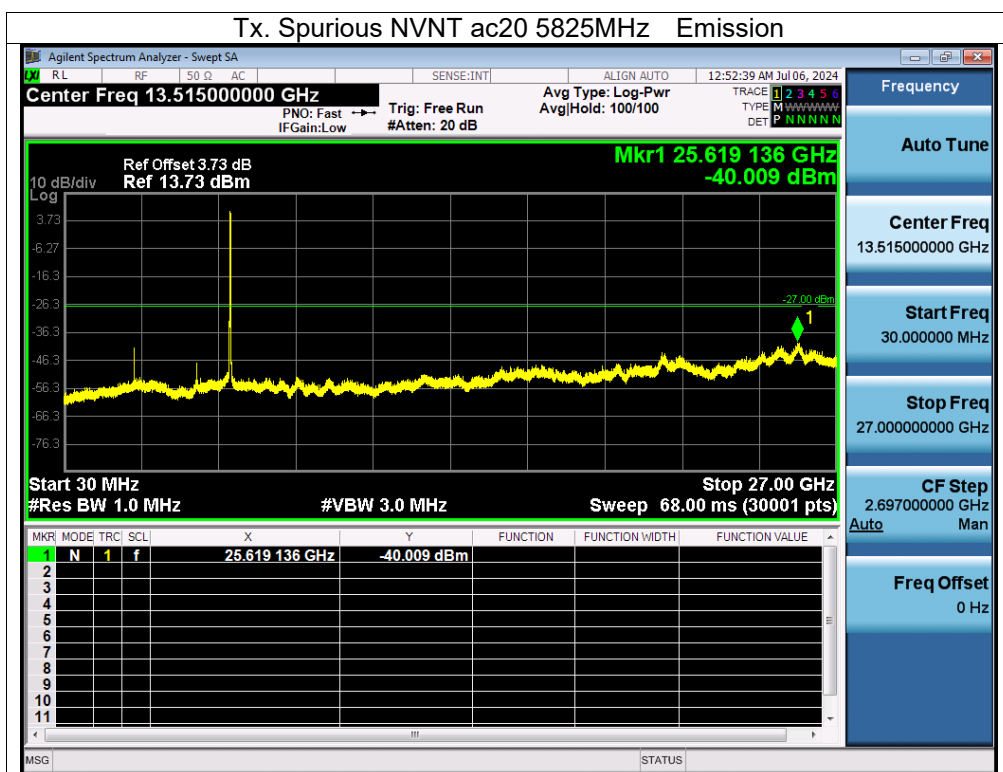
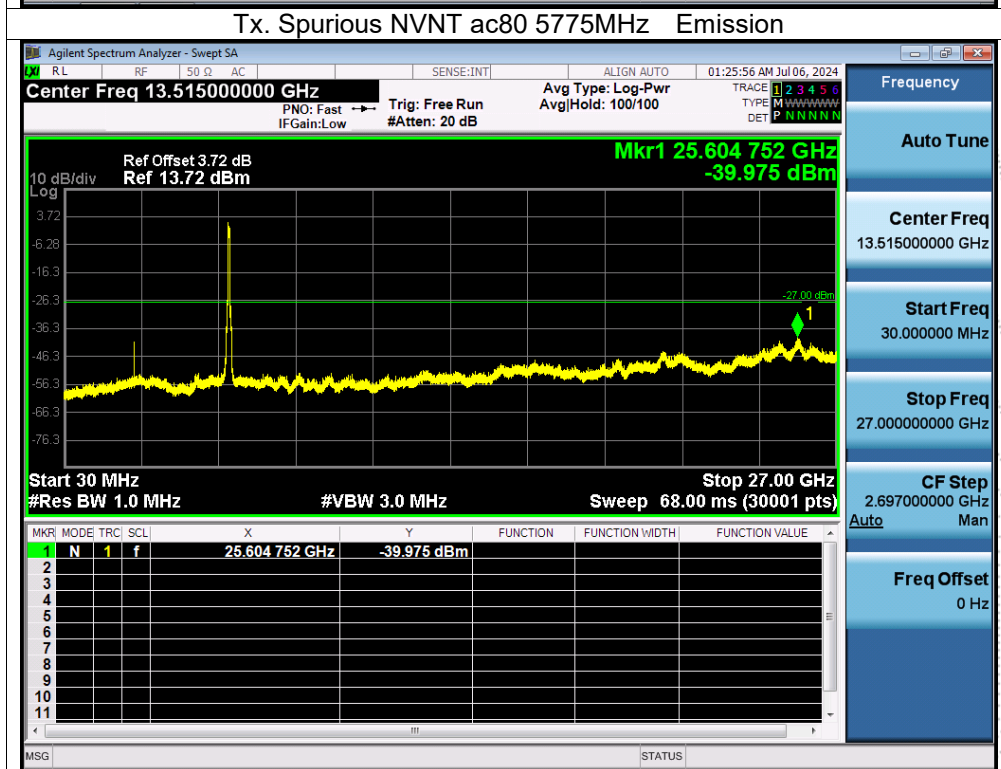
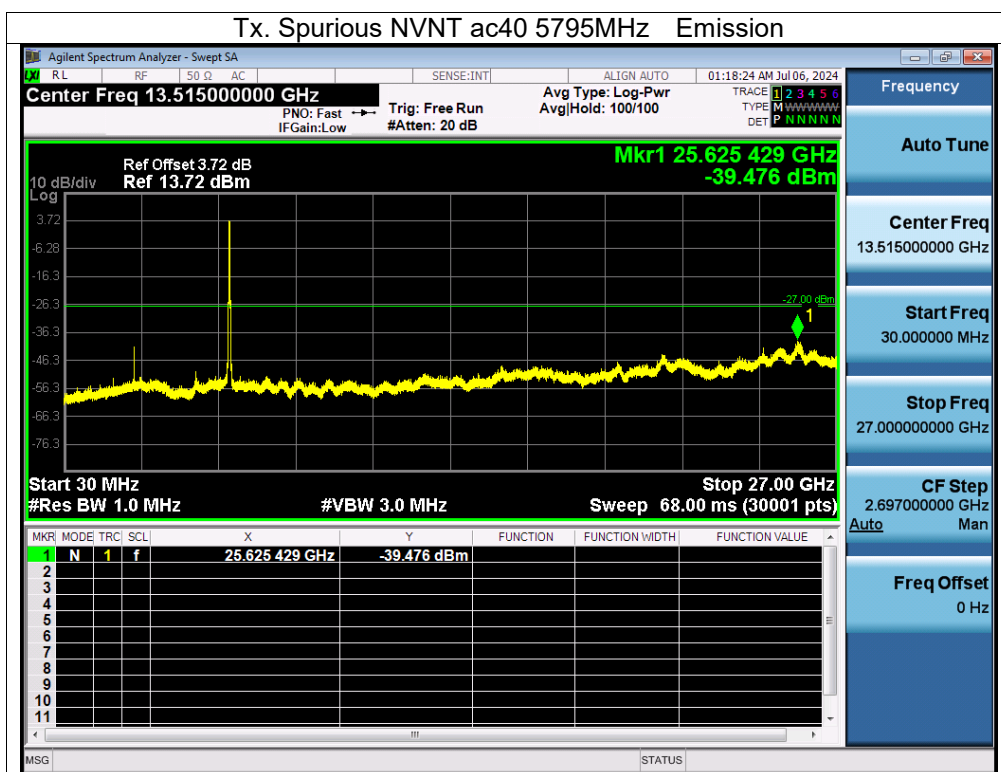












13. Frequency Stability Measurement

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 3.87V
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)	3.87	5180.0094	5180	0.0094	1.8147
		V max (V)	4.45	5180.0066	5180	0.0066	1.2741
		V min (V)	3.29	5180.0089	5180	0.0089	1.7181
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)	3.87	T (°C)	-20	5180.0112	5180	0.0112	2.1622
		T (°C)	-10	5180.0088	5180	0.0088	1.6988
		T (°C)	0	5180.0131	5180	0.0131	2.5290
		T (°C)	10	5180.0025	5180	0.0025	0.4826
		T (°C)	20	5180.0099	5180	0.0099	1.9112
		T (°C)	30	5180.0037	5180	0.0037	0.7143
		T (°C)	40	5180.0065	5180	0.0065	1.2548
		T (°C)	50	5180.0062	5180	0.0062	1.1969
		T (°C)	60	5180.0033	5180	0.0033	0.6371
		T (°C)	70	5180.0032	5180	0.0032	0.6178
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)	3.87	5200.0074	5200	0.0074	1.4231
		V max (V)	4.45	5200.0126	5200	0.0126	2.4231
		V min (V)	3.29	5200.0132	5200	0.0132	2.5385
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)	3.87	T (°C)	-20	5200.01270	5200	0.01270	2.4423
		T (°C)	-10	5200.00400	5200	0.00400	0.7692
		T (°C)	0	5200.00090	5200	0.00090	0.1731
		T (°C)	10	5200.00460	5200	0.00460	0.8846
		T (°C)	20	5200.00040	5200	0.00040	0.0769
		T (°C)	30	5200.00350	5200	0.00350	0.6731
		T (°C)	40	5200.00580	5200	0.00580	1.1154
		T (°C)	50	5200.01190	5200	0.01190	2.2885
		T (°C)	60	5200.00640	5200	0.00640	1.2308
		T (°C)	70	5200.00040	5200	0.00040	0.0769
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)	3.87	5240.0086	5240	0.0086	1.6412
		V max (V)	4.45	5240.0114	5240	0.0114	2.1756
		V min (V)	3.29	5240.0051	5240	0.0051	0.9733
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)	3.87	T (°C)	-20	5240.0107	5240	0.0107	2.0420
		T (°C)	-10	5240.0086	5240	0.0086	1.6412
		T (°C)	0	5240.0052	5240	0.0052	0.9924
		T (°C)	10	5240.0096	5240	0.0096	1.8321
		T (°C)	20	5240.0094	5240	0.0094	1.7939
		T (°C)	30	5240.0051	5240	0.0051	0.9733
		T (°C)	40	5240.0069	5240	0.0069	1.3168
		T (°C)	50	5240.0109	5240	0.0109	2.0802
		T (°C)	60	5240.0025	5240	0.0025	0.4771
		T (°C)	70	5240.0083	5240	0.0083	1.5840
Limits				5150-5250 MHz			
Result				Complies			

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage:	DC 3.87V
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)	3.87	5745.01320	5745	0.01320	2.2977
		V max (V)	4.45	5745.01150	5745	0.01150	2.0017
		V min (V)	3.29	5745.00930	5745	0.00930	1.6188
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)	3.87	T (°C)	-20	5745.00800	5745	0.00800	1.3925
		T (°C)	-10	5745.01040	5745	0.01040	1.8103
		T (°C)	0	5745.00070	5745	0.00070	0.1218
		T (°C)	10	5745.00700	5745	0.00700	1.2185
		T (°C)	20	5745.00730	5745	0.00730	1.2707
		T (°C)	30	5745.00600	5745	0.00600	1.0444
		T (°C)	40	5745.01210	5745	0.01210	2.1062
		T (°C)	50	5745.00960	5745	0.00960	1.6710
		T (°C)	60	5745.00320	5745	0.00320	0.5570
		T (°C)	70	5745.00110	5745	0.00110	0.1915
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)	3.87	5785.00810	5785	0.00810	1.4002
		V max (V)	4.45	5785.00240	5785	0.00240	0.4149
		V min (V)	3.29	5785.00980	5785	0.00980	1.6940
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)	3.87	T (°C)	-20	5785.00660	5785	0.00660	1.1409
		T (°C)	-10	5785.00870	5785	0.00870	1.5039
		T (°C)	0	5785.00310	5785	0.00310	0.5359
		T (°C)	10	5785.01230	5785	0.01230	2.1262
		T (°C)	20	5785.00370	5785	0.00370	0.6396
		T (°C)	30	5785.01190	5785	0.01190	2.0570
		T (°C)	40	5785.01060	5785	0.01060	1.8323
		T (°C)	50	5785.01320	5785	0.01320	2.2818
		T (°C)	60	5785.00550	5785	0.00550	0.9507
		T (°C)	70	5785.00500	5785	0.00500	0.8643
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)	3.87	5825.00840	5825	0.00840	1.4421
		V max (V)	4.45	5825.00940	5825	0.00940	1.6137
		V min (V)	3.29	5825.01070	5825	0.01070	1.8369
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)	3.87	T (°C)	-20	5825.00210	5825	0.00210	0.3605
		T (°C)	-10	5825.00670	5825	0.00670	1.1502
		T (°C)	0	5825.00920	5825	0.00920	1.5794
		T (°C)	10	5825.00060	5825	0.00060	0.1030
		T (°C)	20	5825.00910	5825	0.00910	1.5622
		T (°C)	30	5825.00120	5825	0.00120	0.2060
		T (°C)	40	5825.00940	5825	0.00940	1.6137
		T (°C)	50	5825.00570	5825	0.00570	0.9785
		T (°C)	60	5825.00810	5825	0.00810	1.3906
		T (°C)	70	5825.00520	5825	0.00520	0.8927
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 = $T_{on} / (T_{on} + T_{off})$

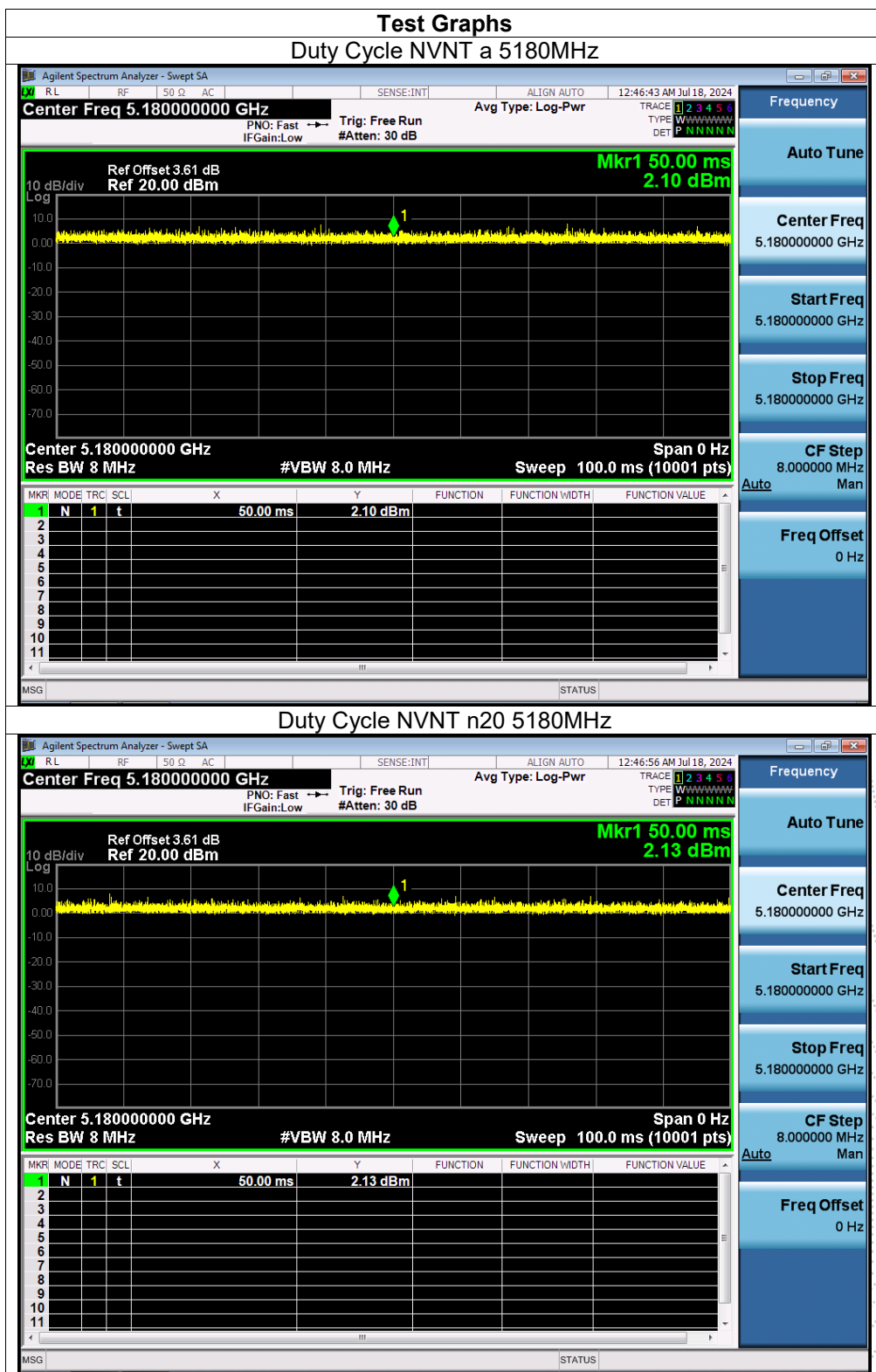
14.3 Test Procedure

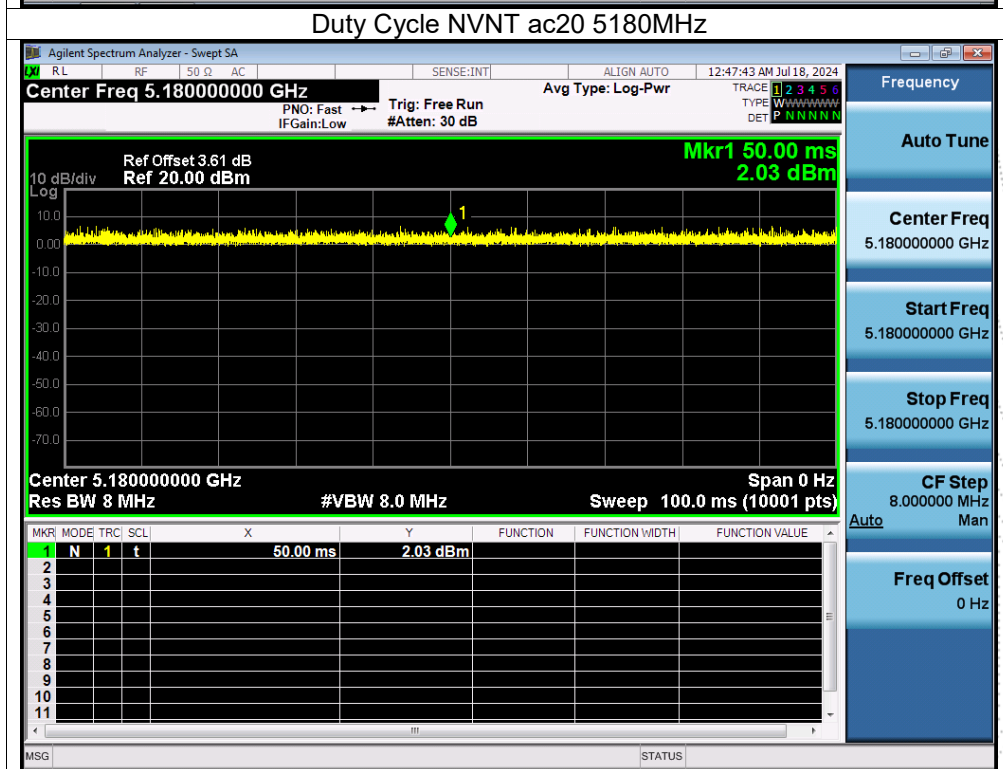
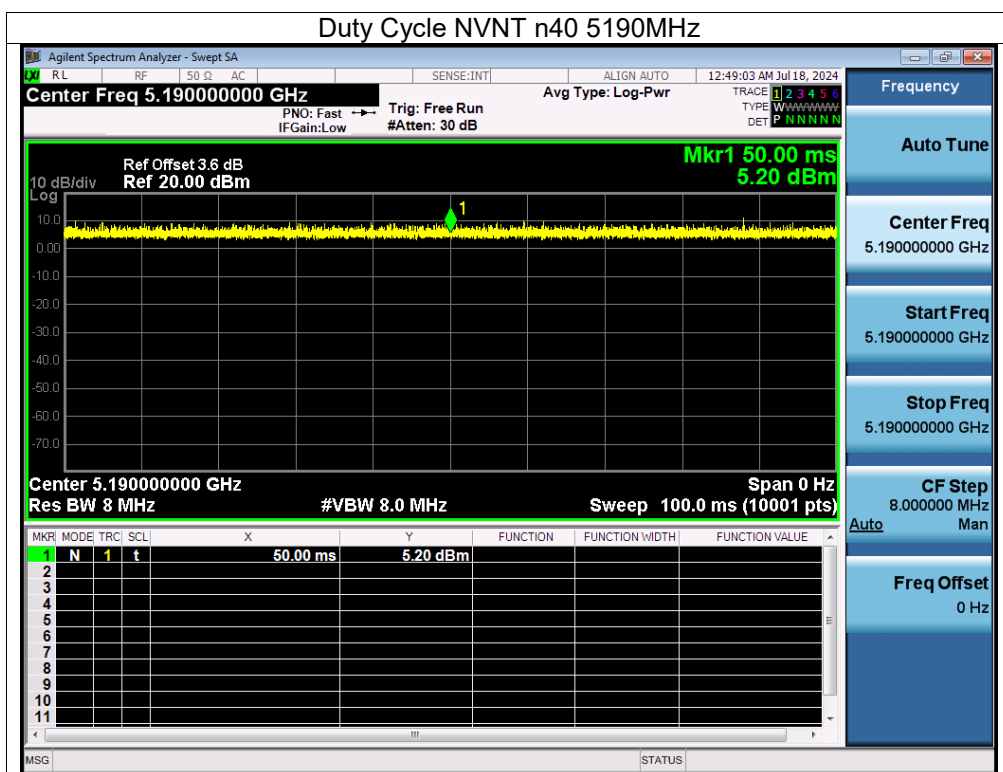
1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

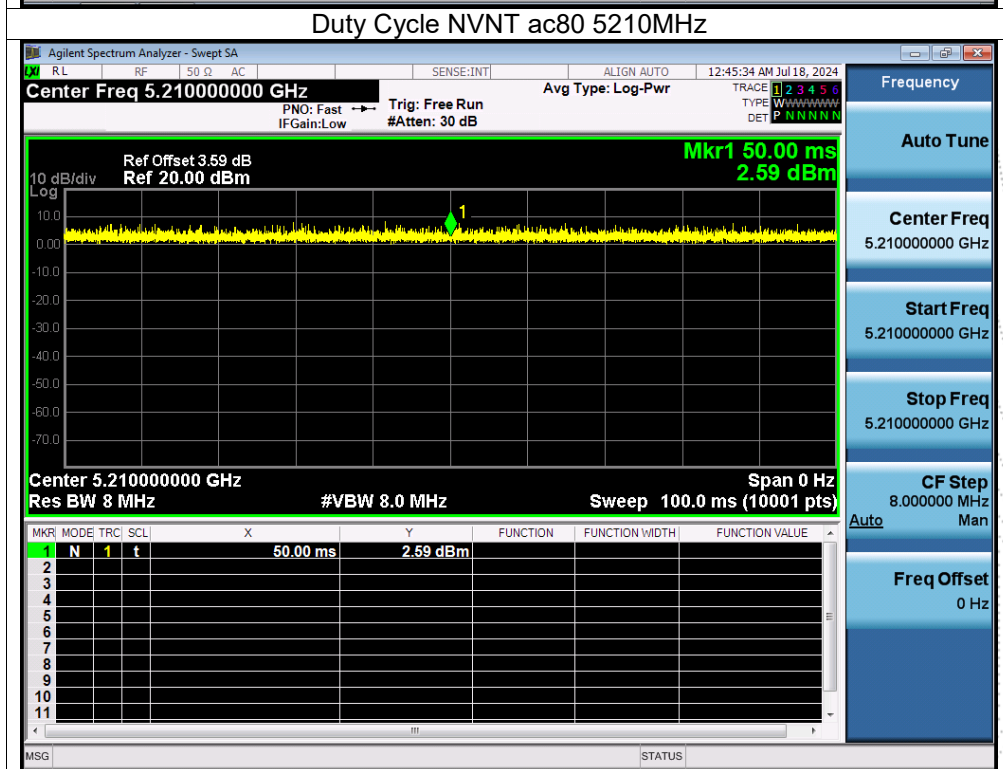
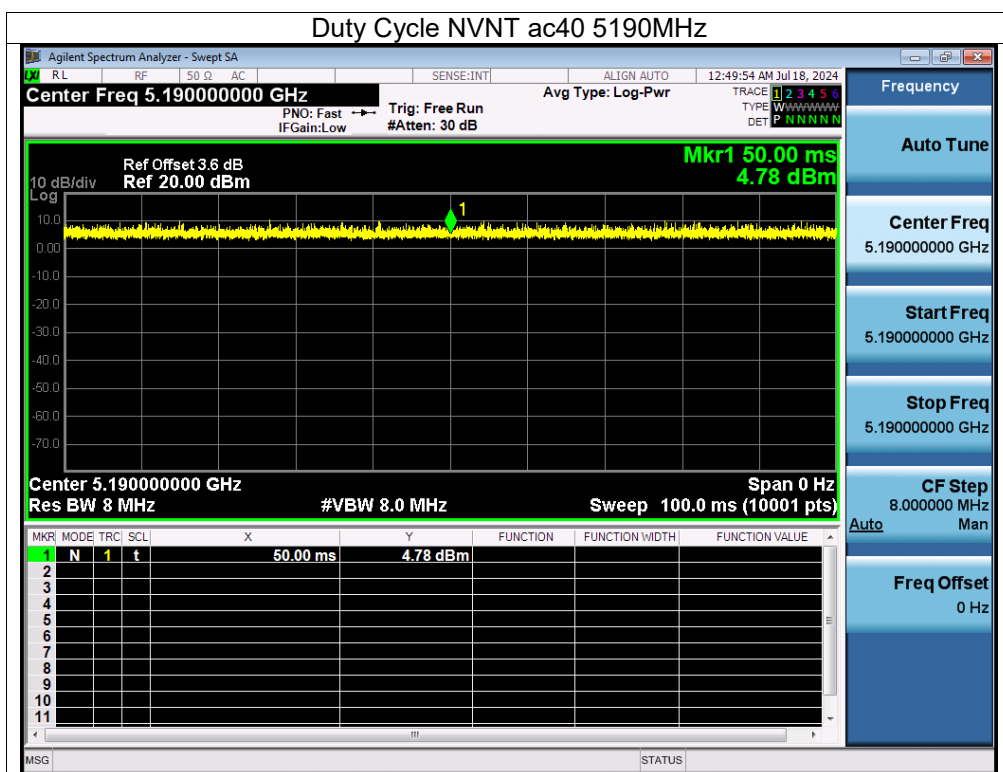
14.4 Test Result

5.1G

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

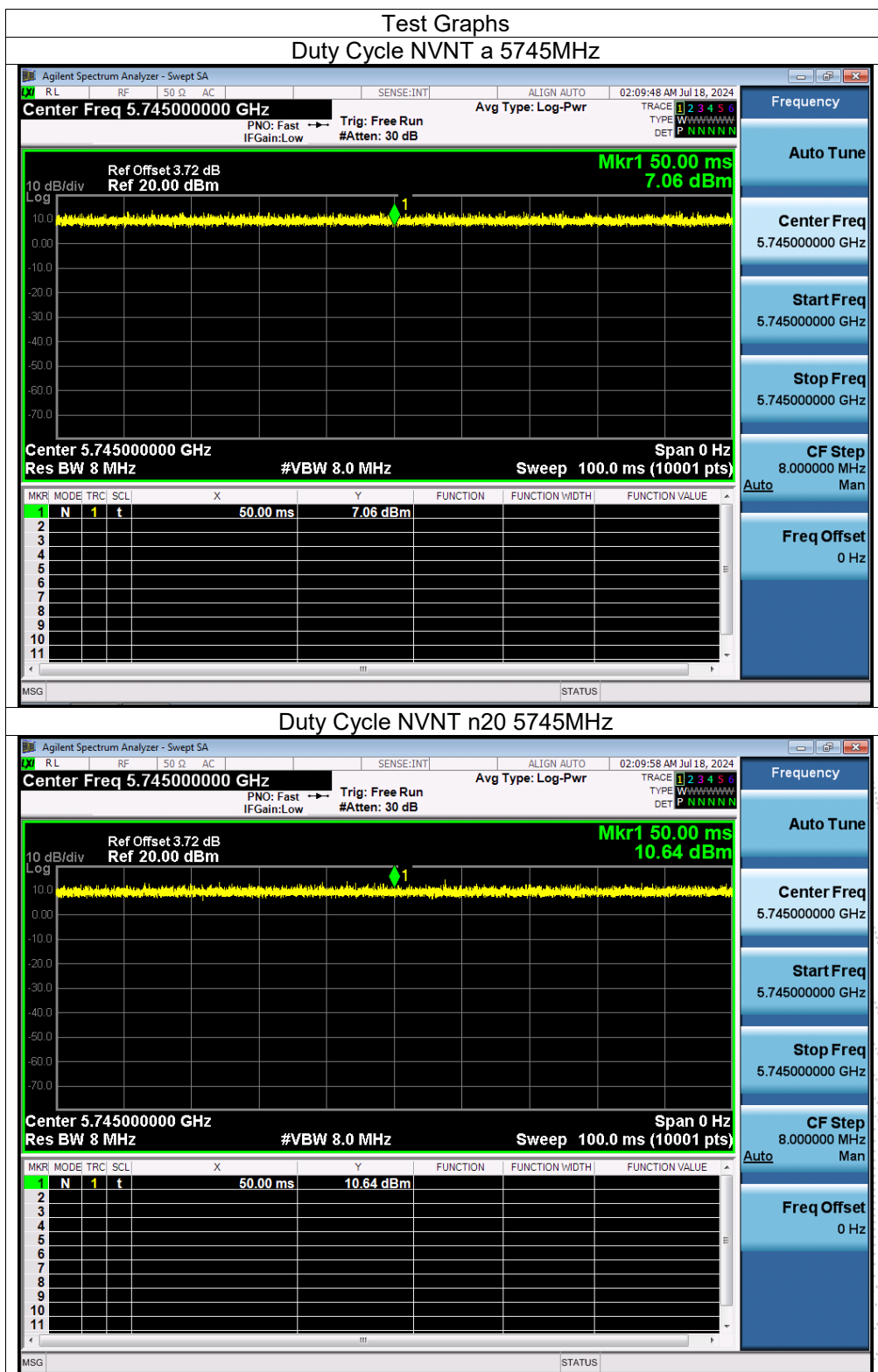


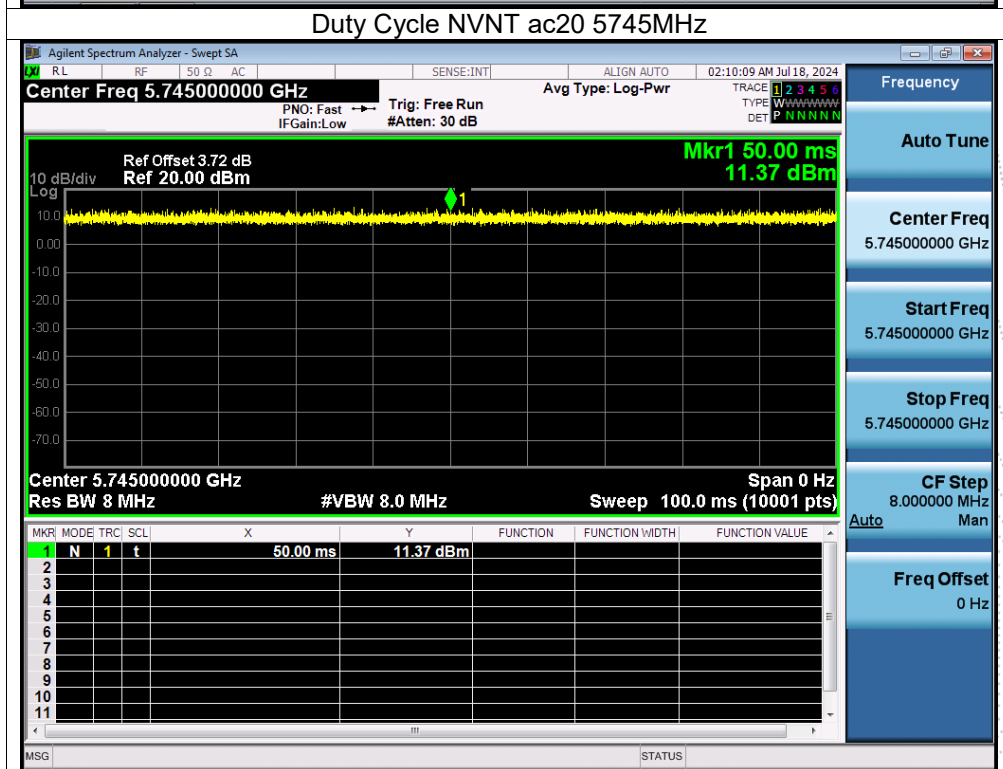
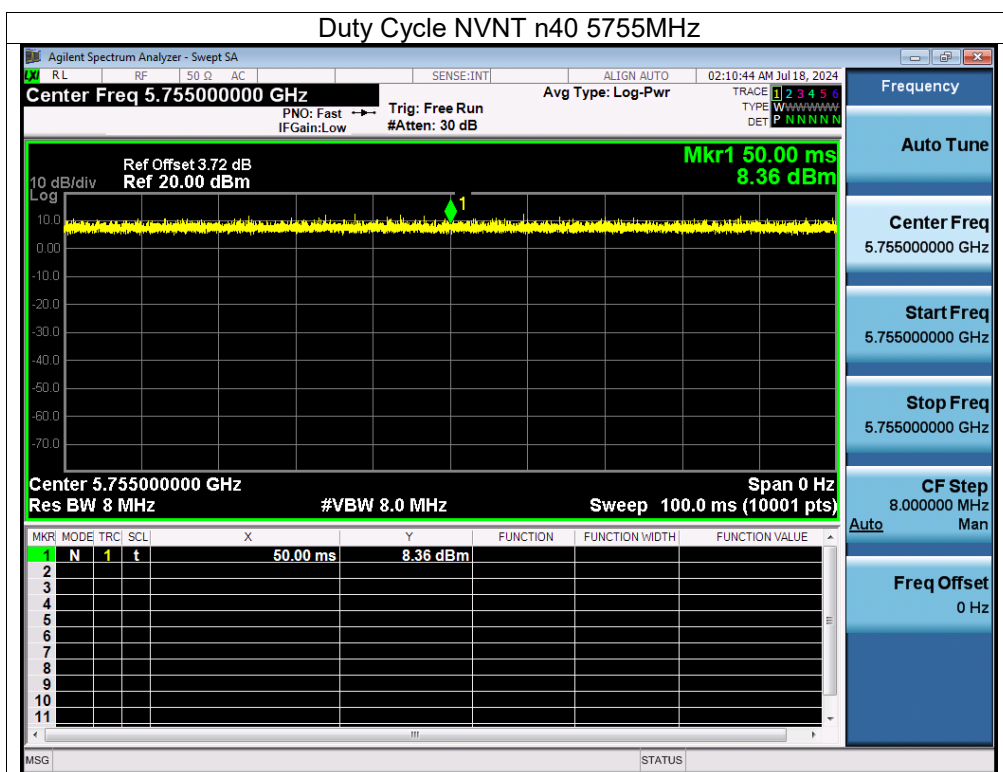


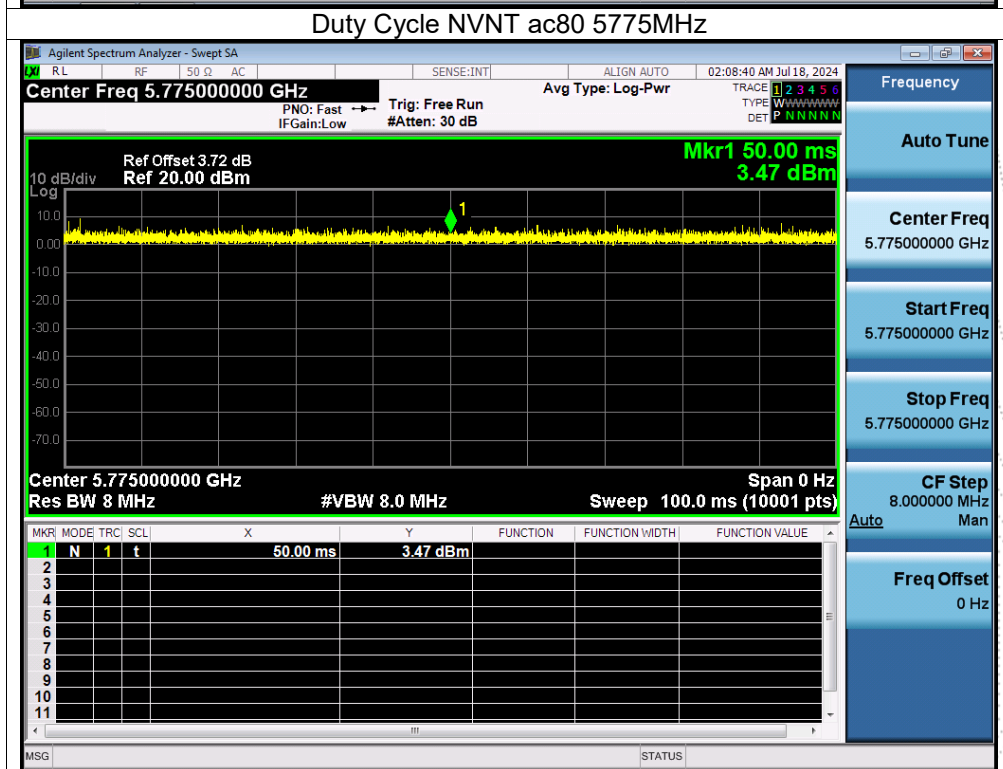
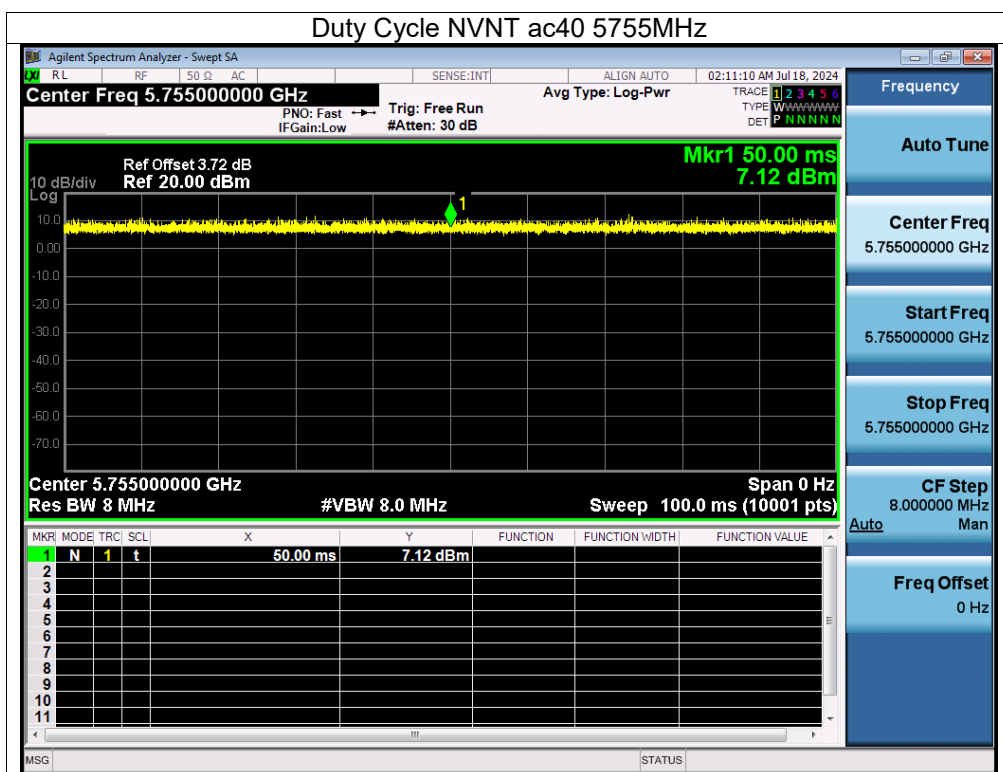


5.8G

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







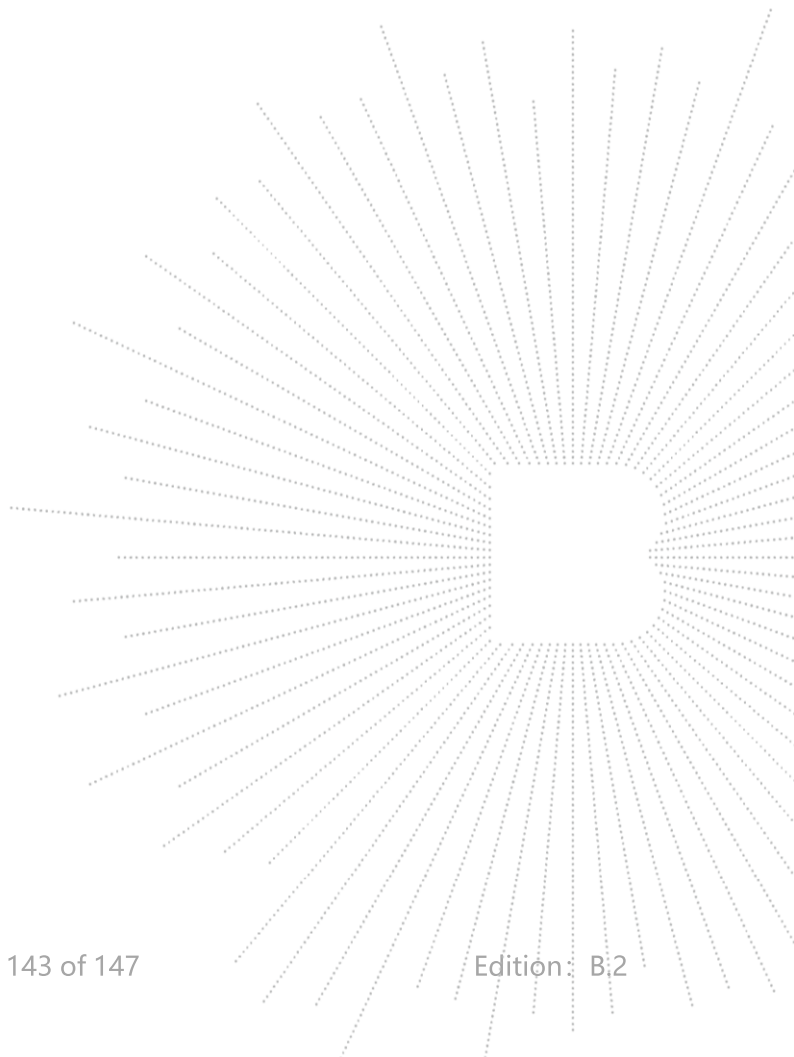
15. Antenna Requirement

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.

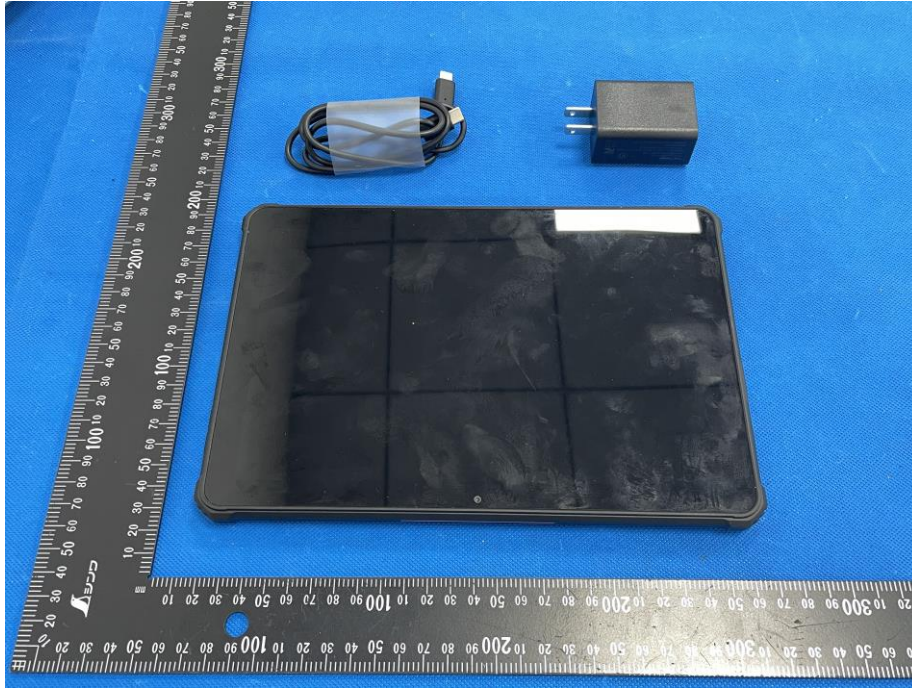
15.2 Test Result

The EUT antenna is Internal antenna (antenna gain: 1.11dBi). It comply with the standard requirement.



16. EUT Photographs

EUT Photo 1



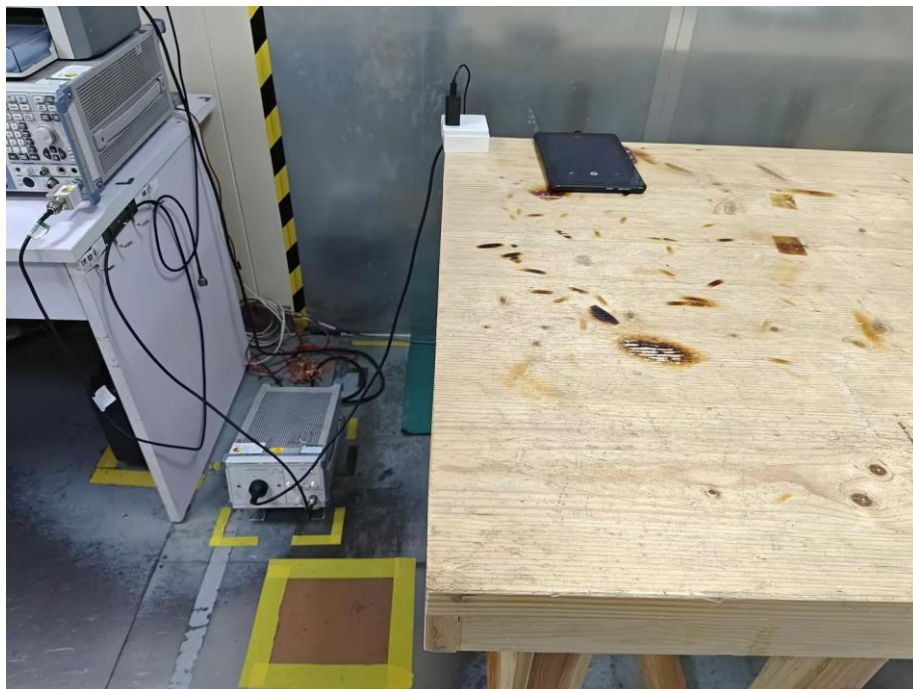
EUT Photo 2



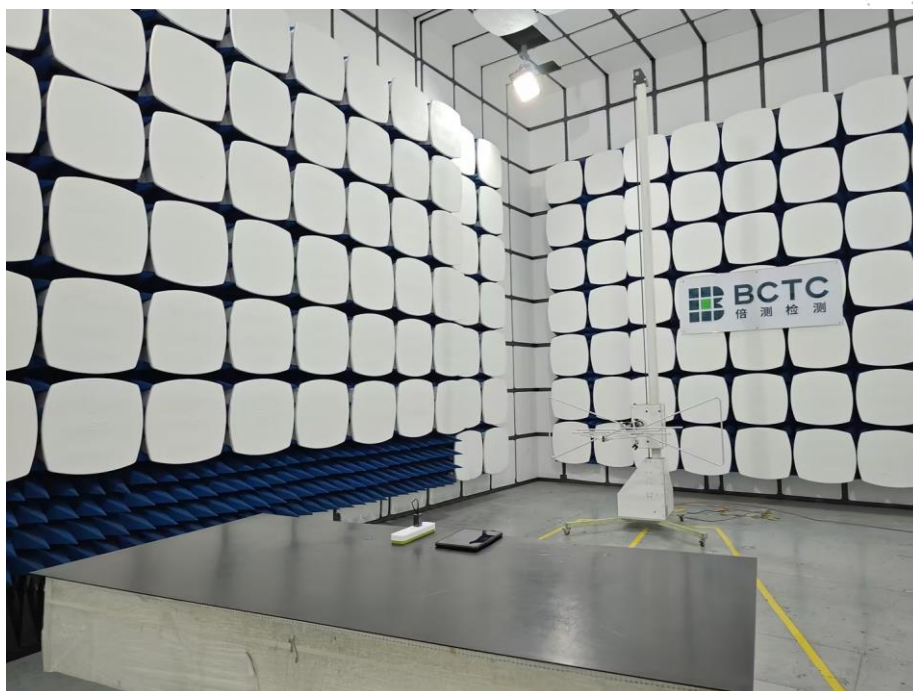
NOTE: Appendix-Photographs Of EUT Constructional Details.

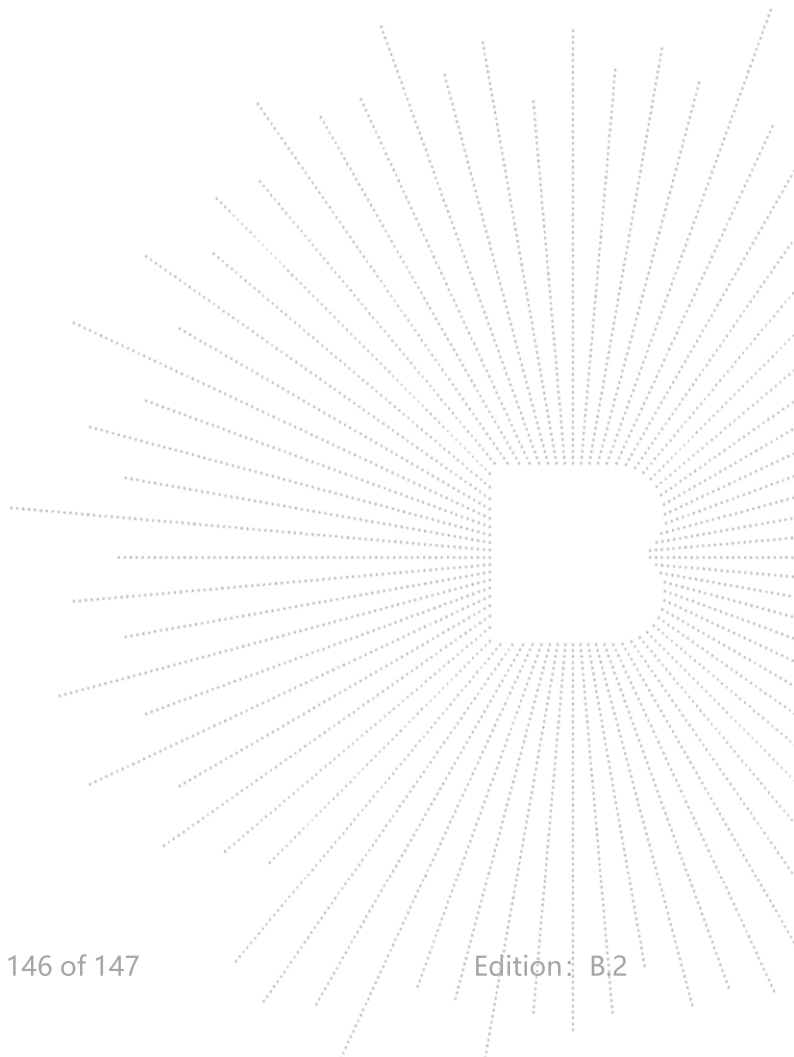
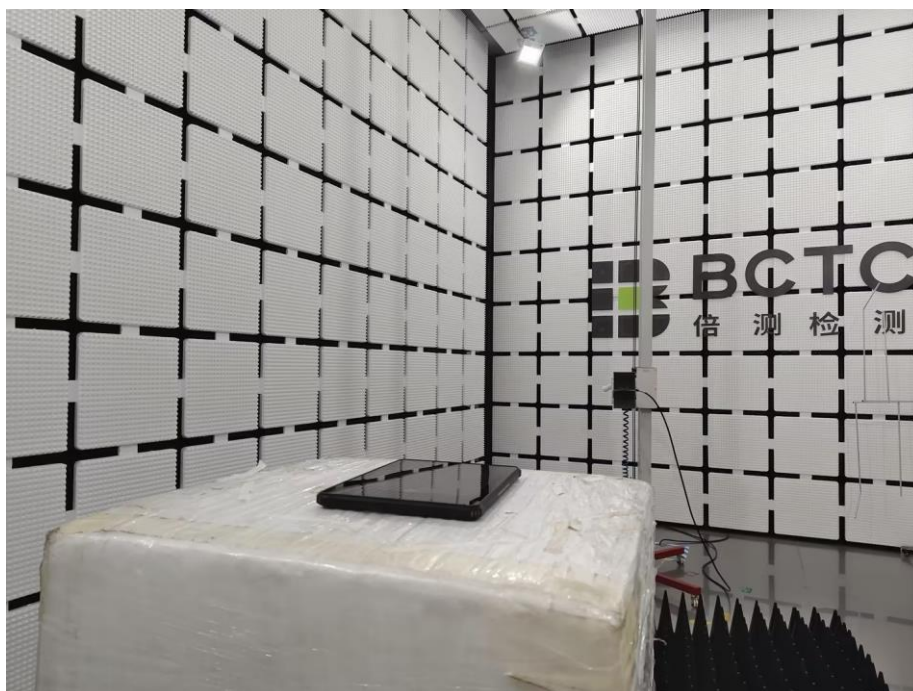
17. EUT Test Setup Photographs

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.

Address:

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

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

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

※※※※※ END ※※※※※