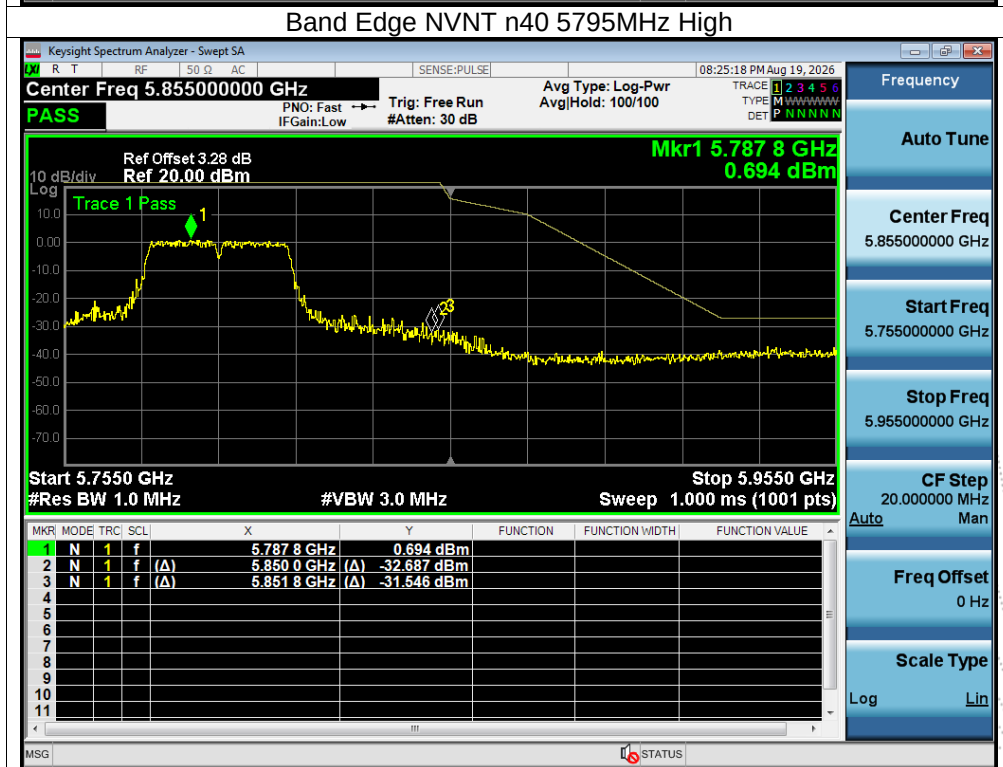
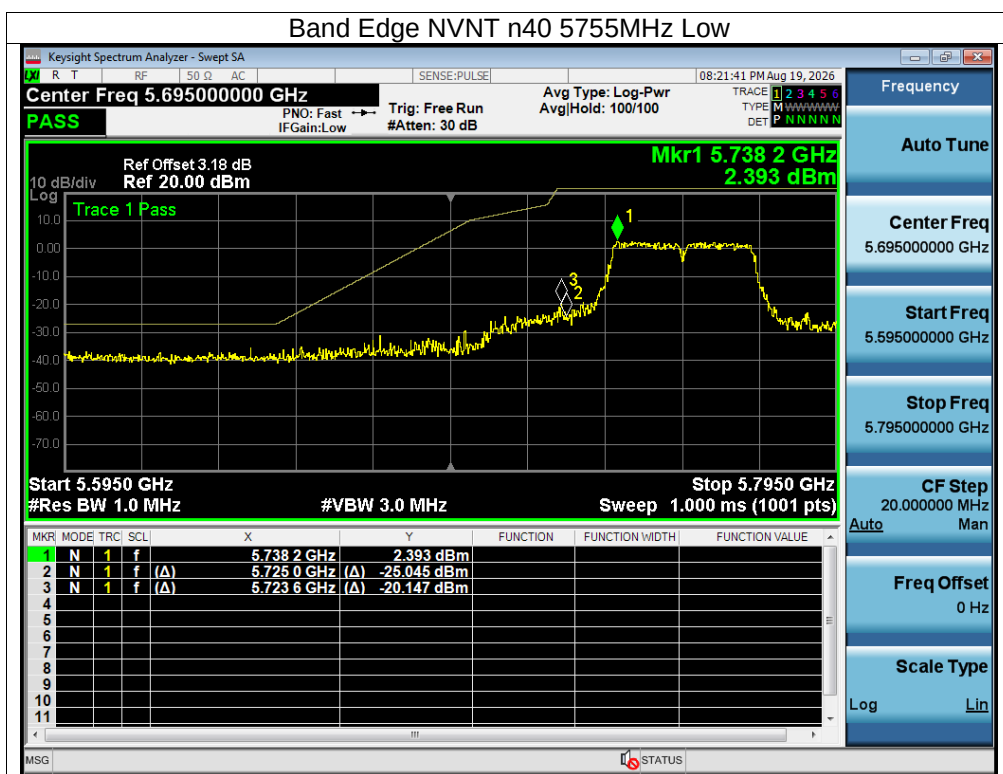
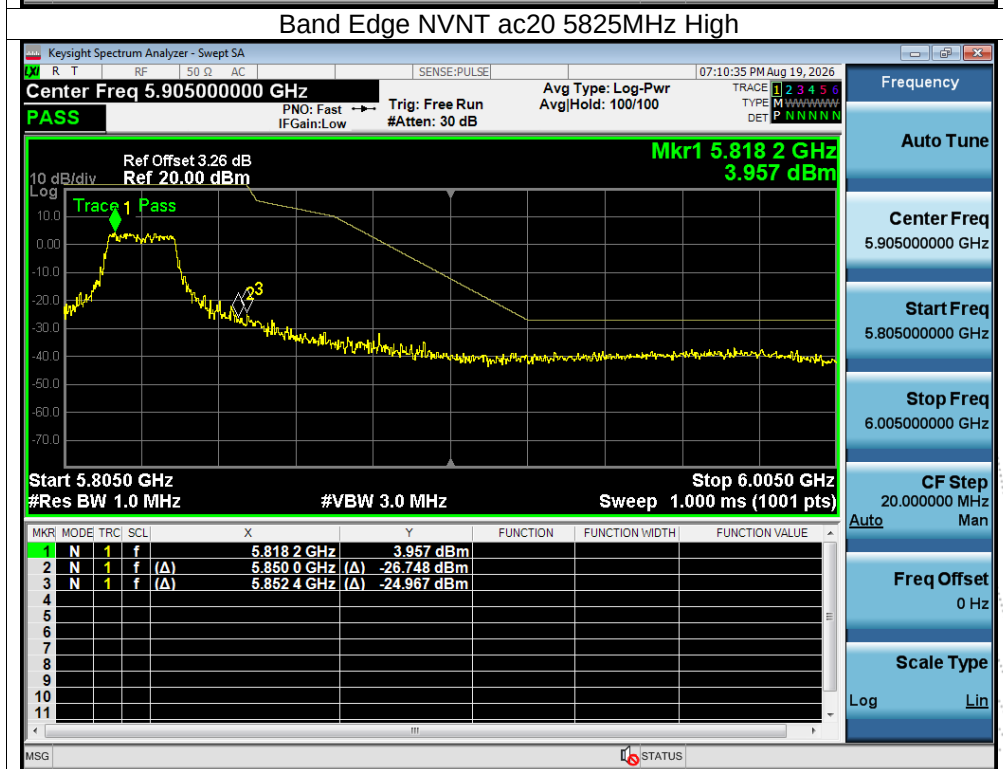
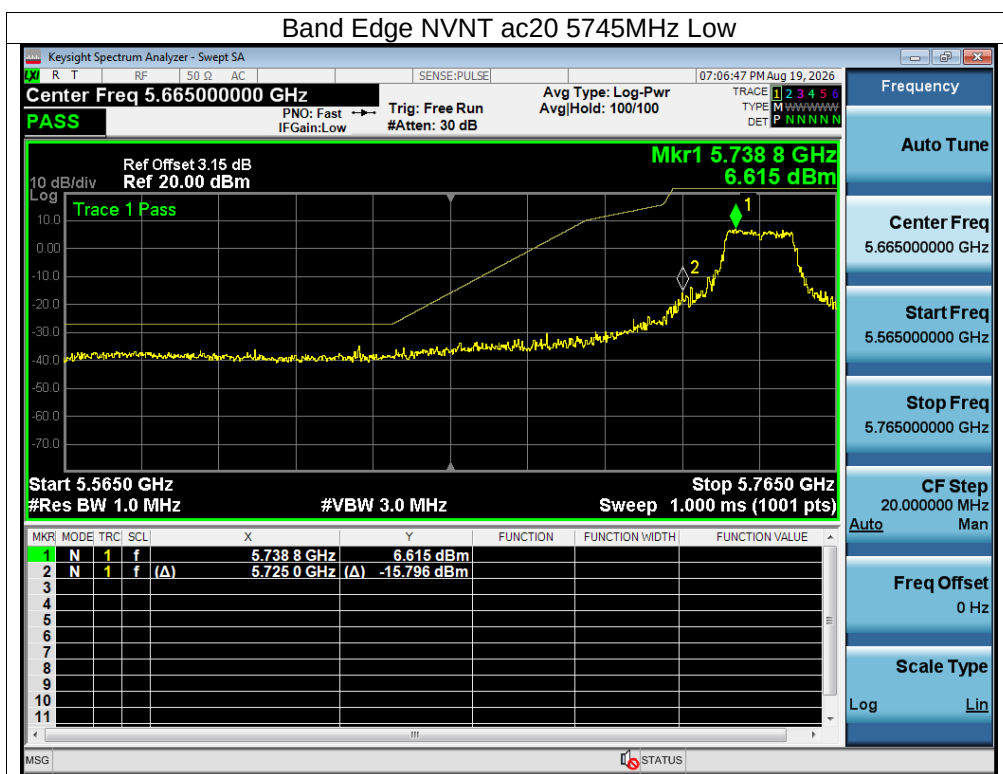
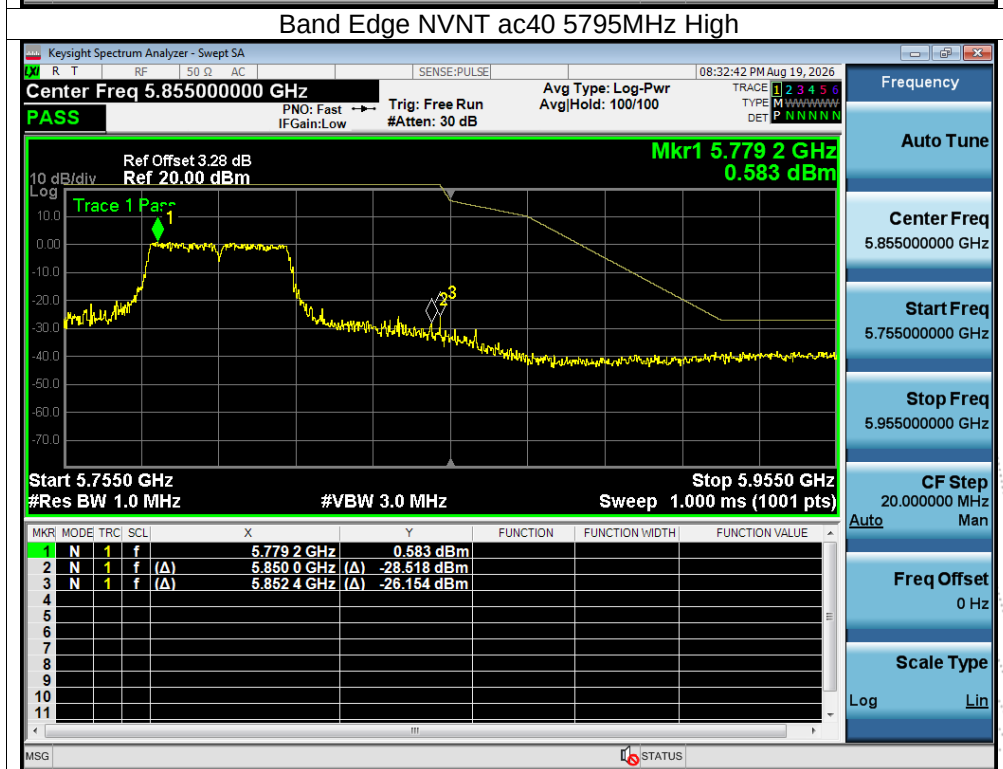
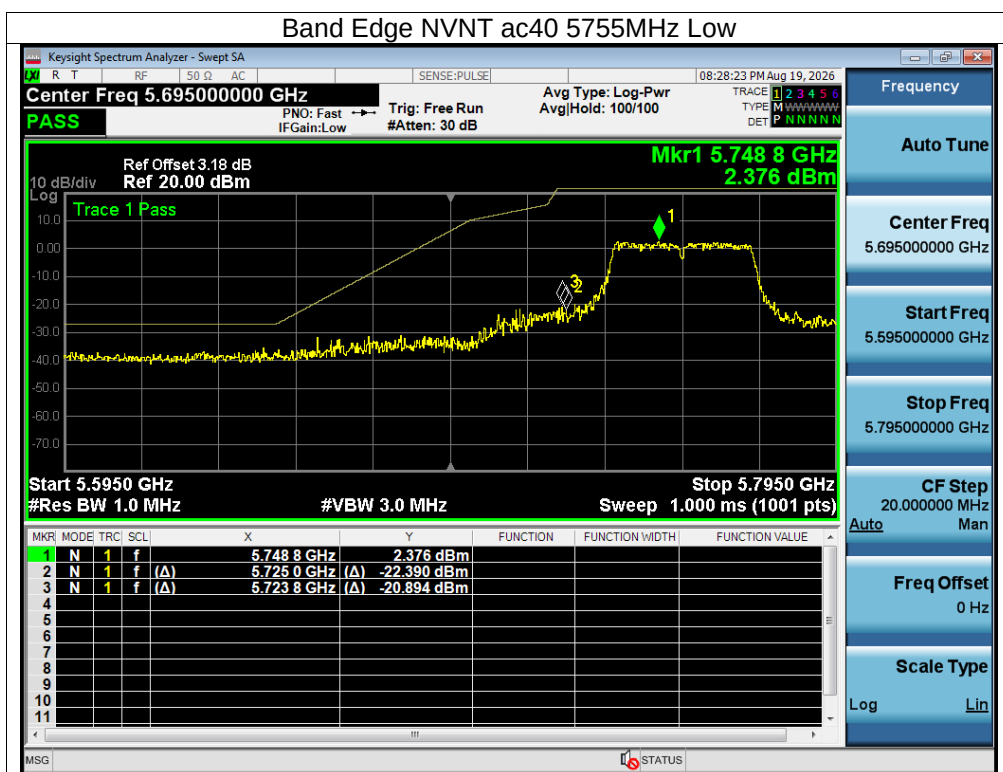
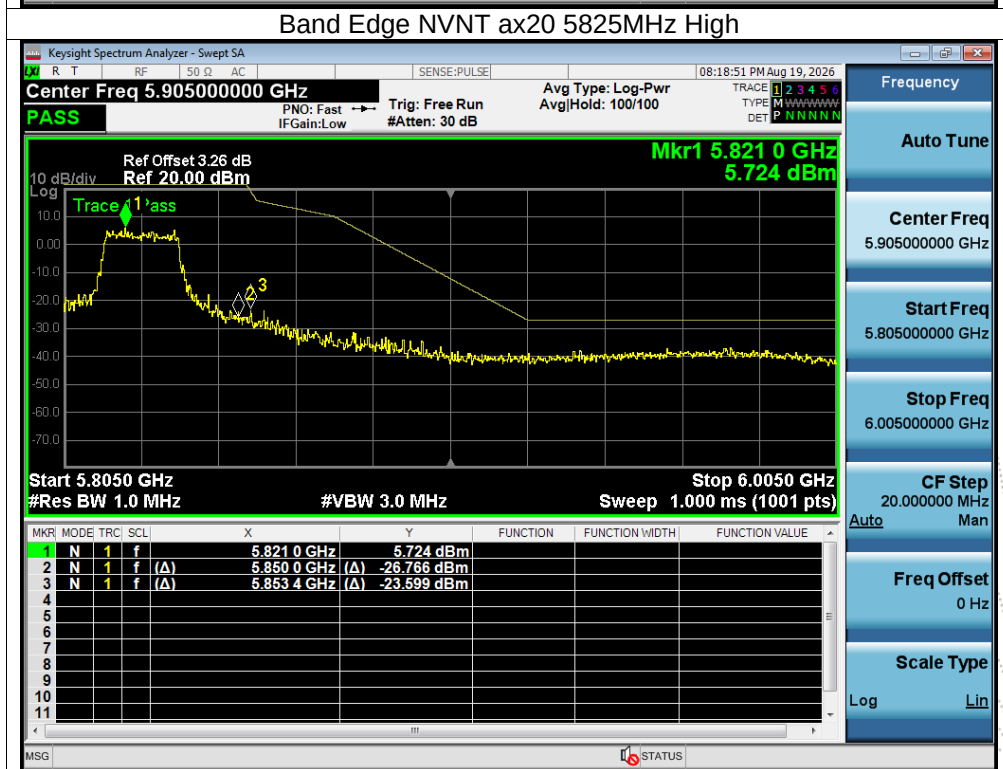
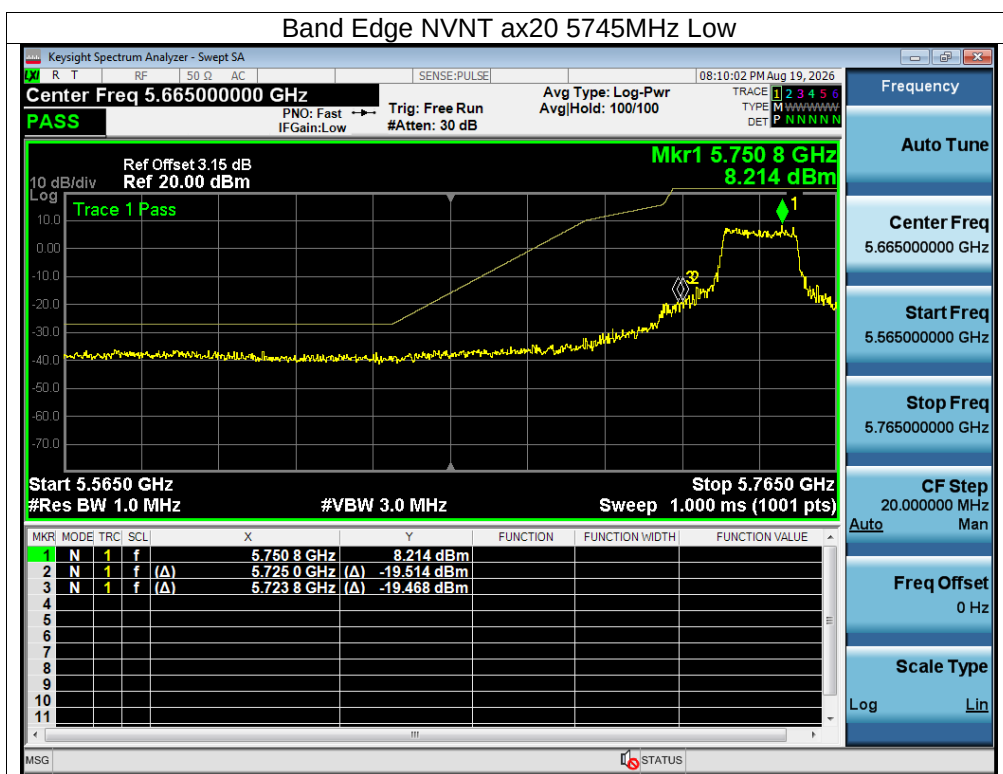
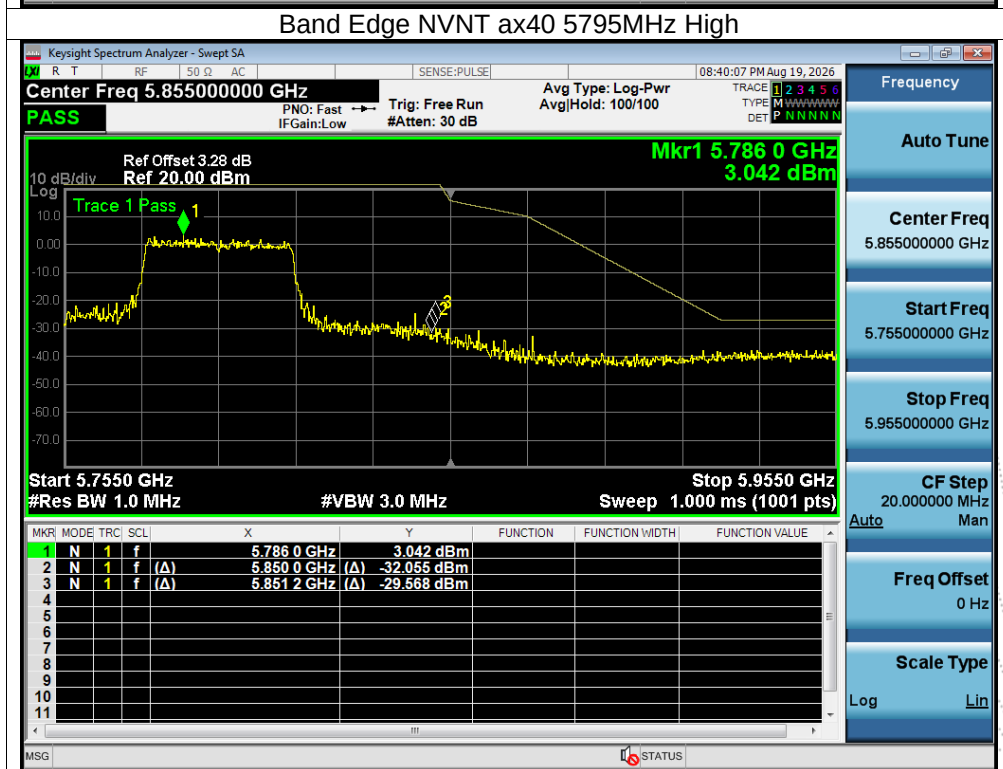
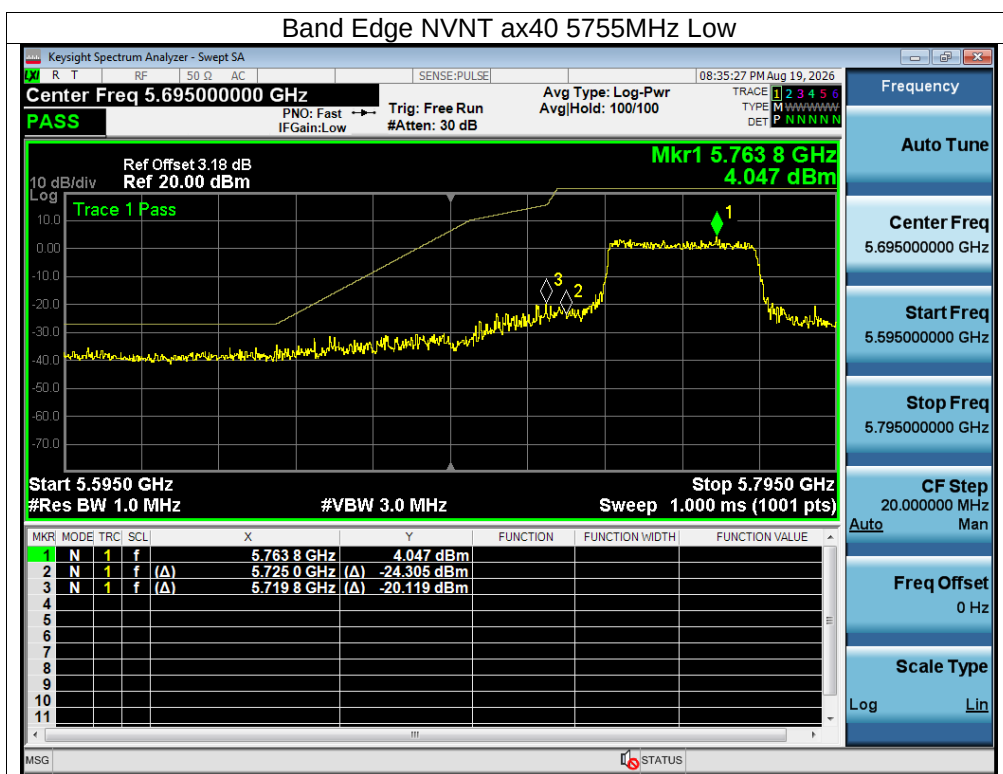












12. Spurious RF Conducted Emissions

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.

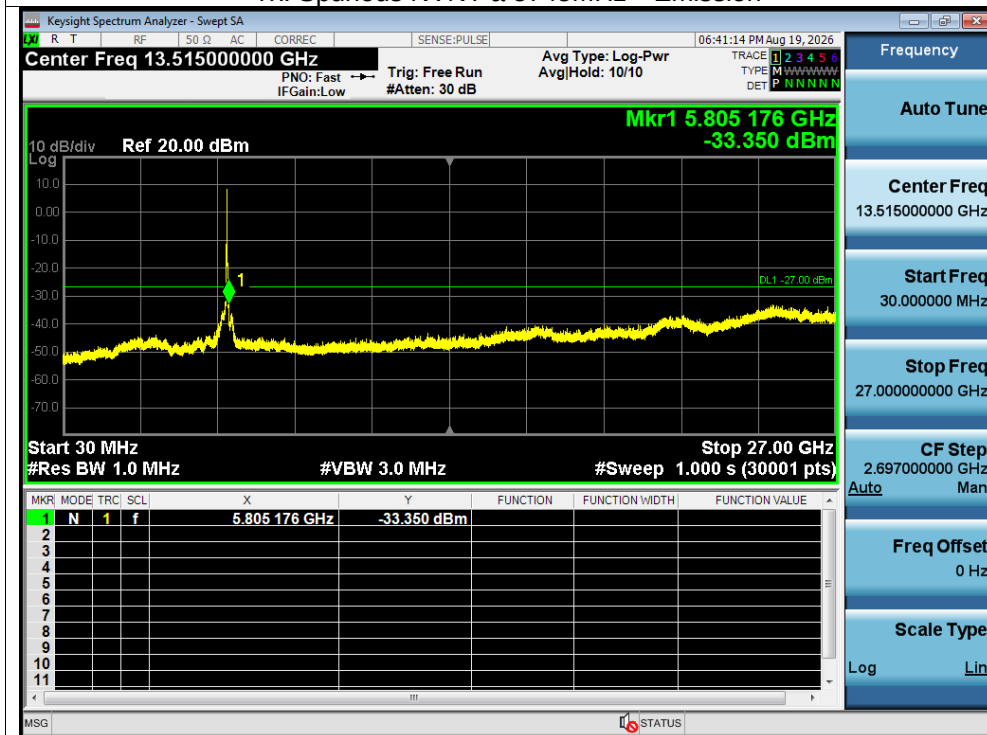
12.4 Test Result

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 band edge measurement data.

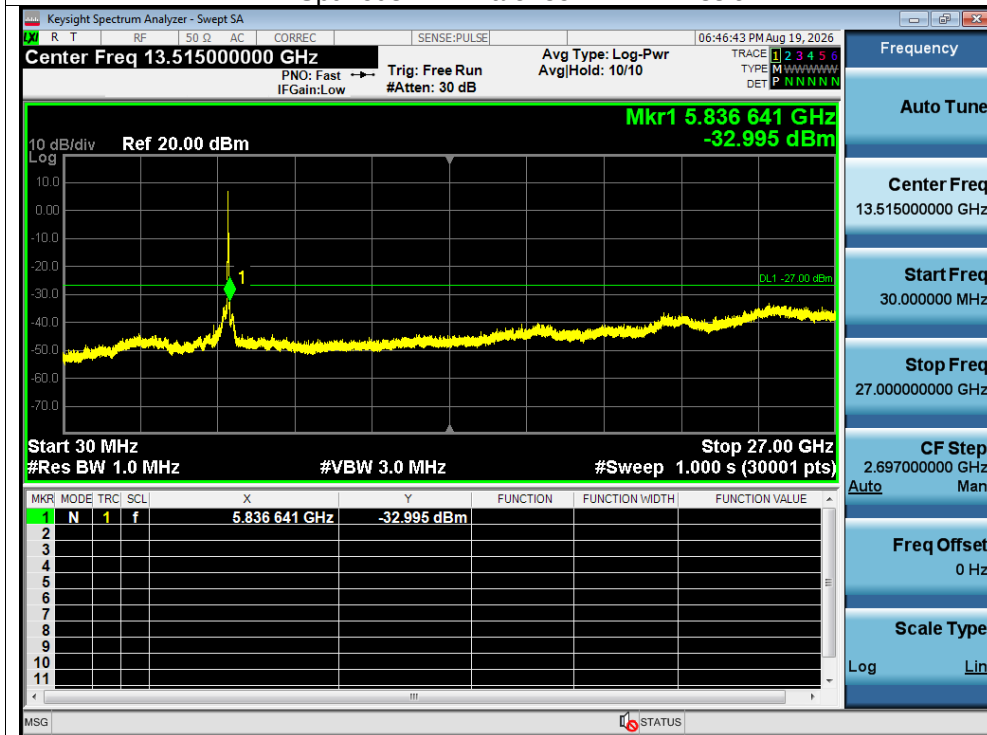
About: 26.5GHz-40GHz, The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

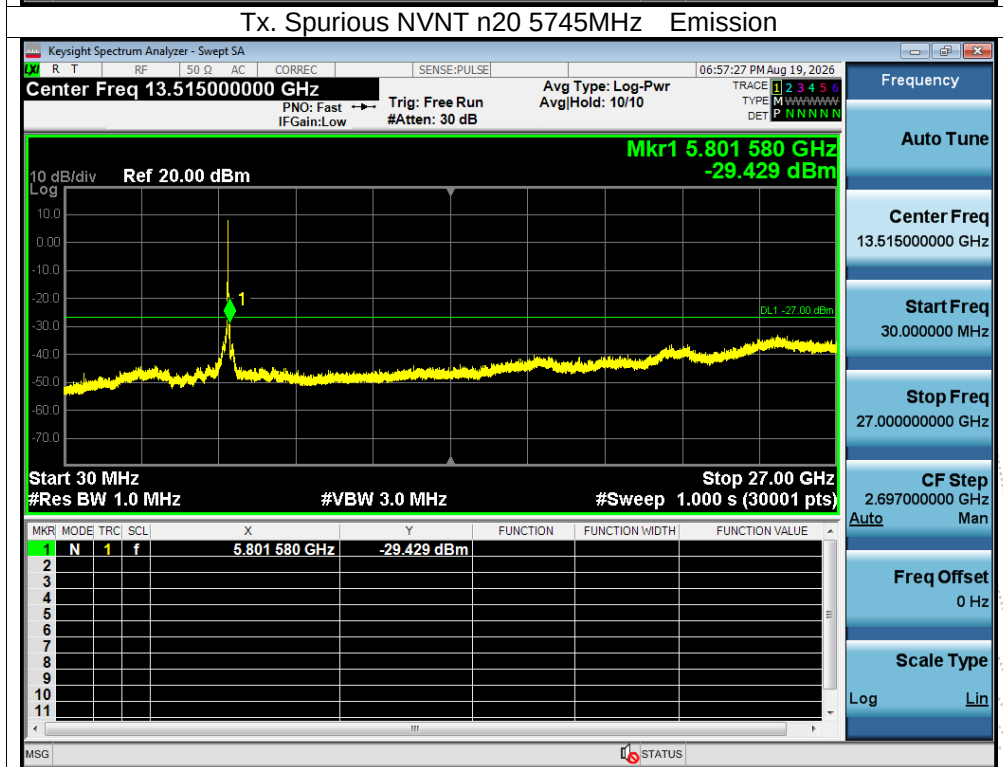
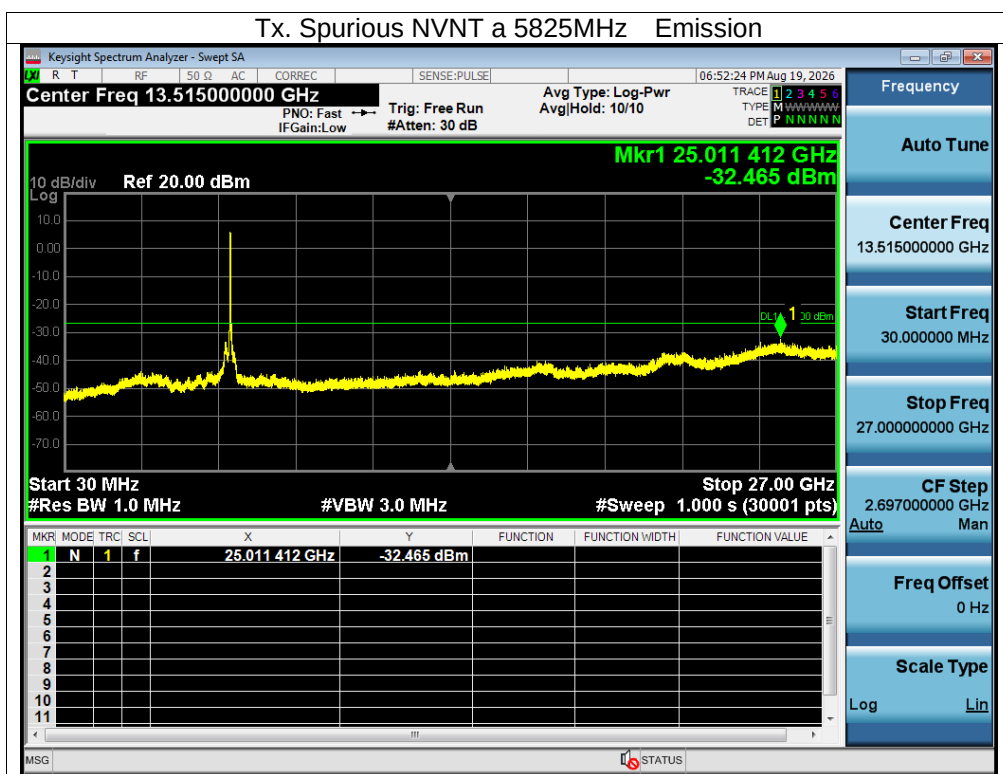
Test Graphs

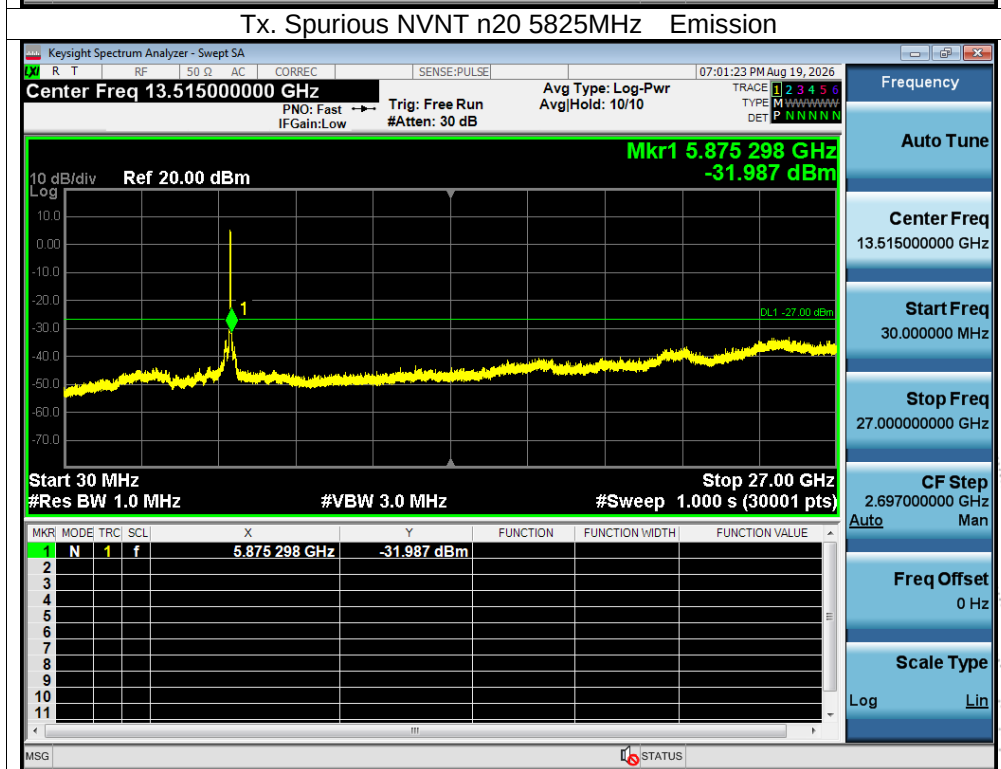
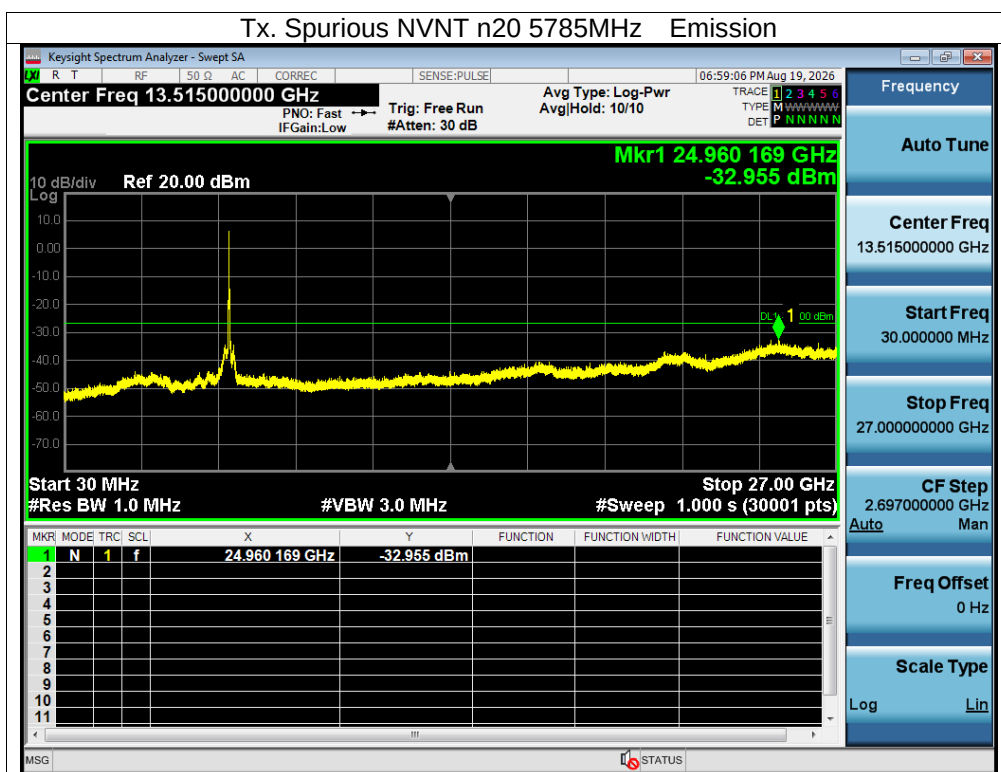
Tx. Spurious NVNT a 5745MHz Emission

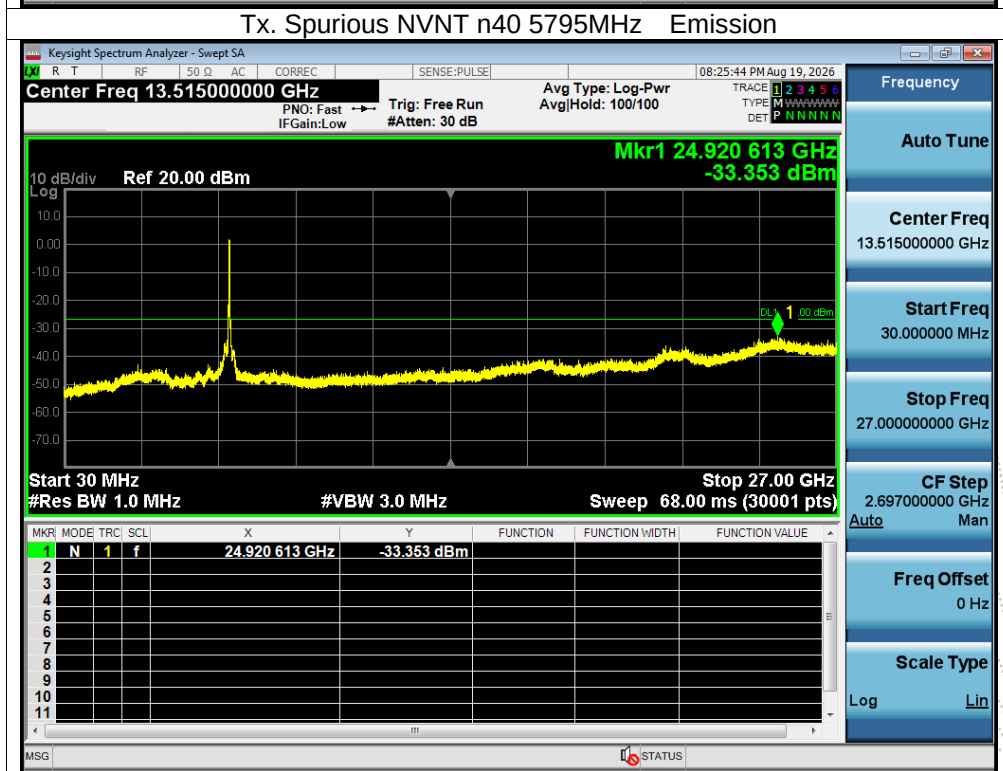
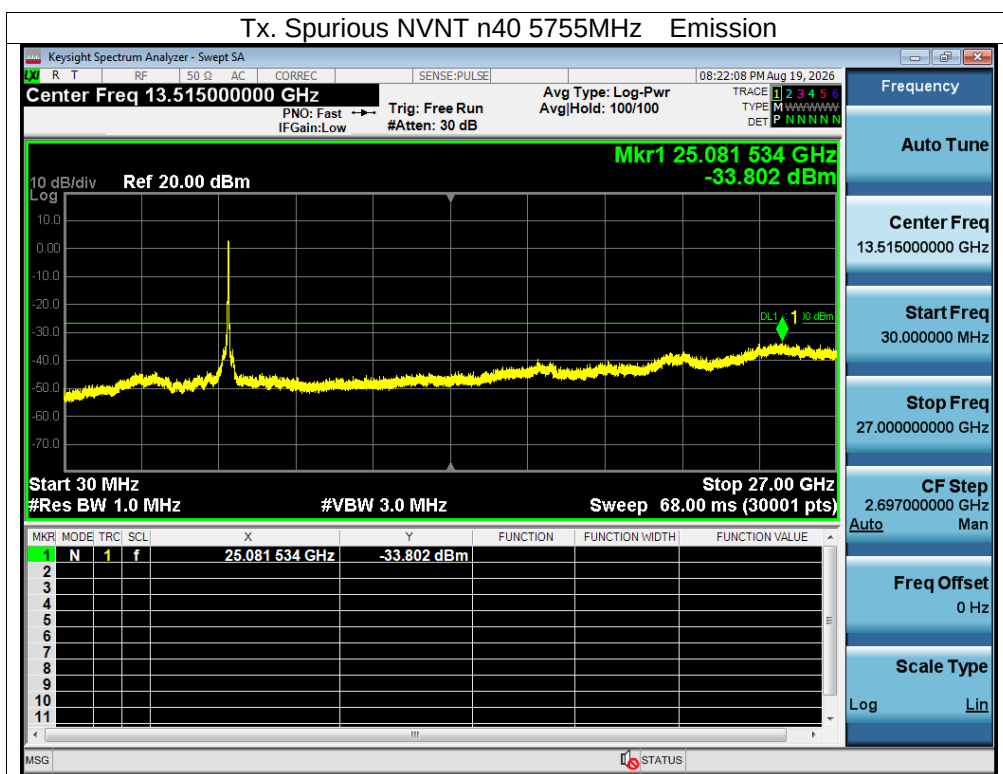


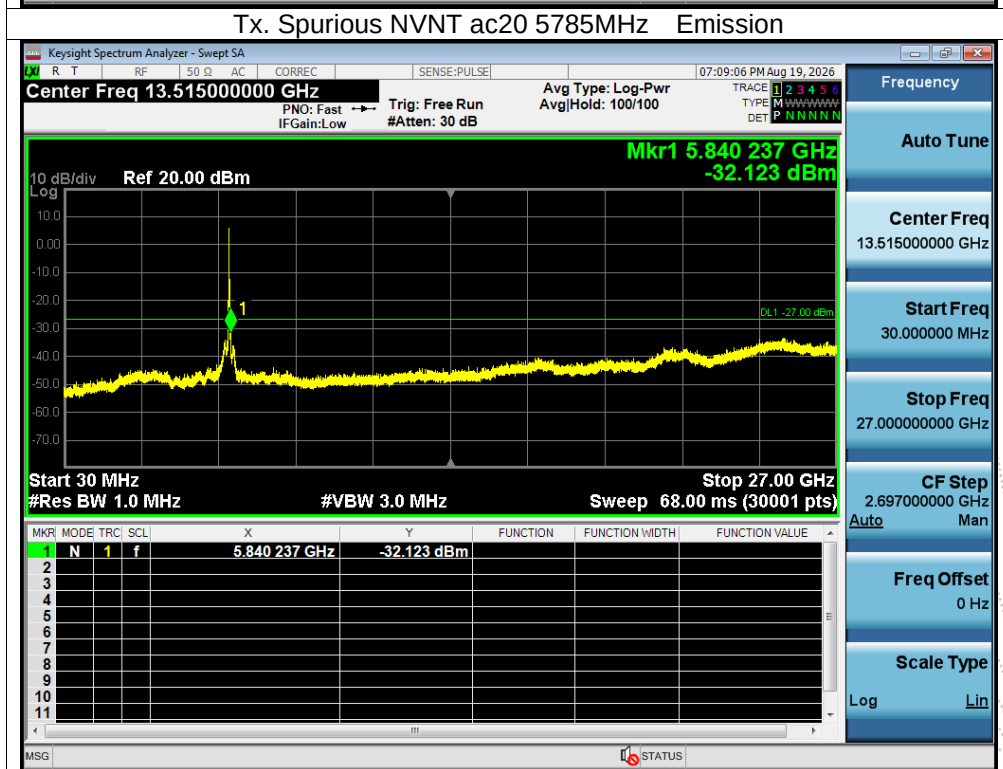
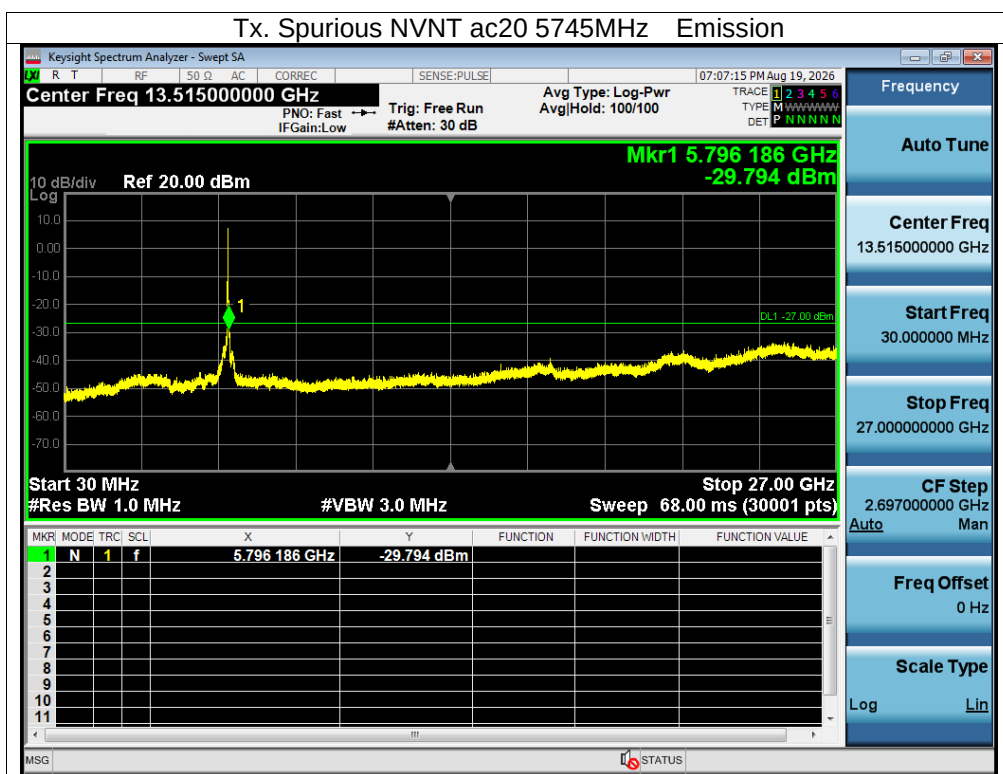
Tx. Spurious NVNT a 5785MHz Emission

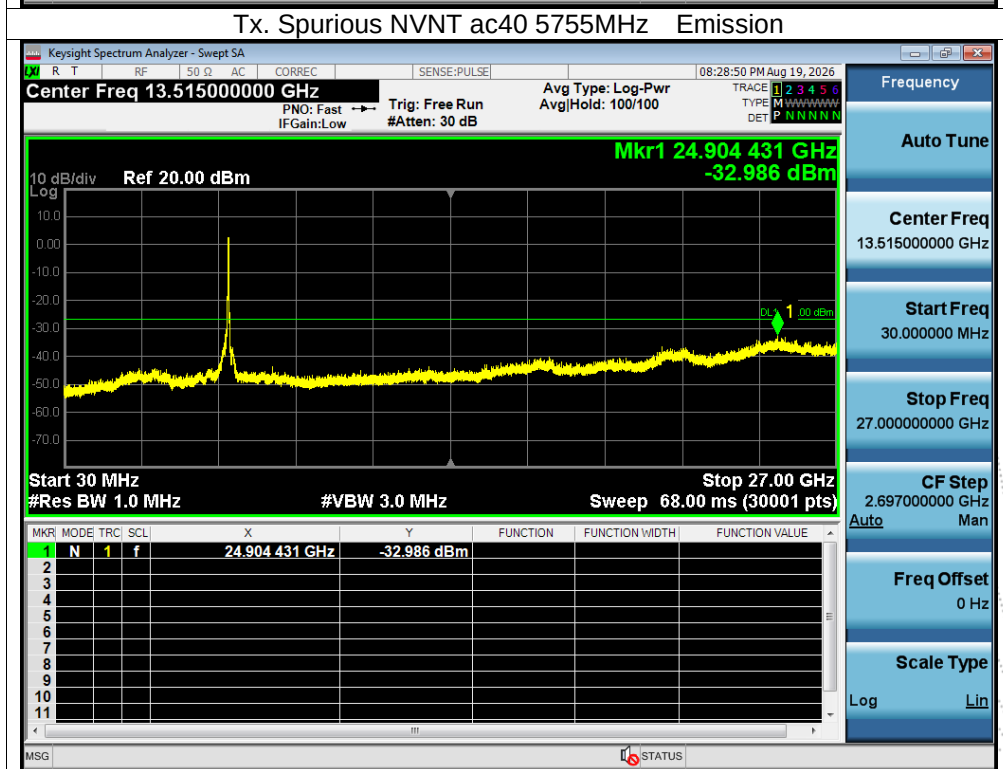
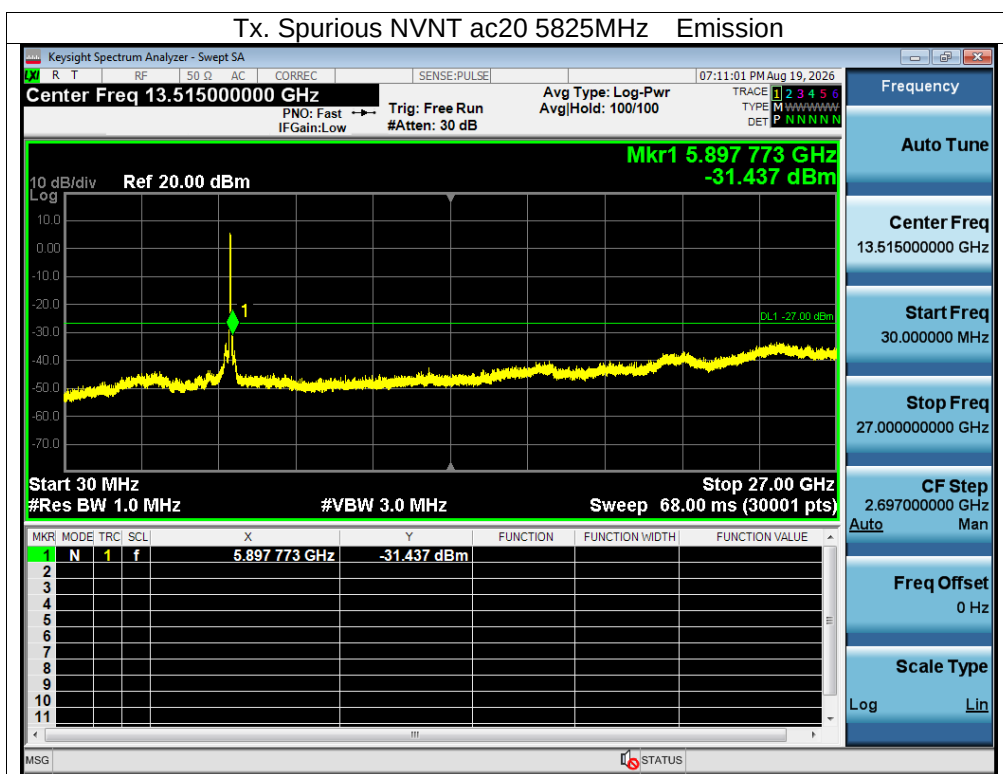




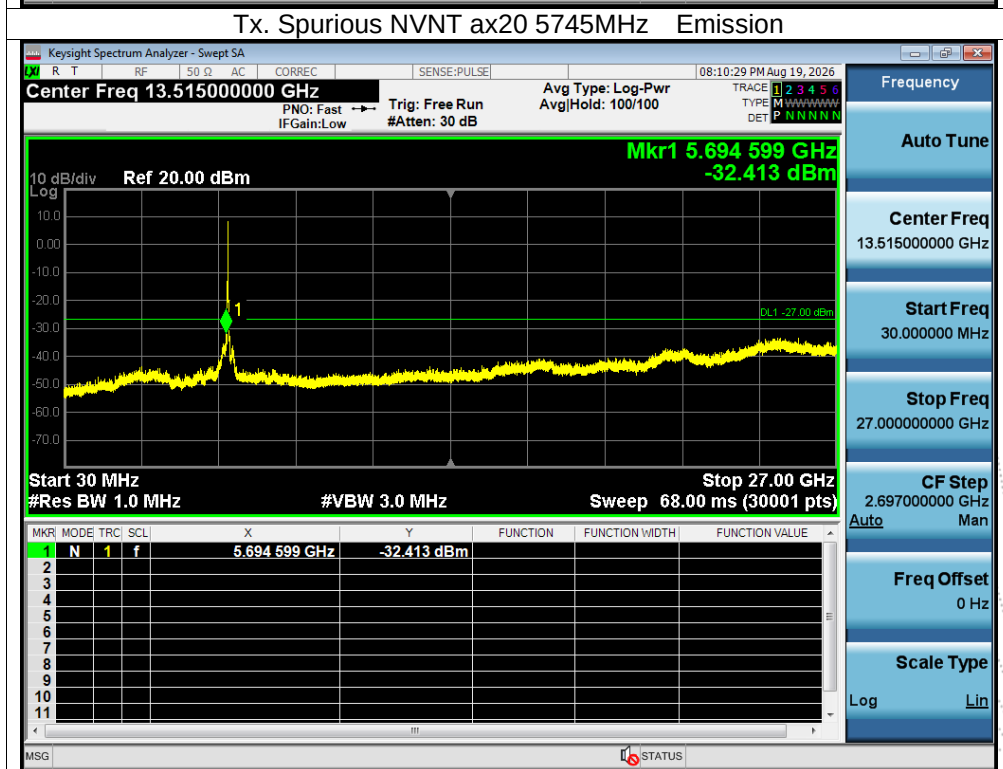
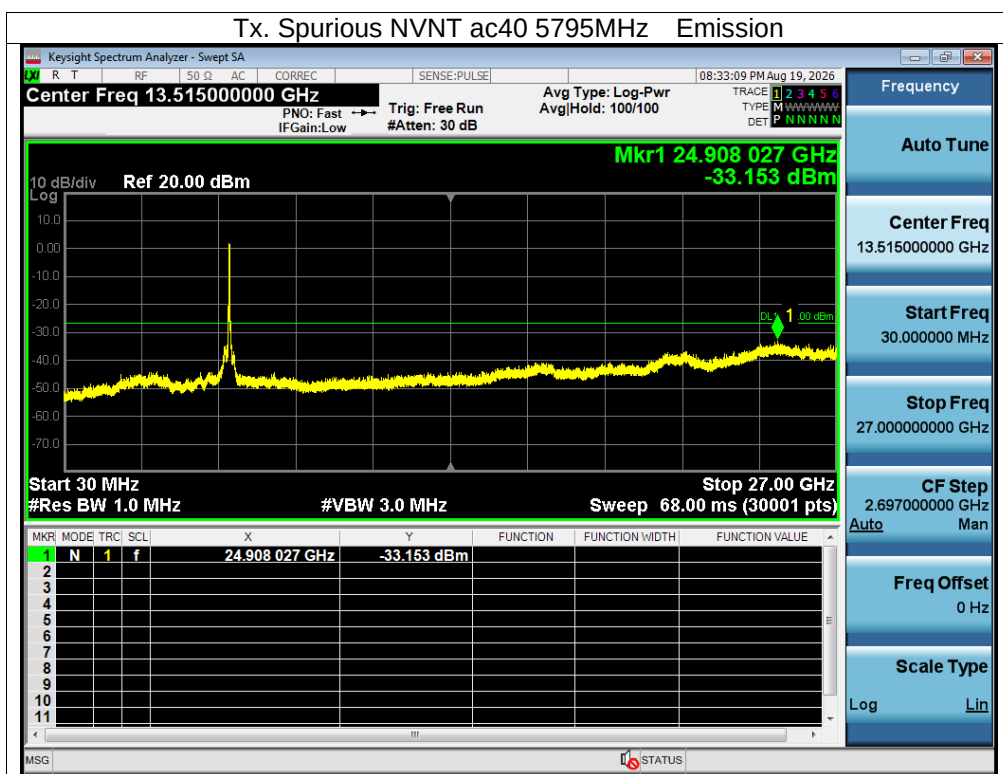


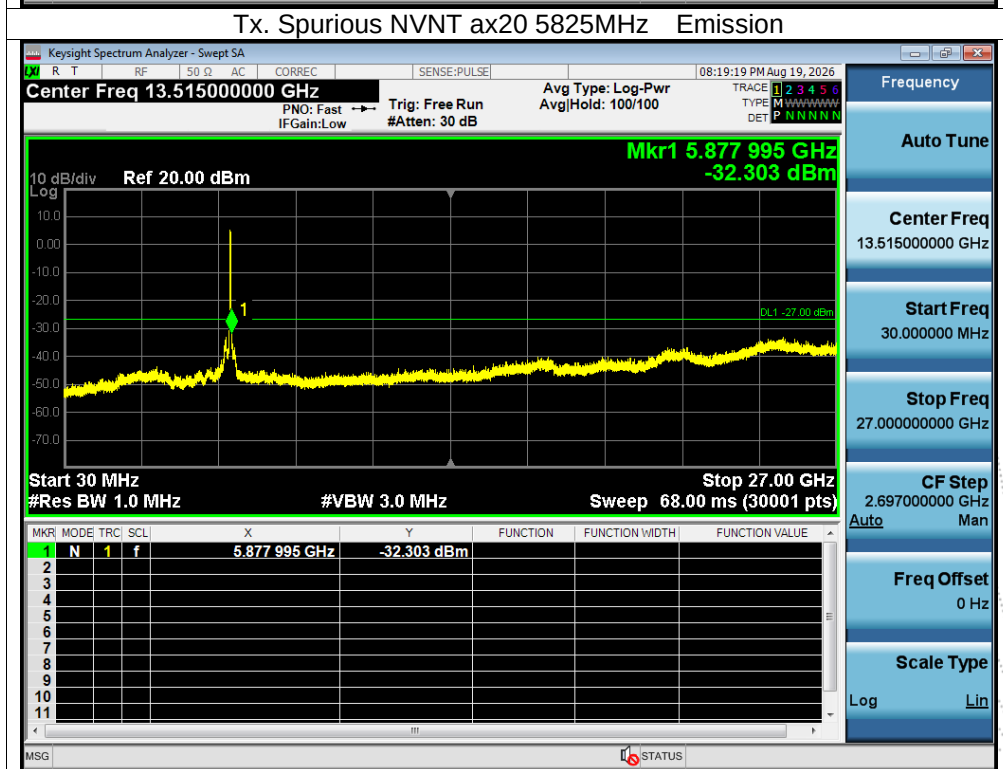
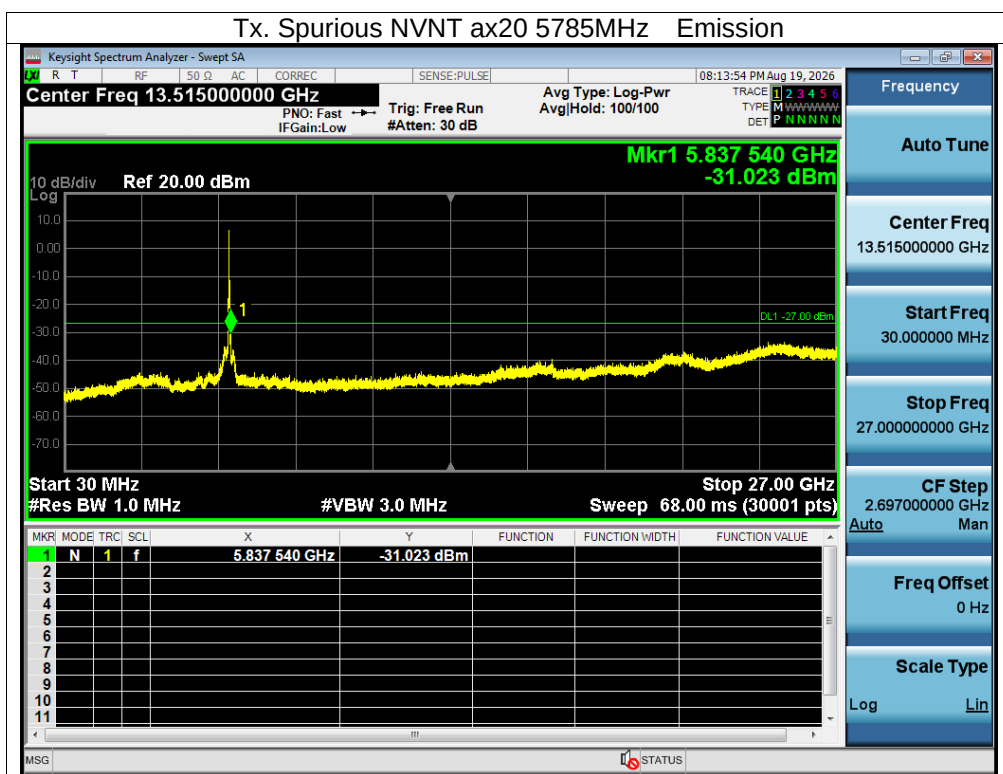


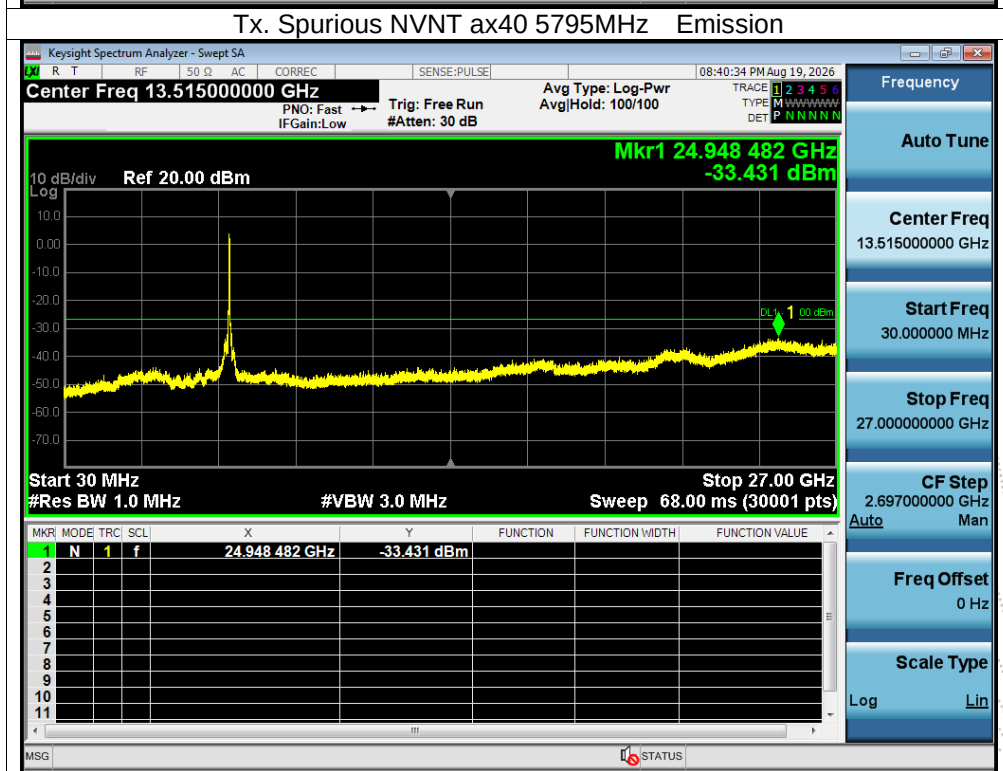
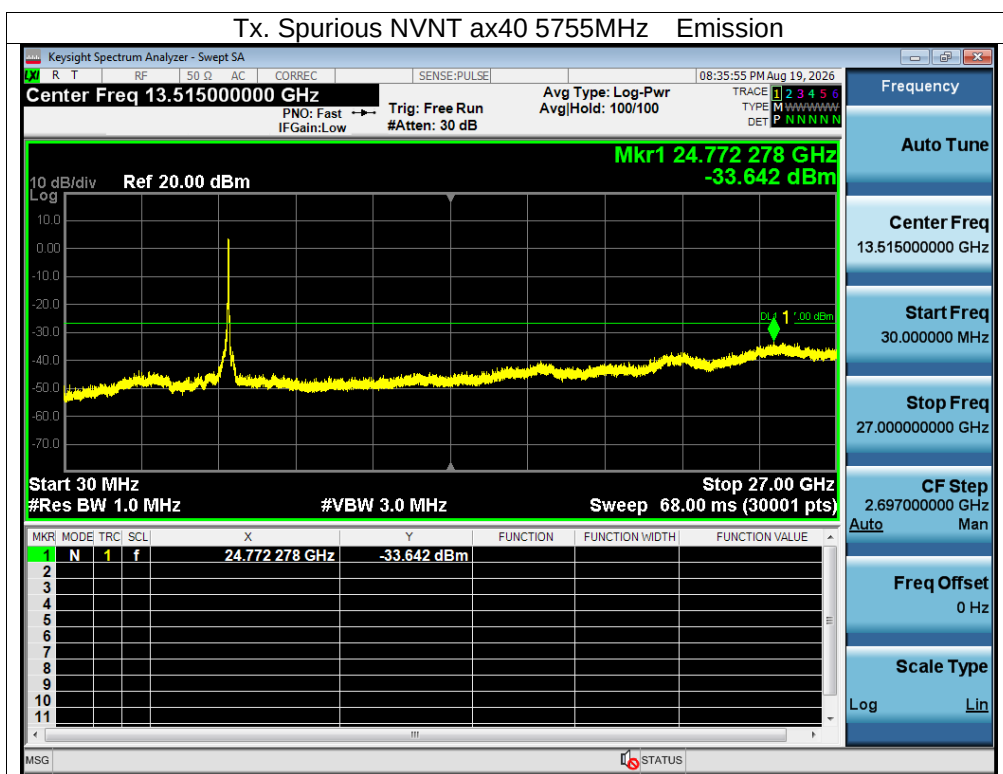




CO., LTD

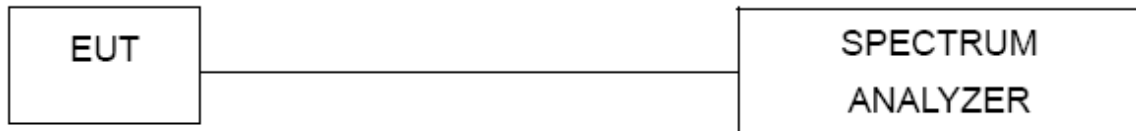






13. Frequency Stability Measurement

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 5V
Test Mode:	TX (5.8G) Mode Frequency U-NII-3 (5745-5825MHz)		

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

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	5.00	5745.00800	5745	0.00800	1.3925
		V max (V)	5.75	5745.01000	5745	0.01000	1.7406
		V min (V)	4.25	5745.00980	5745	0.00980	1.7058
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	5745.01070	5745	0.01070	1.8625
		T (°C)	-10	5745.00140	5745	0.00140	0.2437
		T (°C)	0	5745.00920	5745	0.00920	1.6014
		T (°C)	10	5745.00350	5745	0.00350	0.6092
		T (°C)	20	5745.00400	5745	0.00400	0.6963
		T (°C)	30	5745.00470	5745	0.00470	0.8181
		T (°C)	40	5745.00510	5745	0.00510	0.8877
		T (°C)	50	5745.00850	5745	0.00850	1.4795
		T (°C)	60	5745.01240	5745	0.01240	2.1584
		T (°C)	70	5745.00900	5745	0.00900	1.5666
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	5785.00980	5785	0.00980	1.6940
		V max (V)	5.75	5785.00920	5785	0.00920	1.5903
		V min (V)	4.25	5785.00560	5785	0.00560	0.9680
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	5785.00420	5785	0.00420	0.7260
		T (°C)	-10	5785.00600	5785	0.00600	1.0372
		T (°C)	0	5785.00360	5785	0.00360	0.6223
		T (°C)	10	5785.00270	5785	0.00270	0.4667
		T (°C)	20	5785.00620	5785	0.00620	1.0717
		T (°C)	30	5785.00160	5785	0.00160	0.2766
		T (°C)	40	5785.00150	5785	0.00150	0.2593
		T (°C)	50	5785.00850	5785	0.00850	1.4693
		T (°C)	60	5785.00520	5785	0.00520	0.8989
		T (°C)	70	5785.00260	5785	0.00260	0.4494
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	5825.00080	5825	0.00080	0.1373
		V max (V)	5.75	5825.01280	5825	0.01280	2.1974
		V min (V)	4.25	5825.00590	5825	0.00590	1.0129
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	5825.00200	5825	0.00200	0.3433
		T (°C)	-10	5825.01230	5825	0.01230	2.1116
		T (°C)	0	5825.00060	5825	0.00060	0.1030
		T (°C)	10	5825.00140	5825	0.00140	0.2403
		T (°C)	20	5825.00270	5825	0.00270	0.4635
		T (°C)	30	5825.01220	5825	0.01220	2.0944
		T (°C)	40	5825.00360	5825	0.00360	0.6180
		T (°C)	50	5825.01010	5825	0.01010	1.7339
		T (°C)	60	5825.00320	5825	0.00320	0.5494
		T (°C)	70	5825.00550	5825	0.00550	0.9442
Limits				5725-5850 MHz			
Result				Complies			

SHENZHEN

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

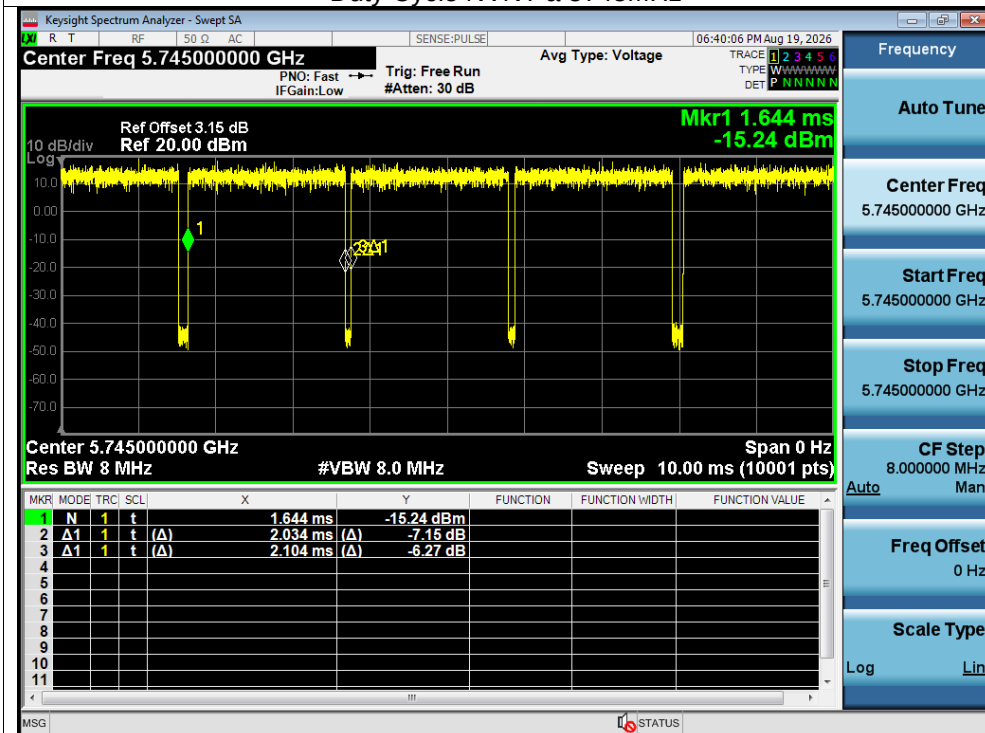
1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

14.4 Test Result

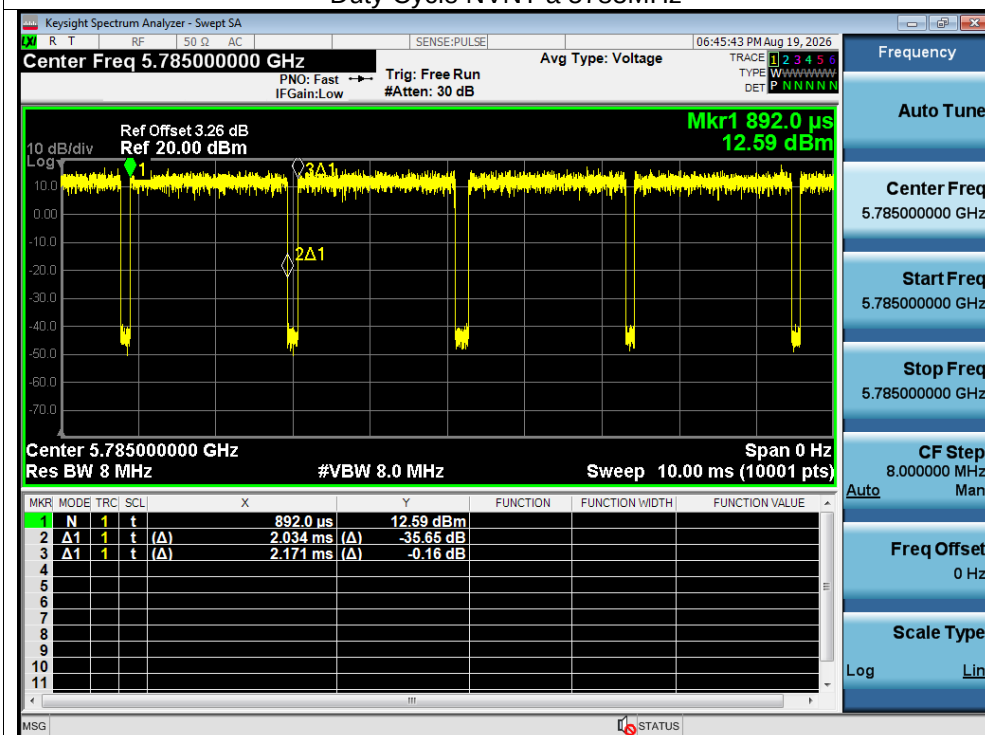
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5745	96.67	0.15	0.49
NVNT	a	5785	93.69	0.28	0.49
NVNT	a	5825	92.87	0.32	0.49
NVNT	n20	5745	92.03	0.36	0.53
NVNT	n20	5785	96.44	0.16	0.53
NVNT	n20	5825	94.46	0.25	0.53
NVNT	n40	5755	92.16	0.35	1.06
NVNT	n40	5795	86.24	0.64	1.06
NVNT	ac20	5745	92.47	0.34	0.53
NVNT	ac20	5785	91.44	0.39	0.53
NVNT	ac20	5825	90.83	0.42	0.53
NVNT	ac40	5755	88.68	0.52	1.06
NVNT	ac40	5795	89.52	0.48	1.06
NVNT	ax20	5745	91.16	0.4	0.68
NVNT	ax20	5785	90.48	0.43	0.68
NVNT	ax20	5825	95.37	0.21	0.68
NVNT	ax40	5755	78.5	1.05	1.31
NVNT	ax40	5795	78.42	1.06	1.31

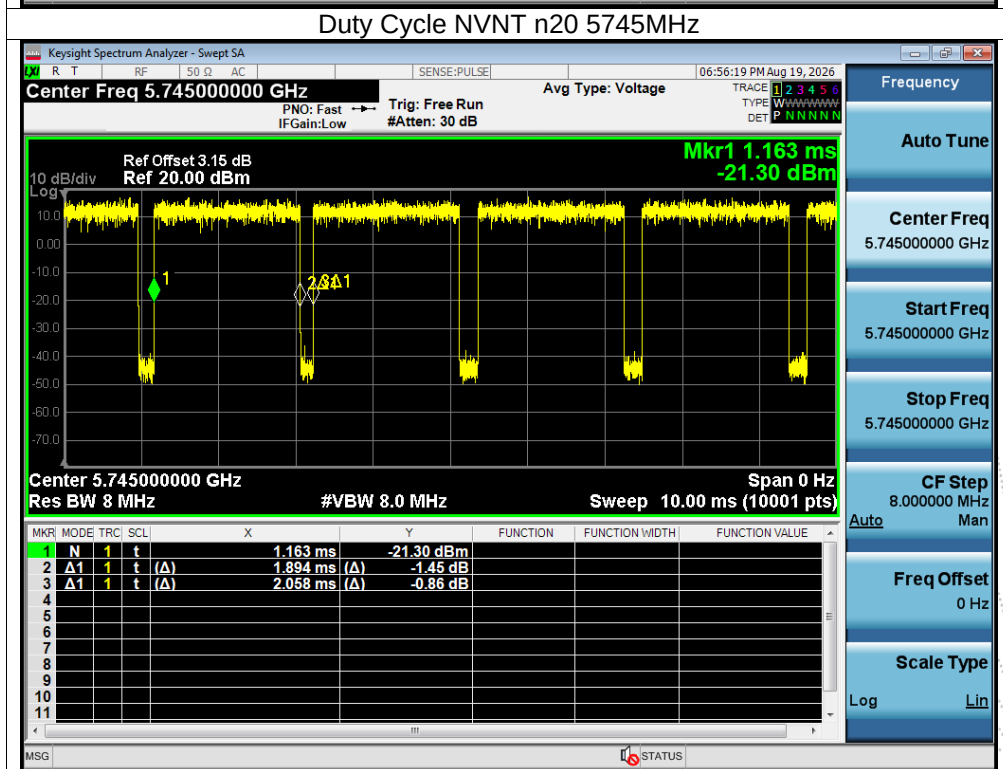
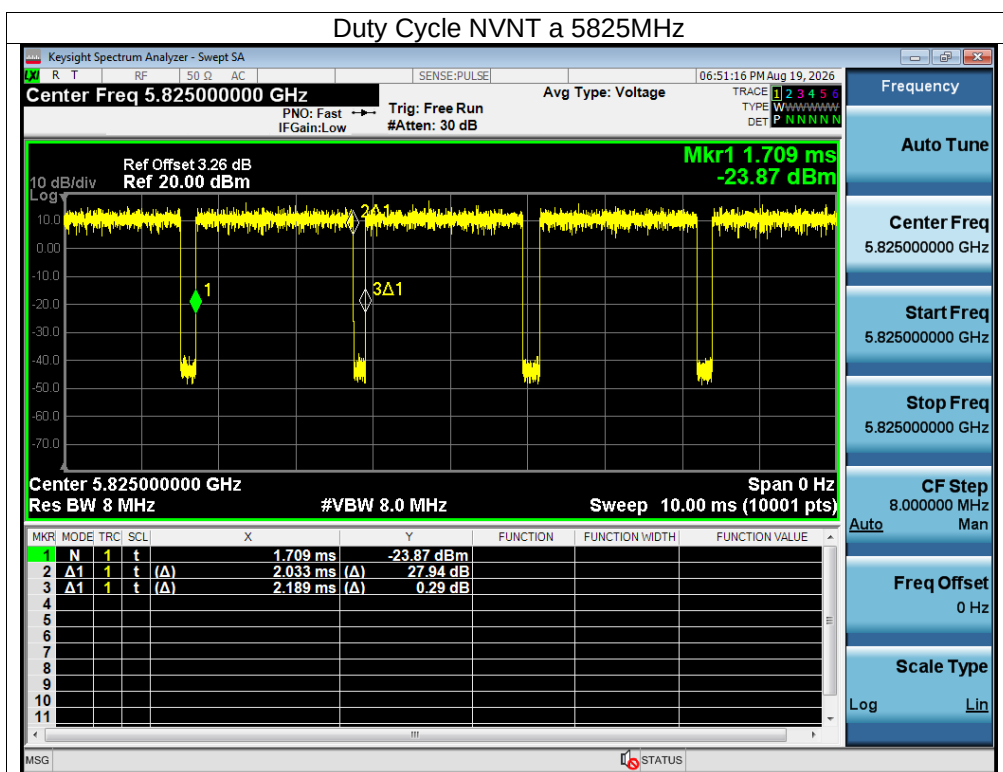
Test Graphs

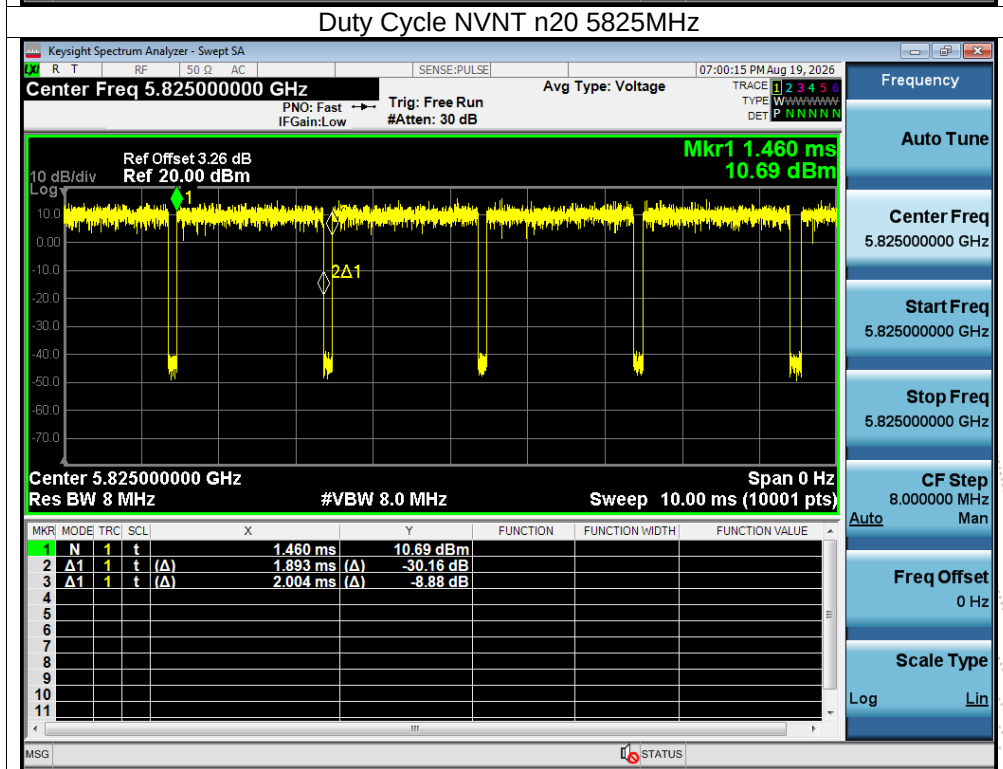
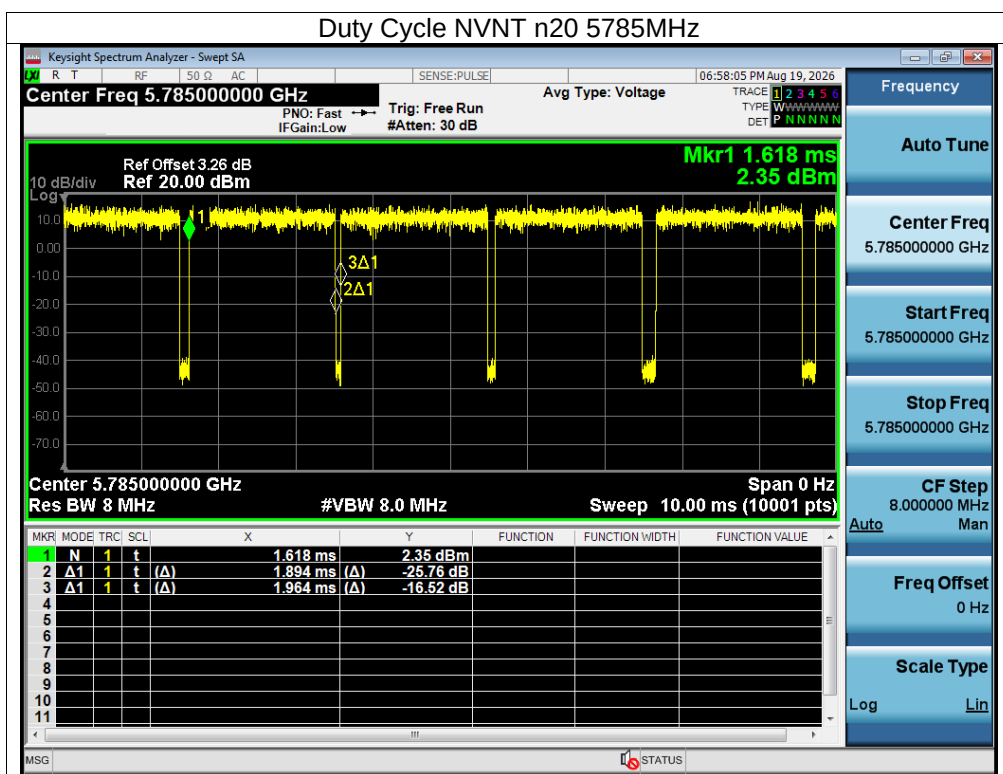
Duty Cycle NVNT a 5745MHz

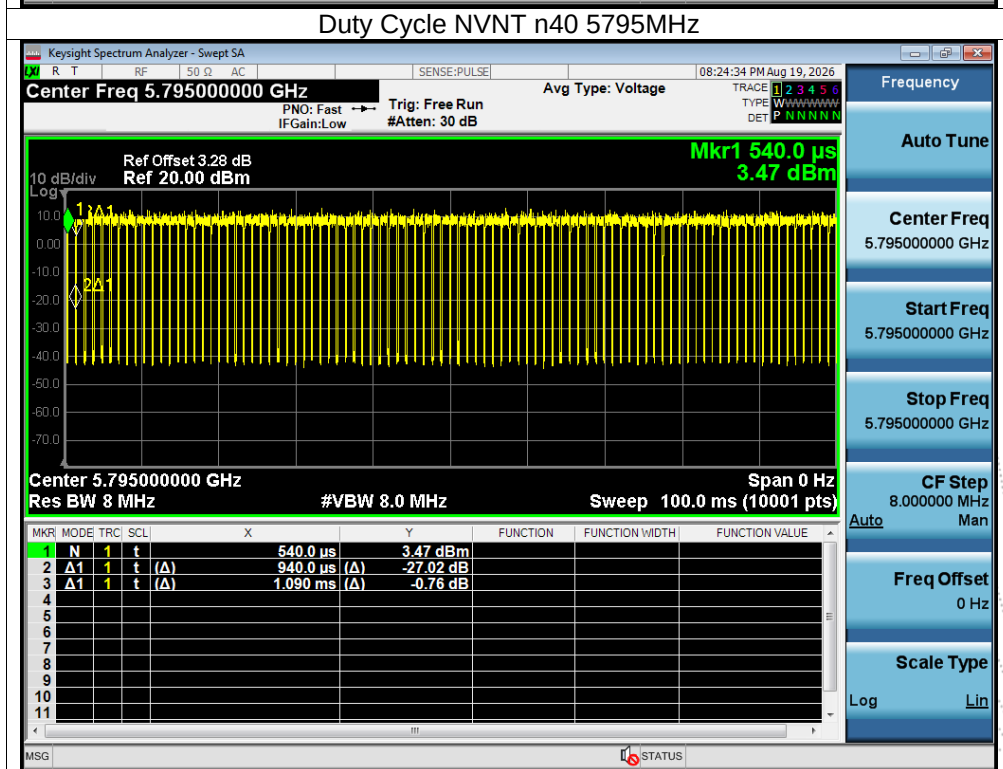
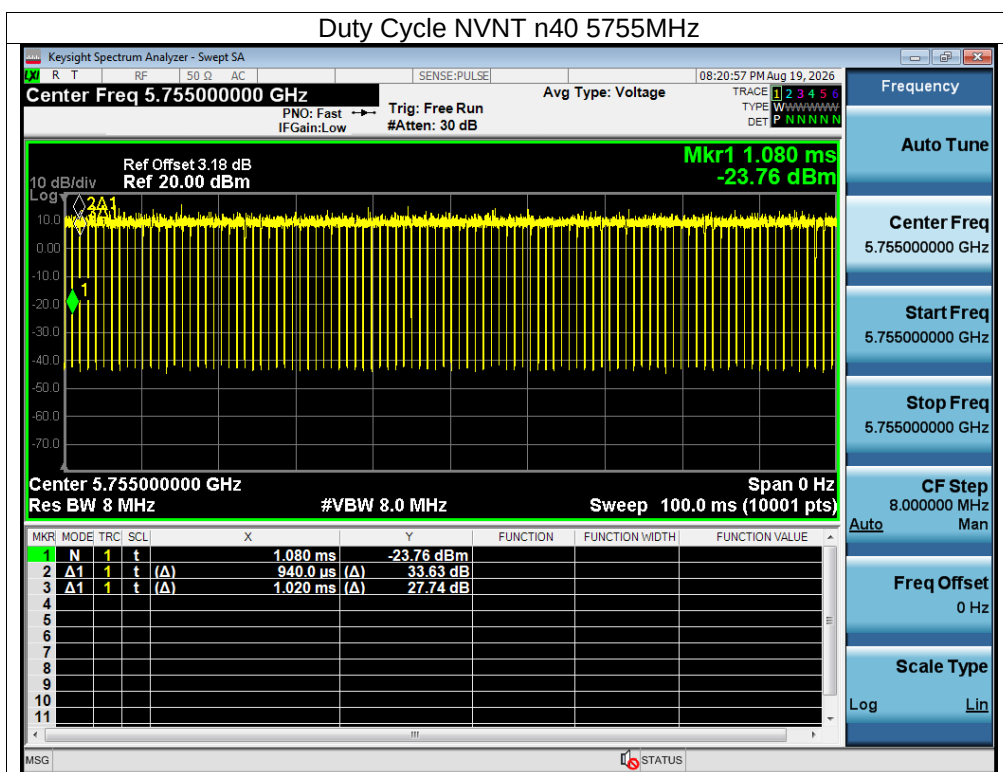


Duty Cycle NVNT a 5785MHz

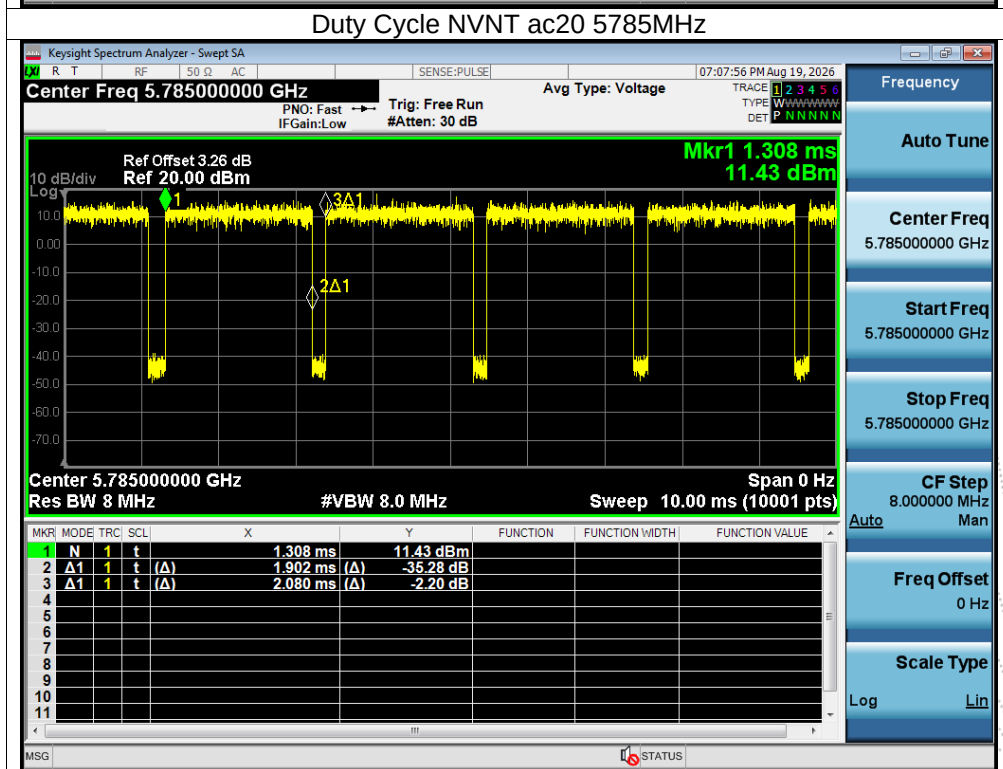
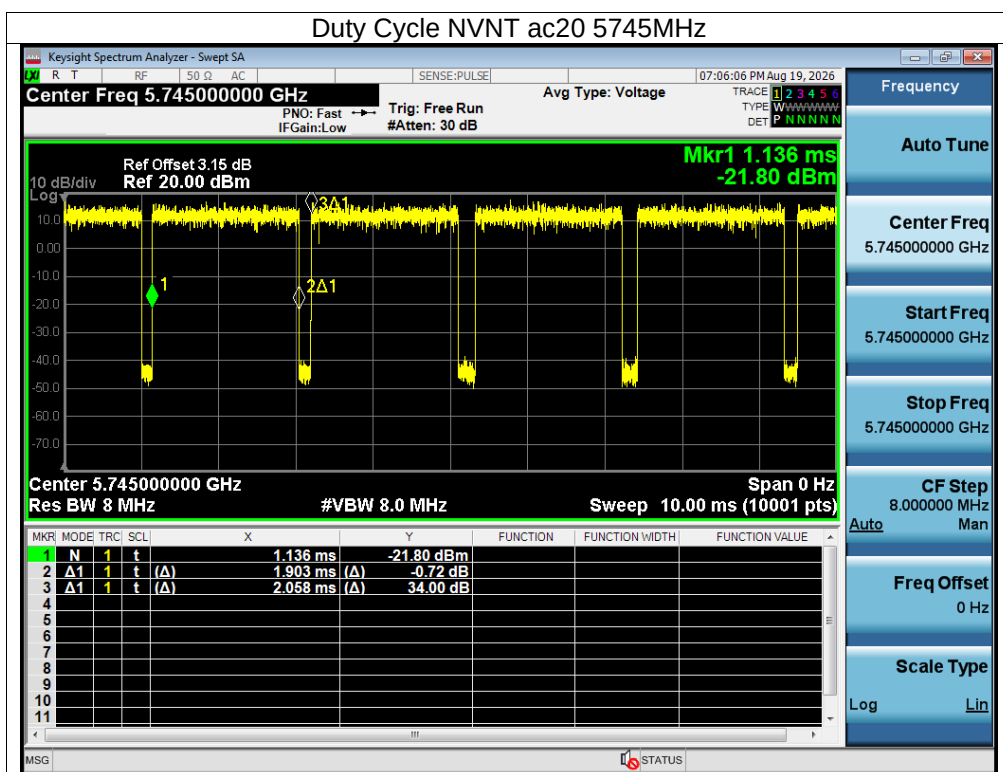


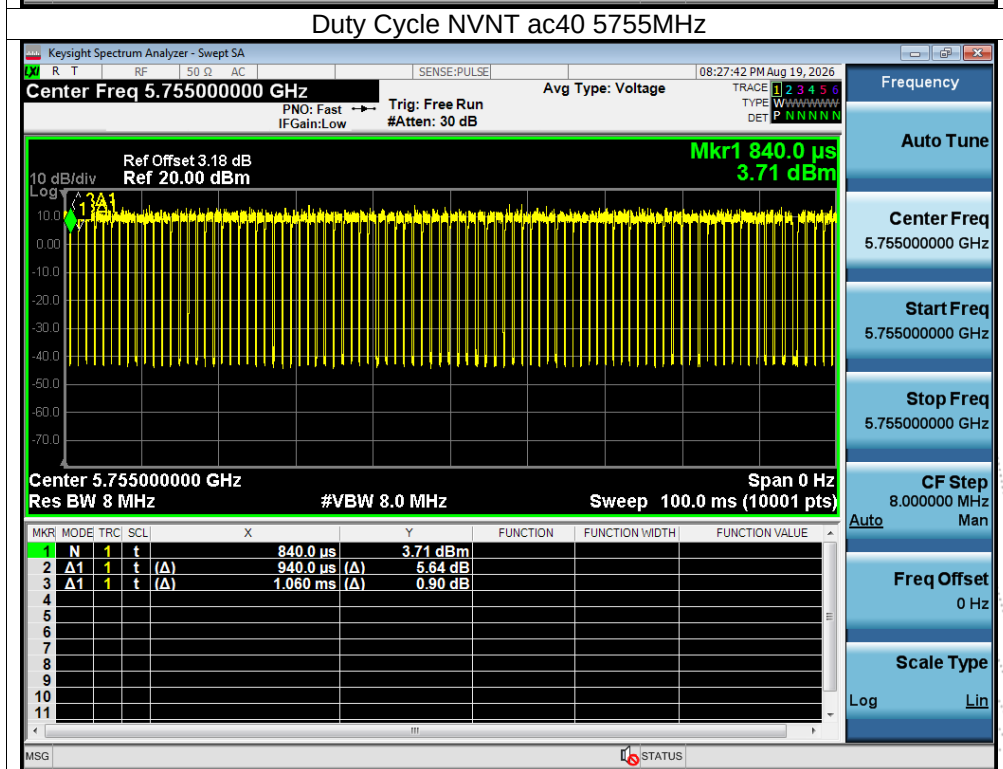
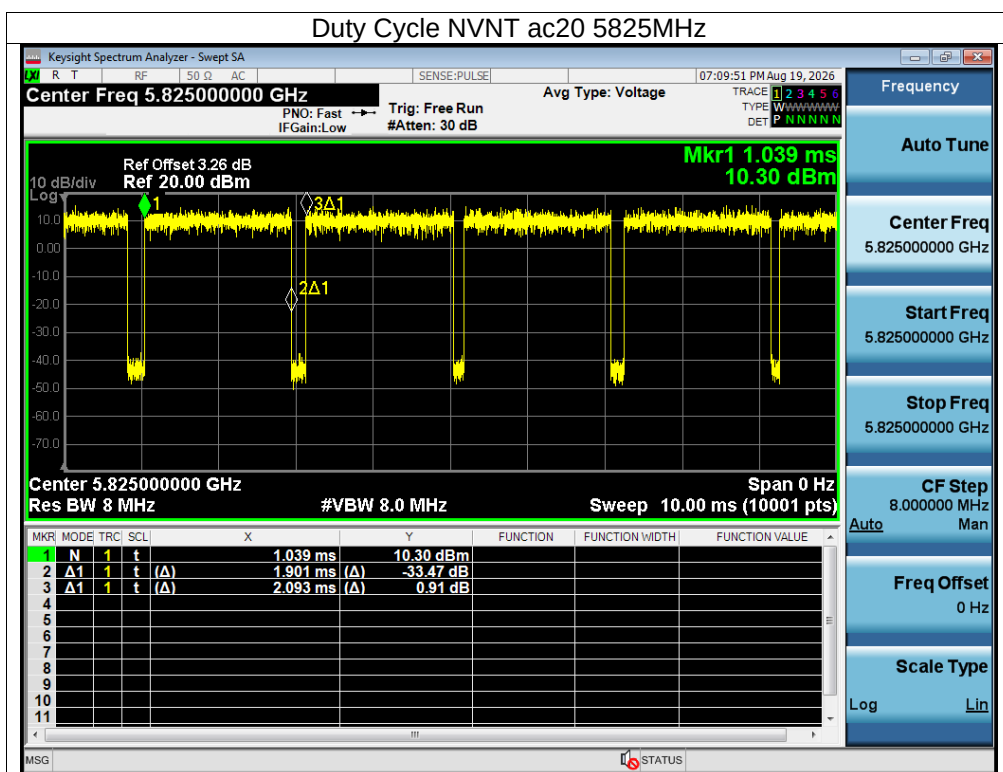


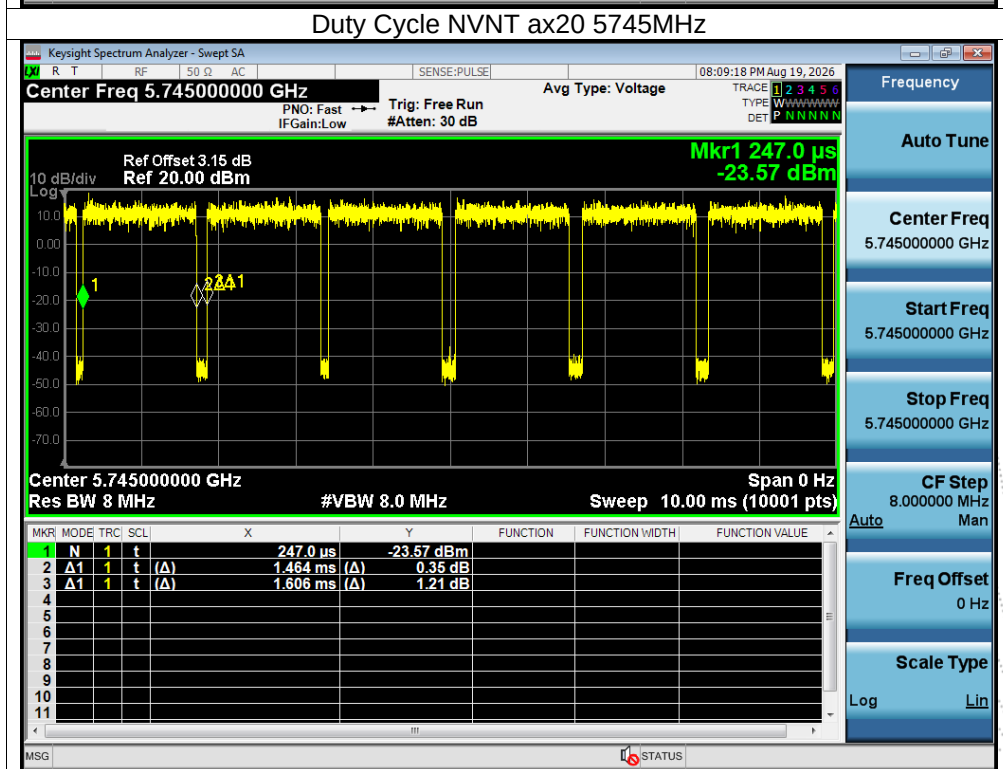
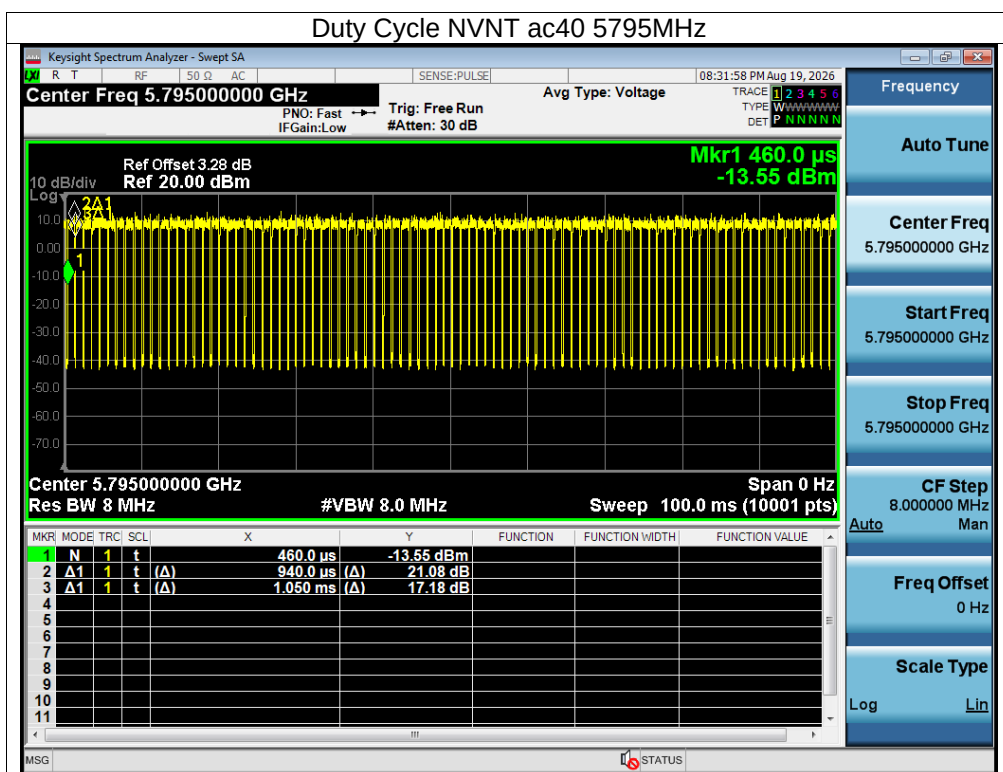


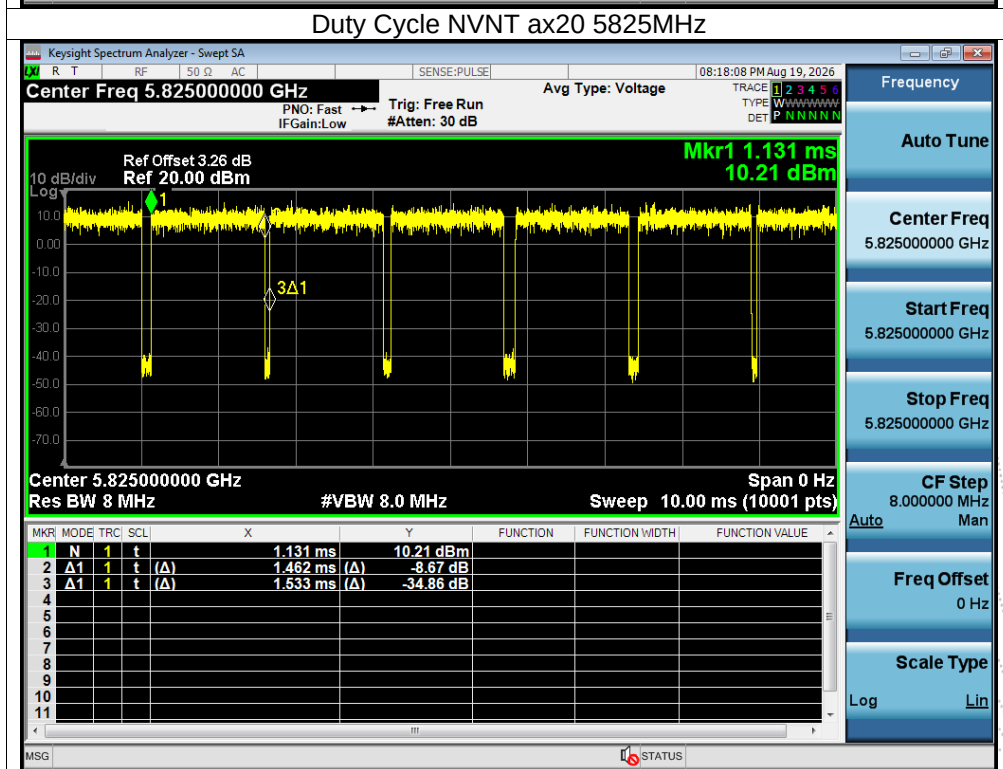
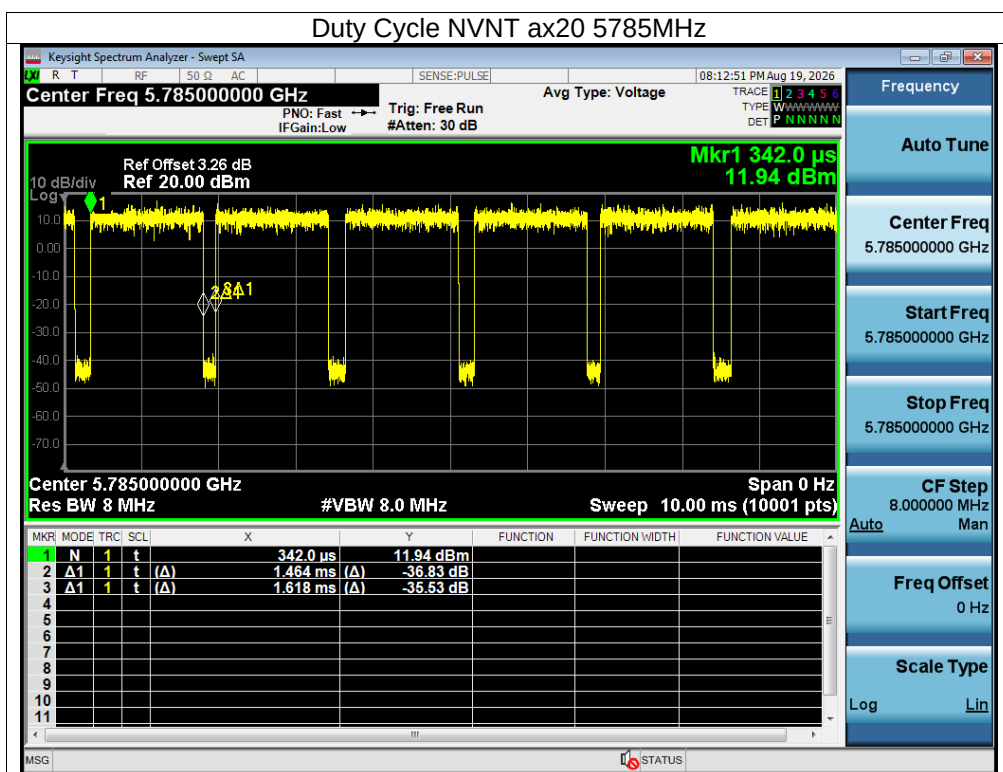


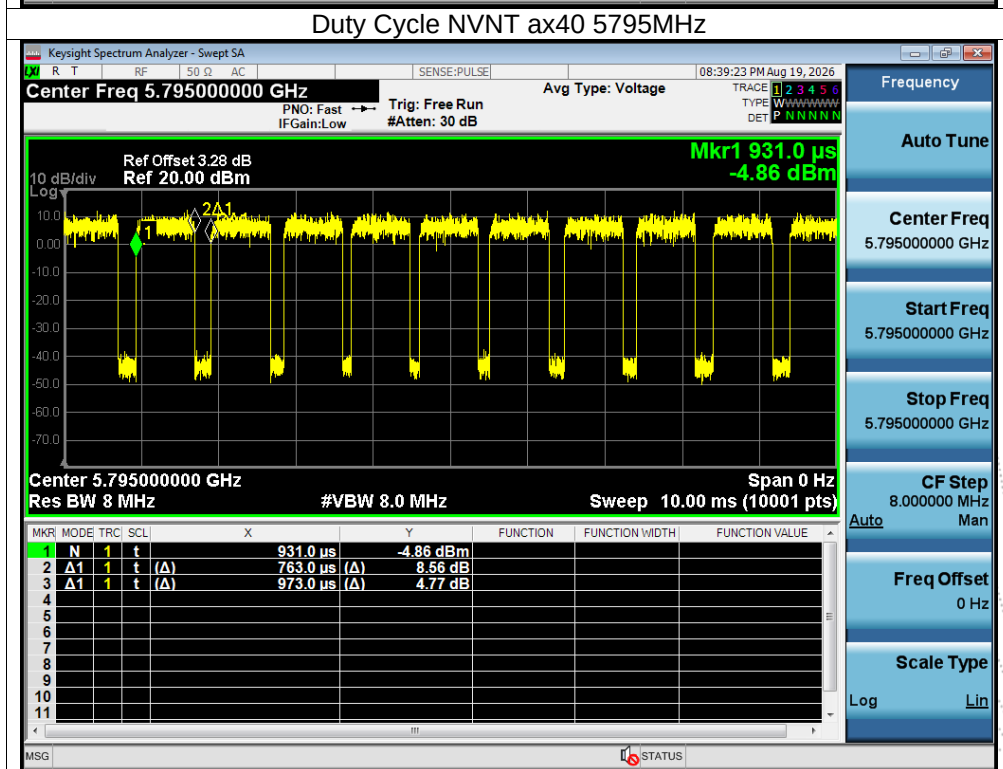
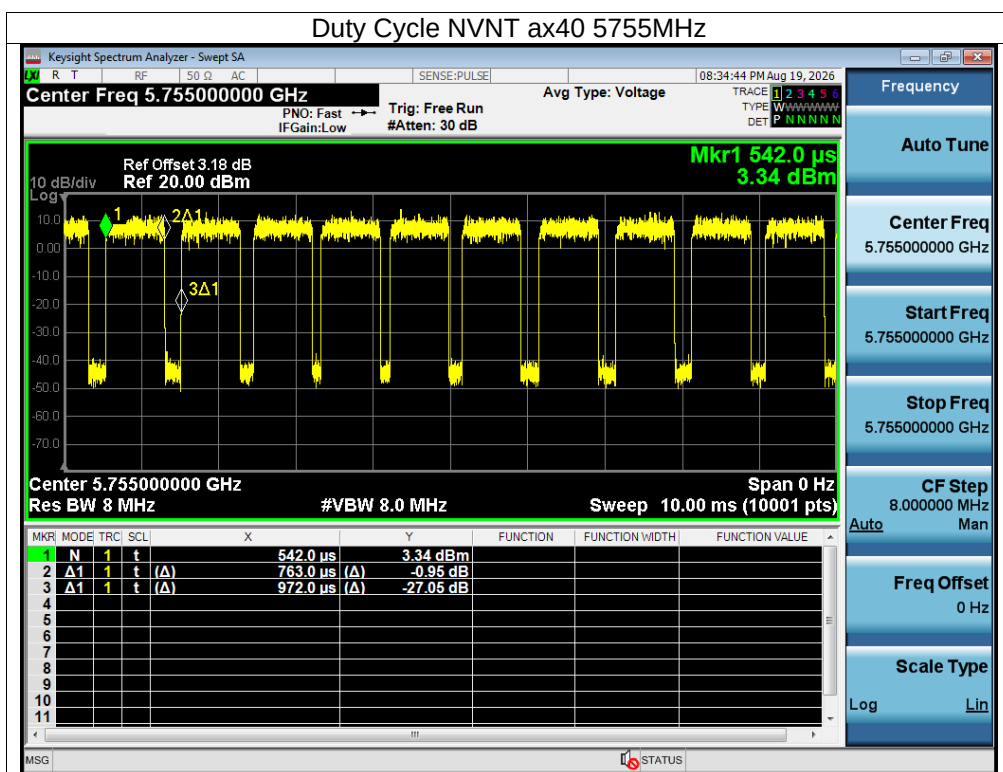
BCTC CO., LTD











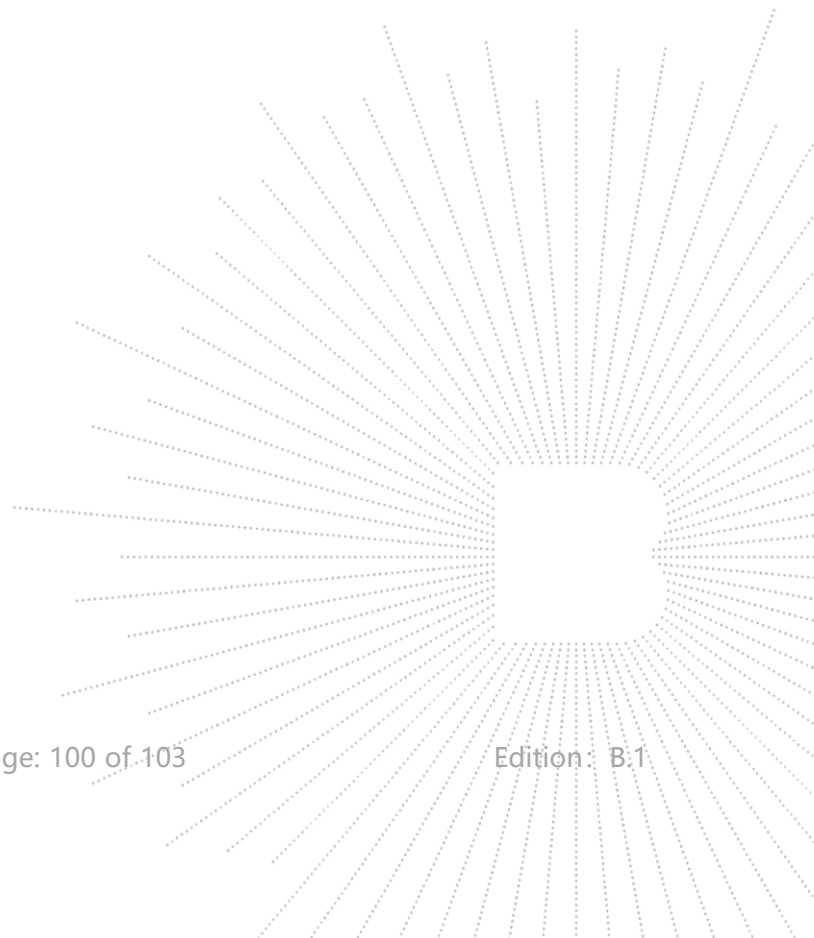
15. Antenna Requirement

15.1 Limit

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

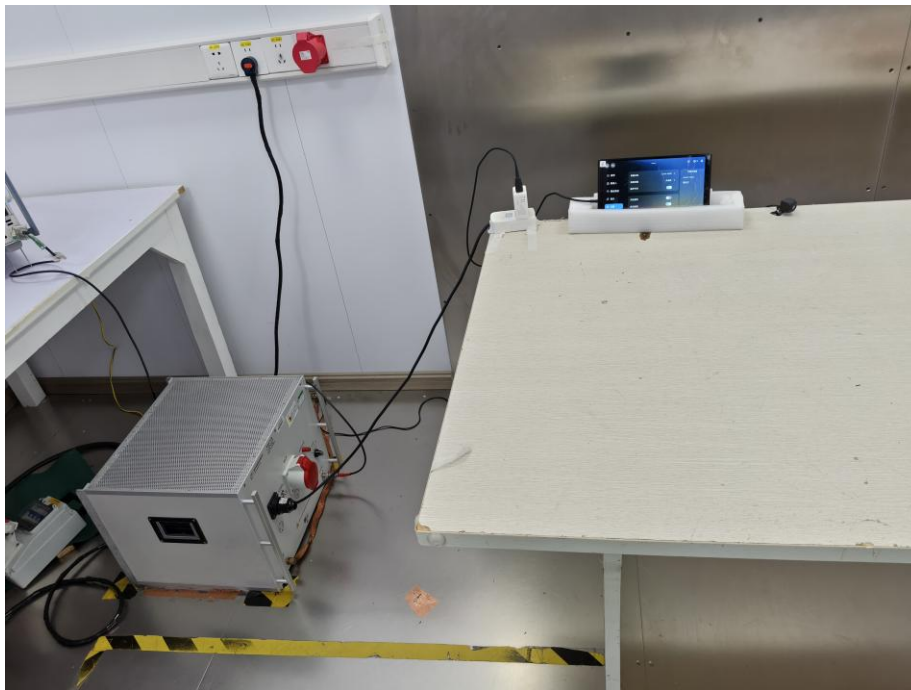
15.2 Test Result

The EUT antenna is FPC antenna, antenna connector type is IPEX, fulfill the requirement of this section.

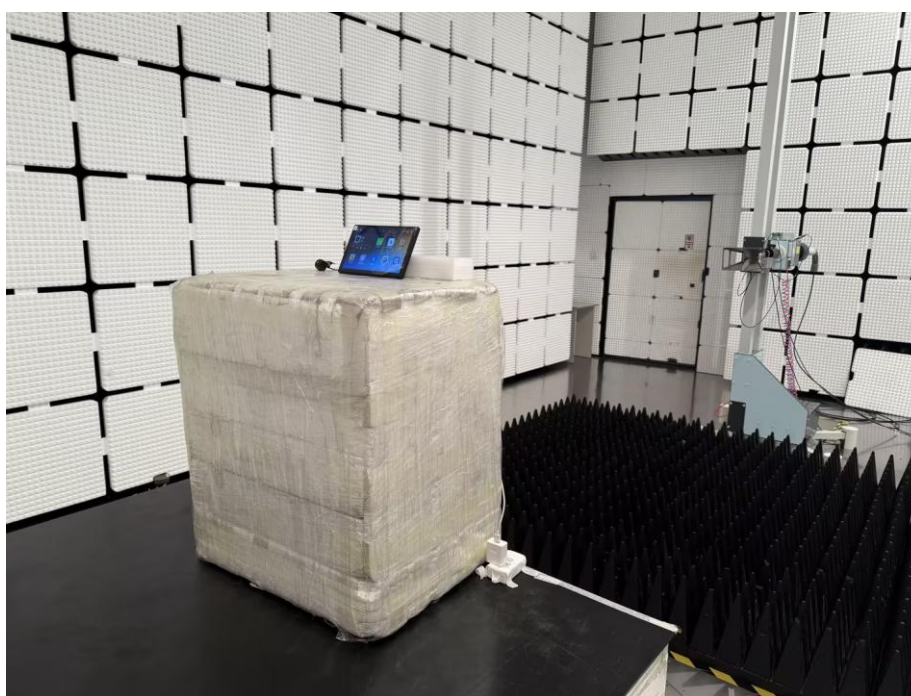


16. EUT Test Setup Photographs

Conducted emissions



Radiated Measurement Photos



STATEMENT

1. The equipment lists are traceable to the International System of Units (SI)
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/IEC 17025:2017.
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:

Room 101M, Unit 1, Building1, Pengyuan, No.18, Lilang Road, Shanglilang, Nanwan Subdistrict, Longgang District, Shenzhen, Guangdong, China

TEL: 400-788-9558

P.C.: 518116

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 *****

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