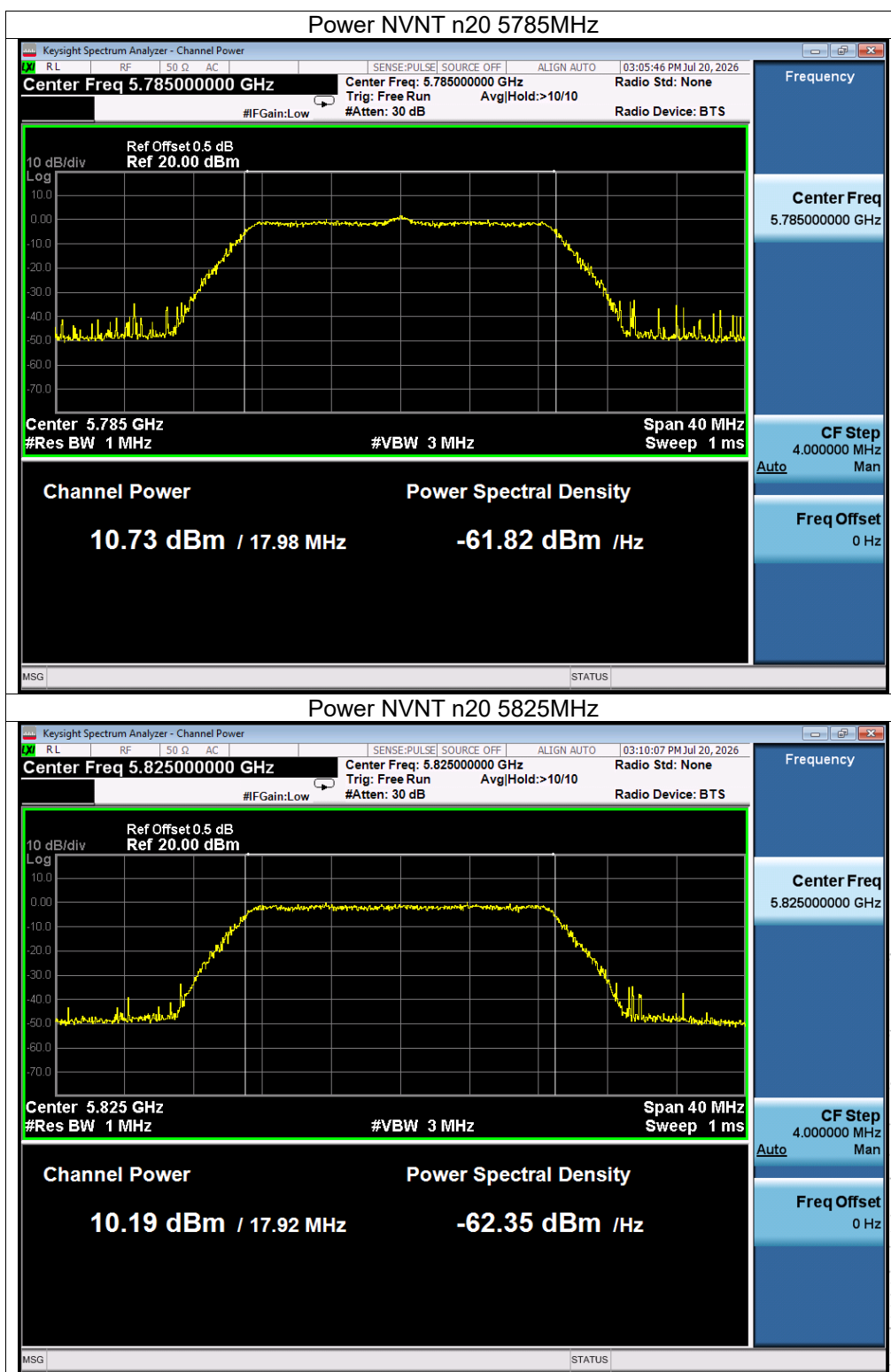
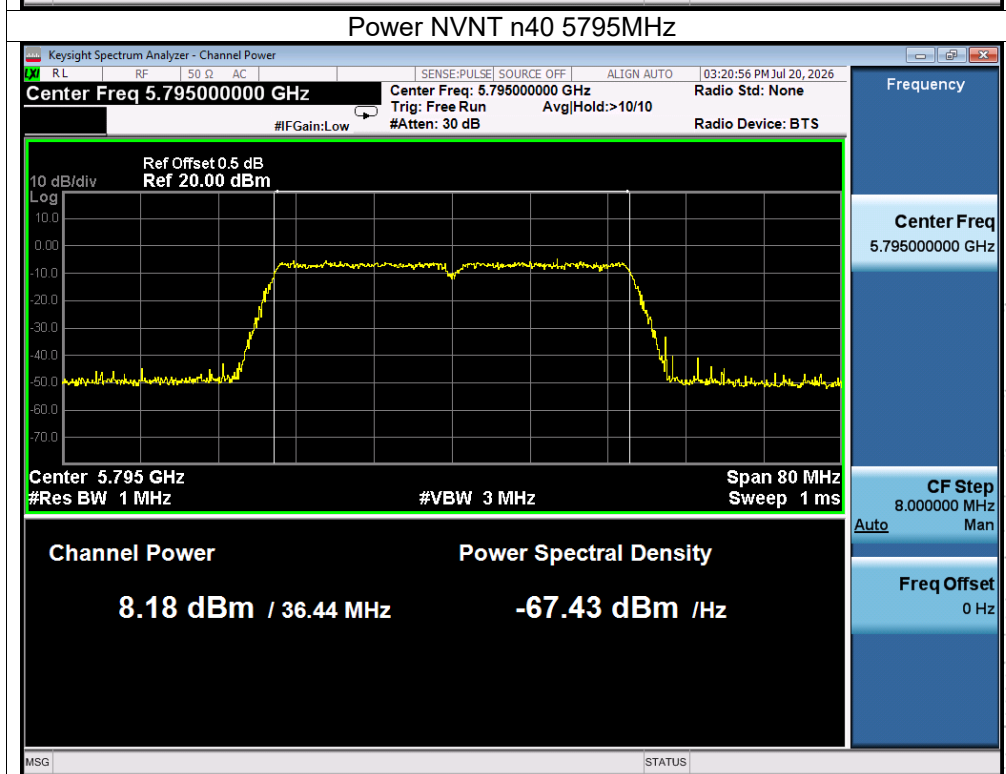
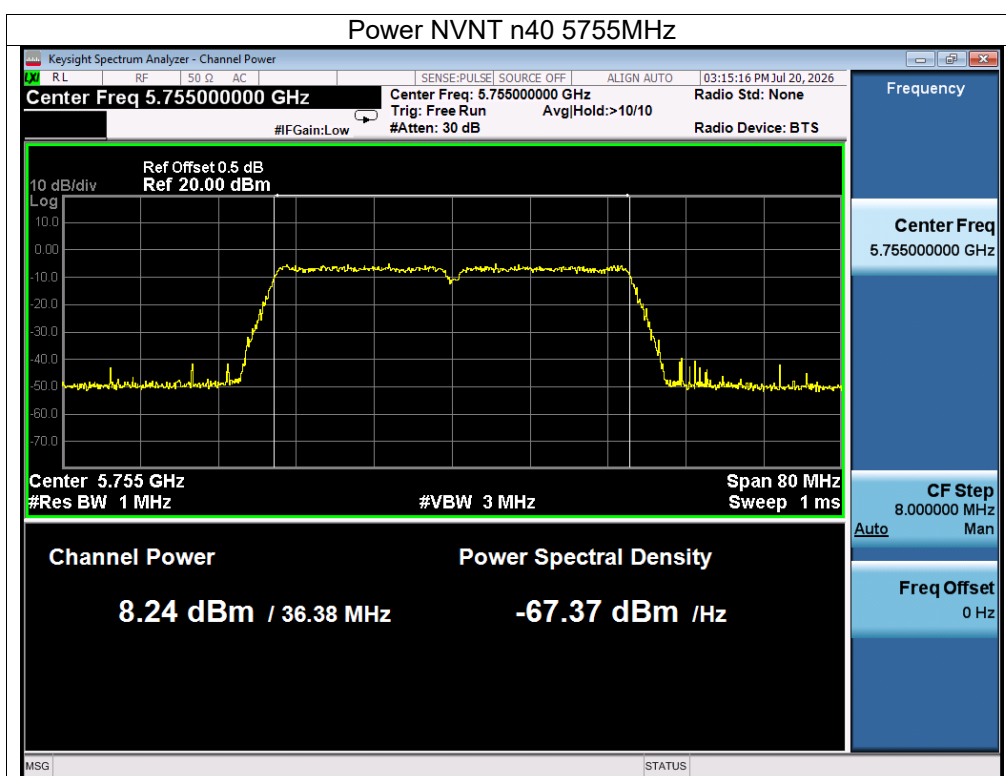
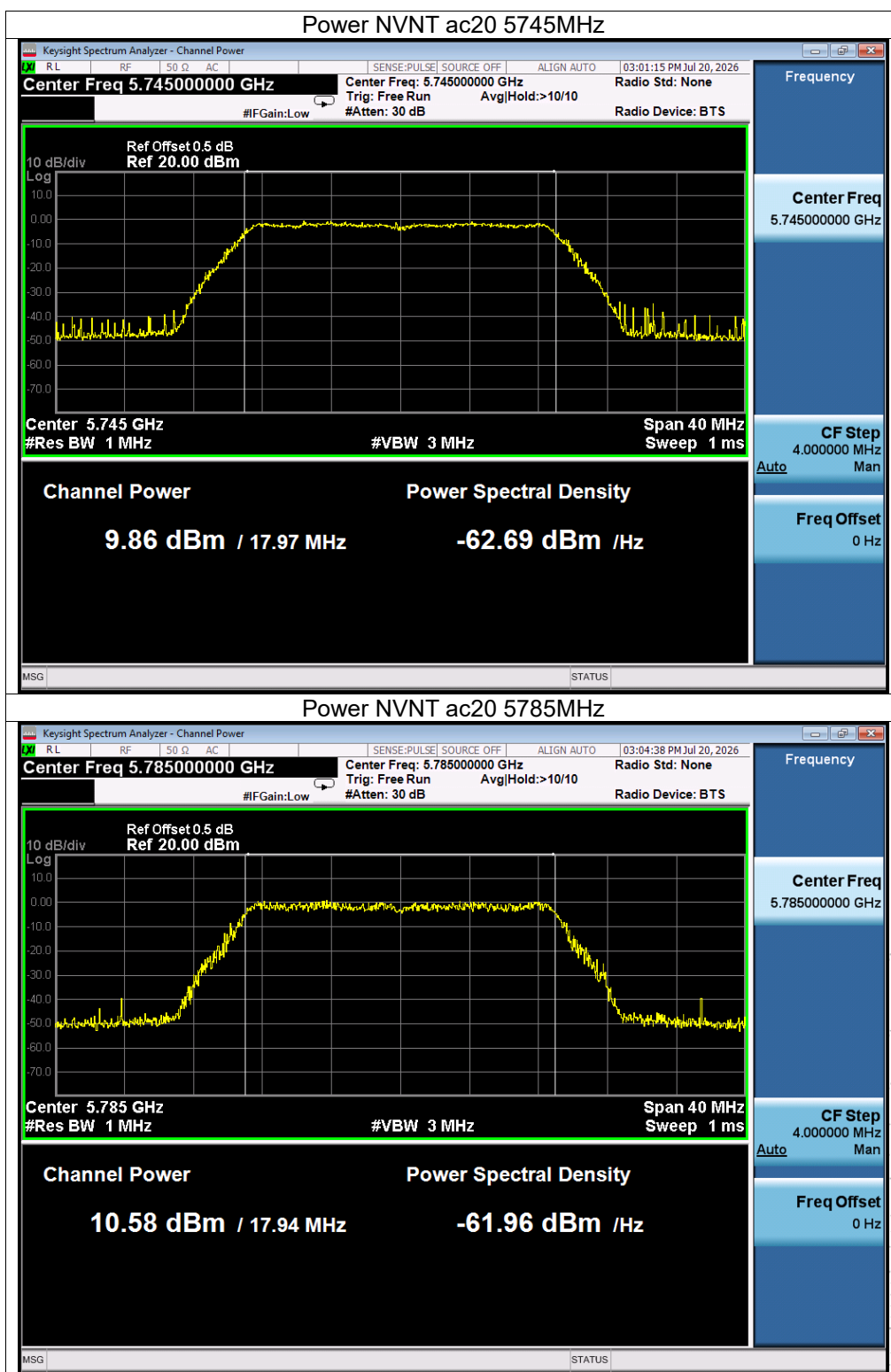
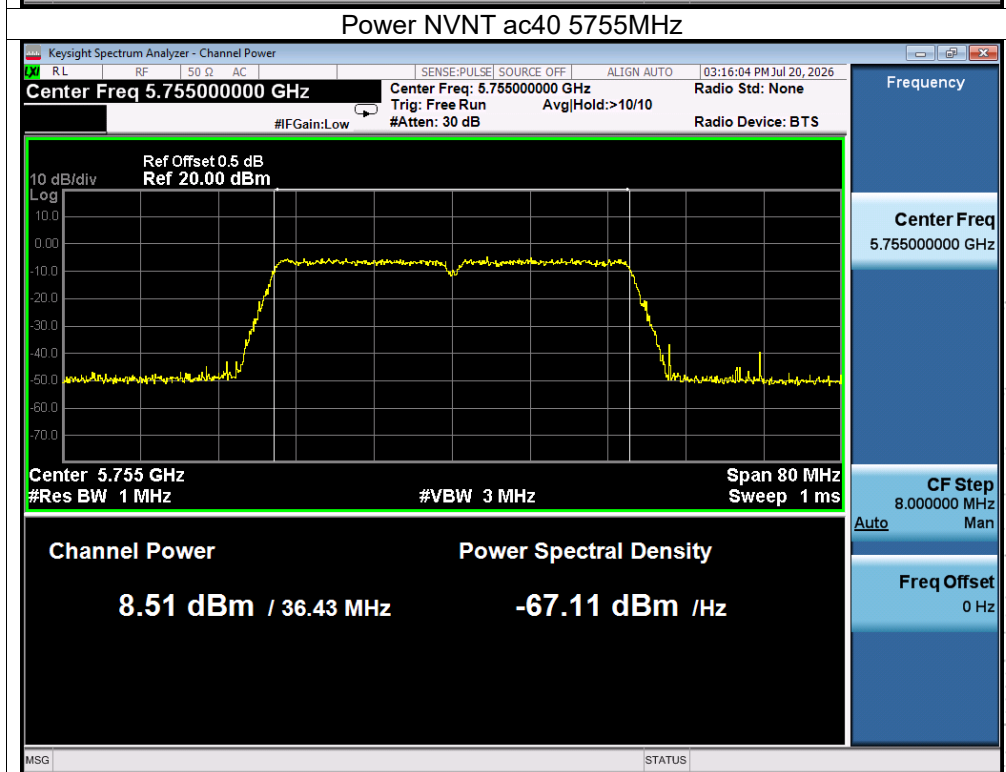
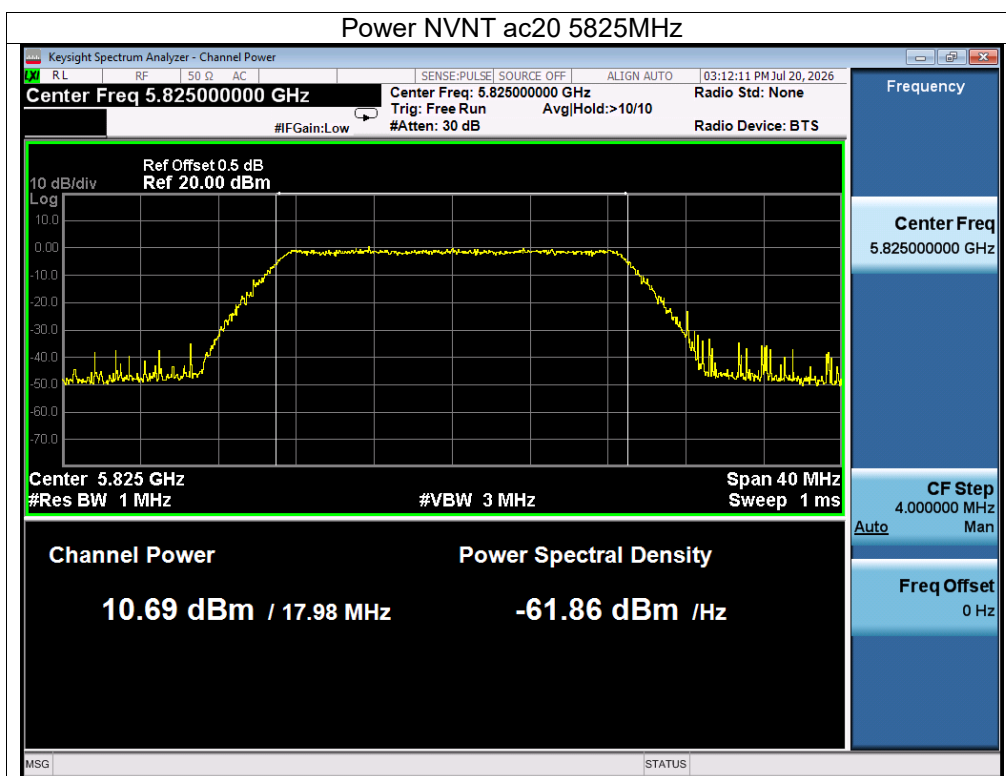
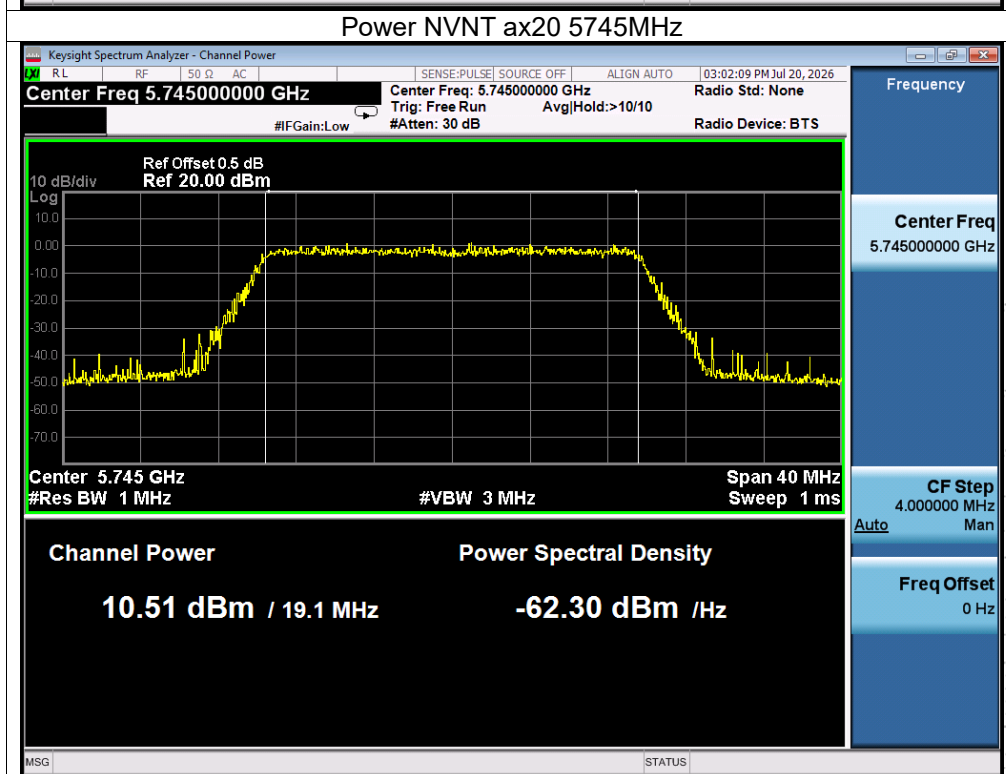
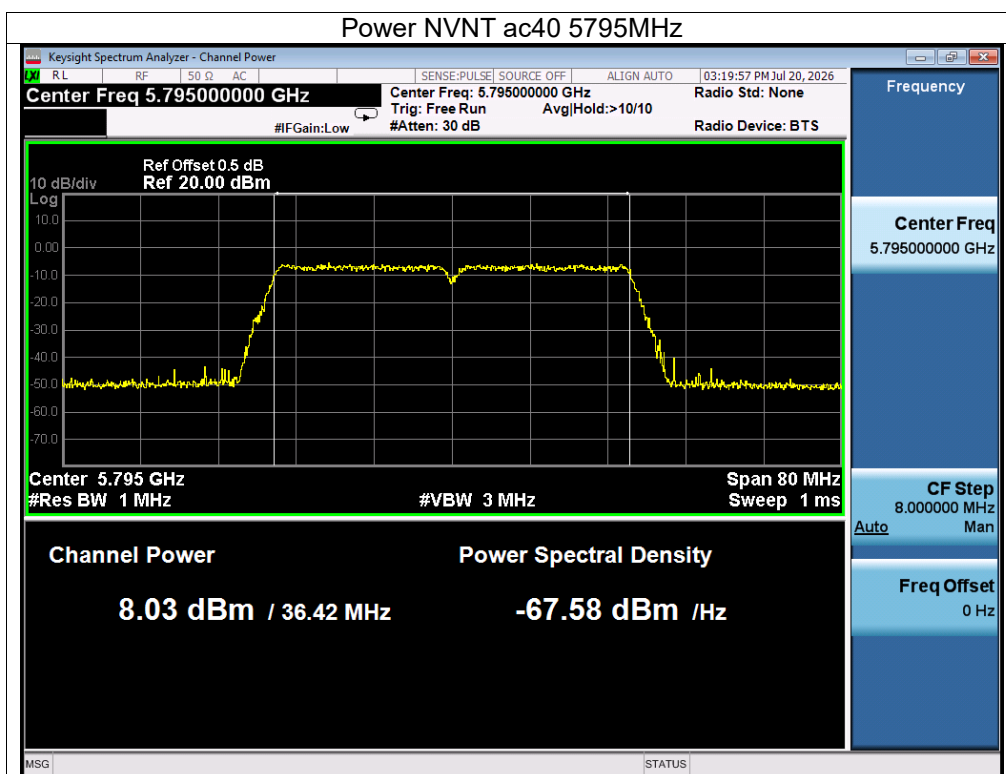


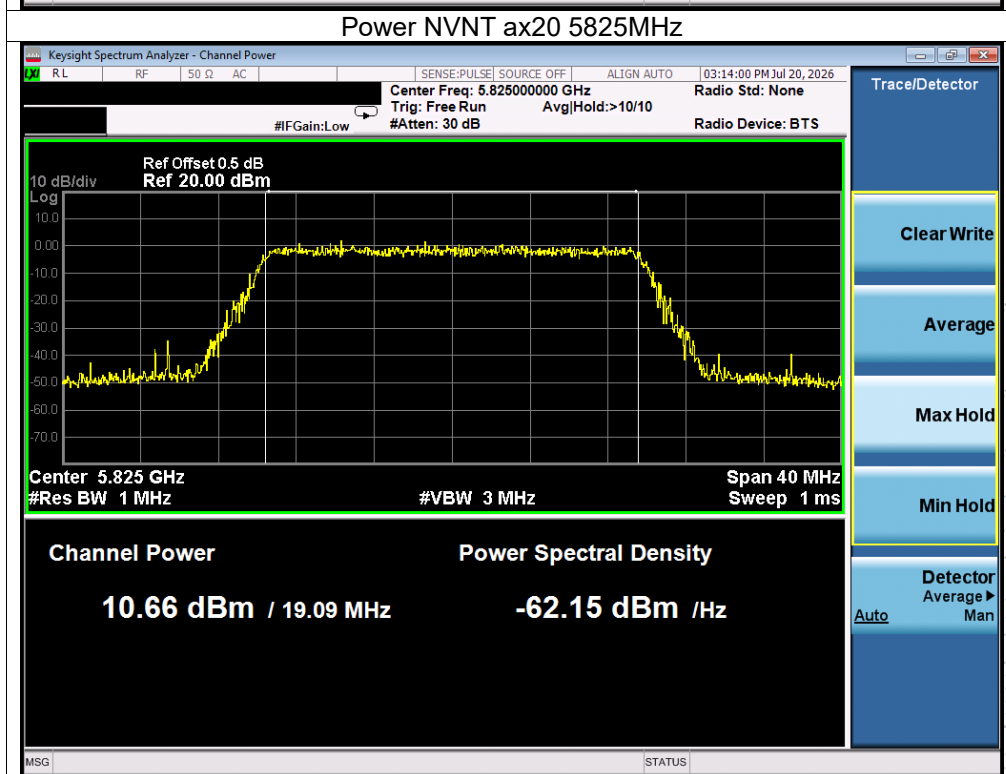
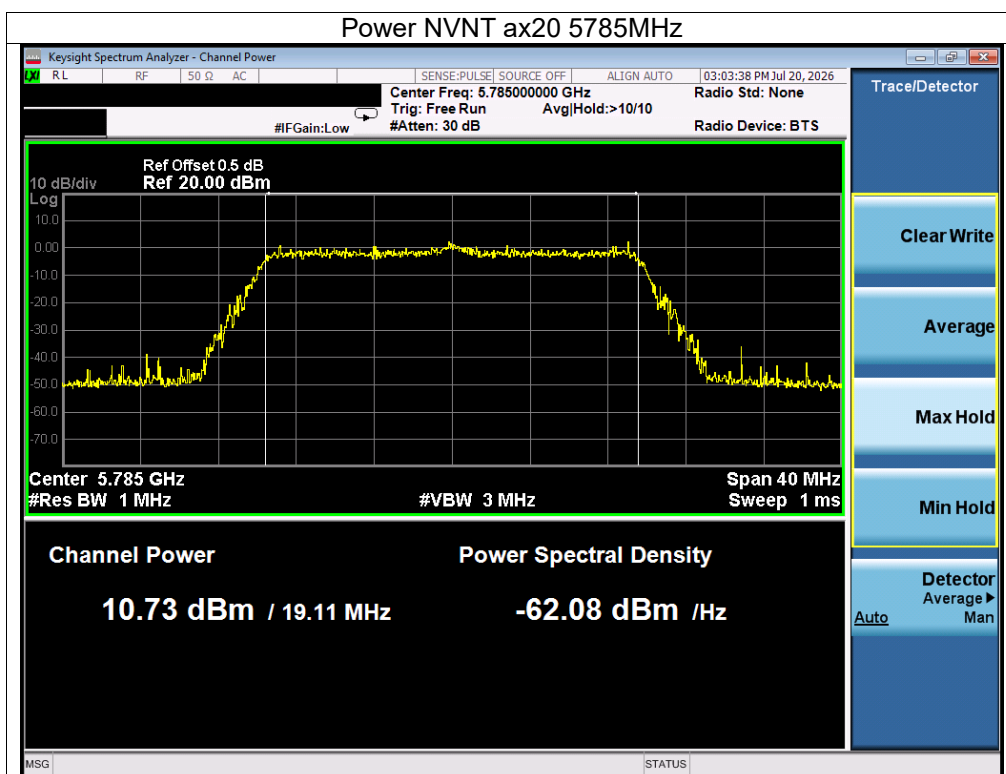




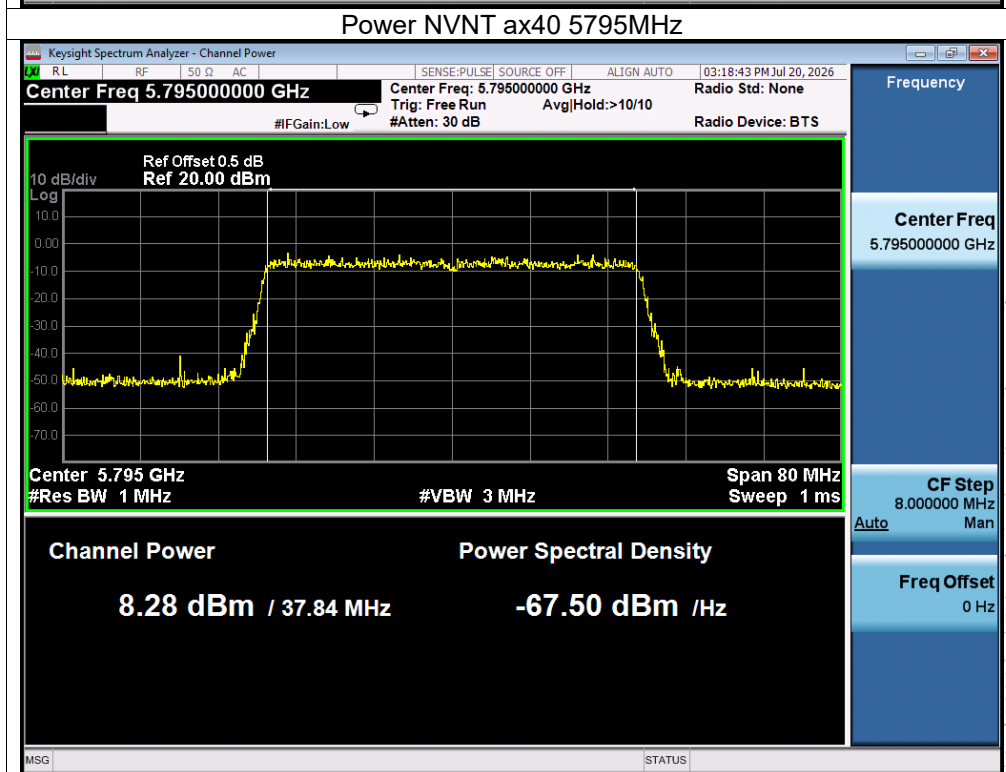
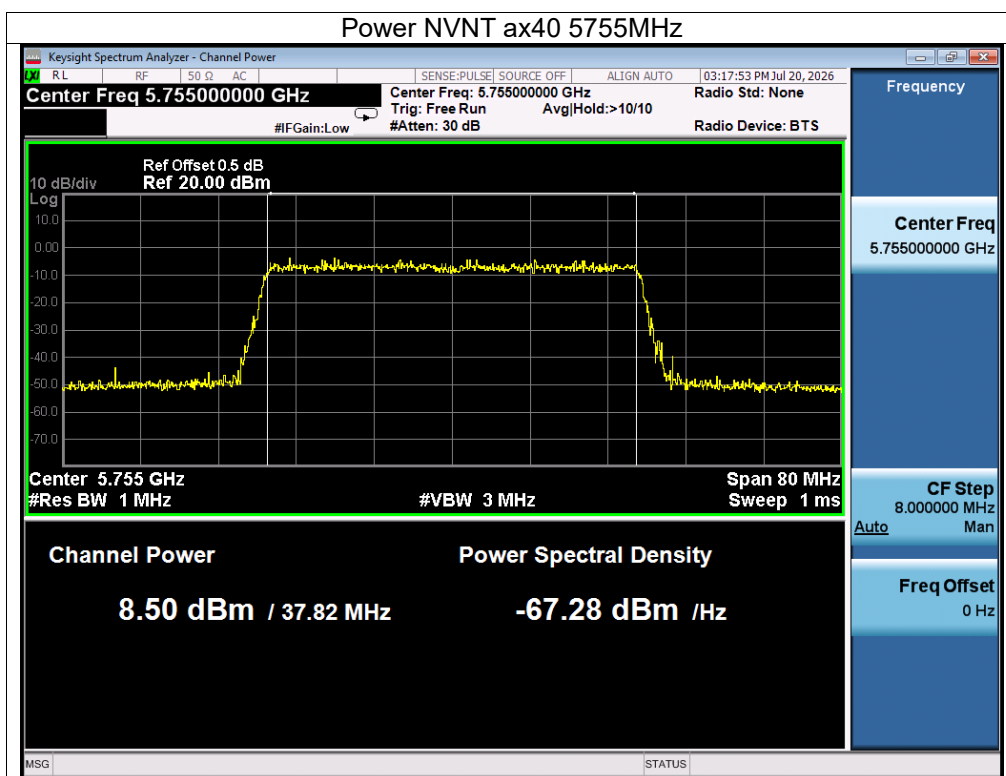








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11. Out Of Band Emissions

11.1 Block Diagram Of Test Setup



11.2 Limit

According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(10) 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 (68.2 dBuV/m@3m).

(2) For transmitters operating in the 5.25-5.35 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 (68.2 dBuV/m@3m).

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz (68.2 dBuV/m@3m).

(4) For transmitters operating solely in the 5.725-5.850 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.

11.3 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.

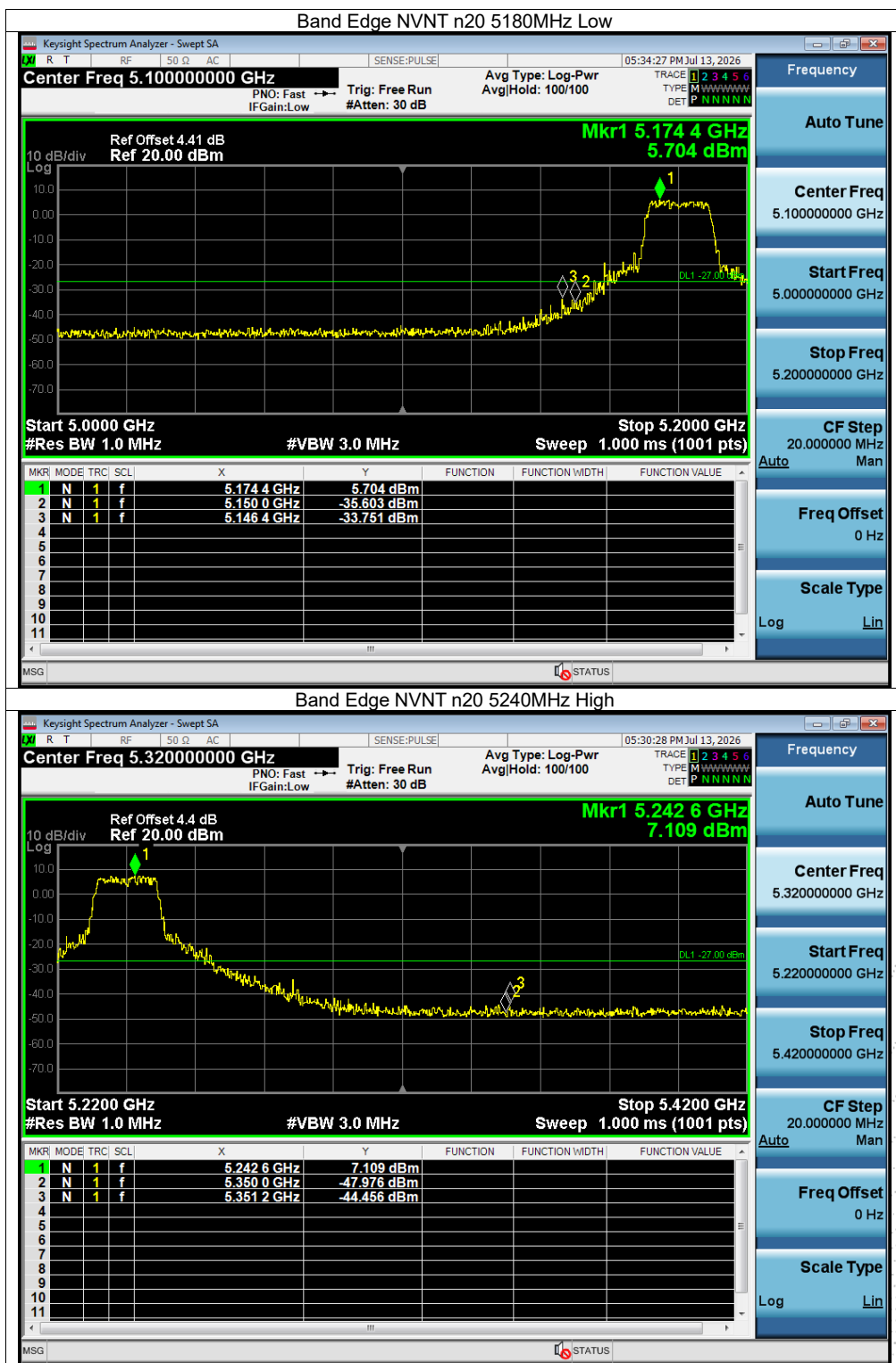
11.4 EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data

11.5 Test Result

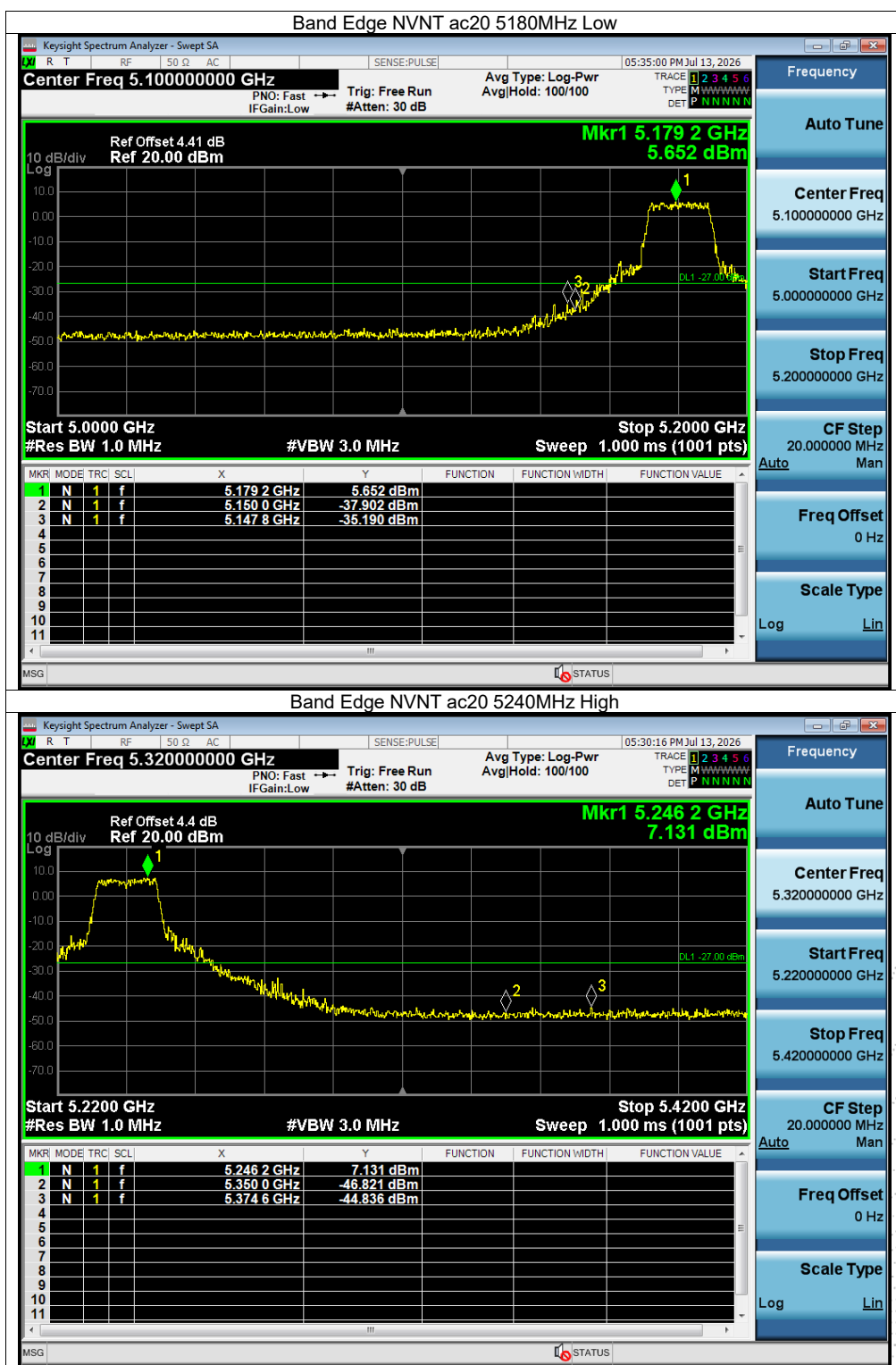
Test Mode:	5180-5240MHz
Note:	Test data Ref Offset has added antenna gain







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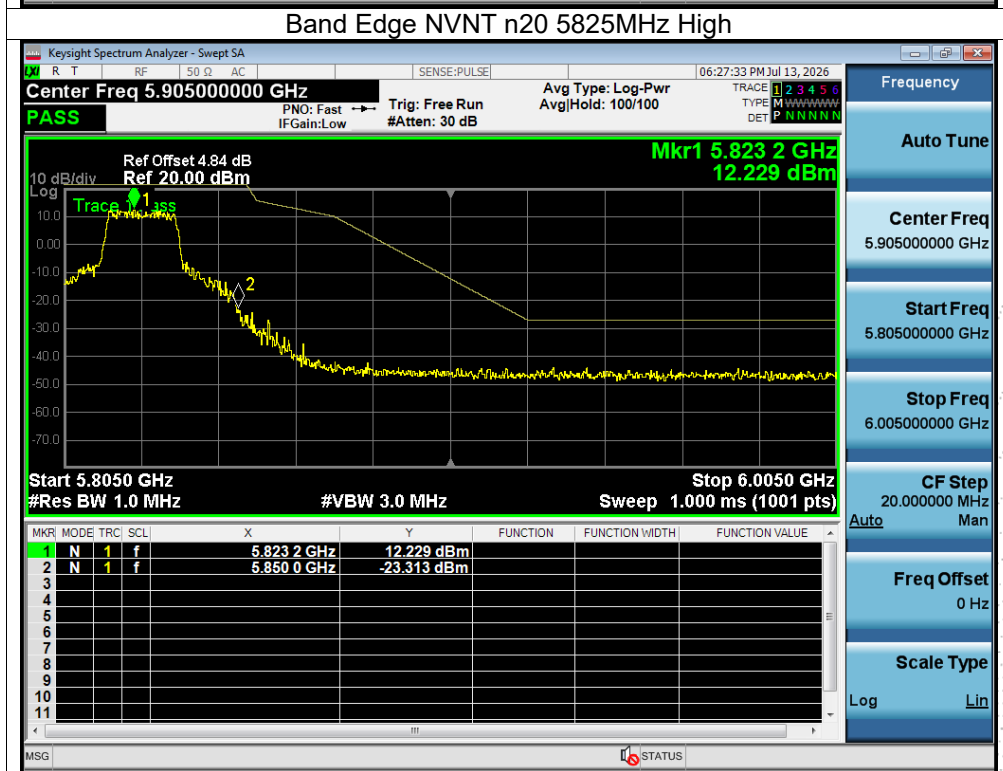
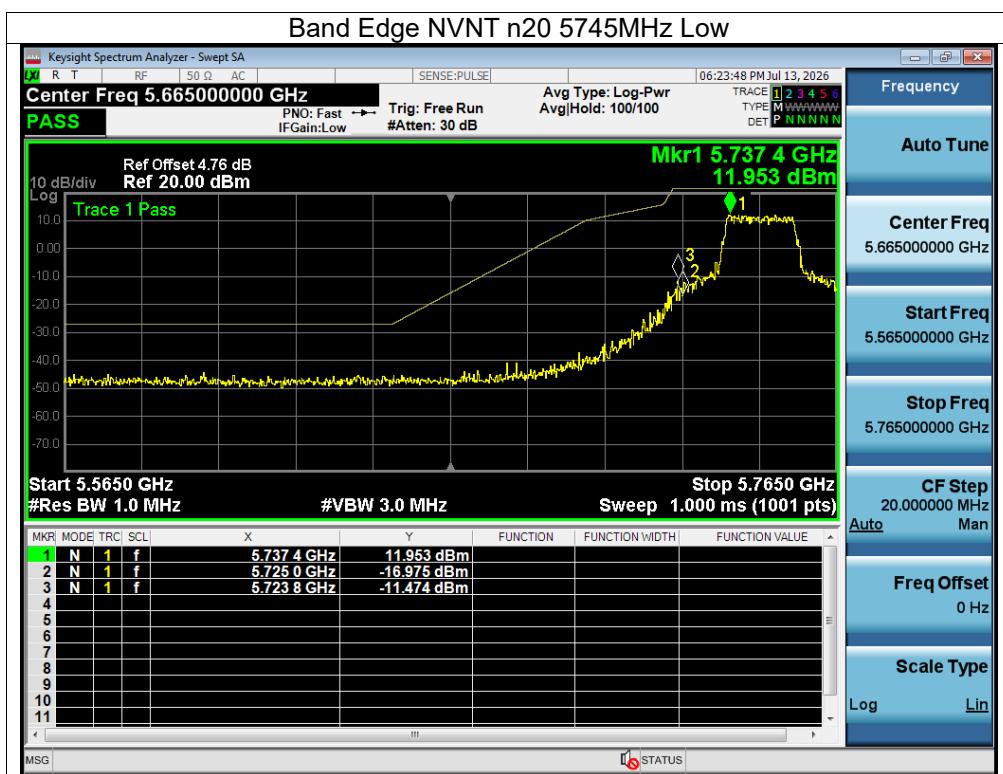




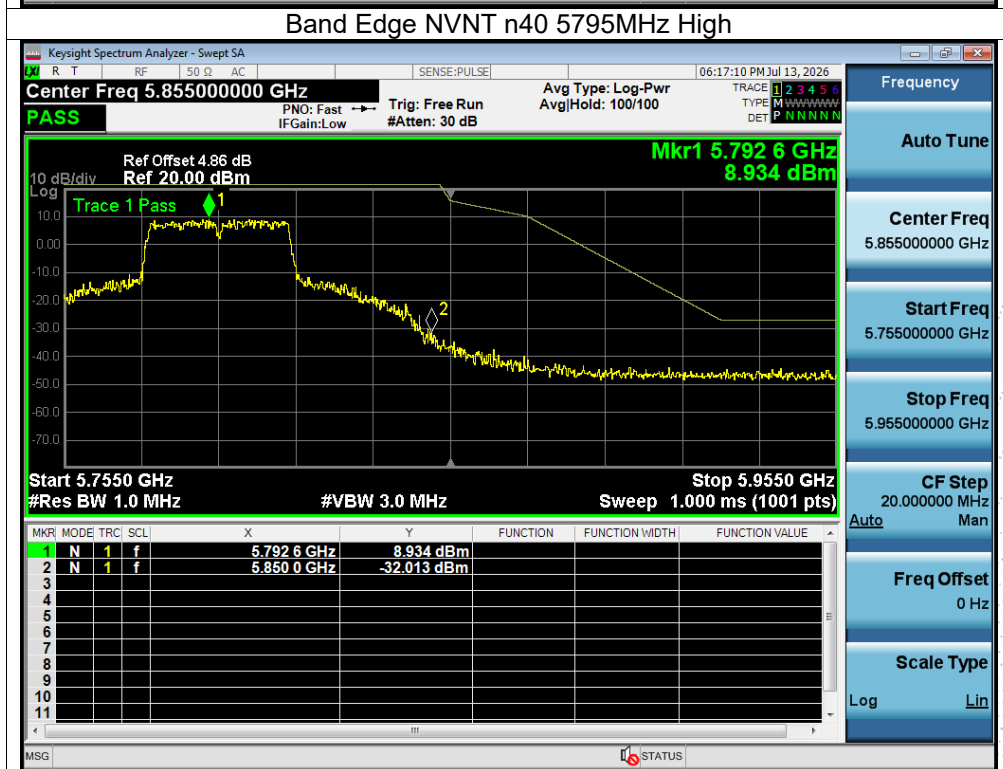
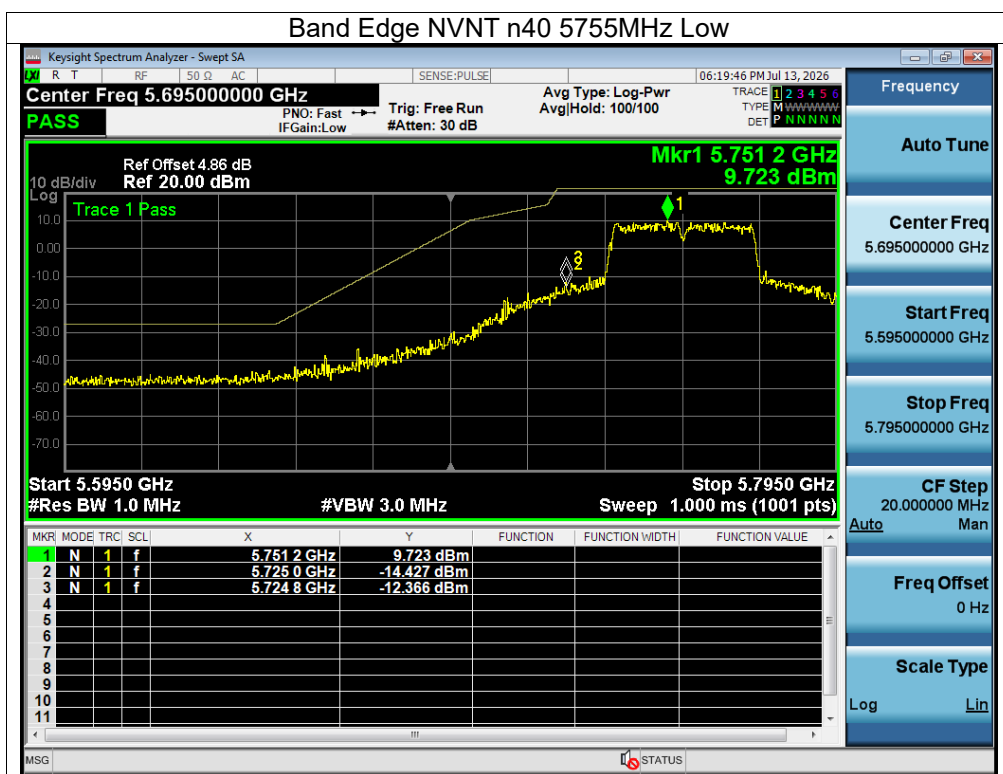


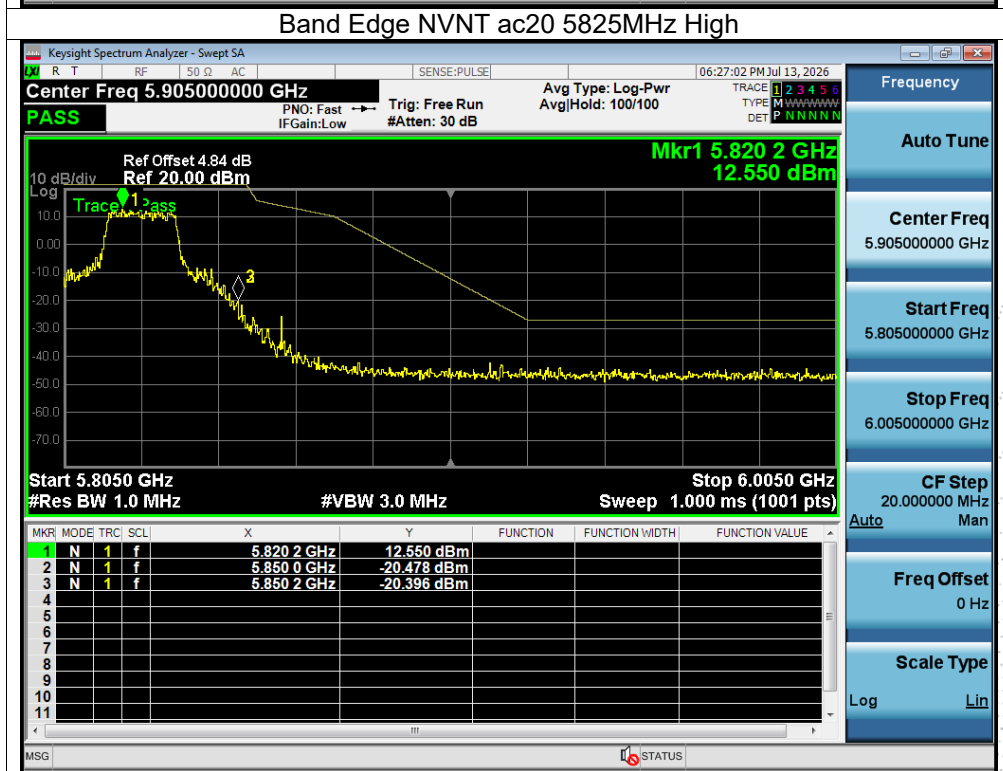
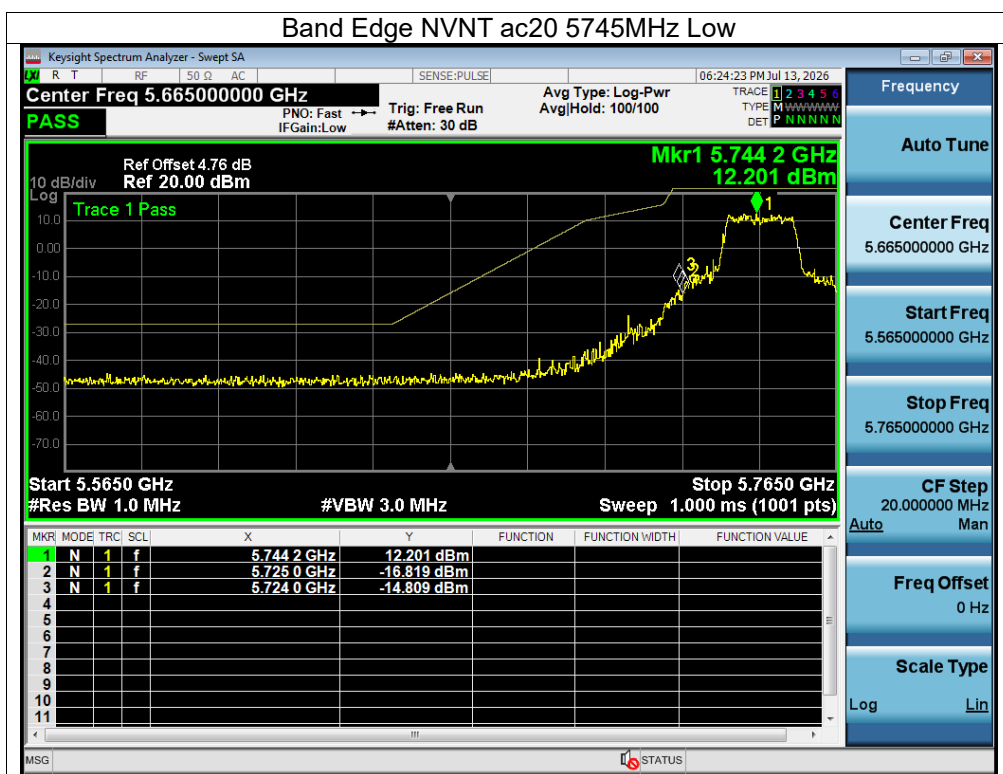
Test Mode:	5745-5825MHz
Note:	Test data Ref Offset has added antenna gain

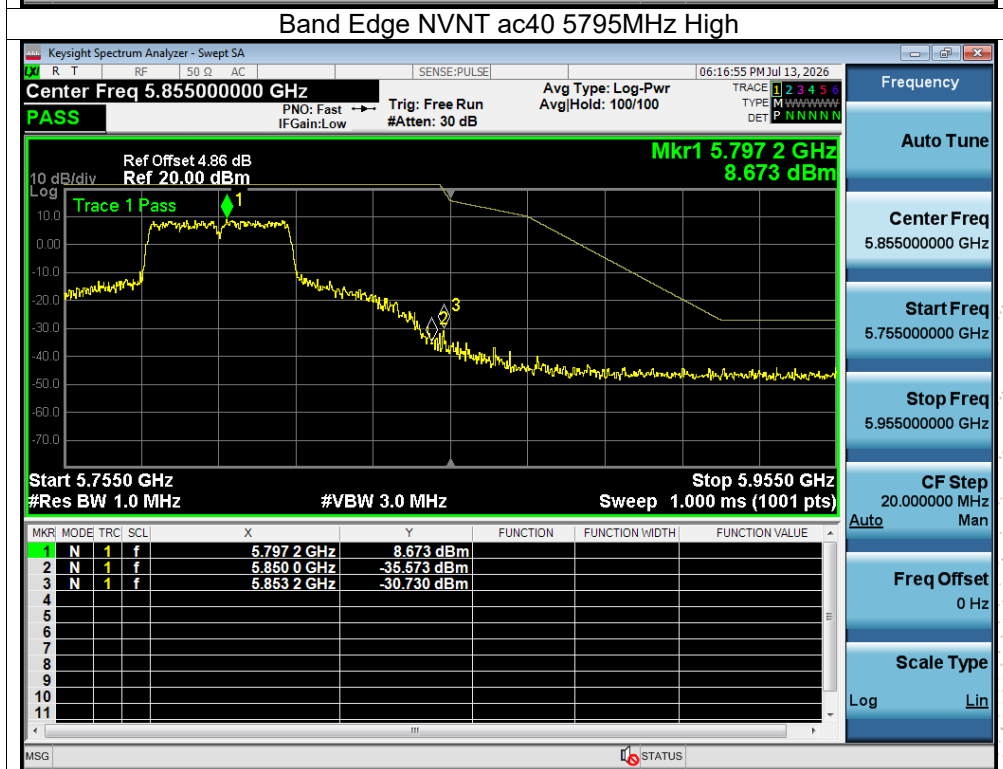
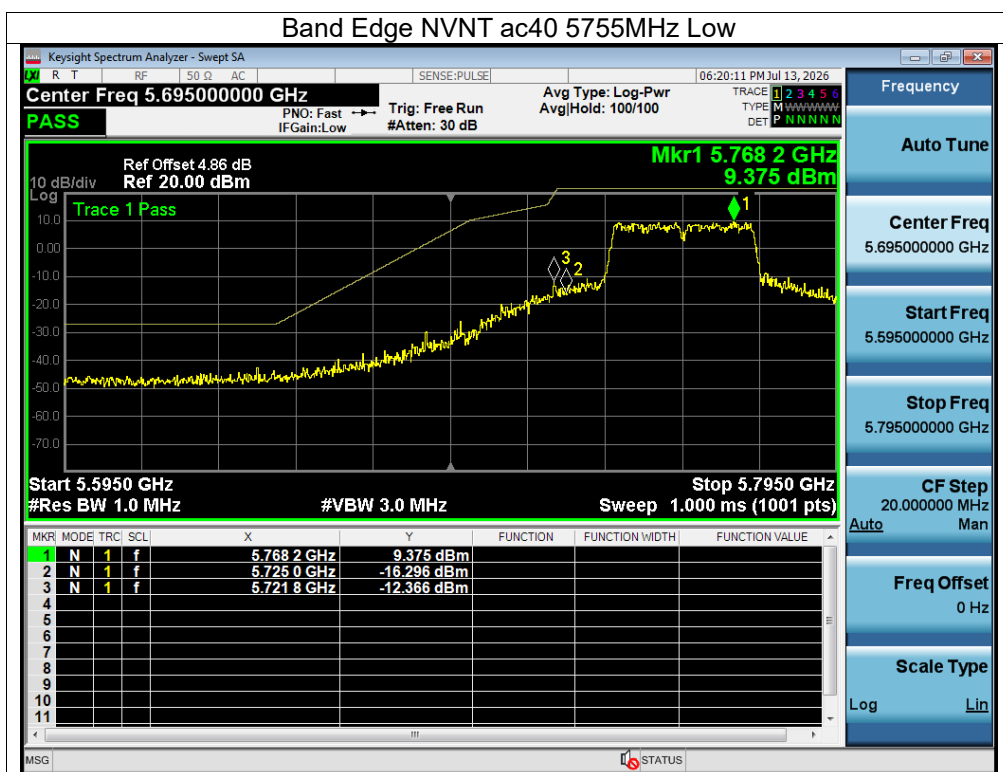


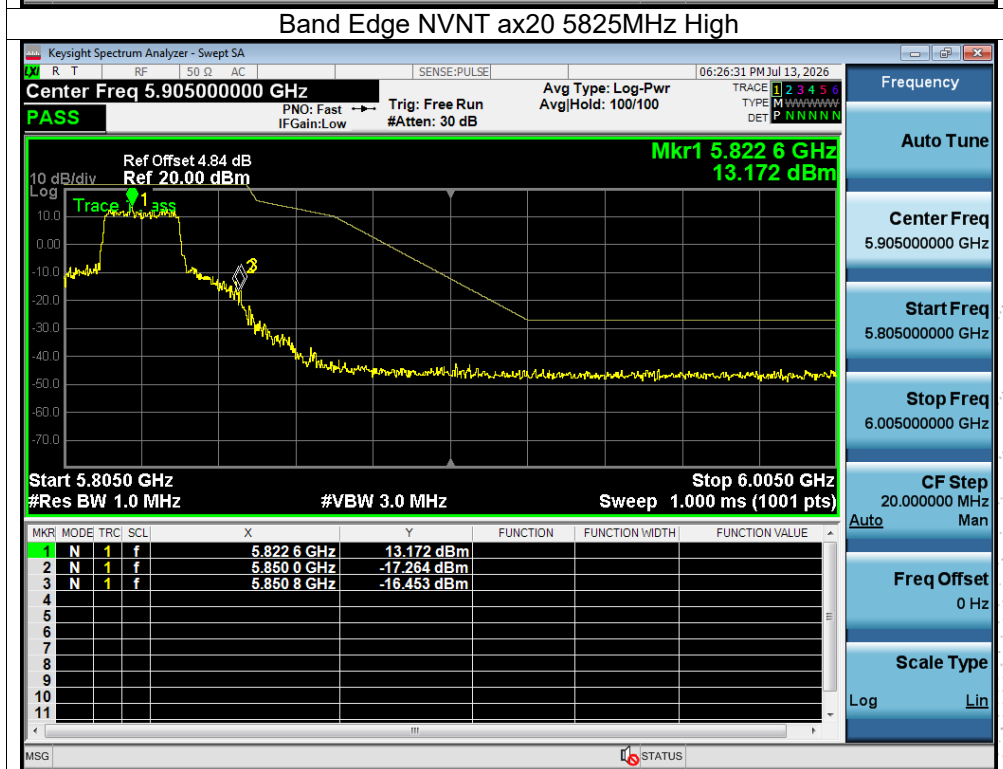
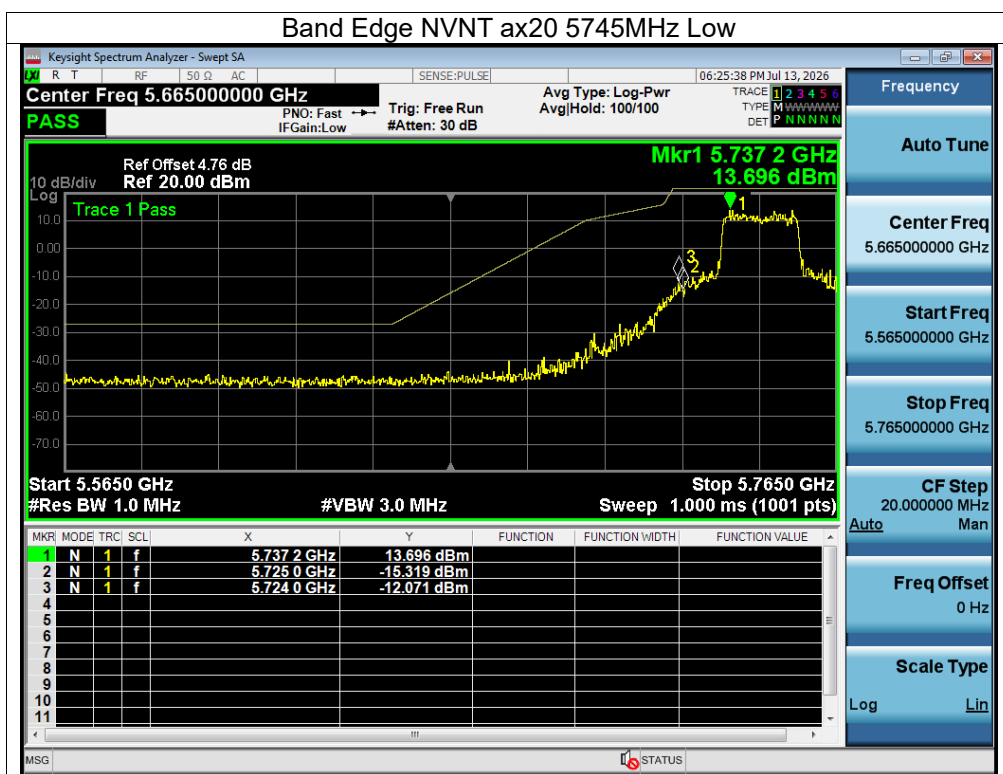


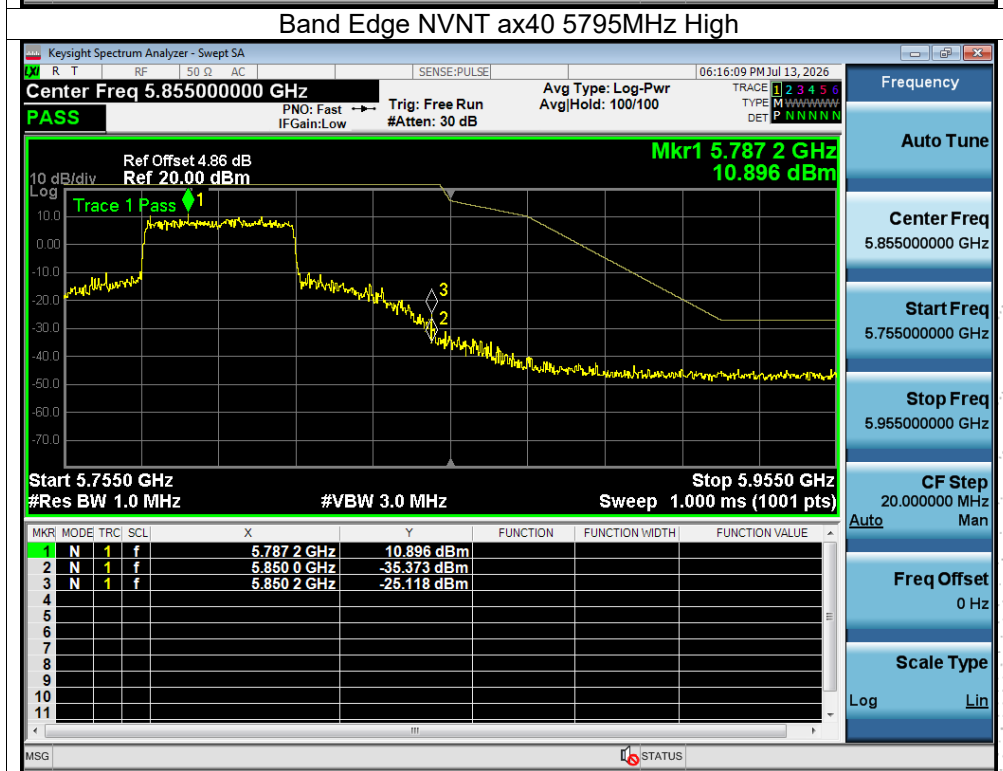
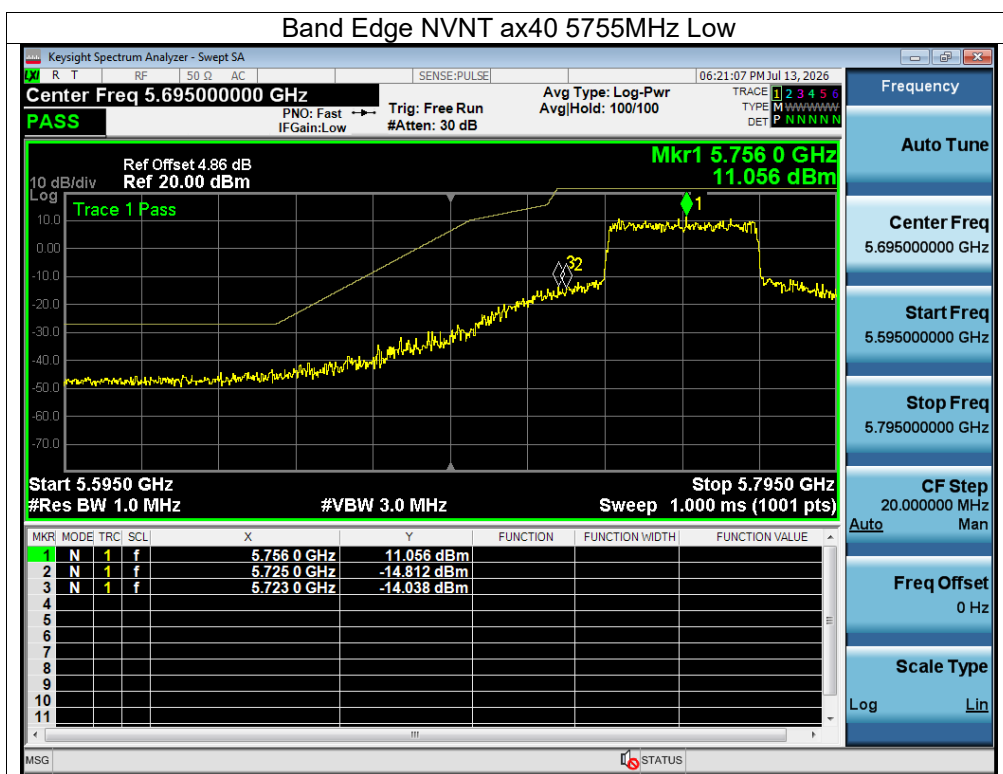
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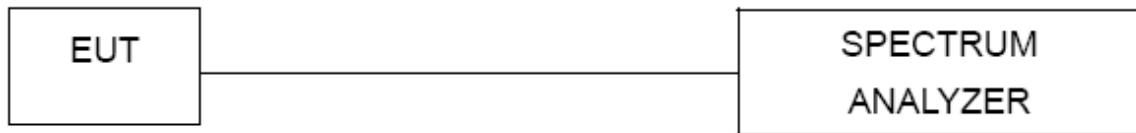






12. Frequency Stability Measurement

12.1 Block Diagram Of Test Setup



12.2 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).

12.3 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 $-20^\circ\text{C} \sim 70^\circ\text{C}$.

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12.4 Test Result

Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
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)	26	V nom (V)	120	5179.9820	5180	-0.0180	-3.4779
		V max (V)	132	5179.9823	5180	-0.0177	-3.4183
		V min (V)	108	5179.9841	5180	-0.0159	-3.0742
Limits				5150-5250 MHz			
Result				Complies			

Temperature vs. Frequency Stability

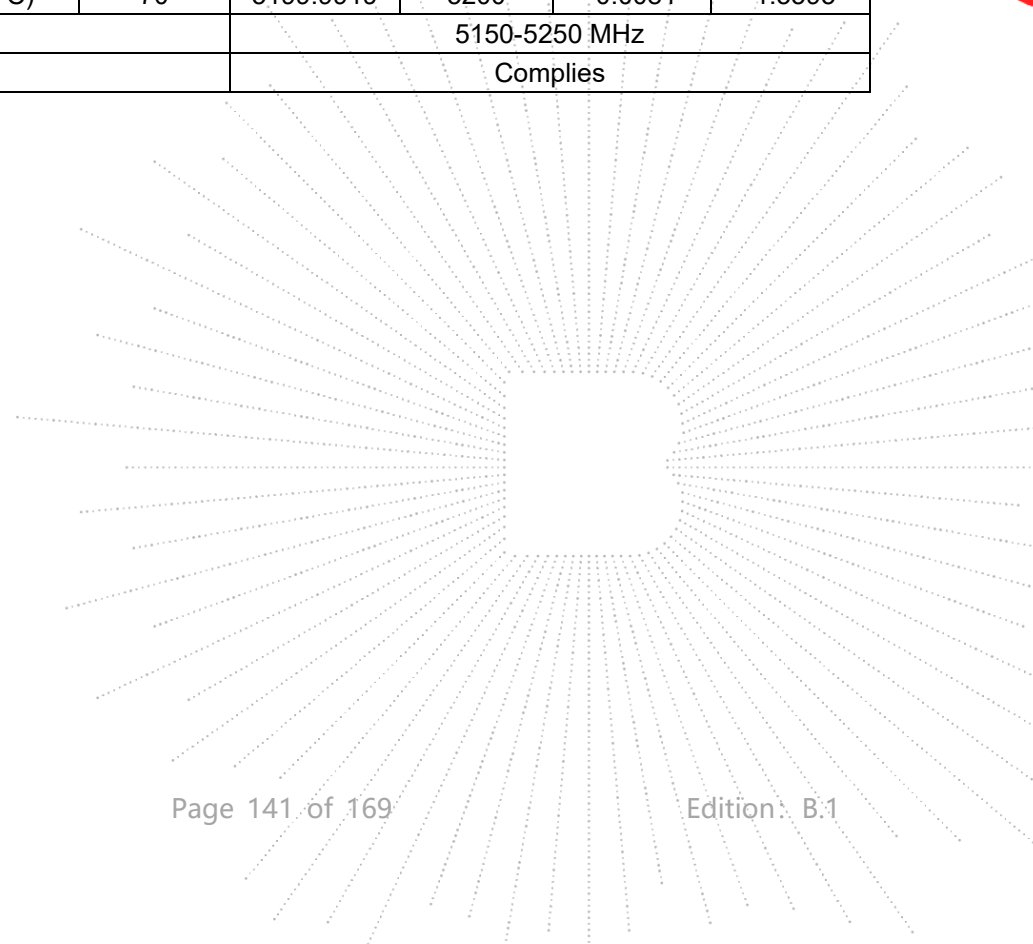
TEST CONDITIONS				Reference Frequency: 5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	-20	5179.9841	5180	-0.0159	-3.0685
		T (°C)	-10	5179.9846	5180	-0.0154	-2.9716
		T (°C)	0	5179.9842	5180	-0.0158	-3.0532
		T (°C)	10	5179.9851	5180	-0.0149	-2.8793
		T (°C)	20	5179.9849	5180	-0.0151	-2.9205
		T (°C)	30	5179.9821	5180	-0.0179	-3.4652
		T (°C)	40	5179.9820	5180	-0.0180	-3.4748
		T (°C)	50	5179.9834	5180	-0.0166	-3.1954
		T (°C)	60	5179.9826	5180	-0.0174	-3.3582
T (°C)	70	5179.9837	5180	-0.0163	-3.1433		
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)	26	V nom (V)	120	5199.9921	5200	-0.0079	-1.5208
		V max (V)	132	5199.9923	5200	-0.0077	-1.4850
		V min (V)	108	5199.9926	5200	-0.0074	-1.4311
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)	120	T (°C)	-20	5199.9907	5200	-0.0093	-1.8025
		T (°C)	-10	5199.9922	5200	-0.0078	-1.5111
		T (°C)	0	5199.9897	5200	-0.0103	-1.9890
		T (°C)	10	5199.9925	5200	-0.0075	-1.4510
		T (°C)	20	5199.9899	5200	-0.0101	-1.9412
		T (°C)	30	5199.9902	5200	-0.0098	-1.8920
		T (°C)	40	5199.9916	5200	-0.0084	-1.6146
		T (°C)	50	5199.9916	5200	-0.0084	-1.6159
		T (°C)	60	5199.9924	5200	-0.0076	-1.4527
		T (°C)	70	5199.9919	5200	-0.0081	-1.5595
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)	26	V nom (V)	120	5239.9917	5240	-0.0083	-1.5787
		V max (V)	132	5239.9909	5240	-0.0091	-1.7353
		V min (V)	108	5239.9910	5240	-0.0090	-1.7129
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)	120	T (°C)	-20	5239.9893	5240	-0.0107	-2.0701
		T (°C)	-10	5239.9914	5240	-0.0086	-1.6574
		T (°C)	0	5239.9918	5240	-0.0082	-1.5731
		T (°C)	10	5239.9902	5240	-0.0098	-1.8726
		T (°C)	20	5239.9915	5240	-0.0085	-1.6427
		T (°C)	30	5239.9897	5240	-0.0103	-1.9802
		T (°C)	40	5239.9899	5240	-0.0101	-1.9524
		T (°C)	50	5239.9904	5240	-0.0096	-1.8403
		T (°C)	60	5239.9915	5240	-0.0085	-1.6177
		T (°C)	70	5239.9910	5240	-0.0090	-1.7192
Limits				5150-5250 MHz			
Result				Complies			

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Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
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)	26	V nom (V)	120	5744.9893	5745	-0.0107	-1.8608
		V max (V)	132	5744.9908	5745	-0.0092	-1.5955
		V min (V)	108	5744.9887	5745	-0.0113	-1.9730
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)	120	T (°C)	-20	5744.9886	5745	-0.0114	-2.2035
		T (°C)	-10	5744.9910	5745	-0.0090	-1.7370
		T (°C)	0	5744.9899	5745	-0.0101	-1.7523
		T (°C)	10	5744.9891	5745	-0.0109	-1.8947
		T (°C)	20	5744.9887	5745	-0.0113	-2.1908
		T (°C)	30	5744.9898	5745	-0.0102	-1.9737
		T (°C)	40	5744.9890	5745	-0.0110	-2.1157
		T (°C)	50	5744.9897	5745	-0.0103	-1.7869
		T (°C)	60	5744.9907	5745	-0.0093	-1.6269
		T (°C)	70	5744.9901	5745	-0.0099	-1.7177
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)	26	V nom (V)	120	5784.9890	5785	-0.0110	-1.8937
		V max (V)	132	5784.9916	5785	-0.0084	-1.4434
		V min (V)	108	5784.9886	5785	-0.0114	-1.9723
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)	120	T (°C)	-20	5784.9890	5785	-0.0110	-2.1280
		T (°C)	-10	5784.9915	5785	-0.0085	-1.6466
		T (°C)	0	5784.9913	5785	-0.0087	-1.5118
		T (°C)	10	5784.9906	5785	-0.0094	-1.6192
		T (°C)	20	5784.9913	5785	-0.0087	-1.6716
		T (°C)	30	5784.9915	5785	-0.0085	-1.6458
		T (°C)	40	5784.9890	5785	-0.0110	-2.1168
		T (°C)	50	5784.9899	5785	-0.0101	-1.7395
		T (°C)	60	5784.9885	5785	-0.0115	-1.9879
		T (°C)	70	5784.9890	5785	-0.0110	-1.8941
Limits				5725-5850 MHz			
Result				Complies			

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Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency: 5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	26	V nom (V)	120	5824.9894	5825	-0.0106	-1.8165
		V max (V)	132	5824.9917	5825	-0.0083	-1.4193
		V min (V)	108	5824.9898	5825	-0.0102	-1.7508
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)	120	T (°C)	-20	5824.9922	5825	-0.0078	-1.5006
		T (°C)	-10	5824.9895	5825	-0.0105	-2.0361
		T (°C)	0	5824.9894	5825	-0.0106	-1.8271
		T (°C)	10	5824.9909	5825	-0.0091	-1.5645
		T (°C)	20	5824.9896	5825	-0.0104	-2.0147
		T (°C)	30	5824.9922	5825	-0.0078	-1.4981
		T (°C)	40	5824.9913	5825	-0.0087	-1.6738
		T (°C)	50	5824.9892	5825	-0.0108	-1.8495
		T (°C)	60	5824.9903	5825	-0.0097	-1.6583
		T (°C)	70	5824.9918	5825	-0.0082	-1.4087
Limits				5725-5850 MHz			
Result				Complies			



13. Duty Cycle Of Test Signal

13.1 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.

13.2 Formula

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

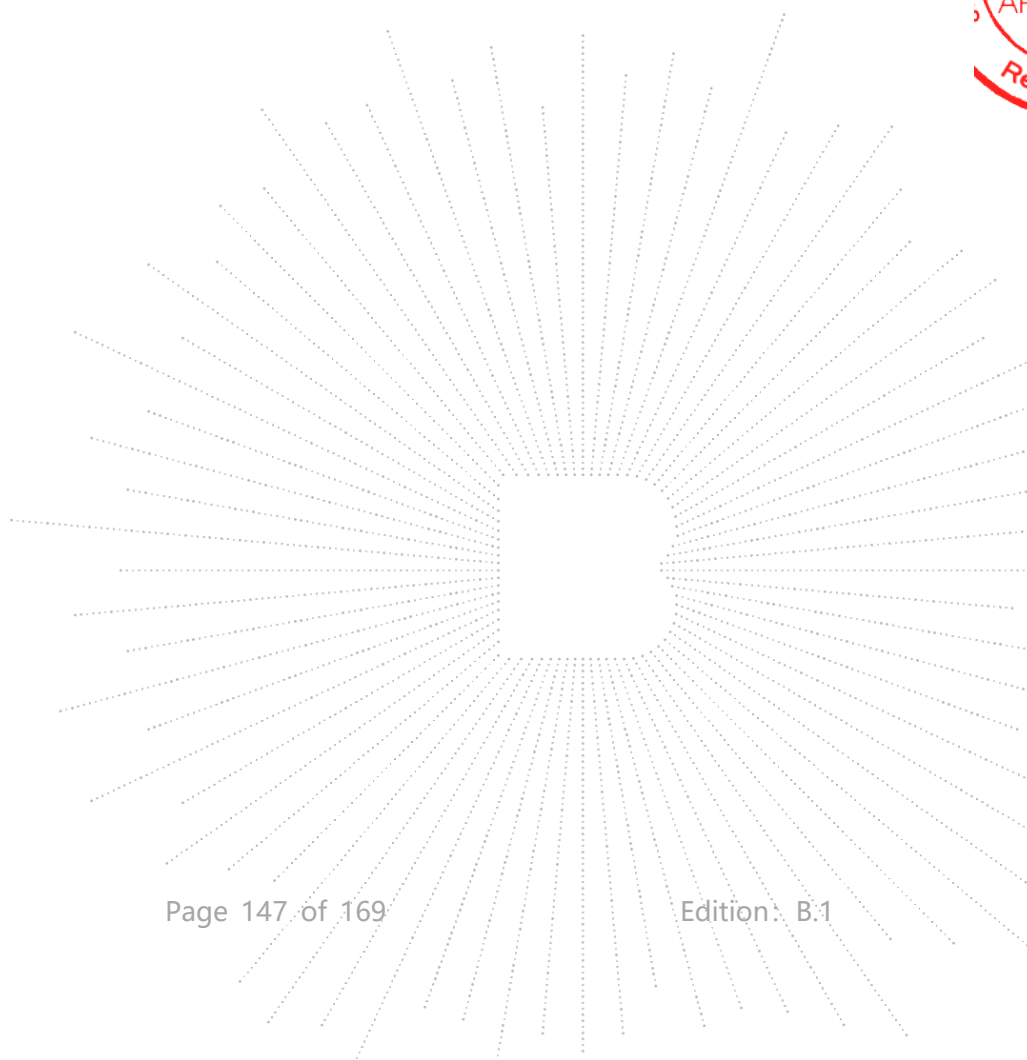
13.3 Test Procedure

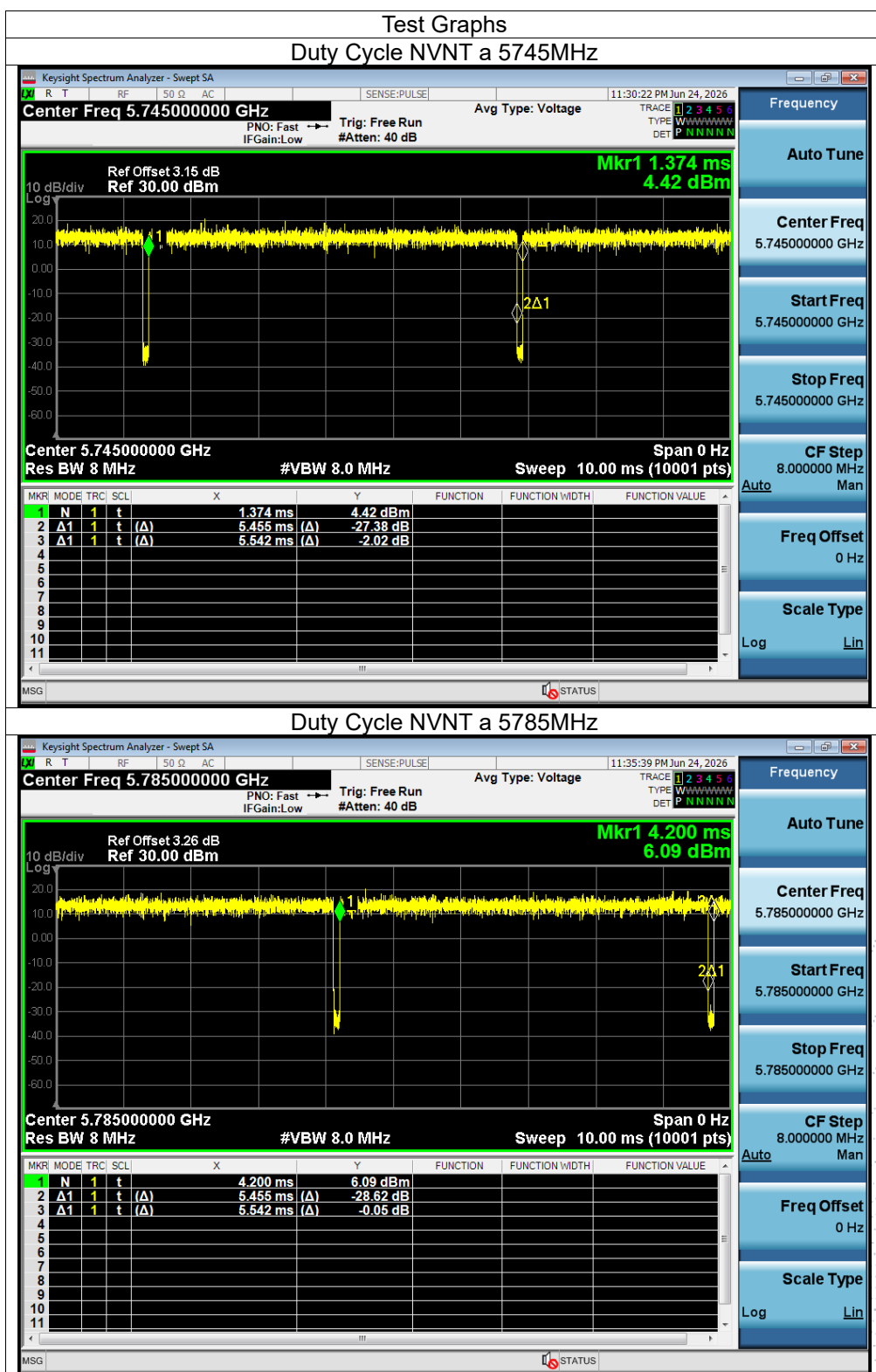
1. Set span = Zero
2. RBW = 8MHz
3. VBW = 8MHz,
4. Detector = Peak

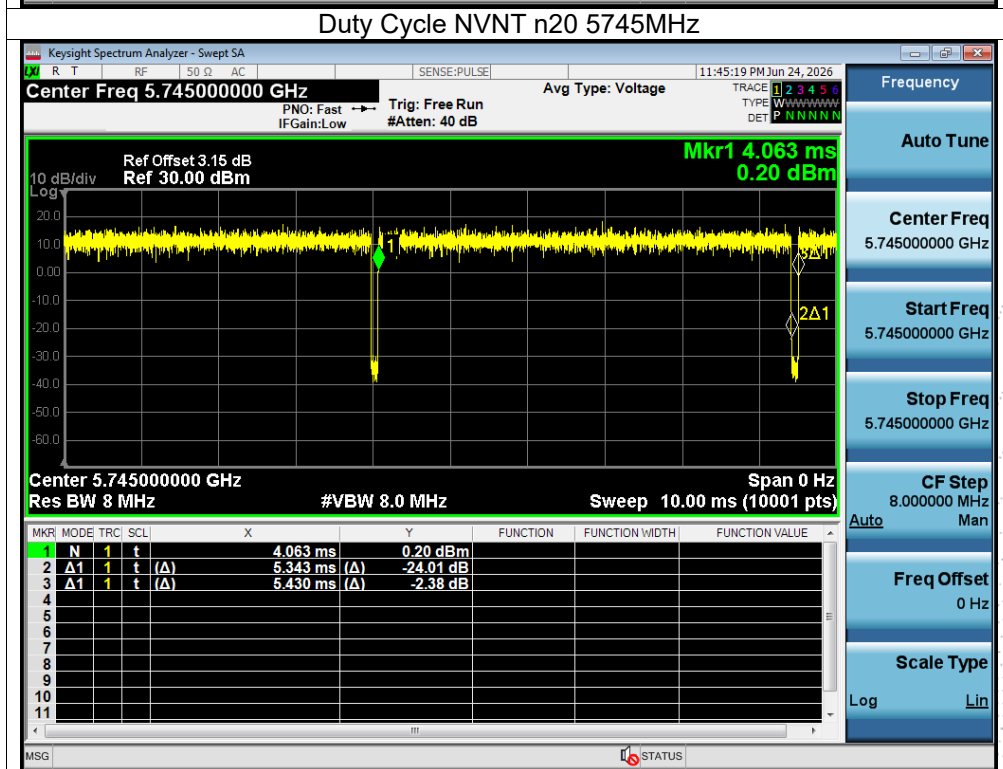
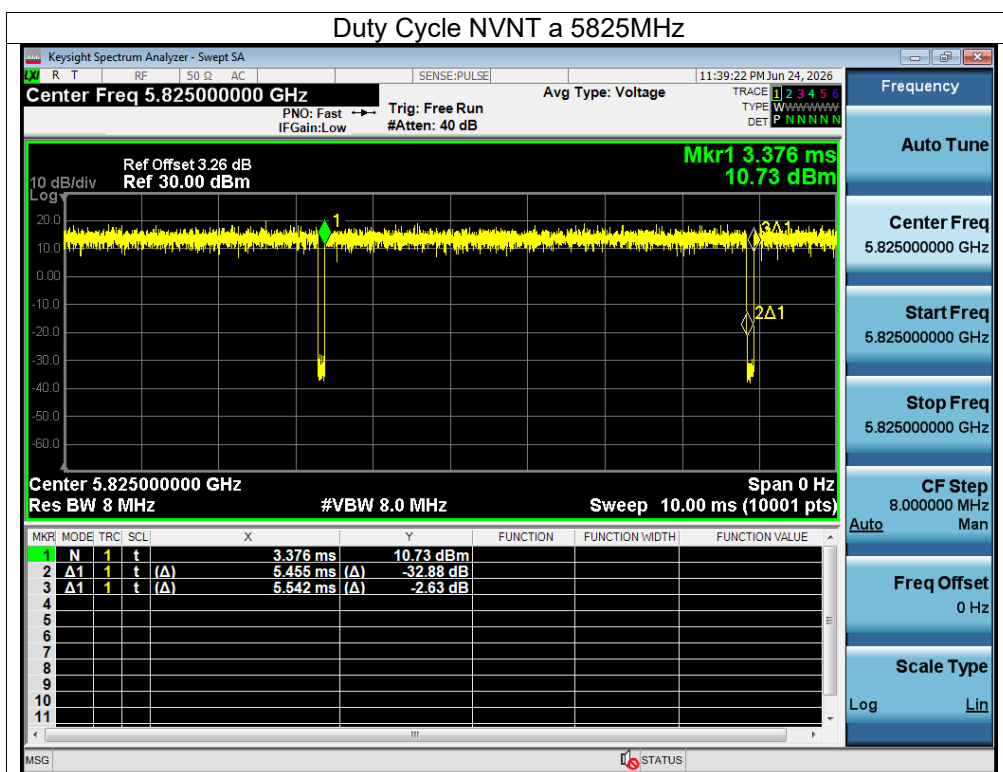
13.4 Test Result

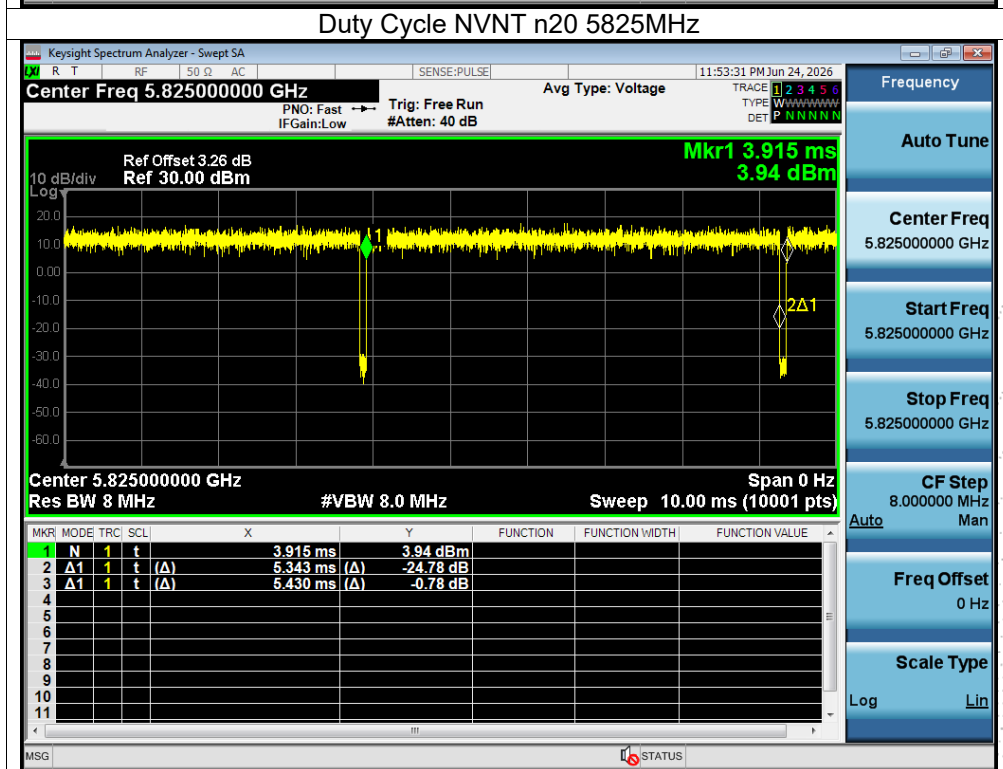
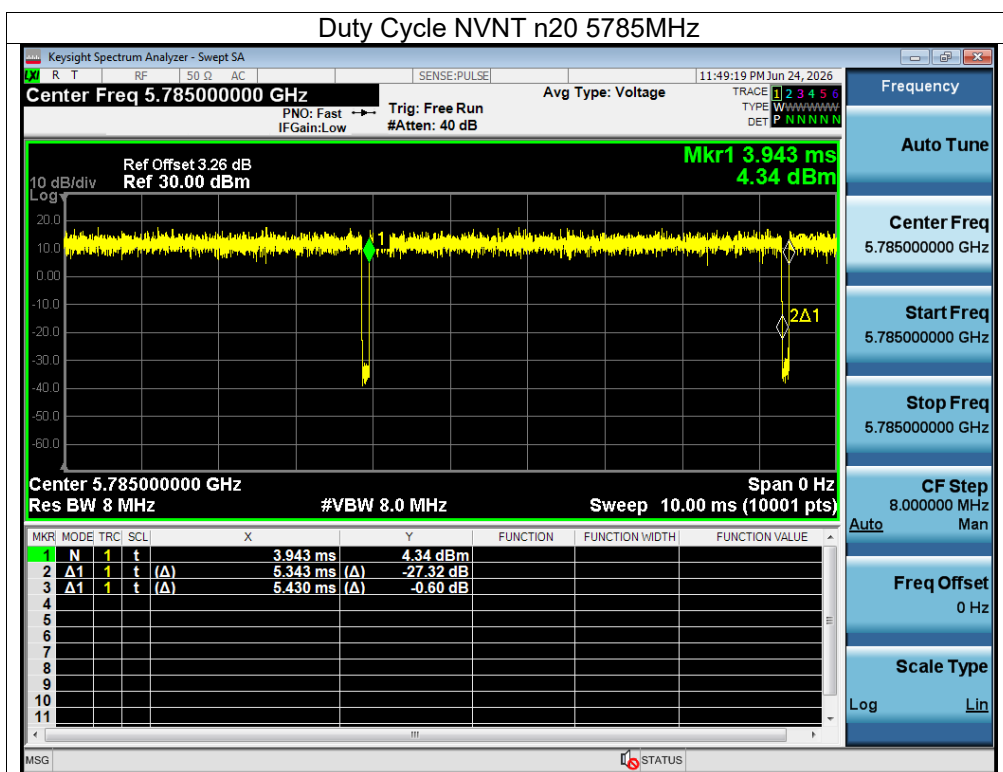
Condition	Mode	Frequency (MHz)	Duty Cycle (%RH)	Correction Factor (dB)
NVNT	a	5180	98.41	0.07
NVNT	a	5200	98.43	0.07
NVNT	a	5240	98.43	0.07
NVNT	n20	5180	98.40	0.07
NVNT	n20	5200	98.40	0.07
NVNT	n20	5240	98.40	0.07
NVNT	n40	5190	96.35	0.16
NVNT	n40	5230	96.18	0.17
NVNT	ac20	5180	98.40	0.07
NVNT	ac20	5200	98.38	0.07
NVNT	ac20	5240	98.40	0.07
NVNT	ac40	5190	96.51	0.15
NVNT	ac40	5230	96.35	0.16
NVNT	ax20	5180	86.59	0.63
NVNT	ax20	5200	86.55	0.63
NVNT	ax20	5240	86.71	0.62
NVNT	ax40	5190	99.96	0.00
NVNT	ax40	5230	86.56	0.63

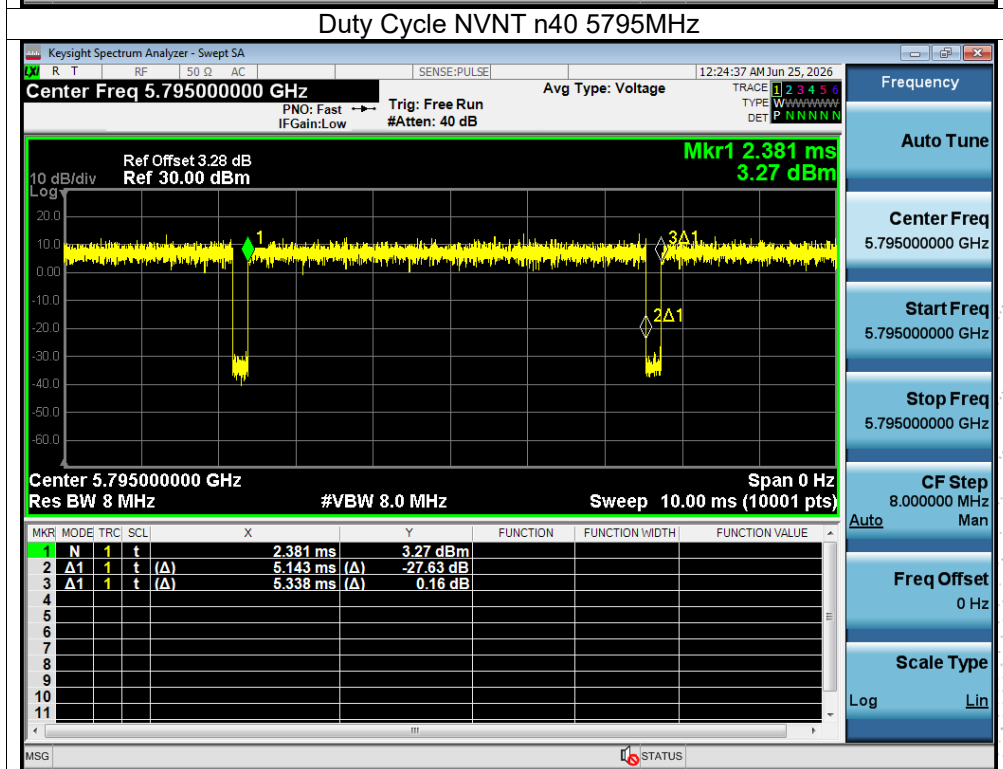
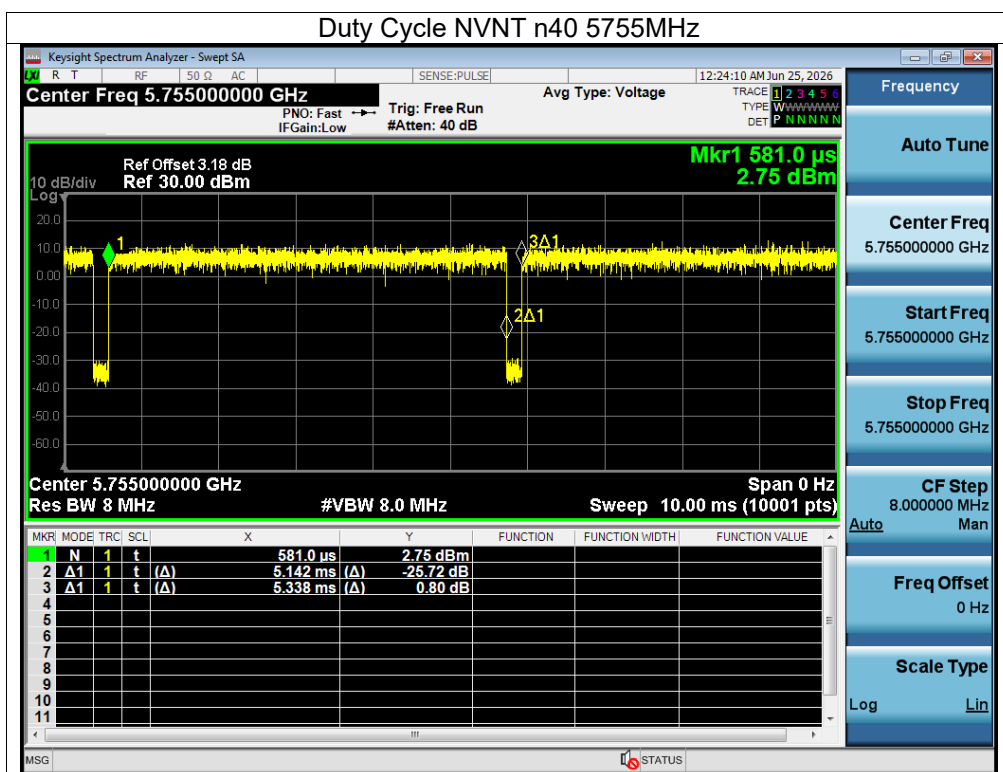
Condition	Mode	Frequency (MHz)	Duty Cycle (%RH)	Correction Factor (dB)
NVNT	a	5745	98.43	0.07
NVNT	a	5785	98.43	0.07
NVNT	a	5825	98.43	0.07
NVNT	n20	5745	98.4	0.07
NVNT	n20	5785	98.4	0.07
NVNT	n20	5825	98.4	0.07
NVNT	n40	5755	96.33	0.16
NVNT	n40	5795	96.35	0.16
NVNT	ac20	5745	98.4	0.07
NVNT	ac20	5785	98.64	0.06
NVNT	ac20	5825	98.4	0.07
NVNT	ac40	5755	96.49	0.16
NVNT	ac40	5795	96.33	0.16
NVNT	ax20	5745	86.71	0.62
NVNT	ax20	5785	86.59	0.63
NVNT	ax20	5825	86.73	0.62
NVNT	ax40	5755	86.56	0.63
NVNT	ax40	5795	86.23	0.64



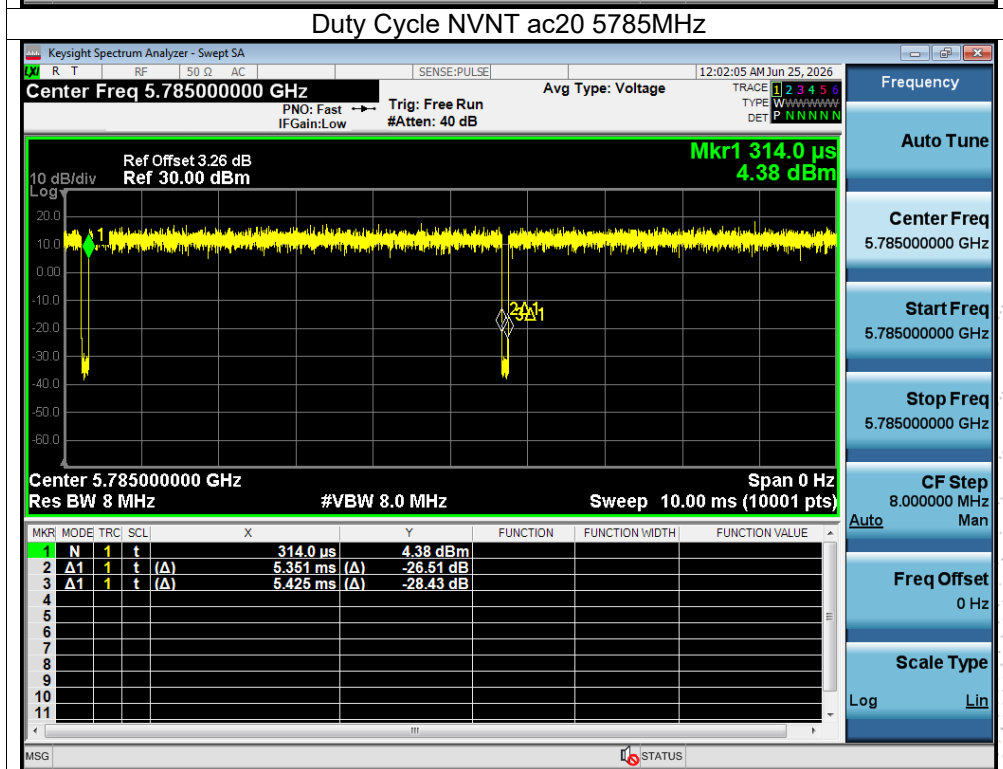
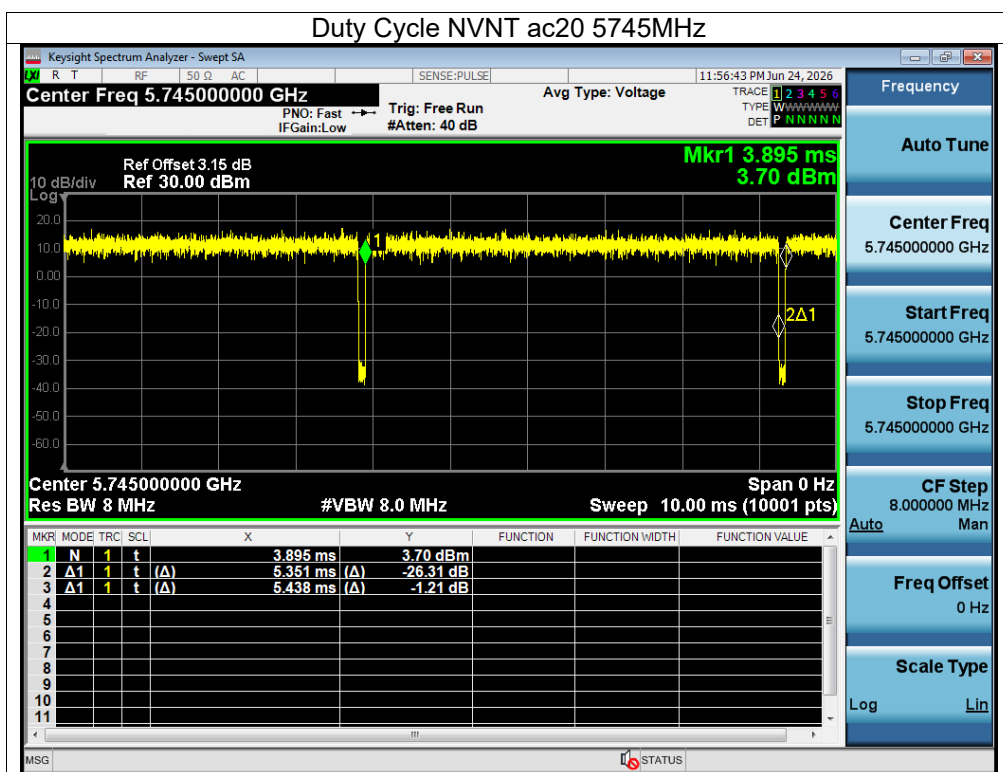


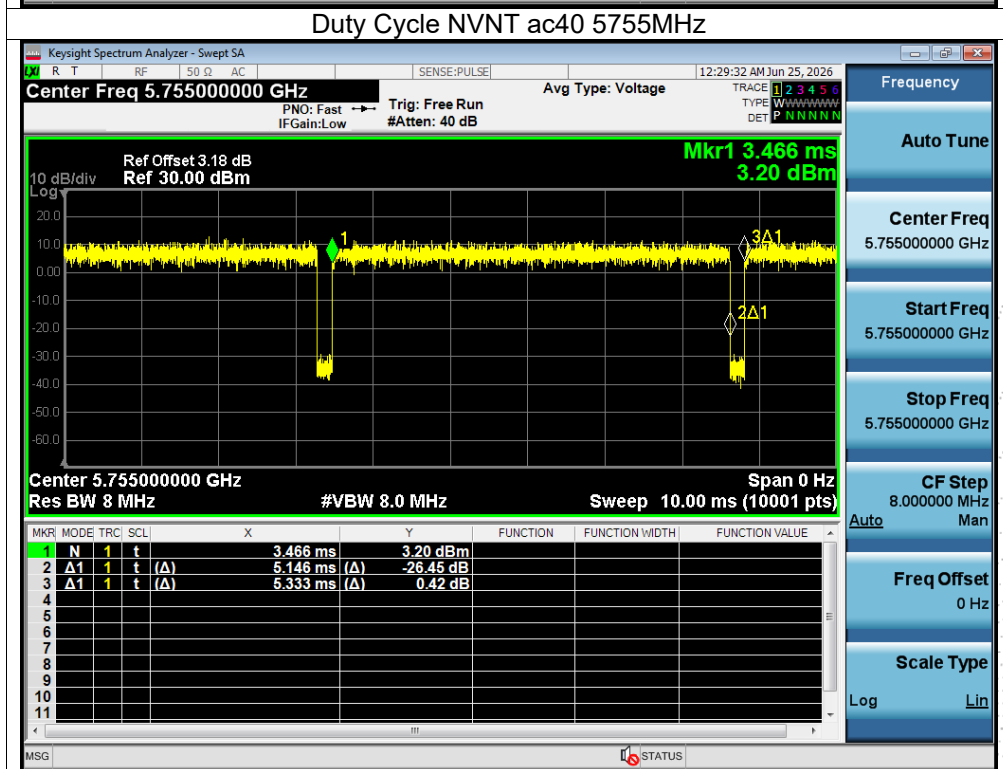
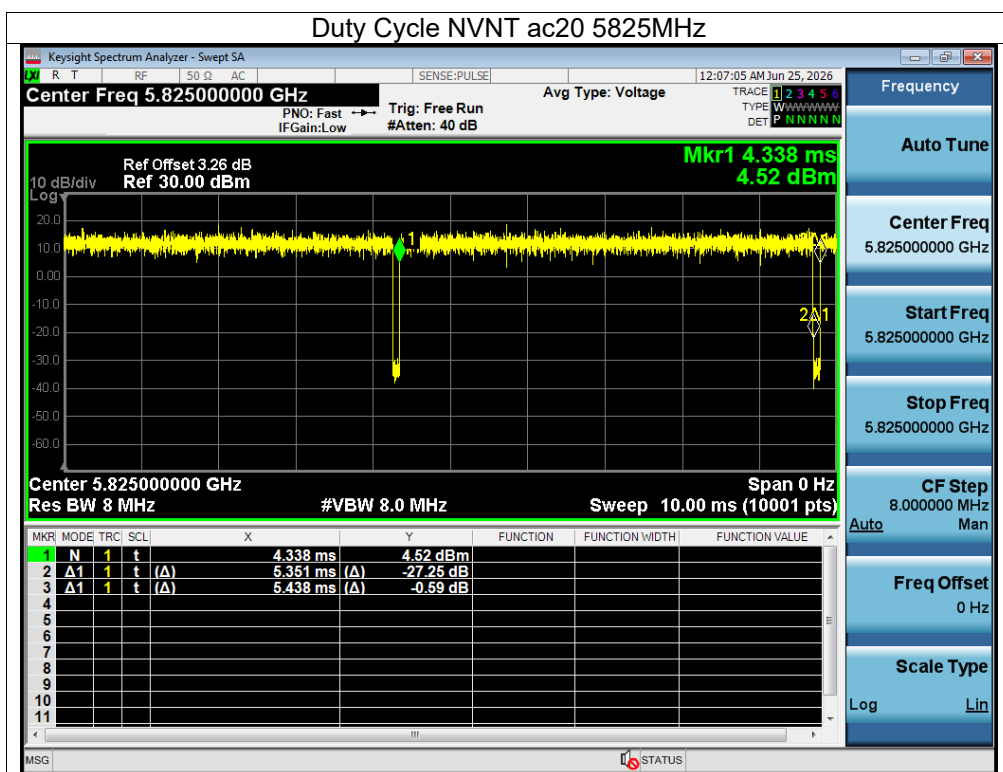


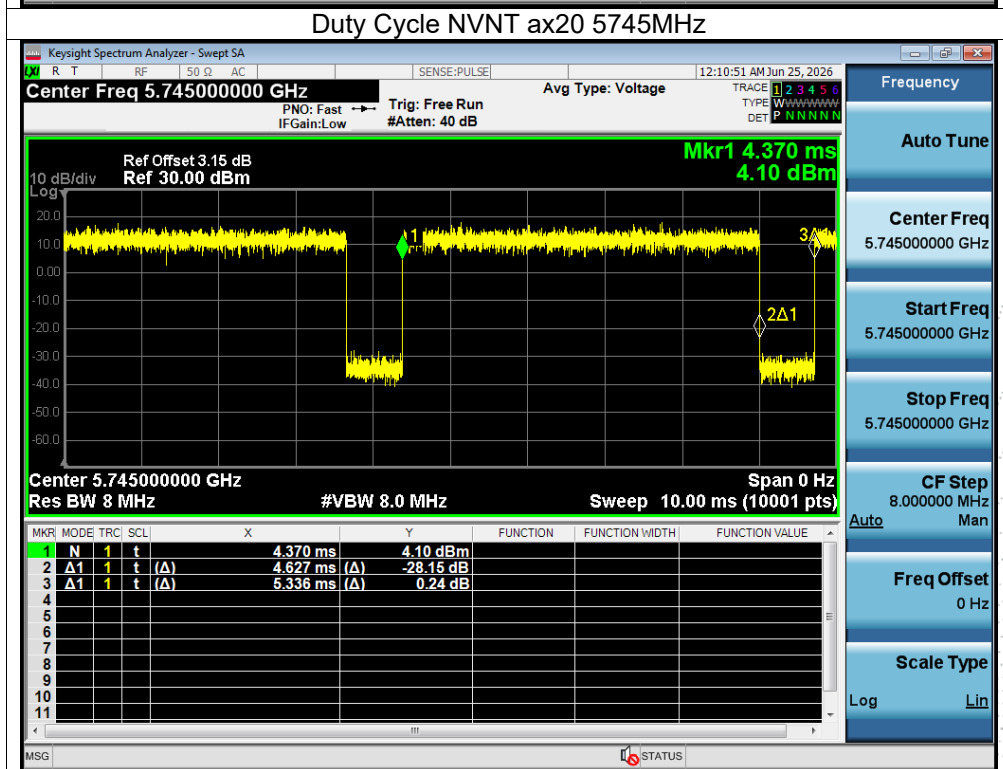
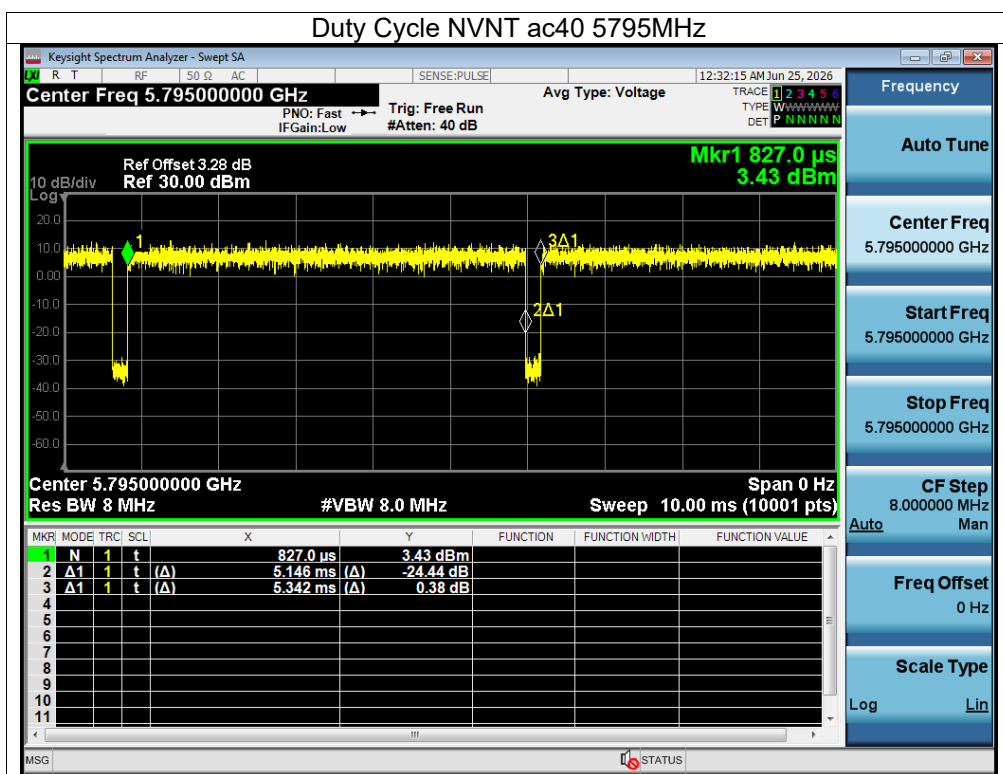


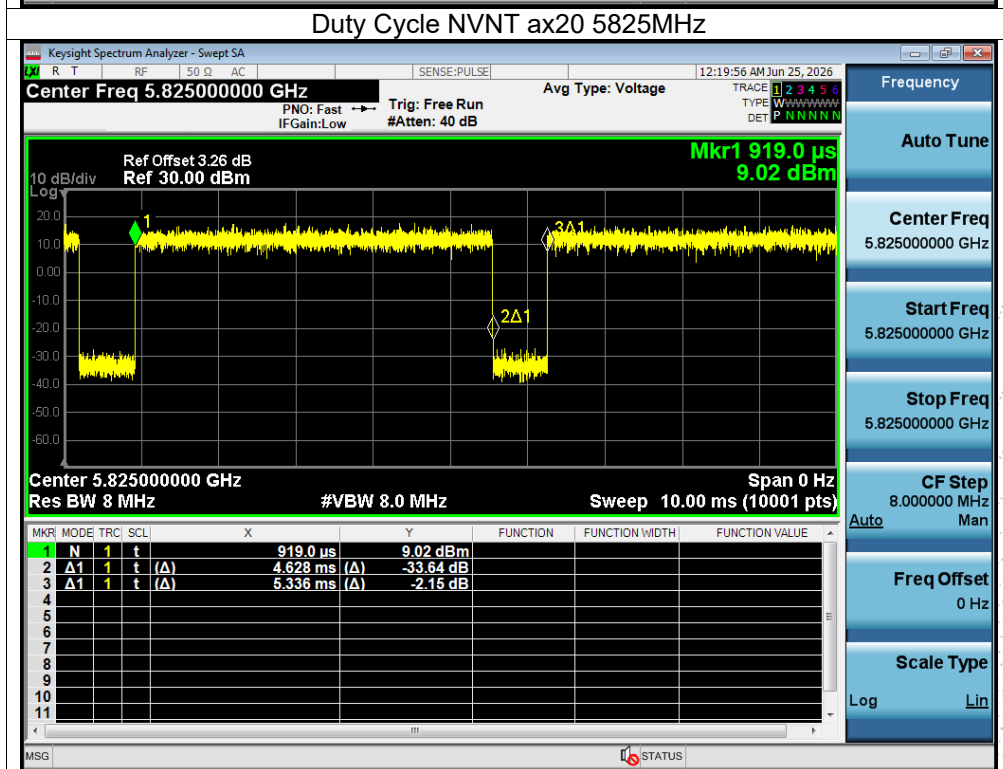
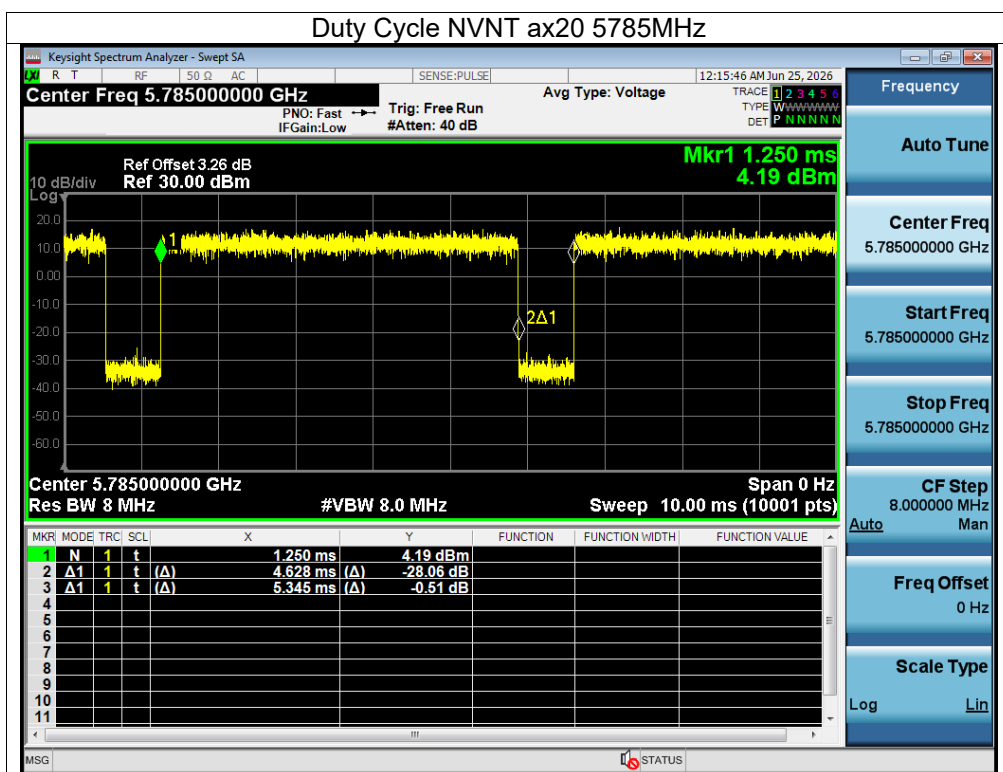


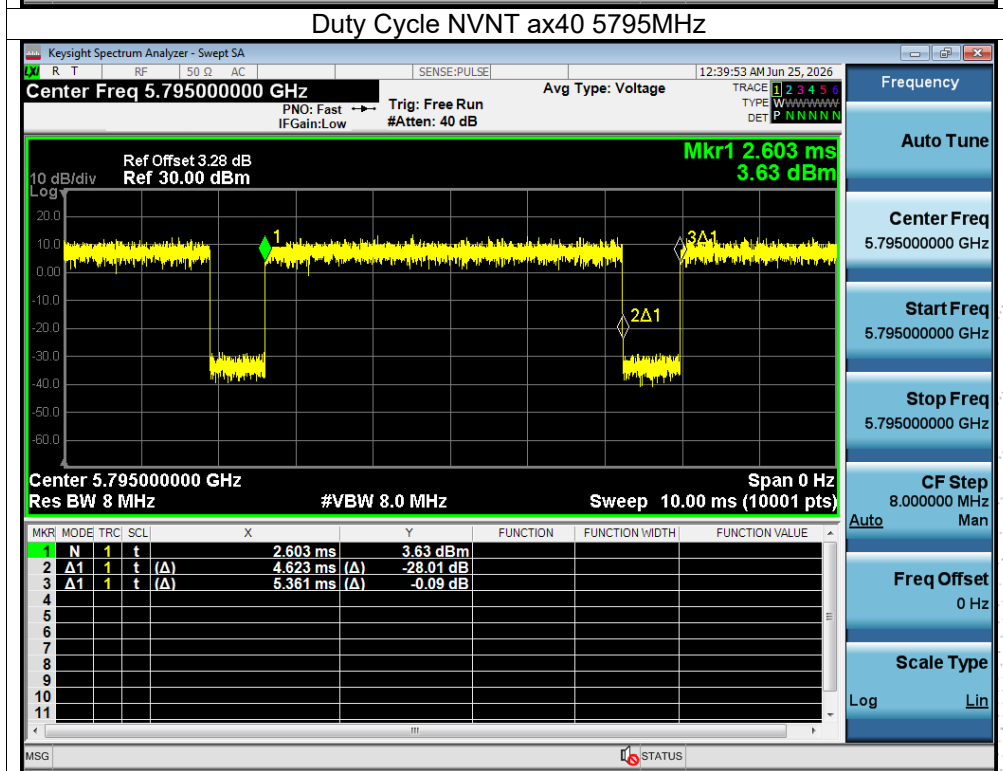
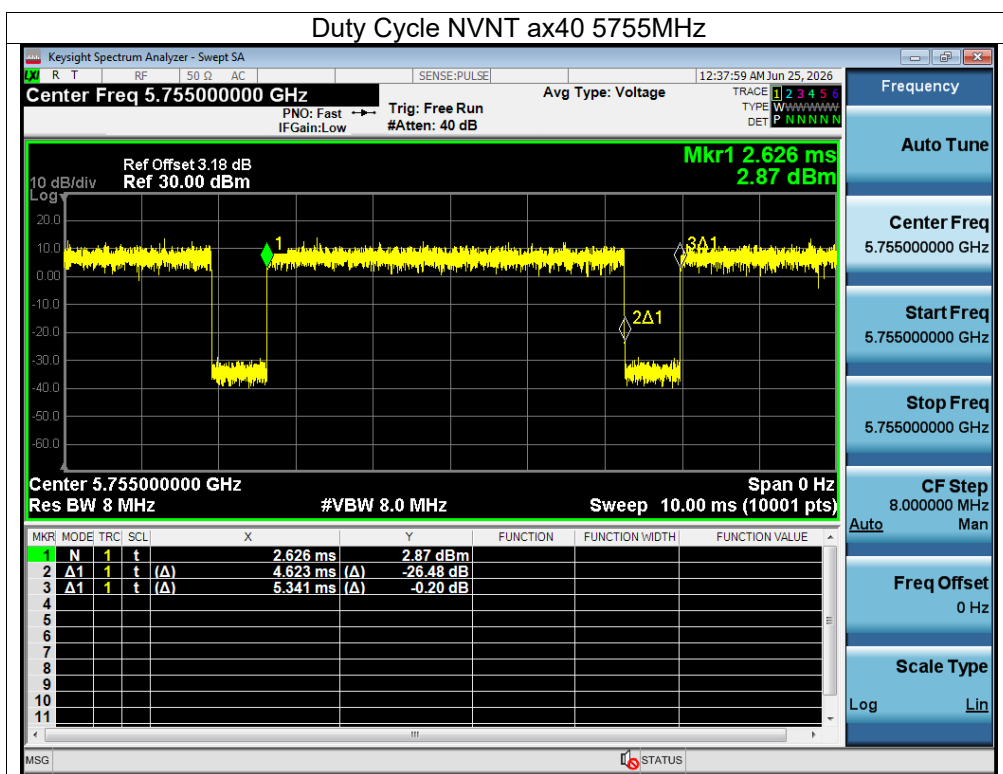
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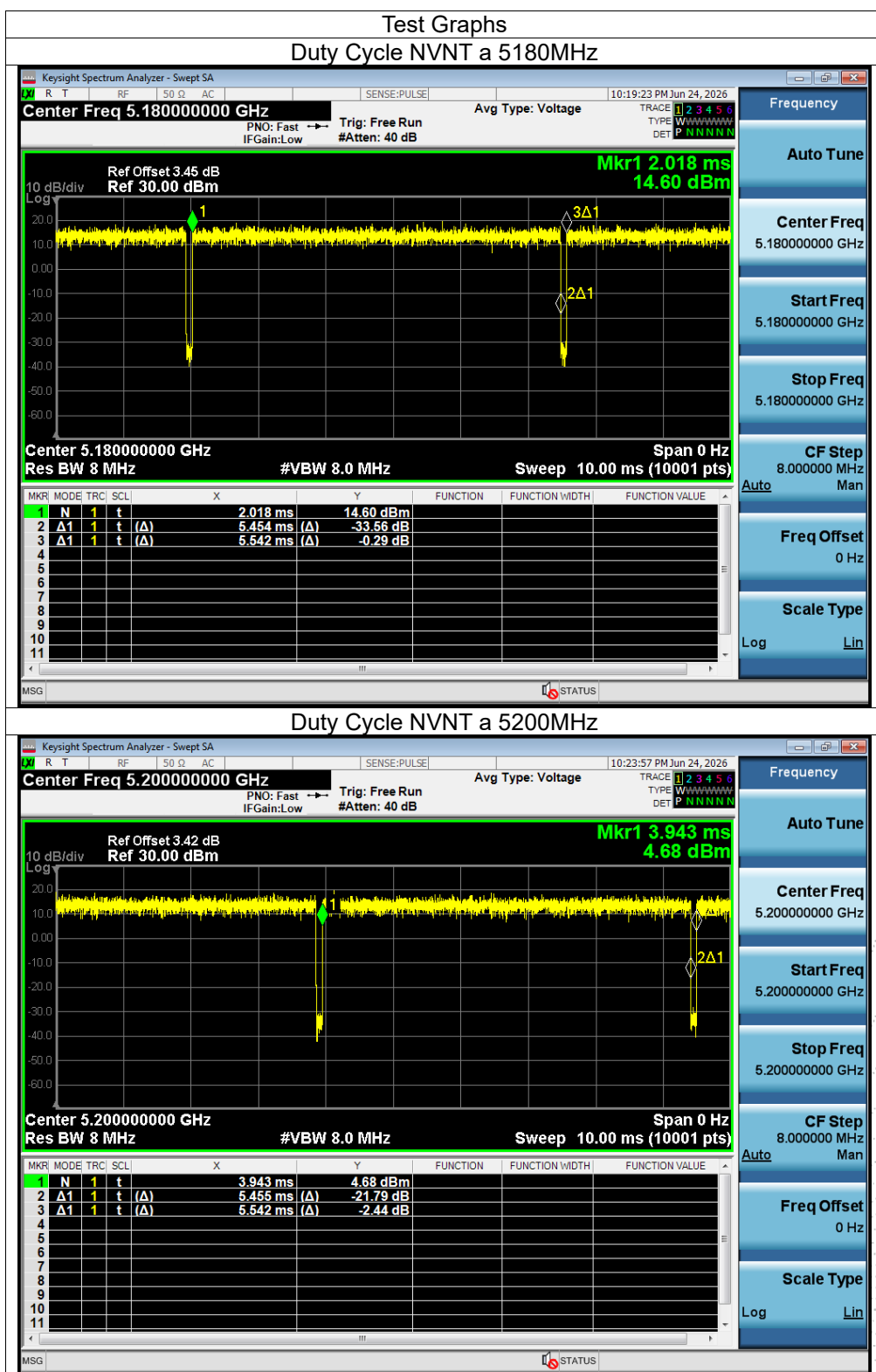




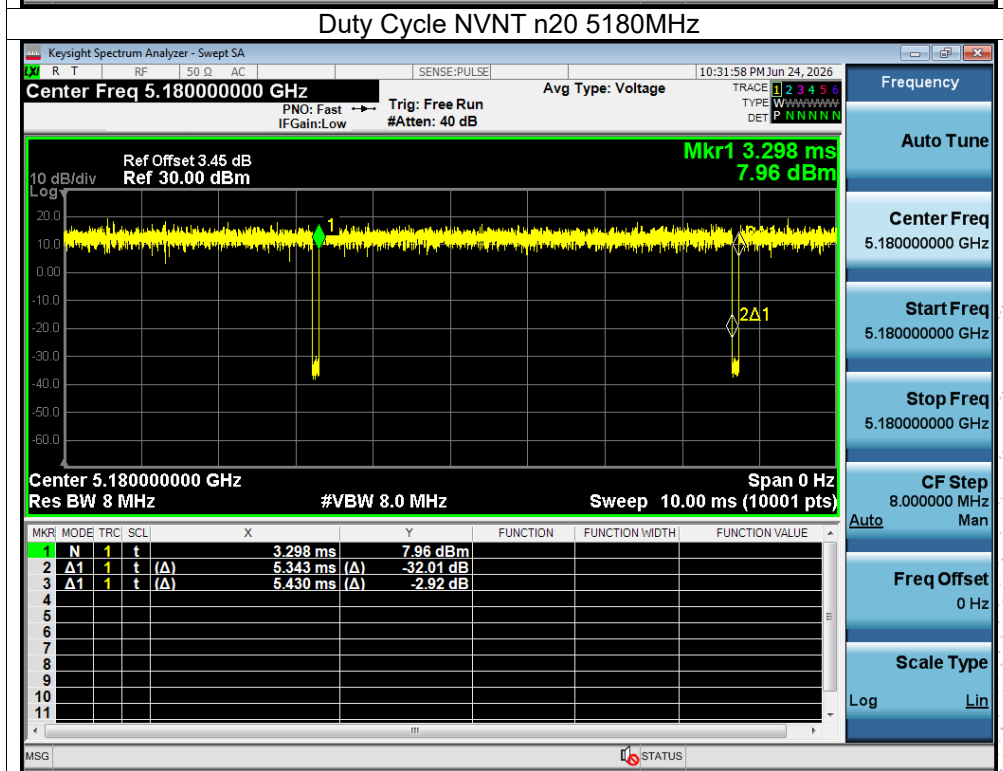
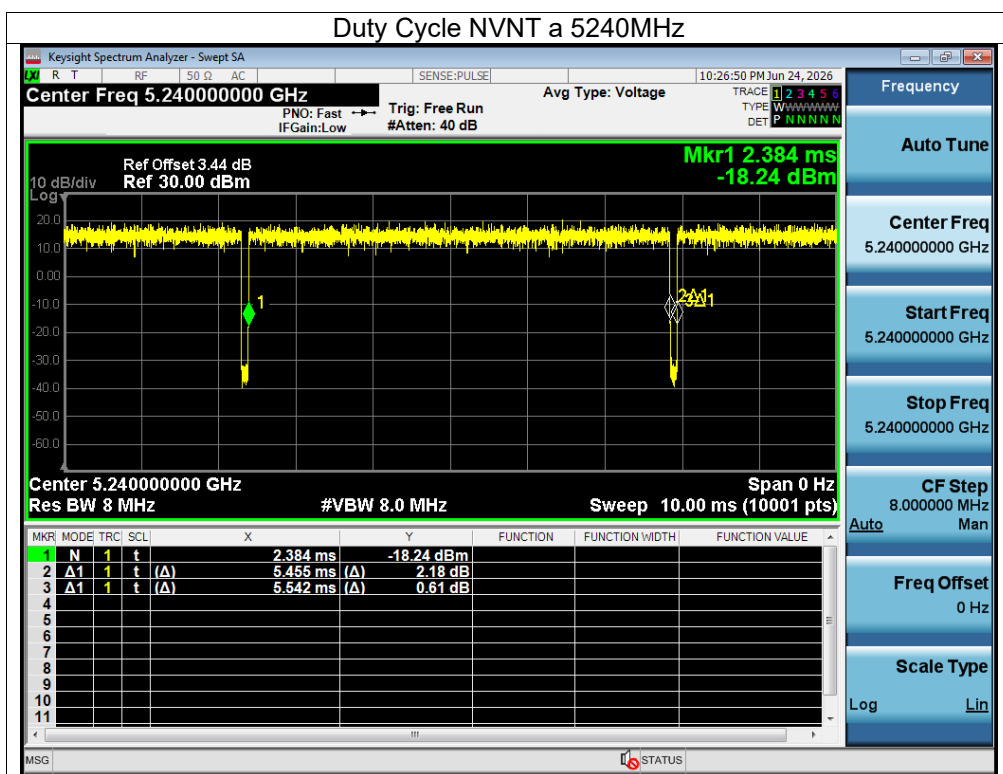


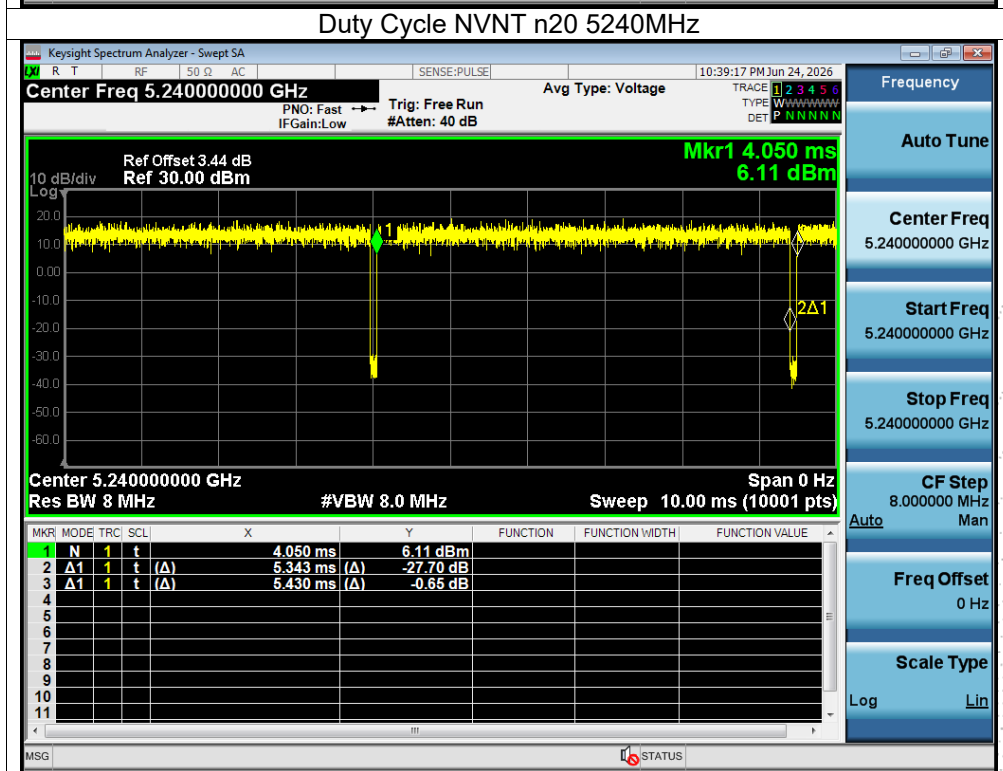
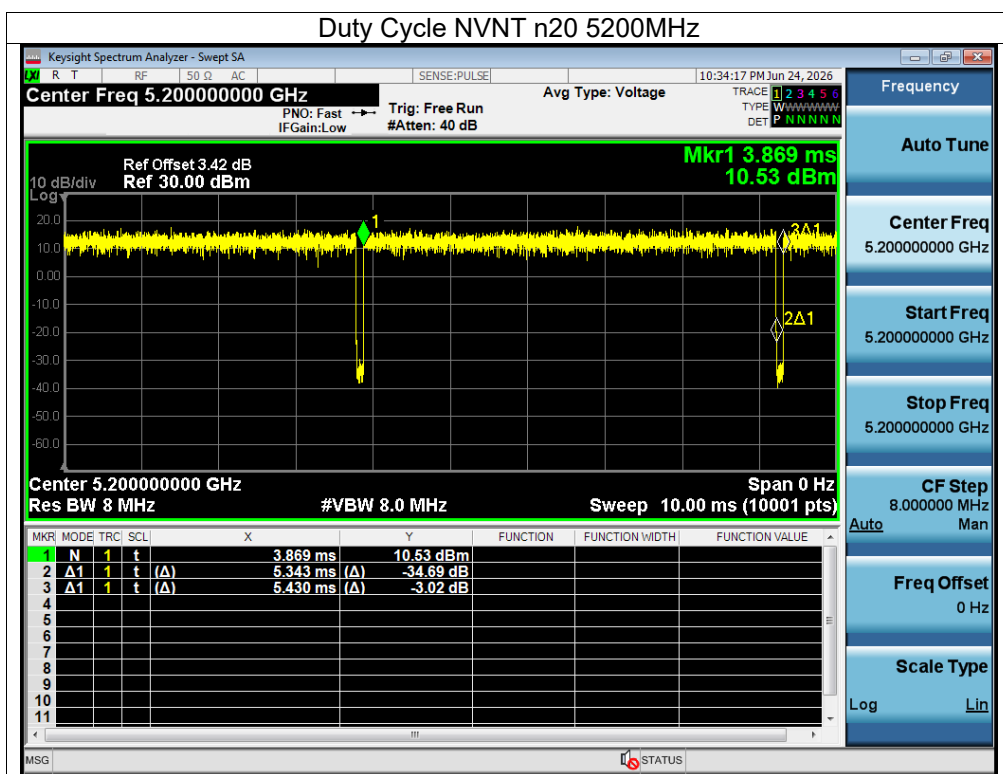


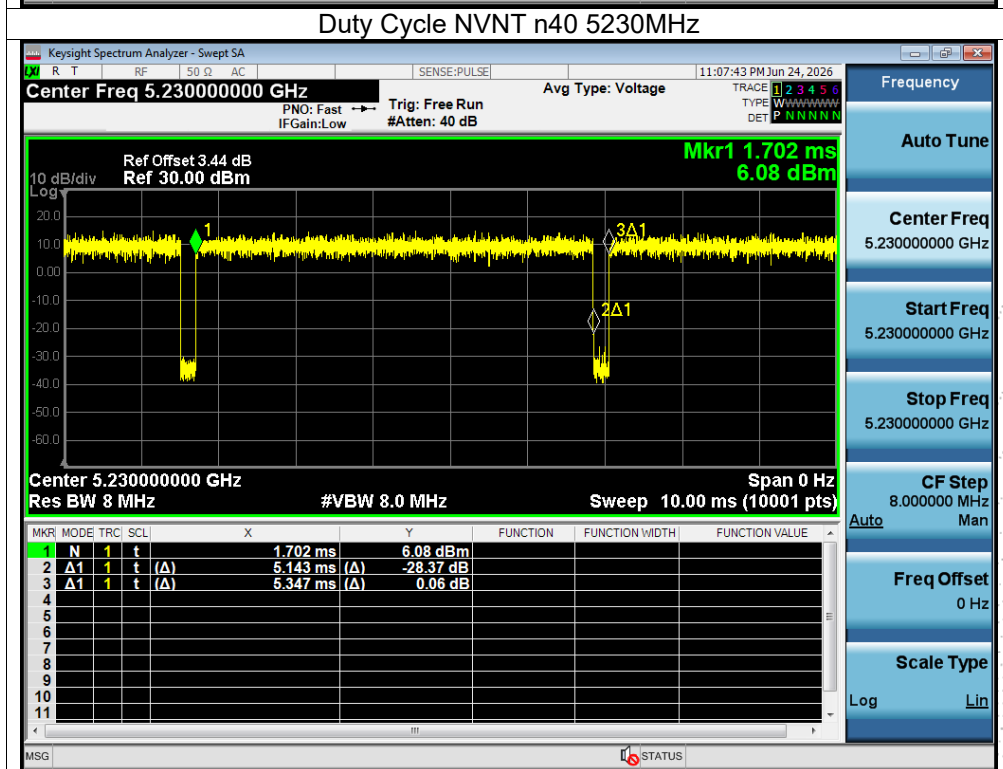
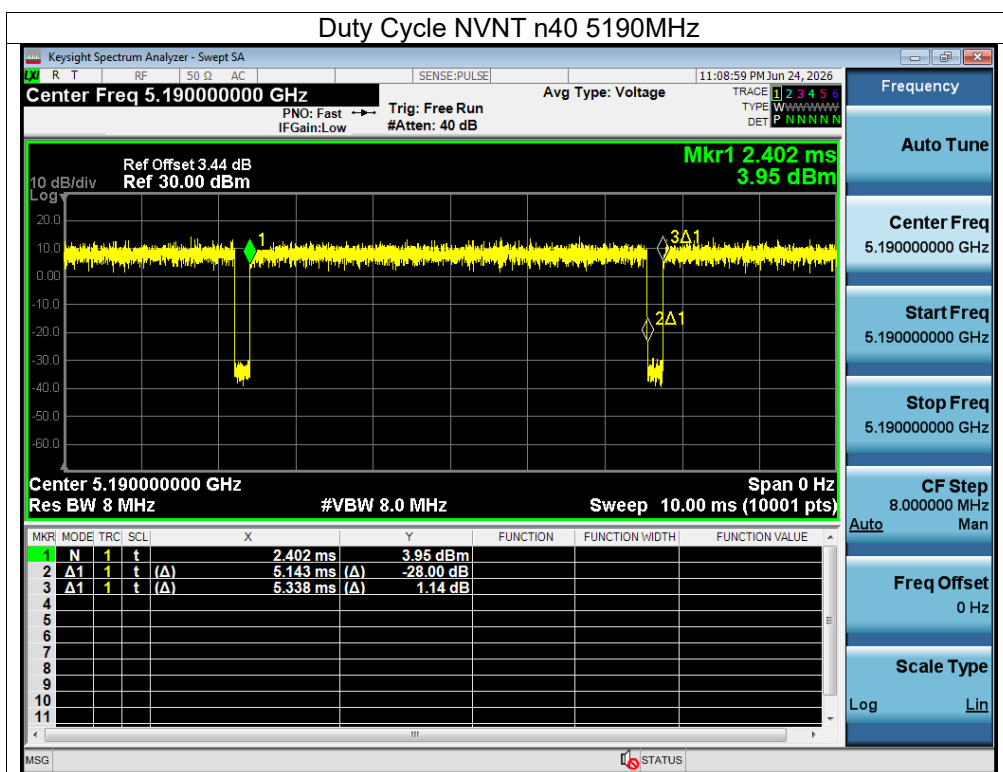


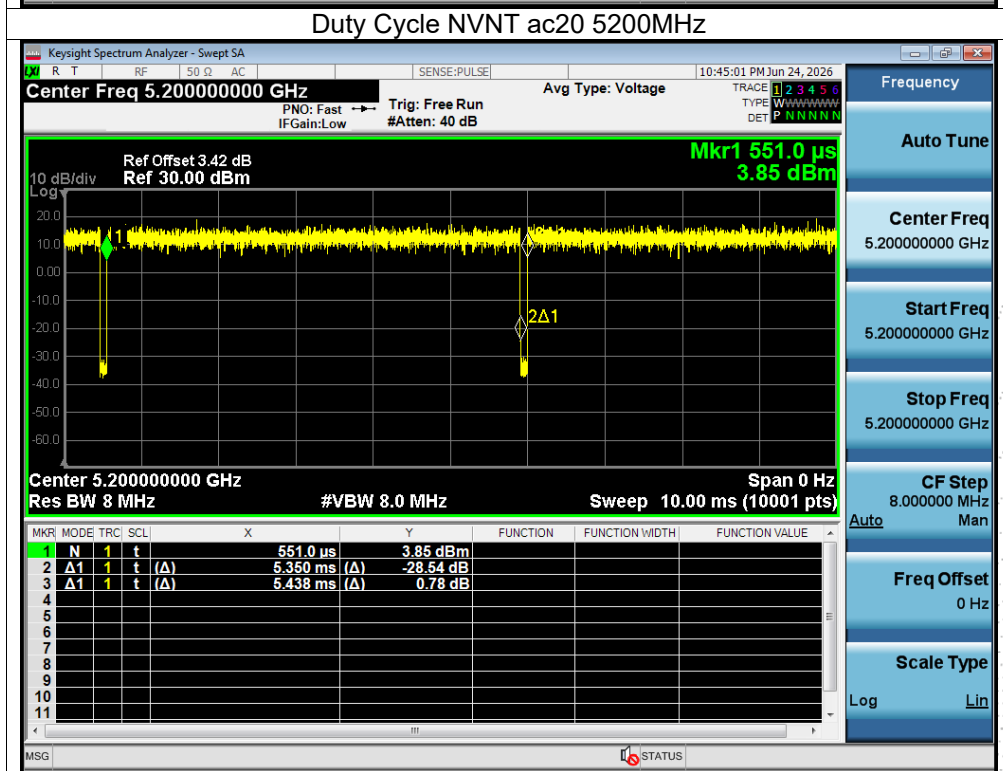
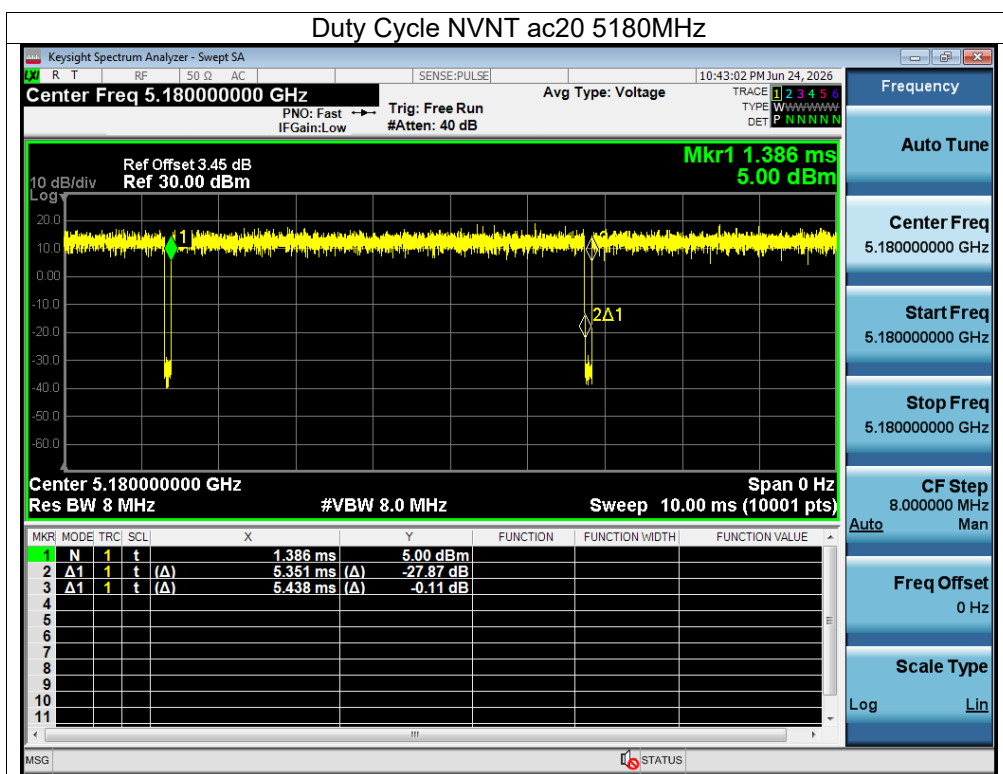


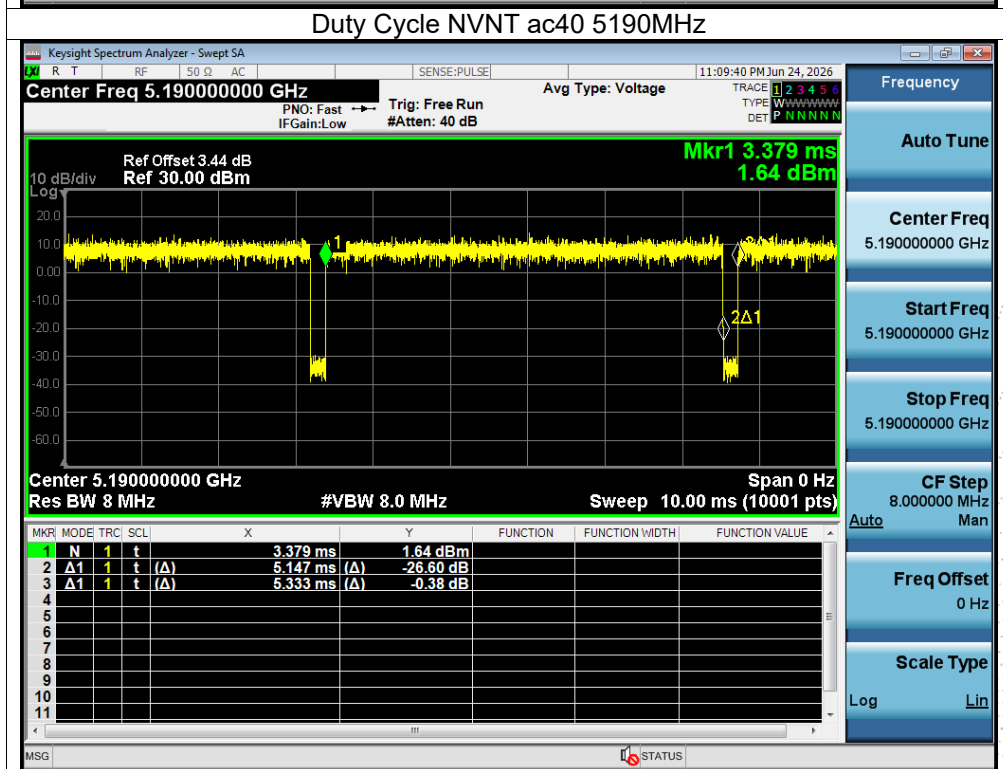
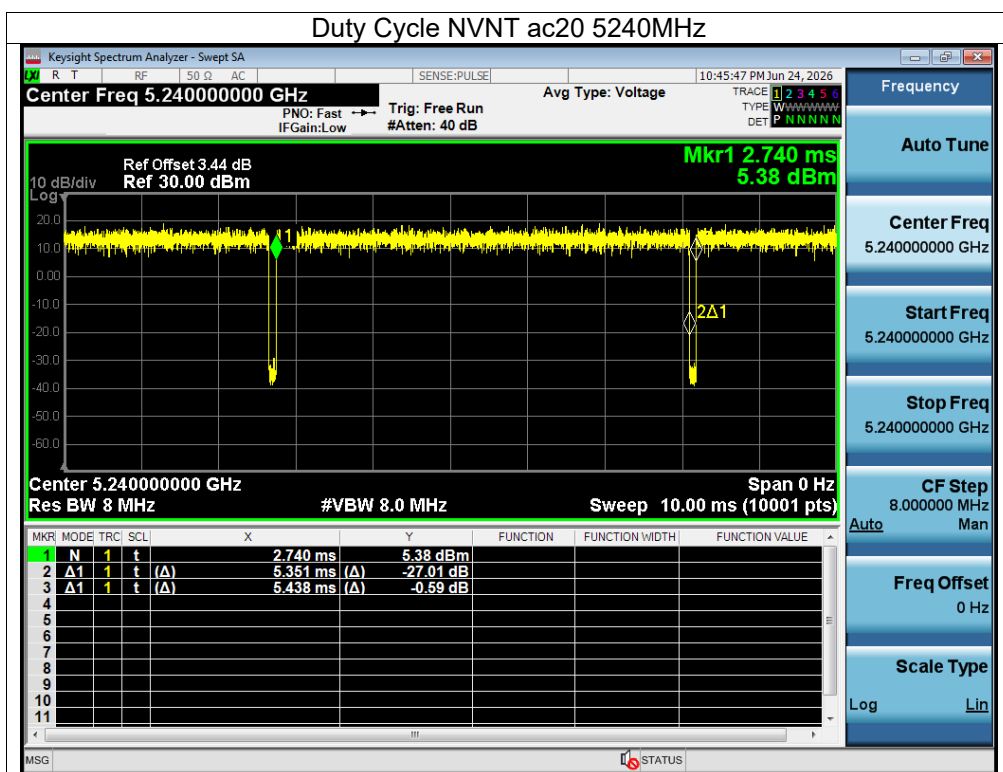
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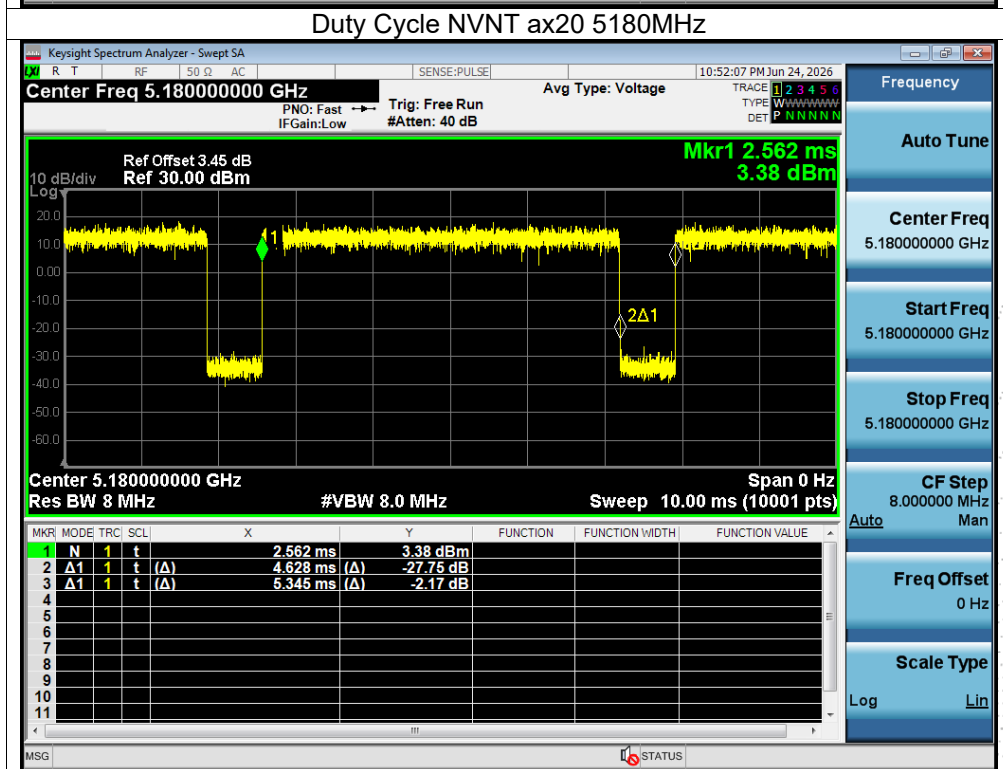
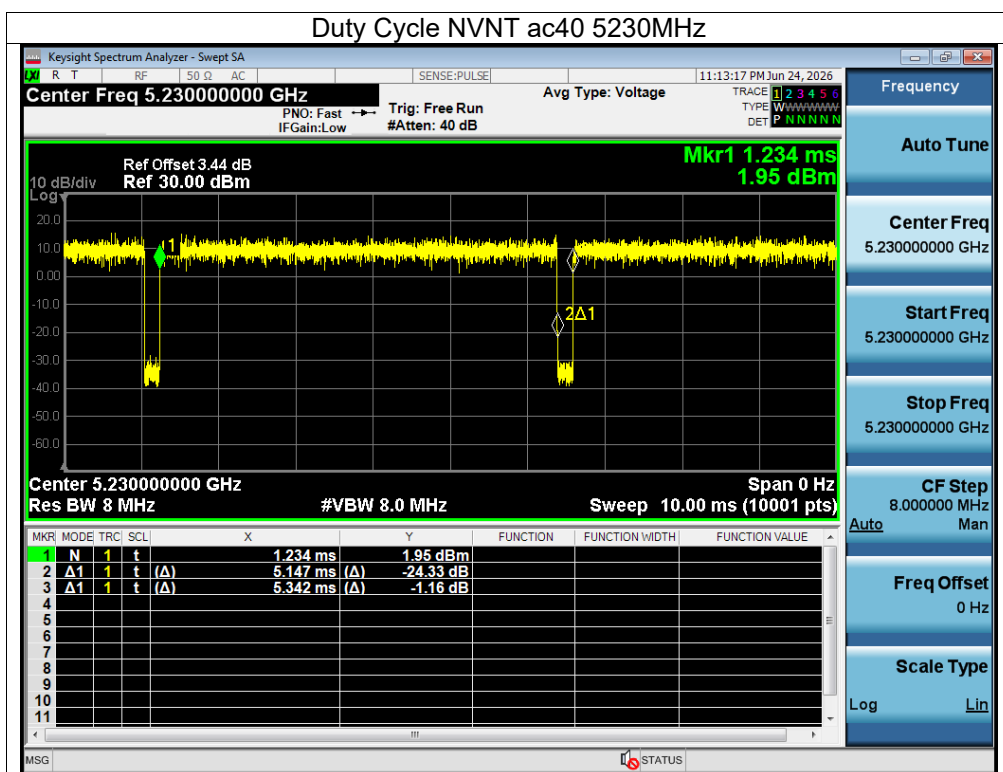




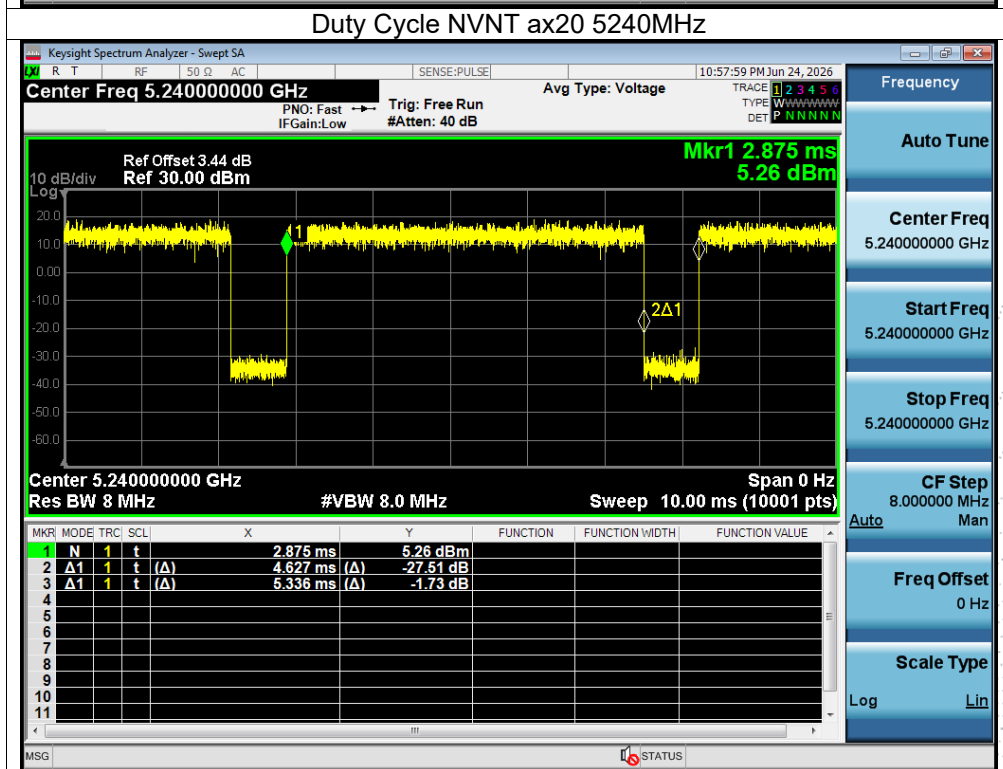
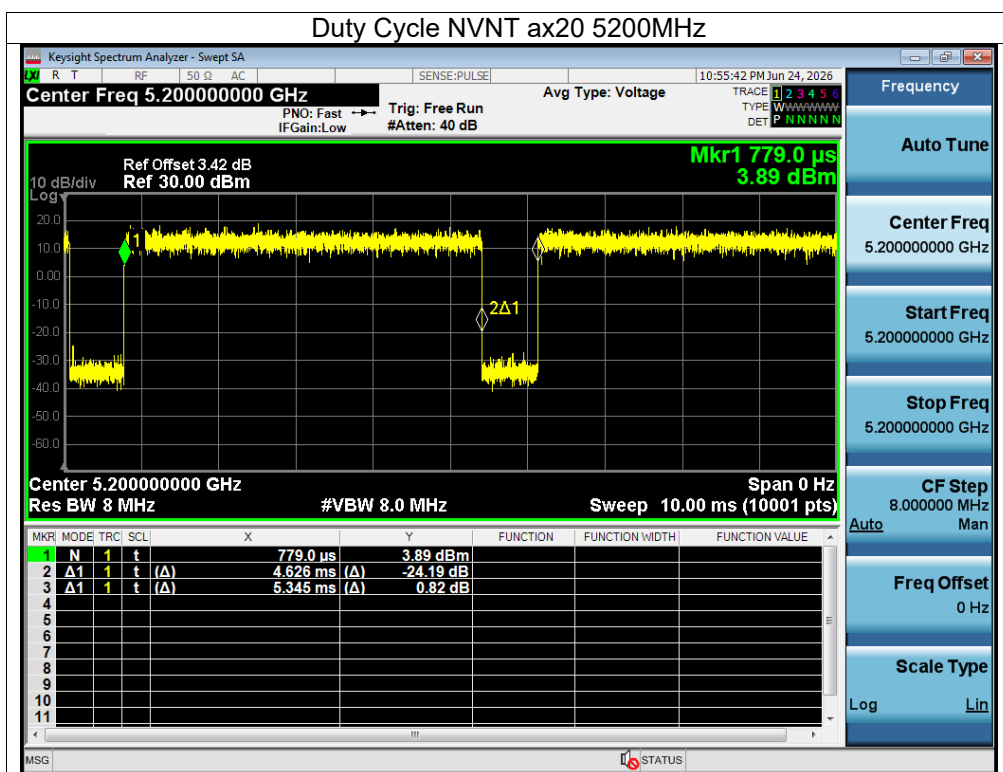


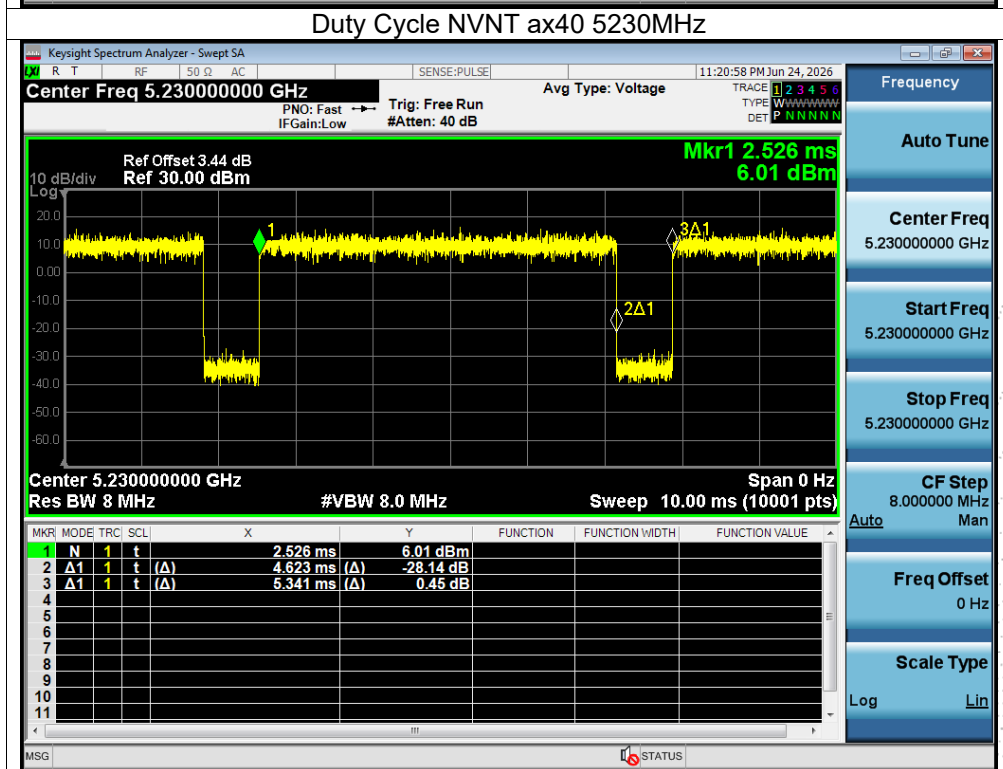
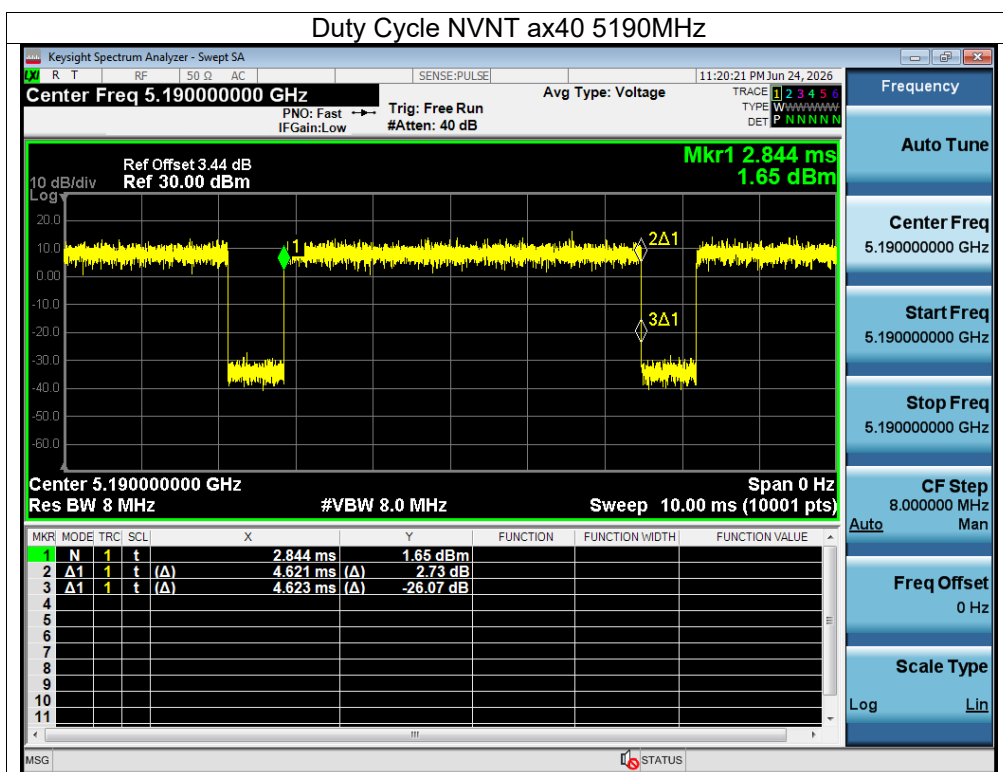






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14. Antenna Requirement

14.1 Limit

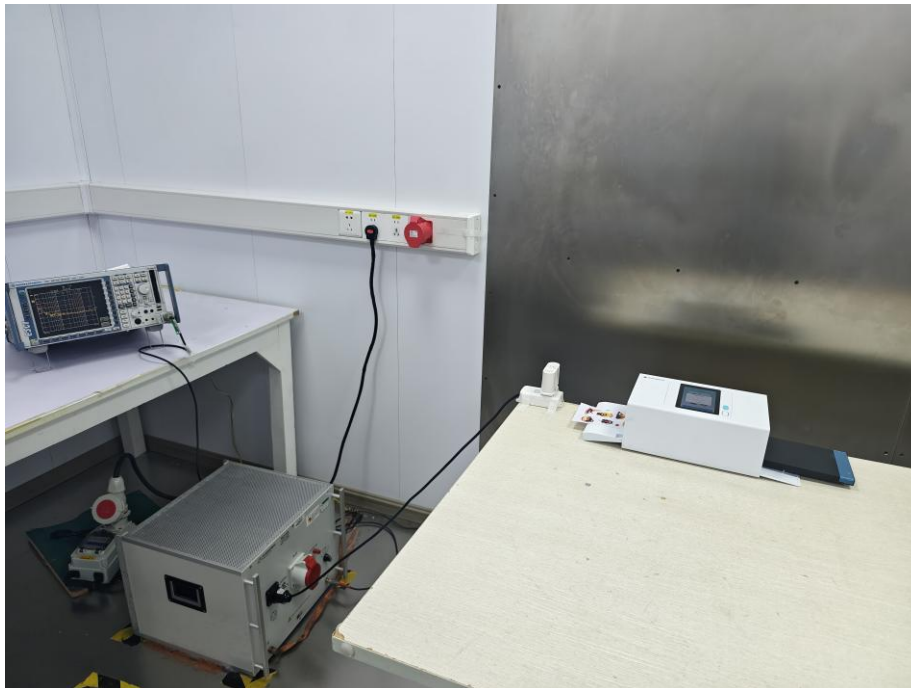
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply 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.

14.2 Test Result

The antenna to be tested on the equipment is a built-in antenna, and it uses a FPC antenna. This fully complies with the requirements of this section.

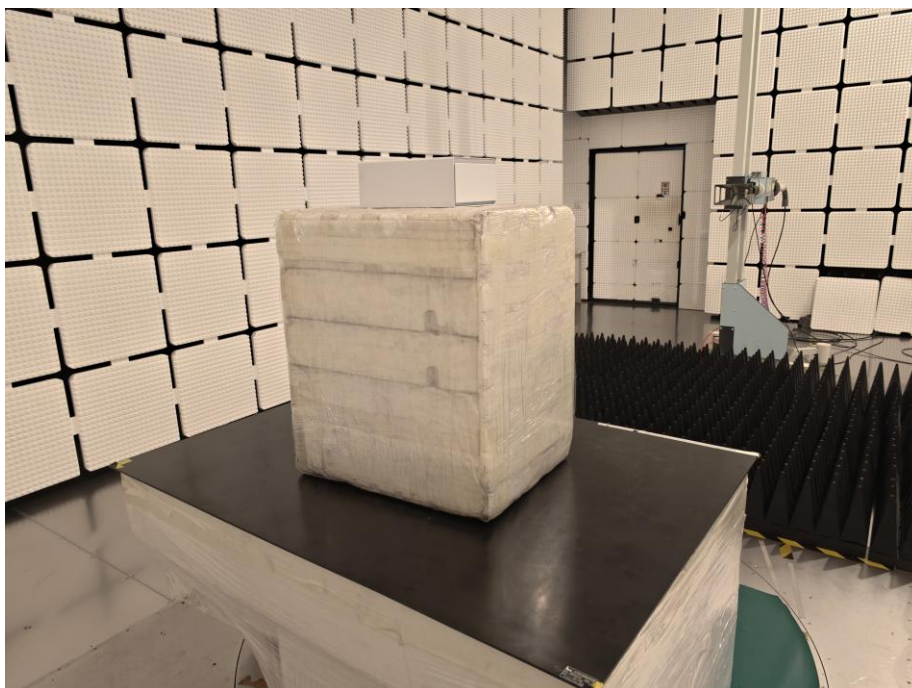
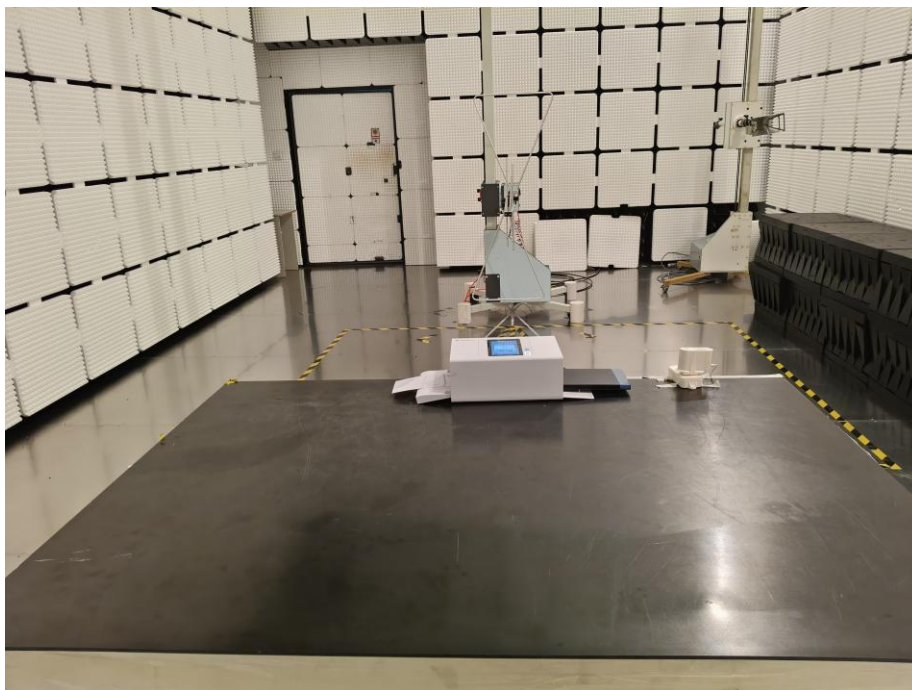
15. EUT Test Setup Photographs

Conducted Emission Measurement Photos



TECHNICAL
STANDARD
OVERVIEW
t se

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.

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

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

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

***** END *****