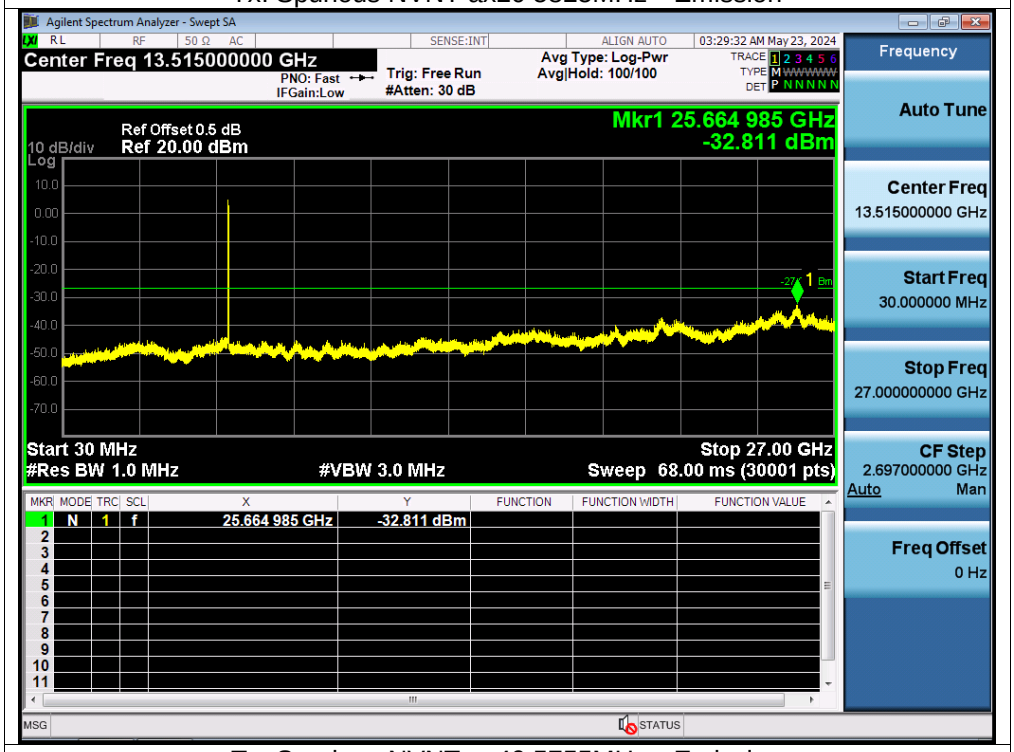
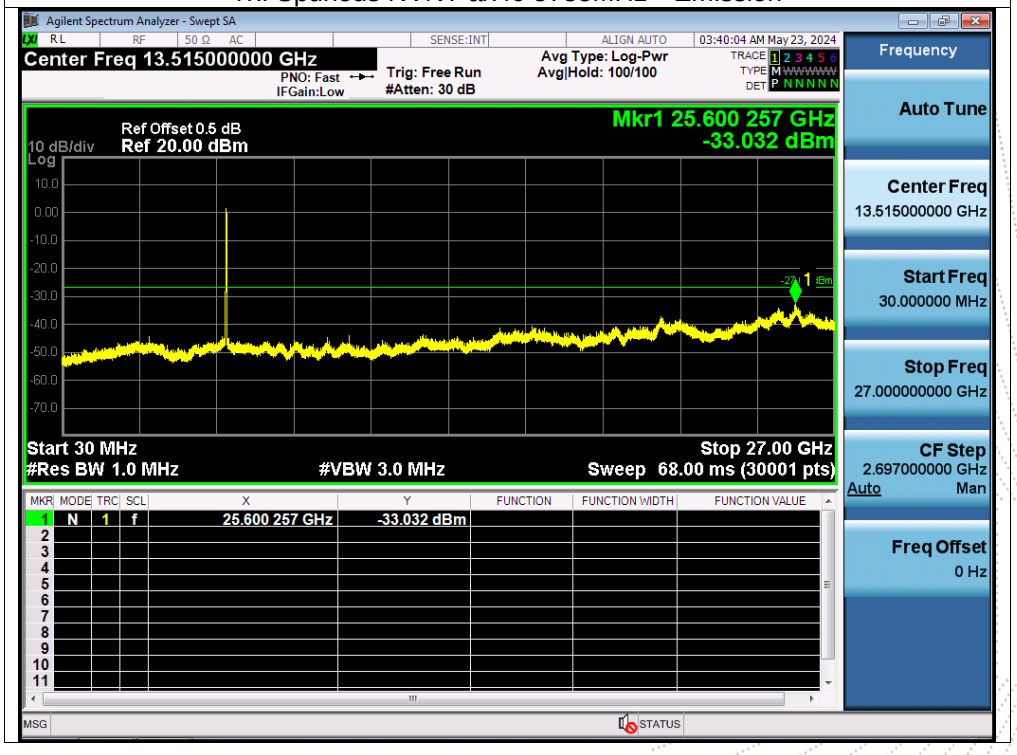
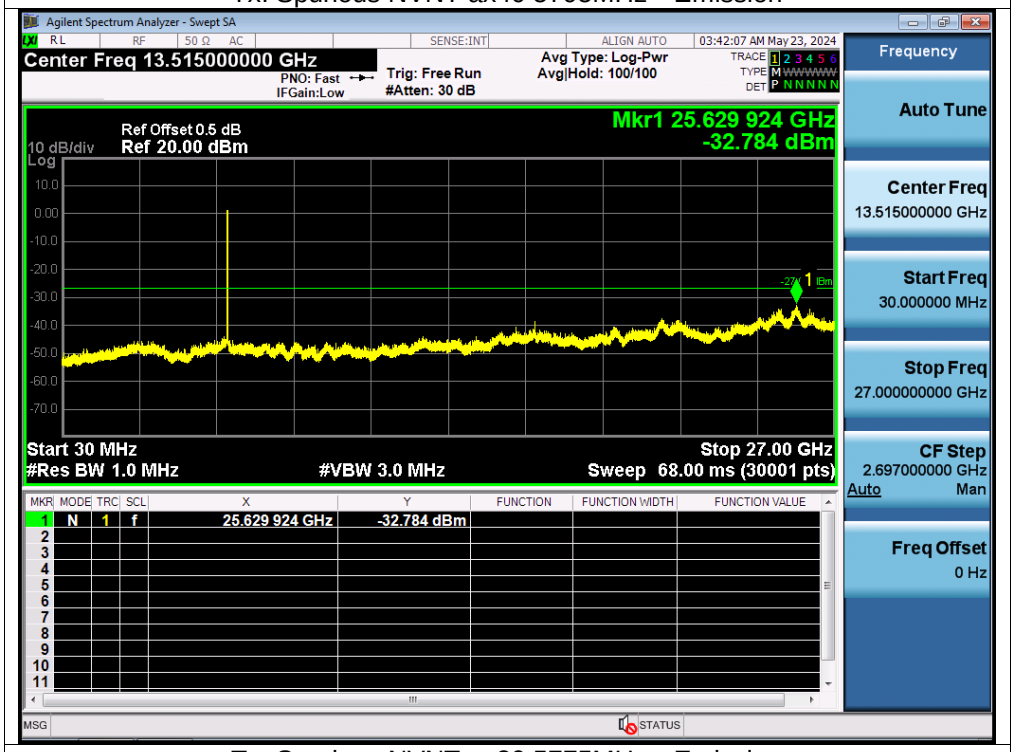
Tx. Spurious NVNT ax20 5825MHz Emission



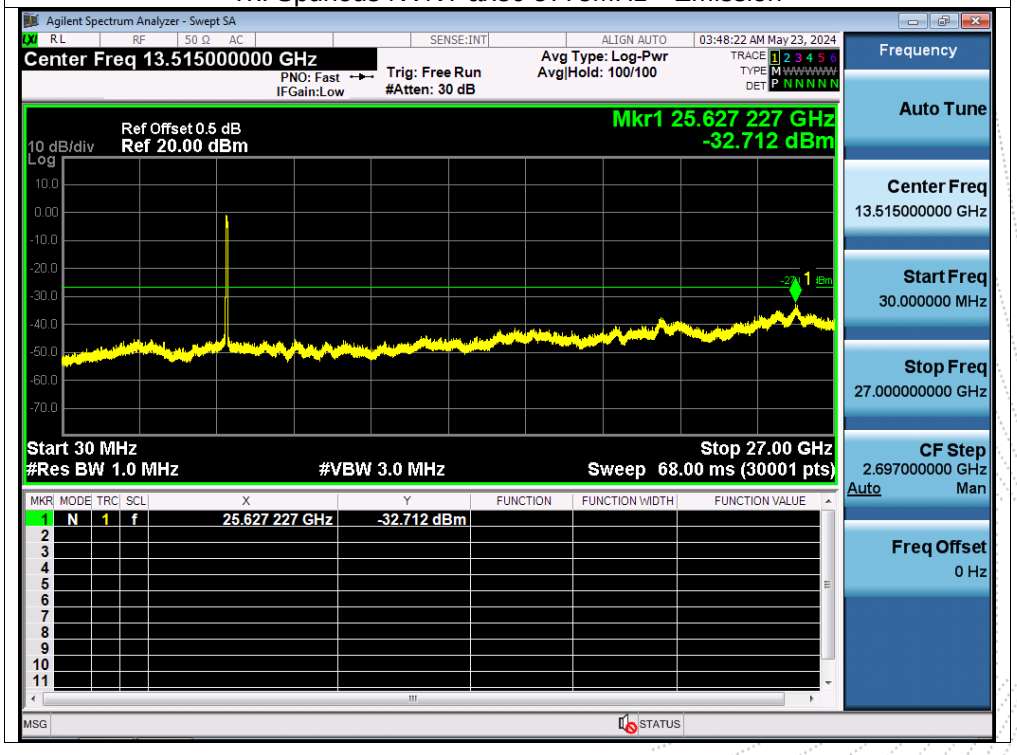
Tx. Spurious NVNT ax40 5755MHz Emission



Tx. Spurious NVNT ax40 5795MHz Emission

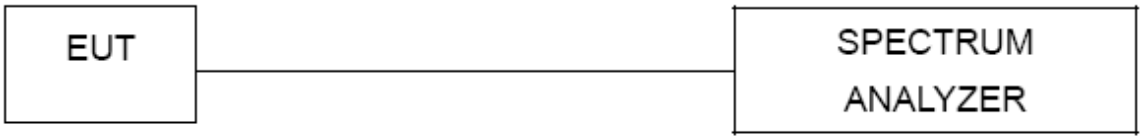


Tx. Spurious NVNT ax80 5775MHz Emission



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. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 106 ppm and he limit is less than ±20ppm (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°C~70°C.

13.4 Test Result

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage:	DC 11.4V
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)	7.40	5180.0043	5180	0.0043	0.8301
		V max (V)	8.51	5180.0105	5180	0.0105	2.0270
		V min (V)	6.29	5180.0093	5180	0.0093	1.7954
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)	7.4	T (°C)	-20	5180.0091	5180	0.0091	1.7568
		T (°C)	-10	5180.0067	5180	0.0067	1.2934
		T (°C)	0	5180.0107	5180	0.0107	2.0656
		T (°C)	10	5180.0068	5180	0.0068	1.3127
		T (°C)	20	5180.0030	5180	0.0030	0.5792
		T (°C)	30	5180.0052	5180	0.0052	1.0039
		T (°C)	40	5180.0057	5180	0.0057	1.1004
		T (°C)	50	5180.0121	5180	0.0121	2.3359
		T (°C)	60	5180.0058	5180	0.0058	1.1197
		T (°C)	70	5180.0035	5180	0.0035	0.6757
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)	7.40	5200.0019	5200	0.0019	0.3654
		V max (V)	8.51	5200.0002	5200	0.0002	0.0385
		V min (V)	6.29	5200.0032	5200	0.0032	0.6154
Limits				5725-5850 MHz			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.4	T (°C)	-20	5200.00820	5200	0.00820	1.5769
		T (°C)	-10	5200.00980	5200	0.00980	1.8846
		T (°C)	0	5200.00650	5200	0.00650	1.2500
		T (°C)	10	5200.00560	5200	0.00560	1.0769
		T (°C)	20	5200.01180	5200	0.01180	2.2692
		T (°C)	30	5200.00090	5200	0.00090	0.1731
		T (°C)	40	5200.01200	5200	0.01200	2.3077
		T (°C)	50	5200.00590	5200	0.00590	1.1346
		T (°C)	60	5200.00290	5200	0.00290	0.5577
		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)	7.40	5240.0110	5240	0.0110	2.0992
		V max (V)	8.51	5240.0060	5240	0.0060	1.1450
		V min (V)	6.29	5240.0076	5240	0.0076	1.4504
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)	7.4	T (°C)	-20	5240.0103	5240	0.0103	1.9656
		T (°C)	-10	5240.0131	5240	0.0131	2.5000
		T (°C)	0	5240.0091	5240	0.0091	1.7366
		T (°C)	10	5240.0040	5240	0.0040	0.7634
		T (°C)	20	5240.0105	5240	0.0105	2.0038
		T (°C)	30	5240.0095	5240	0.0095	1.8130
		T (°C)	40	5240.0067	5240	0.0067	1.2786
		T (°C)	50	5240.0093	5240	0.0093	1.7748
		T (°C)	60	5240.0018	5240	0.0018	0.3435
		T (°C)	70	5240.0079	5240	0.0079	1.5076
Limits				5150-5250 MHz			
Result				Complies			

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Test Voltage:	DC 11.4V
Test Mode:	TX 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)	7.40	5745.01050	5745	0.01050	1.8277
		V max (V)	8.51	5745.00360	5745	0.00360	0.6266
		V min (V)	6.29	5745.00490	5745	0.00490	0.8529
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)	7.4	T (°C)	-20	5745.01120	5745	0.01120	1.9495
		T (°C)	-10	5745.01300	5745	0.01300	2.2628
		T (°C)	0	5745.00600	5745	0.00600	1.0444
		T (°C)	10	5745.01110	5745	0.01110	1.9321
		T (°C)	20	5745.00300	5745	0.00300	0.5222
		T (°C)	30	5745.01120	5745	0.01120	1.9495
		T (°C)	40	5745.00510	5745	0.00510	0.8877
		T (°C)	50	5745.01110	5745	0.01110	1.9321
		T (°C)	60	5745.00210	5745	0.00210	0.3655
		T (°C)	70	5745.00560	5745	0.00560	0.9748
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)	7.40	5785.00540	5785	0.00540	0.9334
		V max (V)	8.51	5785.00860	5785	0.00860	1.4866
		V min (V)	6.29	5785.01030	5785	0.01030	1.7805
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)	7.4	T (°C)	-20	5785.00210	5785	0.00210	0.3630
		T (°C)	-10	5785.00170	5785	0.00170	0.2939
		T (°C)	0	5785.00960	5785	0.00960	1.6595
		T (°C)	10	5785.00930	5785	0.00930	1.6076
		T (°C)	20	5785.00020	5785	0.00020	0.0346
		T (°C)	30	5785.00170	5785	0.00170	0.2939
		T (°C)	40	5785.00830	5785	0.00830	1.4347
		T (°C)	50	5785.01310	5785	0.01310	2.2645
		T (°C)	60	5785.01350	5785	0.01350	2.3336
		T (°C)	70	5785.01090	5785	0.01090	1.8842
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)	7.40	5825.00900	5825	0.00900	1.5451
		V max (V)	8.51	5825.00220	5825	0.00220	0.3777
		V min (V)	6.29	5825.00360	5825	0.00360	0.6180
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)	7.4	T (°C)	-20	5825.01150	5825	0.01150	1.9742
		T (°C)	-10	5825.01020	5825	0.01020	1.7511
		T (°C)	0	5825.00280	5825	0.00280	0.4807
		T (°C)	10	5825.00510	5825	0.00510	0.8755
		T (°C)	20	5825.00670	5825	0.00670	1.1502
		T (°C)	30	5825.00350	5825	0.00350	0.6009
		T (°C)	40	5825.00930	5825	0.00930	1.5966
		T (°C)	50	5825.00670	5825	0.00670	1.1502
		T (°C)	60	5825.00600	5825	0.00600	1.0300
		T (°C)	70	5825.00700	5825	0.00700	1.2017
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 = Ton / (Ton+Toff)

14.3 Test Procedure

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

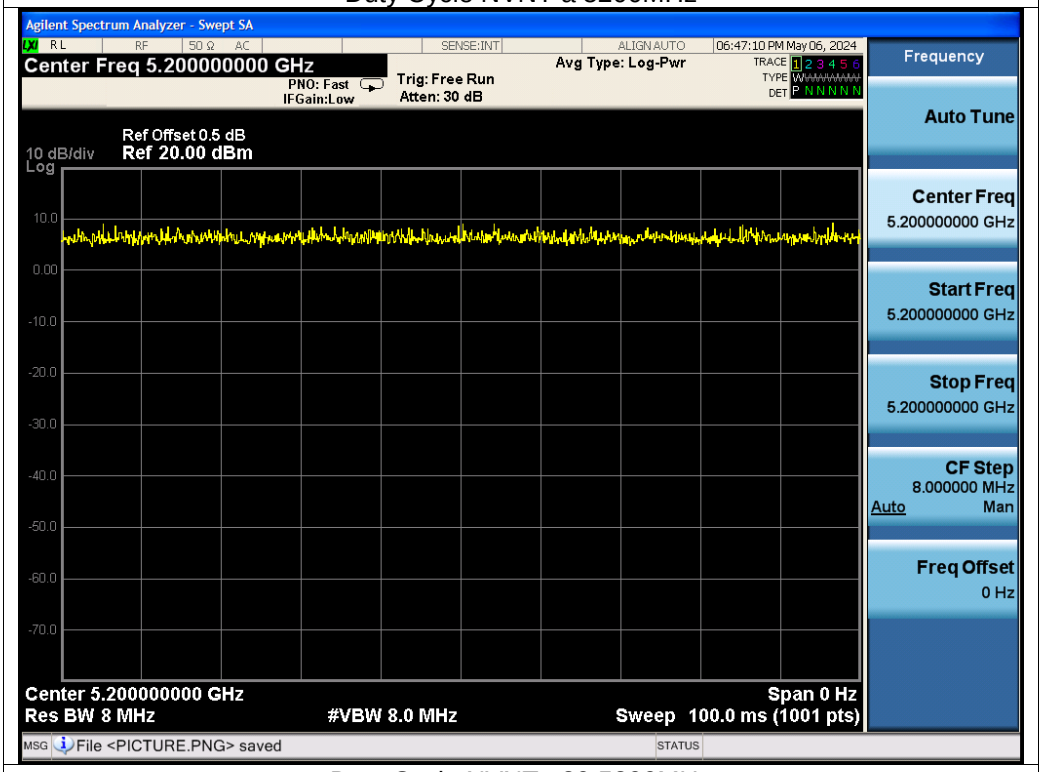
14.4 Test Result

ANT A

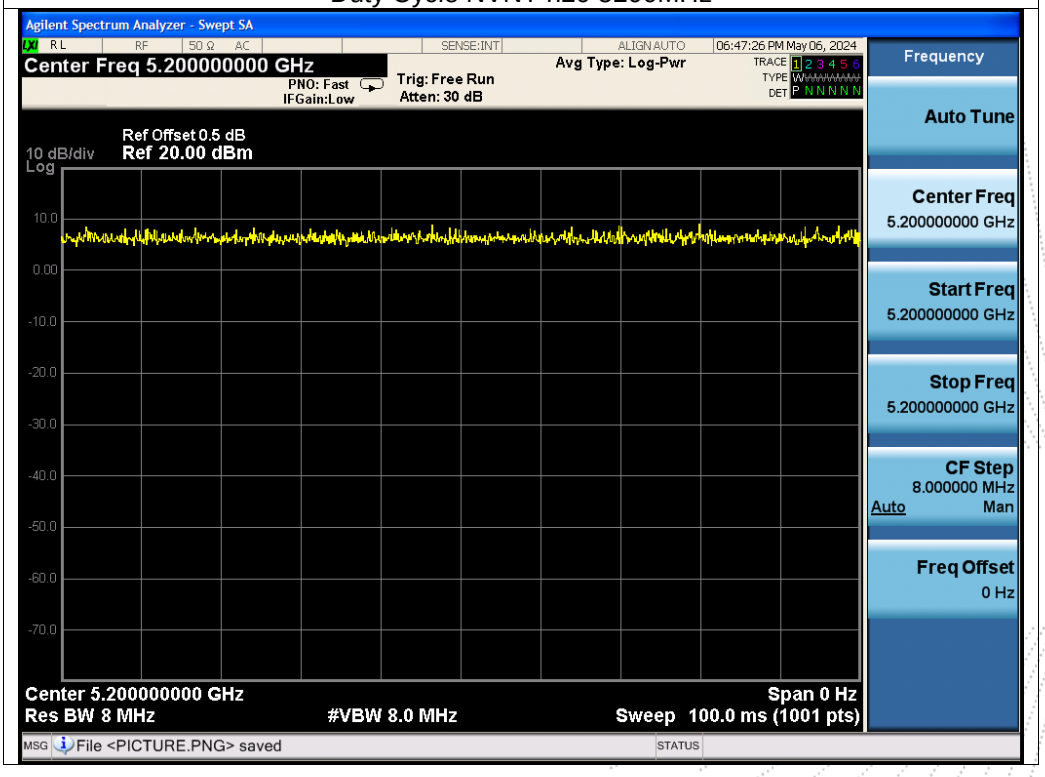
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5200	100	0	0
NVNT	n20	5200	100	0	0
NVNT	n40	5190	100	0	0
NVNT	ac20	5200	100	0	0
NVNT	ac40	5190	100	0	0
NVNT	ac80	5210	100	0	0
NVNT	ax20	5200	100	0	0
NVNT	ax40	5190	100	0	0
NVNT	ax80	5210	100	0	0

Test Graphs

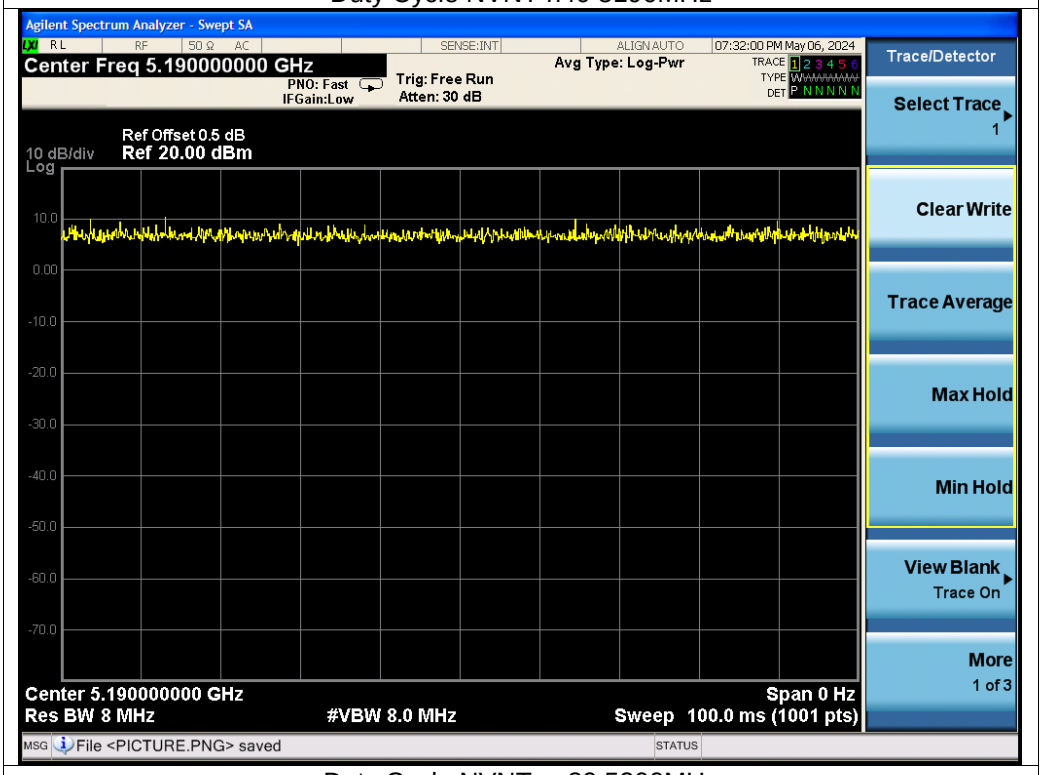
Duty Cycle NVNT a 5200MHz



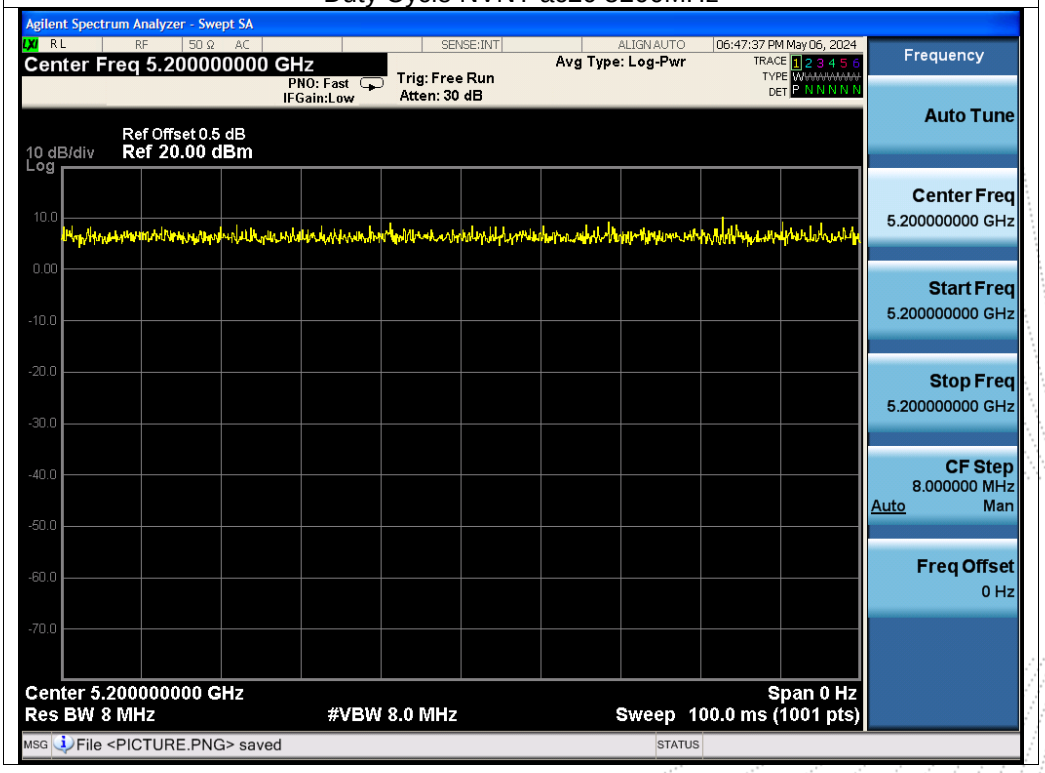
Duty Cycle NVNT n20 5200MHz



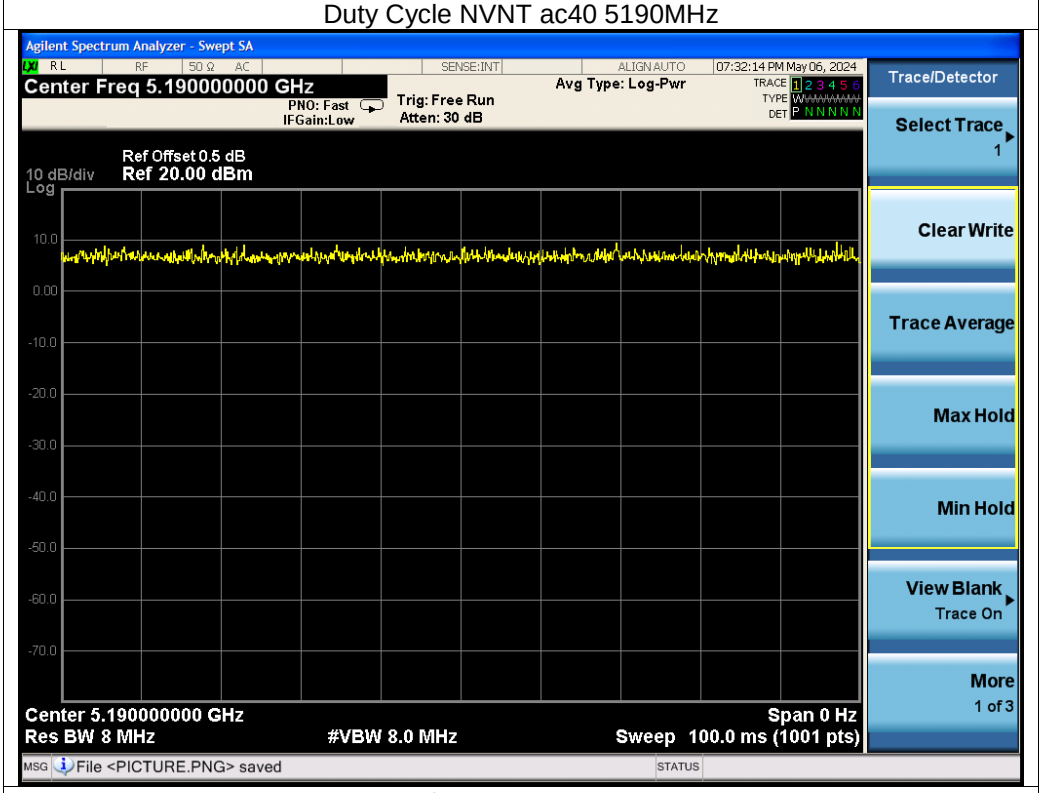
Duty Cycle NVNT n40 5190MHz



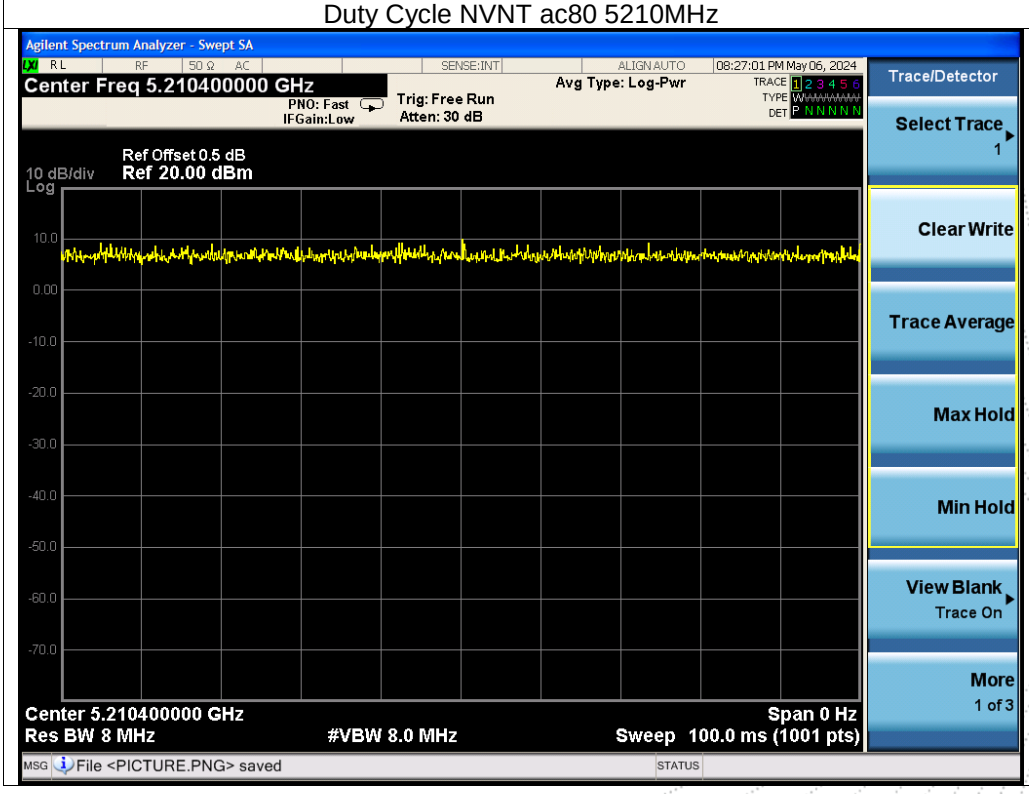
Duty Cycle NVNT ac20 5200MHz



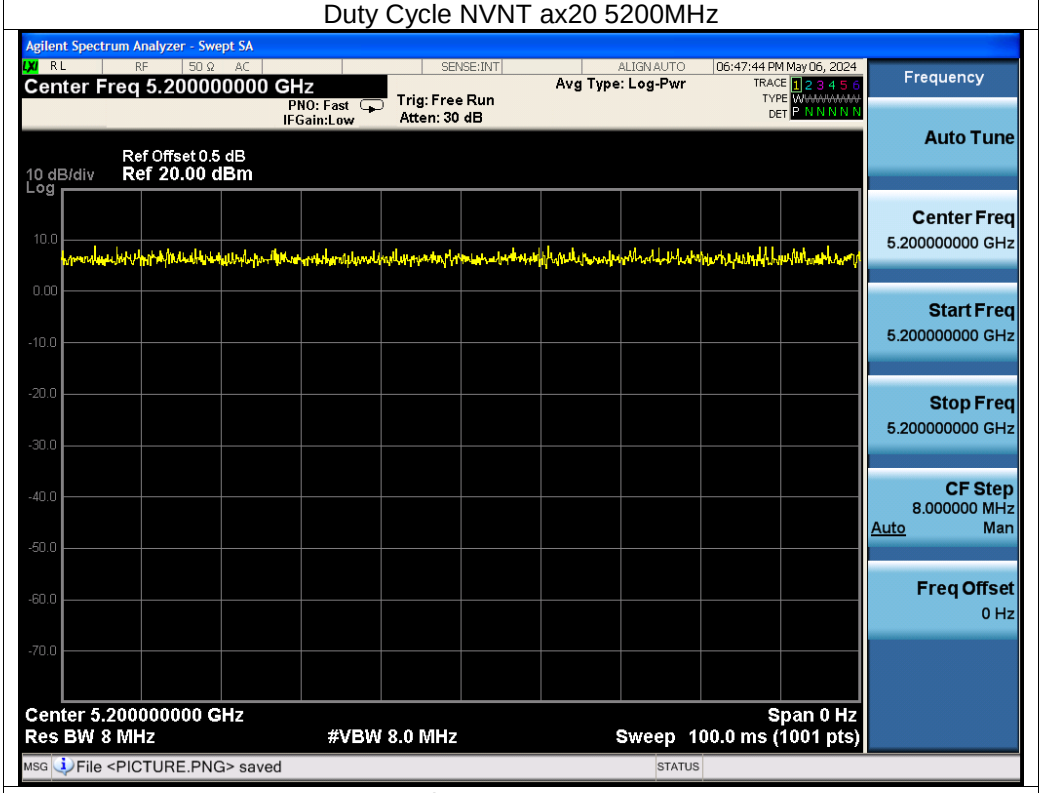
Duty Cycle NVNT ac40 5190MHz



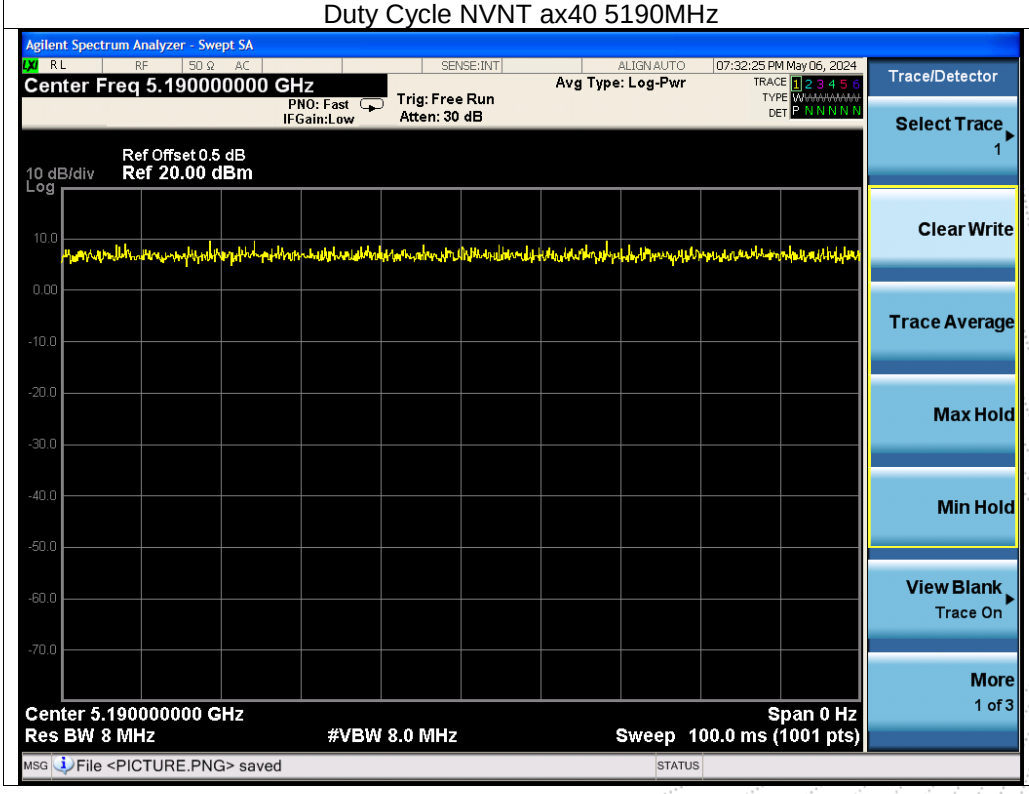
Duty Cycle NVNT ac80 5210MHz



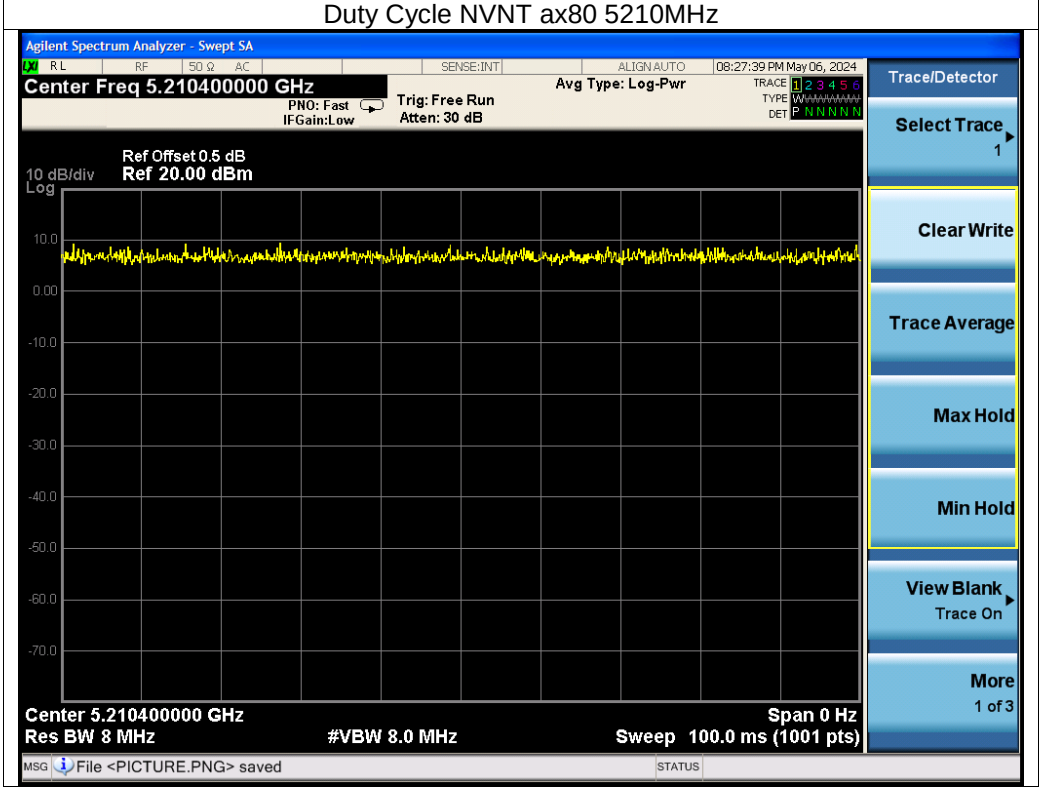
Duty Cycle NVNT ax20 5200MHz



Duty Cycle NVNT ax40 5190MHz



Duty Cycle NVNT ax80 5210MHz

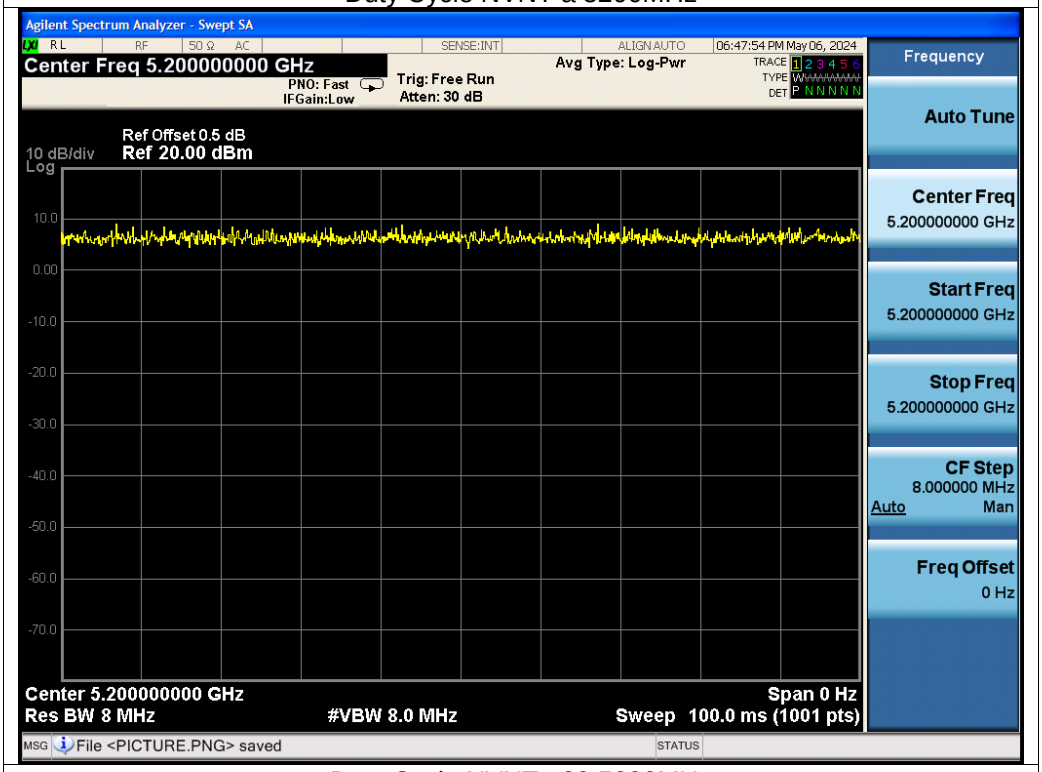


ANT B

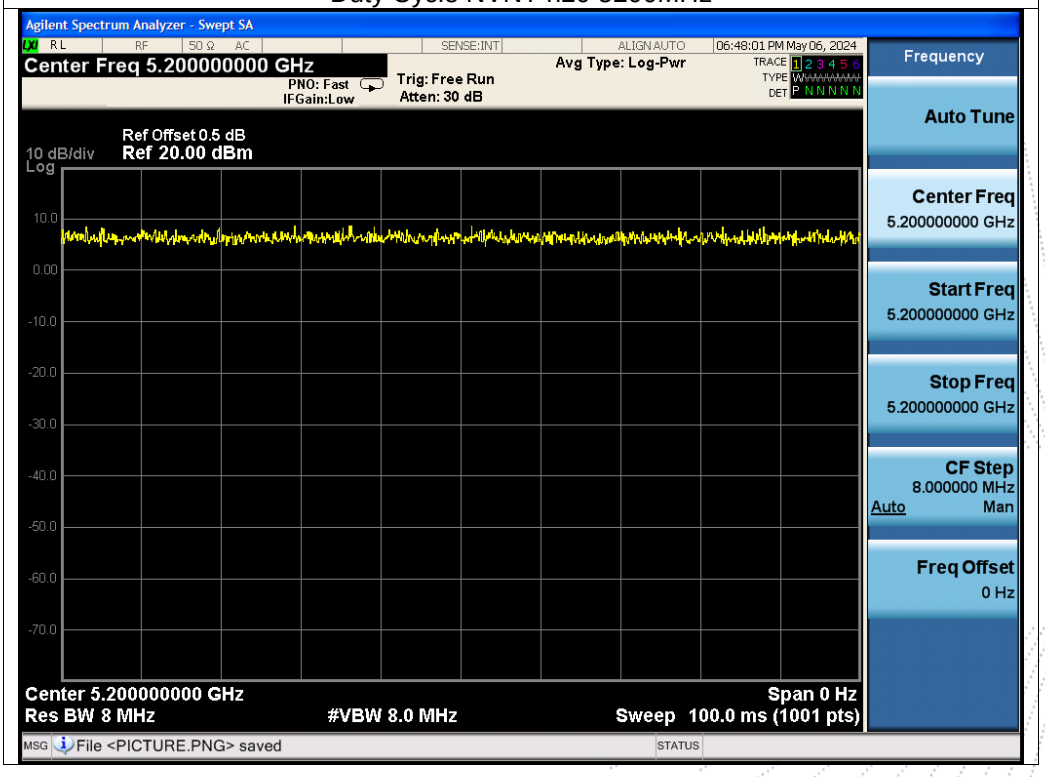
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5200	100	0	0
NVNT	n20	5200	100	0	0
NVNT	n40	5190	100	0	0
NVNT	ac20	5200	100	0	0
NVNT	ac40	5190	100	0	0
NVNT	ac80	5210	100	0	0
NVNT	ax20	5200	100	0	0
NVNT	ax40	5190	100	0	0
NVNT	ax80	5210	100	0	0

Test Graphs

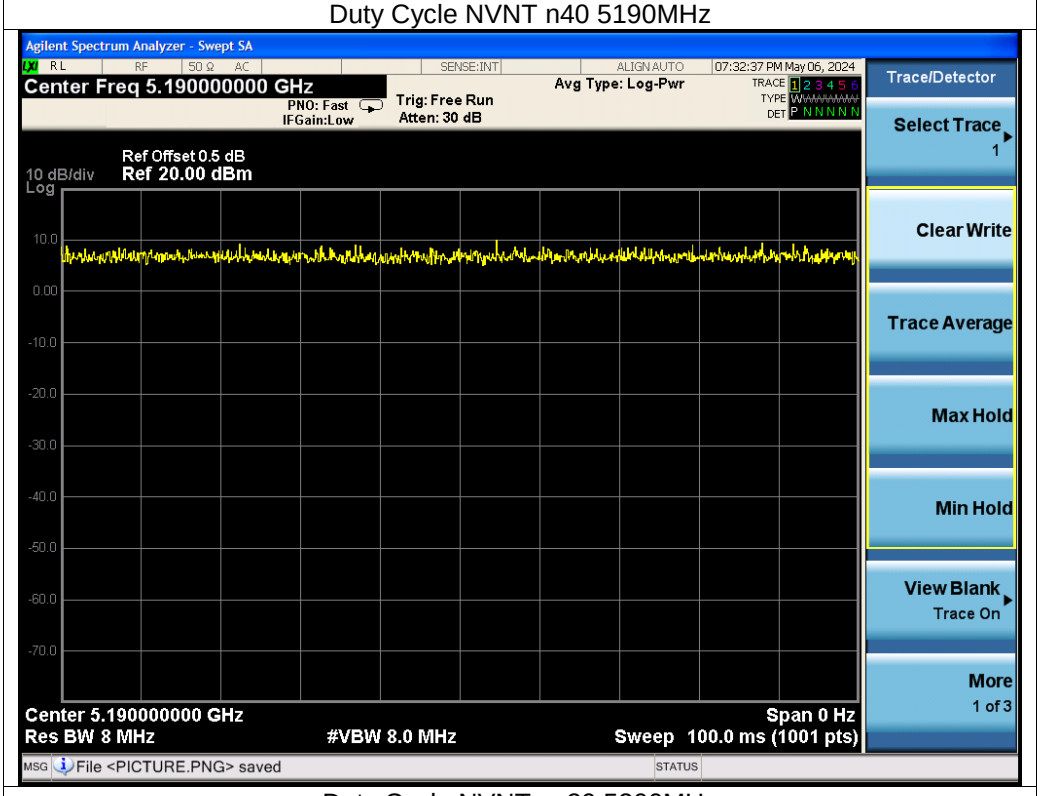
Duty Cycle NVNT a 5200MHz



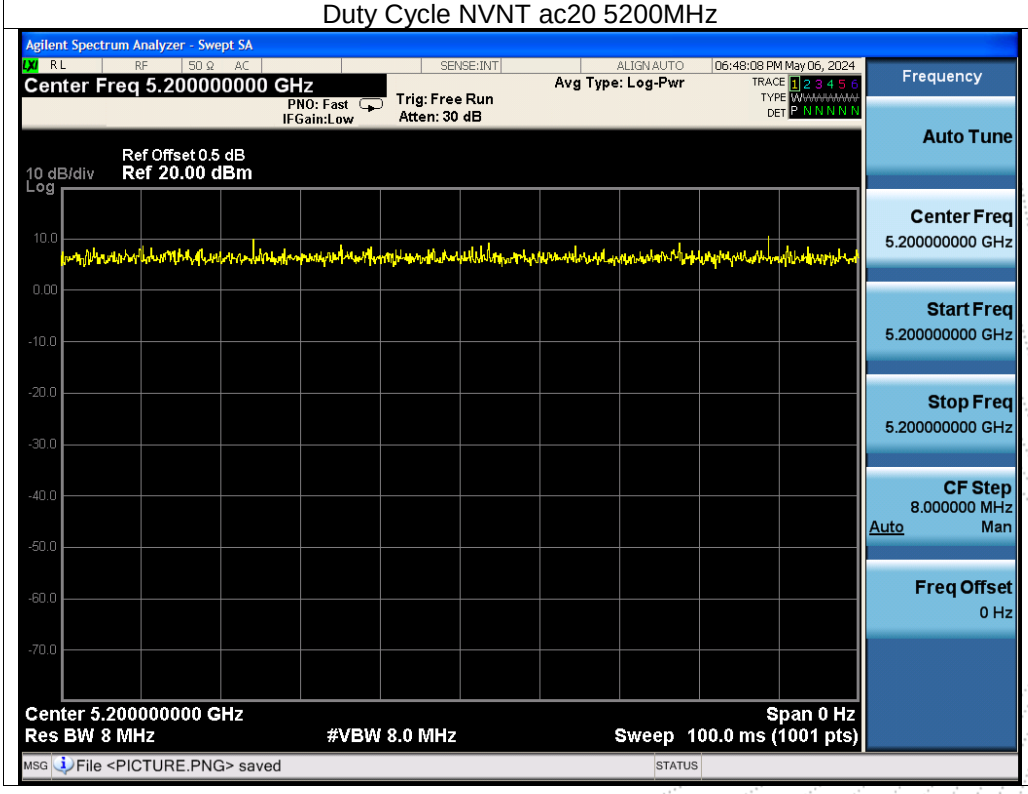
Duty Cycle NVNT n20 5200MHz



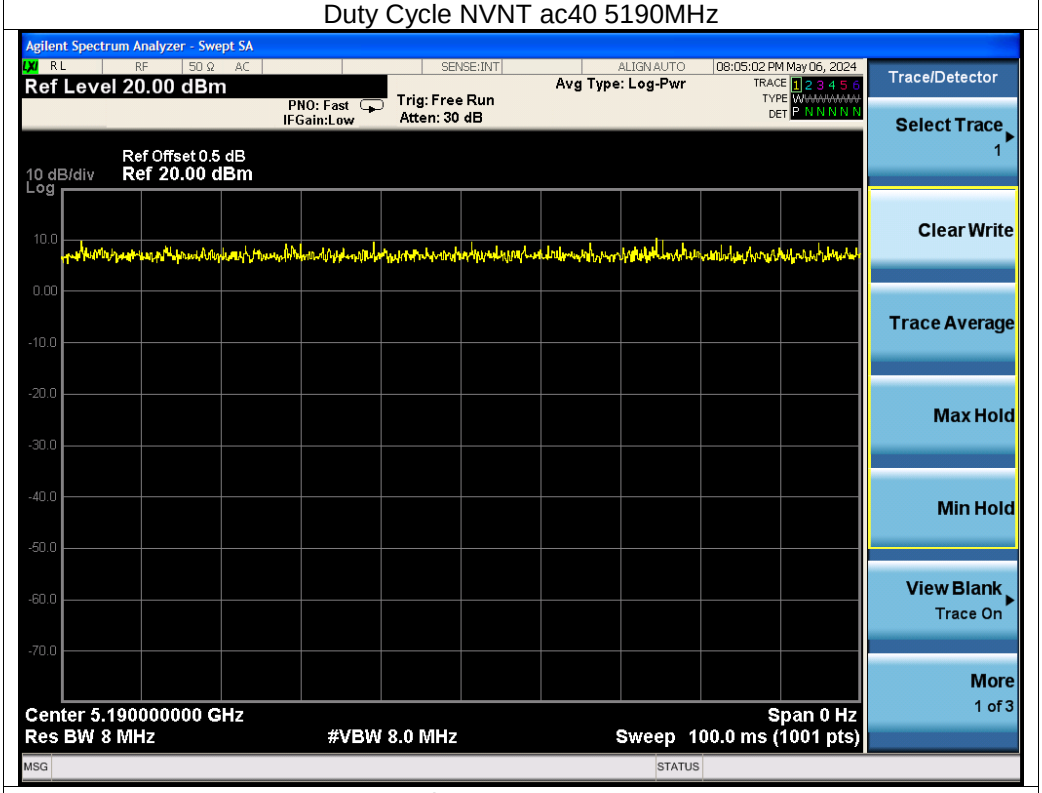
Duty Cycle NVNT n40 5190MHz



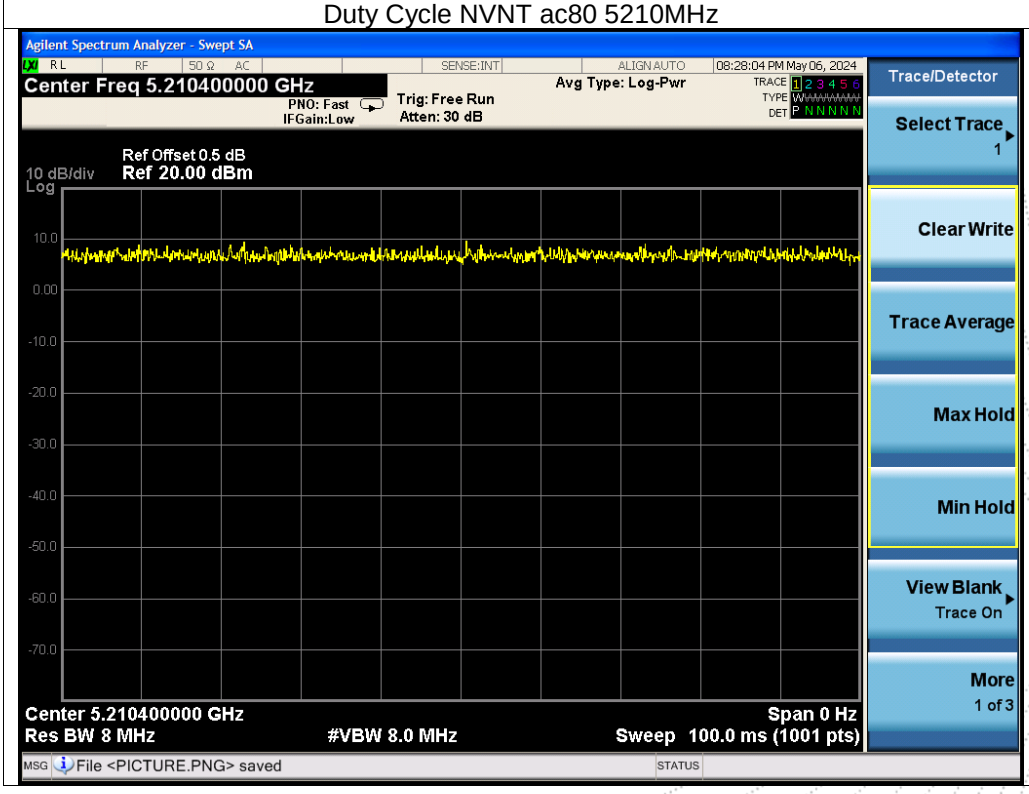
Duty Cycle NVNT ac20 5200MHz



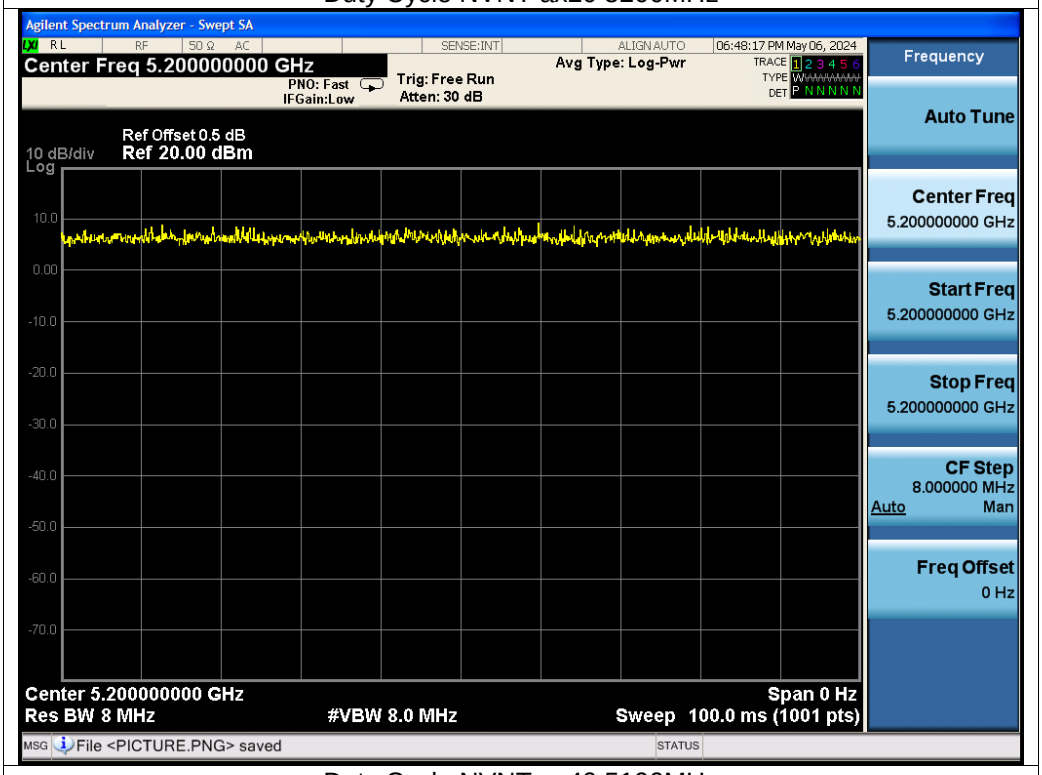
Duty Cycle NVNT ac40 5190MHz



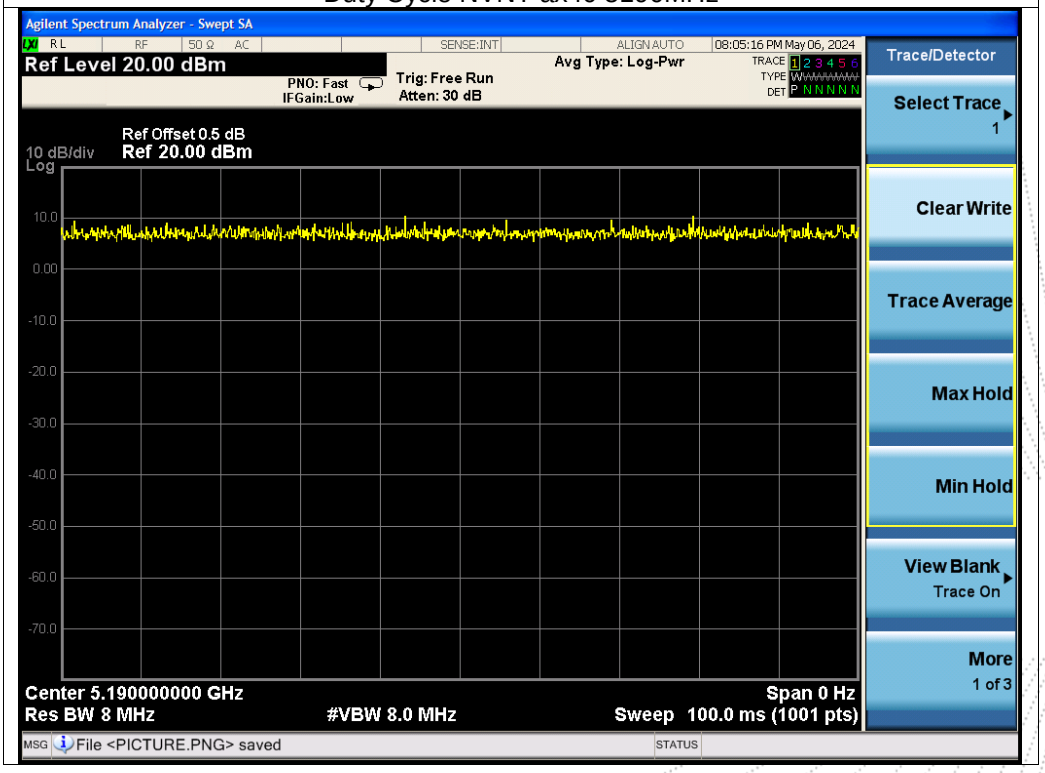
Duty Cycle NVNT ac80 5210MHz



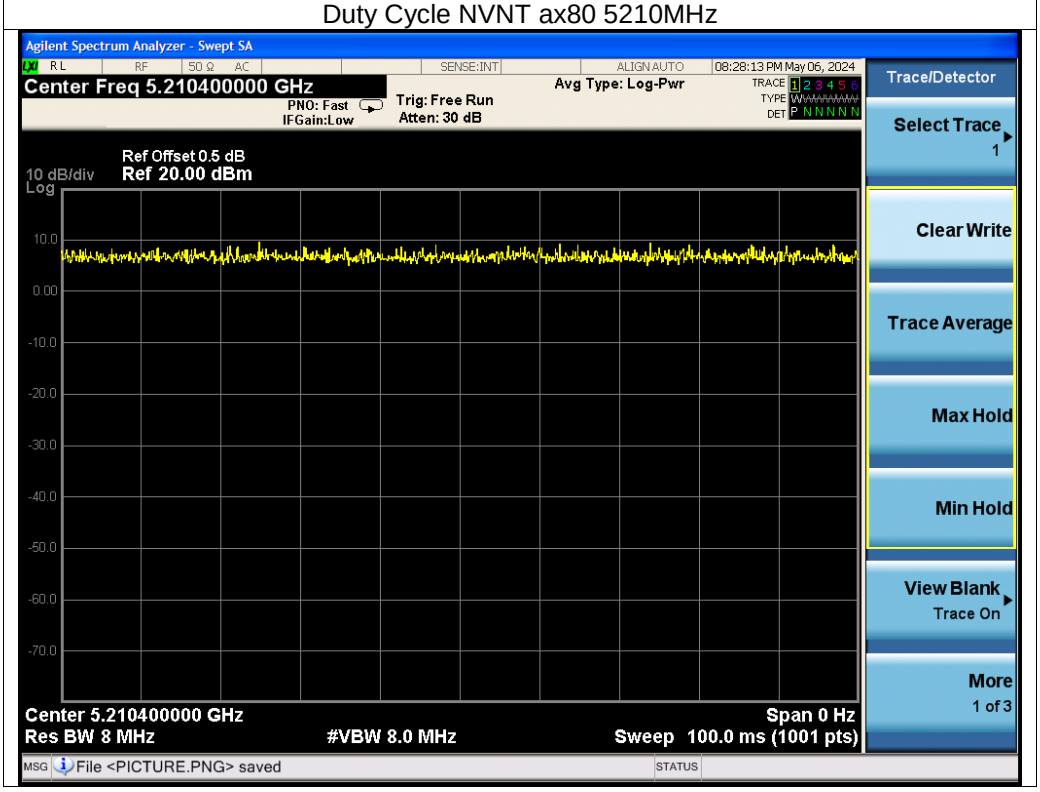
Duty Cycle NVNT ax20 5200MHz



Duty Cycle NVNT ax40 5190MHz



Duty Cycle NVNT ax80 5210MHz

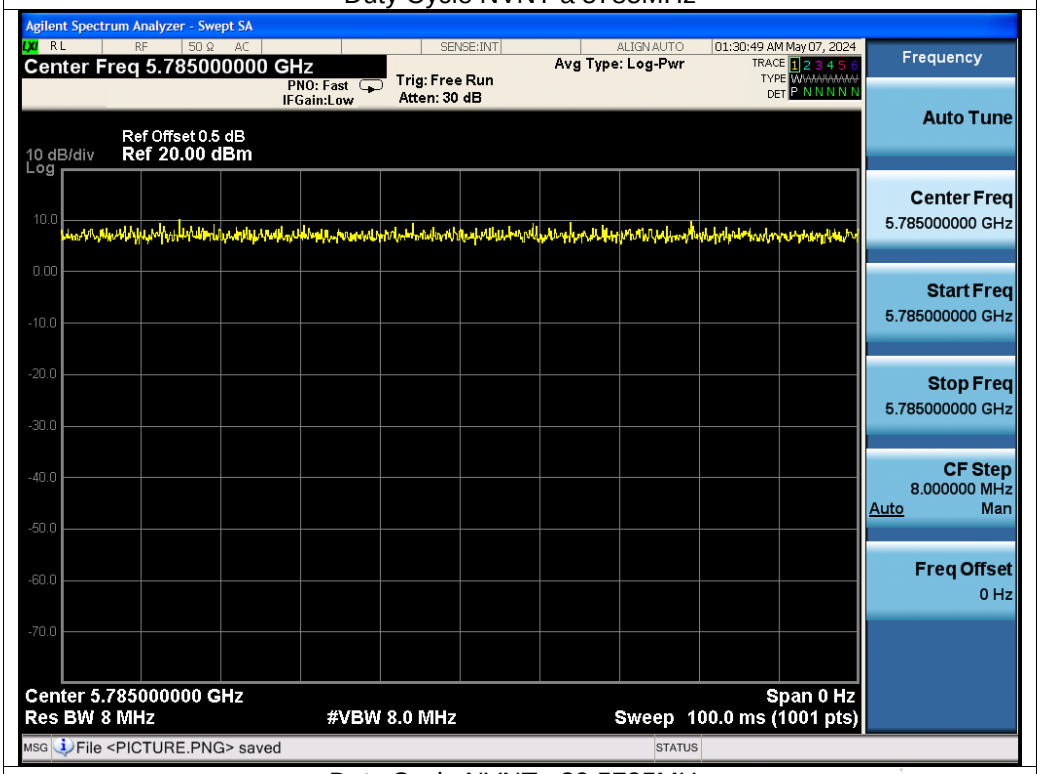


ANT A

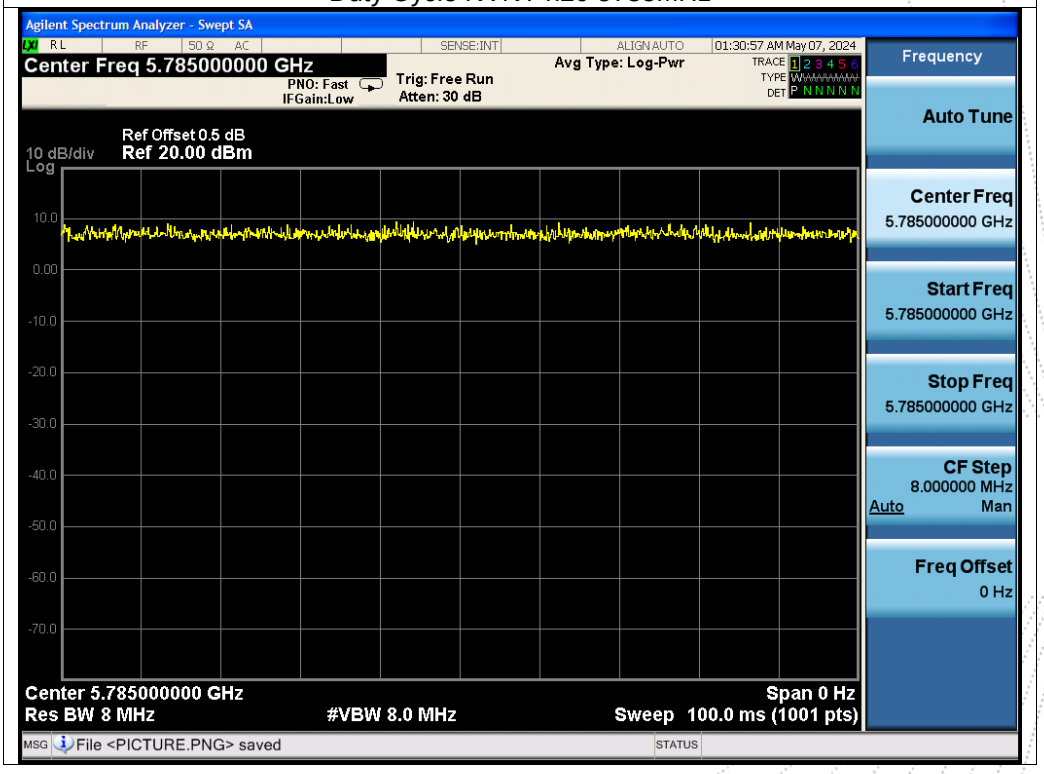
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5785	100	0	0
NVNT	n20	5785	100	0	0
NVNT	n40	5755	100	0	0
NVNT	ac20	5785	100	0	0
NVNT	ac40	5755	100	0	0
NVNT	ac80	5775	100	0	0
NVNT	ax20	5785	100	0	0
NVNT	ax40	5755	100	0	0
NVNT	ax80	5775	100	0	0

Test Graphs

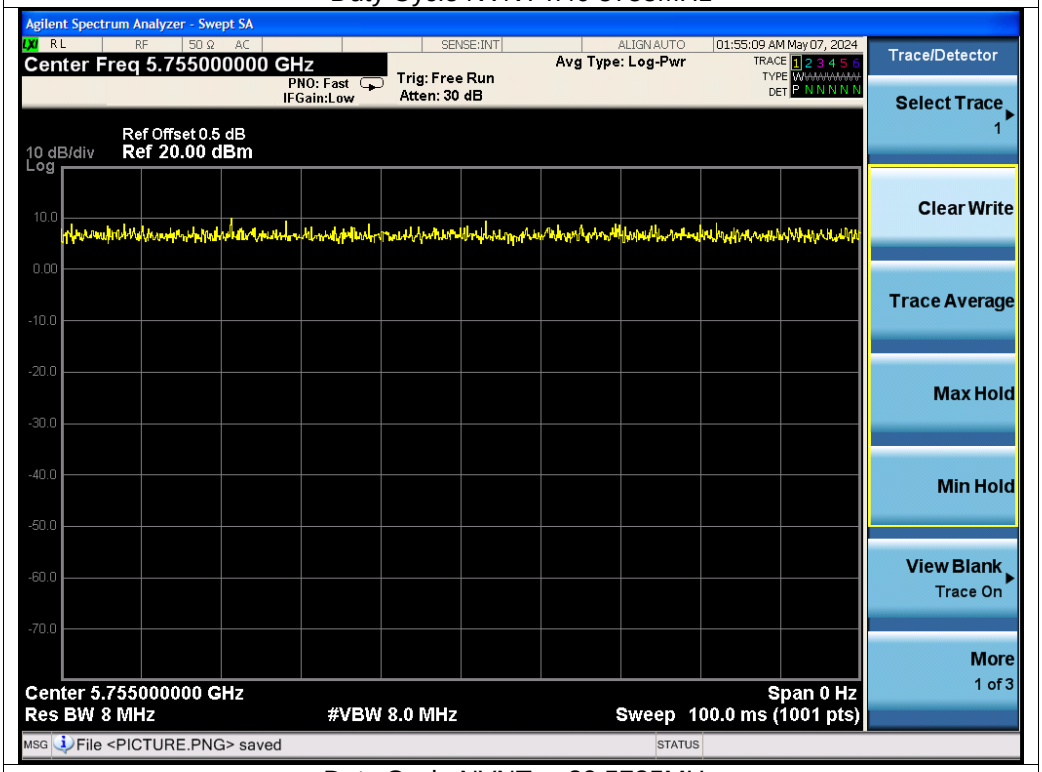
Duty Cycle NVNT a 5785MHz



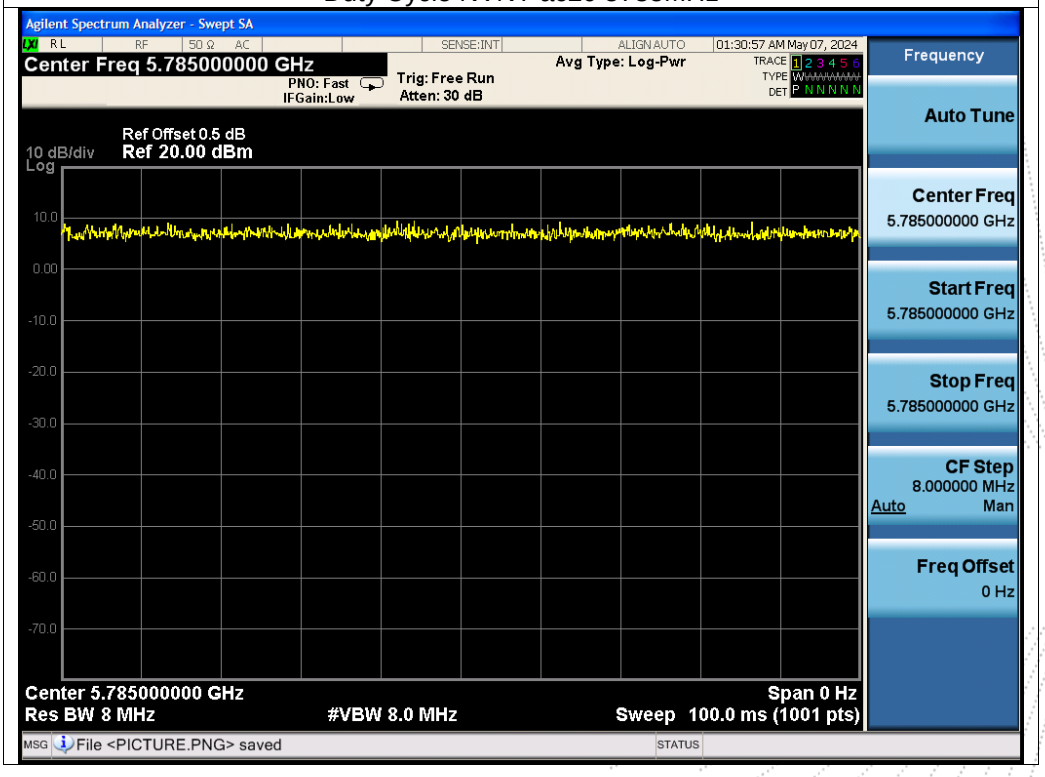
Duty Cycle NVNT n20 5785MHz



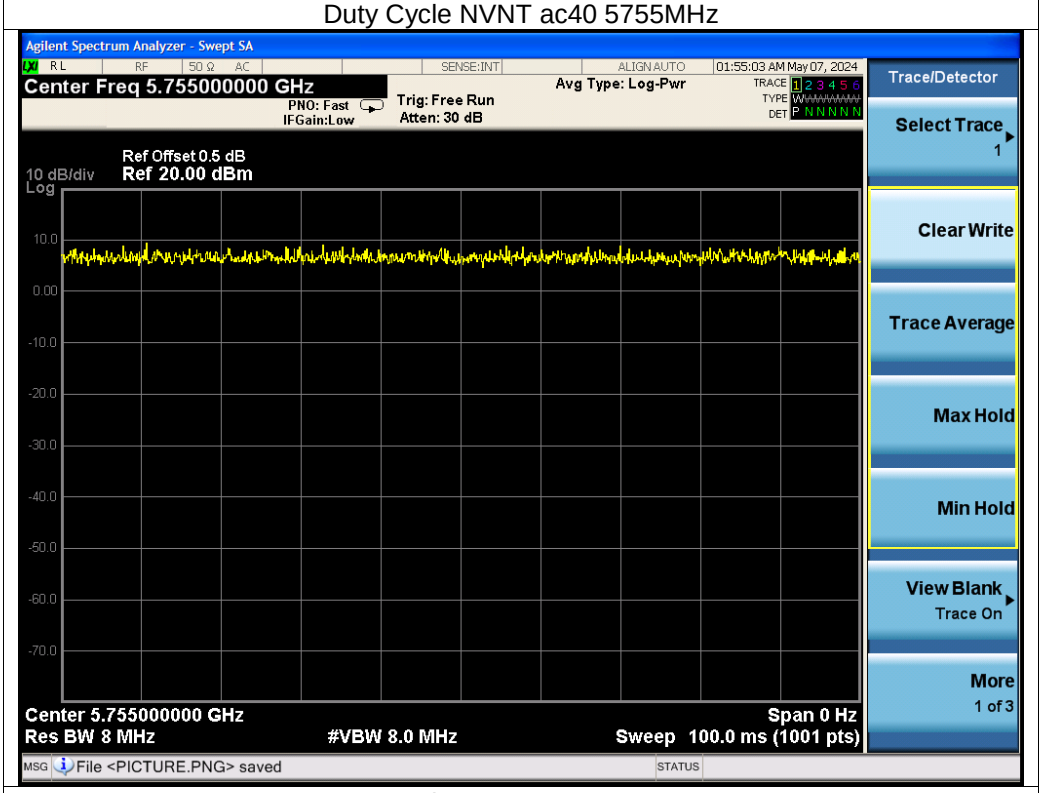
Duty Cycle NVNT n40 5755MHz



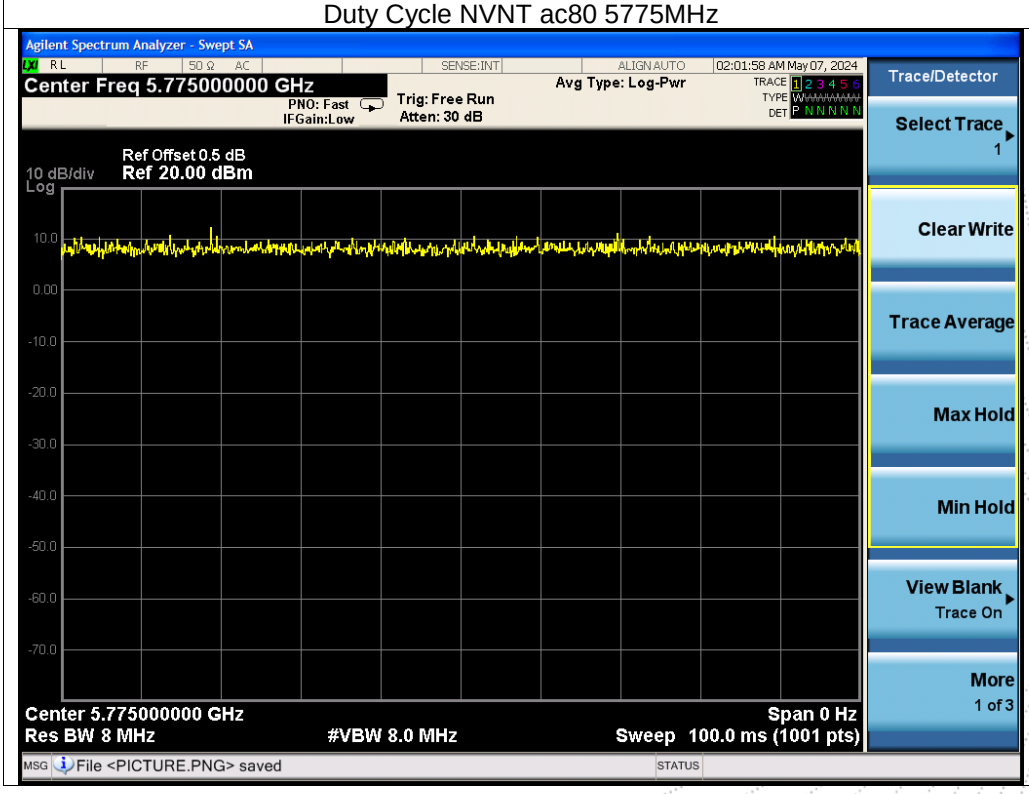
Duty Cycle NVNT ac20 5785MHz



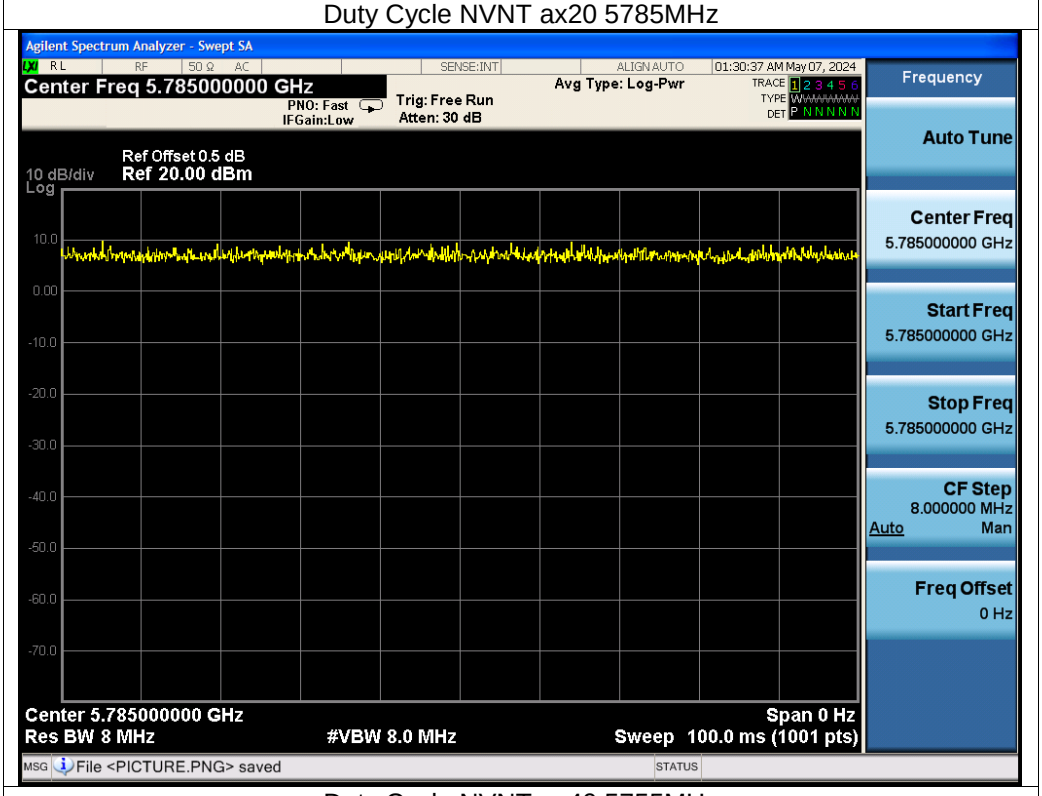
Duty Cycle NVNT ac40 5755MHz



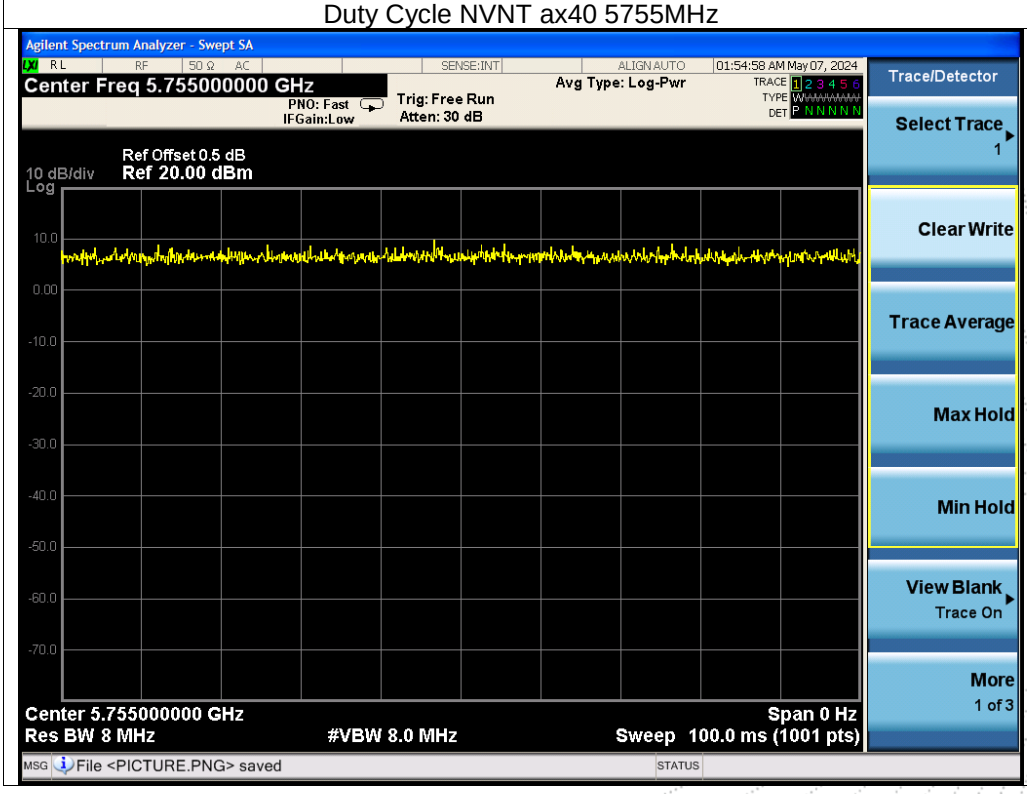
Duty Cycle NVNT ac80 5775MHz



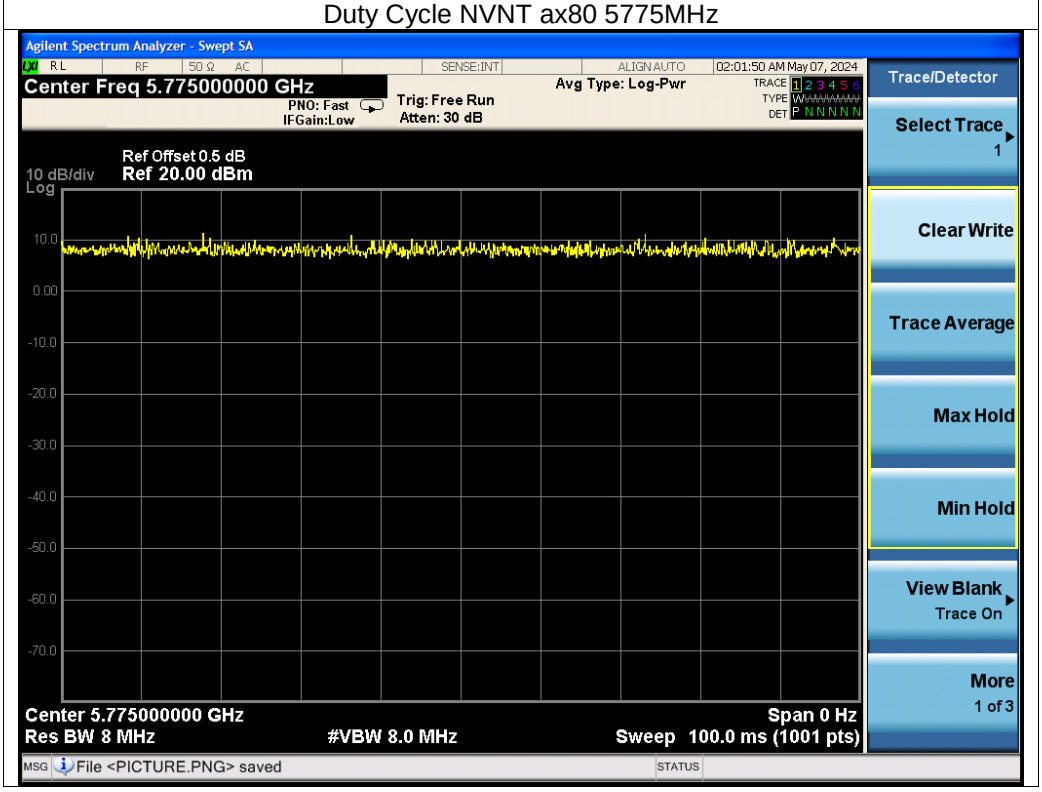
Duty Cycle NVNT ax20 5785MHz



Duty Cycle NVNT ax40 5755MHz



Duty Cycle NVNT ax80 5775MHz

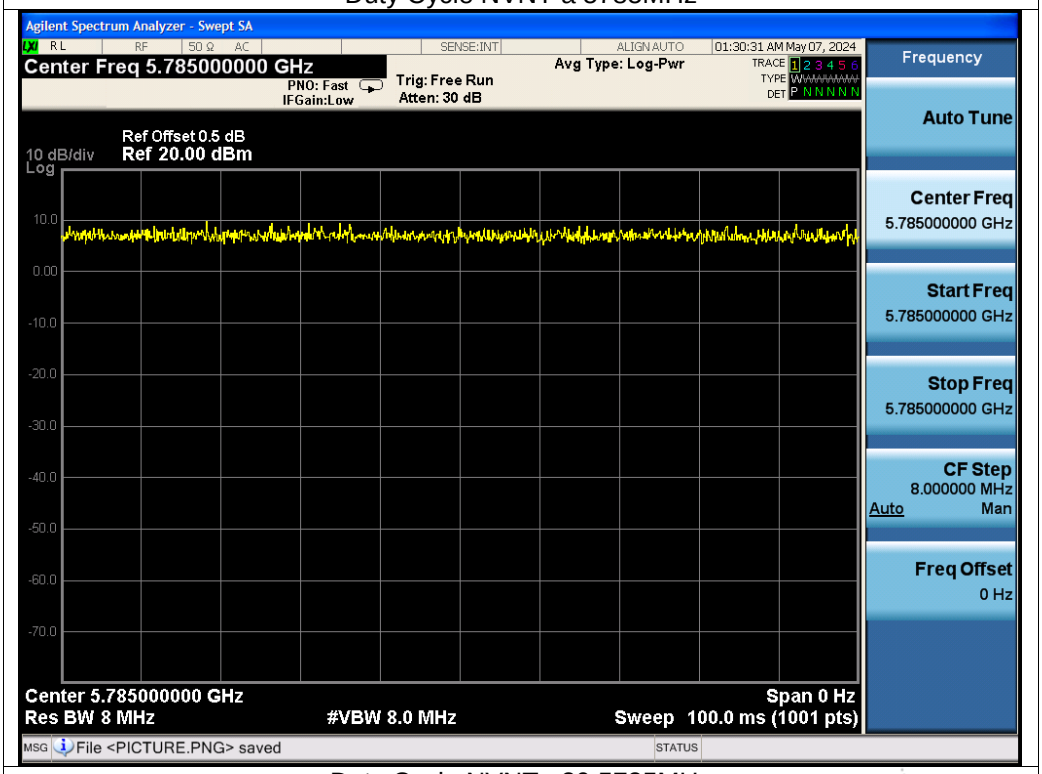


ANT B

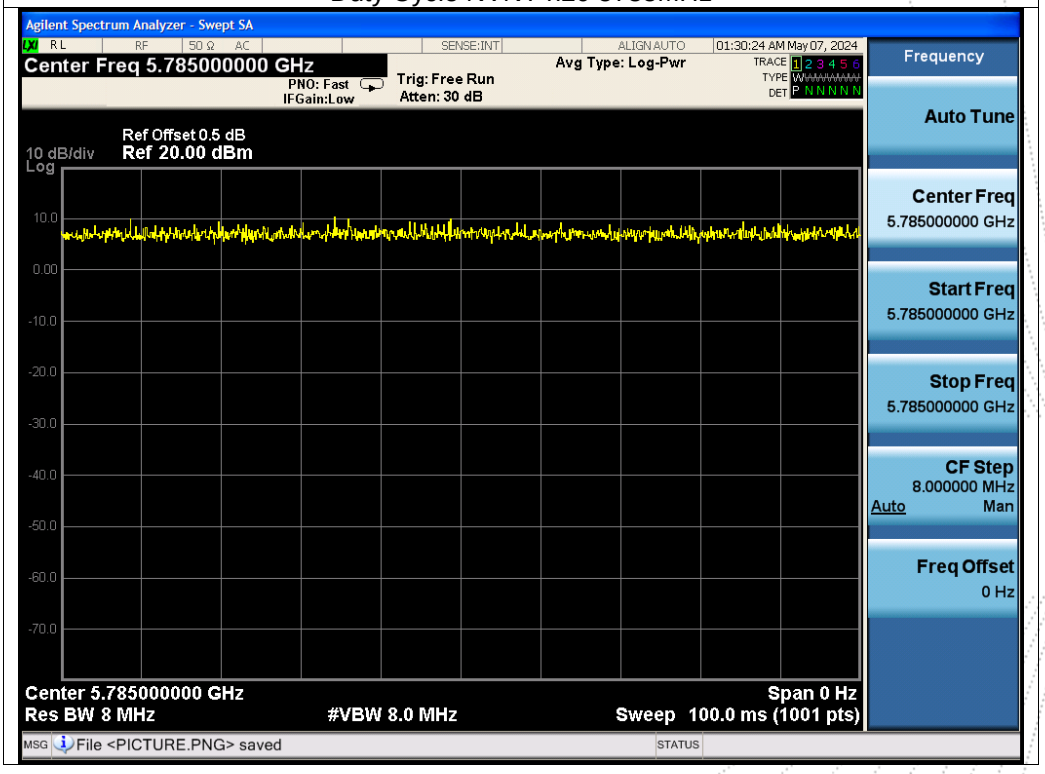
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	a	5785	100	0	0
NVNT	n20	5785	100	0	0
NVNT	n40	5755	100	0	0
NVNT	ac20	5785	100	0	0
NVNT	ac40	5755	100	0	0
NVNT	ac80	5775	100	0	0
NVNT	ax20	5785	100	0	0
NVNT	ax40	5755	100	0	0
NVNT	ax80	5775	100	0	0

Test Graphs

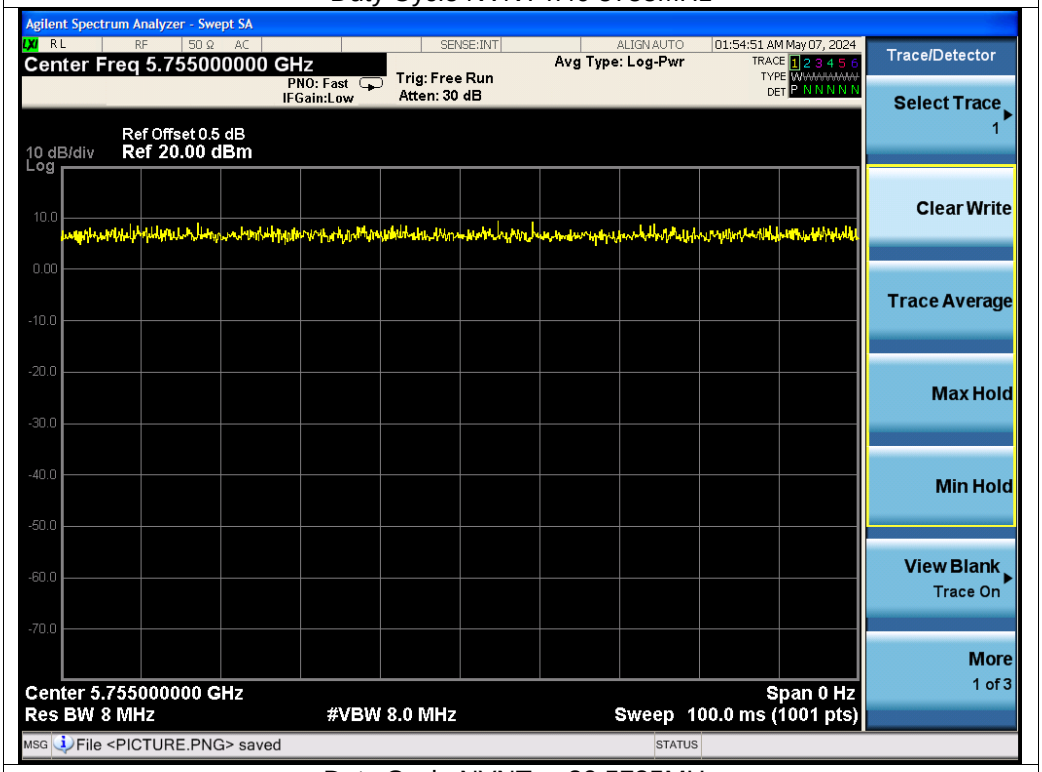
Duty Cycle NVNT a 5785MHz



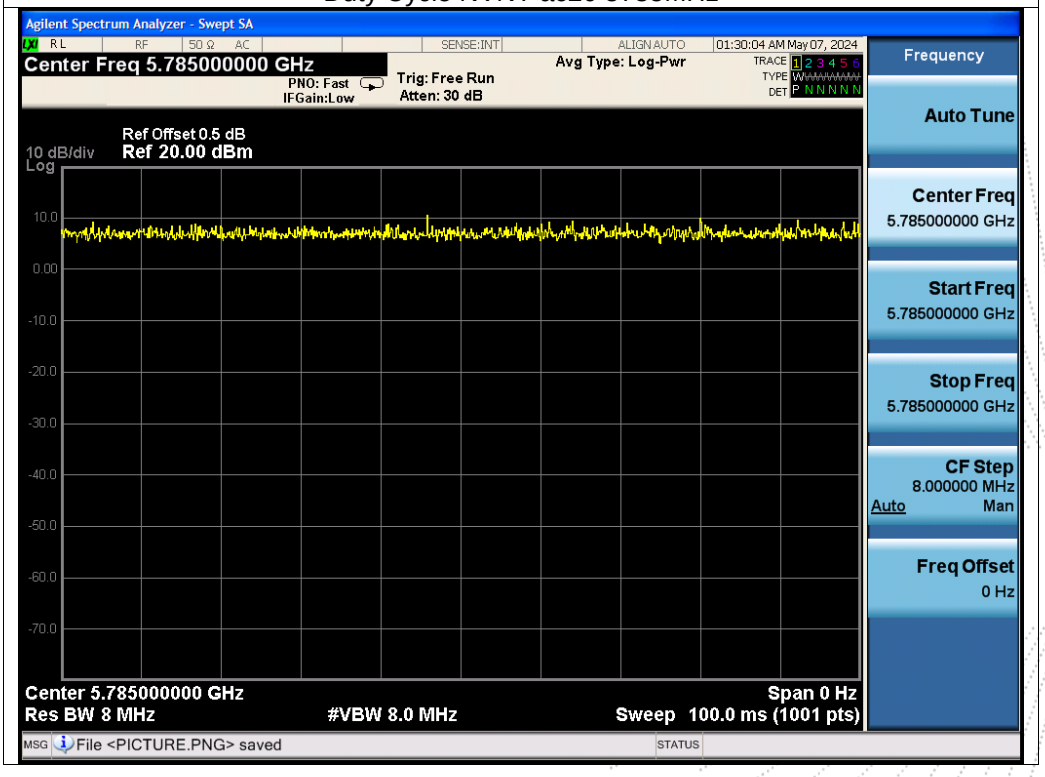
Duty Cycle NVNT n20 5785MHz



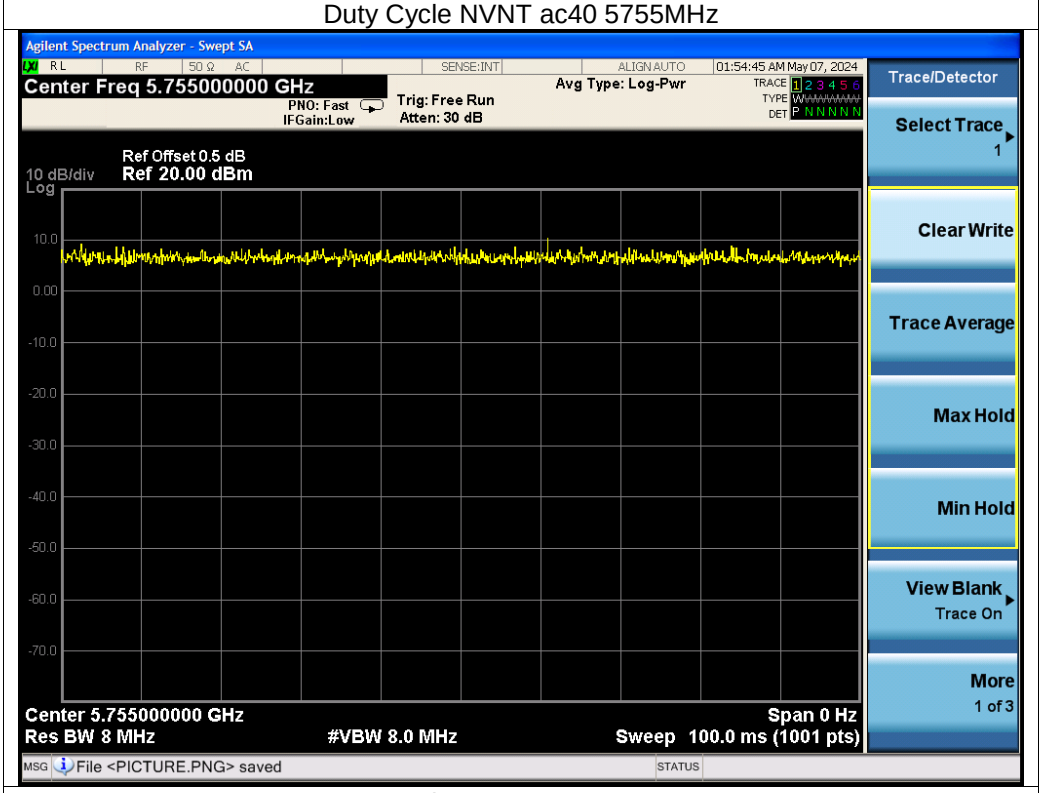
Duty Cycle NVNT n40 5755MHz



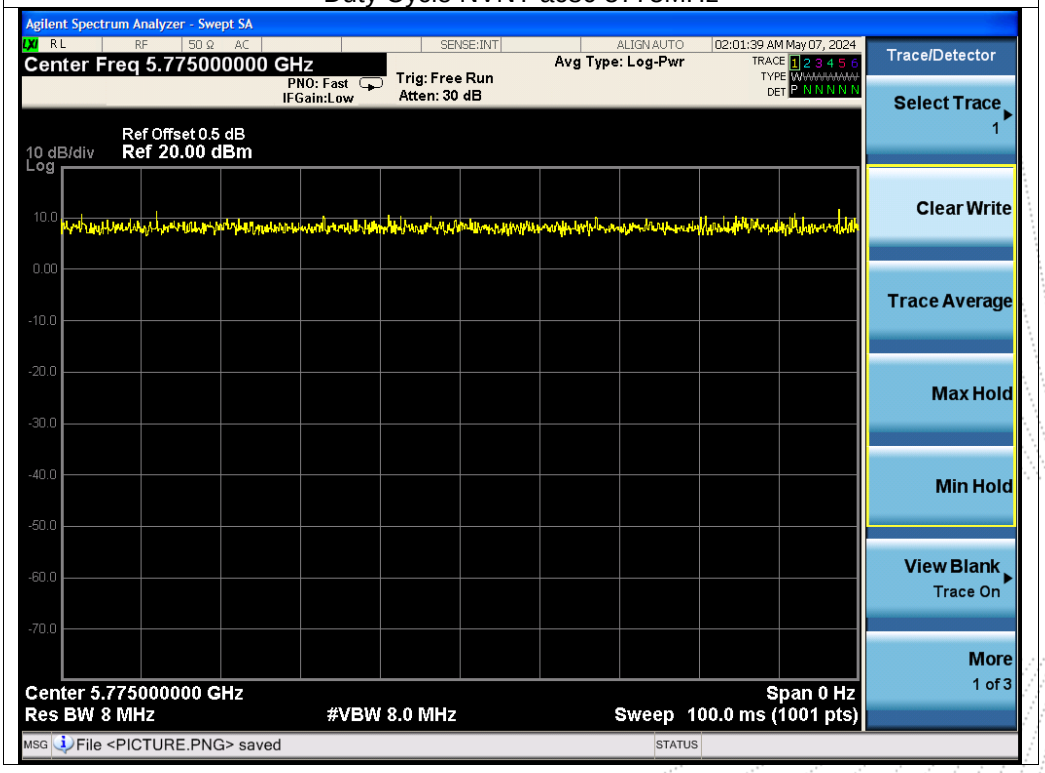
Duty Cycle NVNT ac20 5785MHz



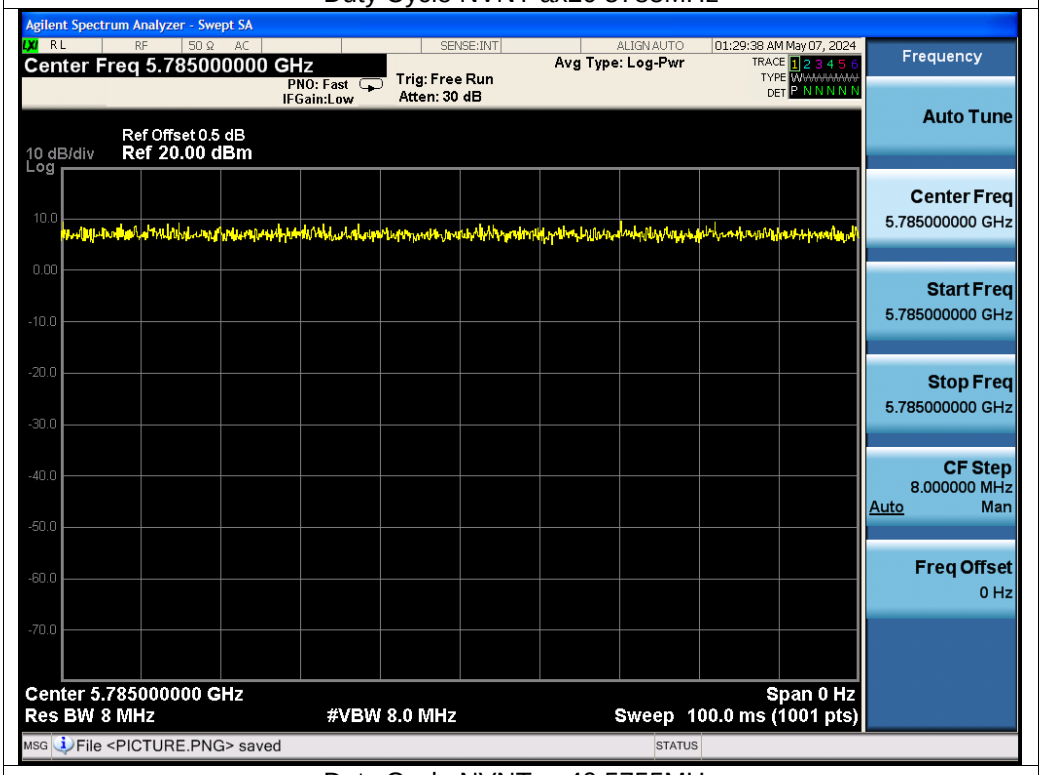
Duty Cycle NVNT ac40 5755MHz



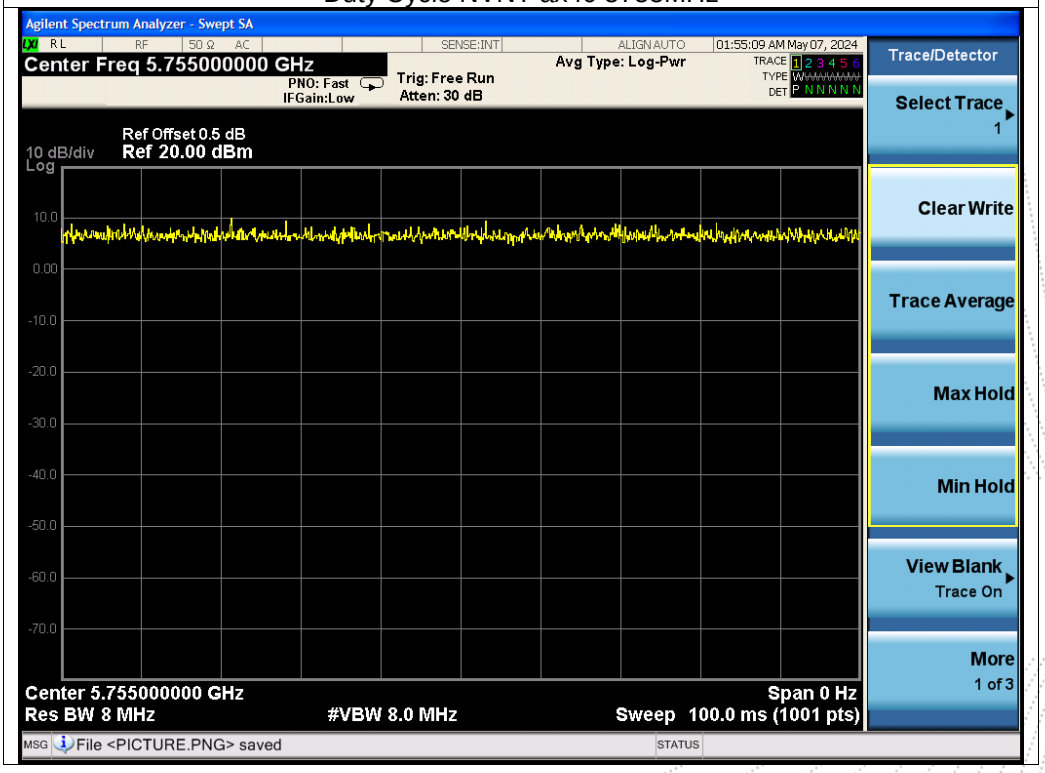
Duty Cycle NVNT ac80 5775MHz



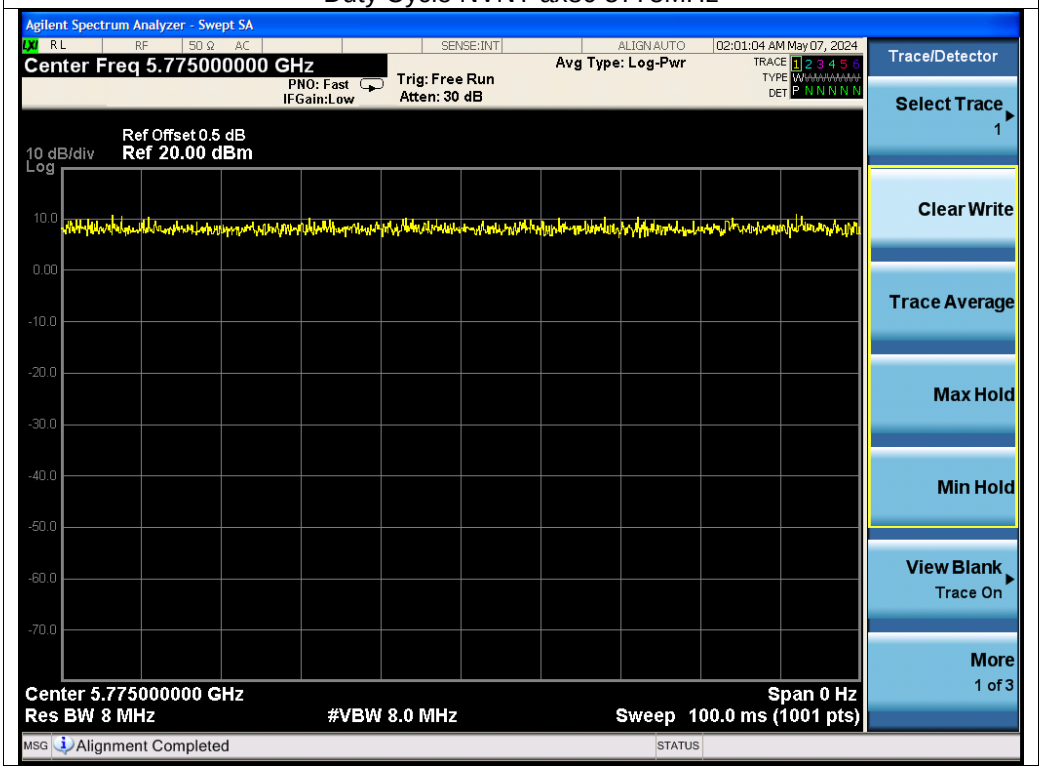
Duty Cycle NVNT ax20 5785MHz



Duty Cycle NVNT ax40 5755MHz



Duty Cycle NVNT ax80 5775MHz



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 (5.1GHz: Antenna A gain:3.48 dBi, Antenna B gain: 1.39 dBi; 5.8GHz: Antenna A gain:2.01 dBi, Antenna B gain: 3.31 dBi). It comply with the standard requirement.

16. EUT Photographs

EUT Photo 1

EUT Photo 2

EUT Photo 3

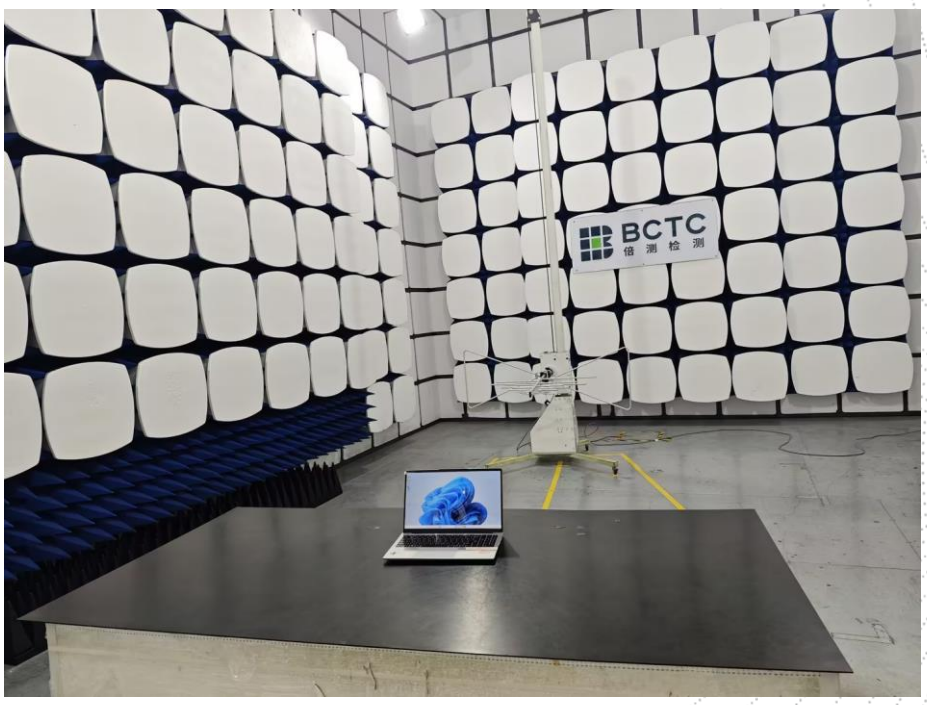
EUT Photo 4

NOTE: Appendix-Photographs Of EUT Constructional Details.

17. EUT Test Setup Photographs

Conducted Measurement Photo

Radiated Measurement Photos



BCT
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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.

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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

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