

8.3 Test Procedure

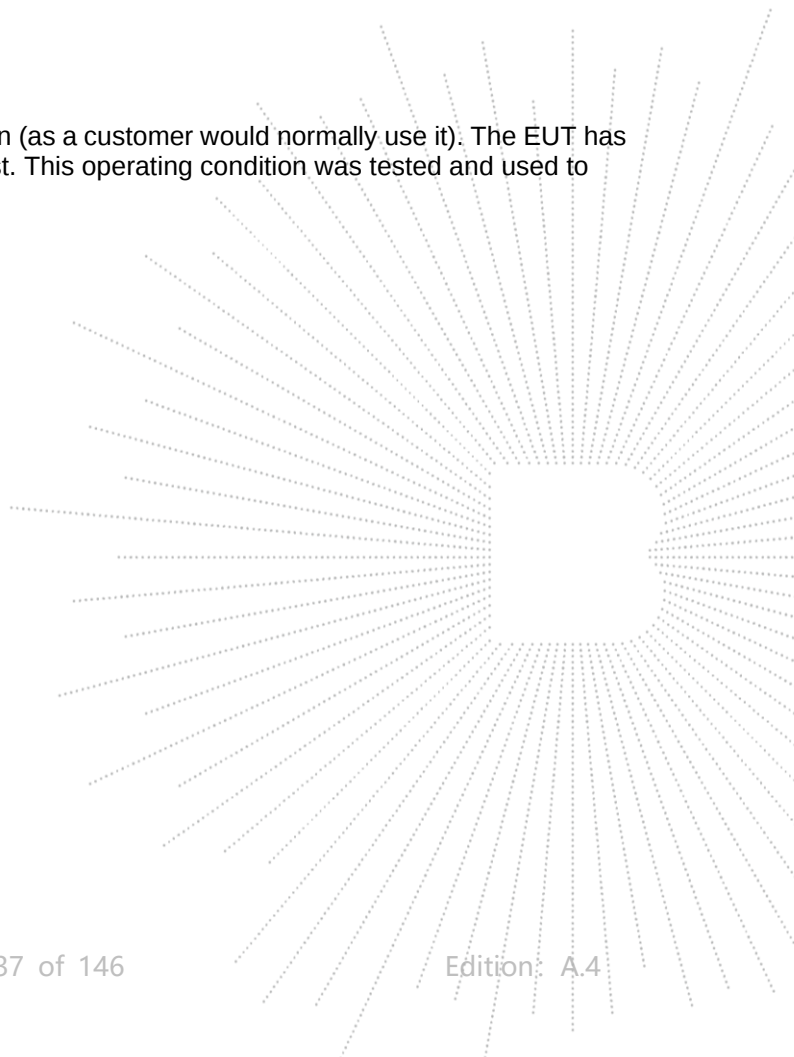
For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

- a) Set $RBW \geq 1/T$, where T is defined in section II.B.I.a).
- b) Set $VBW \geq 3 RBW$.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10\log(500\text{kHz}/RBW)$ to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10\log(1\text{MHz}/RBW)$ to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHz is available on nearly all spectrum analyzers.

8.4 EUT Operating Conditions

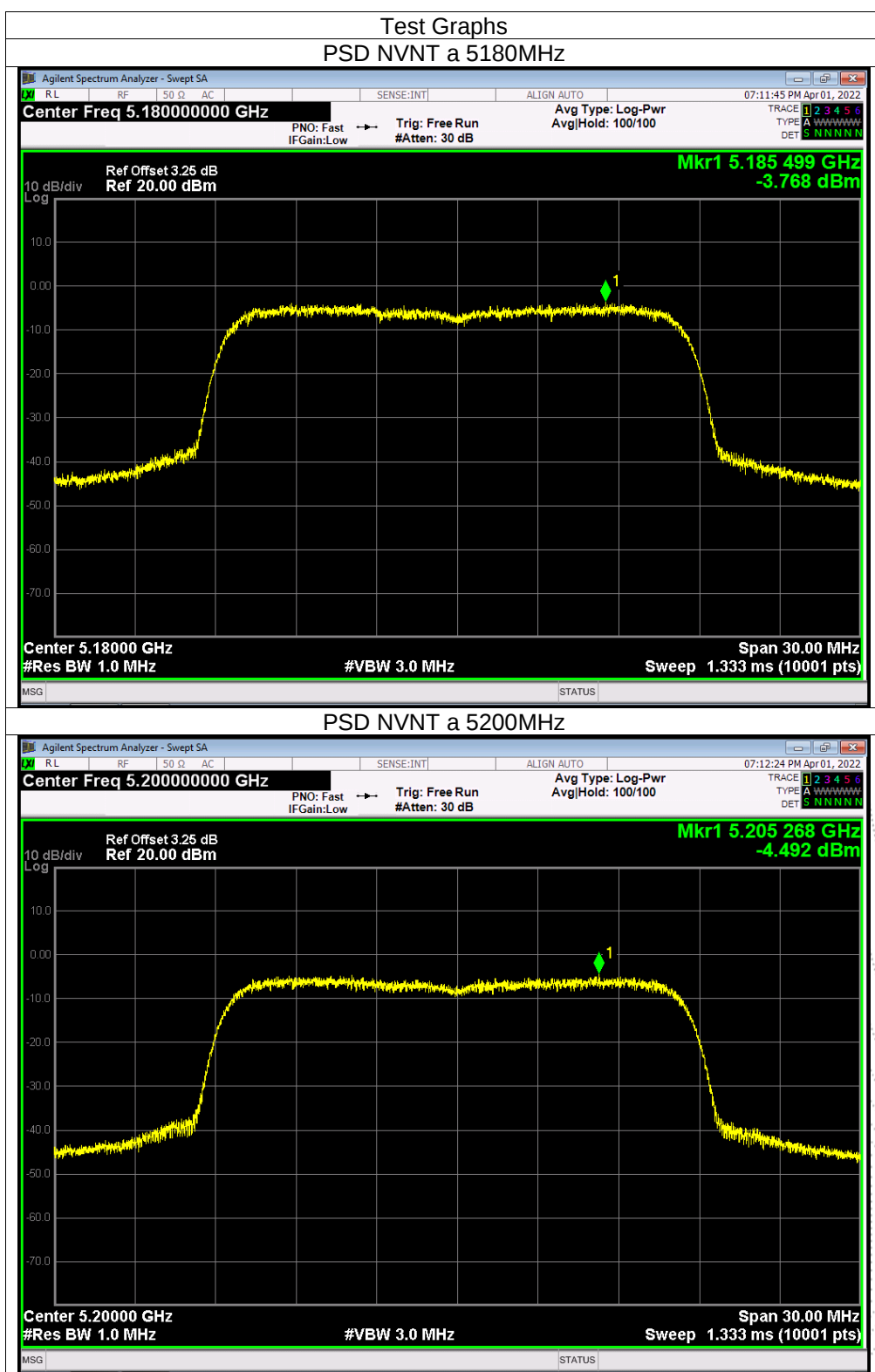
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

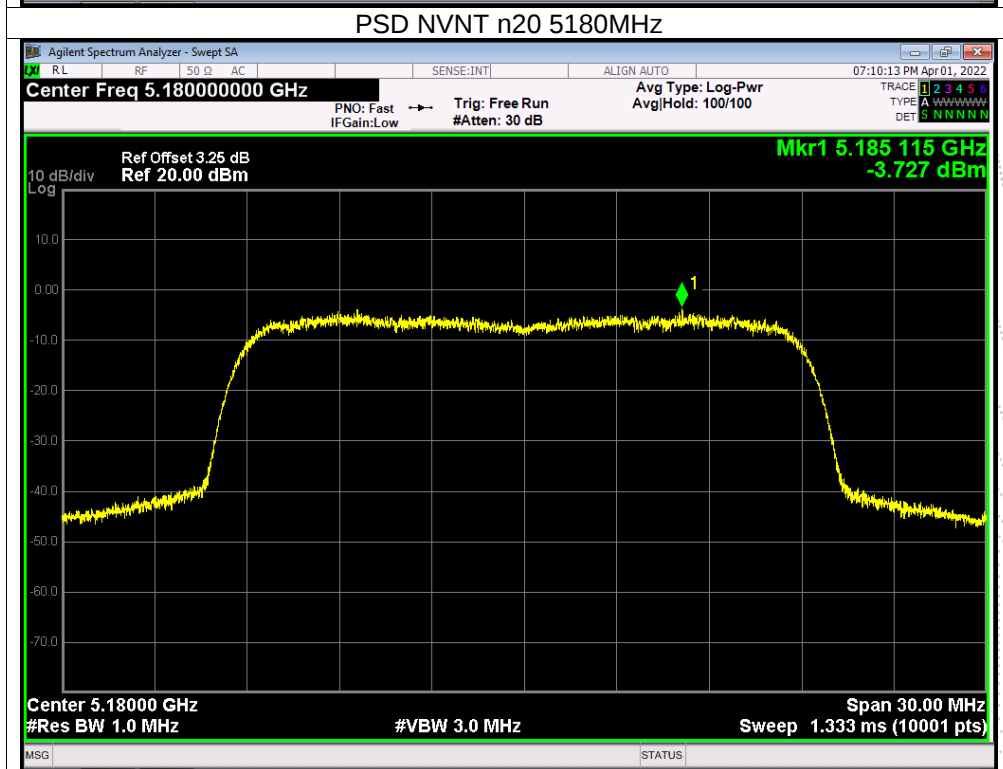
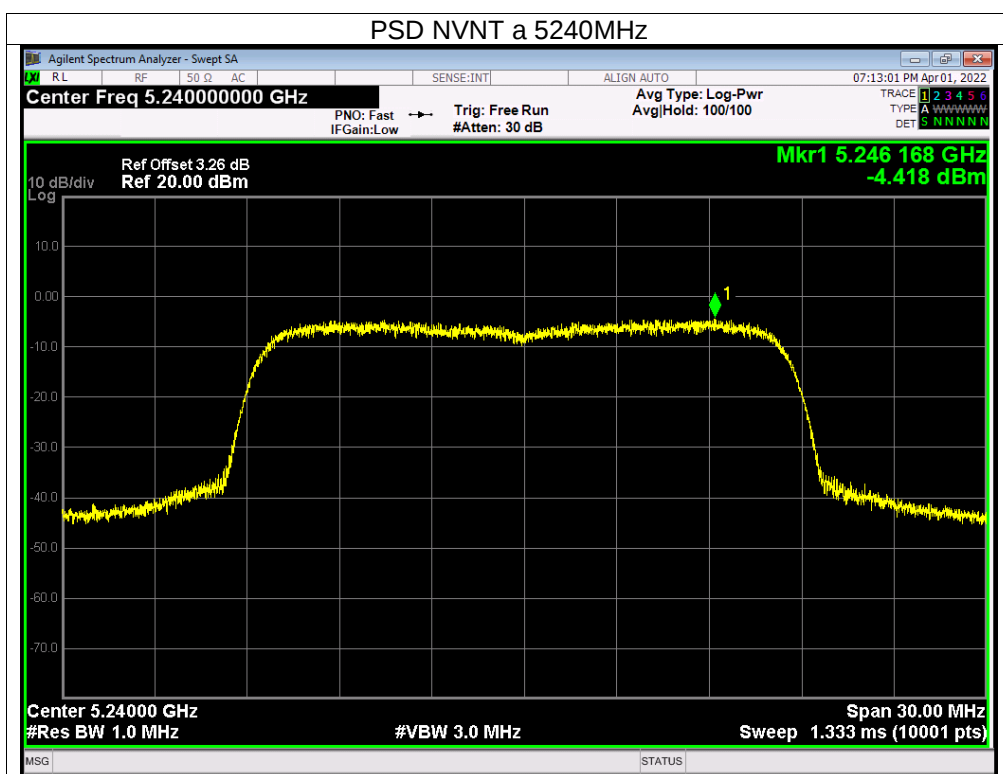


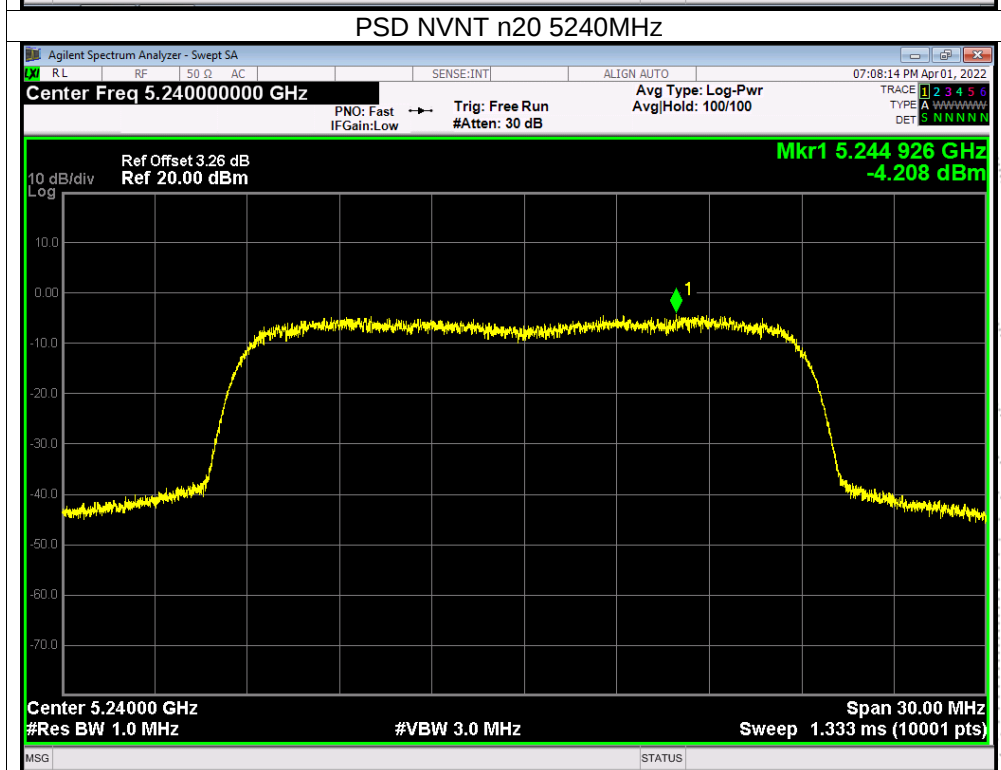
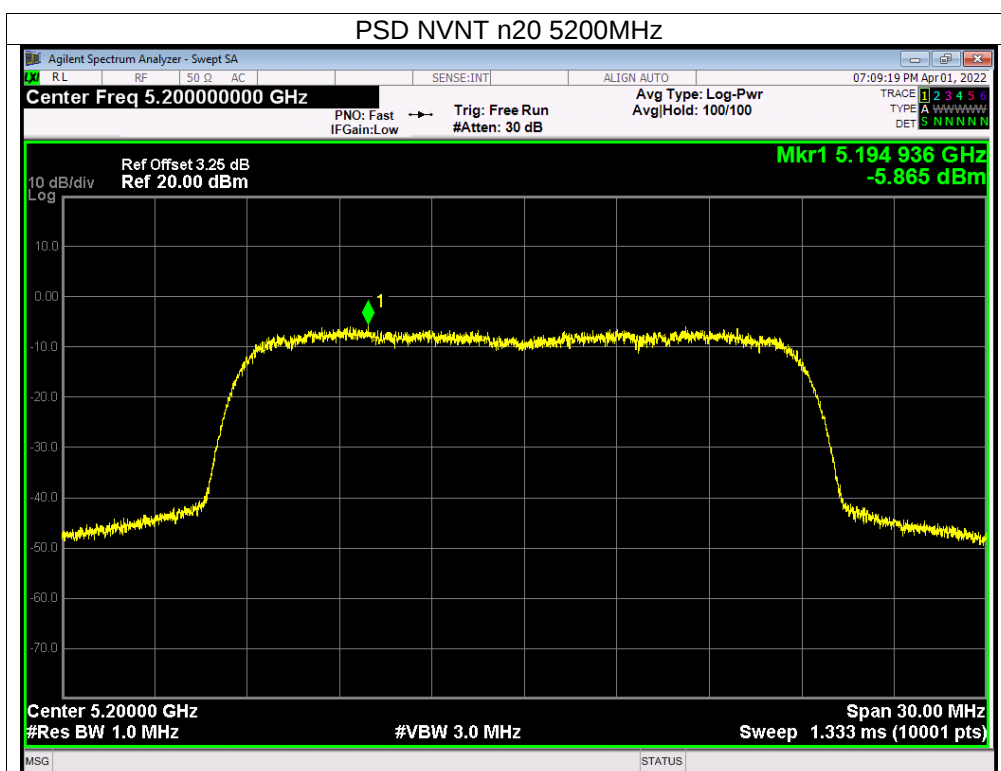
8.5 Test Result

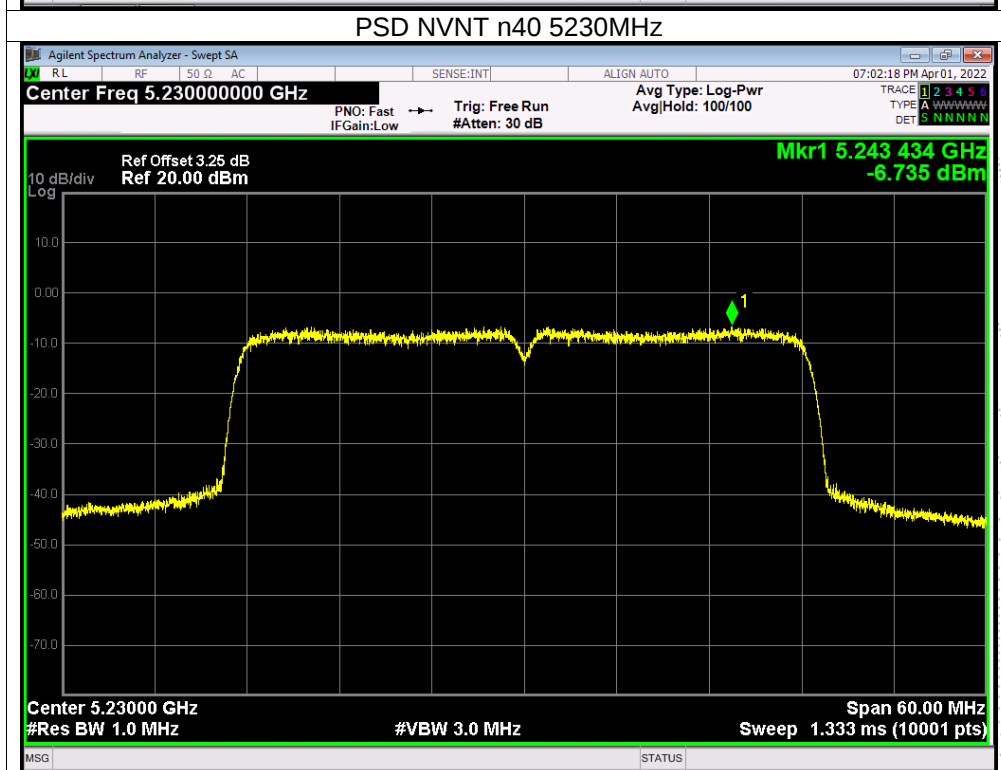
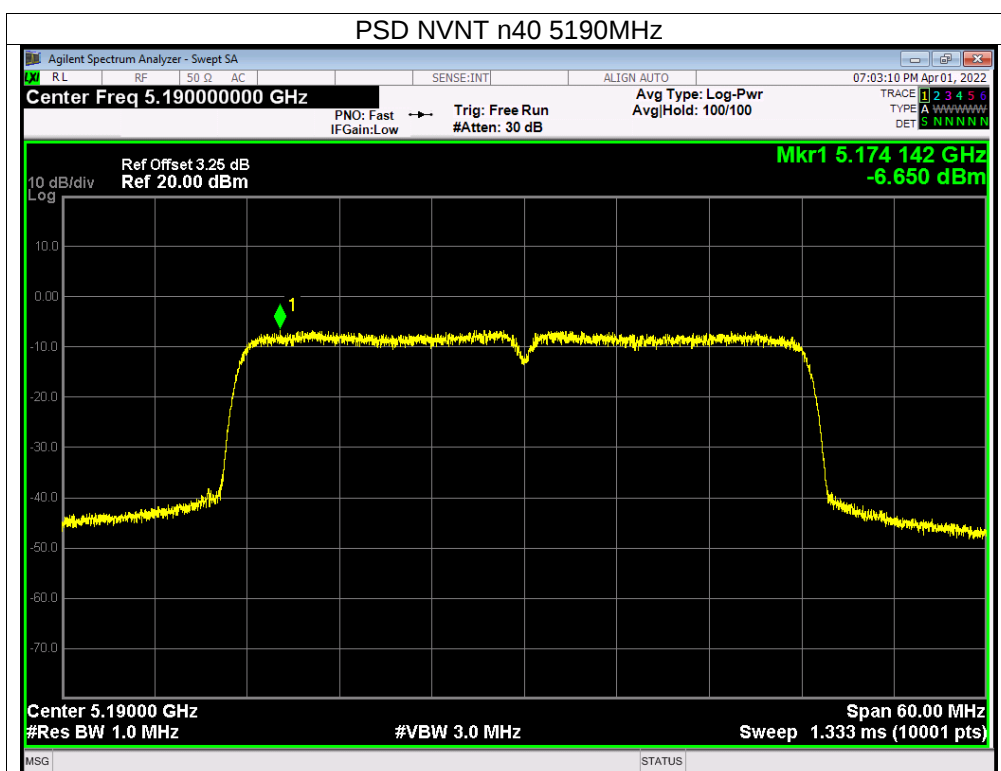
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Frequency U-NII-1 (5180-5240MHz)		

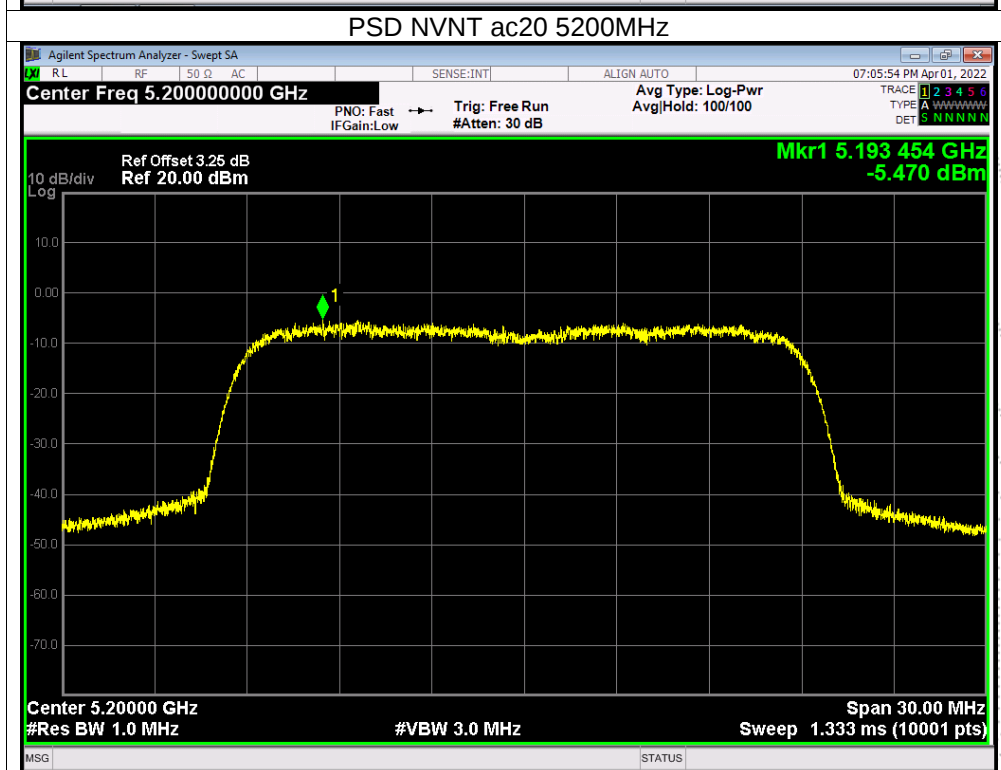
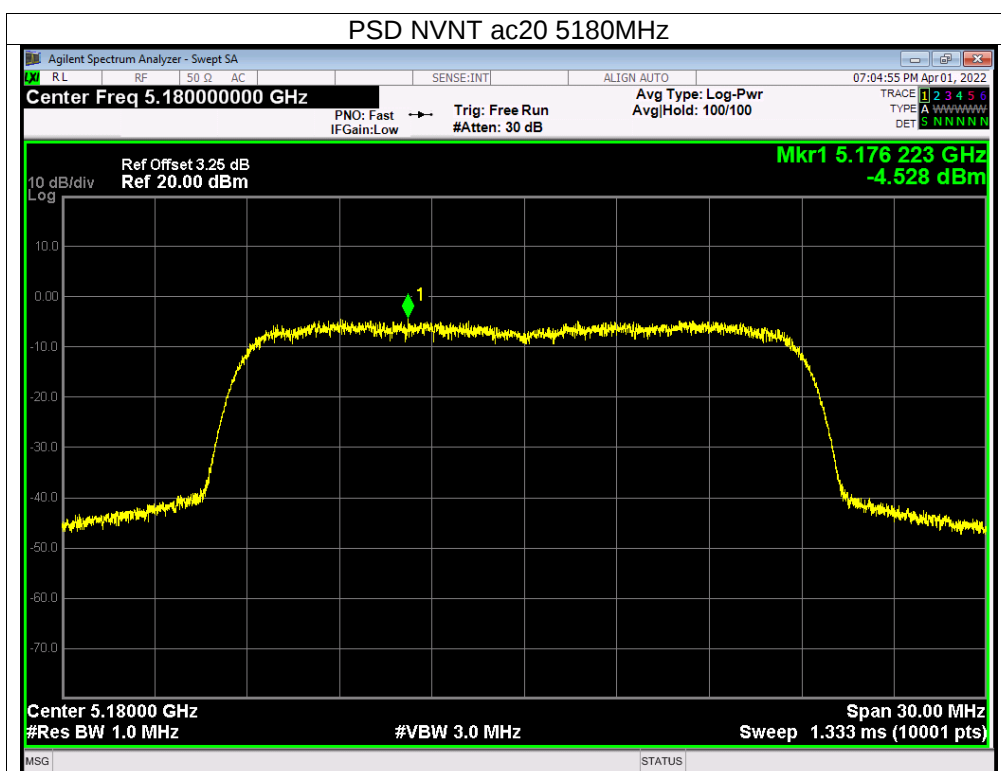
Test Mode	Frequency	Measured Power Density (dBm/MHz)	Limit (dBm/MHz)	Result
802.11 a	5180 MHz	-3.77	11	PASS
	5200 MHz	-4.49	11	PASS
	5240 MHz	-4.42	11	PASS
802.11 n20	5180 MHz	-3.73	11	PASS
	5200 MHz	-5.87	11	PASS
	5240 MHz	-4.21	11	PASS
802.11 n40	5190 MHz	-6.65	11	PASS
	5230 MHz	-6.74	11	PASS
802.11 AC20	5180 MHz	-4.53	11	PASS
	5200 MHz	-5.47	11	PASS
	5240 MHz	-4.1	11	PASS
802.11 AC40	5190 MHz	-7.41	11	PASS
	5230 MHz	-8.2	11	PASS
802.11 AC80	5210 MHz	-10.44	11	PASS

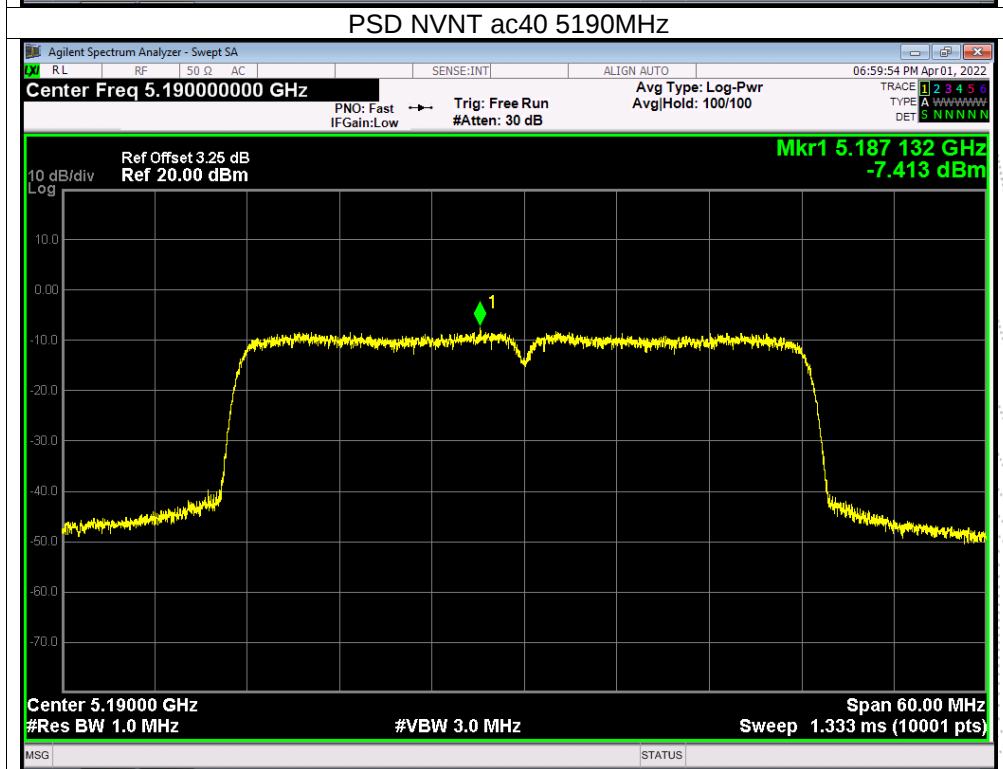
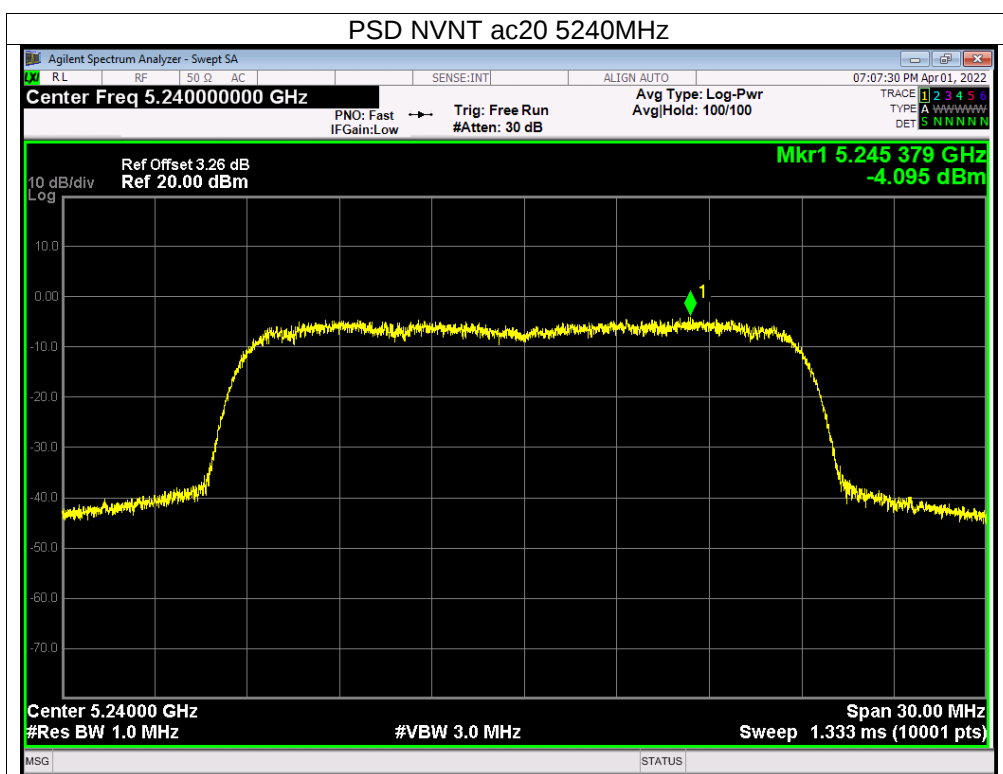


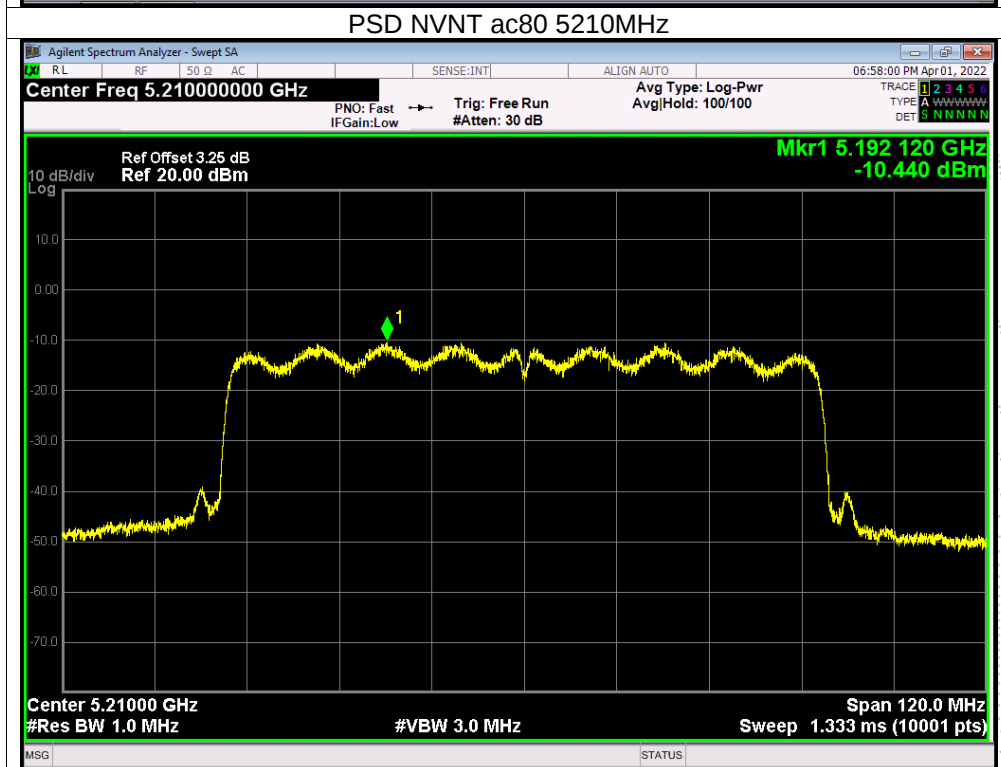
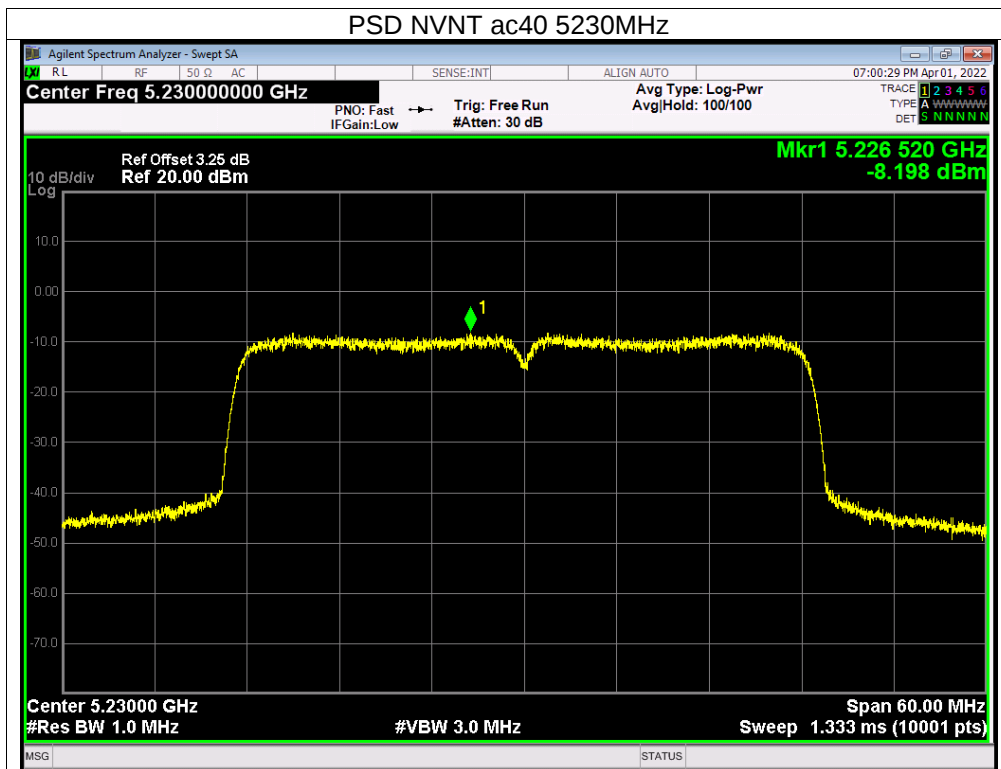






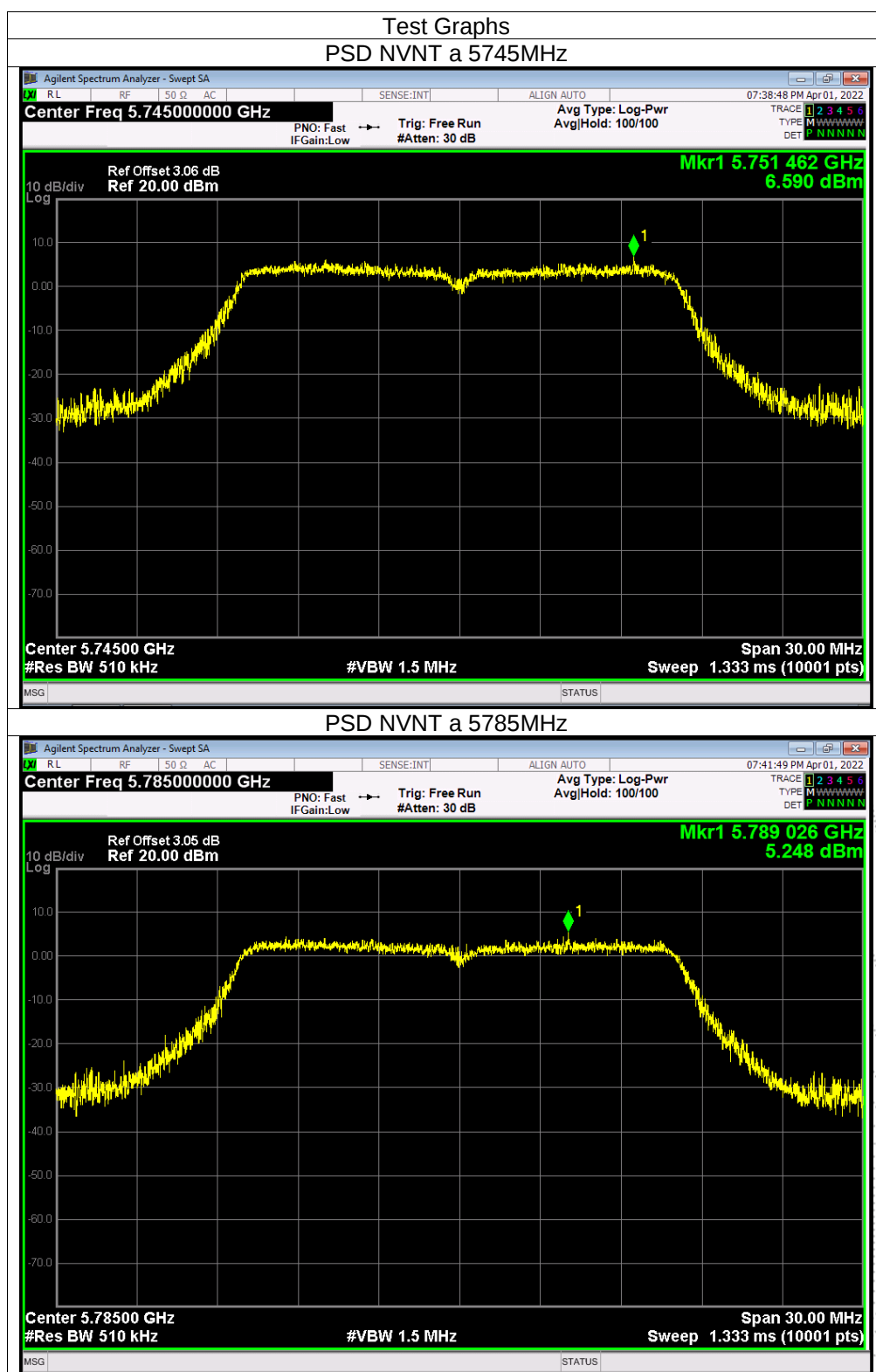


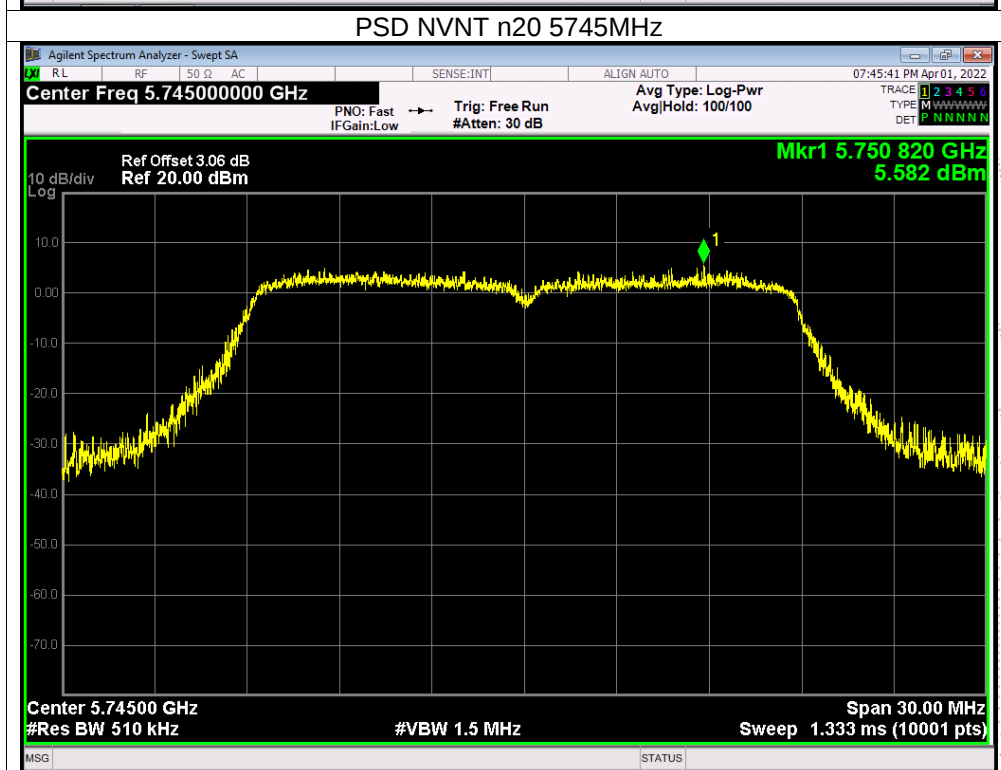
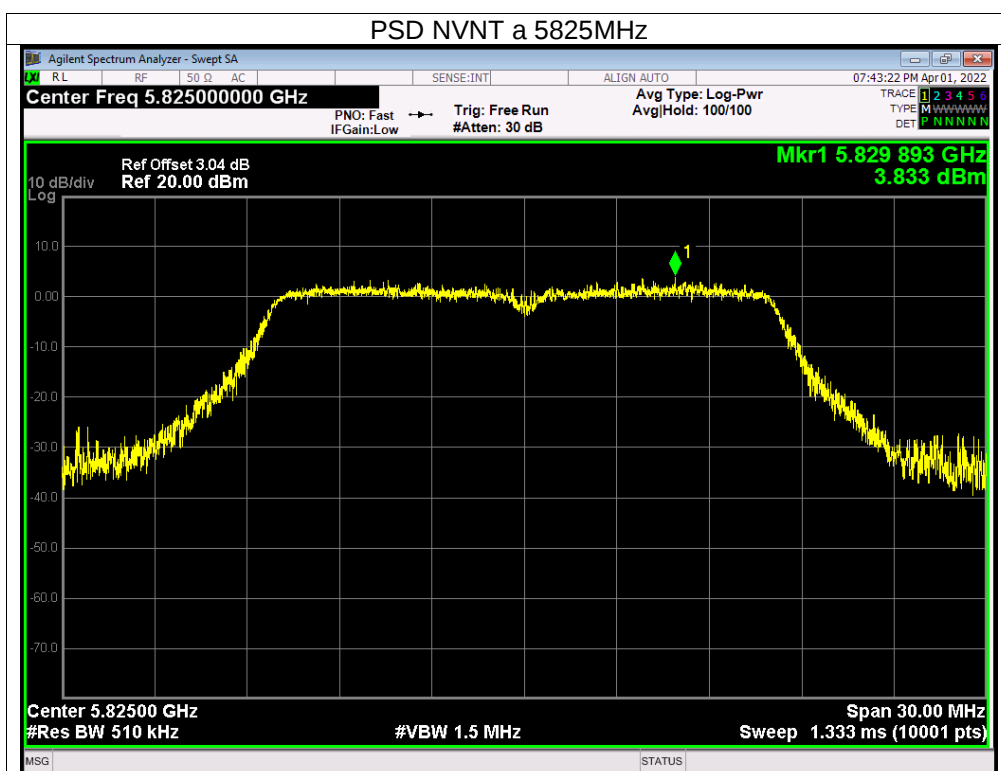


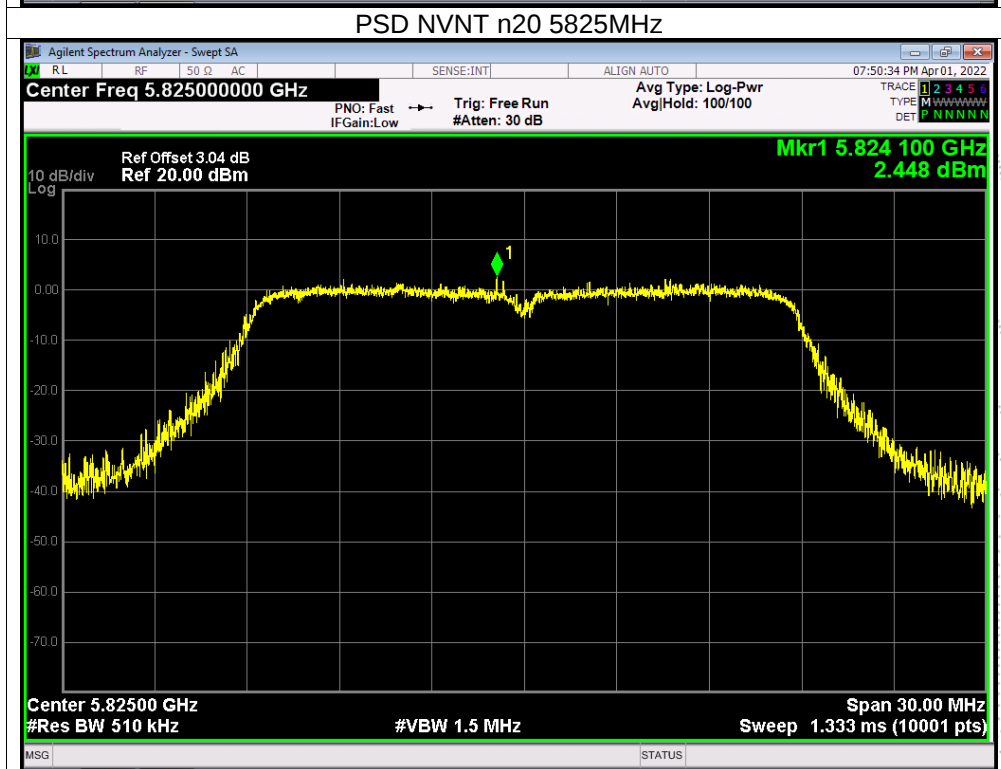
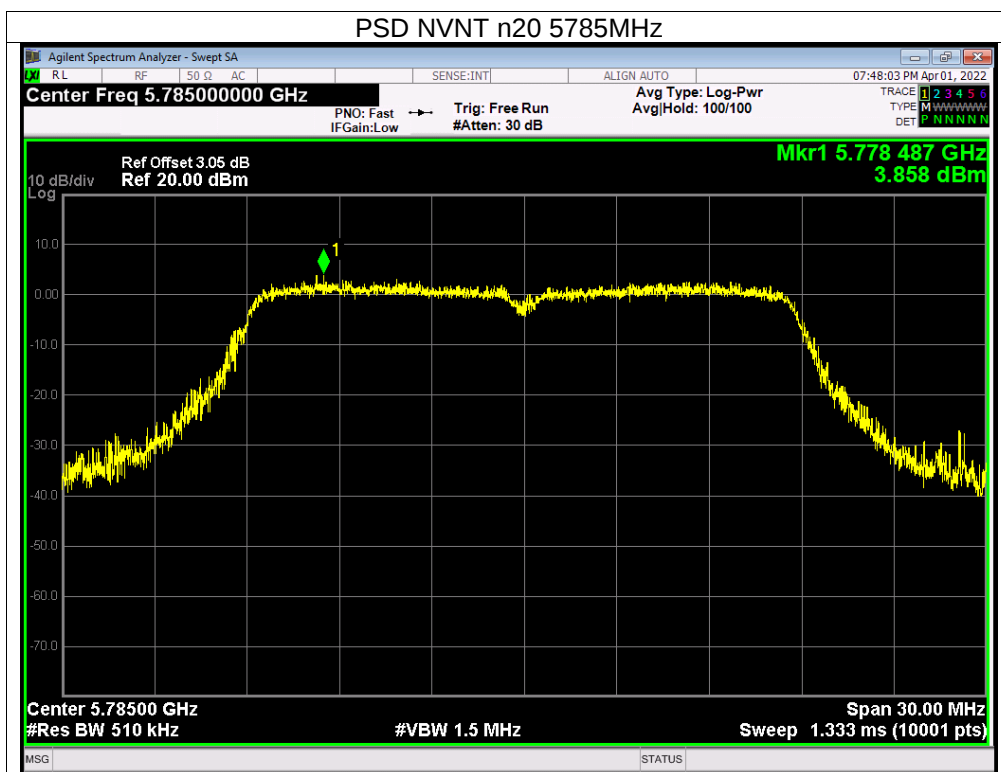


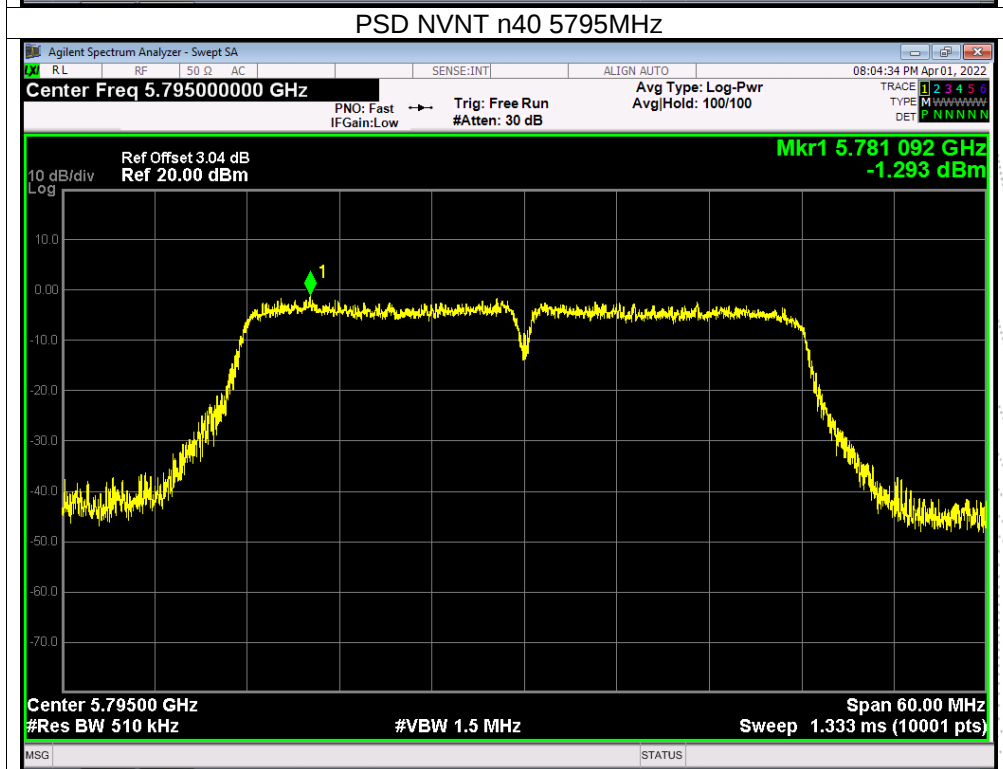
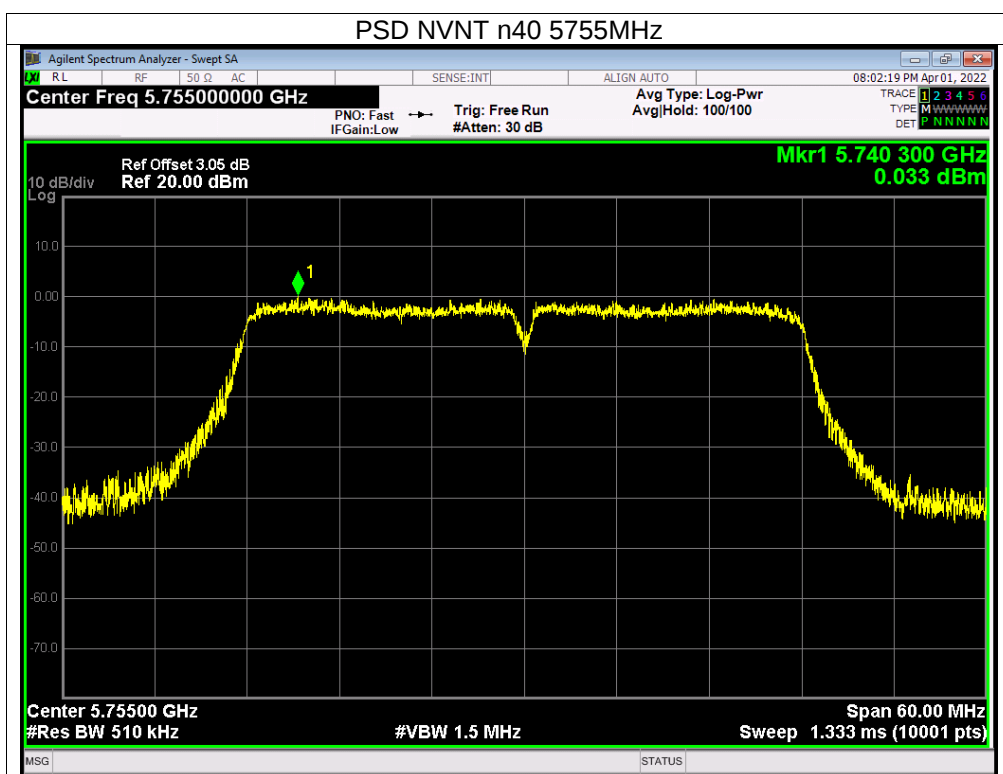
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Frequency U-NII-3 (5745-5825MHz)		

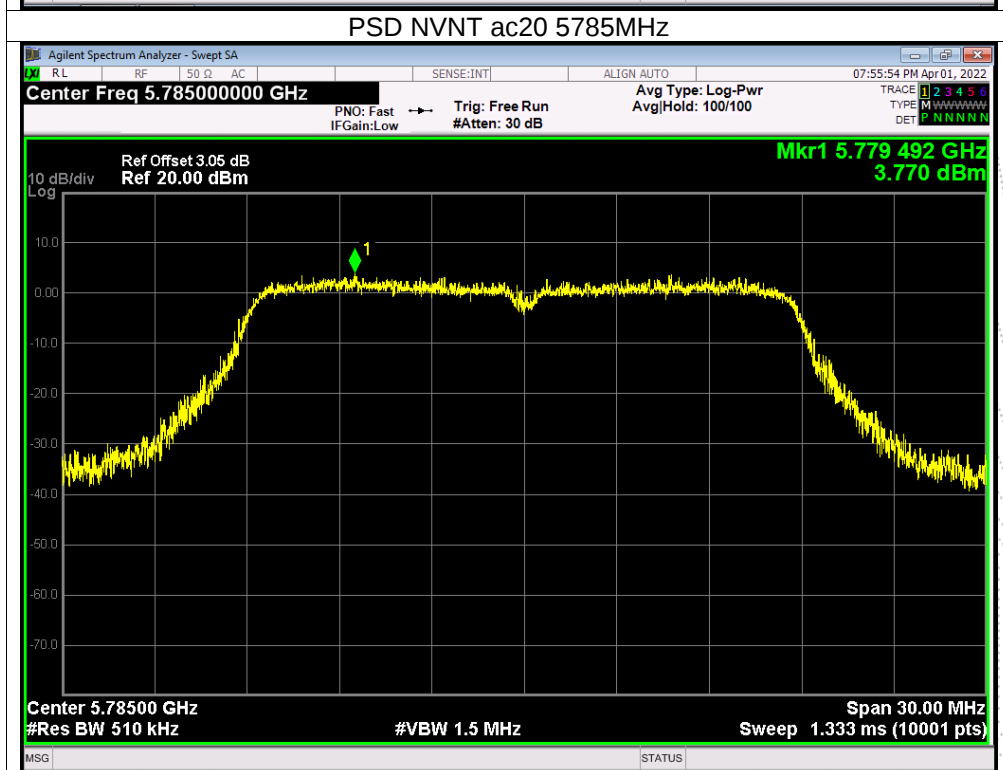
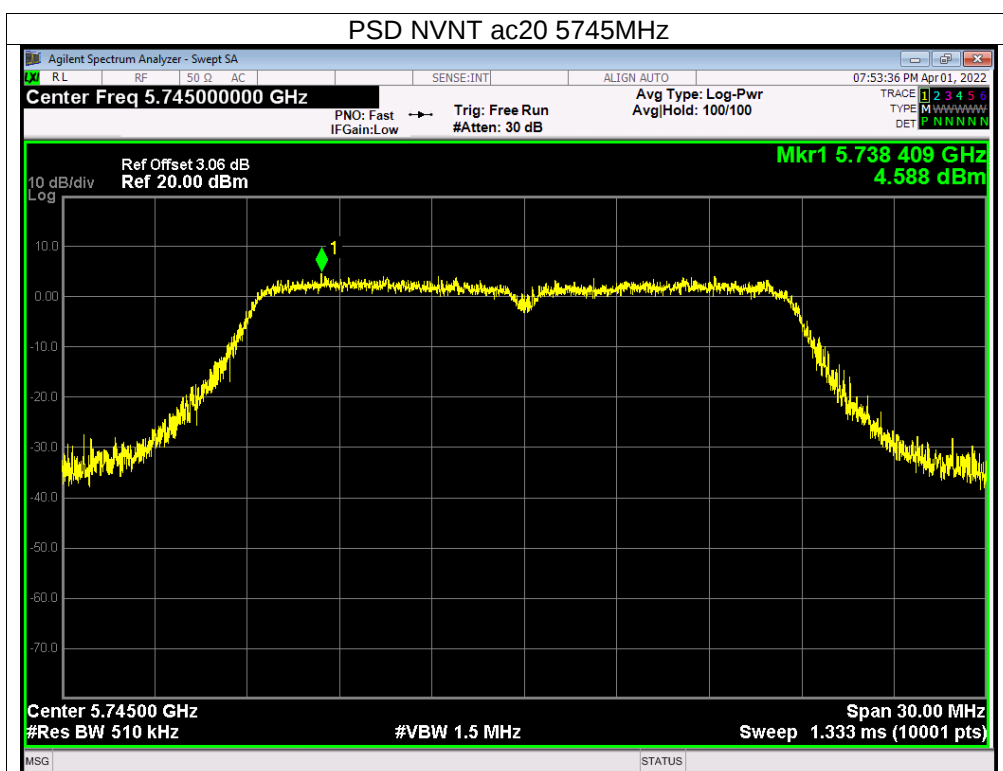
Mode	Frequency	Measured Power Density (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11 a	5745 MHz	6.59	30	PASS
	5785 MHz	5.25	30	PASS
	5825 MHz	3.83	30	PASS
802.11 n20	5745 MHz	5.58	30	PASS
	5785 MHz	3.86	30	PASS
	5825 MHz	2.45	30	PASS
802.11 n40	5755 MHz	0.03	30	PASS
	5795 MHz	-1.29	30	PASS
802.11 AC20	5745 MHz	4.59	30	PASS
	5785 MHz	3.77	30	PASS
	5825 MHz	1.09	30	PASS
802.11 AC40	5755 MHz	-0.05	30	PASS
	5795 MHz	-1.26	30	PASS
802.11 AC80	5775 MHz	-1.49	30	PASS

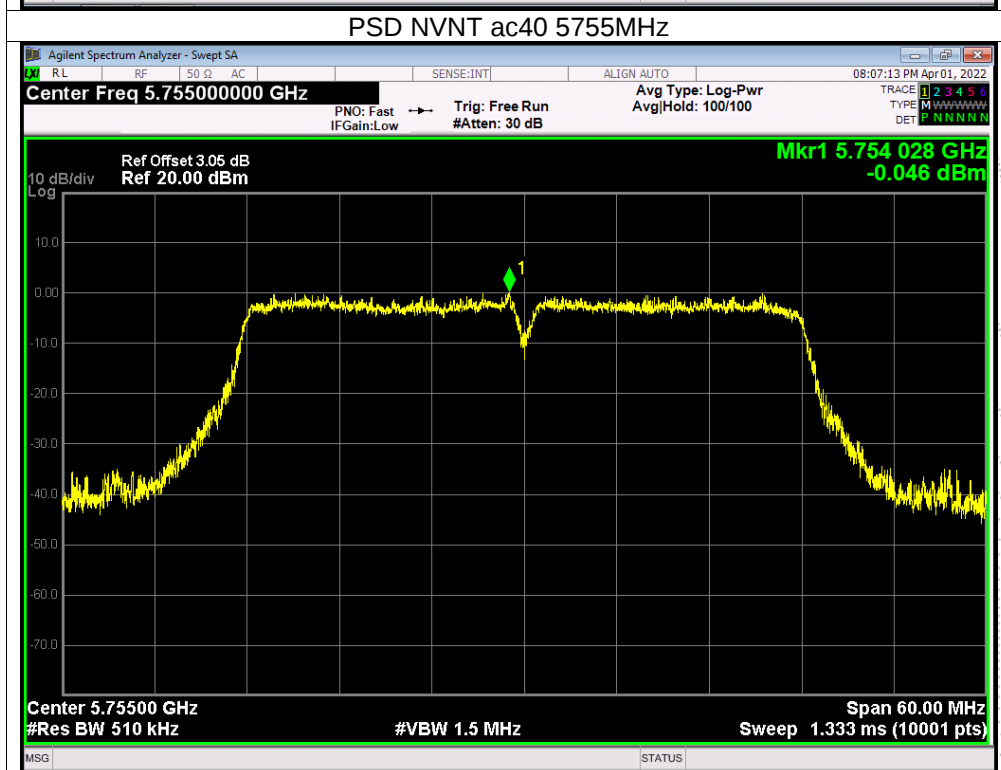
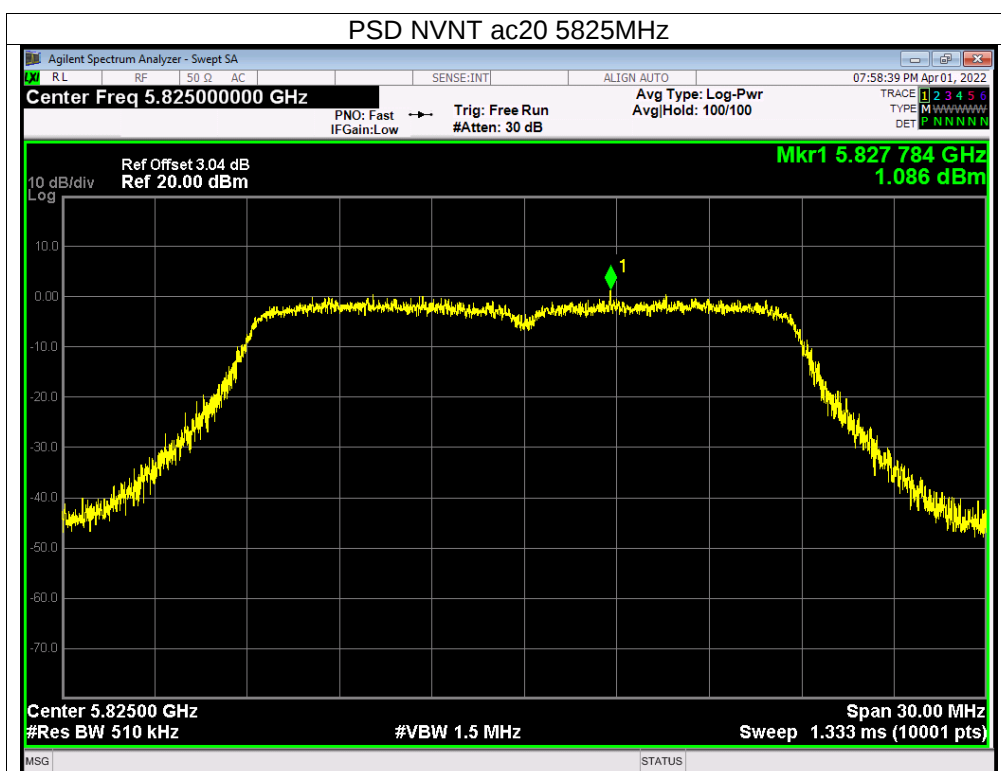


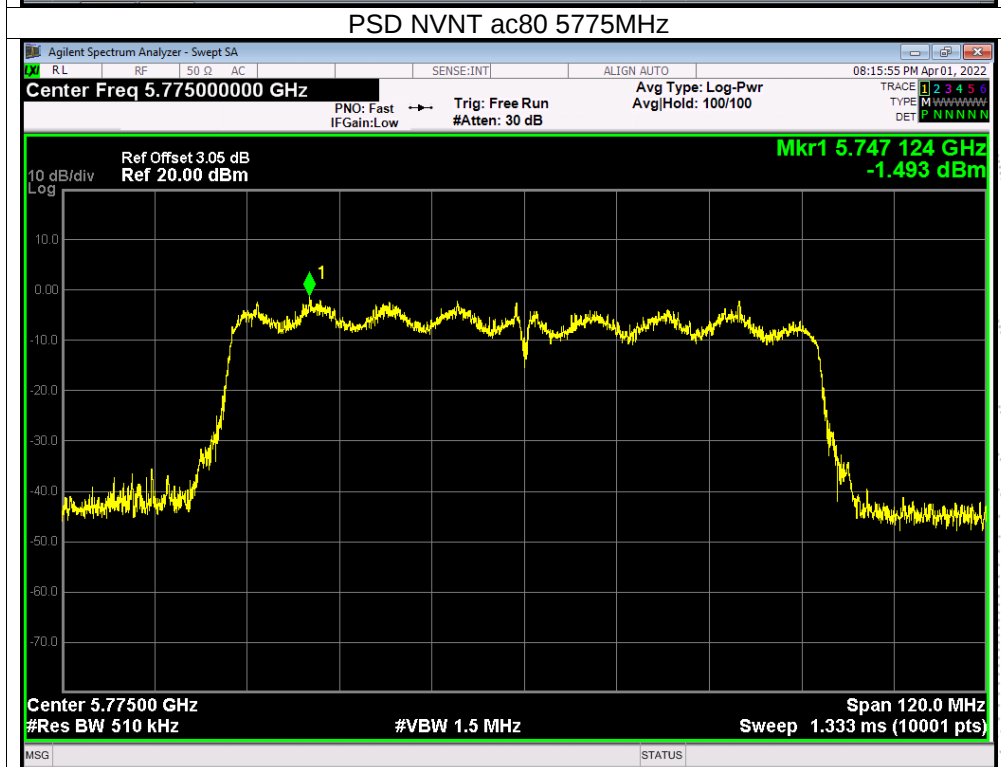
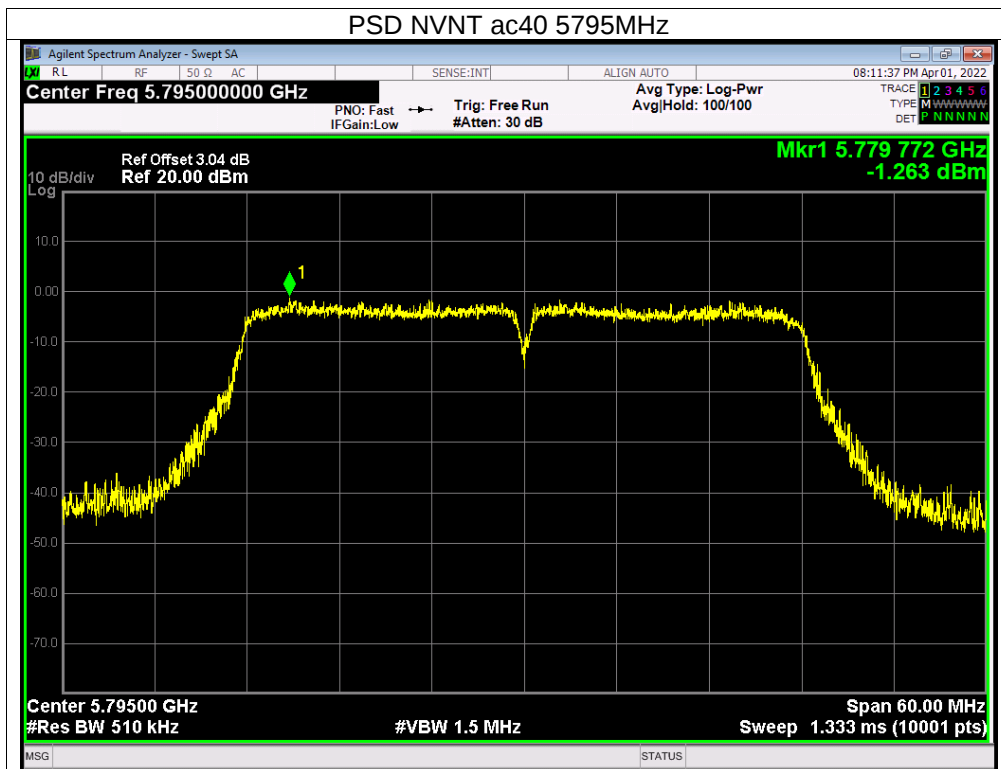






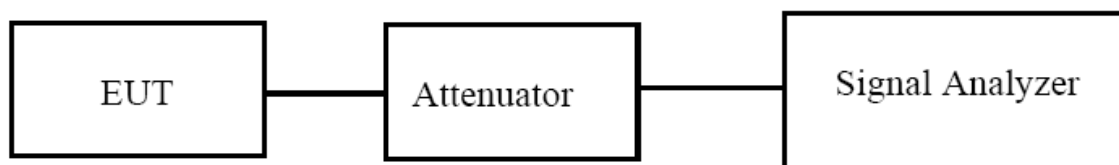






9. 26dB & 6dB & 99% Emission Bandwidth

9.1 Block Diagram Of Test Setup



9.2 Limit

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

9.3 Test Procedure

a) Set RBW = approximately 1% of the emission bandwidth.

b) Set the VBW > RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW $\geq 3 \cdot$ RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

9.4 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.

9.5 Test Result

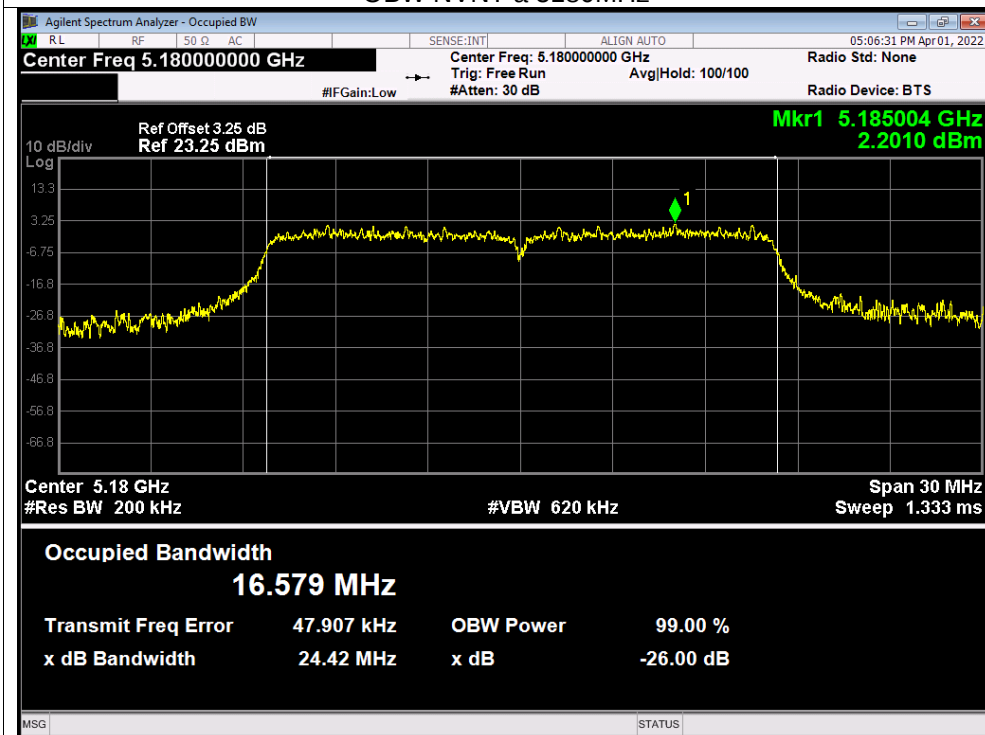
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	AC 120V/60Hz
Test Mode :	TX Frequency U-NII-1 (5180-5240MHz)		

Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	26dB bandwidth(MHz)	Result
802.11a	CH36	5180	16.579	28.133	Pass
	CH40	5200	16.648	28.364	Pass
	CH48	5240	16.721	29.577	Pass
802.11 n20	CH36	5180	17.634	22.162	Pass
	CH40	5200	17.643	25.105	Pass
	CH48	5240	17.667	27.299	Pass
802.11 n40	CH 38	5190	36.071	48.405	Pass
	CH 46	5230	36.128	53.234	Pass
802.11 AC20	CH36	5180	17.63	23.983	Pass
	CH40	5200	17.718	25.944	Pass
	CH48	5240	17.697	26.432	Pass
802.11 AC40	CH 38	5190	36.135	51.047	Pass
	CH 46	5230	36.211	58.426	Pass
802.11 AC80	CH 42	5210	75.164	82.865	Pass

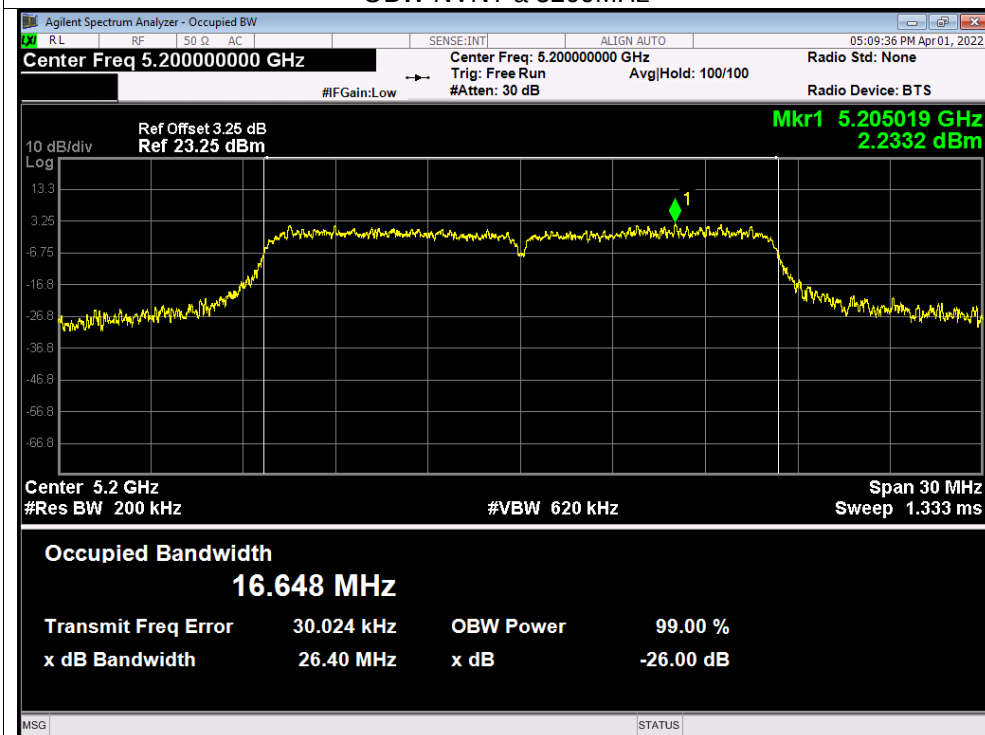
99% OBW

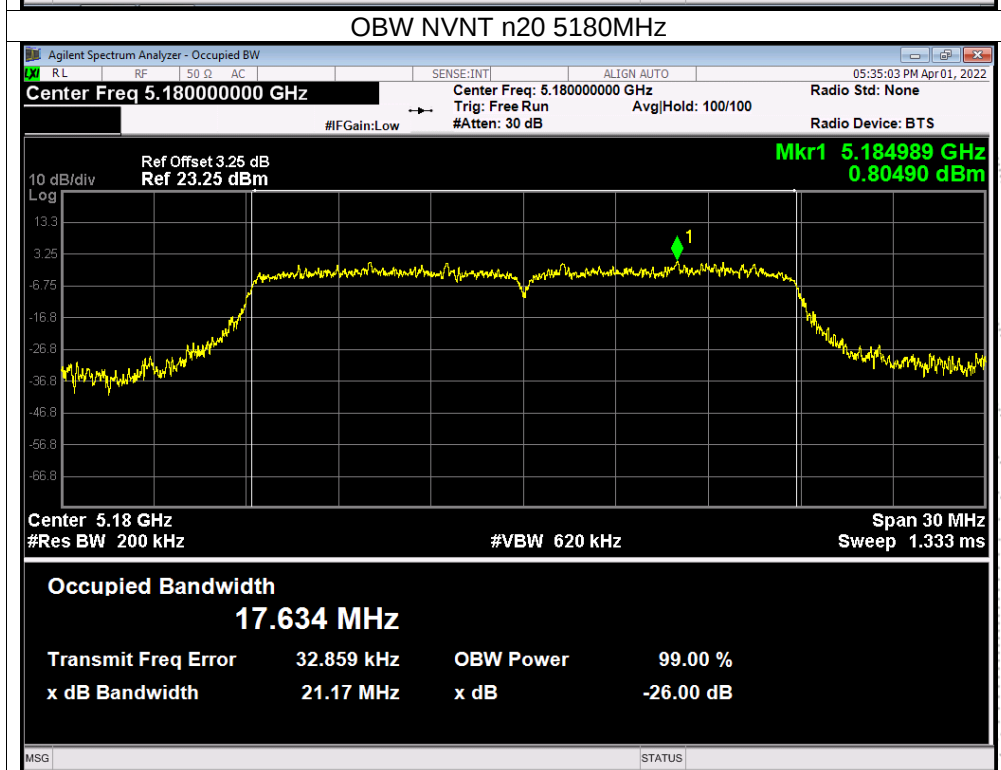
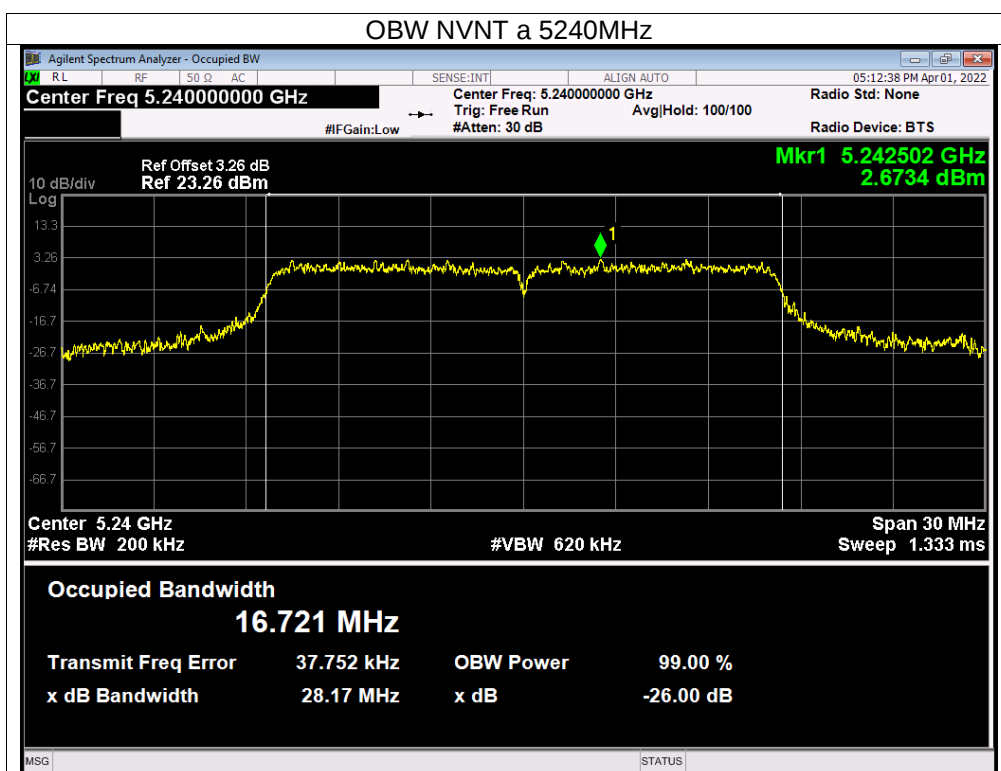
Test Graphs

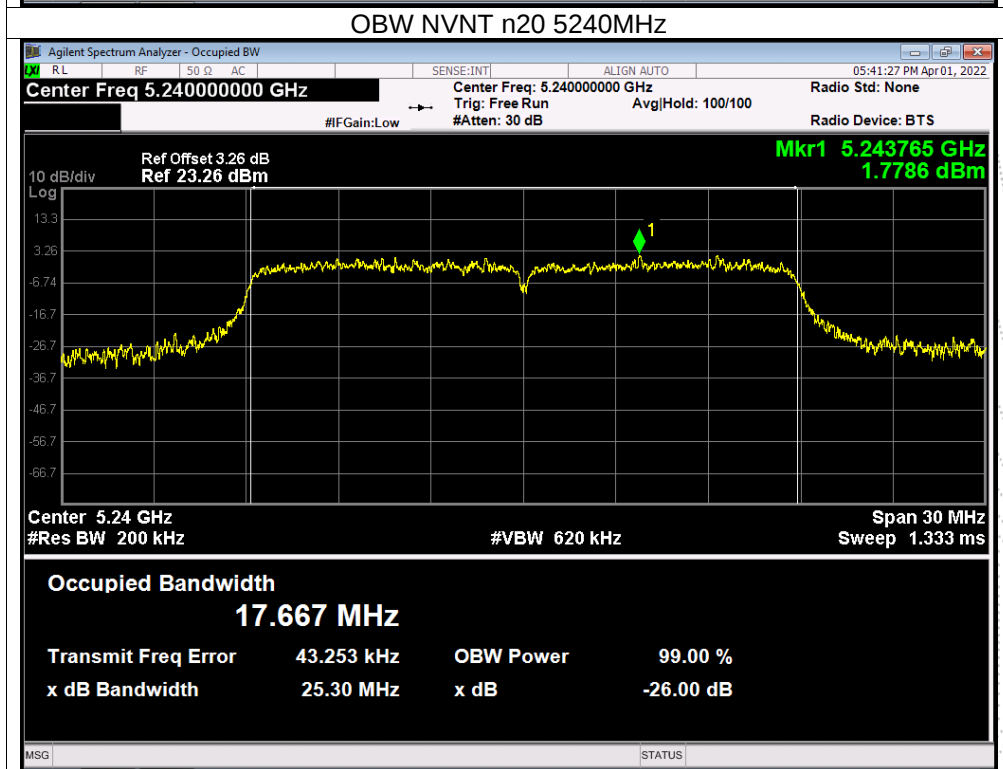
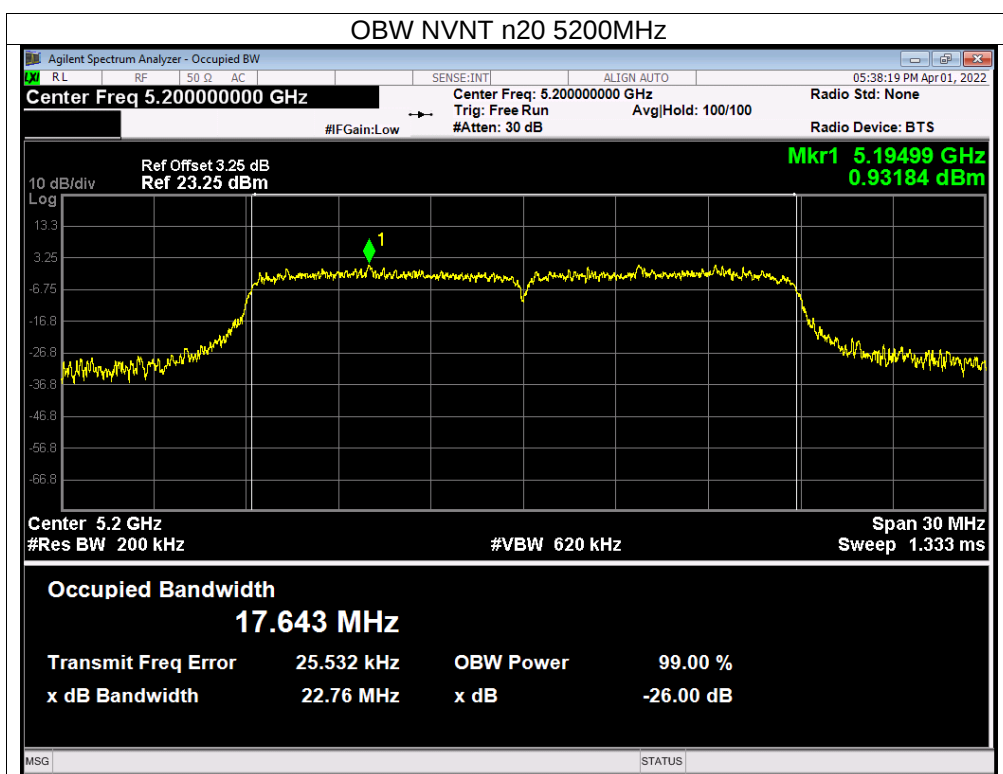
OBW NVNT a 5180MHz

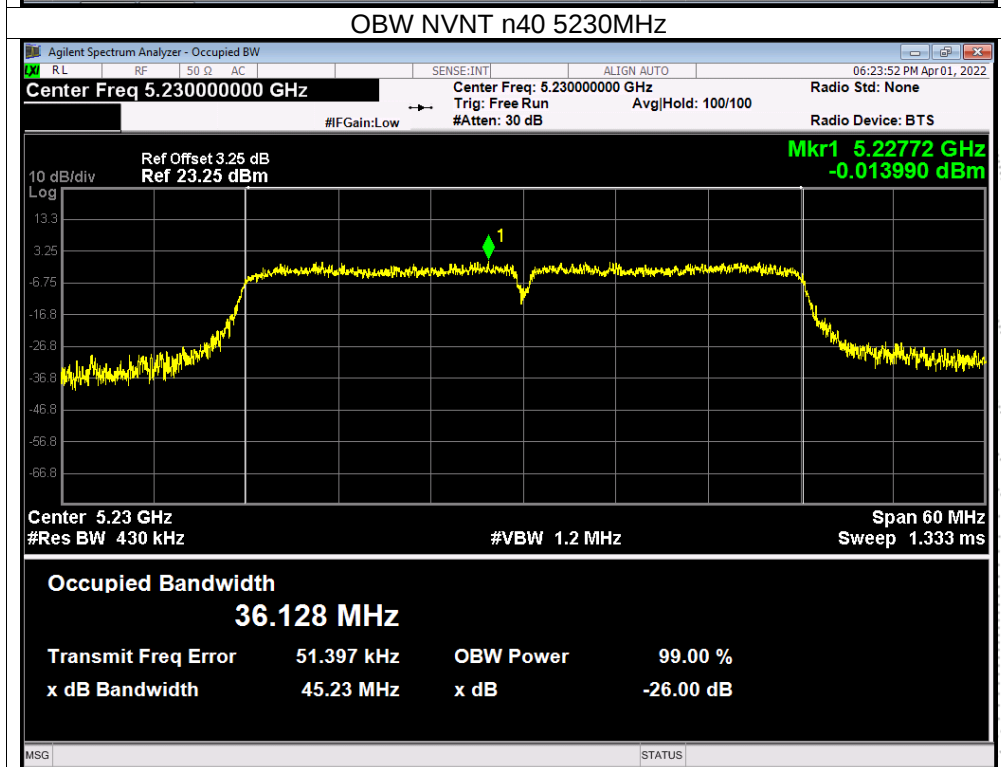
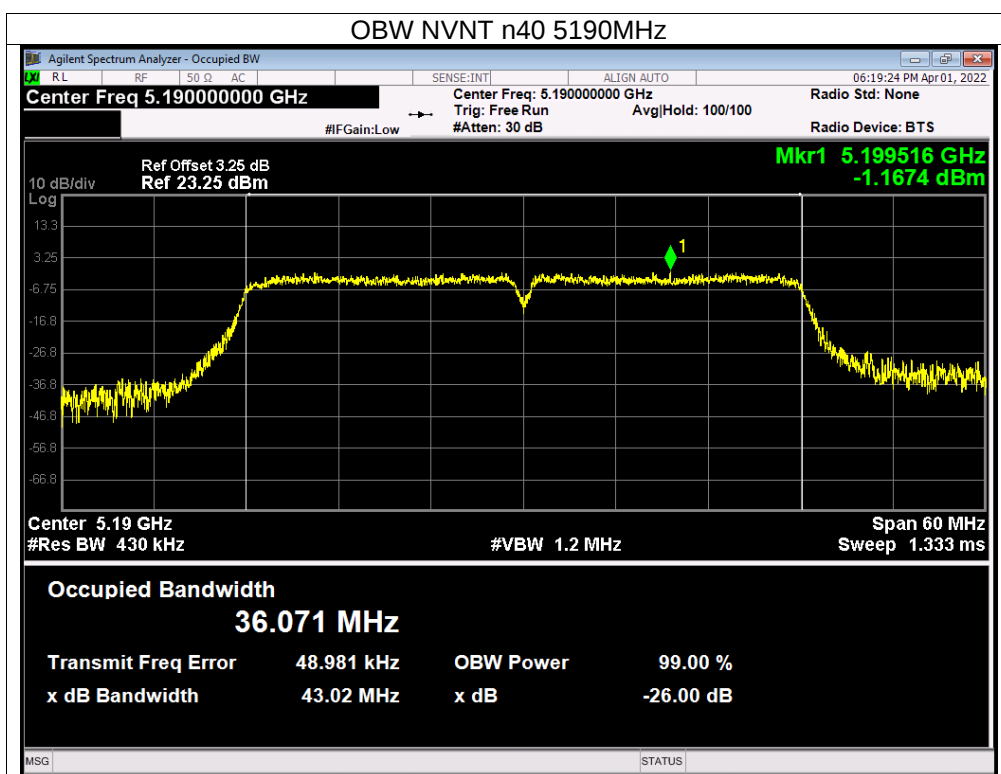


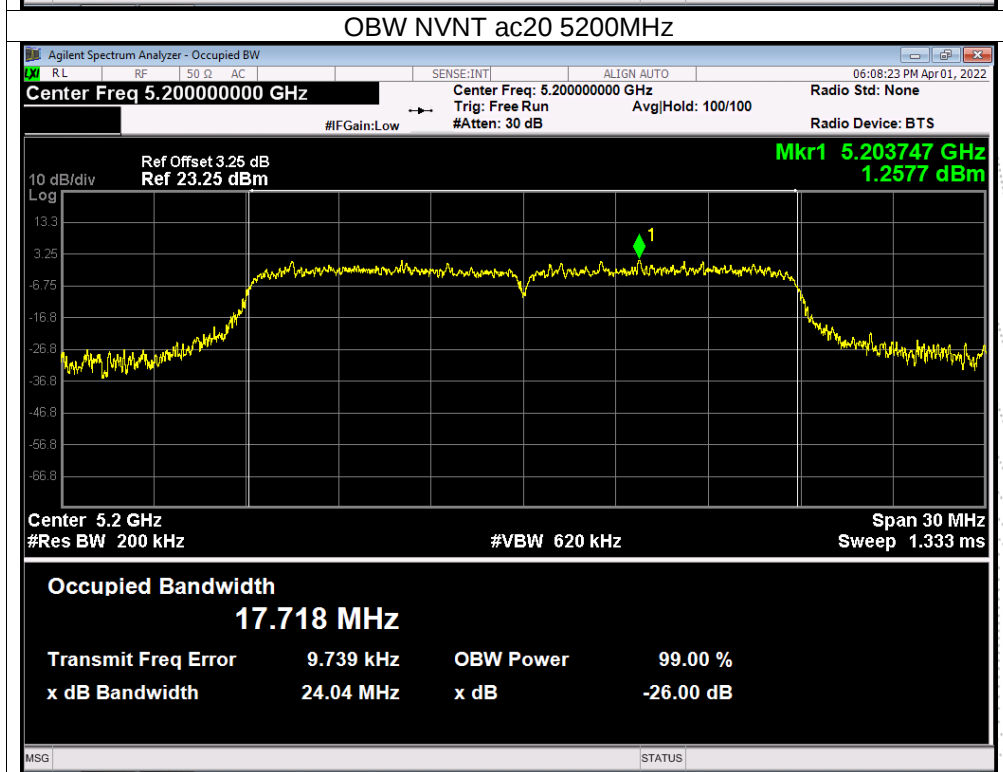
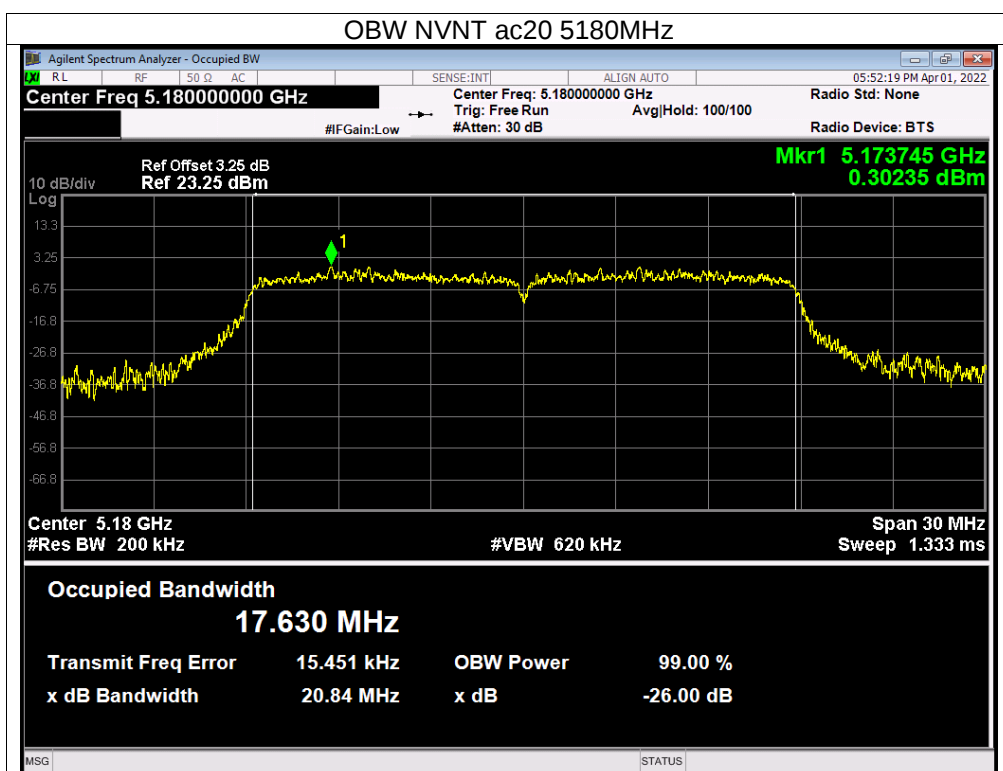
OBW NVNT a 5200MHz

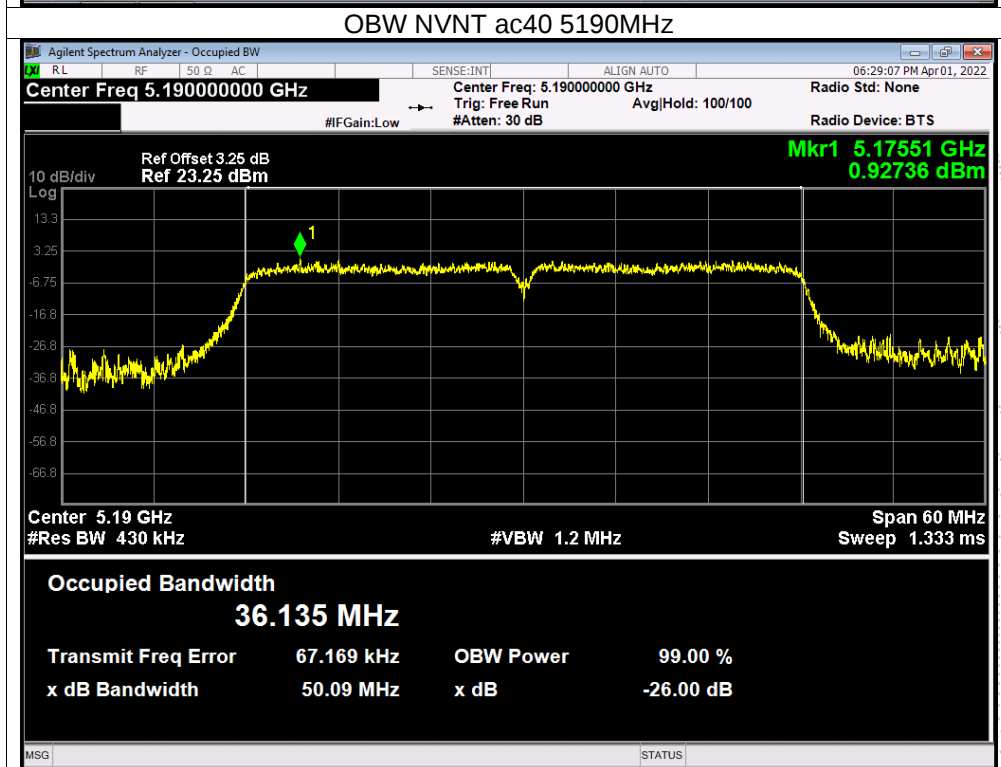
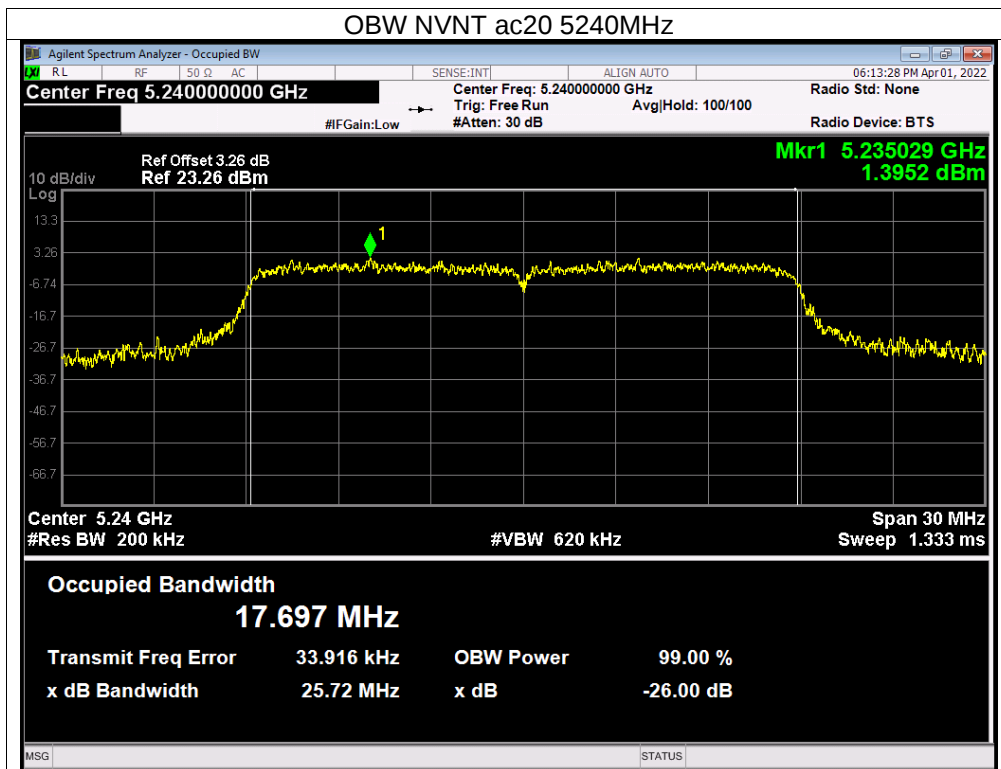


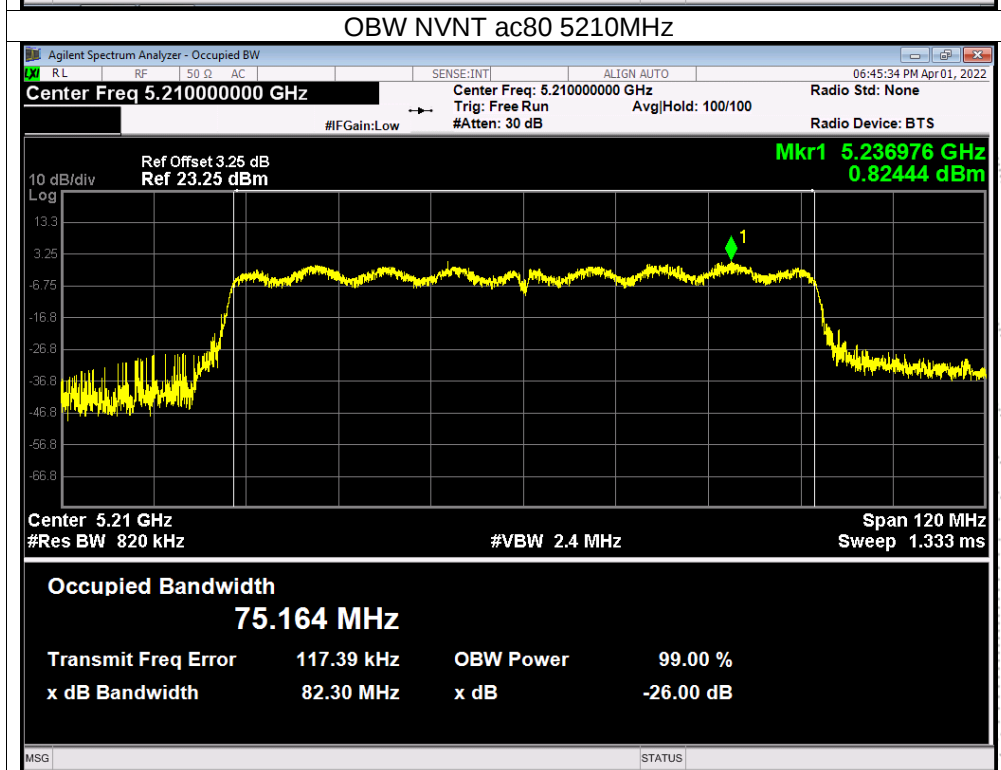
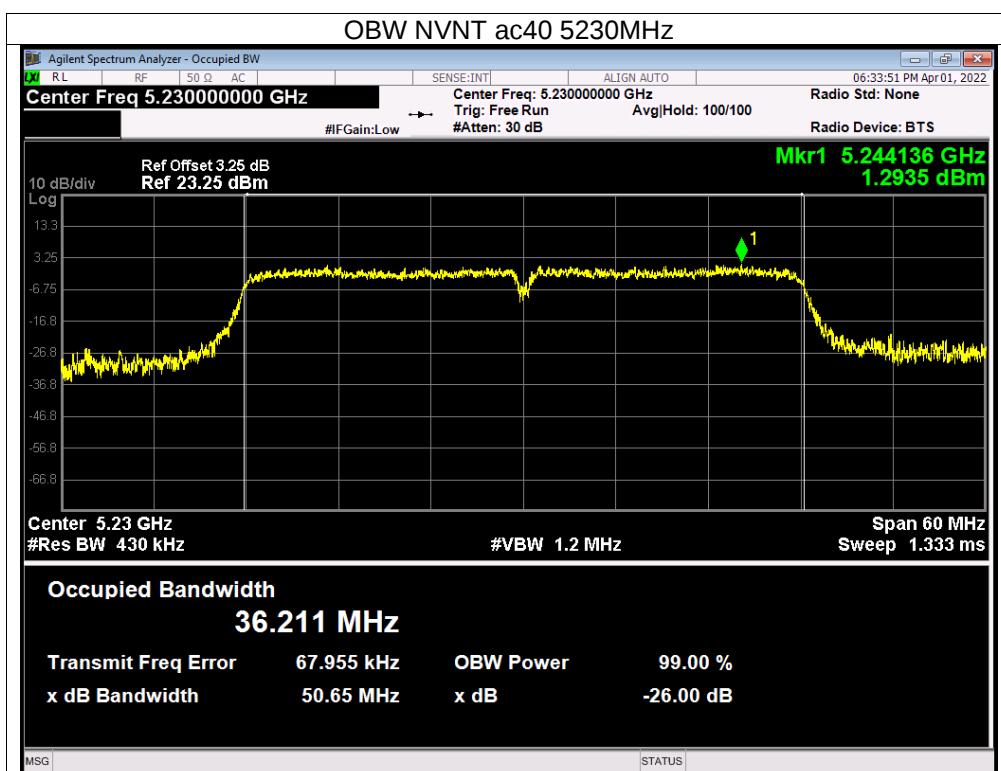








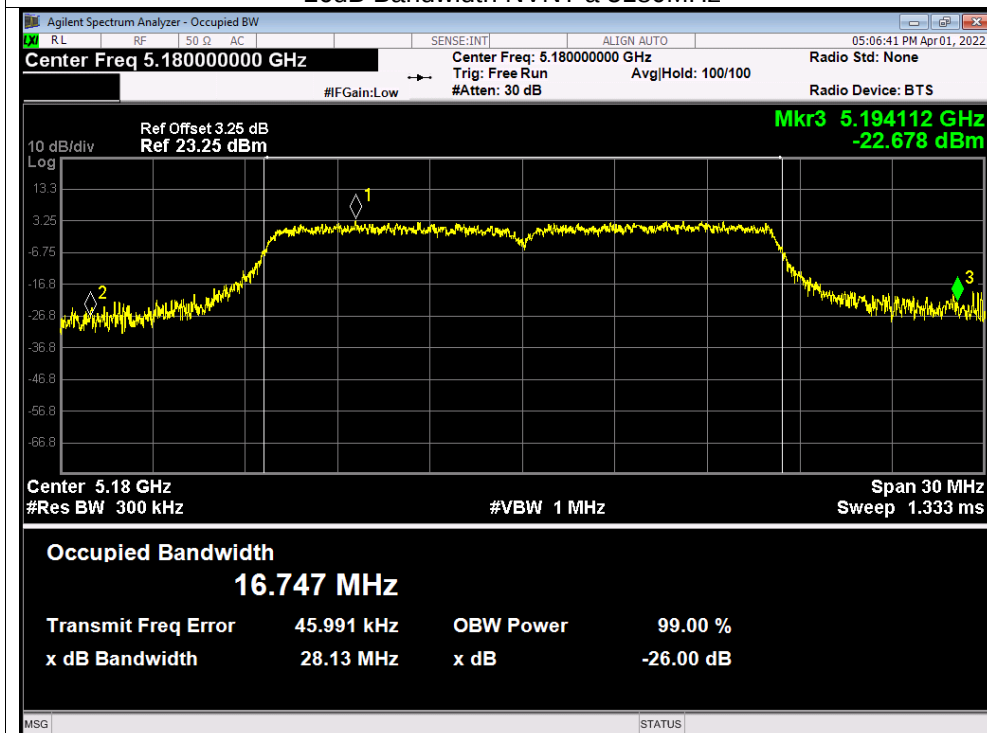




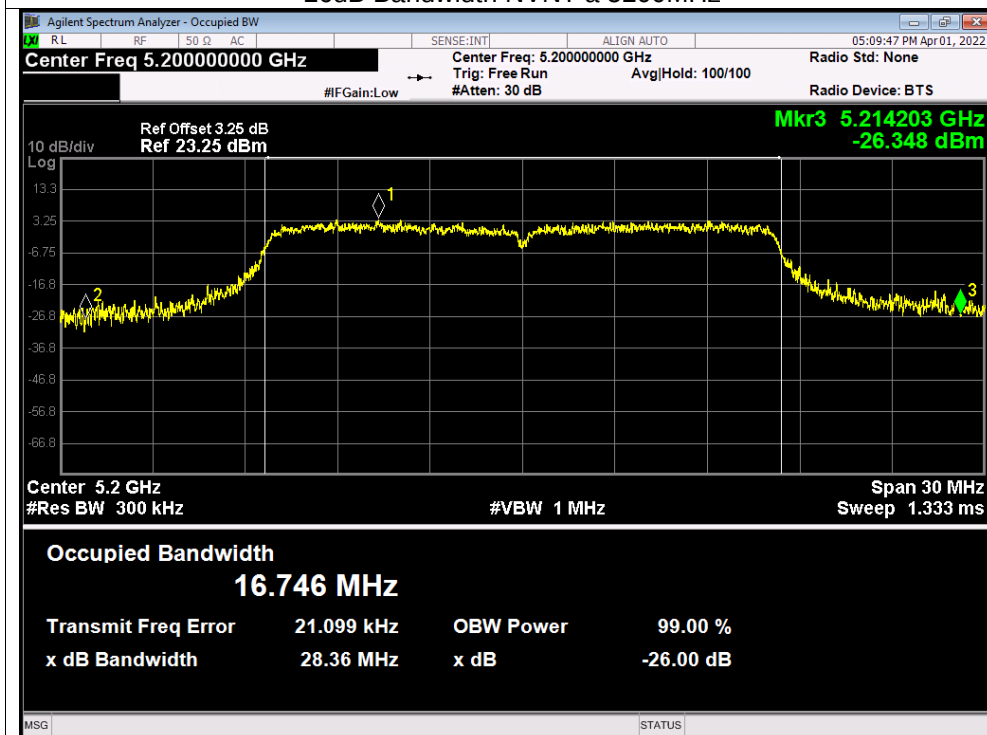
-26dB Bandwidth

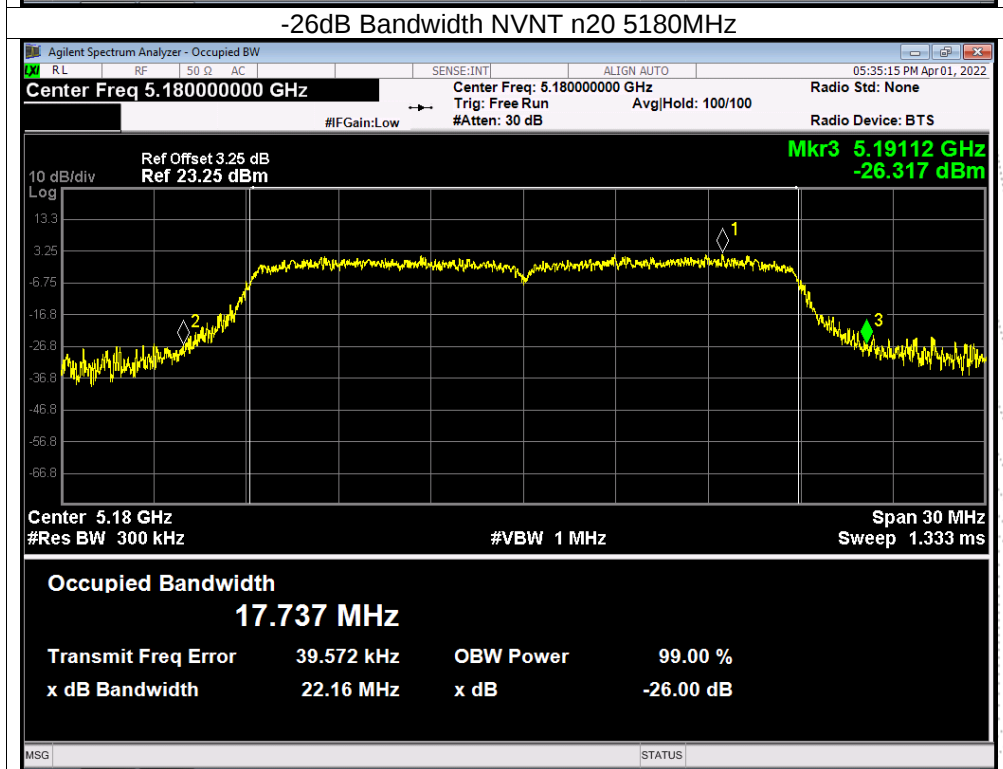
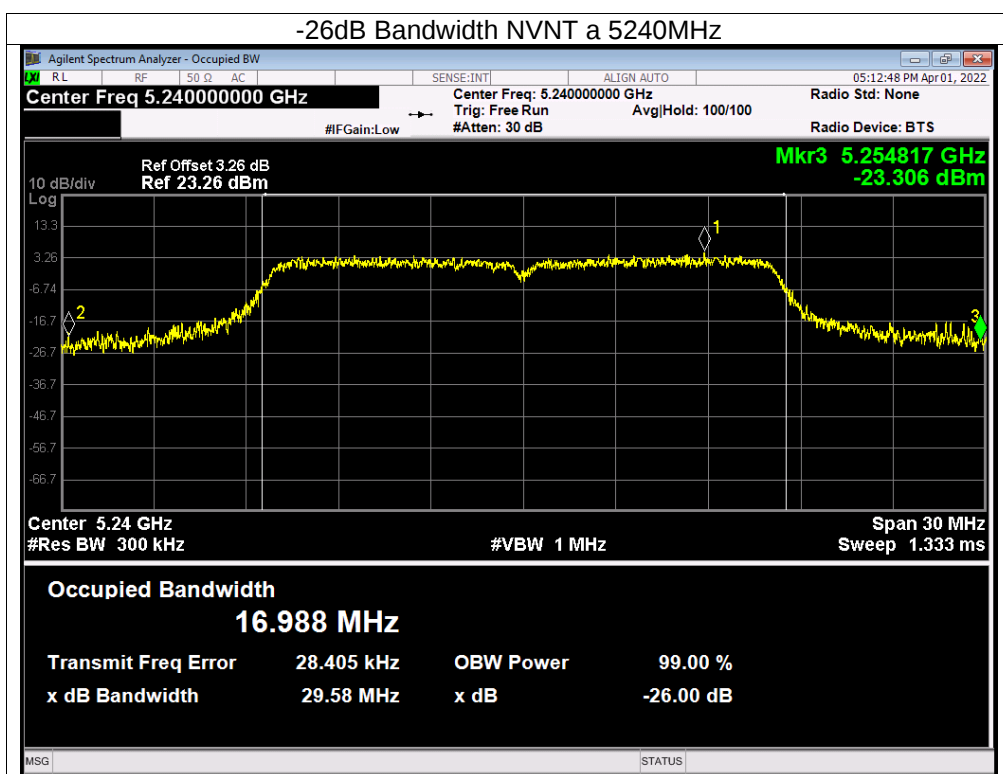
Test Graphs

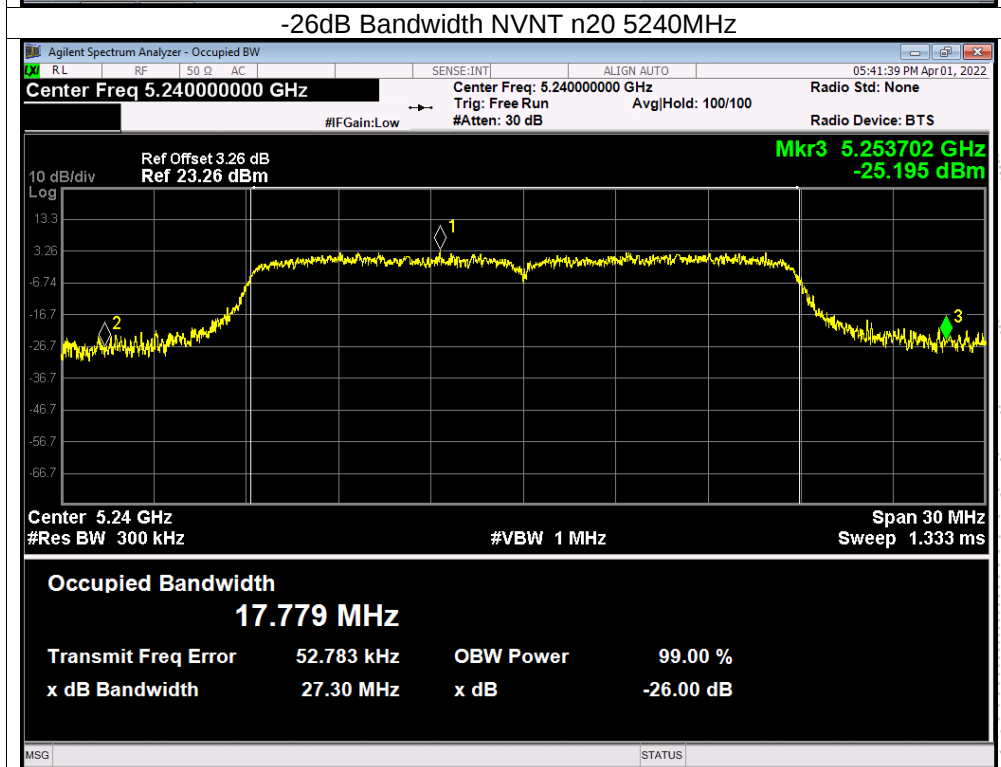
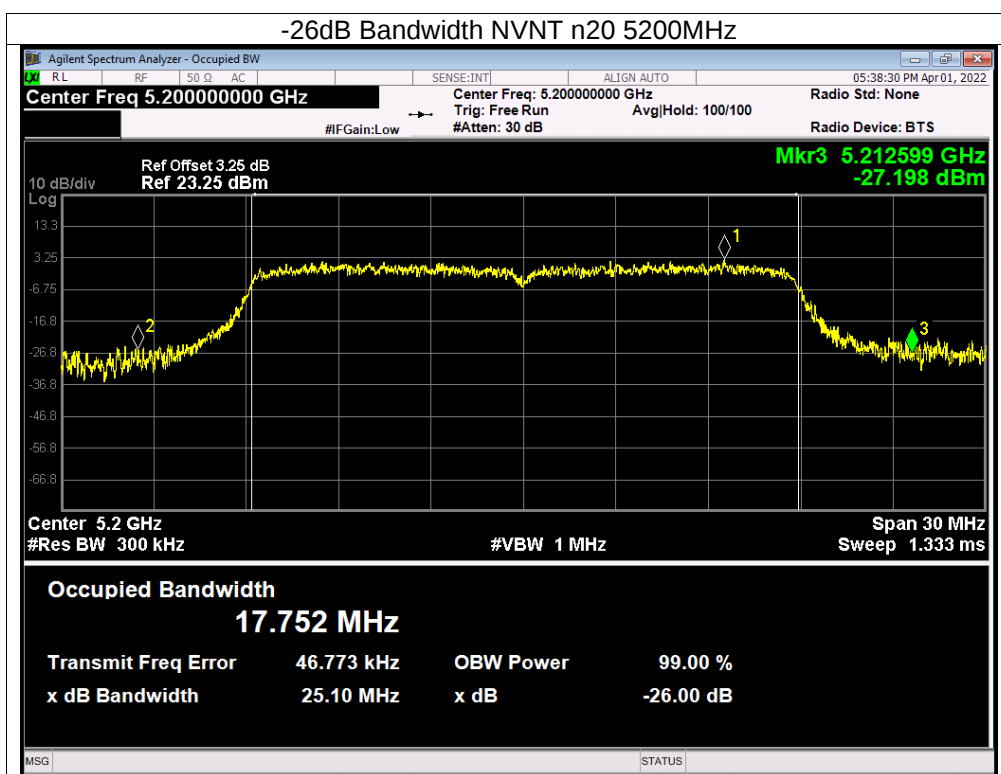
-26dB Bandwidth NVNT a 5180MHz

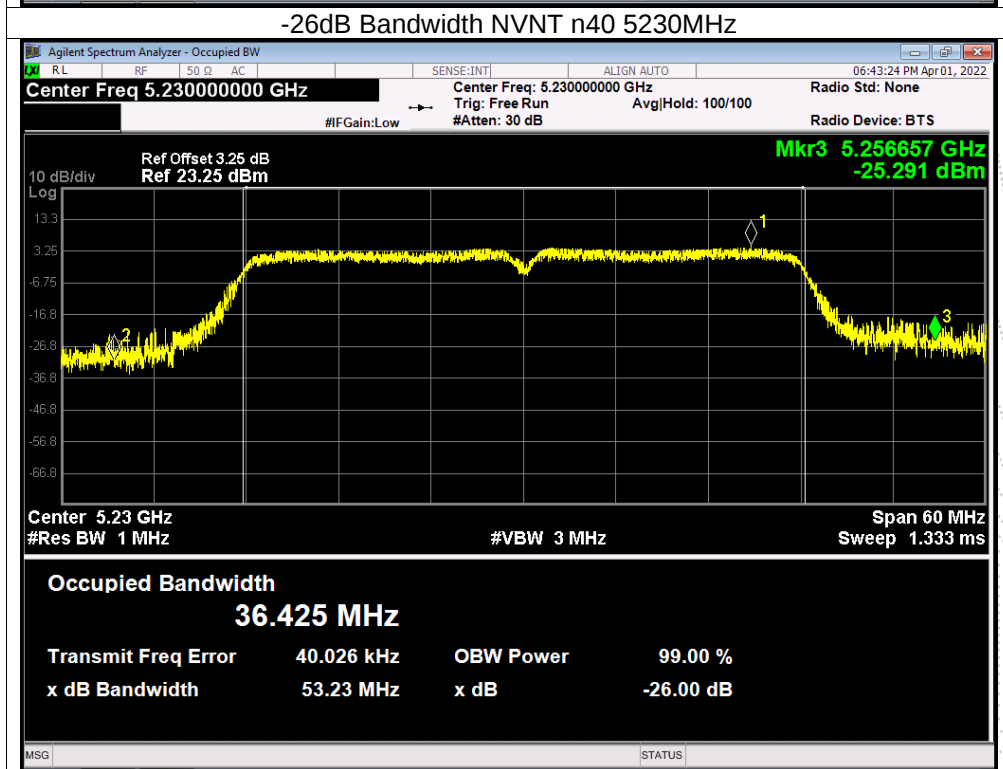
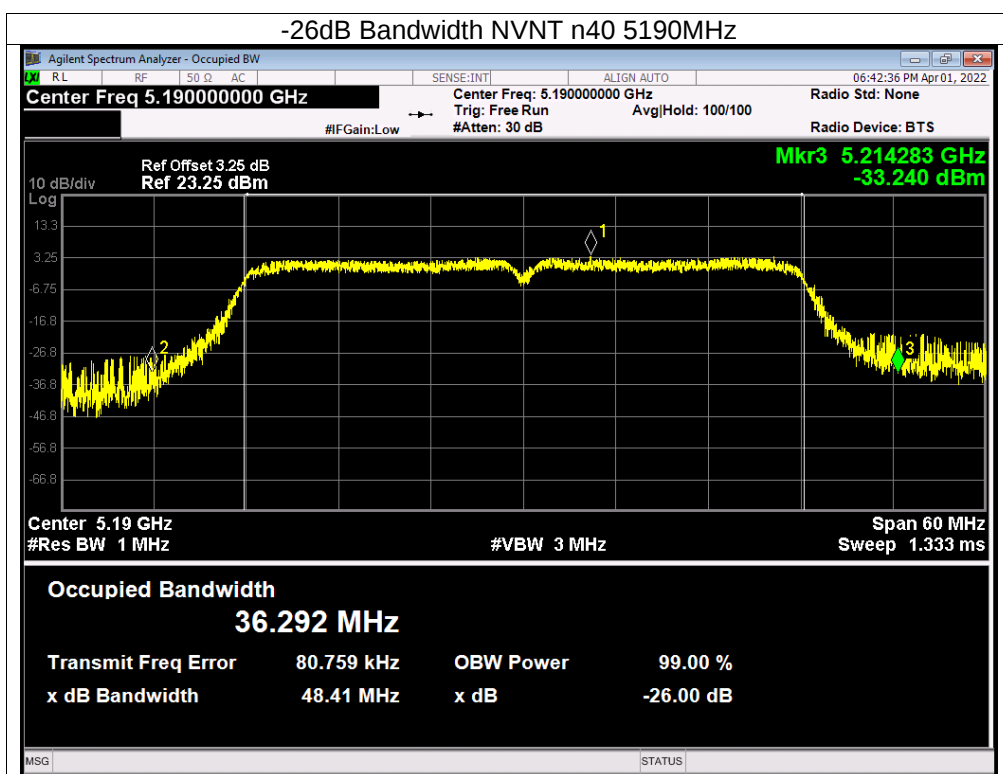


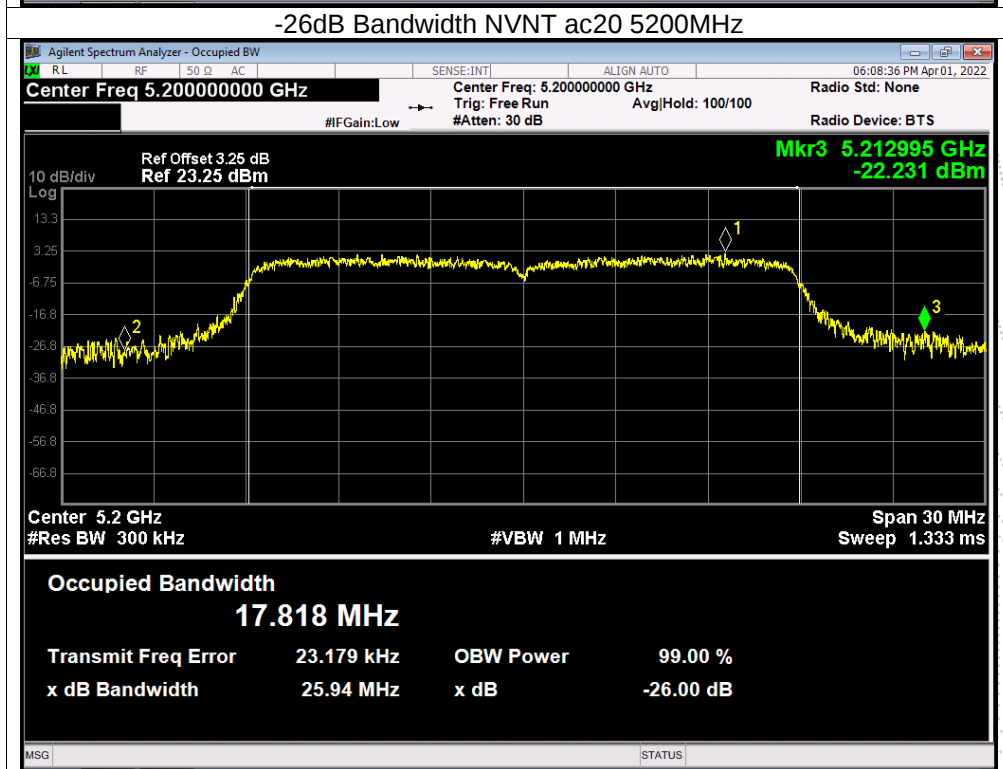
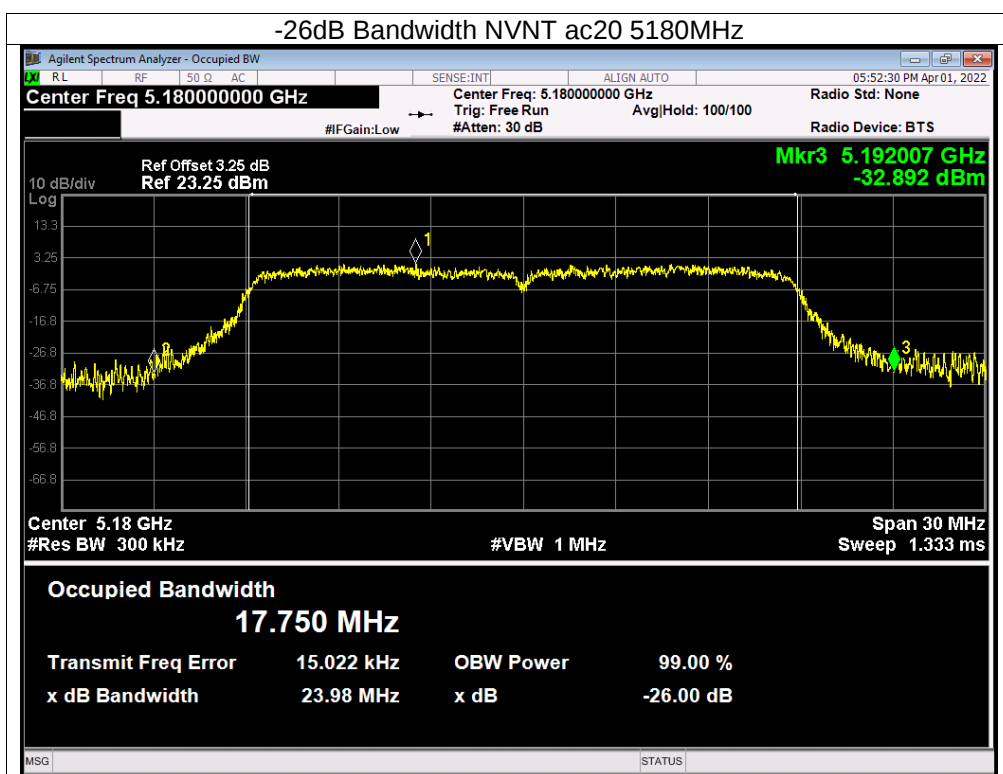
-26dB Bandwidth NVNT a 5200MHz

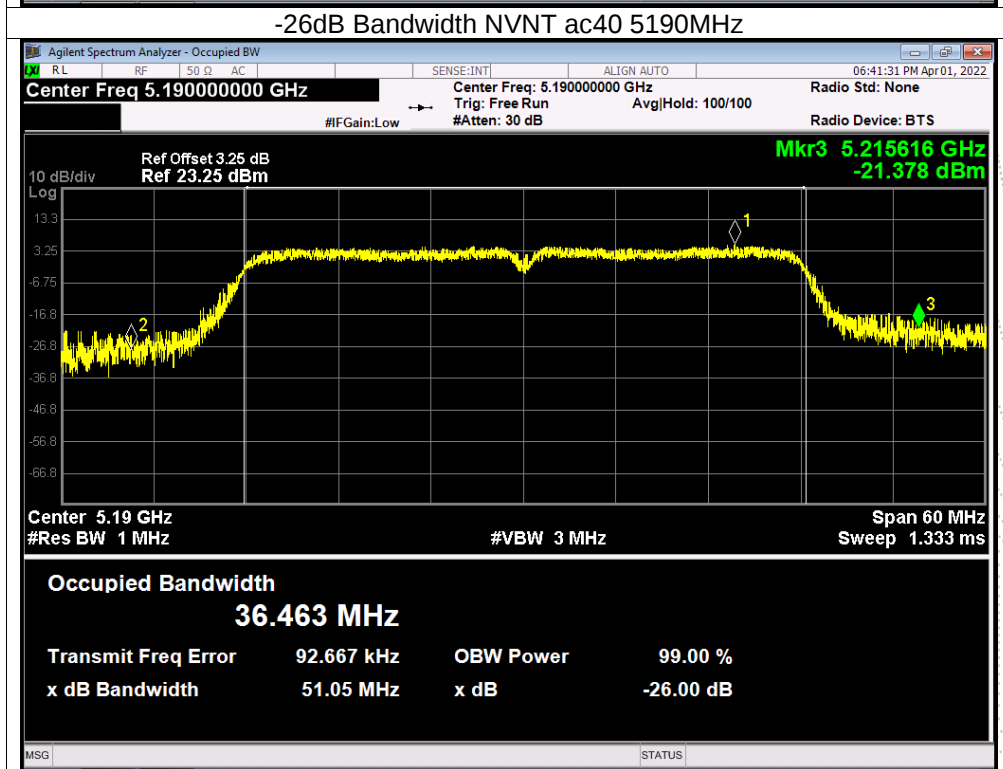
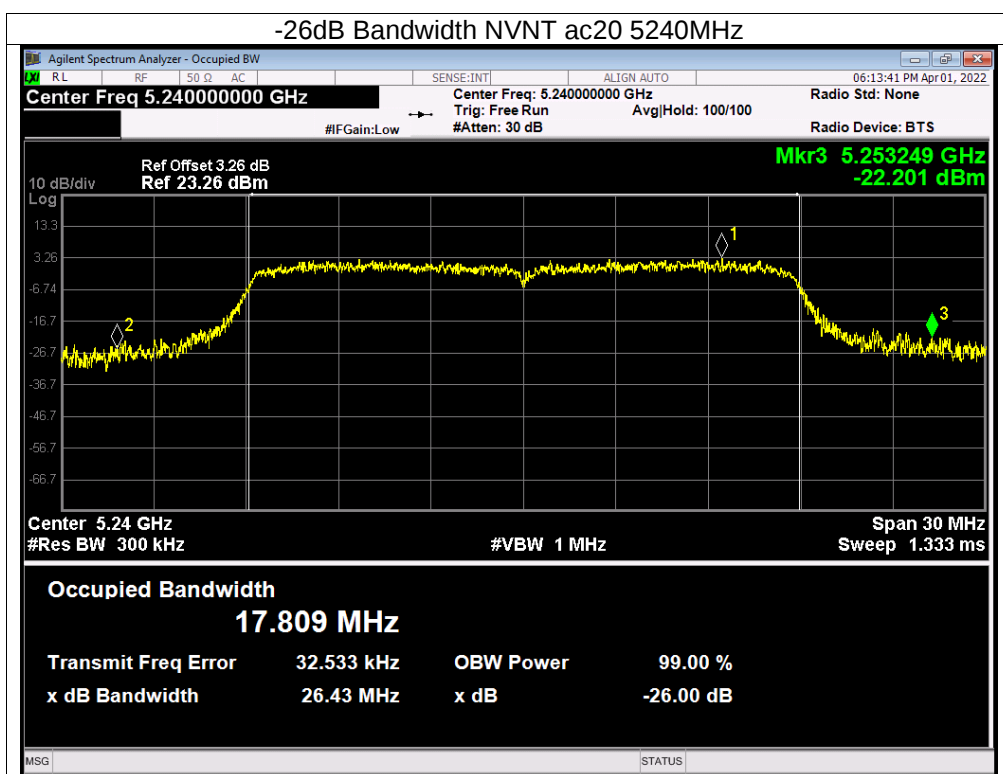


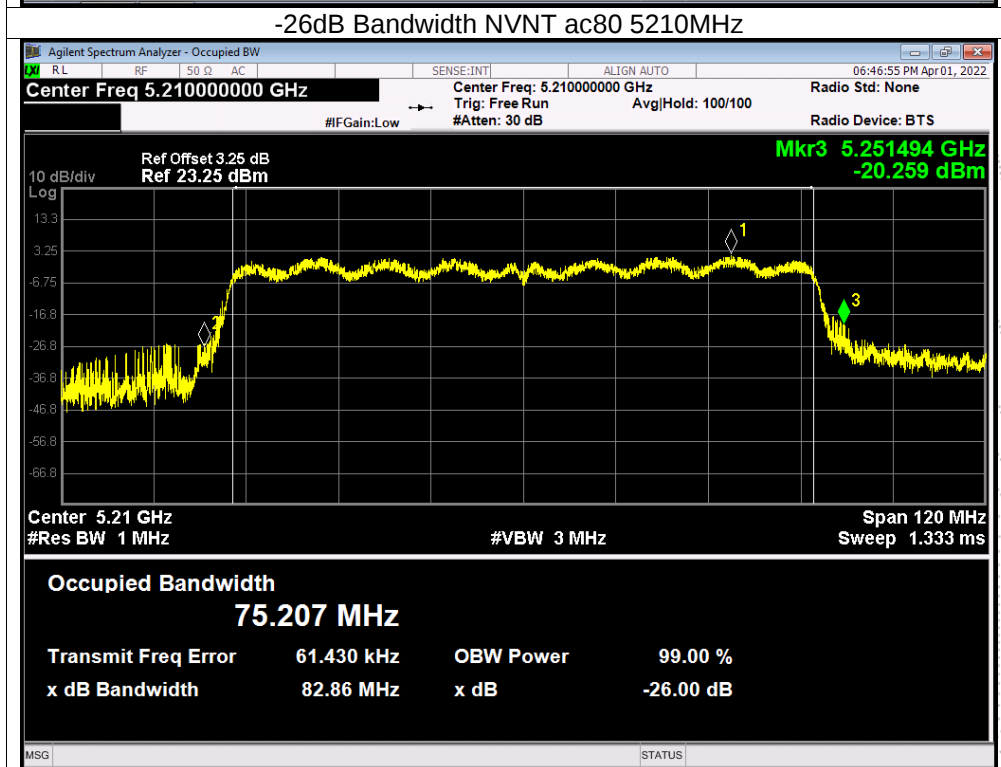
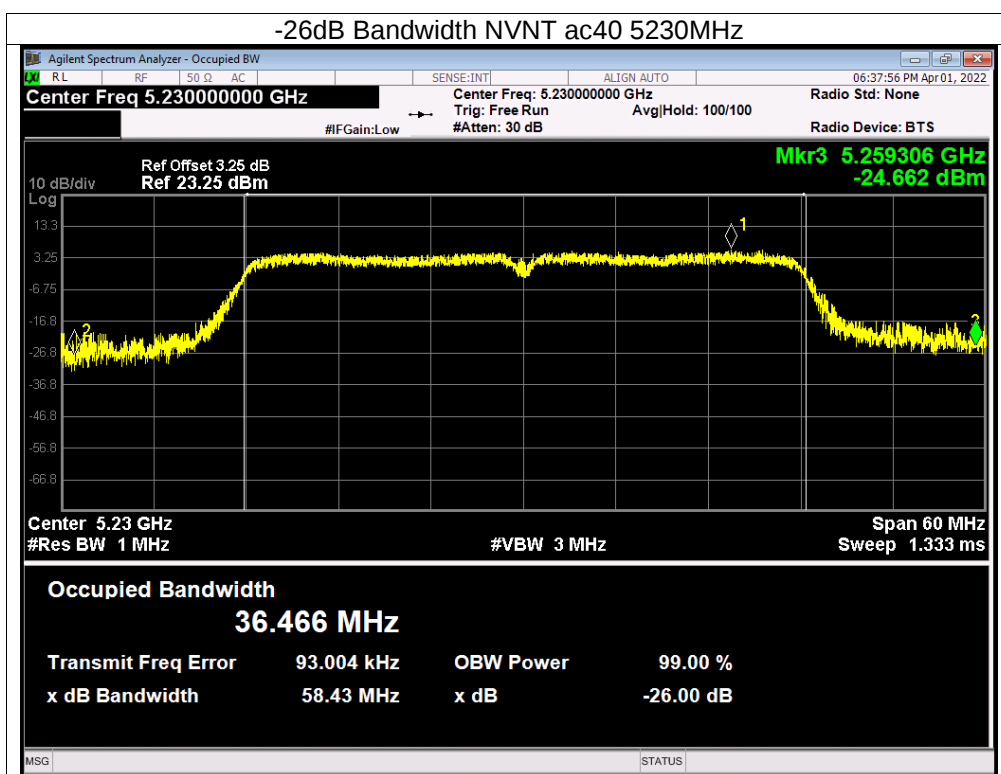






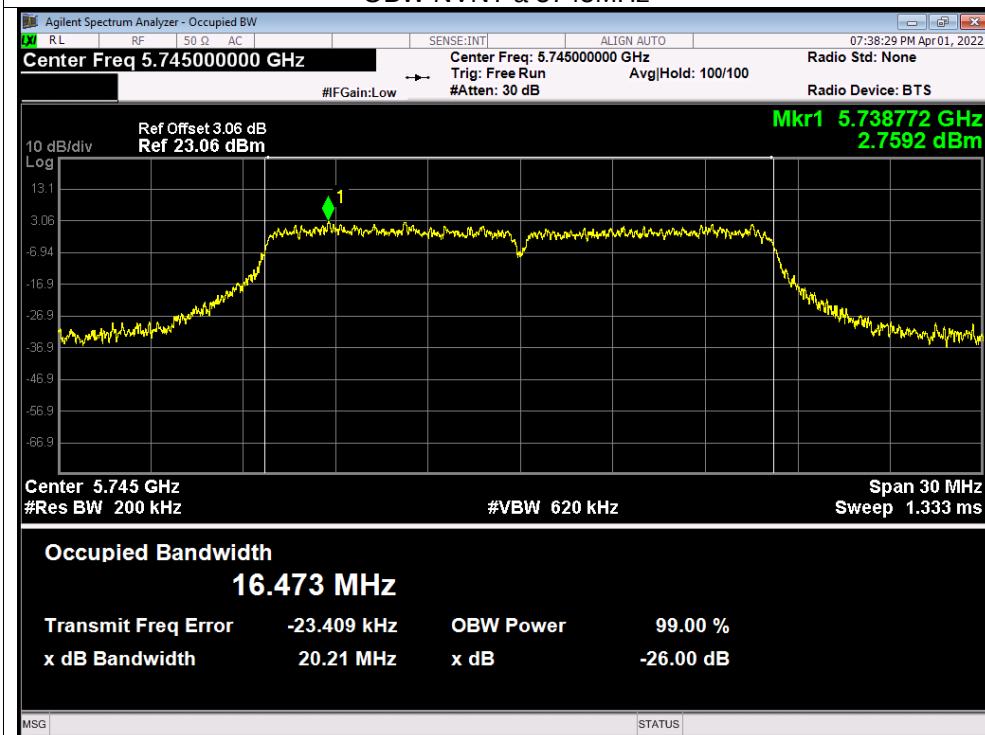
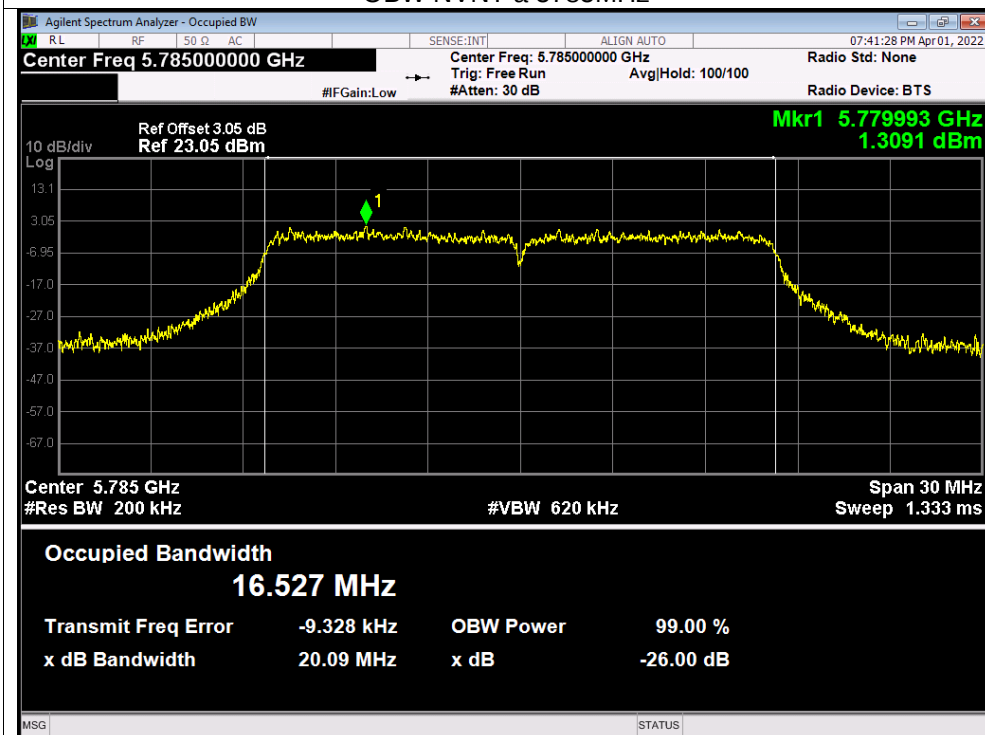


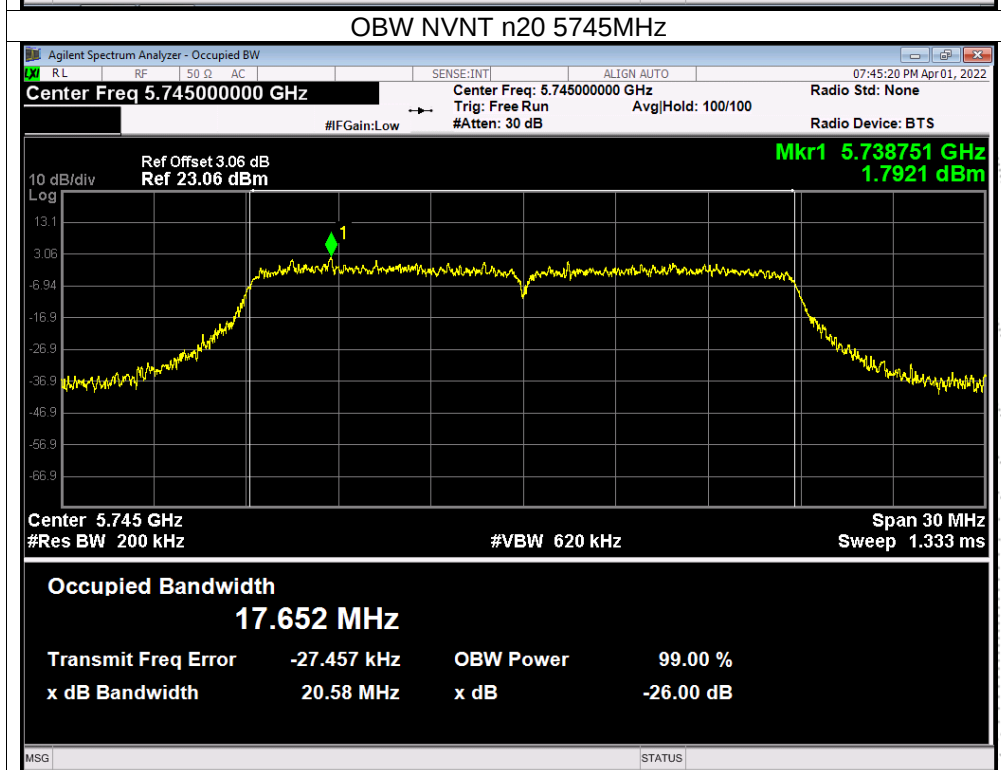
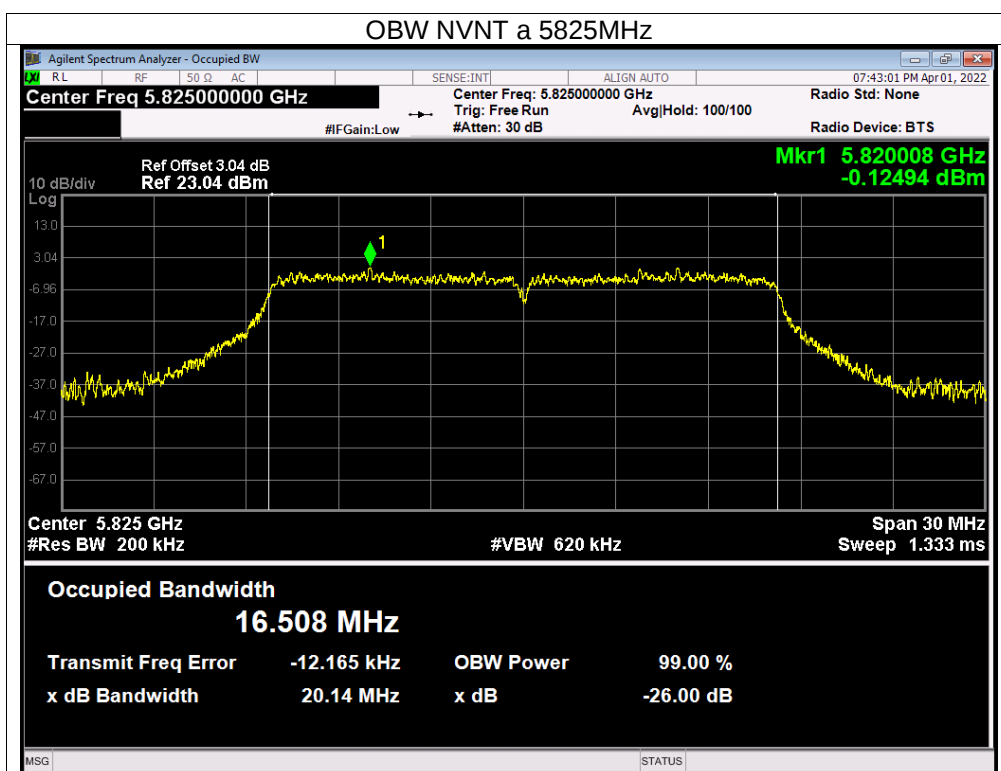


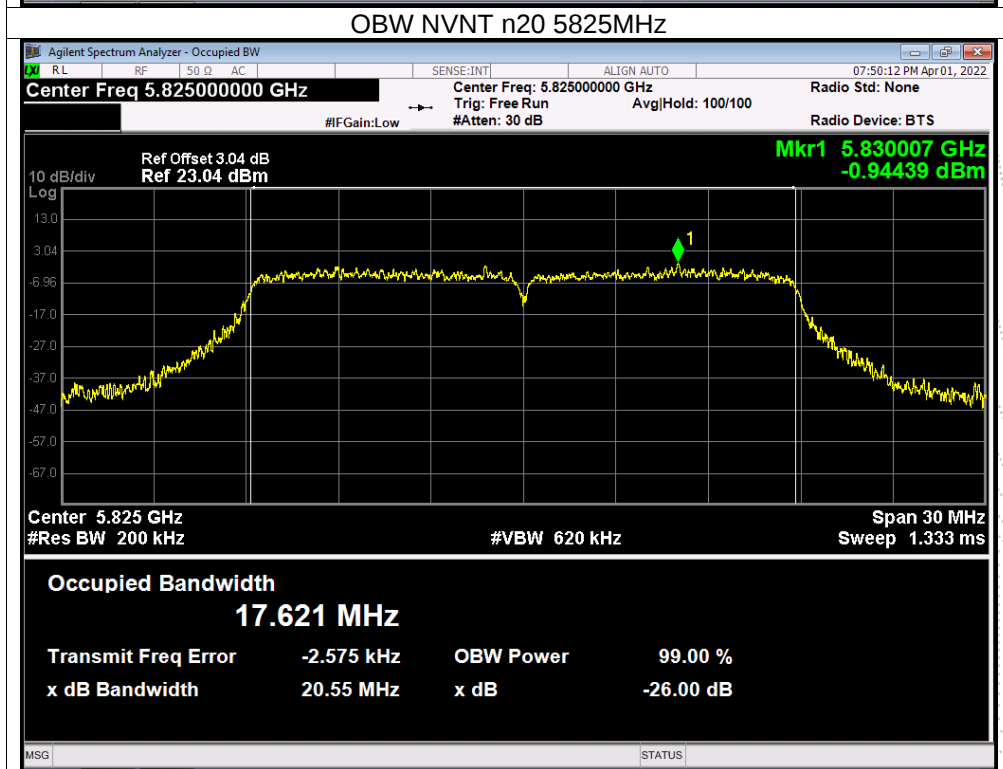
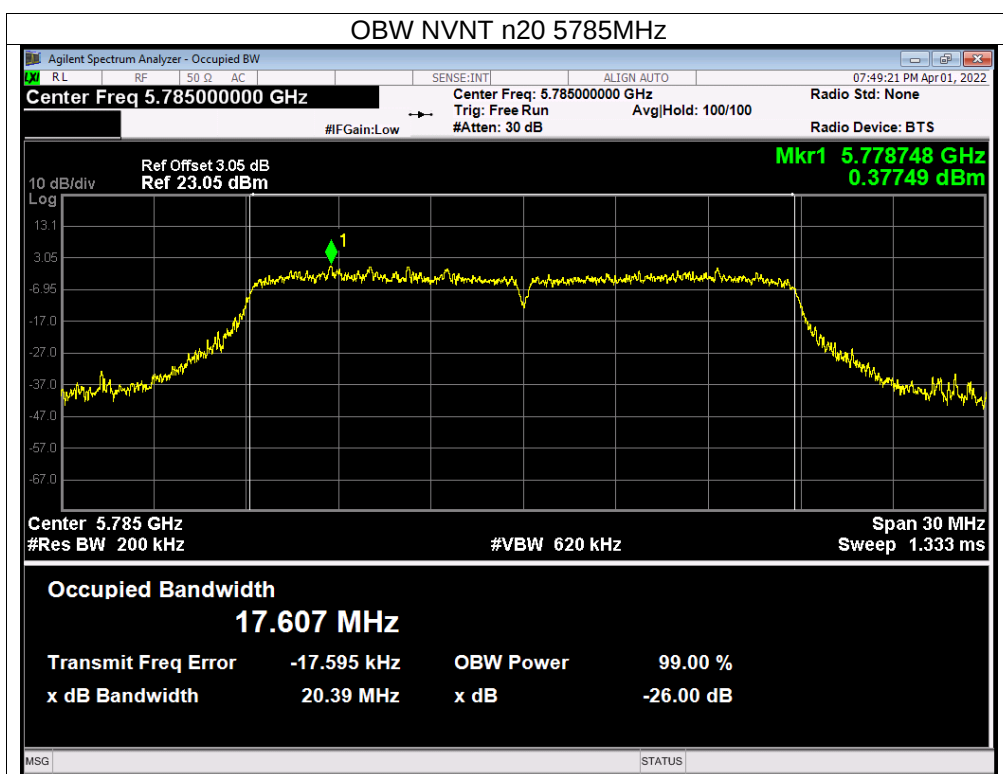


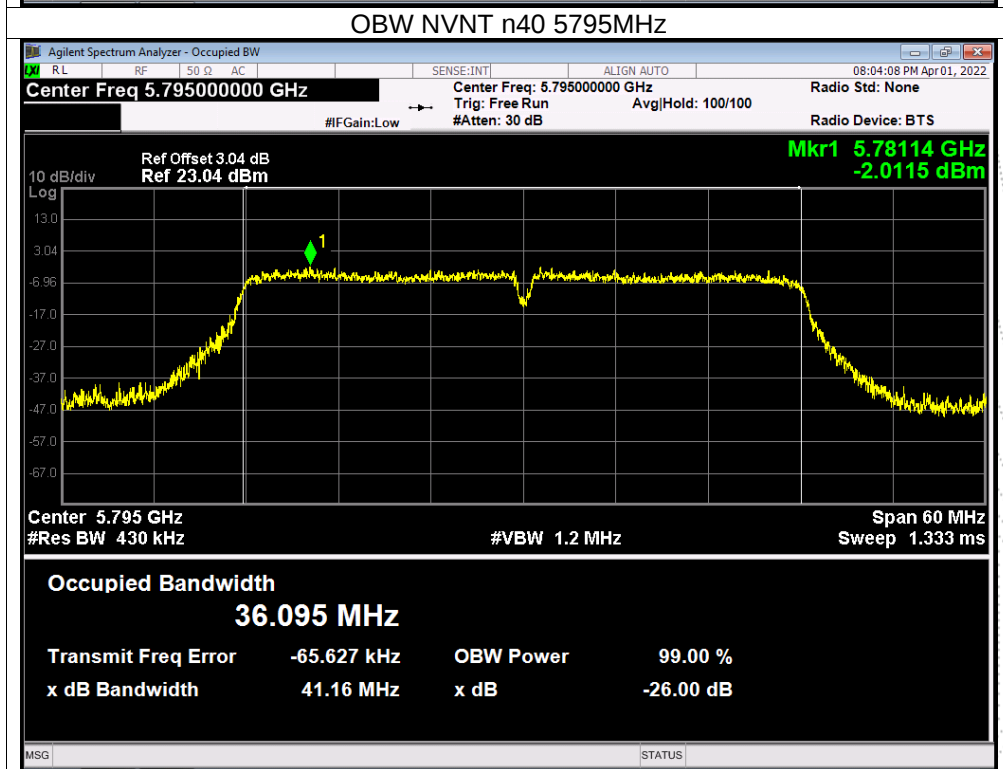
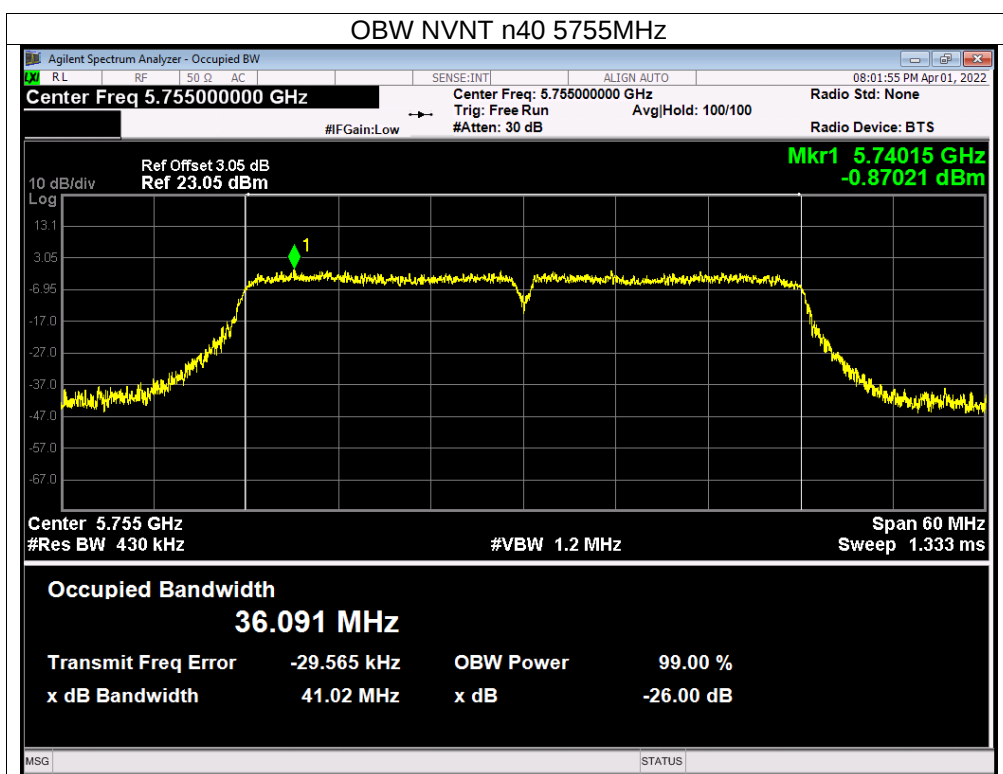
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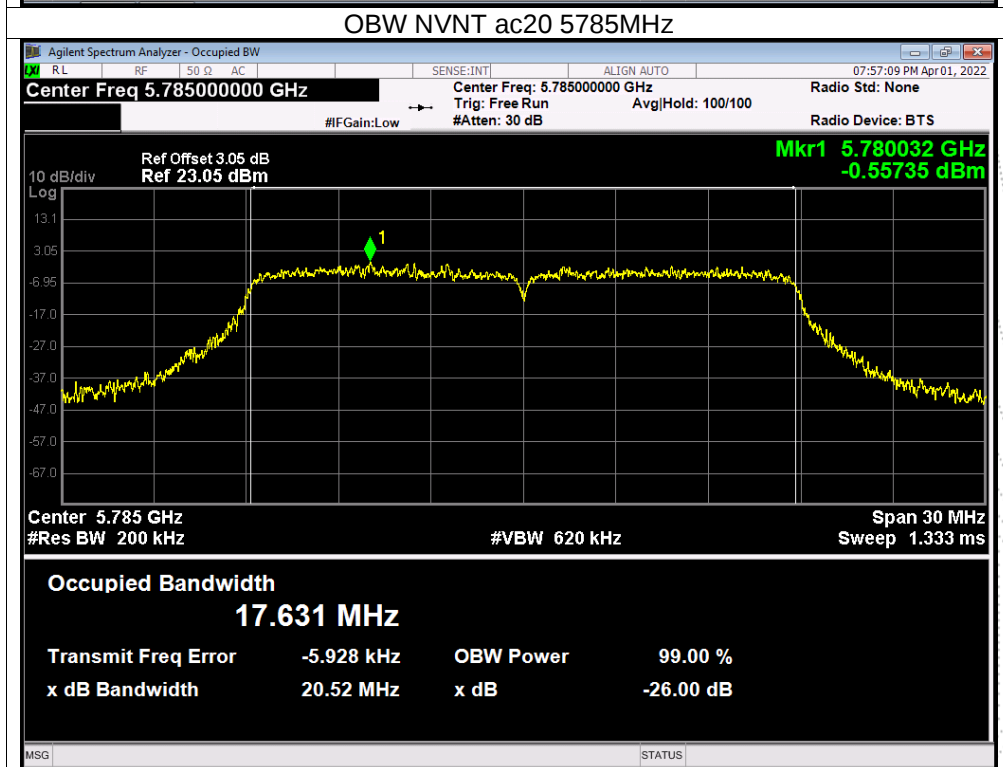
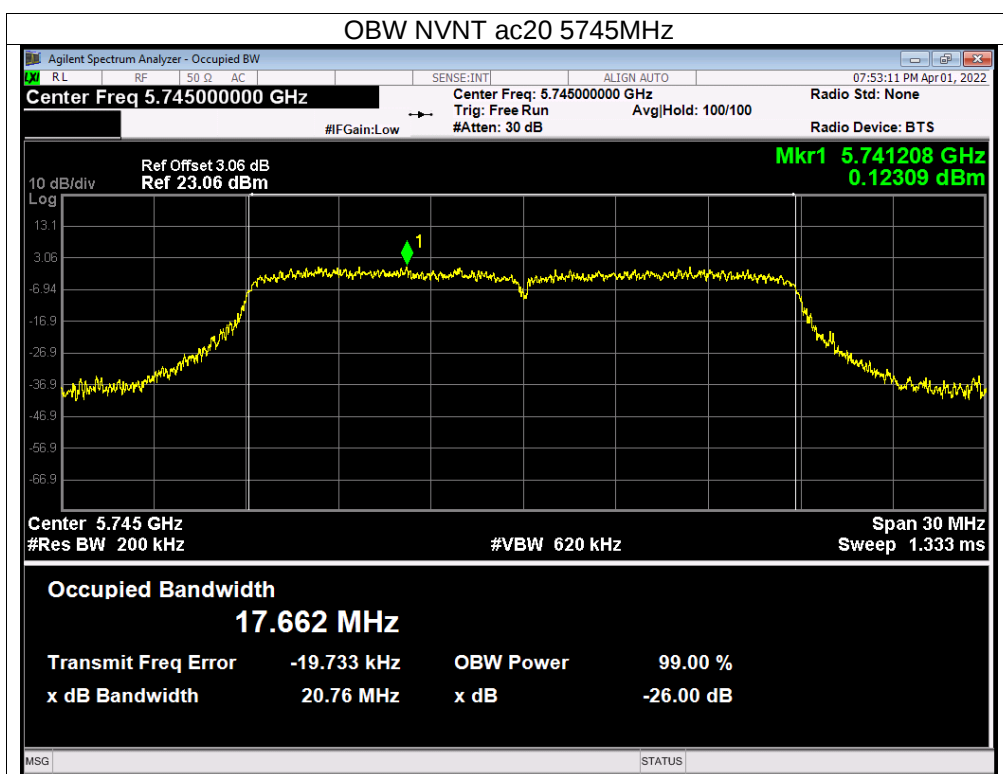
Mode	Channel	Frequency (MHz)	99% bandwidth(MHz)	6dB bandwidth (MHz)	Limit kHz	Result
802.11a	CH149	5745	16.473	16.288	≥500	Pass
	CH157	5785	16.527	16.33	≥500	Pass
	CH165	5825	16.508	16.33	≥500	Pass
802.11 n20	CH149	5745	17.652	16.561	≥500	Pass
	CH157	5785	17.607	16.918	≥500	Pass
	CH165	5825	17.621	16.991	≥500	Pass
802.11 n40	CH151	5755	36.091	35.388	≥500	Pass
	CH159	5795	36.095	35.674	≥500	Pass
802.11 AC20	CH149	5745	17.662	17.149	≥500	Pass
	CH157	5785	17.631	16.306	≥500	Pass
	CH165	5825	17.603	16.881	≥500	Pass
802.11 AC40	CH151	5755	36.086	35.437	≥500	Pass
	CH159	5795	36.118	35.056	≥500	Pass
802.11 AC80	CH151	5755	75.156	75.07	≥500	Pass

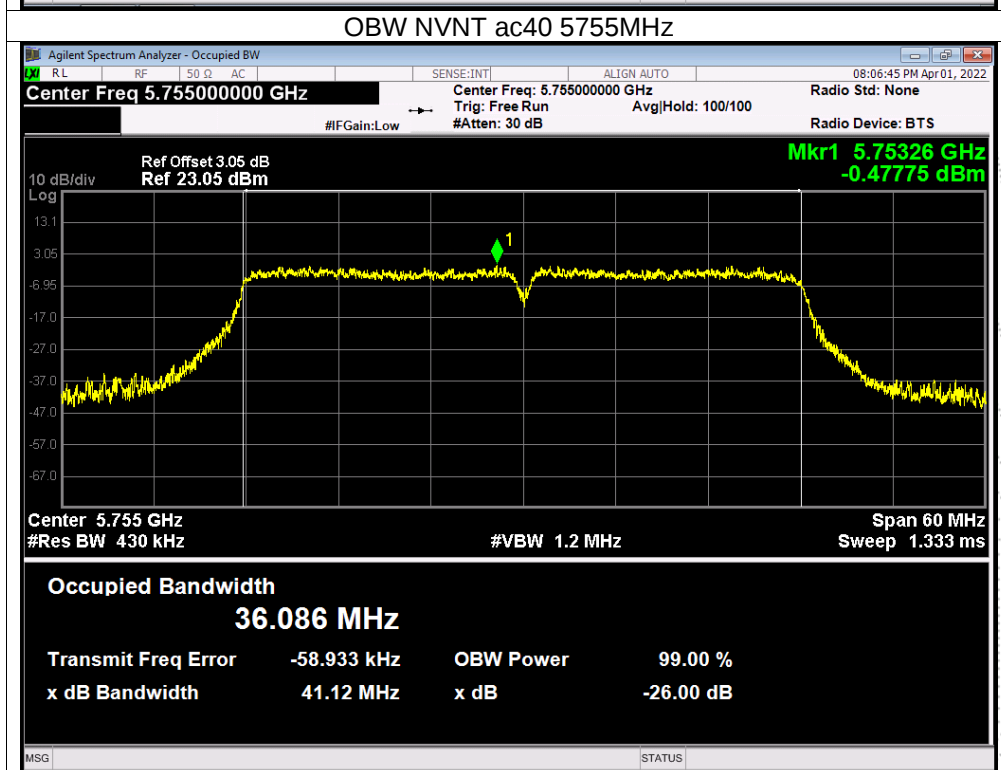
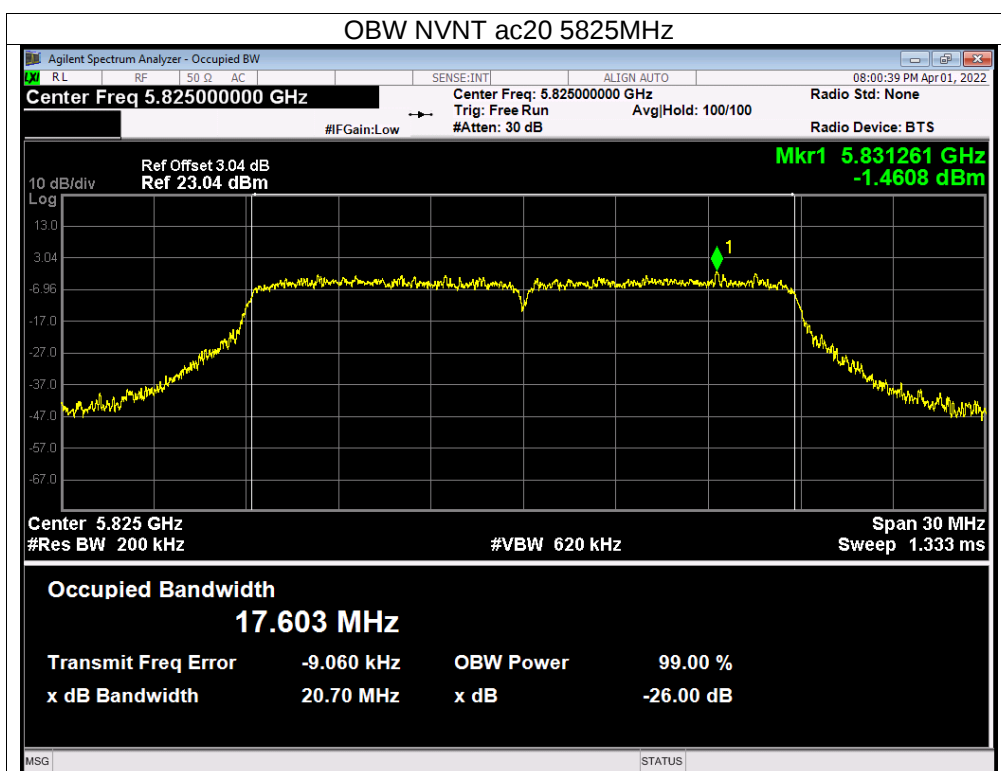
99% OBW
Test Graphs
OBW NVNT a 5745MHz

OBW NVNT a 5785MHz


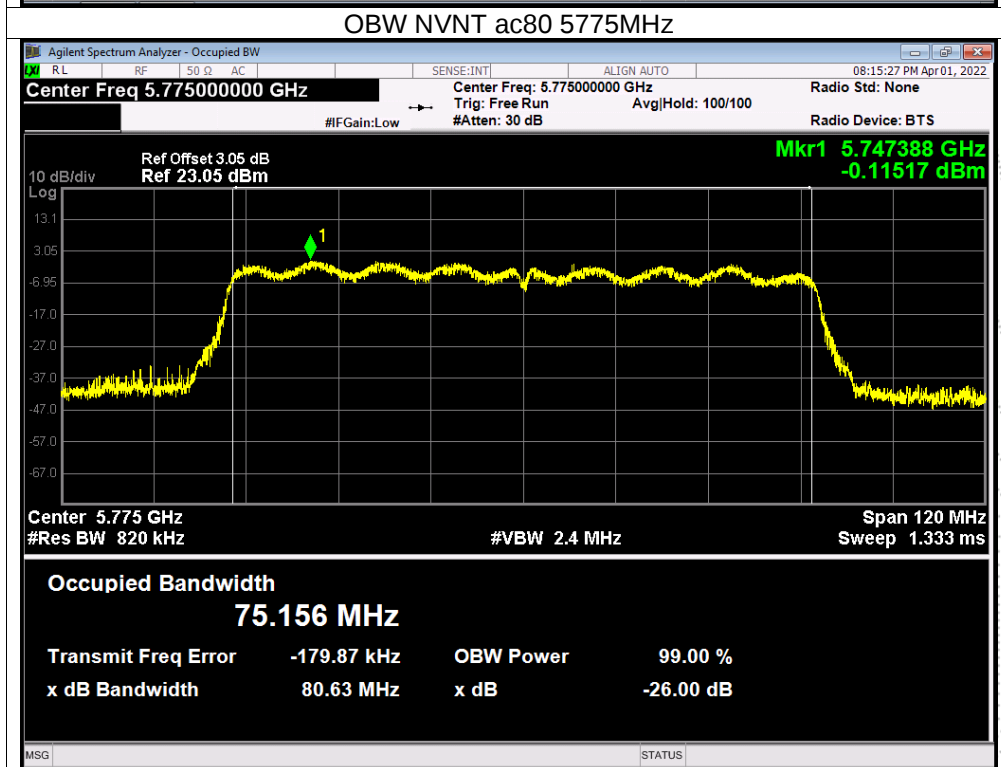
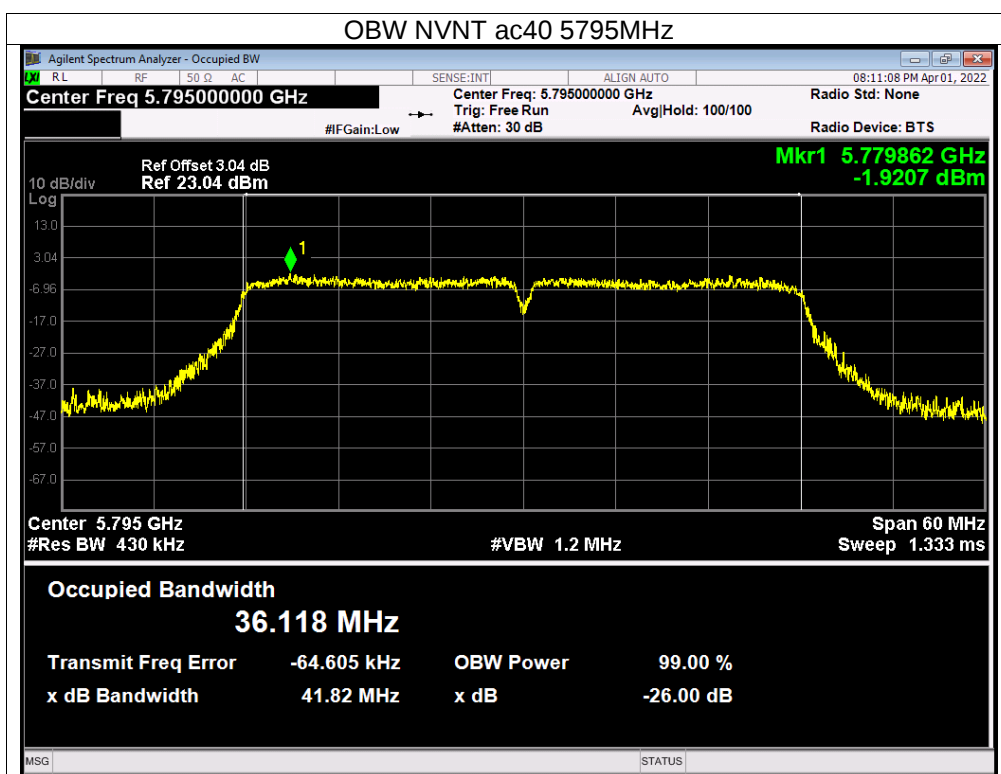








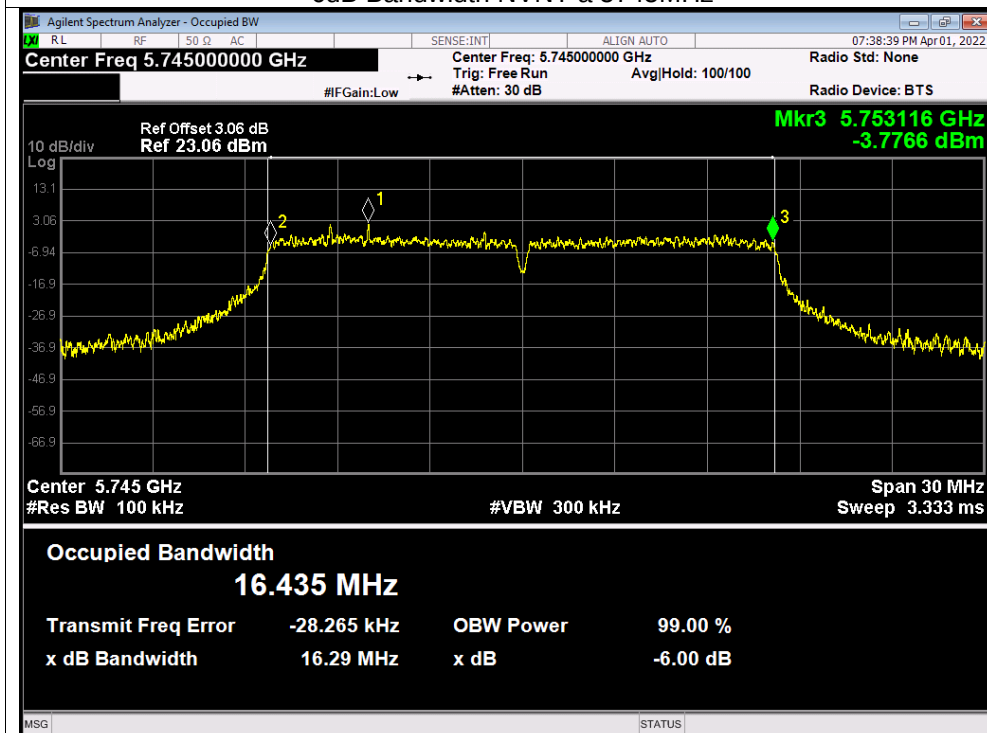




-6dB Bandwidth

Test Graphs

-6dB Bandwidth NVNT a 5745MHz



-6dB Bandwidth NVNT a 5785MHz

