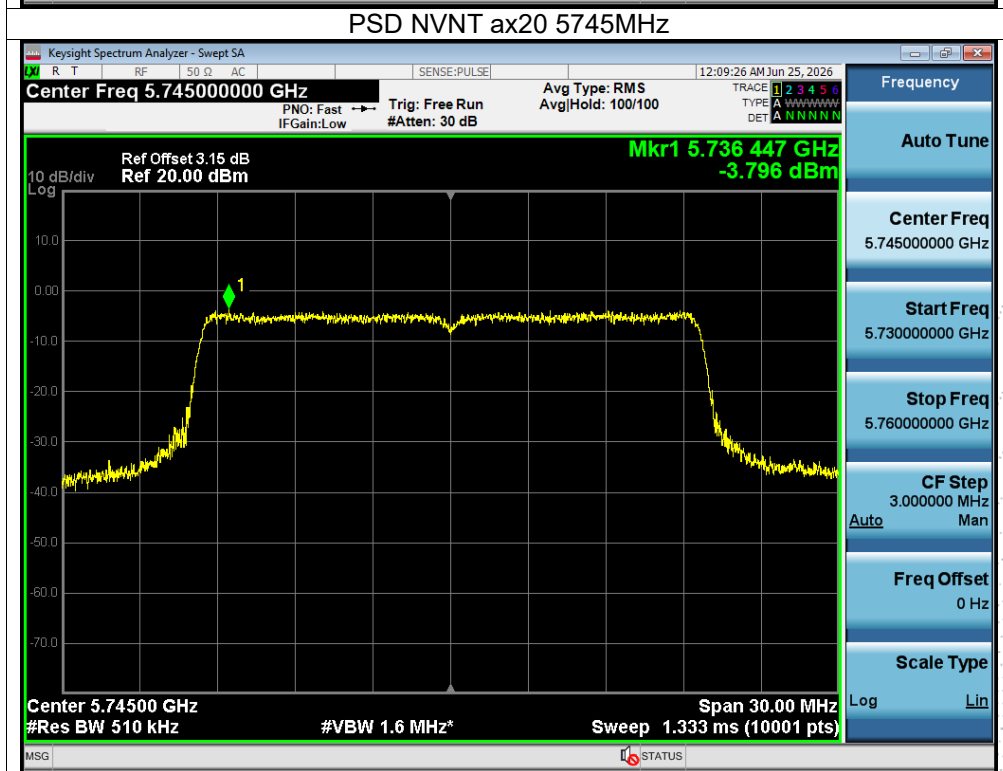
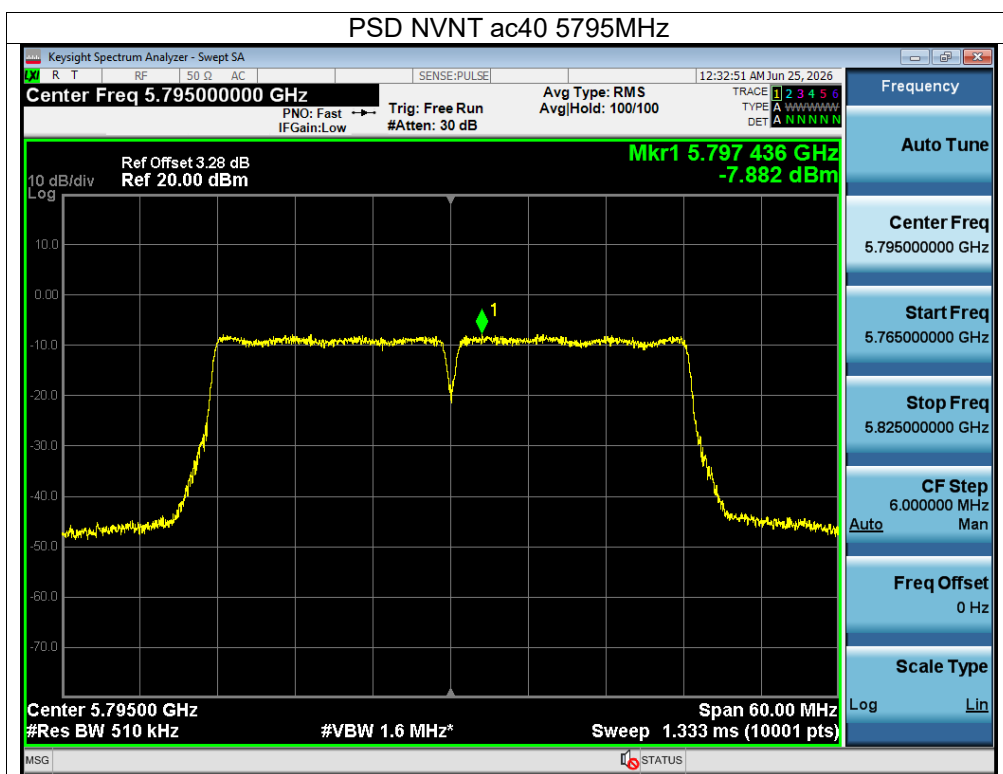
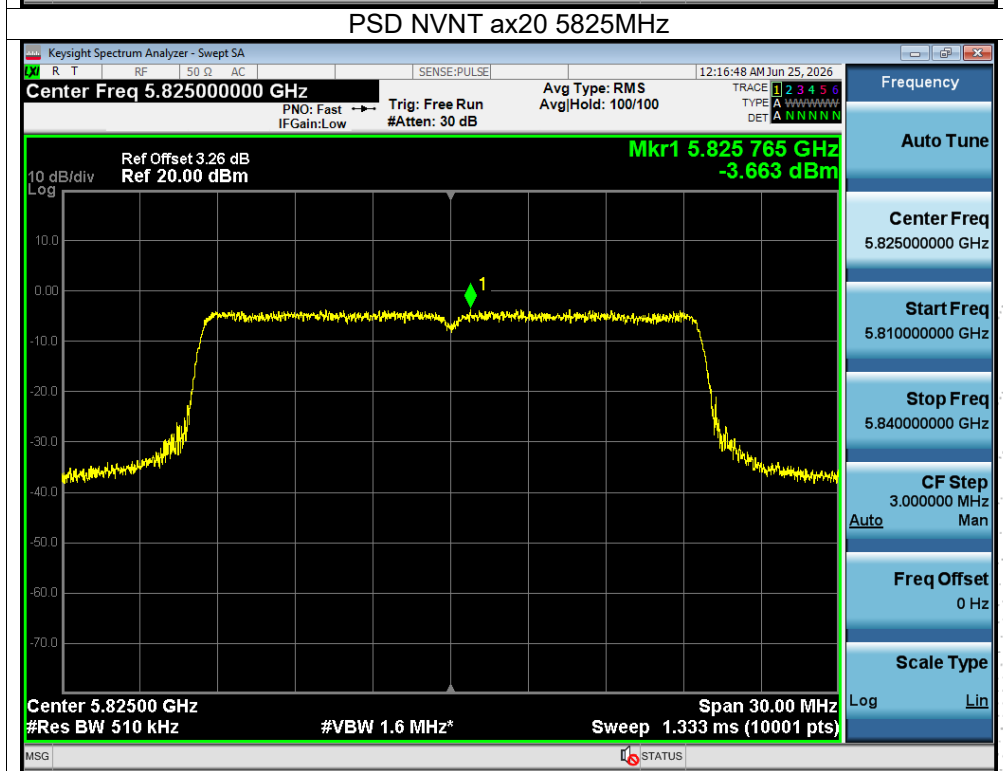
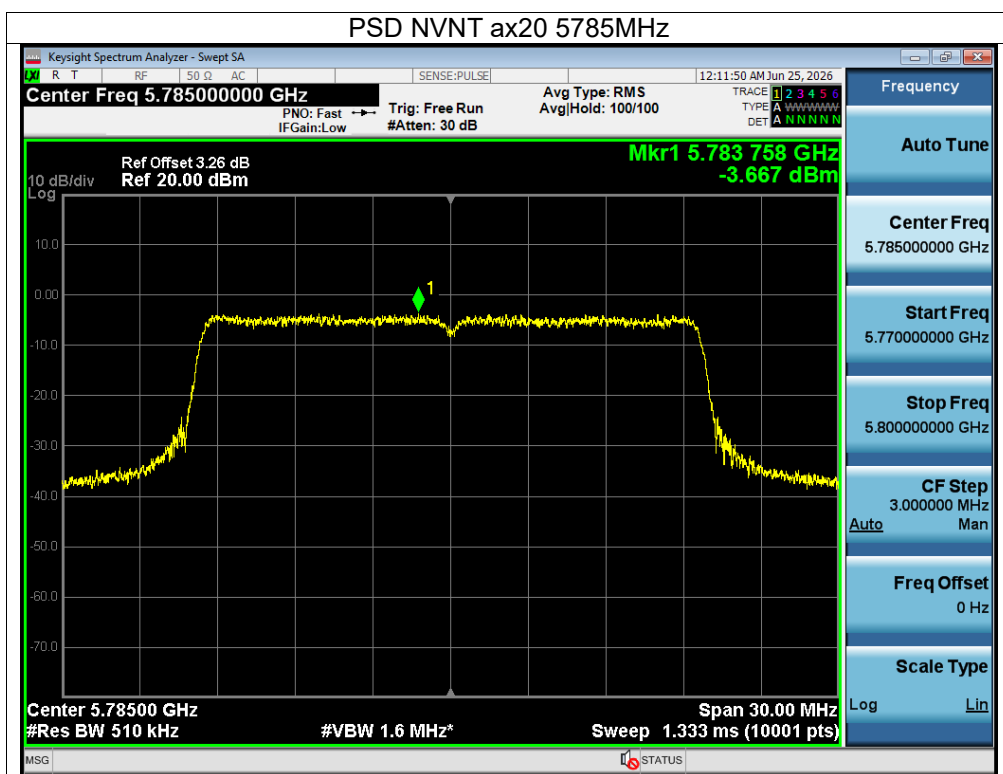
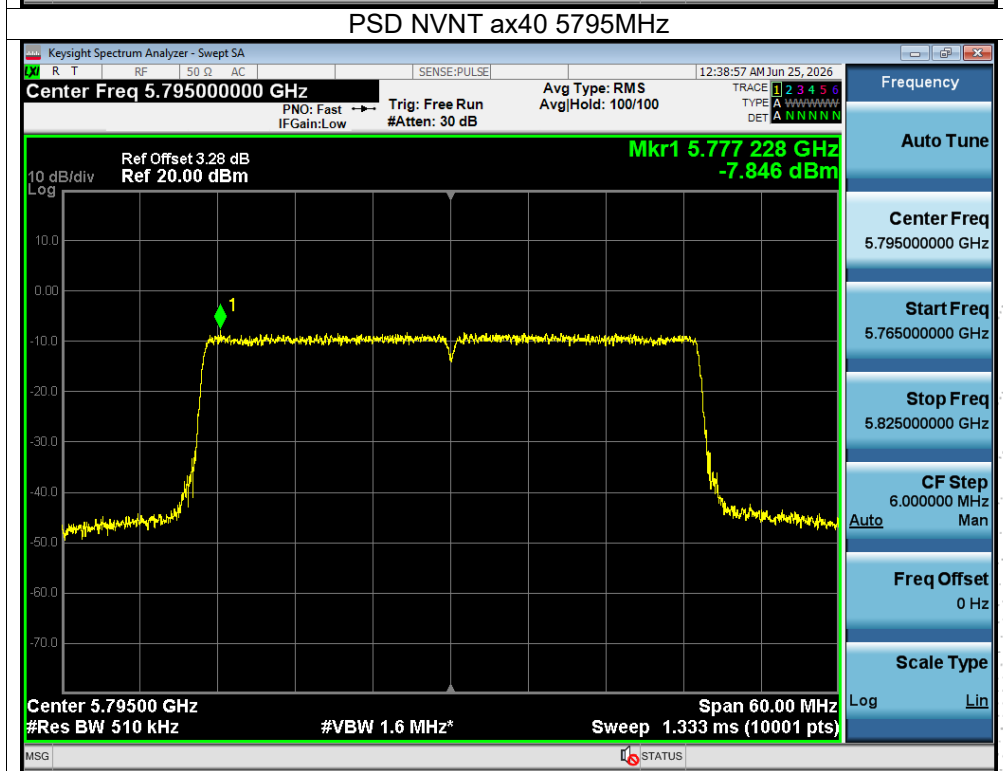
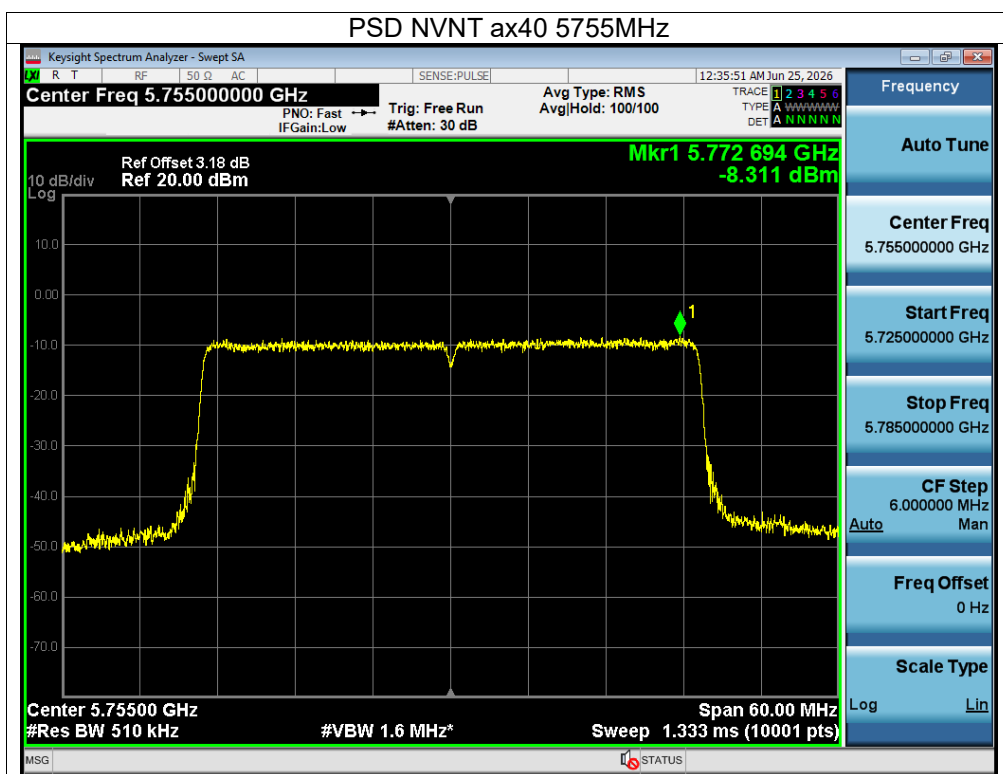




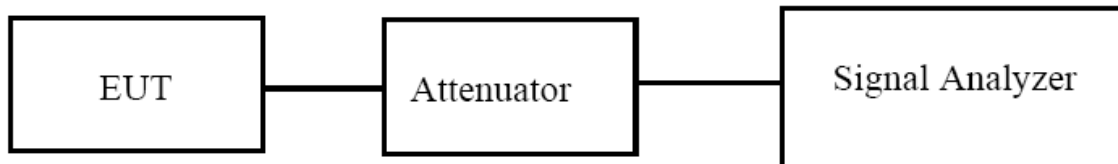
SHENZHEN





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

9.1 Block Diagram Of Test Setup



9.2 Limit

(1) For the band 5.15-5.25 GHz.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

9.3 Test Procedure

- a) Set RBW = shall be in the range of 1% to 5% 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 peak of the emission. Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is in the range of 1%RH to 5%RH.

The following procedure shall be used for measuring (99 %RH) 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 %RH to 5 %RH 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 %RH power bandwidth function of the instrument (if available).
- 7. If the instrument does not have a 99 %RH 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 %RH of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 %RH of the total is reached; that frequency is recorded as the upper frequency. The 99%RH occupied bandwidth is the difference between these two frequencies.

Emission bandwidth for the band 5.725 GHz to 5.85 GHz

The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max-hold.
- e) Sweep = No faster than coupled (auto) time.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

9.4 EUT Operating Conditions

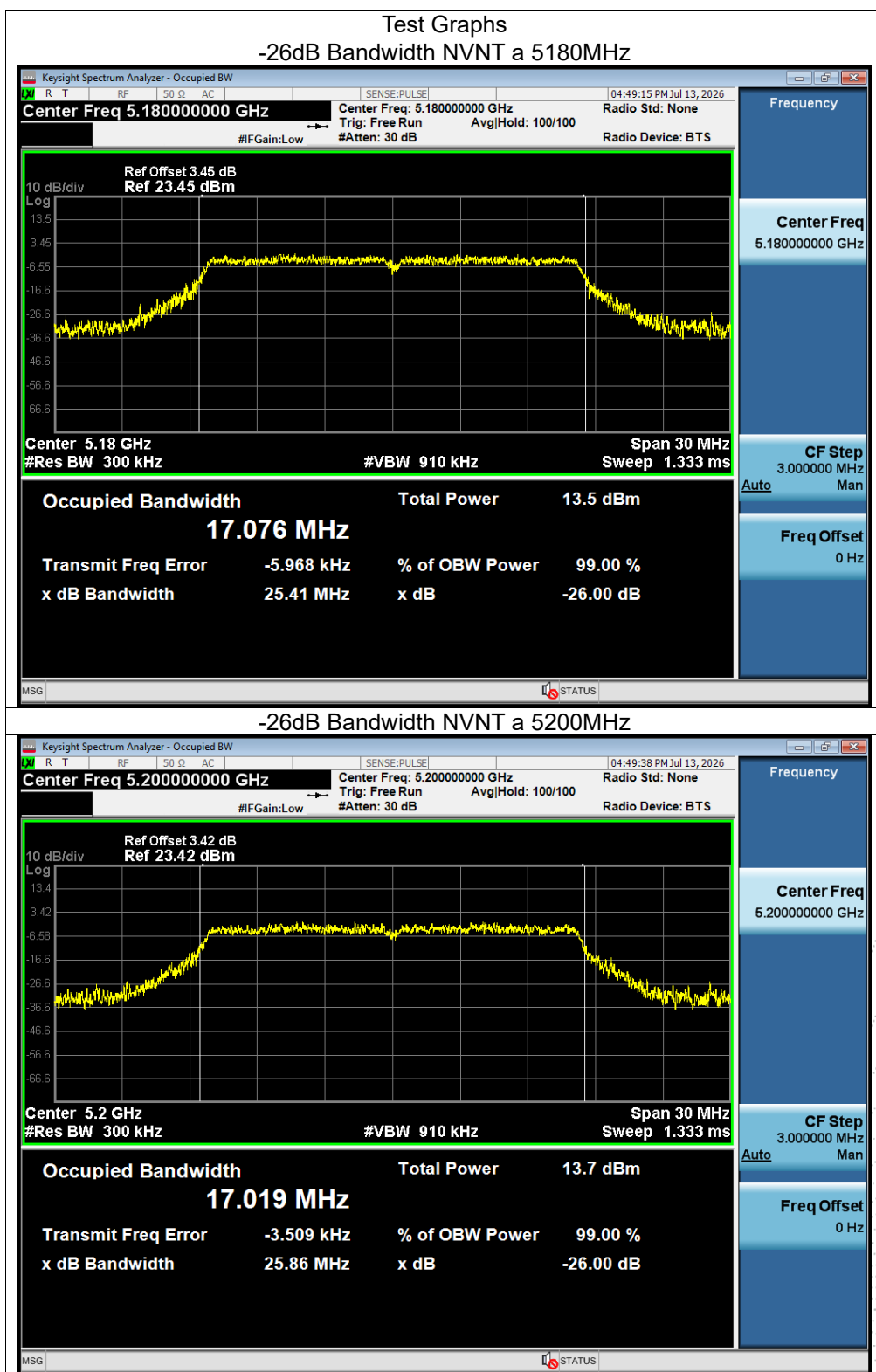
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

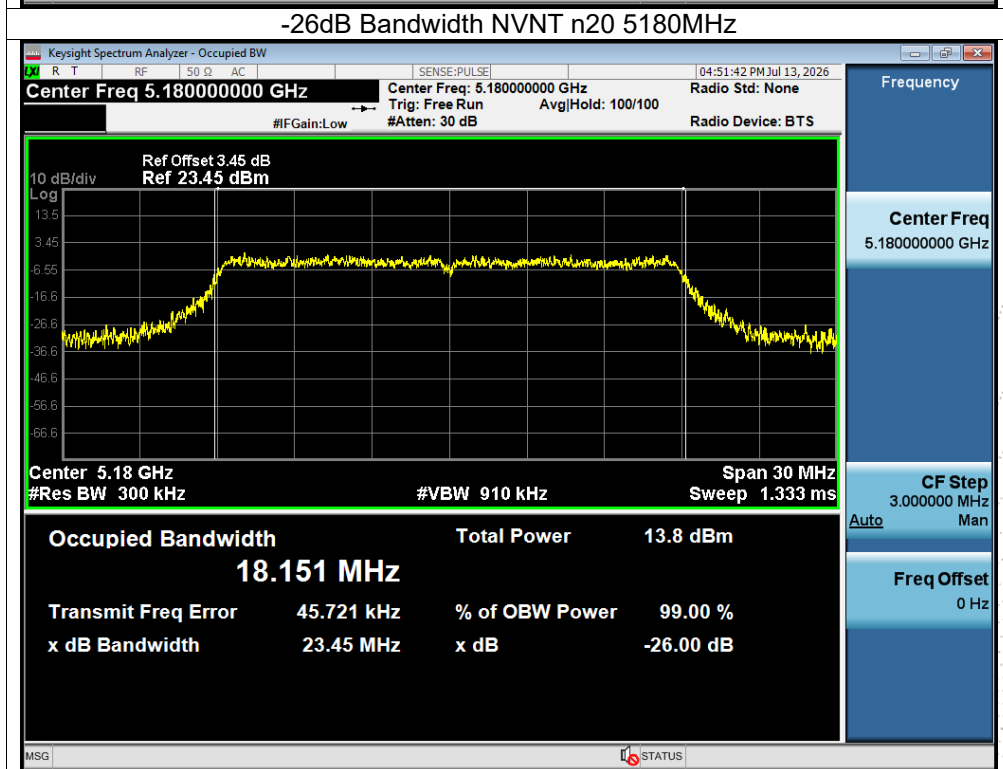
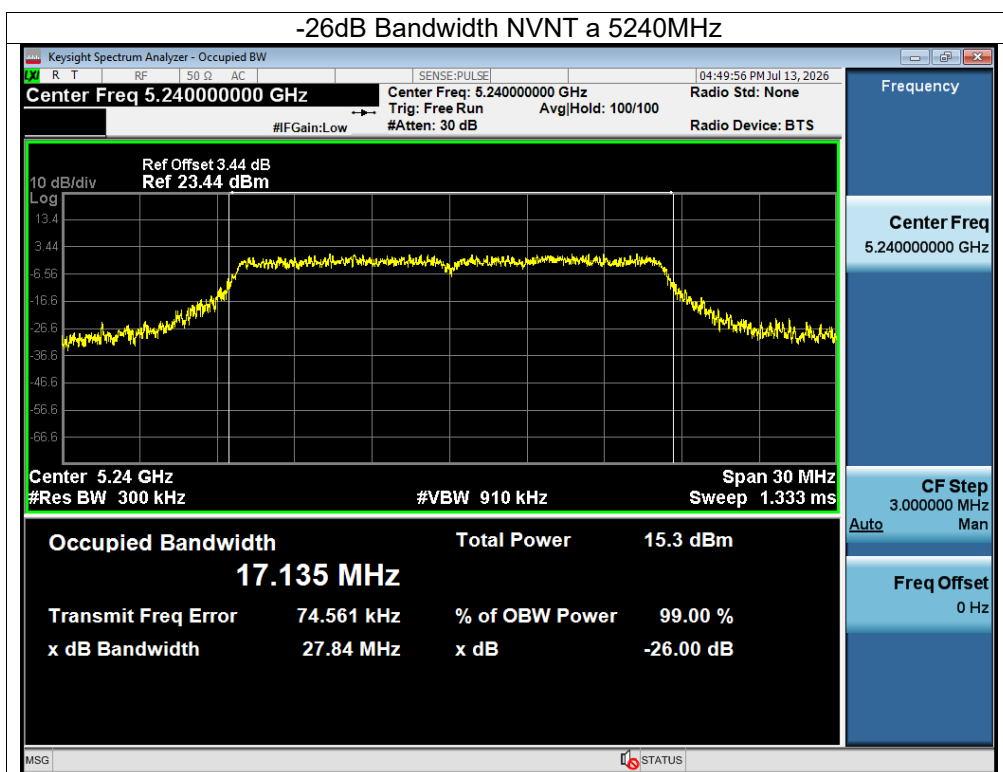
9.5 Test Result

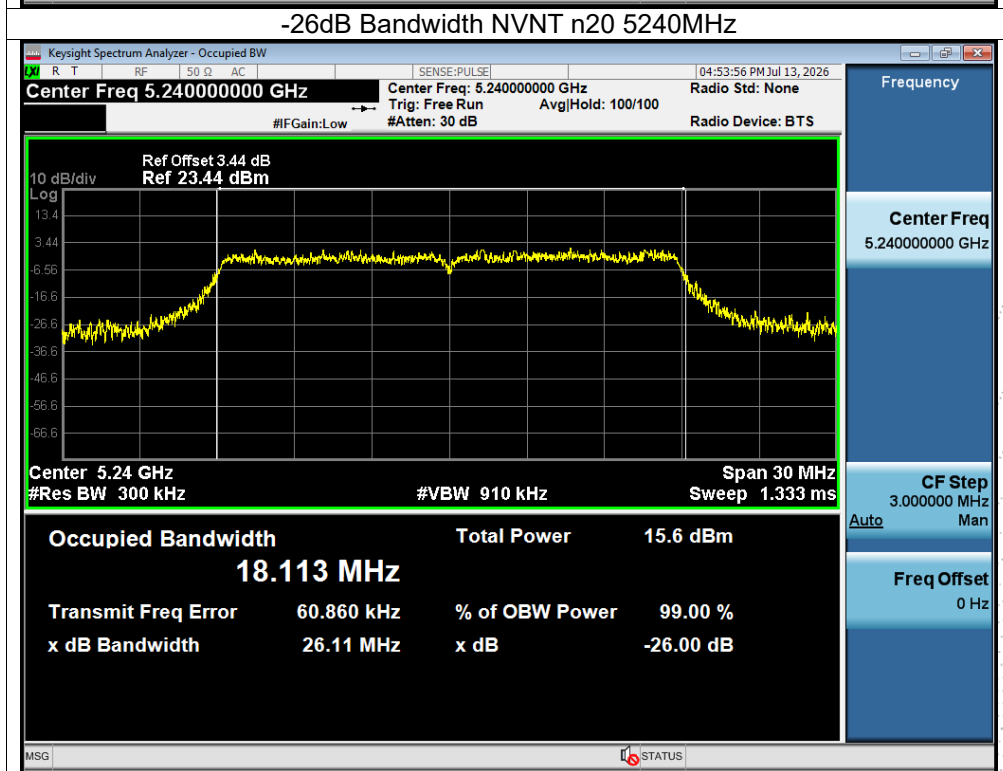
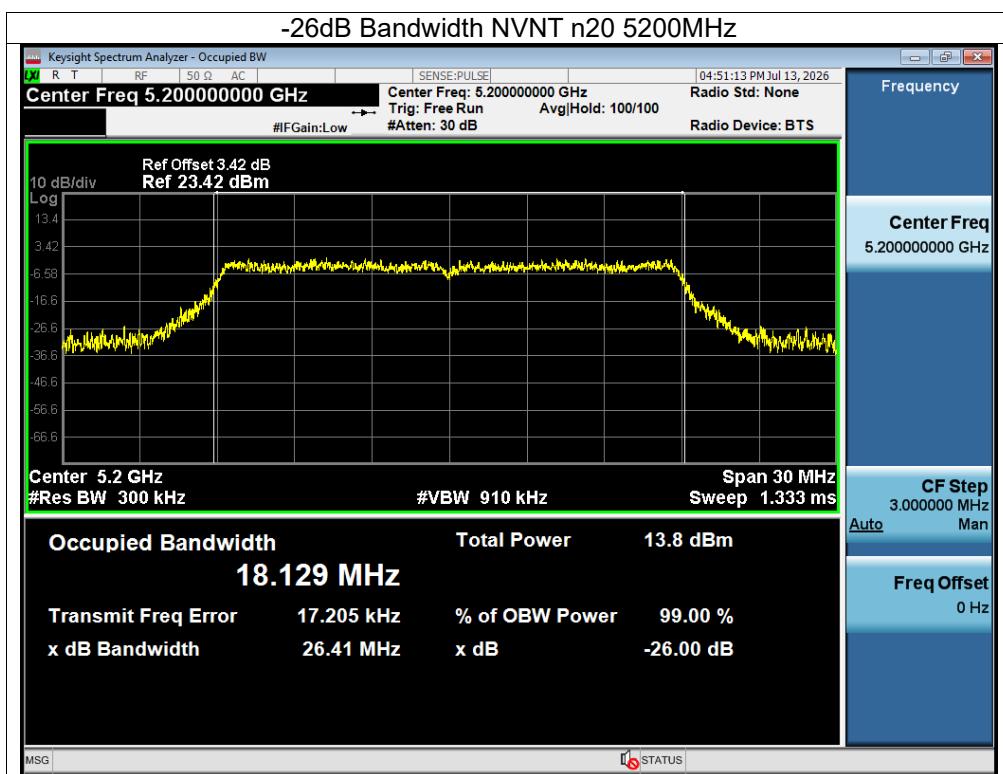
Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
Test Mode:	(5180-5240MHz)		

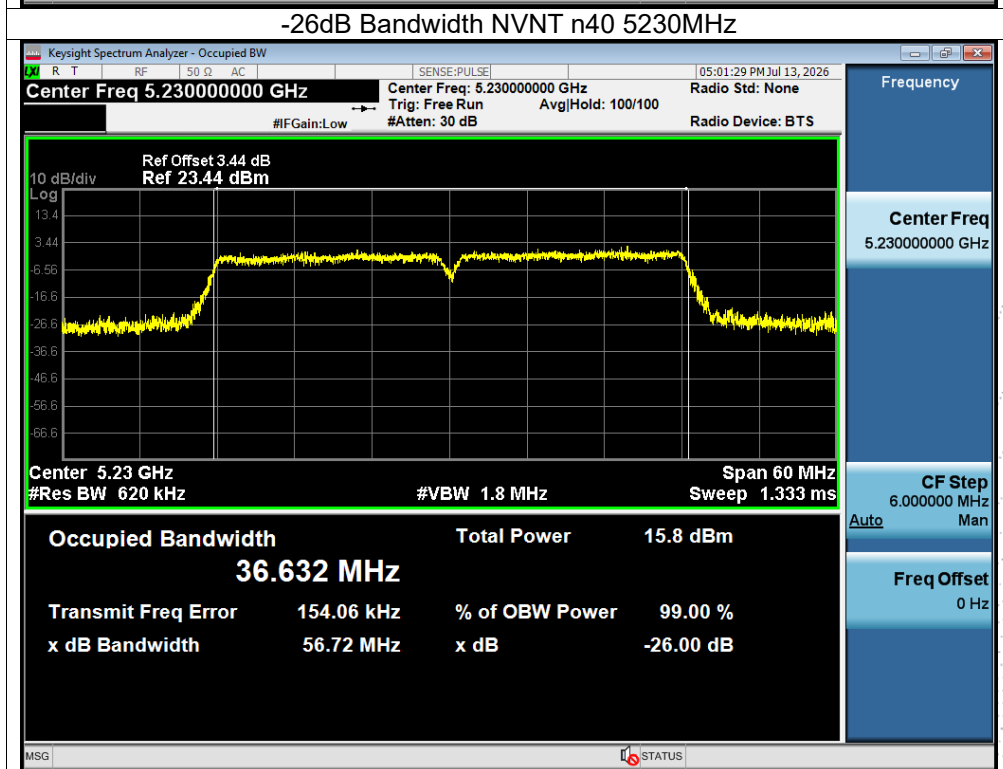
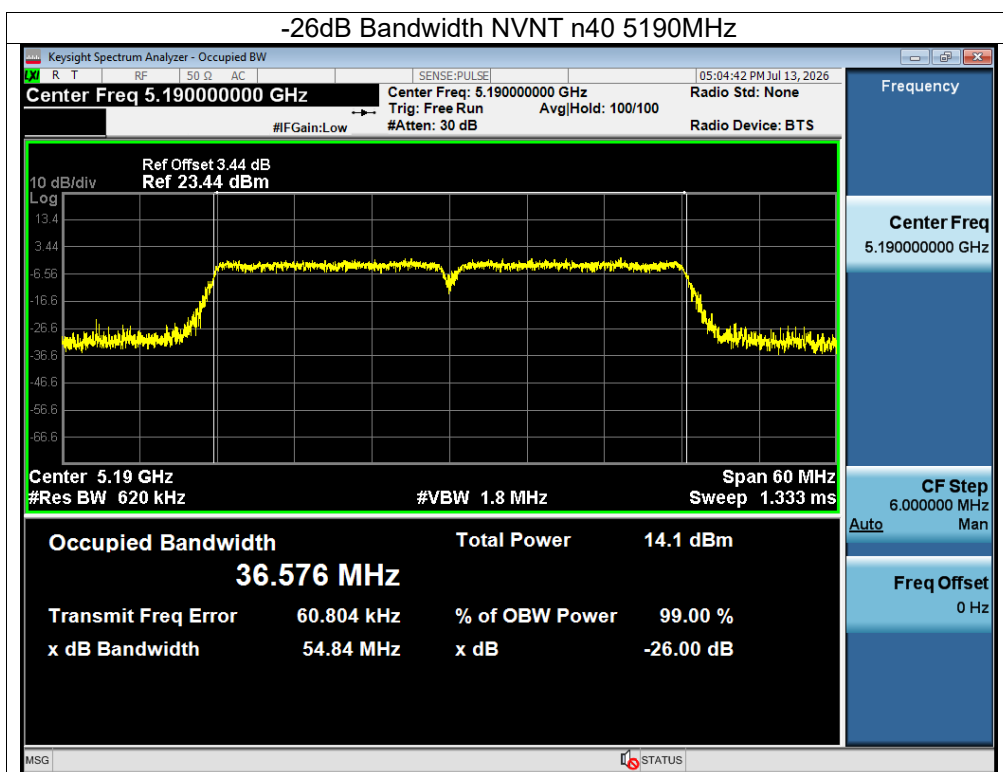
Condition	Mode	Frequency (MHz)	-26 dB Bandwidth (MHz)	Verdict
NVNT	a	5180	25.413	Pass
NVNT	a	5200	25.855	Pass
NVNT	a	5240	27.839	Pass
NVNT	n20	5180	23.446	Pass
NVNT	n20	5200	26.406	Pass
NVNT	n20	5240	26.108	Pass
NVNT	n40	5190	54.841	Pass
NVNT	n40	5230	56.716	Pass
NVNT	ac20	5180	23.04	Pass
NVNT	ac20	5200	26.684	Pass
NVNT	ac20	5240	27.204	Pass
NVNT	ac40	5190	54.130	Pass
NVNT	ac40	5230	58.774	Pass
NVNT	ax20	5180	22.371	Pass
NVNT	ax20	5200	22.813	Pass
NVNT	ax20	5240	23.753	Pass
NVNT	ax40	5190	57.815	Pass
NVNT	ax40	5230	55.167	Pass

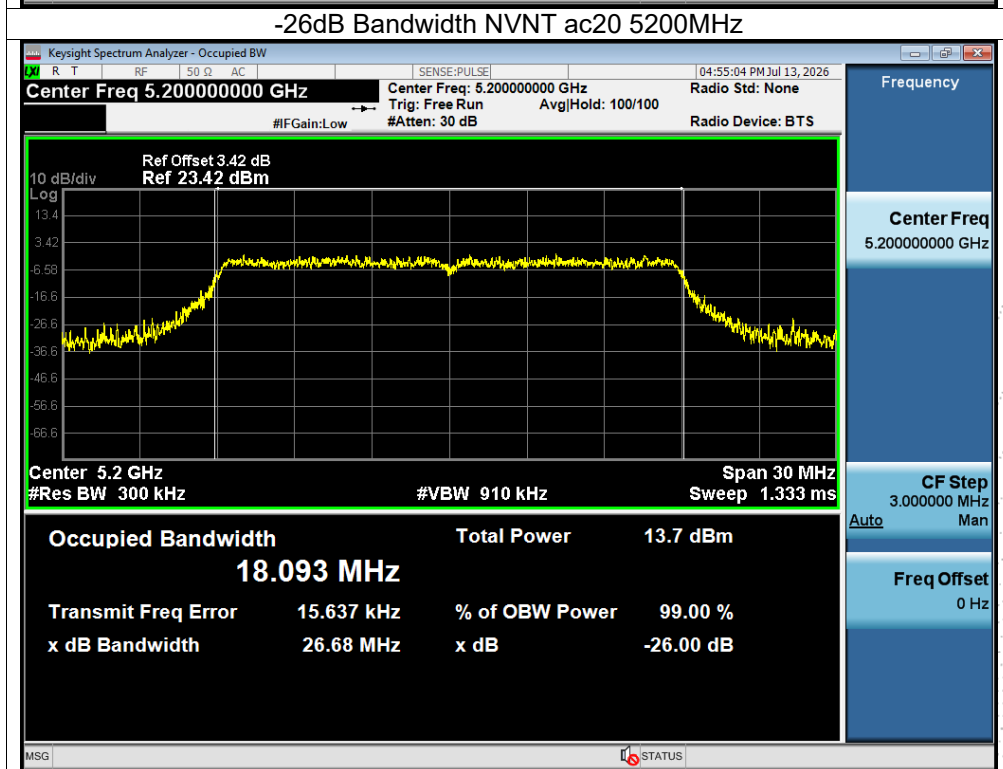
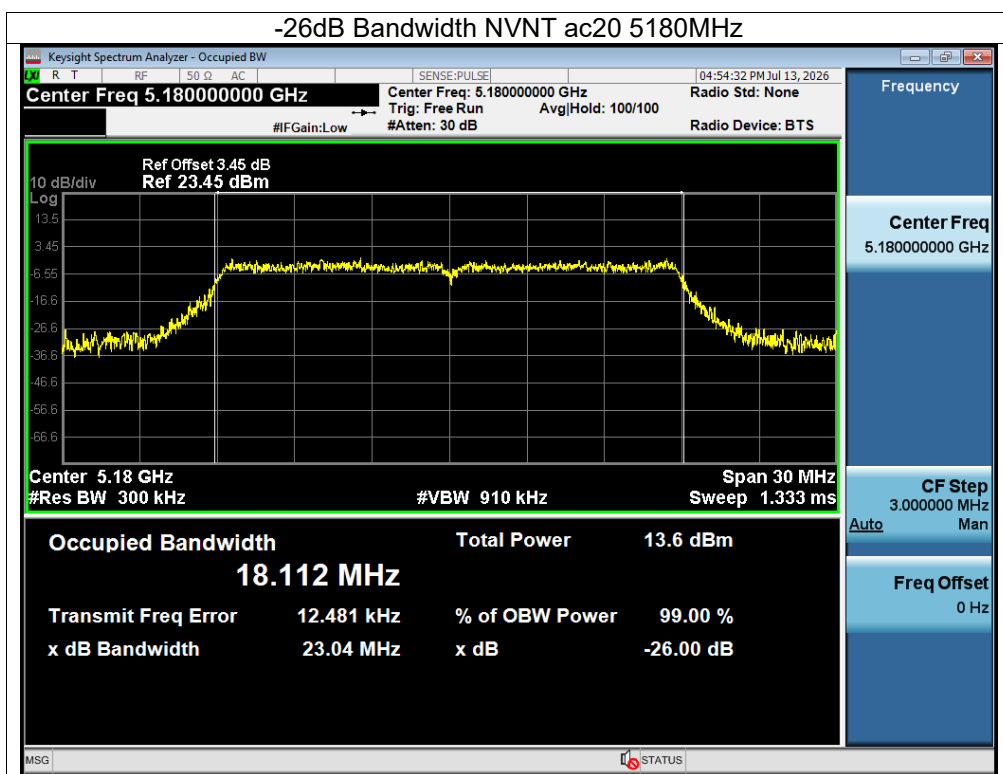
Condition	Mode	Frequency (MHz)	99%RH OBW (MHz)
NVNT	a	5180	16.876
NVNT	a	5200	16.852
NVNT	a	5240	16.930
NVNT	n20	5180	17.977
NVNT	n20	5200	17.929
NVNT	n20	5240	17.939
NVNT	n40	5190	36.380
NVNT	n40	5230	36.393
NVNT	ac20	5180	17.931
NVNT	ac20	5200	17.923
NVNT	ac20	5240	17.980
NVNT	ac40	5190	36.389
NVNT	ac40	5230	36.430
NVNT	ax20	5180	19.071
NVNT	ax20	5200	19.135
NVNT	ax20	5240	19.142
NVNT	ax40	5190	37.875
NVNT	ax40	5230	37.835

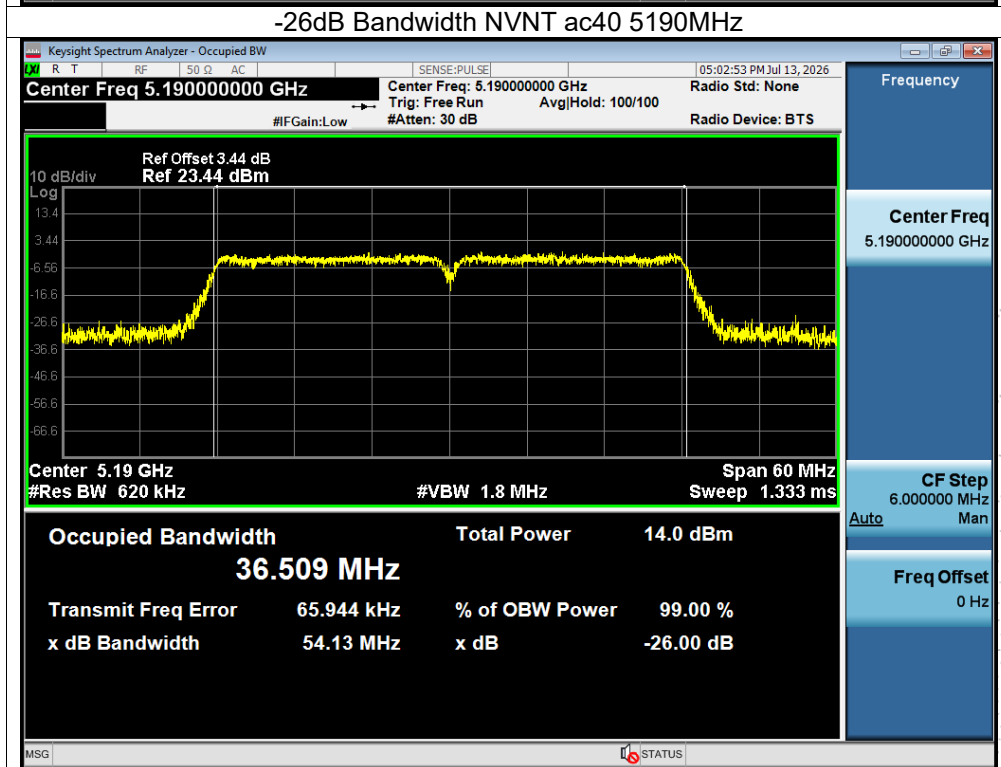
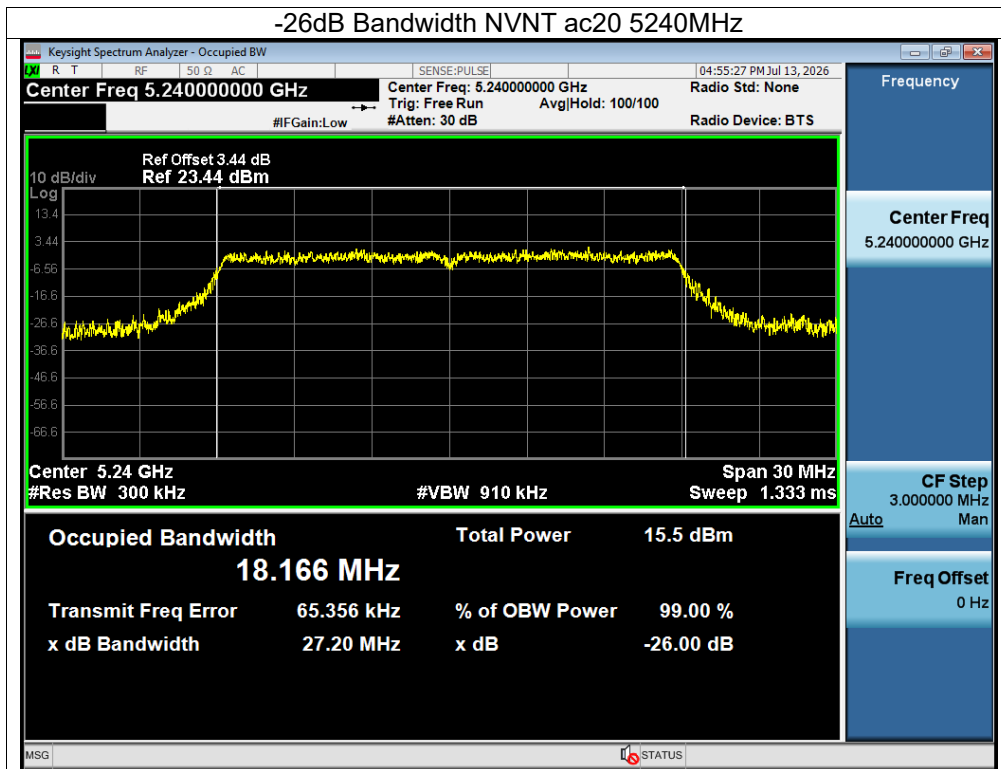


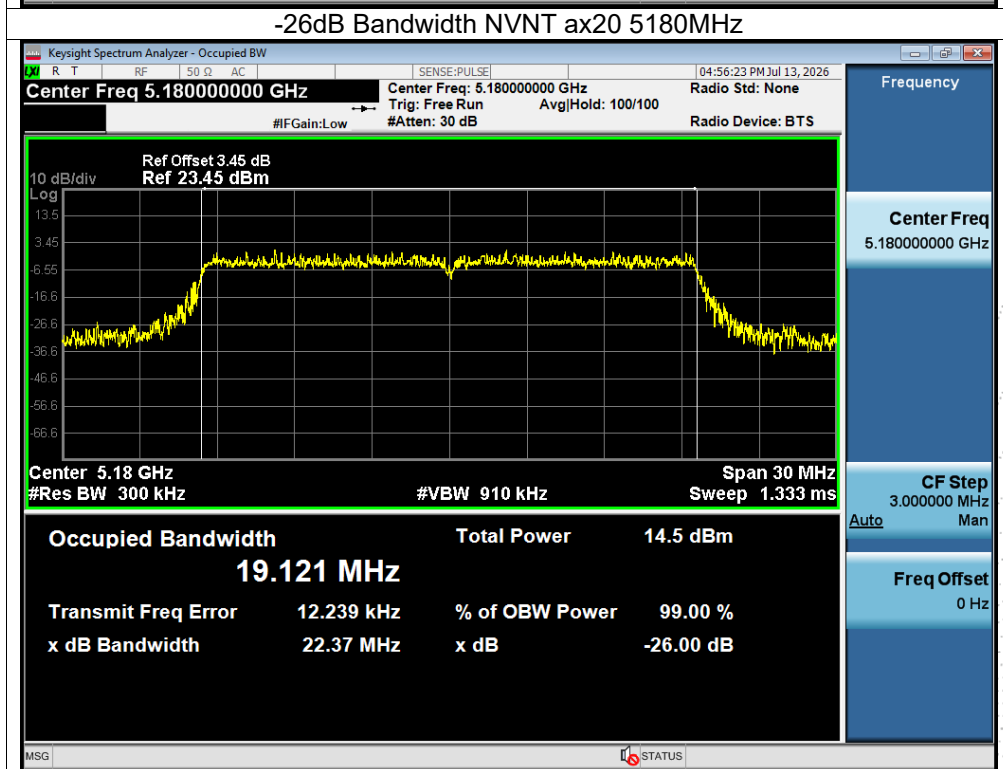
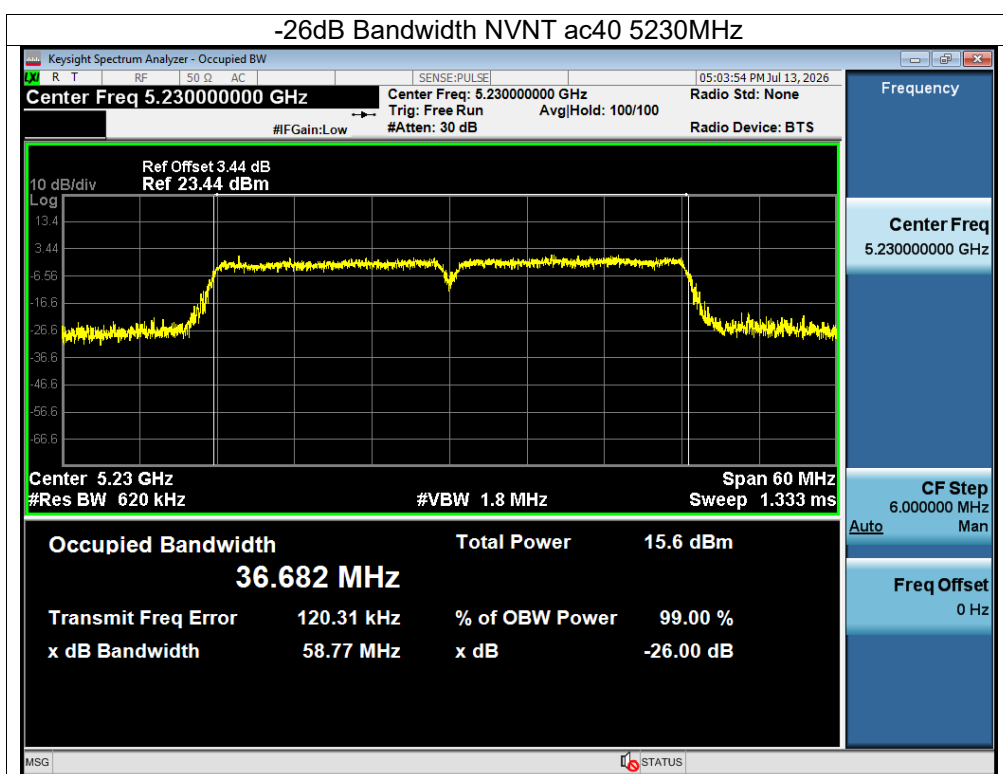


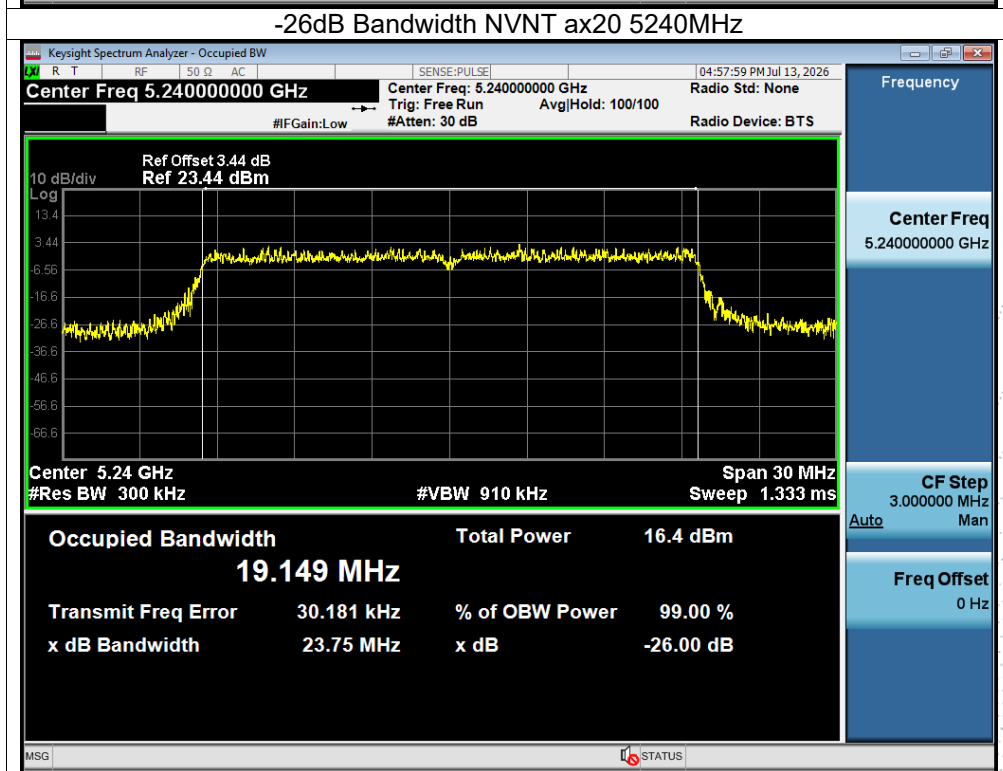
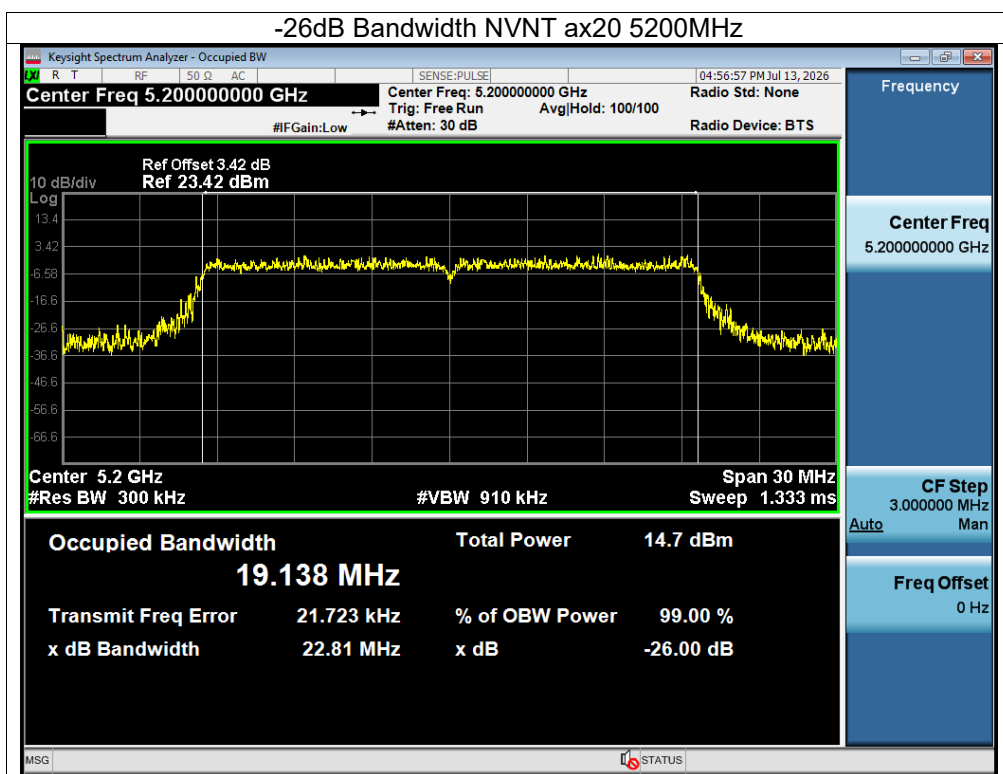


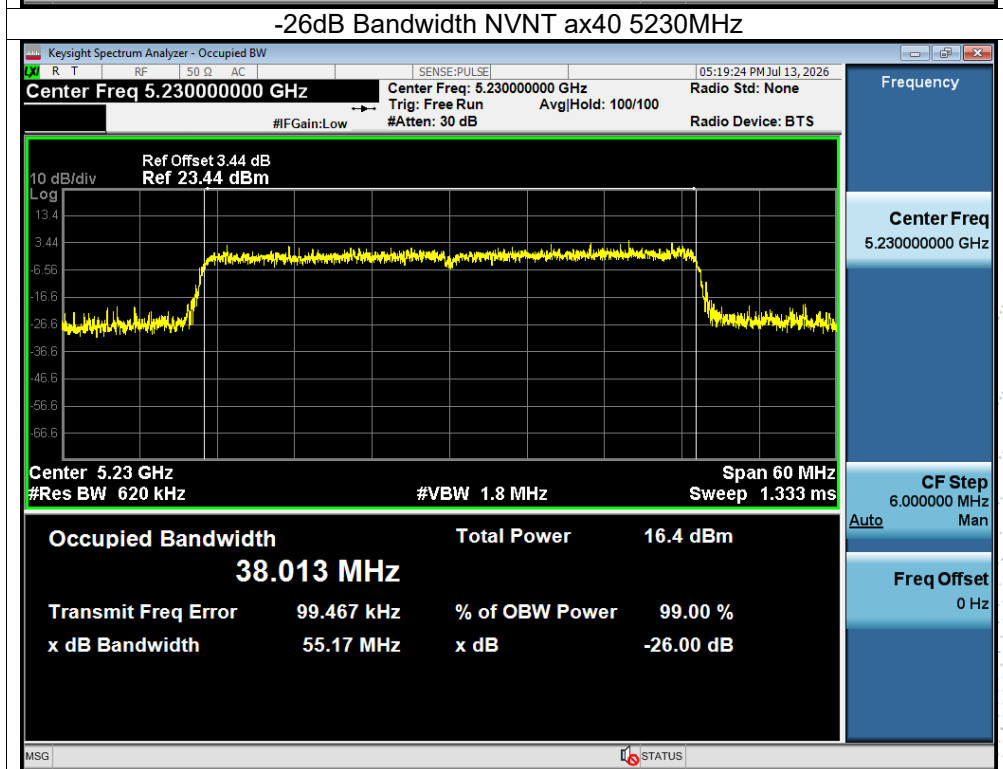
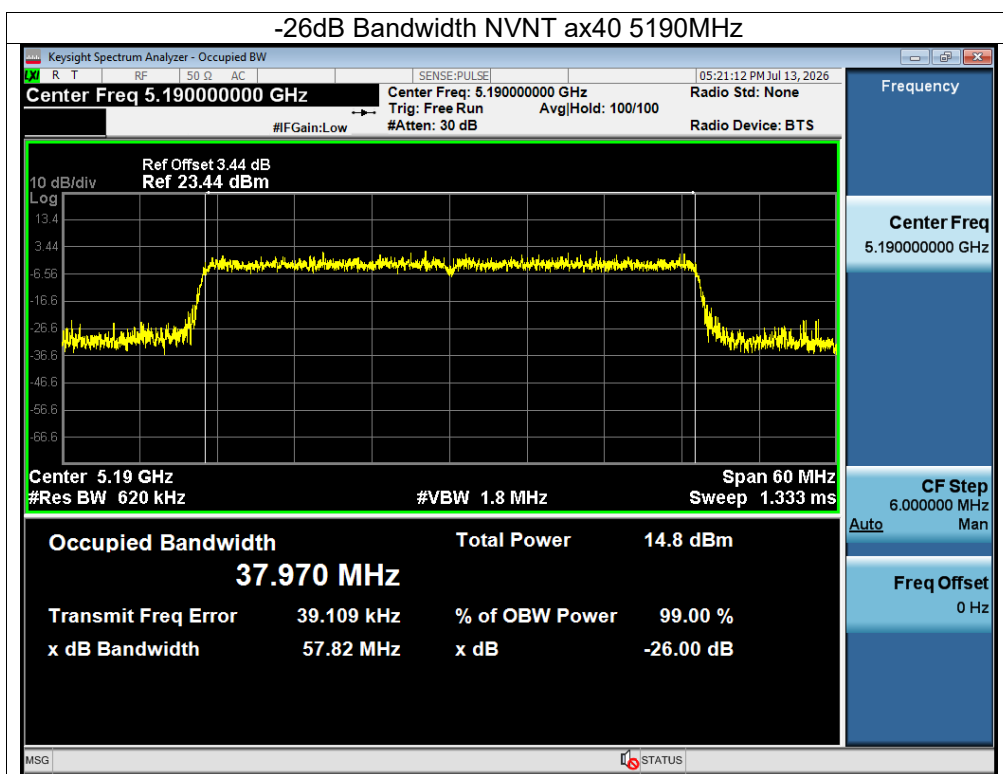


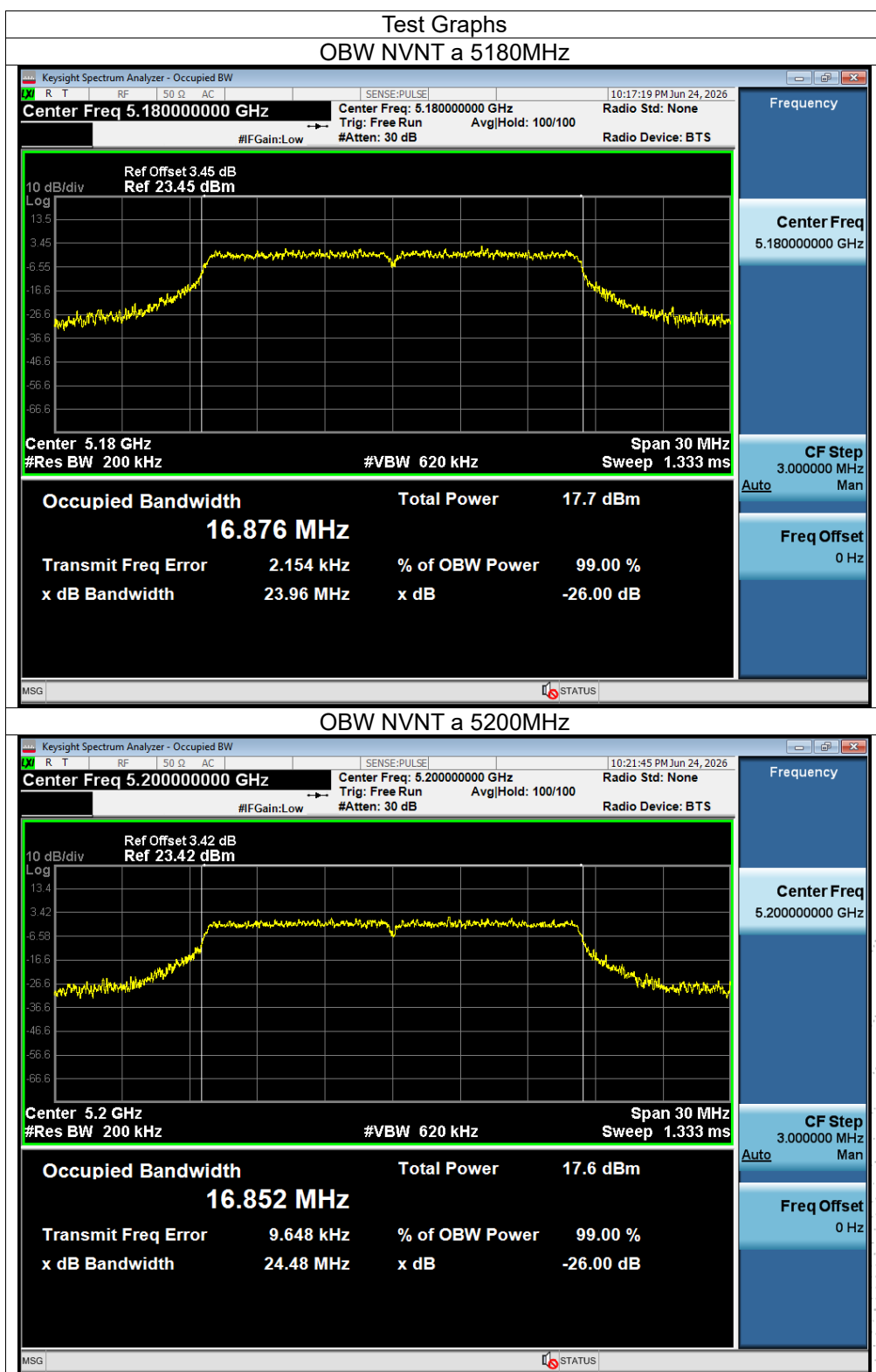


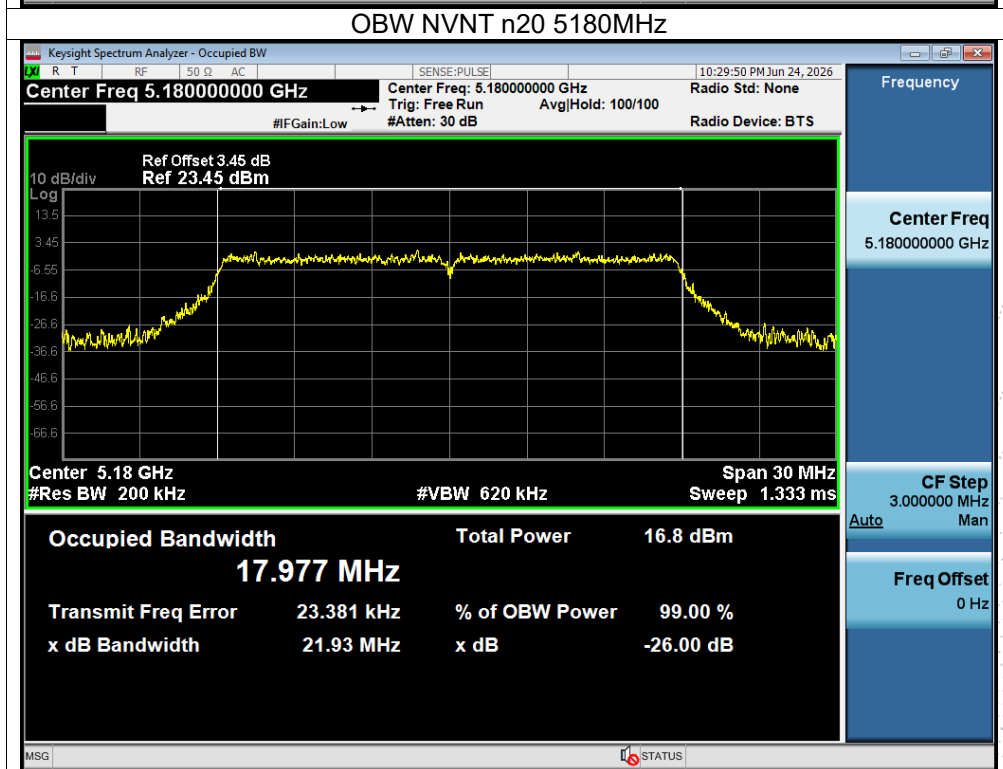
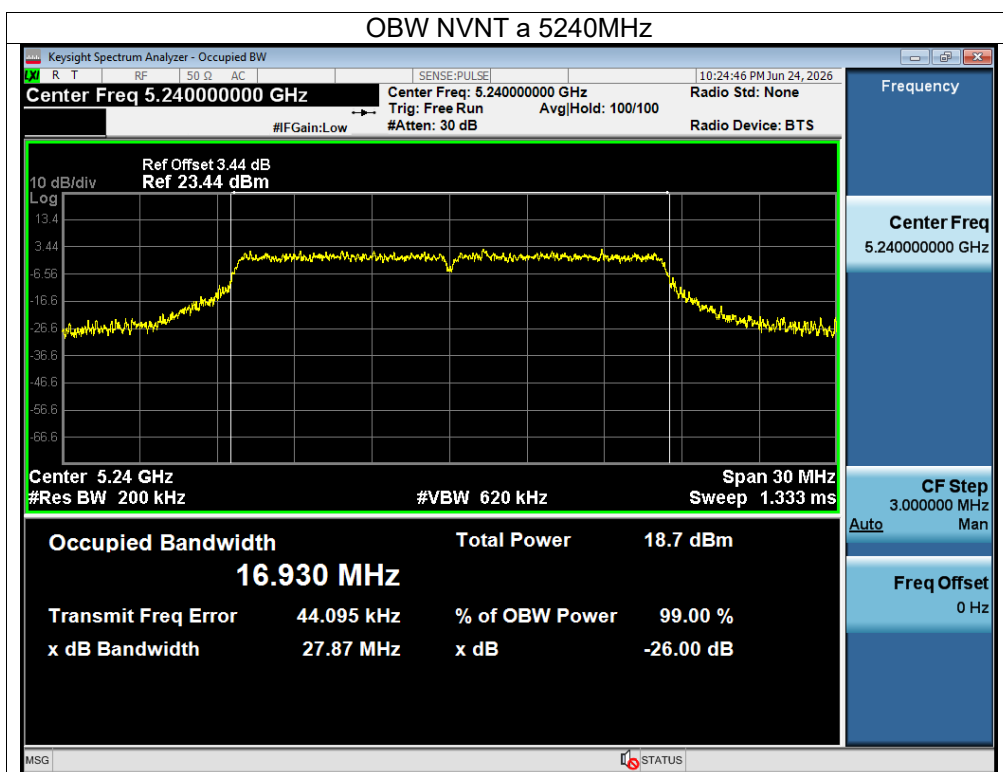


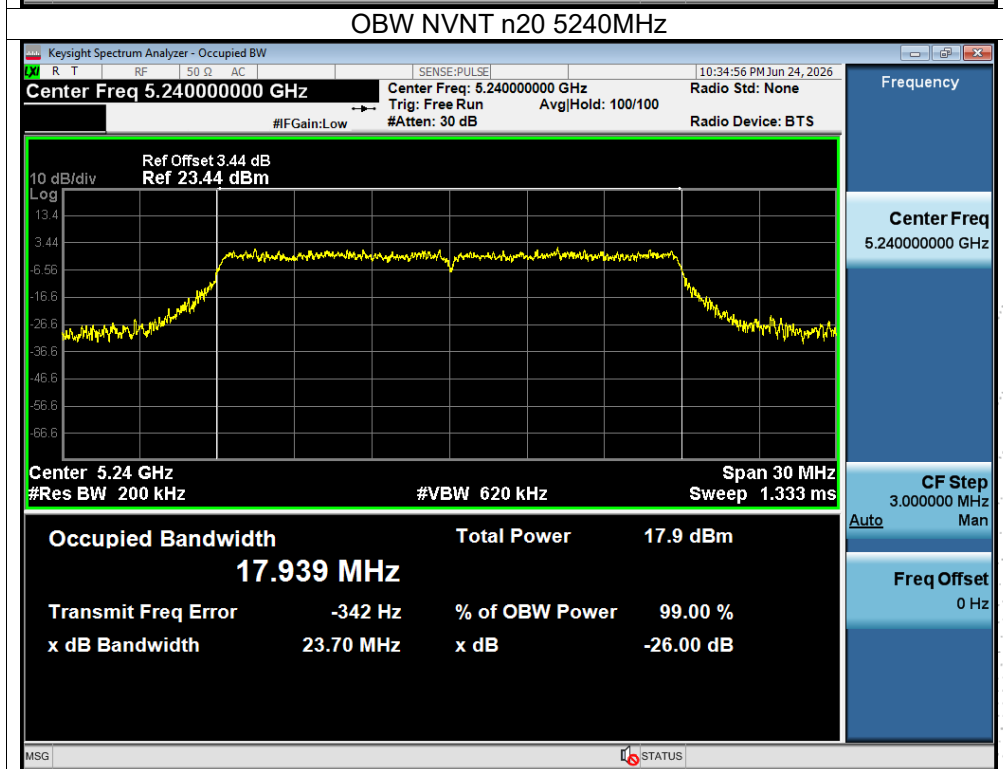
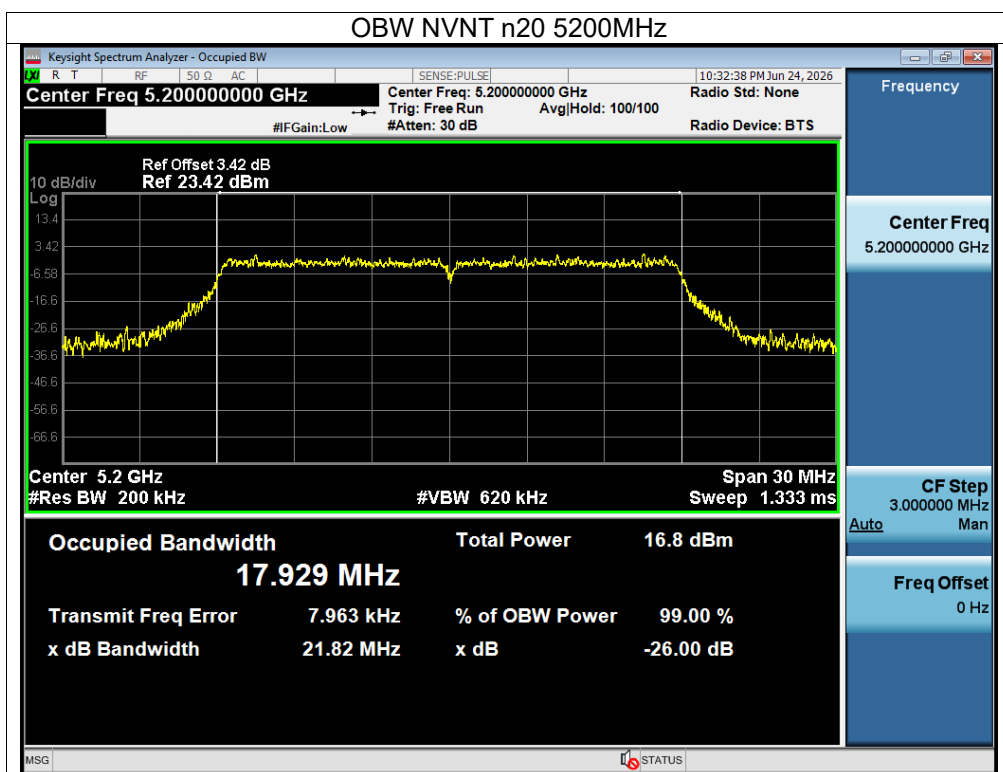




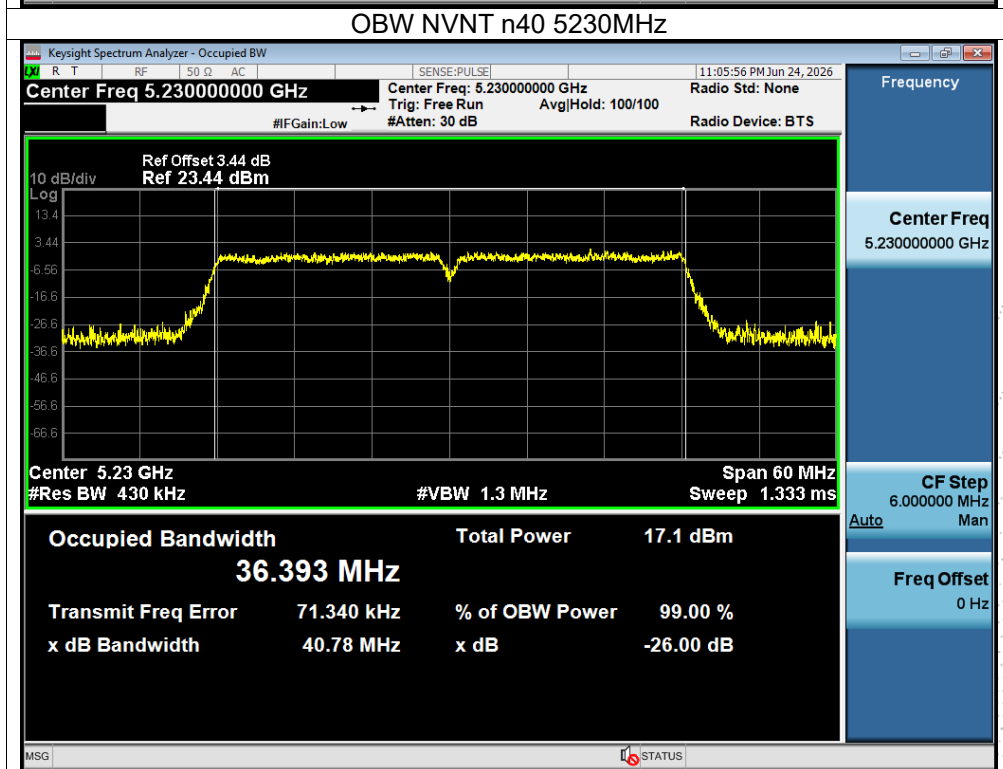
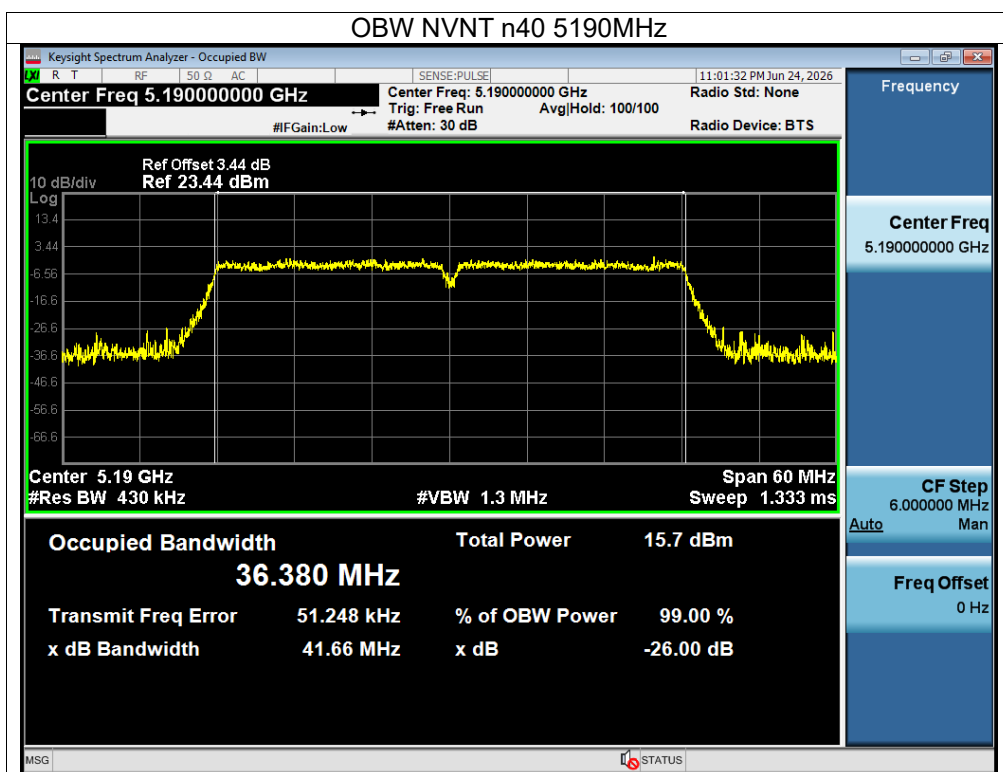


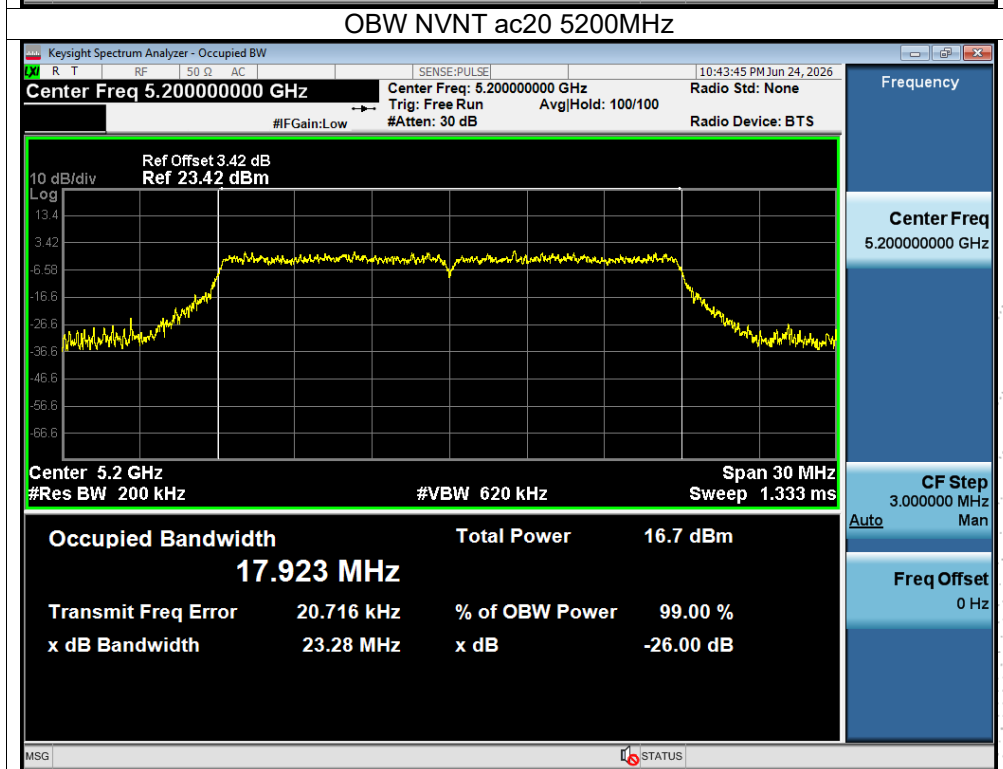
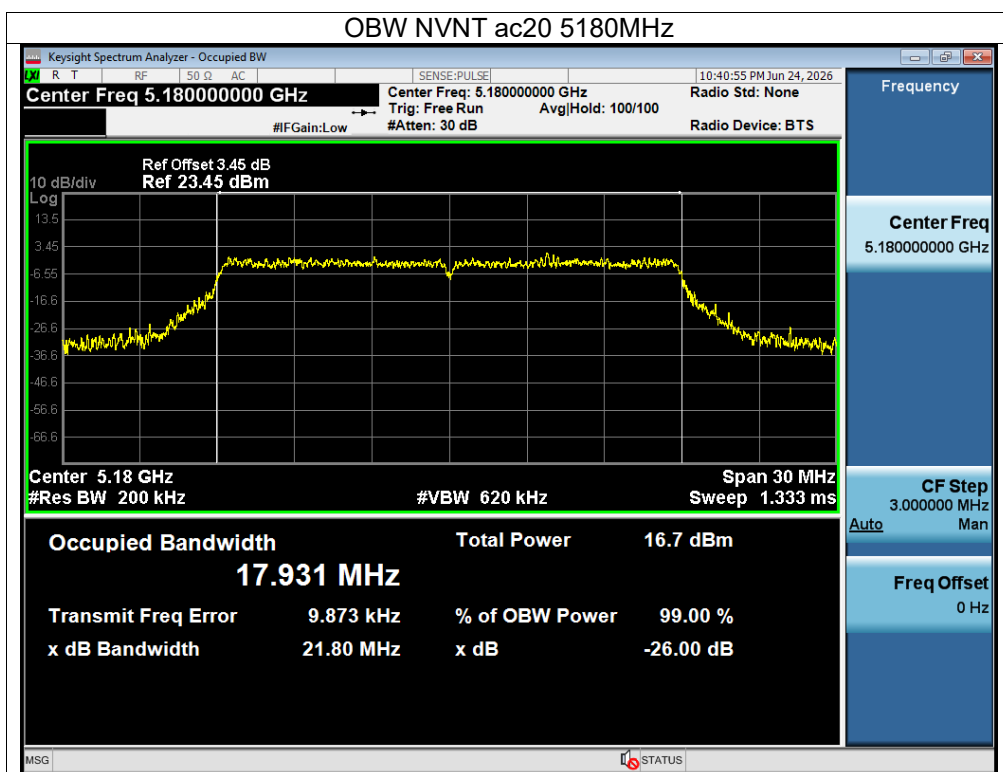


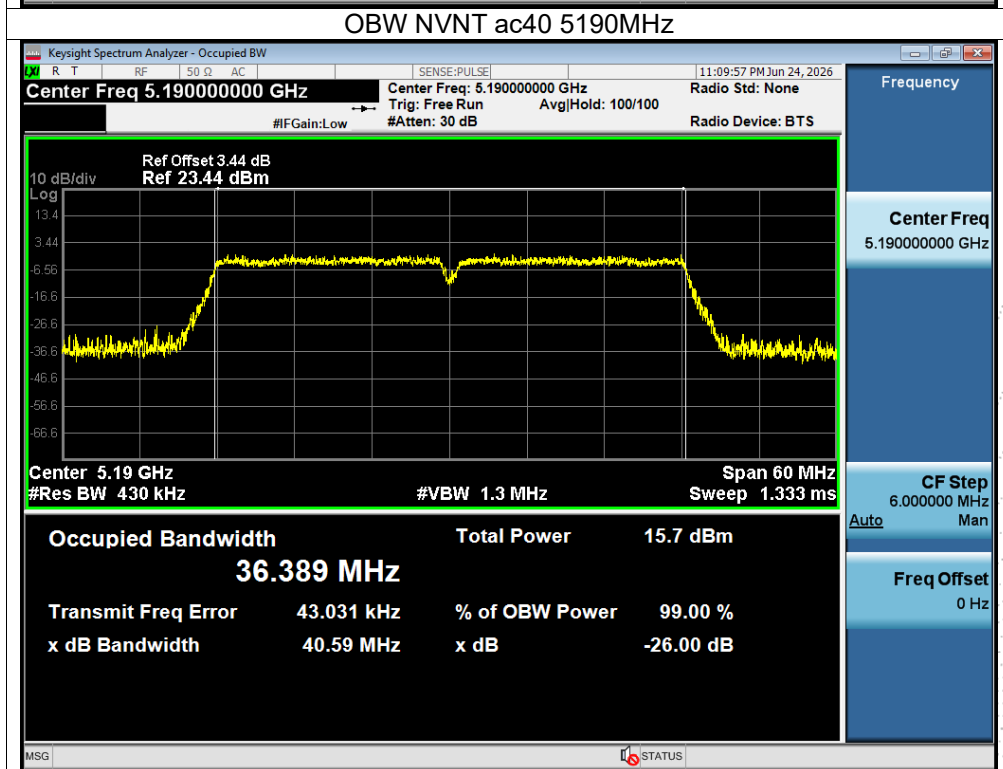
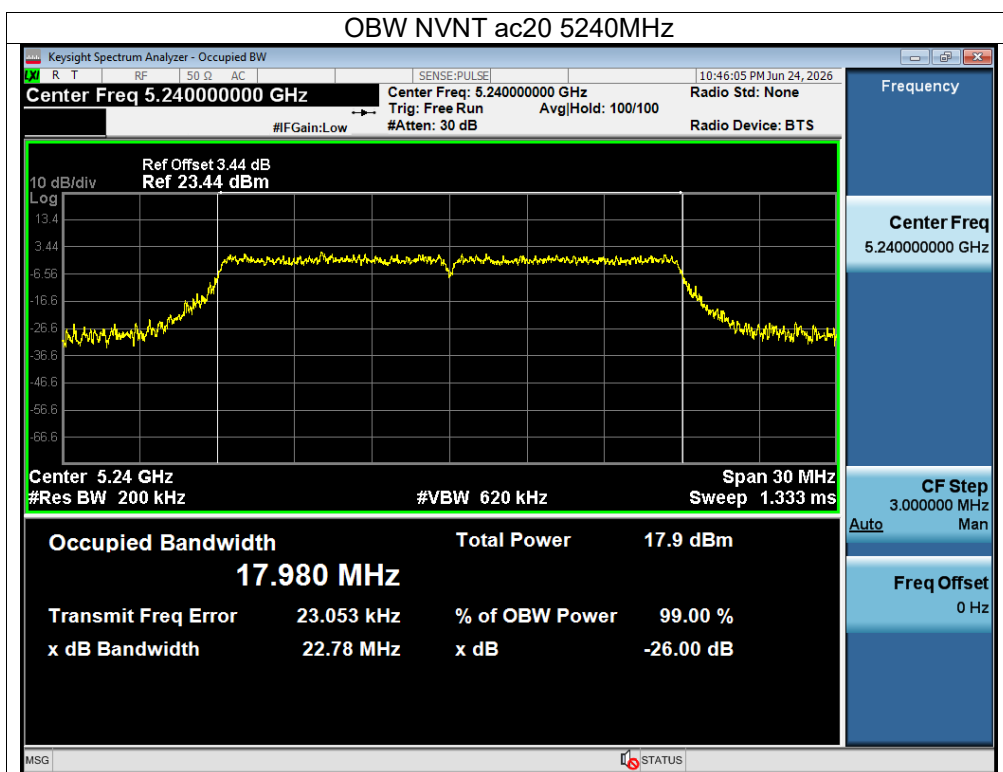


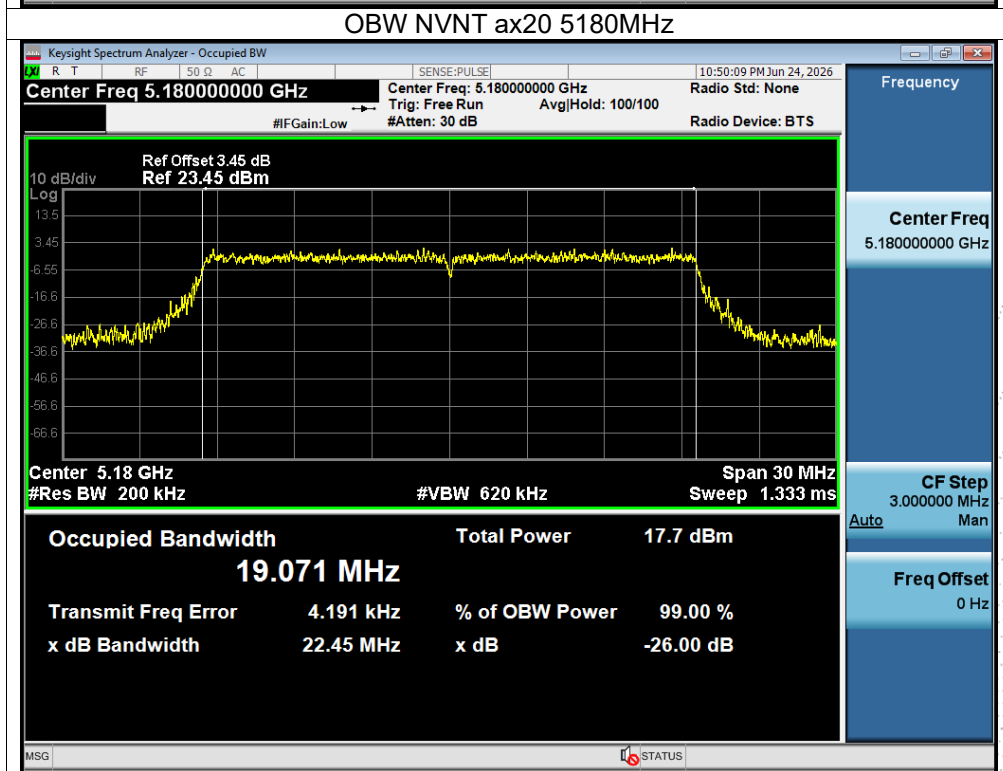
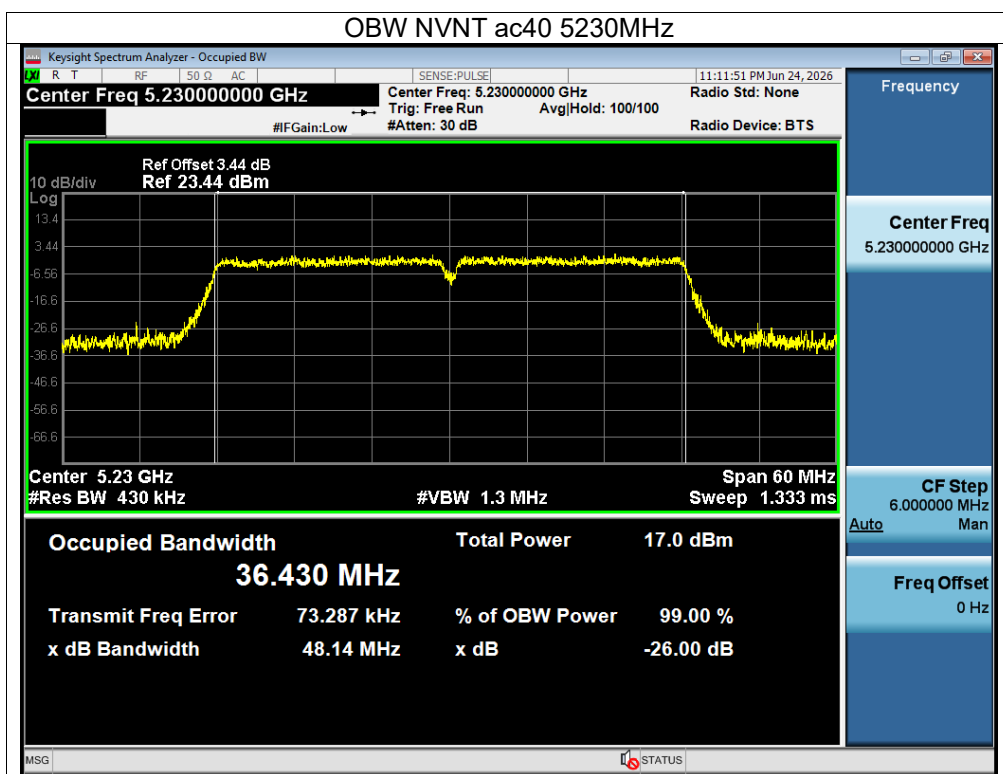


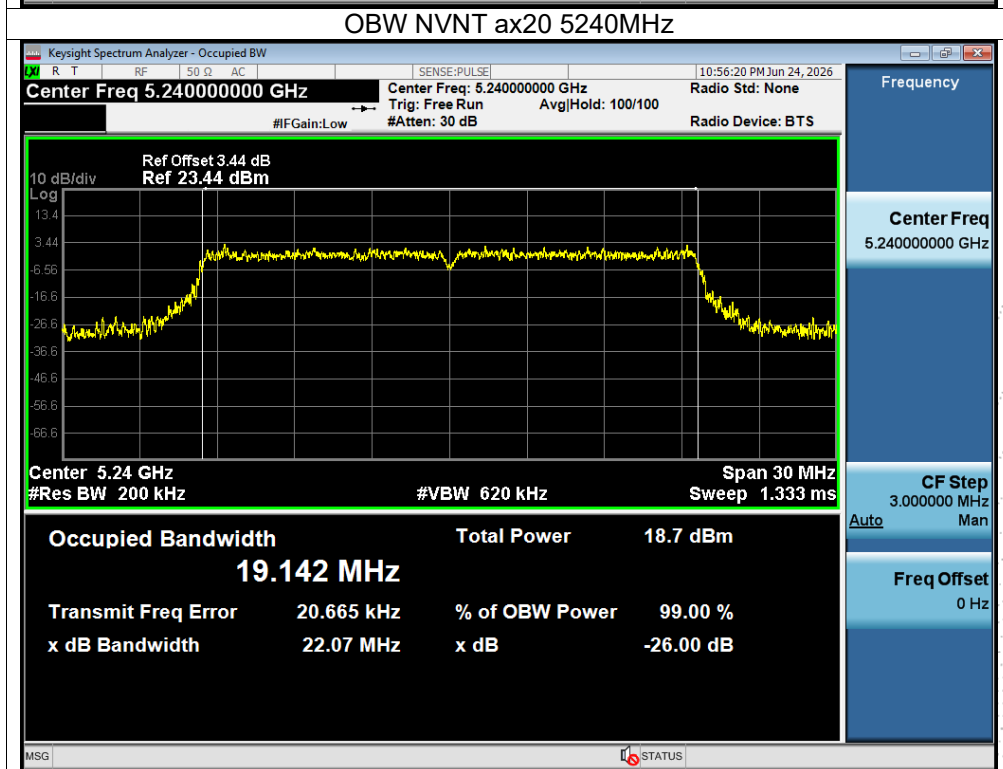
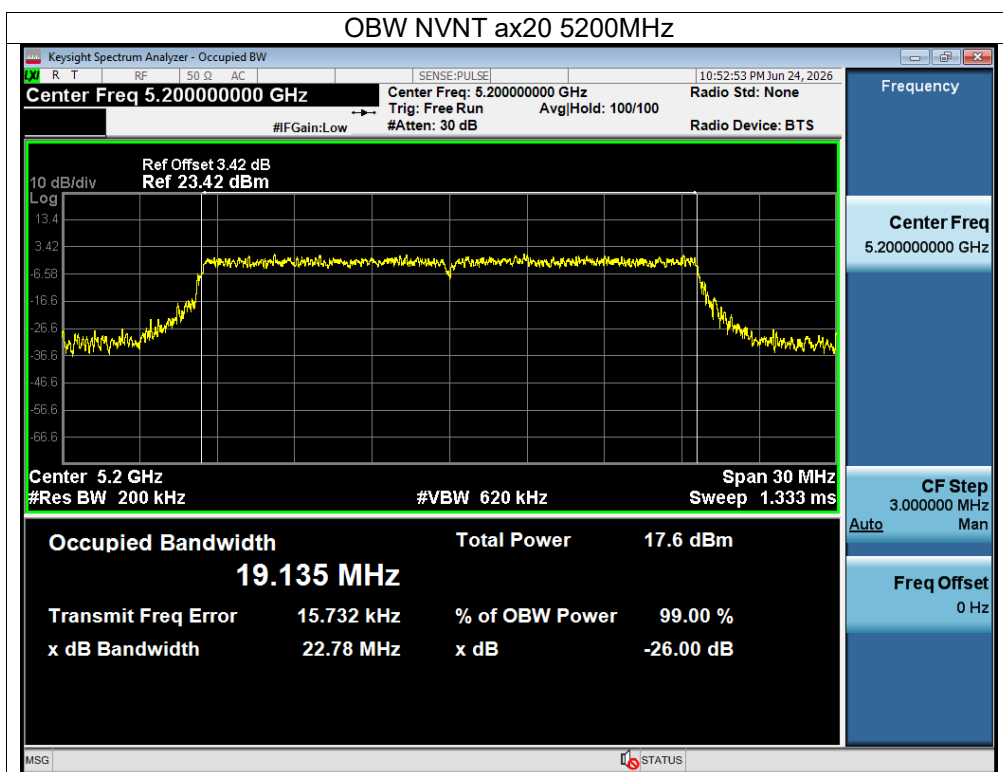
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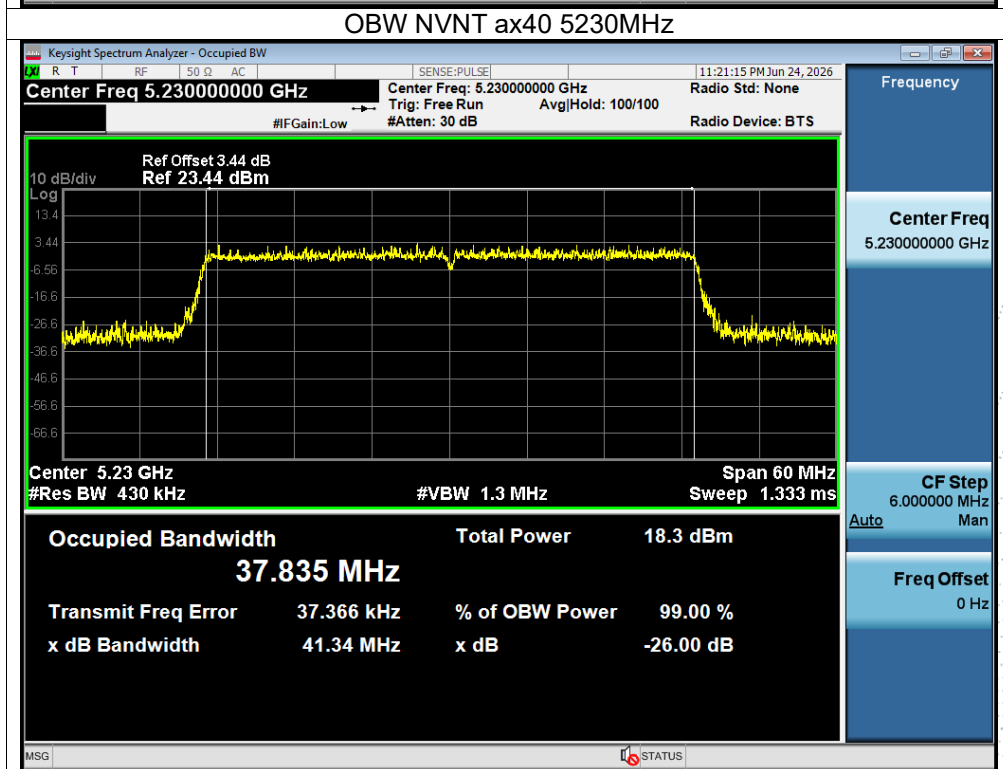
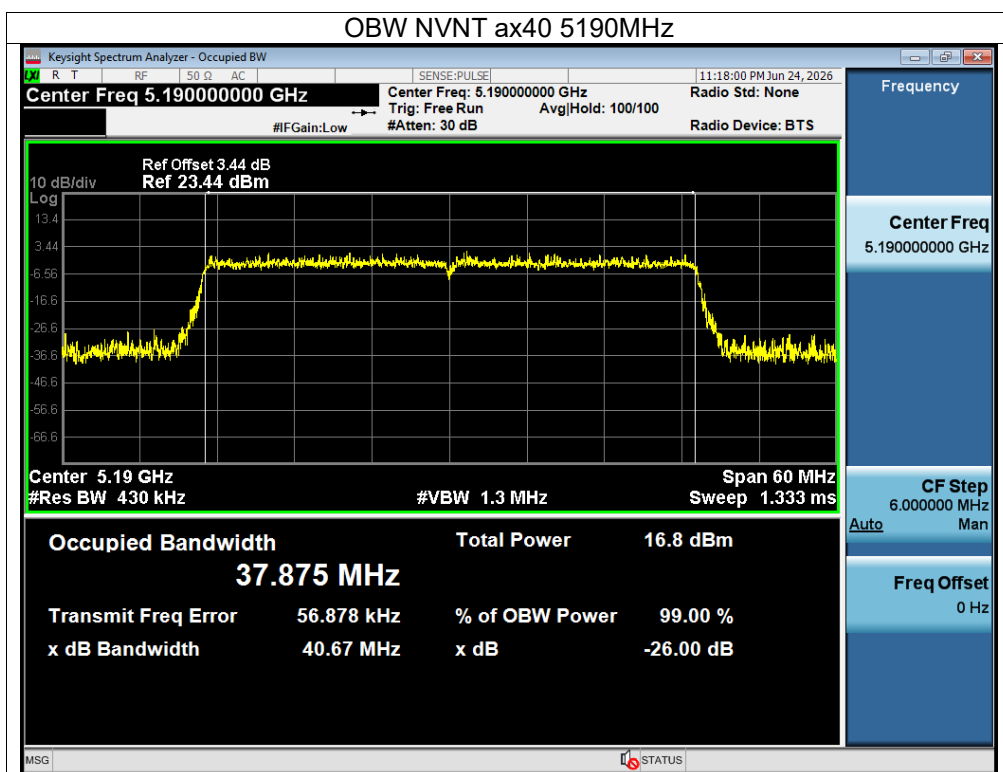










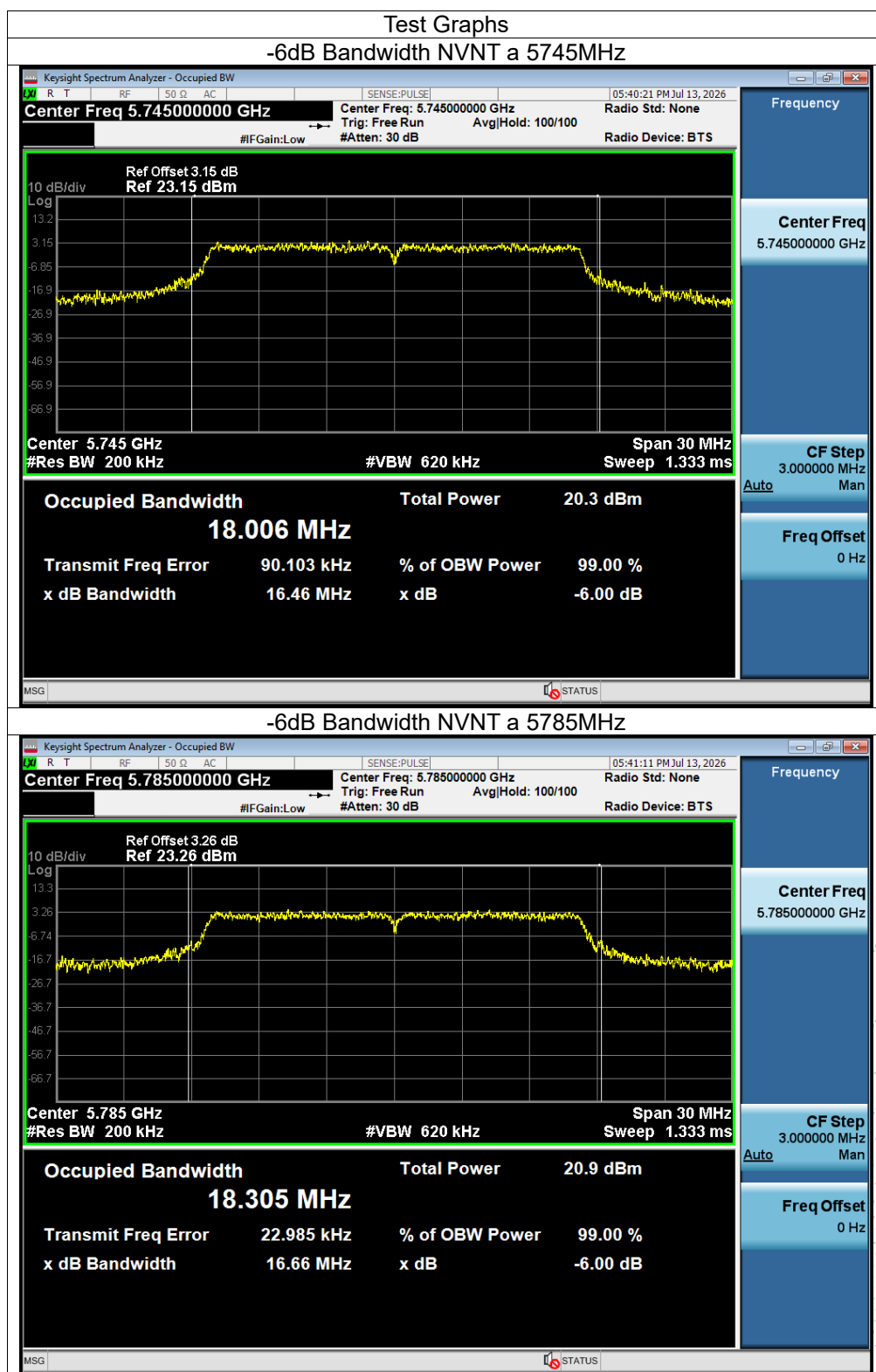


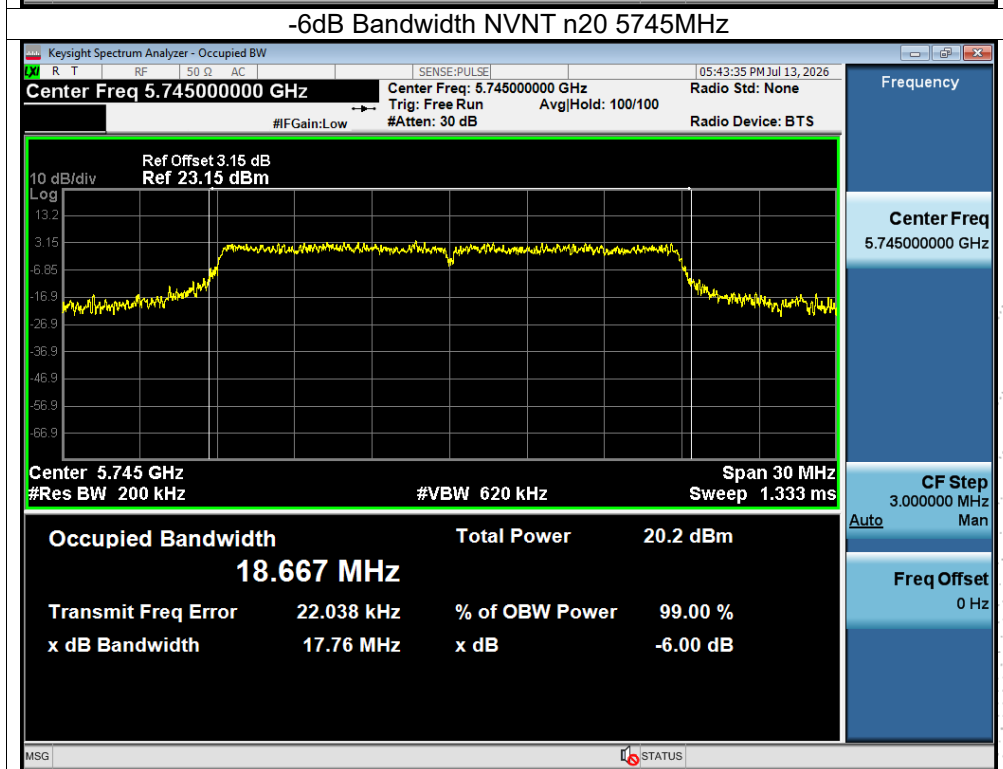
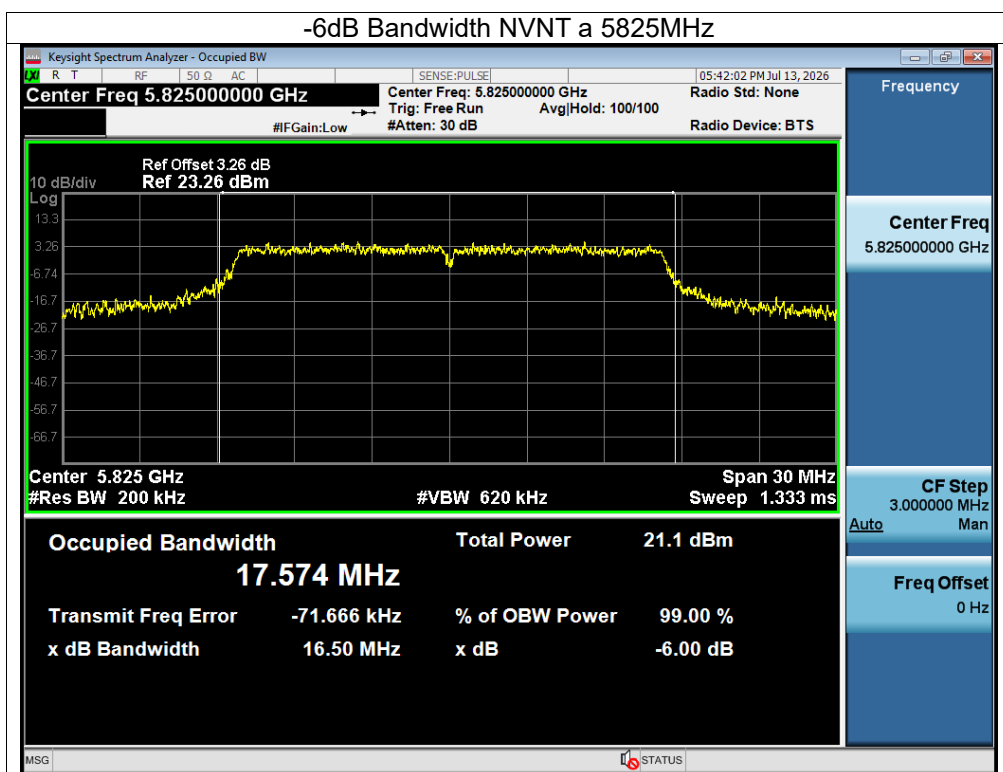
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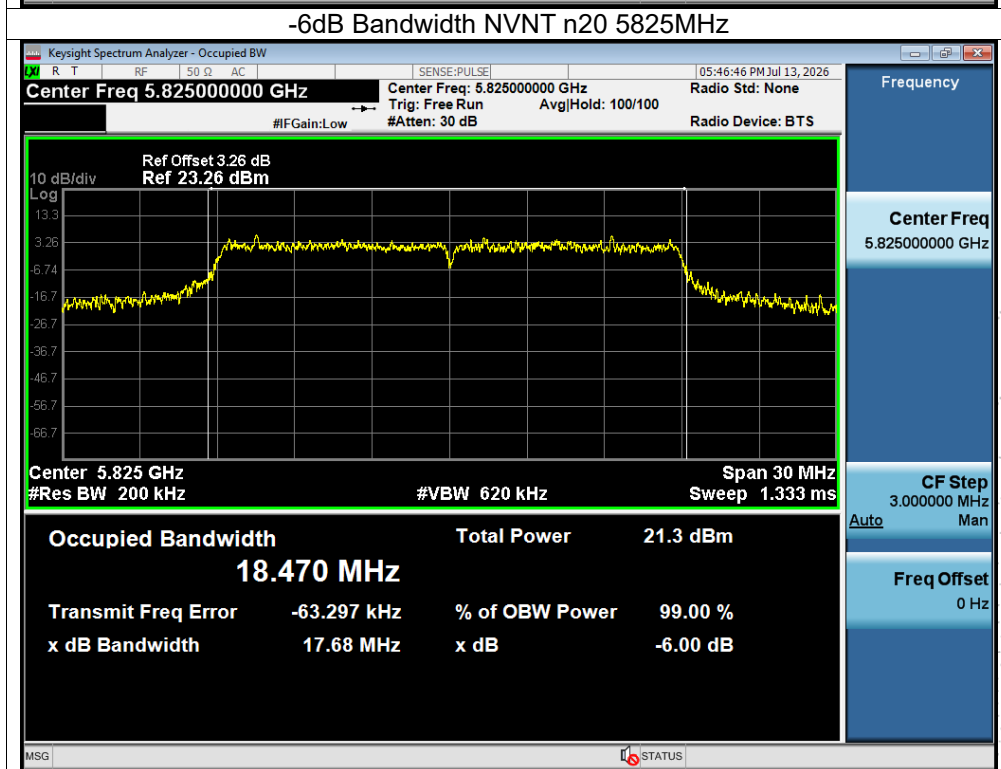
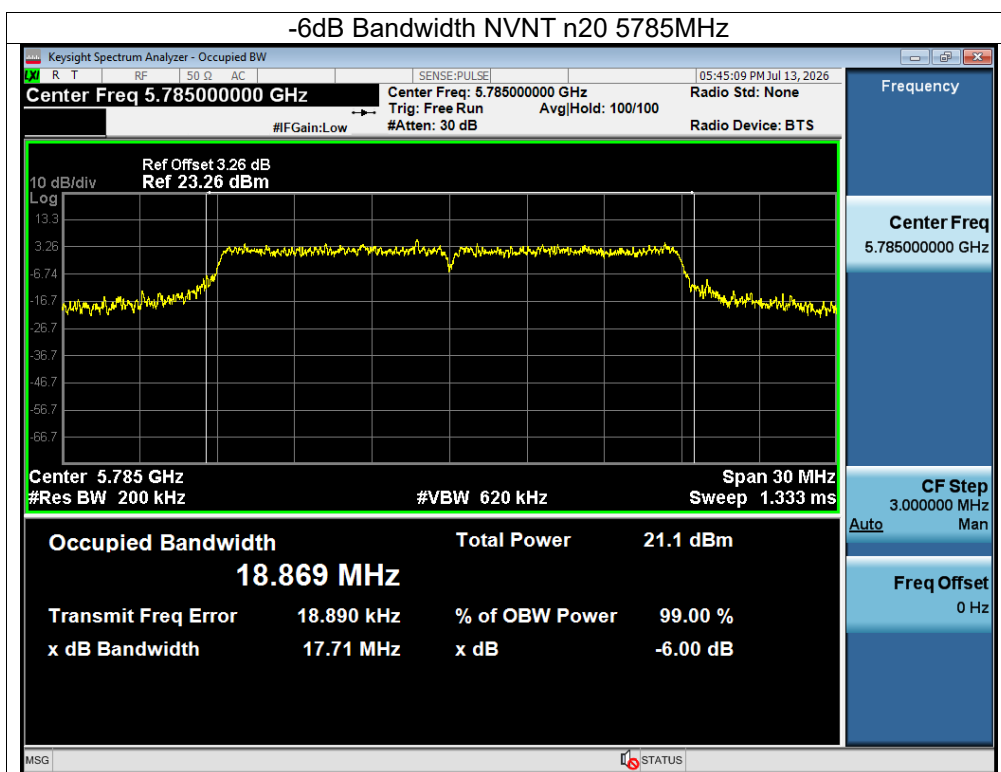
Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
Test Mode:	(5745-5825MHz)		

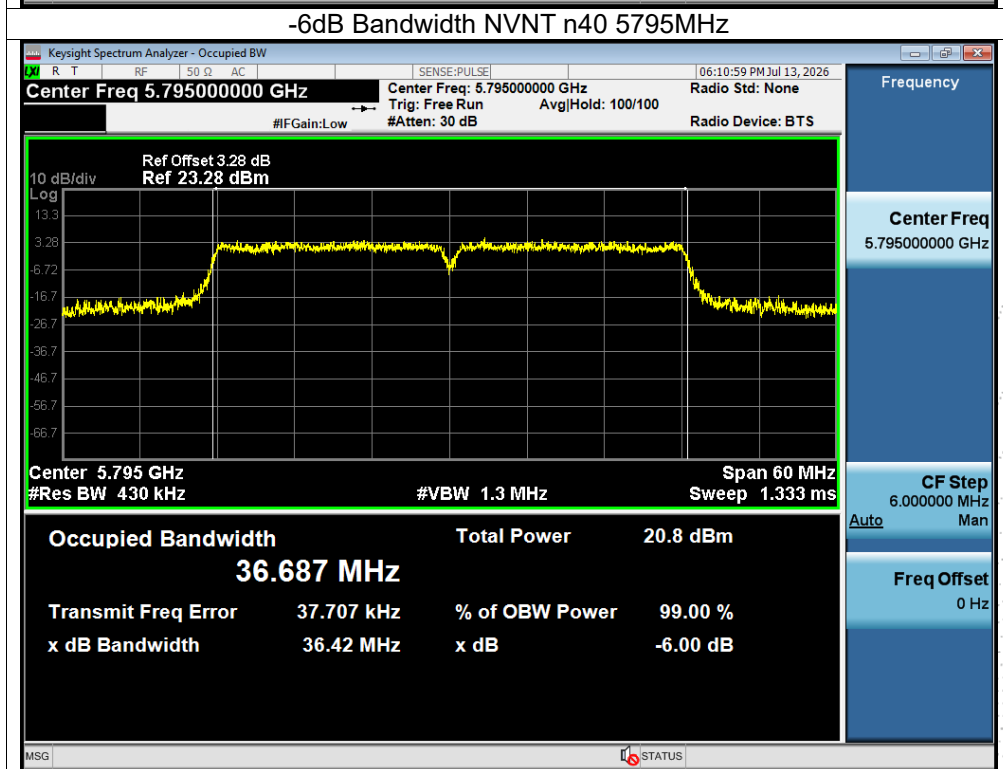
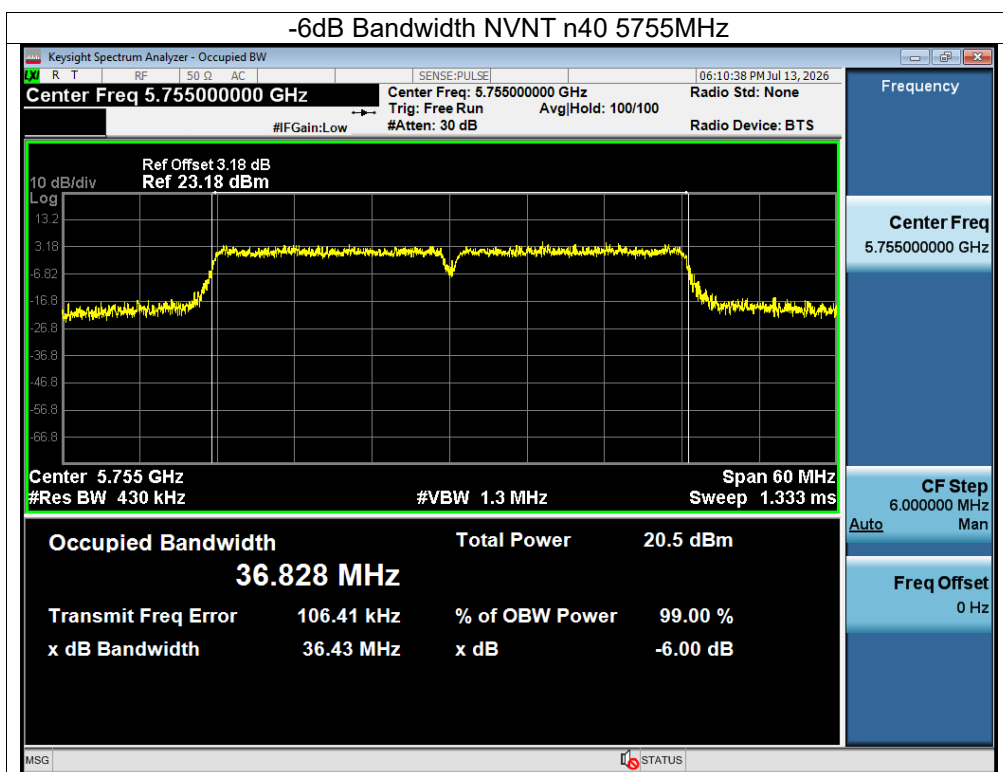
Condition	Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	a	5745	16.458	0.5	Pass
NVNT	a	5785	16.655	0.5	Pass
NVNT	a	5825	16.499	0.5	Pass
NVNT	n20	5745	17.759	0.5	Pass
NVNT	n20	5785	17.71	0.5	Pass
NVNT	n20	5825	17.677	0.5	Pass
NVNT	n40	5755	36.43	0.5	Pass
NVNT	n40	5795	36.424	0.5	Pass
NVNT	ac20	5745	17.696	0.5	Pass
NVNT	ac20	5785	17.706	0.5	Pass
NVNT	ac20	5825	17.639	0.5	Pass
NVNT	ac40	5755	36.486	0.5	Pass
NVNT	ac40	5795	36.442	0.5	Pass
NVNT	ax20	5745	19.139	0.5	Pass
NVNT	ax20	5785	19.026	0.5	Pass
NVNT	ax20	5825	19.009	0.5	Pass
NVNT	ax40	5755	37.943	0.5	Pass
NVNT	ax40	5795	38.052	0.5	Pass

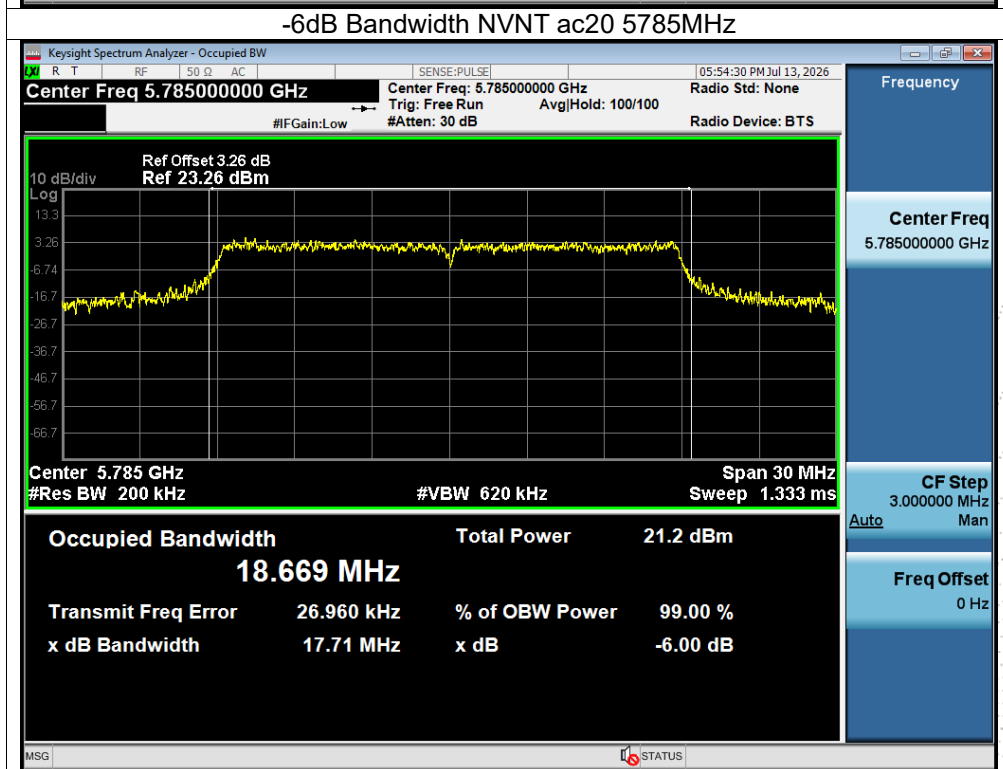
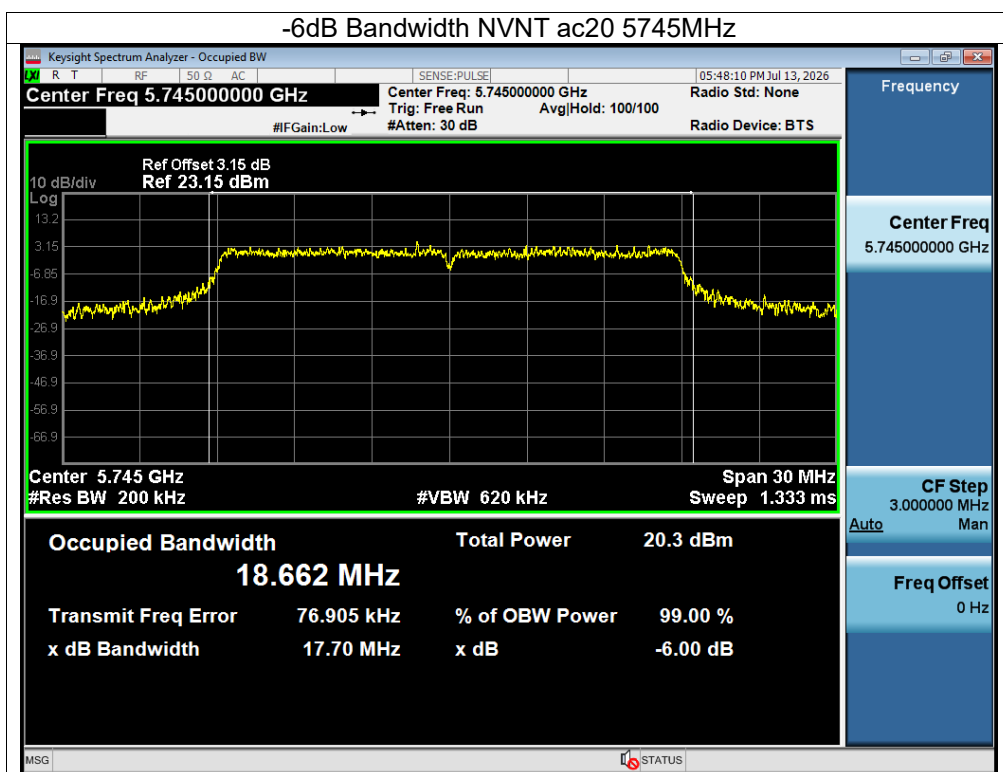
Condition	Mode	Frequency (MHz)	99%RH OBW (MHz)
NVNT	a	5745	16.943
NVNT	a	5785	16.949
NVNT	a	5825	17.003
NVNT	n20	5745	17.899
NVNT	n20	5785	17.984
NVNT	n20	5825	17.924
NVNT	n40	5755	36.378
NVNT	n40	5795	36.436
NVNT	ac20	5745	17.971
NVNT	ac20	5785	17.939
NVNT	ac20	5825	17.978
NVNT	ac40	5755	36.428
NVNT	ac40	5795	36.415
NVNT	ax20	5745	19.103
NVNT	ax20	5785	19.111
NVNT	ax20	5825	19.090
NVNT	ax40	5755	37.823
NVNT	ax40	5795	37.844



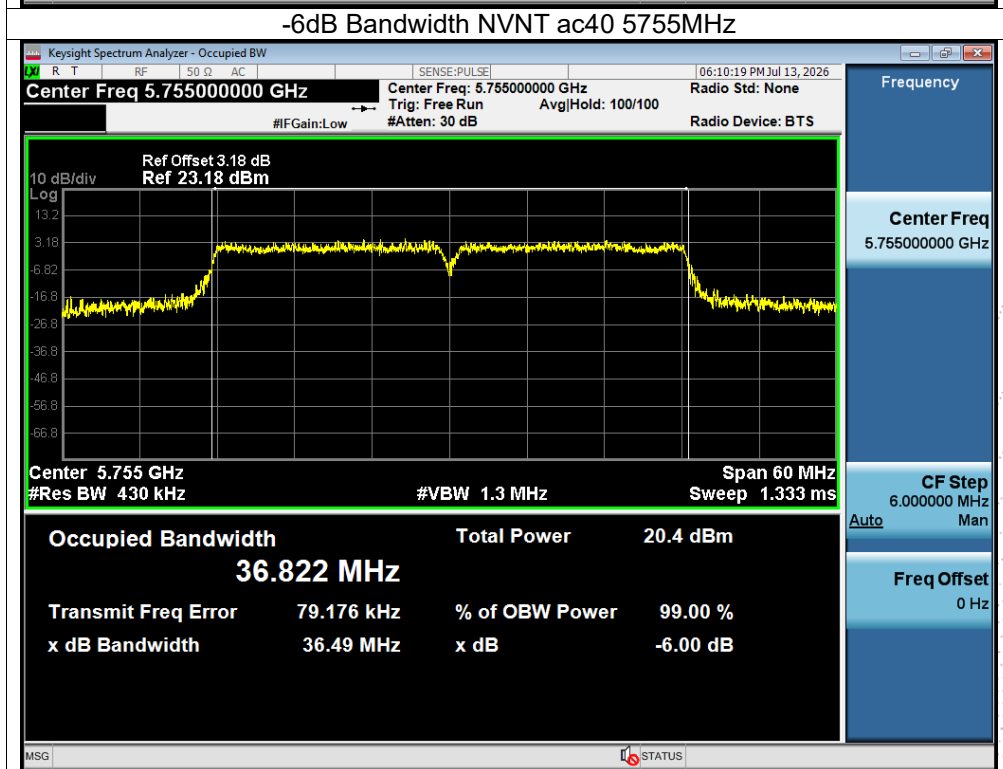
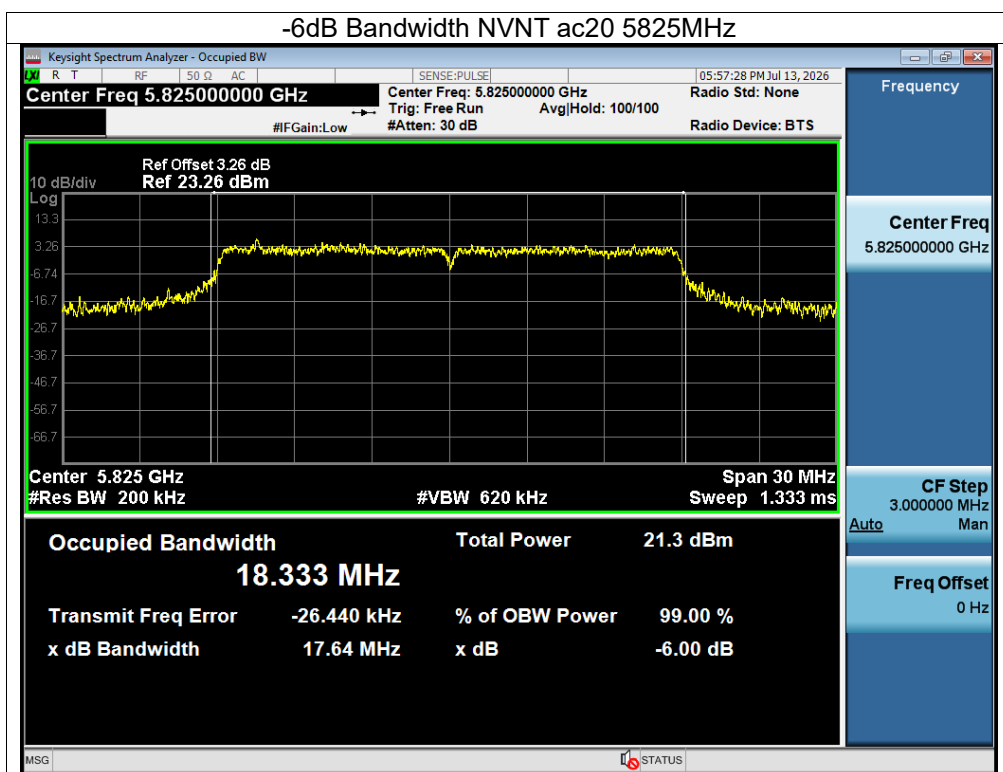


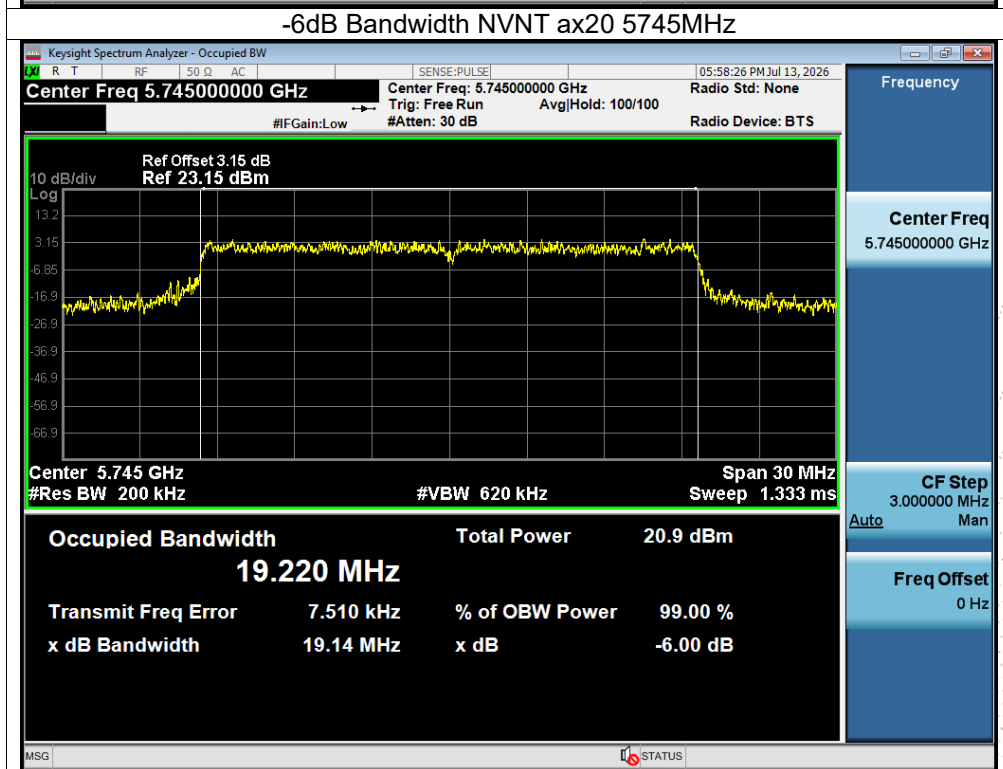
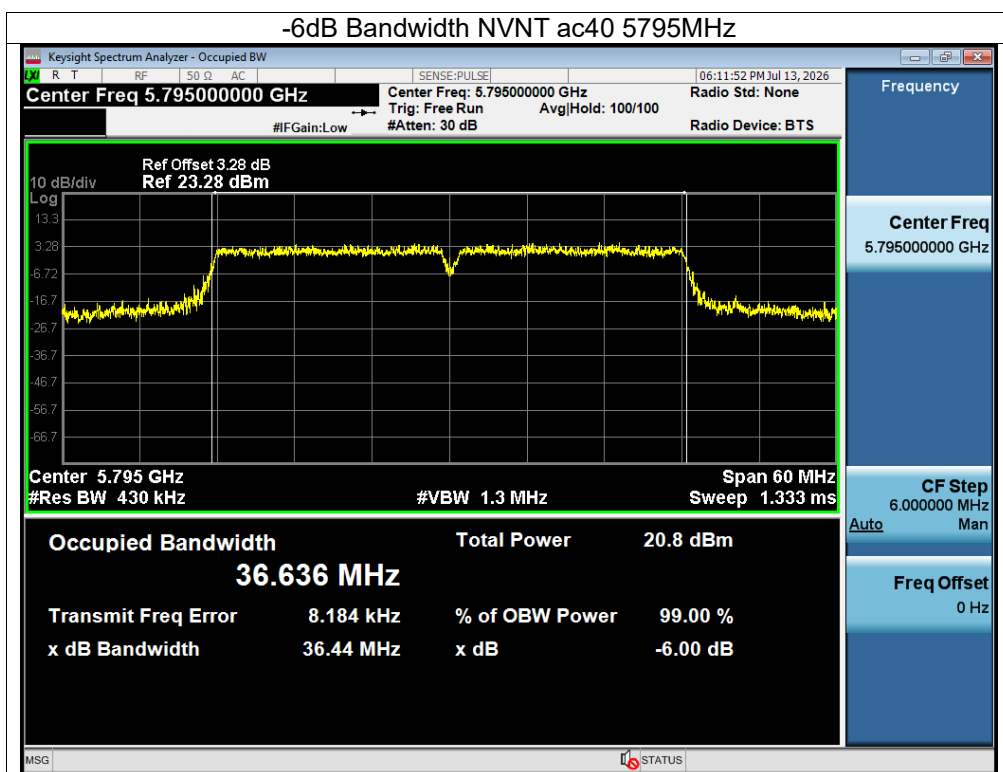


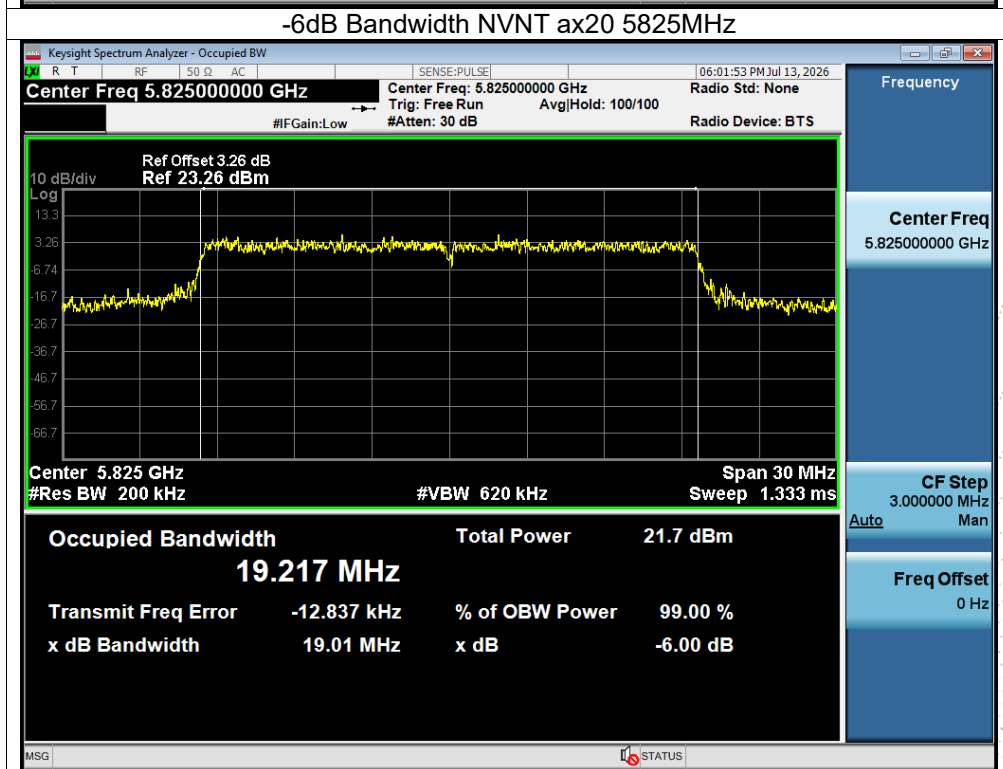
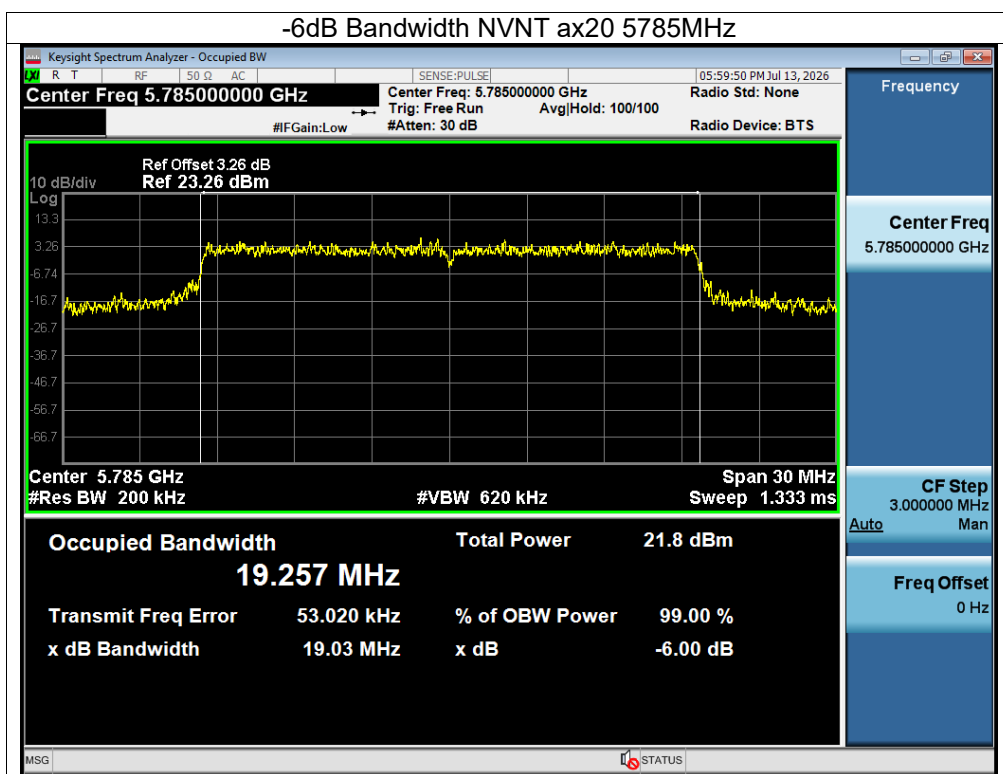


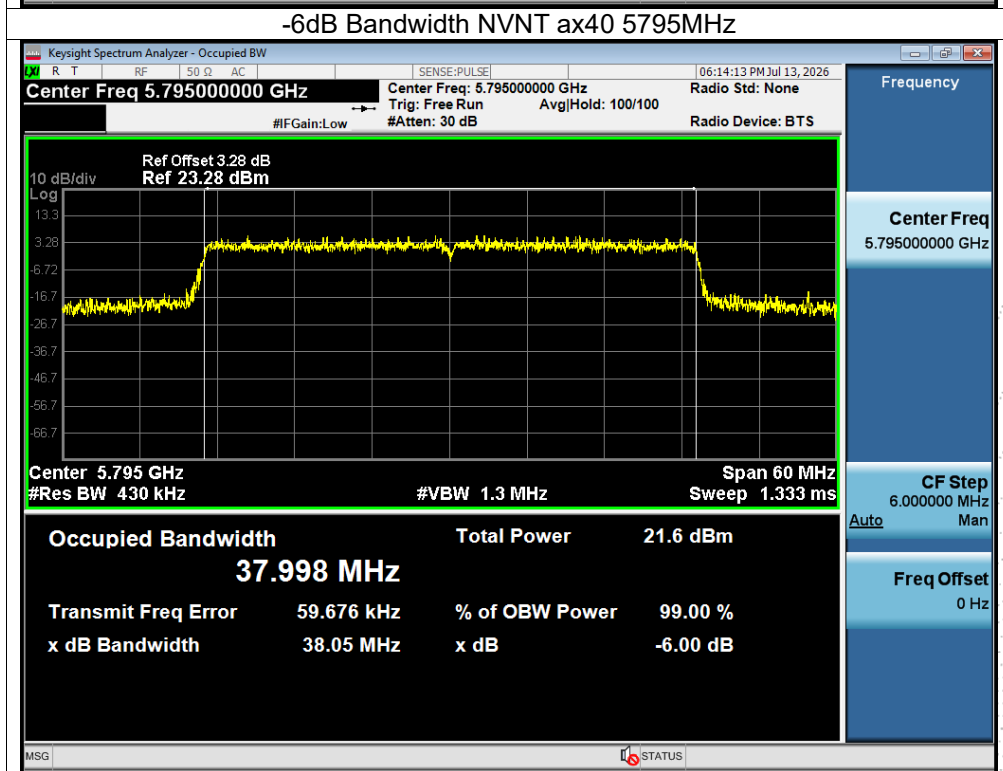
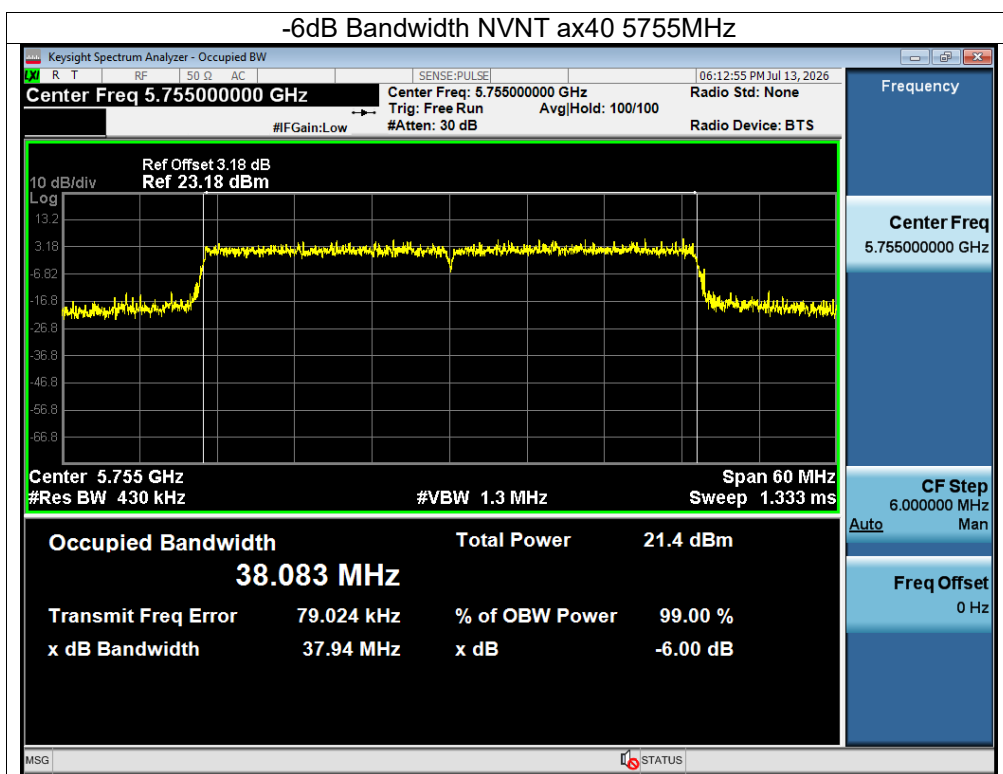


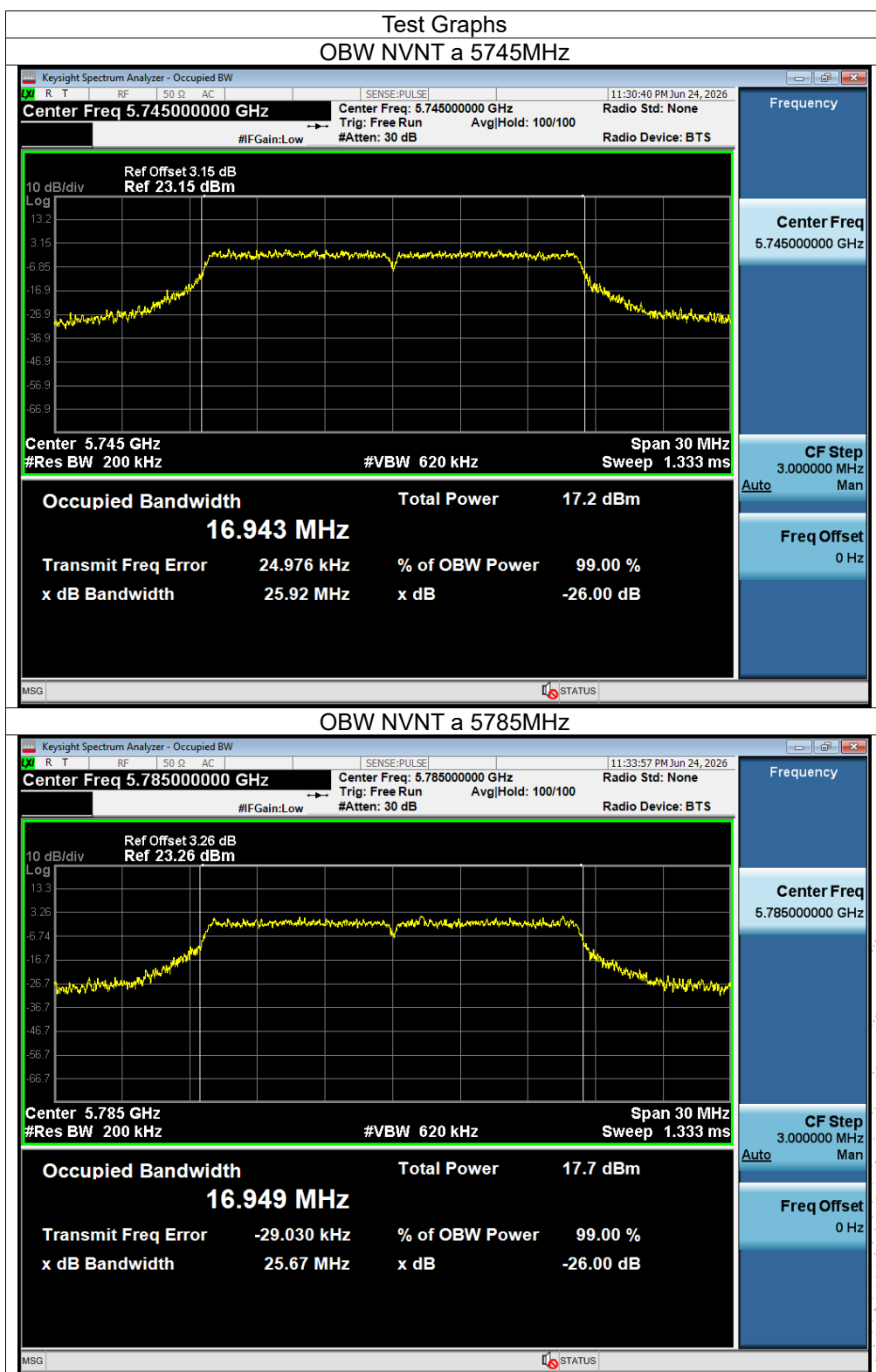
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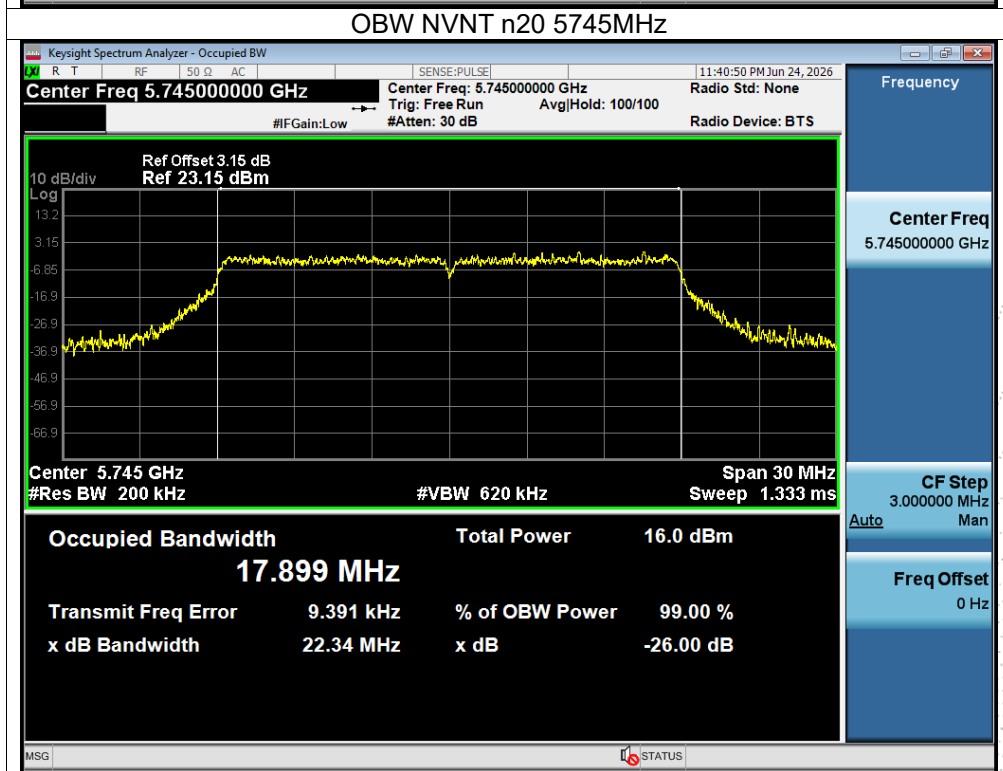
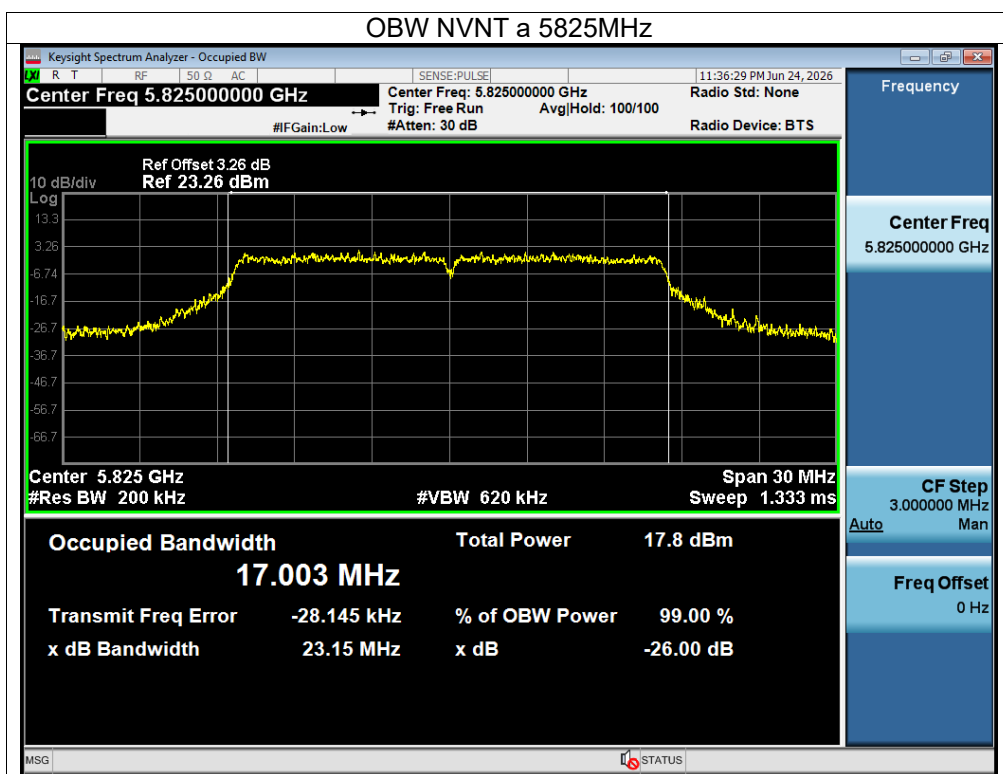




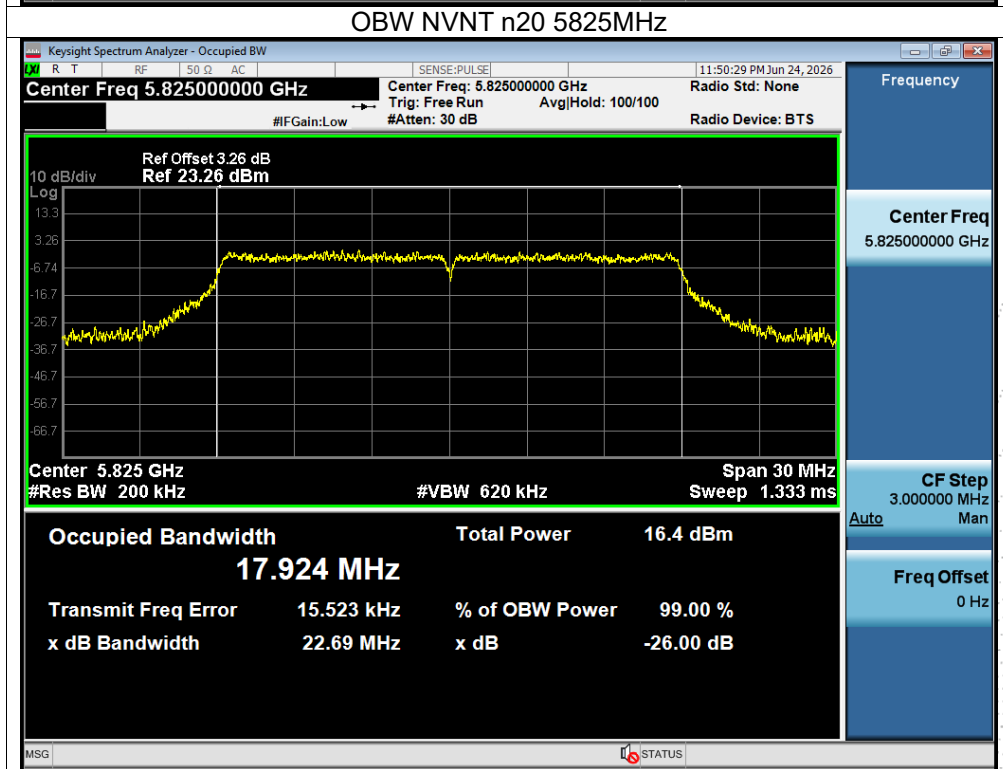
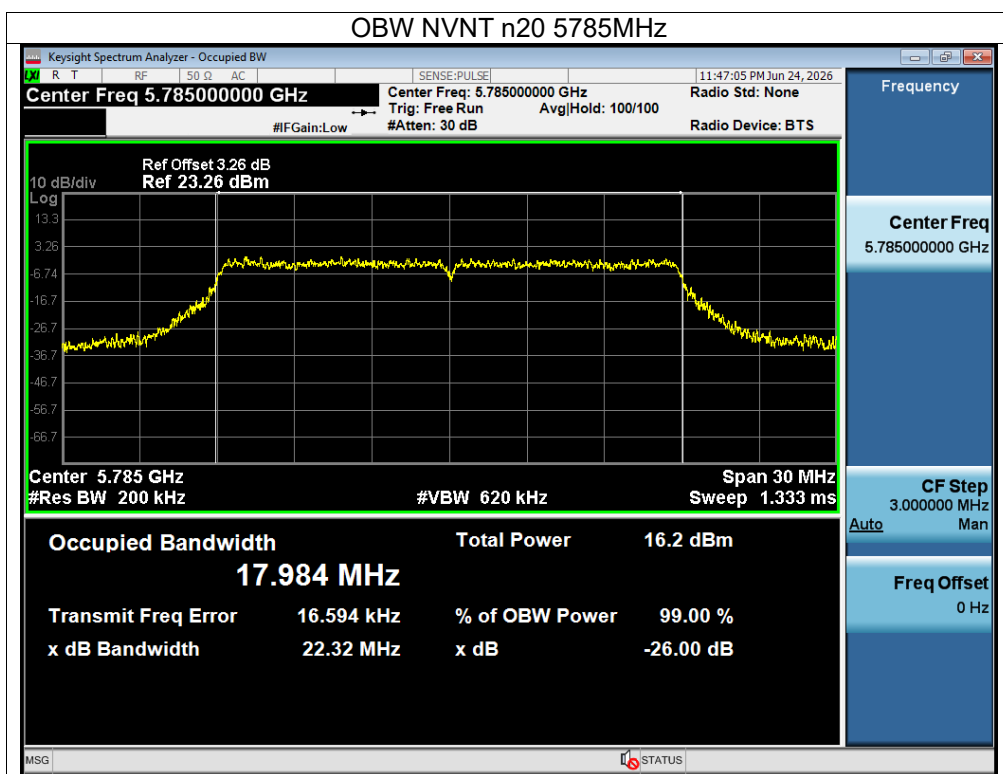


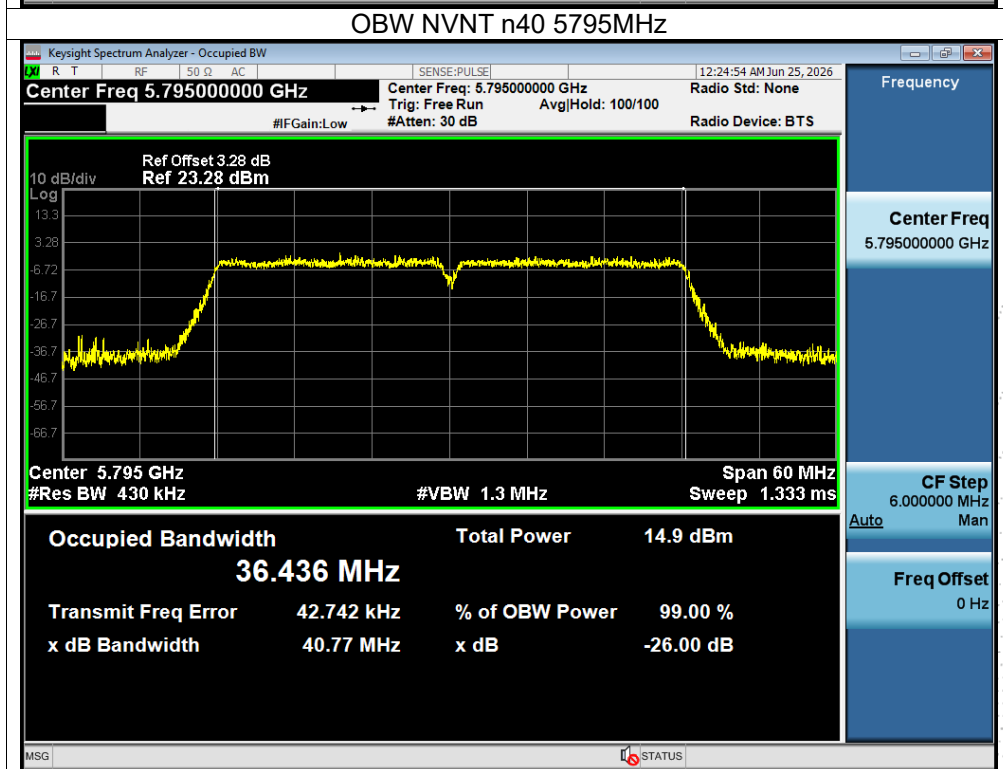
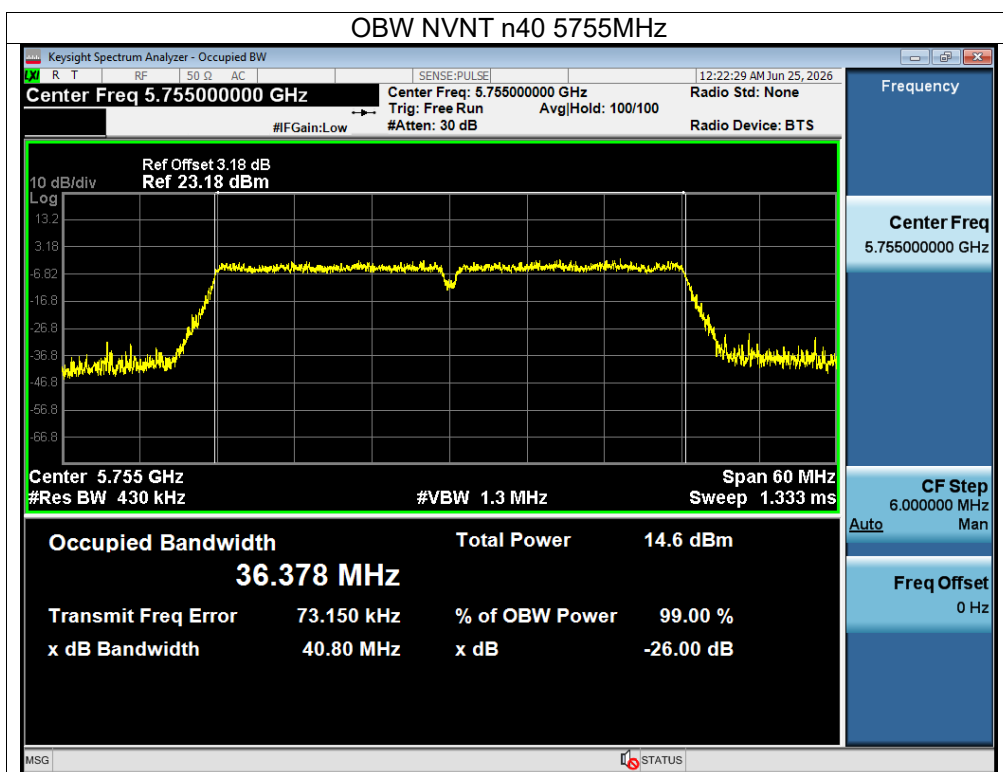


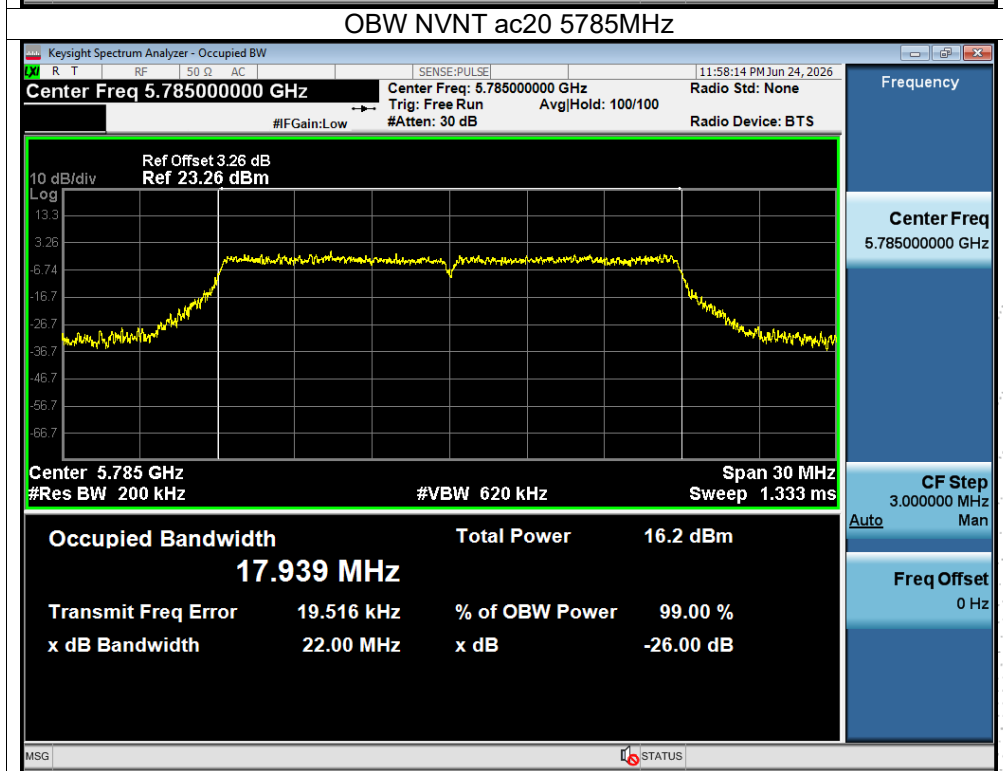
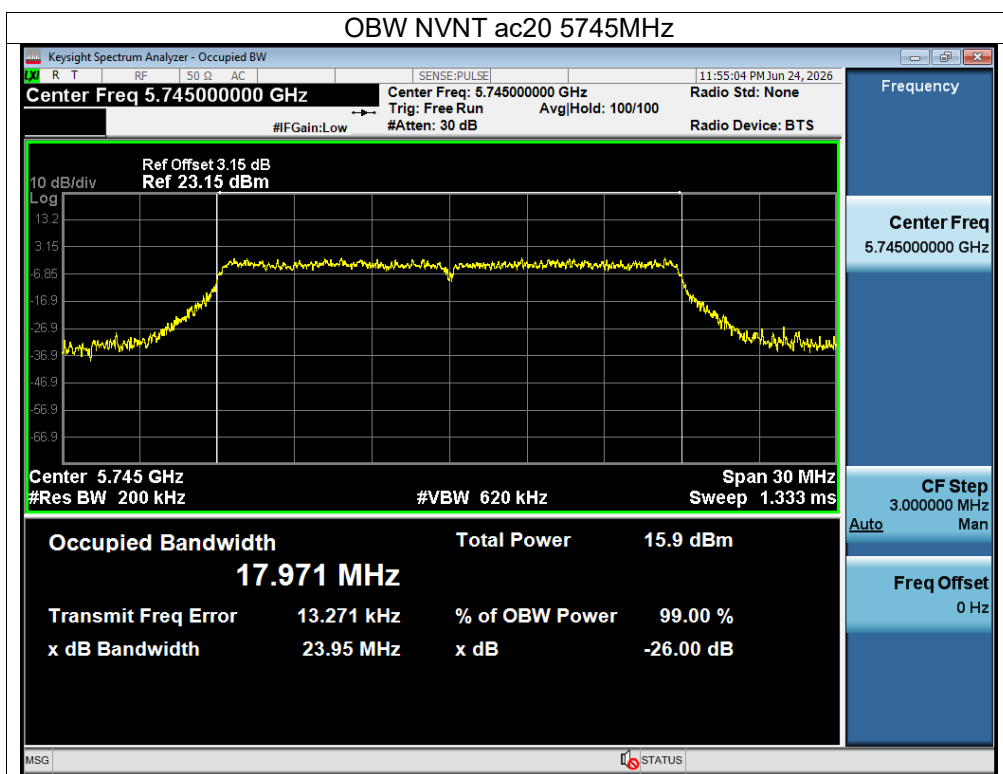


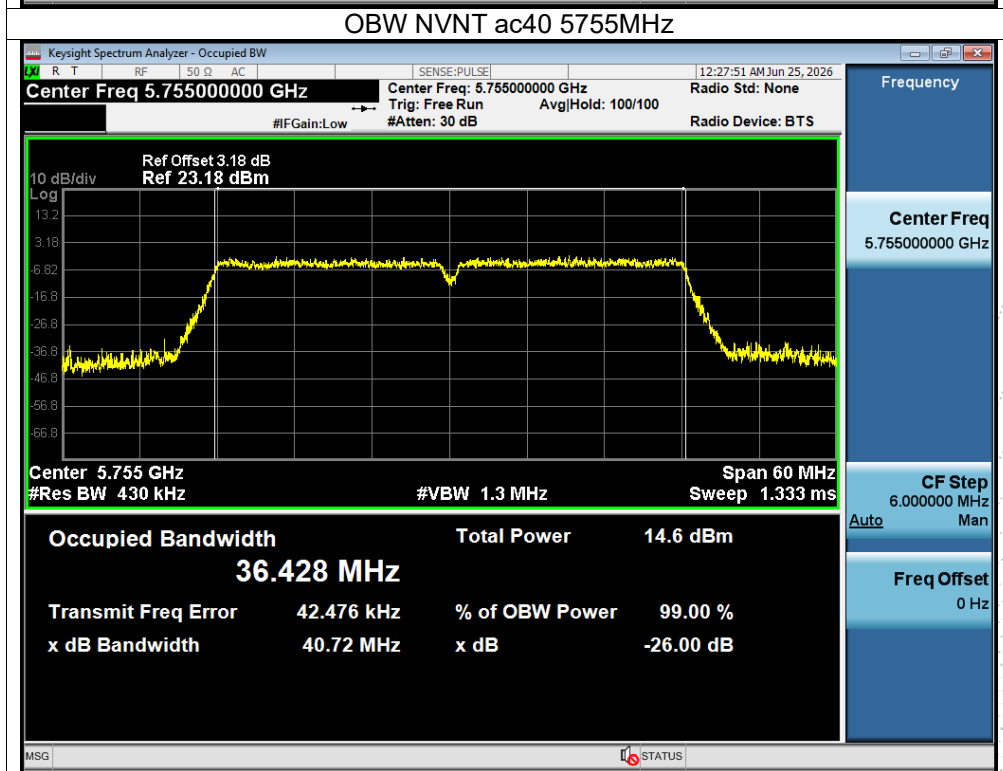
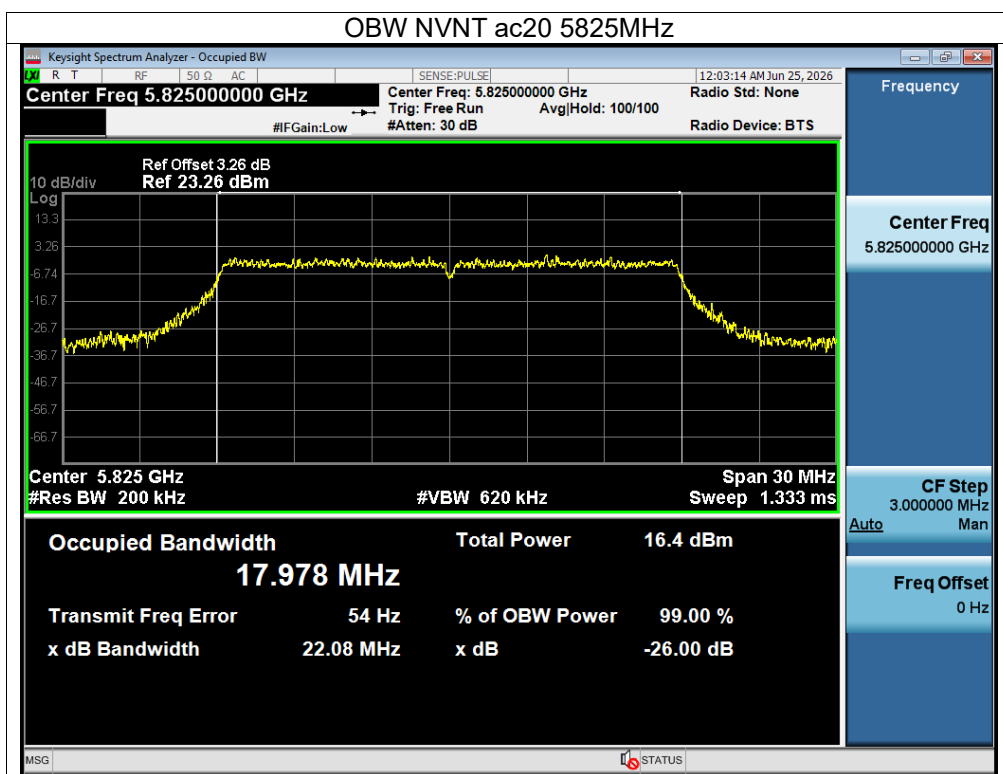


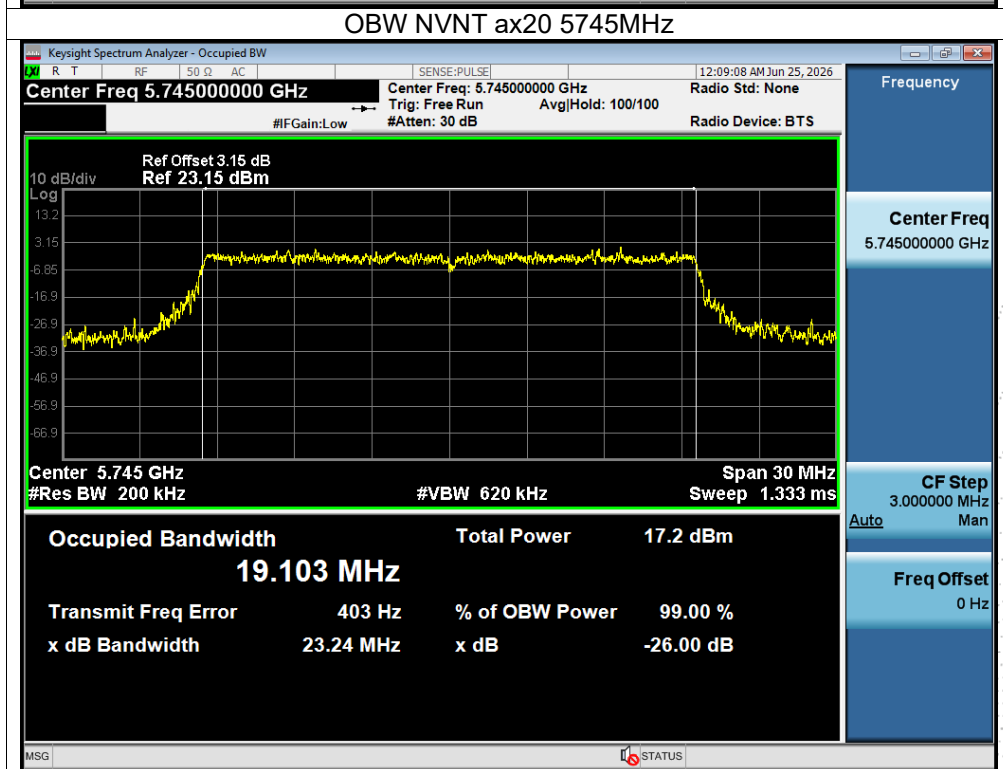
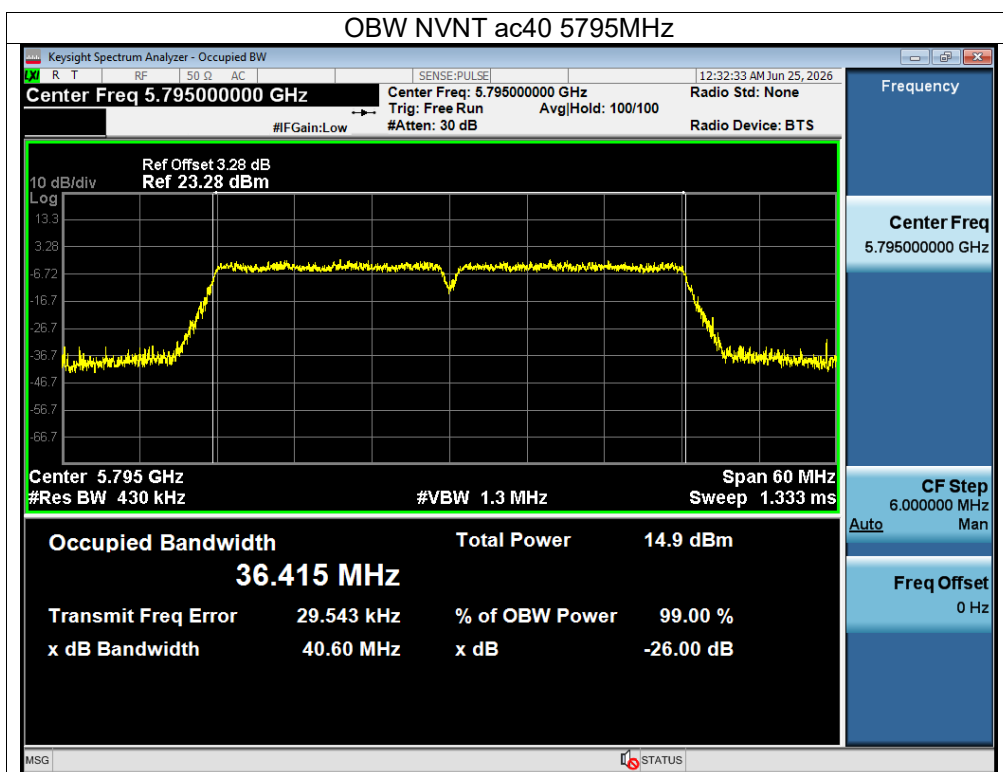
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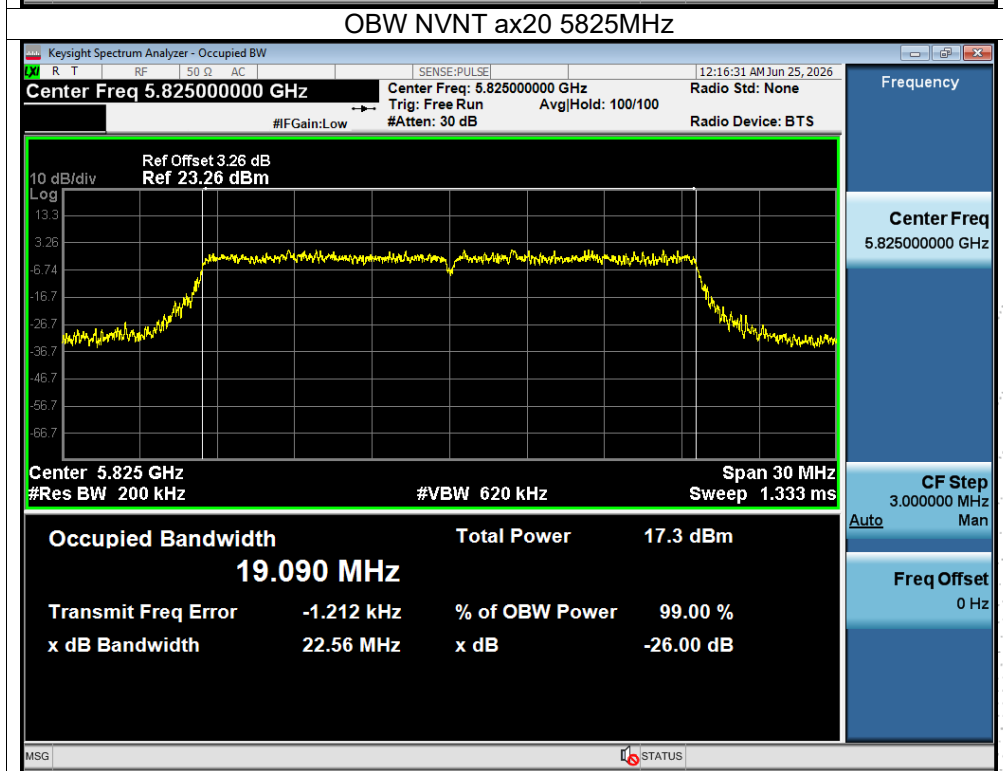
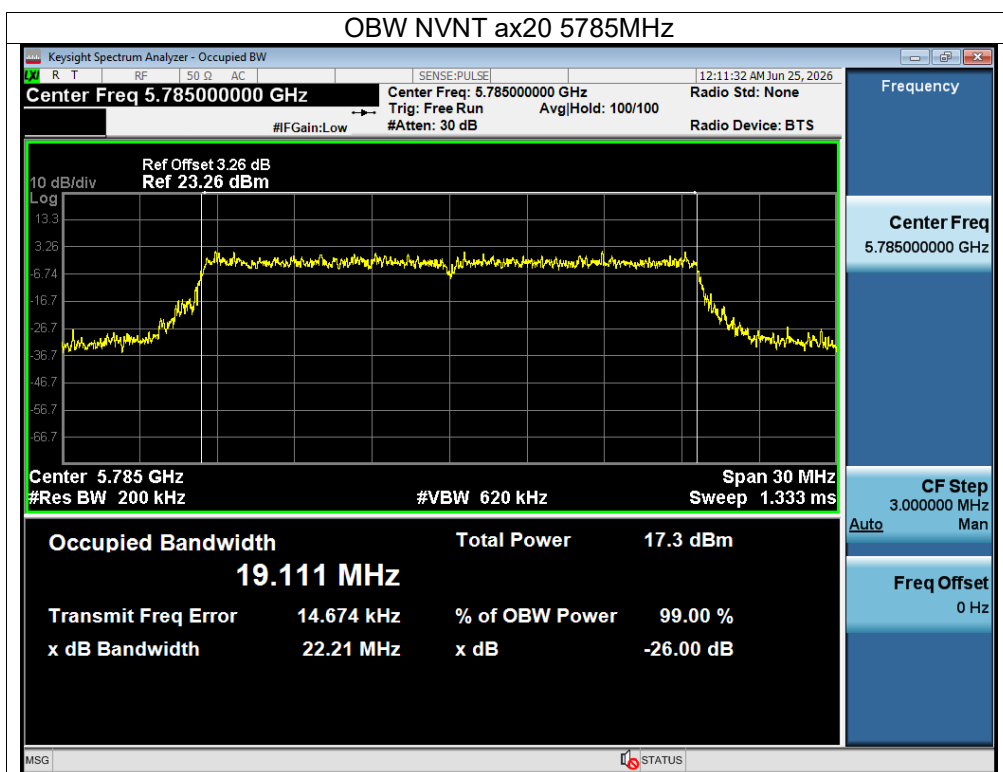




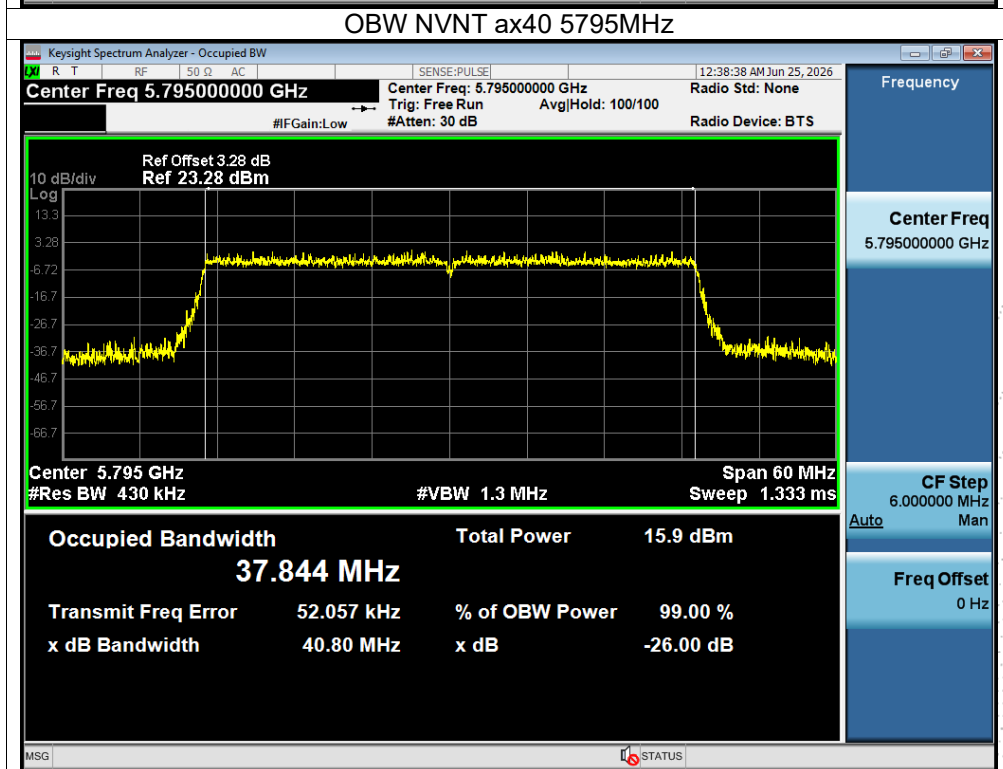
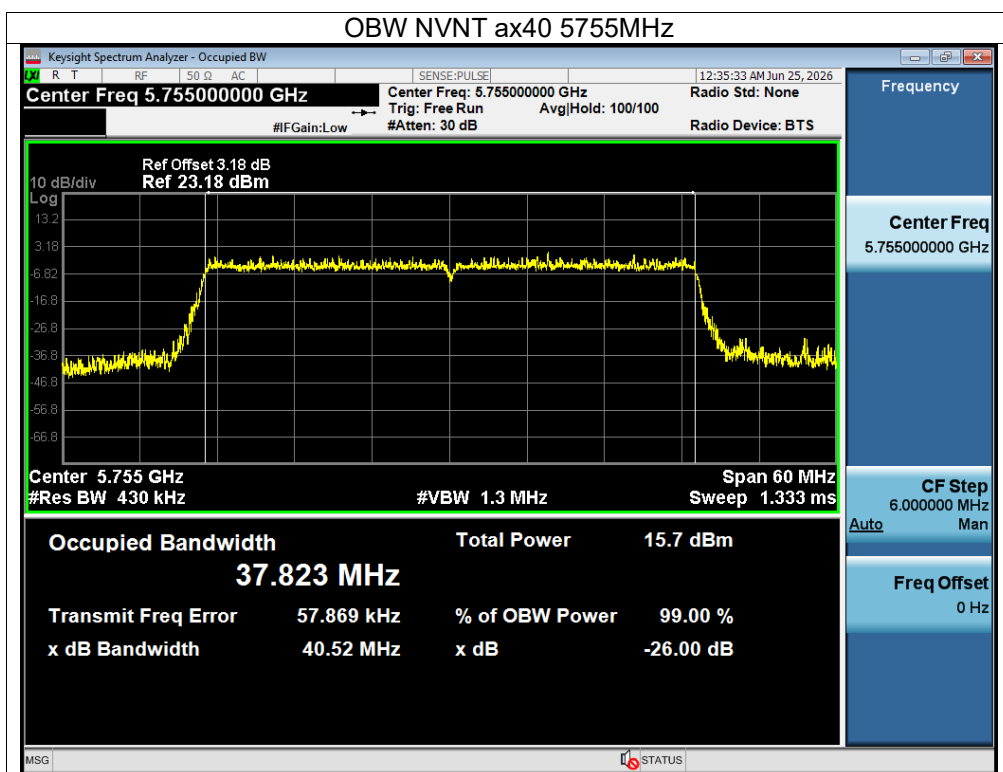








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10. Maximum Conducted Output Power

10.1 Block Diagram Of Test Setup



10.2 Limit

According to FCC §15.407

The maximum conducted output power should not exceed:

Frequency Band(MHz)	Limit
5150~5250	0.25W
5250~5350	250 mW or 11 dBm + 10log B, whichever is less.
5470~5725	250 mW or 11 dBm + 10log B, whichever is less.
5725~5850	1W
Note: Where "B" is the 26 dB emissions bandwidth in MHz.	

10.3 Test Procedure

Method SA-1 or method SA-1A (alternative) shall be applied if either of the following conditions can be satisfied:

1) The EUT transmits continuously (or with a $D \geq 98\%RH$).

Method SA-1 uses trace averaging with the EUT transmitting at full power throughout each sweep. The procedure for this method is as follows:

- Set span to encompass the entire 99%RH OBW of the signal.
- Set RBW = 1 MHz.
- Set VBW ≥ 3 MHz.
- Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)
- Sweep time = auto.
- Detector = Power averaging (rms), if available. Otherwise, use sample detector mode.
- If transmit duty cycle $< 98\%RH$, use a video trigger with the trigger level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle $\geq 98\%RH$, and if each transmission is entirely at the maximum power control level, then the

trigger shall be set to “free run.”

h) Trace average at least 100 traces in power averaging (rms) mode.

i) Compute power by integrating the spectrum across the 99%RH OBW of the signal using the instrument's band-power measurement function, with band limits set equal to the OBW band-edges. If the instrument does not have a band-power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 99%RH OBW of the spectrum.

Method SA-2 or method SA-2A (alternative) shall be applied if the conditions of the preceding item a) cannot be achieved, and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than $\pm 2\%RH$.

Method SA-2 uses trace averaging across ON and OFF times of the EUT transmissions, followed by duty cycle correction. The procedure for this method is as follows:

a) Measure the duty cycle D of the transmitter output signal as described in 12.2.

b) Set span to encompass the entire 99%RH OBW of the signal.

c) Set RBW = 1 MHz.

d) Set VBW ≥ 3 MHz.

e) Number of points in sweep $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)

f) Sweep time = auto.

g) Detector = Power averaging (rms), if available. Otherwise, use sample detector mode.

h) Do not use sweep triggering. Allow the sweep to “free run.”

i) Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the ON and OFF periods of the transmitter.

j) Compute power by integrating the spectrum across the 99%RH OBW of the signal using the instrument's band-power measurement function with band limits set equal to the EBW or OBW band-edges. If the instrument does not have a band-power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 99%RH OBW of the spectrum.

k) Add $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times (because the measurement represents an average over both the ON and OFF times of the transmission). For example, add $[10 \log (1 / 0.25)] = 6$ dB if the duty cycle is 25%RH.

10.4 EUT Operating Conditions

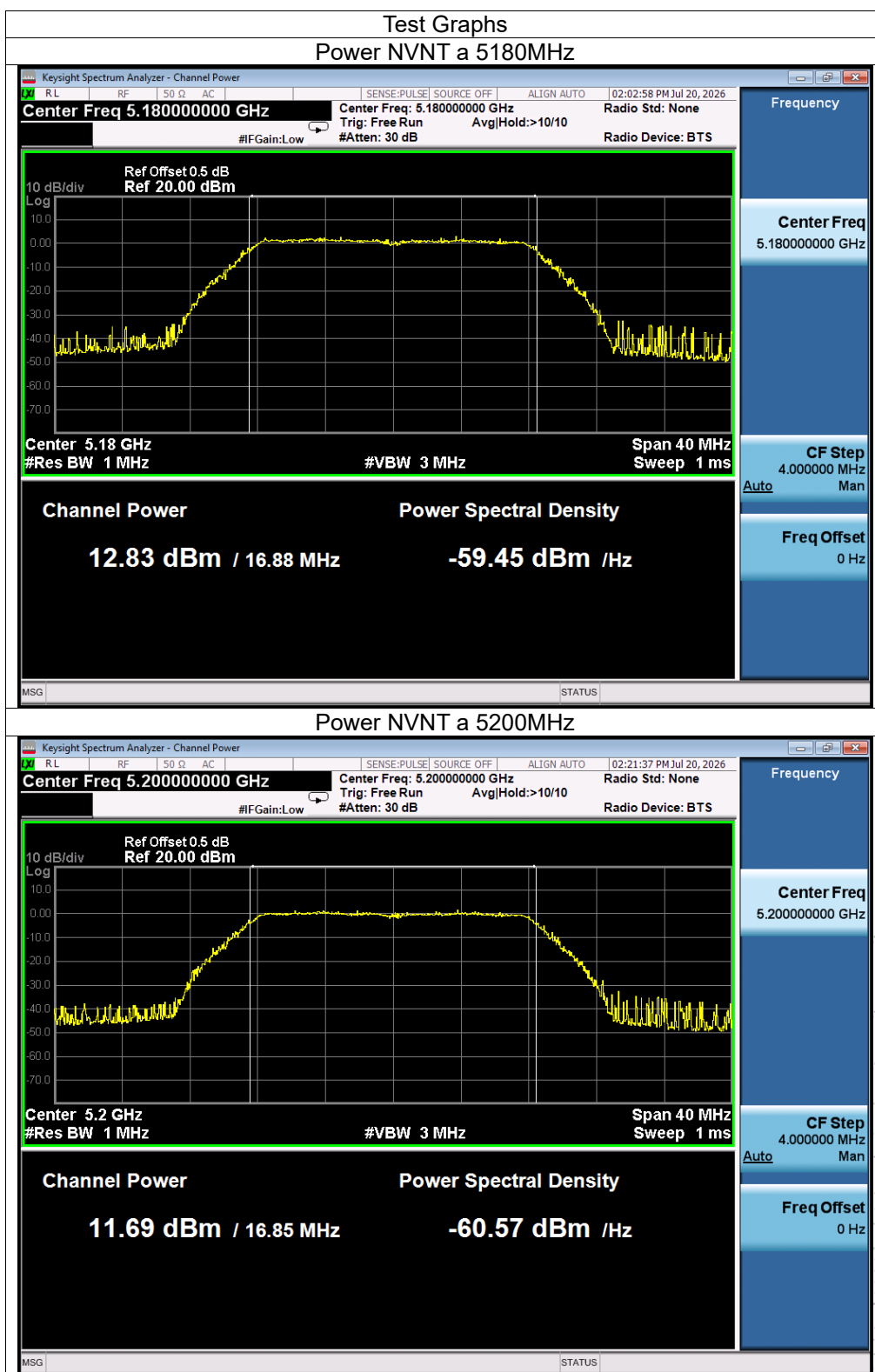
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

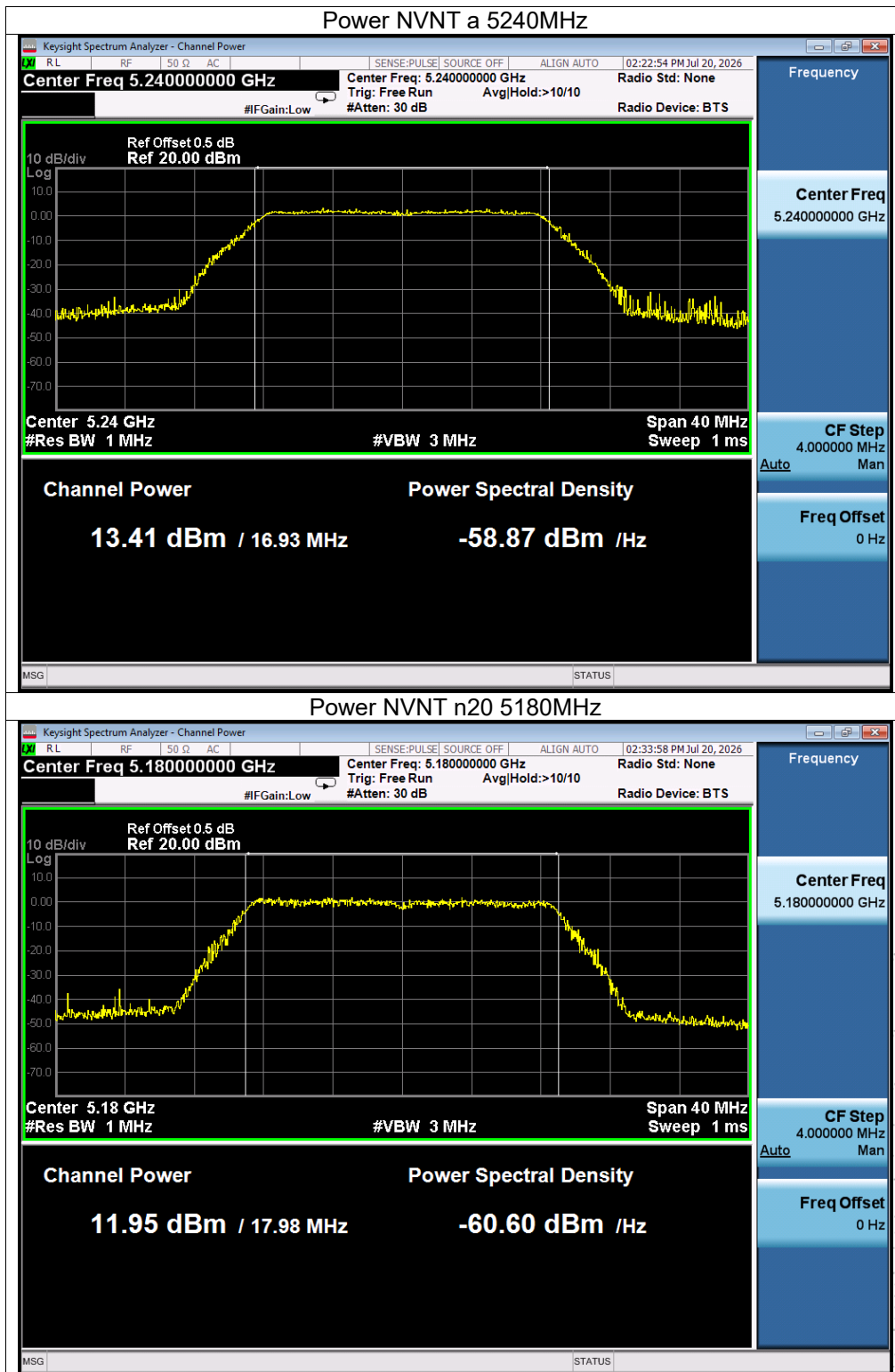
10.5 Test Result

Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
Test Mode:	5180-5240MHz		

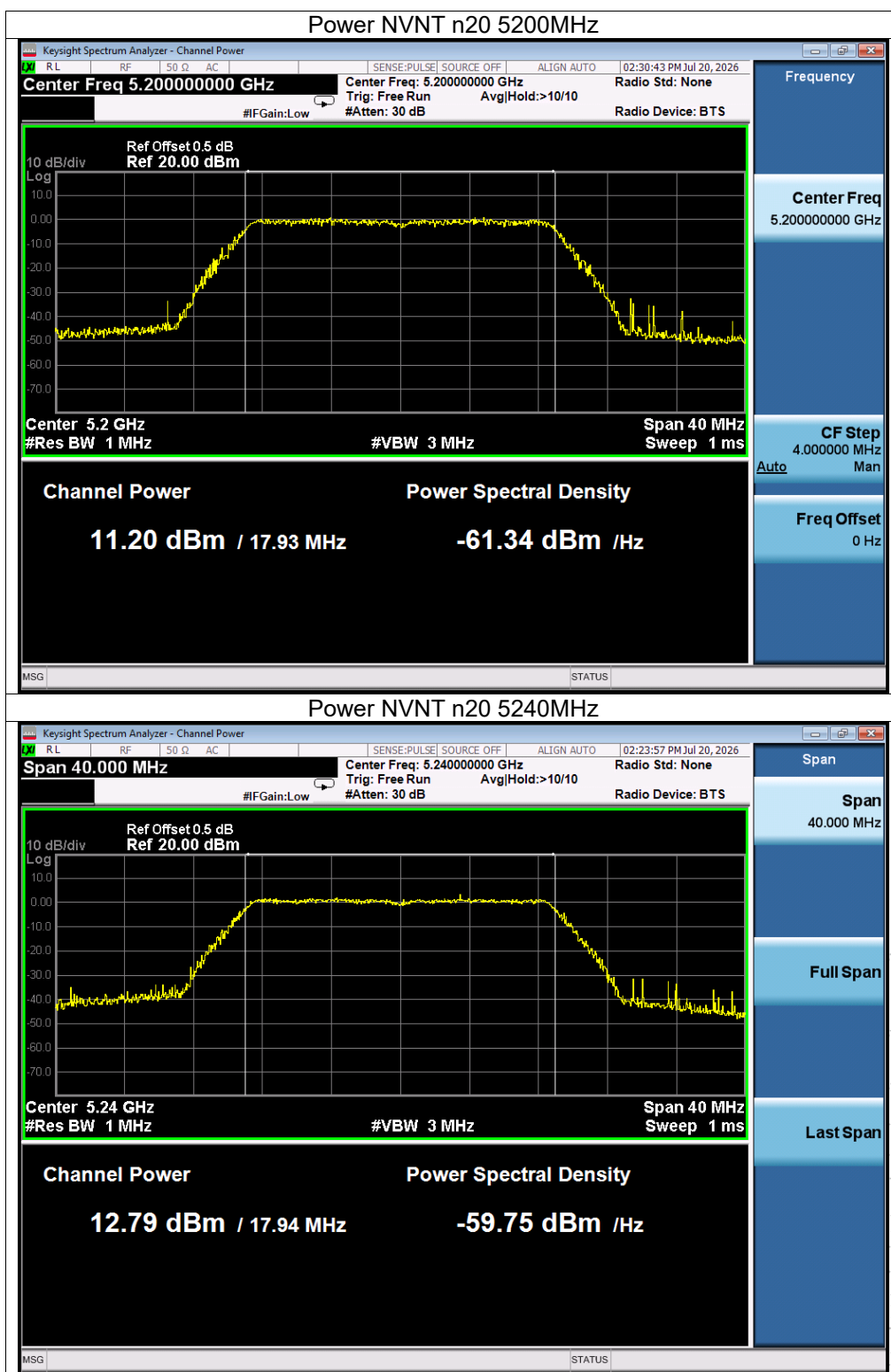
Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Correction Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	12.83	0.07	12.90	24	Pass
NVNT	a	5200	11.69	0.07	11.76	24	Pass
NVNT	a	5240	13.41	0.07	13.48	24	Pass
NVNT	n20	5180	11.95	0.07	12.02	24	Pass
NVNT	n20	5200	11.20	0.07	11.27	24	Pass
NVNT	n20	5240	12.79	0.07	12.86	24	Pass
NVNT	n40	5190	10.24	0.16	10.40	24	Pass
NVNT	n40	5230	12.35	0.17	12.52	24	Pass
NVNT	ac20	5180	11.76	0.07	11.83	24	Pass
NVNT	ac20	5200	11.26	0.07	11.33	24	Pass
NVNT	ac20	5240	11.90	0.07	11.97	24	Pass
NVNT	ac40	5190	10.13	0.15	10.28	24	Pass
NVNT	ac40	5230	10.71	0.16	10.87	24	Pass
NVNT	ax20	5180	10.34	0.63	10.97	24	Pass
NVNT	ax20	5200	11.06	0.63	11.69	24	Pass
NVNT	ax20	5240	12.60	0.62	13.22	24	Pass
NVNT	ax40	5190	10.54	0.00	10.54	24	Pass
NVNT	ax40	5230	11.44	0.63	12.07	24	Pass

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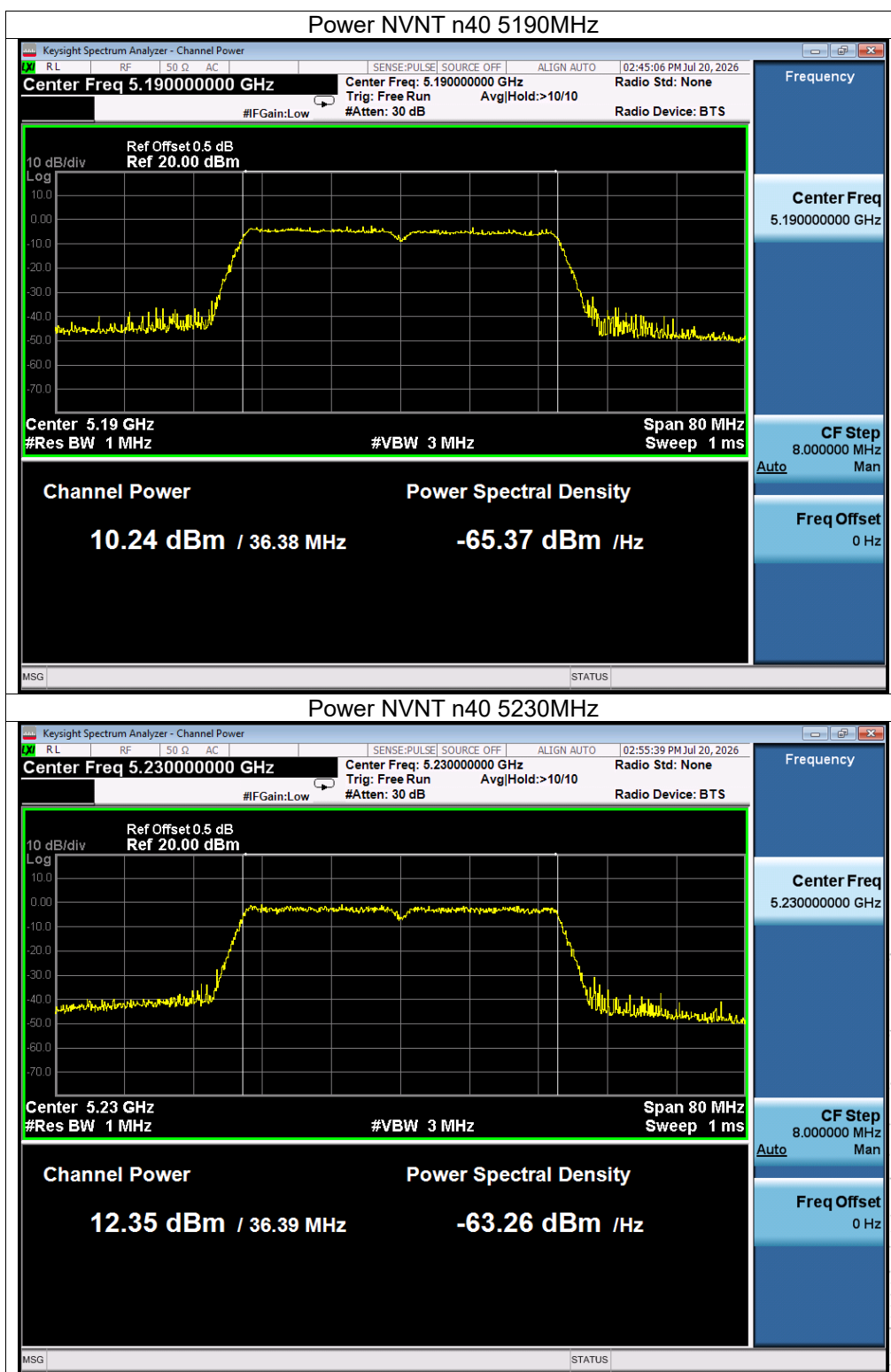


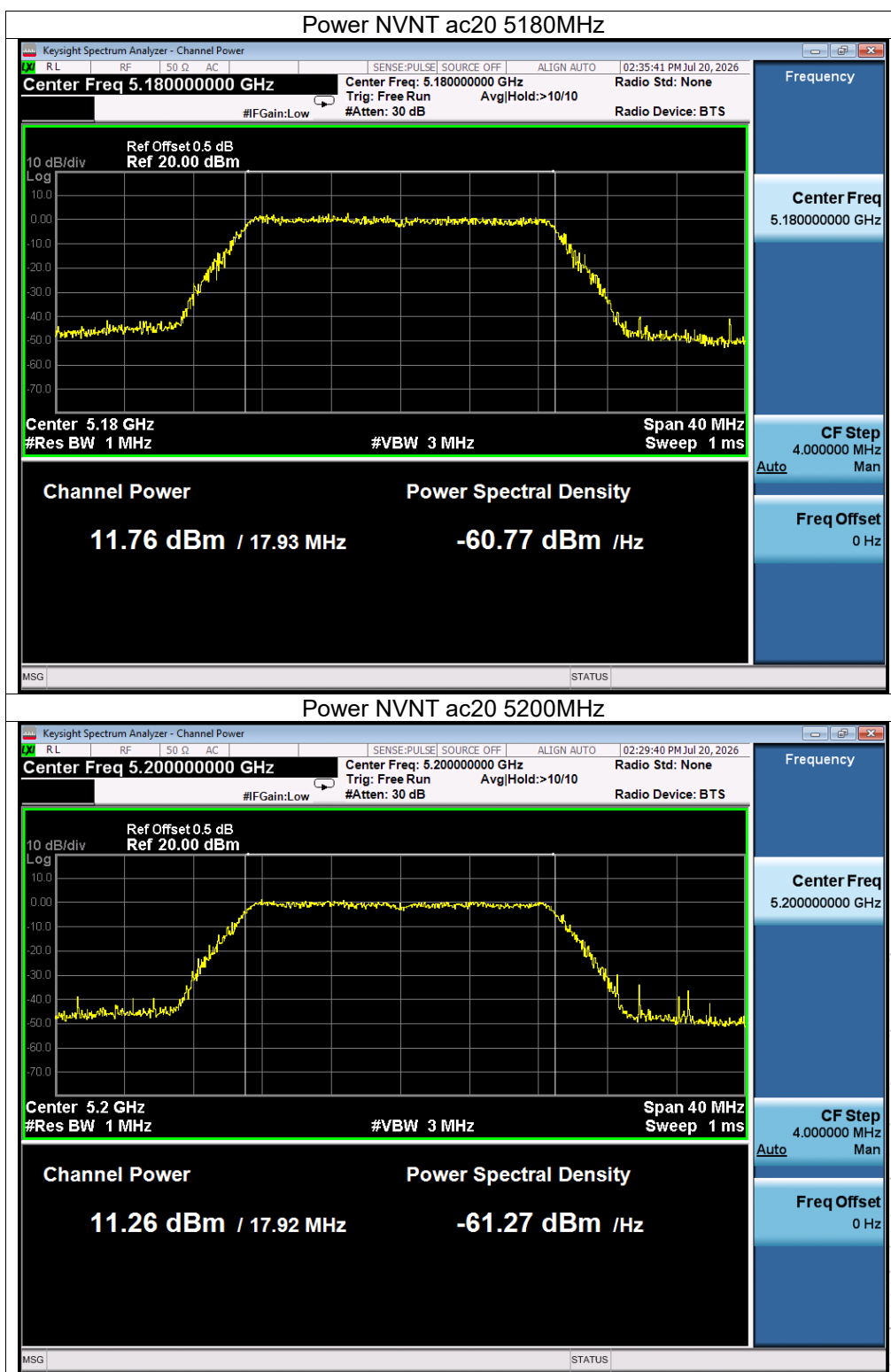


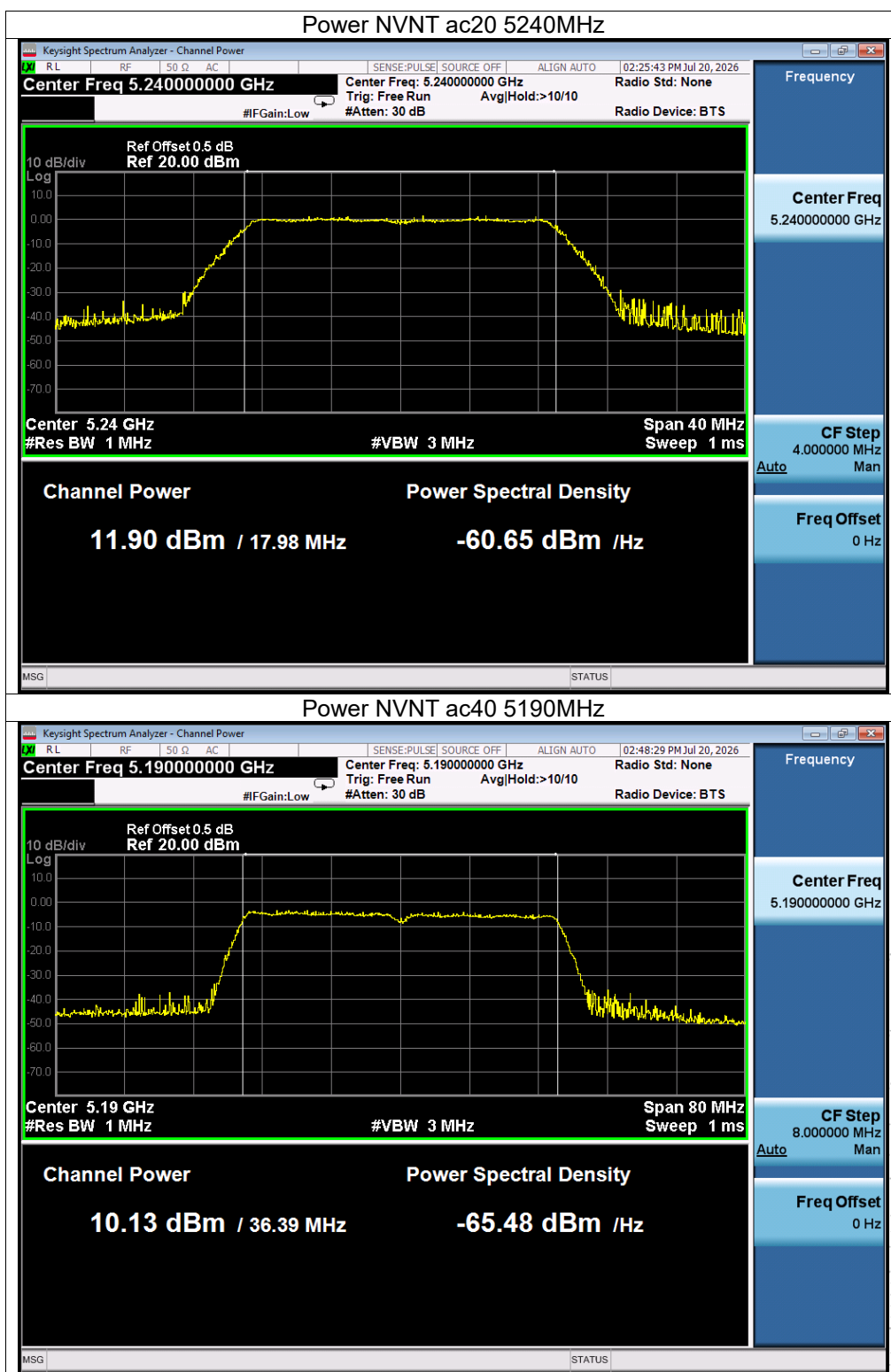
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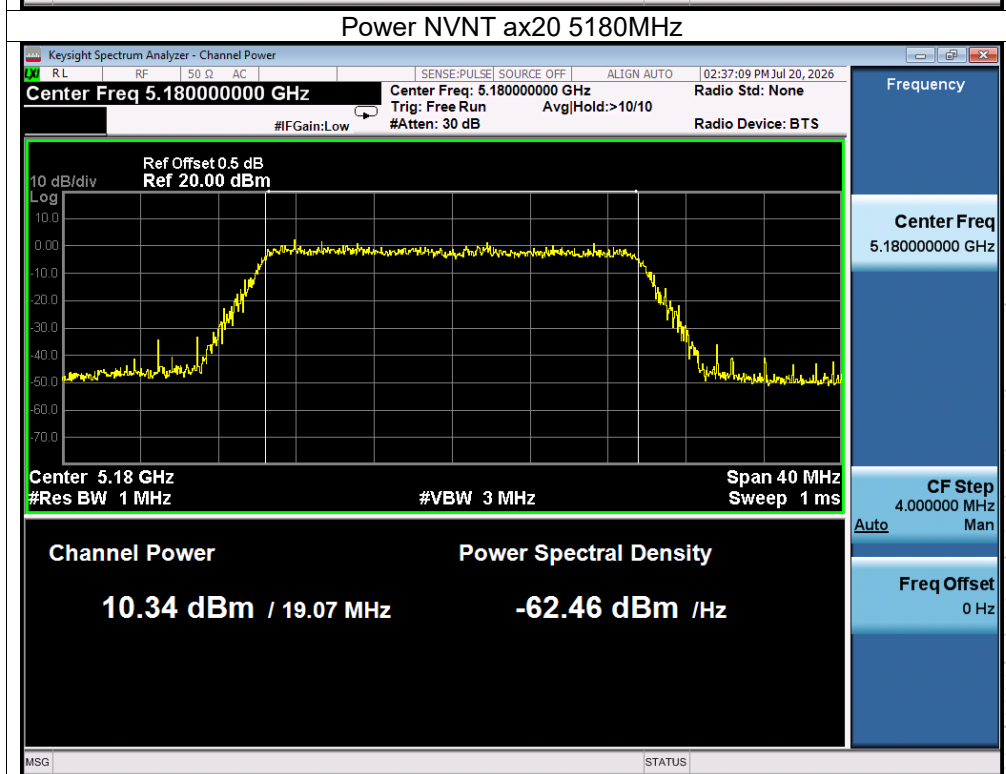
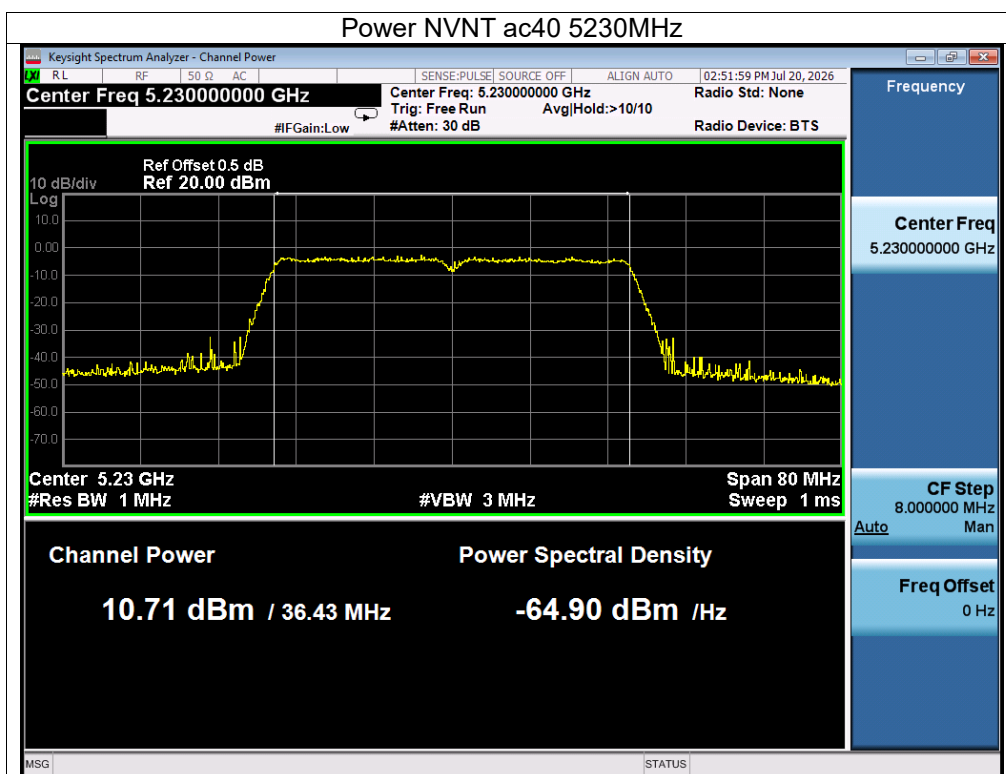


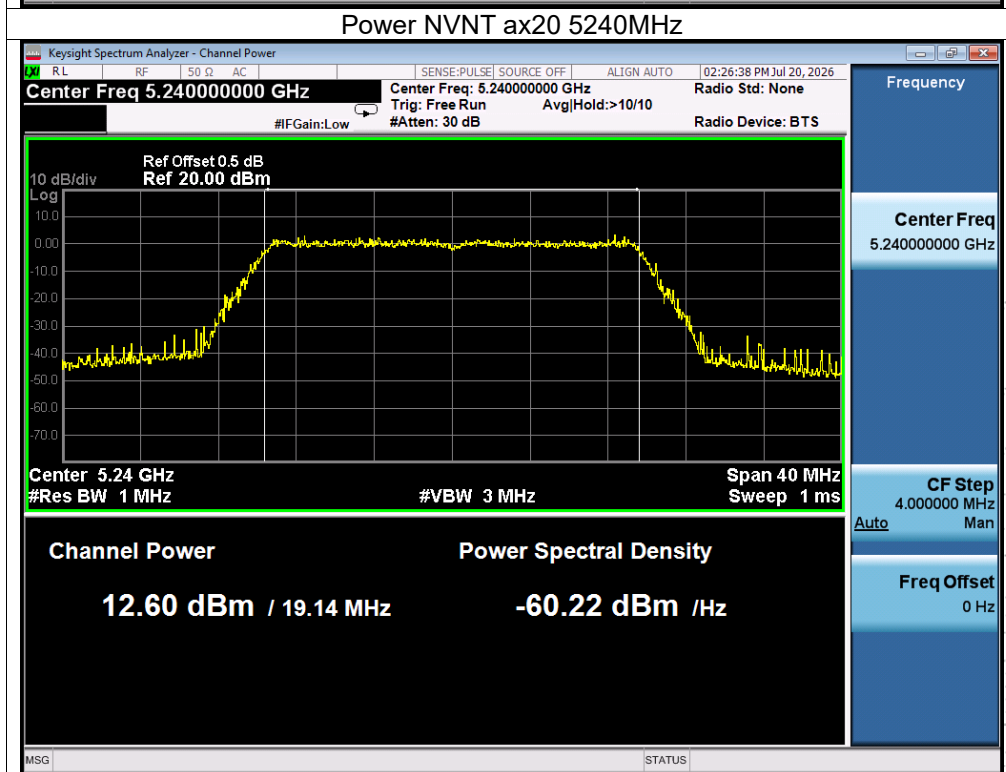
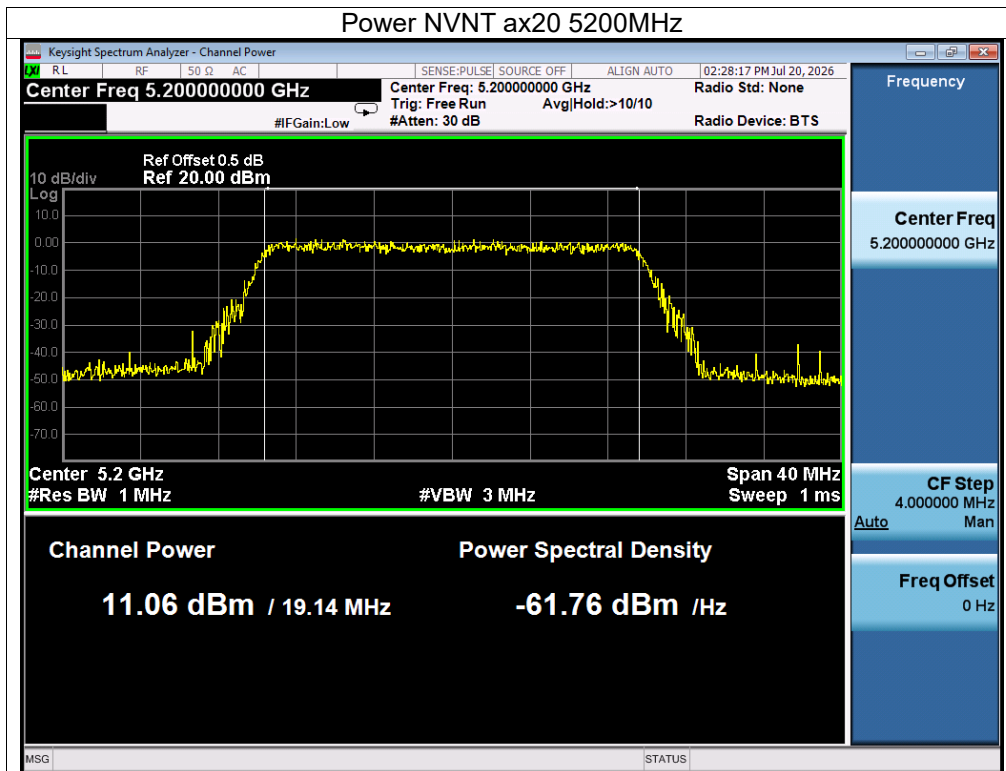
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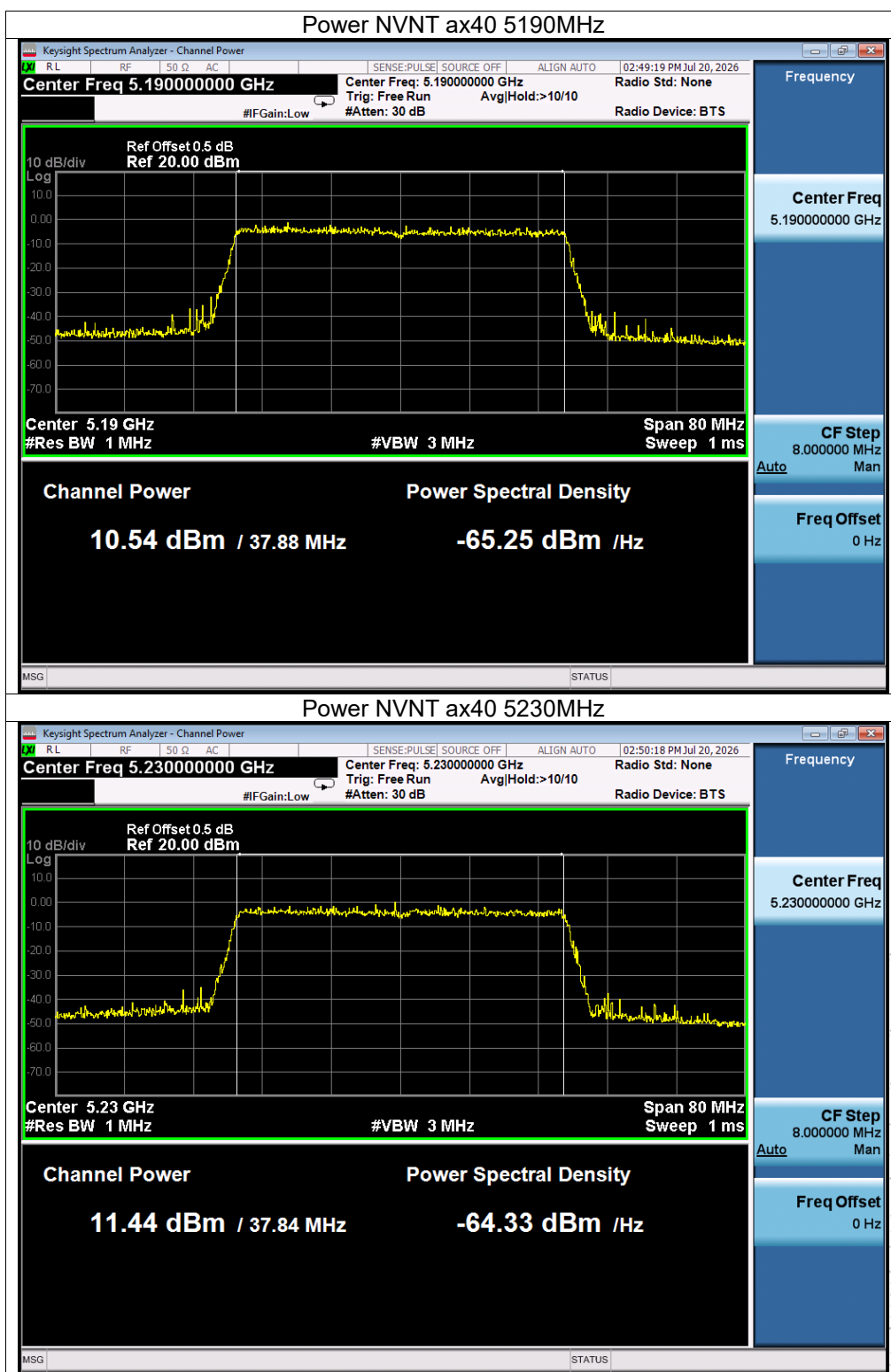








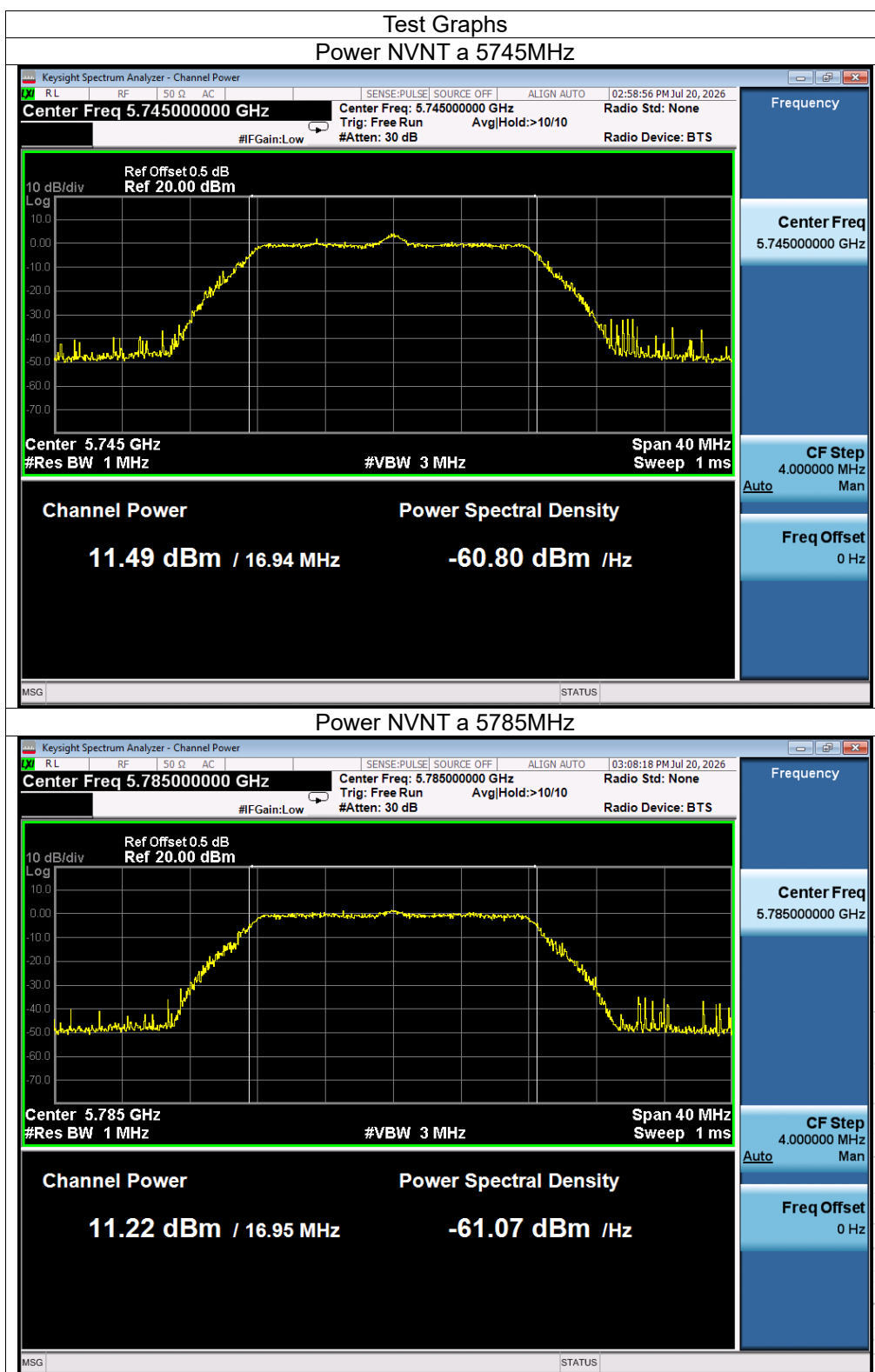




Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
Test Mode:	5745-5825MHz		

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Correction Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	11.49	0.07	11.56	24	Pass
NVNT	a	5785	11.22	0.07	11.29	24	Pass
NVNT	a	5825	11.64	0.07	11.71	24	Pass
NVNT	n20	5745	10.00	0.07	10.07	24	Pass
NVNT	n20	5785	10.73	0.07	10.80	24	Pass
NVNT	n20	5825	10.19	0.07	10.26	24	Pass
NVNT	n40	5755	8.24	0.16	8.40	24	Pass
NVNT	n40	5795	8.18	0.16	8.34	24	Pass
NVNT	ac20	5745	9.86	0.07	9.93	24	Pass
NVNT	ac20	5785	10.58	0.06	10.64	24	Pass
NVNT	ac20	5825	10.69	0.07	10.76	24	Pass
NVNT	ac40	5755	8.51	0.16	8.67	24	Pass
NVNT	ac40	5795	8.03	0.16	8.19	24	Pass
NVNT	ax20	5745	10.51	0.62	11.13	24	Pass
NVNT	ax20	5785	10.73	0.63	11.36	24	Pass
NVNT	ax20	5825	10.66	0.62	11.28	24	Pass
NVNT	ax40	5755	8.50	0.63	9.13	24	Pass
NVNT	ax40	5795	8.28	0.64	8.92	24	Pass





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