

Test Mode: TX (5.8G) --802.11ax-HT20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenn a Factor (dB/m)	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV /m)	Margi n (dB)	Detecto r Type
Low Channel (5745 MHz)-Above 1G									
V	4679.106	57.06	5.94	35.40	44.00	54.40	74	-19.60	PK
V	4679.106	43.76	5.94	35.40	44.00	41.10	54	-12.90	AV
V	11490.179	53.14	8.46	39.75	44.50	56.85	68.2	-11.35	PK
V	11490.179	43.69	8.46	39.75	44.50	47.40	54	-6.60	AV
V	17235.073	59.45	10.12	38.80	44.10	64.27	68.2	-3.93	PK
V	17235.073	43.36	10.12	38.80	42.70	49.58	54	-4.42	AV
H	4679.036	58.92	5.94	35.18	44.00	56.04	74	-17.96	PK
H	4679.036	43.68	5.94	35.18	44.00	40.80	54	-13.20	AV
H	11490.106	48.91	8.46	38.71	44.50	51.58	68.2	-16.62	PK
H	11490.106	42.01	8.46	38.71	44.50	44.68	54	-9.32	AV
H	17235.130	50.81	10.12	38.38	44.10	55.21	68.2	-12.99	PK
H	17235.130	44.84	10.12	38.38	44.10	49.24	54	-4.76	AV
middle Channel (5785 MHz)-Above 1G									
V	4592.012	61.22	6.48	36.35	44.05	60.00	74	-14.00	PK
V	4592.012	43.81	6.48	36.35	44.05	42.59	54	-11.41	AV
V	11570.127	58.91	8.47	37.88	44.51	60.75	68.2	-7.45	PK
V	11570.127	43.63	8.47	37.88	44.51	45.47	54	-8.53	AV
V	17355.106	57.04	10.12	38.80	44.10	61.86	68.2	-6.34	PK
V	17355.106	43.04	10.12	38.80	42.70	49.26	54	-4.74	AV
H	4592.071	56.61	6.48	36.37	44.05	55.41	74	-18.59	PK
H	4592.071	43.21	6.48	36.37	44.05	42.01	54	-11.99	AV
H	11570.055	53.84	8.47	38.64	44.50	56.45	68.2	-11.75	PK
H	11570.055	42.45	8.47	38.64	44.50	45.06	54	-8.94	AV
H	17355.096	52.43	10.12	38.38	44.10	56.83	68.2	-11.37	PK
H	17355.096	44.25	10.12	38.38	44.10	48.65	54	-5.35	AV
High Channel (5825 MHz)-Above 1G									
V	6039.146	58.68	7.10	37.24	43.50	59.52	68.2	-8.68	PK
V	6039.146	43.17	7.10	37.24	43.50	44.01	54	-9.99	AV
V	11650.014	56.98	8.46	37.68	44.50	58.62	74	-15.38	PK
V	11650.014	43.55	8.46	37.68	44.50	45.19	54	-8.81	AV
V	17475.029	58.13	10.12	38.80	44.10	62.95	68.2	-5.25	PK
V	17475.029	43.21	10.12	38.80	42.70	49.43	54	-4.57	AV
H	6039.079	58.72	7.10	37.24	43.50	59.56	68.2	-8.64	PK
H	6039.079	43.00	7.10	37.24	43.50	43.84	54	-10.16	AV
H	11650.061	53.24	8.46	38.57	44.50	55.77	74	-18.23	PK
H	11650.061	41.48	8.46	38.57	44.50	44.01	54	-9.99	AV
H	17475.007	51.73	10.12	38.38	44.10	56.13	68.2	-12.07	PK
H	17475.007	41.05	10.12	38.38	44.10	45.45	54	-8.55	AV

Note: PK value is lower than the Average value limit, So average didn't record.

The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

Test Mode :	TX (5.8G) -- 802.11ax-HT40
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Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Cable loss (dB)	Antenn a Factor (dB/m)	Preamp Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margi n (dB)	Detecto r Type
Low Channel (5755 MHz)-Above 1G									
V	4679.103	59.68	5.94	35.40	44.00	57.02	74	-16.98	PK
V	4679.103	43.38	5.94	35.40	44.00	40.72	54	-13.28	AV
V	11510.052	56.01	8.46	39.75	44.50	59.72	74	-14.28	PK
V	11510.052	43.05	8.46	39.75	44.50	46.76	54	-7.24	AV
V	17265.105	58.68	10.12	38.80	44.10	63.50	68.2	-4.70	PK
V	17265.105	43.76	10.12	38.80	42.70	49.98	54	-4.02	AV
H	4679.000	57.06	5.94	35.18	44.00	54.18	74	-19.82	PK
H	4679.000	43.99	5.94	35.18	44.00	41.11	54	-12.89	AV
H	11510.075	53.51	8.46	38.71	44.50	56.18	74	-17.82	PK
H	11510.075	43.23	8.46	38.71	44.50	45.90	54	-8.10	AV
H	17265.170	51.20	10.12	38.38	44.10	55.60	68.2	-12.60	PK
H	17265.170	43.25	10.12	38.38	44.10	47.65	54	-6.35	AV
middle Channel (5795 MHz)-Above 1G									
V	6039.018	56.50	6.48	36.35	44.05	55.28	68.2	-12.92	PK
V	6039.018	43.74	6.48	36.35	44.05	42.52	54	-11.48	AV
V	11590.080	56.02	8.47	37.88	44.51	57.86	74	-16.14	PK
V	11590.080	43.06	8.47	37.88	44.51	44.90	54	-9.10	AV
V	17385.080	55.16	10.12	38.80	44.10	59.98	68.2	-8.22	PK
V	17385.080	41.49	10.12	38.80	42.70	47.71	54	-6.29	AV
H	6039.024	58.76	6.48	36.37	44.05	57.56	68.2	-10.64	PK
H	6039.024	43.93	6.48	36.37	44.05	42.73	54	-11.27	AV
H	11590.131	53.06	8.47	38.64	44.50	55.67	74	-18.33	PK
H	11590.131	43.05	8.47	38.64	44.50	45.66	54	-8.34	AV
H	17385.145	51.08	10.12	38.38	44.10	55.48	68.2	-12.72	PK
H	17385.145	43.36	10.12	38.38	44.10	47.76	54	-6.24	AV

Note: PK value is lower than the Average value limit, So average didn't record.

The 26.5-40G amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

8. Power Spectral Density Test

8.1 Block Diagram Of Test Setup



8.2 Limit

For the band 5.15-5.25 GHz,

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 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.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple colocated 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.

(iv) For client devices in the 5.15-5.25 GHz band, 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.

For the band 5.725-5.85 GHz

(3) For the band 5.725-5.85 GHz, 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.

8.3 Test Procedure

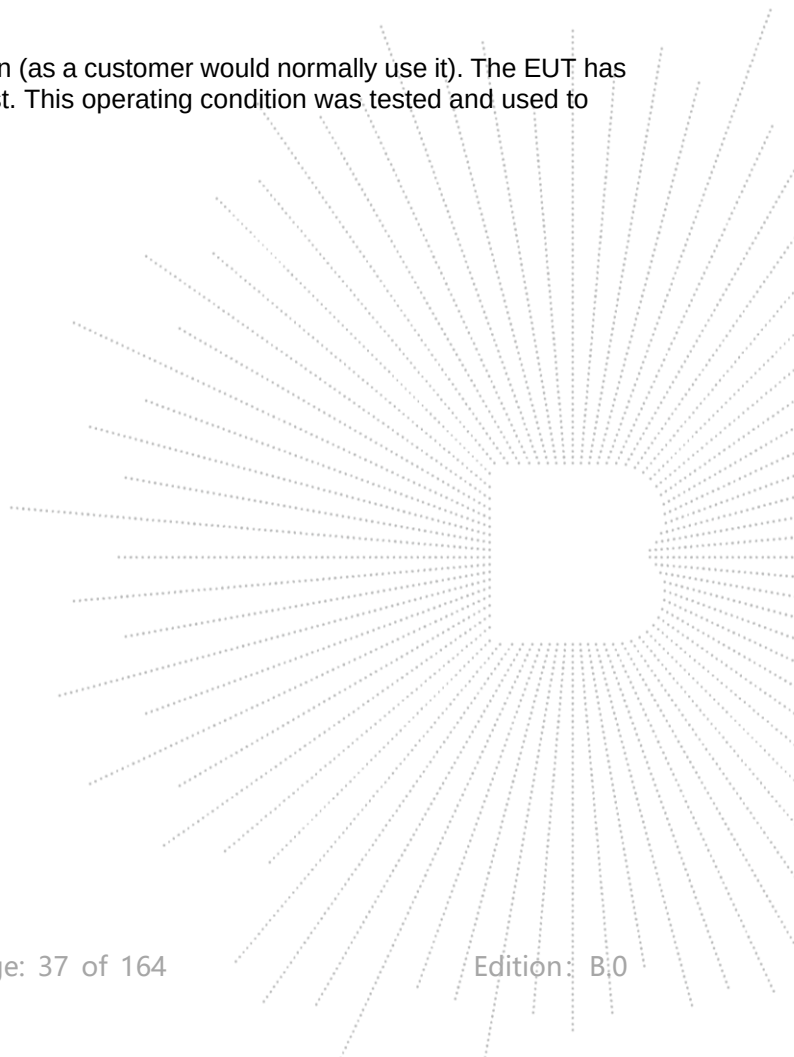
For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 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.

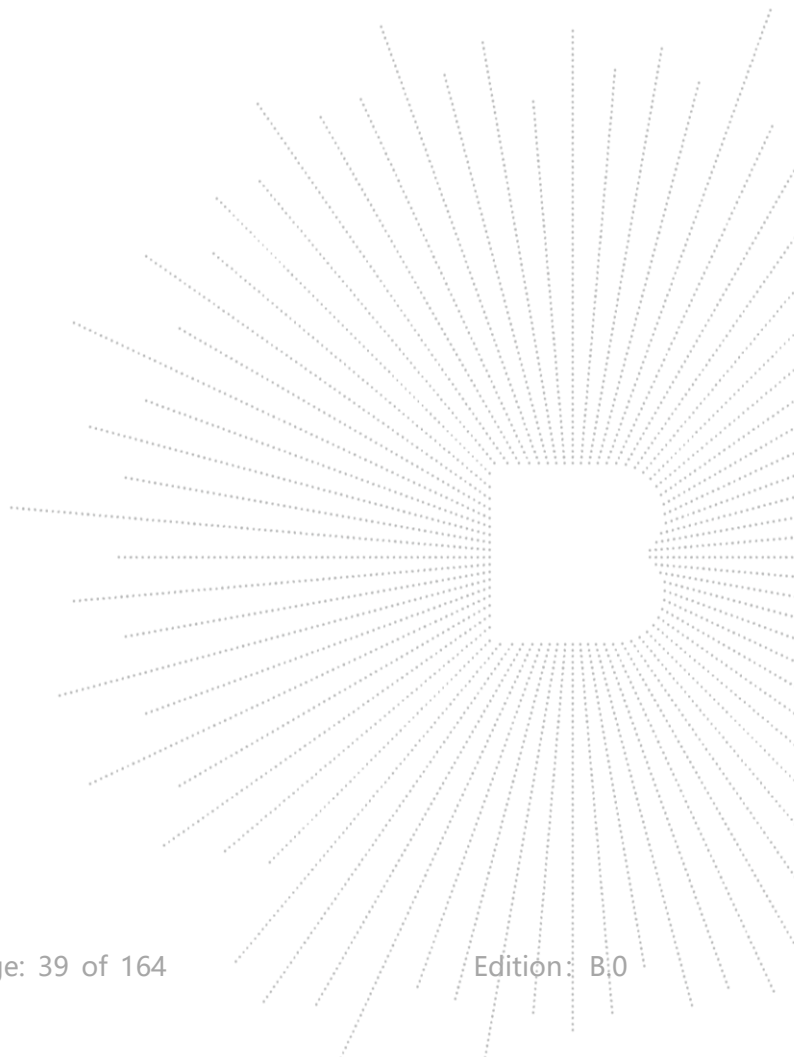


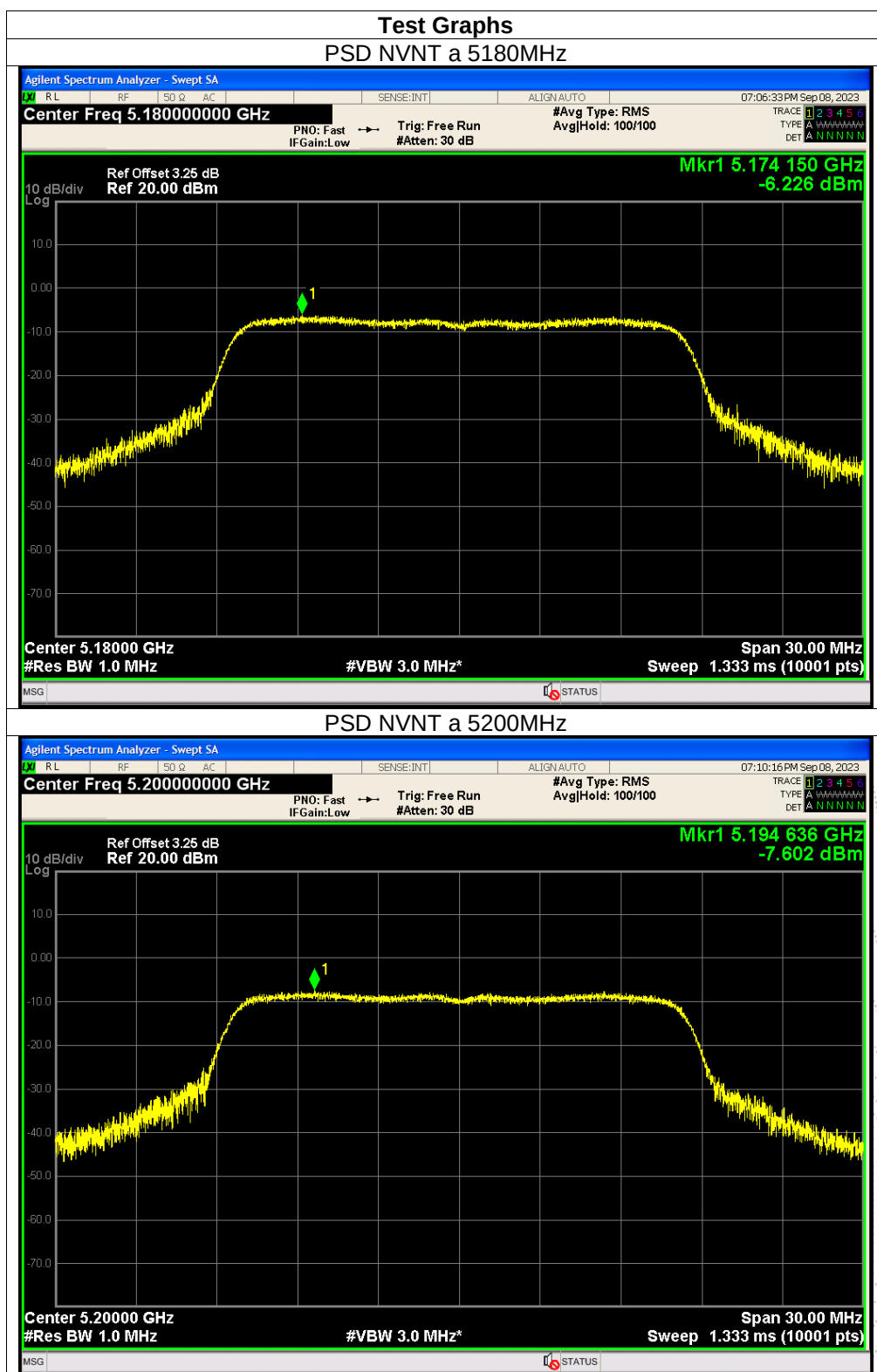
8.5 Test Result

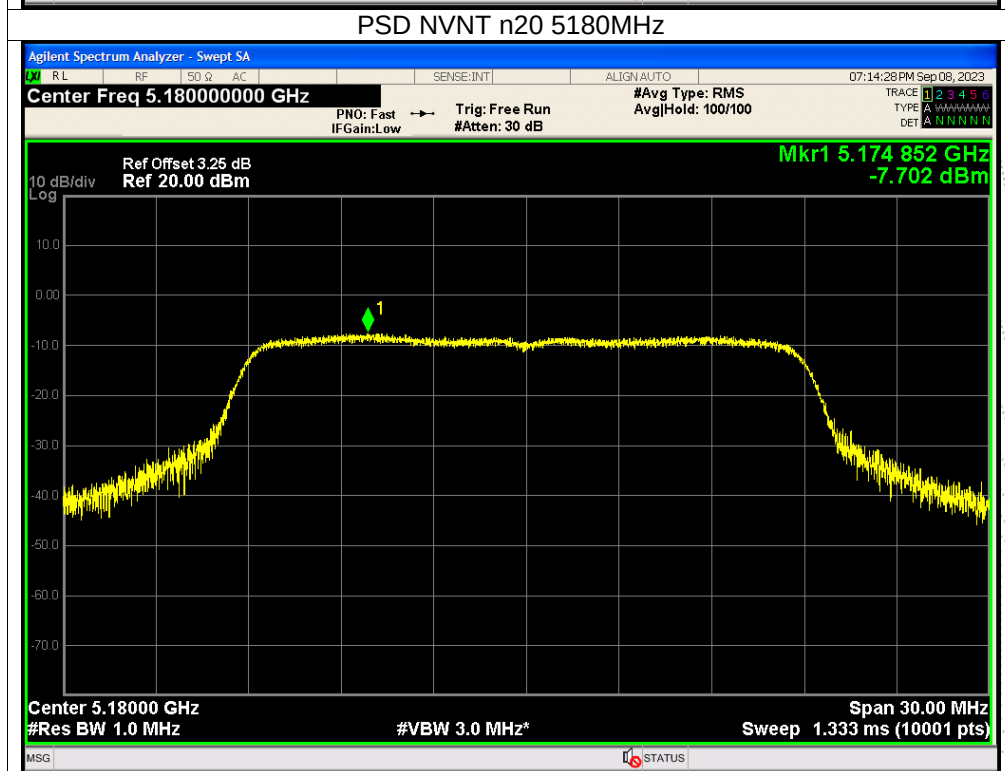
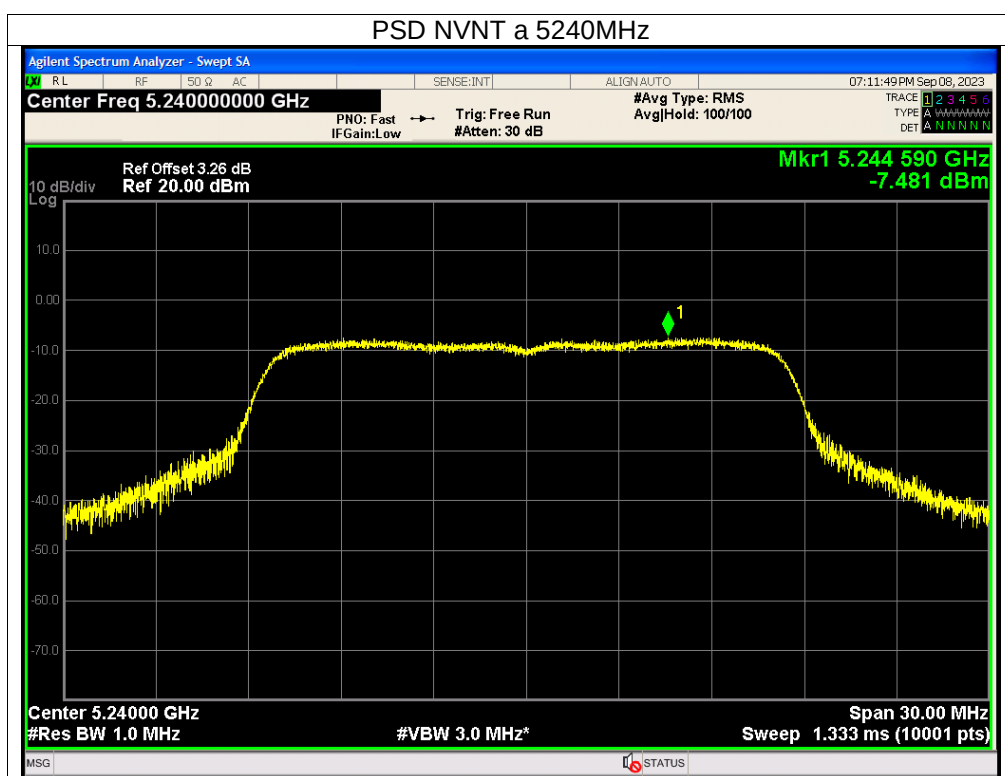
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 3.8V
Test Mode :	(5180-5240MHz); (5745-5825MHz)		

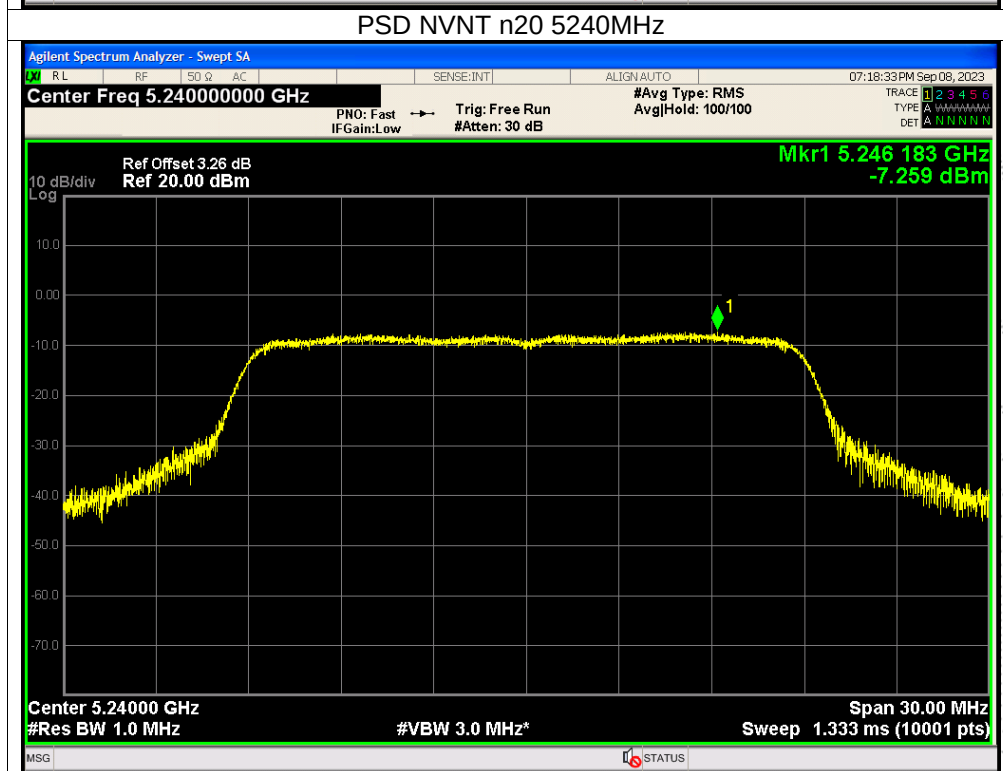
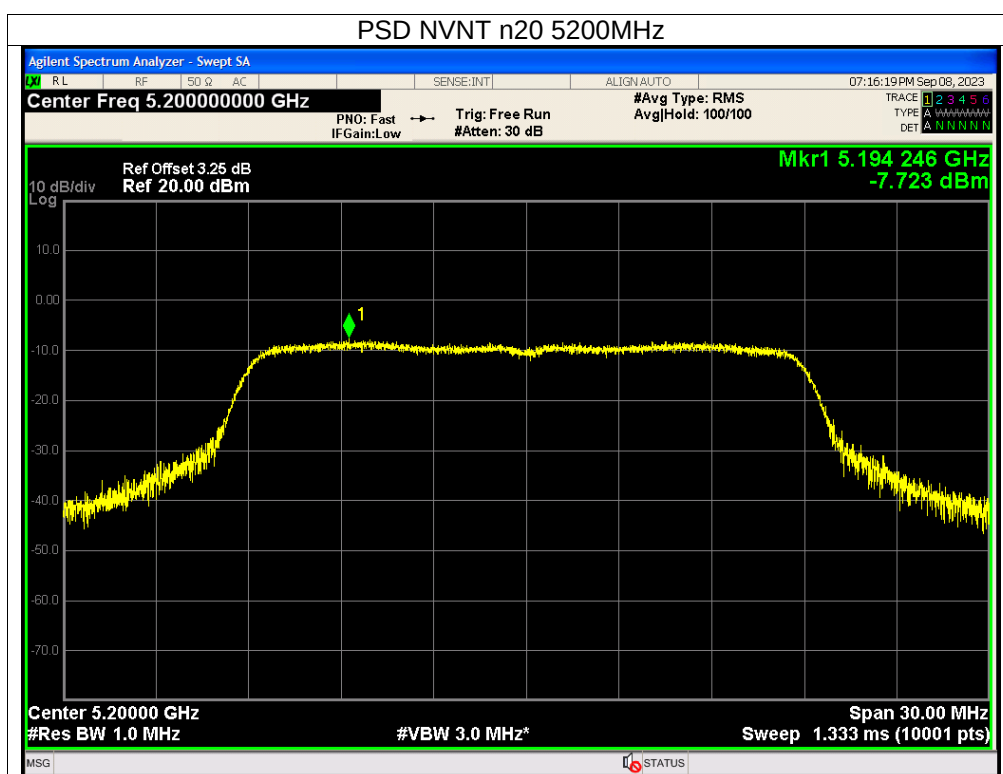
Condition	Mode	Frequency (MHz)	Conducted PSD (dBm)	Limit (dBm)	Verdict
NVNT	a	5180	-6.23	11	Pass
NVNT	a	5200	-7.6	11	Pass
NVNT	a	5240	-7.48	11	Pass
NVNT	n20	5180	-7.7	11	Pass
NVNT	n20	5200	-7.72	11	Pass
NVNT	n20	5240	-7.26	11	Pass
NVNT	n40	5190	-12.09	11	Pass
NVNT	n40	5230	-11.69	11	Pass
NVNT	ac20	5180	-7.65	11	Pass
NVNT	ac20	5200	-7.7	11	Pass
NVNT	ac20	5240	-7	11	Pass
NVNT	ac40	5190	-11.66	11	Pass
NVNT	ac40	5230	-11.61	11	Pass
NVNT	ax20	5180	-7.72	11	Pass
NVNT	ax20	5200	-7.84	11	Pass
NVNT	ax20	5240	-7	11	Pass
NVNT	ax40	5190	-12.57	11	Pass
NVNT	ax40	5230	-12.14	11	Pass

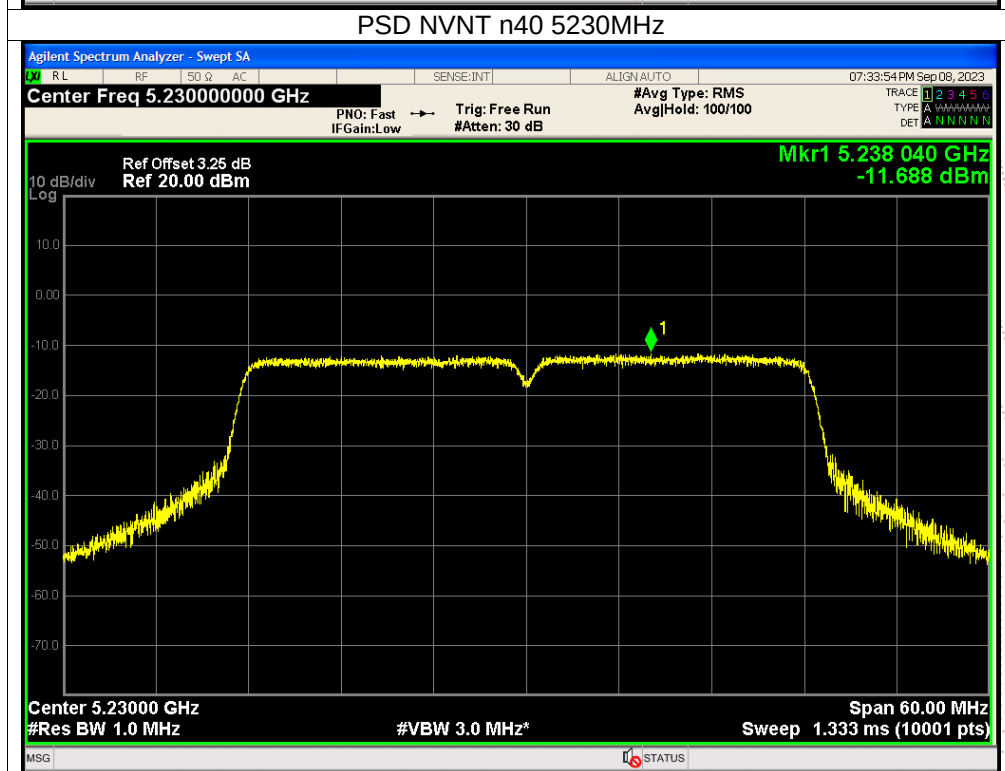
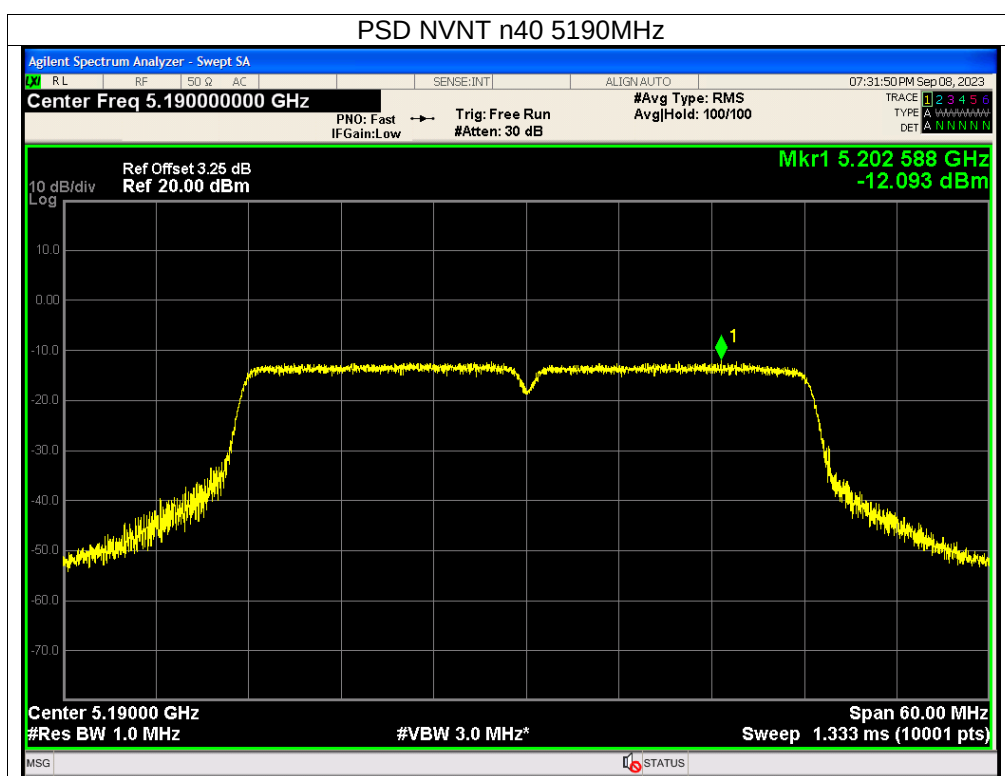
Condition	Mode	Frequency (MHz)	Conducted PSD (dBm)	Limit (dBm)	Verdict
NVNT	a	5745	-9.29	30	Pass
NVNT	a	5785	-10.37	30	Pass
NVNT	a	5825	-10.19	30	Pass
NVNT	n20	5745	-11.57	30	Pass
NVNT	n20	5785	-11.98	30	Pass
NVNT	n20	5825	-12.17	30	Pass
NVNT	n40	5755	-15.24	30	Pass
NVNT	n40	5795	-15.69	30	Pass
NVNT	ac20	5745	-11.39	30	Pass
NVNT	ac20	5785	-12.16	30	Pass
NVNT	ac20	5825	-12.21	30	Pass
NVNT	ac40	5755	-15.18	30	Pass
NVNT	ac40	5795	-15.48	30	Pass
NVNT	ax20	5745	-10.98	30	Pass
NVNT	ax20	5785	-11.96	30	Pass
NVNT	ax20	5825	-12.84	30	Pass
NVNT	ax40	5755	-14.65	30	Pass
NVNT	ax40	5795	-15.7	30	Pass

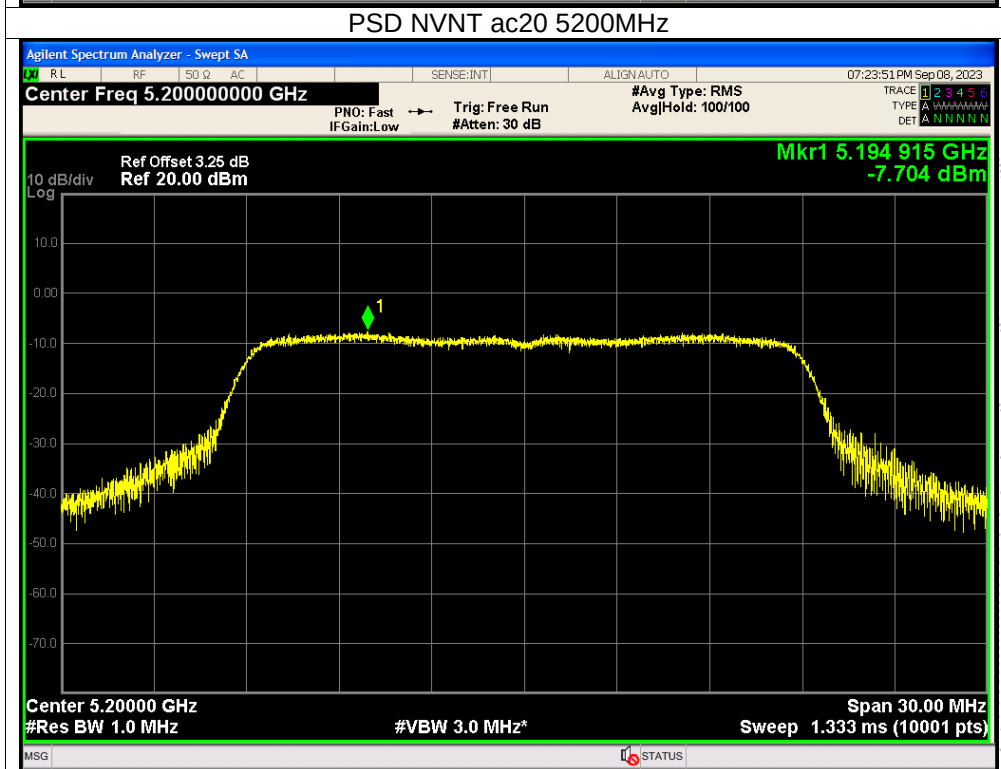
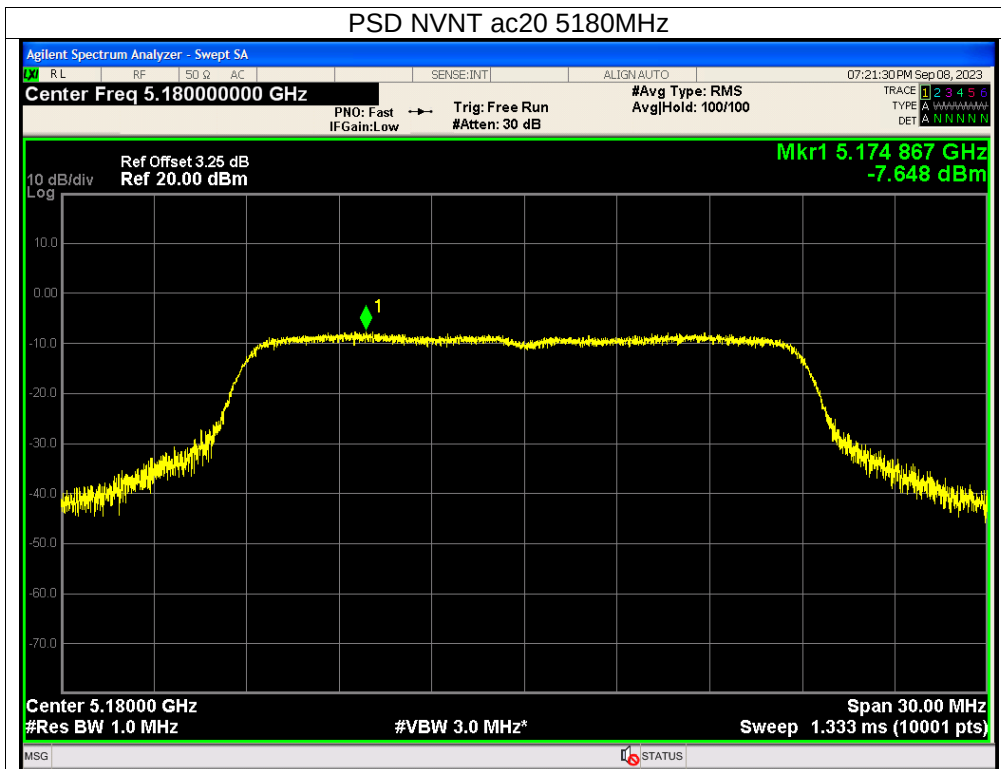


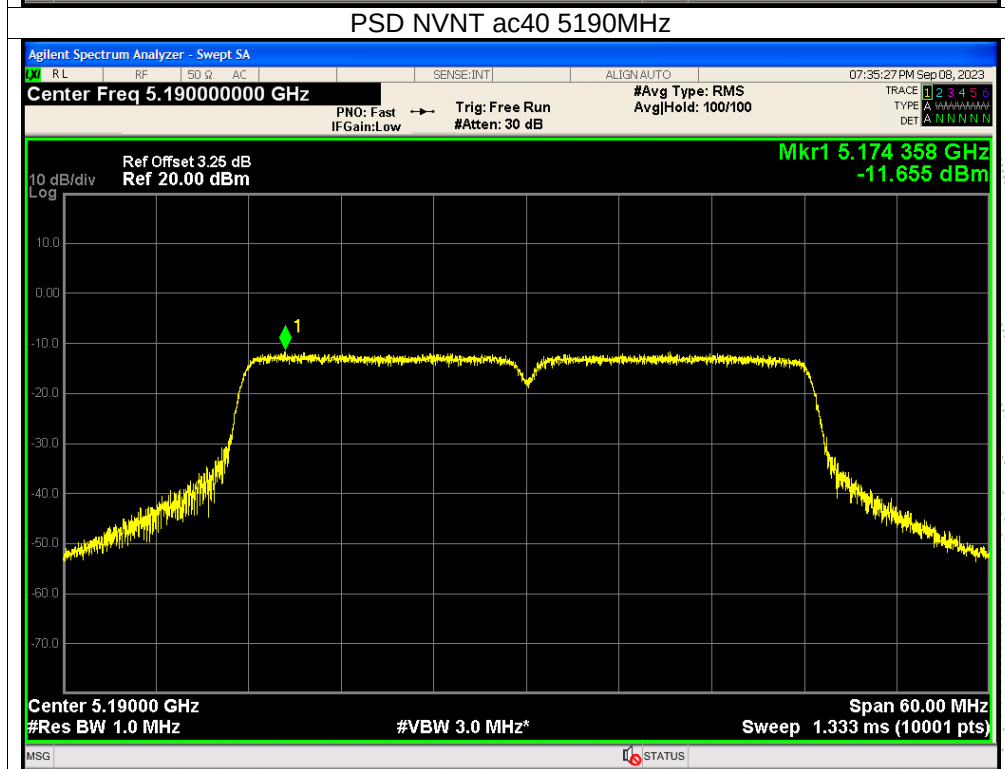
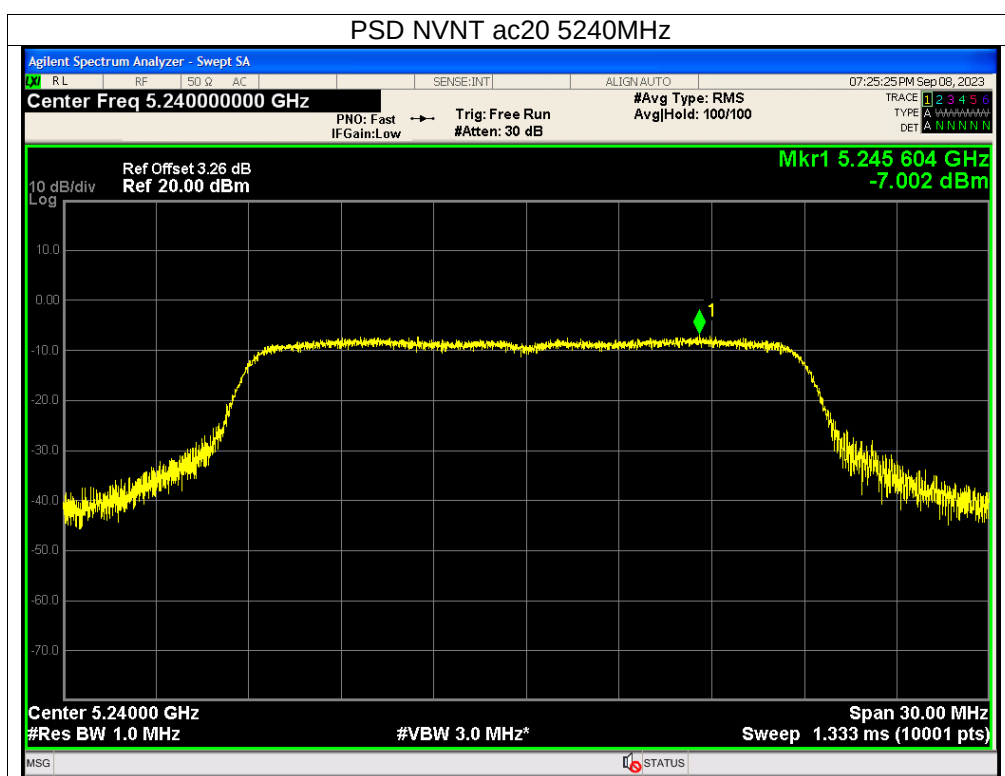


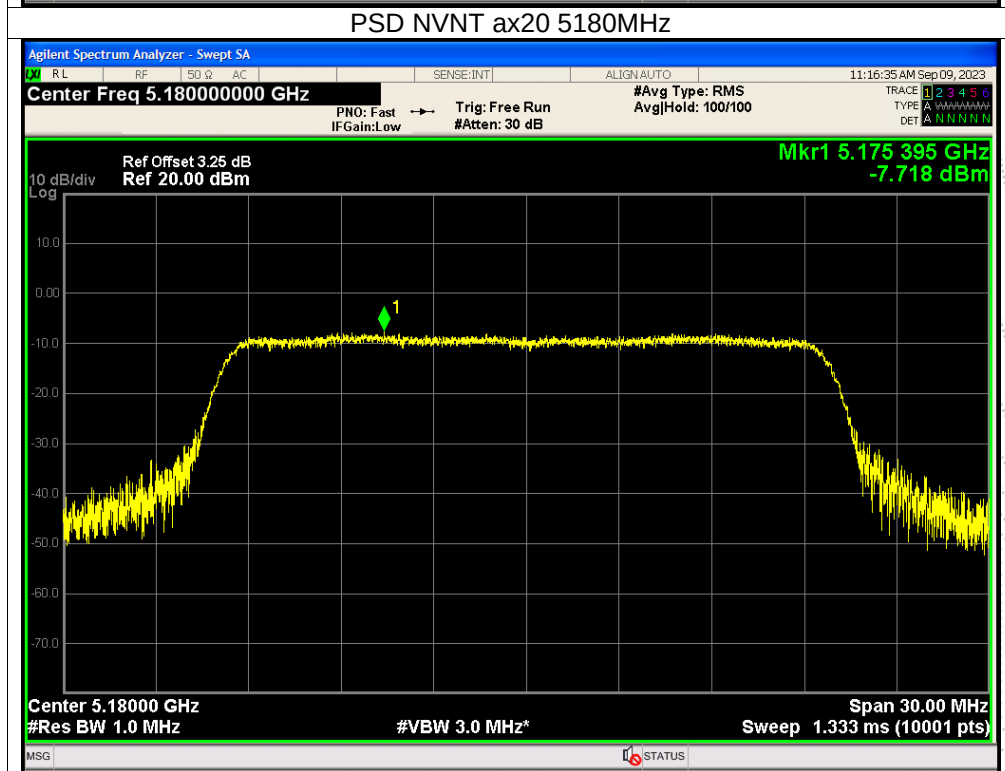
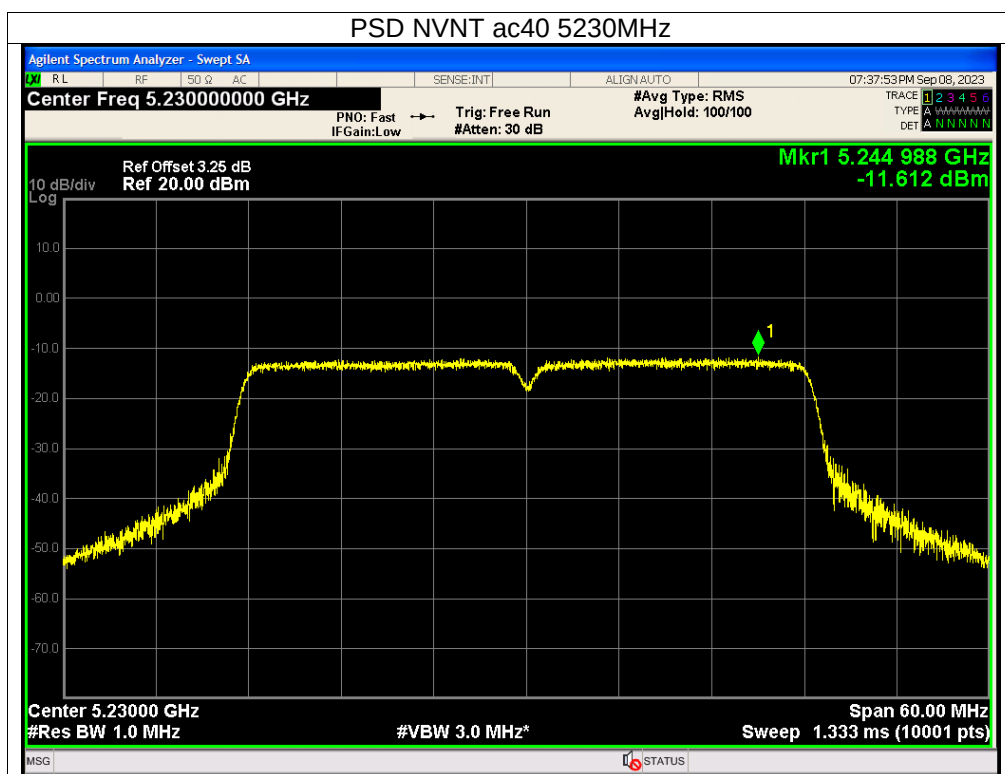


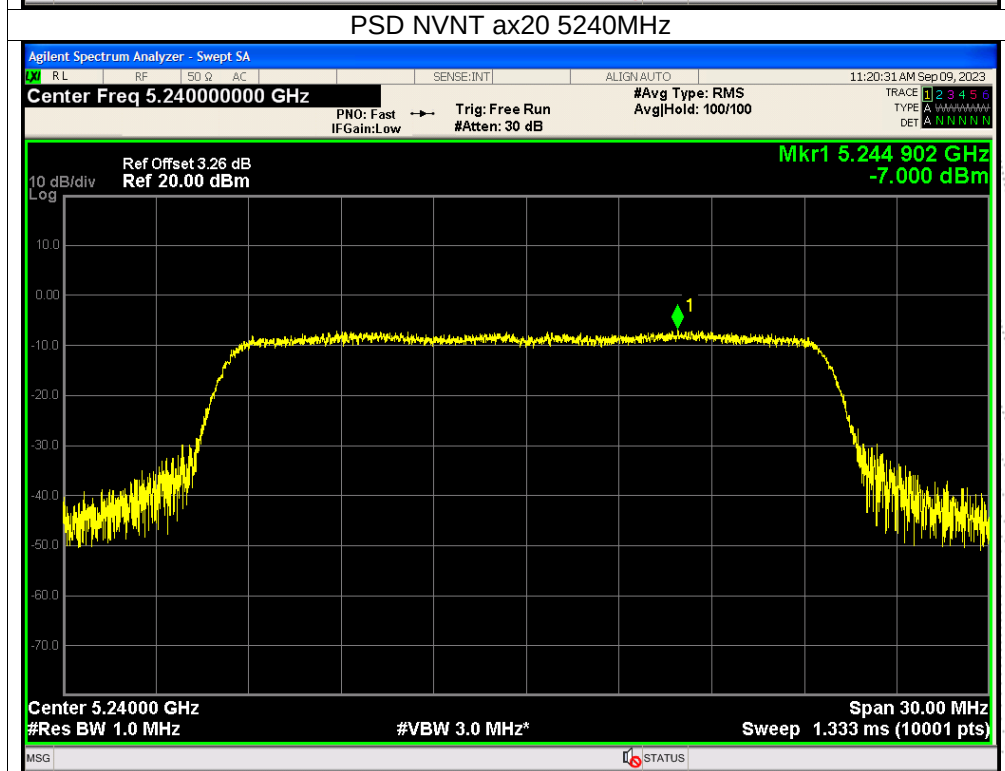
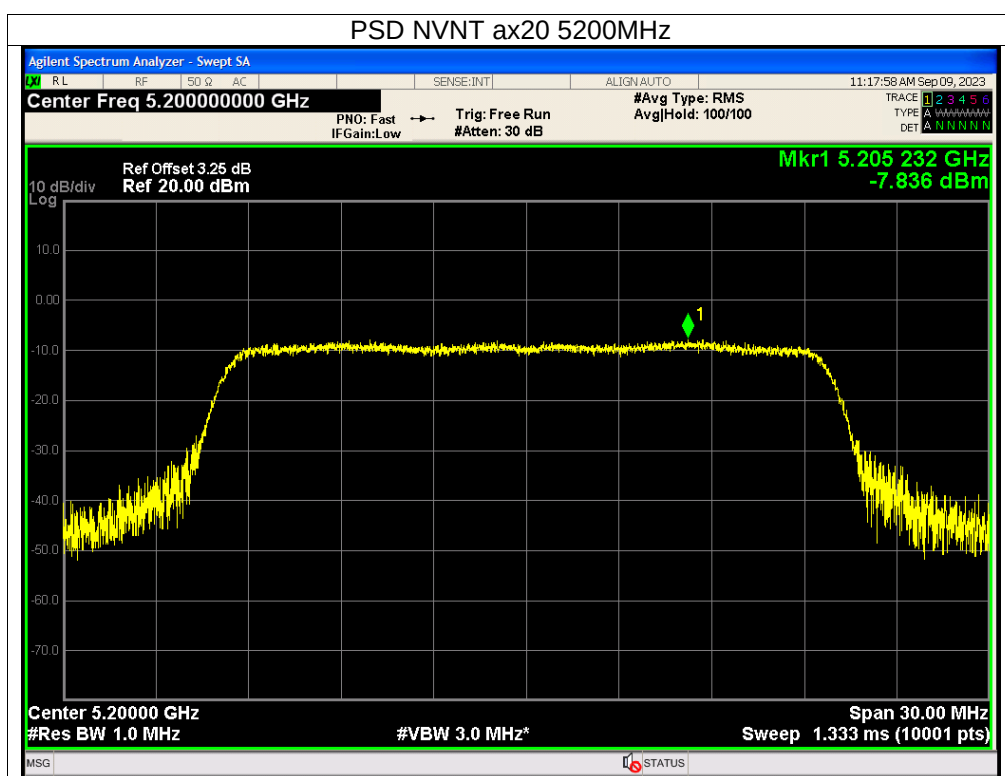


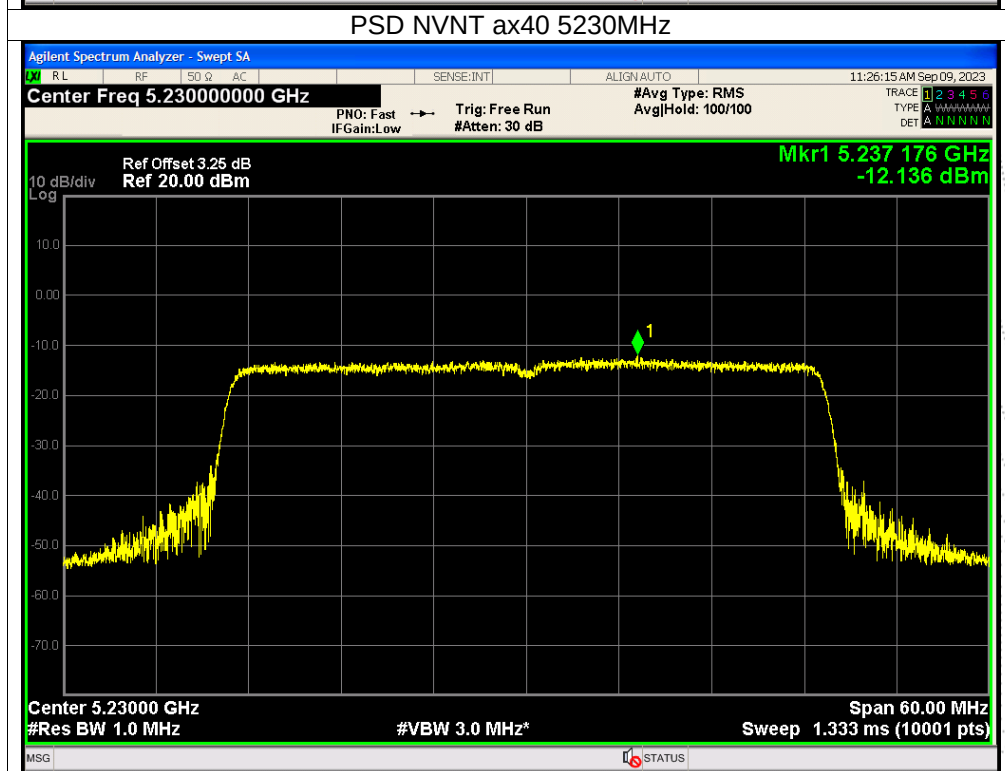
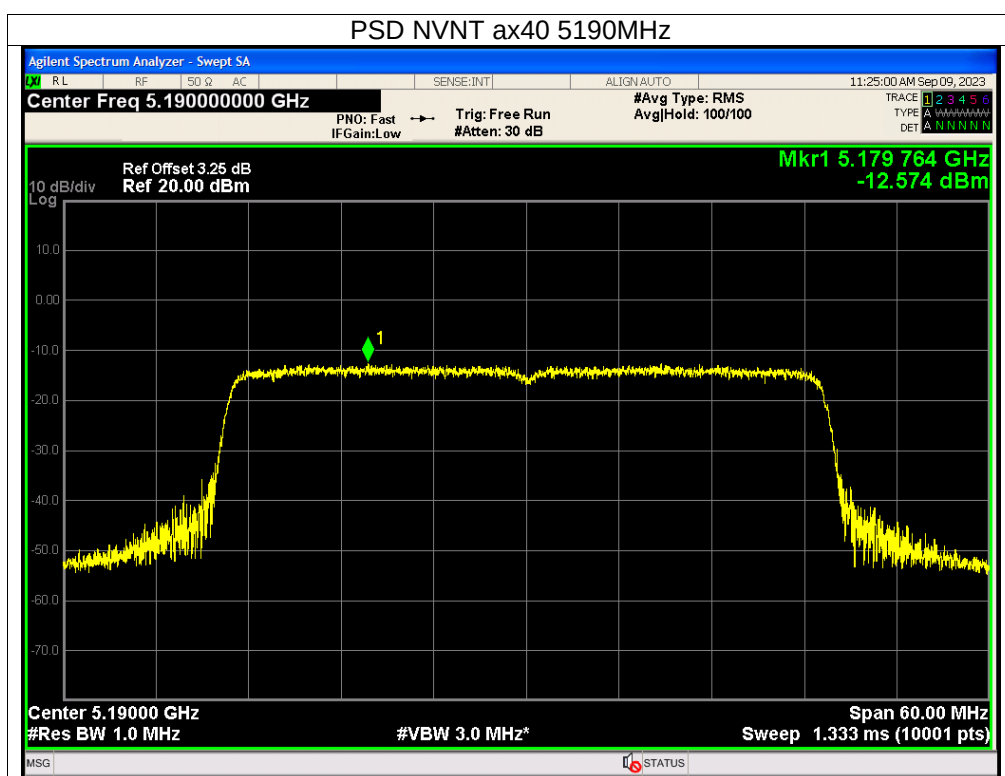


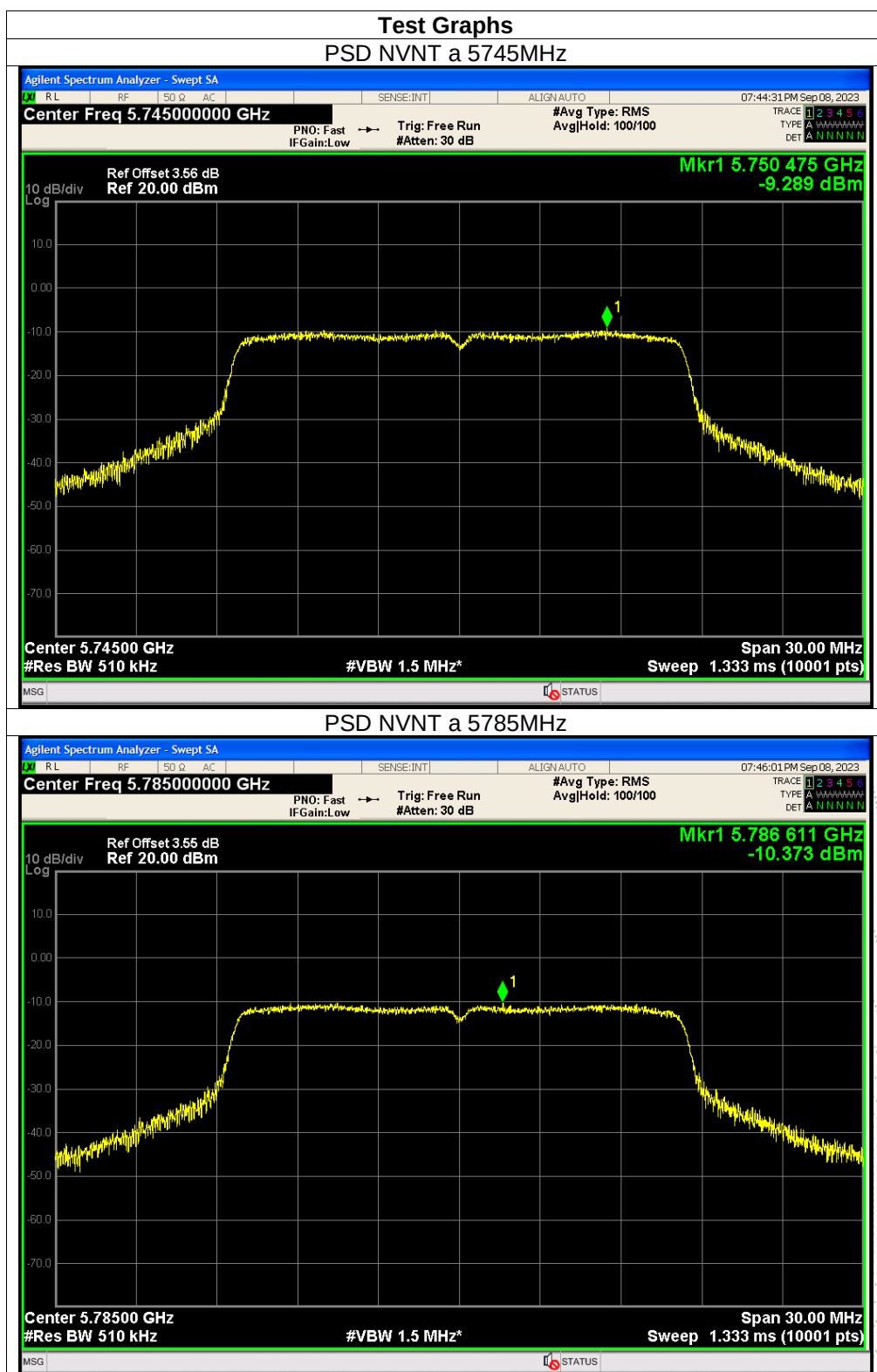


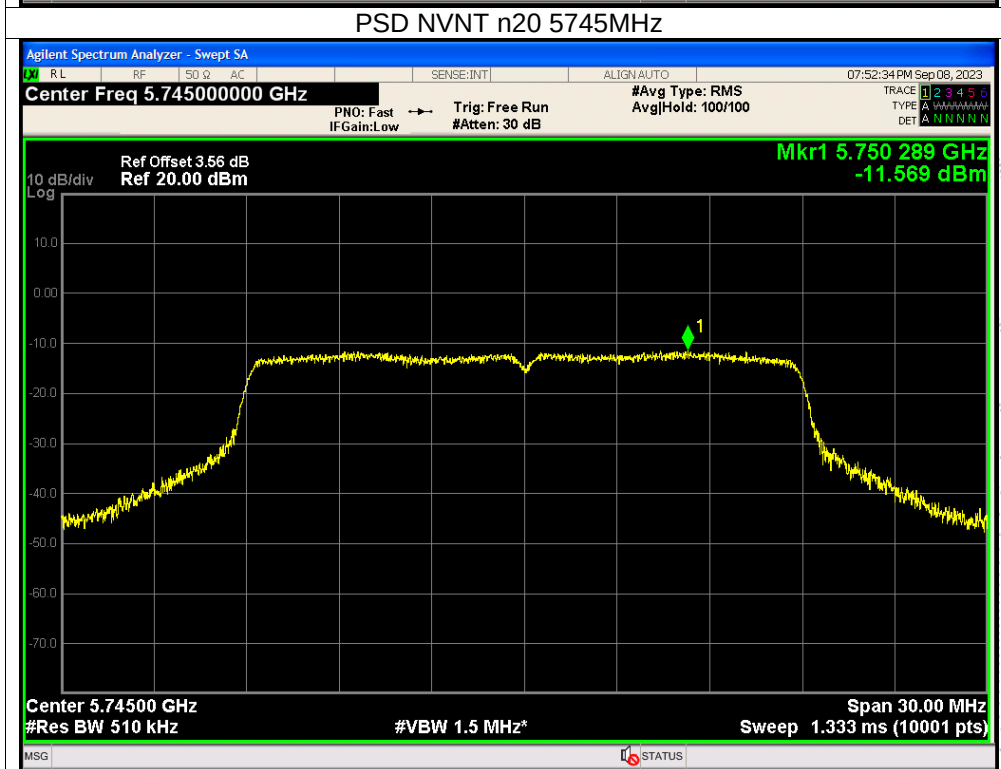
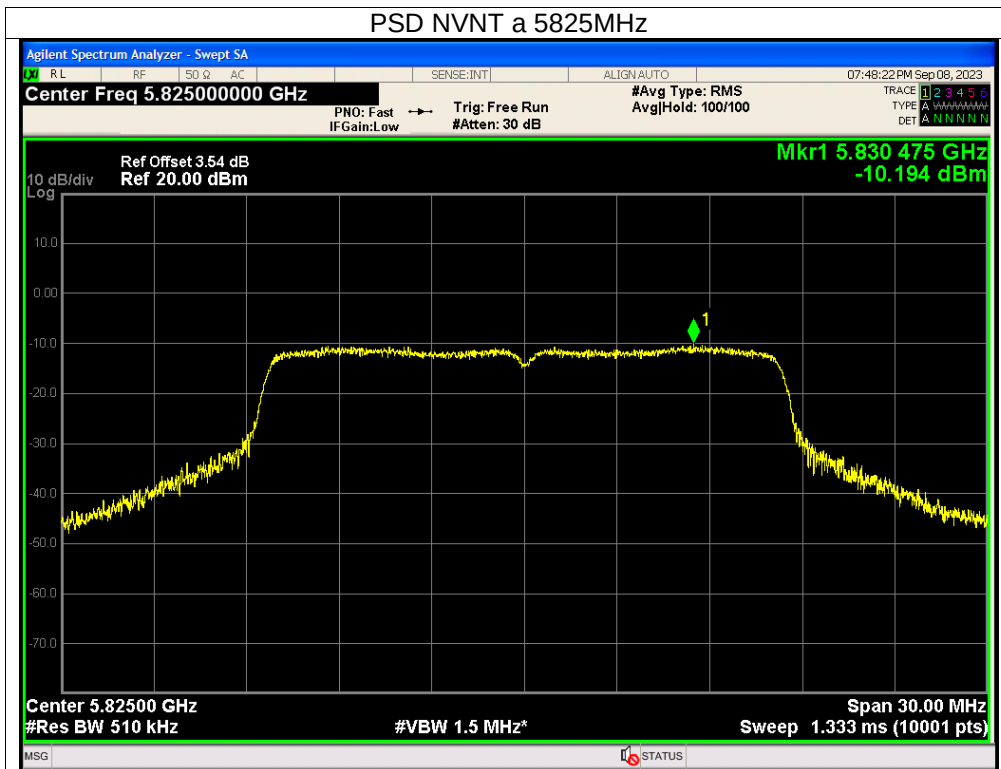


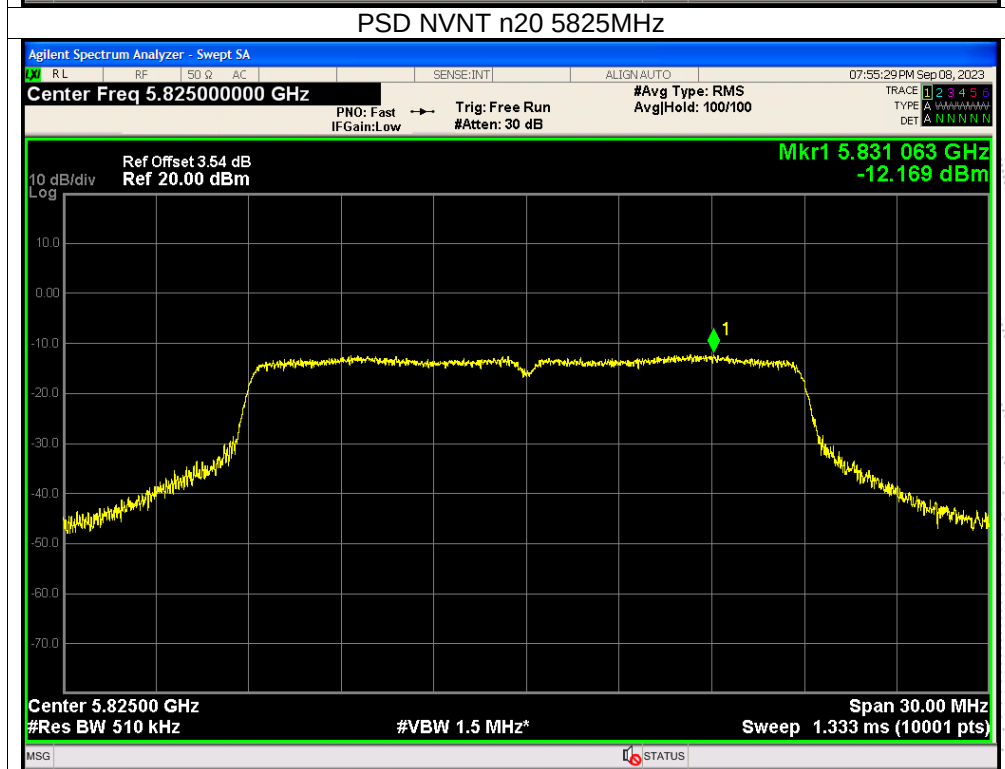
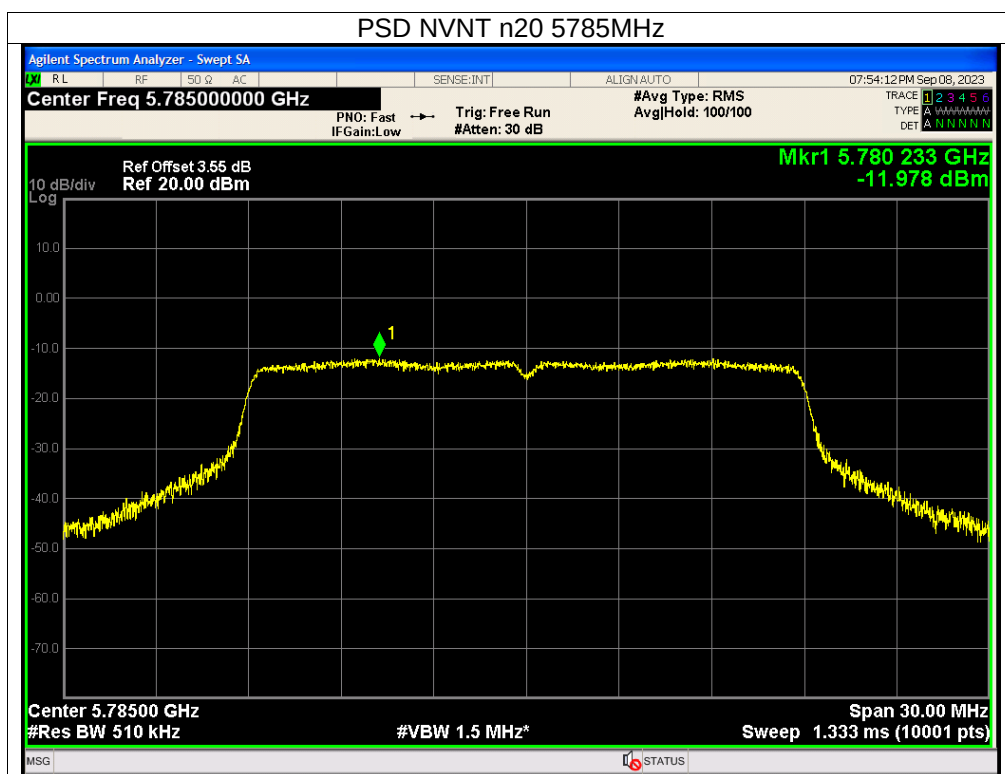


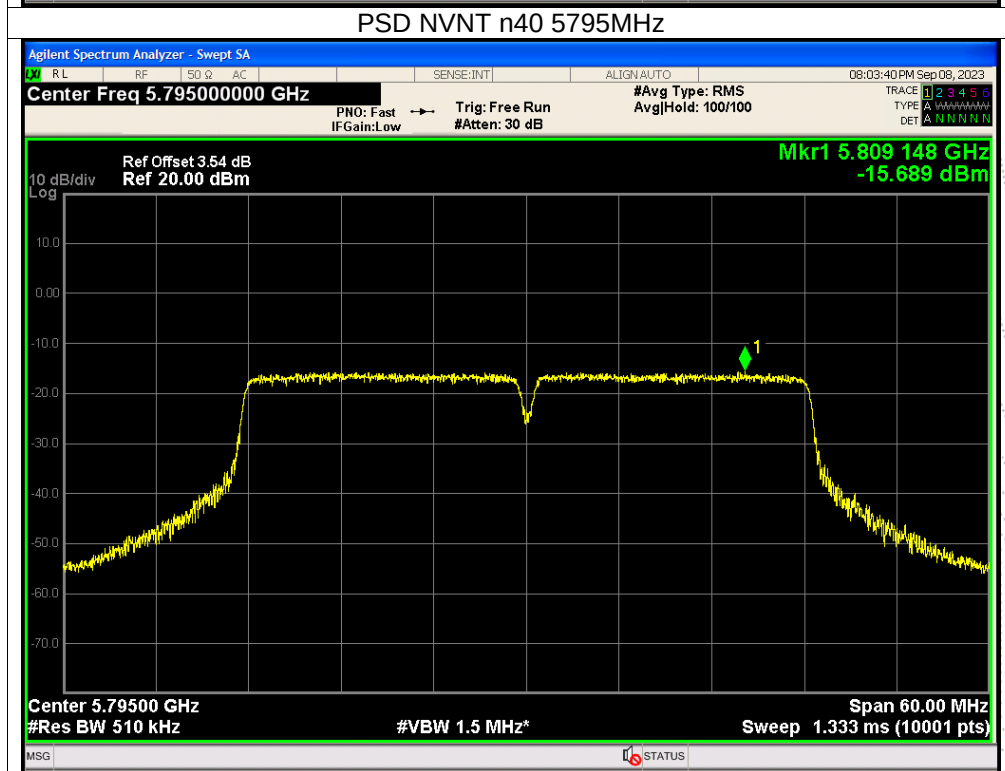
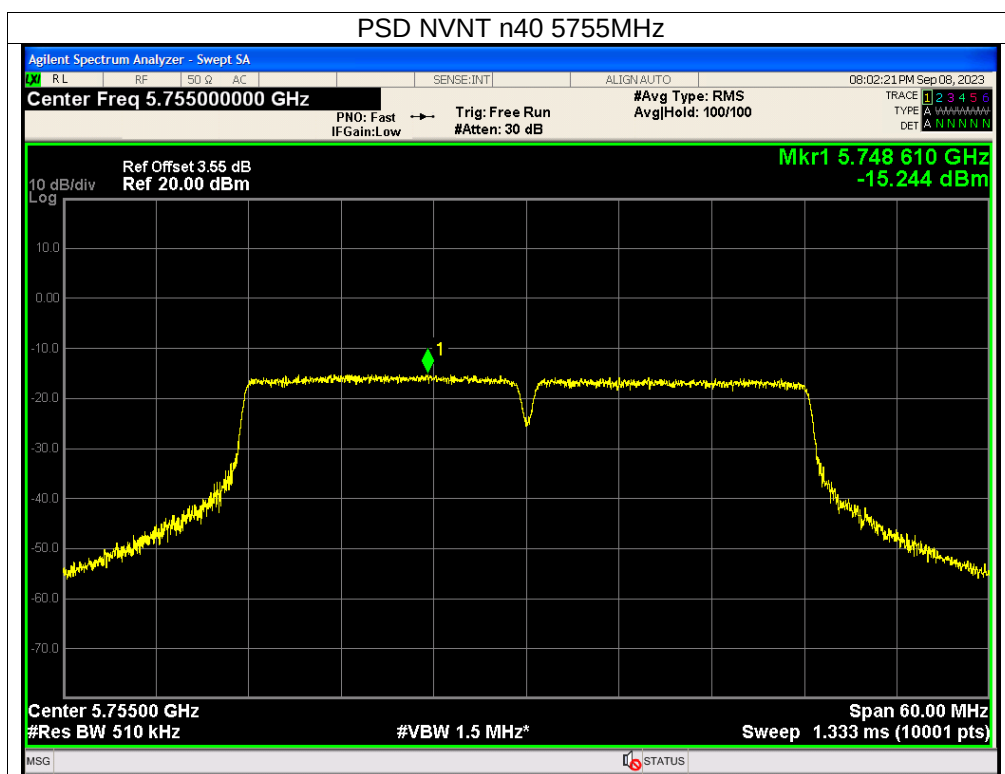


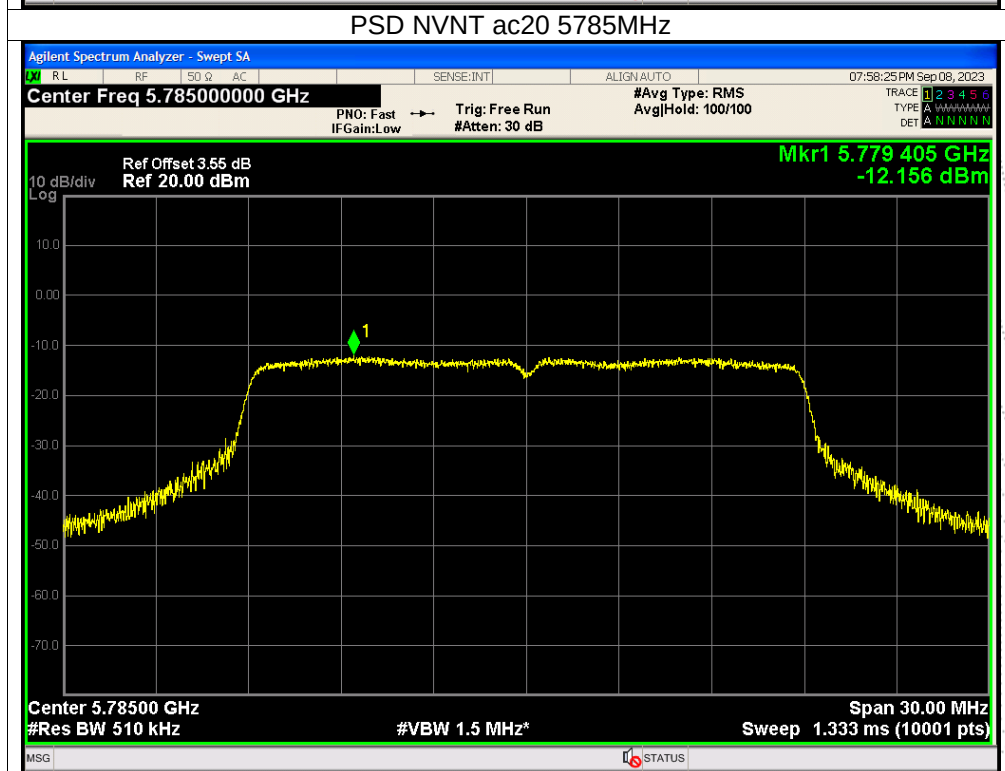
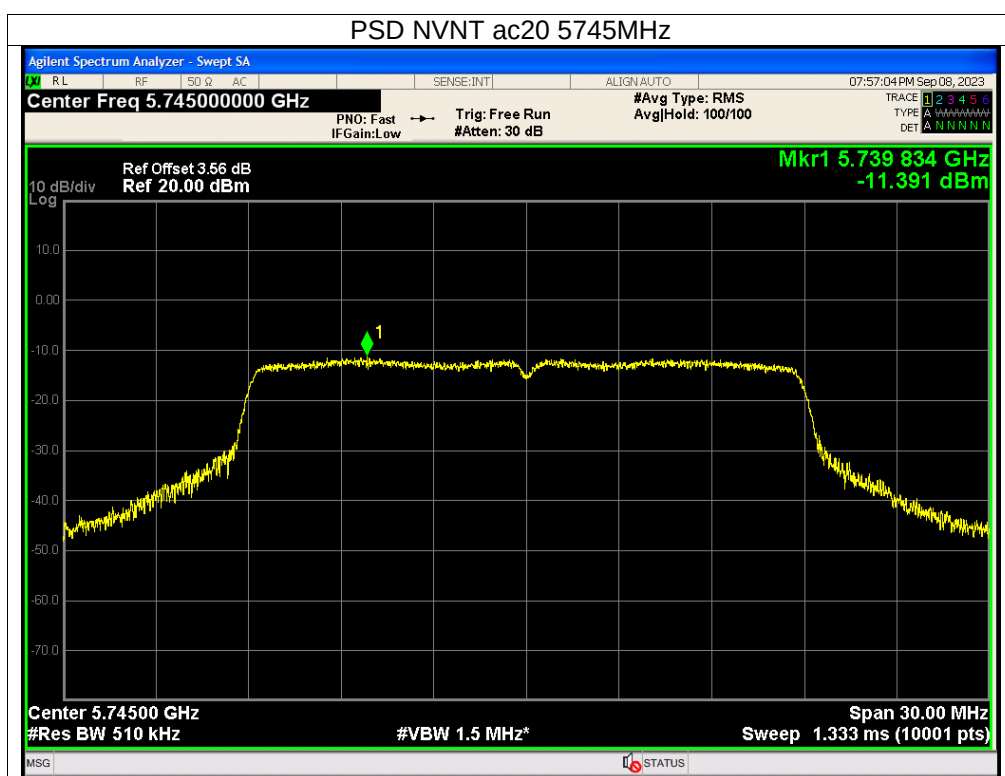


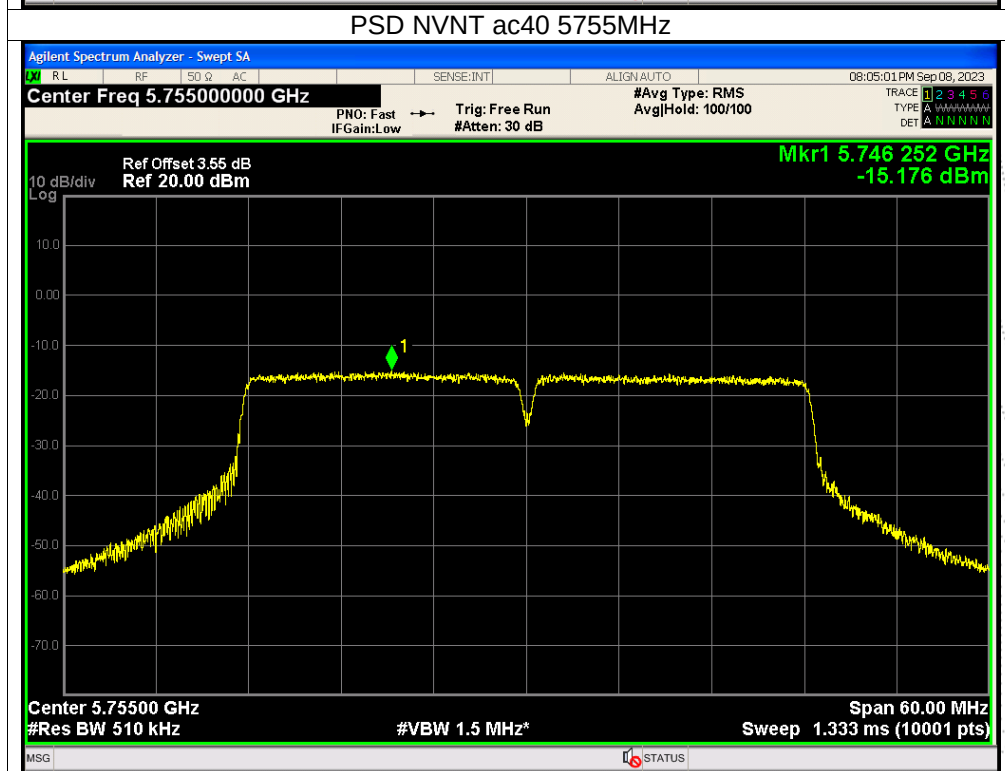
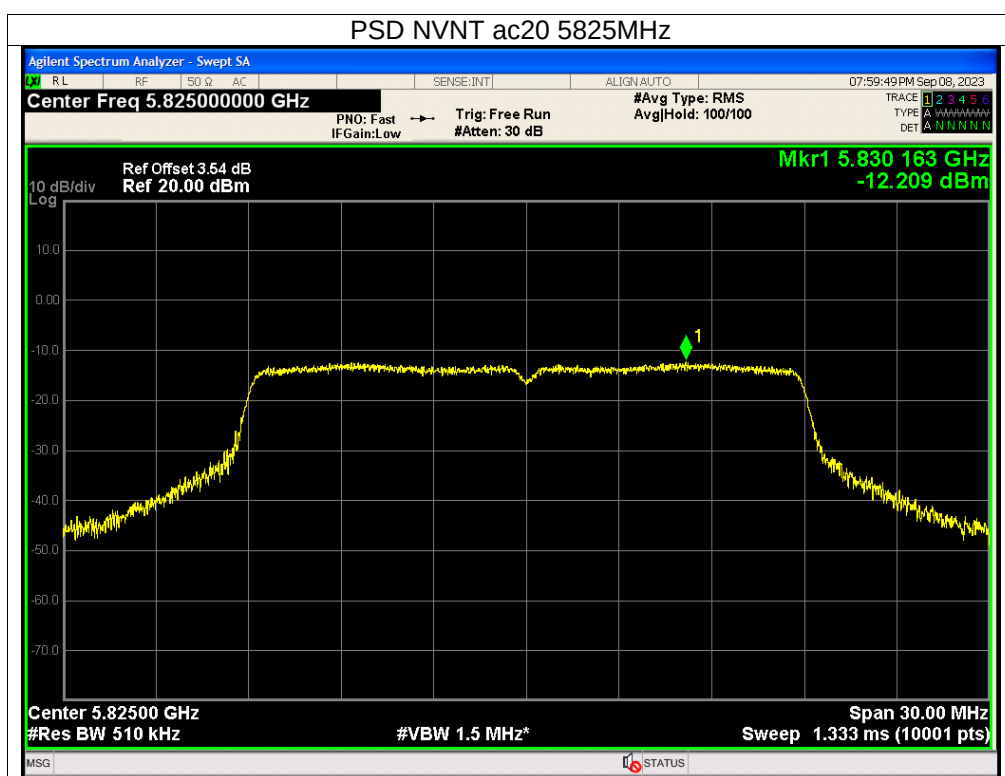


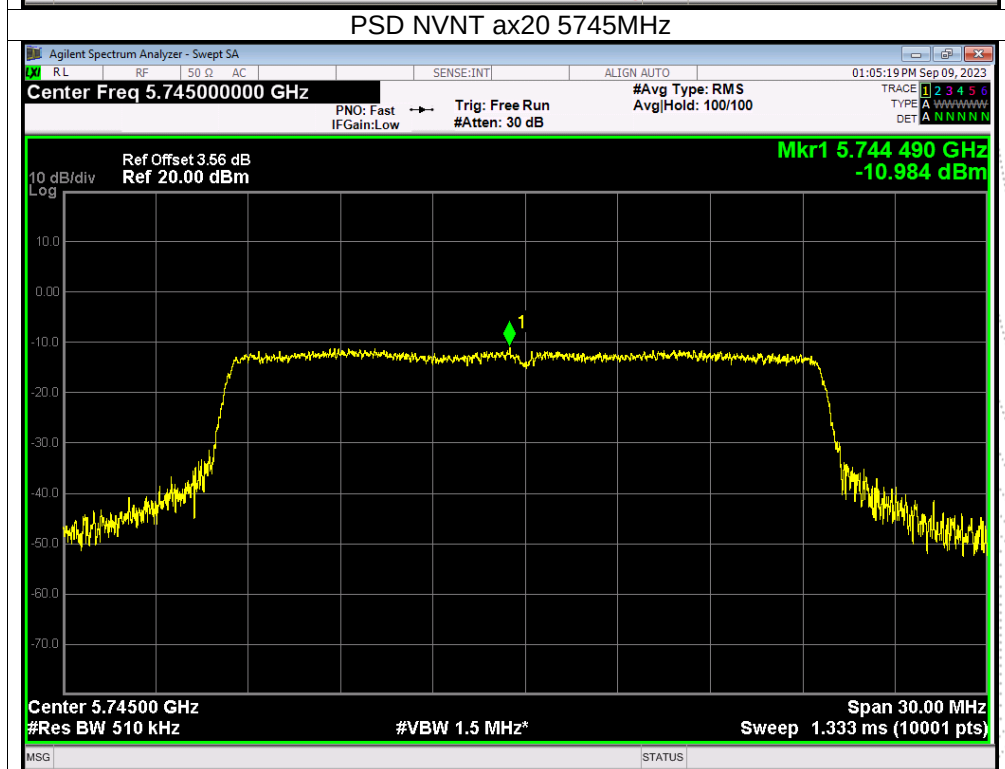
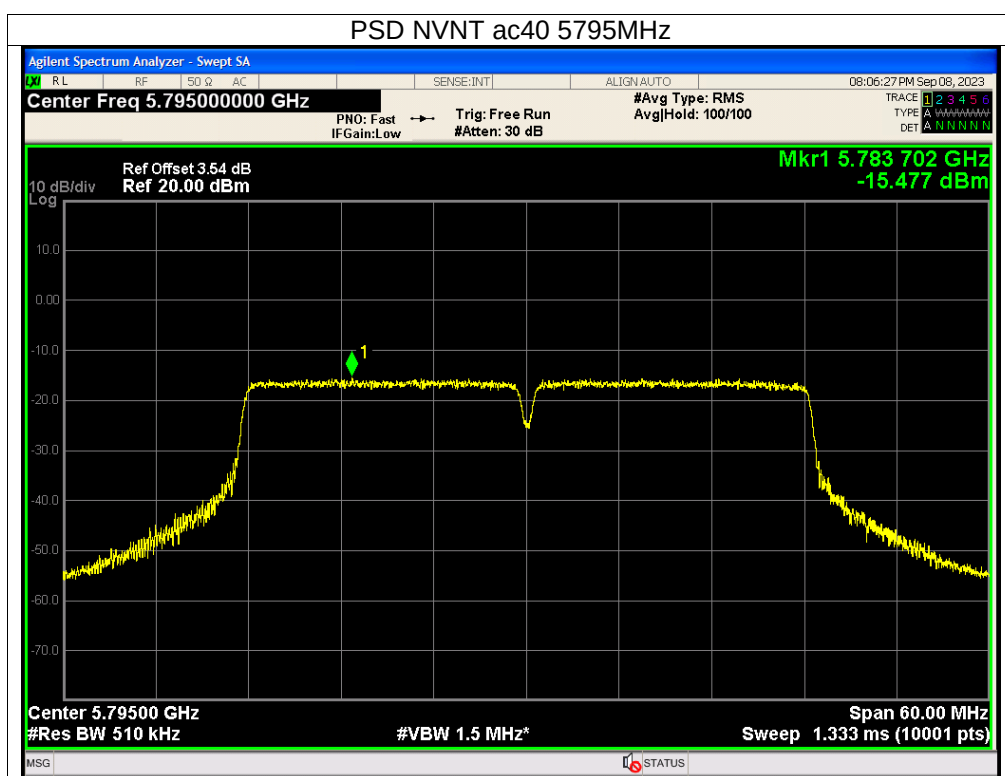


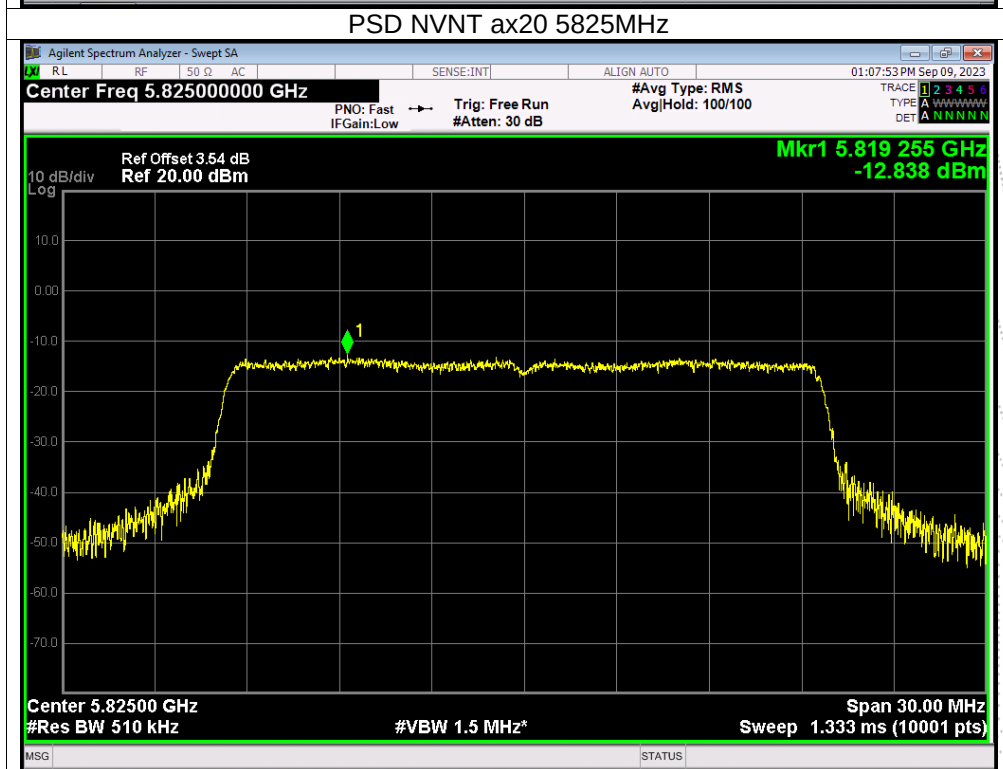
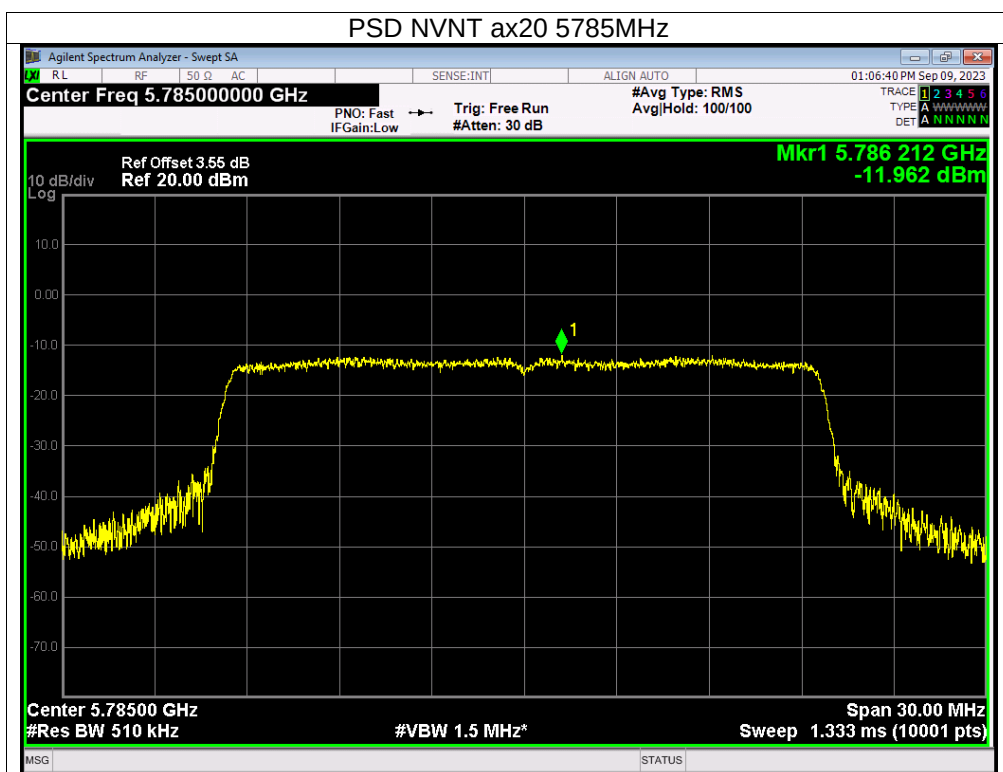


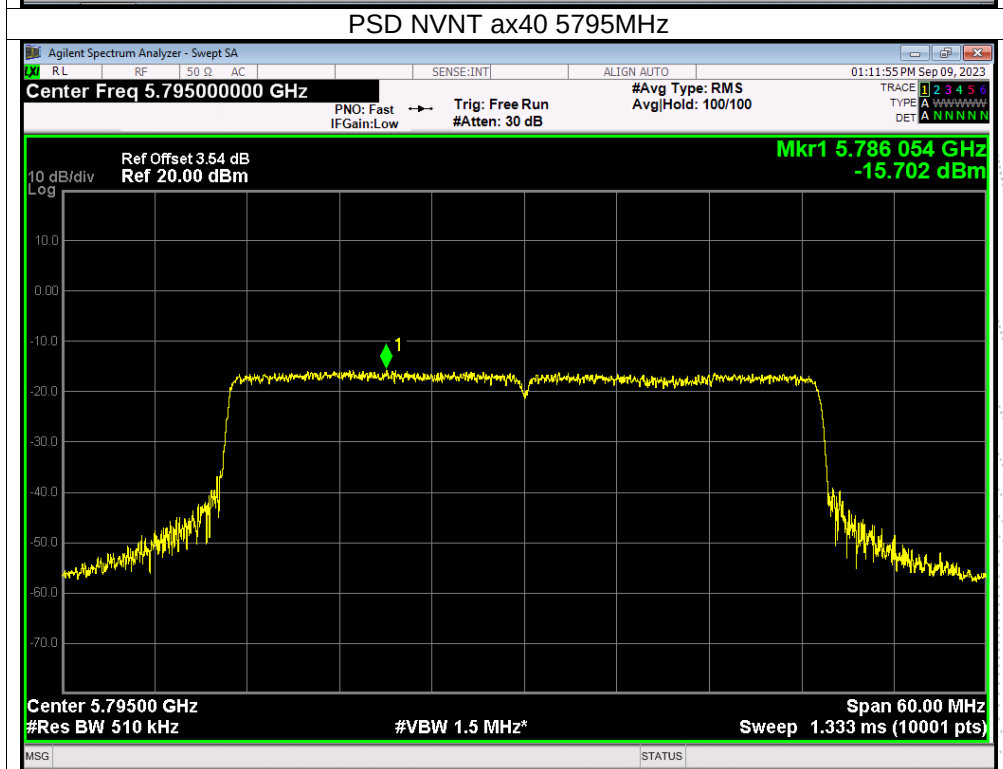
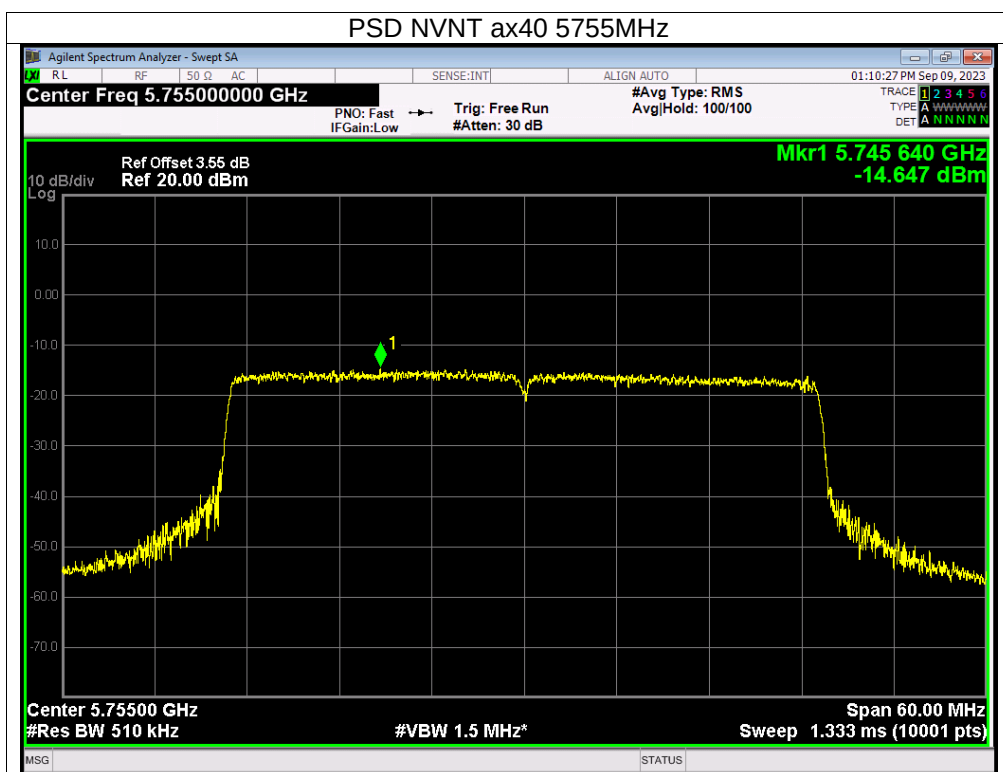






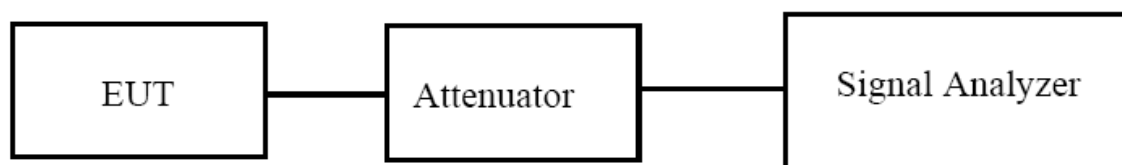






9. 26dB & 6dB & 99% Emission Bandwidth

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.
(6dB bandwidth)>500kHz

9.3 Test Procedure

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- 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:

- Set center frequency to the nominal EUT channel center frequency.
- Set span = 1.5 times to 5.0 times the OBW.
- Set RBW = 1 % to 5 % of the OBW
- Set $VBW \geq 3 \cdot RBW$
- 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.
- Use the 99 % power bandwidth function of the instrument (if available).
- 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.

6dB

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times RBW$.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.

6. Allow the trace to stabilize.

7. 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%
Pressure :	101kPa	Test Voltage :	DC 3.8V
Test Mode :	TX Frequency U-NII-1 (5180-5240MHz)		

Condition	Mode	Frequency (MHz)	99% bandwidth (MHz)	26dB bandwidth (MHz)	Limit -26 dB Bandwidth	Result
NVNT	a	5180	16.732	24.373	0.5	Pass
NVNT	a	5200	16.732	24.562	0.5	Pass
NVNT	a	5240	16.711	25.326	0.5	Pass
NVNT	n20	5180	17.958	27.264	0.5	Pass
NVNT	n20	5200	17.907	25.901	0.5	Pass
NVNT	n20	5240	17.948	26.408	0.5	Pass
NVNT	n40	5190	36.565	50.559	0.5	Pass
NVNT	n40	5230	36.496	50.269	0.5	Pass
NVNT	ac20	5180	17.953	26.555	0.5	Pass
NVNT	ac20	5200	17.916	26.735	0.5	Pass
NVNT	ac20	5240	17.935	26.82	0.5	Pass
NVNT	ac40	5190	36.482	51.123	0.5	Pass
NVNT	ac40	5230	36.486	50.485	0.5	Pass
NVNT	ax20	5180	19.156	25.557	0.5	Pass
NVNT	ax20	5200	19.094	25.785	0.5	Pass
NVNT	ax20	5240	19.107	25.211	0.5	Pass
NVNT	ax40	5190	37.913	42.87	0.5	Pass
NVNT	ax40	5230	37.898	46.45	0.5	Pass

