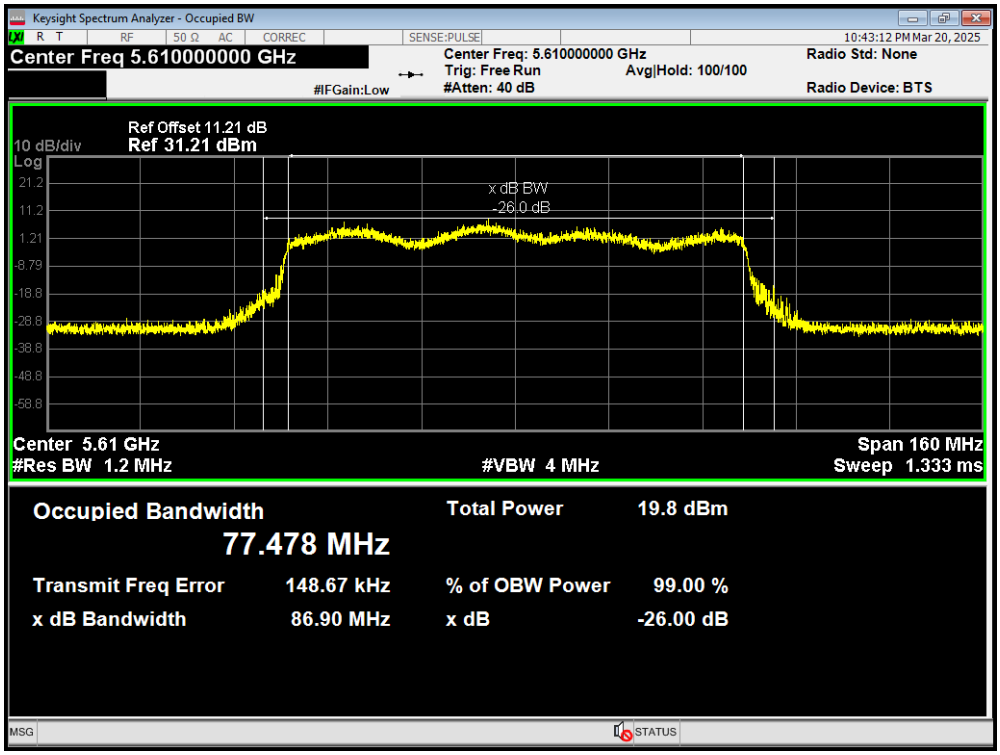
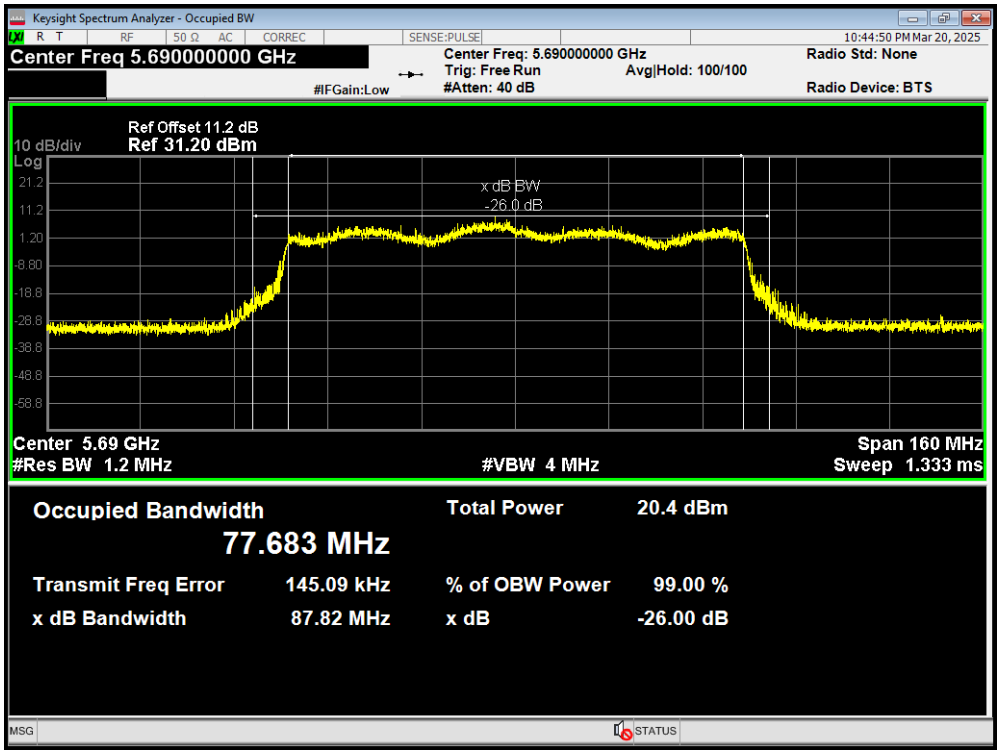
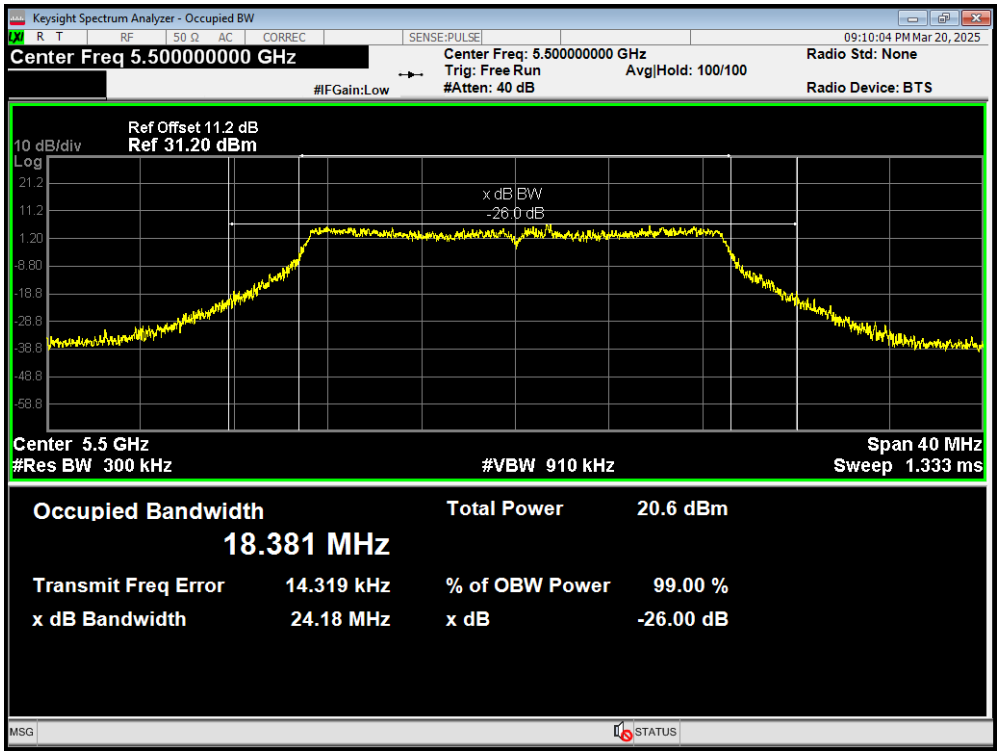
OBW 802.11be(80) 5610MHz



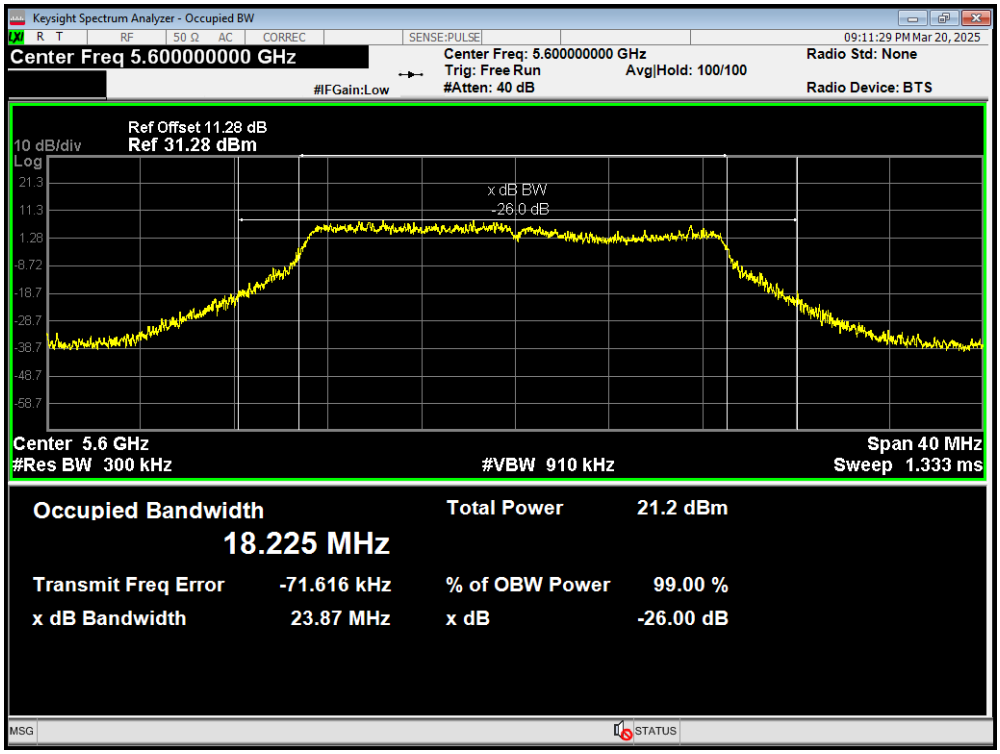
OBW 802.11be(80) 5690MHz



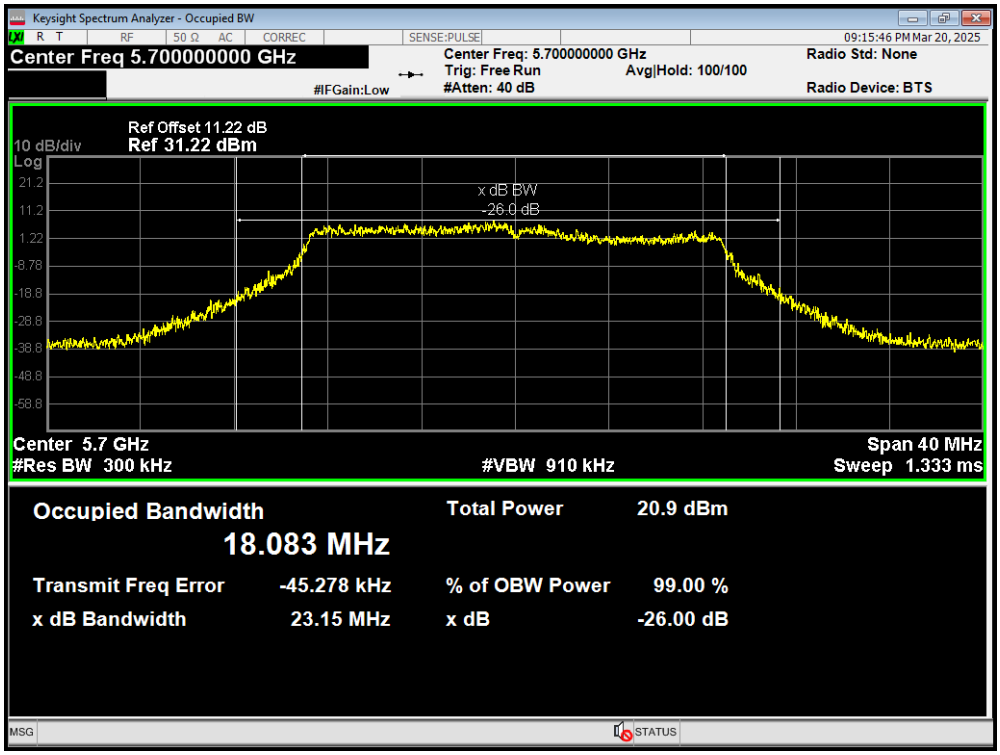
OBW 802.11n(HT20) 5500MHz



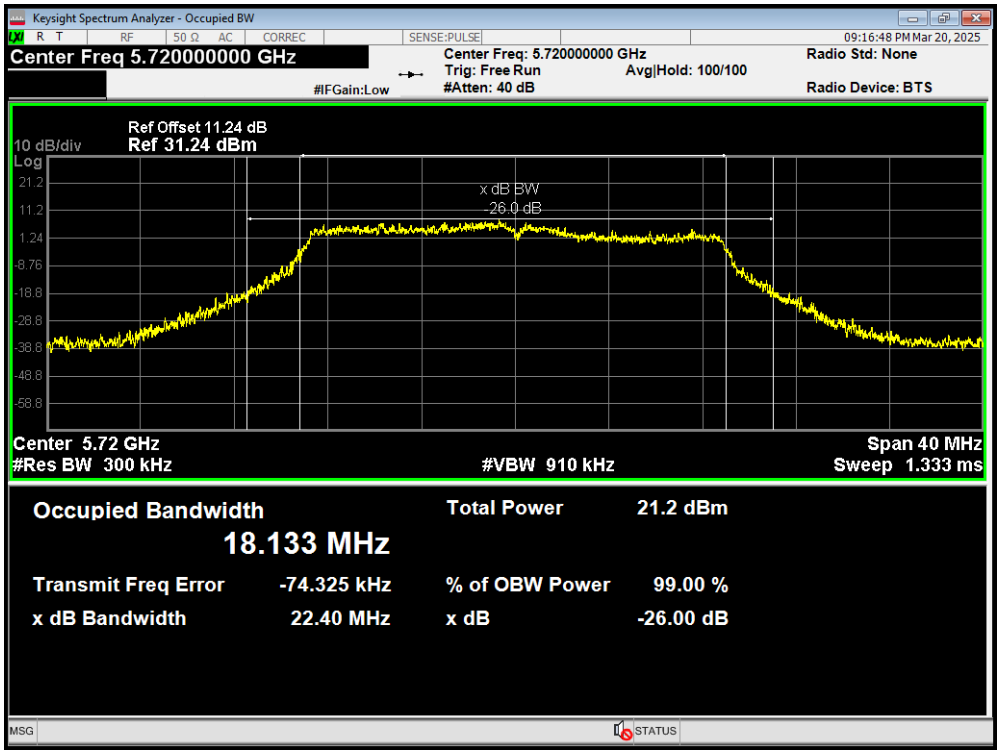
OBW 802.11n(HT20) 5600MHz



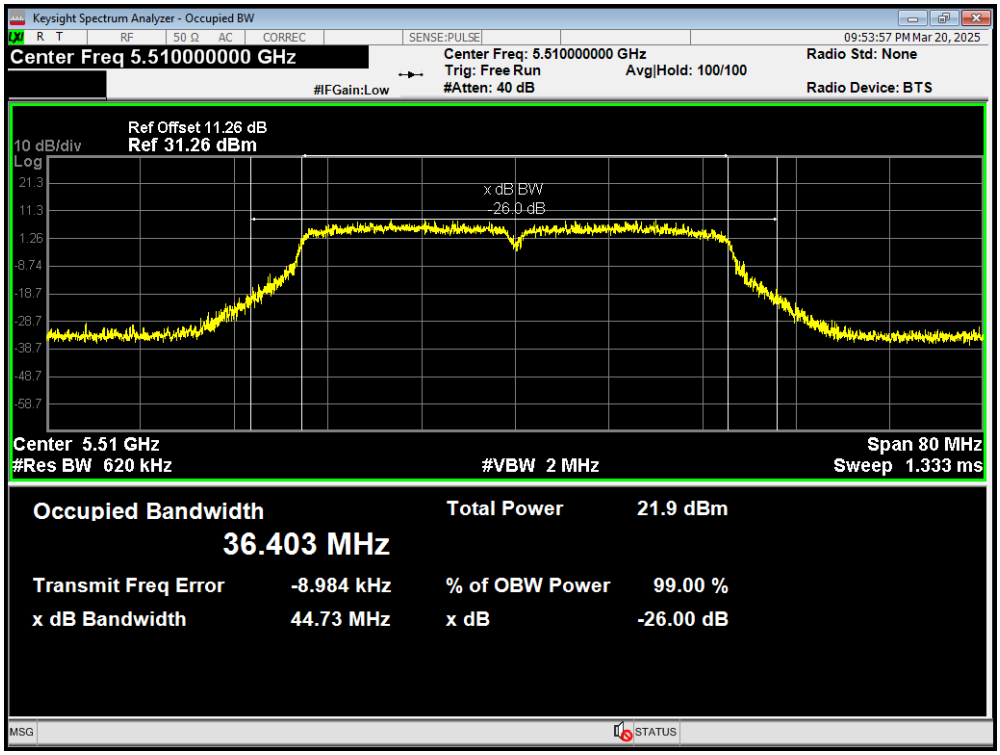
OBW 802.11n(HT20) 5700MHz



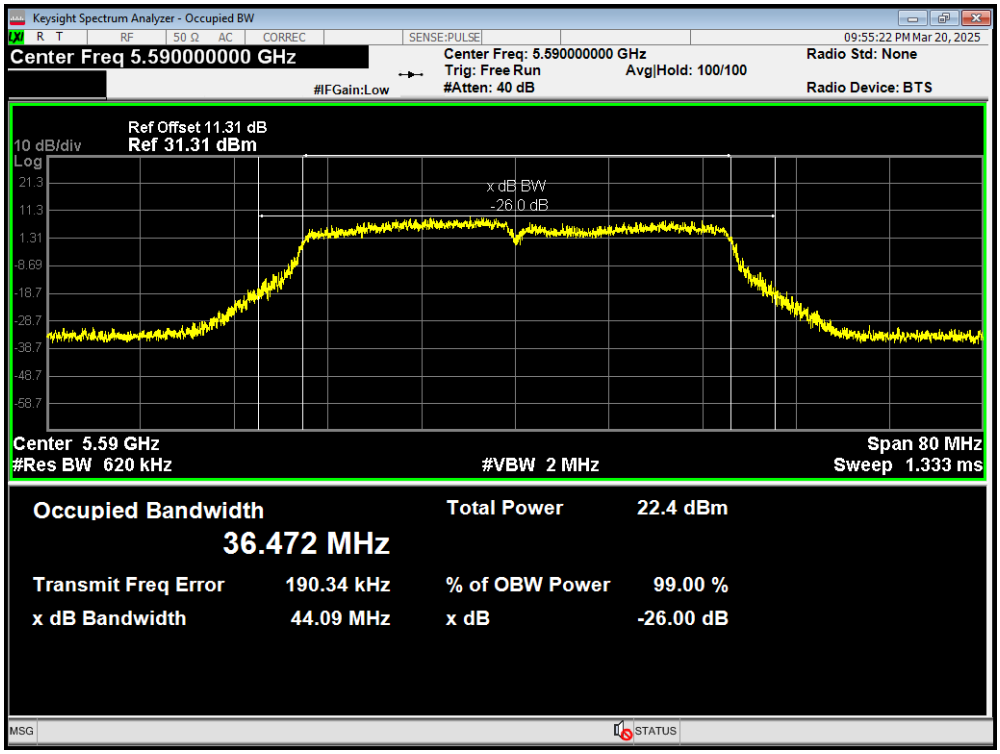
OBW 802.11n(HT20) 5720MHz



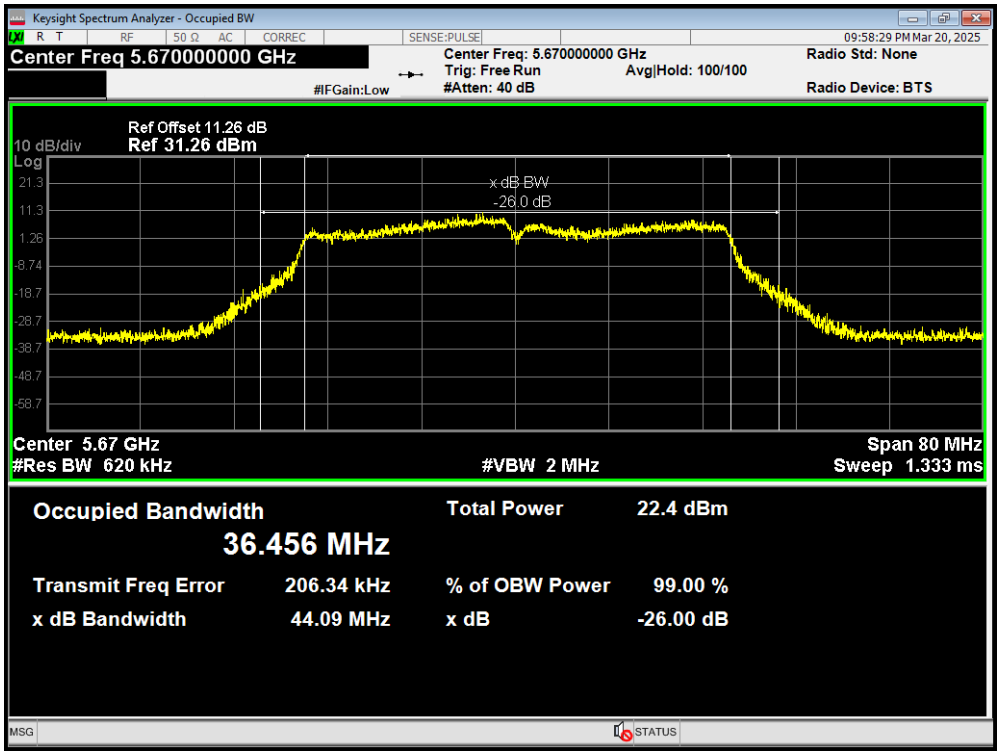
OBW 802.11n(HT40) 5510MHz



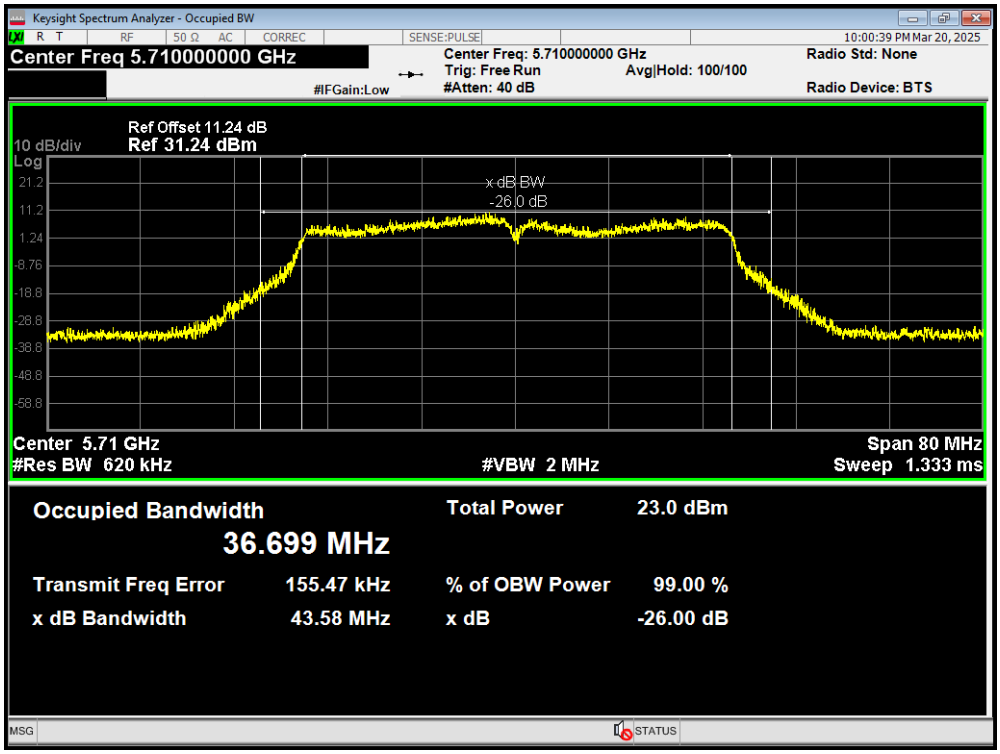
OBW 802.11n(HT40) 5590MHz



OBW 802.11n(HT40) 5670MHz

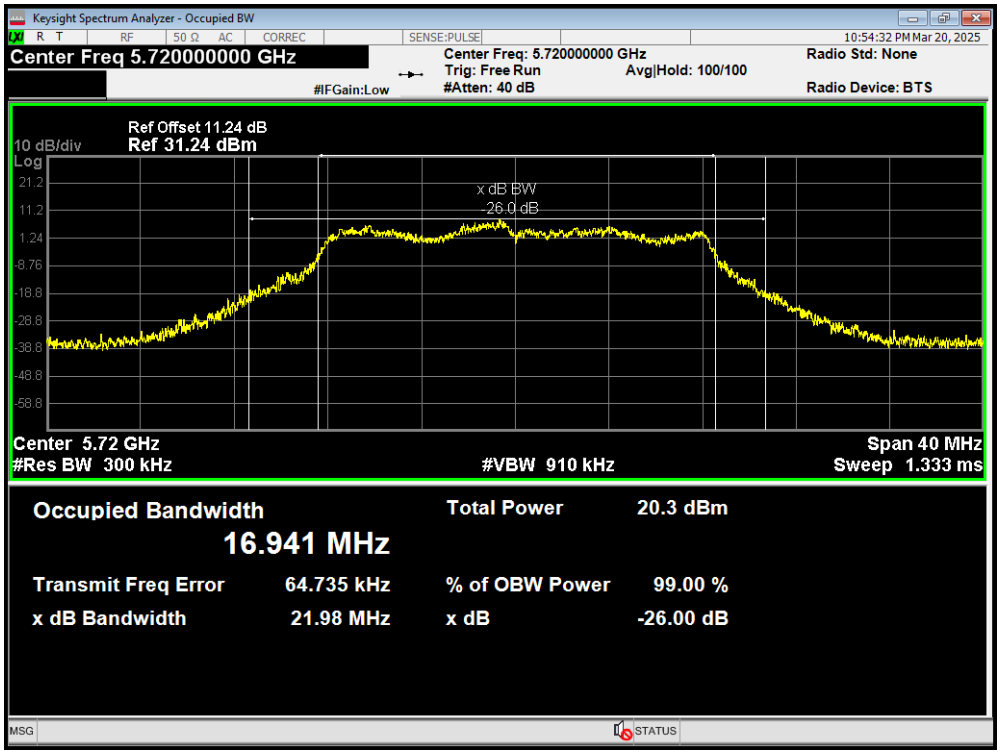


OBW 802.11n(HT40) 5710MHz

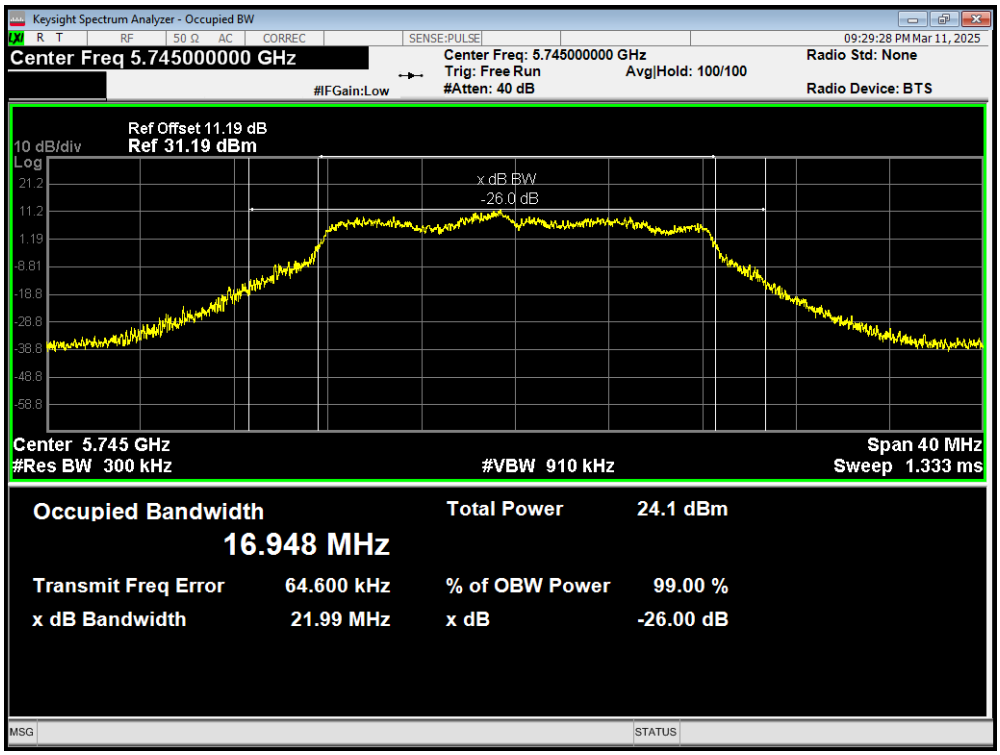


U-NII-3

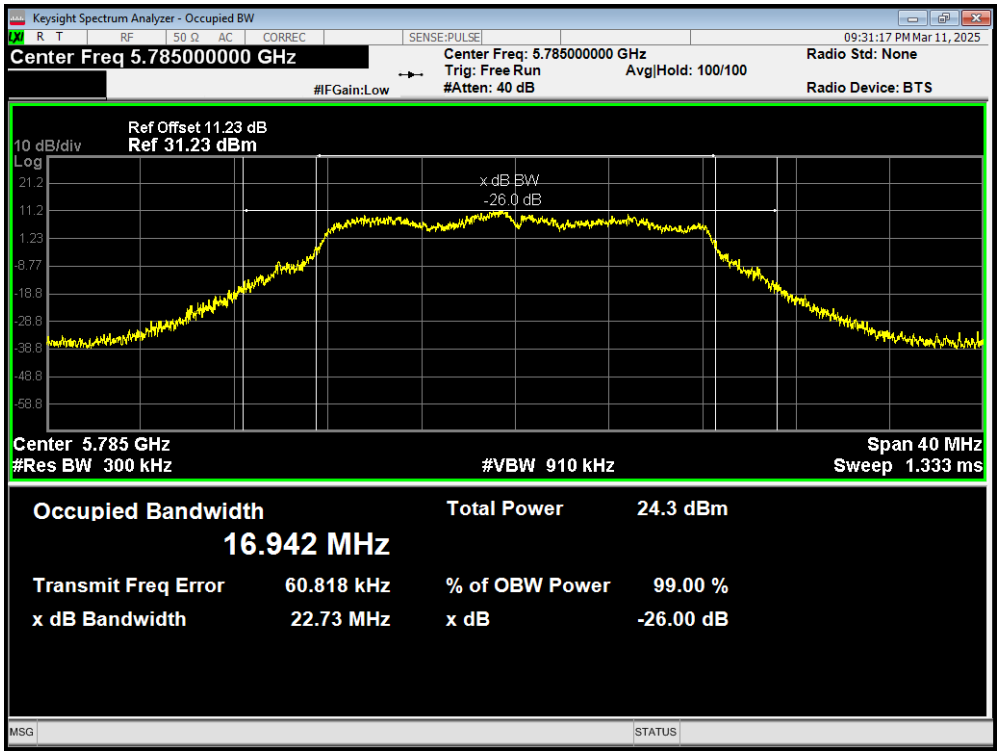
OBW 802.11a 5720MHz



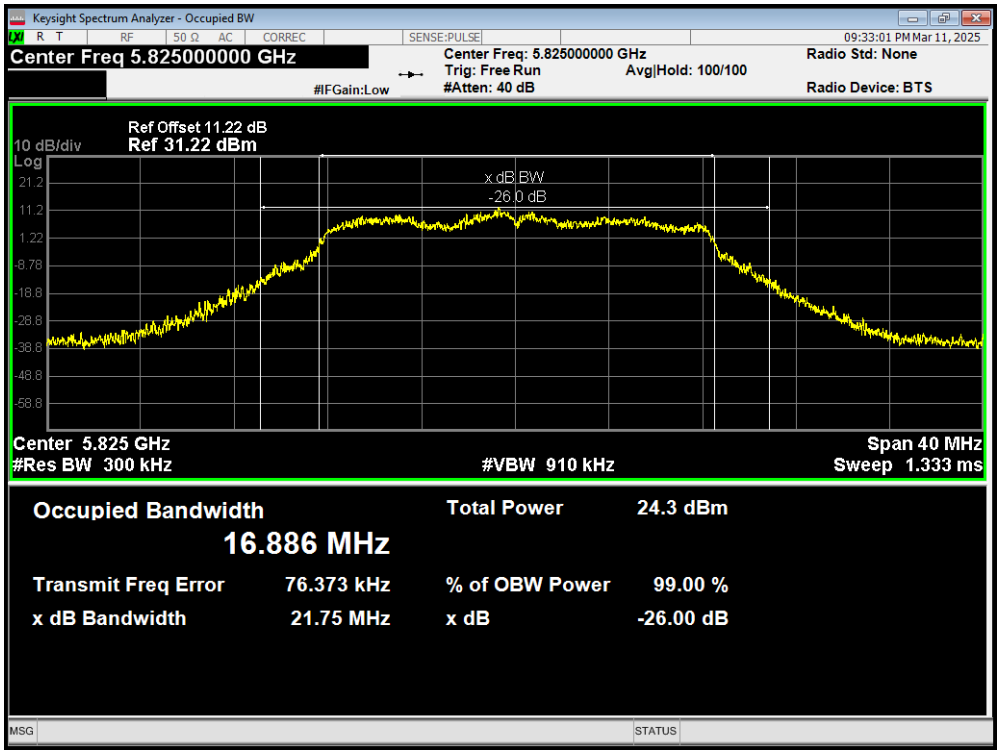
OBW 802.11a 5745MHz



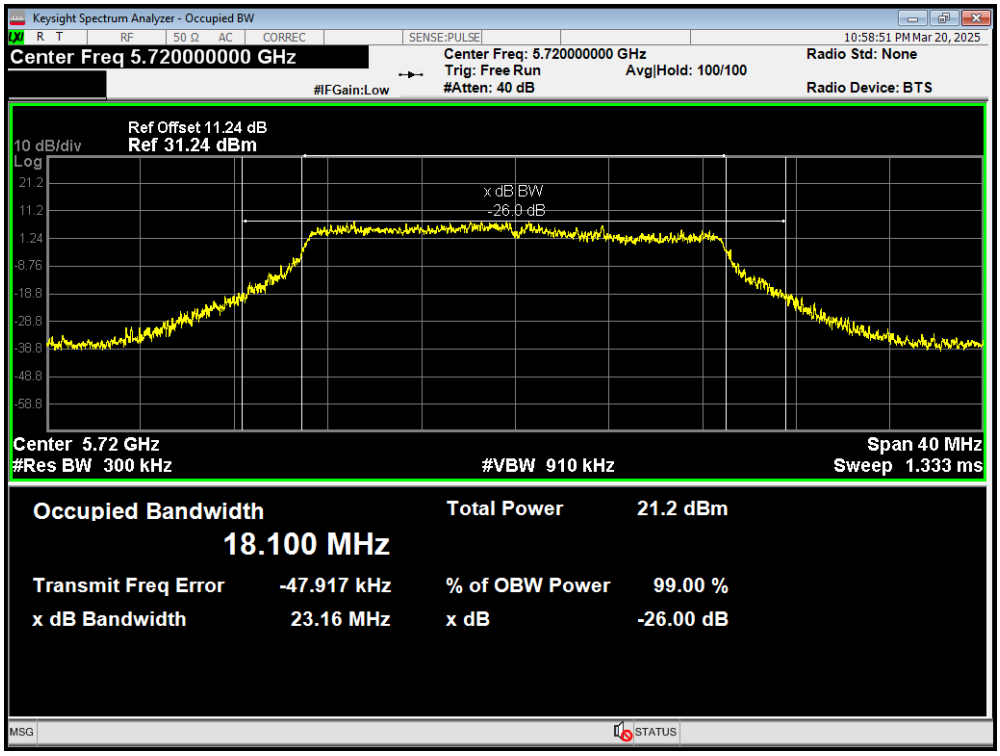
OBW 802.11a 5785MHz



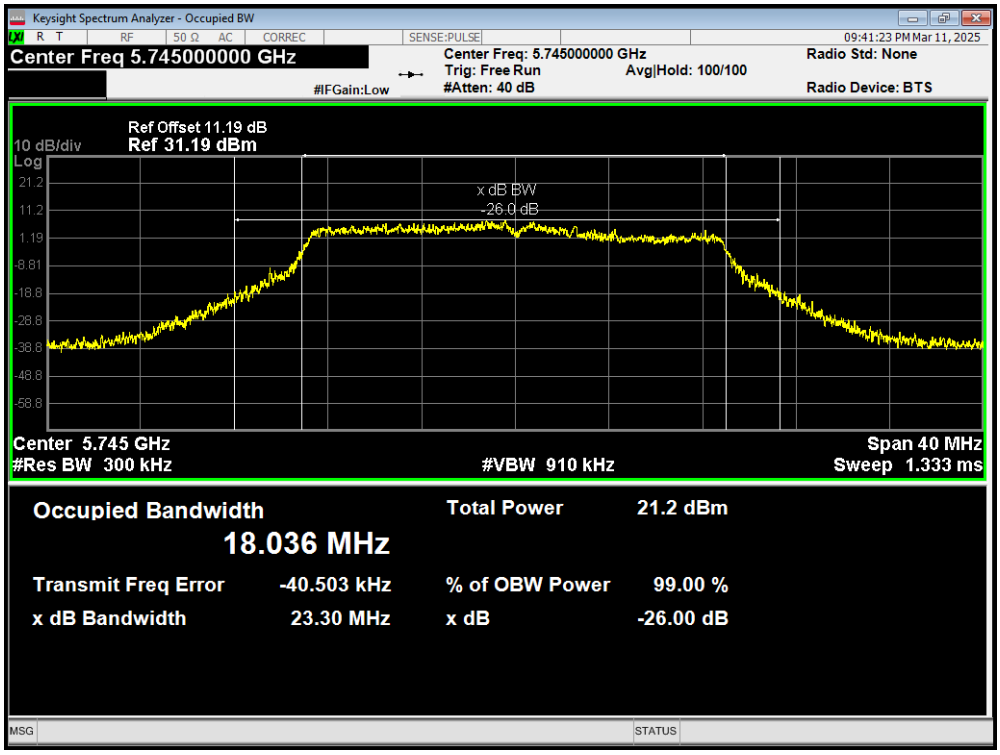
OBW 802.11a 5825MHz



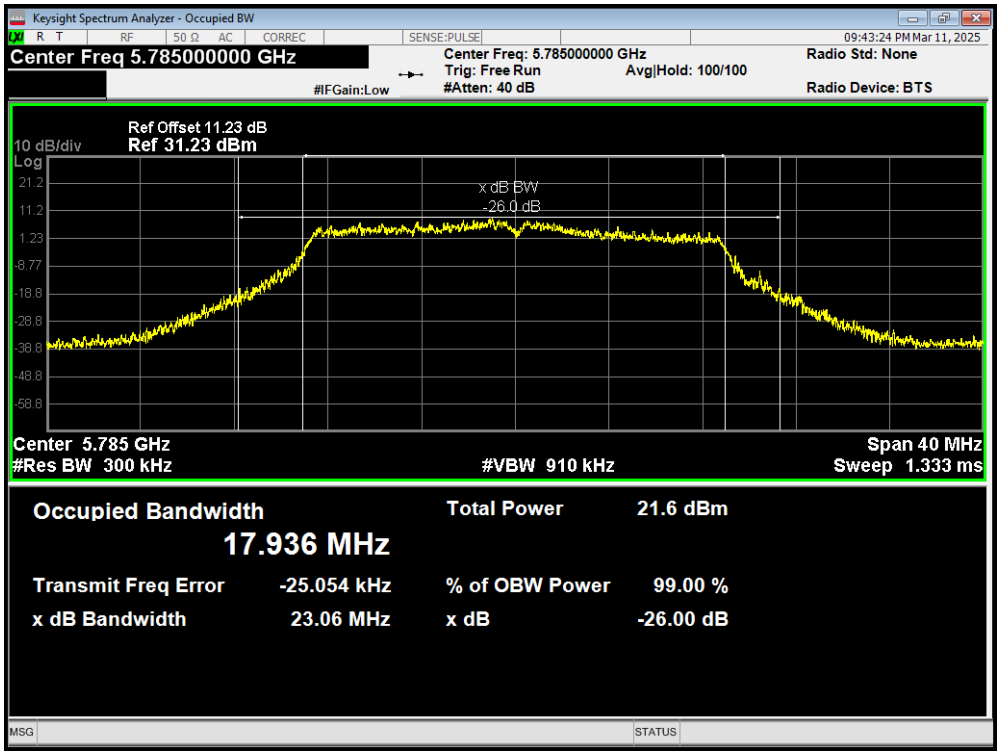
OBW 802.11ac(VHT20) 5720MHz



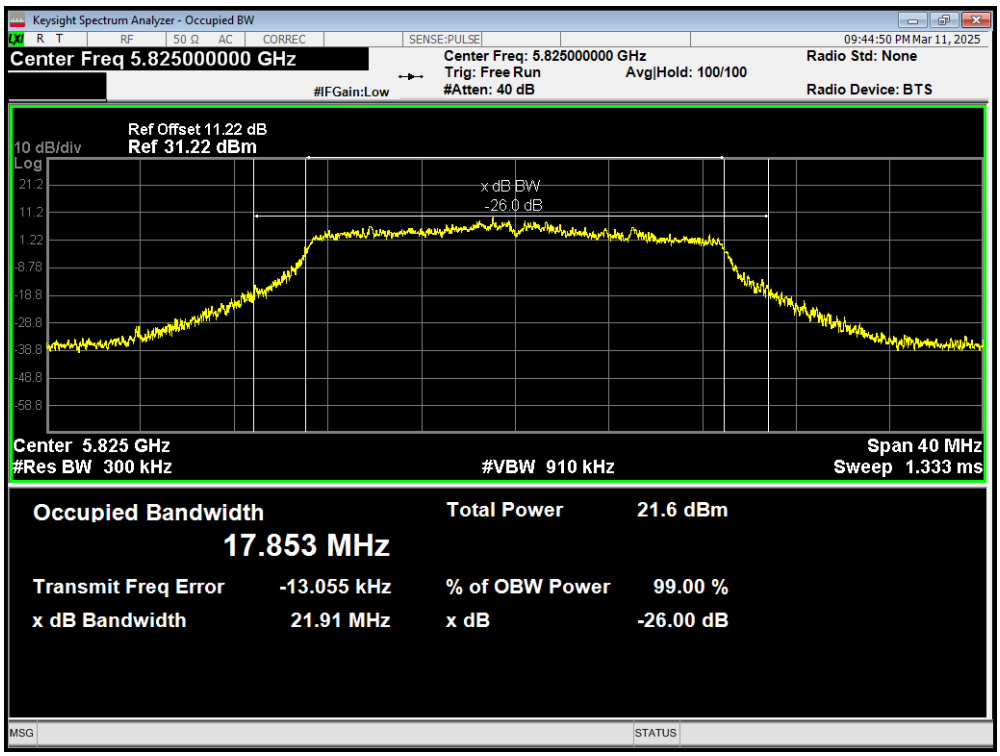
OBW 802.11ac(VHT20) 5745MHz



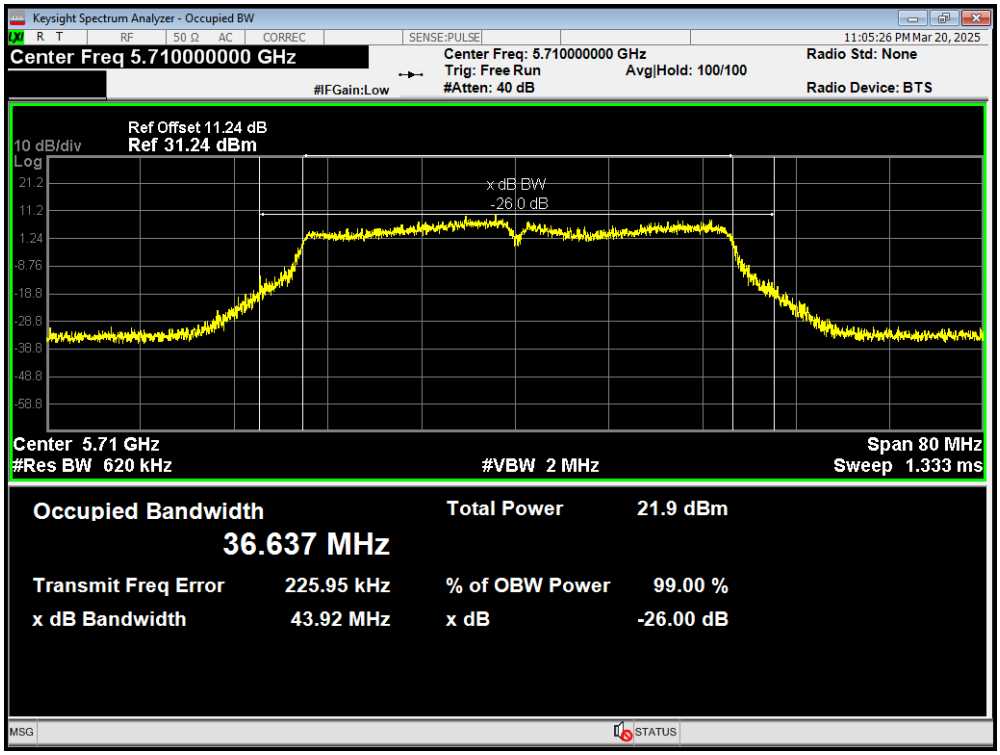
OBW 802.11ac(VHT20) 5785MHz



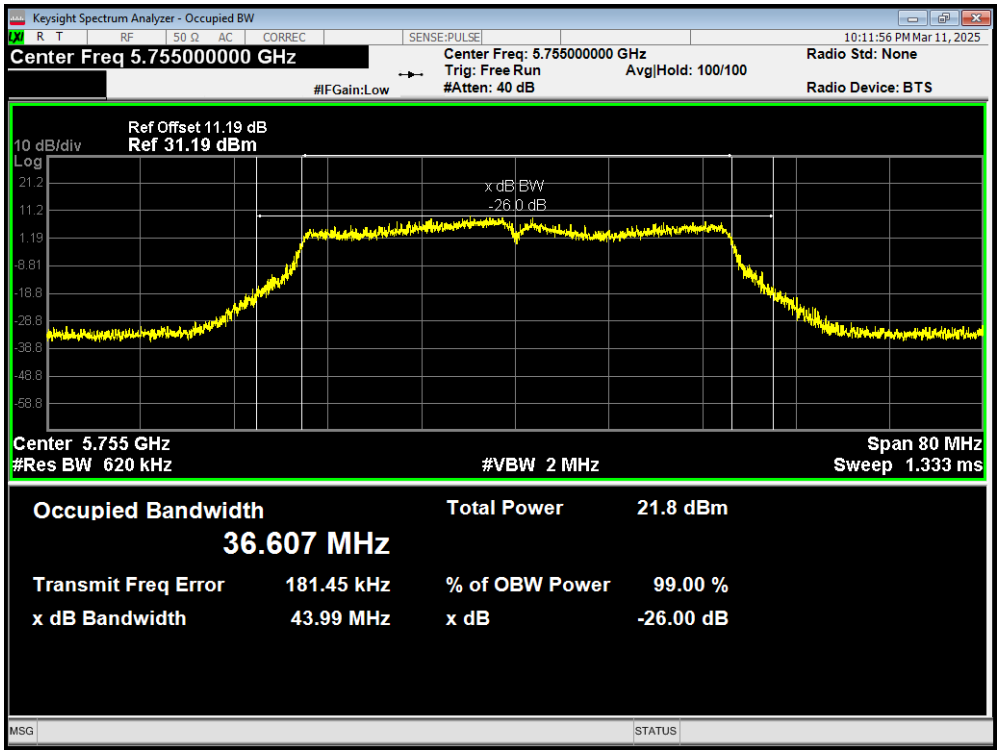
OBW 802.11ac(VHT20) 5825MHz



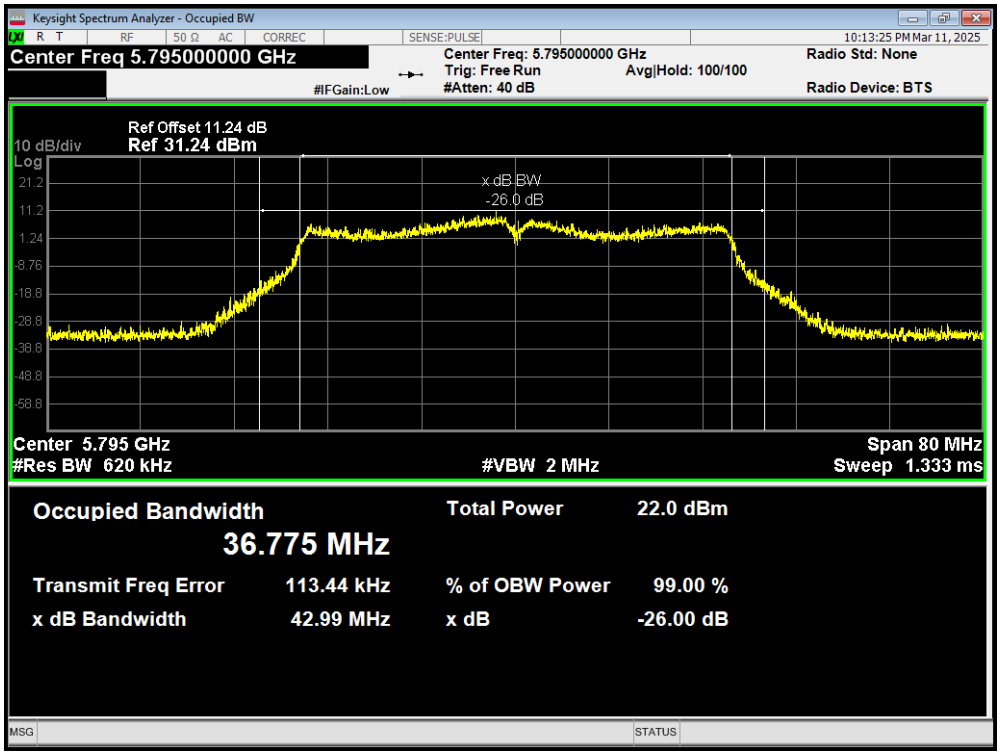
OBW 802.11ac(VHT40) 5710MHz



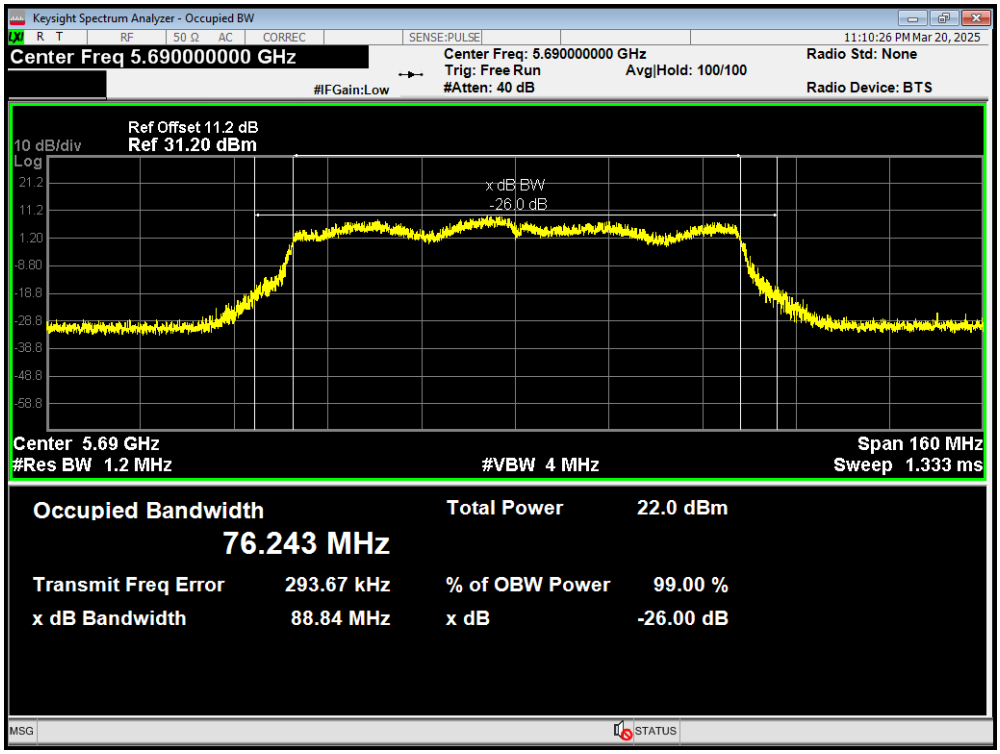
OBW 802.11ac(VHT40) 5755MHz



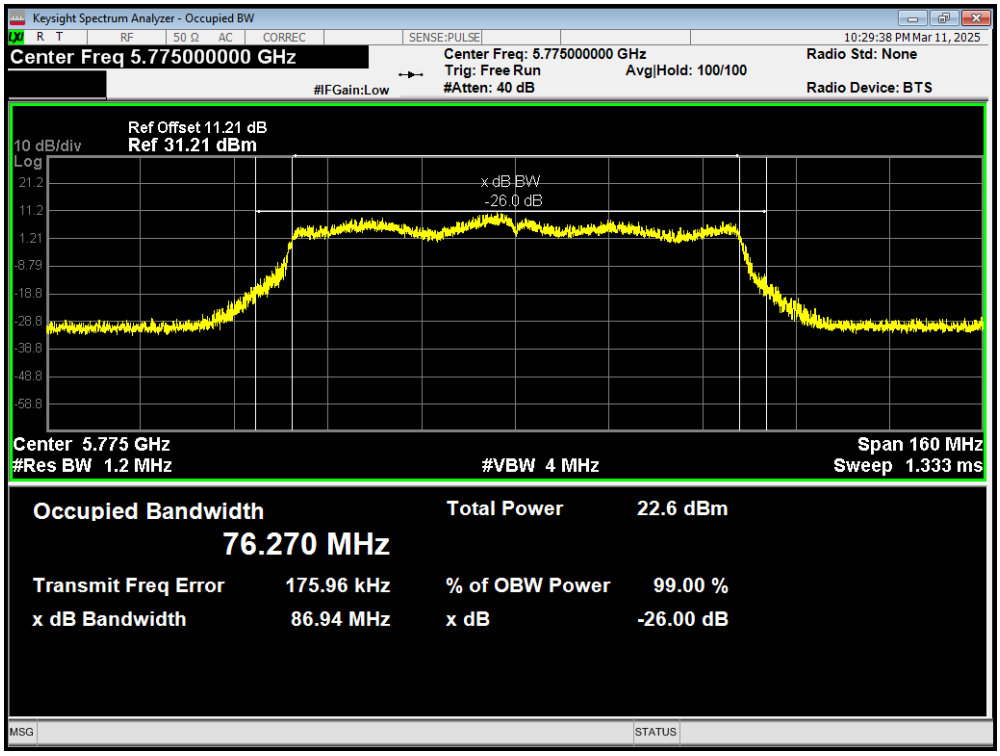
OBW 802.11ac(VHT40) 5795MHz



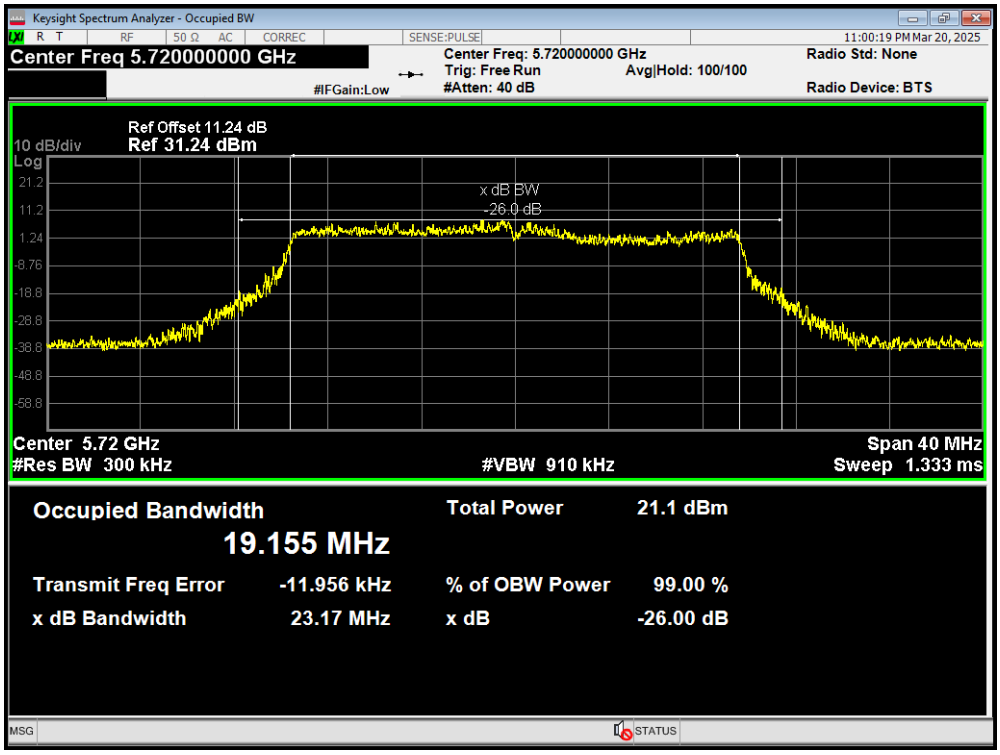
OBW 802.11ac(VHT80) 5690MHz



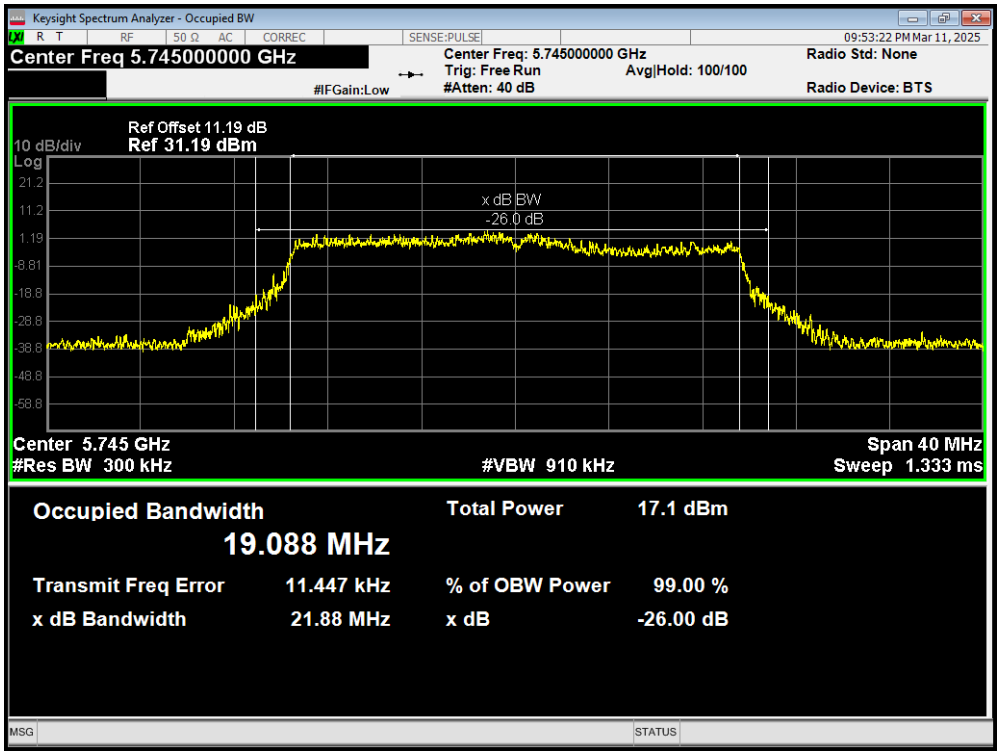
OBW 802.11ac(VHT80) 5775MHz



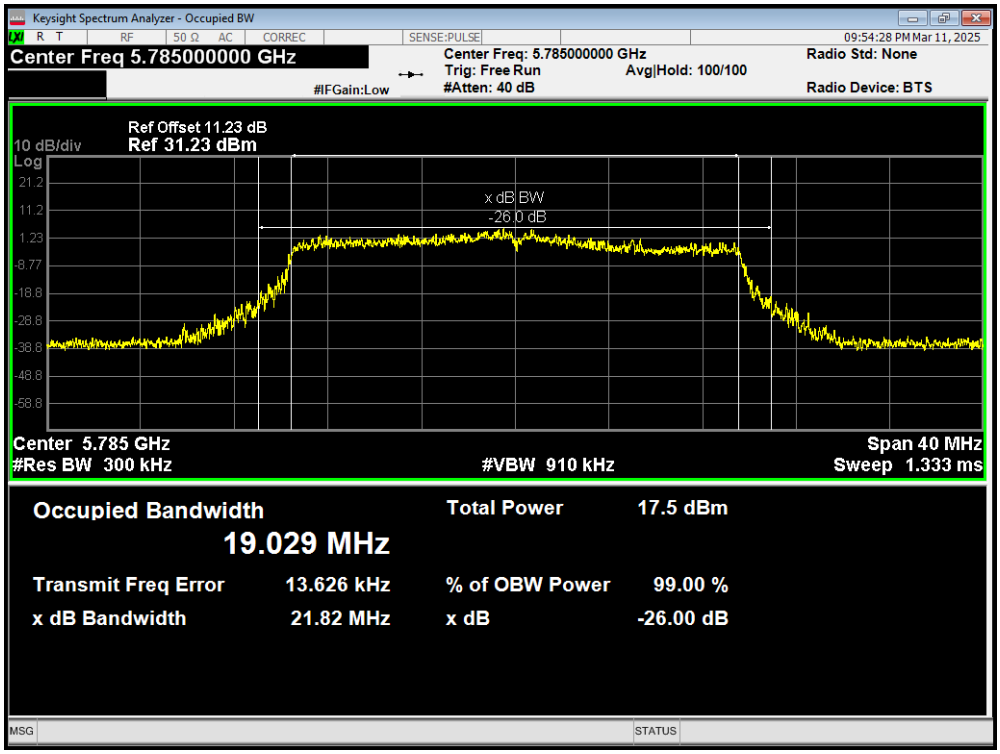
OBW 802.11ax(HE20) 5720MHz



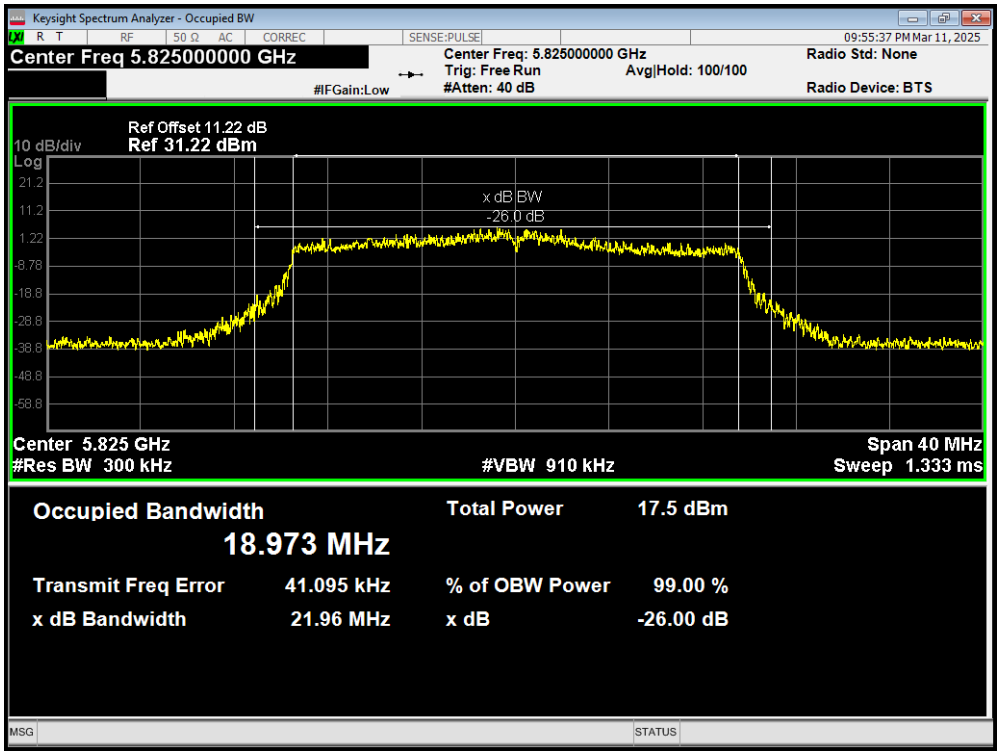
OBW 802.11ax(HE20) 5745MHz



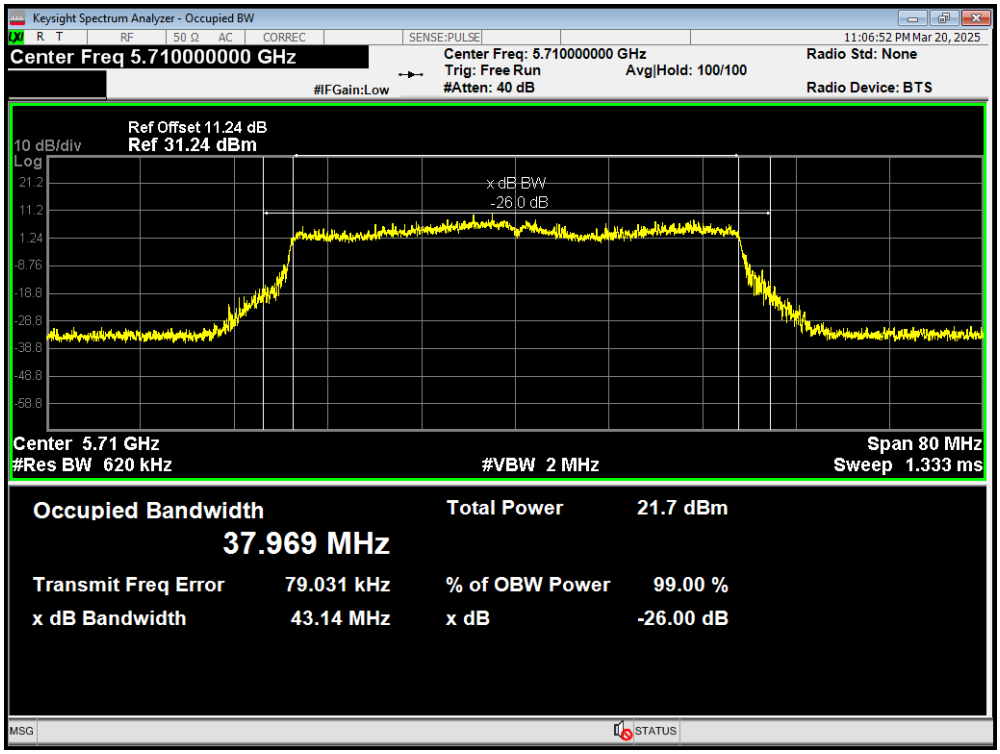
OBW 802.11ax(HE20) 5785MHz



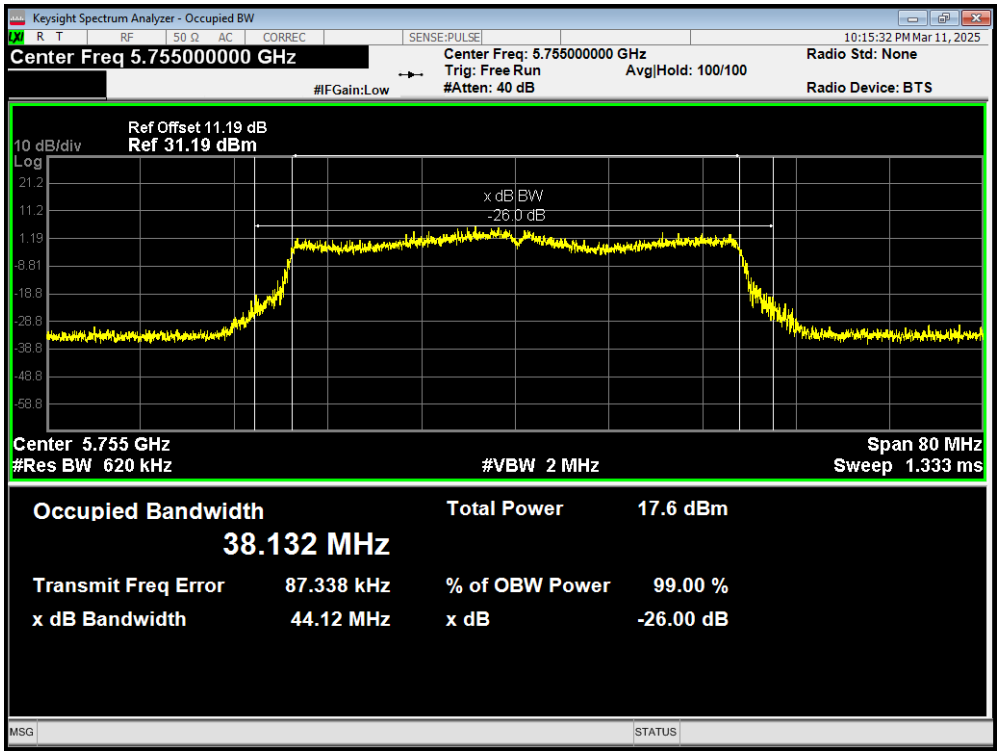
OBW 802.11ax(HE20) 5825MHz



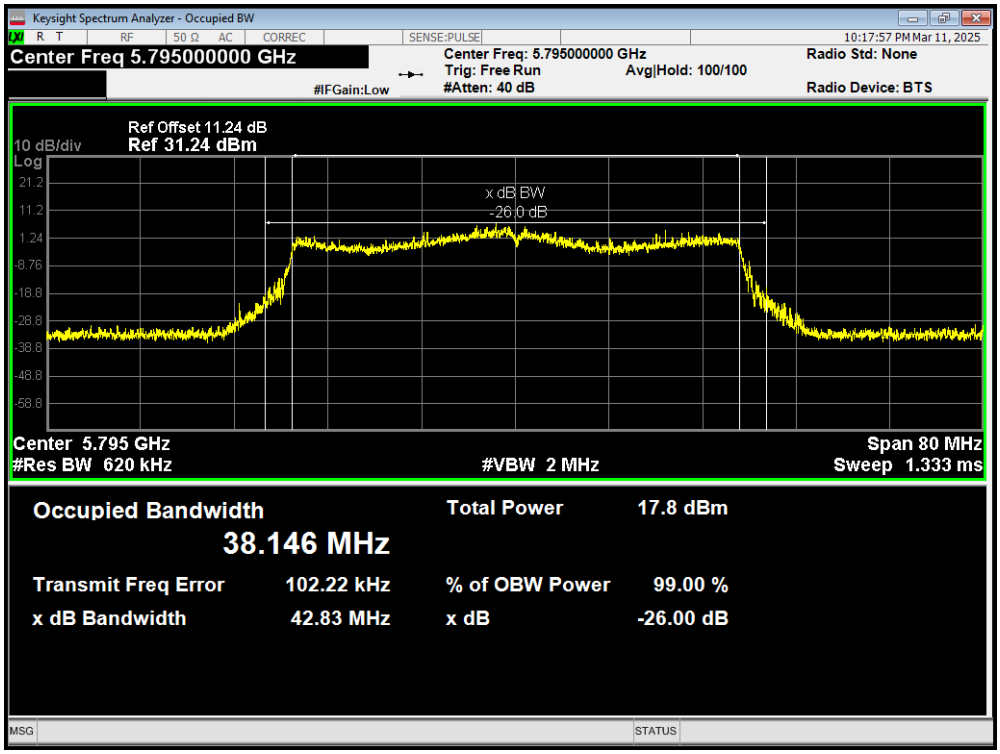
OBW 802.11ax(HE40) 5710MHz



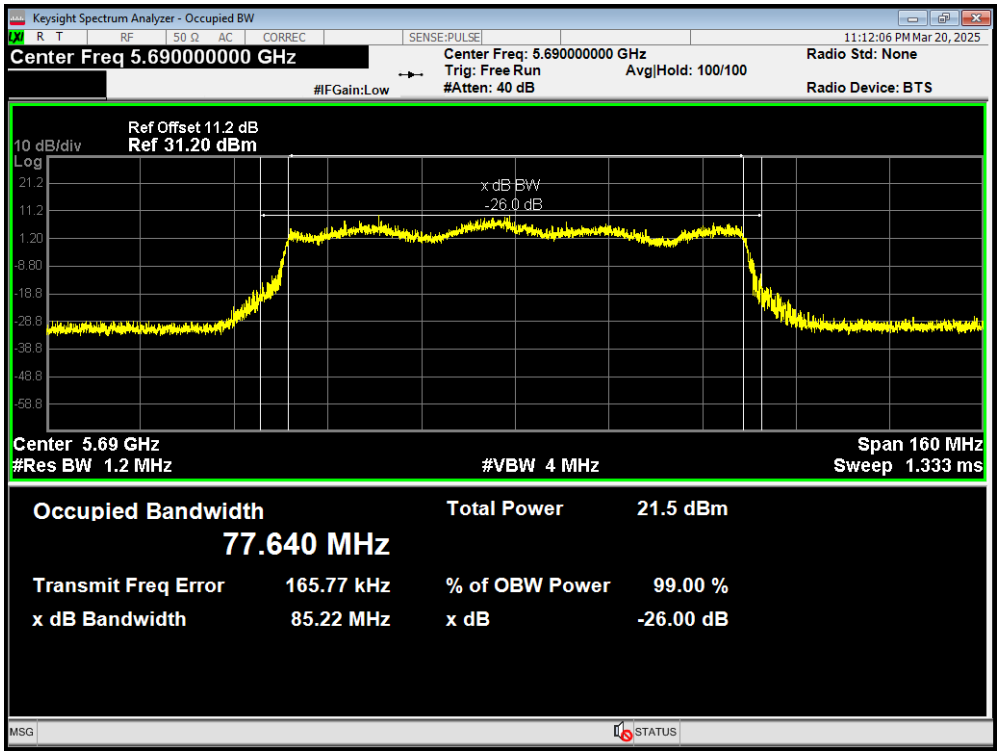
OBW 802.11ax(HE40) 5755MHz



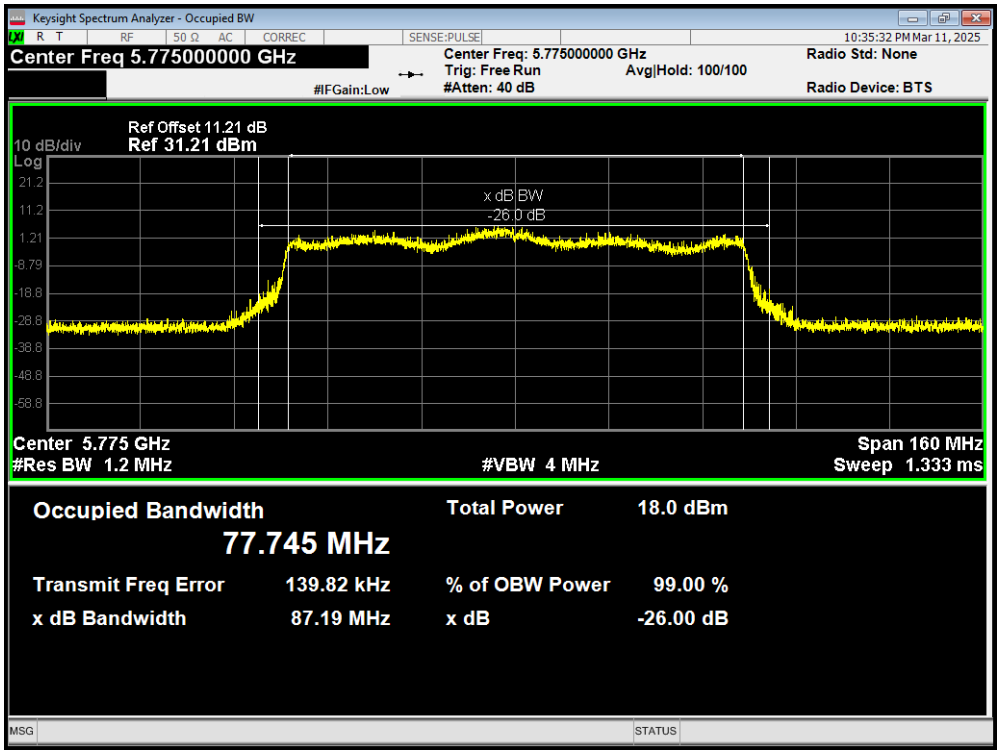
OBW 802.11ax(HE40) 5795MHz



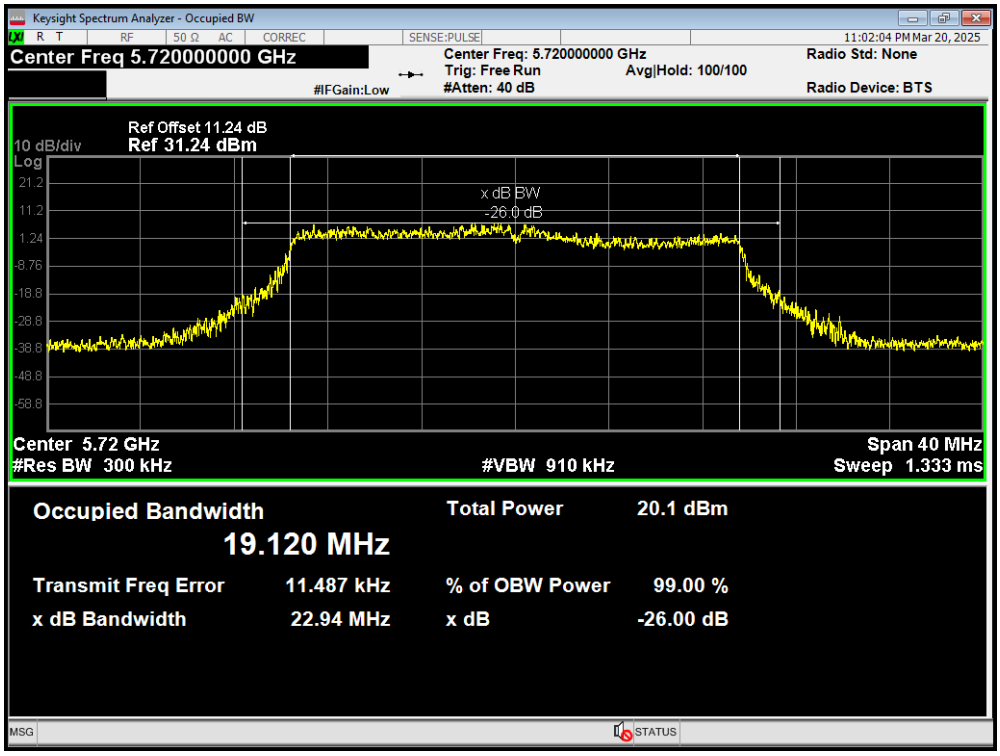
OBW 802.11ax(HE80) 5690MHz



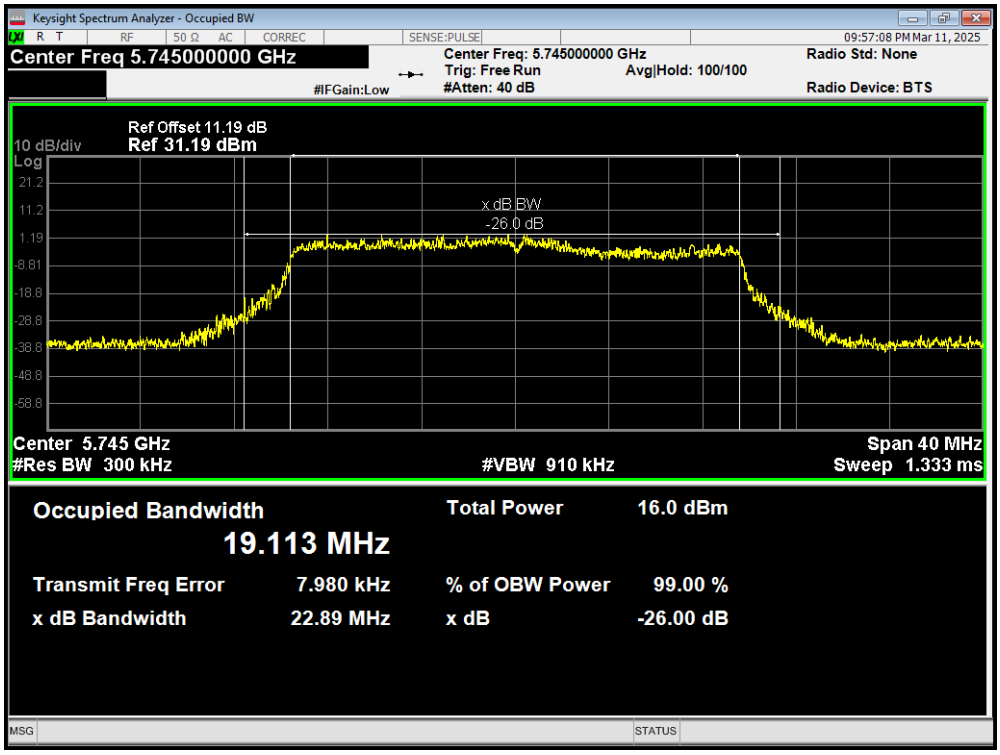
OBW 802.11ax(HE80) 5775MHz



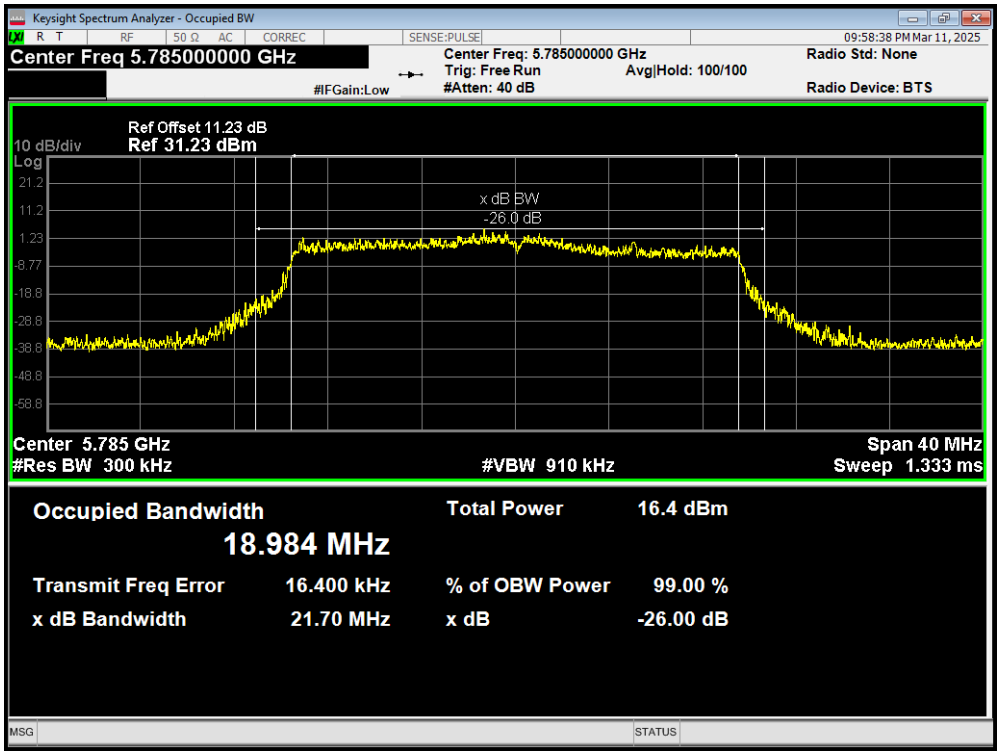
OBW 802.11be(20) 5720MHz



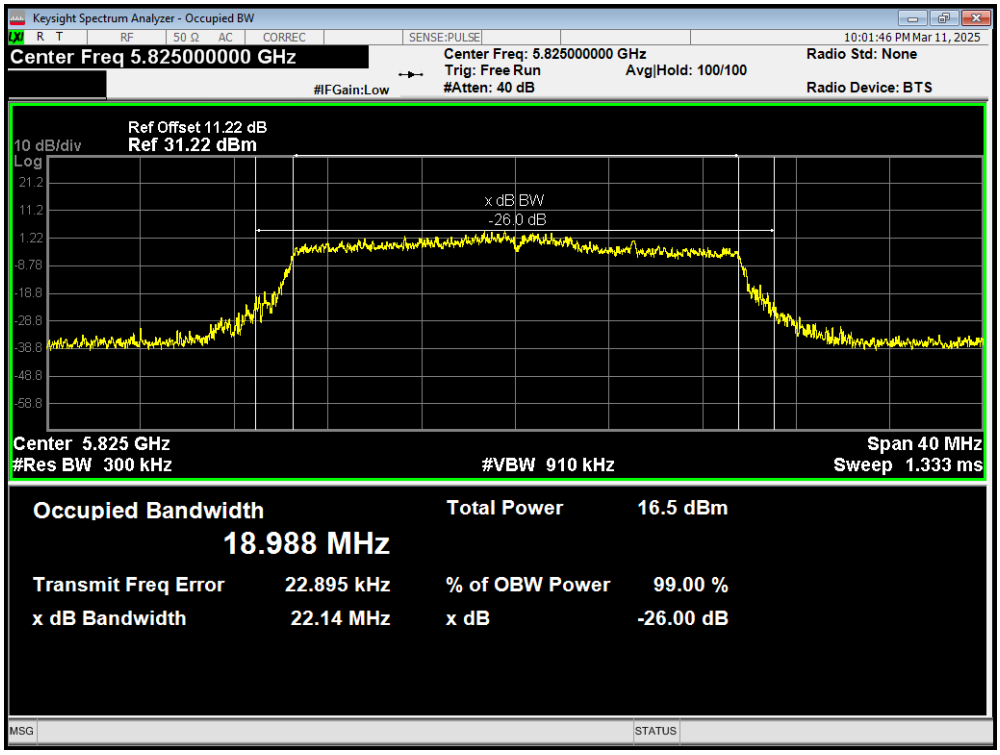
OBW 802.11be(20) 5745MHz



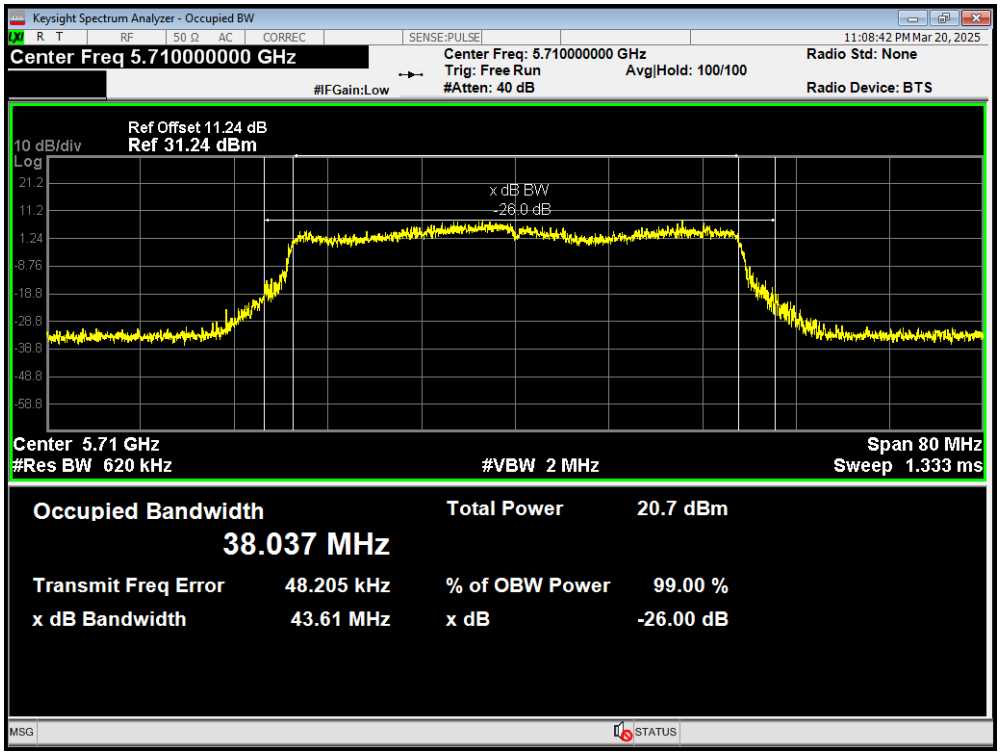
OBW 802.11be(20) 5785MHz



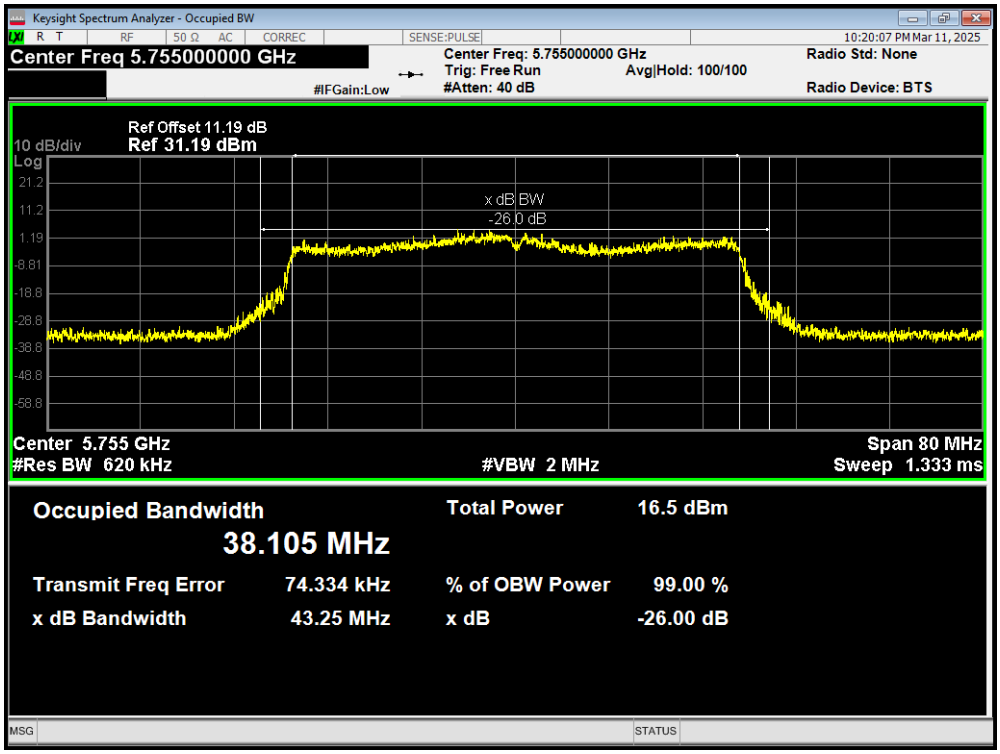
OBW 802.11be(20) 5825MHz



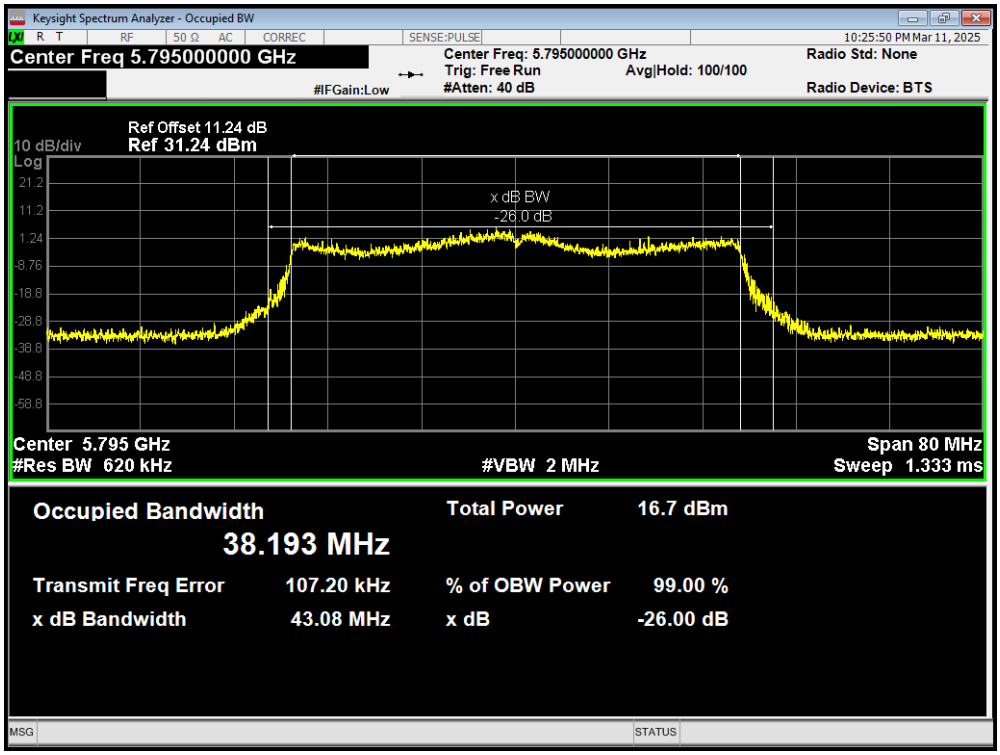
OBW 802.11be(40) 5710MHz



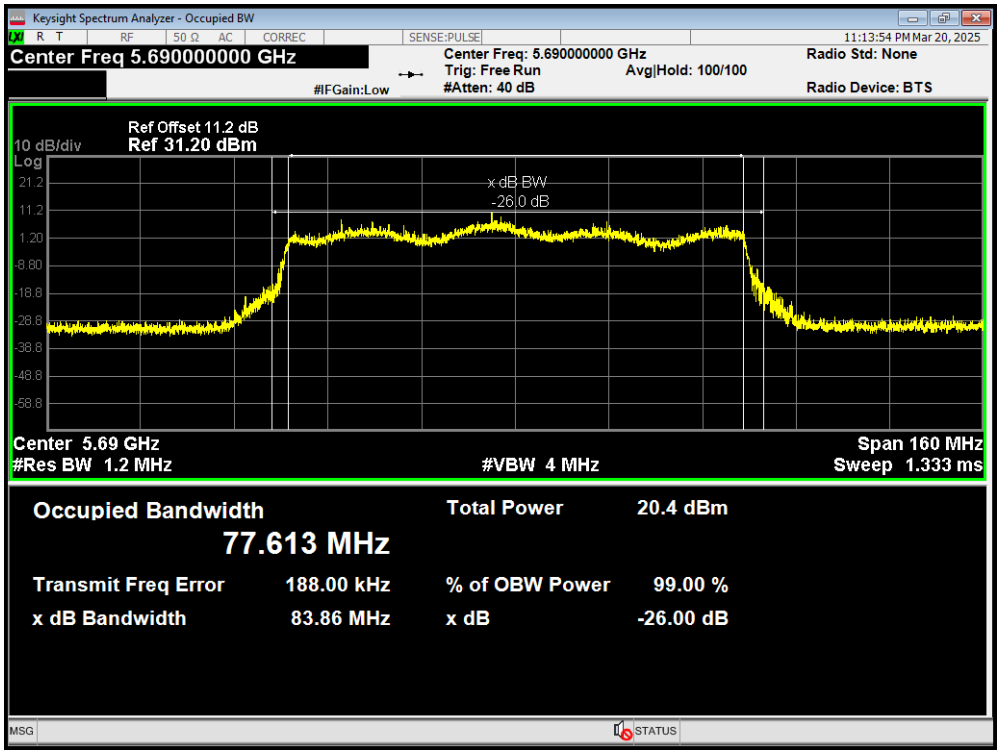
OBW 802.11be(40) 5755MHz



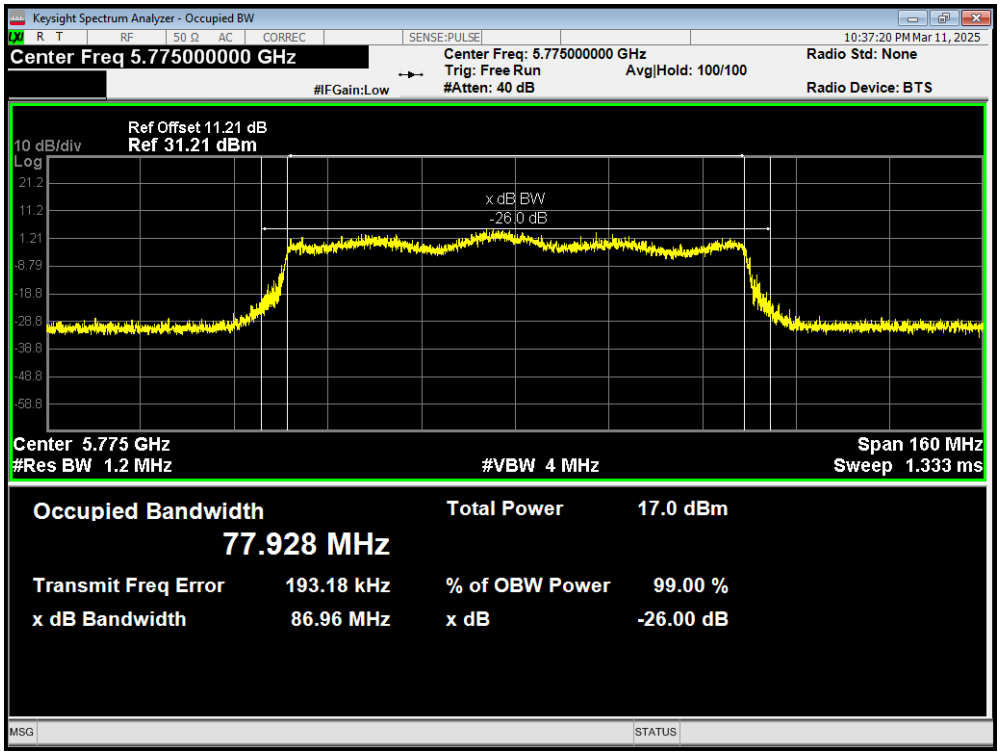
OBW 802.11be(40) 5795MHz



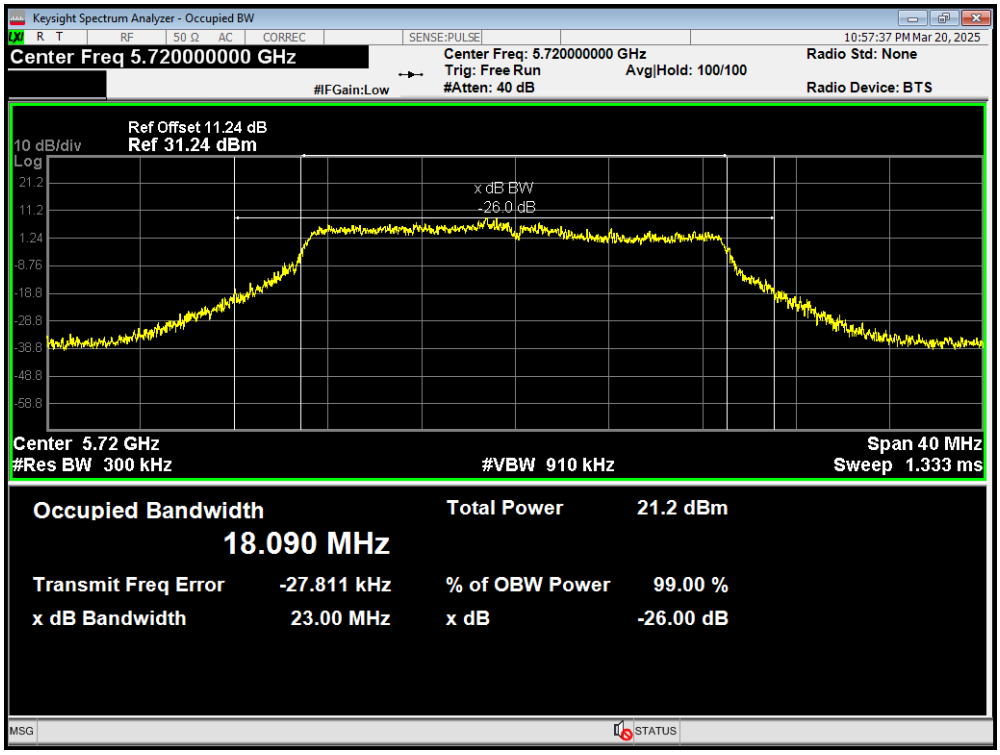
OBW 802.11be(80) 5690MHz



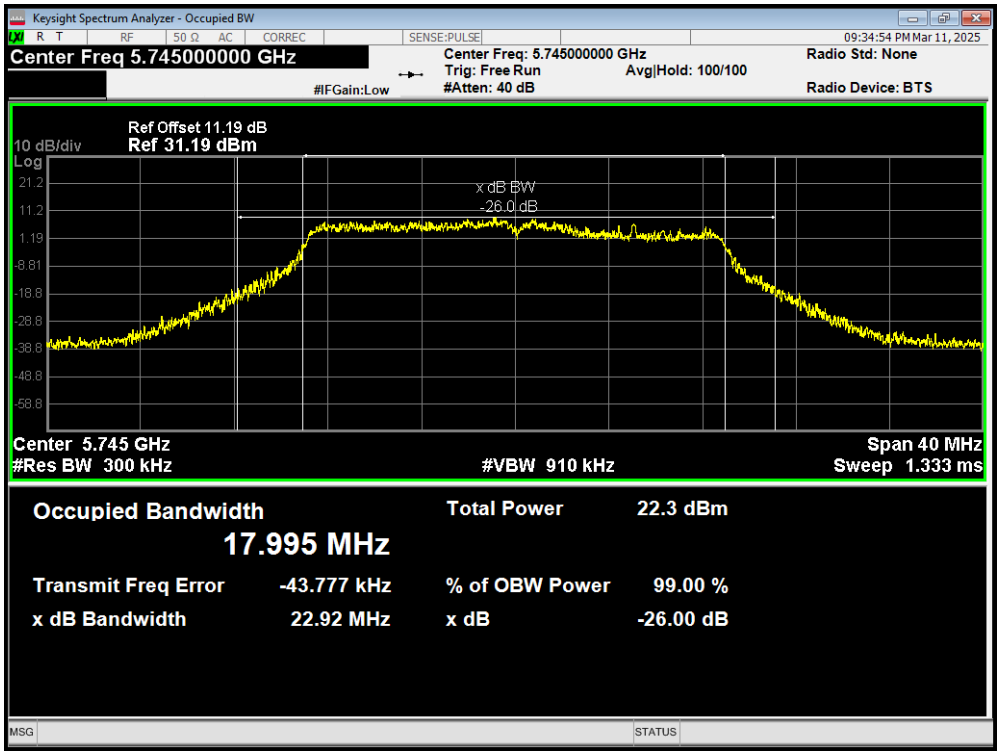
OBW 802.11be(80) 5775MHz



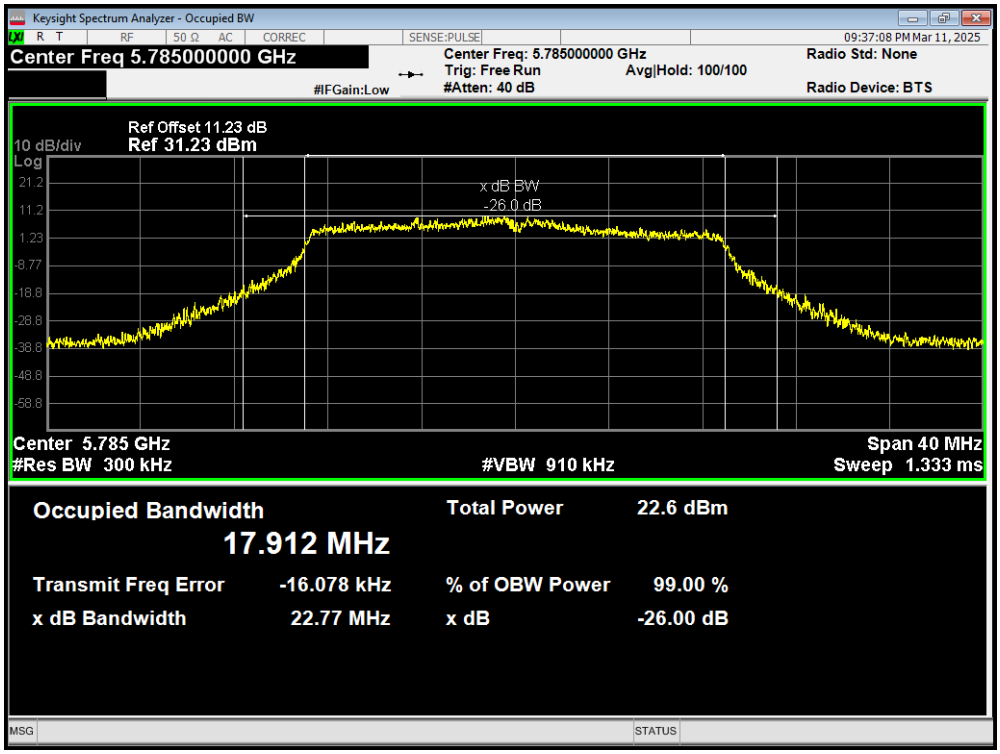
OBW 802.11n(HT20) 5720MHz



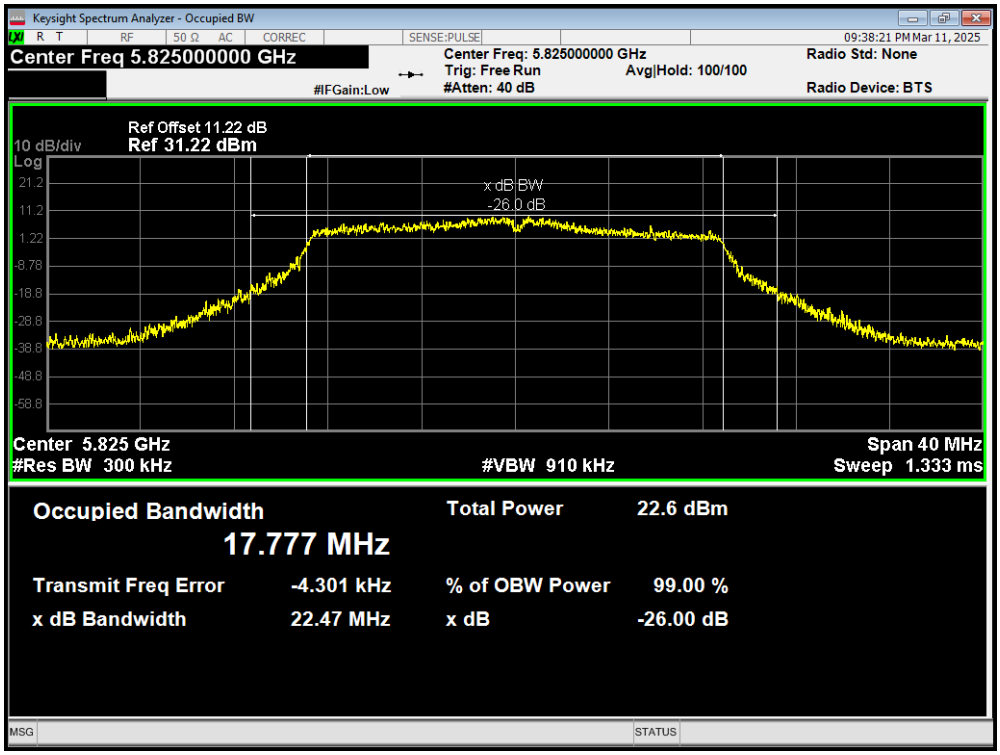
OBW 802.11n(HT20) 5745MHz



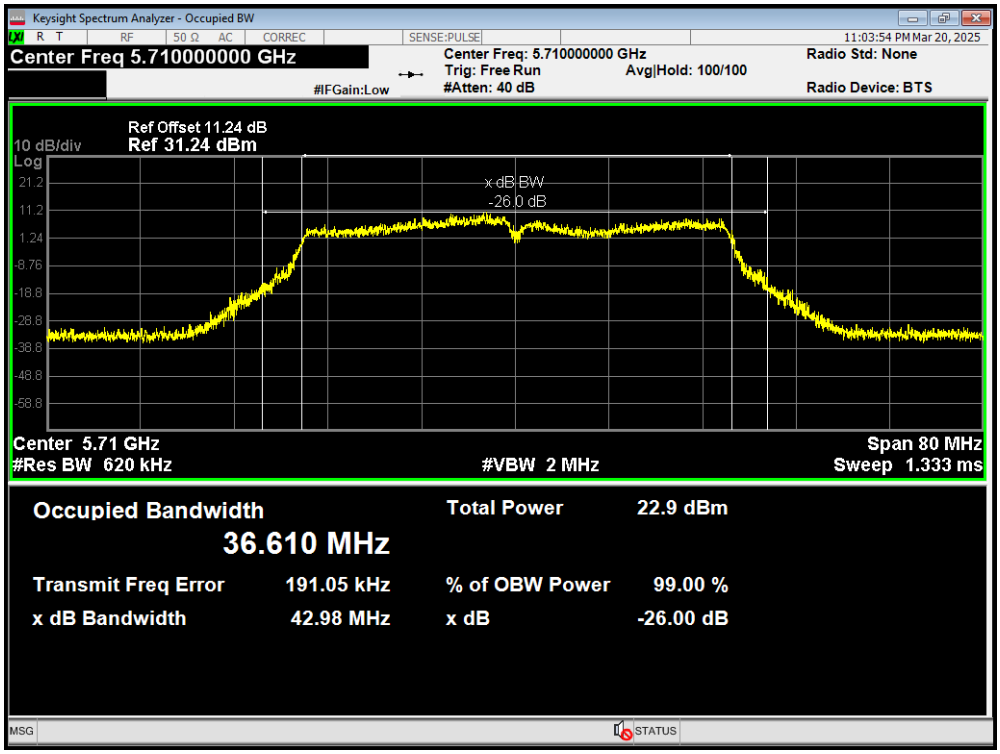
OBW 802.11n(HT20) 5785MHz



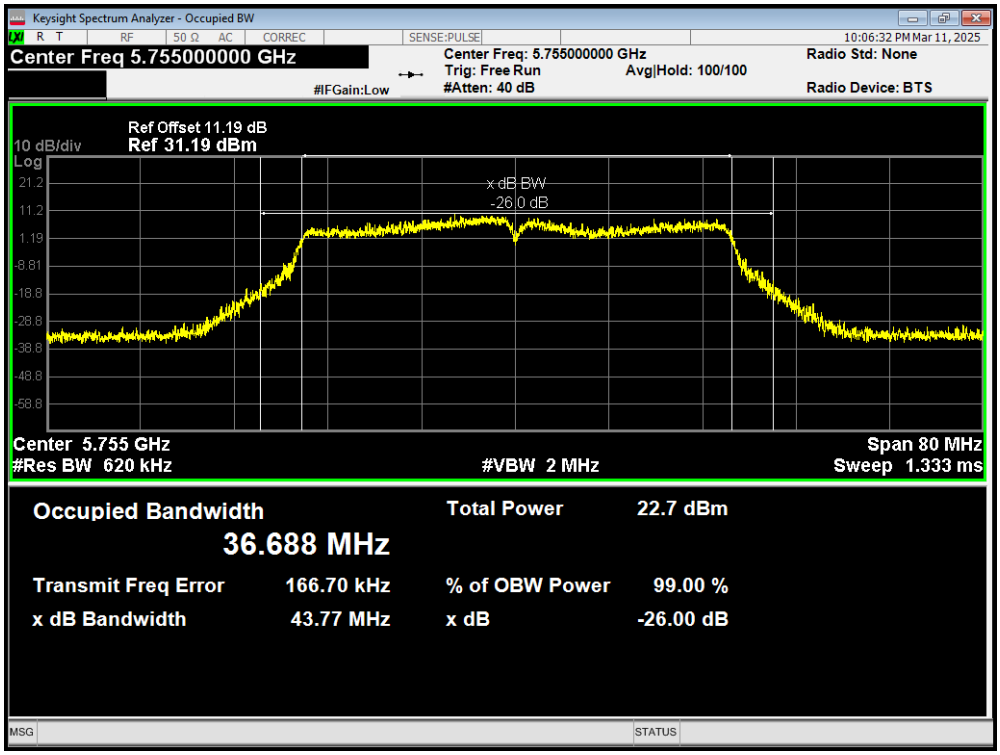
OBW 802.11n(HT20) 5825MHz



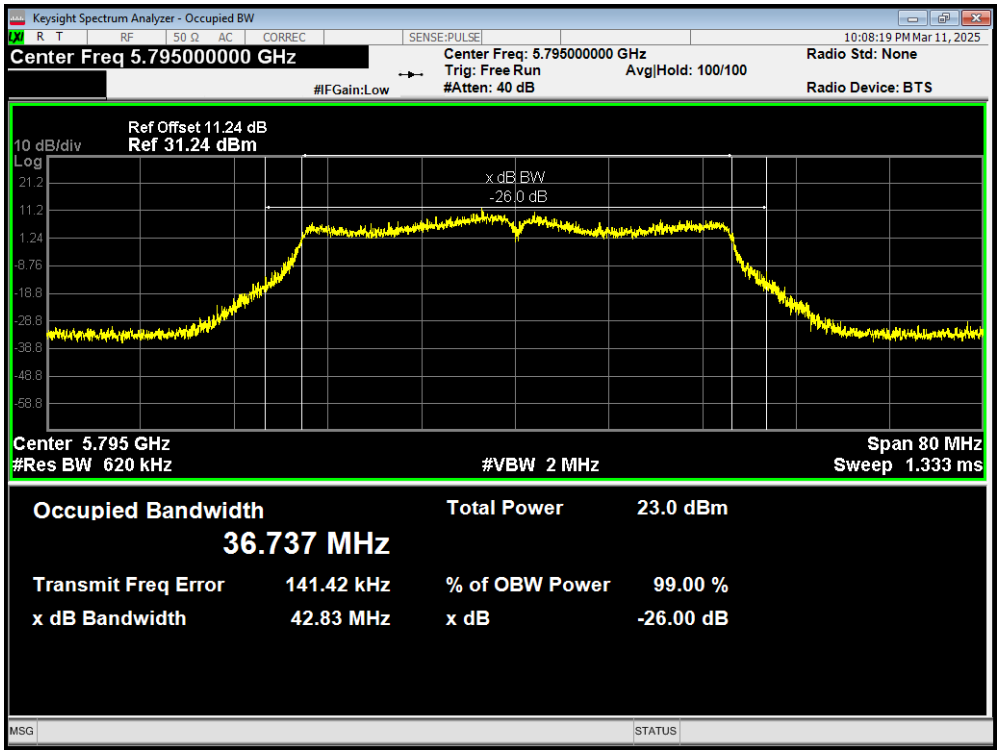
OBW 802.11n(HT40) 5710MHz



OBW 802.11n(HT40) 5755MHz



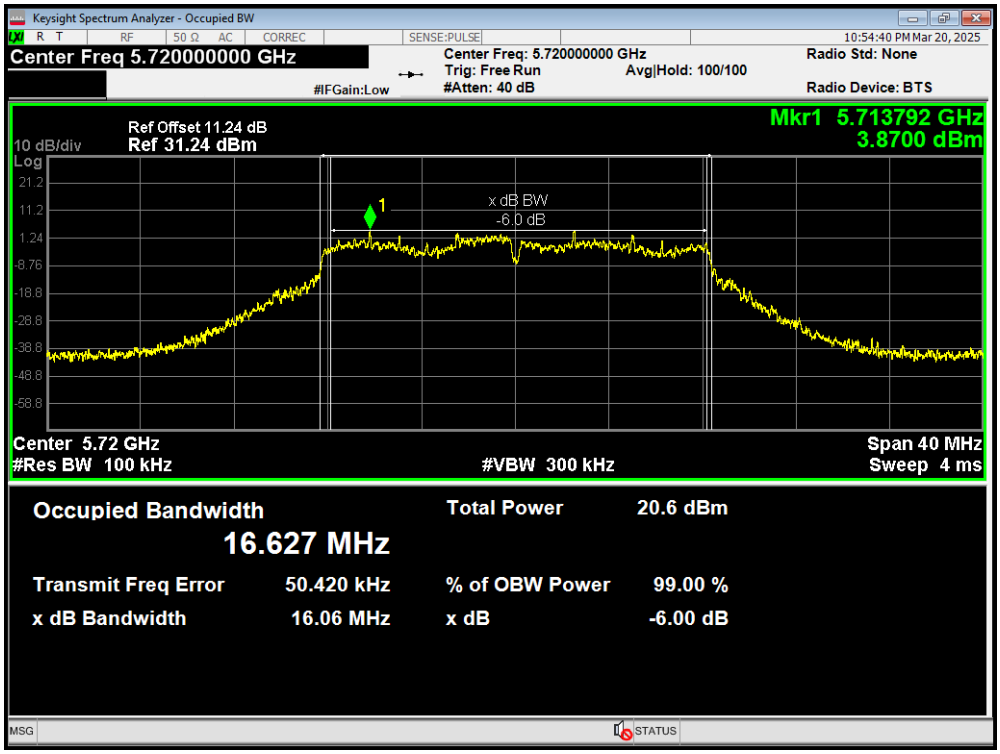
OBW 802.11n(HT40) 5795MHz



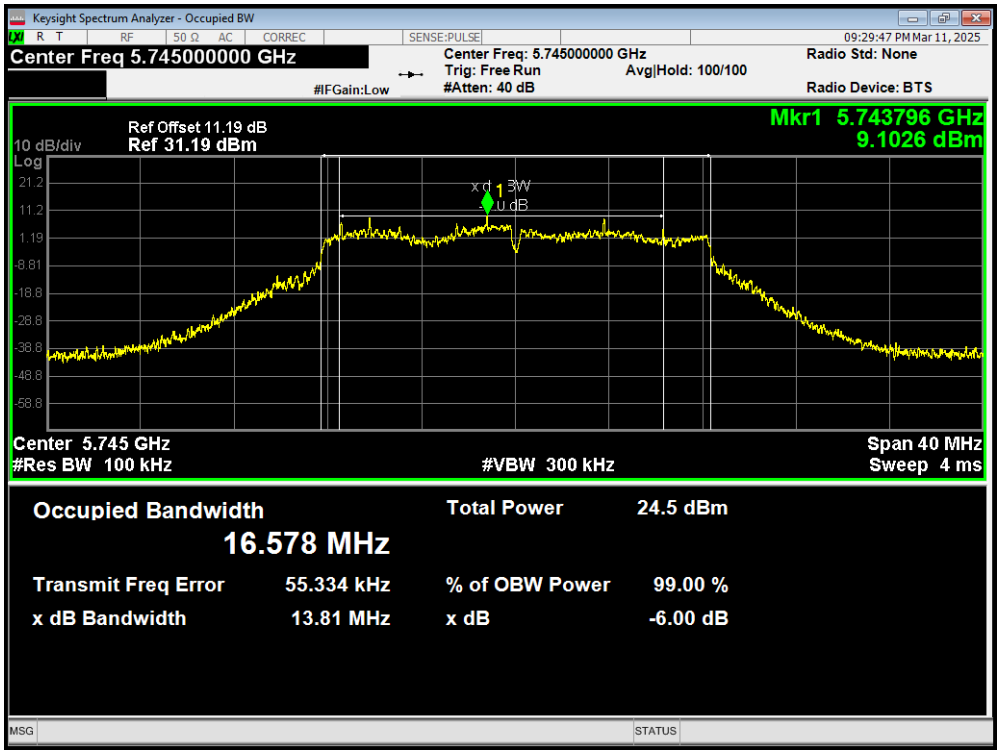
Minimum 6 dB bandwidth

U-NII-3

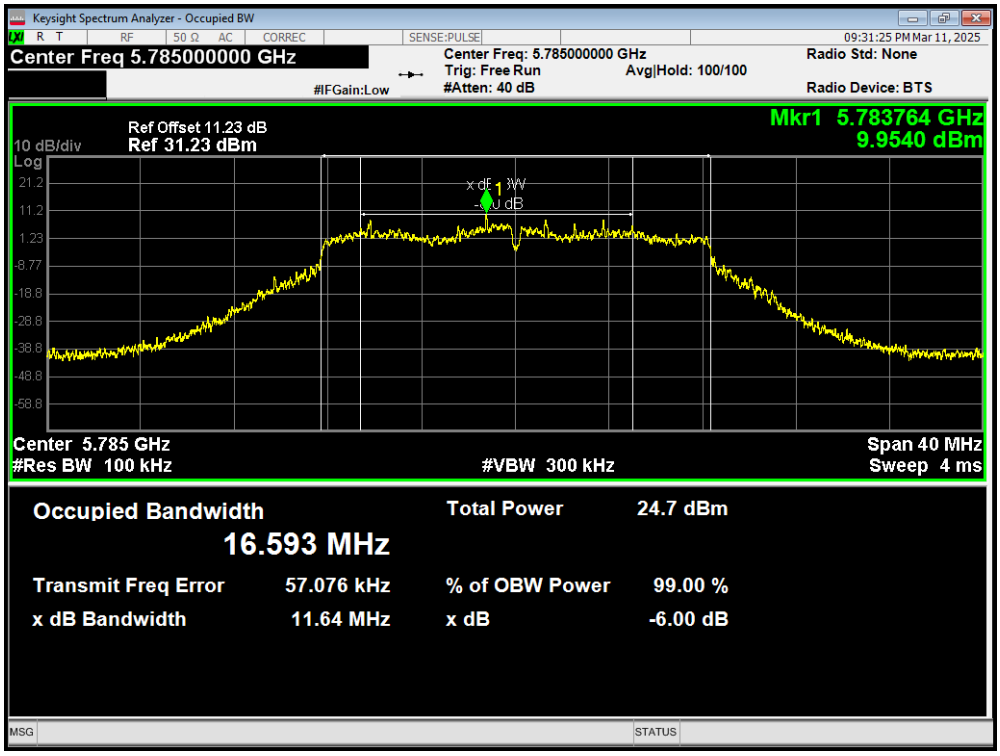
-6dB Bandwidth 802.11a 5720MHz



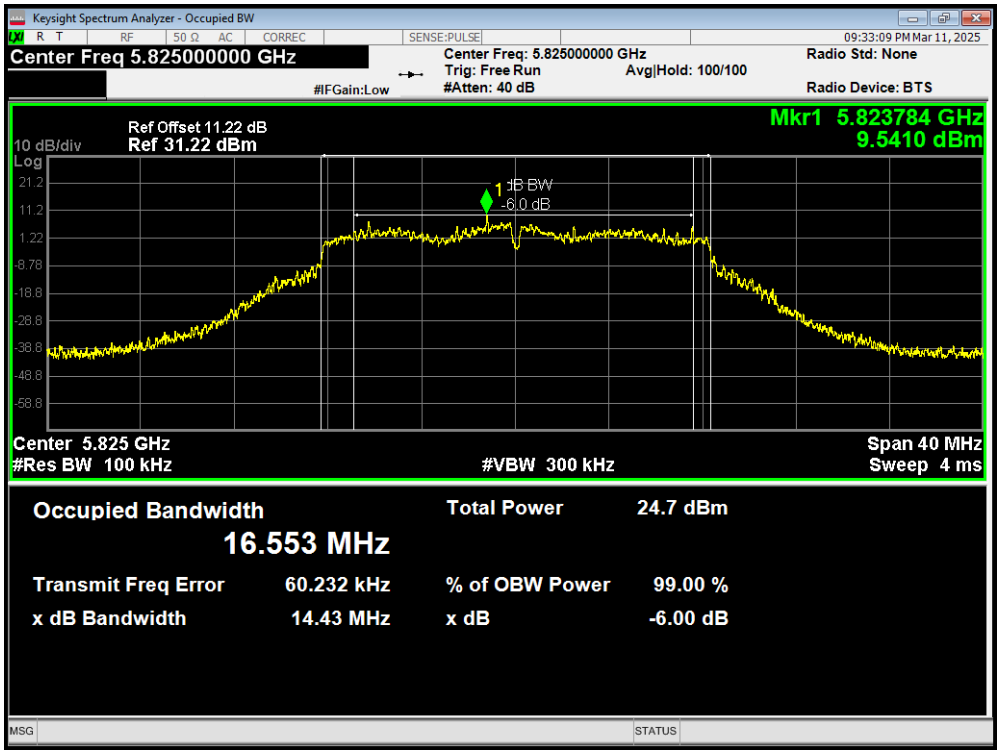
-6dB Bandwidth 802.11a 5745MHz



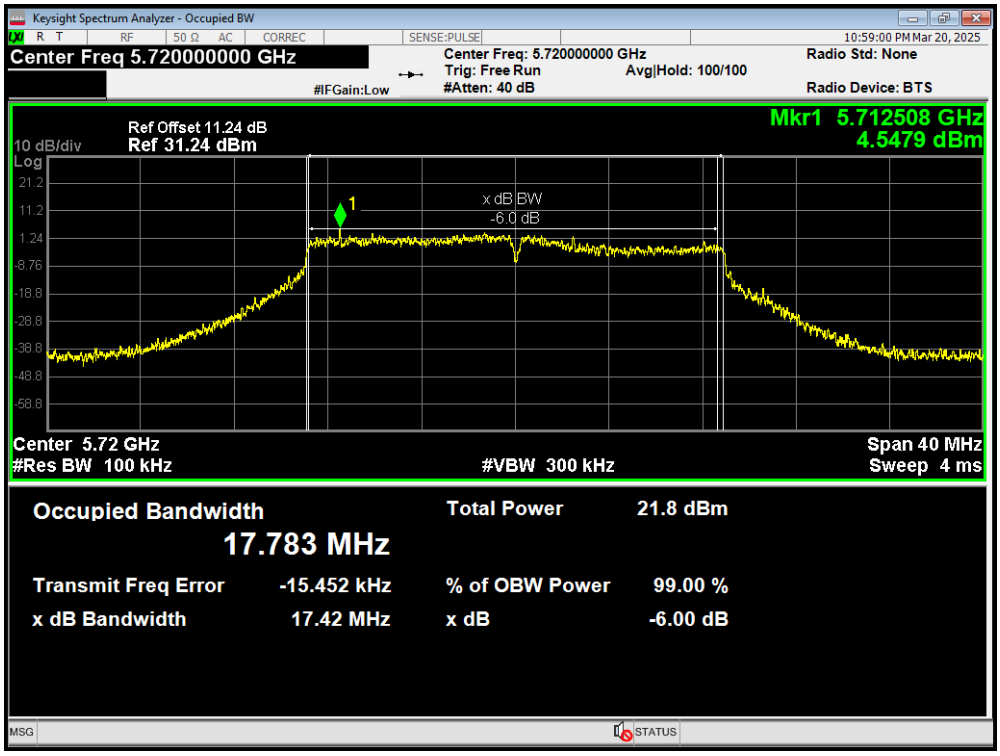
-6dB Bandwidth 802.11a 5785MHz



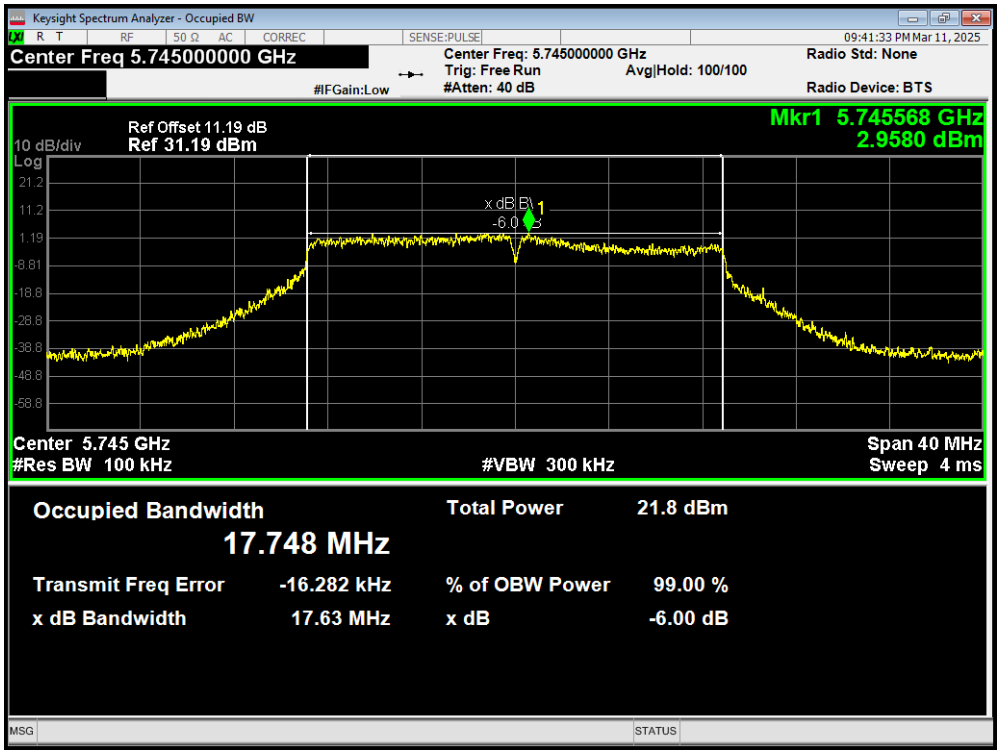
-6dB Bandwidth 802.11a 5825MHz



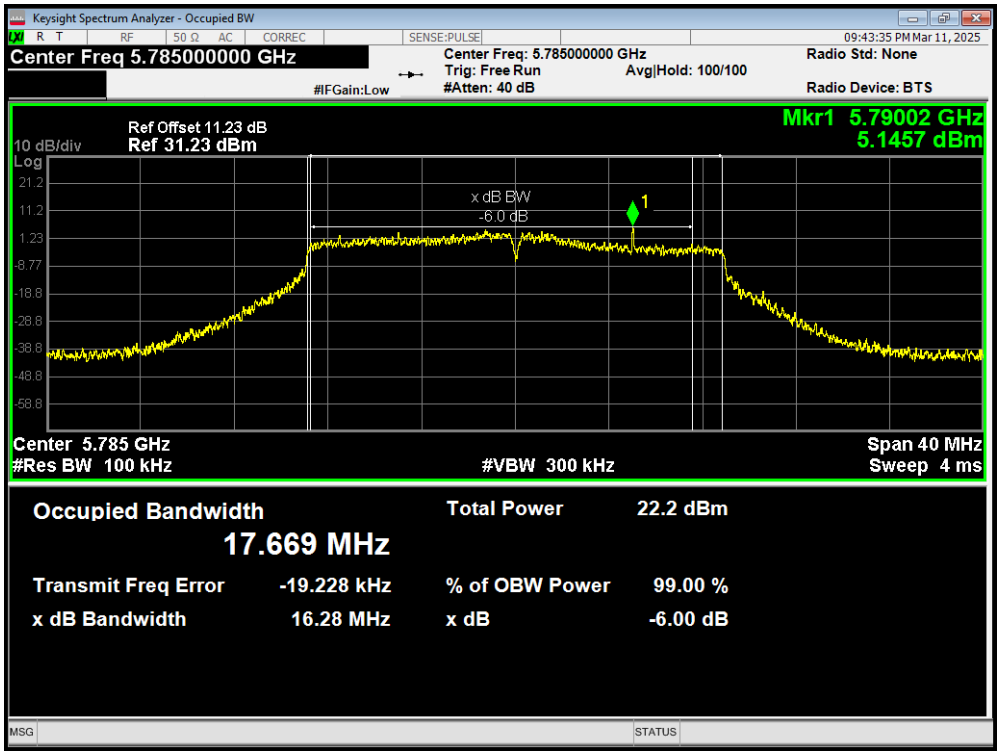
-6dB Bandwidth 802.11ac(VHT20) 5720MHz



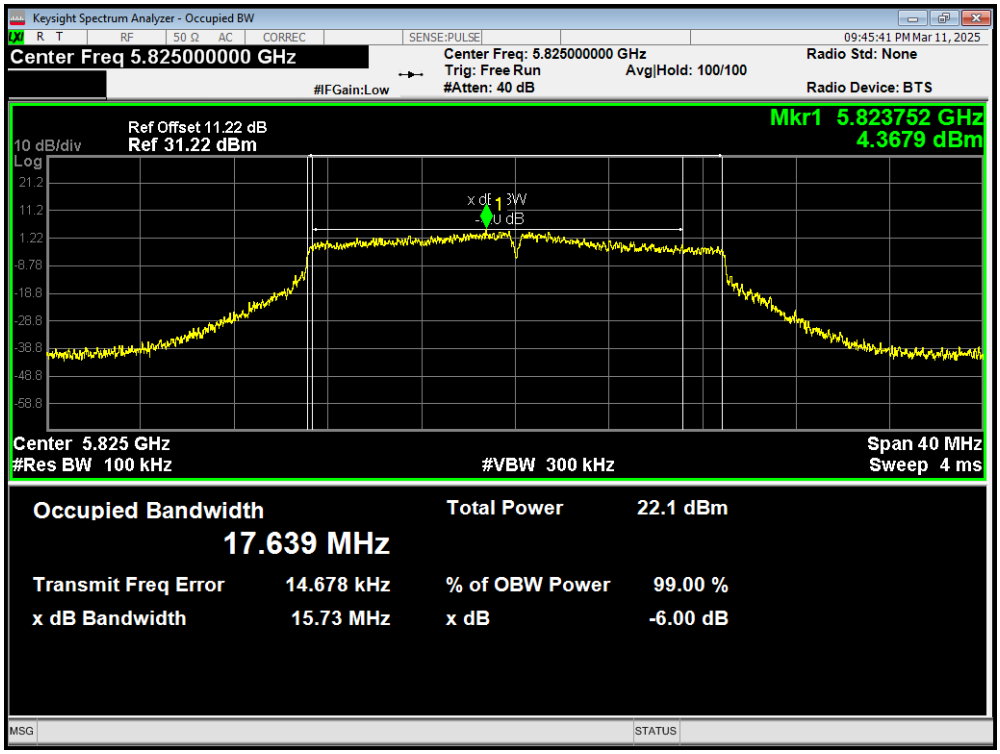
-6dB Bandwidth 802.11ac(VHT20) 5745MHz



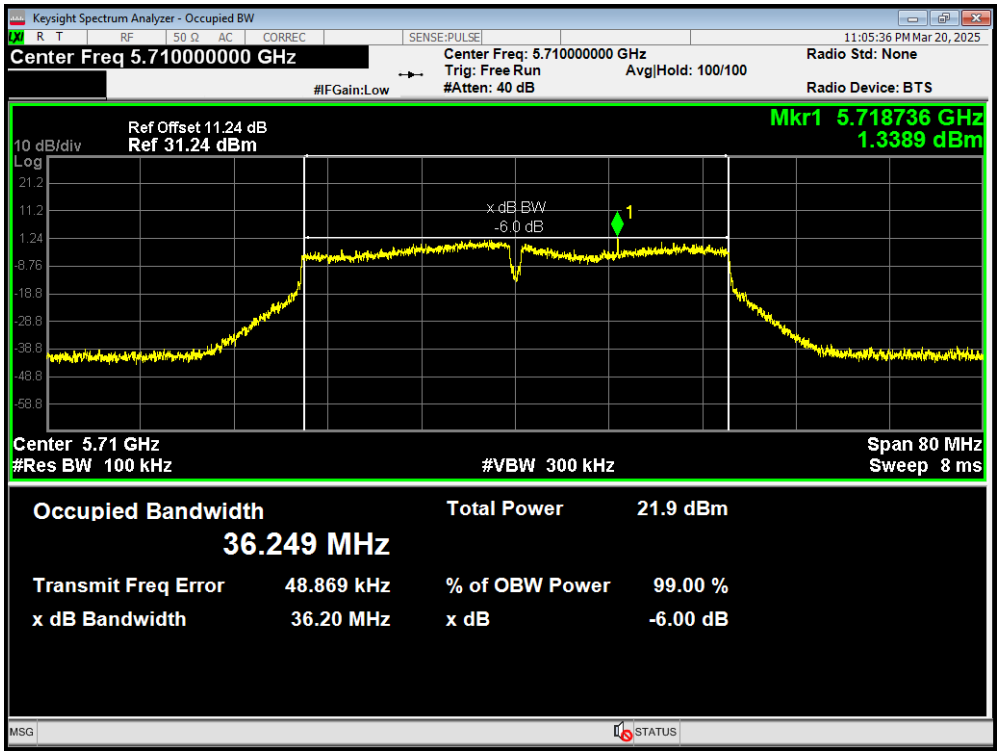
-6dB Bandwidth 802.11ac(VHT20) 5785MHz



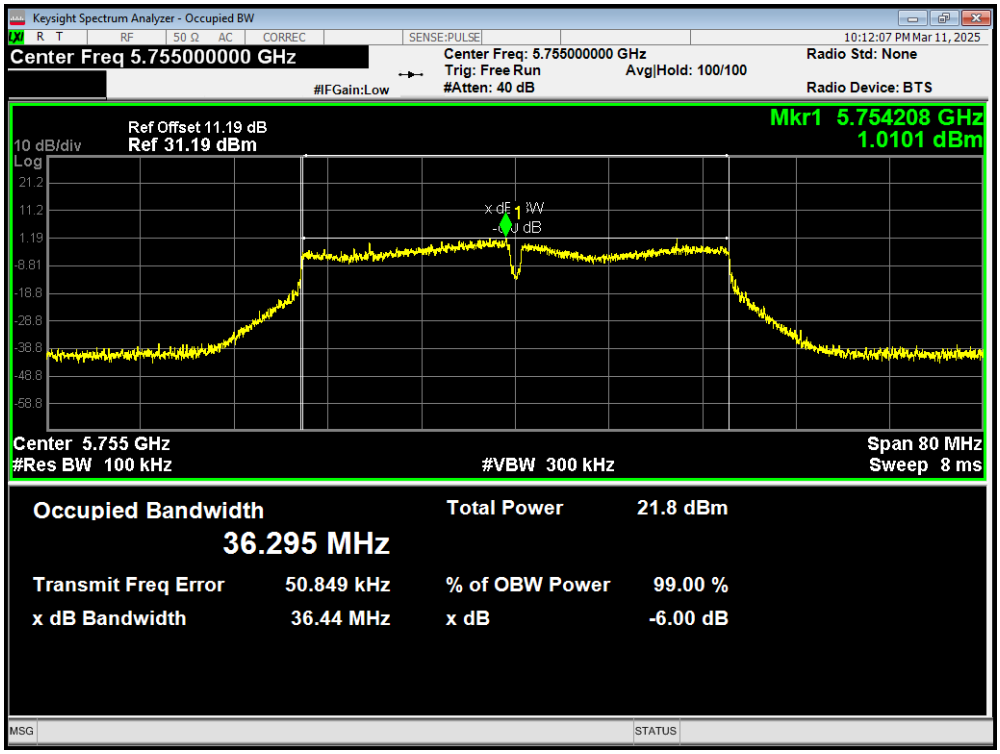
-6dB Bandwidth 802.11ac(VHT20) 5825MHz



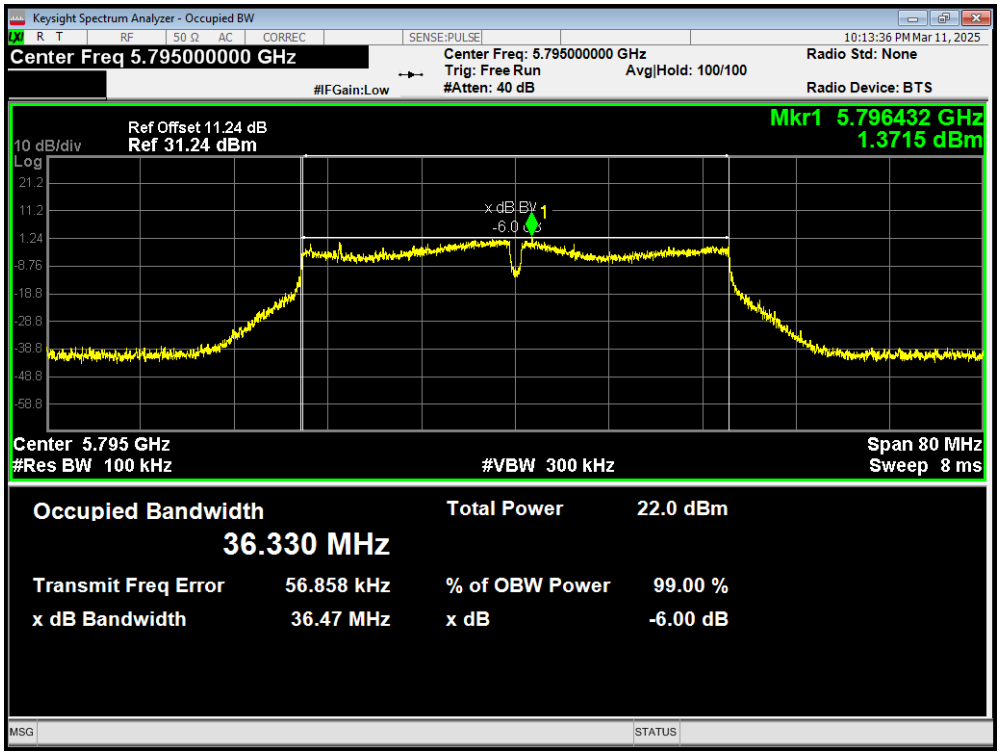
-6dB Bandwidth 802.11ac(VHT40) 5710MHz



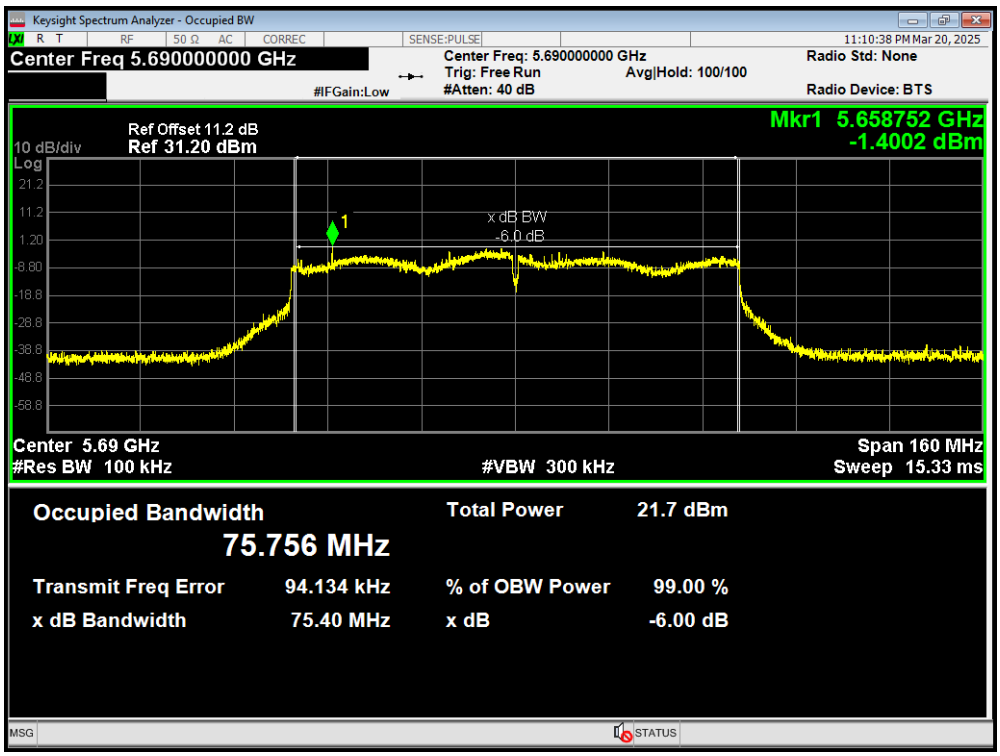
-6dB Bandwidth 802.11ac(VHT40) 5755MHz



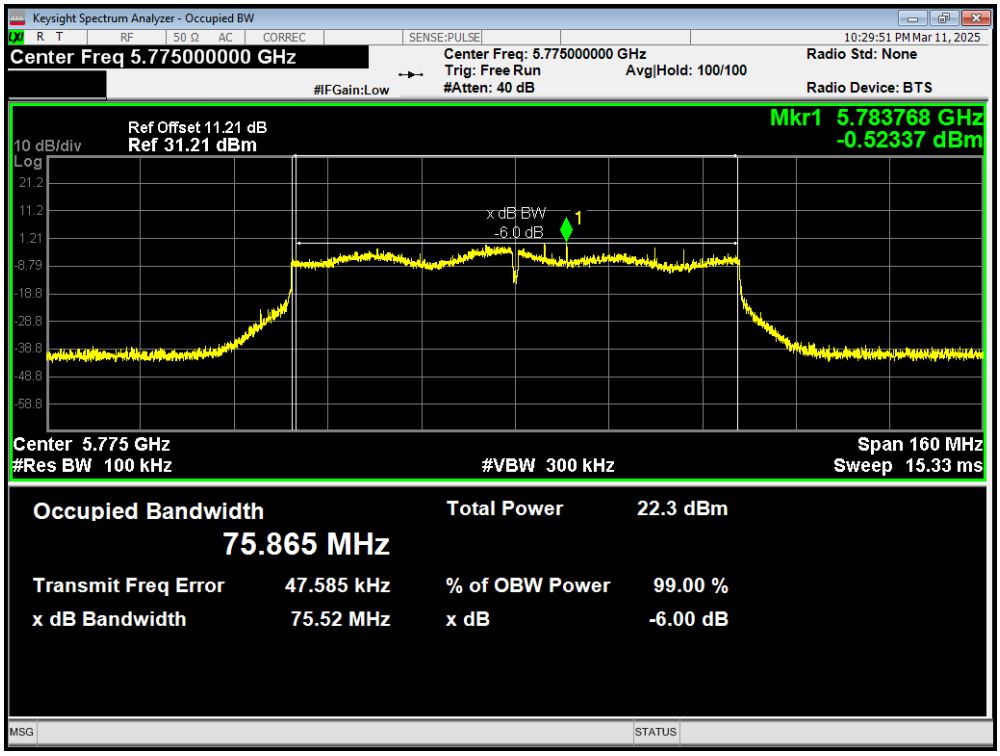
-6dB Bandwidth 802.11ac(VHT40) 5795MHz



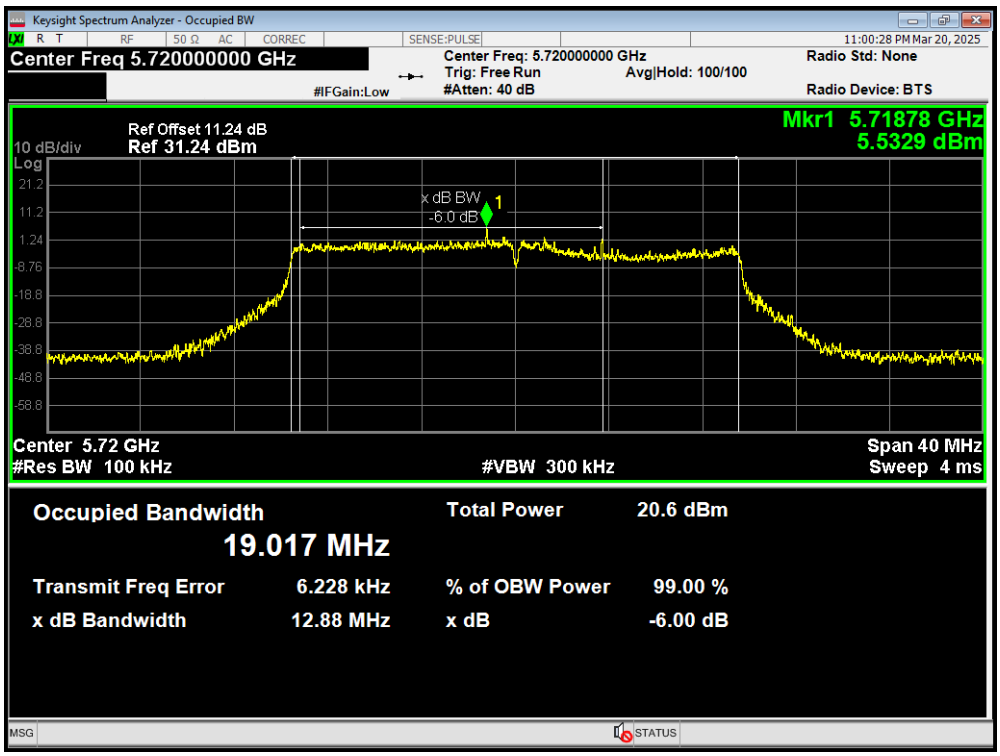
-6dB Bandwidth 802.11ac(VHT80) 5690MHz



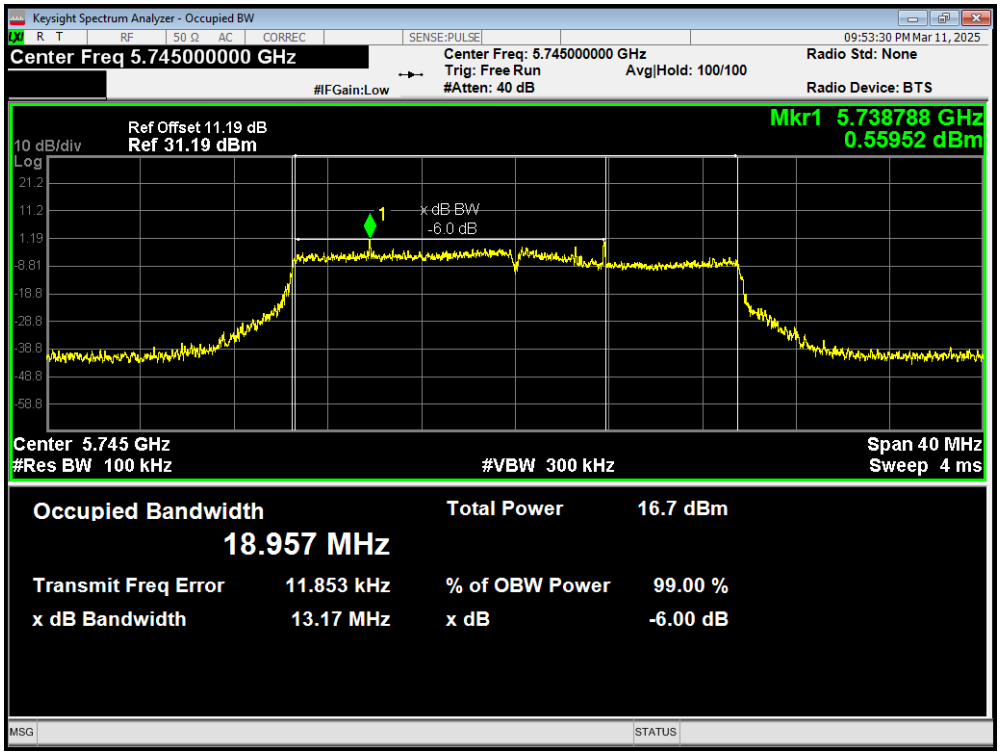
-6dB Bandwidth 802.11ac(VHT80) 5775MHz



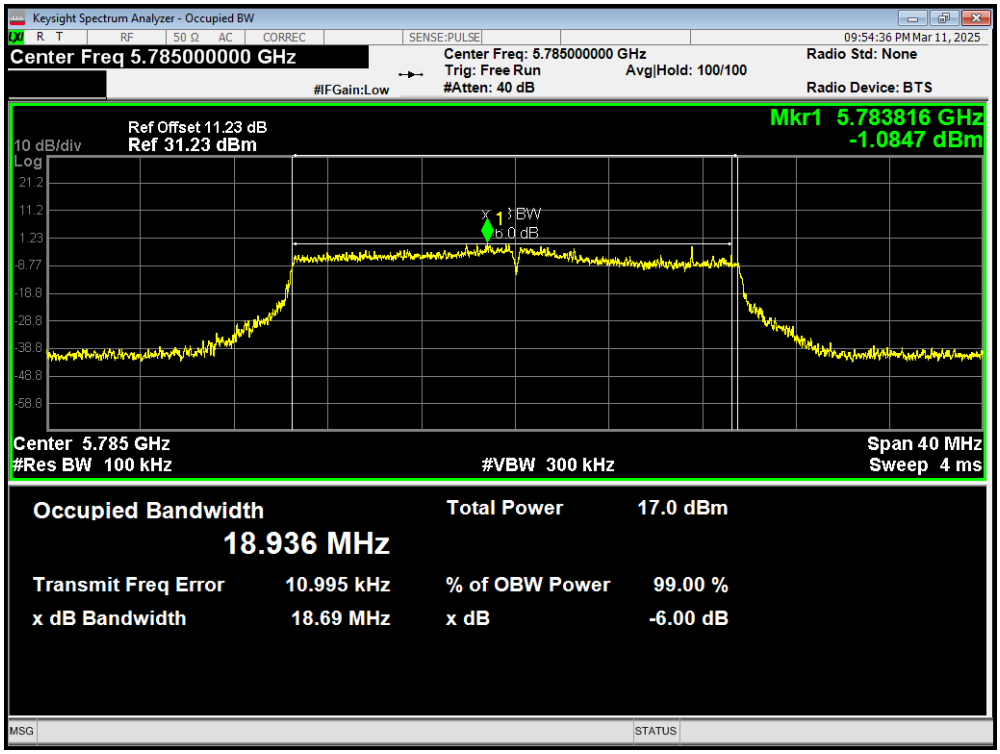
-6dB Bandwidth 802.11ax(HE20) 5720MHz



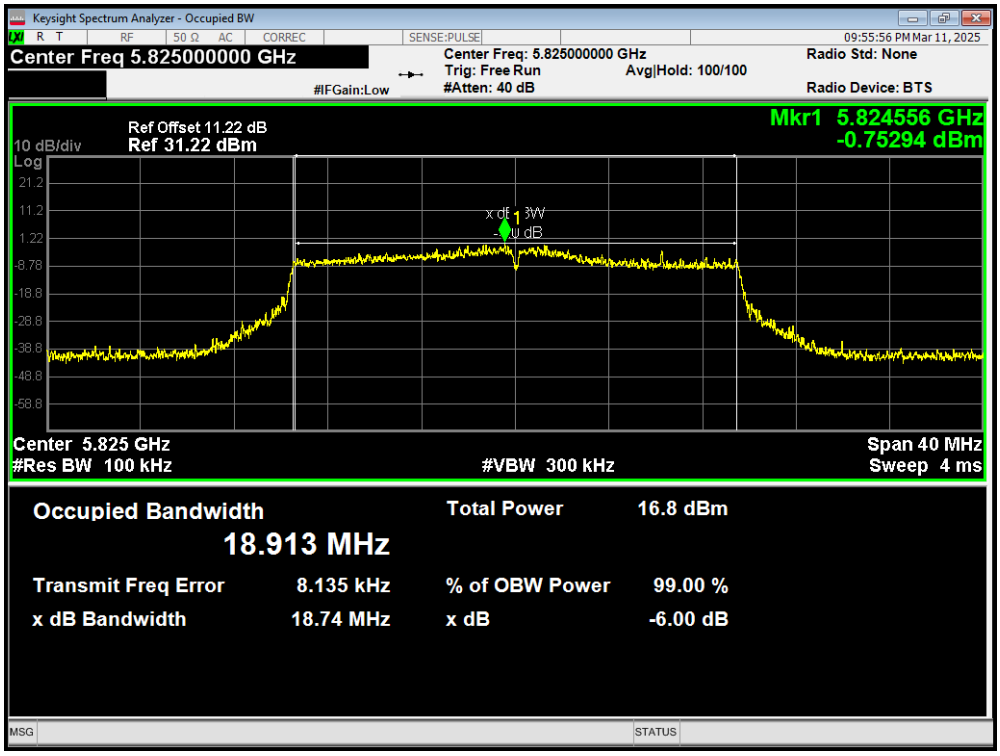
-6dB Bandwidth 802.11ax(HE20) 5745MHz



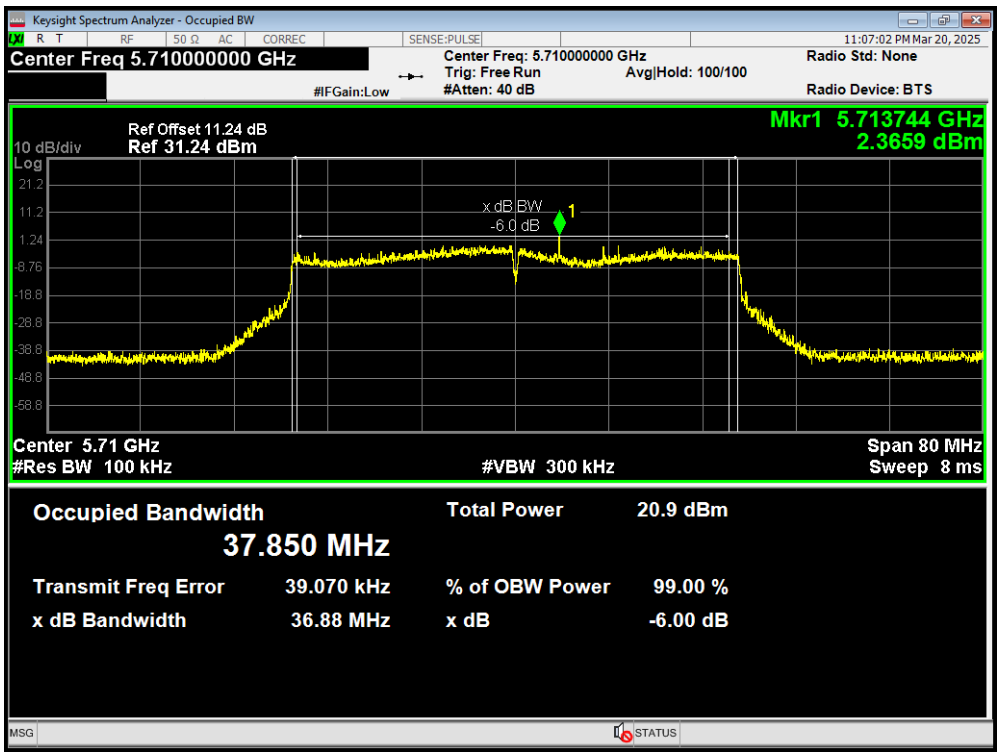
-6dB Bandwidth 802.11ax(HE20) 5785MHz



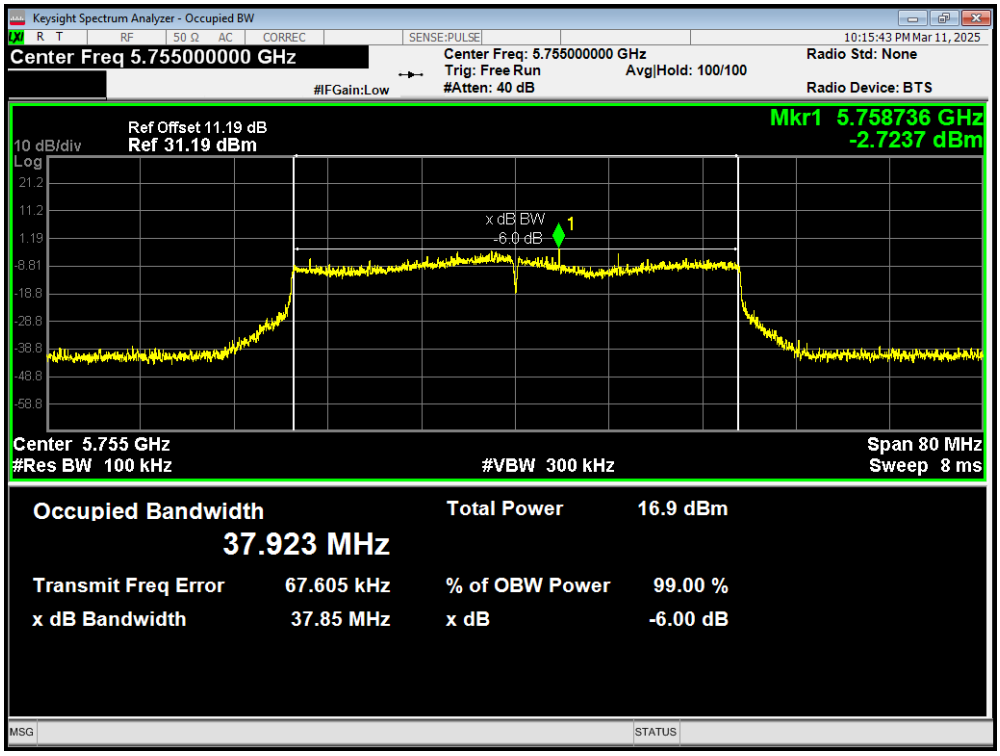
-6dB Bandwidth 802.11ax(HE20) 5825MHz



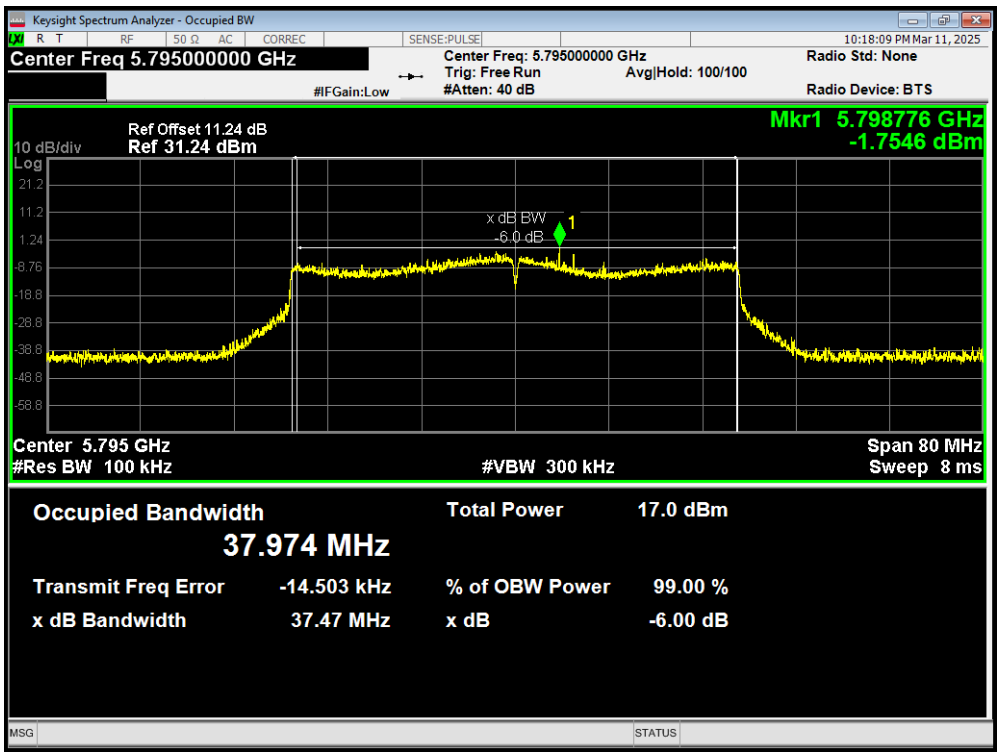
-6dB Bandwidth 802.11ax(HE40) 5710MHz



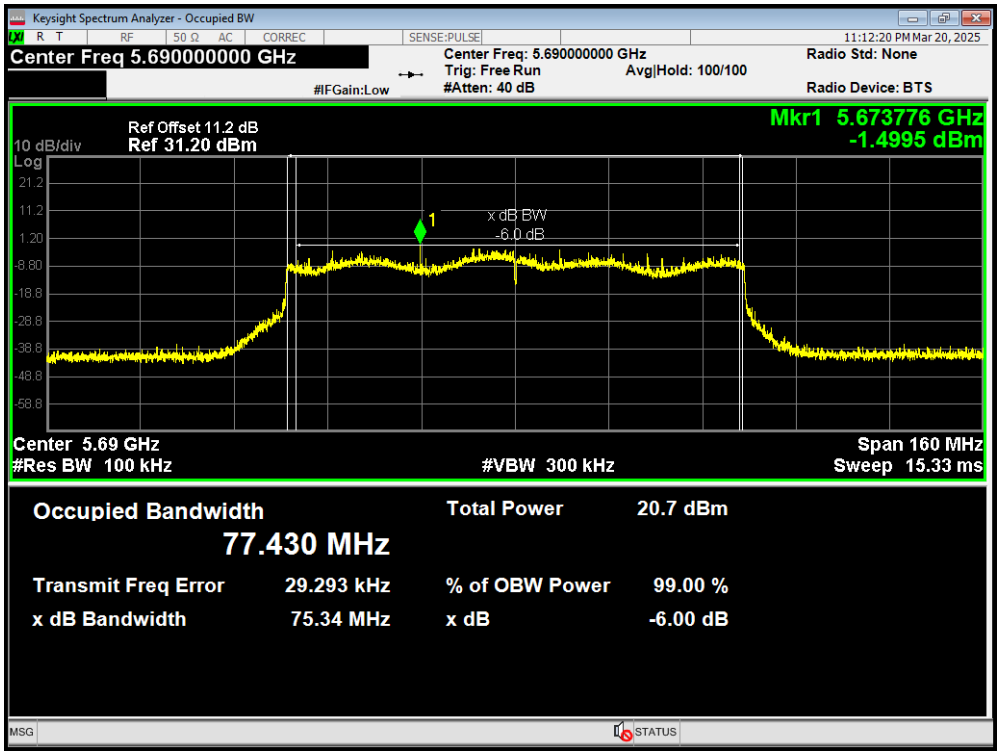
-6dB Bandwidth 802.11ax(HE40) 5755MHz



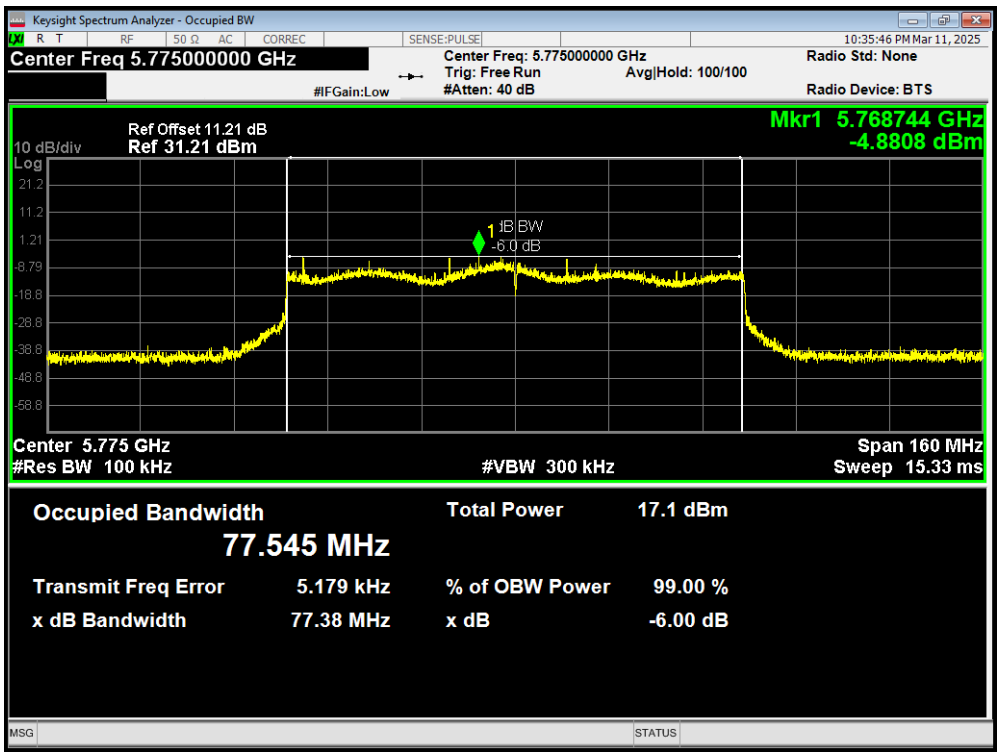
-6dB Bandwidth 802.11ax(HE40) 5795MHz



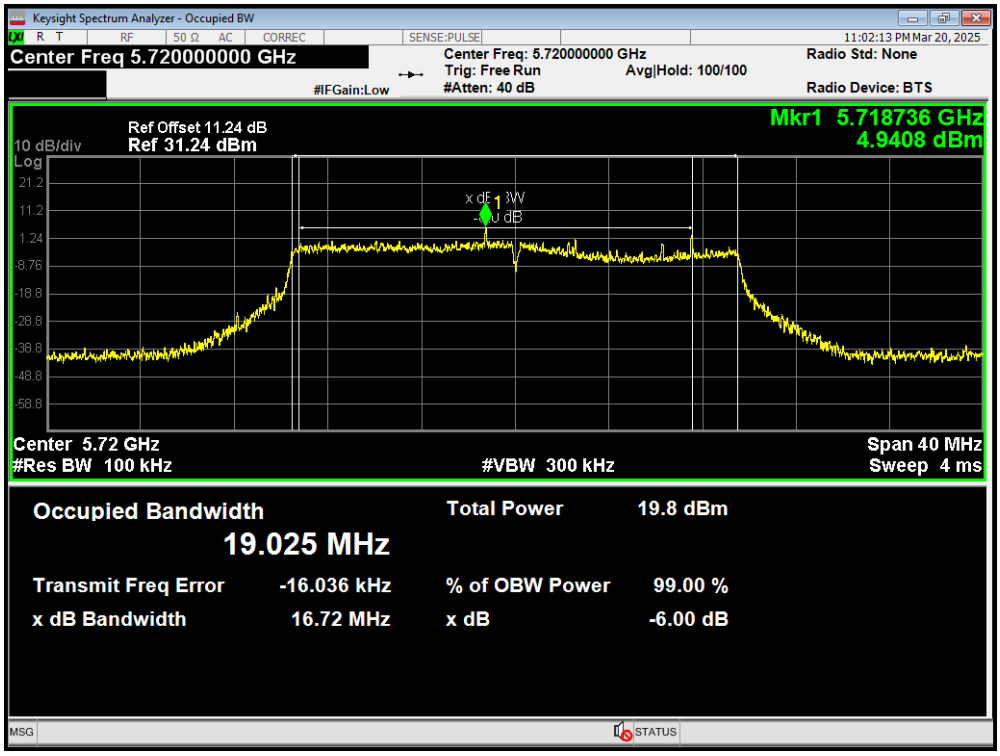
-6dB Bandwidth 802.11ax(HE80) 5690MHz



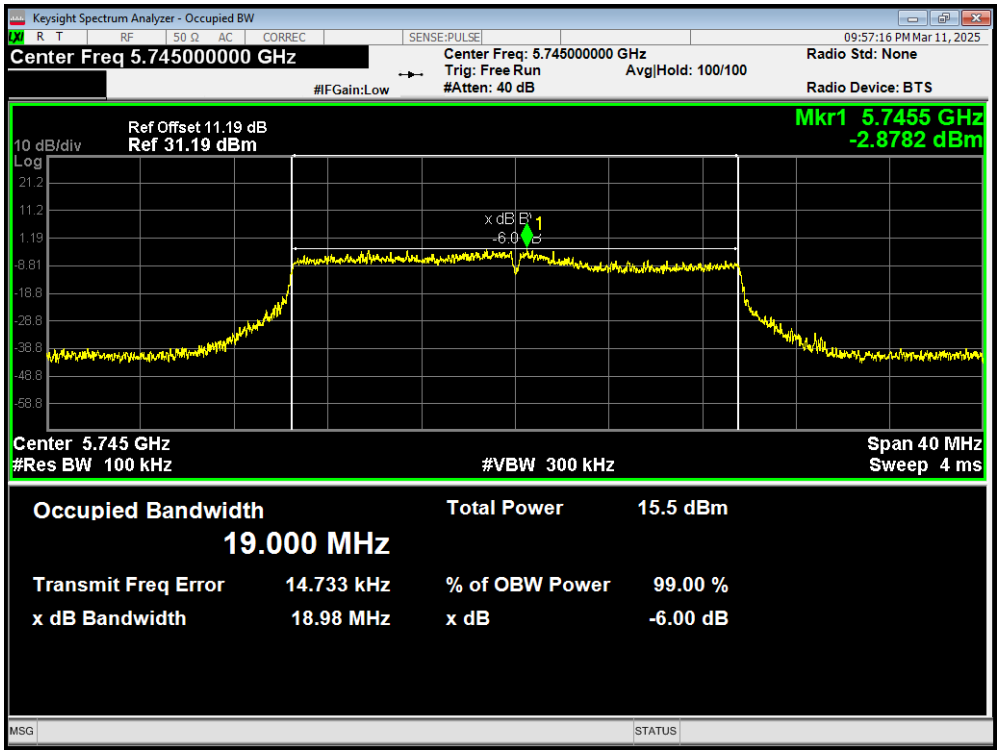
-6dB Bandwidth 802.11ax(HE80) 5775MHz



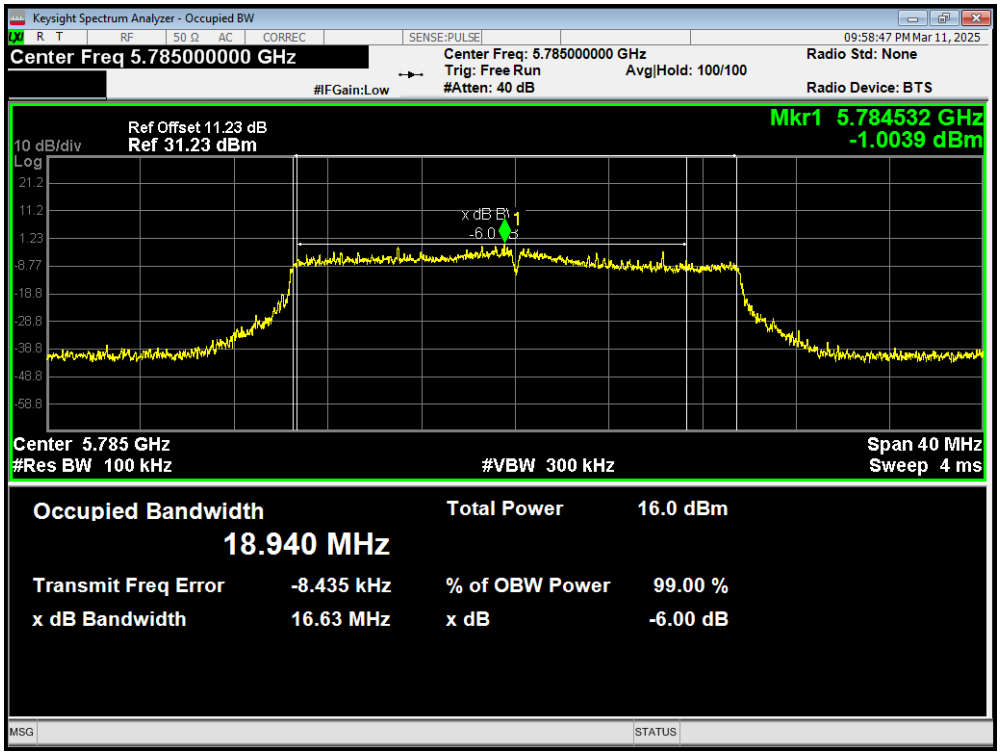
-6dB Bandwidth 802.11be(20) 5720MHz



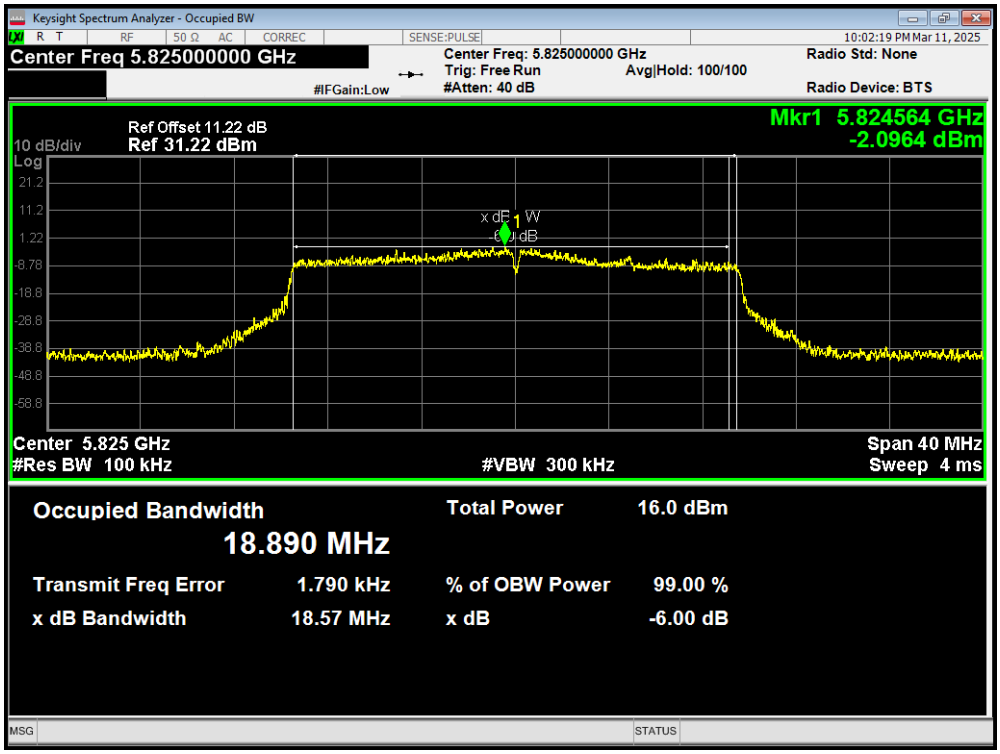
-6dB Bandwidth 802.11be(20) 5745MHz



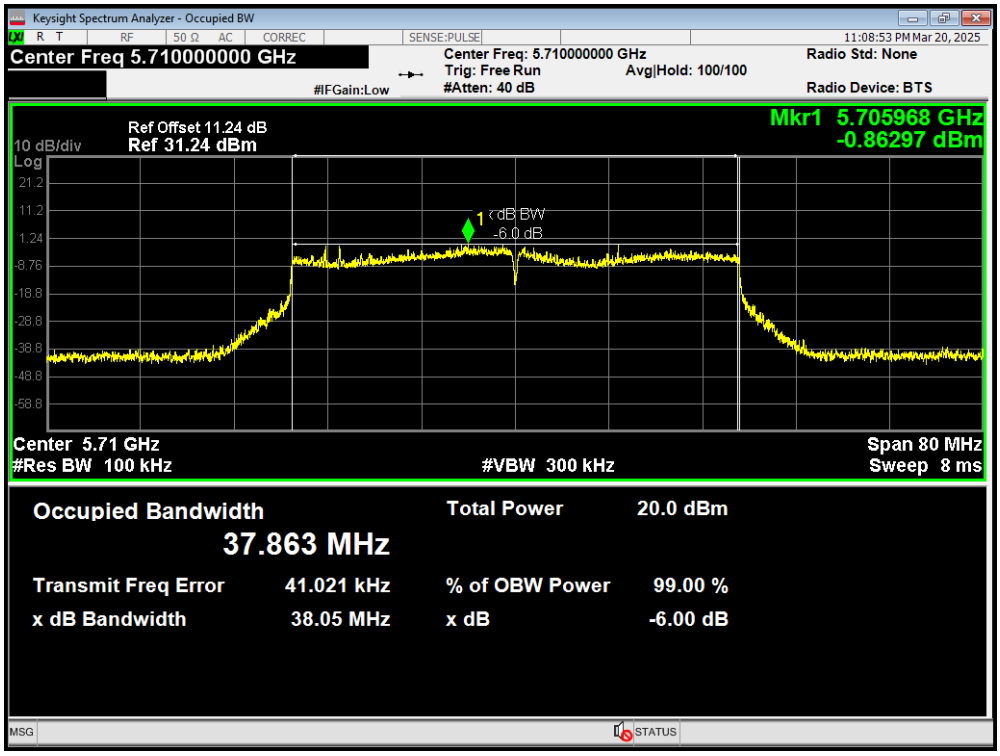
-6dB Bandwidth 802.11be(20) 5785MHz



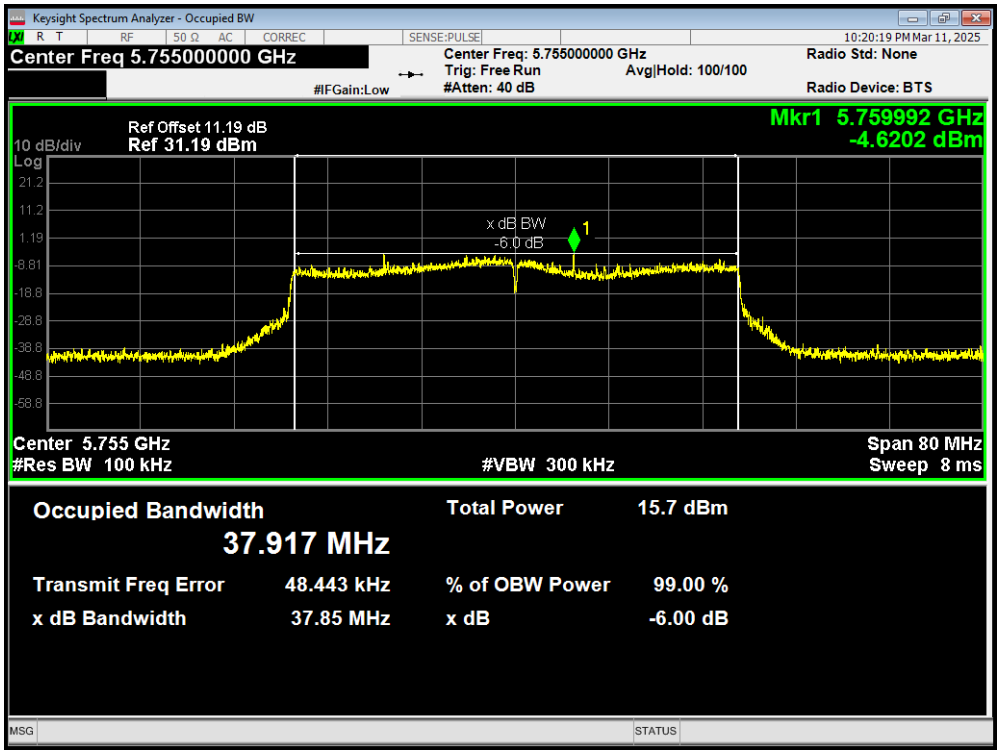
-6dB Bandwidth 802.11be(20) 5825MHz



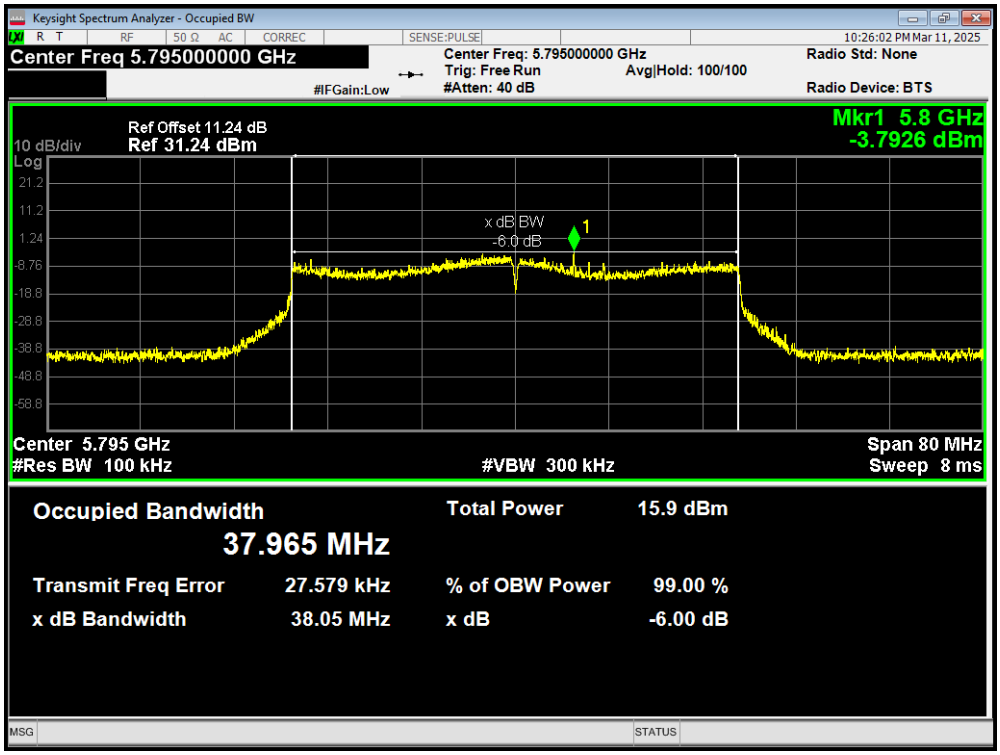
-6dB Bandwidth 802.11be(40) 5710MHz



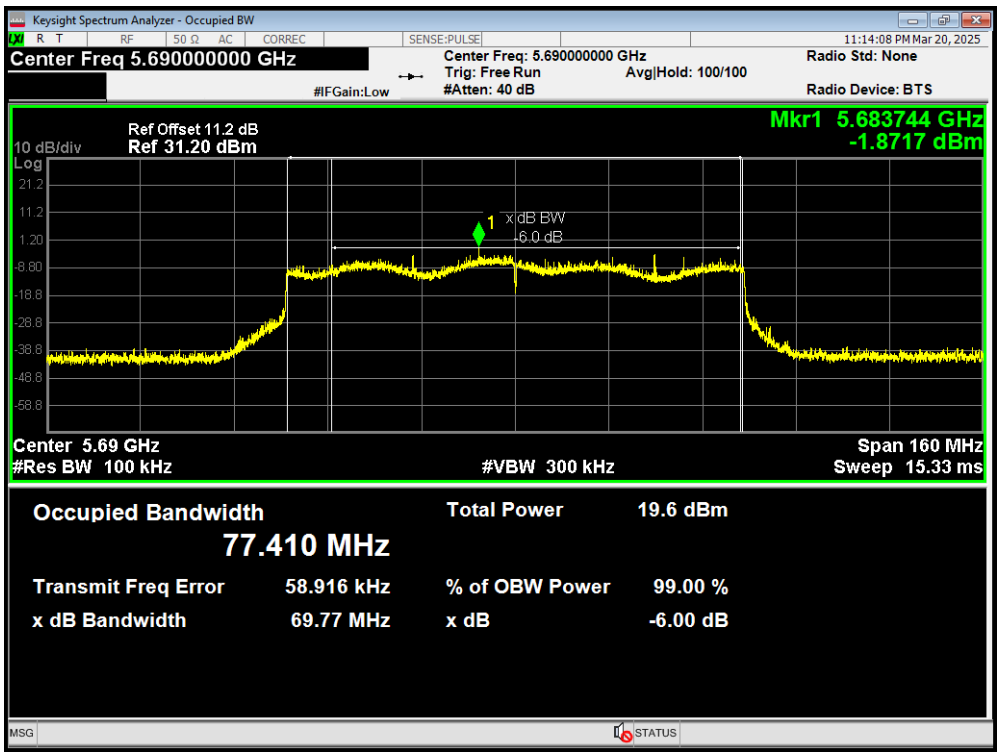
-6dB Bandwidth 802.11be(40) 5755MHz



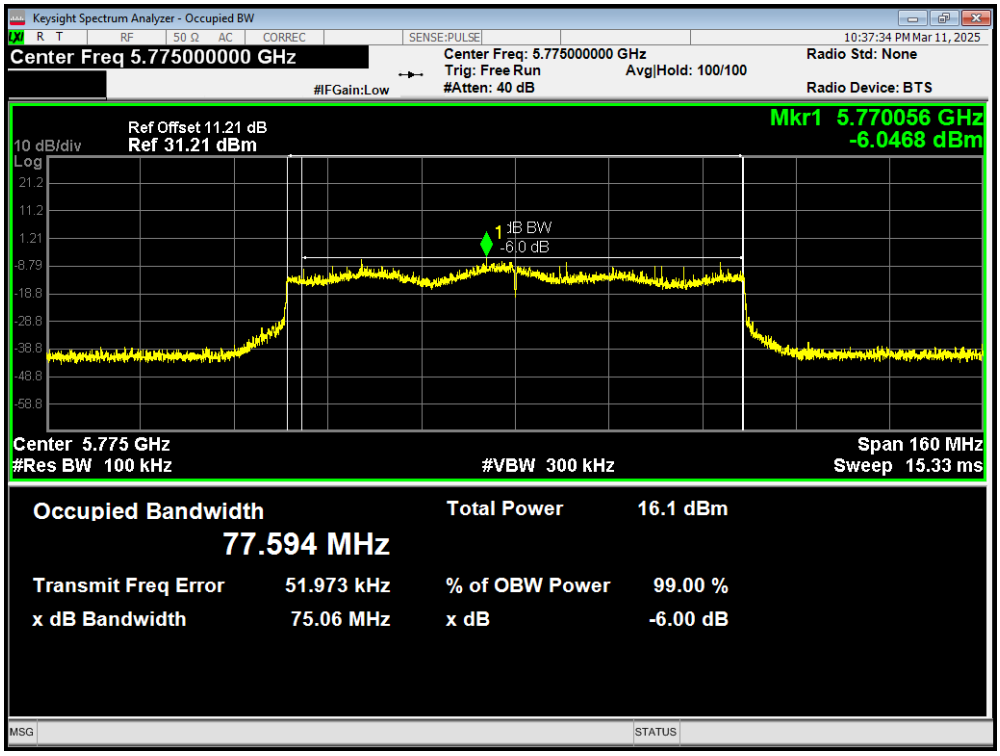
-6dB Bandwidth 802.11be(40) 5795MHz



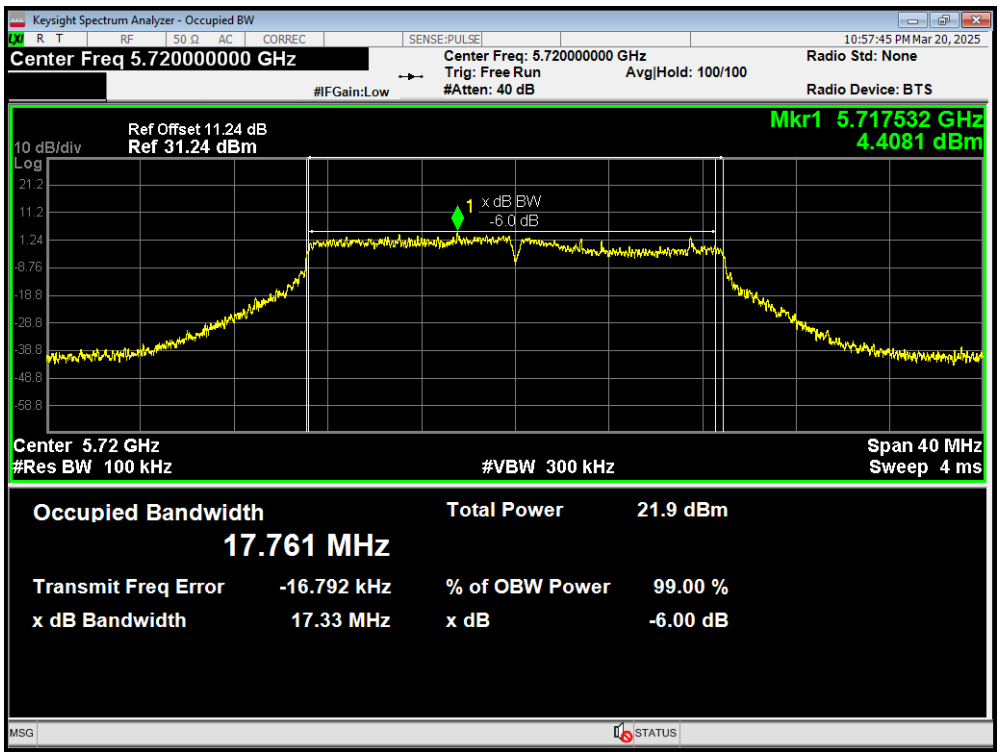
-6dB Bandwidth 802.11be(80) 5690MHz



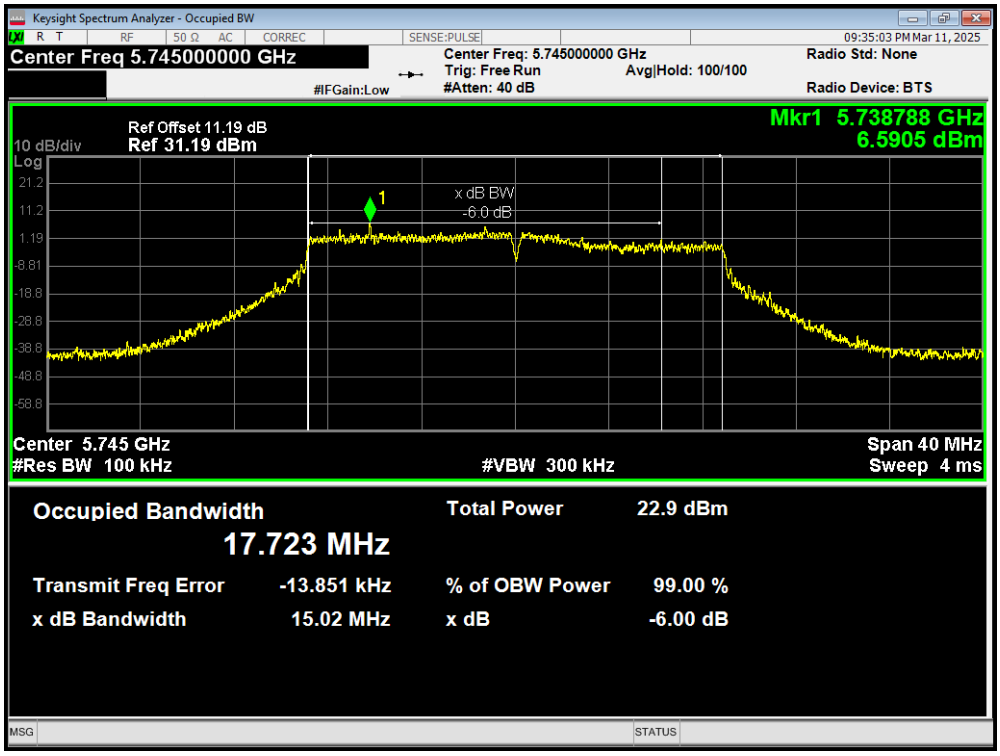
-6dB Bandwidth 802.11be(80) 5775MHz



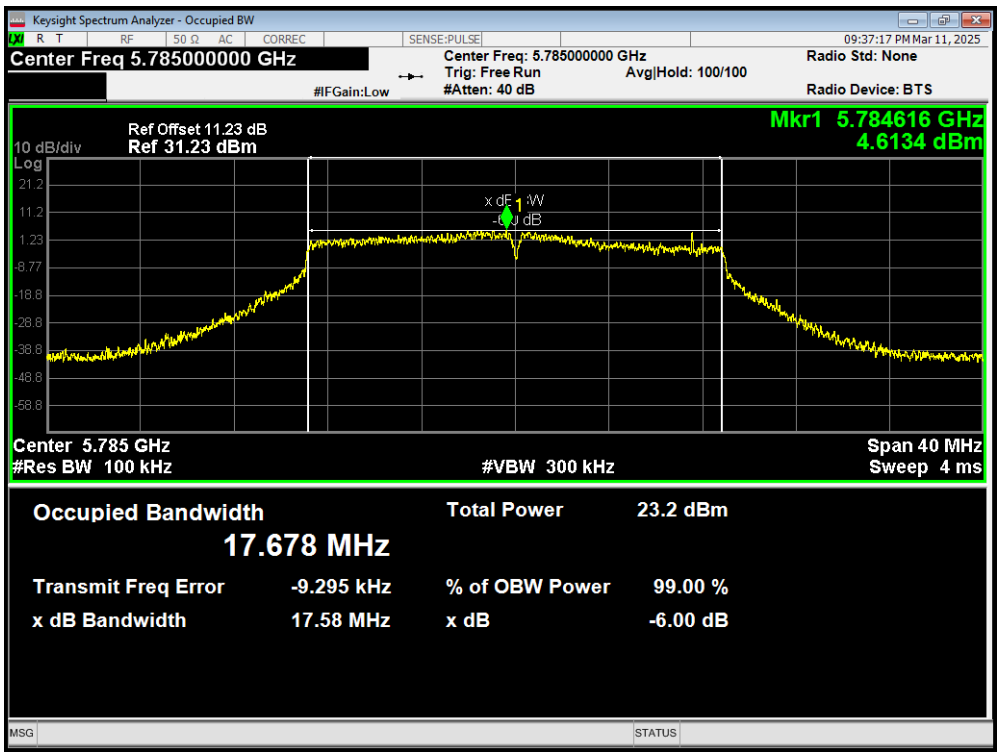
-6dB Bandwidth 802.11n(HT20) 5720MHz



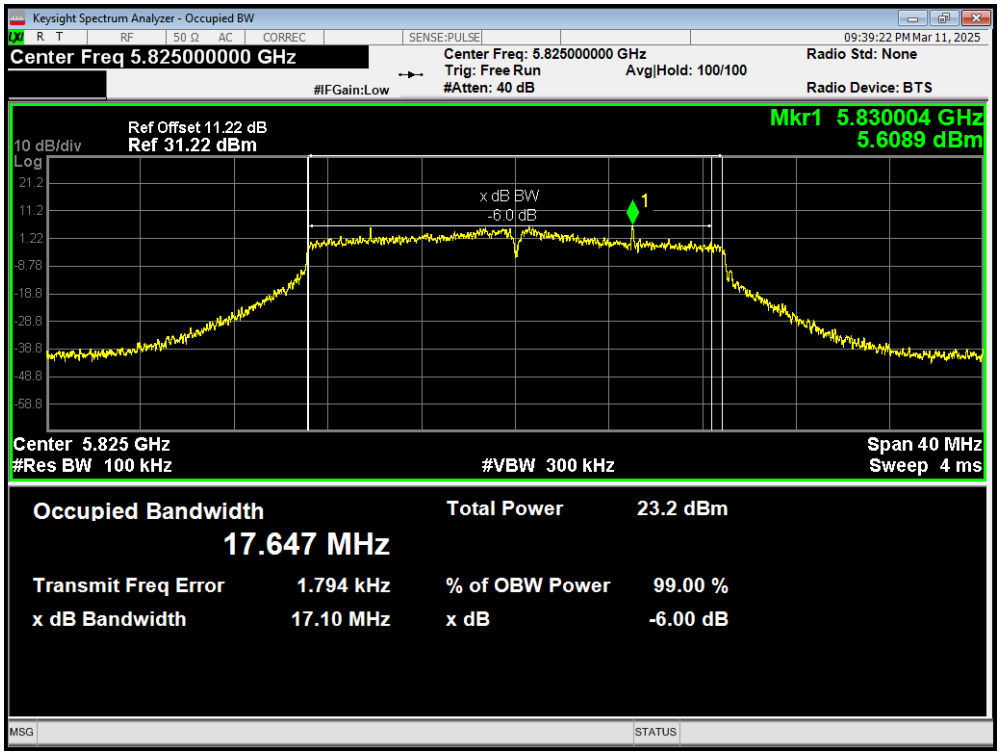
-6dB Bandwidth 802.11n(HT20) 5745MHz



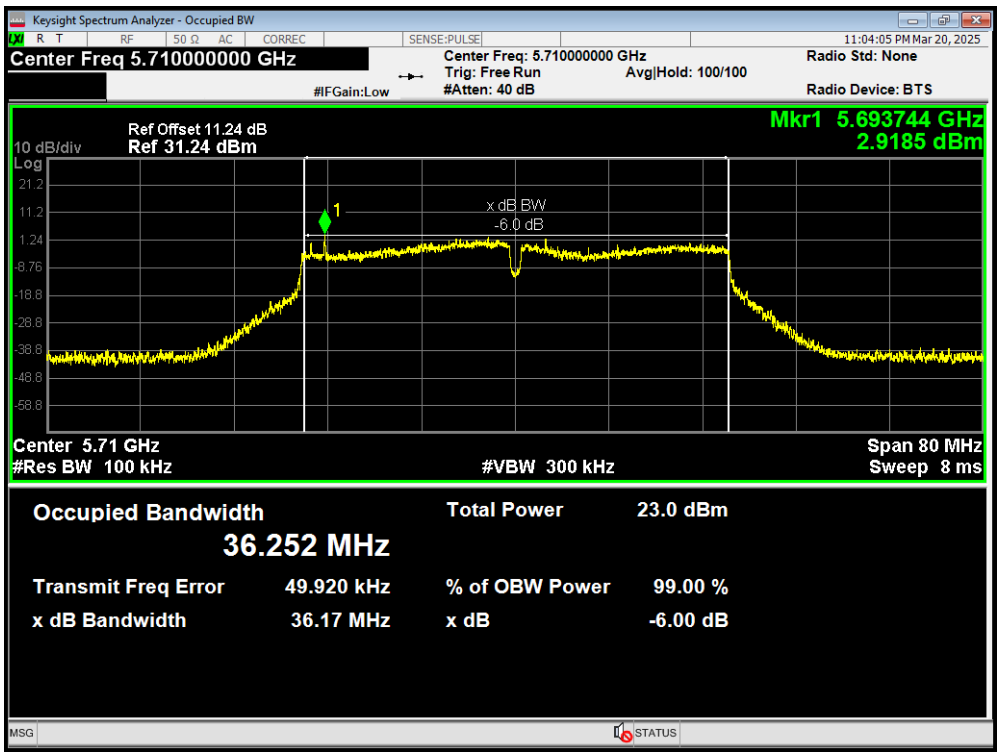
-6dB Bandwidth 802.11n(HT20) 5785MHz



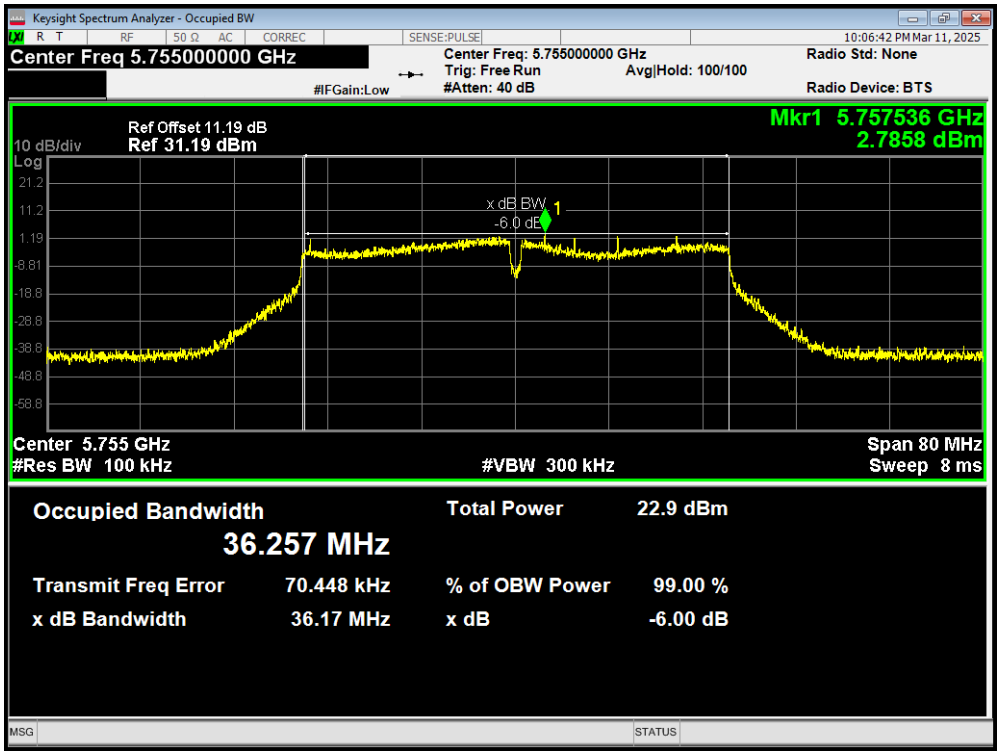
-6dB Bandwidth 802.11n(HT20) 5825MHz



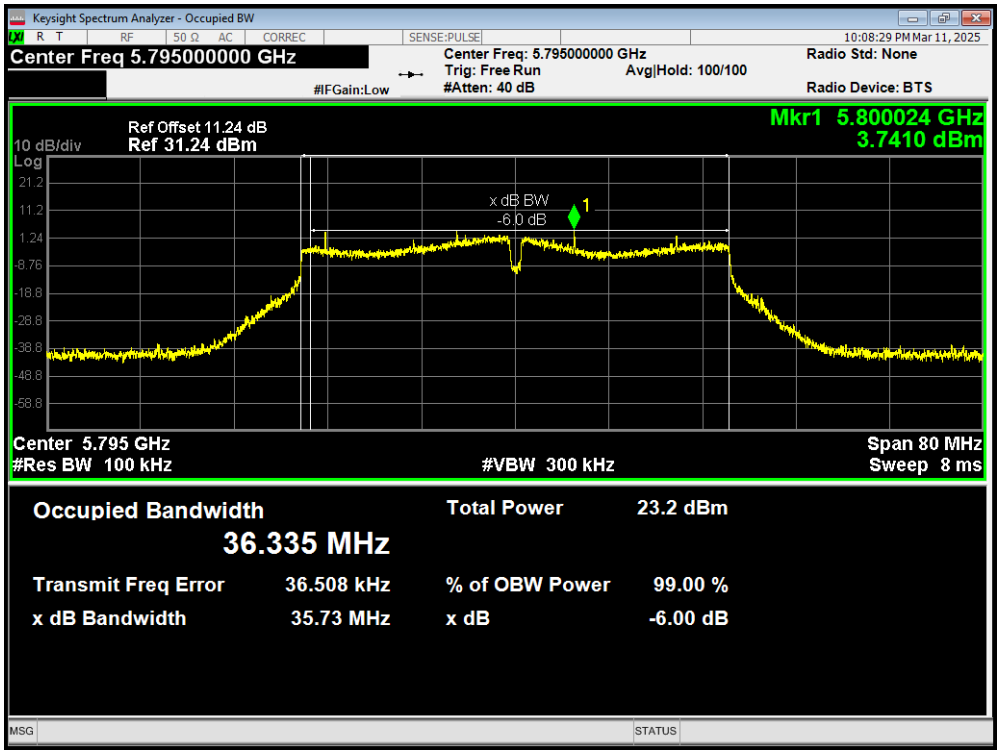
-6dB Bandwidth 802.11n(HT40) 5710MHz



-6dB Bandwidth 802.11n(HT40) 5755MHz



-6dB Bandwidth 802.11n(HT40) 5795MHz



5.2. Average Power Output

Ambient condition

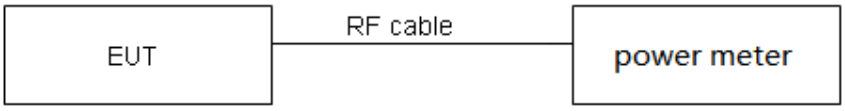
Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Methods of Measurement

During the process of the testing, The EUT was connected to the average power meter through an external attenuator and a known loss cable. The EUT is max power transmission with proper modulation. We use Maximum average Conducted Output Power Level Method in KDB789033 for this test

The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

Test Setup



Limits

Rule FCC Part 15.407(a)(1) / FCC Part 15.407(a) (2) / FCC Part 15.407(a) (3)
(1) 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 conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, 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 conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, 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 conducted output power over the frequency band of operation shall not exceed 1 W. In addition, 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 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.
(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 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.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.44 dB.

Test Results

Mode	Duty cycle	Duty cycle correction Factor (dB)
802.11a	0.997	0.000
802.11n HT20	0.997	0.000
802.11n HT40	0.997	0.000
802.11ac VHT20	0.997	0.000
802.11ac VHT40	0.997	0.000
802.11ac VHT80	0.997	0.000
802.11ac VHT160	0.997	0.000
802.11ax HE20	0.997	0.000
802.11ax HE40	0.997	0.000
802.11ax HE80	0.997	0.000
802.11ax HE160	0.997	0.000
802.11be HE20	0.997	0.000
802.11be HE40	0.997	0.000
802.11be HE80	0.997	0.000
802.11be HE160	0.997	0.000
Note: when Duty cycle≥0.98, Duty cycle correction Factor not required.		

Test Mode		Channel/ Frequency (MHz)	B=26 dB bandwidth (MHz)	Limit 11 dBm + 10 log B (dBm)	Final Limit (dBm)
U-NII-2A	802.11a	52/5260	22.36	24.49	24
		60/5300	22.30	24.48	24
		64/5320	22.75	24.57	24
	802.11n HT20	52/5260	23.72	24.75	24
		60/5300	23.01	24.62	24
		64/5320	23.19	24.65	24
	802.11n HT40	54/5270	44.03	27.44	24
		62/5310	44.02	27.44	24
	802.11ac VHT20	52/5260	23.14	24.64	24
		60/5300	23.10	24.64	24
		64/5320	23.85	24.77	24
	802.11ac VHT40	54/5270	44.33	27.47	24
		62/5310	43.70	27.41	24
	802.11ac VHT80	58/5290	88.86	30.49	24
	802.11ac VHT160	50/5250	175.22	33.44	24
	802.11ax HE20	52/5260	21.55	24.33	24
		60/5300	22.62	24.54	24
		64/5320	22.71	24.56	24
	802.11ax HE40	54/5270	44.34	27.47	24
		62/5310	43.23	27.36	24
	802.11ax HE80	58/5290	86.49	30.37	24
	802.11ax HE160	50/5250	176.74	33.47	24
	802.11be HE20	52/5260	22.05	24.43	24
		60/5300	22.38	24.50	24
		64/5320	22.49	24.52	24
	802.11be HE40	54/5270	43.27	27.36	24
		62/5310	43.41	27.38	24
	802.11be HE80	58/5290	87.11	30.40	24
	802.11be HE160	50/5250	175.18	33.43	24
Note: 250mW=24dBm					

Test Mode		Channel/ Frequency (MHz)	B=26 dB bandwidth (MHz)	Limit 11 dBm + 10 log B (dBm)	Final Limit (dBm)
U-NII-2C	802.11a	100/5500	22.24	24.47	24
		120/5600	22.99	24.61	24
		140/5700	21.52	24.33	24
		144/5720	22.44	24.51	24
	802.11n HT20	100/5500	24.18	24.83	24
		120/5600	23.87	24.78	24
		140/5700	23.15	24.64	24
		144/5720	22.40	24.50	24
	802.11n HT40	102/5510	44.73	27.51	24
		118/5590	44.09	27.44	24
		134/5670	44.09	27.44	24
		142/5710	43.58	27.39	24
	802.11ac VHT20	100/5500	23.95	24.79	24
		120/5600	23.20	24.66	24
		140/5700	23.87	24.78	24
		144/5720	23.60	24.73	24
	802.11ac VHT40	102/5510	44.04	27.44	24
		118/5590	44.13	27.45	24
		134/5670	43.94	27.43	24
		142/5710	43.20	27.35	24
	802.11ac VHT80	106/5530	90.79	30.58	24
		122/5610	91.23	30.60	24
		138/5690	87.82	30.44	24
	802.11ac VHT160	114/5570	172.92	33.38	24
	802.11ax HE20	100/5500	24.06	24.81	24
		120/5600	23.44	24.70	24
		140/5700	22.93	24.60	24
		144/5720	23.09	24.63	24
	802.11ax HE40	102/5510	43.01	27.34	24
		118/5590	43.08	27.34	24
		134/5670	43.05	27.34	24
		142/5710	42.45	27.28	24
	802.11ax HE80	106/5530	86.82	30.39	24
		122/5610	86.54	30.37	24
		138/5690	85.00	30.29	24
	802.11ax HE160	114/5570	174.15	33.41	24
	802.11be HE20	100/5500	23.42	24.70	24

		120/5600	23.01	24.62	24
		140/5700	22.47	24.52	24
		144/5720	22.66	24.55	24
	802.11be HE40	102/5510	43.18	27.35	24
		118/5590	42.70	27.30	24
		134/5670	42.28	27.26	24
		142/5710	43.48	27.38	24
	802.11be HE80	106/5530	86.04	30.35	24
		122/5610	86.90	30.39	24
		138/5690	87.82	30.44	24
	802.11be HE160	114/5570	175.28	33.44	24
Note: 250mW=24dBm					

MIMO

U-NII-1

Test Mode	Channel/ Frequency (MHz)	Power Index	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
			Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	36/5180	15	14.25	14.25	14.81	14.81	17.55	30	PASS
	40/5200	15	14.27	14.27	14.81	14.81	17.56	30	PASS
	48/5240	15	14.34	14.34	14.94	14.94	17.66	30	PASS
802.11n HT20	36/5180	16	15.84	15.84	15.80	15.80	18.83	30	PASS
	40/5200	16	15.77	15.77	15.82	15.82	18.81	30	PASS
	48/5240	16	15.42	15.42	15.77	15.77	18.61	30	PASS
802.11n HT40	38/5190	17	16.72	16.72	17.29	17.29	20.02	30	PASS
	46/5230	17	16.55	16.55	17.28	17.28	19.94	30	PASS
802.11ac VHT20	36/5180	16	15.83	15.83	15.80	15.80	18.82	30	PASS
	40/5200	16	15.80	15.80	15.84	15.84	18.83	30	PASS
	48/5240	16	15.39	15.39	15.79	15.79	18.60	30	PASS
802.11ac VHT40	38/5190	16	15.64	15.64	16.13	16.13	18.90	30	PASS
	46/5230	16	15.57	15.57	16.16	16.16	18.89	30	PASS
802.11ac VHT80	42/5210	16	15.36	15.36	16.02	16.02	18.71	30	PASS
802.11ax HE20	36/5180	15	15.83	15.83	15.12	15.12	18.50	30	PASS
	40/5200	15	15.88	15.88	15.24	15.24	18.58	30	PASS
	48/5240	15	15.60	15.60	15.19	15.19	18.41	30	PASS
802.11ax HE40	38/5190	15	15.26	15.26	15.60	15.60	18.45	30	PASS
	46/5230	15	15.26	15.26	15.77	15.77	18.53	30	PASS
802.11ax HE80	42/5210	15	15.01	15.01	15.24	15.24	18.13	30	PASS
802.11be HE20	36/5180	14	14.13	14.13	14.83	14.83	17.50	30	PASS
	40/5200	14	14.17	14.17	14.82	14.82	17.52	30	PASS
	48/5240	14	14.03	14.03	14.73	14.73	17.41	30	PASS
802.11be HE40	38/5190	14	14.31	14.31	14.69	14.69	17.51	30	PASS
	46/5230	14	14.40	14.40	14.86	14.86	17.65	30	PASS
802.11be HE80	42/5210	14	14.22	14.22	14.41	14.41	17.33	30	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with N_{ANT} ≥ 5.

So Directional gain = G_{ANT} + Array Gain =4.22+0=4.22 dBi<6dBi. So the power limit is 30dBm.

U-NII-2A

Test Mode	Channel/ Frequency (MHz)	Power Index	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
			Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	52/5260	16	15.16	15.16	15.62	15.62	18.41	24	PASS
	60/5300	16	15.36	15.36	15.31	15.31	18.35	24	PASS
	64/5320	16	15.52	15.52	15.10	15.10	18.33	24	PASS
802.11n HT20	52/5260	16	15.67	15.67	15.54	15.54	18.61	24	PASS
	60/5300	16	15.68	15.68	15.22	15.22	18.46	24	PASS
	64/5320	16	15.80	15.80	15.00	15.00	18.43	24	PASS
802.11n HT40	54/5270	17	16.75	16.75	17.07	17.07	19.92	24	PASS
	62/5310	17	16.85	16.85	16.64	16.64	19.76	24	PASS
802.11ac VHT20	52/5260	16	15.55	15.55	15.54	15.54	18.56	24	PASS
	60/5300	16	15.70	15.70	15.14	15.14	18.44	24	PASS
	64/5320	16	15.74	15.74	14.96	14.96	18.38	24	PASS
802.11ac VHT40	54/5270	16	15.79	15.79	16.07	16.07	18.94	24	PASS
	62/5310	16	15.84	15.84	15.61	15.61	18.73	24	PASS
802.11ac VHT80	58/5290	16	15.58	15.58	15.73	15.73	18.66	24	PASS
802.11ac VHT160	50/5250	16	14.95	14.95	15.37	15.37	18.18	24	PASS
802.11ax HE20	52/5260	15	14.71	14.71	14.85	14.85	17.79	24	PASS
	60/5300	15	14.83	14.83	14.59	14.59	17.72	24	PASS
	64/5320	15	14.95	14.95	14.15	14.15	17.58	24	PASS
802.11ax HE40	54/5270	15	14.76	14.76	15.10	15.10	17.94	24	PASS
	62/5310	15	14.78	14.78	14.65	14.65	17.72	24	PASS
802.11ax HE80	58/5290	15	14.59	14.59	14.72	14.72	17.67	24	PASS
802.11ax HE160	50/5250	15	14.79	14.79	15.37	15.37	18.10	24	PASS
802.11be HE20	52/5260	14	13.70	13.70	13.91	13.91	16.82	24	PASS
	60/5300	14	13.82	13.82	13.55	13.55	16.69	24	PASS
	64/5320	14	13.96	13.96	13.21	13.21	16.61	24	PASS
802.11be HE40	54/5270	14	13.85	13.85	13.98	13.98	16.93	24	PASS
	62/5310	14	13.80	13.80	13.55	13.55	16.69	24	PASS
802.11be HE80	58/5290	14	13.67	13.67	13.67	13.67	16.68	24	PASS
802.11be HE160	50/5250	14	13.78	13.78	14.47	14.47	17.15	24	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power =$10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one

spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = G_{ANT} + Array Gain =4.22+0=4.22 dBi<6dBi. So the power limit is 24dBm.

U-NII-2C

Test Mode	Channel/ Frequency (MHz)	Power Index	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
			Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	100/5500	16	15.41	15.41	15.72	15.72	18.58	24	PASS
	120/5600	15	15.09	15.09	15.04	15.04	18.07	24	PASS
	140/5700	15	15.05	15.05	15.49	15.49	18.28	24	PASS
	144/5720	15	13.81	13.81	13.84	13.84	16.83	24	PASS
802.11n HT20	100/5500	17	16.40	16.40	16.69	16.69	19.56	24	PASS
	120/5600	16	16.33	16.33	15.86	15.86	19.11	24	PASS
	140/5700	16	15.33	15.33	15.77	15.77	18.56	24	PASS
	144/5720	16	14.69	14.69	14.90	14.90	17.81	24	PASS
802.11n HT40	102/5510	17	17.01	17.01	17.23	17.23	20.13	24	PASS
	118/5590	17	17.78	17.78	17.36	17.36	20.59	24	PASS
	134/5670	17	17.40	17.40	17.78	17.78	20.61	24	PASS
	142/5710	17	15.98	15.98	16.53	16.53	19.27	24	PASS
802.11ac VHT20	100/5500	16	15.03	15.03	15.06	15.06	18.06	24	PASS
	120/5600	16	15.97	15.97	15.65	15.65	18.82	24	PASS
	140/5700	16	16.04	16.04	16.63	16.63	19.36	24	PASS
	144/5720	16	14.73	14.73	14.86	14.86	17.80	24	PASS
802.11ac VHT40	102/5510	16	15.73	15.73	15.87	15.87	18.81	24	PASS
	118/5590	16	16.31	16.31	15.97	15.97	19.16	24	PASS
	134/5670	16	16.09	16.09	16.50	16.50	19.31	24	PASS
	142/5710	16	15.03	15.03	15.48	15.48	18.27	24	PASS
802.11ac VHT80	106/5530	16	15.70	15.70	15.74	15.74	18.73	24	PASS
	122/5610	16	16.24	16.24	16.38	16.38	19.32	24	PASS
	138/5690	16	14.79	14.79	15.35	15.35	18.09	24	PASS
802.11ac VHT160	114/5570	16	15.89	15.89	15.98	15.98	18.94	24	PASS
802.11ax HE20	100/5500	15	14.06	14.06	14.25	14.25	17.17	24	PASS
	120/5600	15	15.16	15.16	14.66	14.66	17.93	24	PASS
	140/5700	15	15.14	15.14	15.60	15.60	18.39	24	PASS
	144/5720	15	13.77	13.77	13.86	13.86	16.82	24	PASS

802.11ax HE40	102/5510	15	14.68	14.68	14.92	14.92	17.81	24	PASS
	118/5590	15	15.25	15.25	14.72	14.72	18.01	24	PASS
	134/5670	15	15.17	15.17	15.54	15.54	18.37	24	PASS
	142/5710	15	14.12	14.12	14.52	14.52	17.33	24	PASS
802.11ax HE80	106/5530	15	14.66	14.66	14.72	14.72	17.70	24	PASS
	122/5610	15	15.18	15.18	15.16	15.16	18.18	24	PASS
	138/5690	15	13.80	13.80	14.22	14.22	17.03	24	PASS
802.11ax HE160	114/5570	15	14.86	14.86	14.63	14.63	17.76	24	PASS
802.11be HE20	100/5500	14	13.33	13.33	13.55	13.55	16.45	24	PASS
	120/5600	14	14.13	14.13	13.68	13.68	16.92	24	PASS
	140/5700	14	14.16	14.16	14.64	14.64	17.42	24	PASS
	144/5720	14	12.76	12.76	12.94	12.94	15.86	24	PASS
802.11be HE40	102/5510	14	13.66	13.66	13.95	13.95	16.81	24	PASS
	118/5590	14	14.27	14.27	13.82	13.82	17.06	24	PASS
	134/5670	14	14.30	14.30	14.64	14.64	17.48	24	PASS
	142/5710	14	13.10	13.10	13.57	13.57	16.35	24	PASS
802.11be HE80	106/5530	14	13.70	13.70	13.78	13.78	16.75	24	PASS
	122/5610	14	14.28	14.28	14.10	14.10	17.20	24	PASS
	138/5690	14	12.82	12.82	13.40	13.40	16.13	24	PASS
802.11be HE160	114/5570	14	13.87	13.87	13.85	13.85	16.87	24	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power $=10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = G_{ANT} + Array Gain =4.10+0=4.10 dBi<6dBi. So the power limit is 24dBm.

U-NII-3

Test Mode	Channel/ Frequency (MHz)	Power Index	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
			Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	144/5720	15	5.98	5.98	6.93	6.93	9.49	30	PASS
	149/5745	19	18.31	18.31	18.80	18.80	21.57	30	PASS
	157/5785	19	18.55	18.55	18.69	18.69	21.63	30	PASS
	165/5825	19	18.45	18.45	18.91	18.91	21.70	30	PASS
802.11n HT20	144/5720	16	6.46	6.46	8.69	8.69	10.73	30	PASS
	149/5745	17	16.30	16.30	16.88	16.88	19.61	30	PASS
	157/5785	17	16.78	16.78	16.74	16.74	19.77	30	PASS
	165/5825	17	16.85	16.85	17.00	17.00	19.94	30	PASS
802.11n HT40	142/5710	17	6.58	6.58	5.32	5.32	9.01	30	PASS
	151/5755	17	16.46	16.46	16.84	16.84	19.66	30	PASS
	159/5795	17	16.72	16.72	16.97	16.97	19.86	30	PASS
802.11ac VHT20	144/5720	16	6.46	6.46	8.58	8.58	10.66	30	PASS
	149/5745	16	15.28	15.28	15.85	15.85	18.59	30	PASS
	157/5785	16	15.73	15.73	15.70	15.70	18.72	30	PASS
	165/5825	16	15.77	15.77	15.97	15.97	18.88	30	PASS
802.11ac VHT40	142/5710	16	5.72	5.72	4.32	4.32	8.08	30	PASS
	151/5755	16	15.47	15.47	15.82	15.82	18.66	30	PASS
	159/5795	16	15.64	15.64	15.93	15.93	18.80	30	PASS
802.11ac VHT80	138/5690	16	2.09	2.09	0.64	0.64	4.43	30	PASS
	155/5775	16	15.66	15.66	15.70	15.70	18.69	30	PASS
802.11ax HE20	144/5720	15	6.26	6.26	8.04	8.04	10.25	30	PASS
	149/5745	15	14.49	14.49	14.41	14.41	17.46	30	PASS
	157/5785	15	14.87	14.87	14.50	14.50	17.70	30	PASS
	165/5825	15	14.97	14.97	14.86	14.86	17.92	30	PASS
802.11ax HE40	142/5710	15	5.35	5.35	4.19	4.19	7.82	30	PASS
	151/5755	15	14.85	14.85	14.63	14.63	17.75	30	PASS
	159/5795	15	14.82	14.82	14.67	14.67	17.76	30	PASS
802.11ax HE80	138/5690	15	1.79	1.79	0.59	0.59	4.24	30	PASS
	155/5775	15	14.58	14.58	14.22	14.22	17.41	30	PASS
802.11be HE20	144/5720	14	5.32	5.32	7.25	7.25	9.40	30	PASS
	149/5745	14	13.73	13.73	13.54	13.54	16.65	30	PASS
	157/5785	14	13.97	13.97	13.52	13.52	16.76	30	PASS
	165/5825	14	14.06	14.06	13.82	13.82	16.95	30	PASS
802.11be HE40	142/5710	14	4.51	4.51	3.25	3.25	6.94	30	PASS
	151/5755	14	13.88	13.88	13.70	13.70	16.80	30	PASS
	159/5795	14	13.86	13.86	13.62	13.62	16.75	30	PASS

802.11be HE80	138/5690	14	0.76	0.76	-0.41	-0.41	3.22	30	PASS
	155/5775	14	13.58	13.58	13.14	13.14	16.38	30	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power =$10\log(10^{(\text{Power antenna1 in dBm}/10)}+10^{(\text{Power antenna2 in dBm}/10)})$.

2. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate Directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

Directional gain = $G_{ANT\ MAX}$ + Array Gain,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};

Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So Directional gain = G_{ANT} + Array Gain =5.98+0=5.98 dBi<6dBi. So the power limit is 30dBm.

5.3. Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

Method of Measurement

1. Frequency stability with respect to ambient temperature

a) Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT. If possible, a dummy load shall be connected to the EUT because an antenna near the metallic walls of an environmental test chamber could affect the output frequency of the EUT. If the EUT is equipped with a permanently attached, adjustable-length antenna, then the EUT shall be placed in the center of the chamber with the antenna adjusted to the shortest length possible. Turn ON the EUT and tune it to one of the number of frequencies shown in 5.6.

b) Couple the unlicensed wireless device output to the measuring instrument by connecting an antenna to the measuring instrument with a suitable length of coaxial cable and placing the measuring antenna near the EUT (e.g., 15 cm away), or by connecting a dummy load to the measuring instrument, through an attenuator if necessary.

c) Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).

d) Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.

e) Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.

f) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

g) Measure the frequency at each of frequencies specified in 5.6.

h) Switch OFF the EUT but do not switch OFF the oscillator heater.

i) Lower the chamber temperature by not more that 10°C, and allow the temperature inside the chamber to stabilize.

j) Repeat step f) through step i) down to the lowest specified temperature.

2. Frequency stability when varying supply voltage

Unless otherwise specified, these tests shall be made at ambient room temperature (+15°C to +25 °C). An antenna shall be connected to the antenna output terminals of the EUT if possible. If the EUT is equipped with or uses an adjustable-length antenna, then it shall be fully extended.

a) Supply the EUT with nominal voltage or install a new or fully charged battery in the EUT. Turn ON the EUT and couple its output to a frequency counter or other frequency-measuring instrument.

b) Tune the EUT to one of the number of frequencies required in 5.6. Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).
c) Measure the frequency at each of the frequencies specified in 5.6.
d) Repeat the above procedure at 85% and 115% of the nominal supply voltage.

Limit

Manufacturers 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 users manual.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 936Hz

Test Results

Voltage (V)	Temperature (°C)	U-NII-1 Test Results			
		5200MHz			
		1min	2min	5min	10min
12	-30	5200.003116	5200.002712	5199.997067	5199.995314
12	-20	5200.009363	5199.997695	5199.989394	5199.986971
12	-10	5200.004107	5199.988244	5199.980857	5199.983291
12	0	5200.009134	5199.994107	5199.985240	5199.979064
12	10	5200.008454	5199.988537	5199.980849	5199.975478
12	20	5200.007355	5199.979509	5199.974541	5199.967580
12	30	5200.007217	5199.971571	5199.966278	5199.963383
12	40	5200.005601	5199.970686	5199.957654	5199.958690
12	50	5200.001746	5199.968767	5199.954800	5199.953700
5	20	5199.995657	5199.965051	5199.952953	5199.952038
18	20	5199.994294	5199.958725	5199.943906	5199.949401
Max. ΔMHz		-0.005706	-0.041275	-0.056094	-0.050599
PPM		-1.097308	-7.937500	-10.787308	-9.730577

Voltage (V)	Temperature (°C)	U-NII-2A Test Results			
		5300MHz			
		1min	2min	5min	10min
12	-30	5300.007661	5300.007605	5300.001776	5299.998760
12	-20	5299.998937	5300.006202	5300.000406	5299.996776
12	-10	5299.992896	5300.000094	5299.996311	5299.993096
12	0	5299.998795	5300.005413	5299.995654	5299.994908
12	10	5299.994989	5300.000137	5299.991356	5299.994363
12	20	5299.994009	5299.990600	5299.986253	5299.988933
12	30	5299.985427	5299.983430	5299.982780	5299.980035
12	40	5299.984885	5299.978611	5299.976933	5299.978624
12	50	5299.981341	5299.978070	5299.968359	5299.978132
5	20	5299.979640	5299.968865	5299.964520	5299.978004
18	20	5299.976219	5299.962548	5299.956059	5299.977779
Max. ΔMHz		-0.023781	-0.037452	-0.043941	-0.022221
PPM		-4.486981	-7.066415	-8.290755	-4.192642

Voltage (V)	Temperature (°C)	U-NII-2C Test Results			
		5580MHz			
		1min	2min	5min	10min
12	-30	5579.996311	5579.992033	5579.987756	5579.981107
12	-20	5579.991743	5579.986497	5579.977936	5579.974904
12	-10	5579.982910	5579.981231	5579.970506	5579.964987
12	0	5579.983153	5579.985302	5579.973834	5579.966981
12	10	5579.978443	5579.975511	5579.965064	5579.957866
12	20	5579.975691	5579.967213	5579.957992	5579.955027
12	30	5579.971156	5579.962912	5579.953267	5579.951081
12	40	5579.963014	5579.955863	5579.951853	5579.947126
12	50	5579.953063	5579.954000	5579.947216	5579.946568
5	20	5579.948415	5579.946366	5579.941853	5579.945190
18	20	5579.941991	5579.939742	5579.941604	5579.944600
Max. ΔMHz		-0.058009	-0.060258	-0.058396	-0.055400
PPM		-10.395878	-10.798925	-10.465233	-9.928315

Voltage (V)	Temperature (°C)	U-NII-3 Test Results			
		5785MHz			
		1min	2min	5min	10min
12	-30	5784.997071	5784.994482	5784.992222	5784.982999
12	-20	5784.993281	5784.989199	5784.991160	5784.982453
12	-10	5784.990342	5784.984295	5784.983222	5784.979989
12	0	5784.992620	5784.981240	5784.990336	5784.974990
12	10	5784.991453	5784.975115	5784.989885	5784.970253
12	20	5784.987686	5784.965651	5784.986184	5784.960508
12	30	5784.978466	5784.958066	5784.978690	5784.957434
12	40	5784.971805	5784.951102	5784.974715	5784.948107
12	50	5784.962765	5784.949655	5784.973291	5784.941427
5	20	5784.952778	5784.942496	5784.964416	5784.932261
18	20	5784.947520	5784.938575	5784.955844	5784.930453
Max. ΔMHz		-0.052480	-0.061425	-0.044156	-0.069547
PPM		-9.071737	-10.617978	-7.632844	-12.021953

5.4. Power Spectral Density

Ambient condition

Temperature	Relative humidity	Pressure
15°C ~ 35°C	20% ~ 80%	86 kPa ~ 106 kPa

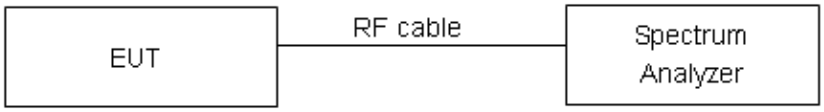
Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable.

Set RBW = 1MHz, VBW =3MHz for the band 5.150-5.250GHz, 5.250-5.350GHz, 5.470-5.725GHz.
Set RBW = 470kHz, VBW =1.5MHz for the band 5.725-5.850GHz

The conducted PSD is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

Test setup



Limits

Rule FCC Part 15.407(a)(1)/ FCC Part 15.407(a)(2) / FCC Part 15.407(a)(3)
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.
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.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, 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, the maximum power spectral density shall not exceed 30 dBm in any 500kHz band. If transmittingantennas 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.

Frequency Bands/GHz	Limits
5.15-5.25	17dBm/MHz
5.25-5.35 and 5.47-5.725	11dBm/MHz
5.725-5.85	30dBm/500kHz

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2, U= 0.75dB.

Test Results:

MIMO

U-NII-1

Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm/MHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11a	36/5180	6.00	6.00	5.64	5.64	8.83	15.77	PASS
	40/5200	6.21	6.21	5.58	5.58	8.92	15.77	PASS
	48/5240	6.14	6.14	5.55	5.55	8.87	15.77	PASS
802.11n HT20	36/5180	7.23	7.23	5.74	5.74	9.56	15.77	PASS
	40/5200	7.30	7.30	5.73	5.73	9.60	15.77	PASS
	48/5240	6.62	6.62	5.56	5.56	9.13	15.77	PASS
802.11n HT40	38/5190	5.45	5.45	4.23	4.23	7.89	15.77	PASS
	46/5230	5.53	5.53	4.19	4.19	7.92	15.77	PASS
802.11ac VHT20	36/5180	7.15	7.15	5.59	5.59	9.45	15.77	PASS
	40/5200	7.02	7.02	5.99	5.99	9.55	15.77	PASS
	48/5240	6.62	6.62	5.49	5.49	9.10	15.77	PASS
802.11ac VHT40	38/5190	4.55	4.55	3.33	3.33	6.99	15.77	PASS
	46/5230	4.22	4.22	3.38	3.38	6.83	15.77	PASS
802.11ac VHT80	42/5210	1.21	1.21	0.34	0.34	3.81	15.77	PASS
802.11ax HE20	36/5180	6.88	6.88	5.42	5.42	9.22	15.77	PASS
	40/5200	7.03	7.03	5.51	5.51	9.35	15.77	PASS
	48/5240	6.56	6.56	4.62	4.62	8.71	15.77	PASS
802.11ax HE40	38/5190	2.00	2.00	4.28	4.28	6.30	15.77	PASS
	46/5230	2.48	2.48	4.04	4.04	6.34	15.77	PASS
802.11ax HE80	42/5210	-0.84	-0.84	1.20	1.20	3.31	15.77	PASS
802.11be EHT20	36/5180	3.58	3.58	6.23	6.23	8.11	15.77	PASS
	40/5200	3.69	3.69	5.97	5.97	7.99	15.77	PASS
	48/5240	3.73	3.73	5.66	5.66	7.81	15.77	PASS
802.11be EHT40	38/5190	1.11	1.11	3.29	3.29	5.35	15.77	PASS
	46/5230	1.43	1.43	3.36	3.36	5.51	15.77	PASS
802.11be EHT80	42/5210	-1.66	-1.66	0.42	0.42	2.51	15.77	PASS

Note: 1. Power Spectral Density =Read Value + Duty cycle correction factor

2.For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a),

the power spectral density=$10\log(10^{(\text{PSD antenna1 in dBm/10})}+10^{(\text{PSD antenna2 in dBm/10})}$

3. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the Highest gain.

Directional gain = G_{ANTMAX}+ Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So directional gain=$G_{ANT\ MAX}$+ Array Gain=4.22+10log(2/1)=7.23>6 dBi.

So the PSD limit is 11-(Directional gain-6 dBi) =17-(7.23-6)=15.77 dBm

U-NII-2A

Mode	Channel /Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11a	52/5260	7.08	7.08	6.18	6.18	9.66	9.77	PASS
	60/5300	7.25	7.25	5.87	5.87	9.62	9.77	PASS
	64/5320	7.09	7.09	6.22	6.22	9.69	9.77	PASS
802.11n HT20	52/5260	6.69	6.69	5.48	5.48	9.14	9.77	PASS
	60/5300	6.83	6.83	4.97	4.97	9.01	9.77	PASS
	64/5320	6.79	6.79	4.70	4.70	8.88	9.77	PASS
802.11n HT40	54/5270	5.49	5.49	3.69	3.69	7.69	9.77	PASS
	62/5310	5.08	5.08	3.48	3.48	7.36	9.77	PASS
802.11ac VHT20	52/5260	6.80	6.80	5.00	5.00	9.00	9.77	PASS
	60/5300	6.48	6.48	4.45	4.45	8.59	9.77	PASS
	64/5320	6.63	6.63	4.54	4.54	8.72	9.77	PASS
802.11ac VHT40	54/5270	4.40	4.40	2.88	2.88	6.72	9.77	PASS
	62/5310	3.92	3.92	2.51	2.51	6.28	9.77	PASS
802.11ac VHT80	58/5290	1.43	1.43	-0.24	-0.24	3.69	9.77	PASS
802.11ac VHT160	50/5250	-2.98	-2.98	-2.76	-2.76	0.14	9.77	PASS
802.11ax HE20	52/5260	5.68	5.68	4.41	4.41	8.10	9.77	PASS
	60/5300	5.88	5.88	3.90	3.90	8.01	9.77	PASS
	64/5320	5.52	5.52	3.85	3.85	7.78	9.77	PASS
802.11ax HE40	54/5270	3.47	3.47	1.84	1.84	5.74	9.77	PASS
	62/5310	2.86	2.86	1.23	1.23	5.13	9.77	PASS
802.11ax HE80	58/5290	0.00	0.00	-1.14	-1.14	2.48	9.77	PASS
802.11ax HE160	50/5250	-3.92	-3.92	-2.25	-2.25	0.01	9.77	PASS
802.11be EHT20	52/5260	4.71	4.71	3.56	3.56	7.18	9.77	PASS
	60/5300	4.36	4.36	2.66	2.66	6.60	9.77	PASS
	64/5320	4.61	4.61	2.90	2.90	6.85	9.77	PASS
802.11be EHT40	54/5270	2.25	2.25	0.51	0.51	4.48	9.77	PASS
	62/5310	1.90	1.90	0.32	0.32	4.19	9.77	PASS
802.11be EHT80	58/5290	-0.85	-0.85	-1.86	-1.86	1.68	9.77	PASS
802.11be EHT160	50/5250	-4.27	-4.27	-3.47	-3.47	-0.84	9.77	PASS

Note: 1. Power Spectral Density =Read Value + Duty cycle correction factor

2.For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a),

the power spectral density=$10\log(10^{(\text{PSD antenna1 in dBm/10})}+10^{(\text{PSD antenna2 in dBm/10})}$

3. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain

may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the Highest gain.

Directional gain = G_{ANTMAX}+ Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So directional gain=$G_{ANT\ MAX}$+ Array Gain=4.22+10log(2/1)=7.23>6 dBi.

So the PSD limit is 11-(Directional gain-6 dBi) =11-(7.23-6)=9.77 dBm.

U-NII-2C

Mode	Channel /Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 7		Antenna 11		Total PSD (dBm/MHz)		
		Read Value (dBm/MHz)	PSD (dBm/MHz)	Read Value (dBm/MHz)	PSD (dBm/MHz)			
802.11a	100/5500	6.92	6.92	6.50	6.50	9.73	9.89	PASS
	120/5600	6.72	6.72	6.52	6.52	9.63	9.89	PASS
	140/5700	6.24	6.24	7.37	7.37	9.85	9.89	PASS
	144/5720	6.27	6.27	6.01	6.01	9.15	9.89	PASS
802.11n HT20	100/5500	6.05	6.05	6.40	6.40	9.24	9.89	PASS
	120/5600	7.32	7.32	6.03	6.03	9.73	9.89	PASS
	140/5700	6.00	6.00	6.80	6.80	9.43	9.89	PASS
	144/5720	6.14	6.14	6.51	6.51	9.34	9.89	PASS
802.11n HT40	102/5510	4.13	4.13	4.21	4.21	7.18	9.89	PASS
	118/5590	5.83	5.83	4.80	4.80	8.36	9.89	PASS
	134/5670	5.33	5.33	5.97	5.97	8.67	9.89	PASS
	142/5710	4.73	4.73	5.13	5.13	7.94	9.89	PASS
802.11ac VHT20	100/5500	5.19	5.19	5.06	5.06	8.14	9.89	PASS
	120/5600	7.27	7.27	5.79	5.79	9.60	9.89	PASS
	140/5700	6.26	6.26	7.31	7.31	9.83	9.89	PASS
	144/5720	6.37	6.37	7.06	7.06	9.74	9.89	PASS
802.11ac VHT40	102/5510	2.85	2.85	2.70	2.70	5.79	9.89	PASS
	118/5590	4.60	4.60	3.76	3.76	7.21	9.89	PASS
	134/5670	4.09	4.09	4.57	4.57	7.35	9.89	PASS
	142/5710	4.20	4.20	4.02	4.02	7.12	9.89	PASS
802.11ac VHT80	106/5530	1.00	1.00	0.83	0.83	3.93	9.89	PASS
	122/5610	1.51	1.51	1.34	1.34	4.44	9.89	PASS
	138/5690	0.63	0.63	0.68	0.68	3.67	9.89	PASS
802.11ac VHT160	114/5570	-1.82	-1.82	-1.64	-1.64	1.28	9.89	PASS
802.11ax HE20	100/5500	3.63	3.63	4.43	4.43	7.06	9.89	PASS
	120/5600	5.86	5.86	4.47	4.47	8.23	9.89	PASS
	140/5700	5.43	5.43	6.53	6.53	9.03	9.89	PASS
	144/5720	5.05	5.05	5.98	5.98	8.55	9.89	PASS
802.11ax HE40	102/5510	1.87	1.87	1.94	1.94	4.92	9.89	PASS
	118/5590	3.92	3.92	2.03	2.03	6.09	9.89	PASS

	134/5670	3.17	3.17	3.41	3.41	6.30	9.89	PASS
	142/5710	2.65	2.65	3.06	3.06	5.87	9.89	PASS
802.11ax HE80	106/5530	-0.42	-0.42	-0.38	-0.38	2.61	9.89	PASS
	122/5610	0.43	0.43	0.01	0.01	3.24	9.89	PASS
	138/5690	-0.37	-0.37	-0.30	-0.30	2.68	9.89	PASS
802.11ax HE160	114/5570	-2.82	-2.82	-2.83	-2.83	0.19	9.89	PASS
802.11be HE20	100/5500	2.89	2.89	3.40	3.40	6.16	9.89	PASS
	120/5600	4.95	4.95	3.61	3.61	7.34	9.89	PASS
	140/5700	4.51	4.51	5.41	5.41	7.99	9.89	PASS
	144/5720	4.05	4.05	4.66	4.66	7.38	9.89	PASS
802.11be HE40	102/5510	0.95	0.95	0.90	0.90	3.94	9.89	PASS
	118/5590	2.38	2.38	1.28	1.28	4.88	9.89	PASS
	134/5670	1.80	1.80	2.51	2.51	5.18	9.89	PASS
	142/5710	1.91	1.91	2.02	2.02	4.98	9.89	PASS
802.11be HE80	106/5530	-1.36	-1.36	-1.19	-1.19	1.74	9.89	PASS
	122/5610	-0.32	-0.32	-0.78	-0.78	2.47	9.89	PASS
	138/5690	-1.42	-1.42	-0.99	-0.99	1.81	9.89	PASS
802.11be HE160	114/5570	-3.94	-3.94	-3.69	-3.69	-0.80	9.89	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a),

the power spectral density=$10\log(10^{(\text{PSD antenna1 in dBm/10})}+10^{(\text{PSD antenna2 in dBm/10})}$

3. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the Highest gain.

Directional gain = G_{ANTMAX}+ Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

So directional gain=$G_{ANT\ MAX}$+ Array Gain=4.10+10log(2/1)=7.11>6 dBi.

So the PSD limit is 11-(Directional gain-6 dBi) =11-(7.11-6)=9.89 dBm.

U-NII-3

Mode	Channel /Frequency (MHz)	Power Spectral Density					Limit (dBm/ 500kHz)	Conclusion
		Antenna 1		Antenna 2		Total PSD (dBm/ 500kHz)		
		Read Value (dBm/ 470kHz)	PSD (dBm/ 500kHz)	Read Value (dBm/ 470kHz)	PSD (dBm/ 500kHz)			
802.11a	144/5720	-0.76	-0.49	-0.27	0.00	2.77	27.01	PASS
	149/5745	7.15	7.42	6.84	7.11	10.28	27.01	PASS
	157/5785	7.46	7.73	7.22	7.49	10.62	27.01	PASS
	165/5825	7.45	7.72	7.04	7.31	10.53	27.01	PASS
802.11n HT20	144/5720	-1.3	-1.03	0.89	1.16	3.21	27.01	PASS
	149/5745	3.88	4.15	4.22	4.49	7.33	27.01	PASS
	157/5785	4.72	4.99	4.15	4.42	7.72	27.01	PASS
	165/5825	4.97	5.24	4.52	4.79	8.03	27.01	PASS
802.11n HT40	142/5710	-1.03	-0.76	-2.29	-2.02	1.67	27.01	PASS
	151/5755	1.78	2.05	1.37	1.64	4.86	27.01	PASS
	159/5795	2.06	2.33	1.56	1.83	5.10	27.01	PASS
802.11ac VHT20	144/5720	-1.33	-1.06	0.49	0.76	2.95	27.01	PASS
	149/5745	2.91	3.18	3.13	3.40	6.30	27.01	PASS
	157/5785	3.73	4.00	3.33	3.60	6.81	27.01	PASS
	165/5825	3.56	3.83	3.69	3.96	6.91	27.01	PASS
802.11ac VHT40	142/5710	-2.03	-1.76	-3.38	-3.11	0.63	27.01	PASS
	151/5755	0.53	0.80	0.36	0.63	3.73	27.01	PASS
	159/5795	0.85	1.12	0.81	1.08	4.11	27.01	PASS
802.11ac VHT80	138/5690	-5.78	-5.51	-7.32	-7.05	-3.20	27.01	PASS
	155/5775	-2.02	-1.75	-2.54	-2.27	1.01	27.01	PASS
802.11ax HE20	144/5720	-1.89	-1.62	-0.55	-0.28	2.11	27.01	PASS
	149/5745	2.42	2.69	2.06	2.33	5.52	27.01	PASS
	157/5785	2.27	2.54	1.99	2.26	5.41	27.01	PASS
	165/5825	2.9	3.17	2.44	2.71	5.96	27.01	PASS
802.11ax HE40	142/5710	-3.27	-3.00	-4.44	-4.17	-0.54	27.01	PASS
	151/5755	-0.46	-0.19	-0.49	-0.22	2.81	27.01	PASS
	159/5795	0.29	0.56	-0.38	-0.11	3.25	27.01	PASS
802.11ax HE80	138/5690	-6.81	-6.54	-8.37	-8.10	-4.24	27.01	PASS
	155/5775	-2.7	-2.43	-3.6	-3.33	0.15	27.01	PASS
802.11be EHT20	144/5720	-2.47	-2.20	-1.62	-1.35	1.26	27.01	PASS
	149/5745	1.22	1.49	0.99	1.26	4.39	27.01	PASS
	157/5785	1.67	1.94	0.83	1.10	4.55	27.01	PASS
	165/5825	1.53	1.80	1.8	2.07	4.95	27.01	PASS
802.11be EHT40	142/5710	-4.31	-4.04	-5.4	-5.13	-1.54	27.01	PASS
	151/5755	-1.22	-0.95	-1.65	-1.38	1.85	27.01	PASS

	159/5795	-1.08	-0.81	-1.17	-0.90	2.16	27.01	PASS
802.11be EHT80	138/5690	-8.06	-7.79	-8.98	-8.71	-5.22	27.01	PASS
	155/5775	-4.24	-3.97	-4.68	-4.41	-1.17	27.01	PASS

Note:1. Power Spectral Density =Read Value + Duty cycle correction factor +10*log(500/470).

2.For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a),

the power spectral density=$10\log(10^{(\text{PSD antenna1 in dBm/10})}+10^{(\text{PSD antenna2 in dBm/10})}$

3. According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)(ii): If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the Highest gain.

Directional gain = G_{ANTMAX}+ Array Gain, For PSD measurements on all devices, Array Gain=10log(Nant/Nss)dB,

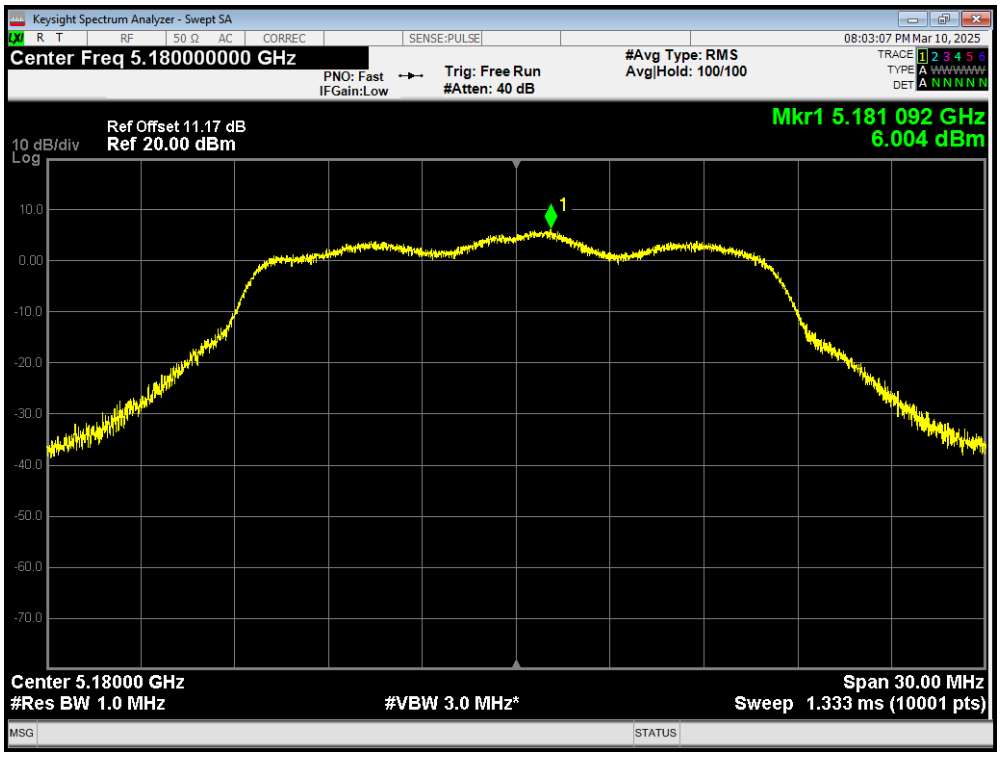
So directional gain=$G_{ANT\ MAX}$+ Array Gain=5.98+10log(2/1)=8.99>6 dBi.

So the PSD limit is 30-(Directional gain-6 dBi) =30-(8.99-6)=27.01 dBm.

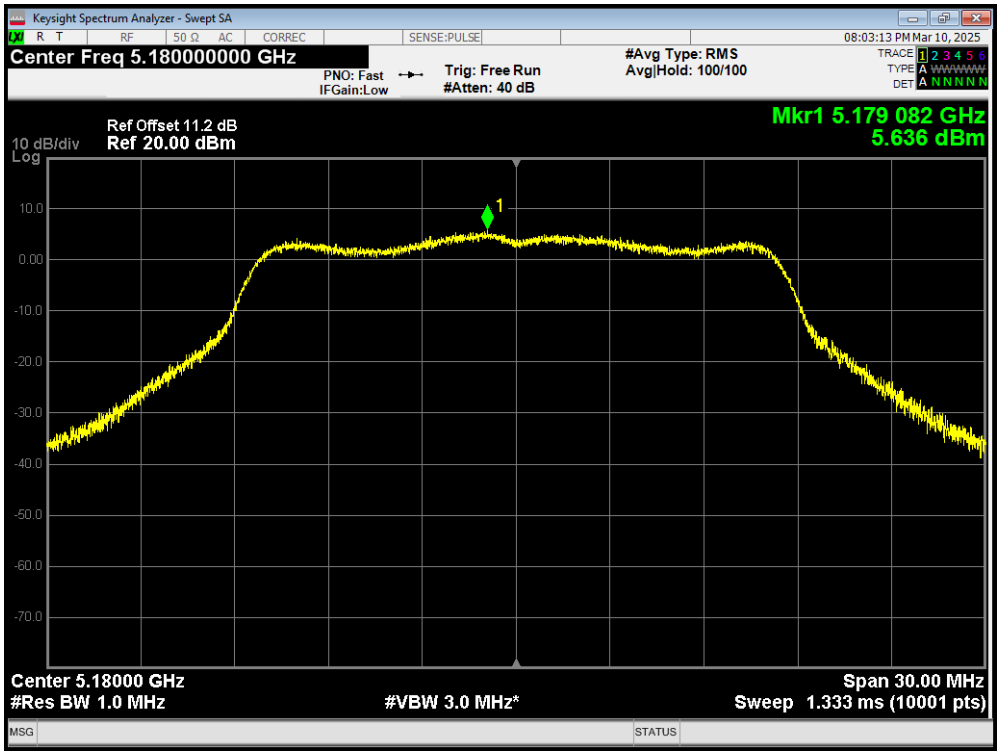
MIMO

U-NII-1

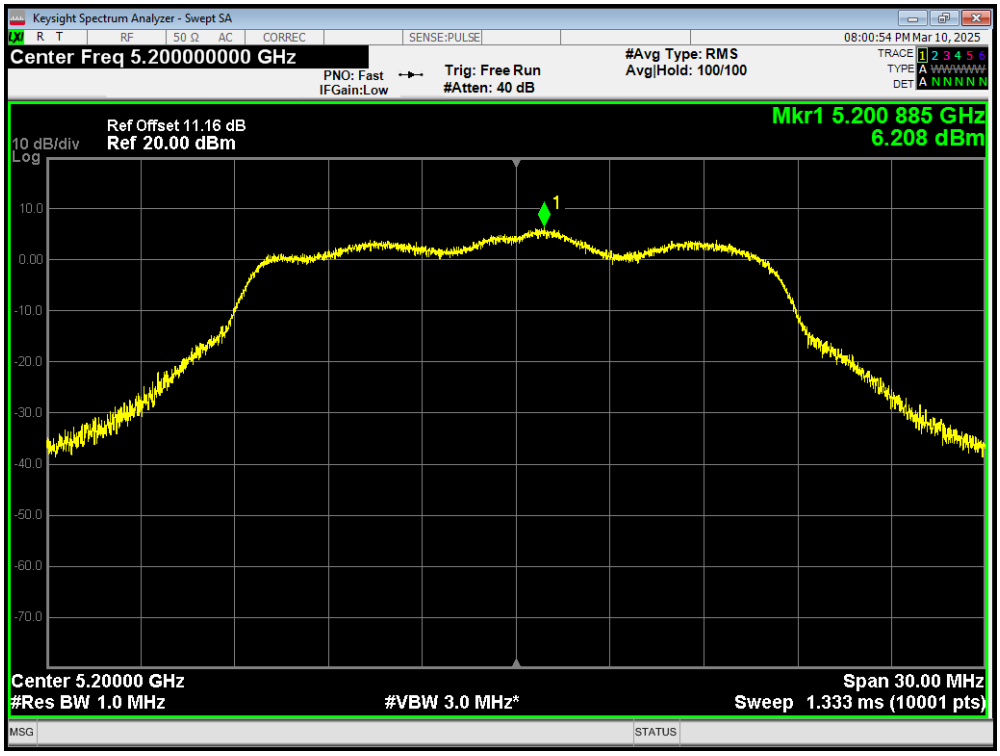
PSD 802.11a 5180MHz Ant1



PSD 802.11a 5180MHz Ant2



PSD 802.11a 5200MHz Ant1



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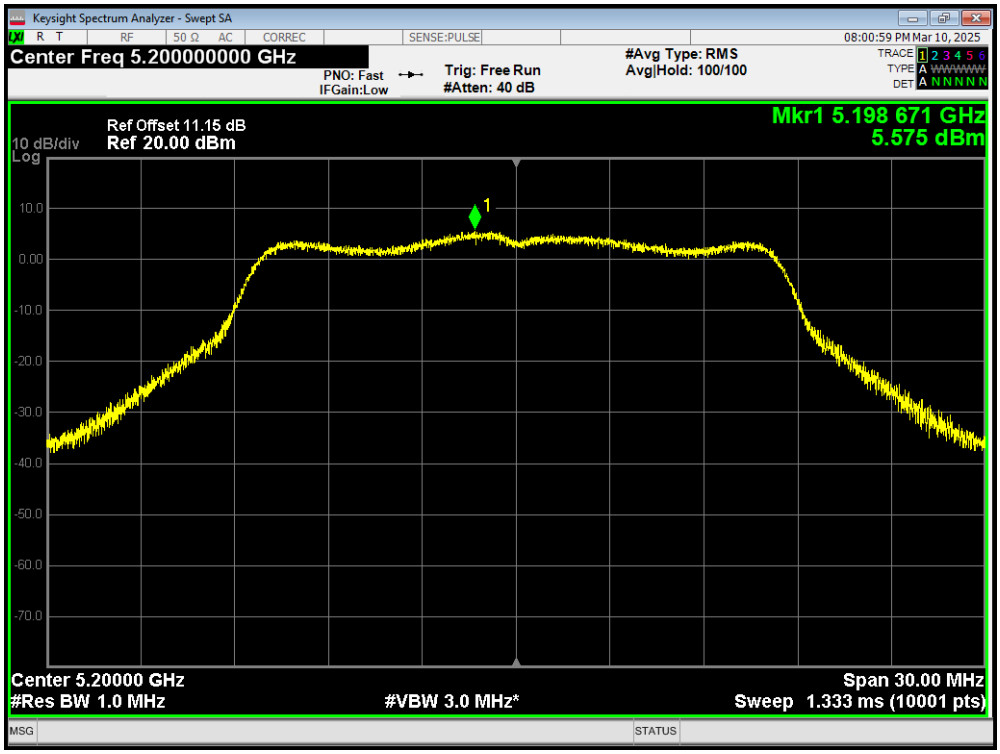
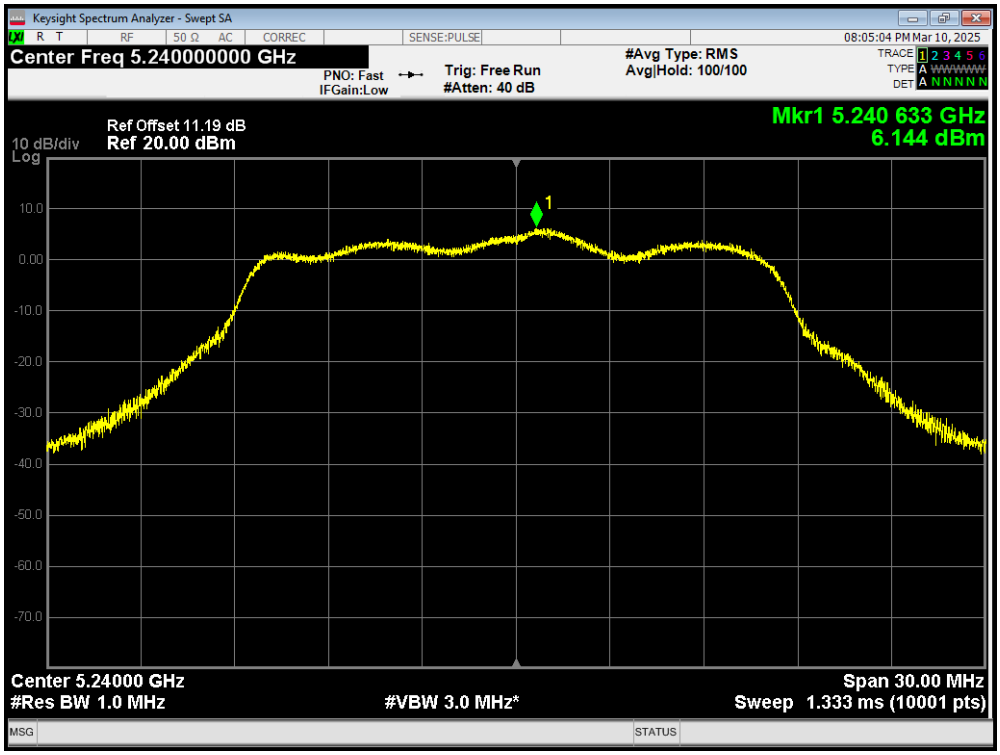
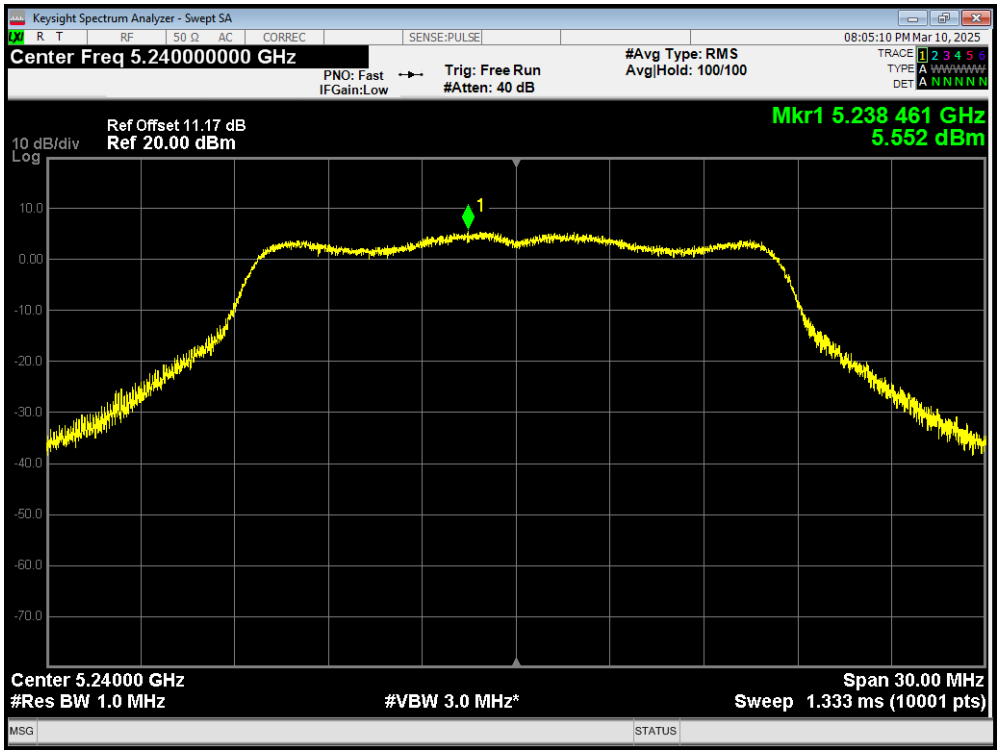


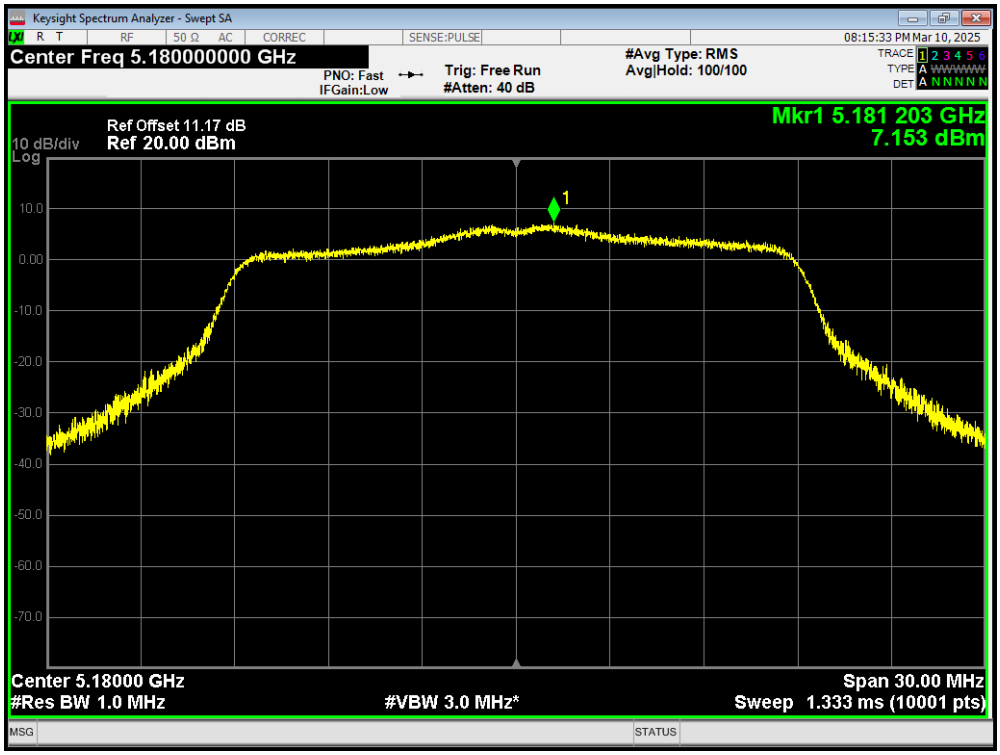
PSD 802.11a 5240MHz Ant1



PSD 802.11a 5240MHz Ant2



PSD 802.11ac(VHT20) 5180MHz Ant1



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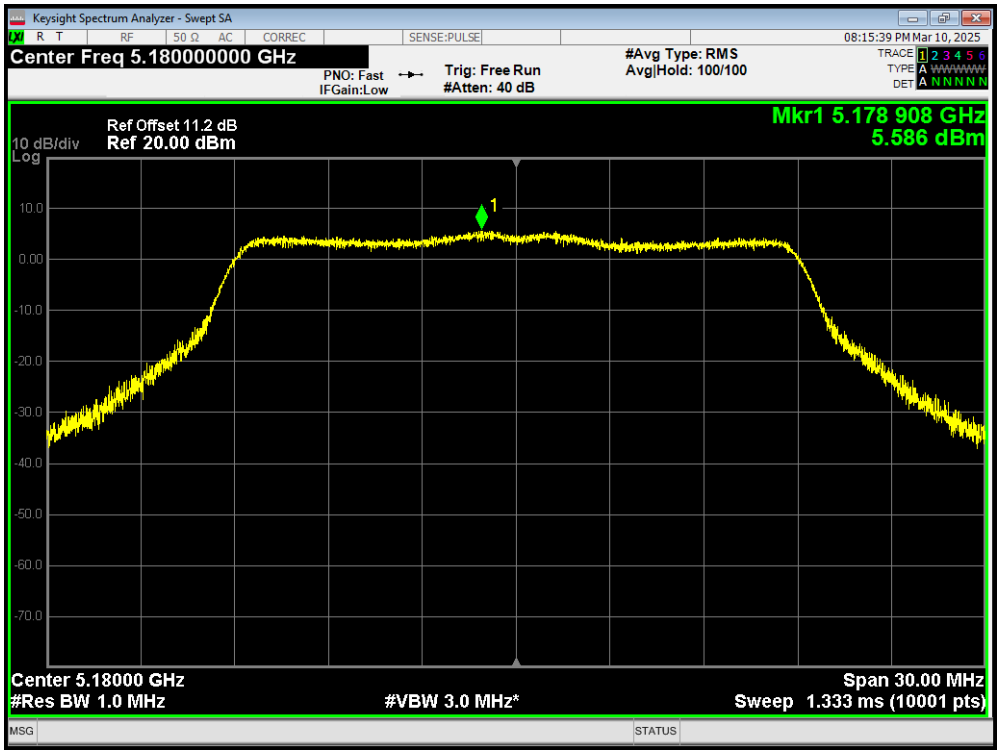

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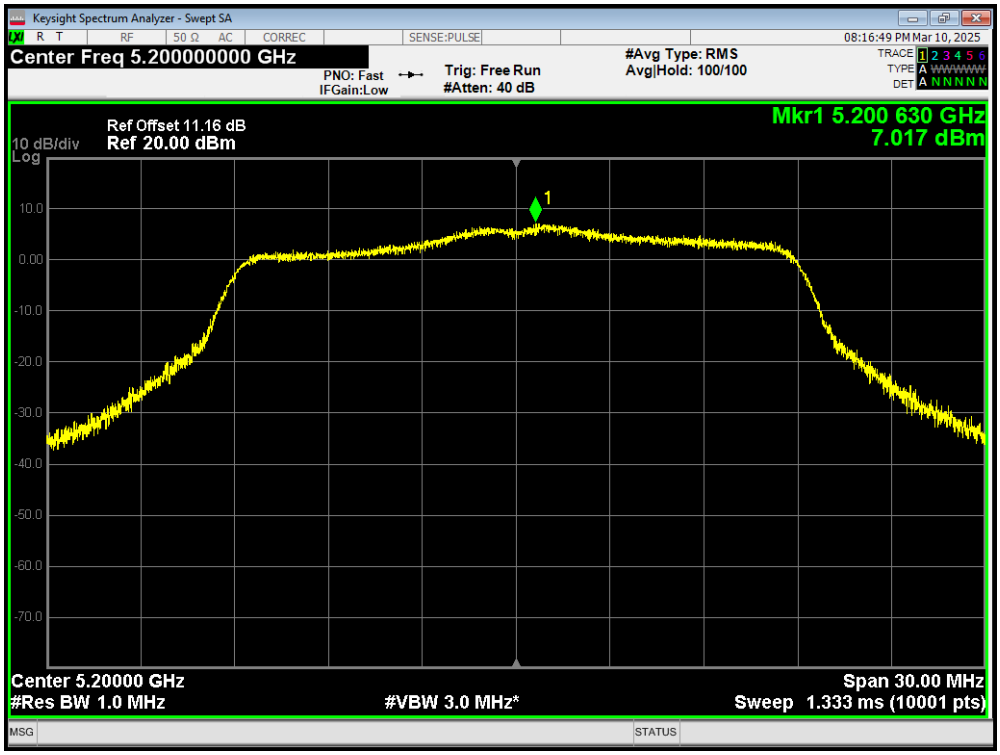

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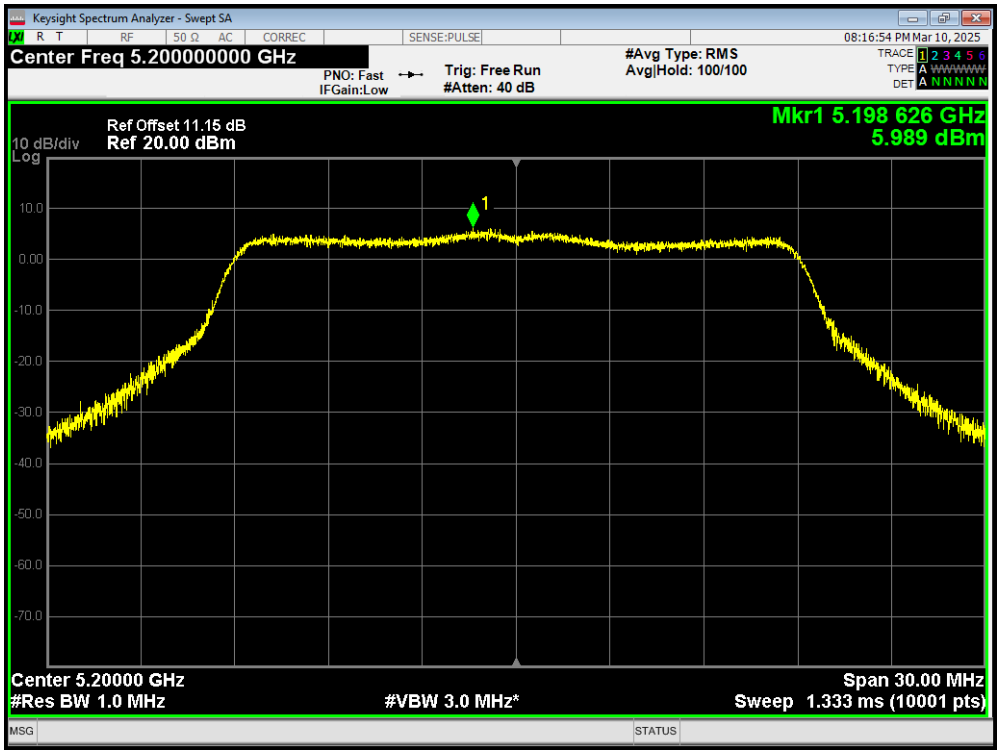
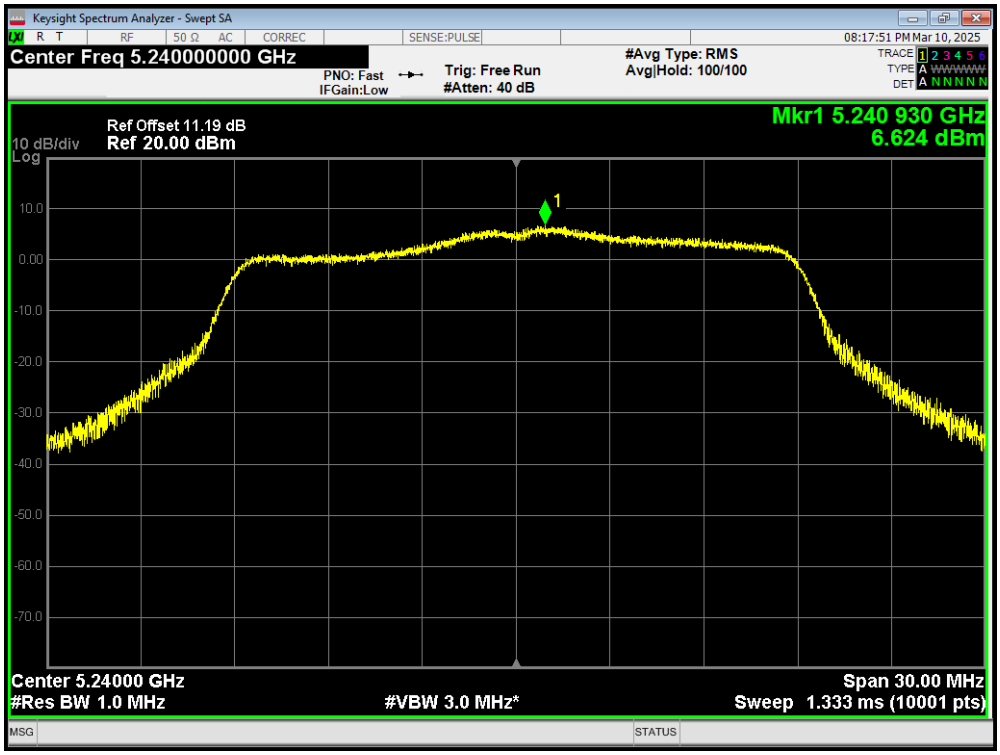


PSD 802.11ac(VHT20) 5240MHz Ant1



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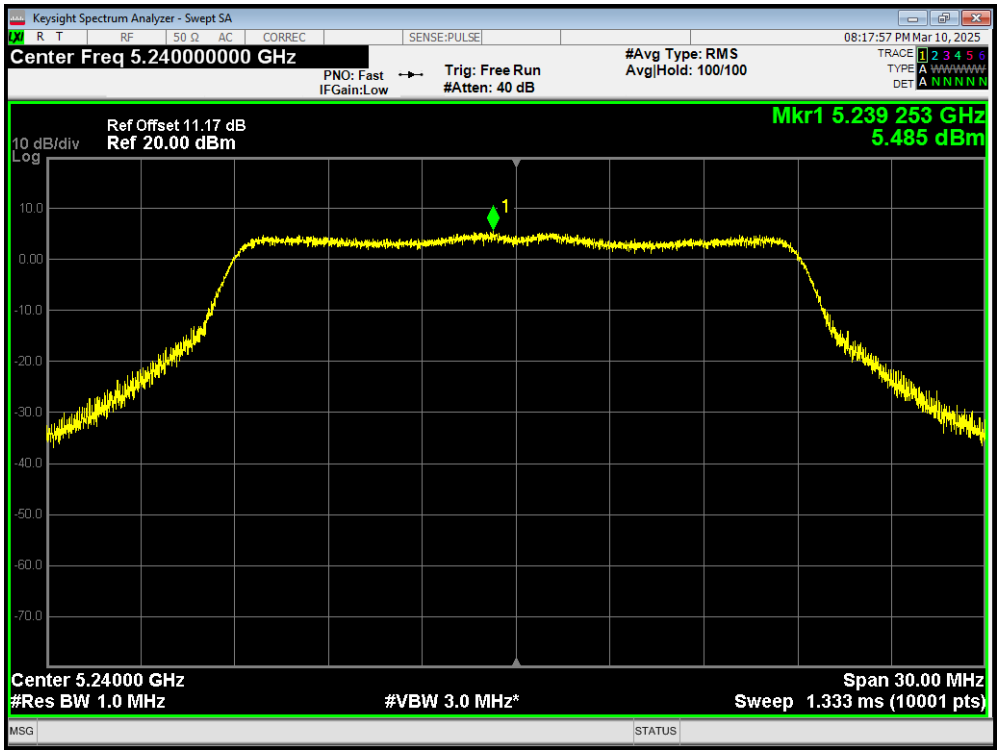
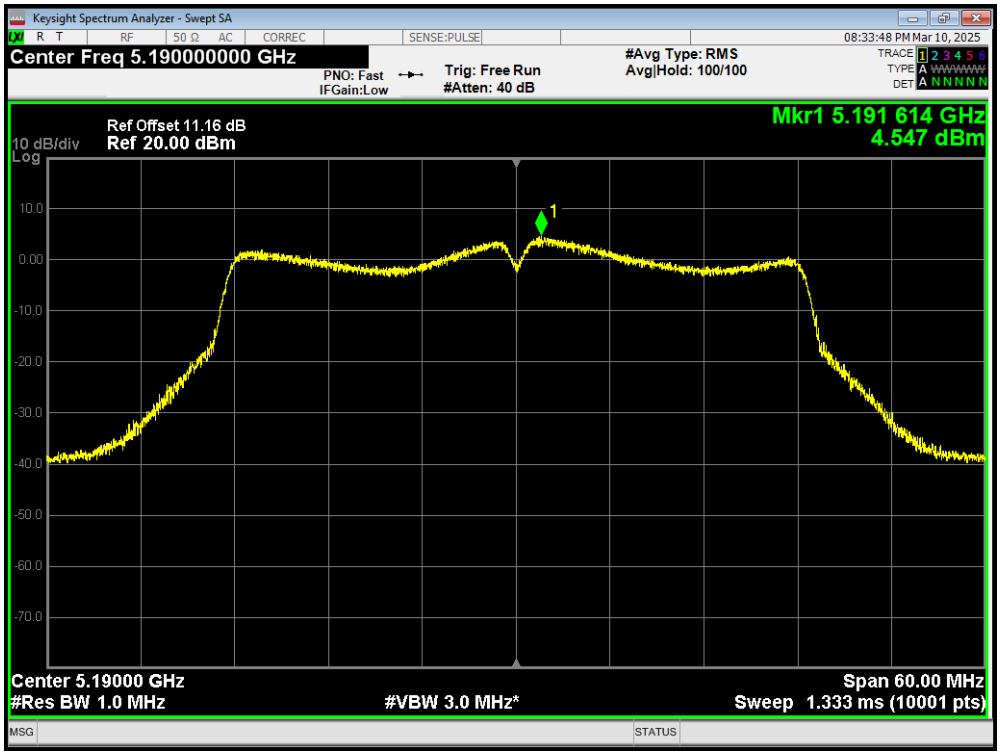
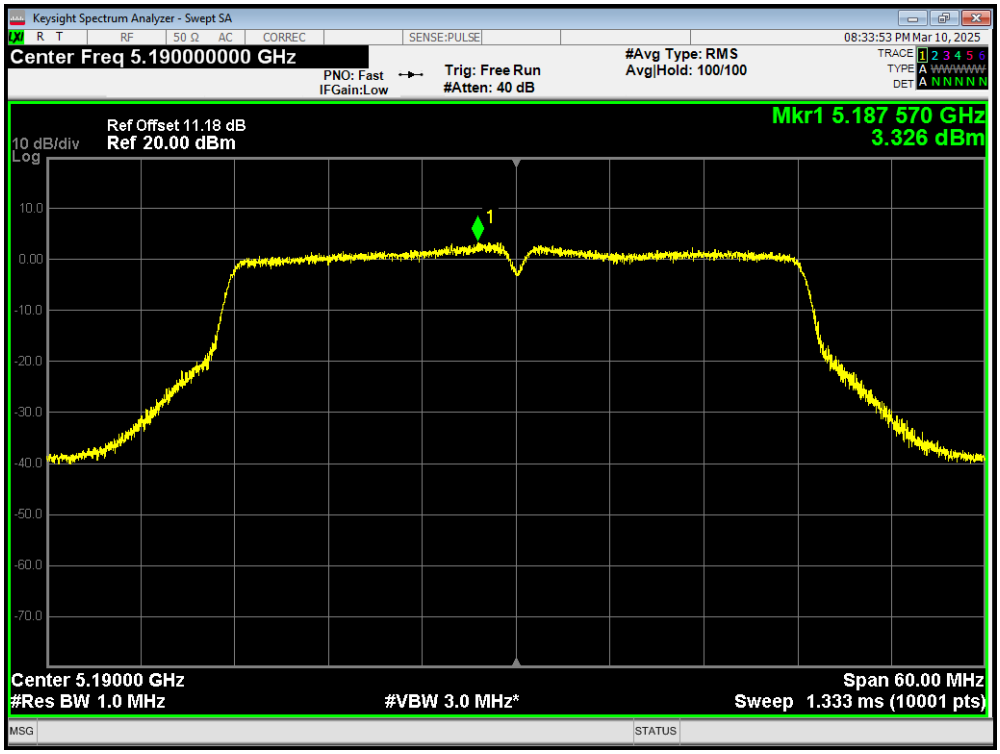


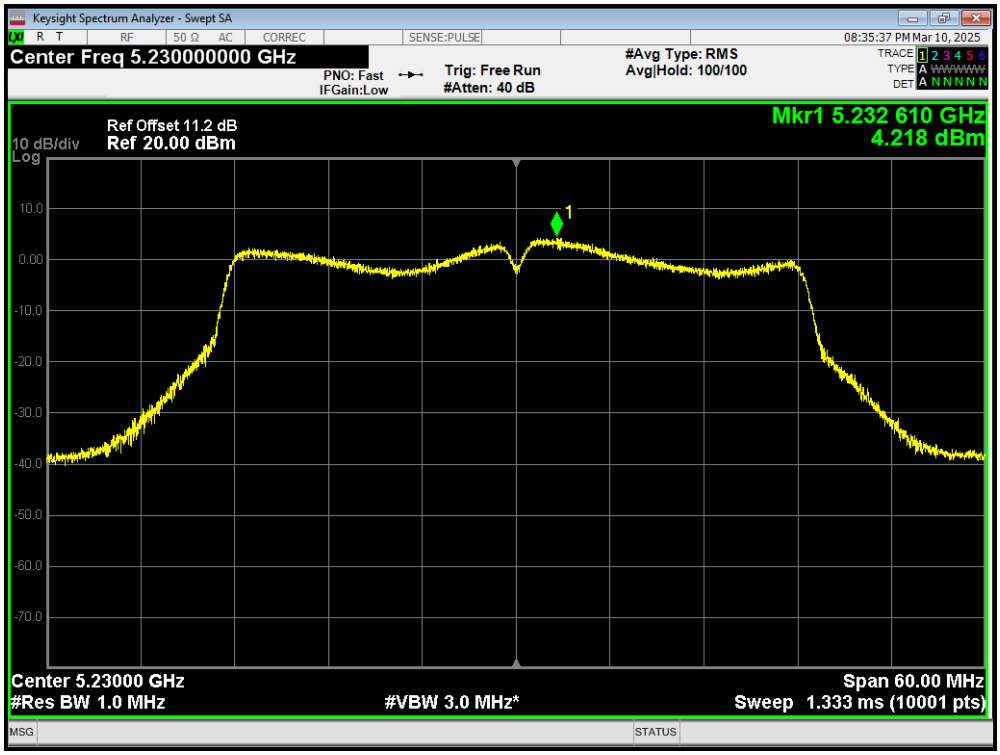
PSD 802.11ac(VHT40) 5190MHz Ant1



PSD 802.11ac(VHT40) 5190MHz Ant2



PSD 802.11ac(VHT40) 5230MHz Ant1



PSD 802.11ac(VHT40) 5230MHz Ant2