

Appendix D

RF Test Data for 5.2G WLAN (Conducted Measurement)

Product Name: IPTV Receiver

Trade Mark: FORMULER

Test Model: Z ALPHA

Environmental Conditions

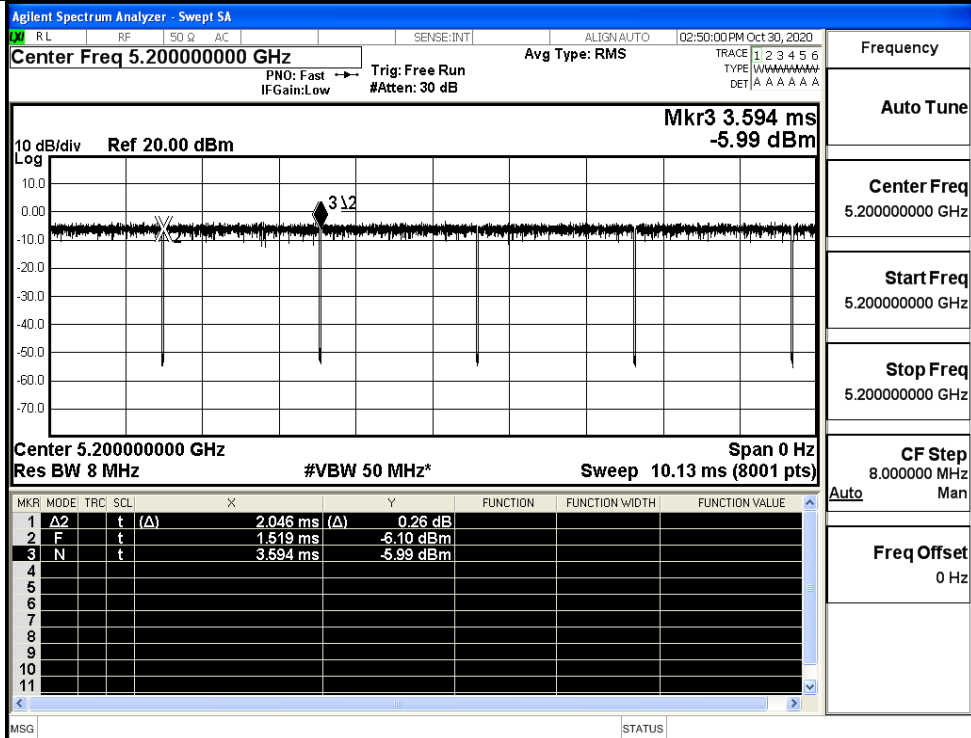
Temperature:	24.6° C
Relative Humidity:	54.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Ken He
Supervised by:	Li Huan

D.1 Duty Cycle

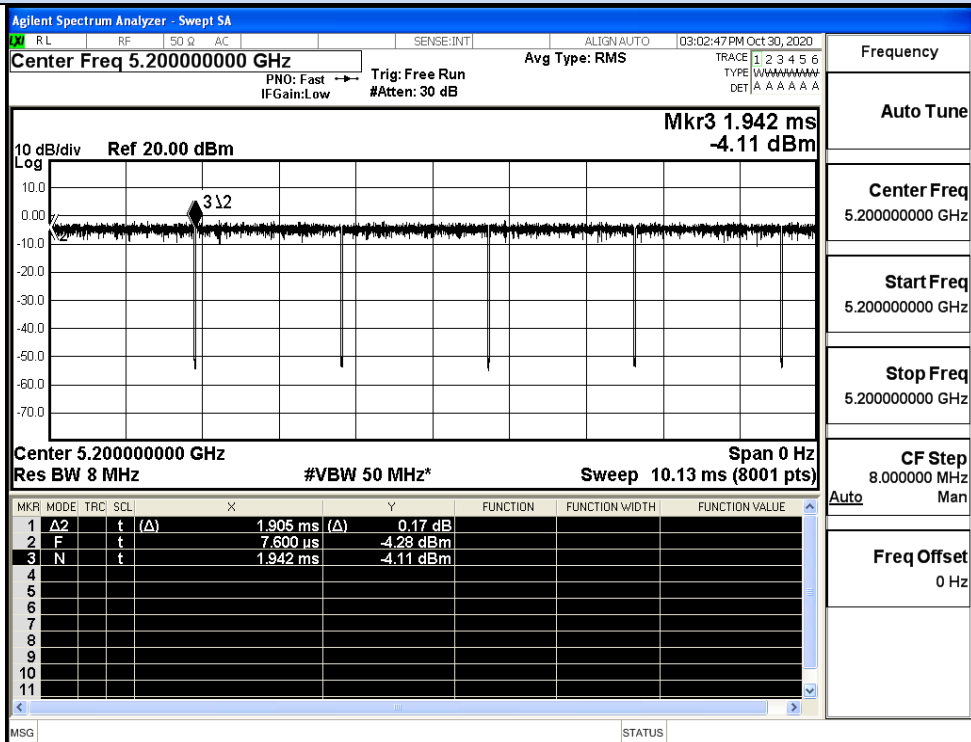
ANT 0

Test Mode	Test Frequency (MHz)	Duty Cycle (%)	10log(1/x) Factor (dB)	1/B Minimum VBW(KHz)
11A	5200	98.6	0	0.01
11N20 SISO	5200	98.49	0	0.01
11N40 SISO	5190	98.17	0	0.01
11AC20 SISO	5200	98.44	0	0.01
11AC40 SISO	5190	98.09	0	0.01
11AC80 SISO	5210	93.72	0.28	0.01

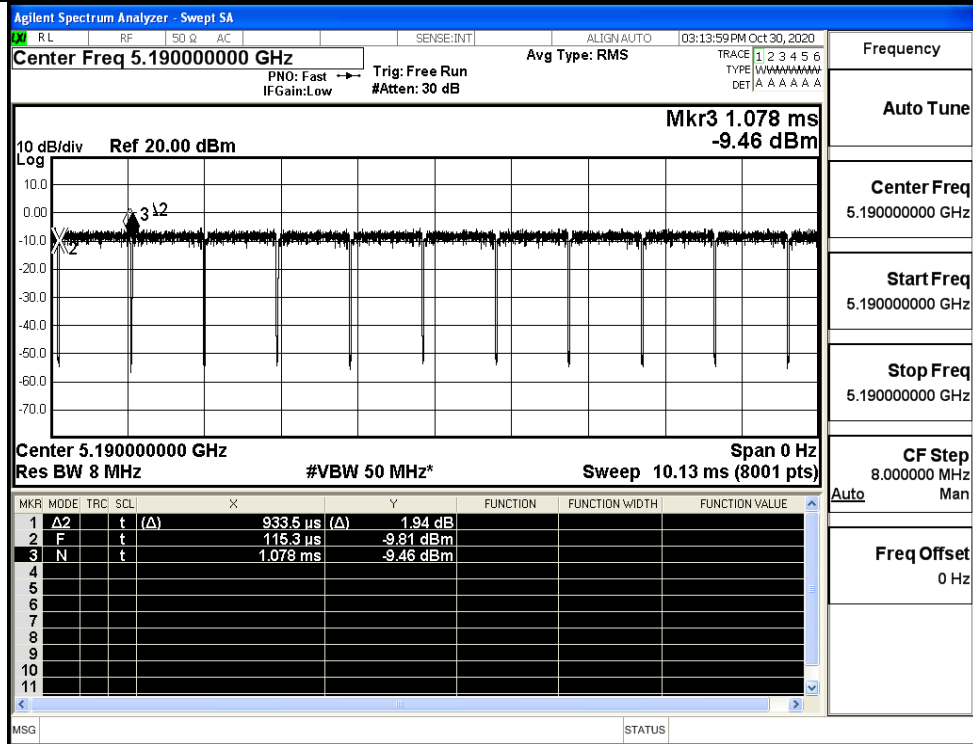
On Time and Duty Cycle



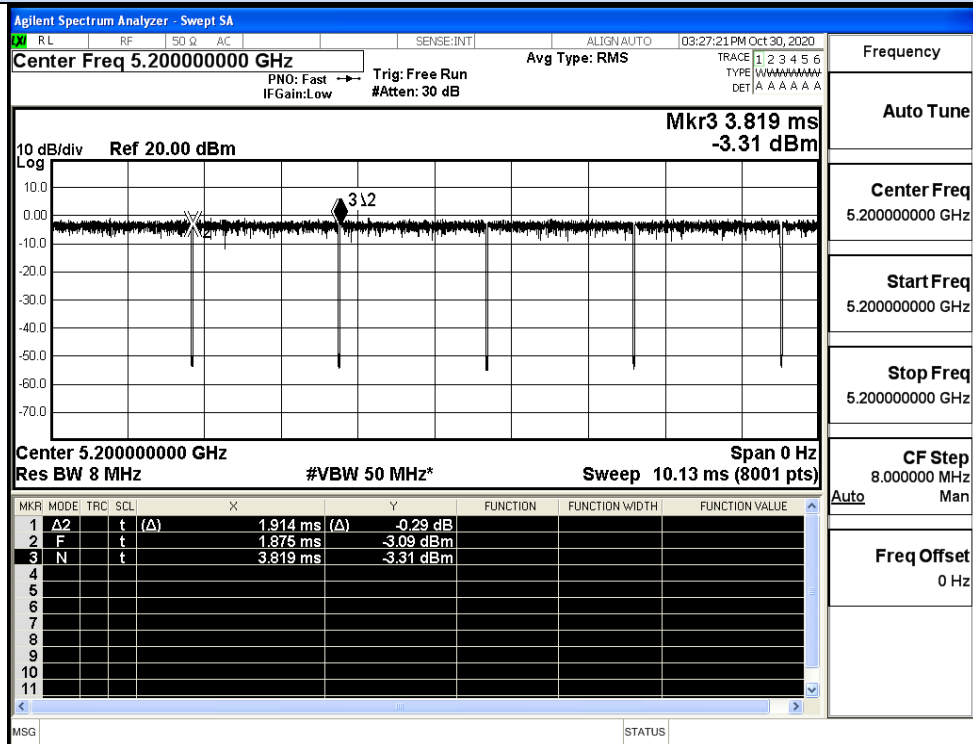
IEEE 802.11a



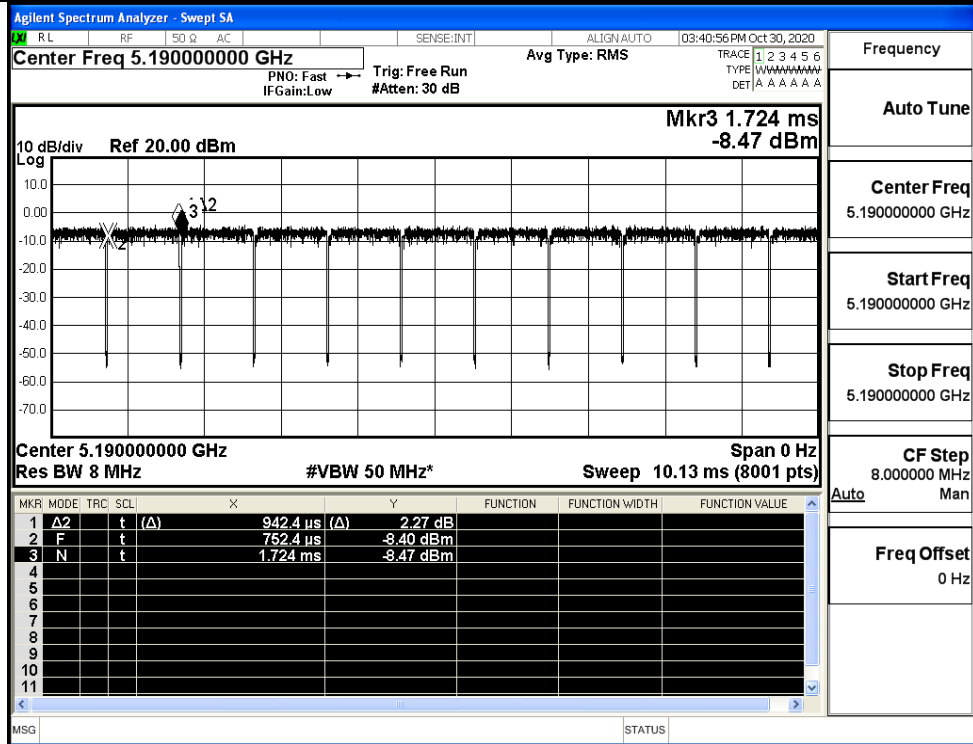
IEEE 802.11n HT20



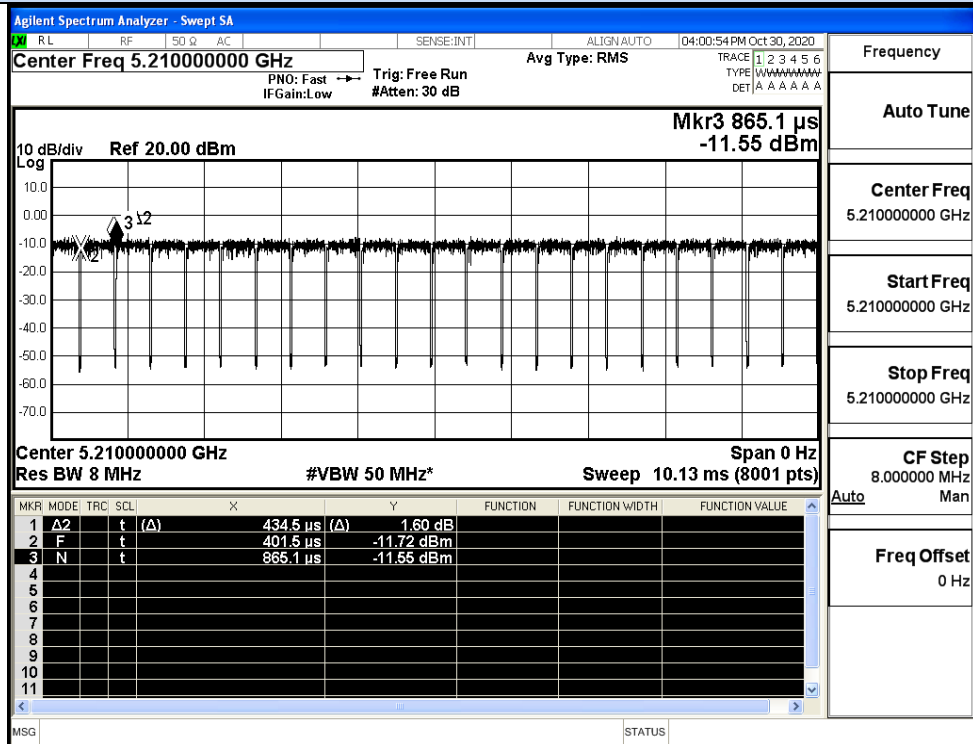
IEEE 802.11n HT40



IEEE 802.11AC20



IEEE 802.11 AC40

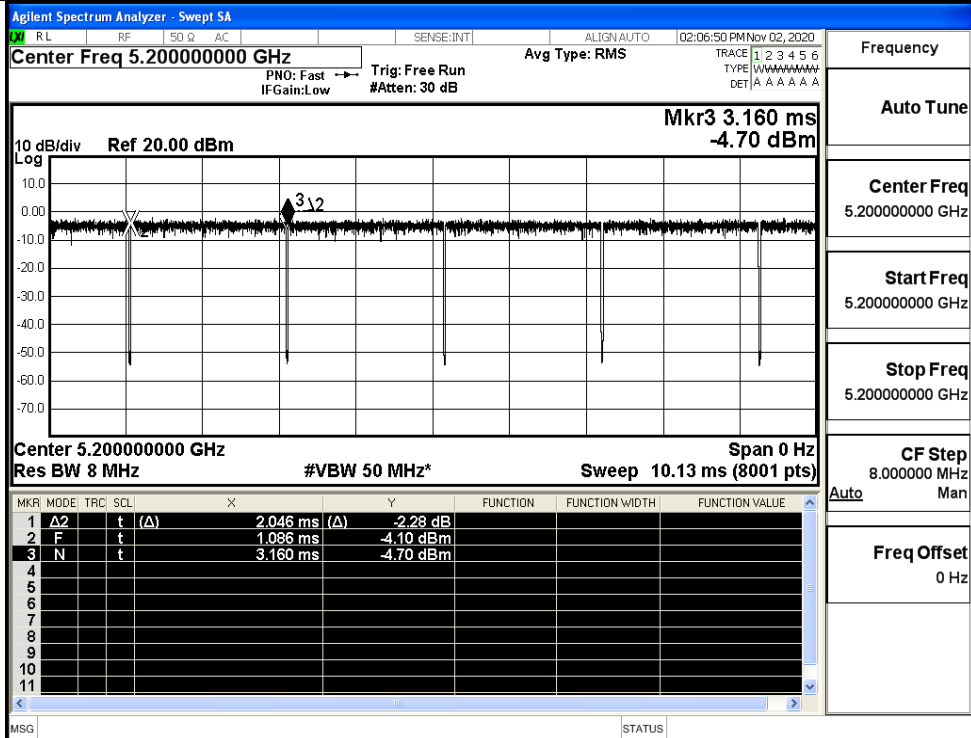


IEEE 802.11AC80

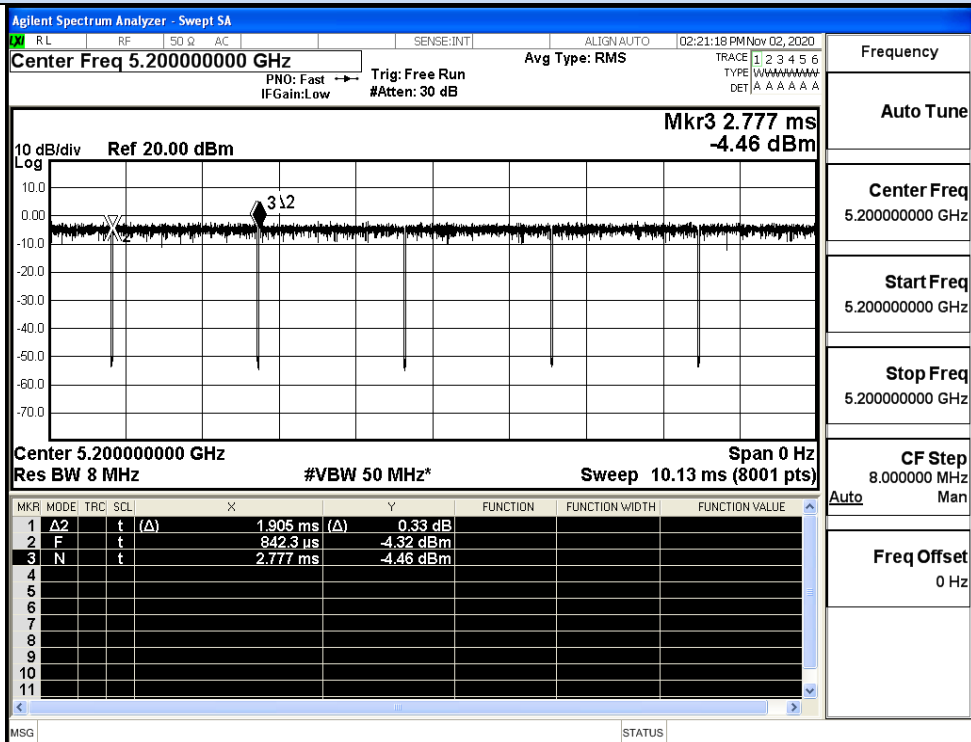
ANT 1

Test Mode	Test Frequency (MHz)	Duty Cycle (%)	10log(1/x) Factor (dB)	1/B Minimum VBW(KHz)
11A	5200	98.6	0	0.01
11N20 SISO	5200	98.49	0	0.01
11N40 SISO	5190	98.05	0	0.01
11AC20 SISO	5200	98.44	0	0.01
11AC40 SISO	5190	98.12	0	0.01
11AC80 SISO	5210	93.72	0.28	0.01

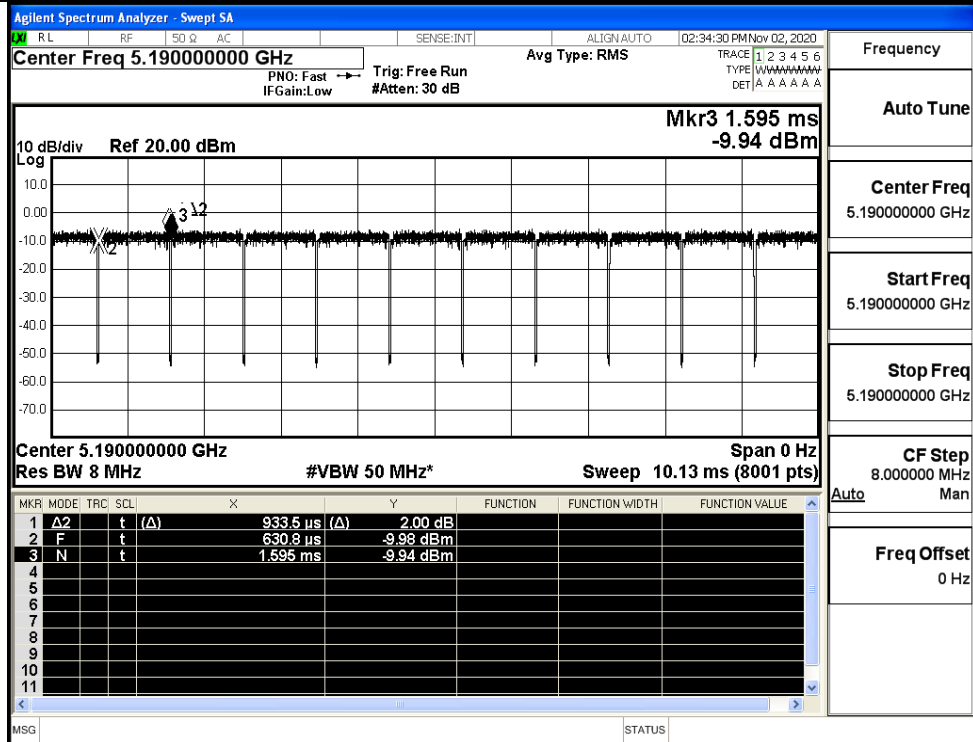
On Time and Duty Cycle



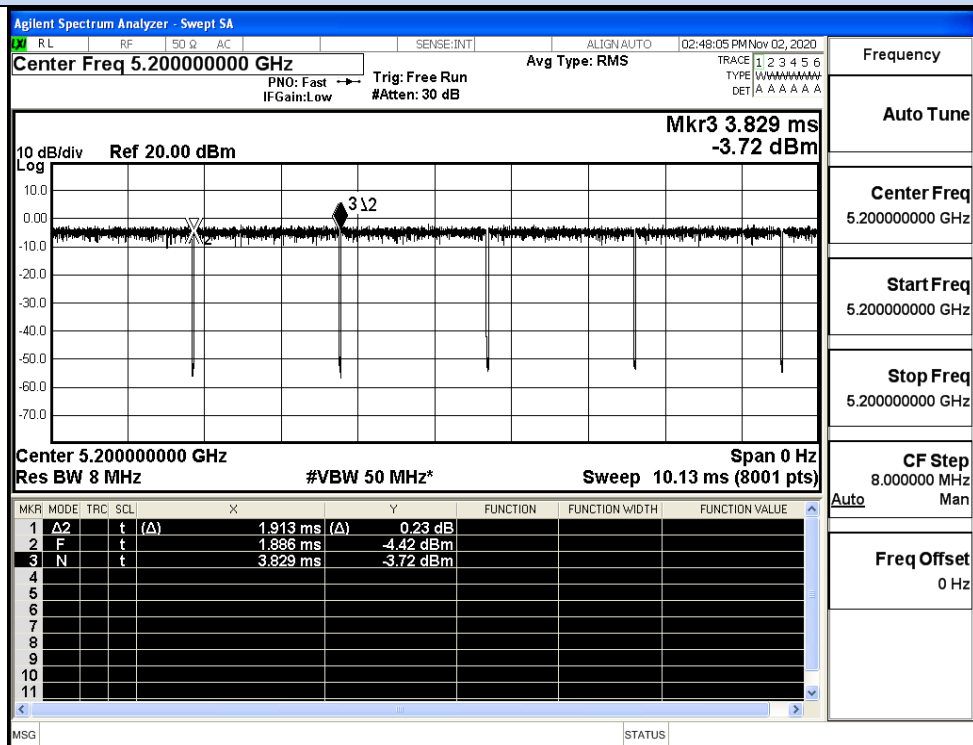
IEEE 802.11a



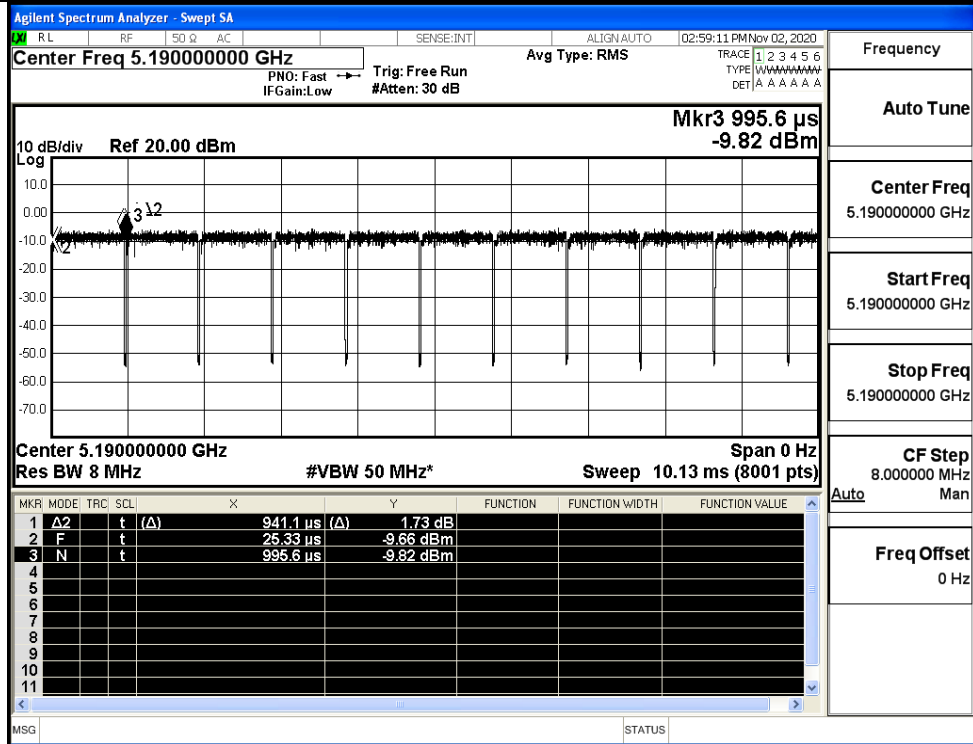
IEEE 802.11n HT20



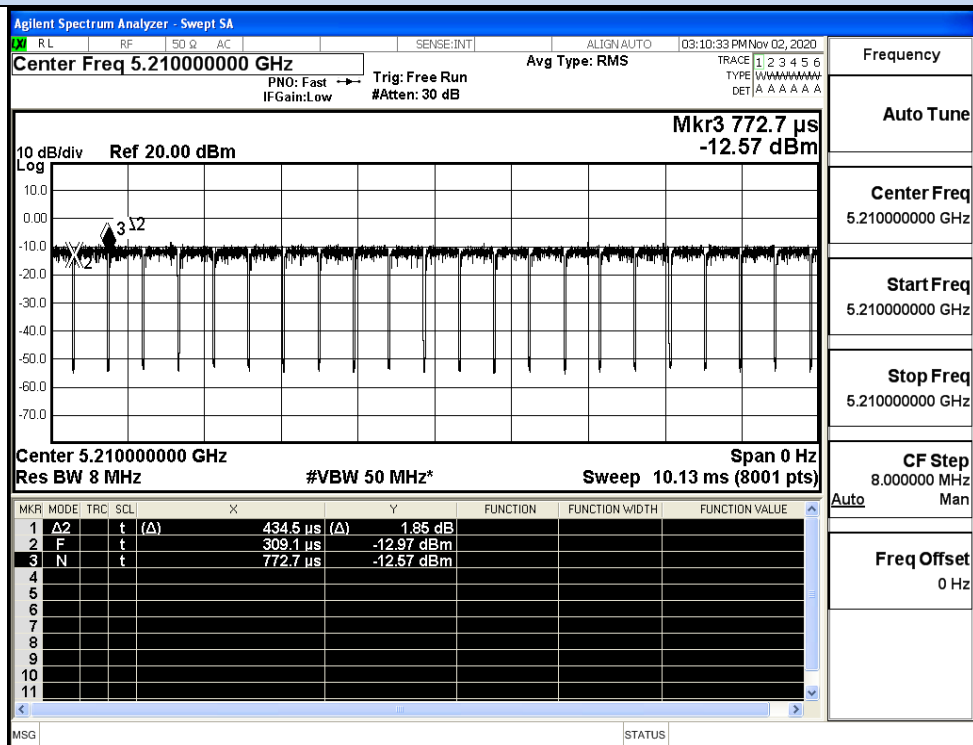
IEEE 802.11n HT40



IEEE 802.11AC20



IEEE 802.11 AC40



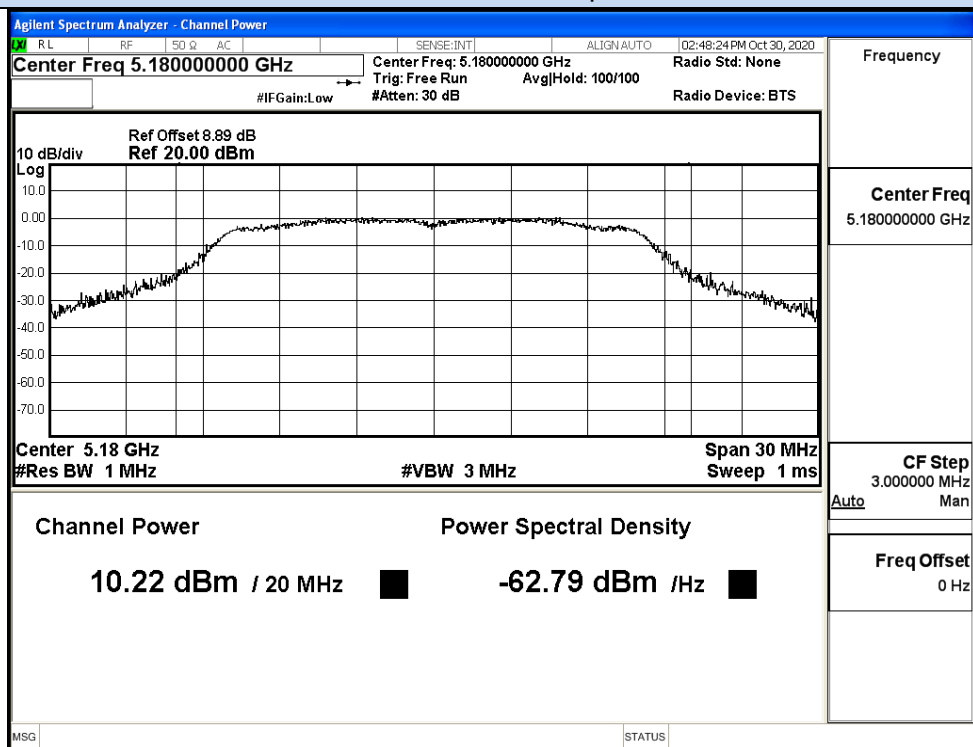
IEEE 802.11AC80

D.2 Maximum Conduct Output Power

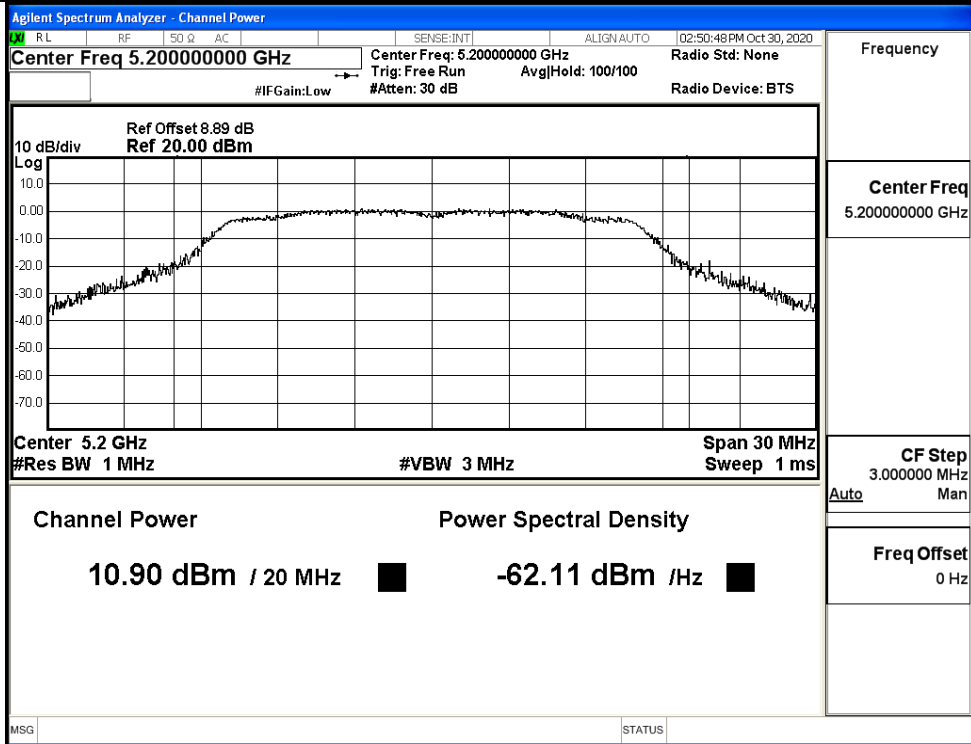
ANT 0

Test Mode	Channel	Frequency (MHz)	AVG Conducted Power (dBm)	Duty Cycle Factor (dB)	Report Conducted Power (dBm)	Limit (dBm)	Verdict
11A	36	5180	10.22	0	10.22	24	Pass
	40	5200	10.90	0	10.90		Pass
	48	5240	12.23	0	12.23		Pass
11N20 SISO	36	5180	11.80	0	11.80	24	Pass
	40	5200	11.69	0	11.69		Pass
	48	5240	12.19	0	12.19		Pass
11N40 SISO	38	5190	11.92	0	11.92	24	Pass
	46	5230	11.80	0	11.80		Pass
11AC20 SISO	36	5180	12.72	0	12.72	24	Pass
	40	5200	13.55	0	13.55		Pass
	48	5240	12.55	0	12.55		Pass
11AC40 SISO	38	5190	13.45	0	13.45	24	Pass
	46	5230	12.83	0	12.83		Pass
11AC80 SISO	42	5210	13.03	0.28	13.31	24	Pass

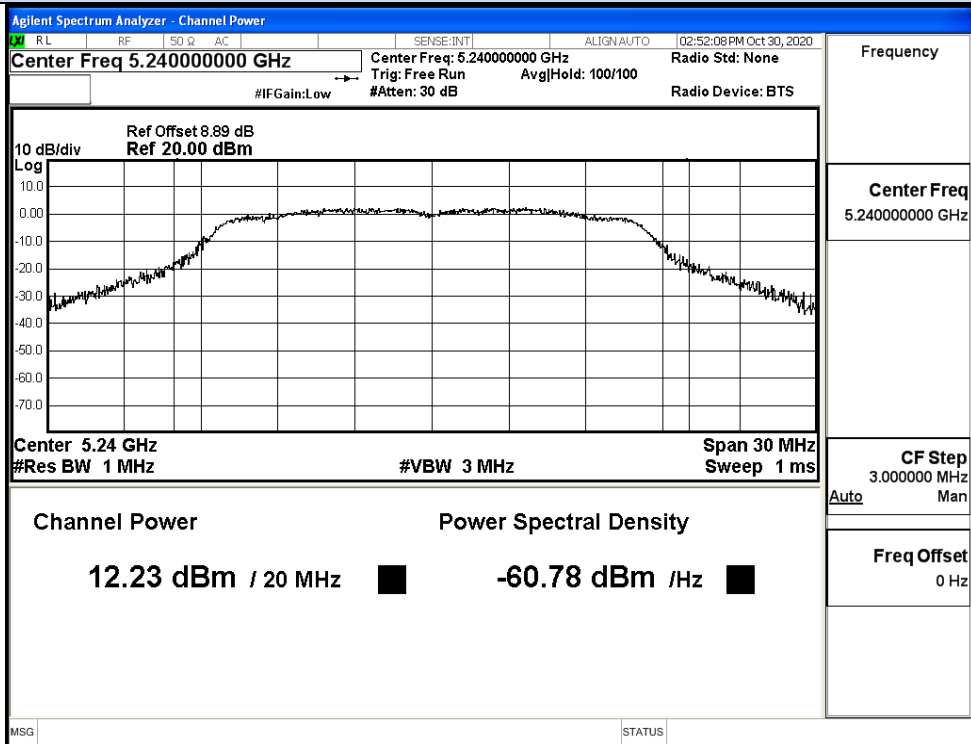
Maximum Conducted Output Power



IEEE 802.11a / Channel 36 / 5180MHz

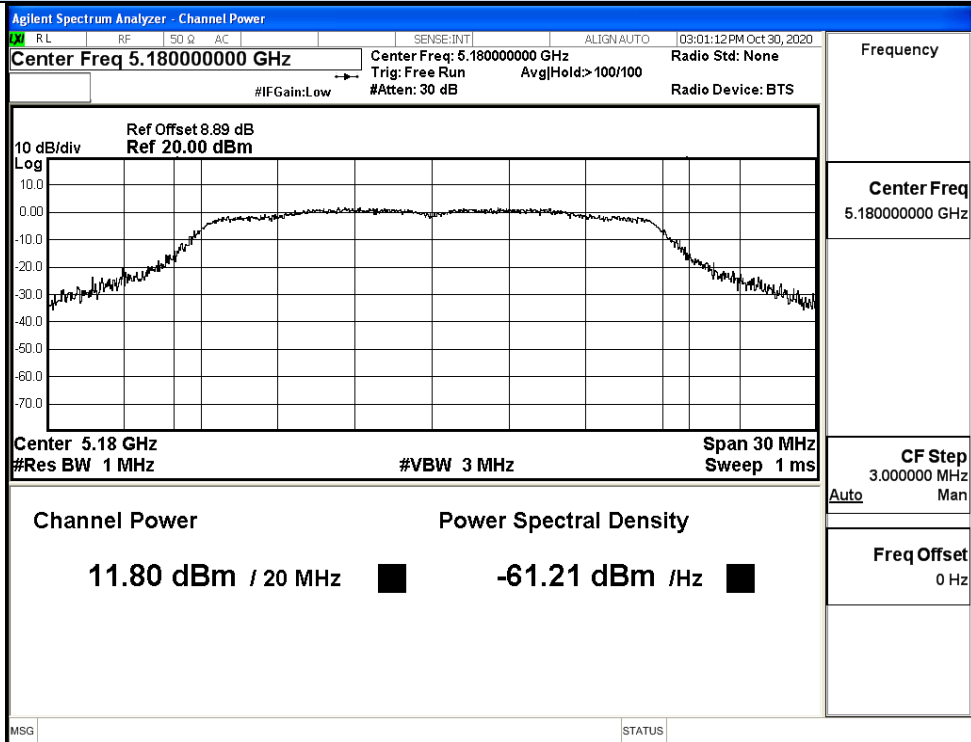


IEEE 802.11a / Channel 40 / 5200MHz

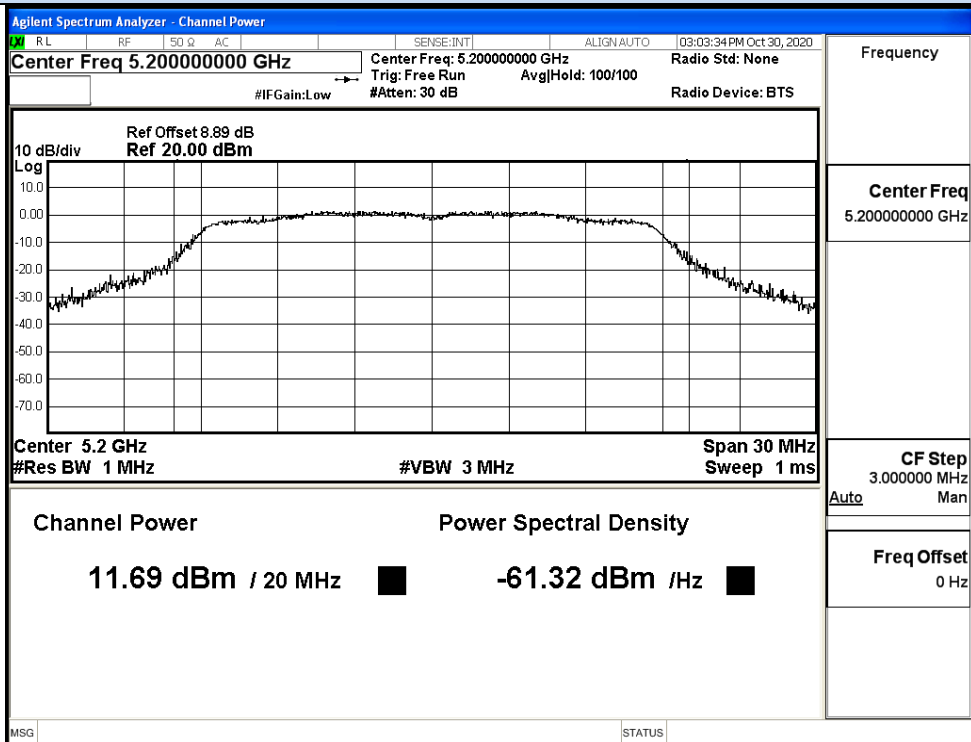


IEEE 802.11a / Channel 48 / 5240MHz

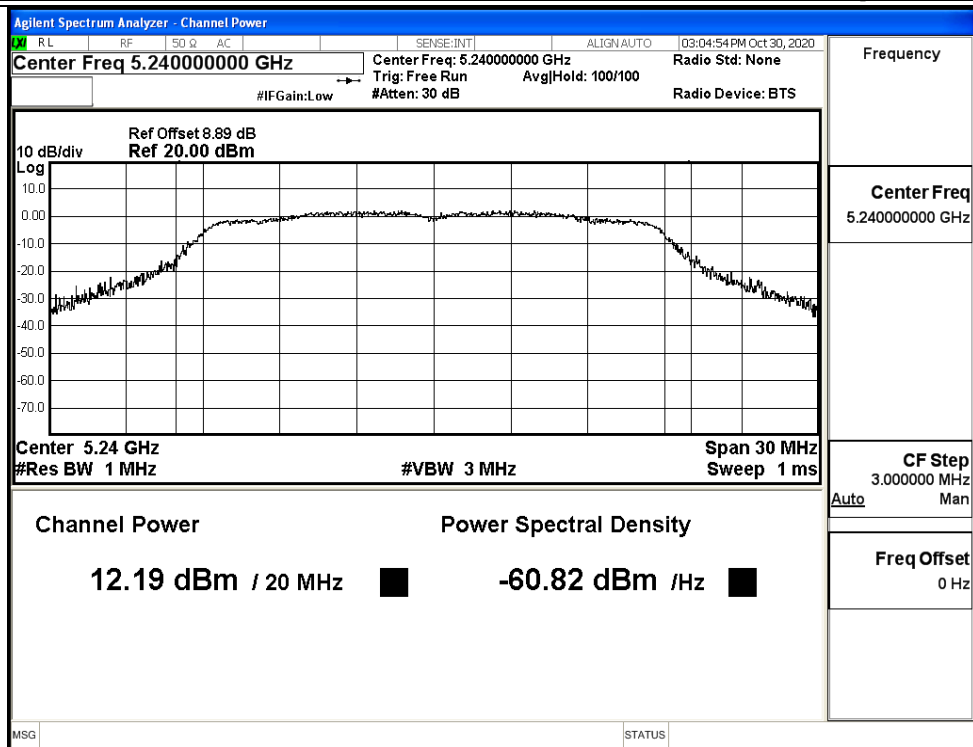
Maximum Conducted Output Power



IEEE 802.11n20 / Channel 36 / 5180MHz

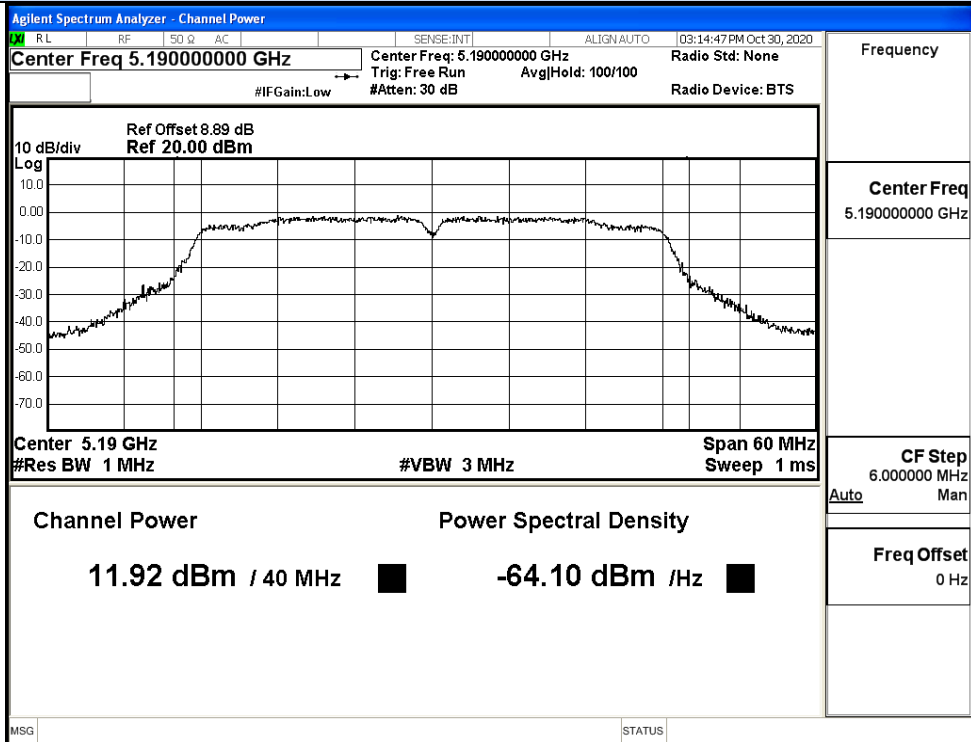


IEEE 802.11n20 / Channel 40 / 5200MHz

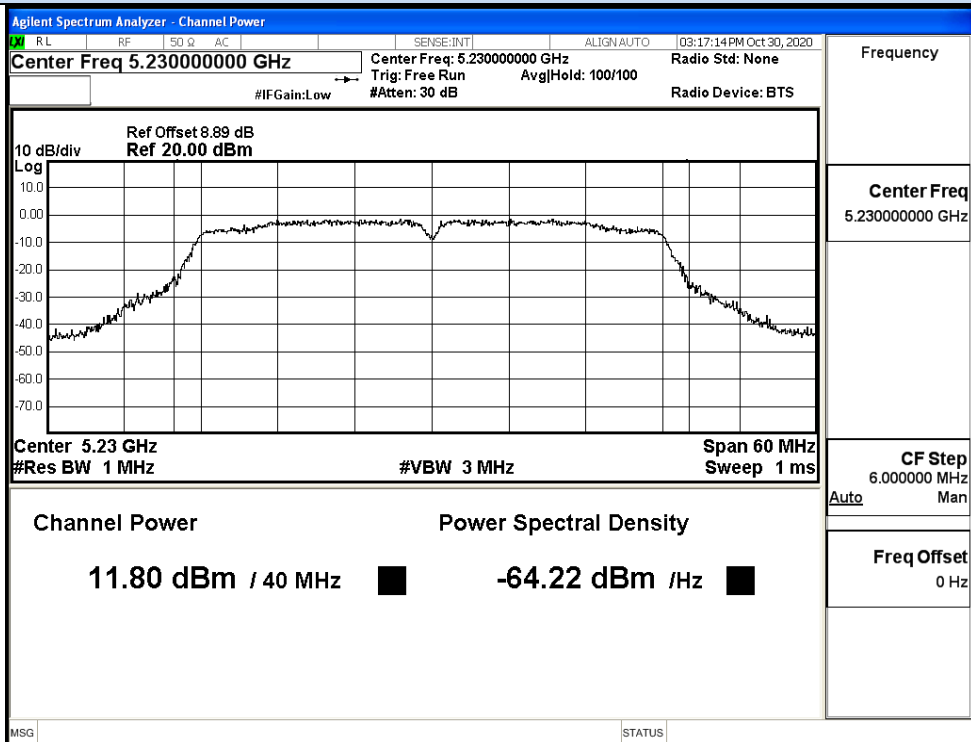


IEEE 802.11n20 / Channel 48 / 5240MHz

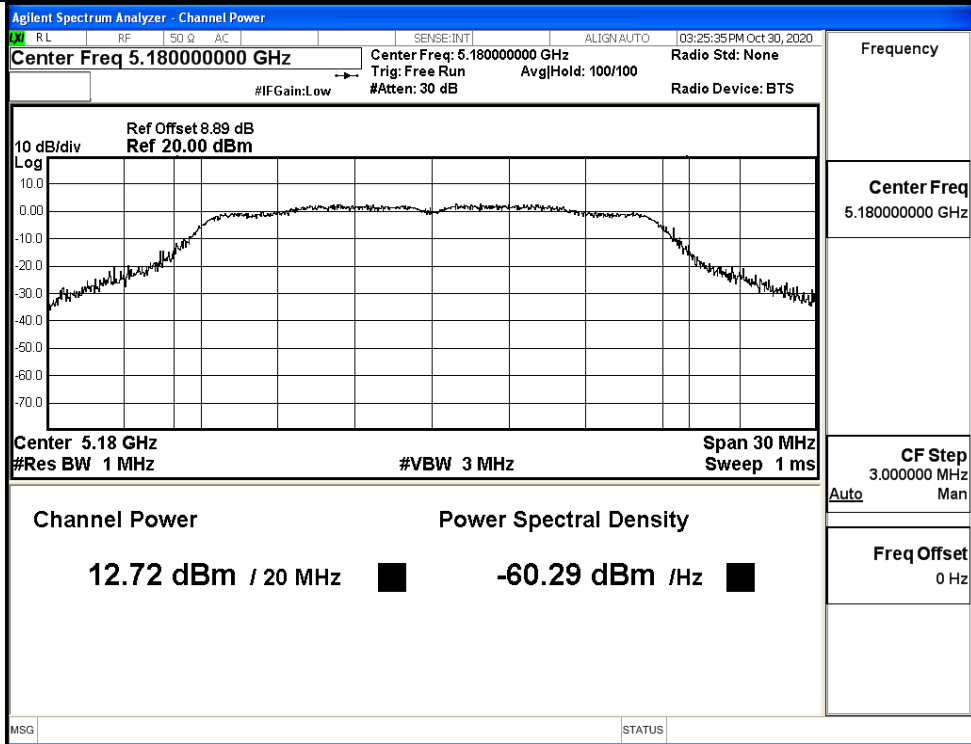
Maximum Conducted Output Power



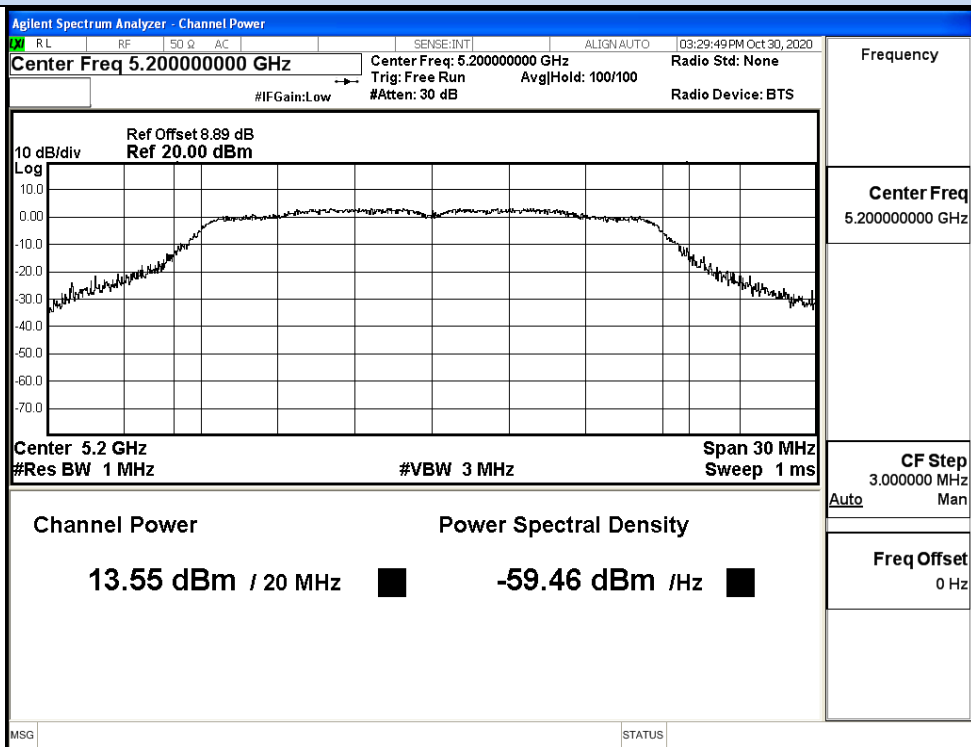
IEEE 802.11n40 / Channel 38 / 5190MHz



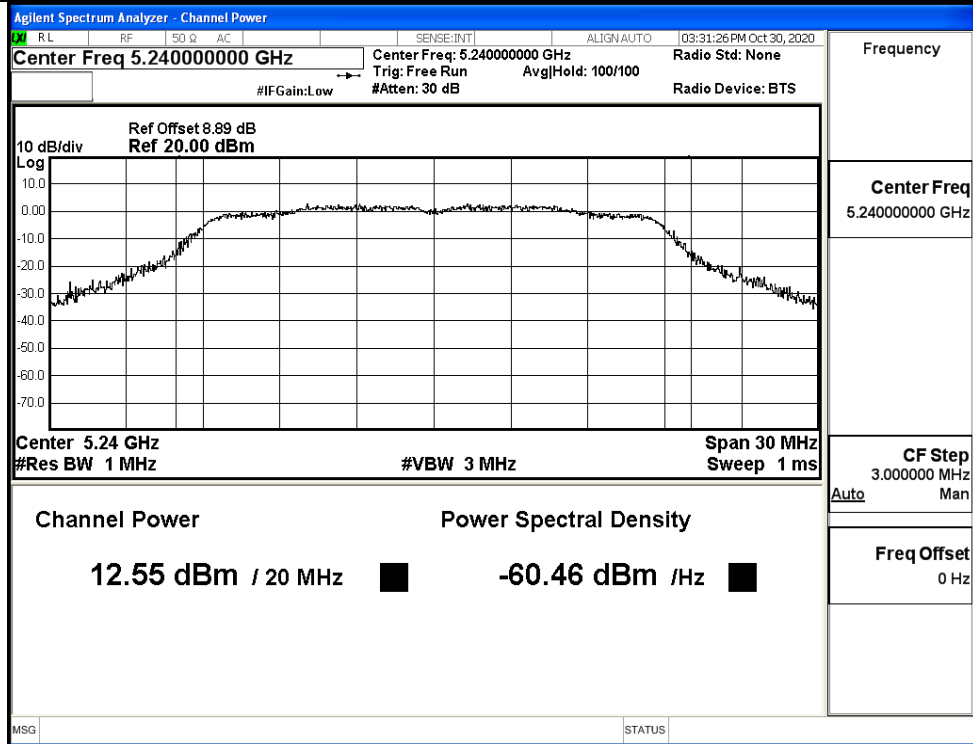
IEEE 802.11n40 / Channel 46 / 5230MHz



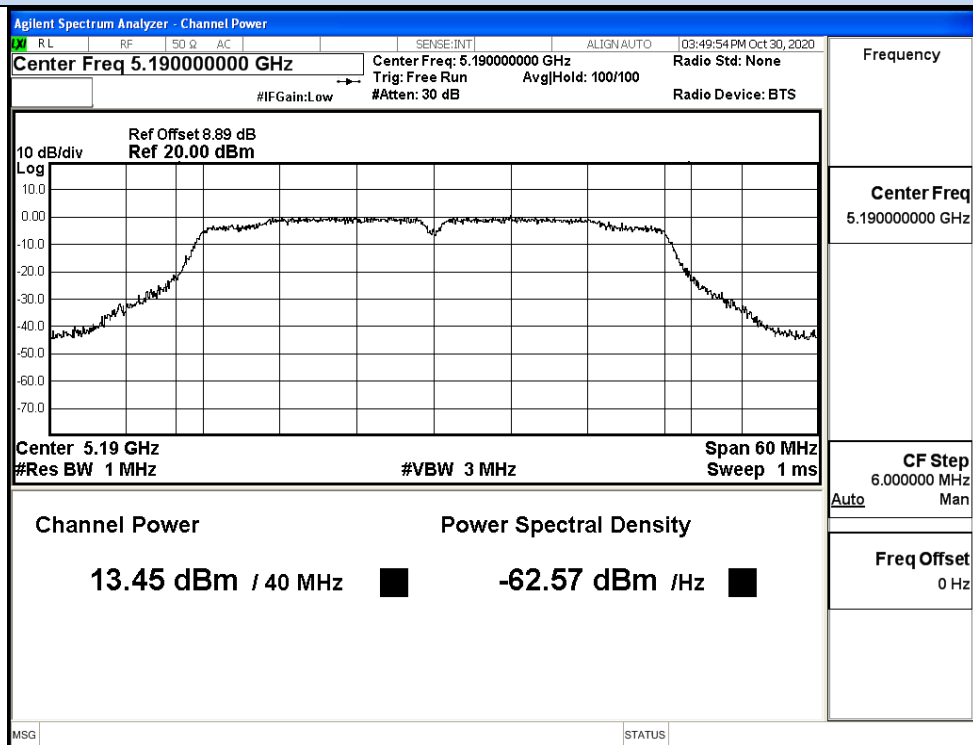
IEEE 802.11ac20 / Channel 36 / 5180MHz



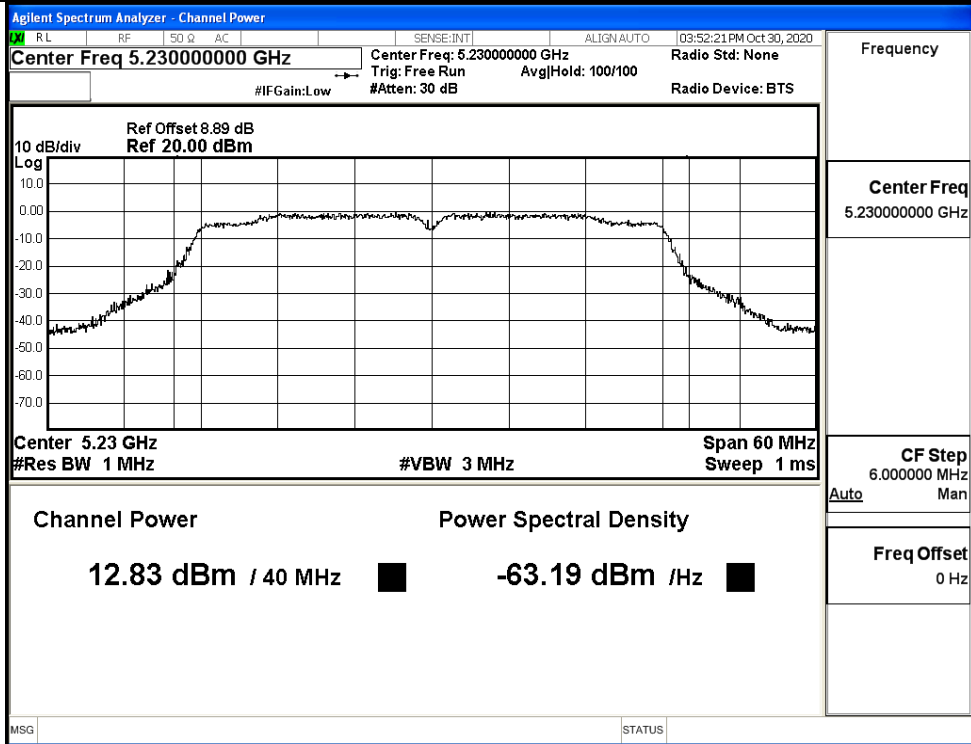
IEEE 802.11ac20 / Channel 40 / 5200MHz



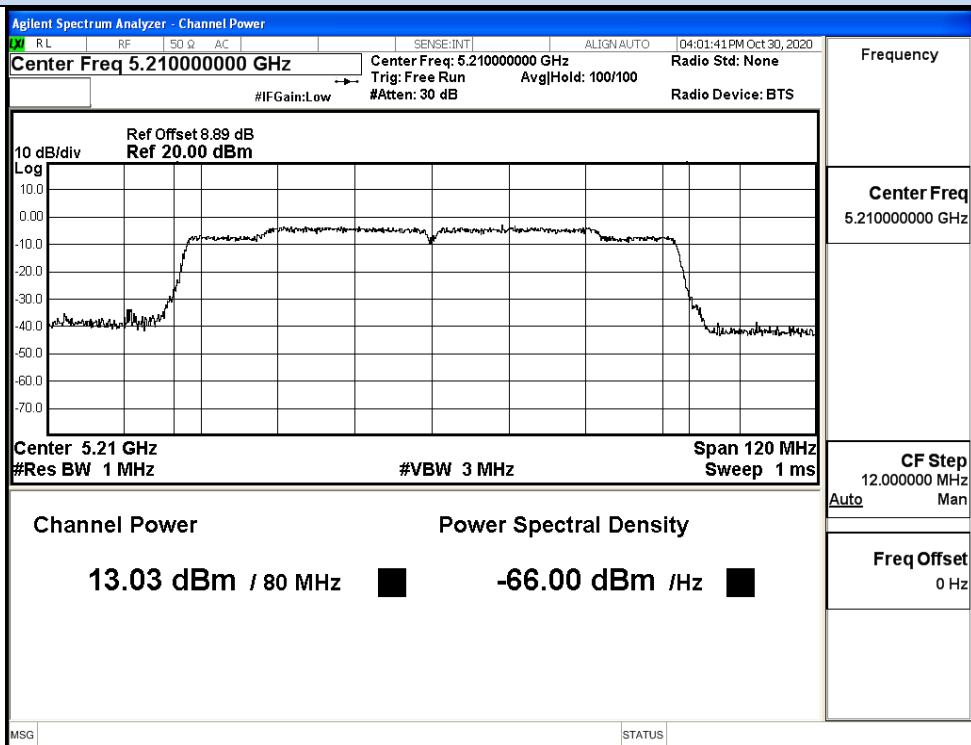
IEEE 802.11ac20 / Channel 48 / 5240MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz



IEEE 802.11ac40 / Channel 46 / 5230MHz

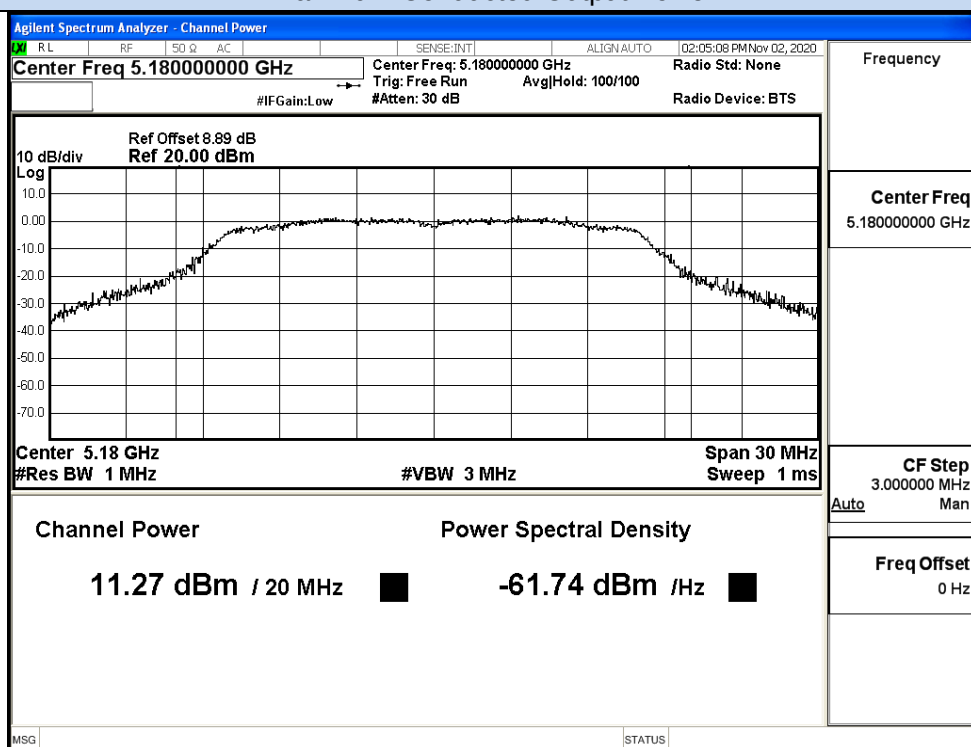


IEEE 802.11ac80 / Channel 42 / 5210MHz

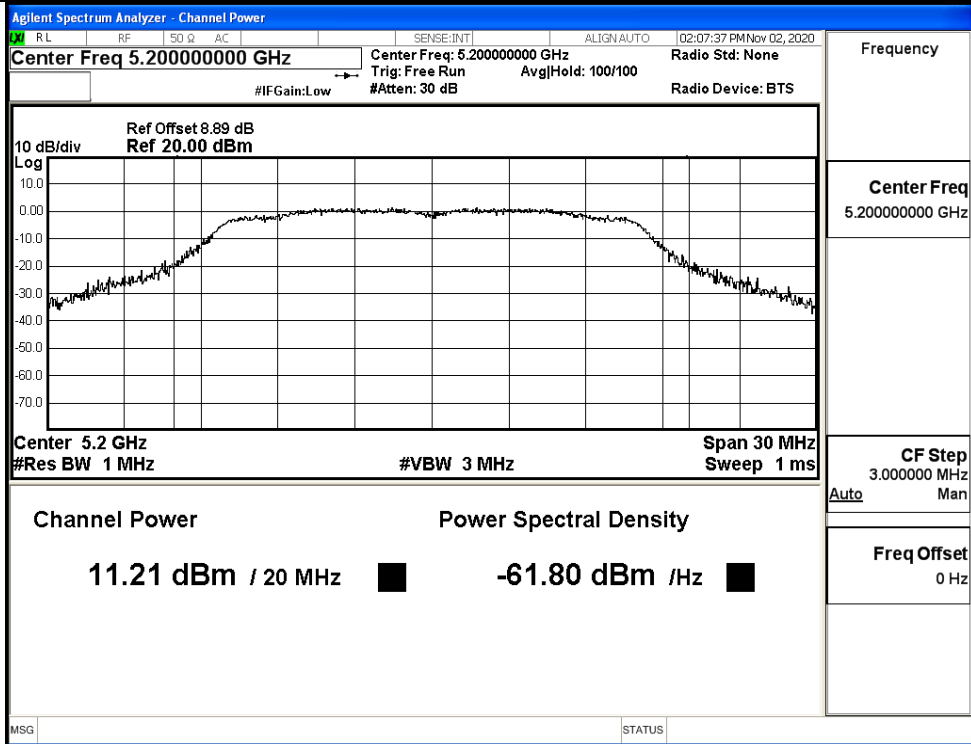
ANT 1

Test Mode	Channel	Frequency (MHz)	AVG Conducted Power (dBm)	Duty Cycle Factor(dB)	Report Conducted Power(dBm)	Limit (dBm)	Verdict
11A	36	5180	11.27	0	11.27	24	Pass
	40	5200	11.21	0	11.21		Pass
	48	5240	11.66	0	11.66		Pass
11N20 SISO	36	5180	11.33	0	11.33	24	Pass
	40	5200	11.61	0	11.61		Pass
	48	5240	11.50	0	11.50		Pass
11N40 SISO	38	5190	11.69	0	11.69	24	Pass
	46	5230	11.57	0	11.57		Pass
11AC20 SISO	36	5180	11.61	0	11.61	24	Pass
	40	5200	11.62	0	11.62		Pass
	48	5240	11.98	0	11.98		Pass
11AC40 SISO	38	5190	11.74	0	11.74	24	Pass
	46	5230	11.57	0	11.57		Pass
11AC80 SISO	42	5210	11.76	0.28	12.04	24	Pass

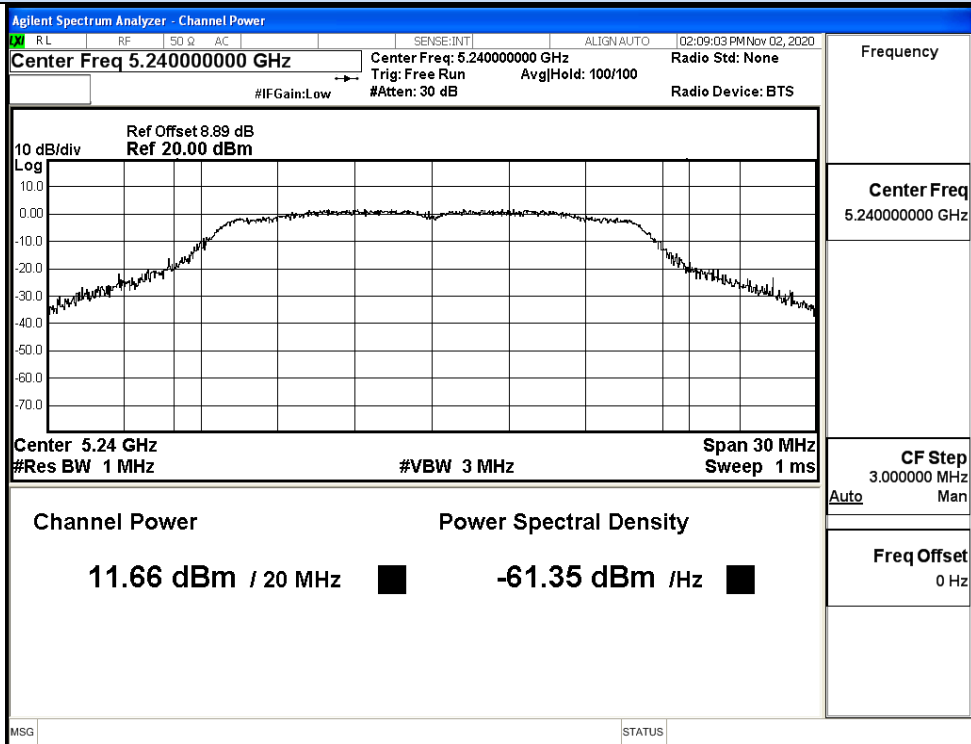
Maximum Conducted Output Power



IEEE 802.11a / Channel 36 / 5180MHz

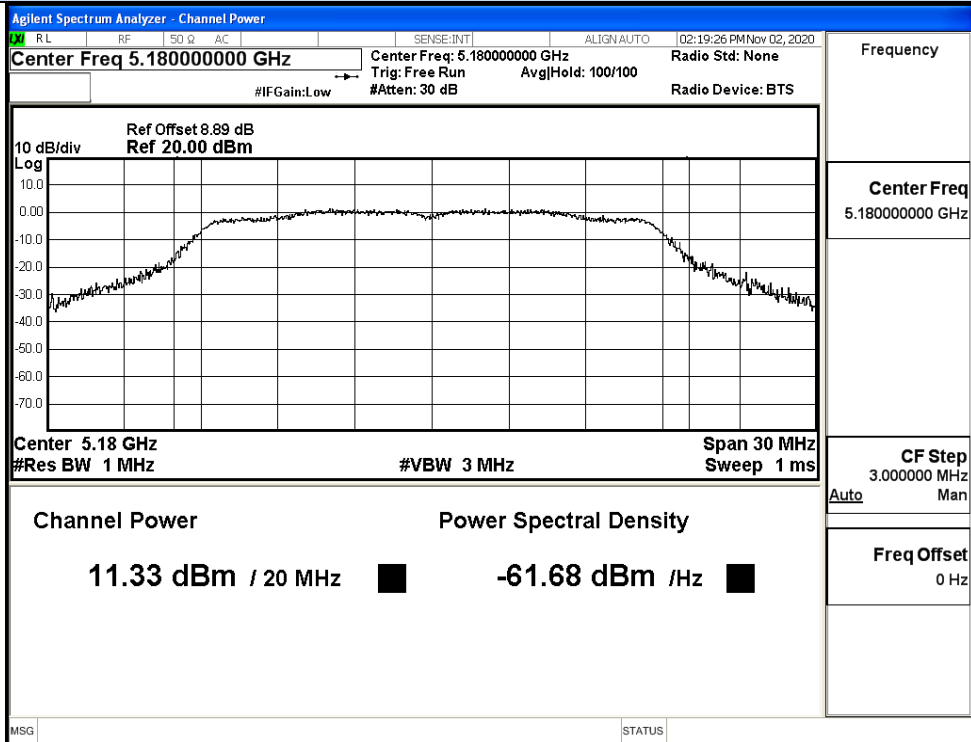


IEEE 802.11a / Channel 40 / 5200MHz

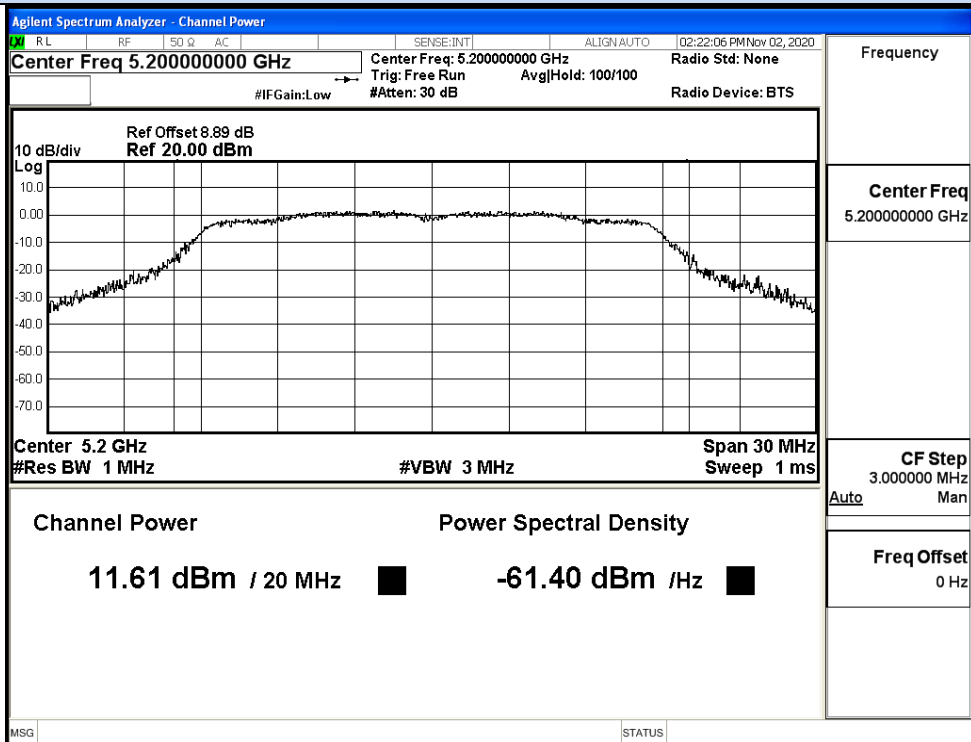


IEEE 802.11a / Channel 48 / 5240MHz

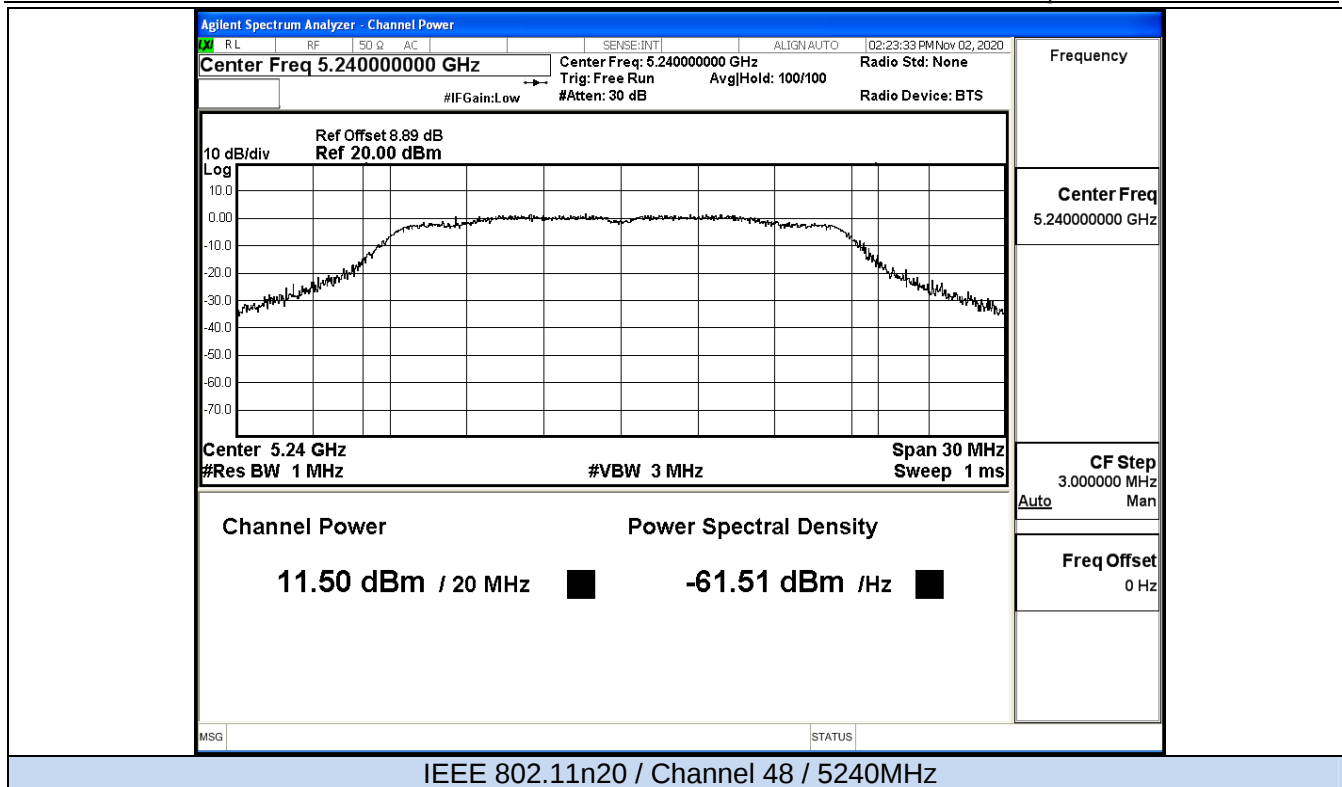
Maximum Conducted Output Power



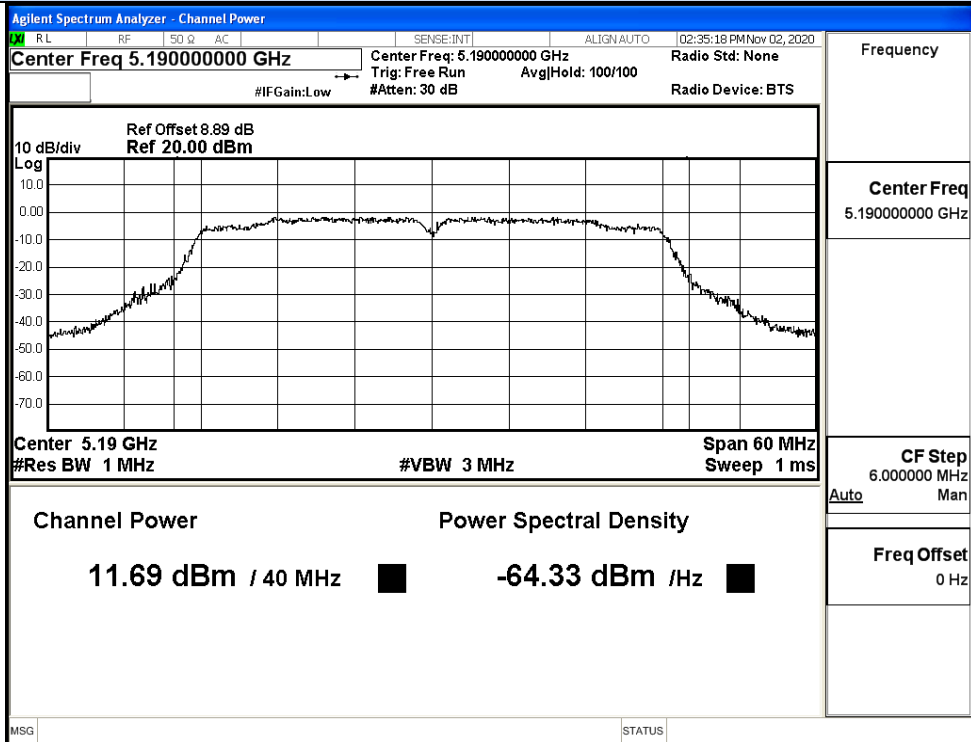
IEEE 802.11n20 / Channel 36 / 5180MHz



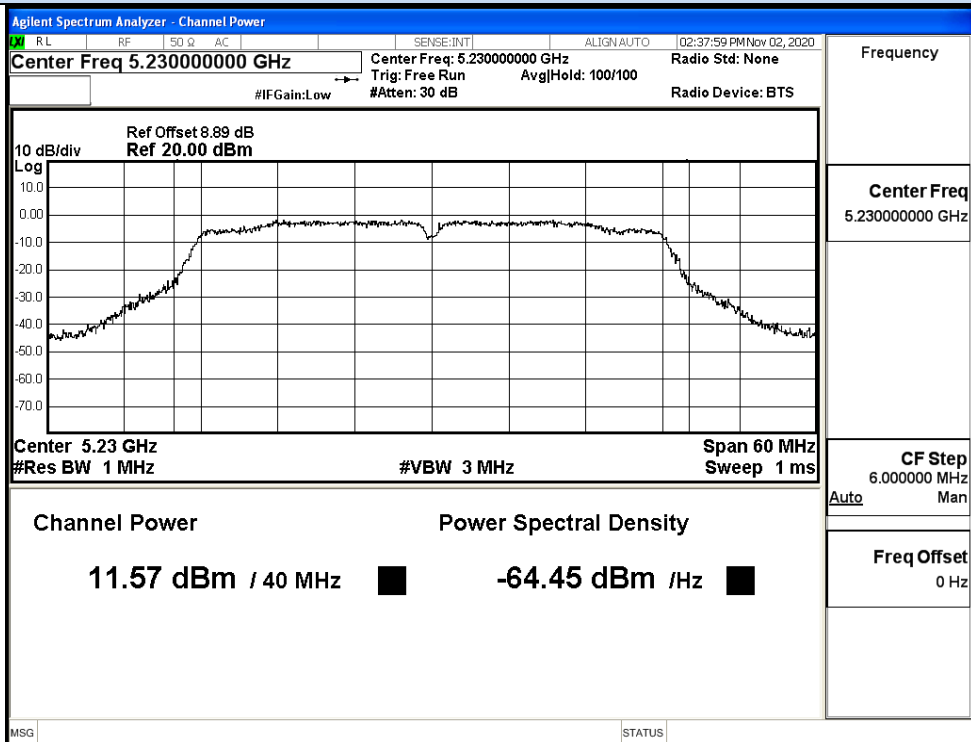
IEEE 802.11n20 / Channel 40 / 5200MHz



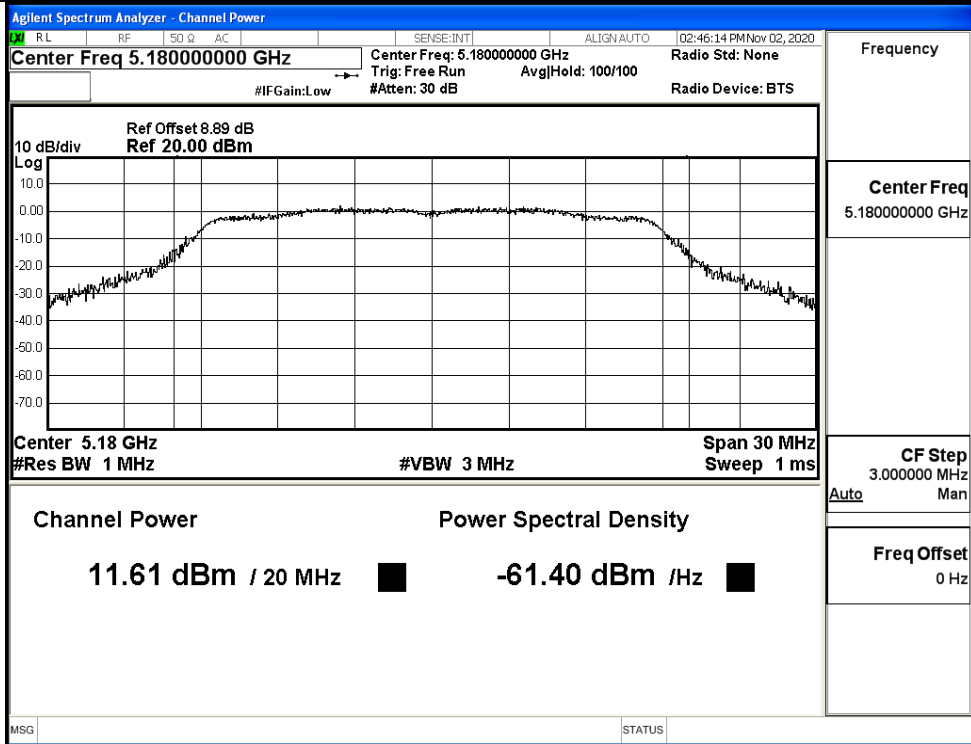
Maximum Conducted Output Power



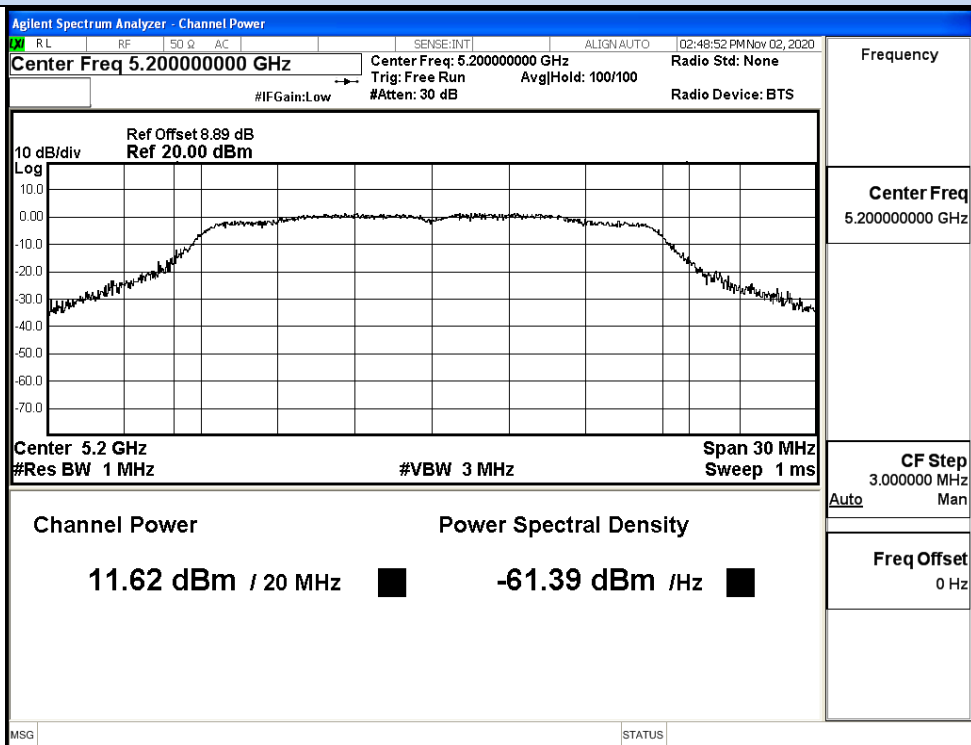
IEEE 802.11n40 / Channel 38 / 5190MHz



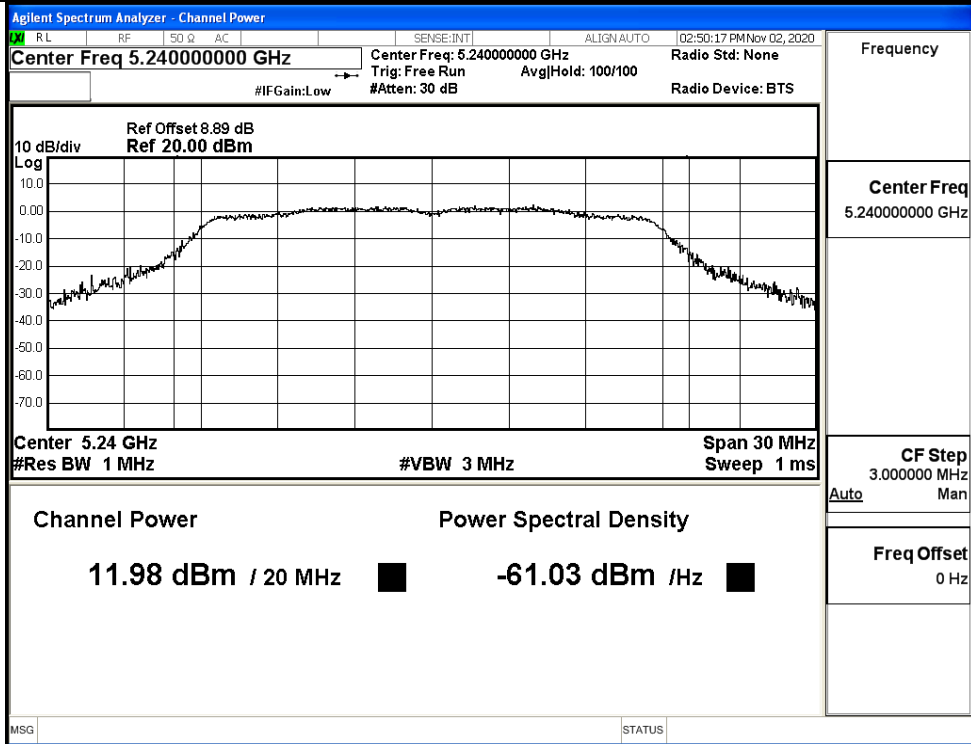
IEEE 802.11n40 / Channel 46 / 5230MHz



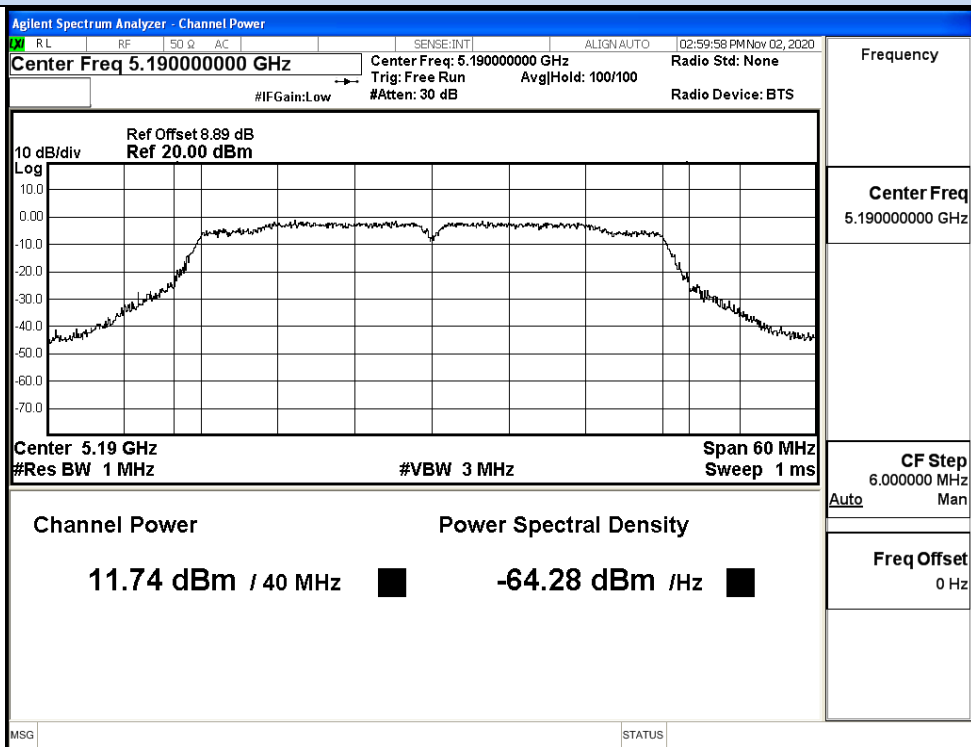
IEEE 802.11ac20 / Channel 36 / 5180MHz



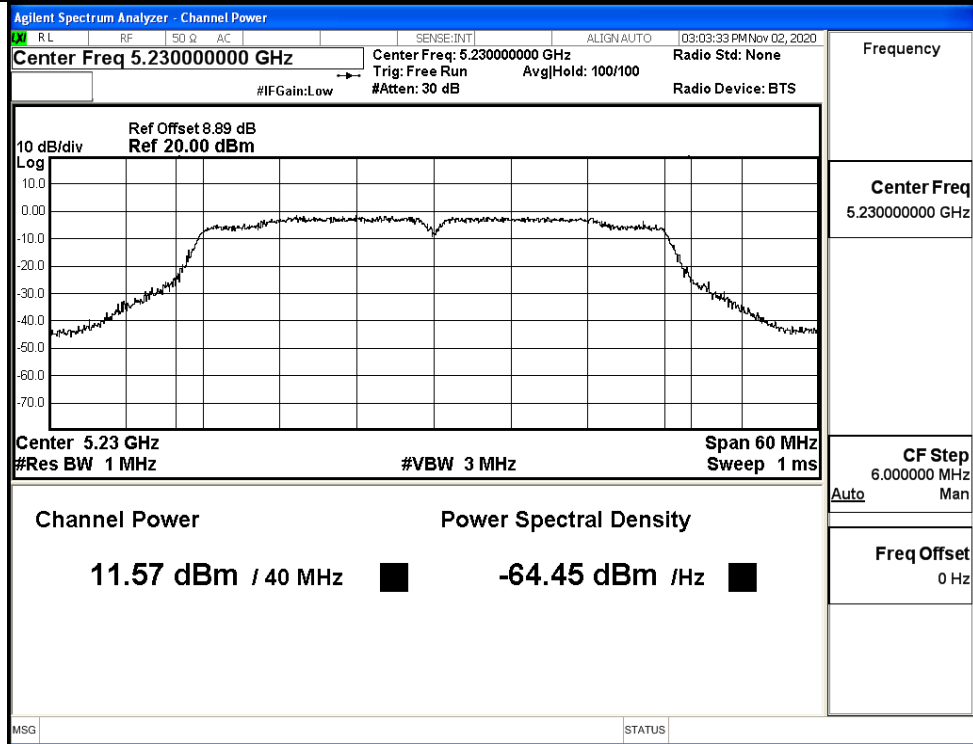
IEEE 802.11ac20 / Channel 40 / 5200MHz



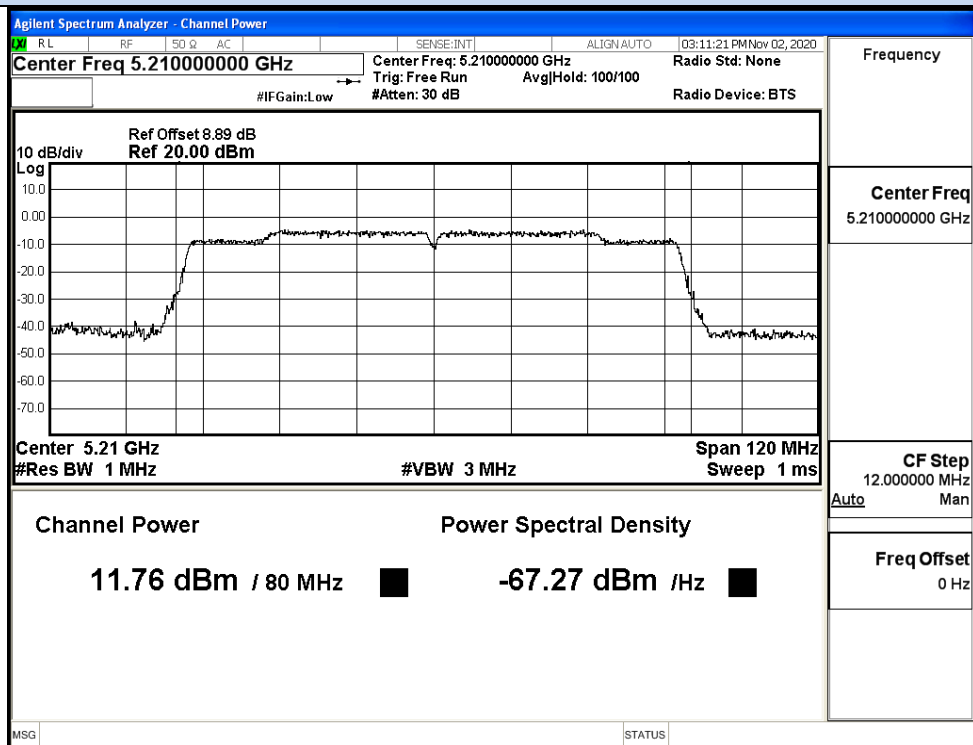
IEEE 802.11ac20 / Channel 48 / 5240MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz



IEEE 802.11ac40 / Channel 46 / 5230MHz



IEEE 802.11ac80 / Channel 42 / 5210MHz

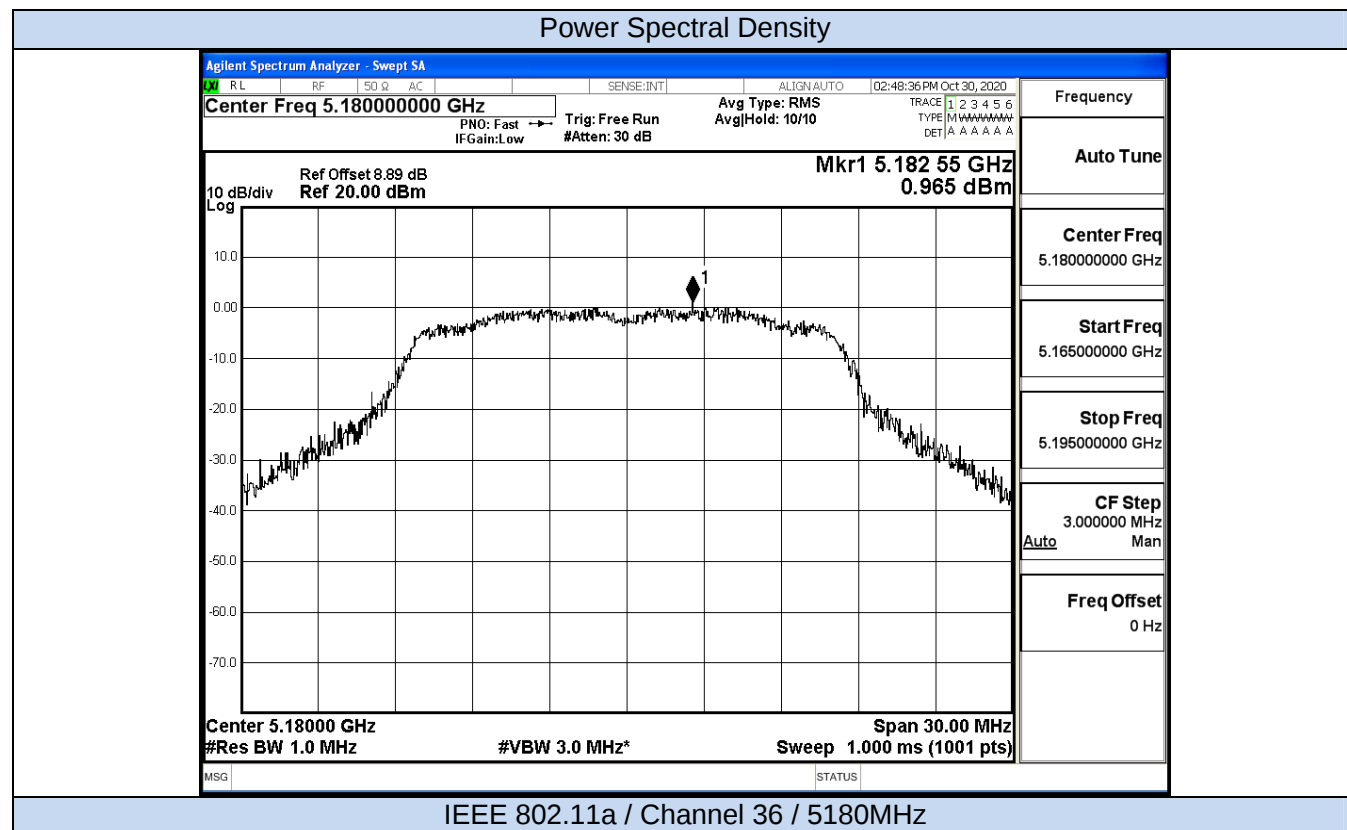
MIMO

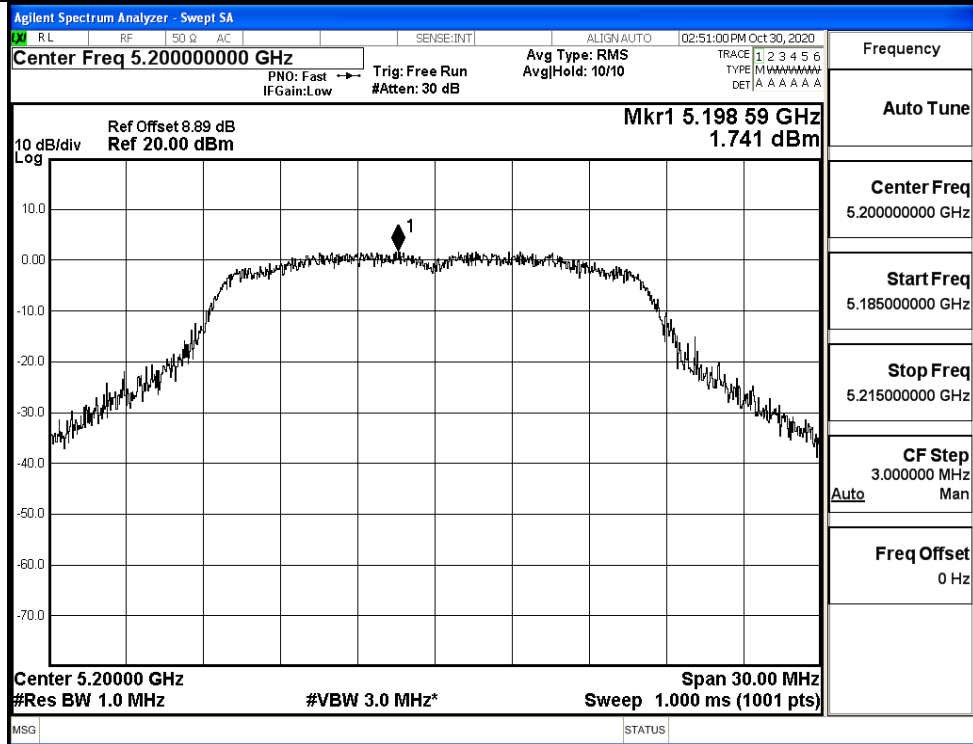
Test Mode	Channel	Frequency (MHz)	ANT 0 AVG Conducted Power (dBm)	ANT 1 AVG Conducted Power (dBm)	MIMO AVG Conducted Power (dBm)	Duty Cycle Factor (dB)	Report Conducted Power (dBm)	Limit (dBm)	Verdict
11N20	36	5180	11.80	11.33	14.58	0	14.58	24	Pass
	40	5200	11.69	11.61	14.66	0	14.66		Pass
	48	5240	12.19	11.50	14.87	0	14.87		Pass
11N40	38	5190	11.92	11.69	14.82	0	14.82	24	Pass
	46	5230	11.80	11.57	14.70	0	14.70		Pass
11AC20	36	5180	12.72	11.61	15.21	0	15.21	24	Pass
	40	5200	13.55	11.62	15.70	0	15.70		Pass
	48	5240	12.55	11.98	15.28	0	15.28		Pass
11AC40	38	5190	13.45	11.74	15.69	0	15.69	24	Pass
	46	5230	12.83	11.57	15.26	0	15.26		Pass
11AC80	42	5210	13.03	11.76	15.45	0.28	15.73	24	Pass

D.3 Power Spectral Density

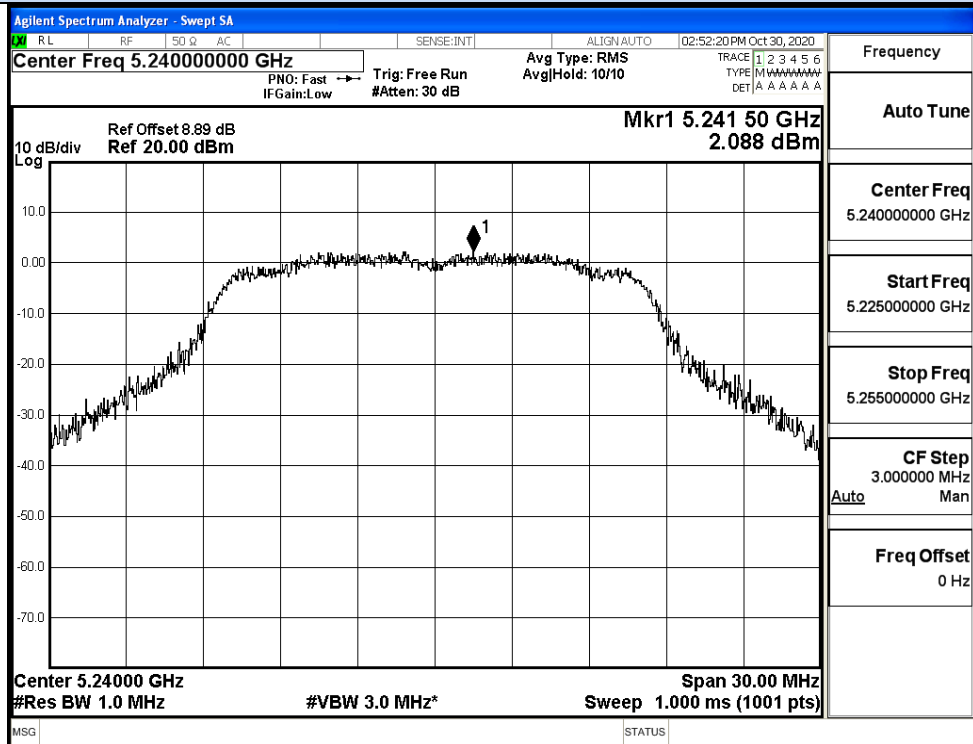
ANT 0

Test Mode	Channel	Frequency (MHz)	Power Density (dBm/MHz)	Duty Cycle Factor (dB)	Report Power Density (dBm/MHz)	Limit (dBm/MHz)	Verdict
11A	36	5180	0.97	0	0.97	11	Pass
	40	5200	1.74	0	1.74		Pass
	48	5240	2.09	0	2.09		Pass
11N20 SISO	36	5180	1.62	0	1.62	11	Pass
	40	5200	2.06	0	2.06		Pass
	48	5240	2.01	0	2.01		Pass
11N40 SISO	38	5190	-1.05	0	-1.05	11	Pass
	46	5230	-0.73	0	-0.73		Pass
11AC20 SISO	36	5180	2.60	0	2.60	11	Pass
	40	5200	3.43	0	3.43		Pass
	48	5240	3.64	0	3.64		Pass
11AC40 SISO	38	5190	0.07	0	0.07	11	Pass
	46	5230	-0.33	0	-0.33		Pass
11AC80 SISO	42	5210	-3.12	0.28	-2.84	11	Pass



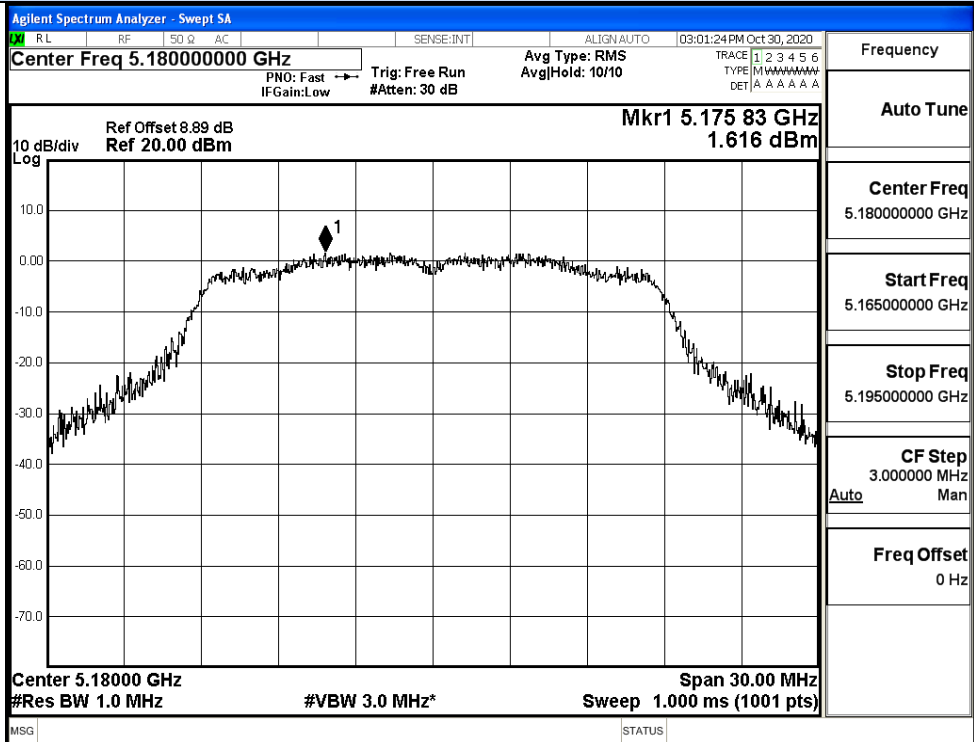


IEEE 802.11na / Channel 40 / 5200MHz

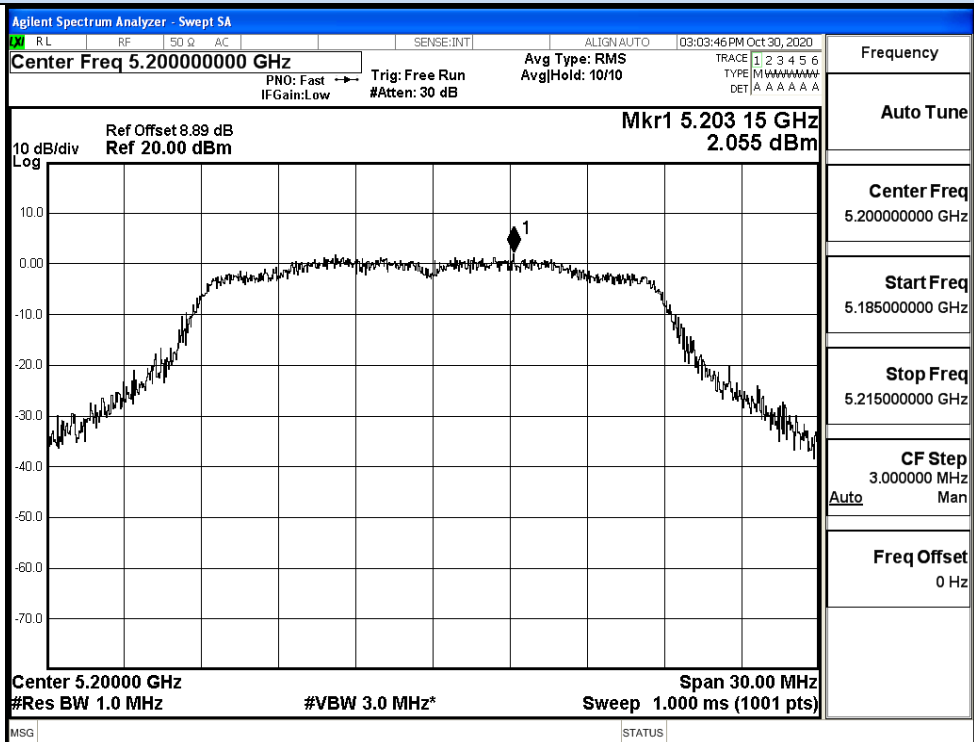


IEEE 802.11na / Channel 48 / 5240MHz

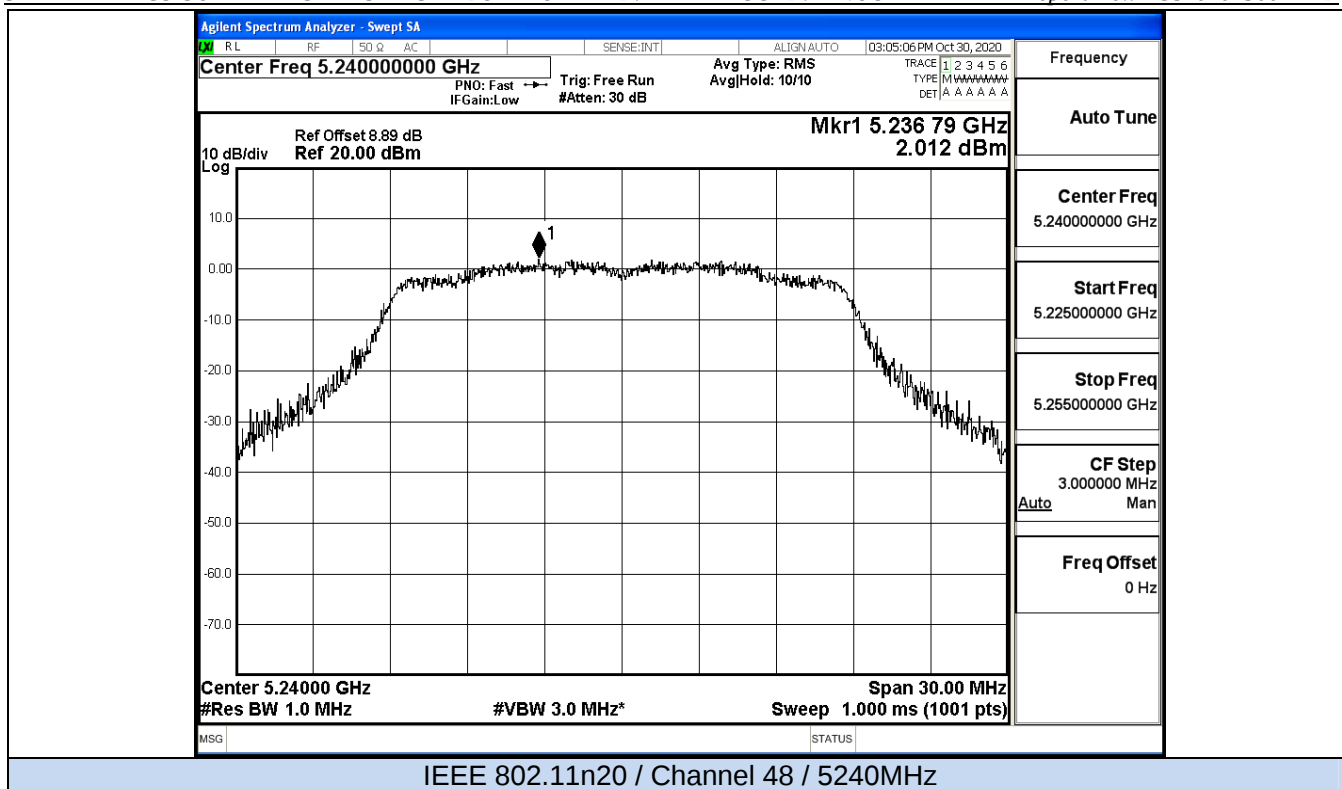
Power Spectral Density



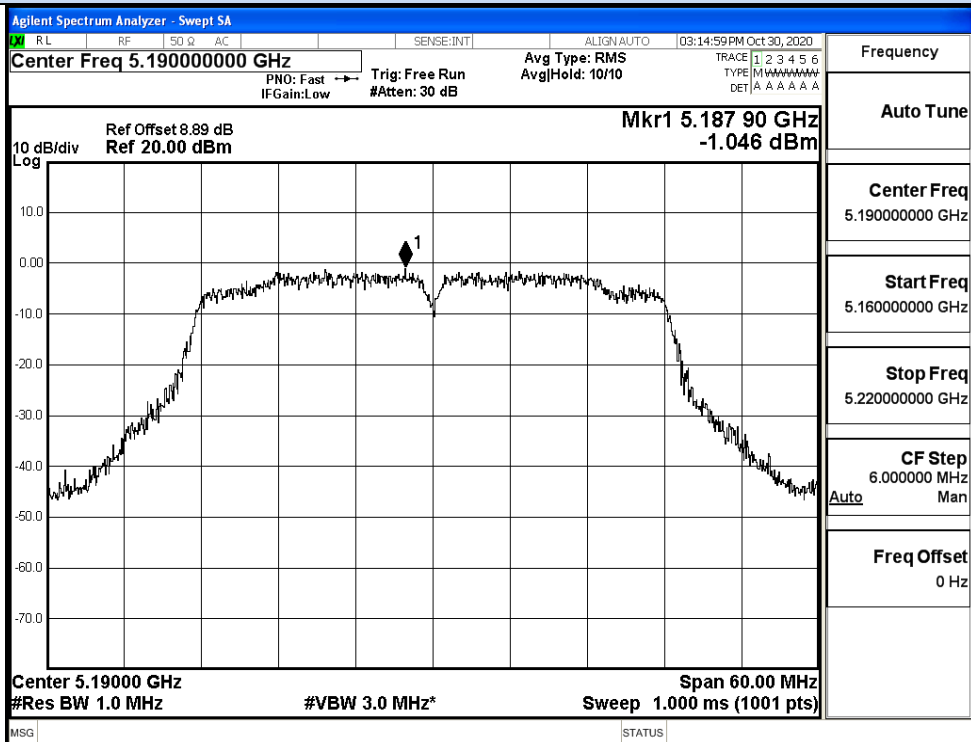
IEEE 802.11n20 / Channel 36 / 5180MHz



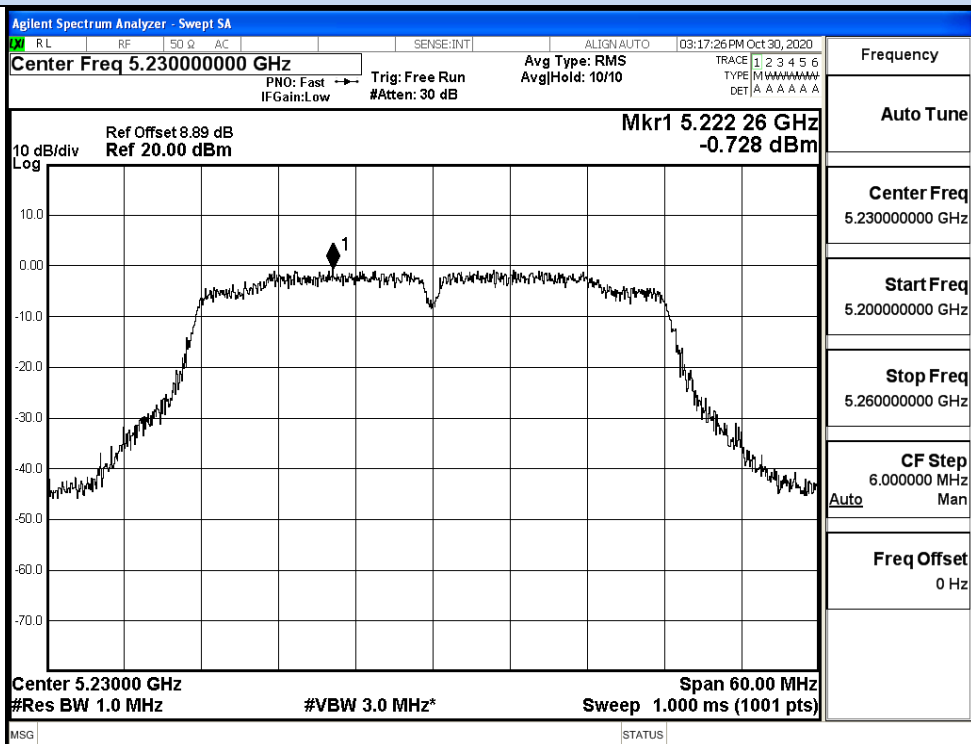
IEEE 802.11n20 / Channel 40 / 5200MHz



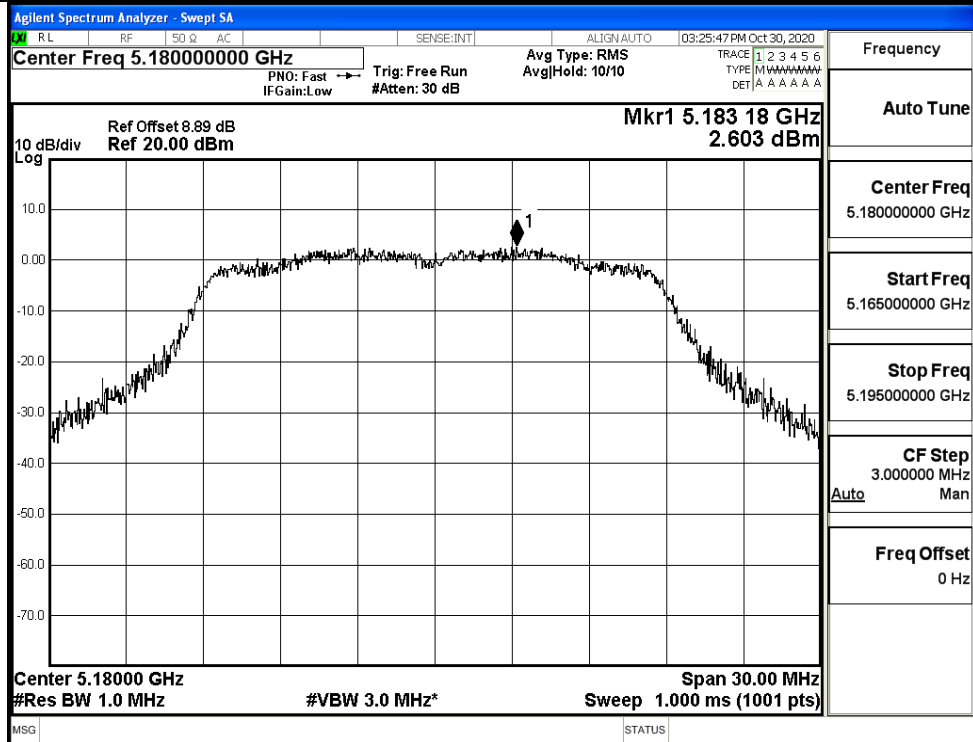
Power Spectral Density



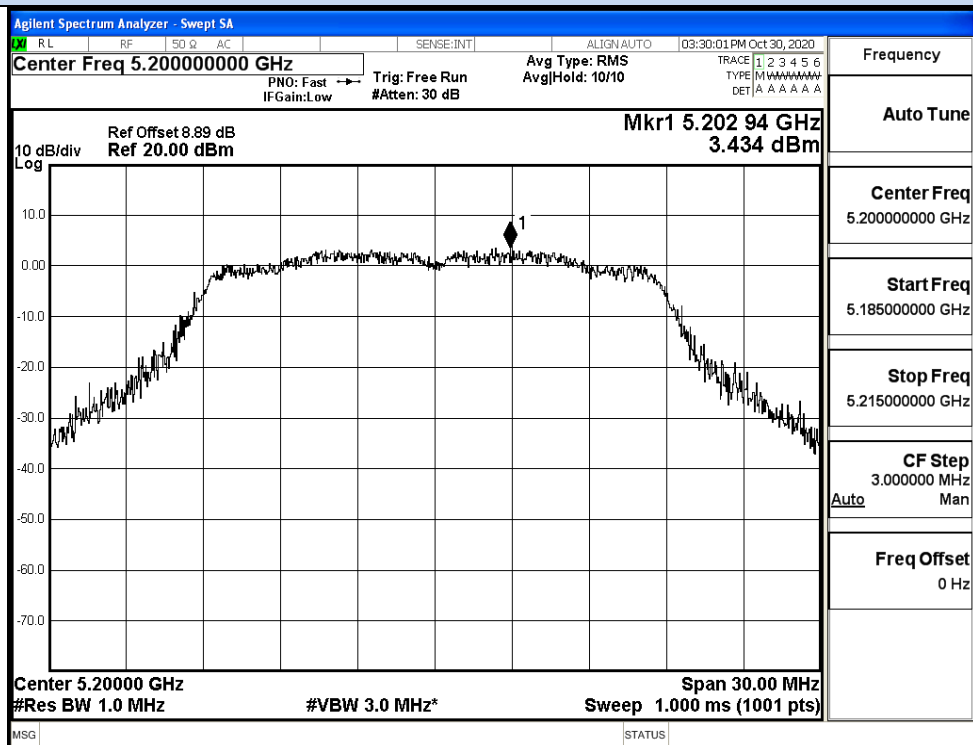
IEEE 802.11n40 / Channel 38 / 5190MHz



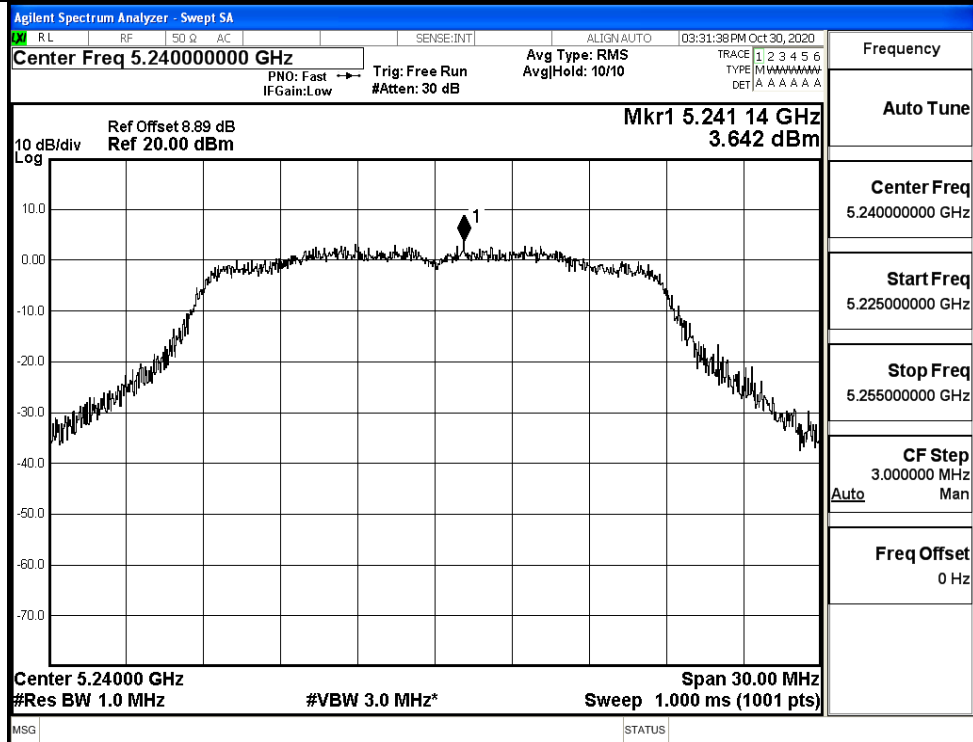
IEEE 802.11n40 / Channel 46 / 5230MHz



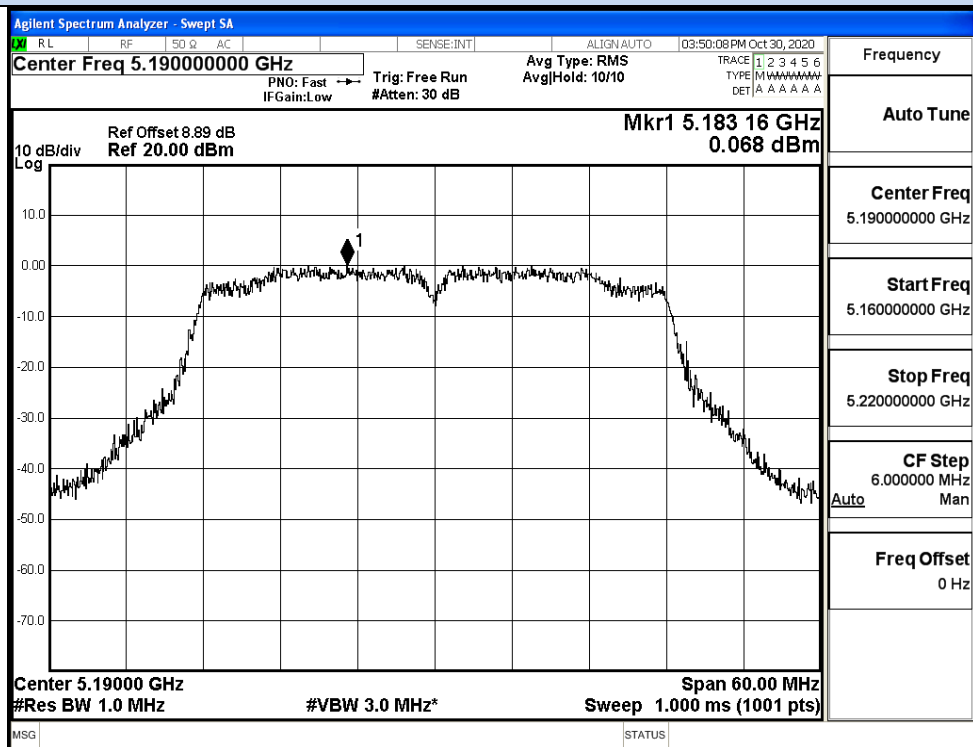
IEEE 802.11ac20 / Channel 36 / 5180MHz



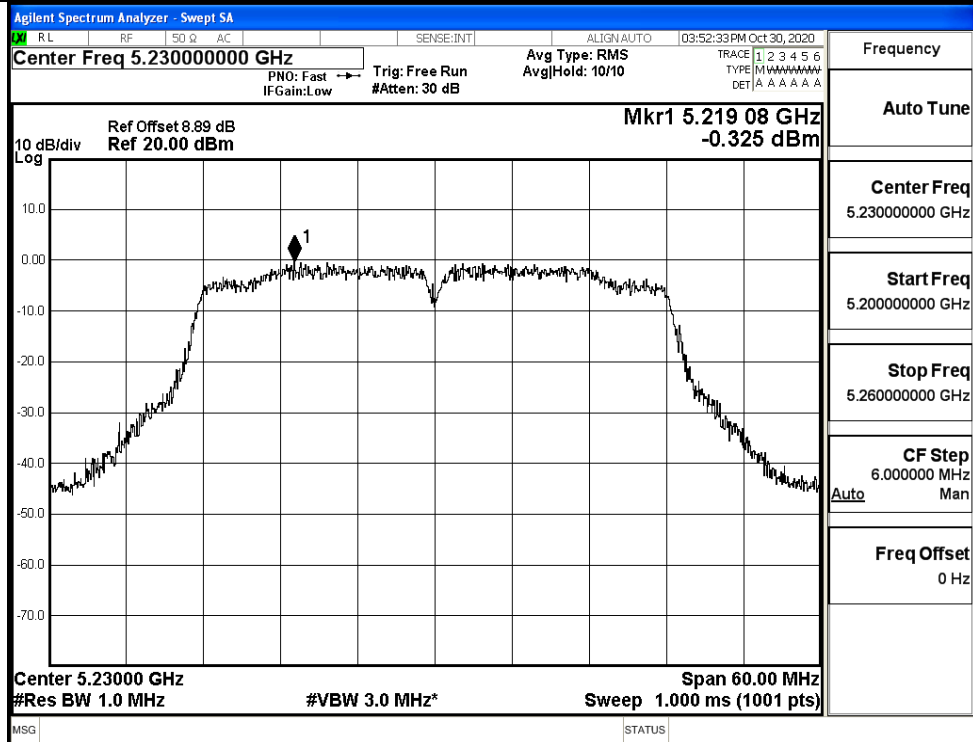
IEEE 802.11ac20 / Channel 40 / 5200MHz



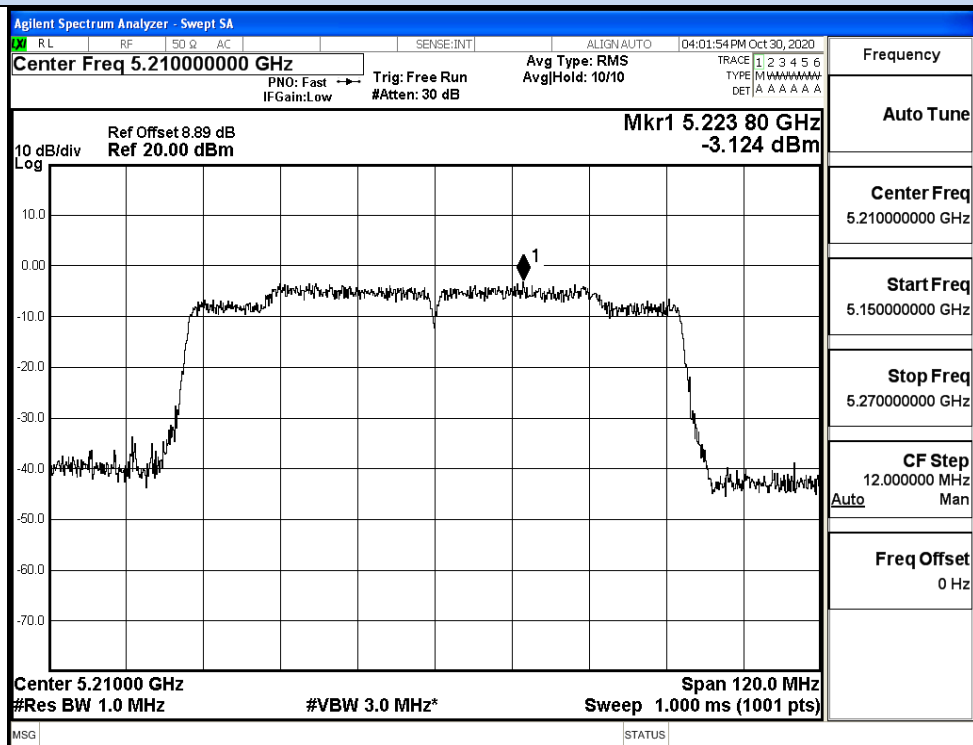
IEEE 802.11ac20 / Channel 48 / 5240MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz

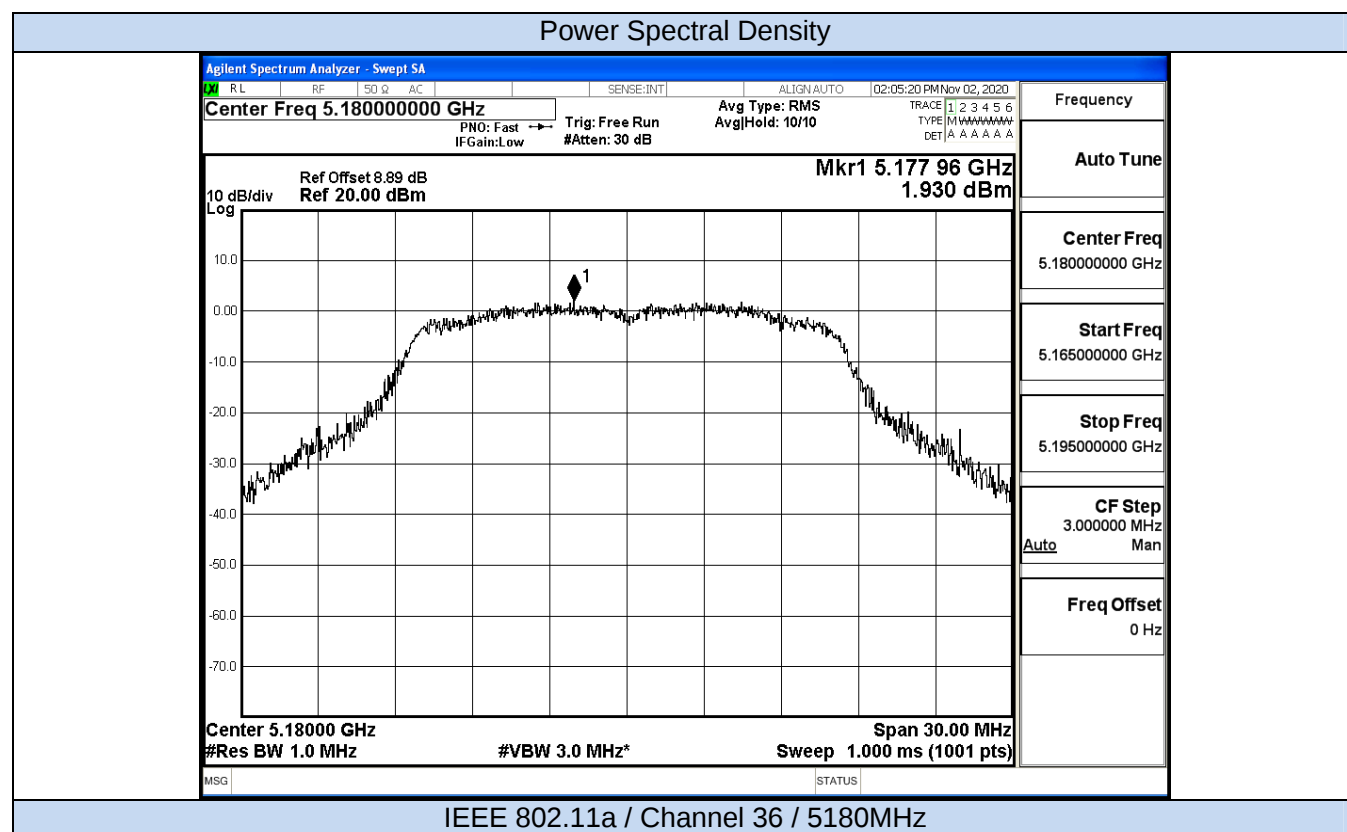


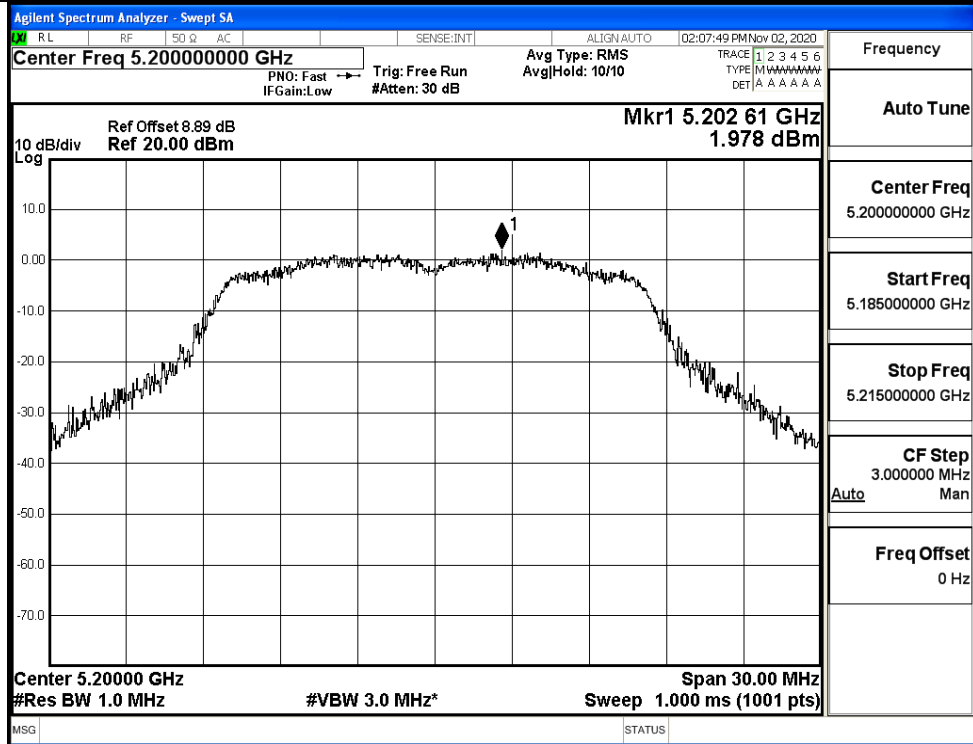
IEEE 802.11ac40 / Channel 46 / 5230MHz



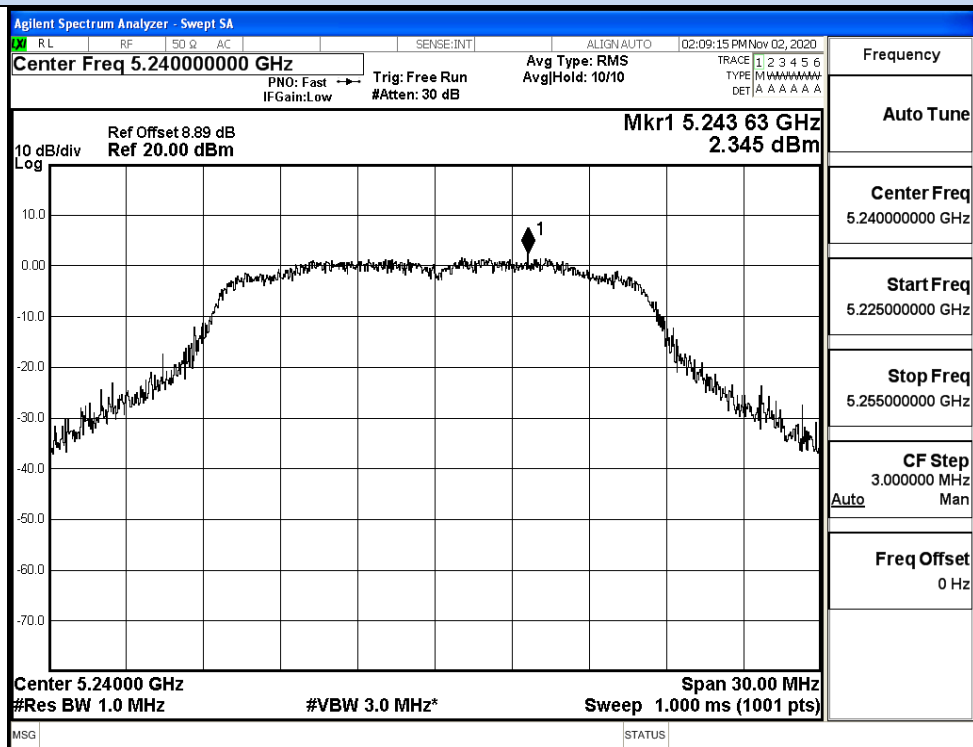
IEEE 802.11ac80 / Channel 42 / 5210MHz

Test Mode	Channel	Frequency (MHz)	Power Density (dBm/MHz)	Duty Cycle Factor (dB)	Report Power Density (dBm/MHz)	Limit (dBm/MHz)	Verdict
11A	36	5180	1.93	0	1.93	11	Pass
	40	5200	1.98	0	1.98		Pass
	48	5240	2.35	0	2.35		Pass
11N20 SISO	36	5180	1.19	0	1.19	11	Pass
	40	5200	1.56	0	1.56		Pass
	48	5240	1.46	0	1.46		Pass
11N40 SISO	38	5190	-1.44	0	-1.44	11	Pass
	46	5230	-1.82	0	-1.82		Pass
11AC20 SISO	36	5180	2.30	0	2.30	11	Pass
	40	5200	1.30	0	1.30		Pass
	48	5240	2.58	0	2.58		Pass
11AC40 SISO	38	5190	-1.15	0	-1.15	11	Pass
	46	5230	-1.18	0	-1.18		Pass
11AC80 SISO	42	5210	-4.86	0.28	-4.58	11	Pass



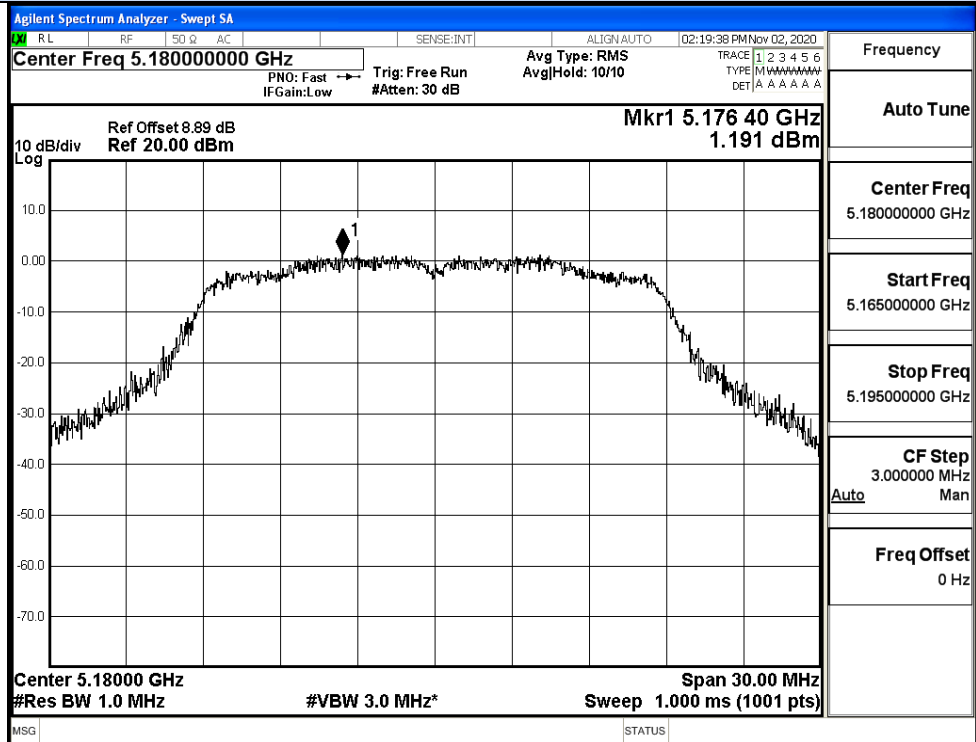


IEEE 802.11na / Channel 40 / 5200MHz

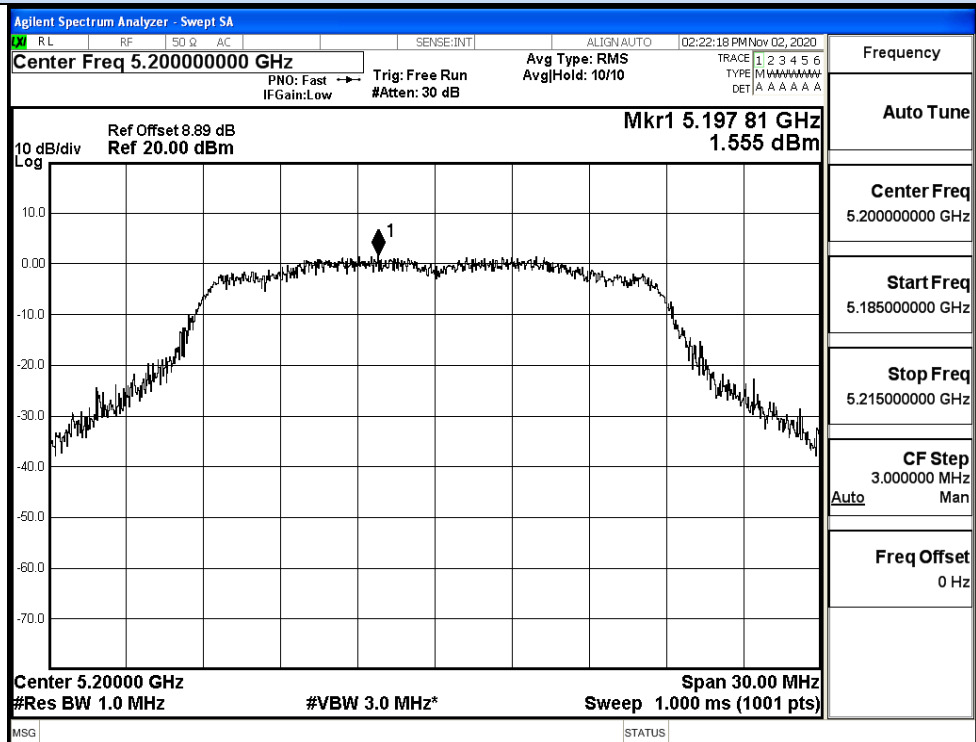


IEEE 802.11na / Channel 48 / 5240MHz

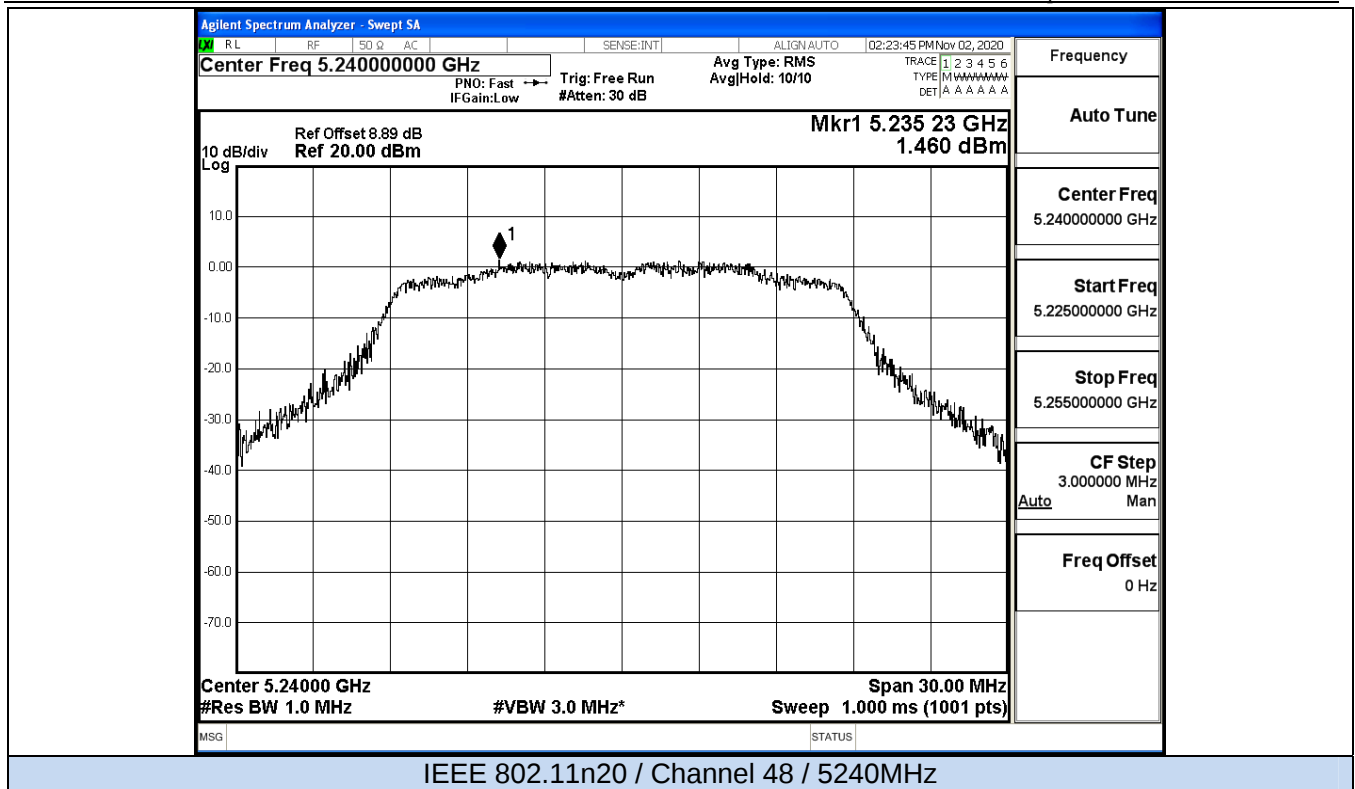
Power Spectral Density



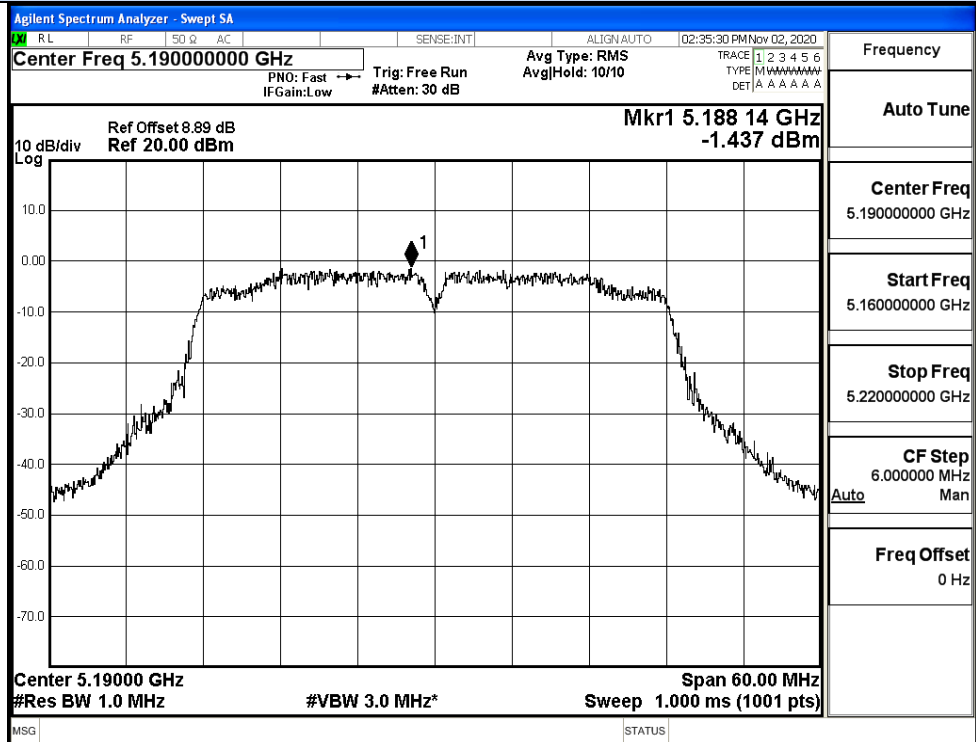
IEEE 802.11n20 / Channel 36 / 5180MHz



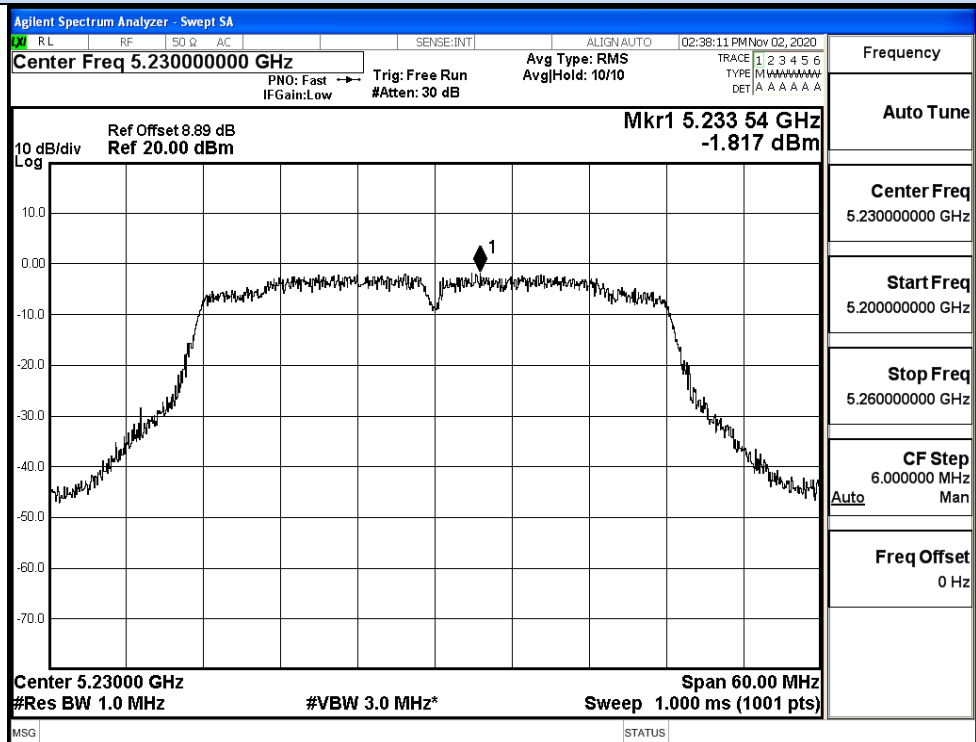
IEEE 802.11n20 / Channel 40 / 5200MHz



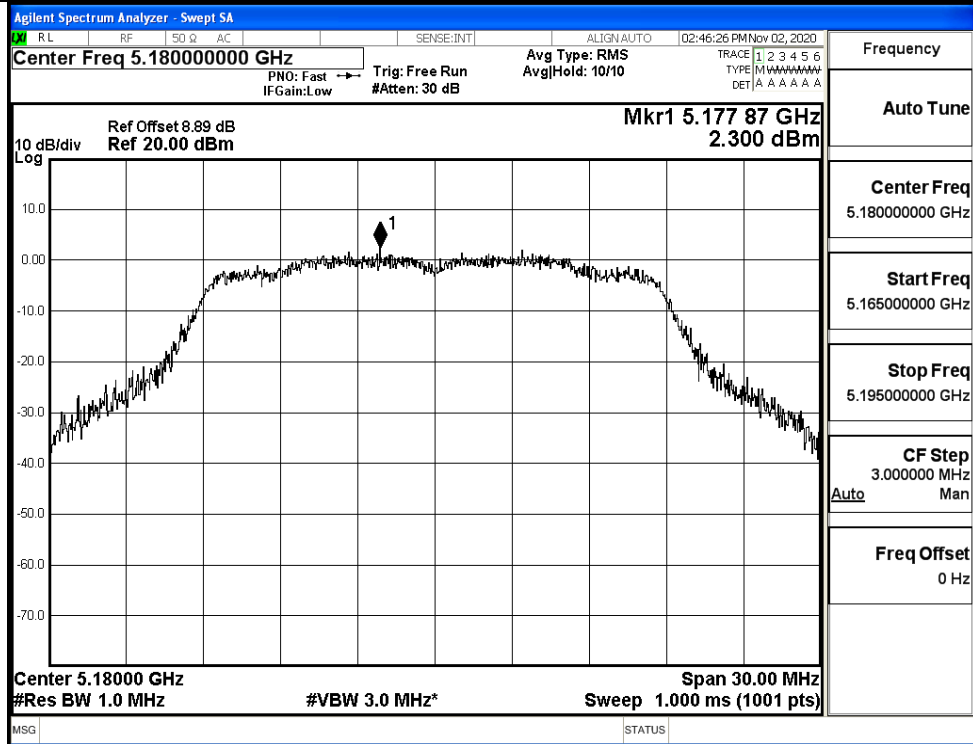
Power Spectral Density



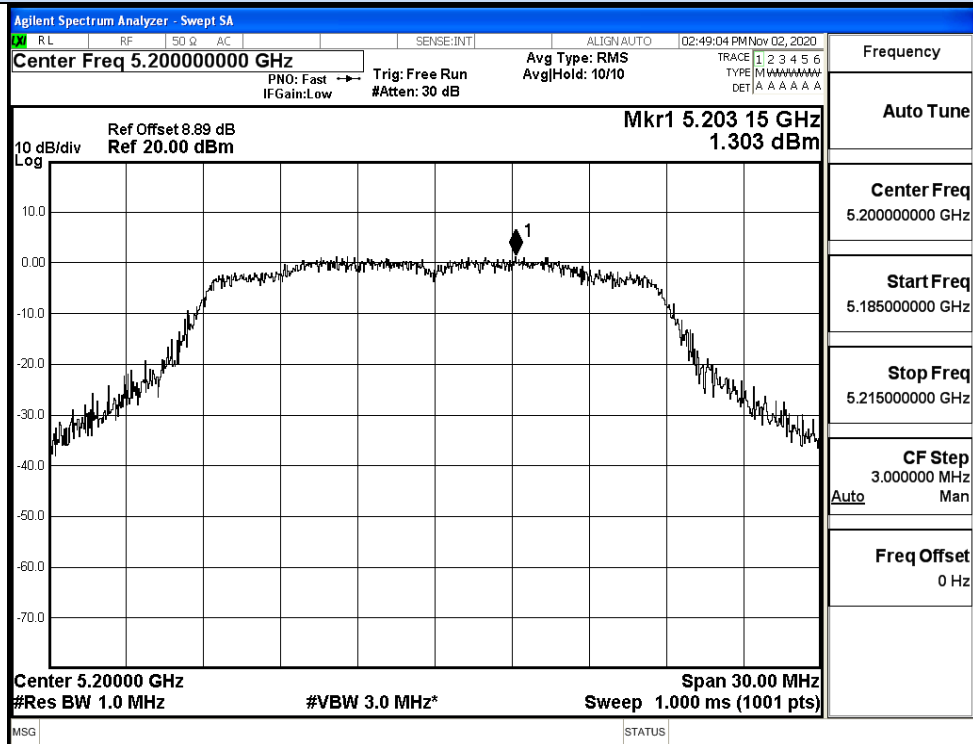
IEEE 802.11n40 / Channel 38 / 5190MHz



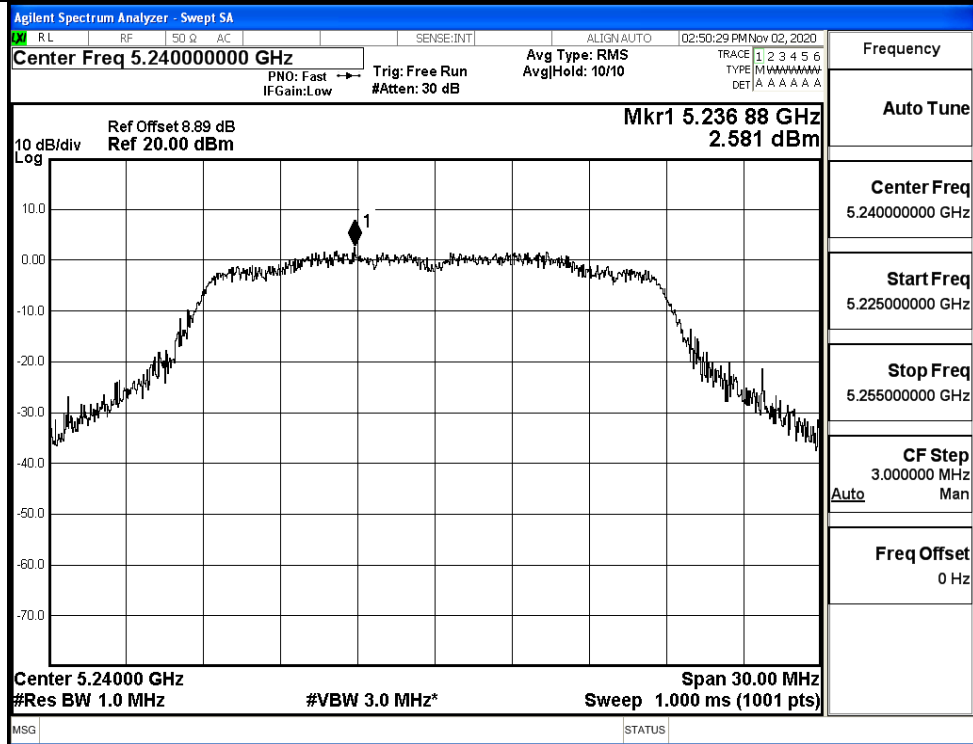
IEEE 802.11n40 / Channel 46 / 5230MHz



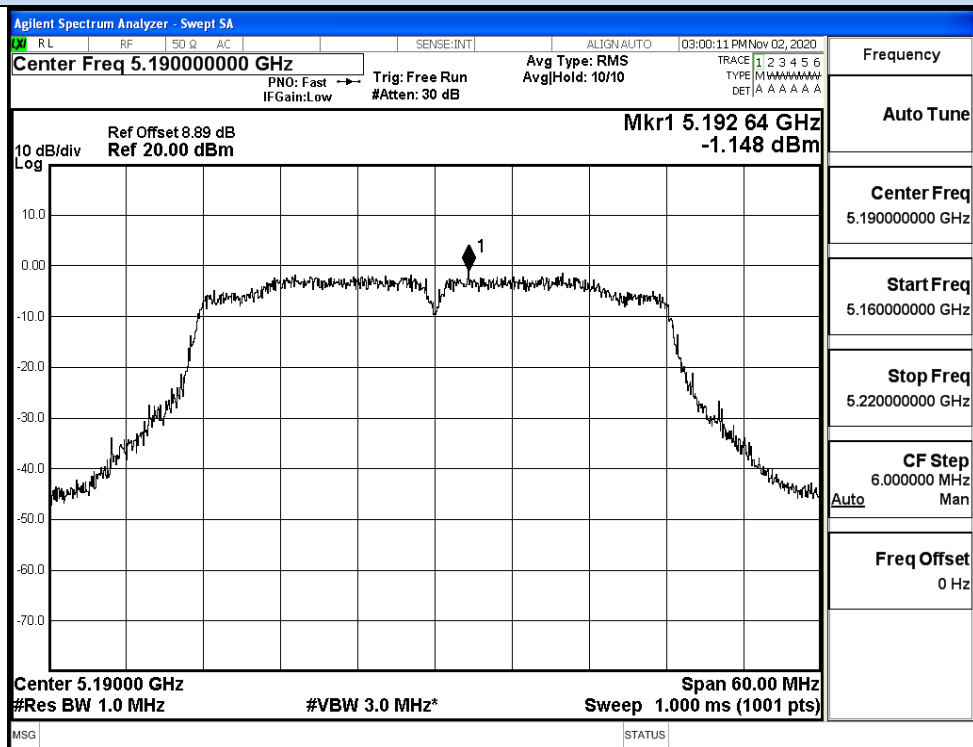
IEEE 802.11ac20 / Channel 36 / 5180MHz



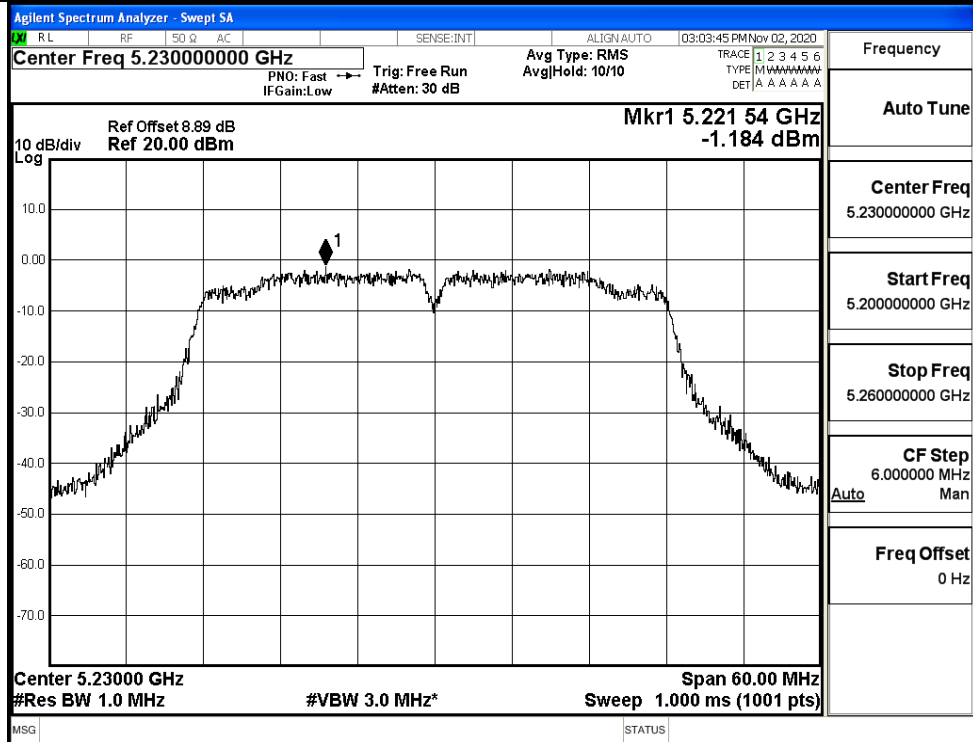
IEEE 802.11ac20 / Channel 40 / 5200MHz



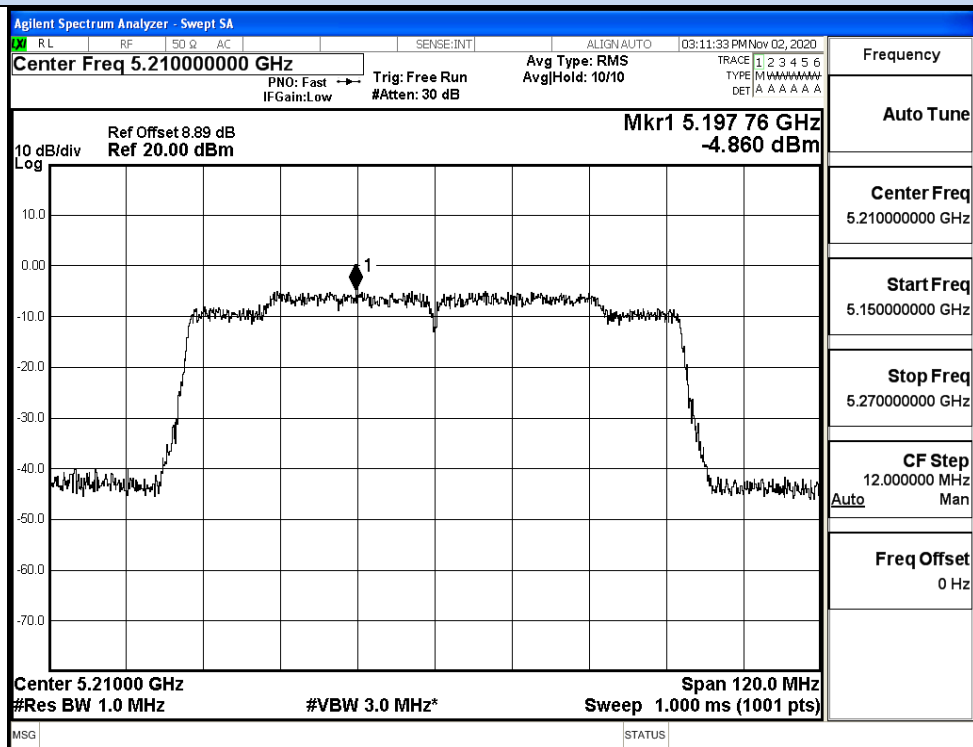
IEEE 802.11ac20 / Channel 48 / 5240MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz



IEEE 802.11ac40 / Channel 46 / 5230MHz



IEEE 802.11ac80 / Channel 42 / 5210MHz

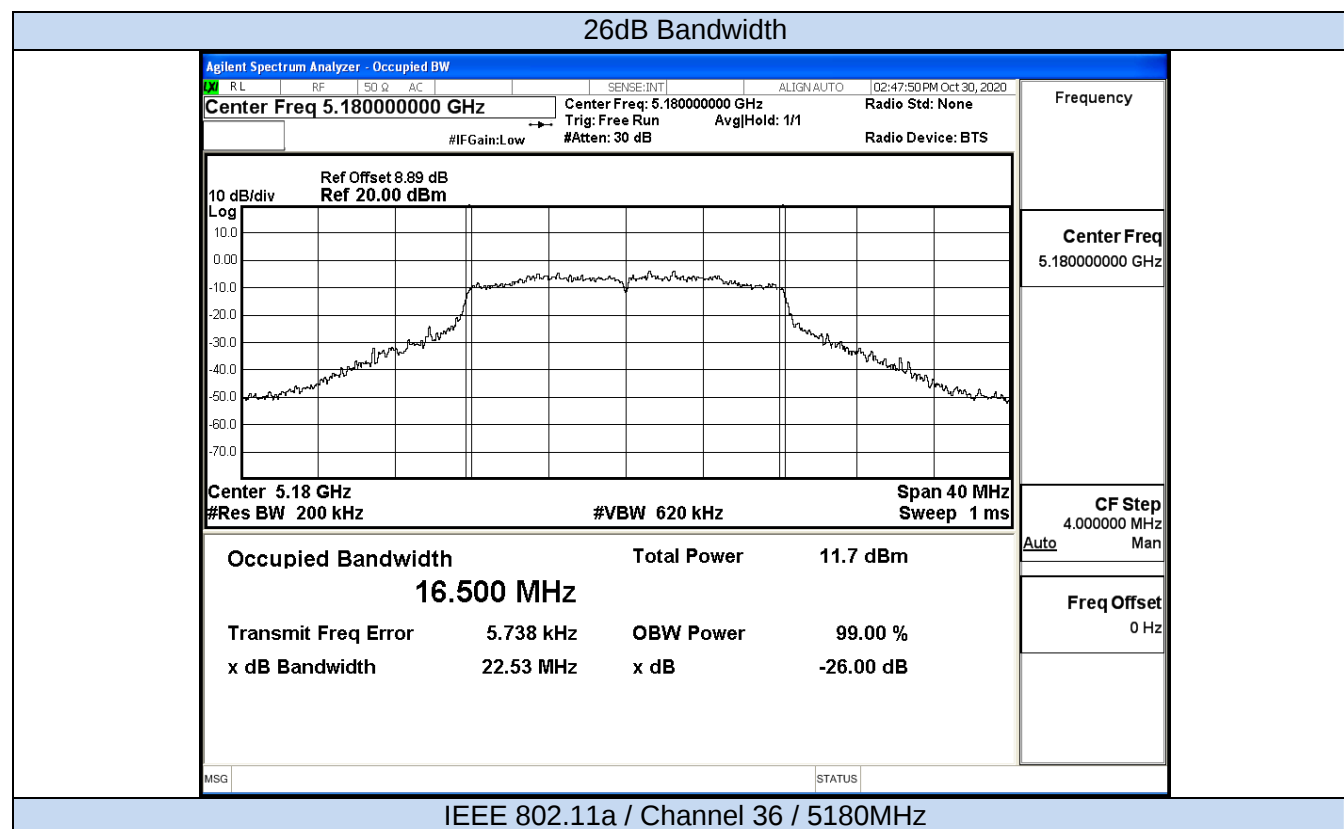
MIMO

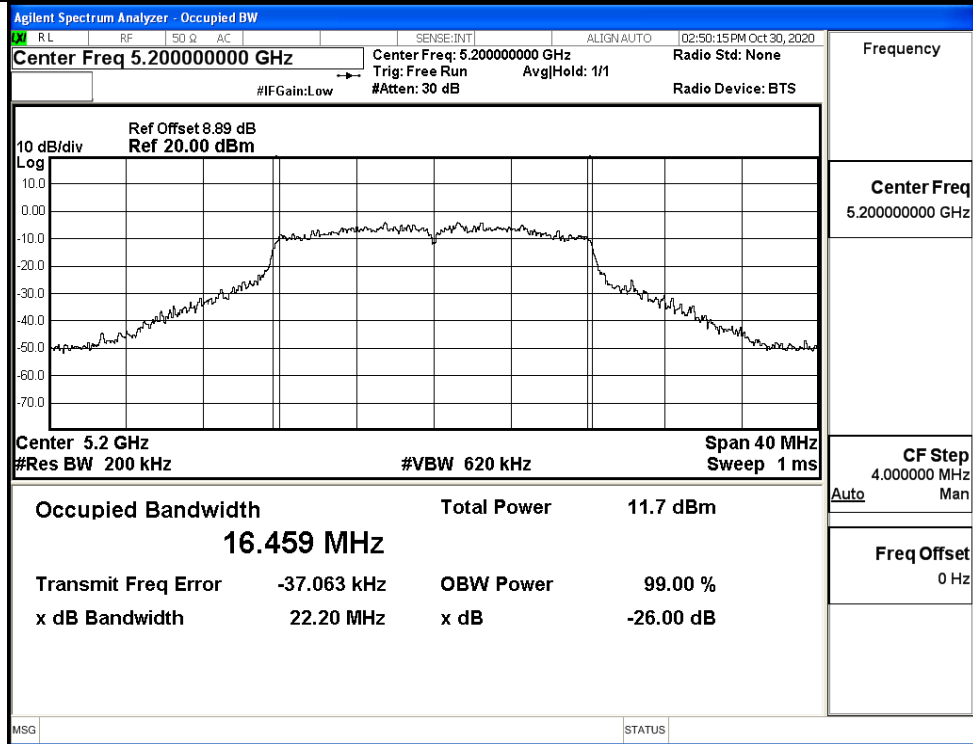
Test Mode	Channel	Frequency (MHz)	ANT 0 Power Density (dBm/MHz)	ANT 1 Power Density (dBm/MHz)	MIMO Power Density (dBm/MHz)	Duty Cycle Factor (dB)	Report Power Density (dBm/MHz)	Limit (dBm/MHz)	Verdict
11N 20	36	5180	1.62	1.19	4.42	0	4.42	11	Pass
	40	5200	2.06	1.56	4.83	0	4.83		Pass
	48	5240	2.01	1.46	4.75	0	4.75		Pass
11N 40	38	5190	-1.05	-1.44	1.77	0	1.77	11	Pass
	46	5230	-0.73	-1.82	1.77	0	1.77		Pass
11A C20	36	5180	2.60	2.30	5.46	0	5.46	11	Pass
	40	5200	3.43	1.30	5.50	0	5.50		Pass
	48	5240	3.64	2.58	6.15	0	6.15		Pass
11A C40	38	5190	0.07	-1.15	2.51	0	2.51	11	Pass
	46	5230	-0.33	-1.18	2.28	0	2.28		Pass
11A C80	42	5210	-3.12	-4.86	-0.89	0.28	-0.61	11	Pass

D.4 Emission Bandwidth

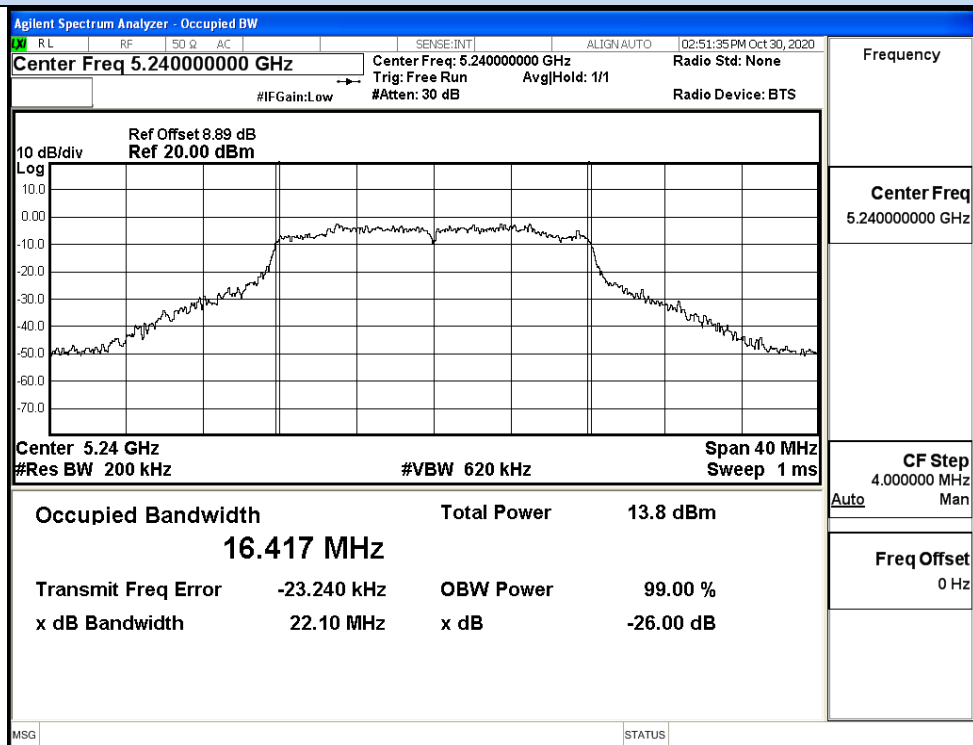
ANT 0

Test Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
11A	36	5180	22.53	No Limit	Pass
	40	5200	22.20		Pass
	48	5240	22.10		Pass
11N20 SISO	36	5180	21.62	No Limit	Pass
	40	5200	21.66		Pass
	48	5240	22.13		Pass
11N40 SISO	38	5190	41.77	No Limit	Pass
	46	5230	41.96		Pass
11AC20 SISO	36	5180	22.85	No Limit	Pass
	40	5200	22.07		Pass
	48	5240	21.81		Pass
11AC40 SISO	38	5190	41.91	No Limit	Pass
	46	5230	41.86		Pass
11AC80 SISO	42	5210	81.44	No Limit	Pass



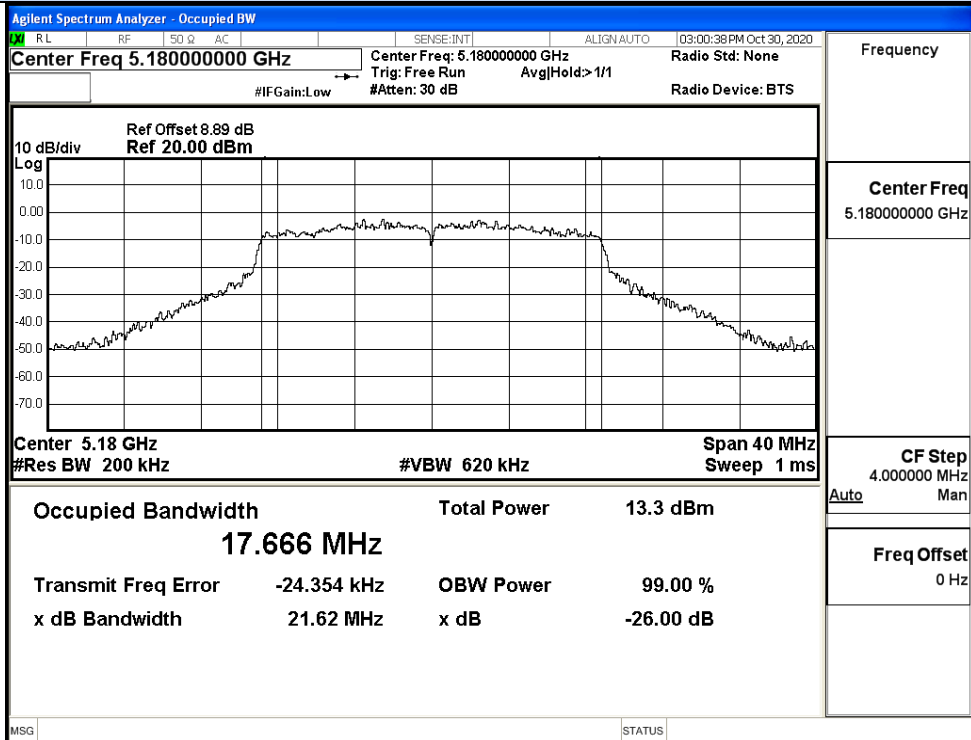


IEEE 802.11a / Channel 40 / 5200MHz

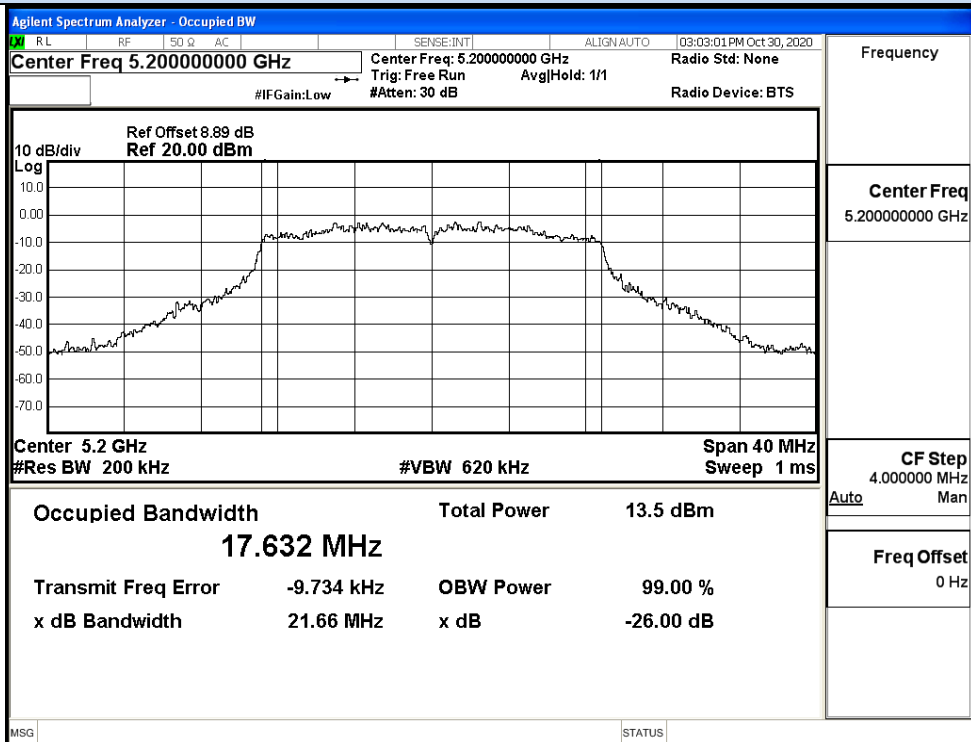


IEEE 802.11a / Channel 48 / 5240MHz

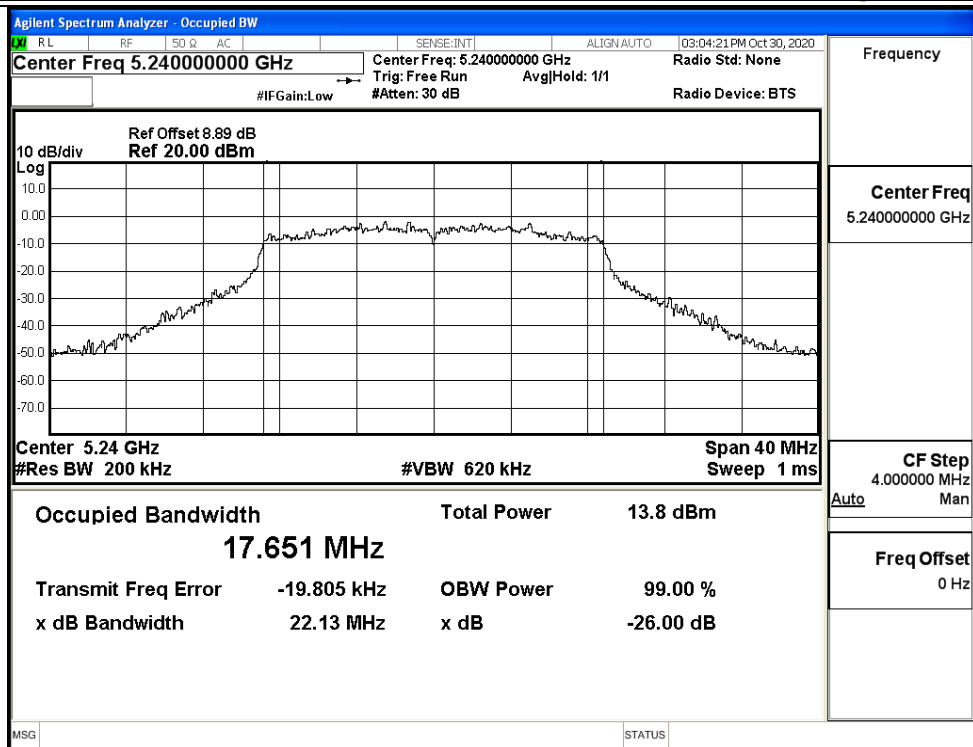
26dB Bandwidth



IEEE 802.11n20 / Channel 36 / 5180MHz

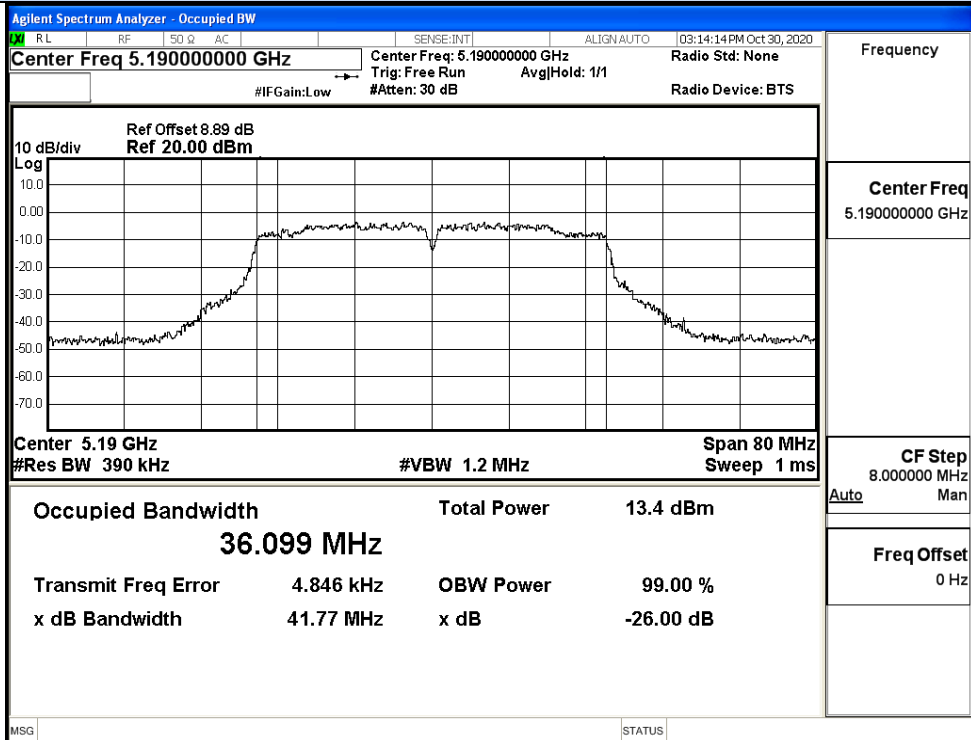


IEEE 802.11n20 / Channel 40 / 5200MHz

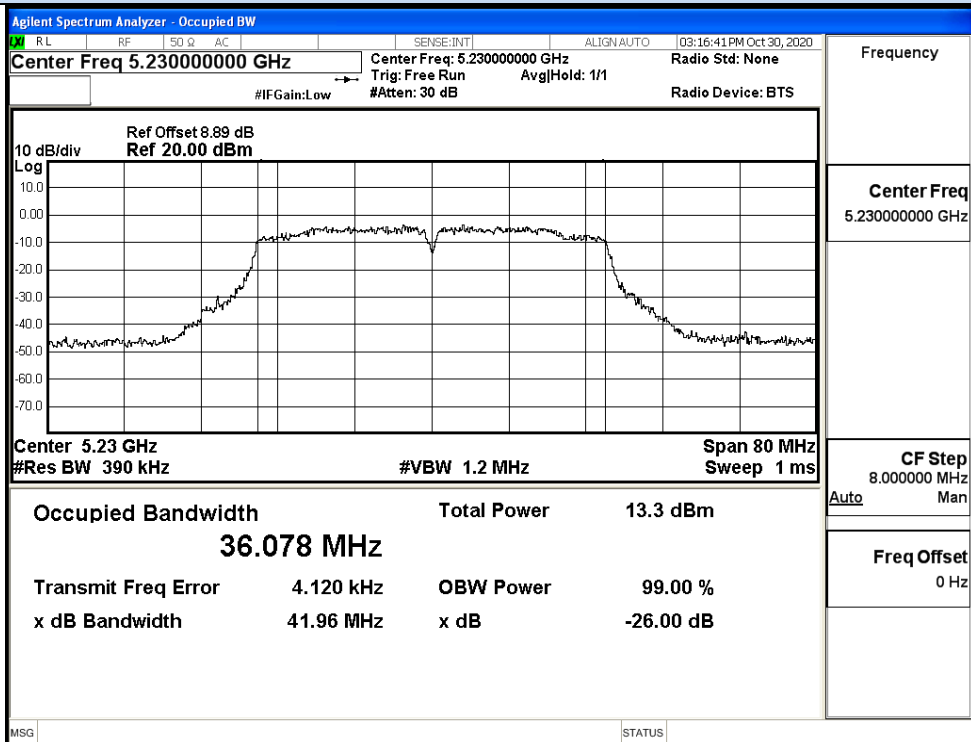


IEEE 802.11n20 / Channel 48 / 5240MHz

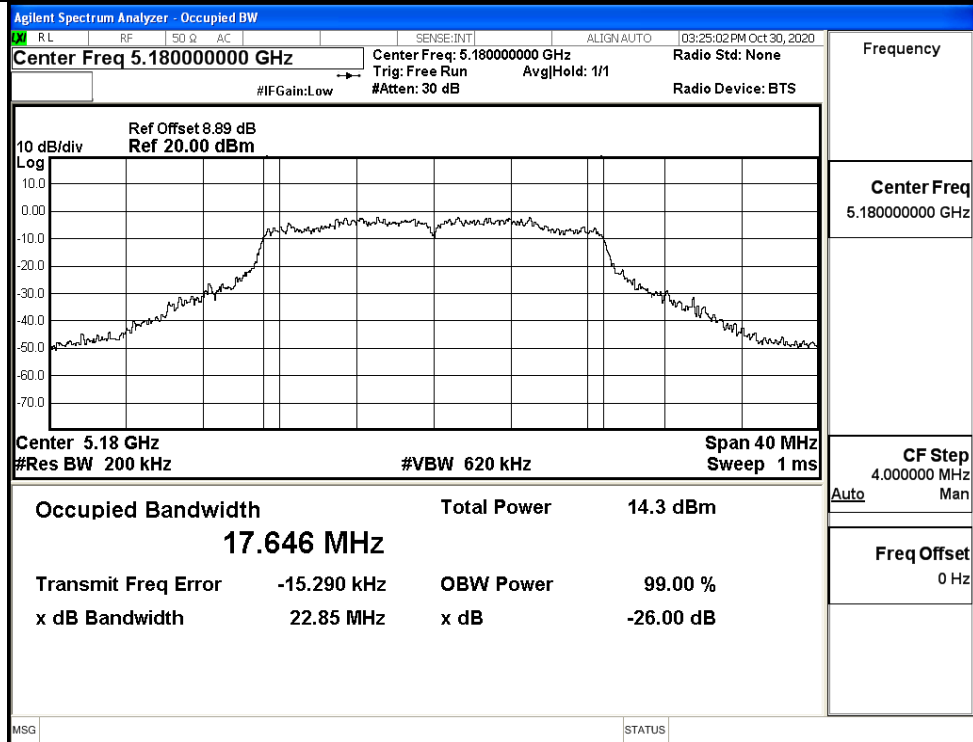
26dB Bandwidth



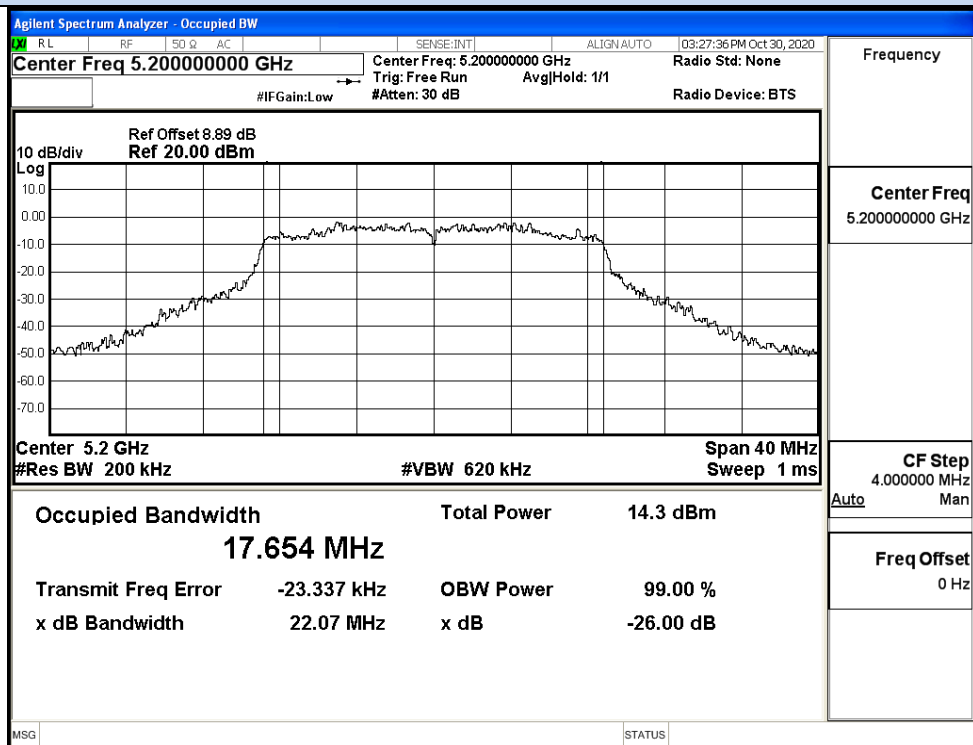
IEEE 802.11n40 / Channel 38 / 5190MHz



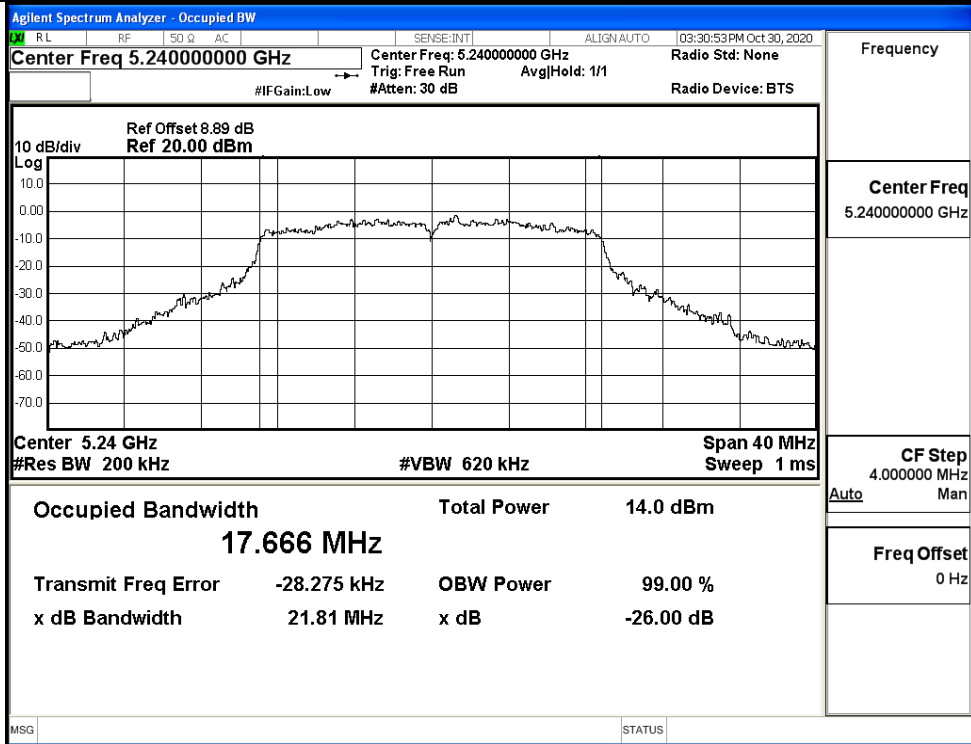
IEEE 802.11n40 / Channel 46 / 5230MHz



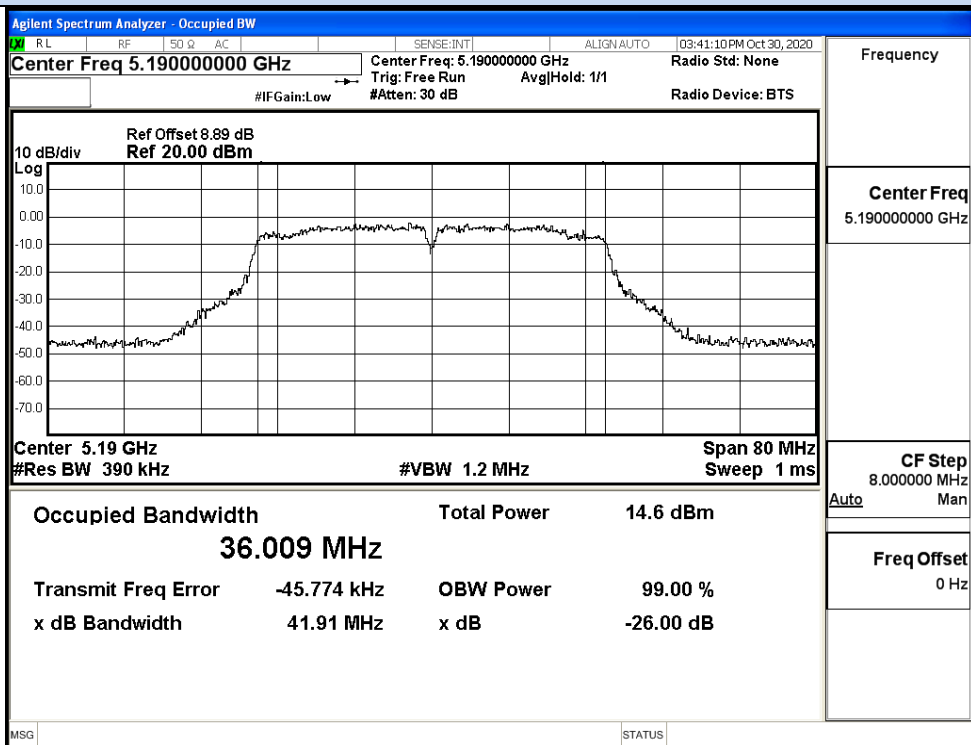
IEEE 802.11ac20 / Channel 36 / 5180MHz



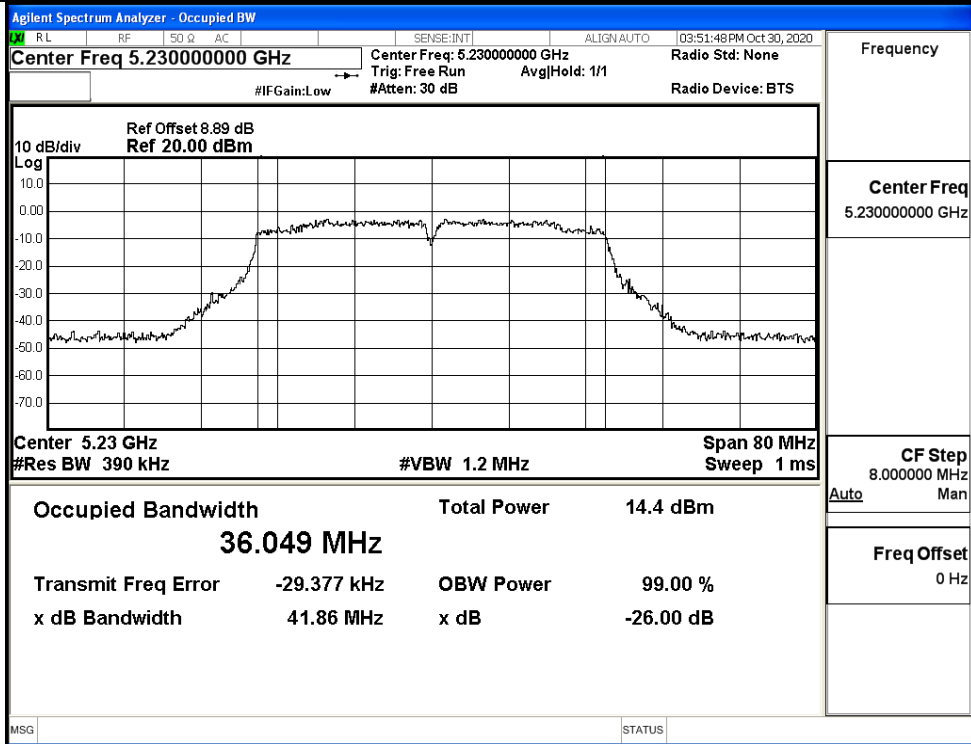
IEEE 802.11ac20 / Channel 40 / 5200MHz



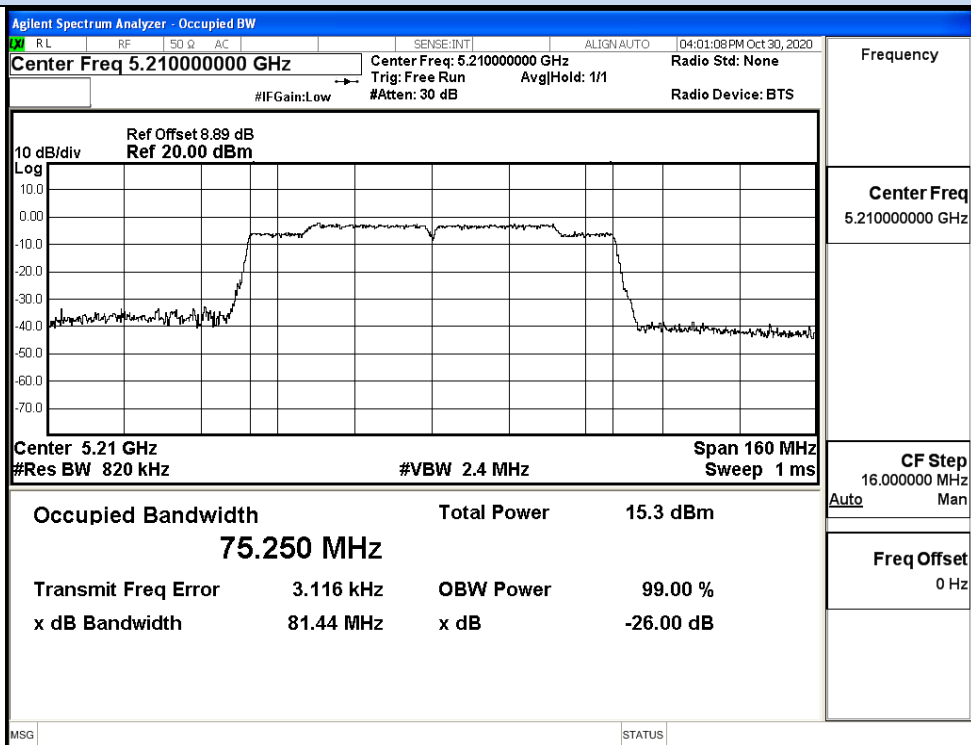
IEEE 802.11ac20 / Channel 48 / 5240MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz



IEEE 802.11ac40 / Channel 46 / 5230MHz

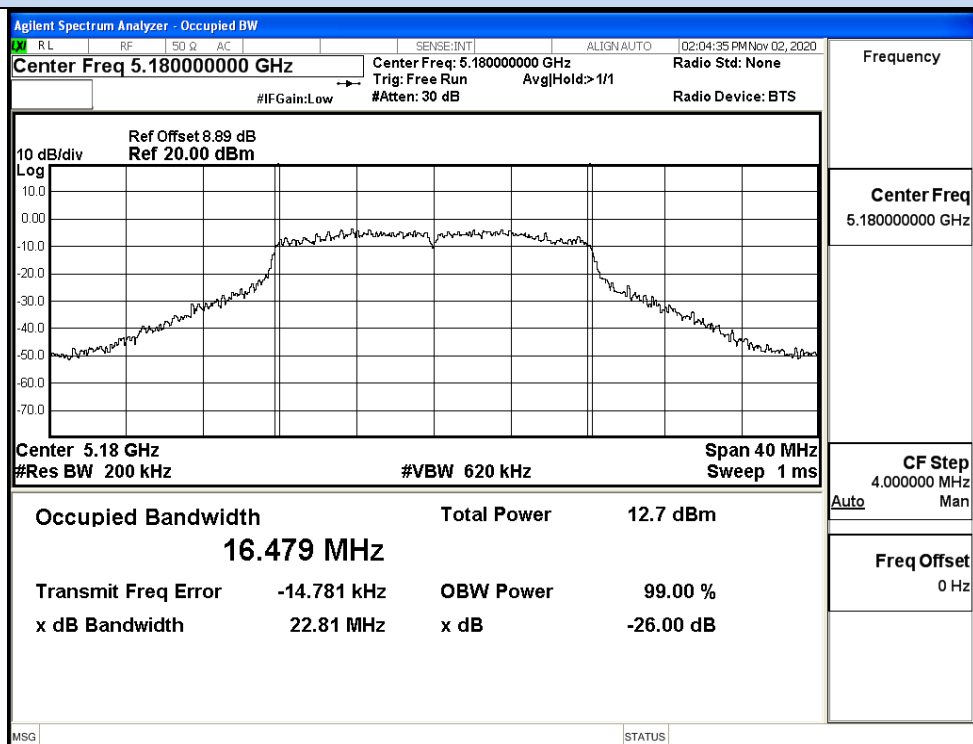


IEEE 802.11ac80 / Channel 42 / 5210MHz

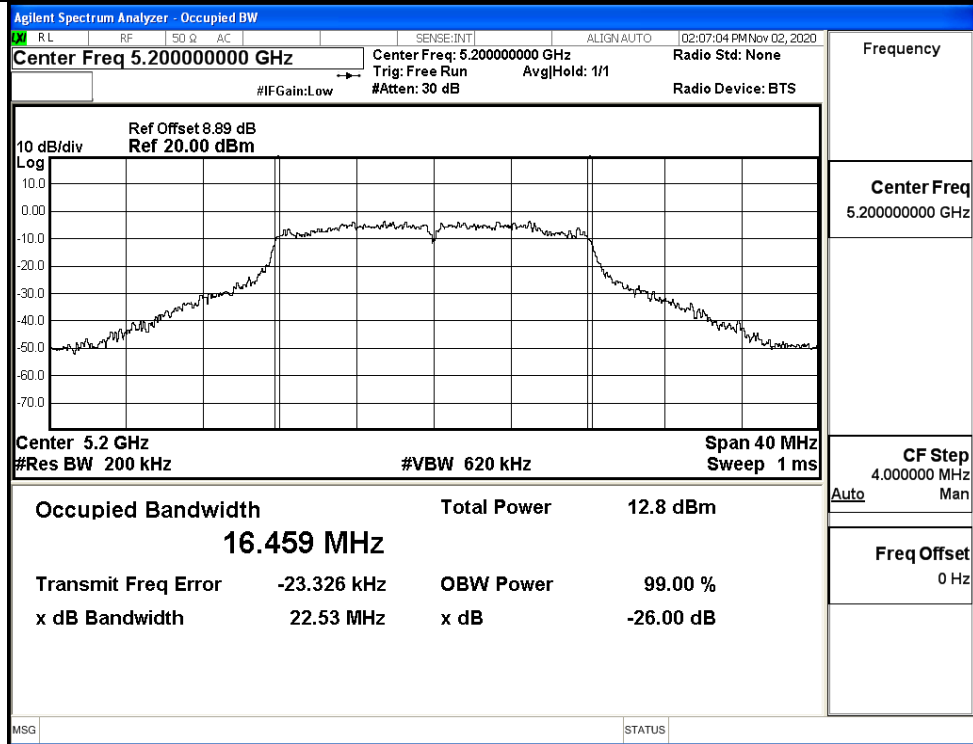
ANT 1

Test Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
11A	36	5180	22.81	No Limit	Pass
	40	5200	22.53		Pass
	48	5240	22.34		Pass
11N20 SISO	36	5180	22.29	No Limit	Pass
	40	5200	22.11		Pass
	48	5240	22.01		Pass
11N40 SISO	38	5190	42.21	No Limit	Pass
	46	5230	42.04		Pass
11AC20 SISO	36	5180	22.10	No Limi	Pass
	40	5200	22.59		Pass
	48	5240	22.67		Pass
11AC40 SISO	38	5190	41.40	No Limi	Pass
	46	5230	41.03		Pass
11AC80 SISO	42	5210	81.22	No Limi	Pass

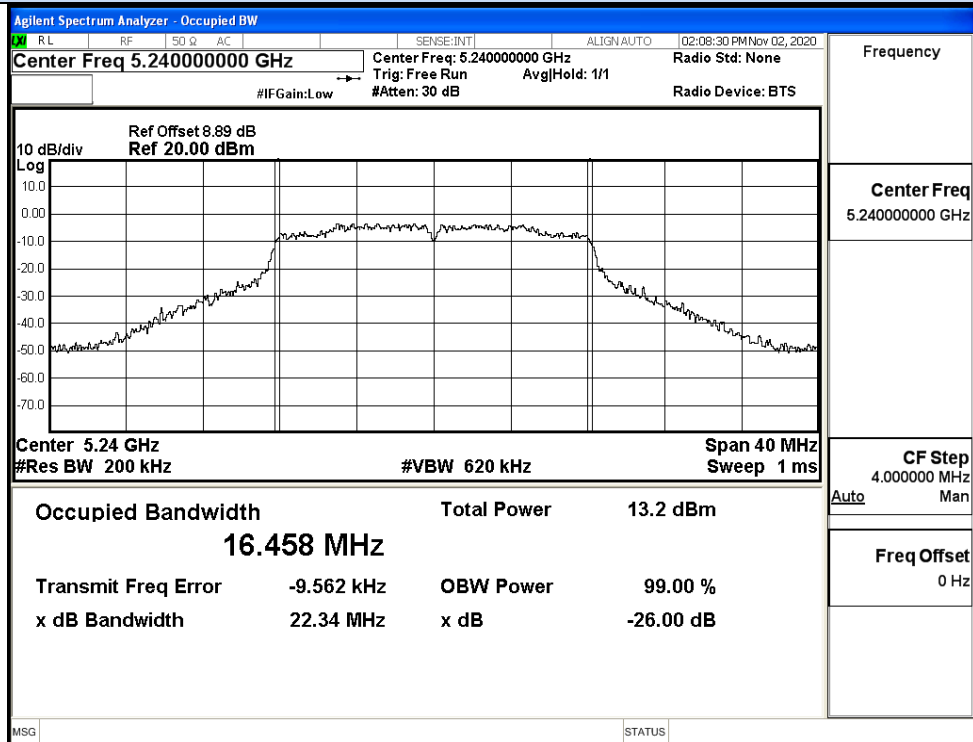
26dB Bandwidth



IEEE 802.11a / Channel 36 / 5180MHz

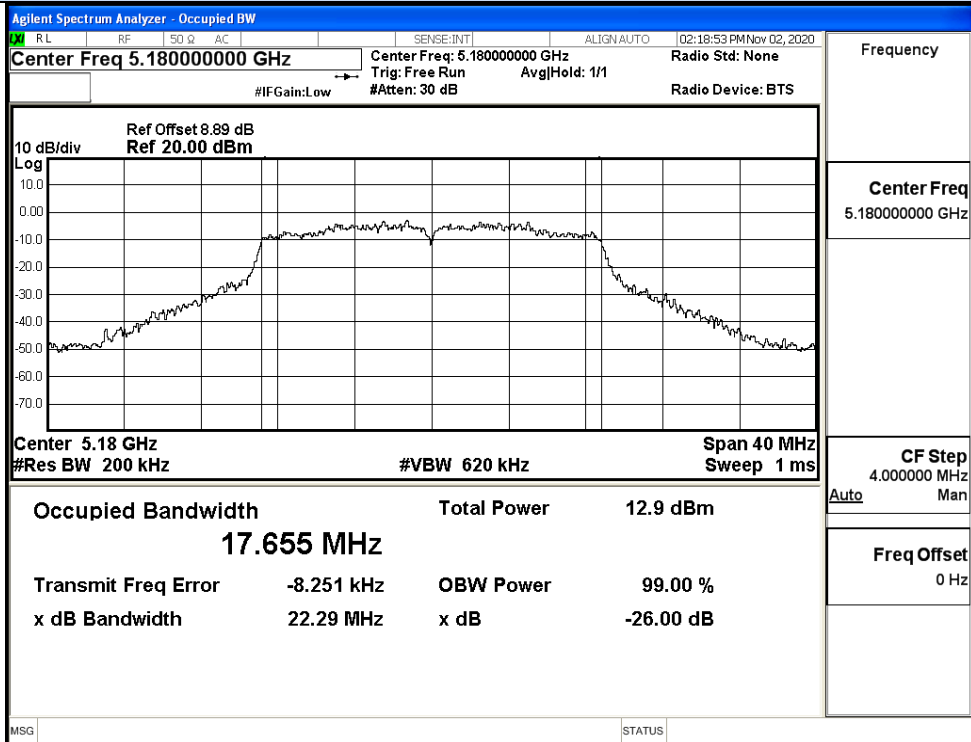


IEEE 802.11a / Channel 40 / 5200MHz

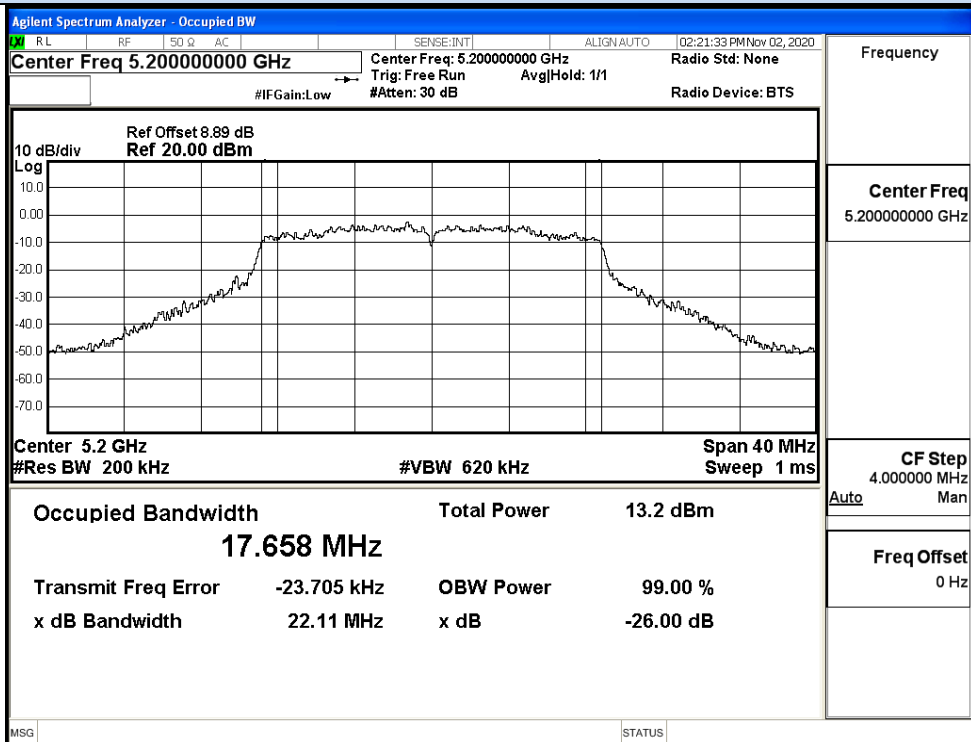


IEEE 802.11a / Channel 48 / 5240MHz

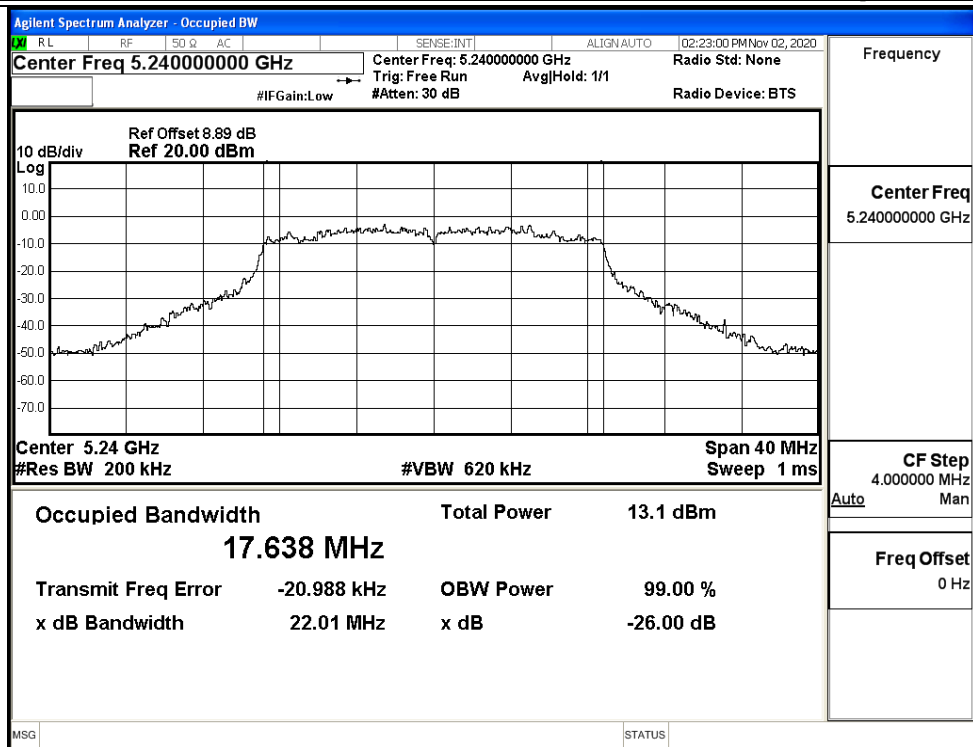
26dB Bandwidth



IEEE 802.11n20 / Channel 36 / 5180MHz

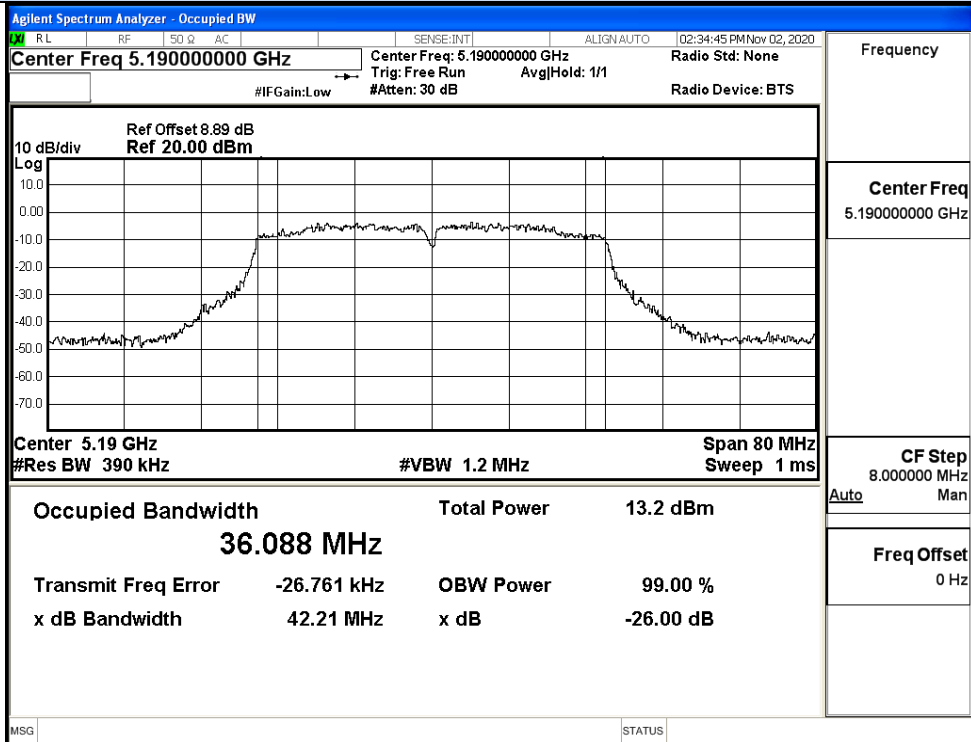


IEEE 802.11n20 / Channel 40 / 5200MHz

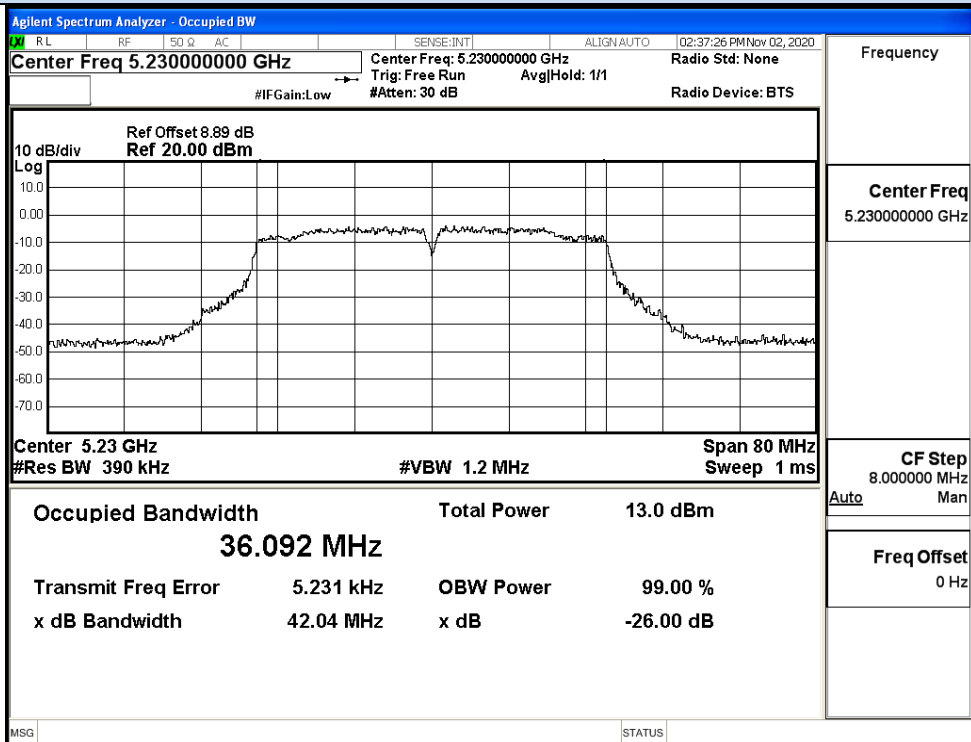


IEEE 802.11n20 / Channel 48 / 5240MHz

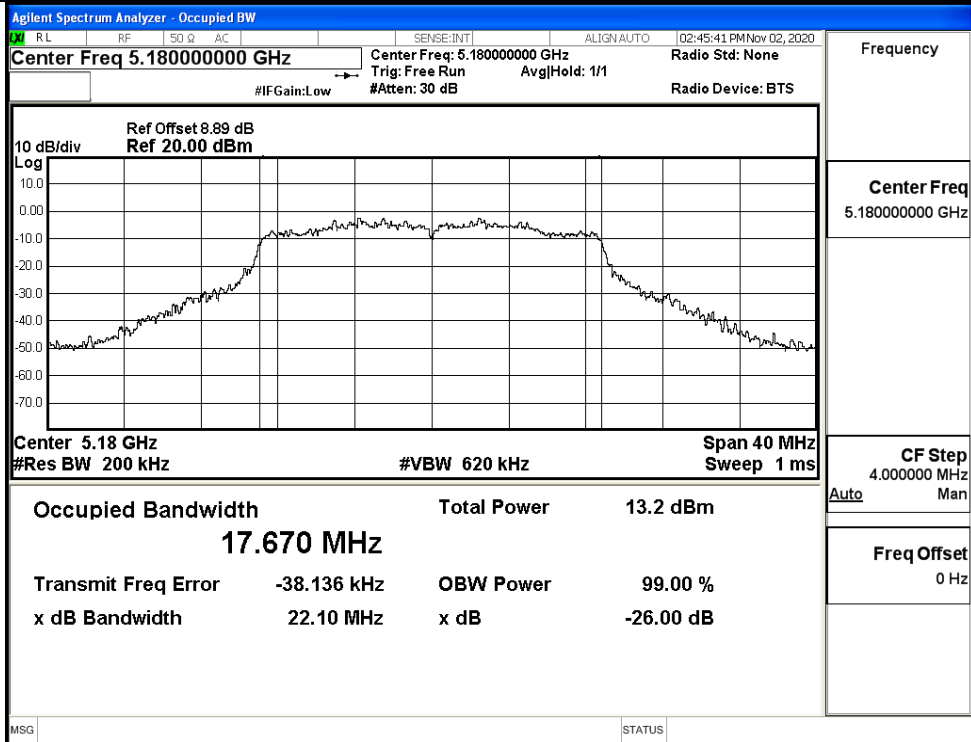
26dB Bandwidth



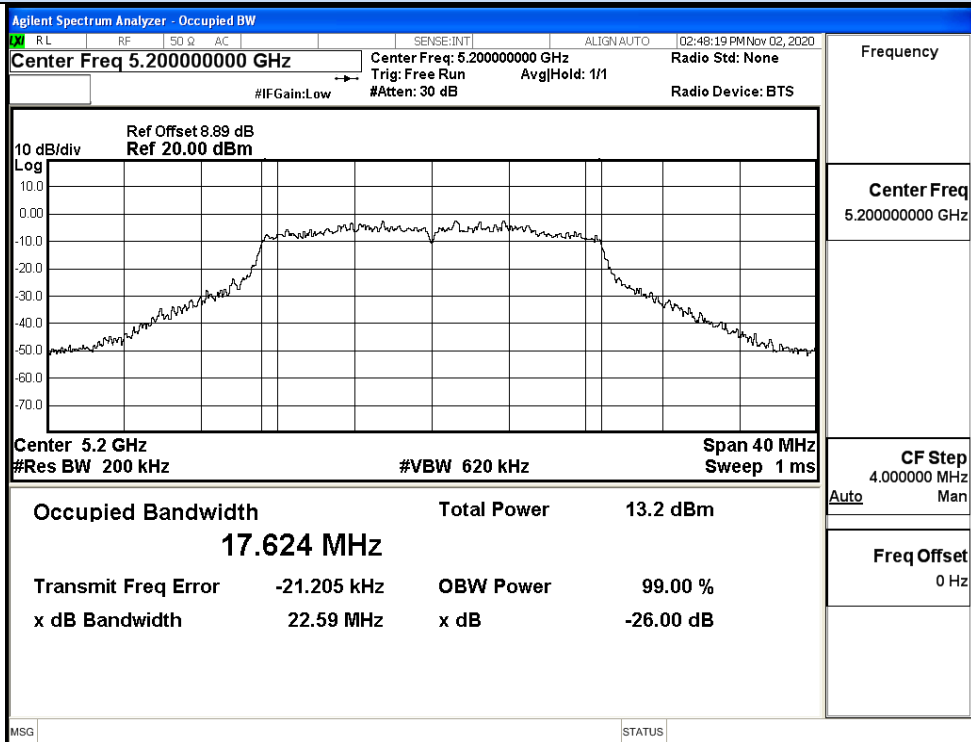
IEEE 802.11n40 / Channel 38 / 5190MHz



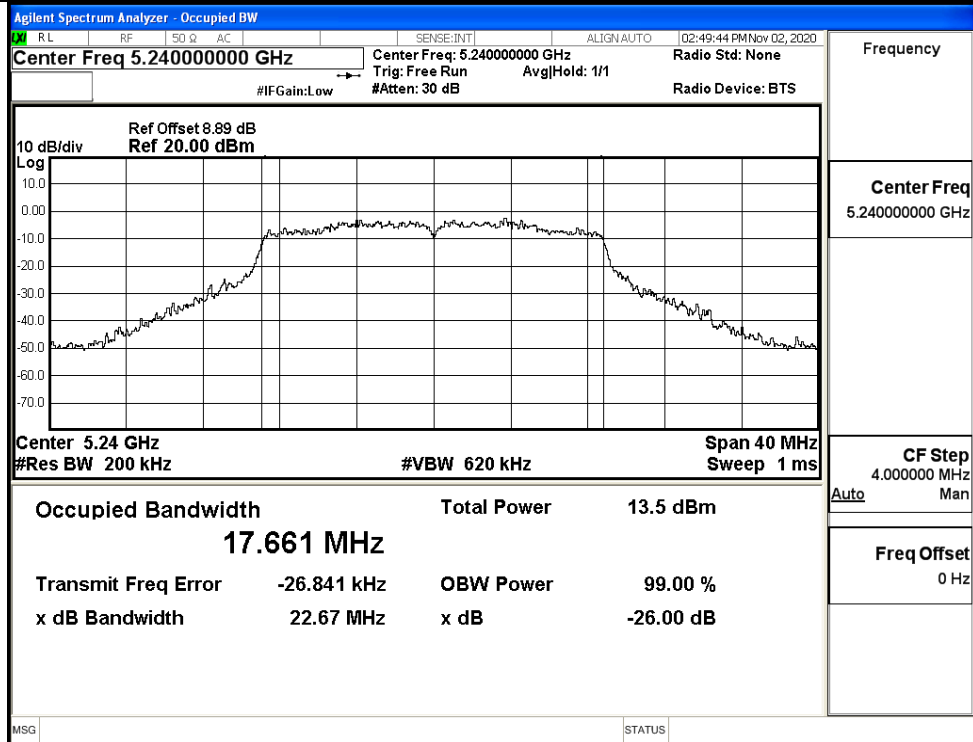
IEEE 802.11n40 / Channel 46 / 5230MHz



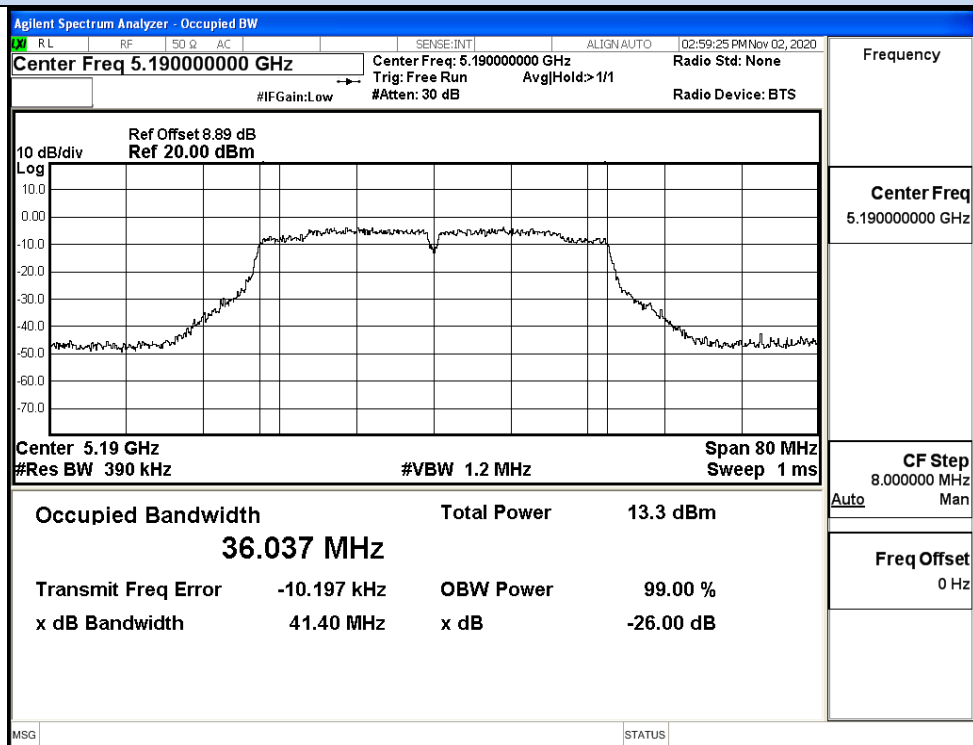
IEEE 802.11ac20 / Channel 36 / 5180MHz



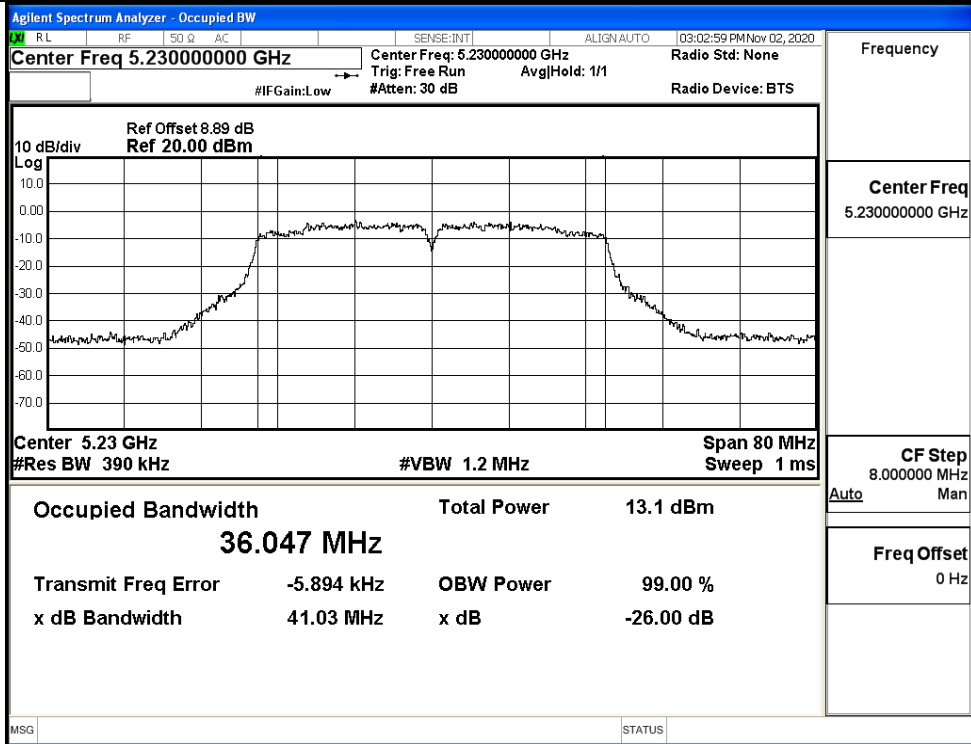
IEEE 802.11ac20 / Channel 40 / 5200MHz



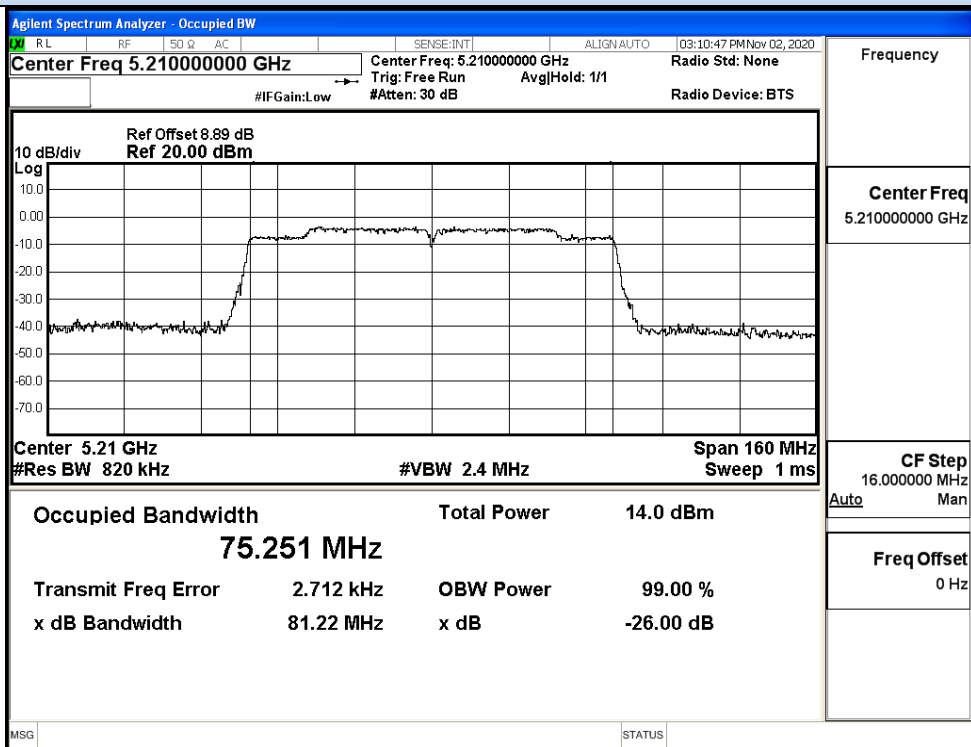
IEEE 802.11ac20 / Channel 48 / 5240MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz



IEEE 802.11ac40 / Channel 46 / 5230MHz



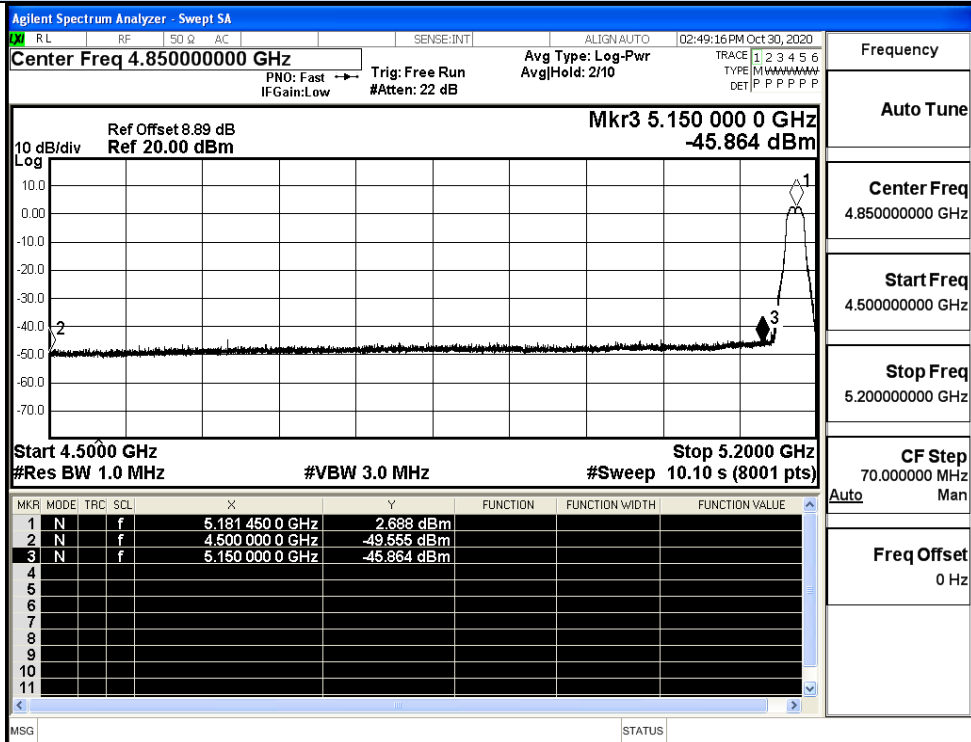
IEEE 802.11ac80 / Channel 42 / 5210MHz

D.5 Undesirable Emissions Measurement

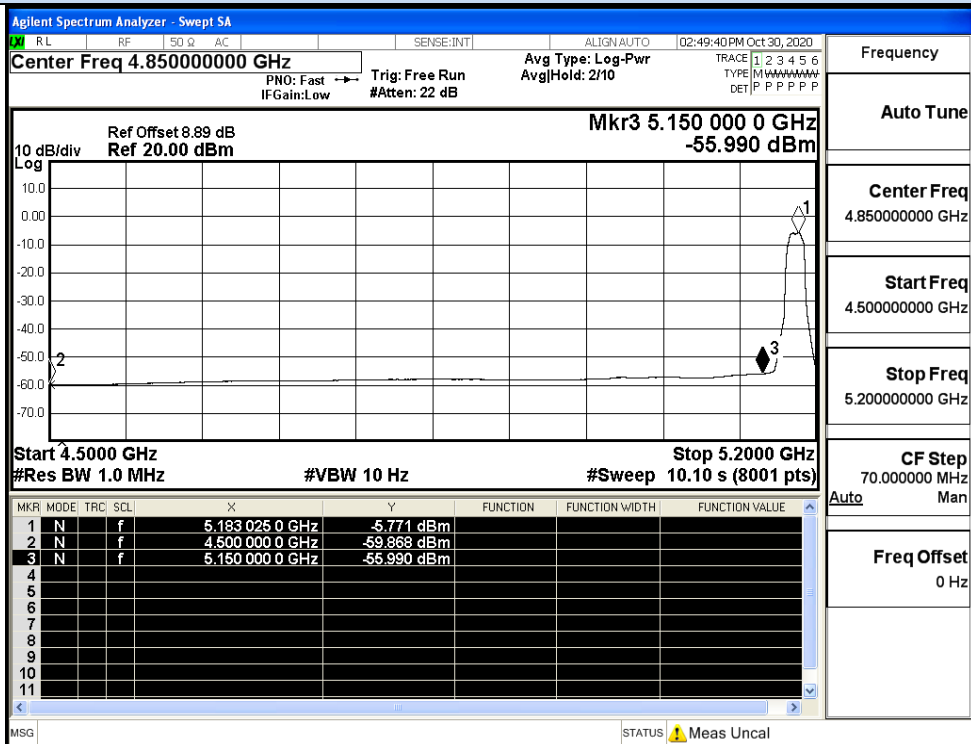
ANT 0

Test Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Ground Reflection Factor (dB)	Covert Radiated E Level At 3m (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
11A	36	4500.0	-49.56	2.00	0	45.67	Peak	68.20	Pass
		4500.0	-59.87	2.00	0	35.36	Average	54.00	Pass
		5150.0	-45.86	2.00	0	49.36	Peak	68.20	Pass
		5150.0	-55.99	2.00	0	39.24	Average	54.00	Pass
	48	5350.0	-46.65	2.00	0	48.58	Peak	68.20	Pass
		5350.0	-56.33	2.00	0	38.89	Average	54.00	Pass
		5460.0	-47.98	2.00	0	47.25	Peak	68.20	Pass
		5460.0	-58.63	2.00	0	36.60	Average	54.00	Pass
11N2 0 SISO	36	4500.0	-49.95	2.00	0	45.27	Peak	68.20	Pass
		4500.0	-59.98	2.00	0	35.25	Average	54.00	Pass
		5150.0	-45.03	2.00	0	50.20	Peak	68.20	Pass
		5150.0	-55.14	2.00	0	40.08	Average	54.00	Pass
	48	5350.0	-46.02	2.00	0	49.20	Peak	68.20	Pass
		5350.0	-56.42	2.00	0	38.81	Average	54.00	Pass
		5460.0	-48.15	2.00	0	47.07	Peak	68.20	Pass
		5460.0	-58.67	2.00	0	36.55	Average	54.00	Pass
11N4 0 SISO	38	4500.0	-49.77	2.00	0	45.46	Peak	68.20	Pass
		4500.0	-60.03	2.00	0	35.20	Average	54.00	Pass
		5150.0	-45.95	2.00	0	49.28	Peak	68.20	Pass
		5150.0	-54.98	2.00	0	40.25	Average	54.00	Pass
	46	5350.0	-46.02	2.00	0	49.21	Peak	68.20	Pass
		5350.0	-56.00	2.00	0	39.23	Average	54.00	Pass
		5460.0	-48.57	2.00	0	46.66	Peak	68.20	Pass
		5460.0	-58.39	2.00	0	36.84	Average	54.00	Pass
11A C20 SISO	36	4500.0	-50.61	2.00	0	44.62	Peak	68.20	Pass
		4500.0	-60.02	2.00	0	35.21	Average	54.00	Pass
		5150.0	-45.10	2.00	0	50.13	Peak	68.20	Pass
		5150.0	-54.56	2.00	0	40.67	Average	54.00	Pass
	48	4500.0	-50.61	2.00	0	44.62	Peak	68.20	Pass
		4500.0	-60.02	2.00	0	35.21	Average	54.00	Pass
		5150.0	-45.10	2.00	0	50.13	Peak	68.20	Pass
		5150.0	-54.56	2.00	0	40.67	Average	54.00	Pass
11A C40 SISO	38	4500.0	-49.98	2.00	0	45.25	Peak	68.20	Pass
		4500.0	-60.13	2.00	0	35.10	Average	54.00	Pass
		5150.0	-42.50	2.00	0	52.73	Peak	68.20	Pass
		5150.0	-52.98	2.00	0	42.25	Average	54.00	Pass
	46	5350.0	-45.49	2.00	0	49.74	Peak	68.20	Pass
		5350.0	-55.98	2.00	0	39.25	Average	54.00	Pass
		5460.0	-48.29	2.00	0	46.94	Peak	68.20	Pass
		5460.0	-58.47	2.00	0	36.76	Average	54.00	Pass
11A C80 SISO	42	4500.0	-45.61	2.00	0	49.62	Peak	68.20	Pass
		5150.0	-55.79	2.00	0	39.44	Average	54.00	Pass
		4500.0	-48.36	2.00	0	46.87	Peak	68.20	Pass
		5150.0	-58.09	2.00	0	37.14	Average	54.00	Pass
		5350.0	-45.61	2.00	0	49.62	Peak	68.20	Pass
		5460.0	-55.79	2.00	0	39.44	Average	54.00	Pass
		5350.0	-48.36	2.00	0	46.87	Peak	68.20	Pass
		5460.0	-58.09	2.00	0	37.14	Average	54.00	Pass

Undesirable Emissions Measurement

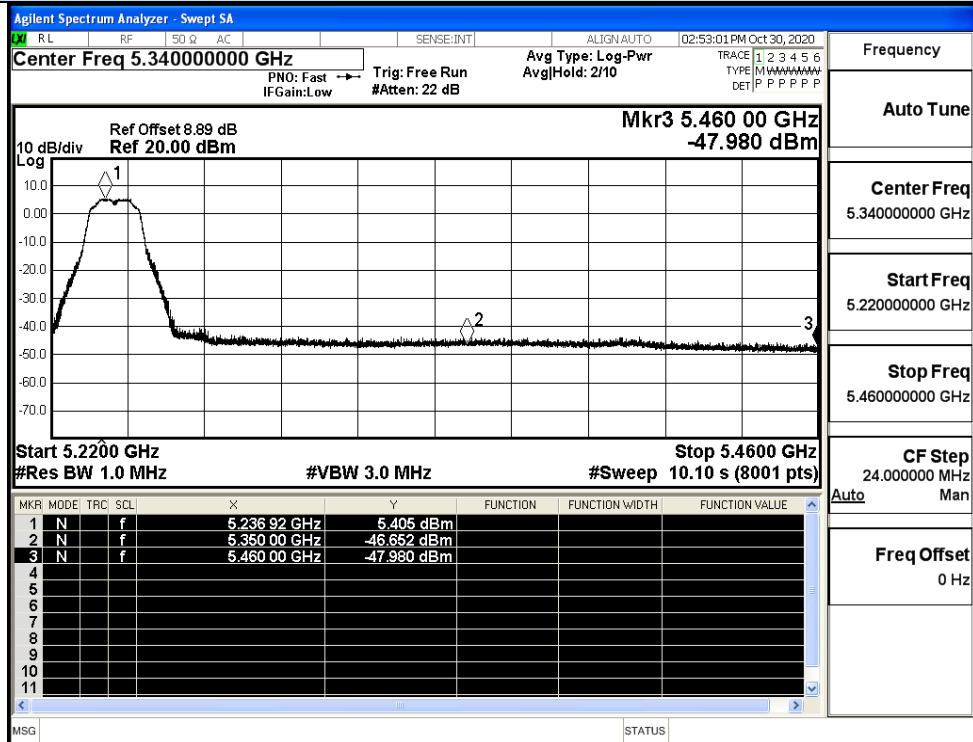


IEEE 802.11a / Channel 36 / 5180MHz / Peak

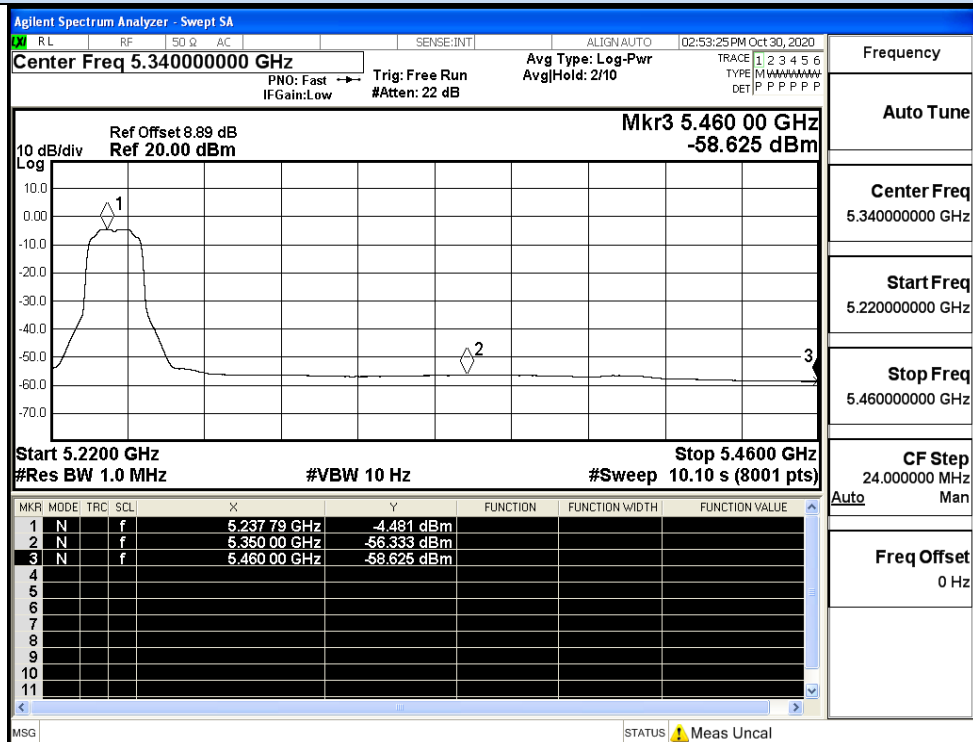


IEEE 802.11a / Channel 36 / 5180MHz / Average

Undesirable Emissions Measurement

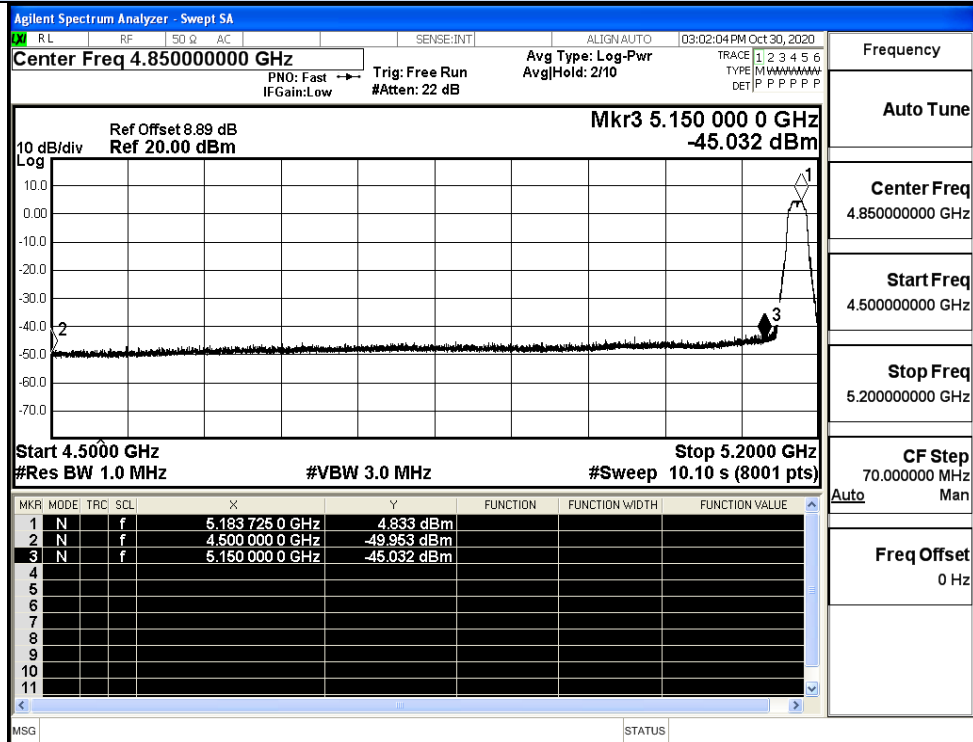


IEEE 802.11a / Channel 48 / 5240MHz / Peak

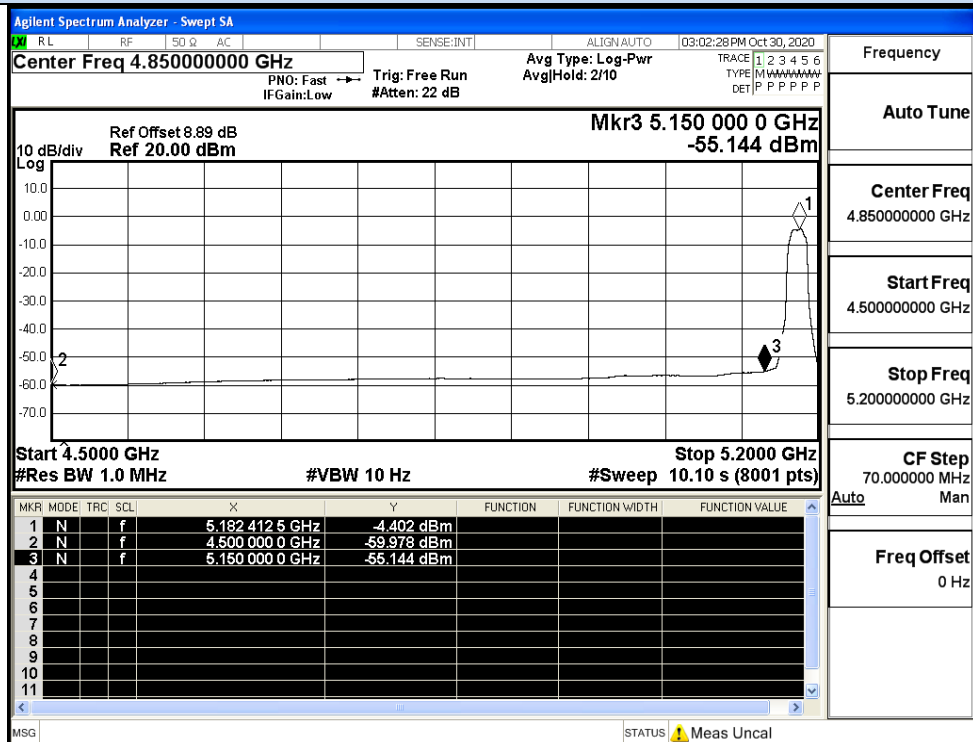


IEEE 802.11a / Channel 48 / 5240MHz / Average

Undesirable Emissions Measurement

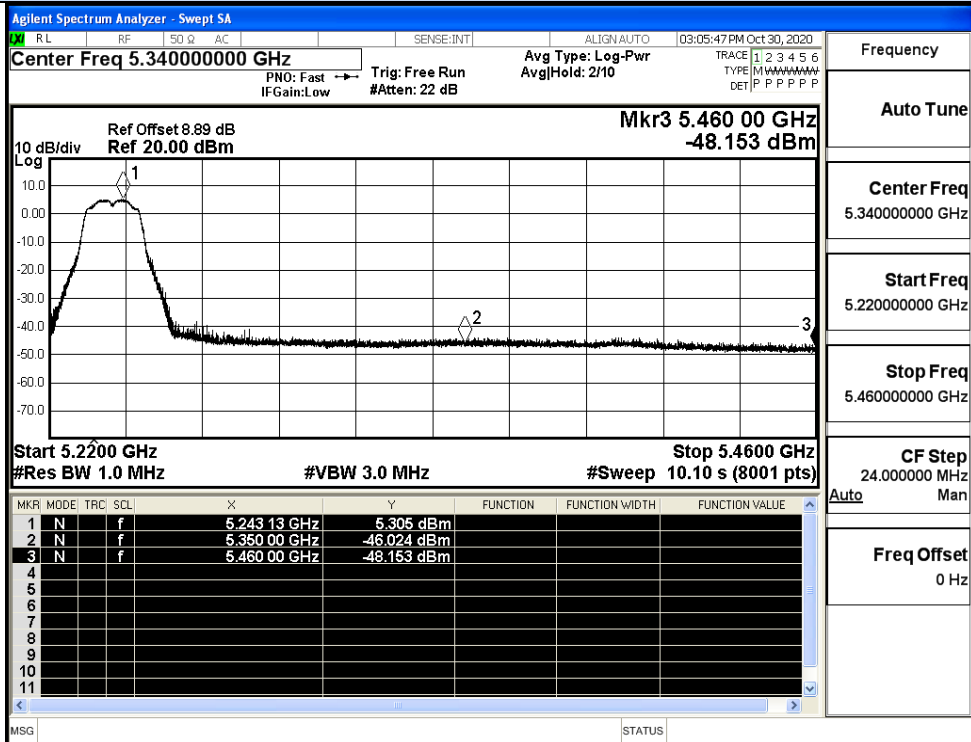


IEEE 802.11n20 / Channel 36 / 5180MHz / Peak

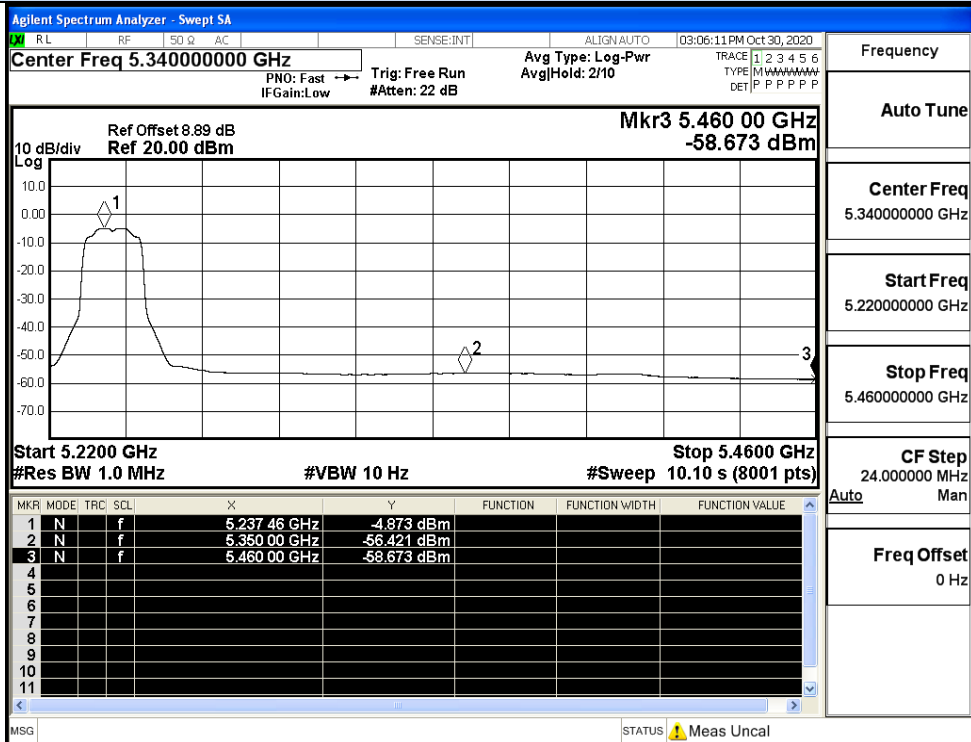


IEEE 802.11n20 / Channel 36 / 5180MHz / Average

Undesirable Emissions Measurement

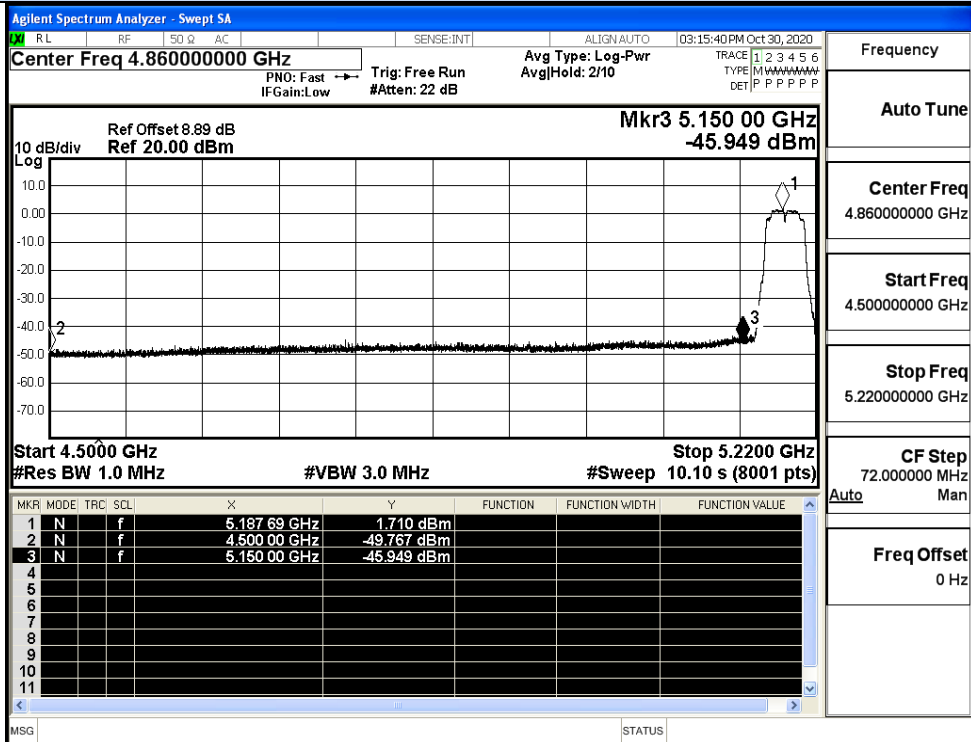


IEEE 802.11n20 / Channel 48 / 5240MHz / Peak

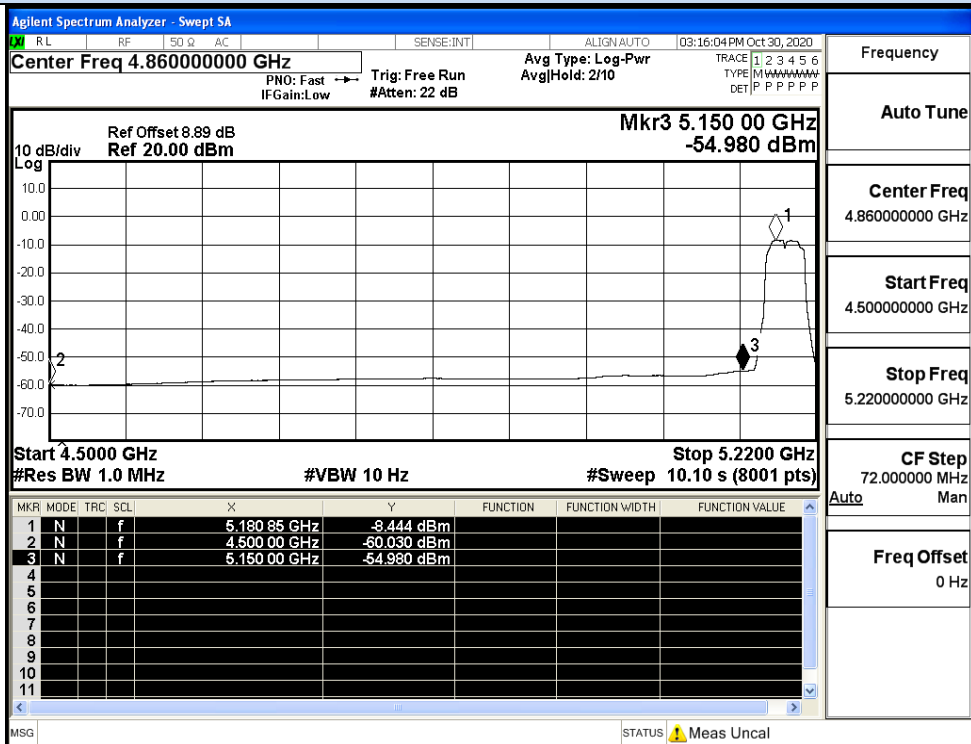


IEEE 802.11n20 / Channel 48 / 5240MHz / Average

Undesirable Emissions Measurement

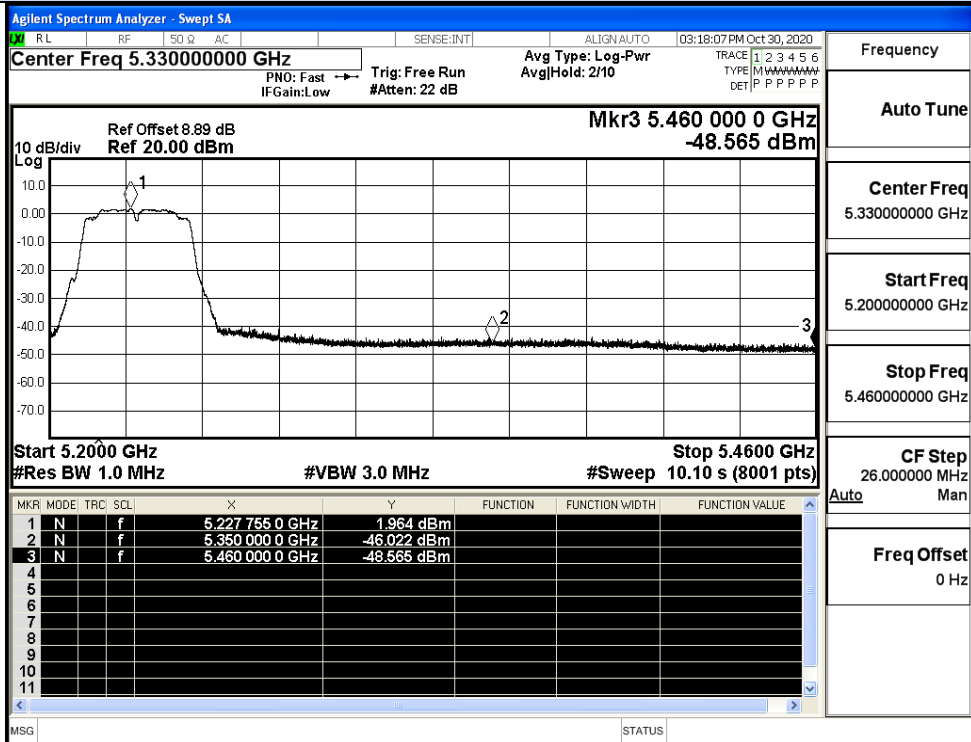


IEEE 802.11n40 / Channel 38 / 5190MHz / Peak

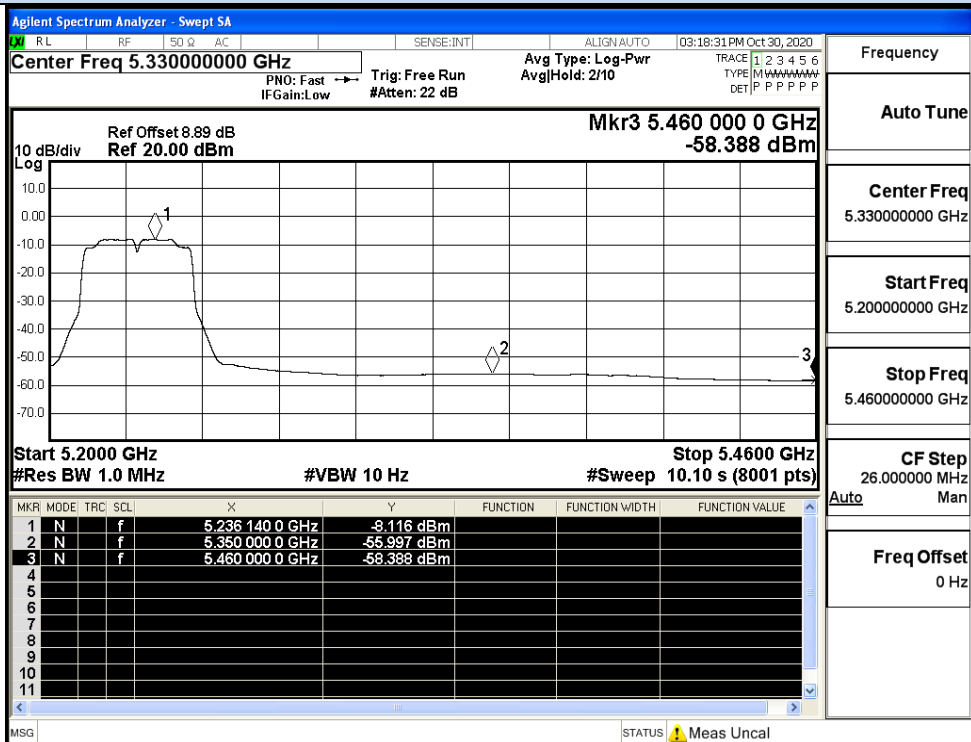


IEEE 802.11n40 / Channel 38 / 5190MHz / Average

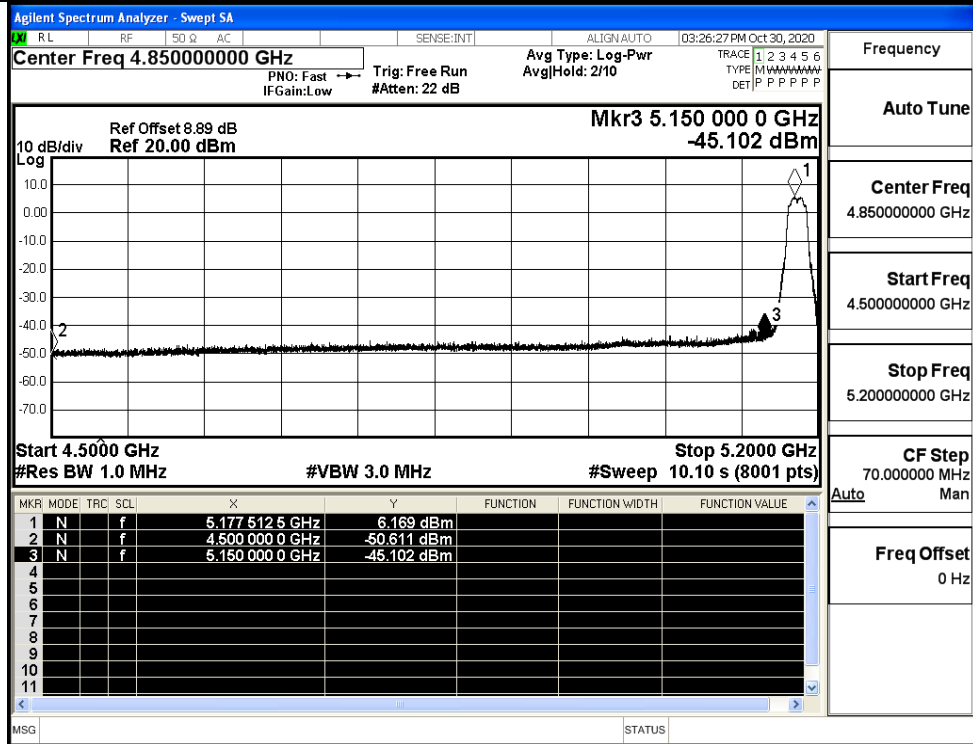
Undesirable Emissions Measurement



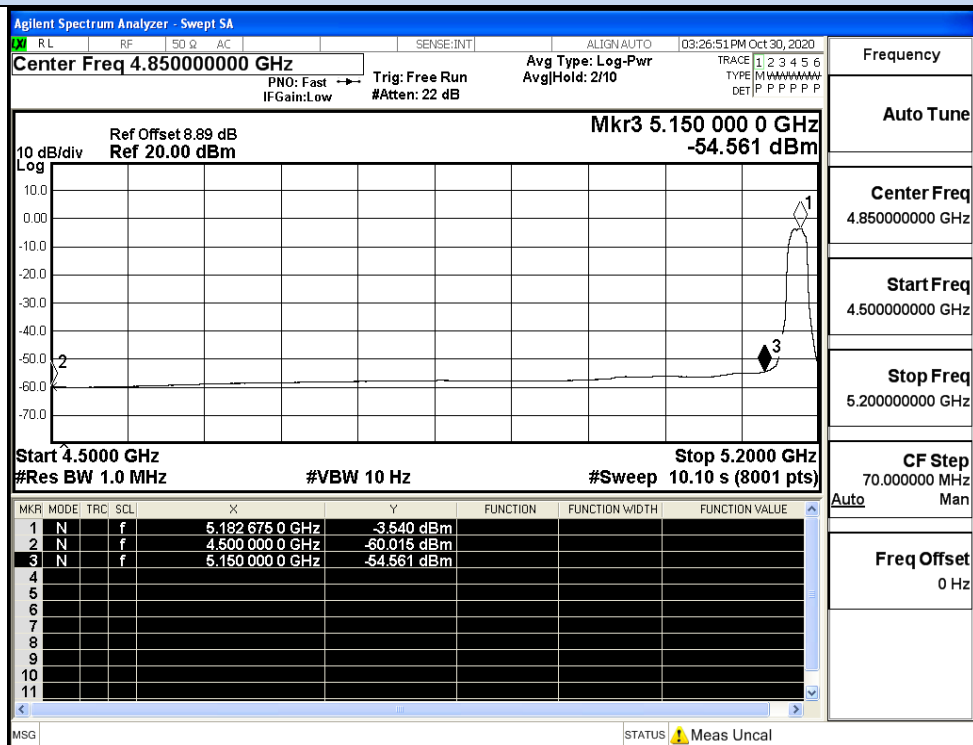
IEEE 802.11n40 / Channel 46 / 5230MHz / Peak



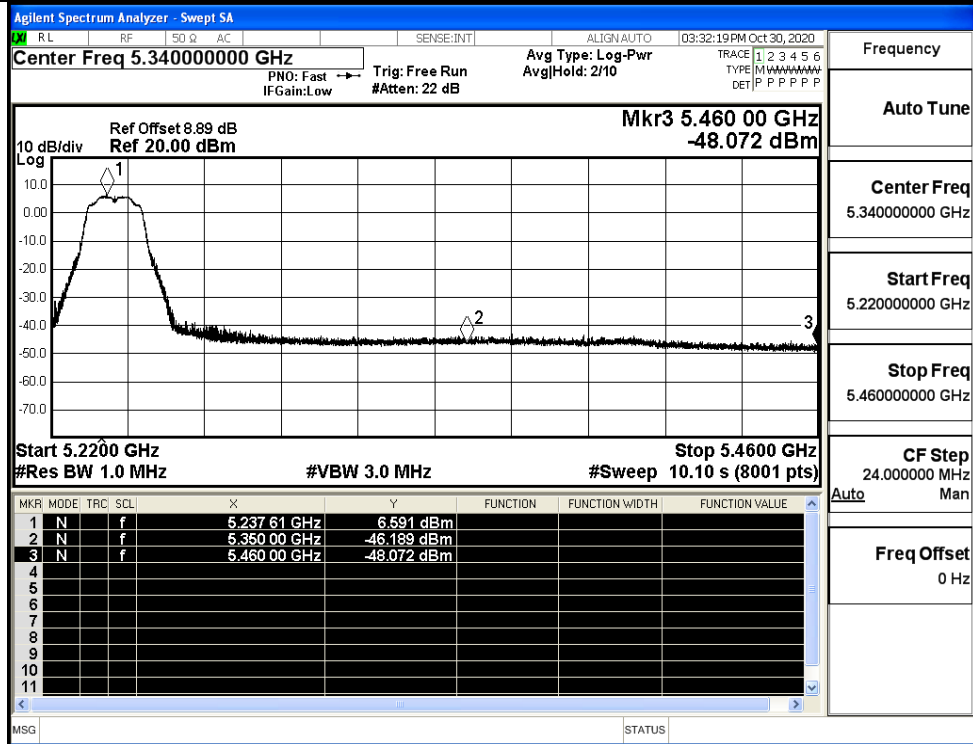
IEEE 802.11n40 / Channel 46 / 5230MHz / Average



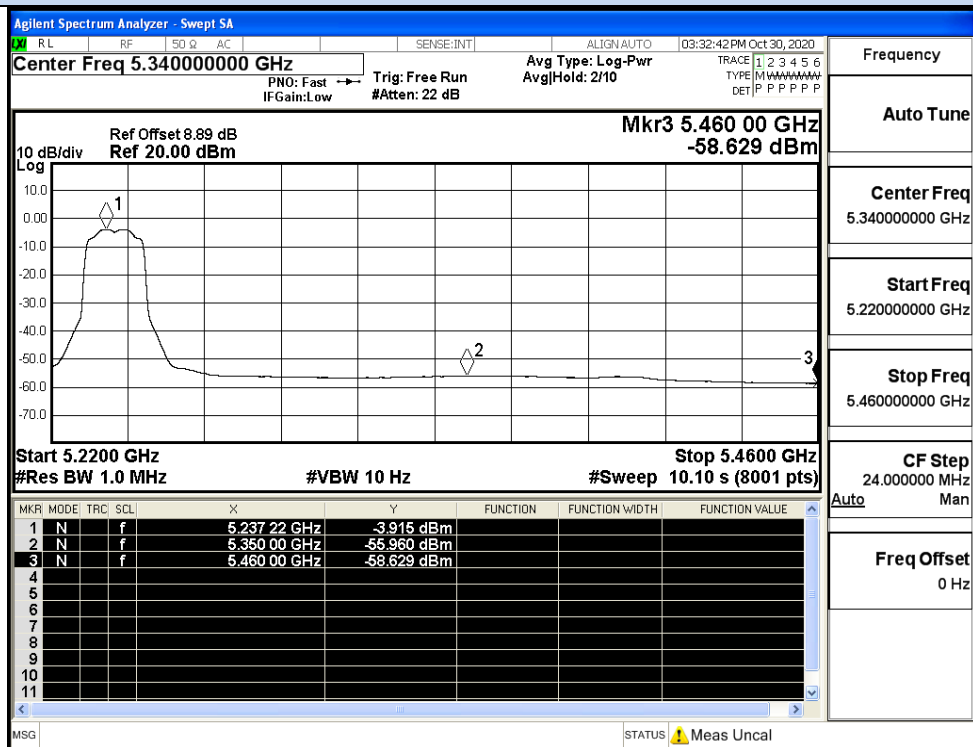
IEEE 802.11ac20 / Channel 36 / 5180MHz / Peak



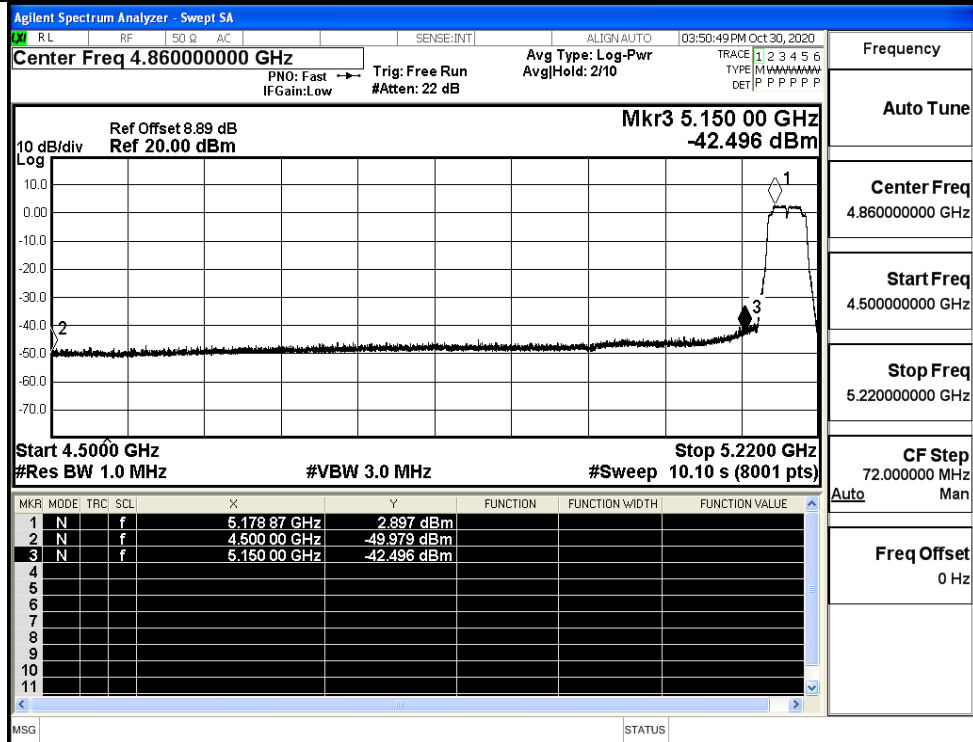
IEEE 802.11ac20 / Channel 36 / 5180MHz / Average



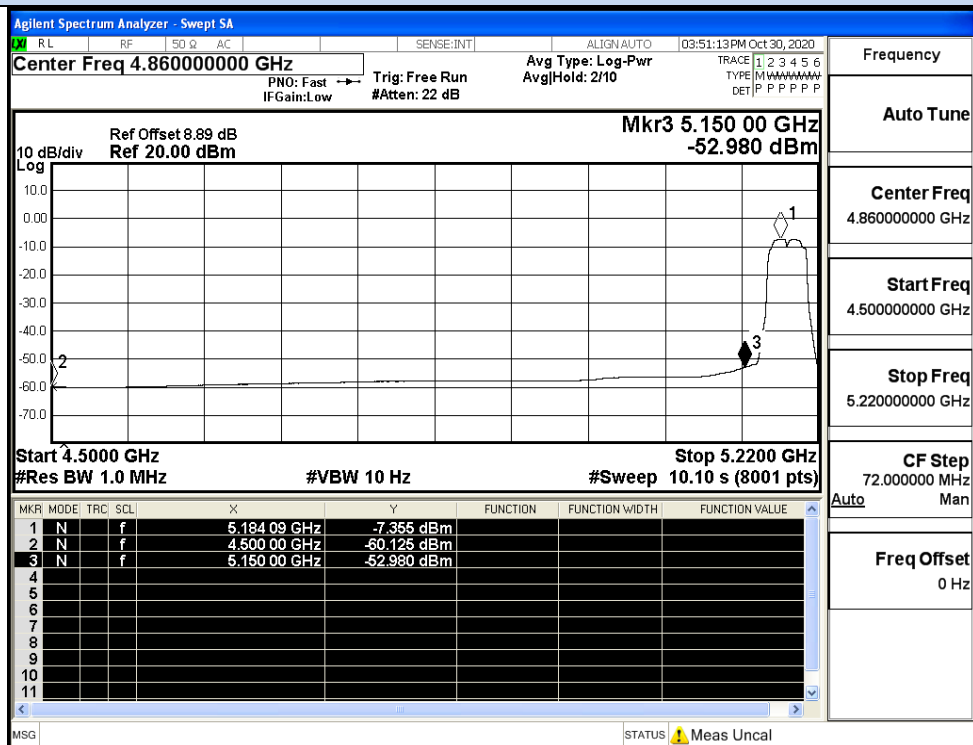
IEEE 802.11ac20 / Channel 48 / 5240MHz / Peak



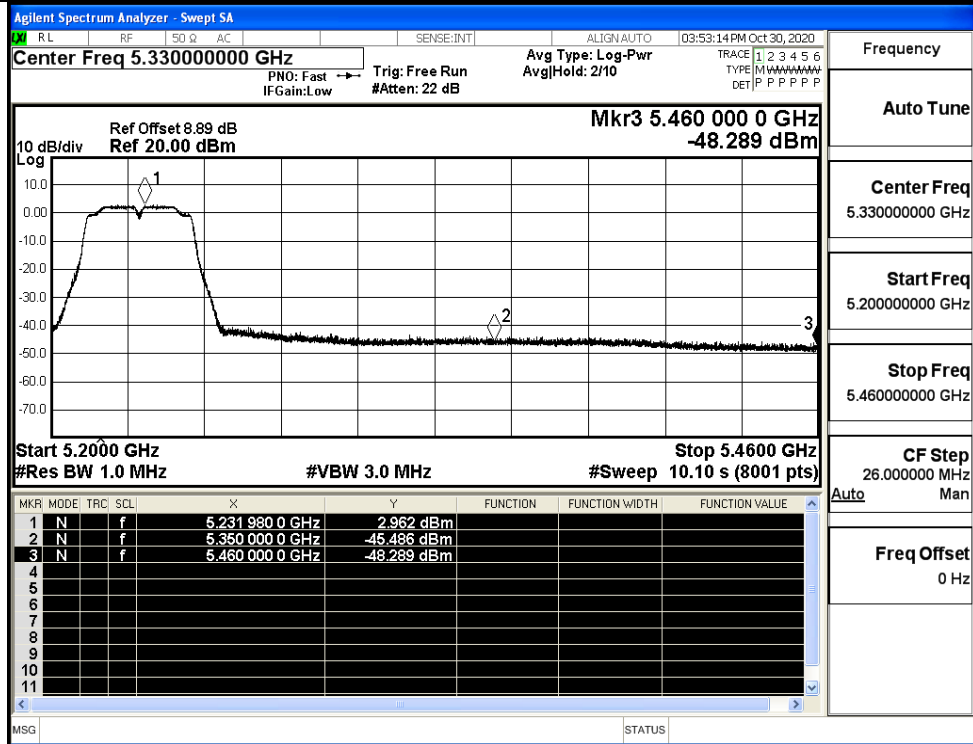
IEEE 802.11ac20 / Channel 48 / 5240MHz / Average



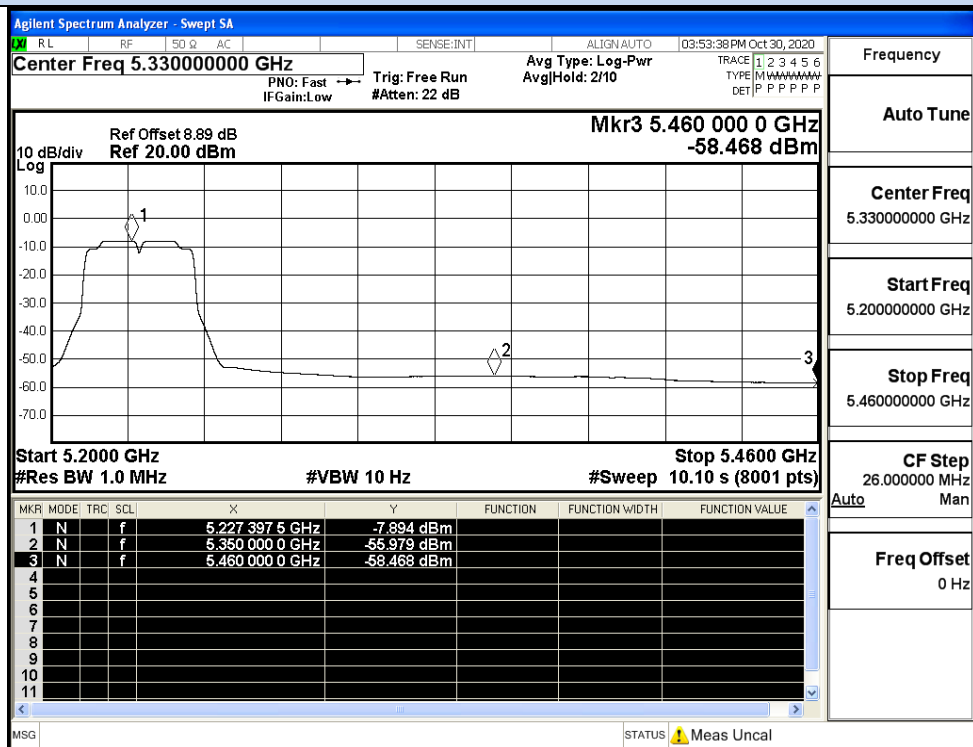
IEEE 802.11ac40 / Channel 38 / 5190MHz / Peak



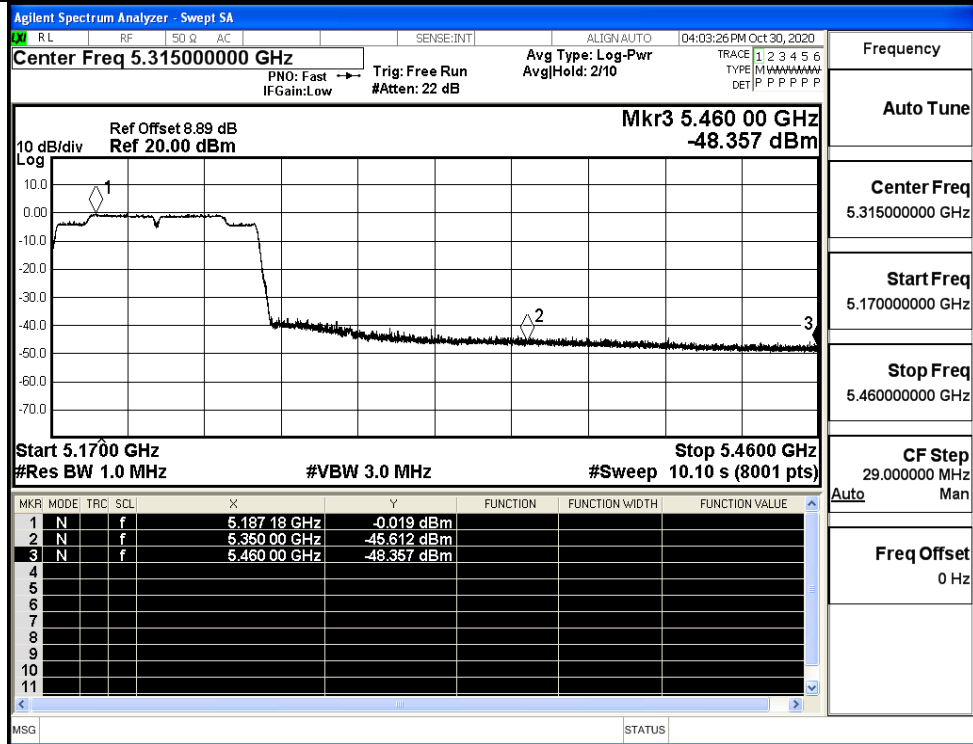
IEEE 802.11ac40 / Channel 38 / 5190MHz / Average



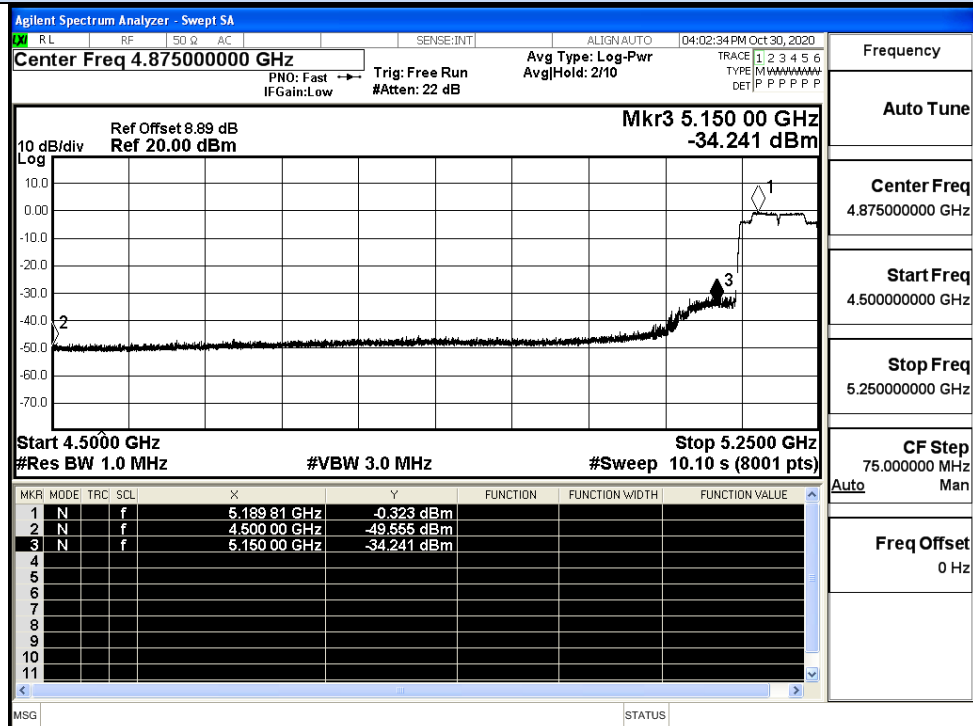
IEEE 802.11ac40 / Channel 46 / 5230MHz / Peak



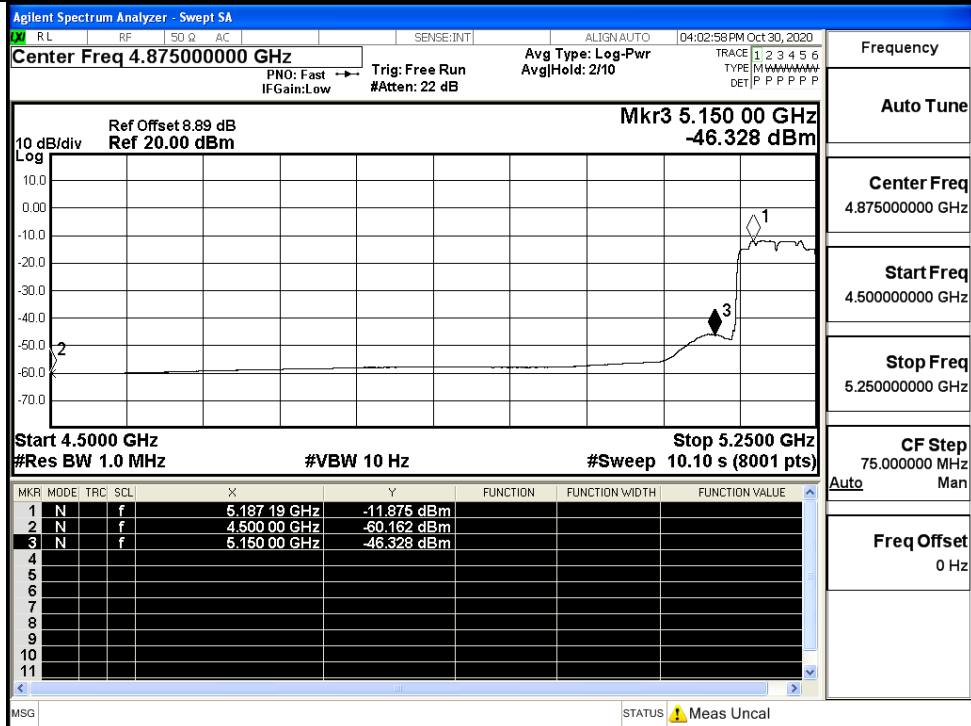
IEEE 802.11ac40 / Channel 46 / 5230MHz / Average



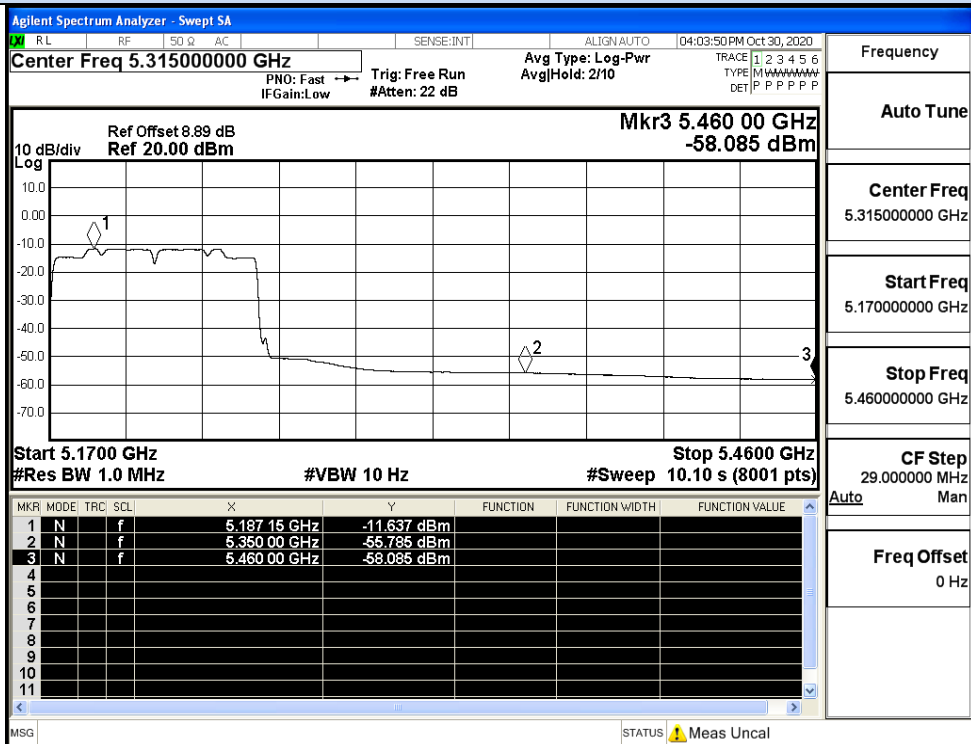
IEEE 802.11ac80 / Channel 42 / 5210MHz / Peak



IEEE 802.11ac80 / Channel 42 / 5210MHz / Average



IEEE 802.11ac80 / Channel 42/ 5210MHz / Peak



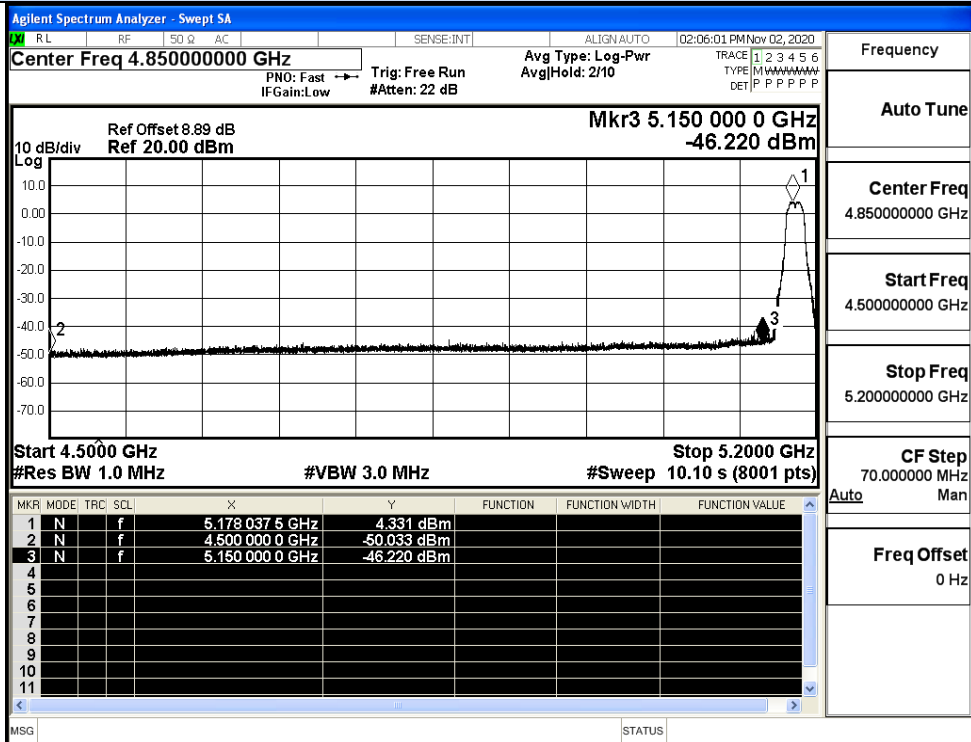
IEEE 802.11ac80 / Channel 42 / 5210MHz / Average

ANT 1

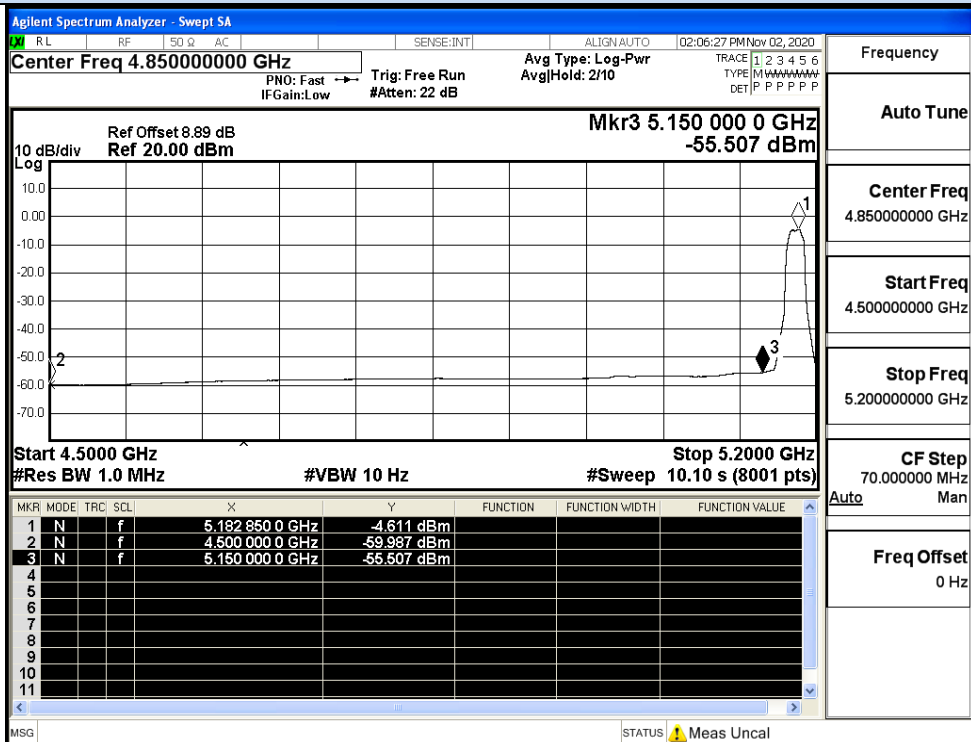
Test Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Ground Reflection Factor (dB)	Covert Radiated E Level At 3m (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
11A	36	4500.0	-50.03	2.00	0	45.19	Peak	68.20	Pass
		4500.0	-59.99	2.00	0	35.24	Average	54.00	Pass
		5150.0	-46.22	2.00	0	49.01	Peak	68.20	Pass
		5150.0	-55.51	2.00	0	39.72	Average	54.00	Pass
	48	5350.0	-45.99	2.00	0	49.24	Peak	68.20	Pass
		5350.0	-56.56	2.00	0	38.67	Average	54.00	Pass
		5460.0	-47.10	2.00	0	48.13	Peak	68.20	Pass
		5460.0	-58.71	2.00	0	36.51	Average	54.00	Pass
11N2 0 SISO	36	4500.0	-49.97	2.00	0	45.25	Peak	68.20	Pass
		4500.0	-60.01	2.00	0	35.22	Average	54.00	Pass
		5150.0	-45.01	2.00	0	50.22	Peak	68.20	Pass
		5150.0	-55.49	2.00	0	39.74	Average	54.00	Pass
	48	5350.0	-46.64	2.00	0	48.58	Peak	68.20	Pass
		5350.0	-56.92	2.00	0	38.30	Average	54.00	Pass
		5460.0	-48.68	2.00	0	46.55	Peak	68.20	Pass
		5460.0	-58.74	2.00	0	36.49	Average	54.00	Pass
11N4 0 SISO	38	4500.0	-50.49	2.00	0	44.74	Peak	68.20	Pass
		4500.0	-59.97	2.00	0	35.25	Average	54.00	Pass
		5150.0	-46.19	2.00	0	49.04	Peak	68.20	Pass
		5150.0	-55.56	2.00	0	39.66	Average	54.00	Pass
	46	5350.0	-46.98	2.00	0	48.25	Peak	68.20	Pass
		5350.0	-56.73	2.00	0	38.50	Average	54.00	Pass
		5460.0	-47.89	2.00	0	47.33	Peak	68.20	Pass
		5460.0	-58.49	2.00	0	36.74	Average	54.00	Pass
11A C20 SIS O	36	4500.0	-50.17	2.00	0	45.06	Peak	68.20	Pass
		4500.0	-59.96	2.00	0	35.27	Average	54.00	Pass
		5150.0	-45.09	2.00	0	50.14	Peak	68.20	Pass
		5150.0	-55.53	2.00	0	39.70	Average	54.00	Pass
	48	4500.0	-50.17	2.00	0	45.06	Peak	68.20	Pass
		4500.0	-59.96	2.00	0	35.27	Average	54.00	Pass
		5150.0	-45.09	2.00	0	50.14	Peak	68.20	Pass
		5150.0	-55.53	2.00	0	39.70	Average	54.00	Pass
11A C40 SIS O	38	4500.0	-50.40	2.00	0	44.83	Peak	68.20	Pass
		4500.0	-60.03	2.00	0	35.20	Average	54.00	Pass
		5150.0	-45.48	2.00	0	49.75	Peak	68.20	Pass
		5150.0	-55.52	2.00	0	39.71	Average	54.00	Pass
	46	5350.0	-46.84	2.00	0	48.39	Peak	68.20	Pass
		5350.0	-56.70	2.00	0	38.53	Average	54.00	Pass
		5460.0	-48.18	2.00	0	47.05	Peak	68.20	Pass
		5460.0	-58.52	2.00	0	36.71	Average	54.00	Pass
11A C80 SIS O	42	4500.0	-46.82	2.00	0	48.41	Peak	68.20	Pass
		5150.0	-56.48	2.00	0	38.75	Average	54.00	Pass
		4500.0	-48.14	2.00	0	47.09	Peak	68.20	Pass
		5150.0	-58.05	2.00	0	37.18	Average	54.00	Pass
		5350.0	-46.82	2.00	0	48.41	Peak	68.20	Pass
		5460.0	-56.48	2.00	0	38.75	Average	54.00	Pass

		5350.0	-48.14	2.00	0	47.09	Peak	68.20	Pass
		5460.0	-58.05	2.00	0	37.18	Average	54.00	Pass

Undesirable Emissions Measurement

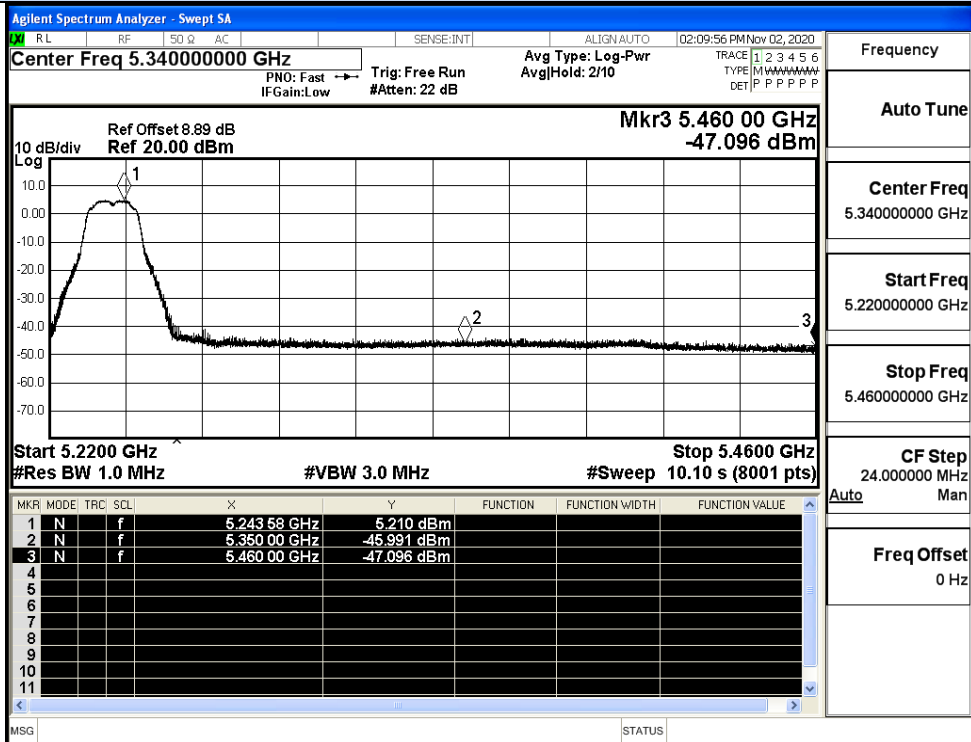


IEEE 802.11a / Channel 36 / 5180MHz / Peak

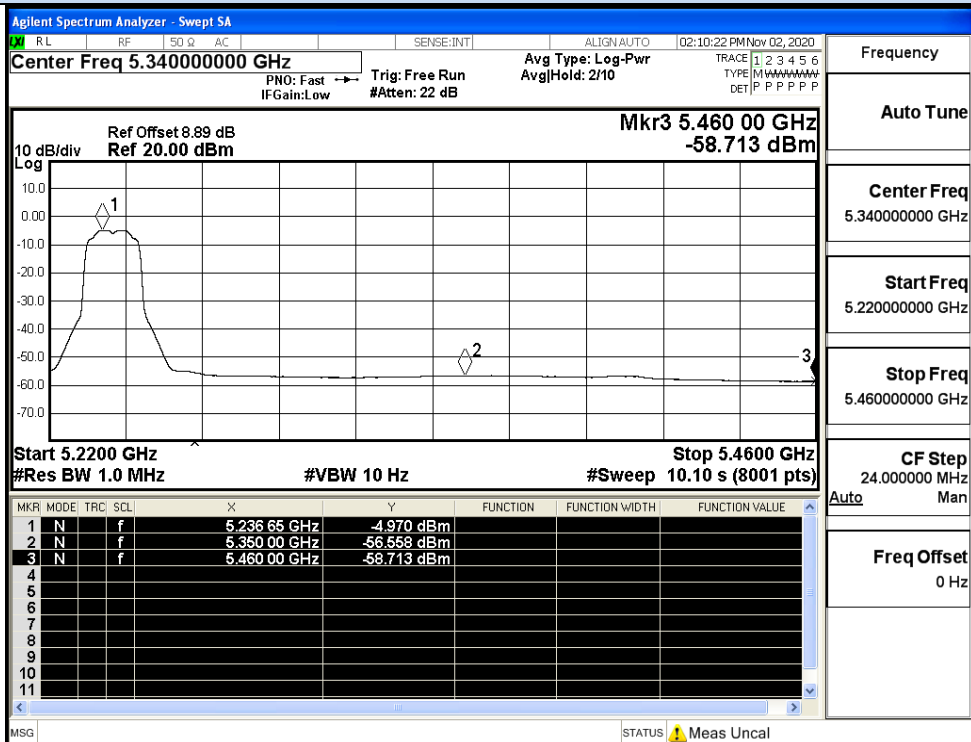


IEEE 802.11a / Channel 36 / 5180MHz / Average

Undesirable Emissions Measurement

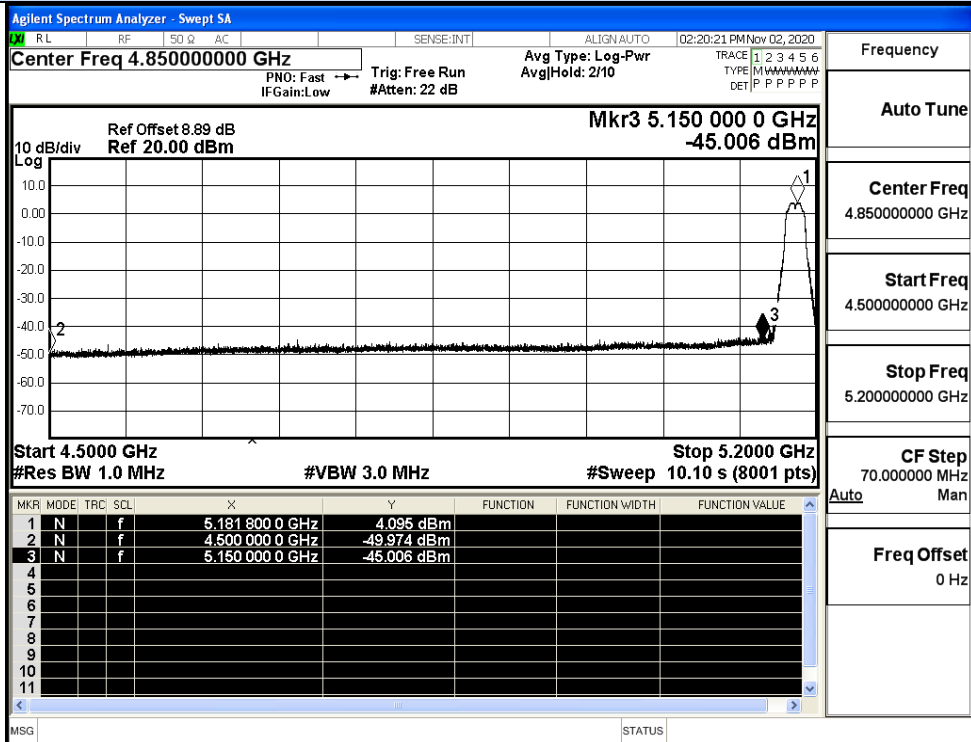


IEEE 802.11a / Channel 48 / 5240MHz / Peak

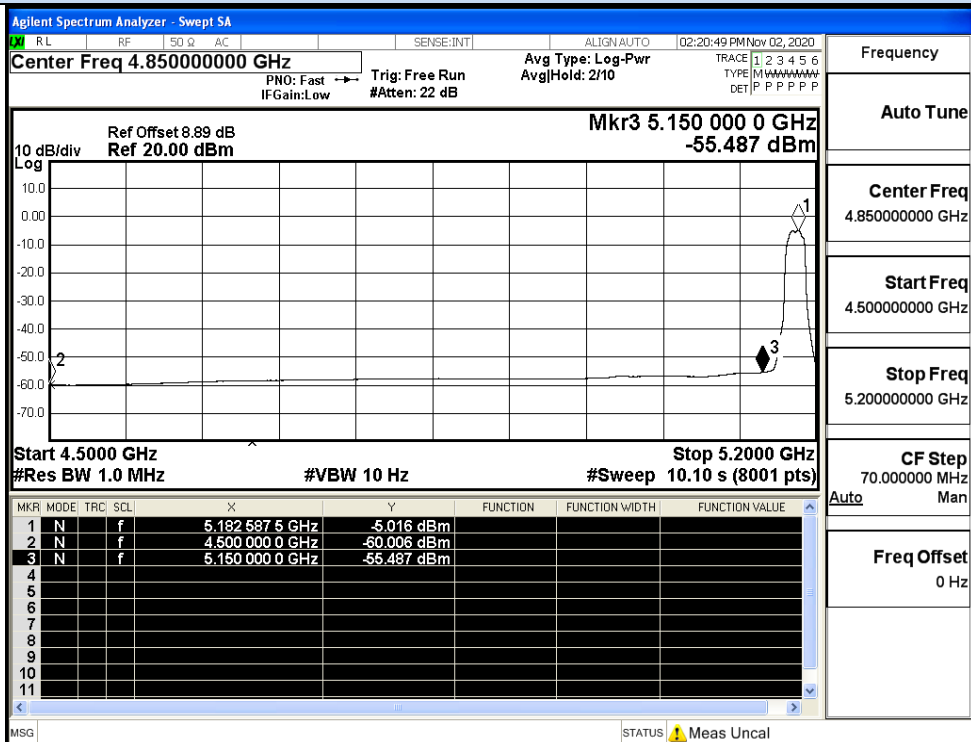


IEEE 802.11a / Channel 48 / 5240MHz / Average

Undesirable Emissions Measurement

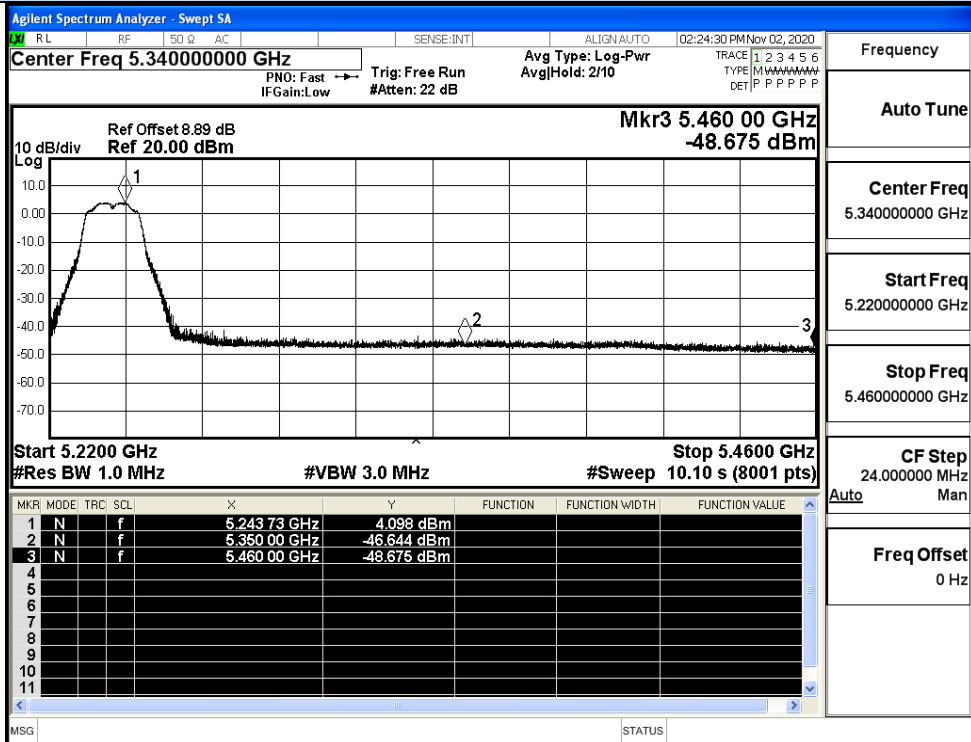


IEEE 802.11n20 / Channel 36 / 5180MHz / Peak

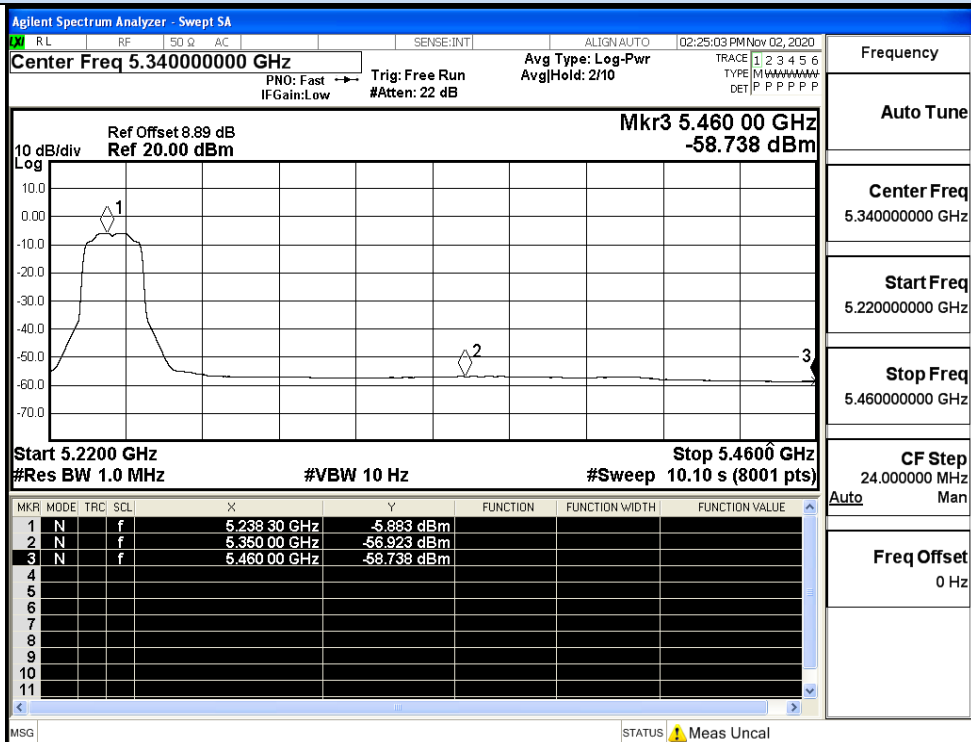


IEEE 802.11n20 / Channel 36 / 5180MHz / Average

Undesirable Emissions Measurement

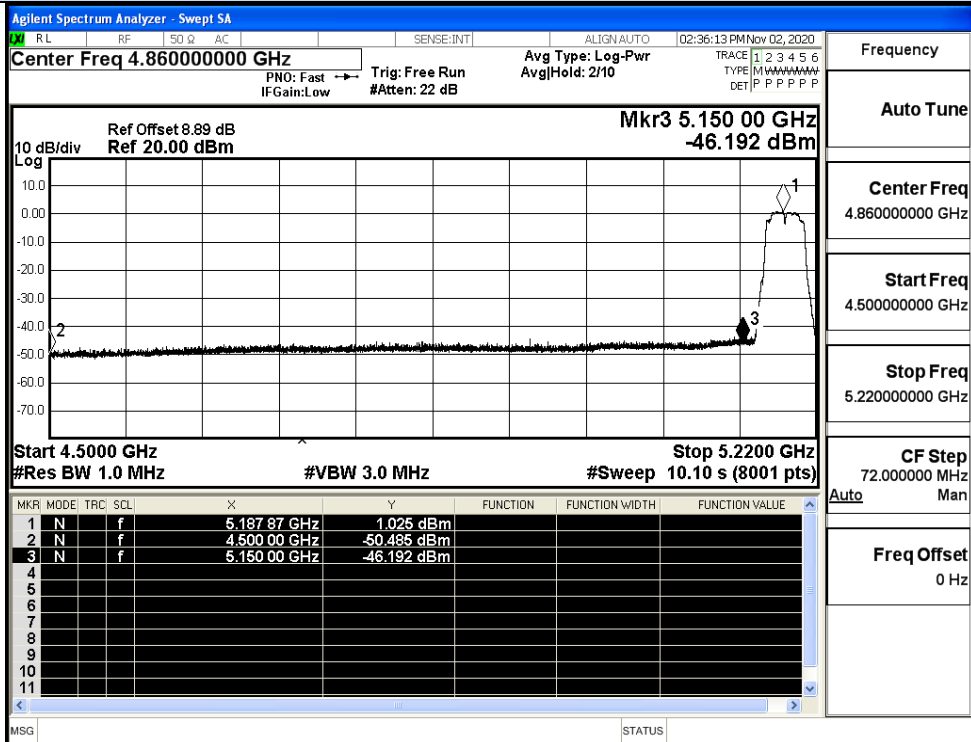


IEEE 802.11n20 / Channel 48 / 5240MHz / Peak

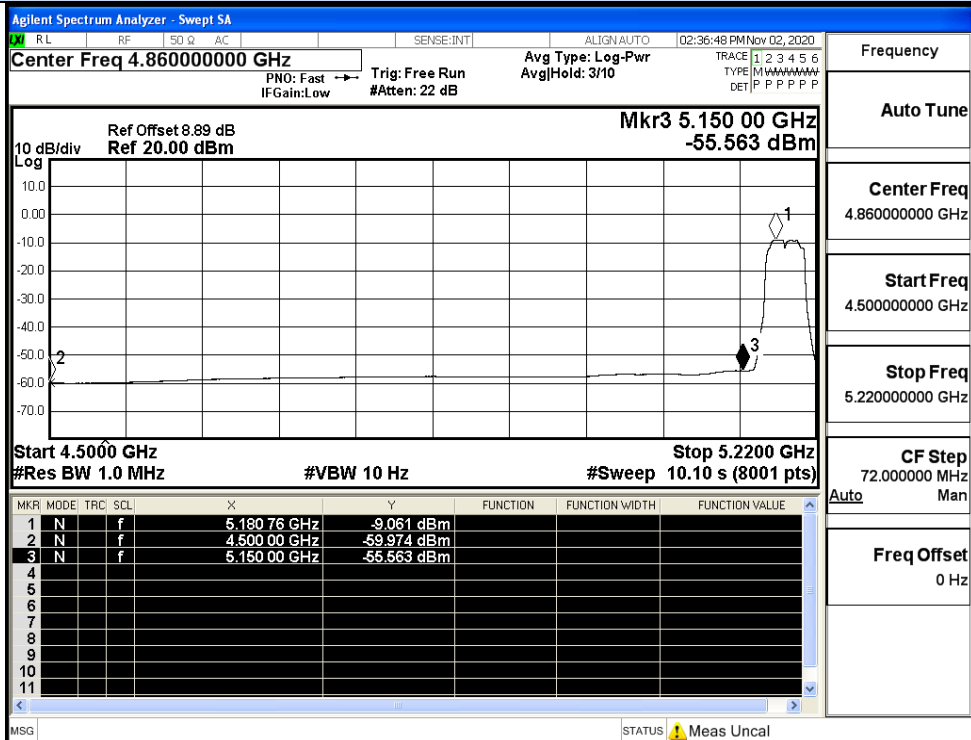


IEEE 802.11n20 / Channel 48 / 5240MHz / Average

Undesirable Emissions Measurement

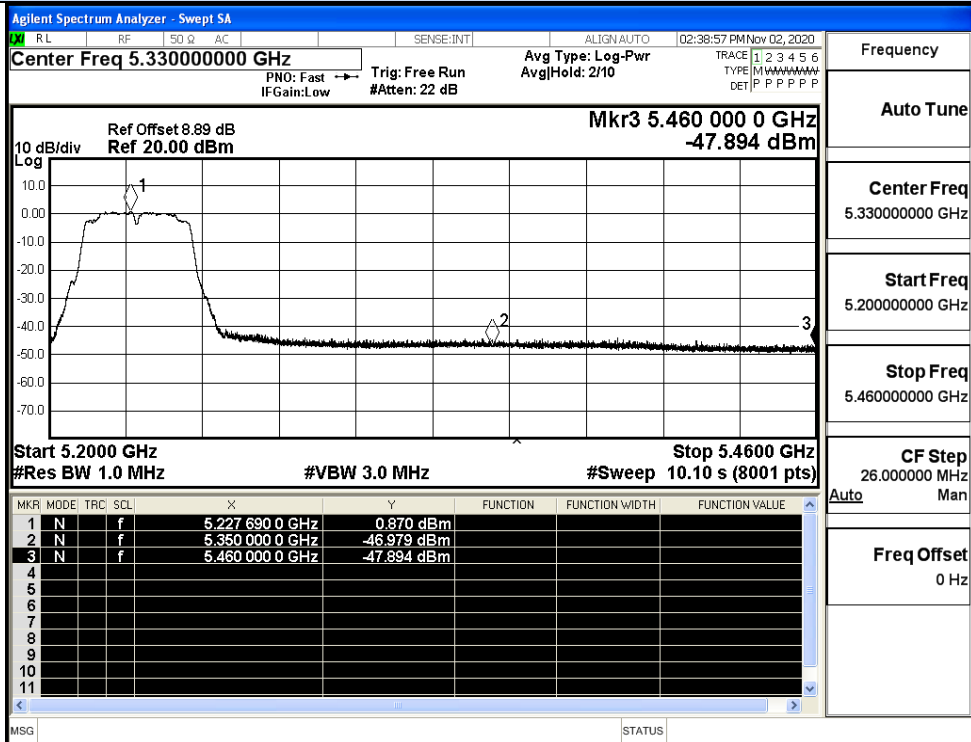


IEEE 802.11n40 / Channel 38 / 5190MHz / Peak

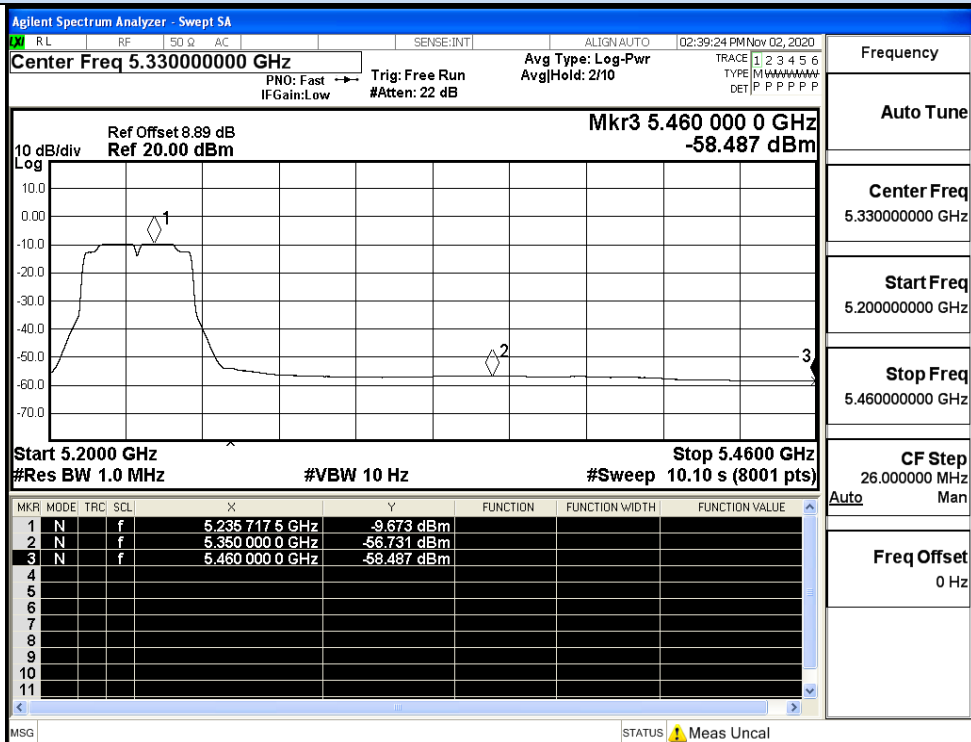


IEEE 802.11n40 / Channel 38 / 5190MHz / Average

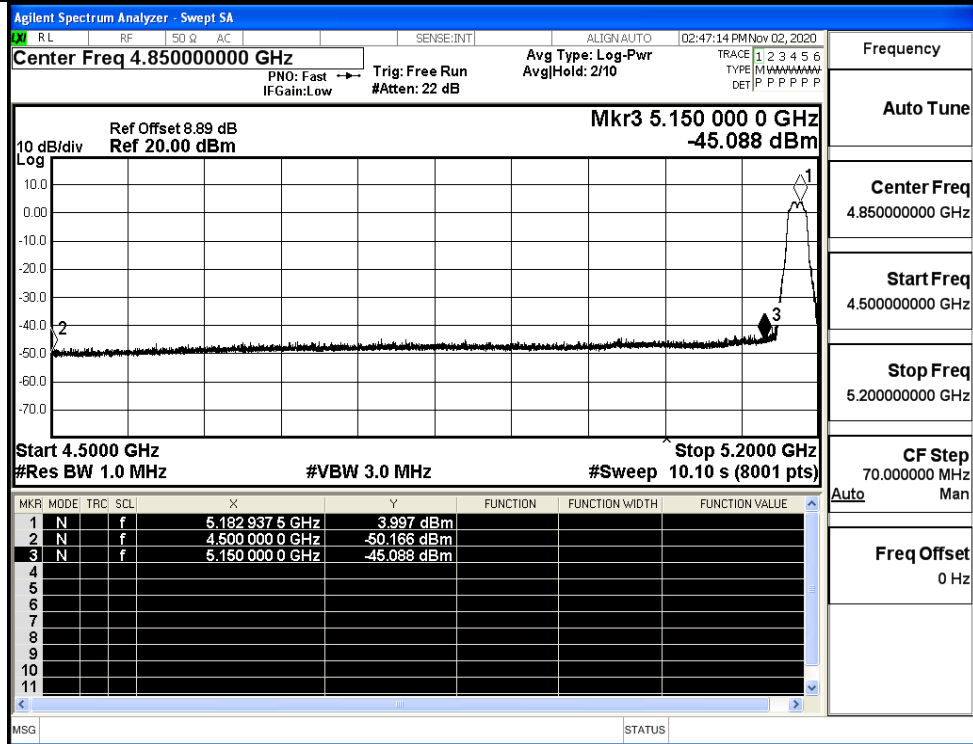
Undesirable Emissions Measurement



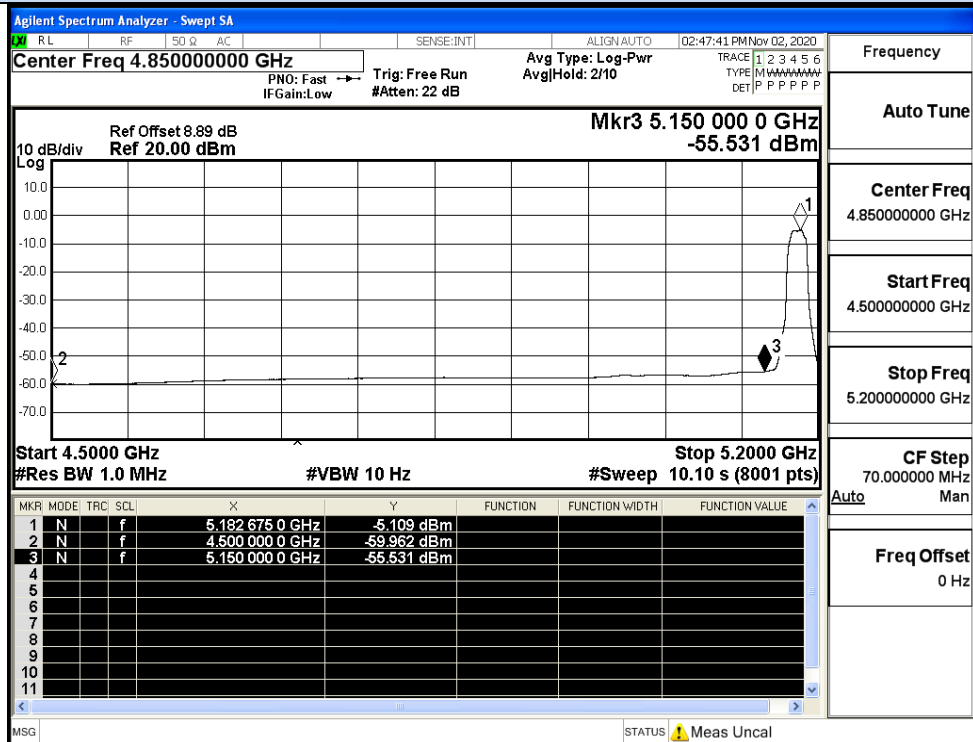
IEEE 802.11n40 / Channel 46 / 5230MHz / Peak



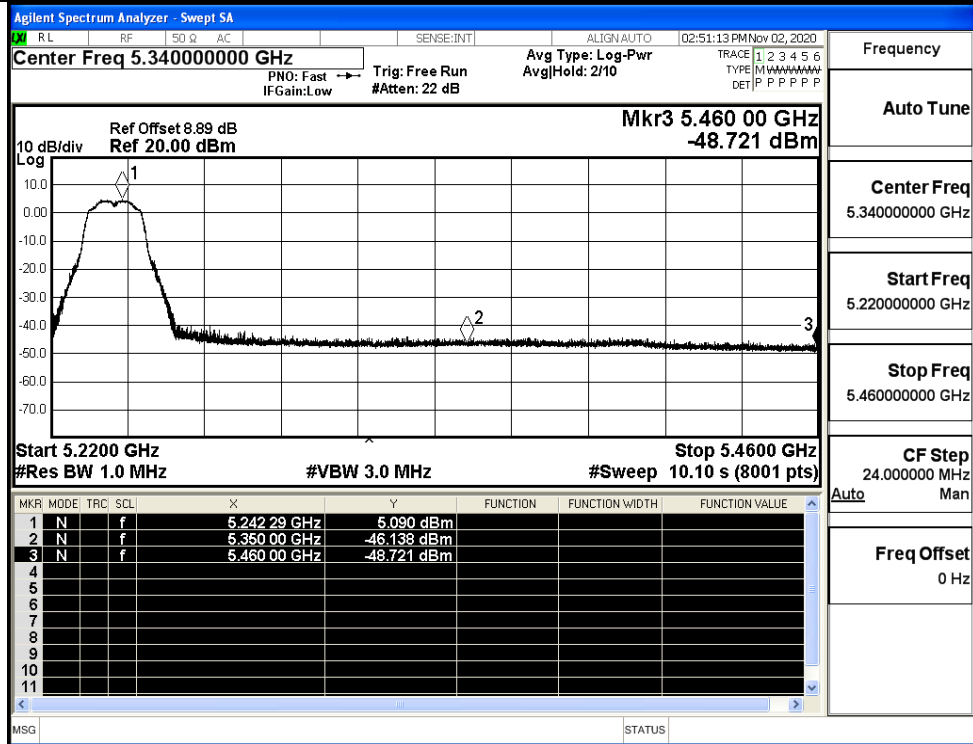
IEEE 802.11n40 / Channel 46 / 5230MHz / Average



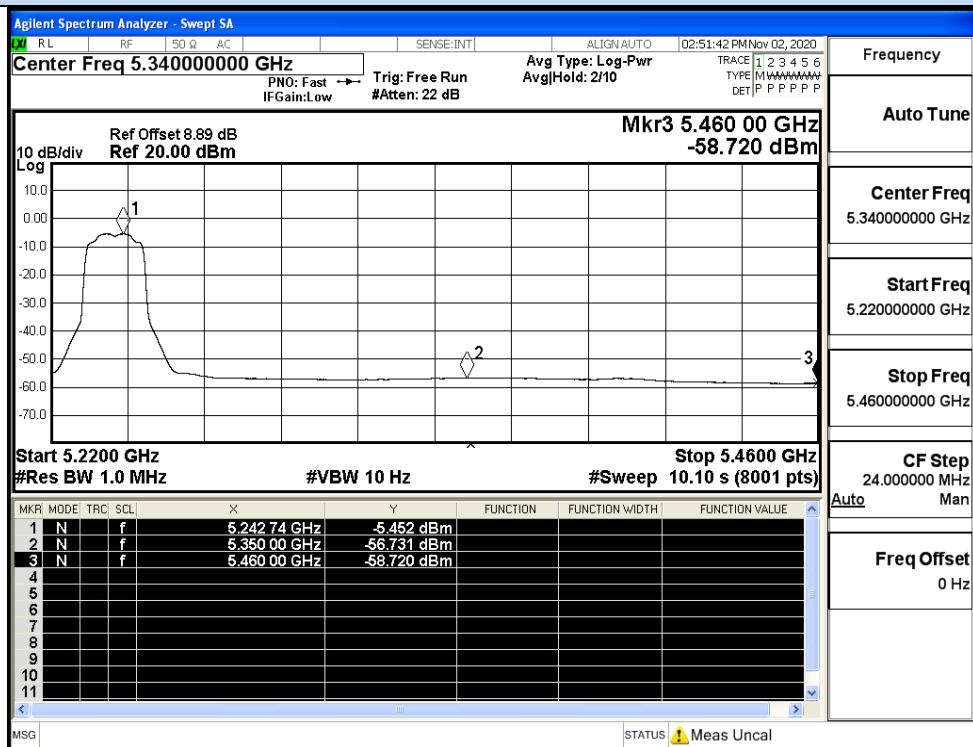
IEEE 802.11ac20 / Channel 36 / 5180MHz / Peak



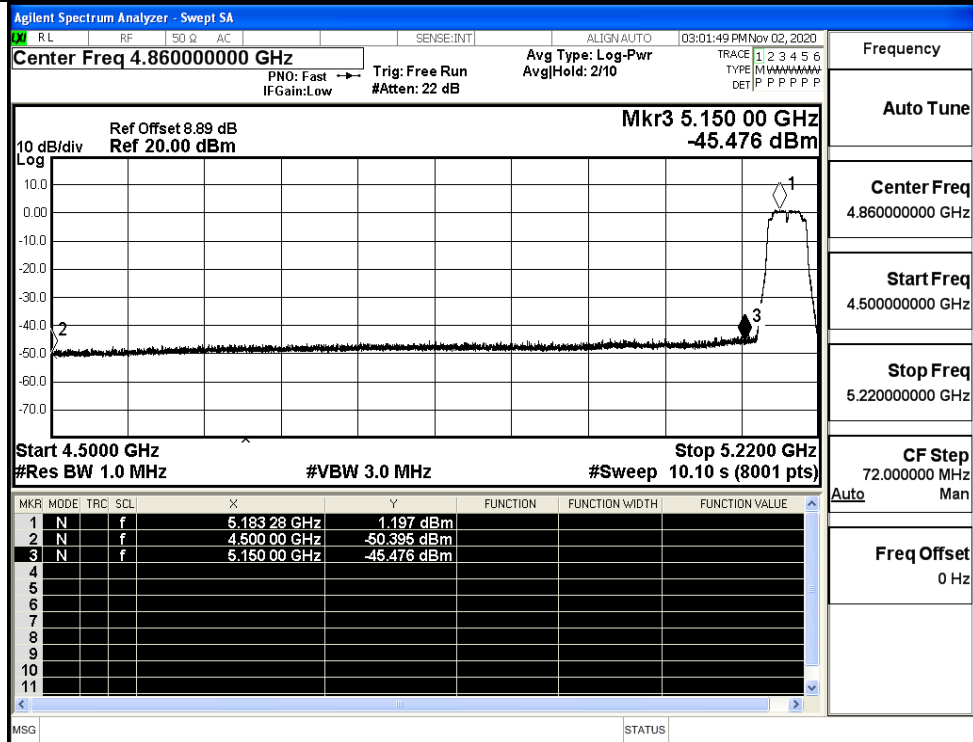
IEEE 802.11ac20 / Channel 36 / 5180MHz / Average



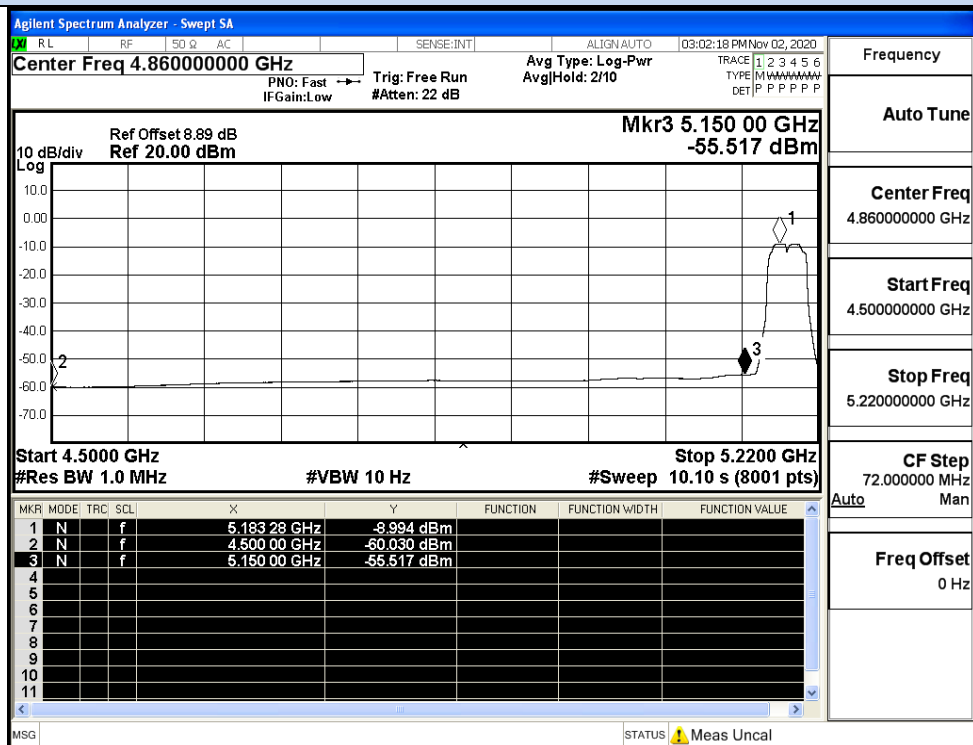
IEEE 802.11ac20 / Channel 48 / 5240MHz / Peak



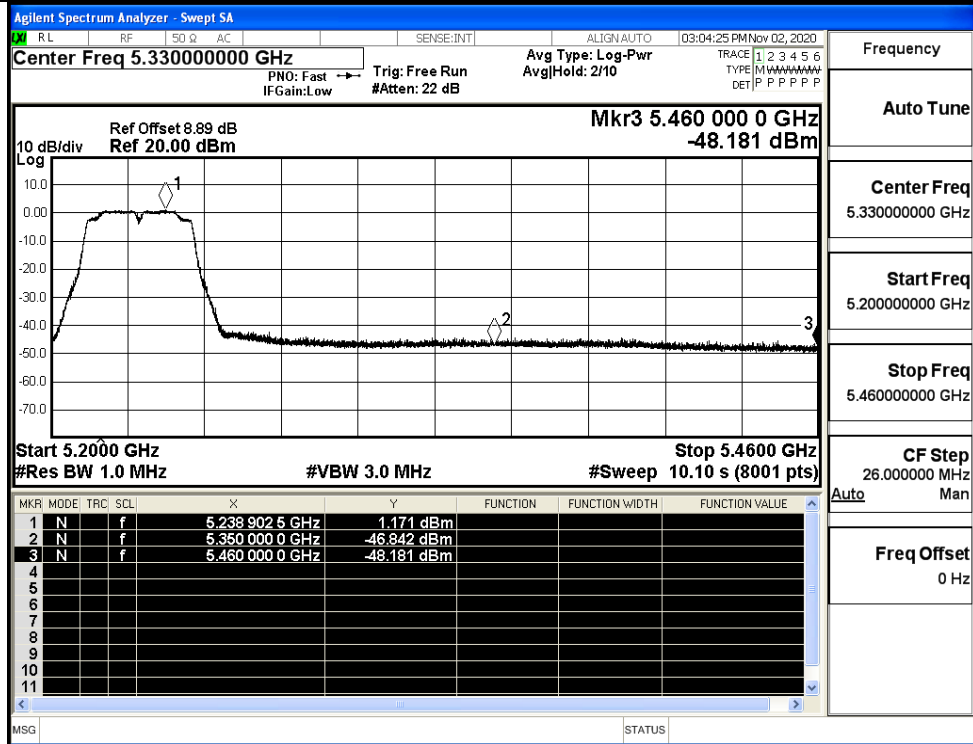
IEEE 802.11ac20 / Channel 48 / 5240MHz / Average



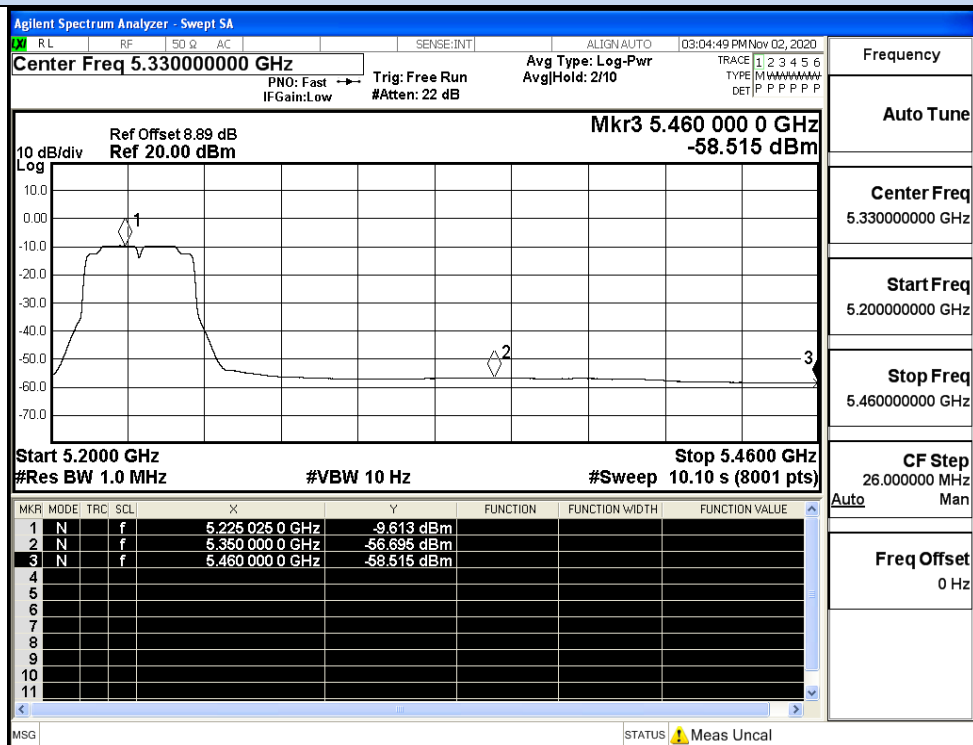
IEEE 802.11ac40 / Channel 38/ 5190MHz / Peak



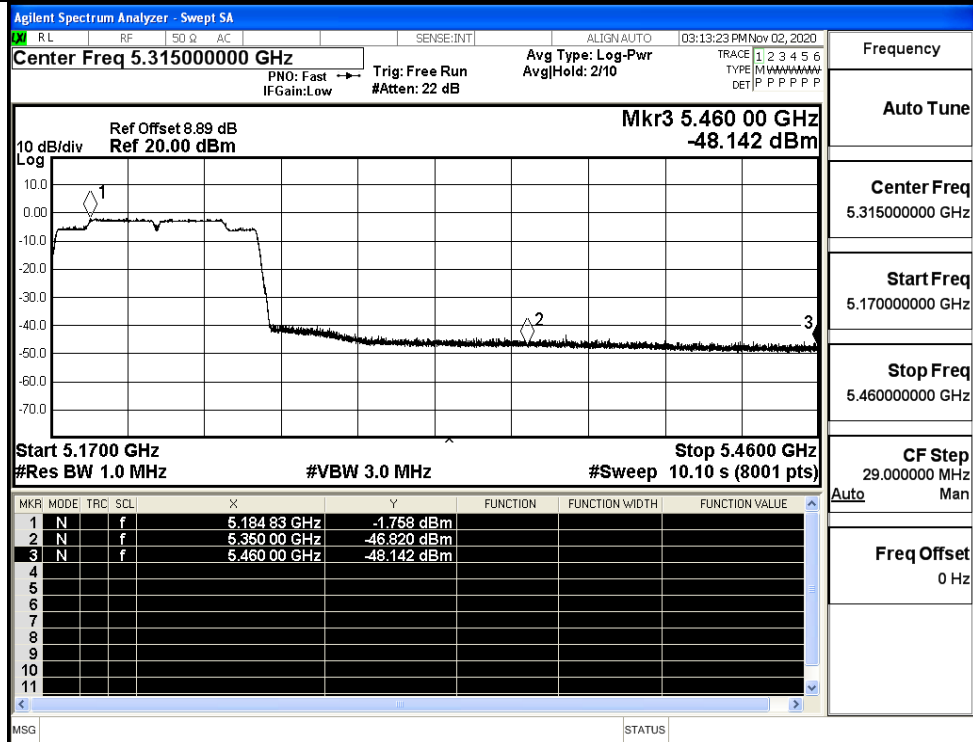
IEEE 802.11ac40 / Channel 38 / 5190MHz / Average



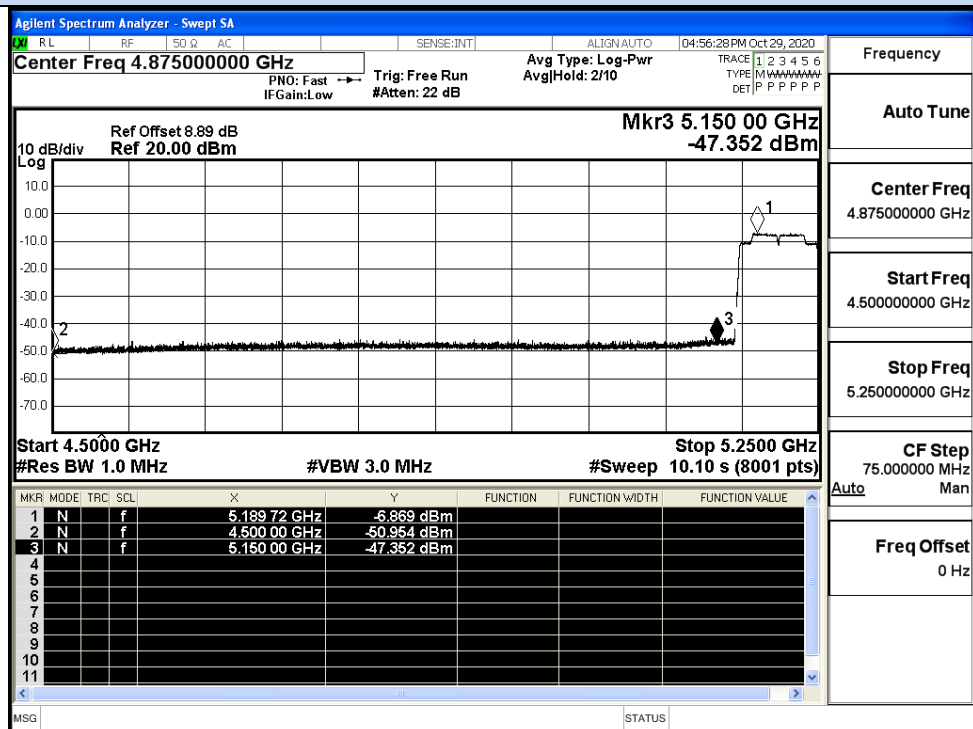
IEEE 802.11ac40 / Channel 46 / 5230MHz / Peak



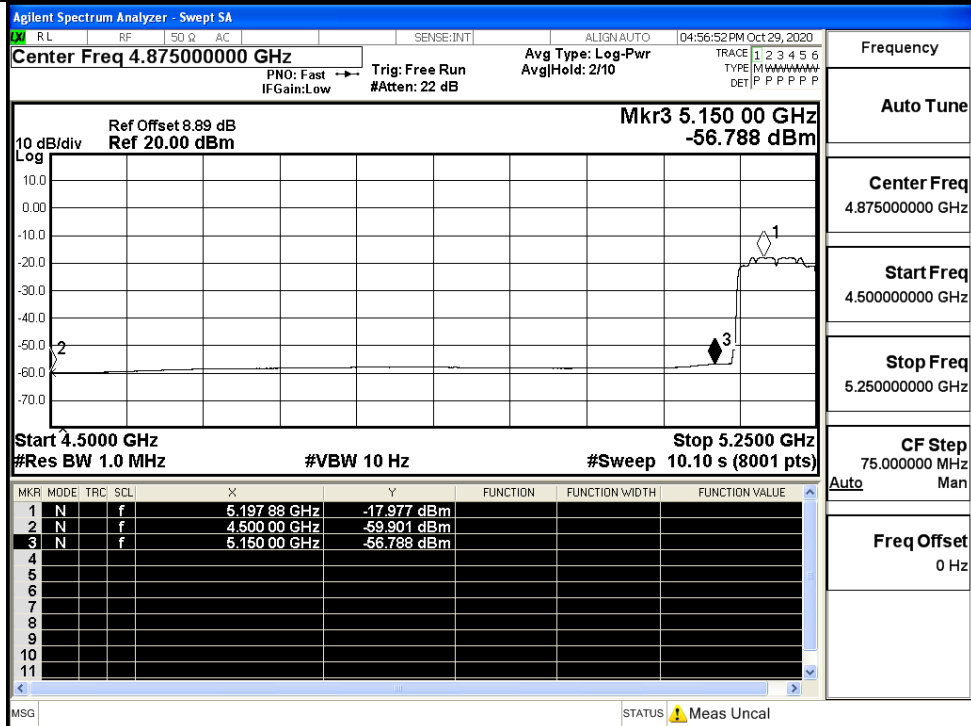
IEEE 802.11ac40 / Channel 46 / 5230MHz / Average



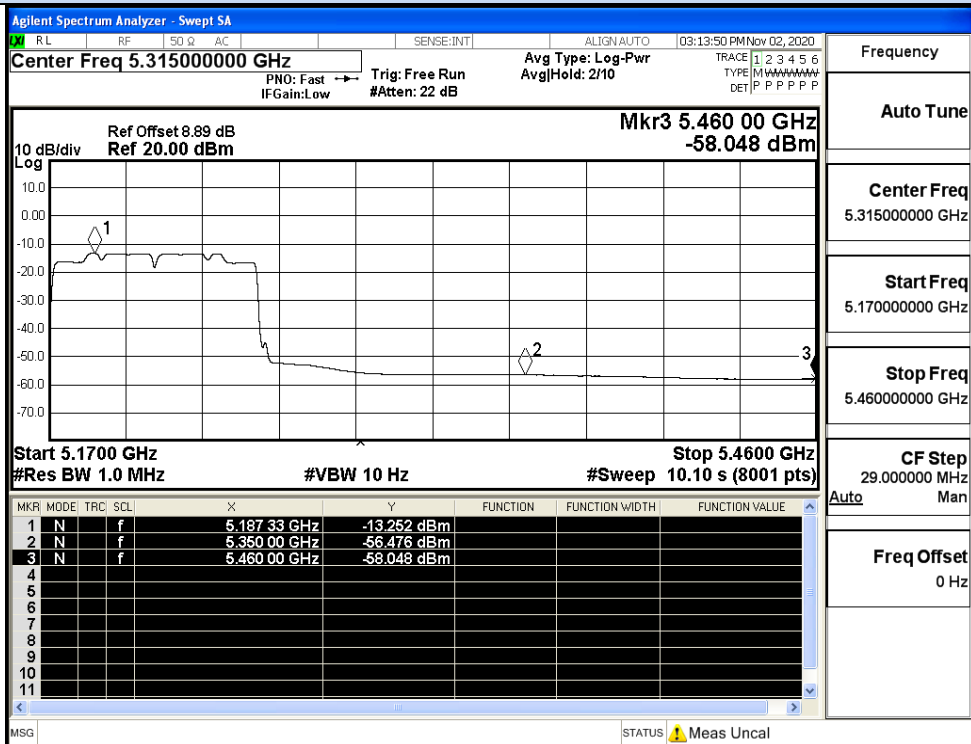
IEEE 802.11ac80 / Channel 42 / 5210MHz / Peak



IEEE 802.11ac80 / Channel 42 / 5210MHz / Average



IEEE 802.11ac80 / Channel 42/ 5210MHz / Peak



IEEE 802.11ac80 / Channel 42 / 5210MHz / Average

MIMO

Test Mode	Channel	Frequency (MHz)	ANT 0 Conducted Power (dBm)	ANT 1 Conducted Power (dBm)	MIMO Conducted Power (dBm)	Antenna Gain (dBi)	Ground Reflection Factor (dB)	Covert Radiated E Level At 3m (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
11N20	36	4500.0	-49.95	-50.03	-46.98	5.01	0	53.26	Peak	68.20	Pass
		4500.0	-59.98	-59.99	-56.97	5.01	0	43.27	Average	54.00	Pass
		5150.0	-45.03	-46.22	-42.57	5.01	0	57.67	Peak	68.20	Pass
		5150.0	-55.14	-55.51	-52.31	5.01	0	47.93	Average	54.00	Pass
	48	5350.0	-46.02	-45.99	-42.99	5.01	0	57.25	Peak	68.20	Pass
		5350.0	-56.42	-56.56	-53.48	5.01	0	46.76	Average	54.00	Pass
		5460.0	-48.15	-47.10	-44.58	5.01	0	55.66	Peak	68.20	Pass
		5460.0	-58.67	-58.71	-55.68	5.01	0	44.56	Average	54.00	Pass
11N40	38	4500.0	-49.77	-49.97	-46.86	5.01	0	53.38	Peak	68.20	Pass
		4500.0	-60.03	-60.01	-57.01	5.01	0	43.23	Average	54.00	Pass
		5150.0	-45.95	-45.01	-42.44	5.01	0	57.80	Peak	68.20	Pass
		5150.0	-54.98	-55.49	-52.22	5.01	0	48.02	Average	54.00	Pass
	46	5350.0	-46.02	-46.64	-43.31	5.01	0	56.93	Peak	68.20	Pass
		5350.0	-56.00	-56.92	-53.43	5.01	0	46.81	Average	54.00	Pass
		5460.0	-48.57	-48.68	-45.61	5.01	0	54.63	Peak	68.20	Pass
		5460.0	-58.39	-58.74	-55.55	5.01	0	44.69	Average	54.00	Pass
11AC20	36	4500.0	-50.61	-50.49	-47.54	5.01	0	52.70	Peak	68.20	Pass
		4500.0	-60.02	-59.97	-56.98	5.01	0	43.26	Average	54.00	Pass
		5150.0	-45.10	-46.19	-42.60	5.01	0	57.64	Peak	68.20	Pass
		5150.0	-54.56	-55.56	-52.02	5.01	0	48.22	Average	54.00	Pass
	48	4500.0	-50.61	-46.98	-45.42	5.01	0	54.82	Peak	68.20	Pass
		4500.0	-60.02	-56.73	-55.06	5.01	0	45.18	Average	54.00	Pass
		5150.0	-45.10	-47.89	-43.26	5.01	0	56.98	Peak	68.20	Pass
		5150.0	-54.56	-58.49	-53.08	5.01	0	47.16	Average	54.00	Pass
11AC40	38	4500.0	-49.98	-50.17	-47.06	5.01	0	53.18	Peak	68.20	Pass
		4500.0	-60.13	-59.96	-57.03	5.01	0	43.21	Average	54.00	Pass
		5150.0	-42.50	-45.09	-40.59	5.01	0	59.65	Peak	68.20	Pass
		5150.0	-52.98	-55.53	-51.06	5.01	0	49.18	Average	54.00	Pass
	46	5350.0	-45.49	-50.17	-44.22	5.01	0	56.02	Peak	68.20	Pass
		5350.0	-55.98	-59.96	-54.52	5.01	0	45.72	Average	54.00	Pass
		5460.0	-48.29	-45.09	-43.39	5.01	0	56.85	Peak	68.20	Pass
		5460.0	-58.47	-55.53	-53.75	5.01	0	46.49	Average	54.00	Pass
11AC80	42	4500.0	-45.61	-50.40	-44.37	5.01	0	55.87	Peak	68.20	Pass
		5150.0	-55.79	-60.03	-54.40	5.01	0	45.84	Average	54.00	Pass
		4500.0	-48.36	-45.48	-43.68	5.01	0	56.56	Peak	68.20	Pass
		5150.0	-58.09	-55.52	-53.61	5.01	0	46.63	Average	54.00	Pass
		5350.0	-45.61	-46.84	-43.17	5.01	0	57.07	Peak	68.20	Pass
		5460.0	-55.79	-56.70	-53.21	5.01	0	47.03	Average	54.00	Pass
		5350.0	-48.36	-48.18	-45.26	5.01	0	54.98	Peak	68.20	Pass
		5460.0	-58.09	-58.52	-55.29	5.01	0	44.95	Average	54.00	Pass

$E [dBuV/m] = \text{Power [dBm]} + \text{Gain} + \text{Ground Factor} + 95.23$

The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater

Directional gain = $3dBi + 10 \log(2) = 5.01dBi$