



Appendix D

RF Test Data for 5.2G WLAN (Conducted Measurement)

Product Name: Firewalla Purple

Trade Mark: Firewalla

Test Model: Firewalla Purple

Environmental Conditions

Temperature:	21.6° C
Relative Humidity:	52.7%
ATM Pressure:	100.0 kPa
Test Engineer:	Carl Fu
Supervised by:	Li Huan

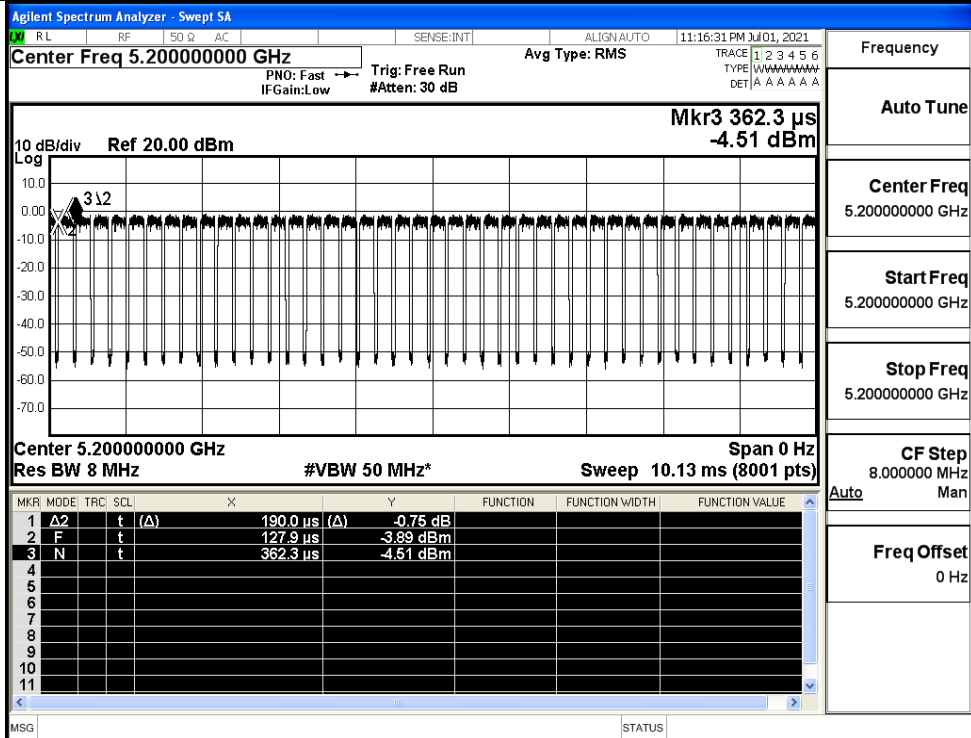
D.1 Duty Cycle

ANT0

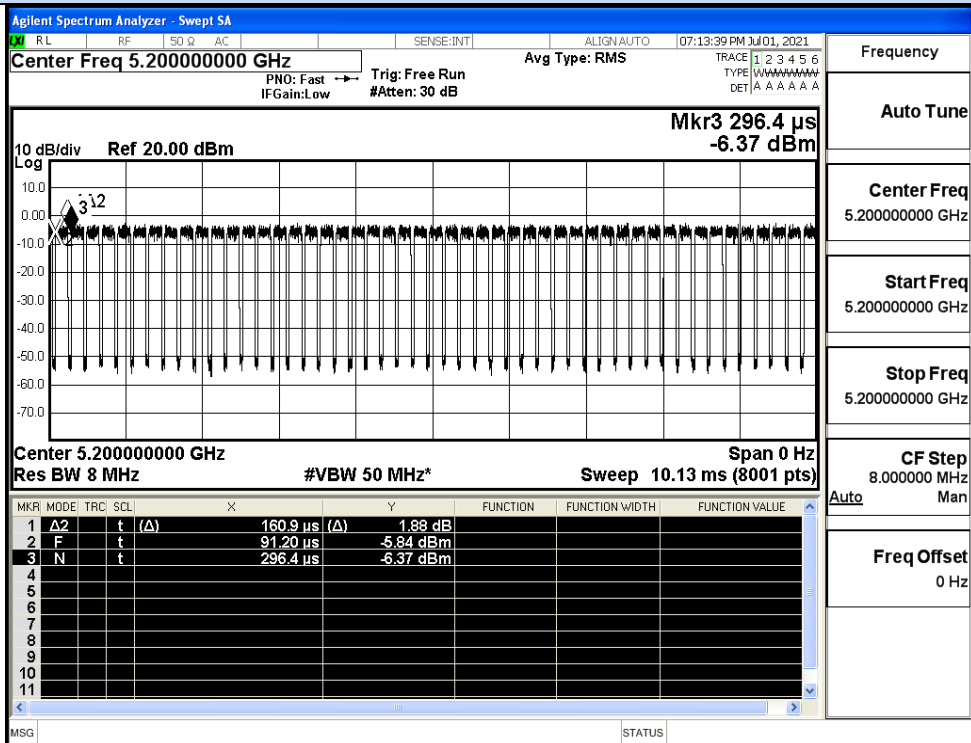
Test Mode	Test Frequency (MHz)	Duty Cycle (%)	10log(1/x) Factor (dB)	1/B Minimum VBW(KHz)
11A	5200	81.08	0.91	0.01
11N20 SISO	5200	78.4	1.06	0.01
11N40 SISO	5190	93.75	0.28	0.01
11AC20 SISO	5200	78.79	1.04	0.01
11AC40 SISO	5190	65.69	1.83	0.01
11AC80 SISO	5210	57.83	2.38	0.01



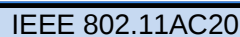
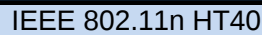
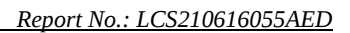
On Time and Duty Cycle

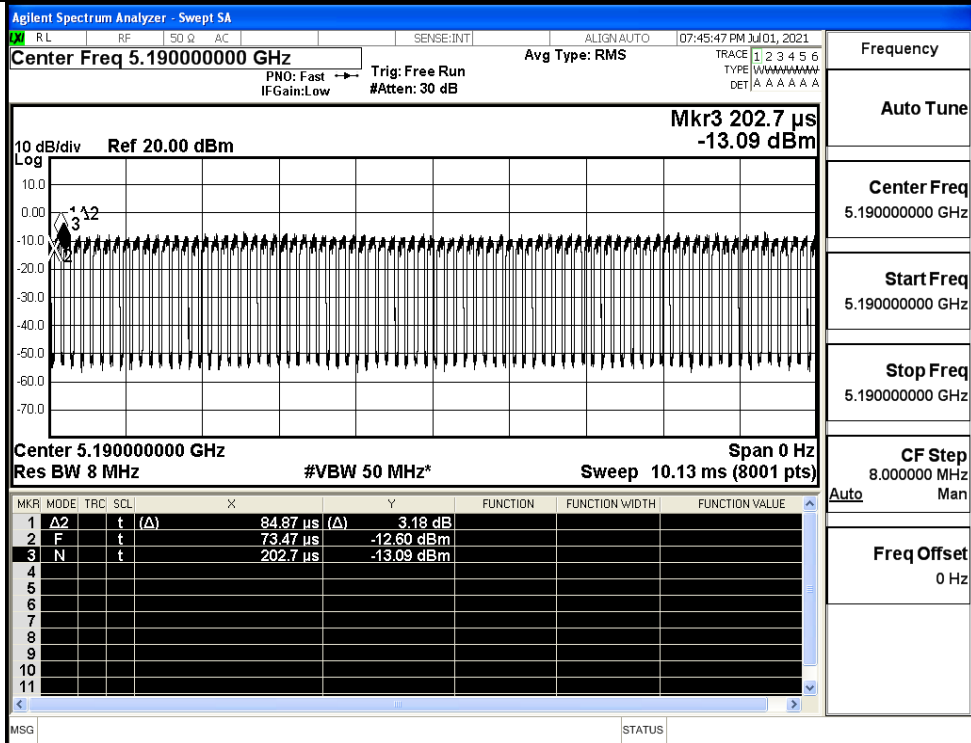


IEEE 802.11a

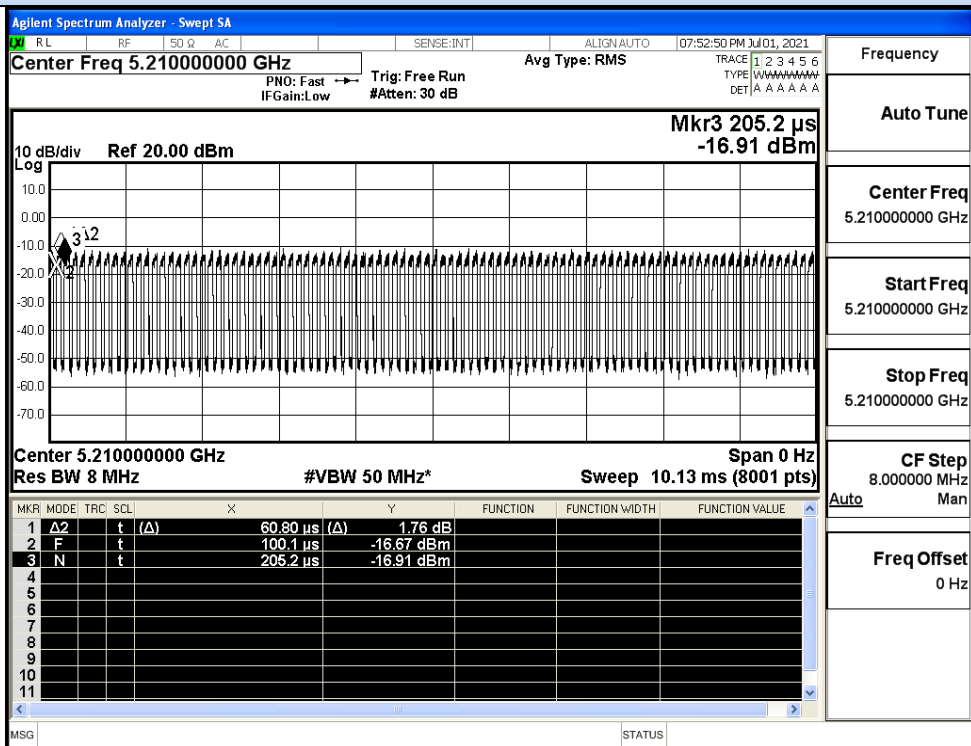


IEEE 802.11n HT20





IEEE 802.11 AC40



IEEE 802.11AC80

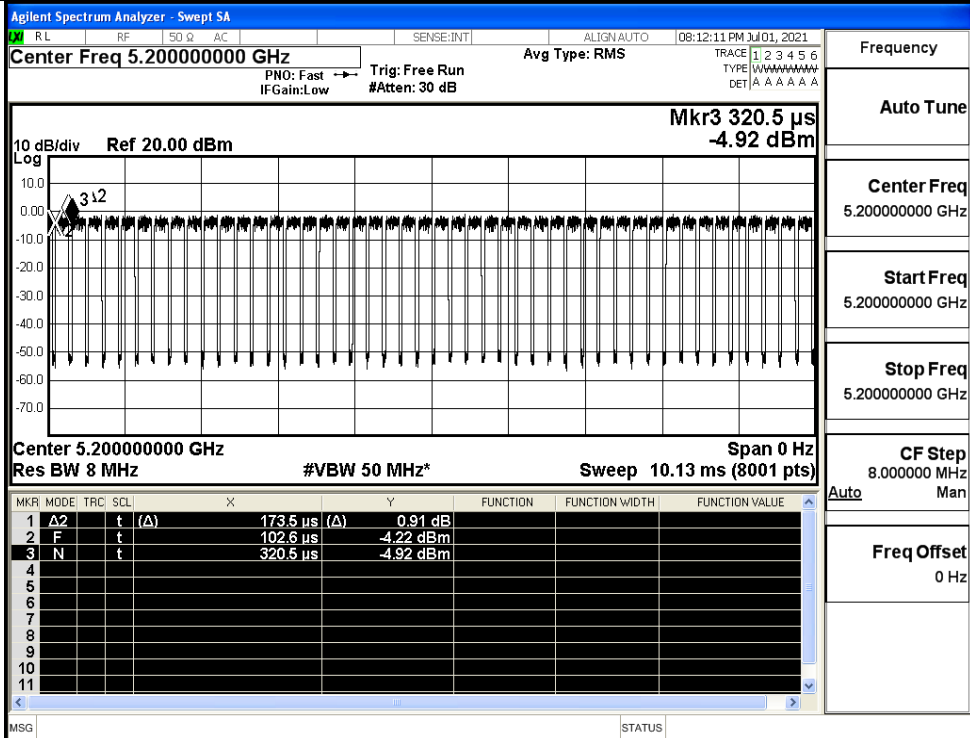


ANT1

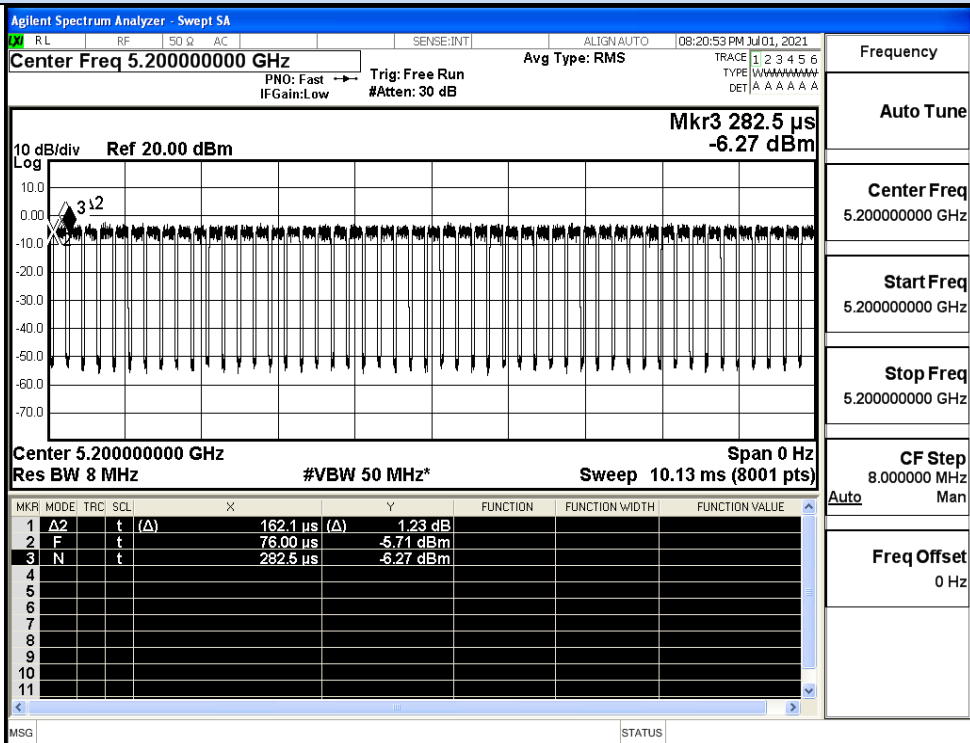
Test Mode	Test Frequency (MHz)	Duty Cycle (%)	10log(1/x) Factor (dB)	1/B Minimum VBW(KHz)
11A	5200	79.65	0.99	0.01
11N20 SISO	5200	78.53	1.05	0.01
11N40 SISO	5190	68.75	1.63	0.01
11AC20 SISO	5200	76.67	1.15	0.01
11AC40 SISO	5190	65.69	1.83	0.01
11AC80 SISO	5210	59.04	2.29	0.01



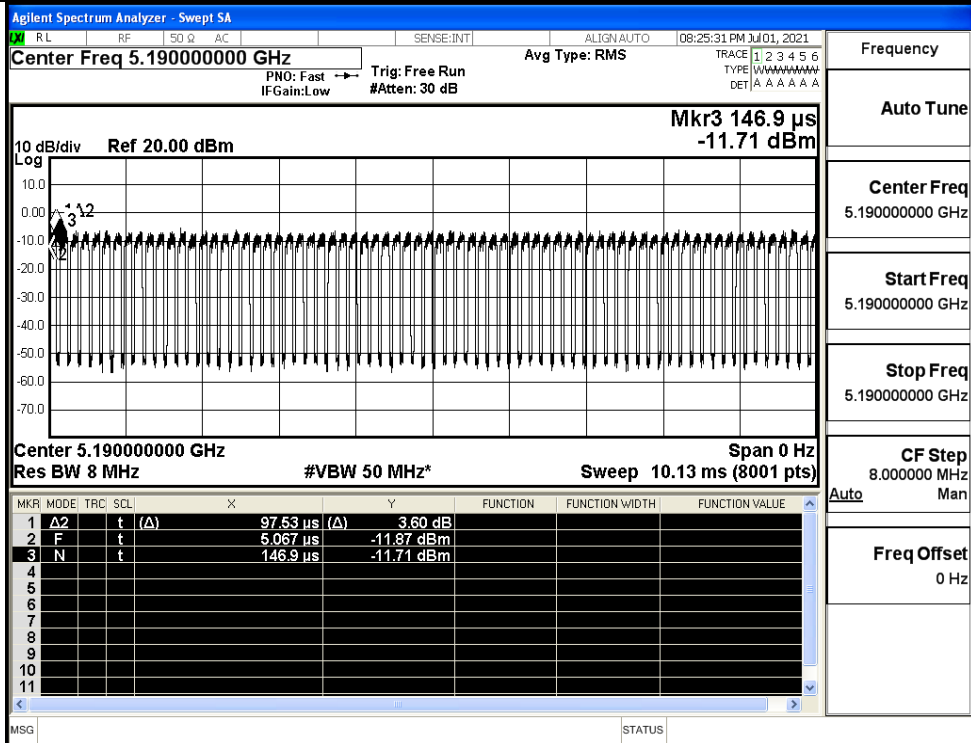
On Time and Duty Cycle



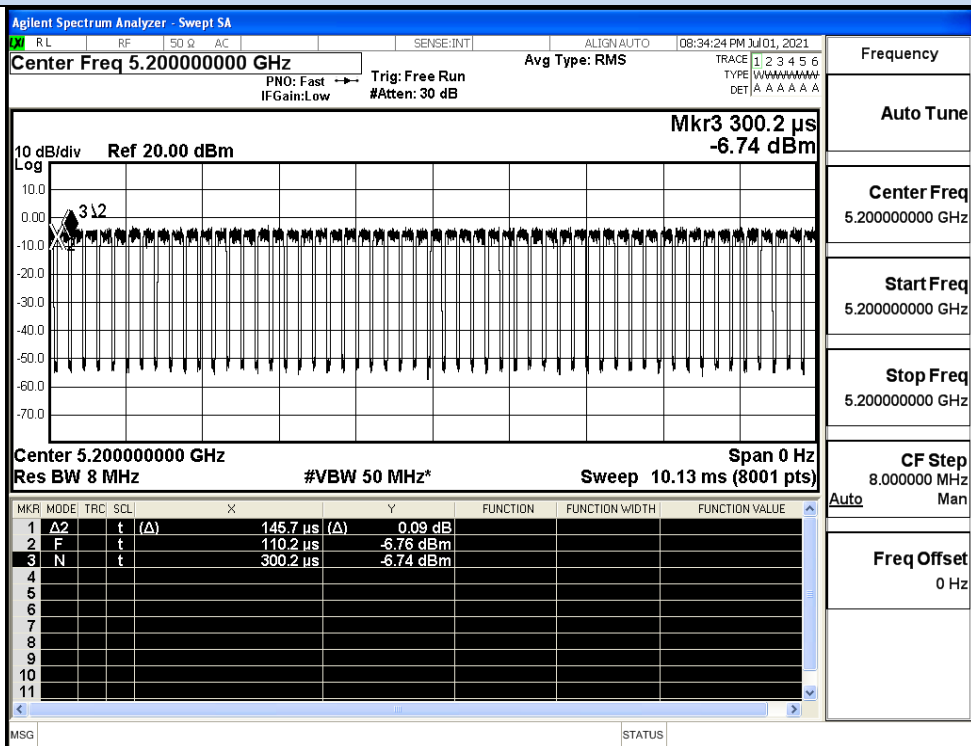
IEEE 802.11a



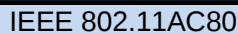
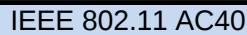
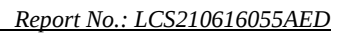
IEEE 802.11n HT20



IEEE 802.11n HT40



IEEE 802.11AC20



**D.2 Maximum Conduct Output Power****ANT0**

Test Mode	Channel	Frequency (MHz)	AVG Conducted Power (dBm)	Duty Cycle Factor(dB)	Report Conducted Power(dBm)	Limit (dBm)	Verdict
11A	36	5180	12.11	0.91	13.02	24	Pass
	40	5200	13.03	0.91	13.94		Pass
	48	5240	12.29	0.91	13.20		Pass
11N20 SISO	36	5180	10.66	1.06	11.72	24	Pass
	40	5200	11.02	1.06	12.08		Pass
	48	5240	10.68	1.06	11.74		Pass
11N40 SISO	38	5190	13.47	0.28	13.75	24	Pass
	46	5230	10.25	0.28	10.53		Pass
11AC20 SISO	36	5180	10.78	1.04	11.82	24	Pass
	40	5200	11.04	1.04	12.08		Pass
	48	5240	10.61	1.04	11.65		Pass
11AC40 SISO	38	5190	9.47	1.83	11.30	24	Pass
	46	5230	9.25	1.83	11.08		Pass
11AC80 SISO	42	5210	8.18	2.38	10.56	24	Pass

ANT1

Test Mode	Channel	Frequency (MHz)	AVG Conducted Power (dBm)	Duty Cycle Factor(dB)	Report Conducted Power(dBm)	Limit (dBm)	Verdict
11A	36	5180	12.55	0.99	13.54	24	Pass
	40	5200	12.57	0.99	13.56		Pass
	48	5240	12.36	0.99	13.35		Pass
11N20 SISO	36	5180	10.68	1.05	11.73	24	Pass
	40	5200	11.01	1.05	12.06		Pass
	48	5240	10.59	1.05	11.64		Pass
11N40 SISO	38	5190	10.29	1.63	11.92	24	Pass
	46	5230	10.27	1.63	11.9		Pass
11AC20 SISO	36	5180	10.31	1.15	11.46	24	Pass
	40	5200	10.61	1.15	11.76		Pass
	48	5240	10.27	1.15	11.42		Pass
11AC40 SISO	38	5190	9.54	1.83	11.37	24	Pass
	46	5230	9.54	1.83	11.37		Pass
11AC80 SISO	42	5210	8.13	2.29	10.42	24	Pass



MIMO

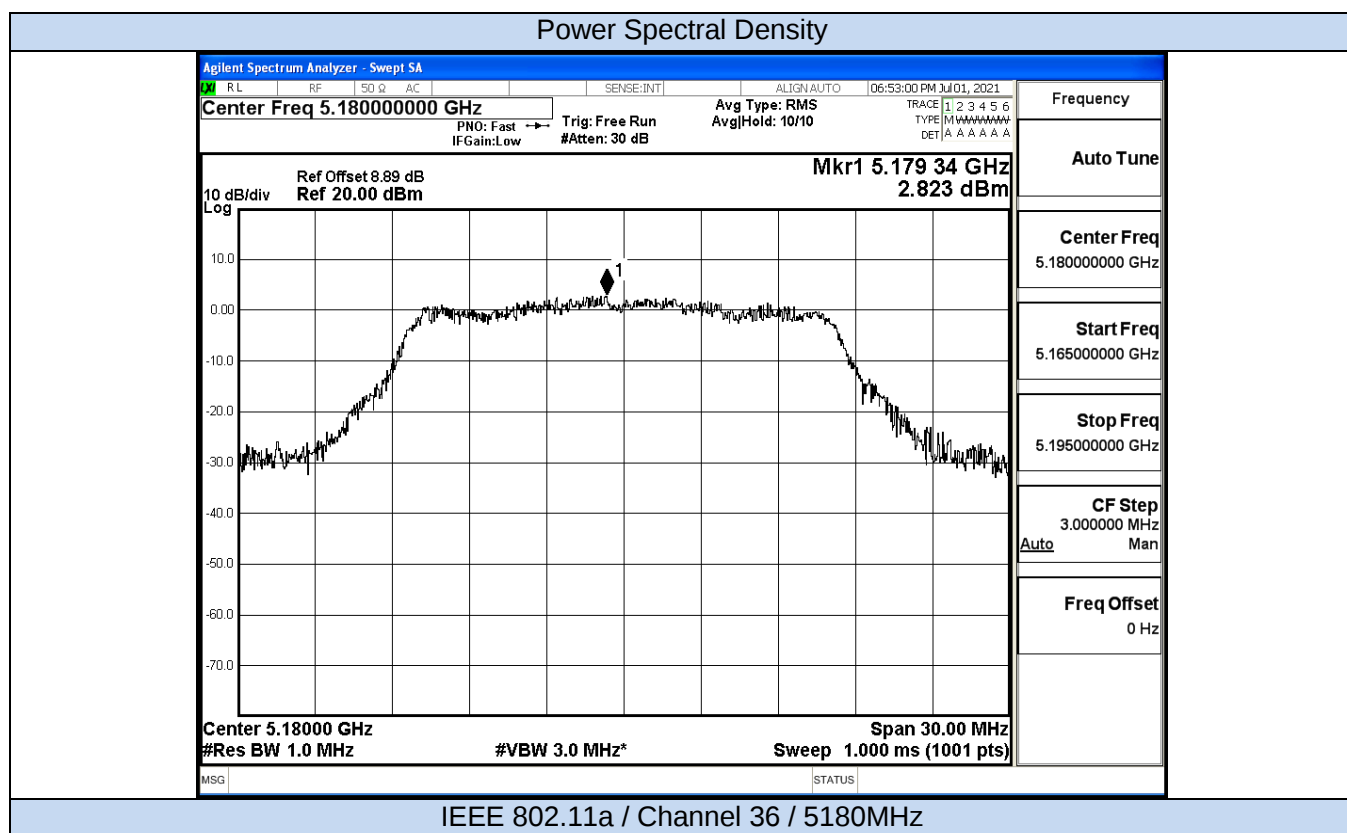
Test Mode	Channel	Frequency (MHz)	ANT 0 Conducted Power (dBm)	ANT 1 Conducted Power (dBm)	MIMO Conducted Power (dBm)	Limit (dBm)	Verdict
11N20	36	5180	11.72	11.73	14.74	24	Pass
	40	5200	12.08	12.06	15.08		Pass
	48	5240	11.74	11.64	14.70		Pass
11N40	38	5190	13.75	11.92	15.94	24	Pass
	46	5230	10.53	11.9	14.28		Pass
11AC20	36	5180	11.82	11.46	14.65	24	Pass
	40	5200	12.08	11.76	14.93		Pass
	48	5240	11.65	11.42	14.55		Pass
11AC40	38	5190	11.30	11.37	14.35	24	Pass
	46	5230	11.08	11.37	14.24		Pass
11AC80	42	5210	10.56	10.42	13.50	24	Pass

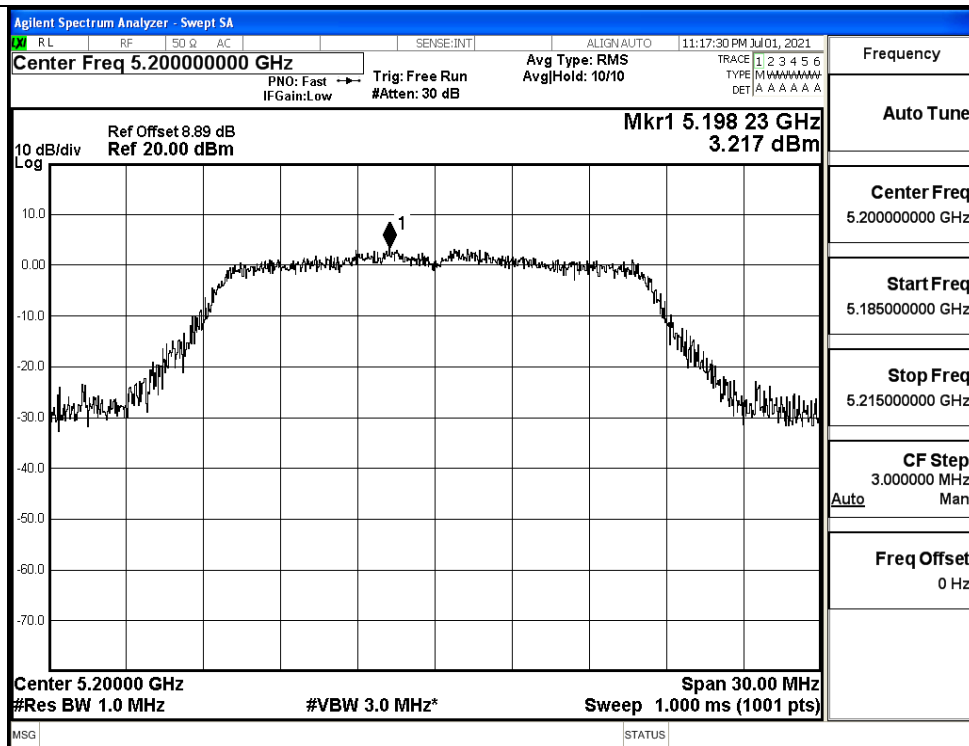


D.3 Power Spectral Density

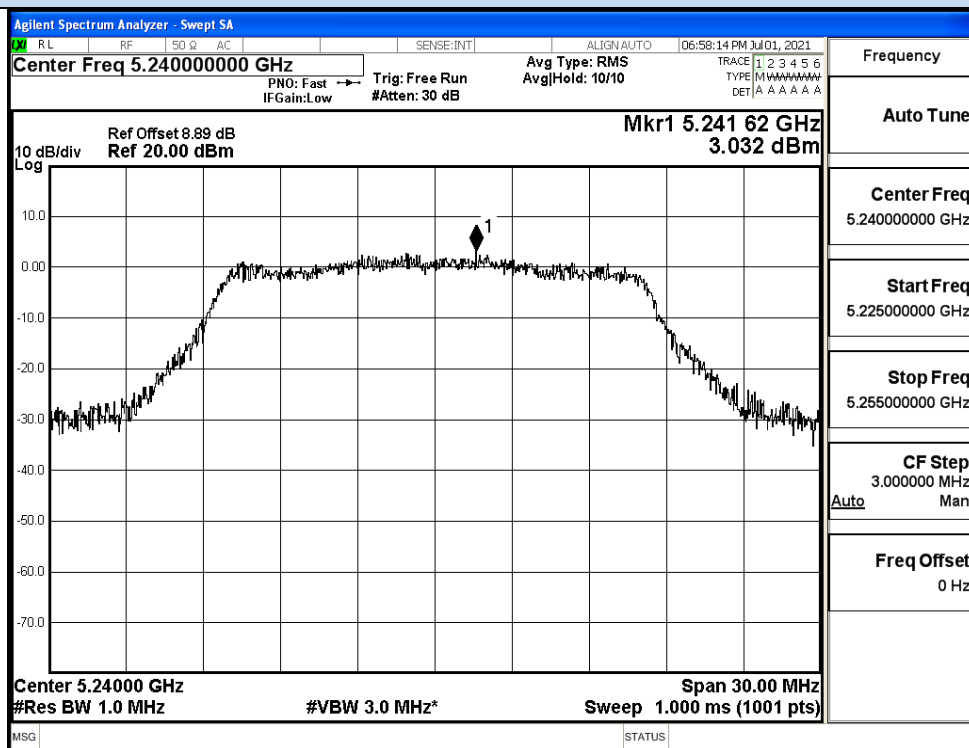
ANT0

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	2.82	0.91	3.73	11	Pass
	40	5200	3.22	0.91	4.13		Pass
	48	5240	3.03	0.91	3.94		Pass
11N20 SISO	36	5180	1.07	1.06	2.13	11	Pass
	40	5200	2.65	1.06	3.71		Pass
	48	5240	1.46	1.06	2.52		Pass
11N40 SISO	38	5190	0.41	0.28	0.69	11	Pass
	46	5230	-2.02	0.28	-1.74		Pass
11AC20 SISO	36	5180	1.46	1.04	2.5	11	Pass
	40	5200	1.55	1.04	2.59		Pass
	48	5240	1.49	1.04	2.53		Pass
11AC40 SISO	38	5190	-3.01	1.83	-1.18	11	Pass
	46	5230	-2.99	1.83	-1.16		Pass
11AC80 SISO	42	5210	-6.77	2.38	-4.39	11	Pass





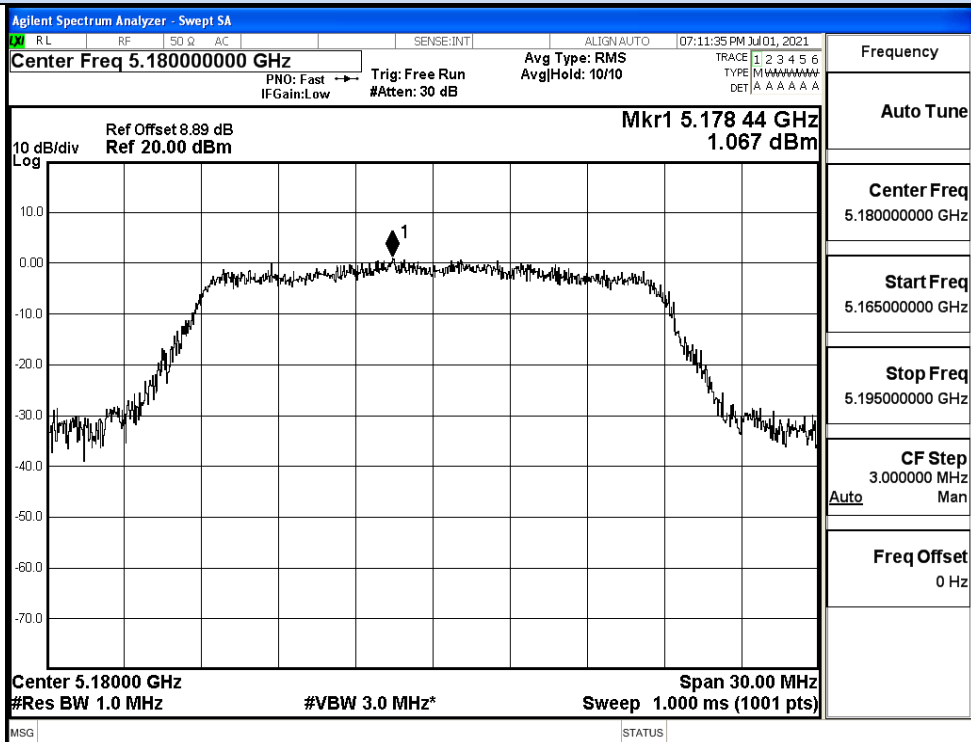
IEEE 802.11na / Channel 40 / 5200MHz



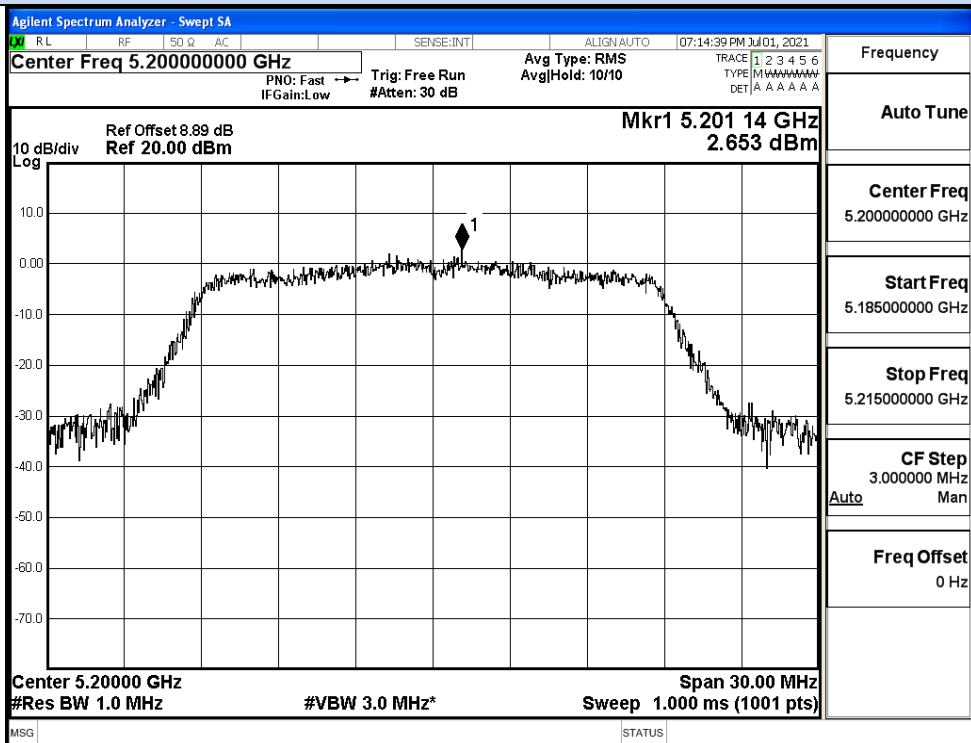
IEEE 802.11na / Channel 48 / 5240MHz



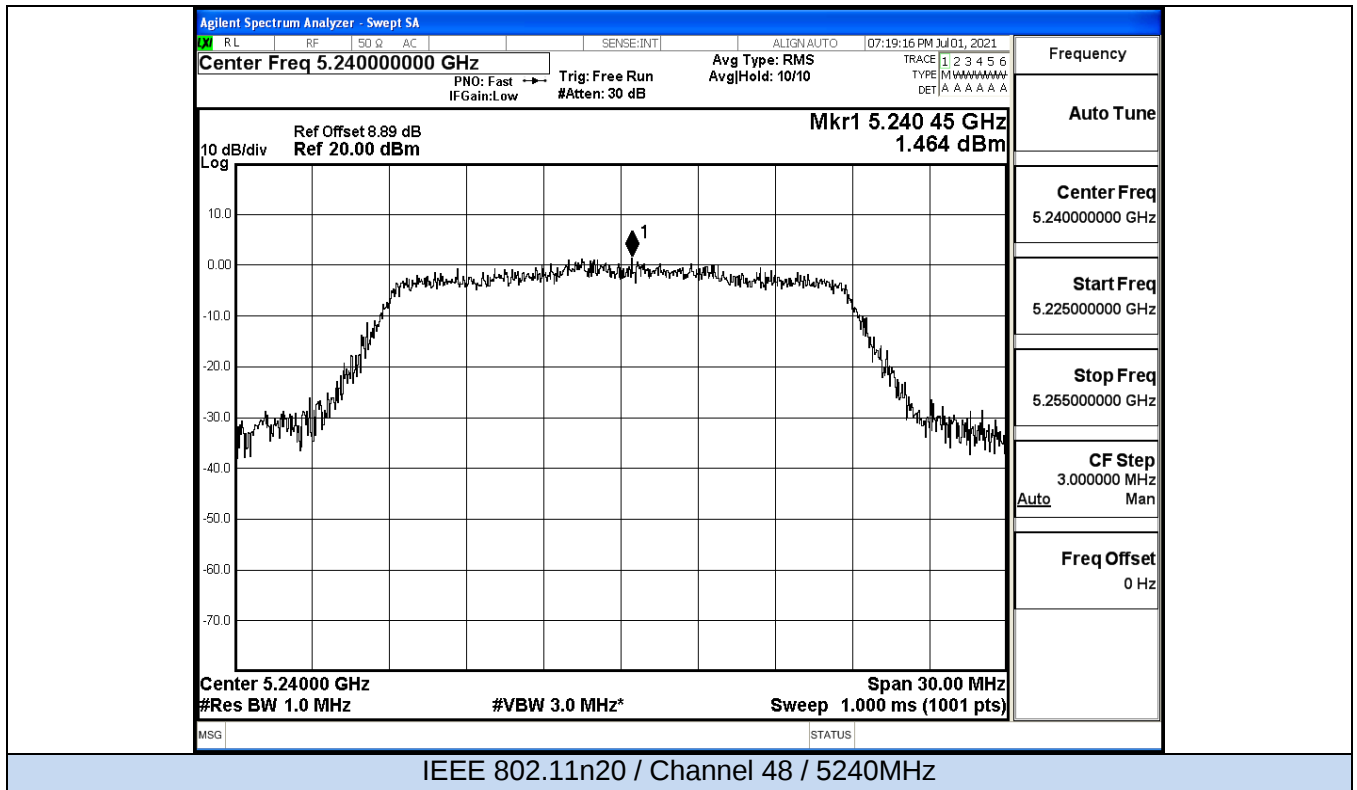
Power Spectral Density



IEEE 802.11n20 / Channel 36 / 5180MHz

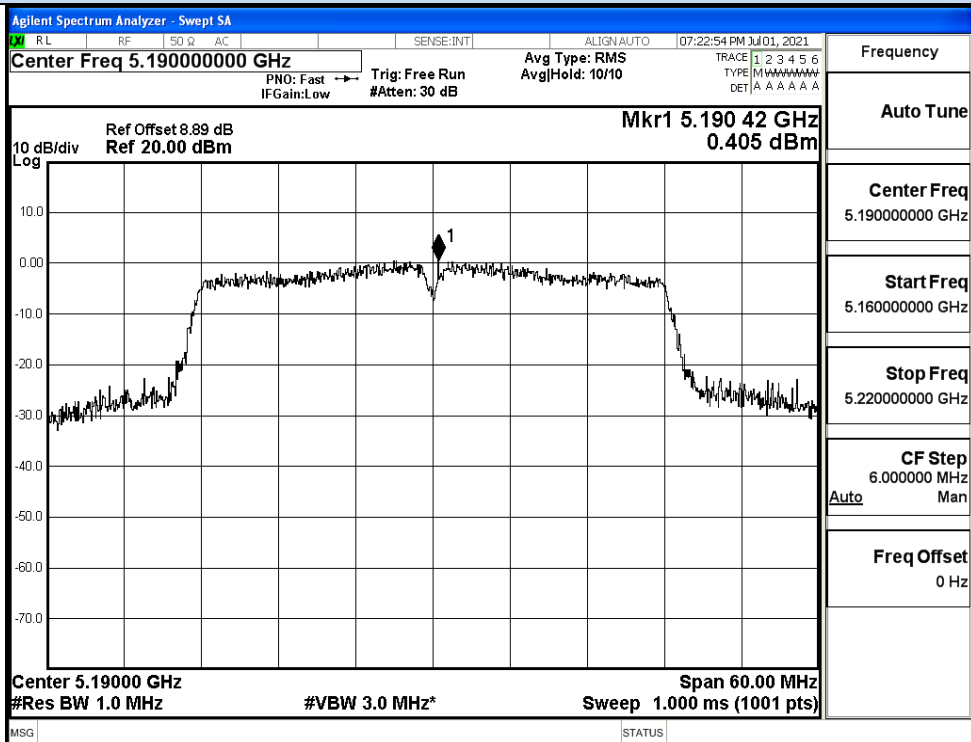


IEEE 802.11n20 / Channel 40 / 5200MHz

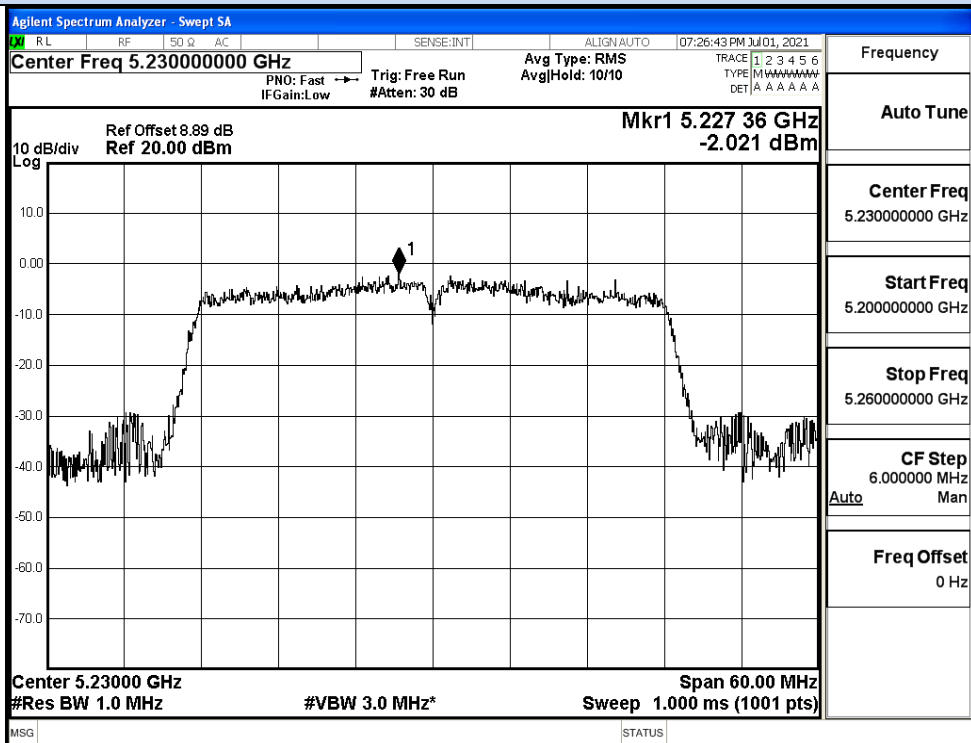




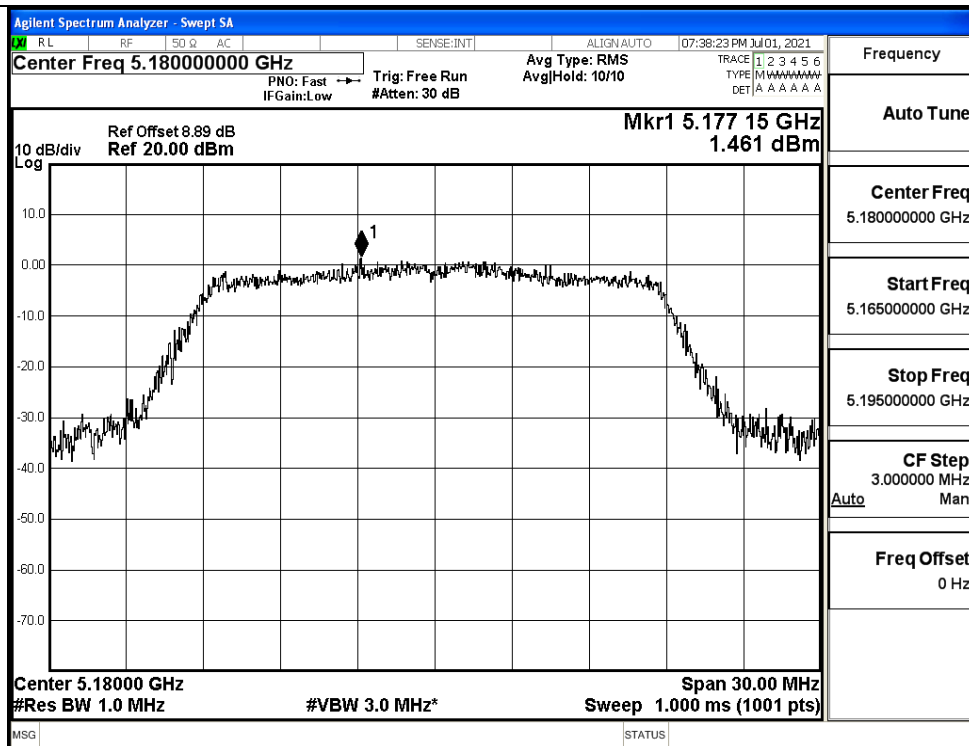
Power Spectral Density



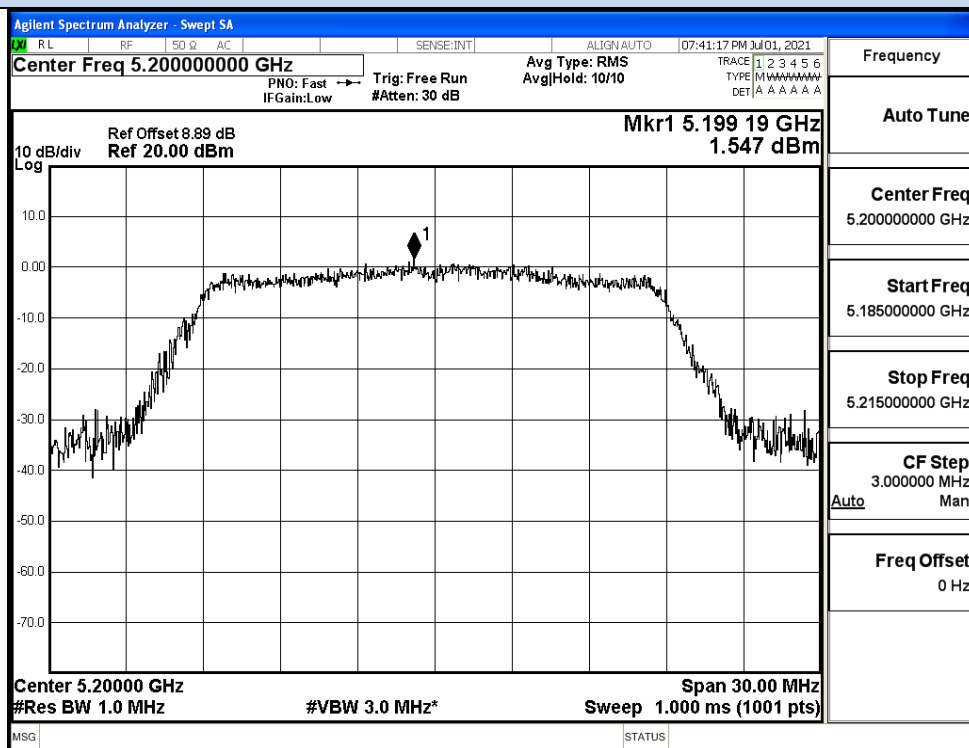
IEEE 802.11n40 / Channel 38 / 5190MHz



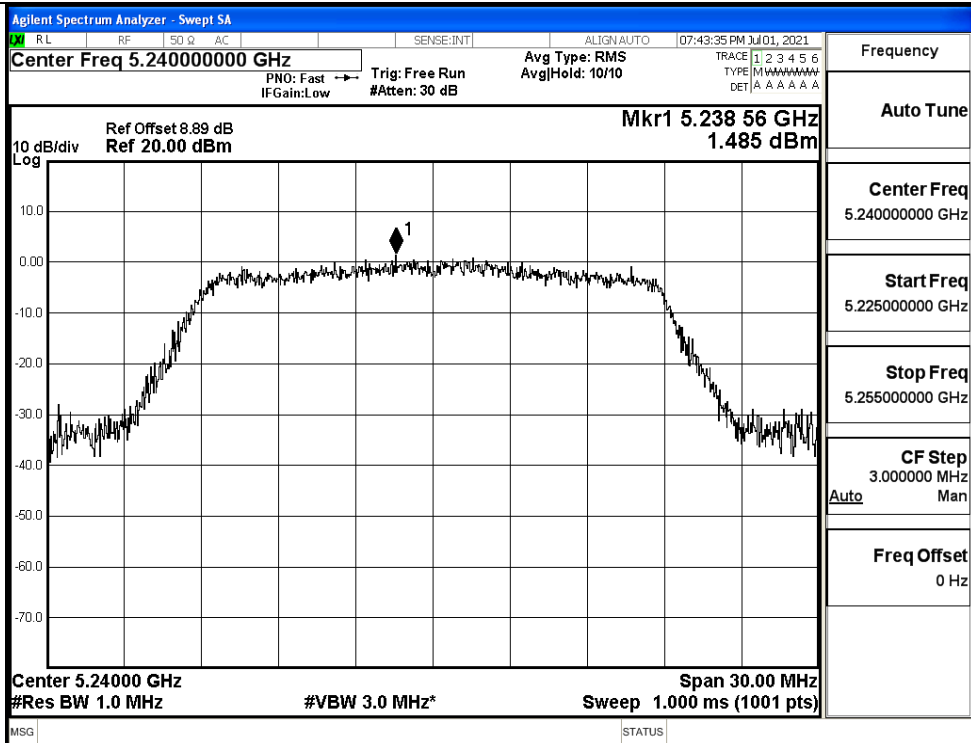
IEEE 802.11n40 / Channel 46 / 5230MHz



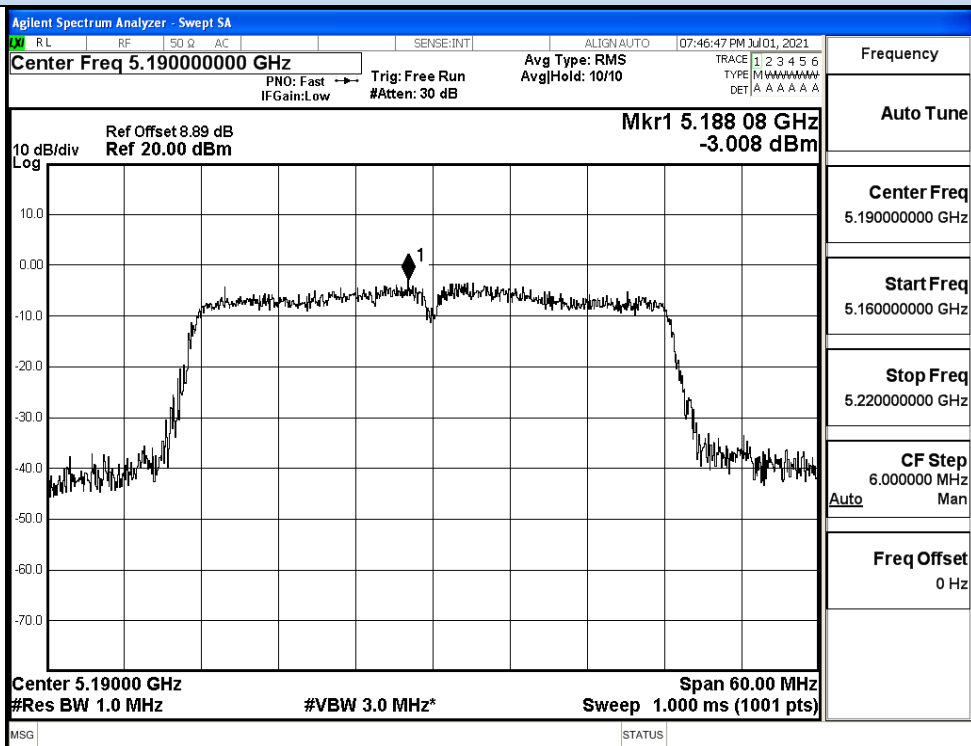
IEEE 802.11ac20 / Channel 36 / 5180MHz



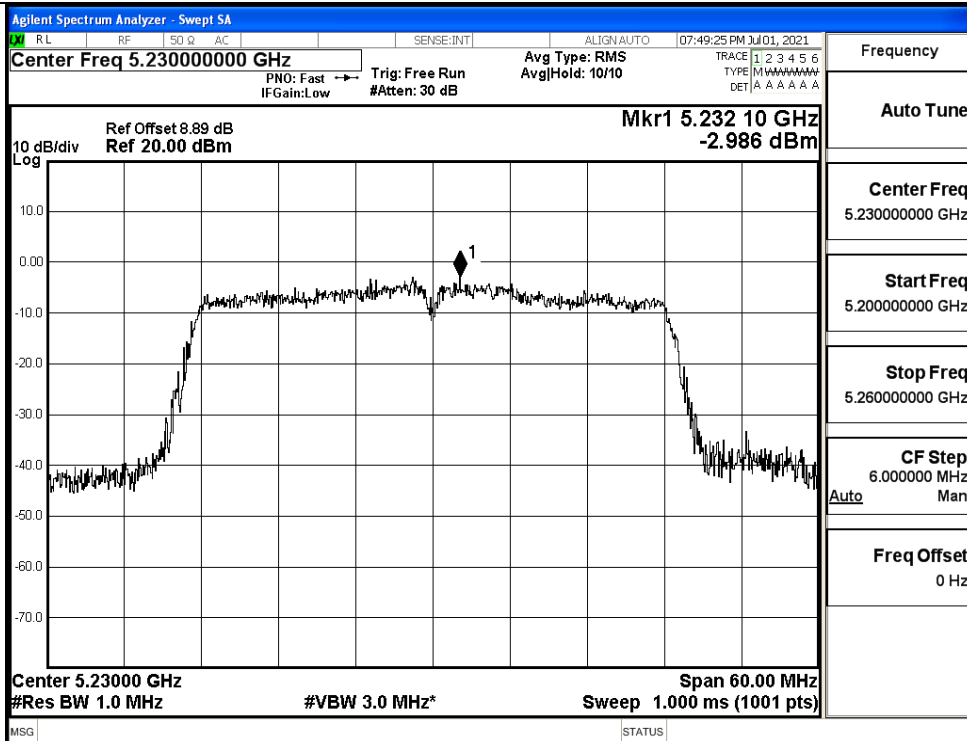
IEEE 802.11ac20 / Channel 40 / 5200MHz



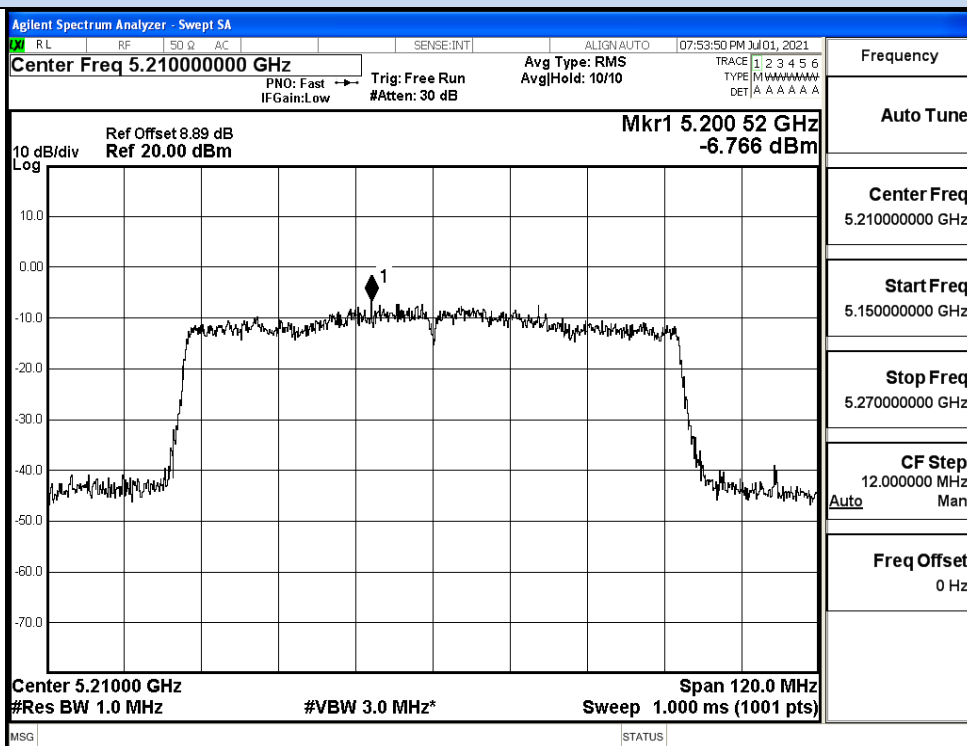
IEEE 802.11ac20 / Channel 48 / 5240MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz



IEEE 802.11ac40 / Channel 46 / 5230MHz

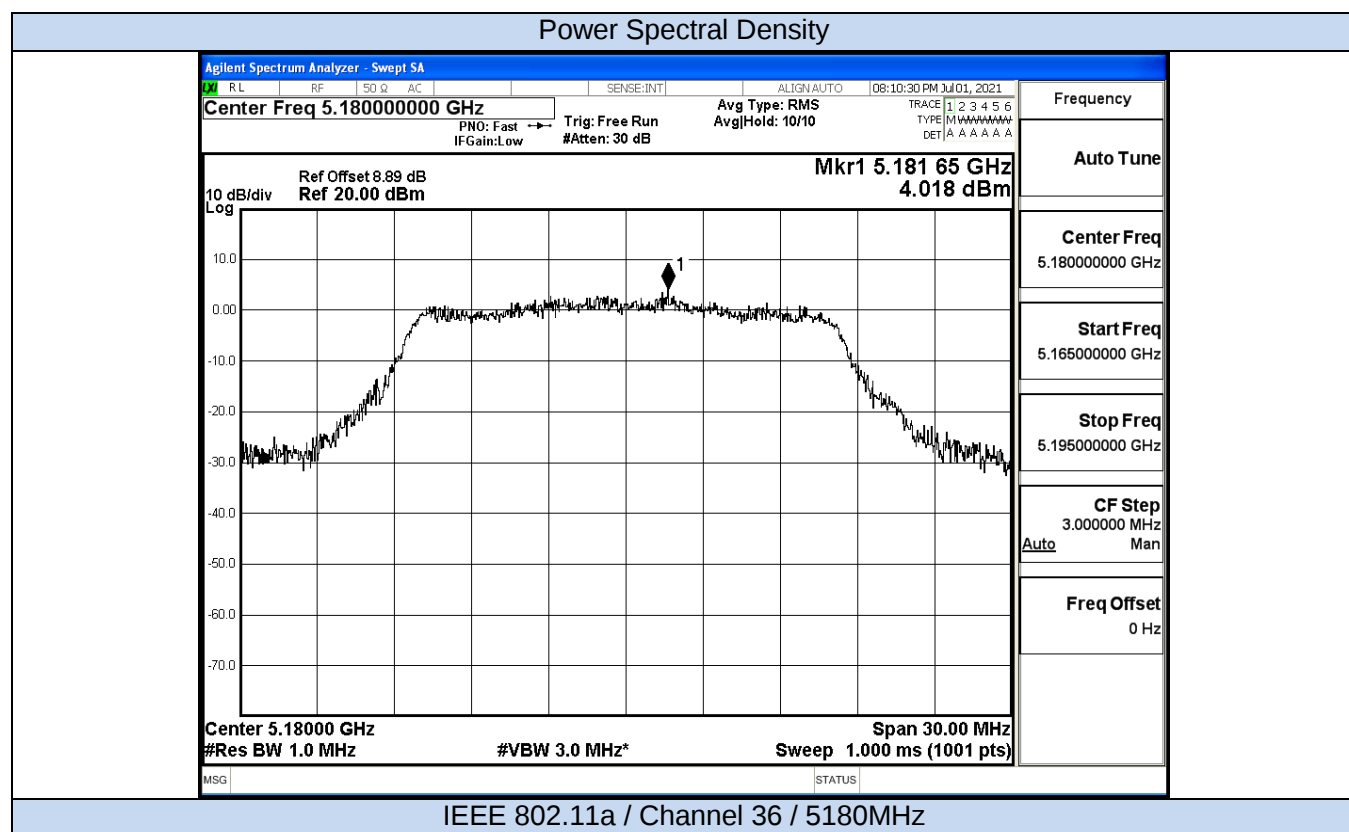


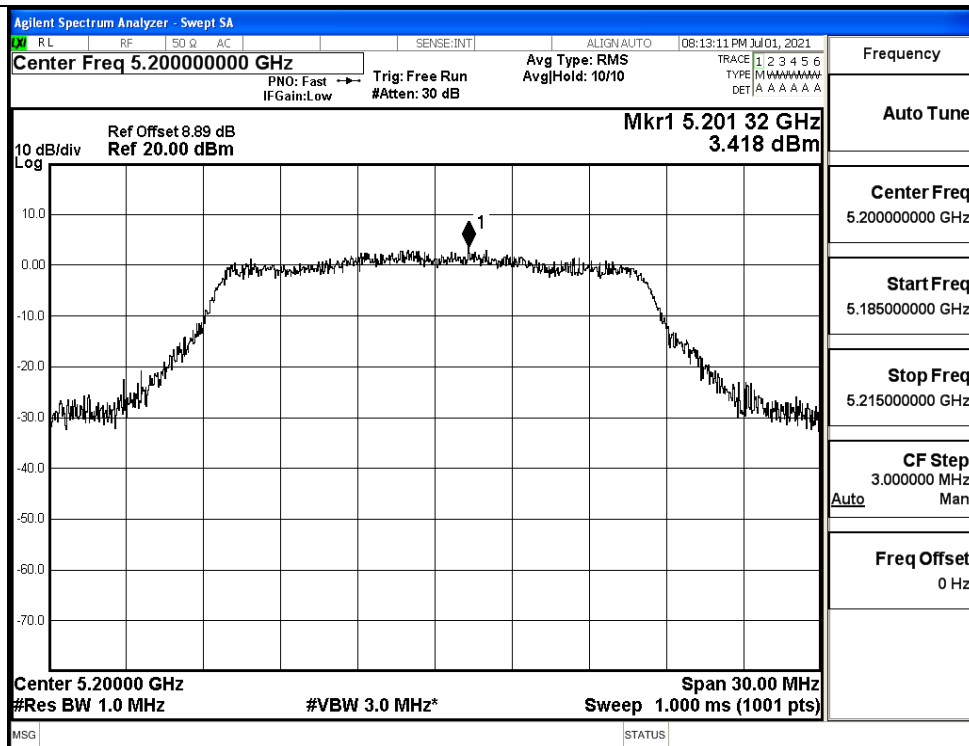
IEEE 802.11ac80 / Channel 42 / 5210MHz



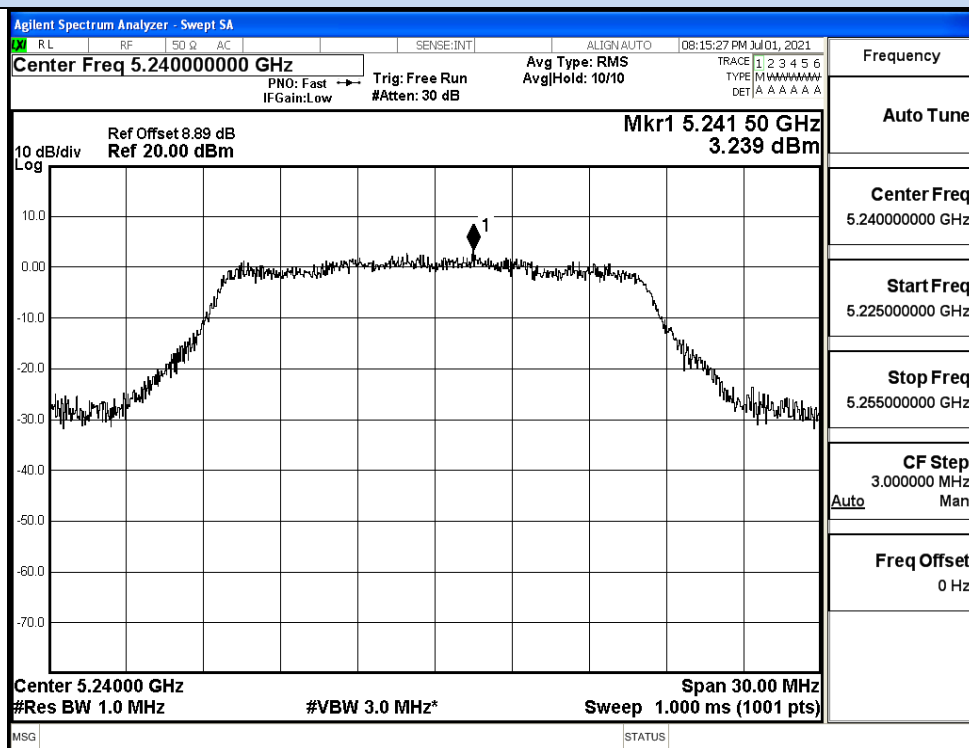
ANT1

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	4.02	0.99	5.01	11	Pass
	40	5200	3.42	0.99	4.41		Pass
	48	5240	3.24	0.99	4.23		Pass
11N20 SISO	36	5180	2.49	1.05	3.54	11	Pass
	40	5200	1.85	1.05	2.9		Pass
	48	5240	1.97	1.05	3.02		Pass
11N40 SISO	38	5190	-1.81	1.63	-0.18	11	Pass
	46	5230	-1.78	1.63	-0.15		Pass
11AC20 SISO	36	5180	0.81	1.15	1.96	11	Pass
	40	5200	1.00	1.15	2.15		Pass
	48	5240	1.84	1.15	2.99		Pass
11AC40 SISO	38	5190	-2.36	1.83	-0.53	11	Pass
	46	5230	-3.18	1.83	-1.35		Pass
11AC80 SISO	42	5210	-6.27	2.29	-3.98	11	Pass





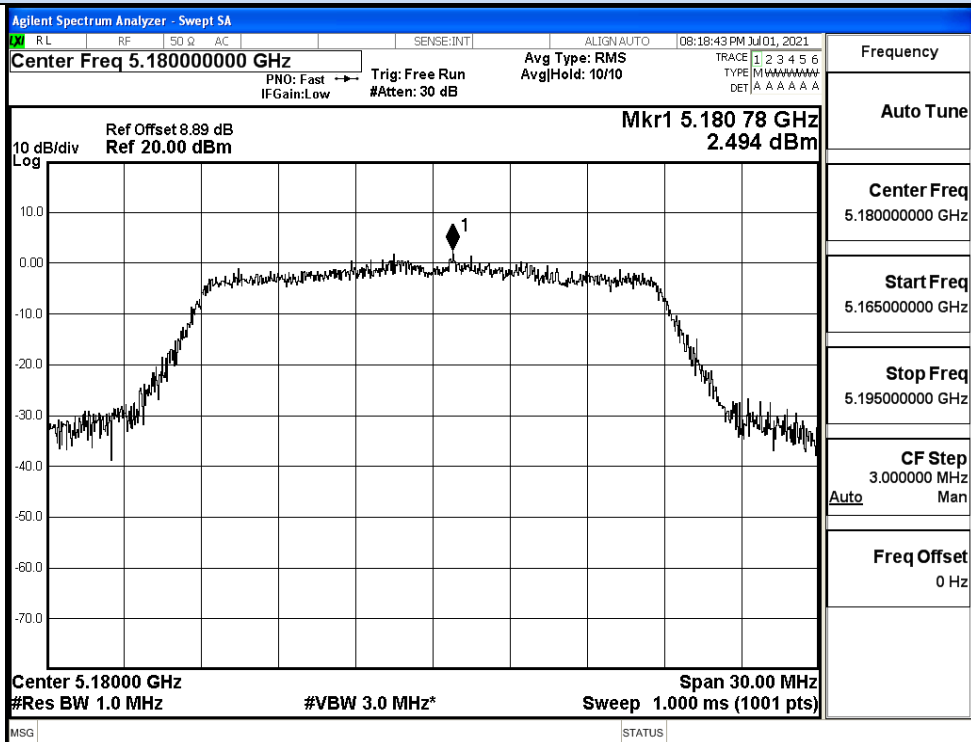
IEEE 802.11na / Channel 40 / 5200MHz



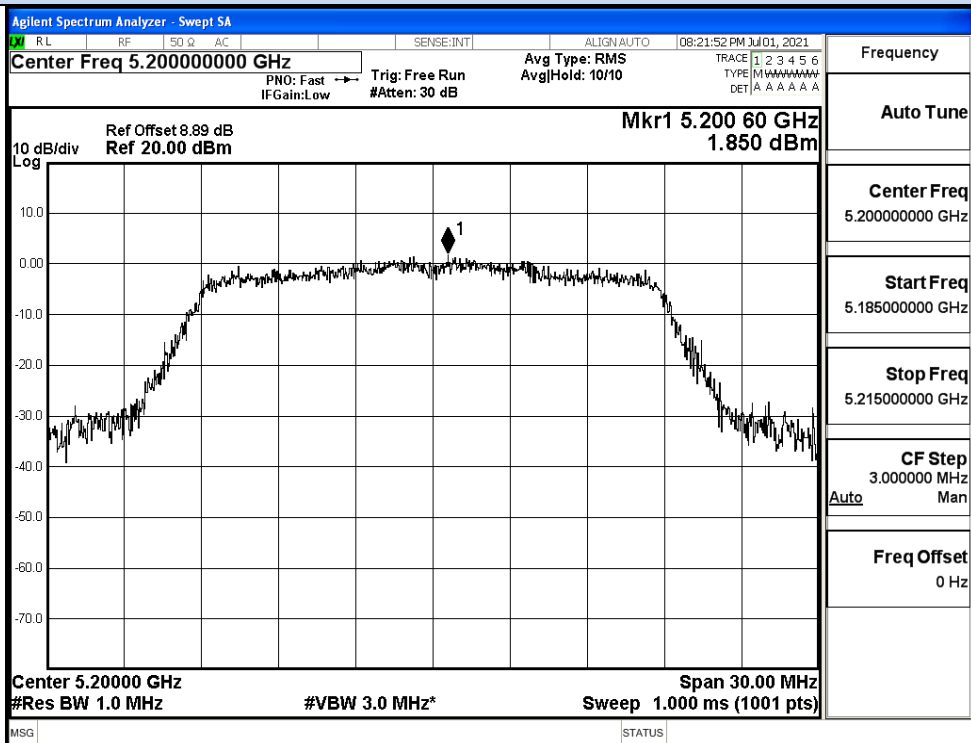
IEEE 802.11na / Channel 48 / 5240MHz



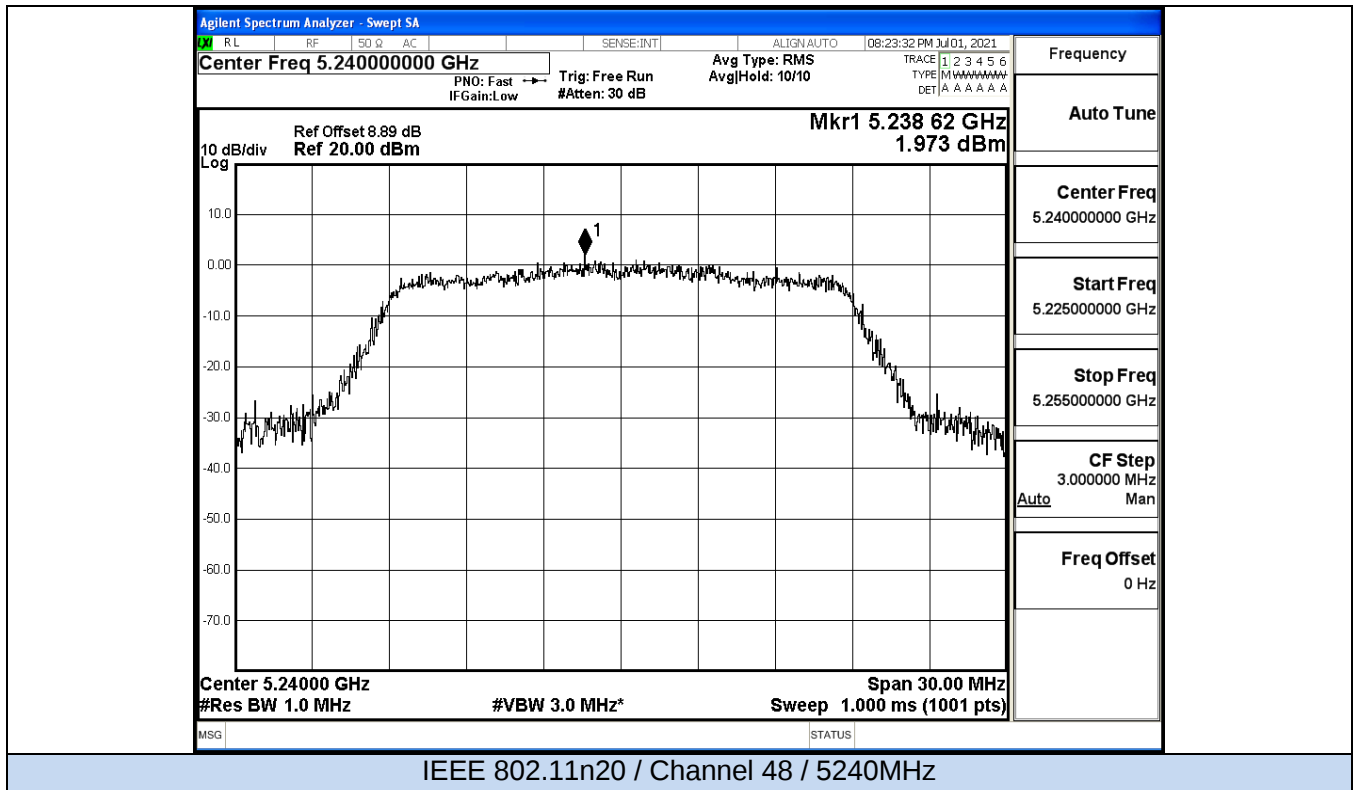
Power Spectral Density



IEEE 802.11n20 / Channel 36 / 5180MHz

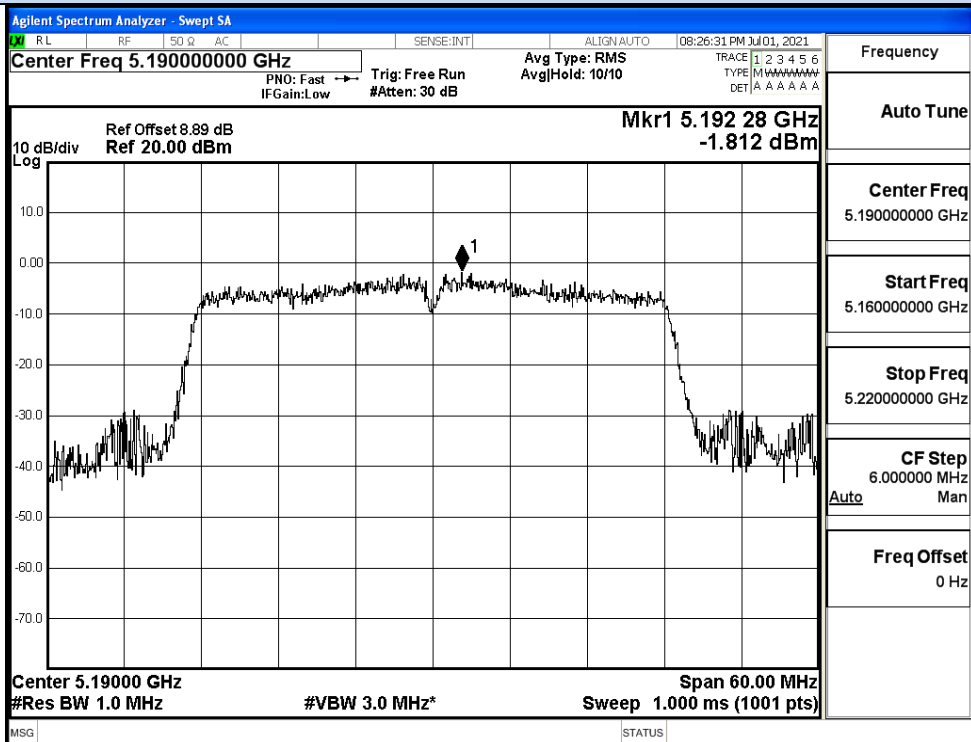


IEEE 802.11n20 / Channel 40 / 5200MHz

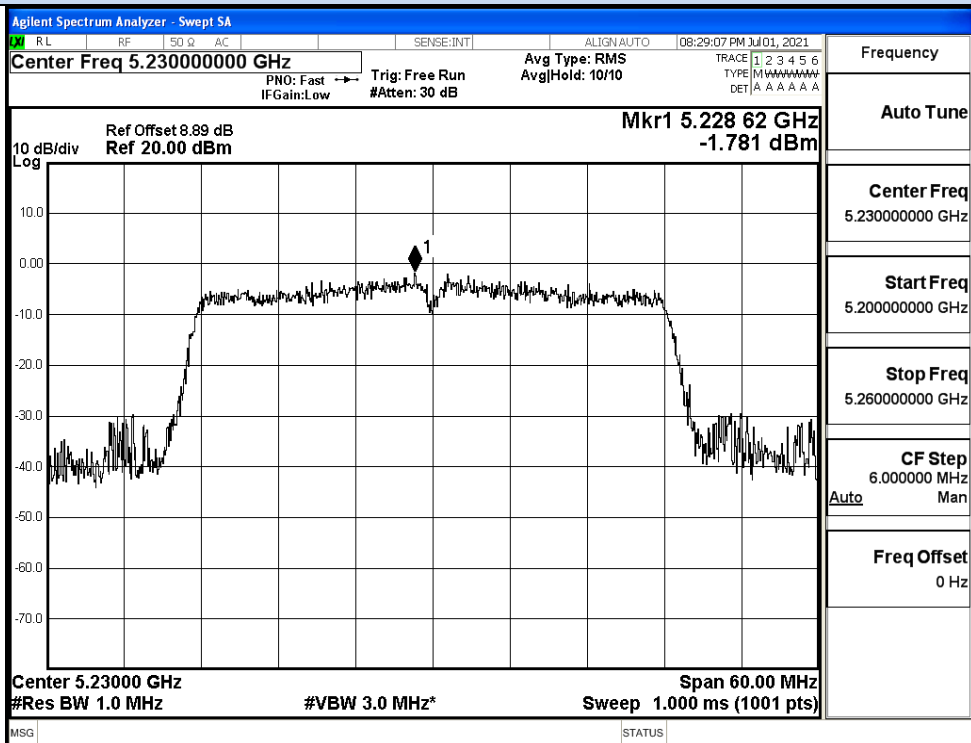




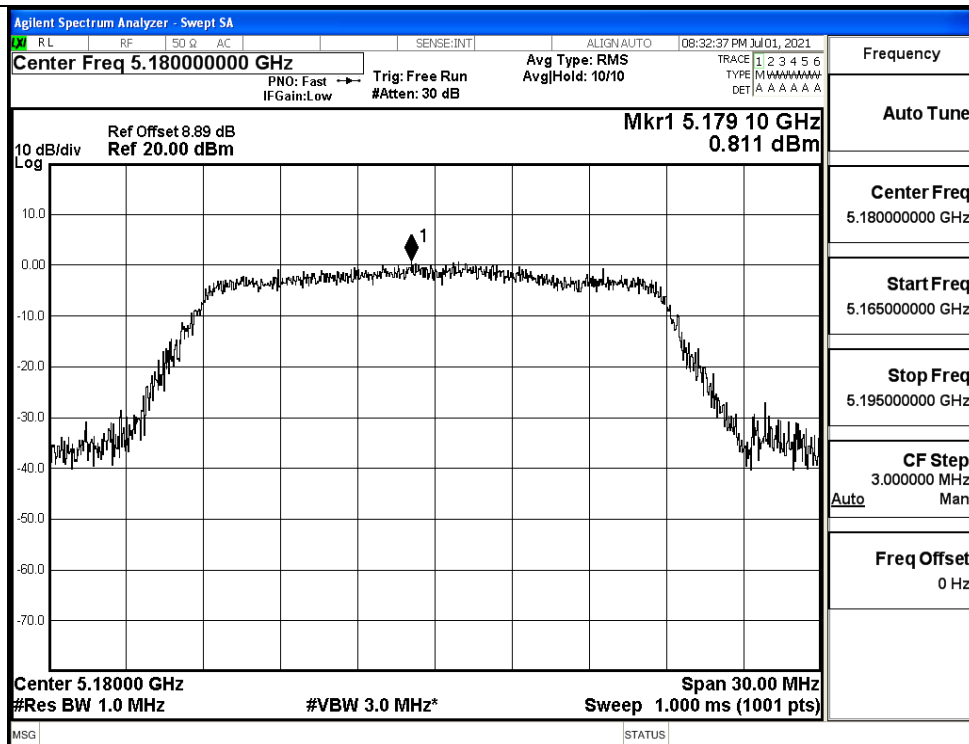
Power Spectral Density



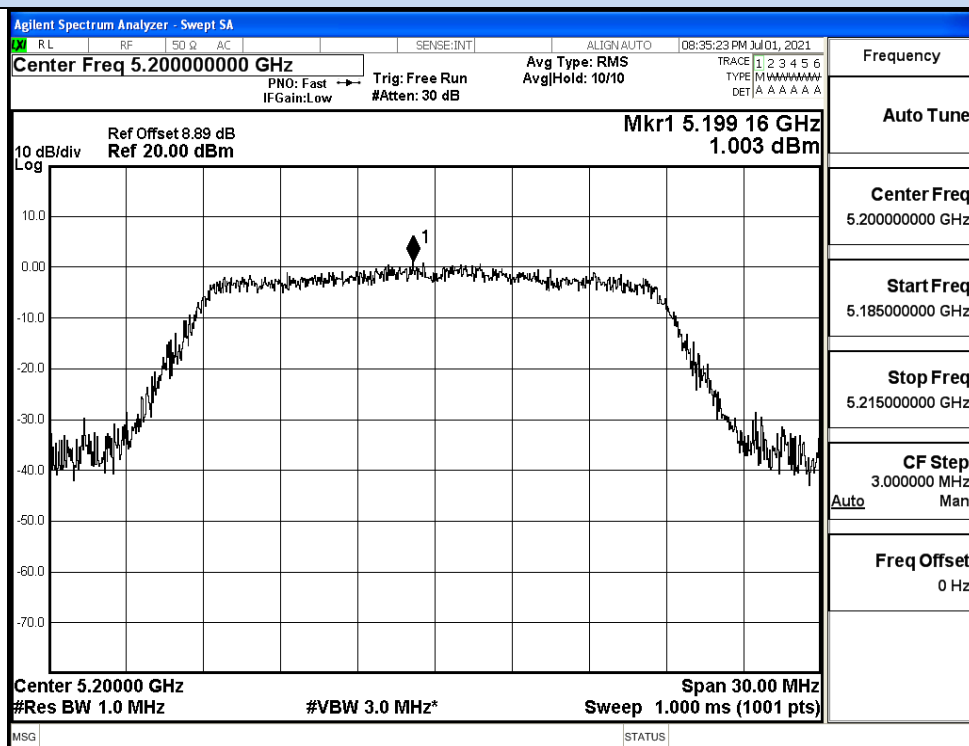
IEEE 802.11n40 / Channel 38 / 5190MHz



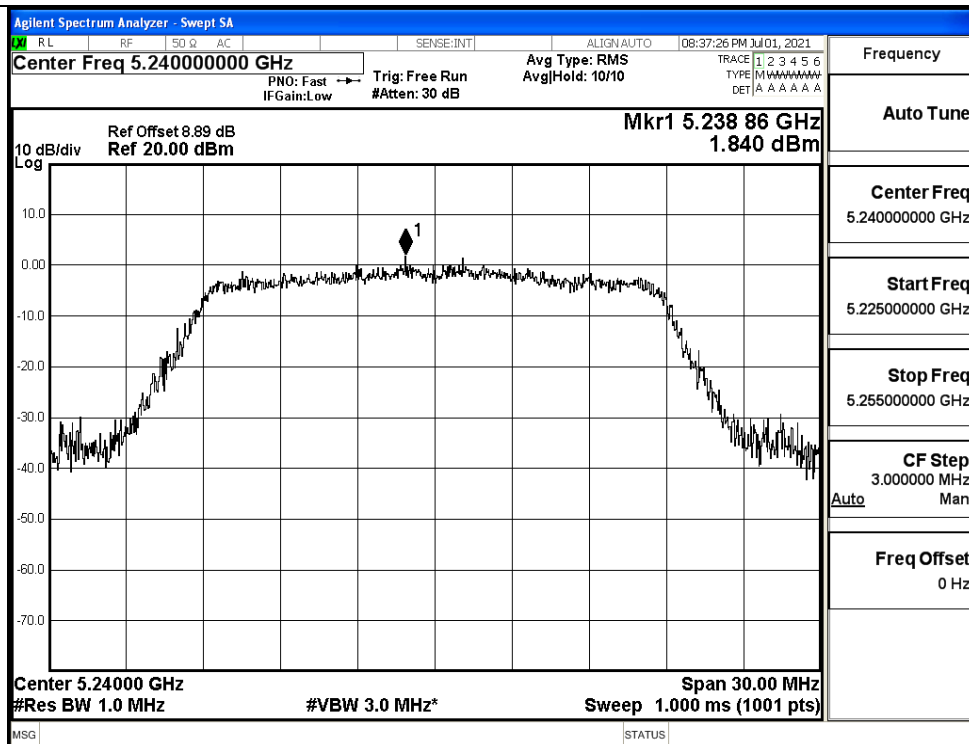
IEEE 802.11n40 / Channel 46 / 5230MHz



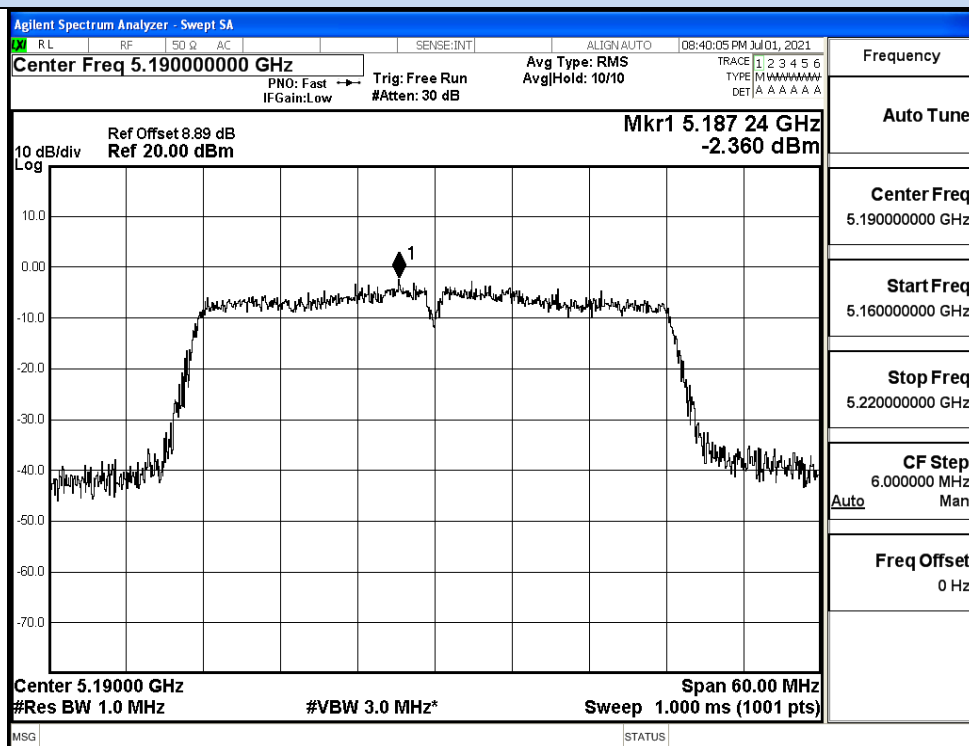
IEEE 802.11ac20 / Channel 36 / 5180MHz



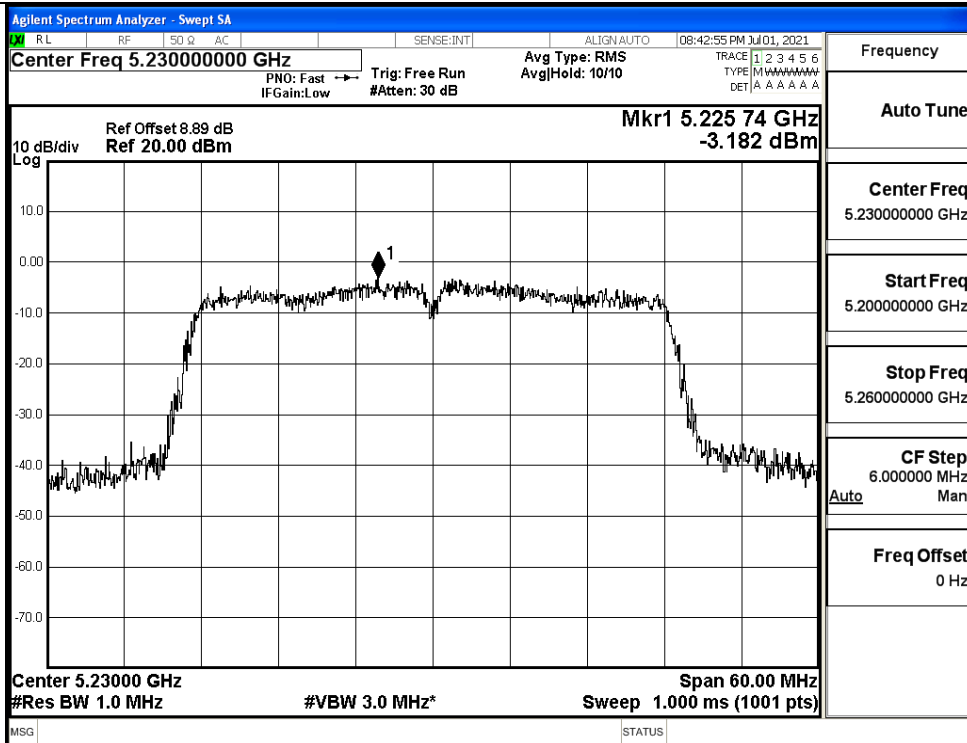
IEEE 802.11ac20 / Channel 40 / 5200MHz



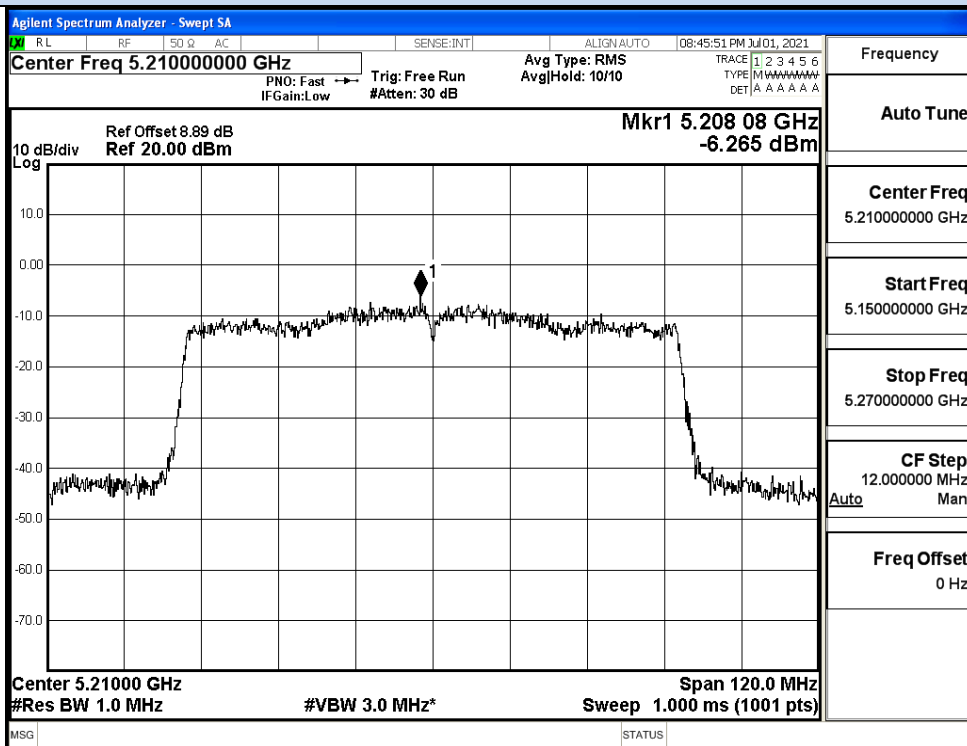
IEEE 802.11ac20 / Channel 48 / 5240MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz



IEEE 802.11ac40 / Channel 46 / 5230MHz



IEEE 802.11ac80 / Channel 42 / 5210MHz



MIMO

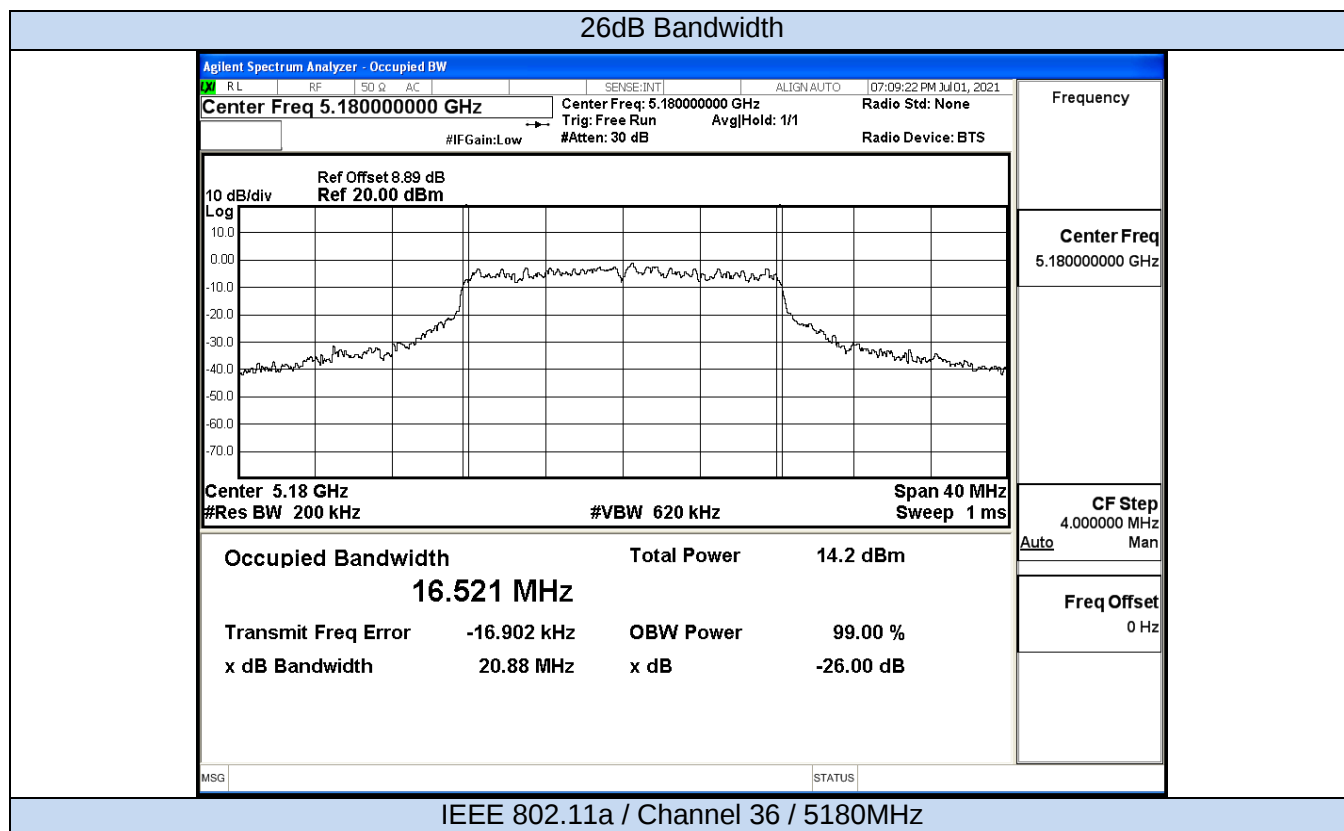
Test Mode	Channel	Frequency (MHz)	ANT 0 Power Density (dBm/MHz)	ANT 1 Power Density (dBm/MHz)	MIMO Power Density (dBm/MHz)	Limit (dBm/MHz)	Verdict
11N20	36	5180	2.13	3.54	5.90	11	Pass
	40	5200	3.71	2.9	6.33		Pass
	48	5240	2.52	3.02	5.79		Pass
11N40	38	5190	0.69	-0.18	3.29	11	Pass
	46	5230	-1.74	-0.15	2.14		Pass
11AC20	36	5180	2.5	1.96	5.25	11	Pass
	40	5200	2.59	2.15	5.39		Pass
	48	5240	2.53	2.99	5.78		Pass
11AC40	38	5190	-1.18	-0.53	2.17	11	Pass
	46	5230	-1.16	-1.35	1.76		Pass
11AC80	42	5210	-4.39	-3.98	-1.17	11	Pass

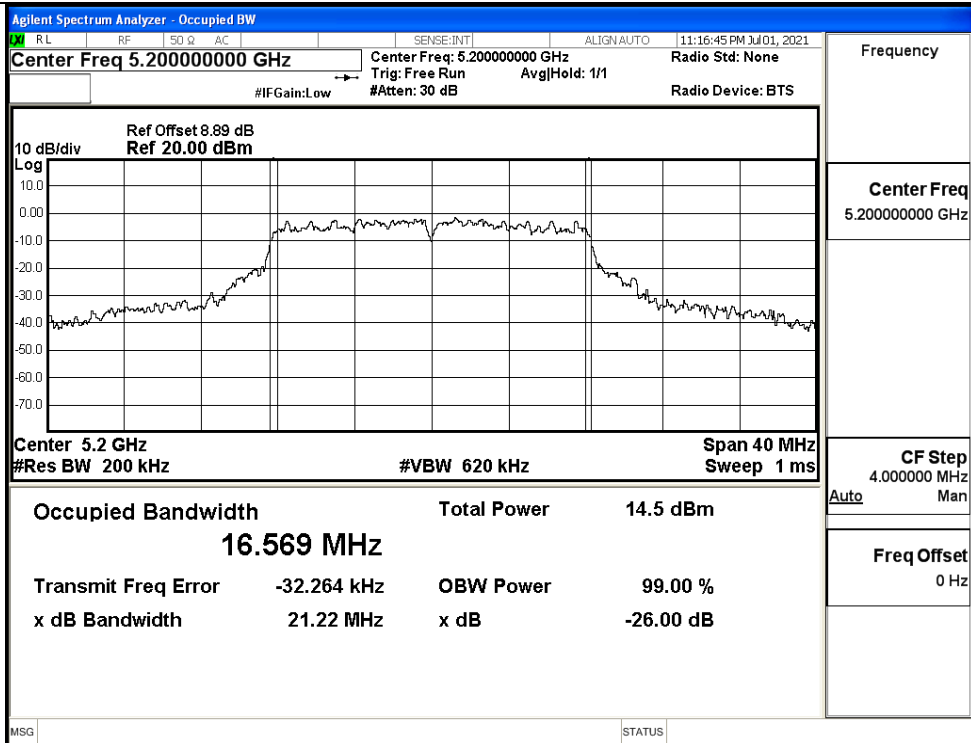


D.4 Emission Bandwidth

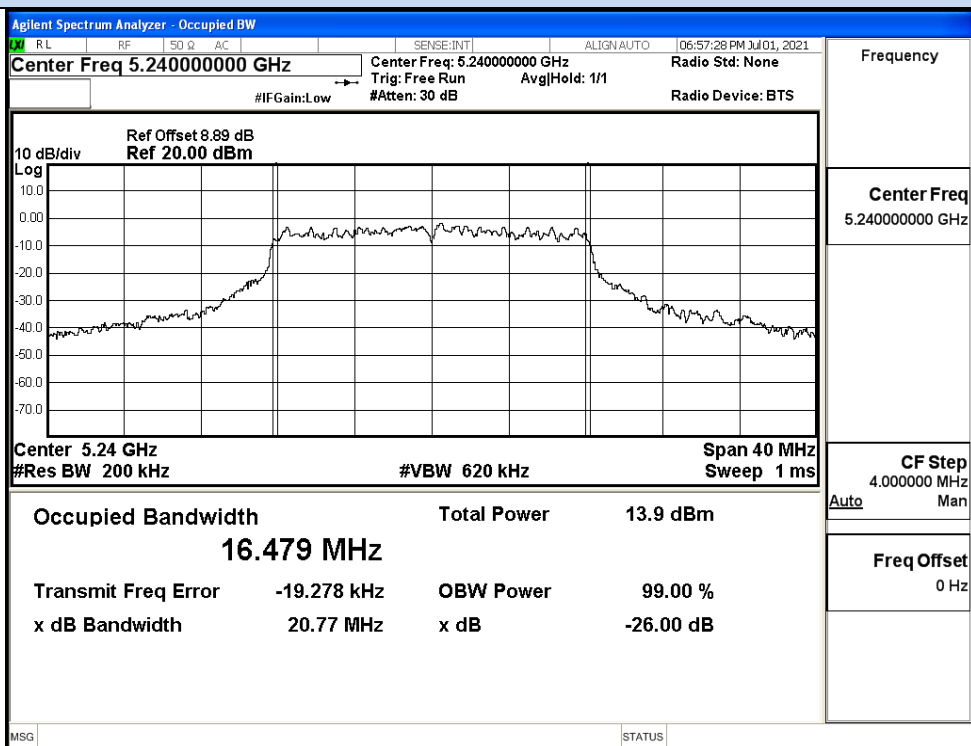
ANT0

Test Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Verdict
11A	36	5180	20.88	16.521	No Limit	Pass
	40	5200	21.22	16.569		Pass
	48	5240	20.77	16.479		Pass
11N20 SISO	36	5180	21.08	17.731	No Limit	Pass
	40	5200	20.91	17.682		Pass
	48	5240	20.97	17.707		Pass
11N40 SISO	38	5190	49.70	36.429	No Limit	Pass
	46	5230	39.14	36.265		Pass
11AC20 SISO	36	5180	21.19	17.772	No Limi	Pass
	40	5200	21.13	17.750		Pass
	48	5240	21.04	17.711		Pass
11AC40 SISO	38	5190	39.94	36.333	No Limi	Pass
	46	5230	39.76	36.380		Pass
11AC80 SISO	42	5210	80.40	75.666	No Limi	Pass





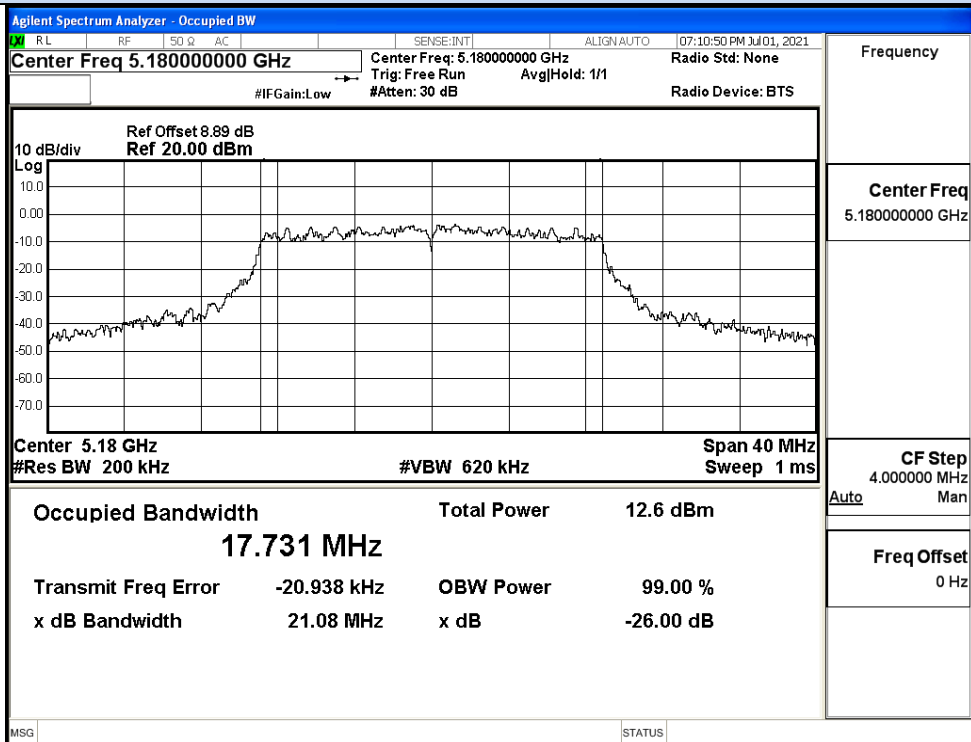
IEEE 802.11a / Channel 40 / 5200MHz



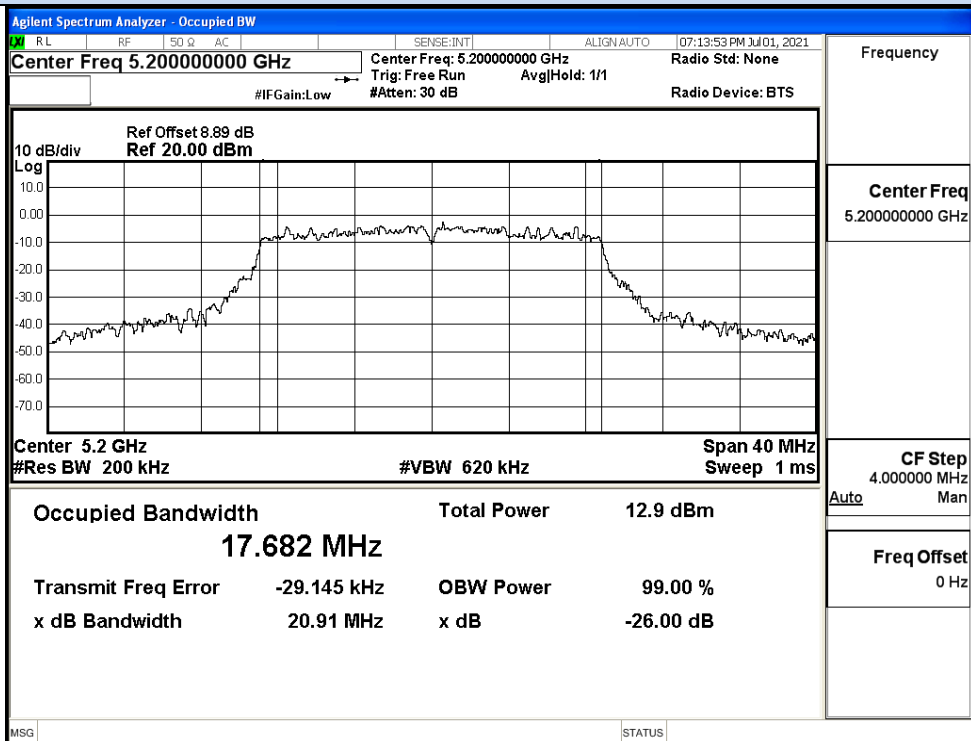
IEEE 802.11a / Channel 48 / 5240MHz



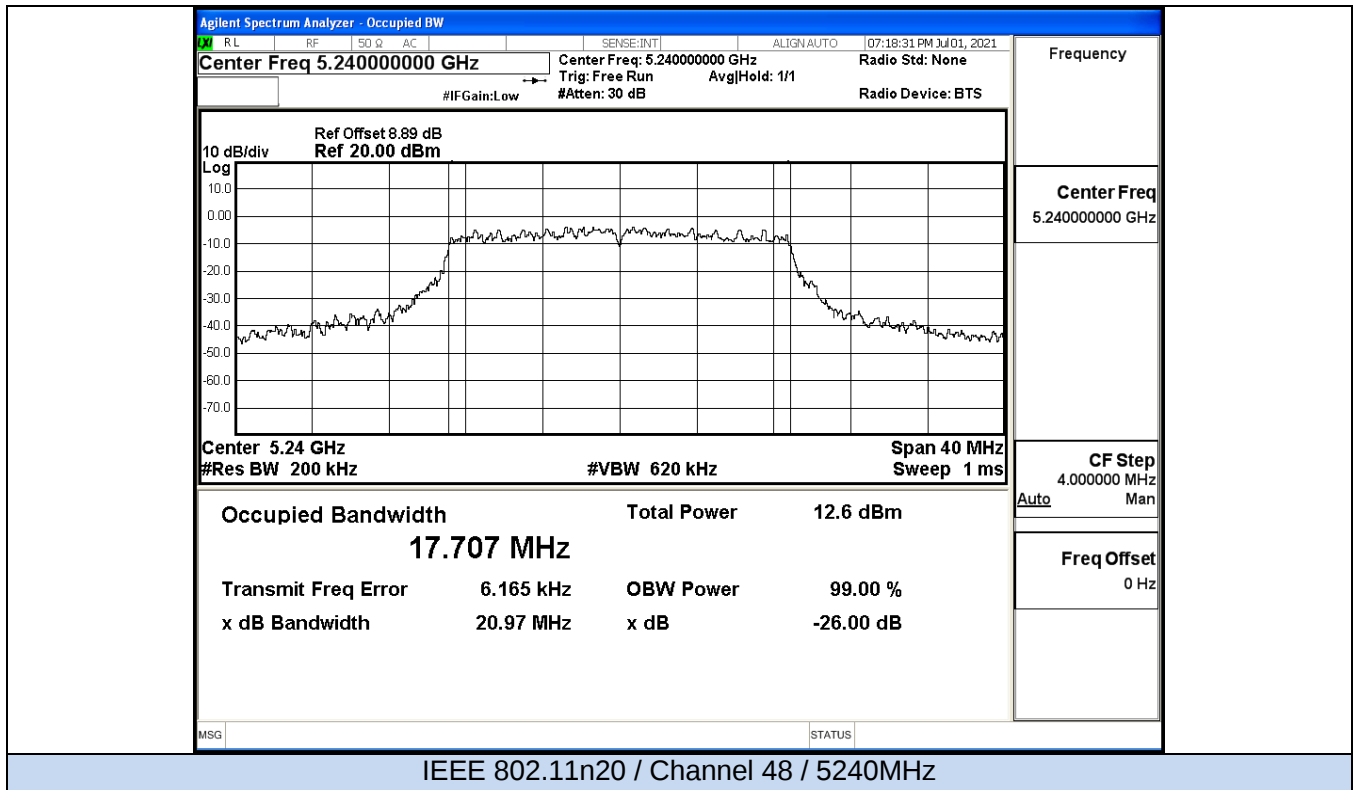
26dB Bandwidth



IEEE 802.11n20 / Channel 36 / 5180MHz

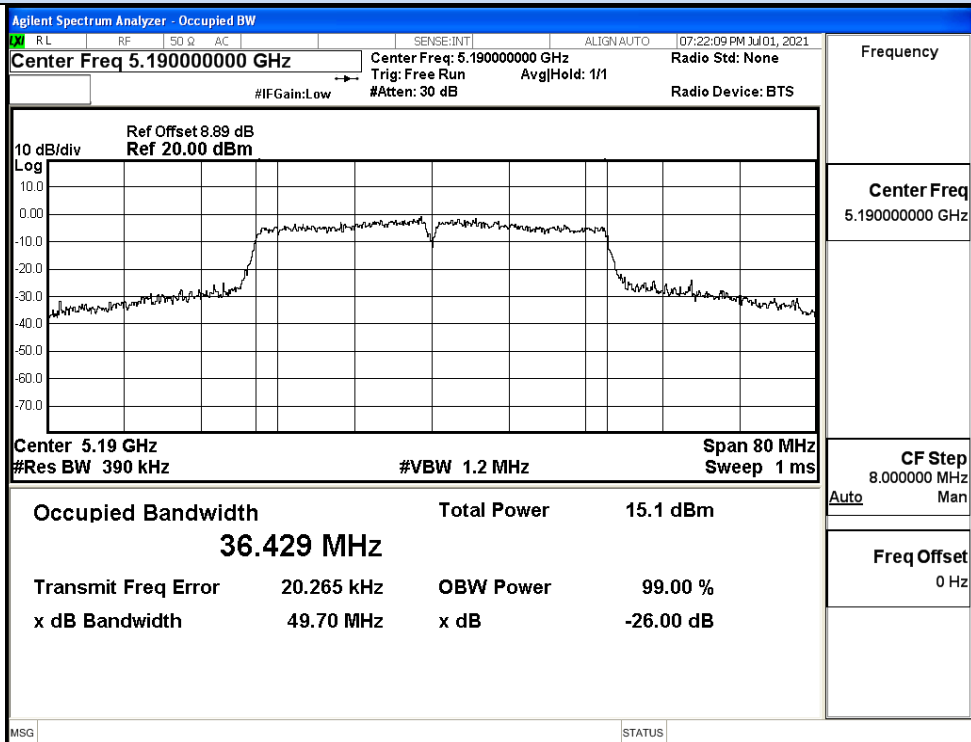


IEEE 802.11n20 / Channel 40 / 5200MHz

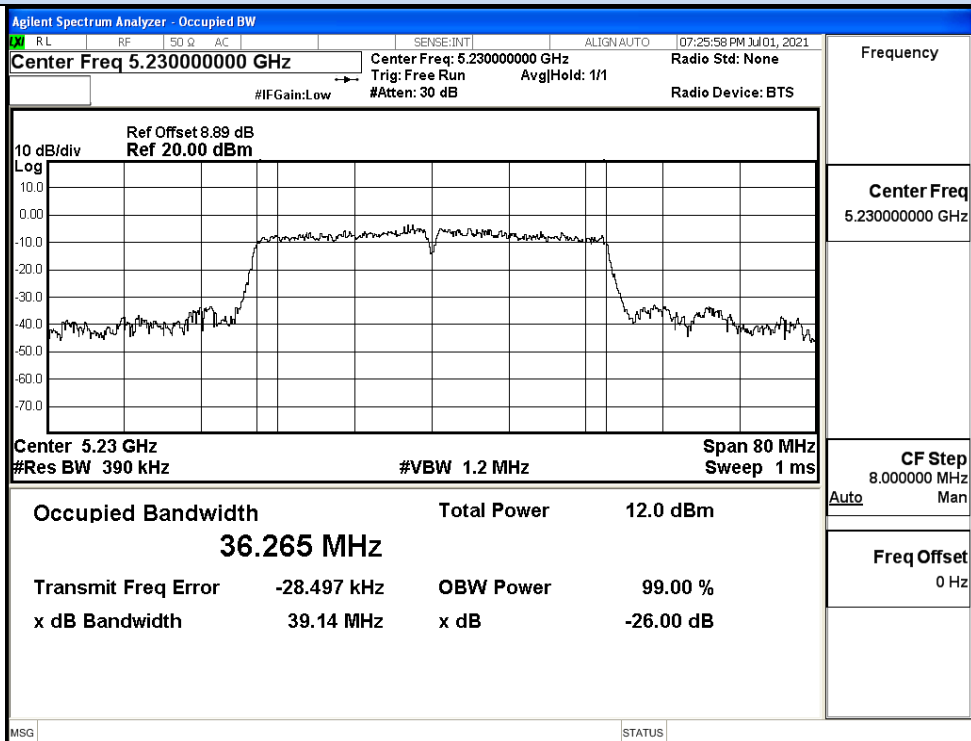




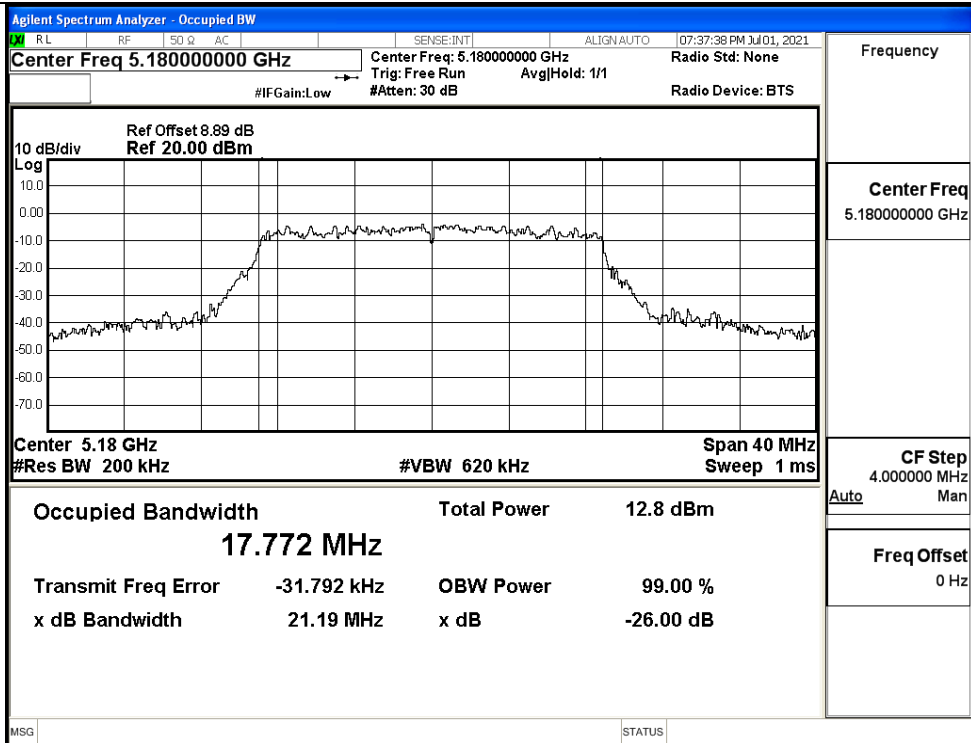
26dB Bandwidth



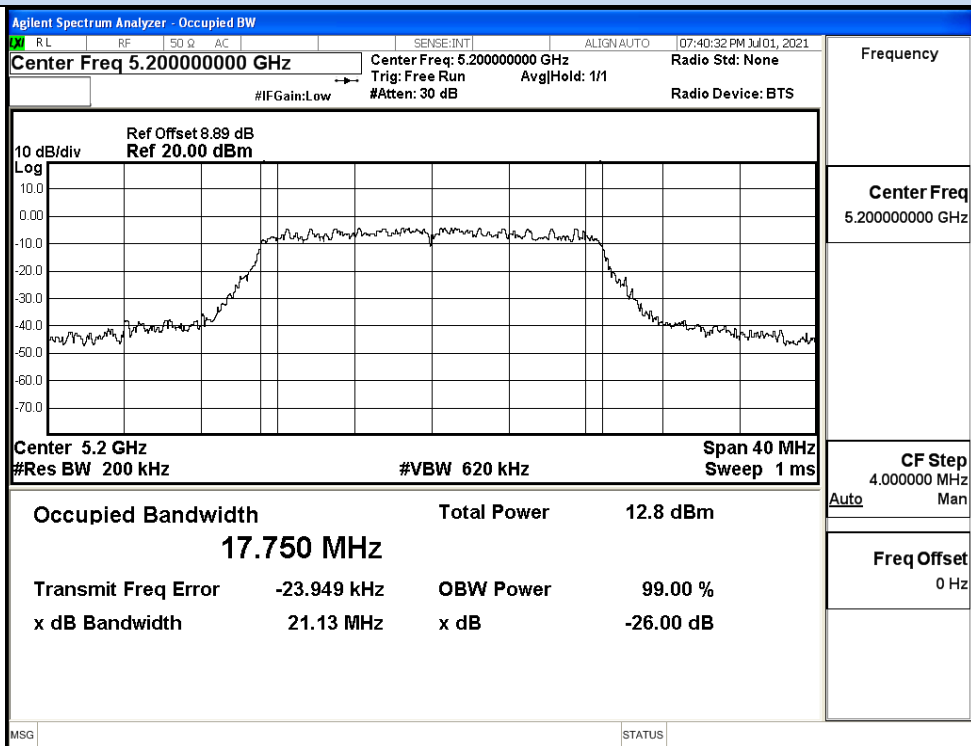
IEEE 802.11n40 / Channel 38 / 5190MHz



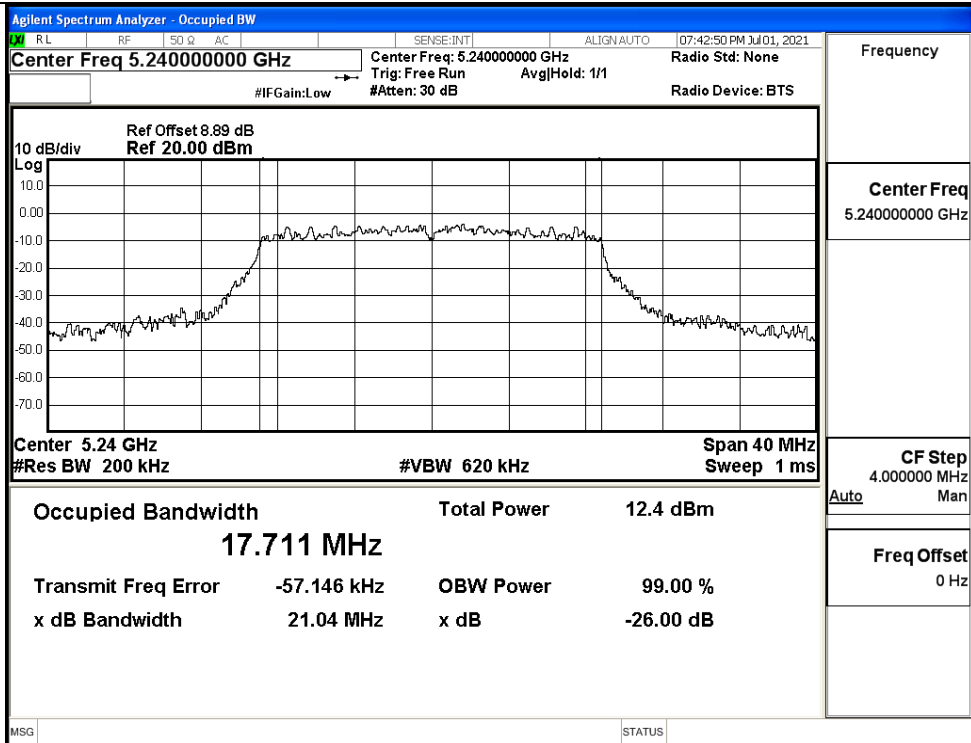
IEEE 802.11n40 / Channel 46 / 5230MHz



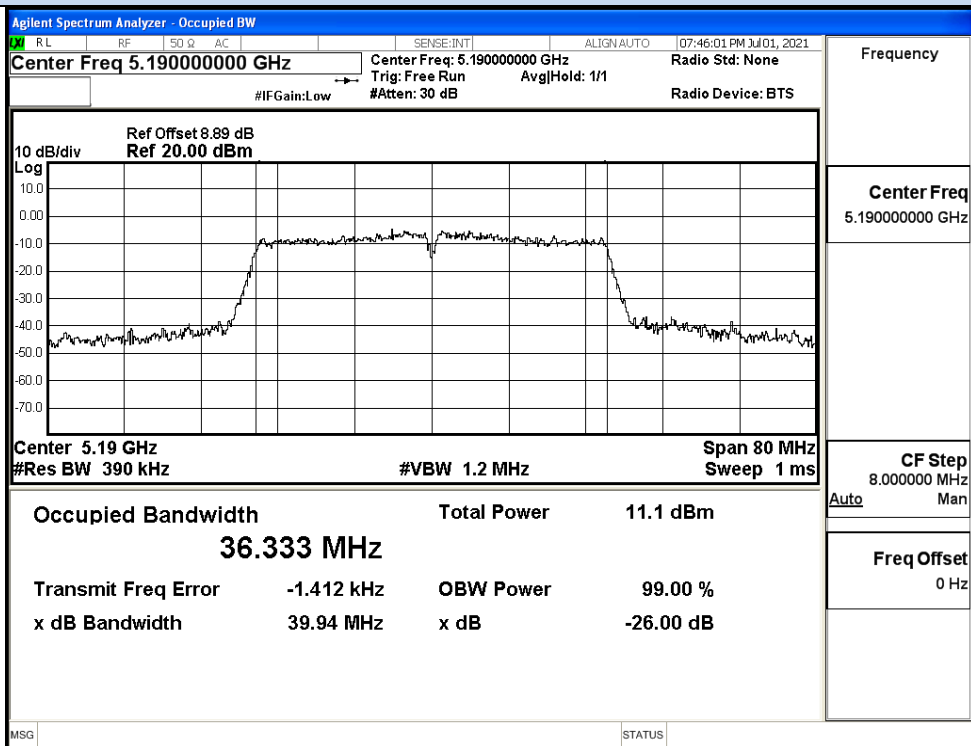
IEEE 802.11ac20 / Channel 36 / 5180MHz



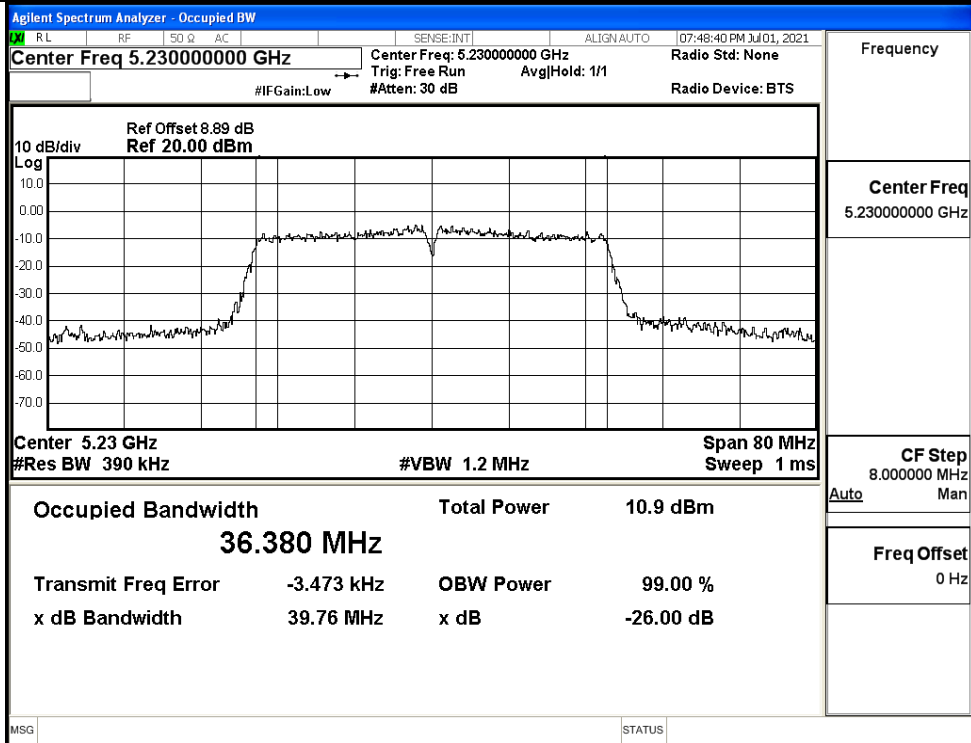
IEEE 802.11ac20 / Channel 40 / 5200MHz



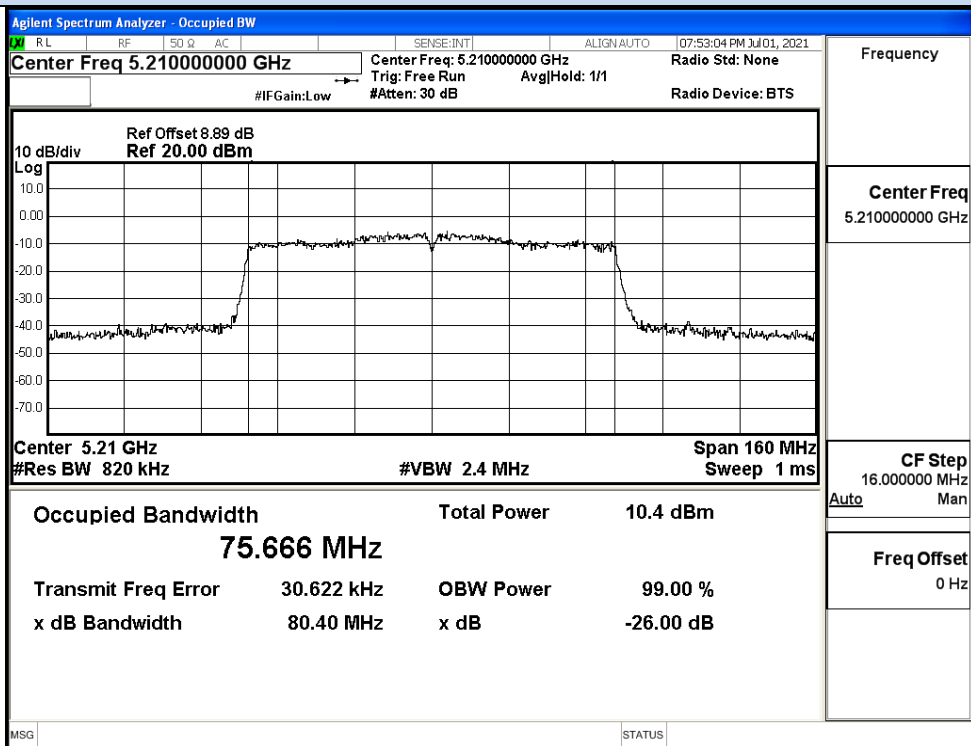
IEEE 802.11ac20 / Channel 48 / 5240MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz



IEEE 802.11ac40 / Channel 46 / 5230MHz

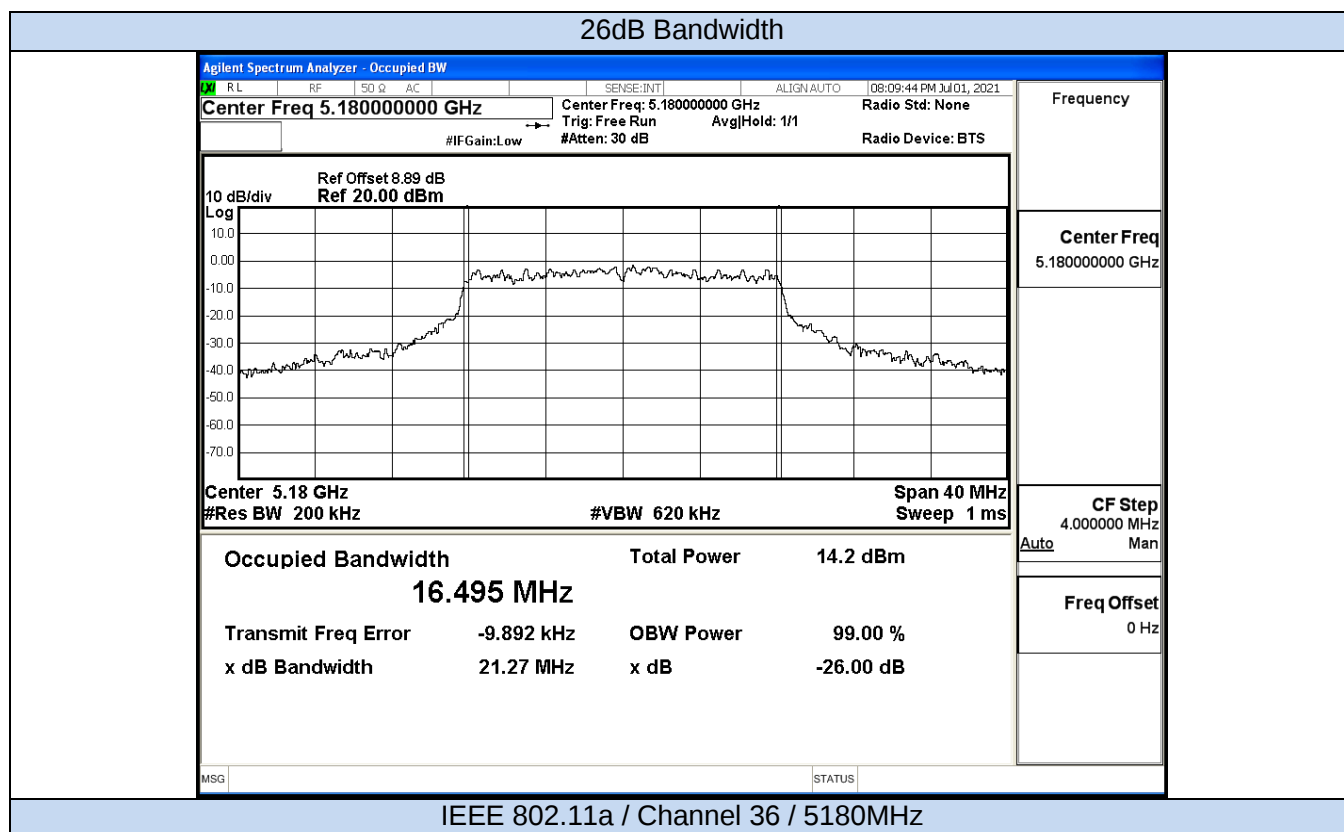


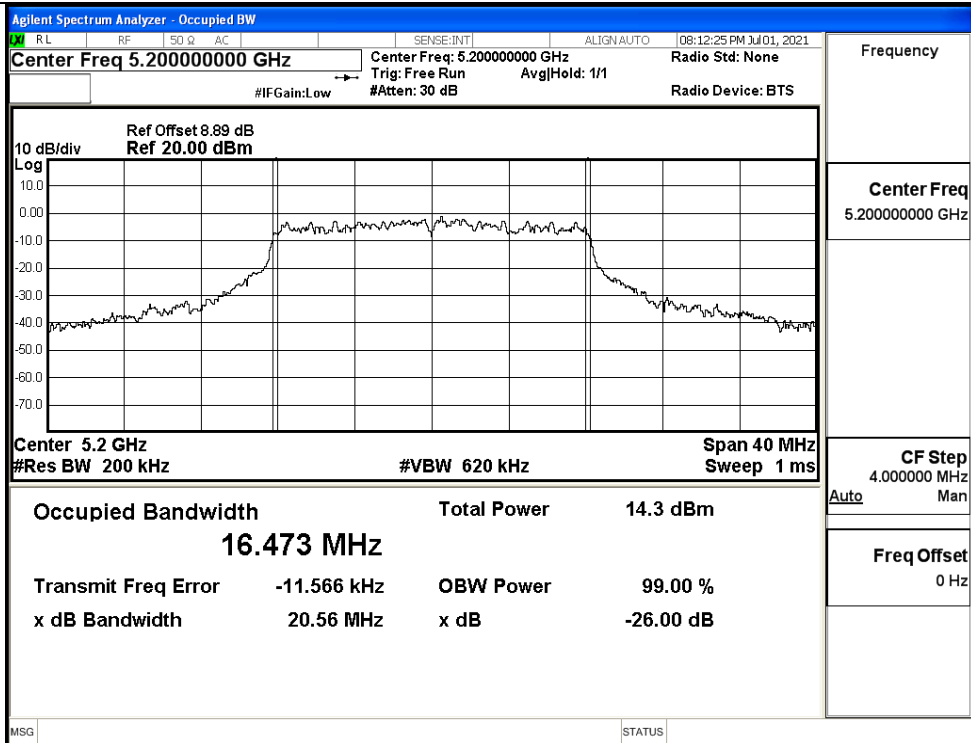
IEEE 802.11ac80 / Channel 42 / 5210MHz



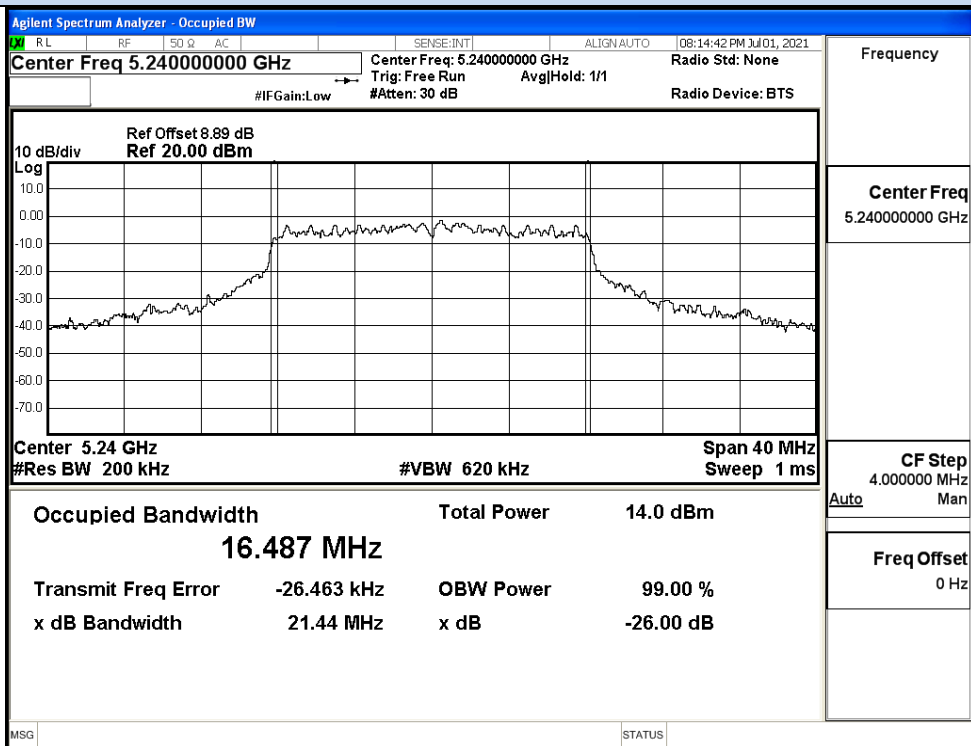
ANT1

Test Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Limit (MHz)	Verdict
11A	36	5180	21.27	16.495	No Limit	Pass
	40	5200	20.56	16.473		Pass
	48	5240	21.44	16.487		Pass
11N20 SISO	36	5180	21.06	17.677	No Limit	Pass
	40	5200	21.09	17.726		Pass
	48	5240	20.79	17.747		Pass
11N40 SISO	38	5190	39.40	36.279	No Limit	Pass
	46	5230	39.32	36.249		Pass
11AC20 SISO	36	5180	20.86	17.759	No Limi	Pass
	40	5200	21.01	17.728		Pass
	48	5240	21.14	17.695		Pass
11AC40 SISO	38	5190	39.83	36.359	No Limi	Pass
	46	5230	39.79	36.389		Pass
11AC80 SISO	42	5210	80.81	75.513	No Limi	Pass





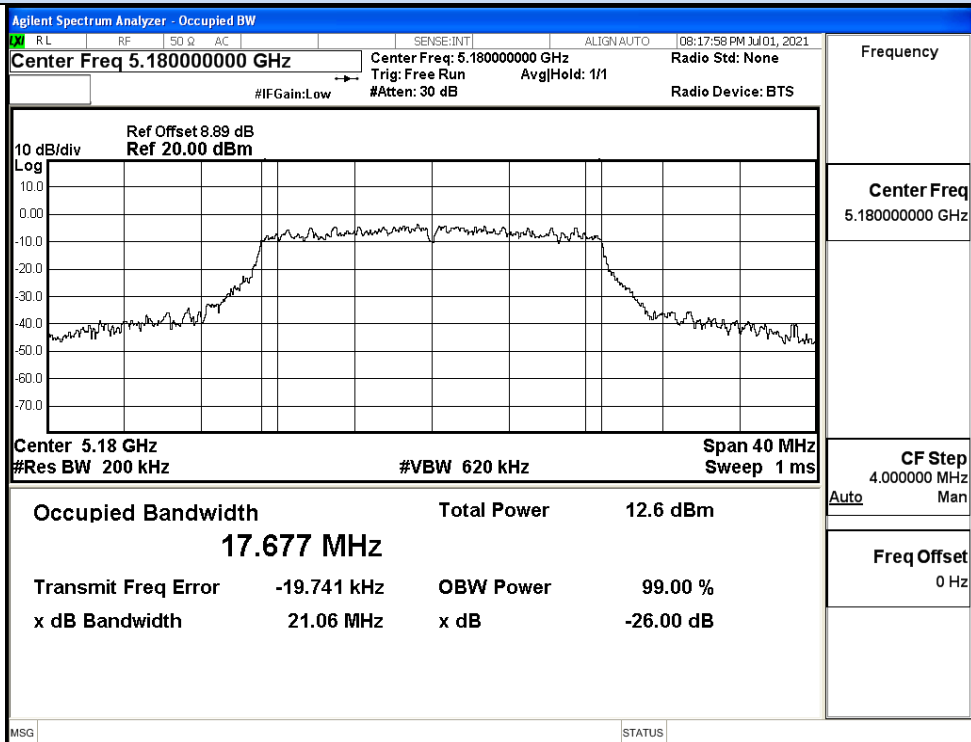
IEEE 802.11a / Channel 40 / 5200MHz



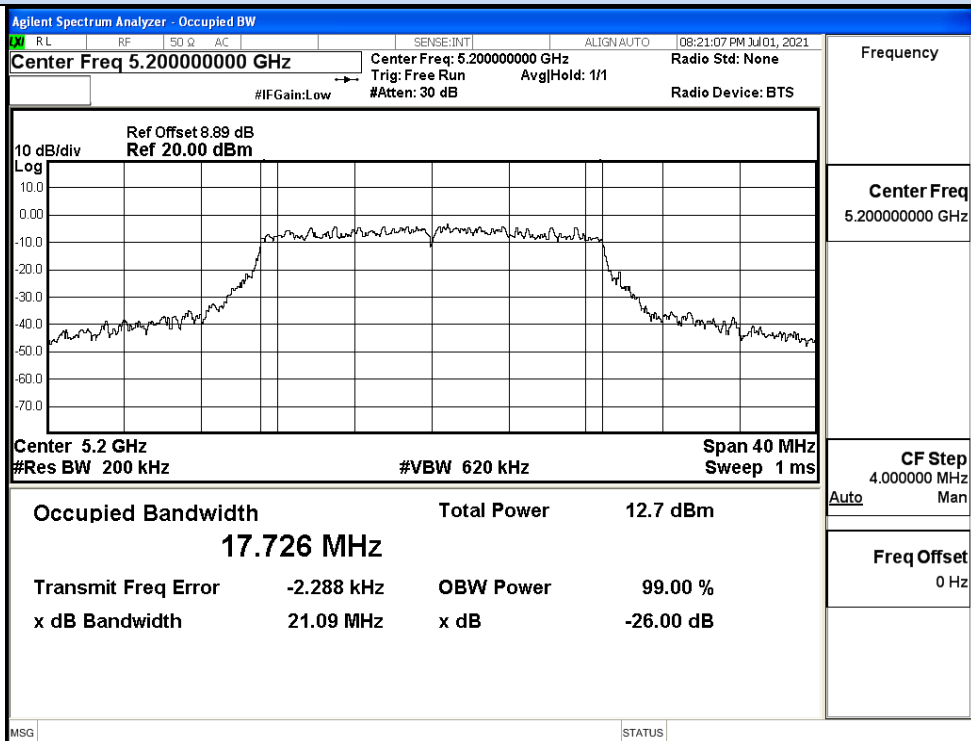
IEEE 802.11a / Channel 48 / 5240MHz



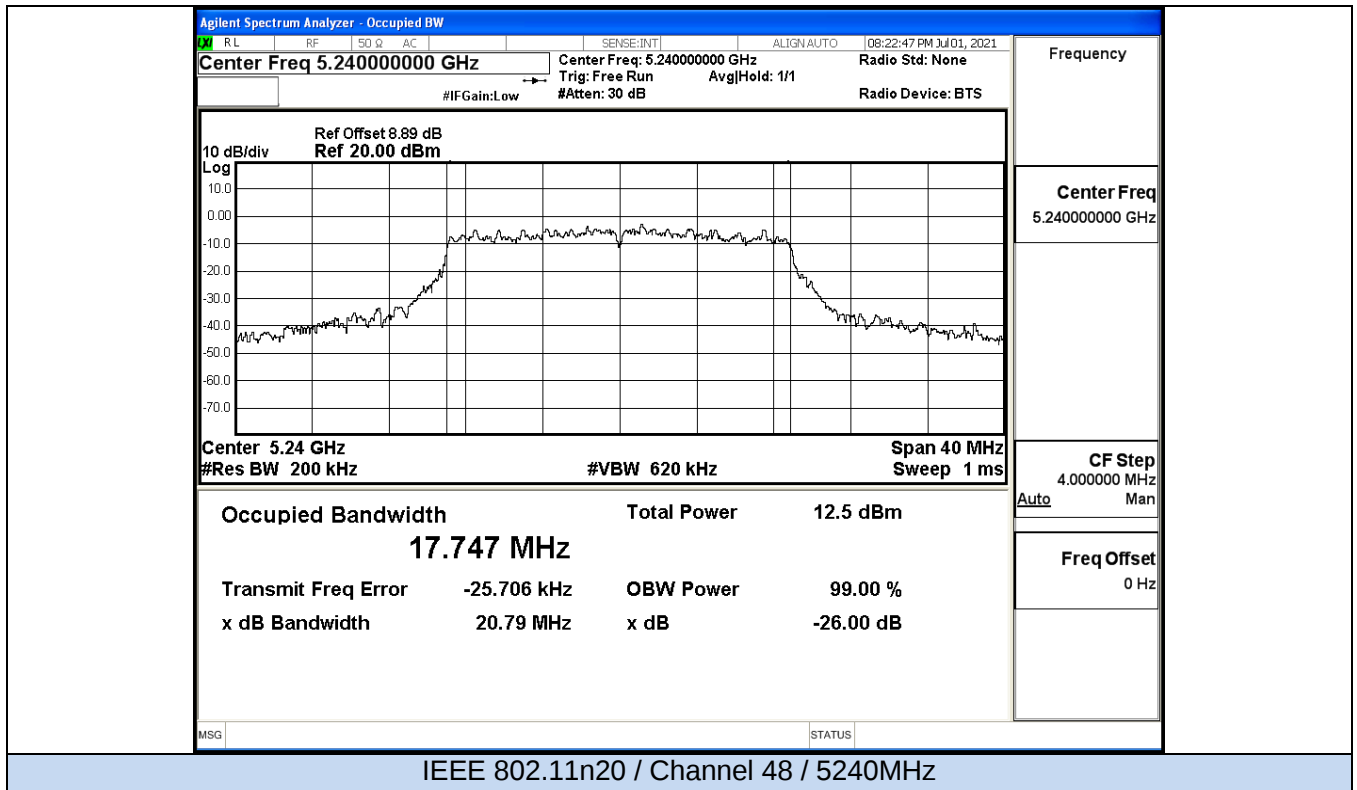
26dB Bandwidth



IEEE 802.11n20 / Channel 36 / 5180MHz

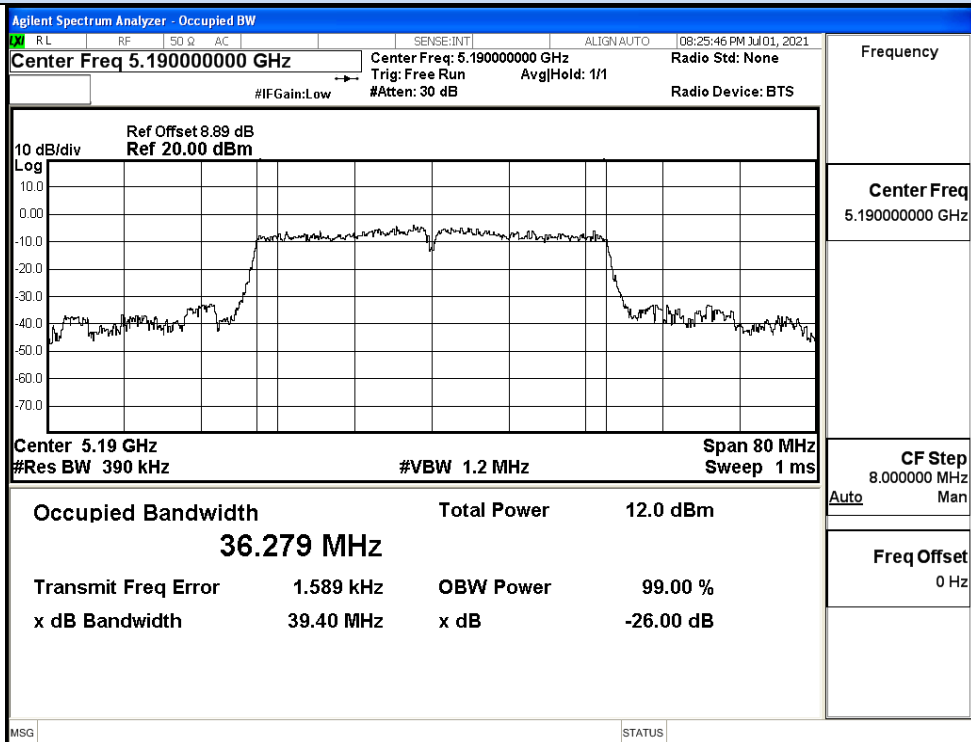


IEEE 802.11n20 / Channel 40 / 5200MHz

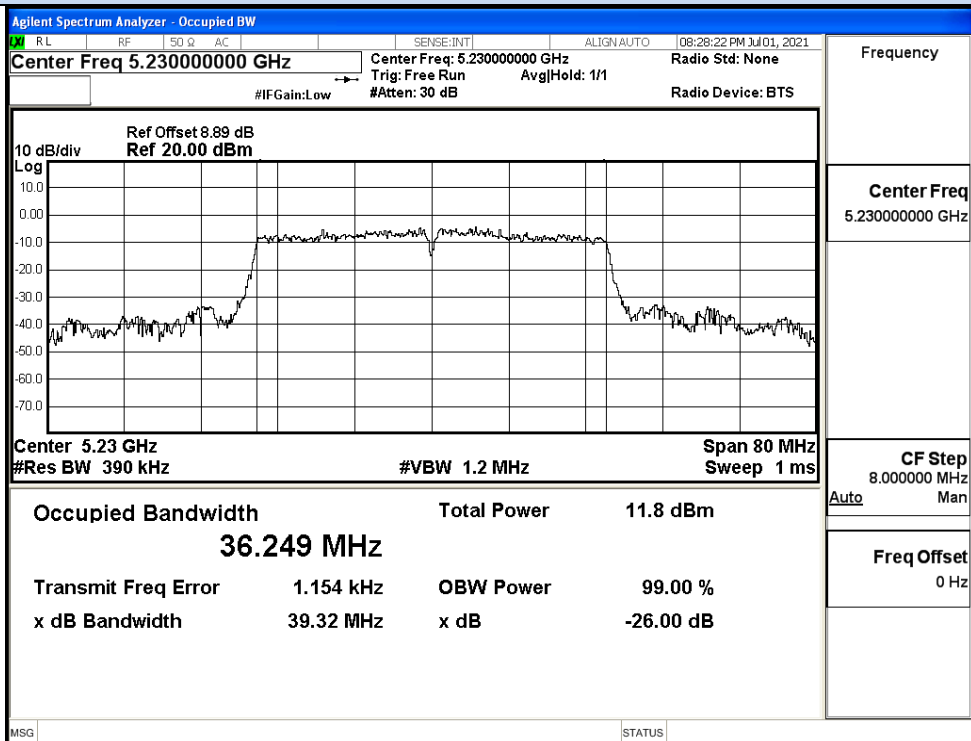




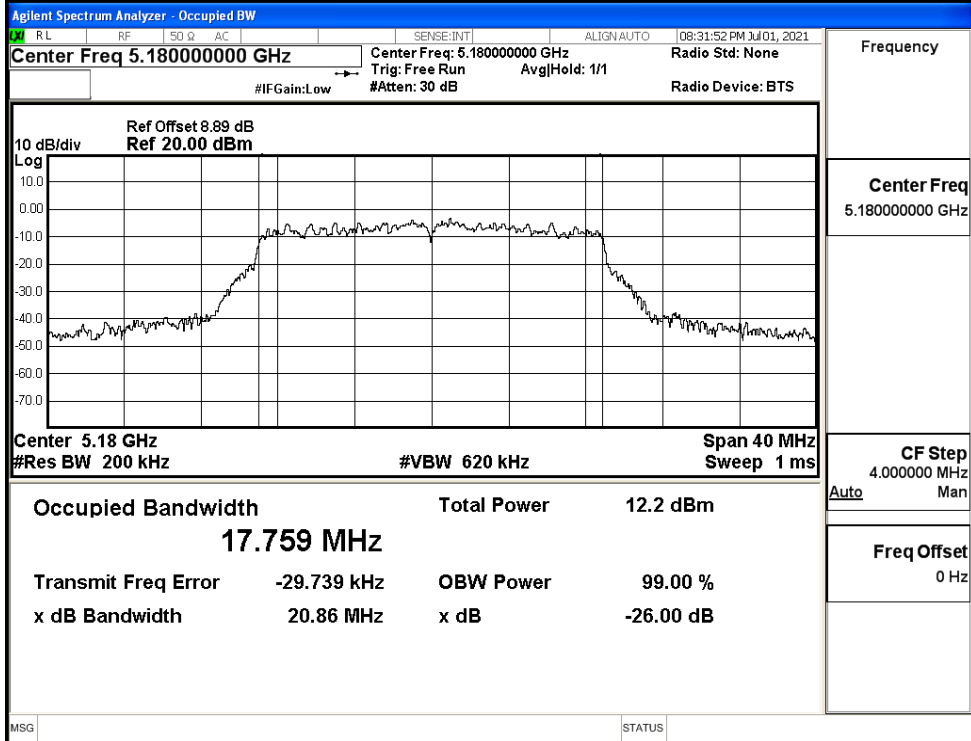
26dB Bandwidth



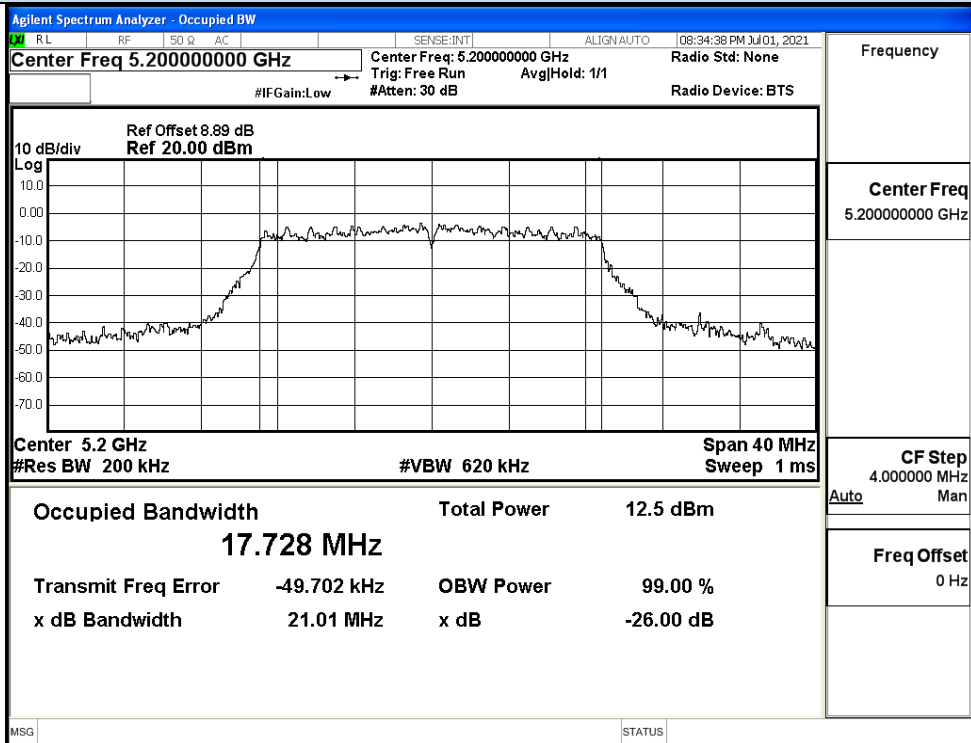
IEEE 802.11n40 / Channel 38 / 5190MHz



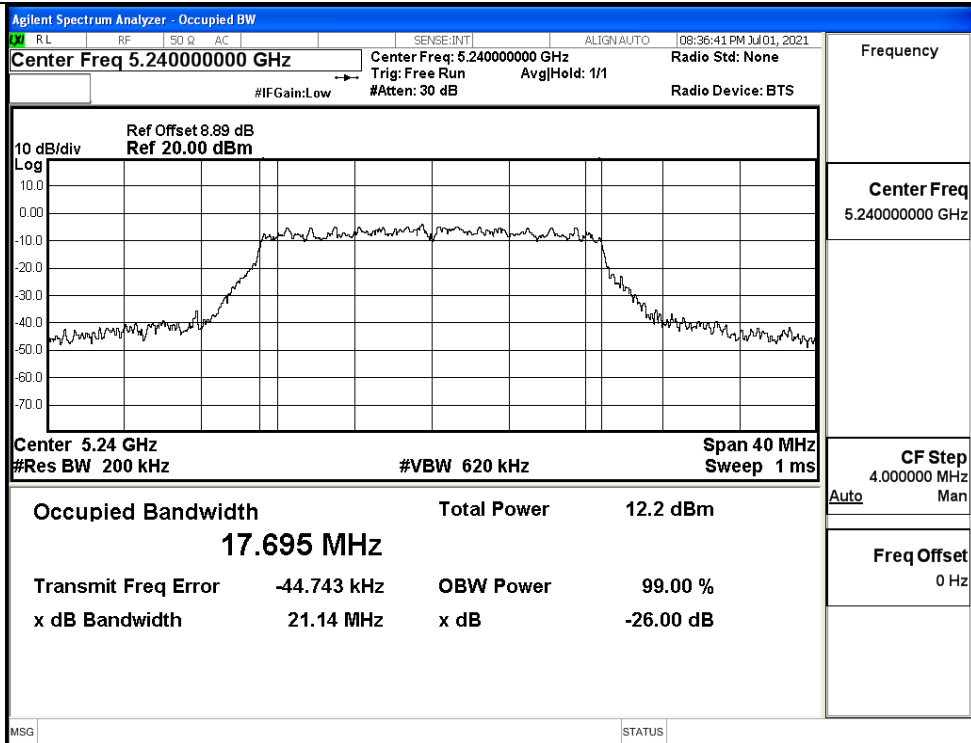
IEEE 802.11n40 / Channel 46 / 5230MHz



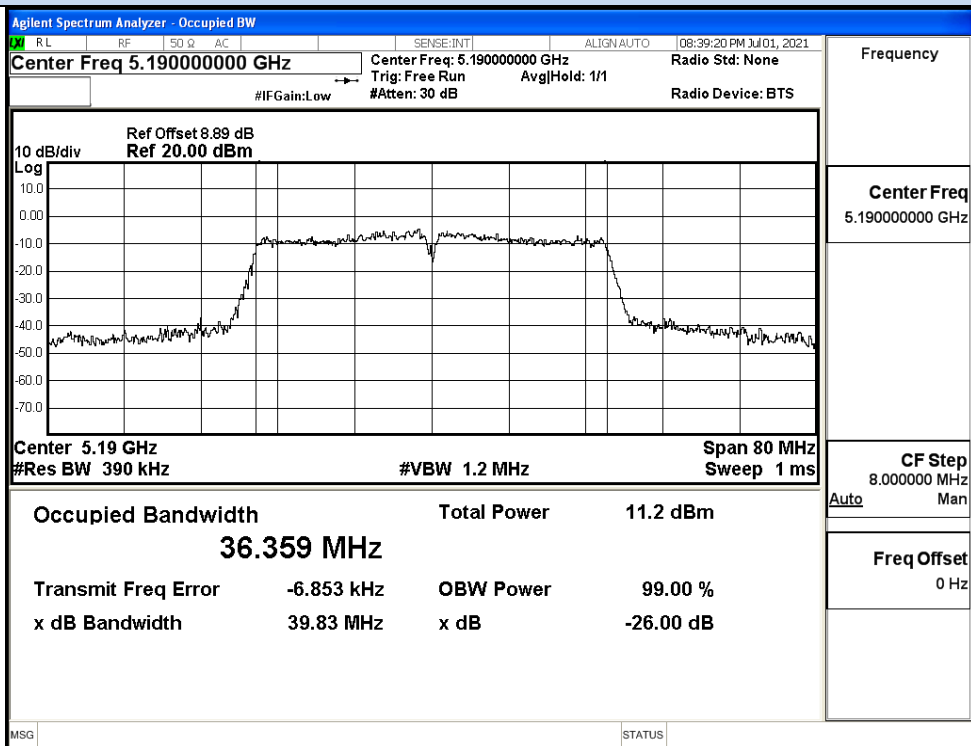
IEEE 802.11ac20 / Channel 36 / 5180MHz



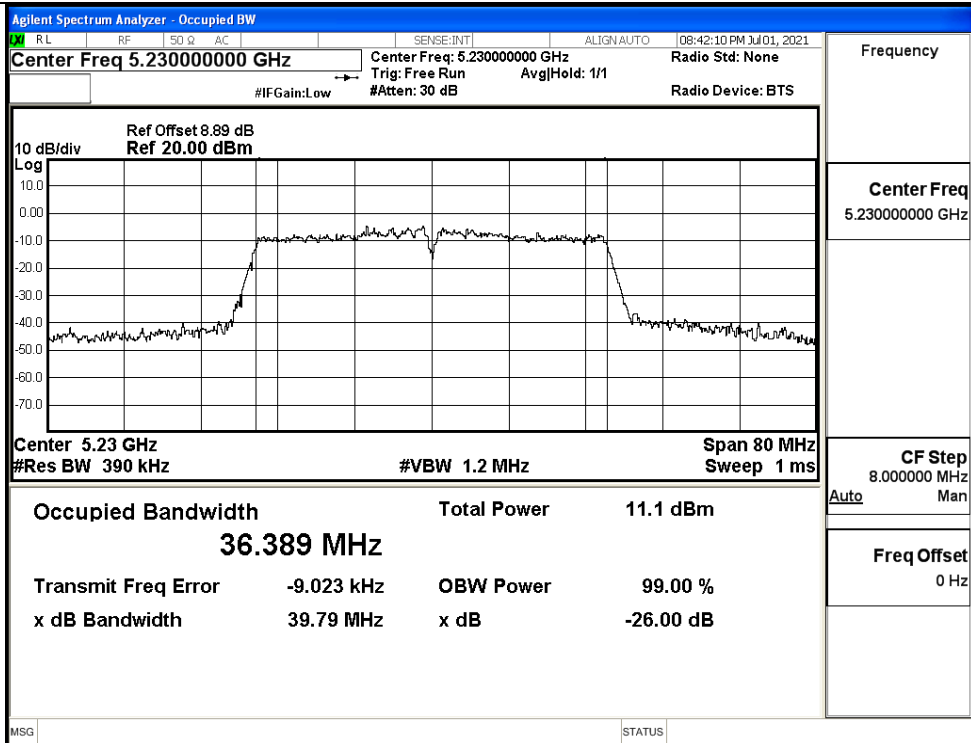
IEEE 802.11ac20 / Channel 40 / 5200MHz



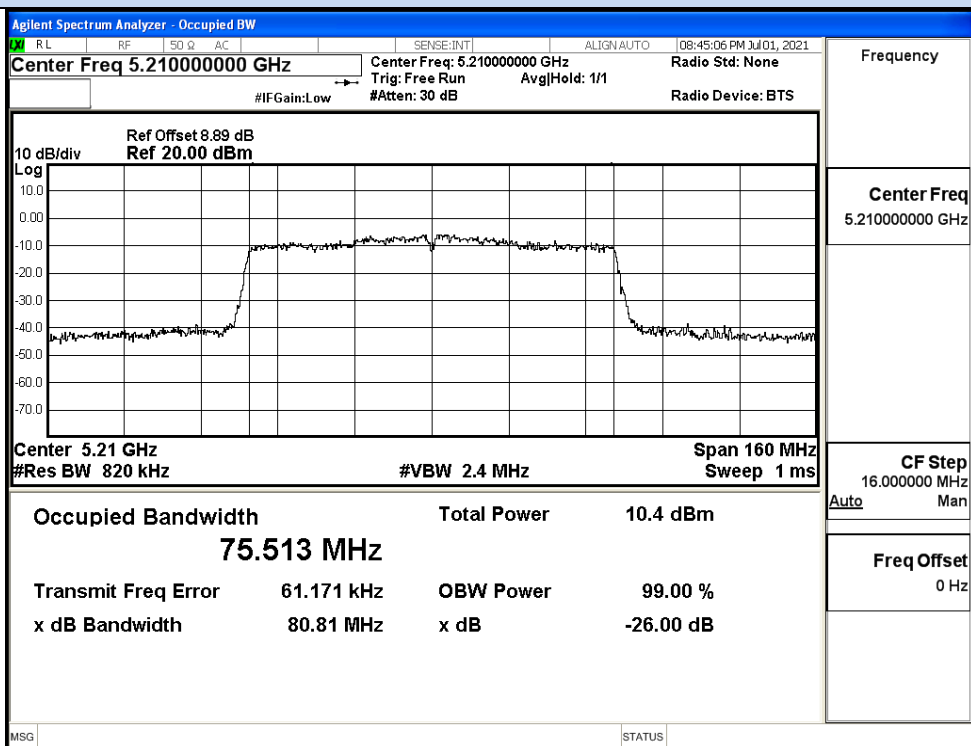
IEEE 802.11ac20 / Channel 48 / 5240MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz



IEEE 802.11ac40 / Channel 46 / 5230MHz



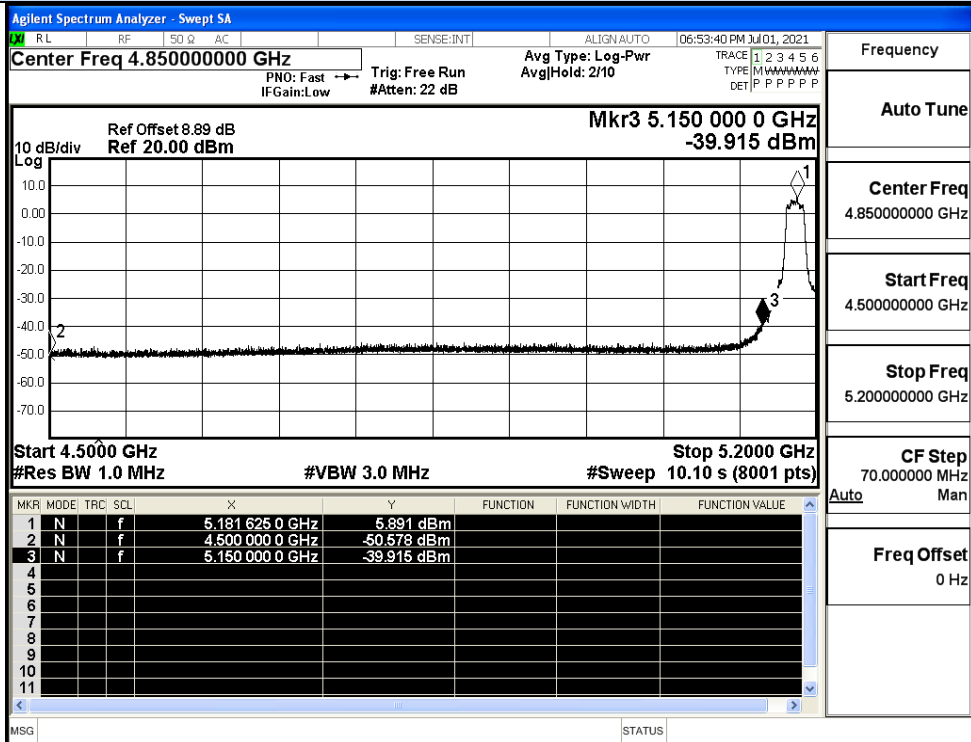
IEEE 802.11ac80 / Channel 42 / 5210MHz

**D.5 Undesirable Emissions Measurement****ANT0**

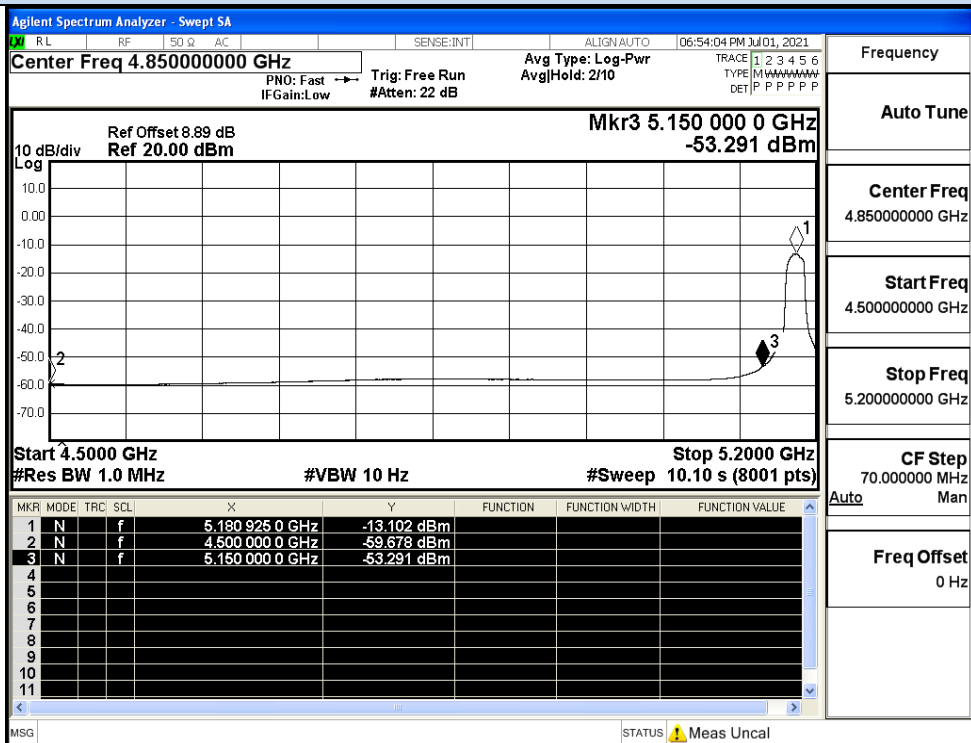
Test Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Ground Reflection Factor (dB)	Covert Radiated E Level At 3m (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
11A	36	4500.0	-50.58	2.00	0	44.65	Peak	68.20	Pass
		4500.0	-59.68	2.00	0	35.55	Average	54.00	Pass
		5150.0	-39.92	2.00	0	55.31	Peak	68.20	Pass
		5150.0	-53.29	2.00	0	41.94	Average	54.00	Pass
	48	5350.0	-48.66	2.00	0	46.57	Peak	68.20	Pass
		5350.0	-59.61	2.00	0	35.62	Average	54.00	Pass
		5460.0	-46.82	2.00	0	48.40	Peak	68.20	Pass
		5460.0	-59.64	2.00	0	35.59	Average	54.00	Pass
11N2 0 SISO	36	4500.0	-50.09	2.00	0	45.14	Peak	68.20	Pass
		4500.0	-59.70	2.00	0	35.53	Average	54.00	Pass
		5150.0	-38.54	2.00	0	56.69	Peak	68.20	Pass
		5150.0	-55.06	2.00	0	40.17	Average	54.00	Pass
	48	5350.0	-47.92	2.00	0	47.31	Peak	68.20	Pass
		5350.0	-59.60	2.00	0	35.62	Average	54.00	Pass
		5460.0	-49.87	2.00	0	45.36	Peak	68.20	Pass
		5460.0	-59.65	2.00	0	35.58	Average	54.00	Pass
11N4 0 SISO	38	4500.0	-49.13	2.00	0	46.09	Peak	68.20	Pass
		4500.0	-59.67	2.00	0	35.56	Average	54.00	Pass
		5150.0	-33.60	2.00	0	63.63	Peak	68.20	Pass
		5150.0	-49.16	2.00	0	48.07	Average	54.00	Pass
	46	5350.0	-48.25	2.00	0	46.97	Peak	68.20	Pass
		5350.0	-59.20	2.00	0	36.03	Average	54.00	Pass
		5460.0	-48.60	2.00	0	46.62	Peak	68.20	Pass
		5460.0	-59.32	2.00	0	35.90	Average	54.00	Pass
11A C20 SIS O	36	4500.0	-50.07	2.00	0	45.15	Peak	68.20	Pass
		4500.0	-59.73	2.00	0	35.50	Average	54.00	Pass
		5150.0	-39.92	2.00	0	55.31	Peak	68.20	Pass
		5150.0	-54.85	2.00	0	40.38	Average	54.00	Pass
	48	4500.0	-50.07	2.00	0	45.15	Peak	68.20	Pass
		4500.0	-59.73	2.00	0	35.50	Average	54.00	Pass
		5150.0	-39.92	2.00	0	55.31	Peak	68.20	Pass
		5150.0	-54.85	2.00	0	40.38	Average	54.00	Pass
11A C40 SIS O	38	4500.0	-50.09	2.00	0	45.13	Peak	68.20	Pass
		4500.0	-59.70	2.00	0	35.52	Average	54.00	Pass
		5150.0	-39.11	2.00	0	56.12	Peak	68.20	Pass
		5150.0	-55.54	2.00	0	39.69	Average	54.00	Pass
	46	5350.0	-49.31	2.00	0	45.91	Peak	68.20	Pass
		5350.0	-59.23	2.00	0	36.00	Average	54.00	Pass
		5460.0	-48.74	2.00	0	46.49	Peak	68.20	Pass
		5460.0	-59.37	2.00	0	35.86	Average	54.00	Pass
11A C80 SIS O	42	4500.0	-47.73	2.00	0	47.50	Peak	68.20	Pass
		4500.0	-58.66	2.00	0	36.57	Average	54.00	Pass
		5150.0	-47.99	2.00	0	47.24	Peak	68.20	Pass
		5150.0	-58.85	2.00	0	36.38	Average	54.00	Pass
		5350.0	-47.73	2.00	0	47.50	Peak	68.20	Pass
		5350.0	-58.66	2.00	0	36.57	Average	54.00	Pass
		5460.0	-47.99	2.00	0	47.24	Peak	68.20	Pass
		5460.0	-58.85	2.00	0	36.38	Average	54.00	Pass



Undesirable Emissions Measurement



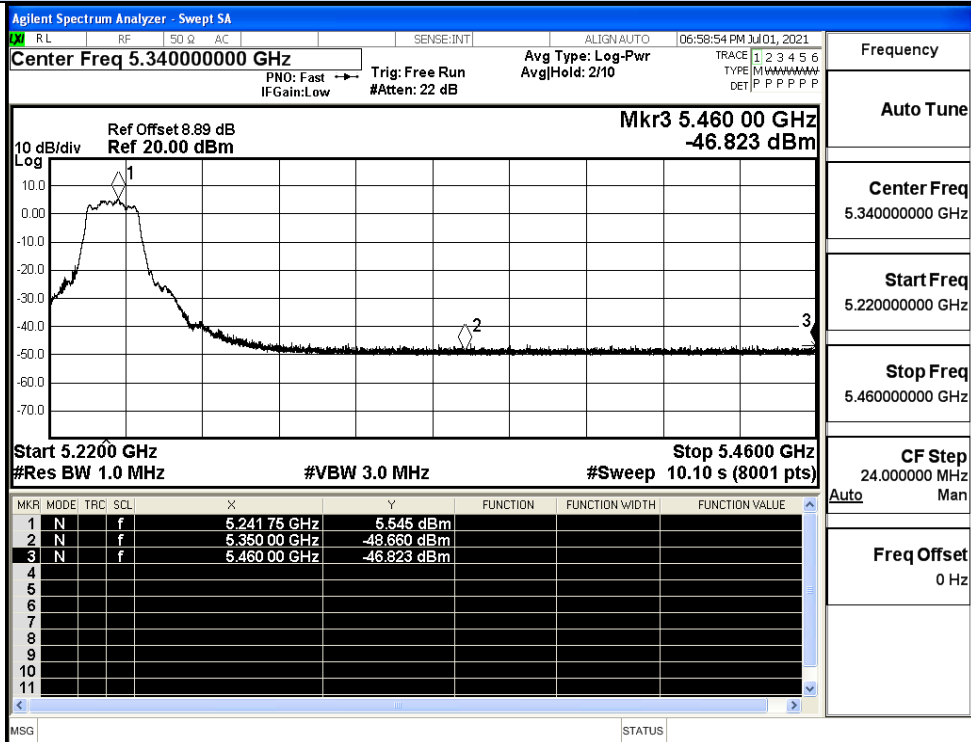
IEEE 802.11a / Channel 36 / 5180MHz / Peak



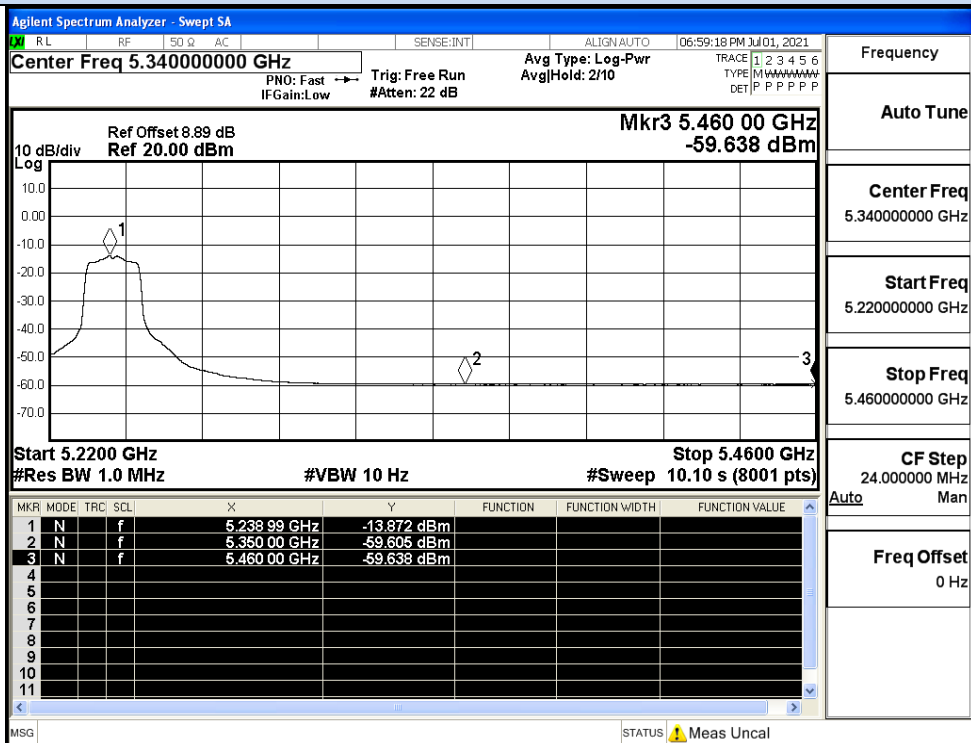
IEEE 802.11a / Channel 36 / 5180MHz / Average



Undesirable Emissions Measurement



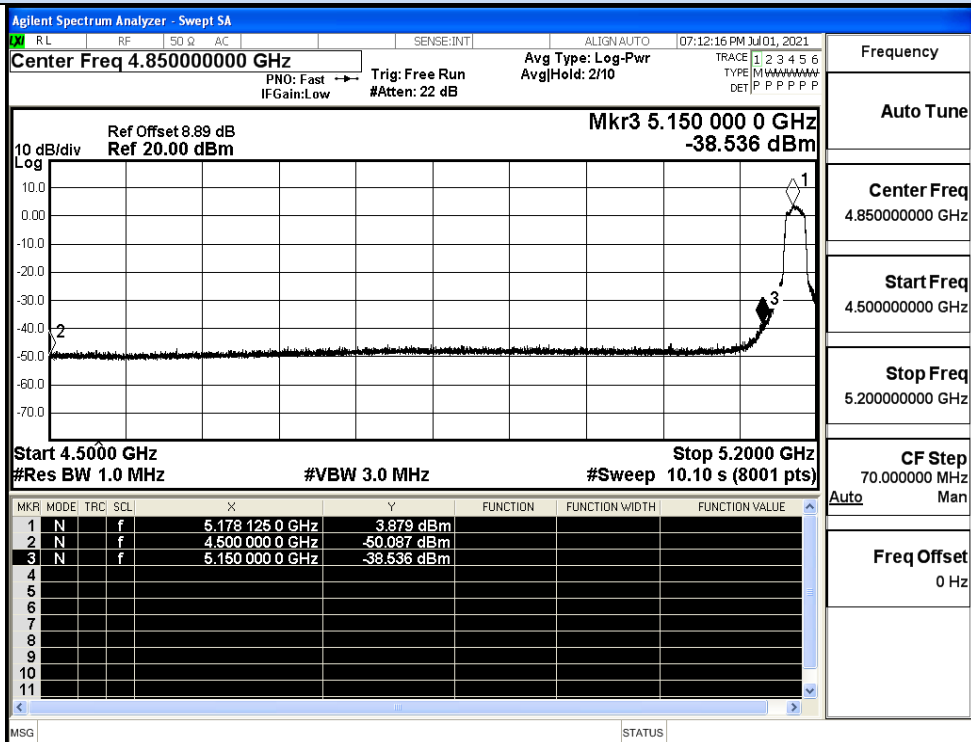
IEEE 802.11a / Channel 48 / 5240MHz / Peak



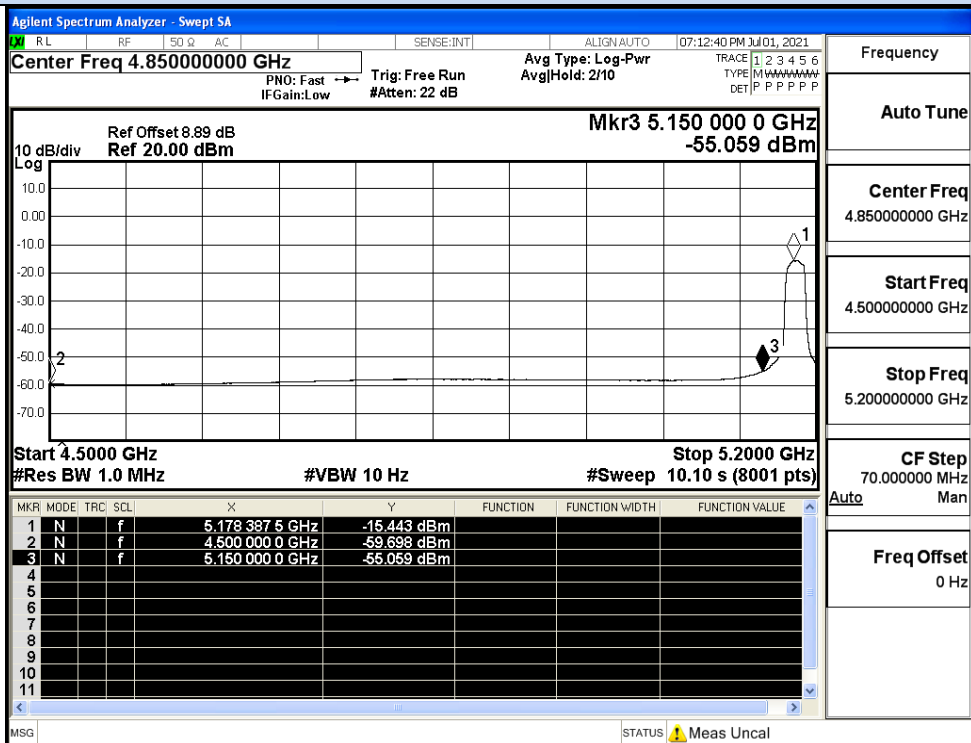
IEEE 802.11a / Channel 48 / 5240MHz / Average



Undesirable Emissions Measurement



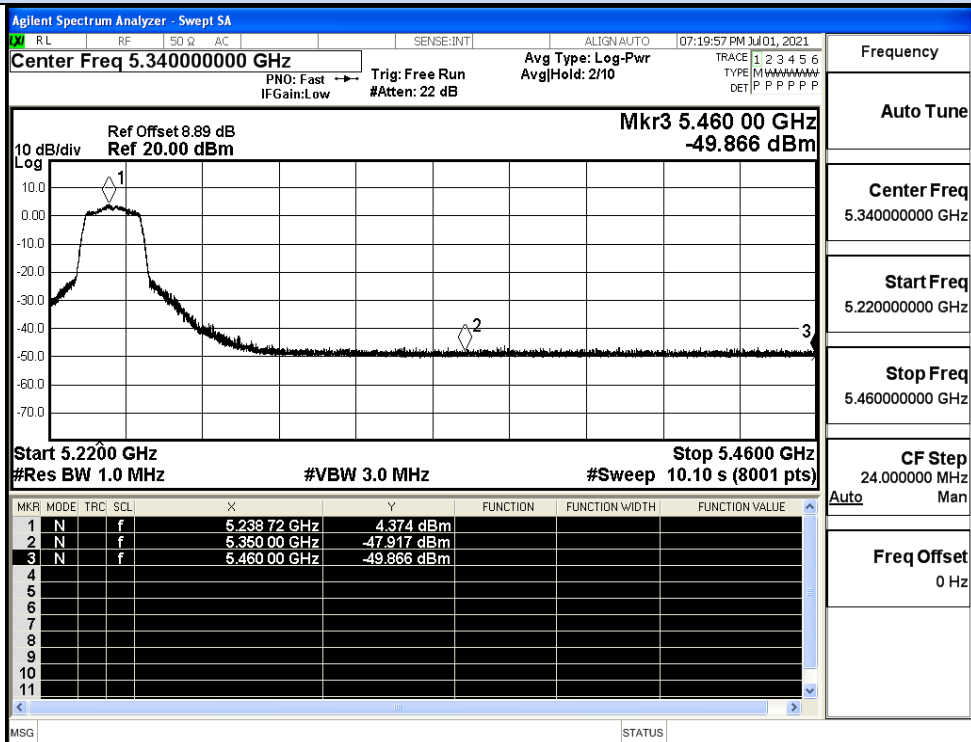
IEEE 802.11n20 / Channel 36 / 5180MHz / Peak



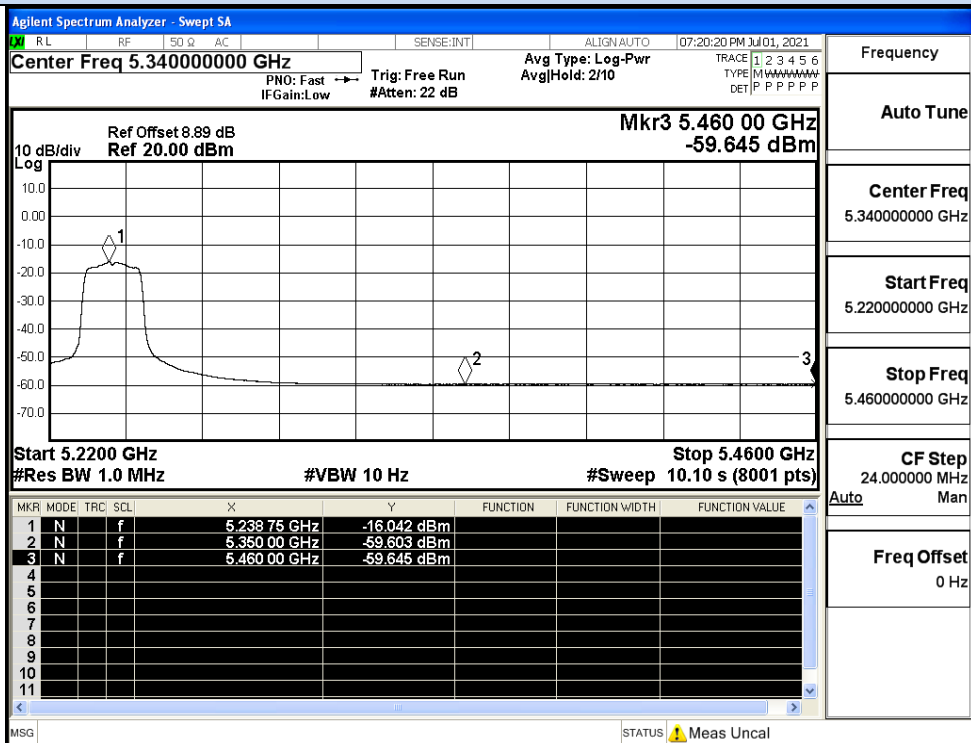
IEEE 802.11n20 / Channel 36 / 5180MHz / Average



Undesirable Emissions Measurement



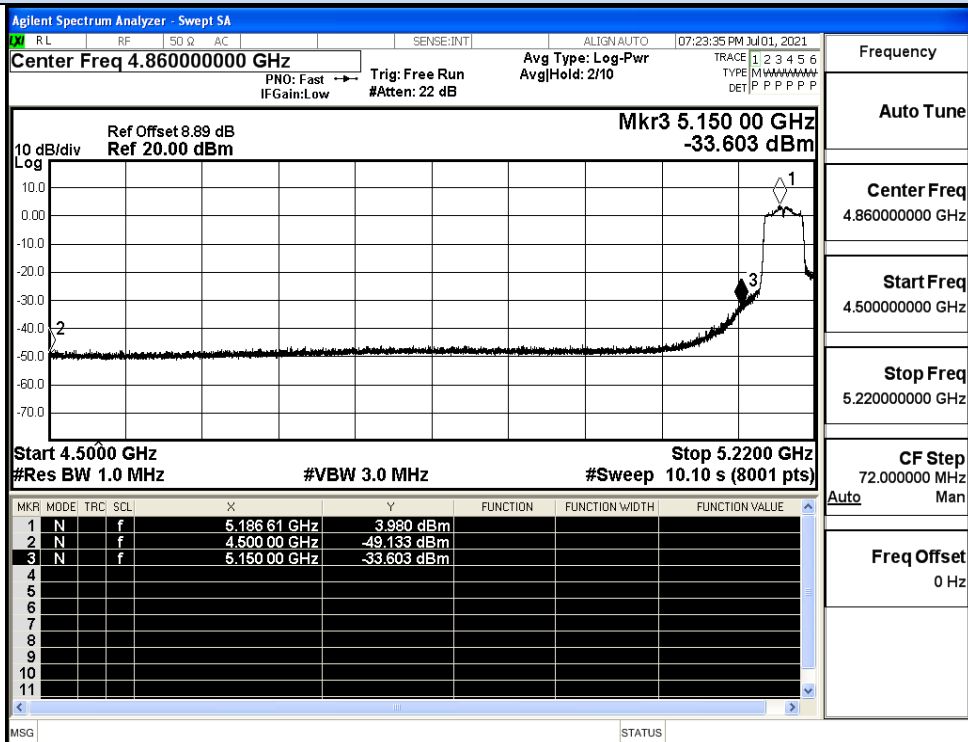
IEEE 802.11n20 / Channel 48 / 5240MHz / Peak



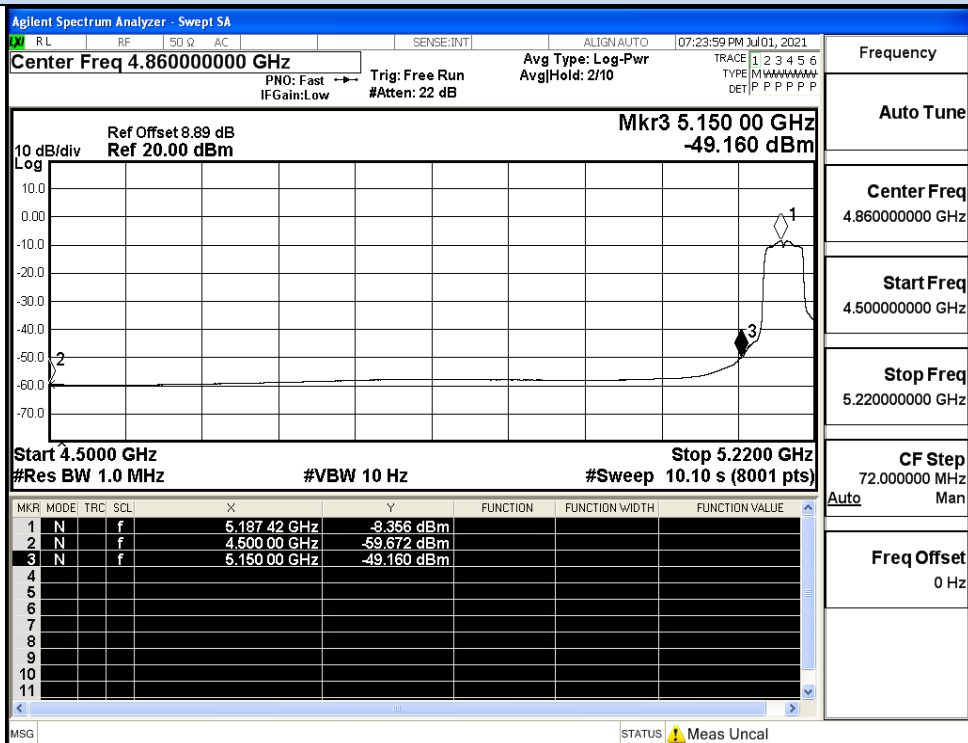
IEEE 802.11n20 / Channel 48 / 5240MHz / Average



Undesirable Emissions Measurement



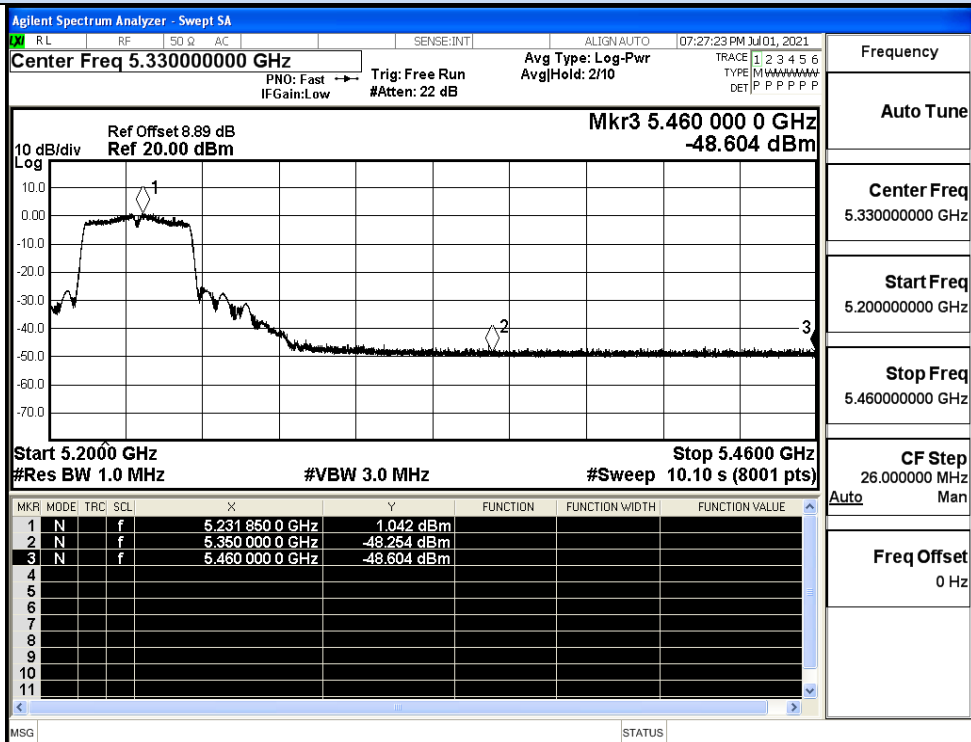
IEEE 802.11n40 / Channel 38 / 5190MHz / Peak



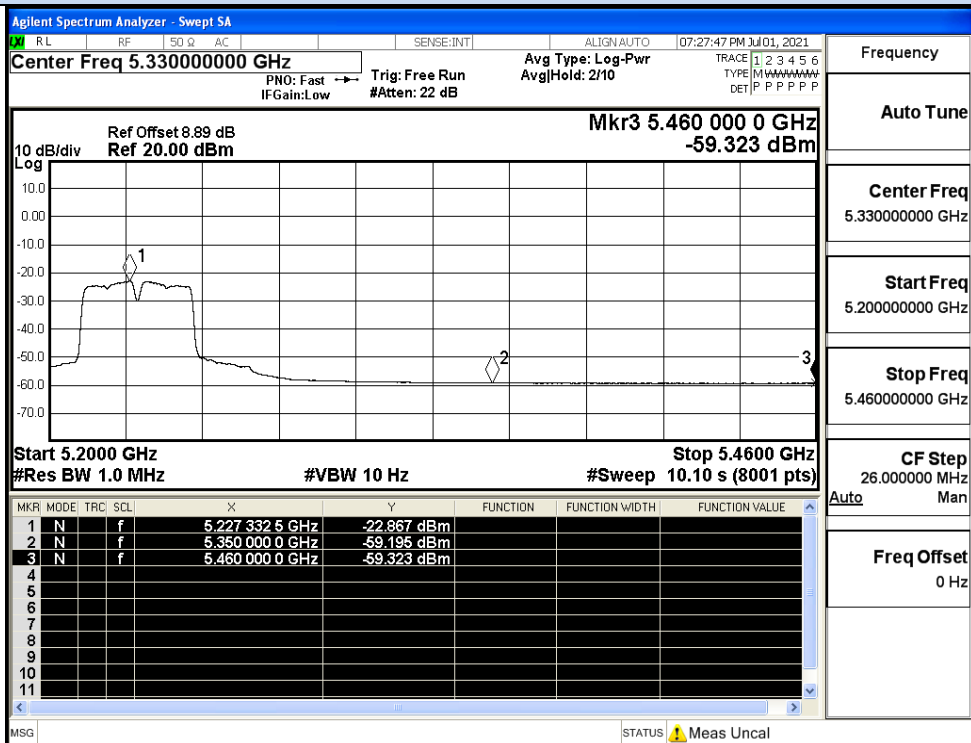
IEEE 802.11n40 / Channel 38 / 5190MHz / Average



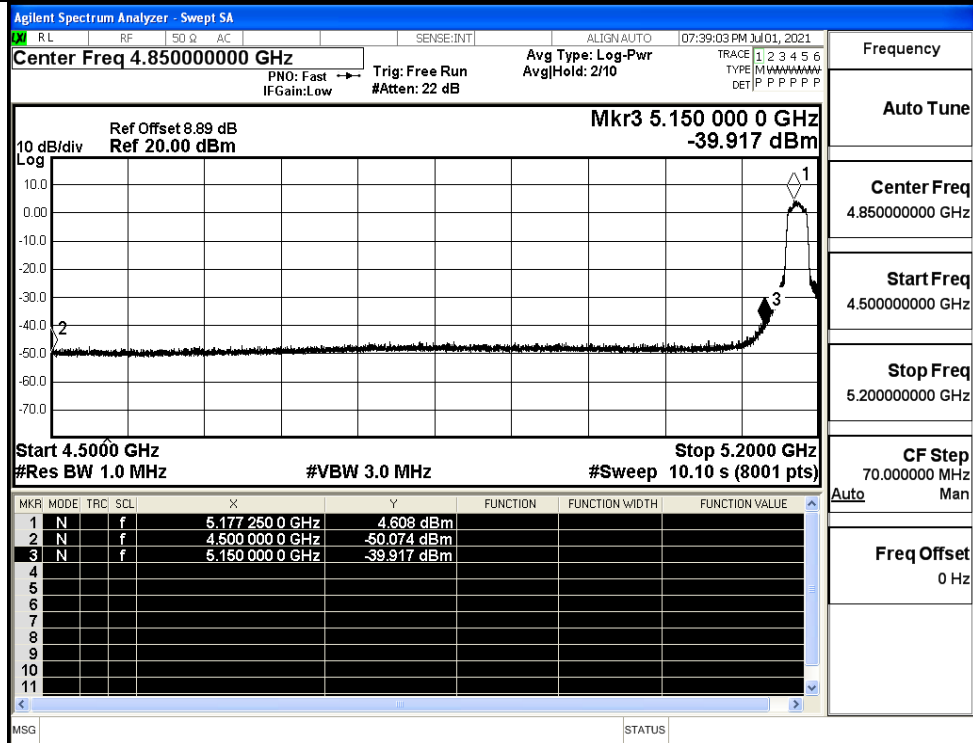
Undesirable Emissions Measurement



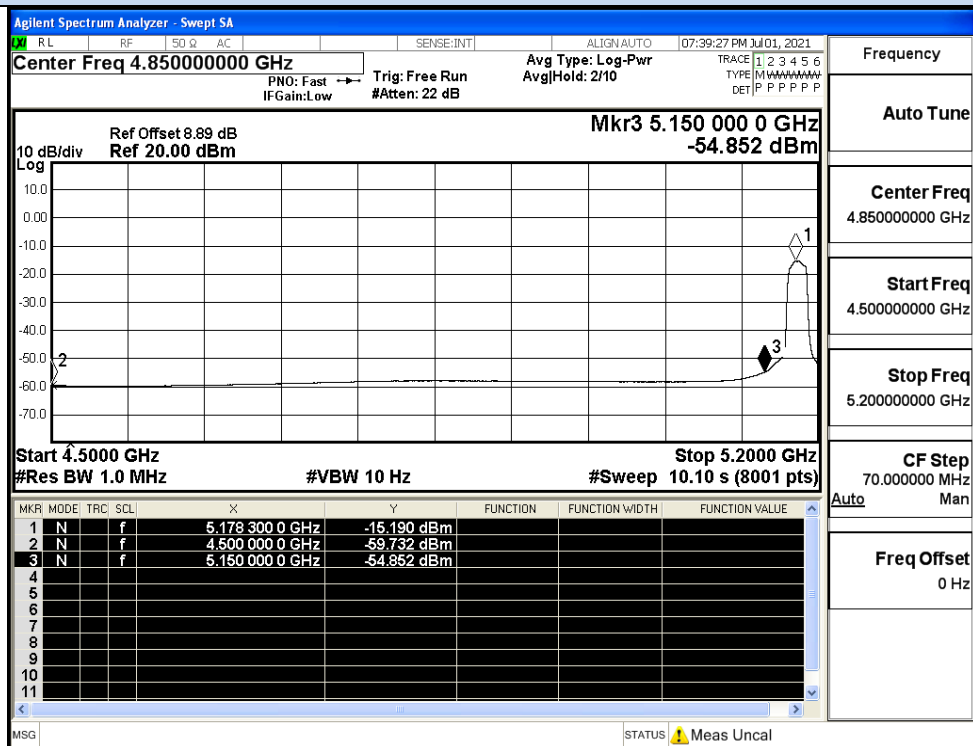
IEEE 802.11n40 / Channel 46 / 5230MHz / Peak



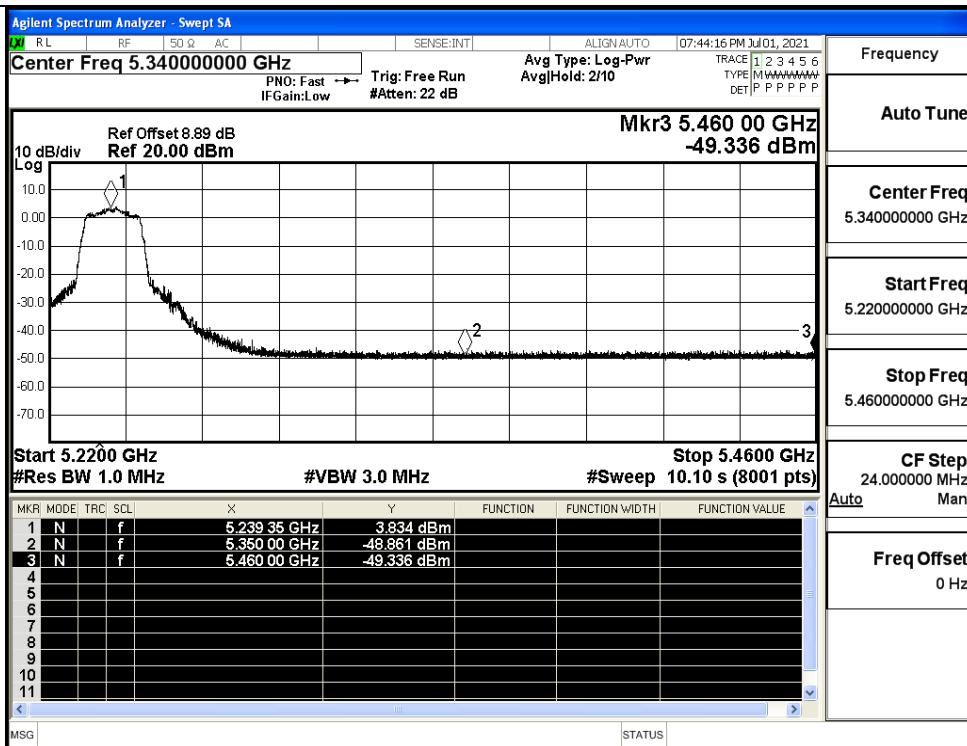
IEEE 802.11n40 / Channel 46 / 5230MHz / Average



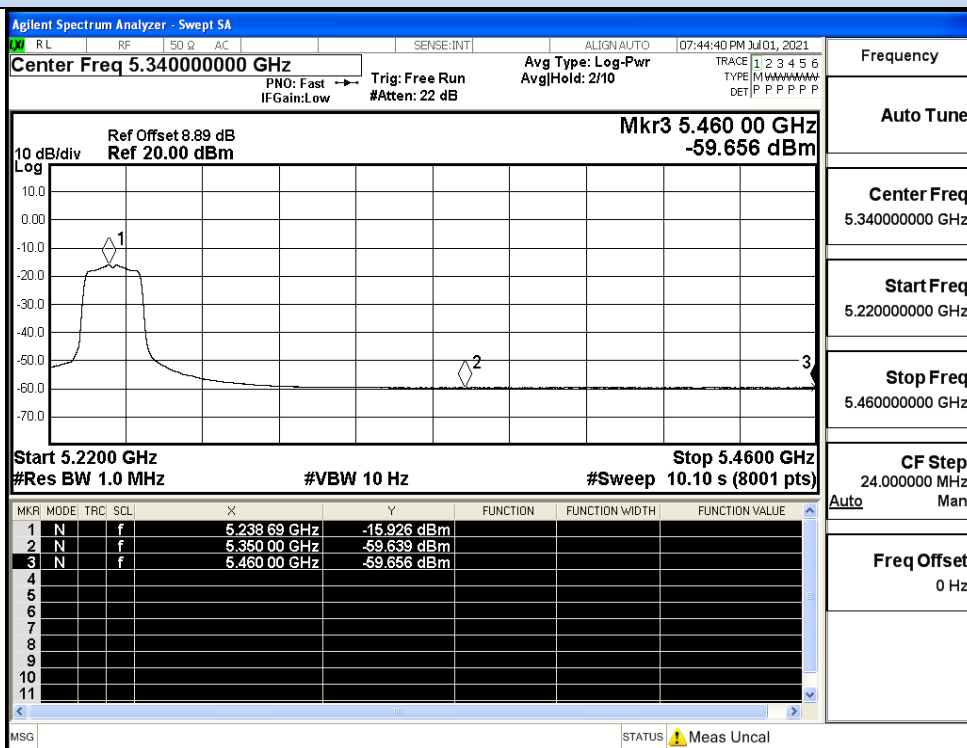
IEEE 802.11ac20 / Channel 36 / 5180MHz / Peak



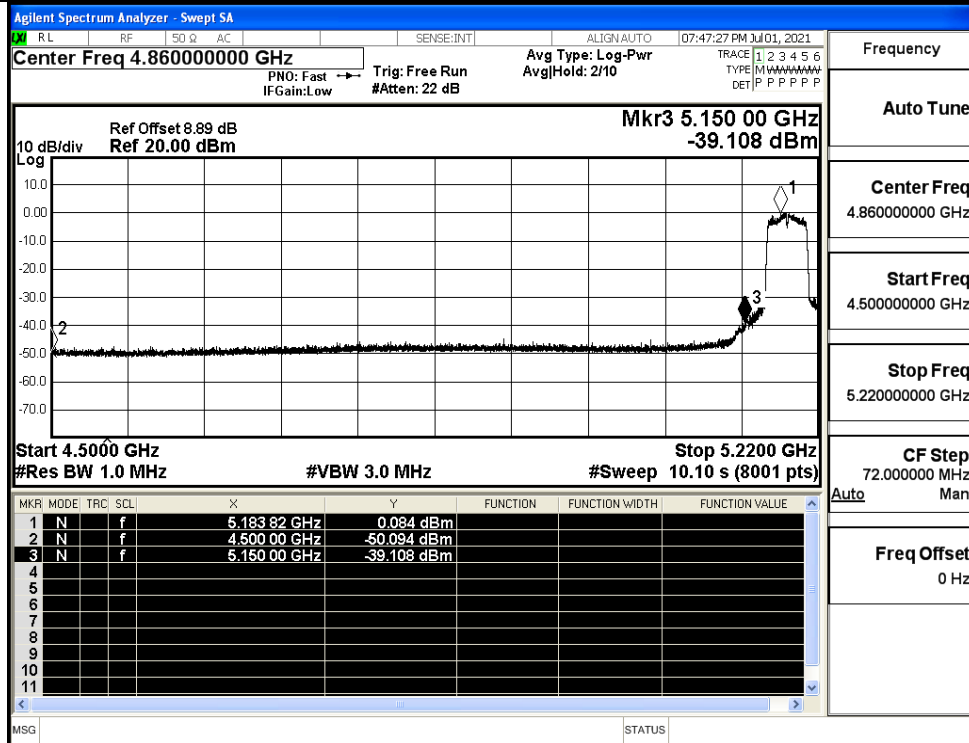
IEEE 802.11ac20 / Channel 36 / 5180MHz / Average



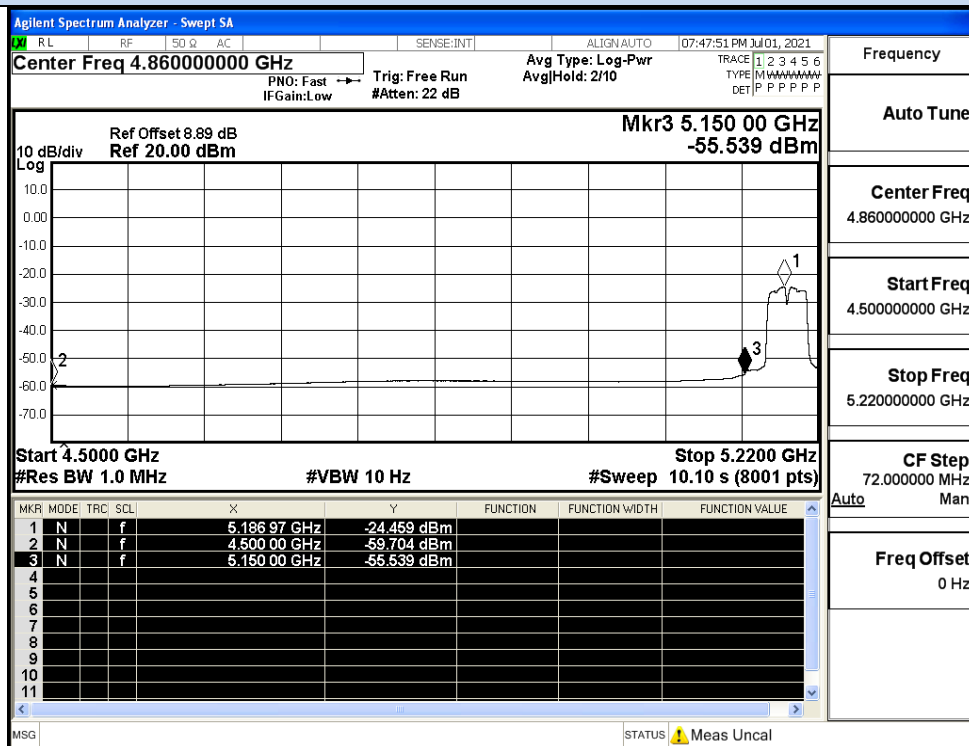
IEEE 802.11ac20 / Channel 48 / 5240MHz / Peak



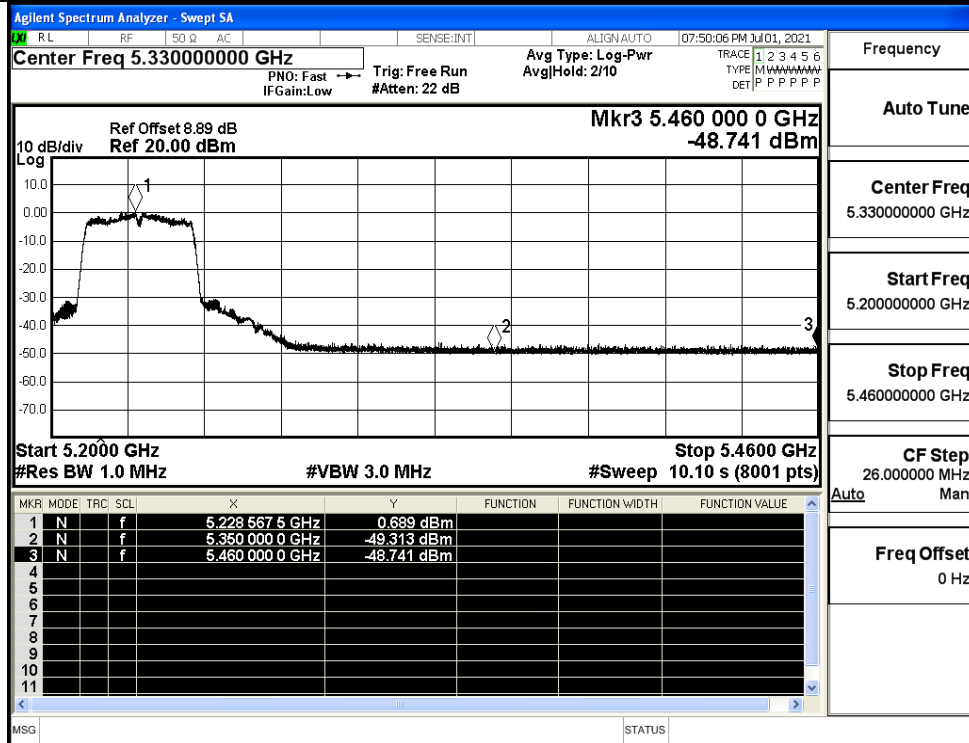
IEEE 802.11ac20 / Channel 48 / 5240MHz / Average



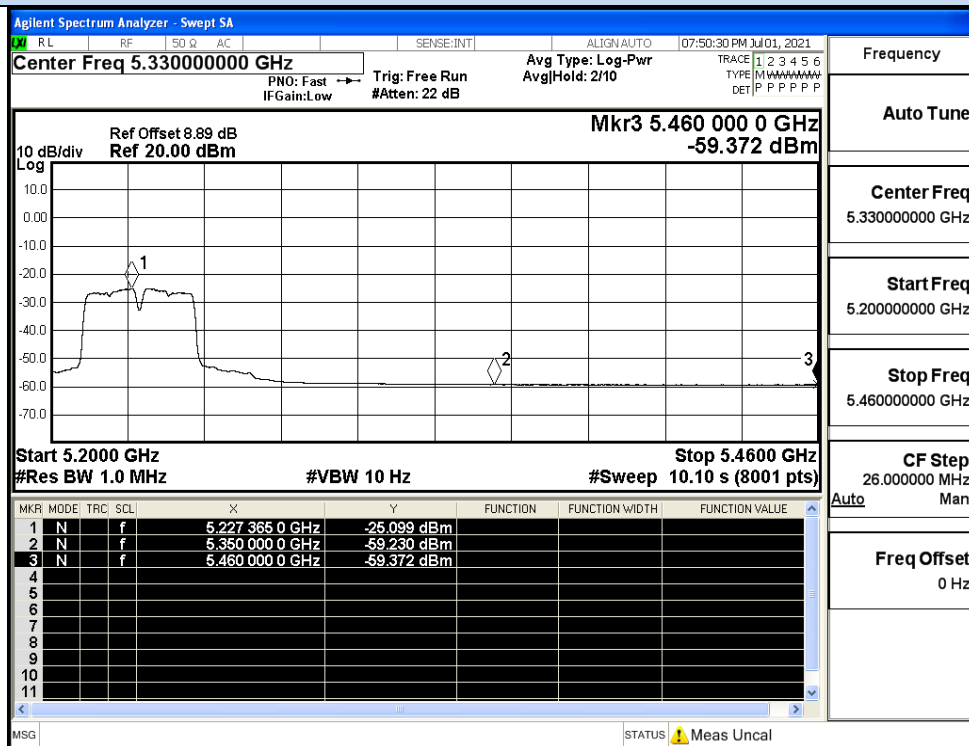
IEEE 802.11ac40 / Channel 38/ 5190MHz / Peak



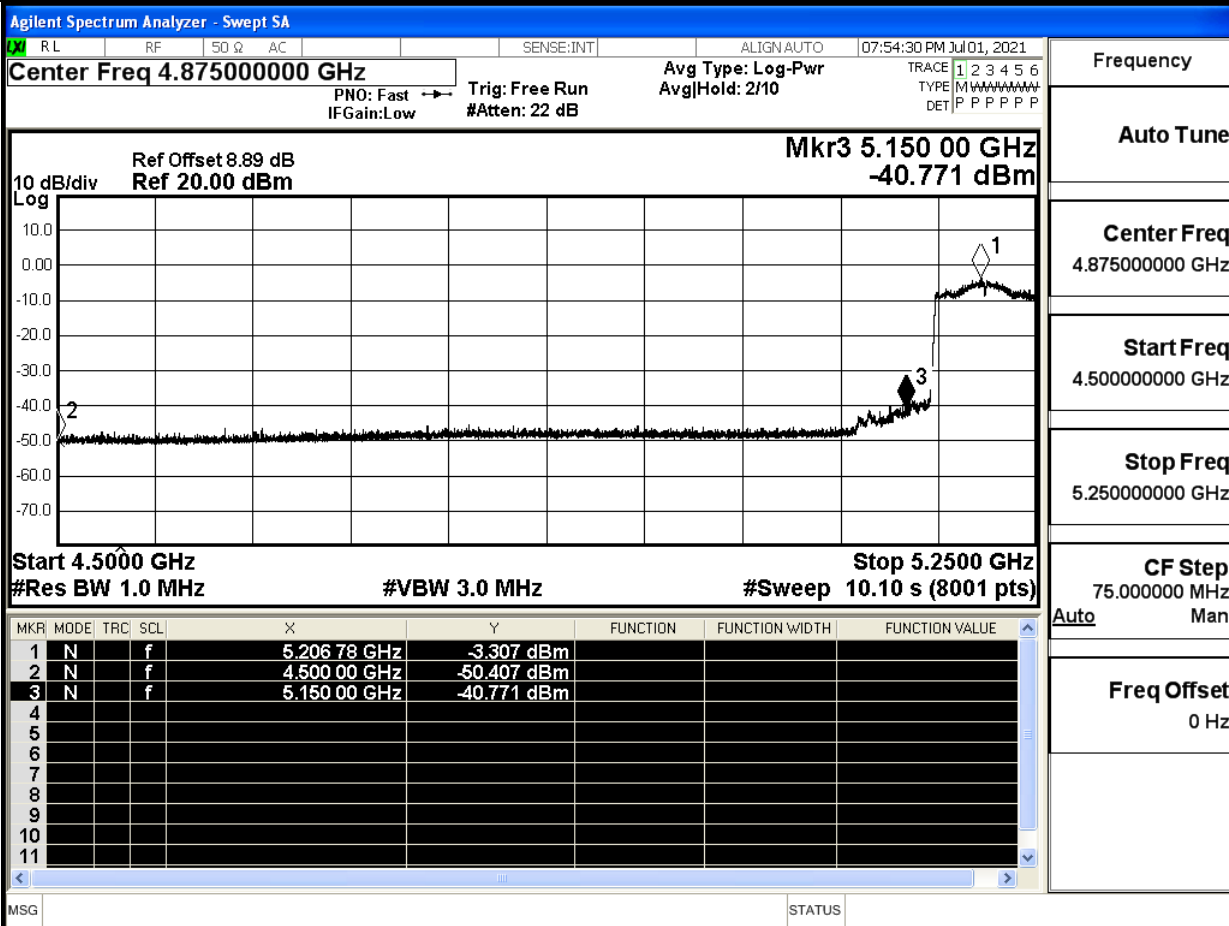
IEEE 802.11ac40 / Channel 38 / 5190MHz / Average



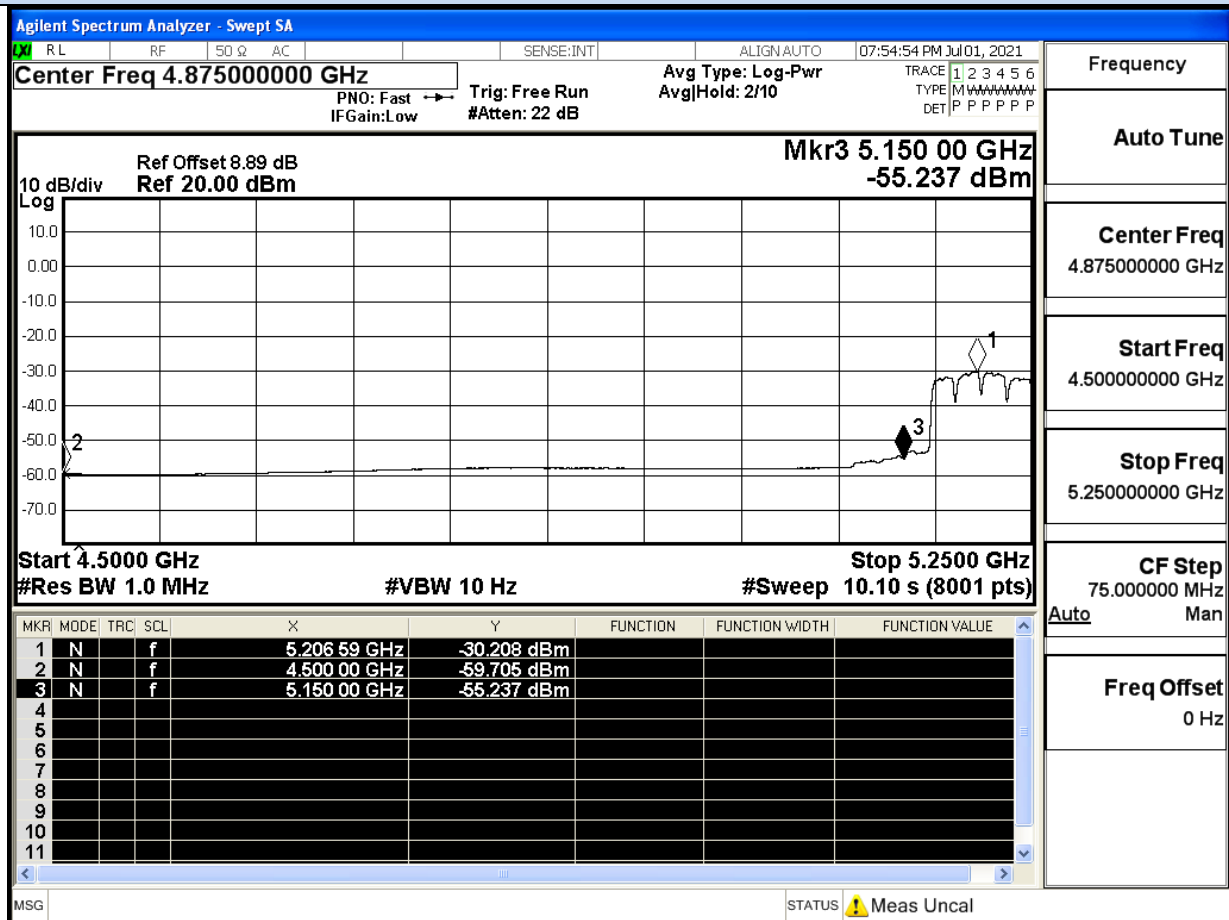
IEEE 802.11ac40 / Channel 46/ 5230MHz / Peak



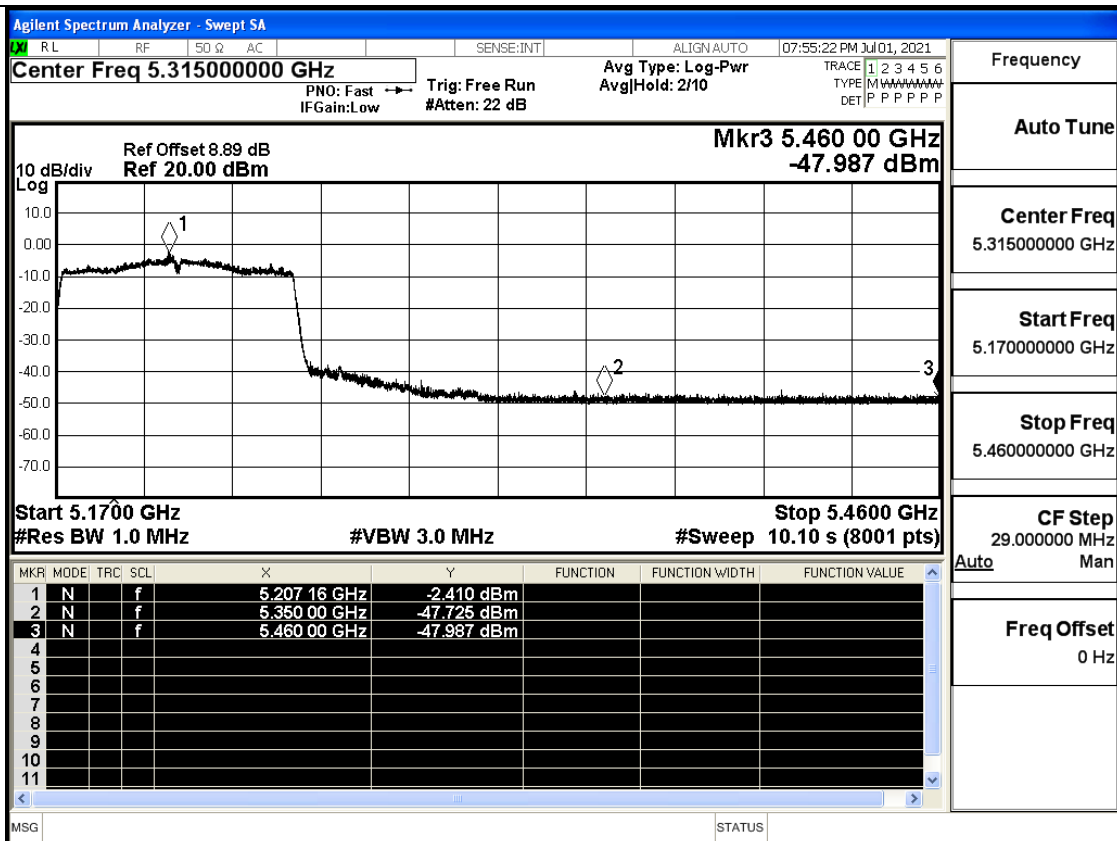
IEEE 802.11ac40 / Channel 46 / 5230MHz / Average



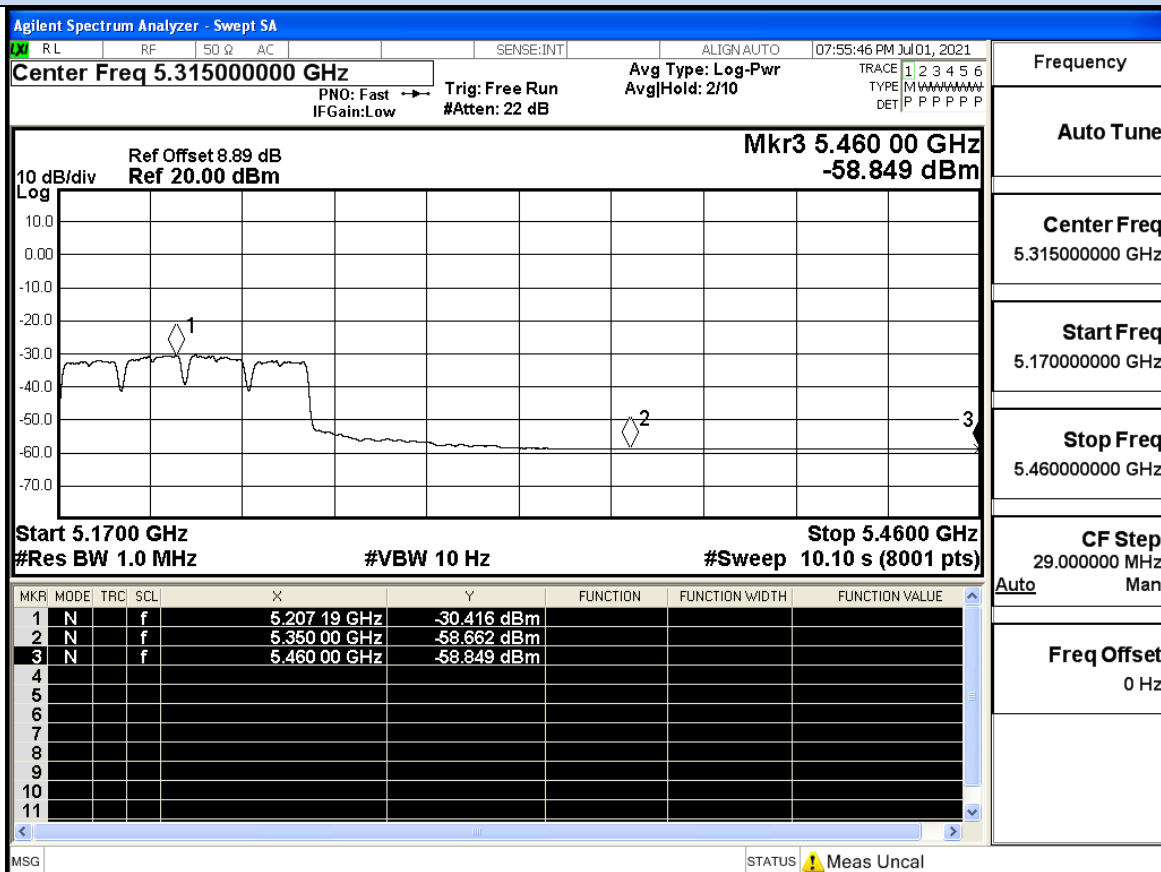
IEEE 802.11ac80 / Channel 42 / 5210MHz / Peak



IEEE 802.11ac80 / Channel 42 / 5210MHz / Average



IEEE 802.11ac80 / Channel 42/ 5210MHz / Peak



IEEE 802.11ac80 / Channel 42/ 5210MHz / Average

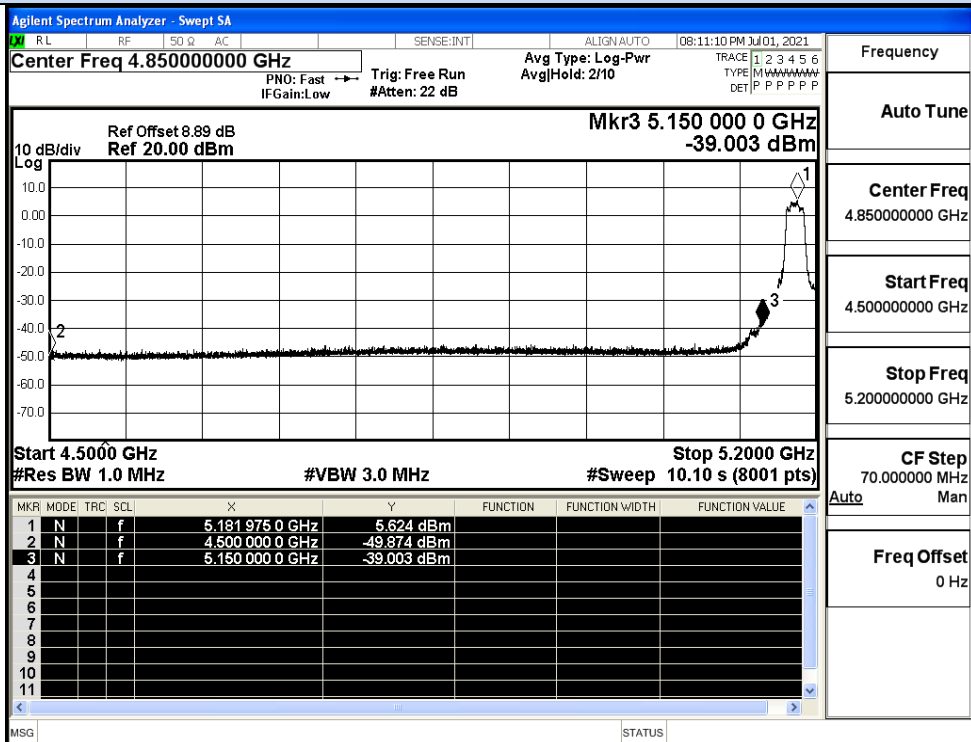


ANT1

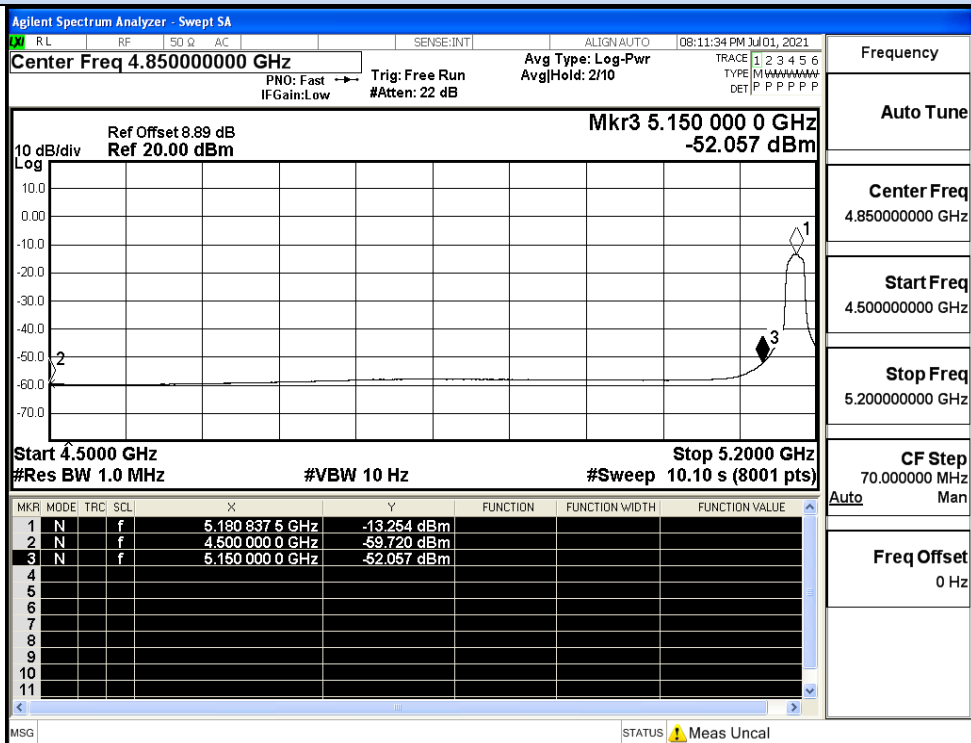
Test Mode	Channel	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Ground Reflection Factor (dB)	Covert Radiated E Level At 3m (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
11A	36	4500.0	-49.87	2.00	0	45.35	Peak	68.20	Pass
		4500.0	-59.72	2.00	0	35.51	Average	54.00	Pass
		5150.0	-39.00	2.00	0	56.22	Peak	68.20	Pass
		5150.0	-52.06	2.00	0	43.17	Average	54.00	Pass
	48	5350.0	-48.40	2.00	0	46.82	Peak	68.20	Pass
		5350.0	-59.59	2.00	0	35.64	Average	54.00	Pass
		5460.0	-48.84	2.00	0	46.39	Peak	68.20	Pass
		5460.0	-59.59	2.00	0	35.64	Average	54.00	Pass
11N2 O SISO	36	4500.0	-49.82	2.00	0	45.41	Peak	68.20	Pass
		4500.0	-59.69	2.00	0	35.54	Average	54.00	Pass
		5150.0	-39.83	2.00	0	55.39	Peak	68.20	Pass
		5150.0	-54.76	2.00	0	40.47	Average	54.00	Pass
	48	5350.0	-48.57	2.00	0	46.66	Peak	68.20	Pass
		5350.0	-59.63	2.00	0	35.60	Average	54.00	Pass
		5460.0	-49.30	2.00	0	45.93	Peak	68.20	Pass
		5460.0	-59.65	2.00	0	35.58	Average	54.00	Pass
11N4 O SISO	38	4500.0	-50.50	2.00	0	44.73	Peak	68.20	Pass
		4500.0	-59.71	2.00	0	35.52	Average	54.00	Pass
		5150.0	-37.77	2.00	0	57.45	Peak	68.20	Pass
		5150.0	-54.21	2.00	0	41.02	Average	54.00	Pass
	46	5350.0	-48.85	2.00	0	46.38	Peak	68.20	Pass
		5350.0	-59.22	2.00	0	36.01	Average	54.00	Pass
		5460.0	-48.04	2.00	0	47.19	Peak	68.20	Pass
		5460.0	-59.33	2.00	0	35.89	Average	54.00	Pass
11A C20 SIS O	36	4500.0	-49.33	2.00	0	45.89	Peak	68.20	Pass
		4500.0	-59.71	2.00	0	35.52	Average	54.00	Pass
		5150.0	-41.66	2.00	0	53.57	Peak	68.20	Pass
		5150.0	-55.53	2.00	0	39.69	Average	54.00	Pass
	48	4500.0	-49.33	2.00	0	45.89	Peak	68.20	Pass
		4500.0	-59.71	2.00	0	35.52	Average	54.00	Pass
		5150.0	-41.66	2.00	0	53.57	Peak	68.20	Pass
		5150.0	-55.53	2.00	0	39.69	Average	54.00	Pass
11A C40 SIS O	38	4500.0	-50.40	2.00	0	44.83	Peak	68.20	Pass
		4500.0	-59.71	2.00	0	35.52	Average	54.00	Pass
		5150.0	-40.33	2.00	0	54.89	Peak	68.20	Pass
		5150.0	-55.56	2.00	0	39.67	Average	54.00	Pass
	46	5350.0	-49.27	2.00	0	45.96	Peak	68.20	Pass
		5350.0	-59.21	2.00	0	36.02	Average	54.00	Pass
		5460.0	-49.72	2.00	0	45.51	Peak	68.20	Pass
		5460.0	-59.35	2.00	0	35.88	Average	54.00	Pass
11A C80 SIS O	42	4500.0	-49.73	2.00	0	45.50	Peak	68.20	Pass
		4500.0	-58.69	2.00	0	36.54	Average	54.00	Pass
		5150.0	-49.81	2.00	0	45.42	Peak	68.20	Pass
		5150.0	-58.87	2.00	0	36.36	Average	54.00	Pass
		5350.0	-49.73	2.00	0	45.50	Peak	68.20	Pass
		5350.0	-58.69	2.00	0	36.54	Average	54.00	Pass
		5460.0	-49.81	2.00	0	45.42	Peak	68.20	Pass
		5460.0	-58.87	2.00	0	36.36	Average	54.00	Pass



Undesirable Emissions Measurement



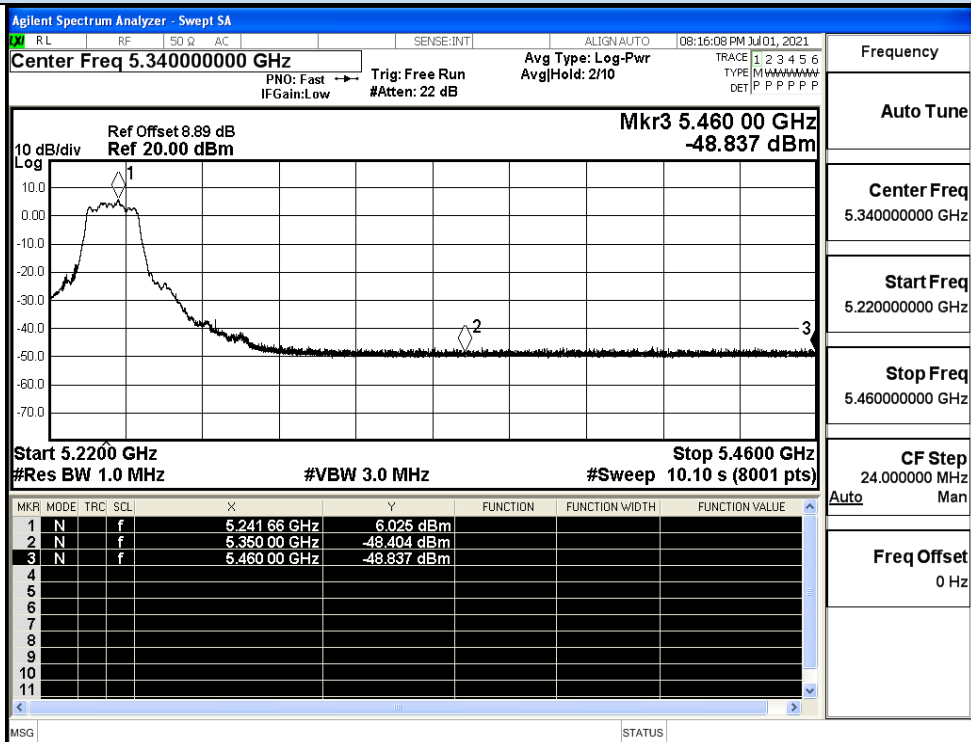
IEEE 802.11a / Channel 36 / 5180MHz / Peak



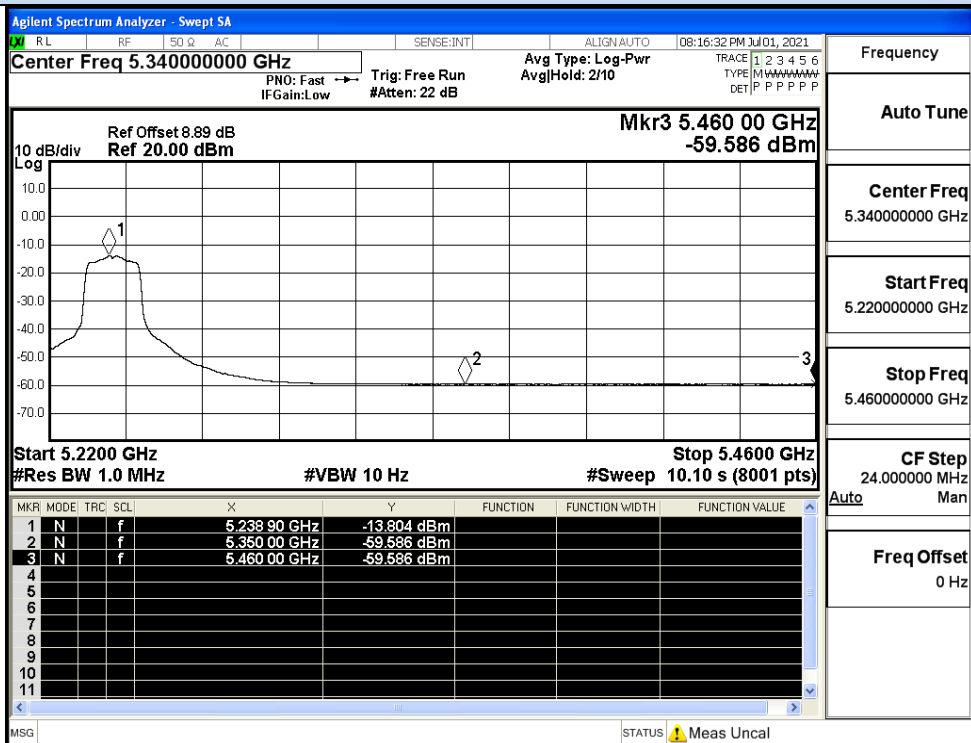
IEEE 802.11a / Channel 36 / 5180MHz / Average



Undesirable Emissions Measurement



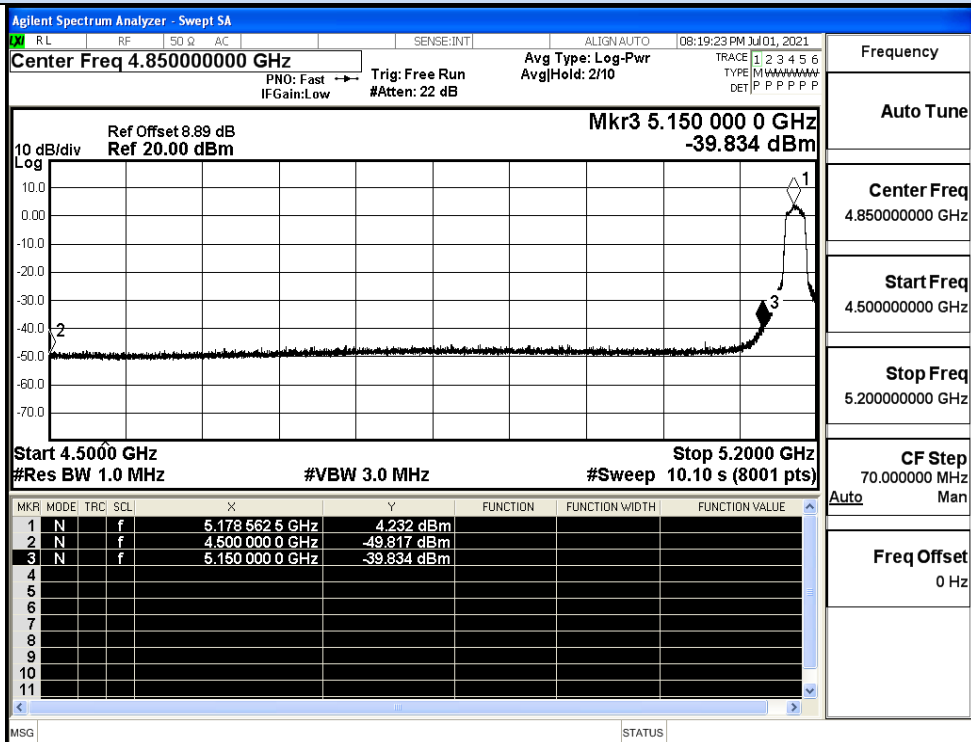
IEEE 802.11a / Channel 48 / 5240MHz / Peak



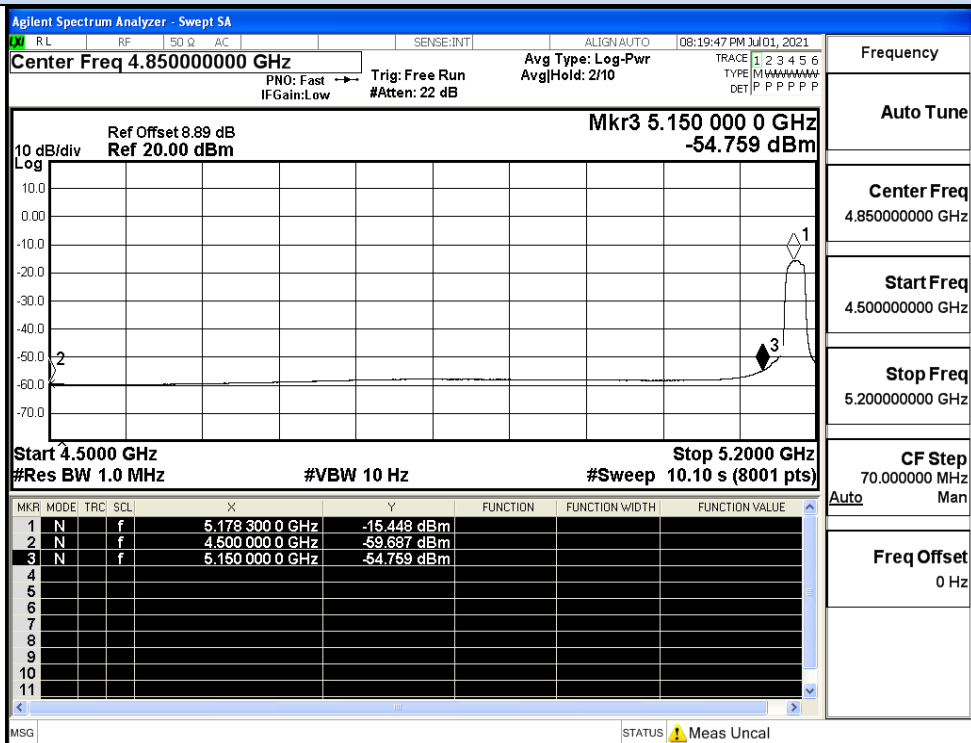
IEEE 802.11a / Channel 48 / 5240MHz / Average



Undesirable Emissions Measurement



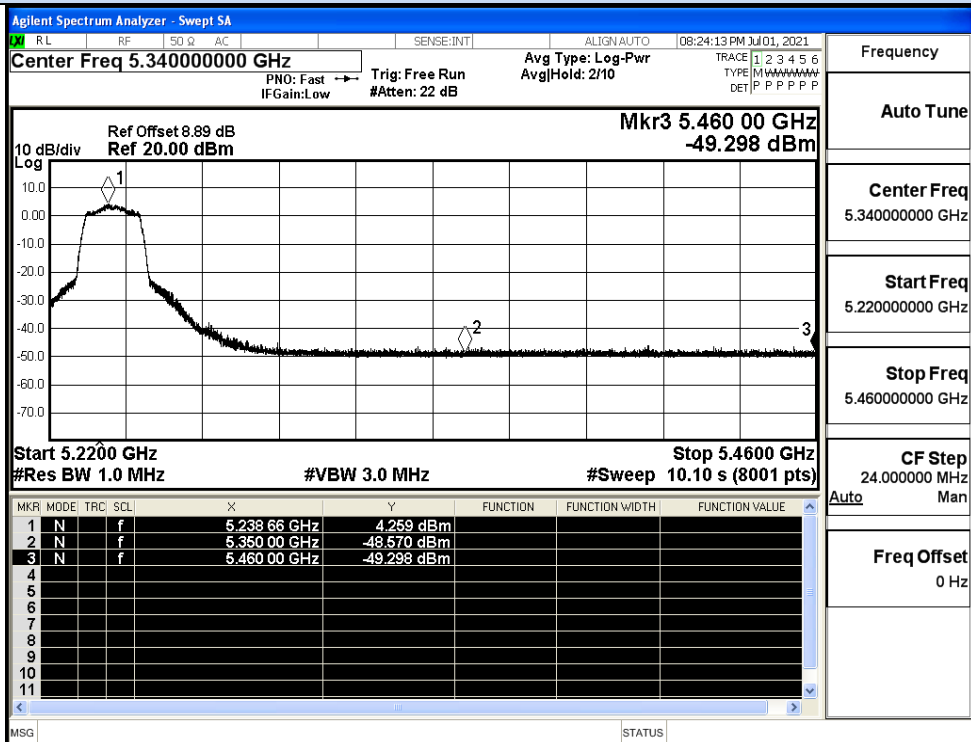
IEEE 802.11n20 / Channel 36 / 5180MHz / Peak



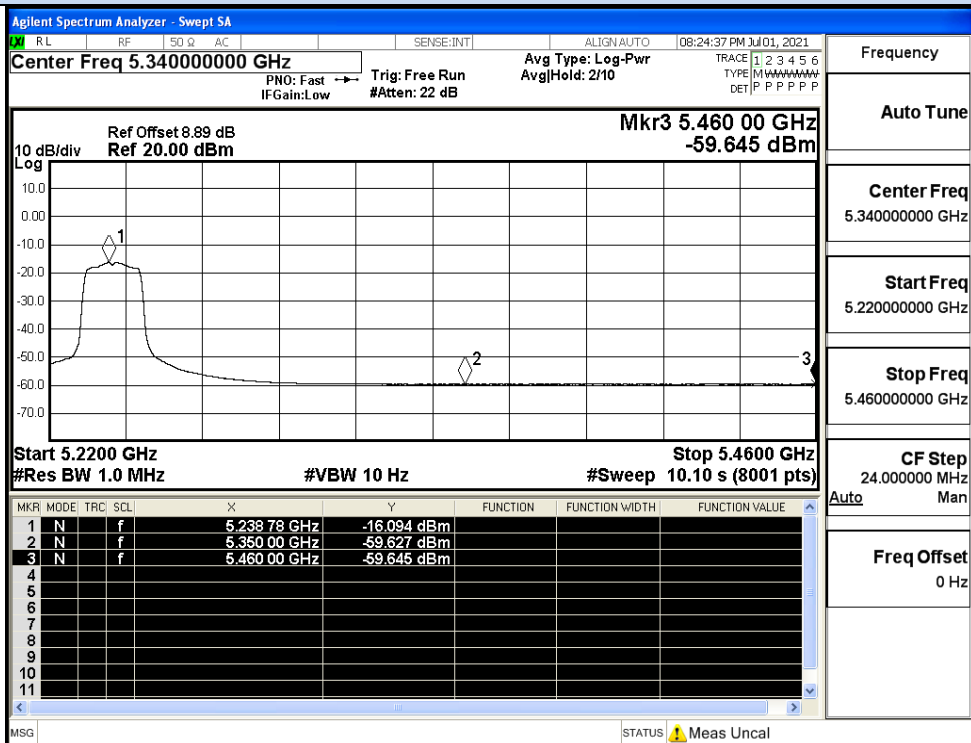
IEEE 802.11n20 / Channel 36 / 5180MHz / Average



Undesirable Emissions Measurement



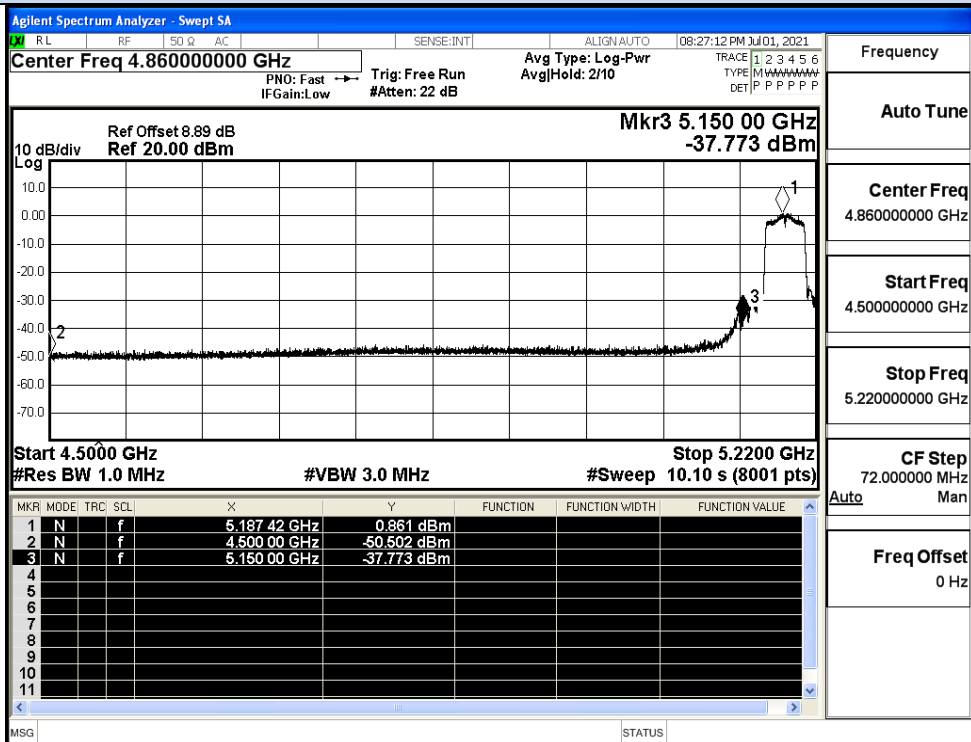
IEEE 802.11n20 / Channel 48 / 5240MHz / Peak



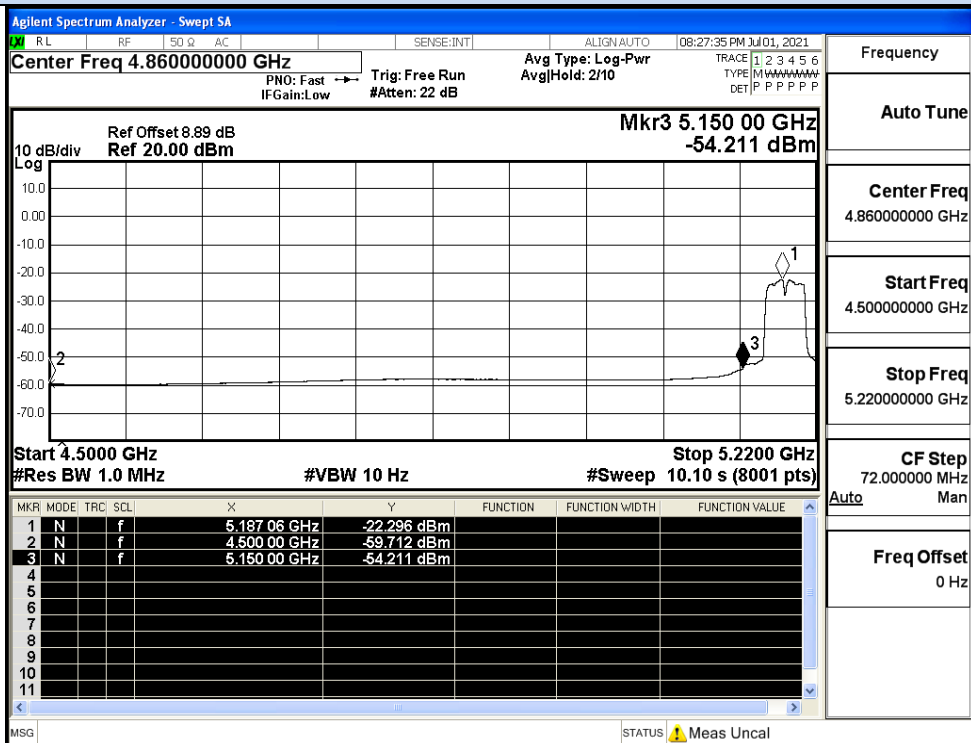
IEEE 802.11n20 / Channel 48 / 5240MHz / Average



Undesirable Emissions Measurement



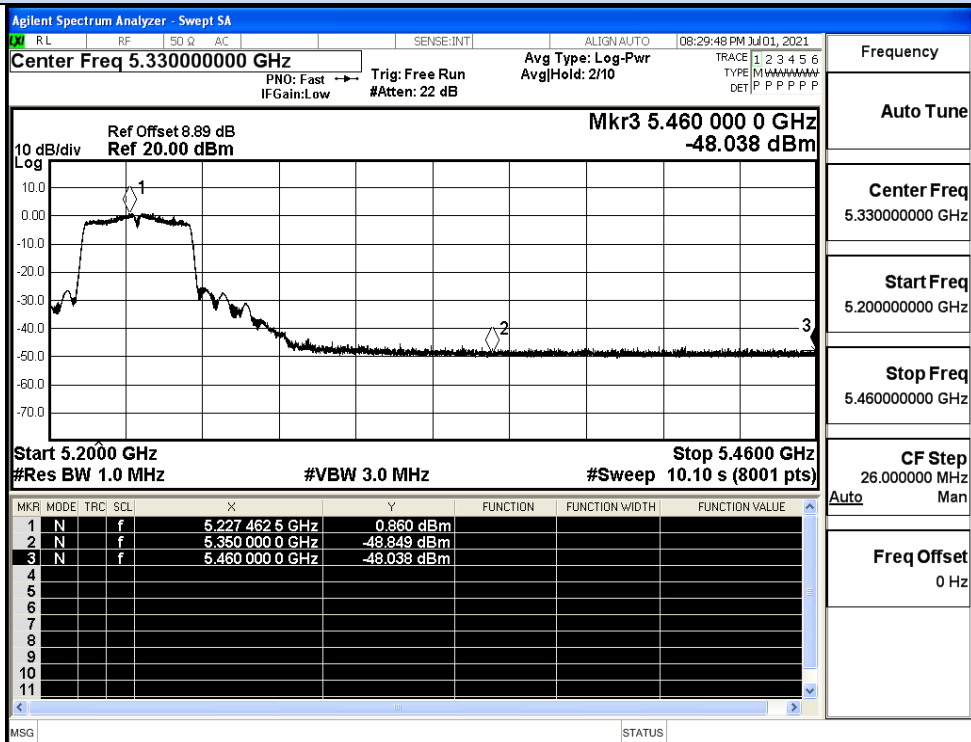
IEEE 802.11n40 / Channel 38 / 5190MHz / Peak



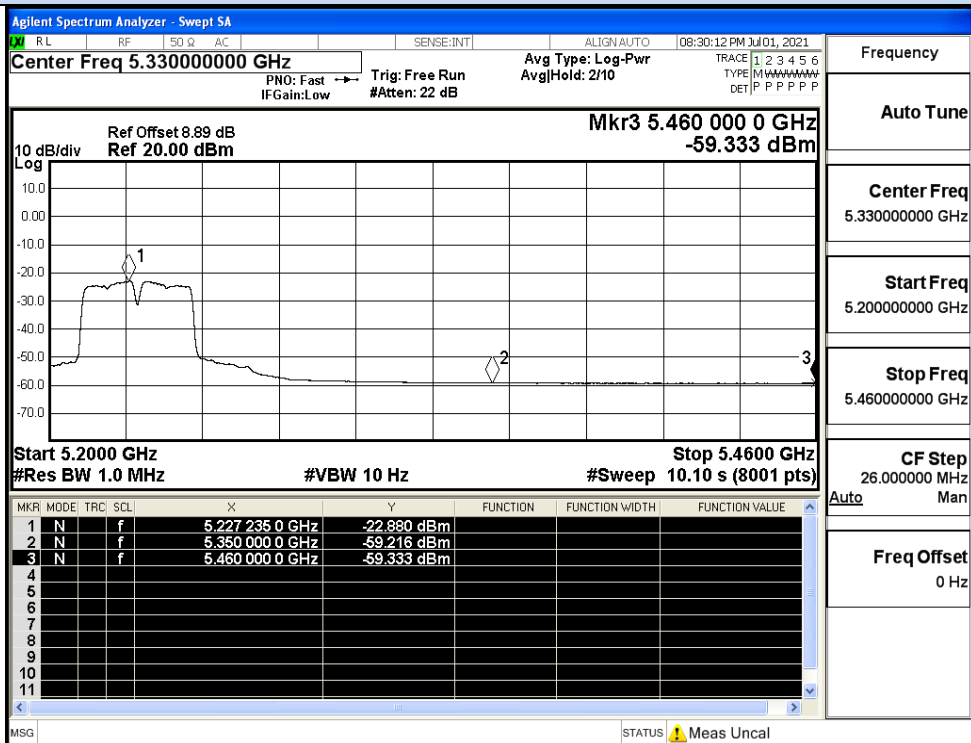
IEEE 802.11n40 / Channel 38 / 5190MHz / Average



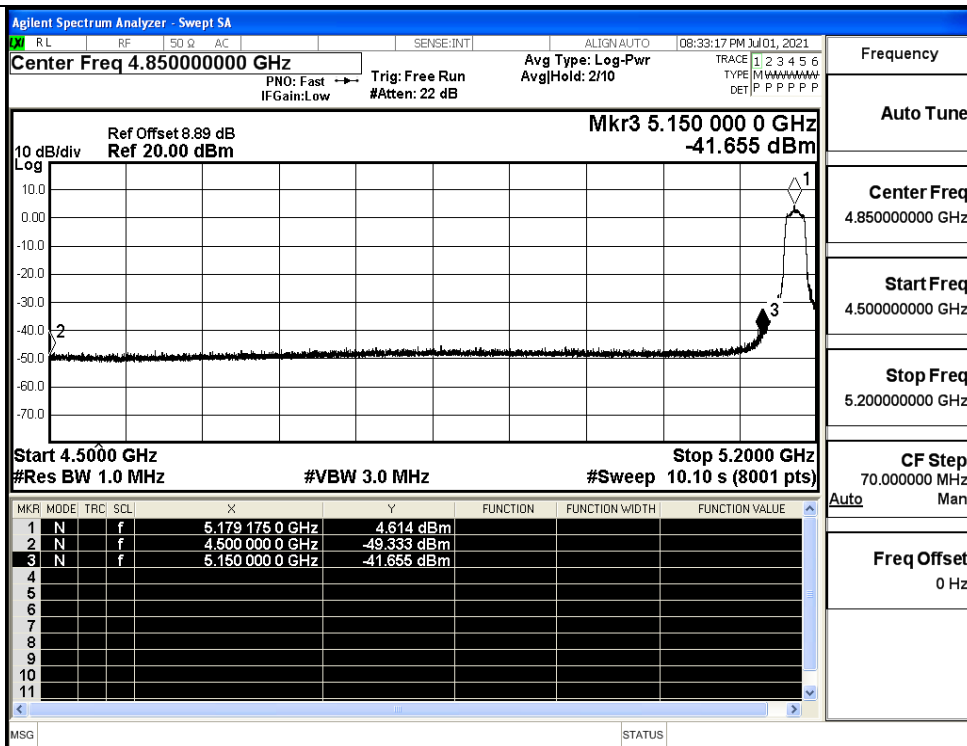
Undesirable Emissions Measurement



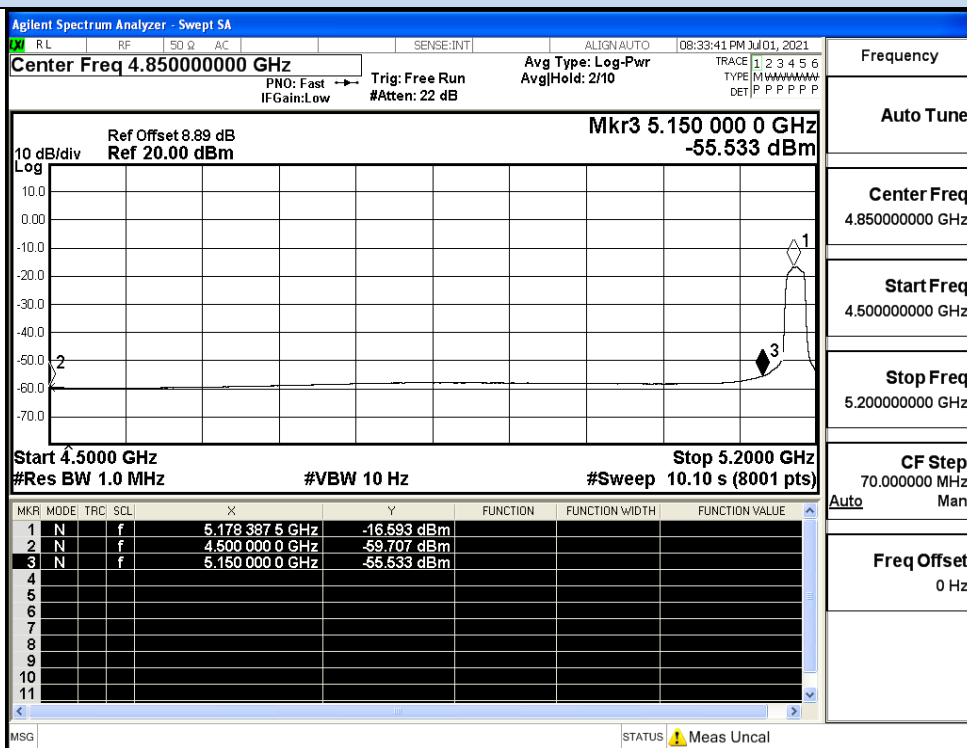
IEEE 802.11n40 / Channel 46 / 5230MHz / Peak



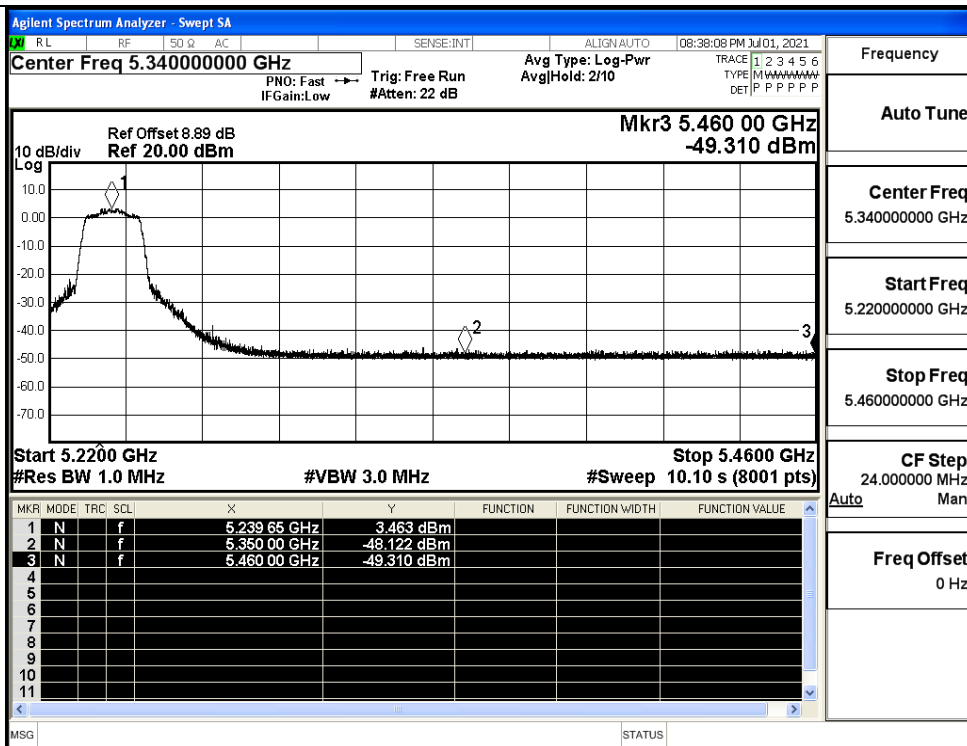
IEEE 802.11n40 / Channel 46 / 5230MHz / Average



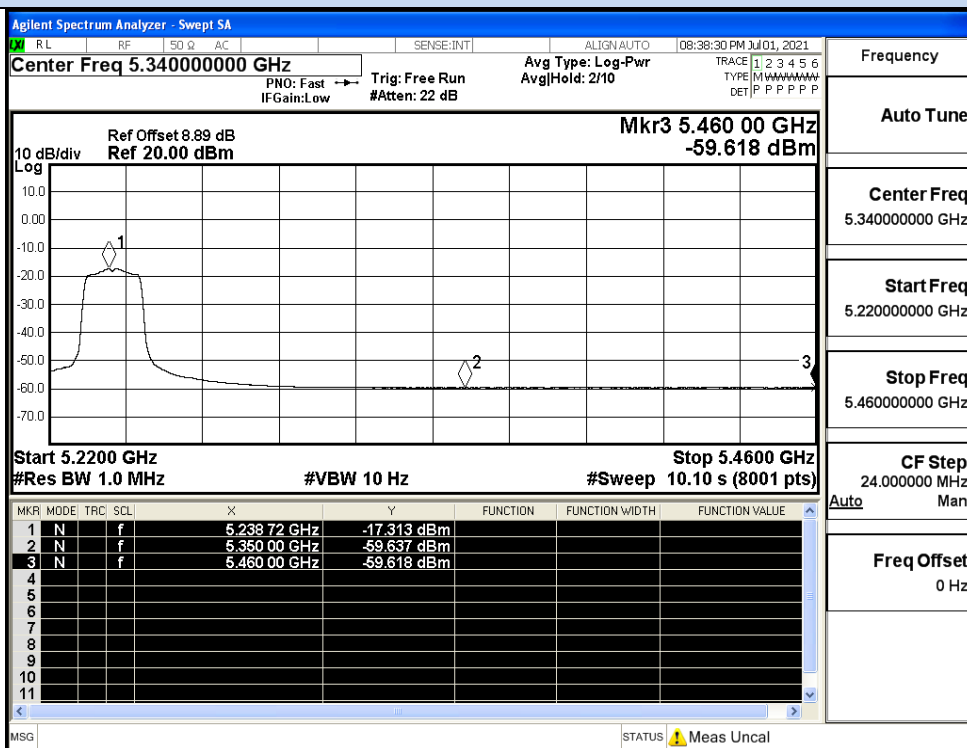
IEEE 802.11ac20 / Channel 36 / 5180MHz / Peak



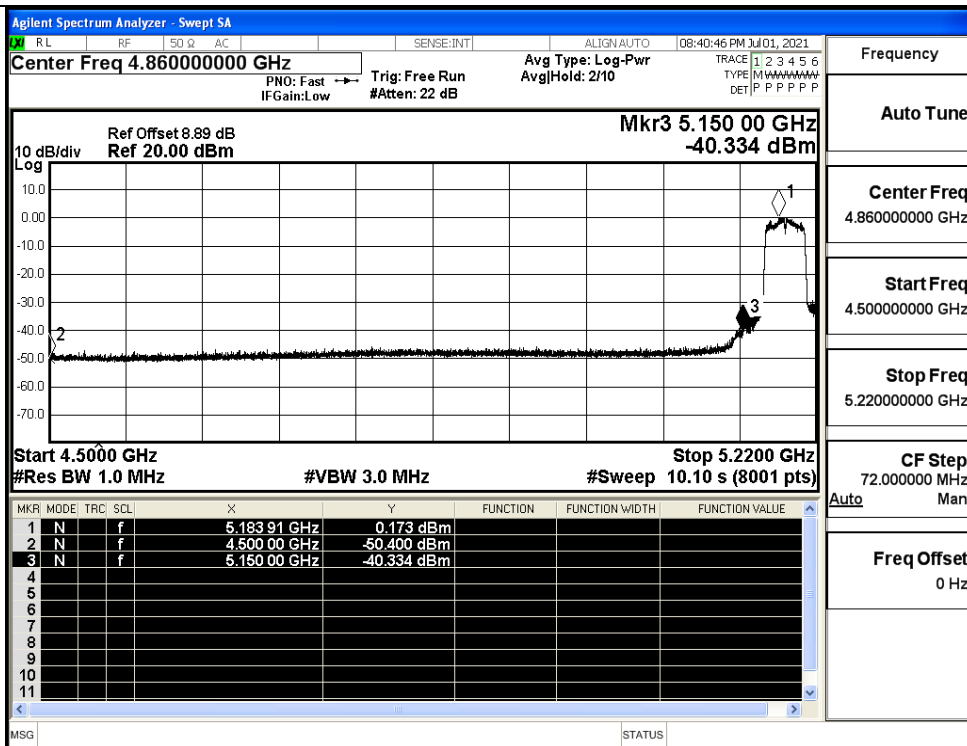
IEEE 802.11ac20 / Channel 36 / 5180MHz / Average



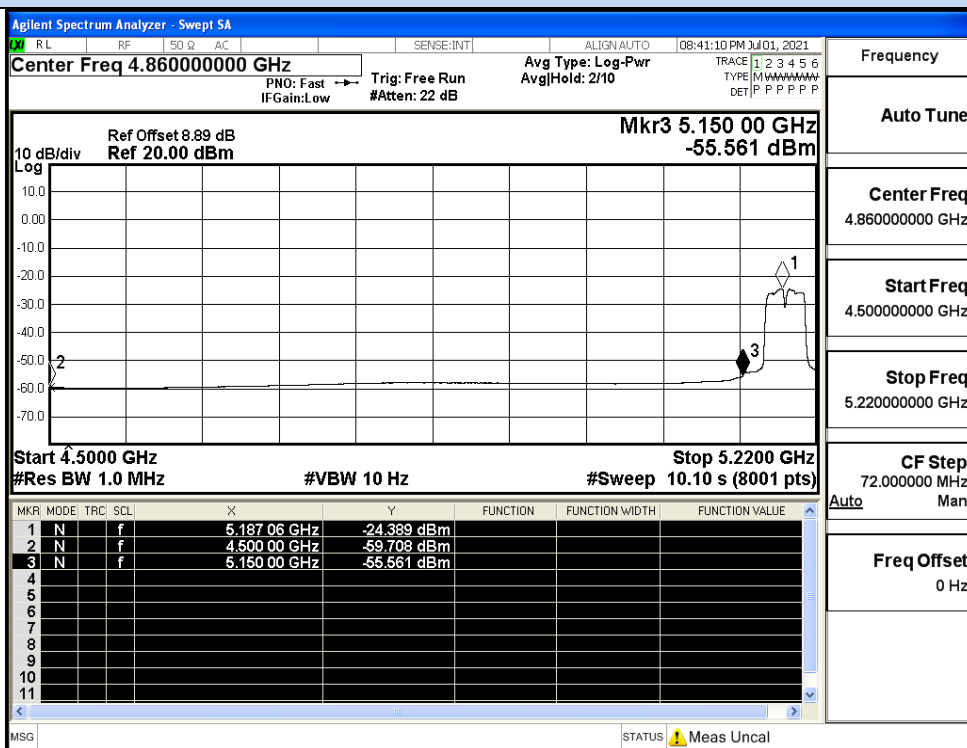
IEEE 802.11ac20 / Channel 48 / 5240MHz / Peak



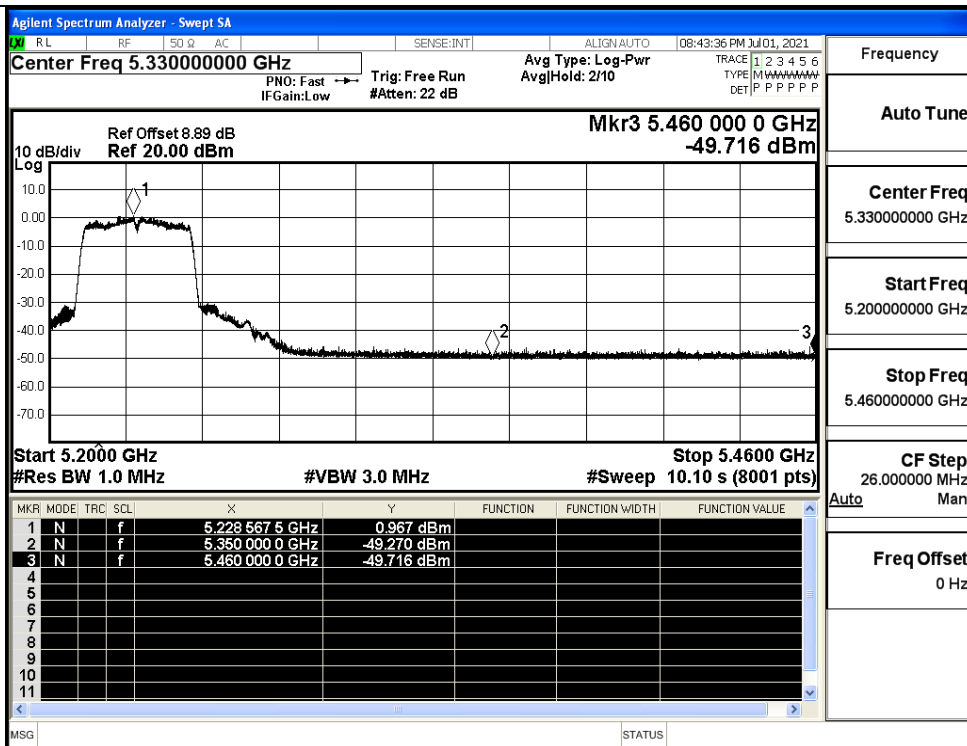
IEEE 802.11ac20 / Channel 48 / 5240MHz / Average



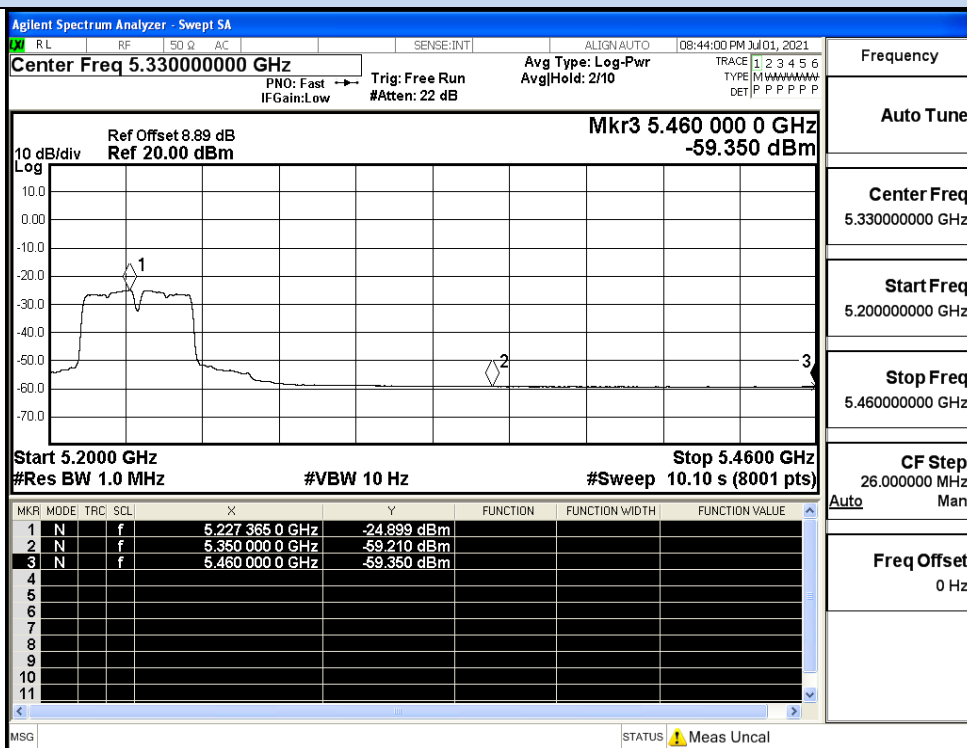
IEEE 802.11ac40 / Channel 38/ 5190MHz / Peak



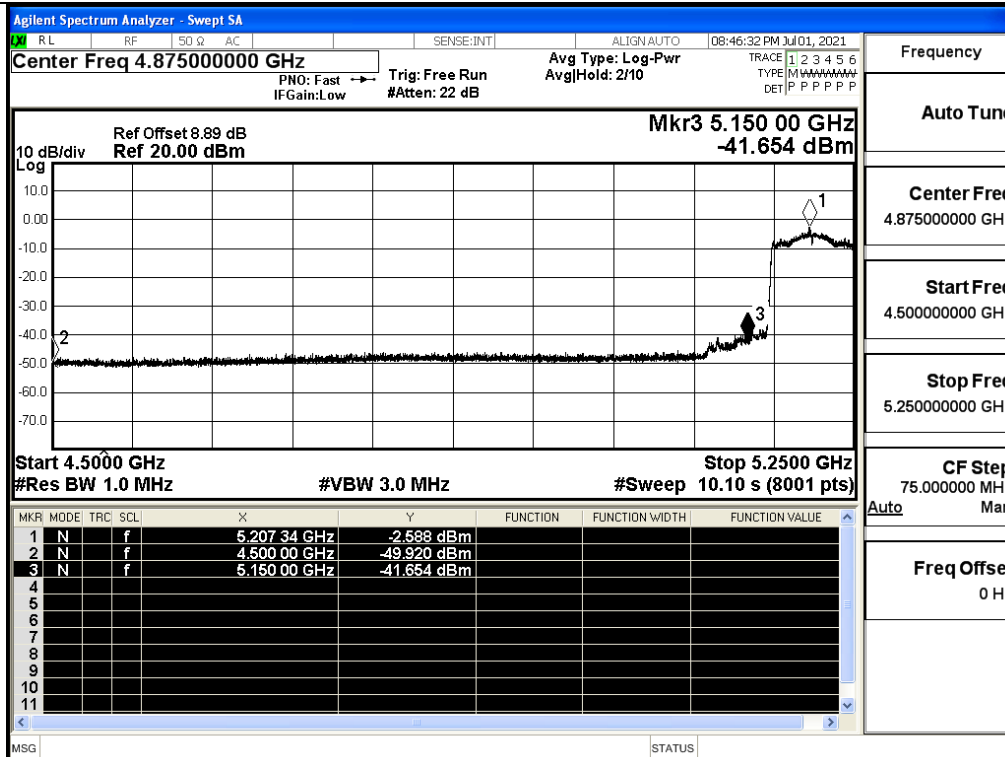
IEEE 802.11ac40 / Channel 38 / 5190MHz / Average



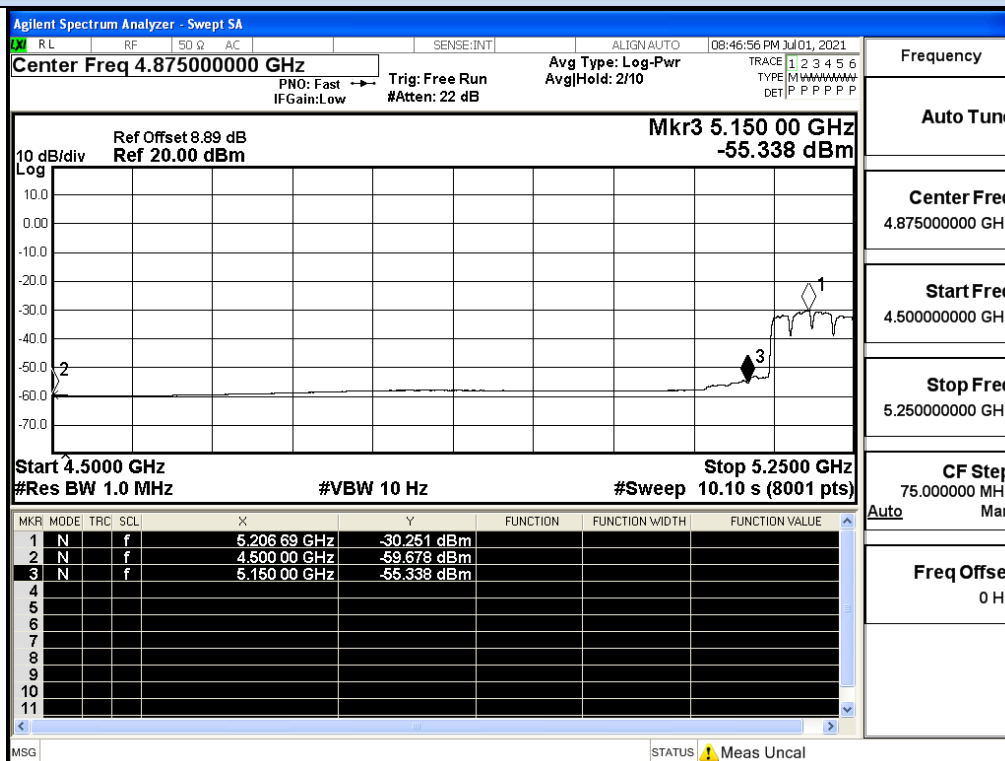
IEEE 802.11ac40 / Channel 46 / 5230MHz / Peak



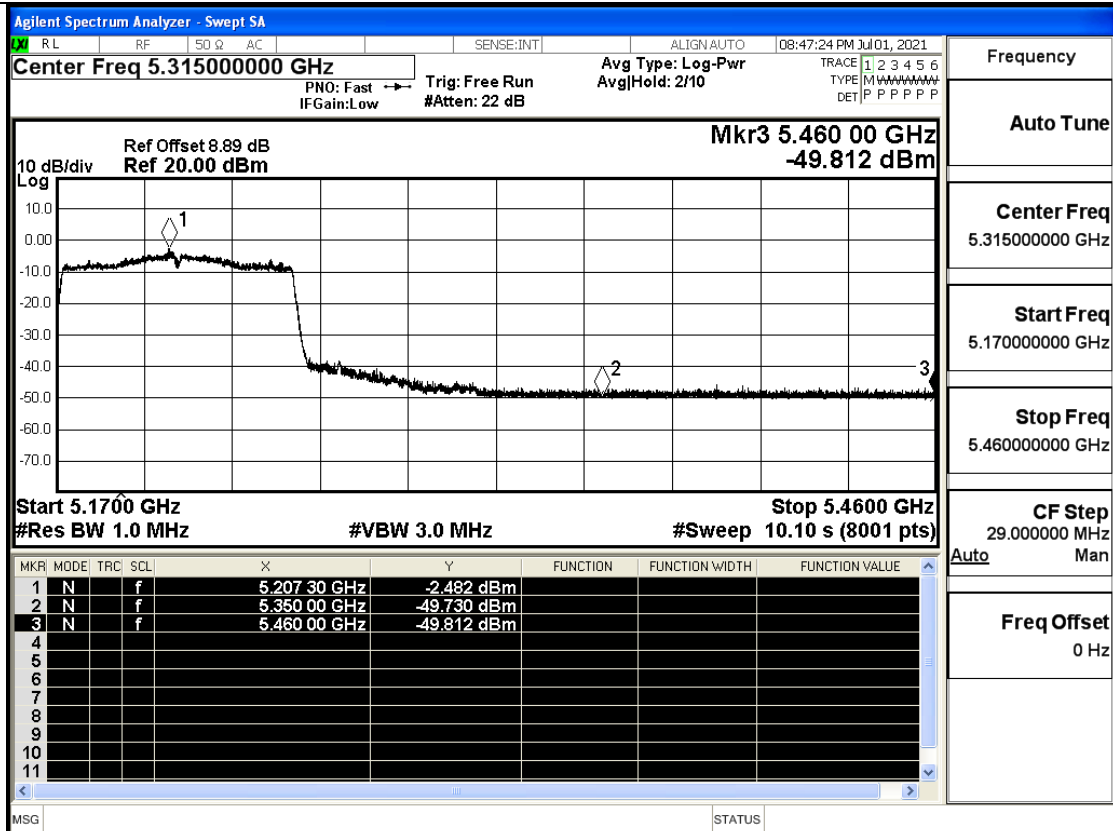
IEEE 802.11ac40 / Channel 46 / 5230MHz / Average



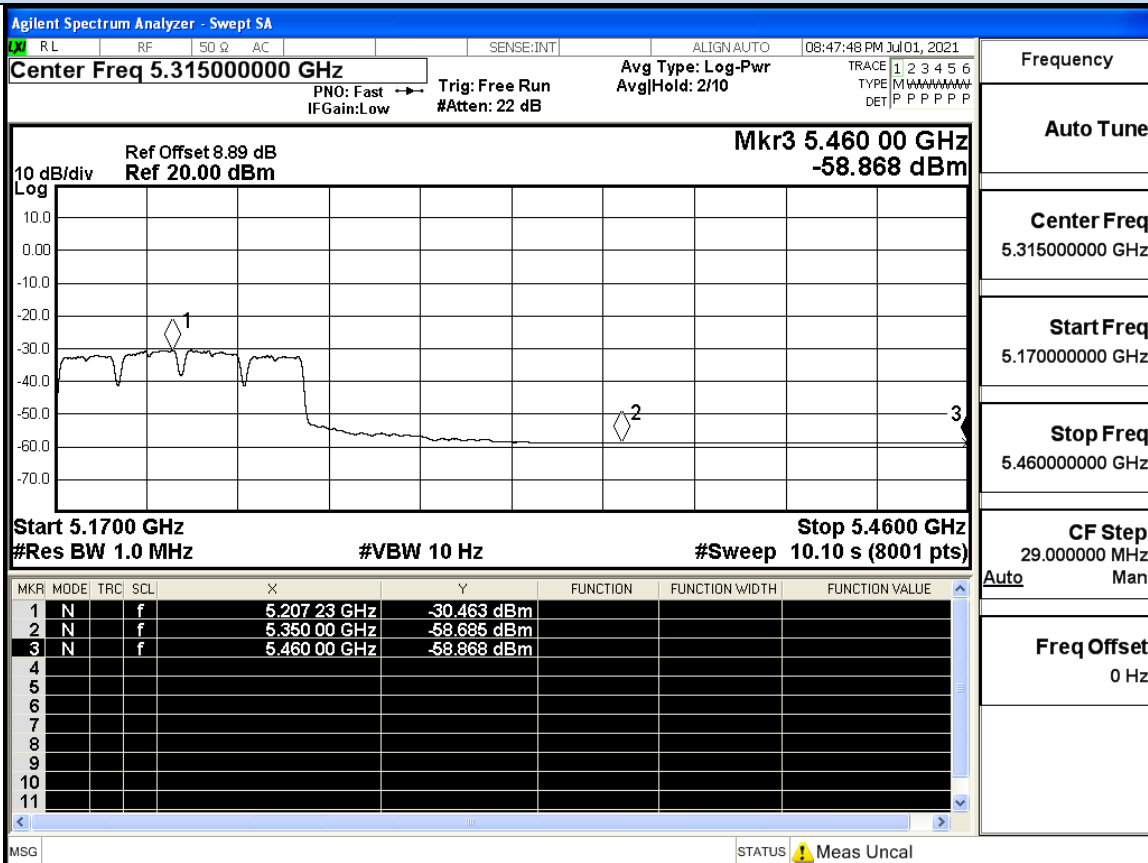
IEEE 802.11ac80 / Channel 42 / 5210MHz / Peak



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	-50.09	-49.82	-46.94	4.01	0	52.29	Peak	68.20	Pass
		4500.0	-59.70	-59.69	-56.68	4.01	0	42.55	Average	54.00	Pass
		5150.0	-38.54	-39.83	-36.13	4.01	0	63.11	Peak	68.20	Pass
		5150.0	-55.06	-54.76	-51.90	4.01	0	47.34	Average	54.00	Pass
	48	5350.0	-47.92	-48.57	-45.22	4.01	0	54.02	Peak	68.20	Pass
		5350.0	-59.60	-59.63	-56.60	4.01	0	42.63	Average	54.00	Pass
		5460.0	-49.87	-49.30	-46.57	4.01	0	52.67	Peak	68.20	Pass
		5460.0	-59.65	-59.65	-56.64	4.01	0	42.60	Average	54.00	Pass
11N40	38	4500.0	-49.13	-50.50	-46.75	4.01	0	52.49	Peak	68.20	Pass
		4500.0	-59.67	-59.71	-56.68	4.01	0	42.56	Average	54.00	Pass
		5150.0	-33.60	-37.77	-32.19	4.01	0	67.05	Peak	68.20	Pass
		5150.0	-49.16	-54.21	-47.98	4.01	0	51.26	Average	54.00	Pass
	46	5350.0	-48.25	-48.85	-45.53	4.01	0	53.71	Peak	68.20	Pass
		5350.0	-59.20	-59.22	-56.20	4.01	0	43.04	Average	54.00	Pass
		5460.0	-48.60	-48.04	-45.30	4.01	0	53.94	Peak	68.20	Pass
		5460.0	-59.32	-59.33	-56.31	4.01	0	42.92	Average	54.00	Pass
11AC20	36	4500.0	-50.07	-49.33	-46.67	4.01	0	52.56	Peak	68.20	Pass
		4500.0	-59.73	-59.71	-56.71	4.01	0	42.53	Average	54.00	Pass
		5150.0	-39.92	-41.66	-37.69	4.01	0	61.54	Peak	68.20	Pass
		5150.0	-54.85	-55.53	-52.17	4.01	0	47.07	Average	54.00	Pass
	48	4500.0	-50.07	-49.33	-46.67	4.01	0	52.56	Peak	68.20	Pass
		4500.0	-59.73	-59.71	-56.71	4.01	0	42.53	Average	54.00	Pass
		5150.0	-39.92	-41.66	-37.69	4.01	0	61.54	Peak	68.20	Pass
		5150.0	-54.85	-55.53	-52.17	4.01	0	47.07	Average	54.00	Pass
11AC40	38	4500.0	-50.09	-50.40	-47.23	4.01	0	52.01	Peak	68.20	Pass
		4500.0	-59.70	-59.71	-56.69	4.01	0	42.54	Average	54.00	Pass
		5150.0	-39.11	-40.33	-36.67	4.01	0	62.57	Peak	68.20	Pass
		5150.0	-55.54	-55.56	-52.54	4.01	0	46.70	Average	54.00	Pass
	46	5350.0	-49.31	-49.27	-46.28	4.01	0	52.96	Peak	68.20	Pass
		5350.0	-59.23	-59.21	-56.21	4.01	0	43.03	Average	54.00	Pass
		5460.0	-48.74	-49.72	-46.19	4.01	0	53.05	Peak	68.20	Pass
		5460.0	-59.37	-59.35	-56.35	4.01	0	42.89	Average	54.00	Pass
11AC80	42	4500.0	-47.73	-49.73	-45.61	4.01	0	53.63	Peak	68.20	Pass
		5150.0	-58.66	-58.69	-55.66	4.01	0	43.57	Average	54.00	Pass
		4500.0	-47.99	-49.81	-45.80	4.01	0	53.44	Peak	68.20	Pass
		5150.0	-58.85	-58.87	-55.85	4.01	0	43.39	Average	54.00	Pass
		5350.0	-47.73	-49.73	-45.61	4.01	0	53.63	Peak	68.20	Pass
		5460.0	-58.66	-58.69	-55.66	4.01	0	43.57	Average	54.00	Pass
		5350.0	-47.99	-49.81	-45.80	4.01	0	54.84	Peak	68.20	Pass
		5460.0	-58.85	-58.87	-55.85	4.01	0	45.36	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=1dBi+10 log (2) = 4.01dBi