Appendix A
RF Test Data for 5.2G WLAN (Conducted Measurement)
Product Name: 5GHz Wireless Video Transmission System
Trade Mark: DwarfConnection
Test Model: DC-LINK-ULR1

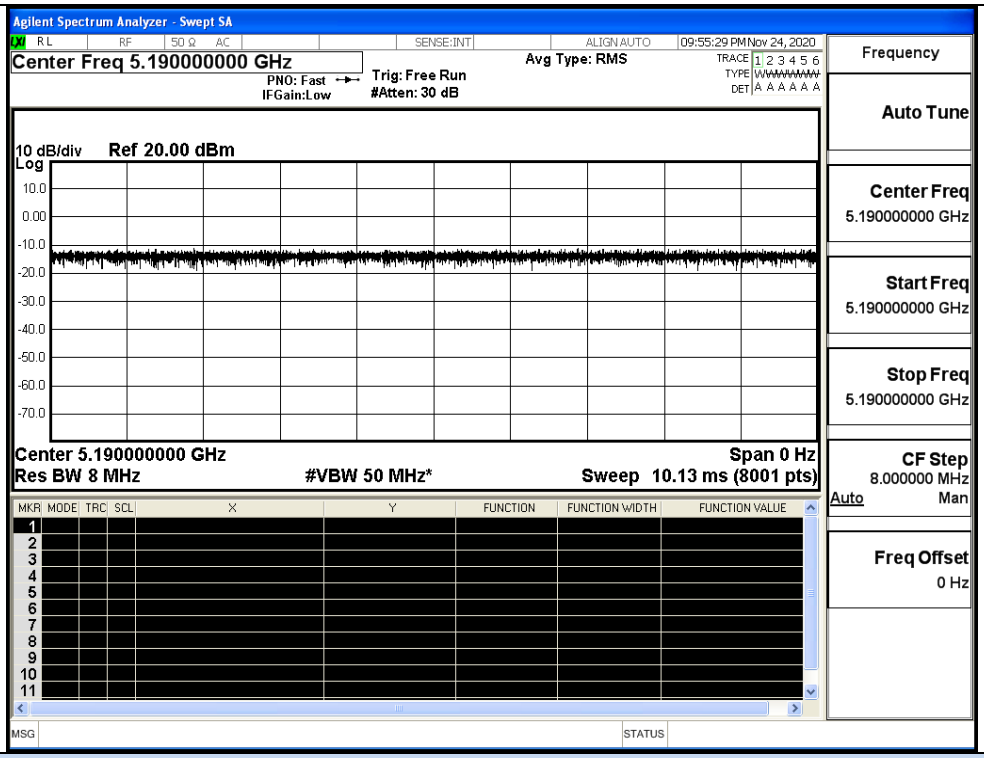
Environmental Conditions

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

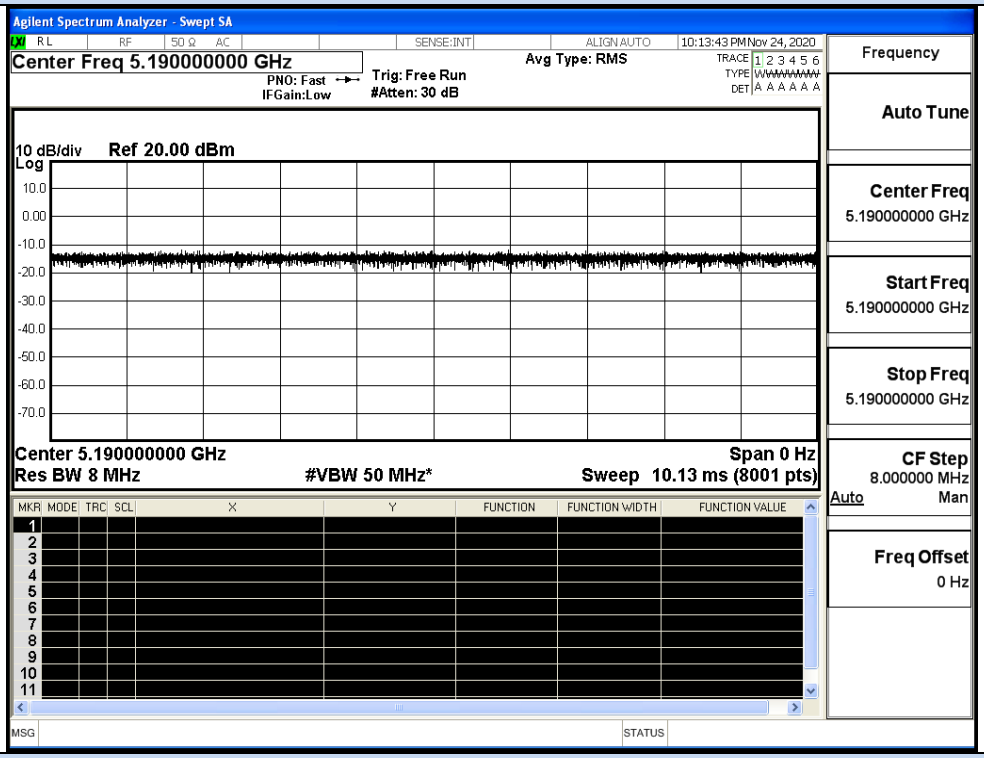
A.1 Duty Cycle

Ant0

Test Mode	Test Frequency (MHz)	Duty Cycle (%)	10log(1/x) Factor (dB)	1/B Minimum VBW(KHz)
11N40 SISO	5190	100	0.00	0.01
11AC40 SISO	5190	100	0.00	0.01



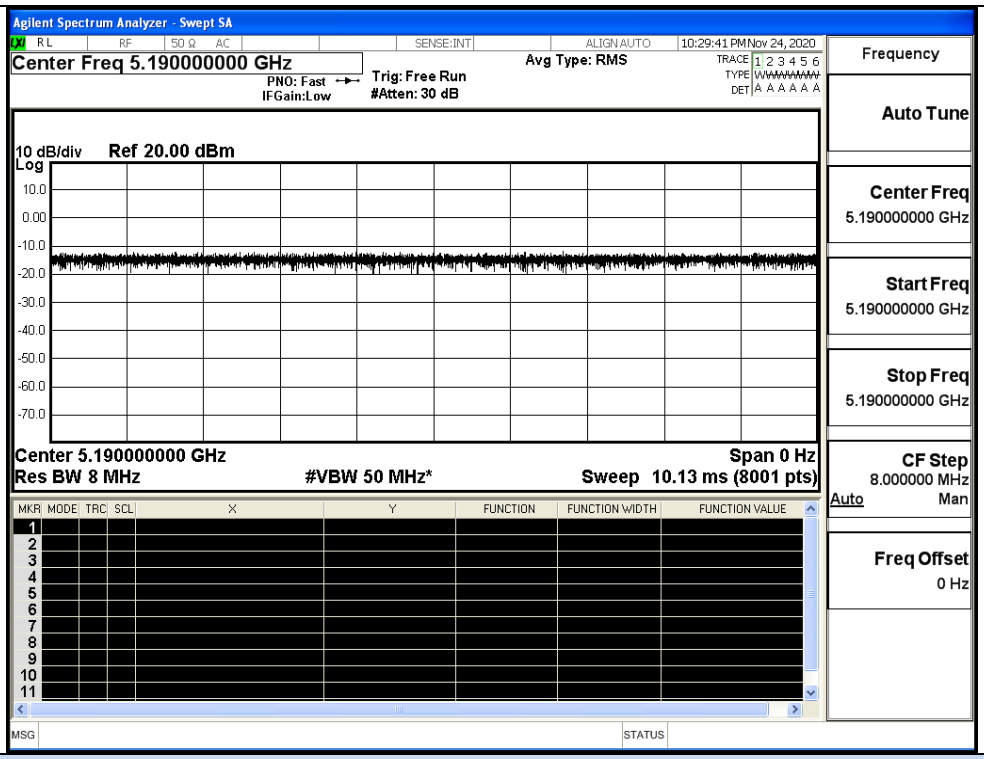
IEEE 802.11n HT40



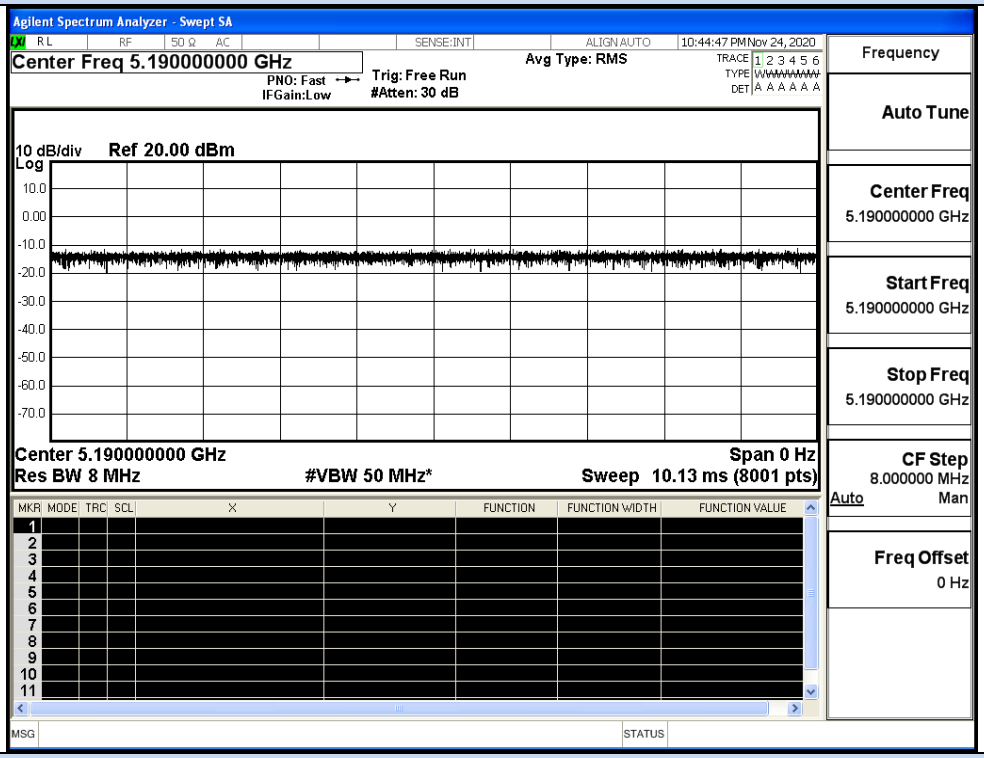
IEEE 802.11 AC40

Ant1

Test Mode	Test Frequency (MHz)	Duty Cycle (%)	10log(1/x) Factor (dB)	1/B Minimum VBW(KHz)
11N40 SISO	5190	100	0.00	0.01
11AC40 SISO	5190	100	0.00	0.01



IEEE 802.11n HT40



IEEE 802.11 AC40

A.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
11N40 SISO	38	5190	6.56	0	6.56	30	Pass
	46	5230	6.86	0	6.86		Pass
11AC40 SISO	38	5190	5.71	0	5.71	30	Pass
	46	5230	6.64	0	6.64		Pass

Ant1

Test Mode	Channel	Frequency (MHz)	AVG Conducted Power (dBm)	Duty Cycle Factor(dB)	Report Conducted Power(dBm)	Limit (dBm)	Verdict
11N40 SISO	38	5190	5.77	0	5.77	30	Pass
	46	5230	6.83	0	6.83		Pass
11AC40 SISO	38	5190	6.16	0	6.16	30	Pass
	46	5230	6.72	0	6.72		Pass

Ant0+ Ant1

Test Mode	Channel	Frequency (MHz)	AVG Conducted Power (dBm)			Duty Cycle Factor(dB)	Report Conducted Power(dBm)			Limit (dBm)	Verdict
			Ant0	Ant1	SUM		Ant0	Ant1	SUM		
11N40 SISO	38	5190	6.56	5.77	9.19	0	6.56	5.77	9.19	29.49	Pass
	46	5230	6.86	6.83	9.86	0	6.86	6.83	9.86		Pass
11AC 40 SISO	38	5190	5.71	6.16	8.95	0	5.71	6.16	8.95	29.49	Pass
	46	5230	6.64	6.72	9.69	0	6.64	6.72	9.69		Pass

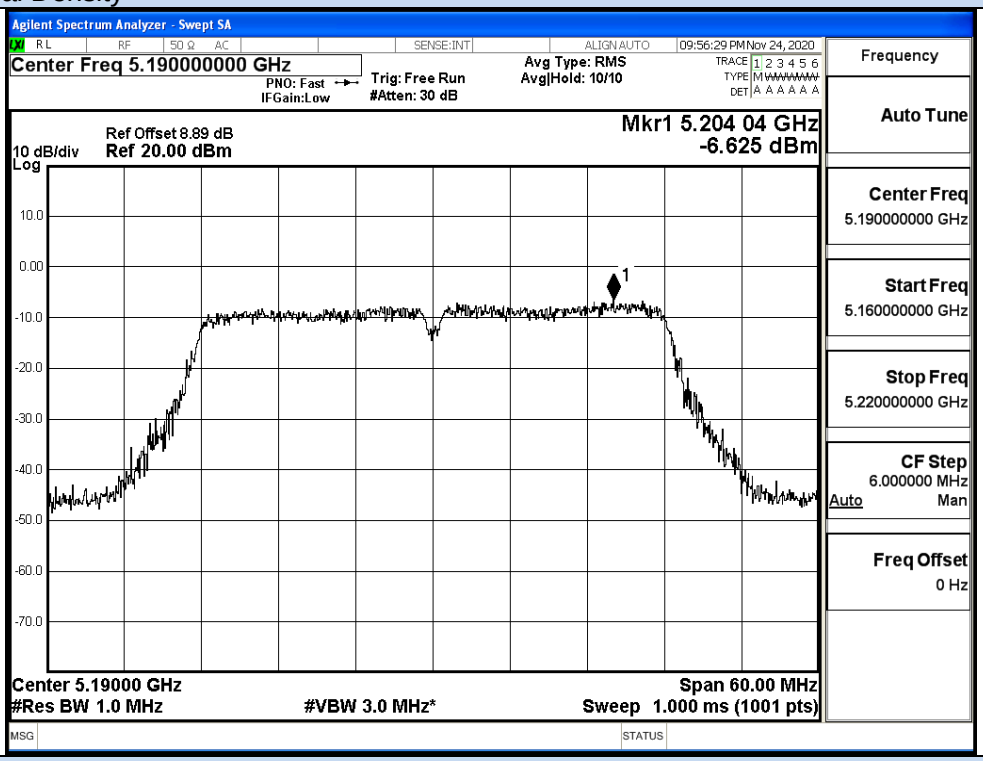
Directional gain=3.5dBi+10 log (2) = 6.51dBi > 6dBi, So the Conducted Power limit shall be reduced to 30-(6.51-6) = 29.49

A.3 Power Spectral Density

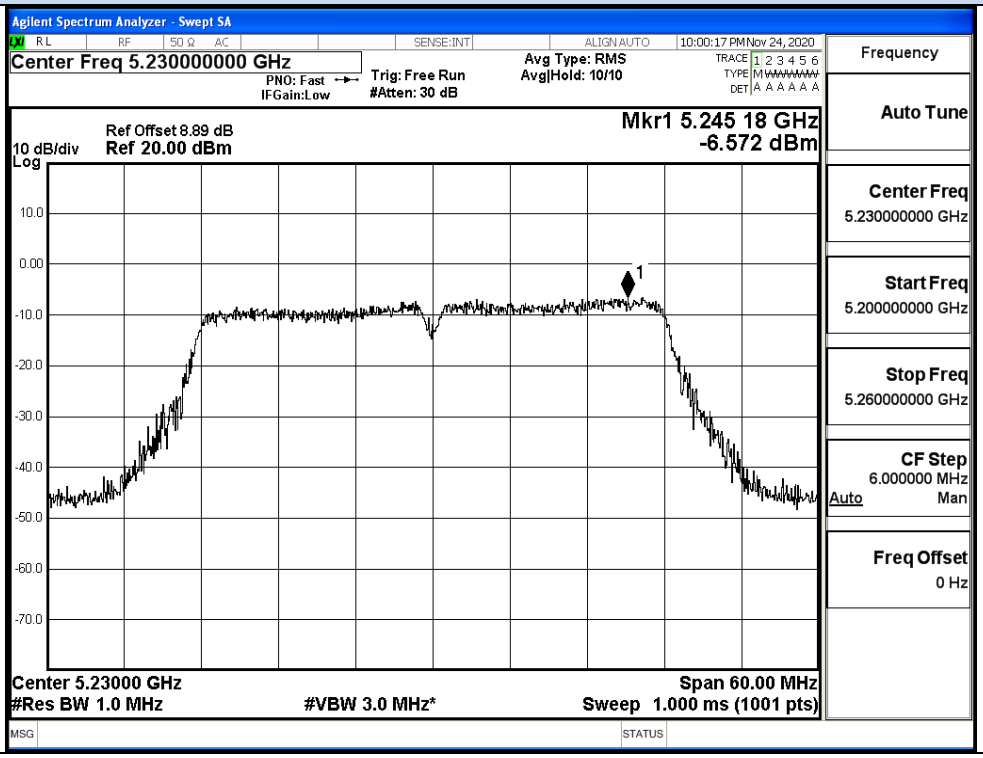
Ant0

Test Mode	Channel	Frequency (MHz)	Power Density (dBm/MHz)	Duty Cycle Factor(dB)	Report Power Density (dBm/MHz)	Limit (dBm/MHz)	Verdict
11N40 SISO	38	5190	-6.63	0	-6.63	17.0	Pass
	46	5230	-6.57	0	-6.57		Pass
11AC40 SISO	38	5190	-8.00	0	-8.00	17.0	Pass
	46	5230	-6.75	0	-6.75		Pass

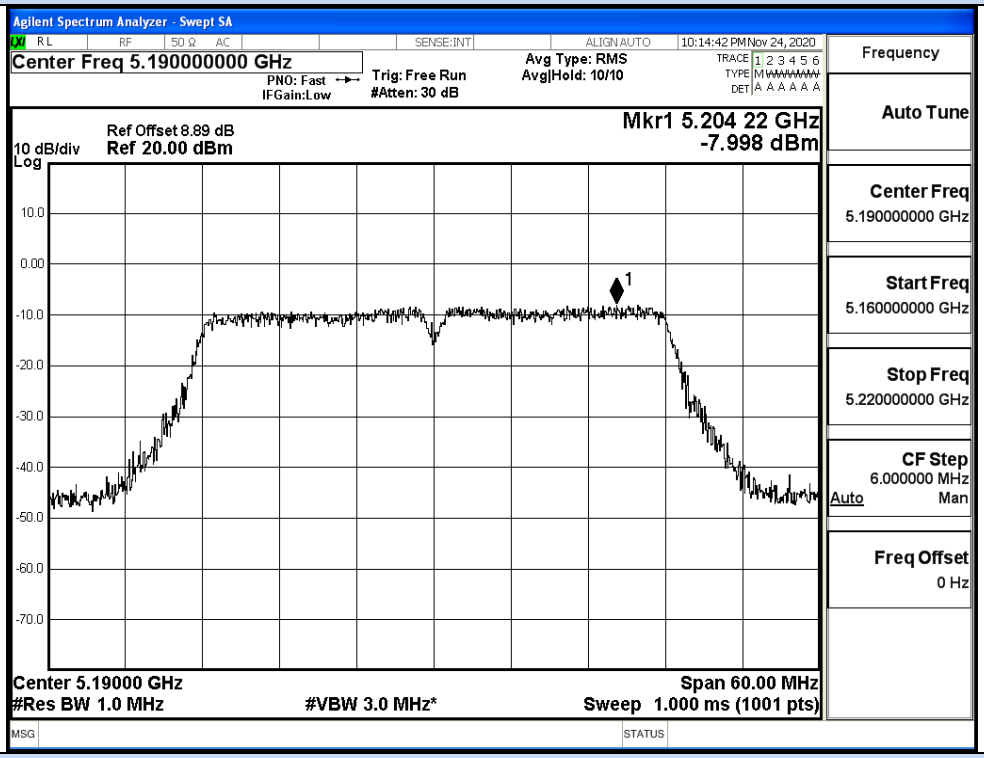
Power Spectral Density



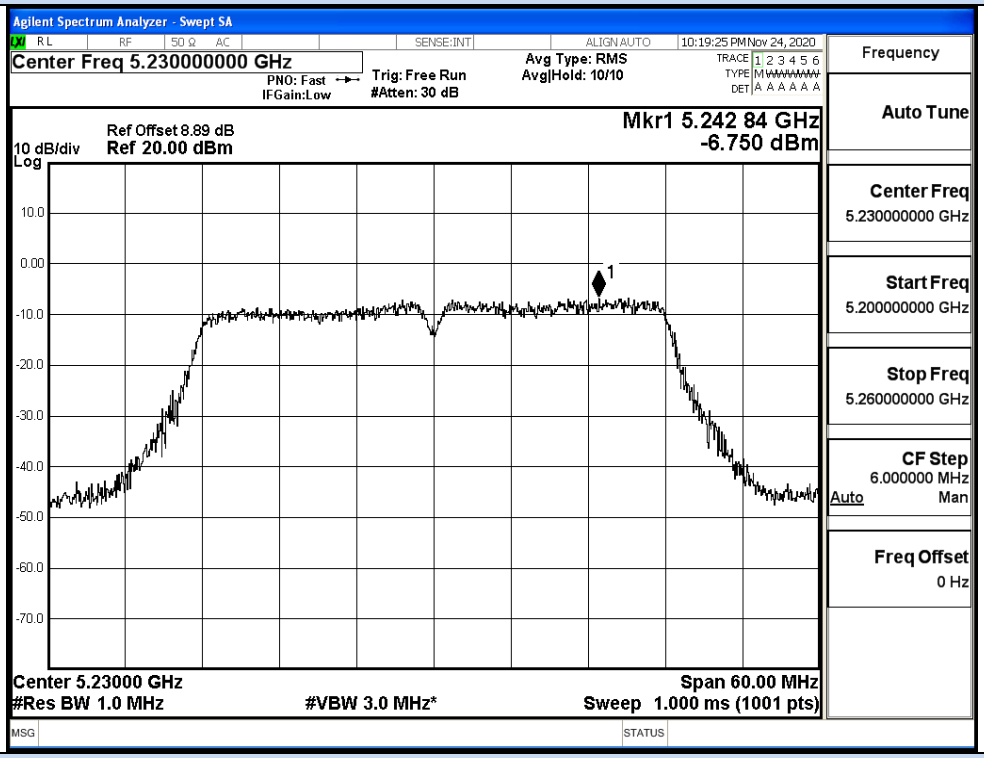
IEEE 802.11n40 / Channel 38 / 5190MHz



IEEE 802.11n40 / Channel 46 / 5230MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz

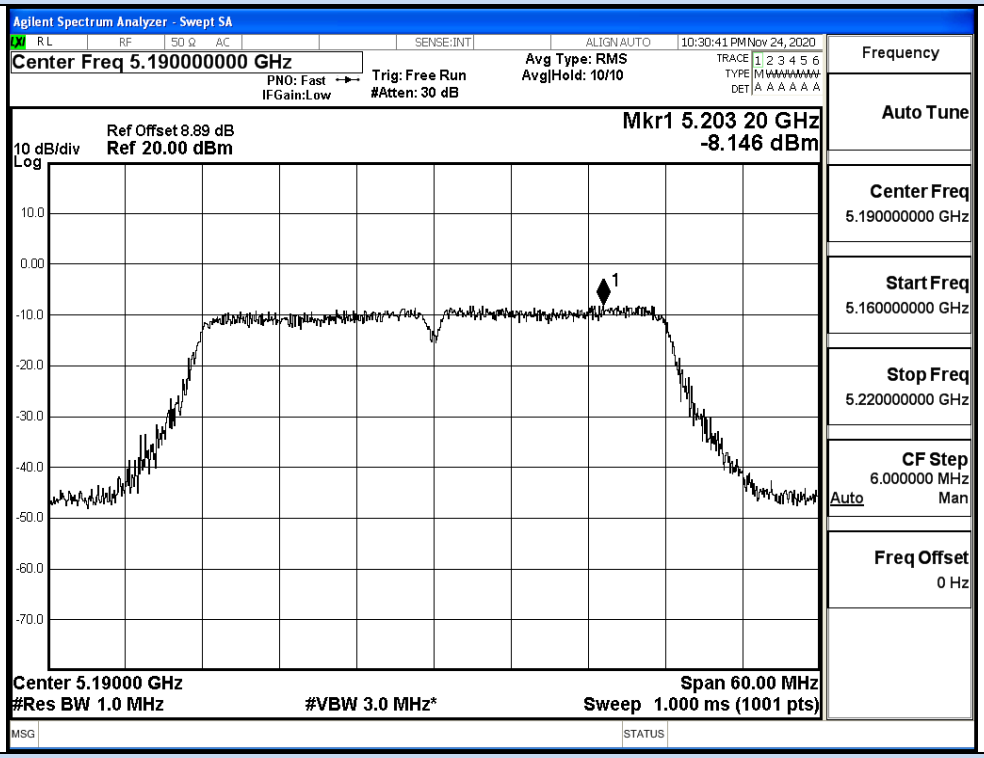


IEEE 802.11ac40 / Channel 46 / 5230MHz

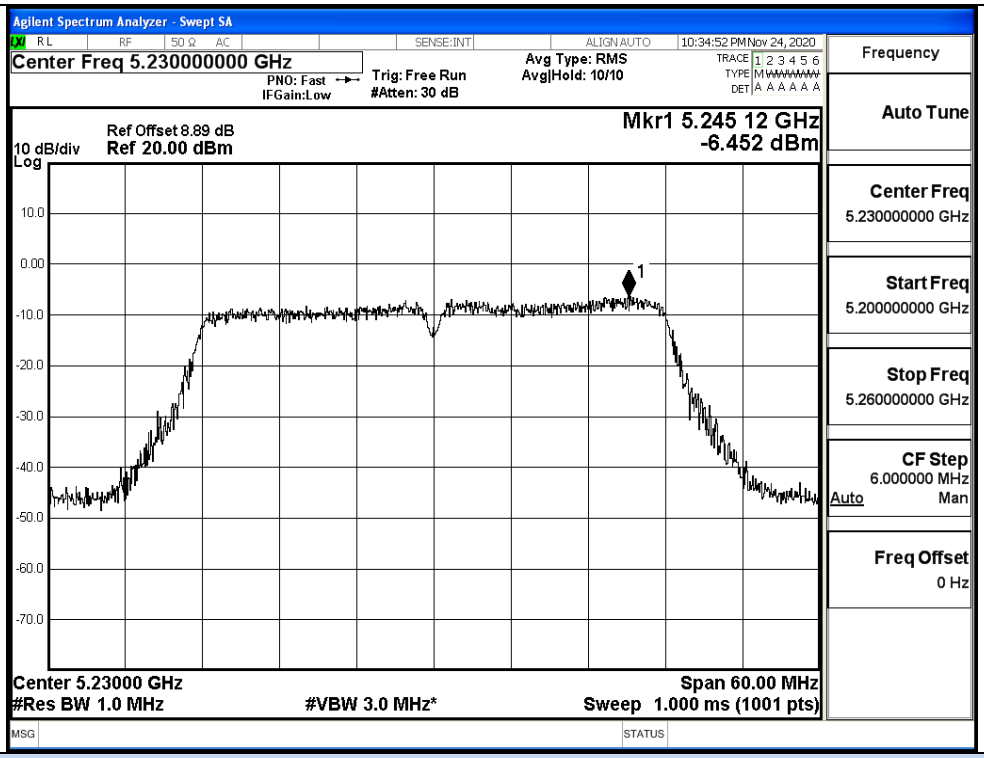
Ant1

Test Mode	Channel	Frequency (MHz)	Power Density (dBm/MHz)	Duty Cycle Factor(dB)	Report Power Density (dBm/MHz)	Limit (dBm/MHz)	Verdict
11N40 SISO	38	5190	-8.15	0	-8.15	17.0	Pass
	46	5230	-6.45	0	-6.45		Pass
11AC40 SISO	38	5190	-7.22	0	-7.22	17.0	Pass
	46	5230	-6.67	0	-6.67		Pass

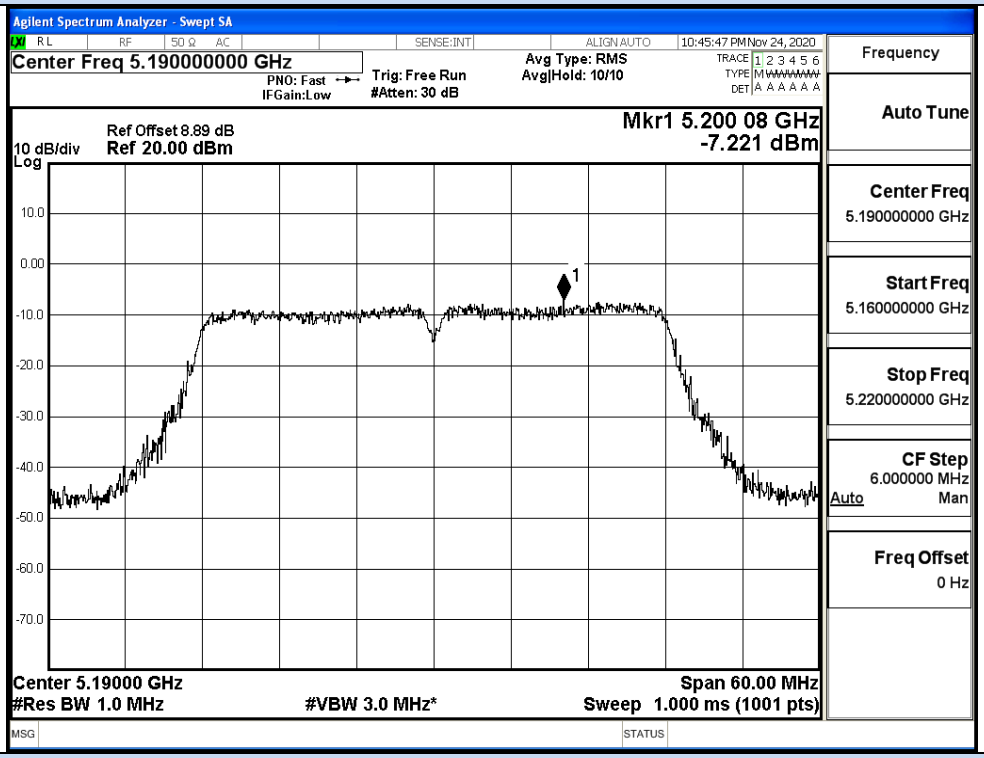
Power Spectral Density



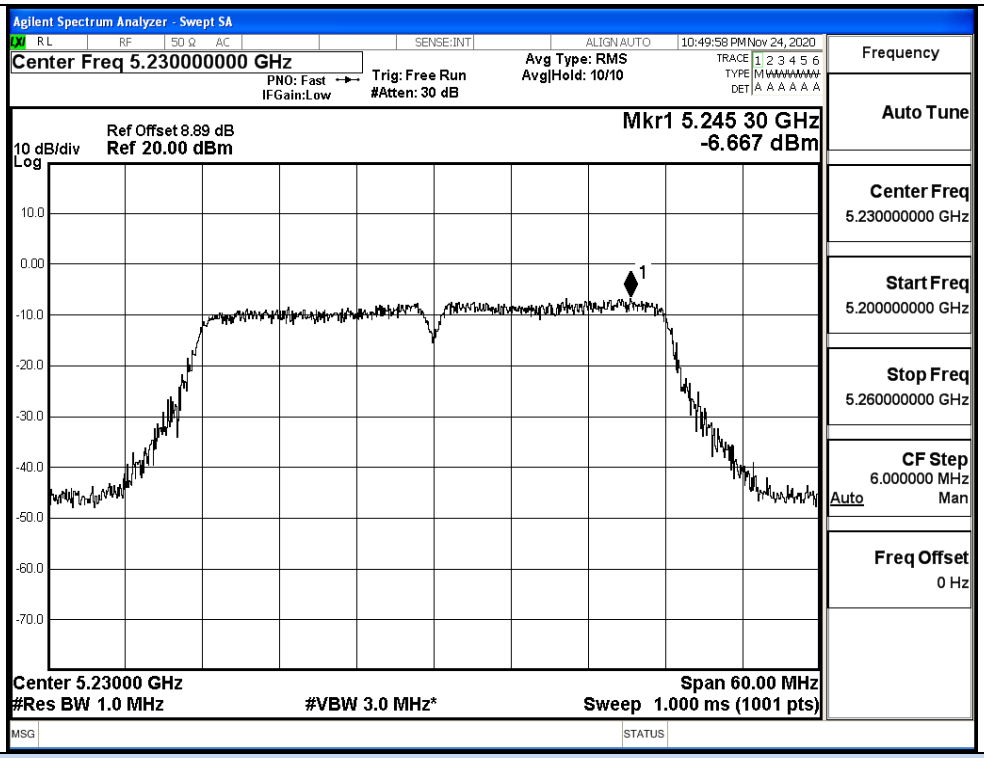
IEEE 802.11n40 / Channel 38 / 5190MHz



IEEE 802.11n40 / Channel 46 / 5230MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz



IEEE 802.11ac40 / Channel 46 / 5230MHz

Ant0+Ant1

Test Mode	Channel	Frequency (MHz)	Power Density (dBm/MHz)			Duty Cycle Factor(dB)	Report Power Density (dBm/MHz)			Limit (dBm/MHz)	Verdict
			Ant0	Ant1	sum		Ant0	Ant1	sum		
11N40 SISO	38	5190	-6.63	-8.15	-4.31	0	-6.63	-8.15	-4.31	16.49	Pass
	46	5230	-6.57	-6.45	-3.50	0	-6.57	-6.45	-3.50		Pass
11AC40 SISO	38	5190	-8.00	-7.22	-4.58	0	-8.00	-7.22	-4.58	16.49	Pass
	46	5230	-6.75	-6.67	-3.70	0	-6.75	-6.67	-3.70		Pass

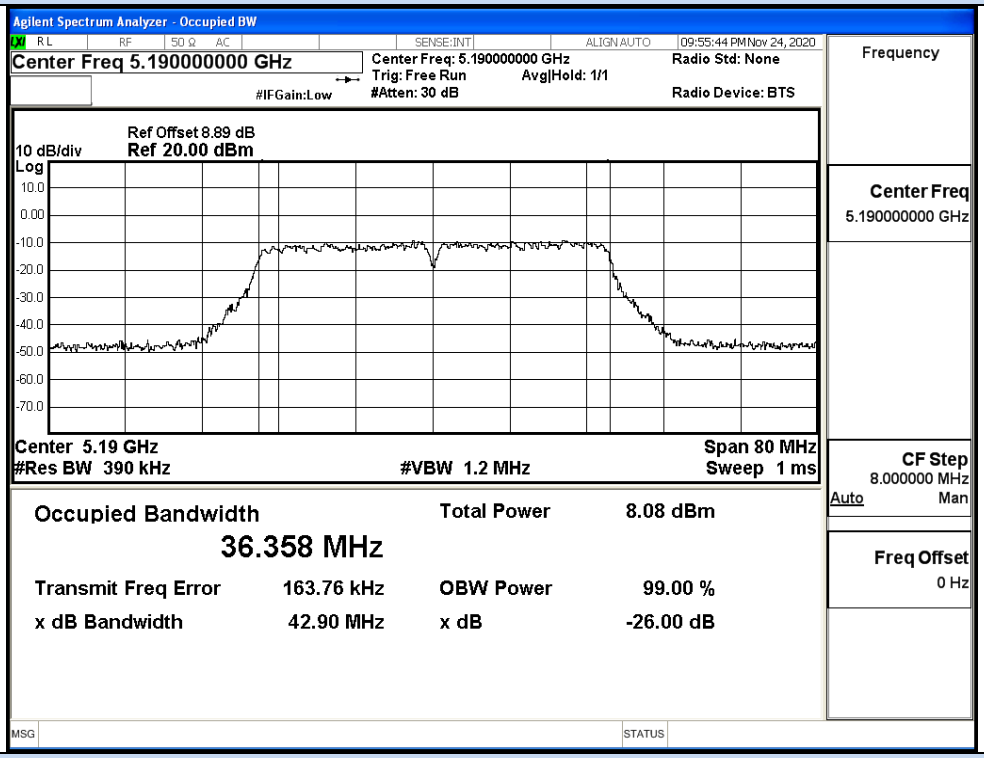
Directional gain=3.5dBi+10 log (2) = 6.51dBi > 6dBi, So the Conducted Power limit shall be reduced to 17-(6.51-6) = 16.49

A.4 Emission Bandwidth

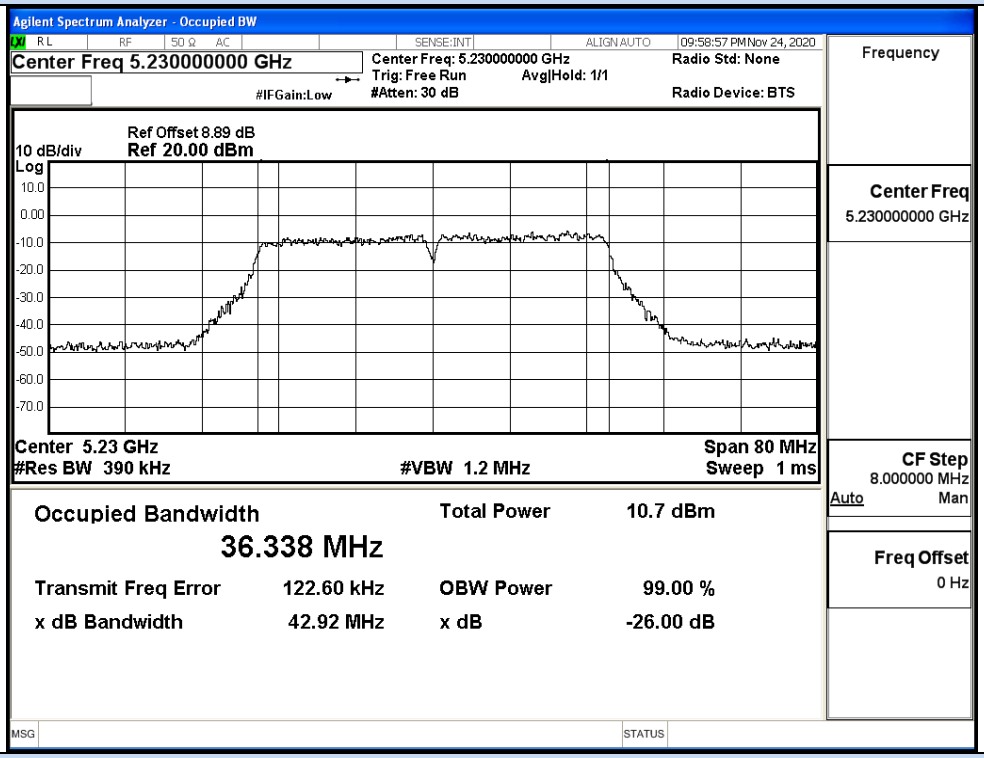
Ant0

Test Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
11N40 SISO	38	5190	42.90	No Limit	Pass
	46	5230	42.92		Pass
11AC40 SISO	38	5190	42.48	No Limi	Pass
	46	5230	43.39		Pass

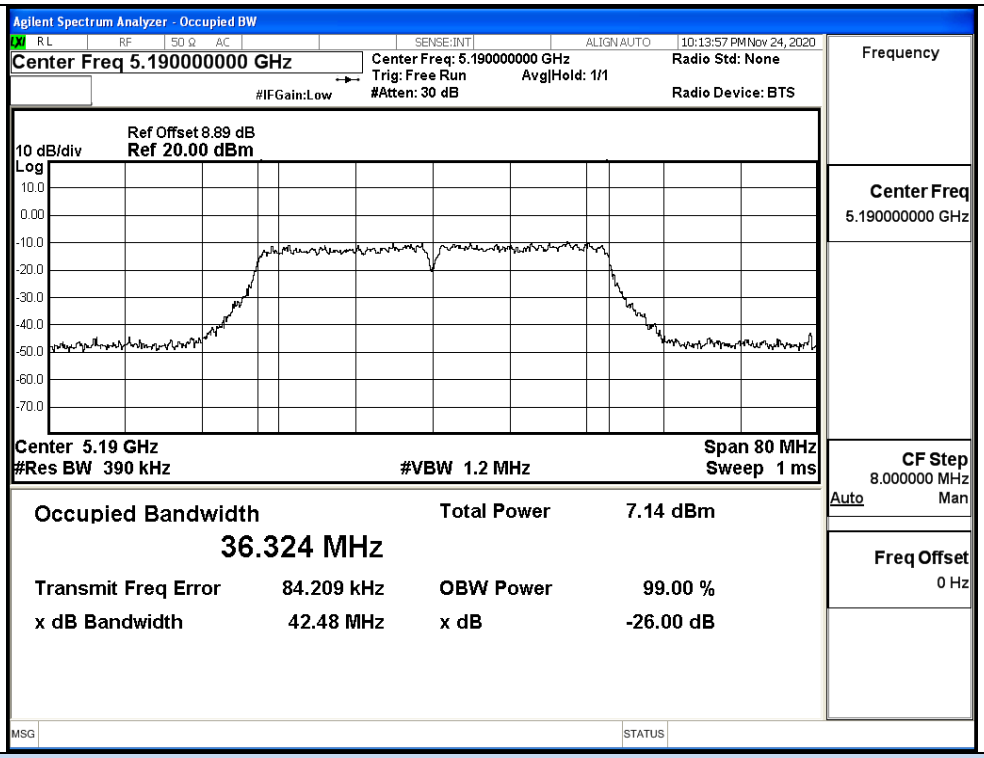
26dB Bandwidth



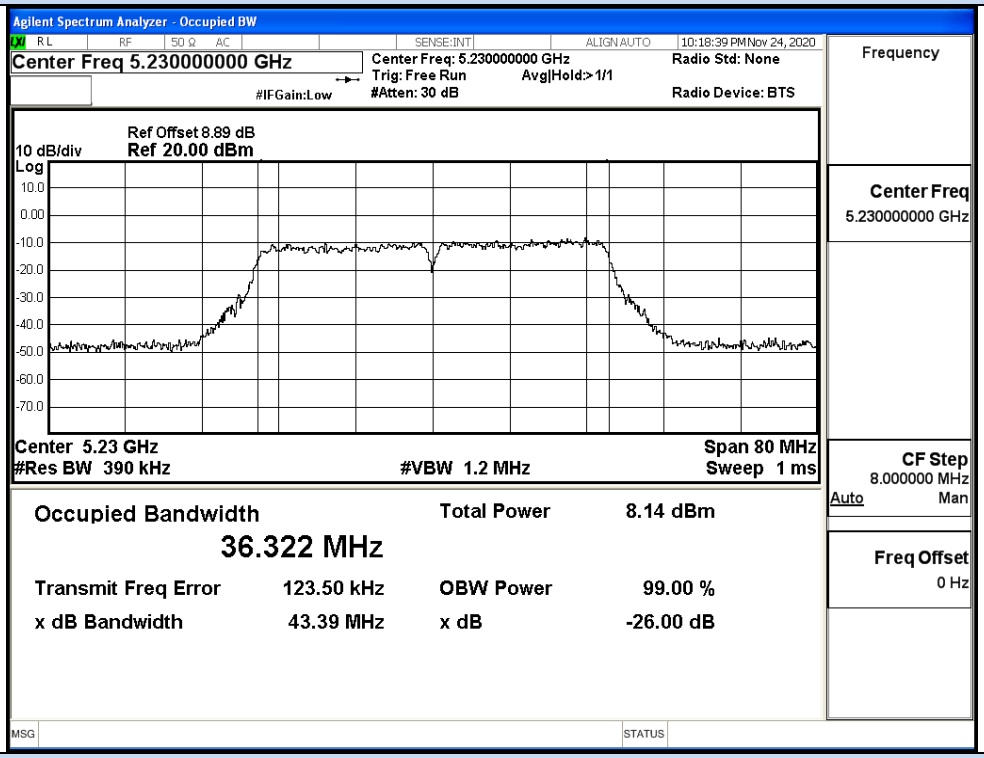
IEEE 802.11n40 / Channel 38 / 5190MHz



IEEE 802.11n40 / Channel 46 / 5230MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz

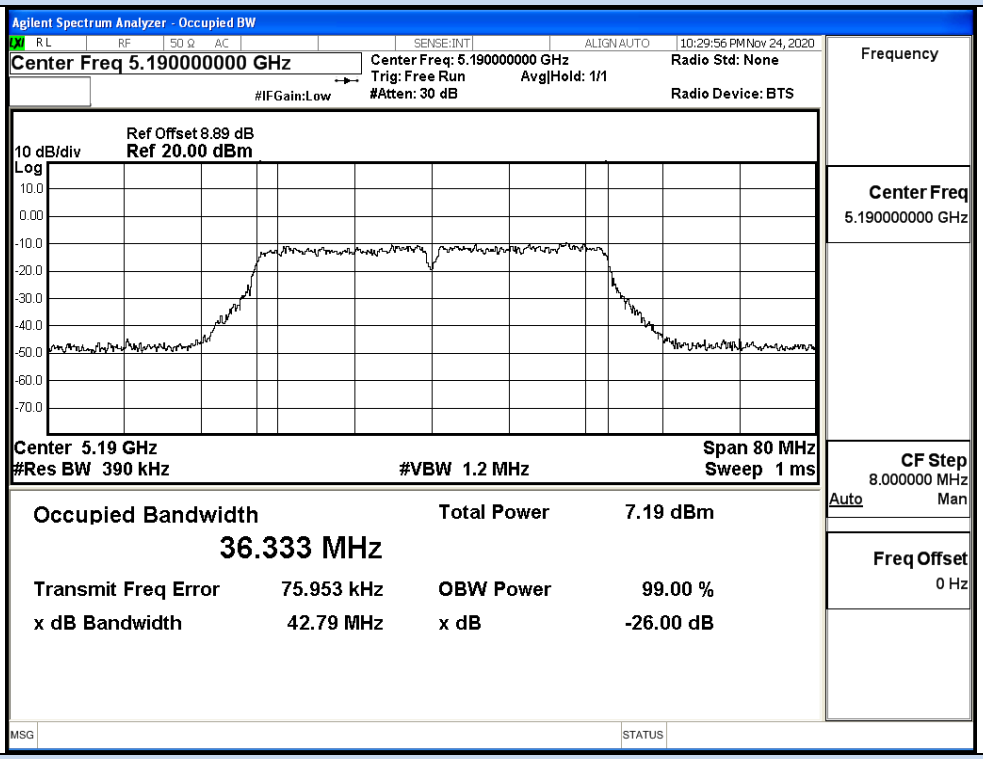


IEEE 802.11ac40 / Channel 46 / 5230MHz

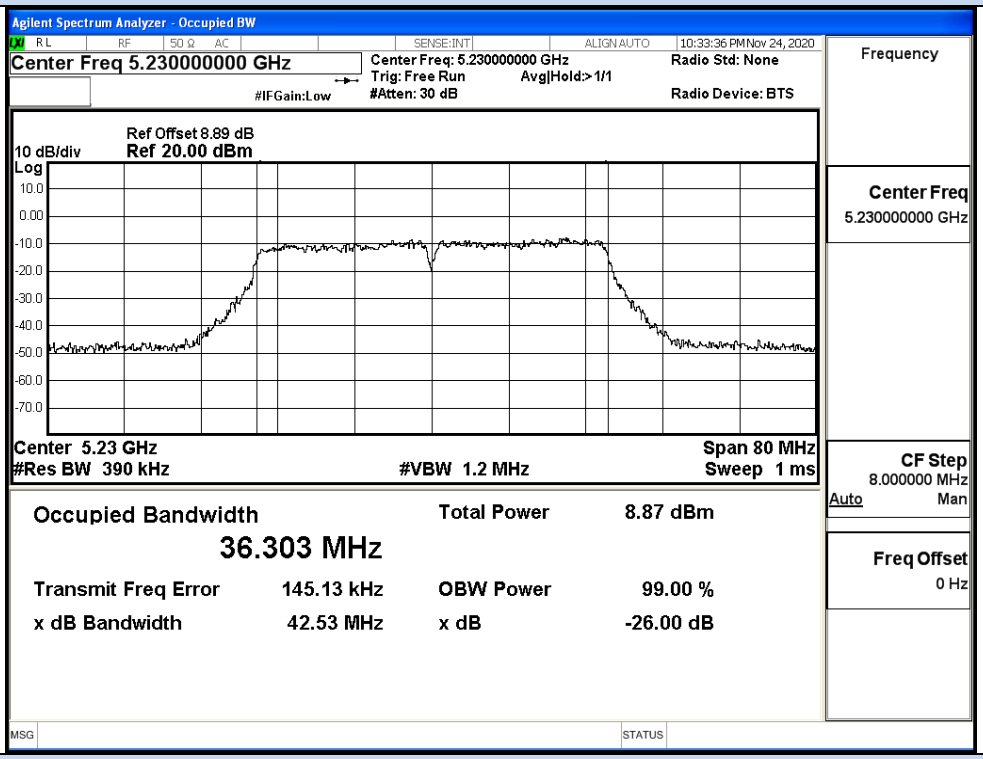
Ant1

Test Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
11N40 SISO	38	5190	42.79	No Limit	Pass
	46	5230	42.53		Pass
11AC40 SISO	38	5190	42.34	No Limi	Pass
	46	5230	42.56		Pass

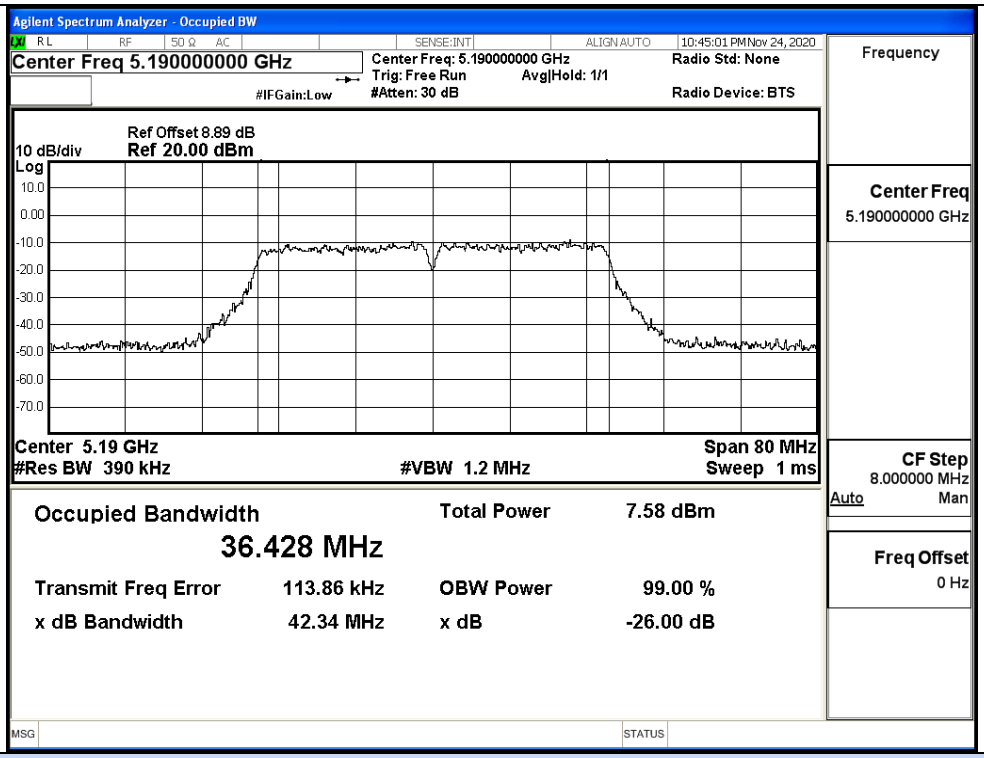
26dB Bandwidth



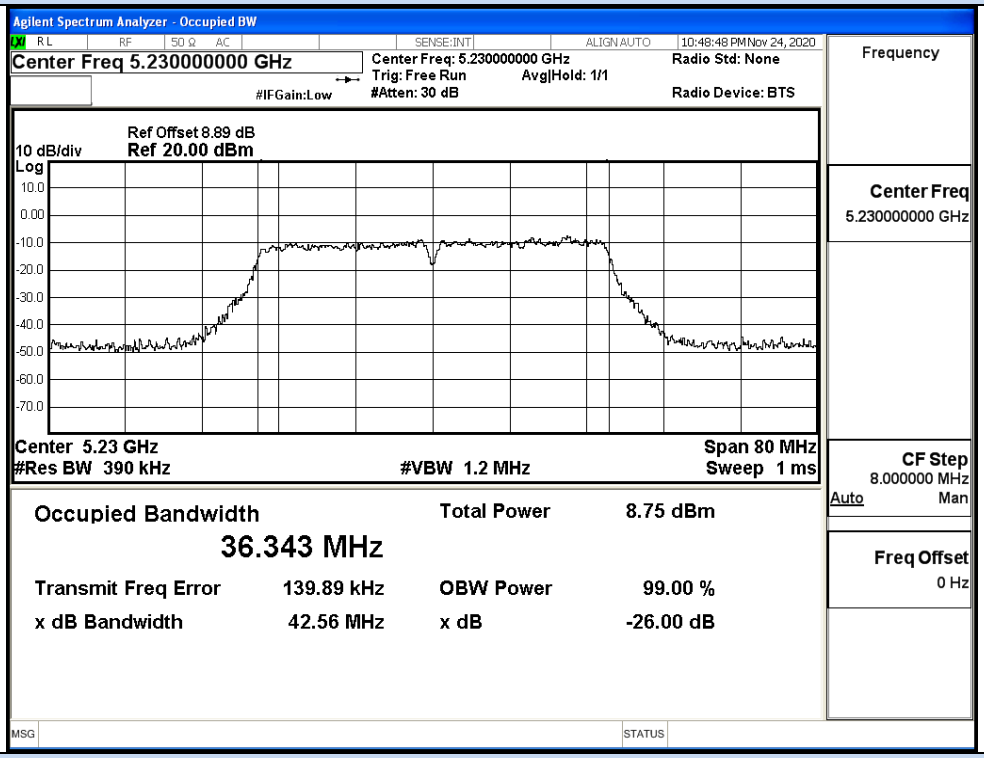
IEEE 802.11n40 / Channel 38 / 5190MHz



IEEE 802.11n40 / Channel 46 / 5230MHz



IEEE 802.11ac40 / Channel 38 / 5190MHz



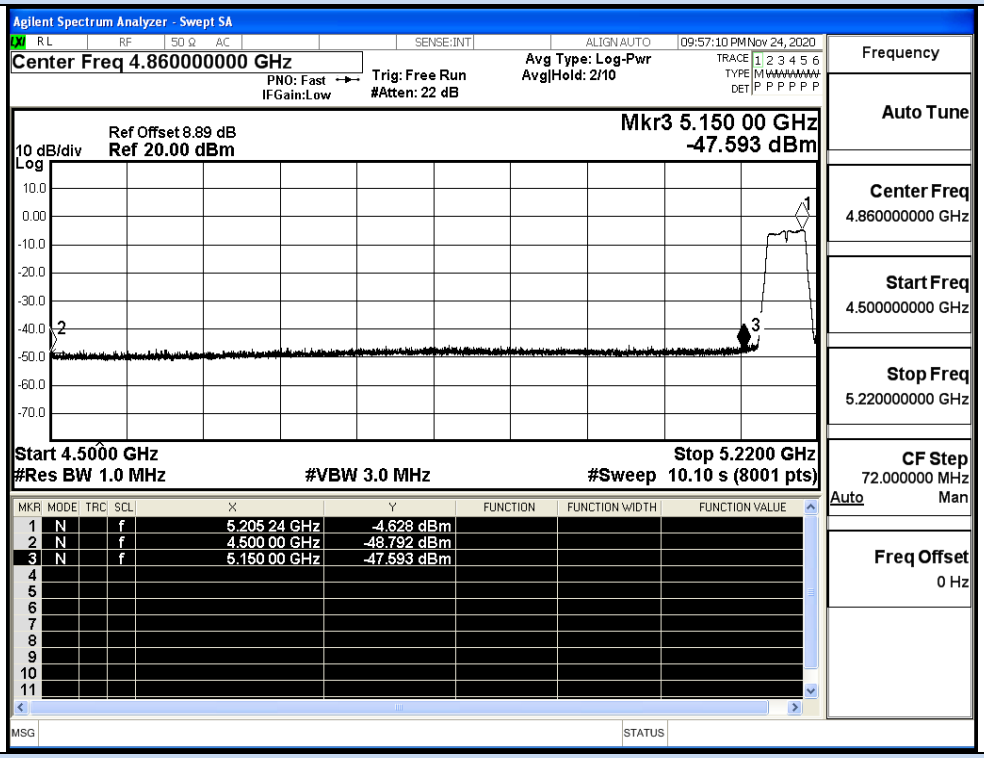
IEEE 802.11ac40 / Channel 46 / 5230MHz

A.5 Undesirable Emissions Measurement

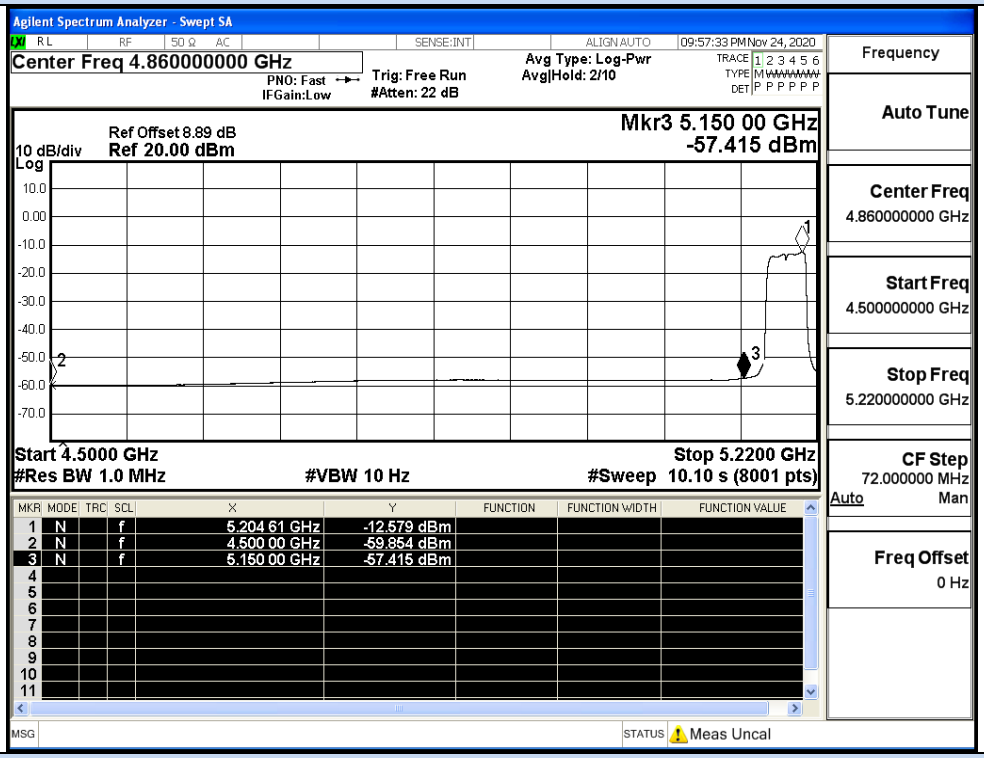
Ant0

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
11N40 SISO	38	4500.0	-48.79	3.5	0	49.97	Peak	68.20	Pass
		4500.0	-59.85	3.5	0	38.91	Average	54.00	Pass
		5150.0	-47.59	3.5	0	51.17	Peak	68.20	Pass
		5150.0	-57.42	3.5	0	41.34	Average	54.00	Pass
	46	5350.0	-48.83	3.5	0	49.93	Peak	68.20	Pass
		5350.0	-59.17	3.5	0	39.59	Average	54.00	Pass
		5460.0	-48.19	3.5	0	50.57	Peak	68.20	Pass
		5460.0	-58.63	3.5	0	40.13	Average	54.00	Pass
11AC40 SISO	38	4500.0	-49.28	3.5	0	49.48	Peak	68.20	Pass
		4500.0	-59.84	3.5	0	38.92	Average	54.00	Pass
		5150.0	-47.34	3.5	0	51.42	Peak	68.20	Pass
		5150.0	-57.54	3.5	0	41.22	Average	54.00	Pass
	46	5350.0	-49.38	3.5	0	49.38	Peak	68.20	Pass
		5350.0	-59.16	3.5	0	39.60	Average	54.00	Pass
		5460.0	-48.39	3.5	0	50.37	Peak	68.20	Pass
		5460.0	-58.61	3.5	0	40.15	Average	54.00	Pass

Undesirable Emissions Measurement

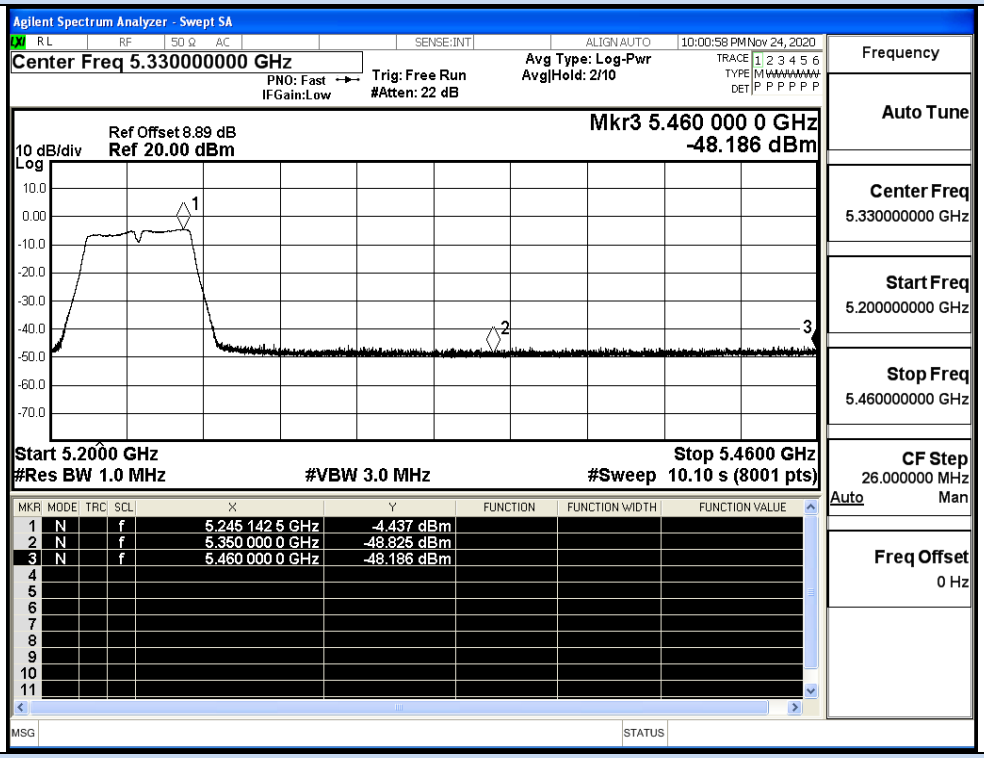


IEEE 802.11n40 / Channel 38 / 5190MHz / Peak

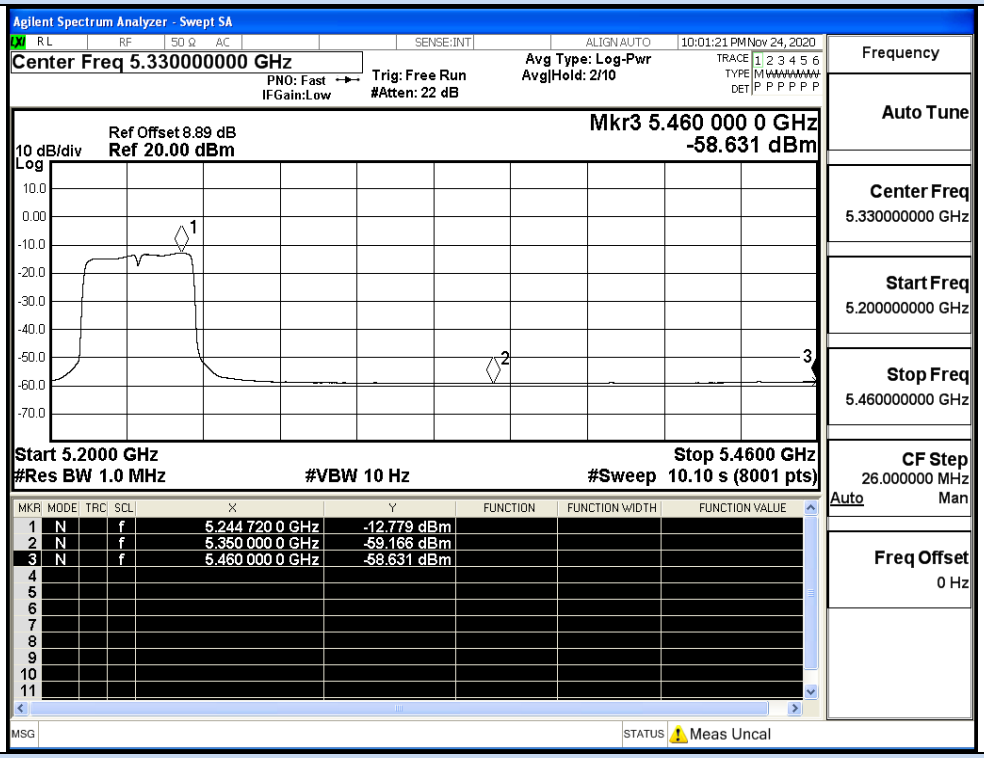


IEEE 802.11n40 / Channel 38 / 5190MHz / Average

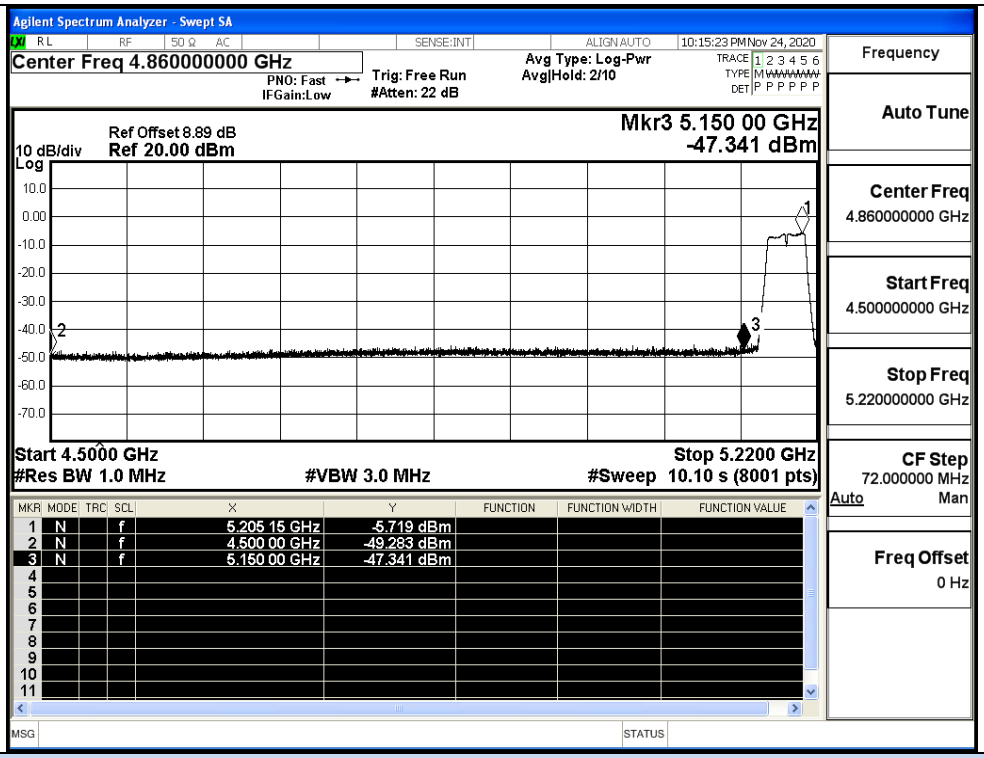
Undesirable Emissions Measurement



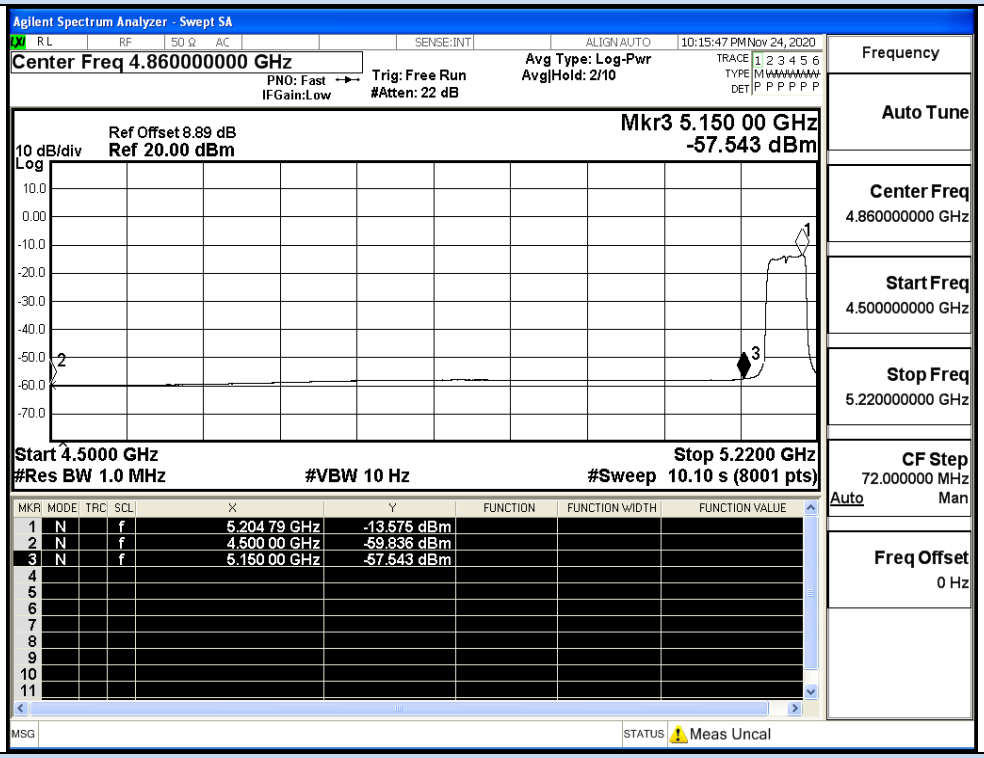
IEEE 802.11n40 / Channel 46 / 5230MHz / Peak



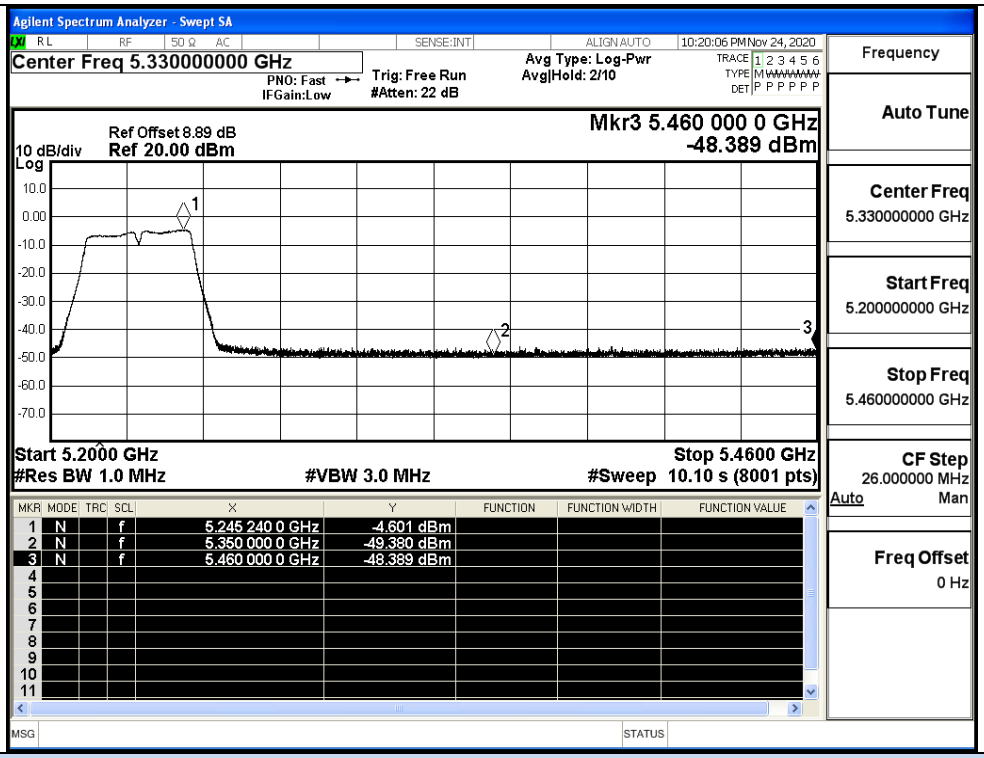
IEEE 802.11n40 / Channel 46 / 5230MHz / Average



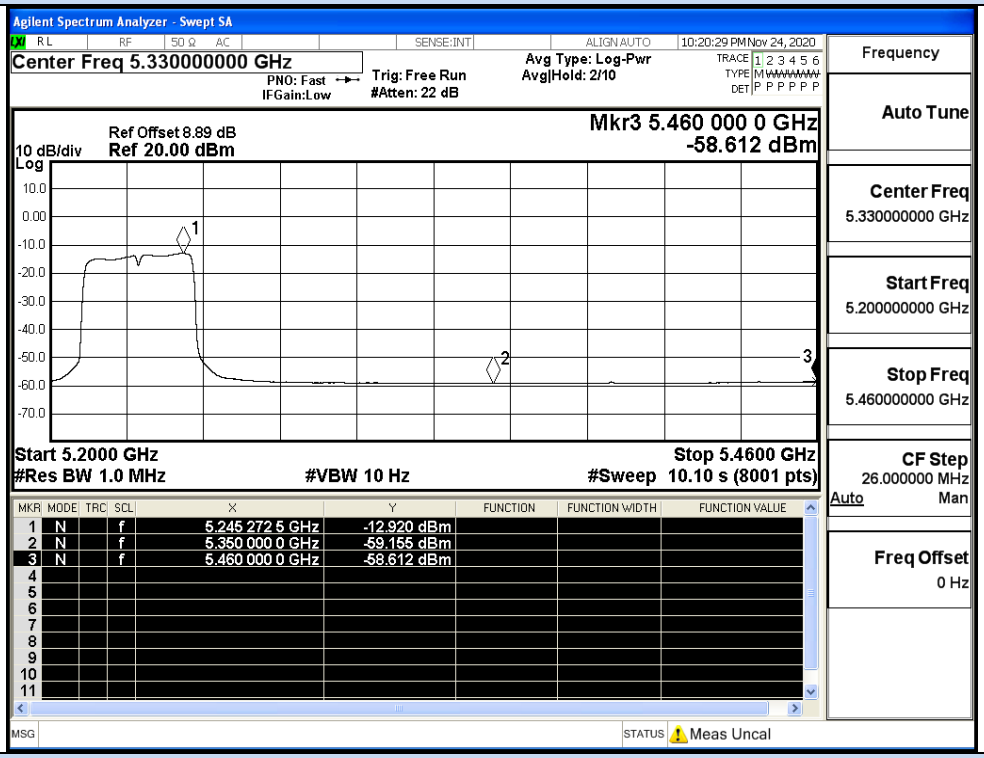
IEEE 802.11ac40 / Channel 38/ 5190MHz / Peak



IEEE 802.11ac40 / Channel 38 / 5190MHz / Average



IEEE 802.11ac40 / Channel 46/ 5230MHz / Peak

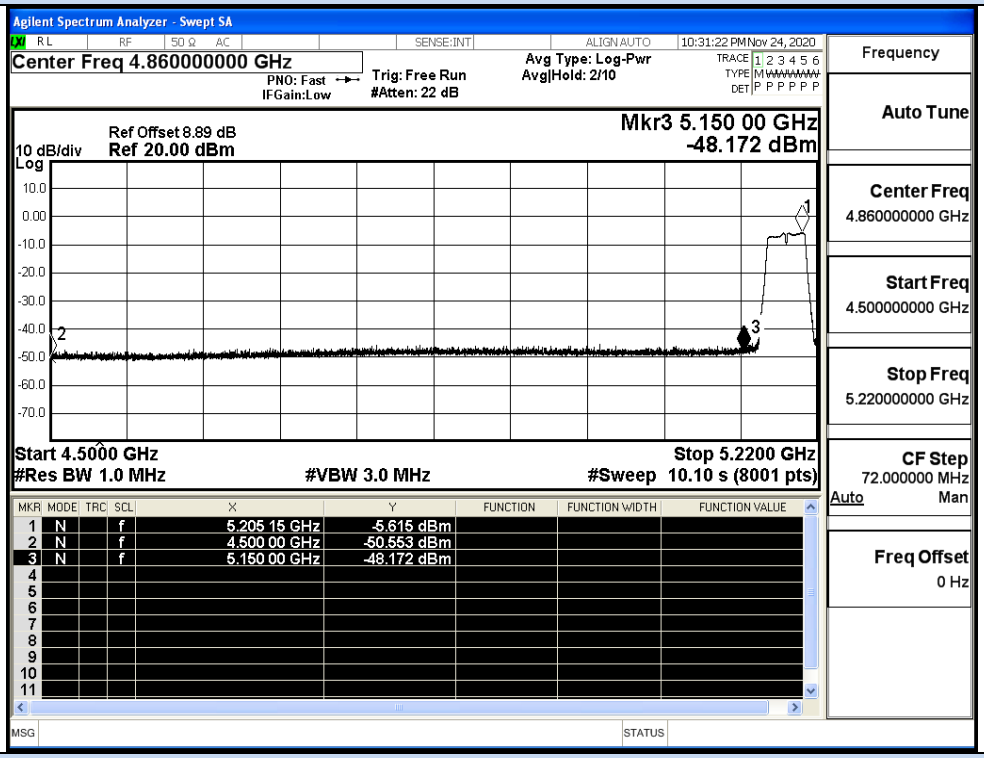


IEEE 802.11ac40 / Channel 46 / 5230MHz / Average

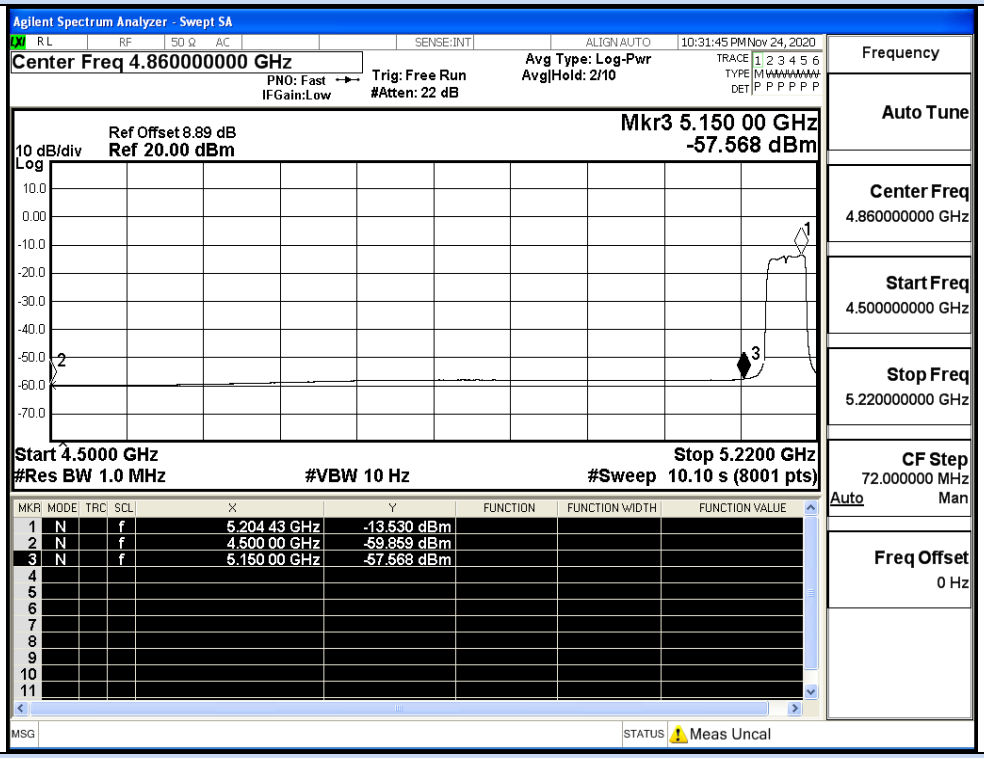
Ant1

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
11N40 SISO	38	4500.0	-50.55	3.5	0	48.21	Peak	68.20	Pass
		4500.0	-59.86	3.5	0	38.90	Average	54.00	Pass
		5150.0	-48.17	3.5	0	50.59	Peak	68.20	Pass
		5150.0	-57.57	3.5	0	41.19	Average	54.00	Pass
	46	5350.0	-49.18	3.5	0	49.58	Peak	68.20	Pass
		5350.0	-59.16	3.5	0	39.60	Average	54.00	Pass
		5460.0	-49.03	3.5	0	49.73	Peak	68.20	Pass
		5460.0	-58.60	3.5	0	40.16	Average	54.00	Pass
11AC40 SISO	38	4500.0	-49.77	3.5	0	48.99	Peak	68.20	Pass
		4500.0	-59.84	3.5	0	38.92	Average	54.00	Pass
		5150.0	-47.98	3.5	0	50.78	Peak	68.20	Pass
		5150.0	-57.45	3.5	0	41.31	Average	54.00	Pass
	46	5350.0	-49.16	3.5	0	49.60	Peak	68.20	Pass
		5350.0	-59.15	3.5	0	39.61	Average	54.00	Pass
		5460.0	-48.16	3.5	0	50.60	Peak	68.20	Pass
		5460.0	-58.60	3.5	0	40.16	Average	54.00	Pass

Undesirable Emissions Measurement

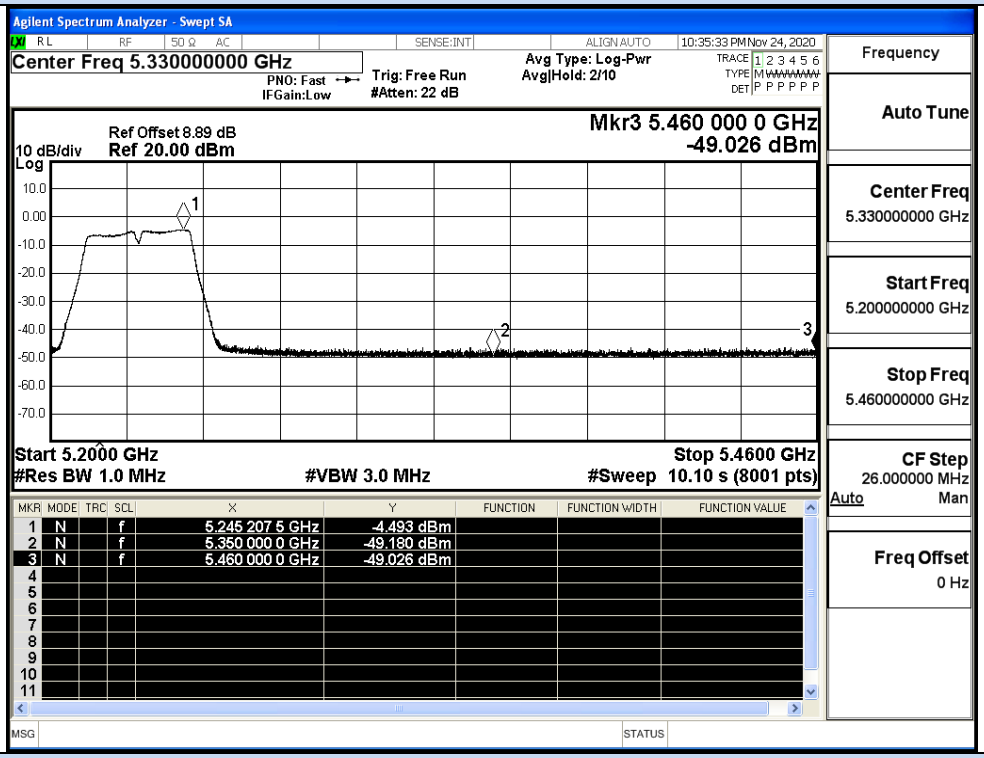


IEEE 802.11n40 / Channel 38 / 5190MHz / Peak

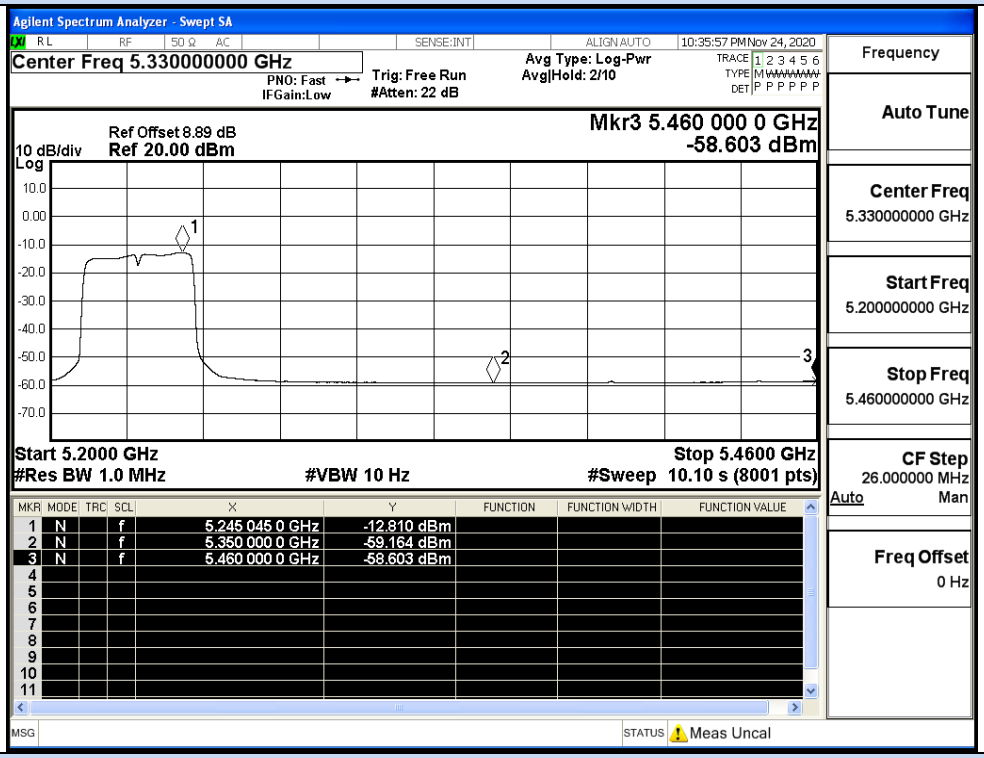


IEEE 802.11n40 / Channel 38 / 5190MHz / Average

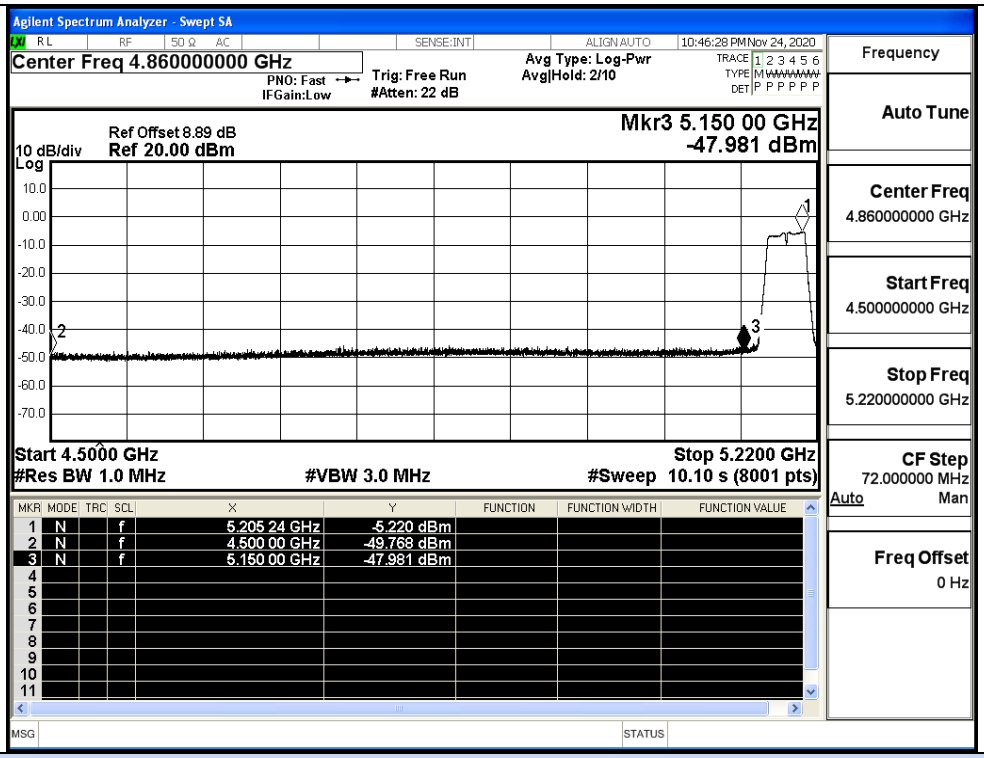
Undesirable Emissions Measurement



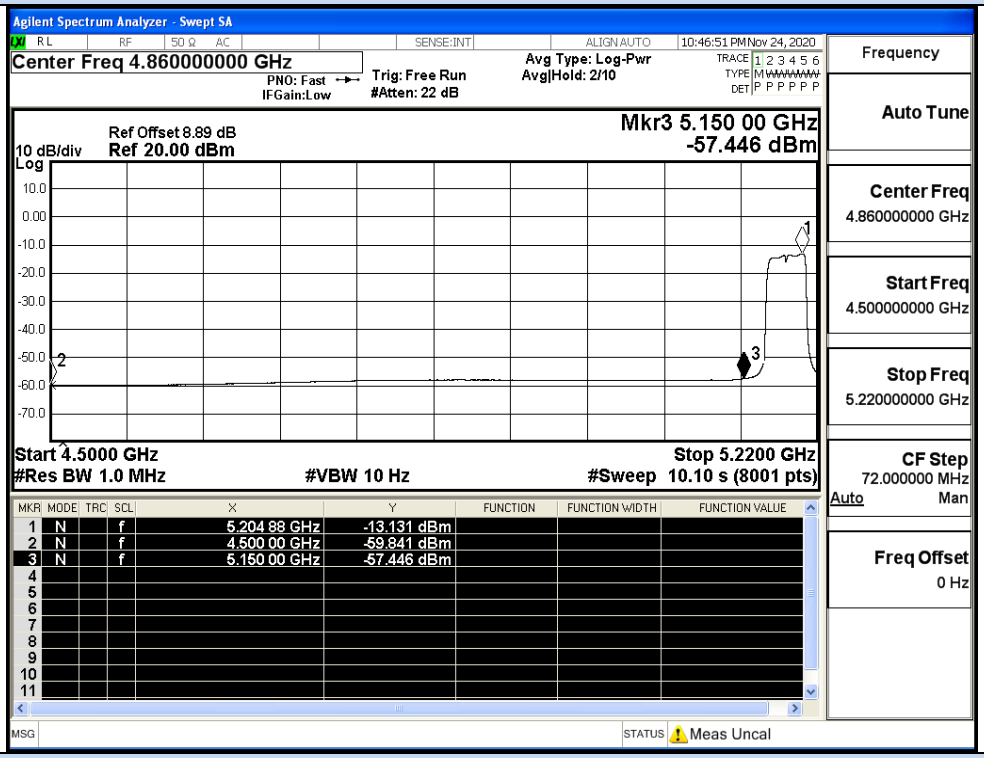
IEEE 802.11n40 / Channel 46 / 5230MHz / Peak



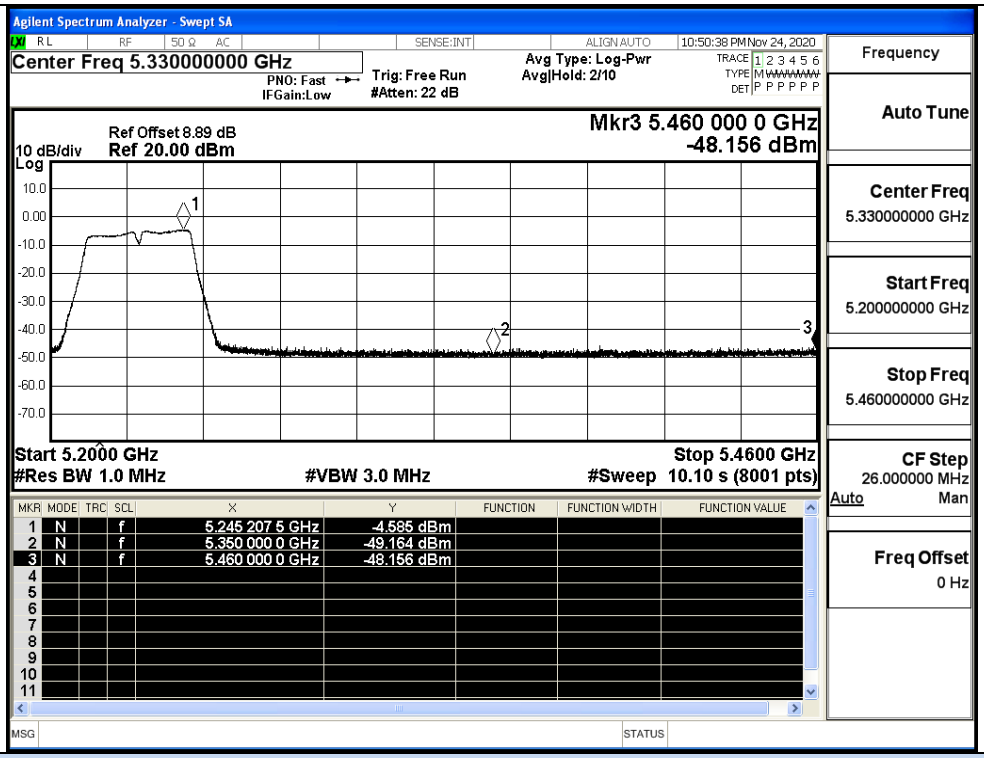
IEEE 802.11n40 / Channel 46 / 5230MHz / Average



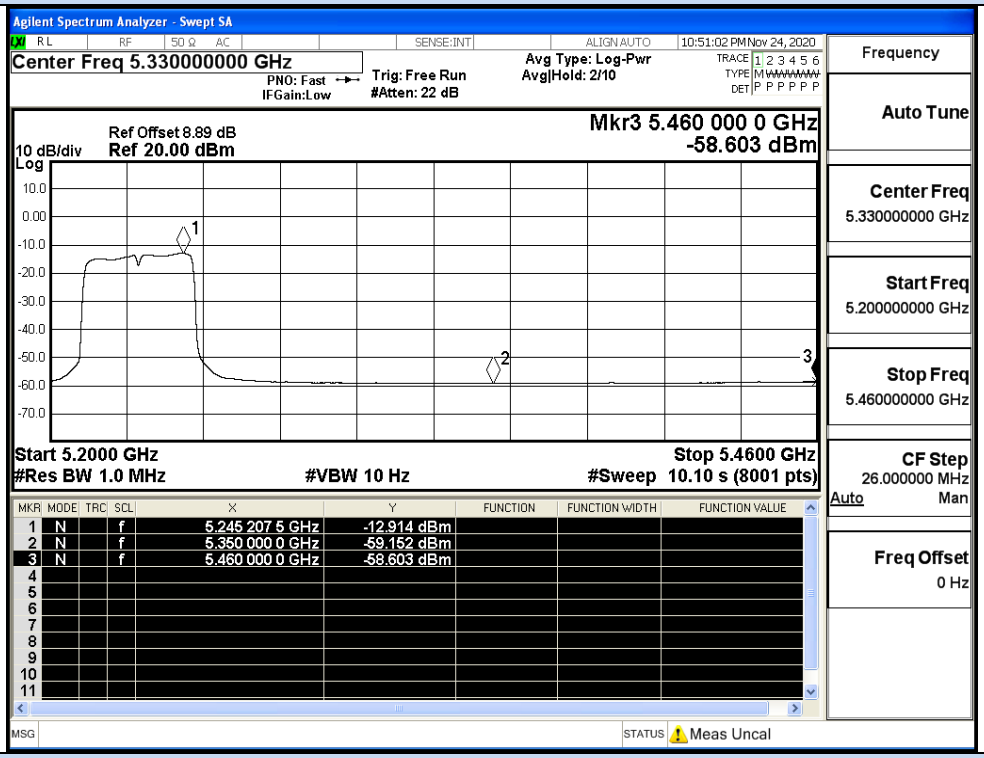
IEEE 802.11ac40 / Channel 38/ 5190MHz / Peak



IEEE 802.11ac40 / Channel 38 / 5190MHz / Average



IEEE 802.11ac40 / Channel 46/ 5230MHz / Peak



IEEE 802.11ac40 / Channel 46 / 5230MHz / Average

Ant0+Ant1

Test Mode	Channel	Frequency (MHz)	ANT 0 Conducted Power (dBm)	ANT 1 Conducted Power (dBm)	ANT 0-1 Conducted Power (dBm)	Antenna Gain (dBi)	Ground Reflection Factor (dB)	Covert Radiated E Level At 3m (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
11N40 SISO	38	4500.0	-48.79	-50.55	-45.78	6.51	0	55.99	Peak	68.20	Pass
		4500.0	-59.85	-59.86	-56.84	6.51	0	44.93	Average	54.00	Pass
		5150.0	-47.59	-48.17	-44.58	6.51	0	57.19	Peak	68.20	Pass
		5150.0	-57.42	-57.57	-54.41	6.51	0	47.36	Average	54.00	Pass
	46	5350.0	-48.83	-49.18	-45.82	6.51	0	55.95	Peak	68.20	Pass
		5350.0	-59.17	-59.16	-56.16	6.51	0	45.61	Average	54.00	Pass
		5460.0	-48.19	-49.03	-45.18	6.51	0	56.59	Peak	68.20	Pass
		5460.0	-58.63	-58.60	-55.62	6.51	0	46.15	Average	54.00	Pass
11AC40 SISO	38	4500.0	-49.28	-49.77	-46.51	6.51	0	55.26	Peak	68.20	Pass
		4500.0	-59.84	-59.84	-56.83	6.51	0	44.94	Average	54.00	Pass
		5150.0	-47.34	-47.98	-44.64	6.51	0	57.13	Peak	68.20	Pass
		5150.0	-57.54	-57.45	-54.48	6.51	0	47.29	Average	54.00	Pass
	46	5350.0	-49.38	-49.16	-46.26	6.51	0	55.51	Peak	68.20	Pass
		5350.0	-59.16	-59.15	-56.14	6.51	0	45.63	Average	54.00	Pass
		5460.0	-48.39	-48.16	-45.26	6.51	0	56.51	Peak	68.20	Pass
		5460.0	-58.61	-58.60	-55.59	6.51	0	46.18	Average	54.00	Pass

E [dBuV/m]= Power [dBm] + Gain + 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 3.5dBi, whichever is greater

Directional gain=3.5dBi+10 log (2) = 6.51dBi