Appendix A
RF Test Data for 5.2G WLAN (Conducted Measurement)
Product Name: VPIXEL Phantom Wireless audio and video transceiver system
Trade Mark: VANXVM
Test Model: Vpixel_S

Environmental Conditions

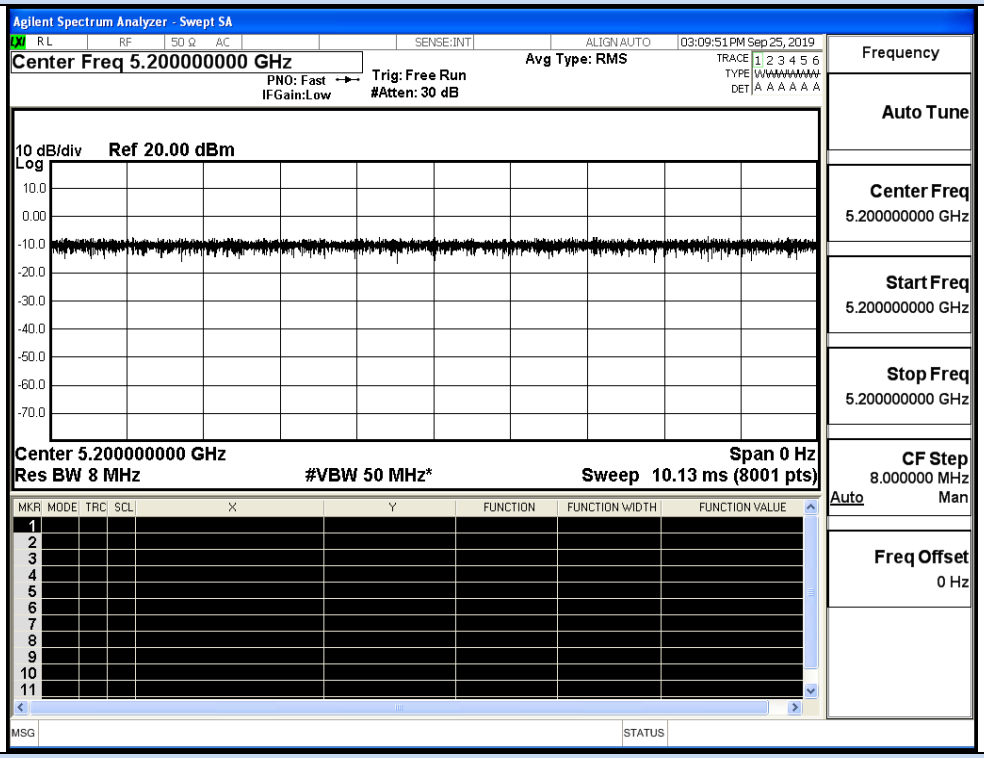
Temperature:	23.2 ° C
Relative Humidity:	52.9%
ATM Pressure:	100.0 kPa
Test Engineer:	JK Zhou
Supervised by:	Wang Chuang

A.1 Duty Cycle

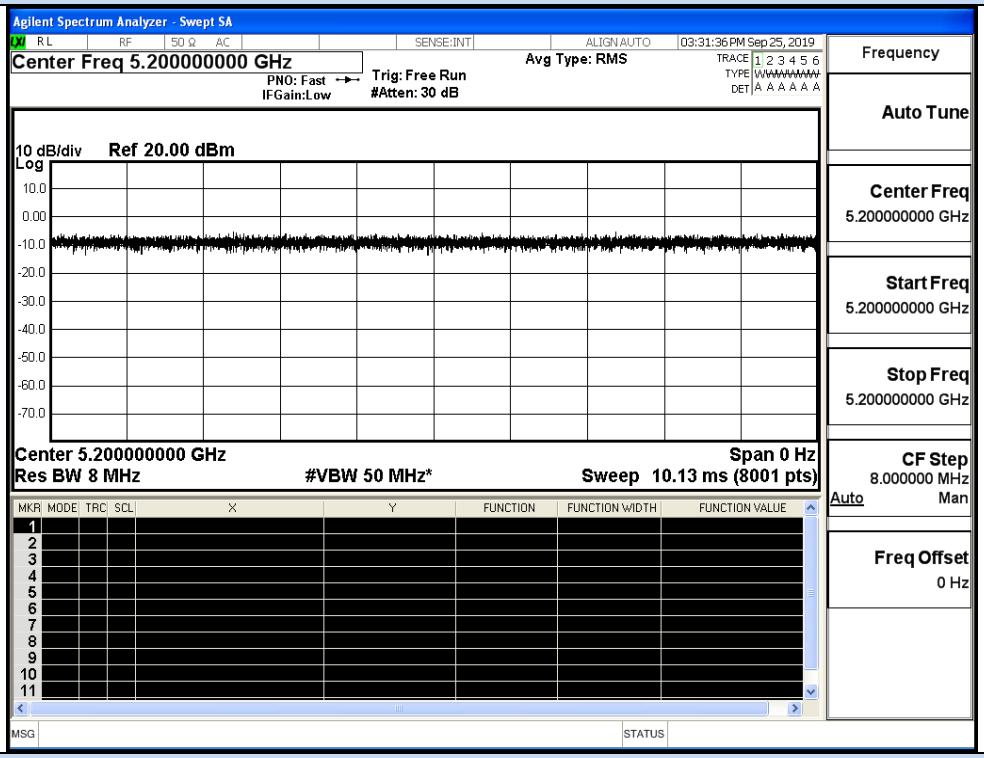
Ant0

Test Mode	Test Frequency (MHz)	Duty Cycle (%)	10log(1/x) Factor (dB)	1/B Minimum VBW(KHz)
11A	5200	100	0.00	0.01
11N20 SISO	5200	100	0.00	0.01

On Time and Duty Cycle



IEEE 802.11a

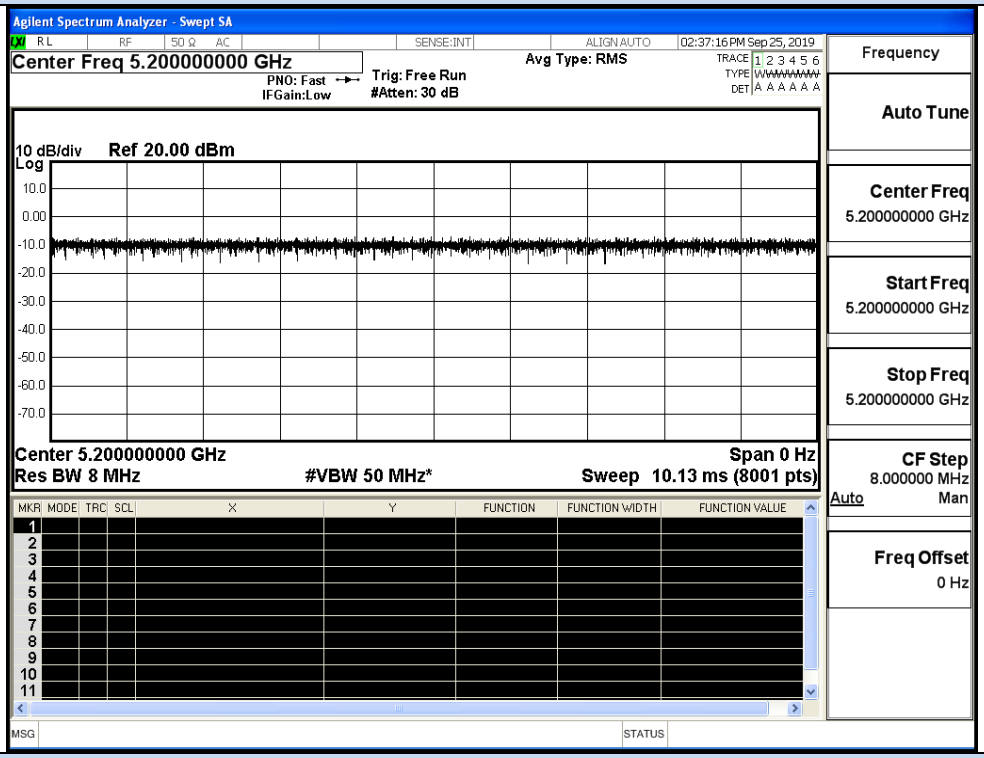


IEEE 802.11n HT20

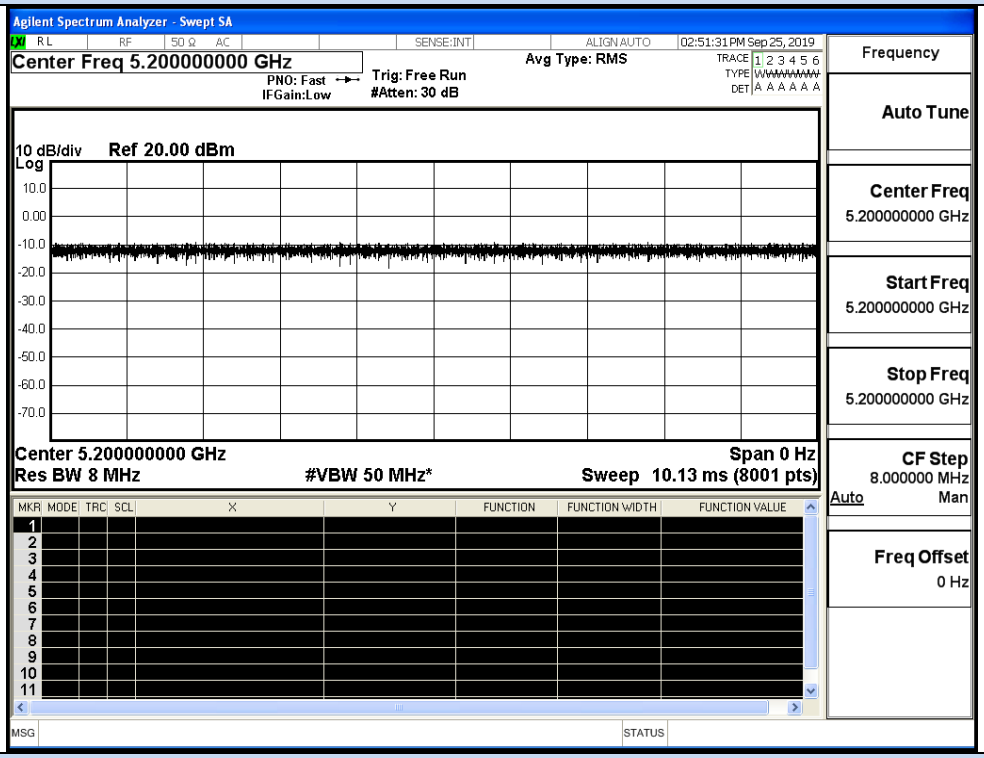
Ant1

Test Mode	Test Frequency (MHz)	Duty Cycle (%)	10log(1/x) Factor (dB)	1/B Minimum VBW(KHz)
11A	5200	100	0.00	0.01
11N20 SISO	5200	100	0.00	0.01

On Time and Duty Cycle



IEEE 802.11a



IEEE 802.11n HT20

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
11A	36	5180	6.69	0	6.69	30	Pass
	40	5200	6.73	0	6.73		Pass
	48	5240	6.83	0	6.83		Pass
11N20 SISO	36	5180	6.82	0	6.82	30	Pass
	40	5200	6.43	0	6.43		Pass
	48	5240	6.73	0	6.73		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	5.99	0	5.99	30	Pass
	40	5200	6.6	0	6.60		Pass
	48	5240	5.54	0	5.54		Pass
11N20 SISO	36	5180	6.83	0	6.83	30	Pass
	40	5200	6.35	0	6.35		Pass
	48	5240	6.04	0	6.04		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		
11N20 SISO	36	5180	6.82	6.83	9.84	0	6.82	6.83	9.84	29.99	Pass
	40	5200	6.43	6.35	9.40	0	6.43	6.35	9.40		Pass
	48	5240	6.73	6.04	9.41	0	6.73	6.04	9.41		Pass

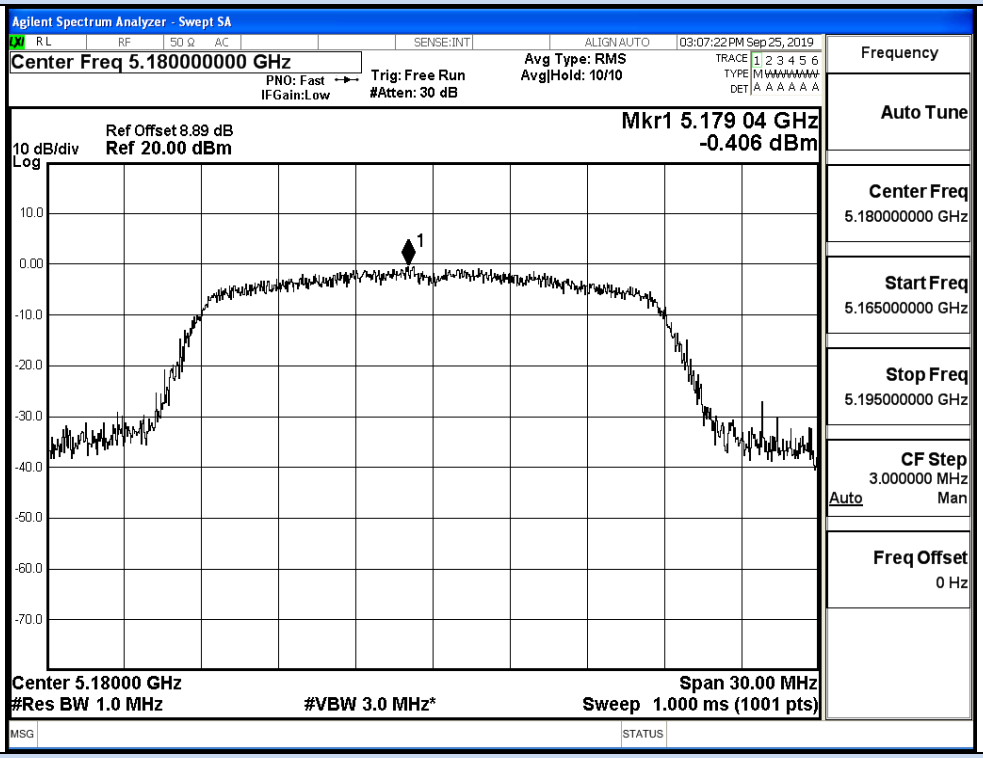
Directional gain=3dBi+10 log (2) = 6.01dBi > 6dBi, So the Conducted Power limit shall be reduced to 30-(6.01-6) = 29.99

A.3 Power Spectral Density

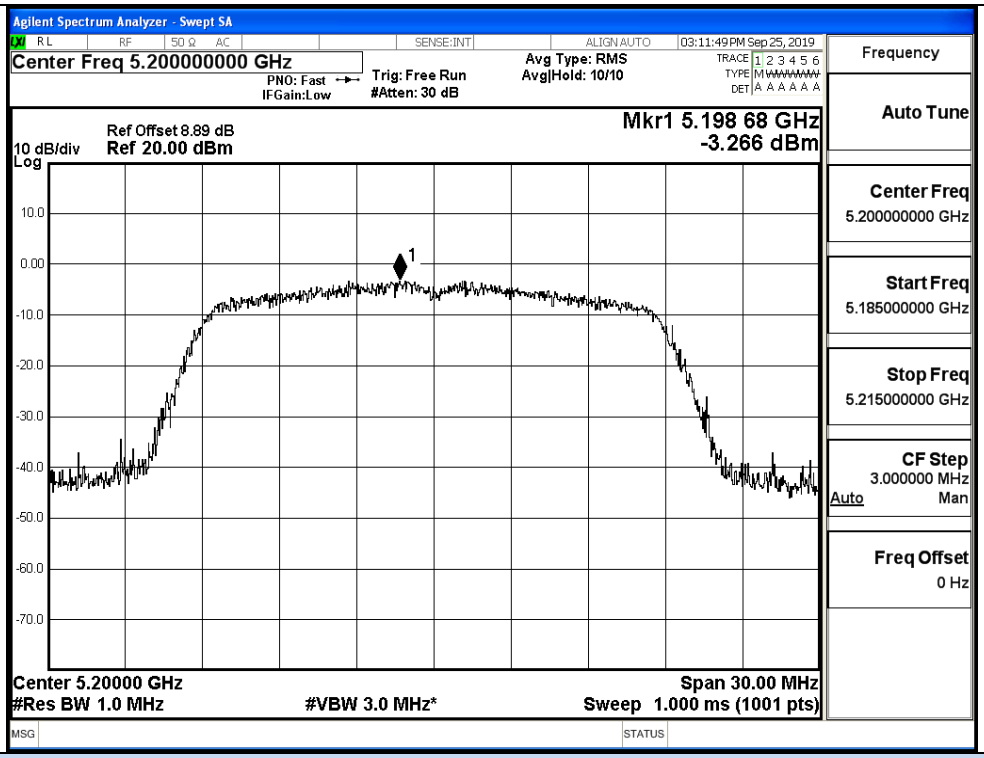
Ant0

Test Mode	Channel	Frequency (MHz)	Power Density (dBm/MHz)	Duty Cycle Factor(dB)	Report Power Density (dBm/MHz)	Limit (dBm/MHz)	Verdict
11A	36	5180	-0.41	0	-0.41	17.0	Pass
	40	5200	-3.27	0	-3.27		Pass
	48	5240	-5.12	0	-5.12		Pass
11N20 SISO	36	5180	-2.07	0	-2.07	17.0	Pass
	40	5200	-1.24	0	-1.24		Pass
	48	5240	-2.44	0	-2.44		Pass

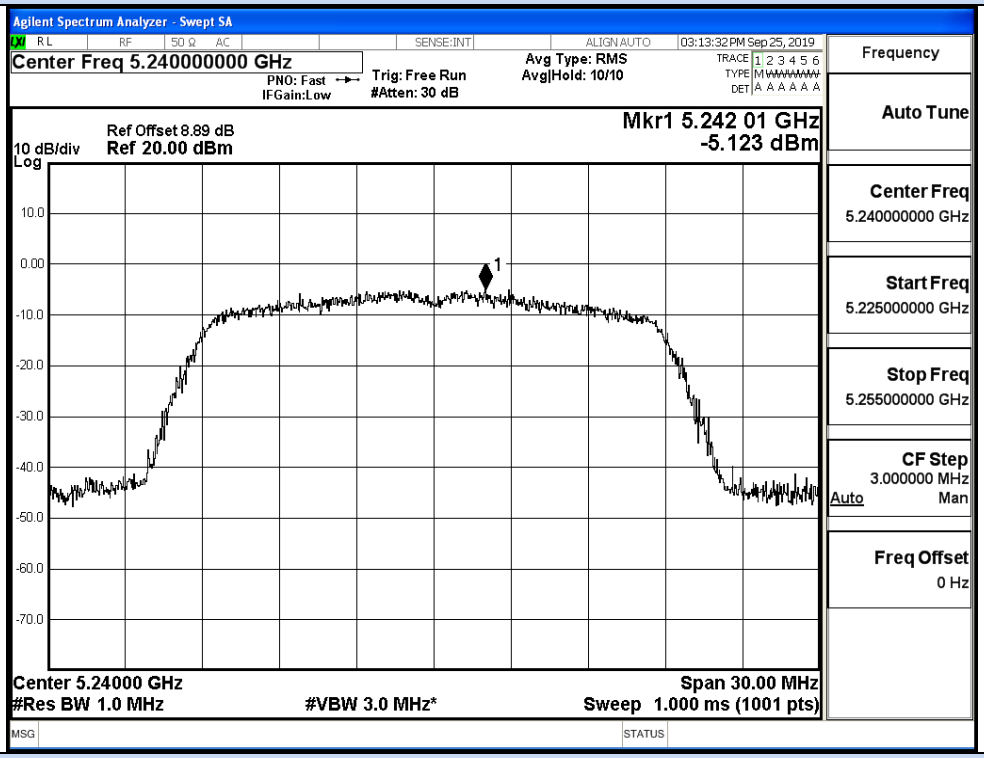
Power Spectral Density



IEEE 802.11a / Channel 36 / 5180MHz

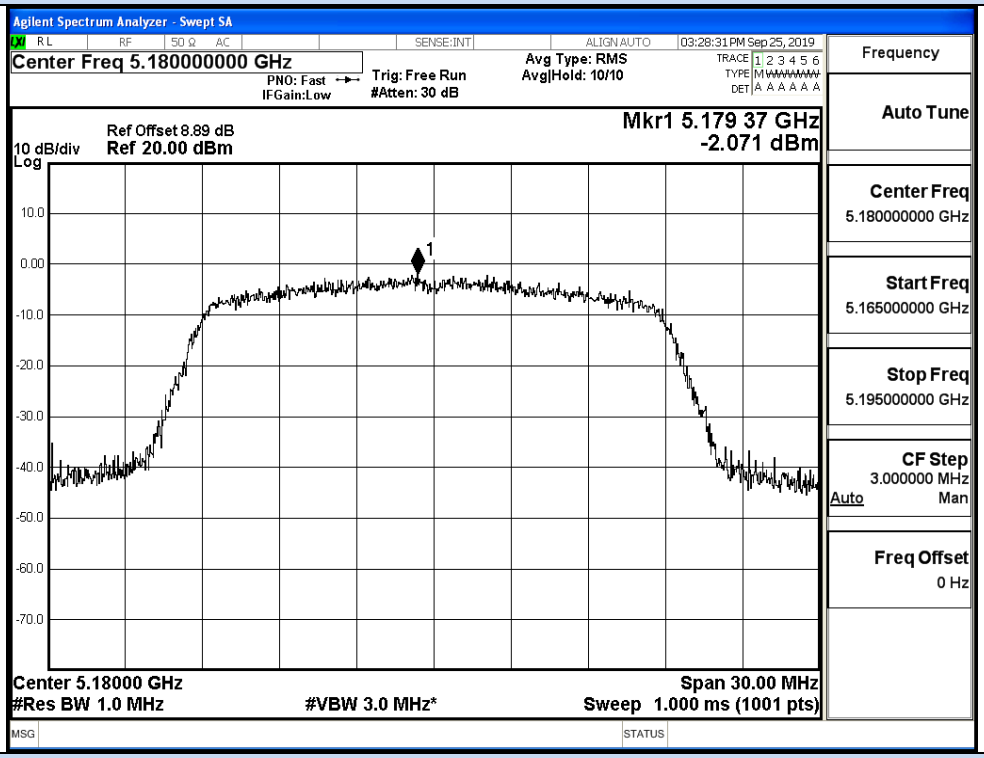


IEEE 802.11na / Channel 40 / 5200MHz

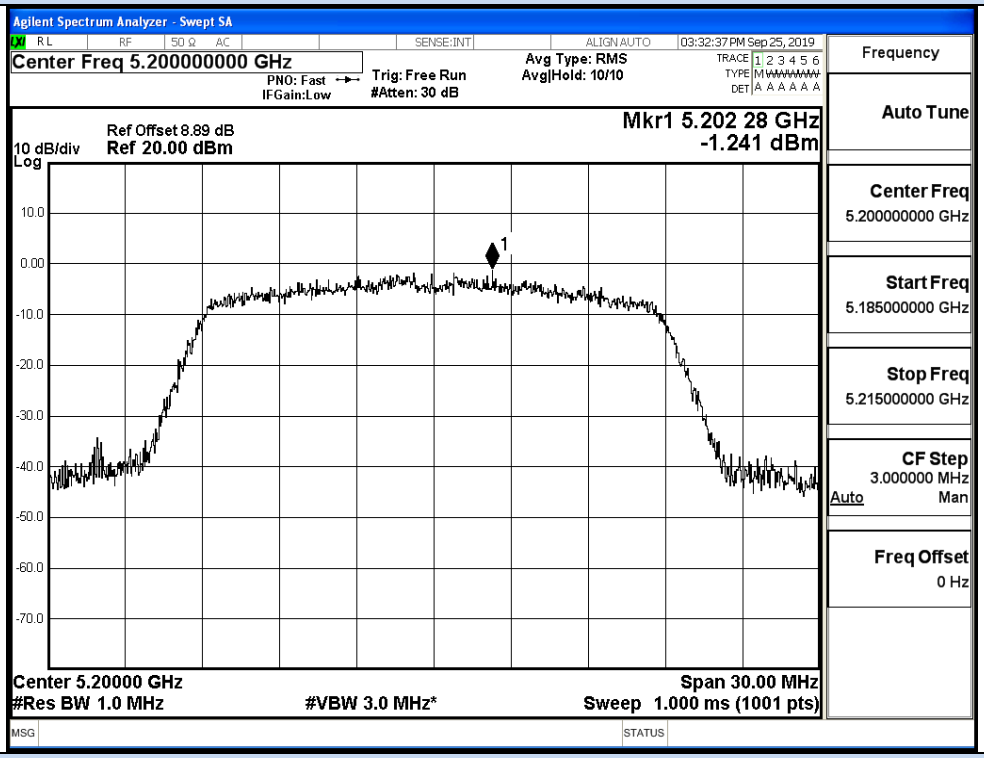


IEEE 802.11na / Channel 48 / 5240MHz

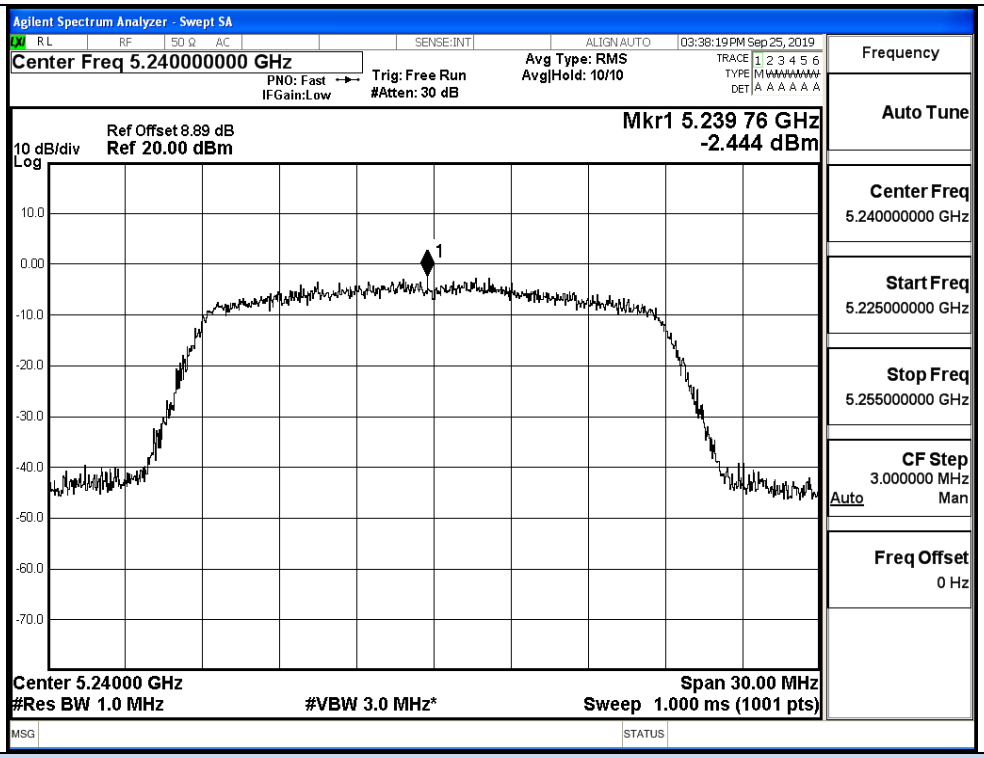
Power Spectral Density



IEEE 802.11n20 / Channel 36 / 5180MHz



IEEE 802.11n20 / Channel 40 / 5200MHz

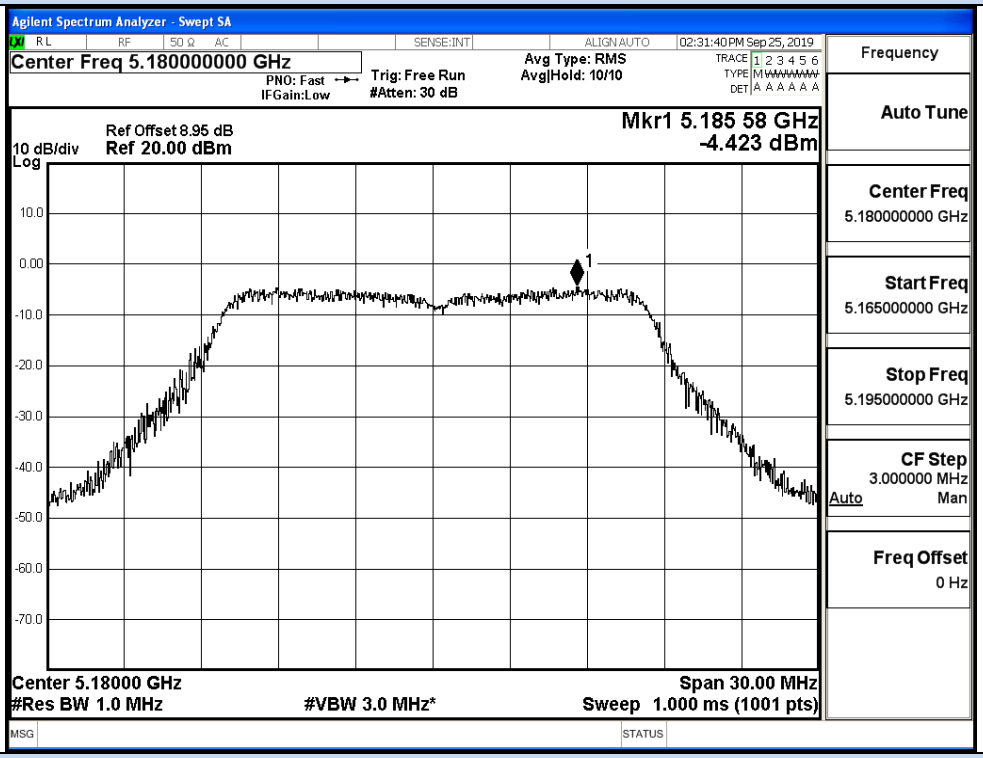


IEEE 802.11n20 / Channel 48 / 5240MHz

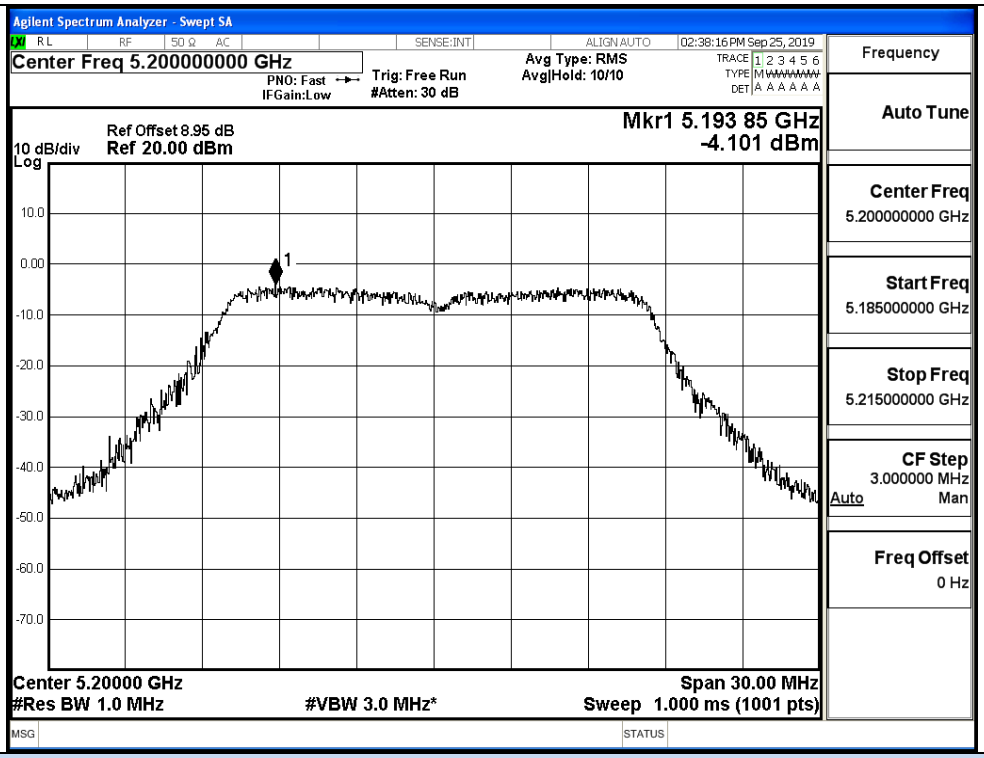
Ant1

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	-4.42	0	-4.42	17.0	Pass
	40	5200	-4.10	0	-4.10		Pass
	48	5240	-5.46	0	-5.46		Pass
11N20 SISO	36	5180	-4.13	0	-4.13	17.0	Pass
	40	5200	-5.27	0	-5.27		Pass
	48	5240	-5.06	0	-5.06		Pass

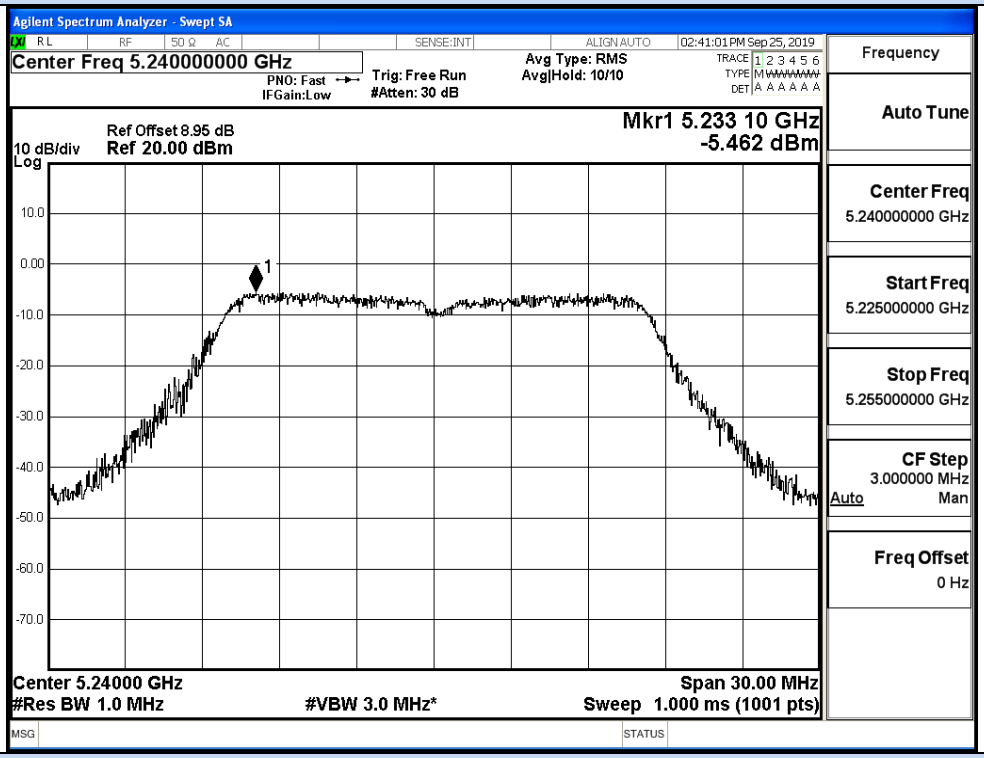
Power Spectral Density



IEEE 802.11a / Channel 36 / 5180MHz

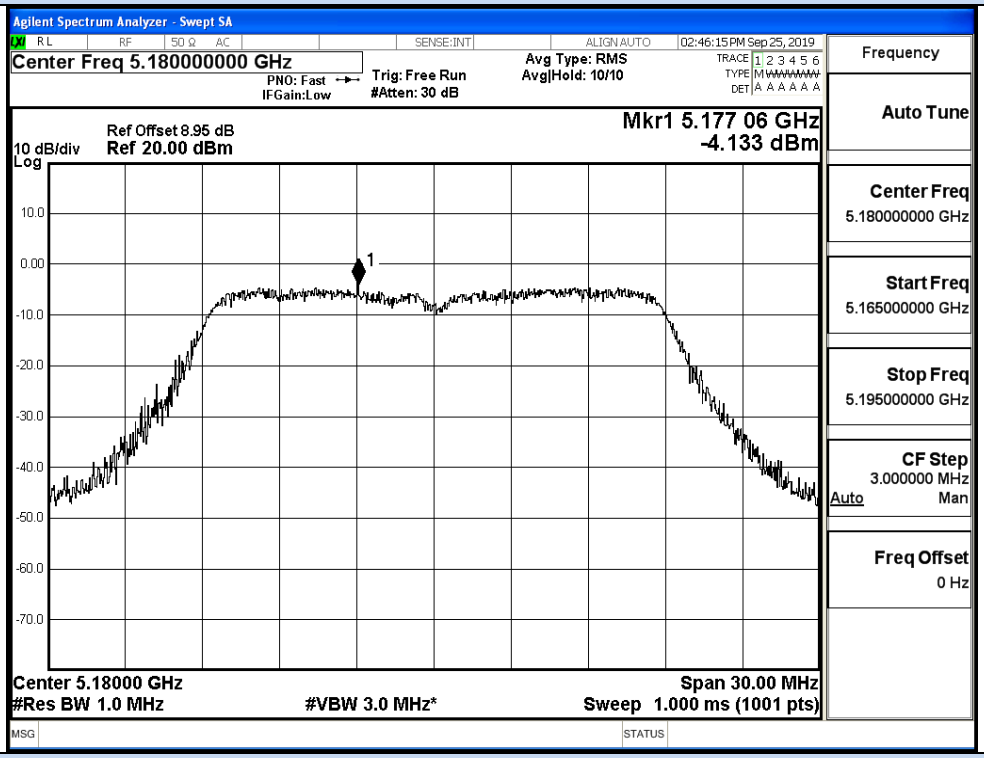


IEEE 802.11na / Channel 40 / 5200MHz

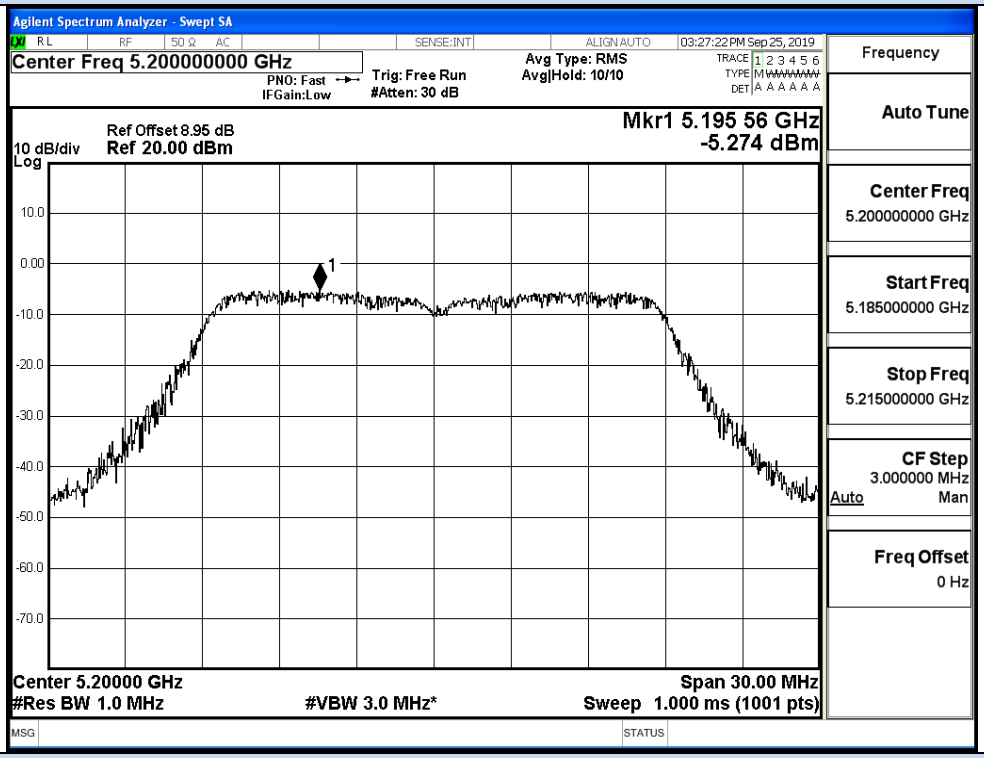


IEEE 802.11na / Channel 48 / 5240MHz

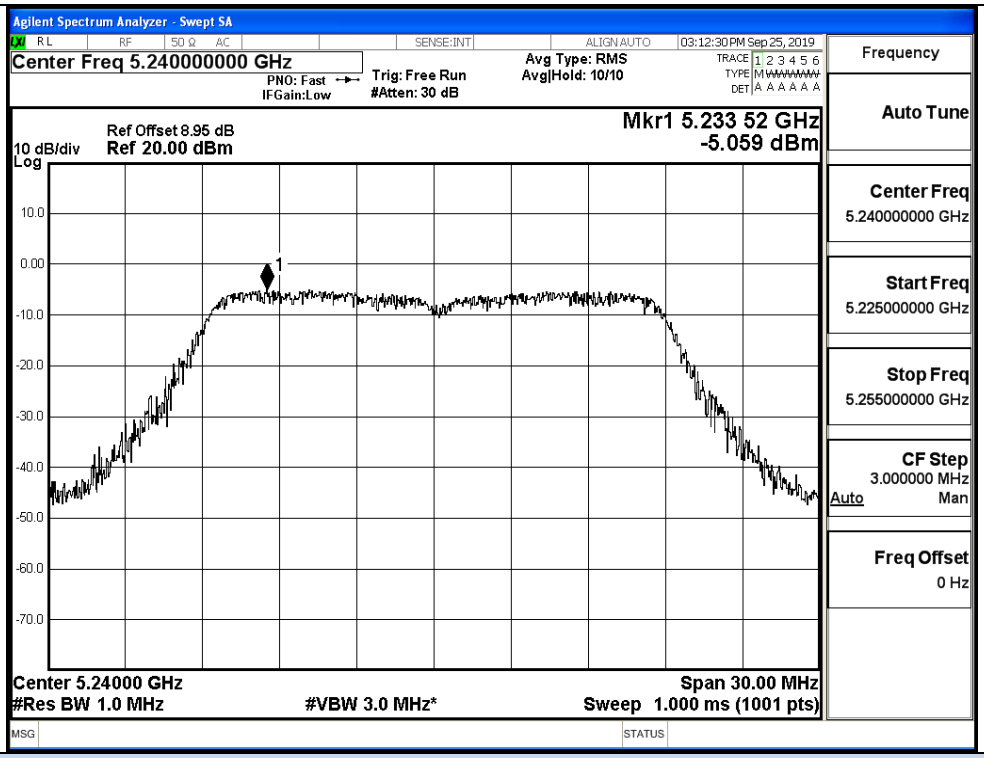
Power Spectral Density



IEEE 802.11n20 / Channel 36 / 5180MHz



IEEE 802.11n20 / Channel 40 / 5200MHz



IEEE 802.11n20 / Channel 48 / 5240MHz

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		
11N20 SISO	36	5180	-2.07	-4.13	0.03	0	-2.07	-4.13	0.03	16.99	Pass
	40	5200	-1.24	-5.27	0.21	0	-1.24	-5.27	0.21		Pass
	48	5240	-2.44	-5.06	-0.55	0	-2.44	-5.06	-0.55		Pass

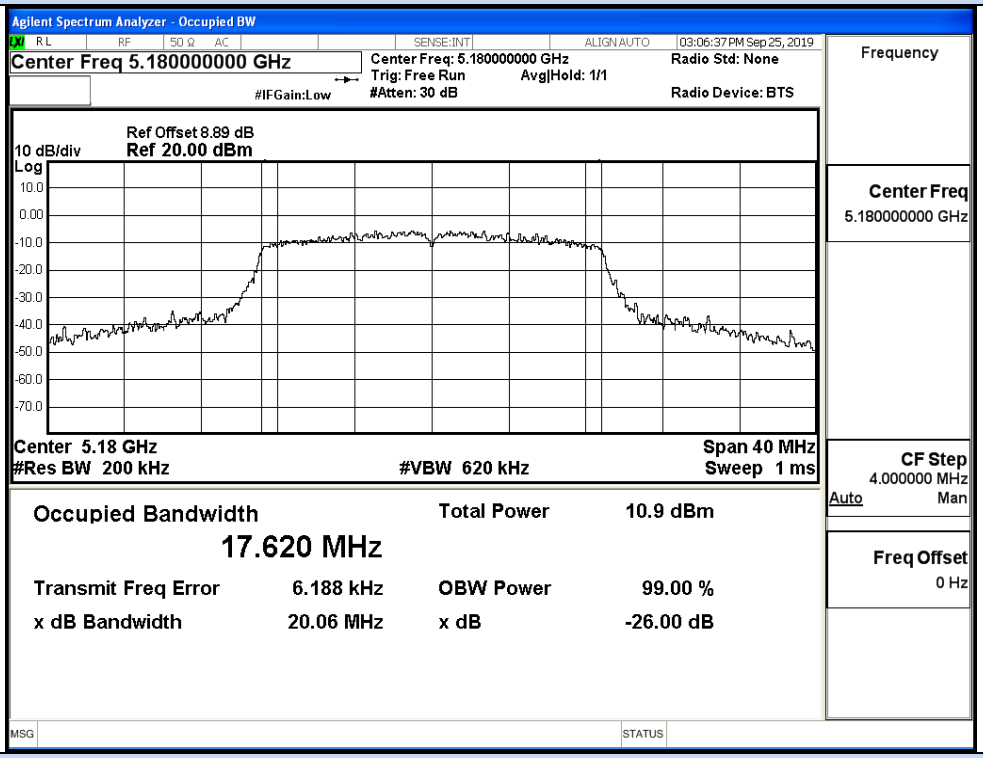
Directional gain=3dBi+10 log (2) = 6.01dBi > 6dBi, So the Conducted Power limit shall be reduced to 17-(6.01-6) = 16.99

A.4 Emission Bandwidth

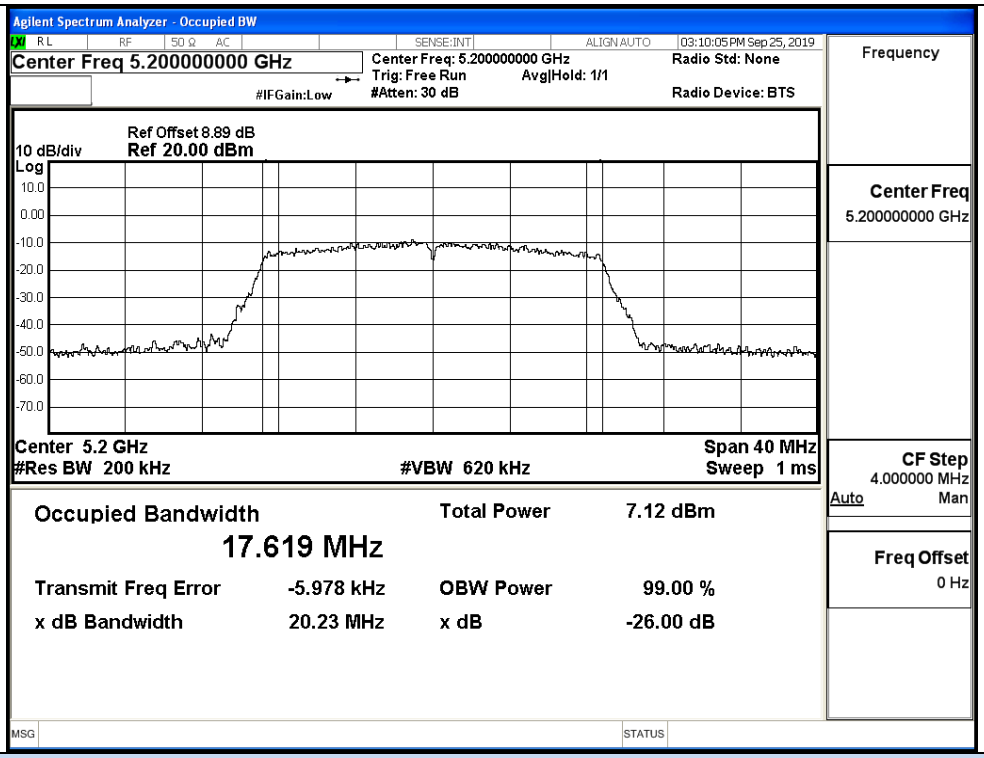
Ant0

Test Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
11A	36	5180	20.06	No Limit	Pass
	40	5200	20.23		Pass
	48	5240	20.23		Pass
11N20 SISO	36	5180	19.67	No Limit	Pass
	40	5200	19.77		Pass
	48	5240	20.01		Pass

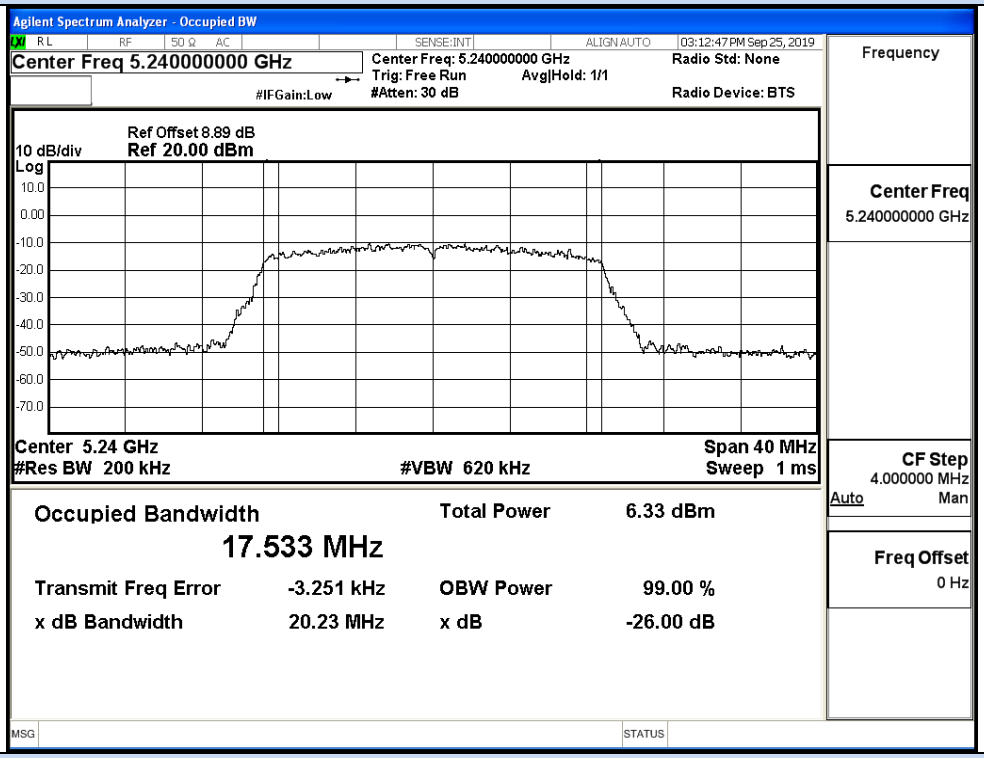
26dB Bandwidth



IEEE 802.11a / Channel 36 / 5180MHz

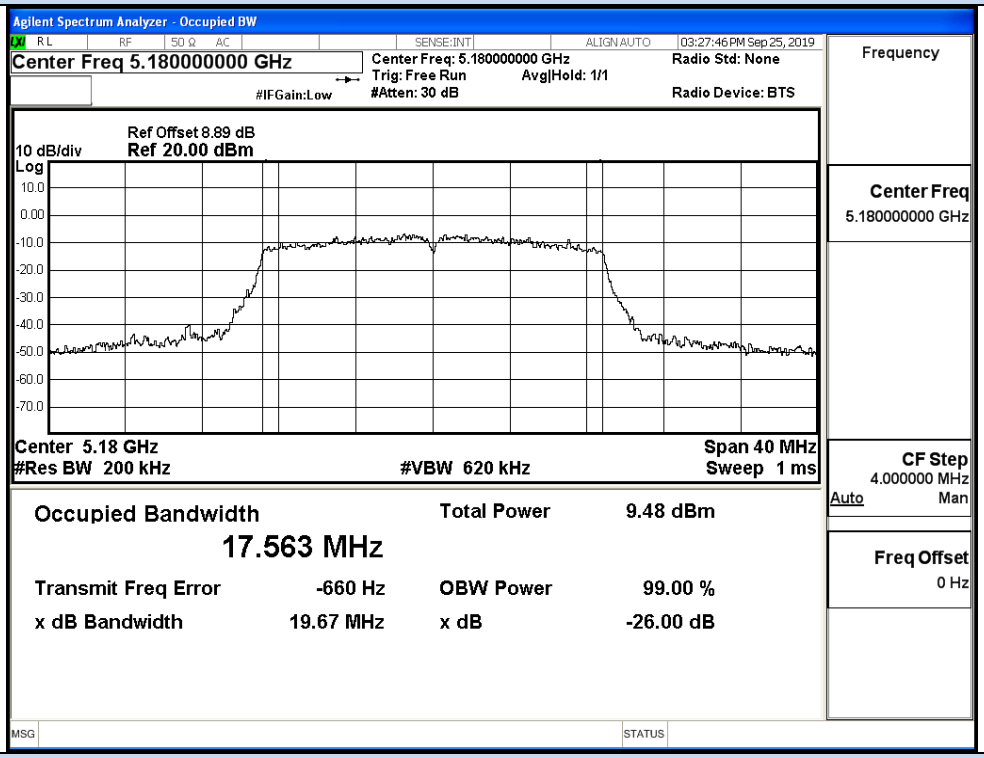


IEEE 802.11a / Channel 40 / 5200MHz

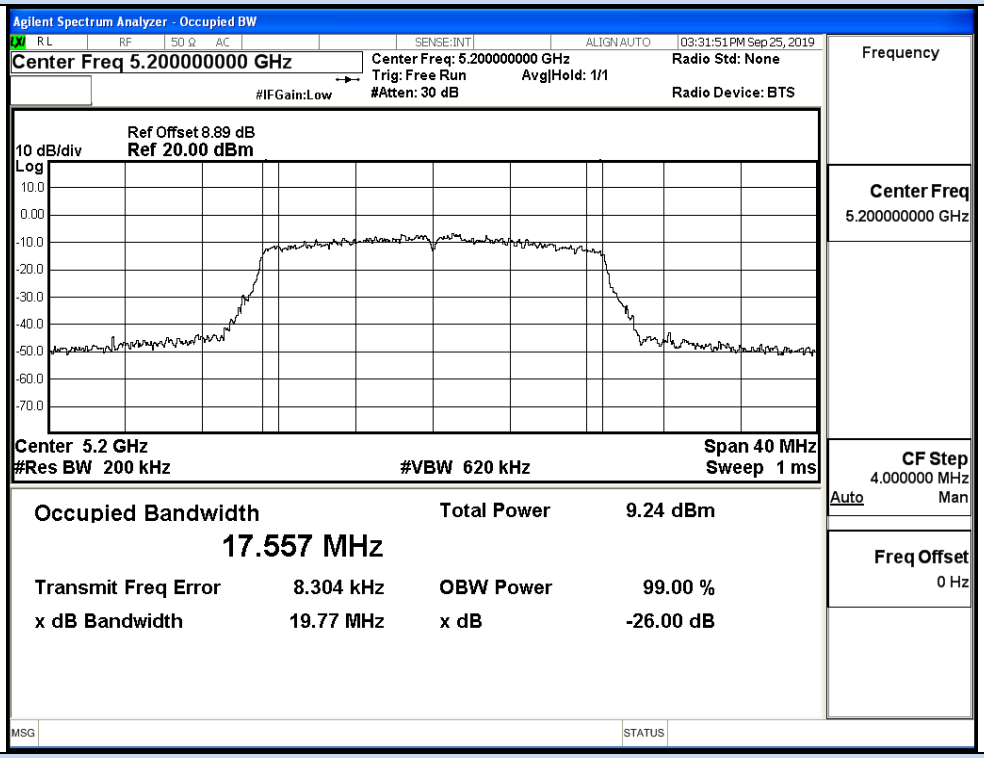


IEEE 802.11a / Channel 48 / 5240MHz

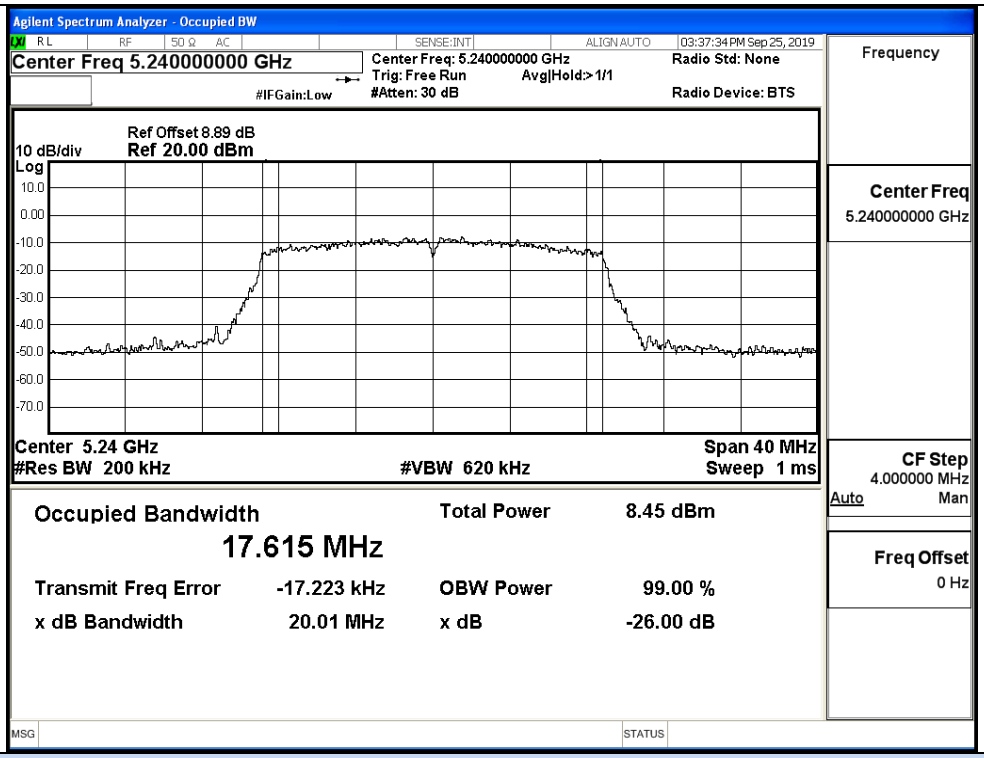
26dB Bandwidth



IEEE 802.11n20 / Channel 36 / 5180MHz



IEEE 802.11n20 / Channel 40 / 5200MHz

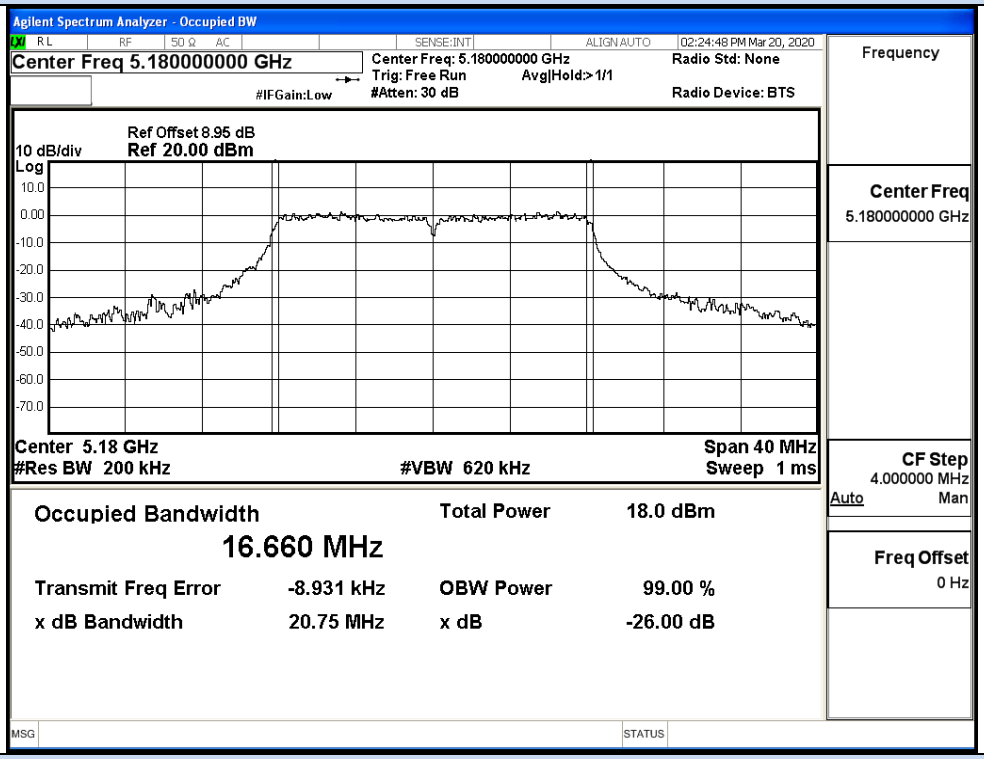


IEEE 802.11n20 / Channel 48 / 5240MHz

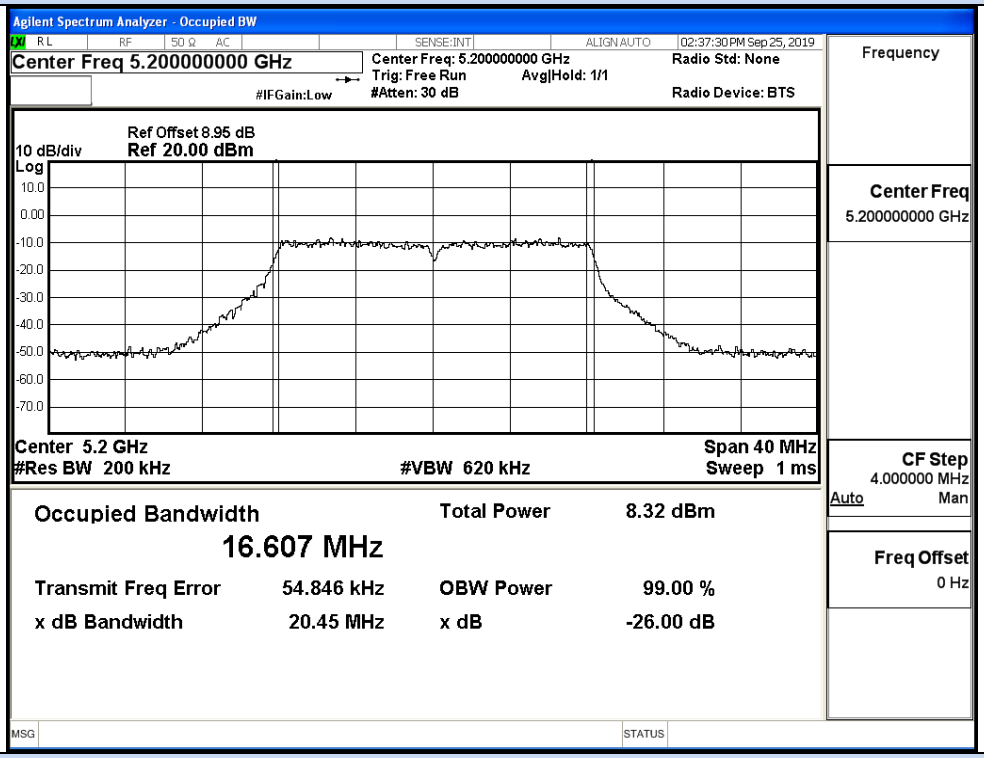
Ant1

Test Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
11A	36	5180	20.75	No Limit	Pass
	40	5200	20.45		Pass
	48	5240	20.78		Pass
11N20 SISO	36	5180	21.48	No Limit	Pass
	40	5200	21.18		Pass
	48	5240	21.47		Pass

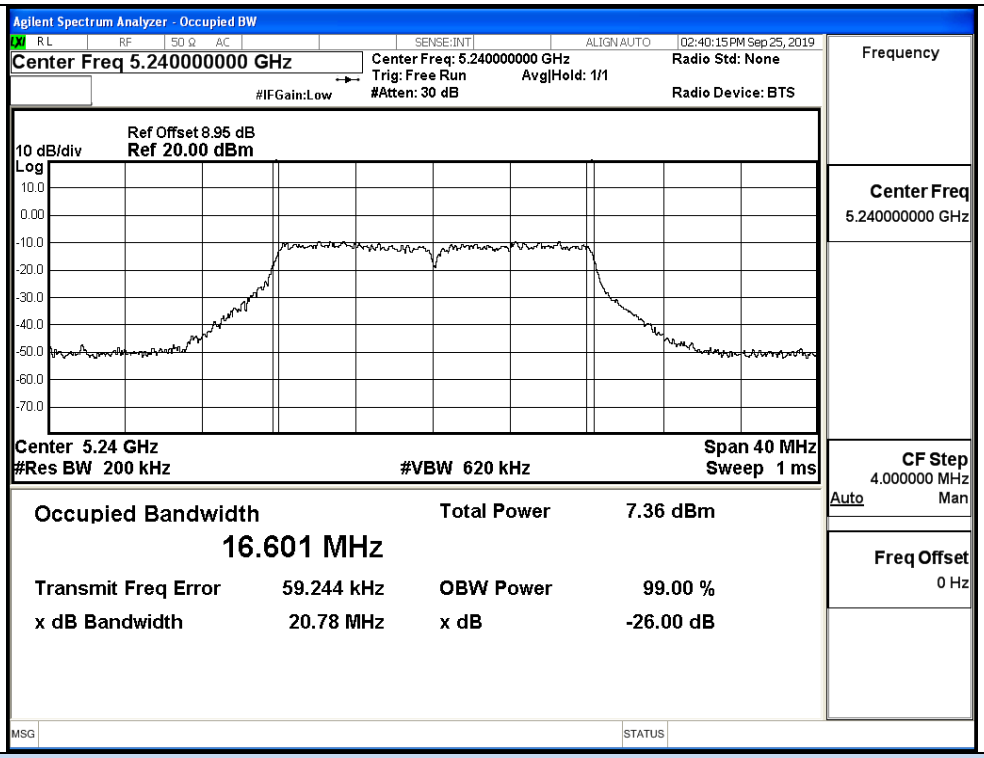
26dB Bandwidth



IEEE 802.11a / Channel 36 / 5180MHz

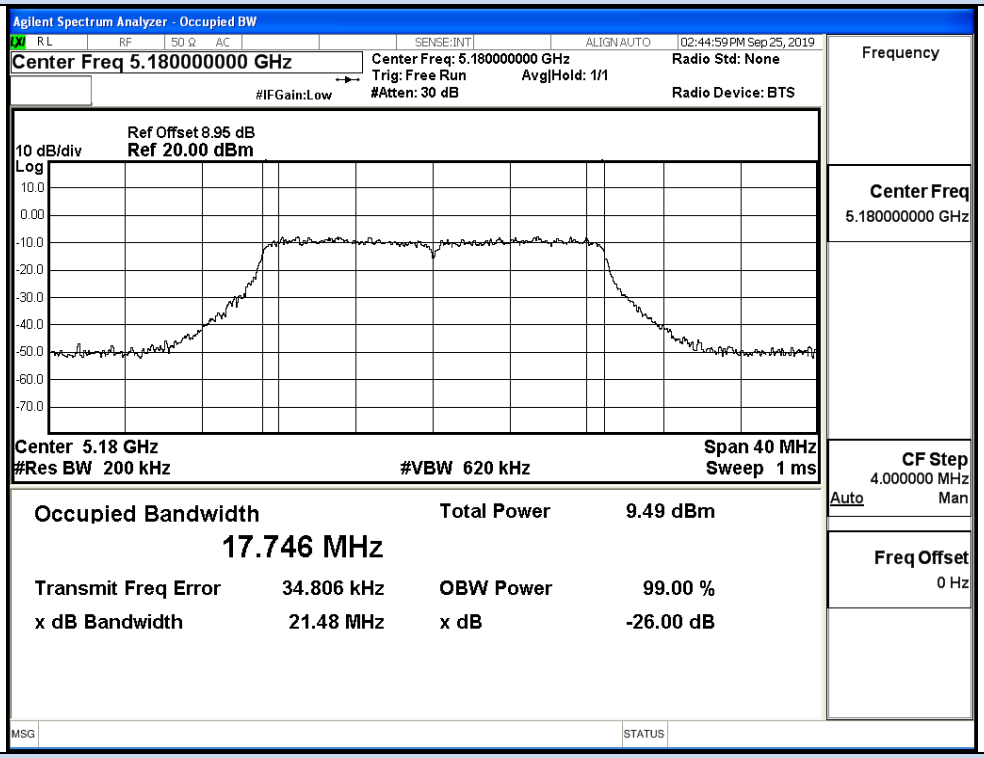


IEEE 802.11a / Channel 40 / 5200MHz

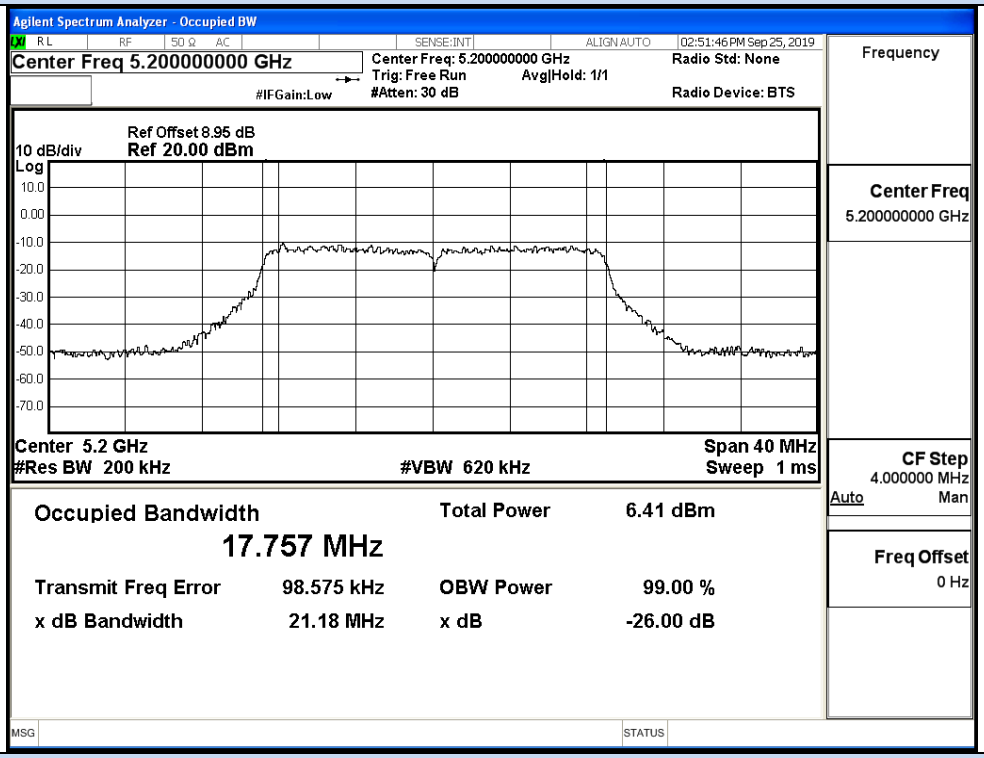


IEEE 802.11a / Channel 48 / 5240MHz

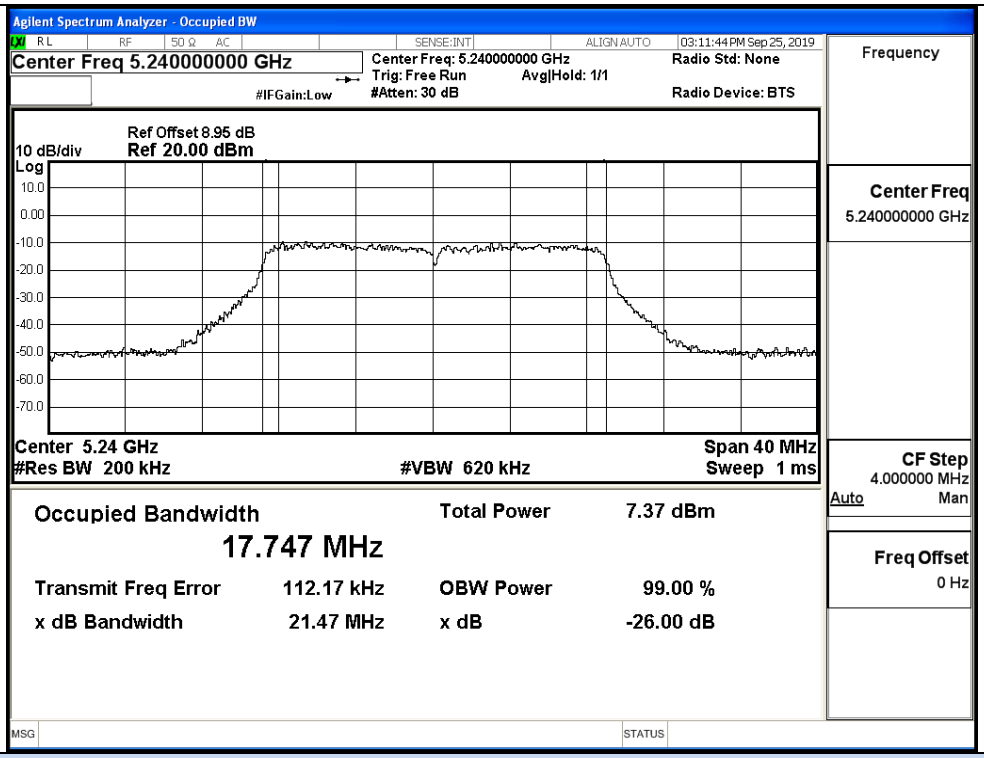
26dB Bandwidth



IEEE 802.11n20 / Channel 36 / 5180MHz



IEEE 802.11n20 / Channel 40 / 5200MHz



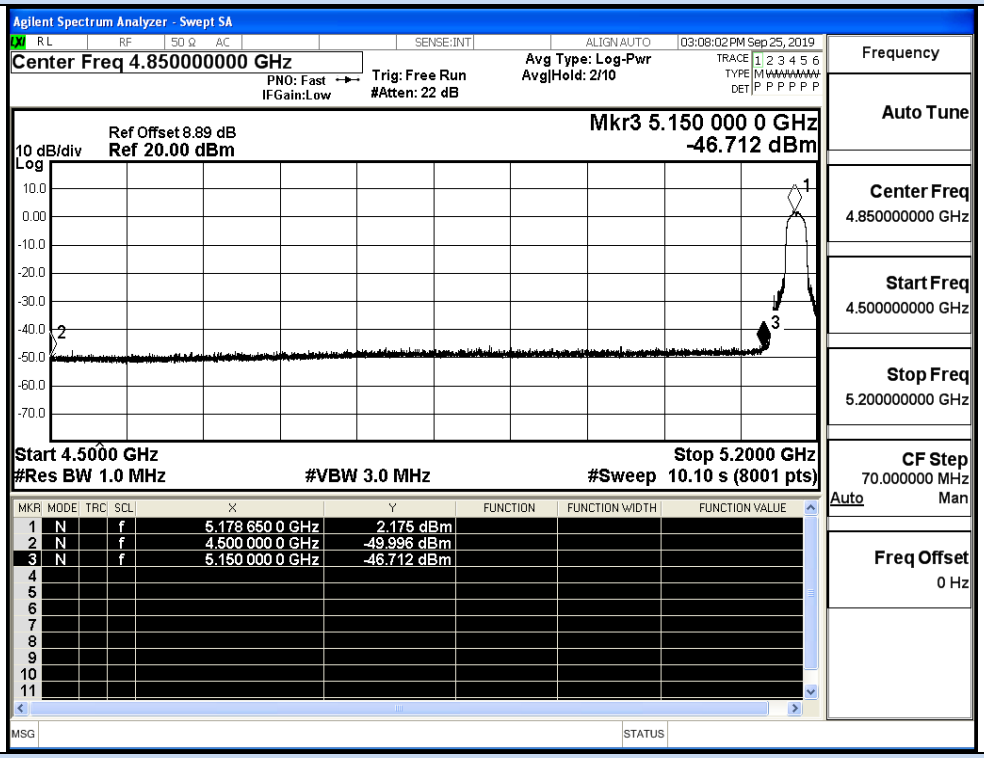
IEEE 802.11n20 / Channel 48 / 5240MHz

A.5 Undesirable Emissions Measurement

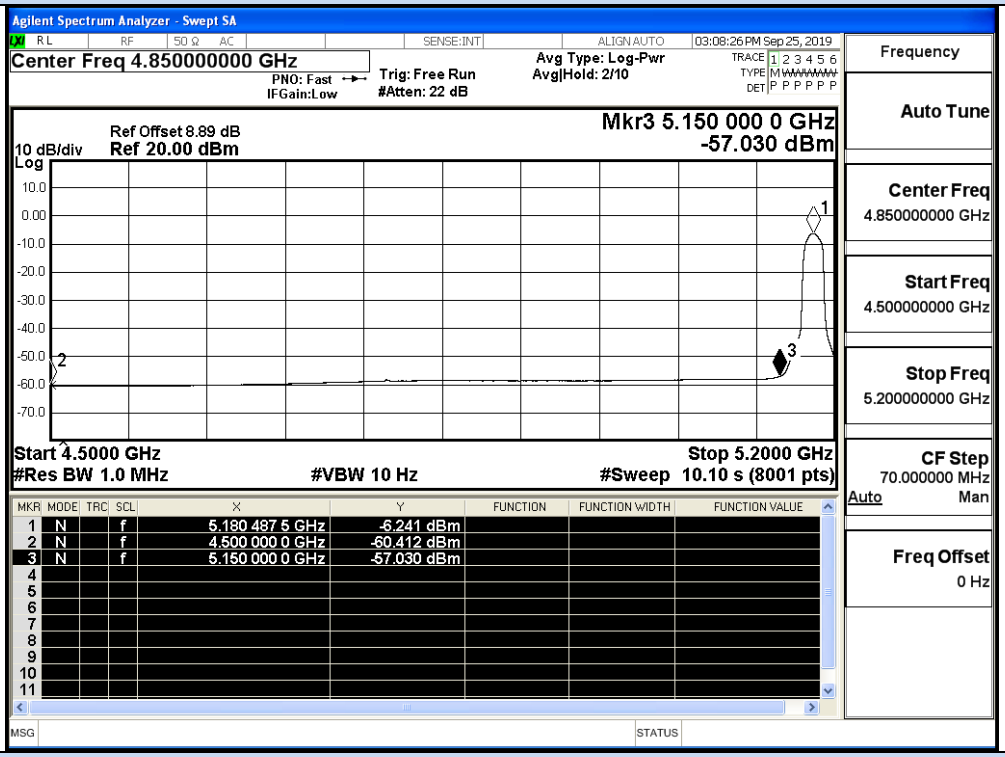
Ant0

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
11A	36	4500.0	-50.00	3.00	0	48.23	Peak	68.20	Pass
		4500.0	-60.41	3.00	0	37.82	Average	54.00	Pass
		5150.0	-46.71	3.00	0	51.52	Peak	68.20	Pass
		5150.0	-57.03	3.00	0	41.20	Average	54.00	Pass
	48	5350.0	-49.31	3.00	0	48.92	Peak	68.20	Pass
		5350.0	-59.48	3.00	0	38.75	Average	54.00	Pass
		5460.0	-48.84	3.00	0	49.39	Peak	68.20	Pass
		5460.0	-59.57	3.00	0	38.66	Average	54.00	Pass
11N20 SISO	36	4500.0	-50.22	3.00	0	48.01	Peak	68.20	Pass
		4500.0	-60.40	3.00	0	37.83	Average	54.00	Pass
		5150.0	-47.30	3.00	0	50.93	Peak	68.20	Pass
		5150.0	-57.32	3.00	0	40.91	Average	54.00	Pass
	48	5350.0	-49.21	3.00	0	49.02	Peak	68.20	Pass
		5350.0	-59.47	3.00	0	38.76	Average	54.00	Pass
		5460.0	-49.46	3.00	0	48.77	Peak	68.20	Pass
		5460.0	-59.57	3.00	0	38.66	Average	54.00	Pass

Undesirable Emissions Measurement

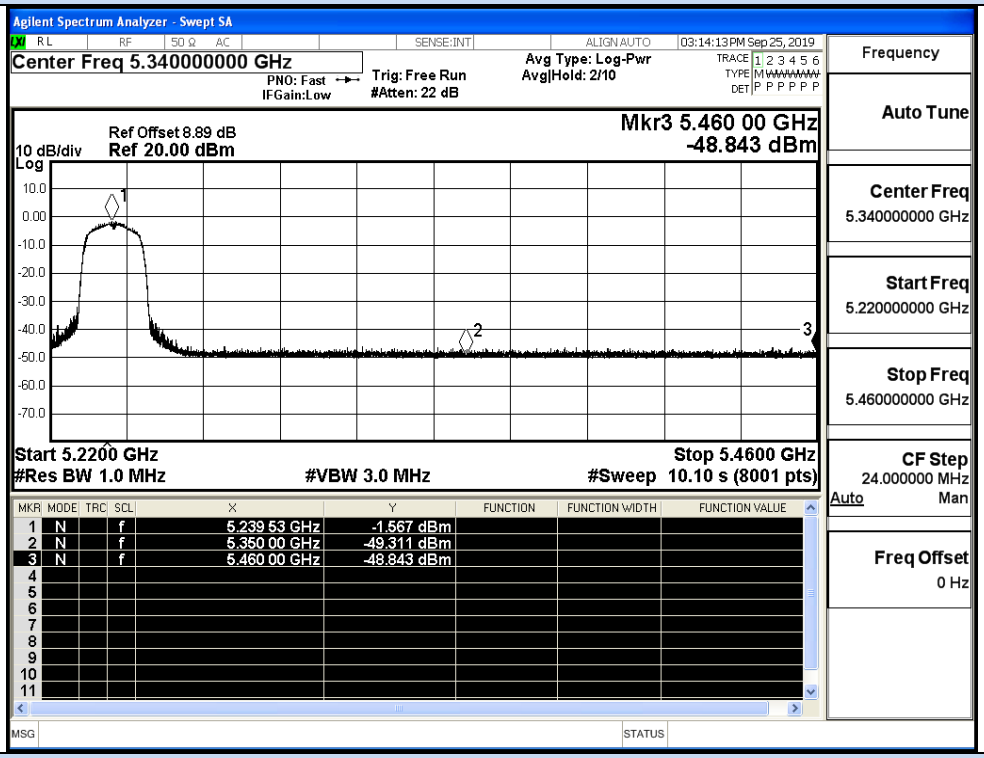


IEEE 802.11a / Channel 36 / 5180MHz / Peak

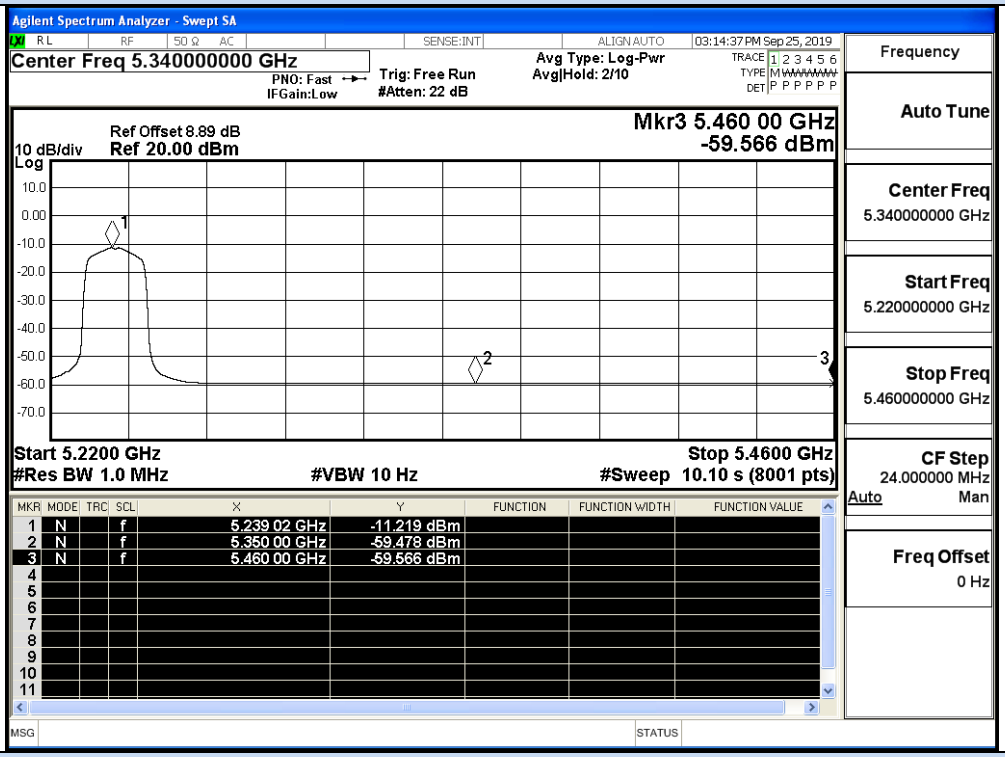


IEEE 802.11a / Channel 36 / 5180MHz / Average

Undesirable Emissions Measurement

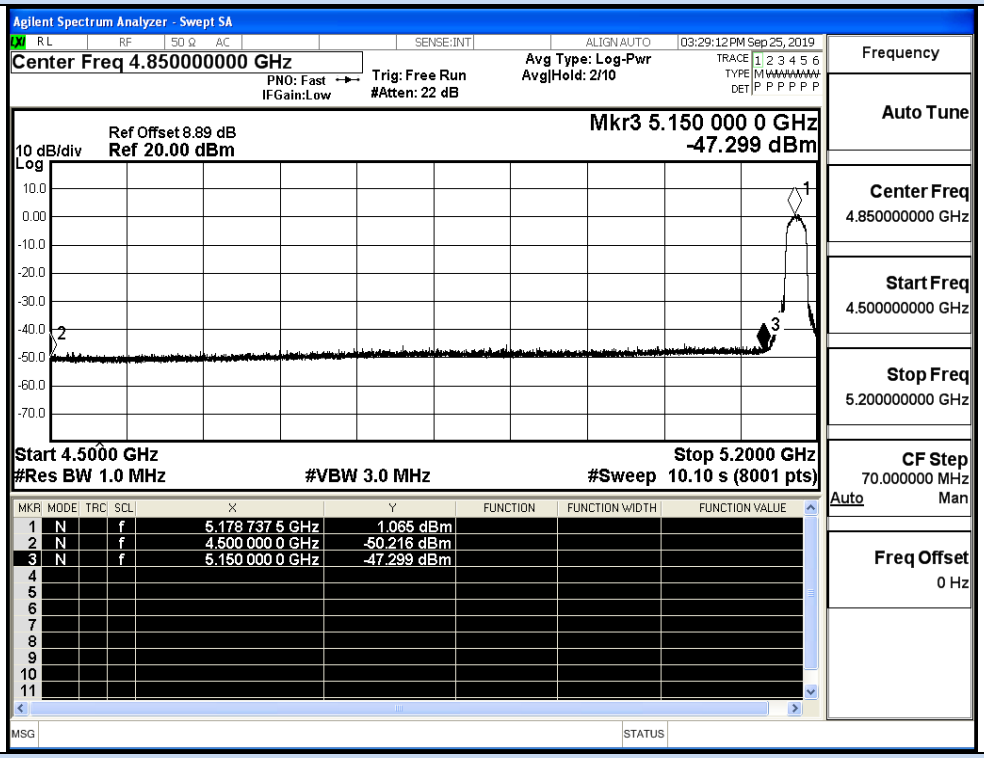


IEEE 802.11a / Channel 48 / 5240MHz / Peak

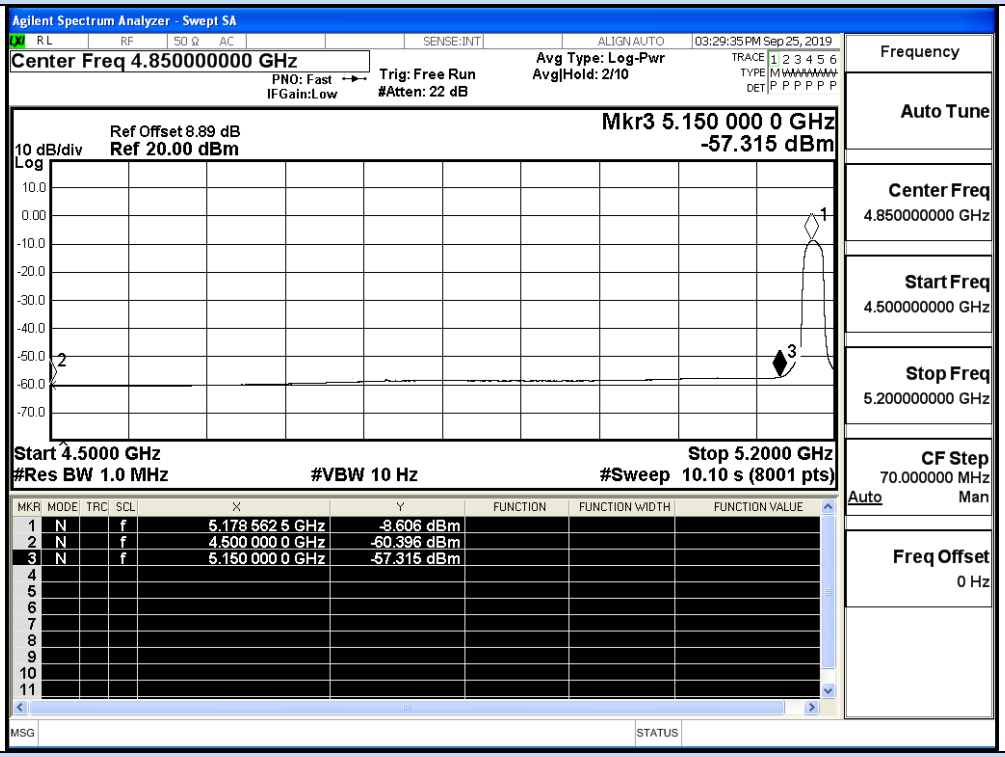


IEEE 802.11a / Channel 48 / 5240MHz / Average

Undesirable Emissions Measurement

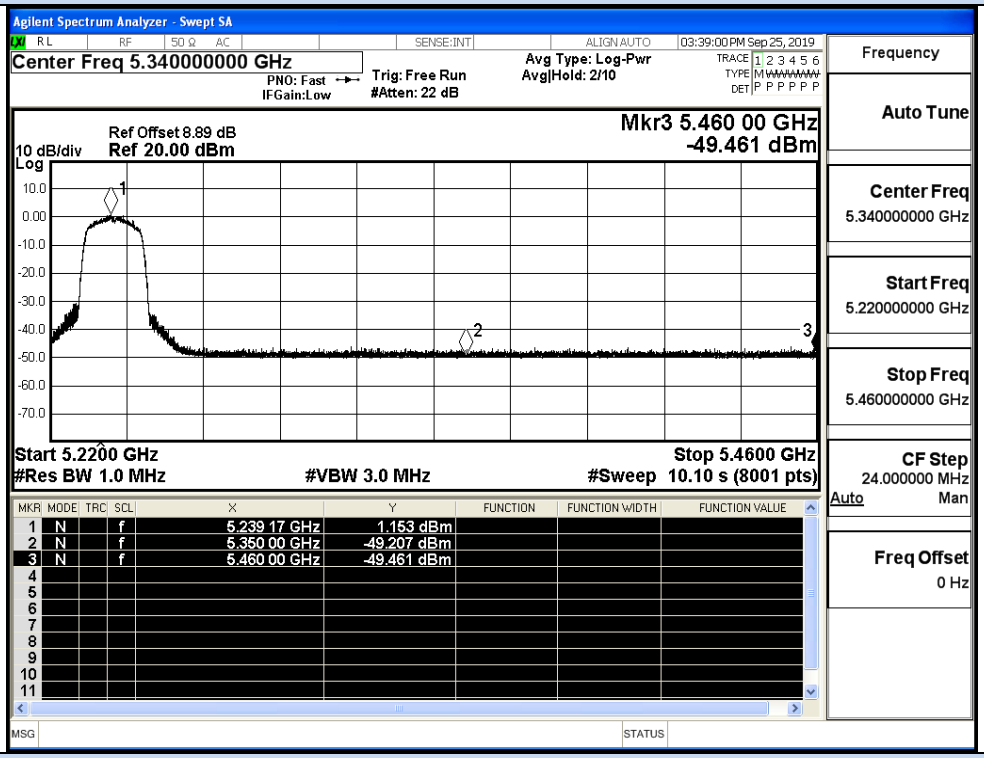


IEEE 802.11n20 / Channel 36 / 5180MHz / Peak

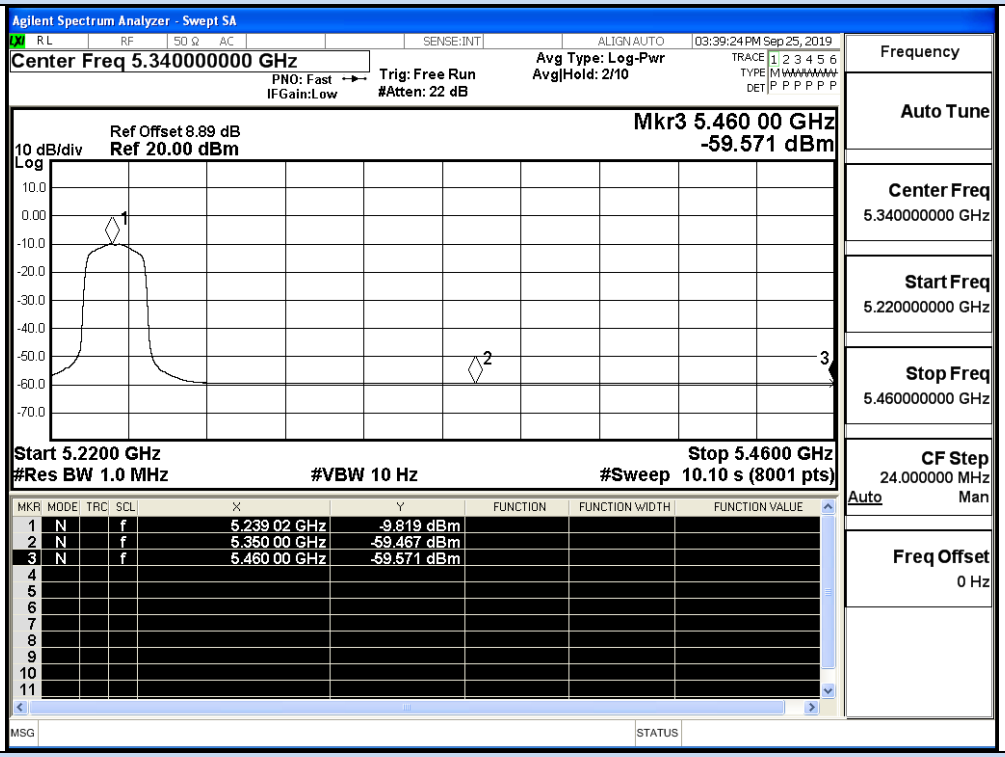


IEEE 802.11n20 / Channel 36 / 5180MHz / Average

Undesirable Emissions Measurement



IEEE 802.11n20 / Channel 48 / 5240MHz / Peak

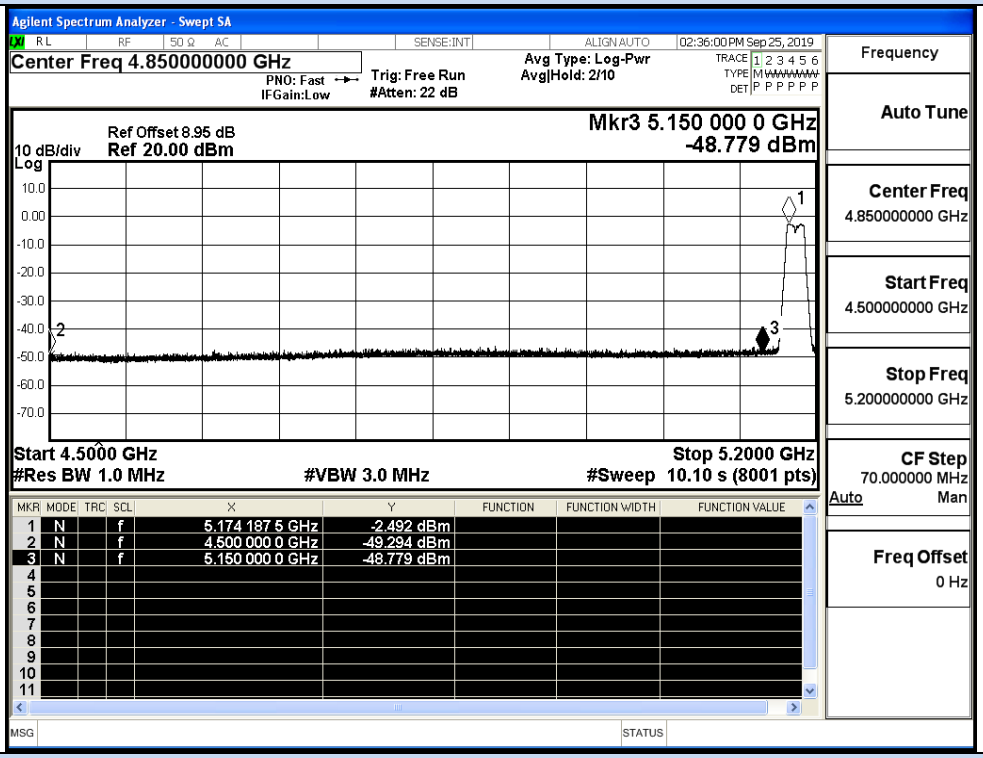


IEEE 802.11n20 / Channel 48 / 5240MHz / Average

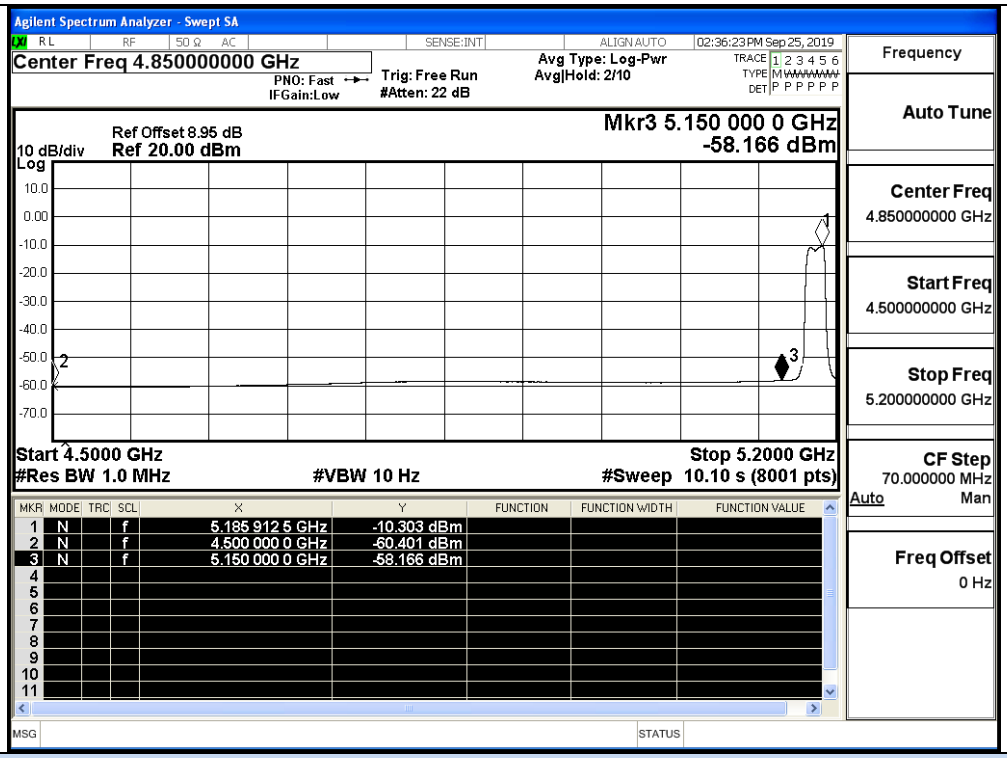
Ant1

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	-49.29	3.00	0	48.94	Peak	68.20	Pass
		4500.0	-60.40	3.00	0	37.83	Average	54.00	Pass
		5150.0	-48.78	3.00	0	49.45	Peak	68.20	Pass
		5150.0	-58.17	3.00	0	40.06	Average	54.00	Pass
	48	5350.0	-48.43	3.00	0	49.80	Peak	68.20	Pass
		5350.0	-59.27	3.00	0	38.96	Average	54.00	Pass
		5460.0	-49.70	3.00	0	48.53	Peak	68.20	Pass
		5460.0	-59.27	3.00	0	38.96	Average	54.00	Pass
11N20 SISO	36	4500.0	-49.54	3.00	0	48.69	Peak	68.20	Pass
		4500.0	-59.61	3.00	0	38.62	Average	54.00	Pass
		5150.0	-47.17	3.00	0	51.06	Peak	68.20	Pass
		5150.0	-57.47	3.00	0	40.76	Average	54.00	Pass
	48	5350.0	-48.09	3.00	0	50.14	Peak	68.20	Pass
		5350.0	-59.26	3.00	0	38.97	Average	54.00	Pass
		5460.0	-48.06	3.00	0	50.17	Peak	68.20	Pass
		5460.0	-59.24	3.00	0	38.99	Average	54.00	Pass

Undesirable Emissions Measurement

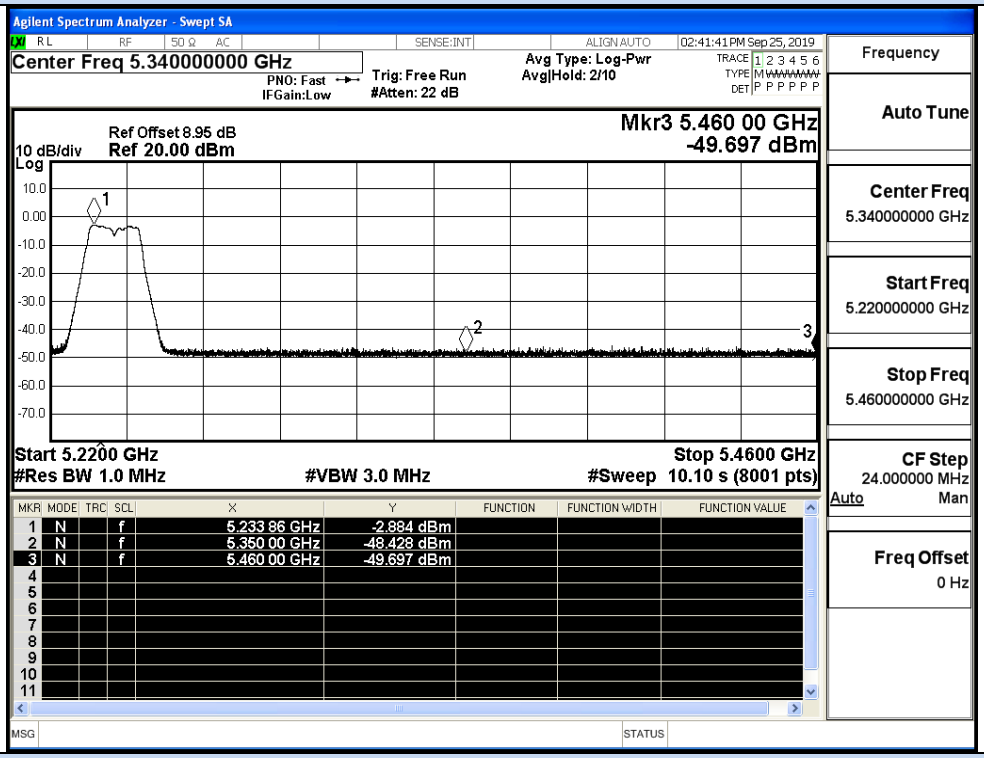


IEEE 802.11a / Channel 36 / 5180MHz / Peak

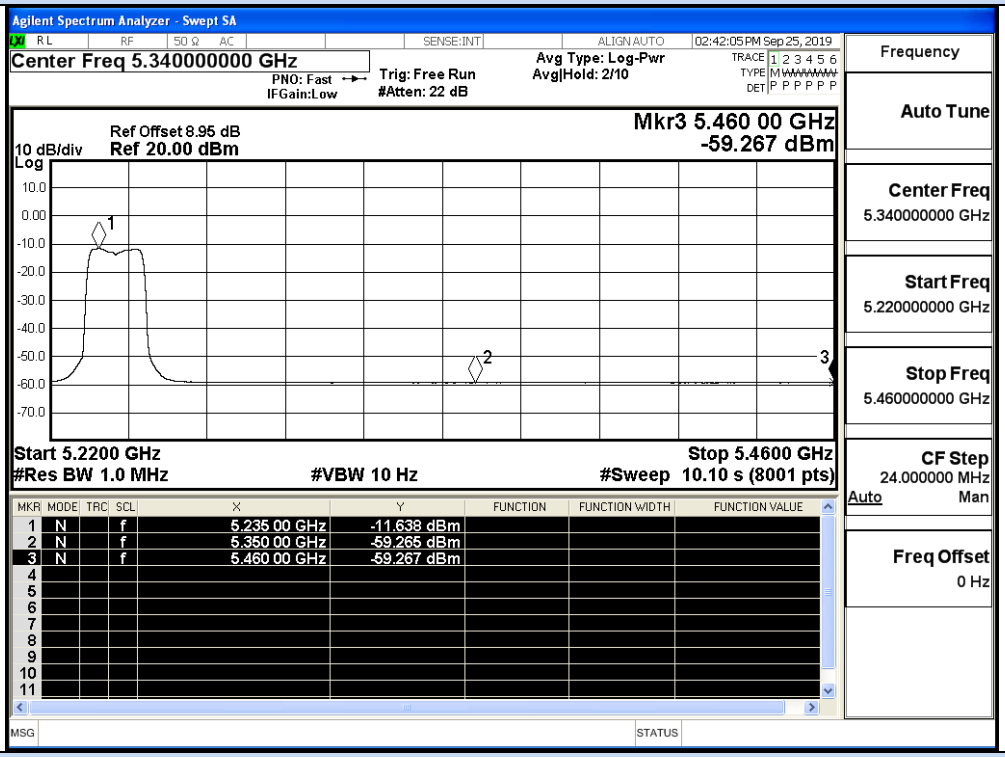


IEEE 802.11a / Channel 36 / 5180MHz / Average

Undesirable Emissions Measurement

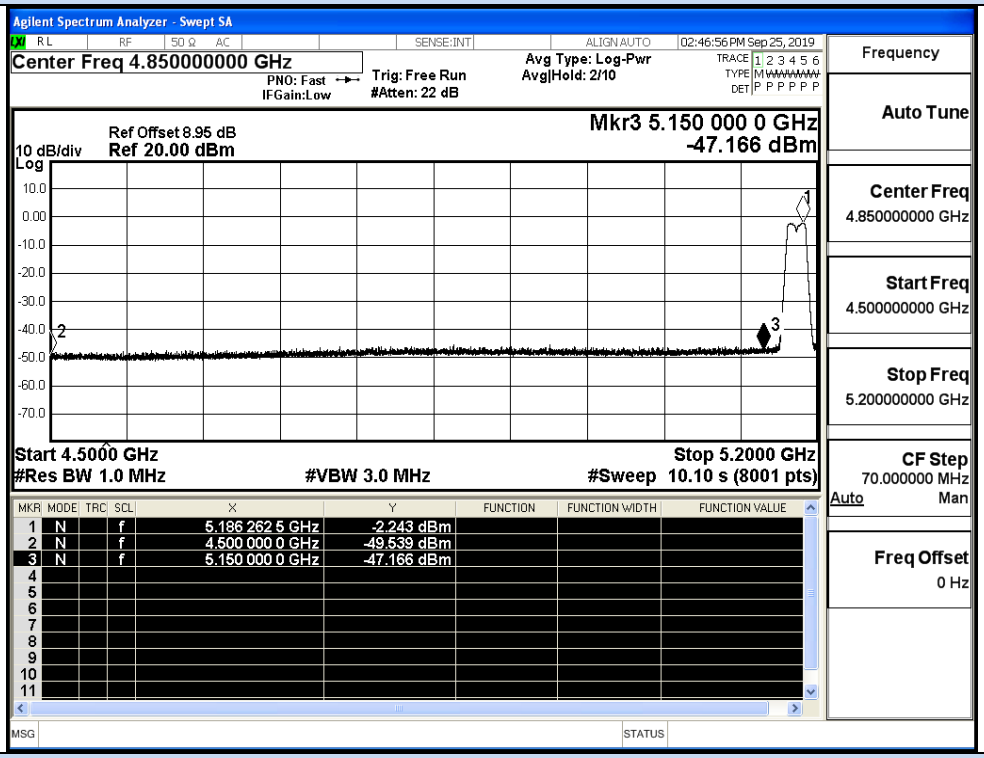


IEEE 802.11a / Channel 48 / 5240MHz / Peak

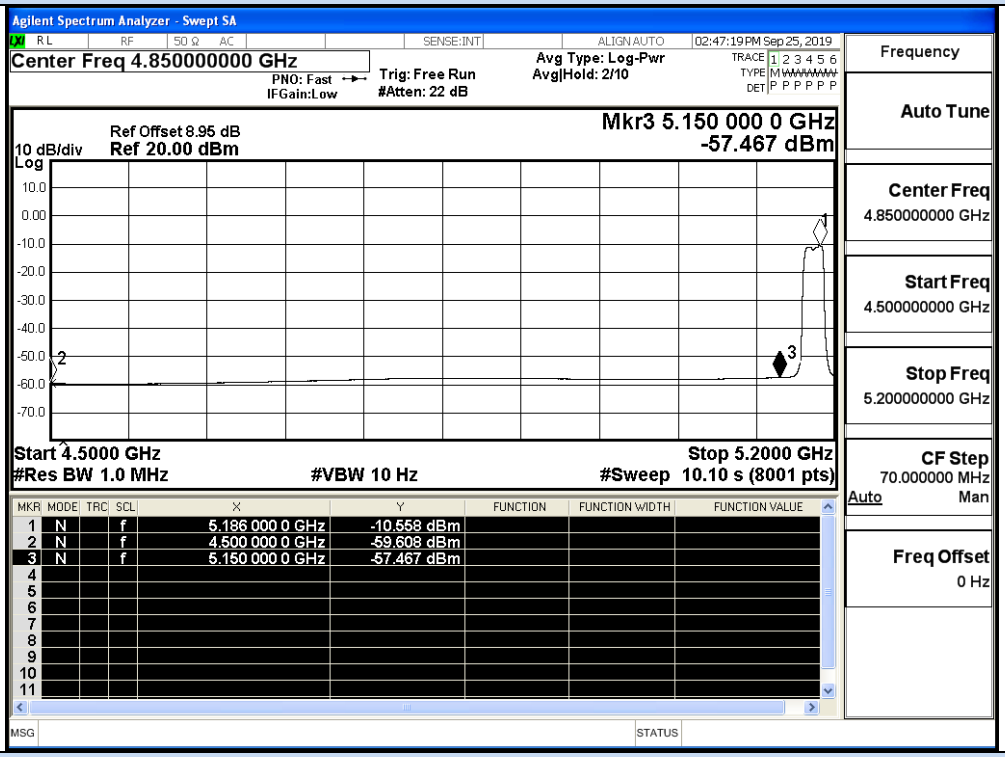


IEEE 802.11a / Channel 48 / 5240MHz / Average

Undesirable Emissions Measurement

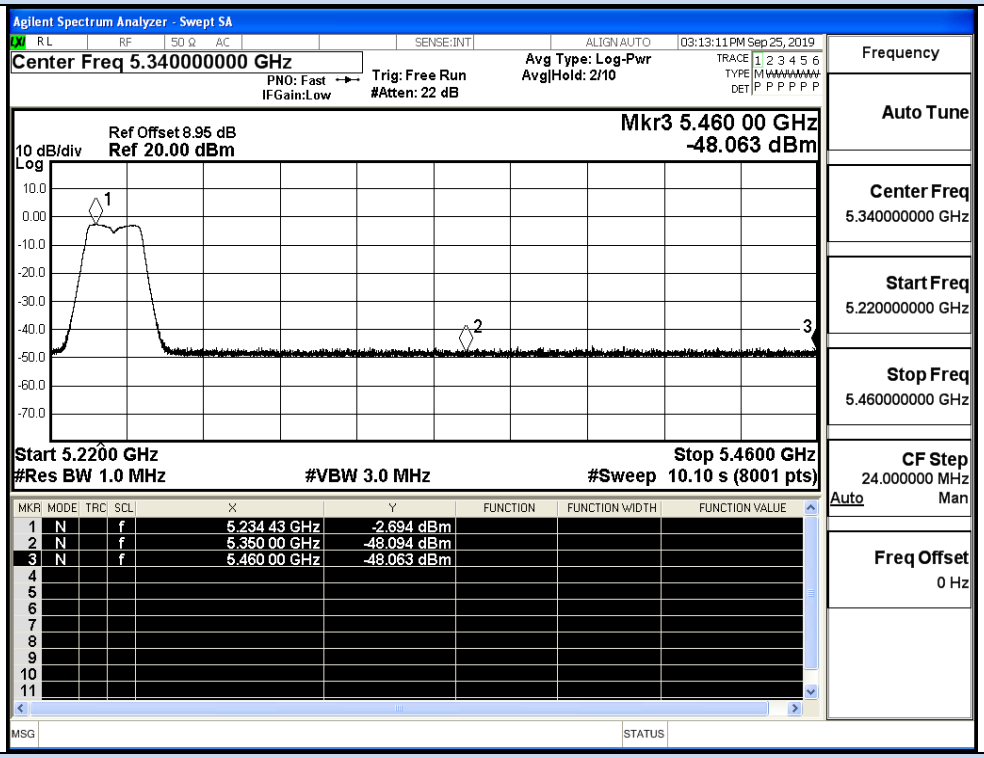


IEEE 802.11n20 / Channel 36 / 5180MHz / Peak

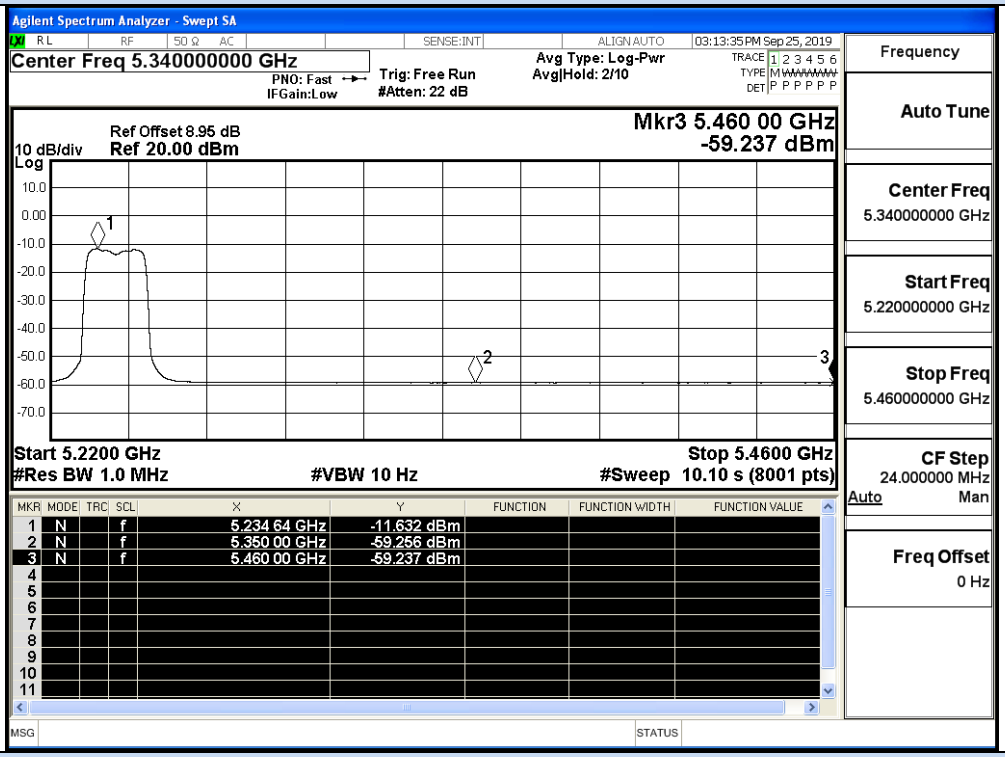


IEEE 802.11n20 / Channel 36 / 5180MHz / Average

Undesirable Emissions Measurement



IEEE 802.11n20 / Channel 48 / 5240MHz / Peak



IEEE 802.11n20 / Channel 48 / 5240MHz / Average

Ant 0+1

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
11N20 SISO	36	4500.0	-50.22	-49.54	-46.86	6.01	0	54.38	Peak	68.20	Pass
		4500.0	-60.40	-59.61	-56.98	6.01	0	44.26	Average	54.00	Pass
		5150.0	-47.30	-47.17	-44.22	6.01	0	57.02	Peak	68.20	Pass
		5150.0	-57.32	-57.47	-54.38	6.01	0	46.86	Average	54.00	Pass
	48	5350.0	-49.21	-48.09	-45.60	6.01	0	55.64	Peak	68.20	Pass
		5350.0	-59.47	-59.26	-56.35	6.01	0	44.89	Average	54.00	Pass
		5460.0	-49.46	-48.06	-45.69	6.01	0	55.55	Peak	68.20	Pass
		5460.0	-59.57	-59.24	-56.39	6.01	0	44.85	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 3.00dBi, whichever is greater

Directional gain=3.00dBi+10 log (2) = 6.01dBi