8.5.3 Maximum Conducted Output Power (average) – UNII-2C band

FCC §15.407(a), RSS-247 Issue 1, 6.2

Test Mode : Set to Lowest channel, Middle channel, Highest channel

802.11a mode

Channel	Frequency (MHz)	Measured conducted power (dBm)		Maximum Conducted Power (dBm)*		Conducted Limit (dBm)		E.I.R.P (dBm)		IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1	Chain 0	Chain 1	FCC	IC	Chain 0	Chain 1	
Lowest	5500	9.10	6.57	9.93	7.40	23.98	23.30	12.63	10.10	29.30
Middle	5580	8.16	5.30	9.00	6.14	23.98	23.70	11.70	8.84	29.70
Highest	5700	6.90	3.76	7.74	4.60	23.98	23.70	10.44	7.30	29.70

802.11n (20 MHz) mode - SISO

Channel	Frequency (MHz)	Measured conducted power (dBm)		Maximum Conducted Power (dBm)*		Conducted Limit (dBm)		E.I.R.P (dBm)		IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1	Chain 0	Chain 1	FCC	IC	Chain 0	Chain 1	
Lowest	5500	8.91	6.35	9.79	7.23	23.98	23.55	12.49	9.93	29.55
Middle	5580	8.02	5.28	8.90	6.16	23.98	23.55	11.60	8.86	29.55
Highest	5700	6.60	3.62	7.51	4.53	23.98	23.55	10.21	7.23	29.55

TEST DATA

802.11n (20 MHz) mode - CDD

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)*	Conducted Limit (dBm)		E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power	FCC	IC		
Lowest	5500	8.34	5.53	0.88	11.05	23.98	23.55	13.75	29.50
Middle	5580	7.46	4.78	0.88	10.21	23.98	23.53	12.91	29.53
Highest	5700	6.41	3.22	0.91	9.02	23.98	23.54	11.72	29.54

802.11n (20 MHz) mode – MIMO

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)*	Conducted Limit (dBm)		E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power	FCC	IC		
Lowest	5500	7.67	5.36	1.58	11.26	23.98	23.56	13.96	29.56
Middle	5580	6.99	4.15	1.59	10.40	23.98	23.53	13.10	29.53
Highest	5700	5.75	2.72	1.60	9.10	23.98	23.53	13.60	29.53

802.11n (40 MHz) mode – SISO

Channel	Frequency (MHz)	Measured conducted power (dBm)		Maximum Conducted Power (dBm)*		Conducted Limit (dBm)		E.I.R.P (dBm)		IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1	Chain 0	Chain 1	FCC	IC	Chain 0	Chain 1	
Lowest	5510	5.14	2.53	6.76	4.15	23.98	23.98	9.46	6.85	30.00
Middle	5550	4.77	2.09	6.40	3.72	23.98	23.98	9.10	6.42	30.00
Highest	5670	3.23	-0.22	4.86	1.41	23.98	23.98	7.56	4.11	30.00

TEST DATA

802.11n (40 MHz) mode - CDD

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)*	Conducted Limit (dBm)		E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power	FCC	IC		
Lowest	5510	4.80	2.40	1.62	8.39	23.98	23.98	11.09	30.00
Middle	5550	4.31	1.92	1.63	7.92	23.98	23.98	10.62	30.00
Highest	5670	2.85	-0.34	1.63	6.18	23.98	23.98	8.88	30.00

802.11n (40 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)*	Conducted Limit (dBm)		E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power	FCC	IC		
Lowest	5510	3.85	1.38	2.67	8.47	23.98	23.98	11.17	30.00
Middle	5550	3.48	0.96	2.67	8.08	23.98	23.98	10.78	30.00
Highest	5670	1.91	-1.07	2.67	6.35	23.98	23.98	9.05	30.00

802.11ac (20 MHz) mode - SISO

Channel	Frequency (MHz)	Measured conducted power (dBm)		Maximum Conducted Power (dBm)*		Conducted Limit (dBm)		E.I.R.P (dBm)		IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1	Chain 0	Chain 1	FCC	IC	Chain 0	Chain 1	
Lowest	5500	8.01	6.47	8.90	7.36	23.98	23.56	11.60	10.06	29.56
Middle	5580	8.21	5.27	9.11	6.17	23.98	23.55	11.81	8.87	29.55
Highest	5700	6.62	3.65	7.51	4.54	23.98	23.54	10.21	7.24	29.54

TEST DATA

802.11ac (20 MHz) mode - CDD

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)*	Conducted Limit (dBm)		E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power	FCC	IC		
Lowest	5500	8.18	5.89	0.89	11.08	23.98	23.50	13.78	29.50
Middle	5580	7.47	4.89	0.90	10.28	23.98	23.50	12.98	29.50
Highest	5700	6.57	3.30	0.89	9.14	23.98	23.50	11.84	29.50

802.11ac (20 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)*	Conducted Limit (dBm)		E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power	FCC	IC		
Lowest	5500	7.68	5.33	1.57	11.24	23.98	23.55	15.74	29.55
Middle	5580	7.02	4.35	1.56	10.46	23.98	23.53	13.16	29.53
Highest	5700	6.01	2.82	1.56	9.27	23.98	23.53	11.97	29.53

802.11ac (40 MHz) mode - SISO

Channel	Frequency (MHz)	Measured conducted power (dBm)		Maximum Conducted Power (dBm)*		Conducted Limit (dBm)		E.I.R.P (dBm)		IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1	Chain 0	Chain 1	FCC	IC	Chain 0	Chain 1	
Lowest	5510	5.21	2.40	6.83	4.02	23.98	23.98	9.53	6.72	30.00
Middle	5550	4.83	2.17	6.46	3.80	23.98	23.98	9.16	6.50	30.00
Highest	5670	3.11	0.11	4.73	1.73	23.98	23.98	7.43	4.43	30.00

TEST DATA

802.11ac (40 MHz) mode - CDD

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)*	Conducted Limit (dBm)		E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power	FCC	IC		
Lowest	5510	4.72	2.37	1.62	8.33	23.98	23.98	11.03	30.00
Middle	5550	4.33	1.95	1.63	7.94	23.98	23.98	10.64	30.00
Highest	5670	2.85	-0.11	1.62	6.25	23.98	23.98	8.95	30.00

802.11ac (40 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)*	Conducted Limit (dBm)		E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power	FCC	IC		
Lowest	5510	3.92	1.50	2.65	8.54	23.98	23.98	11.24	30.00
Middle	5550	3.66	1.05	2.67	8.23	23.98	23.98	10.93	30.00
Highest	5670	2.01	-1.19	2.68	6.39	23.98	23.98	9.09	30.00

802.11ac (80 MHz) mode - SISO

Channel	Frequency (MHz)	Measured conducted power (dBm)		Maximum Conducted Power (dBm)*		Conducted Limit (dBm)		E.I.R.P (dBm)		IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1	Chain 0	Chain 1	FCC	IC	Chain 0	Chain 1	
	5530	2.40	-0.06	5.22	2.76	23.98	23.98	7.92	5.46	30.00

TEST DATA

802.11ac (80 MHz) mode – CDD

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)*	Conducted Limit (dBm)		E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power	FCC	IC		
	5530	2.06	-0.20	2.82	6.91	23.98	23.98	9.61	30.00

802.11ac (80 MHz) mode – MIMO

Channel	Frequency (MHz)	Measured conducted power (dBm)		Duty Factor (dB)	Maximum Conducted Power (dBm)*	Conducted Limit (dBm)		E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power	FCC	IC		
	5530	1.04	-1.40	4.12	7.12	23.98	23.98	9.82	30.00

TEST DATA

Note:

1. *Maximum Conducted (average) Power = Measured conducted power + Duty Factor
2. Total output power = 10 log [10^{(Chain 0 Power + duty factor)/10} + 10^{(Chain 1 Power + duty factor)/10}]
3. For CDD transmission, directional gain is. **2.7 dBi**

   For MIMO transmission, directional gain is **2.7 dBi.**

   Directional gain was calculated according to KDB662911 D01 Multiple Transmitter Output v02r01.

   For power measurements on IEEE 802.11 devices employing CDD, directional gain is as follows,

   Directional gain = G_{ANT} + Array Gain = 2.7 dBi + 0 dB = 2.7 dBi

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

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

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

   For power measurements on all devices employing MIMO, directional gain is as follows,

   Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi, where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi. = 2.7 dBi + 10 log(2/2) dB = 2.7 dBi.

   For this device, MIMO mode means SM-MIMO(Spatial Multiplexing) transmission and N_{SS}=2.
4. E.I.R.P = Maximum conducted Power + Duty Cycle Factor + Antenna gain.

   E.I.R.P was calculated by following equation according to KDB412172 D01 Determining ERP and EIRP v01.

   E.I.R.P = $P_T + G_T – Lc$

   P_T = Peak outputpower (dBm)

   G_T = Gain of the transmitting antenna in dBi, Directional antenna gain is **2.7 dBi.**

   L_C = Signal attenuation in the connecting cable between the transmitter and antenna in dB. This factor of an integral antenna is negligible.
5. FCC conducted output power limit = 250 mW or 11 dBm + 10 log B, whichever power is less.

   B is the 26 dB emission bandwidth in megahertz.

   IC conducted output power limit = 250 mW or 11 dBm + 10 log B, whichever power is less.

   B is the 99% emission bandwidth in megahertz,

   IC E.I.R.P Limit = 1.0 W (30dBm) or 17 + 10 log10B dBm, whichever power is less.

   B is the 99% emission bandwidth in megahertz.
6. The following equation was used for spectrum offset:

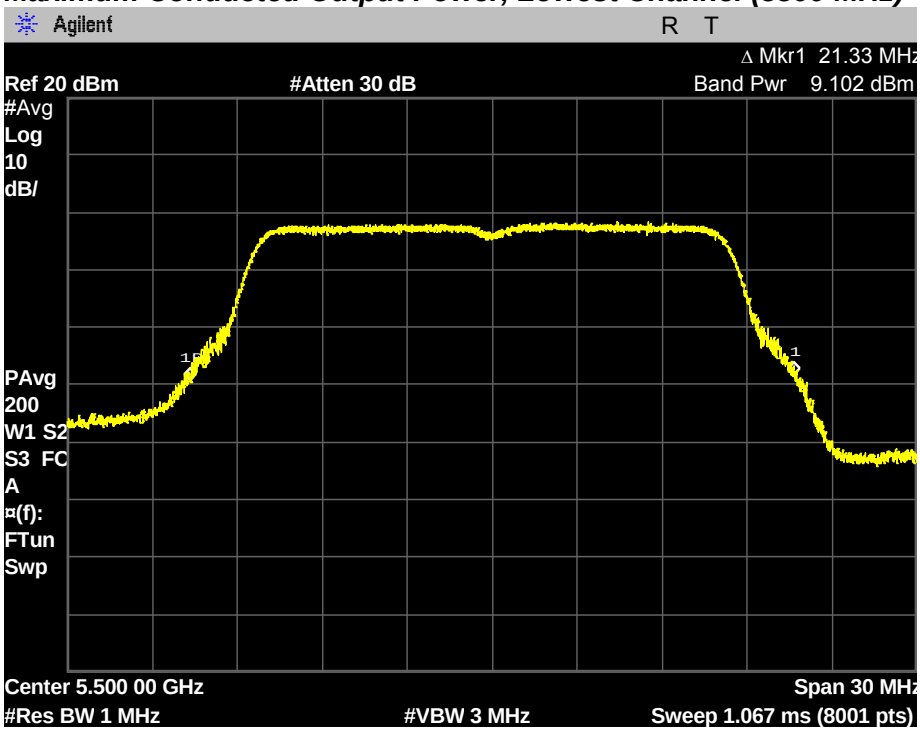
   Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)
7. A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW (26.99dBm) for FCC and IC requirements.

PLOTS OF EMISSIONS

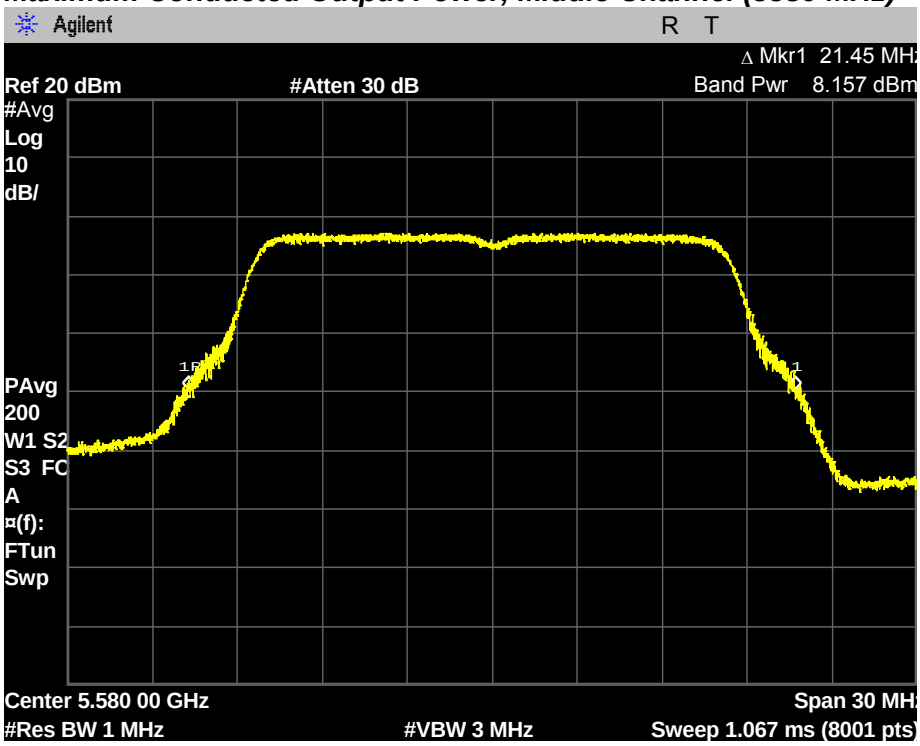
802.11a mode

Chain 0

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

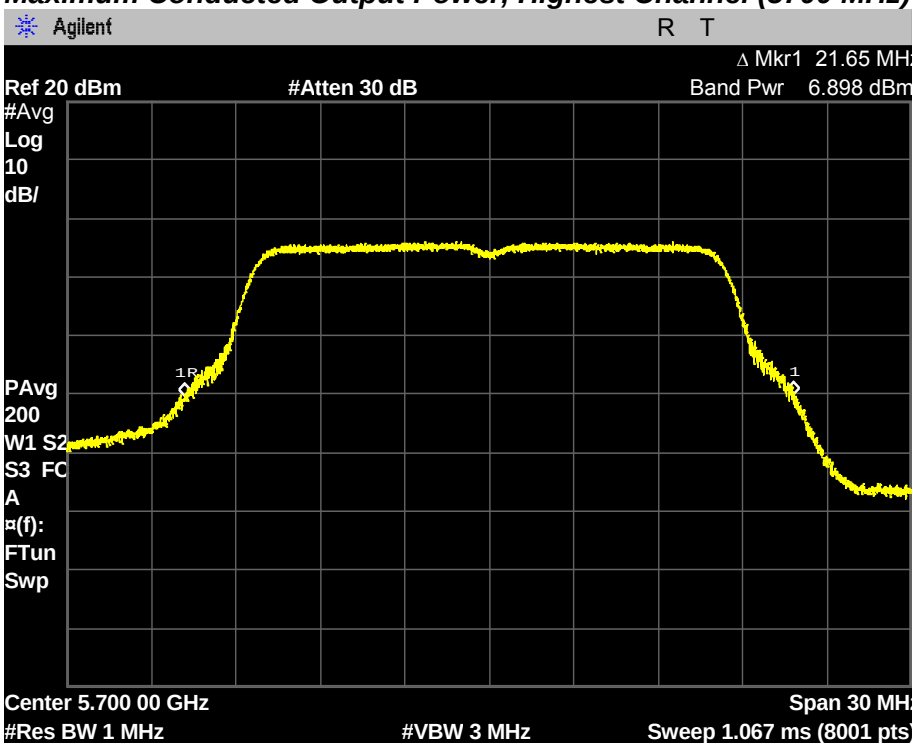


Maximum Conducted Output Power, Middle Channel (5580 MHz)



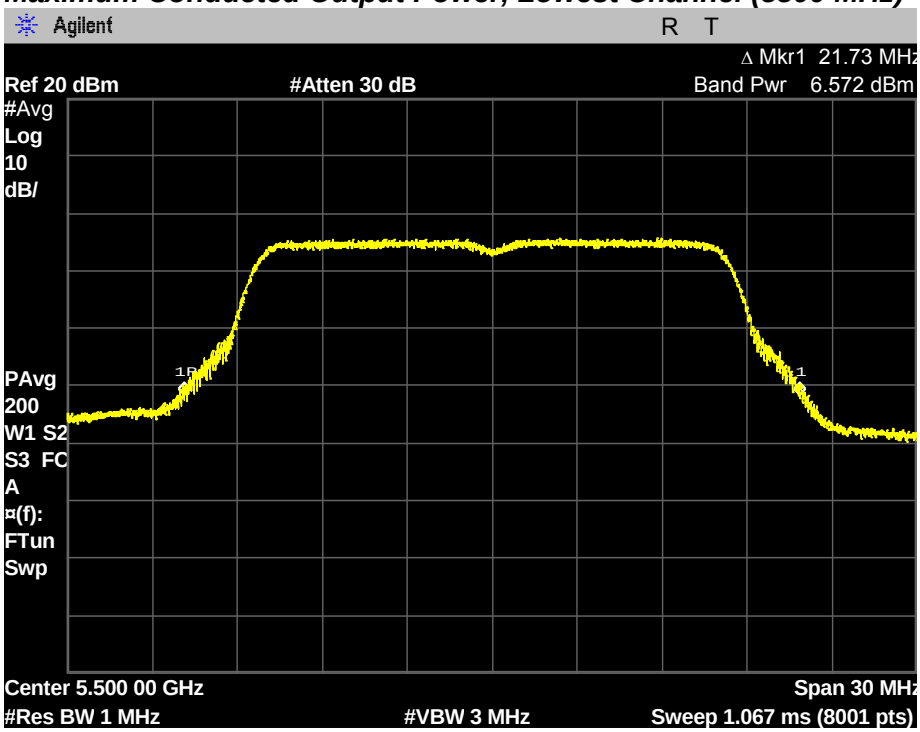
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5700 MHz)



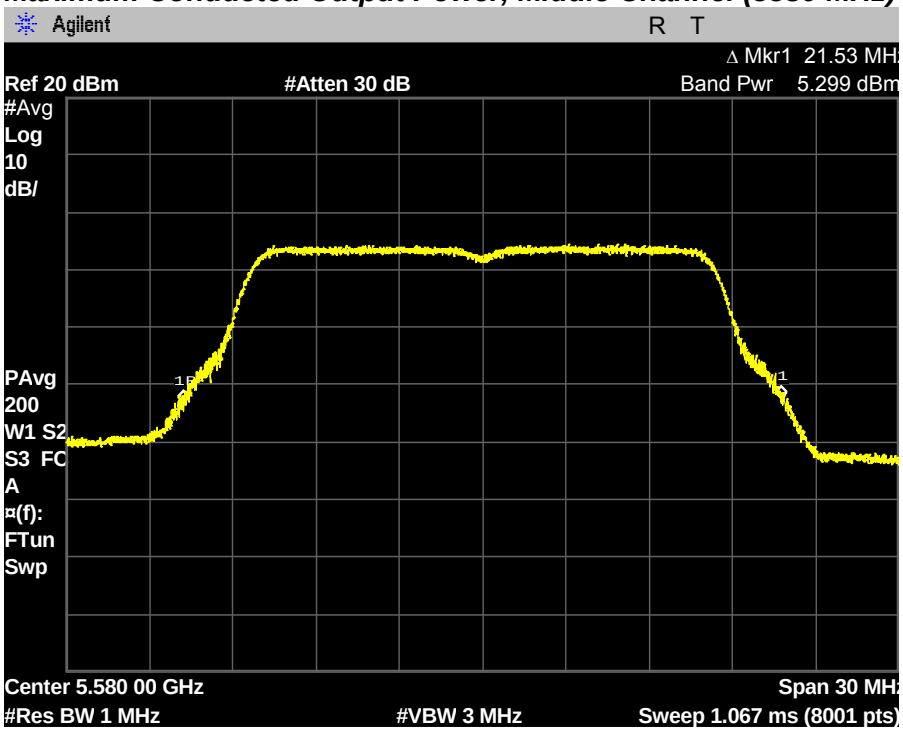
Chain 1

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

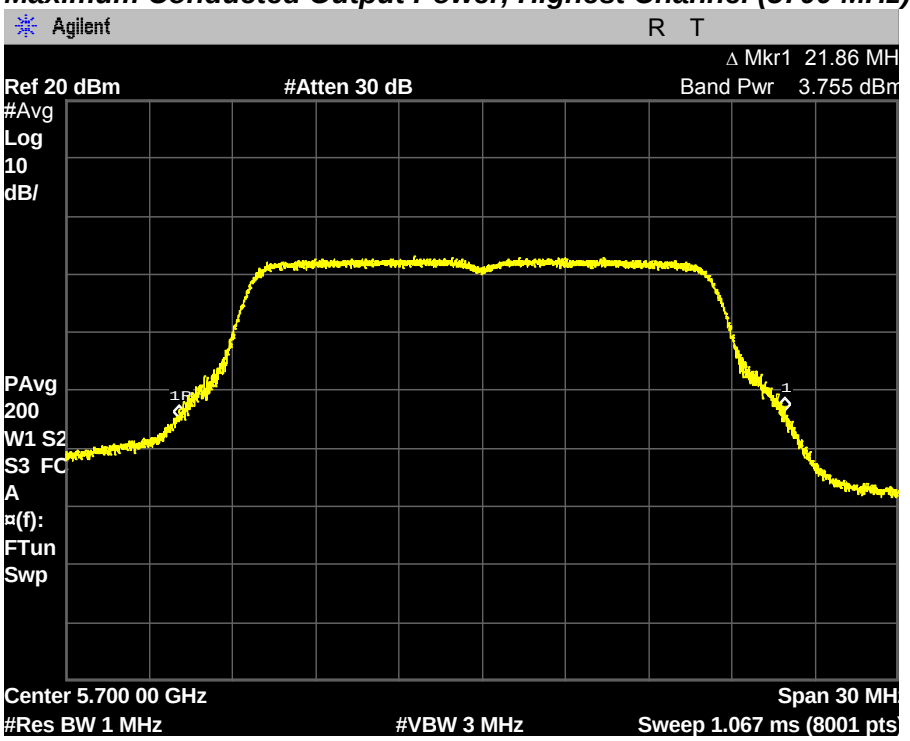


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5580 MHz)



Maximum Conducted Output Power, Highest Channel (5700 MHz)

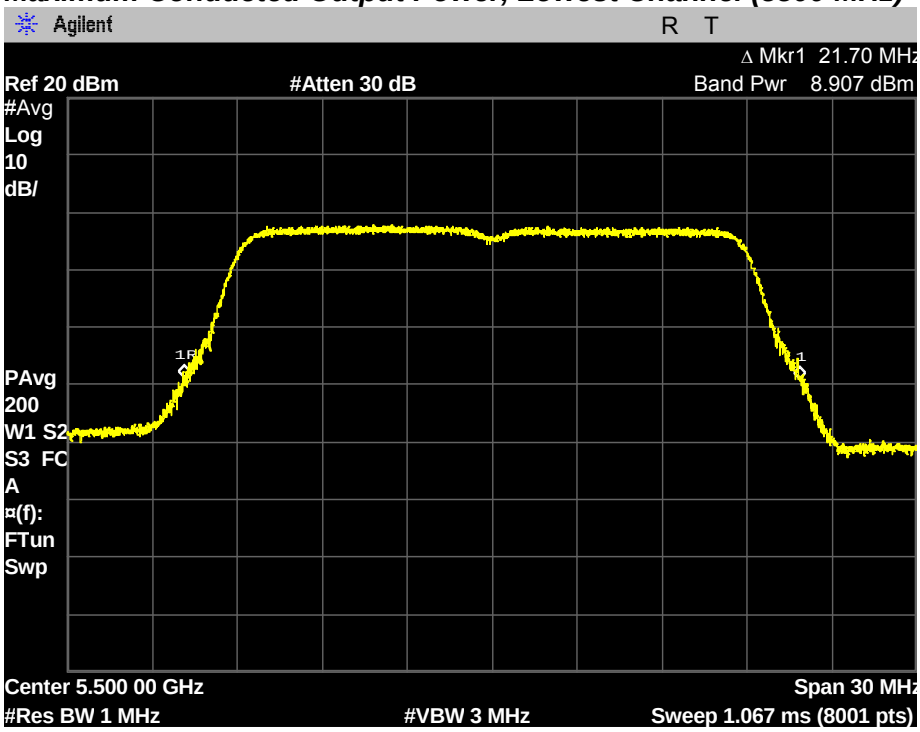


PLOTS OF EMISSIONS

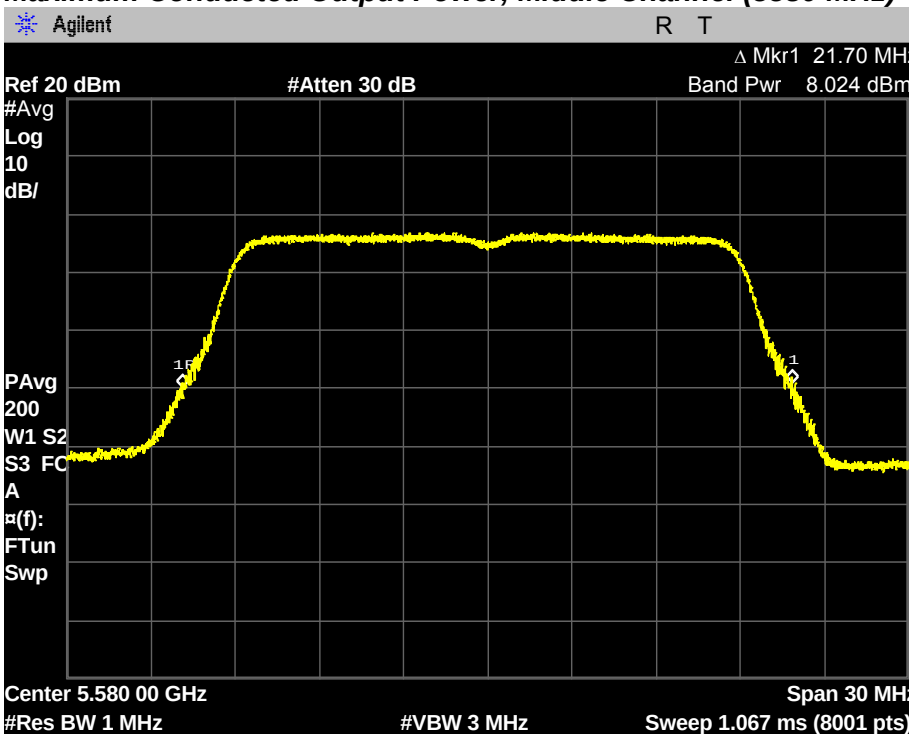
802.11n(20MHz) mode - SISO

Chain 0

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

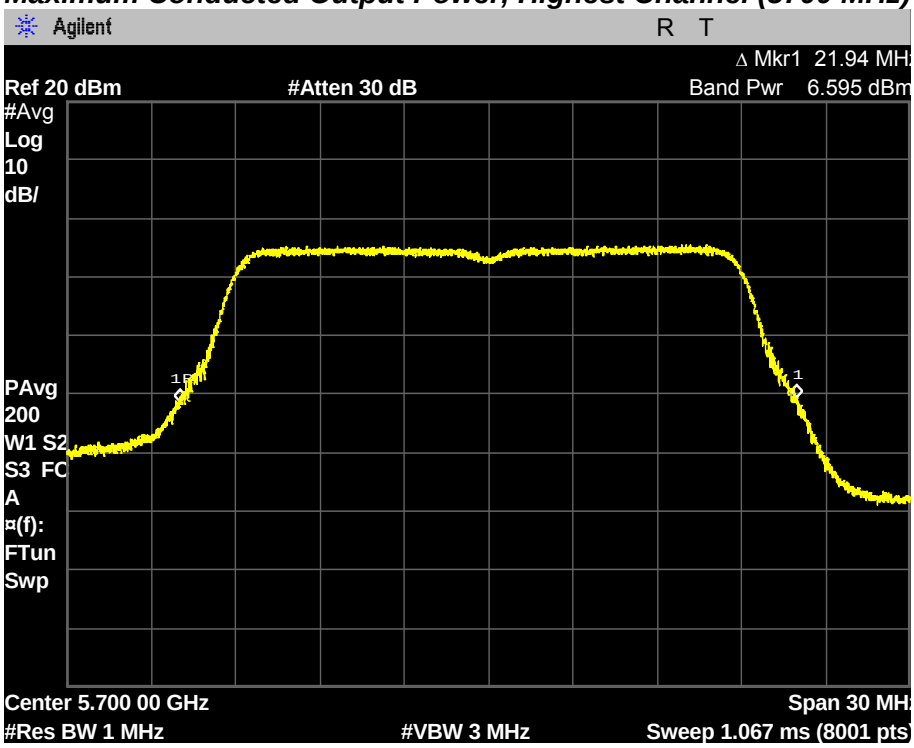


Maximum Conducted Output Power, Middle Channel (5580 MHz)



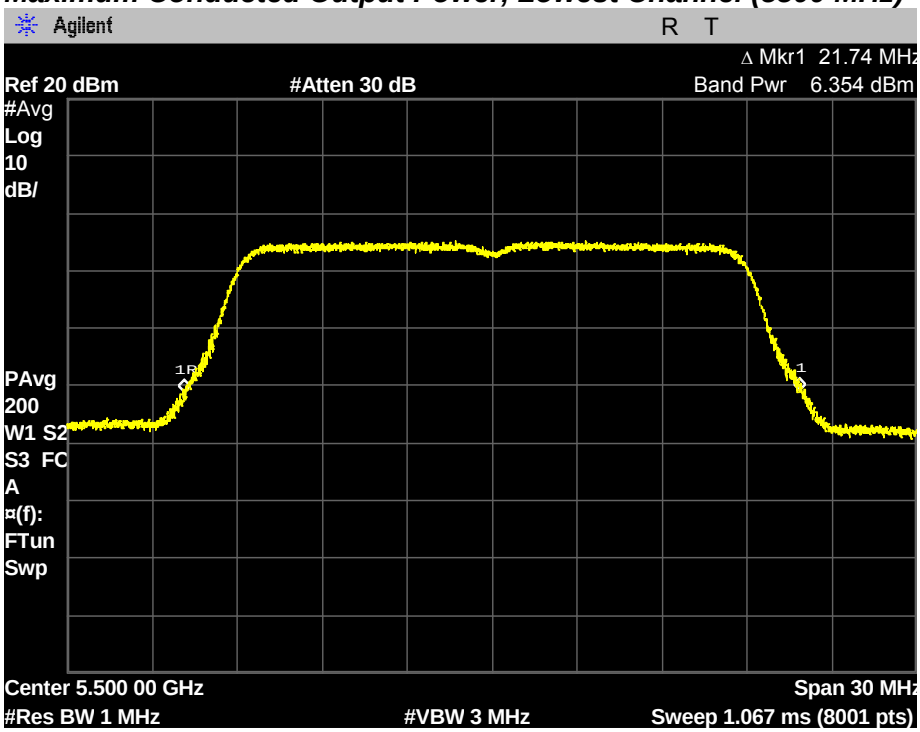
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5700 MHz)



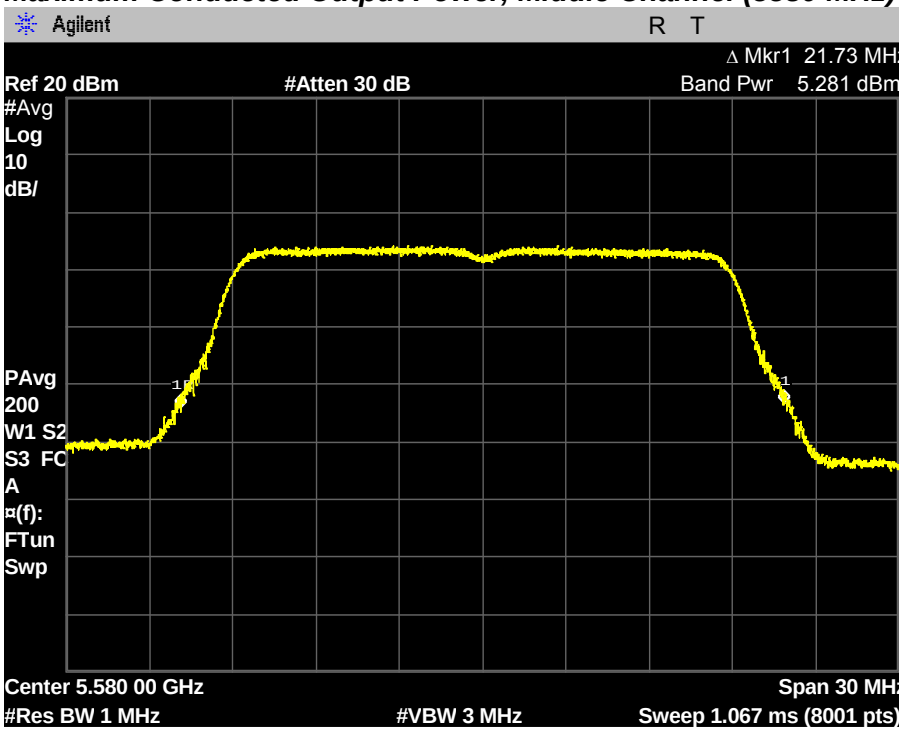
Chain 1

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

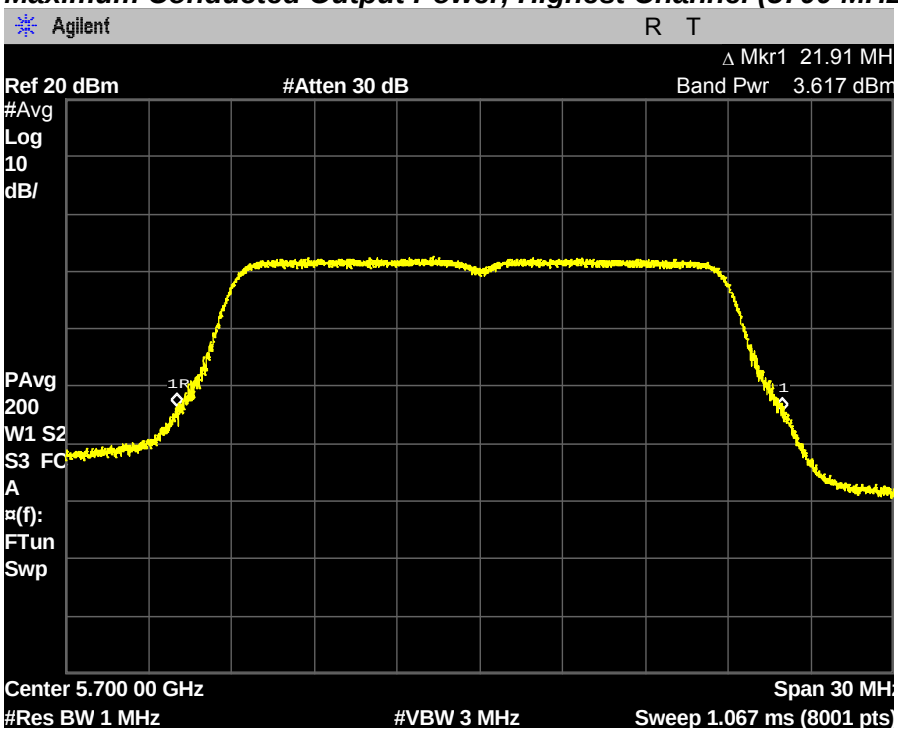


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5580 MHz)



Maximum Conducted Output Power, Highest Channel (5700 MHz)

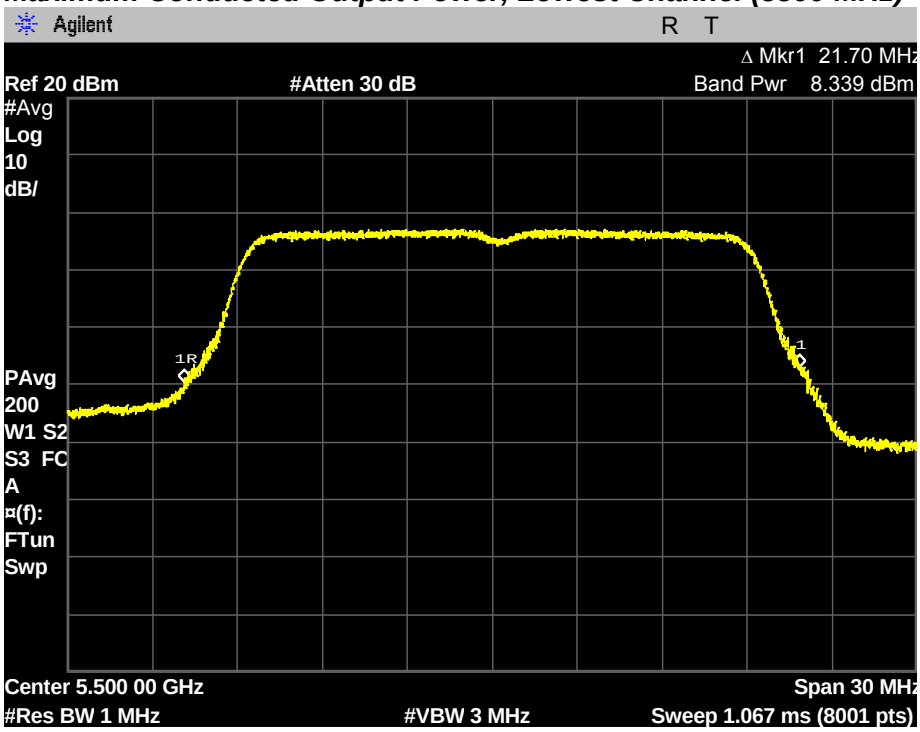


PLOTS OF EMISSIONS

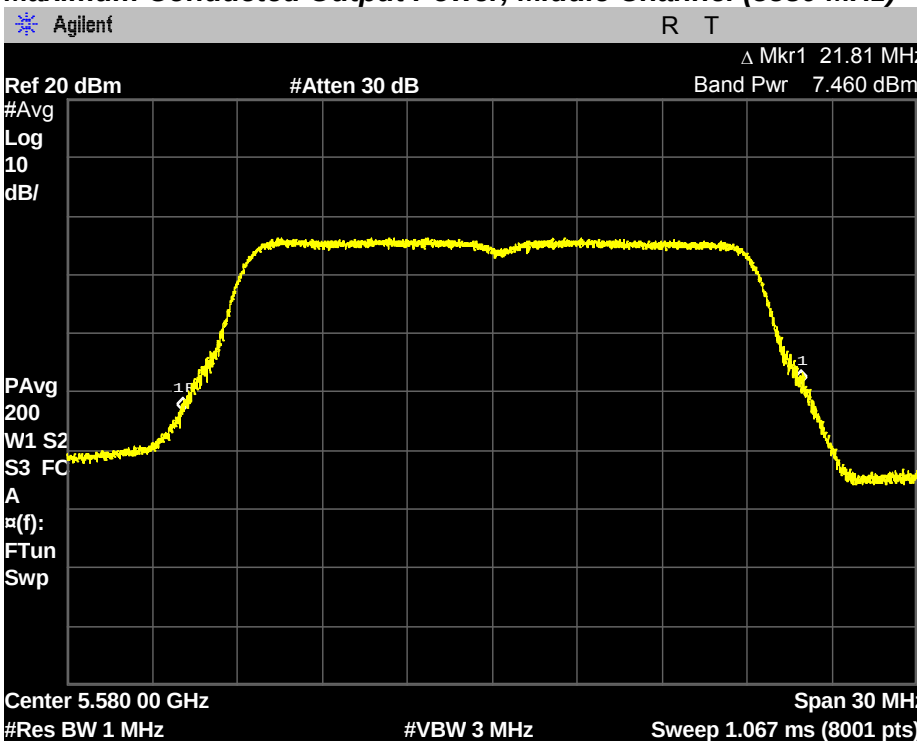
802.11n(20MHz) mode - CDD

Chain 0

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

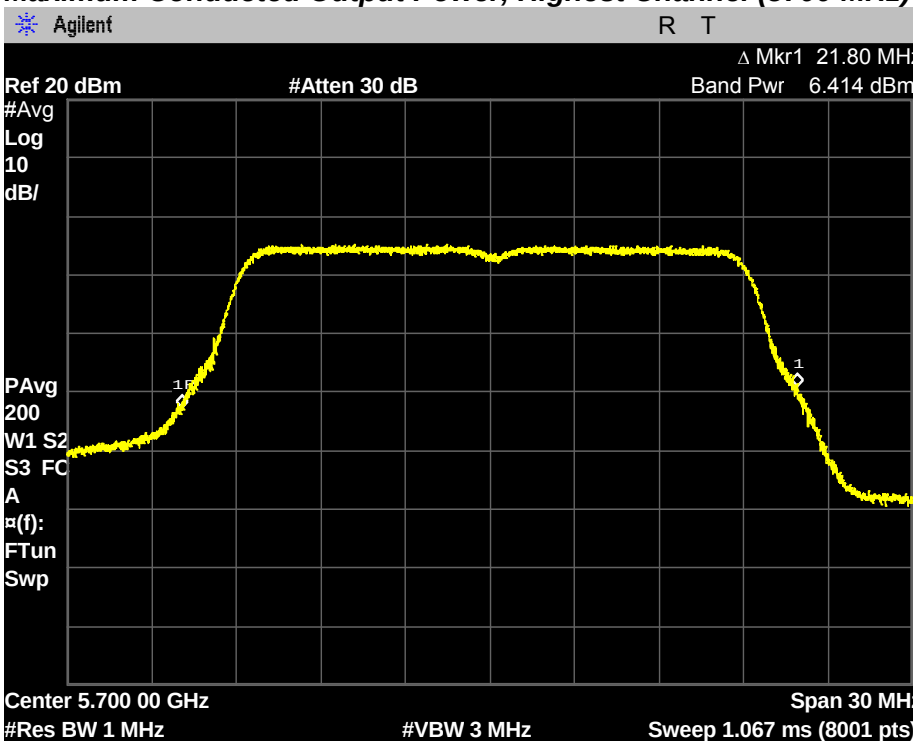


Maximum Conducted Output Power, Middle Channel (5580 MHz)



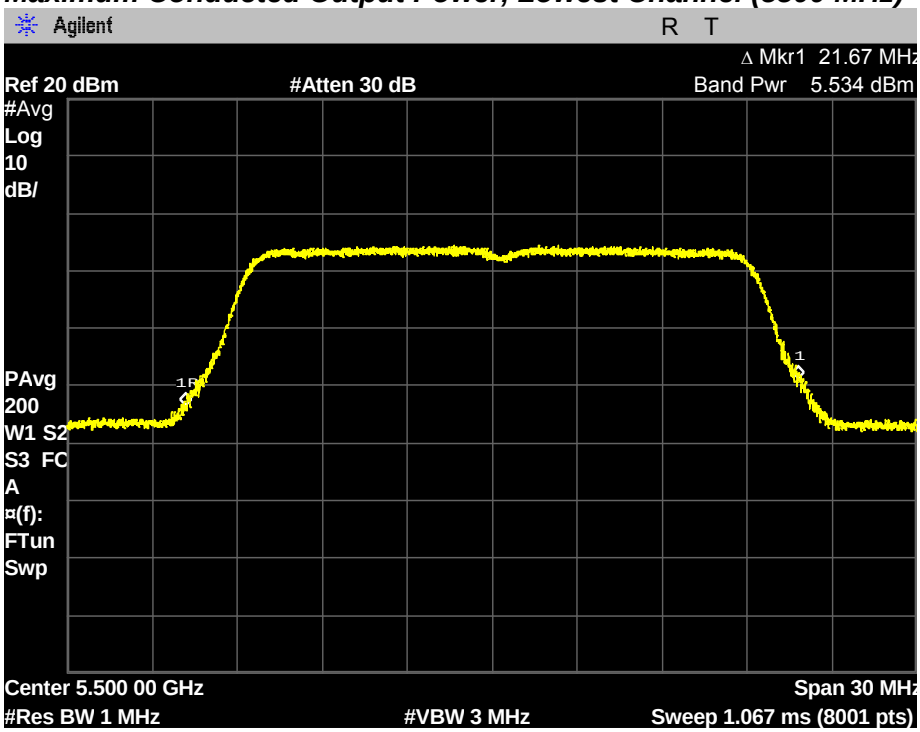
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5700 MHz)



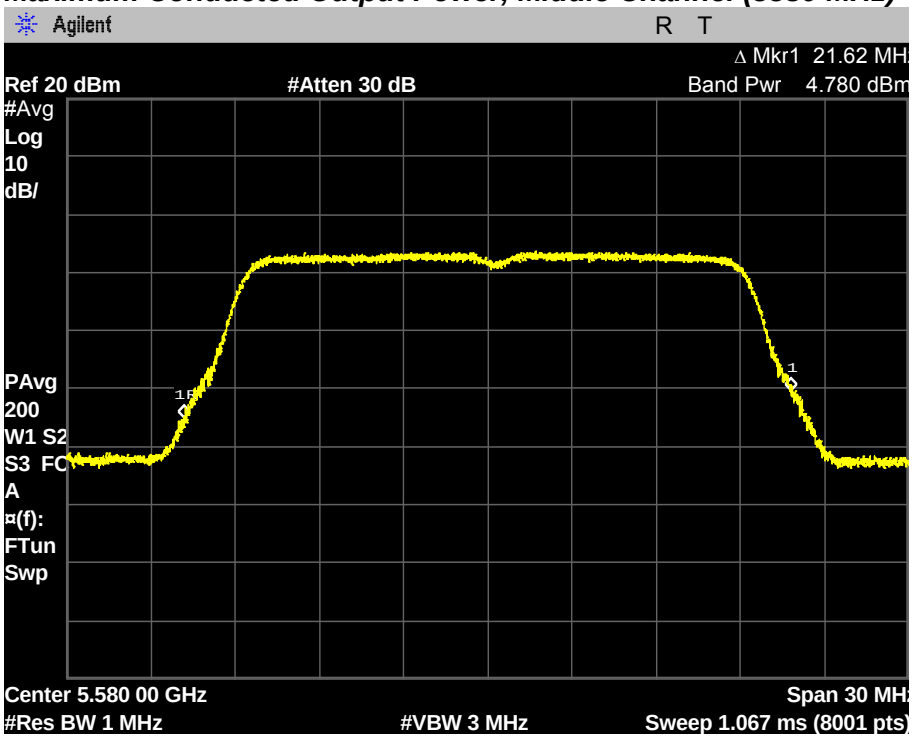
<u>Chain 1</u>

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

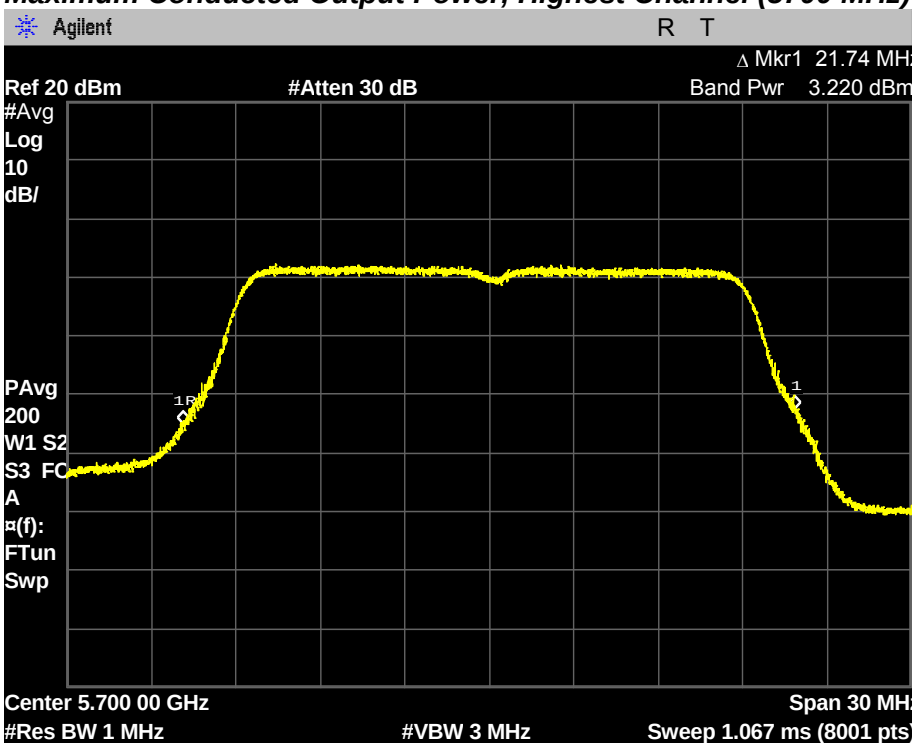


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5580 MHz)



Maximum Conducted Output Power, Highest Channel (5700 MHz)

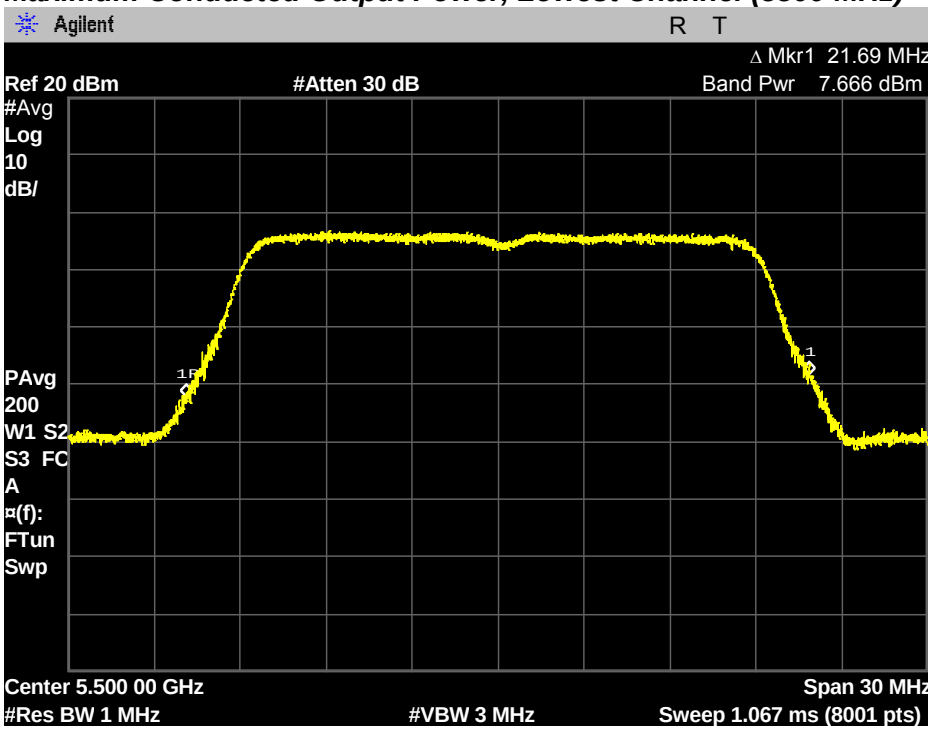


PLOTS OF EMISSIONS

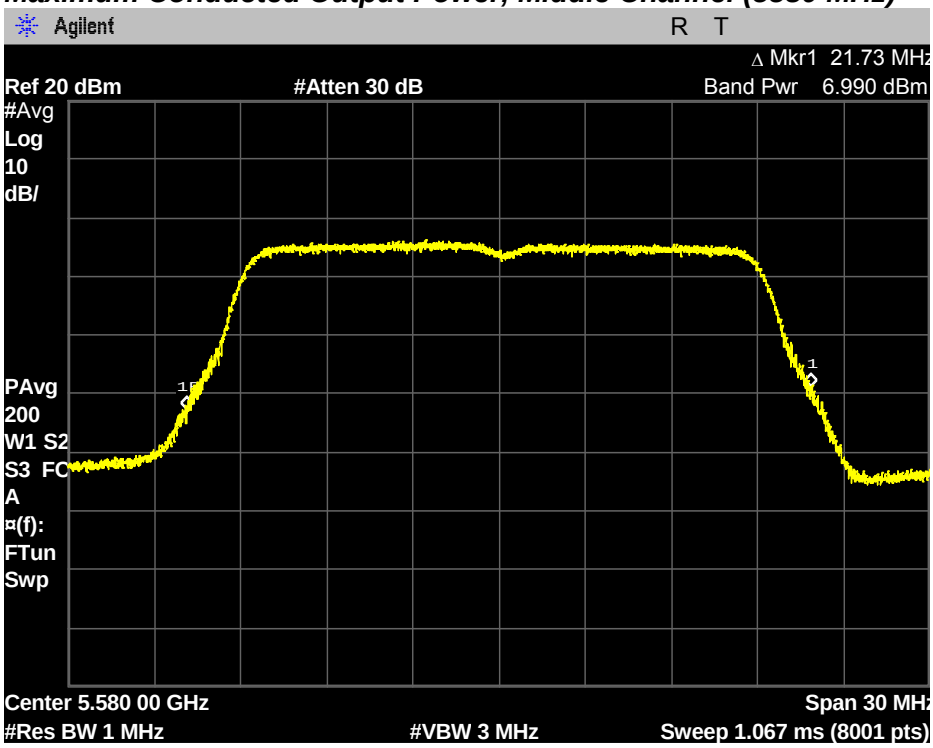
802.11n(20MHz) mode - MIMO

Chain 0

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

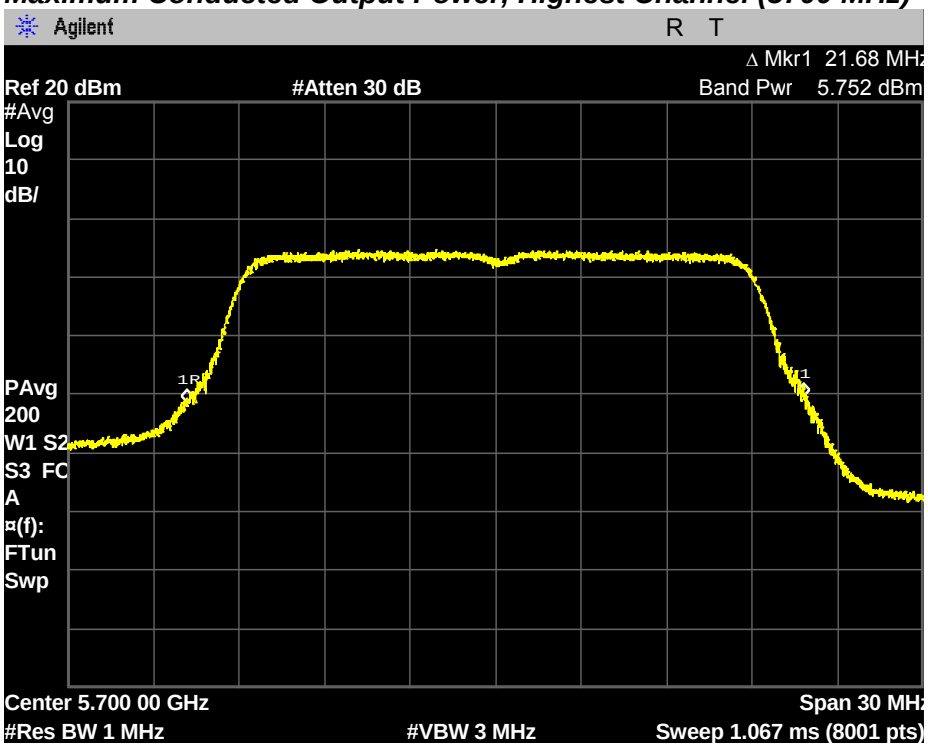


Maximum Conducted Output Power, Middle Channel (5580 MHz)



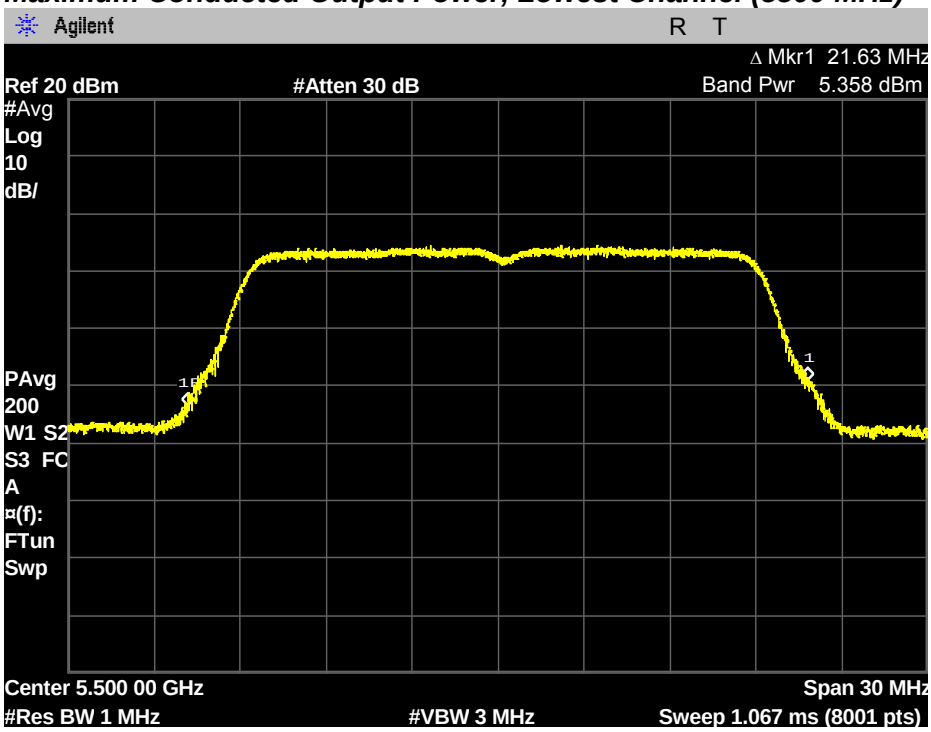
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5700 MHz)



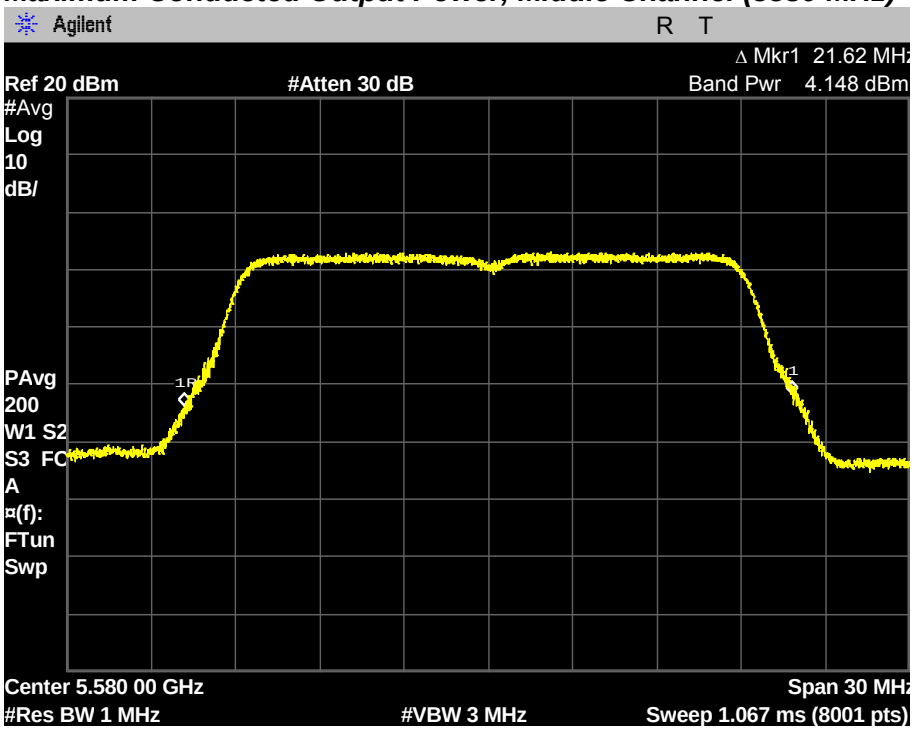
<u>Chain 1</u>

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

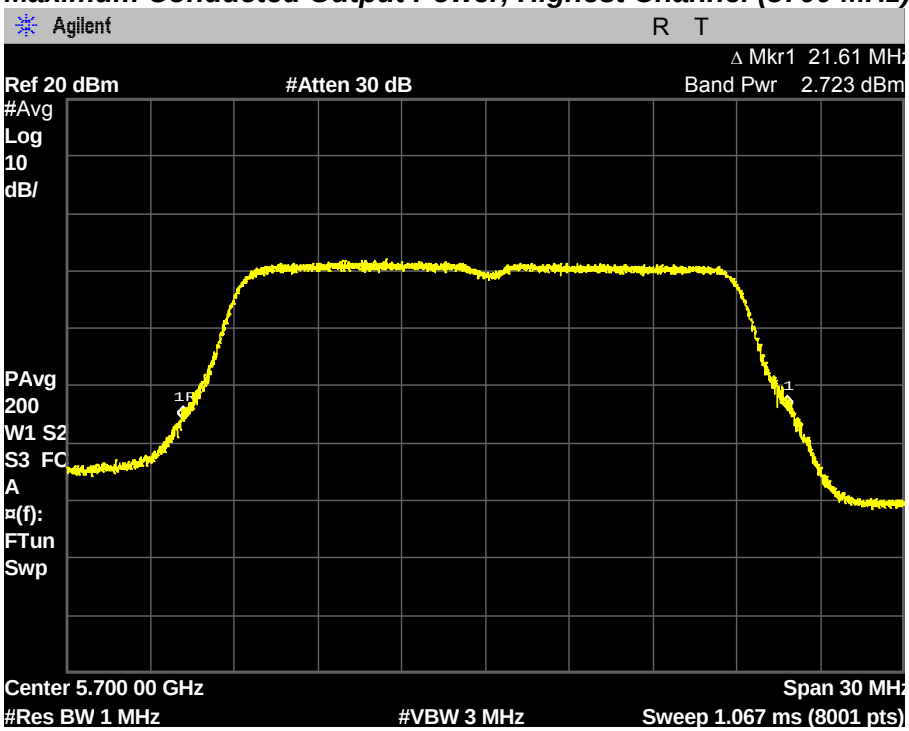


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5580 MHz)



Maximum Conducted Output Power, Highest Channel (5700 MHz)

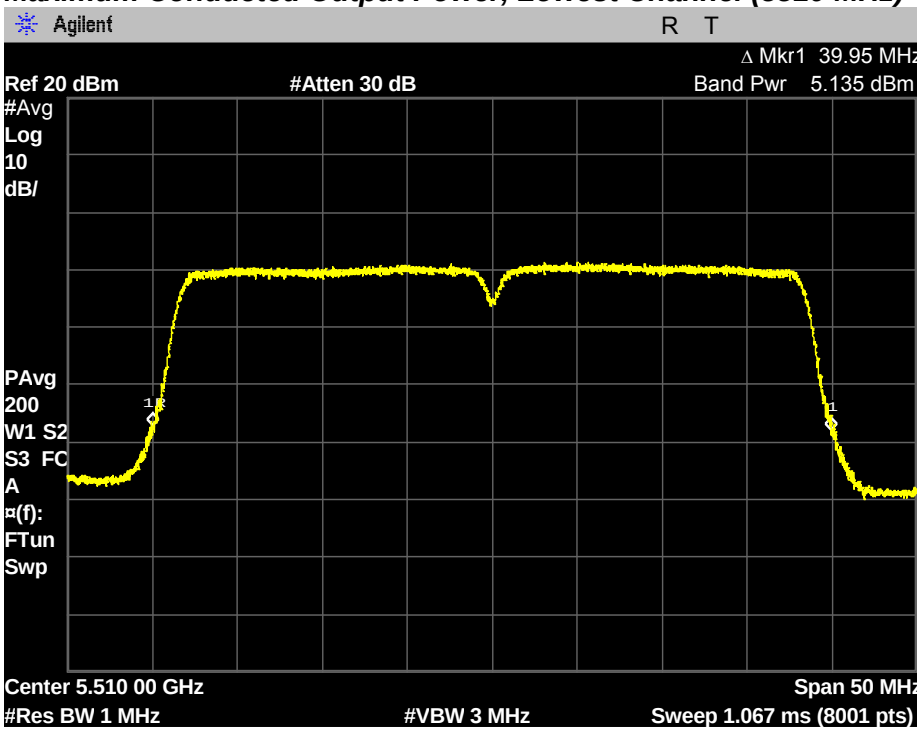


PLOTS OF EMISSIONS

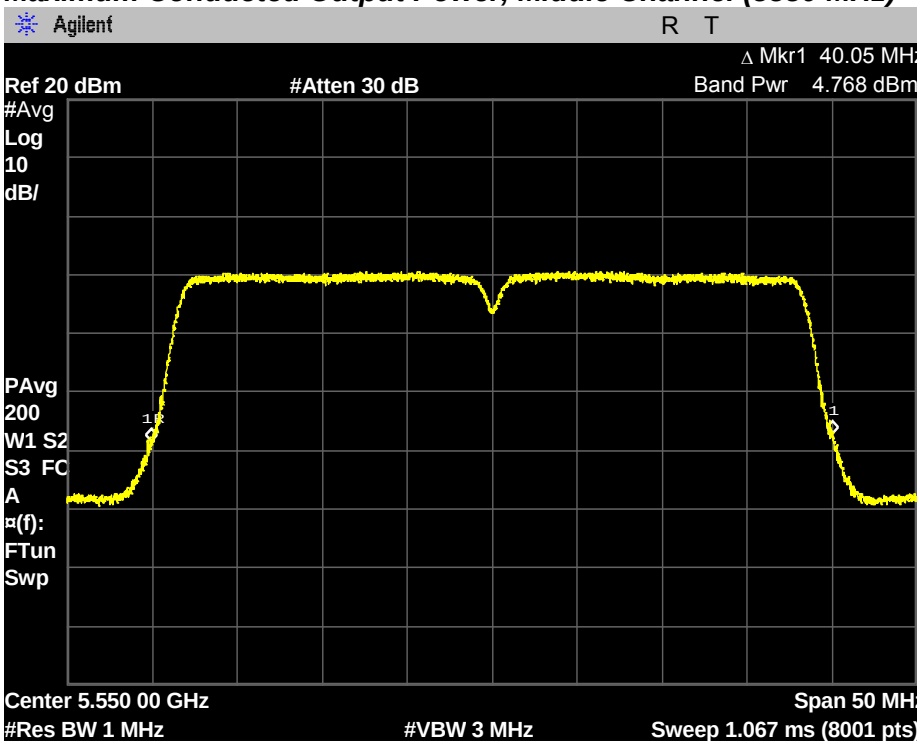
802.11n(40MHz) mode - SISO

Chain 0

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

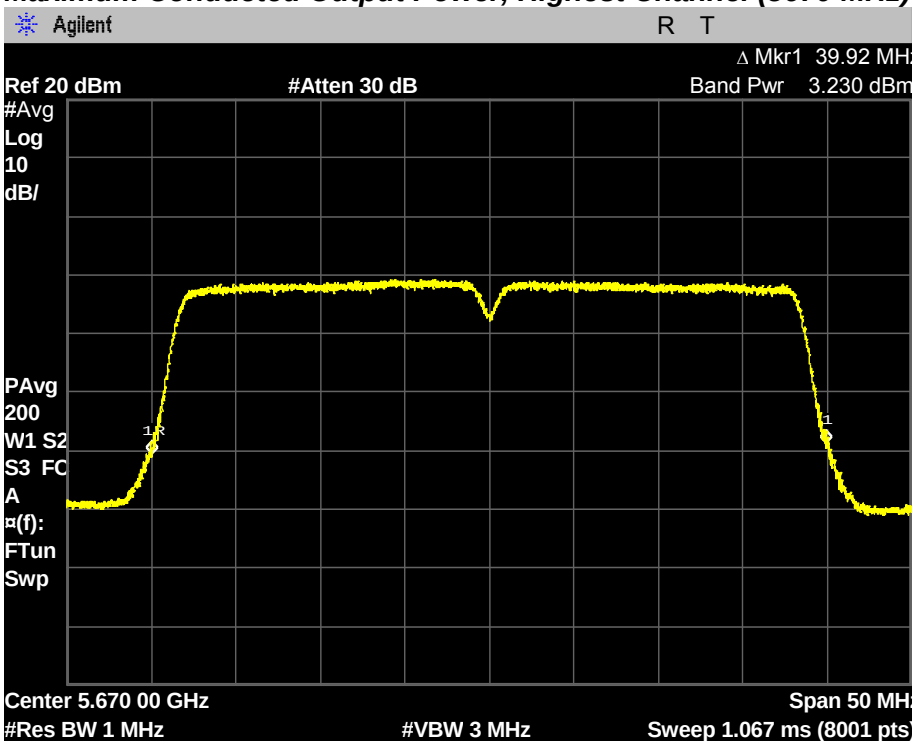


Maximum Conducted Output Power, Middle Channel (5550 MHz)



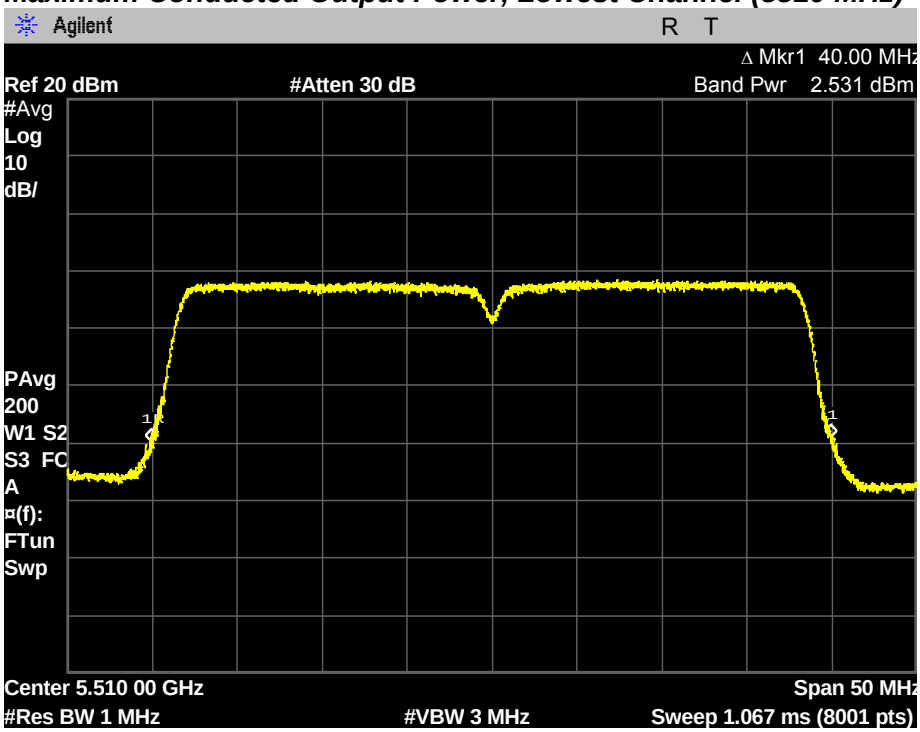
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5670 MHz)



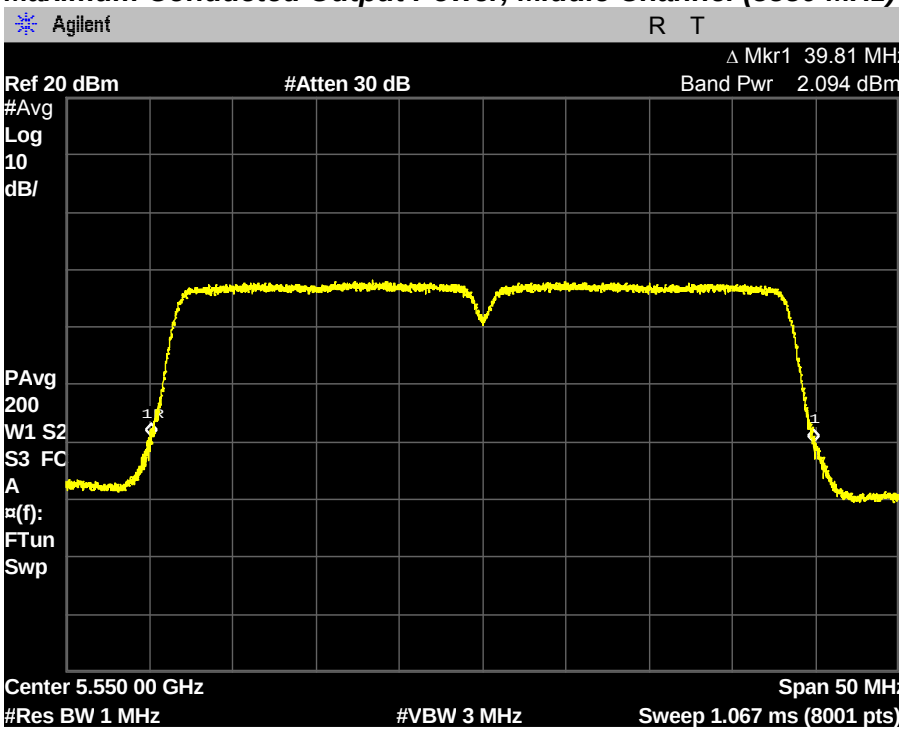
Chain 1

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

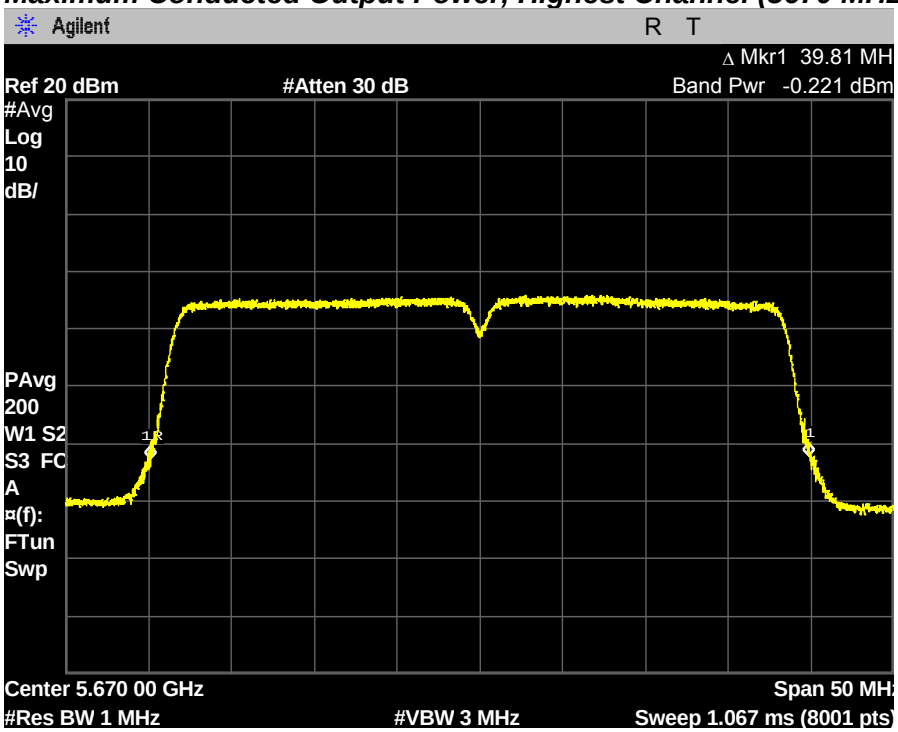


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5550 MHz)



Maximum Conducted Output Power, Highest Channel (5670 MHz)

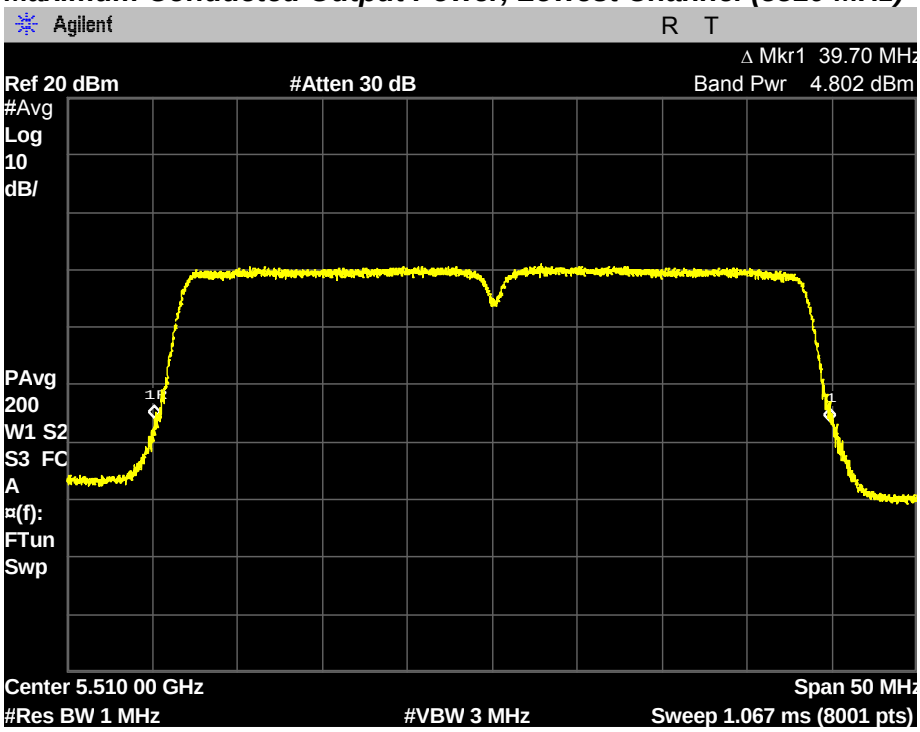


PLOTS OF EMISSIONS

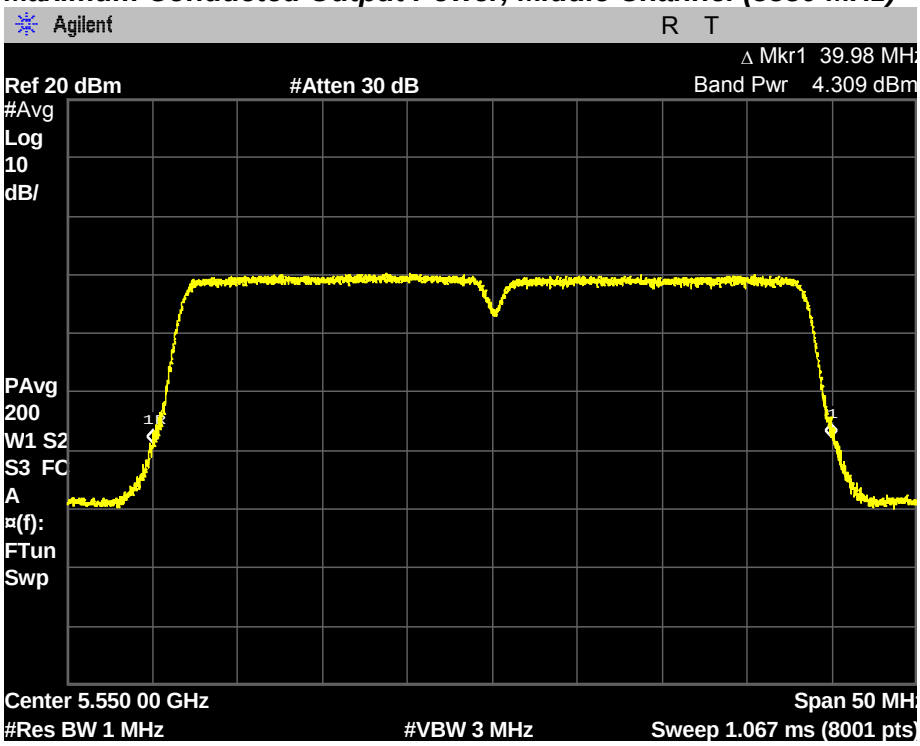
802.11n(40MHz) mode - CDD

Chain 0

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

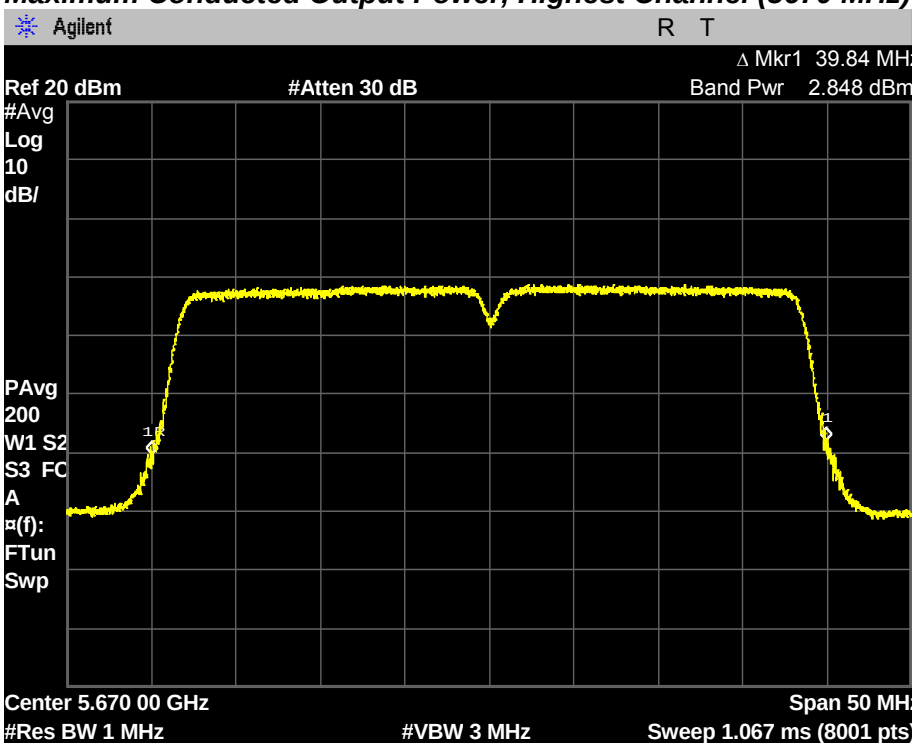


Maximum Conducted Output Power, Middle Channel (5550 MHz)



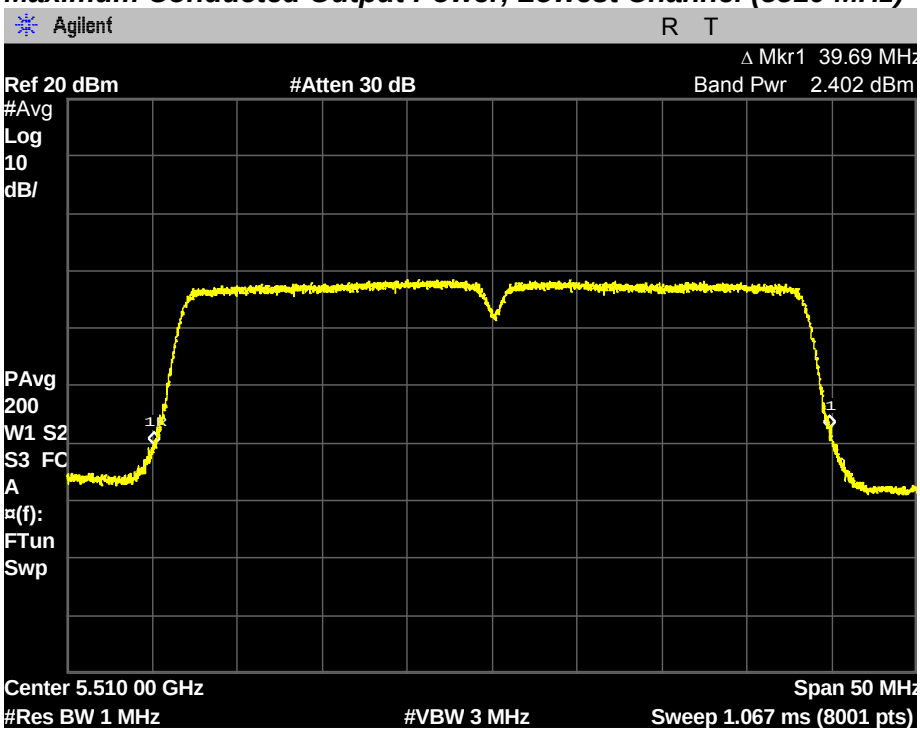
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5670 MHz)



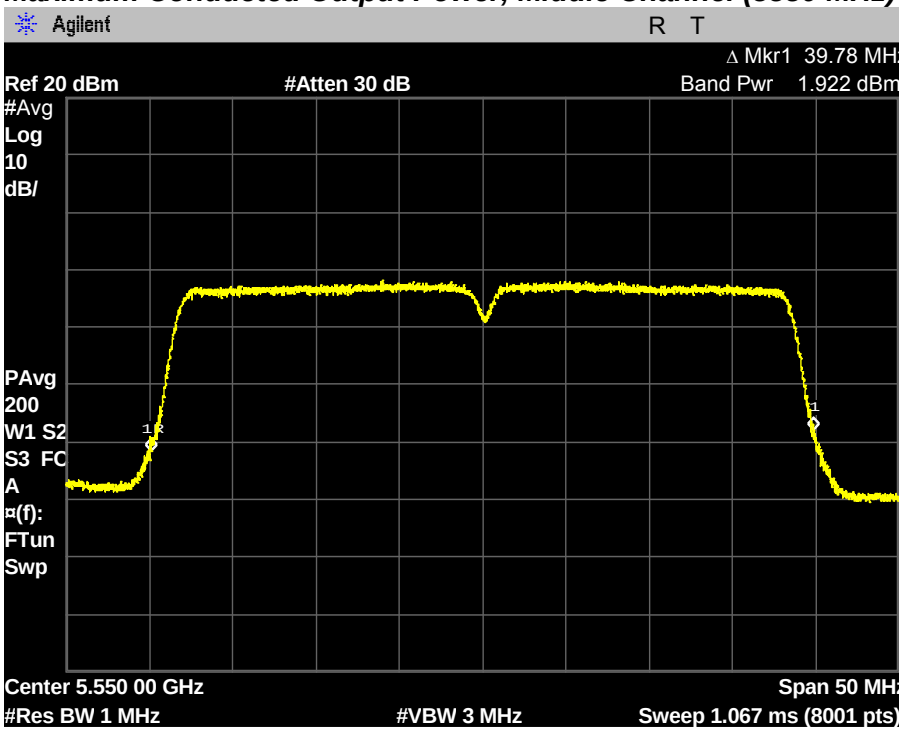
Chain 1

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

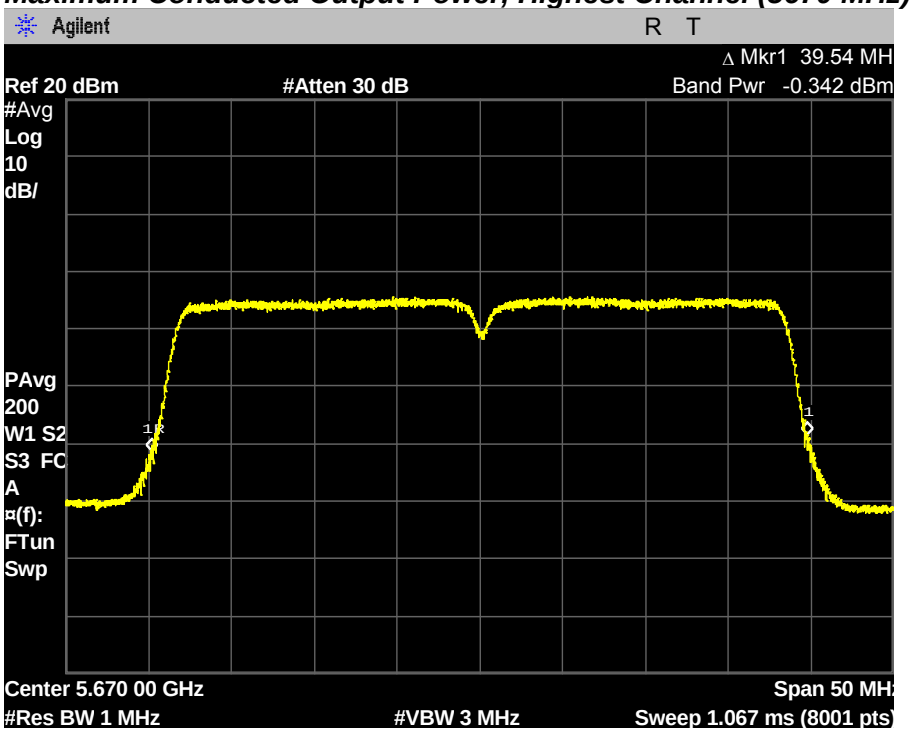


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5550 MHz)



Maximum Conducted Output Power, Highest Channel (5670 MHz)

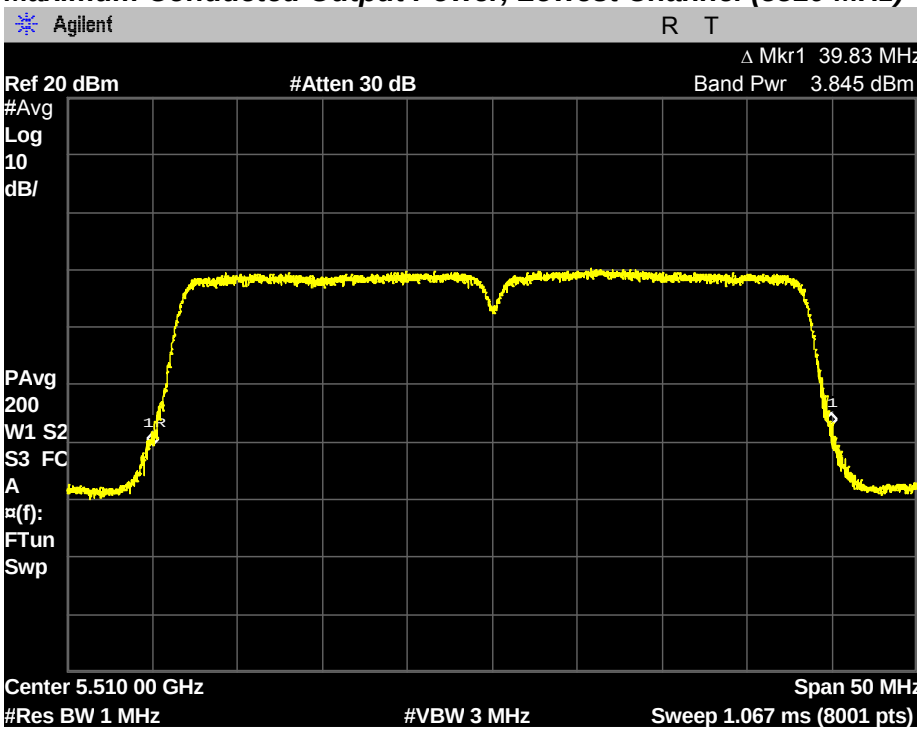


PLOTS OF EMISSIONS

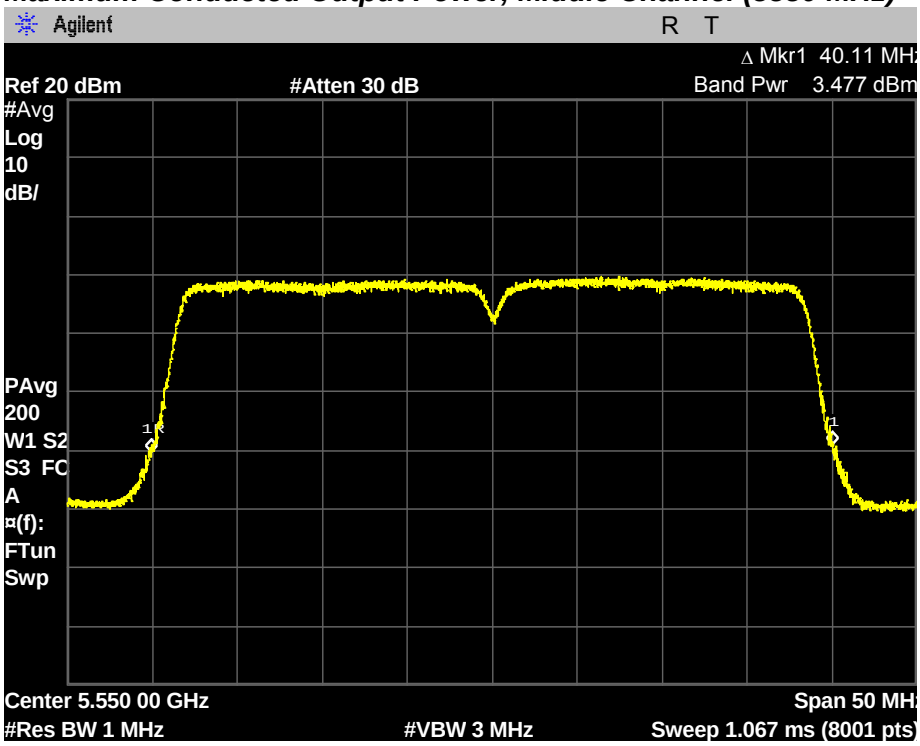
802.11n(40MHz) mode - MIMO

Chain 0

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

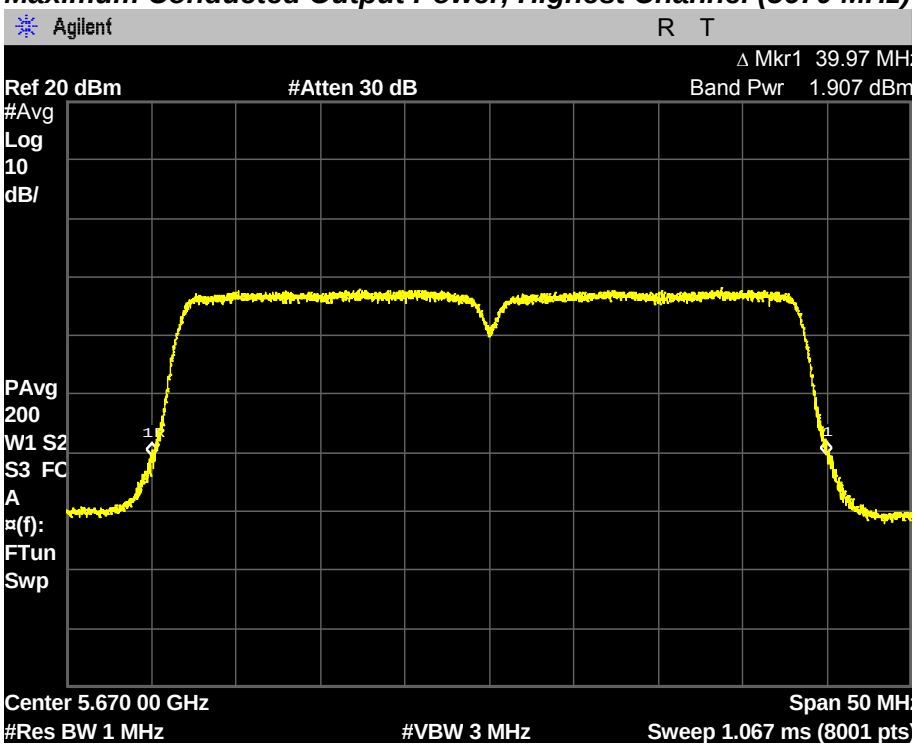


Maximum Conducted Output Power, Middle Channel (5550 MHz)



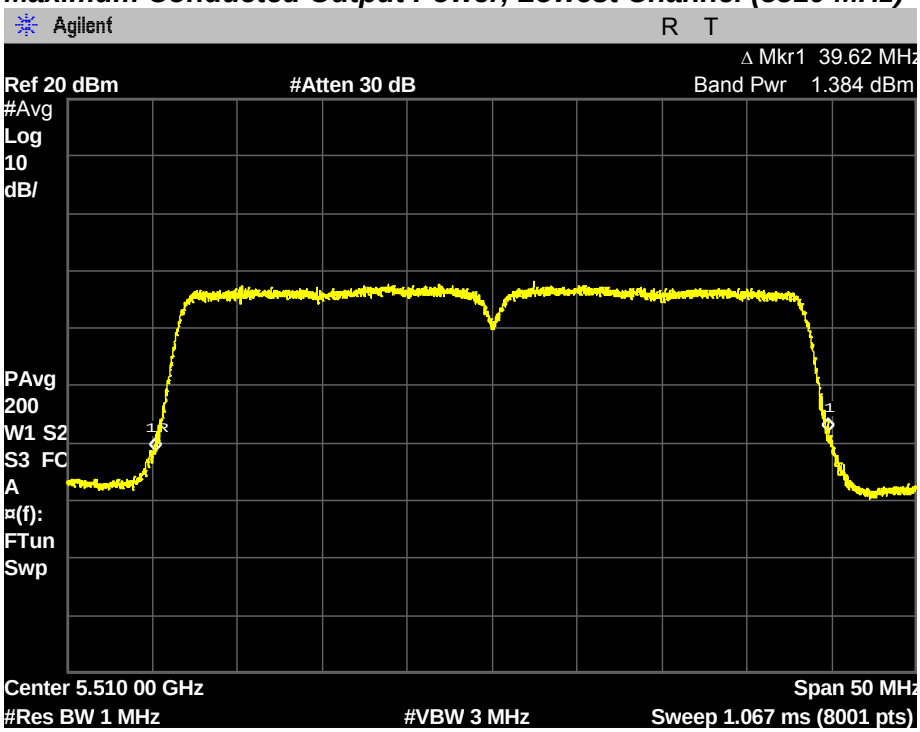
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5670 MHz)



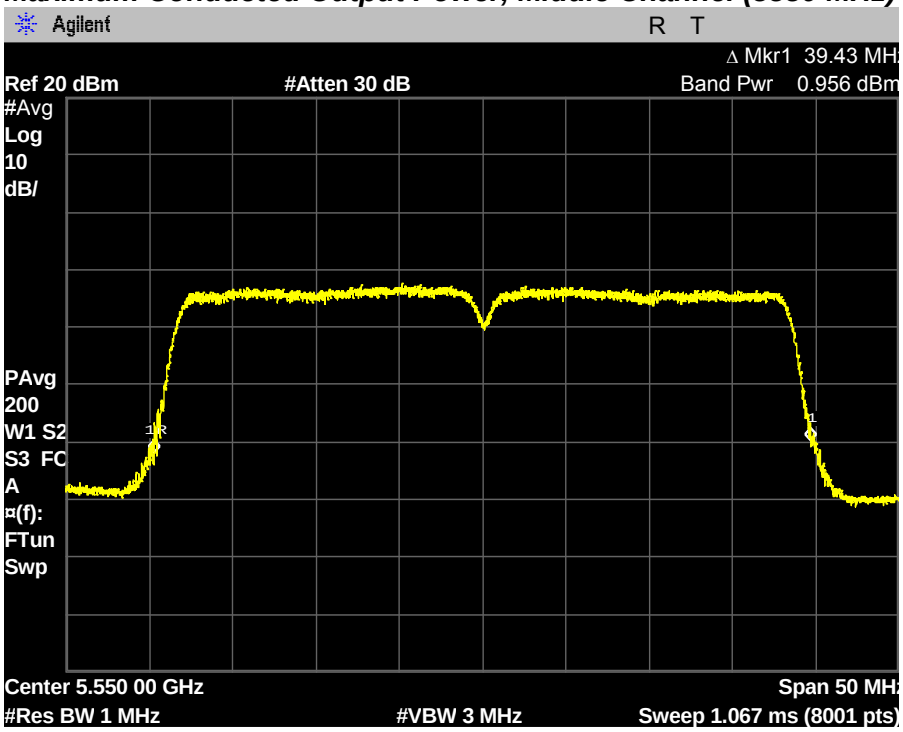
<u>Chain 1</u>

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

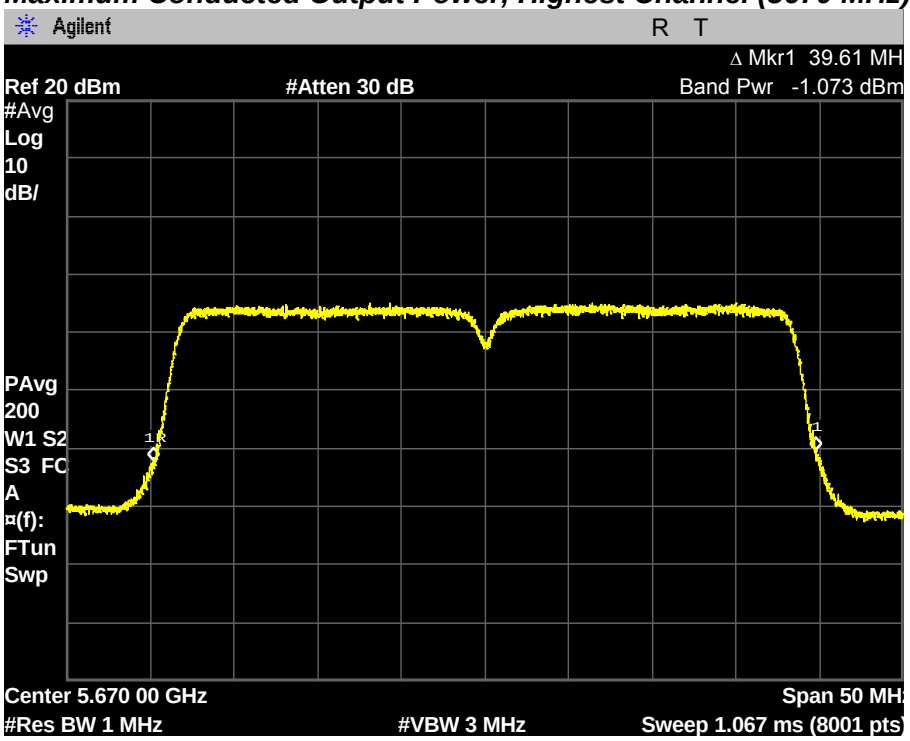


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5550 MHz)



Maximum Conducted Output Power, Highest Channel (5670 MHz)

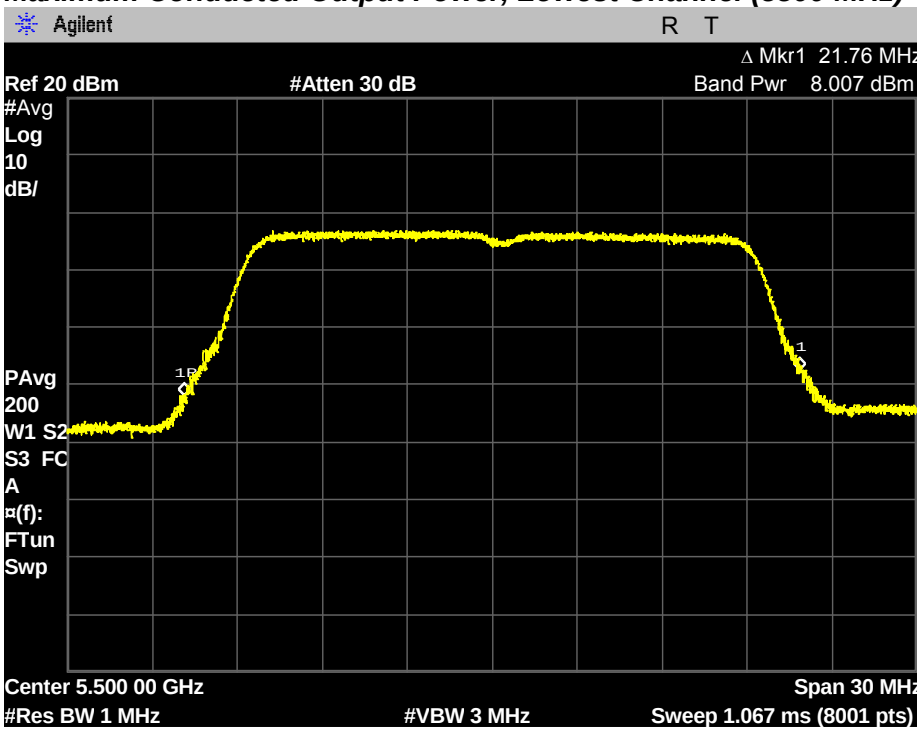


PLOTS OF EMISSIONS

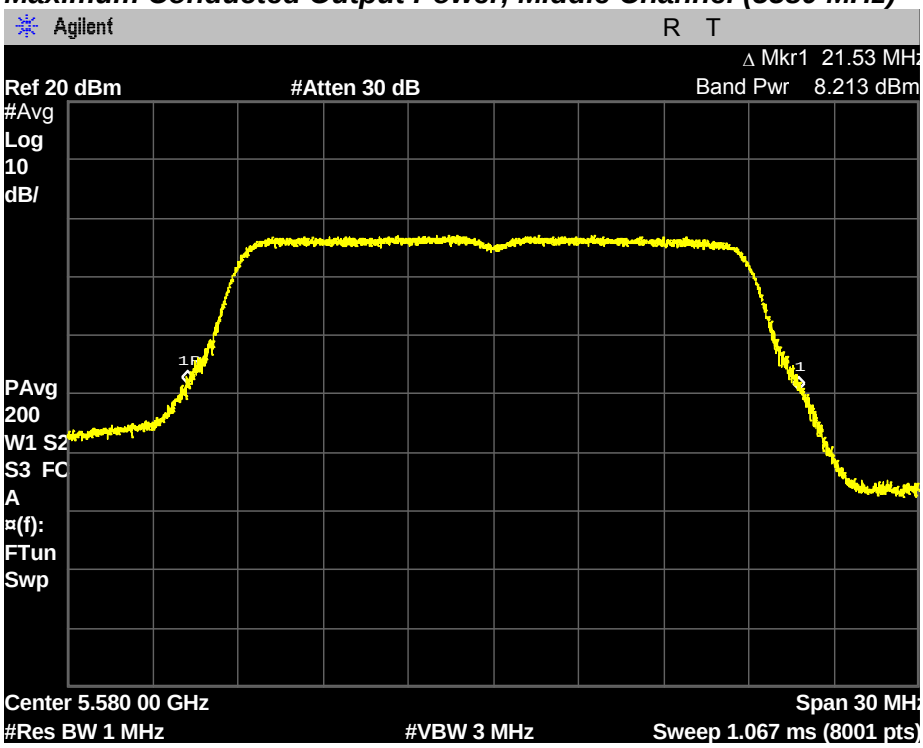
802.11ac(20MHz) mode - SISO

Chain 0

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

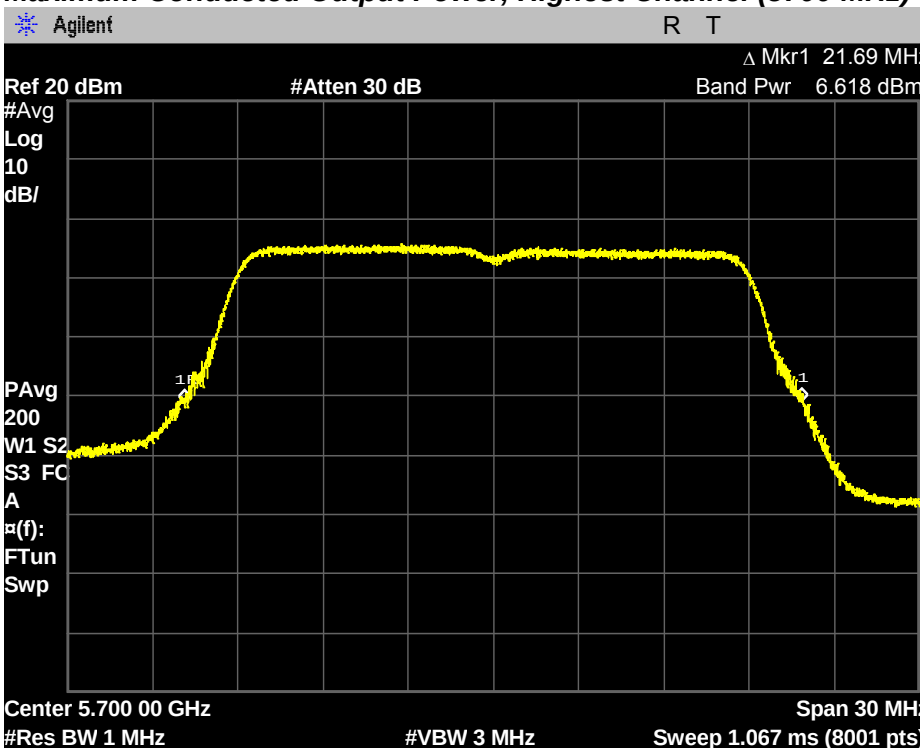


Maximum Conducted Output Power, Middle Channel (5580 MHz)



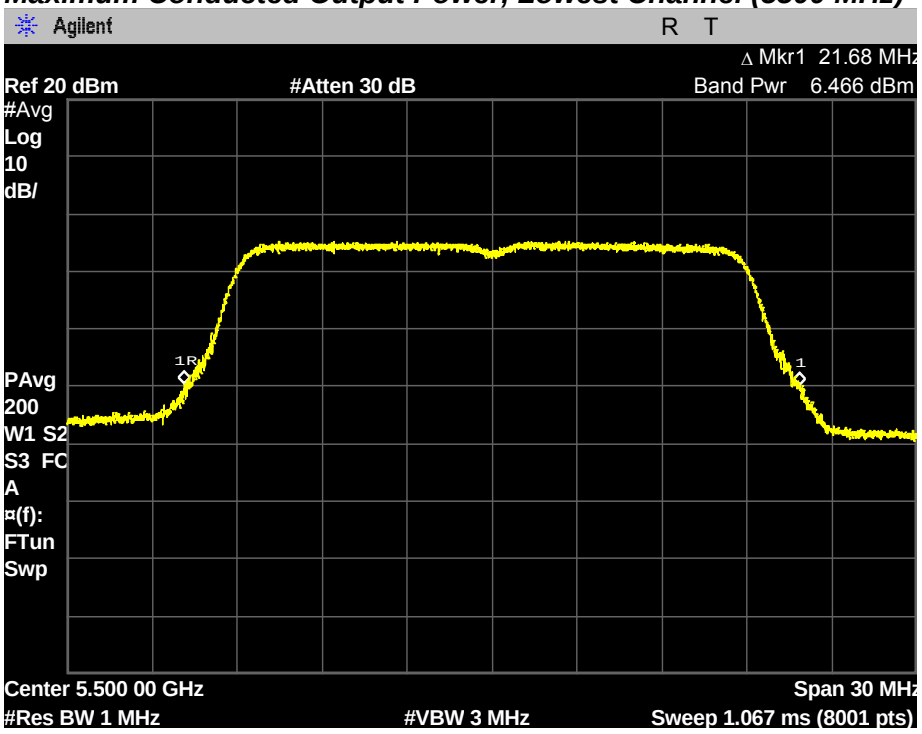
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5700 MHz)



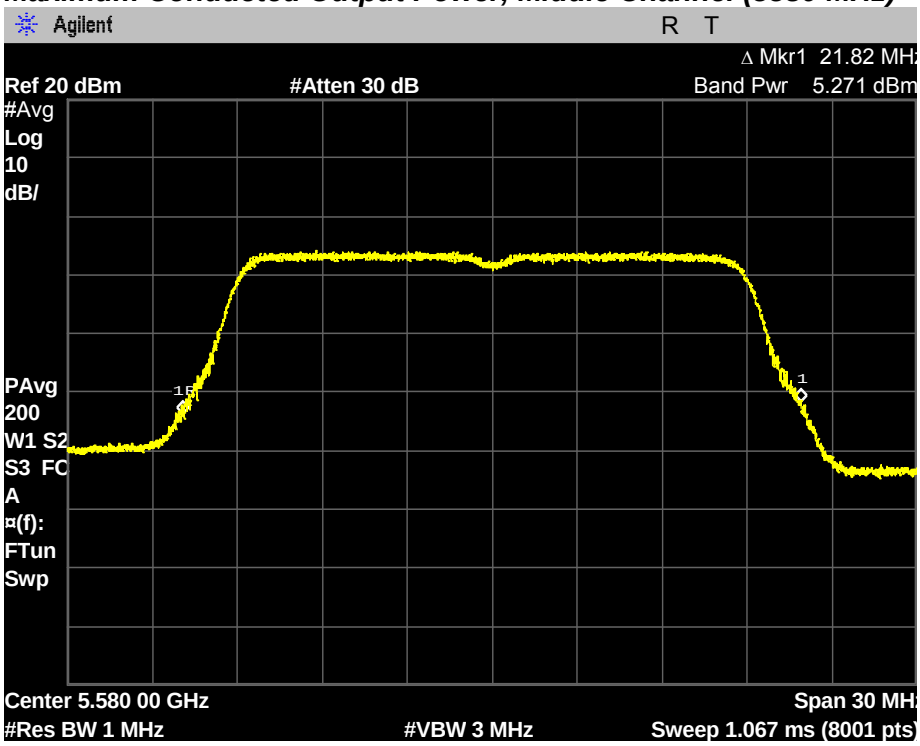
Chain 1

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

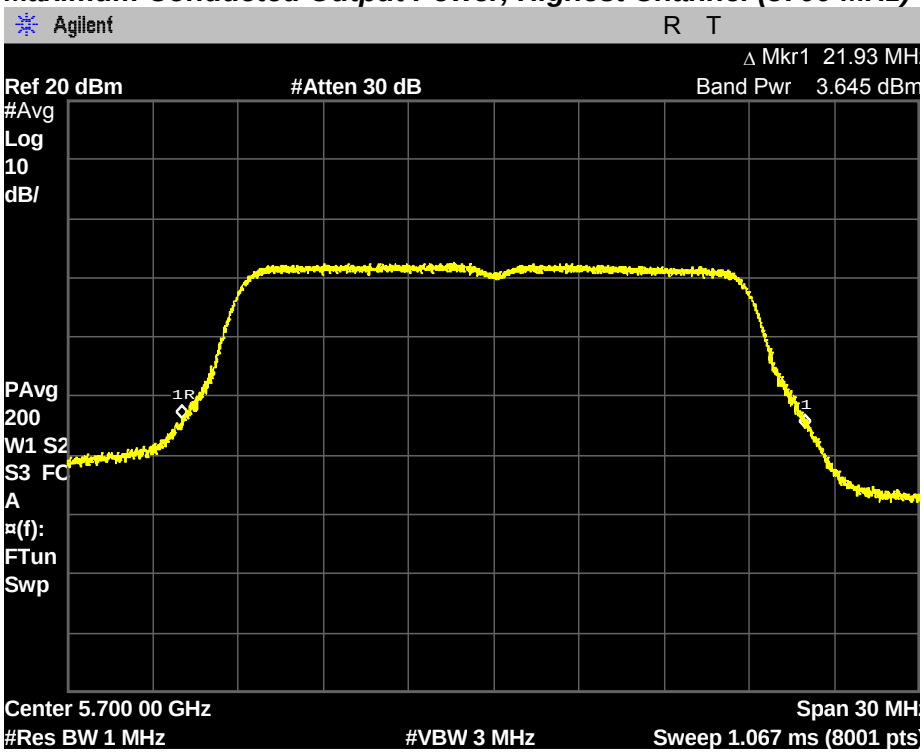


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5580 MHz)



Maximum Conducted Output Power, Highest Channel (5700 MHz)

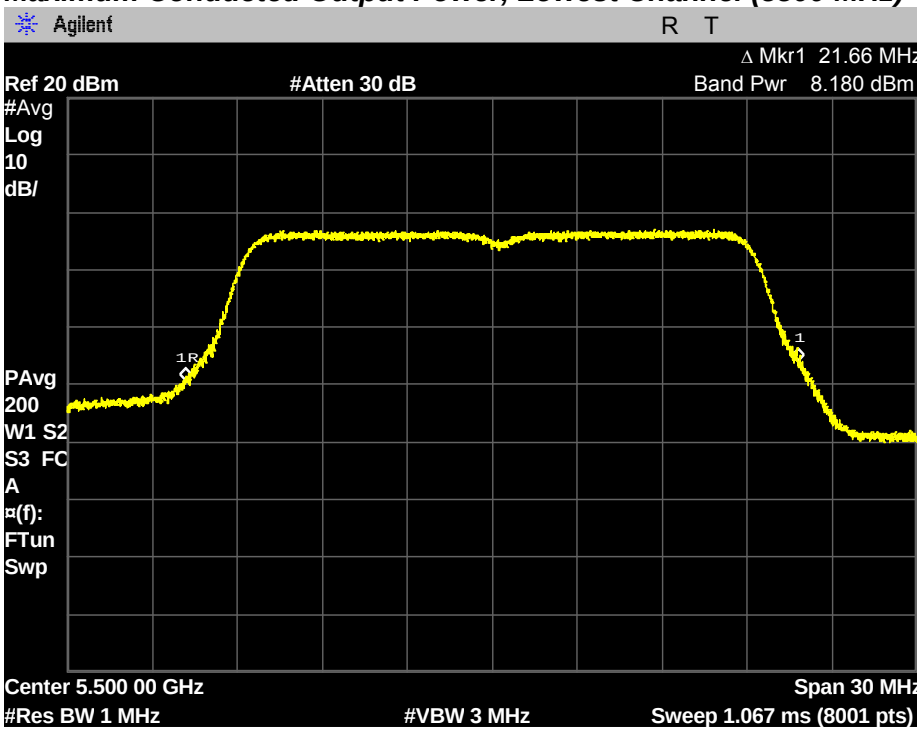


PLOTS OF EMISSIONS

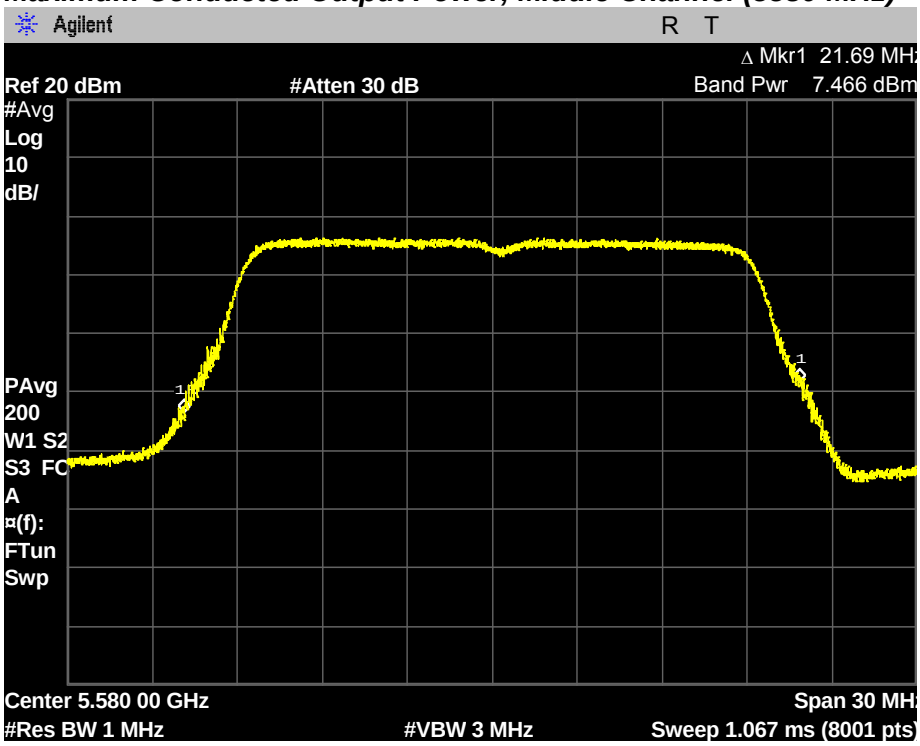
802.11ac(20MHz) mode - CDD

Chain 0

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

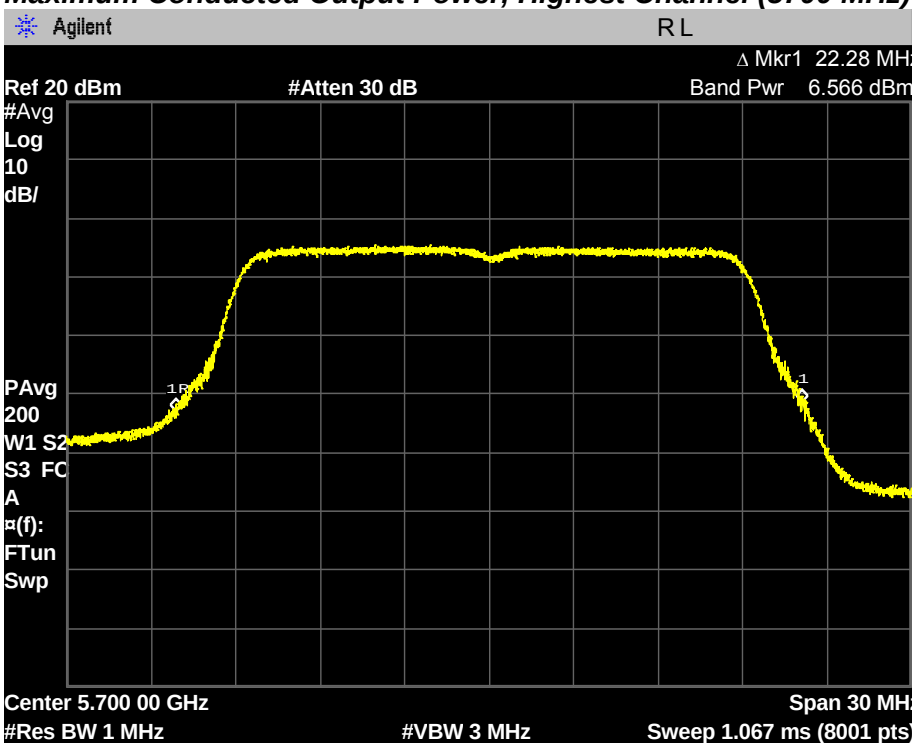


Maximum Conducted Output Power, Middle Channel (5580 MHz)



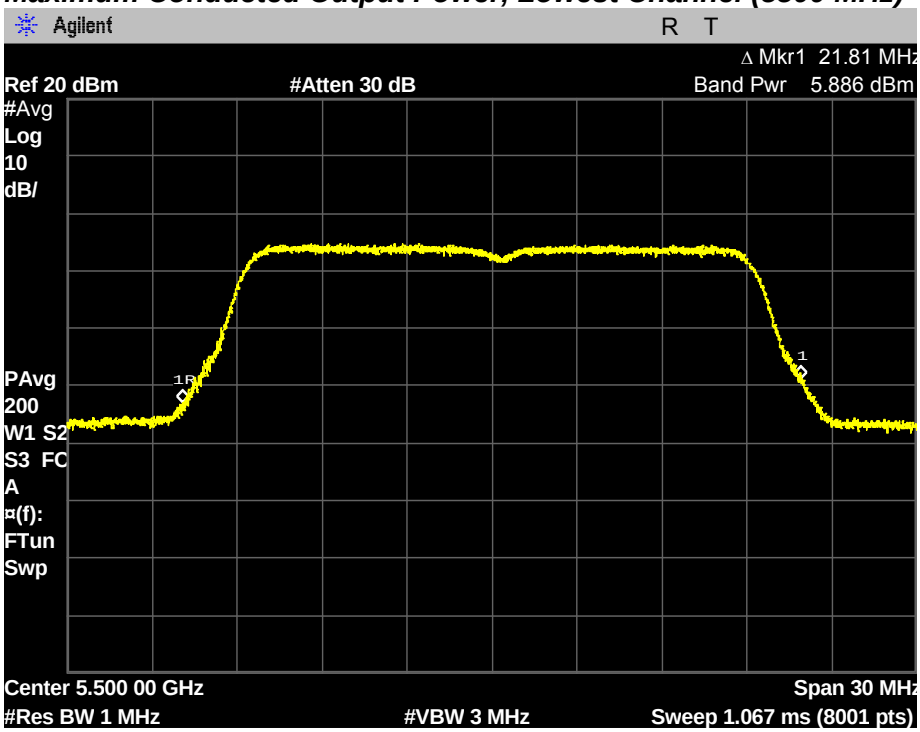
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5700 MHz)



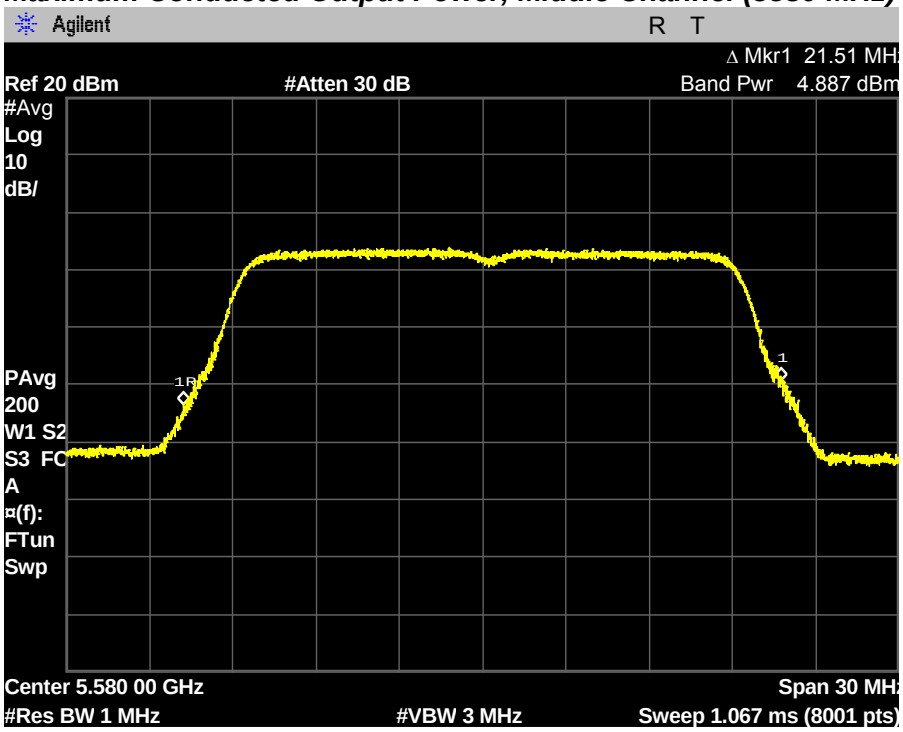
Chain 1

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

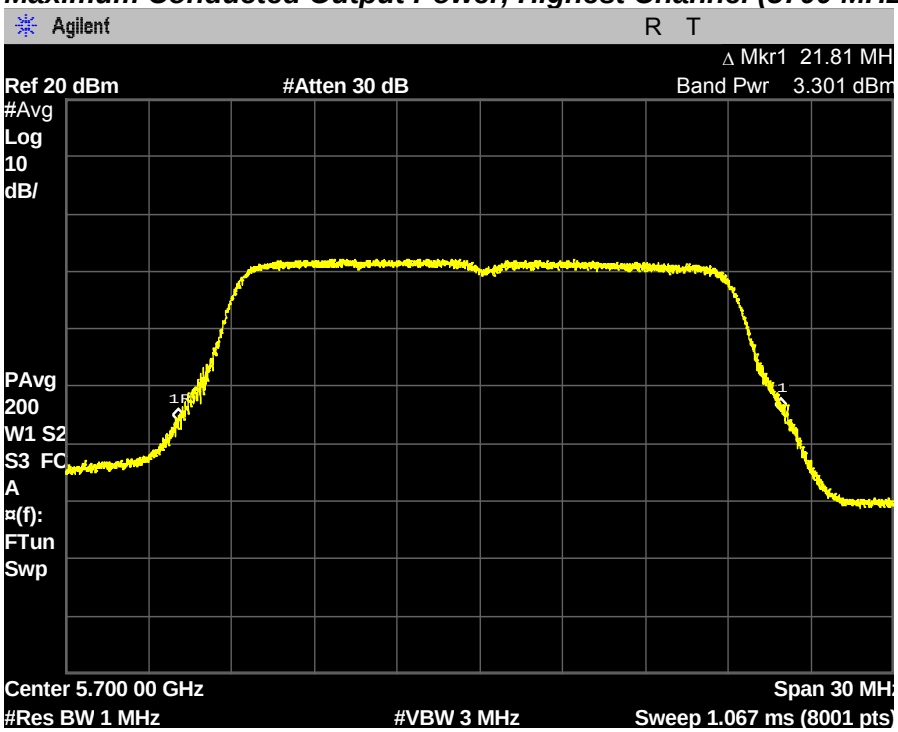


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5580 MHz)



Maximum Conducted Output Power, Highest Channel (5700 MHz)

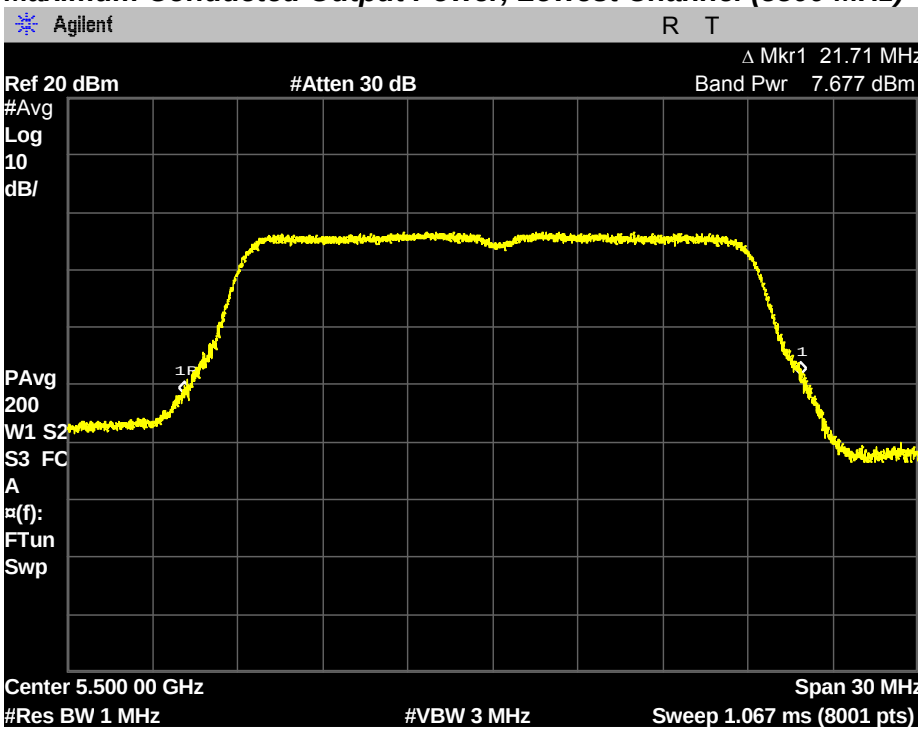


PLOTS OF EMISSIONS

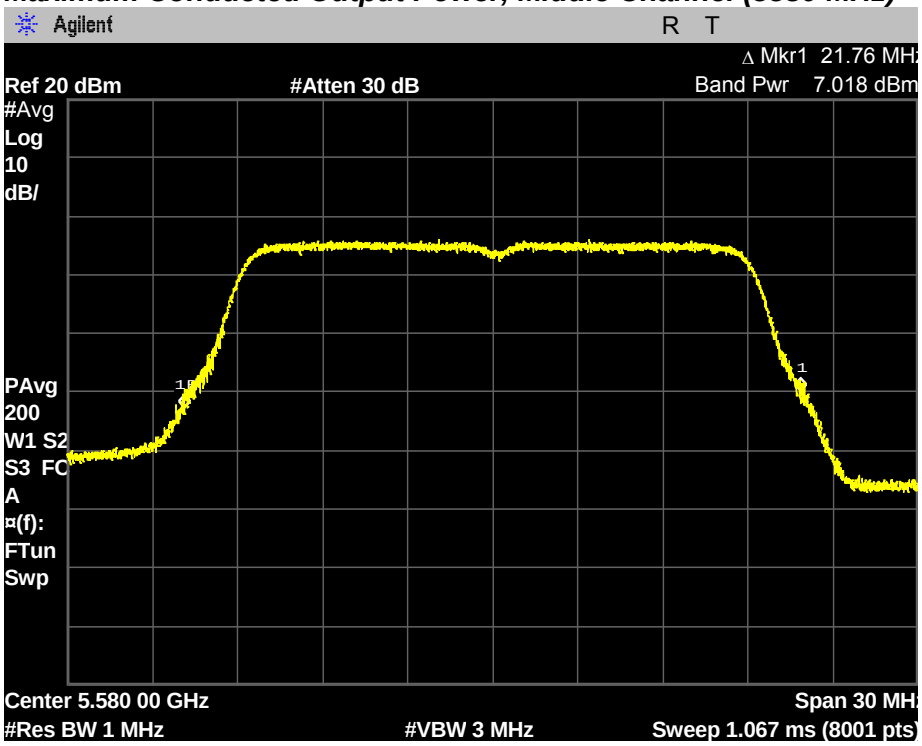
802.11ac(20MHz) mode - MIMO

Chain 0

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

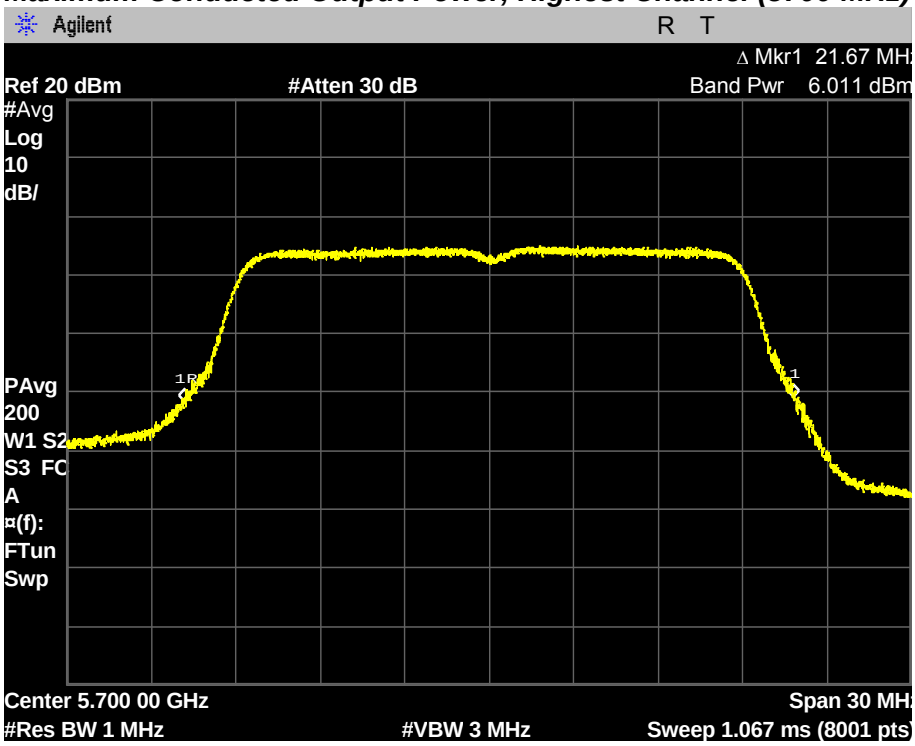


Maximum Conducted Output Power, Middle Channel (5580 MHz)



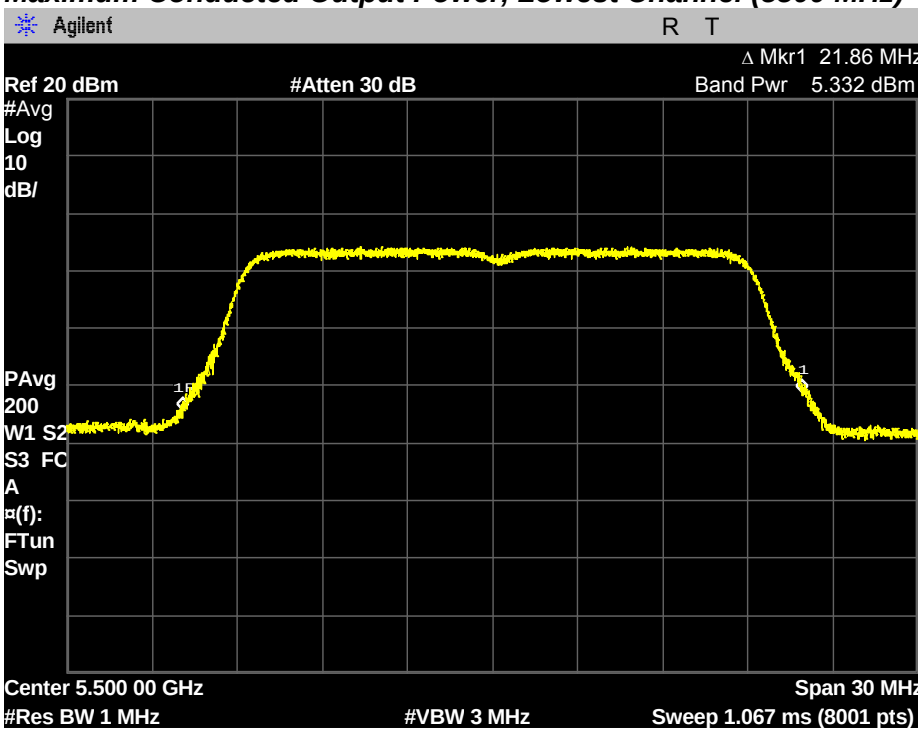
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5700 MHz)



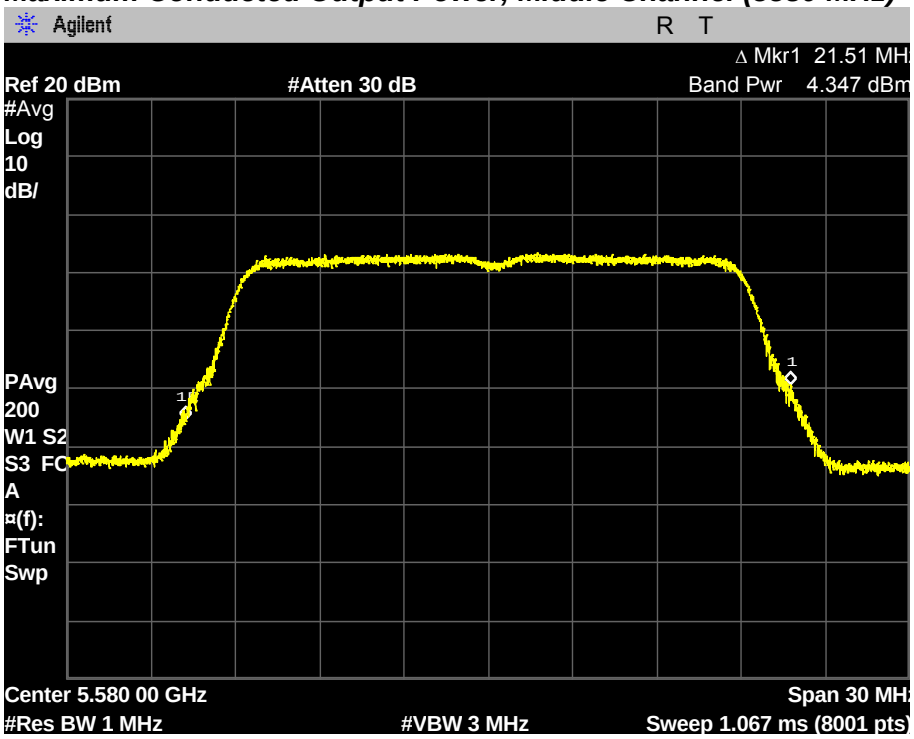
<u>Chain 1</u>

Maximum Conducted Output Power, Lowest Channel (5500 MHz)

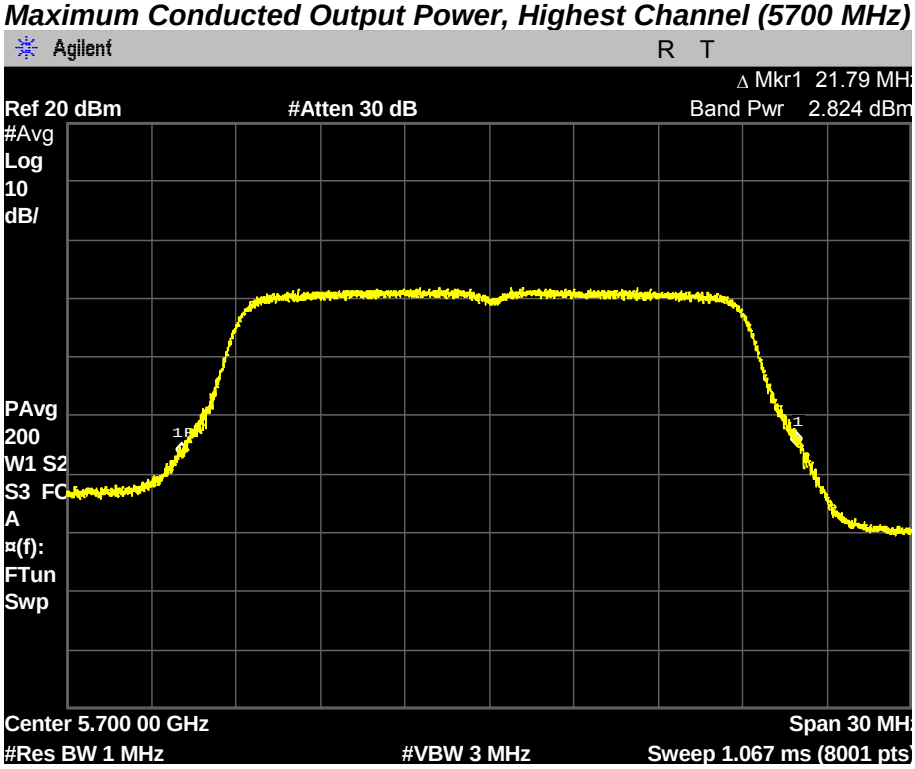


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5580 MHz)



Maximum Conducted Output Power, Highest Channel (5700 MHz)

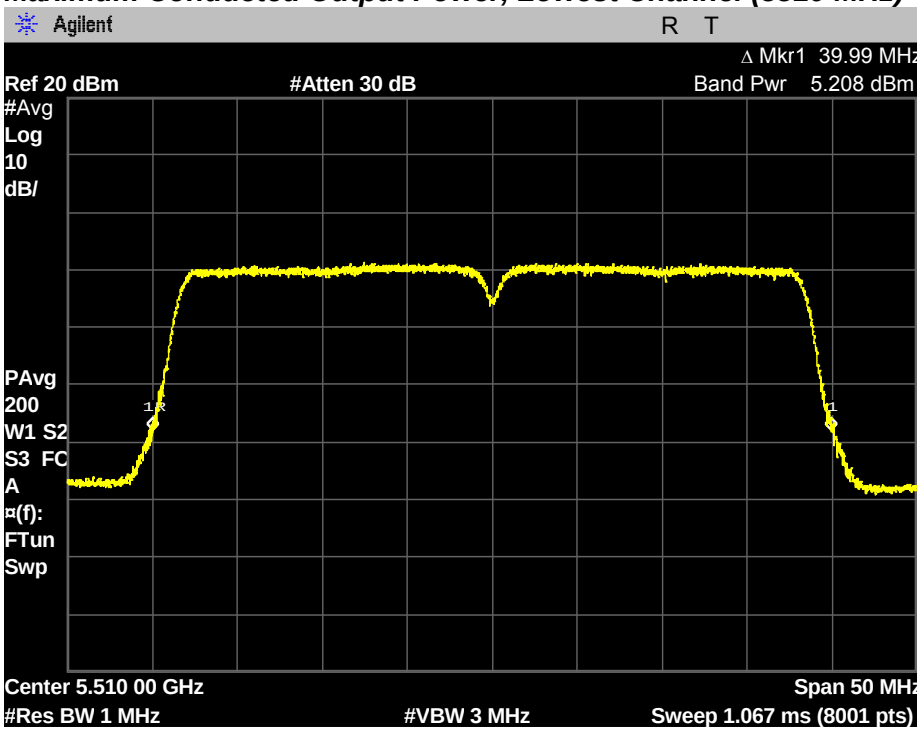


PLOTS OF EMISSIONS

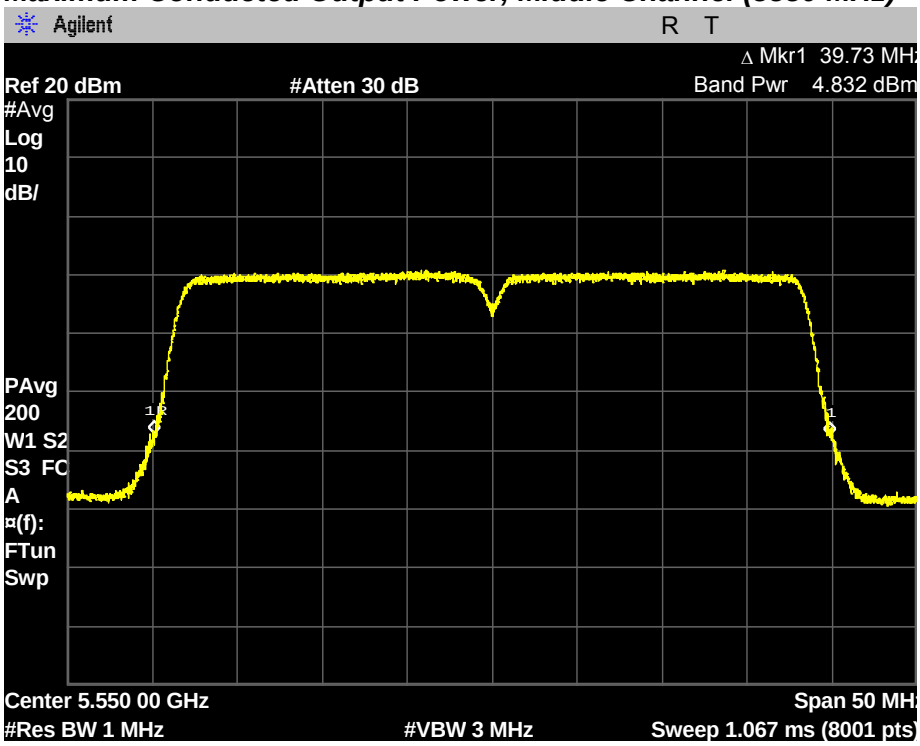
802.11ac(40MHz) mode - SISO

Chain 0

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

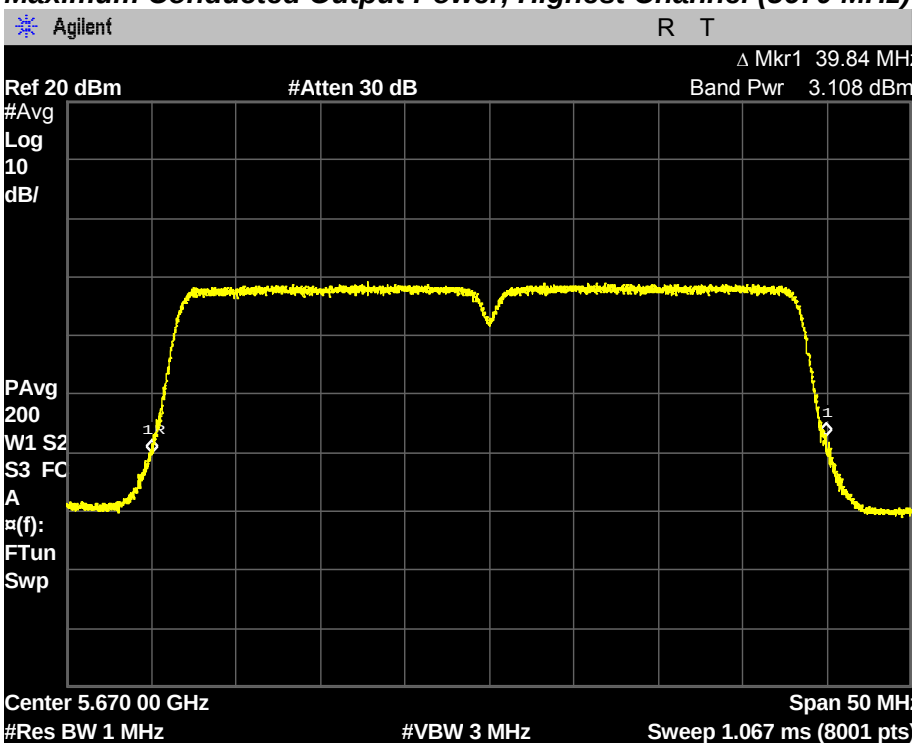


Maximum Conducted Output Power, Middle Channel (5550 MHz)



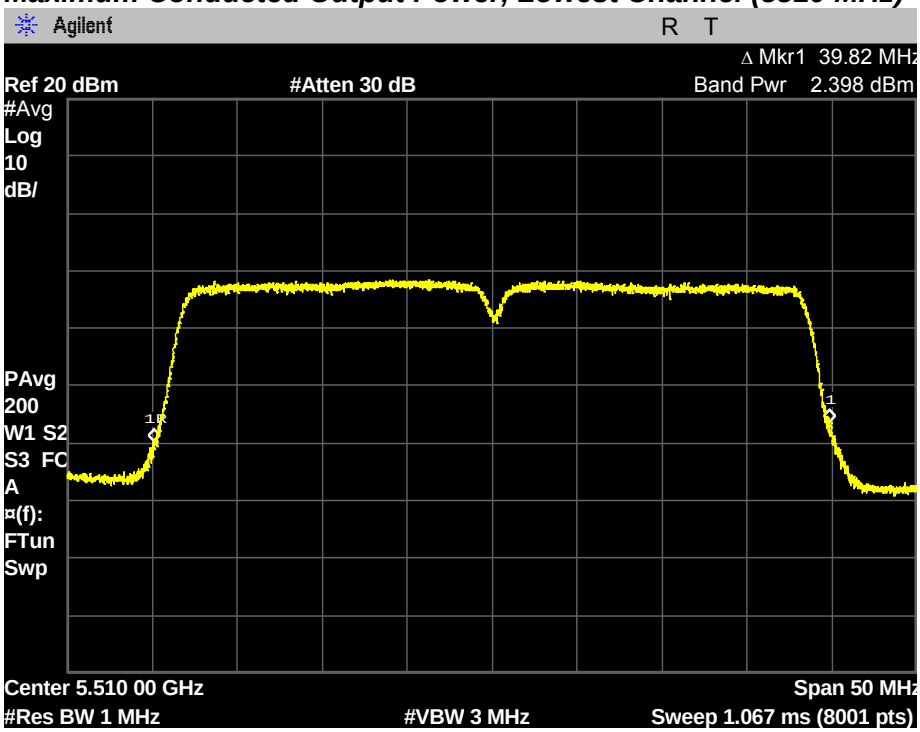
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5670 MHz)



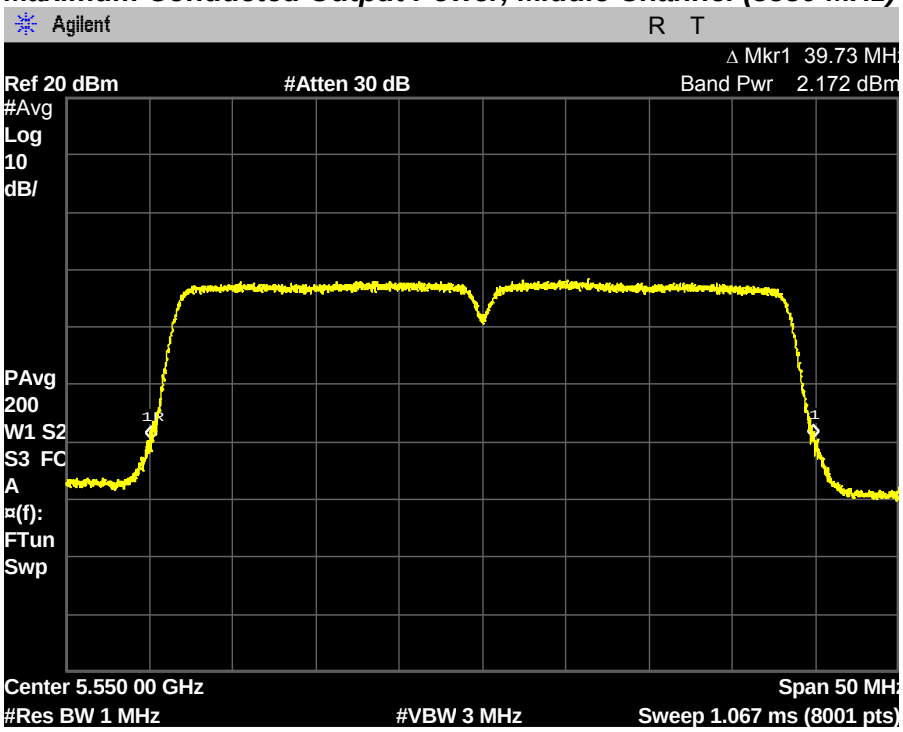
<u>Chain 1</u>

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

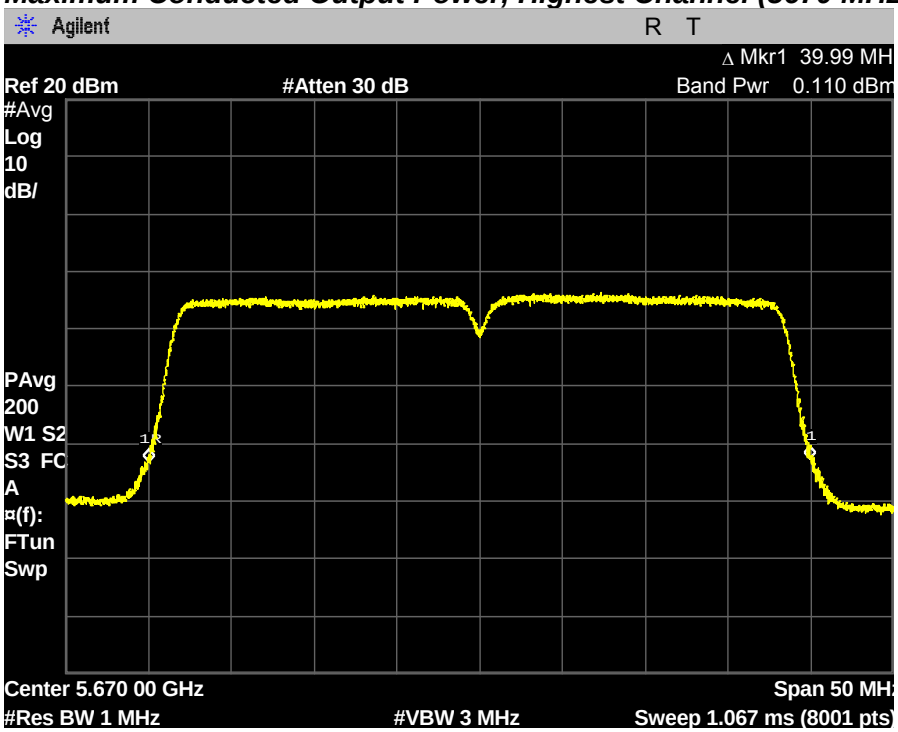


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5550 MHz)



Maximum Conducted Output Power, Highest Channel (5670 MHz)

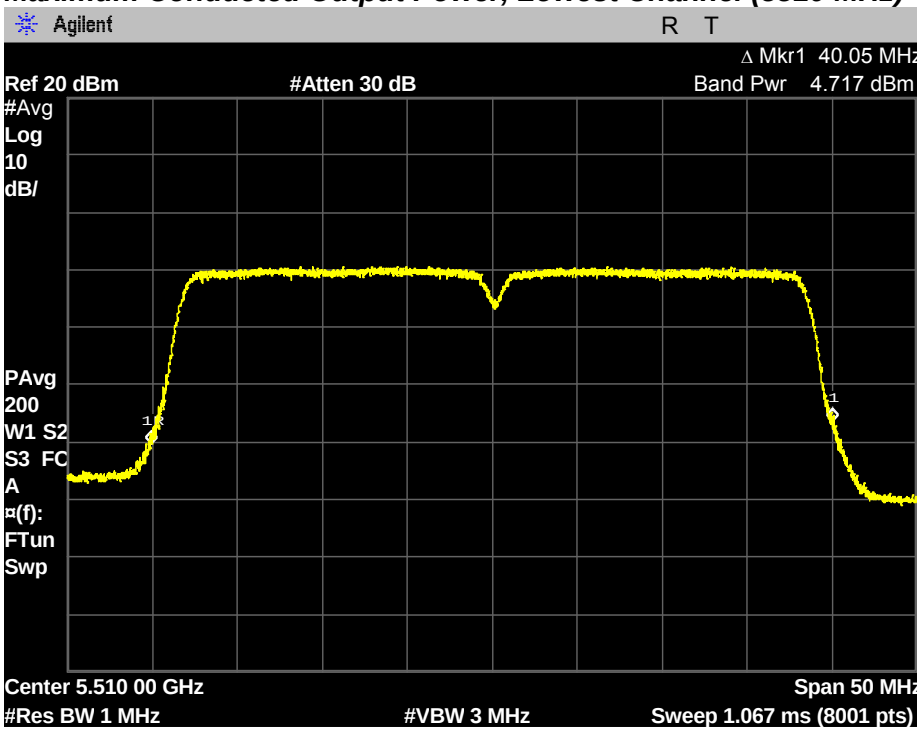


PLOTS OF EMISSIONS

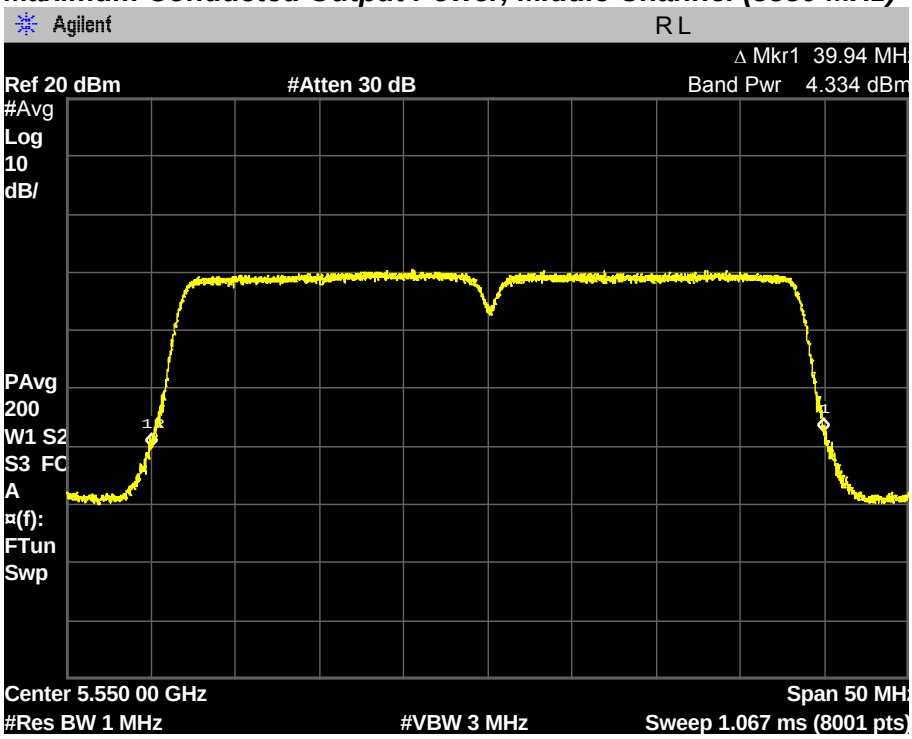
802.11ac(40MHz) mode - CDD

Chain 0

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

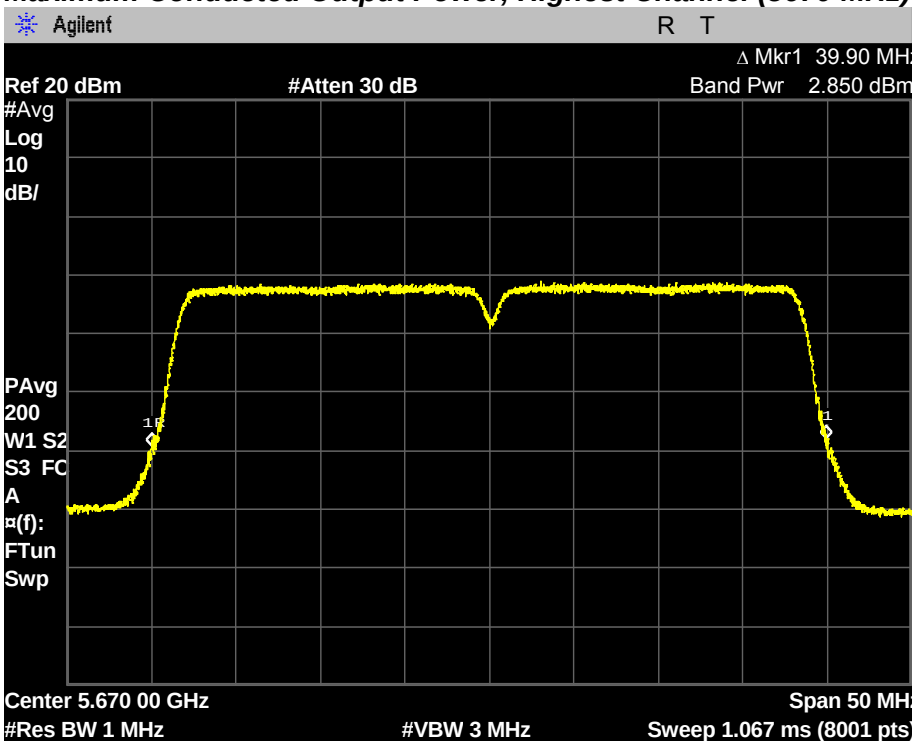


Maximum Conducted Output Power, Middle Channel (5550 MHz)



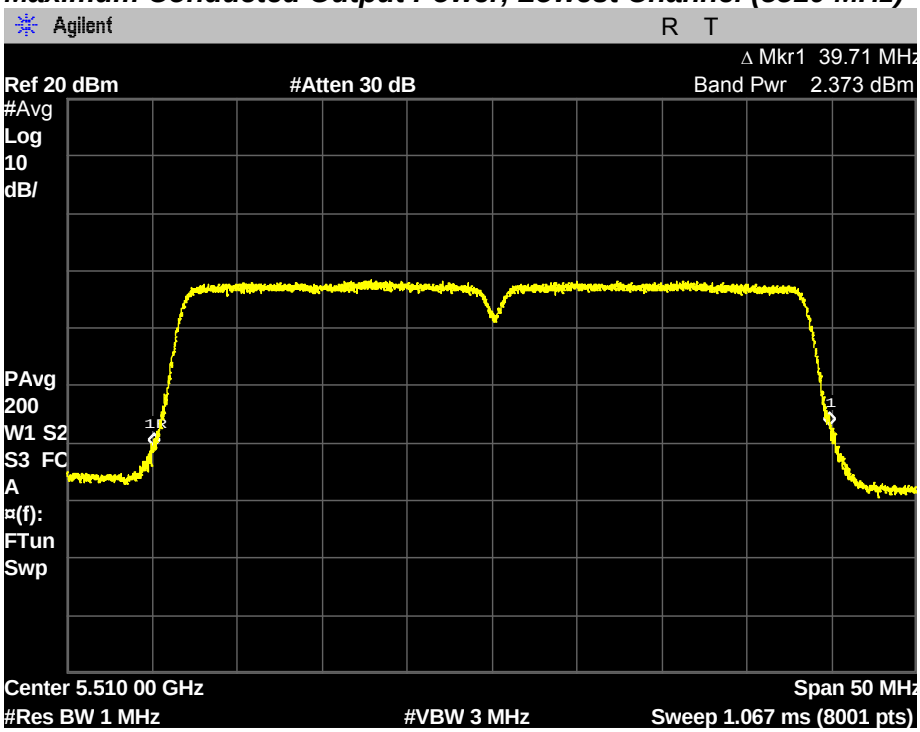
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5670 MHz)



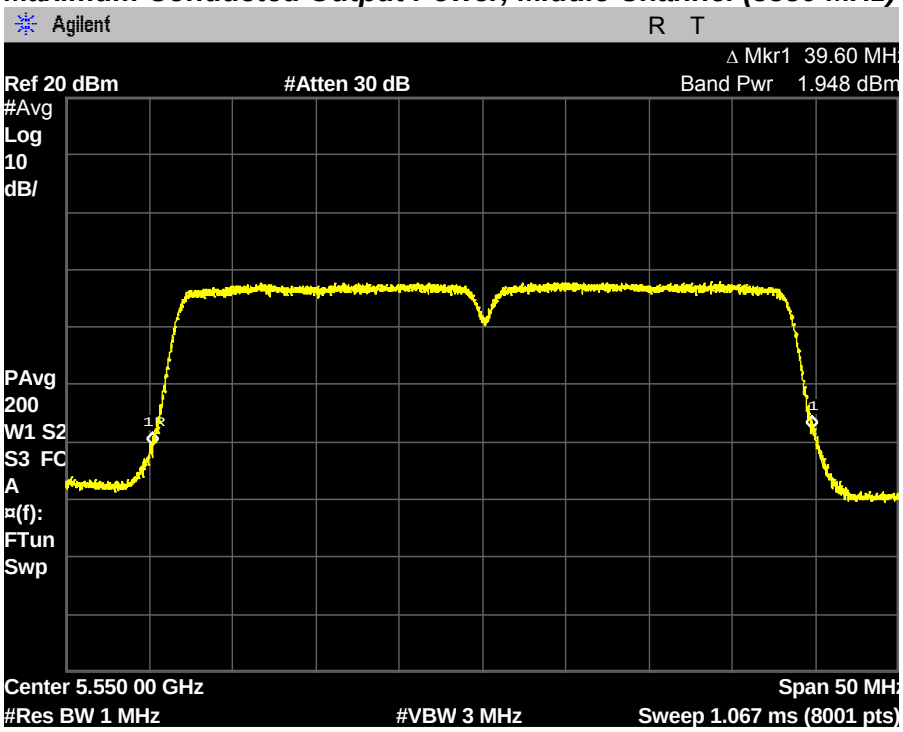
Chain 1

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

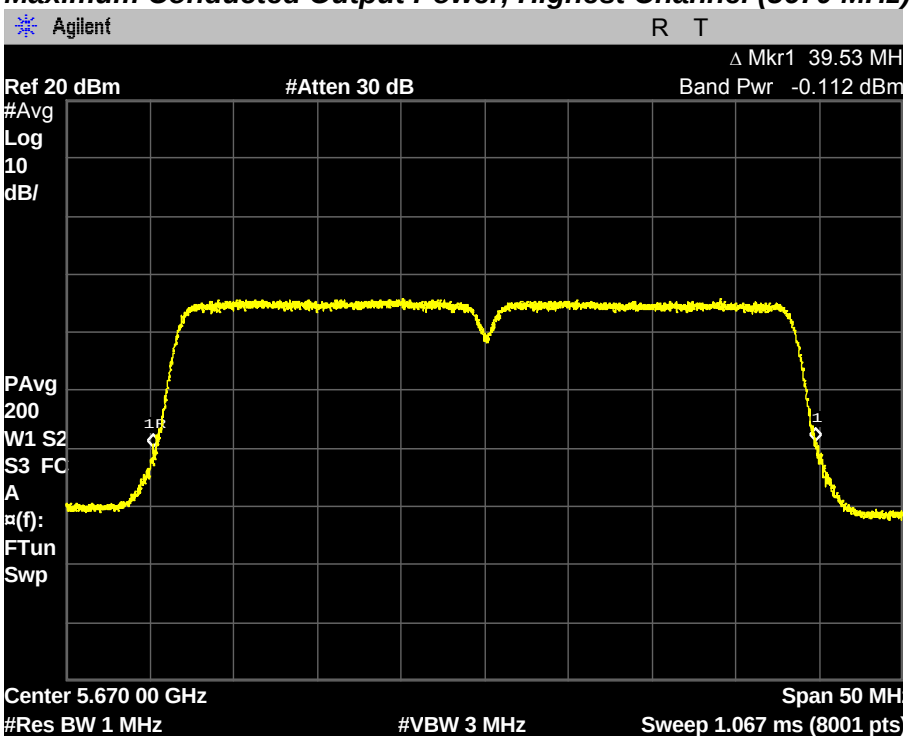


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5550 MHz)



Maximum Conducted Output Power, Highest Channel (5670 MHz)

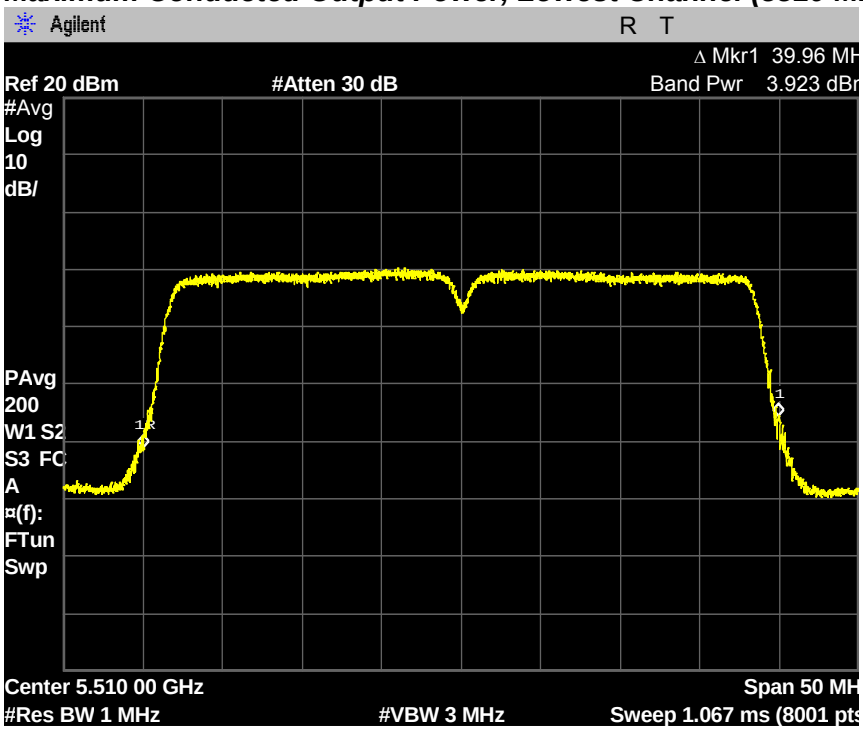


PLOTS OF EMISSIONS

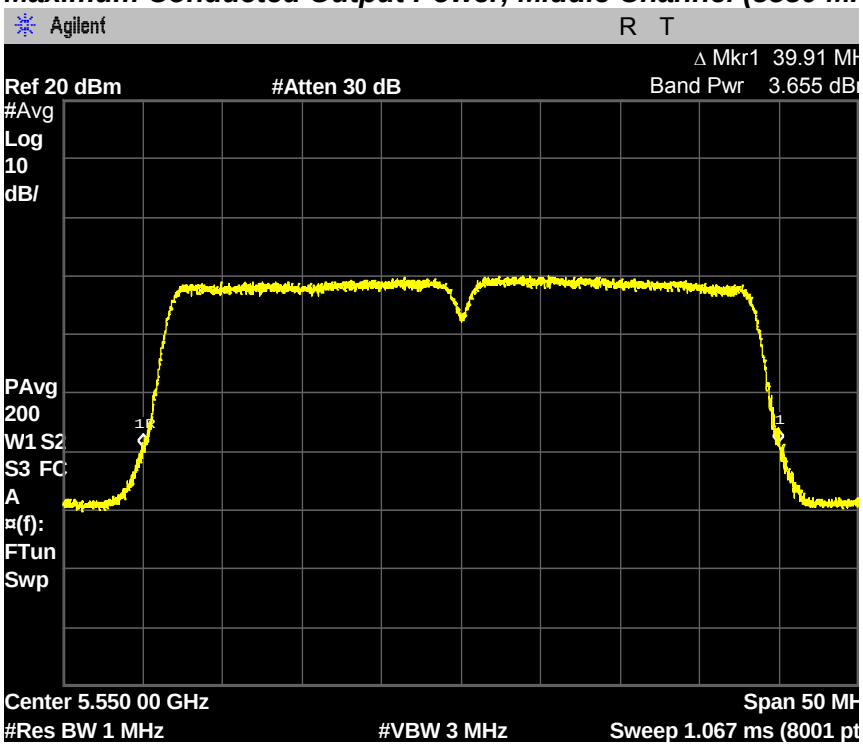
802.11ac(40MHz) mode - MIMO

Chain 0

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

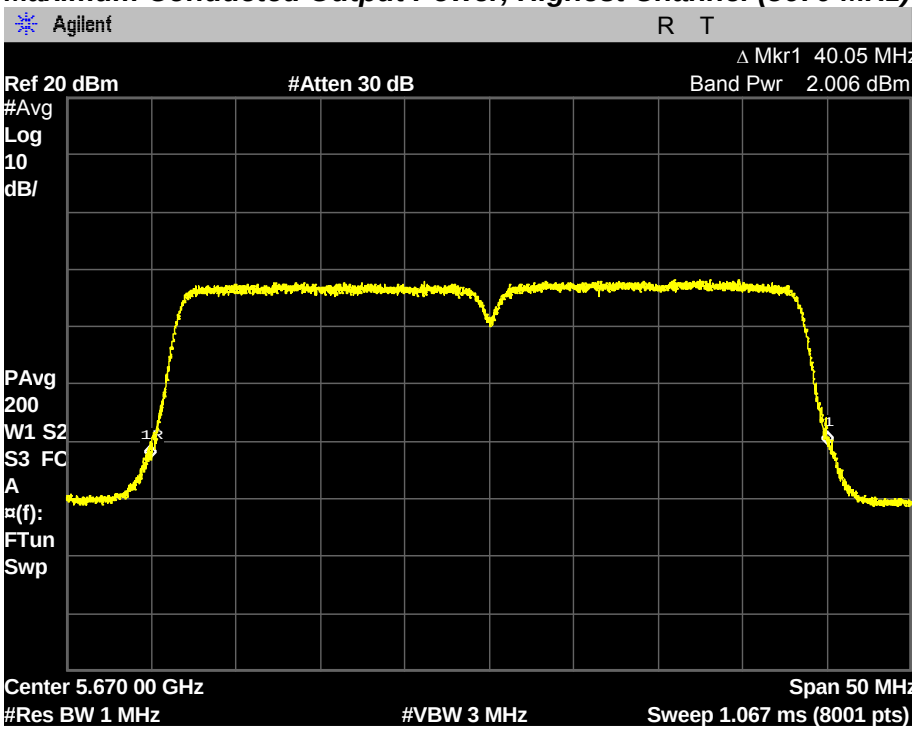


Maximum Conducted Output Power, Middle Channel (5550 MHz)



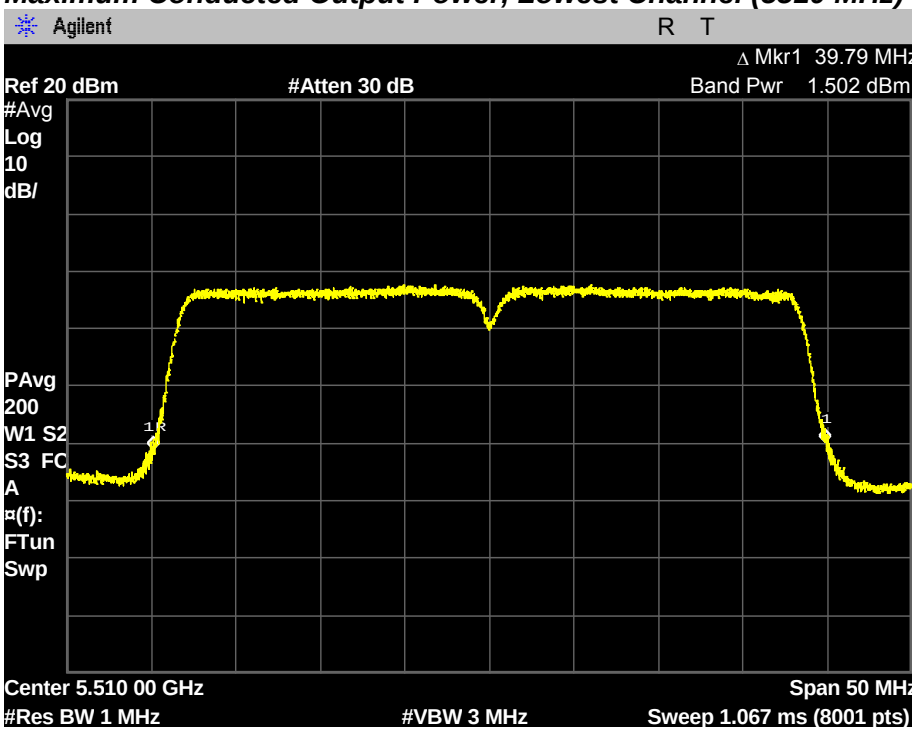
PLOTS OF EMISSIONS

Maximum Conducted Output Power, Highest Channel (5670 MHz)



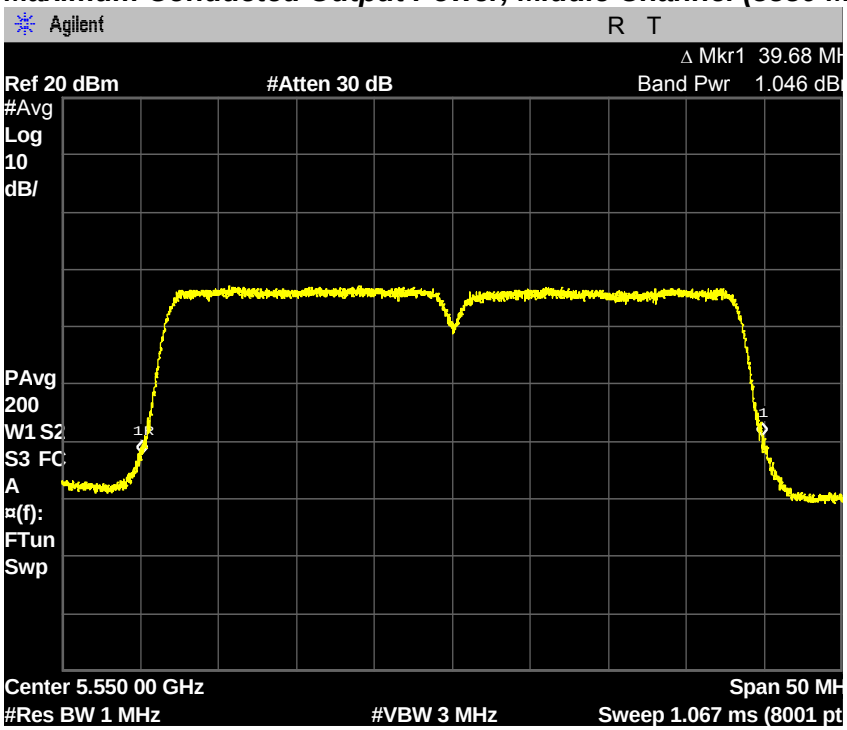
<u>Chain 1</u>

Maximum Conducted Output Power, Lowest Channel (5510 MHz)

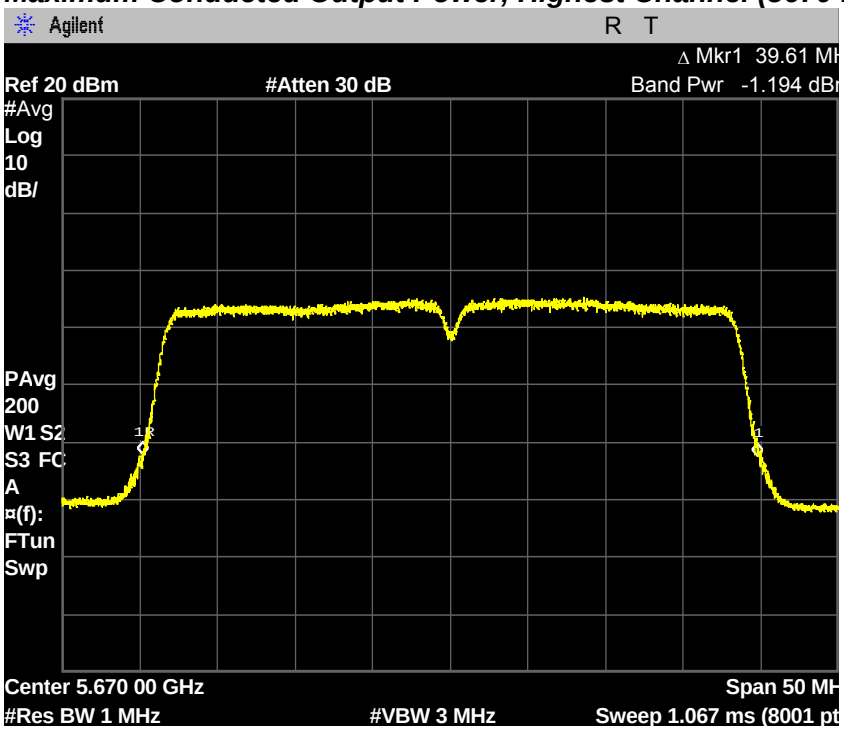


PLOTS OF EMISSIONS

Maximum Conducted Output Power, Middle Channel (5550 MHz)



Maximum Conducted Output Power, Highest Channel (5670 MHz)

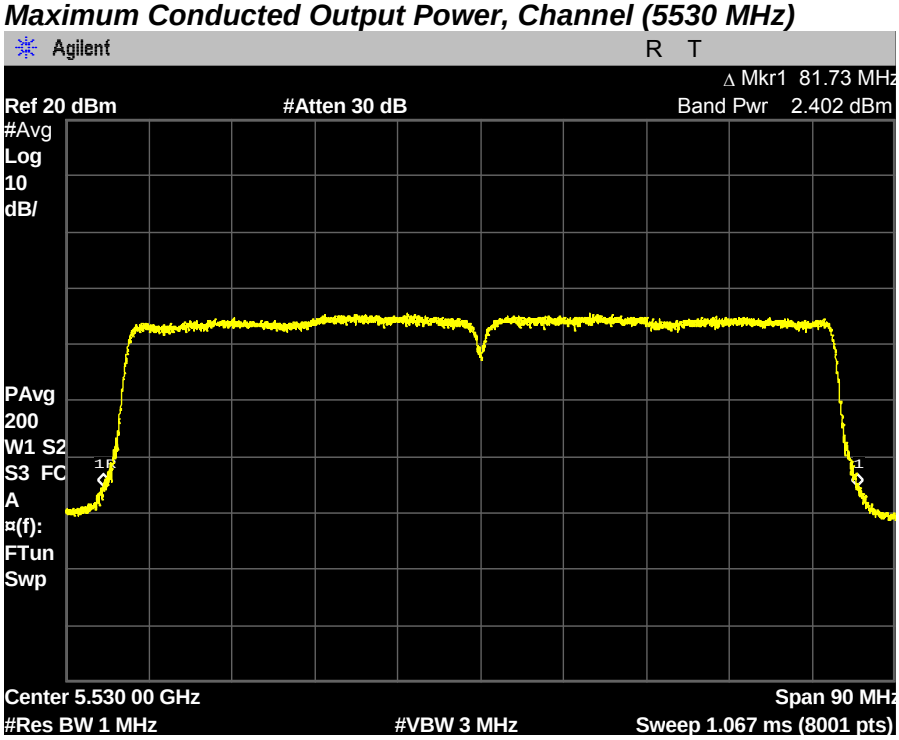


PLOTS OF EMISSIONS

802.11ac(80MHz) mode - SISO

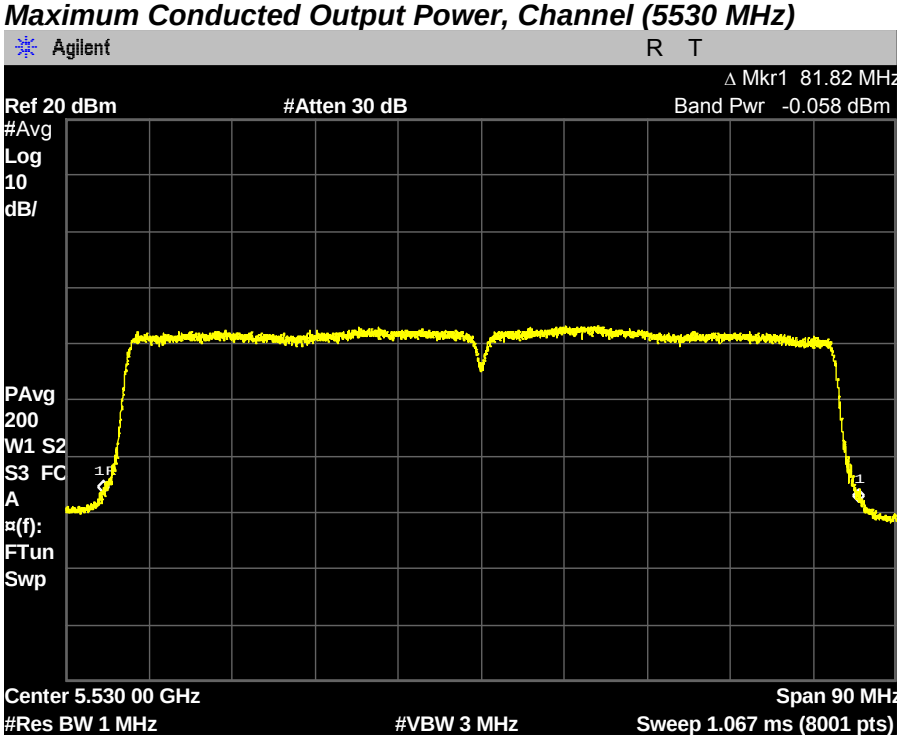
Chain 0

Maximum Conducted Output Power, Channel (5530 MHz)



Chain 1

Maximum Conducted Output Power, Channel (5530 MHz)

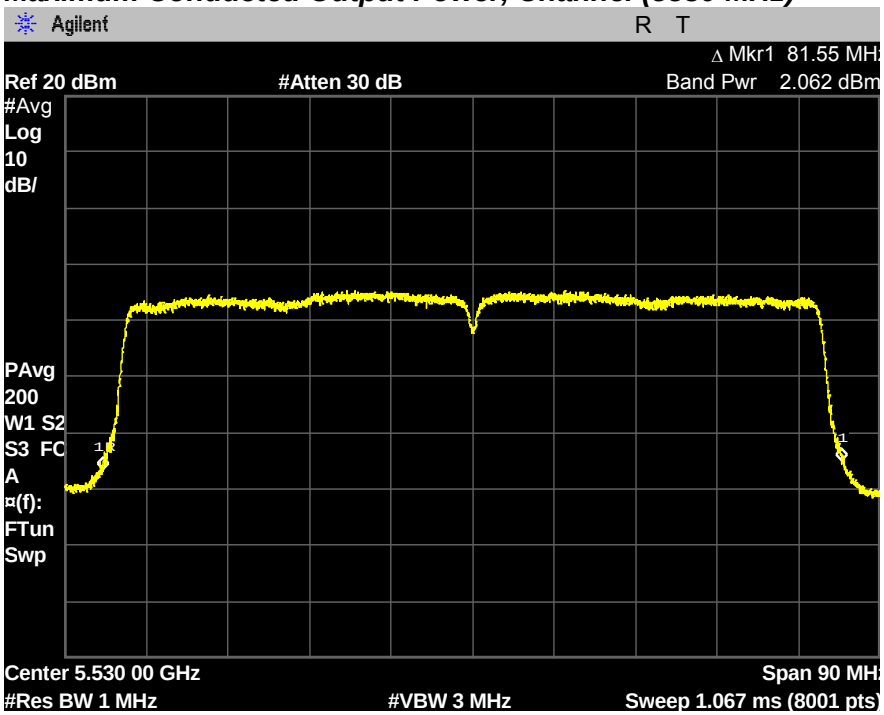


PLOTS OF EMISSIONS

802.11ac(80MHz) mode - CDD

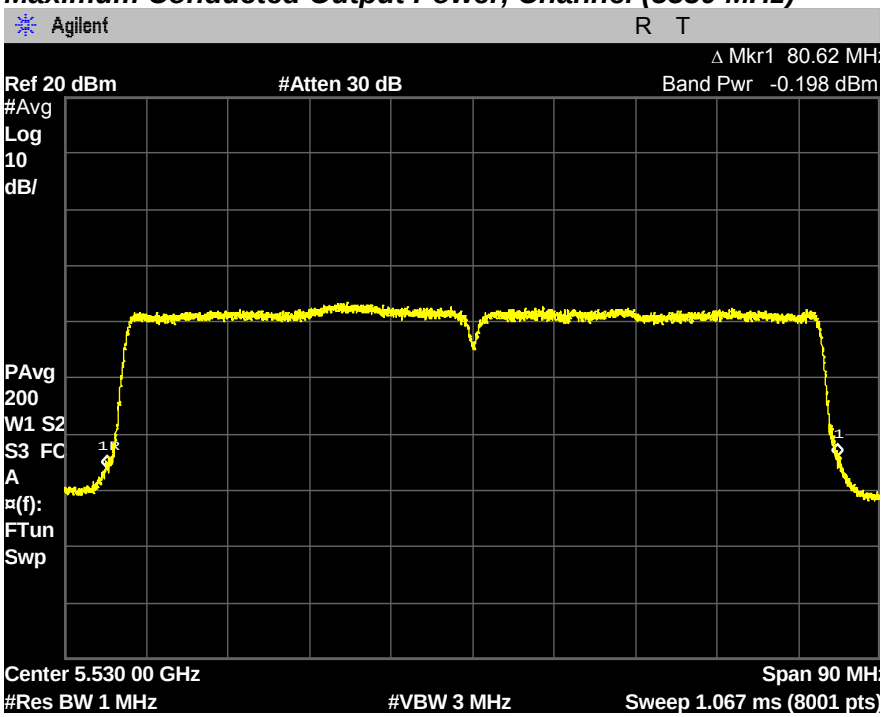
Chain 0

Maximum Conducted Output Power, Channel (5530 MHz)



Chain 1

Maximum Conducted Output Power, Channel (5530 MHz)

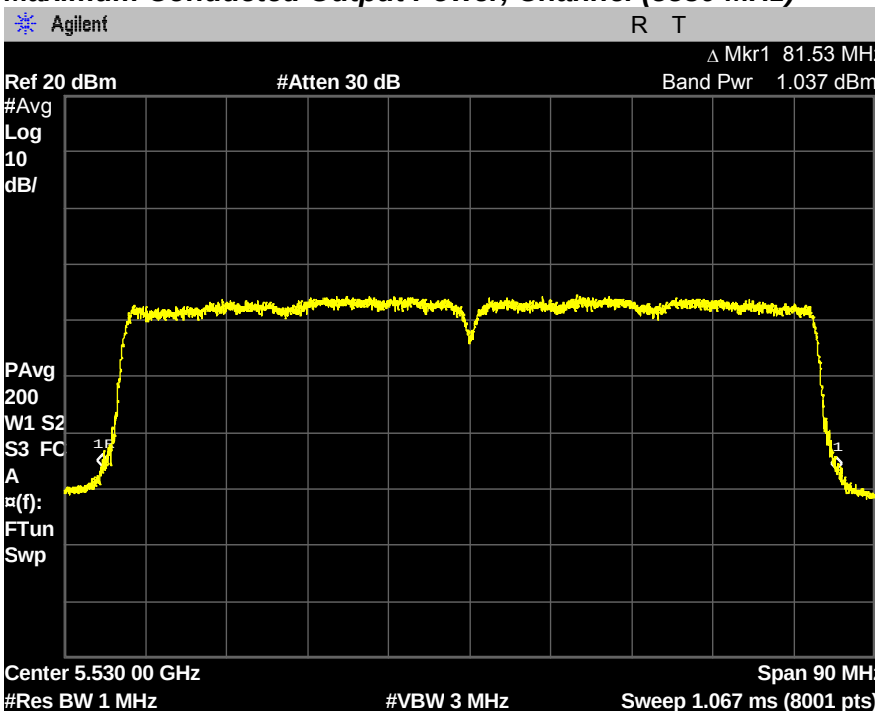


PLOTS OF EMISSIONS

802.11ac(80MHz) mode - MIMO

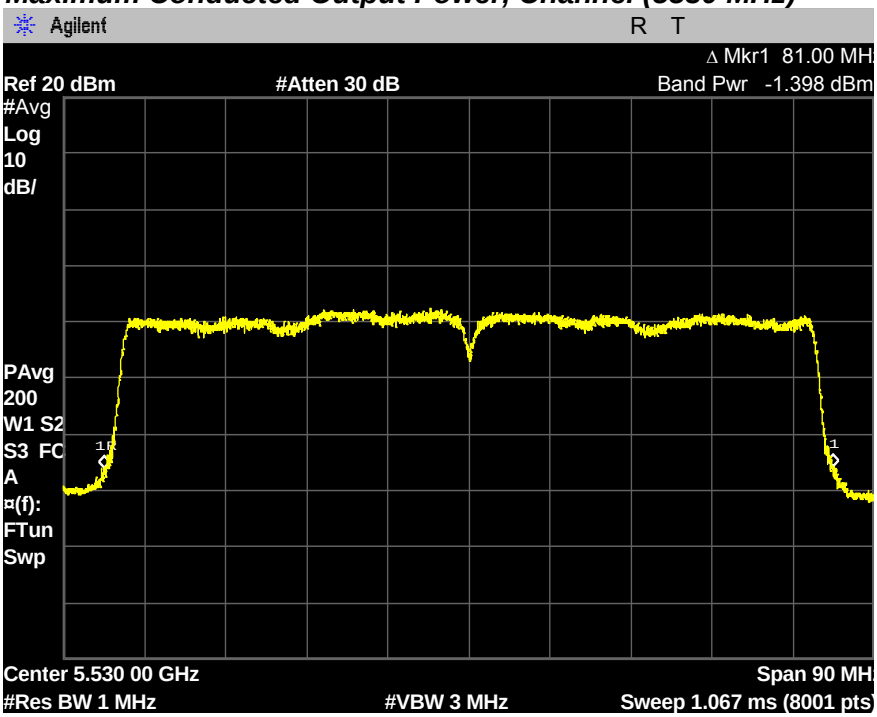
Chain 0

Maximum Conducted Output Power, Channel (5530 MHz)



Chain 1

Maximum Conducted Output Power, Channel (5530 MHz)



8.6 Maximum Power Spectral Density

8.6.1 Maximum Power Spectral Density – UNII-1 band

FCC §15.407(a), RSS-247 Issue 1, 6.2

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode-SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		*Maximum PSD (dBm)		FCC Limit (dBm/ MHz)	E.I.R.P (dBm)		IC E.I.R.P Limit (dBm/ MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		Chain 0	Chain 1	
Lowest	5180	-2.12	-2.53	-1.29	-1.70	11.00	1.41	1.00	10.00
Middle	5220	-1.30	-3.18	-0.47	-2.35	11.00	2.23	0.35	10.00
Highest	5240	-1.90	-1.86	-1.06	-1.02	11.00	1.64	1.68	10.00

802.11n (20 MHz) mode - SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		*Maximum PSD (dBm)		FCC Limit (dBm/ MHz)	E.I.R.P (dBm)		IC E.I.R.P Limit (dBm/ MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		Chain 0	Chain 1	
Lowest	5180	-2.50	-3.24	-1.62	-2.36	11.00	1.08	0.34	10.00
Middle	5220	-1.77	-2.93	-0.89	-2.05	11.00	1.81	0.65	10.00
Highest	5240	-2.14	-2.55	-1.24	-1.65	11.00	1.46	1.05	10.00

TEST DATA

802.11n (20 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	*Maximum PSD (dBm)	FCC Limit (dBm/MHz)	E.I.R.P (dBm)	IC E.I.R.P Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power			
Lowest	5180	-2.41	-3.10	0.88	1.15	11.00	6.86	10.00
Middle	5220	-1.96	-3.40	0.88	1.27	11.00	6.98	10.00
Highest	5240	-2.13	-2.37	0.90	1.66	11.00	7.37	10.00

802.11n (20 MHz) mode – MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	*Maximum PSD (dBm)	FCC Limit (dBm/MHz)	E.I.R.P (dBm)	IC E.I.R.P Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power			
Lowest	5180	-3.04	-3.85	1.59	1.17	11.00	3.87	10.00
Middle	5220	-2.50	-3.84	1.56	1.45	11.00	4.15	10.00
Highest	5240	-2.76	-3.06	1.59	1.69	11.00	4.39	10.00

802.11n (40 MHz) mode – SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		*Maximum PSD (dBm)		FCC Limit (dBm)	E.I.R.P (dBm)		IC E.I.R.P Limit (dBm/ MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		Chain 0	Chain 1	
Low	5190	-6.33	-7.12	-4.71	-5.50	11.00	-2.01	-2.80	10.00
Highest	5230	-6.06	-5.72	-4.43	-4.09	11.00	0.07	0.41	10.00

TEST DATA

802.11n (40 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	*Maximum PSD (dBm)	FCC Limit (dBm)	E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power			
Low	5190	-6.27	-6.87	1.62	-1.93	11.00	3.78	10.00
Highest	5230	-5.92	-5.55	1.63	-1.09	9.49	6.42	10.00

802.11n (40 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	*Maximum PSD (dBm)	FCC Limit (dBm)	E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power			
Low	5190	-6.88	-8.13	2.67	-1.78	11.00	0.92	10.00
Highest	5230	-7.04	-6.65	2.68	-1.15	11.00	3.35	10.00

802.11ac (20MHz) mode-SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		*Maximum PSD (dBm)		FCC Limit (dBm/ MHz)	E.I.R.P (dBm)		IC E.I.R.P Limit (dBm/ MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		Chain 0	Chain 1	
Lowest	5180	-2.49	-3.41	-1.61	-2.53	11.00	1.09	0.17	10.00
Middle	5220	-1.73	-3.38	-0.85	-2.50	11.00	1.85	0.20	10.00
Highest	5240	-2.21	-2.35	-1.33	-1.47	11.00	1.37	1.23	10.00

TEST DATA

802.11ac (20 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	*Maximum PSD (dBm)	FCC Limit (dBm/MHz)	E.I.R.P (dBm)	IC E.I.R.P Limit (dBm/MHz)
		Chain 0	Chain 1		Total output power			
Lowest	5180	-2.57	-2.99	0.88	1.12	11.00	6.83	10.00
Middle	5220	-1.70	-3.28	0.88	1.47	11.00	7.18	10.00
Highest	5240	-1.96	-2.24	0.88	1.79	11.00	7.50	10.00

802.11ac (20 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	*Maximum PSD (dBm)	FCC Limit (dBm/MHz)	E.I.R.P (dBm)	IC E.I.R.P Limit (dBm/MHz)
		Chain 0	Chain 1		Total output power			
Lowest	5180	-2.71	-4.06	1.55	1.23	11.00	3.93	10.00
Middle	5220	-2.61	-3.68	1.56	1.46	11.00	4.16	10.00
Highest	5240	-3.20	-2.83	1.55	1.55	11.00	4.25	10.00

802.11ac (40 MHz) mode – SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		*Maximum PSD (dBm)		FCC Limit (dBm)	E.I.R.P (dBm)		IC E.I.R.P Limit (dBm/MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		Chain 0	Chain 1	
Low	5190	-6.07	-7.07	-4.45	-5.45	11.00	-1.75	-2.75	10.00
Highest	5230	-5.93	-6.03	-4.31	-4.41	11.00	0.19	0.09	10.00

TEST DATA

802.11ac (40 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	*Maximum PSD (dBm)	FCC Limit (dBm)	E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power			
Low	5190	-6.14	-7.23	1.62	-2.02	11.00	3.69	10.00
Highest	5230	-6.16	-5.65	1.62	-1.27	9.49	6.24	10.00

802.11ac (40 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)	FCC Limit (dBm)	E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power			
Low	5190	-7.08	-8.39	2.64	-2.04	9.49	0.66	10.00
Highest	5230	-6.99	-6.80	2.70	-1.18	9.49	6.33	10.00

802.11ac (80 MHz) mode - SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		*Maximum PSD (dBm)		FCC Limit (dBm)	E.I.R.P (dBm)		IC E.I.R.P Limit (dBm/ MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		Chain 0	Chain 1	
	5210	-12.14	-11.40	-9.33	-8.59	11.00	-6.63	-5.89	10.00

802.11ac (80 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	*Maximum PSD (dBm)	FCC Limit (dBm)	E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power			
	5210	-12.05	-11.50	2.81	-5.95	11.00	-0.24	10.00

802.11ac (80 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	*Maximum PSD (dBm)	FCC Limit (dBm)	E.I.R.P (dBm)	IC E.I.R.P Limit (dBm)
		Chain 0	Chain 1		Total output power			
	5210	-12.61	-12.28	4.18	-5.25	11.00	0.46	10.00

Note:

1. *Maximum Conducted (average) Power = Measured conducted power + Duty Factor
2. Total output power = 10 log [10^{(Chain 0 Power + duty factor)/10} + 10^{(Chain 1 Power + duty factor)/10}]
3. For CDD transmission, directional gain is. **5.71 dBi**

   For MIMO transmission, directional gain is **2.7 dBi.**

   Directional gain was calculated according to KDB662911 D01 Multiple Transmitter Output v02r01.

   For power spectral density (PSD) measurements on all devices employing CDD, directional gain is as follows,

   Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi, where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi. = 2.7 dBi + 10 log(2/1) dB = 5.71 dBi.

   For CDD mode of this device, N_{SS}=1.

   For power spectral density (PSD) measurements on all devices employing MIMO, directional gain is as follows,

   Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi, where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi. = 2.7 dBi + 10 log(2/2) dB = 2.7 dBi.

   For this device, MIMO mode means SM-MIMO(Spatial Multiplexing) transmission and N_{SS}=2.
4. E.I.R.P = Maximum conducted Power + Duty Cycle Factor + Antenna gain.

   E.I.R.P was calculated by following equation according to KDB412172 D01 Determining ERP and EIRP v01.

   E.I.R.P = $P_T + G_T – Lc$

   P_T = Peak outputpower (dBm)

   G_T = Gain of the transmitting antenna in dBi, Directional antenna gain is **5.71 dBi or 2.7dBi**

   L_C = Signal attenuation in the connecting cable between the transmitter and antenna in dB. This factor of an integral antenna is negligible.
5. For FCC PSD Limit, If transmitting antennas of directional gain greater than 6 dBi was used, maximum power spectral density was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
6. The following equation was used for spectrum offset:

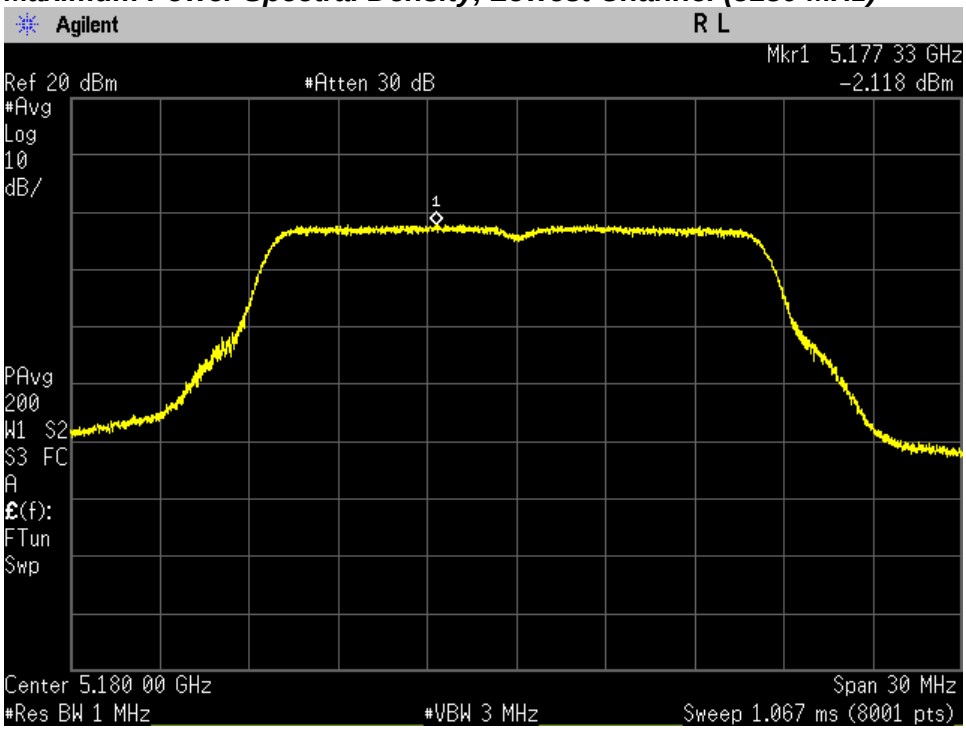
   Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)

PLOTS OF EMISSIONS

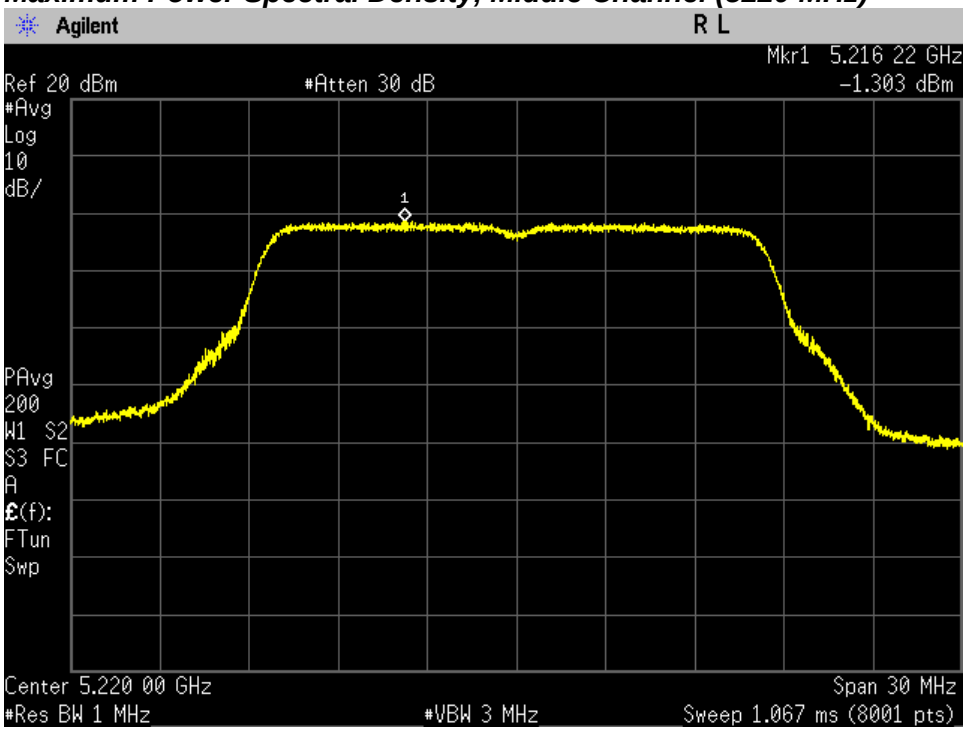
802.11a mode

Chain 0

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

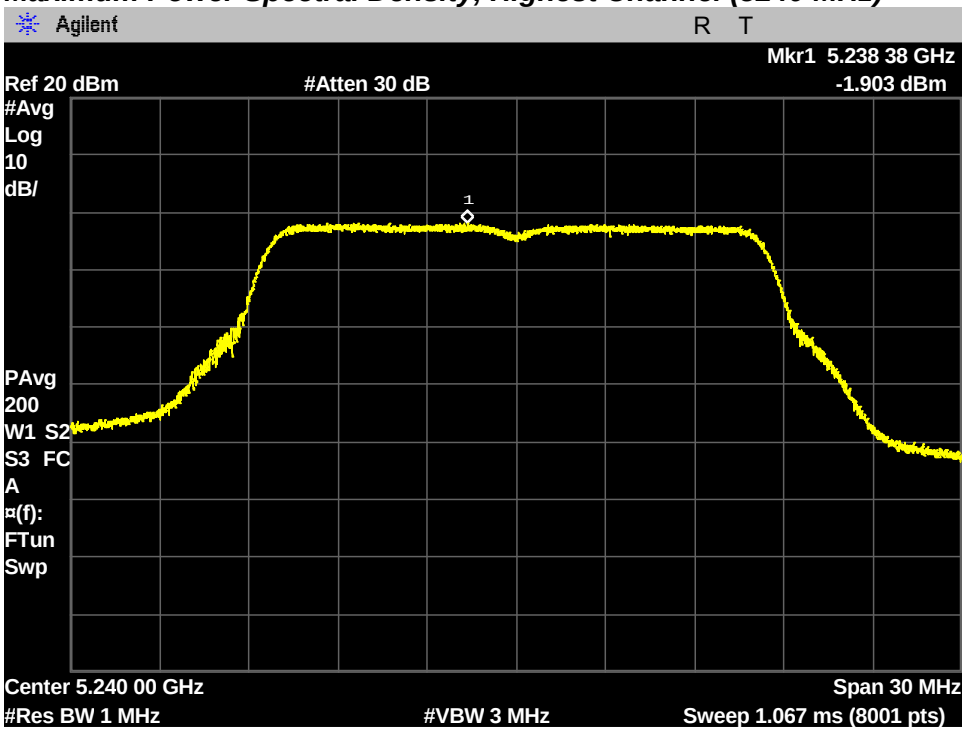


Maximum Power Spectral Density, Middle Channel (5220 MHz)



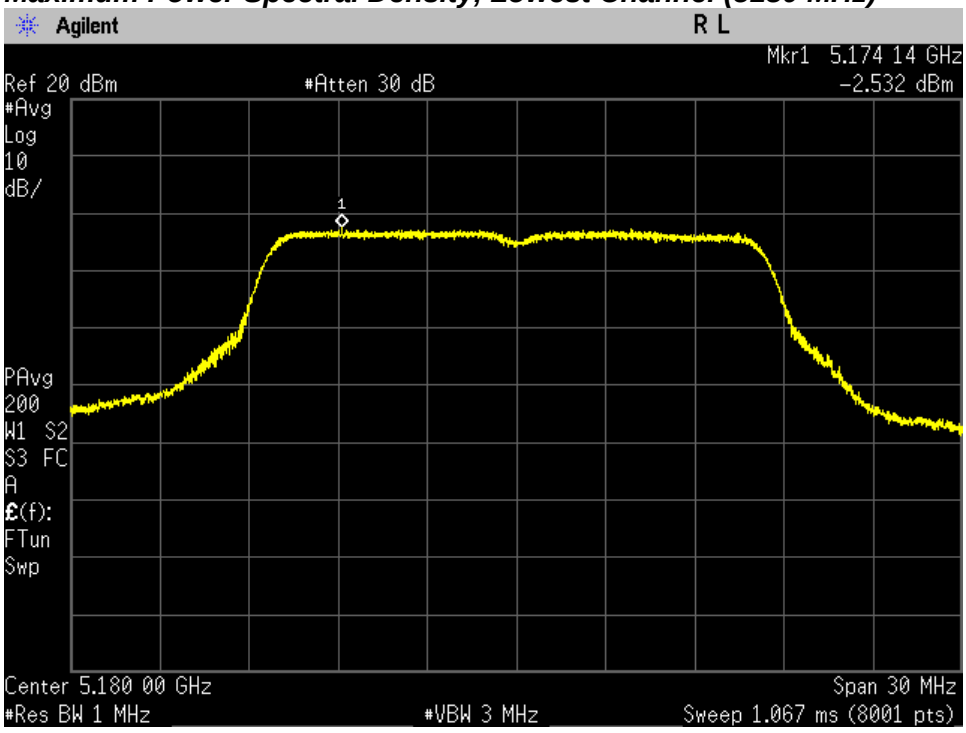
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5240 MHz)



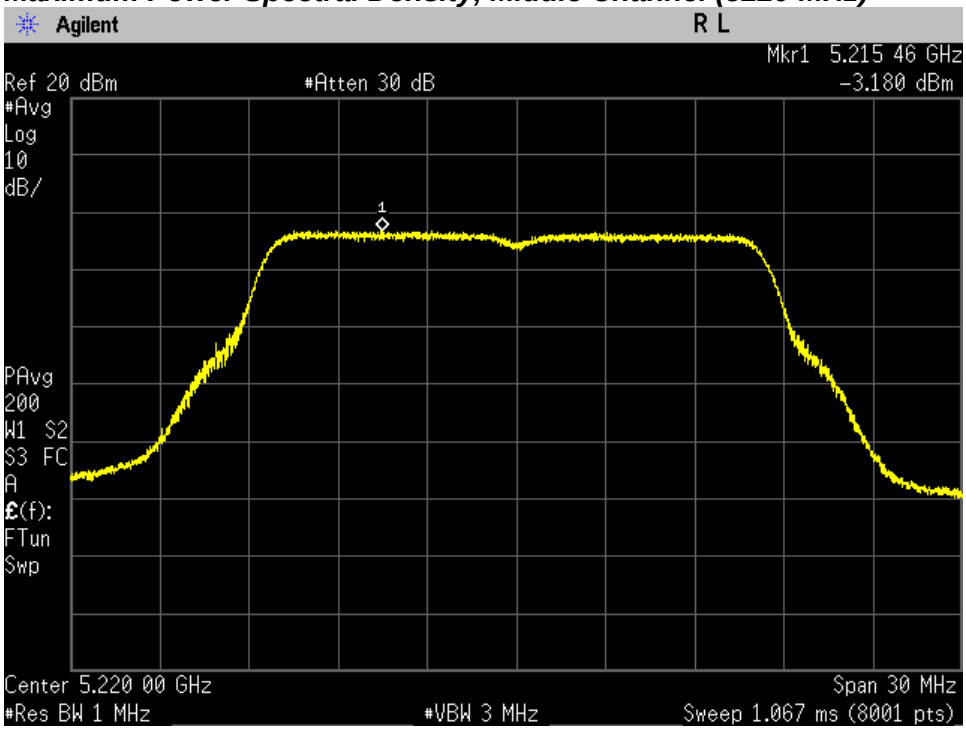
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

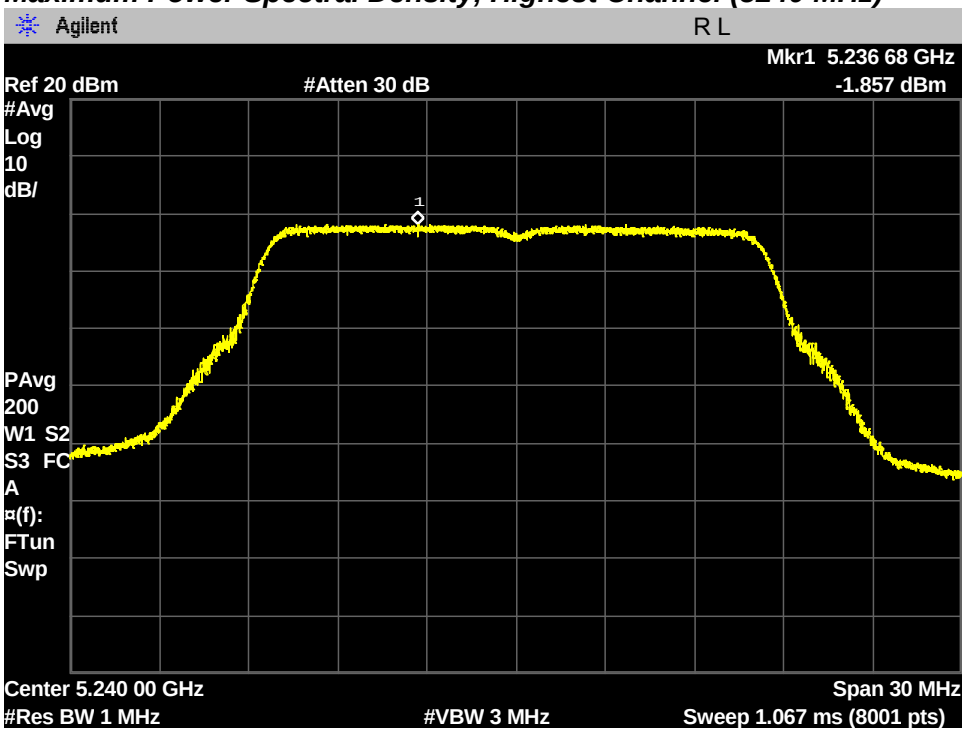


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5220 MHz)



Maximum Power Spectral Density, Highest Channel (5240 MHz)

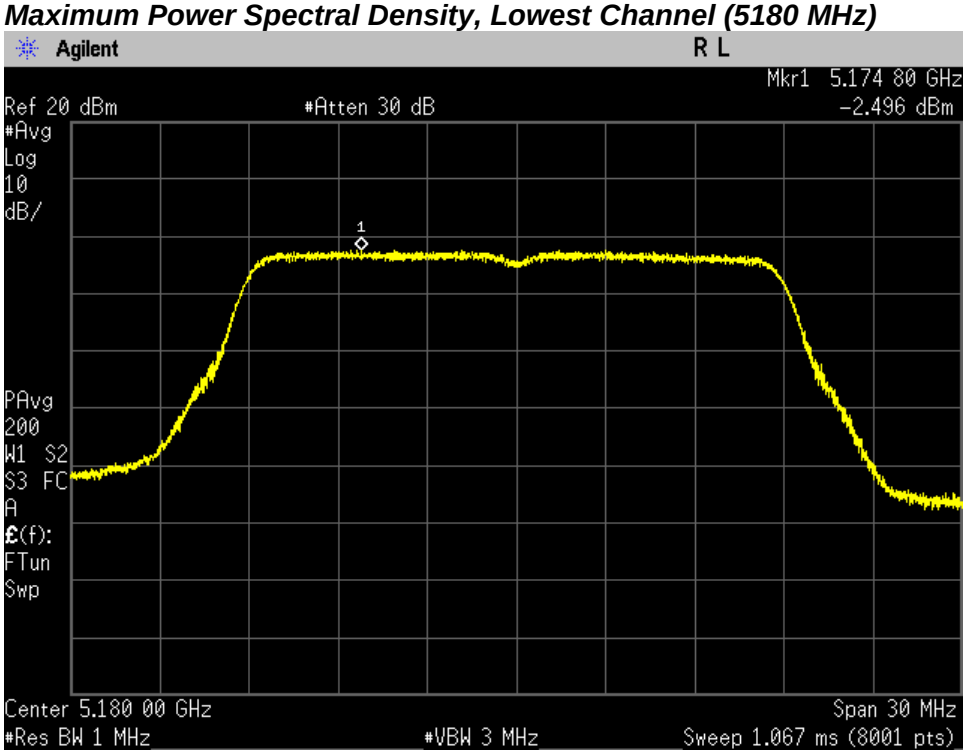


PLOTS OF EMISSIONS

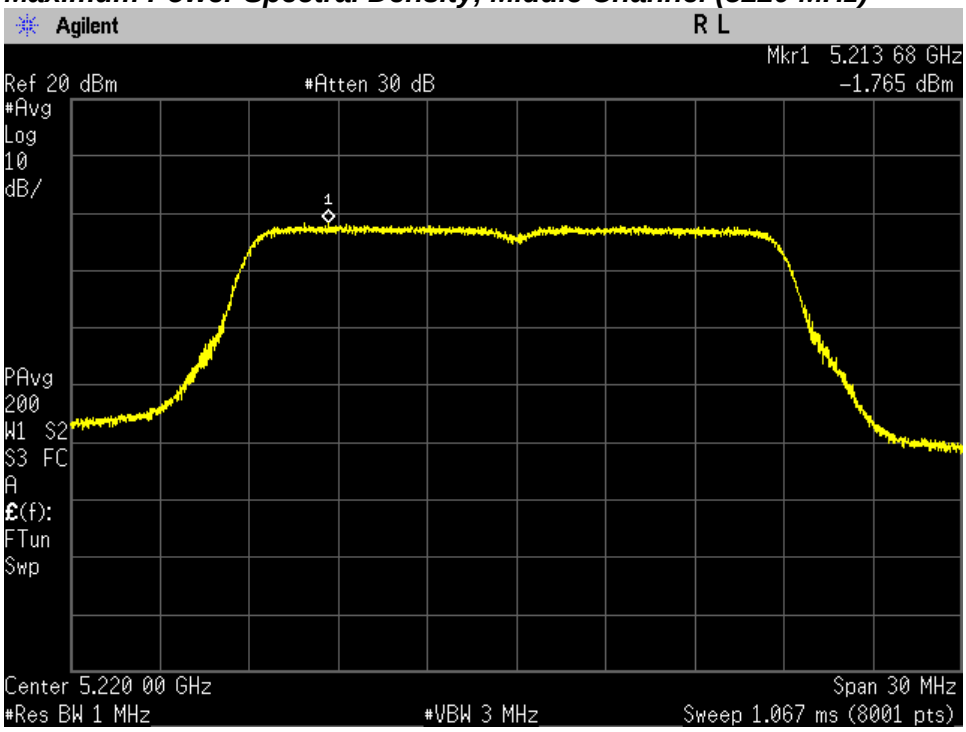
802.11n (20 MHz) mode - SISO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

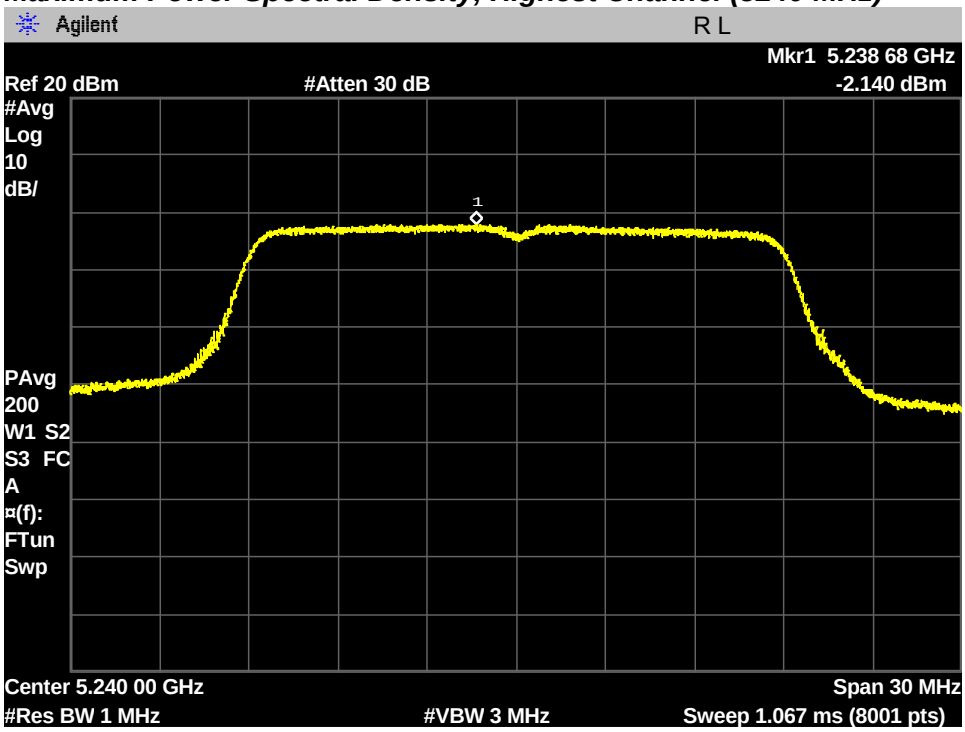


Maximum Power Spectral Density, Middle Channel (5220 MHz)



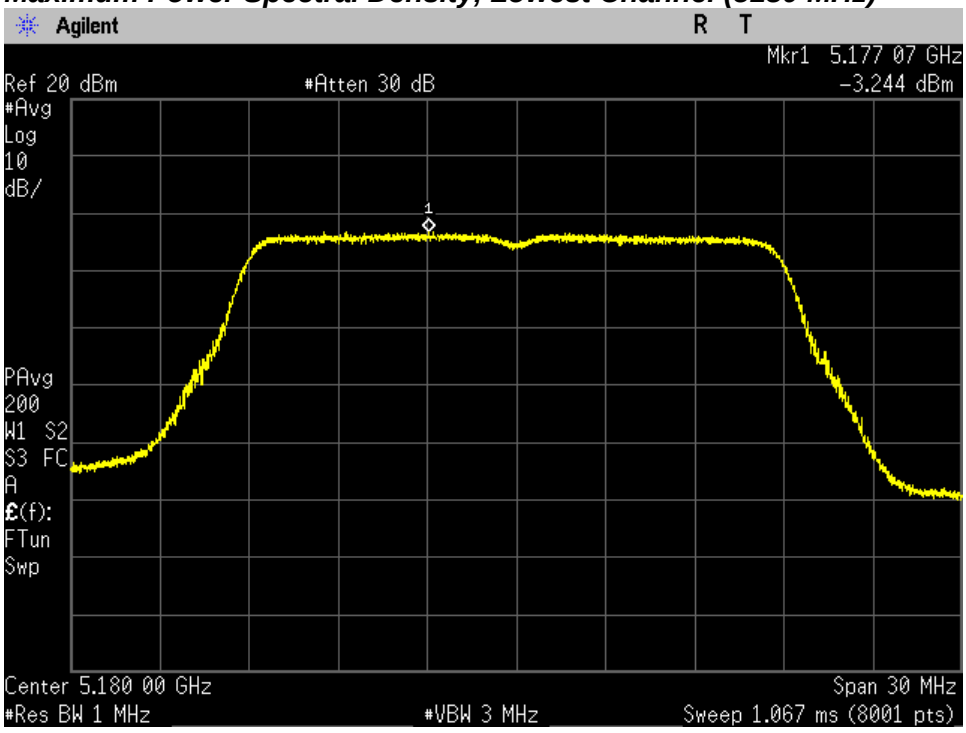
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5240 MHz)



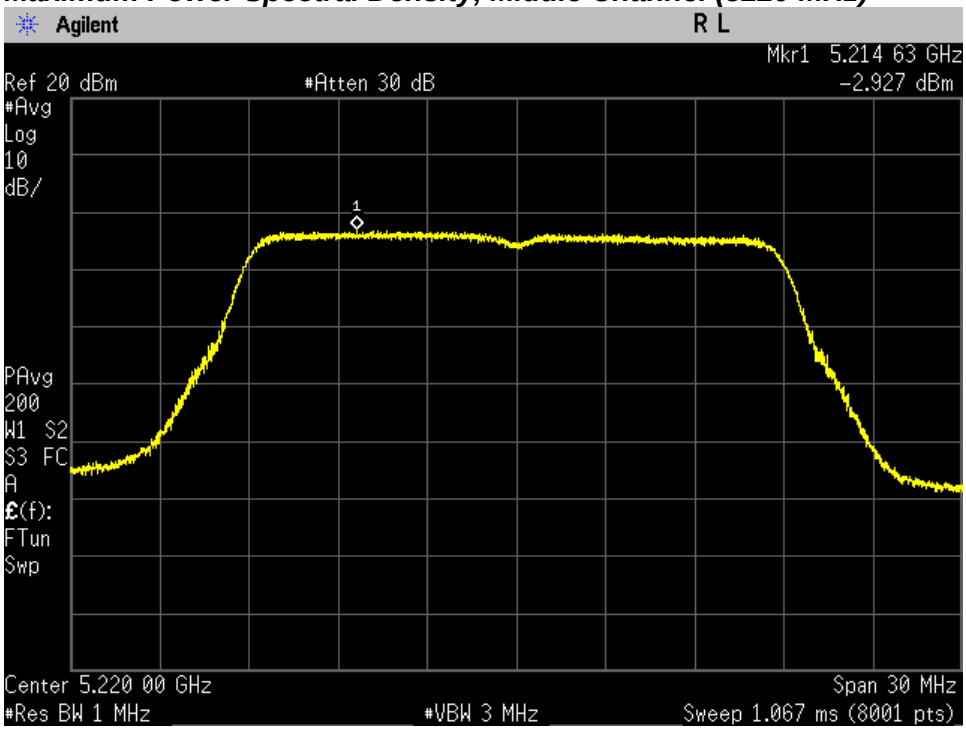
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

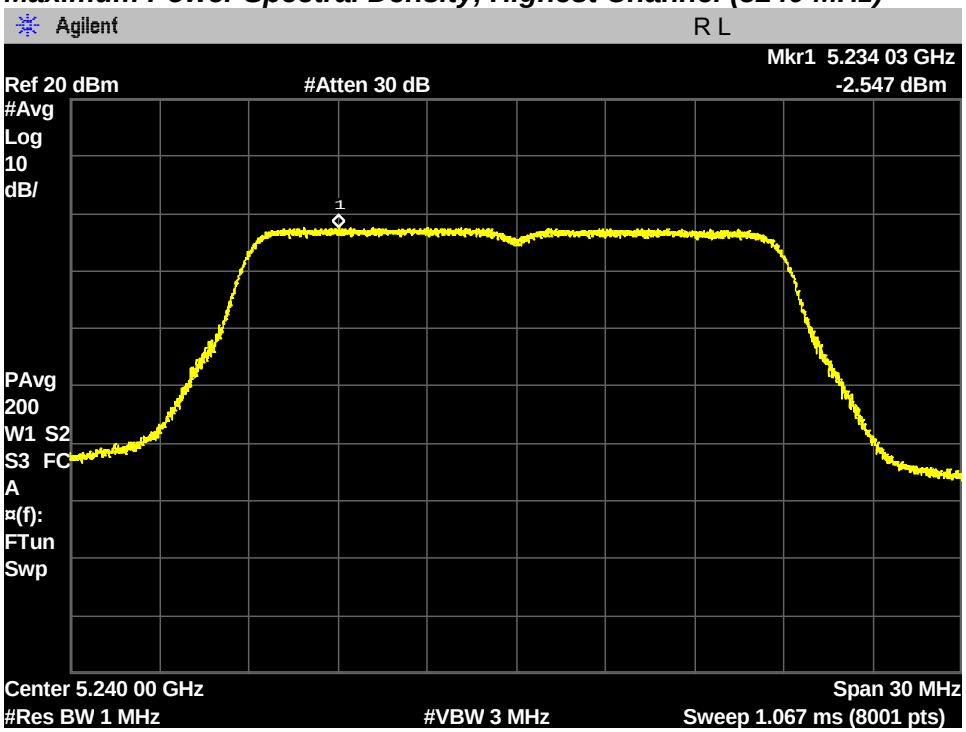


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5220 MHz)



Maximum Power Spectral Density, Highest Channel (5240 MHz)

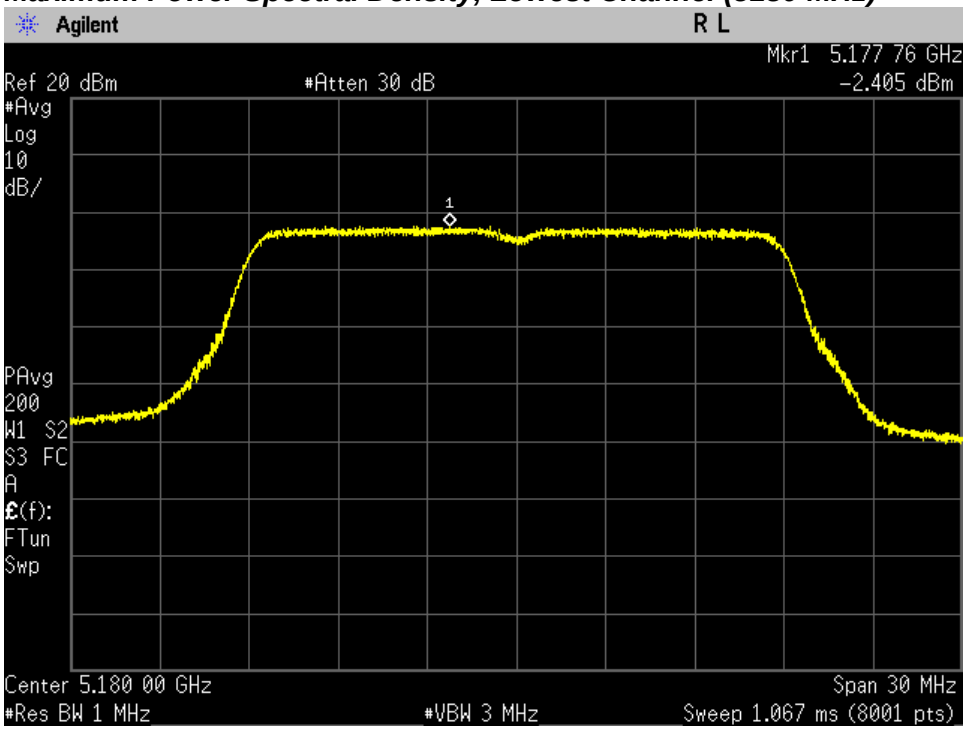


PLOTS OF EMISSIONS

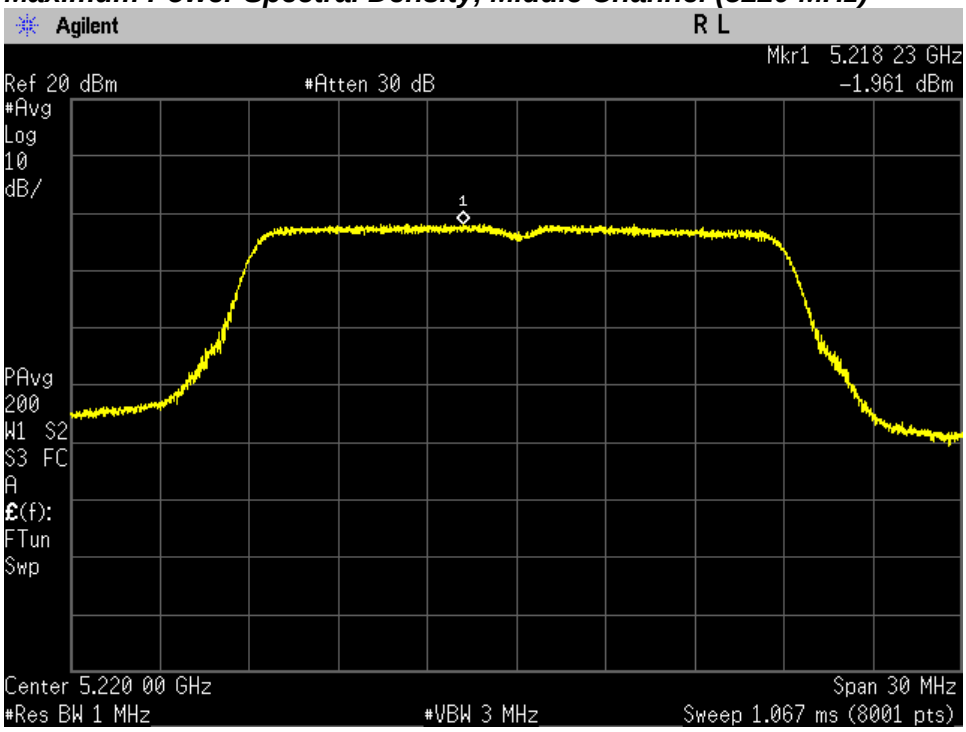
802.11n (20 MHz) mode - CDD

Chain 0

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

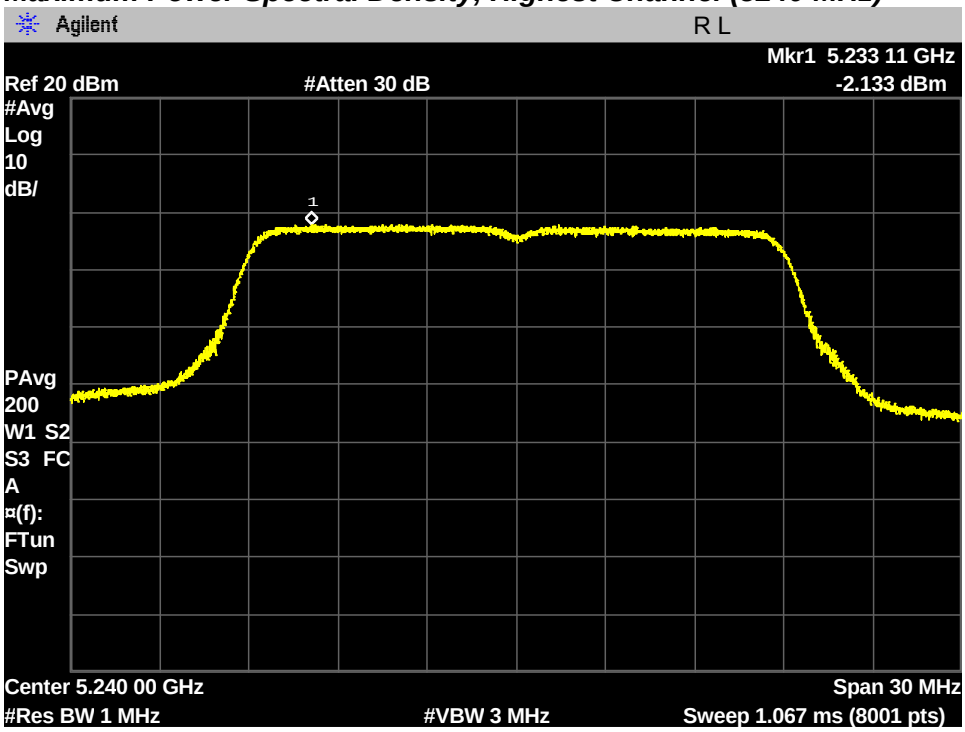


Maximum Power Spectral Density, Middle Channel (5220 MHz)



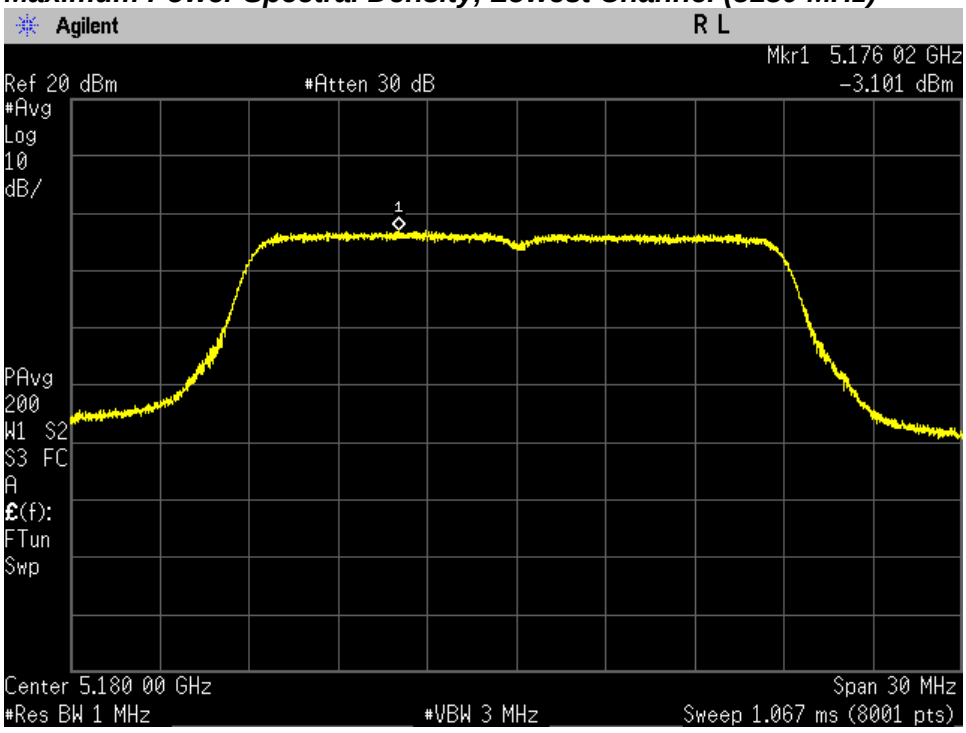
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5240 MHz)



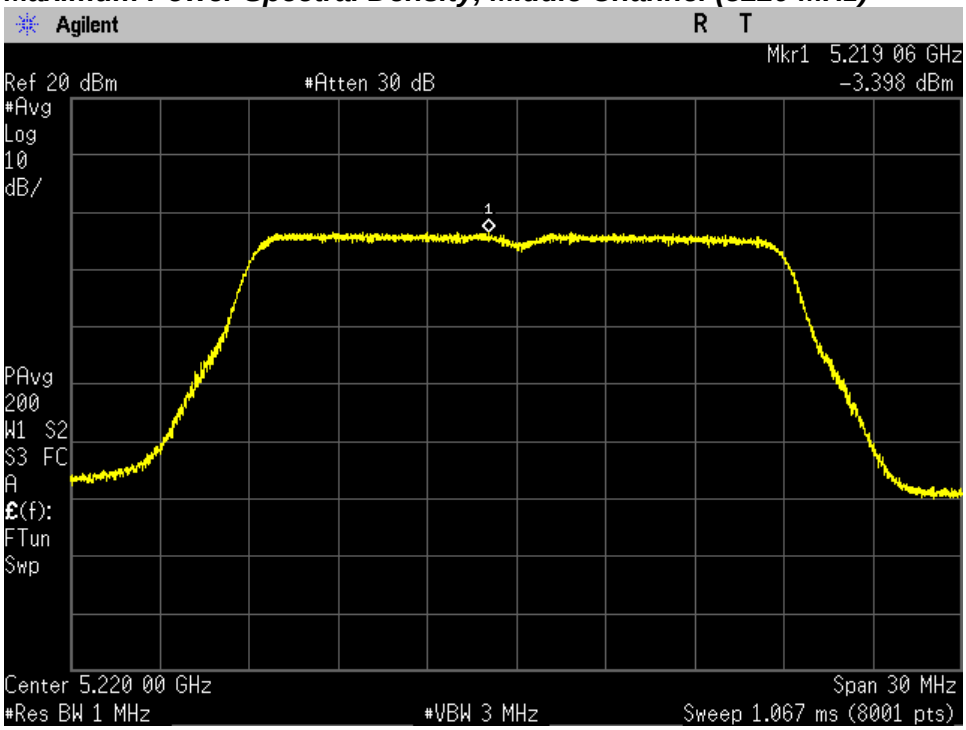
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

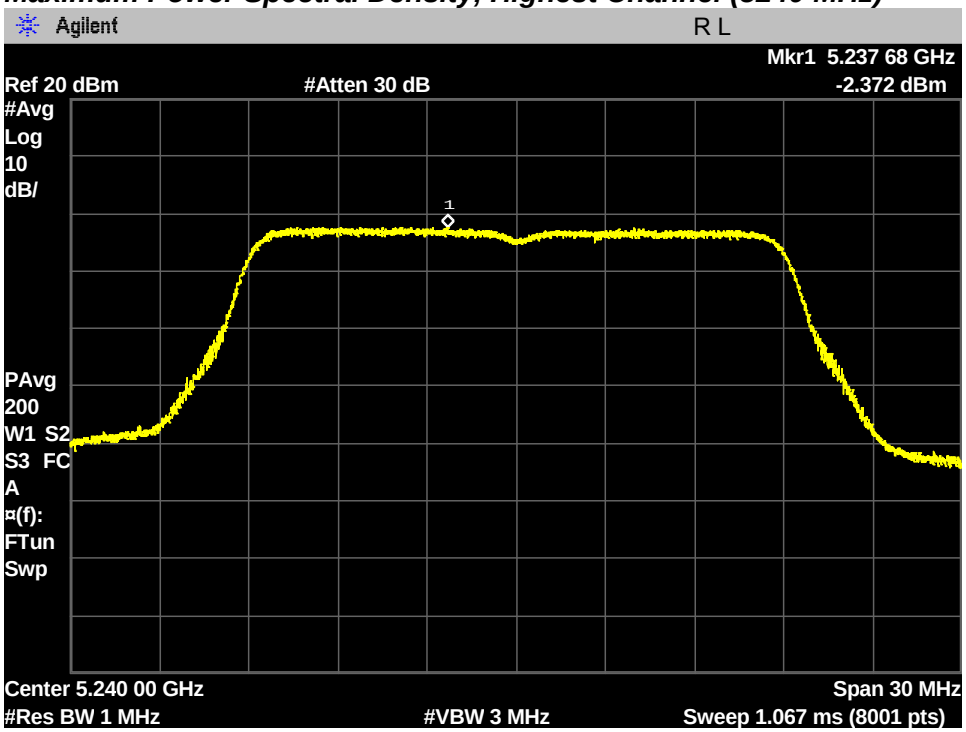


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5220 MHz)



Maximum Power Spectral Density, Highest Channel (5240 MHz)

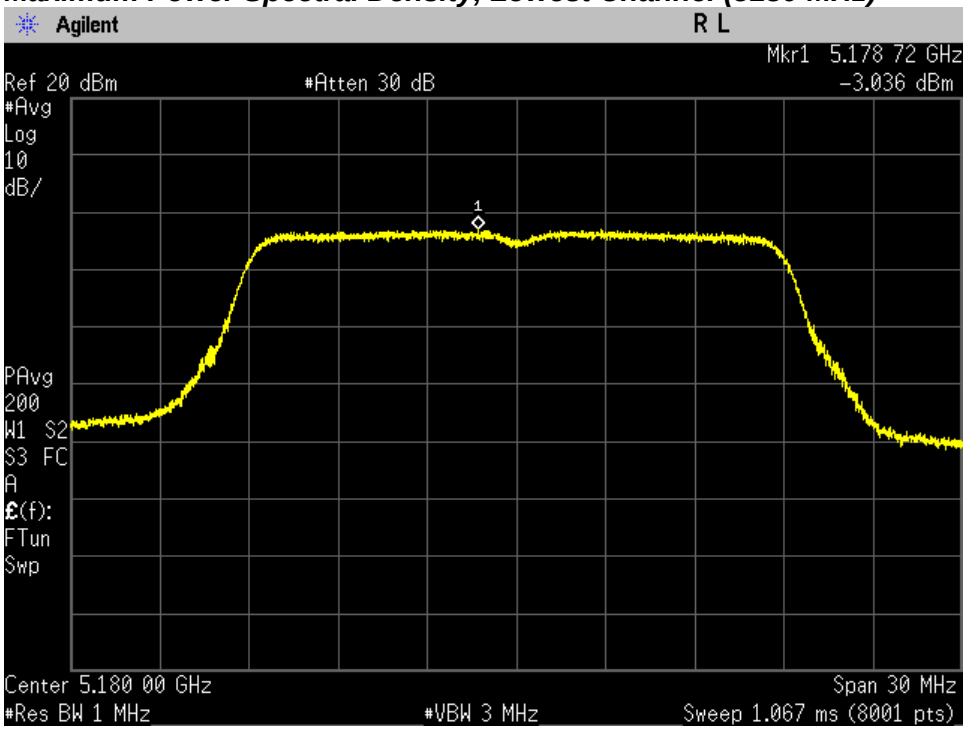


PLOTS OF EMISSIONS

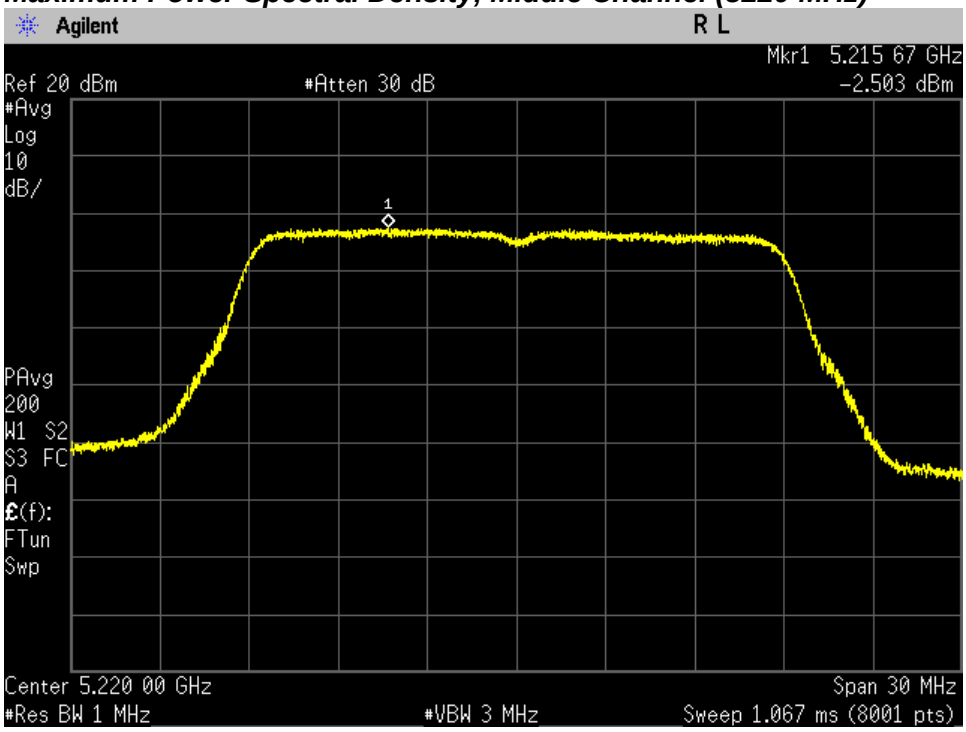
802.11n (20 MHz) mode - MIMO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

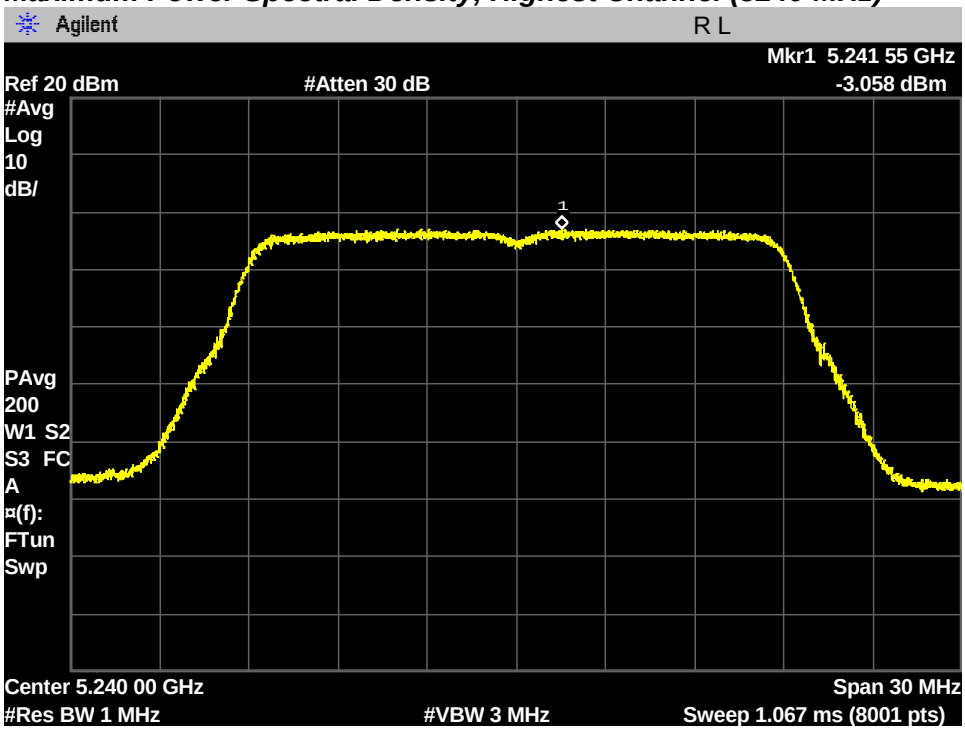


Maximum Power Spectral Density, Middle Channel (5220 MHz)



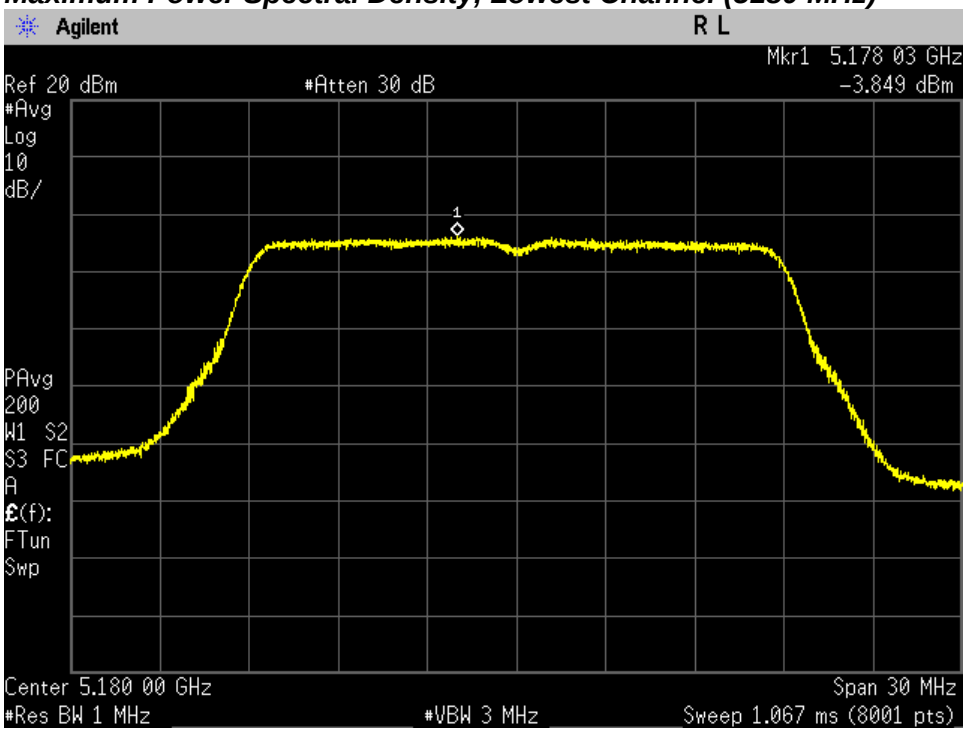
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5240 MHz)



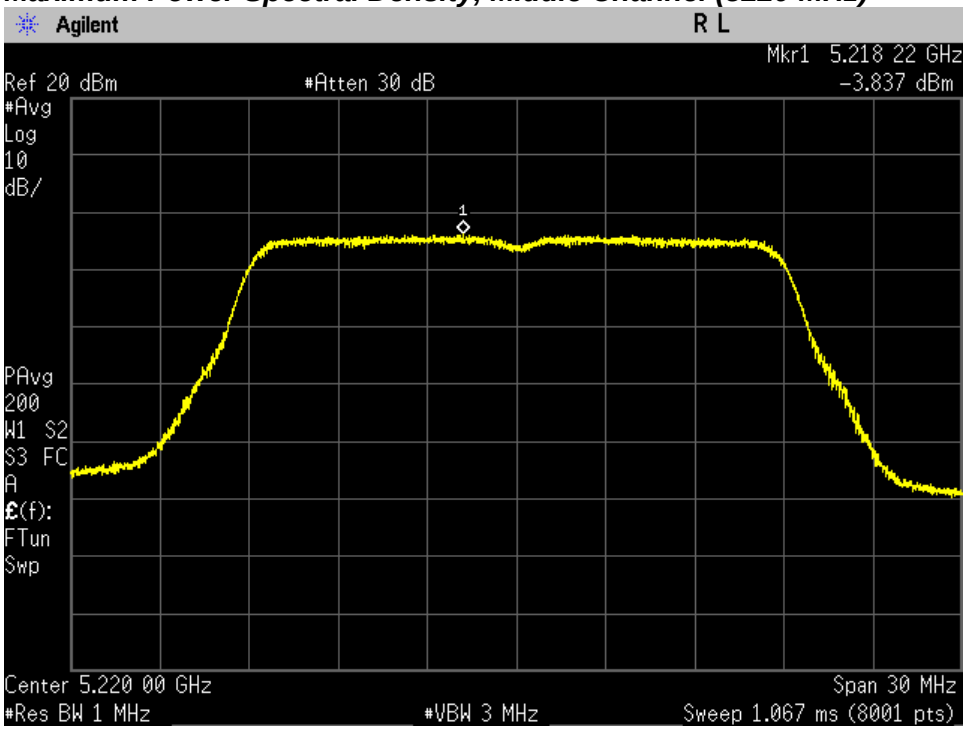
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

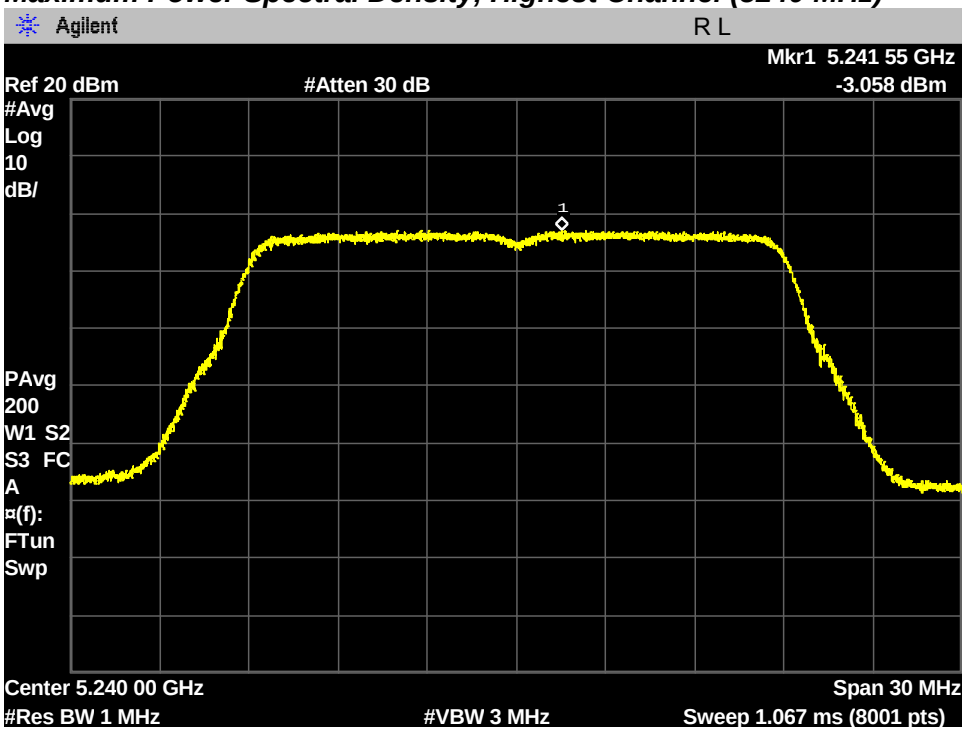


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5220 MHz)



Maximum Power Spectral Density, Highest Channel (5240 MHz)

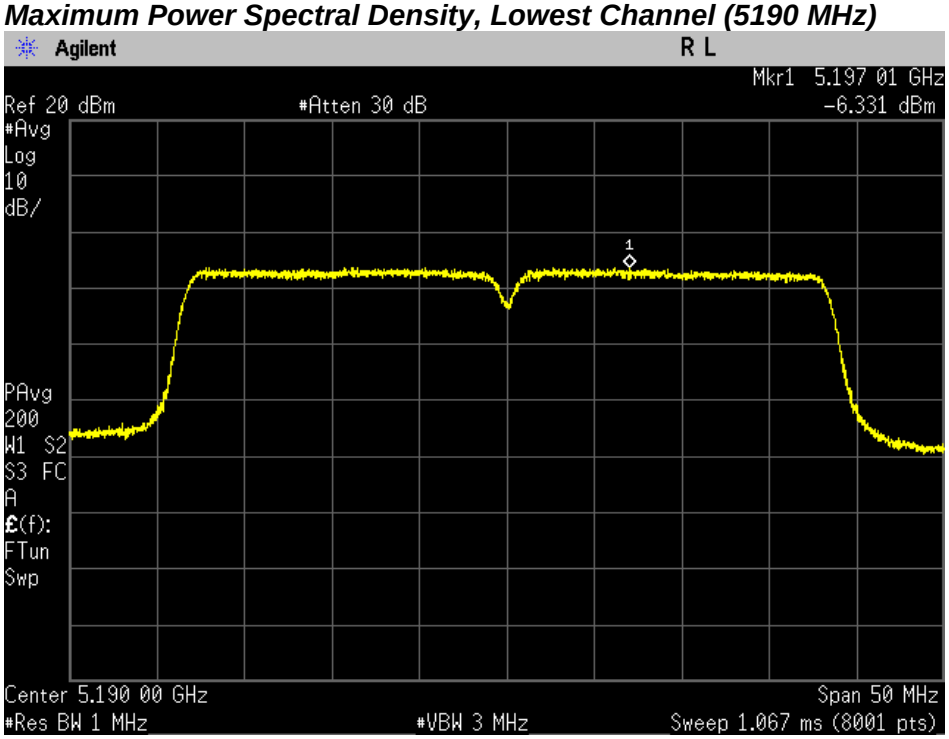


PLOTS OF EMISSIONS

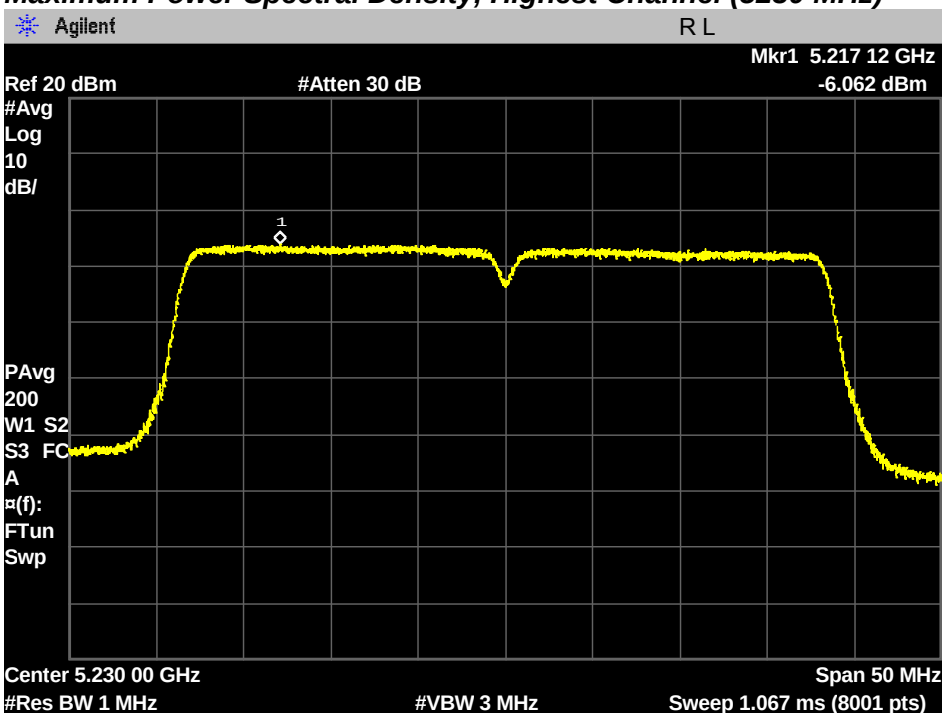
802.11n (40 MHz) mode - SISO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



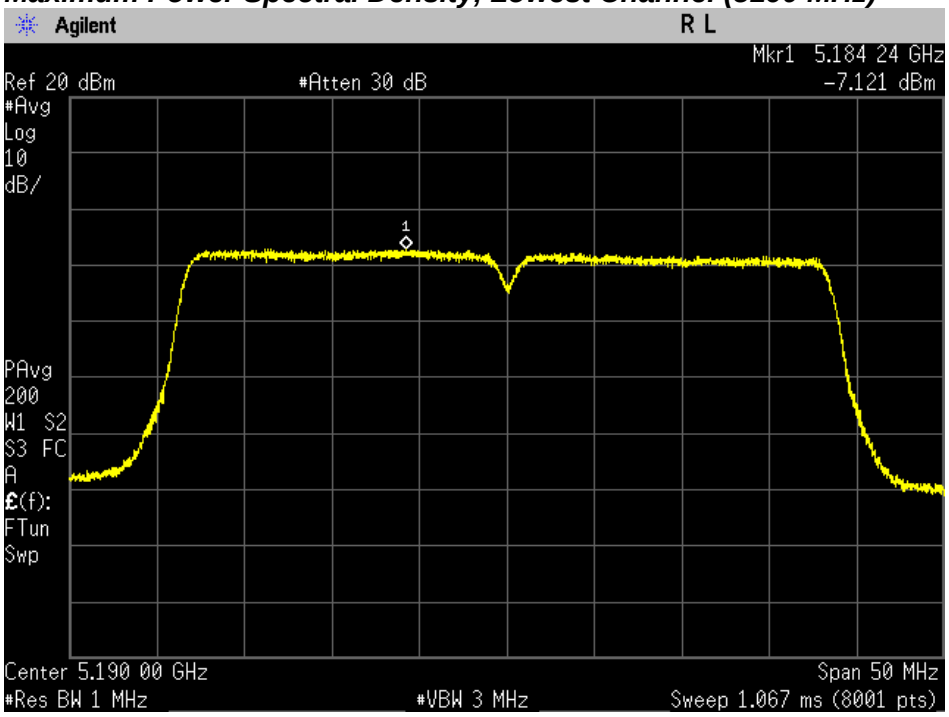
Maximum Power Spectral Density, Highest Channel (5230 MHz)



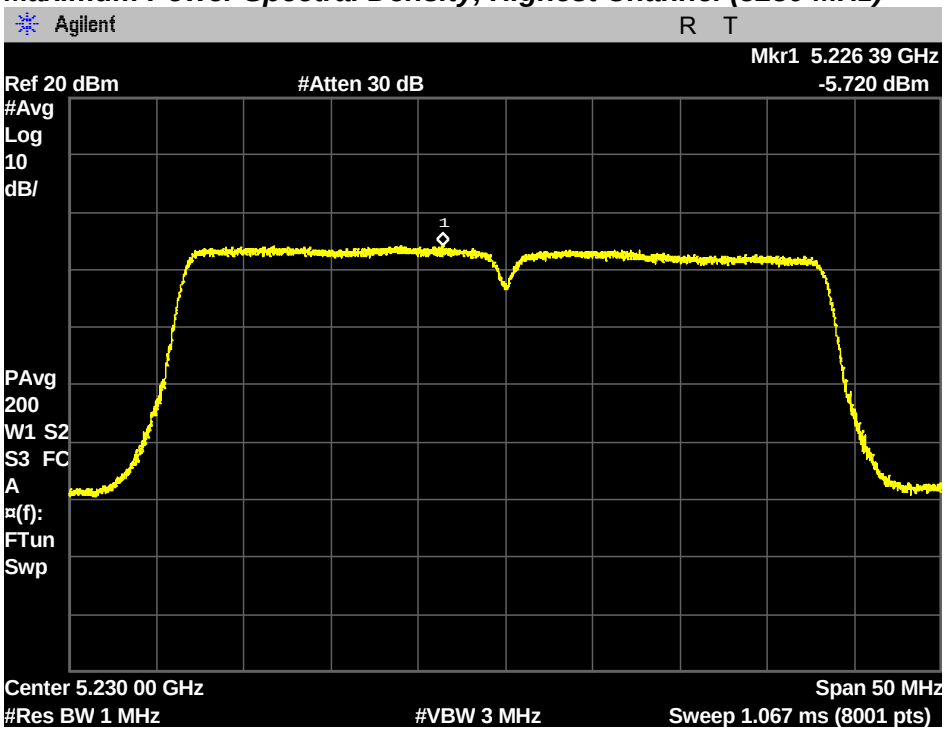
PLOTS OF EMISSIONS

Chain 1

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



Maximum Power Spectral Density, Highest Channel (5230 MHz)

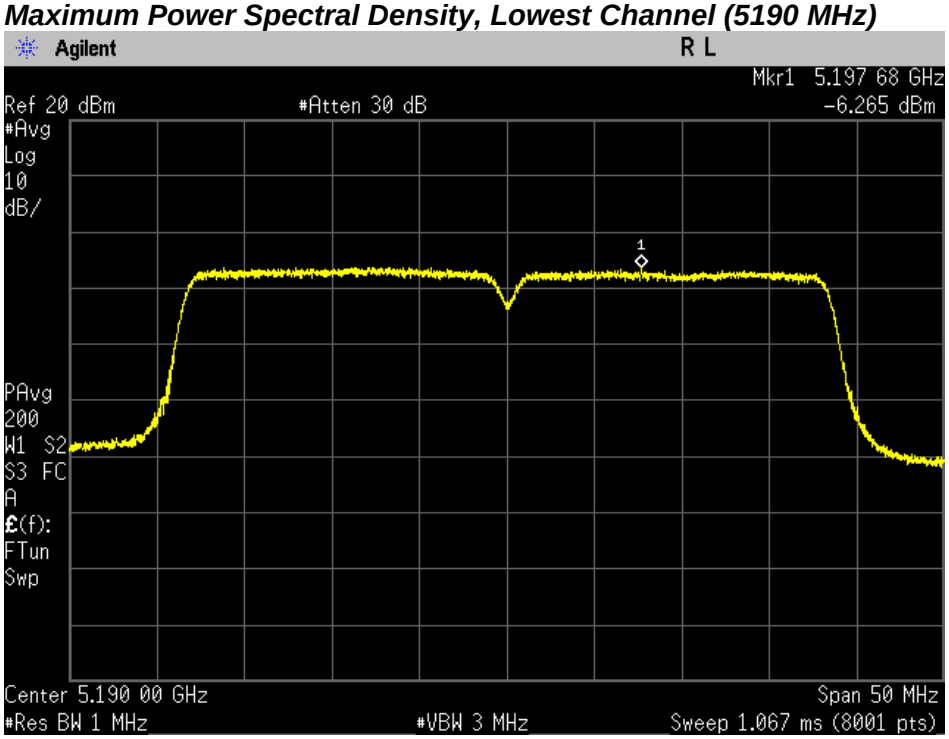


PLOTS OF EMISSIONS

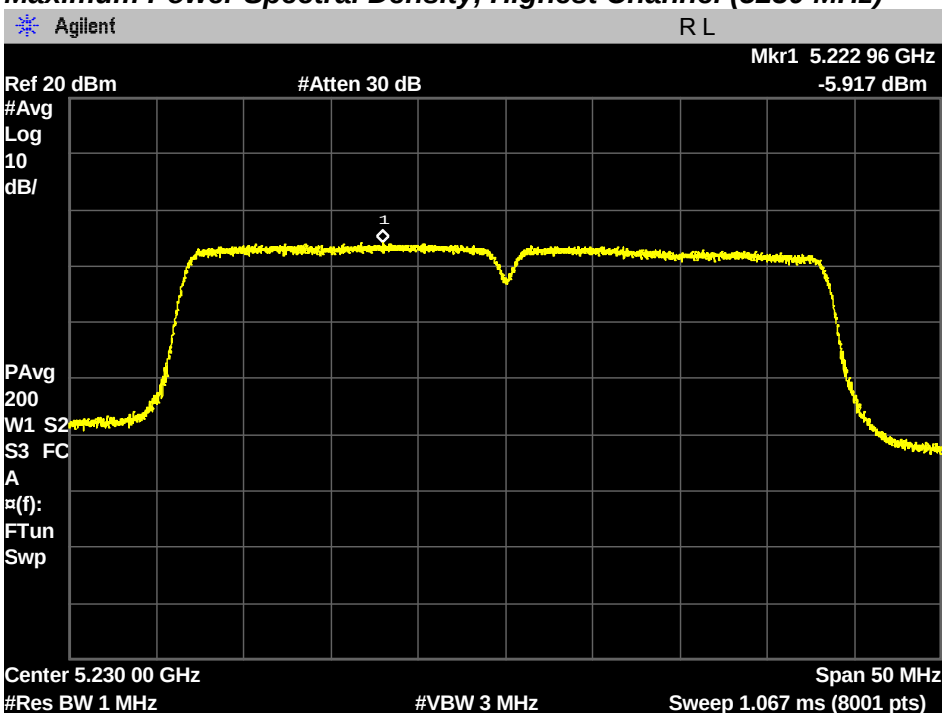
802.11n (40 MHz) mode - CDD

Chain 0

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



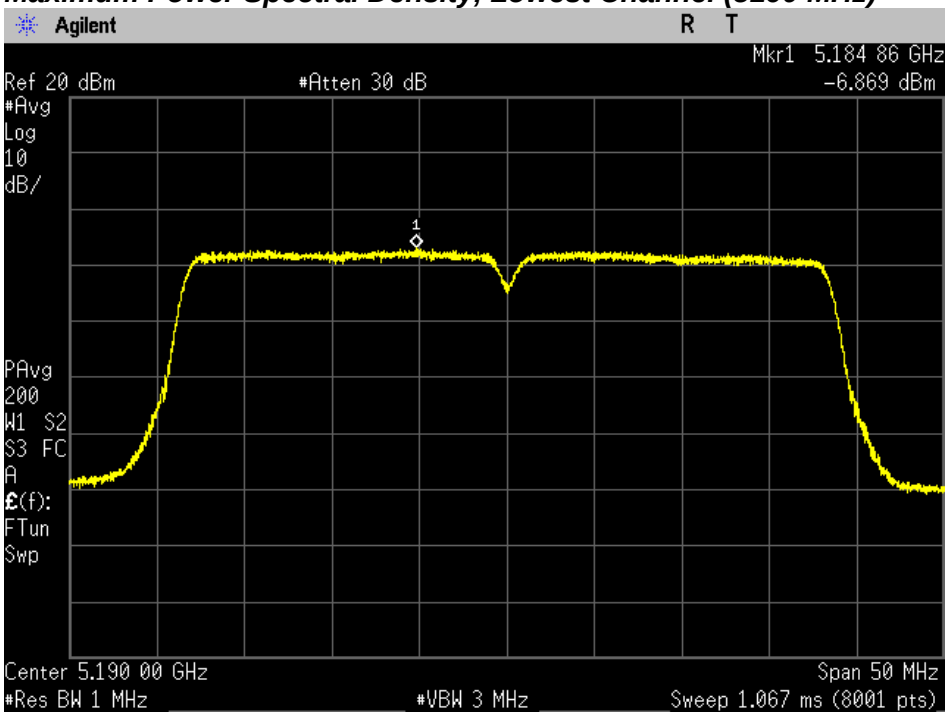
Maximum Power Spectral Density, Highest Channel (5230 MHz)



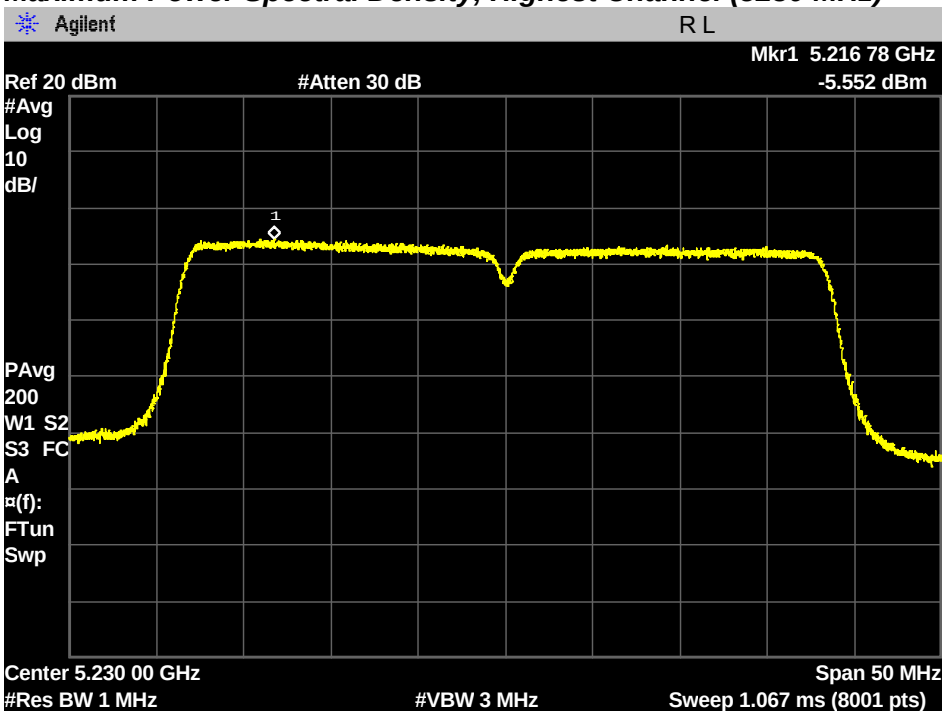
PLOTS OF EMISSIONS

Chain 1

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



Maximum Power Spectral Density, Highest Channel (5230 MHz)

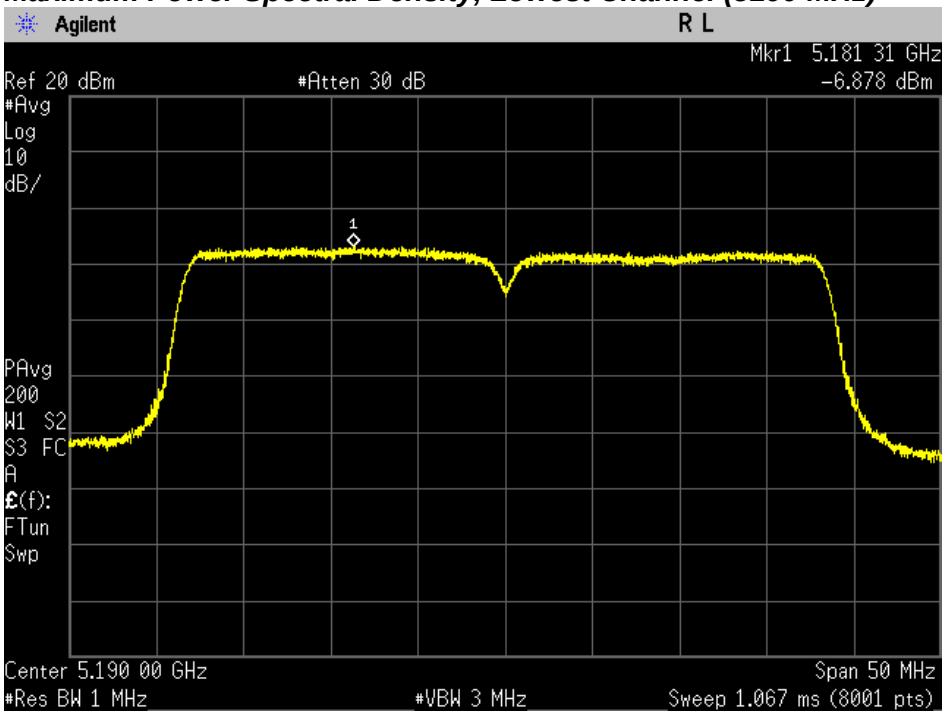


PLOTS OF EMISSIONS

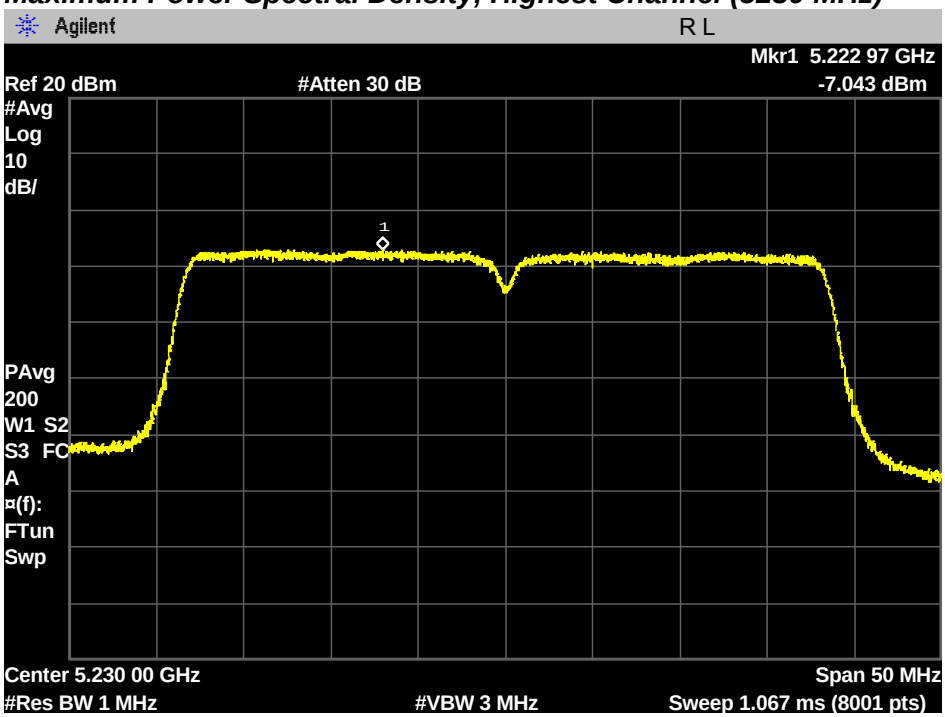
802.11n (40 MHz) mode - MIMO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



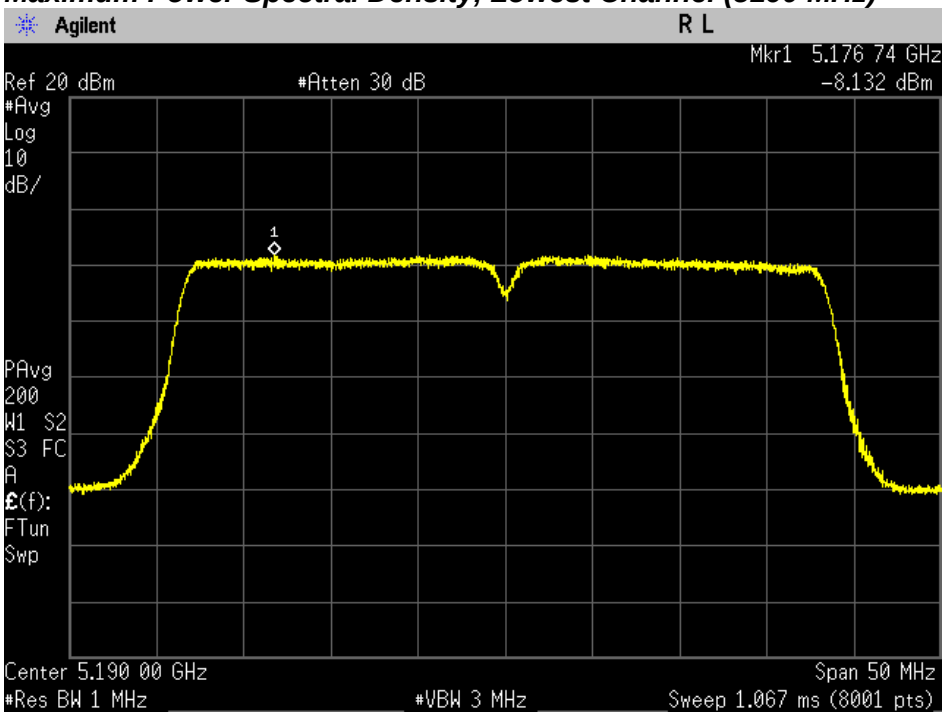
Maximum Power Spectral Density, Highest Channel (5230 MHz)



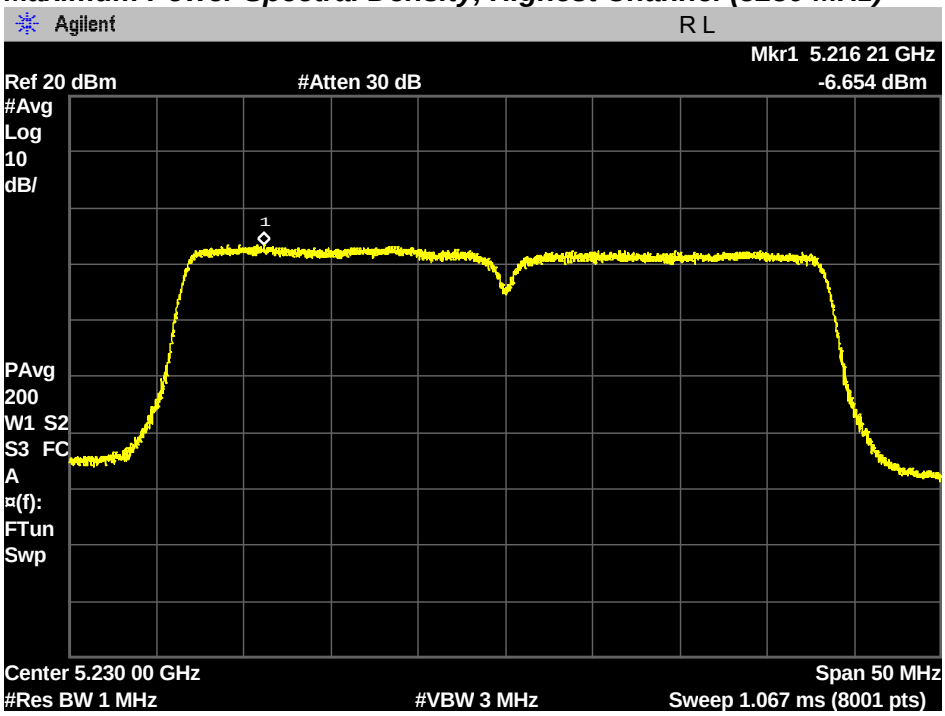
PLOTS OF EMISSIONS

Chain 1

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



Maximum Power Spectral Density, Highest Channel (5230 MHz)

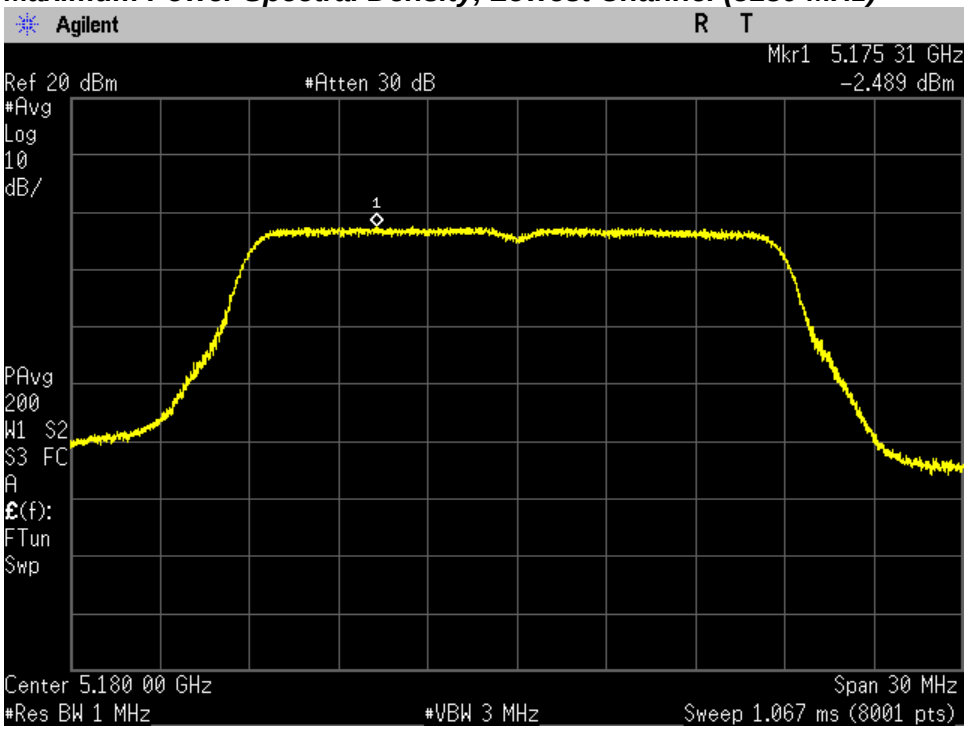


PLOTS OF EMISSIONS

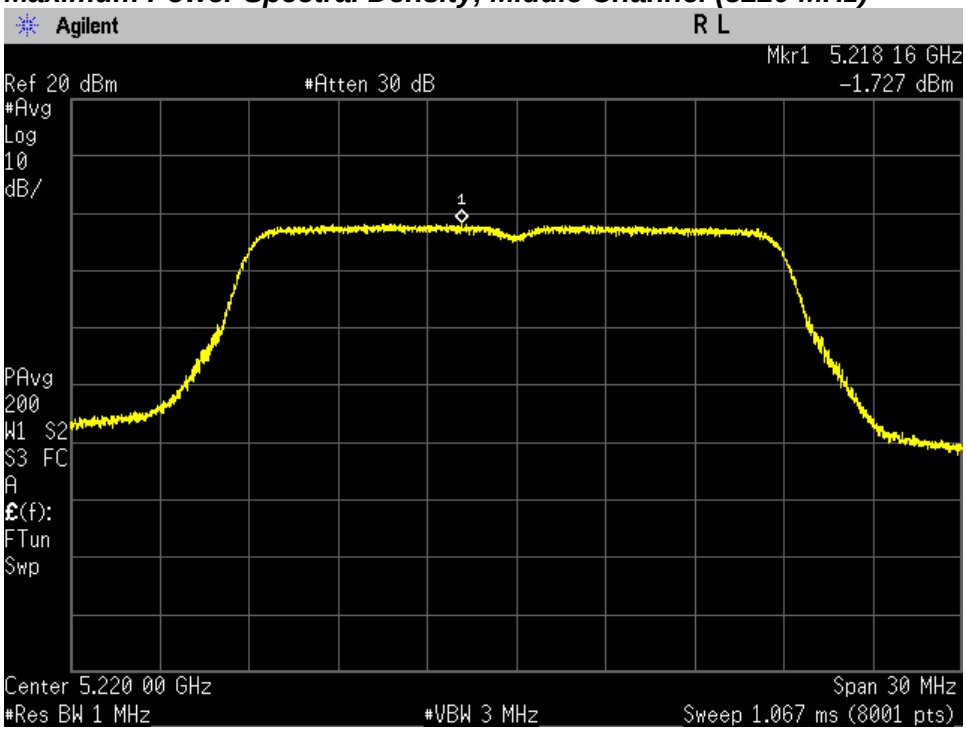
802.11ac (20 MHz) mode - SISO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

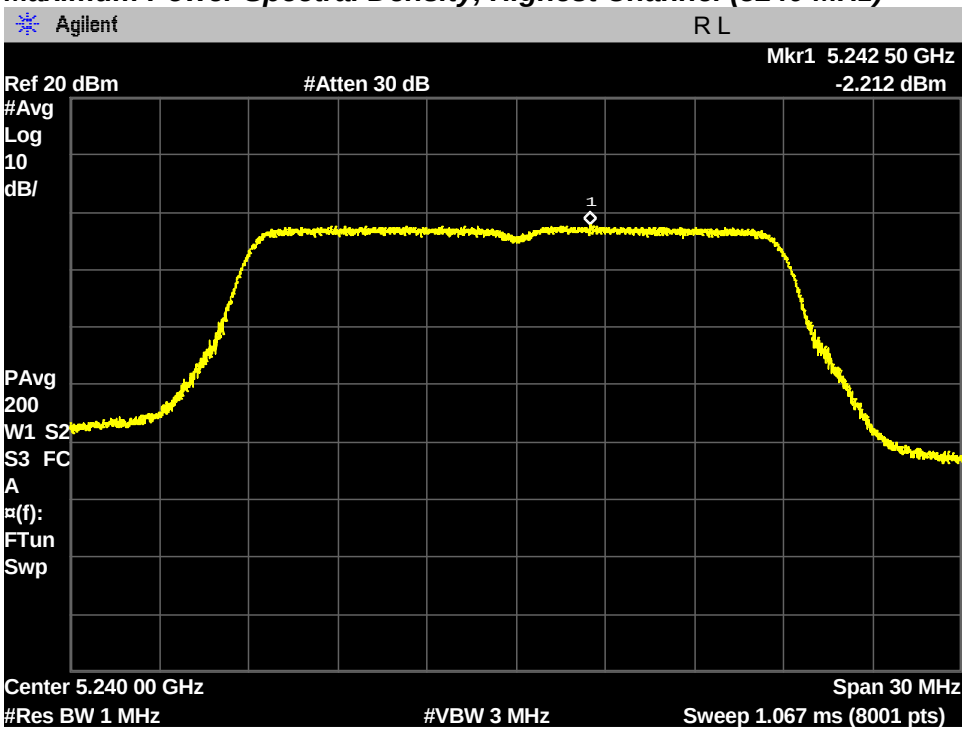


Maximum Power Spectral Density, Middle Channel (5220 MHz)



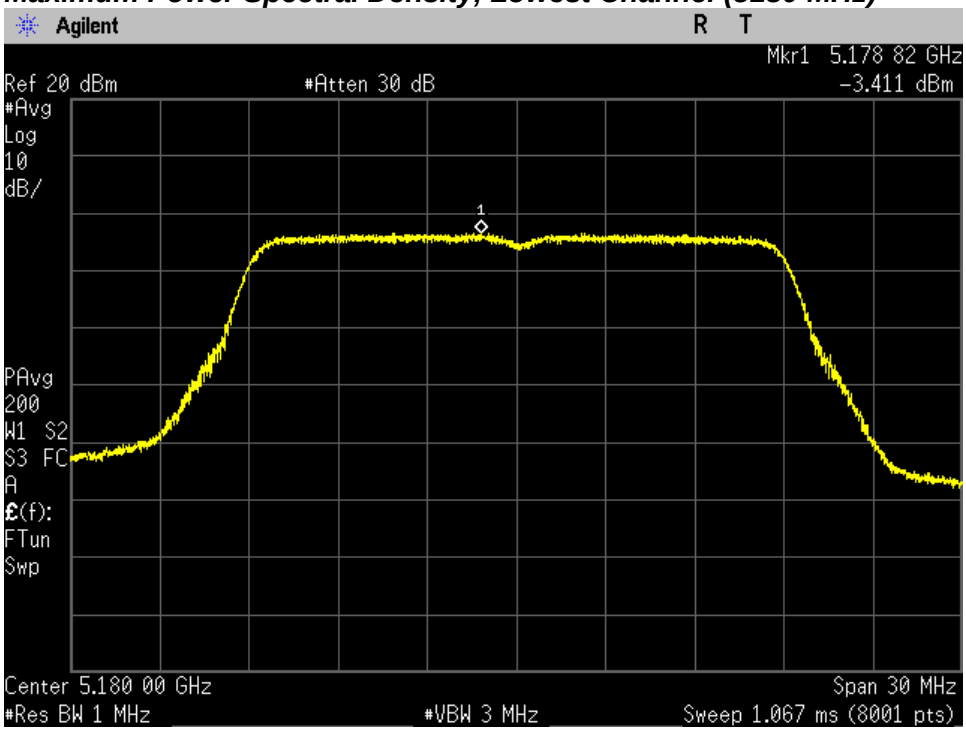
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5240 MHz)



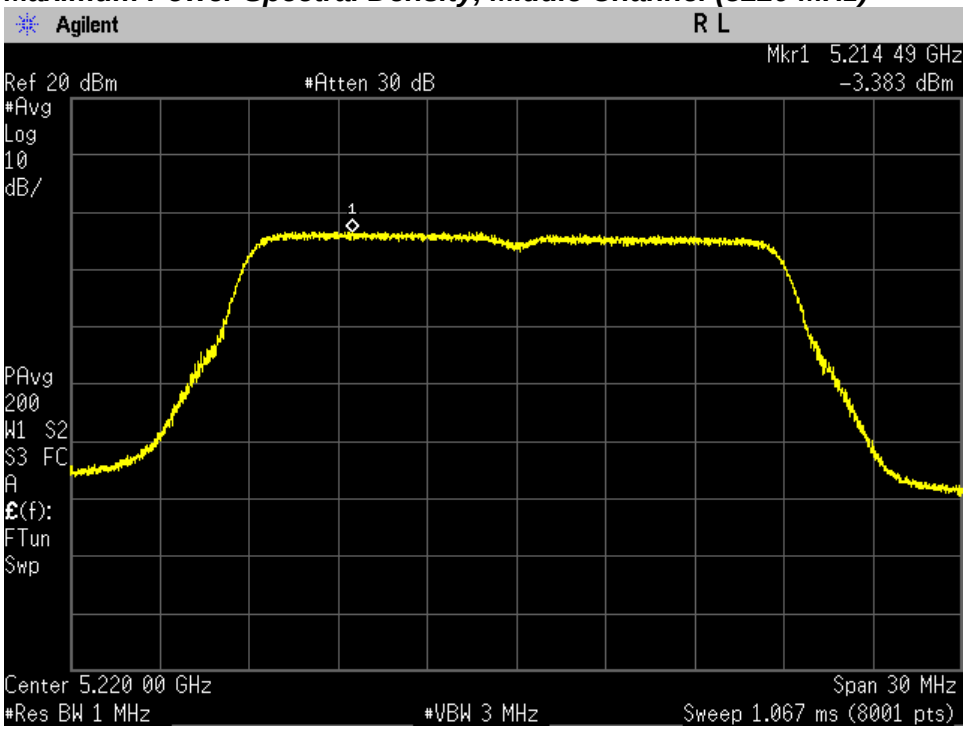
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

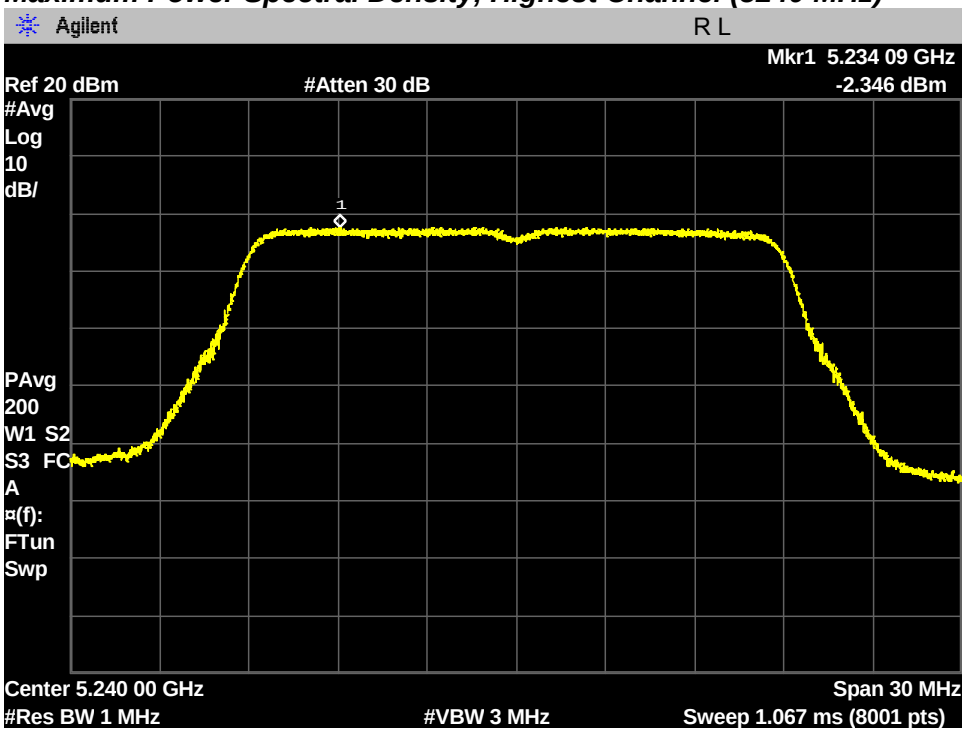


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5220 MHz)



Maximum Power Spectral Density, Highest Channel (5240 MHz)

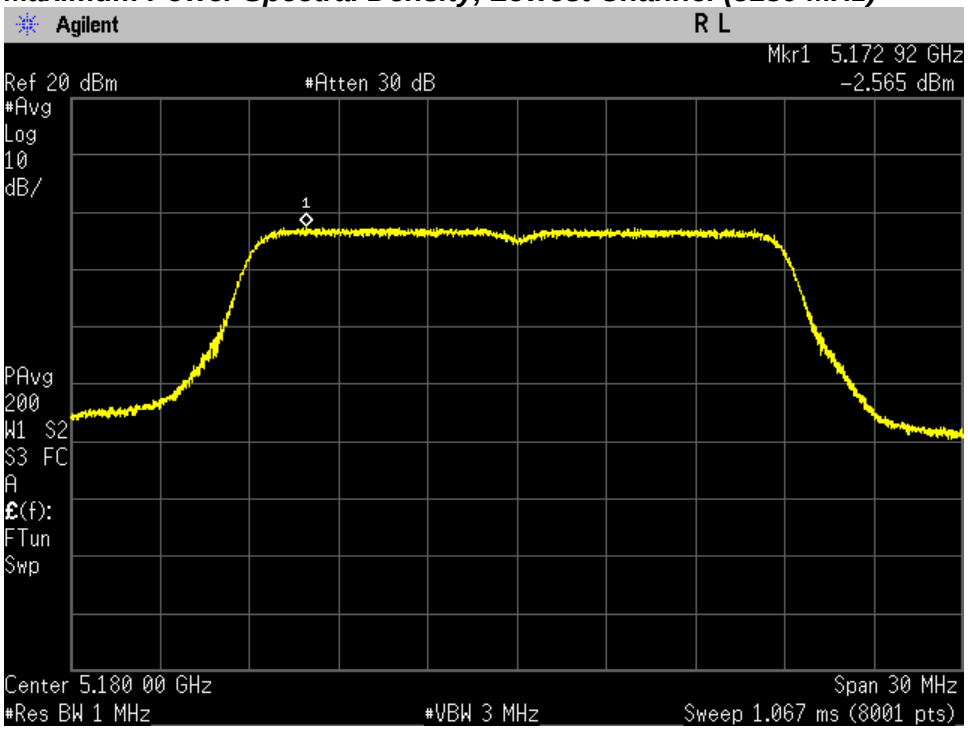


PLOTS OF EMISSIONS

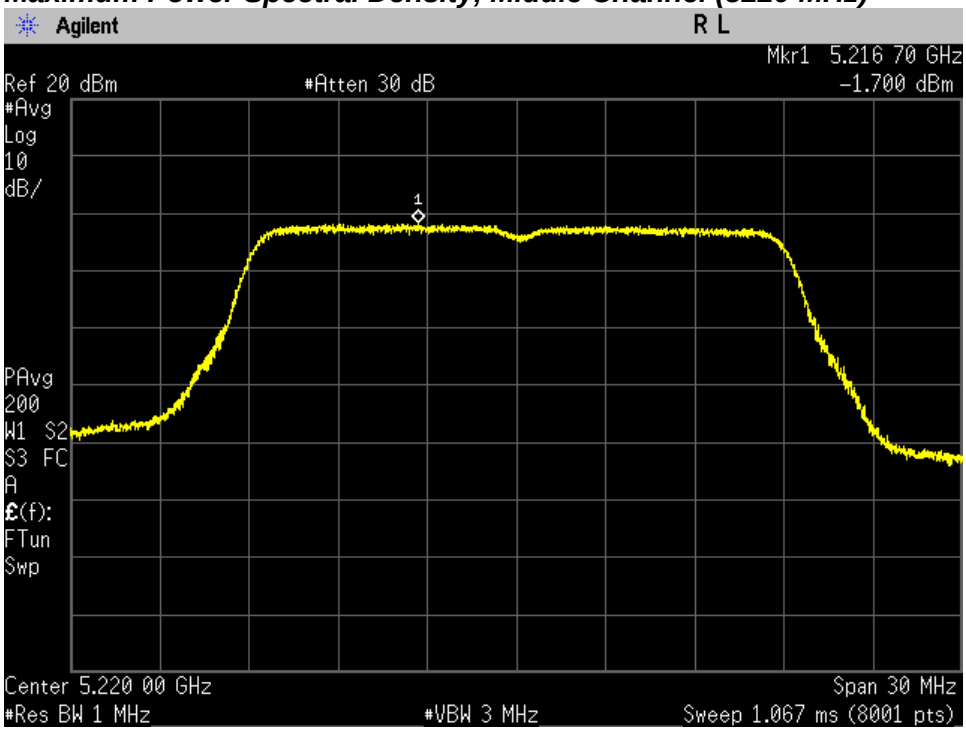
802.11ac (20 MHz) mode - CDD

Chain 0

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

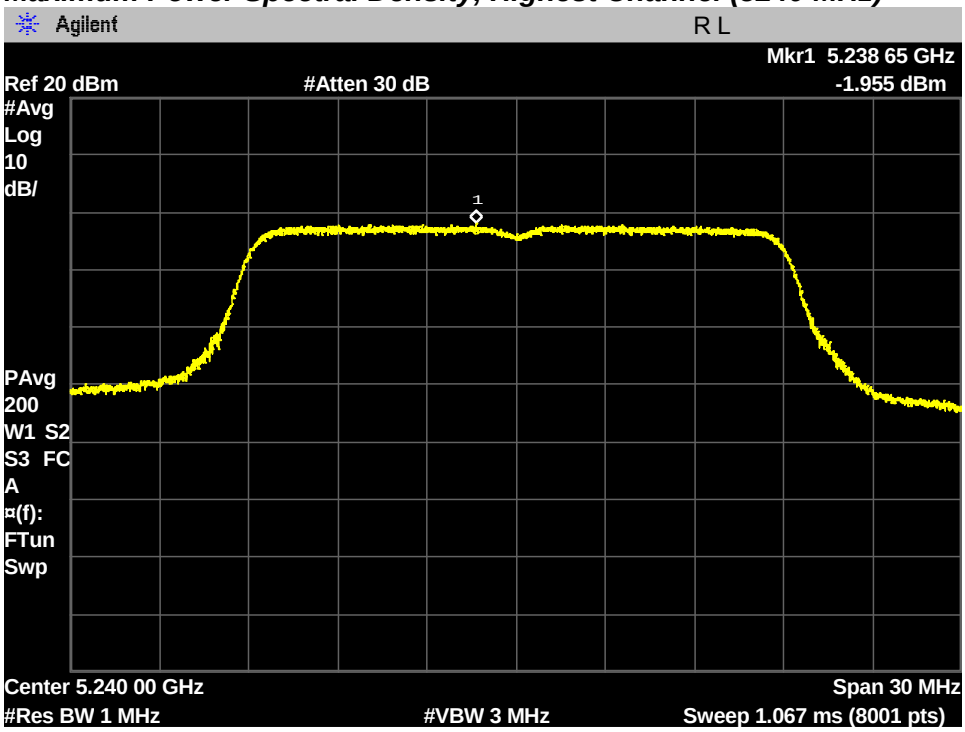


Maximum Power Spectral Density, Middle Channel (5220 MHz)



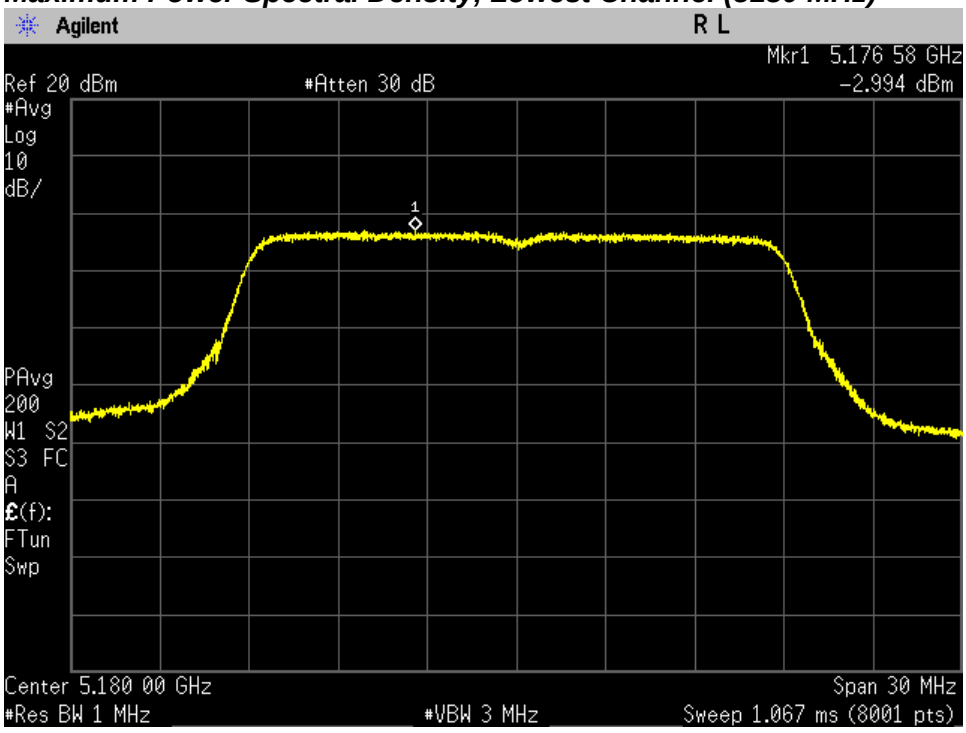
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5240 MHz)



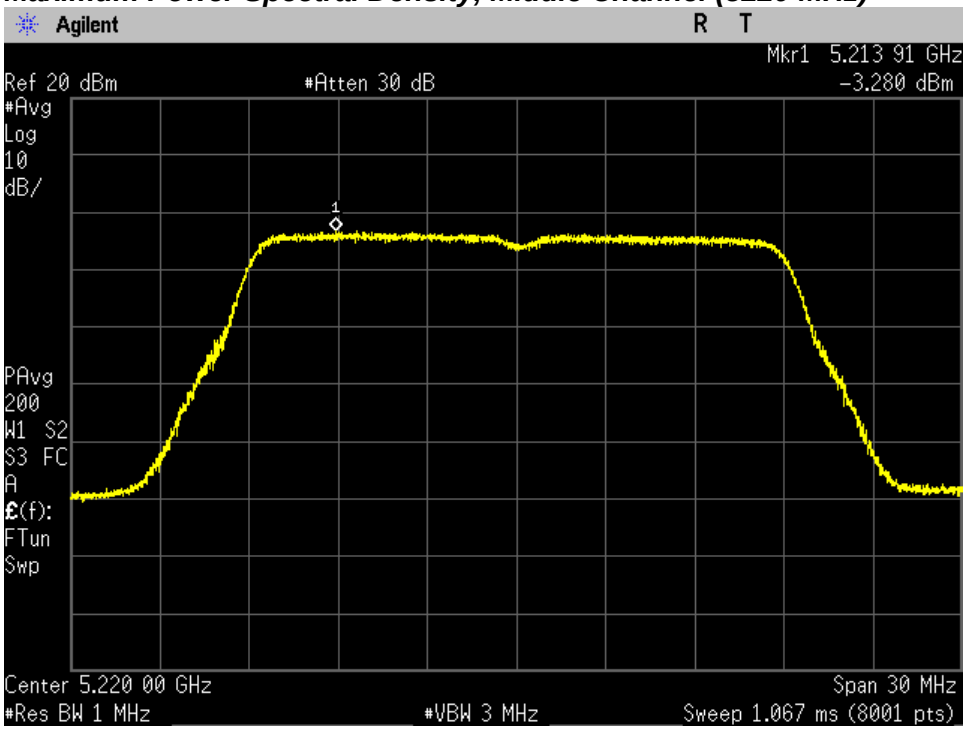
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

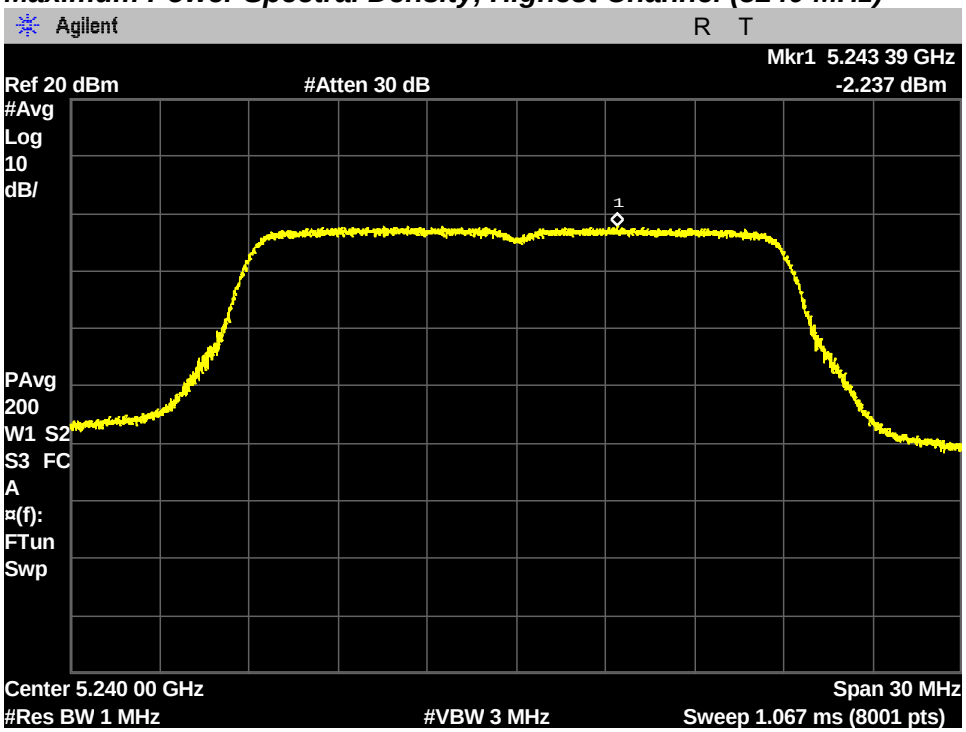


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5220 MHz)



Maximum Power Spectral Density, Highest Channel (5240 MHz)

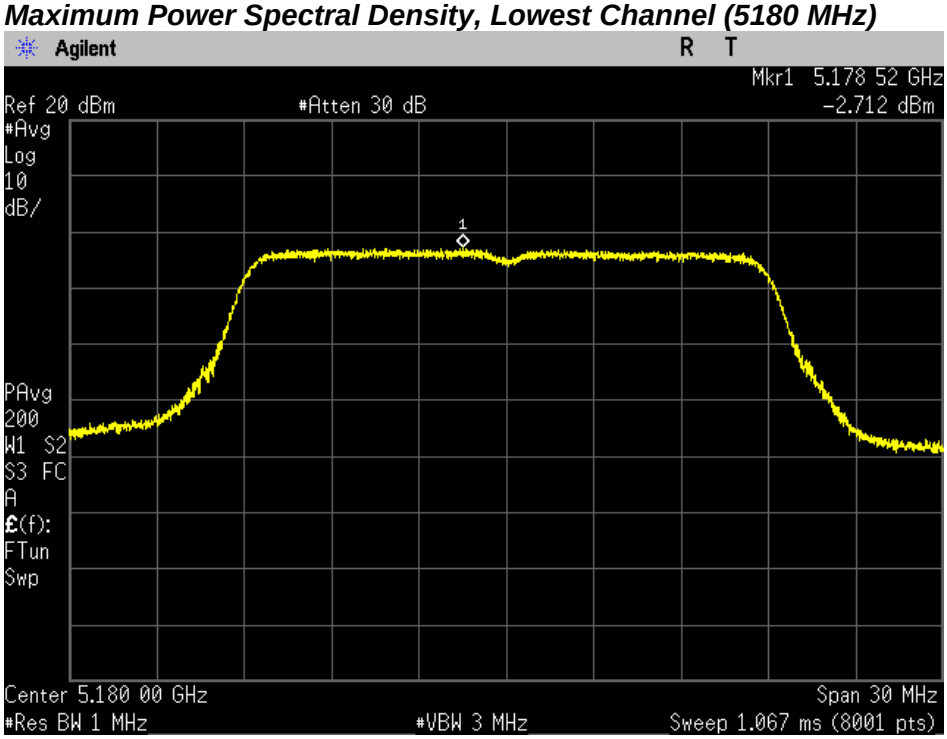


PLOTS OF EMISSIONS

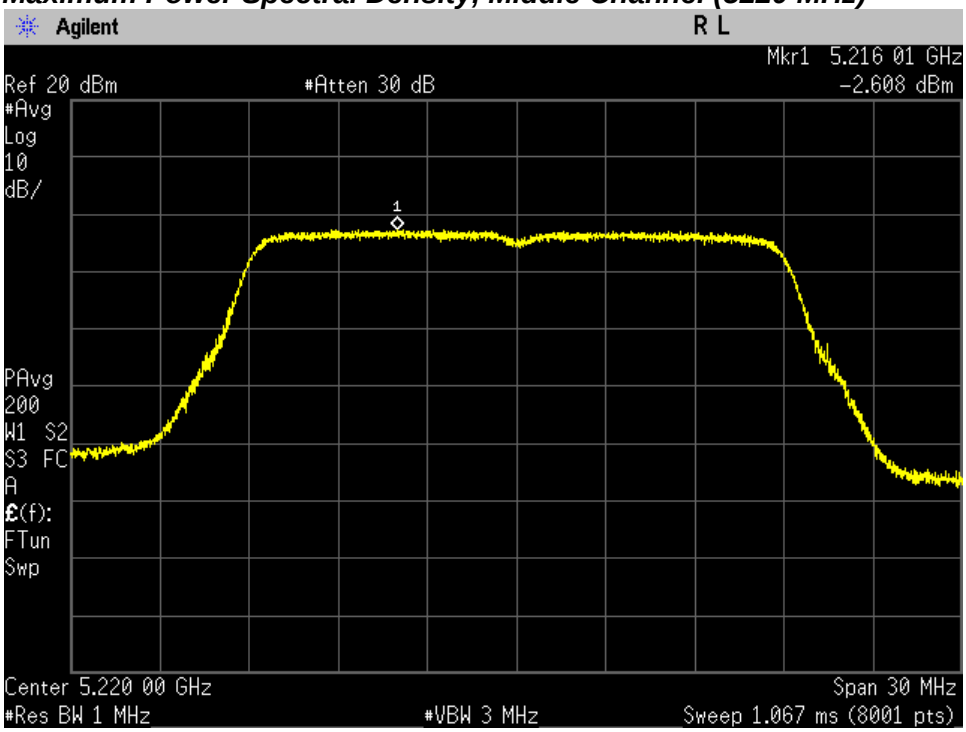
802.11ac (20 MHz) mode - MIMO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

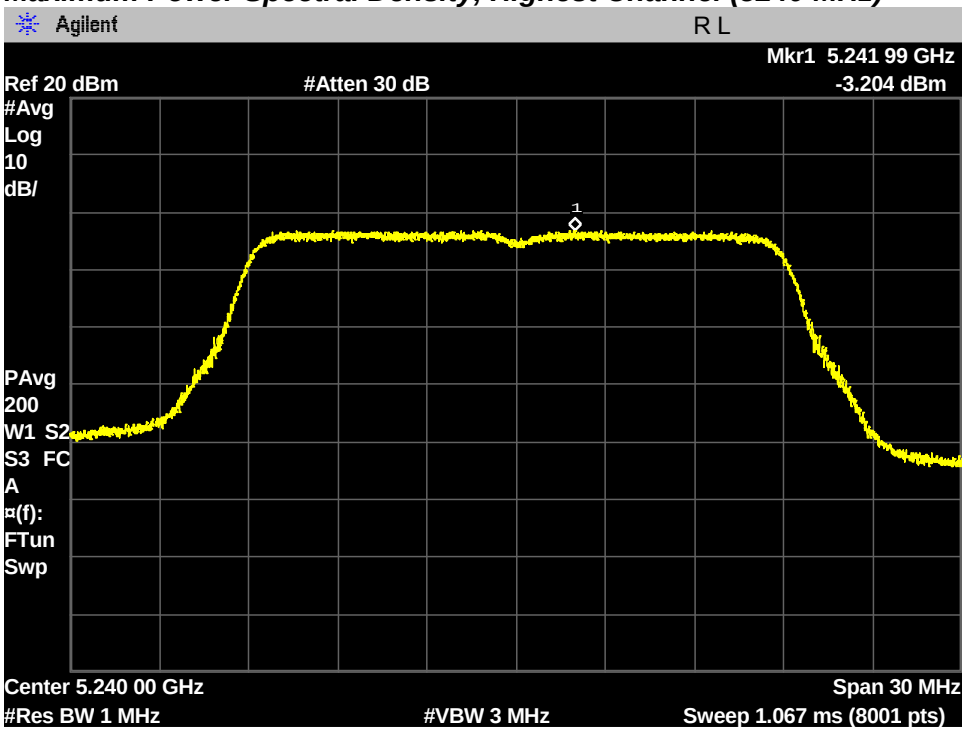


Maximum Power Spectral Density, Middle Channel (5220 MHz)



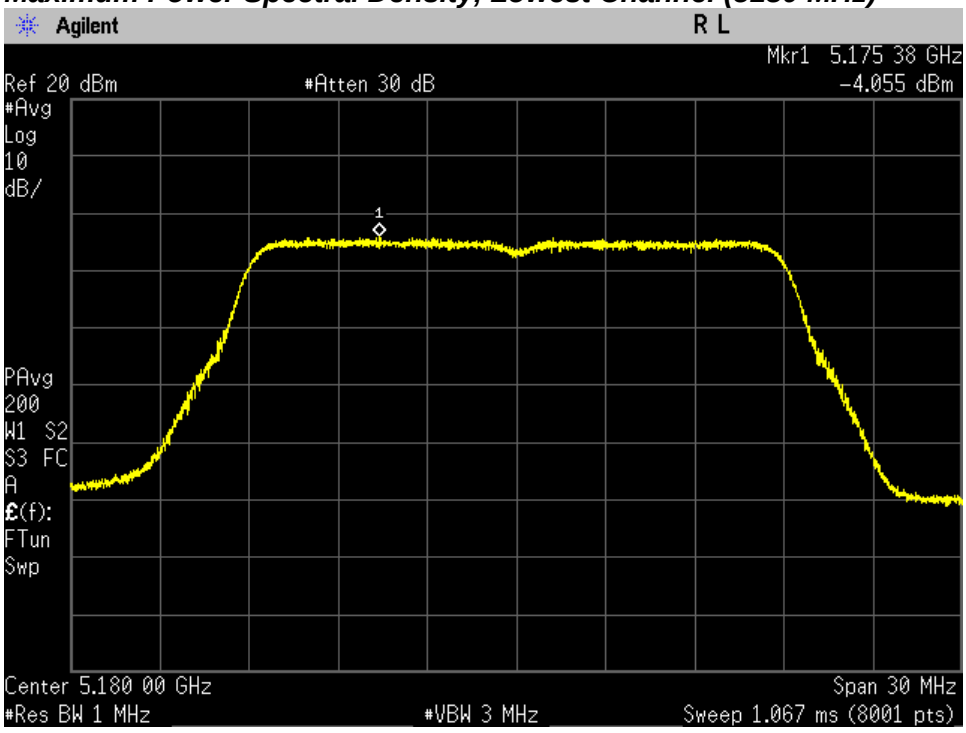
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5240 MHz)



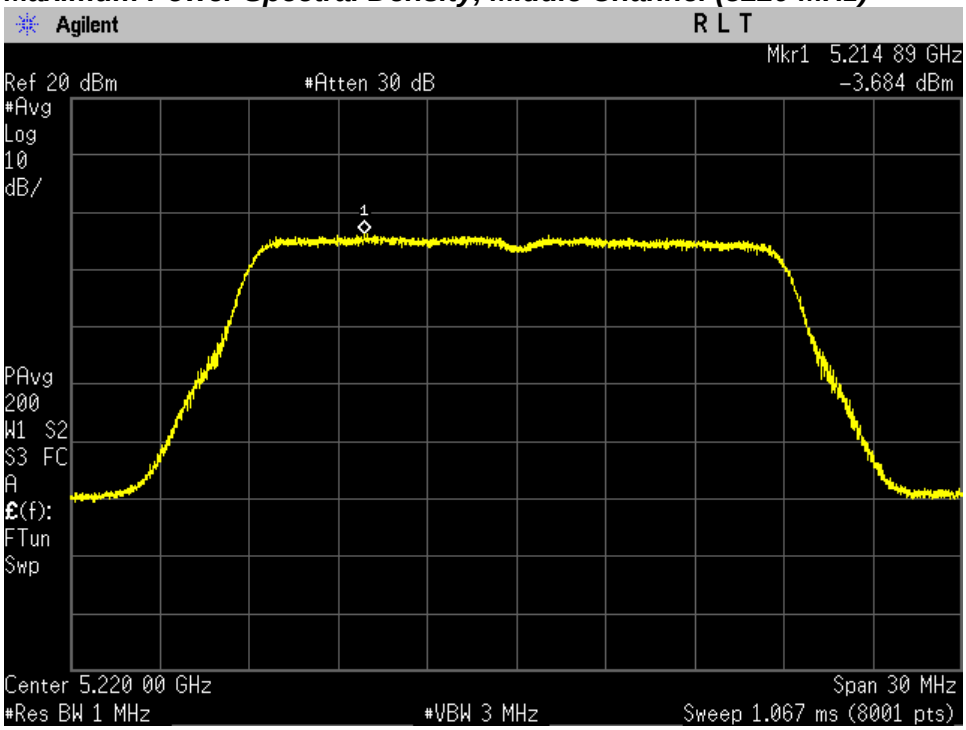
Chain 1

Maximum Power Spectral Density, Lowest Channel (5180 MHz)

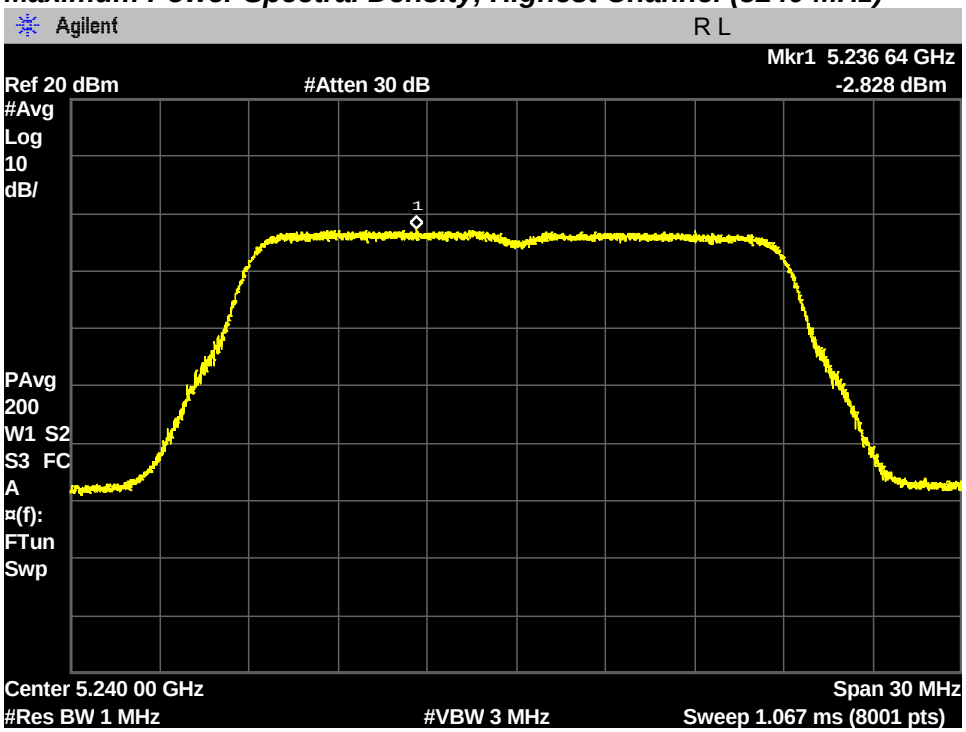


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5220 MHz)



Maximum Power Spectral Density, Highest Channel (5240 MHz)

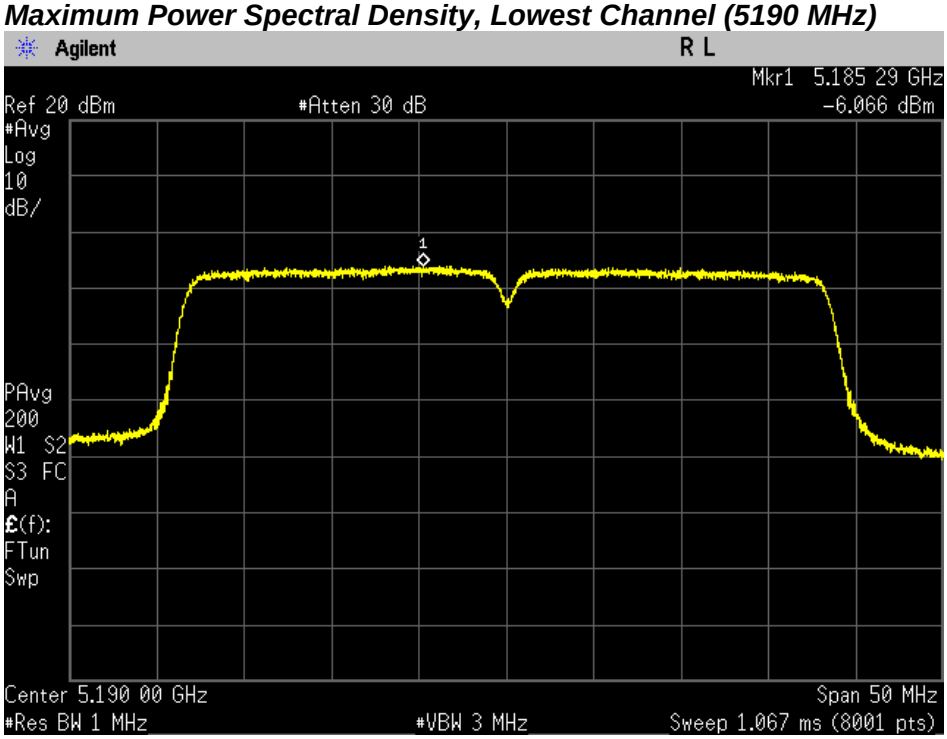


PLOTS OF EMISSIONS

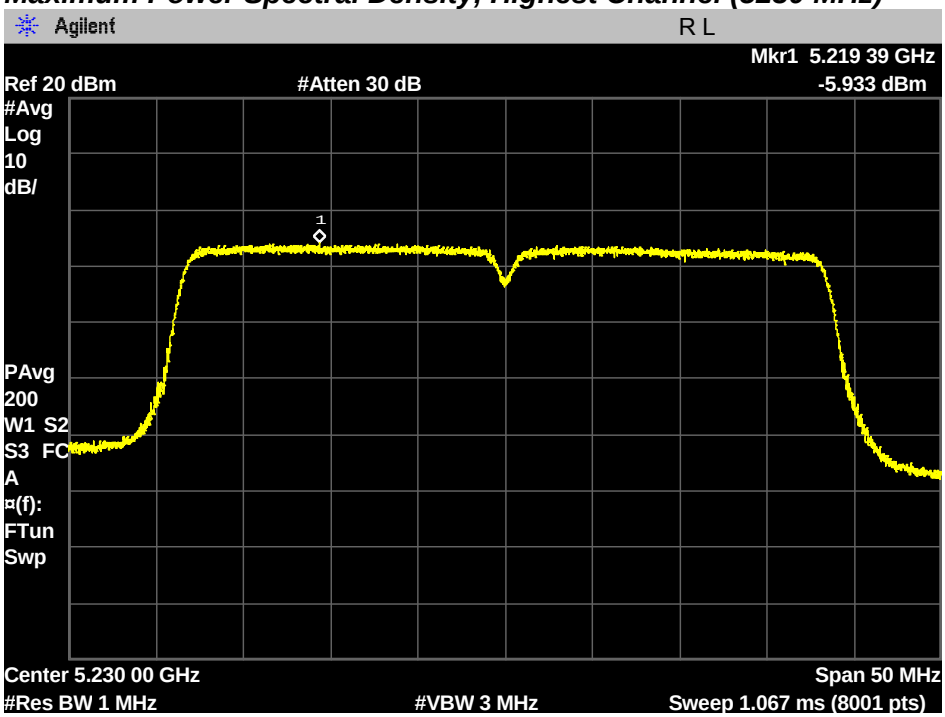
802.11ac (40 MHz) mode - SISO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



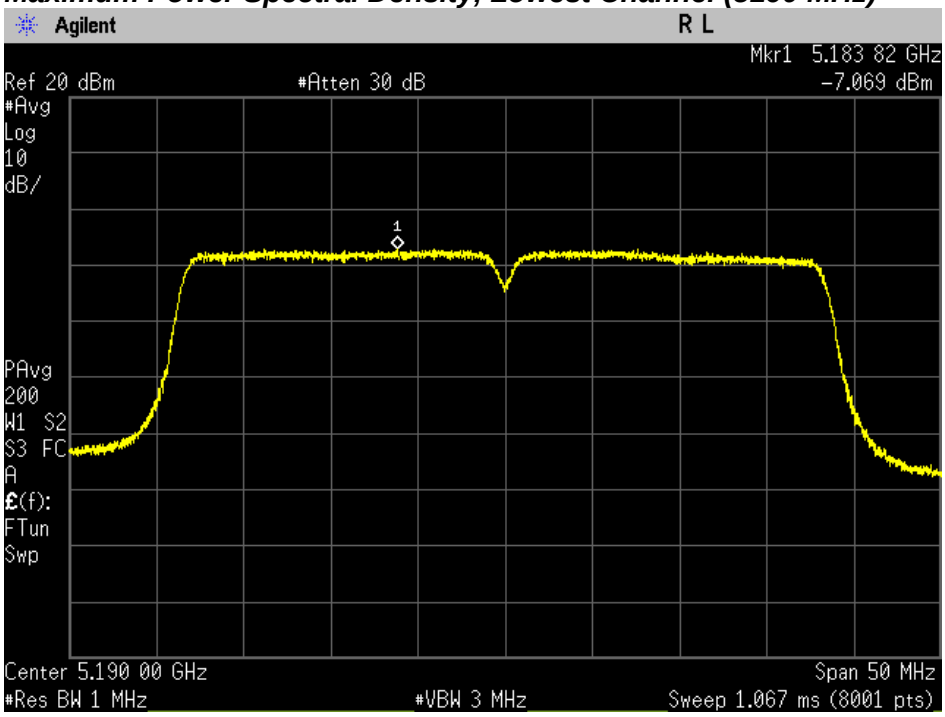
Maximum Power Spectral Density, Highest Channel (5230 MHz)



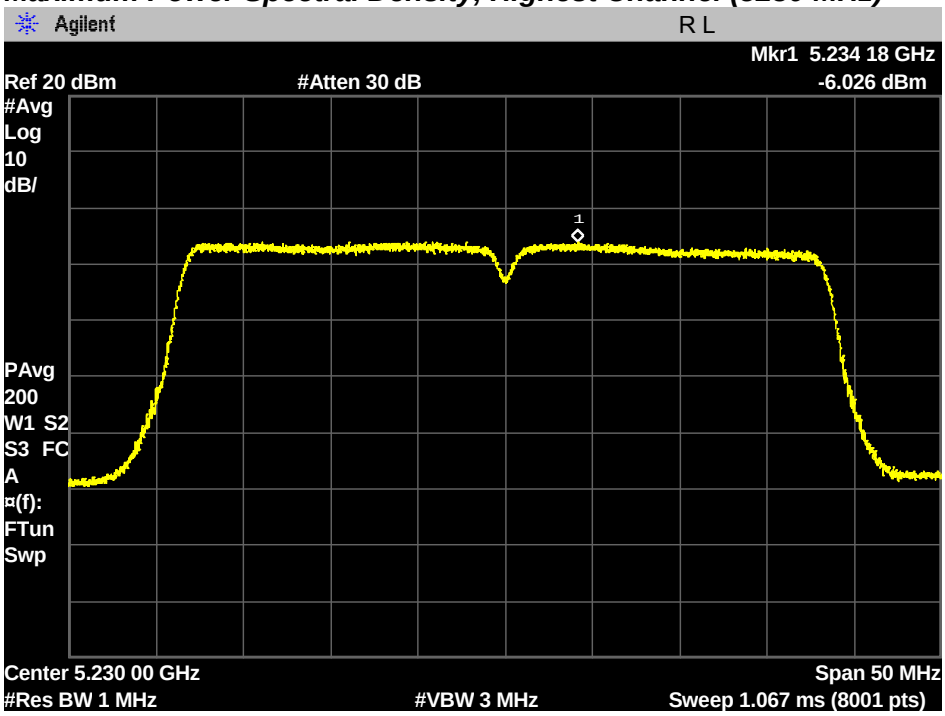
PLOTS OF EMISSIONS

Chain 1

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



Maximum Power Spectral Density, Highest Channel (5230 MHz)

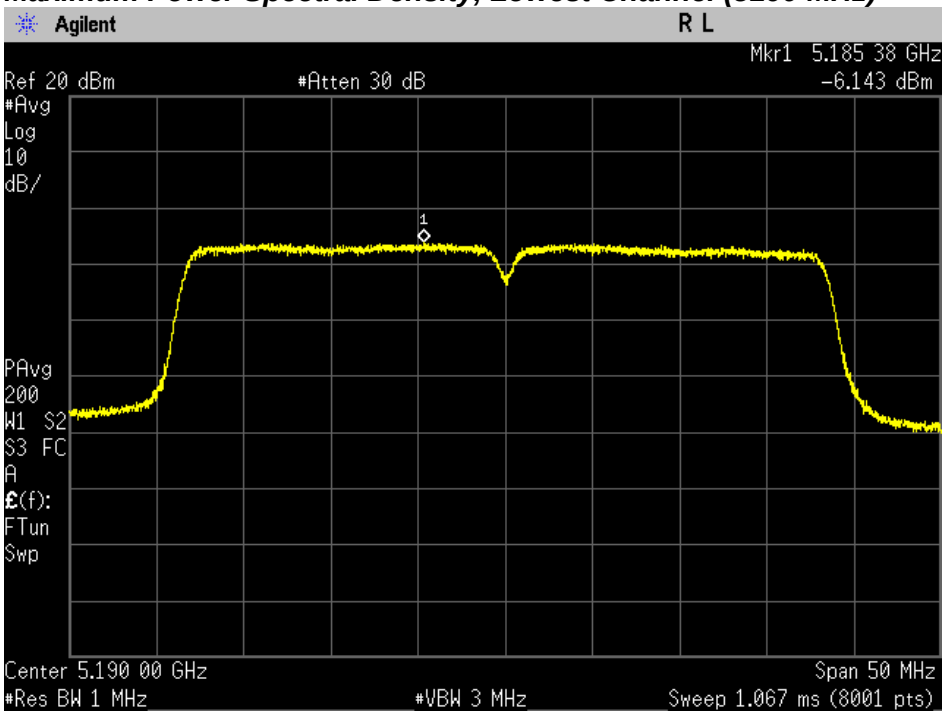


PLOTS OF EMISSIONS

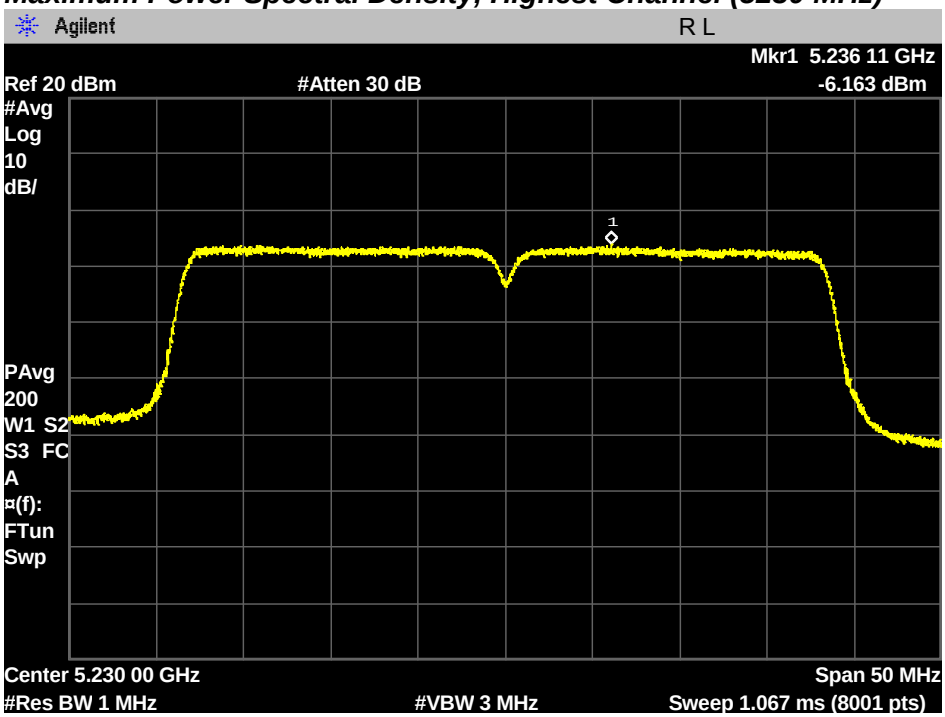
802.11ac (40 MHz) mode - CDD

Chain 0

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



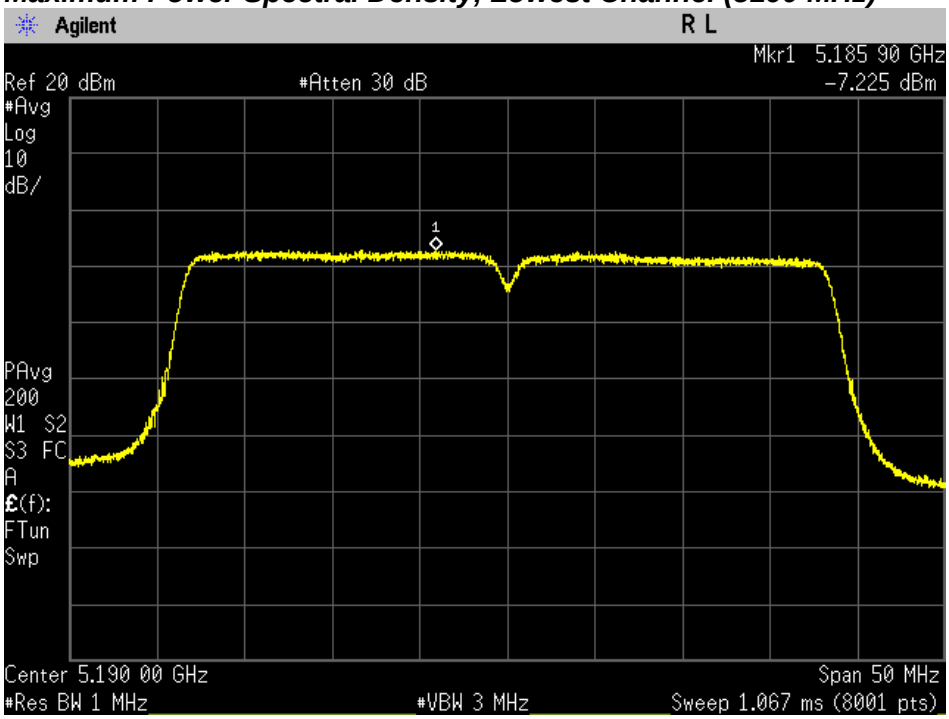
Maximum Power Spectral Density, Highest Channel (5230 MHz)



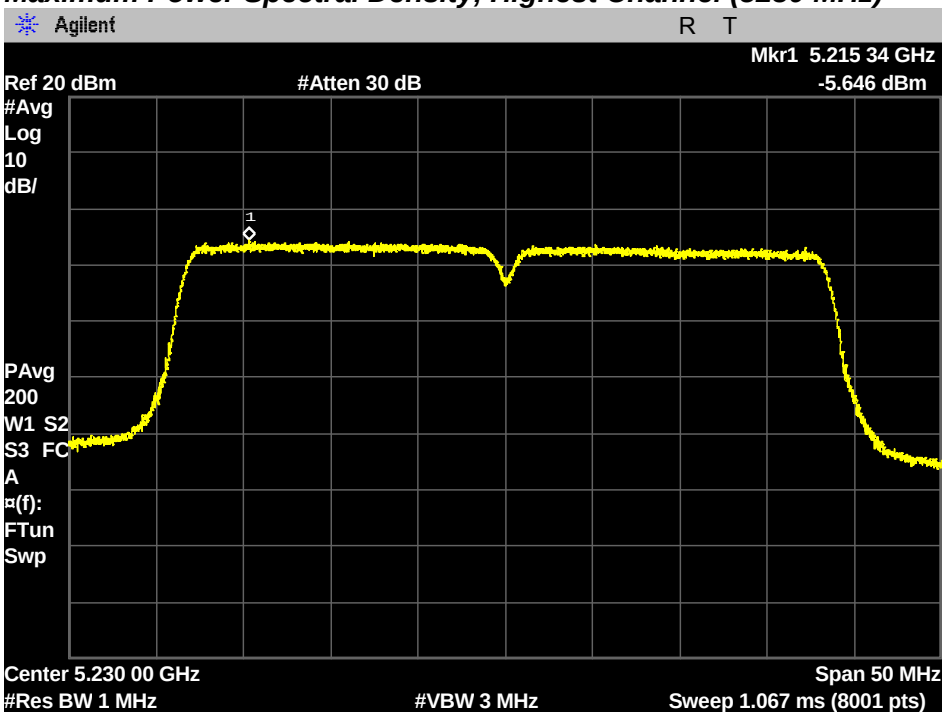
PLOTS OF EMISSIONS

Chain 1

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



Maximum Power Spectral Density, Highest Channel (5230 MHz)

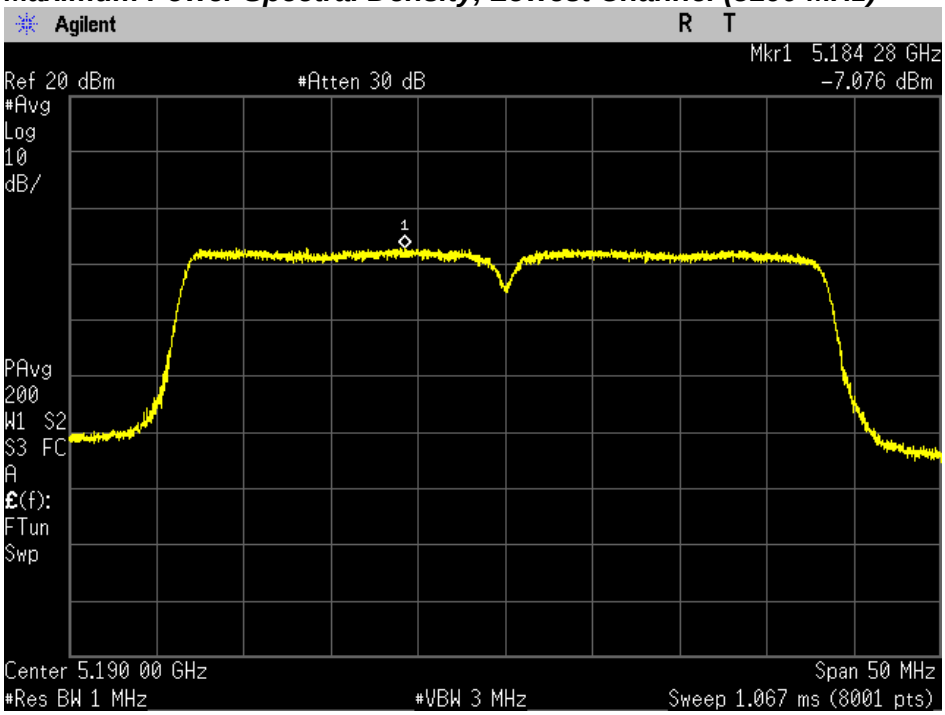


PLOTS OF EMISSIONS

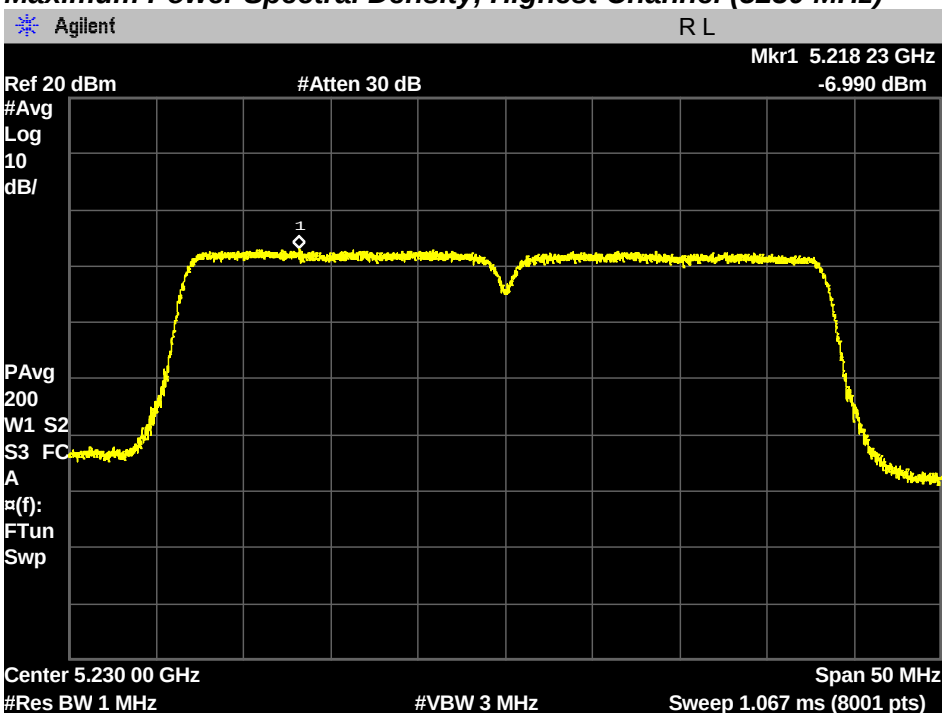
802.11ac (40 MHz) mode - MIMO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



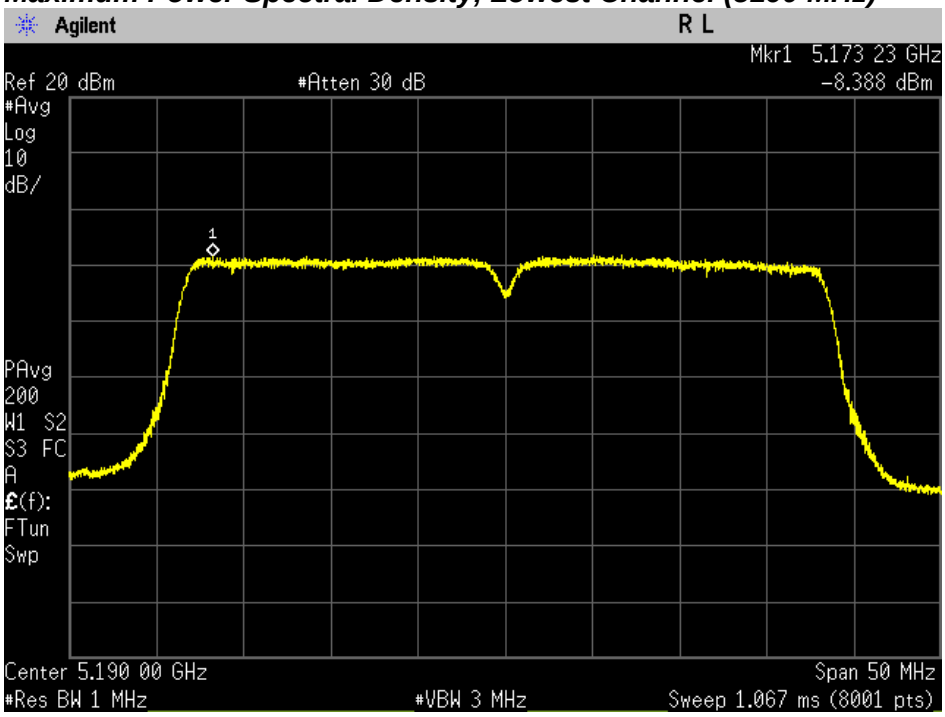
Maximum Power Spectral Density, Highest Channel (5230 MHz)



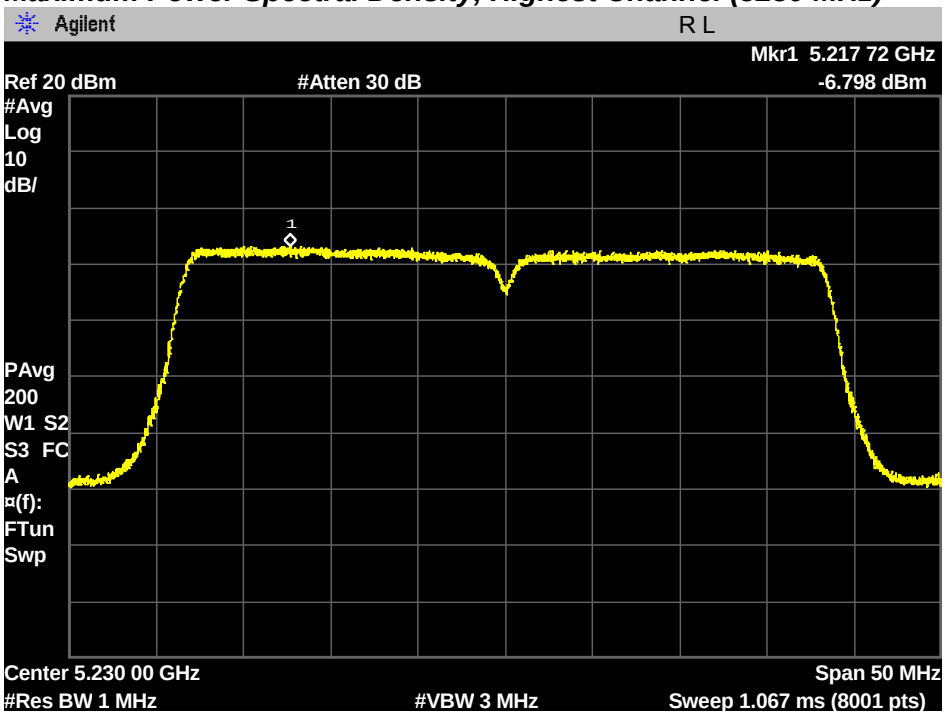
PLOTS OF EMISSIONS

Chain 1

Maximum Power Spectral Density, Lowest Channel (5190 MHz)



Maximum Power Spectral Density, Highest Channel (5230 MHz)

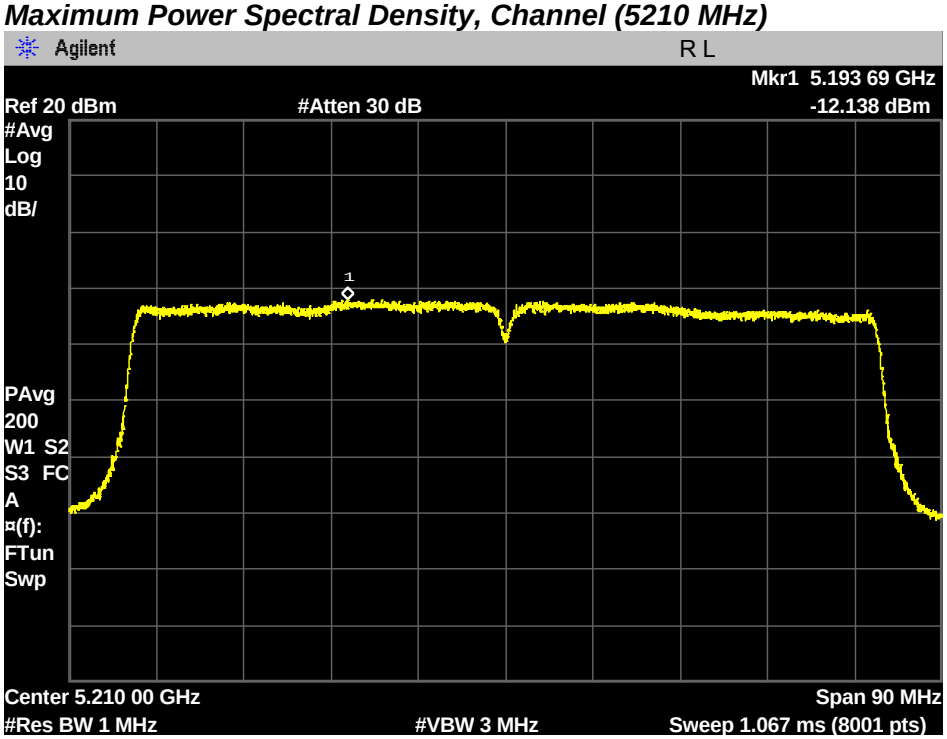


PLOTS OF EMISSIONS

802.11ac (80 MHz) mode - SISO

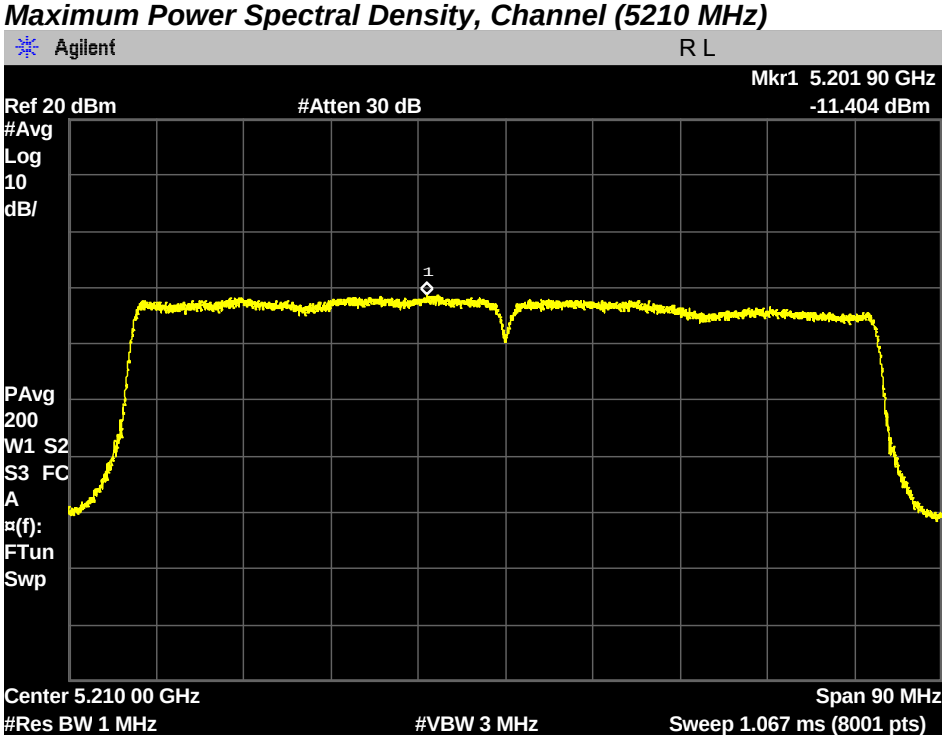
Chain 0

Maximum Power Spectral Density, Channel (5210 MHz)



Chain 1

Maximum Power Spectral Density, Channel (5210 MHz)

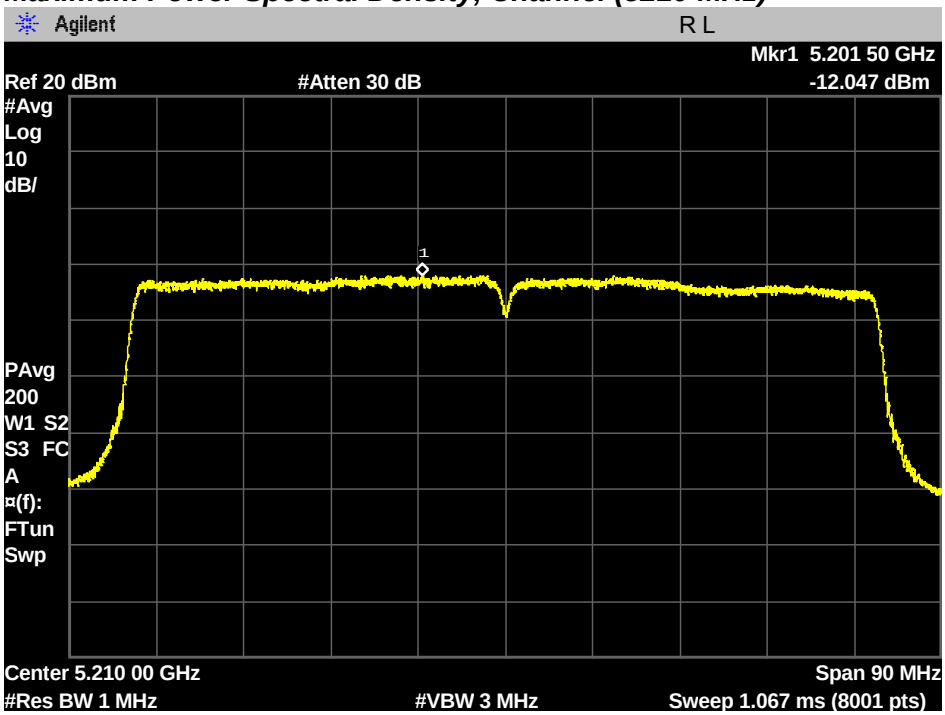


PLOTS OF EMISSIONS

802.11ac (80 MHz) mode - CDD

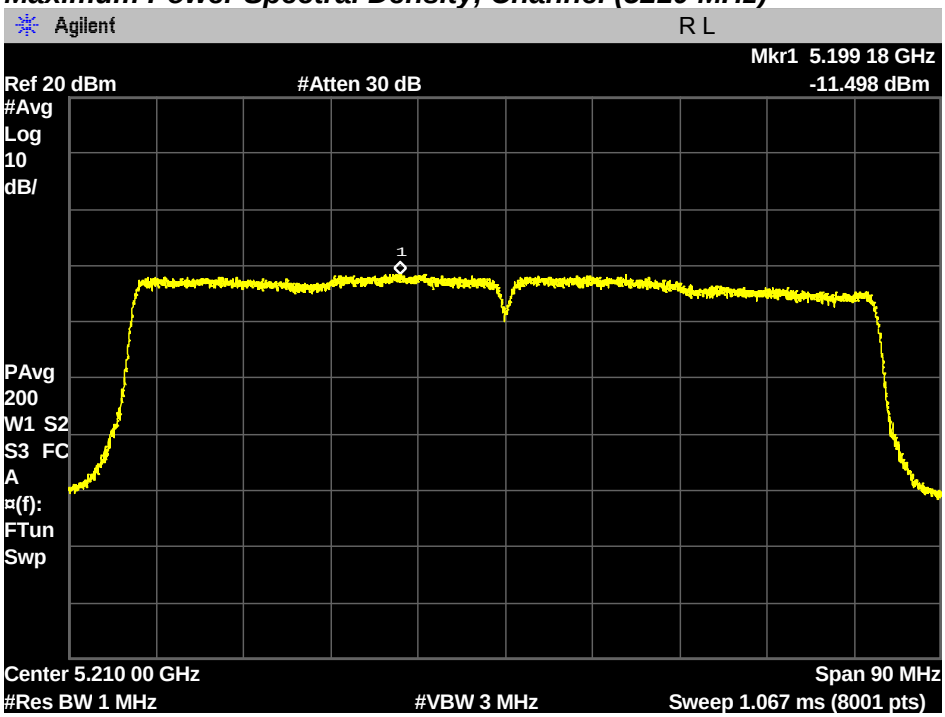
Chain 0

Maximum Power Spectral Density, Channel (5210 MHz)



Chain 1

Maximum Power Spectral Density, Channel (5210 MHz)

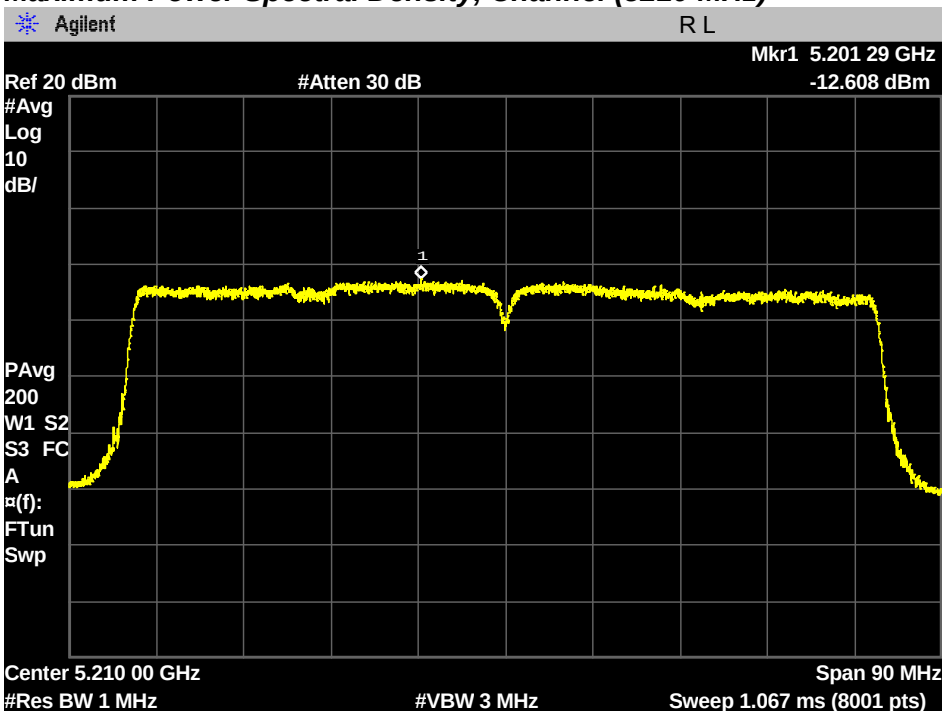


PLOTS OF EMISSIONS

802.11ac (80 MHz) mode - MIMO

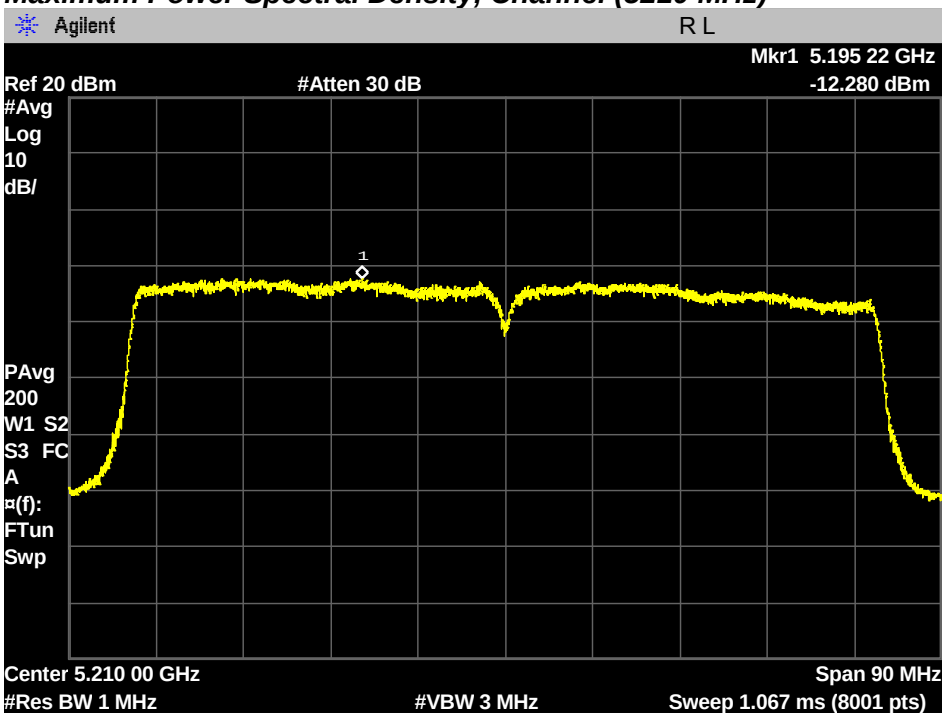
Chain 0

Maximum Power Spectral Density, Channel (5210 MHz)



Chain 1

Maximum Power Spectral Density, Channel (5210 MHz)



8.6.2 Maximum Power Spectral Density – UNII-2A band

FCC §15.407(a), RSS-247 Issue 1, 6.2

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode

Channel	Frequency (MHz)	Measured PSD (dBm)		Maximum PSD (dBm)*		FCC Limit (dBm/ MHz)	IC Limit (dBm/MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		
Lowest	5260	-1.77	1.70	-0.94	2.53	11.00	11.00
Middle	5300	-1.35	-1.84	-0.51	-1.00	11.00	11.00
Highest	5320	-1.42	-1.81	-0.58	-0.97	11.00	11.00

802.11n (20 MHz) mode - SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5260	-2.39	-2.20	0.88	1.60	11.00	11.00
Middle	5300	-1.92	-2.22	0.90	1.84	11.00	11.00
Highest	5320	-1.72	-2.52	0.88	1.79	11.00	11.00

802.11n (20 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5260	-2.32	-2.25	0.88	1.61	11.00	11.00
Middle	5300	-2.14	-2.60	0.90	1.55	11.00	11.00
Highest	5320	-2.35	-2.98	0.88	1.24	11.00	11.00

TEST DATA

802.11n (20 MHz) mode – MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5260	-2.92	-2.72	1.58	1.77	11.00	11.00
Middle	5300	-2.66	-2.93	1.58	1.80	11.00	11.00
Highest	5320	-2.81	-3.36	1.58	1.51	11.00	11.00

802.11n (40 MHz) mode – SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		Maximum PSD (dBm)*		FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		
Lowest	5270	-8.76	-8.75	-7.13	-7.12	11.00	11.00
Highest	5310	-8.62	-8.90	-6.99	-7.27	11.00	11.00

802.11n (40 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5270	-9.10	-8.80	1.63	-4.31	11.00	11.00
Highest	5310	-8.67	-9.09	1.63	-4.23	11.00	11.00

802.11n (40 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5270	-9.91	-9.56	2.66	-4.06	11.00	11.00
Highest	5310	-9.40	-9.64	2.66	-3.85	11.00	11.00

TEST DATA

802.11ac (20 MHz) mode - SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		Maximum PSD (dBm)*		FCC Limit (dBm/ MHz)	IC Limit (dBm/MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		
Lowest	5260	-2.57	-1.88	-1.69	-1.00	11.00	11.00
Middle	5300	-1.86	-2.03	-0.98	-1.15	11.00	11.00
Highest	5320	-1.85	-2.51	-0.95	-1.61	11.00	11.00

802.11ac (20 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5260	-2.55	-2.31	0.88	1.46	11.00	11.00
Middle	5300	-2.30	-2.65	0.88	1.42	11.00	11.00
Highest	5320	-2.39	-2.91	0.90	1.27	11.00	11.00

802.11ac (20 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5260	-2.92	-2.85	1.57	1.70	11.00	11.00
Middle	5300	-2.73	-2.94	1.58	1.76	11.00	11.00
Highest	5320	-2.75	-3.01	1.56	1.69	11.00	11.00

TEST DATA

802.11ac (40 MHz) mode – SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		Maximum PSD (dBm)*		FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		
Lowest	5270	-9.00	-8.75	-7.39	-7.14	11.00	11.00
Highest	5310	-8.62	-8.61	-7.00	-6.99	11.00	11.00

802.11ac (40 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5270	-9.22	-8.69	1.61	-4.33	11.00	11.00
Highest	5310	-8.91	-8.90	1.62	-4.27	11.00	11.00

802.11ac (40 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5270	-9.98	-9.63	2.65	-4.14	11.00	11.00
Highest	5310	-9.29	-6.94	2.64	-2.31	11.00	11.00

802.11ac (80 MHz) mode - SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		Maximum PSD (dBm)*		FCC Limit (dBm/MHz)	IC Limit (dBm/MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		
	5290	-11.50	-11.29	-8.69	-8.48	11.00	11.00

TEST DATA

802.11ac (80 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/MHz)
		Chain 0	Chain 1		Total output power		
	5290	-11.83	-11.22	2.81	-5.69	11.00	11.00

802.11ac (80 MHz) mode – MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/MHz)
		Chain 0	Chain 1		Total output power		
	5290	-12.73	-12.48	4.13	-5.46	11.00	11.00

TEST DATA

Note:

1. *Maximum Conducted (average) Power = Measured conducted power + Duty Factor
2. Total output power = 10 log [10^{(Chain 0 Power + duty factor)/10} + 10^{(Chain 1 Power + duty factor)/10}]
3. For CDD transmission, directional gain is. **5.71 dBi**

   For MIMO transmission, directional gain is **2.7 dBi.**

   Directional gain was calculated according to KDB662911 D01 Multiple Transmitter Output v02r01.

   For power spectral density (PSD) measurements on all devices employing CDD, directional gain is as follows,

   Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi, where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi. = 2.7 dBi + 10 log(2/1) dB = 5.71 dBi.

   For CDD mode of this device, N_{SS}=1.

   For power spectral density (PSD) measurements on all devices employing MIMO, directional gain is as follows,

   Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi, where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi. = 2.7 dBi + 10 log(2/2) dB = 2.7 dBi.

   For this device, MIMO mode means SM-MIMO(Spatial Multiplexing) transmission and N_{SS}=2.
4. For FCC PSD Limit, If transmitting antennas of directional gain greater than 6 dBi was used, maximum power spectral density was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
5. The following equation was used for spectrum offset:

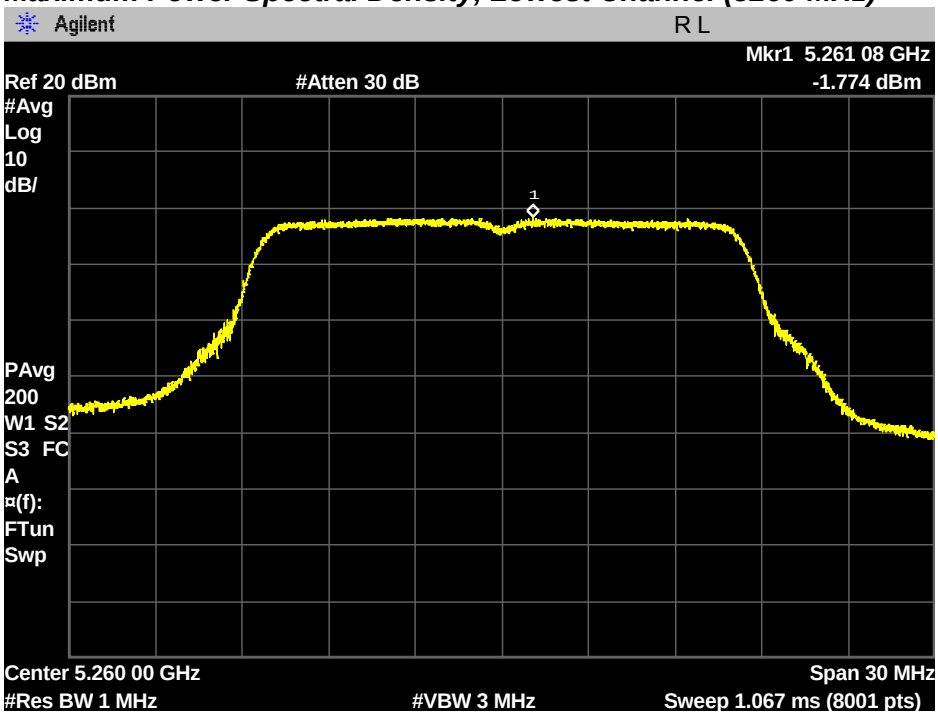
   Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)

PLOTS OF EMISSIONS

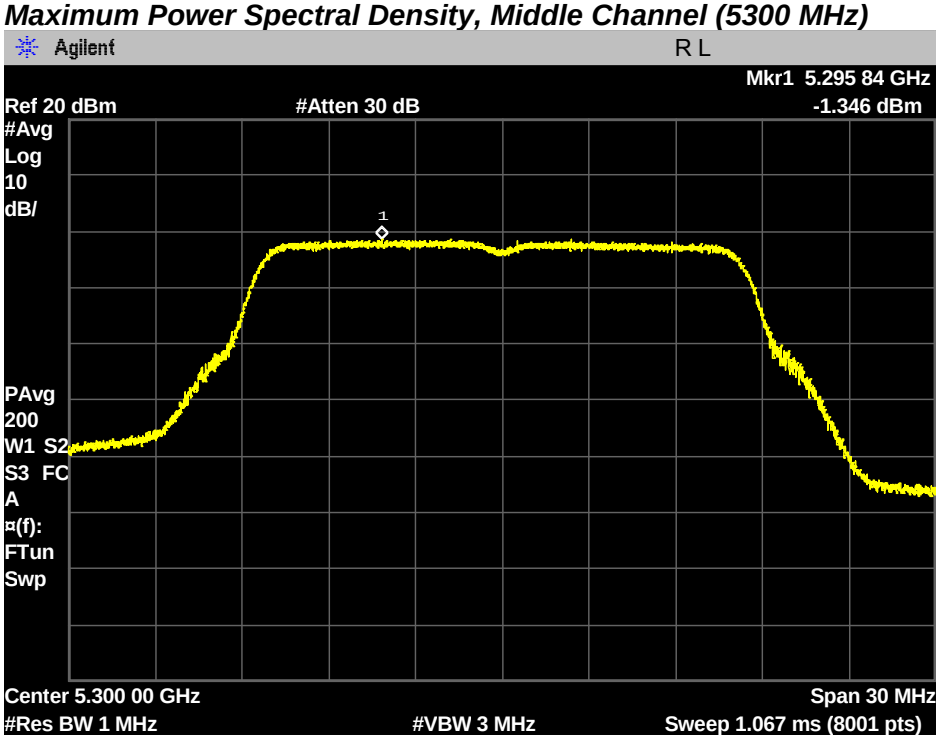
802.11a mode

Chain 0

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

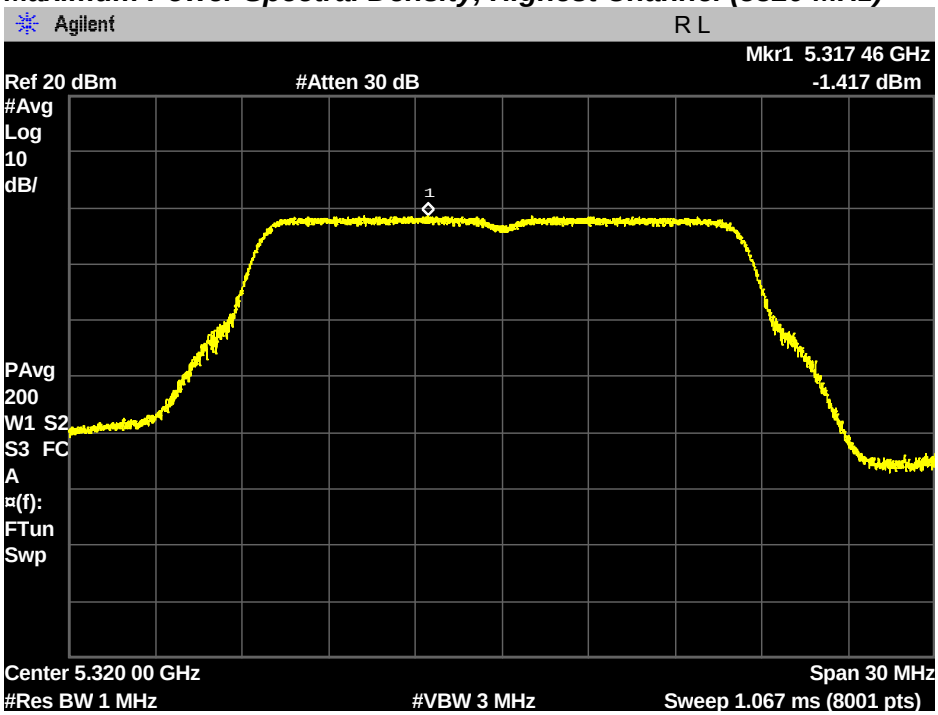


Maximum Power Spectral Density, Middle Channel (5300 MHz)



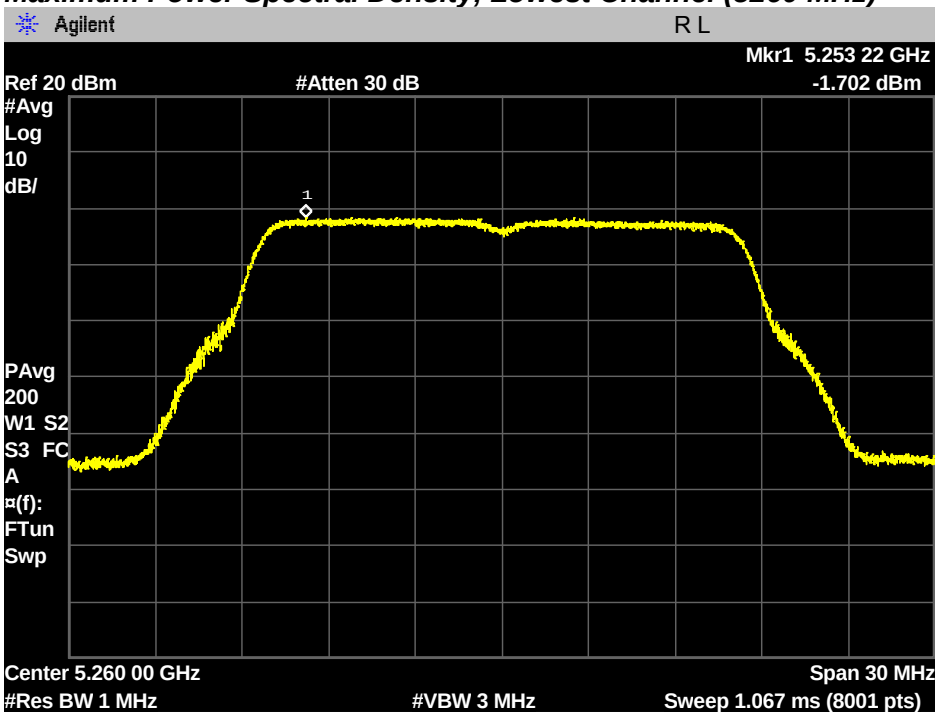
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5320 MHz)



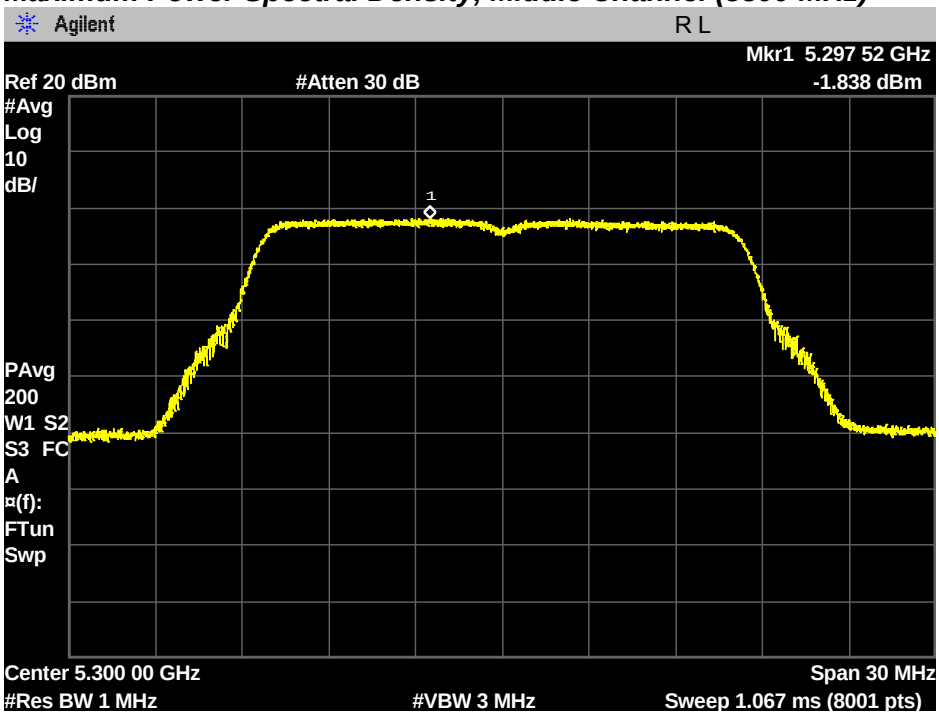
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

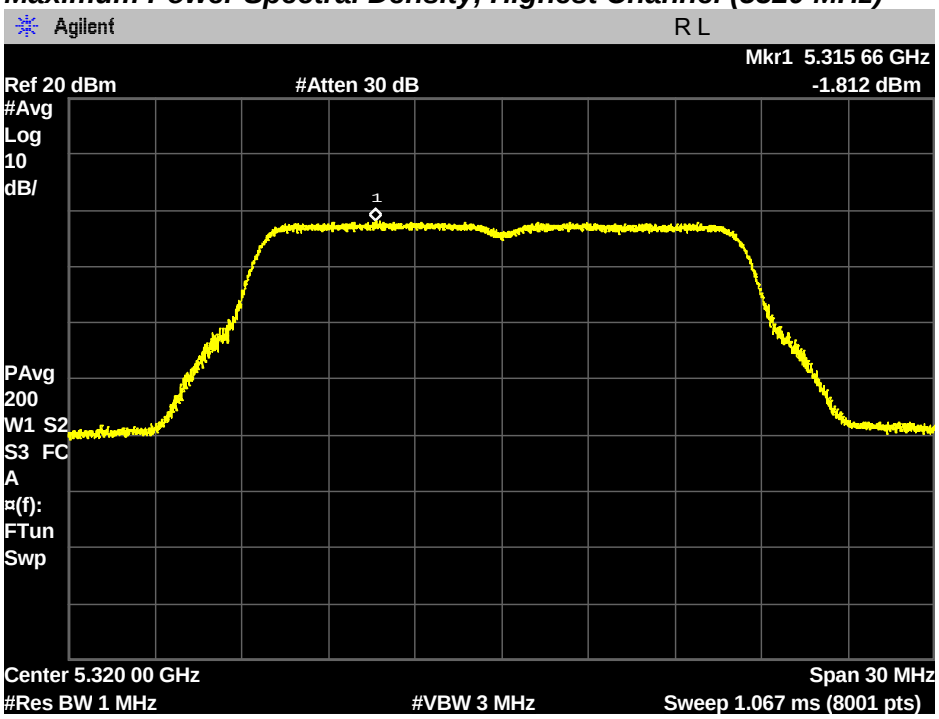


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5300 MHz)



Maximum Power Spectral Density, Highest Channel (5320 MHz)

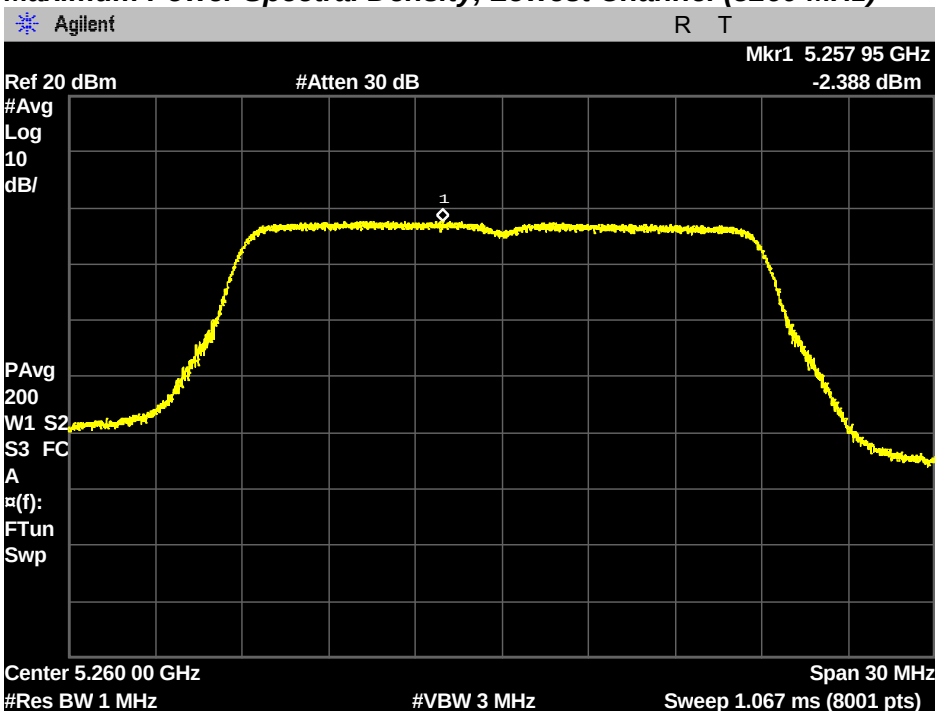


PLOTS OF EMISSIONS

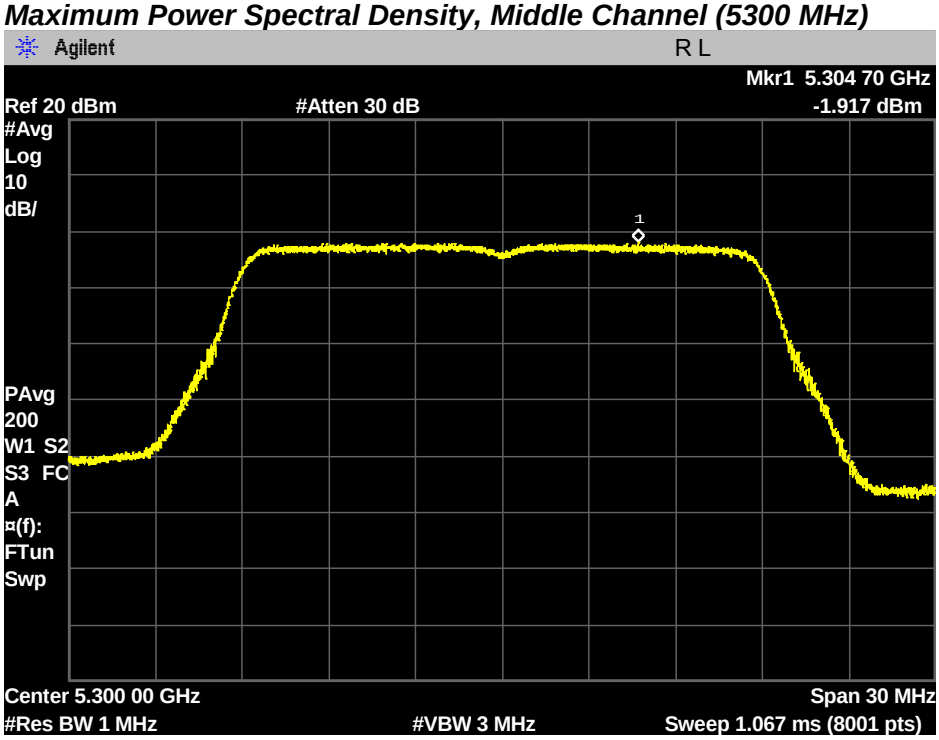
802.11n (20 MHz) mode - SISO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

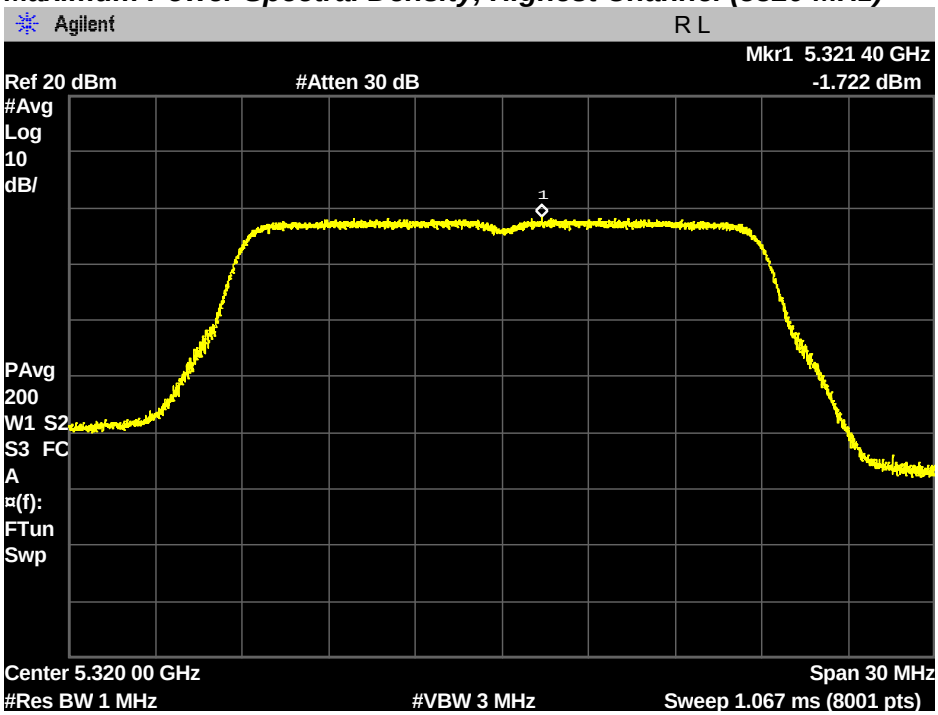


Maximum Power Spectral Density, Middle Channel (5300 MHz)



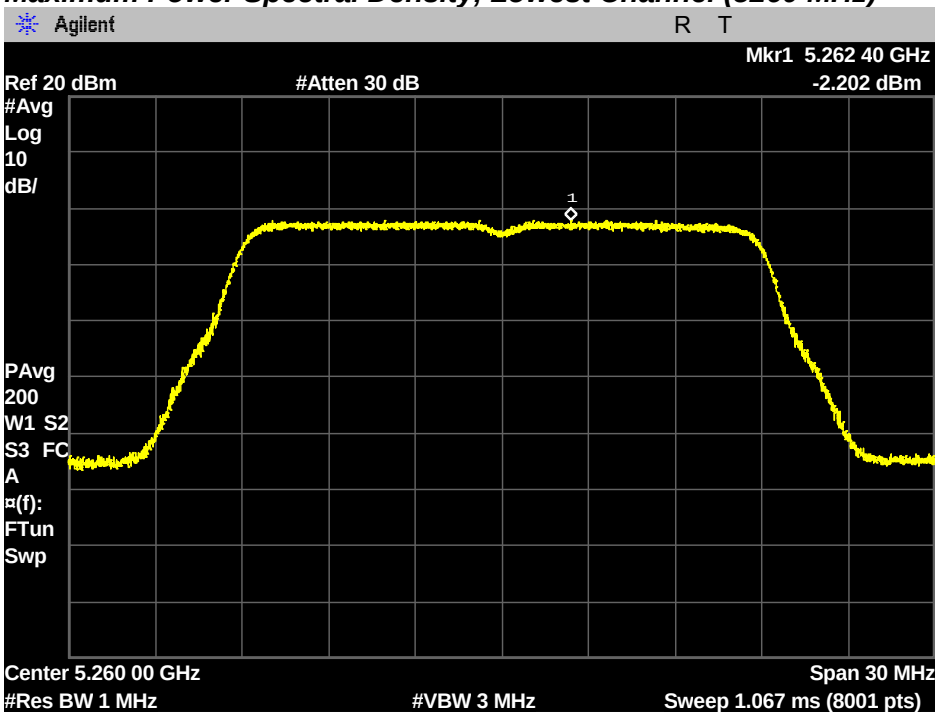
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5320 MHz)



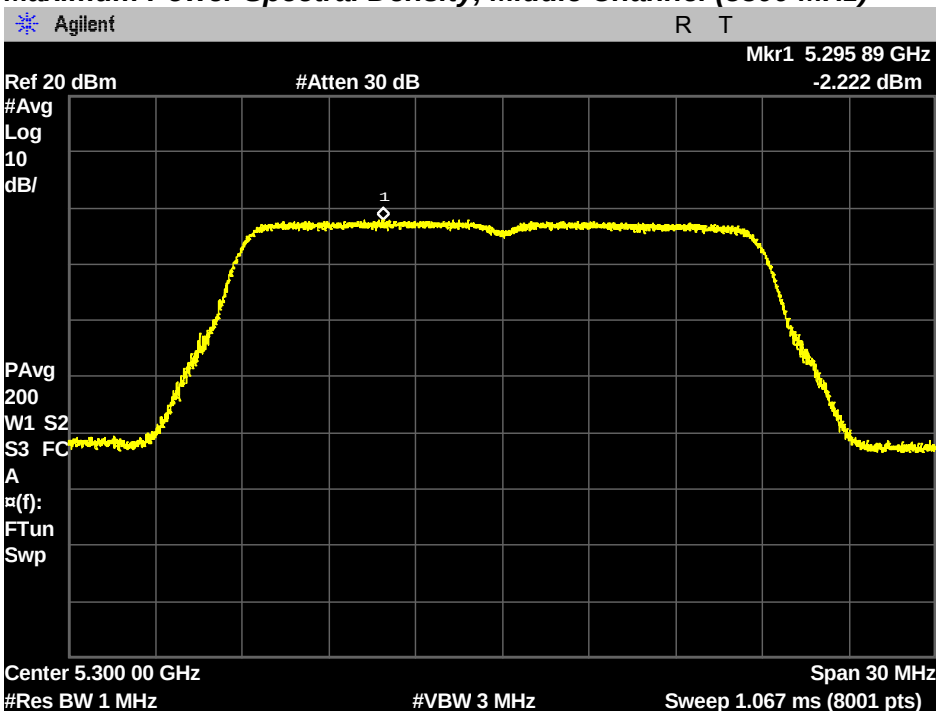
Chain 1

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

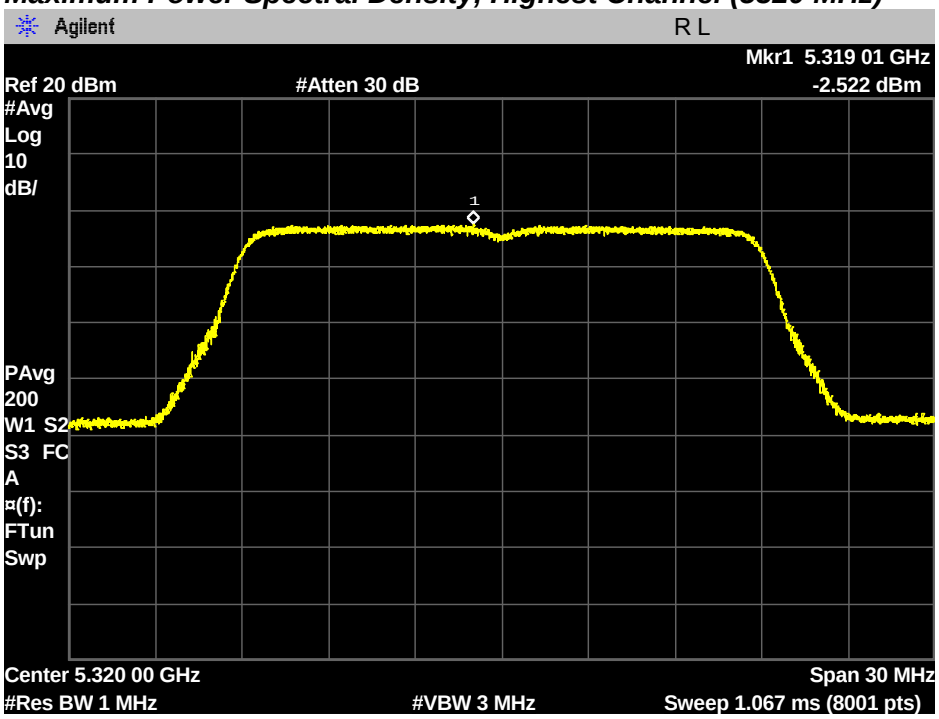


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5300 MHz)



Maximum Power Spectral Density, Highest Channel (5320 MHz)

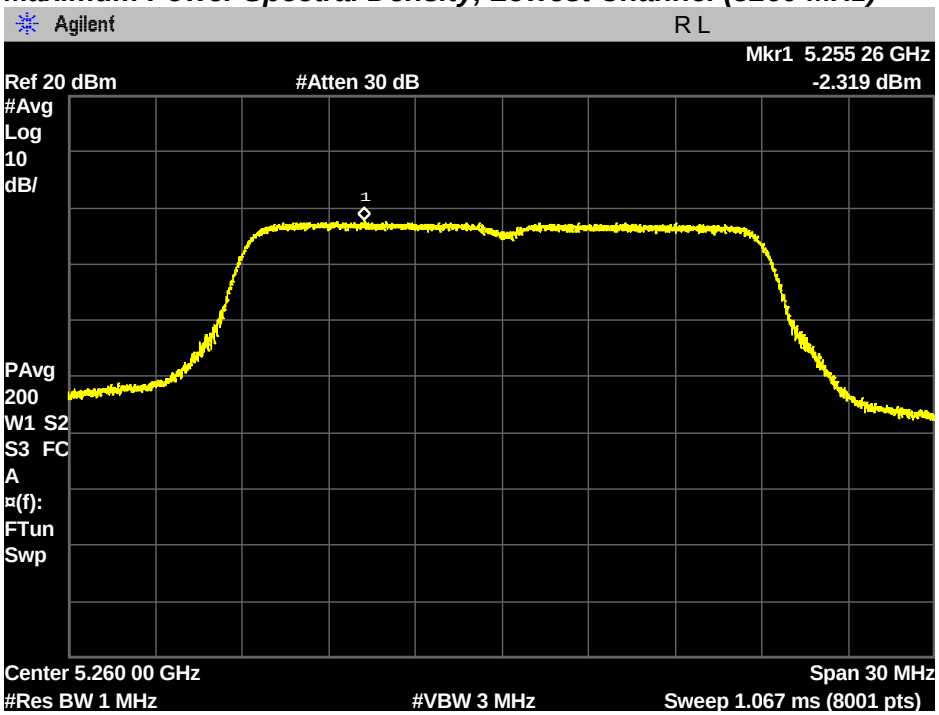


PLOTS OF EMISSIONS

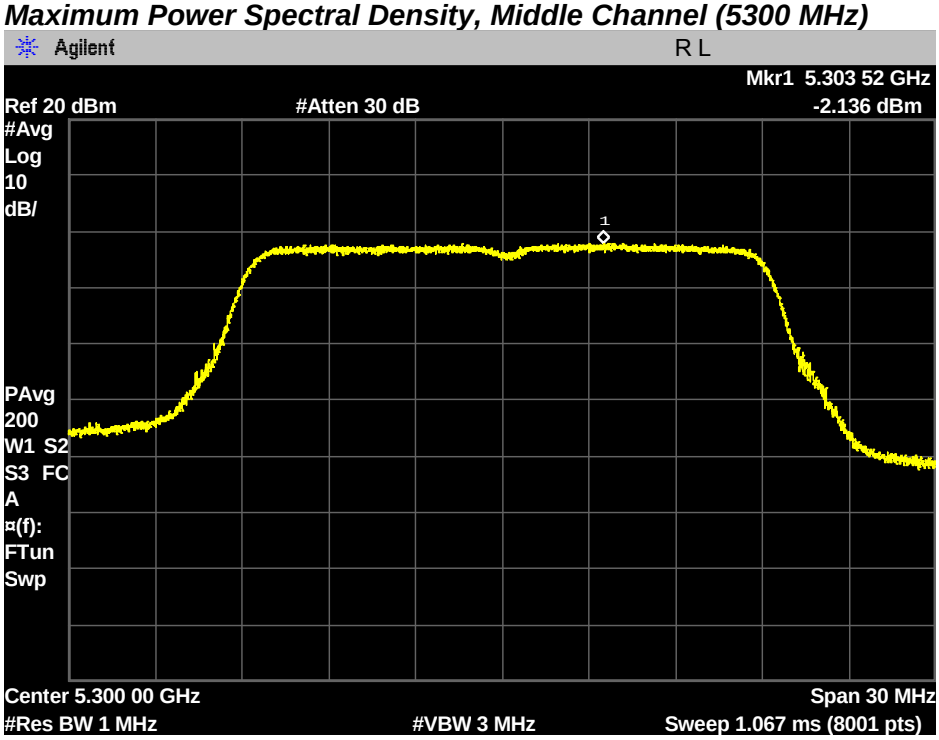
802.11n (20 MHz) mode - CDD

Chain 0

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

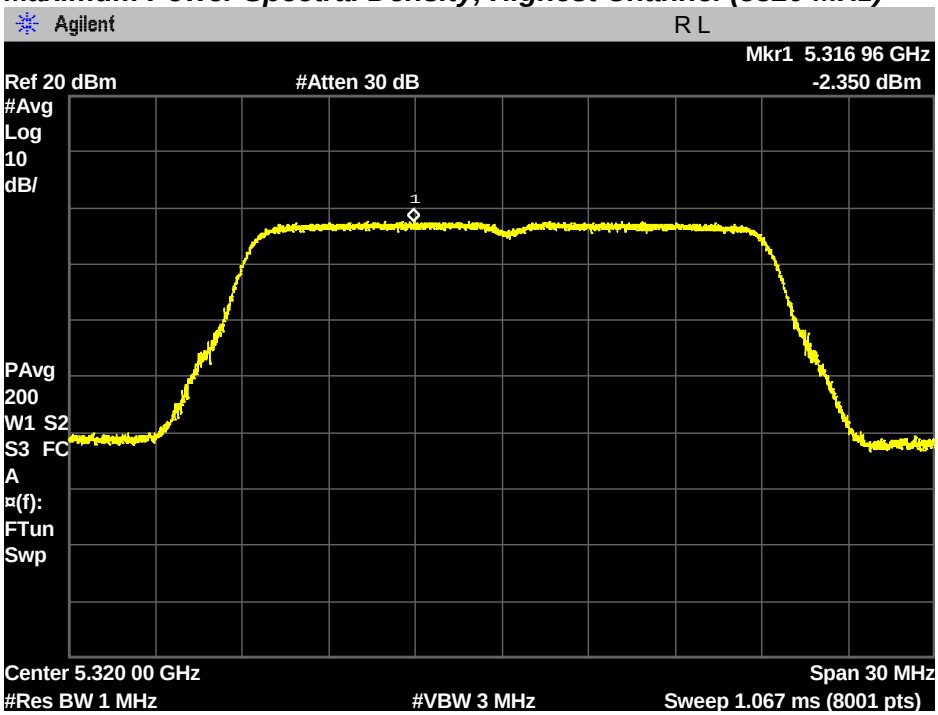


Maximum Power Spectral Density, Middle Channel (5300 MHz)



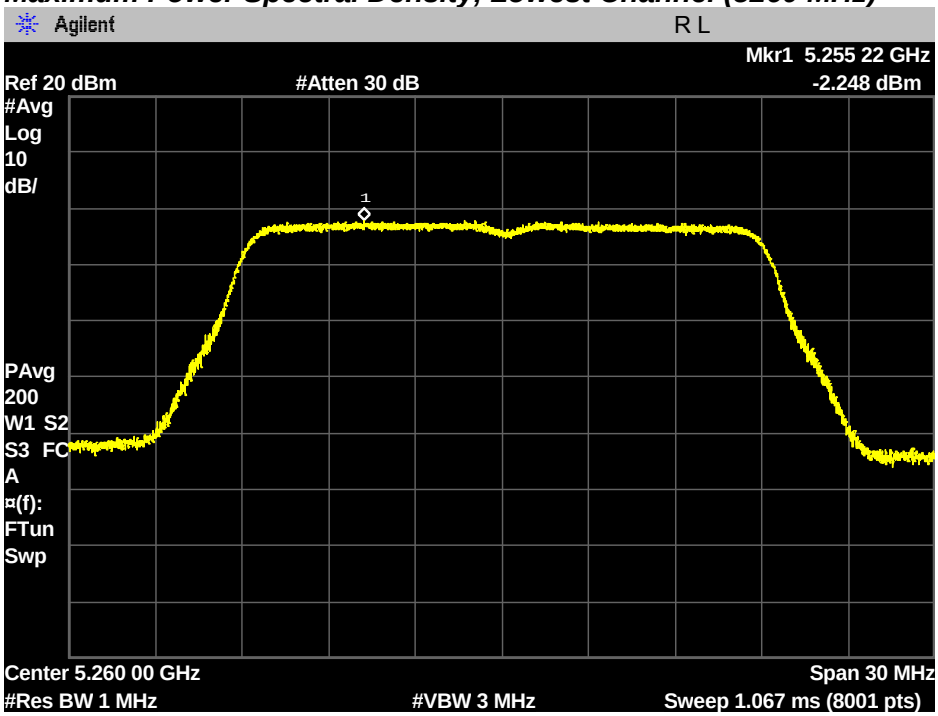
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5320 MHz)



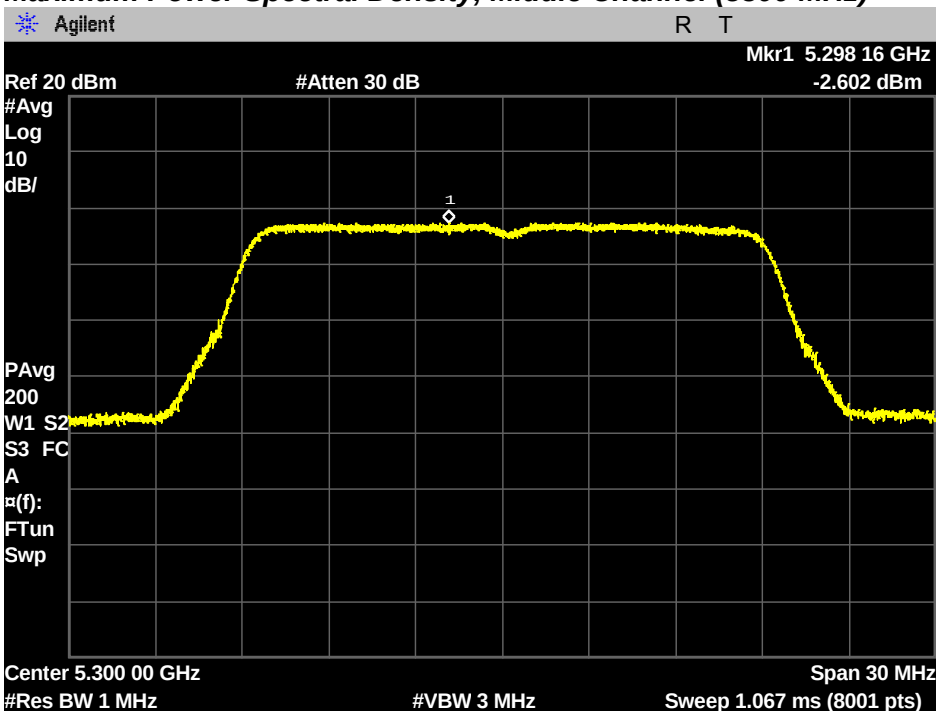
Chain 1

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

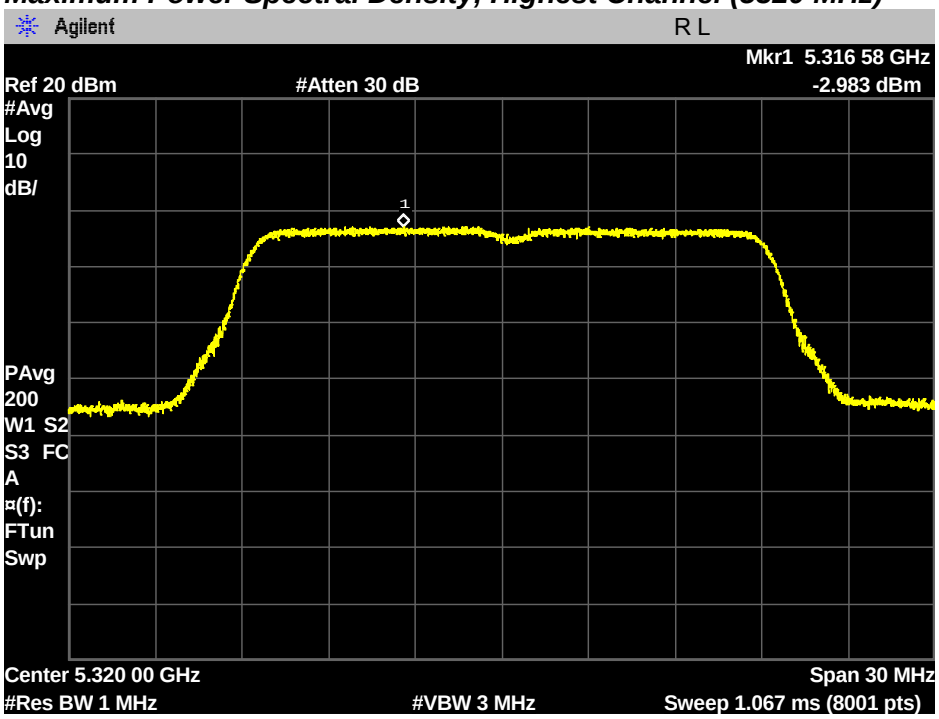


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5300 MHz)



Maximum Power Spectral Density, Highest Channel (5320 MHz)

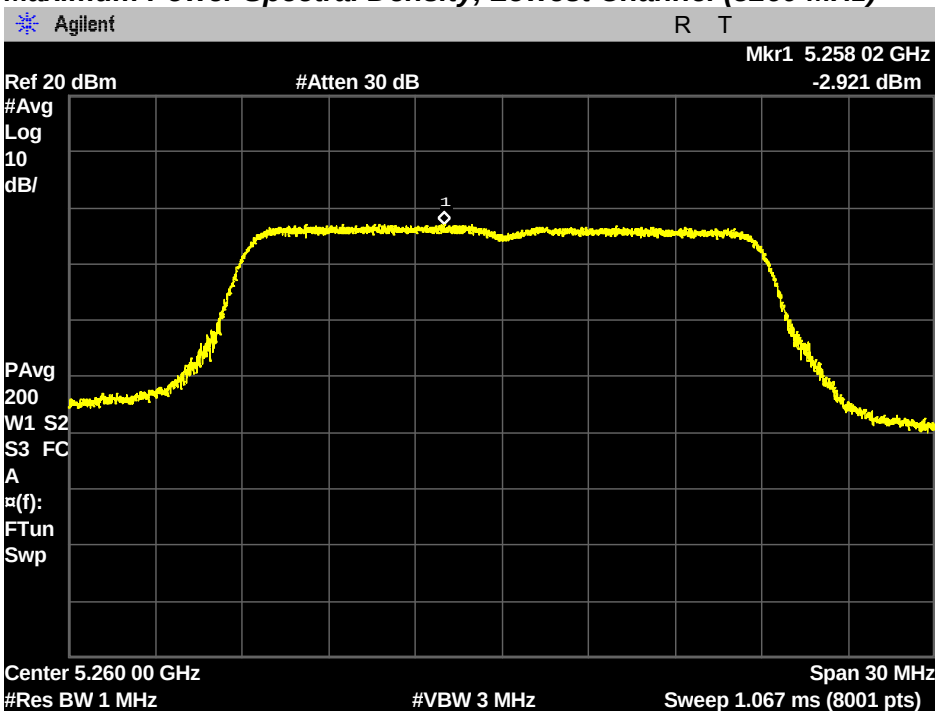


PLOTS OF EMISSIONS

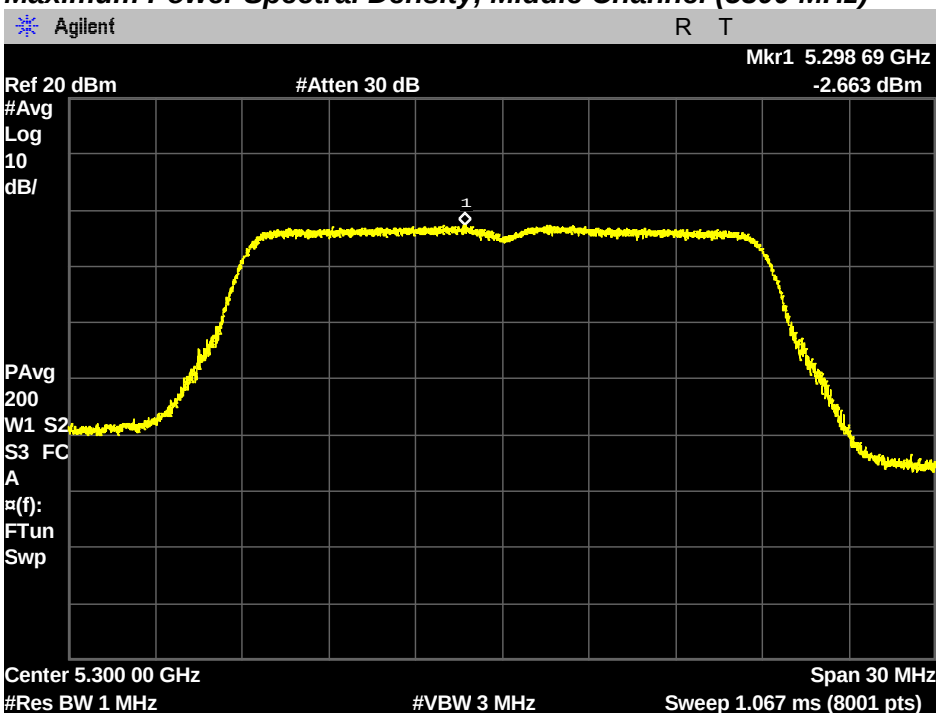
802.11n (20 MHz) mode - MIMO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

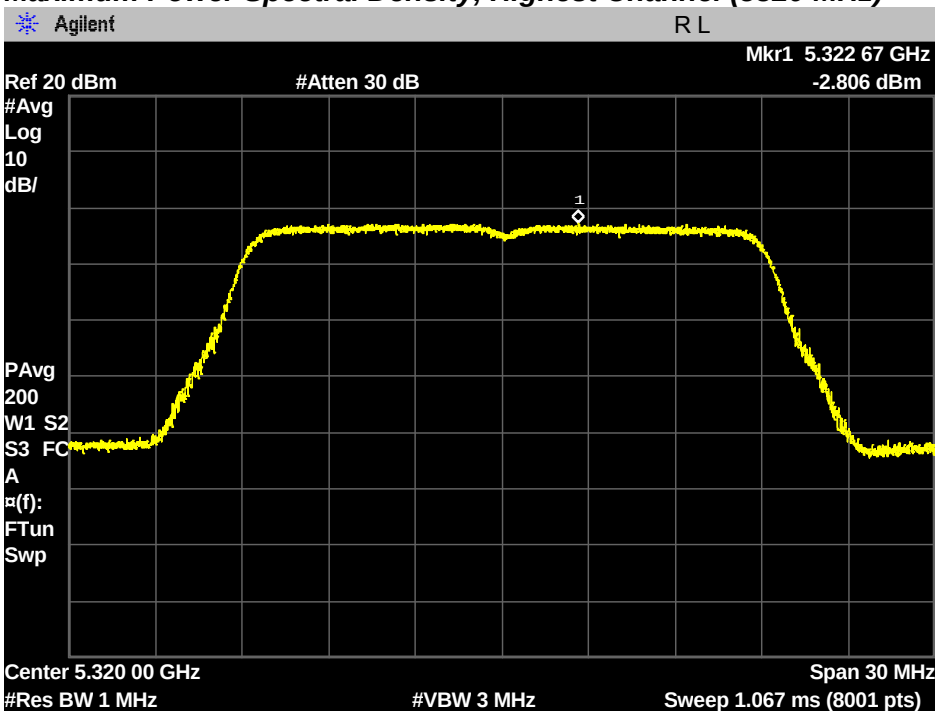


Maximum Power Spectral Density, Middle Channel (5300 MHz)



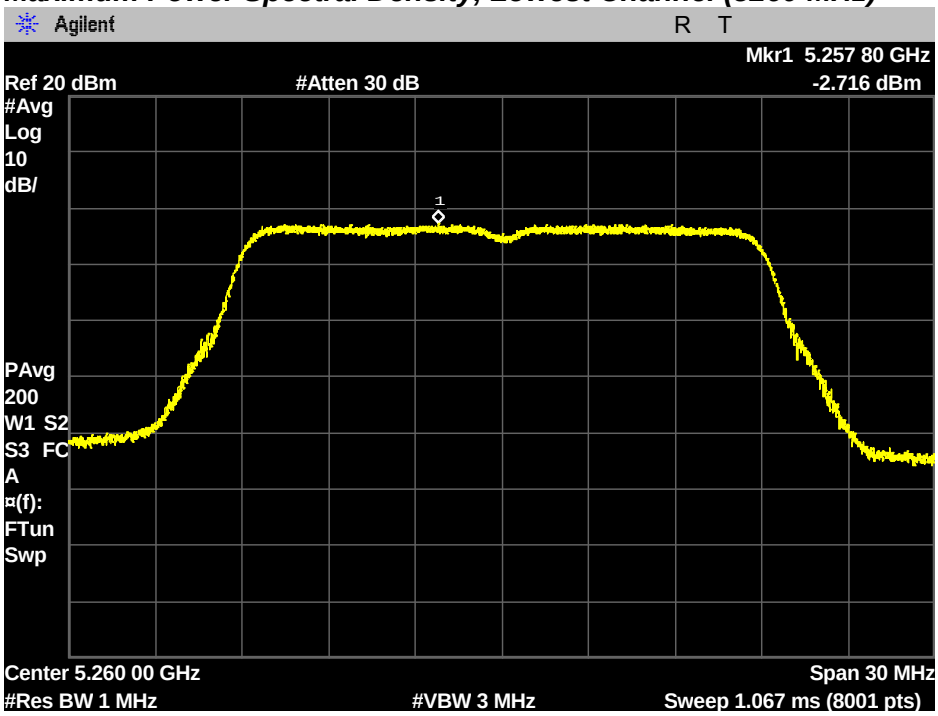
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5320 MHz)



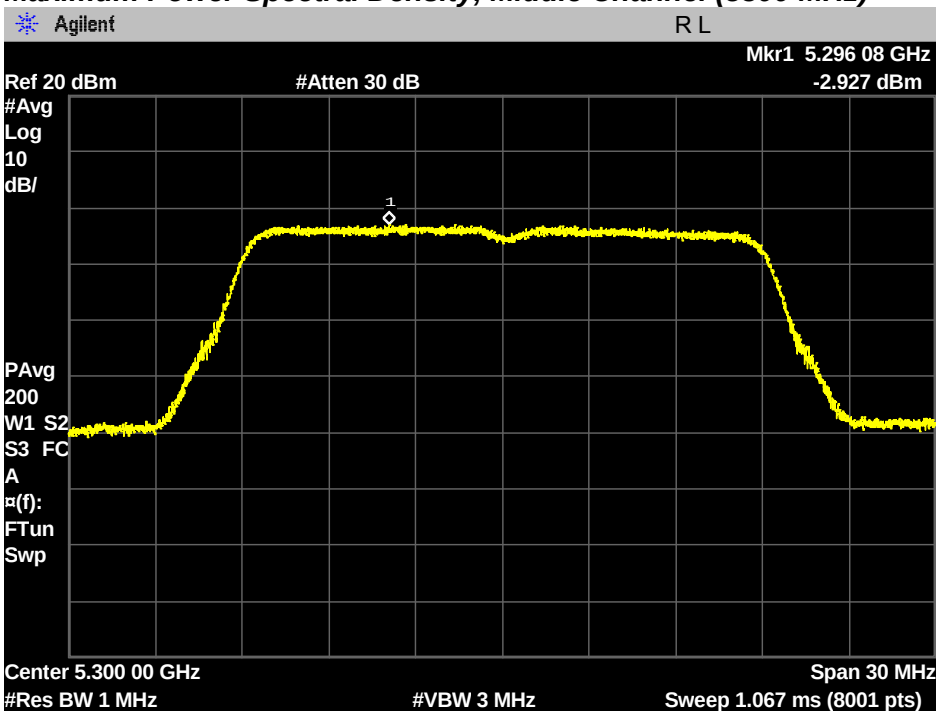
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

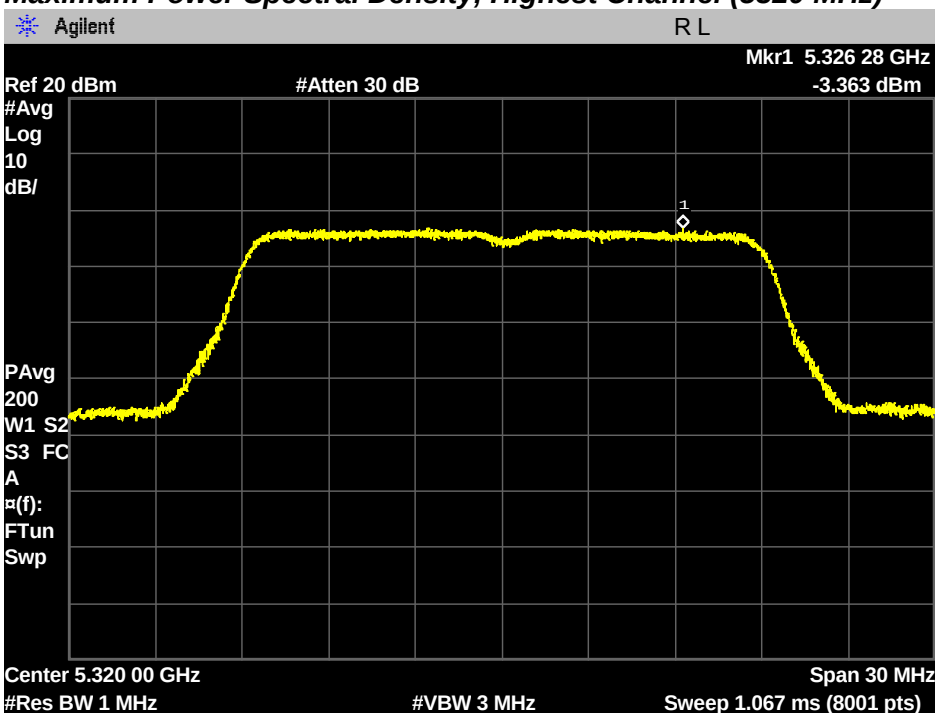


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5300 MHz)



Maximum Power Spectral Density, Highest Channel (5320 MHz)

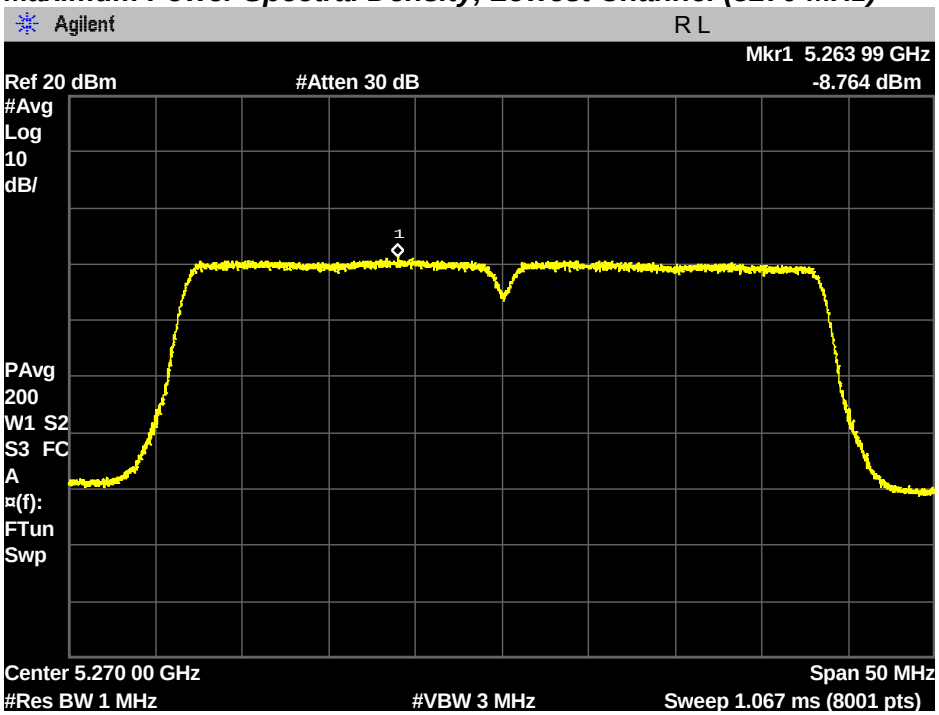


PLOTS OF EMISSIONS

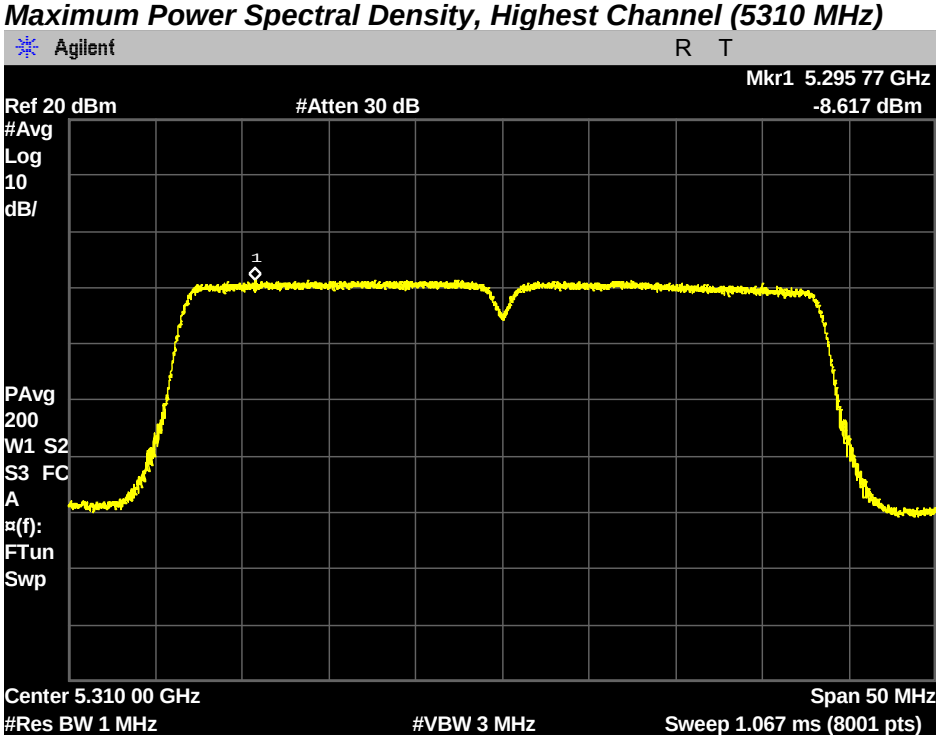
802.11n (40 MHz) mode - SISO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



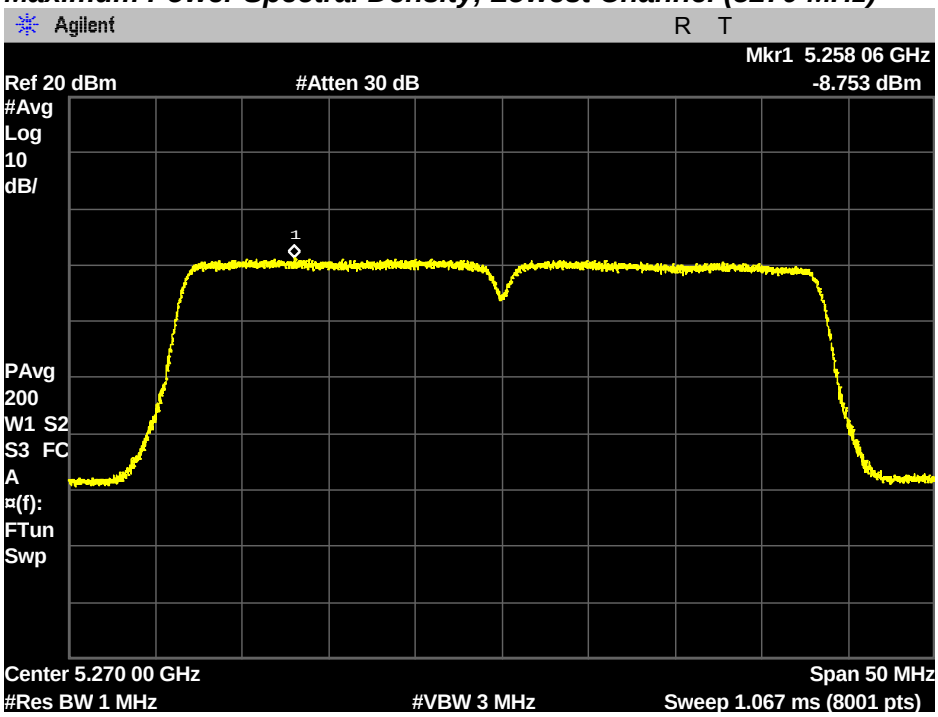
Maximum Power Spectral Density, Highest Channel (5310 MHz)



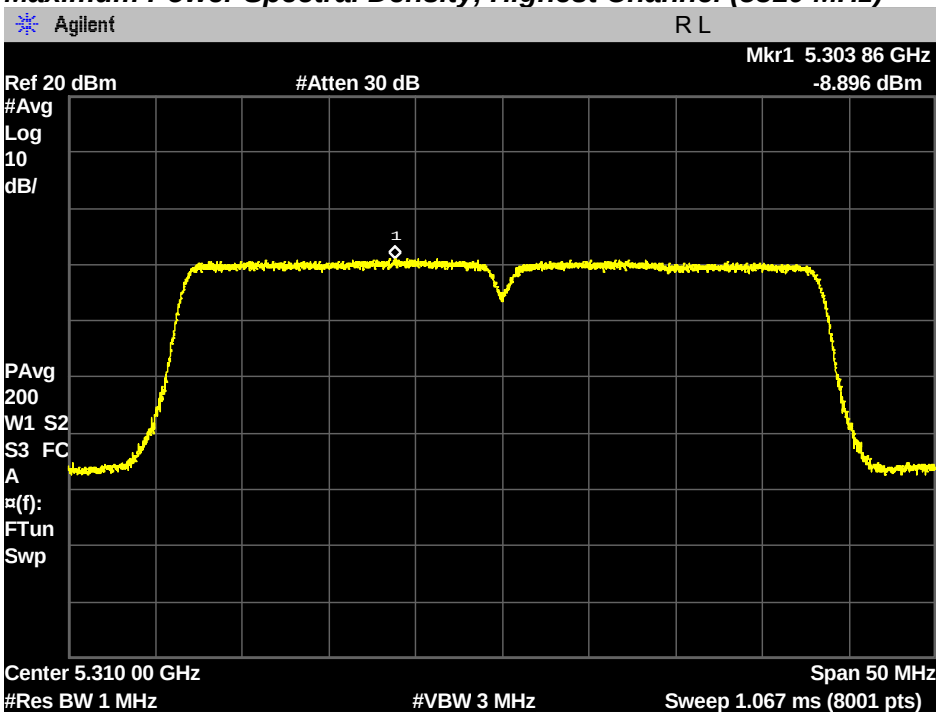
PLOTS OF EMISSIONS

Chain 1

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



Maximum Power Spectral Density, Highest Channel (5310 MHz)

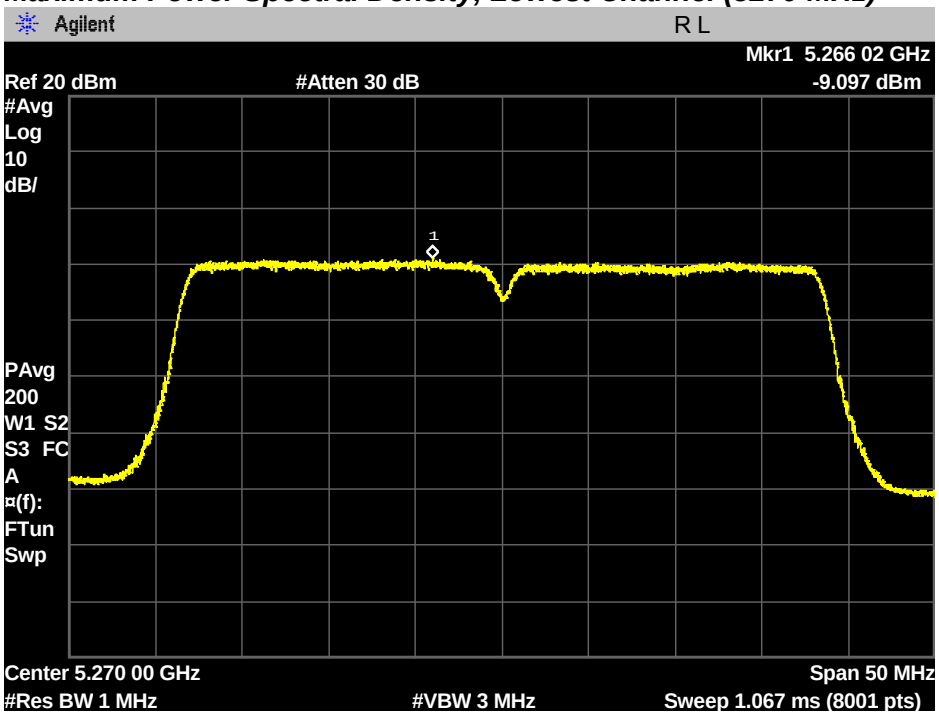


PLOTS OF EMISSIONS

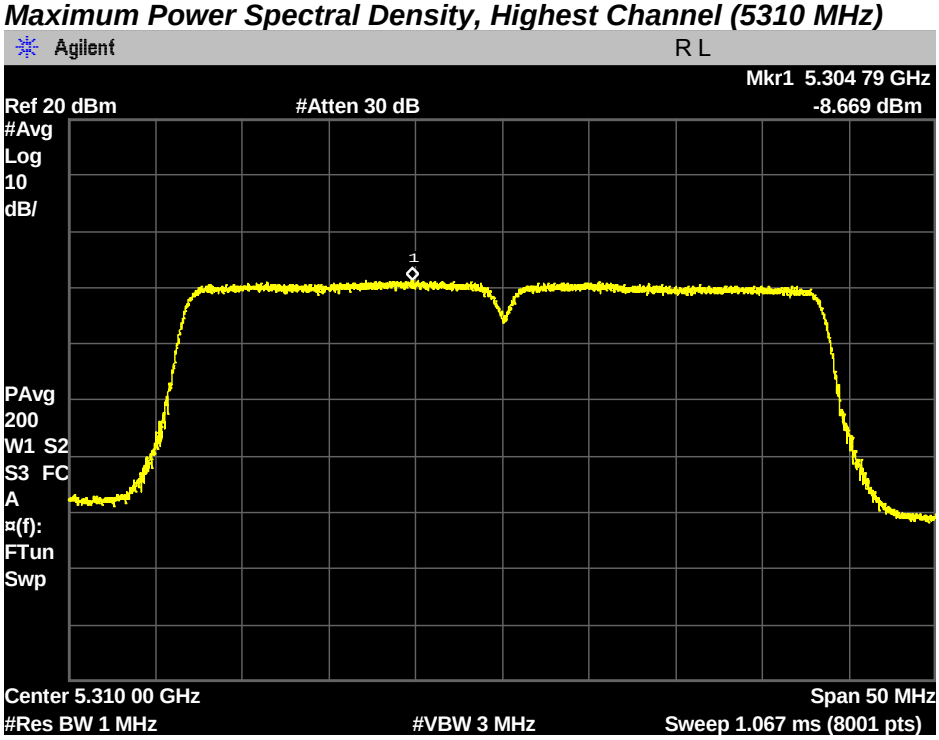
802.11n (40 MHz) mode - CDD

Chain 0

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



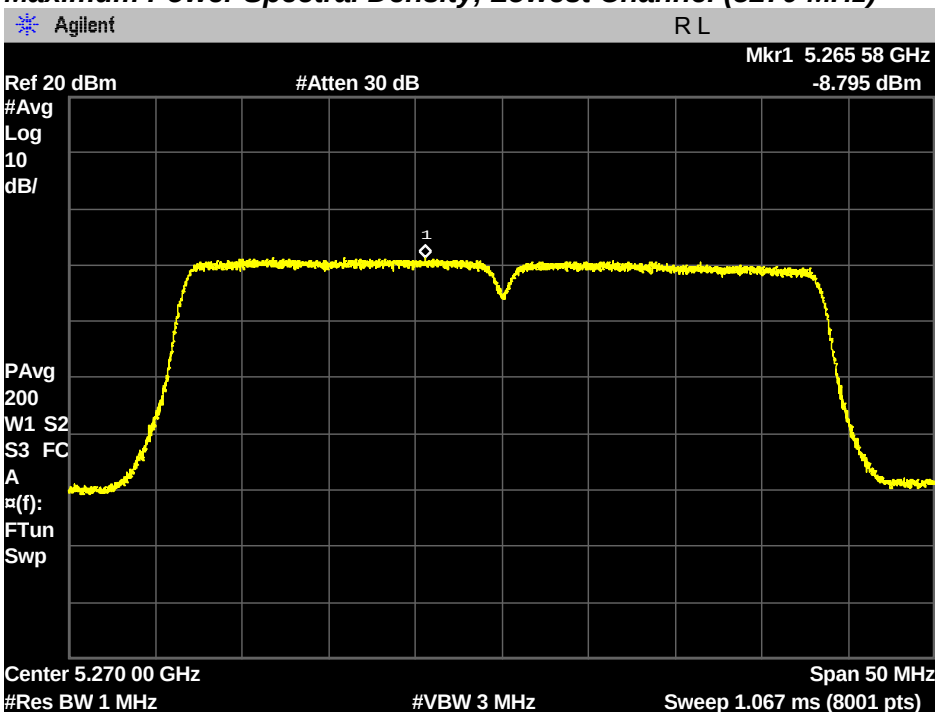
Maximum Power Spectral Density, Highest Channel (5310 MHz)



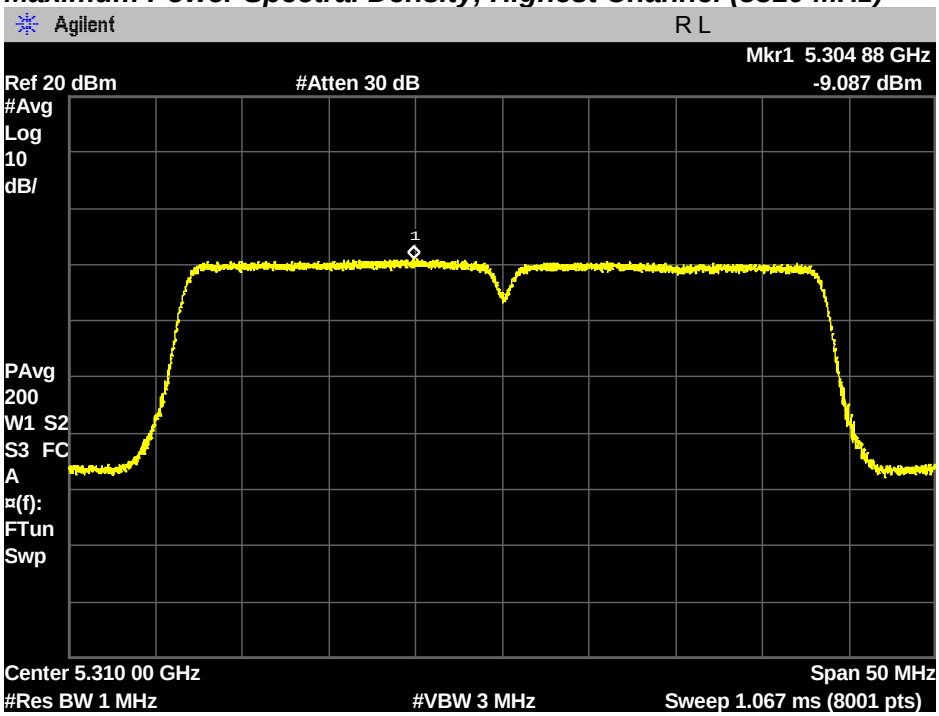
PLOTS OF EMISSIONS

Chain 1

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



Maximum Power Spectral Density, Highest Channel (5310 MHz)

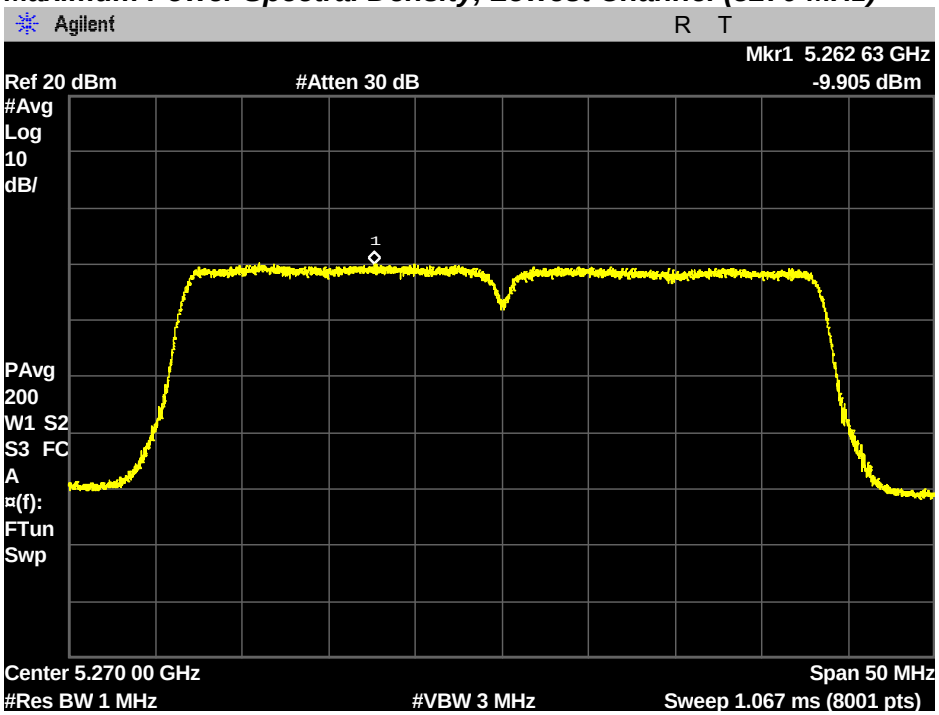


PLOTS OF EMISSIONS

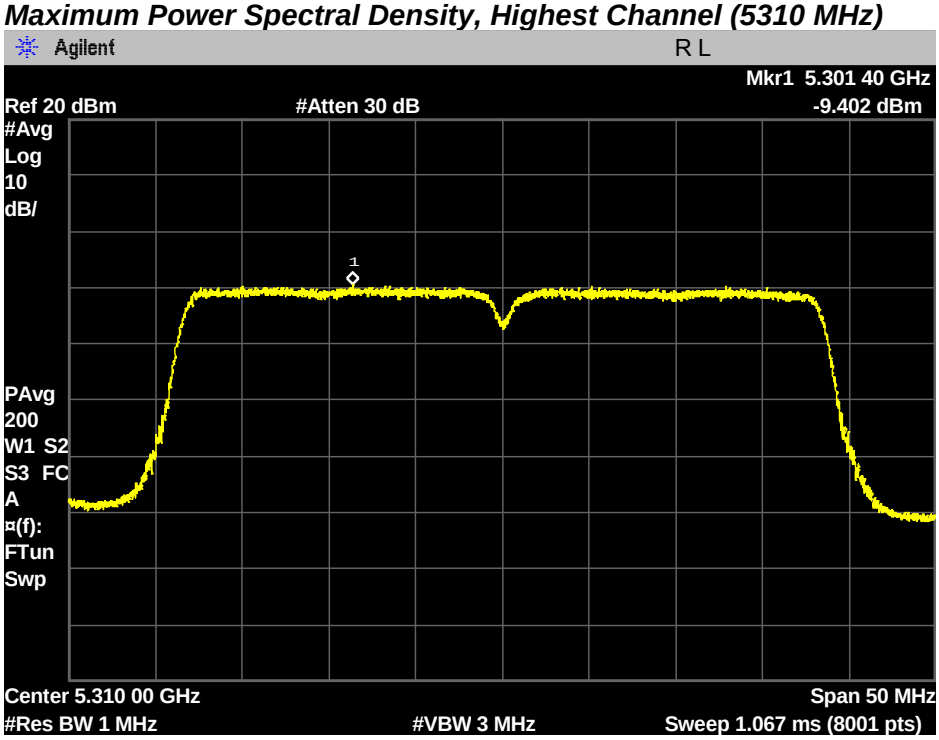
802.11n (40 MHz) mode - MIMO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



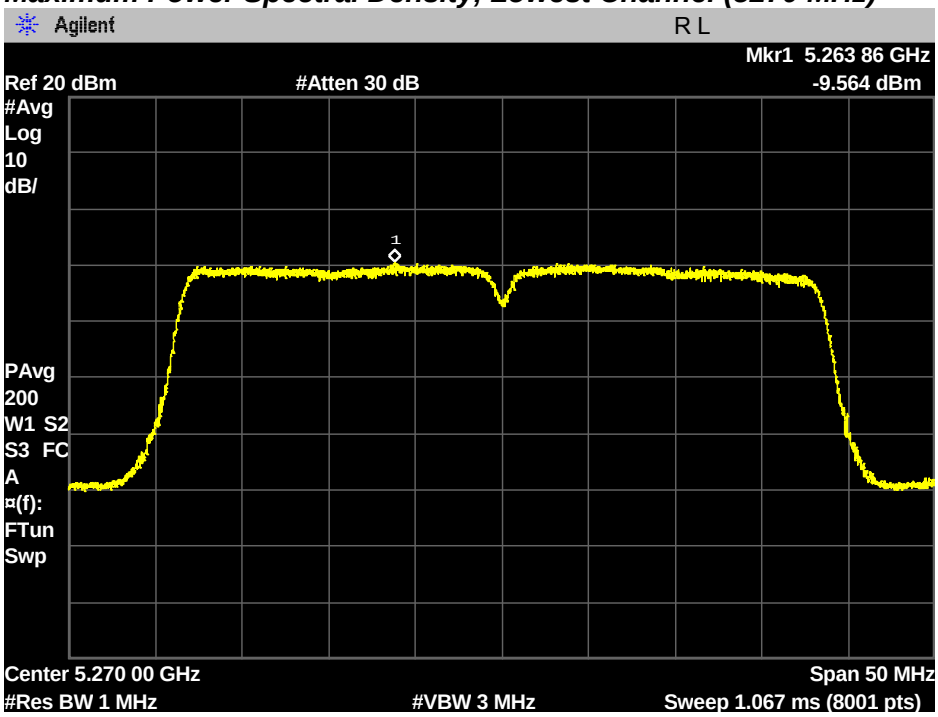
Maximum Power Spectral Density, Highest Channel (5310 MHz)



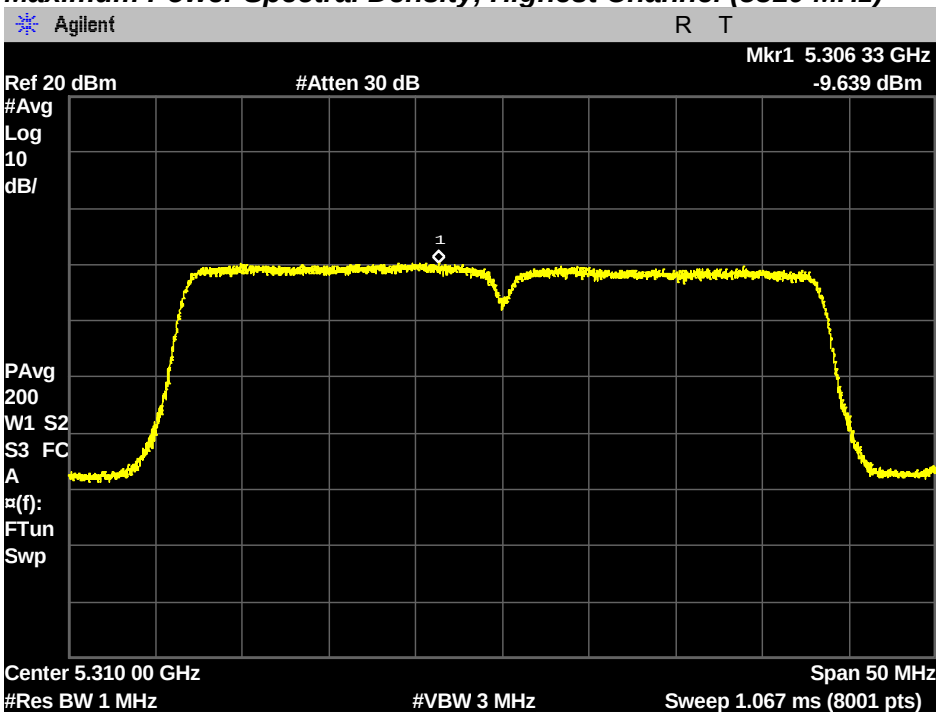
PLOTS OF EMISSIONS

Chain 1

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



Maximum Power Spectral Density, Highest Channel (5310 MHz)

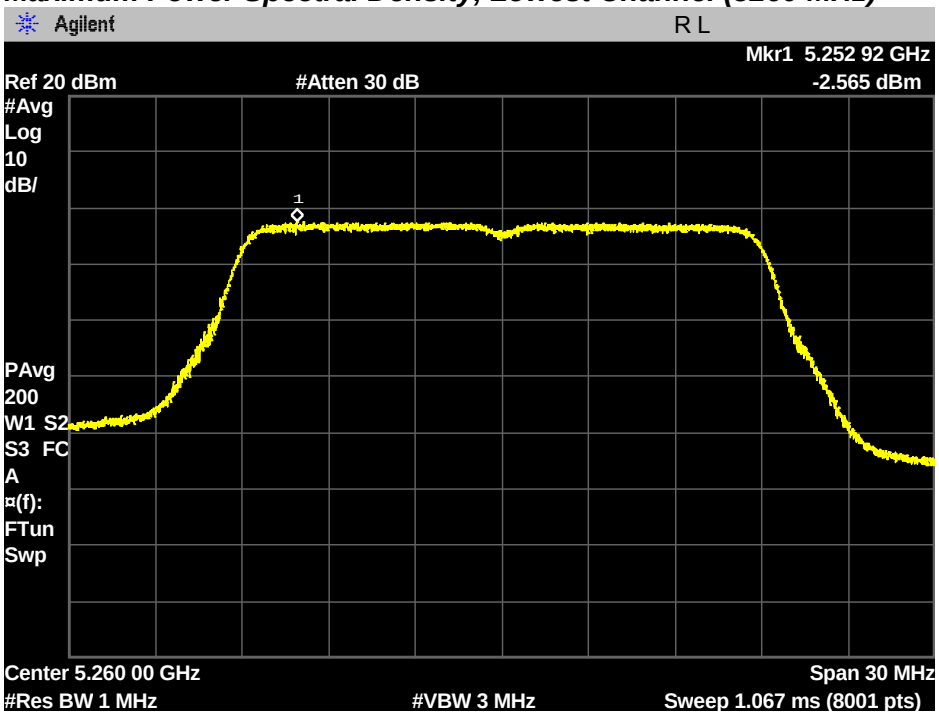


PLOTS OF EMISSIONS

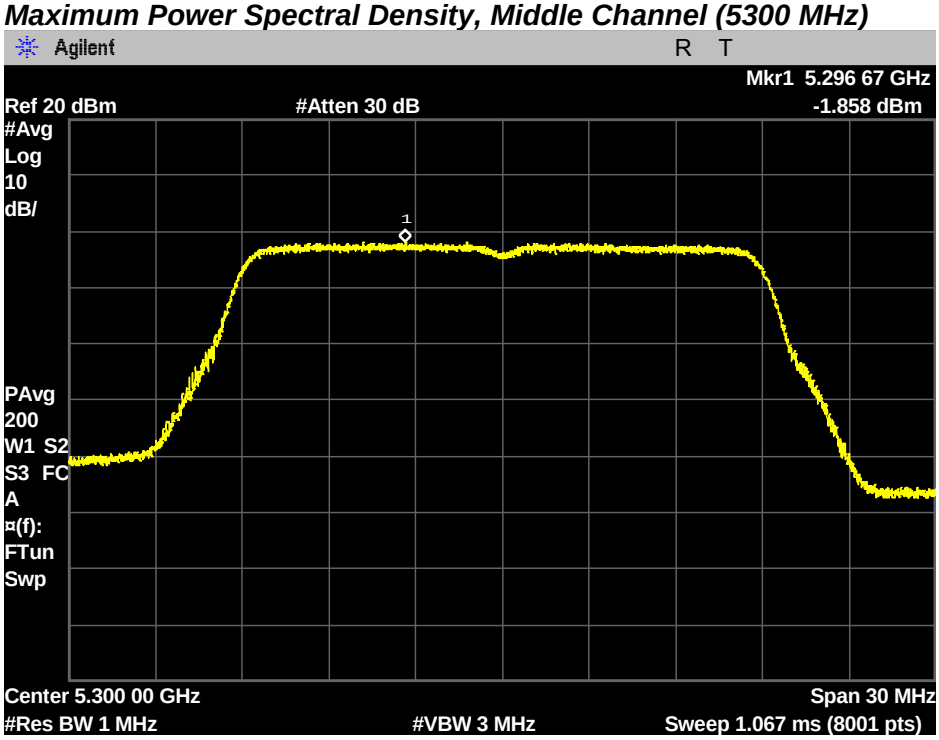
802.11ac (20 MHz) mode - SISO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

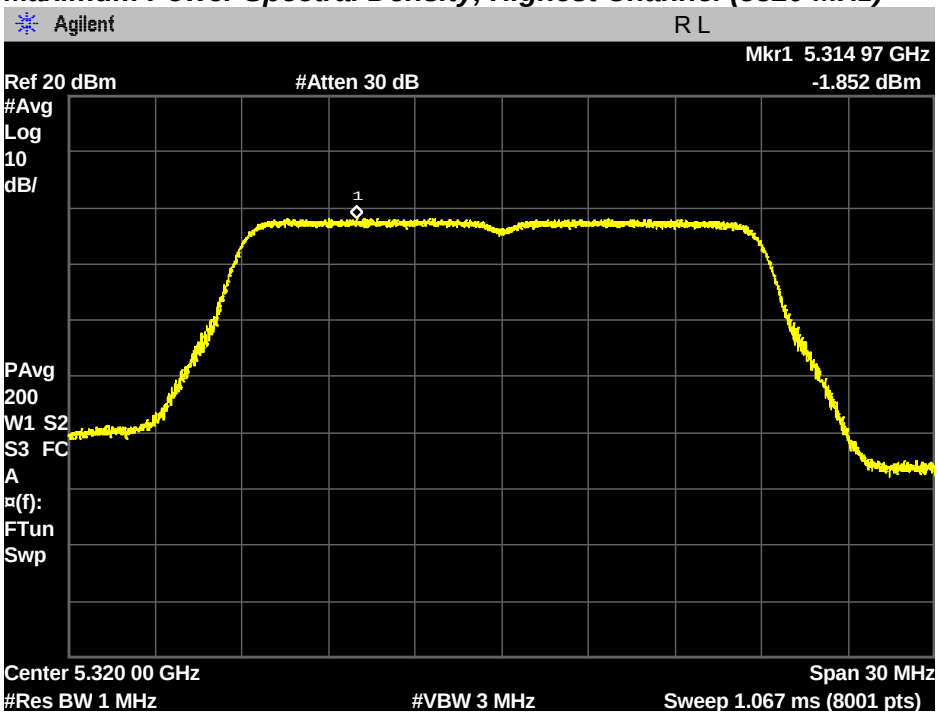


Maximum Power Spectral Density, Middle Channel (5300 MHz)



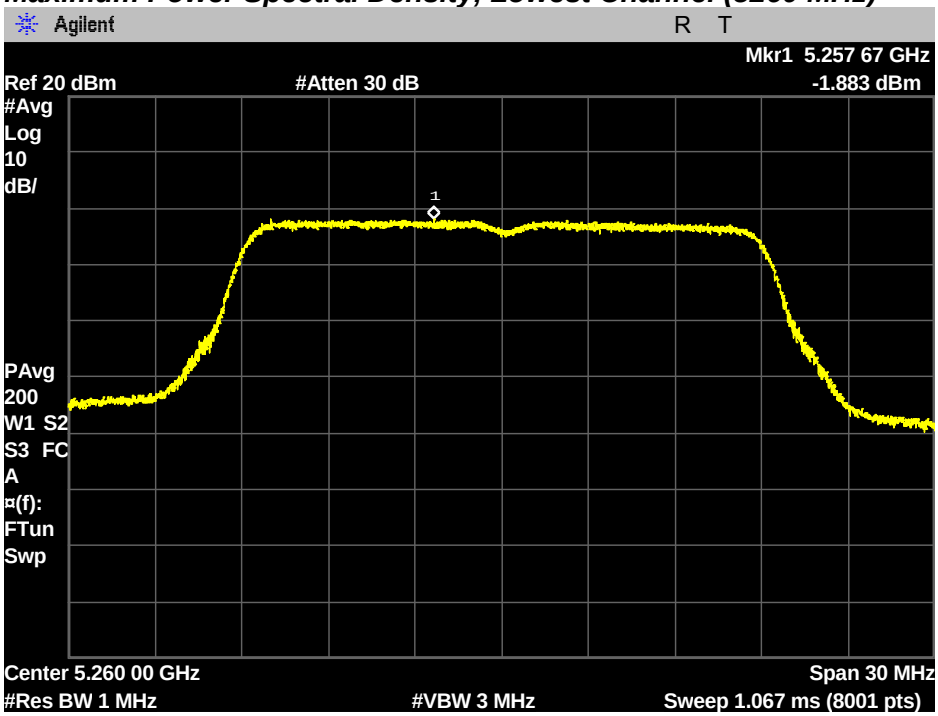
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5320 MHz)



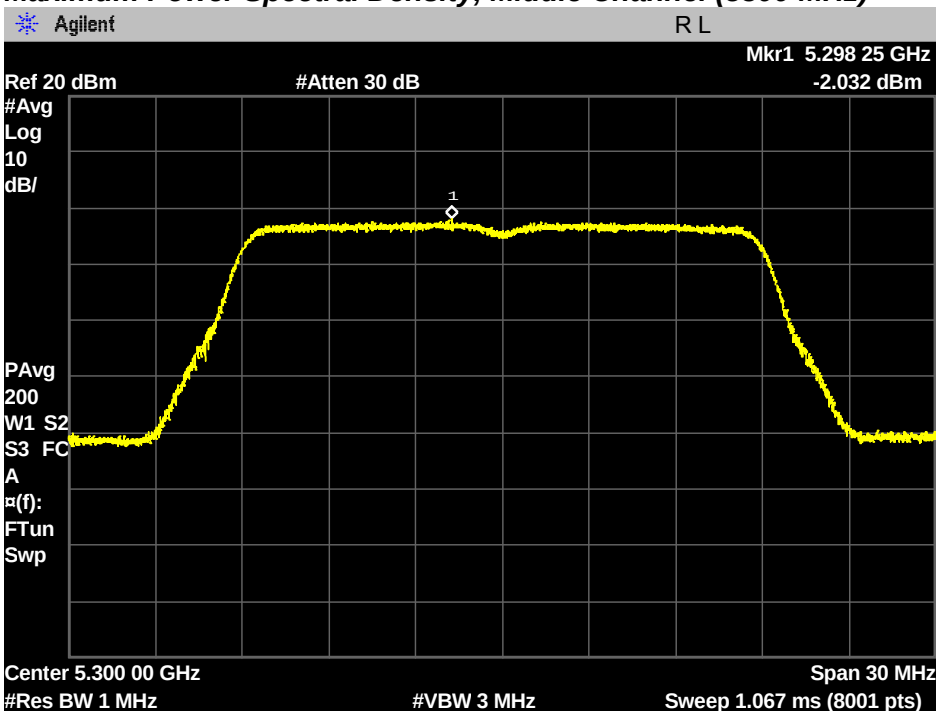
Chain 1

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

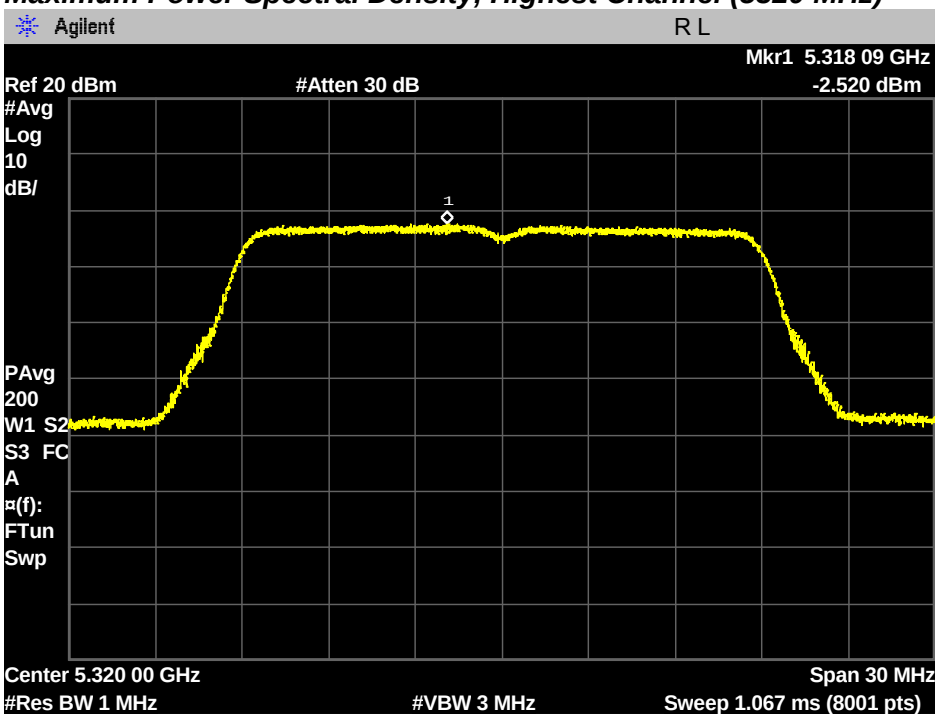


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5300 MHz)



Maximum Power Spectral Density, Highest Channel (5320 MHz)

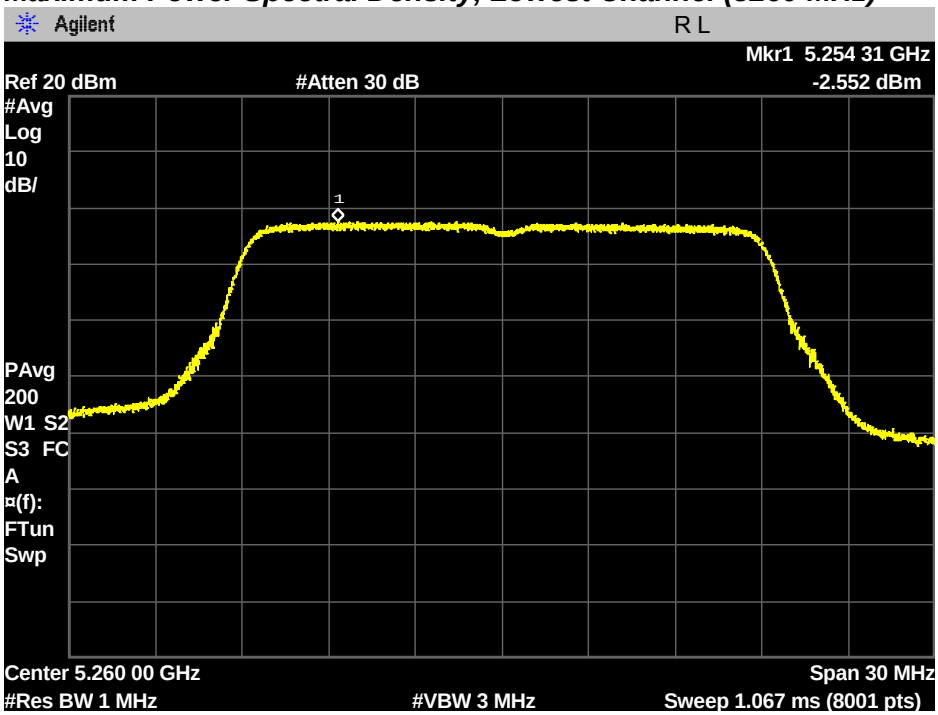


PLOTS OF EMISSIONS

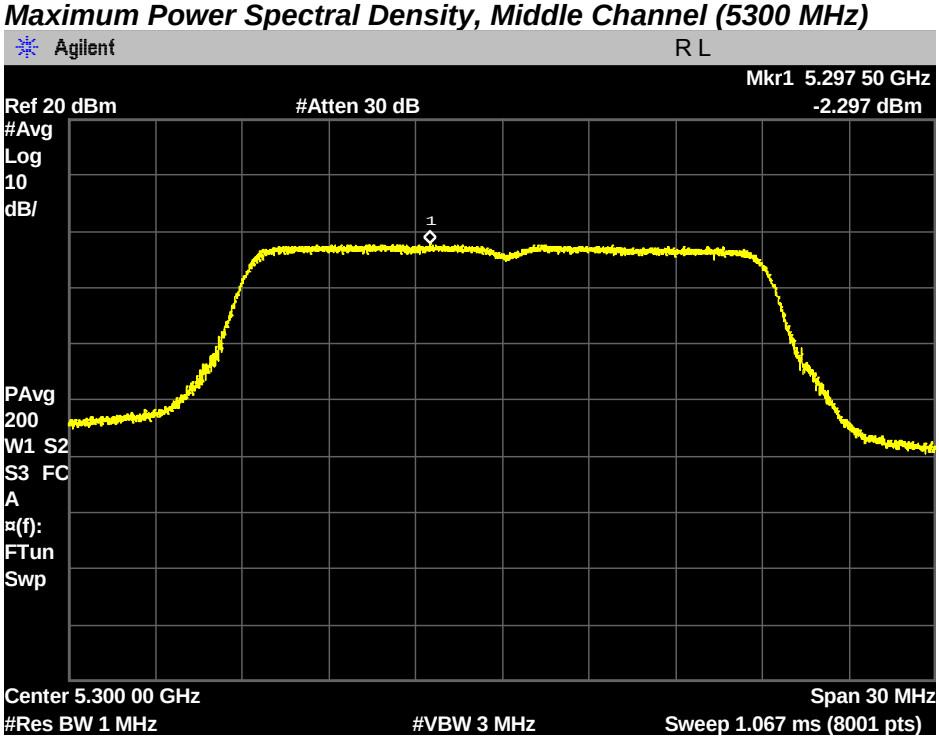
802.11ac (20 MHz) mode - CDD

Chain 0

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

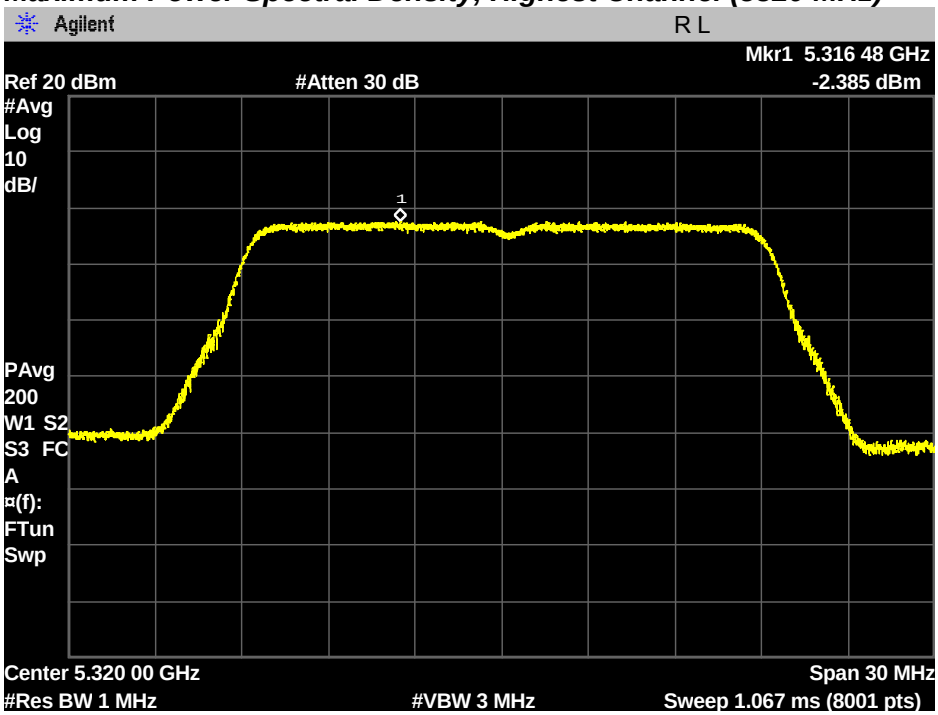


Maximum Power Spectral Density, Middle Channel (5300 MHz)



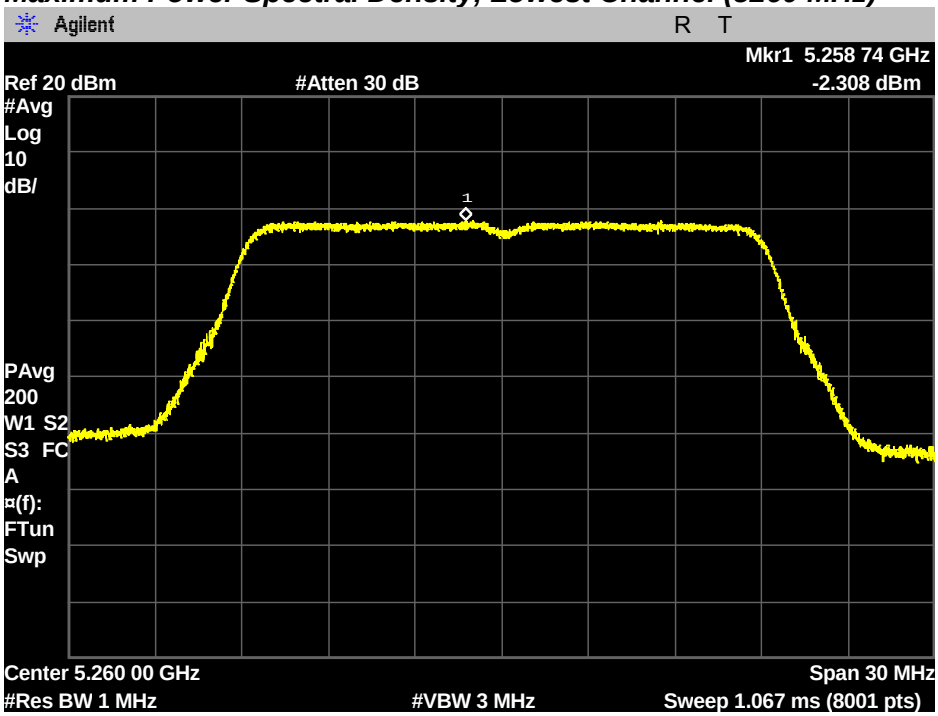
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5320 MHz)



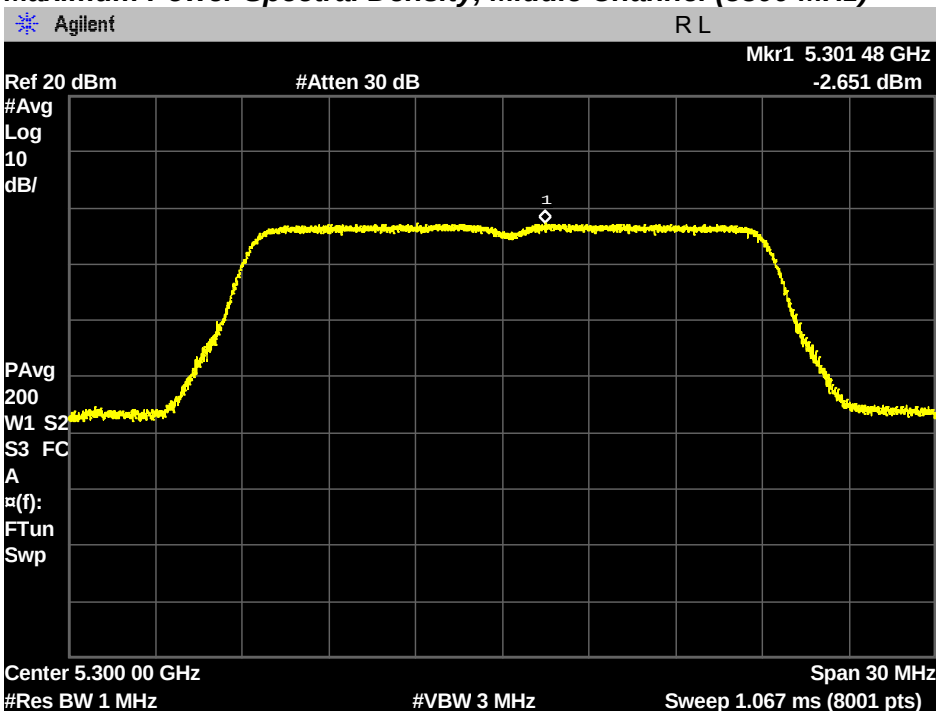
Chain 1

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

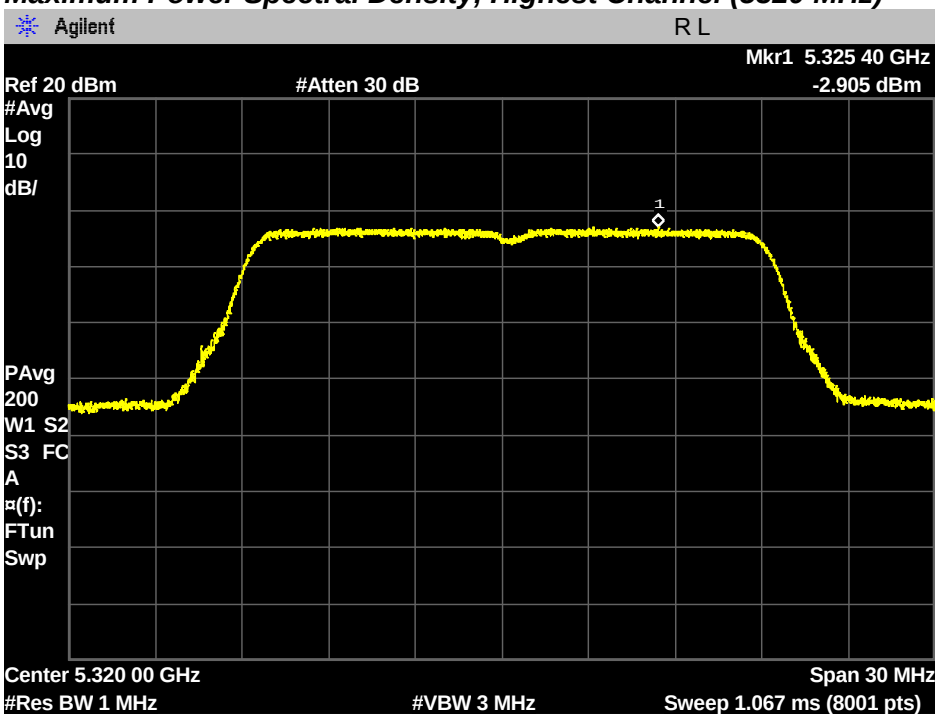


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5300 MHz)



Maximum Power Spectral Density, Highest Channel (5320 MHz)

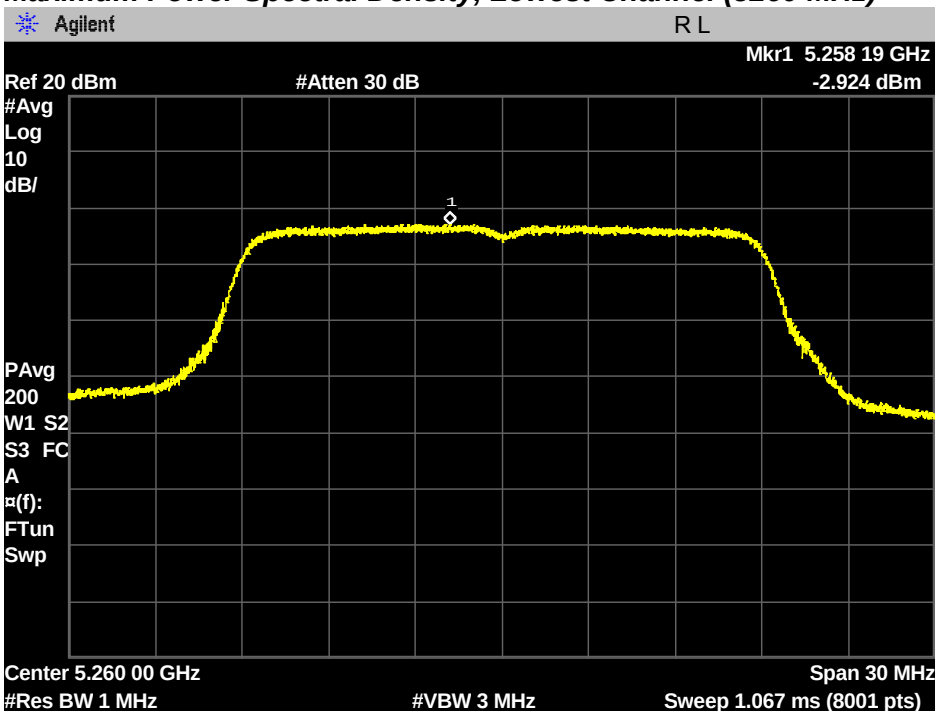


PLOTS OF EMISSIONS

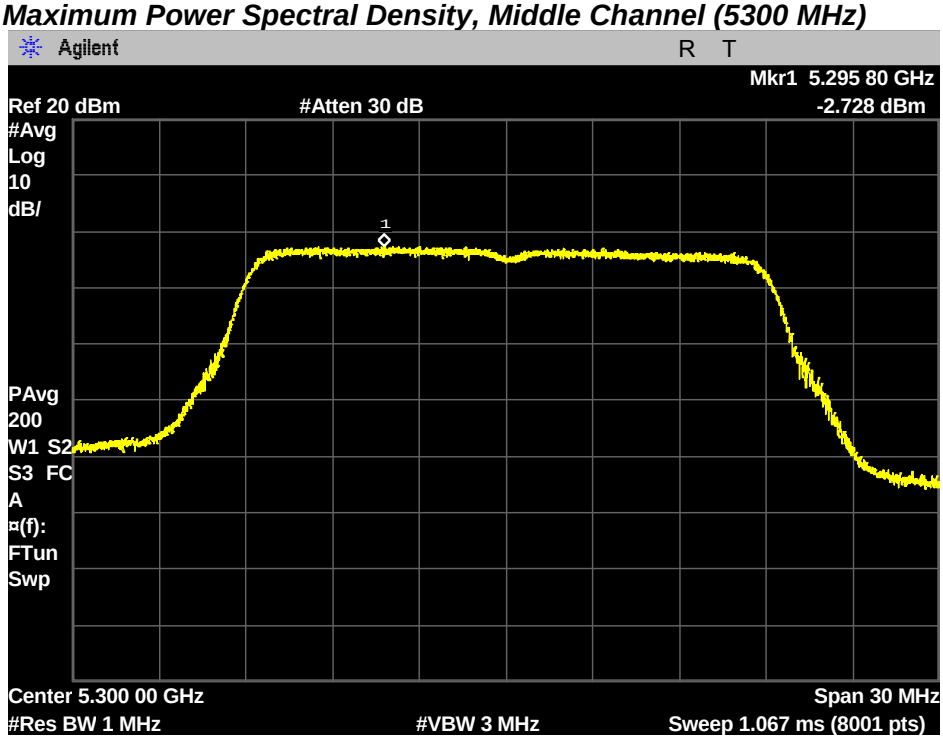
802.11ac (20 MHz) mode - MIMO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

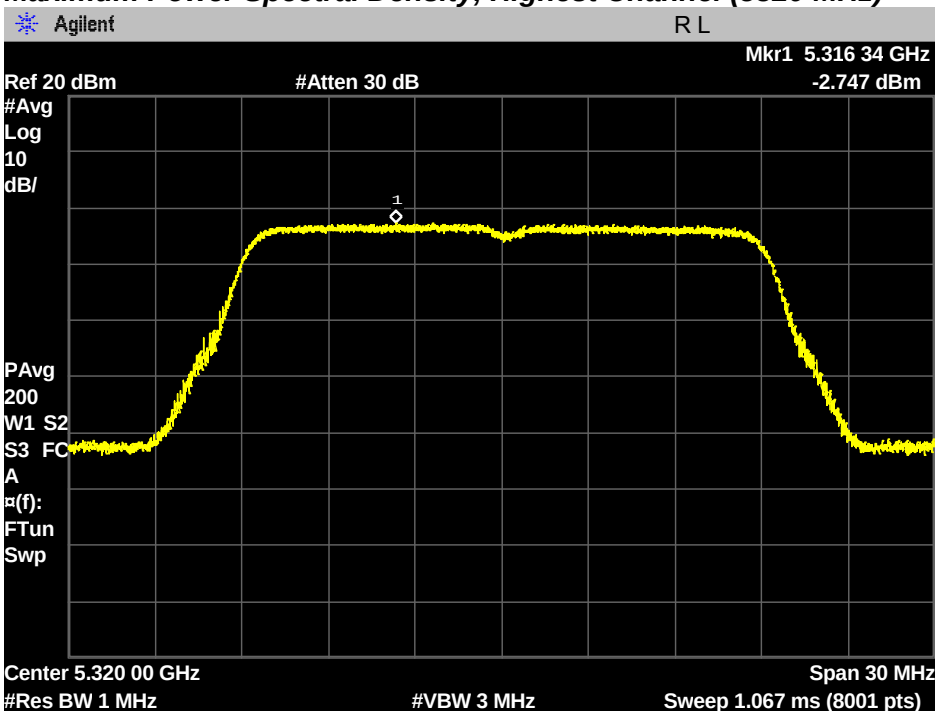


Maximum Power Spectral Density, Middle Channel (5300 MHz)



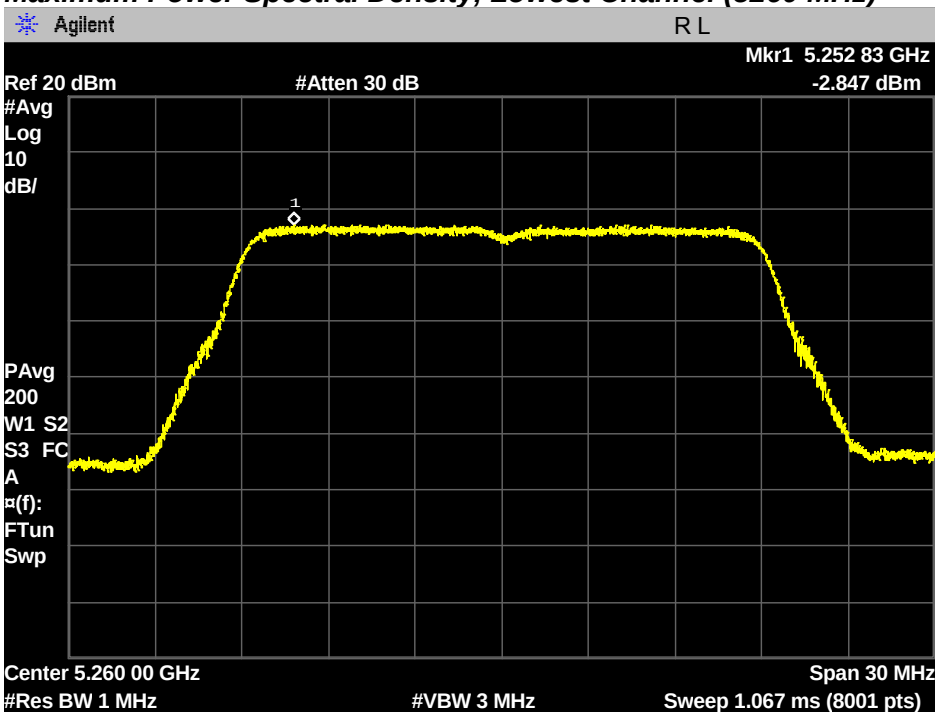
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5320 MHz)



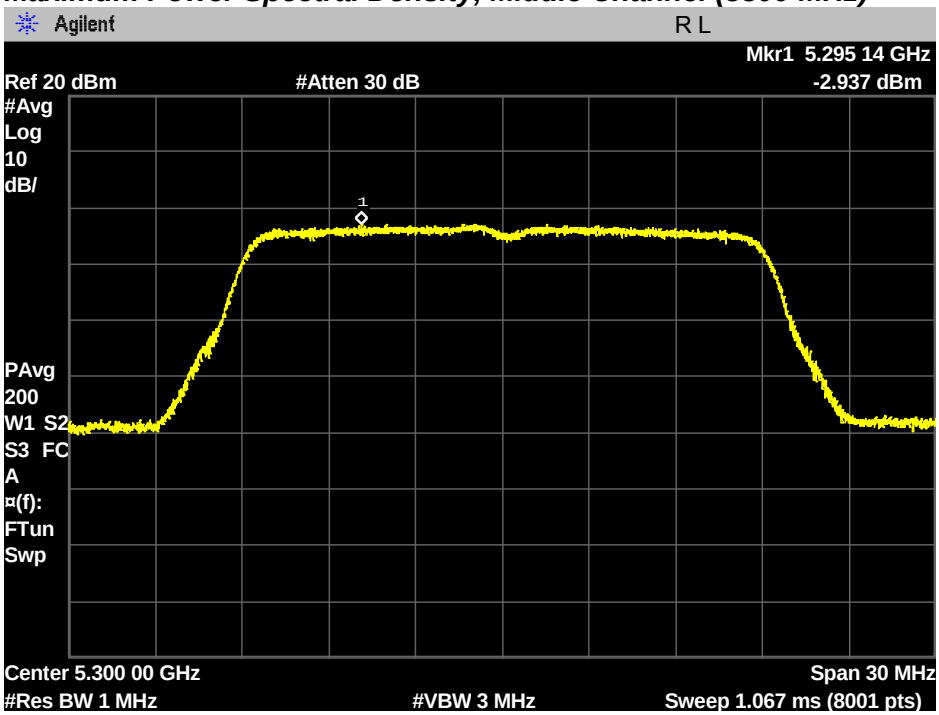
Chain 1

Maximum Power Spectral Density, Lowest Channel (5260 MHz)

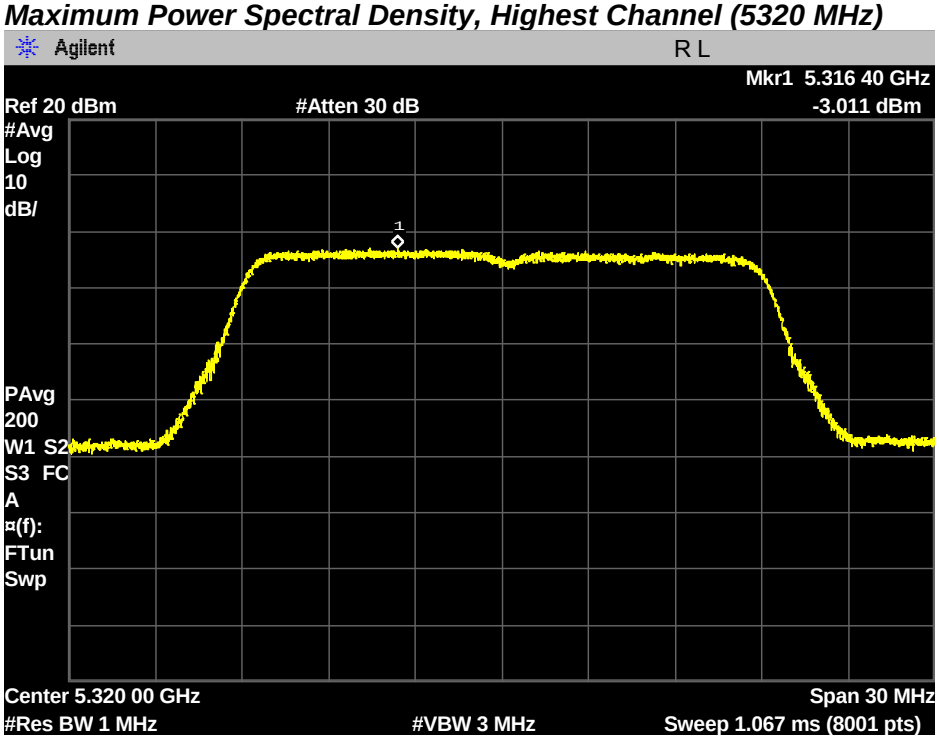


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5300 MHz)



Maximum Power Spectral Density, Highest Channel (5320 MHz)

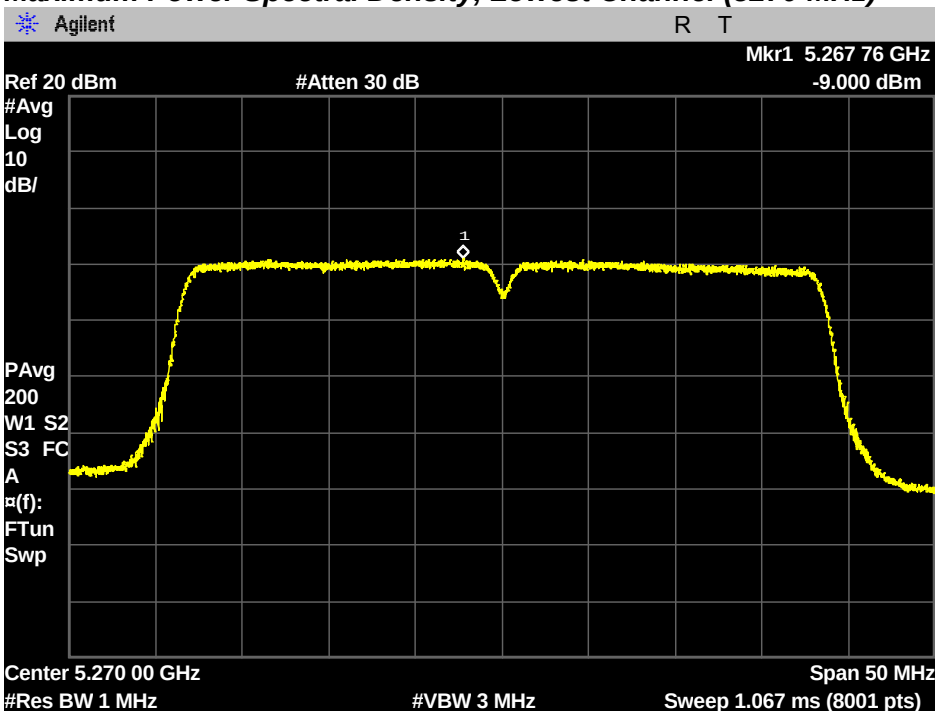


PLOTS OF EMISSIONS

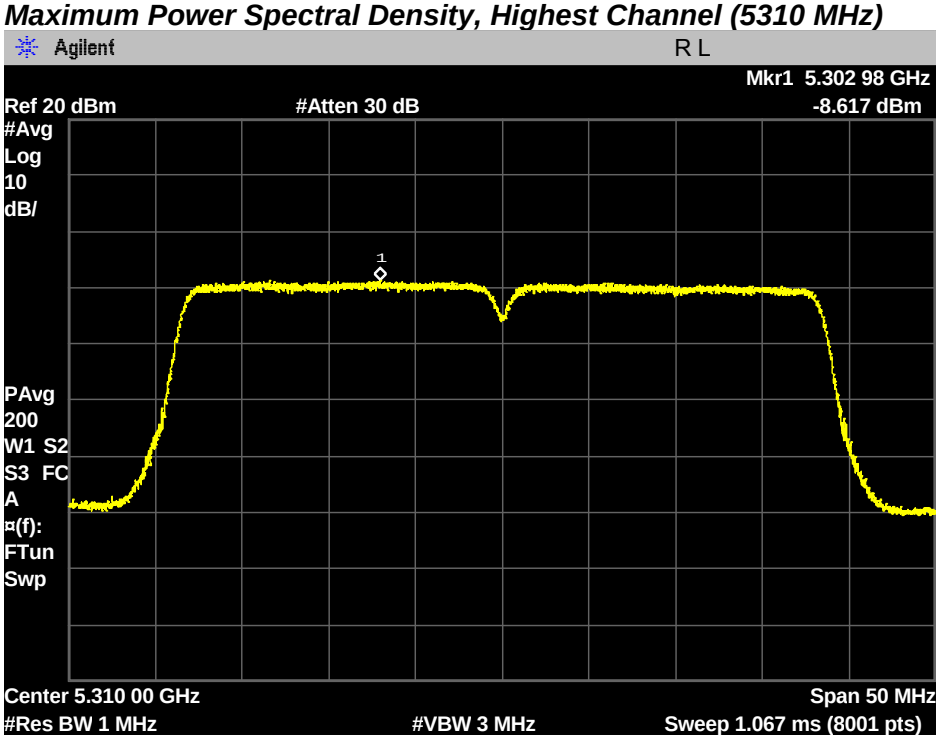
802.11ac (40 MHz) mode - SISO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



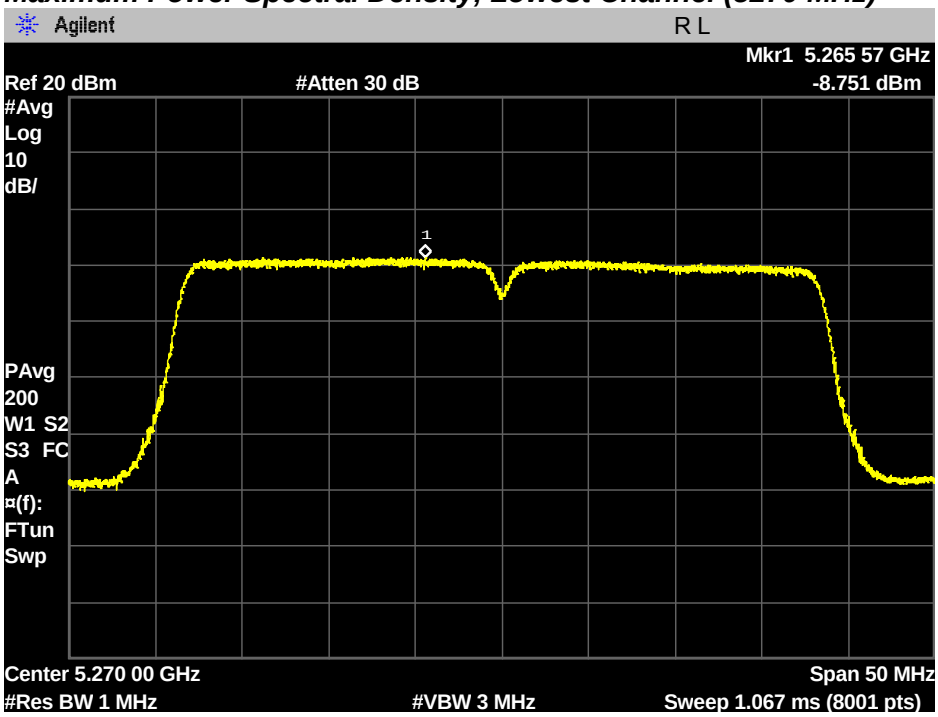
Maximum Power Spectral Density, Highest Channel (5310 MHz)



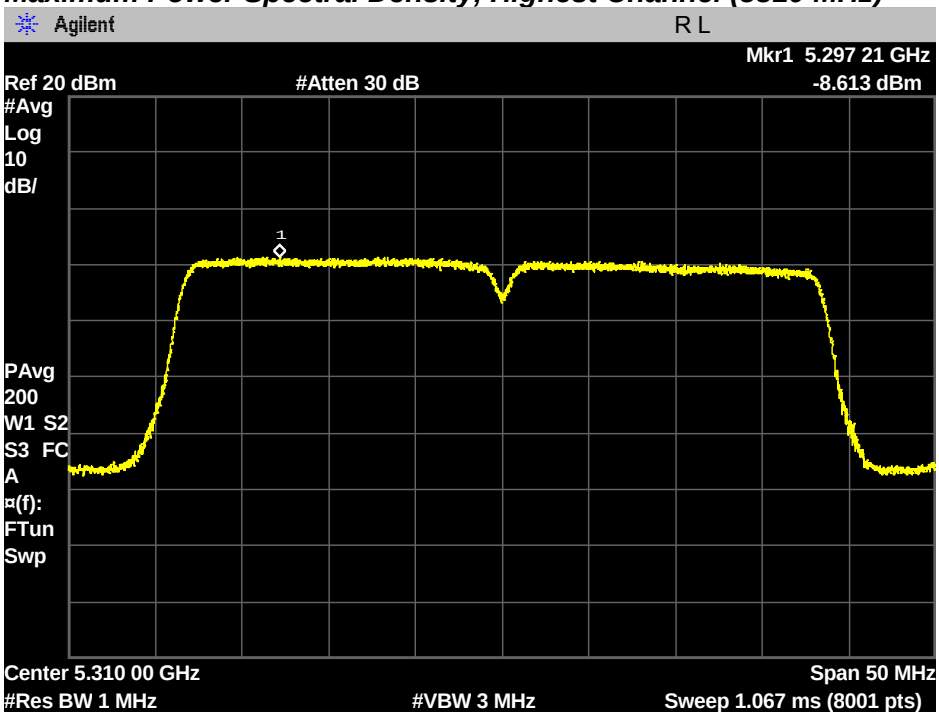
PLOTS OF EMISSIONS

Chain 1

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



Maximum Power Spectral Density, Highest Channel (5310 MHz)

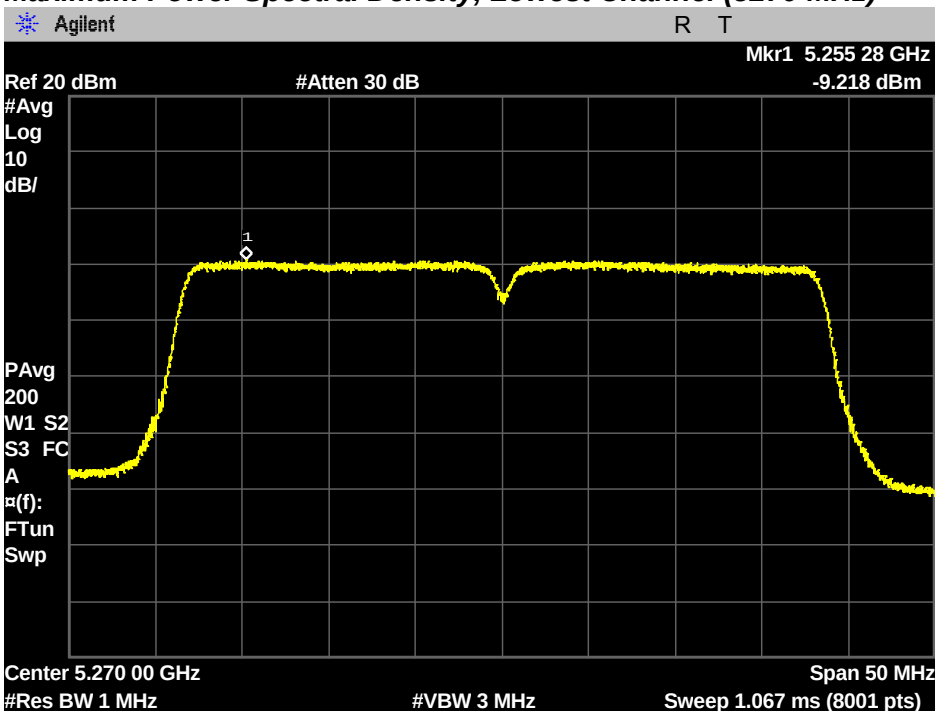


PLOTS OF EMISSIONS

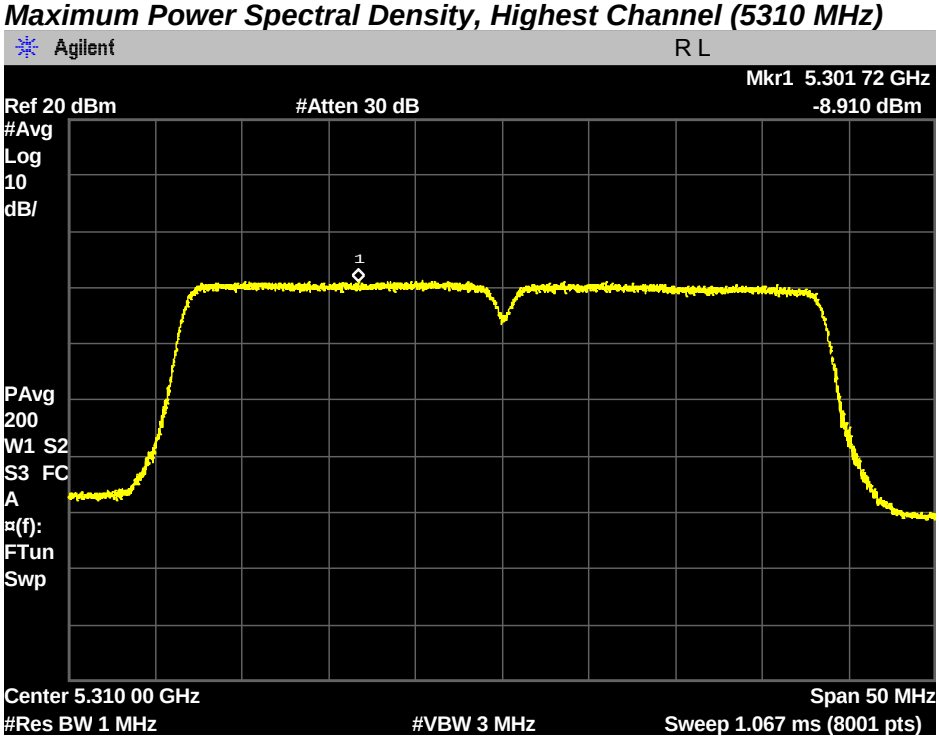
802.11ac (40 MHz) mode - CDD

Chain 0

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



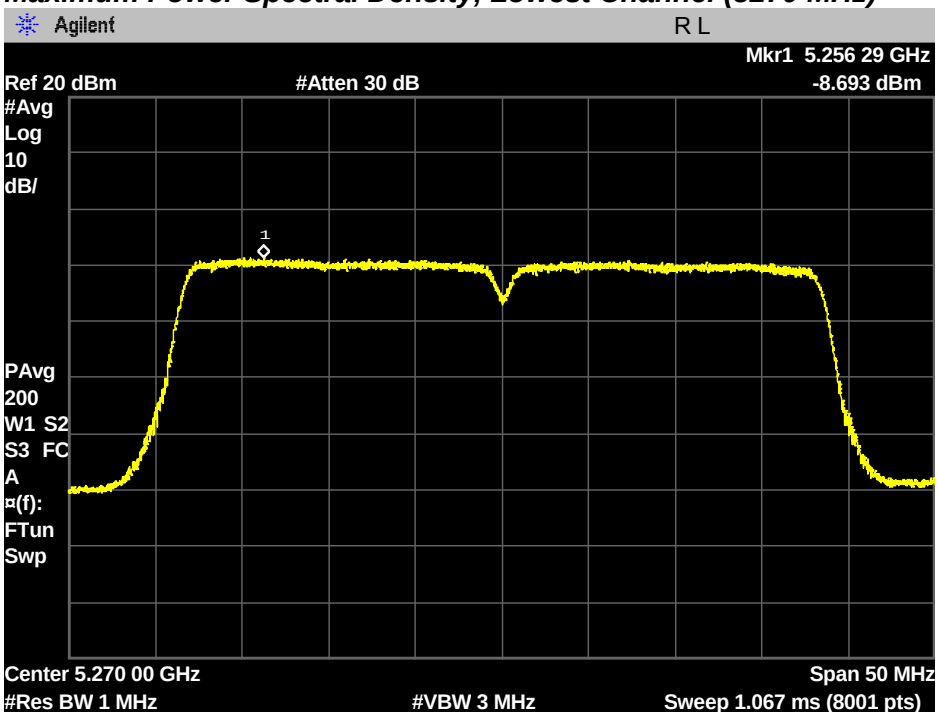
Maximum Power Spectral Density, Highest Channel (5310 MHz)



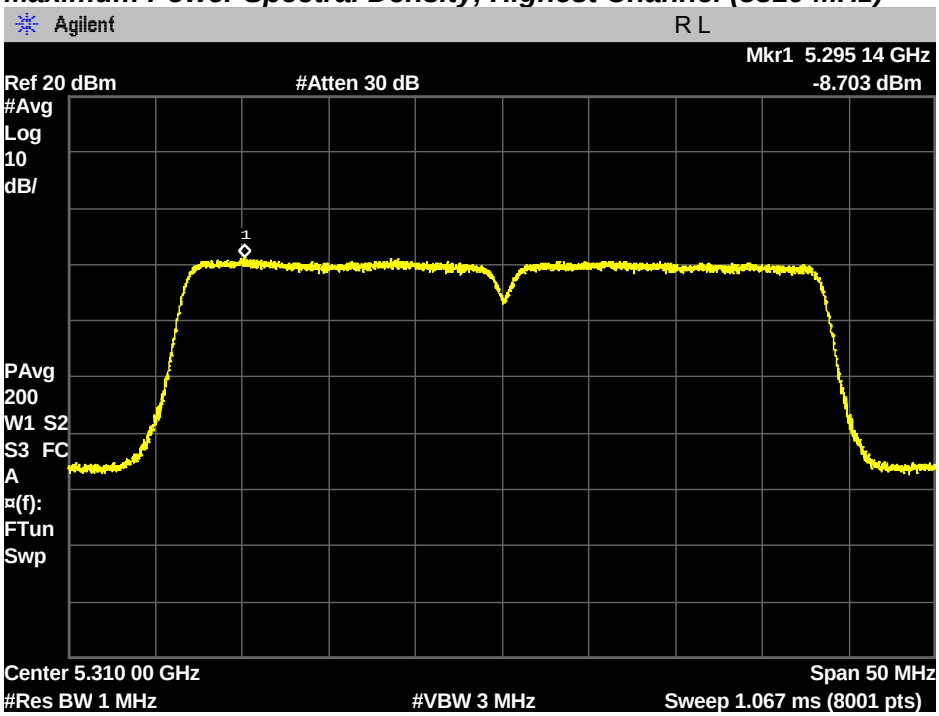
PLOTS OF EMISSIONS

Chain 1

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



Maximum Power Spectral Density, Highest Channel (5310 MHz)

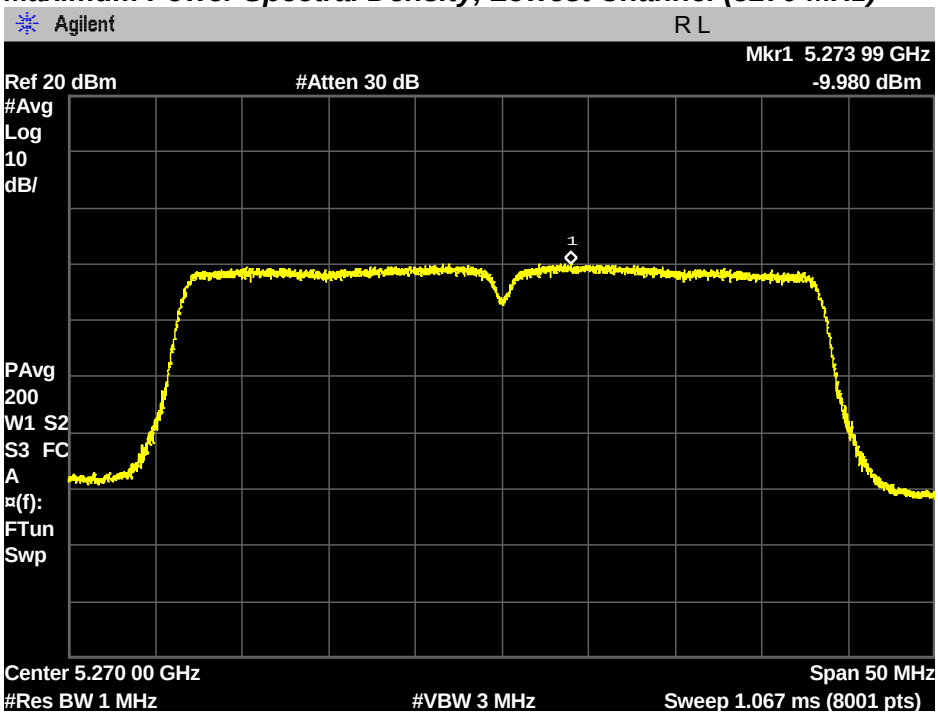


PLOTS OF EMISSIONS

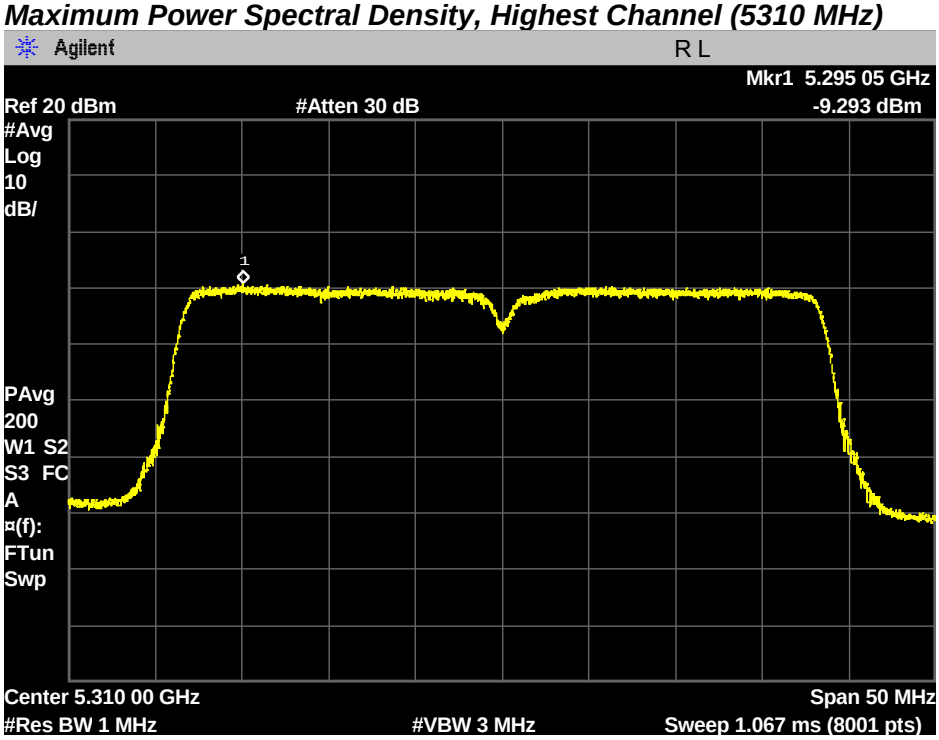
802.11ac (40 MHz) mode - MIMO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



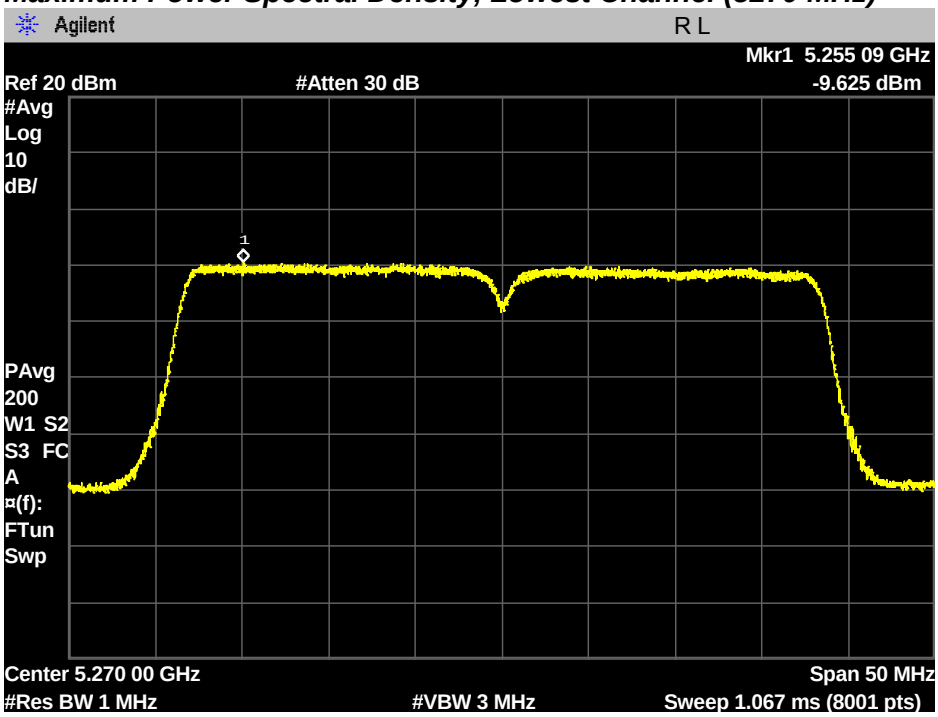
Maximum Power Spectral Density, Highest Channel (5310 MHz)



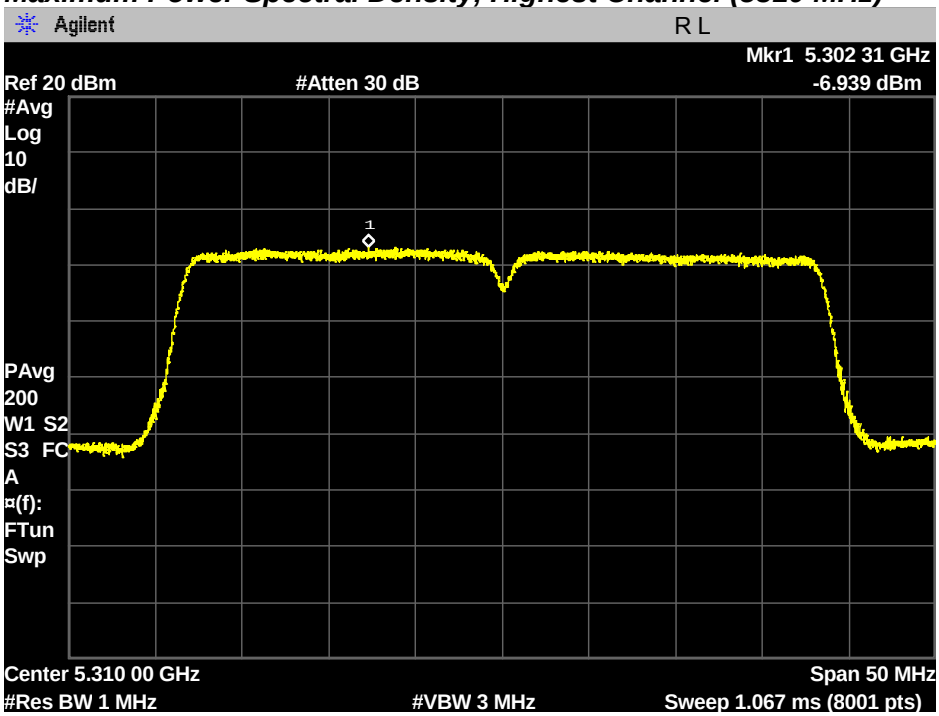
PLOTS OF EMISSIONS

Chain 1

Maximum Power Spectral Density, Lowest Channel (5270 MHz)



Maximum Power Spectral Density, Highest Channel (5310 MHz)

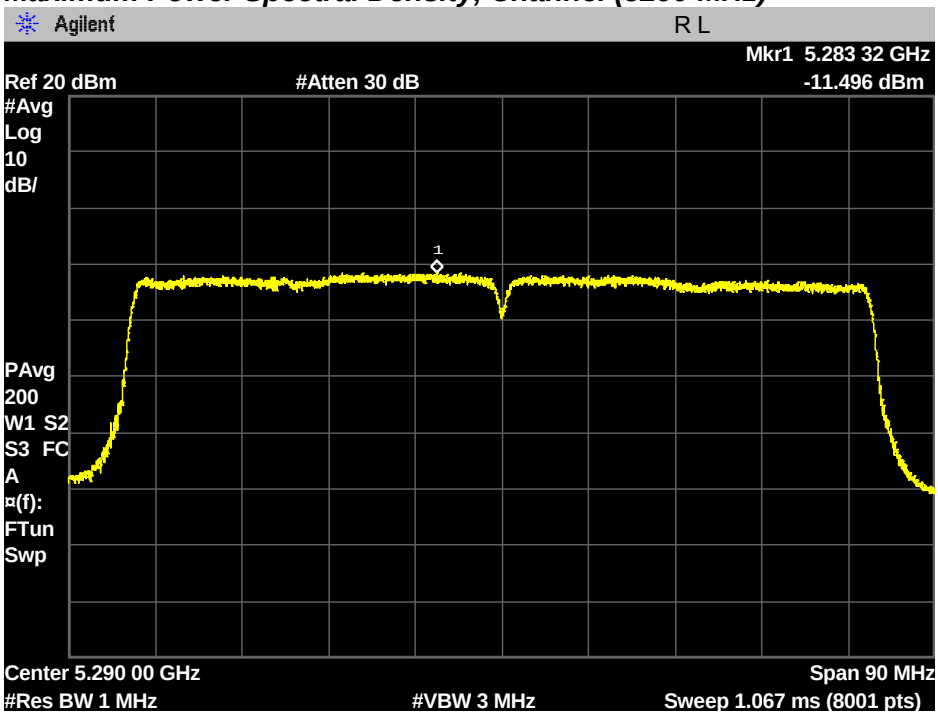


PLOTS OF EMISSIONS

802.11ac (80 MHz) mode - SISO

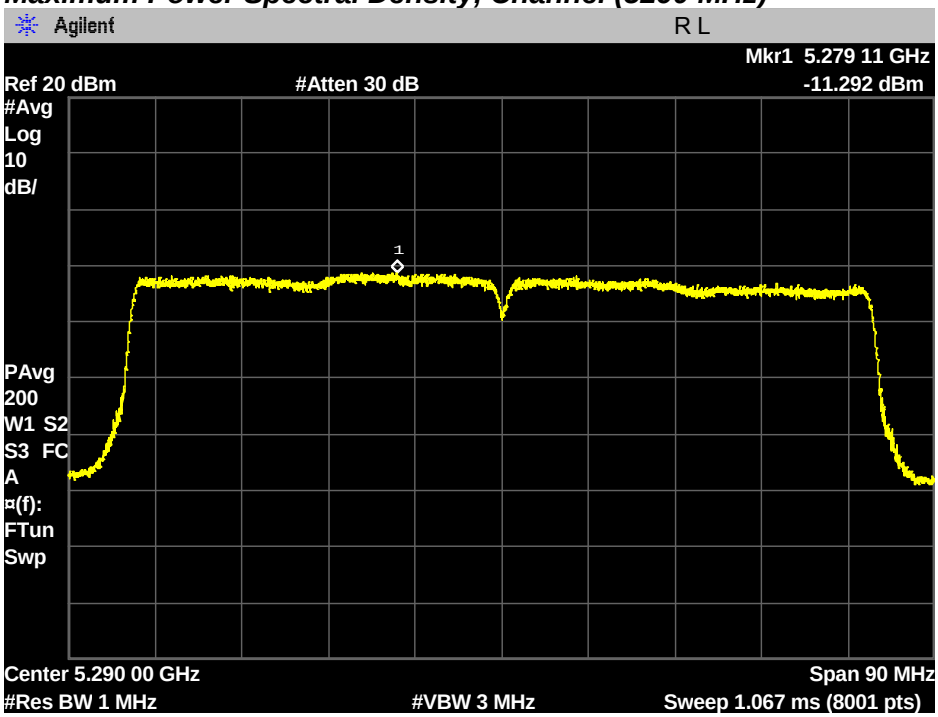
Chain 0

Maximum Power Spectral Density, Channel (5290 MHz)



Chain 1

Maximum Power Spectral Density, Channel (5290 MHz)

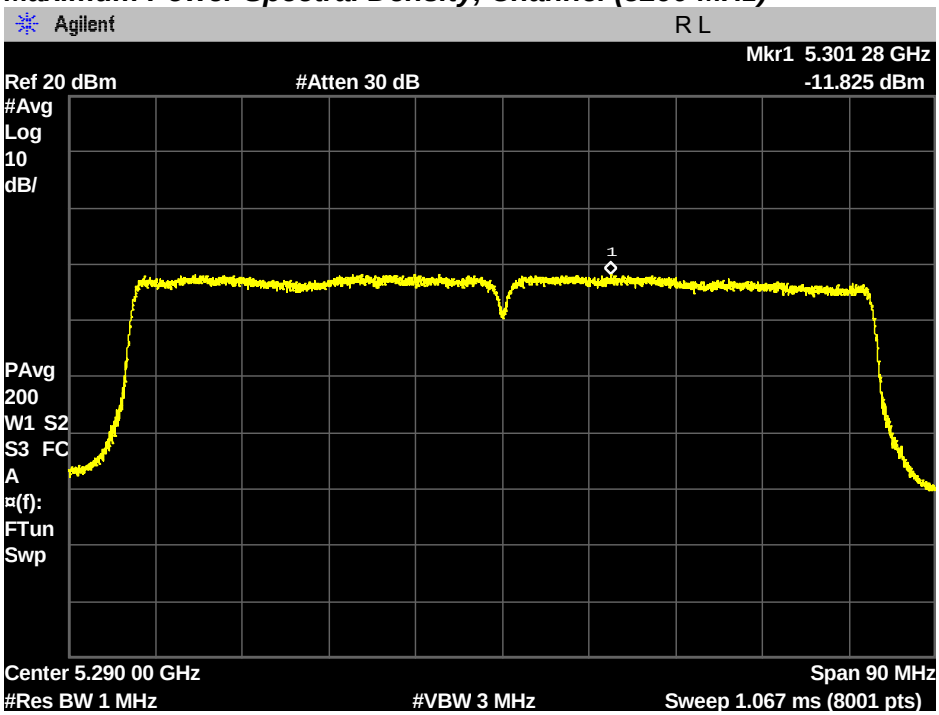


PLOTS OF EMISSIONS

802.11ac (80 MHz) mode - CDD

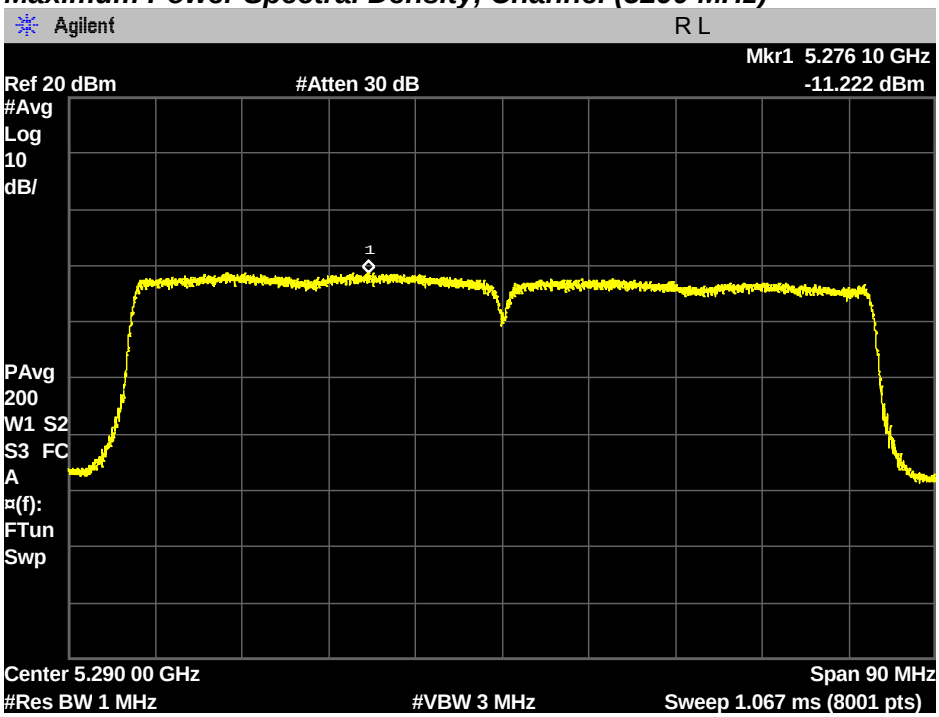
Chain 0

Maximum Power Spectral Density, Channel (5290 MHz)



Chain 1

Maximum Power Spectral Density, Channel (5290 MHz)

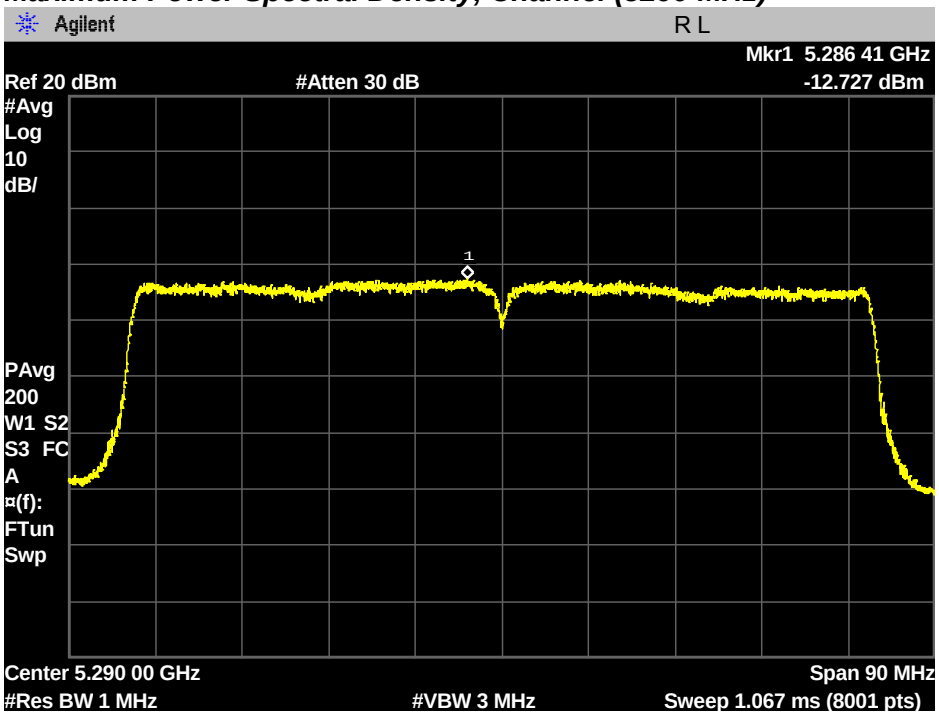


PLOTS OF EMISSIONS

802.11ac (80 MHz) mode - MIMO

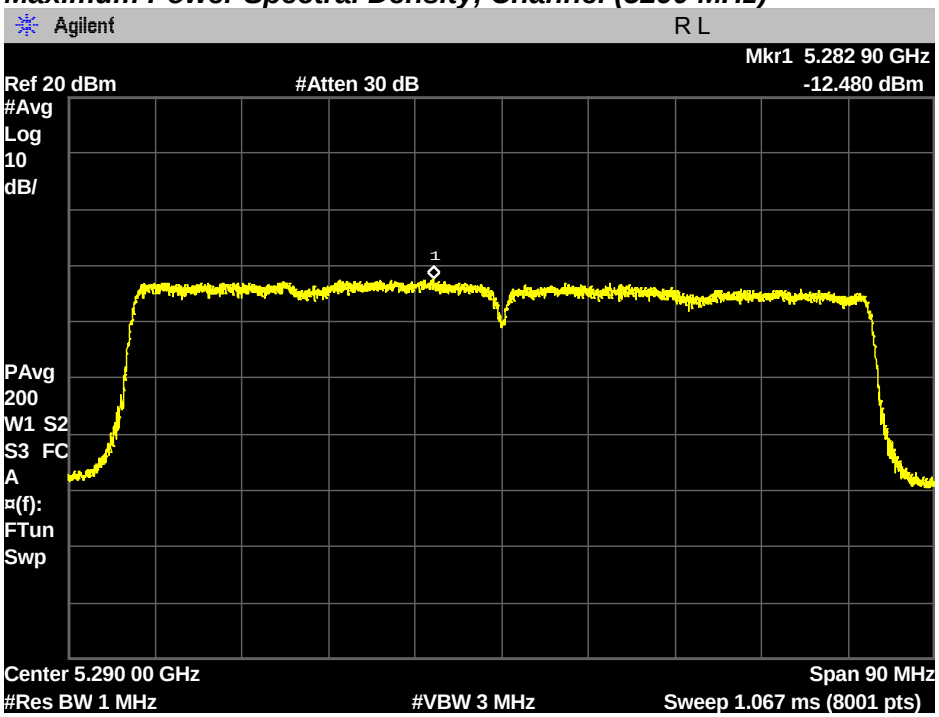
Chain 0

Maximum Power Spectral Density, Channel (5290 MHz)



Chain 1

Maximum Power Spectral Density, Channel (5290 MHz)



8.6.3 Maximum Power Spectral Density – UNII-2C band

FCC §15.407(a), RSS-247 Issue 1, 6.2

Test Mode : Set to Lowest channel, Middle channel Highest channel

802.11a mode

Channel	Frequency (MHz)	Measured PSD (dBm)		Maximum PSD (dBm)*		FCC Limit (dBm/ MHz)	IC Limit (dBm/MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		
Lowest	5500	-1.38	-4.44	-0.55	-3.61	11.00	11.00
Middle	5580	-2.71	-5.14	-1.87	-4.30	11.00	11.00
Highest	5700	-4.08	-7.04	-3.24	-6.20	11.00	11.00

802.11n (20 MHz) mode - SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		Maximum PSD (dBm)*		FCC Limit (dBm/ MHz)	IC Limit (dBm/MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		
Lowest	5500	-2.51	-4.78	-1.63	-3.90	11.00	11.00
Middle	5580	-2.89	-5.87	-2.01	-4.99	11.00	11.00
Highest	5700	-4.72	-7.64	-3.81	-6.73	11.00	11.00

TEST DATA

802.11n (20 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5500	-2.76	-5.15	0.88	0.10	11.00	11.00
Middle	5580	-3.69	-6.02	0.88	-0.81	11.00	11.00
Highest	5700	-4.81	-7.85	0.91	-2.15	11.00	11.00

802.11n (20 MHz) mode – MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5500	-3.19	-5.56	1.58	0.38	11.00	11.00
Middle	5580	-4.12	-6.72	1.59	-0.63	11.00	11.00
Highest	5700	-5.12	-8.13	1.60	-1.76	11.00	11.00

802.11n (40 MHz) mode – SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		Maximum PSD (dBm)*		FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		
Lowest	5510	-8.77	-11.58	-7.15	-9.96	11.00	11.00
Middle	5550	-8.92	-12.01	-7.29	-10.38	11.00	11.00
Highest	5670	-10.60	-14.14	-8.97	-12.51	11.00	11.00

TEST DATA

802.11n (40 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5510	-9.13	-11.49	1.62	-5.52	11.00	11.00
Middle	5550	-9.38	-11.75	1.63	-5.76	11.00	11.00
Highest	5670	-11.32	-14.37	1.63	-7.94	11.00	11.00

802.11n (40 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5510	-10.13	-12.20	2.67	-5.36	11.00	11.00
Middle	5550	-10.39	-12.71	2.67	-5.72	11.00	11.00
Highest	5670	-11.80	-14.95	2.67	-7.42	11.00	11.00

802.11ac (20 MHz) mode - SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		Maximum PSD (dBm)*		FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		
Lowest	5500	-3.27	-4.56	-2.38	-3.67	11.00	11.00
Middle	5580	-3.02	-6.07	-2.12	-5.17	11.00	11.00
Highest	5700	-4.44	-7.60	-3.55	-6.71	11.00	11.00

TEST DATA

802.11ac (20 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5500	-2.81	-5.29	0.89	0.02	11.00	11.00
Middle	5580	-3.67	-6.24	0.90	-0.86	11.00	11.00
Highest	5700	-4.88	-8.08	0.89	-2.29	11.00	11.00

802.11ac (20 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5500	-3.43	-5.42	1.57	0.27	11.00	11.00
Middle	5580	-3.97	-6.72	1.56	-0.56	11.00	11.00
Highest	5700	-5.18	-8.15	1.56	-1.85	11.00	11.00

802.11ac (40 MHz) mode – SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		Maximum PSD (dBm)*		FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		
Lowest	5510	-8.53	-11.60	-6.91	-9.98	11.00	11.00
Middle	5550	-9.26	-11.86	-7.63	-10.23	11.00	11.00
Highest	5670	-10.70	-14.14	-9.08	-12.52	11.00	11.00

TEST DATA

802.11ac (40 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5510	-9.03	-11.41	1.62	-5.43	11.00	11.00
Middle	5550	-9.71	-11.93	1.63	-6.04	11.00	11.00
Highest	5670	-11.16	-13.99	1.62	-7.72	11.00	11.00

802.11ac (40 MHz) mode - MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/ MHz)
		Chain 0	Chain 1		Total output power		
Lowest	5510	-9.51	-12.12	2.65	-4.96	11.00	11.00
Middle	5550	-10.25	-12.73	2.67	-5.64	11.00	11.00
Highest	5670	-11.82	-14.70	2.68	-7.34	11.00	11.00

802.11ac (80 MHz) mode - SISO

Channel	Frequency (MHz)	Measured PSD (dBm)		Maximum PSD (dBm)*		FCC Limit (dBm/MHz)	IC Limit (dBm/MHz)
		Chain 0	Chain 1	Chain 0	Chain 1		
	5530	-14.15	-16.74	-11.33	-13.92	11.00	11.00

TEST DATA

802.11ac (80 MHz) mode - CDD

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/MHz)
		Chain 0	Chain 1		Total output power		
	5530	-14.63	-16.96	2.82	-9.81	11.00	11.00

802.11ac (80 MHz) mode – MIMO

Channel	Frequency (MHz)	Measured PSD (dBm)		Duty Factor (dB)	Maximum PSD (dBm)*	FCC Limit (dBm/MHz)	IC Limit (dBm/MHz)
		Chain 0	Chain 1		Total output power		
	5530	-15.90	-18.08	4.12	-9.72	11.00	11.00

TEST DATA

Note:

1. *Maximum Conducted (average) Power = Measured conducted power + Duty Factor
2. Total output power = 10 log [10^{(Chain 0 Power + duty factor)/10} + 10^{(Chain 1 Power + duty factor)/10}]
3. For CDD transmission, directional gain is. **5.71 dBi**

   For MIMO transmission, directional gain is **2.7 dBi.**

   Directional gain was calculated according to KDB662911 D01 Multiple Transmitter Output v02r01.

   For power spectral density (PSD) measurements on all devices employing CDD, directional gain is as follows,

   Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi, where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi. = 2.7 dBi + 10 log(2/1) dB = 5.71 dBi.

   For CDD mode of this device, N_{SS}=1.

   For power spectral density (PSD) measurements on all devices employing MIMO, directional gain is as follows,

   Directional gain = G_{ANT} + 10 log(N_{ANT}/N_{SS}) dBi, where N_{SS} = the number of independent spatial streams of data and G_{ANT} is the antenna gain in dBi. = 2.7 dBi + 10 log(2/2) dB = 2.7 dBi.

   For this device, MIMO mode means SM-MIMO(Spatial Multiplexing) transmission and N_{SS}=2.
4. For FCC PSD Limit, If transmitting antennas of directional gain greater than 6 dBi was used, maximum power spectral density was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
5. The following equation was used for spectrum offset:

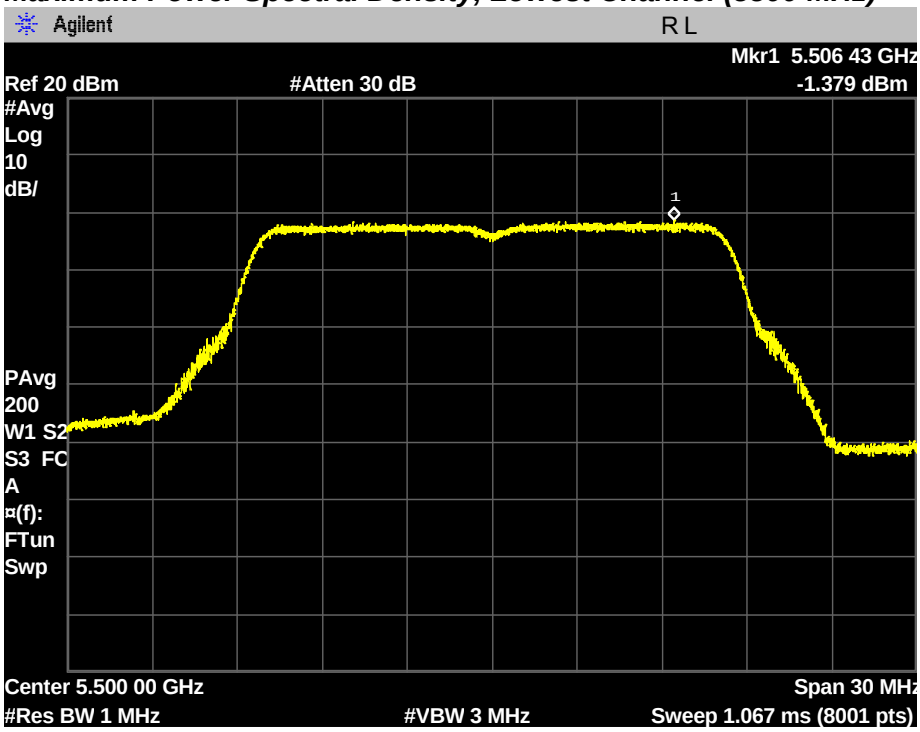
   Spectrum offset (dB) = Attenuator (dB) + Cable Loss (dB) + SMA Type Connector Loss (dB)

PLOTS OF EMISSIONS

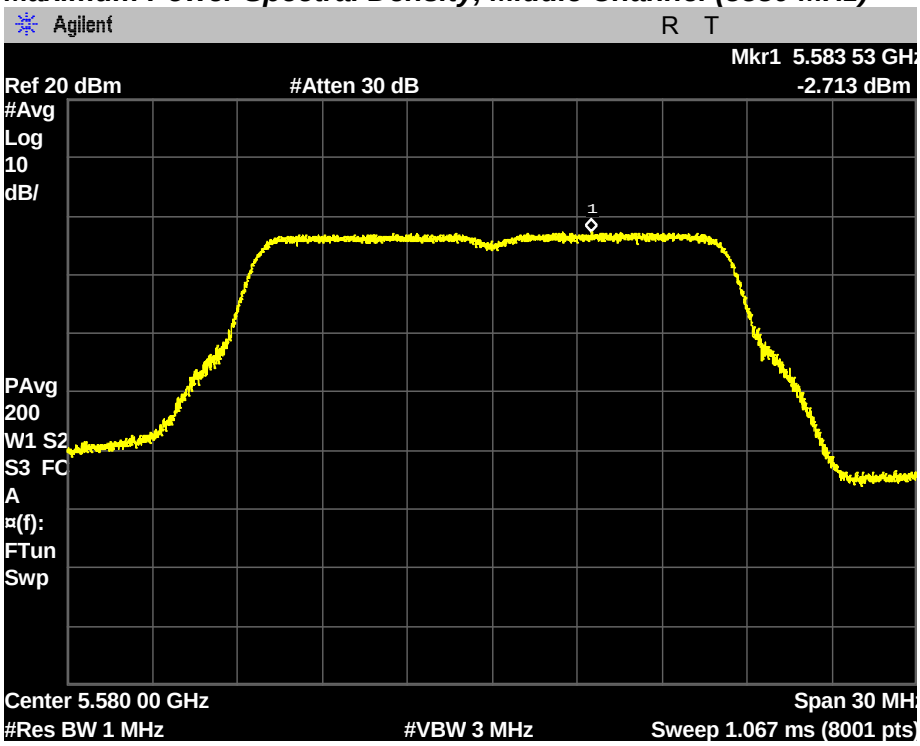
802.11a mode

Chain 0

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

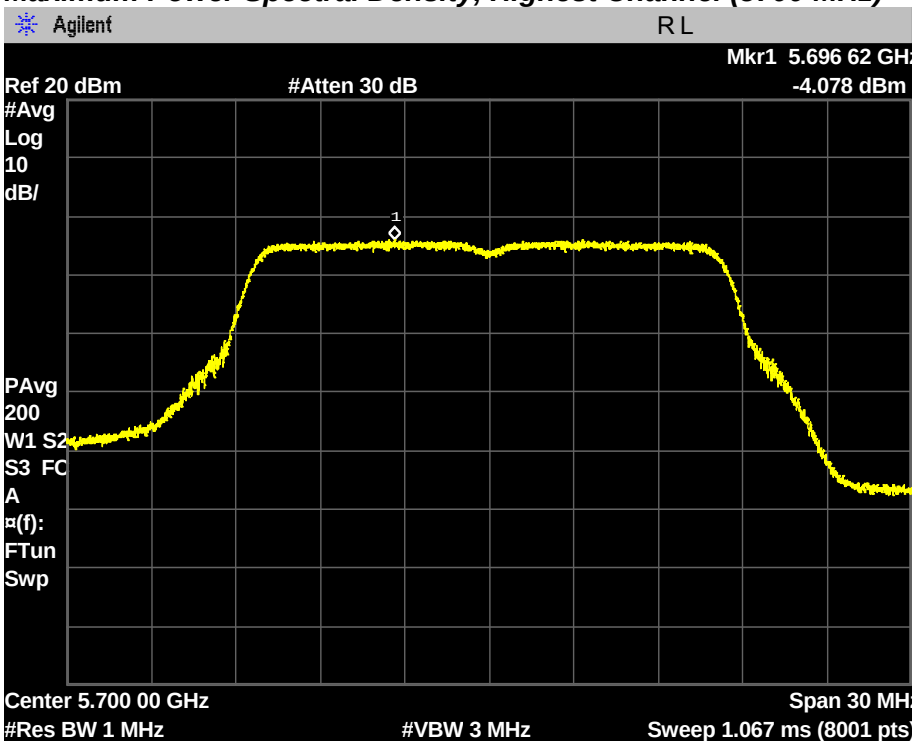


Maximum Power Spectral Density, Middle Channel (5580 MHz)



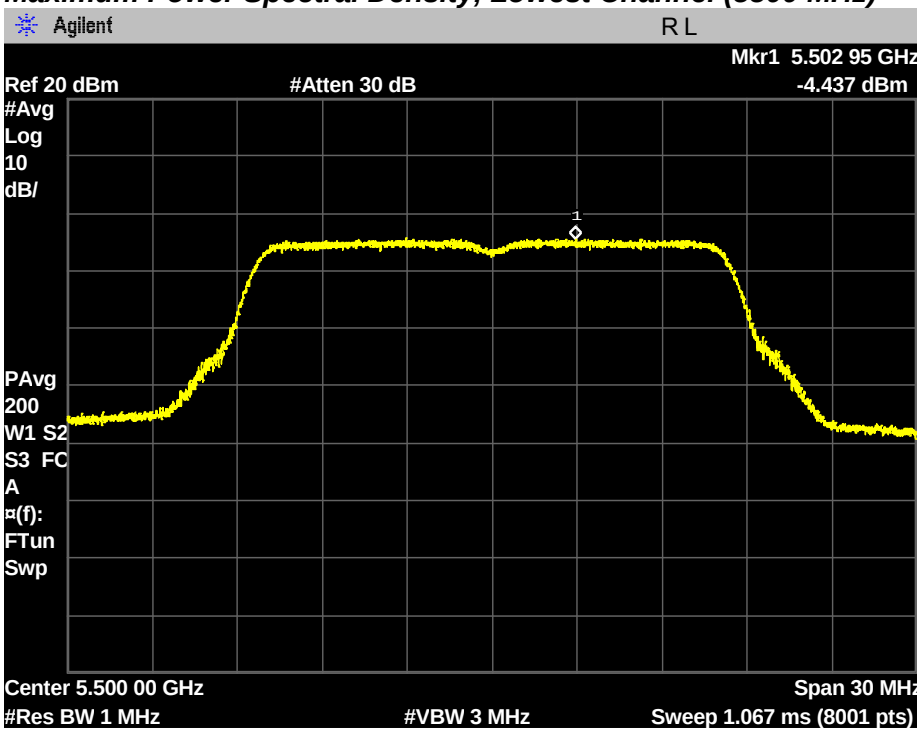
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5700 MHz)



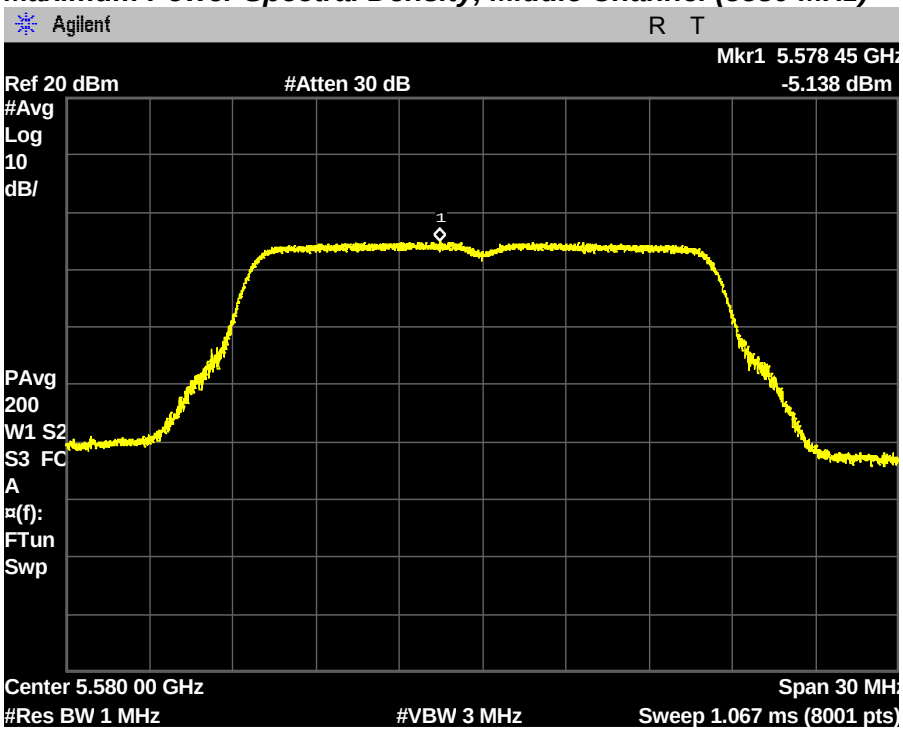
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

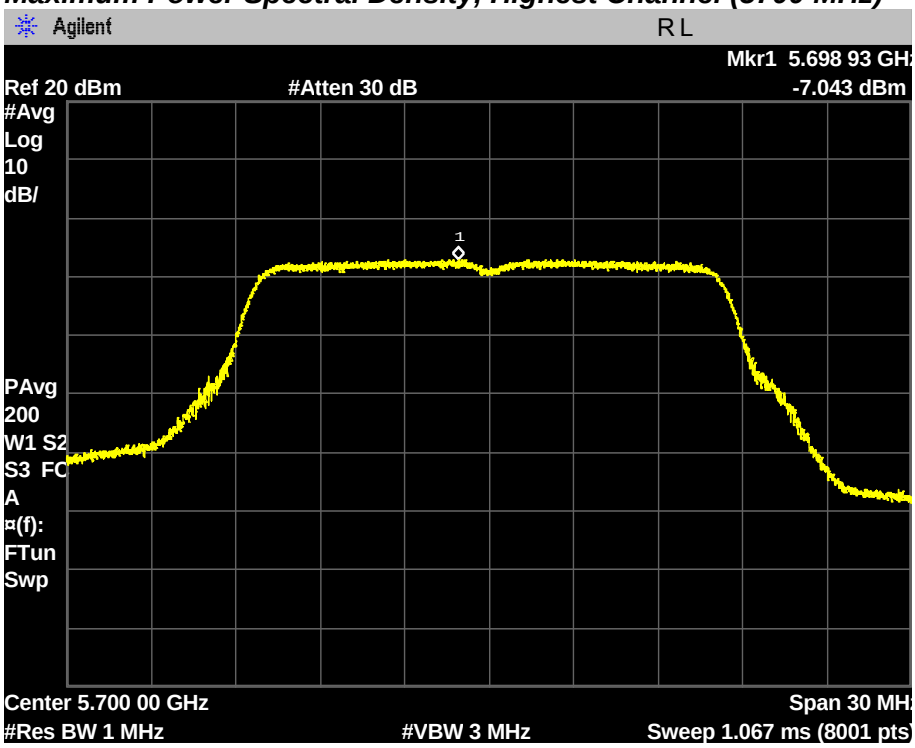


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5580 MHz)



Maximum Power Spectral Density, Highest Channel (5700 MHz)

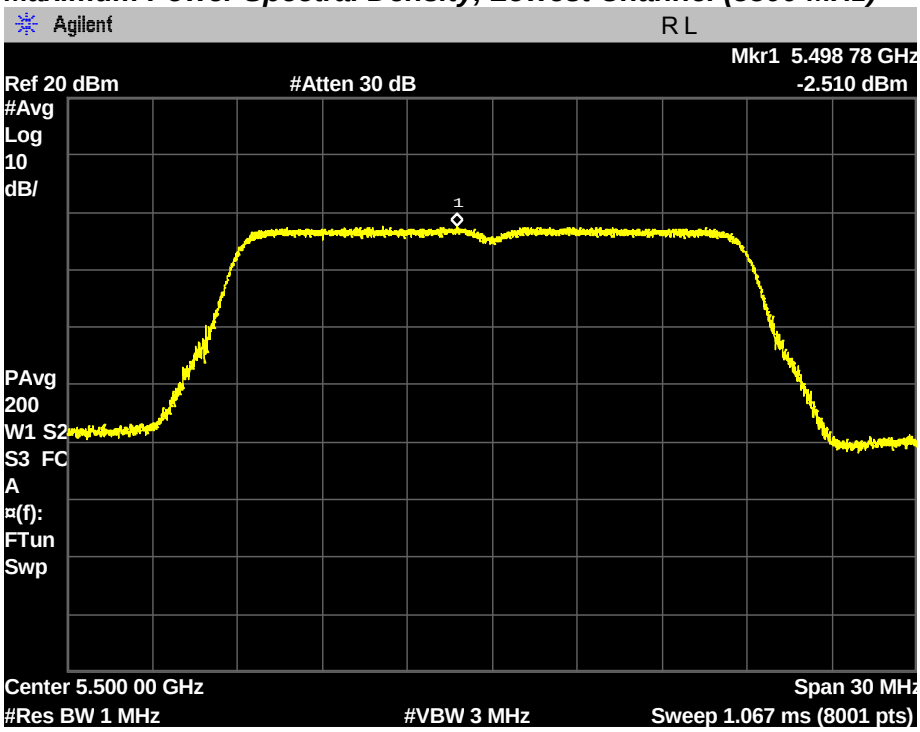


PLOTS OF EMISSIONS

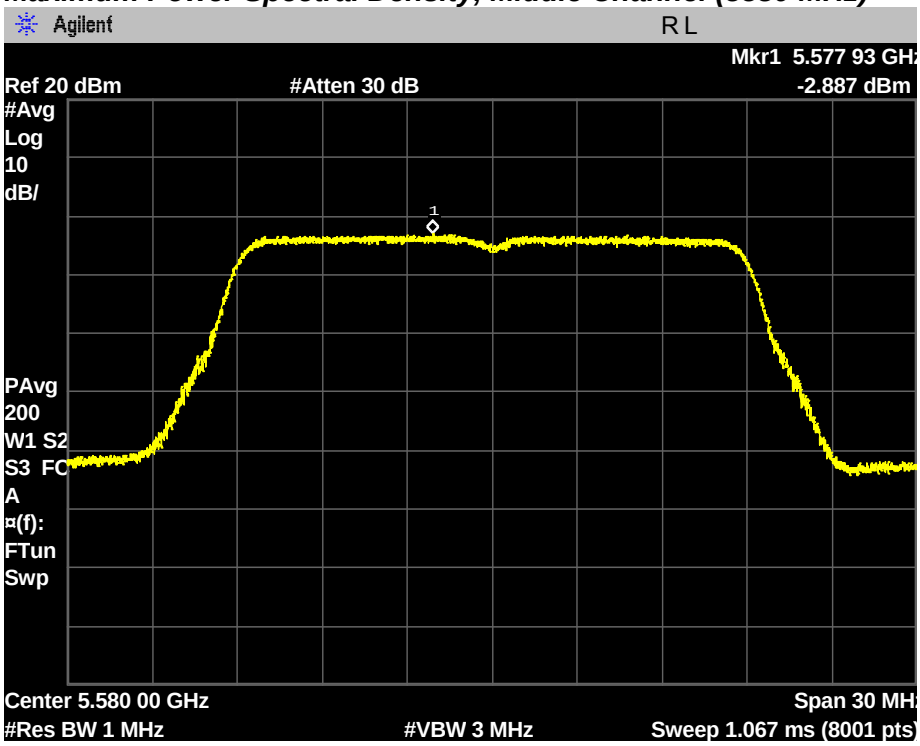
802.11n (20 MHz) mode - SISO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

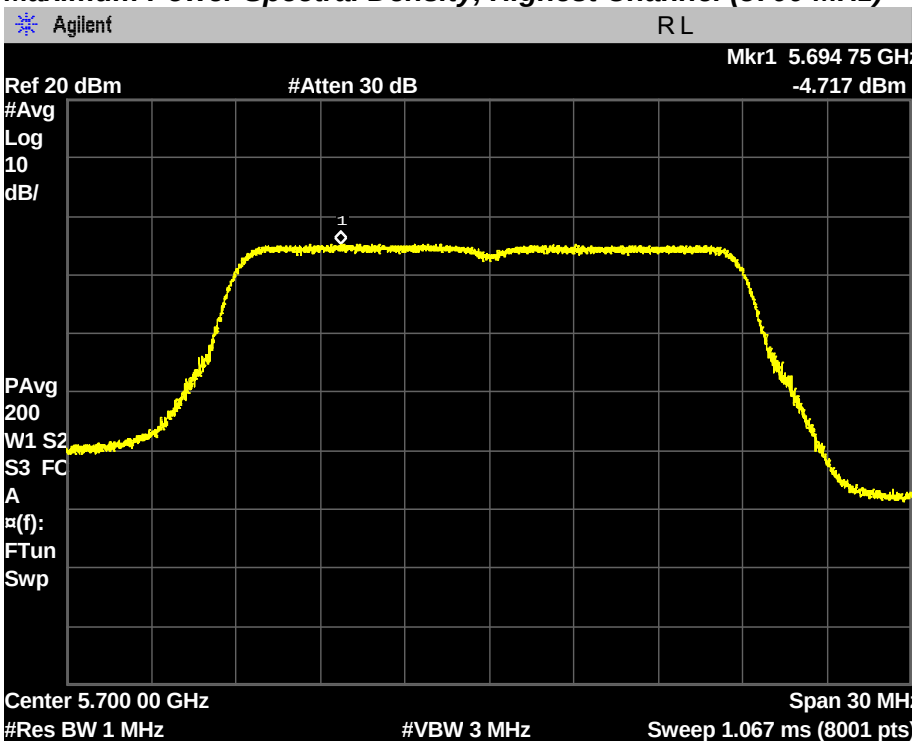


Maximum Power Spectral Density, Middle Channel (5580 MHz)



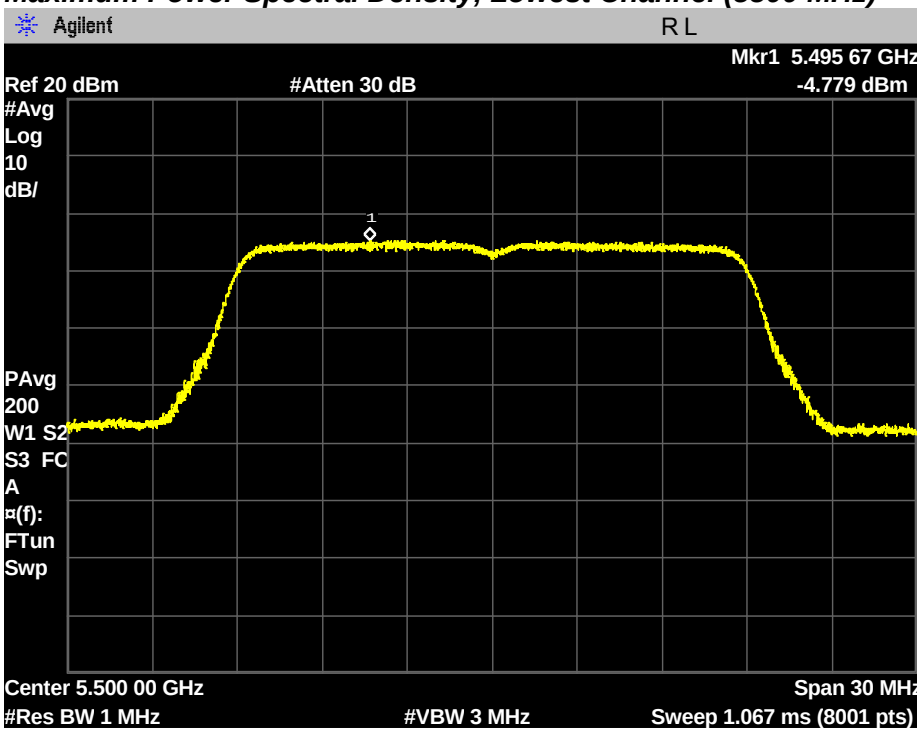
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5700 MHz)



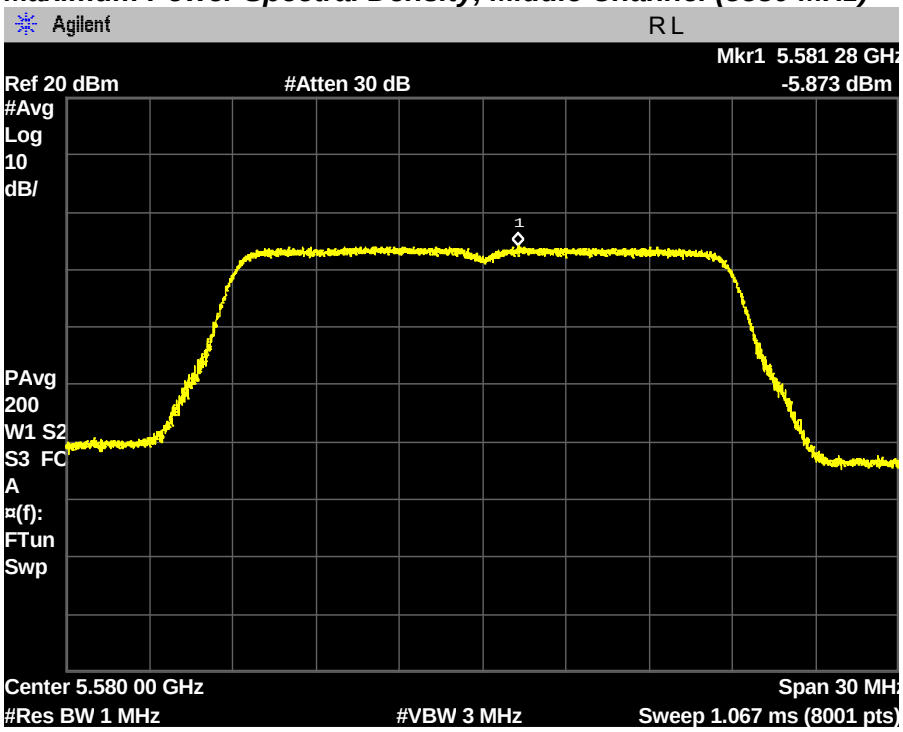
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

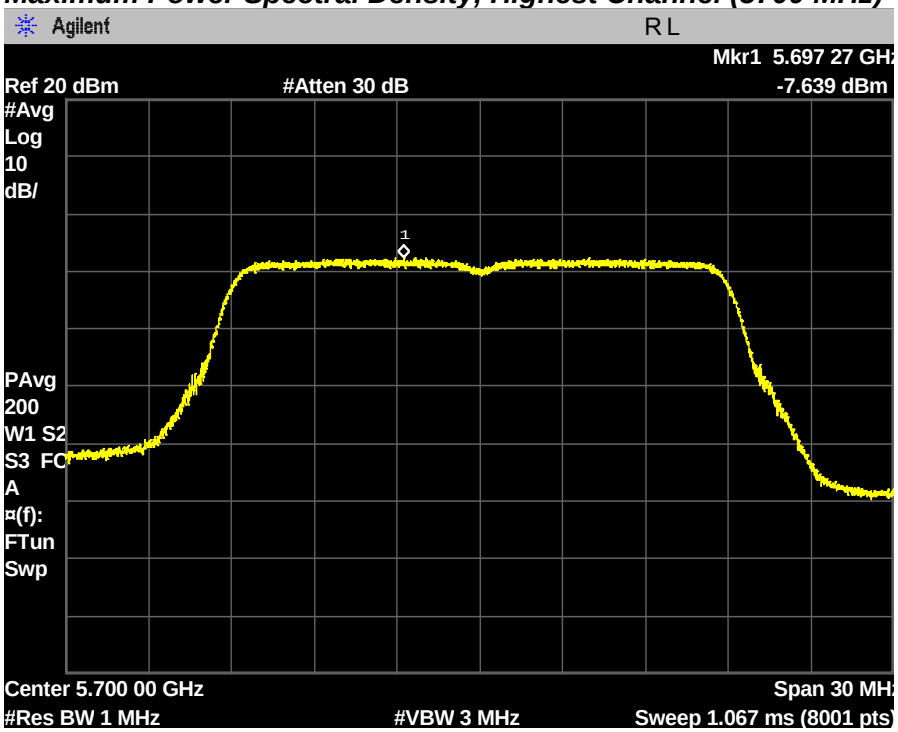


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5580 MHz)



Maximum Power Spectral Density, Highest Channel (5700 MHz)

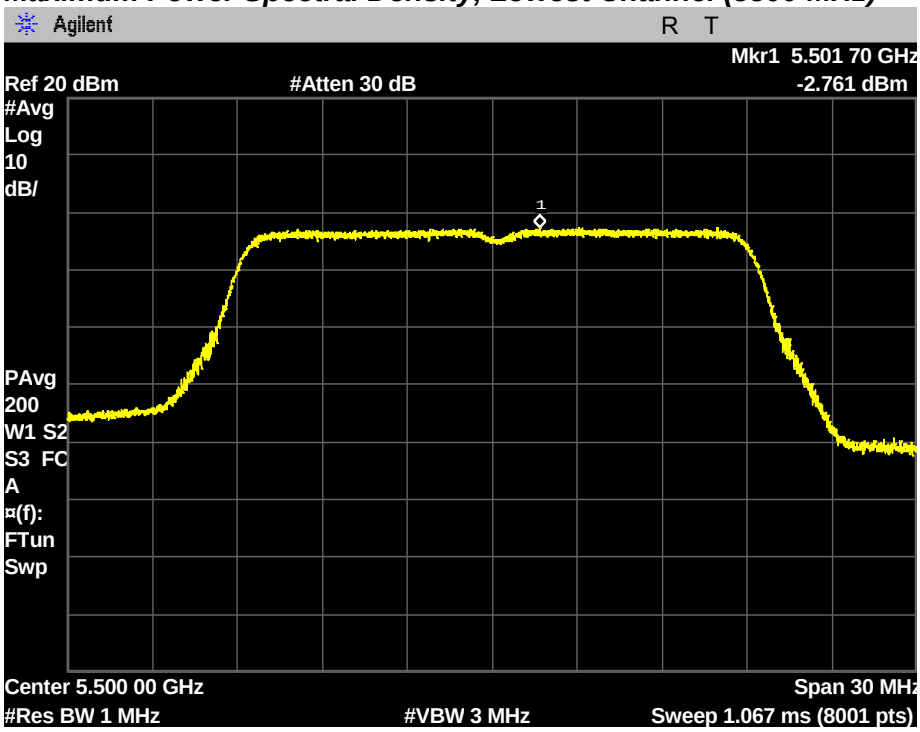


PLOTS OF EMISSIONS

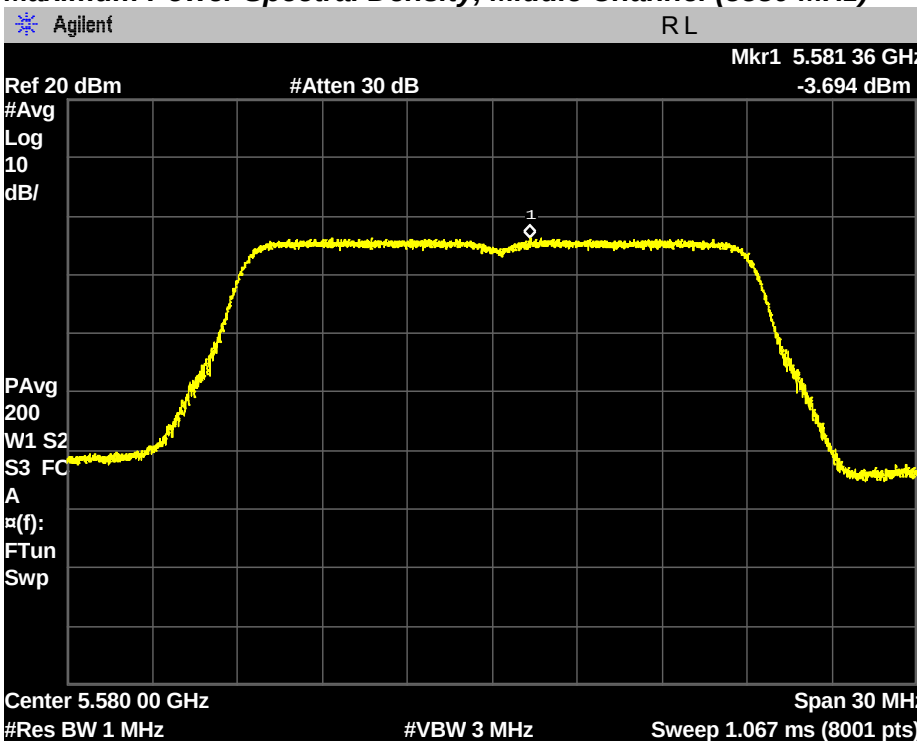
802.11n (20 MHz) mode - CDD

Chain 0

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

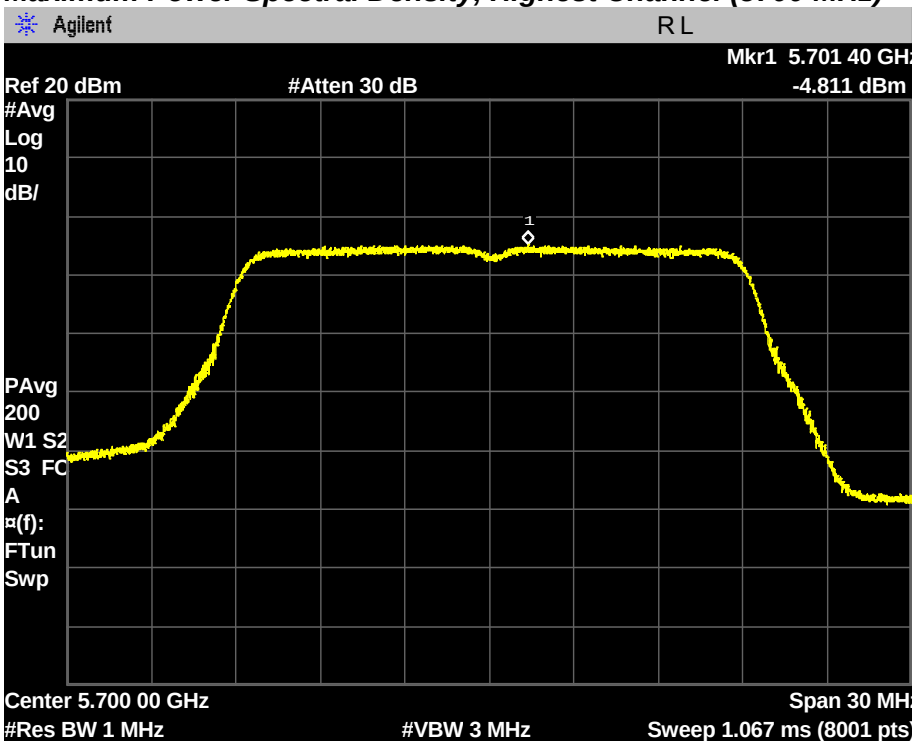


Maximum Power Spectral Density, Middle Channel (5580 MHz)



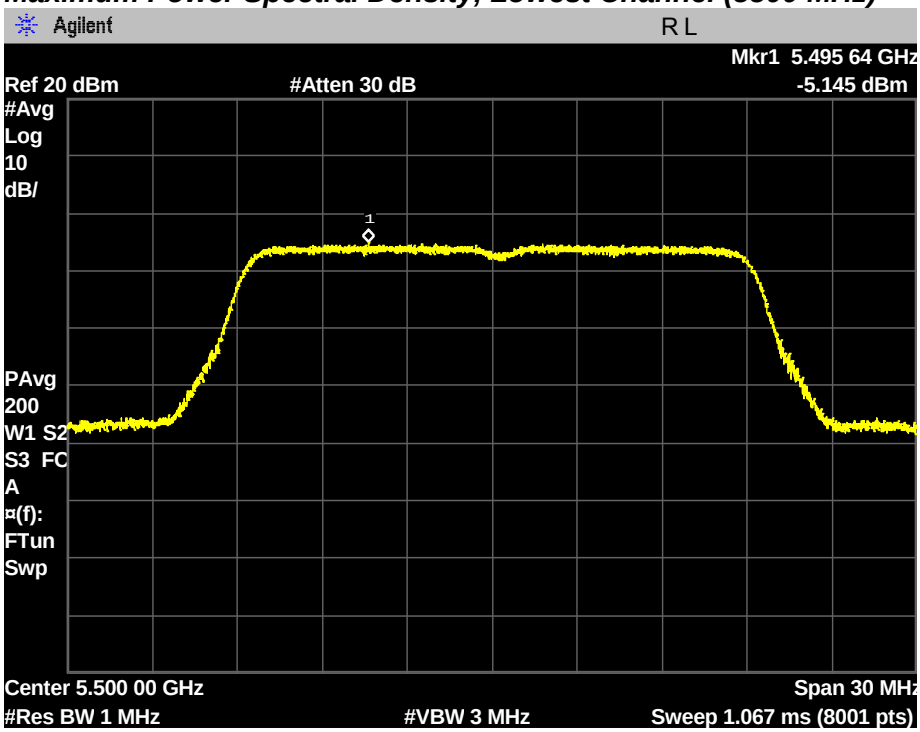
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5700 MHz)



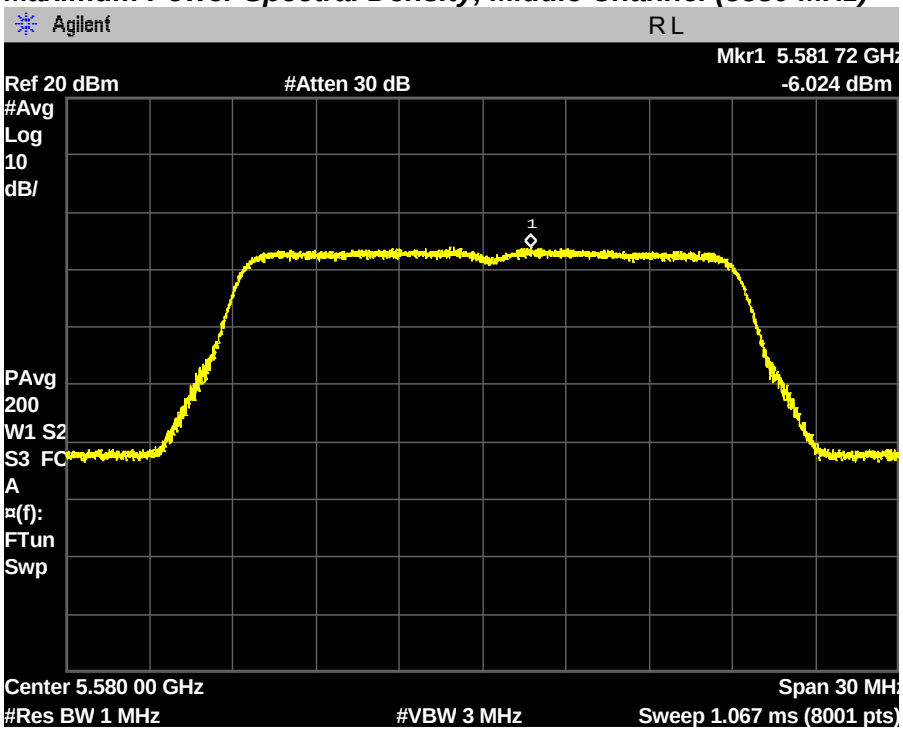
Chain 1

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

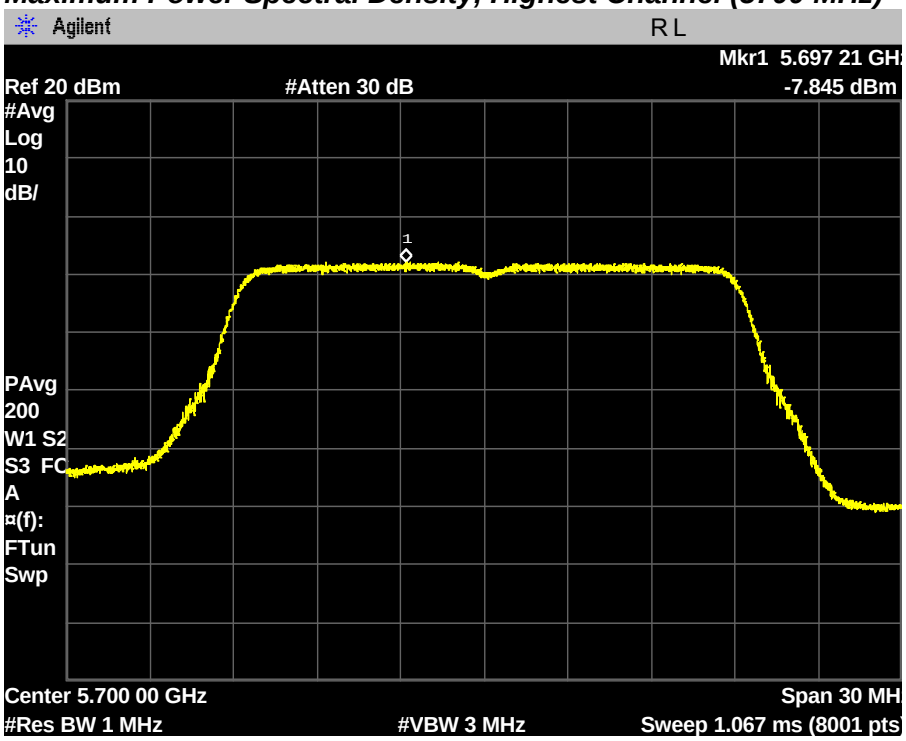


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5580 MHz)



Maximum Power Spectral Density, Highest Channel (5700 MHz)

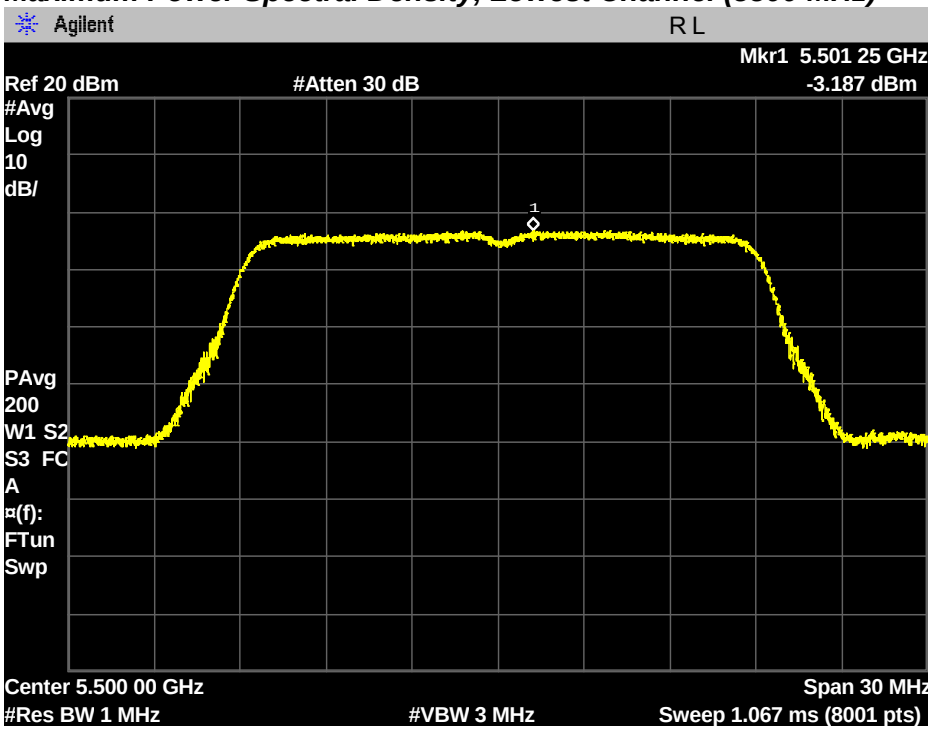


PLOTS OF EMISSIONS

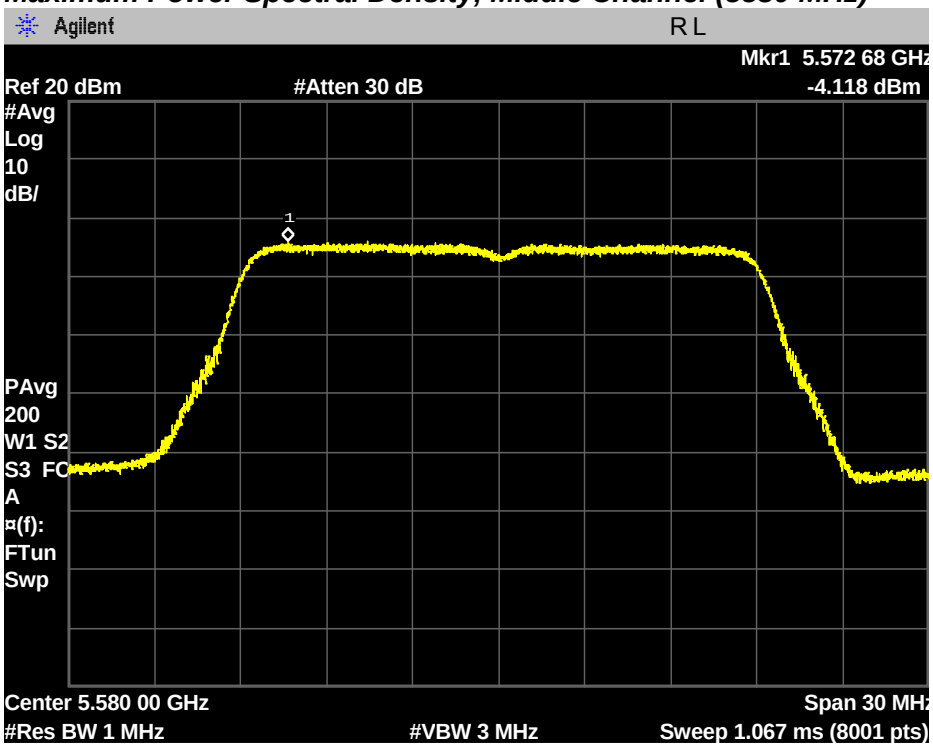
802.11n (20 MHz) mode - MIMO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

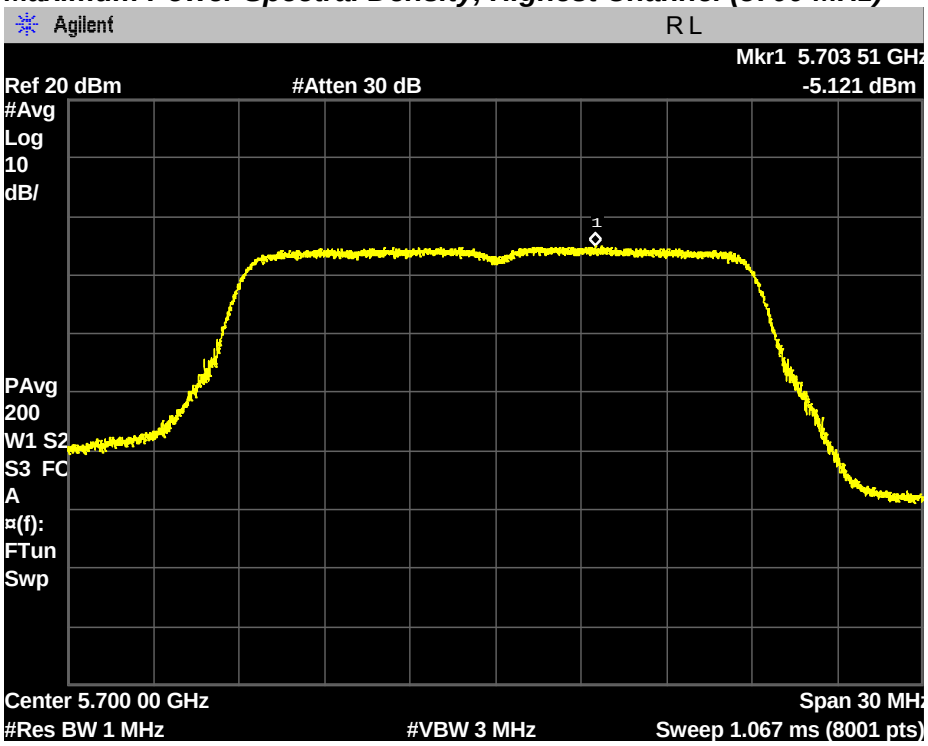


Maximum Power Spectral Density, Middle Channel (5580 MHz)



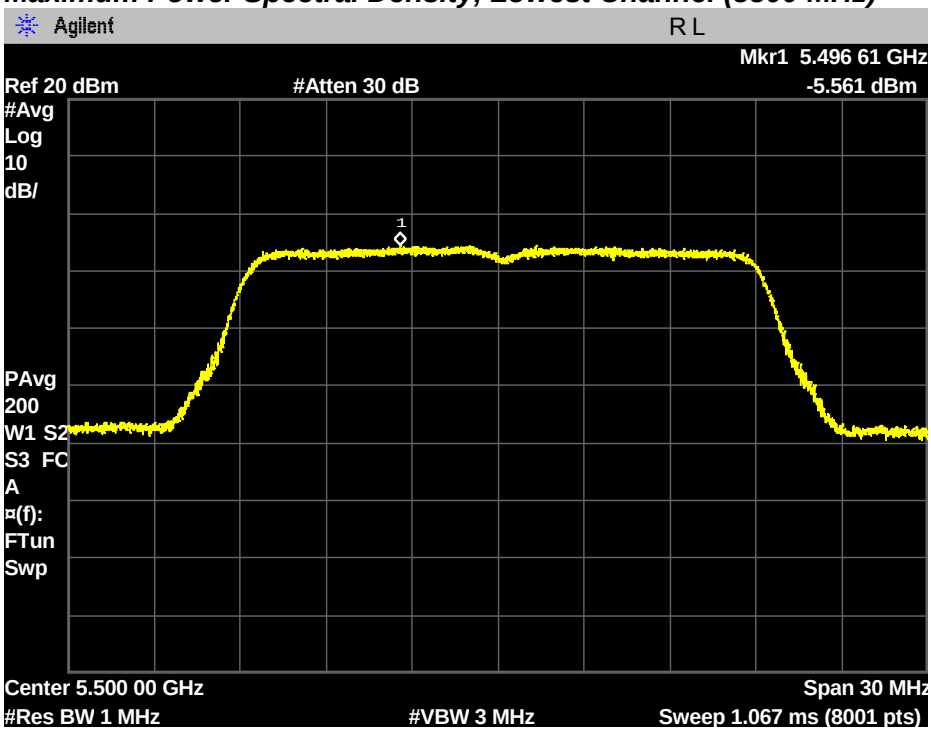
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5700 MHz)



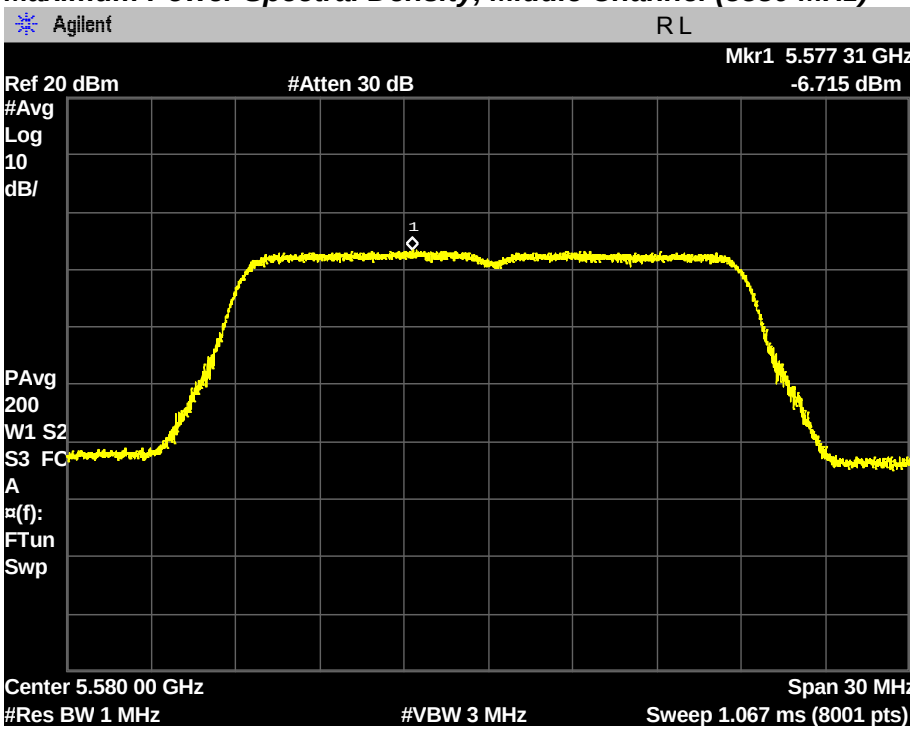
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

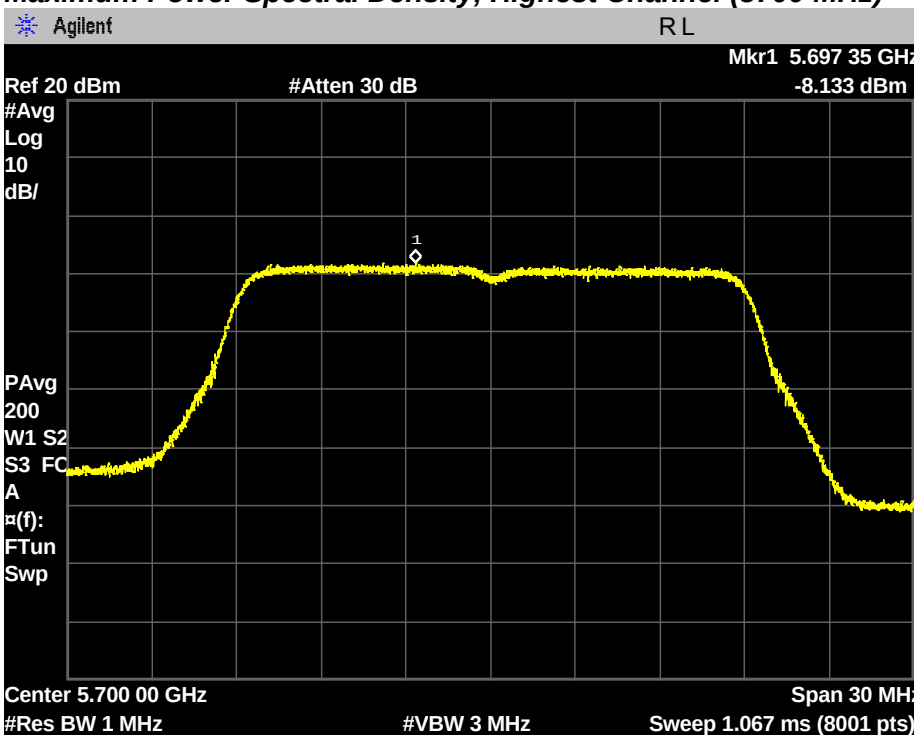


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5580 MHz)



Maximum Power Spectral Density, Highest Channel (5700 MHz)

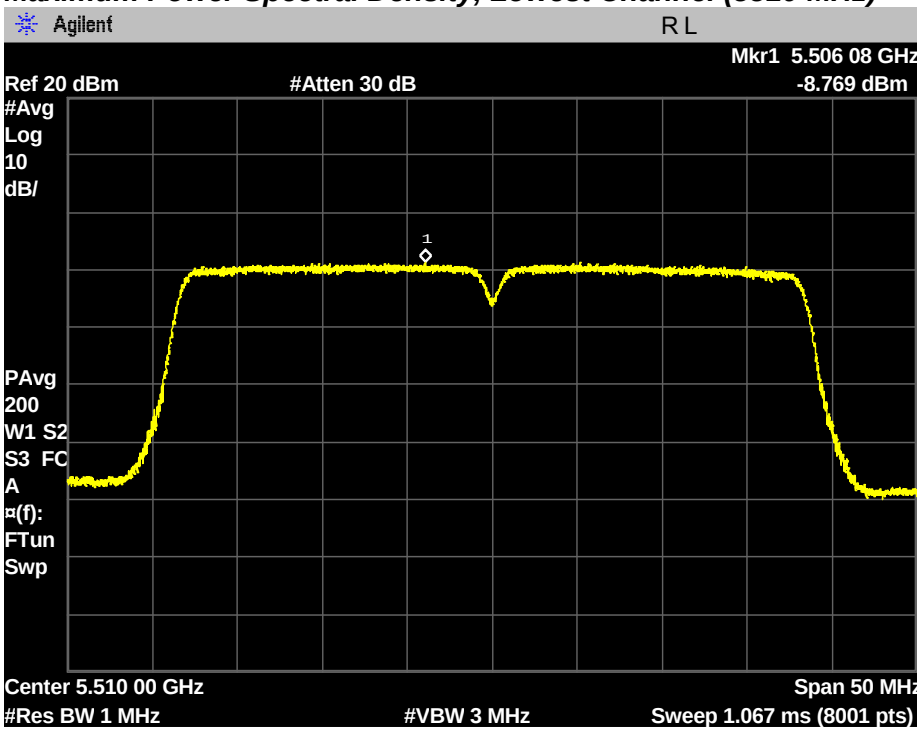


PLOTS OF EMISSIONS

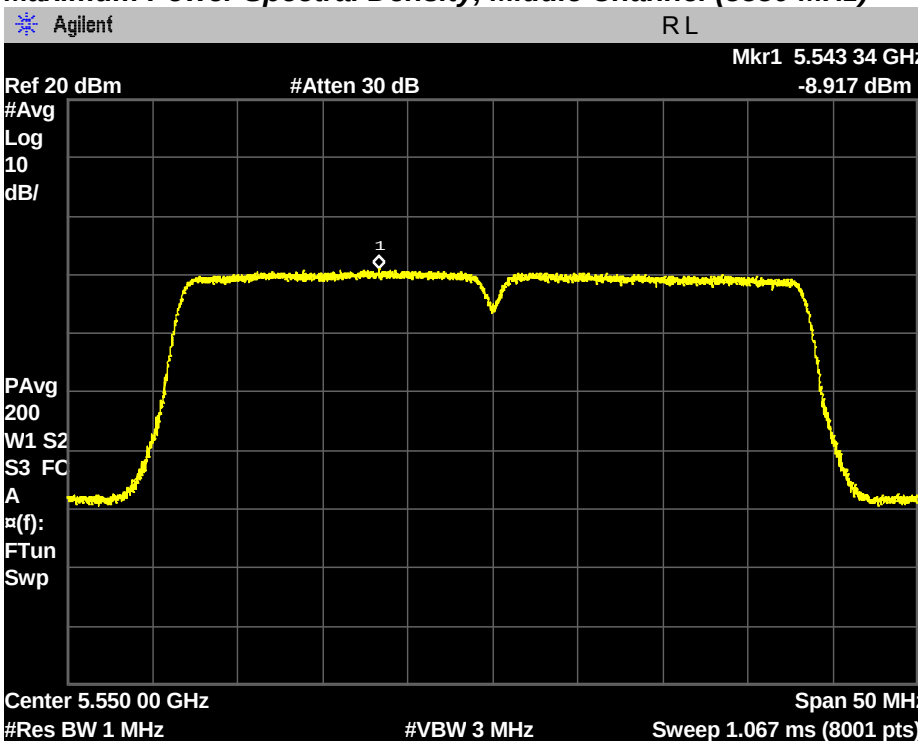
802.11n(40MHz) mode - SISO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

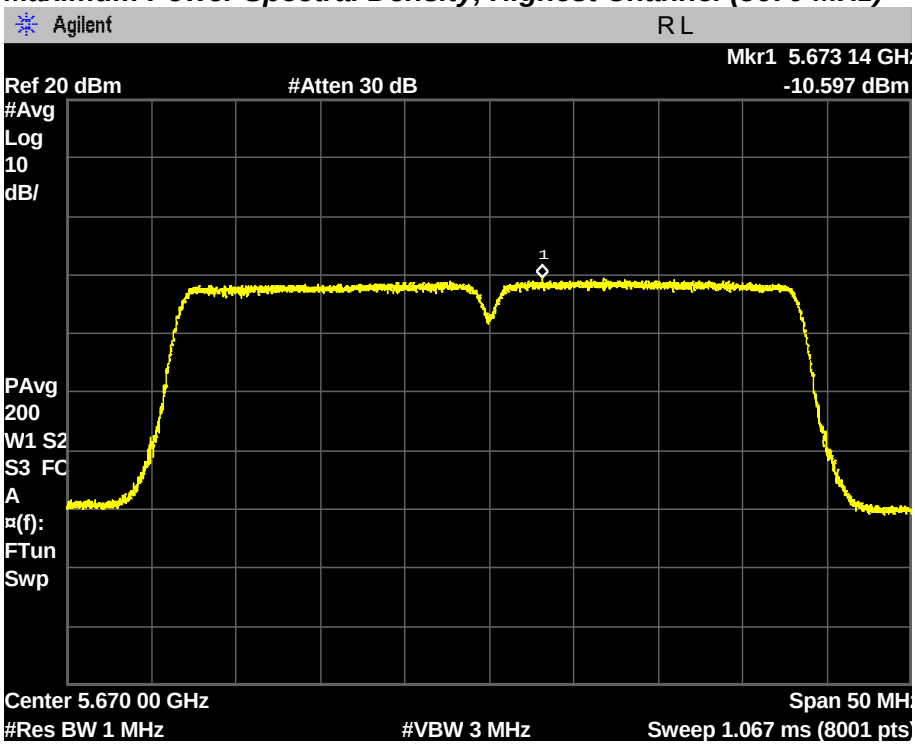


Maximum Power Spectral Density, Middle Channel (5550 MHz)



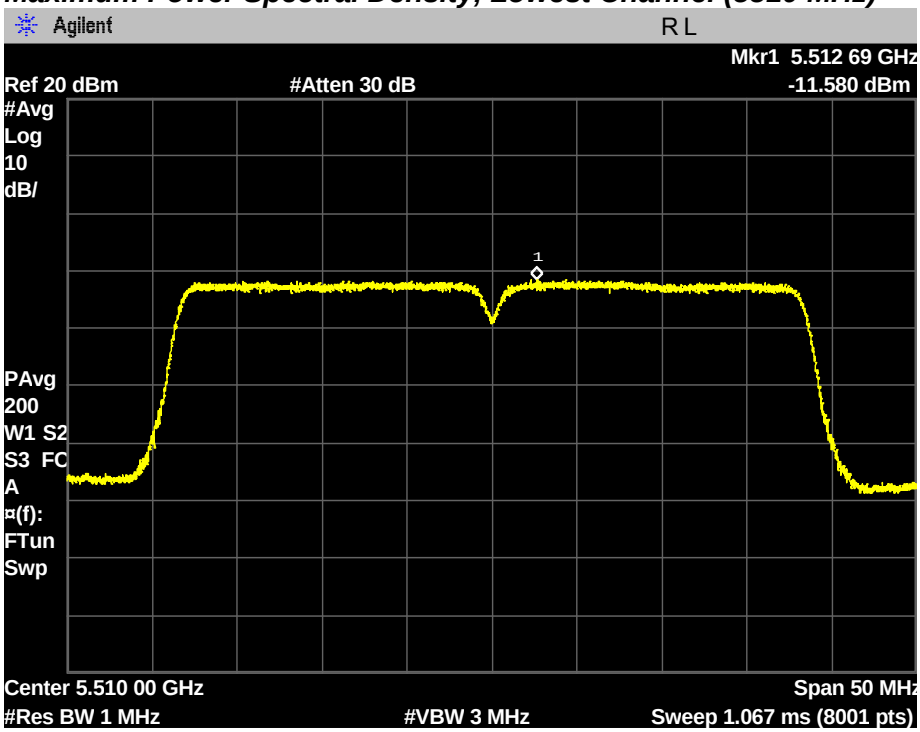
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5670 MHz)



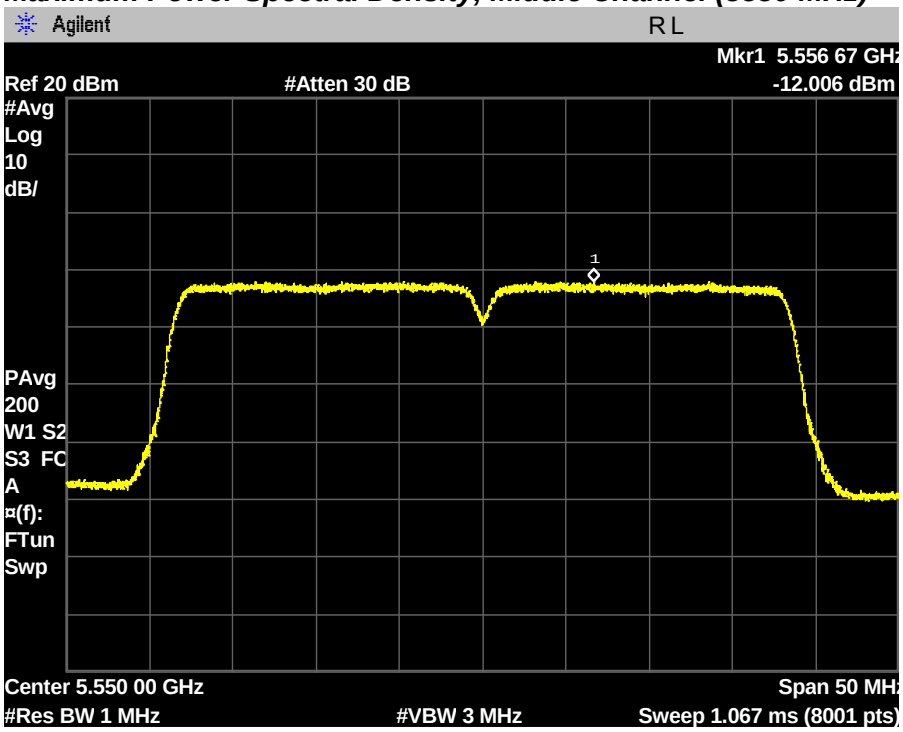
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

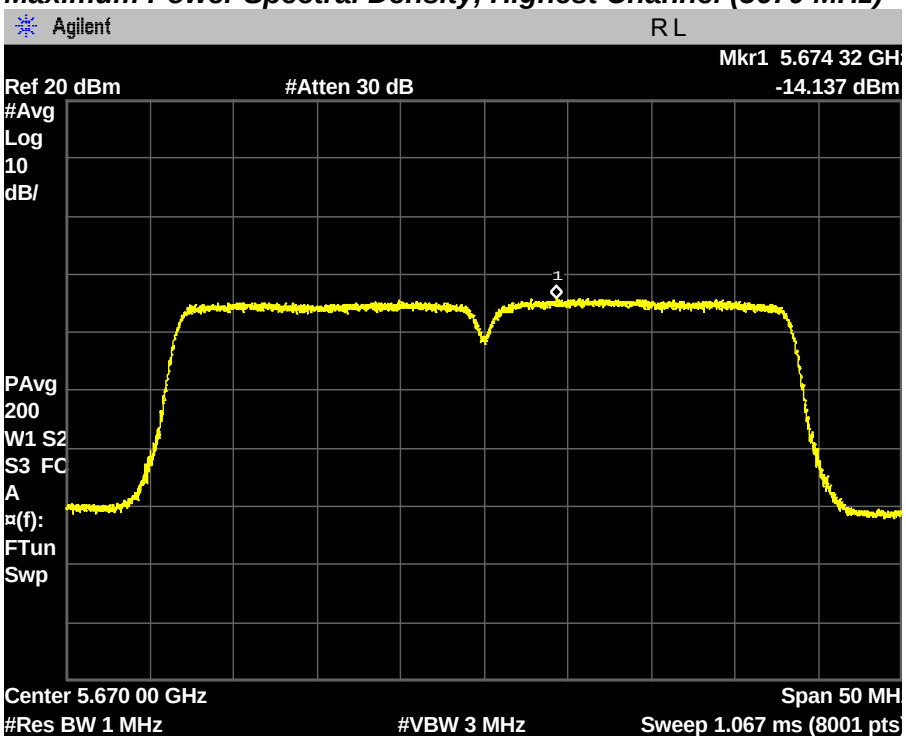


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5550 MHz)



Maximum Power Spectral Density, Highest Channel (5670 MHz)

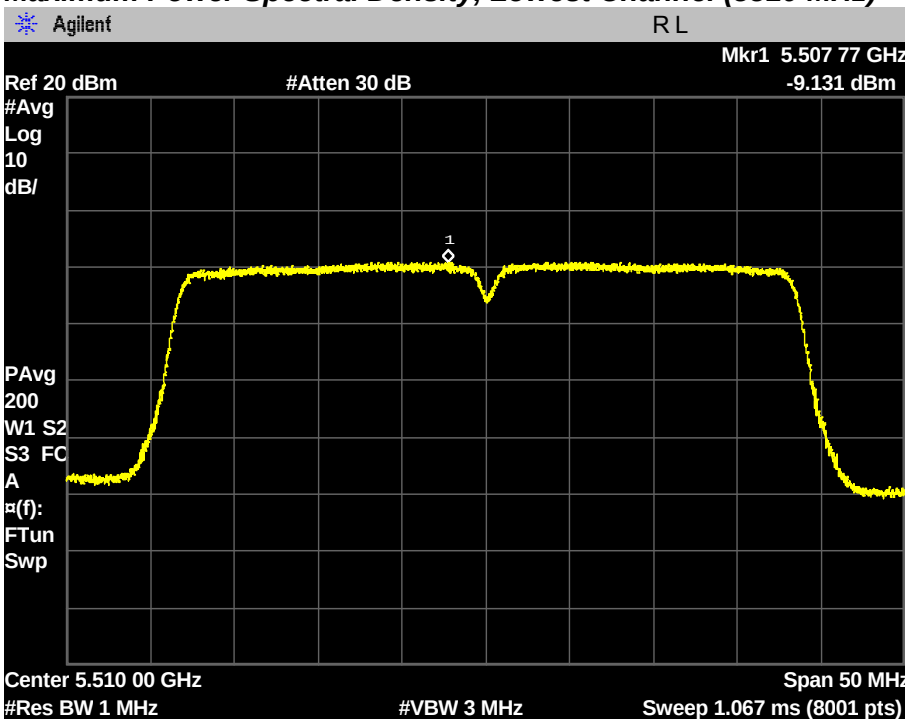


PLOTS OF EMISSIONS

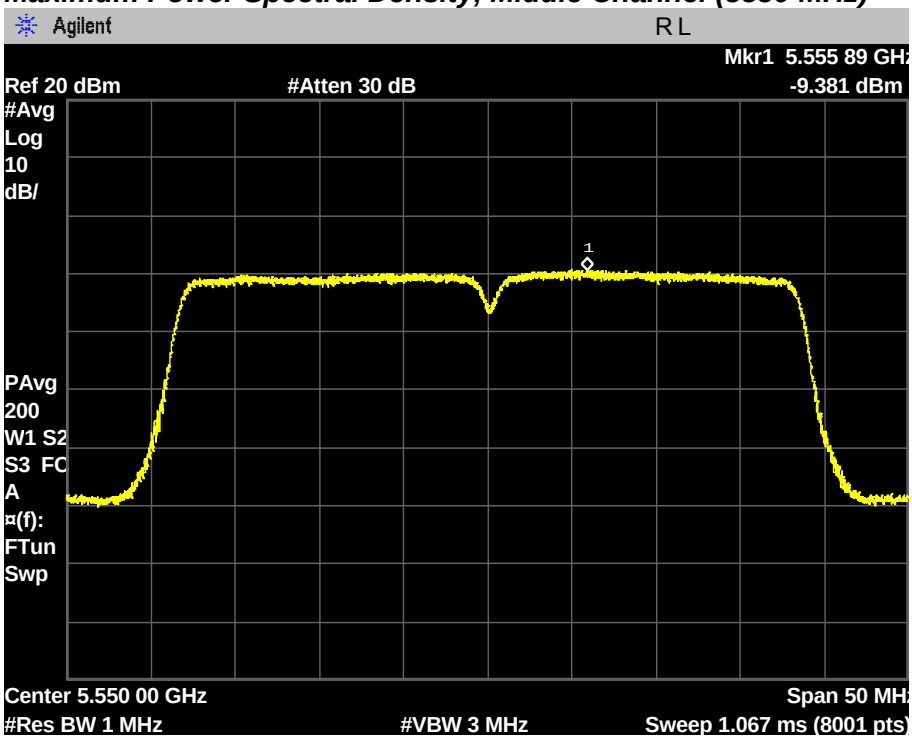
802.11n(40MHz) mode - CDD

Chain 0

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

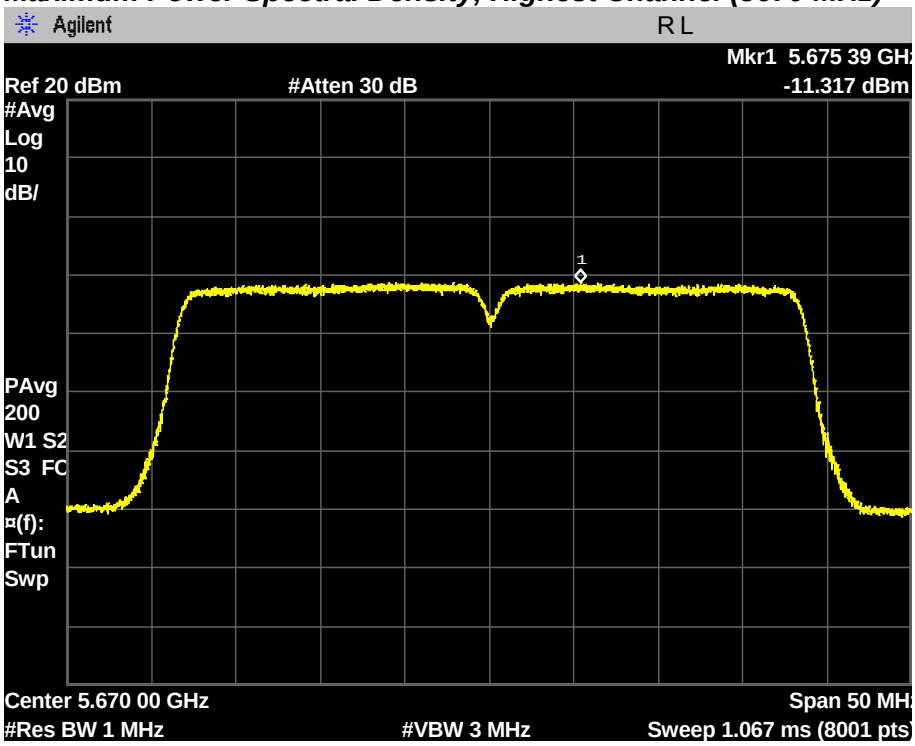


Maximum Power Spectral Density, Middle Channel (5550 MHz)



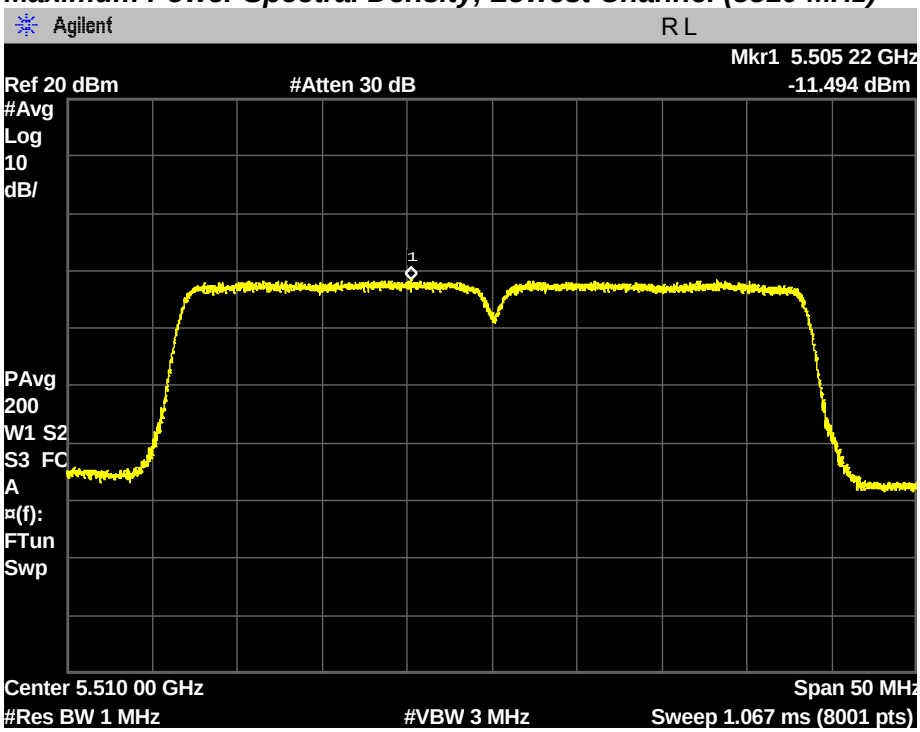
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5670 MHz)



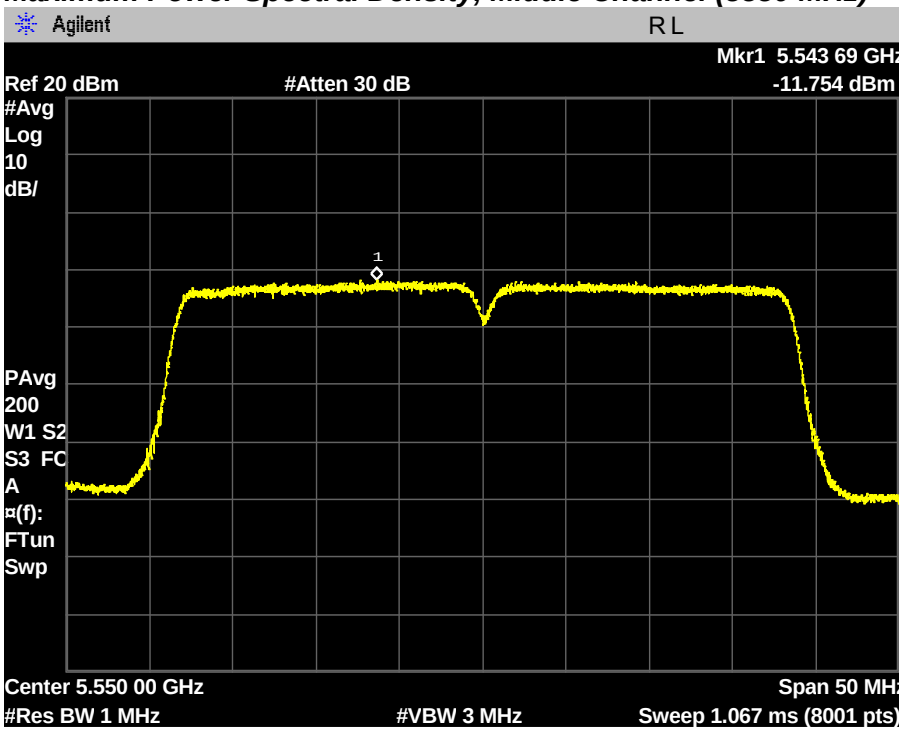
Chain 1

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

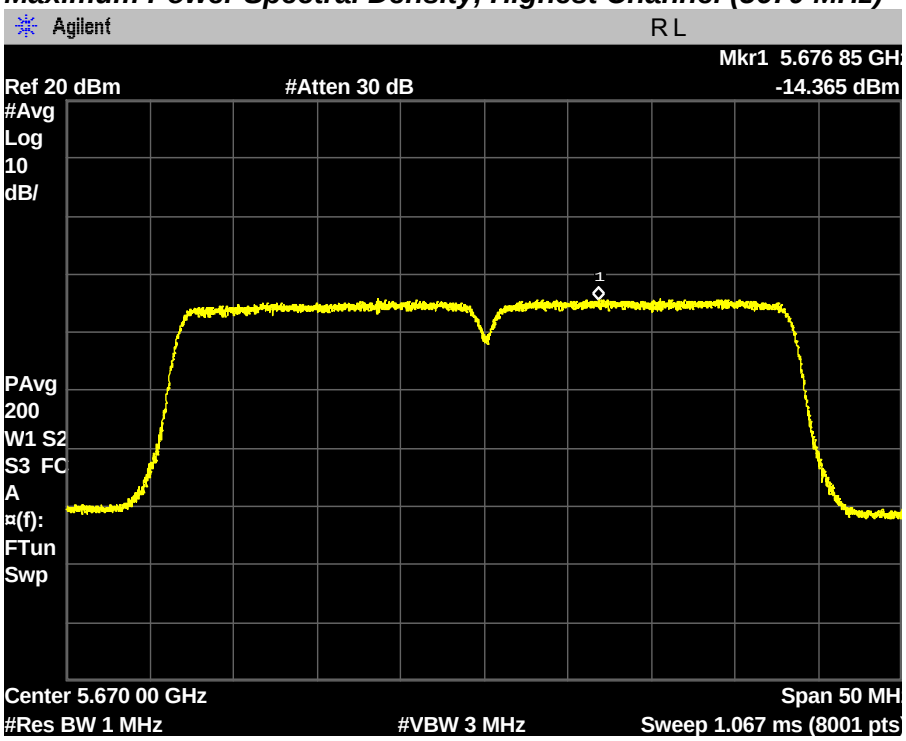


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5550 MHz)



Maximum Power Spectral Density, Highest Channel (5670 MHz)

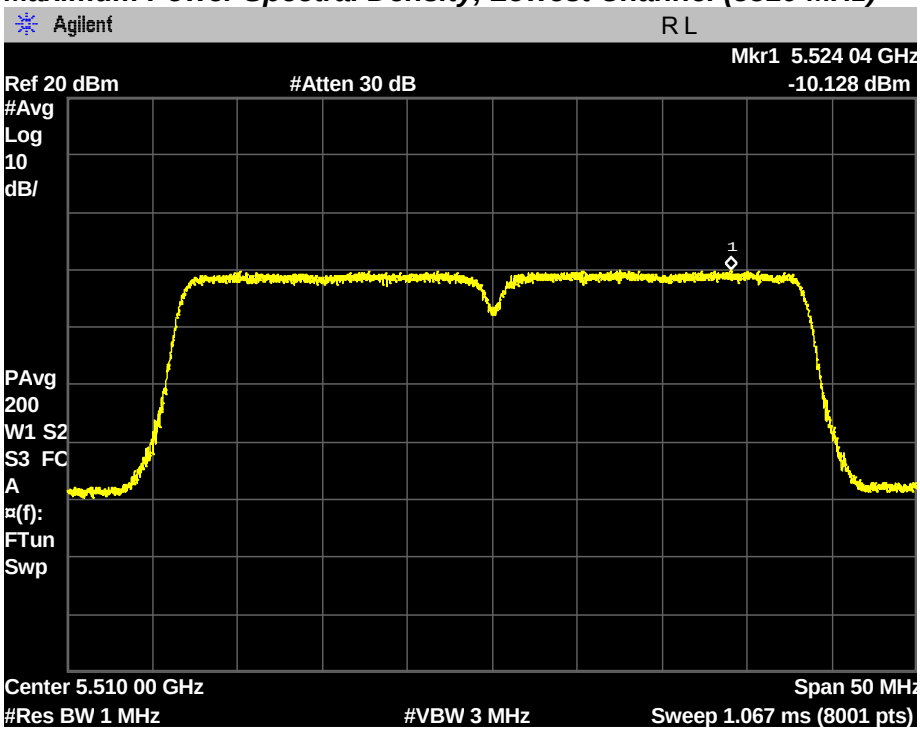


PLOTS OF EMISSIONS

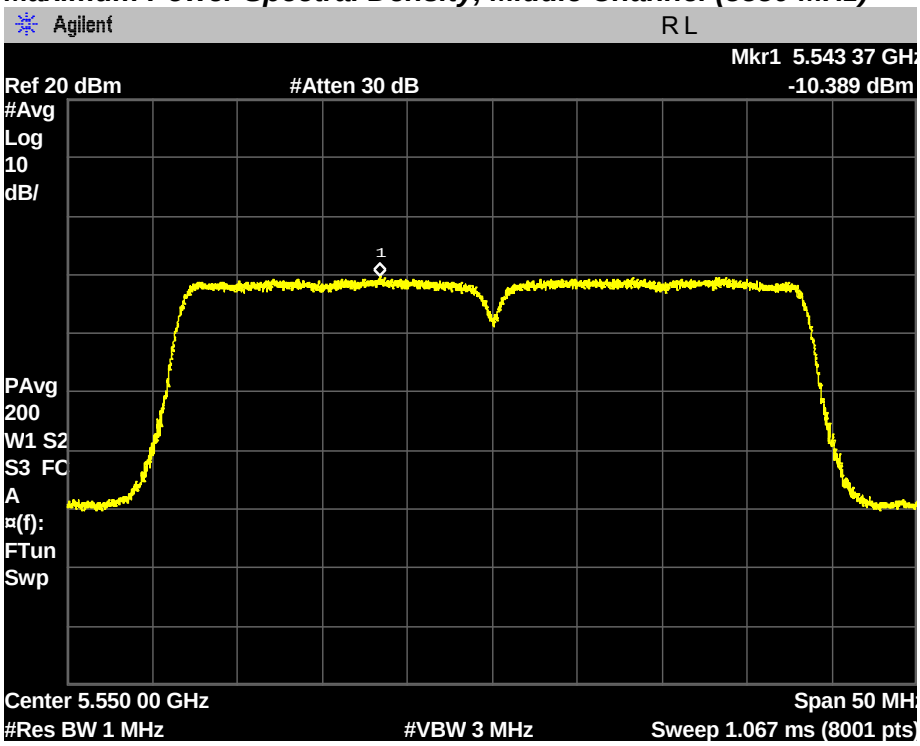
802.11n(40MHz) mode - MIMO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

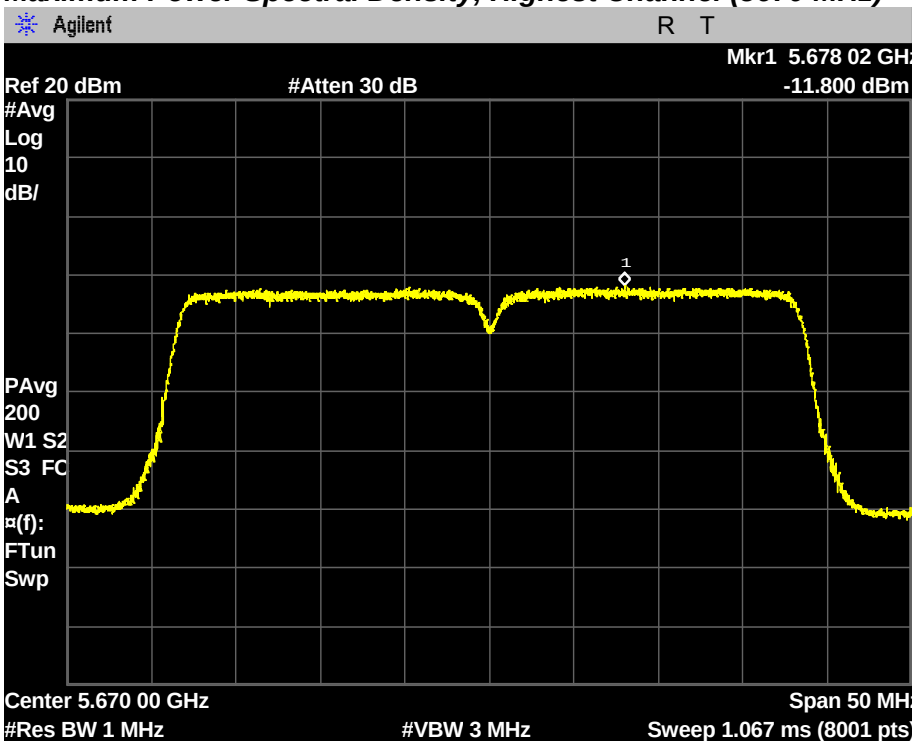


Maximum Power Spectral Density, Middle Channel (5550 MHz)



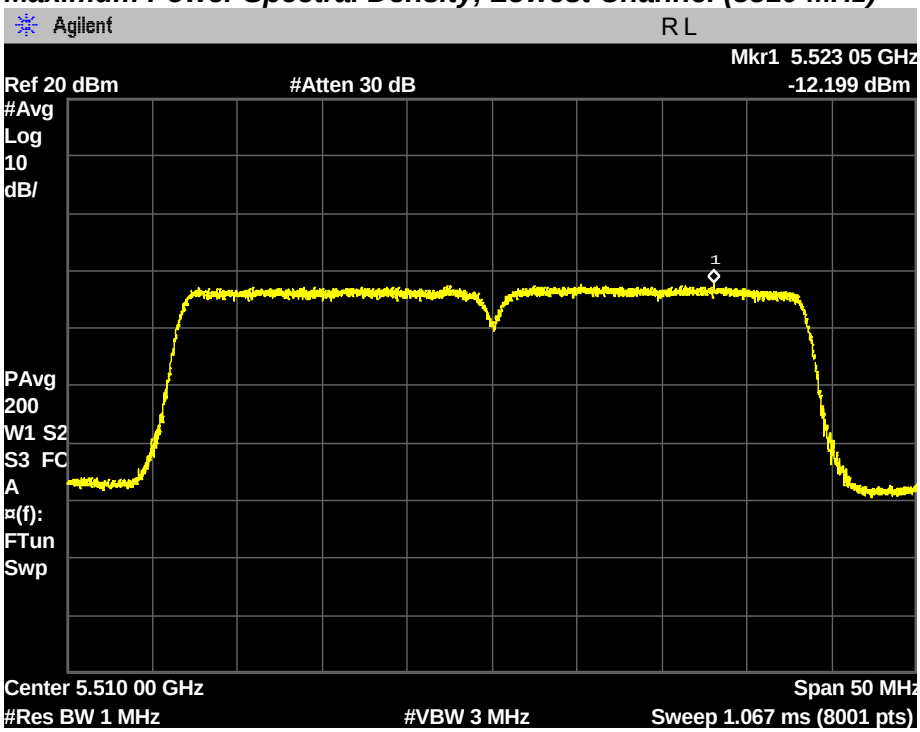
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5670 MHz)



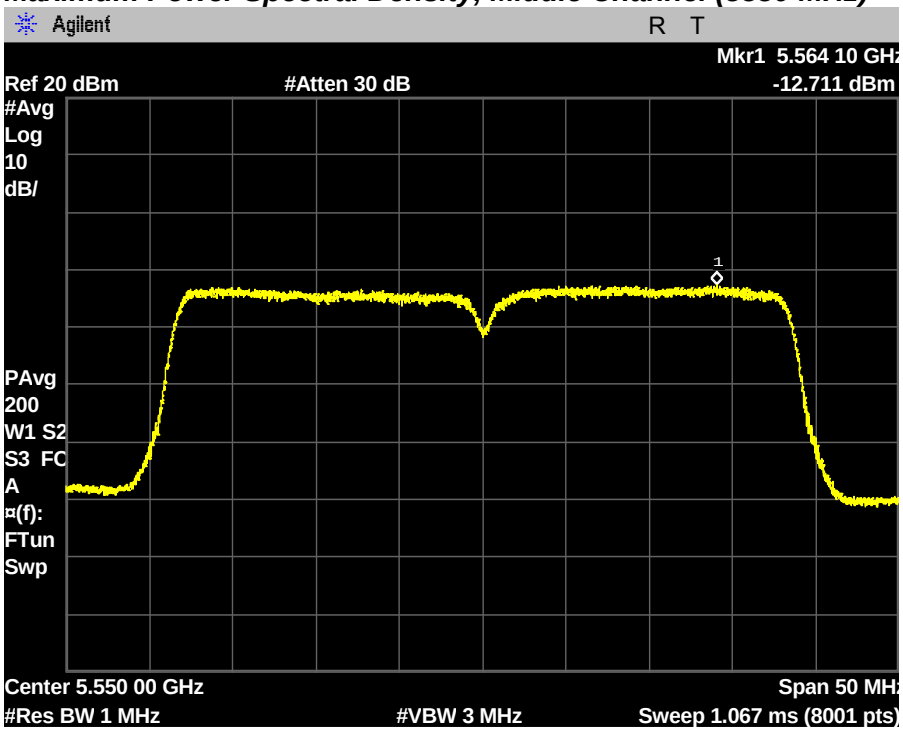
Chain 1

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

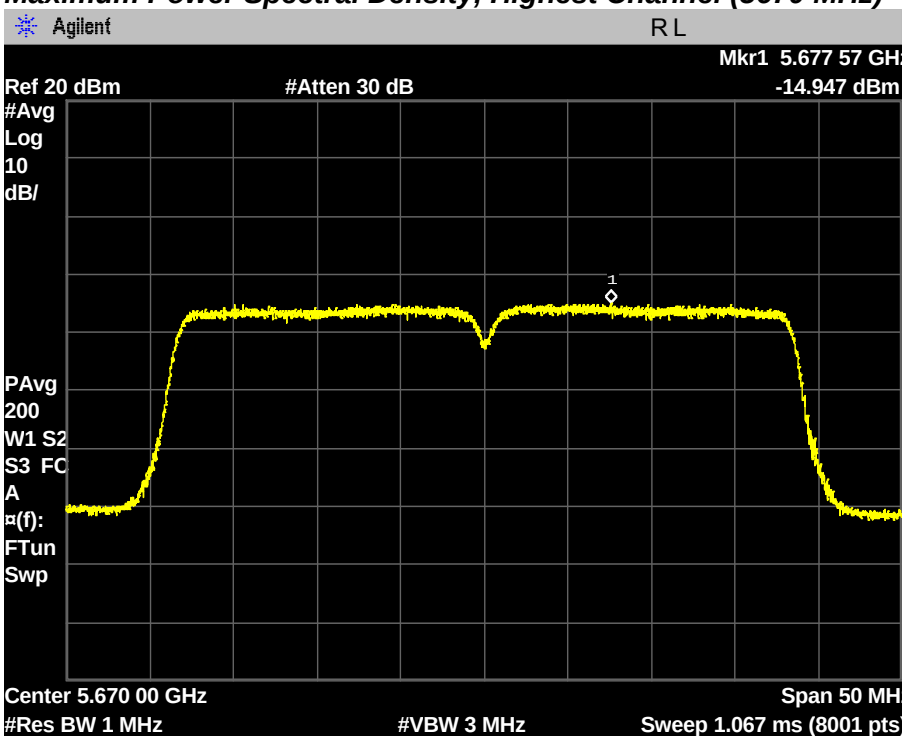


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5550 MHz)



Maximum Power Spectral Density, Highest Channel (5670 MHz)

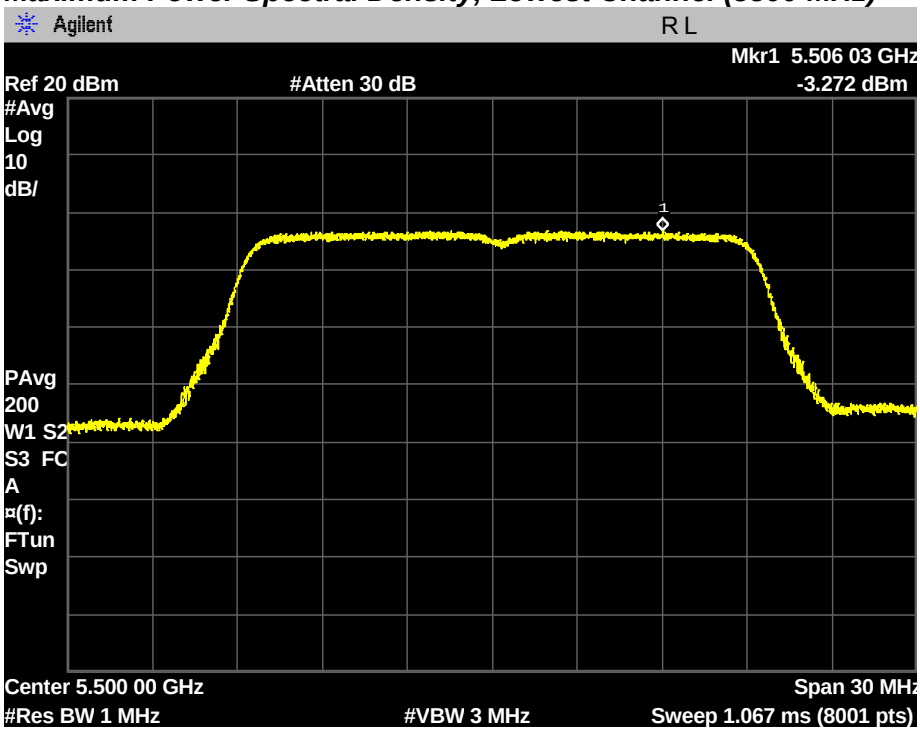


PLOTS OF EMISSIONS

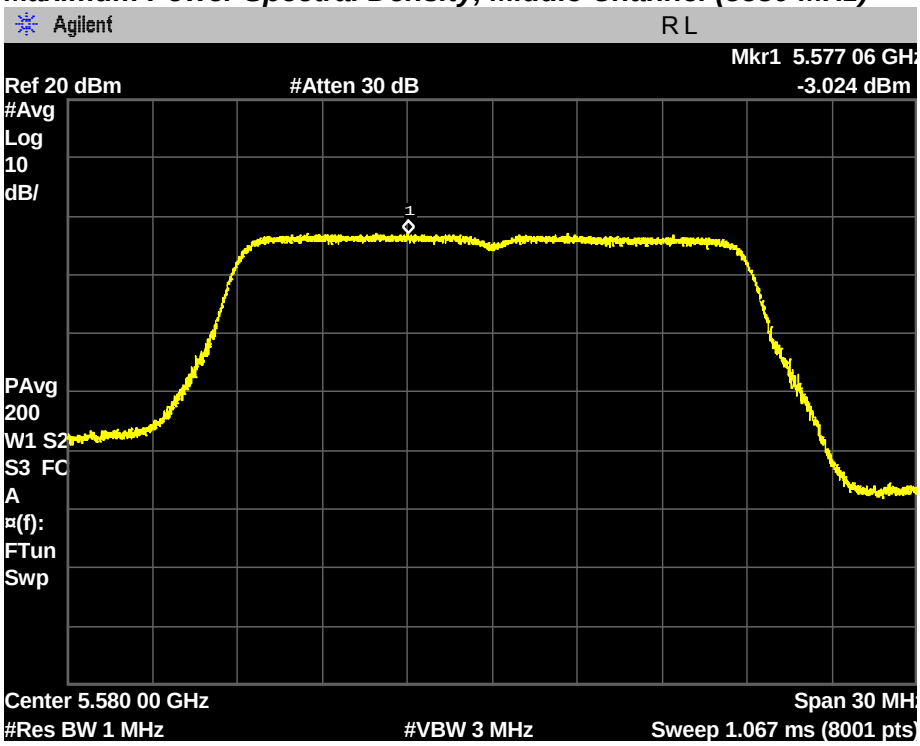
802.11ac(20MHz) mode - SISO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

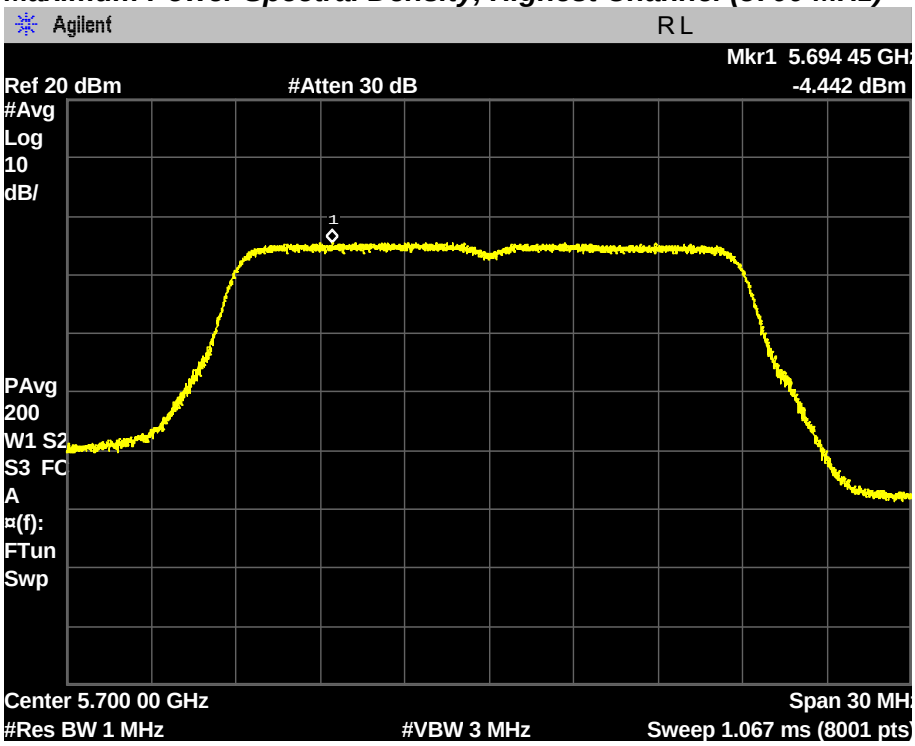


Maximum Power Spectral Density, Middle Channel (5580 MHz)



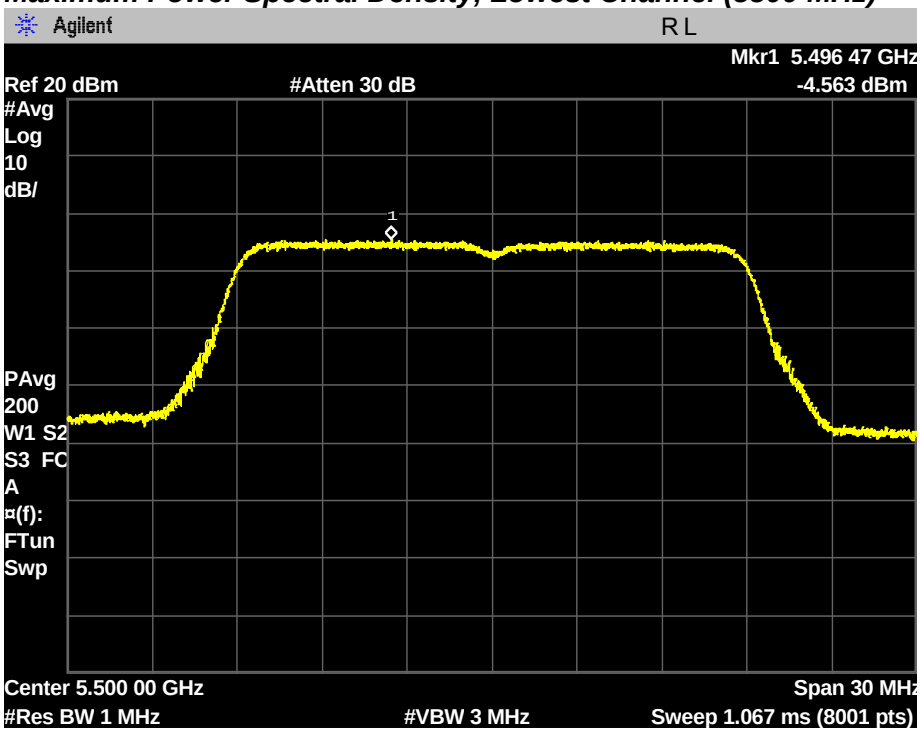
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5700 MHz)



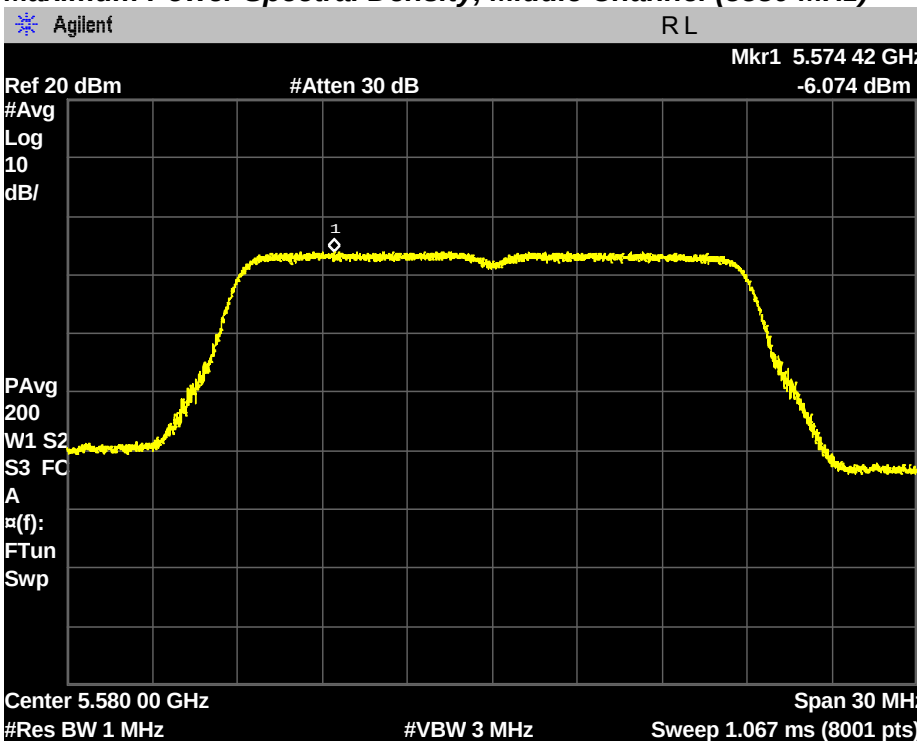
Chain 1

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

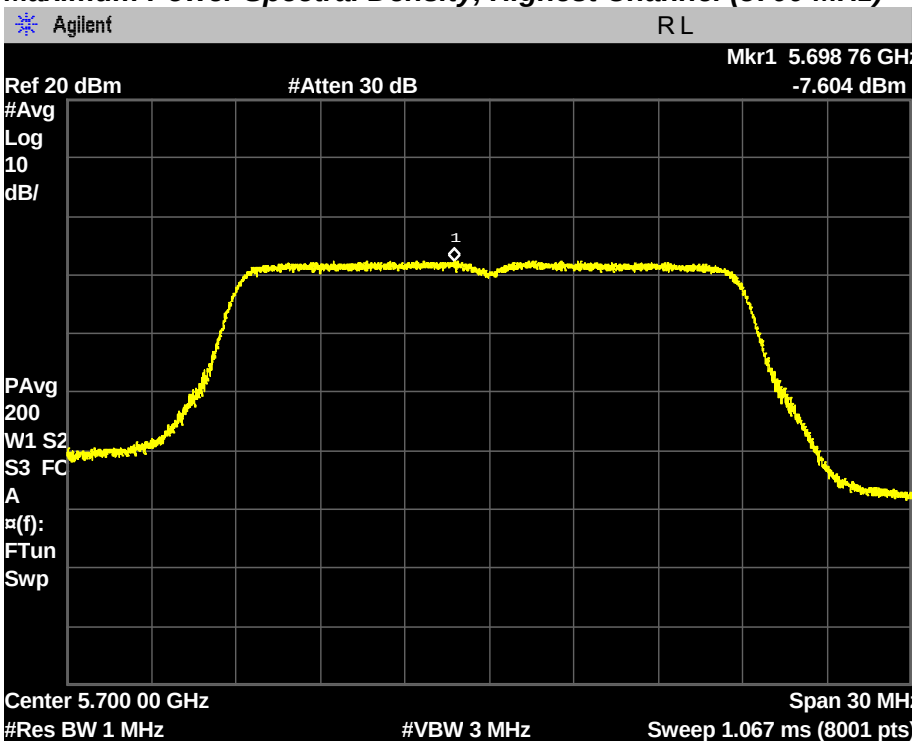


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5580 MHz)



Maximum Power Spectral Density, Highest Channel (5700 MHz)

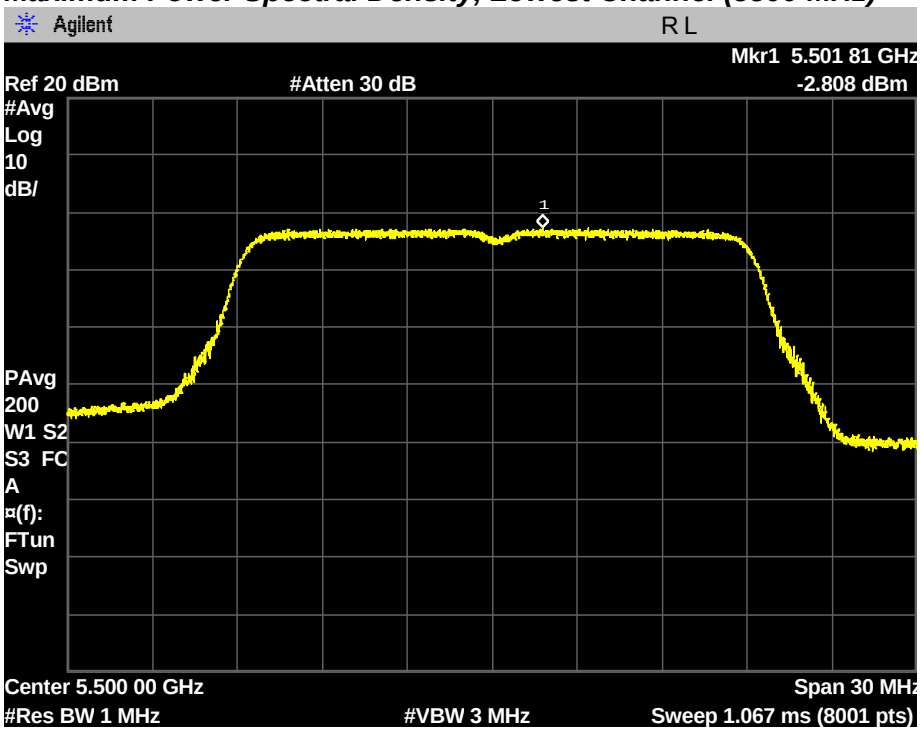


PLOTS OF EMISSIONS

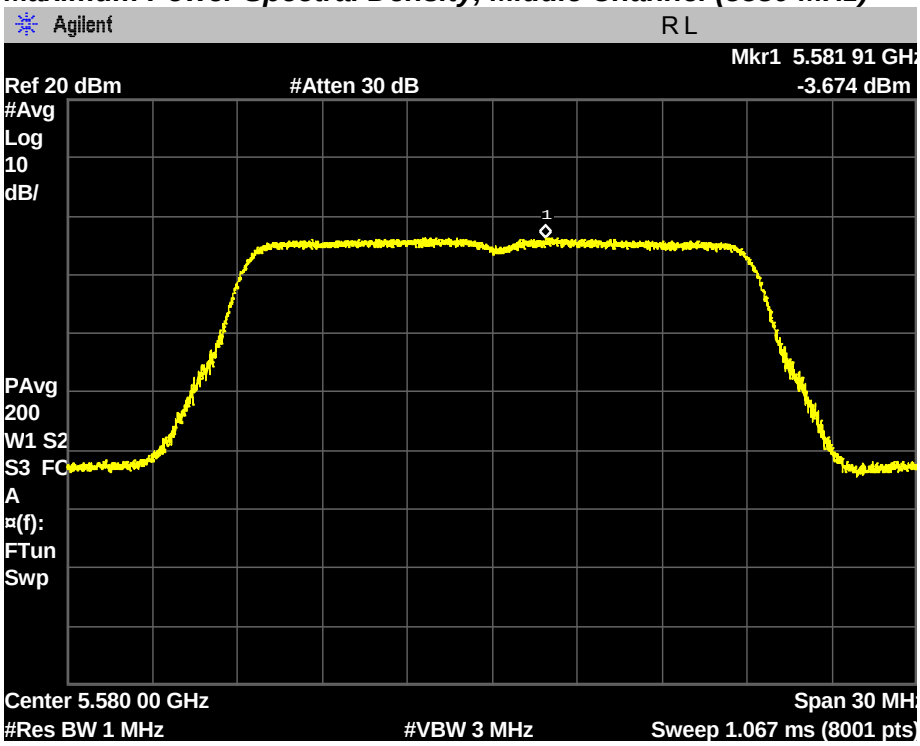
802.11ac(20MHz) mode - CDD

Chain 0

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

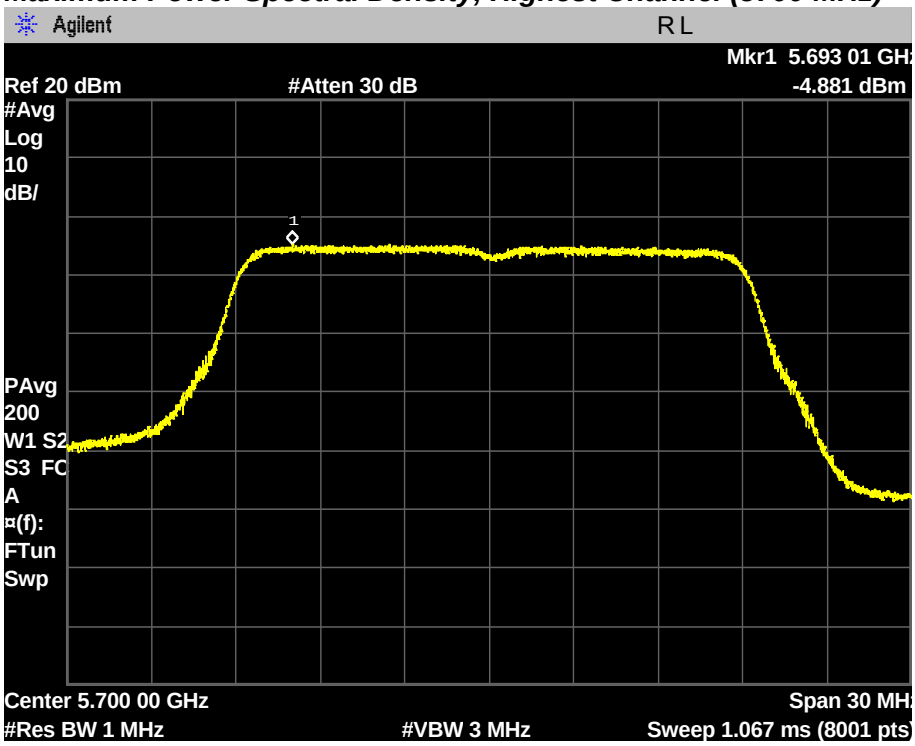


Maximum Power Spectral Density, Middle Channel (5580 MHz)



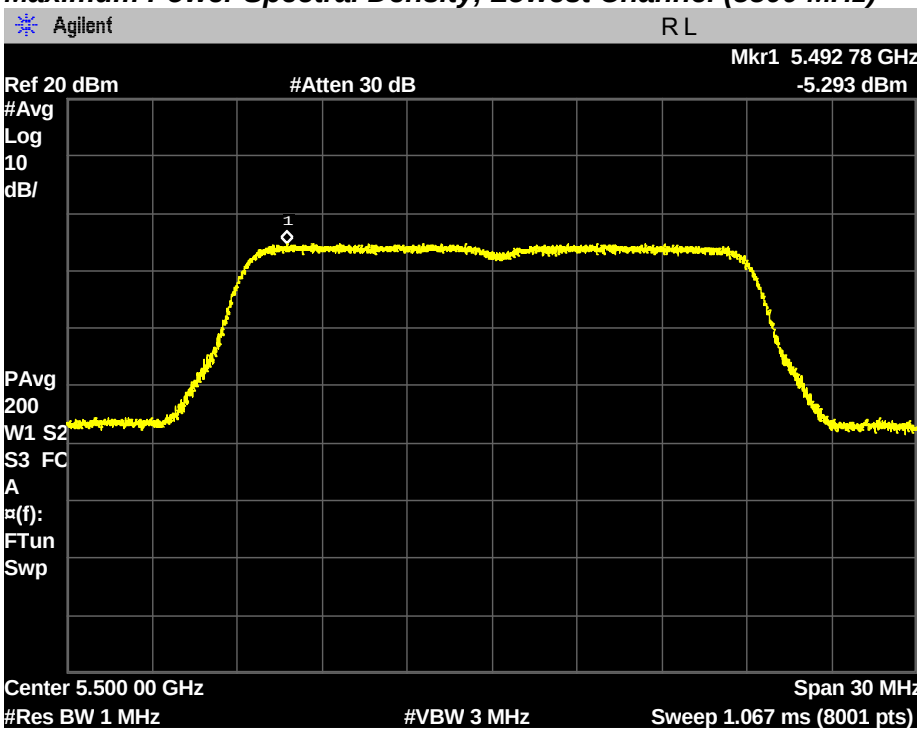
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5700 MHz)



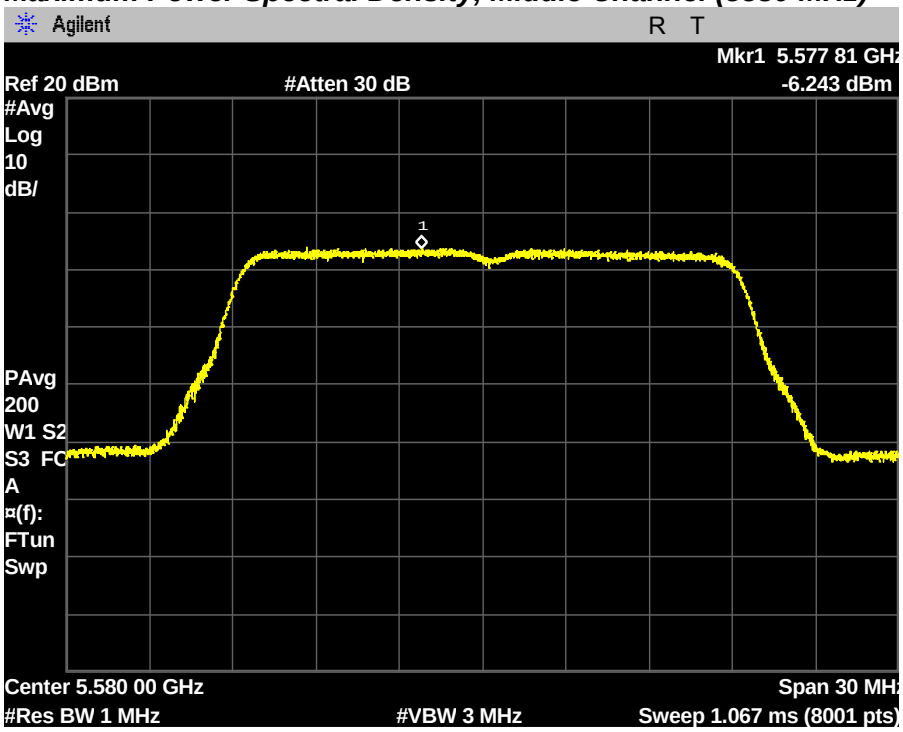
Chain 1

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

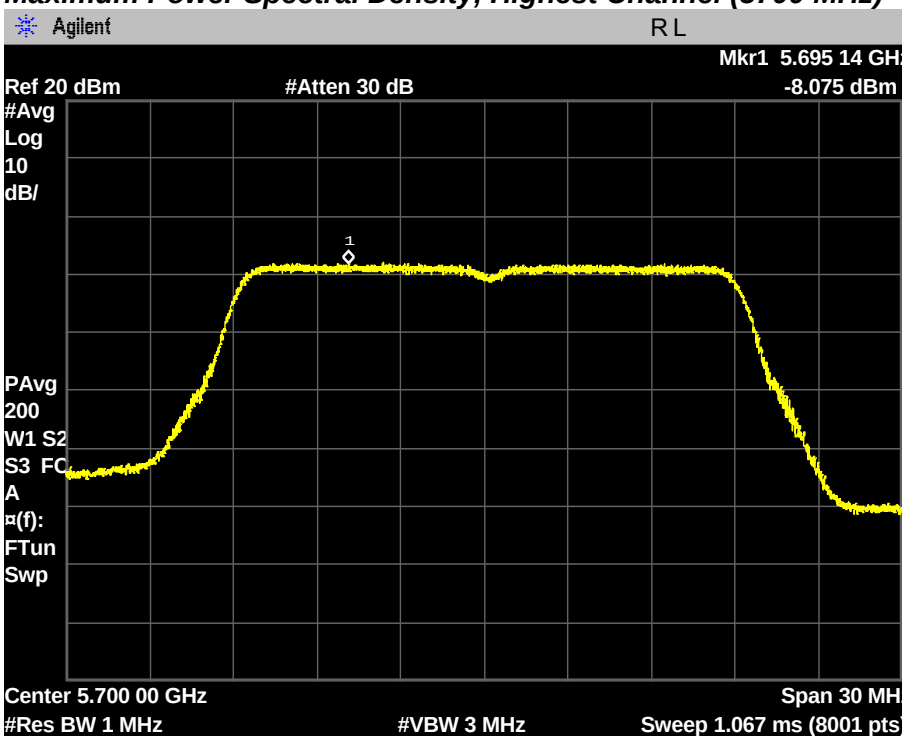


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5580 MHz)



Maximum Power Spectral Density, Highest Channel (5700 MHz)

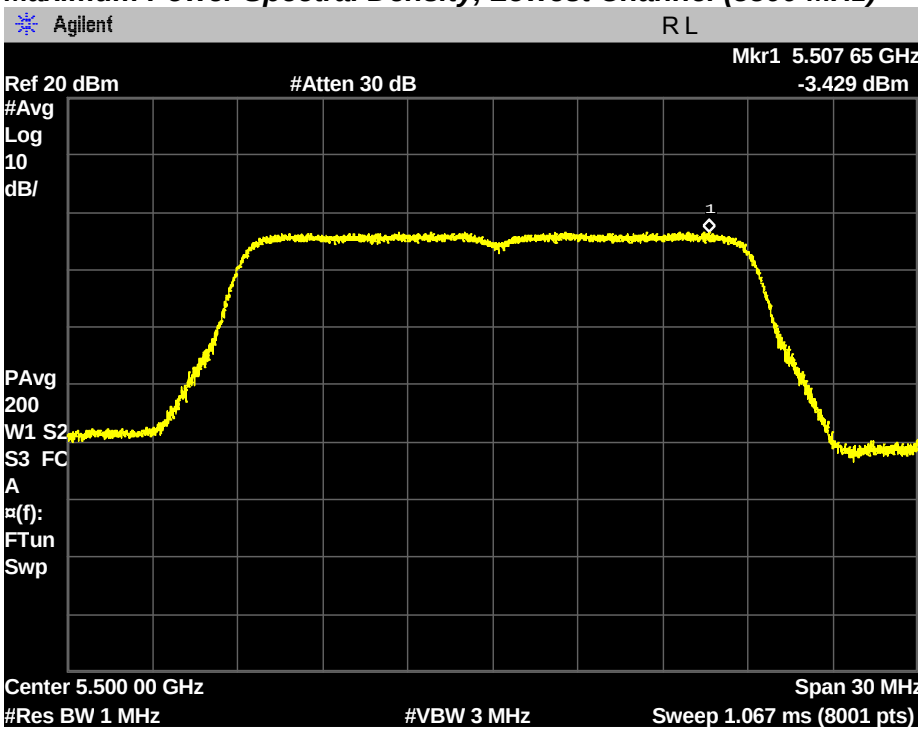


PLOTS OF EMISSIONS

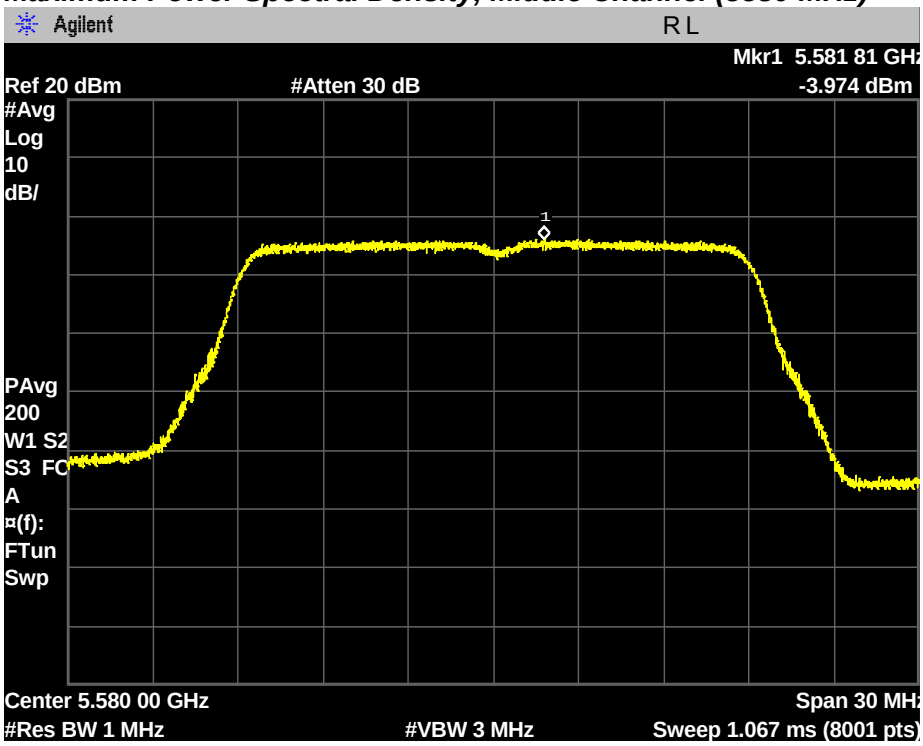
802.11ac(20MHz) mode - MIMO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

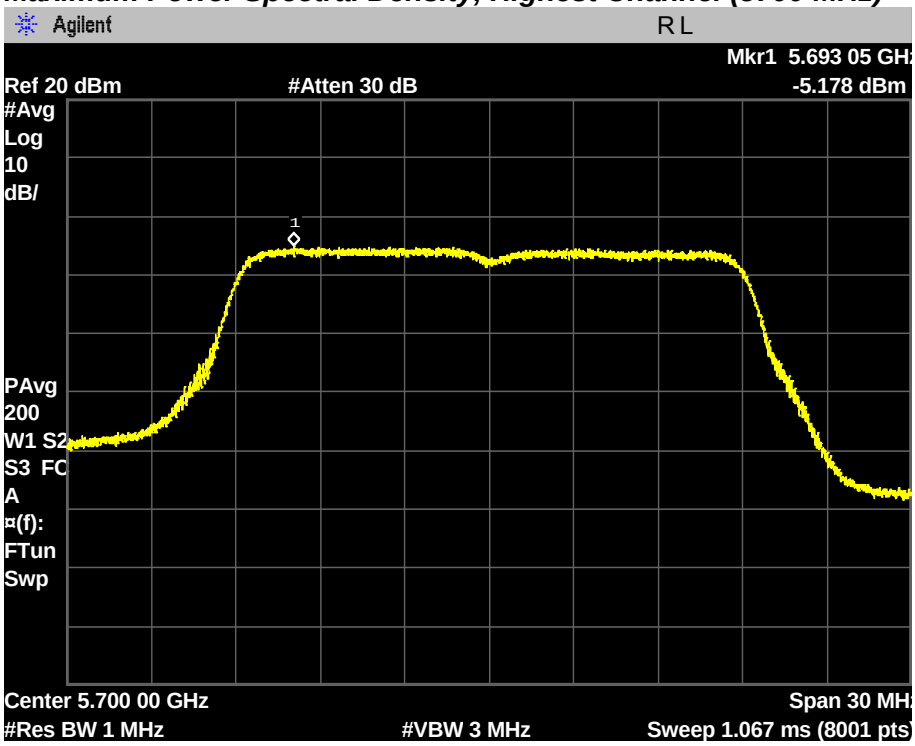


Maximum Power Spectral Density, Middle Channel (5580 MHz)



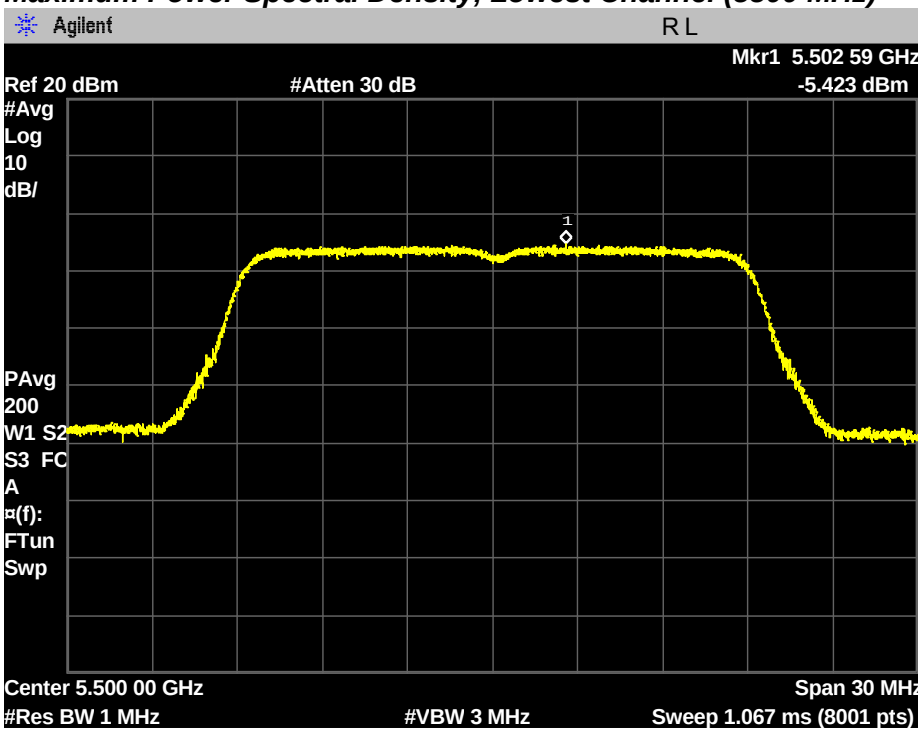
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5700 MHz)



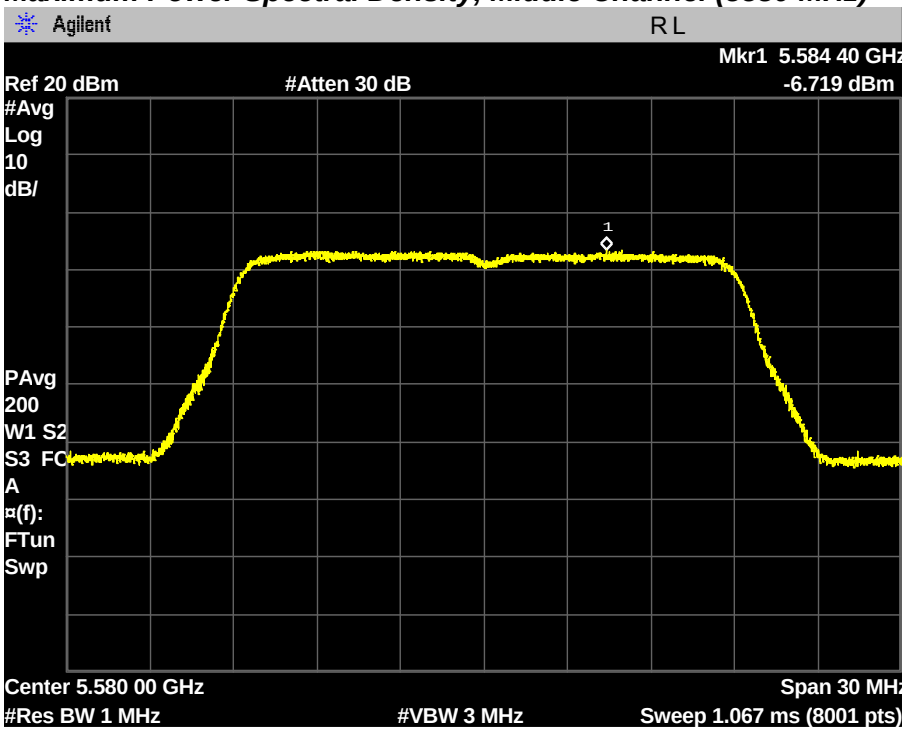
Chain 1

Maximum Power Spectral Density, Lowest Channel (5500 MHz)

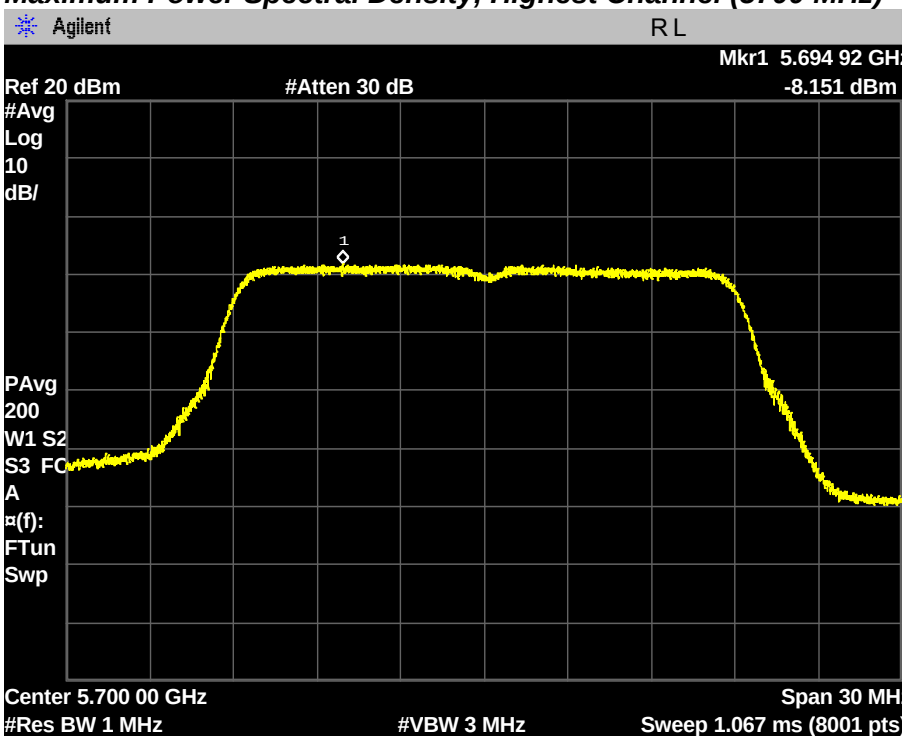


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5580 MHz)



Maximum Power Spectral Density, Highest Channel (5700 MHz)

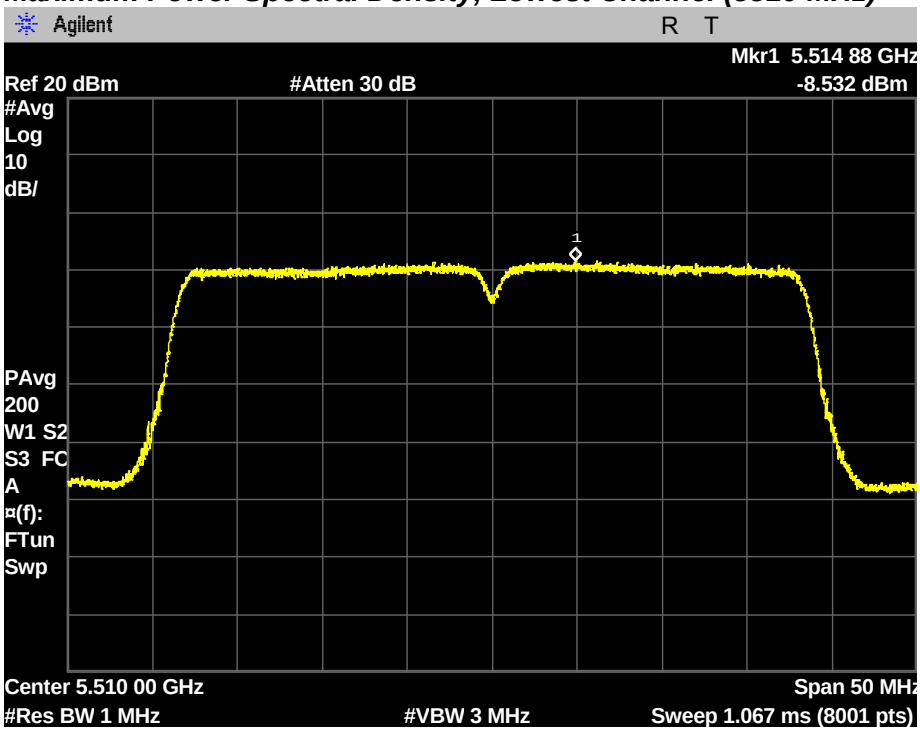


PLOTS OF EMISSIONS

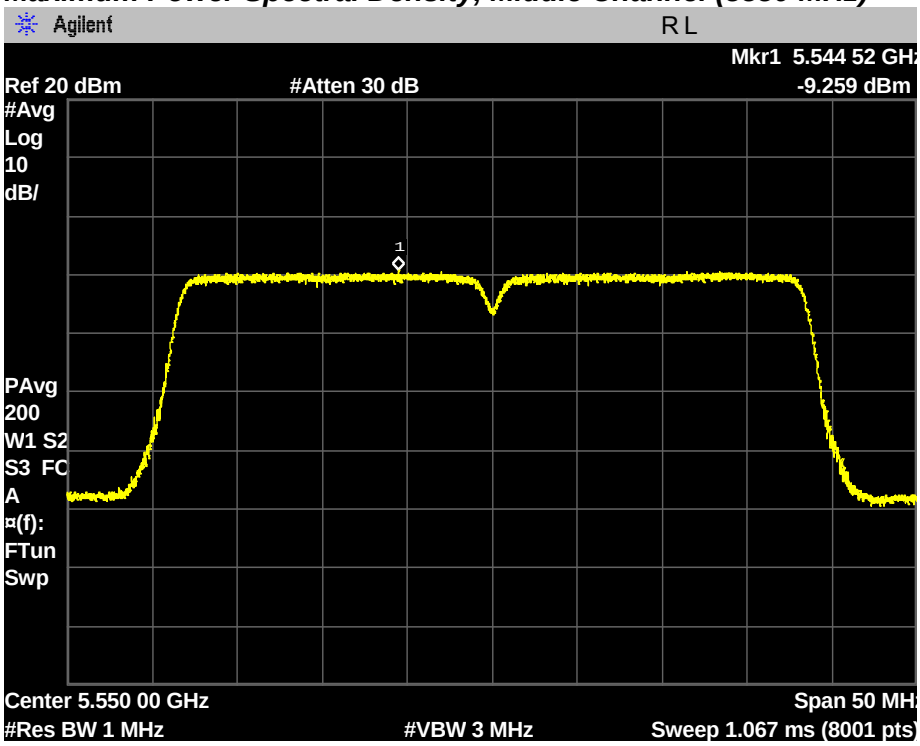
802.11ac(40MHz) mode - SISO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

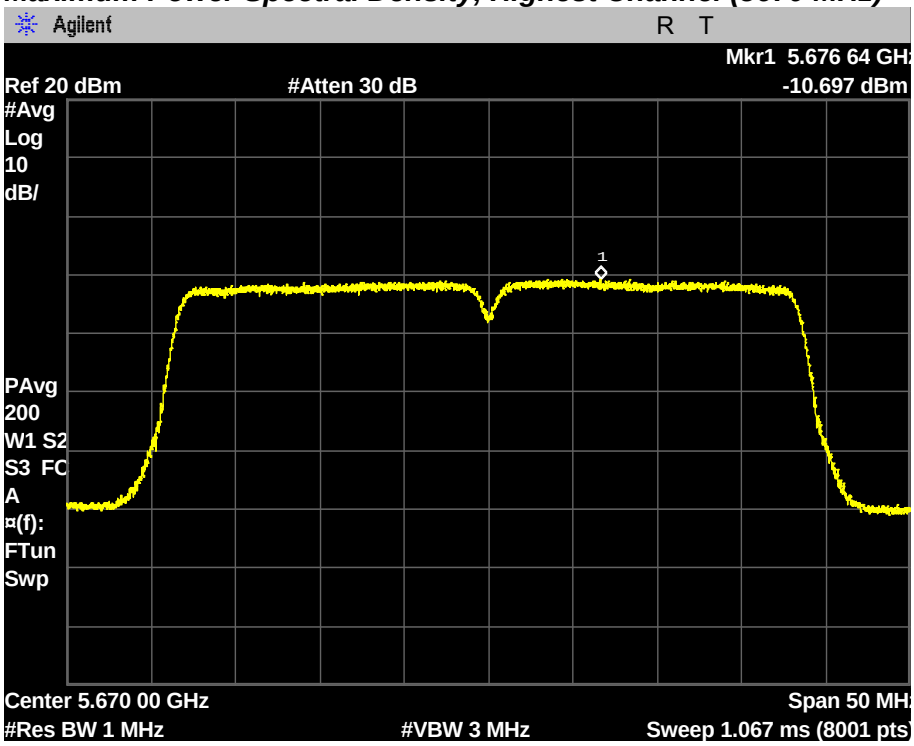


Maximum Power Spectral Density, Middle Channel (5550 MHz)



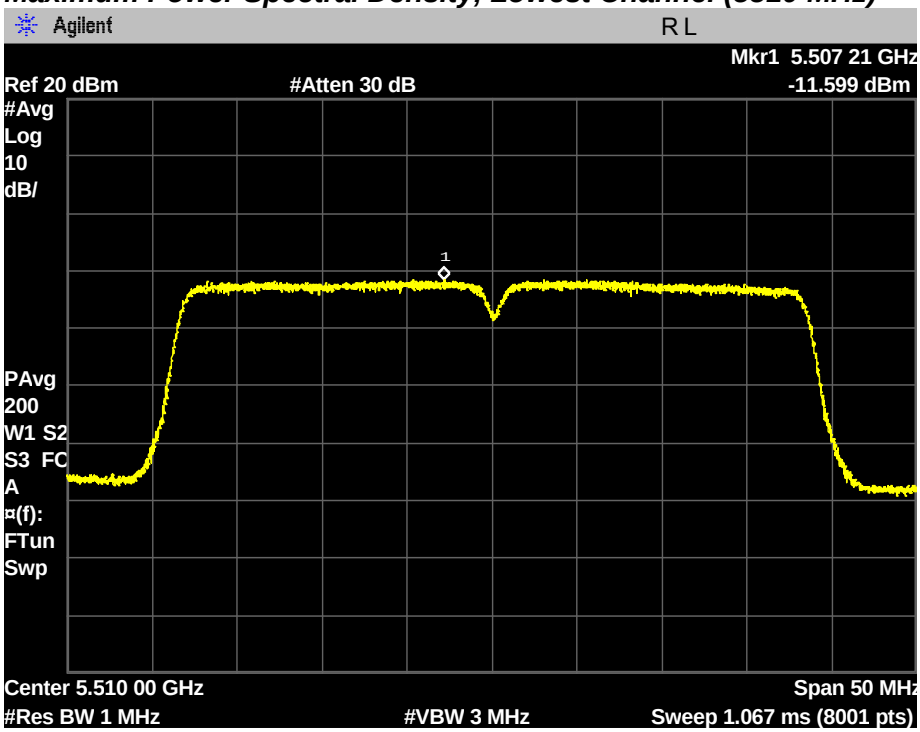
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5670 MHz)



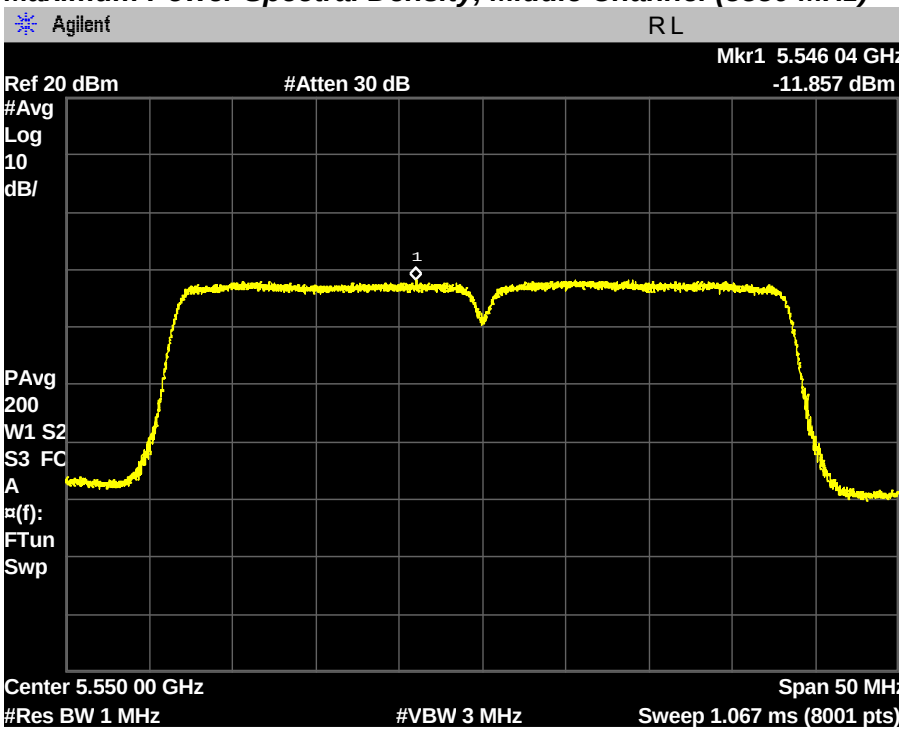
<u>Chain 1</u>

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

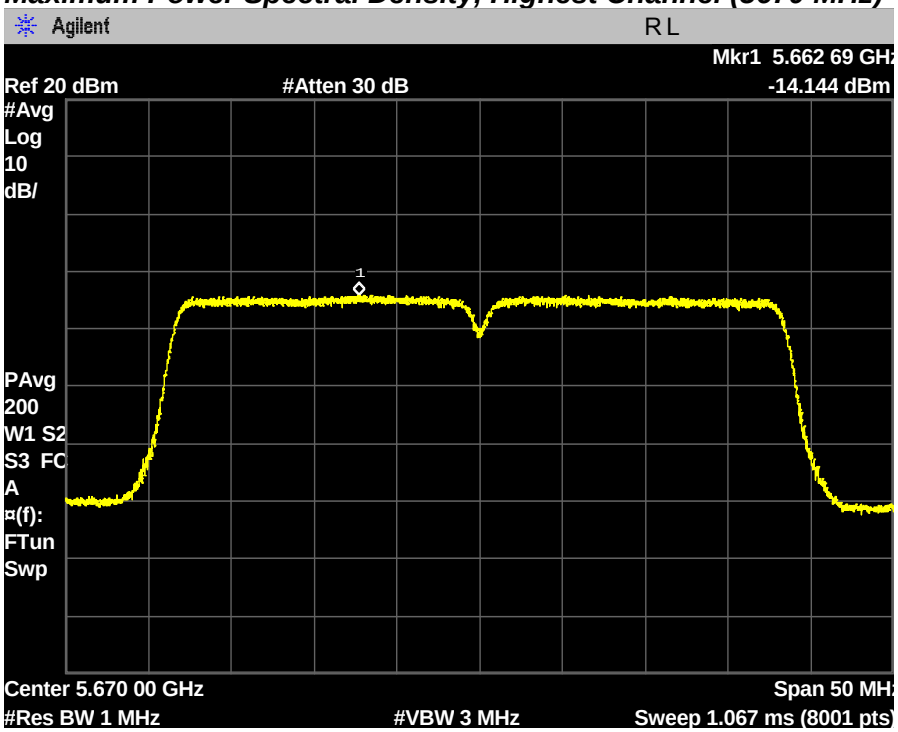


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5550 MHz)



Maximum Power Spectral Density, Highest Channel (5670 MHz)

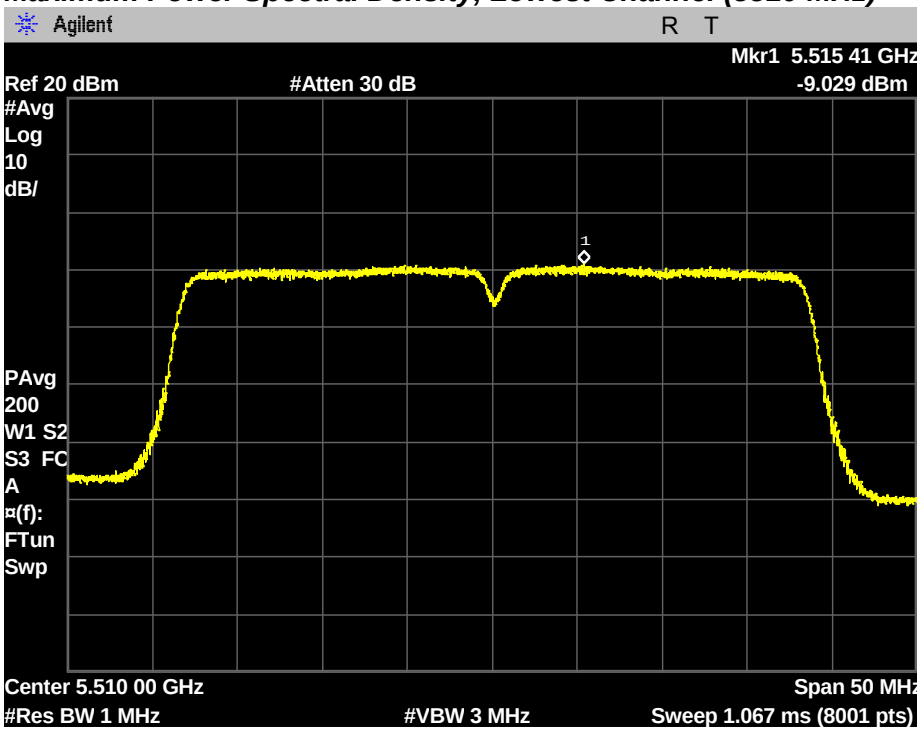


PLOTS OF EMISSIONS

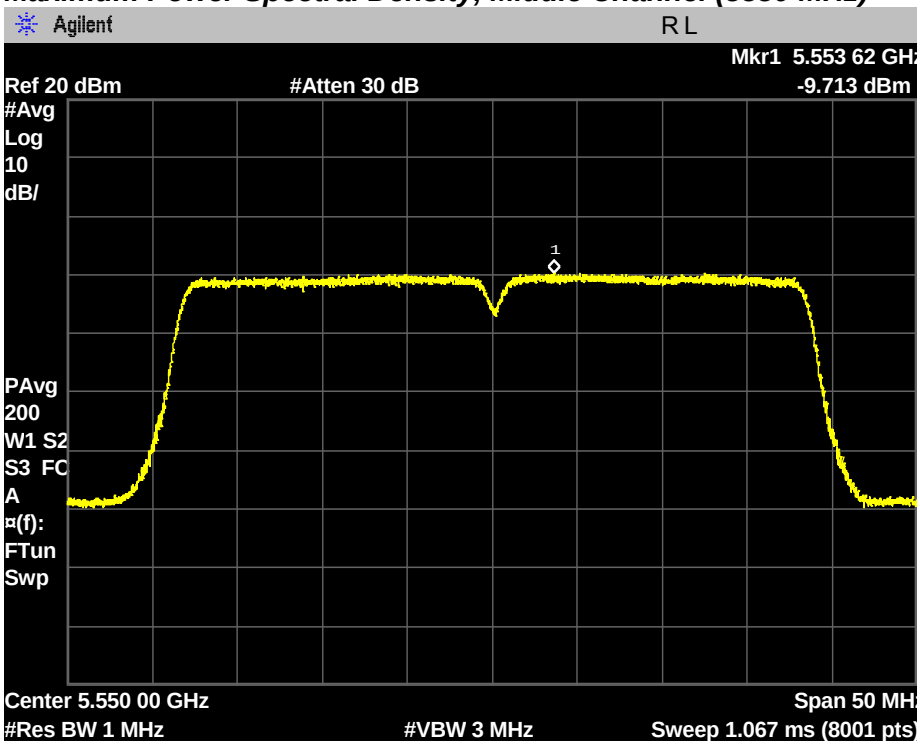
802.11ac(40MHz) mode - CDD

Chain 0

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

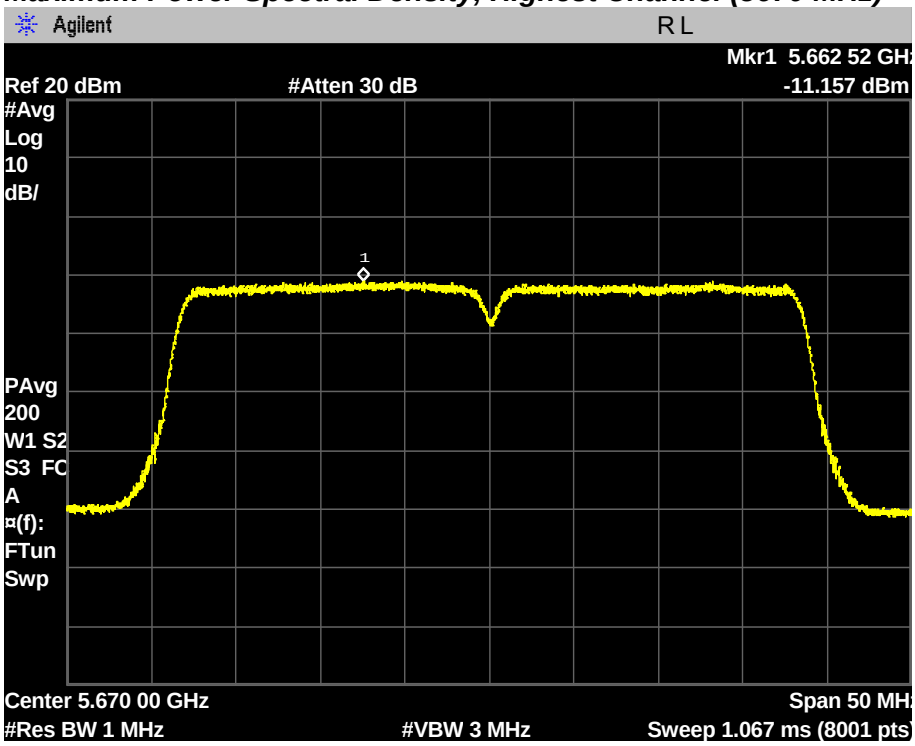


Maximum Power Spectral Density, Middle Channel (5550 MHz)



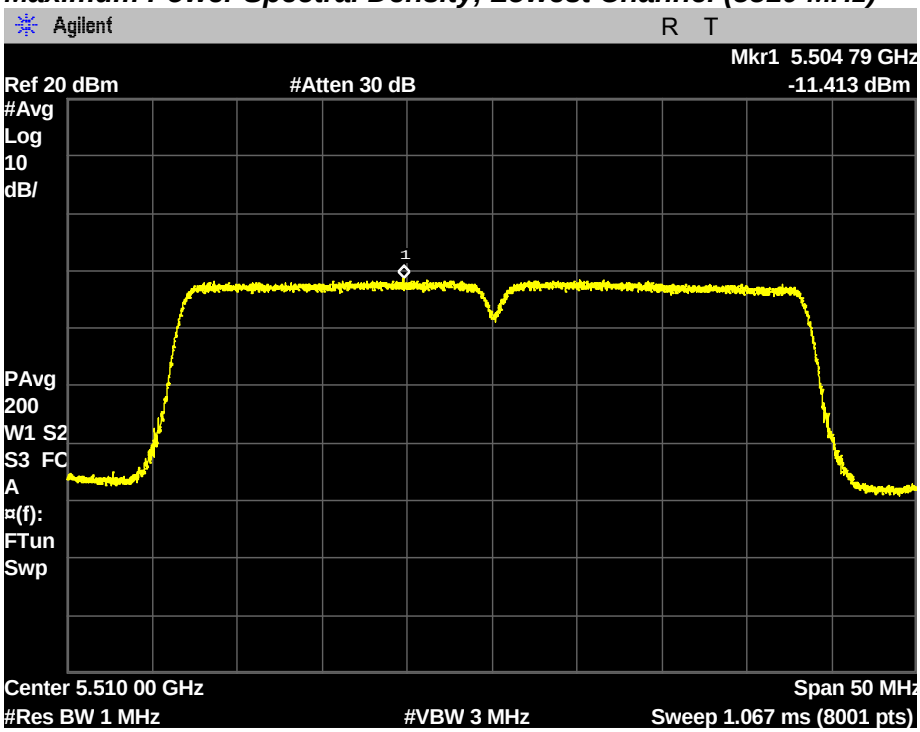
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5670 MHz)



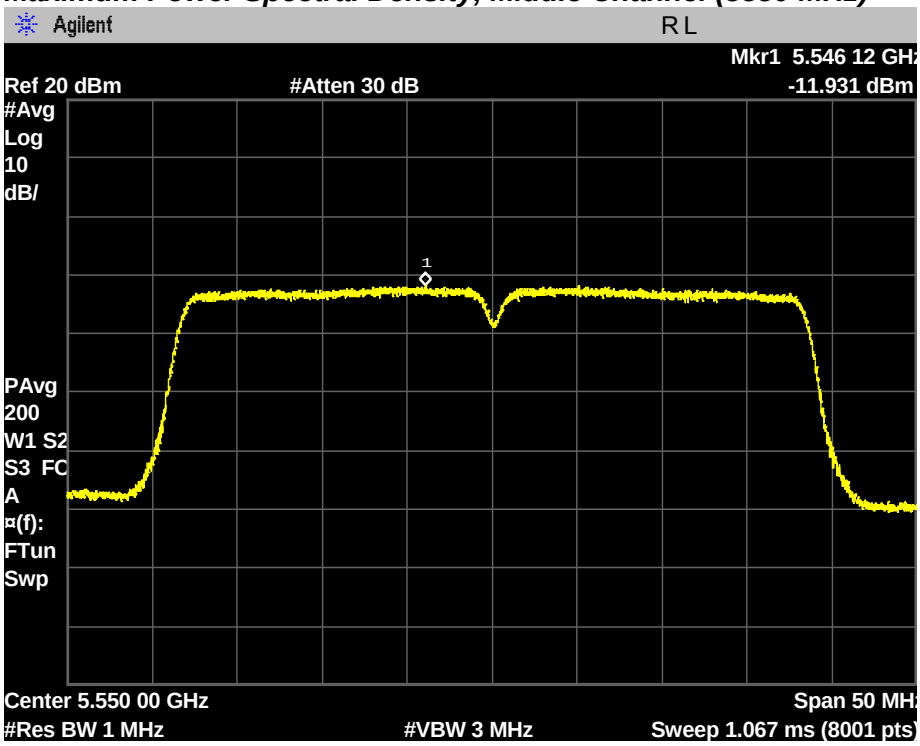
Chain 1

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

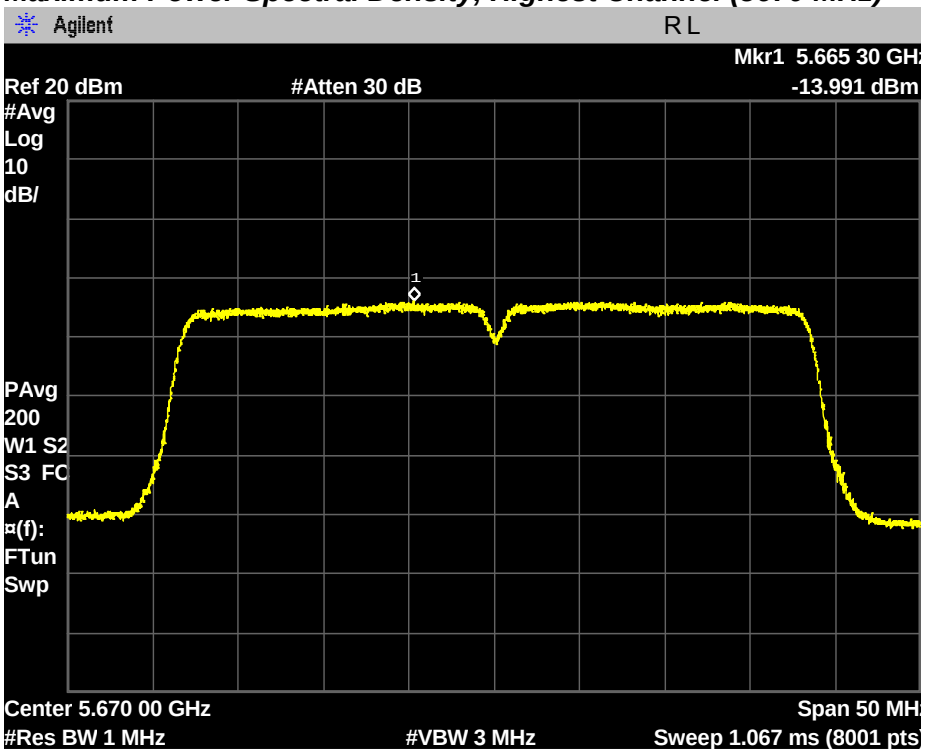


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5550 MHz)



Maximum Power Spectral Density, Highest Channel (5670 MHz)

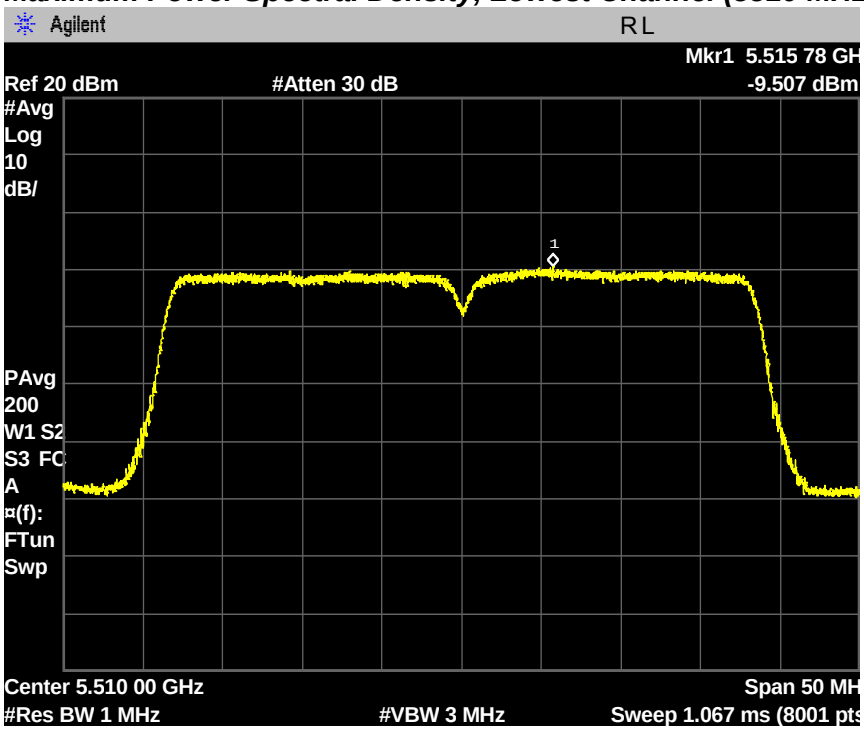


PLOTS OF EMISSIONS

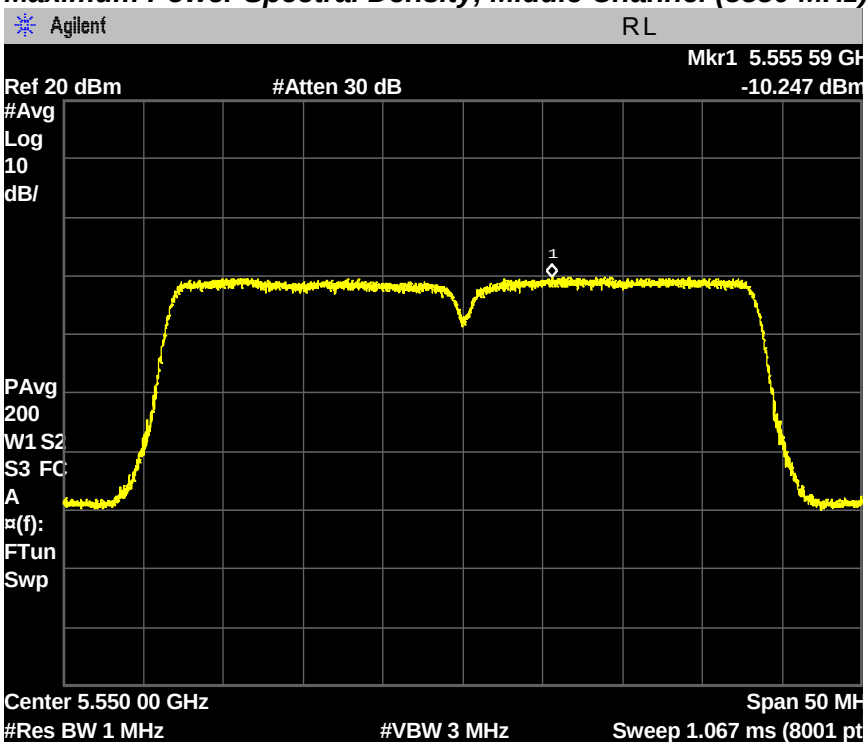
802.11ac(40MHz) mode - MIMO

Chain 0

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

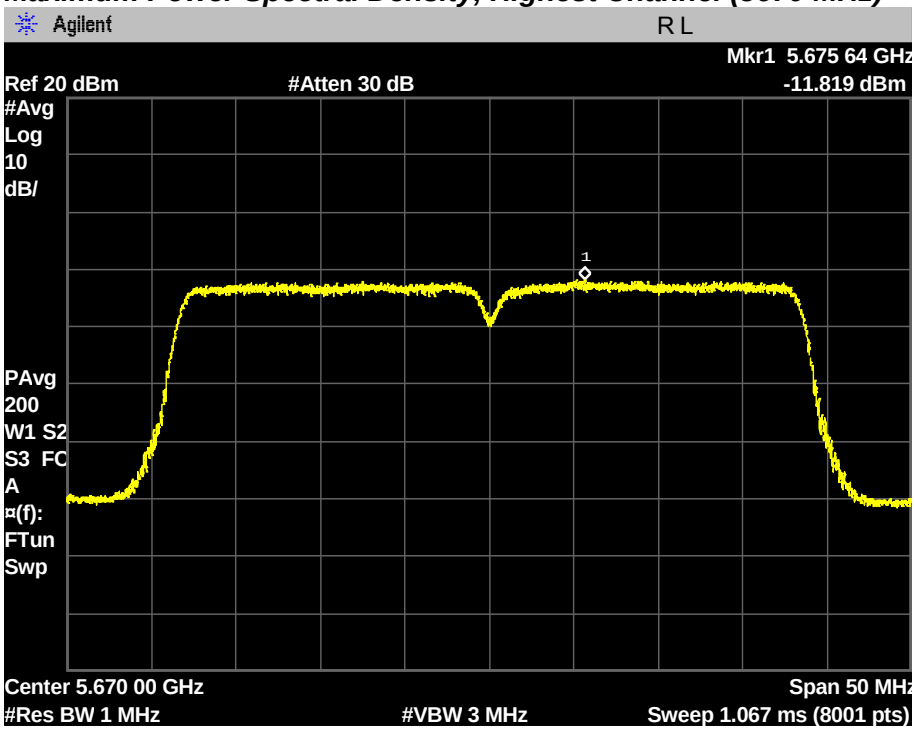


Maximum Power Spectral Density, Middle Channel (5550 MHz)



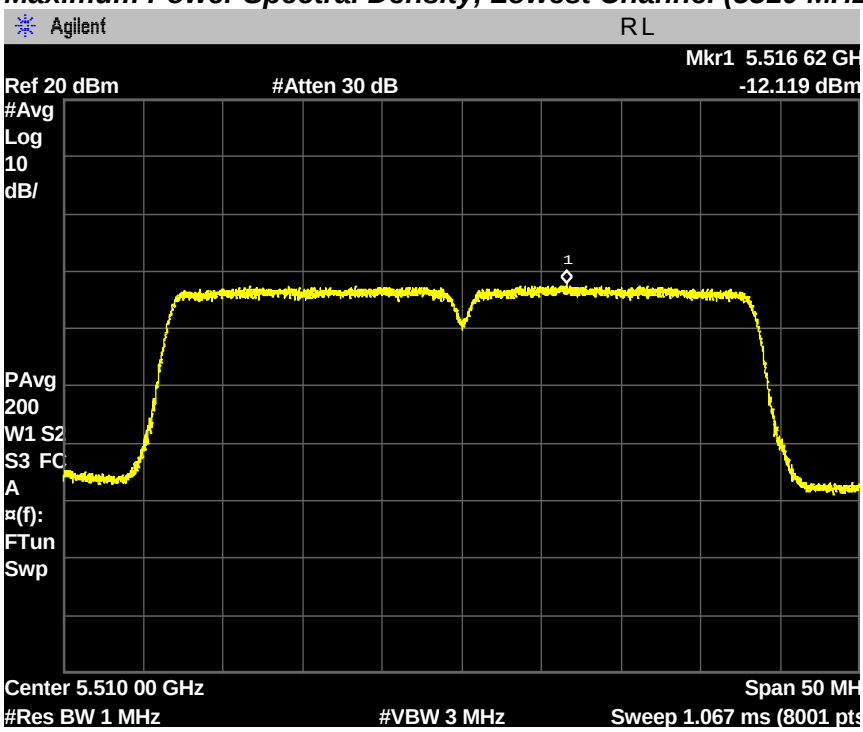
PLOTS OF EMISSIONS

Maximum Power Spectral Density, Highest Channel (5670 MHz)



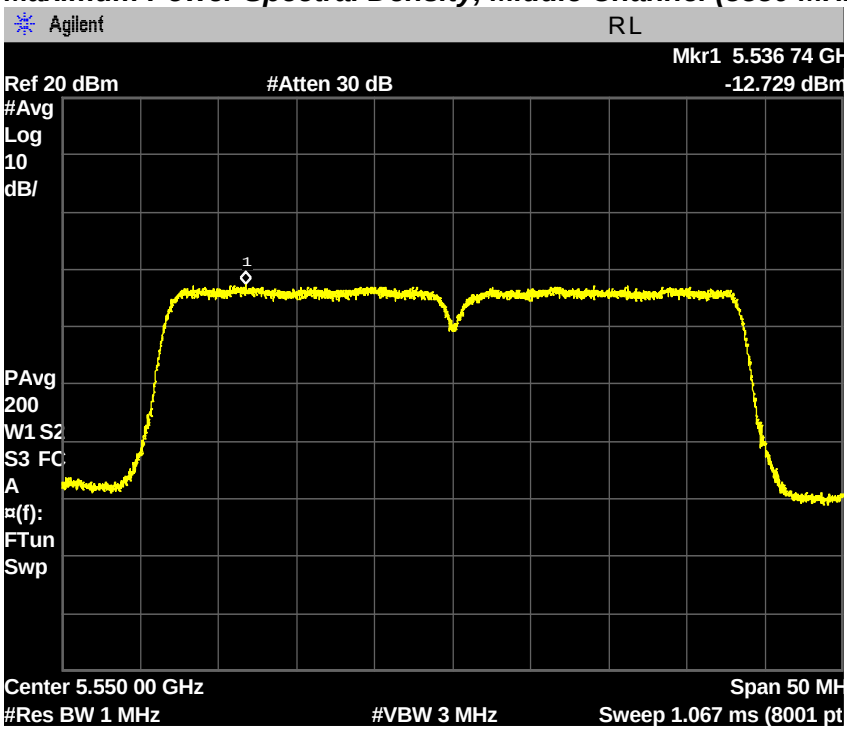
Chain 1

Maximum Power Spectral Density, Lowest Channel (5510 MHz)

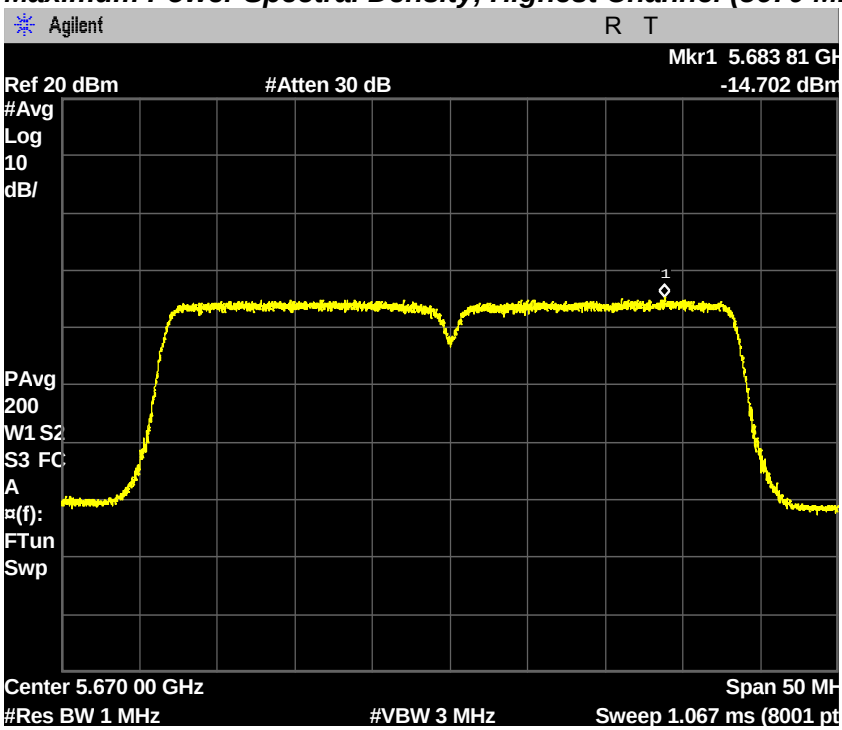


PLOTS OF EMISSIONS

Maximum Power Spectral Density, Middle Channel (5550 MHz)



Maximum Power Spectral Density, Highest Channel (5670 MHz)

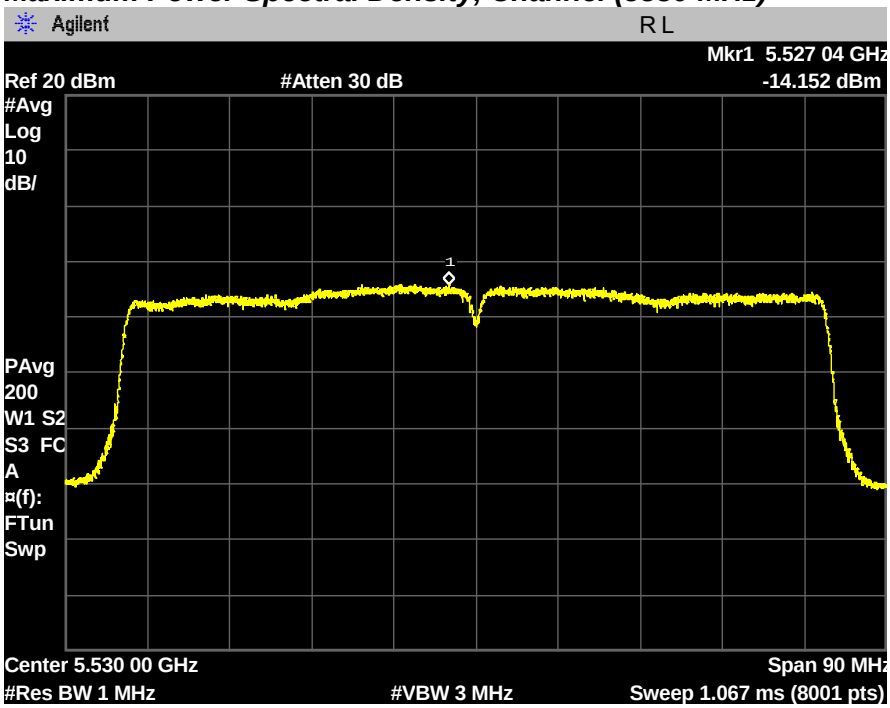


PLOTS OF EMISSIONS

802.11ac(80MHz) mode - SISO

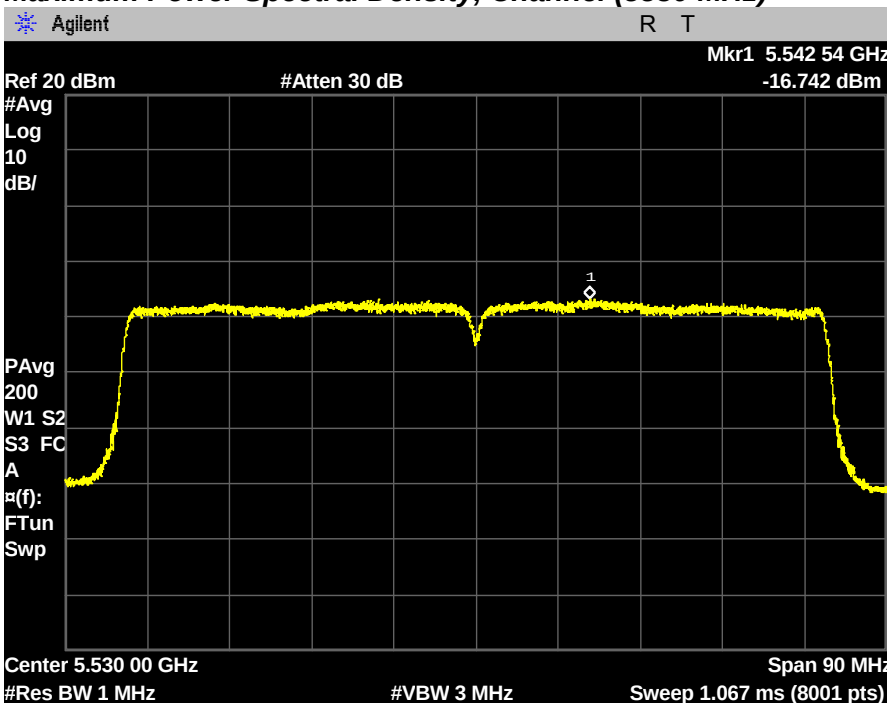
Chain 0

Maximum Power Spectral Density, Channel (5530 MHz)



Chain 1

Maximum Power Spectral Density, Channel (5530 MHz)

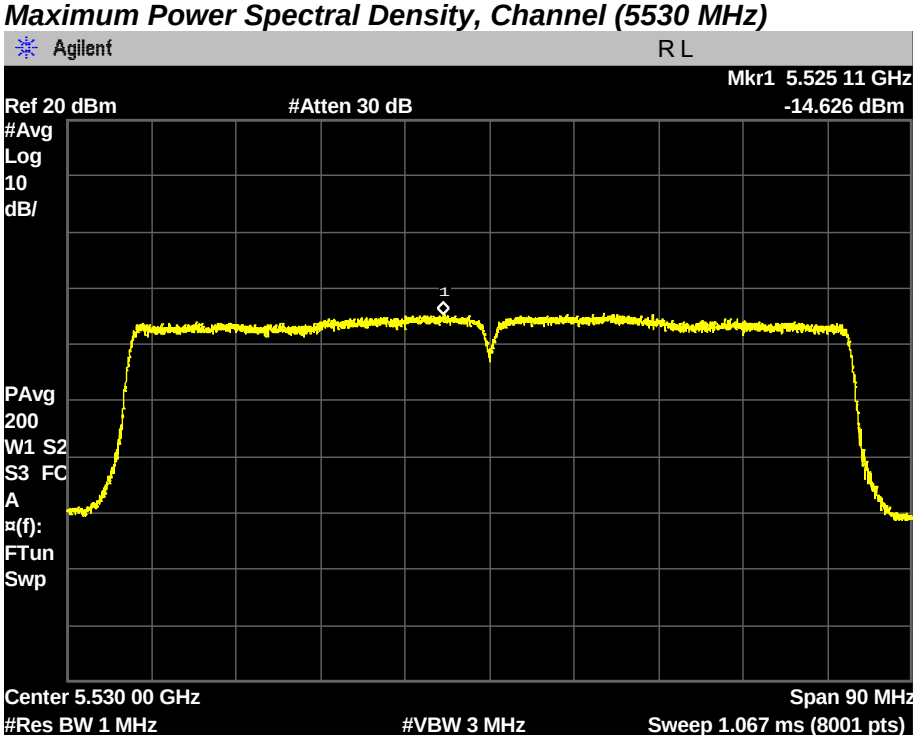


PLOTS OF EMISSIONS

802.11ac(80MHz) mode - CDD

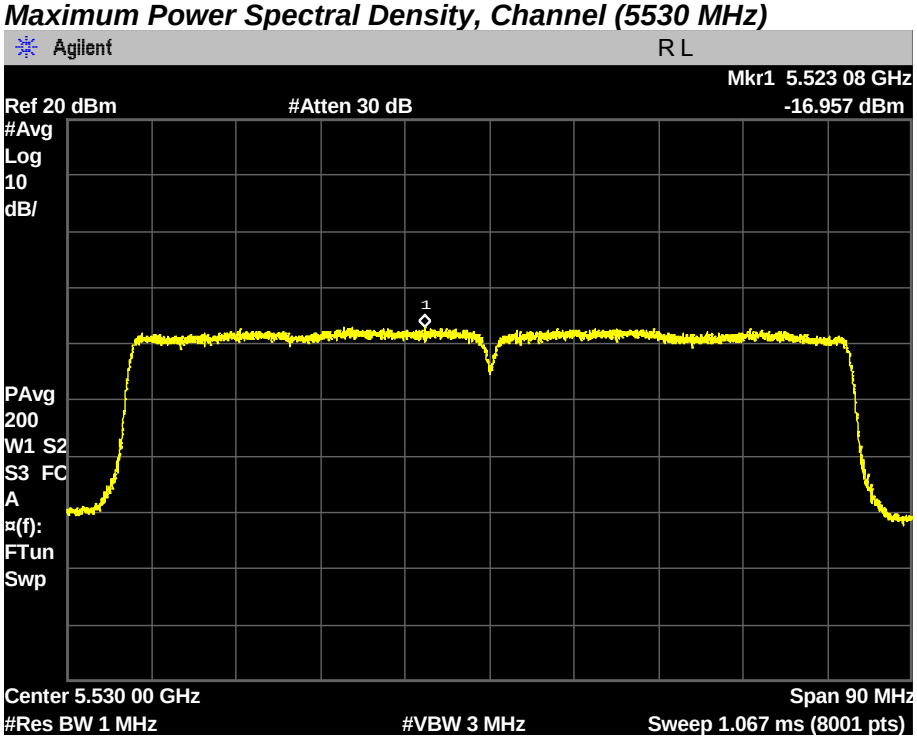
Chain 0

Maximum Power Spectral Density, Channel (5530 MHz)



Chain 1

Maximum Power Spectral Density, Channel (5530 MHz)

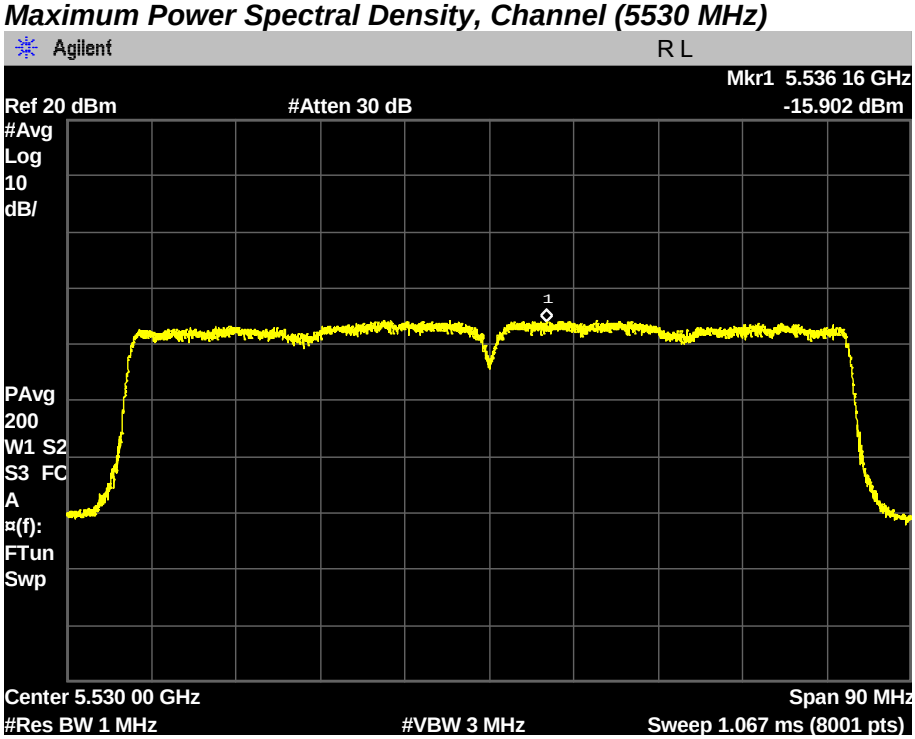


PLOTS OF EMISSIONS

802.11ac(80MHz) mode - MIMO

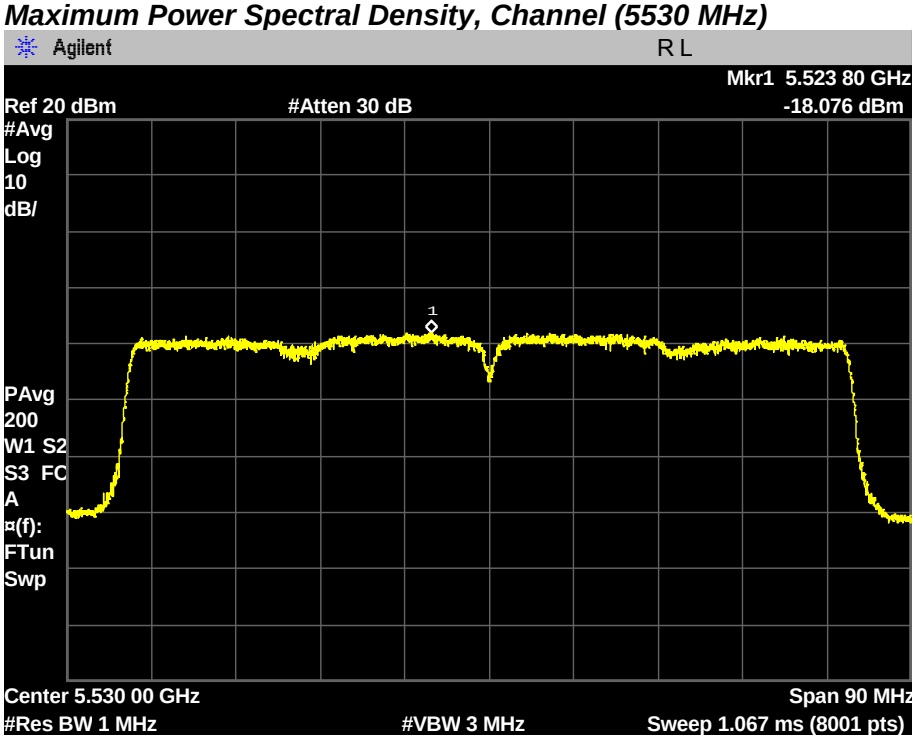
Chain 0

Maximum Power Spectral Density, Channel (5530 MHz)



Chain 1

Maximum Power Spectral Density, Channel (5530 MHz)



8.7 Radiated Spurious Emissions

8.7.1 Radiated Spurious Emissions – UNII-1 band

FCC §15.407(b), RSS-247 Issue 1, 6.2

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode

Chain 0

Lowest Channel (5180 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.36	46.8	V	peak	4.2	51.0	68.2	17.2

Middle Channel (5220 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.44	46.9	V	peak	4.7	51.6	68.2	16.6

Highest Channel (5240 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.48	44.2	V	peak	4.9	49.1	68.2	19.1

802.11ac (20 MHz) mode – SISO

Chain 0

Lowest Channel (5180 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.36	47.0	V	peak	4.2	51.2	68.2	17.0

Middle Channel (5220 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.44	46.8	V	peak	4.7	51.5	68.2	16.7

Highest Channel (5240 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.48	44.8	V	peak	4.9	49.7	68.2	18.5

802.11ac (20 MHz) mode – CDD

Lowest Channel (5180 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.36	47.7	H	peak	4.2	51.9	68.2	16.3

Middle Channel (5220 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.44	46.8	H	peak	4.7	51.5	68.2	16.7

Highest Channel (5240 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.48	44.8	H	peak	4.9	49.7	68.2	18.5

TEST DATA

802.11ac (20 MHz) mode – MIMO

Lowest Channel (5180 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.36	47.3	H	peak	4.2	51.5	68.2	16.7

Middle Channel (5220 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.44	46.4	V	peak	4.7	51.1	68.2	17.1

Highest Channel (5240 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.48	44.6	V	peak	4.9	49.5	68.2	18.7

802.11ac (40 MHz) mode – SISO

Chain 0

Lowest Channel (5190 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.38	47.4	H	peak	4.3	51.7	68.2	16.5

Highest Channel (5230 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.46	45.1	V	peak	4.8	49.9	68.2	18.3

TEST DATA

802.11ac (40 MHz) mode – CDD

Lowest Channel (5190 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.38	46.8	V	peak	4.3	51.1	68.2	17.1

Highest Channel (5230 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.46	44.8	V	peak	4.8	49.6	68.2	18.6

802.11ac (40 MHz) mode – MIMO

Lowest Channel (5190 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.38	47.1	H	peak	4.3	51.4	68.2	16.8

Highest Channel (5230 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.46	44.7	H	peak	4.8	49.5	68.2	18.7

802.11ac (80 MHz) mode – SISO

Chain 0

Channel (5230 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.42	44.8	V	peak	4.5	49.3	68.2	18.9

TEST DATA

802.11ac (80 MHz) mode – CDD

Channel (5230 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.42	45.4	H	peak	4.5	49.9	68.2	18.3

802.11ac (40 MHz) mode – MIMO

Channel (5230 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.42	45.2	H	peak	4.5	49.7	68.2	18.5

Note:

*1. *Pol. H = Horizontal V = Vertical*

*2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.*

3. At frequencies above 1 GHz, peak emissions were measured using RBW = 1 MHz, VBW = 3 MHz, Detector = Peak.

4. As the EUT was configured to transmit with duty cycles < 98 percent, at frequencies above 1 GHz, average emission levels were measured using the "Method VB" by setting the analyzer RBW = 1 MHz, VBW = 3 kHz (VBW ≥ 1/T), Detector = Peak.

5. The spectrum is measured from 9 kHz to 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the third harmonic and 26.5GHz for this device.

6. For outside of the restricted band, the peak limit is 68.2 dBµV/m. (E[dBµV/m] = EIRP[dBm] + 95.2 = 68.2 dBuV/m, for EIPR[dBm] = -27dBm.)

7. For restricted band, the peak limit is 74 dBµV/m, the average limit is 54 dBµV/m per FCC §15.209 and RSS-GEN Issue4 8.9

8. ac mode was the worst case of a/n/ac modes.

8. The radiated emissions testing were made by rotating EUT through three orthogonal axes and rotating the receive antenna with horizontal, Vertical polarization. The worst data was recorded.

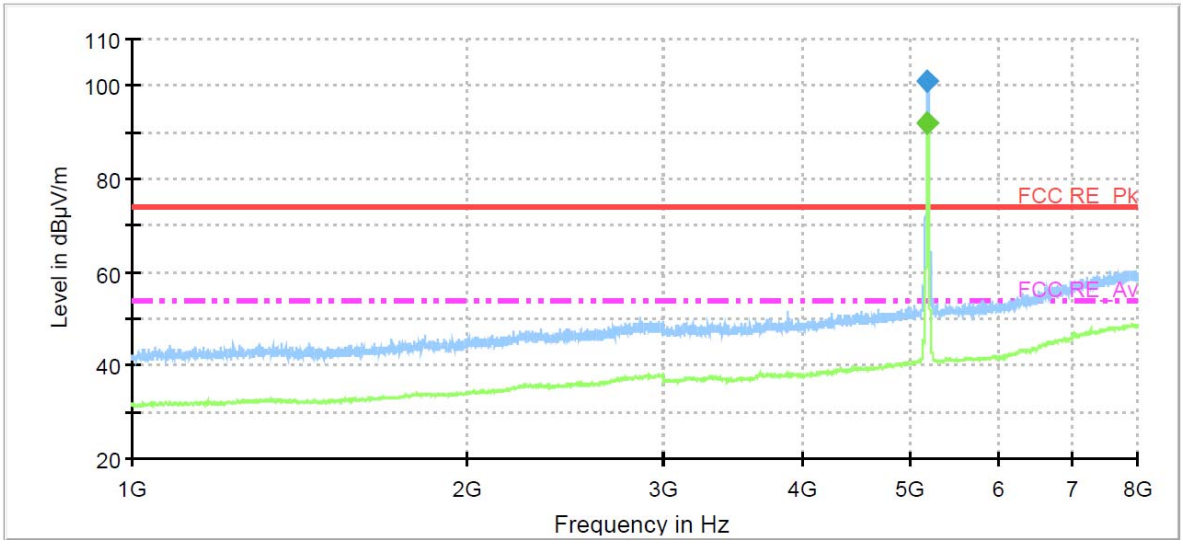
9. At frequencies above 1 GHz, EUT was placed at a height of 1.5m above the floor on a support according to ANSI 63.10-2013.

PLOTS OF EMISSIONS

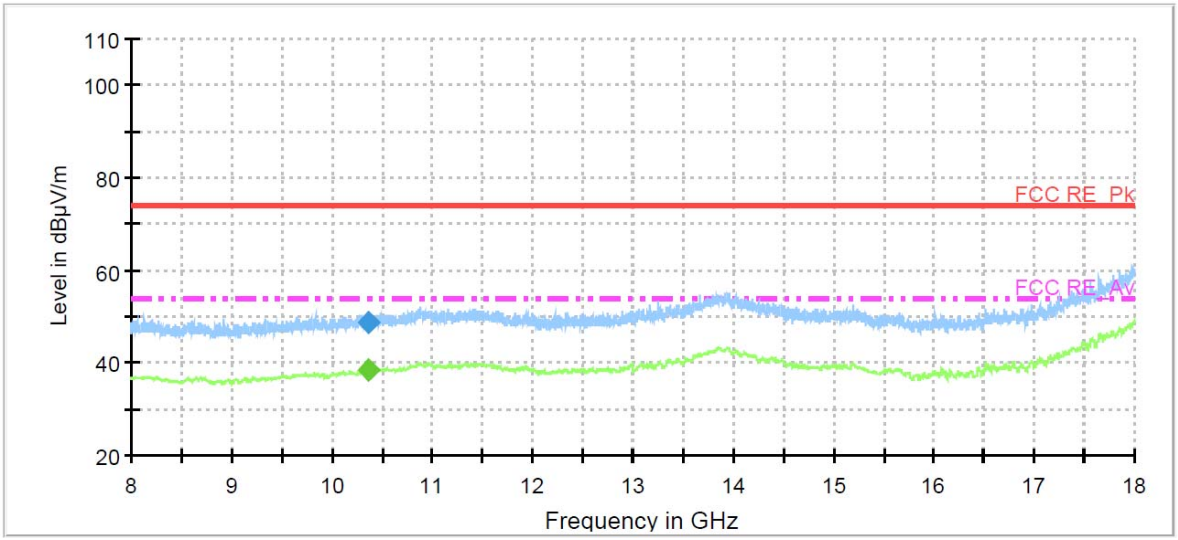
Worst Case

802.11ac (20 MHz) mode-CDD

Lowest Channel : 1 GHz to 8 GHz

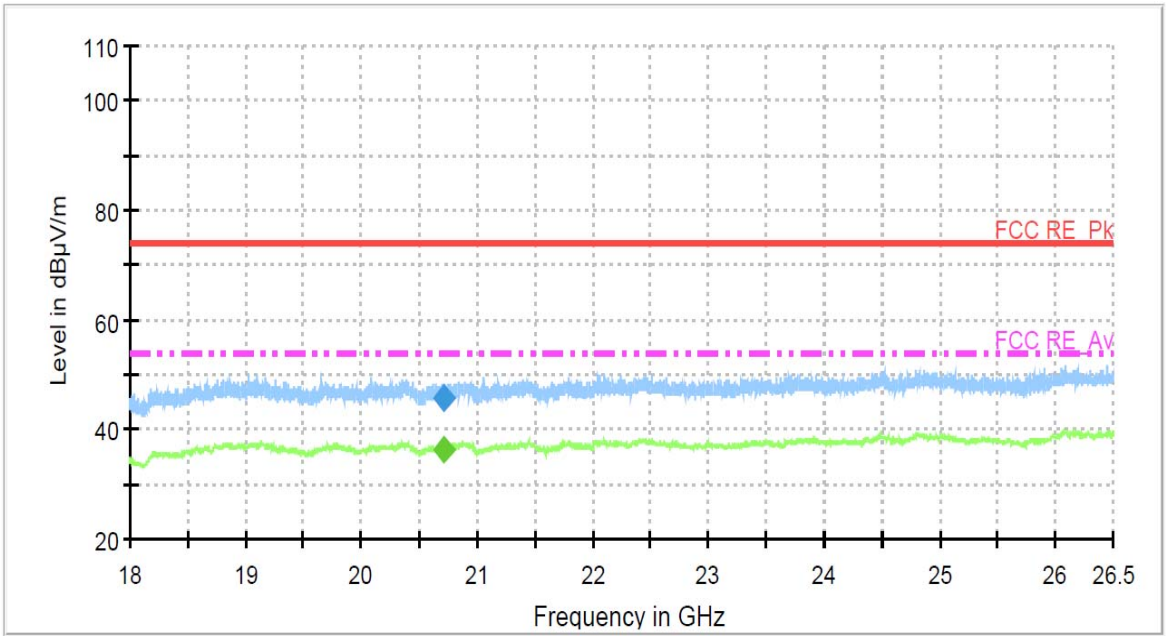


Lowest channel : 8 GHz to 18 GHz



PLOTS OF EMISSIONS

Lowest channel : 18 GHz to 26 GHz



8.7.2 Radiated Spurious Emissions – UNII-2A band

FCC §15.407(b), RSS-247 Issue 1, 6.2

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode

Chain 0

Lowest Channel (5260 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.52	45.5	V	peak	5.1	50.6	74.0	23.4

Middle Channel (5300 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.60	43.9	V	peak	5.3	49.2	74.0	24.8
10.60	35.9	V	average	5.3	41.2	54.0	12.8

Highest Channel (5320 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.64	44.7	H	peak	5.3	50.0	74.0	24.0
10.64	34.9	H	average	5.3	40.2	54.0	13.8

TEST DATA

802.11ac (20 MHz) mode - SISO

Chain 0

Lowest Channel (5260 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.52	44.9	V	peak	5.1	50.0	74.0	24.0

Middle Channel (5300 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.60	44.0	V	peak	5.3	49.3	74.0	24.7
10.60	34.5	V	average	5.3	39.8	54.0	14.2

Highest Channel (5320 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.64	43.0	H	peak	5.3	48.3	74.0	25.7
10.64	34.7	H	average	5.3	40.0	54.0	14.0

802.11ac (20 MHz) mode - CDD

Lowest Channel (5260 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.52	44.6	V	peak	5.1	49.7	74.0	24.3

Middle Channel (5300 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.60	42.9	H	peak	5.3	48.2	74.0	25.8
10.60	34.7	H	average	5.3	40.0	54.0	14.0

Highest Channel (5320 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.64	42.7	H	peak	5.3	48.0	74.0	26.0
10.64	35.3	H	average	5.3	40.6	54.0	13.4

802.11ac (20 MHz) mode - MIMO

Lowest Channel (5260 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.52	45.2	V	peak	5.1	50.3	74.0	23.7

Middle Channel (5300 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.60	42.4	H	peak	5.3	47.7	74.0	26.3
10.60	34.2	H	average	5.3	39.5	54.0	14.5

Highest Channel (5320 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.64	44.8	H	peak	5.3	50.1	74.0	23.9
10.64	34.7	H	average	5.3	40.0	54.0	14.0

802.11ac (40 MHz) mode - SISO

Chain 0

Lowest Channel (5270 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.54	44.8	V	peak	5.1	49.9	74.0	24.1

Highest Channel (5310 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.62	43.6	V	peak	5.3	48.9	74.0	25.1
10.62	35.1	V	average	5.3	40.4	54.0	13.6

802.11ac (40 MHz) mode - CDD

Lowest Channel (5270 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.54	44.8	V	peak	5.1	49.9	74.0	24.1

Highest Channel (5310 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.62	44.4	V	peak	5.3	49.7	74.0	24.3
10.62	35.3	V	average	5.3	40.6	54.0	13.4

802.11ac (40 MHz) mode - MIMO

Lowest Channel (5270 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.54	44.7	V	peak	5.1	49.8	74.0	24.2

Highest Channel (5310 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.62	45.0	V	peak	5.3	50.3	74.0	23.7
10.62	35.0	V	average	5.3	40.3	54.0	13.7

802.11ac (80 MHz) mode - SISO

Chain 0

Channel (5290 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.58	45.5	V	peak	5.2	50.7	74.0	23.3
10.58	34.7	V	average	5.2	39.9	54.0	14.1

802.11ac (80 MHz) mode - CDD

Channel (5290 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.58	44.5	V	peak	5.2	49.7	74.0	24.3
10.58	34.7	V	average	5.2	39.9	54.0	14.1

802.11ac (80 MHz) mode - MIMO

Channel (5290 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
10.58	44.5	V	peak	5.2	49.7	74.0	24.3
10.58	34.7	V	average	5.2	39.9	54.0	14.1

TEST DATA

Note:

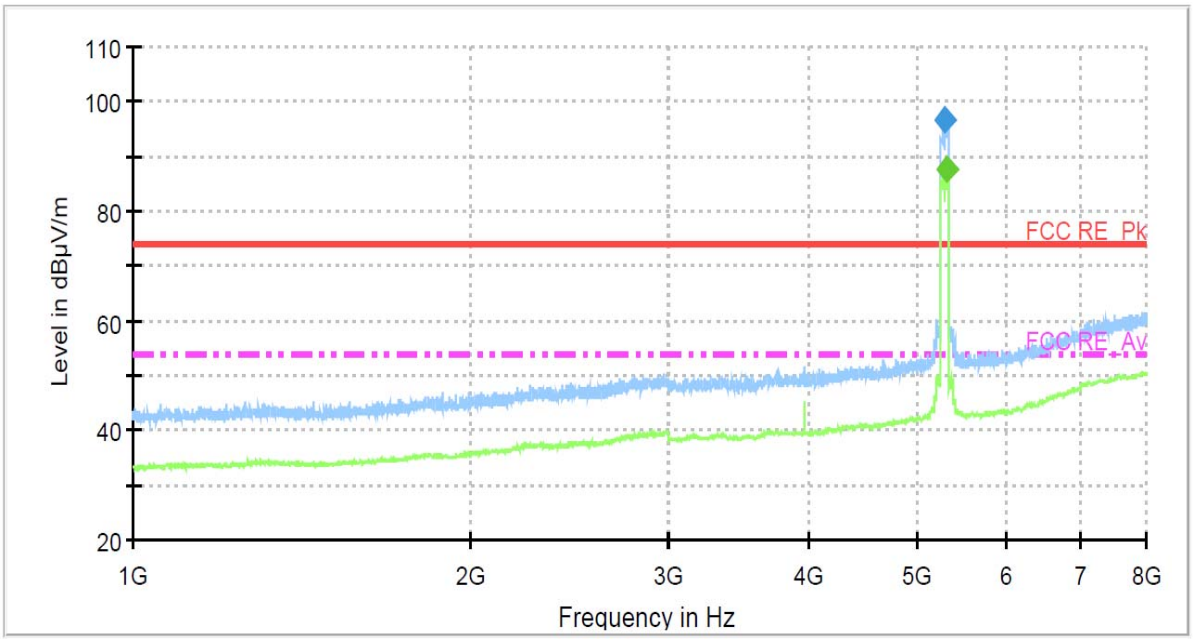
1. *Pol. H = Horizontal V = Vertical
2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.
3. At frequencies above 1 GHz, peak emissions were measured using RBW = 1 MHz, VBW = 3 MHz, Detector = Peak.
4. As the EUT was configured to transmit with duty cycles < 98 percent, at frequencies above 1 GHz, average emission levels were measured using the "Method VB" by setting the analyzer RBW = 1 MHz, VBW = 3 kHz (VBW ≥ 1/T), Detector = Peak.
5. The spectrum is measured from 9 kHz to 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the third harmonic and 26.5GHz for this device.
6. For outside of the restricted band, the peak limit is 68.2 dBμV/m. (E[dBμV/m] = EIRP[dBm] + 95.2 = 68.2 dBuV/m, for EIPR[dBm] = -27dBm.)
7. For restricted band, the peak limit is 74 dBμV/m, the average limit is 54 dBμV/m per FCC §15.209 and RSS-GEN Issue4 8.9
8. ac mode was the worst case of a/n/ac modes.
9. The radiated emissions testing were made by rotating EUT through three orthogonal axes and rotating the receive antenna with horizontal, Vertical polarization. The worst data was recorded.
10. At frequencies above 1 GHz, EUT was placed at a height of 1.5m above the floor on a support according to ANSI 63.10-2013.

PLOTS OF EMISSIONS

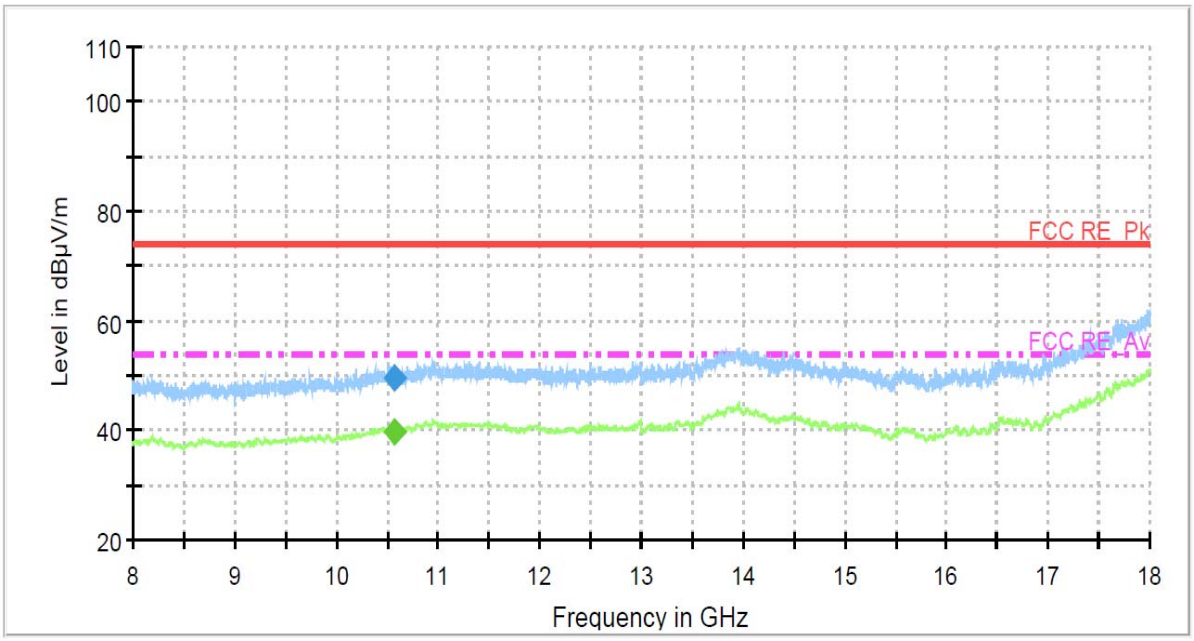
Worst Case

802.11ac (80 MHz) mode – MIMO

1 GHz to 8 GHz

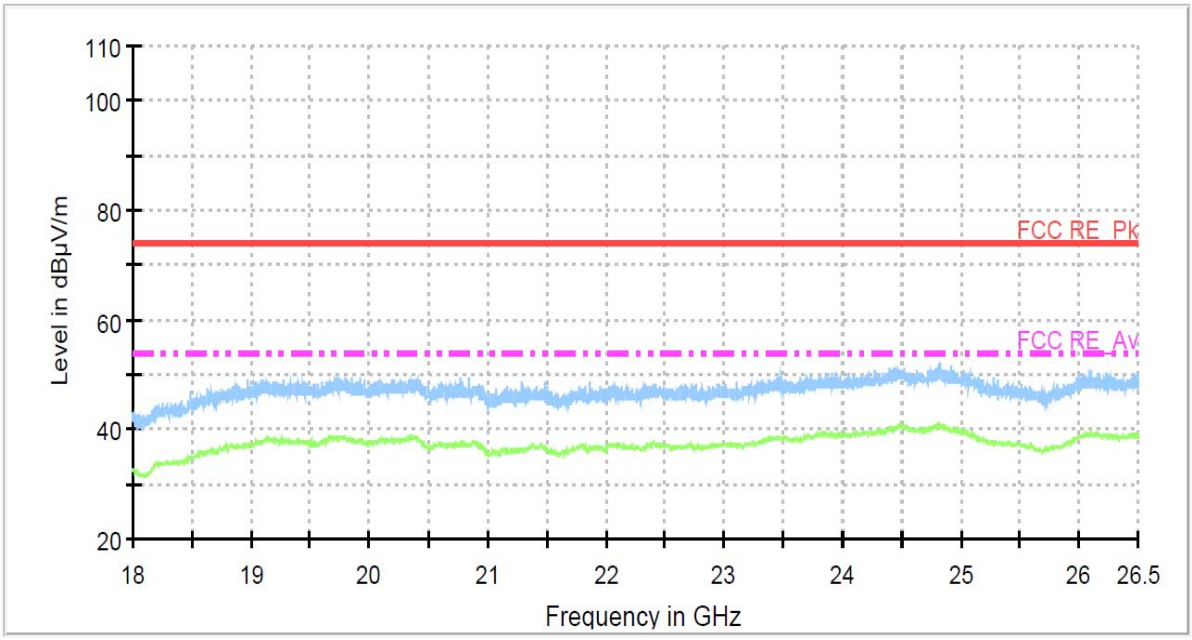


8 GHz to 18 GHz



PLOTS OF EMISSIONS

8 GHz to 26 GHz



8.7.3 Radiated Spurious Emissions – UNII-2C band

FCC §15.407(b), RSS-247 Issue 1, 6.2

Test Mode : Set to Lowest channel, Middle channel and Highest channel

802.11a mode

Chain 0

Lowest Channel (5500 MHz)

Frequency (GHz)	Reading (dBμV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11.00	45.0	V	peak	5.6	50.6	74.0	23.4
11.00	35.4	V	average	5.6	41.0	54.0	13.0

Middle Channel (5580 MHz)

Frequency (GHz)	Reading (dBμV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11.16	43.3	V	peak	6.1	49.4	74.0	24.6
11.16	35.1	V	average	6.1	41.2	54.0	12.8

Highest Channel (5700 MHz)

Frequency (GHz)	Reading (dBμV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
11.40	43.4	V	peak	5.8	49.2	74.0	24.8
11.40	35.3	V	average	5.8	41.1	54.0	12.9

TEST DATA

802.11ac (20 MHz) mode - SISO

Chain 0

Lowest Channel (5500 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.00	44.8	H	peak	5.6	50.4	74.0	23.6
11.00	35.3	H	average	5.6	40.9	54.0	13.1

Middle Channel (5580 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.16	44.1	V	peak	6.1	50.2	74.0	23.8
11.16	35.0	V	average	6.1	41.1	54.0	12.9

Highest Channel (5700 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.40	43.4	V	peak	5.8	49.2	74.0	24.8
11.40	35.4	V	average	5.8	41.2	54.0	12.8

802.11ac (20 MHz) mode - CDD

Lowest Channel (5500 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.00	44.6	H	peak	5.6	50.2	74.0	23.8
11.00	35.1	H	average	5.6	40.7	54.0	13.3

Middle Channel (5580 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.16	44.3	V	peak	6.1	50.4	74.0	23.6
11.16	34.7	V	average	6.1	40.8	54.0	13.2

Highest Channel (5700 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.40	44.2	V	peak	5.8	50.0	74.0	24.0
11.40	35.2	V	average	5.8	41.0	54.0	13.0

802.11ac (20 MHz) mode - MIMO

Lowest Channel (5500 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.00	43.9	H	peak	5.6	49.5	74.0	24.5
11.00	35.4	H	average	5.6	41.0	54.0	13.0

Middle Channel (5580 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.16	43.0	V	peak	6.1	49.1	74.0	24.9
11.16	34.7	V	average	6.1	40.8	54.0	13.2

Highest Channel (5700 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.40	44.9	V	peak	5.8	50.7	74.0	23.3
11.40	35.5	V	average	5.8	41.3	54.0	12.7

802.11ac (40 MHz) mode - SISO

Chain 0

Lowest Channel (5510 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.02	43.1	H	peak	5.6	48.7	74.0	25.3
11.02	36.0	H	average	5.6	41.6	54.0	12.4

TEST DATA

Middle Channel (5550 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.10	45.1	H	peak	5.9	51.0	74.0	23.0
11.10	34.5	H	average	5.9	40.4	54.0	13.6

Highest Channel (5670 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.34	41.9	H	peak	6.1	48.0	74.0	26.0
11.34	34.2	H	average	6.1	40.3	54.0	13.7

802.11ac (40 MHz) mode - CDD

Lowest Channel (5510 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.02	42.7	H	peak	5.6	48.3	74.0	25.7
11.02	35.2	H	average	5.6	40.8	54.0	13.2

Middle Channel (5550 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.10	42.2	V	peak	5.9	48.1	74.0	25.9
11.10	34.8	V	average	5.9	40.7	54.0	13.3

Highest Channel (5670 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.34	42.4	H	peak	6.1	48.5	74.0	25.5
11.34	34.3	H	average	6.1	40.4	54.0	13.6

TEST DATA

802.11ac (40 MHz) mode - MIMO

Lowest Channel (5510 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.02	44.5	H	peak	5.6	50.1	74.0	23.9
11.02	35.0	H	average	5.6	40.6	54.0	13.4

Middle Channel (5550 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.10	43.8	V	peak	5.9	49.7	74.0	24.3
11.10	34.4	V	average	5.9	40.3	54.0	13.7

Highest Channel (5670 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.34	43.1	H	peak	6.1	49.2	74.0	24.8
11.34	34.3	H	average	6.1	40.4	54.0	13.6

802.11ac (80 MHz) mode - SISO

Chain 0

Channel (5530 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.06	43.4	H	peak	5.8	49.2	74.0	24.8
11.06	34.5	H	average	5.8	40.3	54.0	13.7

TEST DATA

802.11ac (80 MHz) mode - CDD

Channel (5530 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.06	42.8	V	peak	5.8	48.6	74.0	25.4
11.06	34.8	V	average	5.8	40.6	54.0	13.4

802.11ac (80 MHz) mode - MIMO

Channel (5530 MHz)

Frequency (GHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
11.06	44.0	H	peak	5.8	49.8	74.0	24.2
11.06	34.8	H	average	5.8	40.6	54.0	13.4

TEST DATA

Note:

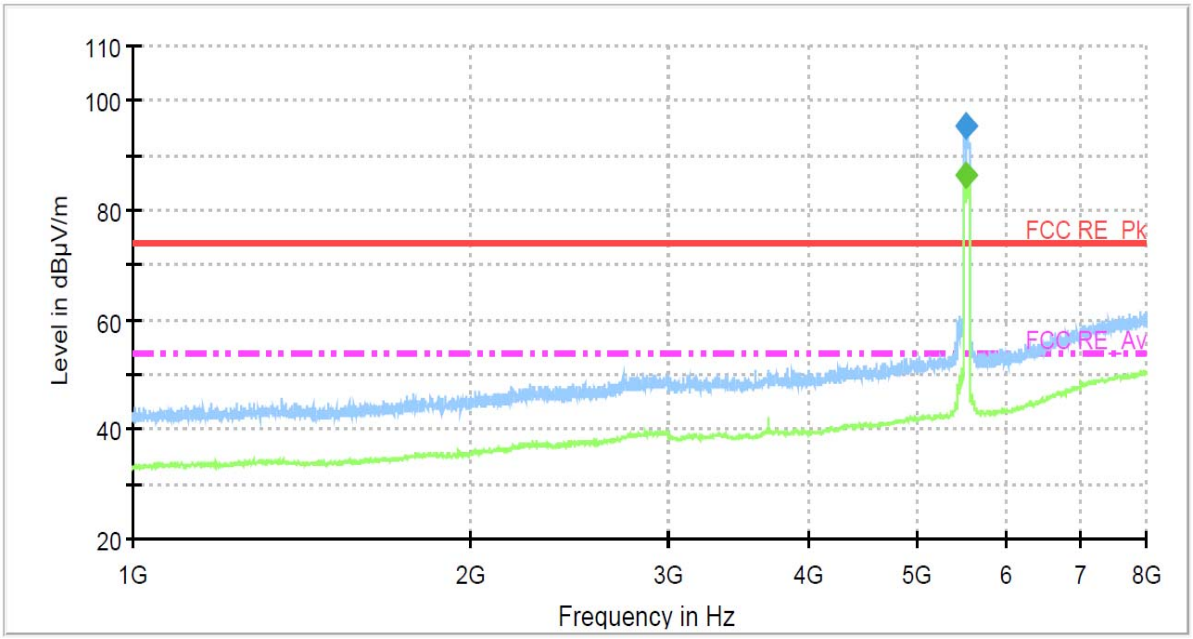
1. *Pol. H = Horizontal V = Vertical
2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.
3. At frequencies above 1 GHz, peak emissions were measured using RBW = 1 MHz, VBW = 3 MHz, Detector = Peak.
4. As the EUT was configured to transmit with duty cycles < 98 percent, at frequencies above 1 GHz, average emission levels were measured using the "Method VB" by setting the analyzer RBW = 1 MHz, VBW = 3 kHz (VBW ≥ 1/T), Detector = Peak.
5. The spectrum is measured from 9 kHz to 10th harmonic and the worst-case emissions are reported. No significant emissions were found beyond the third harmonic and 26.5GHz for this device.
6. For outside of the restricted band, the peak limit is 68.2 dBμV/m. (E[dBμV/m] = EIRP[dBm] + 95.2 = 68.2 dBuV/m, for EIPR[dBm] = -27dBm.)
7. For restricted band, the peak limit is 74 dBμV/m, the average limit is 54 dBμV/m per FCC §15.209 and RSS-GEN Issue4 8.9
8. ac mode was the worst case of a/n/ac modes.
9. The radiated emissions testing were made by rotating EUT through three orthogonal axes and rotating the receive antenna with horizontal, Vertical polarization. The worst data was recorded.
10. At frequencies above 1 GHz, EUT was placed at a height of 1.5m above the floor on a support according to ANSI 63.10-2013.

PLOTS OF EMISSIONS

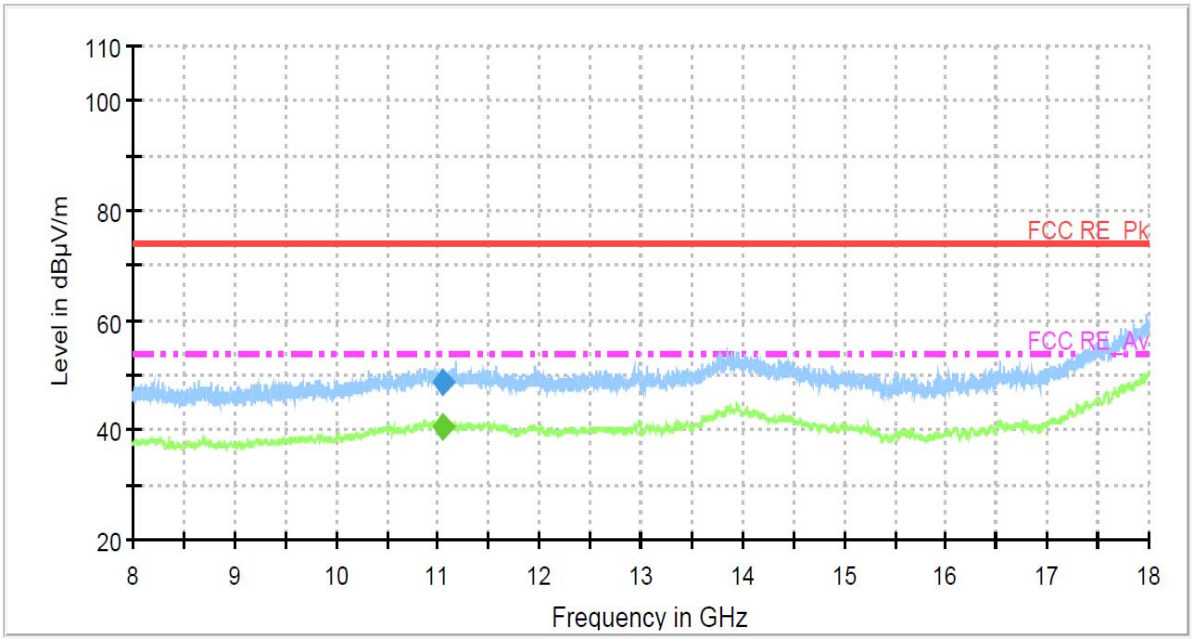
Worst Case

802.11ac (80 MHz) mode – CDD

Lowest channel : 1 GHz to 8 GHz

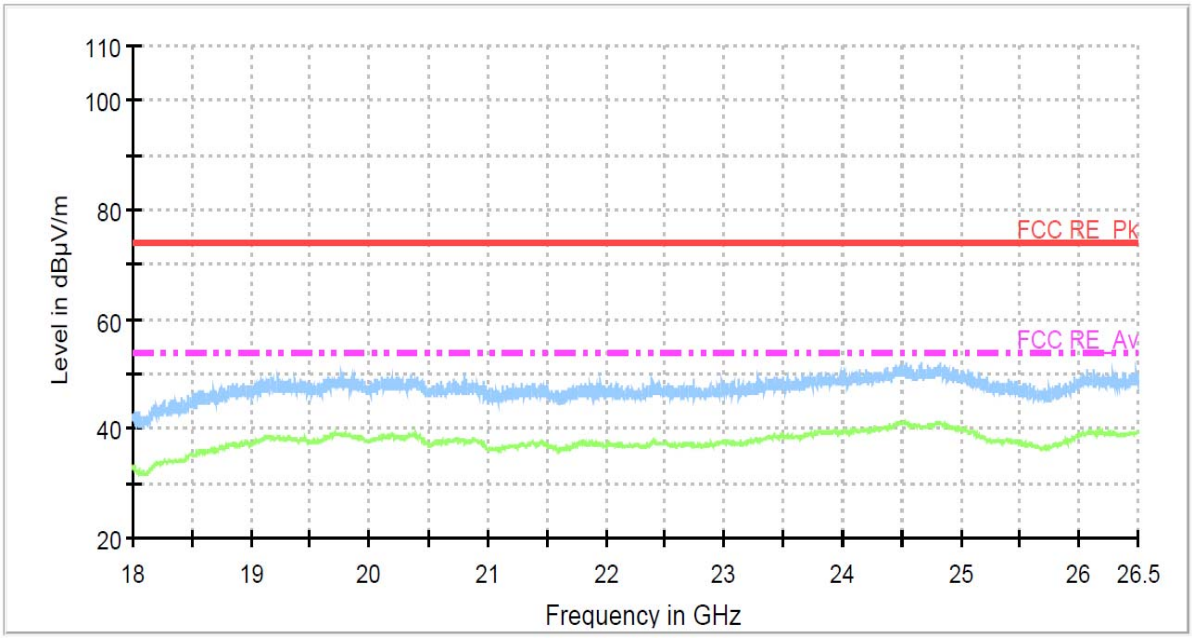


Lowest channel : 8 GHz to 18 GHz



PLOTS OF EMISSIONS

Lowest channel : 18 GHz to 26 GHz



8.8 Radiated Band Edge

8.8.1 Radiated Band Edge – UNII-1 band

FCC §15.407(b), RSS-247 Issue 1, 6.2

Test Mode : Set to Lowest channel and Highest channel

802.11a mode

Chain 0

Lowest Channel (5180 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	48.00	H	peak	10.20	58.20	74.0	15.80
5150.00	32.20	H	average	10.20	42.40	54.0	11.60

802.11n (20 MHz) mode – SISO

Chain 0

Lowest Channel (5180 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	51.60	H	peak	10.20	61.80	74.0	12.20
5150.00	34.10	H	average	10.20	44.30	54.0	9.70

802.11n (20 MHz) mode – CDD

Lowest Channel (5180 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	53.80	H	peak	10.20	64.00	74.0	10.00
5150.00	38.80	H	average	10.20	49.00	54.0	5.00

802.11n (20 MHz) mode – MIMO

Lowest Channel (5180 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	50.50	H	peak	10.20	60.70	74.0	13.30
5150.00	34.20	H	average	10.20	44.40	54.0	9.60

802.11n (40 MHz) mode – SISO

Chain 0

Lowest Channel (5190 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	53.40	H	peak	10.20	63.60	74.0	10.40
5150.00	37.70	H	average	10.20	47.90	54.0	6.10

TEST DATA

802.11n (40 MHz) mode – CDD

Lowest Channel (5190 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	55.90	H	peak	10.20	66.10	74.0	7.90
5150.00	41.20	H	average	10.20	51.40	54.0	2.60

802.11n (40 MHz) mode – MIMO

Lowest Channel (5190 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	55.20	H	peak	10.20	65.40	74.0	8.60
5150.00	40.80	H	average	10.20	51.00	54.0	3.00

TEST DATA

802.11ac (20 MHz) mode – SISO

Chain 0

Lowest Channel (5180 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	48.70	H	peak	10.20	58.90	74.0	15.10
5150.00	32.60	H	average	10.20	42.80	54.0	11.20

802.11ac (20 MHz) mode – CDD

Lowest Channel (5180 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	50.70	H	peak	10.20	60.90	74.0	13.10
5150.00	35.10	H	average	10.20	45.30	54.0	8.70

802.11ac (20 MHz) mode – MIMO

Lowest Channel (5180 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	49.00	H	peak	10.20	59.20	74.0	14.80
5150.00	34.20	H	average	10.20	44.40	54.0	9.60

TEST DATA

802.11ac (40 MHz) mode – SISO

Chain 0

Lowest Channel (5190 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	53.60	H	peak	10.20	63.80	74.0	10.20
5150.00	37.70	H	average	10.20	47.90	54.0	6.10

802.11ac (40 MHz) mode – CDD

Lowest Channel (5190 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5149.57	56.20	H	peak	10.20	66.40	74.0	7.60
5150.00	40.90	H	average	10.20	51.10	54.0	2.90

802.11ac (40 MHz) mode – MIMO

Lowest Channel (5190 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	52.90	H	peak	10.20	63.10	74.0	10.90
5150.00	39.50	H	average	10.20	49.70	54.0	4.30

TEST DATA

802.11ac (80 MHz) mode – SISO

Chain 0

Channel (5210 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	43.10	H	peak	10.20	53.30	74.0	20.70
5150.00	32.90	H	average	10.20	43.10	54.0	10.90

802.11ac (80 MHz) mode – CDD

Channel (5210 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5149.57	45.40	H	peak	10.20	55.60	74.0	18.40
5150.00	34.70	H	average	10.20	44.90	54.0	9.10

802.11ac (80 MHz) mode – MIMO

Channel (5210 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5150.00	45.50	H	peak	10.20	55.70	74.0	18.30
5150.00	34.20	H	average	10.20	44.40	54.0	9.60

8.8.2 Radiated Band Edge – UNII-2A band

FCC §15.407(b), RSS-247 Issue 1, 6.2

Test Mode : Set to Lowest channel and Highest channel

802.11a mode

Chain 0

Highest Channel (5320 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	50.40	H	peak	10.60	61.00	74.0	13.00
5350.00	35.20	H	average	10.60	45.80	54.0	8.20

802.11n (20 MHz) mode – SISO

Chain 0

Highest Channel (5320 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	49.10	V	peak	10.60	59.70	74.0	14.30
5350.00	34.40	V	average	10.60	45.00	54.0	9.00

TEST DATA

802.11n (20 MHz) mode – CDD

Highest Channel (5320 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	49.60	V	peak	10.60	60.20	74.0	13.80
5350.00	36.20	V	average	10.60	46.80	54.0	7.20

802.11n (20 MHz) mode – MIMO

Highest Channel (5320 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	53.50	V	peak	10.60	64.10	74.0	9.90
5350.00	37.70	V	average	10.60	48.30	54.0	5.70

802.11n (40 MHz) mode – SISO

Chain 0

Highest Channel (5320 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	46.50	V	peak	10.60	57.10	74.0	16.90
5350.00	33.70	V	average	10.60	44.30	54.0	9.70

TEST DATA

802.11n (40 MHz) mode – CDD

Highest Channel (5320 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	51.90	V	peak	10.60	62.50	74.0	11.50
5350.00	38.40	V	average	10.60	49.00	54.0	5.00

802.11n (40 MHz) mode – MIMO

Highest Channel (5320 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	51.10	V	peak	10.60	61.70	74.0	12.30
5350.00	38.50	V	average	10.60	49.10	54.0	4.90

802.11ac (20 MHz) mode – SISO

Chain 0

Highest Channel (5230 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	52.30	V	peak	10.60	62.90	74.0	11.10
5350.00	35.90	V	average	10.60	46.50	54.0	7.50

TEST DATA

802.11ac (20 MHz) mode – CDD

Highest Channel (5320 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	52.70	V	peak	10.60	63.30	74.0	10.70
5350.00	37.50	V	average	10.60	48.10	54.0	5.90

802.11ac (20 MHz) mode – MIMO

Highest Channel (5320 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	47.90	V	peak	10.60	58.50	74.0	15.50
5350.00	35.30	V	average	10.60	45.90	54.0	8.10

802.11ac (40 MHz) mode – SISO

Chain 0

Highest Channel (5310 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	45.80	V	peak	10.60	56.40	74.0	17.60
5350.00	33.90	V	average	10.60	44.50	54.0	9.50

TEST DATA

802.11ac (40 MHz) mode – CDD

Highest Channel (5310 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	50.50	V	peak	10.60	61.10	74.0	12.90
5350.00	37.80	V	average	10.60	48.40	54.0	5.60
5350.88	51.60	V	peak	10.60	62.20	74.0	11.80
5350.88	38.90	V	average	10.60	49.50	54.0	4.50

802.11ac (40 MHz) mode – MIMO

Highest Channel (5310 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	51.50	V	peak	10.60	62.10	74.0	11.90
5350.00	38.70	V	average	10.60	49.30	54.0	4.70

802.11ac (80 MHz) mode – SISO

Channel (5290 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	45.00	V	peak	10.60	55.60	74.0	18.40
5350.00	33.00	V	average	10.60	43.60	54.0	10.40

TEST DATA

802.11ac (80 MHz) mode – CDD

Channel (5290 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	48.90	V	peak	10.60	59.50	74.0	14.50
5350.00	38.60	V	average	10.60	49.20	54.0	4.80

802.11ac (80 MHz) mode – MIMO

Channel (5290 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5350.00	51.20	V	peak	10.60	61.80	74.0	12.20
5350.00	39.60	V	average	10.60	50.20	54.0	3.80

8.8.3 Radiated Band Edge – UNII-2C band

FCC §15.407(b), RSS-247 Issue 1, 6.2

Test Mode : Set to Lowest channel and Highest channel

802.11a mode

Chain 0

Lowest Channel (5500 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	45.20	H	peak	10.90	56.10	74.0	17.90
5460.00	33.90	H	average	10.90	44.80	54.0	9.20

Highest Channel (5700 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	48.90	H	peak	11.00	59.90	68.2	8.30

802.11n (20 MHz) mode – SISO

Chain 0

Lowest Channel (5500 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	45.40	V	peak	10.90	56.30	74.0	17.70
5460.00	34.20	V	average	10.90	45.10	54.0	8.90

TEST DATA

Highest Channel (5700 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	50.70	V	peak	11.00	61.70	68.2	6.50

802.11n (20 MHz) mode – CDD

Lowest Channel (5500 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	49.40	V	peak	10.90	60.30	74.0	13.70
5460.00	34.60	V	average	10.90	45.50	54.0	8.50

Highest Channel (5700 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	50.60	V	peak	11.00	61.60	68.2	6.60

802.11n (20 MHz) mode – MIMO

Lowest Channel (5500 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	48.80	V	peak	10.90	59.70	74.0	14.30
5460.00	34.40	V	average	10.90	45.30	54.0	8.70

TEST DATA

Highest Channel (5700 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	52.60	V	peak	11.00	63.60	68.2	4.60

802.11n (40 MHz) mode – SISO

Chain 0

Lowest Channel (5510 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	49.80	V	peak	10.90	60.70	74.0	13.30
5460.00	35.70	V	average	10.90	46.60	54.0	7.40

Highest Channel (5670 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	42.20	V	peak	11.00	53.20	68.2	15.00

802.11n (40 MHz) mode – CDD

Lowest Channel (5510 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	50.70	V	peak	10.90	61.60	74.0	12.40
5460.00	37.60	V	average	10.90	48.50	54.0	5.50

TEST DATA

Highest Channel (5670 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	41.40	V	peak	11.00	52.40	68.2	15.80

802.11n (40 MHz) mode – MIMO

Lowest Channel (5510 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	49.90	V	peak	10.90	60.80	74.0	13.20
5460.00	36.30	V	average	10.90	47.20	54.0	6.80

Highest Channel (5670 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	43.40	V	peak	11.00	54.40	68.2	13.80

802.11ac (20 MHz) mode – SISO

Chain 0

Lowest Channel (5500 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	46.20	V	peak	10.90	57.10	74.0	16.90
5460.00	33.90	V	average	10.90	44.80	54.0	9.20

TEST DATA

Highest Channel (5700 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	52.10	V	peak	11.00	63.10	68.2	5.10

802.11ac (20 MHz) mode – CDD

Lowest Channel (5500 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	46.30	V	peak	10.90	57.20	74.0	16.80
5460.00	34.50	V	average	10.90	45.40	54.0	8.60

Highest Channel (5700 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	49.00	V	peak	11.00	60.00	68.2	8.20

802.11n (20 MHz) mode – MIMO

Lowest Channel (5500 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	48.20	V	peak	10.90	59.10	74.0	14.90
5460.00	34.30	V	average	10.90	45.20	54.0	8.80

Highest Channel (5700 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	51.70	V	peak	11.00	62.70	68.2	5.50

TEST DATA

802.11ac (40 MHz) mode – SISO

Chain 0

Lowest Channel (5510 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	51.70	V	peak	10.90	62.60	74.0	11.40
5460.00	35.90	V	average	10.90	46.80	54.0	7.20

Highest Channel (5670 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	42.40	V	peak	11.00	53.40	68.2	14.80

802.11ac (40 MHz) mode – CDD

Lowest Channel (5510 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	48.80	V	peak	10.90	59.70	74.0	14.30
5460.00	36.90	V	peak	10.90	47.80	54.0	6.20

Highest Channel (5670 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	42.30	V	peak	11.00	53.30	68.2	14.90

802.11n (40 MHz) mode – MIMO

Lowest Channel (5510 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	47.20	V	peak	10.90	58.10	74.0	15.90
5460.00	36.70	V	average	10.90	47.60	54.0	6.40

Lowest Channel (5670 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5725.00	42.70	V	peak	11.00	53.70	68.2	14.50

802.11ac (80 MHz) mode – SISO

Chain 0

Channel (5530 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	48.80	V	peak	10.90	59.70	74.0	14.30
5460.00	37.00	V	average	10.90	47.90	54.0	6.10

802.11ac (80 MHz) mode – CDD

Channel (5530 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5459.20	51.70	V	peak	10.90	62.60	74.0	11.40
5459.20	38.90	V	average	10.90	49.80	54.0	4.20
5460.00	49.30	V	peak	10.90	60.20	74.0	13.80
5460.00	37.70	V	average	10.90	48.60	54.0	5.40

TEST DATA

802.11ac (80 MHz) mode – MIMO

Channel (5530 MHz)

Frequency (MHz)	Reading (dBµV)	Pol* (H/V)	mode	AF+CL+Amp (dB)**	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
5460.00	49.50	V	peak	10.90	60.40	74.0	13.60
5460.00	37.70	V	average	10.90	48.60	54.0	5.40

TEST DATA

Note:

1. *Pol. H = Horizontal V = Vertical
2. **AF + CL + Amp. = Antenna Factor + Cable Loss + Amplifier.
3. All modes of operation and all lowest, highest channels were investigated and the worst -case emissions in each band are reported.
4. At frequencies above 1 GHz, peak emissions were measured using RBW = 1 MHz, VBW = 3 MHz, Detector = Peak.
5. As the EUT was configured to transmit with duty cycles < 98 percent, at frequencies above 1 GHz, average emission levels were measured using the "Method VB" by setting the analyzer RBW = 1 MHz, VBW = 3kHz (VBW ≥ 1/T), Detector = Peak.
6. For outside of the restricted band, the peak limit is 68.2 dBμV/m. (E[dBμV/m] = EIRP[dBm] + 95.2 = 68.2 dBuV/m, for EIPR[dBm] = -27dBm.)

   ***For 5.725-5.85 GHz band, All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.
   peak limit is 78.2 dBμV/m. (E[dBμV/m] = EIRP[dBm] + 95.2 = 68.2 dBuV/m, for EIPR[dBm] = -17dBm.)
   peak limit is 68.2 dBμV/m. (E[dBμV/m] = EIRP[dBm] + 95.2 = 68.2 dBuV/m, for EIPR[dBm] = -27dBm.)
7. For restricted band, the peak limit is 74 dBμV/m, the average limit is 54 dBμV/m per FCC §15.209 and RSS-GEN Issue4 8.9
8. The radiated emissions testing were made by rotating EUT through three orthogonal axes and rotating the receive antenna with horizontal, Vertical polarization. The worst data was recorded.
9. At frequencies above 1 GHz, EUT was placed at a height of 1.5m above the floor on a support according to ANSI 63.10-2013.

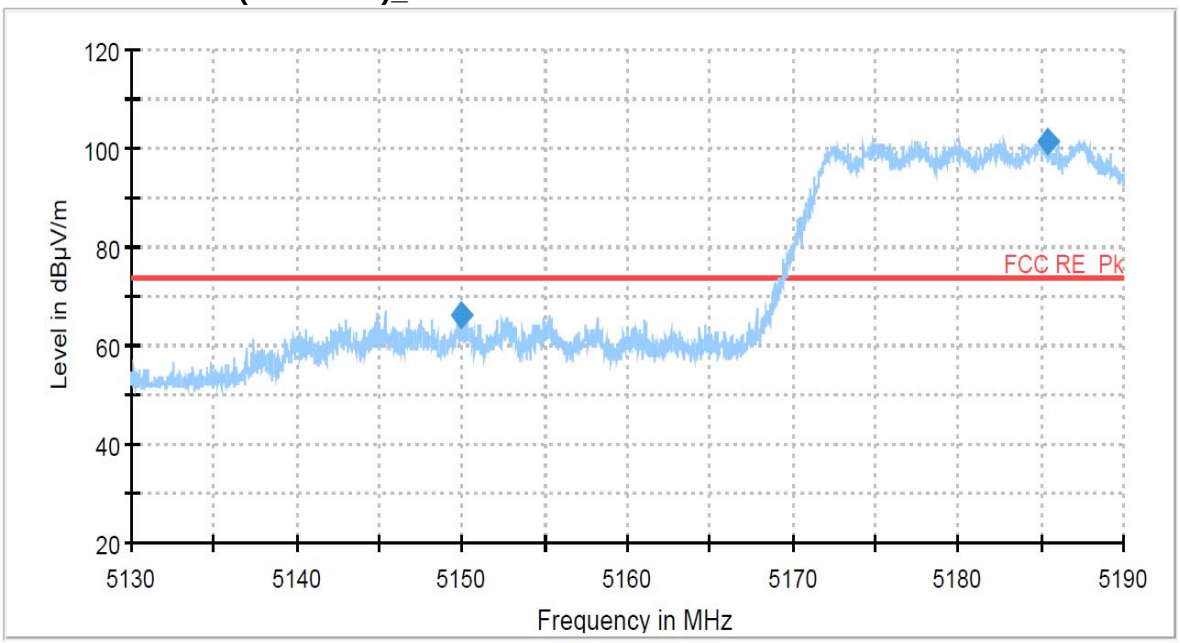
PLOTS OF EMISSIONS

Worst Case

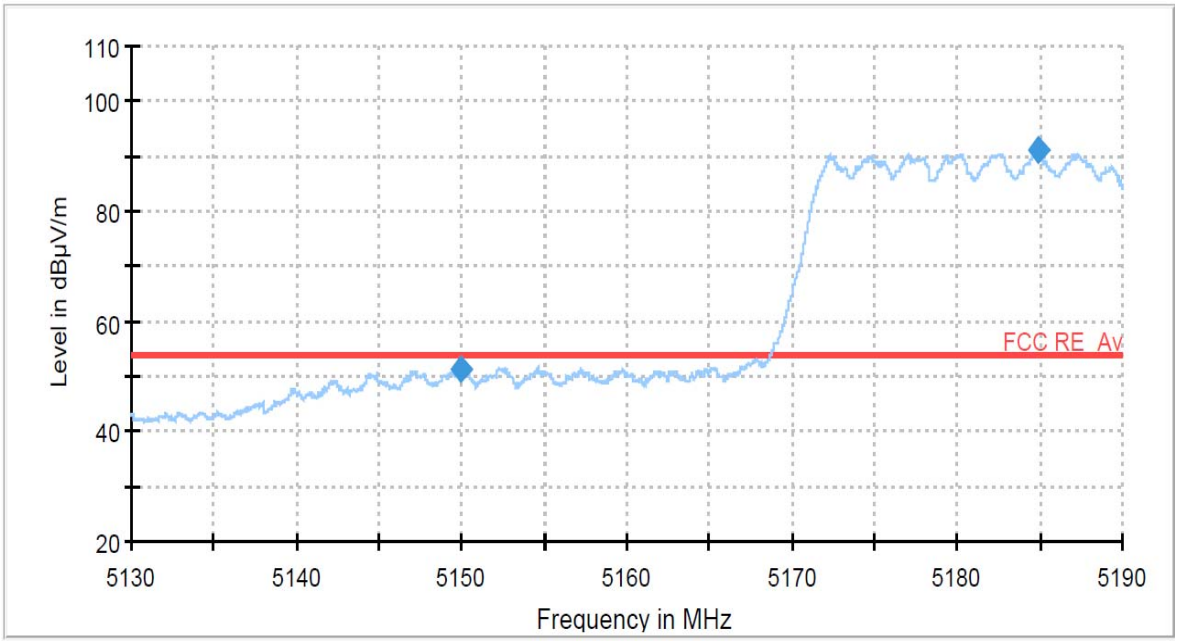
Radiated Band Edge – UNII-1 band

802.11n (40 MHz) mode - CDD

Lowest Channel (5150 MHz)_PK



Lowest Channel (5150 MHz)_AV



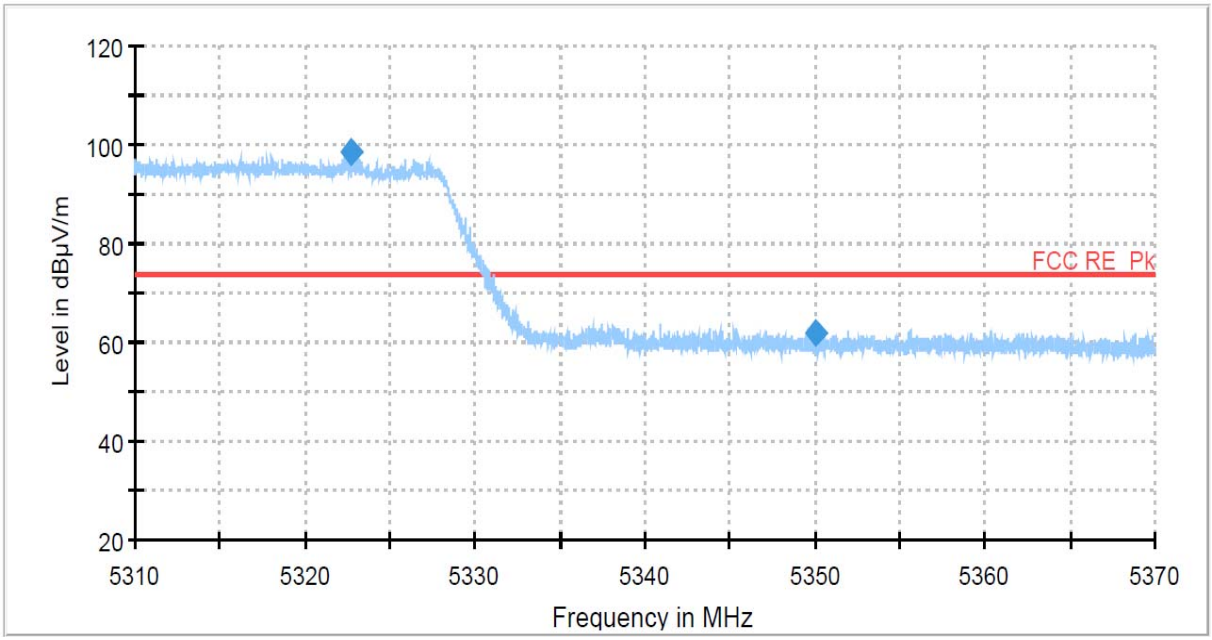
PLOTS OF EMISSIONS

Worst Case

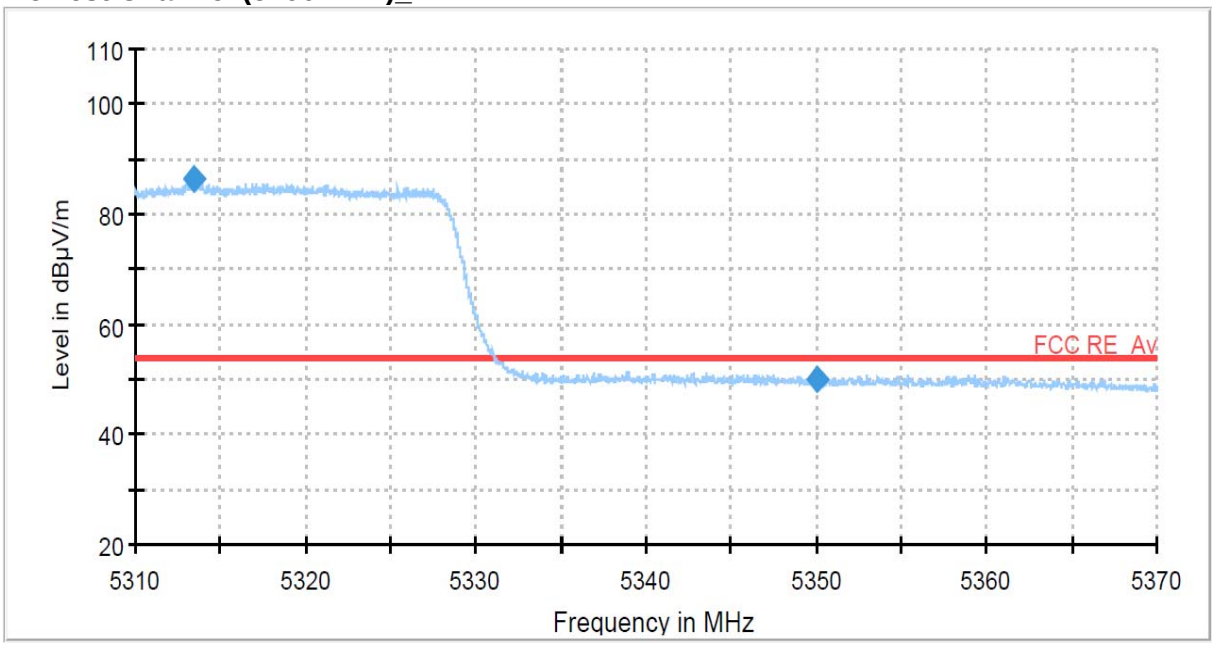
Radiated Band Edge – UNII-2A band

802.11ac (80 MHz) mode - MIMO

Lowest Channel (5290 MHz)_PK



Lowest Channel (5290 MHz)_AV



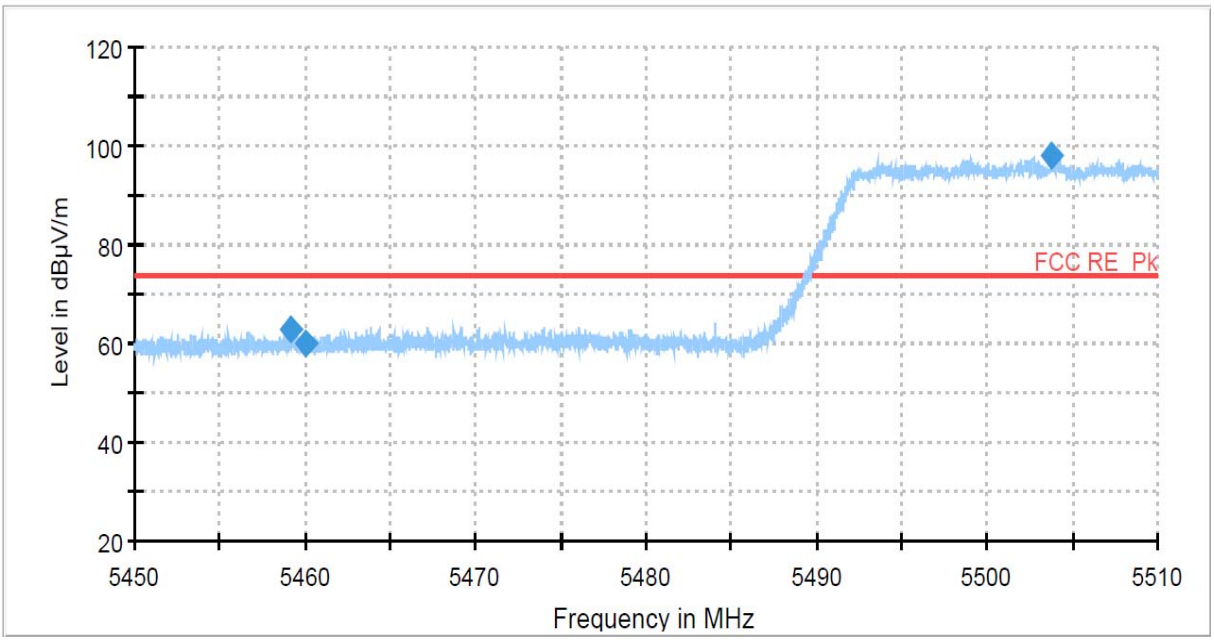
PLOTS OF EMISSIONS

Worst Case

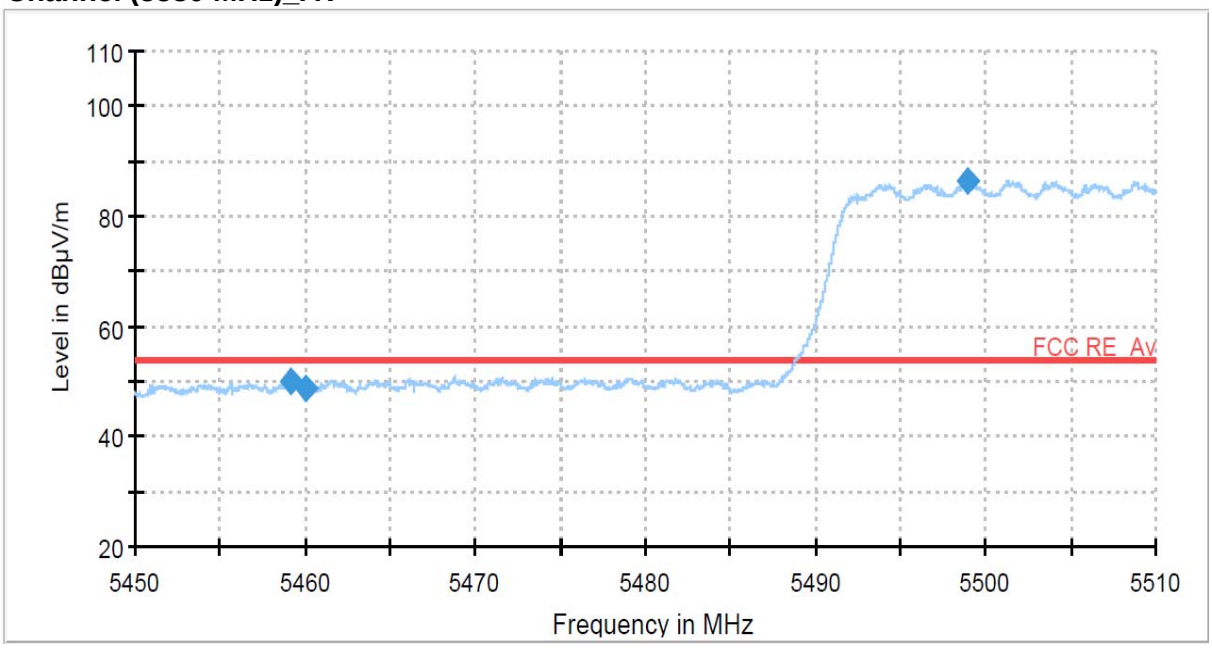
Radiated Band Edge – UNII-2C band

802.11ac (80 MHz) mode - CDD

Channel (5530 MHz)_PK



Channel (5530 MHz)_AV



9. TEST EQUIPMENT

No.	Instrument	Manufacturer	Model	Serial No.	Calibration Date	Calibration Interval
1	*Test Receiver	R & S	ESU 40	100202	Apr. 04 2016	1 year
2	*Test Receiver	R & S	ESCS30	100302	Oct. 06 2015	1 year
3	*Attenuator	PASTERNACK	PE7395-10	1441	Jan. 19 2016	1 year
4	*Attenuator	FAIRVIEW	SA3N5W-06	N/A	Apr. 04 2016	1 year
5	*Attenuator	FAIRVIEW	SA3N5W-10	N/A	Apr. 04 2016	1 year
6	Attenuator	WEINSCHEL	56-10	58765	Oct. 02 2015	1 year
7	*Amplifier	R & S	SCU 01	10030	Apr. 04 2016	1 year
8	*Amplifier	R & S	SCU18	10065	Apr. 04 2016	1 year
9	*Amplifier	R & S	SCU26	10011	Jul. 17 2015	1 year
10	*Amplifier	R & S	SCU40	10008	Aug. 10 2015	1 year
11	*Pre Amplifier	HP	8449B	3008A00107	Jan. 07 2016	1 year
12	Spectrum Analyzer	R & S	FSW43	100732	Apr. 05 2016	1 year
13	*Spectrum Analyzer	Agilent	E4440A	MY44022567	Oct. 15 2015	1 year
14	*Spectrum Analyzer	R&S	FSP40	100361	Jul. 16 2015	1 year
15	DC Power Supply	HP	6574A	US36340190	Jul. 17 2015	1 year
16	*Loop Antenna	R & S	HFH2-Z2	100279	Feb. 22 2016	2 year
17	Wideband Power Sensor	R & S	NRP-Z81	100634	Jul. 17 2015	1 year
18	*Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-474	Sep. 01 2014	2 year
19	*Horn Antenna	Q-par Angus	QSH20S20	8179	Apr. 30 2015	2 year
20	*Horn Antenna	Q-par Angus	QSH22K20	8180	Apr. 30 2015	2 year
21	*Trilog-Broadband Antenna	SCHWARZBECK	VULB 9163	9163-423	Nov. 04 2015	2 year
22	*LISN	R & S	ESH3-Z5	833874/006	Oct. 06 2015	1 year
23	*Controller	INNCO	CO2000-G	CO2000/562/23890210/L	N/A	N/A
24	*Turn Table	INNCO	DT3000-3T	N/A	N/A	N/A
25	*Antenna Mast	INNCO	MA4000-EP	N/A	N/A	N/A
26	*Open Switch And Control Unit	R & S	OSP-120	100015	N/A	N/A
27	*Anechoic Chamber	Seo-Young EMC	N/A	N/A	N/A	N/A
28	*Position Controller	INNCO	CO2000	12480406/L	N/A	N/A
29	*Turn Table	INNCO	DS1200S	N/A	N/A	N/A
30	*Antenna Mast	INNCO	MA4000	N/A	N/A	N/A
31	*Anechoic Chamber	Seo-Young EMC	N/A	N/A	N/A	N/A
32	Shielded Room	Seo-Young EMC	N/A	N/A	N/A	N/A
33	*Open Switch And Control Unit	R & S	OSP-120	100081	N/A	N/A

*) Test equipment used during the test

10. ACCURACY OF MEASUREMENT

The Measurement Uncertainties stated were calculated in accordance with the requirements of measurement uncertainty contained in CISPR 16-4-2 with the confidence level of 95%

1. Conducted Uncertainty Calculation

Source of Uncertainty	*Xi*	Uncertainty of *Xi*		Coverage factor *k*	*u(Xi)* (dB)	*Ci*	*Ci u(Xi)* (dB)
		Value (dB)	Probability Distribution				
Receiver reading	***RI***	± 0.1	normal 1	1.000	0.1	1	0.1
Attenuation AMN-Receiver	***LC***	± 0.08	normal 2	2.000	0.04	1	0.04
AMN Voltage division factor	***LAMN***	± 0.8	normal 2	2.000	0.4	1	0.4
Sine wave voltage	***dVSW***	± 2.00	normal 2	2.000	1.00	1	1.00
Pulse amplitude response	***dVPA***	± 1.50	rectangular	1.732	0.87	1	0.87
Pulse repetition rate response	***dVPR***	± 1.50	rectangular	1.732	0.87	1	0.87
Noise floor proximity	***dVNF***	± 0.00	-	-	0.00	1	0.00
AMN Impedance	***dZ***	± 1.80	triangular	2.449	0.73	1	0.73
ⓐ Mismatch	***M***	+ 0.70	U-Shaped	1.414	0.49	1	0.49
ⓑ Mismatch	***M***	- 0.80	U-Shaped	1.414	- 0.56	1	- 0.56
Measurement System Repeatability	***RS***	0.05	normal 1	1.000	0.05	1	0.05
Remark	ⓐ: AMN-Receiver Mismatch : + ⓑ: AMN-Receiver Mismatch : -						
Combined Standard Uncertainty	Normal			± 1.88			
Expended Uncertainty U	Normal (*k* = 2)			± 3.76			

2. Radiation Uncertainty Calculation

Source of Uncertainty	*Xi*	Uncertainty of *Xi*		Coverage factor *k*	*u(Xi)* (dB)	*Ci*	*Ci u(Xi)* (dB)
		Value (dB)	Probability Distribution				
Measurement System Repeatability	***RS***	0.34	normal 1	1.00	0.34	1	0.34
Receiver reading	***Ri***	± 0.02	normal 2	2.00	0.01	1	0.01
Sine wave voltage	***dVsw***	± 0.17	normal 2	2.00	0.09	1	0.09
Pulse amplitude response	***dVpa***	± 0.92	normal 2	2.00	0.46	1	0.46
Pulse repetition rate response	***dVpr***	± 0.35	normal 2	2.00	0.18	1	0.18
Noise floor proximity	***dVnf***	± 0.50	normal 2	2.00	0.25	1	0.25
Antenna Factor Calibration	***AF***	± 2.00	rectangular	$\sqrt{3}$	1.15	1	1.15
Cable Loss	***CL***	± 1.00	normal 2	2.00	0.50	1	0.50
Antenna Directivity	***AD***	± 0.00	rectangular	$\sqrt{3}$	0.00	1	0.00
Antenna Factor Height Dependence	***AH***	± 2.00	rectangular	$\sqrt{3}$	1.15	1	1.15
Antenna Phase Centre Variation	***AP***	± 0.20	rectangular	$\sqrt{3}$	0.12	1	0.12
Antenna Factor Frequency Interpolation	***Ai***	± 0.25	rectangular	$\sqrt{3}$	0.14	1	0.14
Site Imperfections	***Si***	± 4.00	triangular	$\sqrt{6}$	1.63	1	1.63
Measurement Distance Variation	***DV***	± 0.60	rectangular	$\sqrt{3}$	0.35	1	0.35
Antenna Balance	***Dbal***	± 0.90	rectangular	$\sqrt{3}$	0.52	1	0.52
Cross Polarisation	***DCross***	± 0.00	rectangular	$\sqrt{3}$	0.00	1	0.18
Mismatch	***M***	+ 0.98 - 1.11	U-Shaped	$\sqrt{2}$	0.74	1	0.74
EUT Volume Diameter	***Vd***	0.33	normal 1	1.00	0.33	1	0.11
Remark							
Combined Standard Uncertainty	Normal						
Expended Uncertainty U	Normal (*k* = 2)						