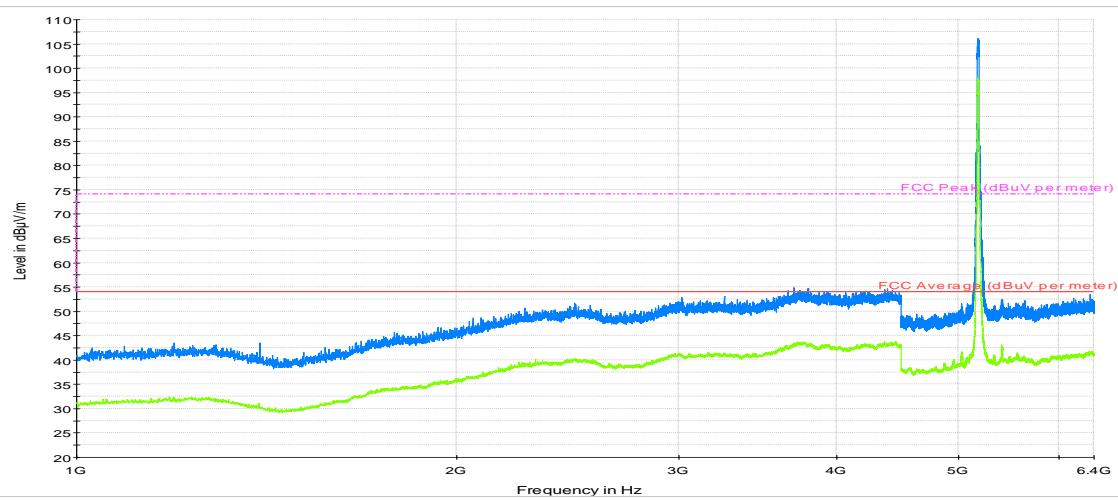
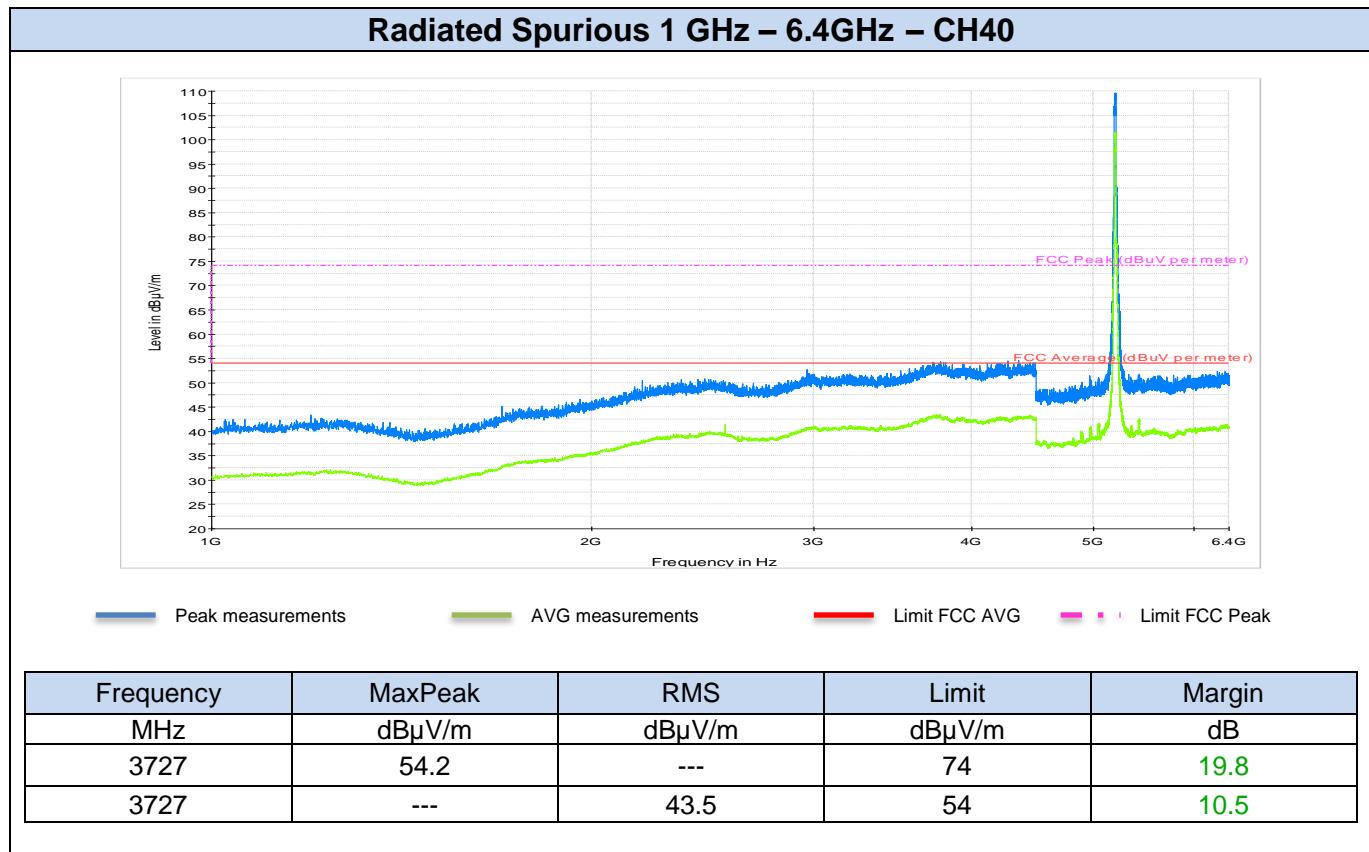


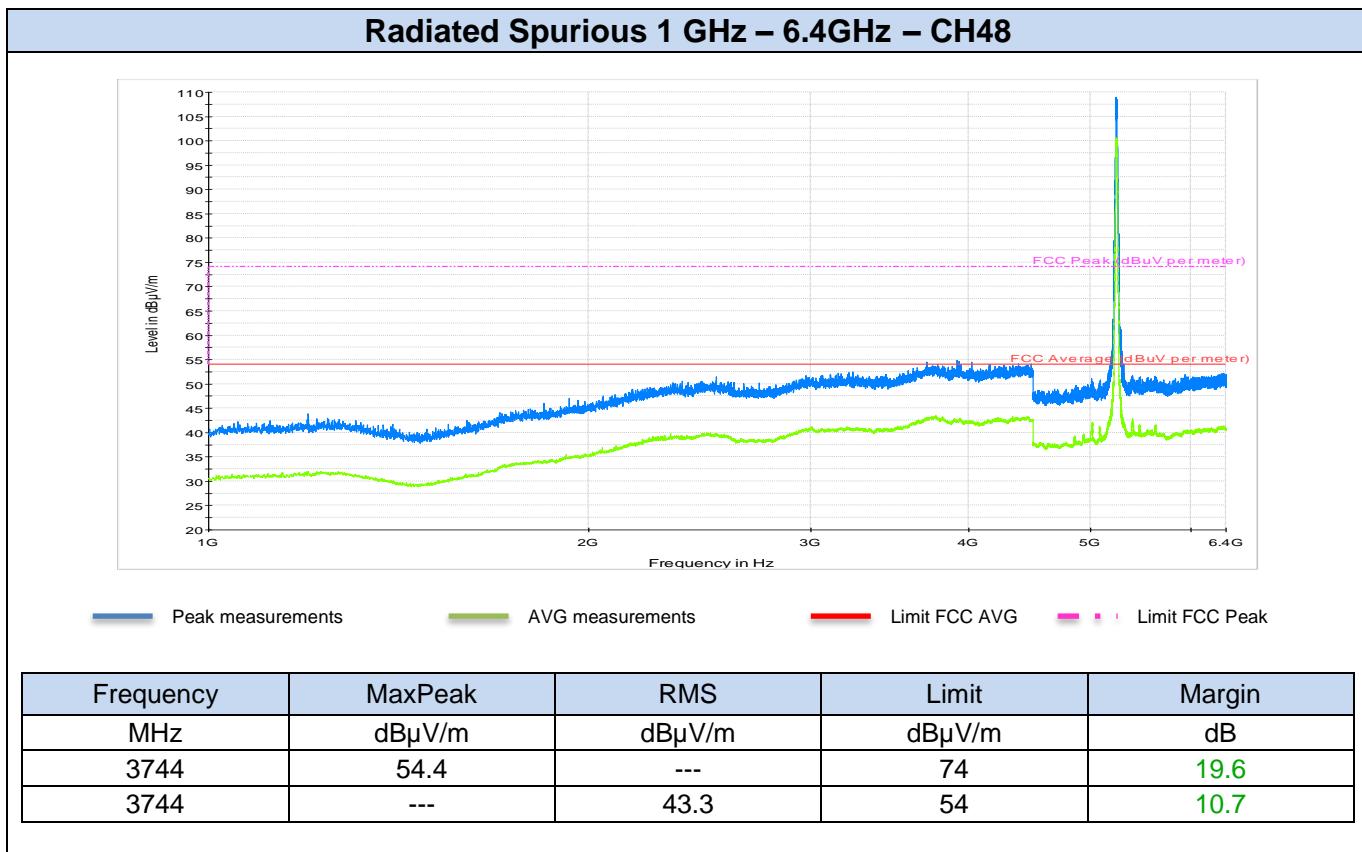
802.11n20, Chain B

Radiated Spurious 1 GHz – 6.4GHz – CH36



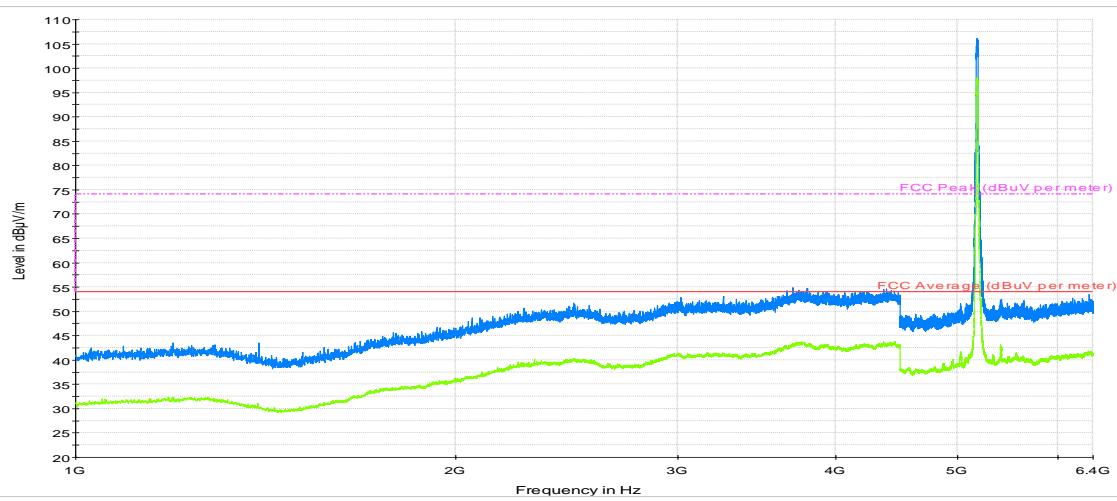
Frequency	MaxPeak	RMS	Limit	Margin
MHz	dB μ V/m	dB μ V/m	dB μ V/m	dB
3788	54.7	---	74	19.3
3788	---	42.9	54	11.1





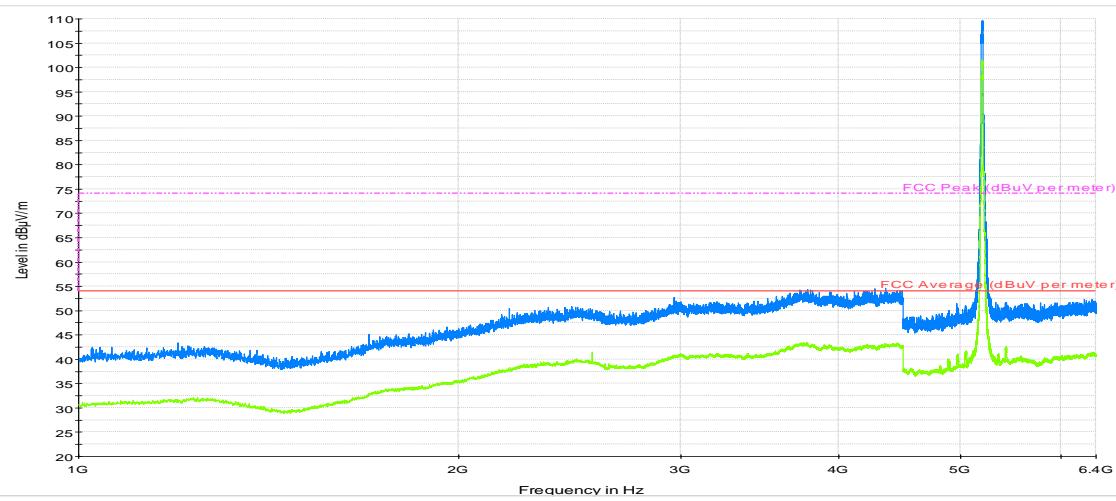
802.11n20, MIMO Chain A+B

Radiated Spurious 1 GHz – 6.4GHz – CH36



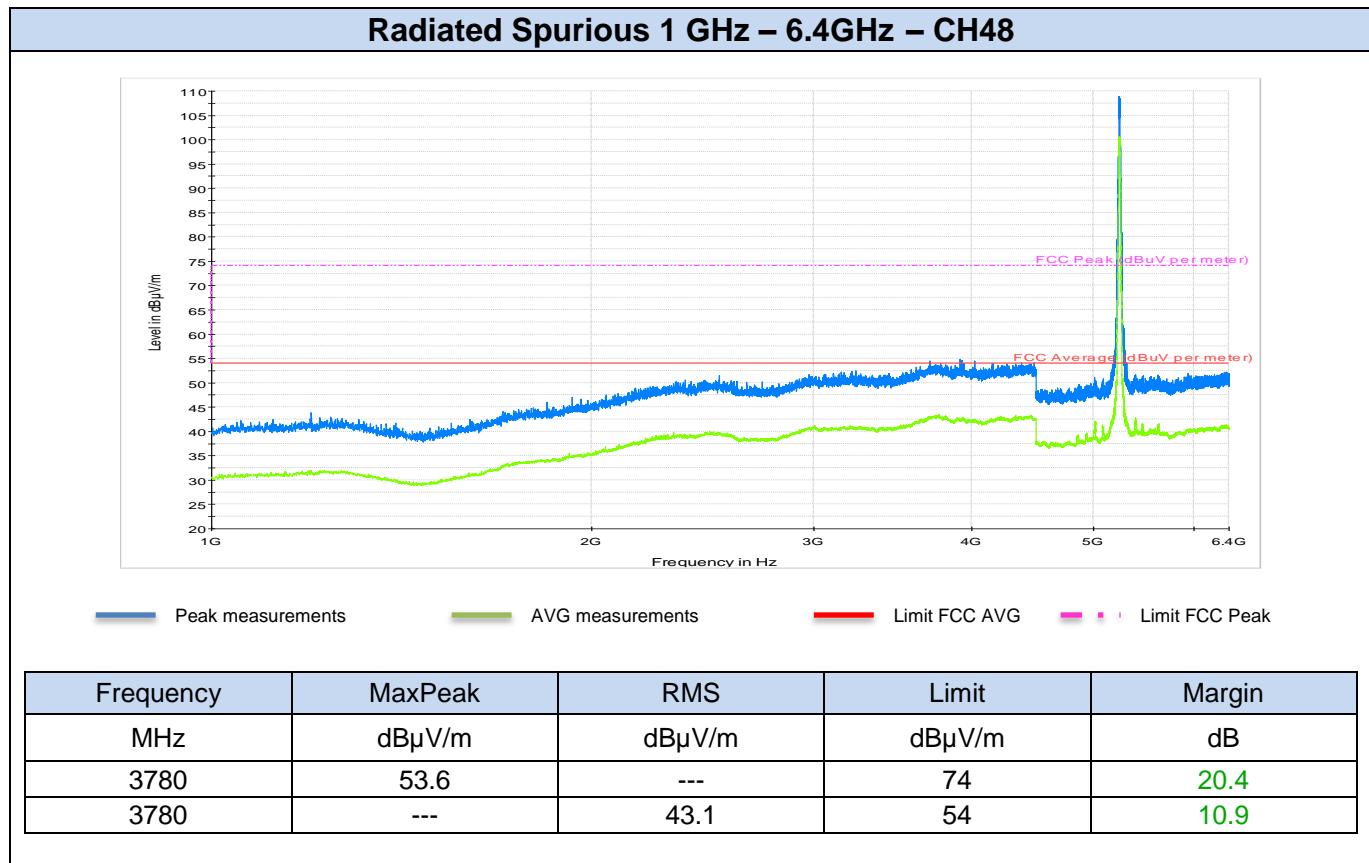
Frequency	MaxPeak	RMS	Limit	Margin
MHz	dB μ V/m	dB μ V/m	dB μ V/m	dB
3750	54.0	---	74	20.0
3750	---	43.3	54	10.7

Radiated Spurious 1 GHz – 6.4GHz – CH40



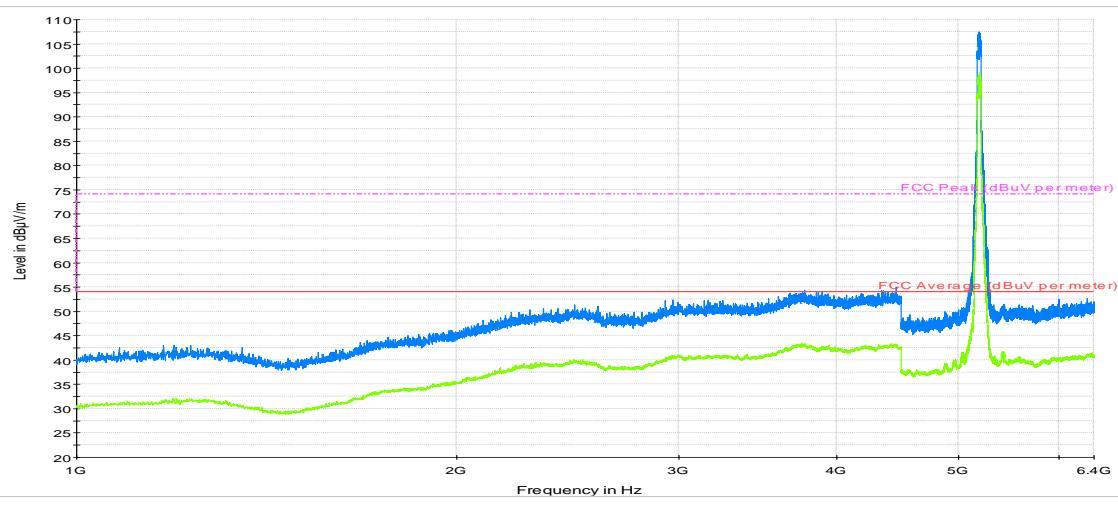
— Peak measurements — AVG measurements — Limit FCC AVG — Limit FCC Peak

Frequency	MaxPeak	RMS	Limit	Margin
MHz	dB μ V/m	dB μ V/m	dB μ V/m	dB
1968	47.5	---	74	26.5
1968	---	38.1	54	15.9
4212	51.5	---	74	22.5
4212	---	42.3	54	11.7

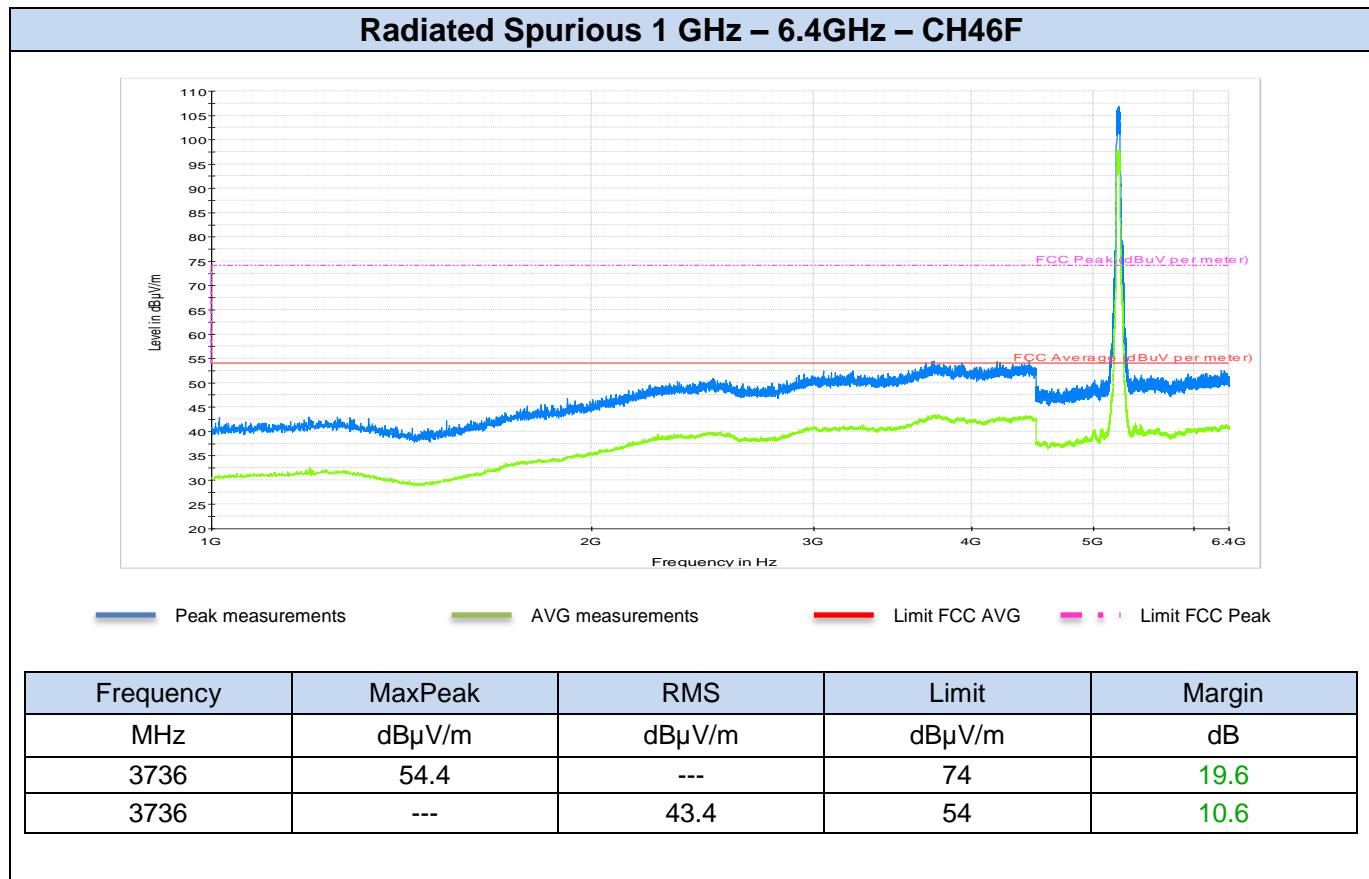


802.11n40, SISO Chain A

Radiated Spurious 1 GHz – 6.4GHz – CH38F

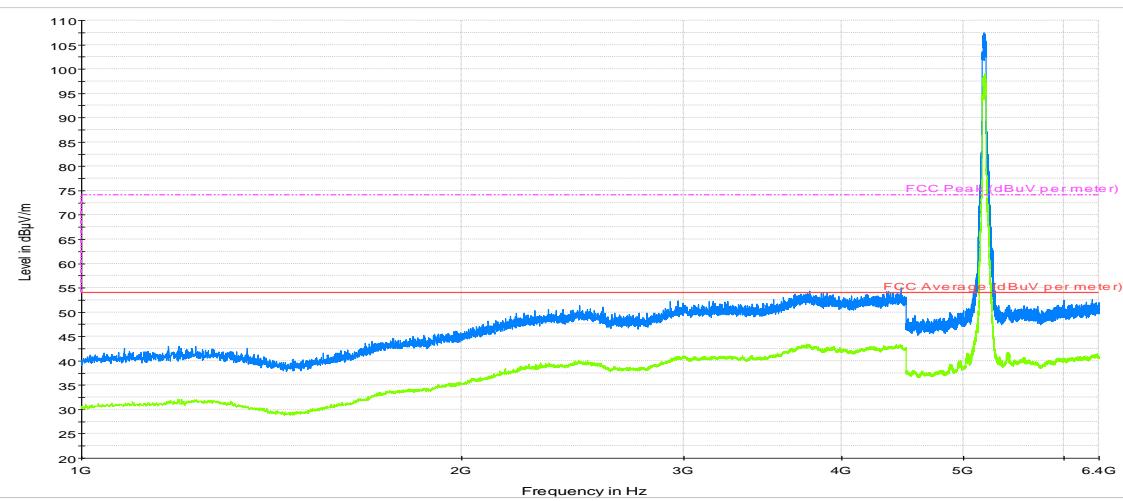


Frequency	MaxPeak	RMS	Limit	Margin
MHz	dB μ V/m	dB μ V/m	dB μ V/m	dB
3772	54.3	---	74	19.7
3772	---	43.4	54	10.6

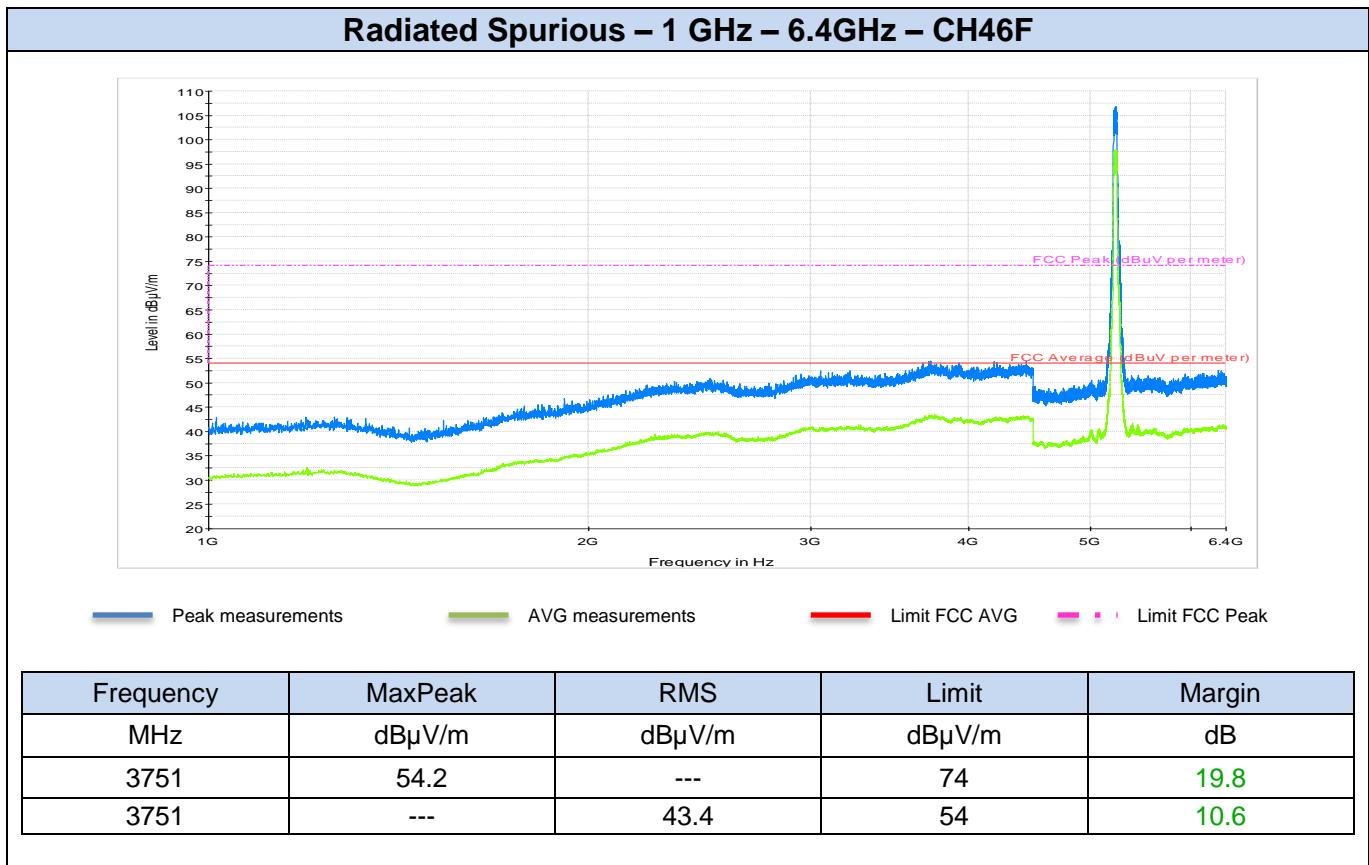


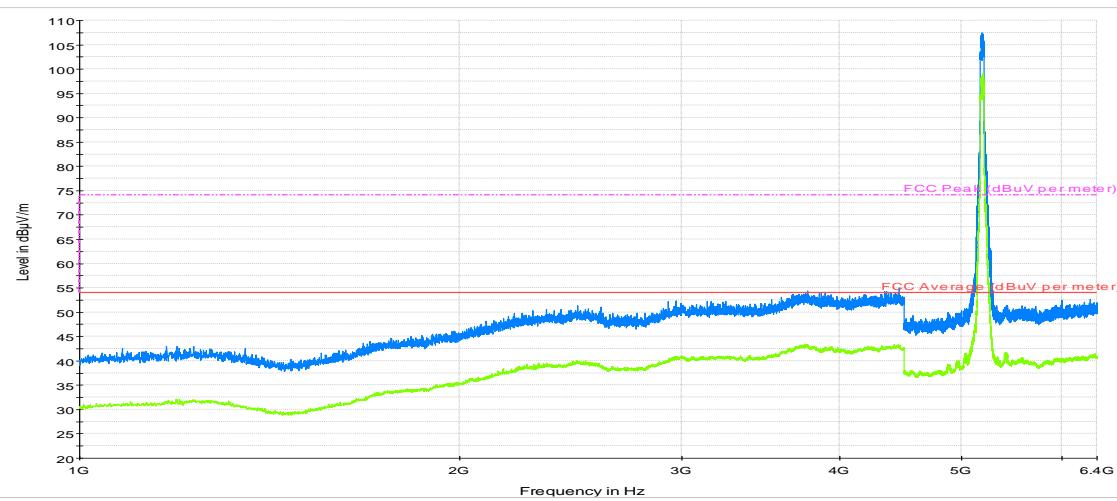
802.11n40, SISO Chain B

Radiated Spurious –1 GHz – 6.4GHz – CH38F

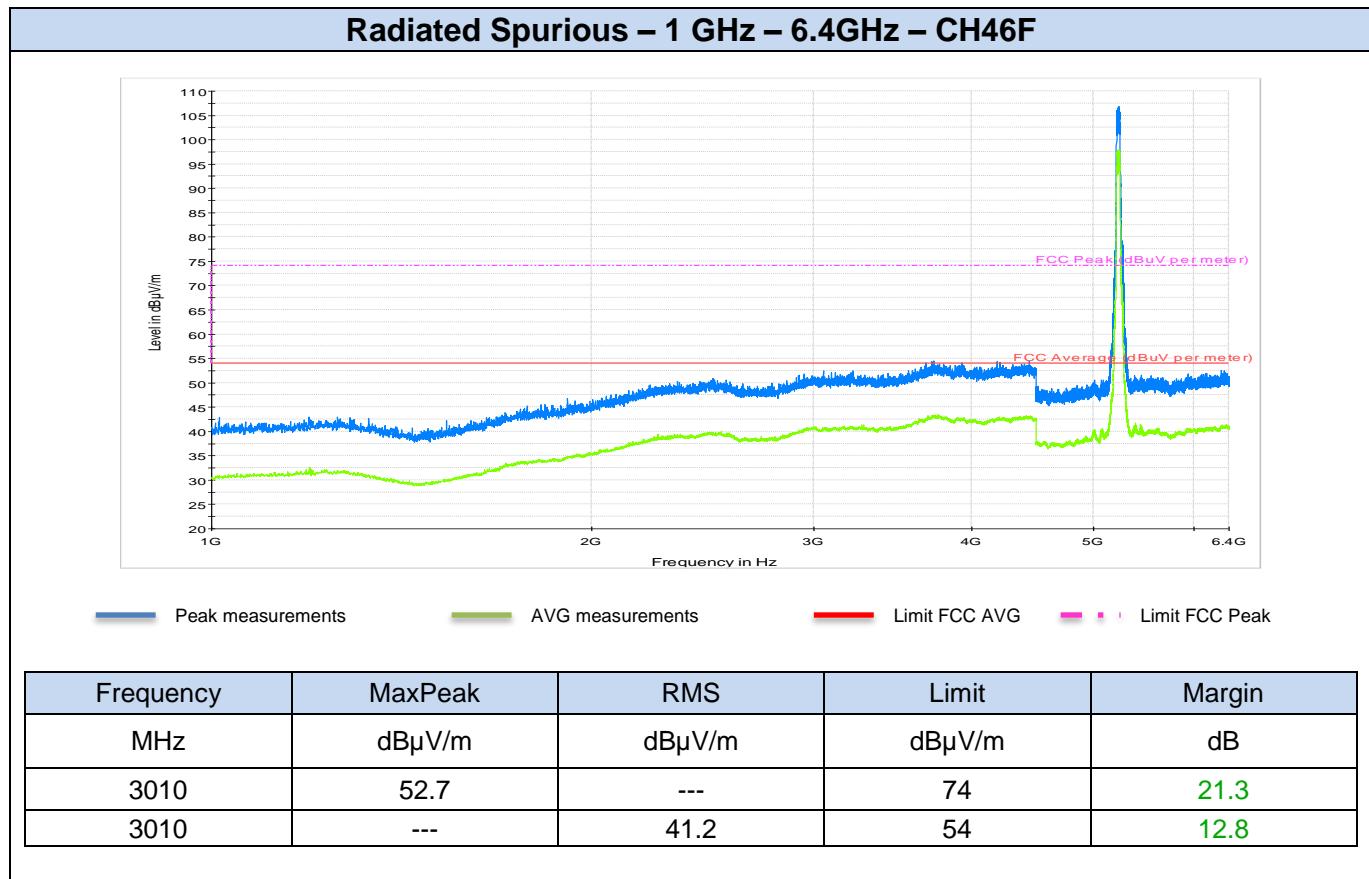


Frequency	MaxPeak	RMS	Limit	Margin
MHz	dB μ V/m	dB μ V/m	dB μ V/m	dB
3761	47.5	---	74	26.5
3761	---	38.1	54	15.9



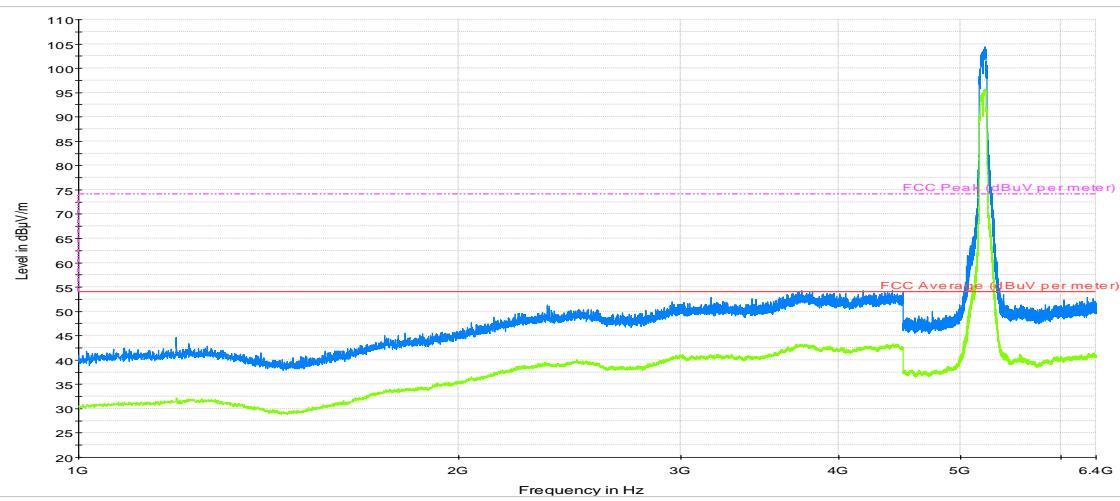
802.11n40, MIMO Chain A+B
Radiated Spurious –1 GHz – 6.4GHz – CH38F


Frequency	MaxPeak	RMS	Limit	Margin
MHz	dB μ V/m	dB μ V/m	dB μ V/m	dB
1781	44.9	---	74	29.1
1781	---	36.7	54	17.3
3739	54.3	---	74	19.7
3739	---	43.1	54	10.9



802.11ac80, SISO Chain A

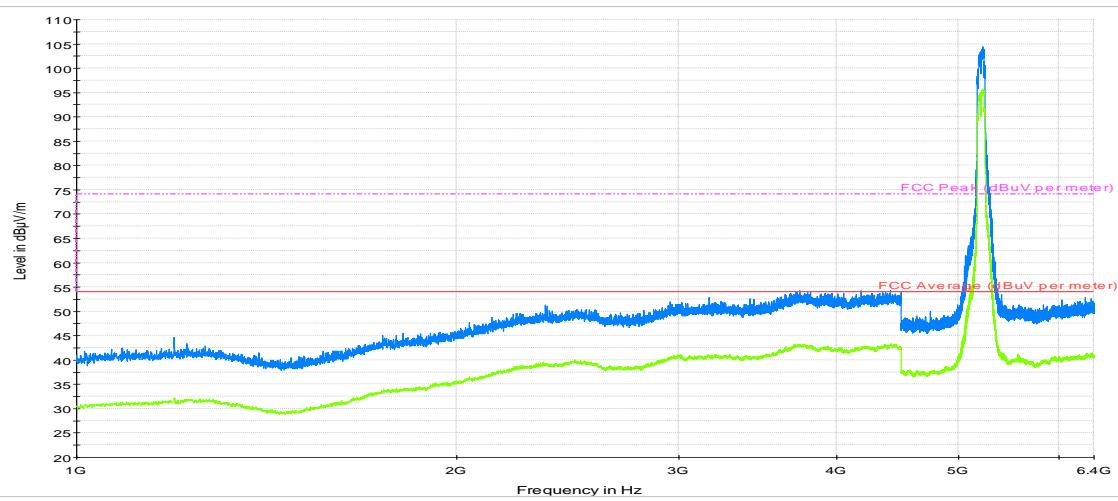
Radiated Spurious –1 GHz – 6.4GHz –CH42ac80



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dB μ V/m	dB μ V/m	dB μ V/m	dB
3729	54.2	---	74	19.8
3729	---	43.2	54	10.8

802.11ac80, SISO Chain B

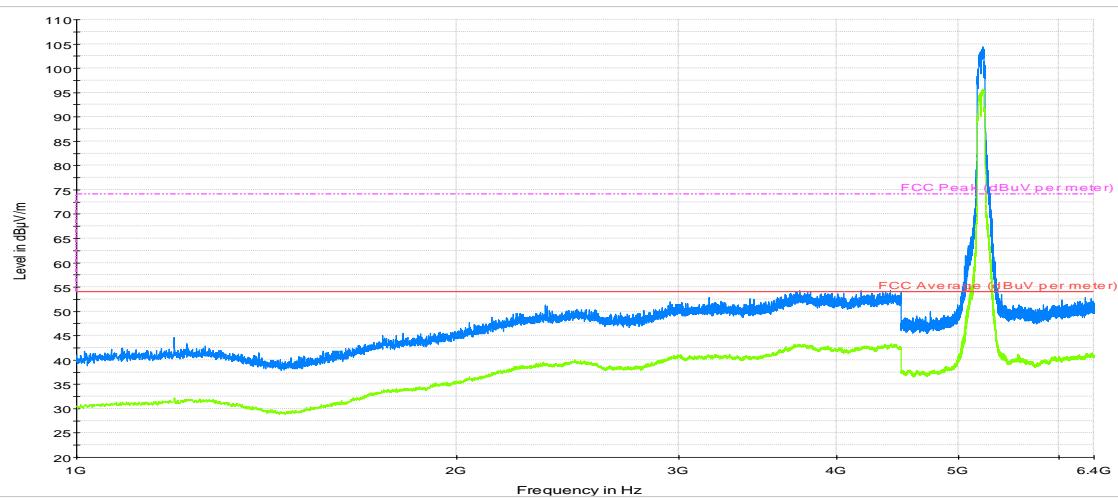
Radiated Spurious –1 GHz – 6.4GHz –CH42ac80



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dB μ V/m	dB μ V/m	dB μ V/m	dB
3699	54.7	---	74	19.3
3699	---	42.8	54	11.2

802.11ac80, MIMO Chain A+B

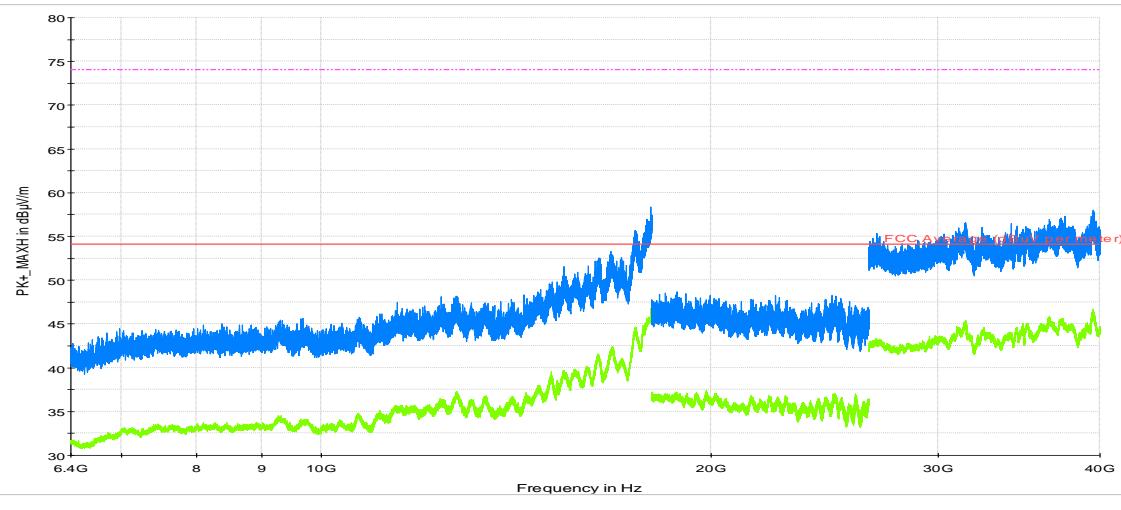
Radiated Spurious 1 GHz – 6.4GHz –CH42ac80



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dB μ V/m	dB μ V/m	dB μ V/m	dB
3748	53.8	---	74	20.2
3748	---	43.2	54	10.8

All modes

Radiated Spurious 6.4 GHz – 40GHz



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dB μ V/m	dB μ V/m	dB μ V/m	dB
18000	58.4	---	74	15.6
18000	---	47.2	54	6.8
31300	56.9	--	74	17.1
31300	--	44.6	54	9.4
39500	57.7	---	74	16.3
39500	---	46.5	54	7.5

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

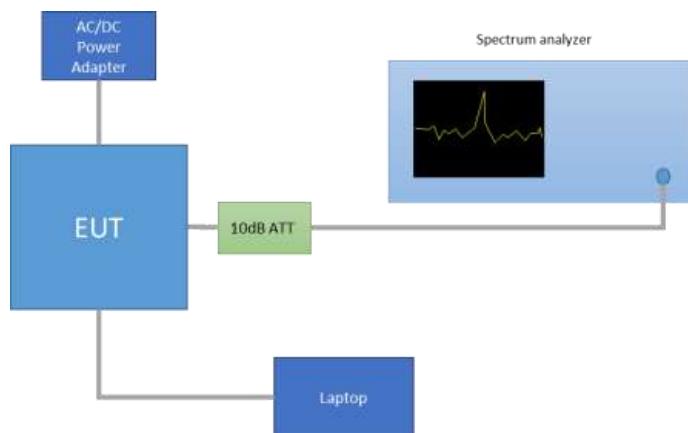
Note 2: This plot is valid for both SISO and MIMO modes.

Annex C. Test Results U-NII-2A

C.1 26dB & 99% Bandwidth

Test procedure:

The setup below was used to measure the 26dB & 99% Bandwidth. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.



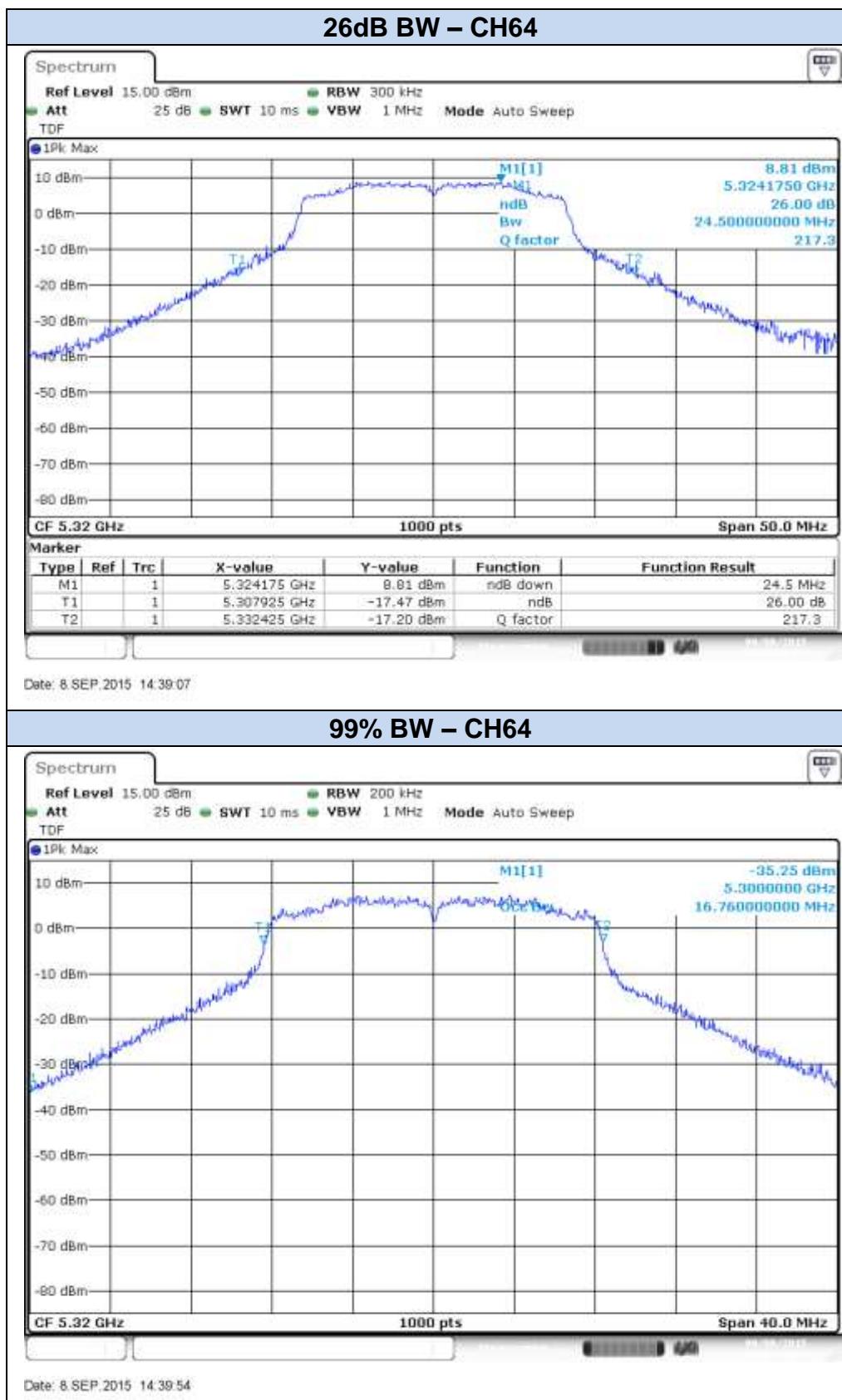
Results tables:

Mode	Rate	Antenna	Channel	Frequency [MHz]	26dB BW [MHz]	99% BW [MHz]
802.11a	6Mbps	SISO CHAIN A	52	5260	39.80	26.88
			56	5280	39.55	26.36
			64	5320	24.50	16.76
		SISO CHAIN B	52	5260	38.20	24.84
			56	5280	38.60	25.04
			64	5320	24.65	16.72
802.11n20	HT0	SISO CHAIN A	52	5260	42.20	27.36
			56	5280	39.20	24.68
			64	5320	25.15	17.80
		SISO CHAIN B	52	5260	41.40	25.88
			56	5280	39.50	25.20
			64	5320	25.55	17.84
802.11n20	HT8	MIMO CHAIN A	52	5260	28.25	18.00
			56	5280	28.65	18.16
			64	5320	24.65	17.76
		MIMO CHAIN B	52	5260	26.10	18.08
			56	5280	26.15	18.12
			64	5320	24.20	17.72

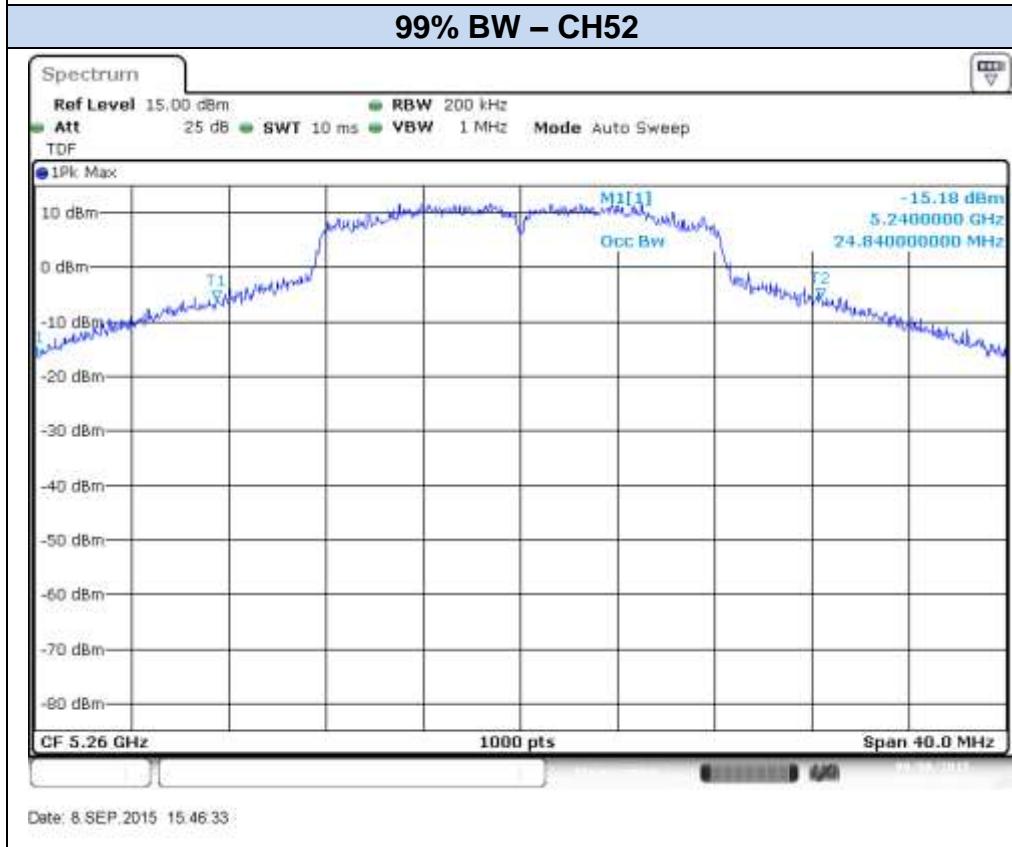
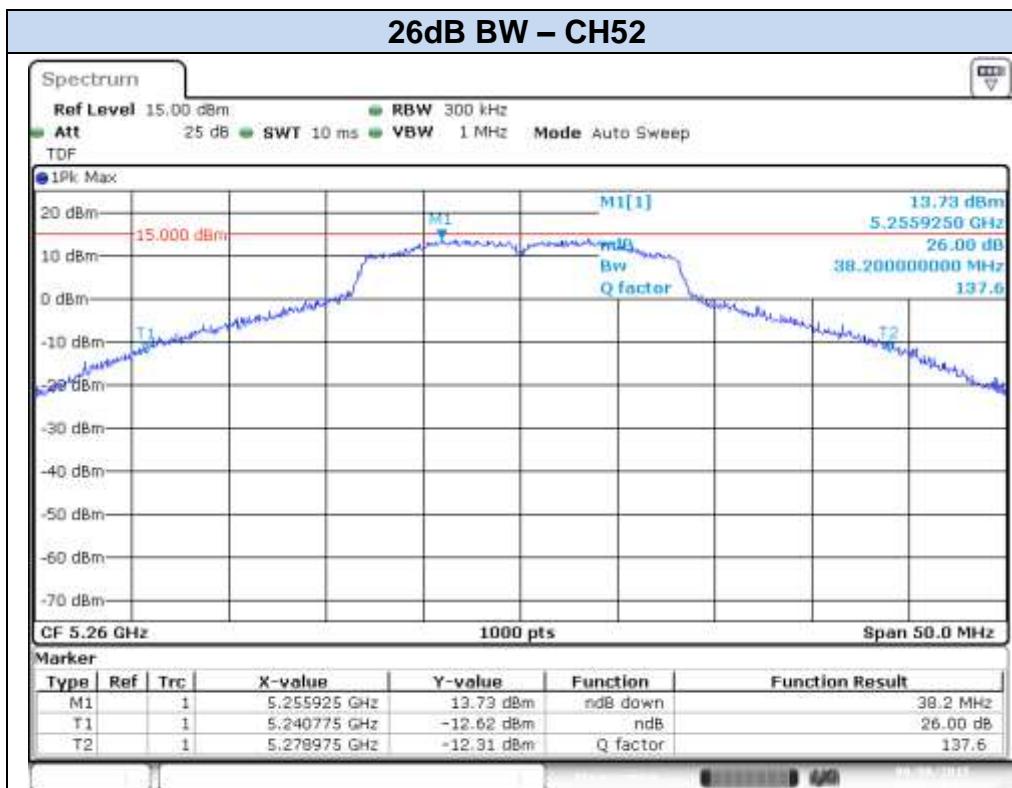
Mode	Rate	Antenna	Channel	Frequency [MHz]	26dB BW [MHz]	99% BW [MHz]
802.11n40	HT0	SISO CHAIN A	54F	5270	53.91	37.44
			62F	5310	45.45	36.32
		SISO CHAIN B	54F	5270	51.75	37.04
			62F	5310	45.09	36.32
	HT8	MIMO CHAIN A	54F	5270	49.95	36.80
			62F	5310	44.91	36.40
		MIMO CHAIN B	54F	5270	46.08	36.32
			62F	5310	43.83	36.16
802.11ac80	VHT0	SISO CHAIN A	58ac80	5290	87.21	75.05
		SISO CHAIN B	58ac80	5290	85.88	75.05
	VHT0	MIMO CHAIN A	58ac80	5290	85.88	74.86
		MIMO CHAIN B	58ac80	5290	84.93	74.86

Results screenshot:
802.11a, 6Mbps – Chain A

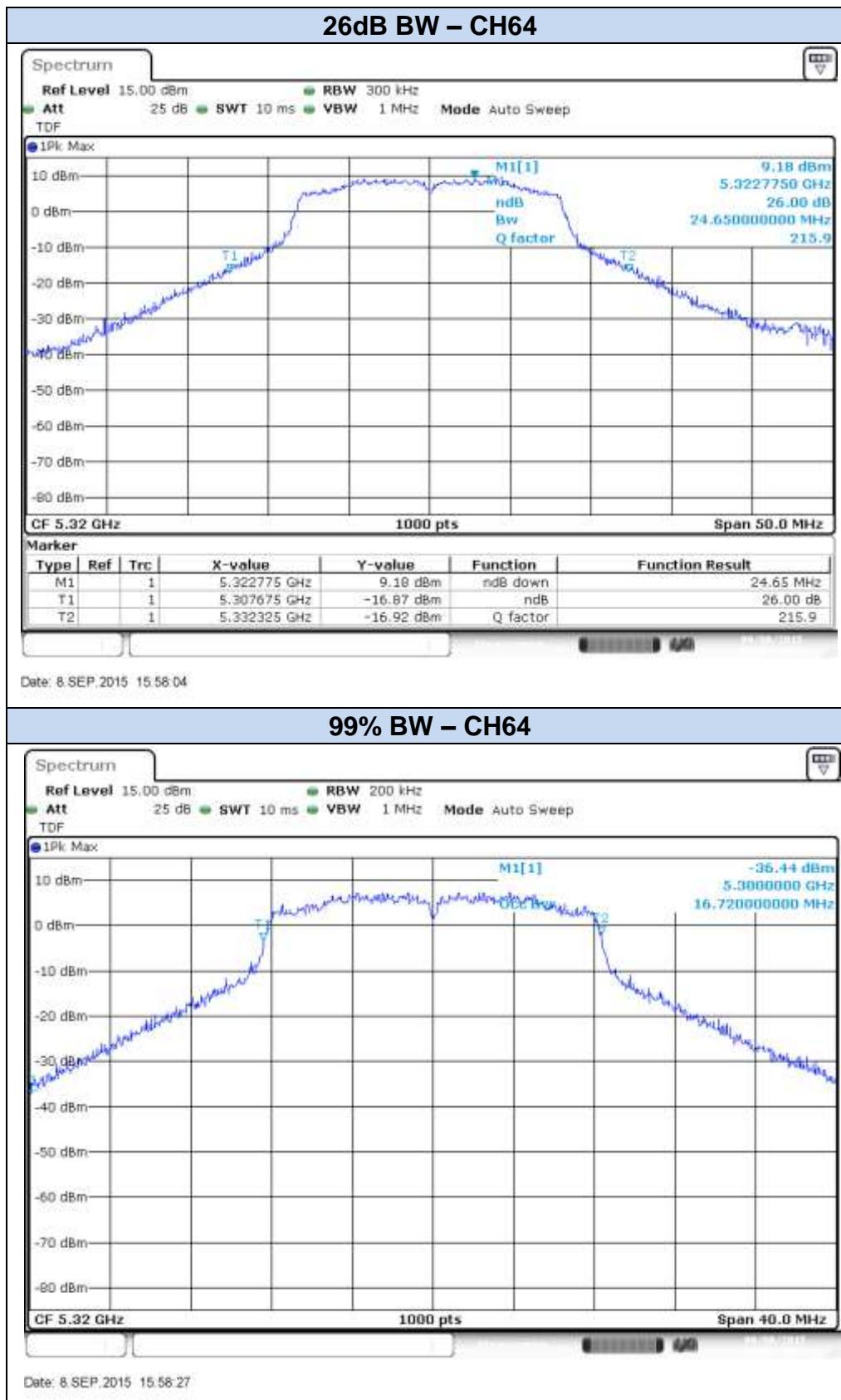


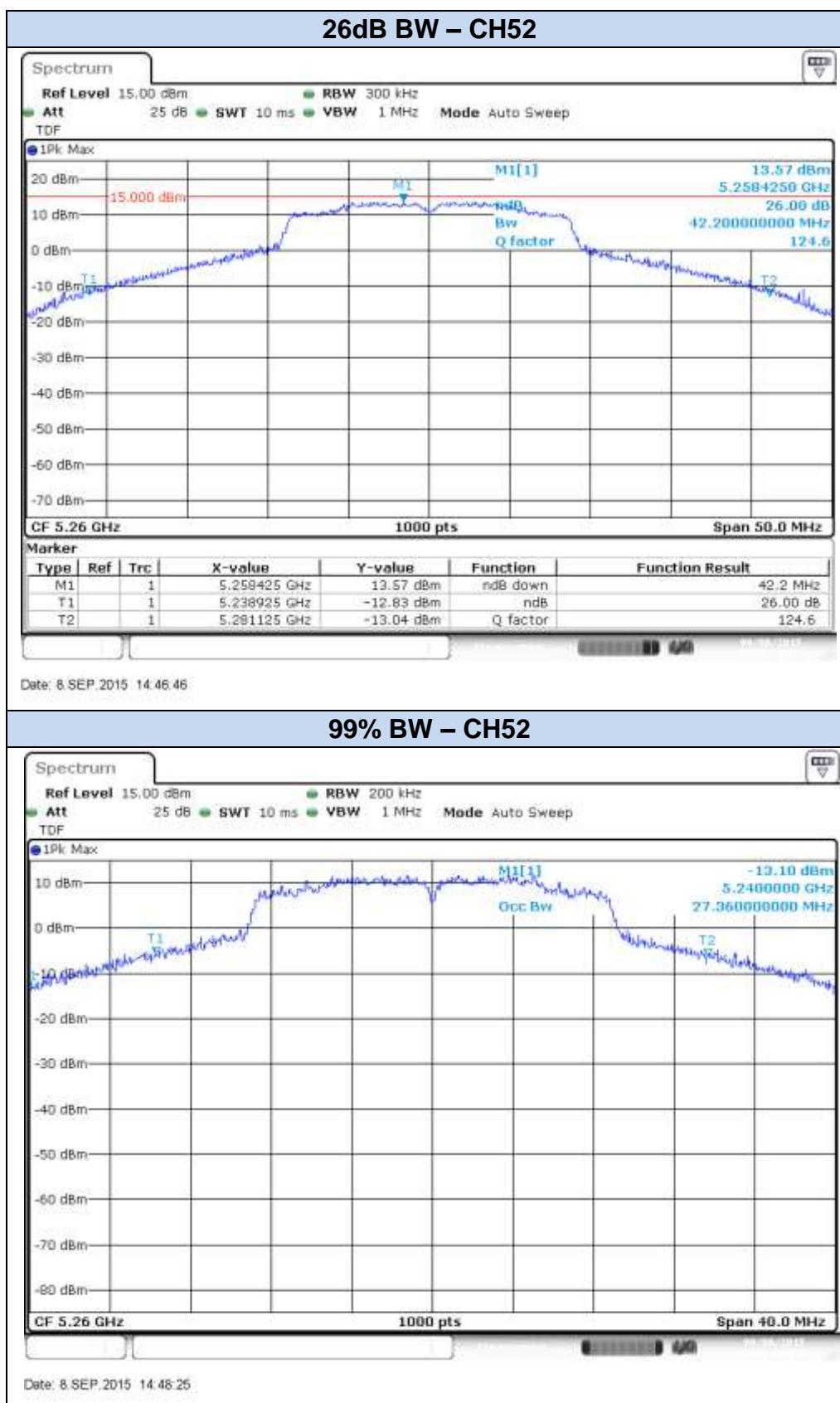
802.11a, 6Mbps – Chain B



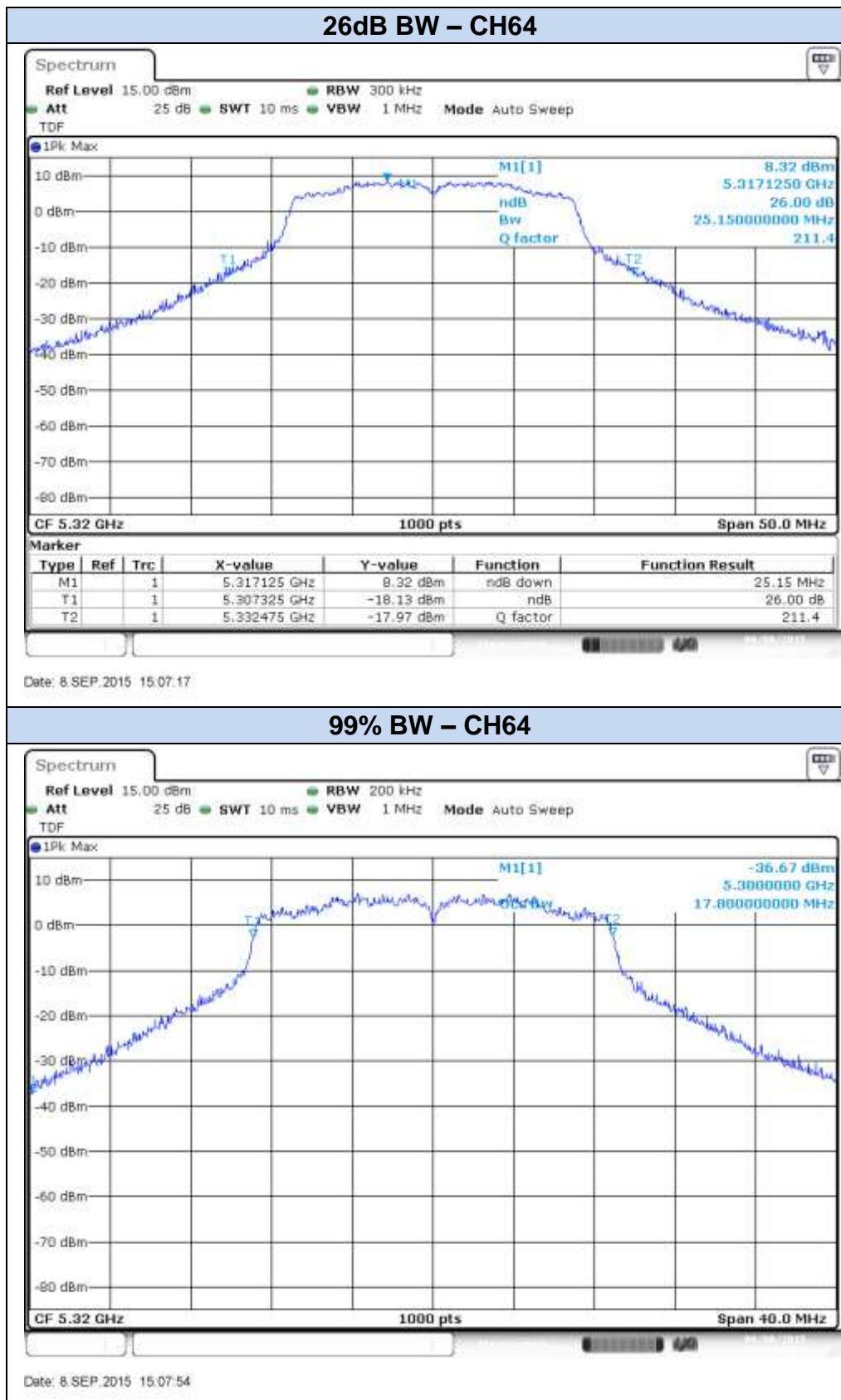




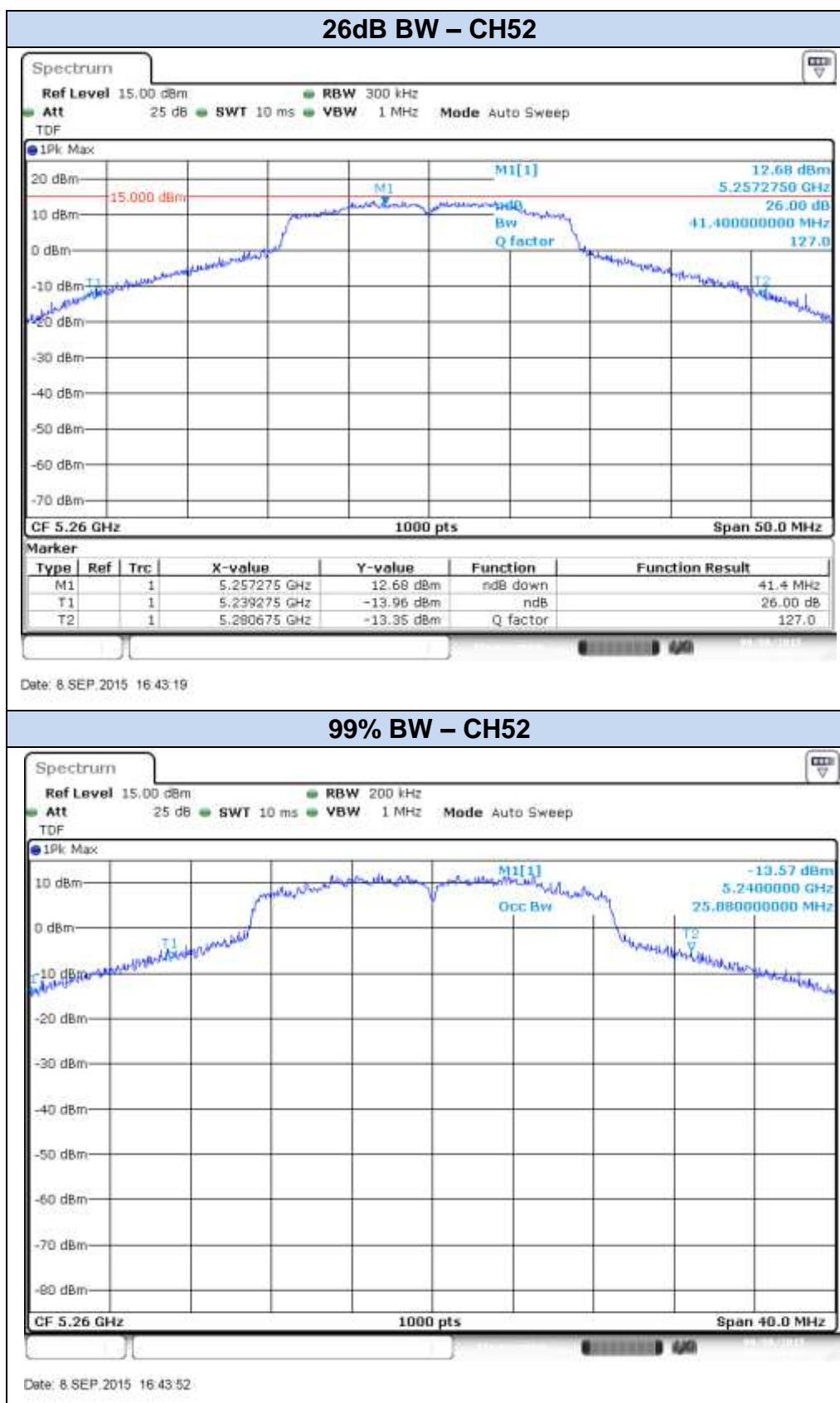
802.11n20, HT0 (SISO) – Chain A



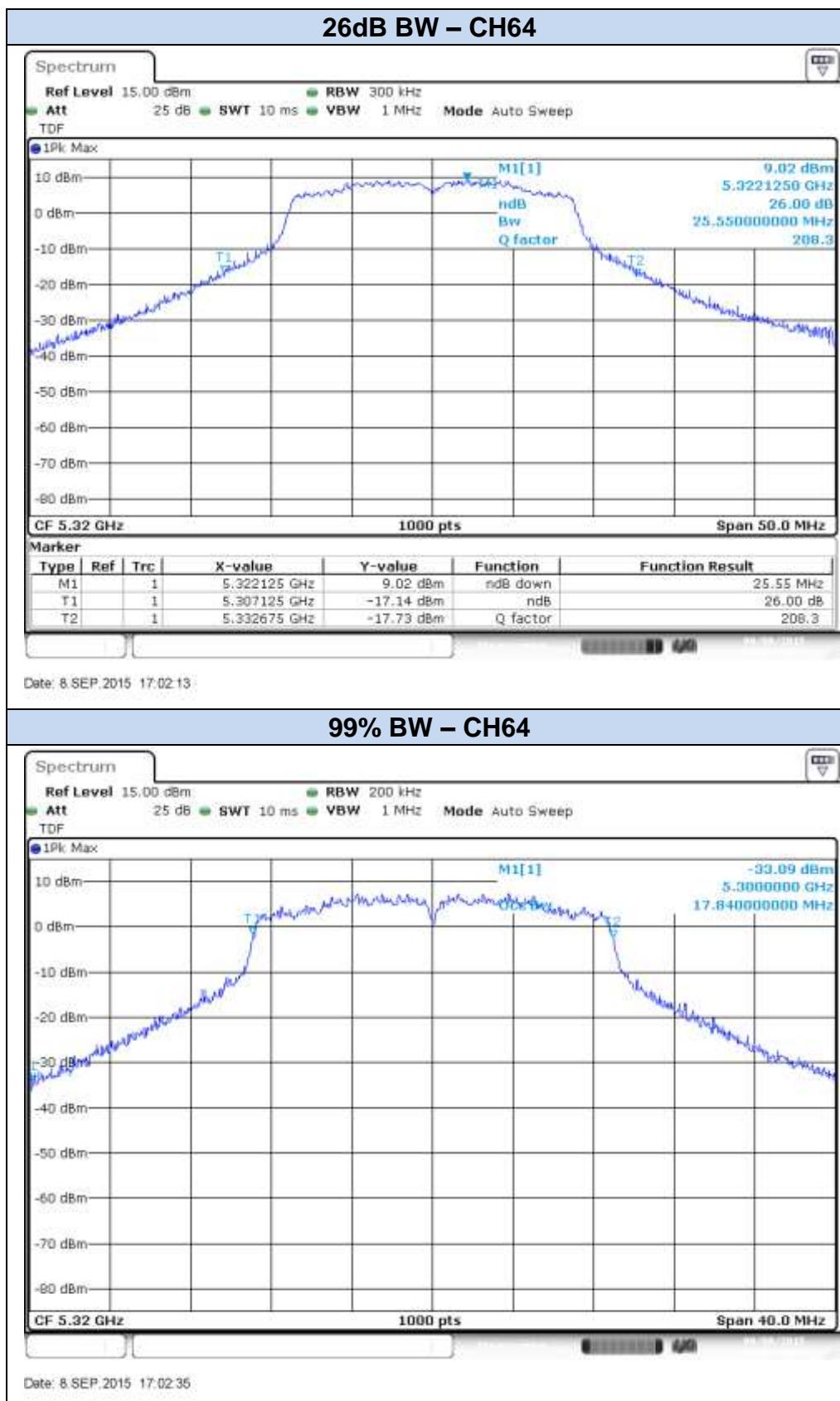




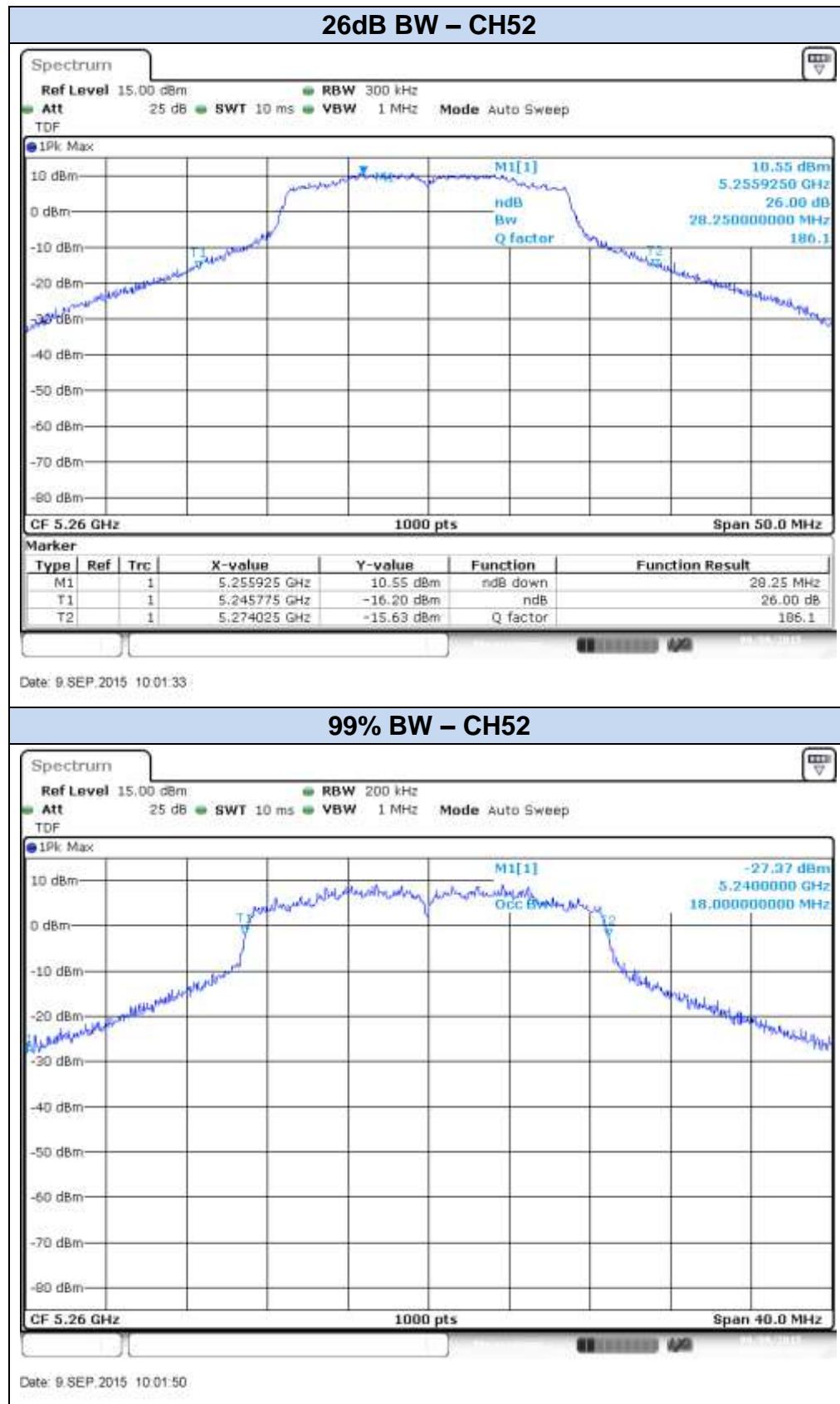
802.11n20, HT0 (SISO) – Chain B

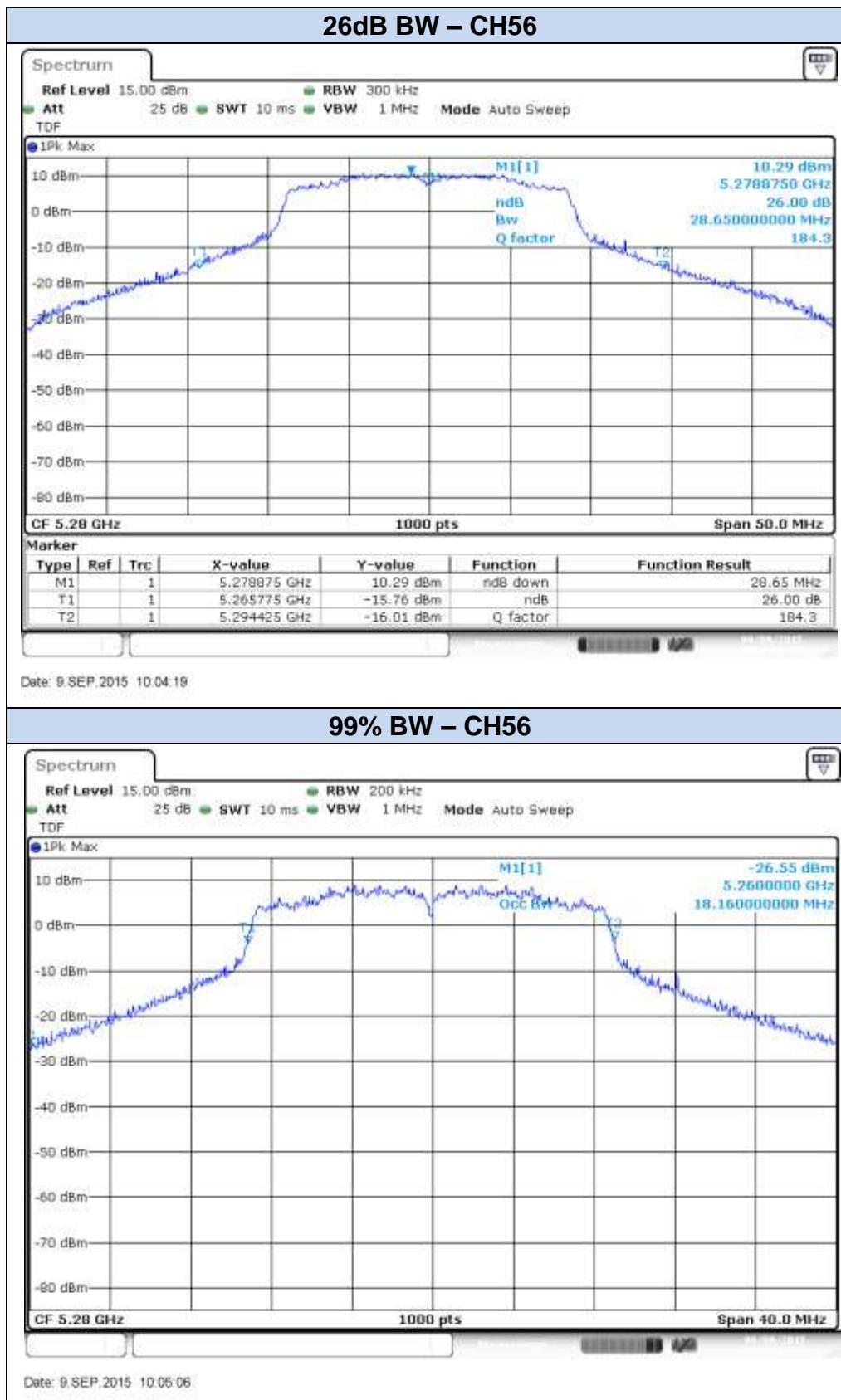


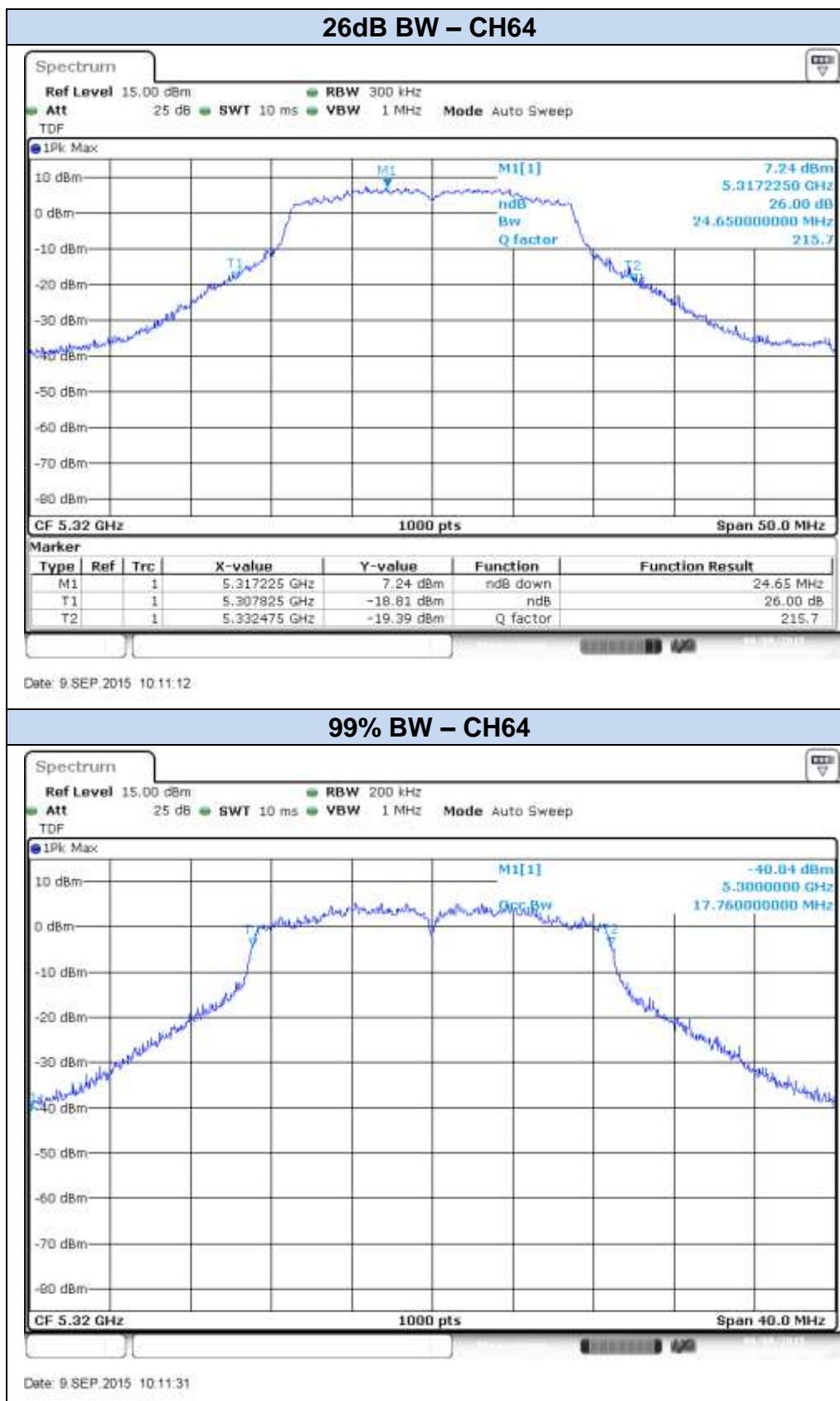




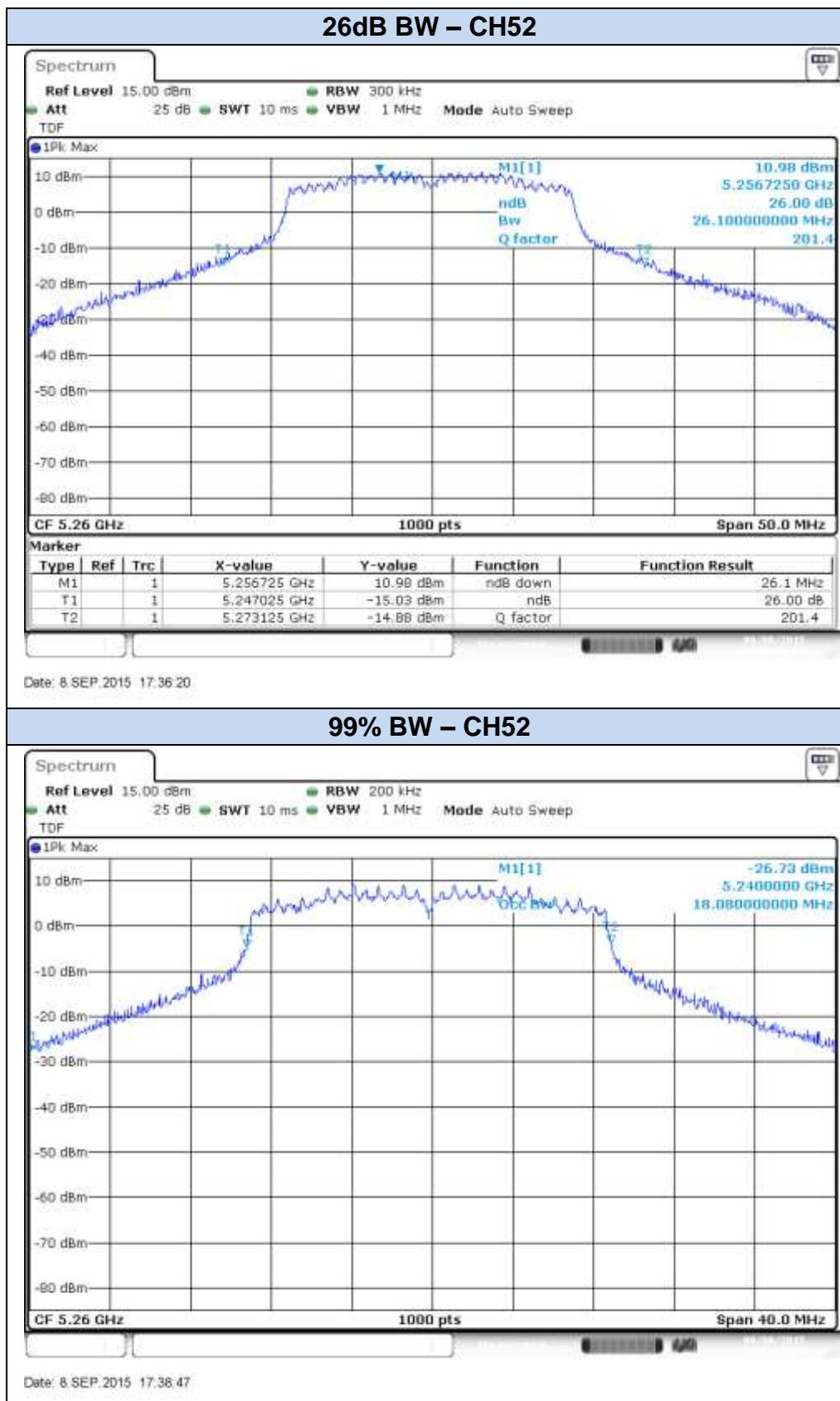
802.11n20, HT8 (MIMO) – Chain A

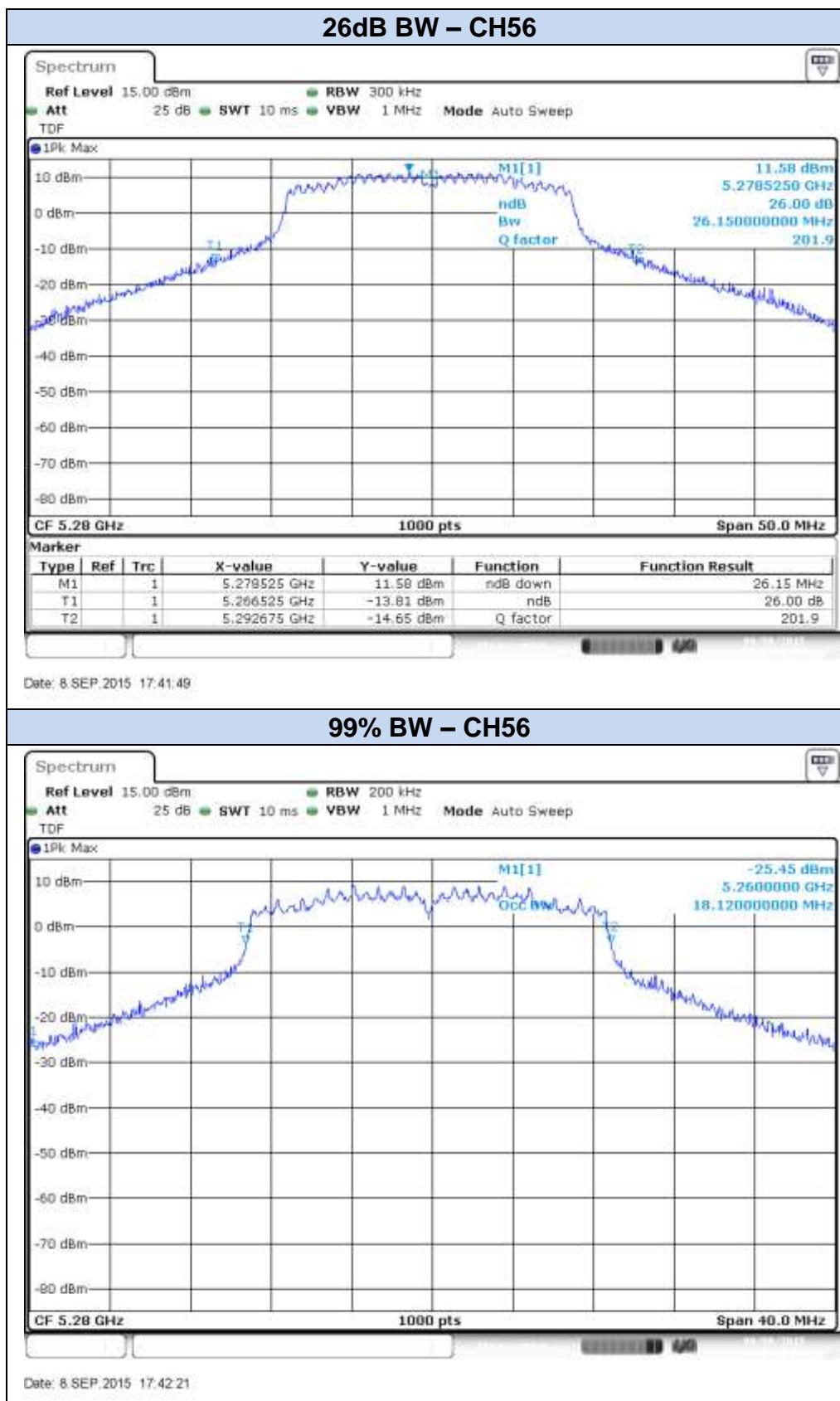


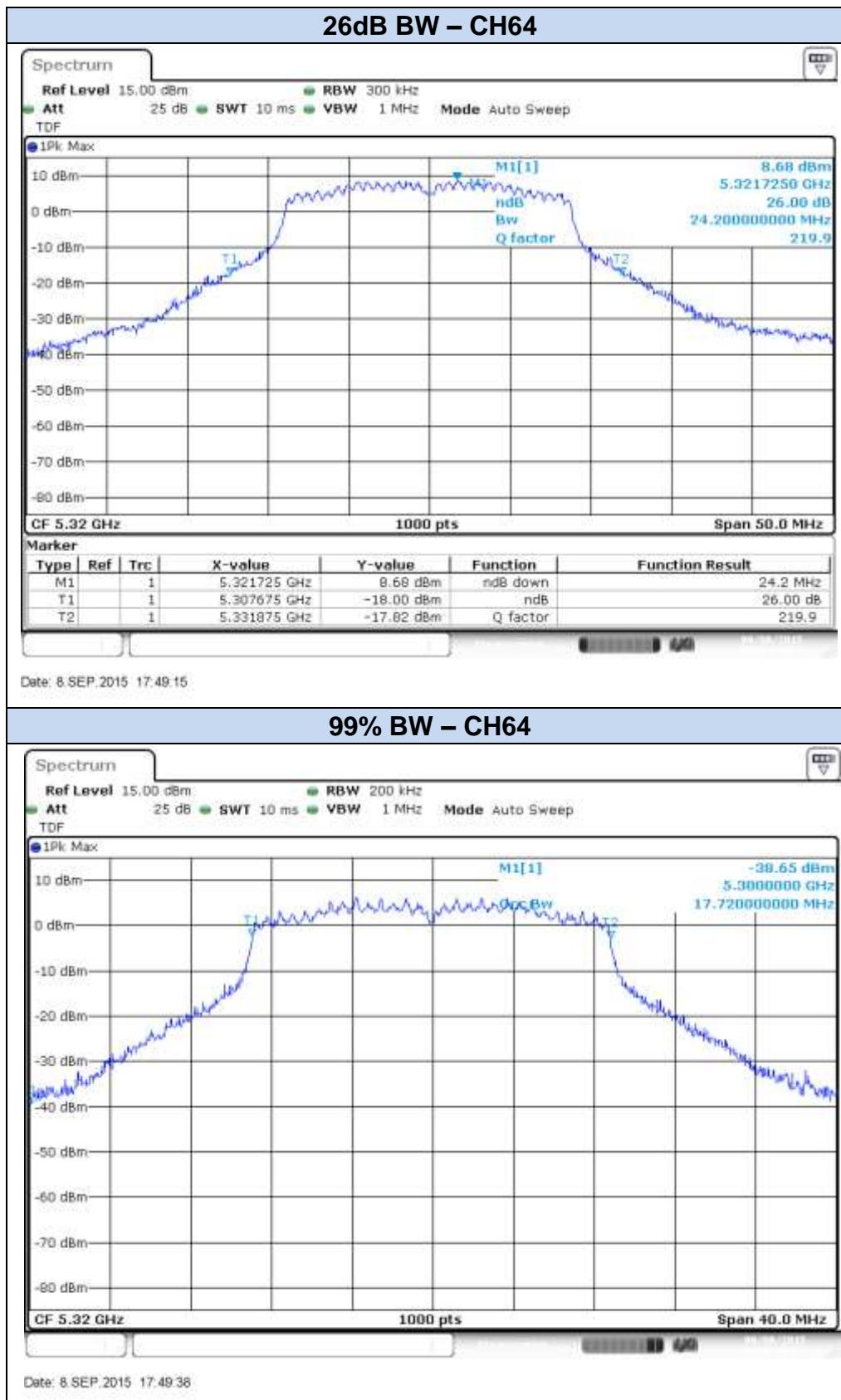




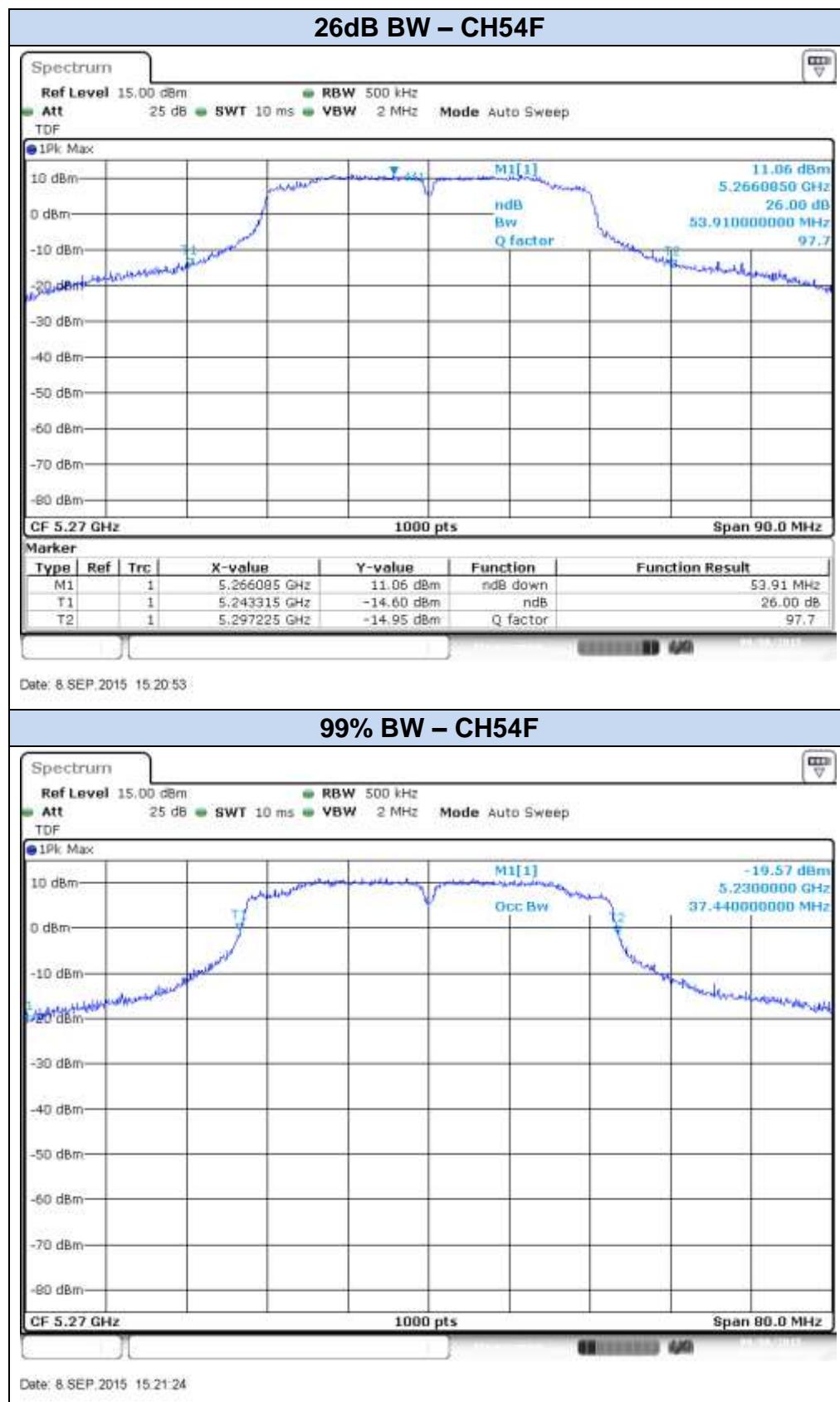
802.11n20, HT8 (MIMO) – Chain B

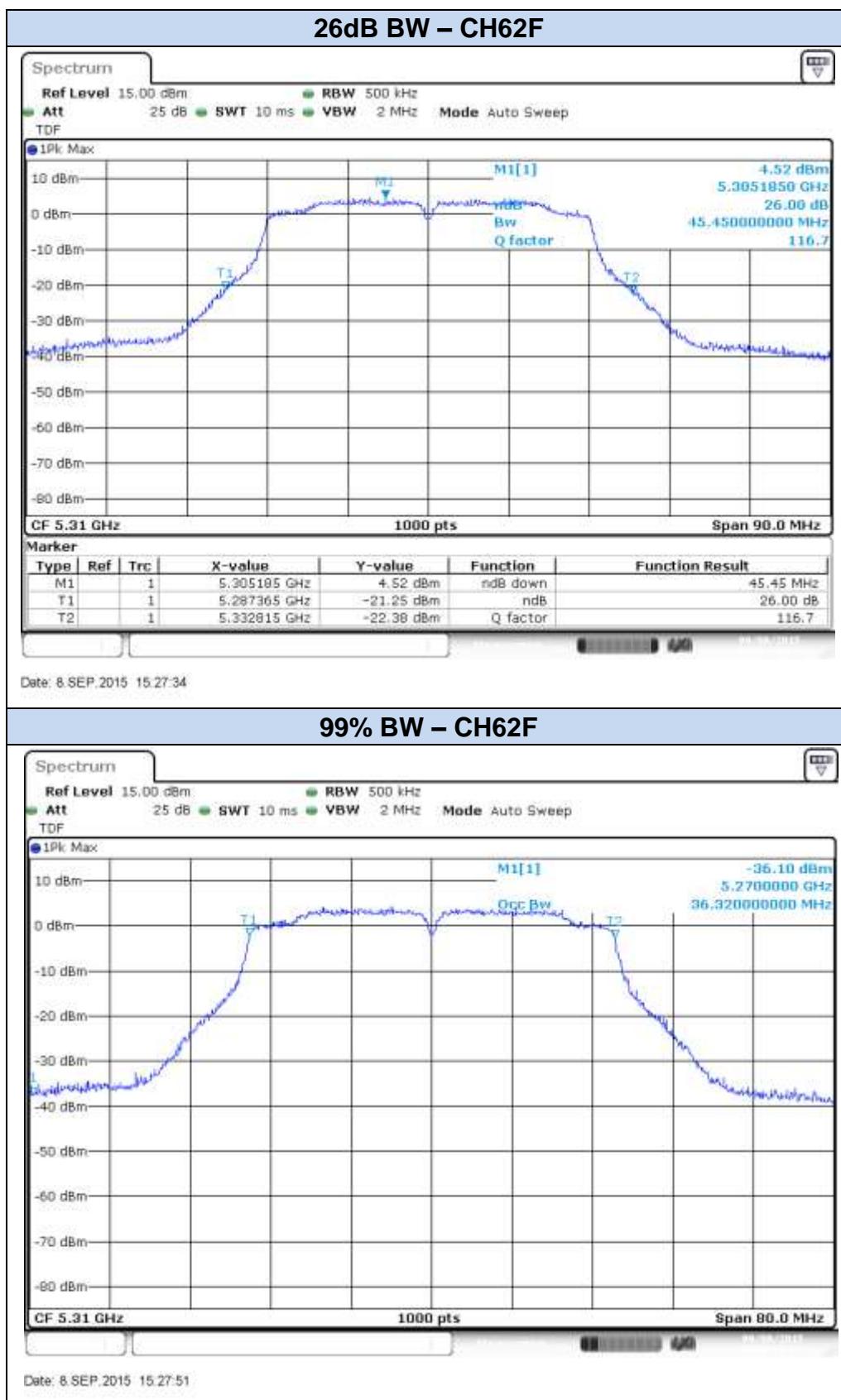




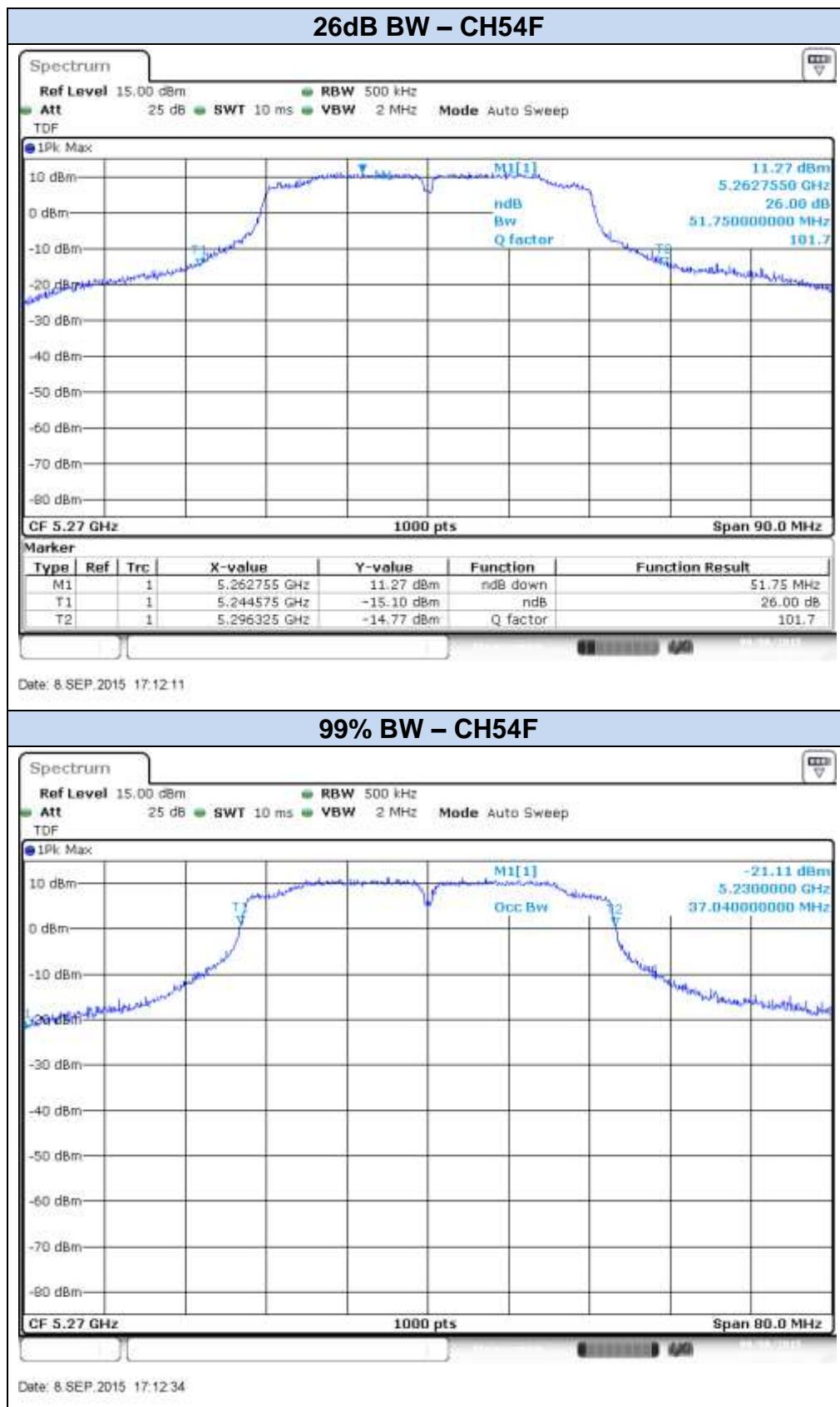


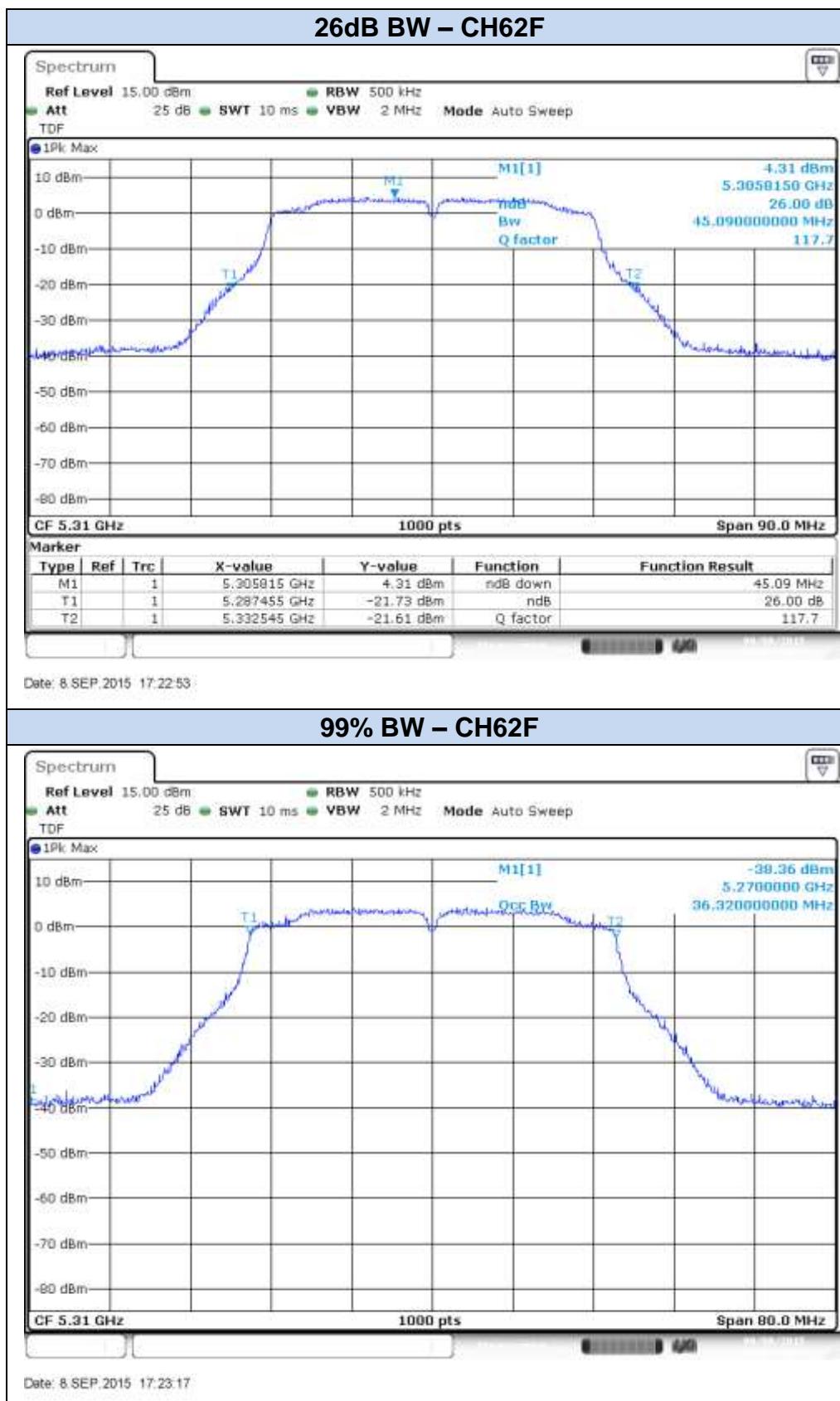
802.11n40, HT0 (SISO) – Chain A



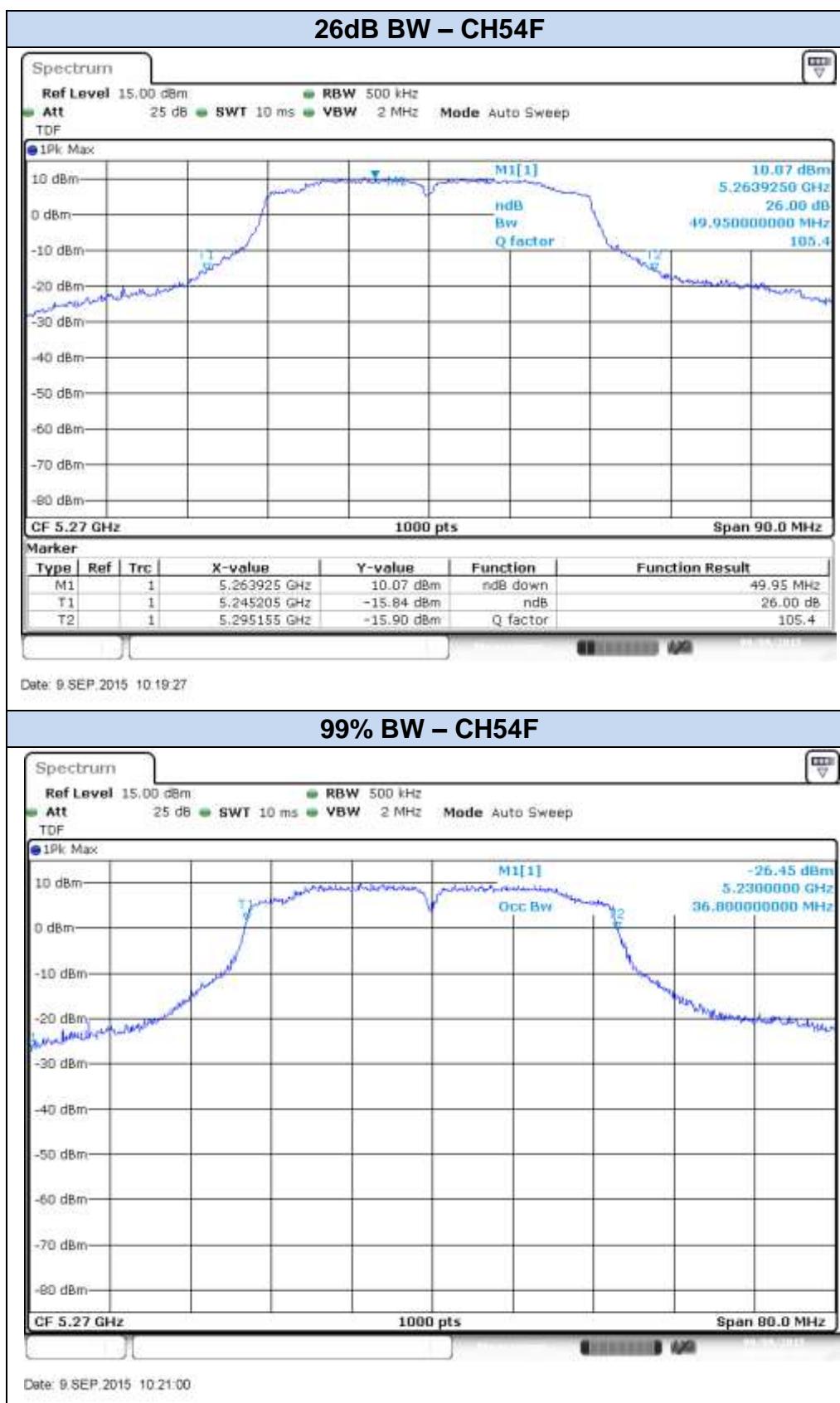


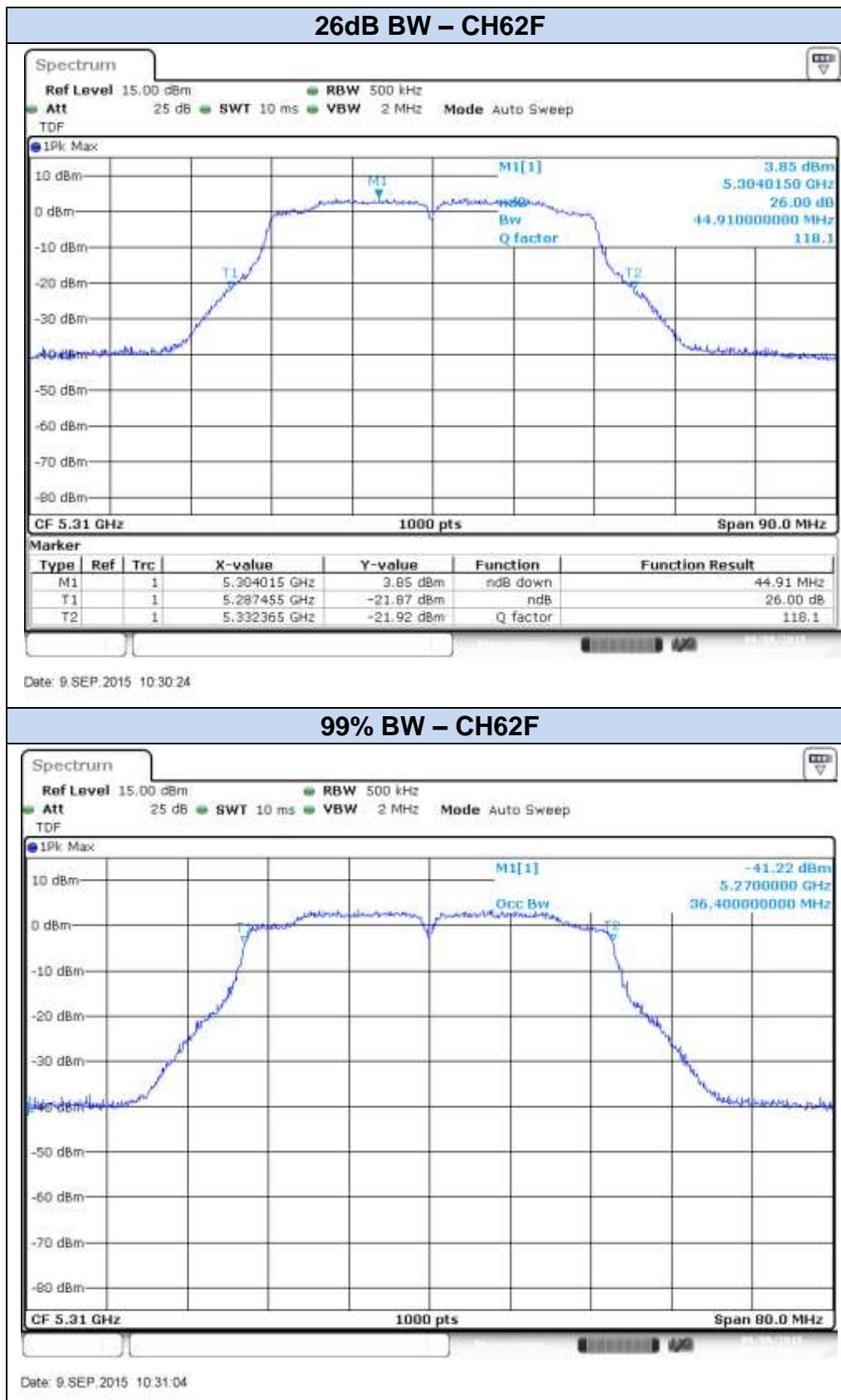
802.11n40, HT0 (SISO) – Chain B



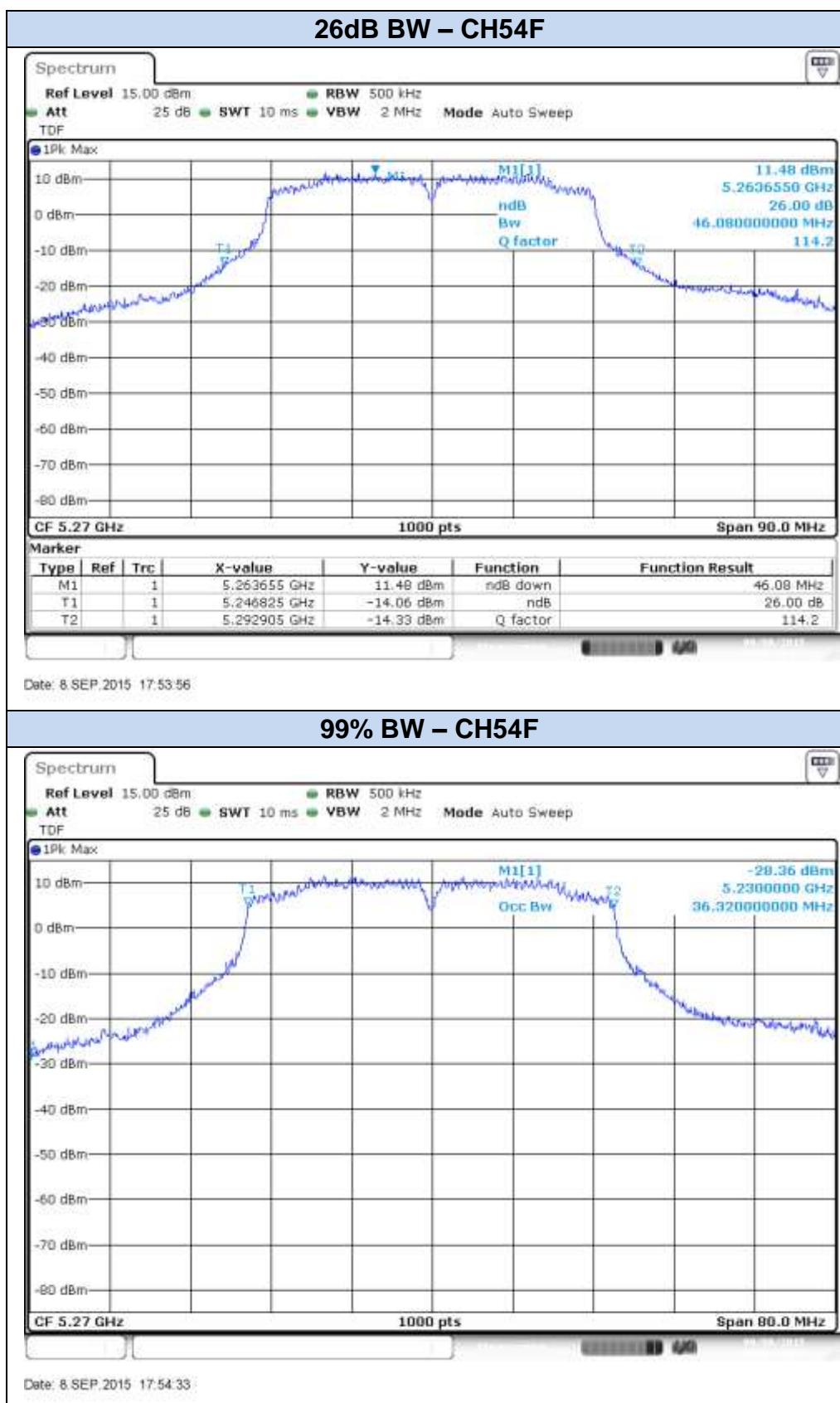


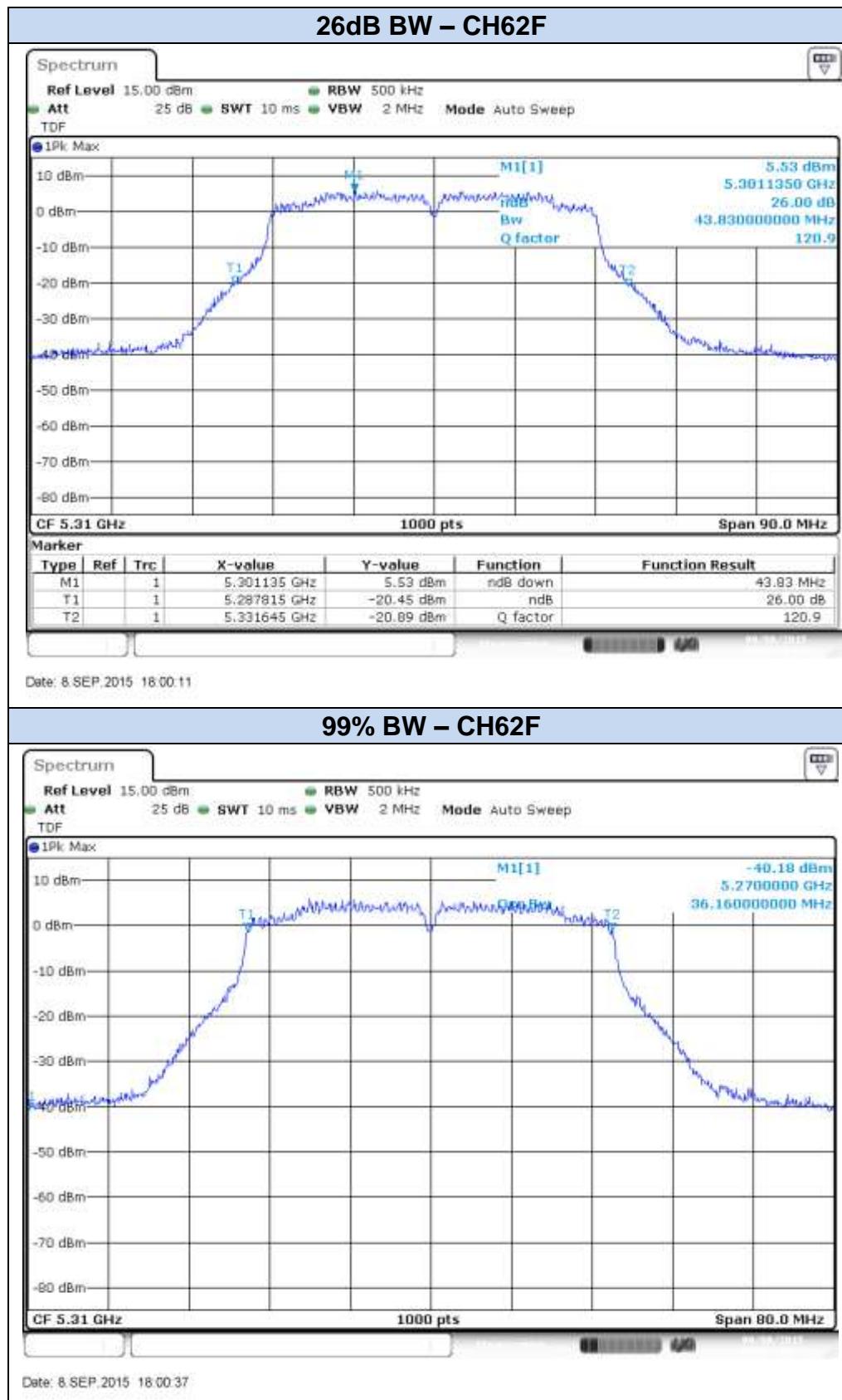
802.11n40, HT8 (MIMO) – Chain A



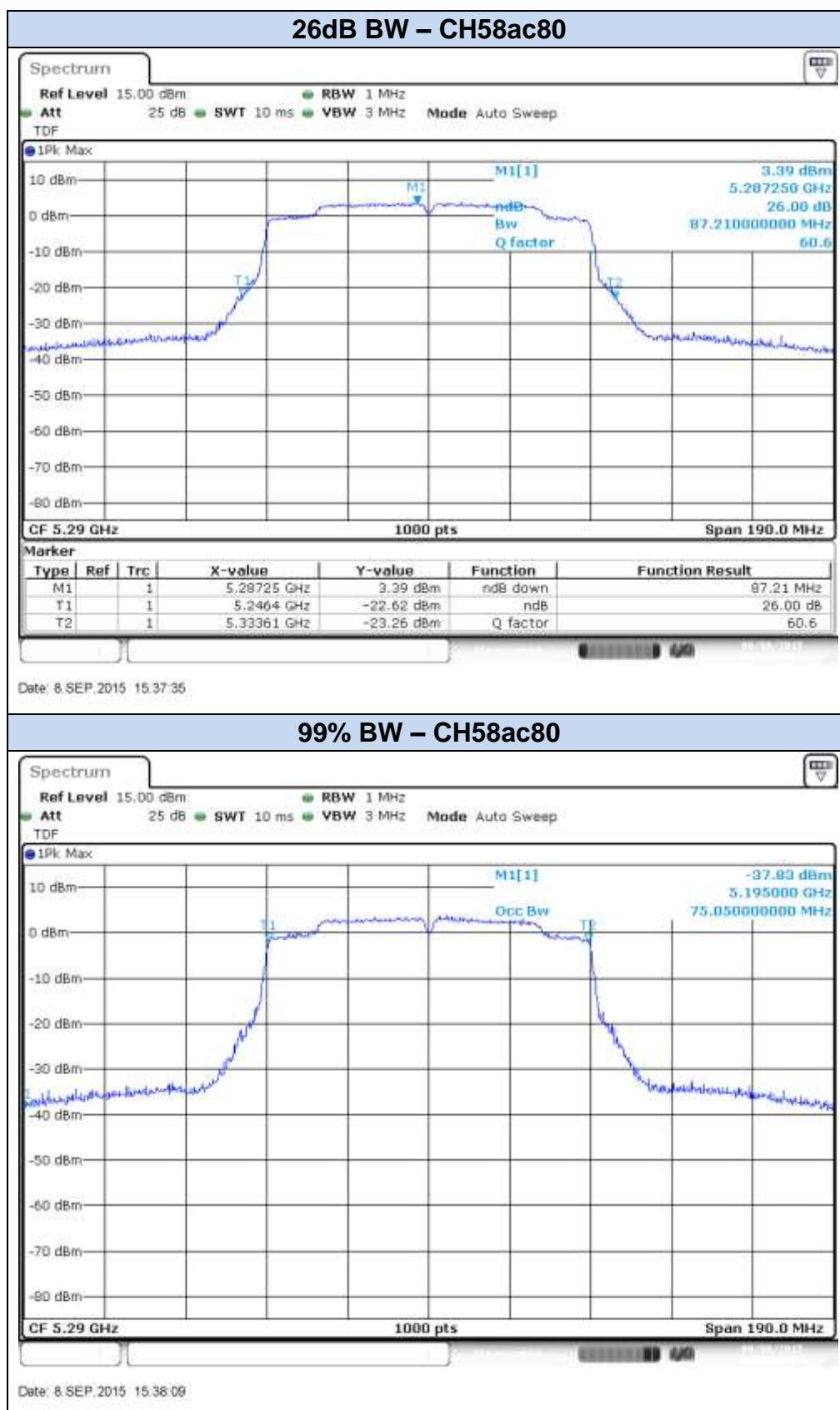


802.11n40, HT8 (MIMO) – Chain B

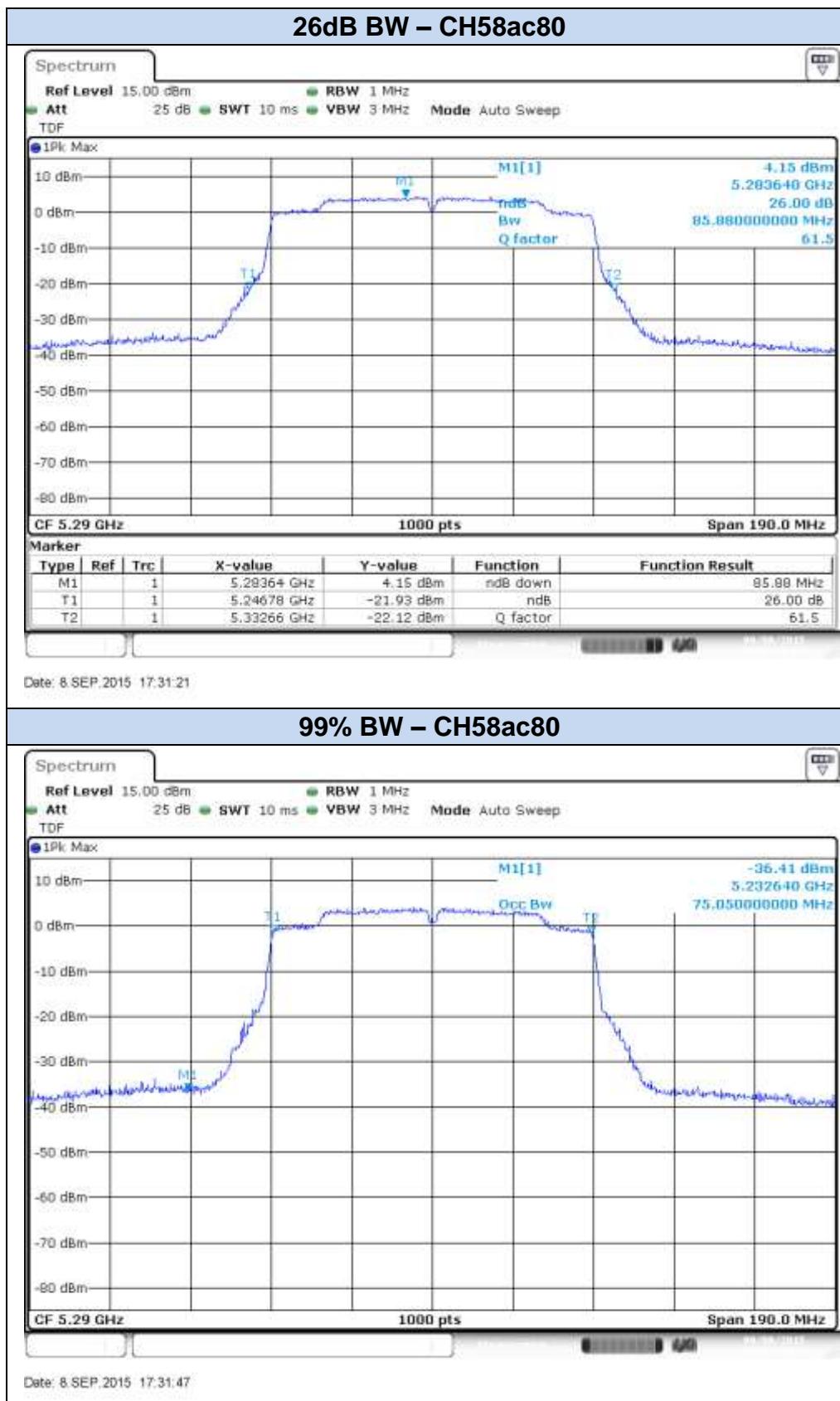




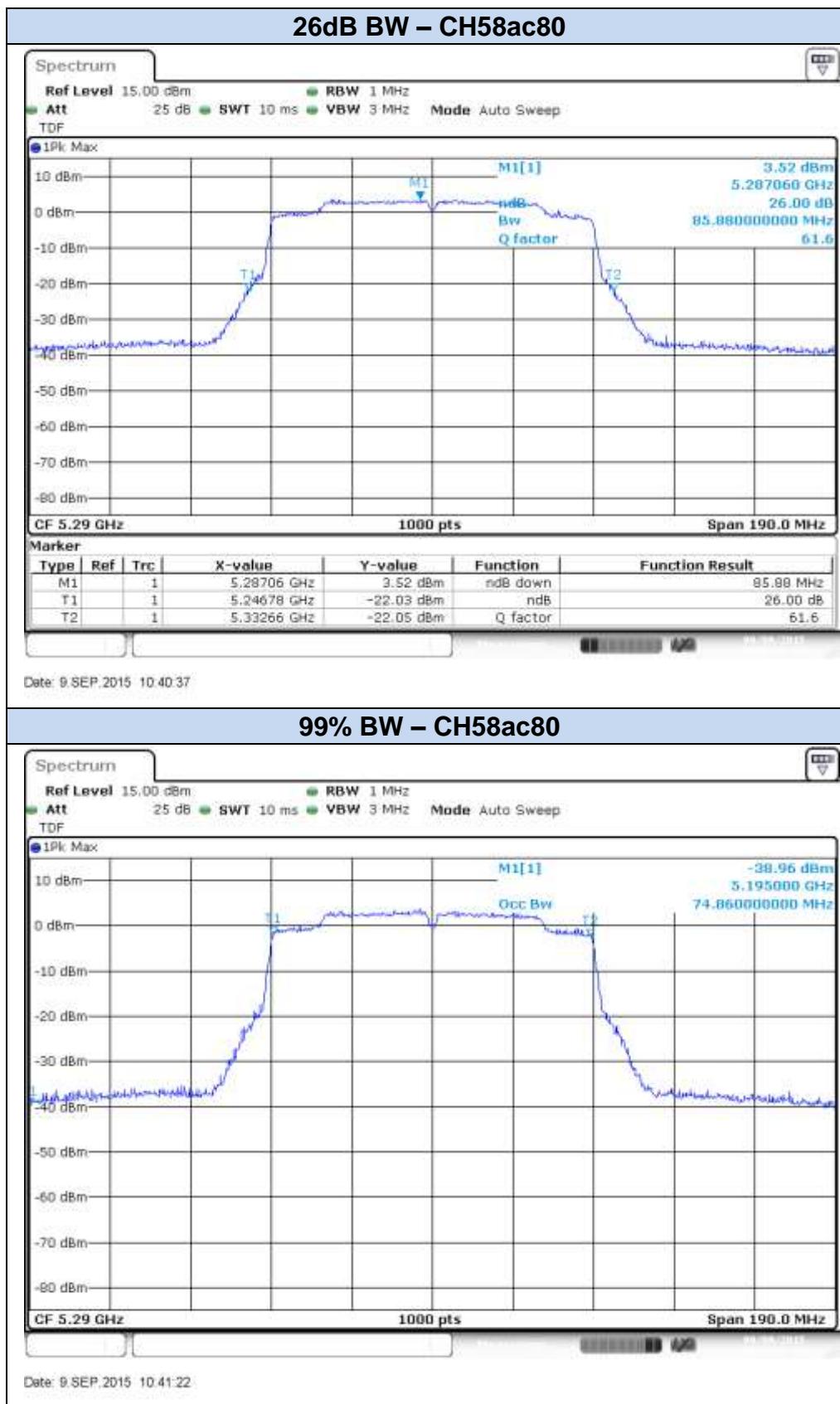
802.11ac80, VHT0 (SISO) – Chain A



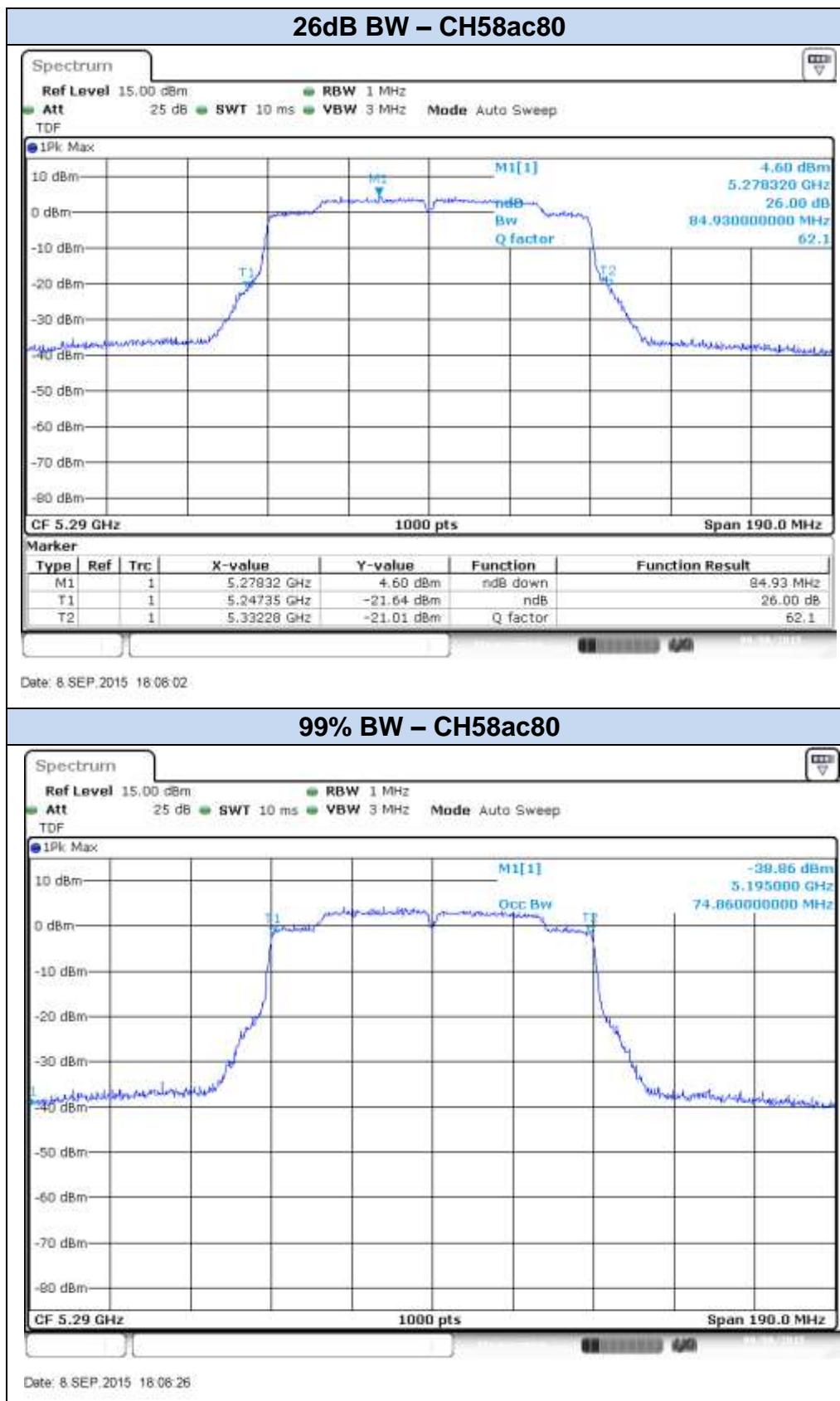
802.11ac80, VHT0 (SISO) – Chain B



802.11ac80, VHT0 (MIMO) – Chain A



802.11ac80, VHT0 (MIMO) – Chain B



C.2 Power Limits. Maximum Output power & Peak power spectral density

Test limits:

FCC part	RSS part	Limits
15.407 (a) (2)	RSS-247 Clause 6.2.2 (1)	For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band.

Test procedure:

The Maximum Conducted Output Power was measured using the channel integration method according to point E) 2) e) (Method SA-2 Alternative) of Guidance 789033 D01.

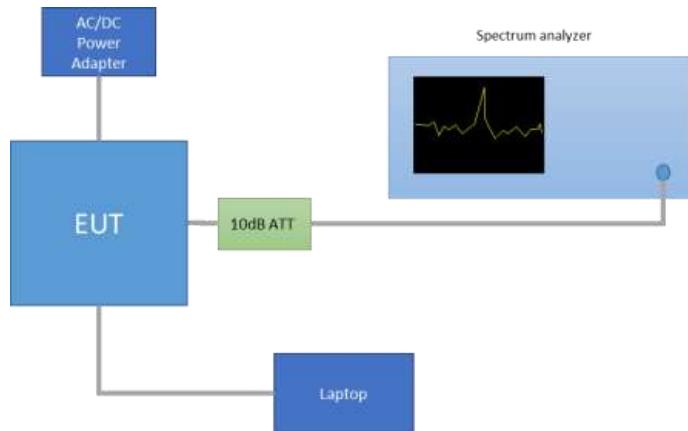
The maximum power spectral density (PSD) was measured using the method according to point F) (Method SA-2 Alternative) of Guidance 789033 D01.

In the measure-and-sum approach for MIMO mode, the conducted emission level (e.g., transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically in linear power units to determine the total emission level from the device.

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power.

The setup below was used to measure the maximum conducted output power and power spectral density. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

The declared maximum antenna gain is 5dBi.



Results tables:

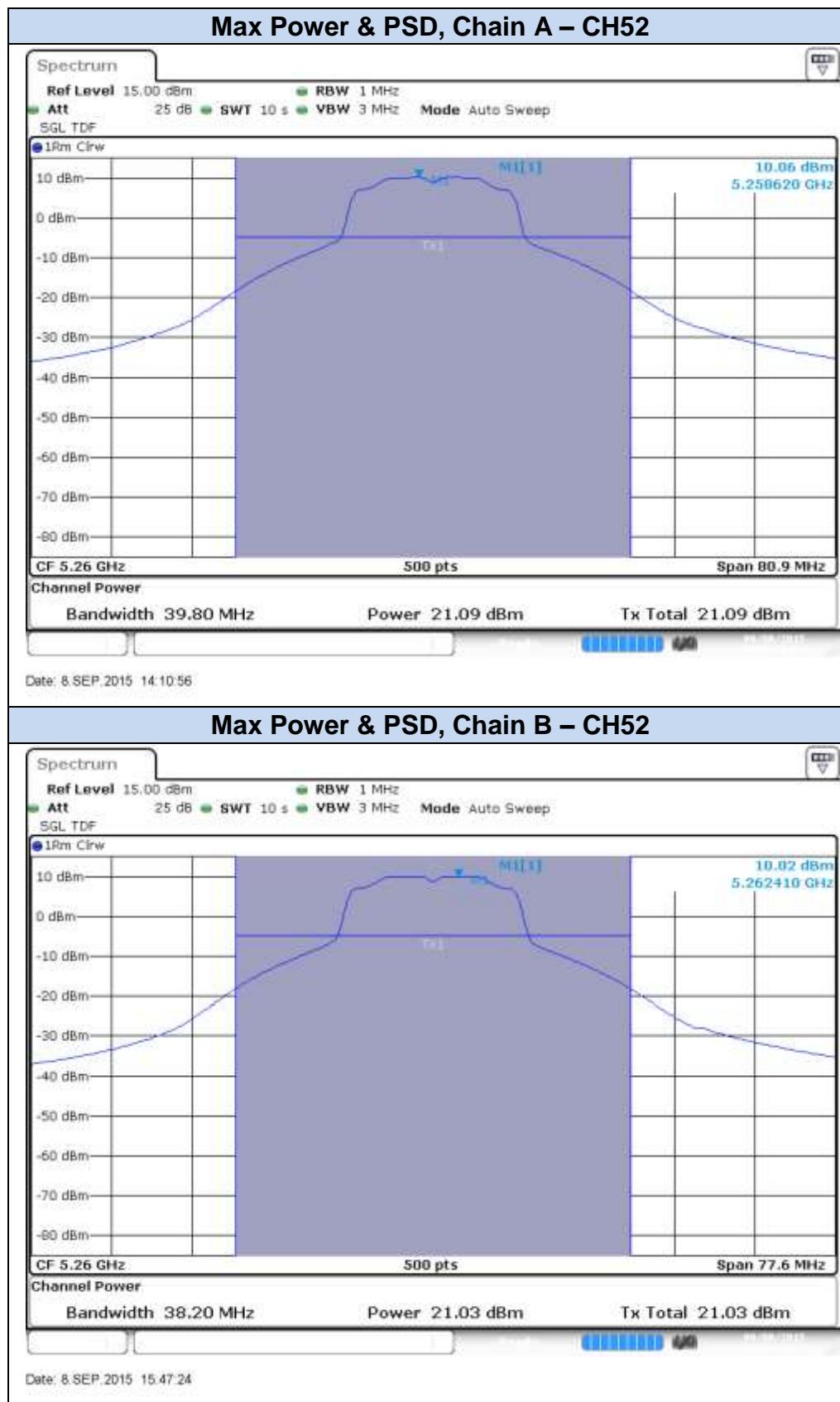
Mode	Rate	Meas. Duty Cycle [%]	CH	Freq. [MHz]	Antenna	Power [dBm]			
						Meas. Cond RMS	Duty cycle Compensated	EIRP	PSD Duty cycle Compensated
802.11n20	802.11a	97.8	52	5260	SISO CHAIN A	21.09	21.19	26.19	10.16
					SISO CHAIN B	21.03	21.13	26.13	10.12
			56	5280	SISO CHAIN A	21.11	21.21	26.21	10.18
					SISO CHAIN B	21.05	21.15	26.15	10.14
			64	5320	SISO CHAIN A	16.59	16.69	21.69	5.75
					SISO CHAIN B	16.72	16.82	21.82	5.89
	802.11n40	97.9	52	5260	SISO CHAIN A	21.04	21.13	26.13	9.91
					SISO CHAIN B	21.04	21.13	26.13	9.94
			56	5280	SISO CHAIN A	20.41	20.50	25.50	9.32
					SISO CHAIN B	20.85	20.94	25.94	9.75
			64	5320	SISO CHAIN A	16.46	16.55	21.55	5.42
					SISO CHAIN B	16.66	16.75	21.75	5.61
802.11ac80	802.11n20	96.3	52	5260	MIMO CHAIN A	18.06	18.22	23.22	7.09
					MIMO CHAIN B	18.07	18.23	23.23	7.11
			56	5280	MIMO CHAIN A	18.04	18.20	23.20	7.09
					MIMO CHAIN B	18.09	18.25	23.25	7.11
			64	5320	MIMO CHAIN A	14.35	14.51	19.51	3.39
					MIMO CHAIN B	15.24	15.40	20.40	4.28
	802.11ac80	93.4	54F	5270	SISO CHAIN A	19.45	19.62	24.62	5.19
					SISO CHAIN B	19.75	19.92	24.92	5.46
			62F	5310	SISO CHAIN A	12.71	12.88	17.88	-1.56
					SISO CHAIN B	12.94	13.11	18.11	-1.31
			54F	5270	MIMO CHAIN A	18.06	18.36	23.36	3.96
					MIMO CHAIN B	18.11	18.41	23.41	4.01
			62F	5310	MIMO CHAIN A	11.84	12.14	17.14	-2.24
					MIMO CHAIN B	12.30	12.60	17.60	-1.78
	VHT0	92.2	58ac80	5290	SISO CHAIN A	11.03	11.38	16.38	-5.81
					SISO CHAIN B	11.65	12.00	17.00	-5.19
		88.4	58ac80	5290	MIMO CHAIN A	10.63	11.16	16.16	-5.90
					MIMO CHAIN B	10.76	11.29	16.29	-5.81

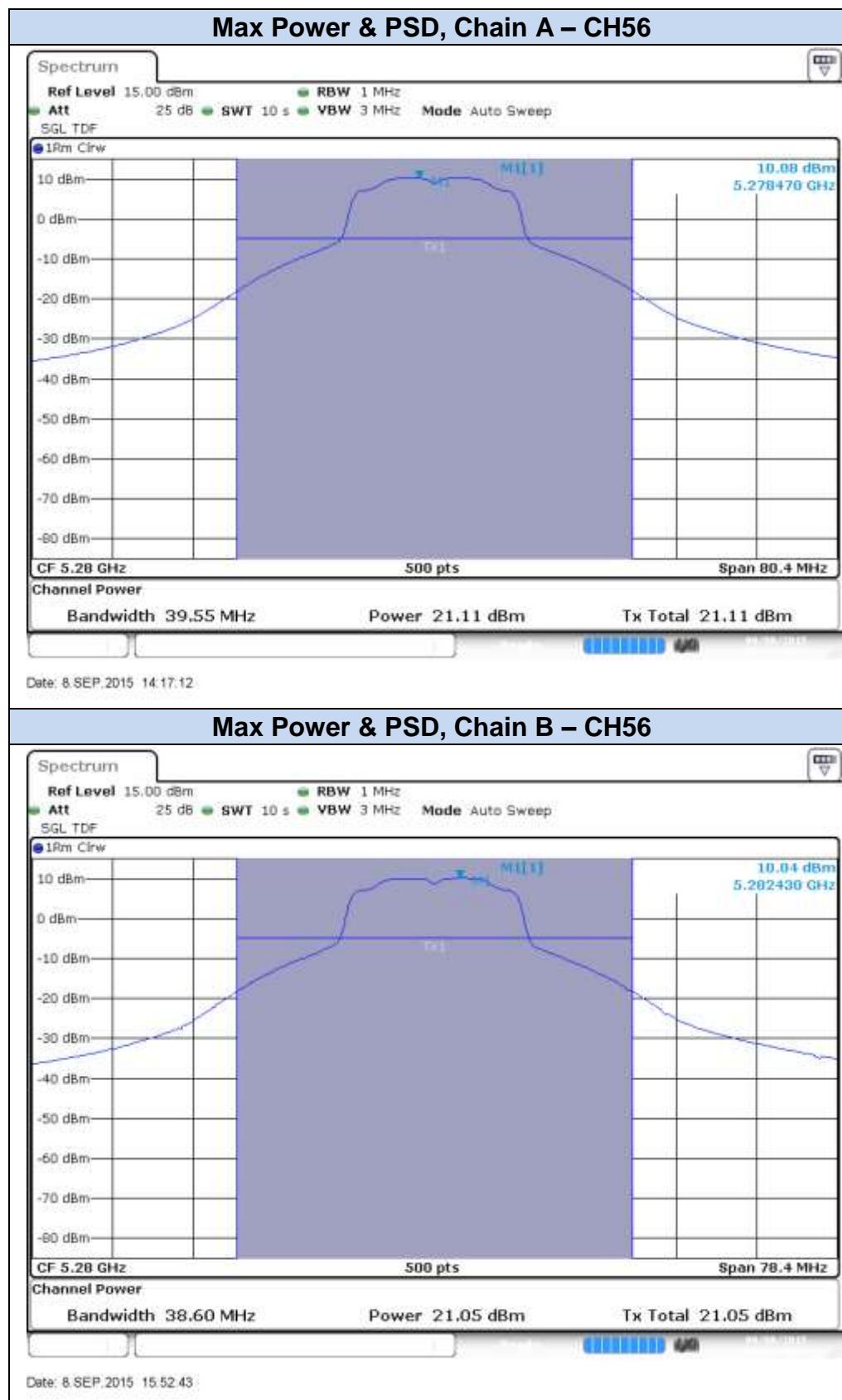
Max Value

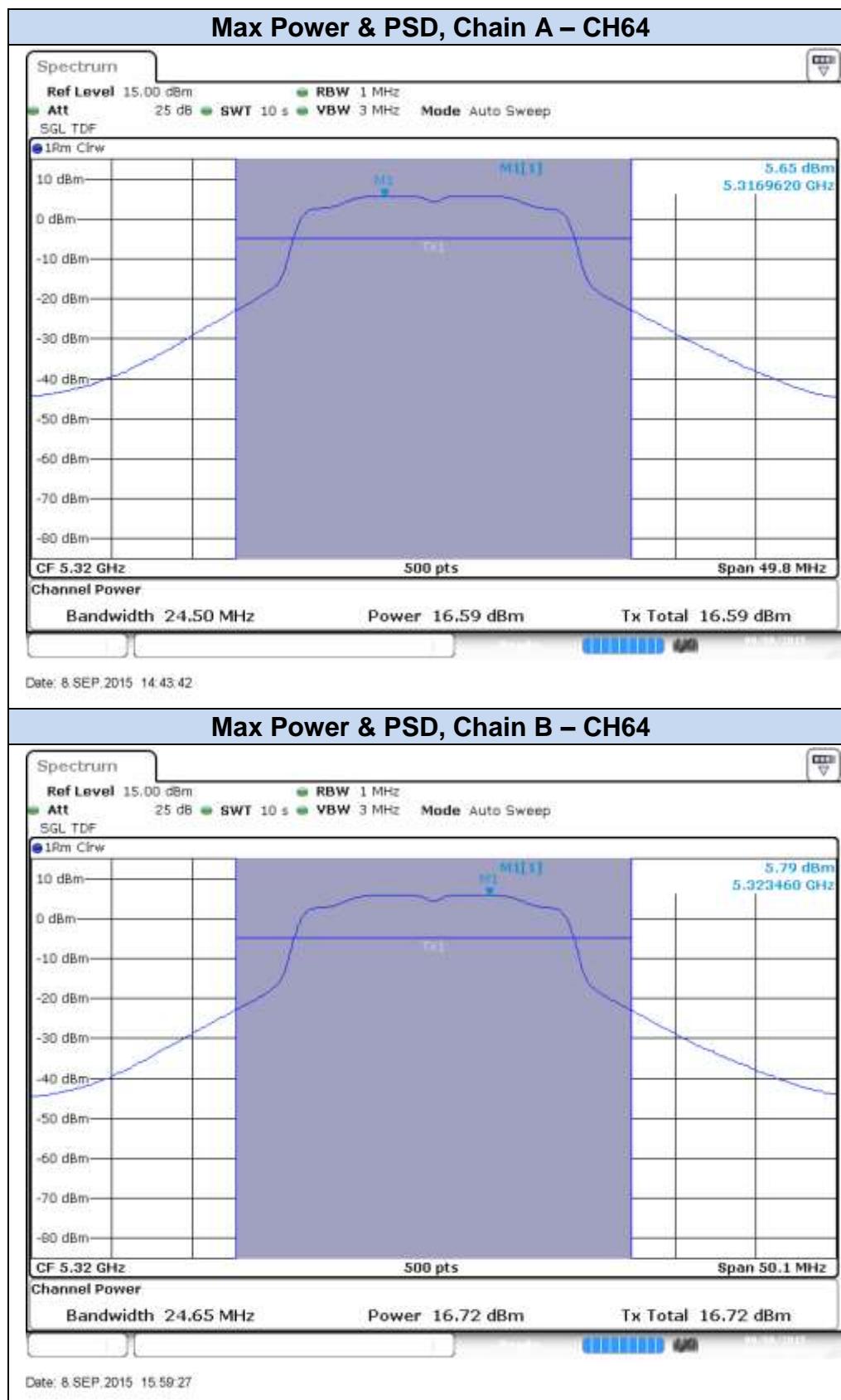
MIMO modes – Combined results

Mode	Rate	Channel	Frequency (MHz)	Antenna	Power [dBm]		
					Combined, Duty Cycle compensated	EIRP	Combined PSD
802.11n20	HT8	52	5260	MIMO CHAIN A + CHAIN B	21.24	26.24	9.95
		56	5280		21.24	26.24	9.95
		64	5320		17.99	22.99	6.71
	HT8	54F	5270		21.39	26.39	6.70
		62F	5310		15.38	20.38	0.71
802.11ac80	VHT0	58ac80	5290		14.24	19.24	-3.37

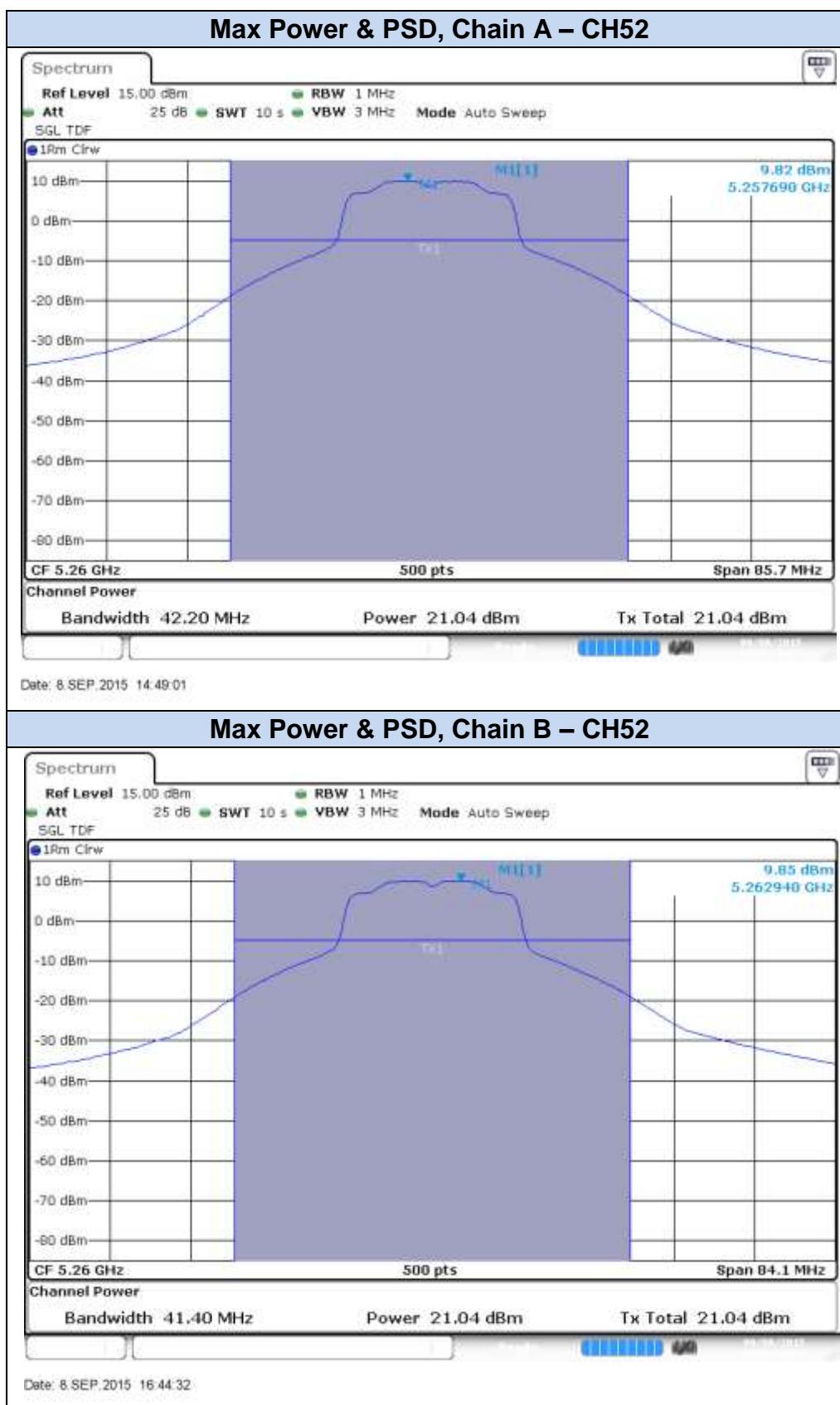
Max Value

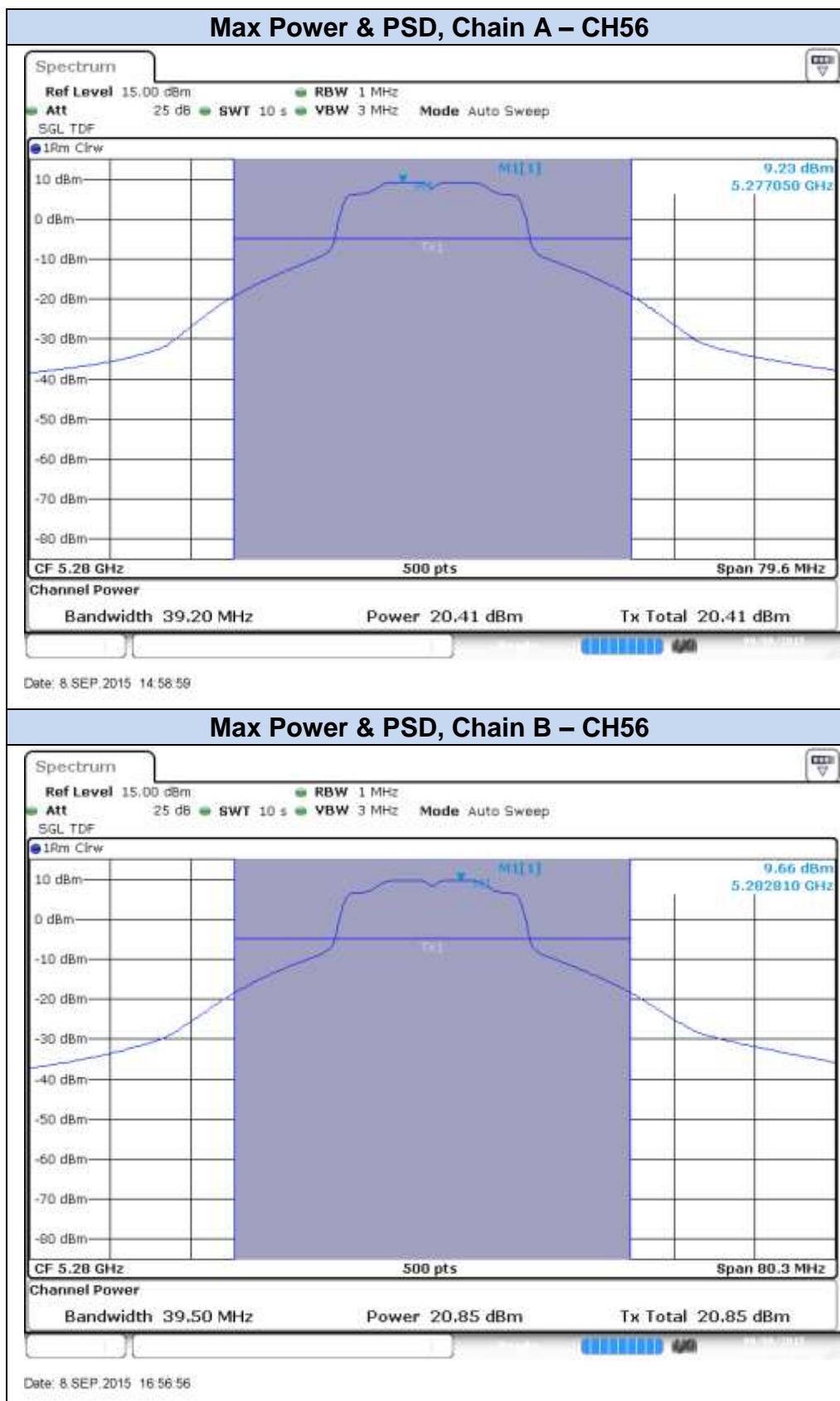
Results screenshot:
802.11a, 6Mbps


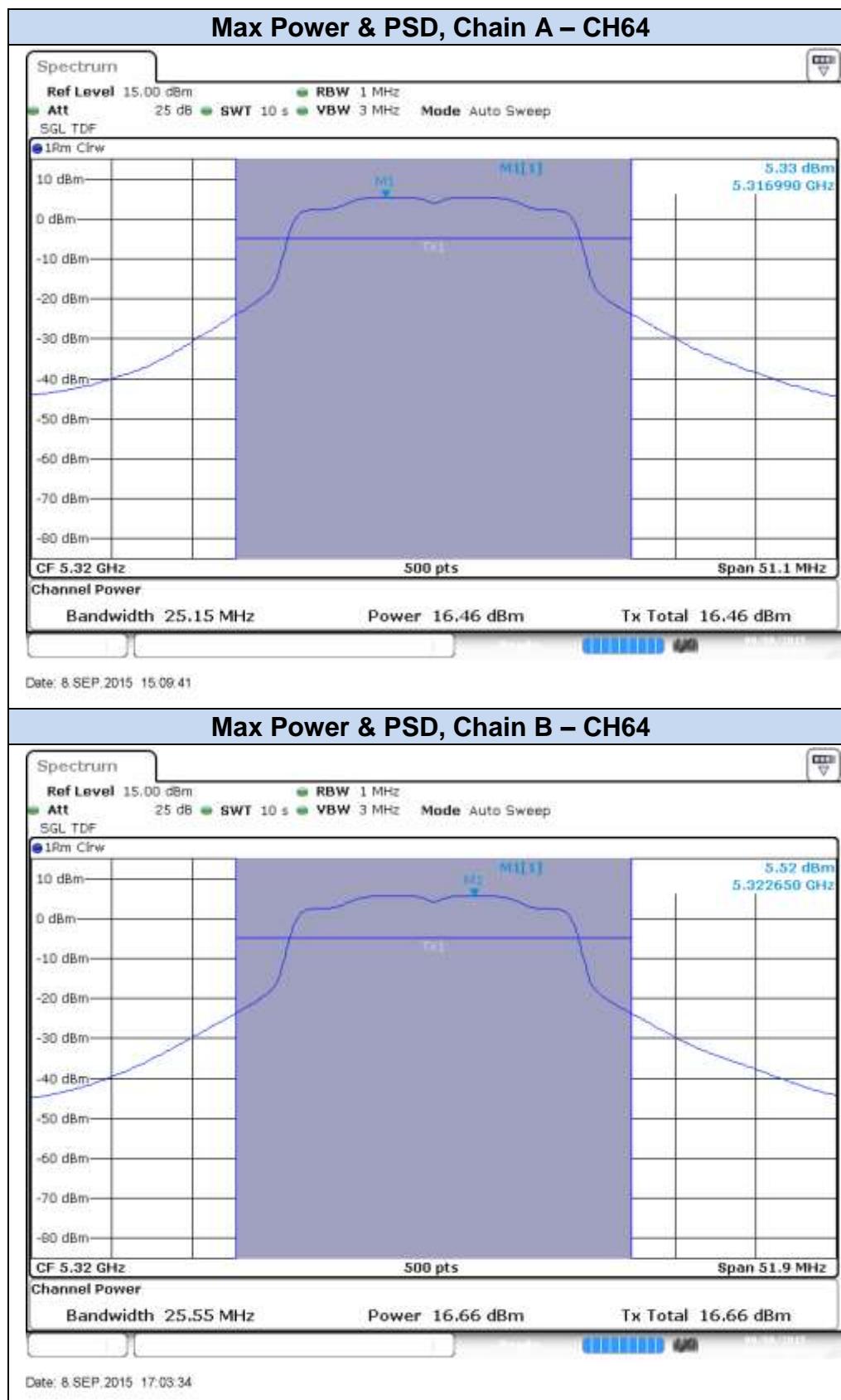




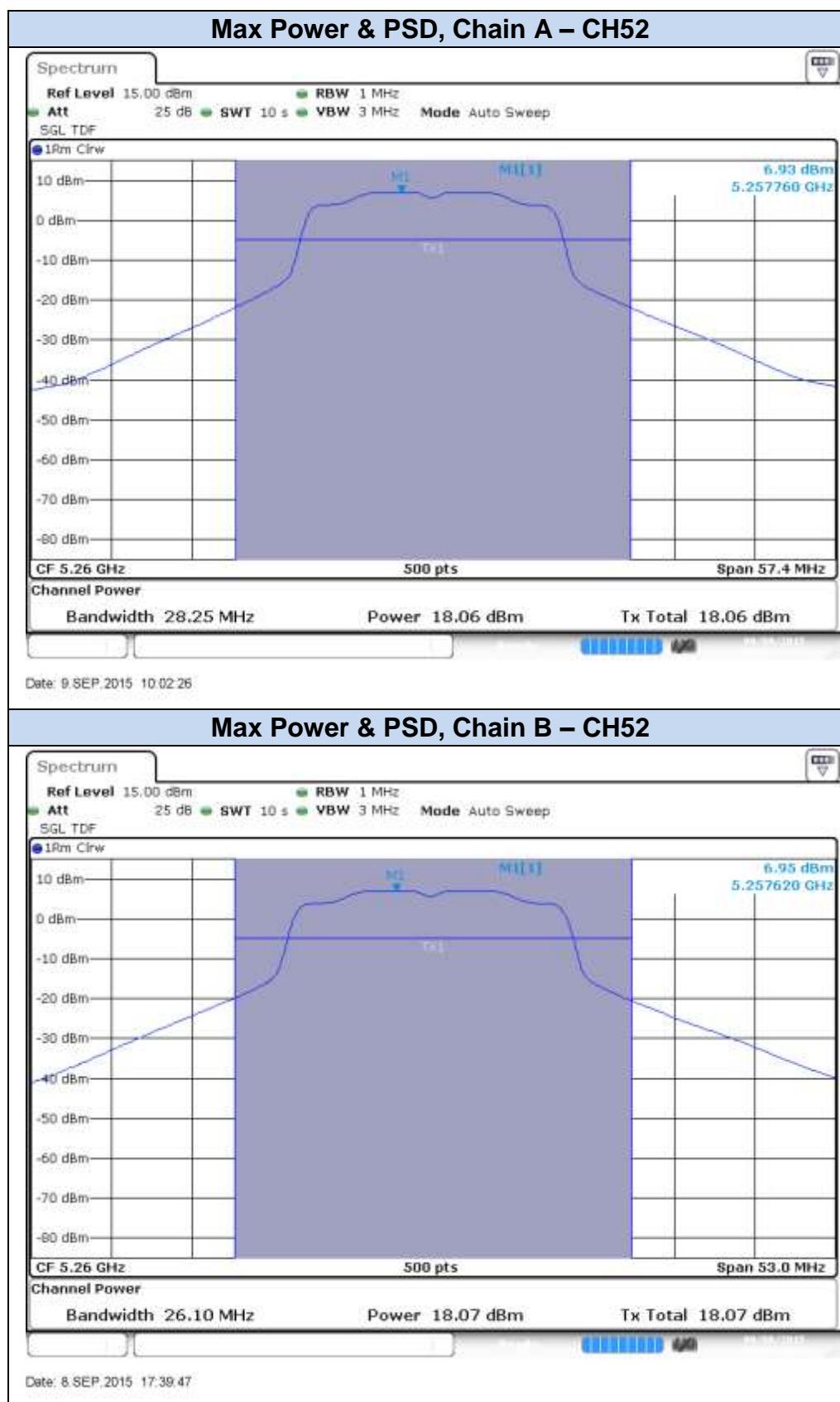
802.11n20, HT0 (SISO)

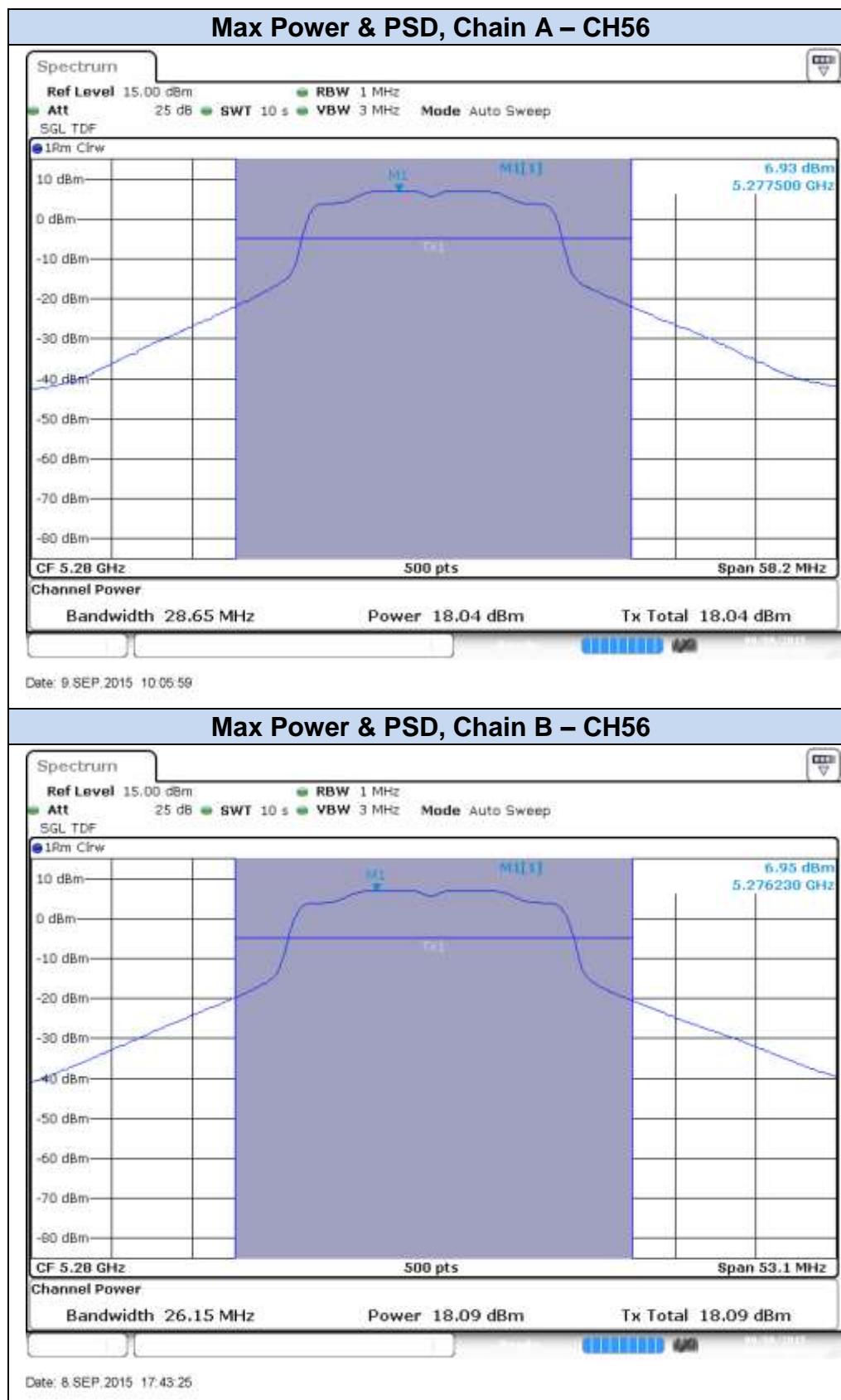


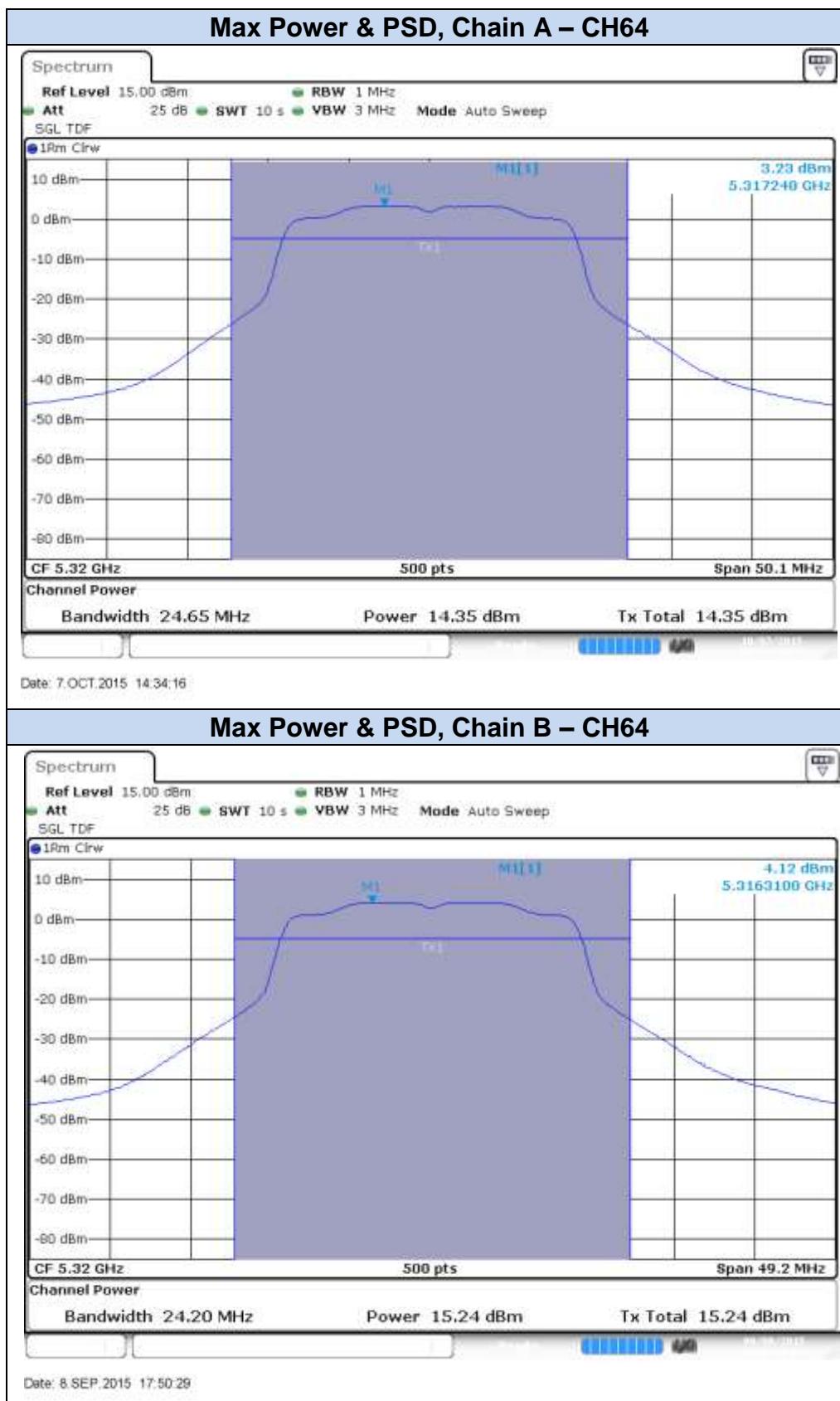




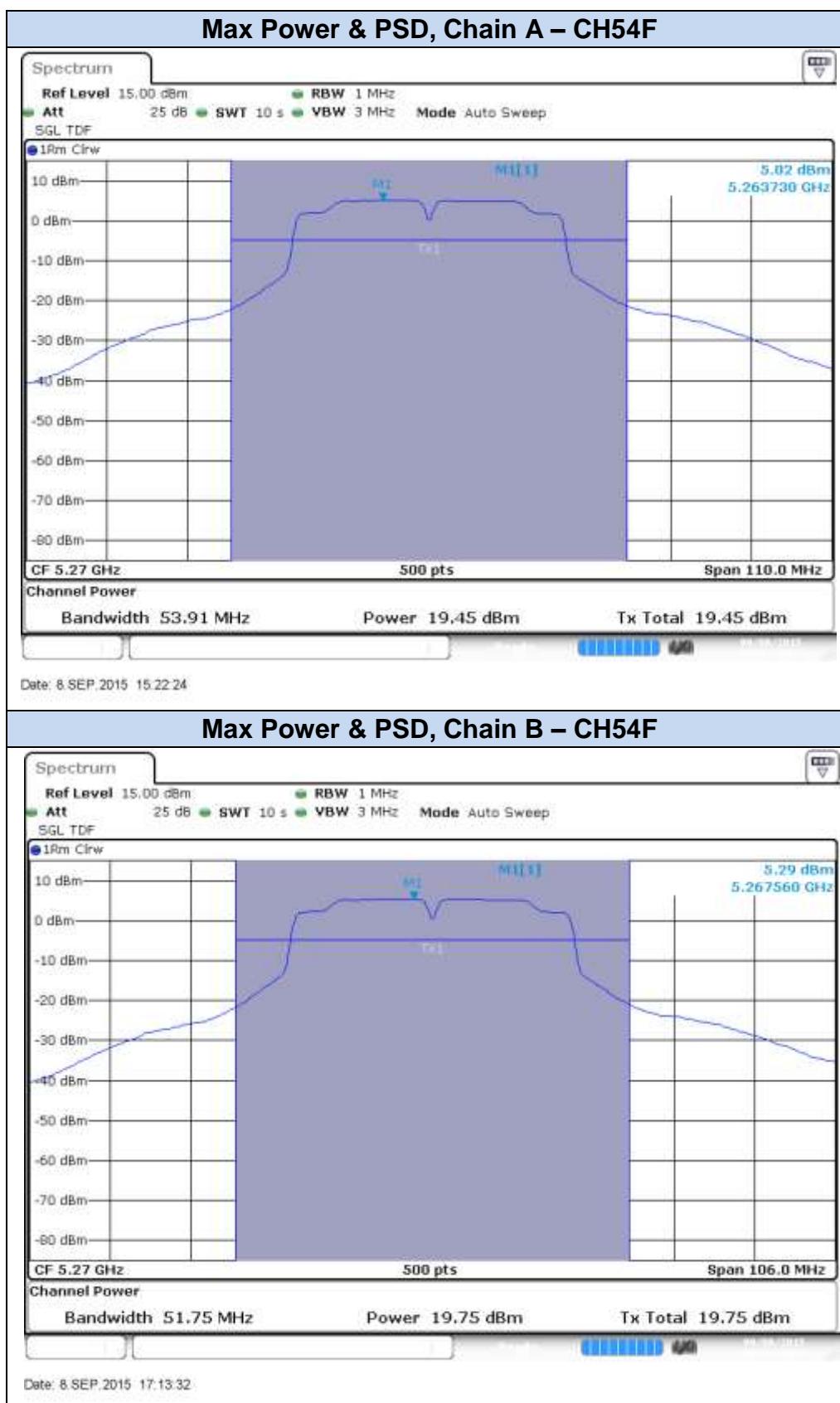
802.11n20, HT8 (MIMO)

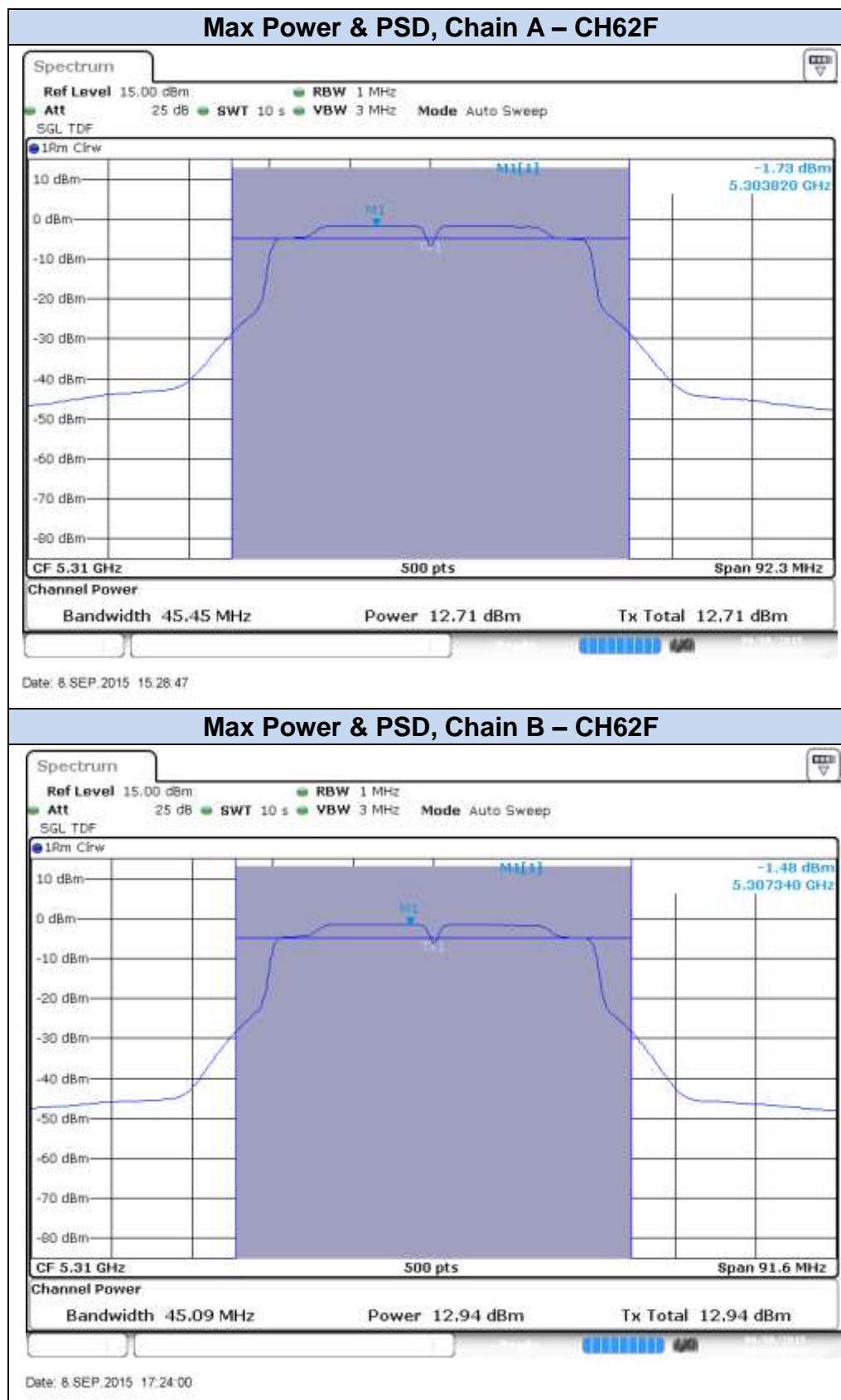






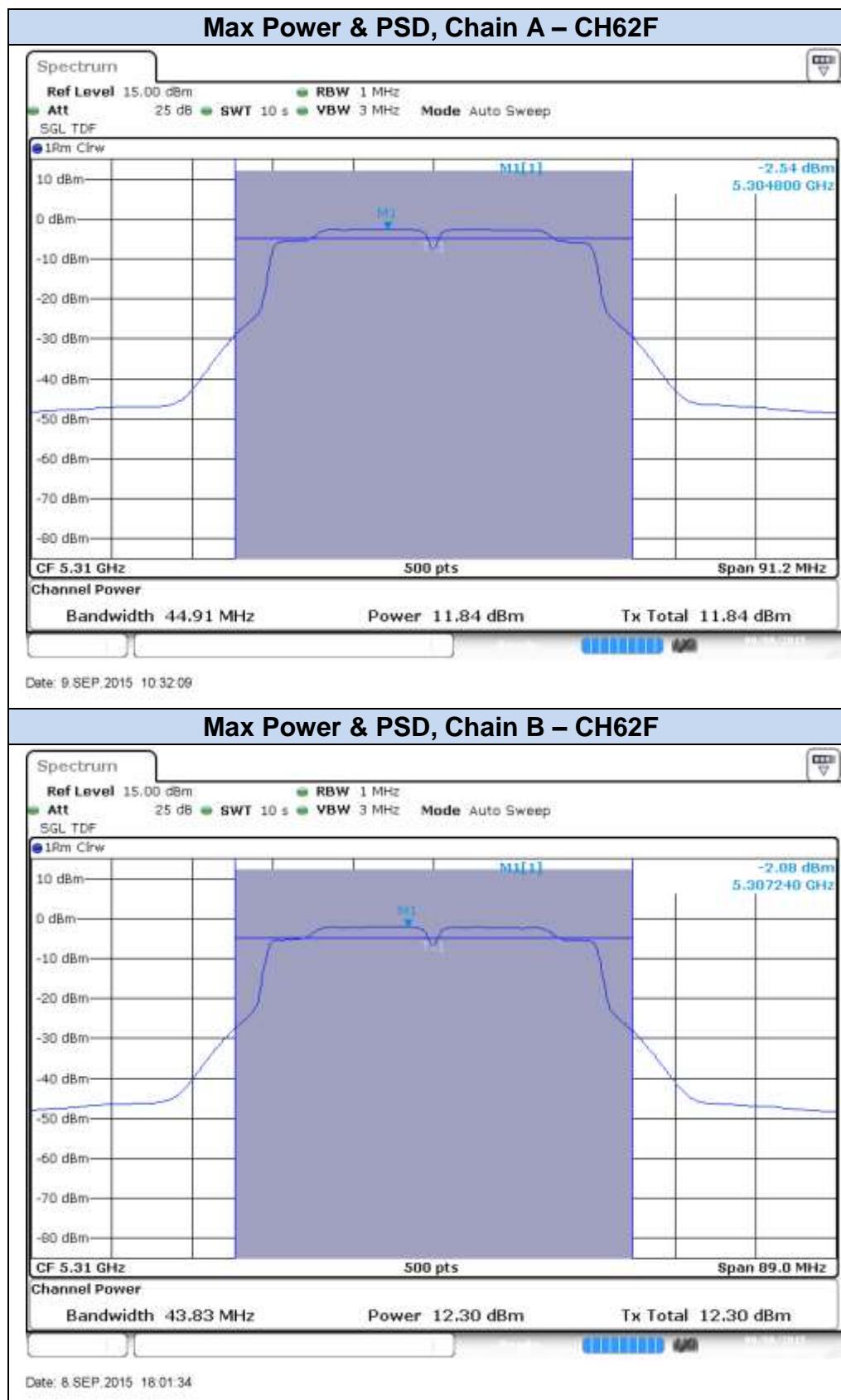
802.11n40, HT0 (SISO)



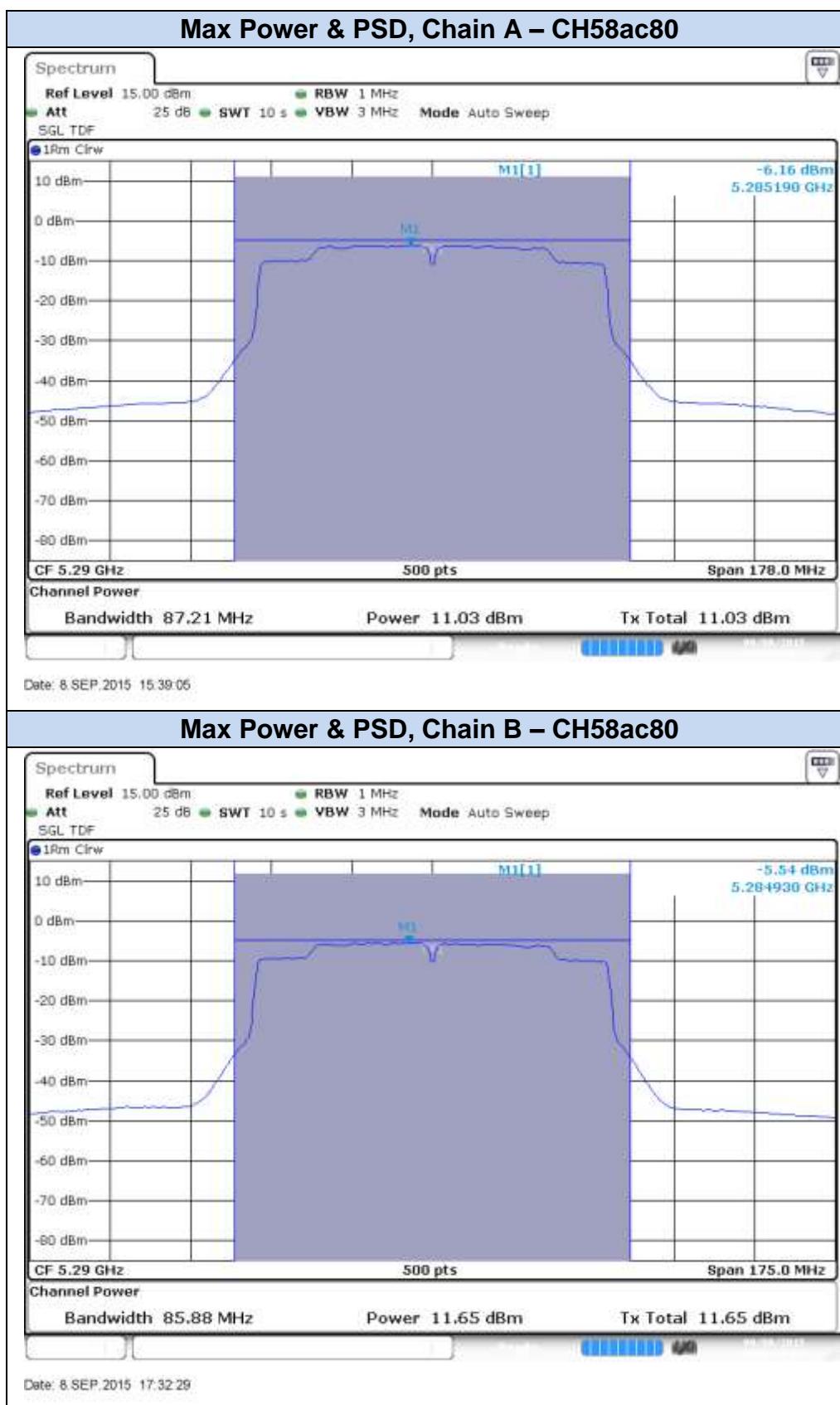


802.11n40, HT8 (MIMO)

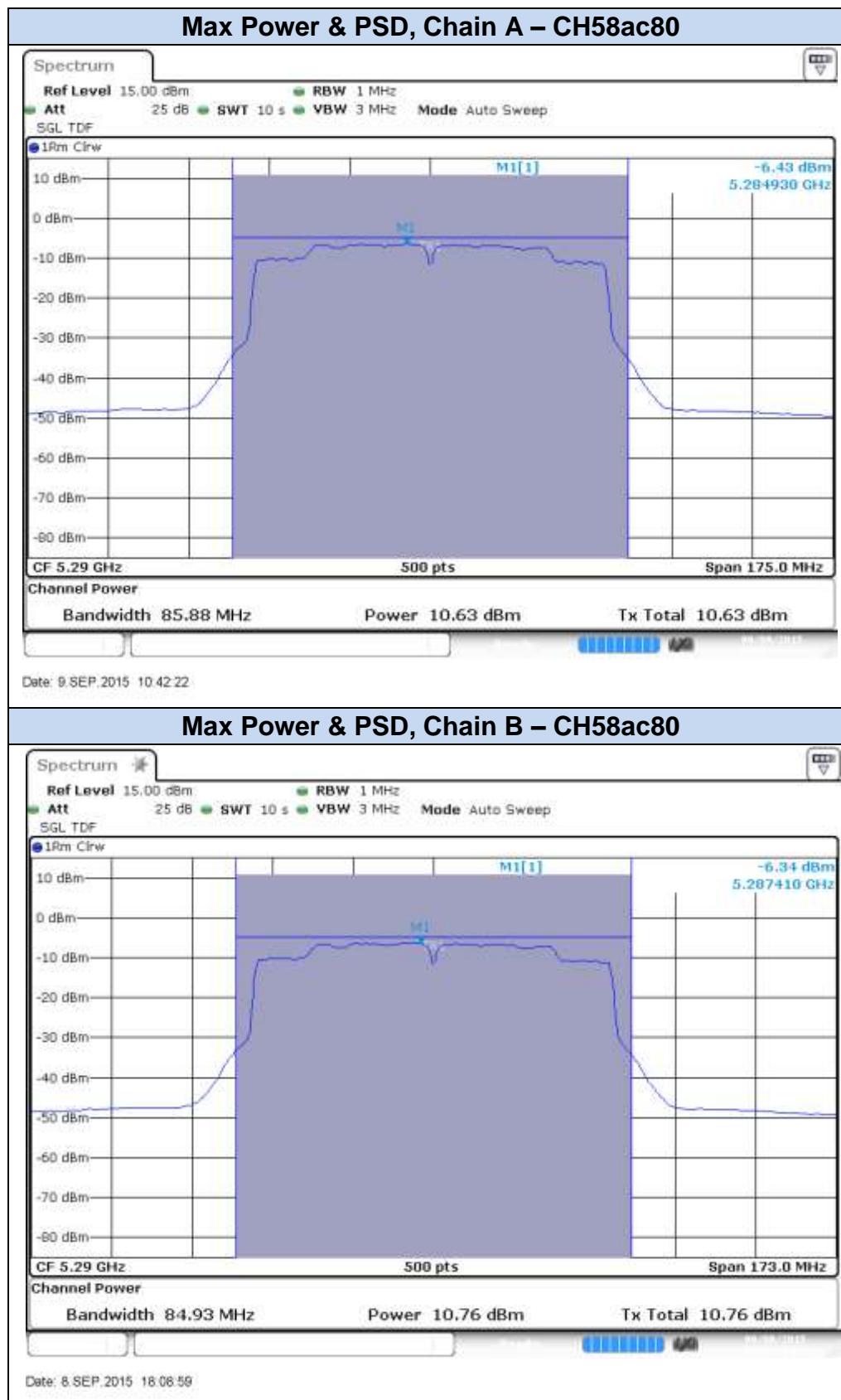




802.11ac80, VHT0 (SISO)



802.11ac80, VHT0 (MIMO)



C.3 Undesirable emissions limits: Band Edge (conducted)

Test limits:

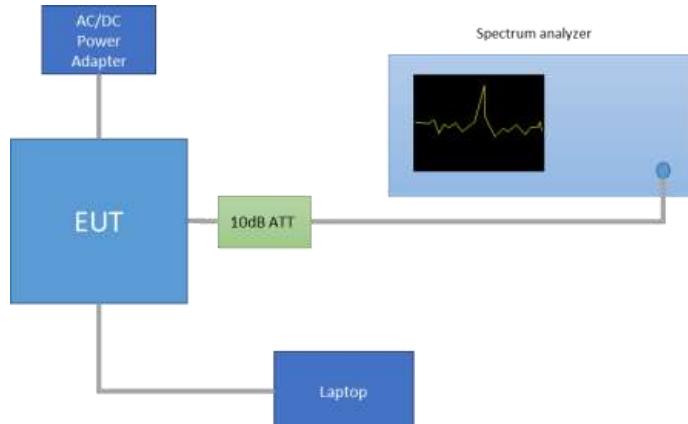
FCC part	RSS part	Limits																																			
15.407 (b) (2)	RSS-247 Clause 6.2.2 (2)	For transmitters operating in the 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz.																																			
15.209	RSS-247 Clause.2.2 (2)	<p>Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a):</p> <table border="1"> <thead> <tr> <th>Freq Range (MHz)</th> <th>Field Strength (μV/m)</th> <th>Field Strength (dBμV/m)</th> <th>Meas. Distance (m)</th> </tr> </thead> <tbody> <tr> <td>0.009-0.490</td> <td>2400/f(kHz)</td> <td>-</td> <td>300</td> </tr> <tr> <td>0.490-1.705</td> <td>24000/f(kHz)</td> <td>-</td> <td>300</td> </tr> <tr> <td>1.705-30.0</td> <td>30</td> <td>-</td> <td>30</td> </tr> <tr> <td>30-88</td> <td>100</td> <td>40</td> <td>3</td> </tr> <tr> <td>88-216</td> <td>150</td> <td>43.5</td> <td>3</td> </tr> <tr> <td>216-960</td> <td>200</td> <td>46</td> <td>3</td> </tr> <tr> <td>Above 960</td> <td>500</td> <td>54</td> <td>3</td> </tr> </tbody> </table> <p>The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p> <p>For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.</p>				Freq Range (MHz)	Field Strength (μ V/m)	Field Strength (dB μ V/m)	Meas. Distance (m)	0.009-0.490	2400/f(kHz)	-	300	0.490-1.705	24000/f(kHz)	-	300	1.705-30.0	30	-	30	30-88	100	40	3	88-216	150	43.5	3	216-960	200	46	3	Above 960	500	54	3
Freq Range (MHz)	Field Strength (μ V/m)	Field Strength (dB μ V/m)	Meas. Distance (m)																																		
0.009-0.490	2400/f(kHz)	-	300																																		
0.490-1.705	24000/f(kHz)	-	300																																		
1.705-30.0	30	-	30																																		
30-88	100	40	3																																		
88-216	150	43.5	3																																		
216-960	200	46	3																																		
Above 960	500	54	3																																		

Test procedure:

The setup below was used to measure undesirable emissions on the Band Edge domain. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss and the declared Antenna Gain.

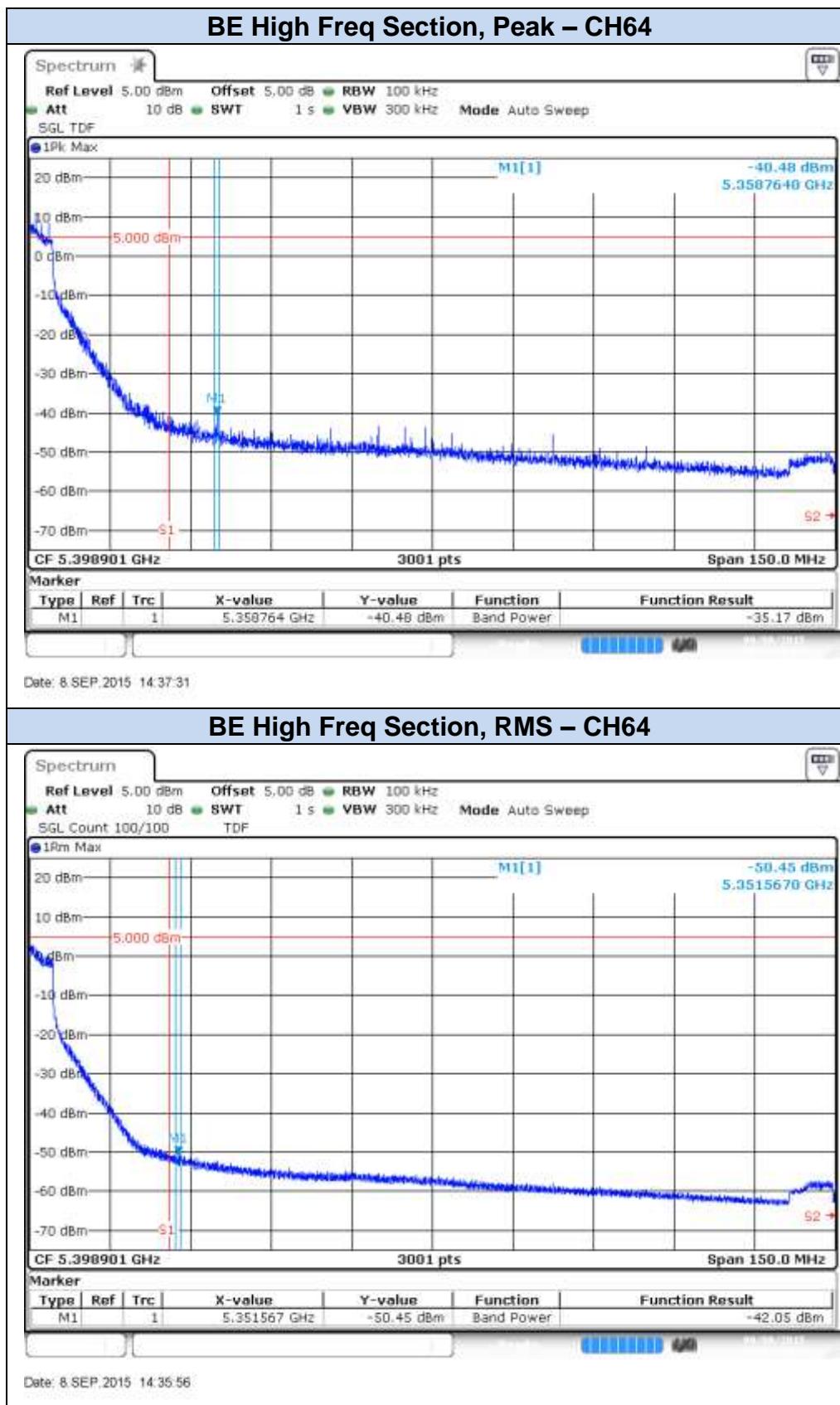
In case of Band Edge measurements falling in restricted bands, the declared Antenna Gain is also compensated in the graph.

The declared maximum antenna gain is 5dBi.

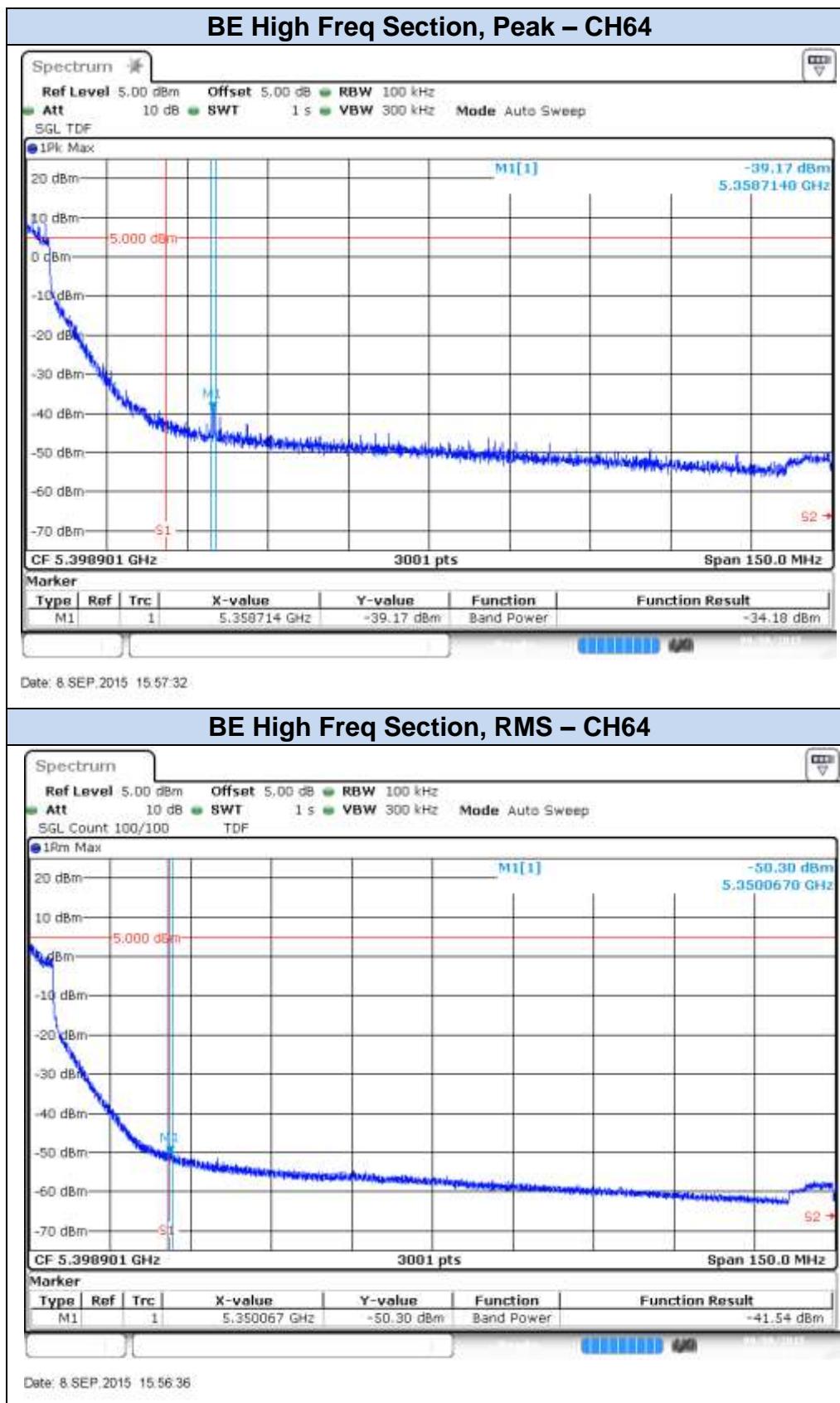


The following limits in dBm were applied for the average detector after the conversion from the limits detailed above in dB μ V/m, according to FCC 47 CFR part 15 - Subpart C – §15.209(a). The limits in dBm for peak detector are 20dB above the indicated values in the table.

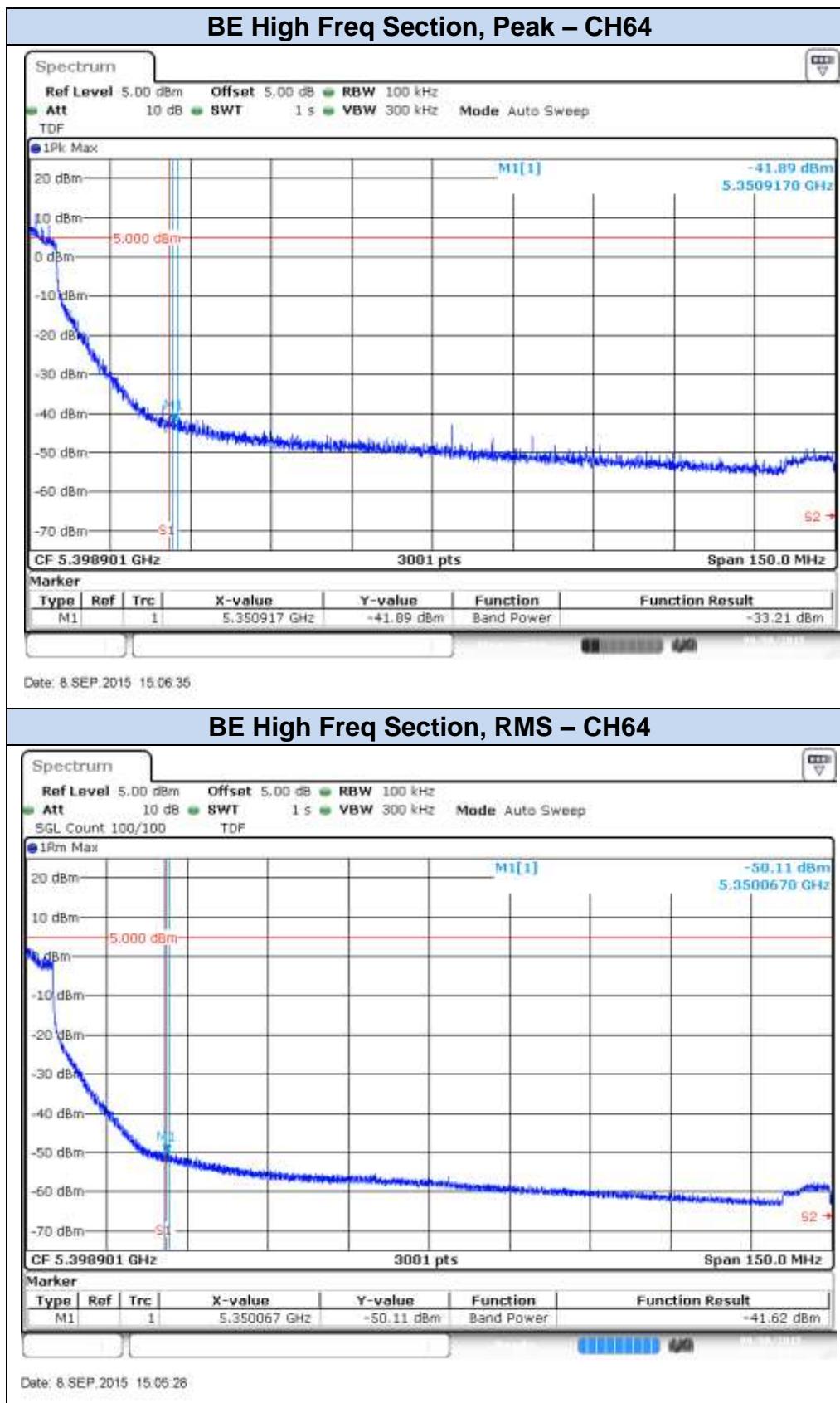
§15.209(a)			Converted values	
Freq Range (MHz)	Distance (m)	Field strength (microvolts/meter)	Field strength (dB microvolts/meter)	Power (dBm)
Above 960	3	500	53.98	-41.2

Results Screenshot:
802.11a, 6Mbps – Chain A


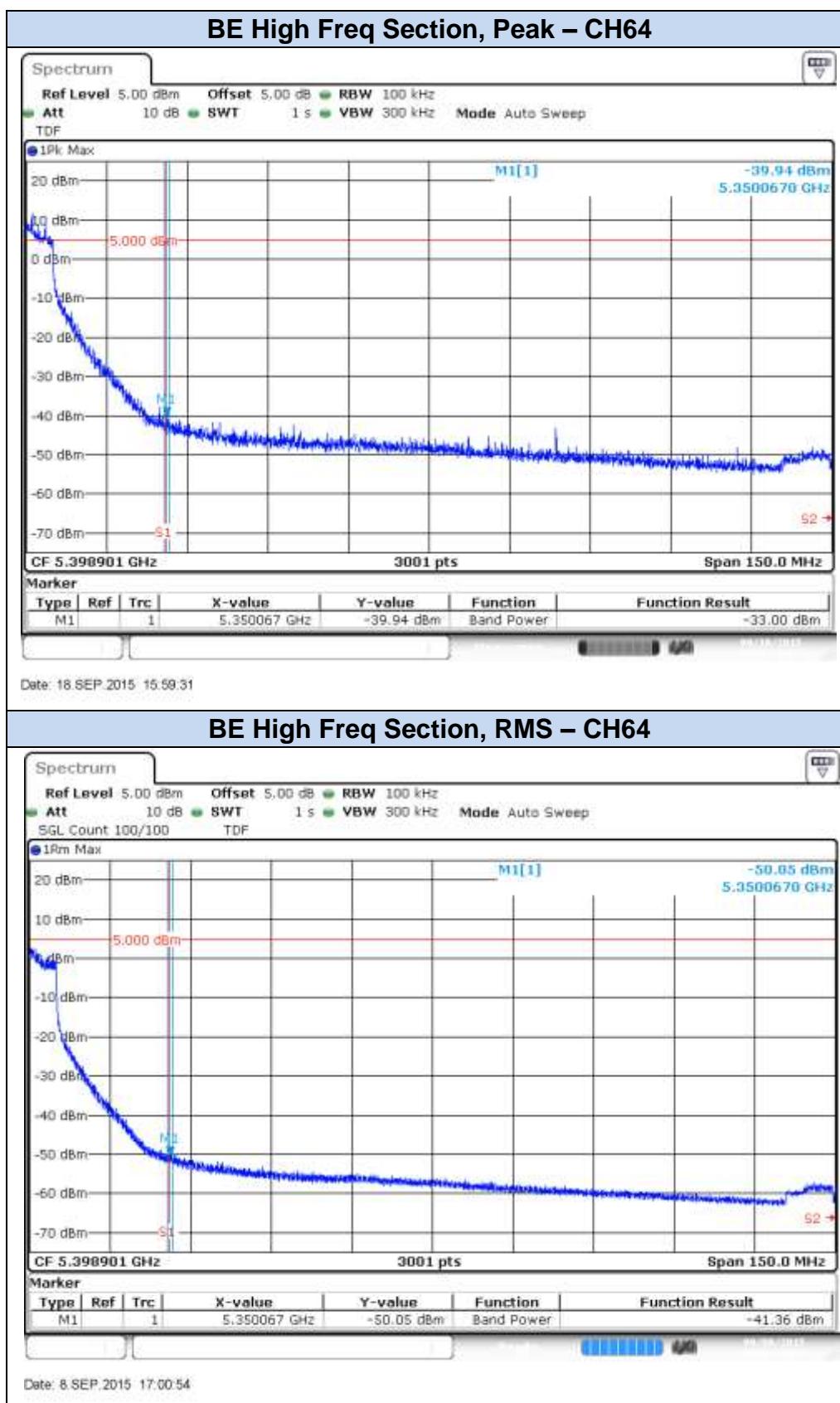
802.11a, 6Mbps – Chain B



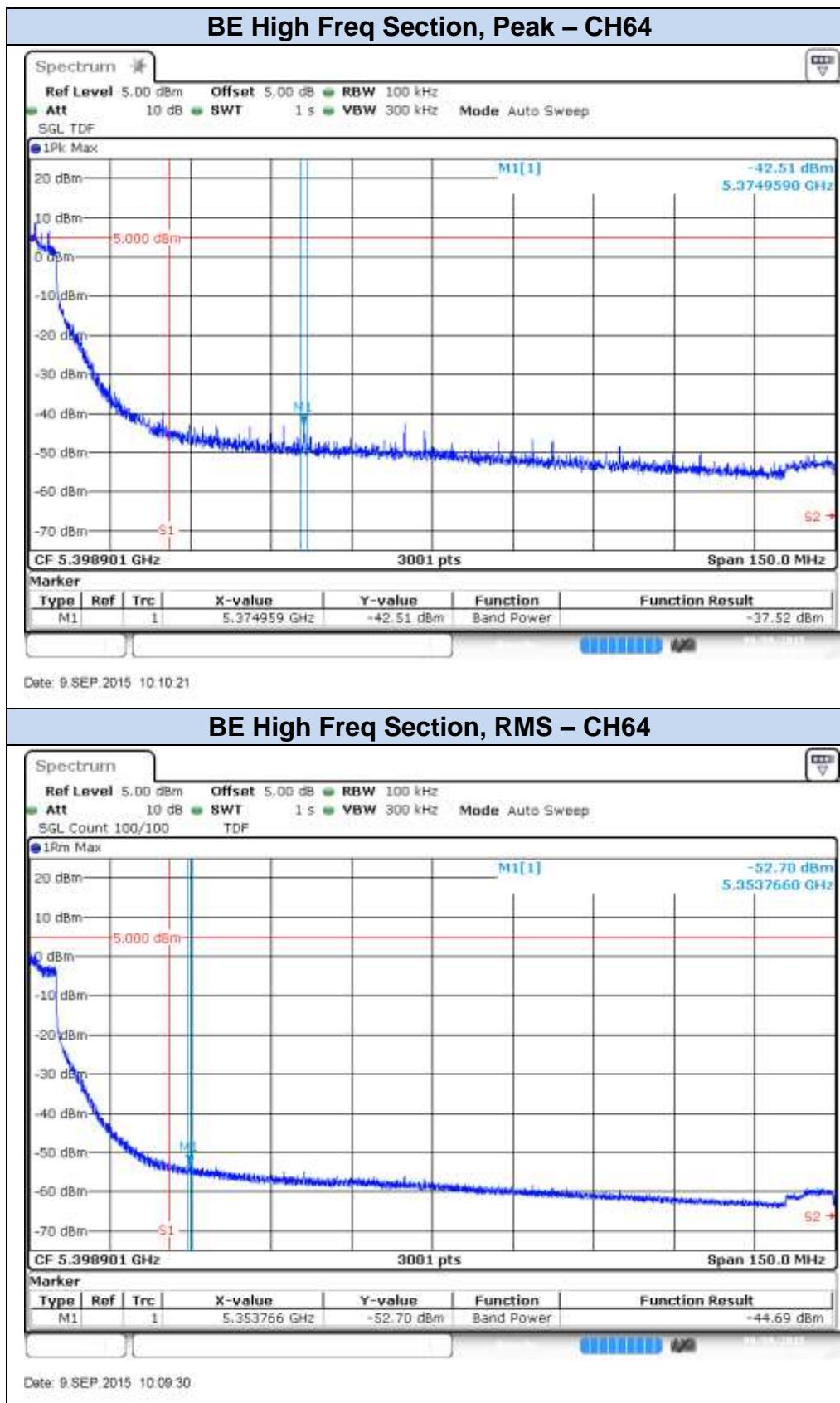
802.11n20, HT0 (SISO) – Chain A



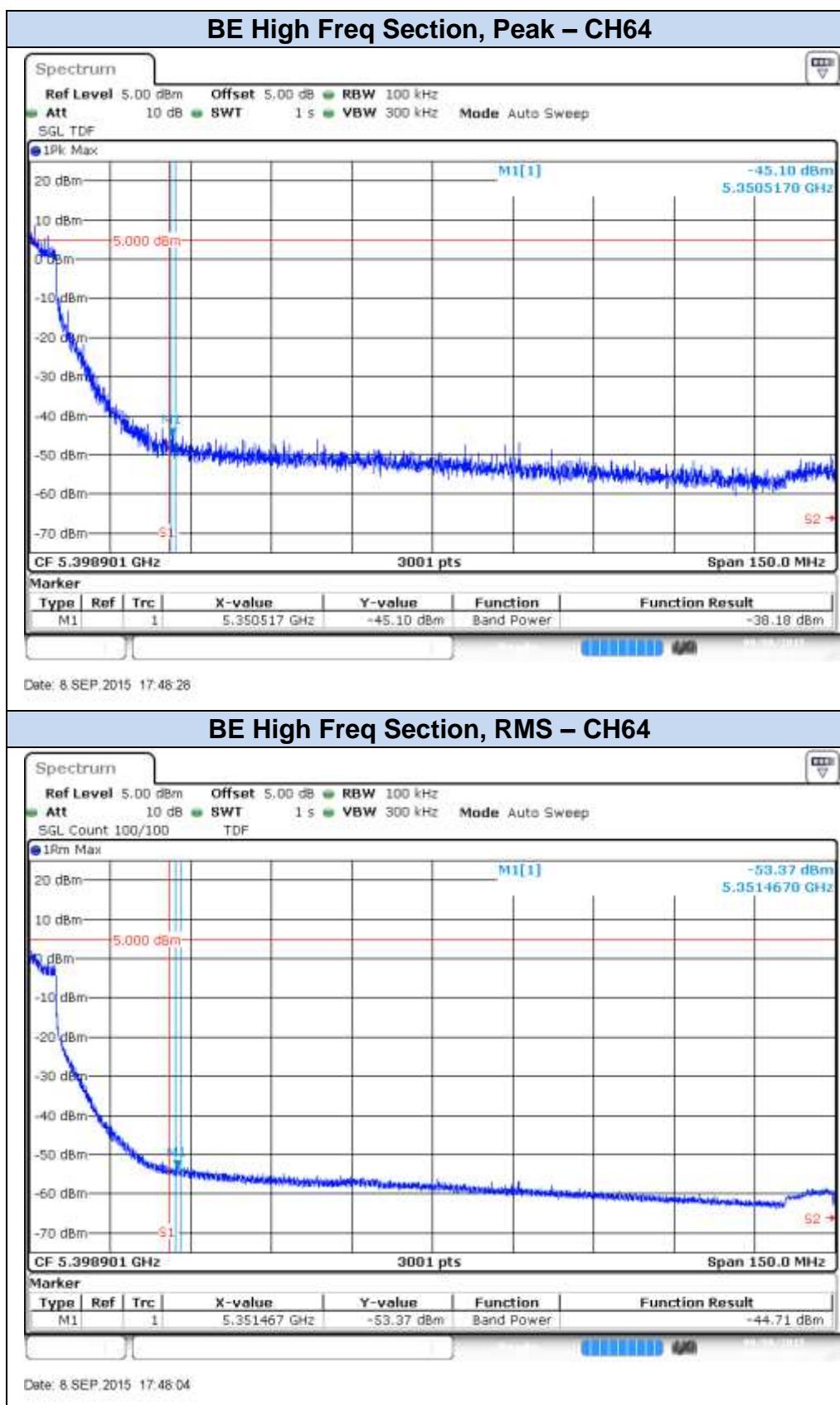
802.11n20, HT0 (SISO) – Chain B



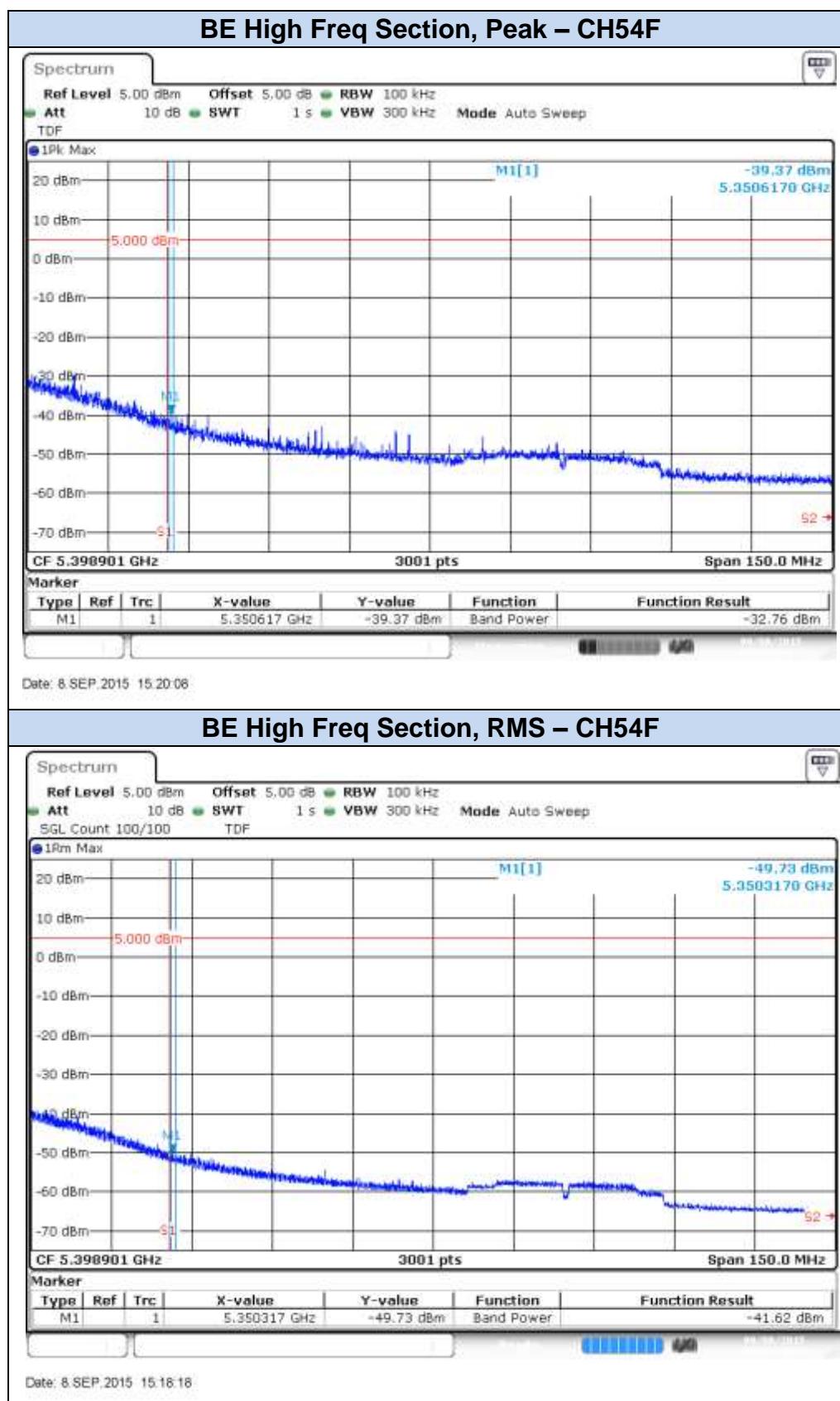
802.11n20, HT8 (MIMO) – Chain A

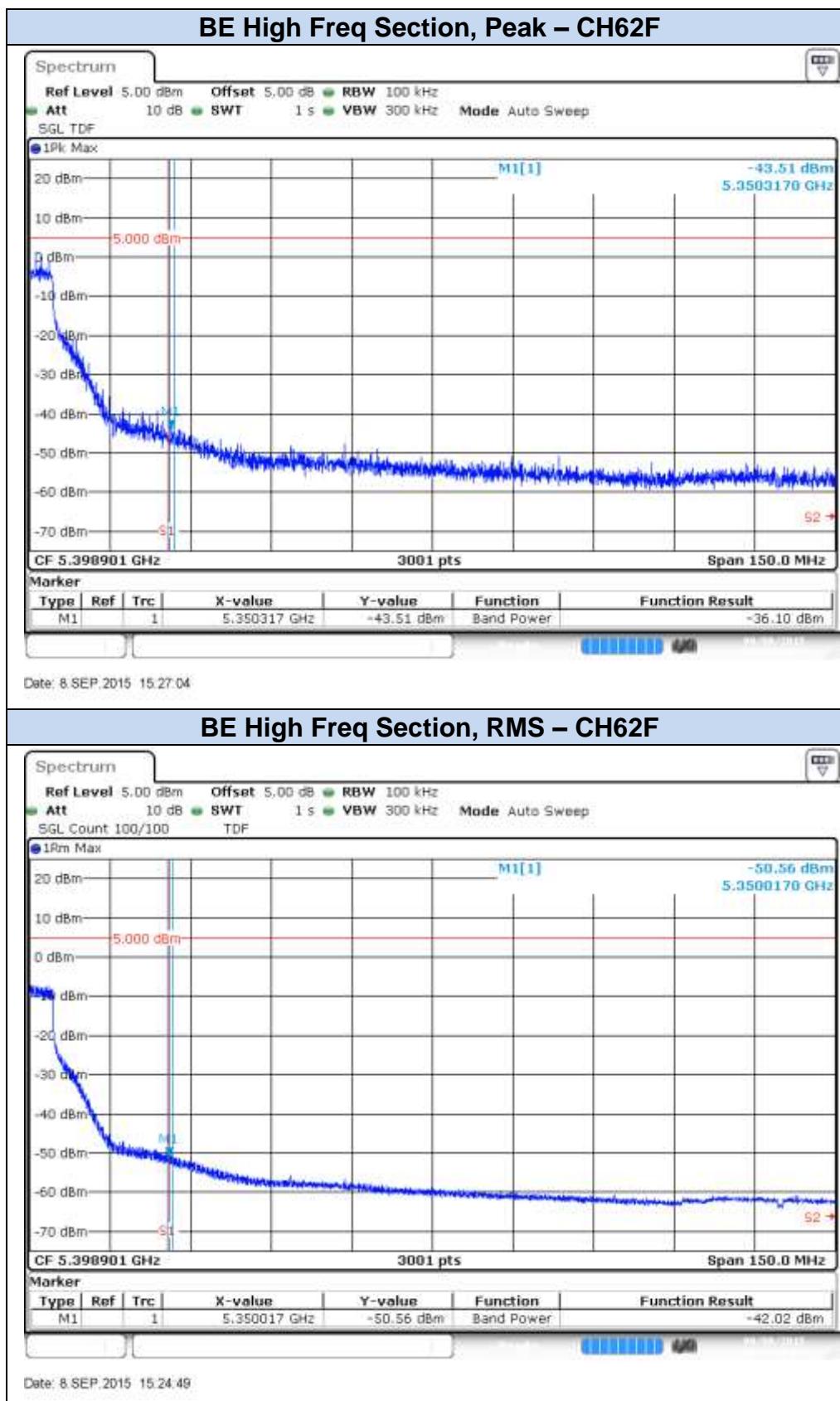


802.11n20, HT8 (MIMO) – Chain B

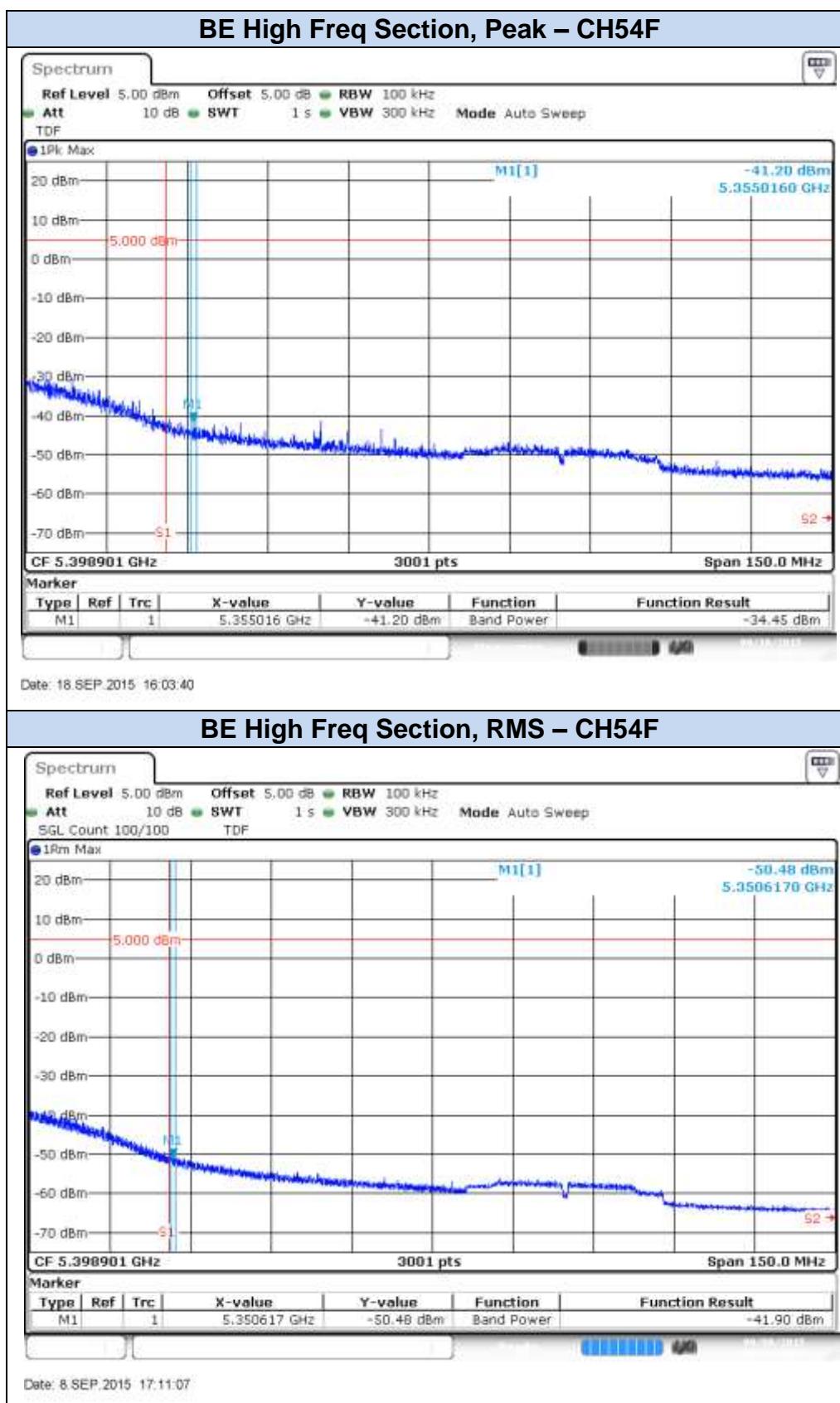


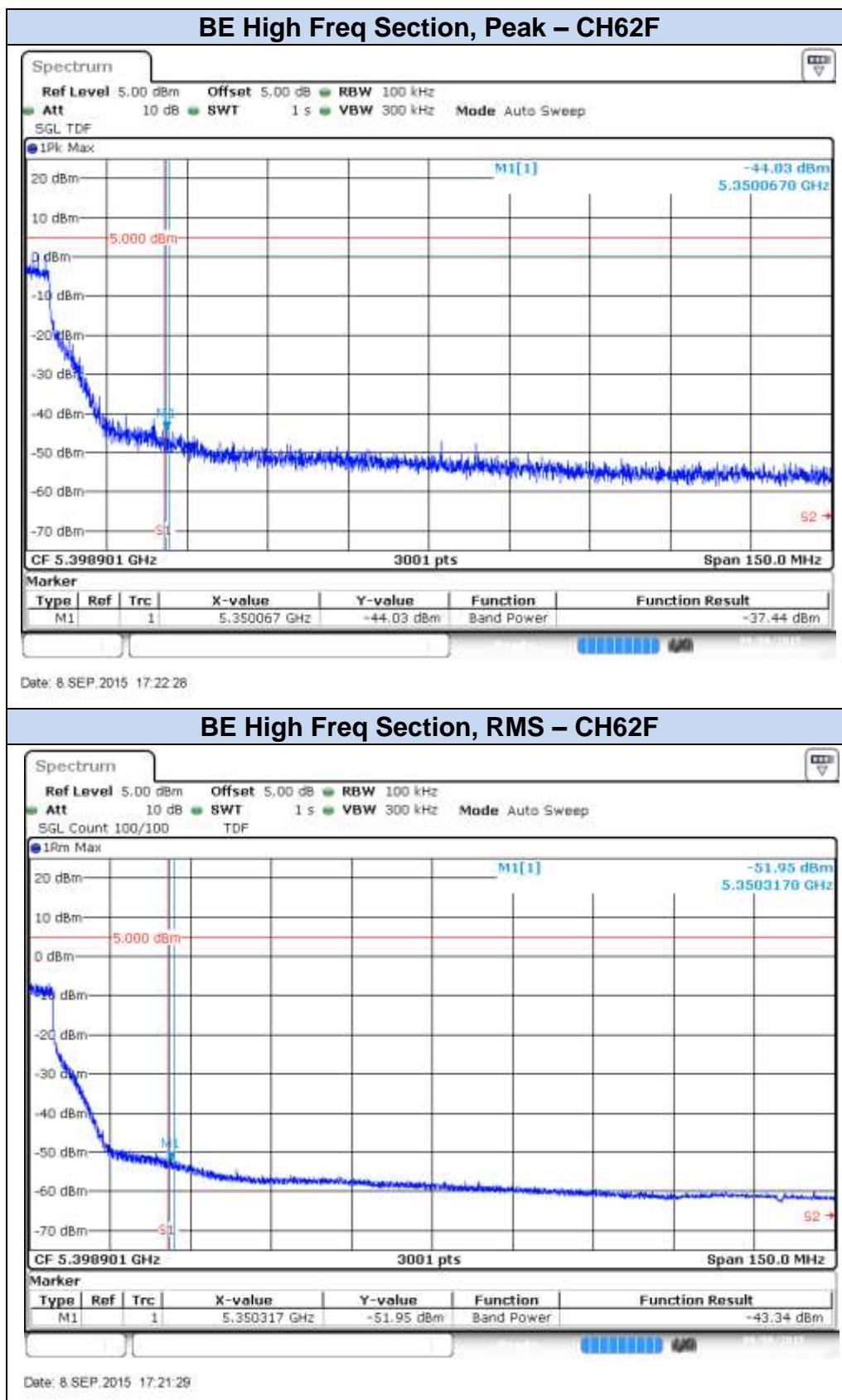
802.11n40, HT0 (SISO) – Chain A



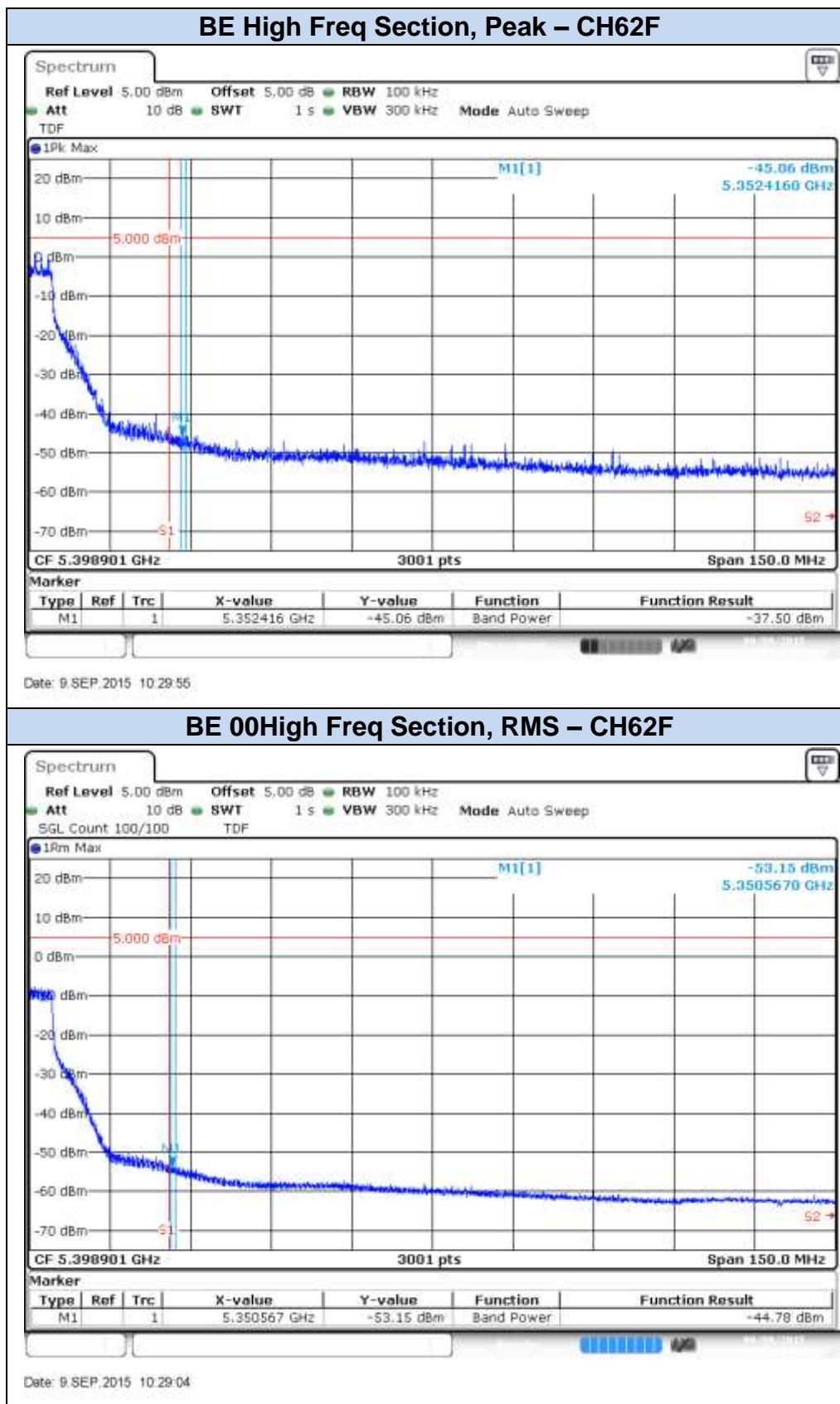


802.11n40, HT0 (SISO) – Chain B

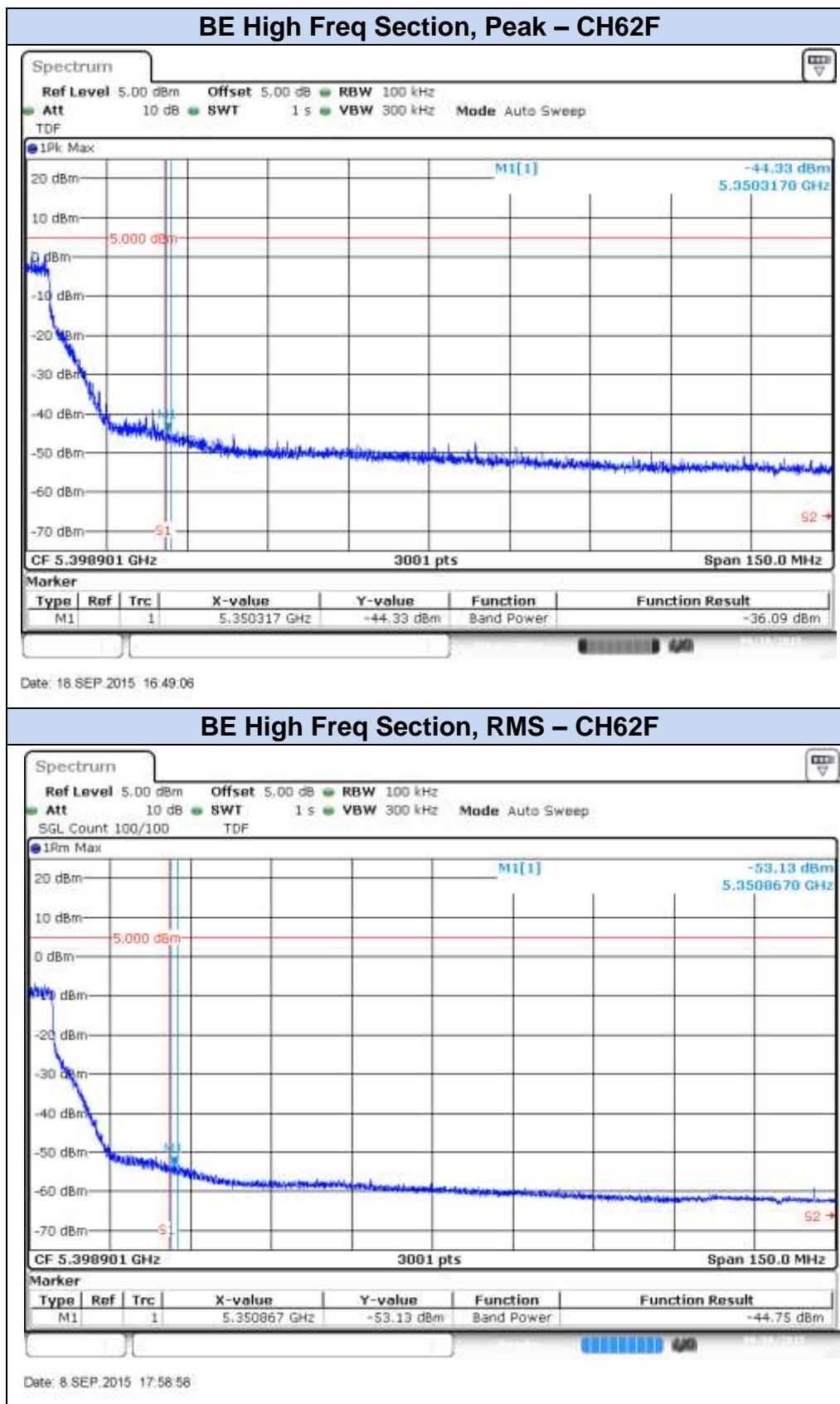




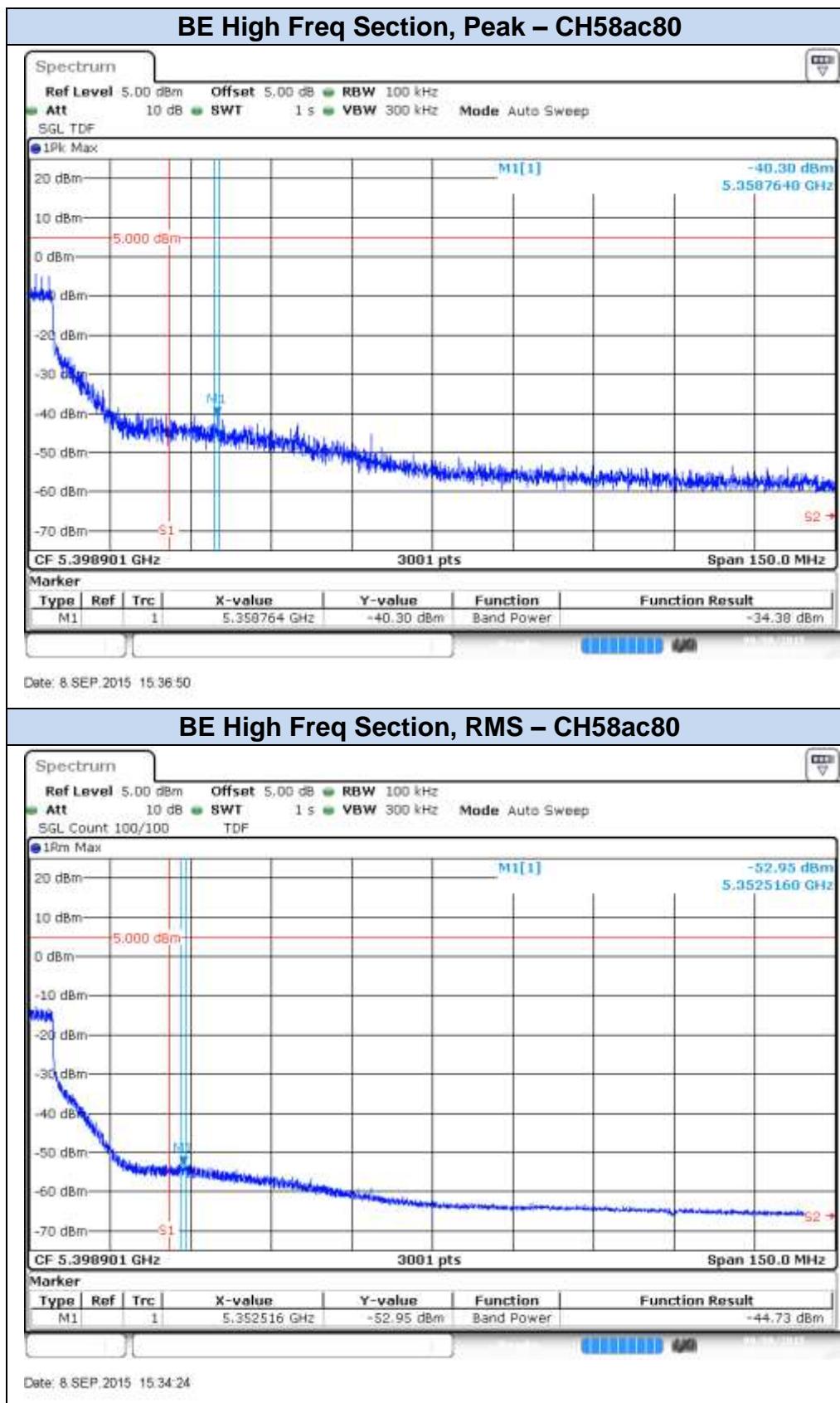
802.11n40, HT8 (MIMO) – Chain A



802.11n40, HT8 (MIMO) – Chain B



802.11ac80, VHT0 (SISO)- Chain A



802.11ac80, VHT0 (SISO)- Chain B

