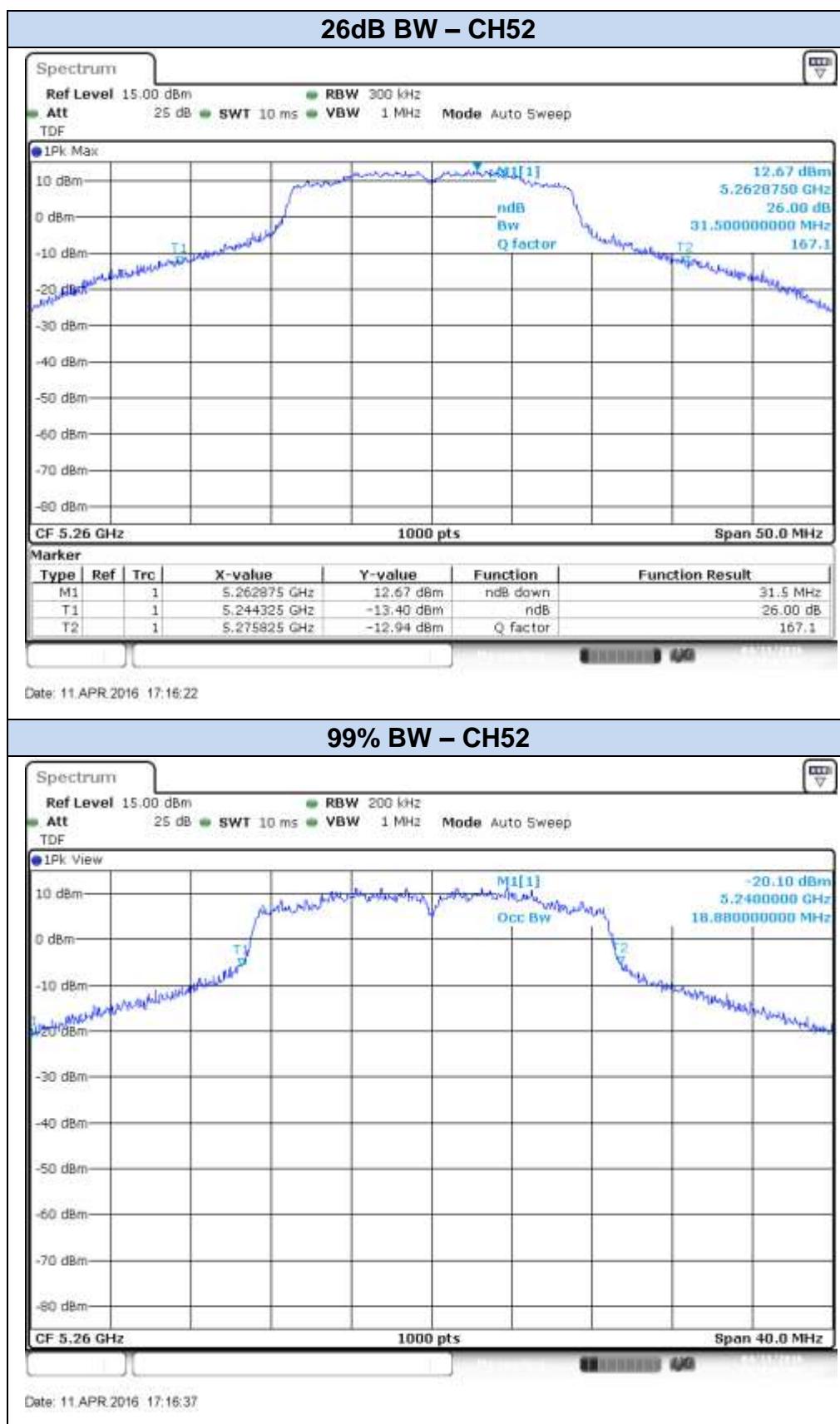
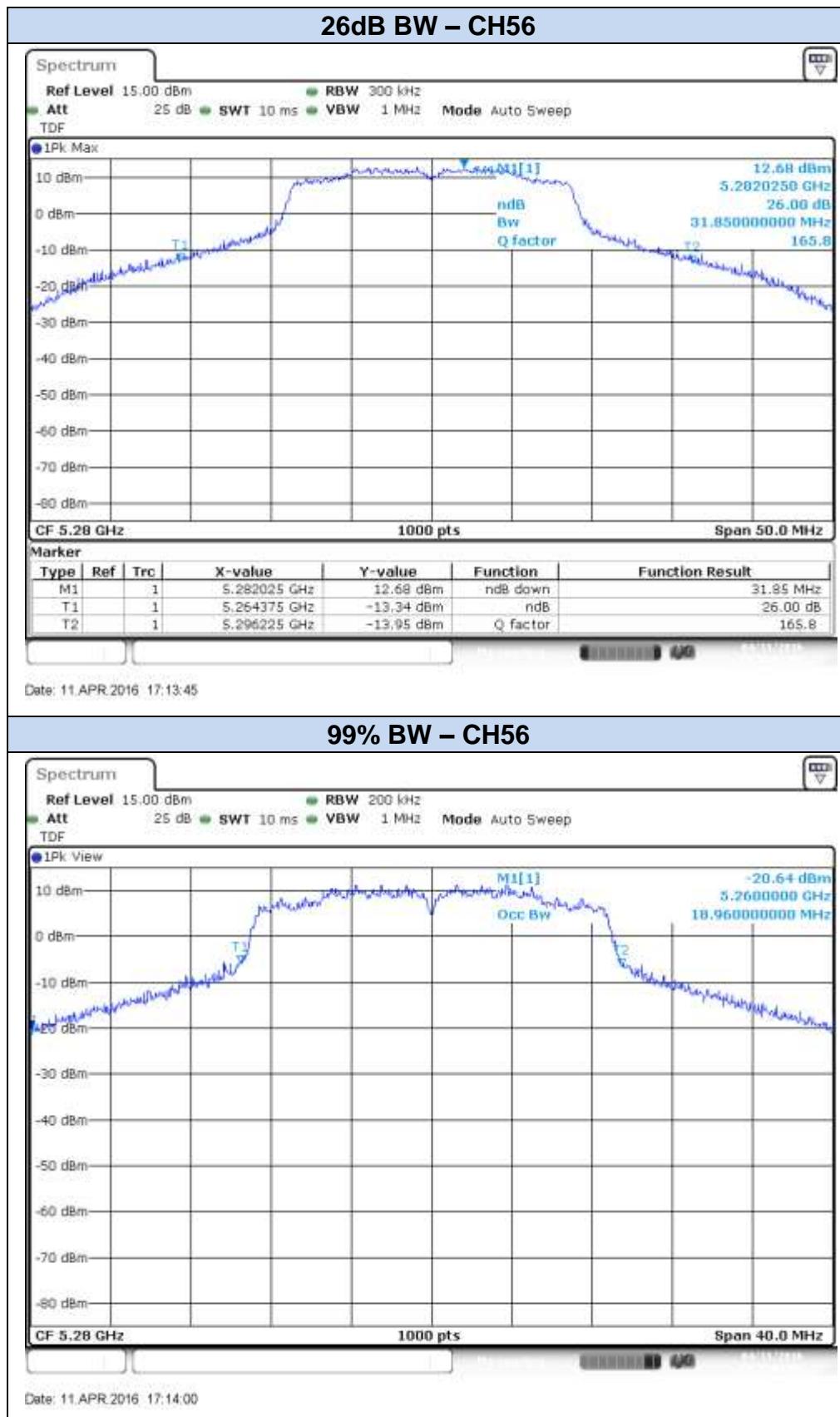
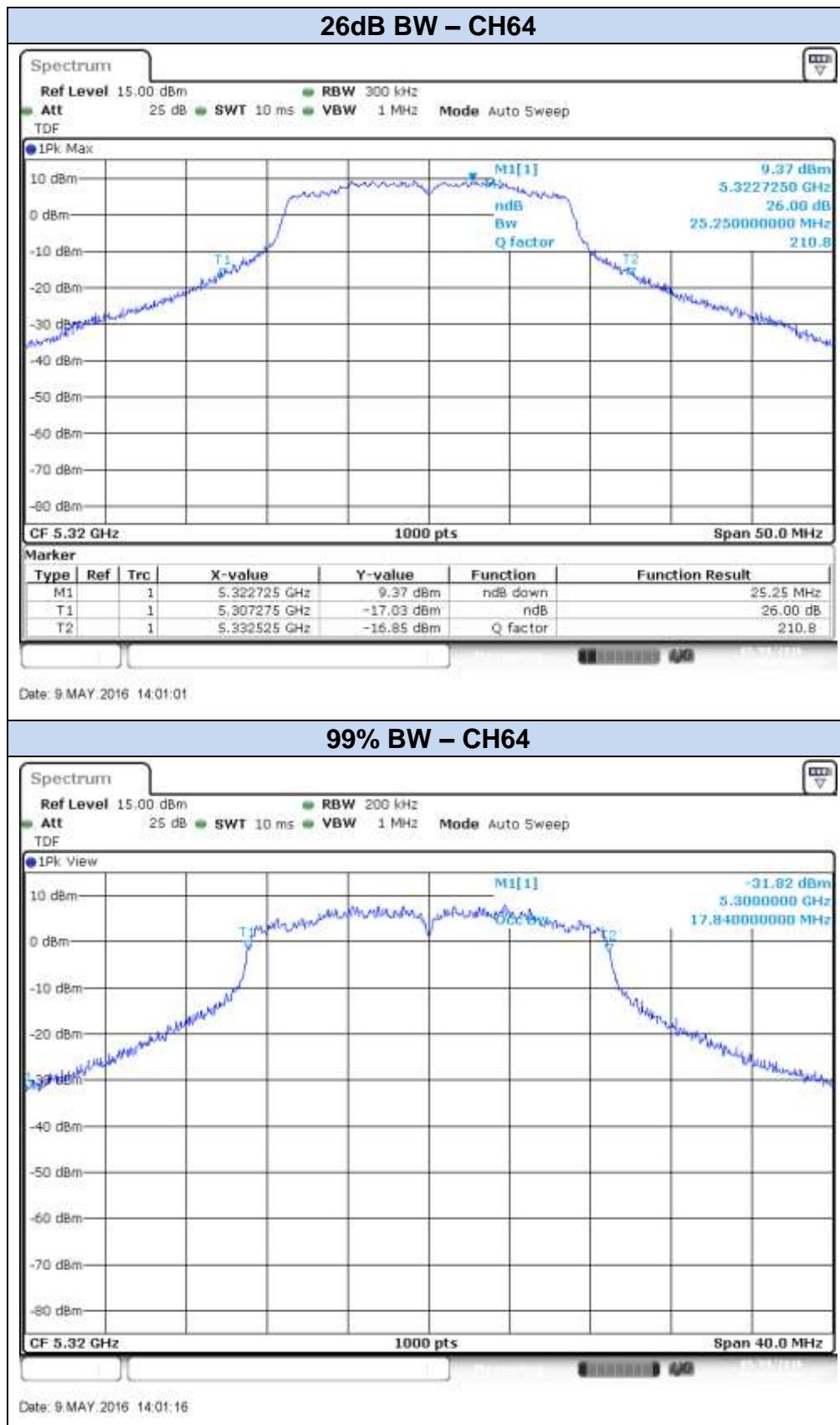


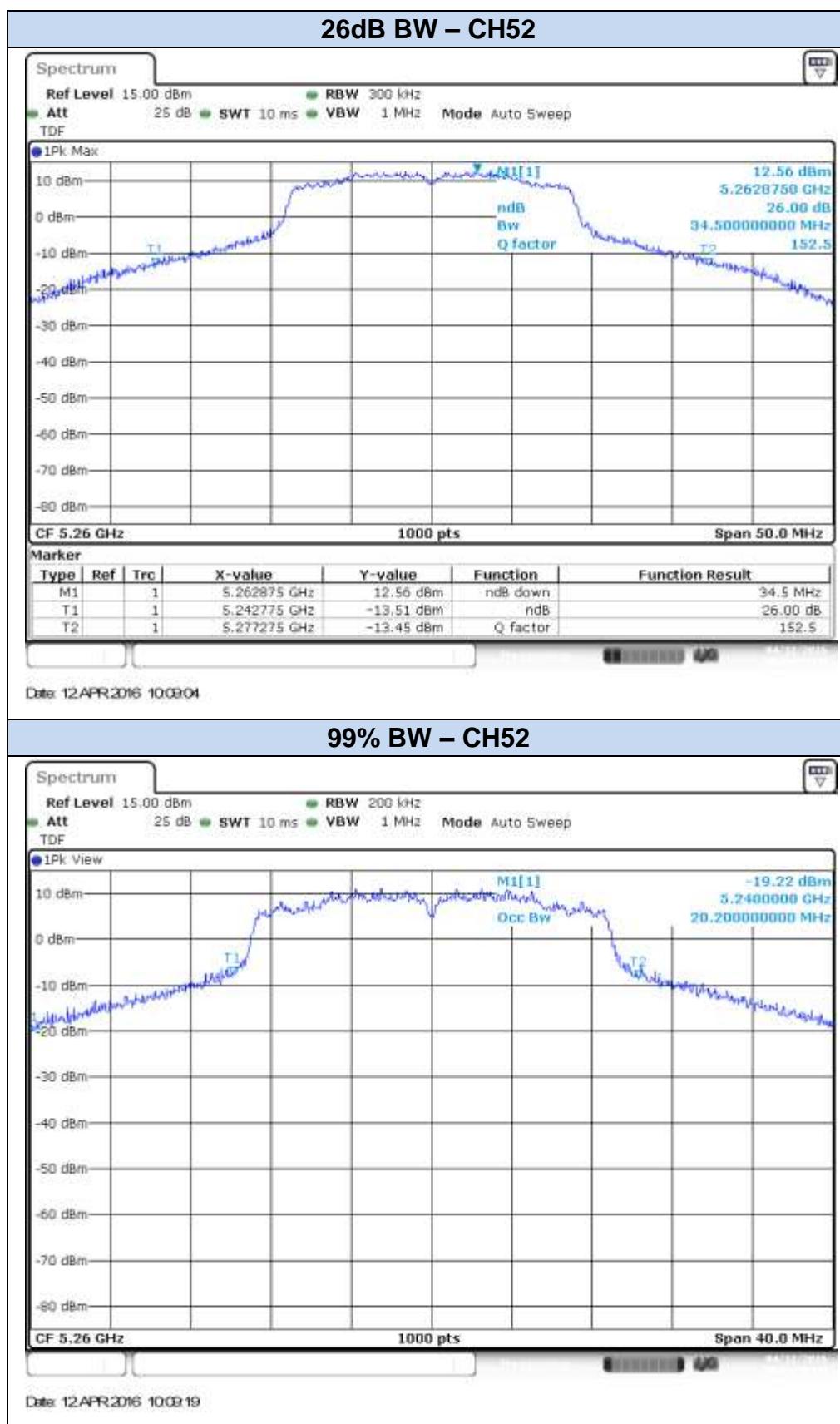
802.11n20, HT0 (SISO) – Chain A

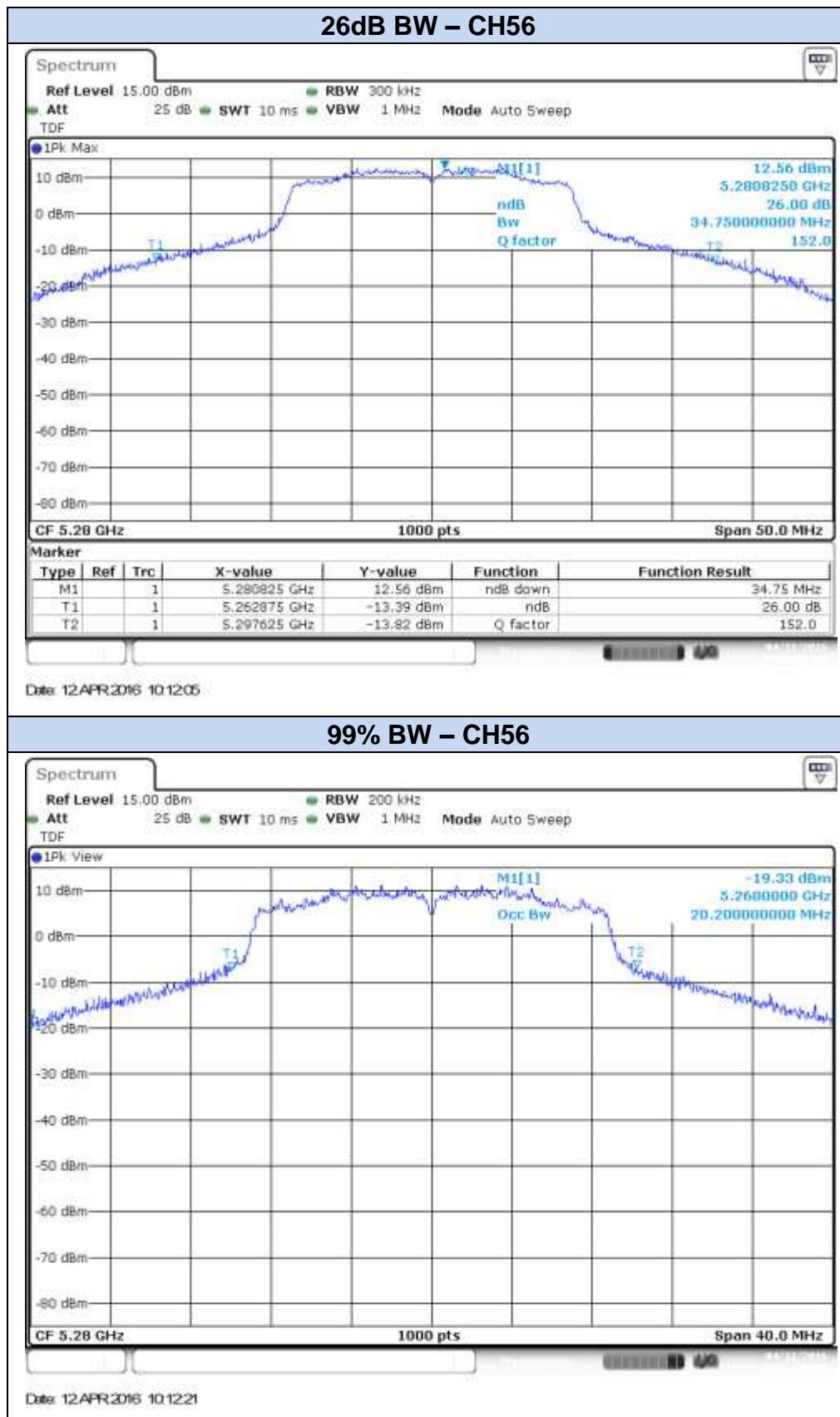


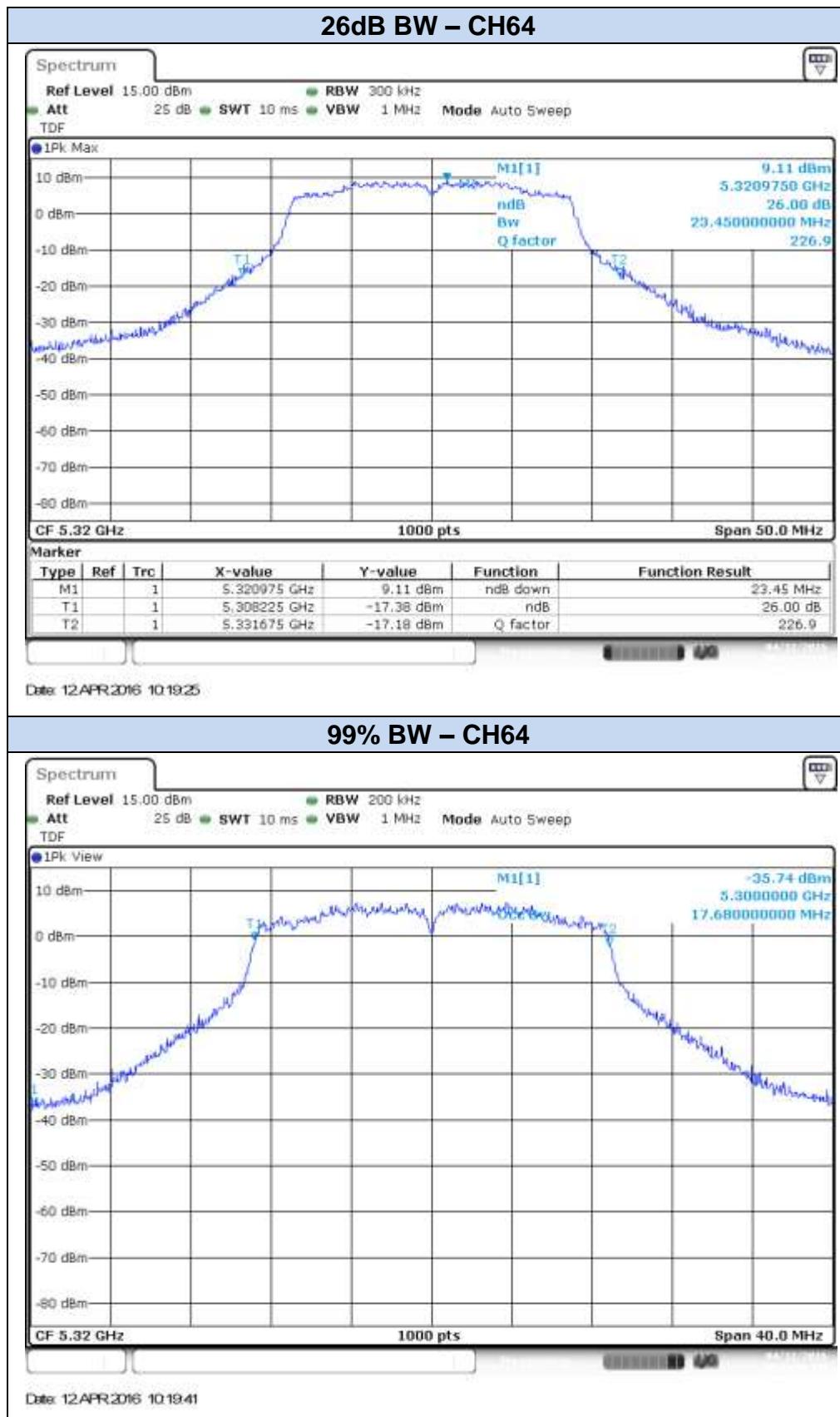




802.11n20, HT0 (SISO) – Chain B

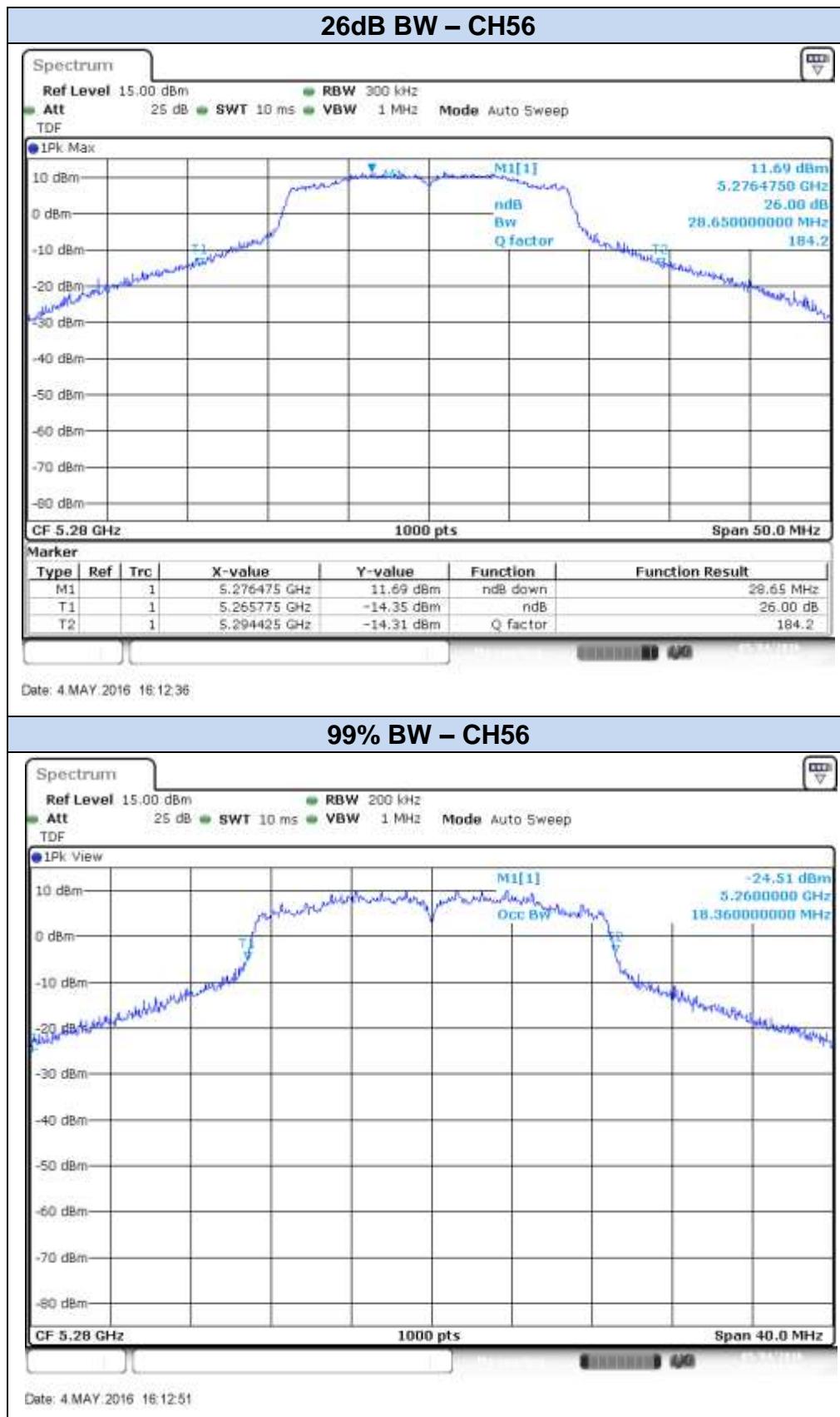


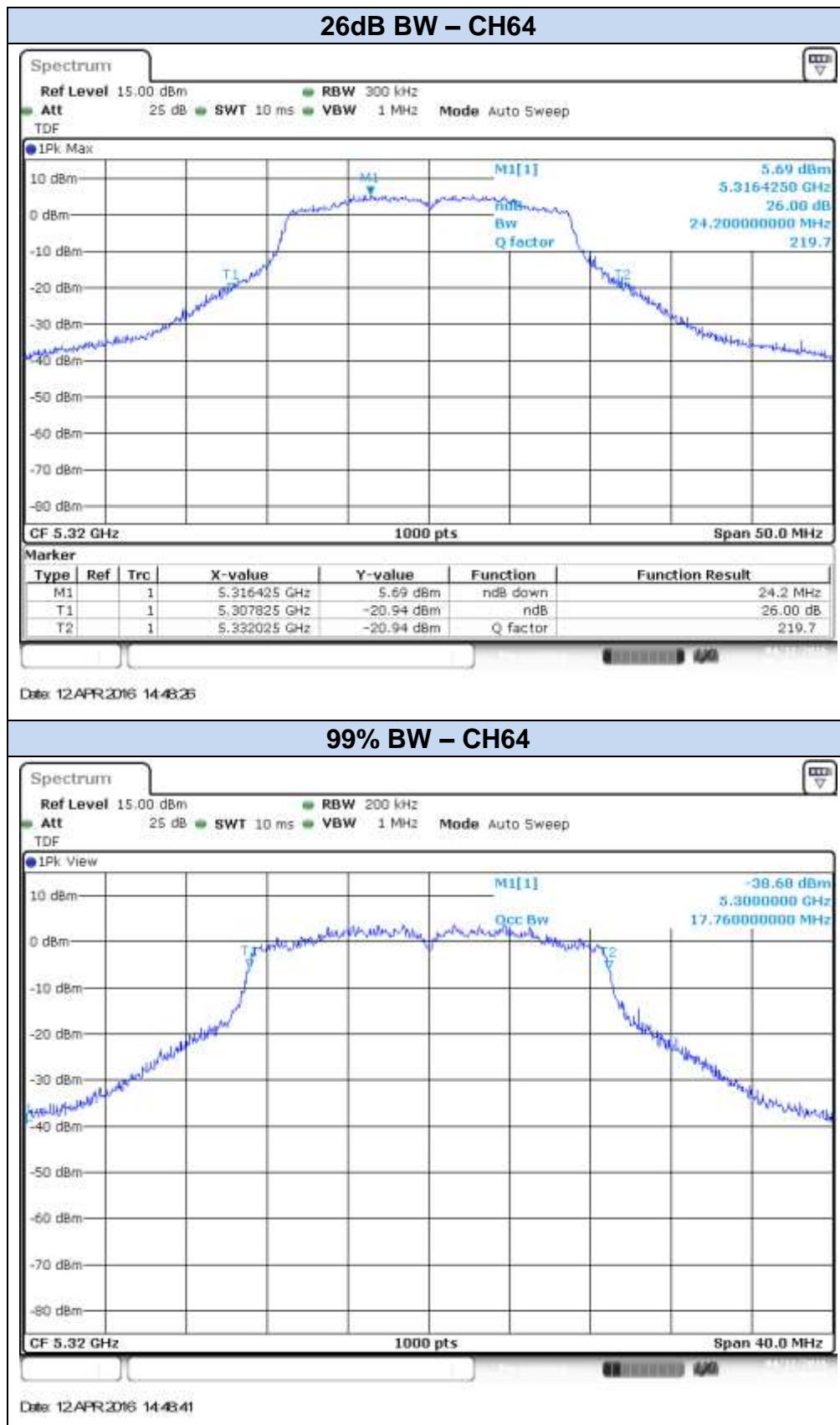




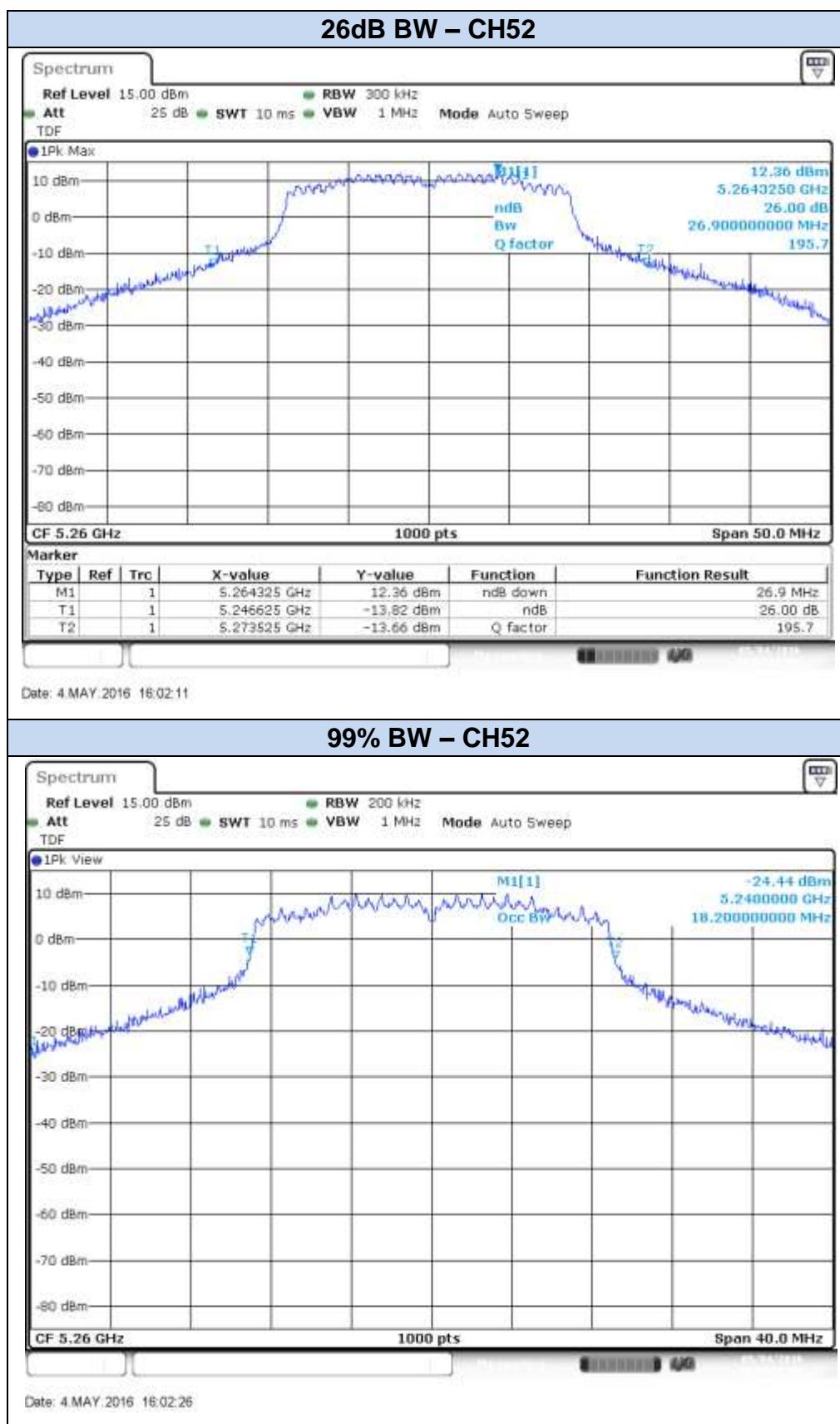
802.11n20, HT8 (MIMO) – Chain A

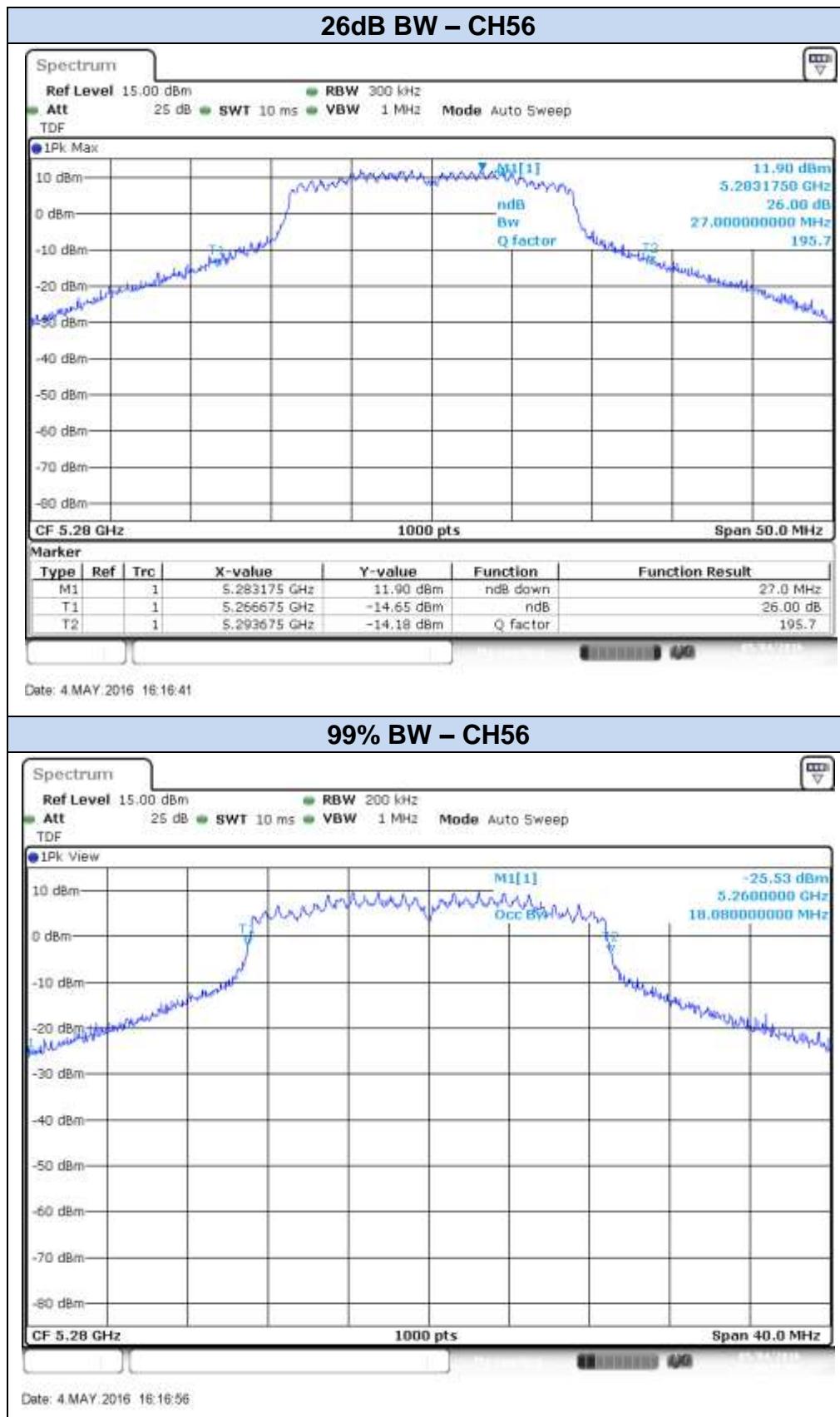


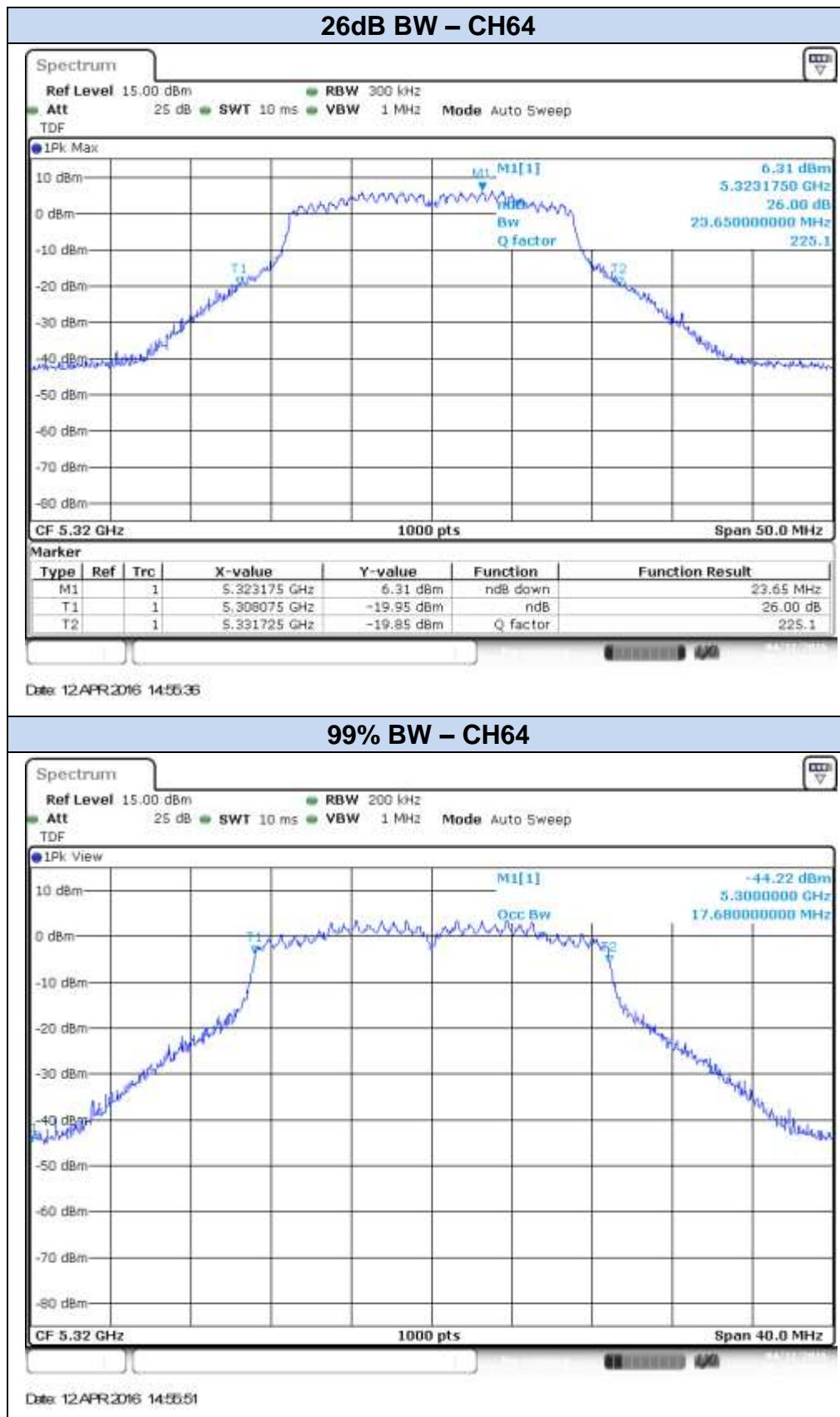




802.11n20, HT8 (MIMO) – Chain B

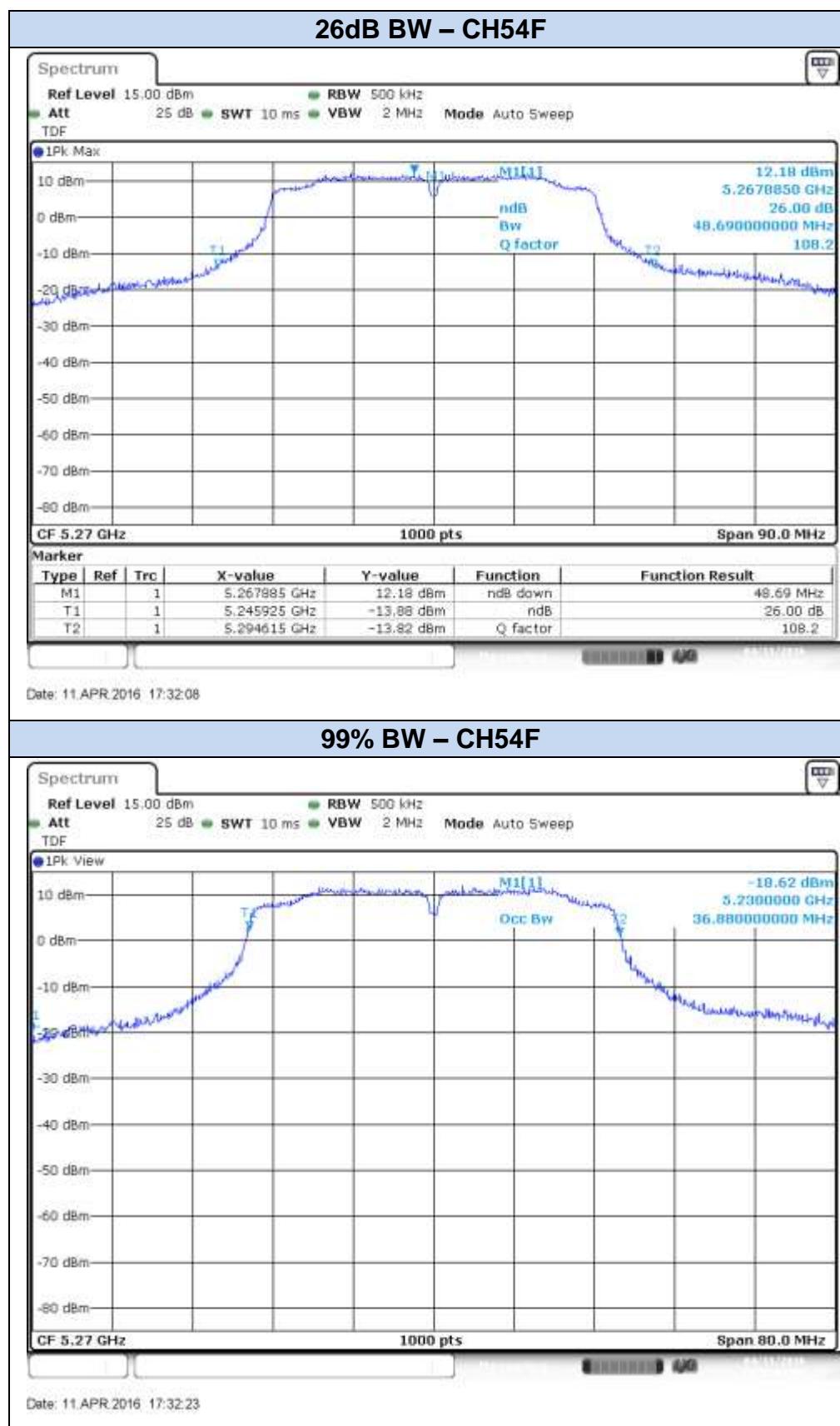


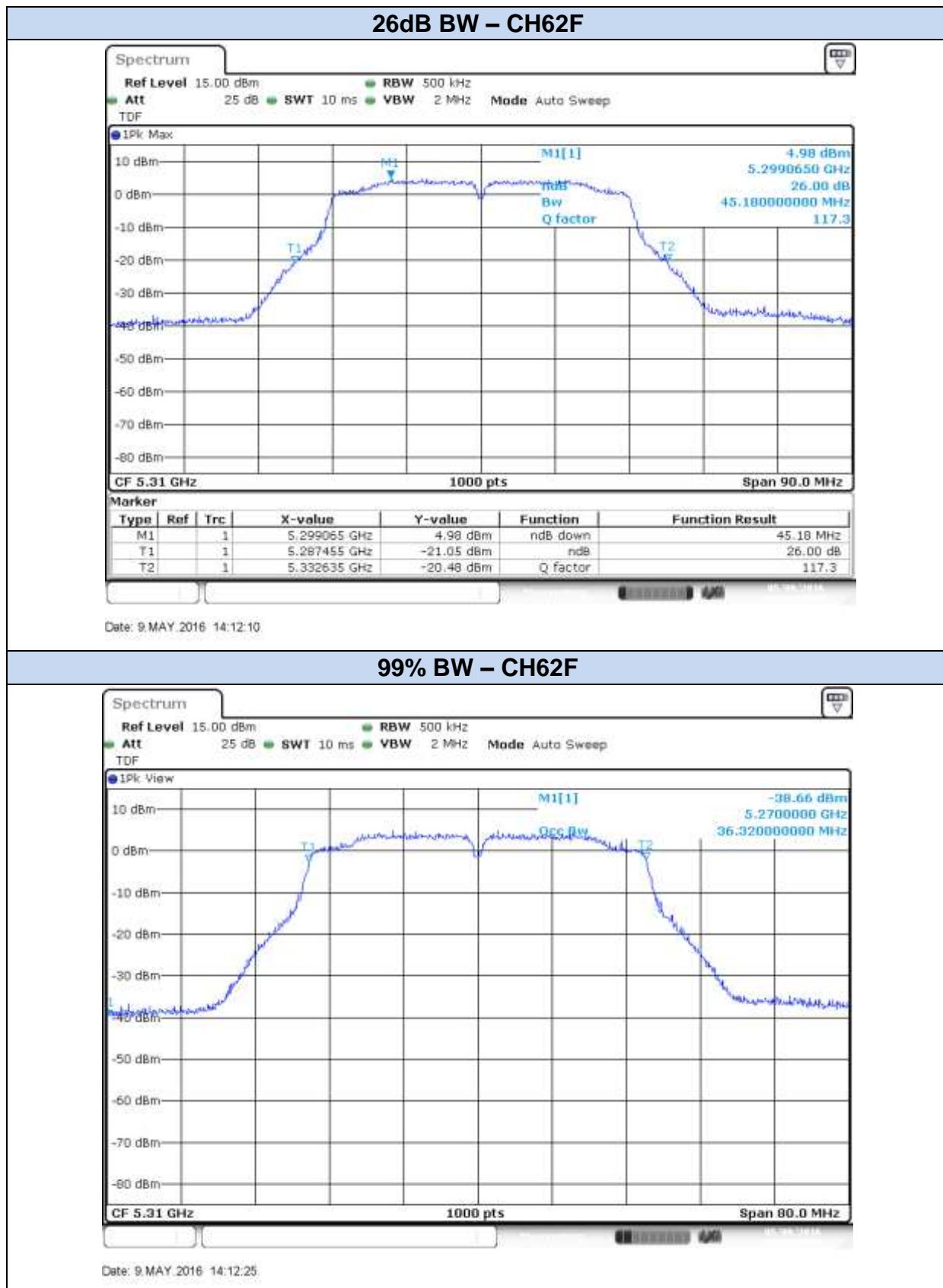




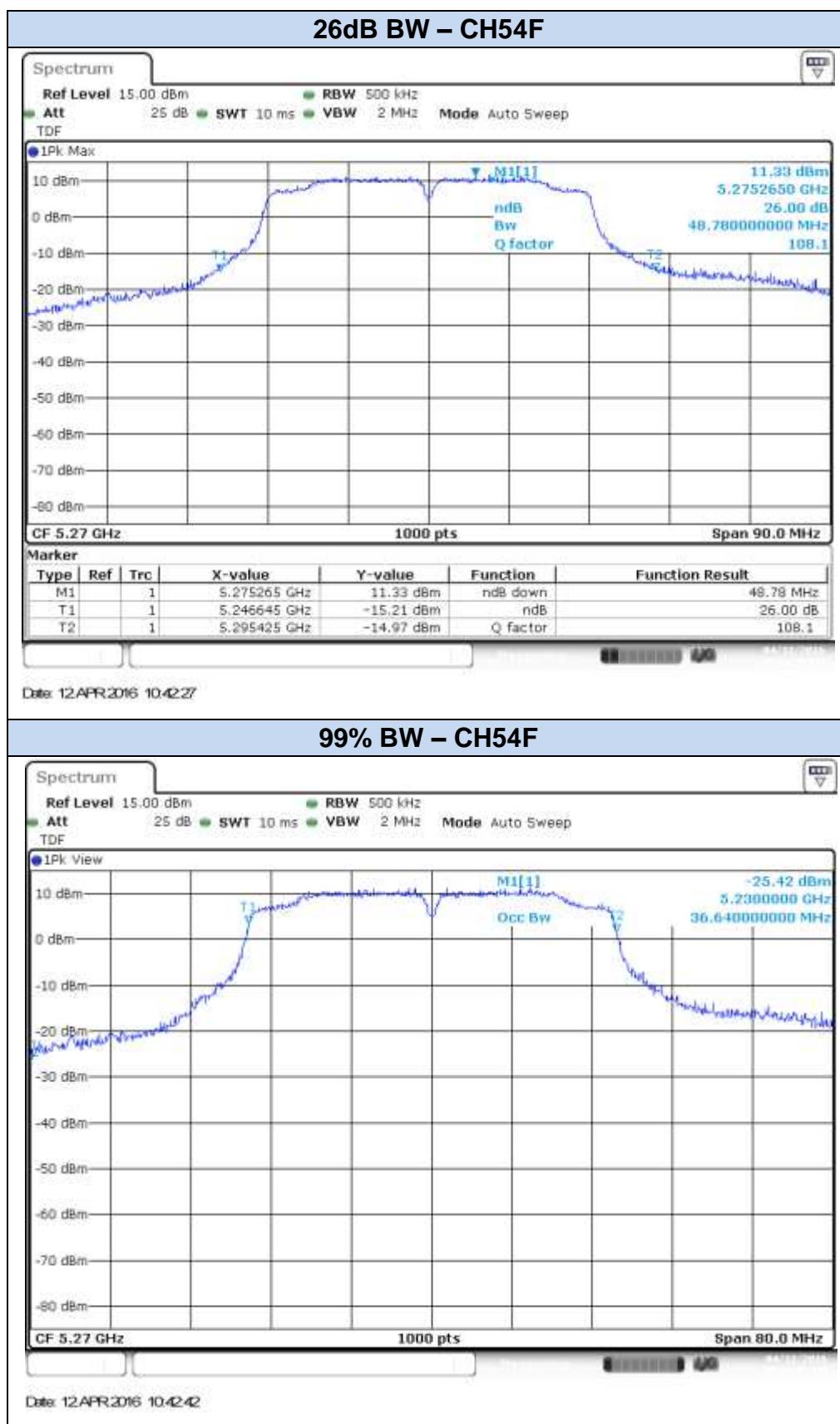


802.11n40, HT0 (SISO) – Chain A





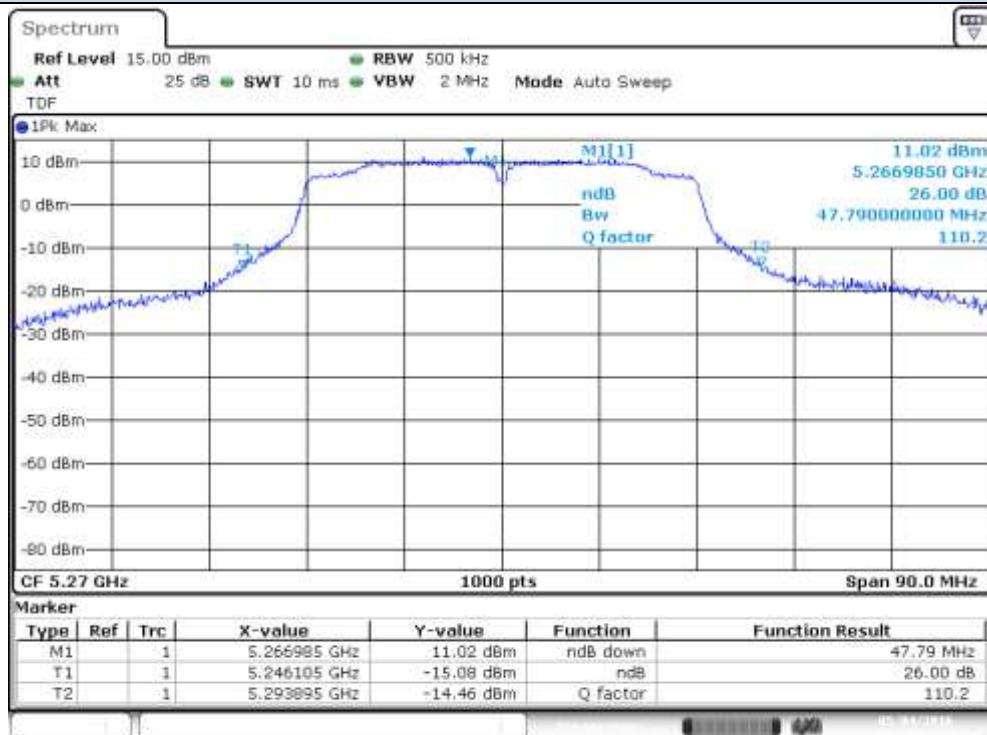
802.11n40, HT0 (SISO) – Chain B





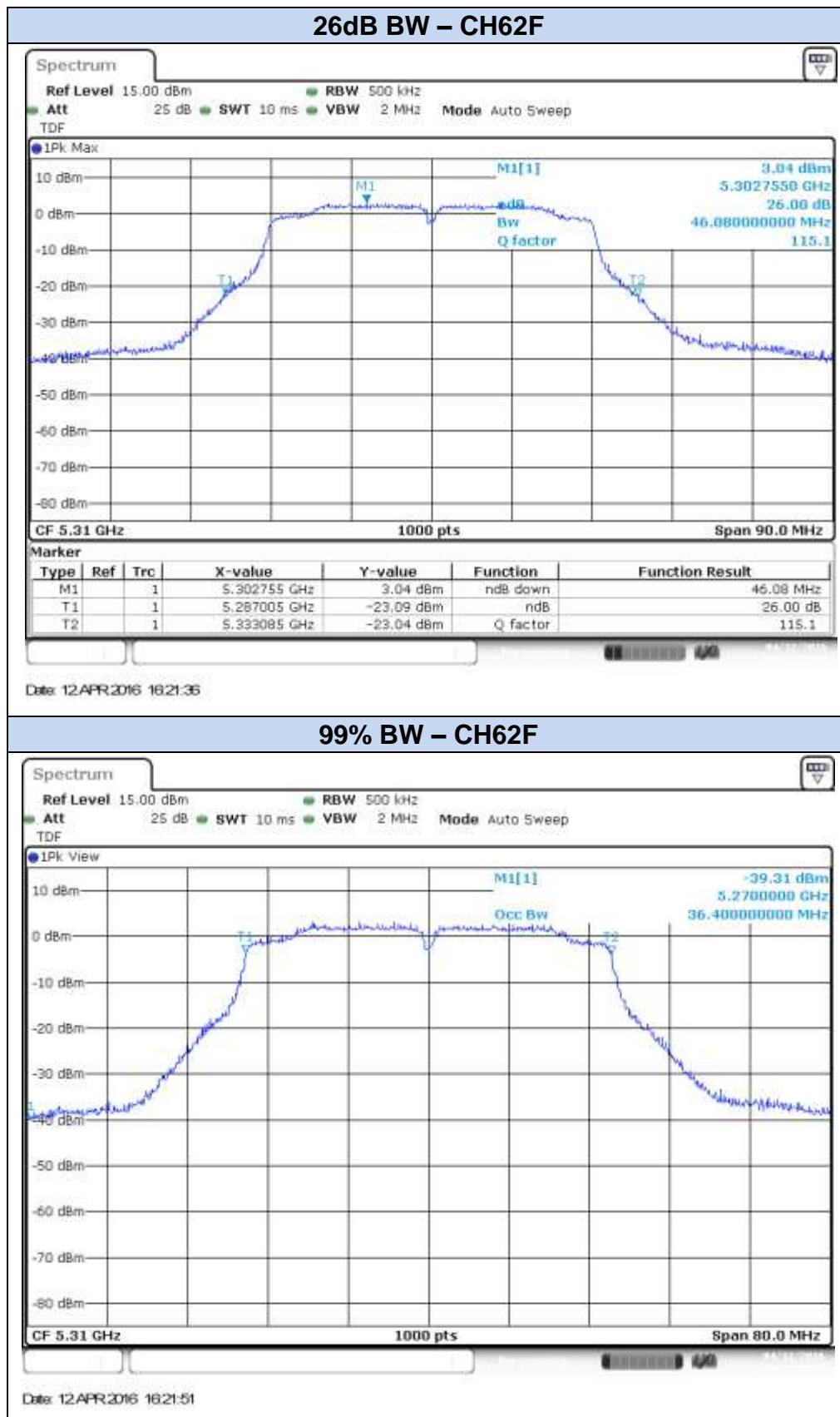
802.11n40, HT8 (MIMO) – Chain A

26dB BW – CH54F



99% BW – CH54F





802.11n40, HT8 (MIMO) – Chain B

26dB BW – CH54F

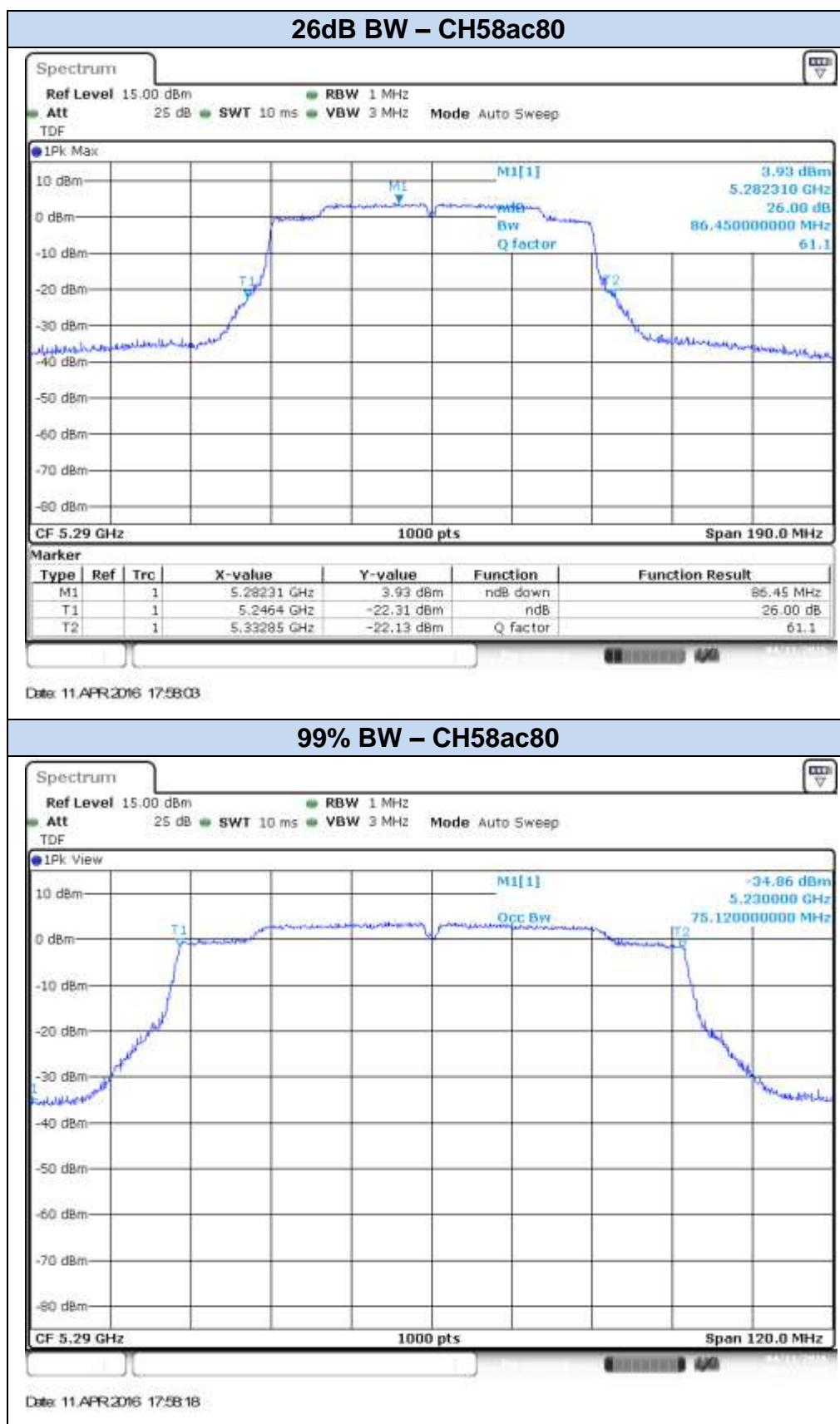


99% BW – CH54F

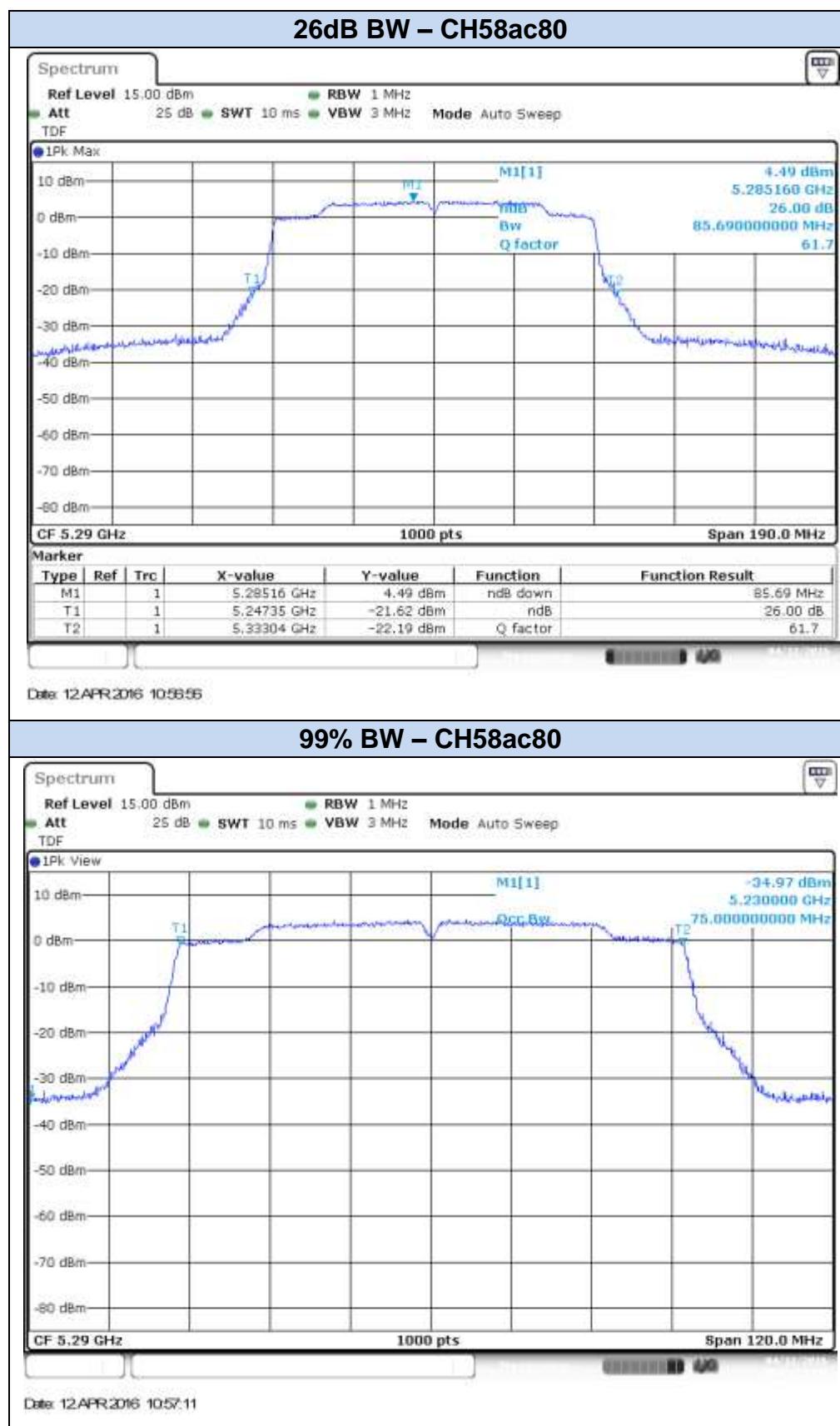




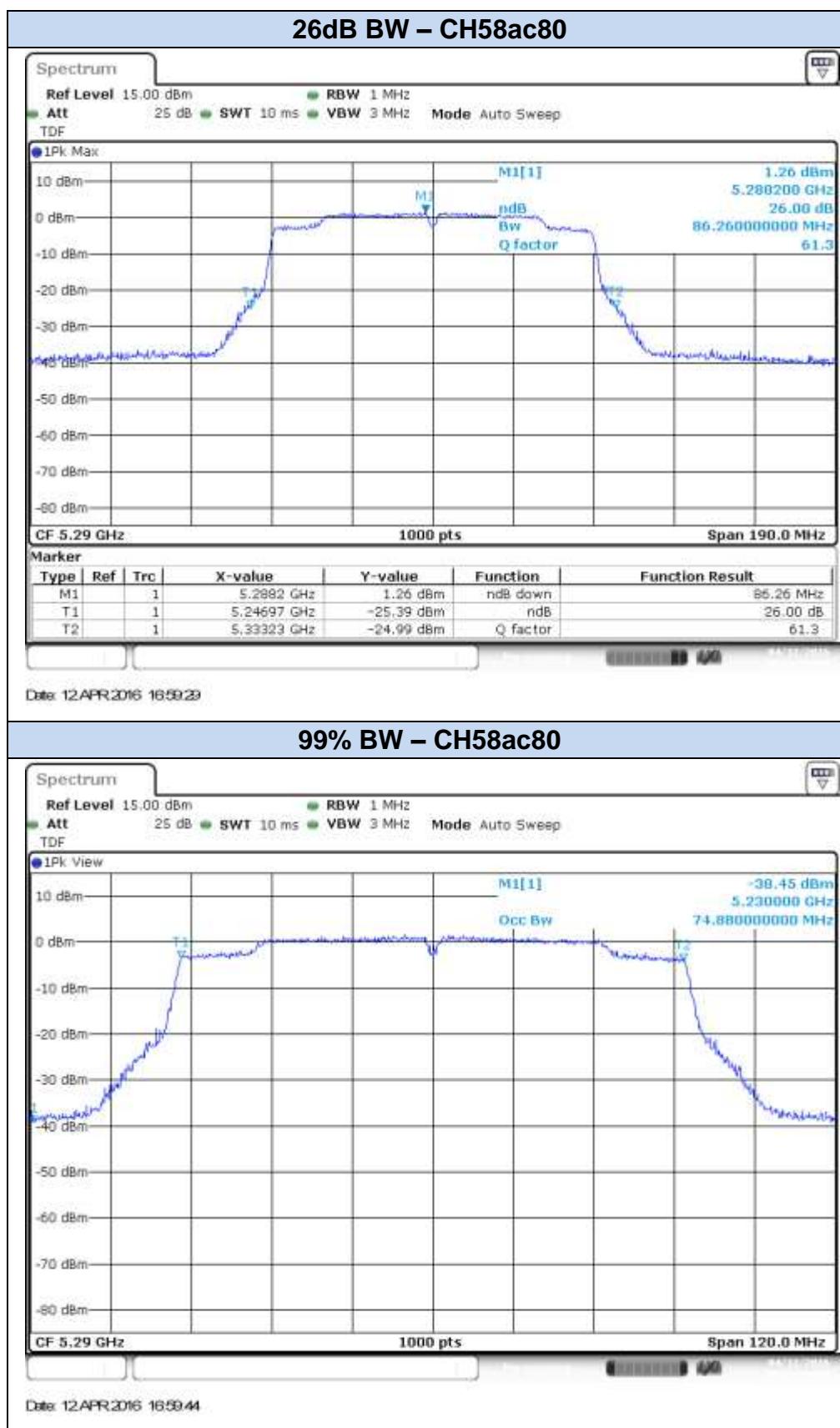
802.11ac80, VHT0 (SISO) – Chain A



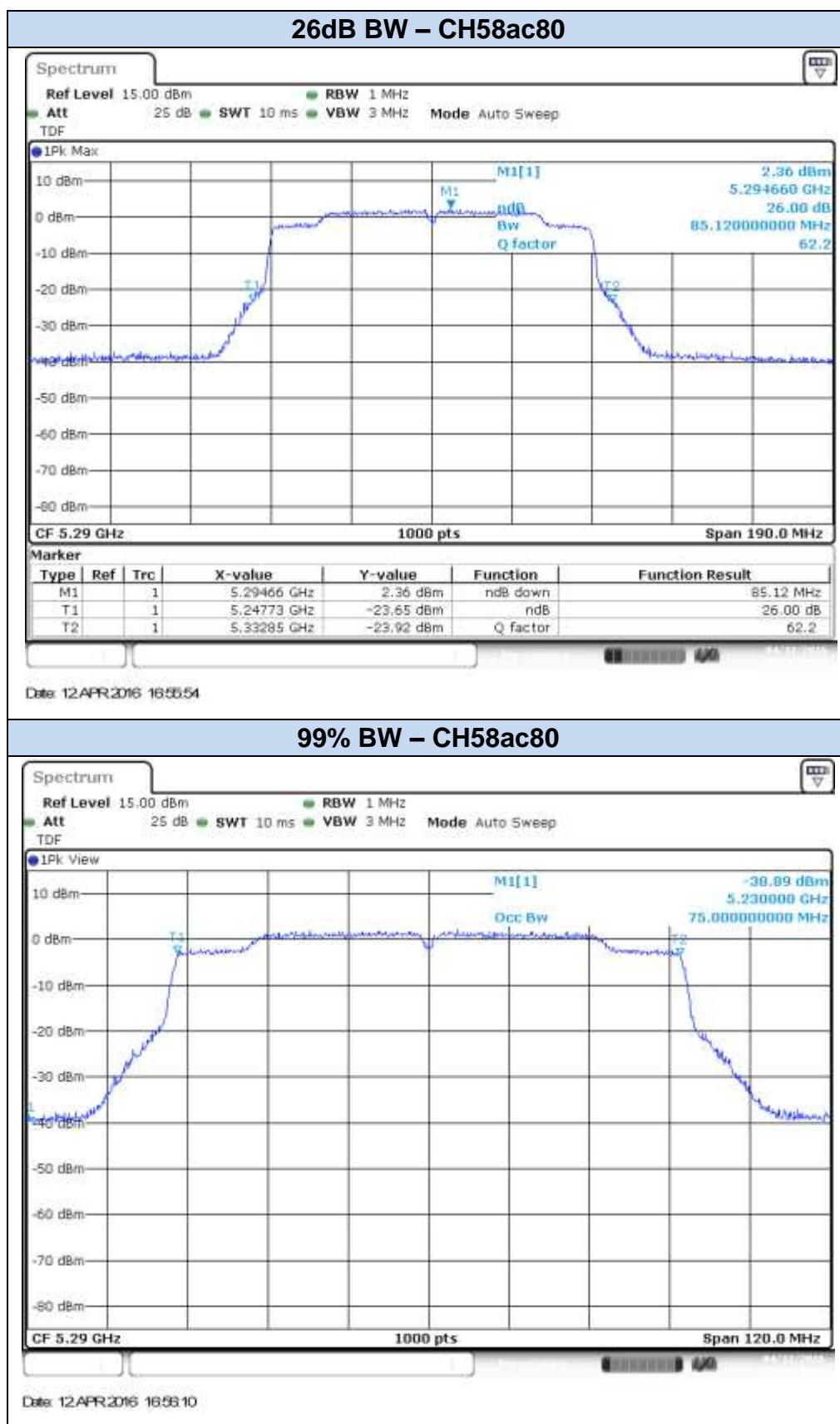
802.11ac80, VHT0 (SISO) – Chain B



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	Limits
15.407 (a) (2)	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 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 KDB 789033 D02.

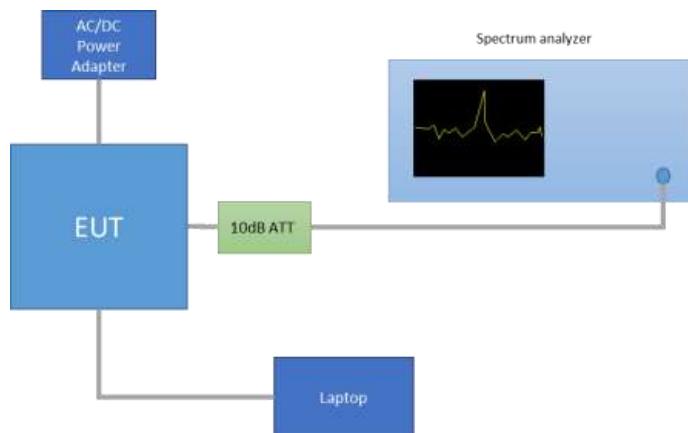
The maximum power spectral density (PSD) was measured using the method according to point F) (Method SA-2 Alternative) of KDB 789033 D02.

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 analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

The declared maximum antenna gain is 5dBi.

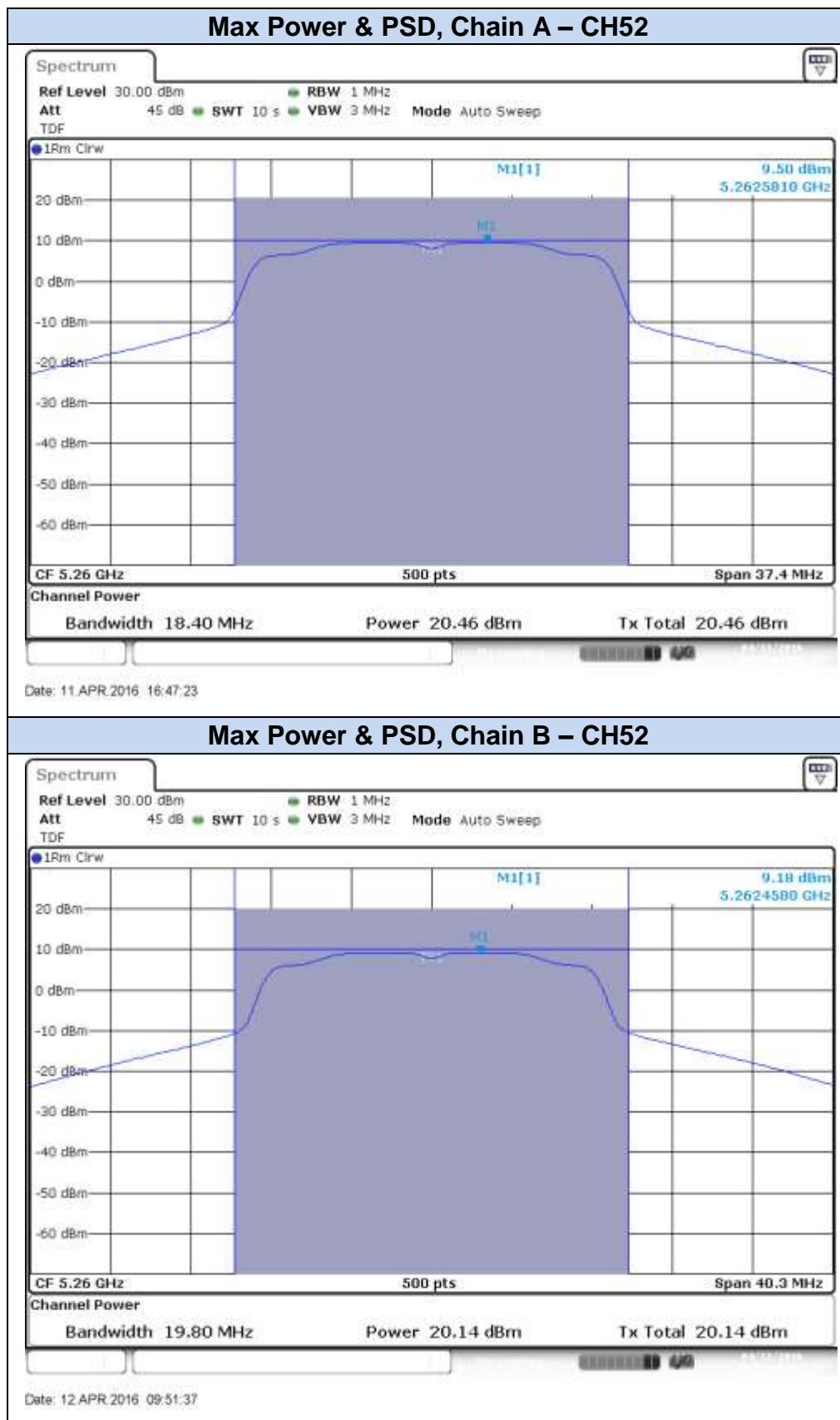


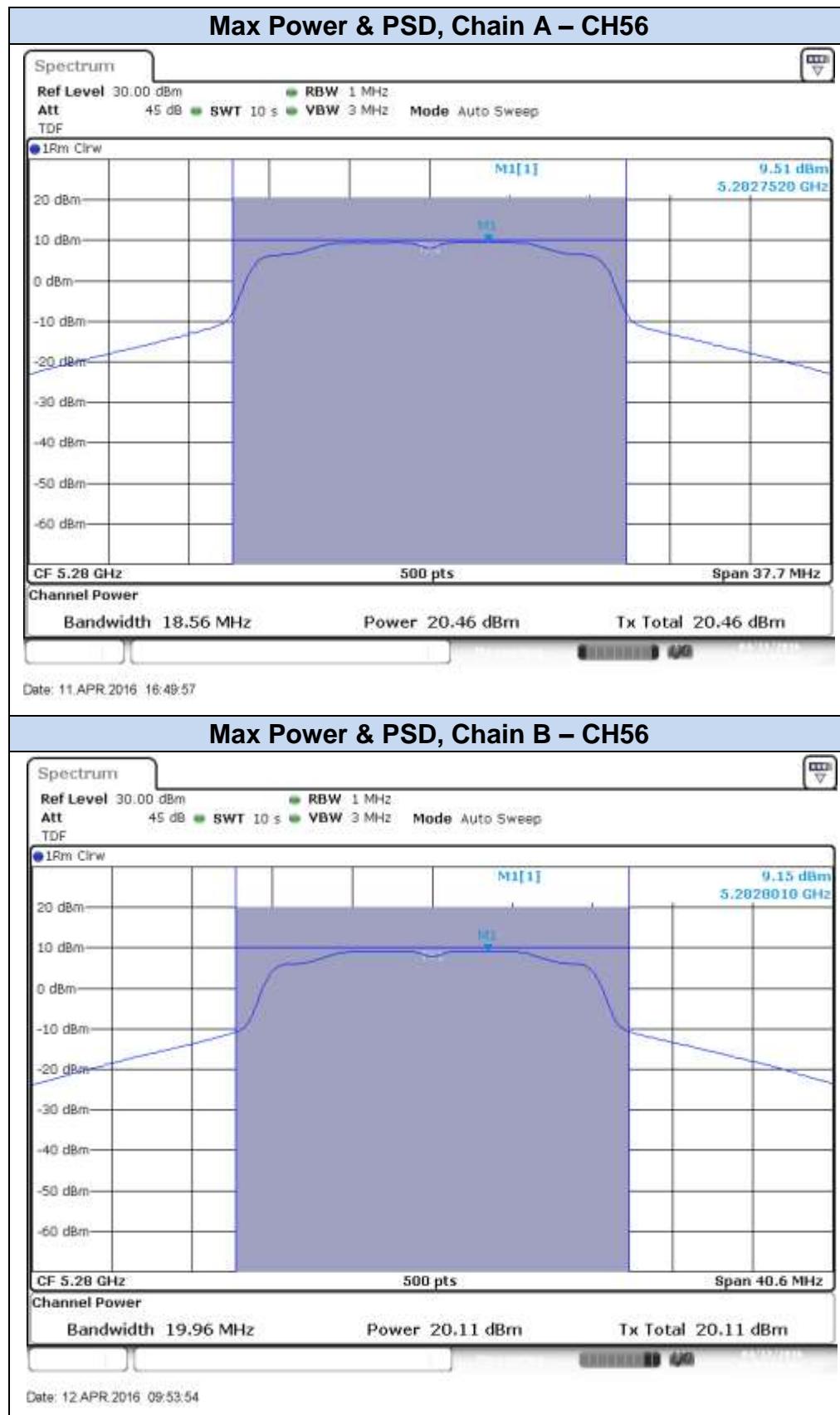
Results tables:

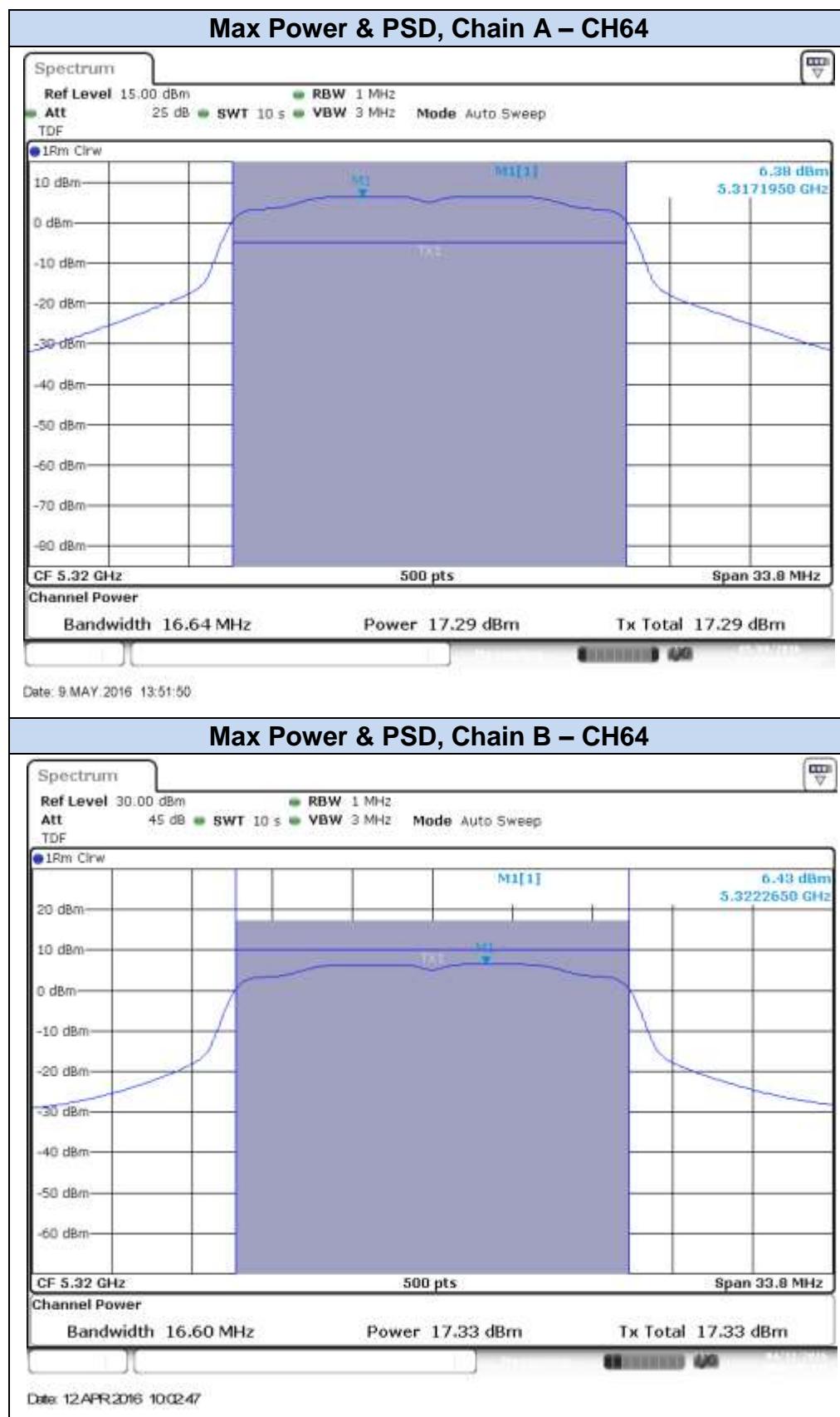
Mode	Rate	Meas. Duty Cycle [%]	CH	Freq. [MHz]	Antenna	Power [dBm]			PSD Duty cycle Compensated	Power (mW)		
						Meas. Cond RMS	Duty cycle Compensated	EIRP				
802.11a	6Mbps	98.0	52	5260	SISO CHAIN A	20.46	20.55	25.55	9.59	113.47		
					SISO CHAIN B	20.14	20.23	25.23	9.27	105.41		
			56	5280	SISO CHAIN A	20.46	20.55	25.55	9.60	113.47		
					SISO CHAIN B	20.11	20.20	25.20	9.24	104.68		
			64	5320	SISO CHAIN A	17.29	17.38	22.38	6.47	54.69		
					SISO CHAIN B	17.33	17.42	22.42	6.52	55.19		
	802.11n20	HT0	52	5260	SISO CHAIN A	20.34	20.42	25.42	9.28	110.24		
					SISO CHAIN B	20.10	20.18	25.18	9.04	104.32		
			56	5280	SISO CHAIN A	20.32	20.40	25.40	9.28	109.74		
					SISO CHAIN B	20.07	20.15	25.15	9.00	103.60		
			64	5320	SISO CHAIN A	17.04	17.12	22.12	6.01	51.56		
					SISO CHAIN B	16.64	16.72	21.72	5.69	47.03		
		HT8	52	5260	MIMO CHAIN A	18.82	18.92	23.92	7.80	78.05		
					MIMO CHAIN B	18.96	19.06	24.06	7.96	80.60		
			56	5280	MIMO CHAIN A	18.99	19.09	24.09	7.95	81.16		
					MIMO CHAIN B	18.69	18.79	23.79	7.70	75.74		
			64	5320	MIMO CHAIN A	12.95	13.05	18.05	1.99	20.20		
					MIMO CHAIN B	12.76	12.86	17.86	1.75	19.34		
802.11n40	HT0	98.1	54F	5270	SISO CHAIN A	20.33	20.41	25.41	5.92	109.99		
					SISO CHAIN B	19.60	19.68	24.68	5.22	92.97		
		62F	5310		SISO CHAIN A	13.07	13.15	18.15	-1.25	20.67		
					SISO CHAIN B	13.88	13.96	18.96	-0.50	24.91		
	HT8	97.6	54F	5270	MIMO CHAIN A	19.20	19.31	24.31	4.83	85.22		
					MIMO CHAIN B	18.94	19.05	24.05	4.62	80.27		
		62F	5310		MIMO CHAIN A	11.40	11.51	16.51	-3.00	14.14		
					MIMO CHAIN B	11.04	11.15	16.15	-3.37	13.02		
802.11ac80	VHT0	98.1	58ac80	5290	SISO CHAIN A	11.39	11.47	16.47	-5.72	14.04		
					SISO CHAIN B	12.17	12.25	17.25	-5.08	16.80		
		97.5			MIMO CHAIN A	9.01	9.12	14.12	-8.07	8.16		
					MIMO CHAIN B	9.18	9.29	14.29	-8.03	8.49		

MIMO modes – Combined results					Power [dBm]			
Mode	Rate	Channel	Frequency (MHz)	Antenna	Combined, Duty Cycle compensated	EIRP	Combined PSD	Power Combined [mW]
802.11n20	HT8	52	5260	MIMO CHAIN A + CHAIN B	22.00	27.00	10.79	158.65
		56	5280		21.96	26.96	10.74	156.90
		64	5320		15.97	20.97	4.78	39.53
802.11n40	HT8	54F	5270		22.19	27.19	7.63	165.49
		62F	5310		14.34	19.34	-0.28	27.16
802.11ac80	VHT0	58ac80	5290		12.21	17.21	-5.15	16.65

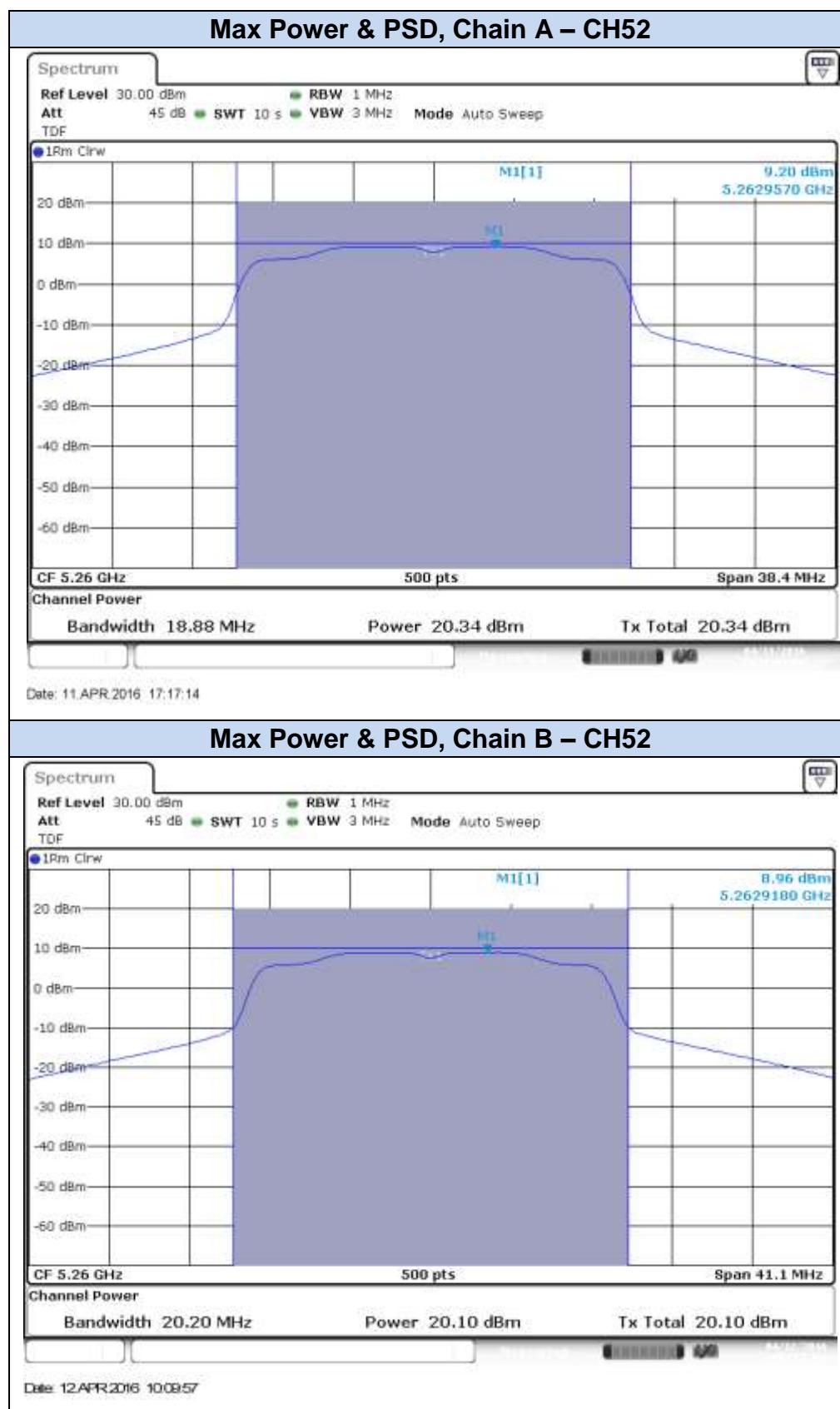
Max Value
Min Value

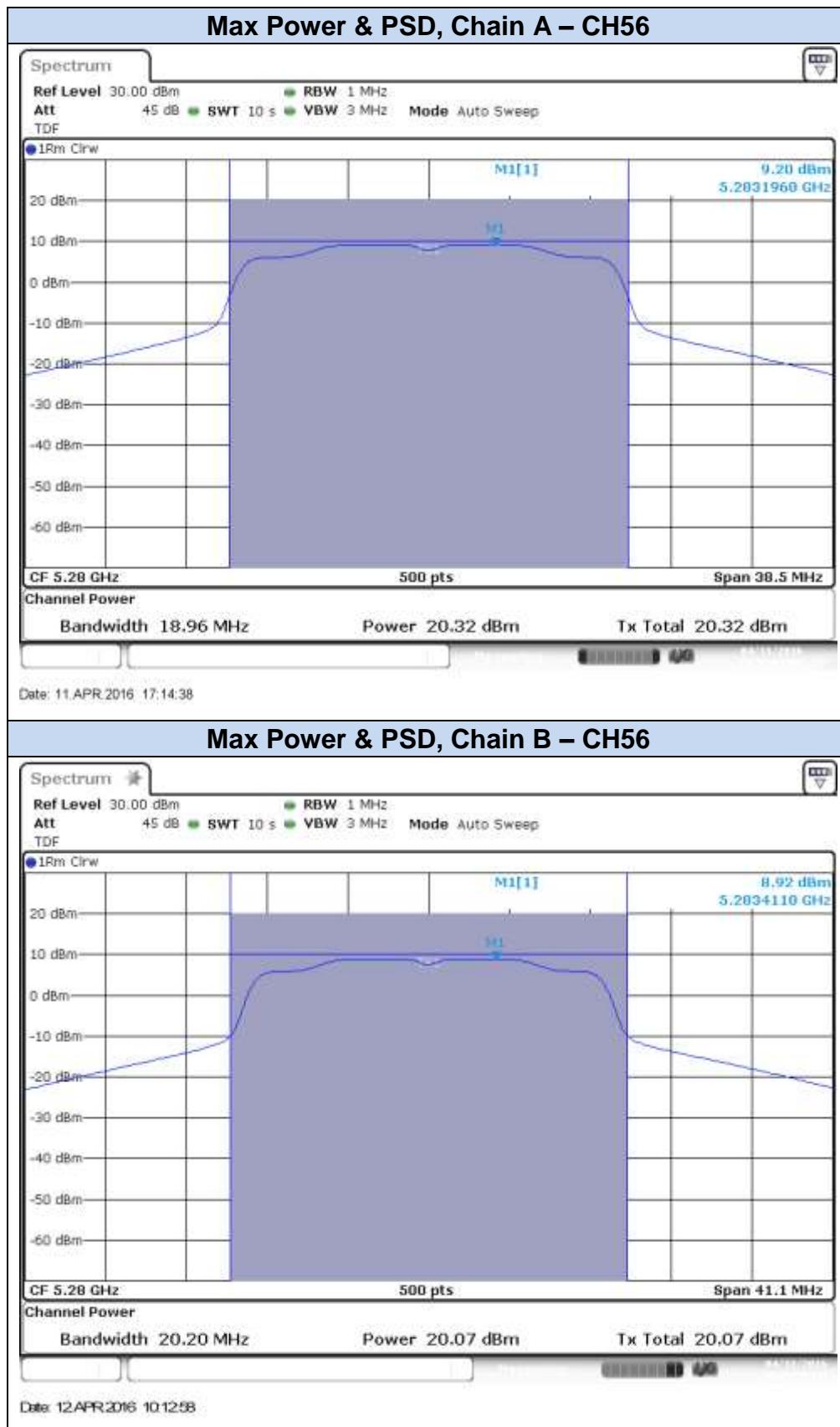
Results screenshot:**802.11a, 6Mbps**

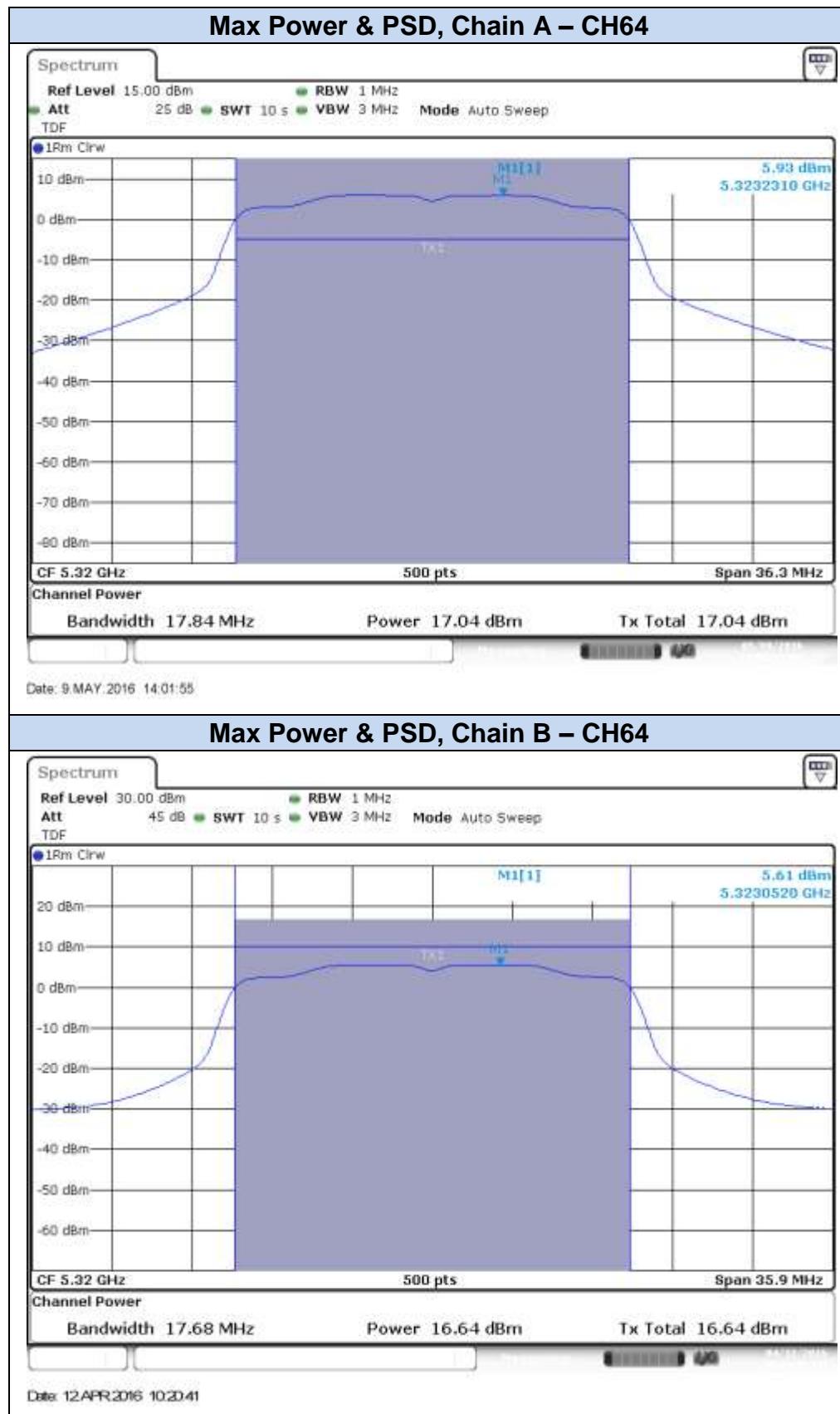


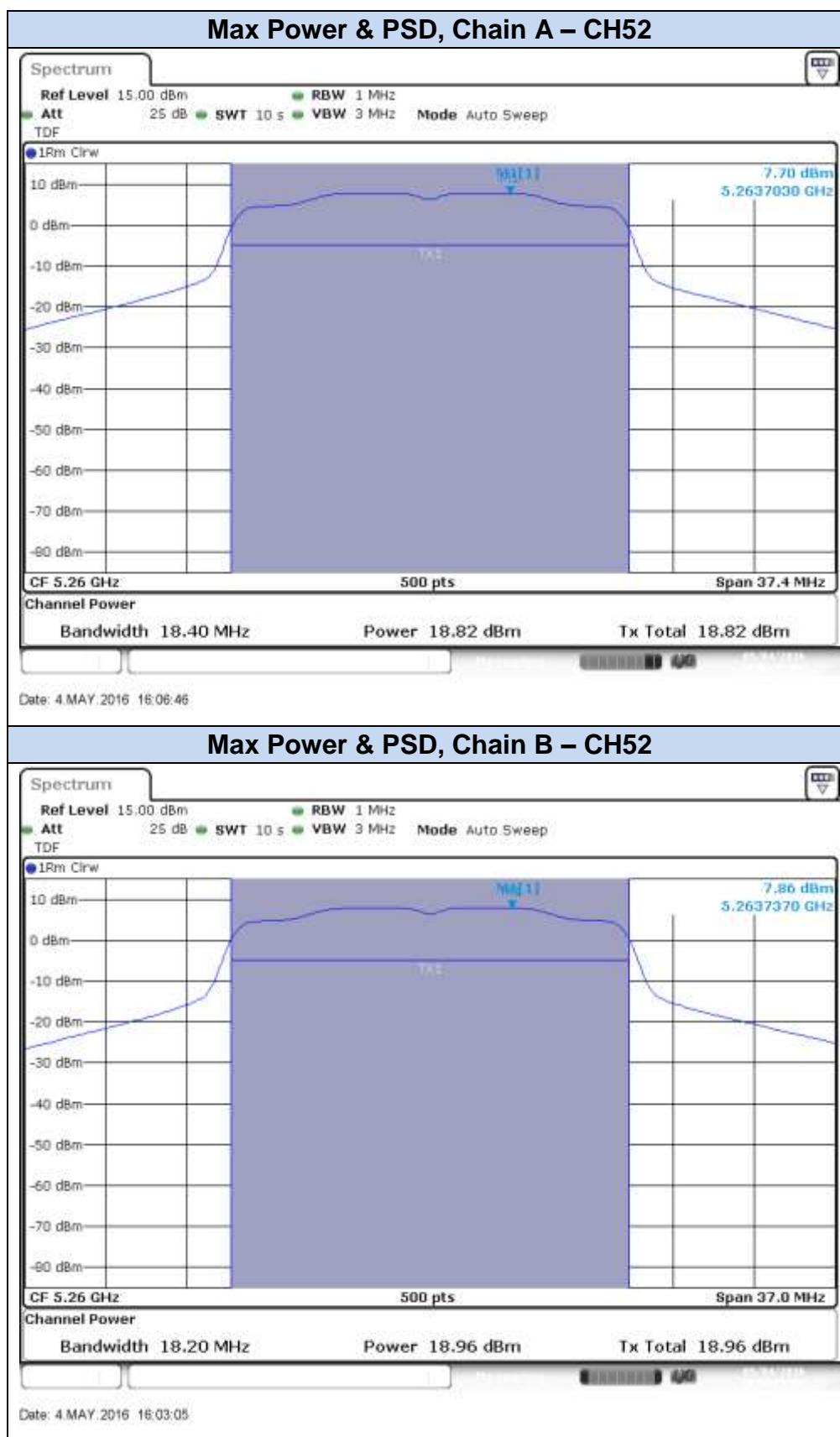


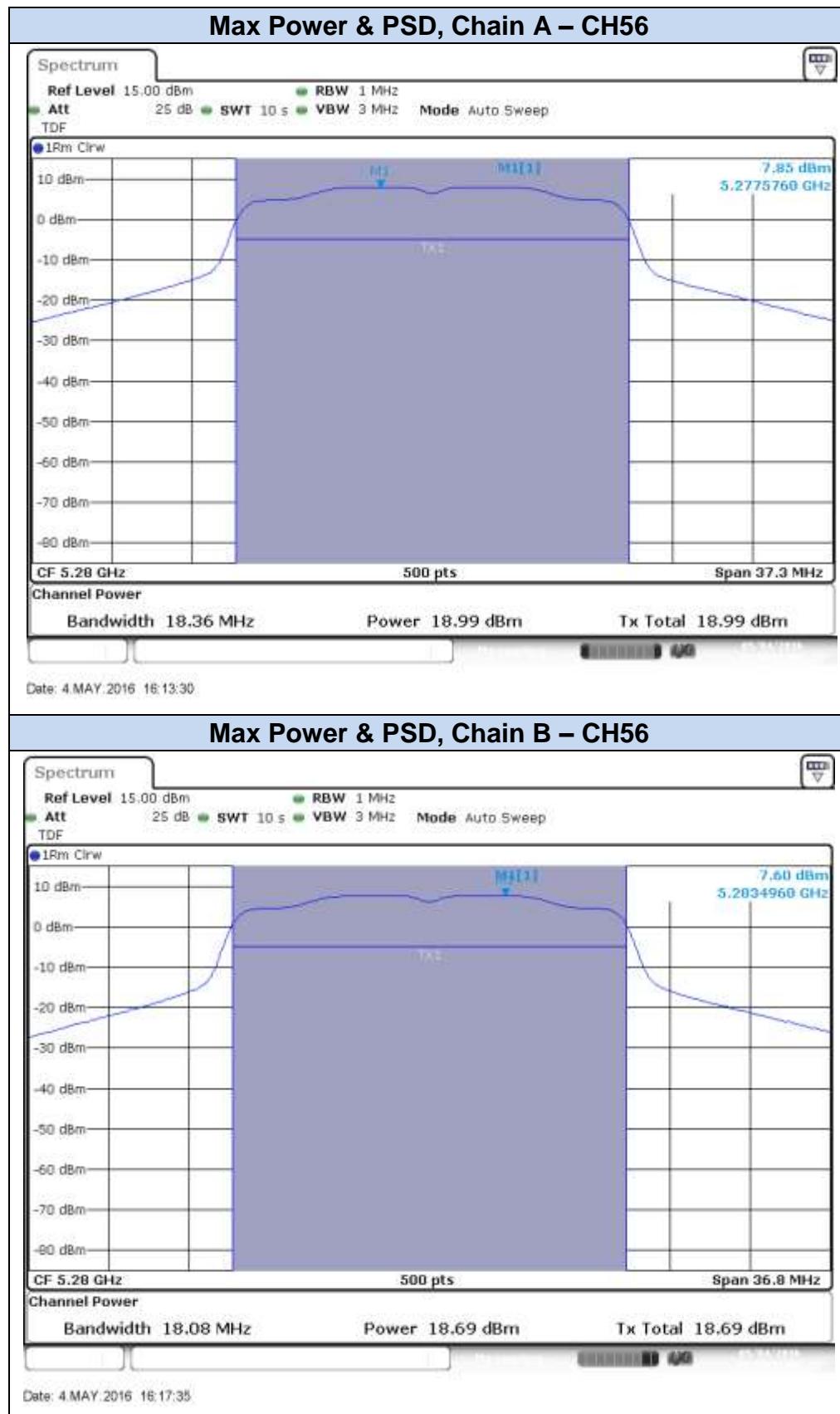
802.11n20, HT0 (SISO)

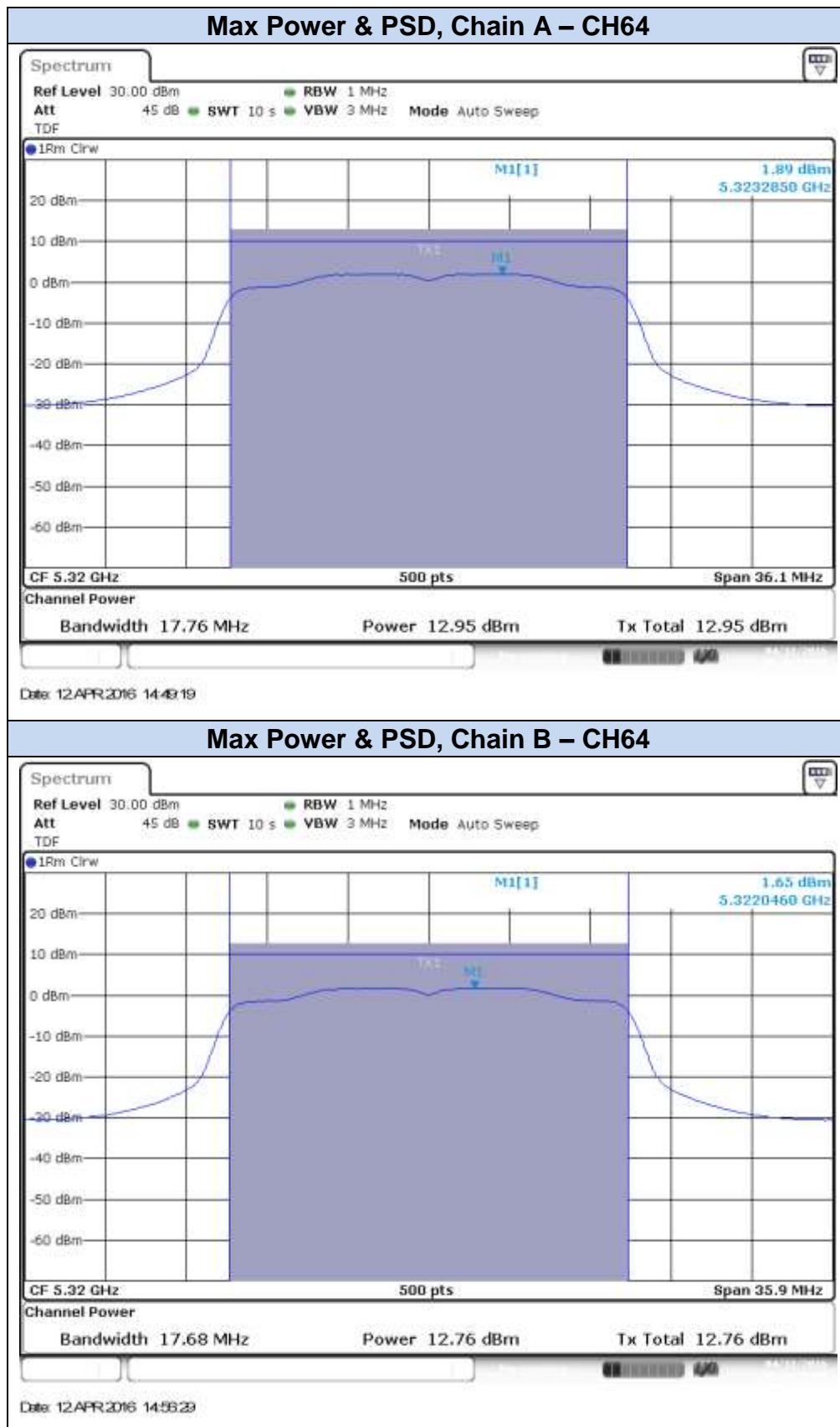


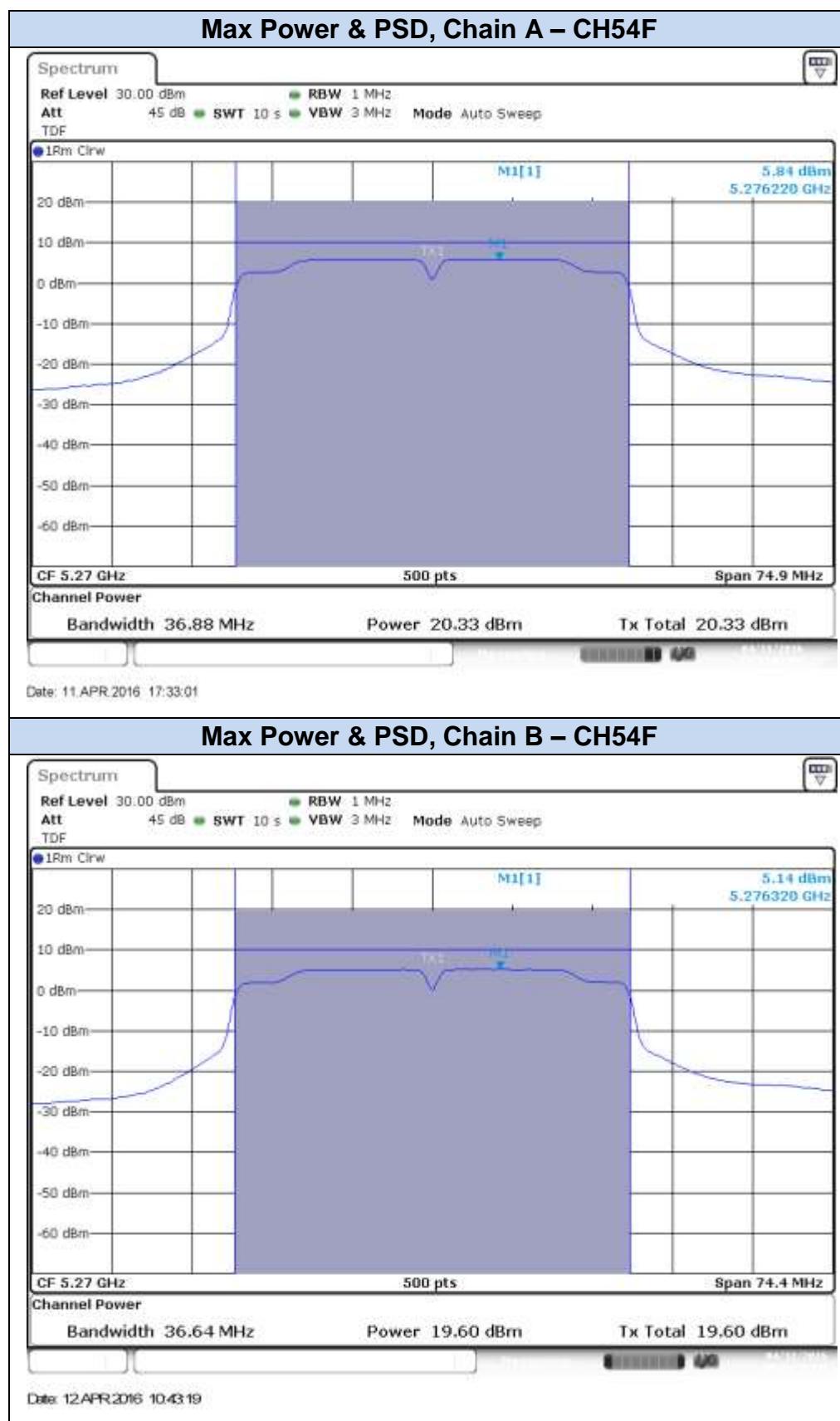


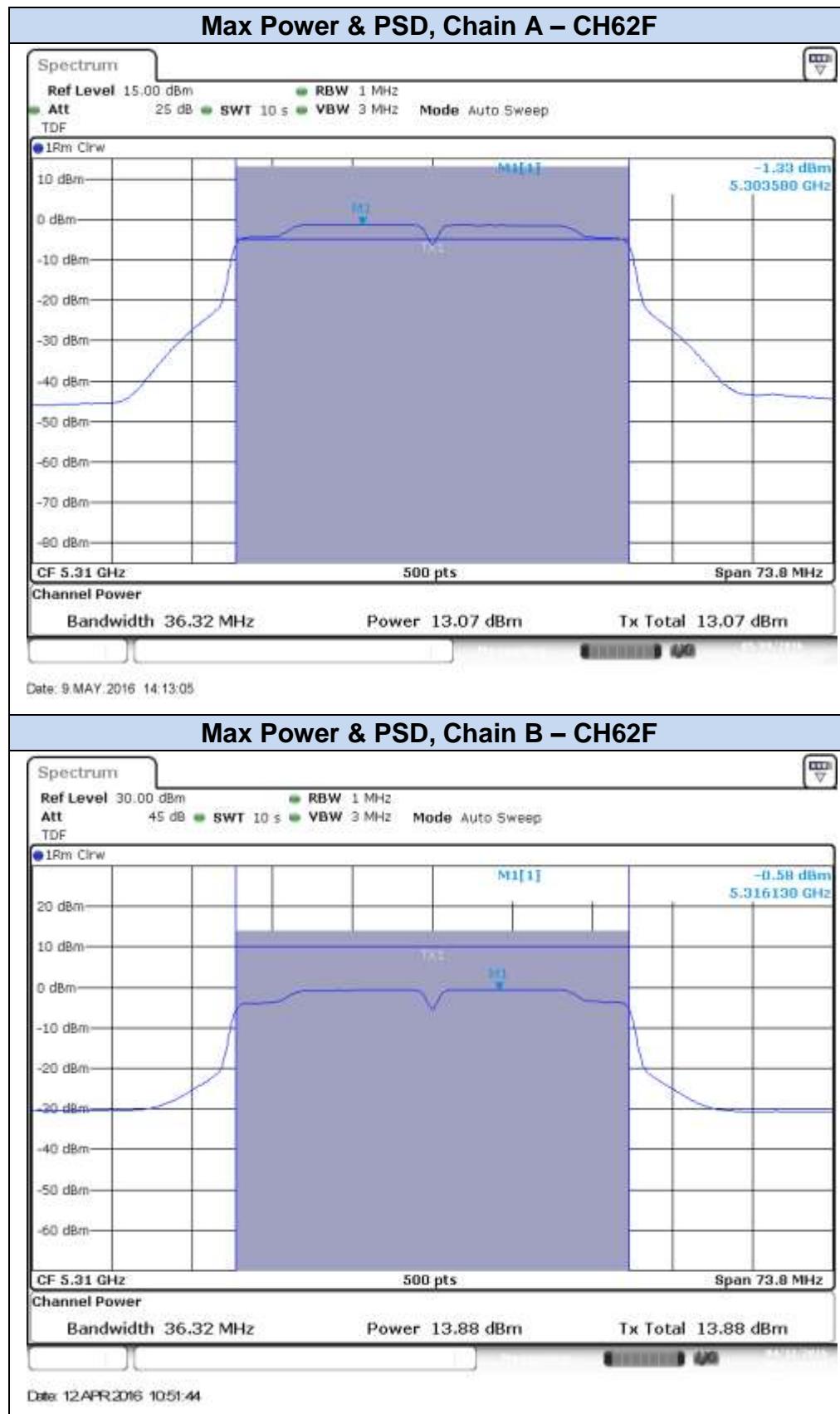


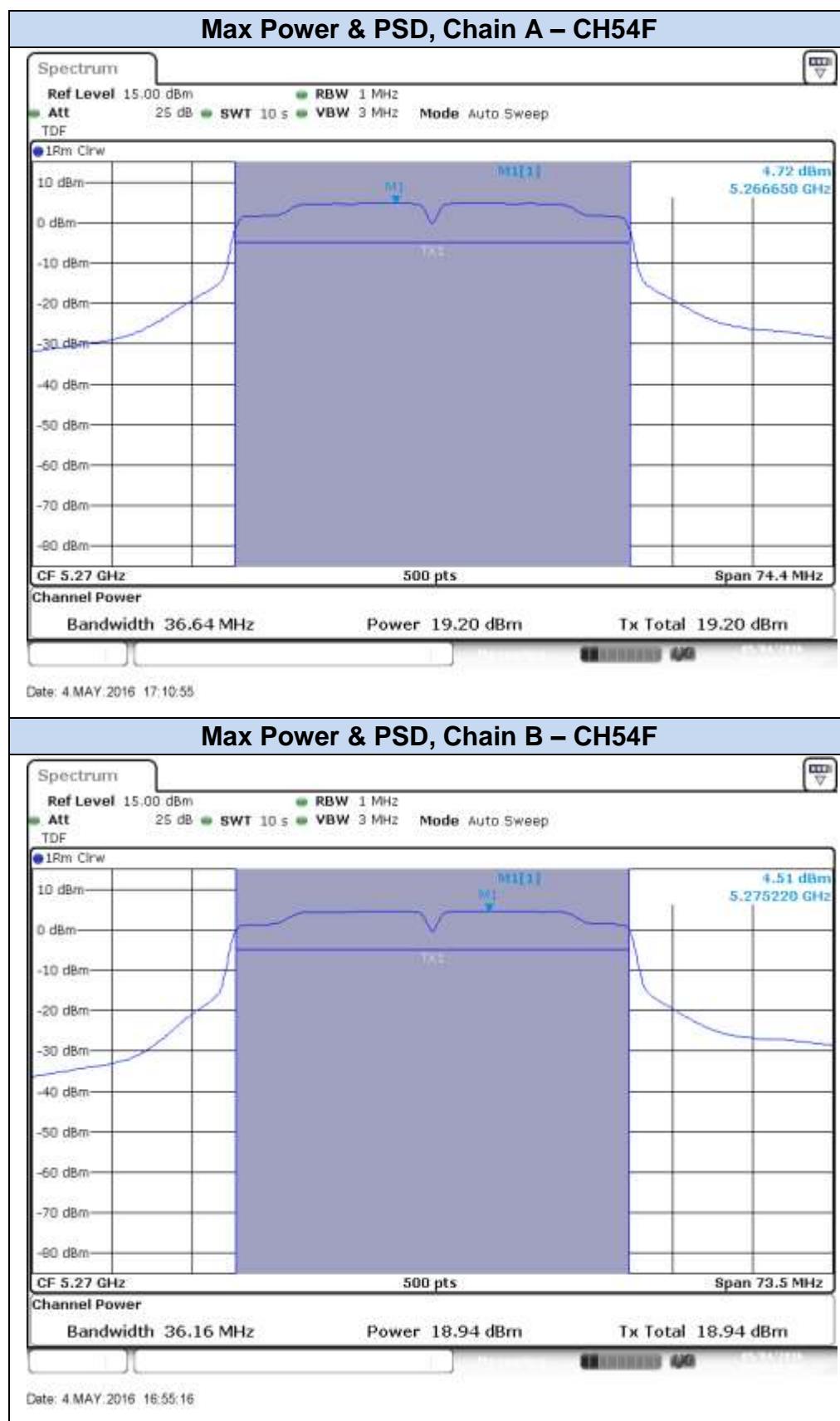
802.11n20, HT8 (MIMO)

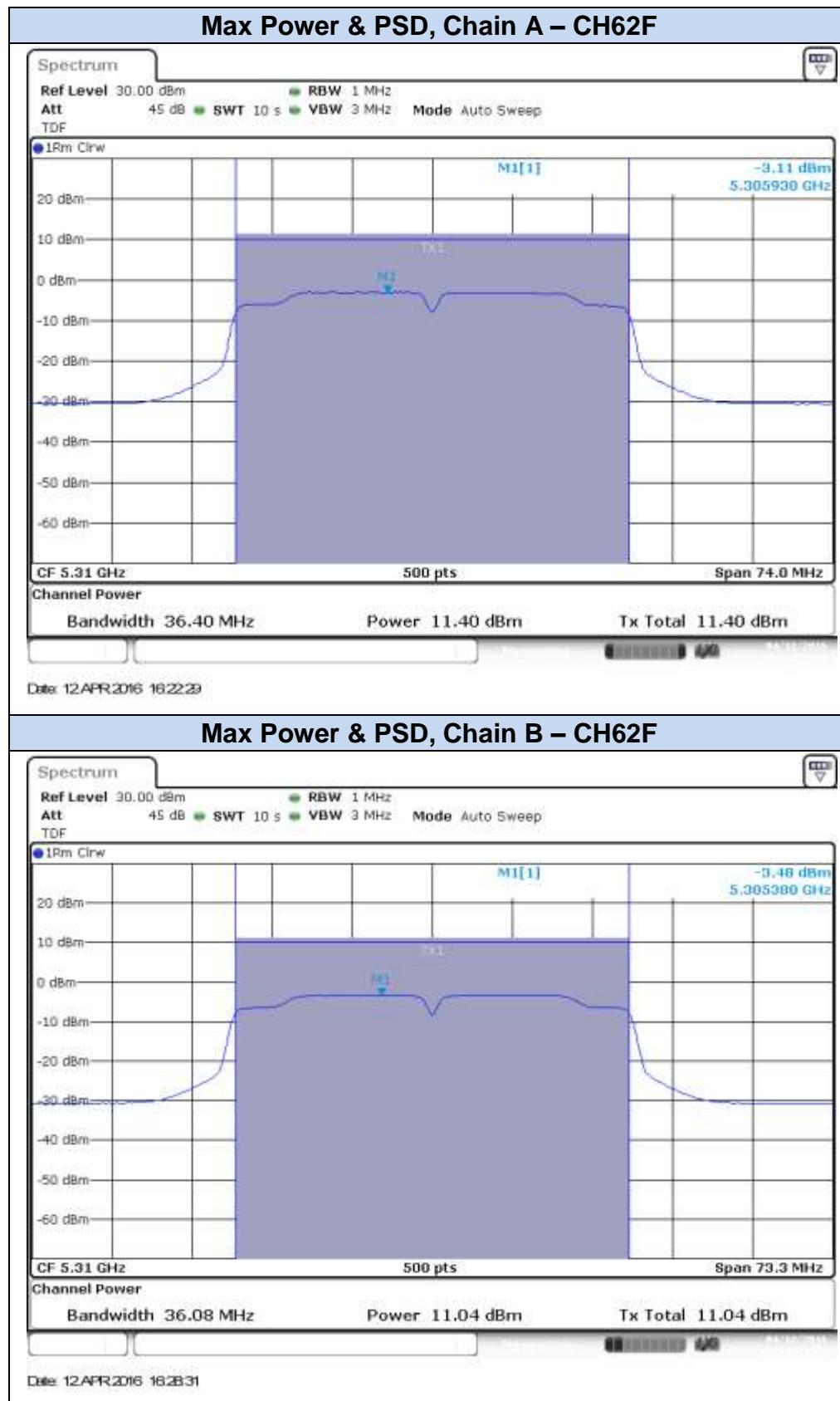




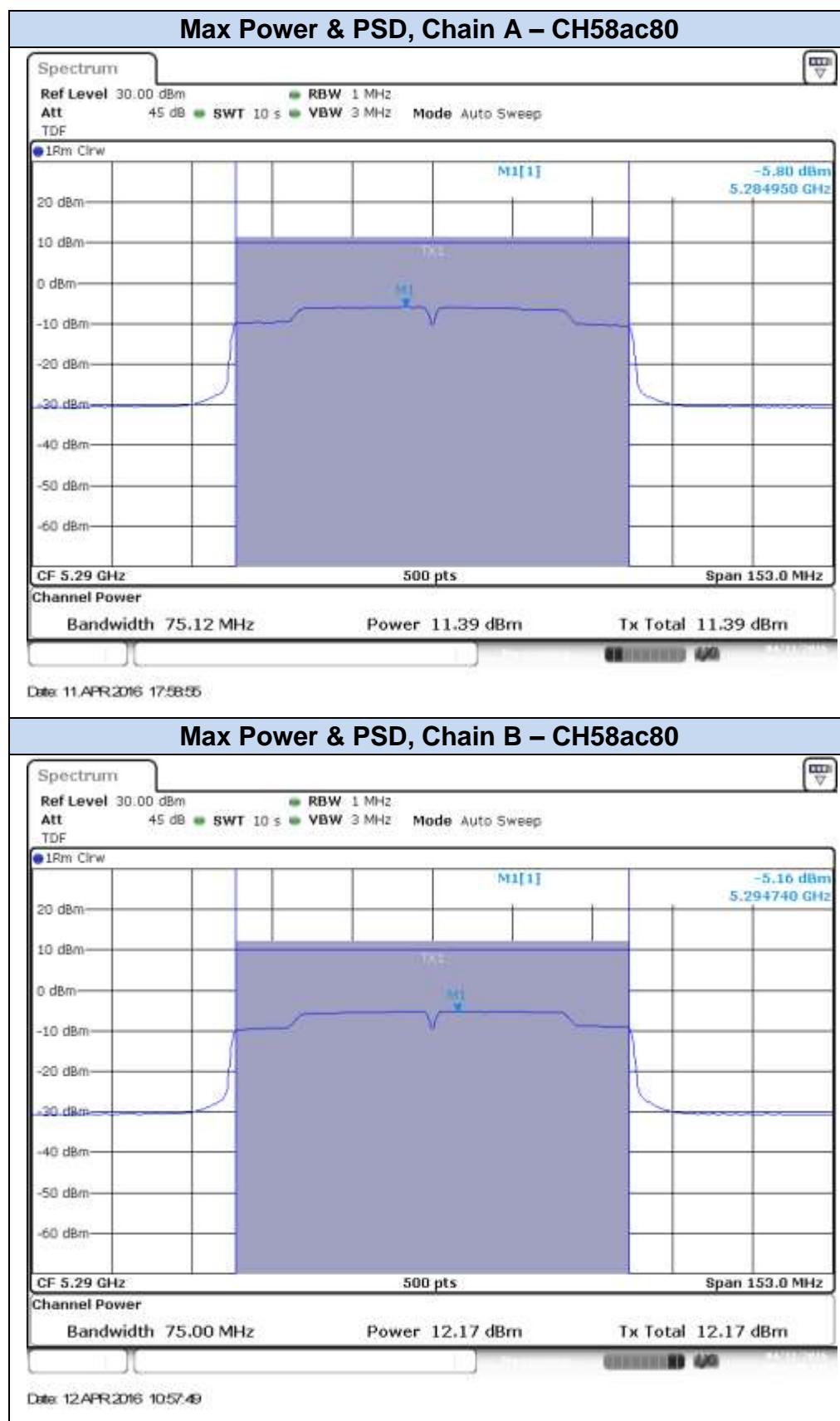
802.11n40, HT0 (SISO)



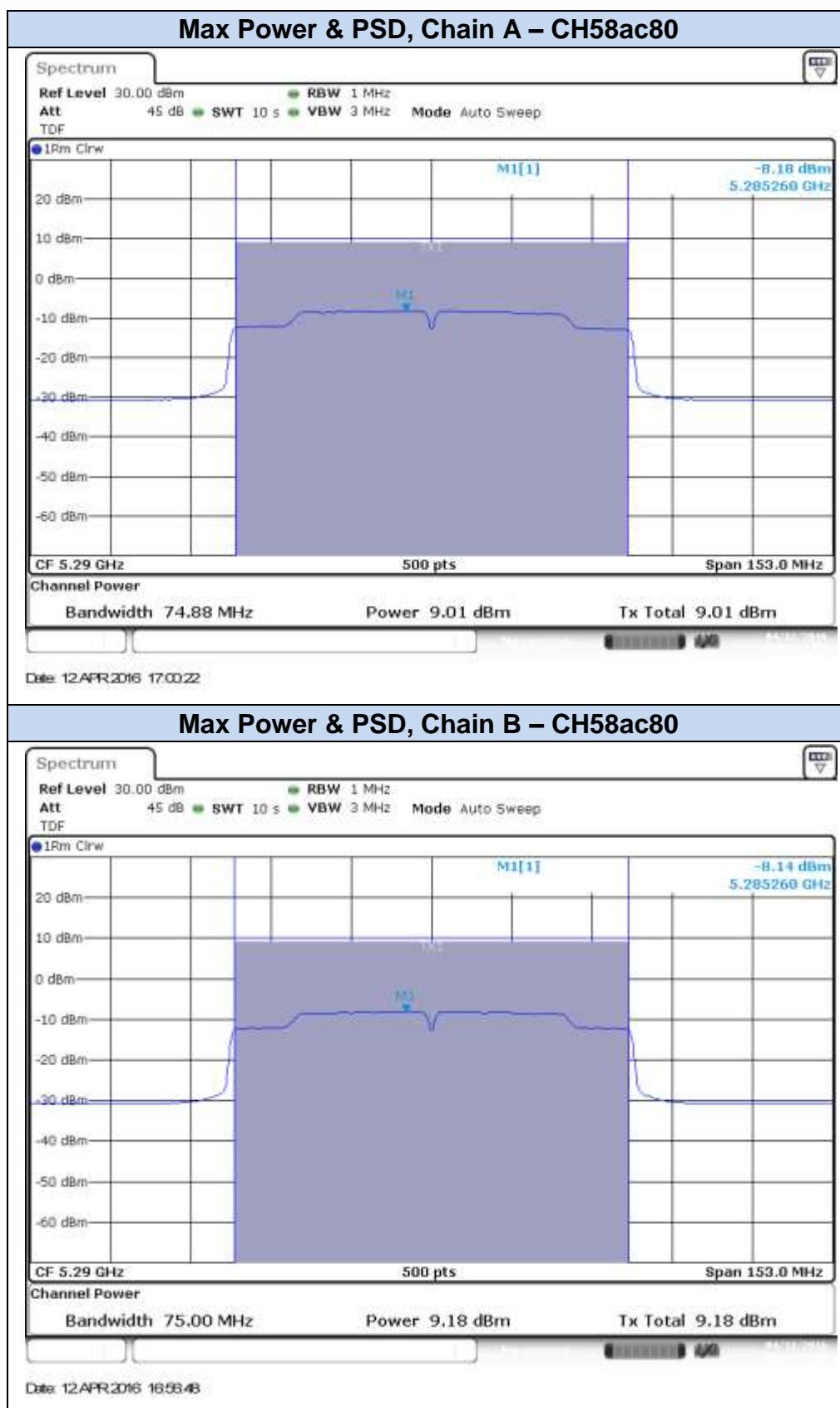
802.11n40, HT8 (MIMO)



802.11ac80, VHT0 (SISO)



802.11ac80, VHT0 (MIMO)



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

Test limits:

FCC part	Limits																																			
15.407 (b) (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	<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 ($\text{dB}\mu\text{V}/\text{m}$)</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. 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 ($\text{dB}\mu\text{V}/\text{m}$)	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 ($\text{dB}\mu\text{V}/\text{m}$)	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																																	

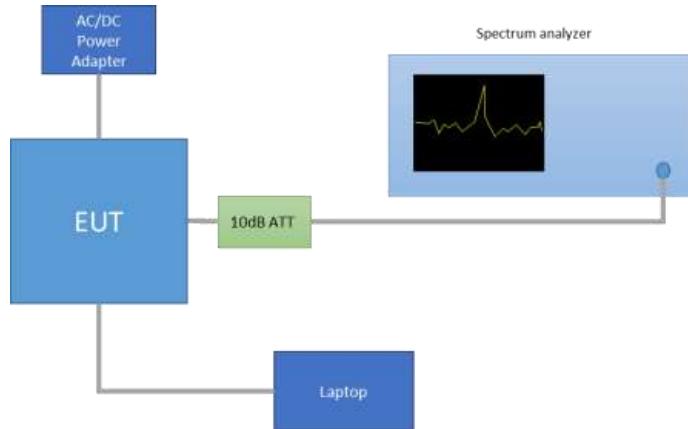
Test procedure:

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 analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss and the declared Antenna Gain.

The Band Edge High, was measured using the method according to point G) 3) d) (ii) (Integration Method) of KDB 789033 D02. This measurement performs a band-power integration across the 1MHz in which the band-edge emission level has to be measured

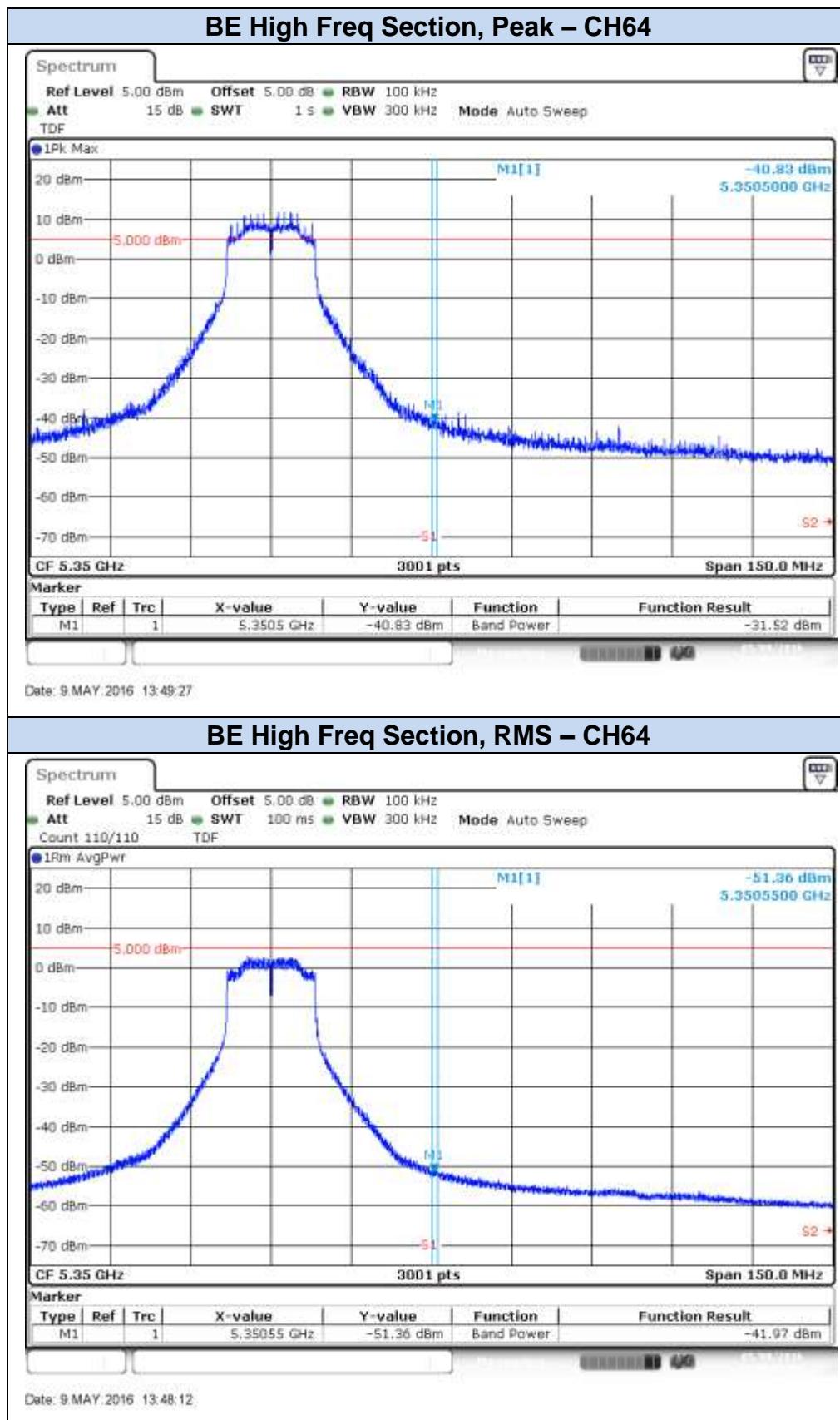
In case of Band Edge measurements falling in restricted bands, the declared Antenna Gain is also compensated in the graph.

The declared maximum antenna gain is 5dBi.

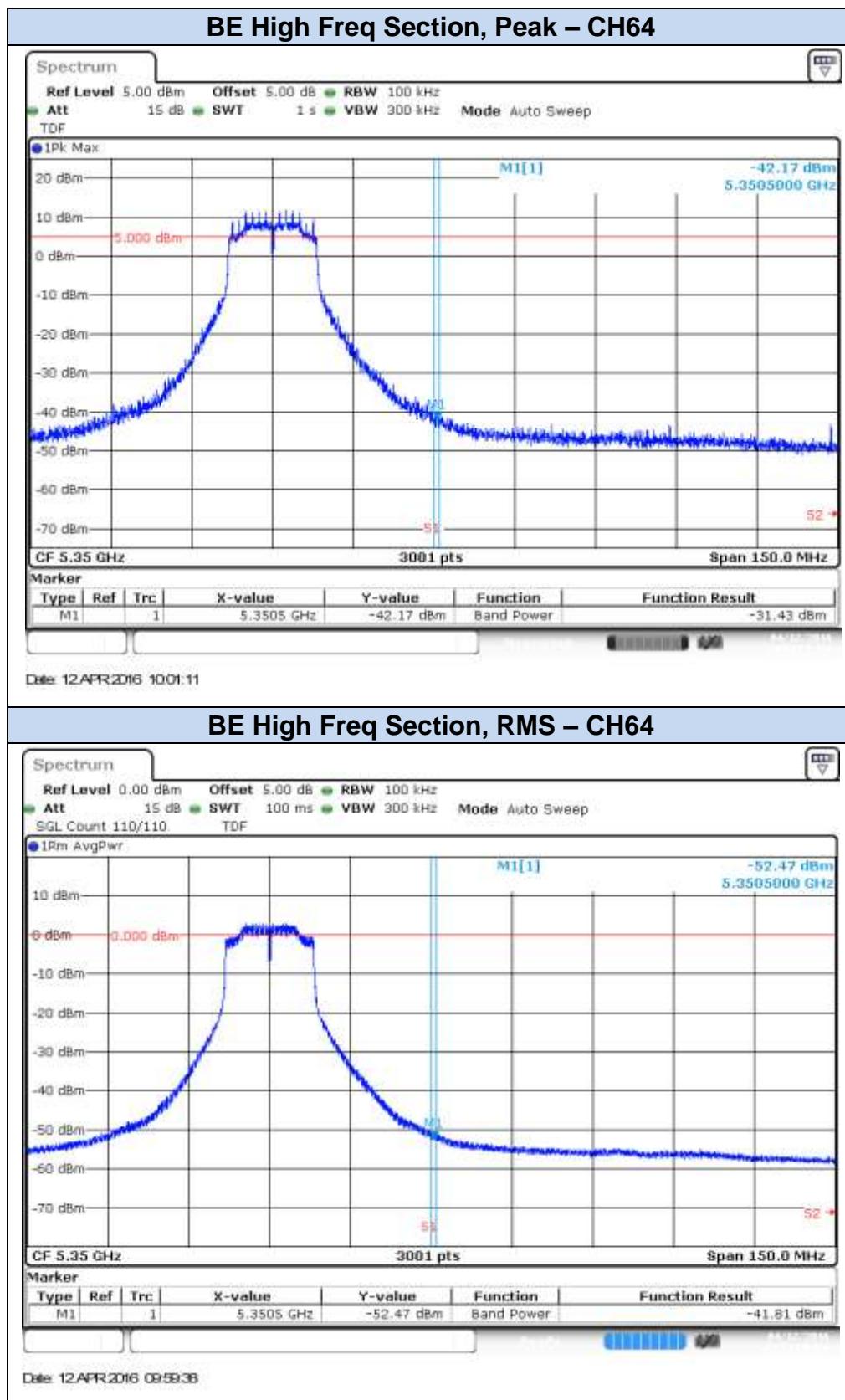


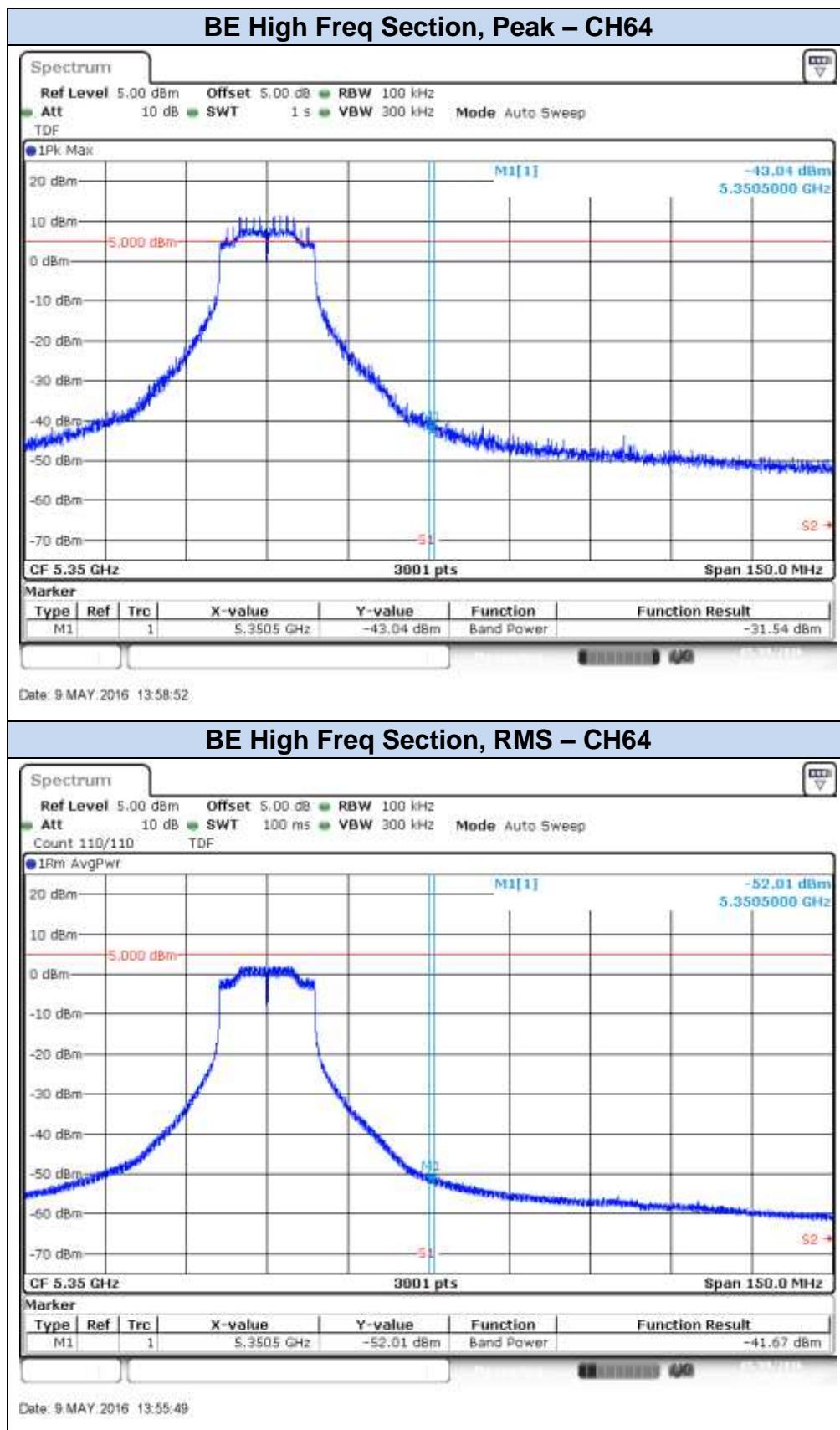
The following limits in dBm were applied for the average detector after the conversion from the limits detailed above in dB μ V/m, according to FCC 47 CFR part 15 - Subpart C – §15.209(a). The limits in dBm for peak detector are 20dB above the indicated values in the table.

§15.209(a)			Converted values	
Freq Range (MHz)	Distance (m)	Field strength (microvolts/meter)	Field strength (dB microvolts/meter)	Power (dBm)
960-25000	3	500	53.98	-41.2

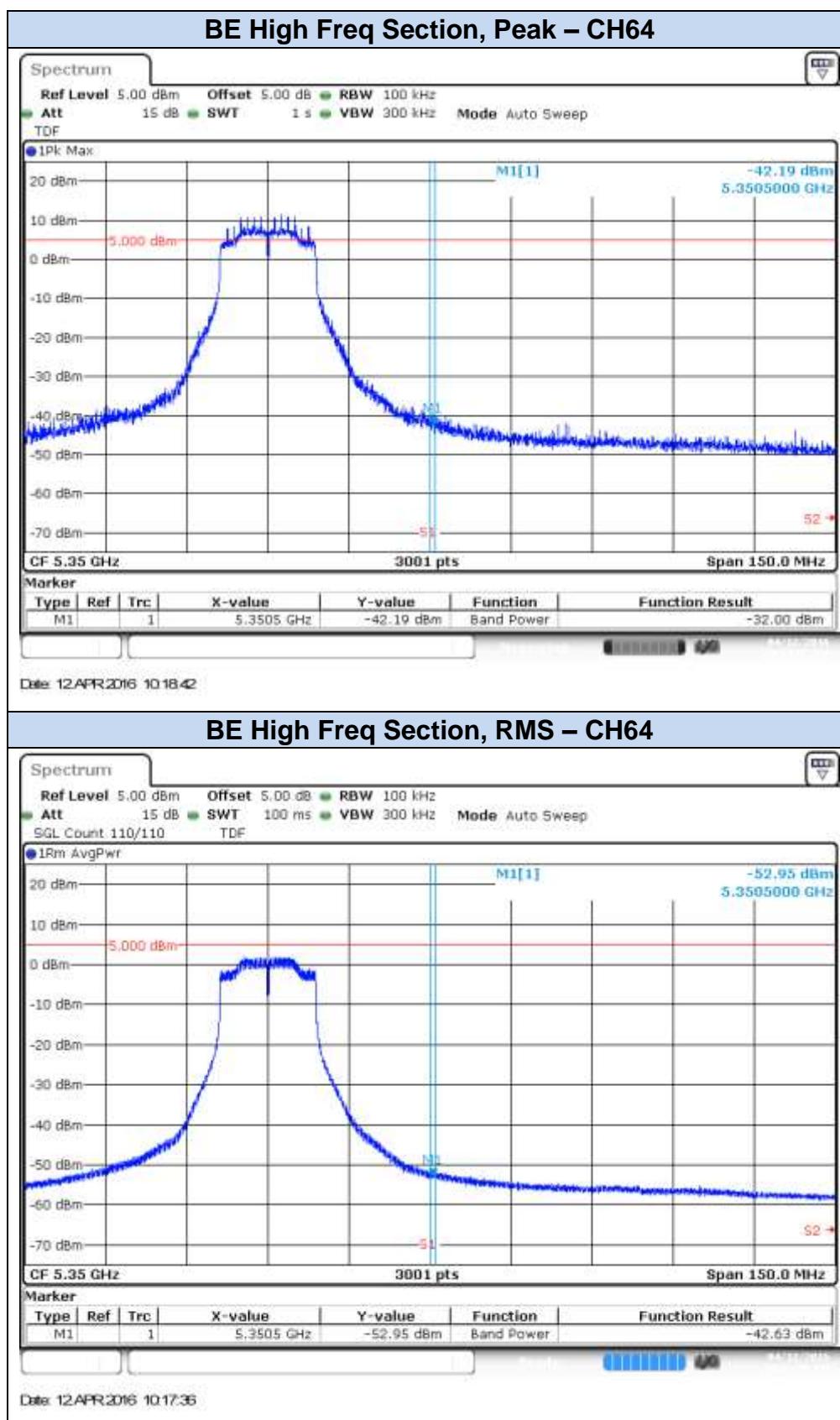
Results Screenshot:**802.11a, 6Mbps – Chain A**

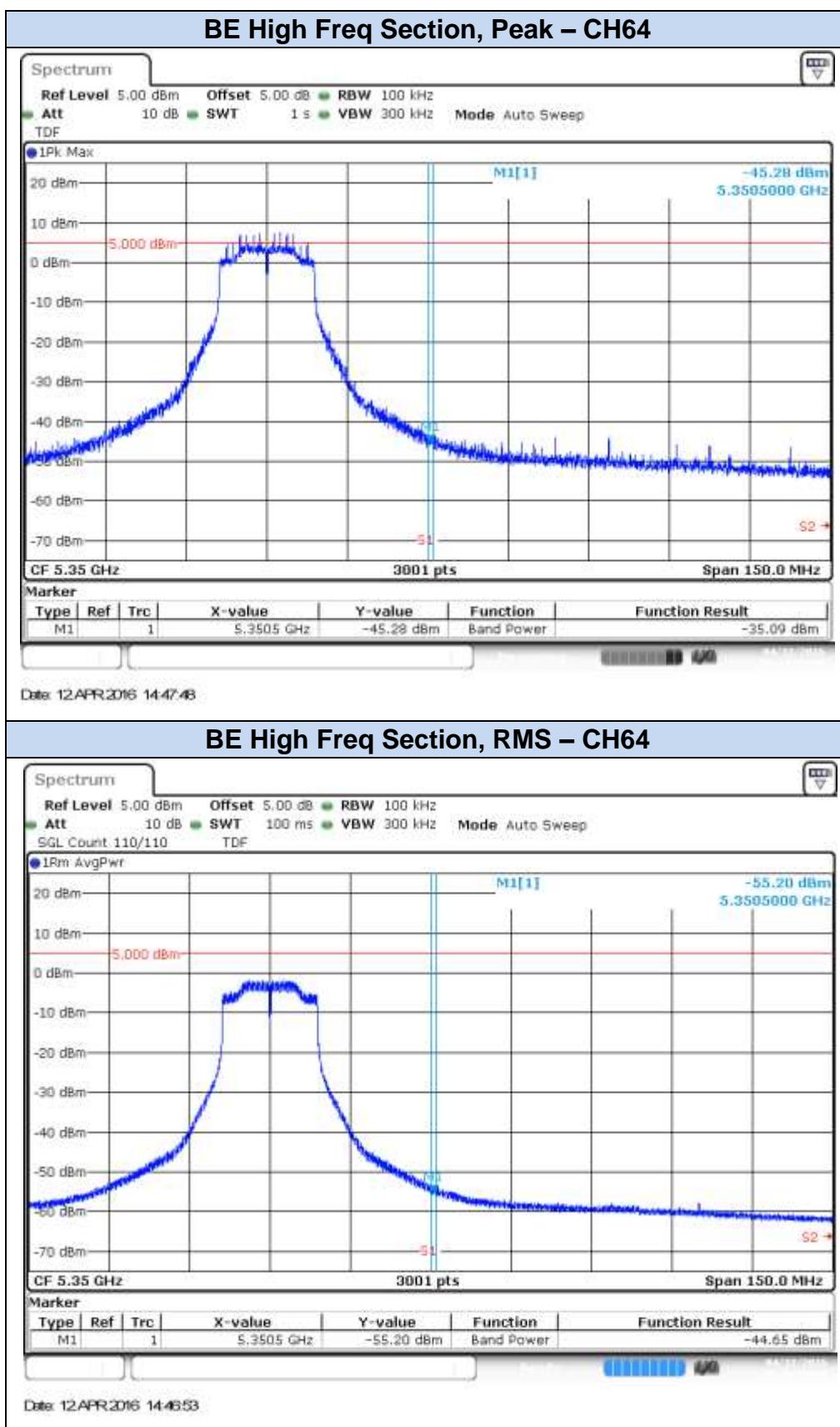
802.11a, 6Mbps – Chain B



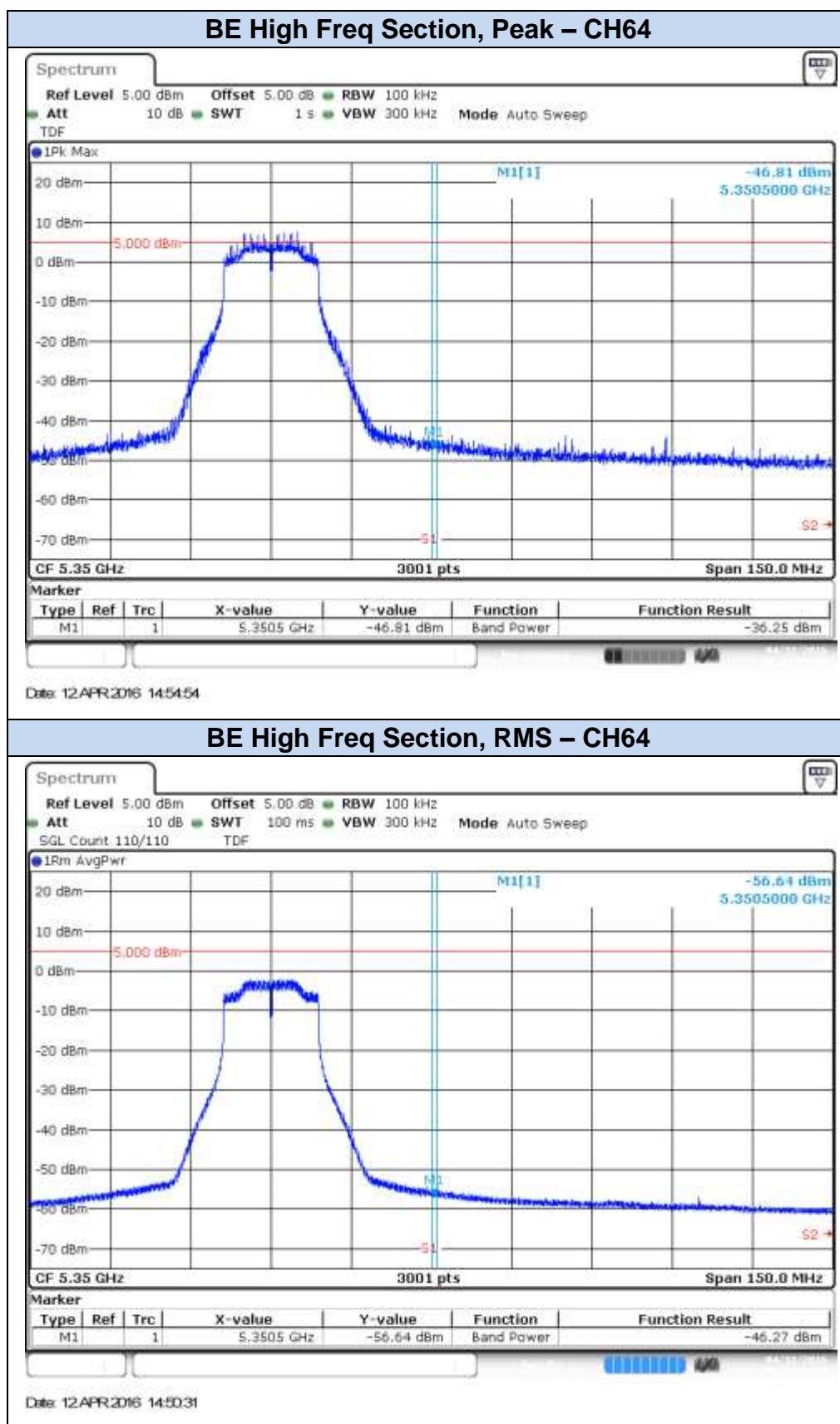
802.11n20, HT0 (SISO) – Chain A

802.11n20, HT0 (SISO) – Chain B

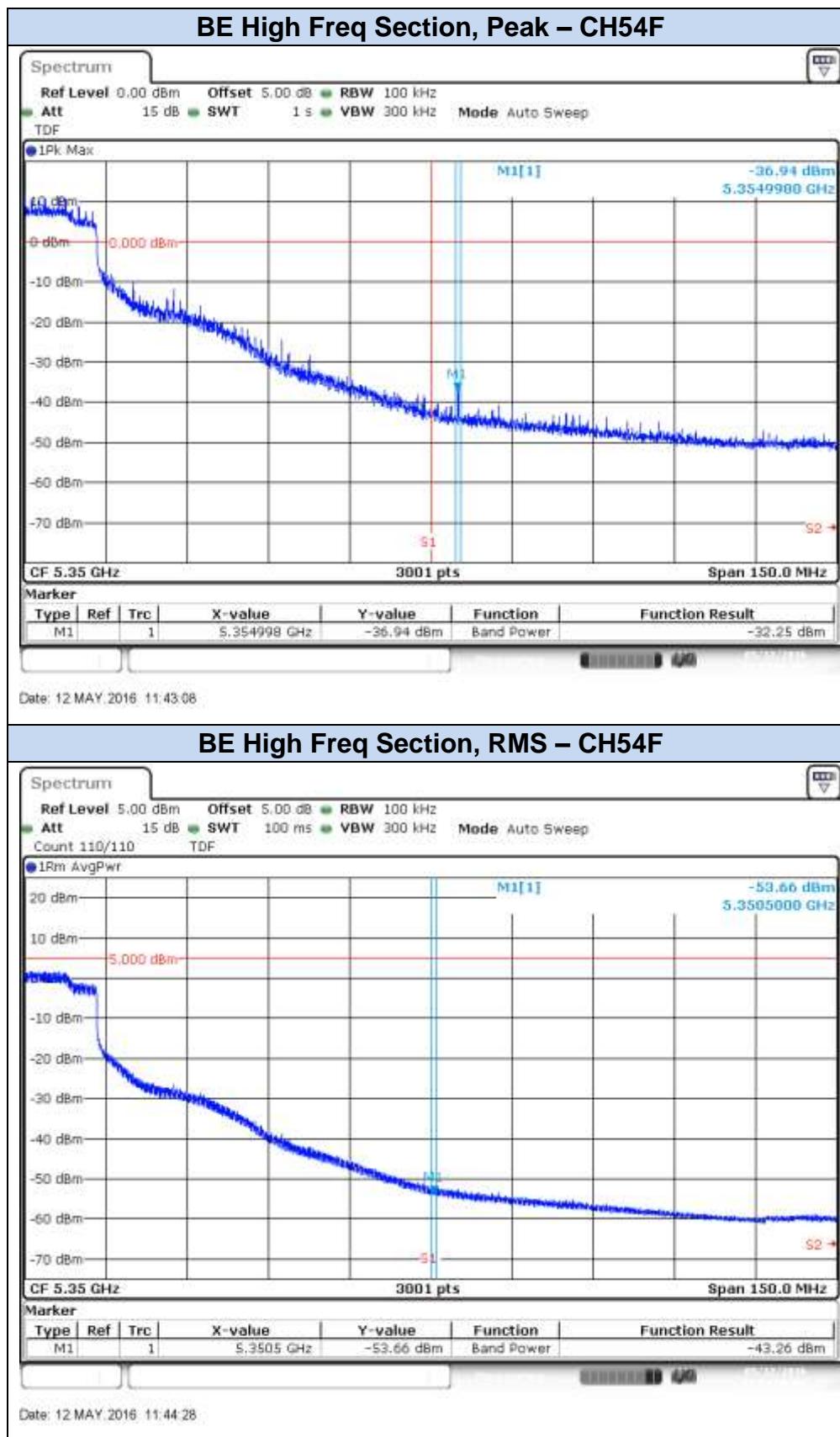


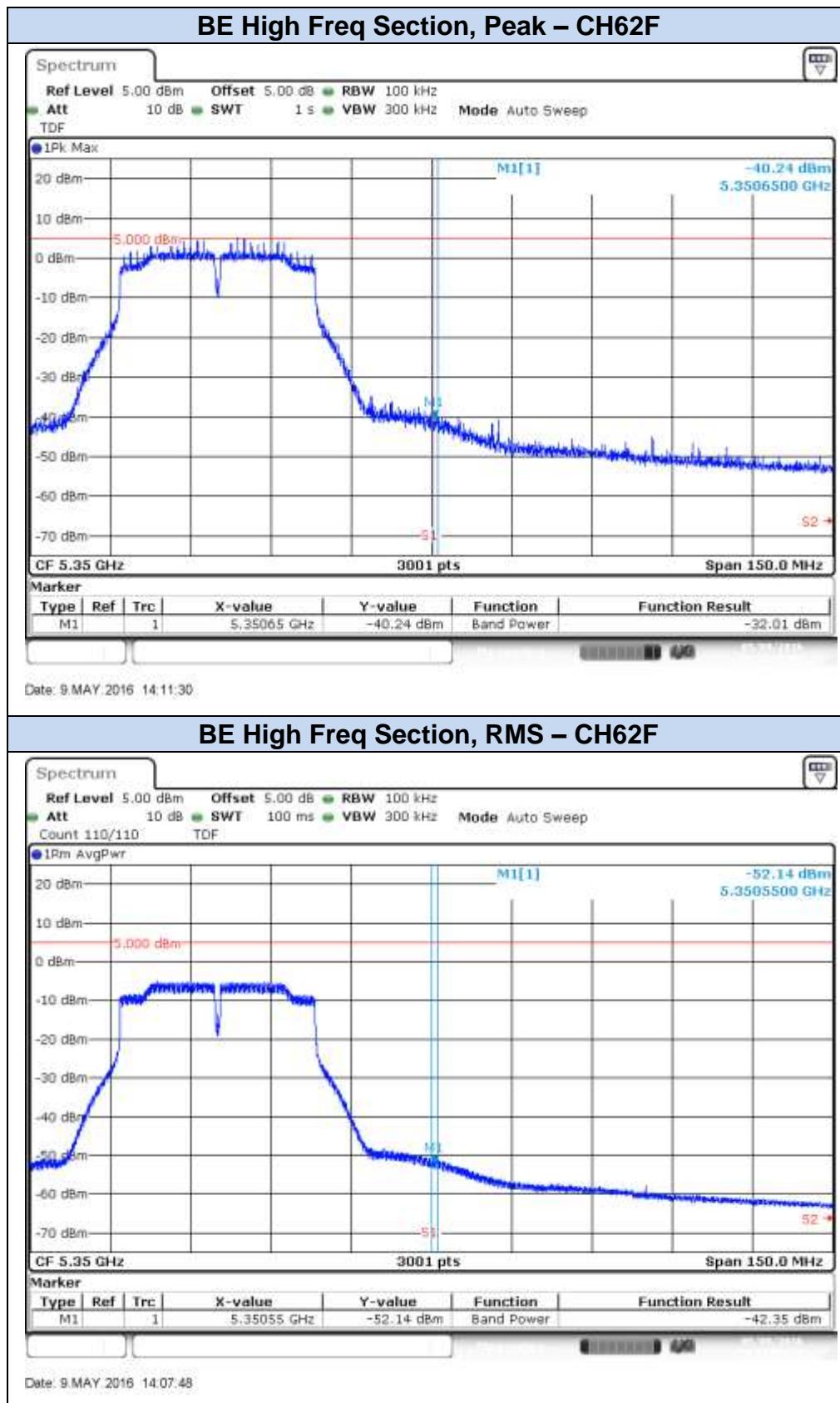
802.11n20, HT8 (MIMO) – Chain A

802.11n20, HT8 (MIMO) – Chain B

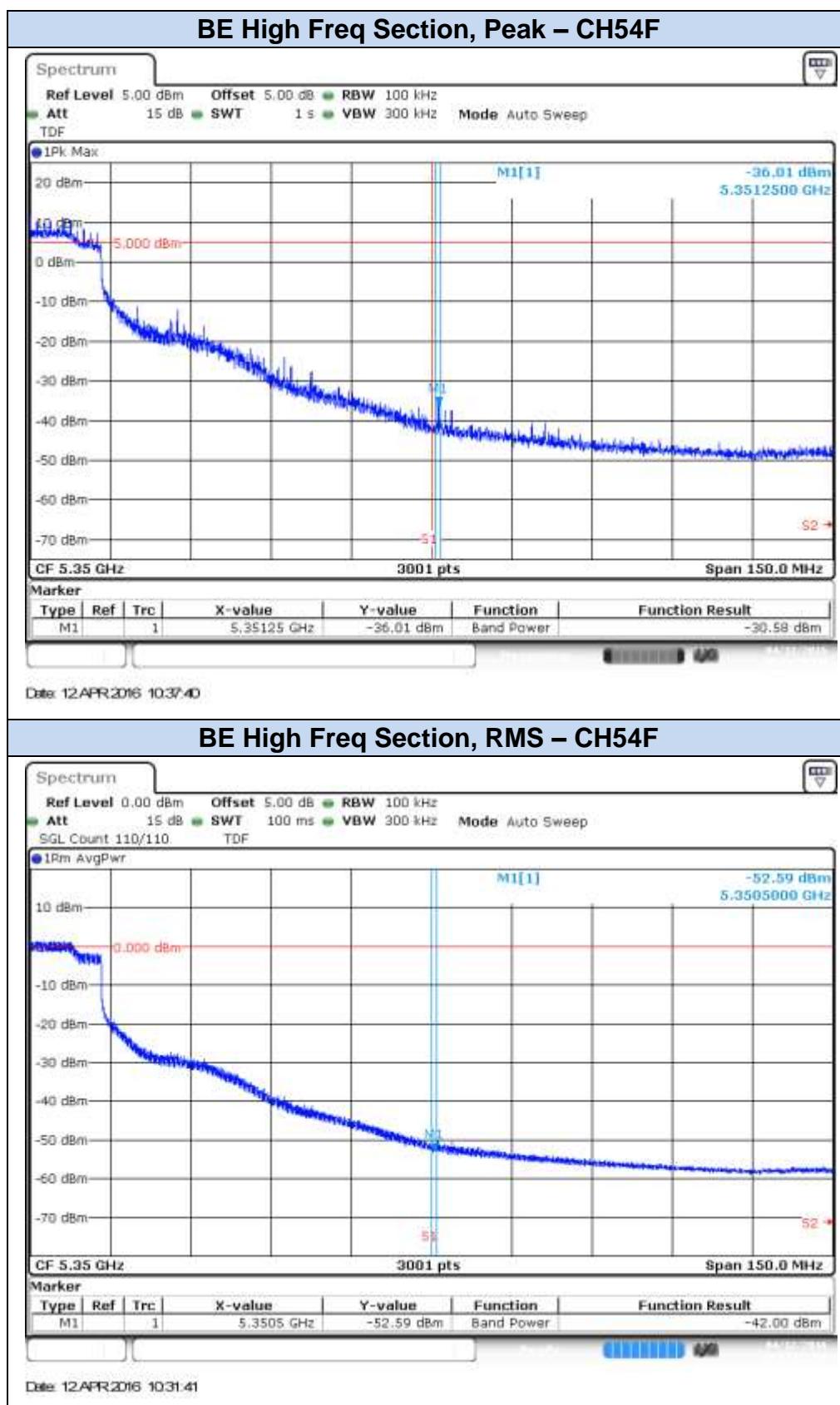


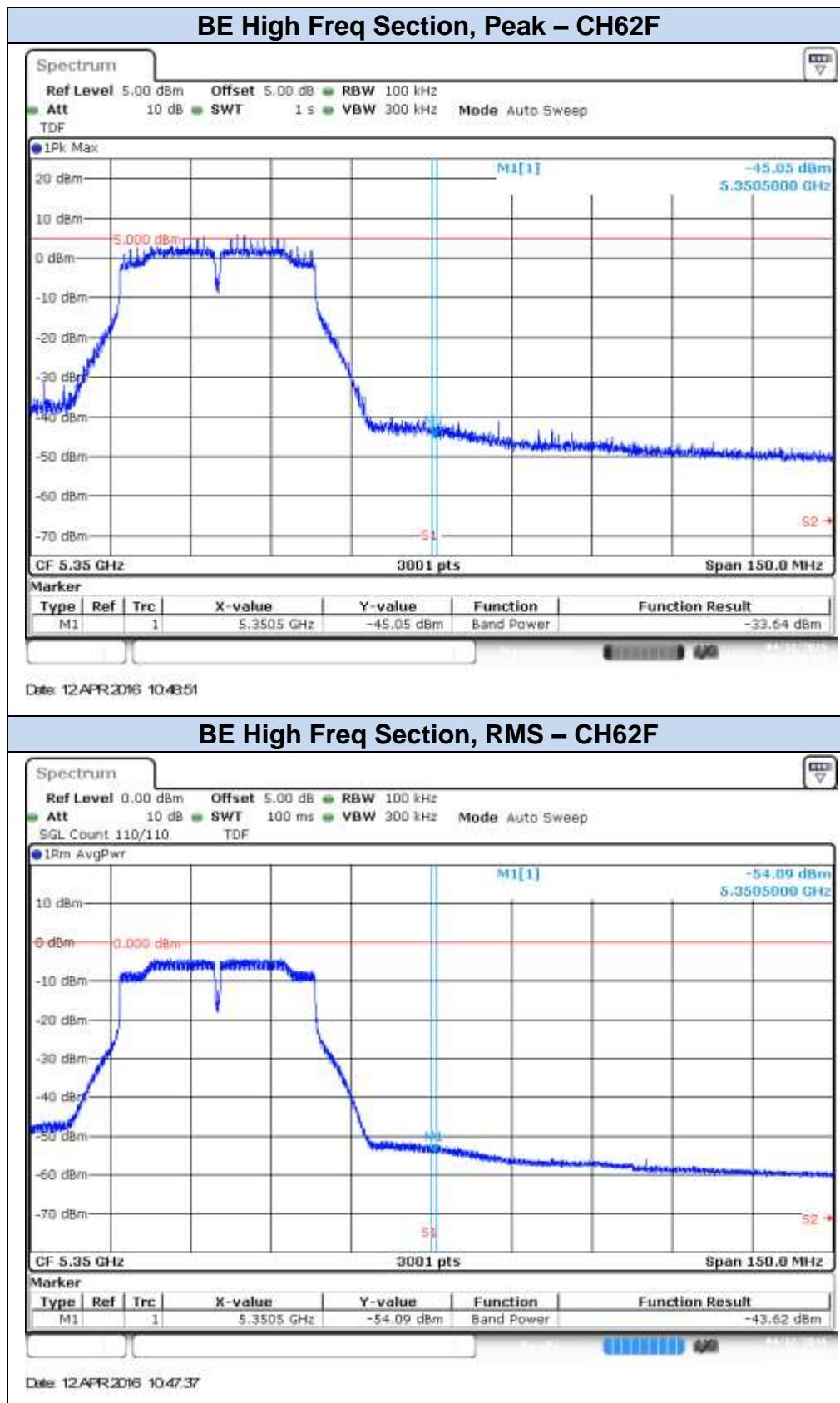
802.11n40, HT0 (SISO) – Chain A



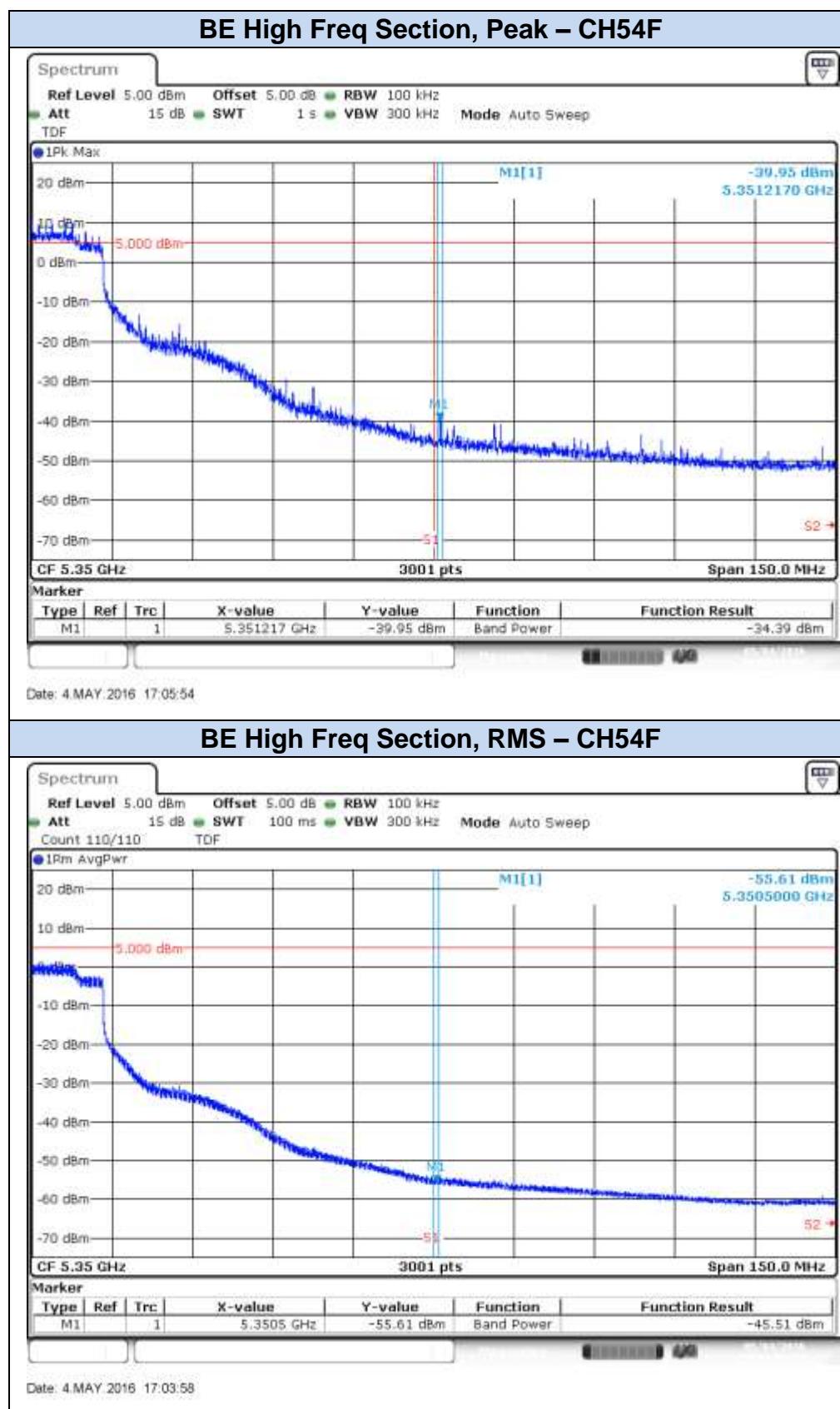


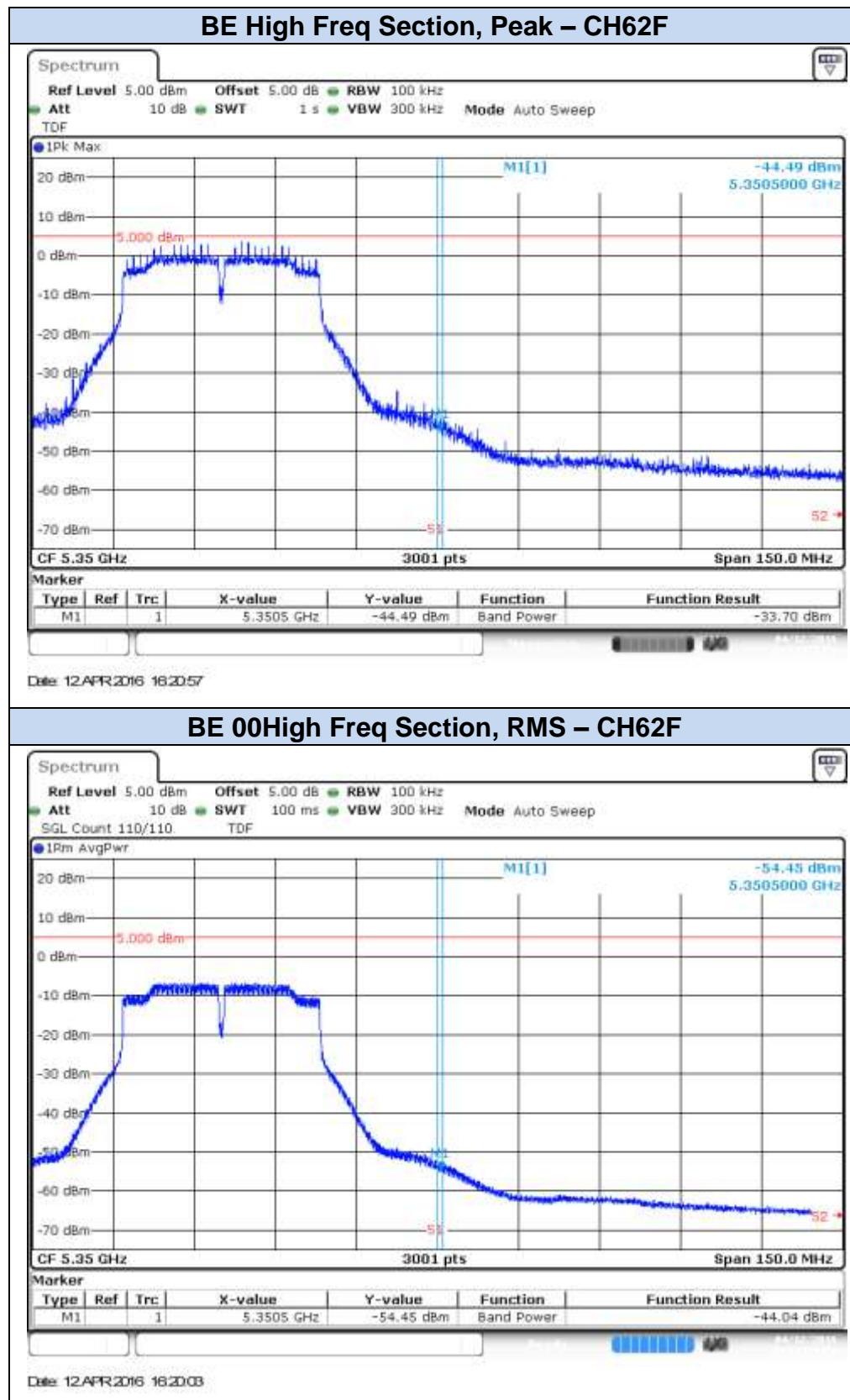
802.11n40, HT0 (SISO) – Chain B



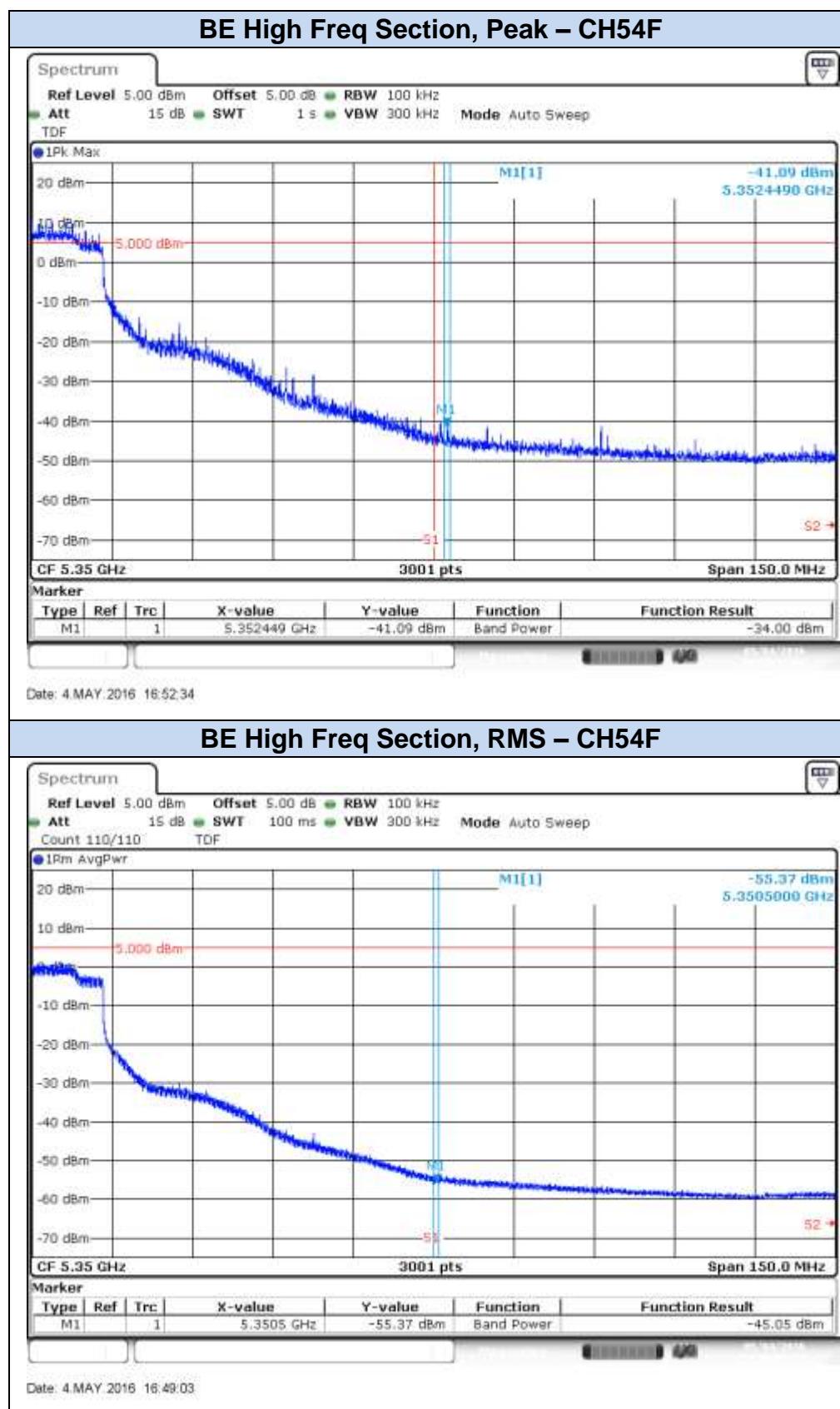


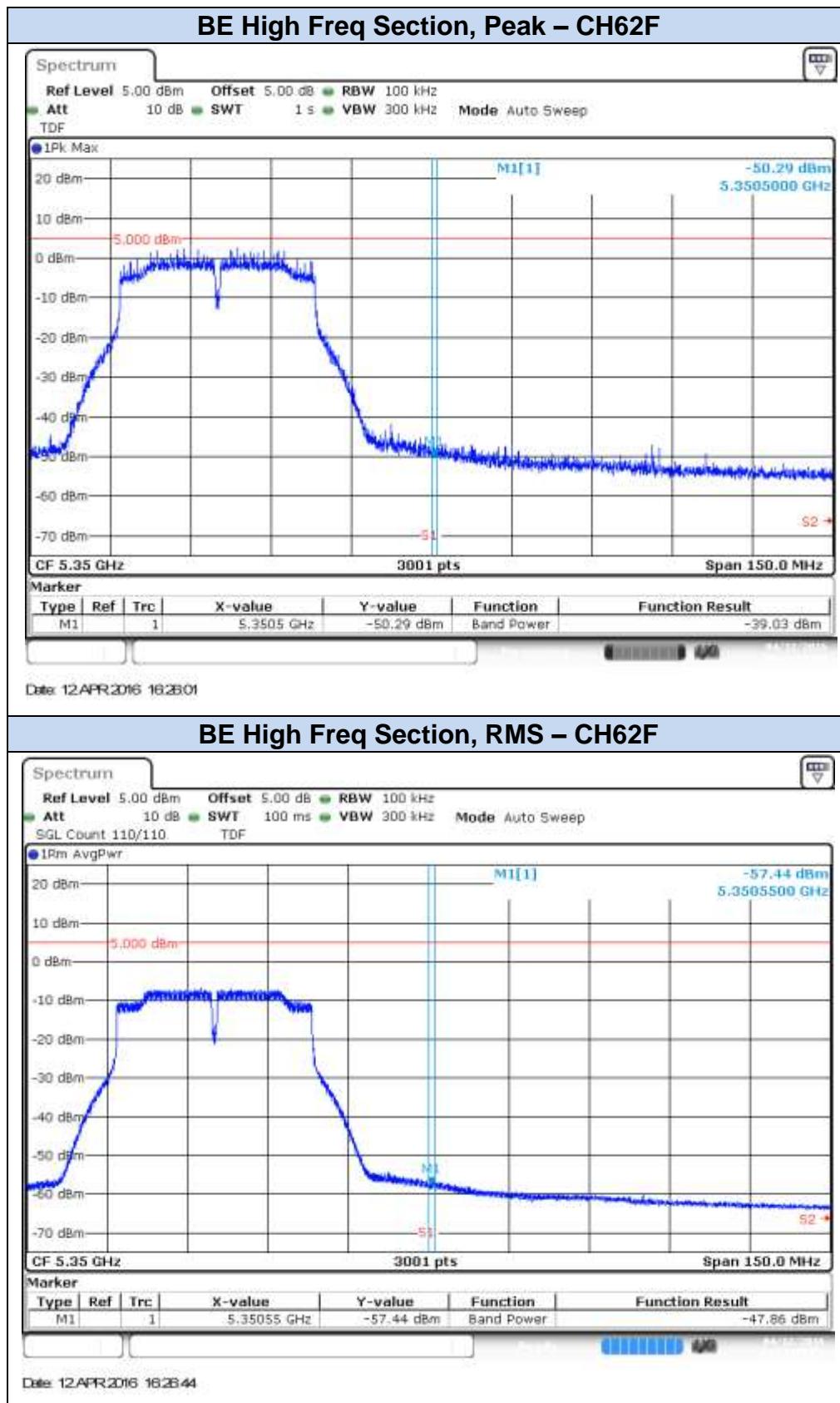
802.11n40, HT8 (MIMO) – Chain A



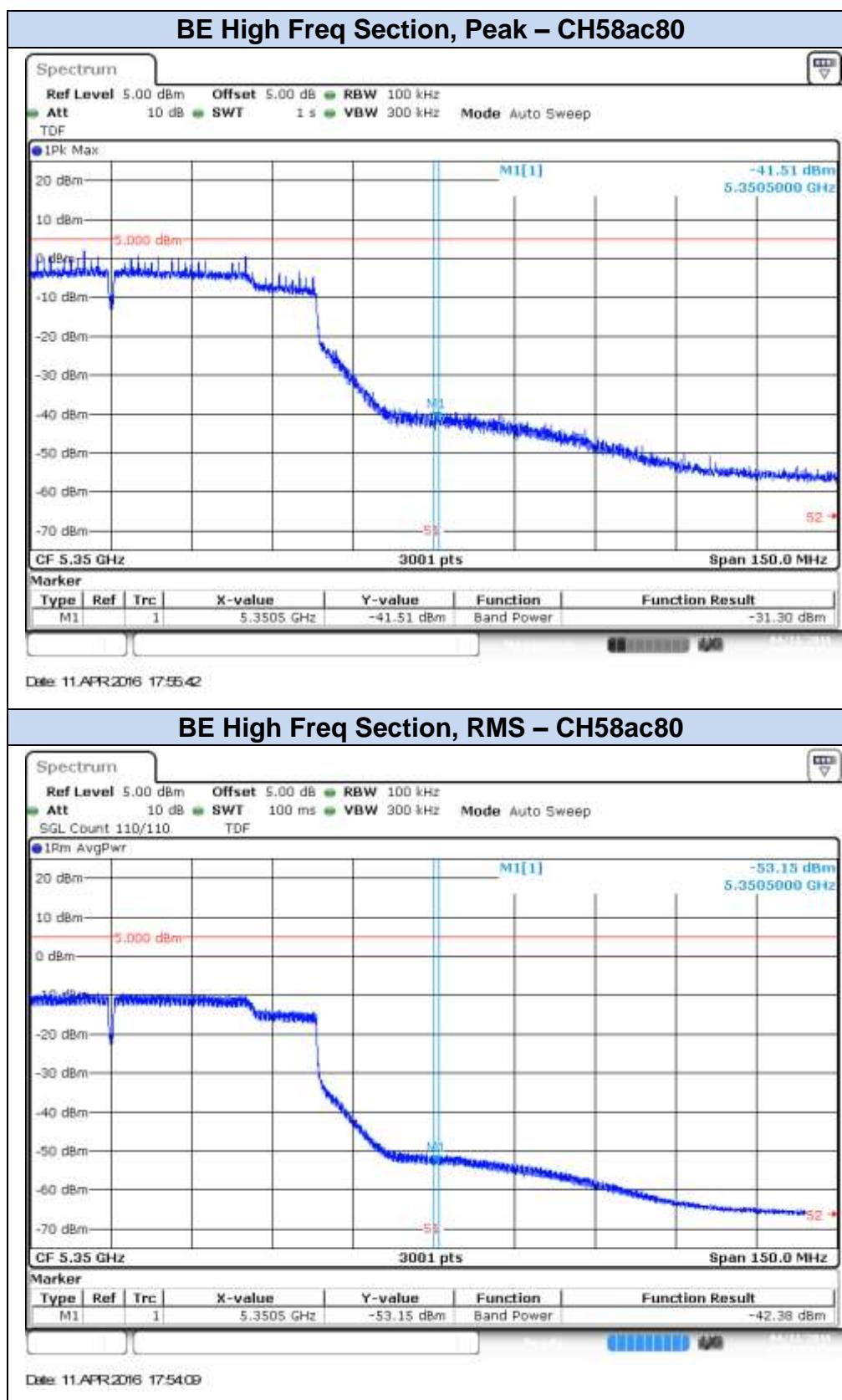


802.11n40, HT8 (MIMO) – Chain B

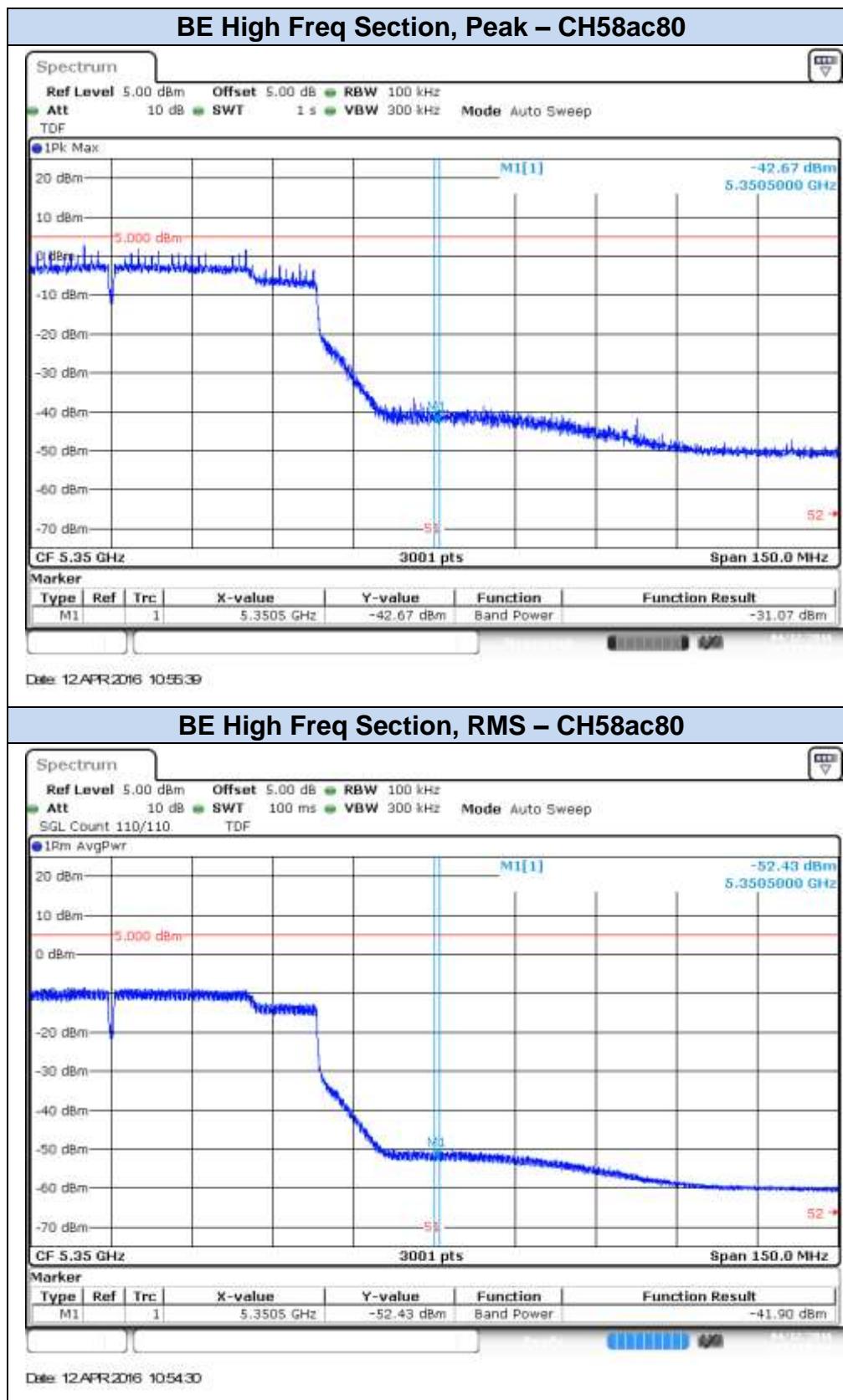




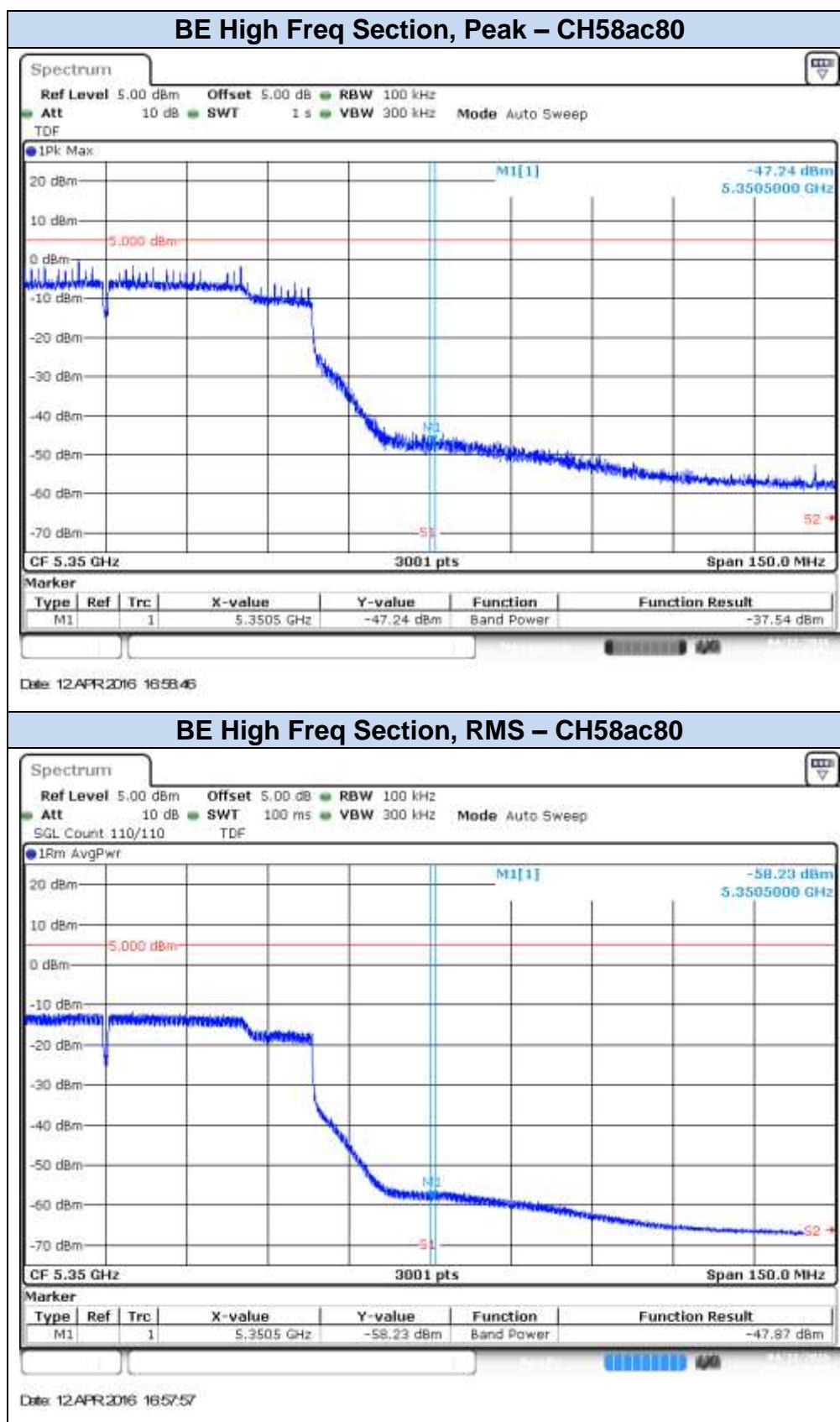
802.11ac80, VHT0 (SISO)- Chain A



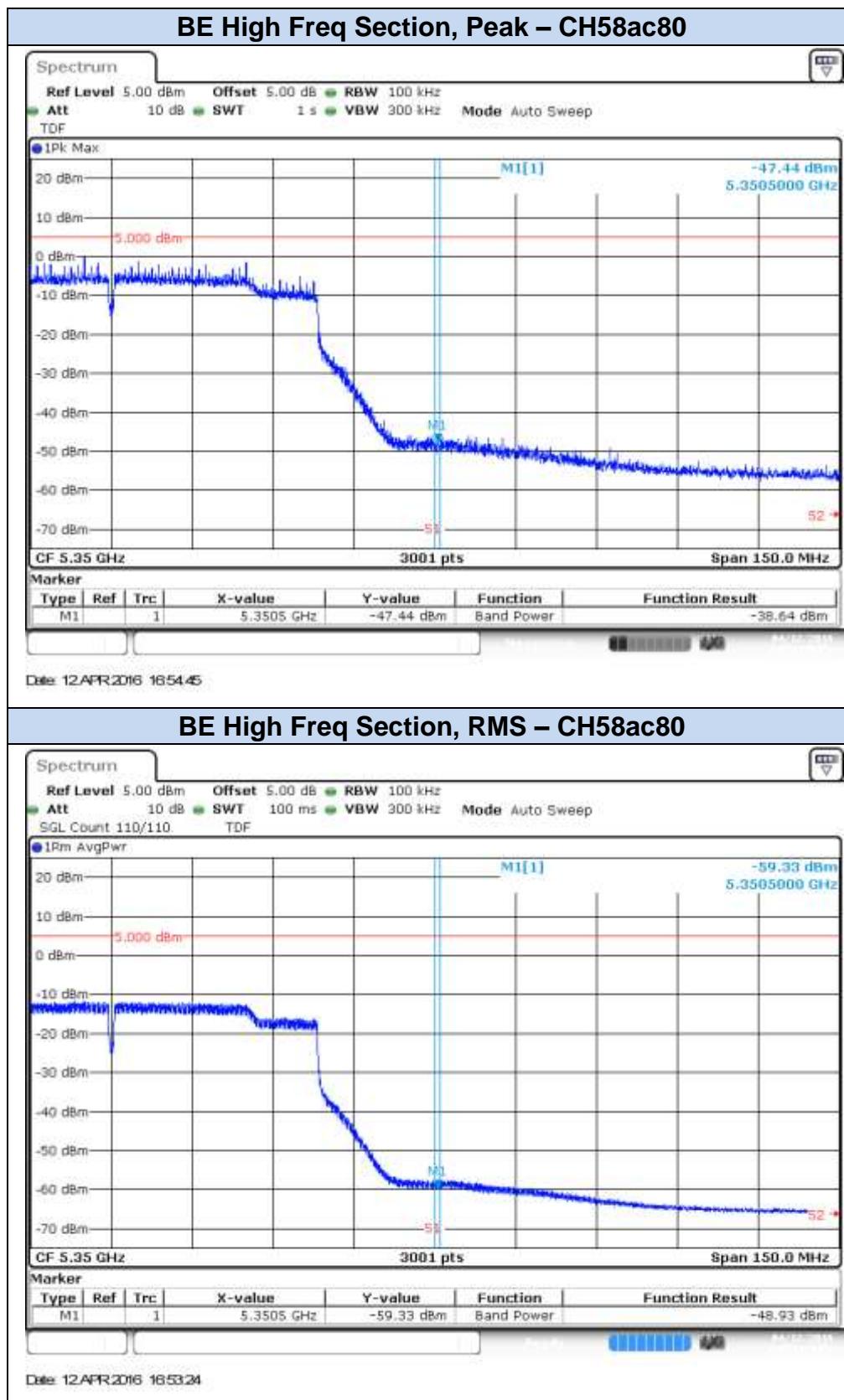
802.11ac80, VHT0 (SISO)- Chain B



802.11ac80, VHT0 (MIMO)- Chain A



802.11ac80, VHT0 (MIMO)- Chain B



C.4 Radiated spurious emission

Standard references:

FCC part	Limits			
	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):			
15.407 (b) (2)	Freq Range (MHz)	Field Strength ($\mu\text{V/m}$)	Field Strength ($\text{dB}\mu\text{V/m}$)	Meas. Distance (m)
15.209	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

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. 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.

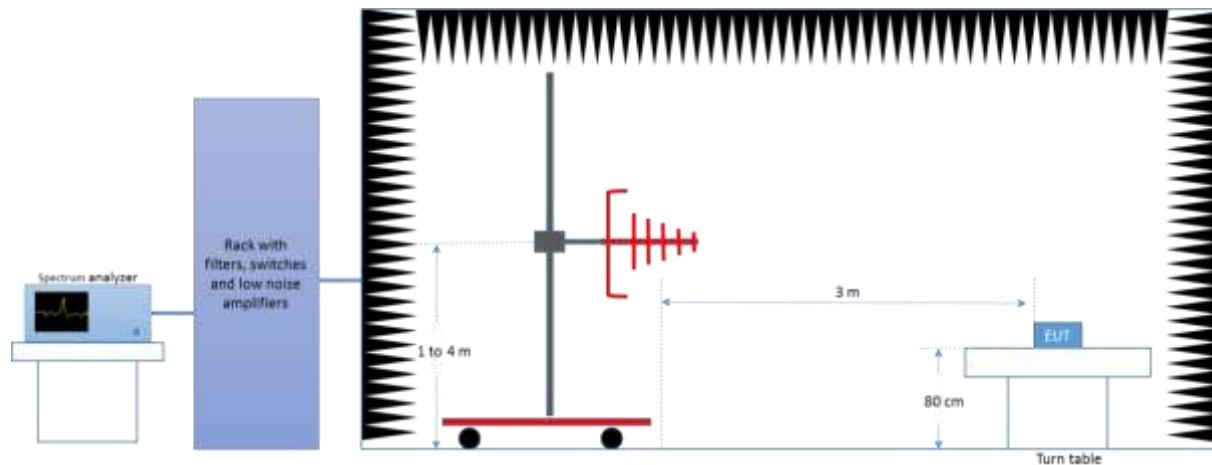
Test procedure:

The below setups were used to measure the radiated spurious emissions.

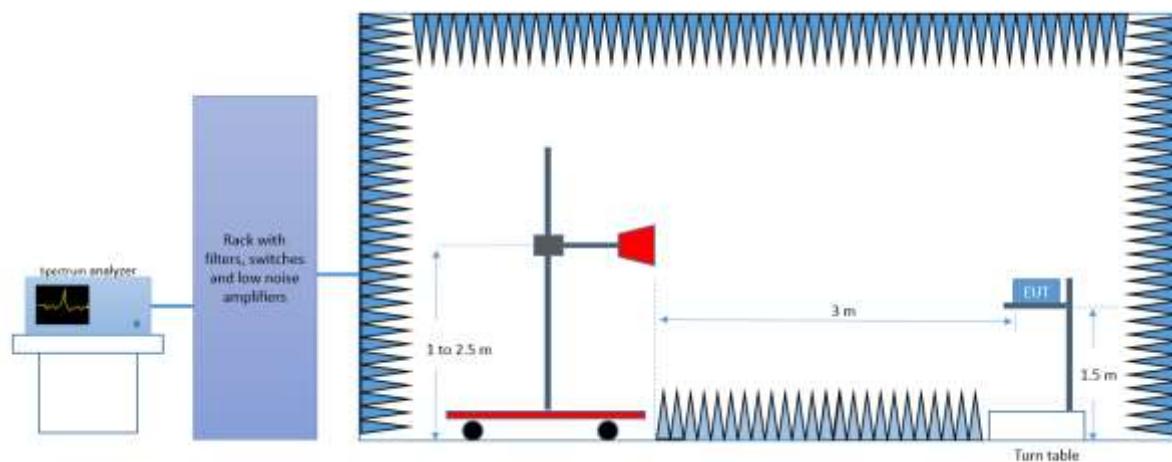
Depending of the frequency range and bands being tested, different antennas and filters were used. The final measurement is done by varying the antenna height, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

The radiated spurious emissions were measured on the worst case configuration selected from the chapter C.2 and using the lowest, middle and highest channels.

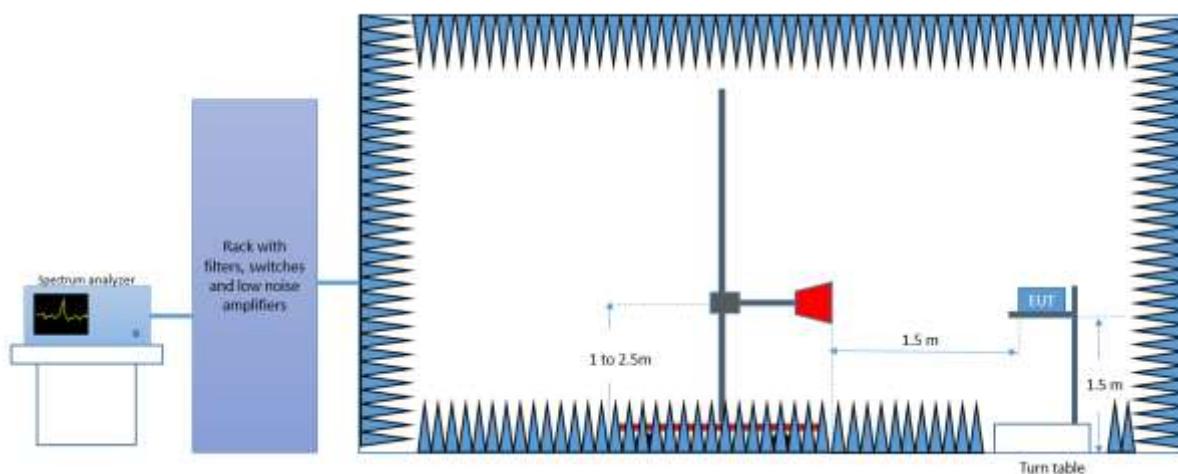
Radiated Setup < 1GHz



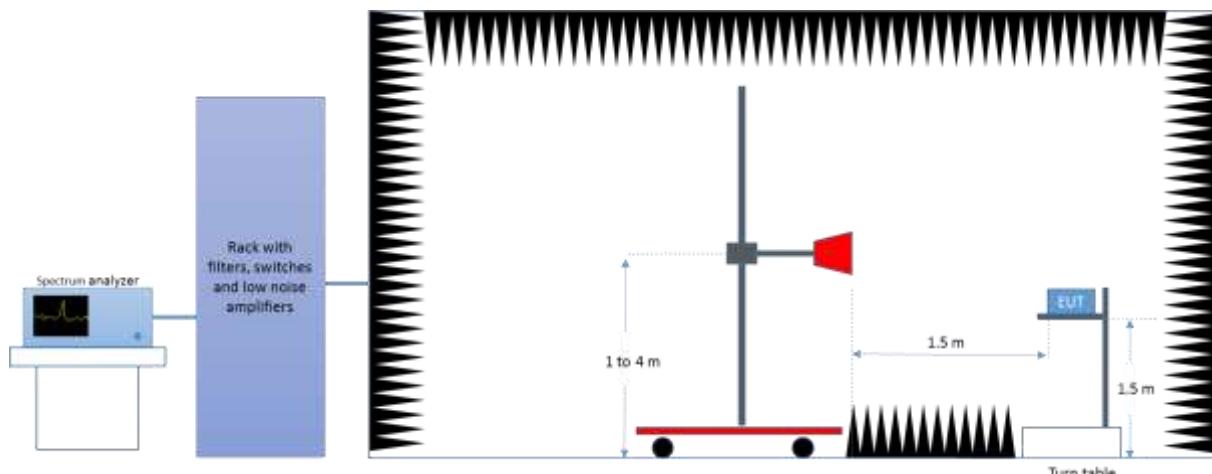
Radiated Setup 1 GHz - 18 GHz

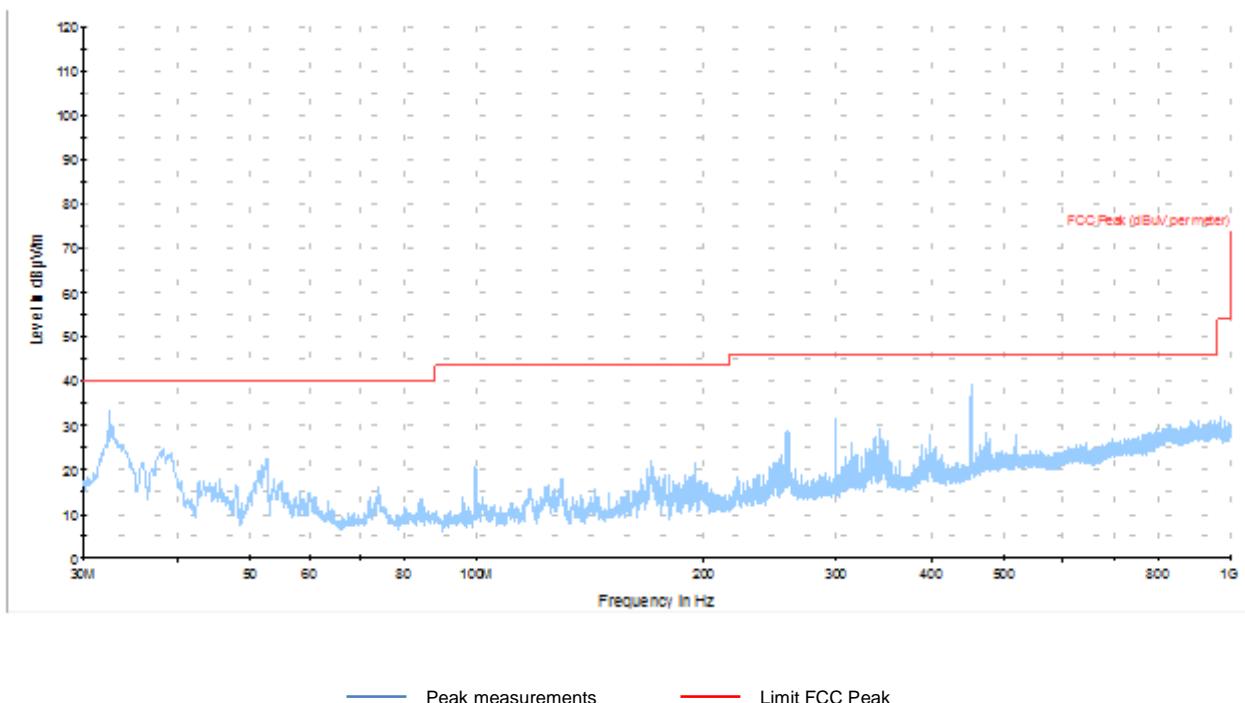


Radiated Setup 18 GHz - 26.5 GHz



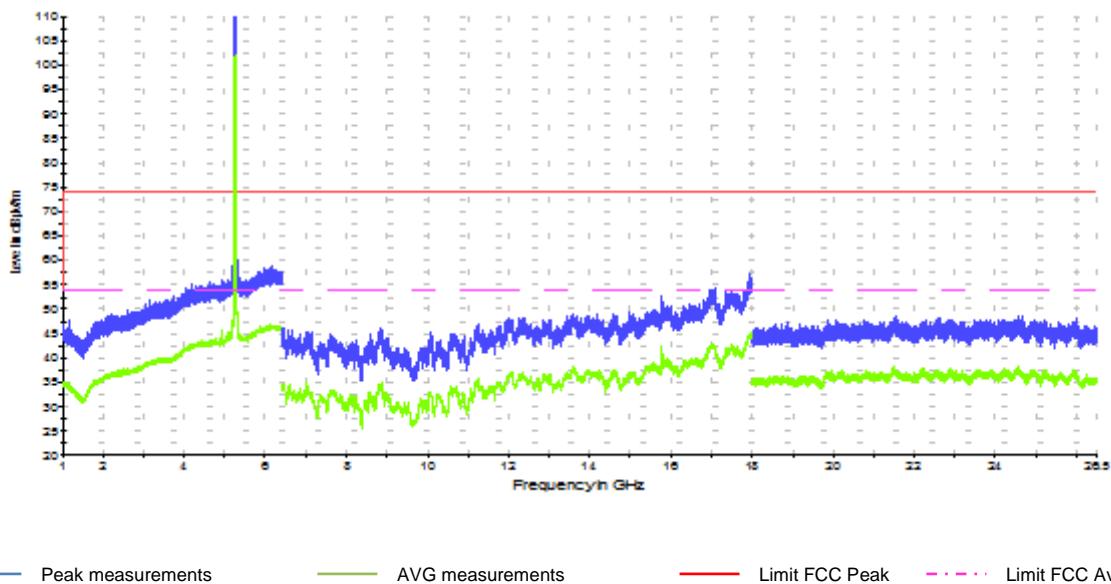
Radiated Setup > 26.5 GHz



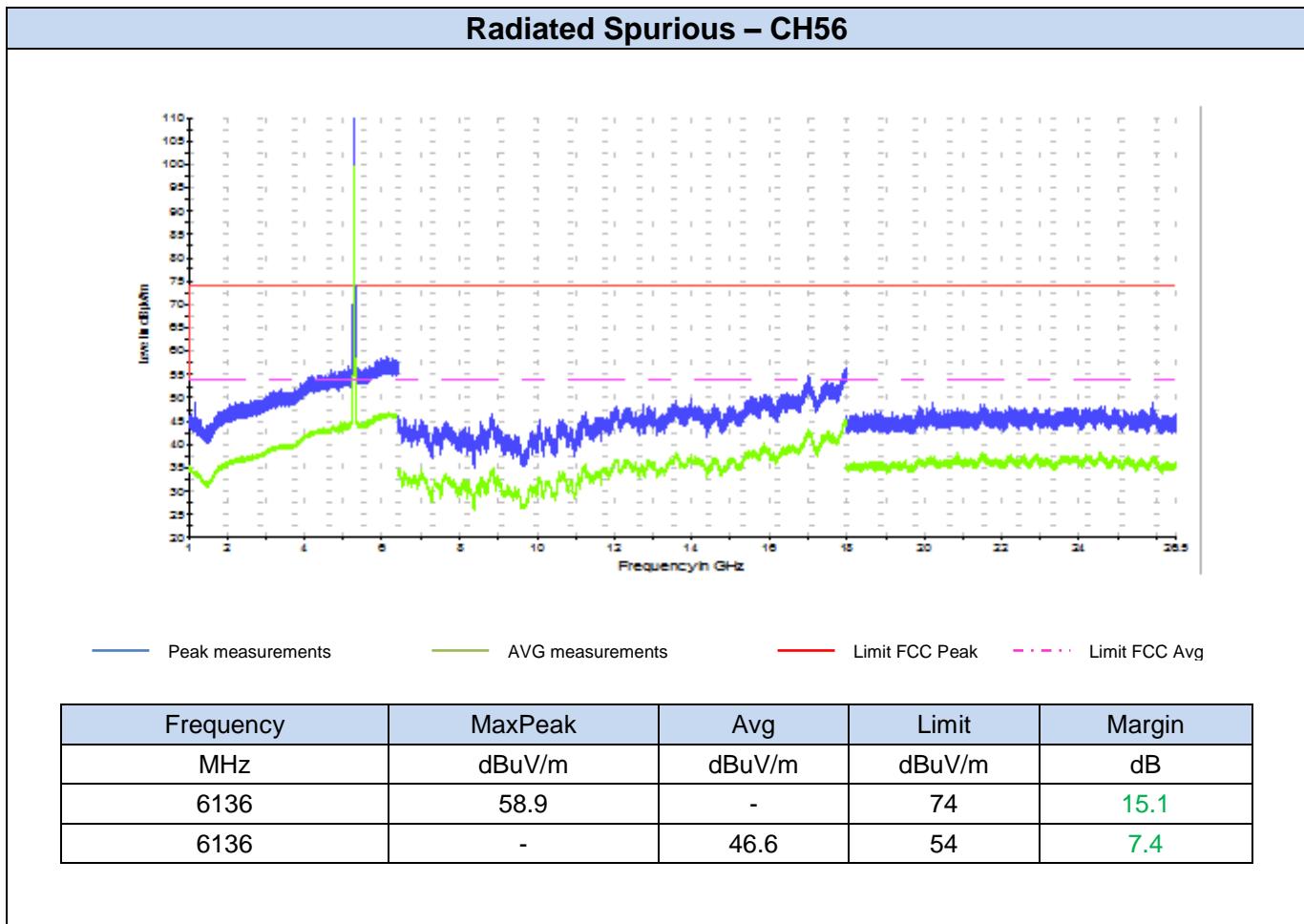
Test Results:**Radiated Spurious – 30MHz to 1GHz****Radiated Spurious – All modes**

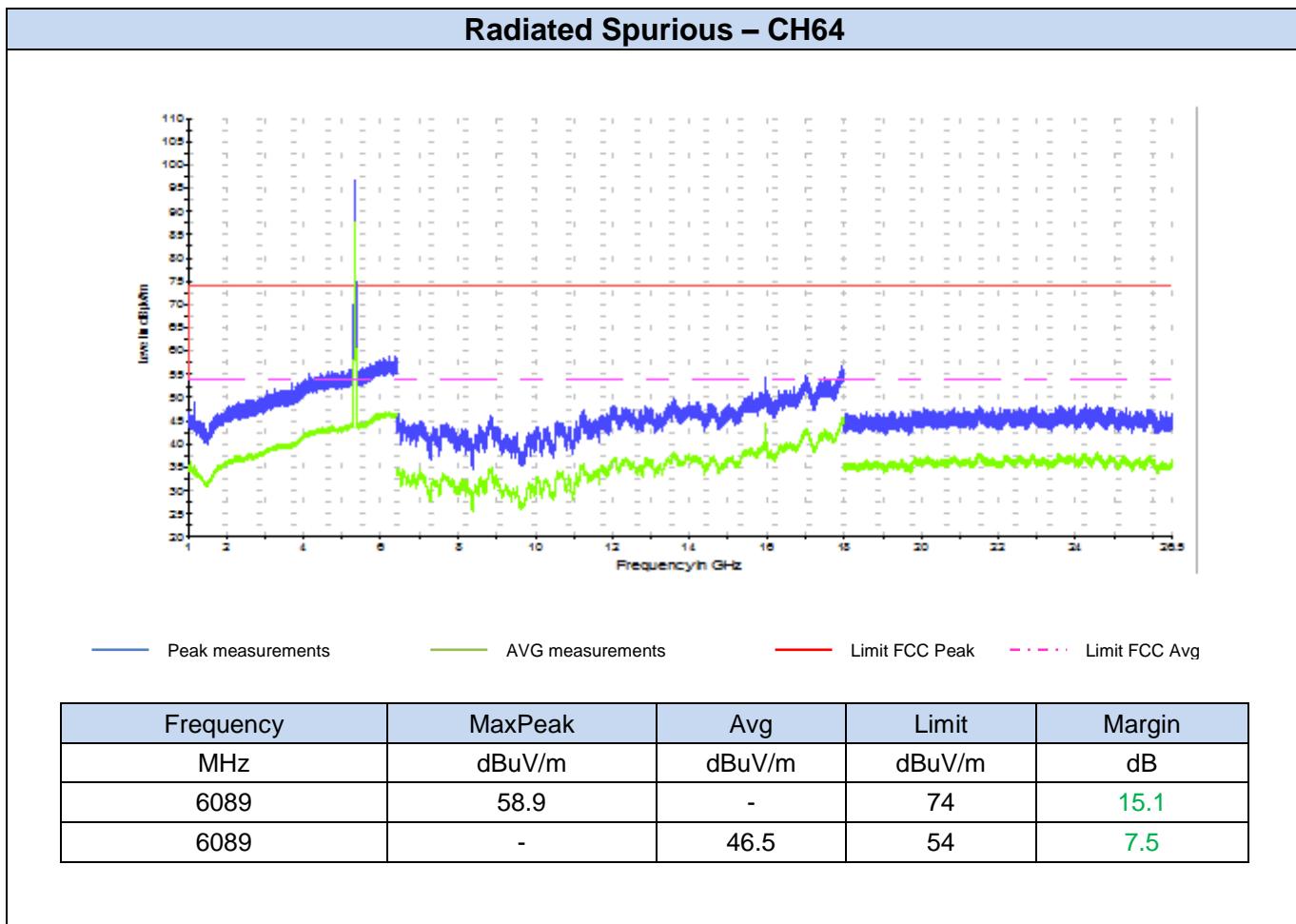
Frequency	MaxPeak	Limit	Margin
MHz	dBm	dBm	dB
454.61	39.36	46	6.64

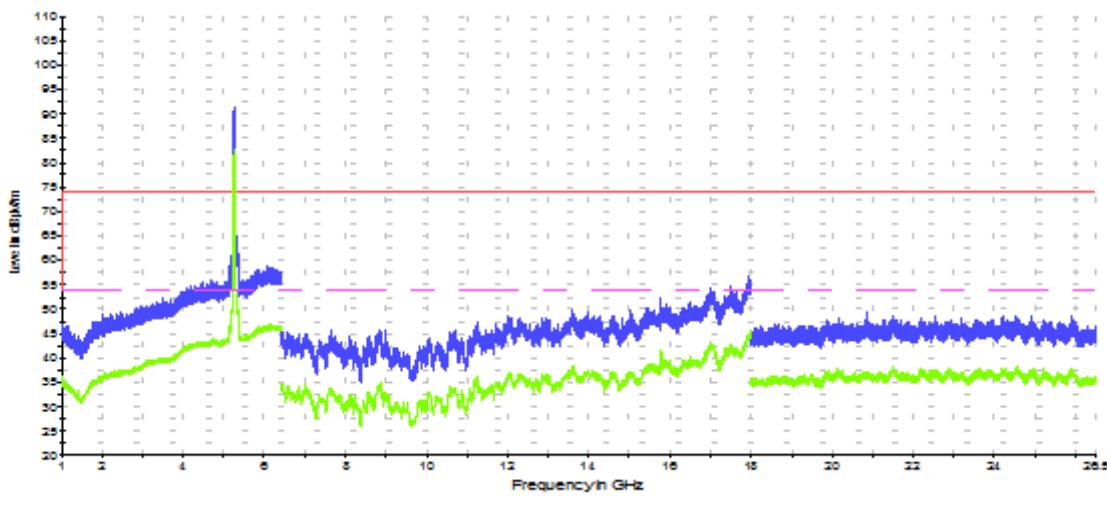
Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

1 GHz – 26.5GHz, 802.11a, Chain A**Radiated Spurious – CH52**

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
6167	59.1	-	74	14.9
6167	-	46.5	54	7.5

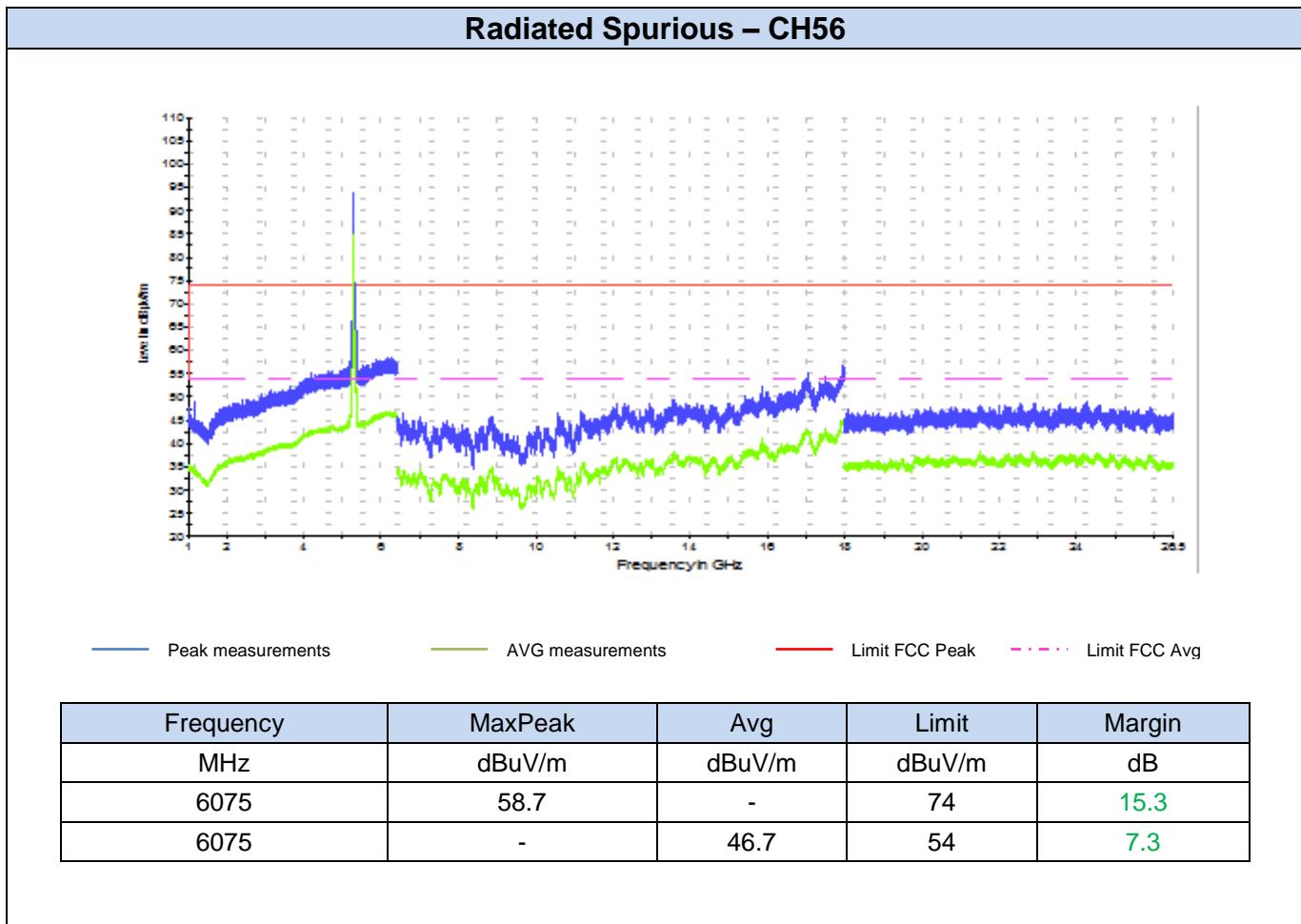


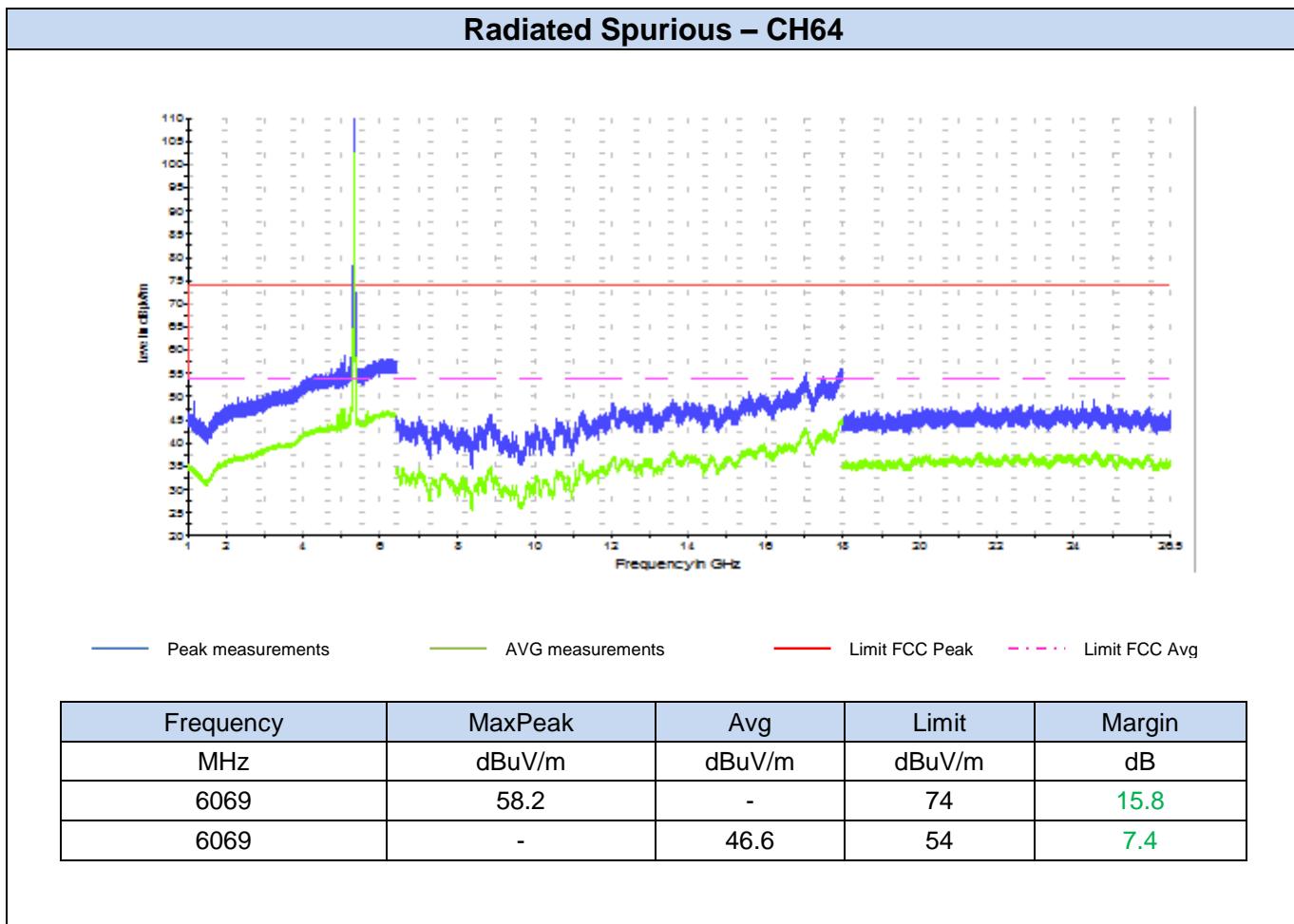


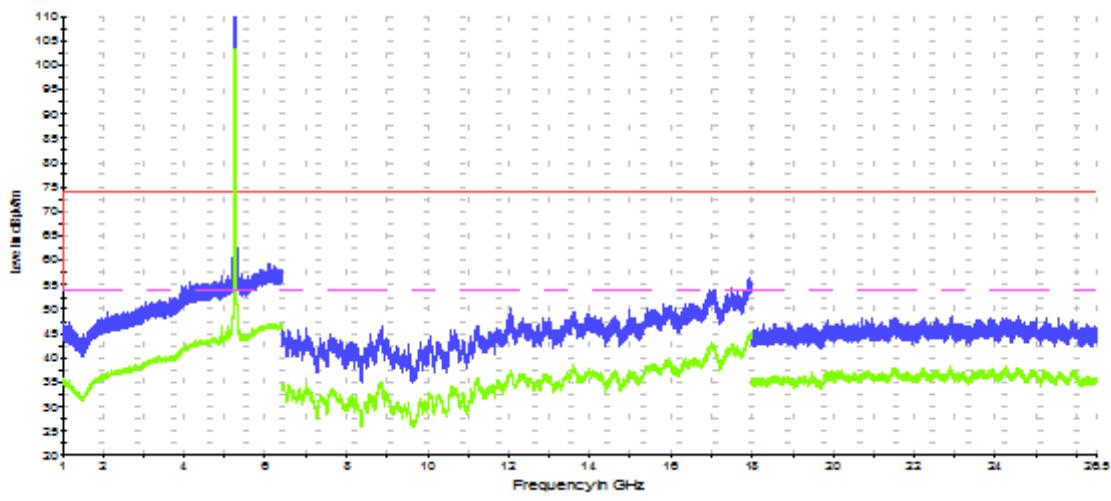
1 GHz – 26.5GHz, 802.11a, Chain B**Radiated Spurious – CH52**

— Peak measurements — AVG measurements — Limit FCC Peak - - - Limit FCC Avg

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
6053	58.7	-	74	15.3
6053	-	46.4	54	7.6

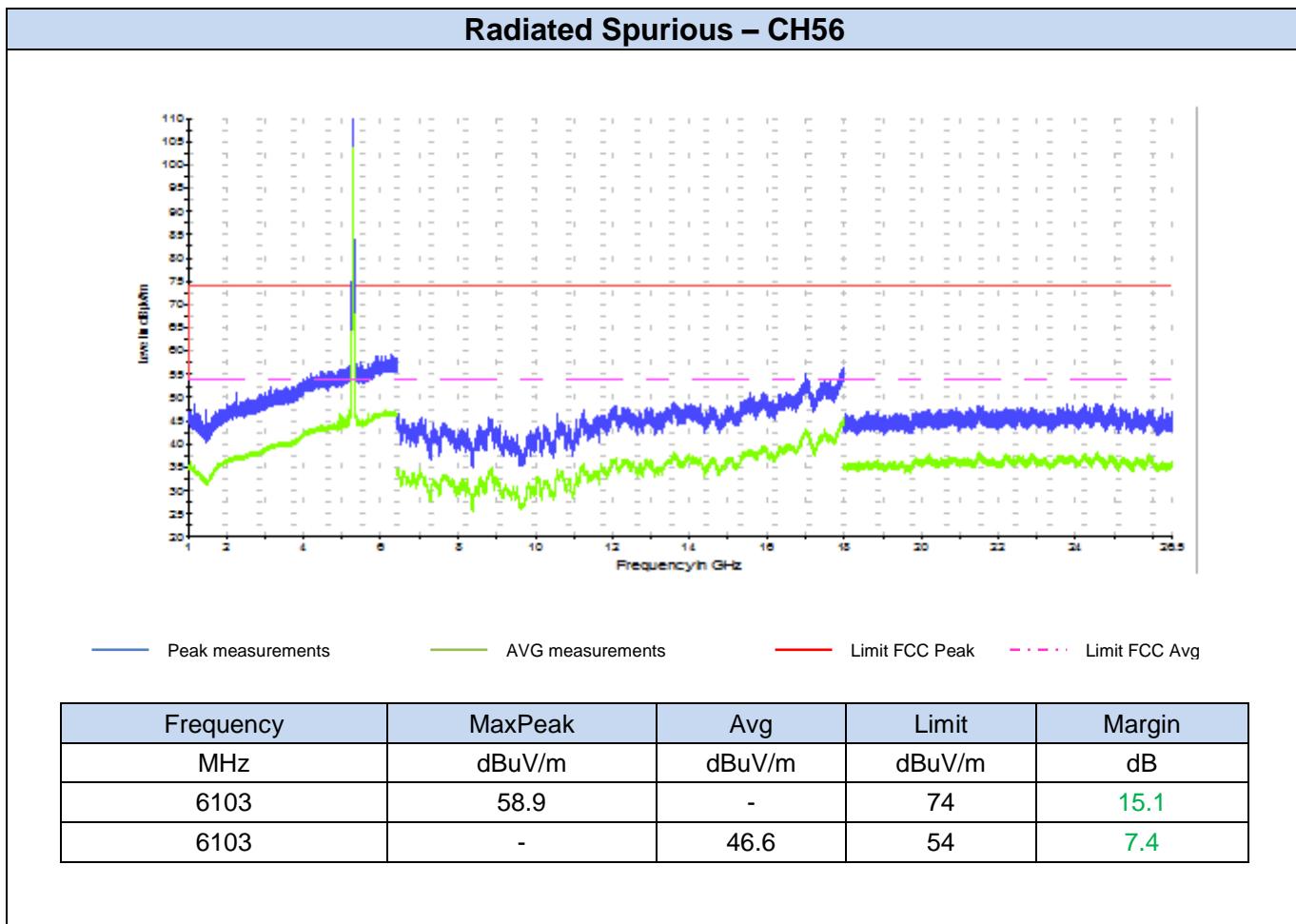


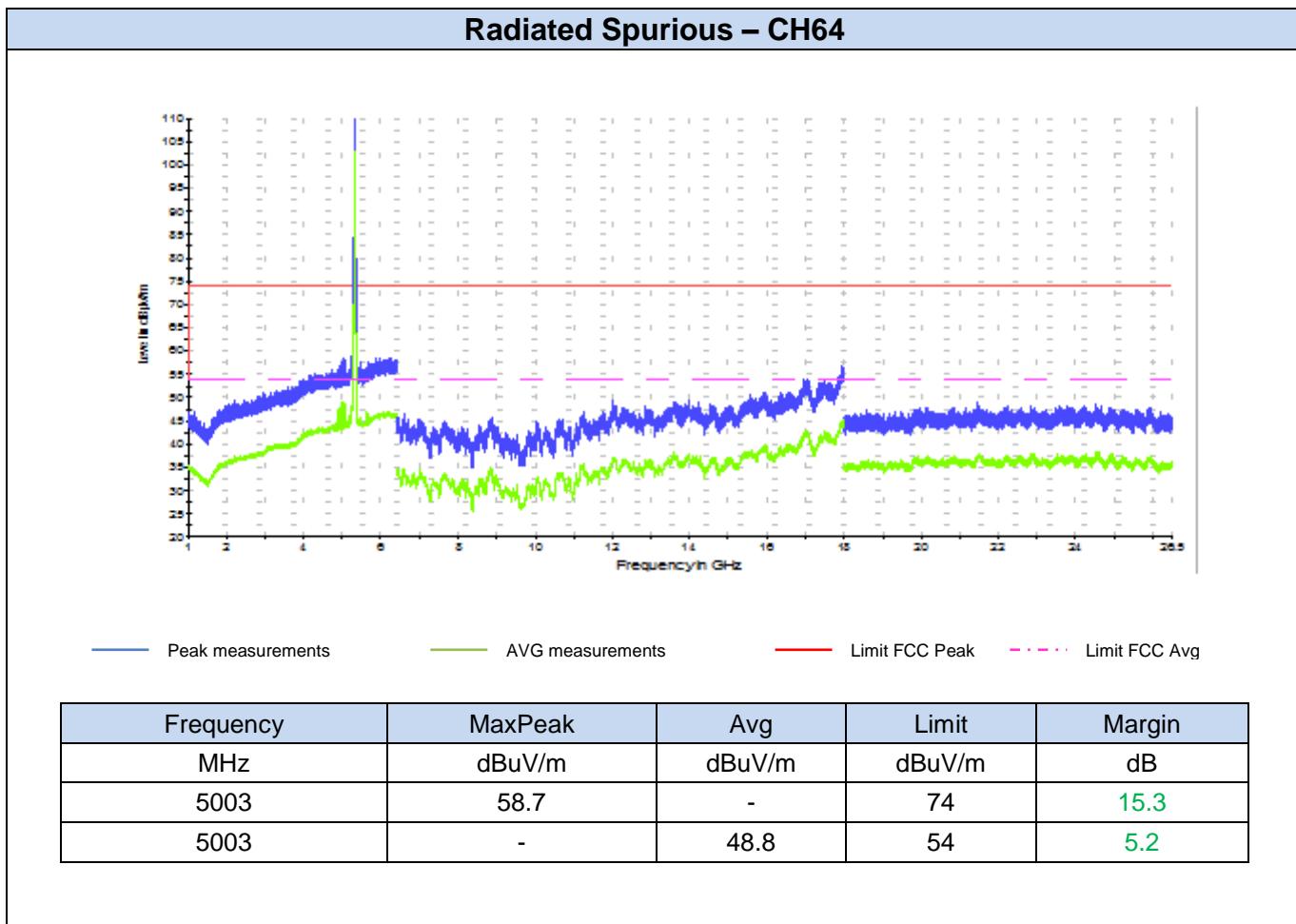


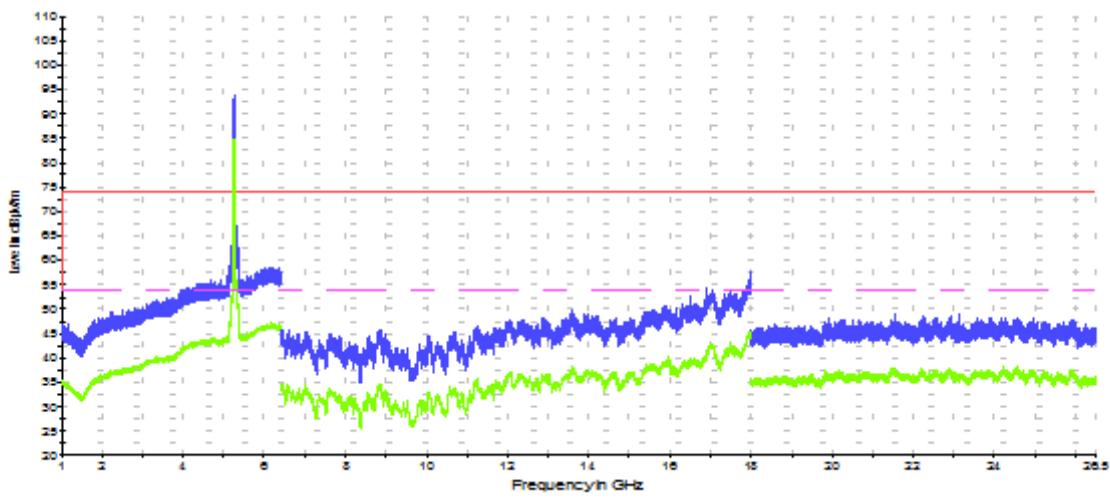
1 GHz – 26.5GHz, 802.11n20, Chain A**Radiated Spurious – CH52**

— Peak measurements — AVG measurements — Limit FCC Peak - - - - Limit FCC Avg

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
6129	59.3	-	74	14.7
6129	-	46.7	54	7.3

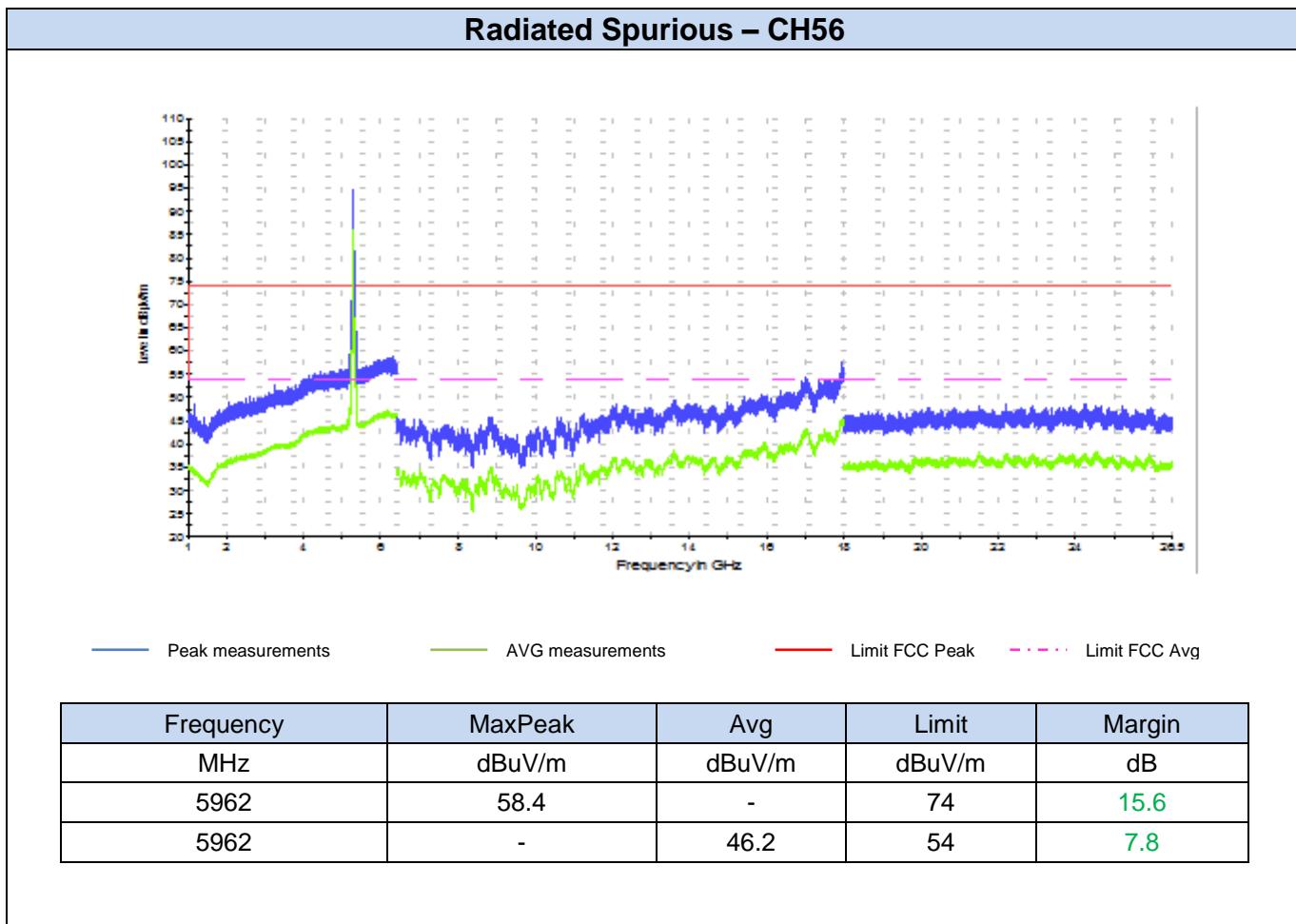


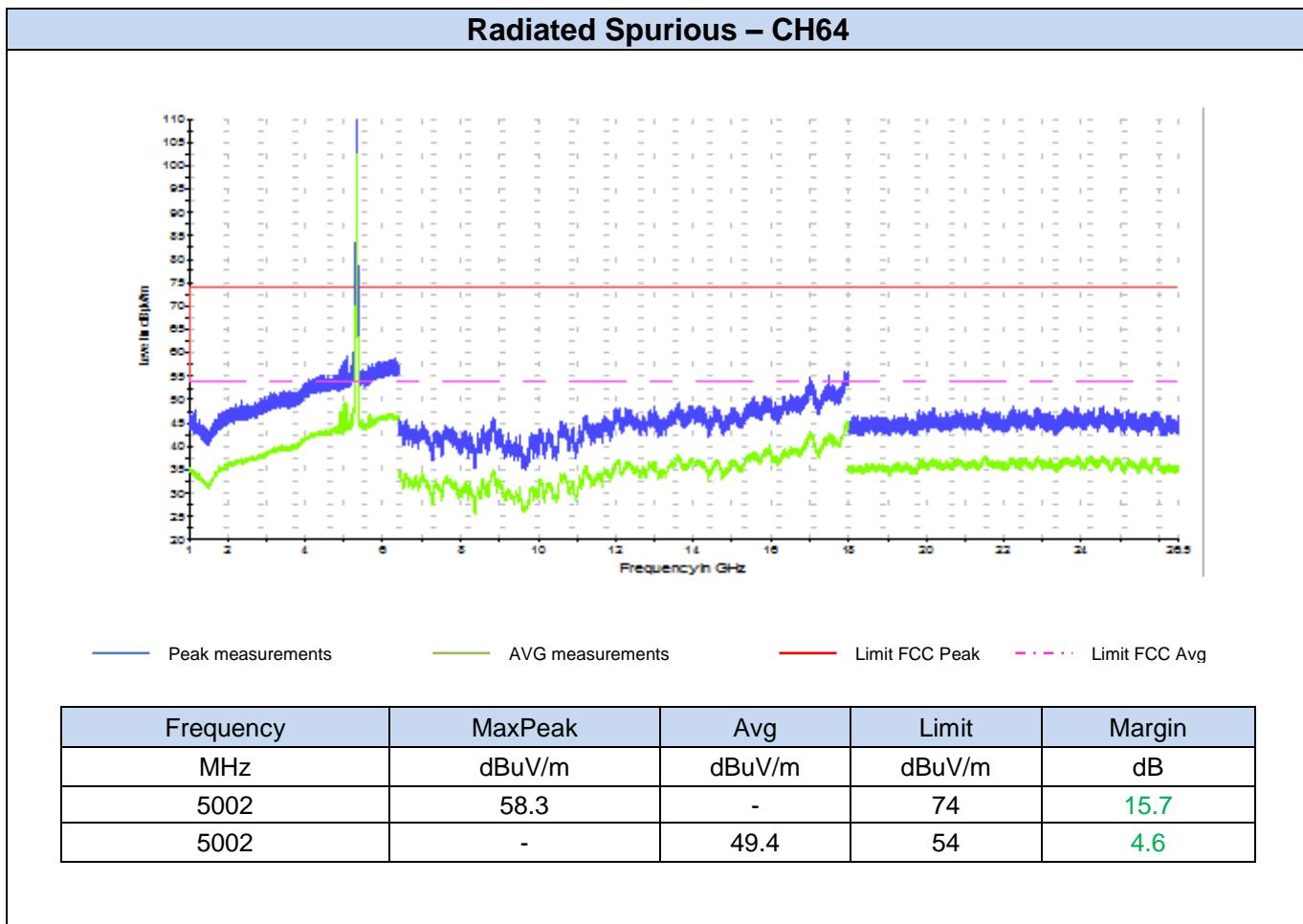


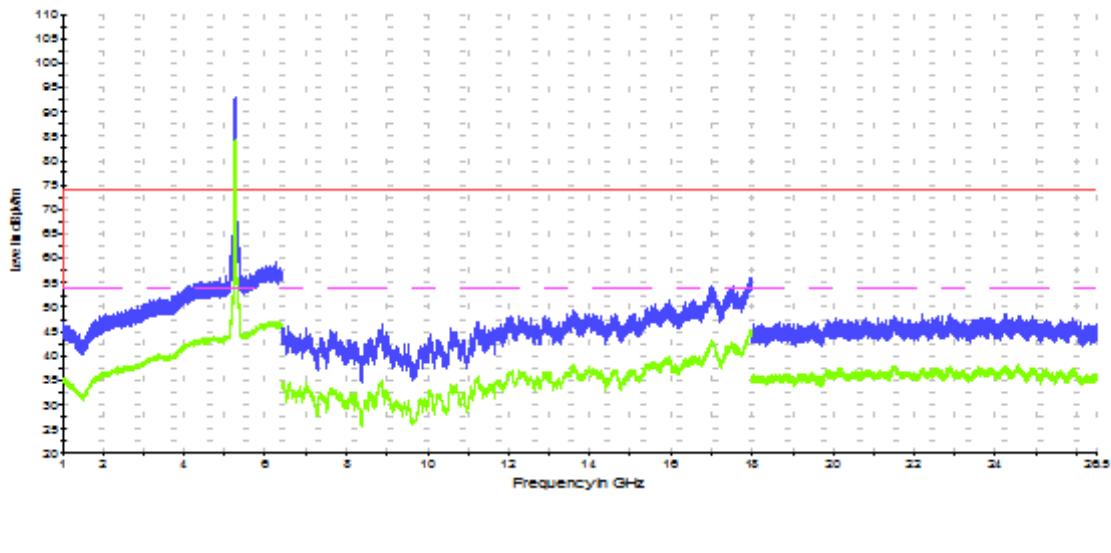
1 GHz – 26.5GHz, 802.11n20, Chain B**Radiated Spurious – CH52**

— Peak measurements — AVG measurements — Limit FCC Peak - - - - Limit FCC Avg

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
6023	58.5	-	74	15.5
6023	-	46.2	54	7.8

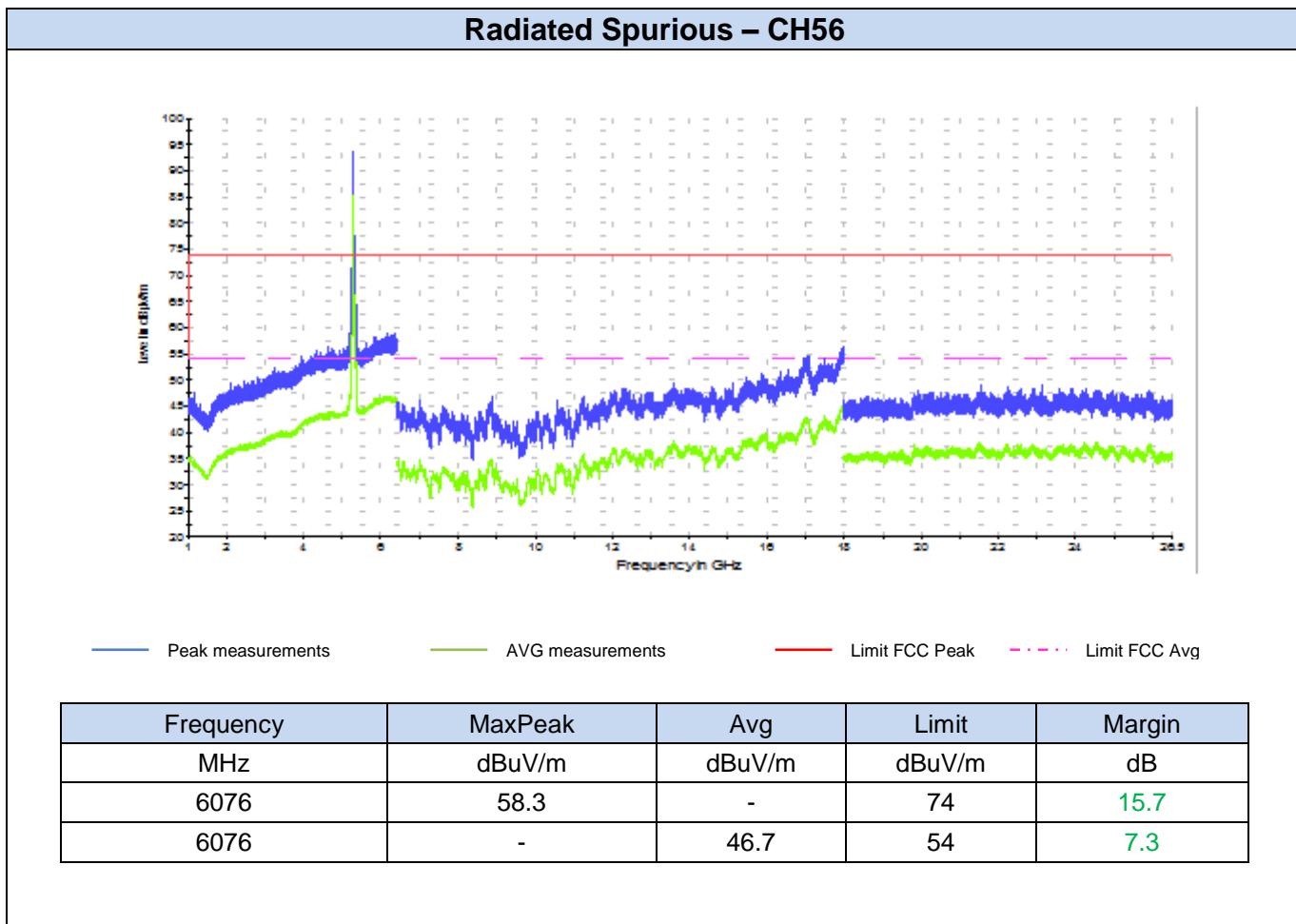


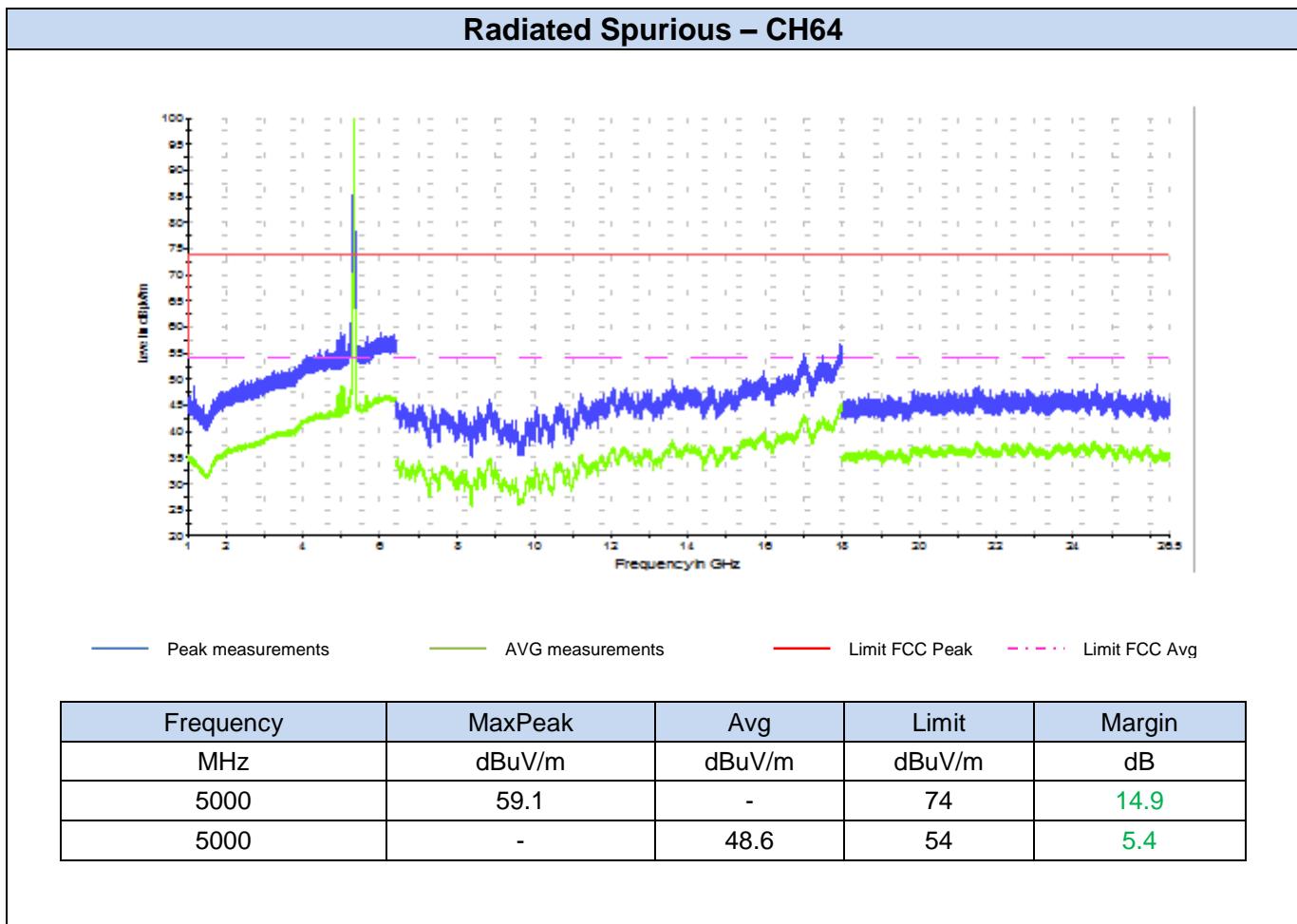


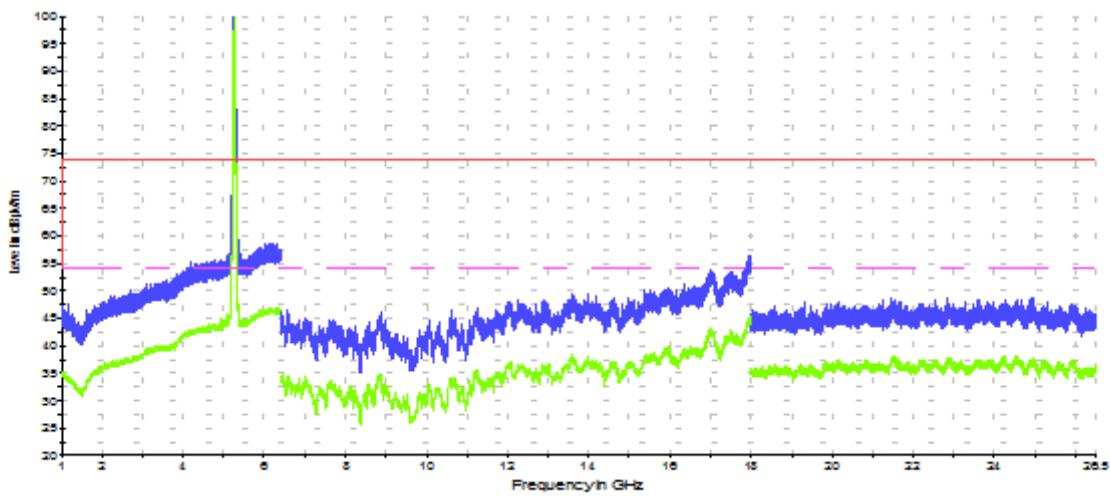
1 GHz – 26.5GHz, 802.11n20, Chain A+B**Radiated Spurious – CH52**

— Peak measurements — AVG measurements — Limit FCC Peak - - - Limit FCC Avg

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
6253	59.5	-	74	15.5
6253	-	46.5	54	7.5

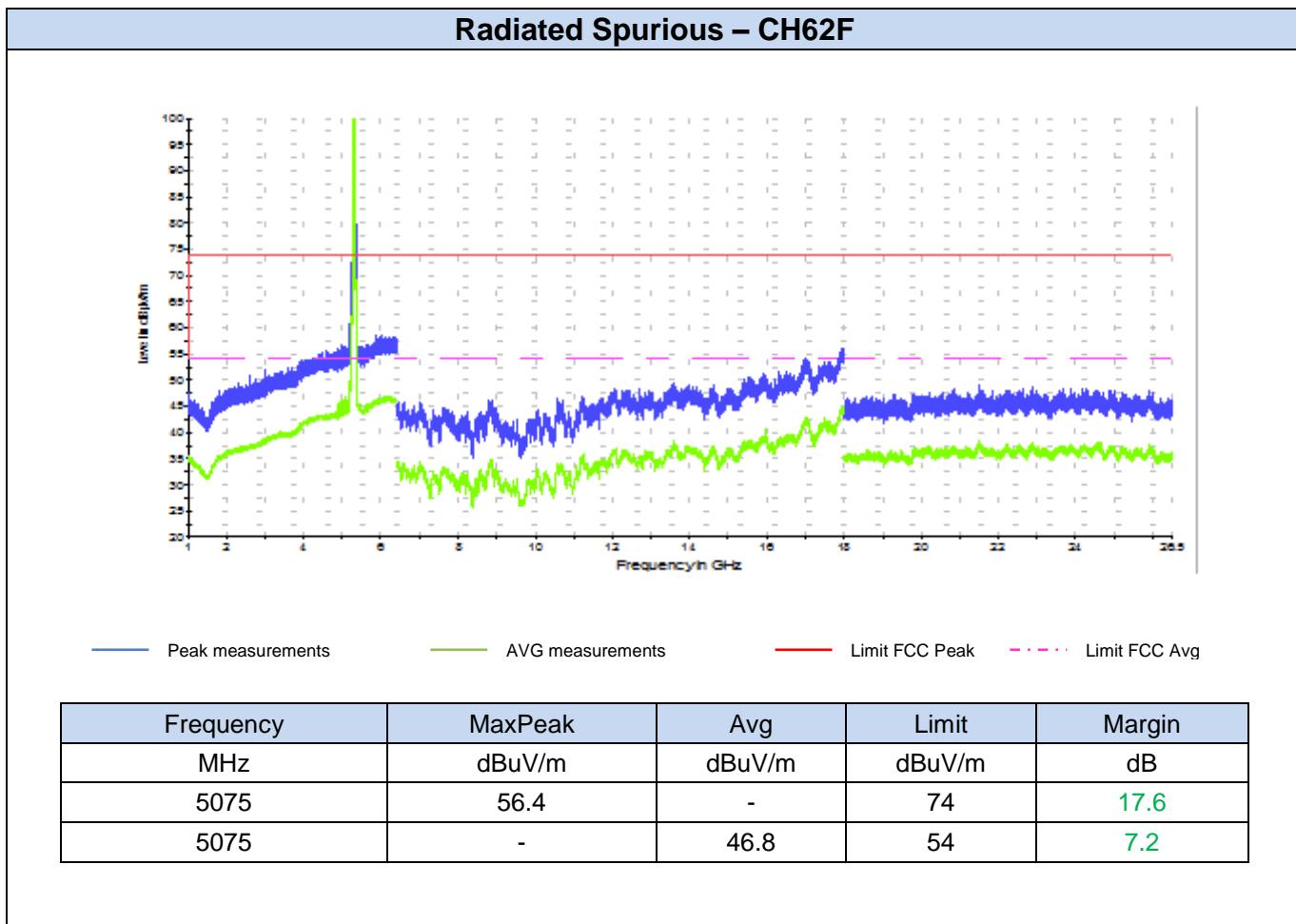


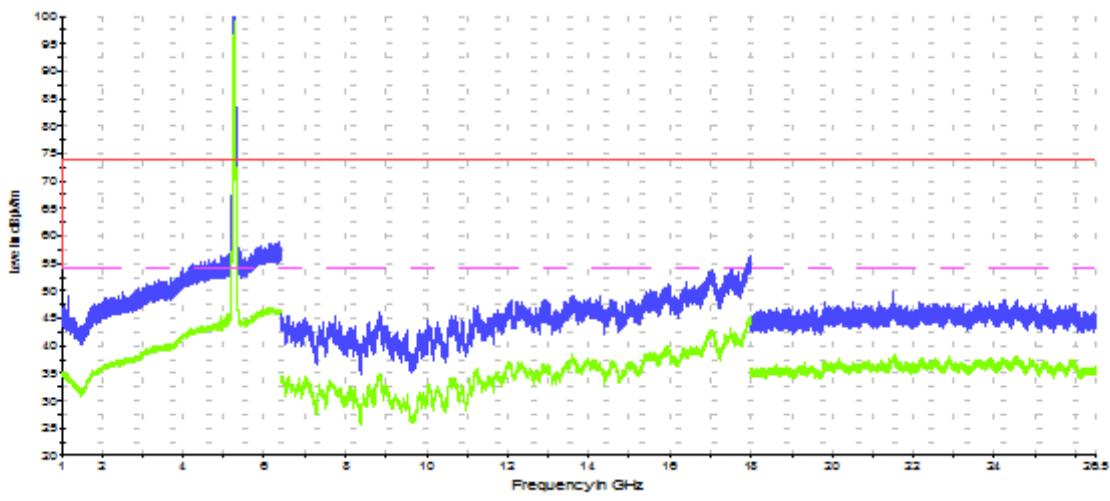


1 GHz – 26.5GHz, 802.11n40, Chain A**Radiated Spurious – CH54F**

— Peak measurements — AVG measurements — Limit FCC Peak - - - Limit FCC Avg

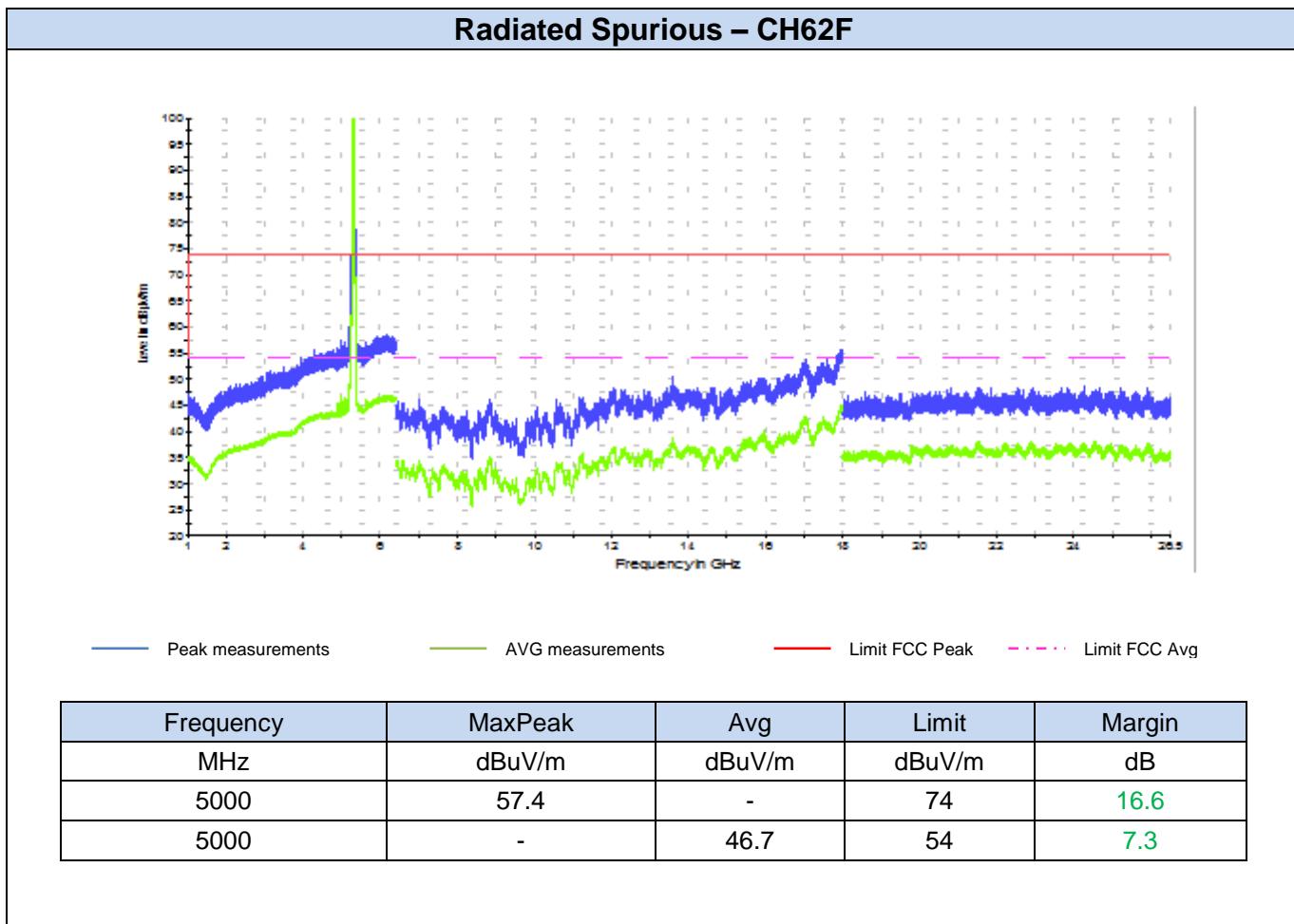
Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
6030	58.6	-	74	15.4
6030	-	46.3	54	7.7

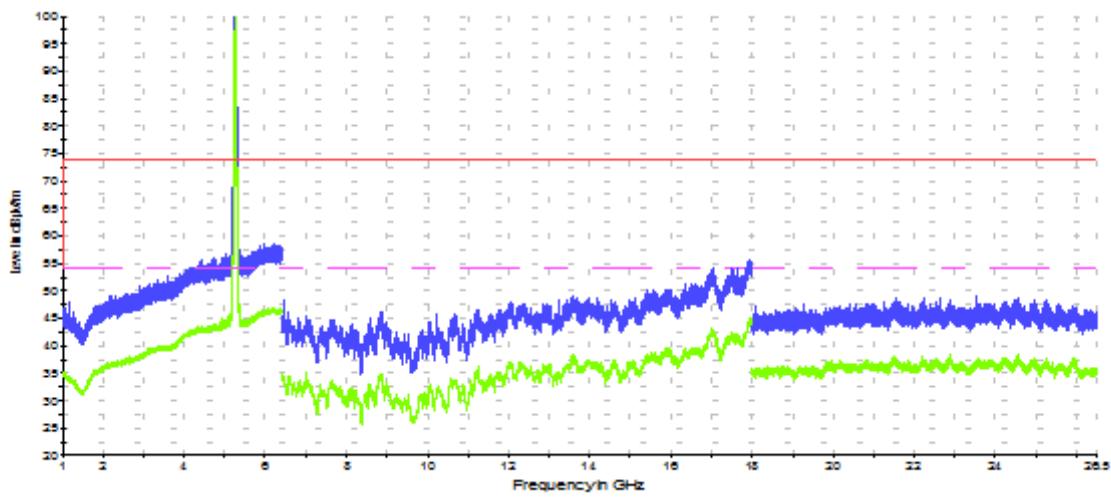


1 GHz – 26.5GHz, 802.11n40, Chain B**Radiated Spurious – CH54F**

— Peak measurements — AVG measurements — Limit FCC Peak - - - Limit FCC Avg

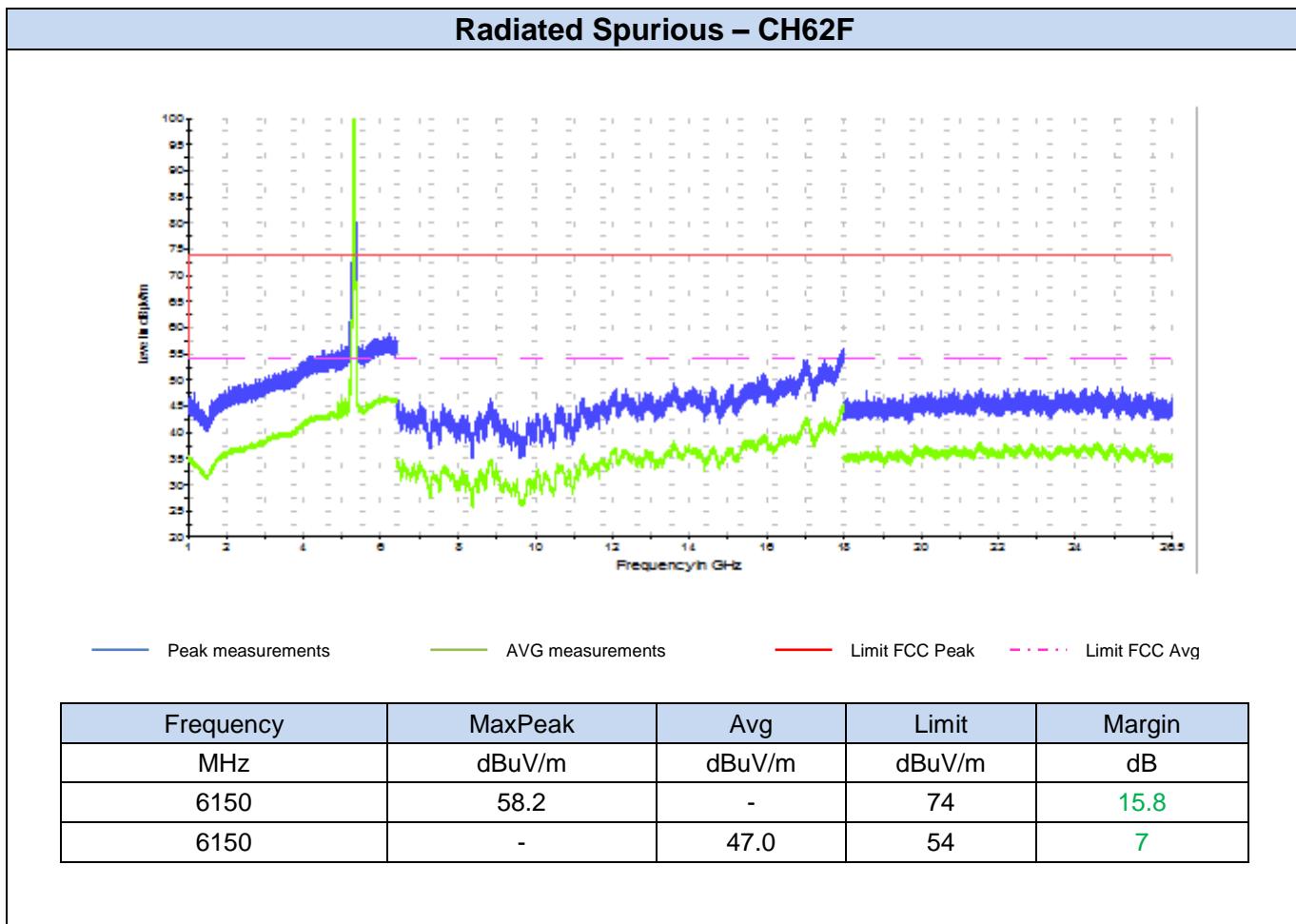
Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
6123	58.7	-	74	15.3
6123	-	46.5	54	7.5

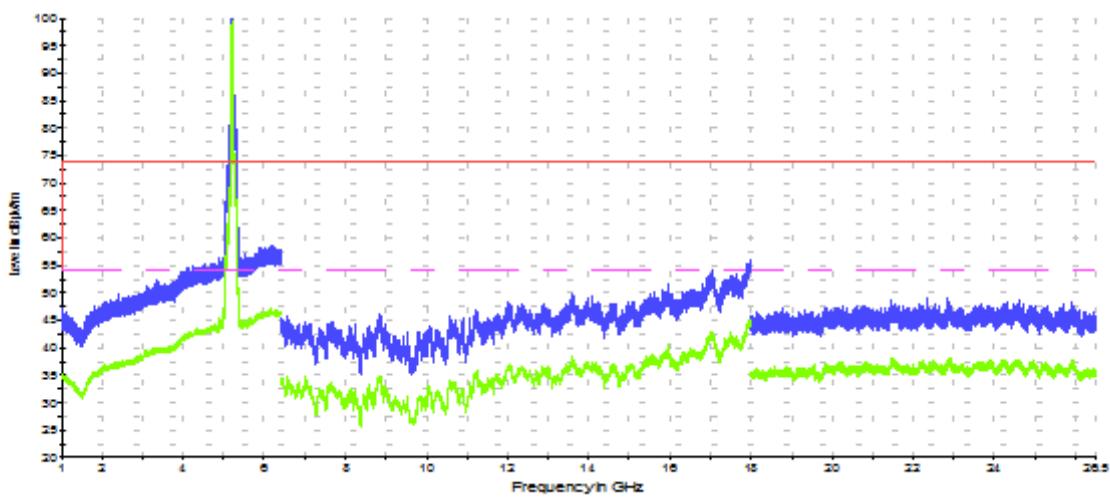


1 GHz – 26.5GHz, 802.11n40, Chain A+B**Radiated Spurious – CH54F**

— Peak measurements — AVG measurements — Limit FCC Peak - - - Limit FCC Avg

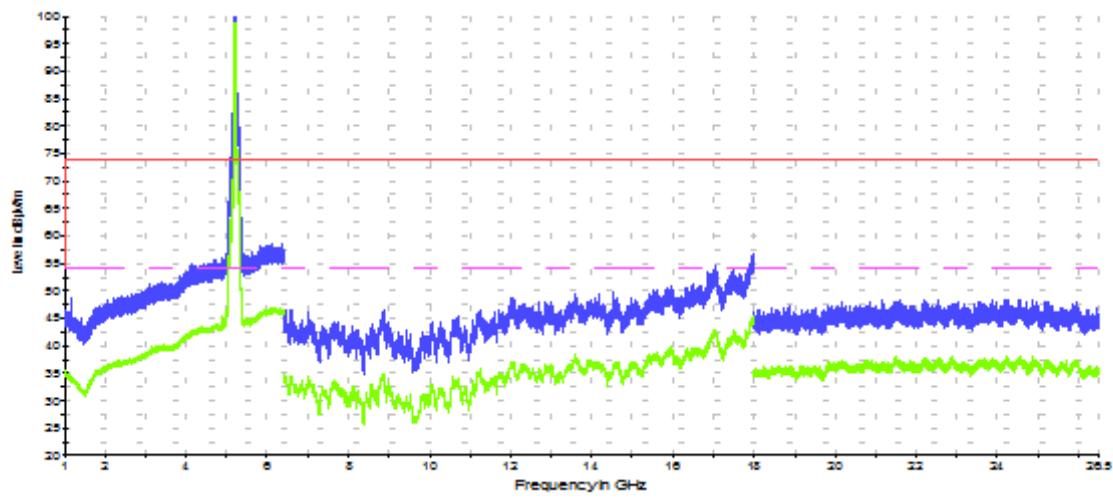
Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
6180	58.3	-	74	15.7
6180	-	46.8	54	7.2



1 GHz – 26.5GHz, 802.11ac80, Chain A**Radiated Spurious – CH58ac80**

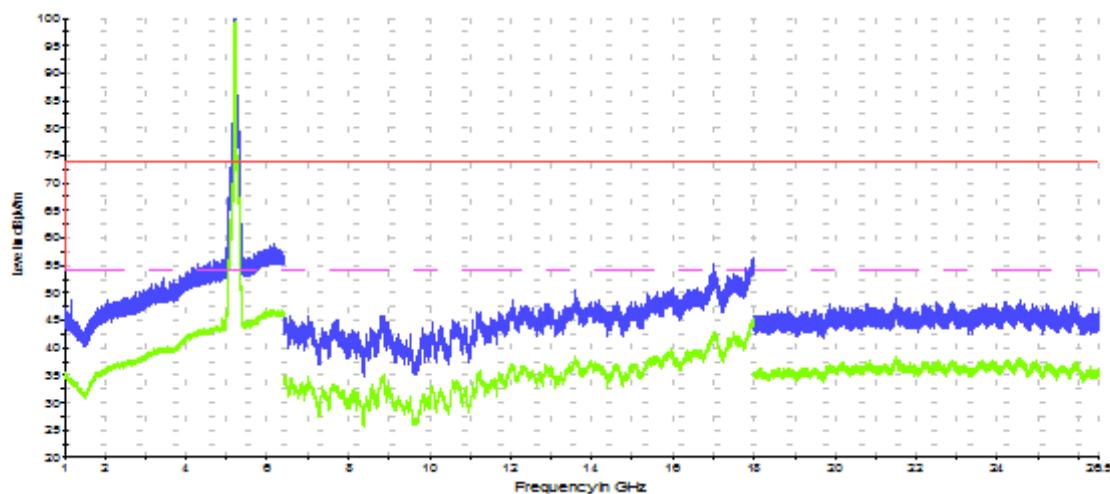
— Peak measurements — AVG measurements — Limit FCC Peak - - - Limit FCC Avg

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
6124	58.8	-	74	15.2
6124	-	46.7	54	7.3

1 GHz – 26.5GHz, 802.11ac80, Chain B**Radiated Spurious – CH58ac80**

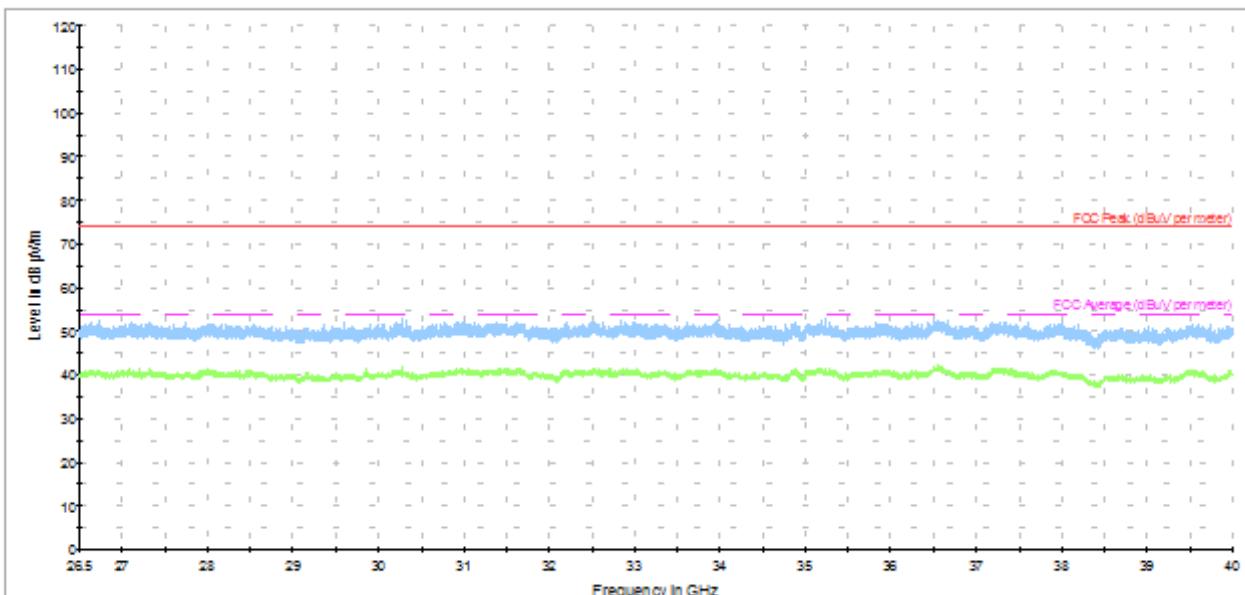
— Peak measurements — AVG measurements — Limit FCC Peak - - - Limit FCC Avg

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
6138	58.9	-	74	15.1
6138	-	46.6	54	7.4

1 GHz – 26.5GHz, 802.11ac80, Chain A+B**Radiated Spurious – CH58ac80**

— Peak measurements — AVG measurements — Limit FCC Peak - - - Limit FCC Avg

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
6057	58.7	-	74	15.3
6057	-	46.4	54	7.6

26.5 GHz – 40GHz**Radiated Spurious – All modes**

— Peak measurements — AVG measurements — Limit FCC Peak - - - Limit FCC Avg

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
35228.71		41.45	54	12.55
35238.35	53.32		74	20.68

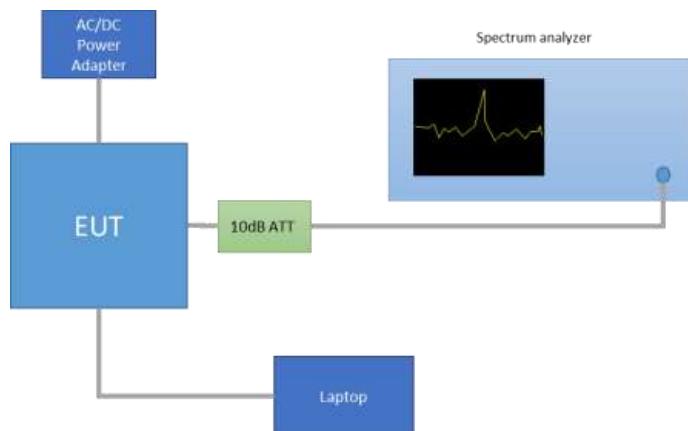
Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

Annex D. Test Results U-NII-2C

D.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 analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.



For the overlapped channels between U-NII-2C and U-NII-3 bands, and according to FCC KDB 644545 D03, the boundary frequency between the bands is used as one edge for defining the portion of the 26dB BW that falls within a particular U-NII band. This rule is only applicable for the 26dB BW and for those channels marked as overlapped.

Results tables:

Mode	Rate	Antenna	Channel	Frequency [MHz]	26dB BW [MHz]	99% BW [MHz]	
802.11a	6Mbps	SISO CHAIN A	100	5500	24.20	16.64	
			120	5600	33.35	20.04	
			140	5700	24.45	16.64	
		SISO CHAIN B	100	5500	24.45	16.68	
	HT0		120	5600	32.30	20.48	
			140	5700	24.35	16.64	
	SISO CHAIN A	100	5500	24.10	17.76		
		120	5600	33.95	20.24		
		140	5700	24.35	17.72		
		144*	5720	19.43	18.12		
	SISO CHAIN B	100	5500	24.70	17.76		
		120	5600	33.95	20.96		
		140	5700	25.05	17.76		
		144*	5720	22.13	19.28		

* Overlapped channels between U-NII-2C and U-NII-3

Max Value

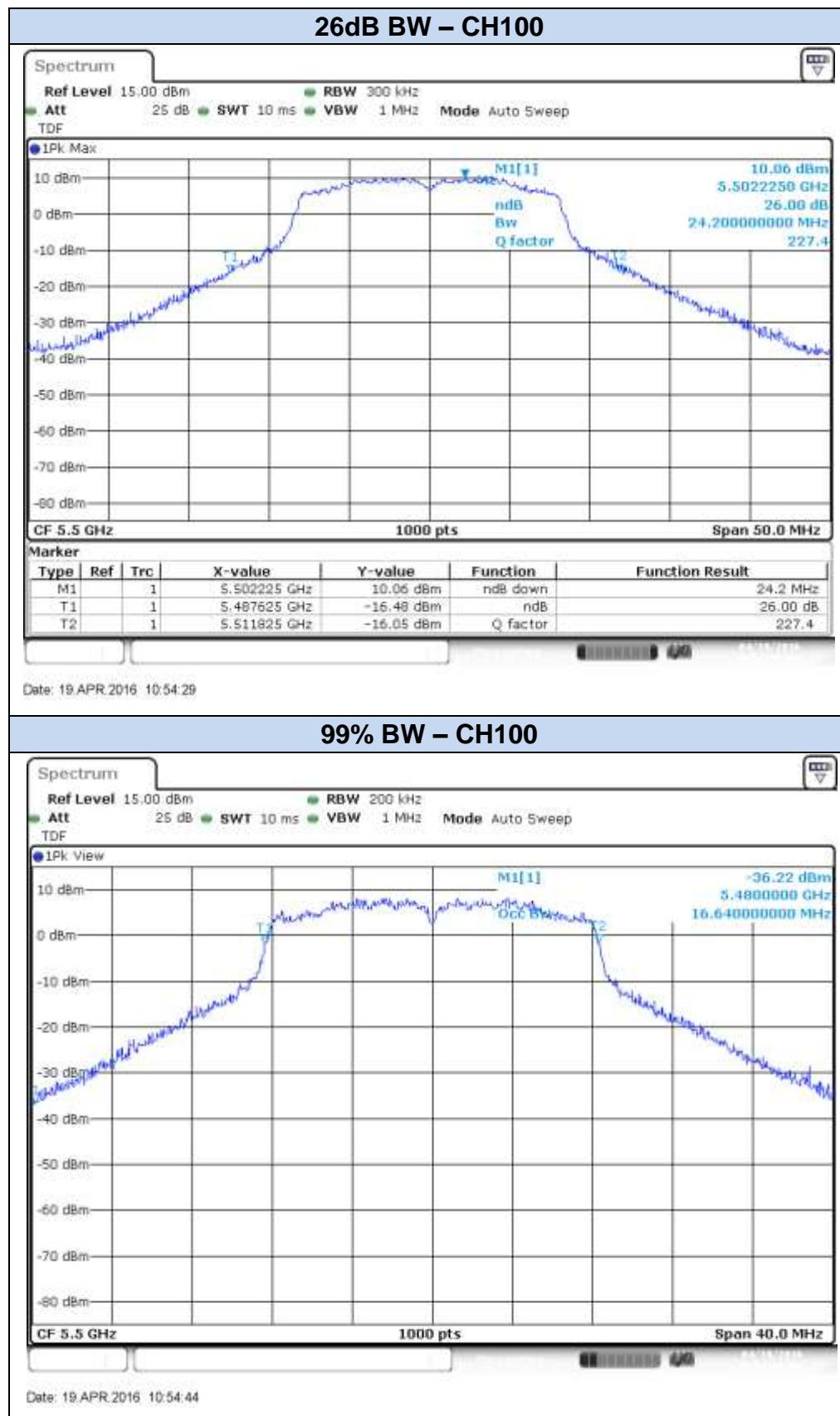
Mode	Rate	Antenna	Channel	Frequency [MHz]	26dB BW [MHz]	99% BW [MHz]
802.11n20	HT8	MIMO CHAIN A	100	5500	25.05	17.80
			120	5600	28.40	18.16
			140	5700	24.30	17.72
			144*	5720	21.07	19.68
		MIMO CHAIN B	100	5500	23.60	17.68
			120	5600	29.05	18.56
			140	5700	23.15	17.68
			144*	5720	22.13	21.92
802.11n40	HT0	SISO CHAIN A	102F	5510	45.81	36.40
			118F	5590	54.00	37.28
			134F	5670	46.08	36.40
			142F*	5710	43.43	37.04
		SISO CHAIN B	102F	5510	45.27	36.40
			118F	5590	55.71	37.68
			134F	5670	46.35	36.48
			142F*	5670	42.94	37.60
	HT8	MIMO CHAIN A	102F	5510	45.81	36.40
			118F	5590	55.89	37.76
			134F	5670	47.07	36.56
			142F*	5710	41.77	37.60
		MIMO CHAIN B	102F	5510	43.29	36.16
			118F	5590	52.29	36.96
			134F	5670	45.09	36.24
			142F*	5710	43.30	37.12
802.11ac80	VHT0	SISO CHAIN A	106ac80	5530	86.07	75.00
			122ac80	5610	90.82	75.24
			138ac80*	5690	82.97	75.72
		SISO CHAIN B	106ac80	5530	84.93	75.00
			122ac80	5610	86.07	75.00
			138ac80*	5690	83.36	75.48
	VHT0	MIMO CHAIN A	106ac80	5530	85.50	75.00
			122ac80	5610	87.40	75.12
			138ac80*	5690	85.06	75.84
		MIMO CHAIN B	106ac80	5530	85.31	74.88
			122ac80	5610	85.69	74.88
			138ac80*	5690	85.44	75.60

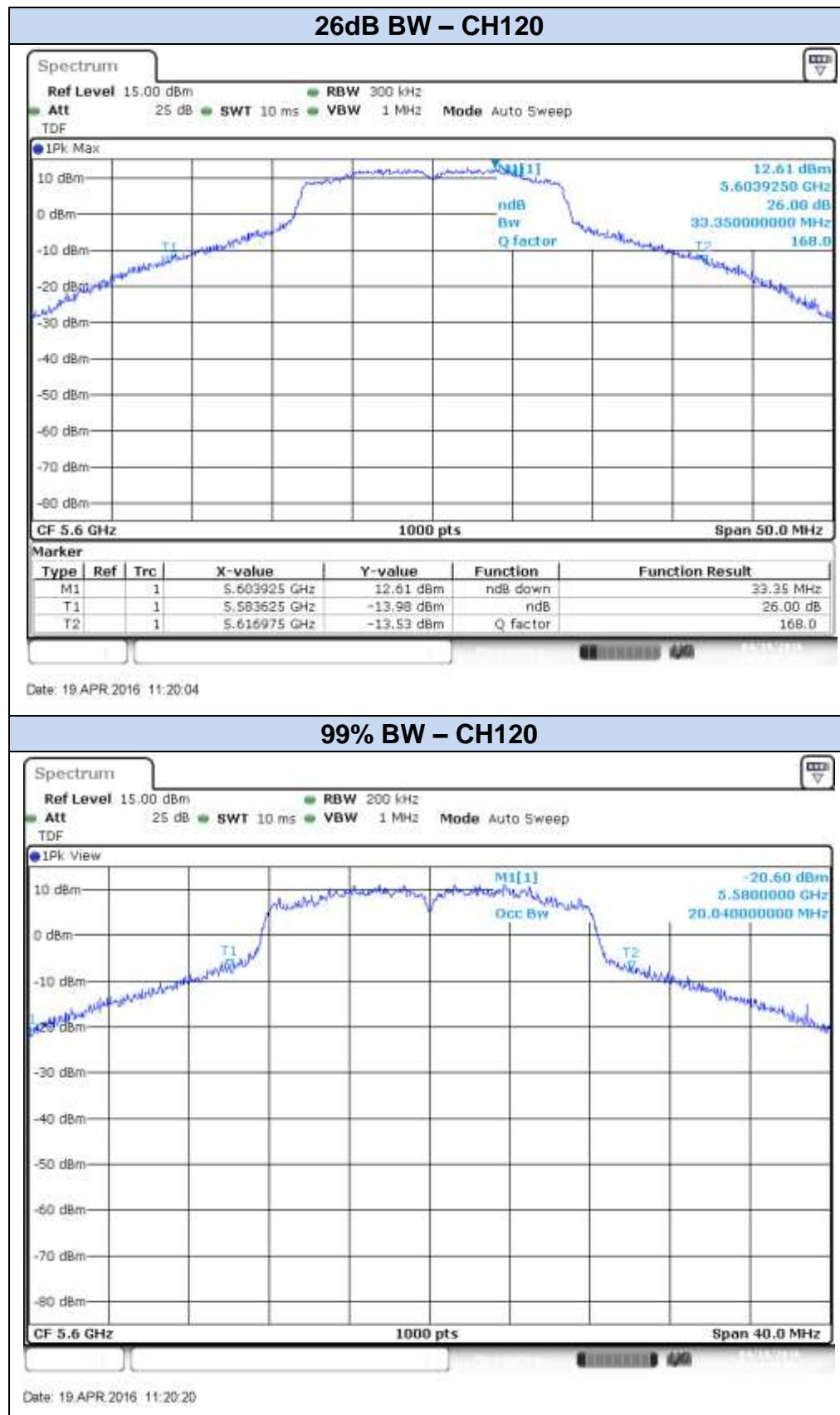
* Overlapped channels between U-NII-2C and U-NII-3

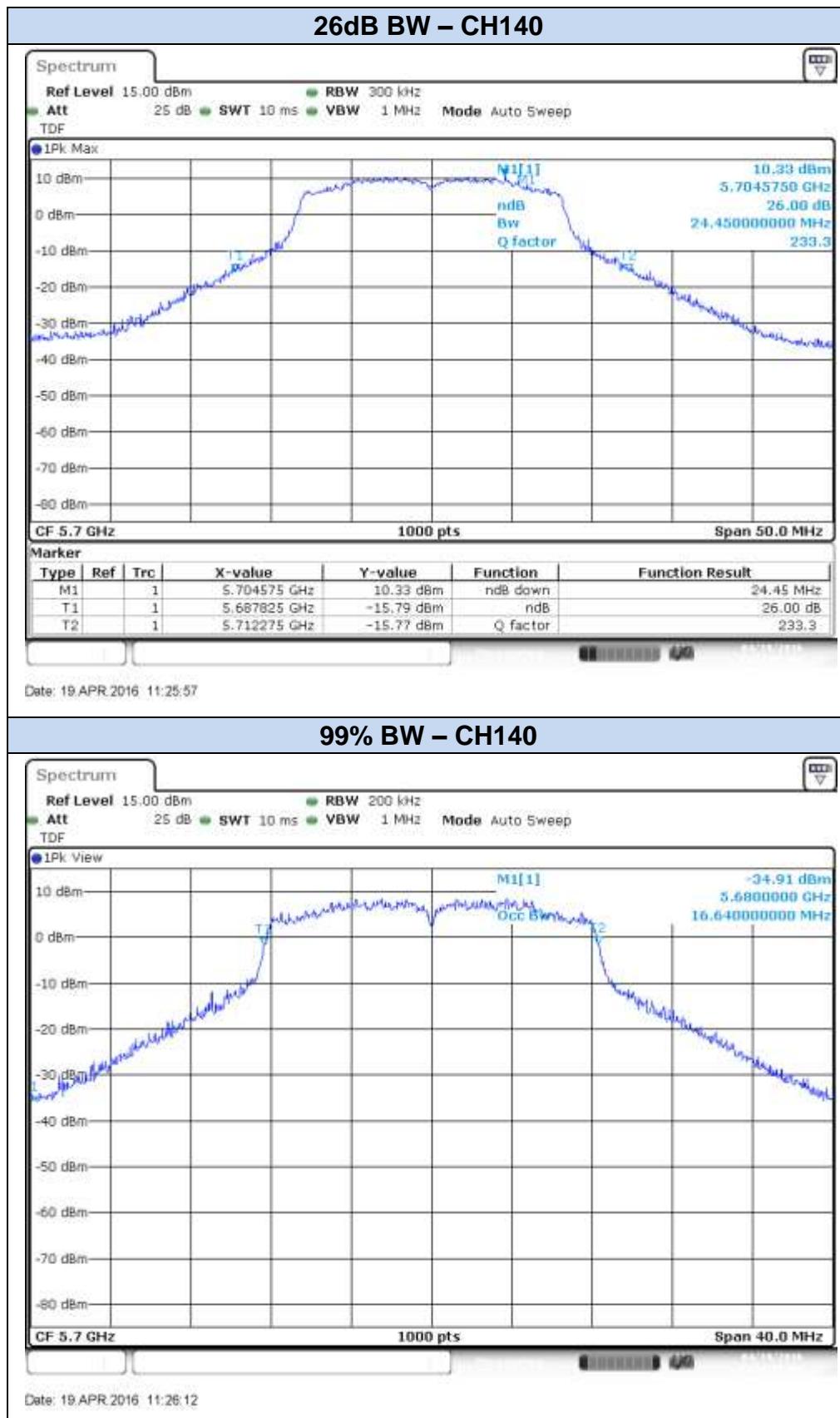
Max Value

Results screenshot

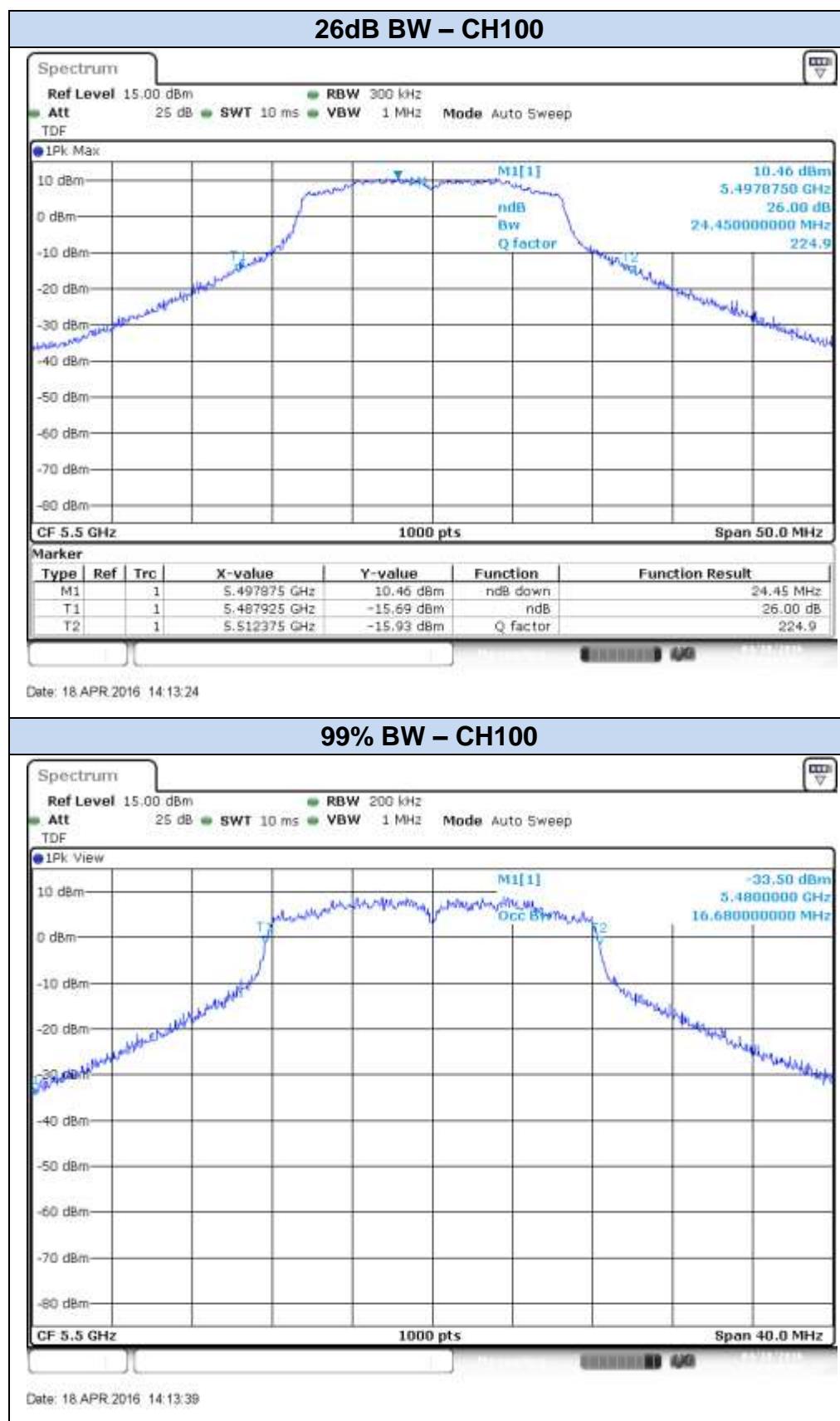
802.11a, 6Mbps – Chain A

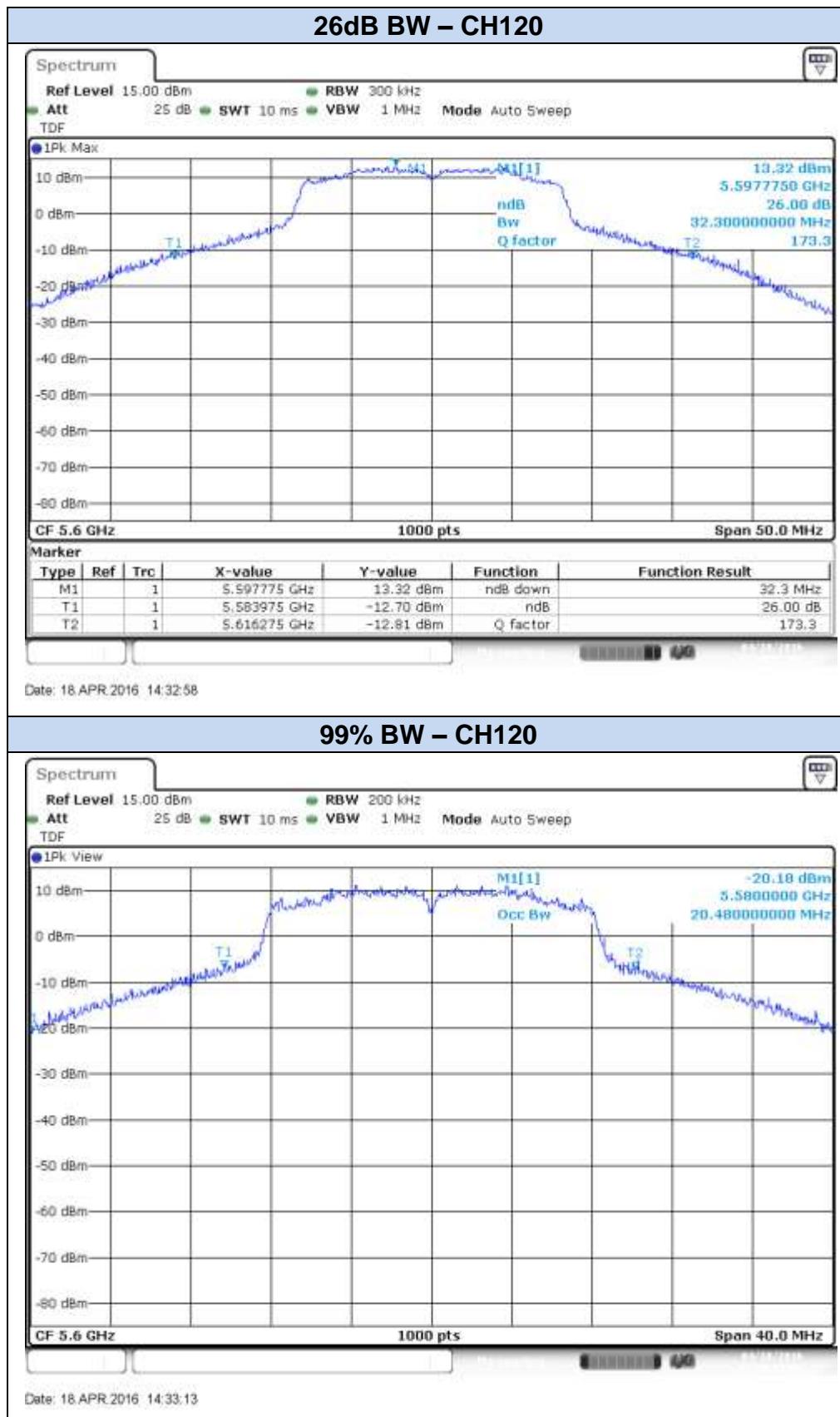


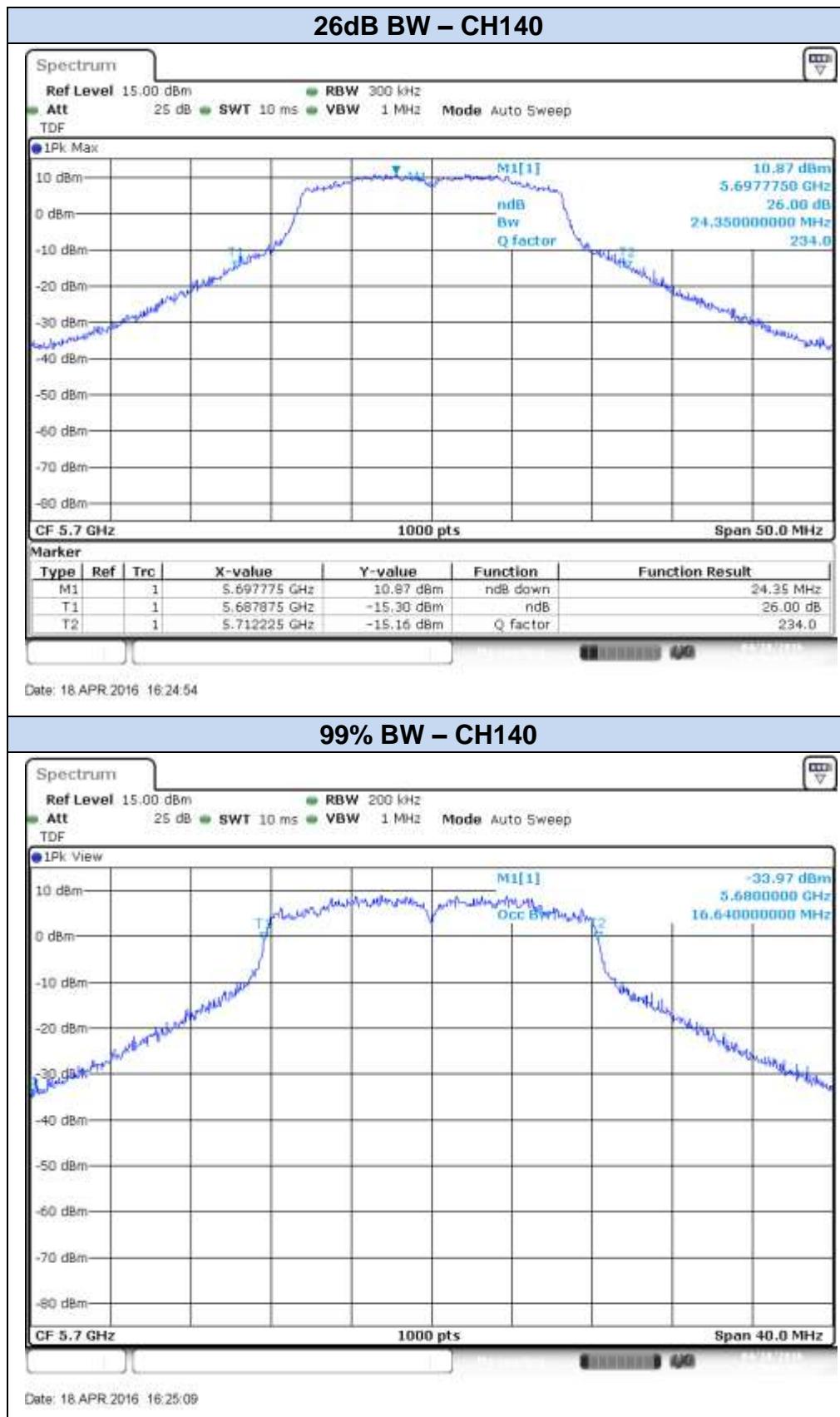




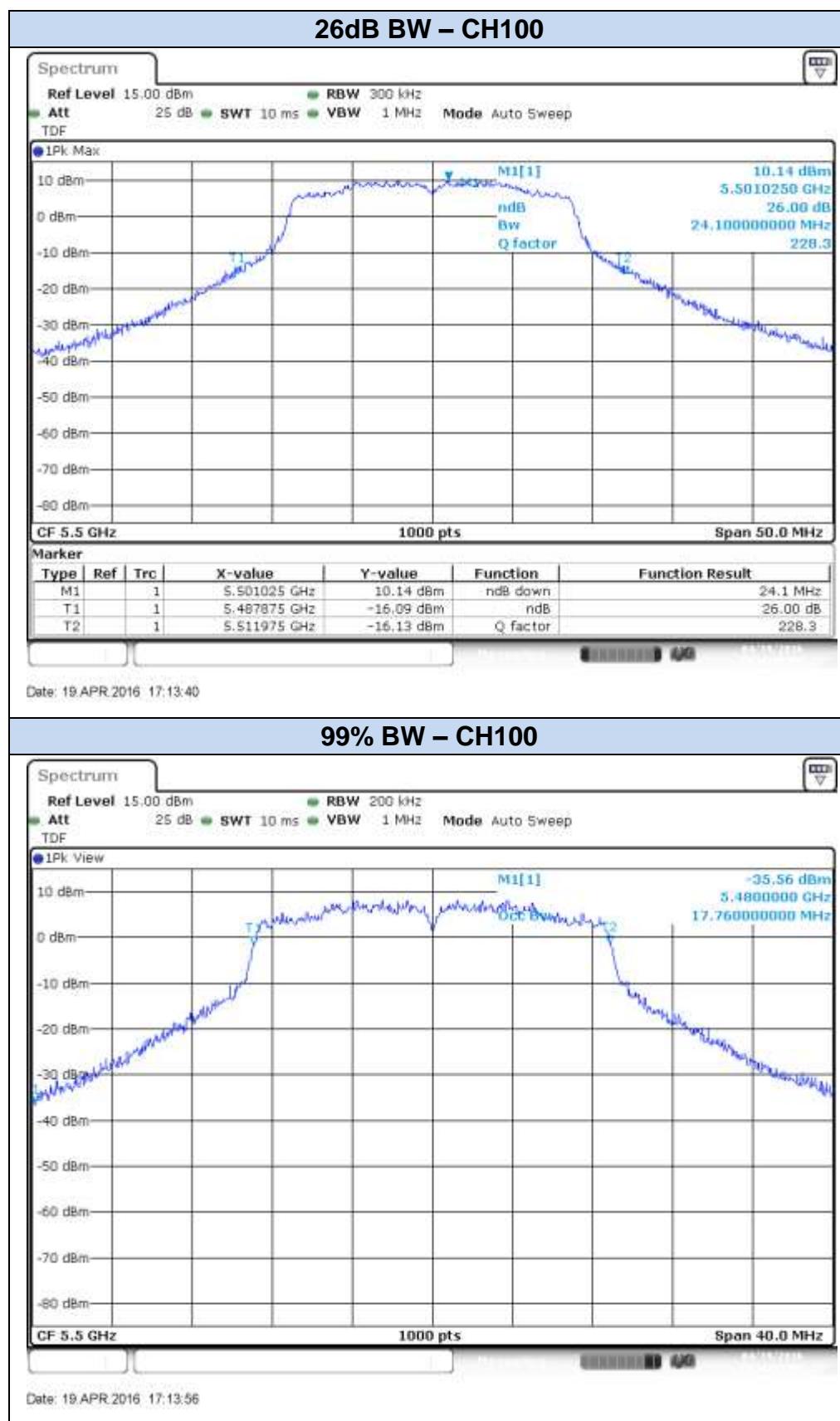
802.11a, 6Mbps – Chain B

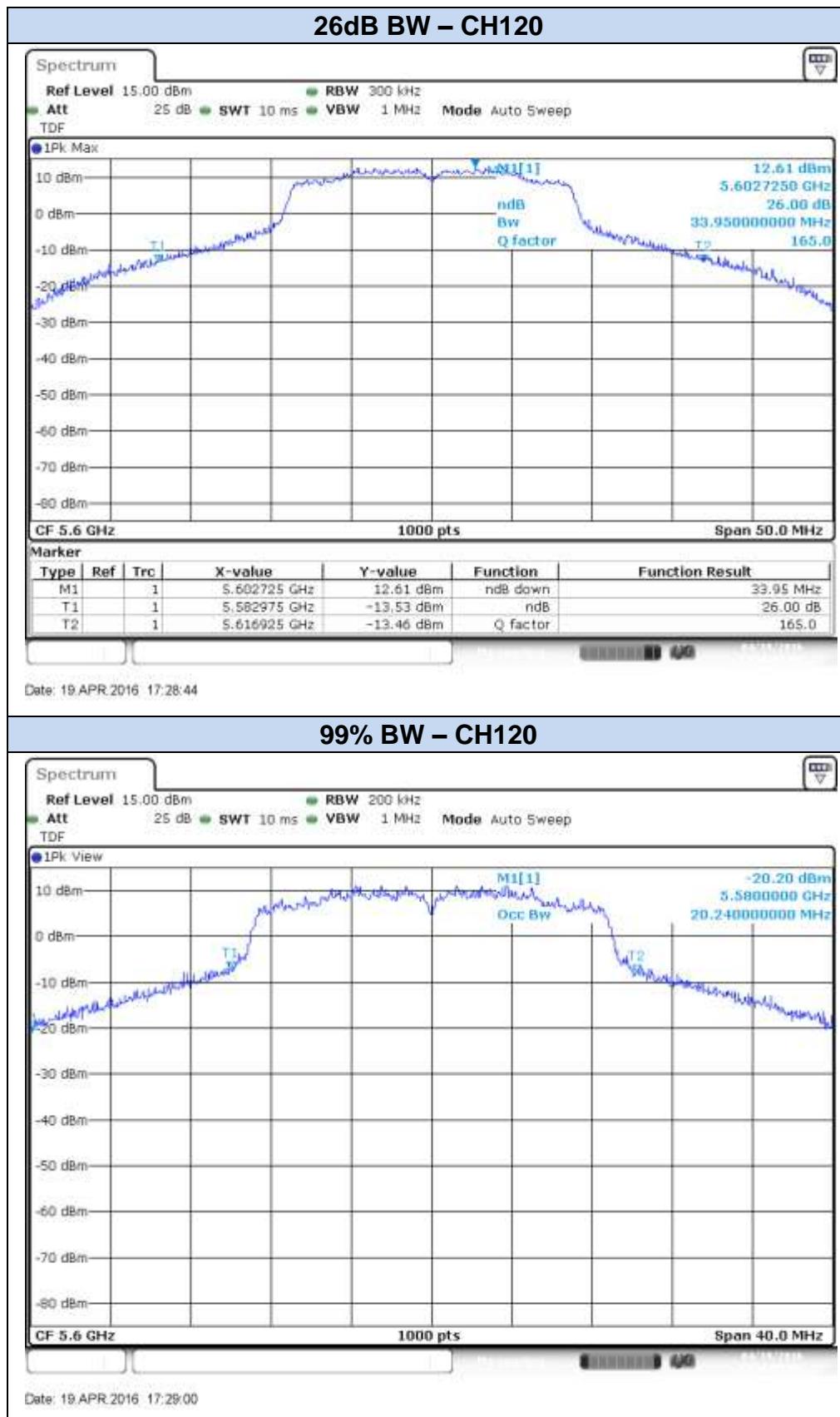


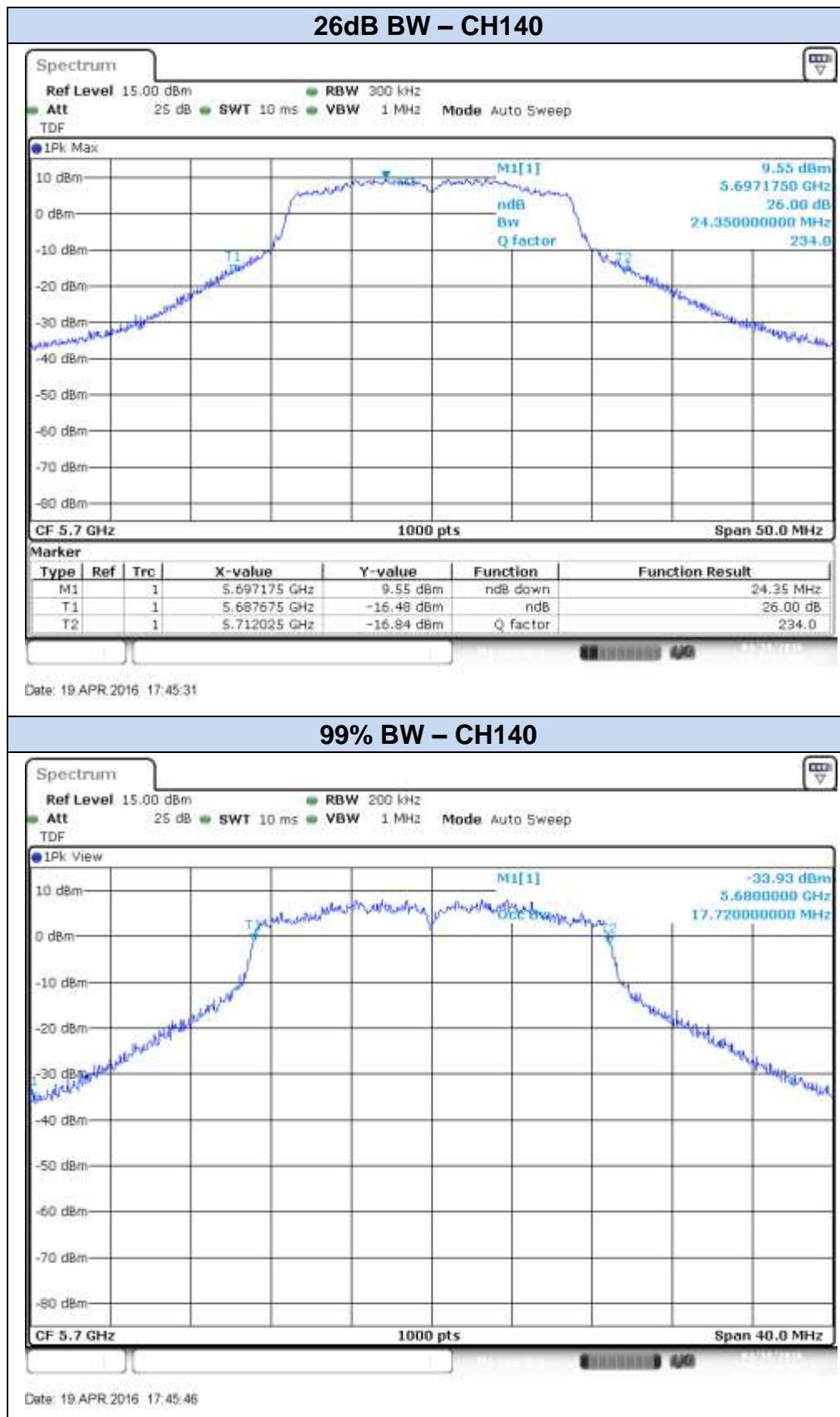


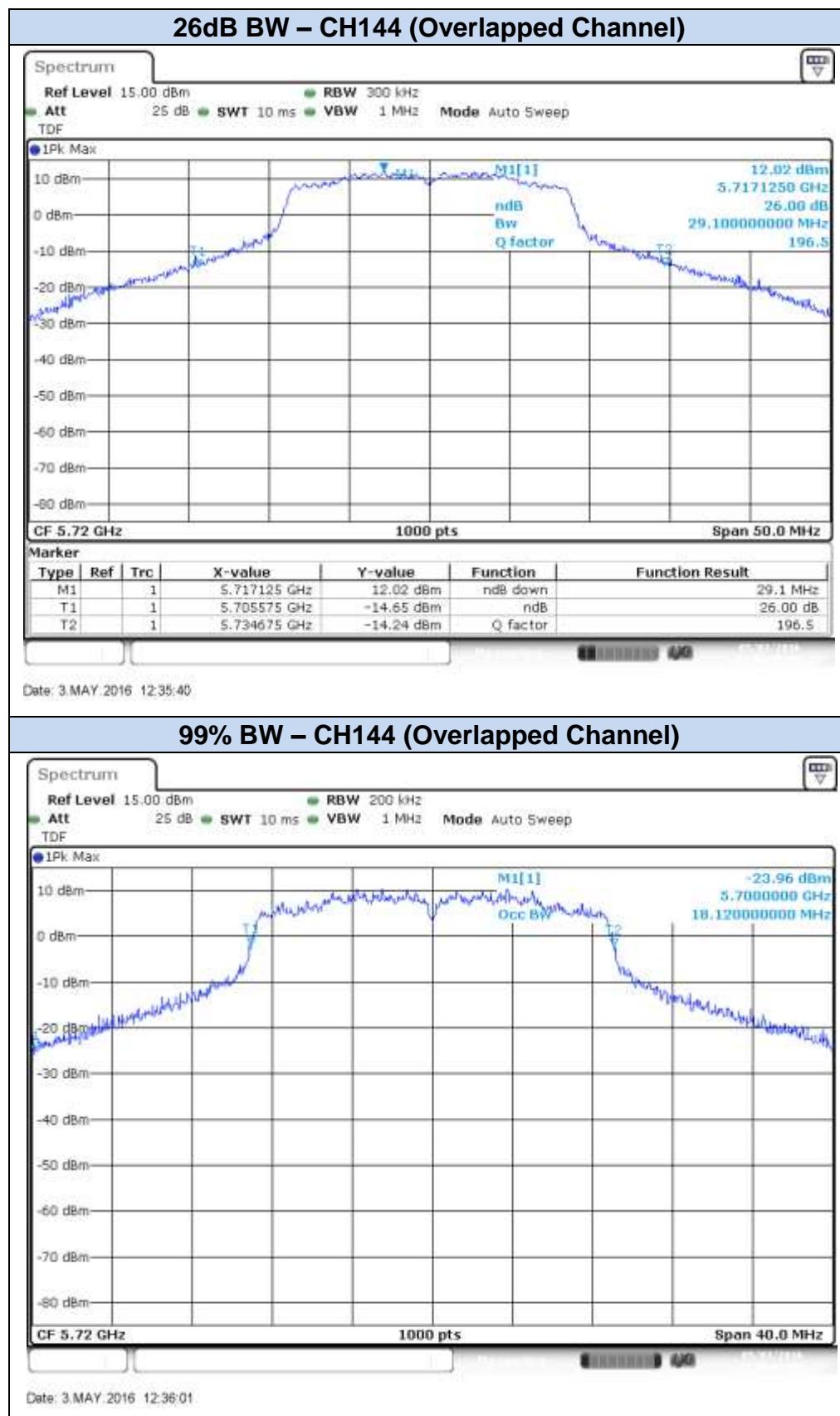


802.11n20, HT0 (SISO) – Chain A









802.11n20, HT0 (SISO) – Chain B

