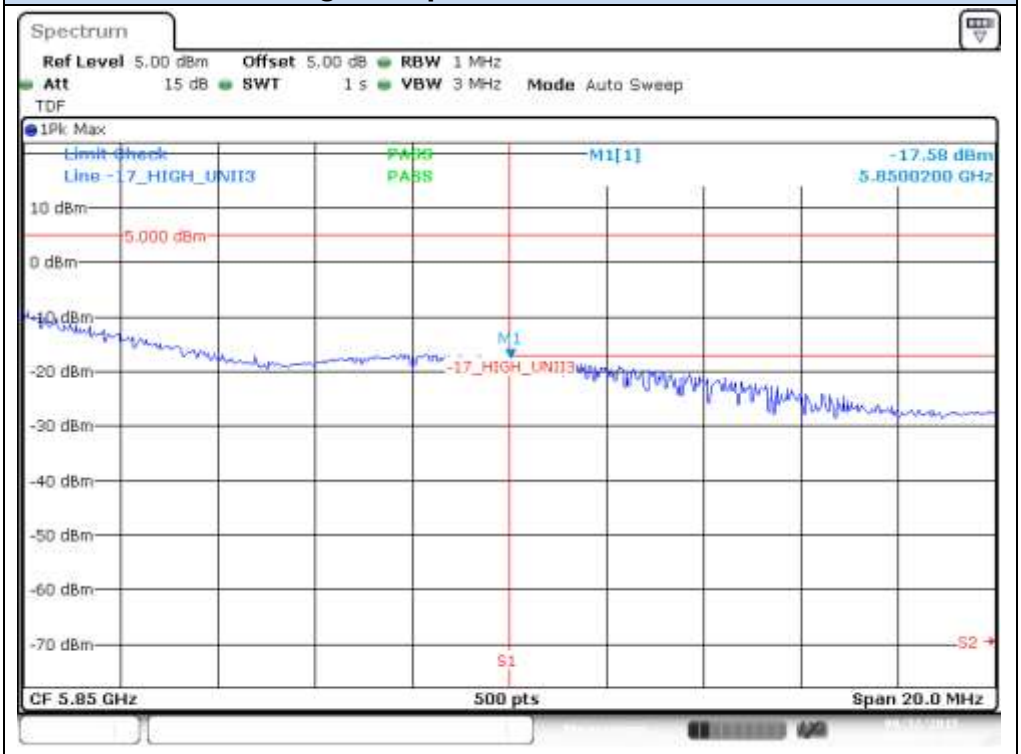
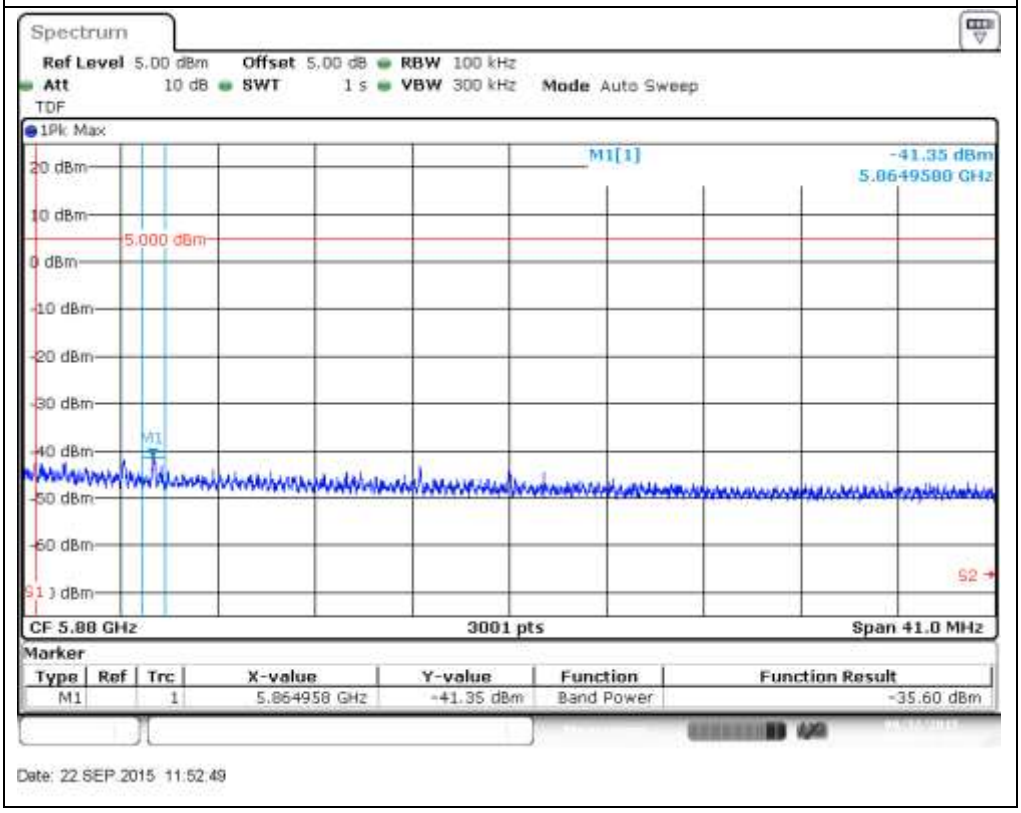
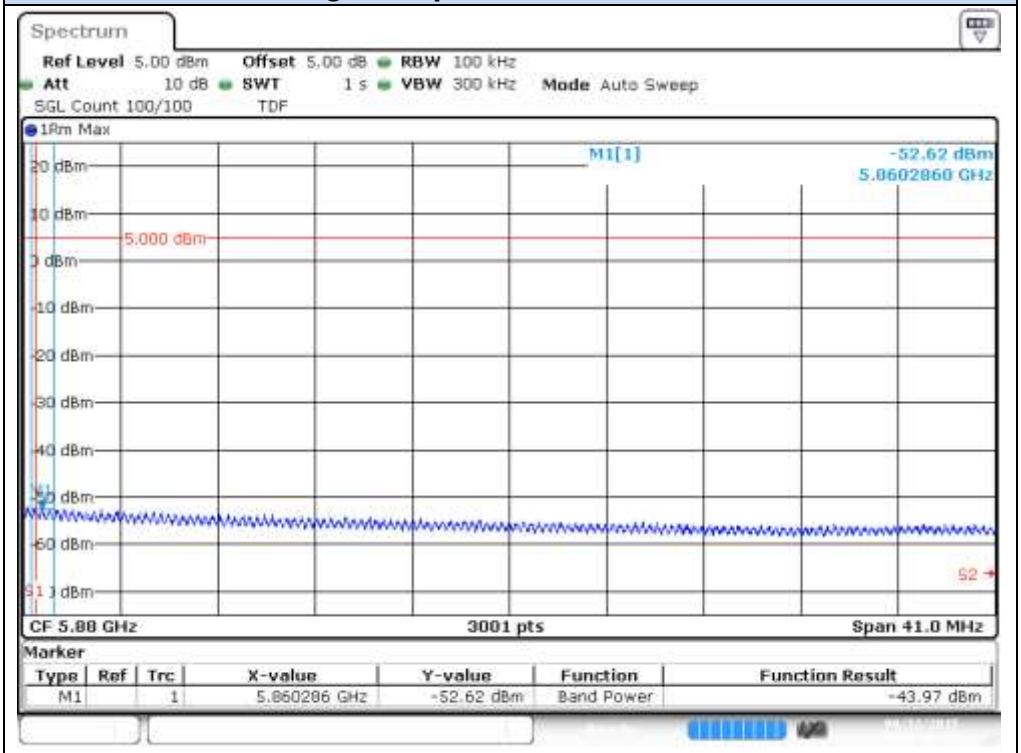
BE High Freq Section, Peak – CH165



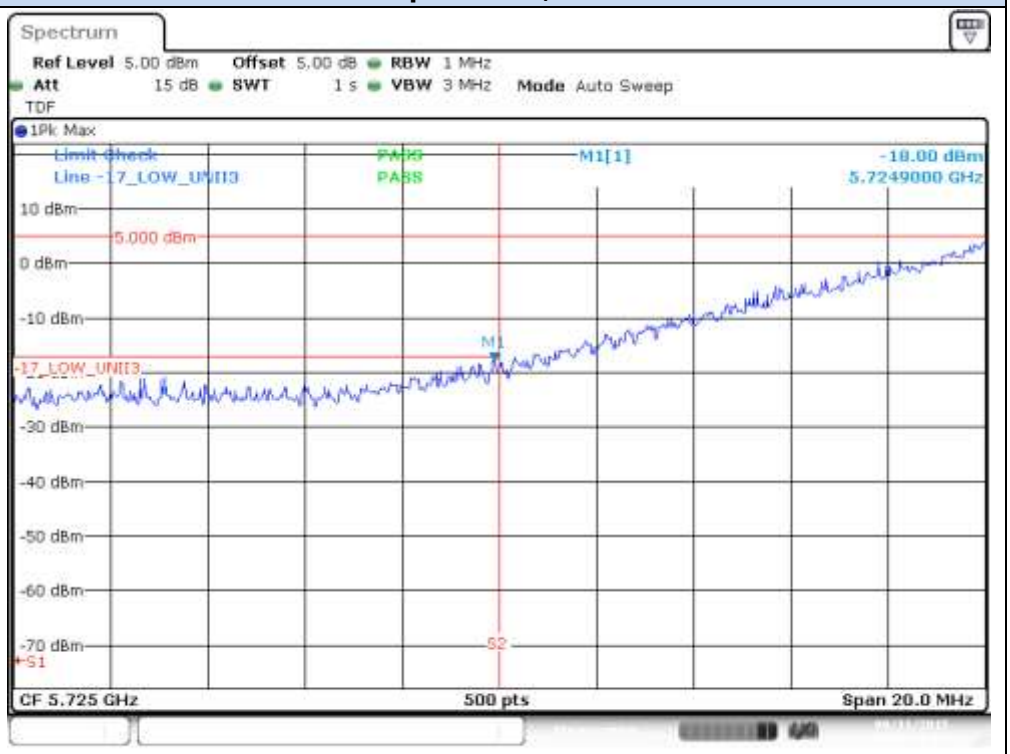


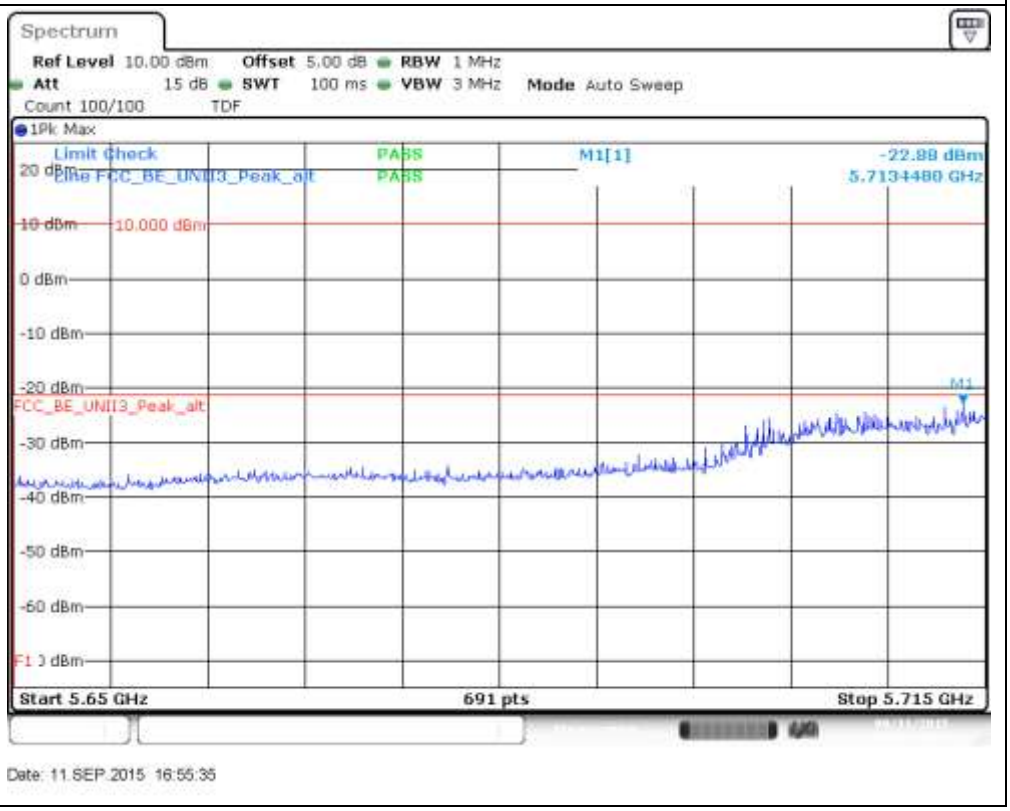
BE High Freq Section, RMS– CH165



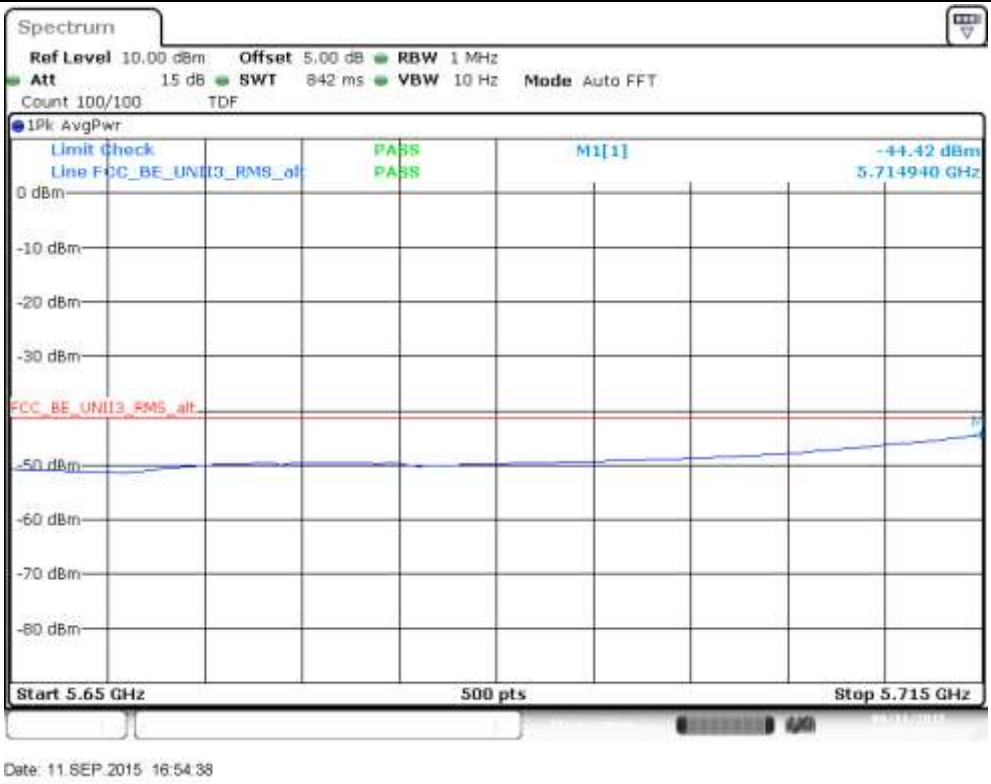
802.11a, 6Mbps – Chain B

BE Low Freq Section, Peak – CH149

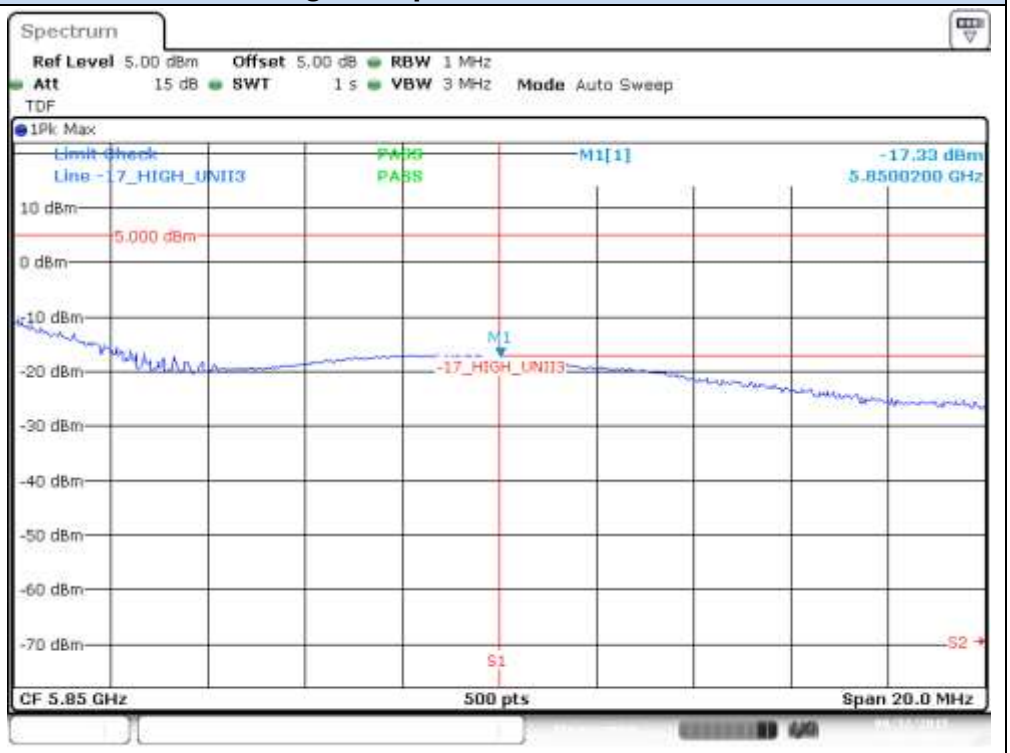


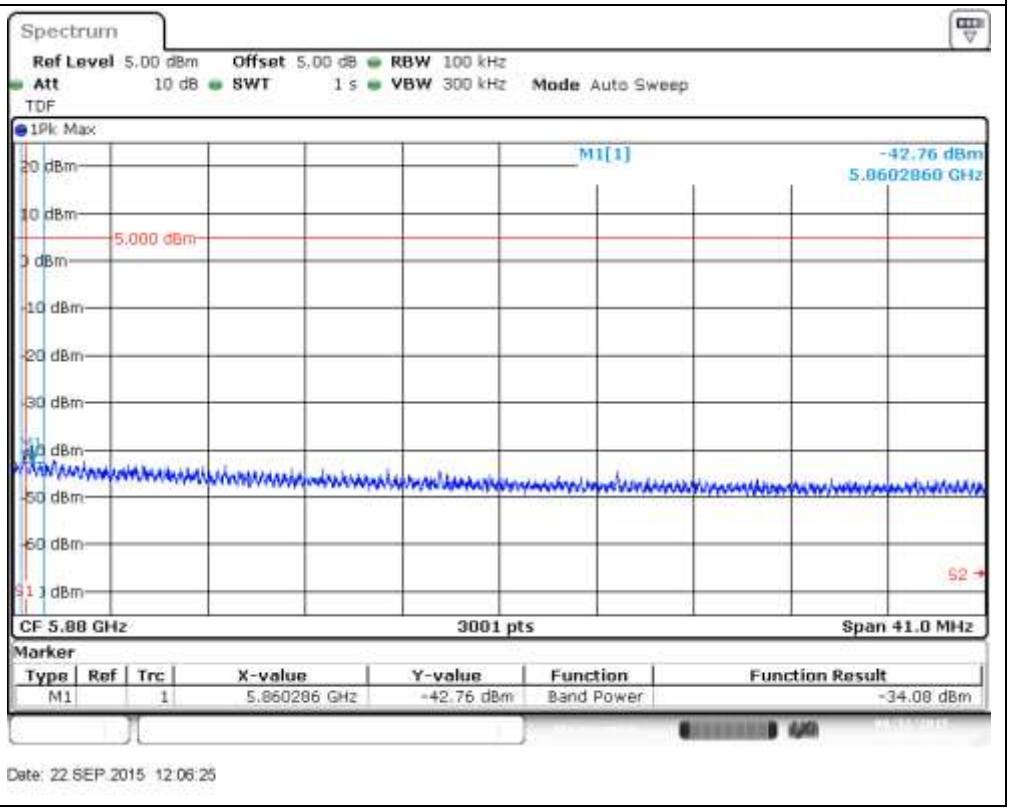


BE Low Freq Section, RMS – CH149

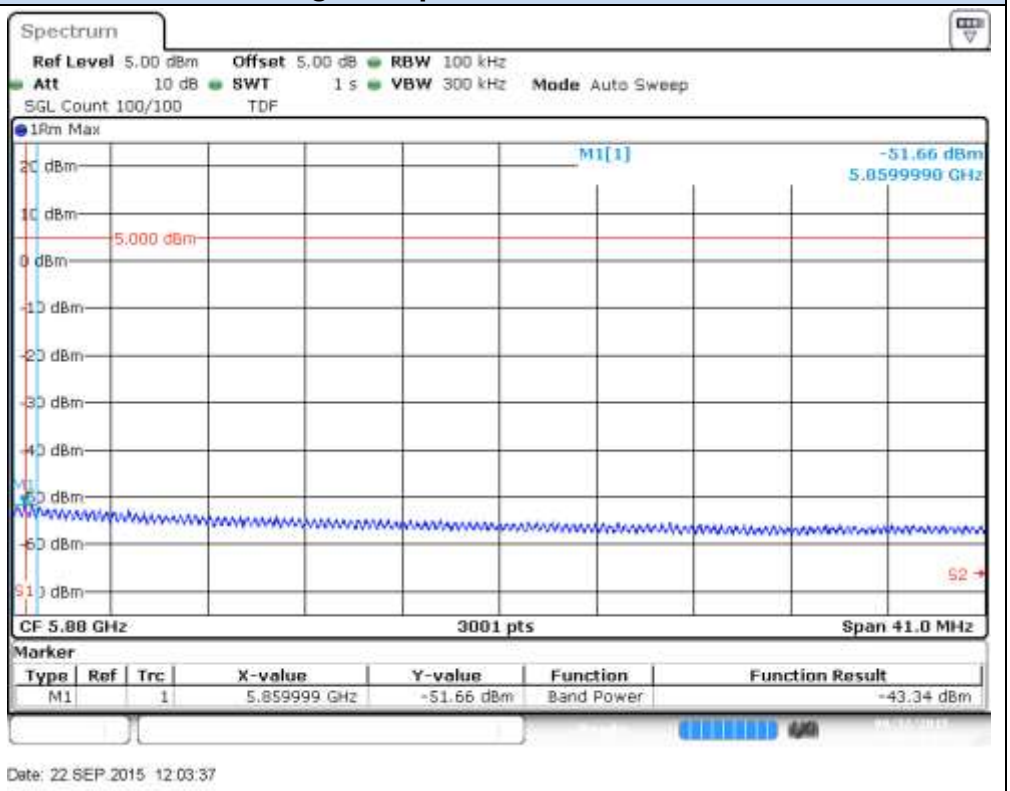


BE High Freq Section, Peak – CH165



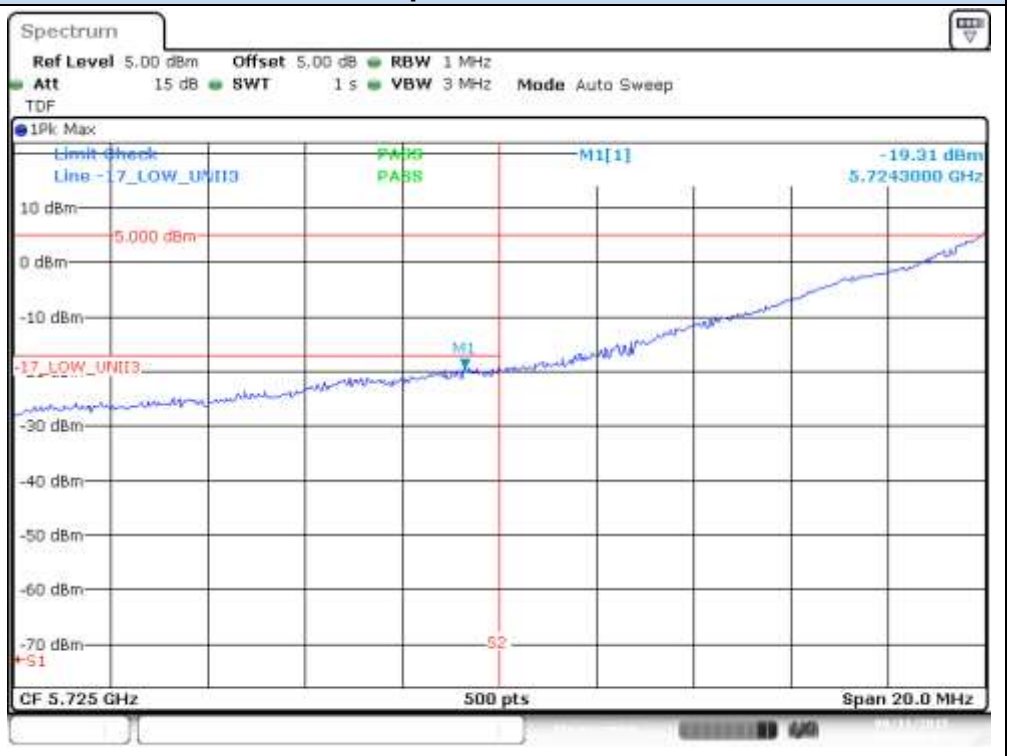


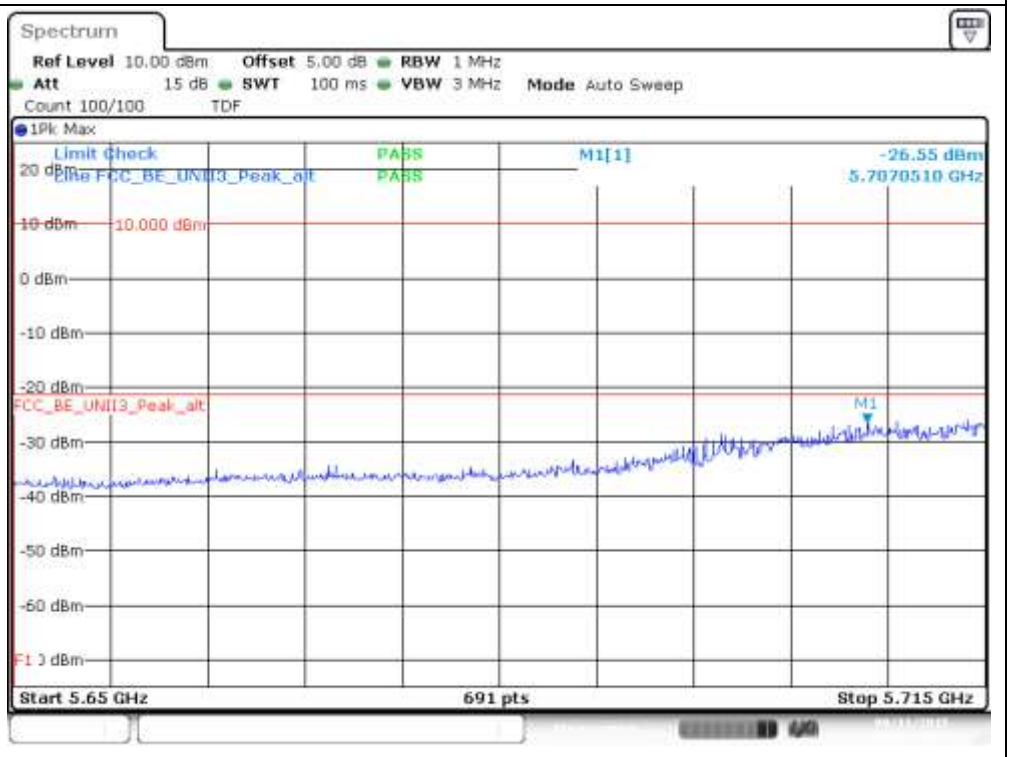
BE High Freq Section, RMS– CH165



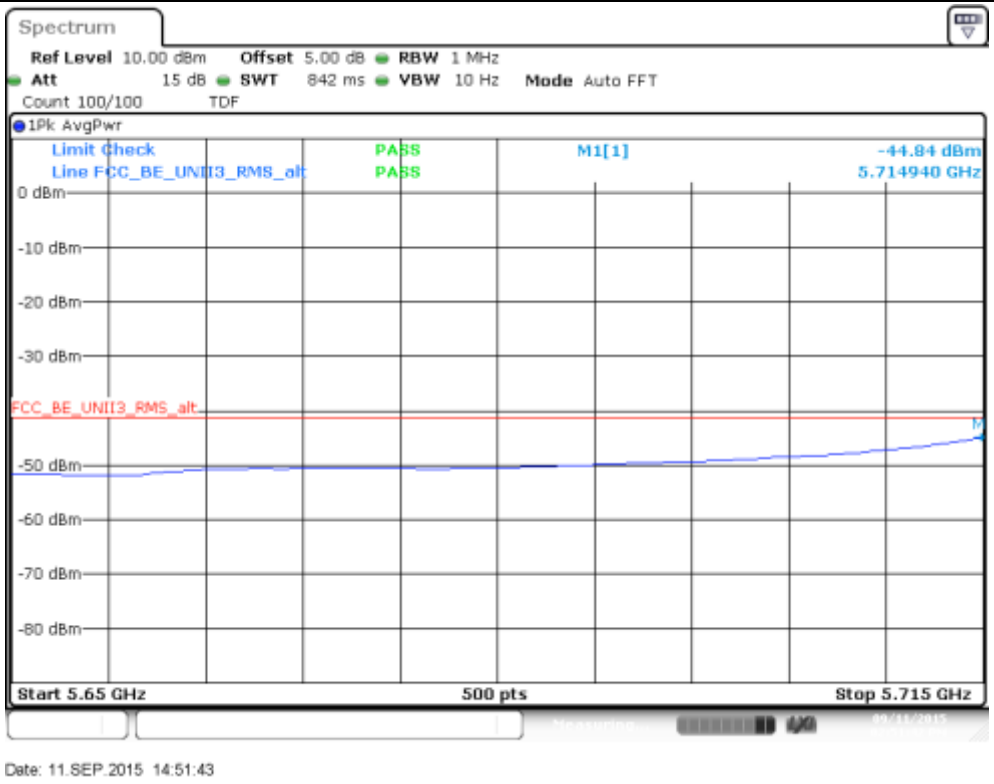
802.11n20, HT0 (SISO) – Chain A

BE Low Freq Section, Peak – CH149

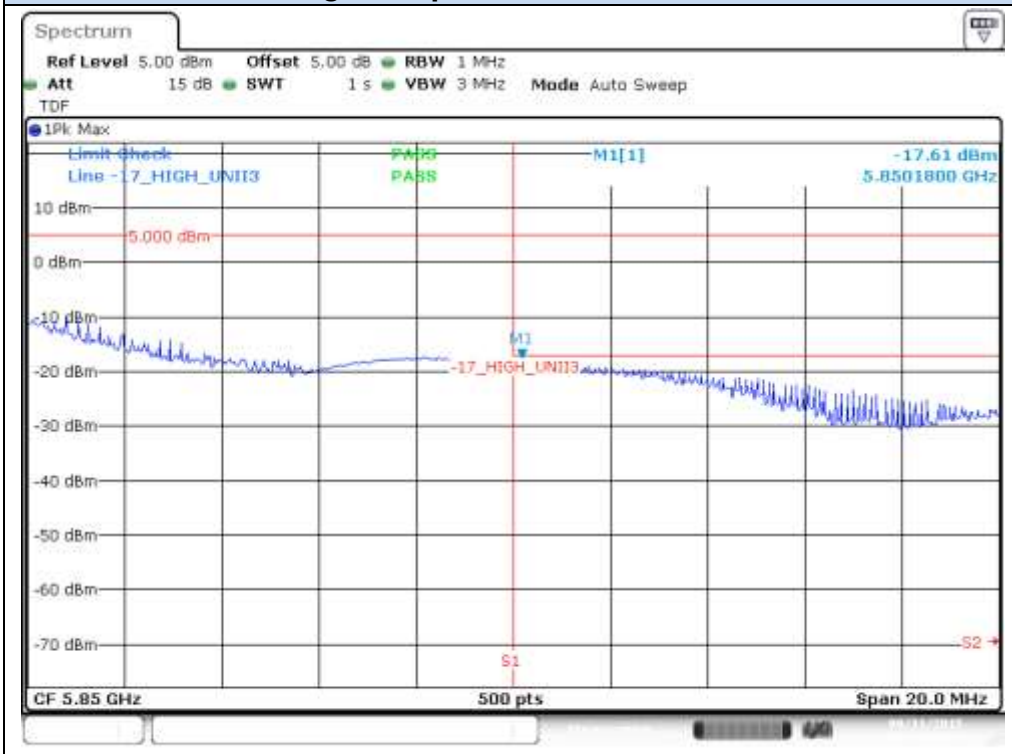


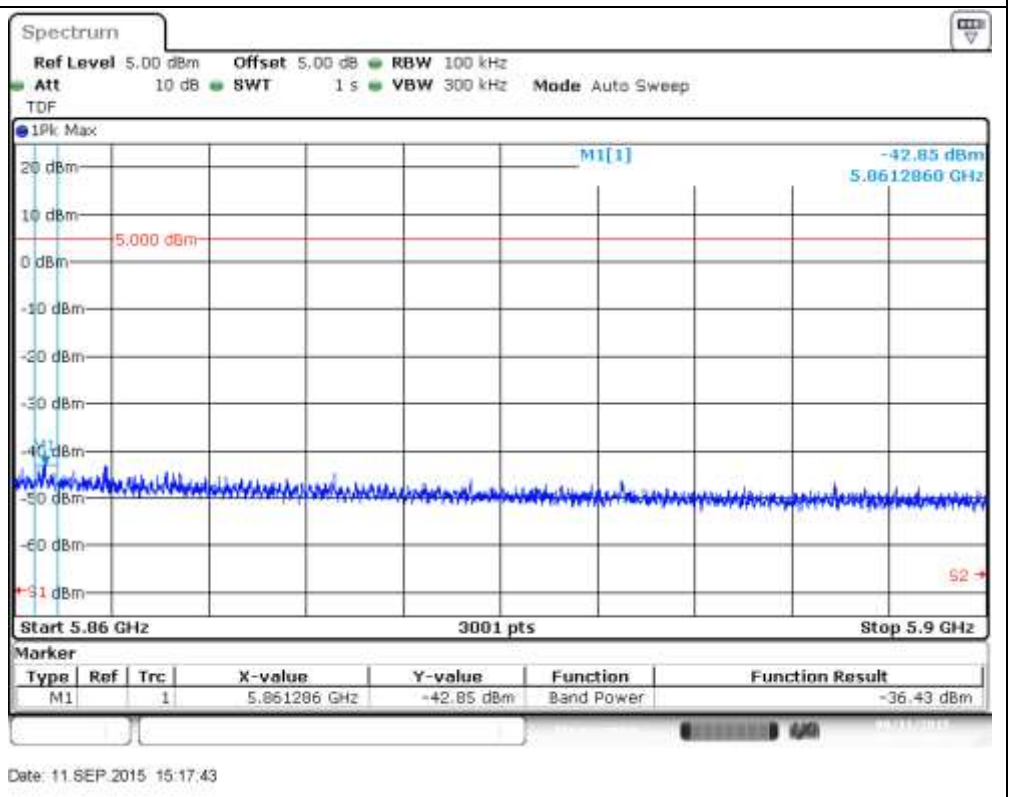


BE Low Freq Section, RMS – CH149

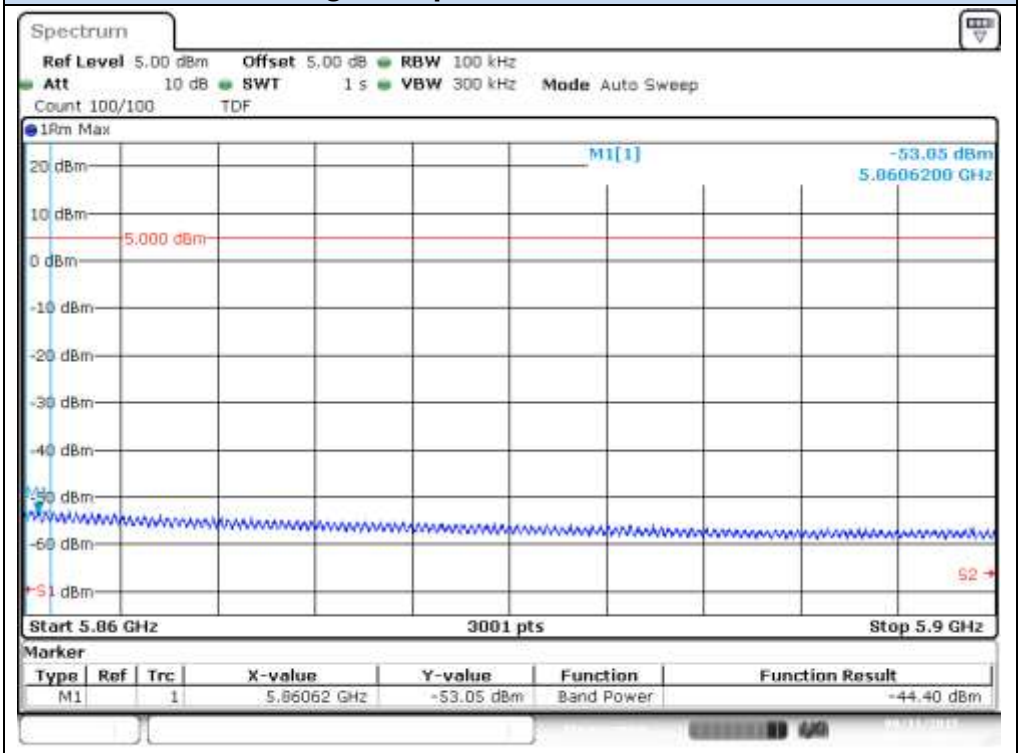


BE High Freq Section, Peak – CH165



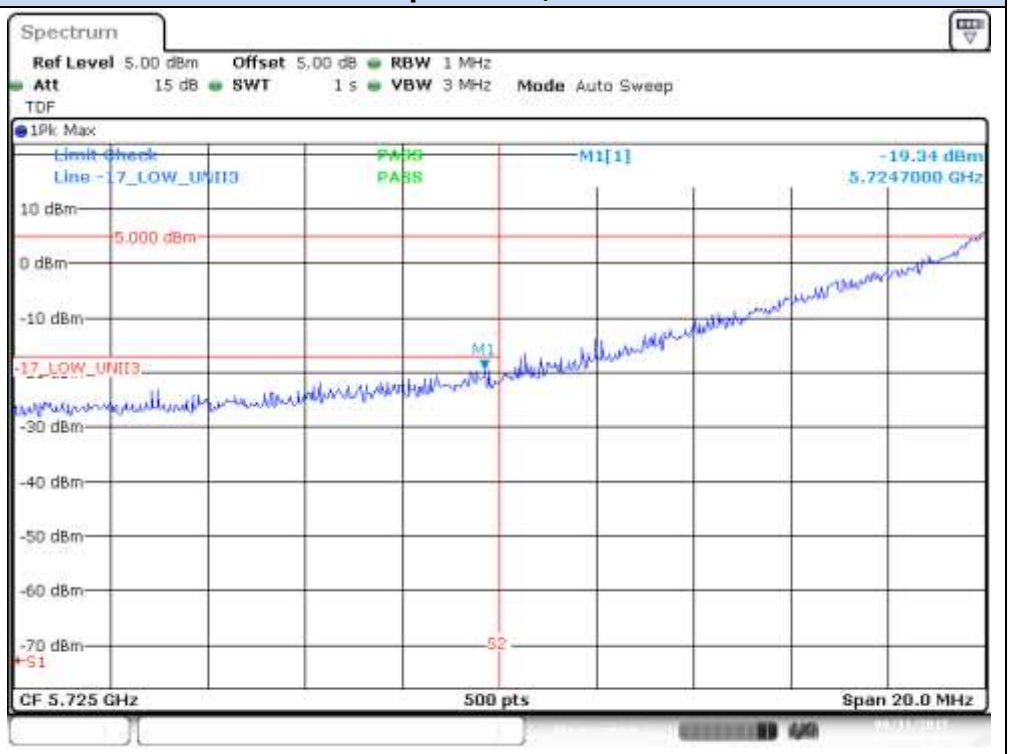


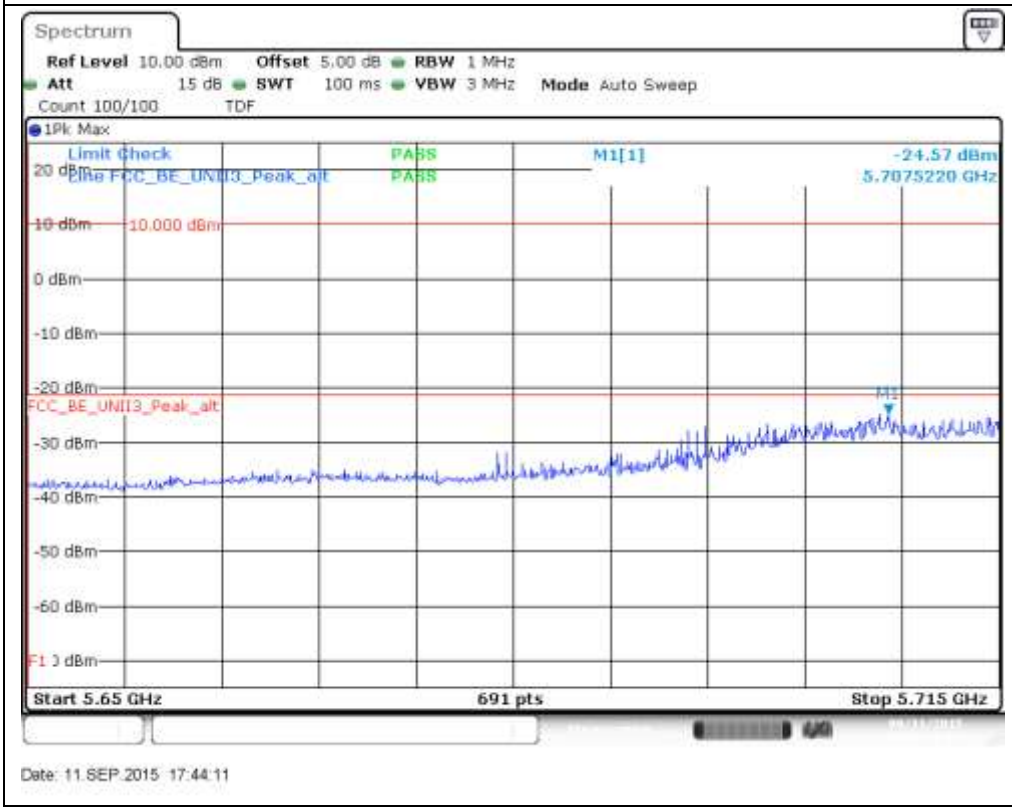
BE High Freq Section, RMS– CH165



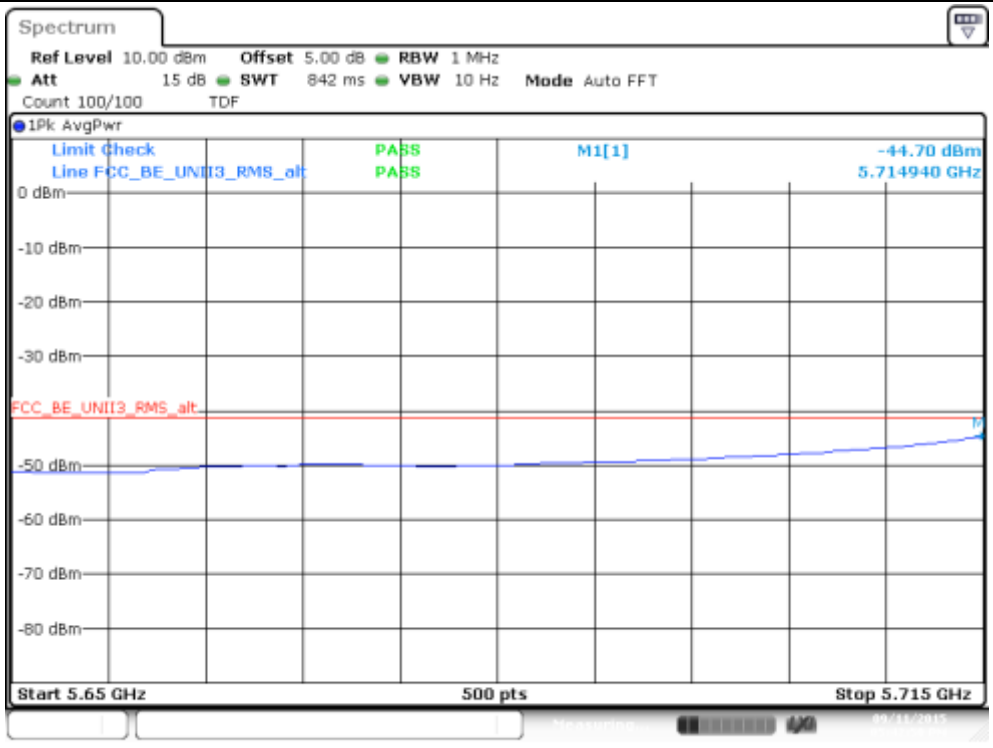
802.11n20, HT0 (SISO) – Chain B

BE Low Freq Section, Peak – CH149

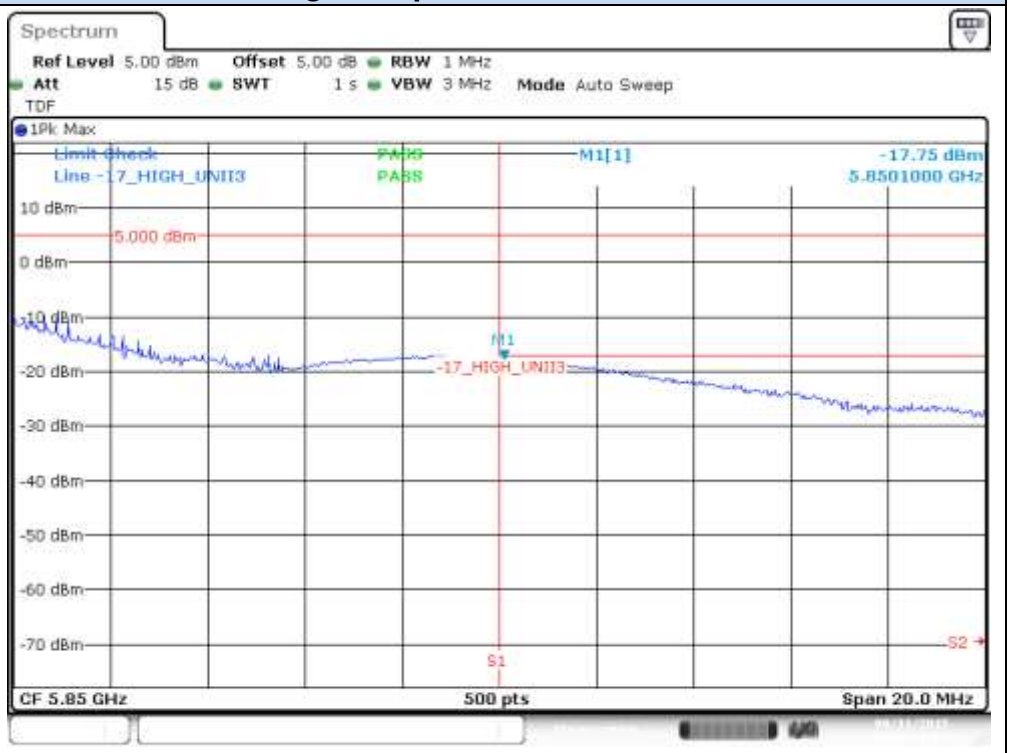


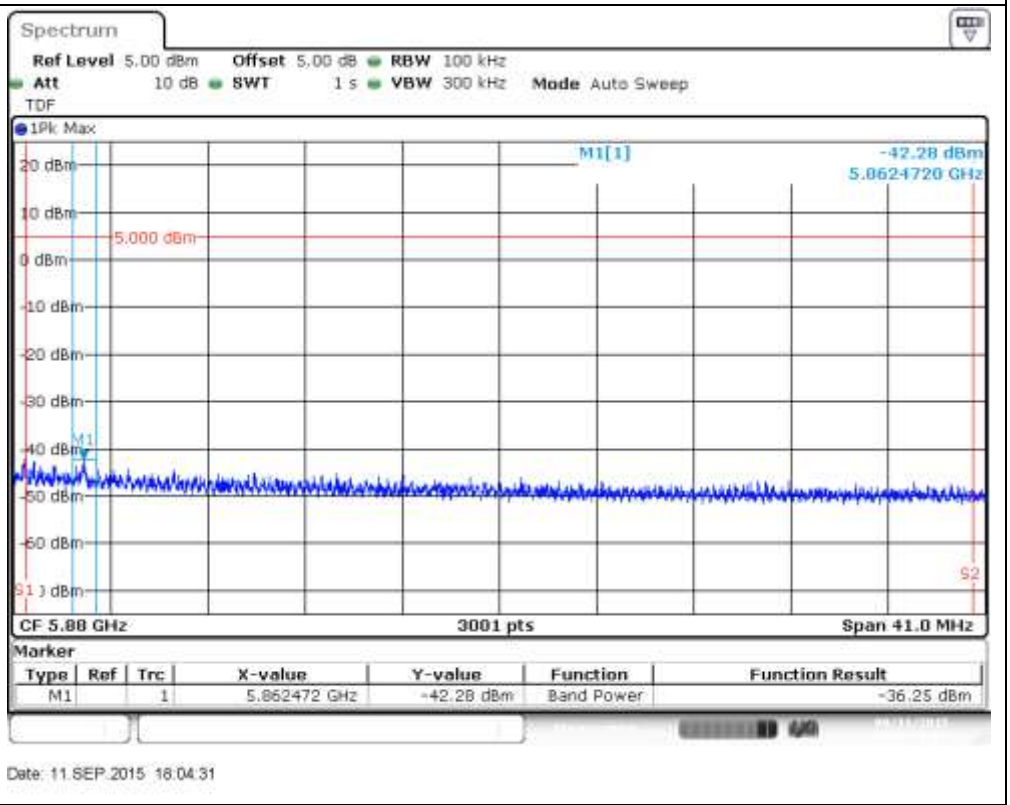


BE Low Freq Section, RMS – CH149

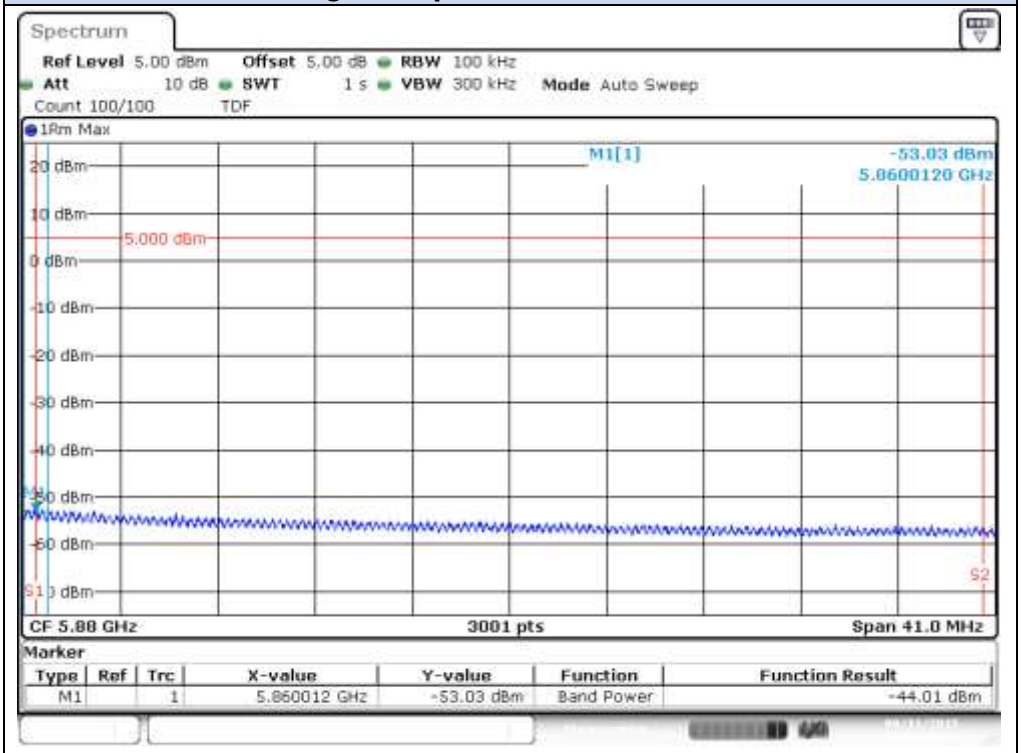


BE High Freq Section, Peak – CH165



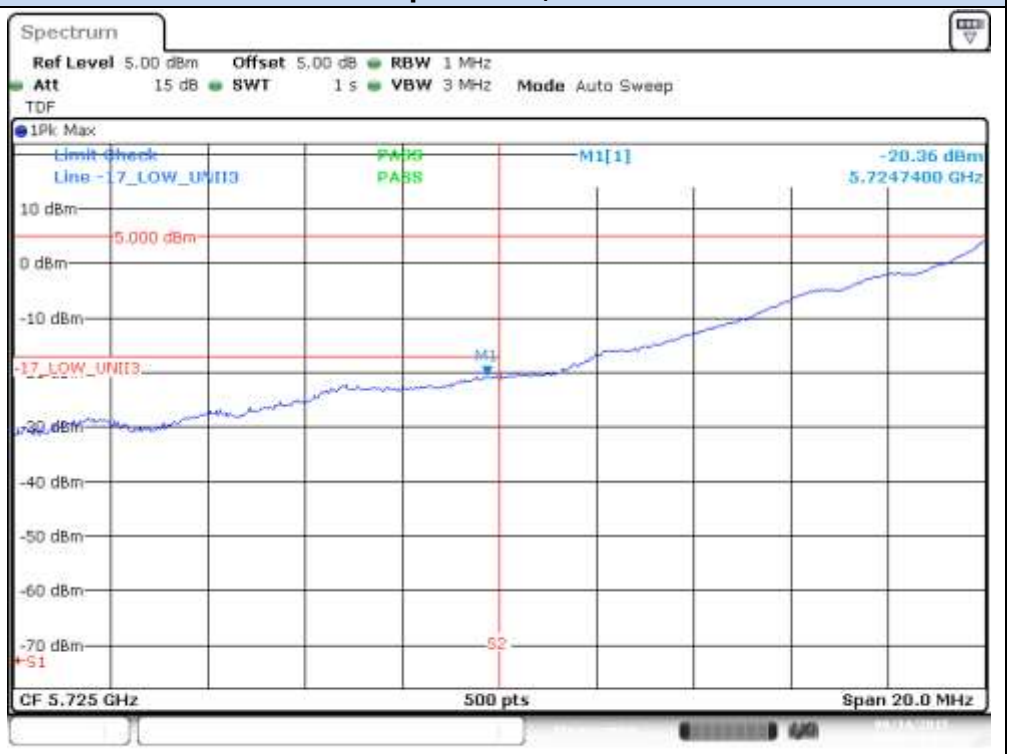


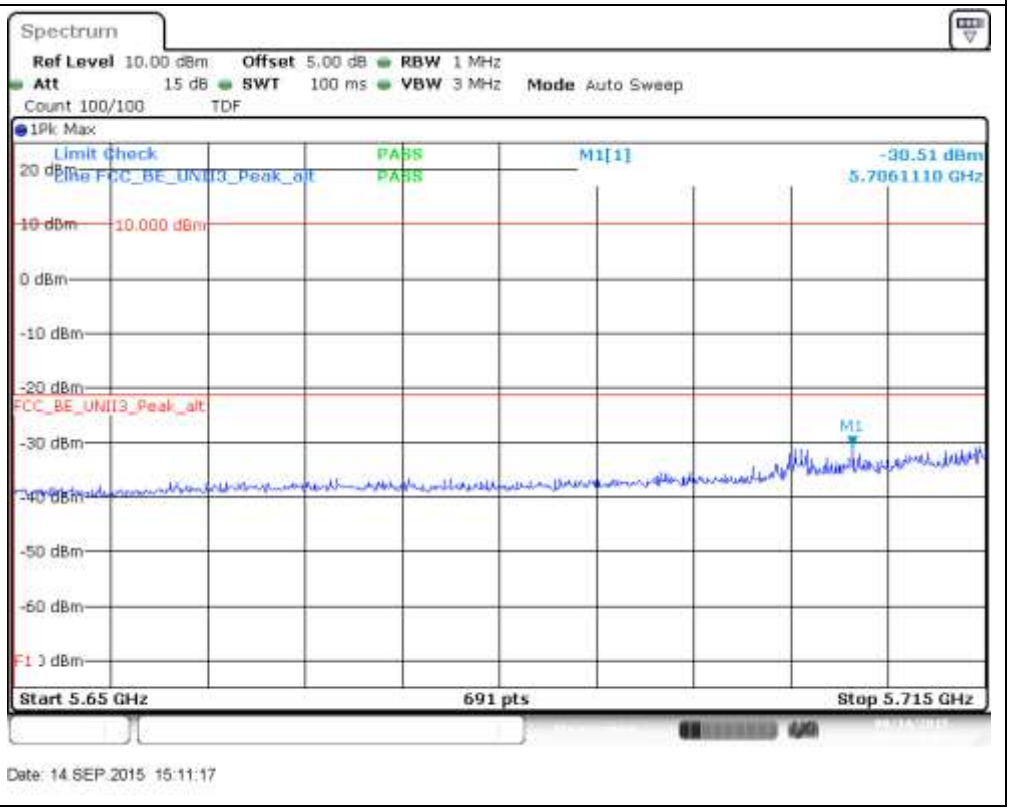
BE High Freq Section, RMS– CH165



802.11n20, HT8 (MIMO) – Chain A

BE Low Freq Section, Peak – CH149





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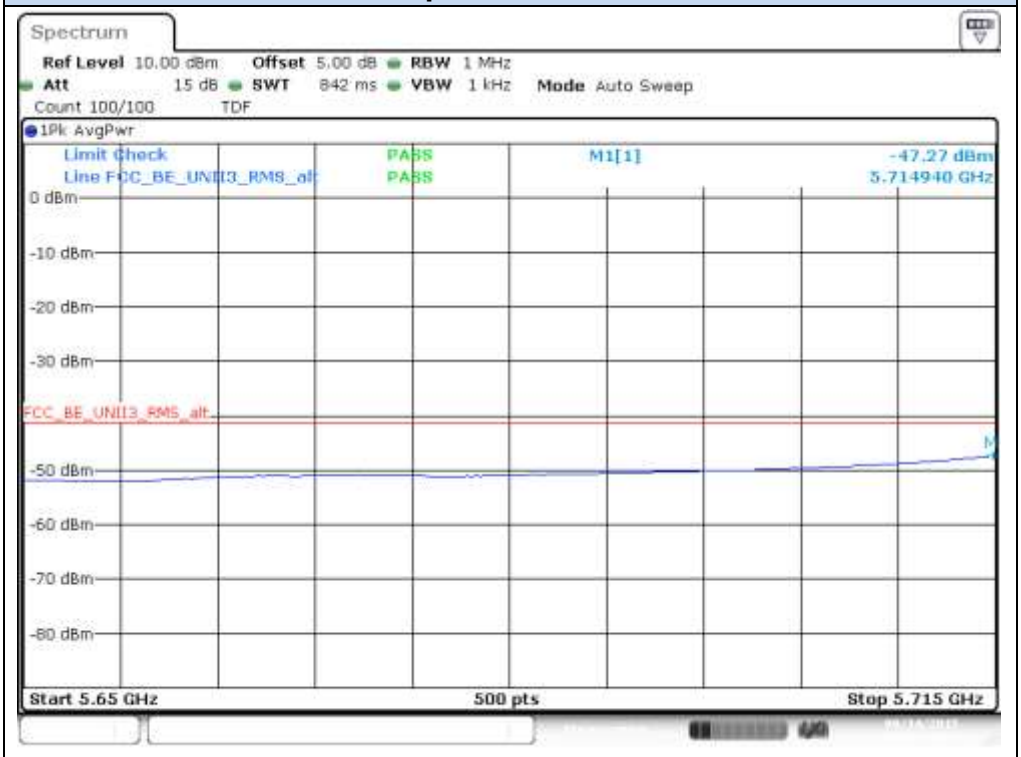
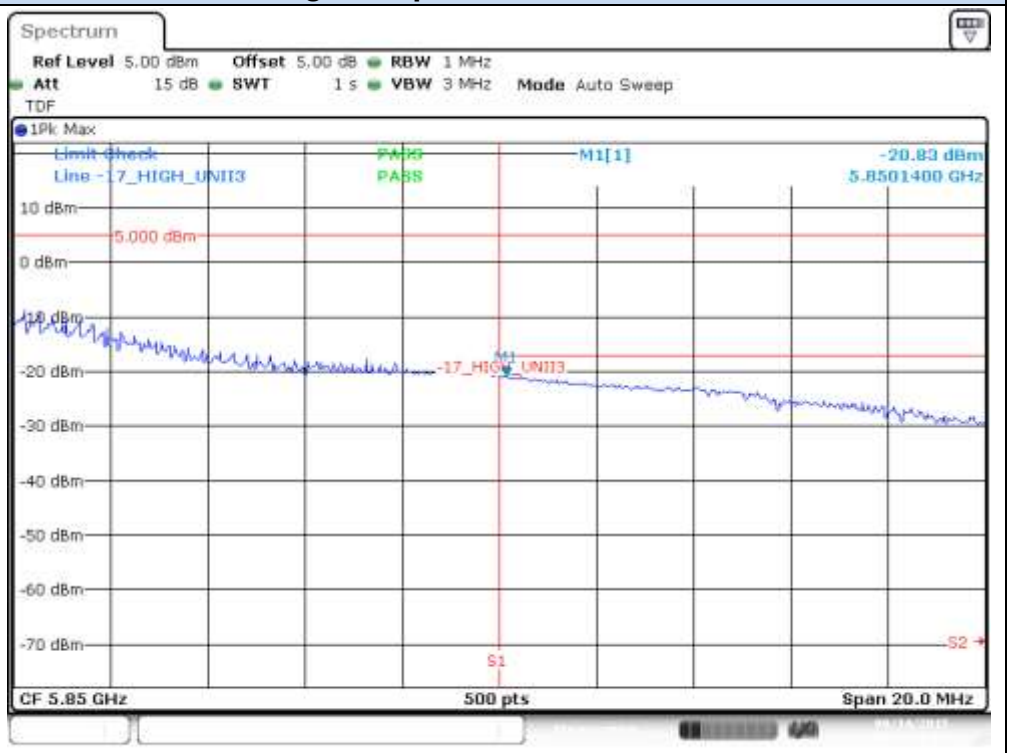
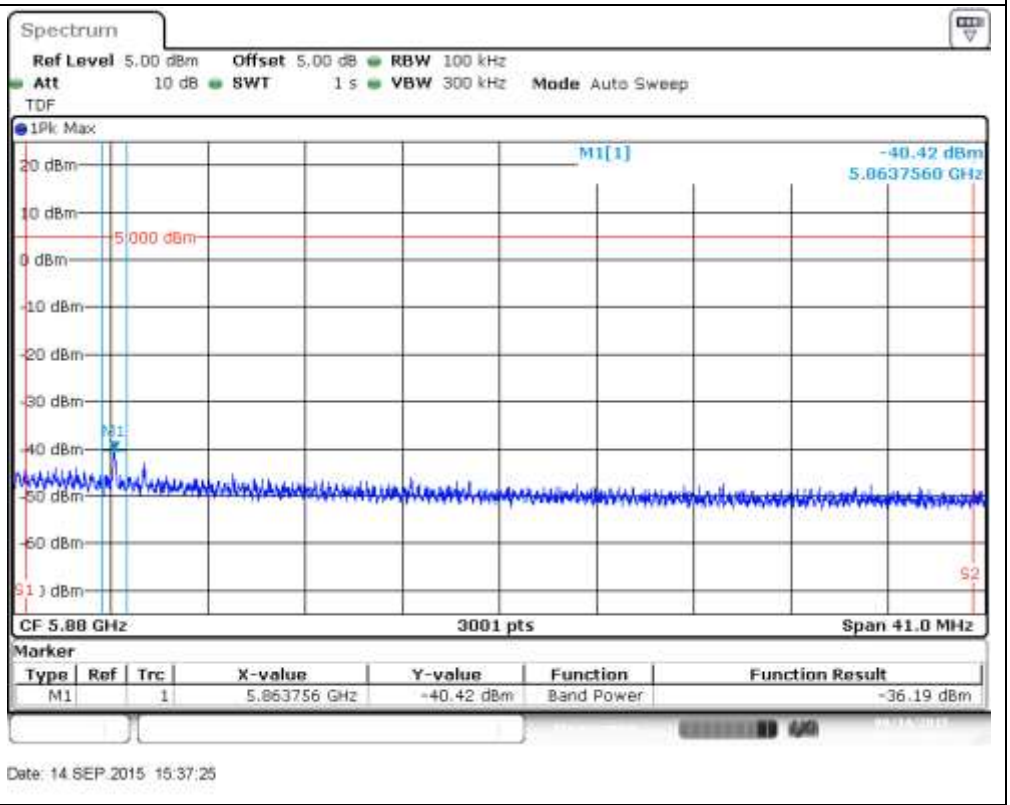
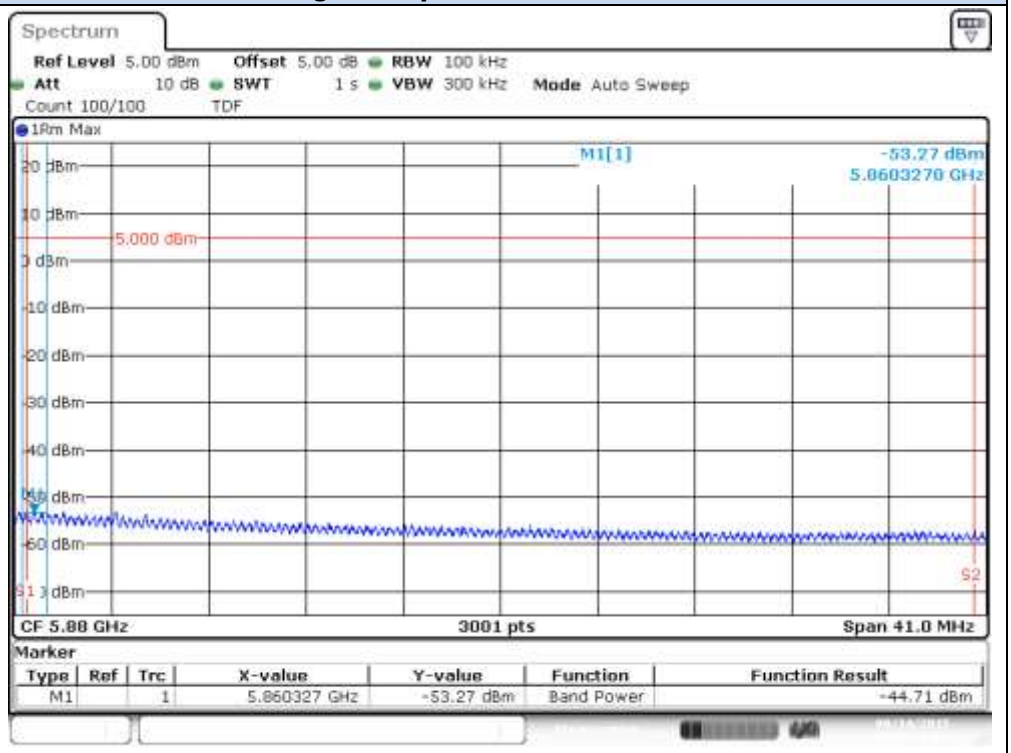


BE High Freq Section, Peak – CH165



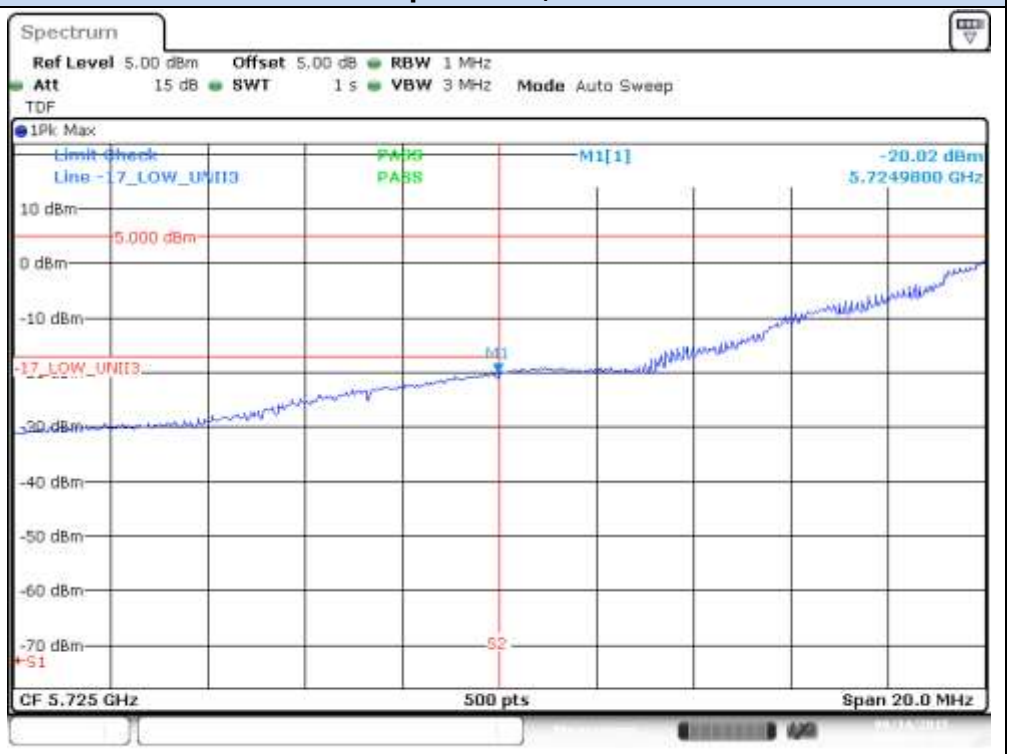


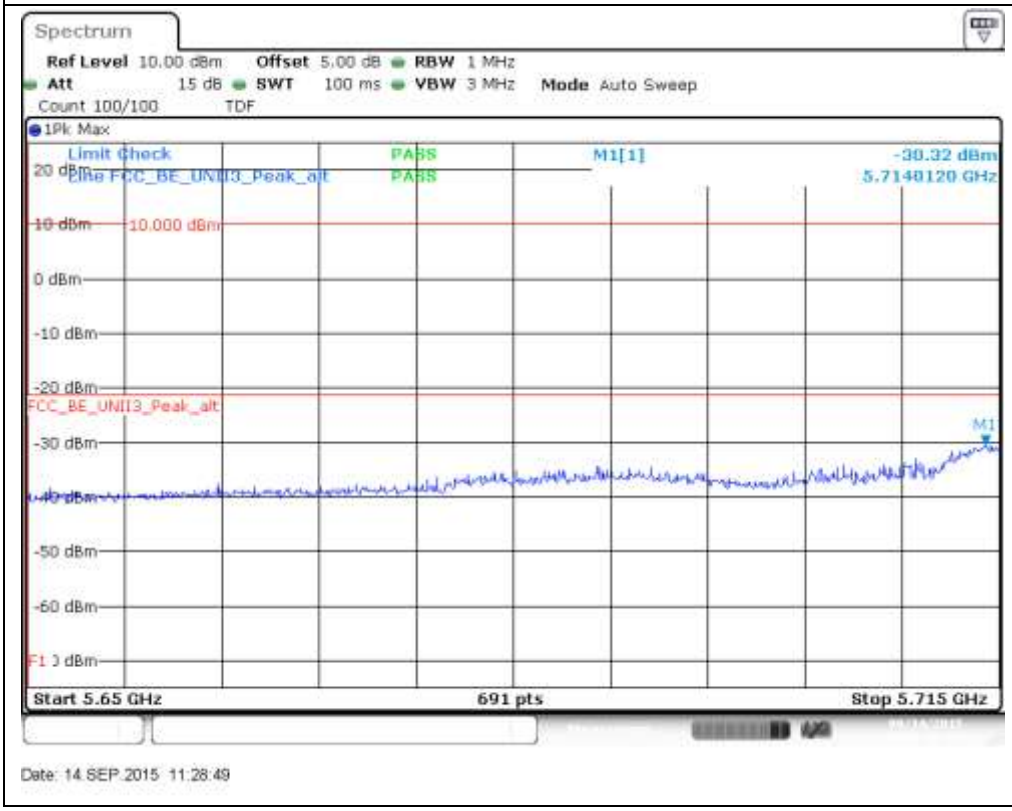
BE High Freq Section, RMS– CH165



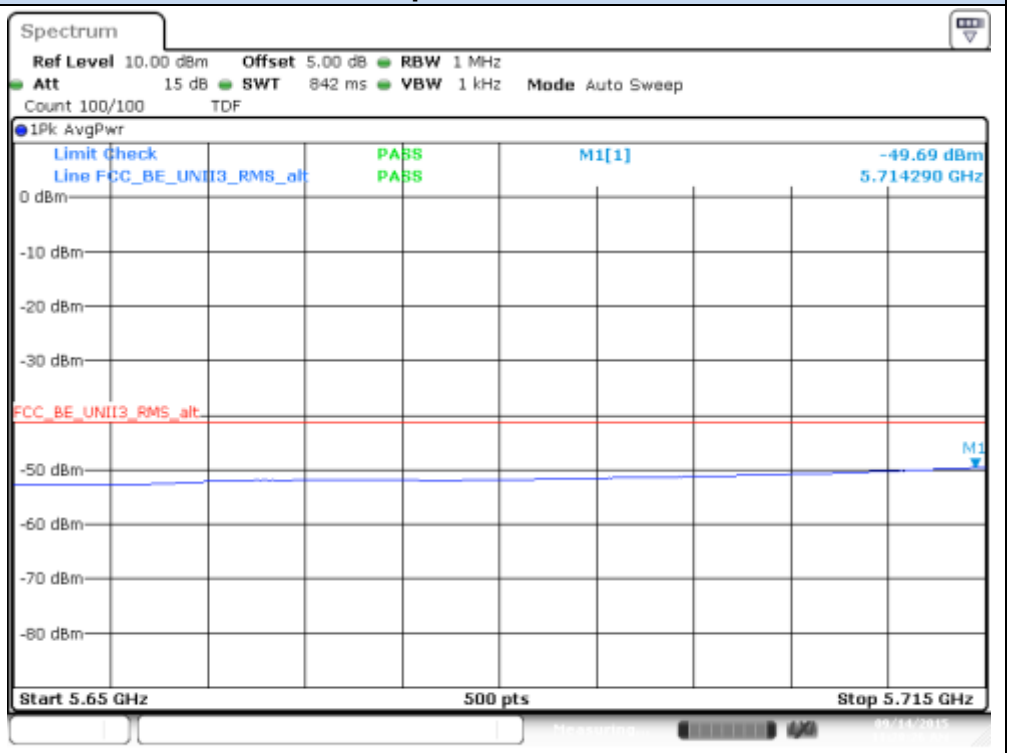
802.11n20, HT8 (MIMO) – Chain B

BE Low Freq Section, Peak – CH149

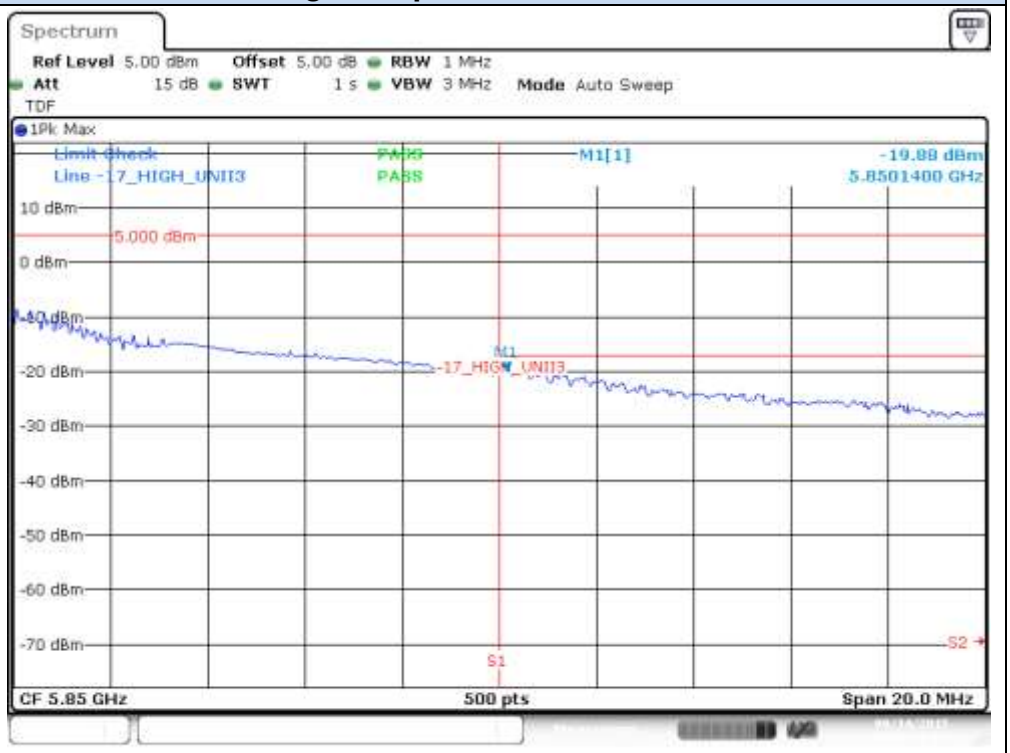


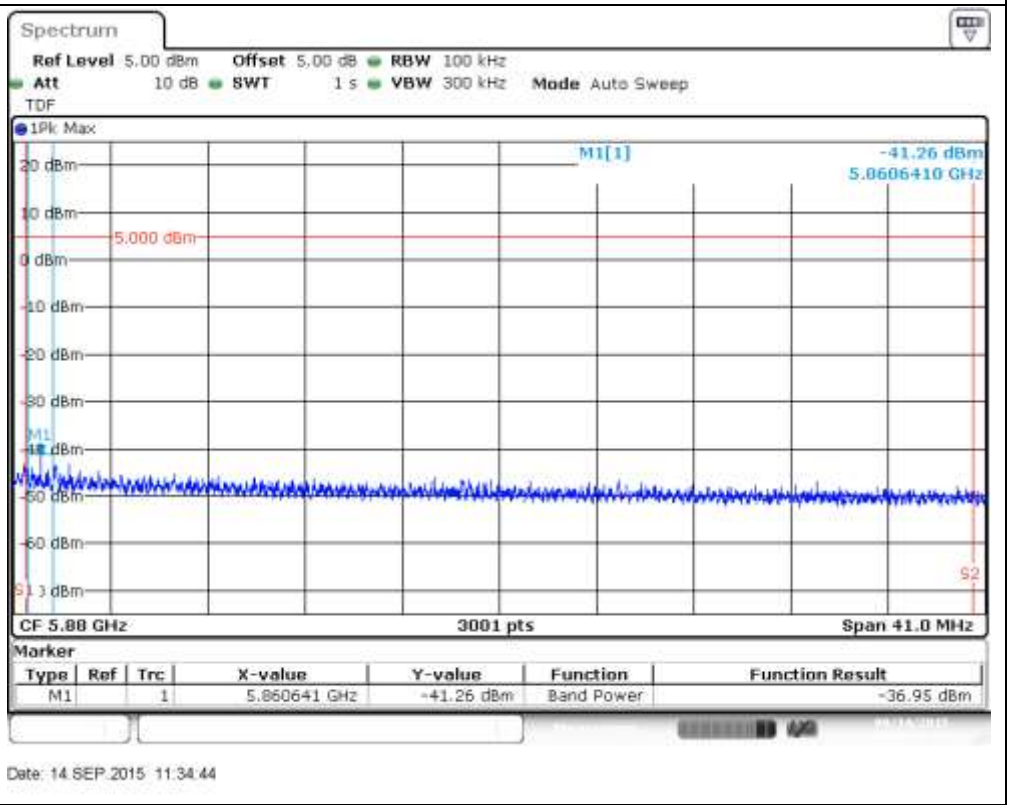


BE Low Freq Section, RMS – CH149

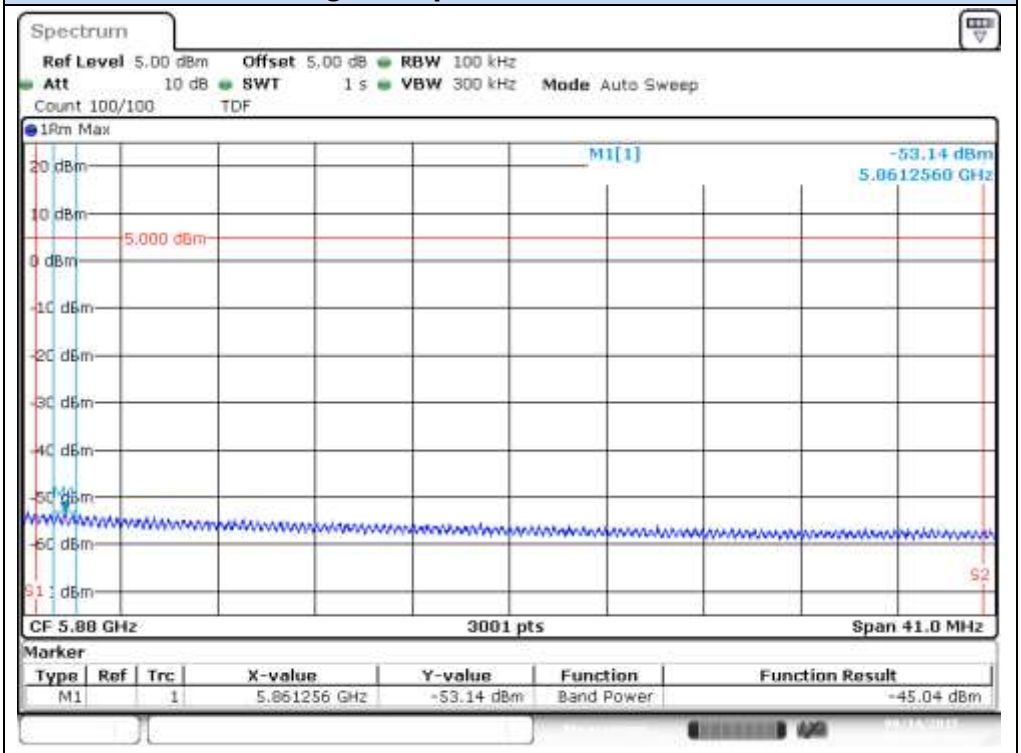


BE High Freq Section, Peak – CH165



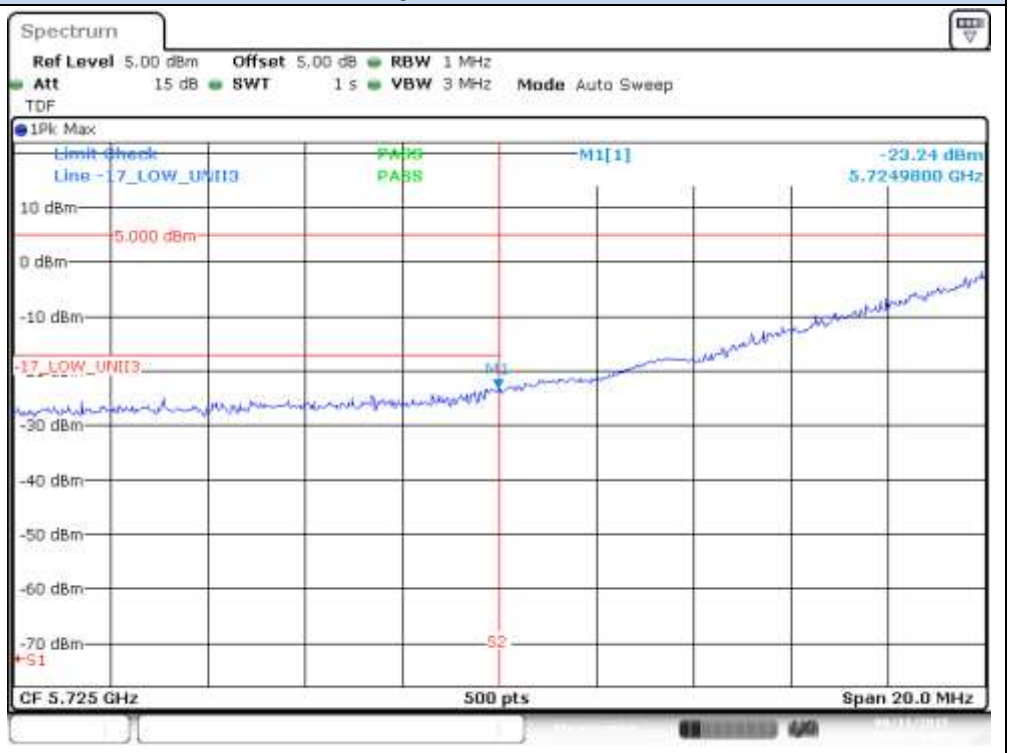


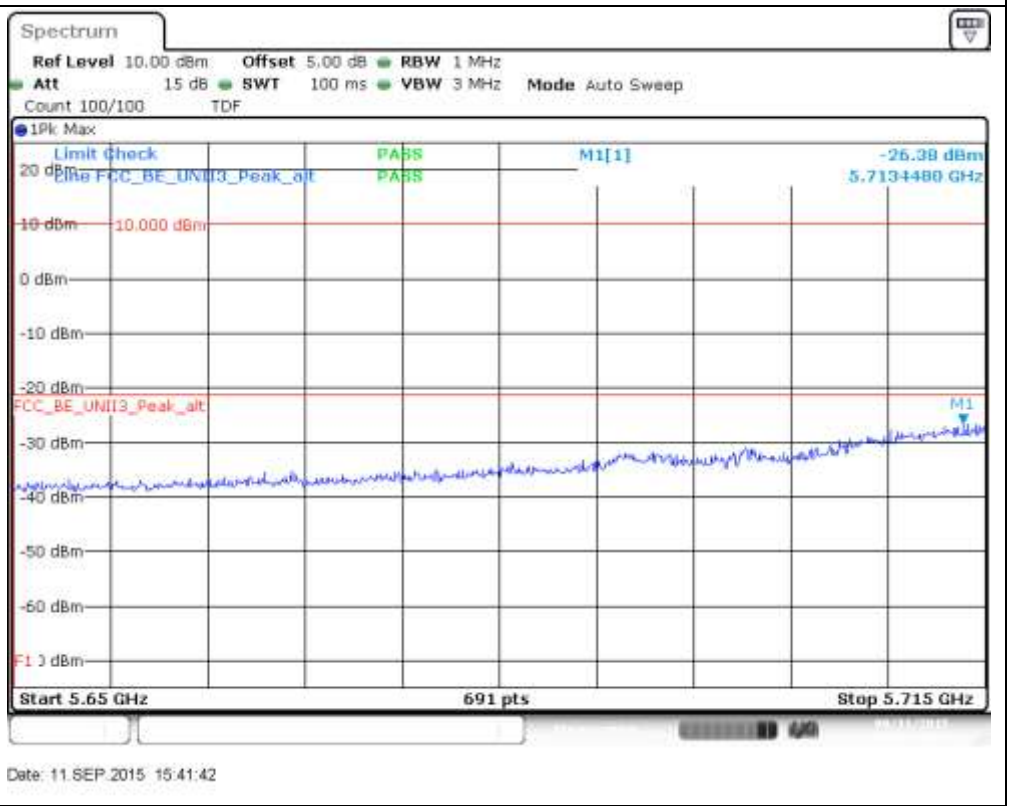
BE High Freq Section, RMS– CH165



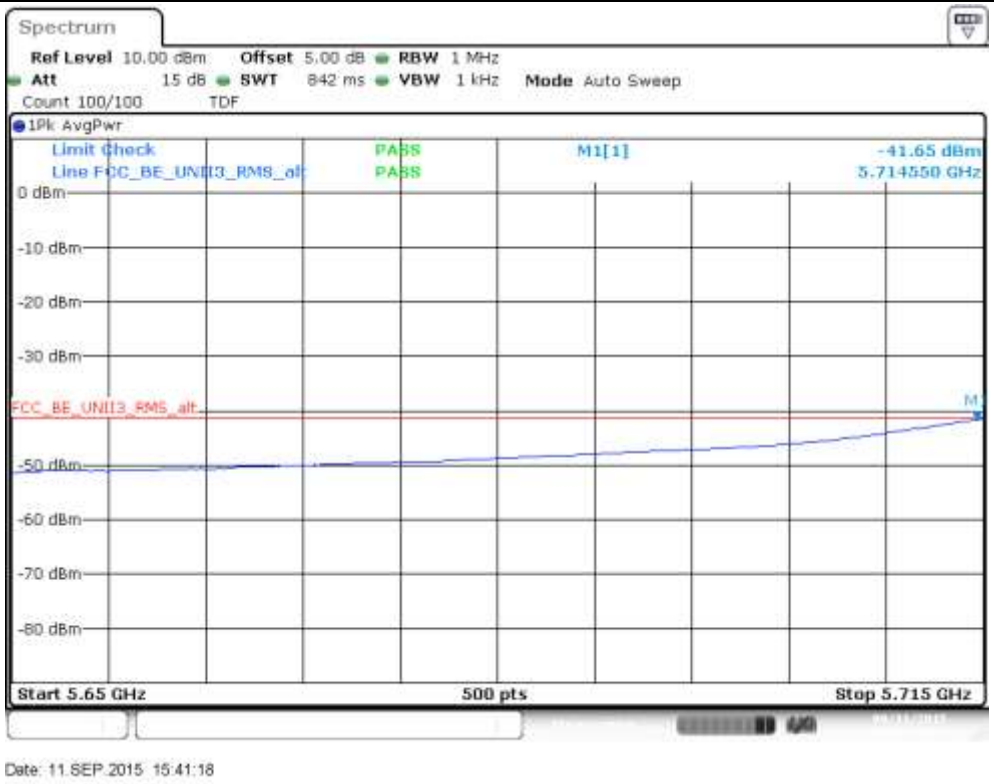
802.11n40, HT0 (SISO) – Chain A

BE Low Freq Section, Peak – CH151F

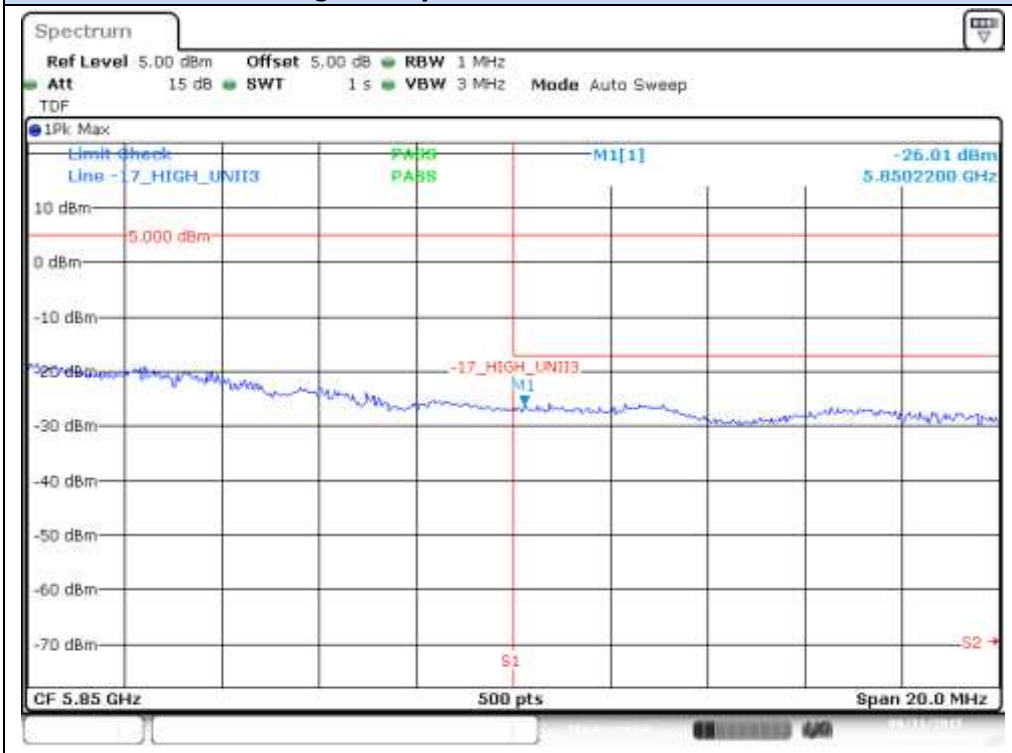




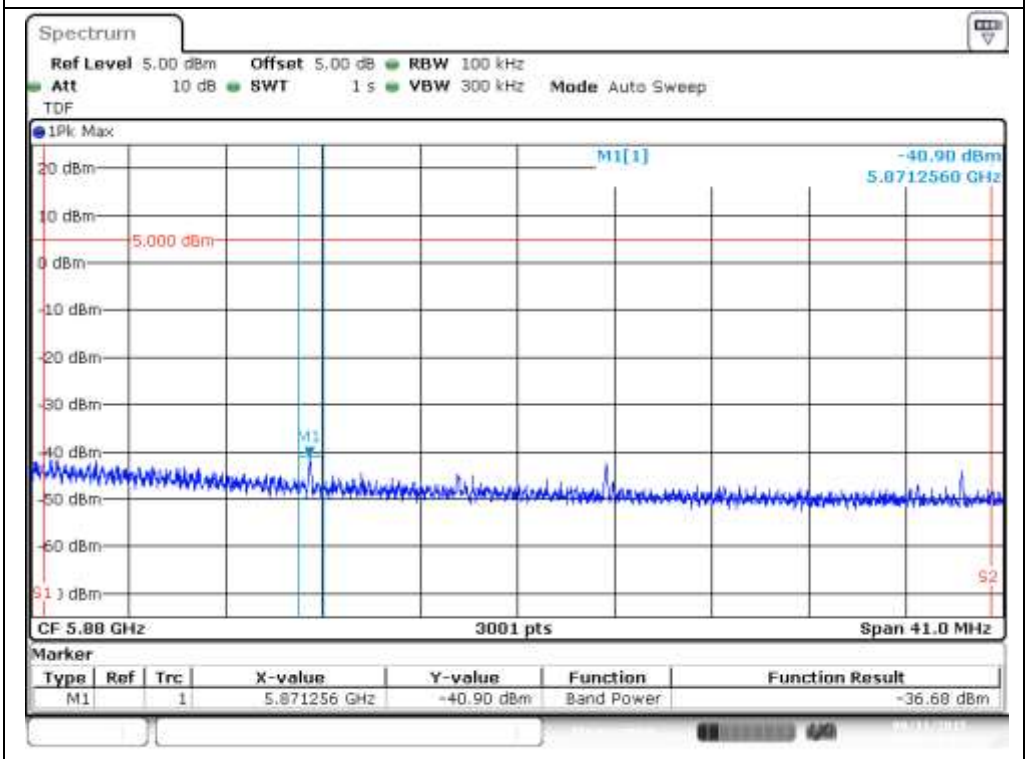
BE Low Freq Section, RMS – CH151F



BE High Freq Section, Peak – CH159F



Date: 11.SEP.2015 16:13:28



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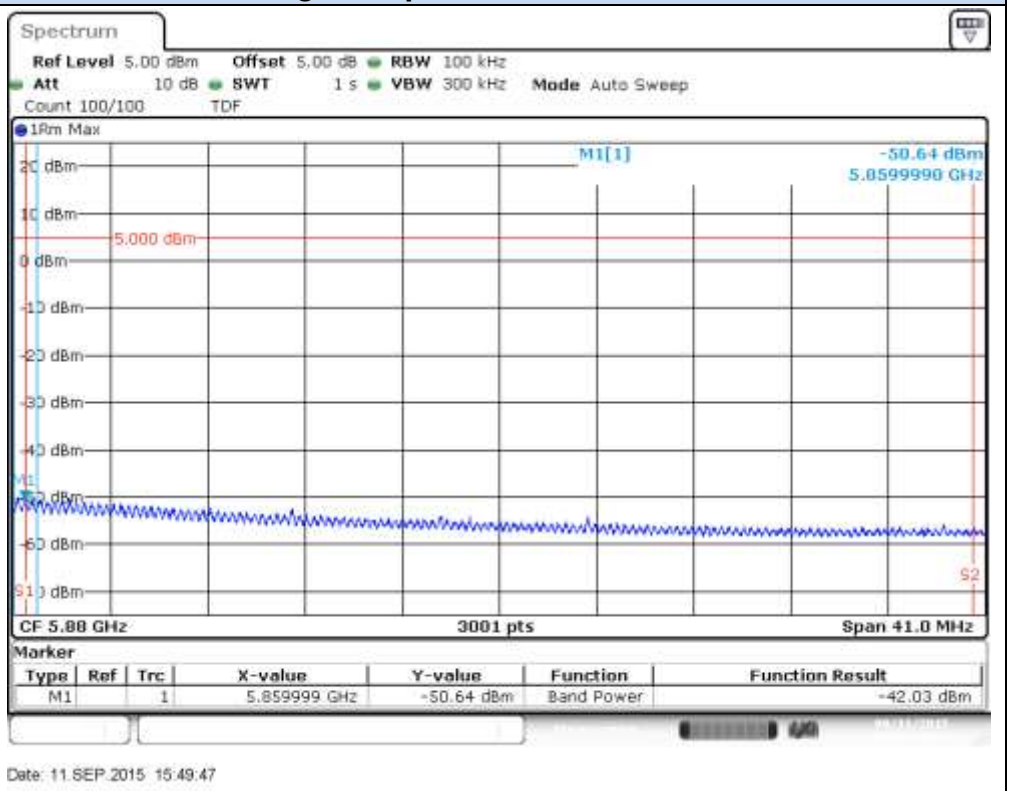
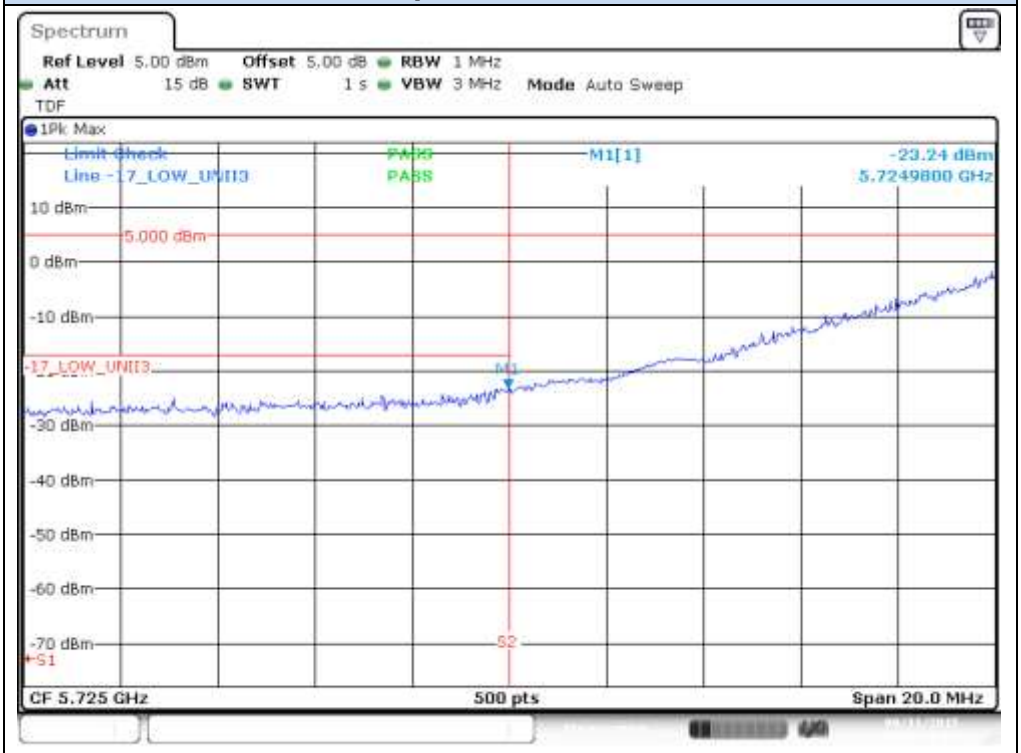
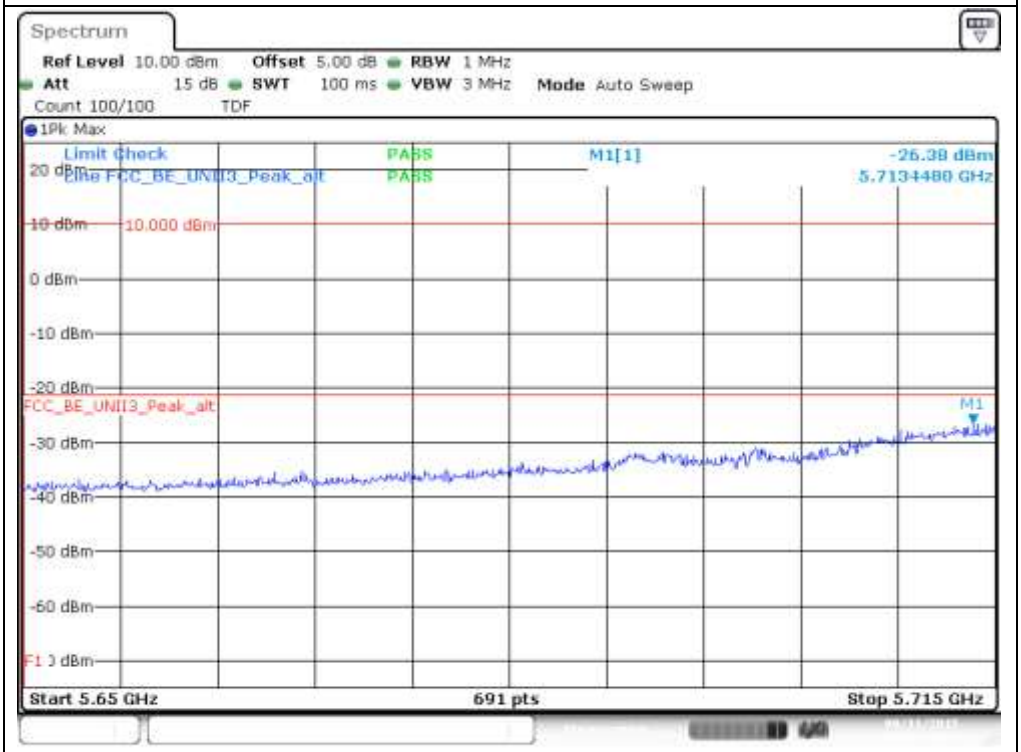
BE High Freq Section, RMS – CH159F



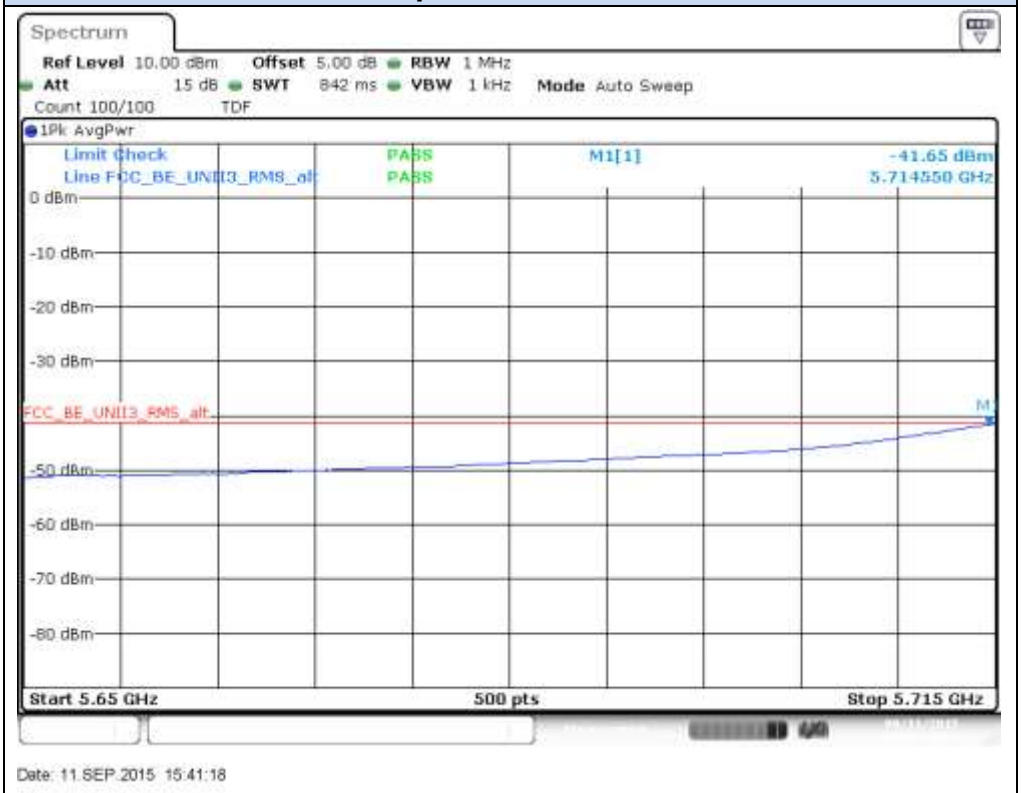
802.11n40, HT0 (SISO) – Chain B

BE Low Freq Section, Peak – CH151F

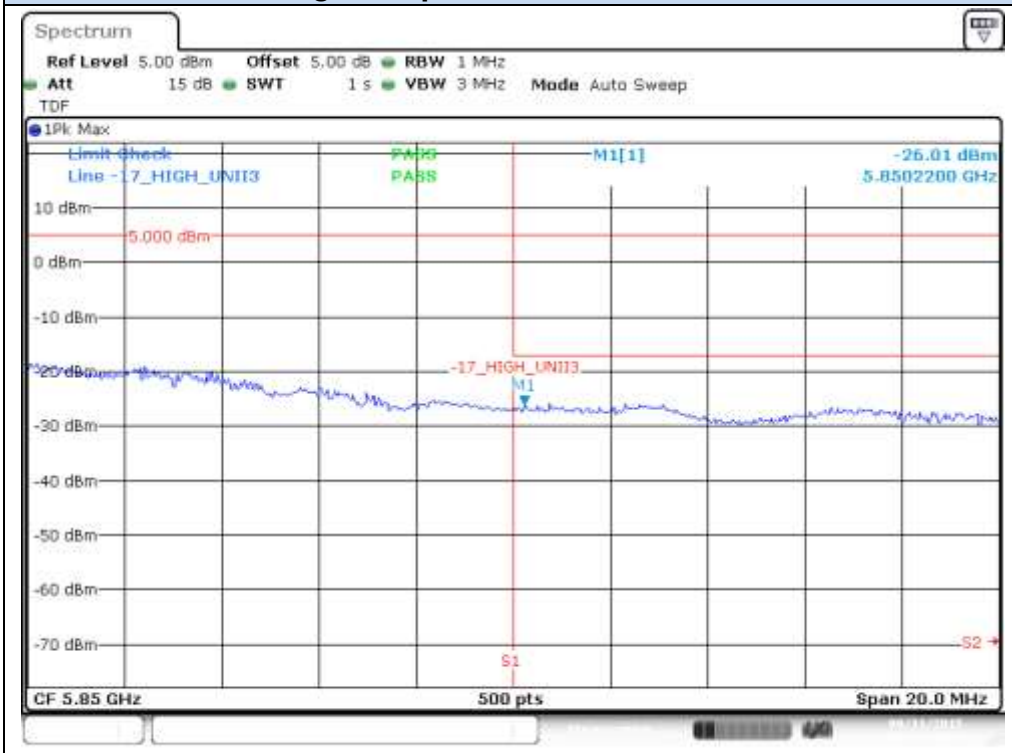


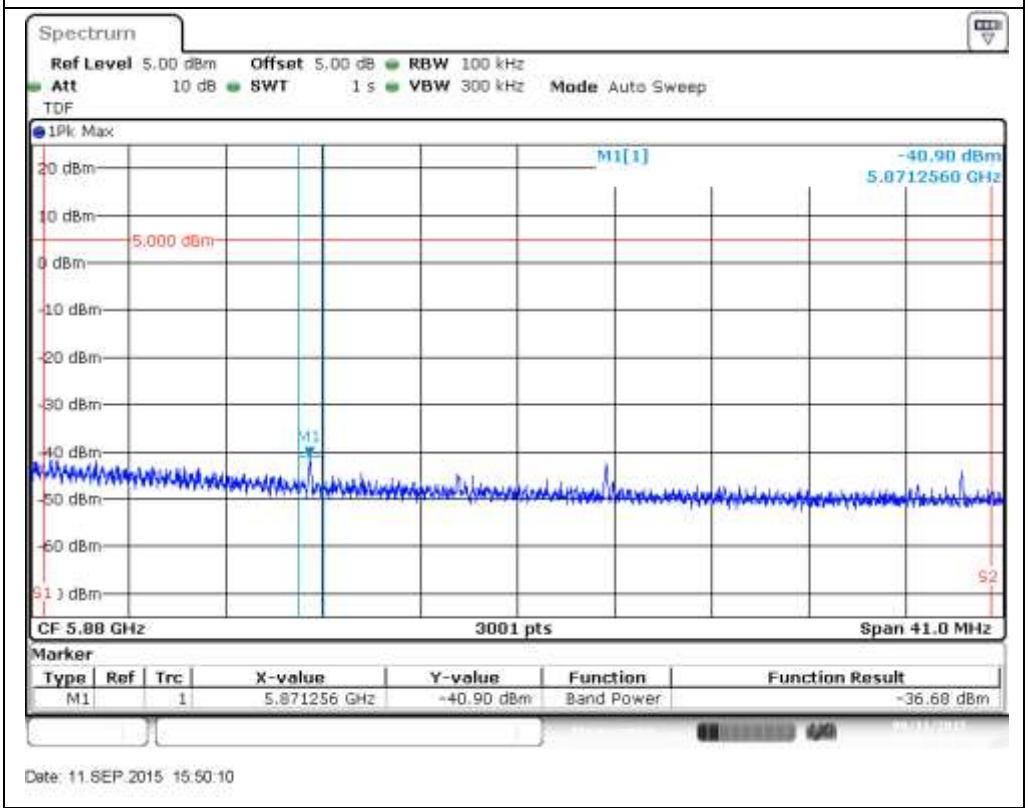


BE Low Freq Section, RMS – CH151F

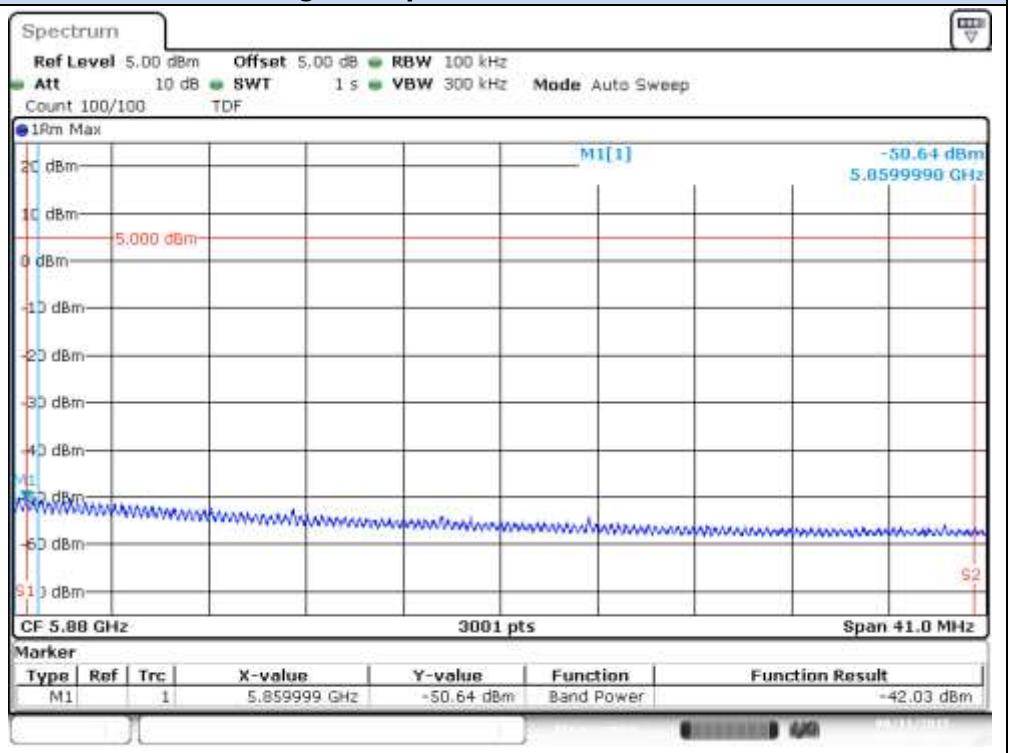


BE High Freq Section, Peak – CH159F



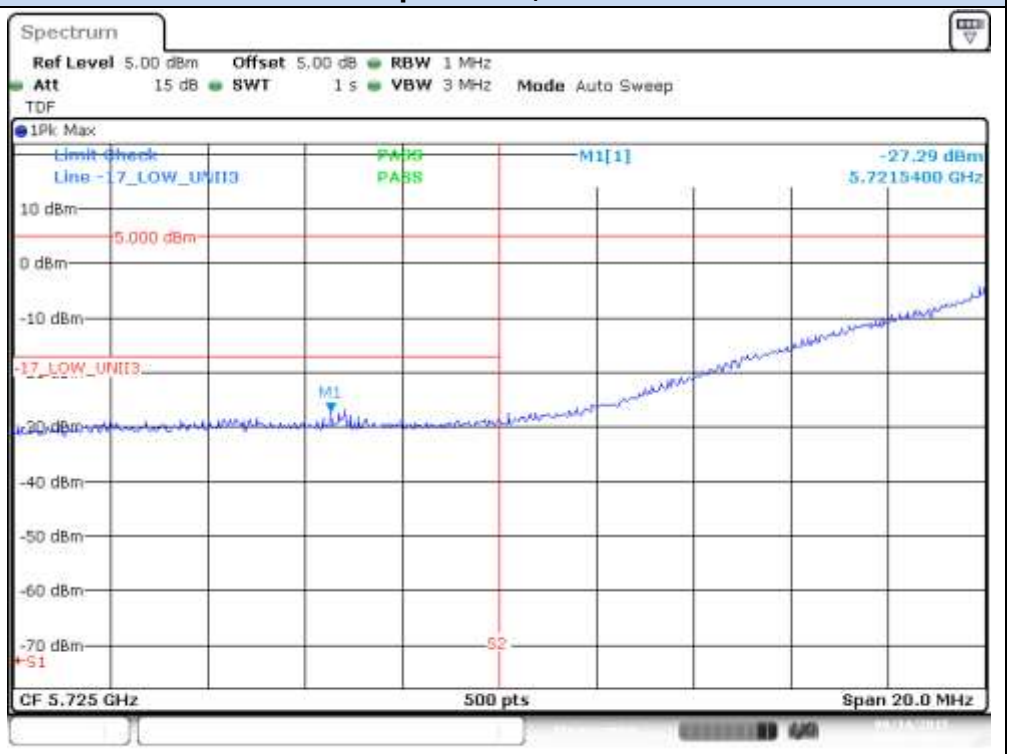


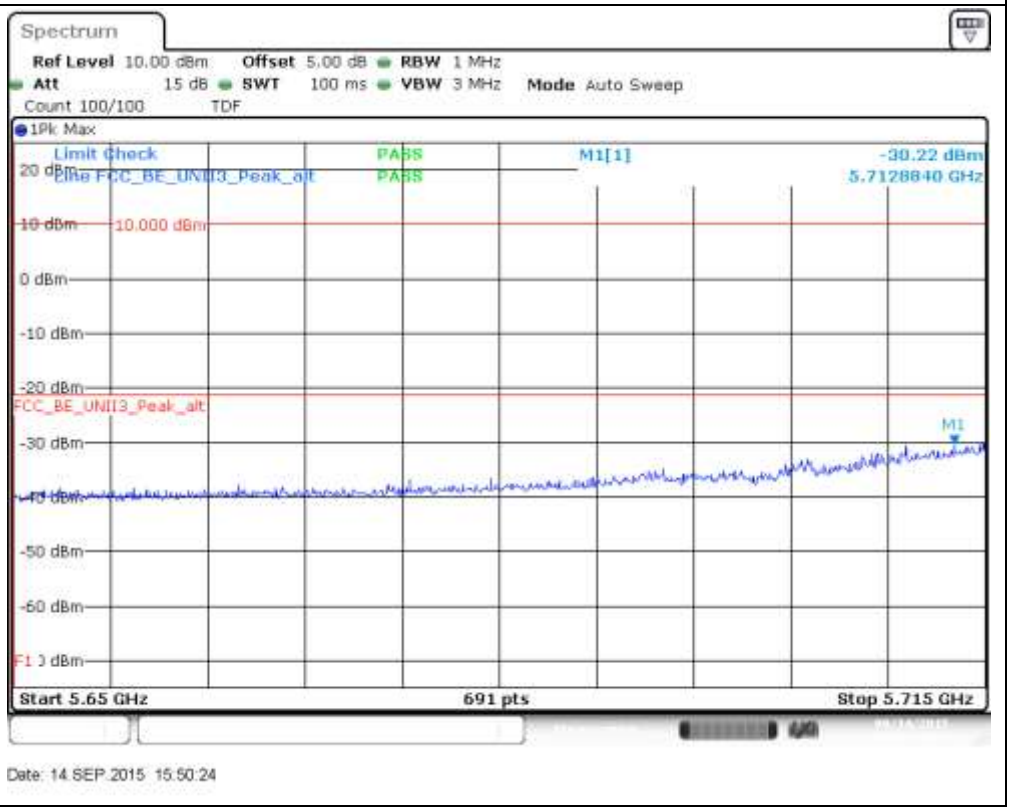
BE High Freq Section, RMS – CH159F



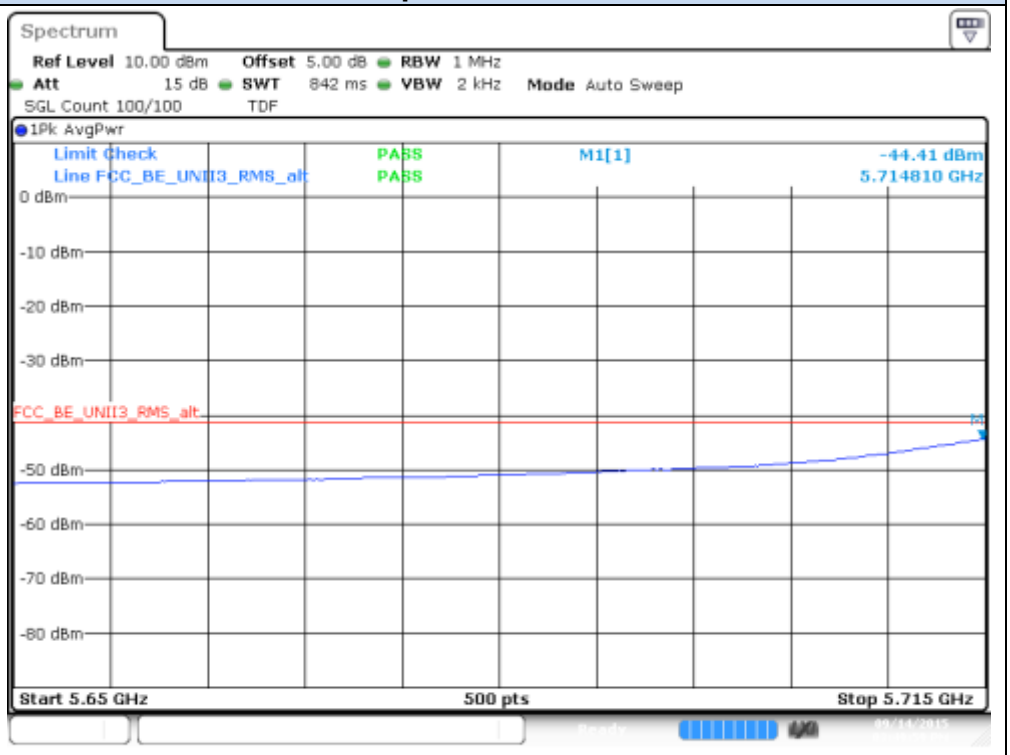
802.11n40, HT8 (MIMO) – Chain A

BE Low Freq Section, Peak – CH151F

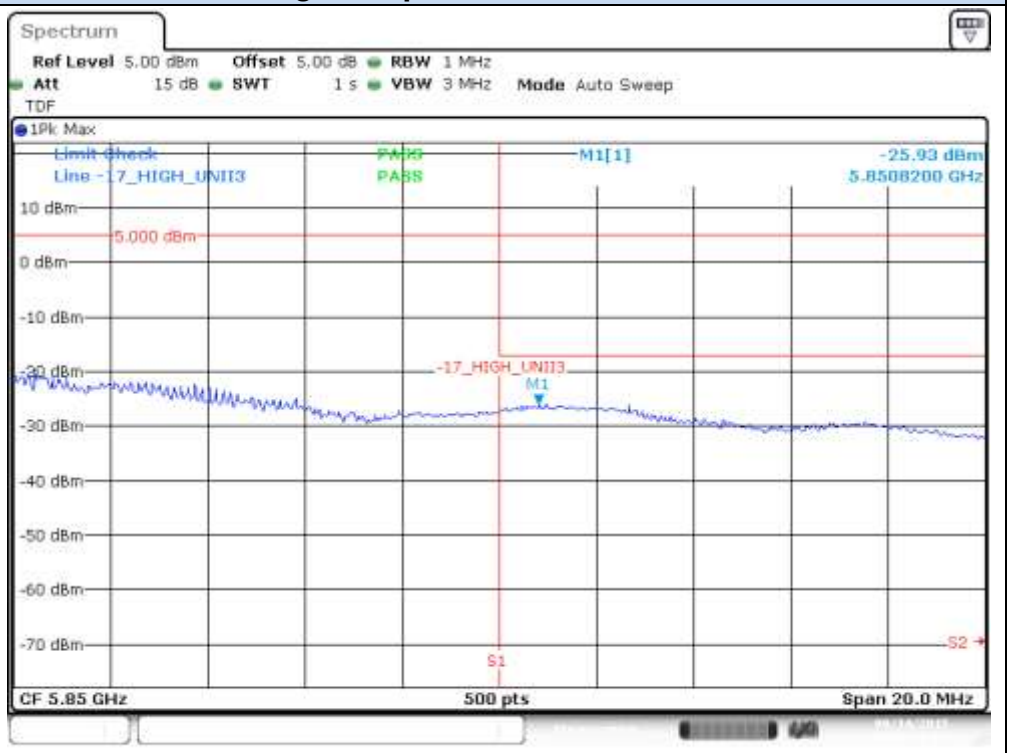


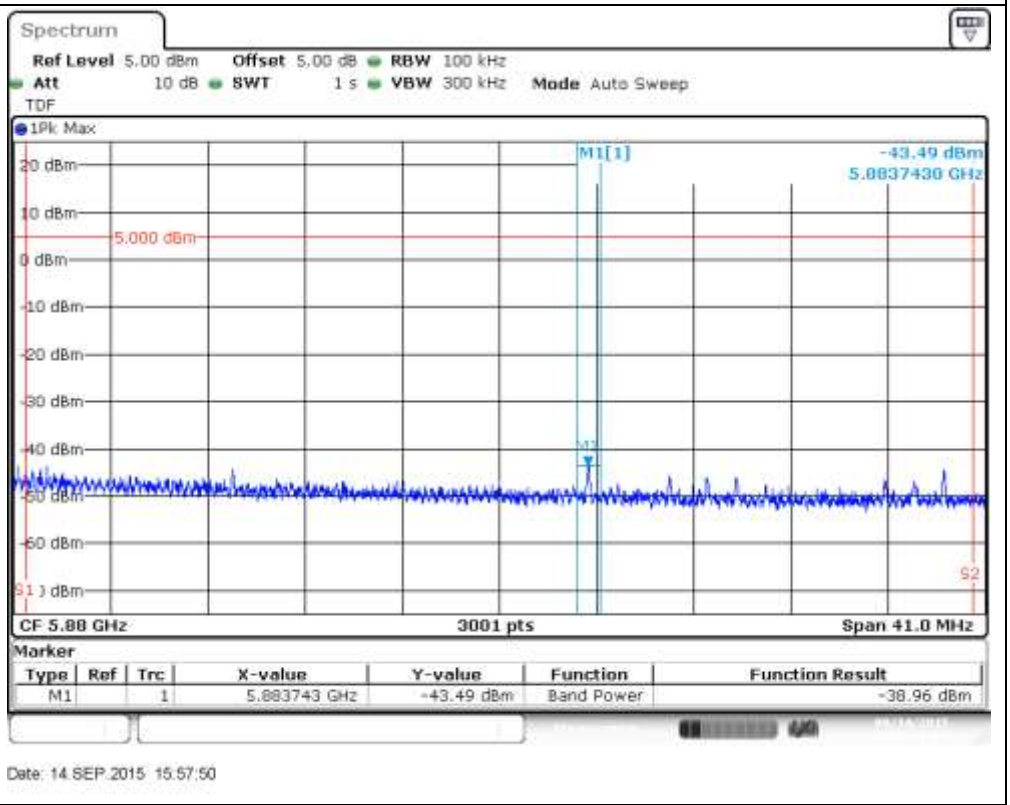


BE Low Freq Section, RMS – CH151F

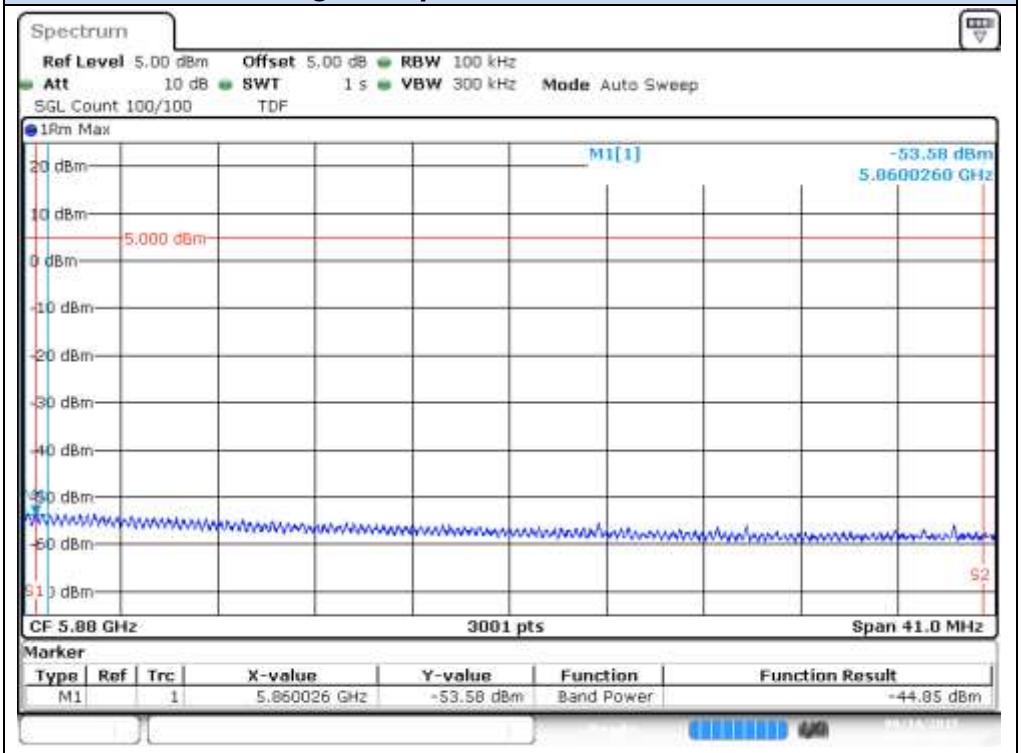


BE High Freq Section, Peak – CH159F



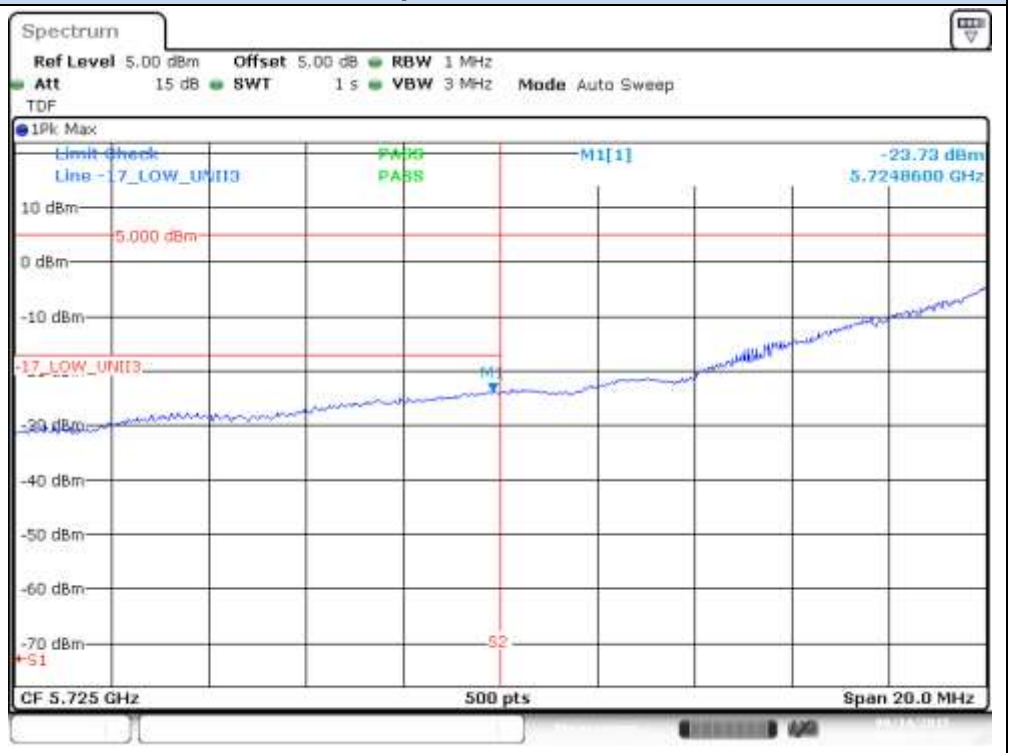


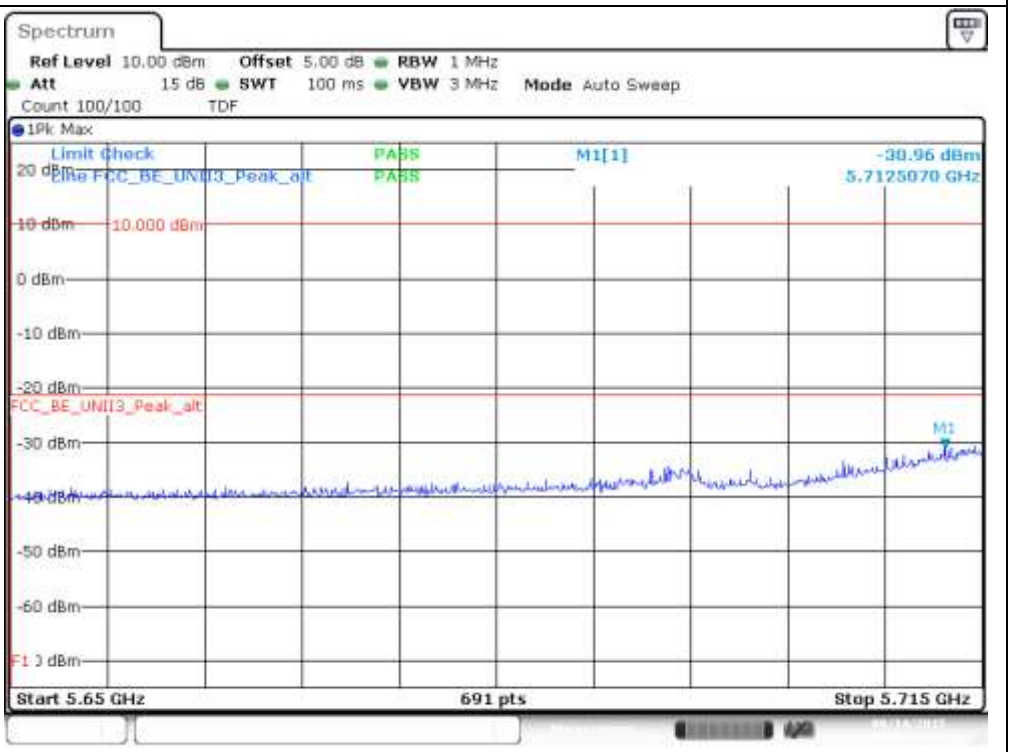
BE High Freq Section, RMS – CH159F



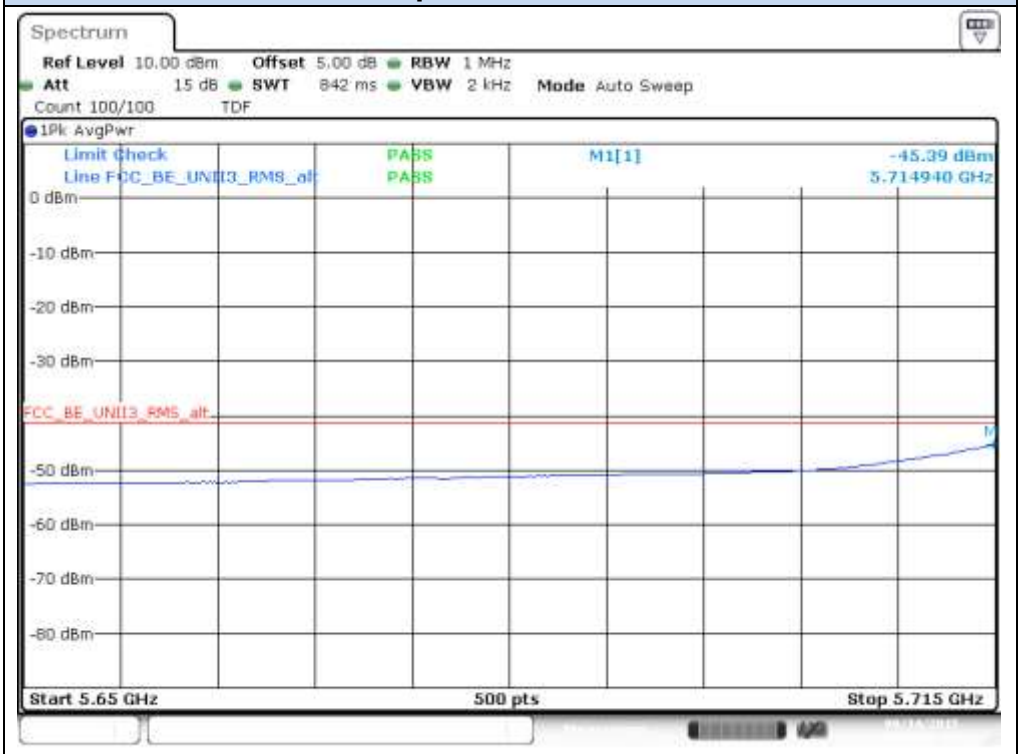
802.11n40, HT8 (MIMO) – Chain B

BE Low Freq Section, Peak – CH151F

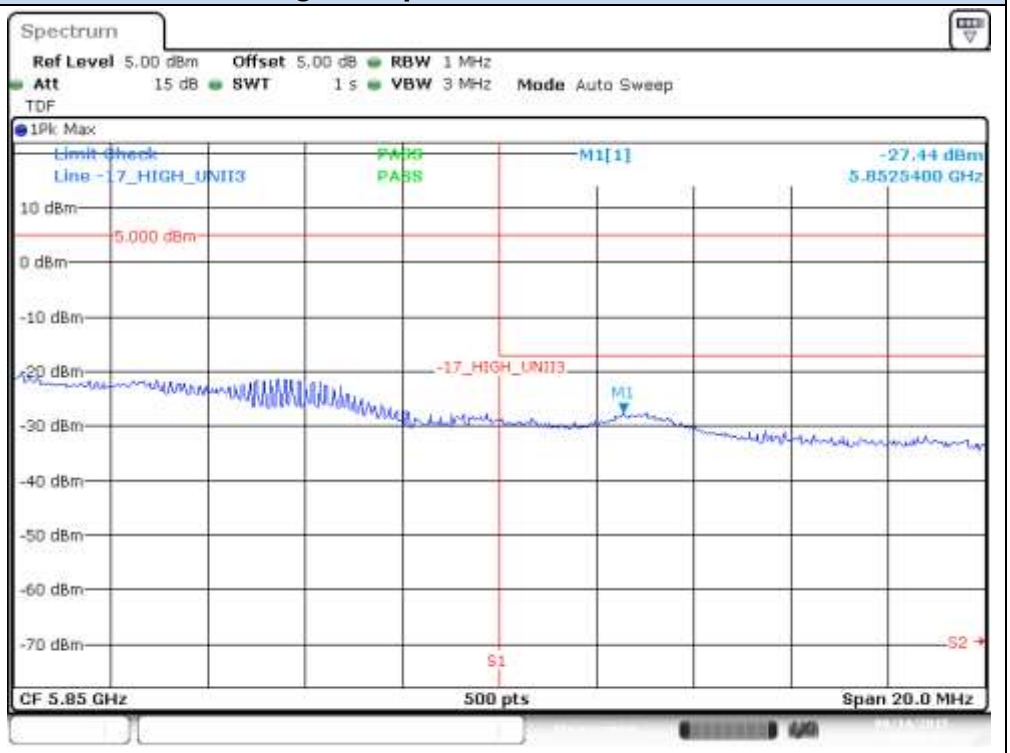




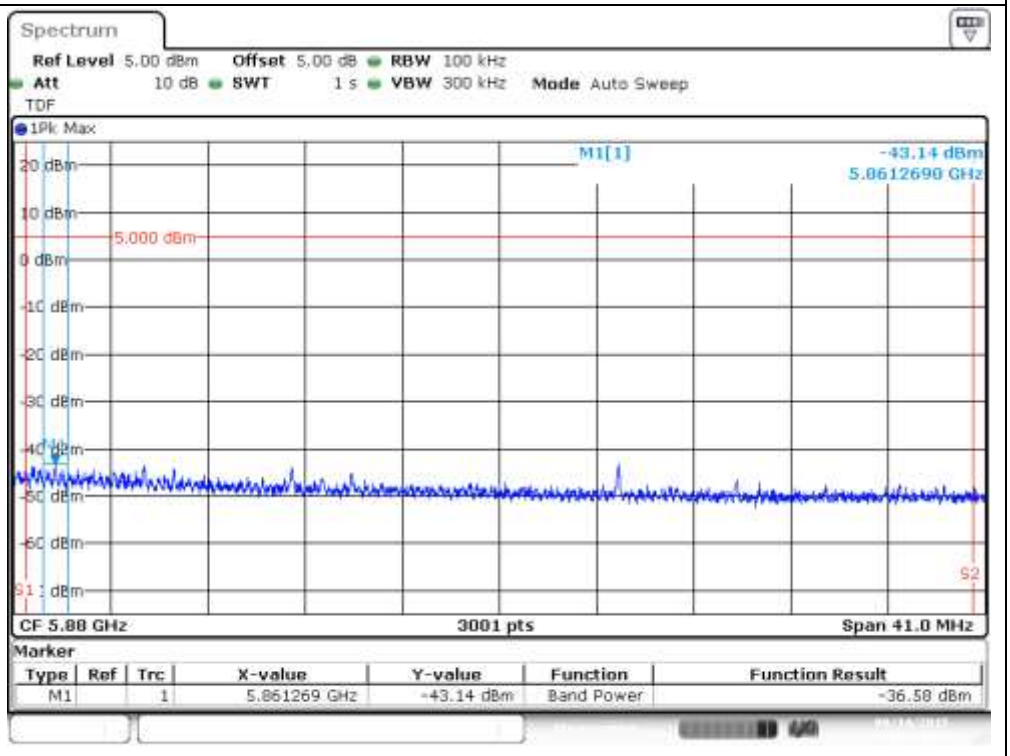
BE Low Freq Section, RMS – CH151F



BE High Freq Section, Peak – CH159F



Date: 14.SEP.2015 12:09:06



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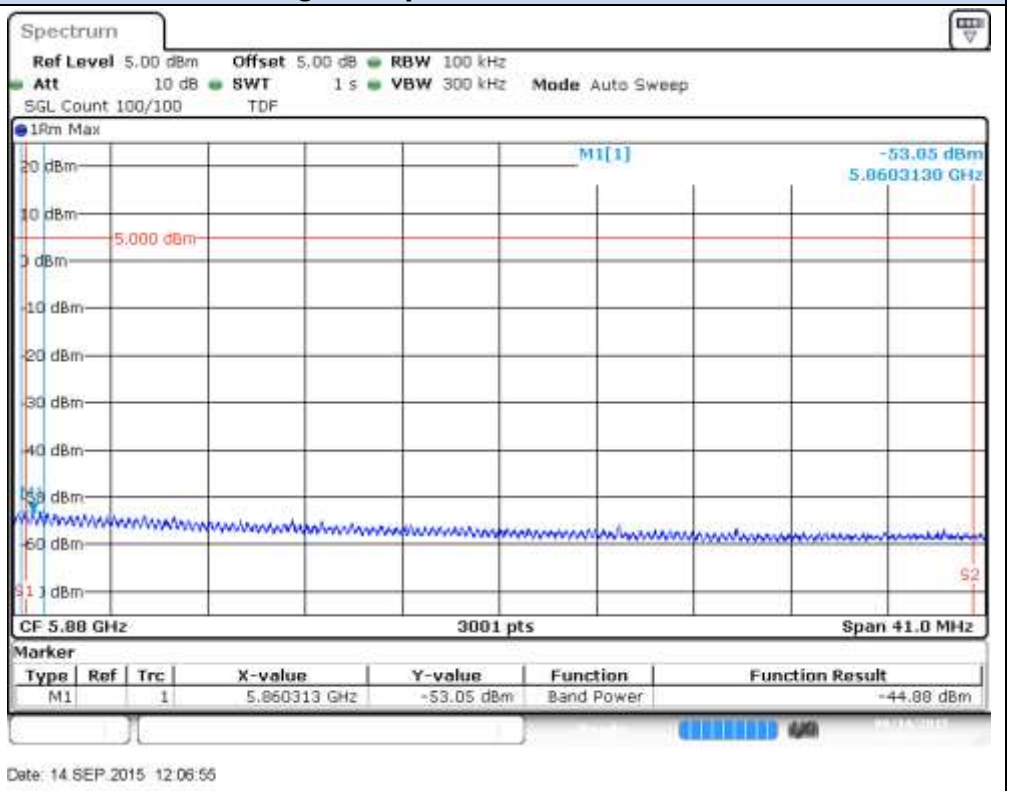
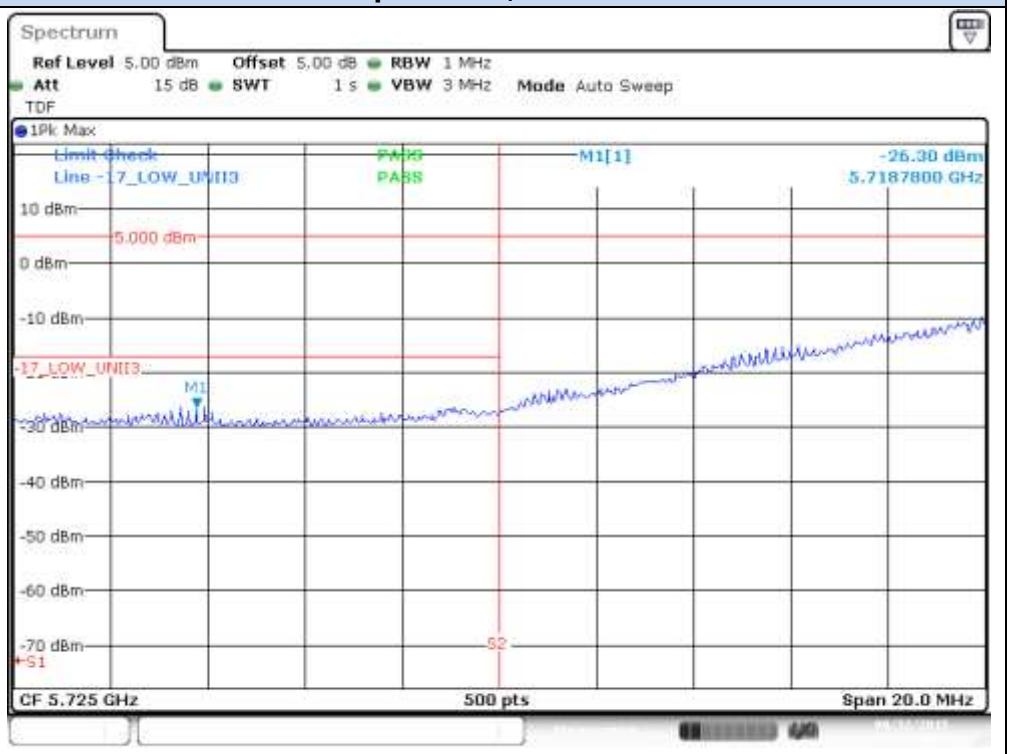
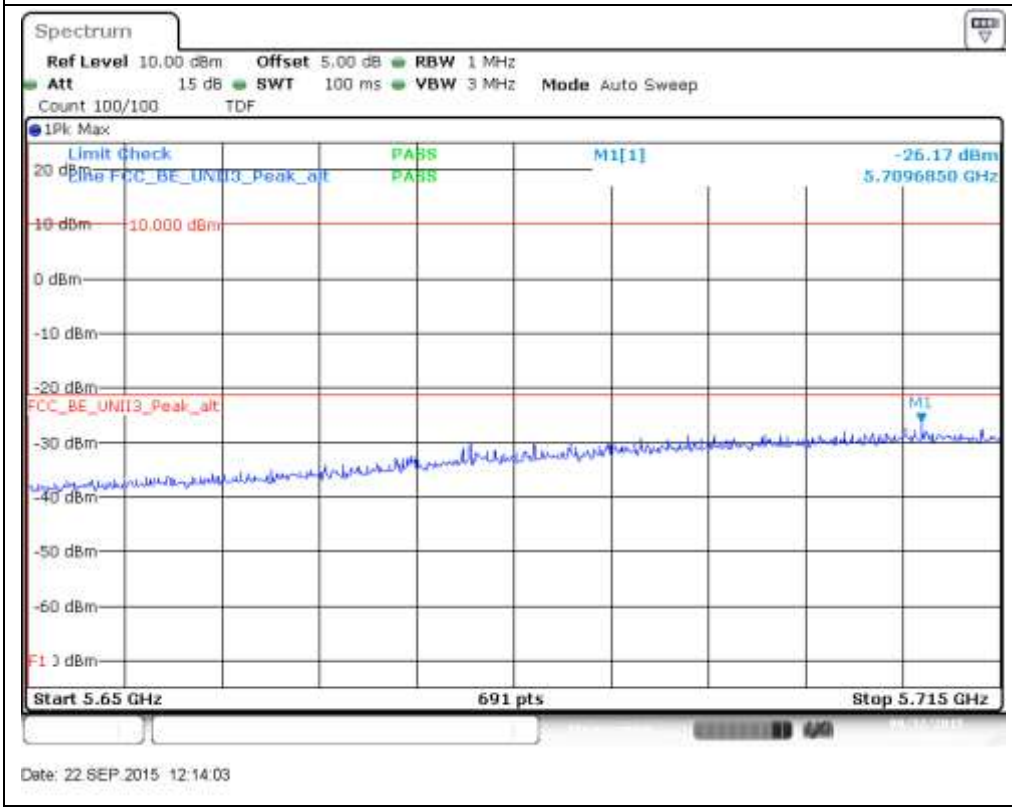
BE High Freq Section, RMS – CH159F



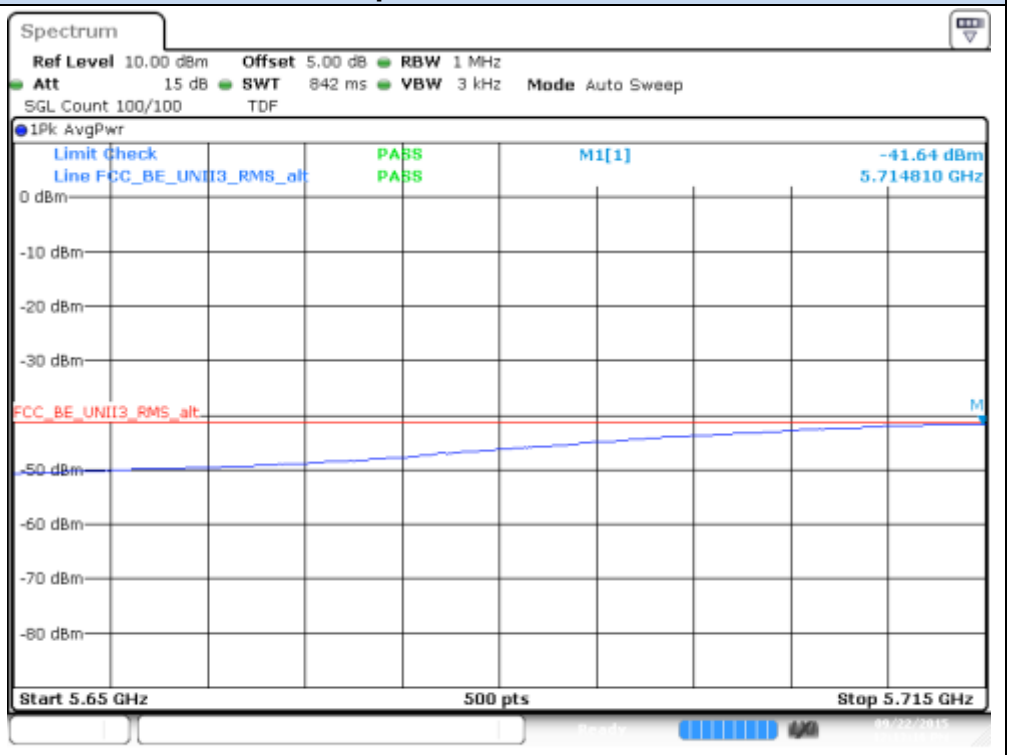
802.11ac80, VHT0 (SISO)- Chain A

BE Low Freq Section, Peak – CH155ac80

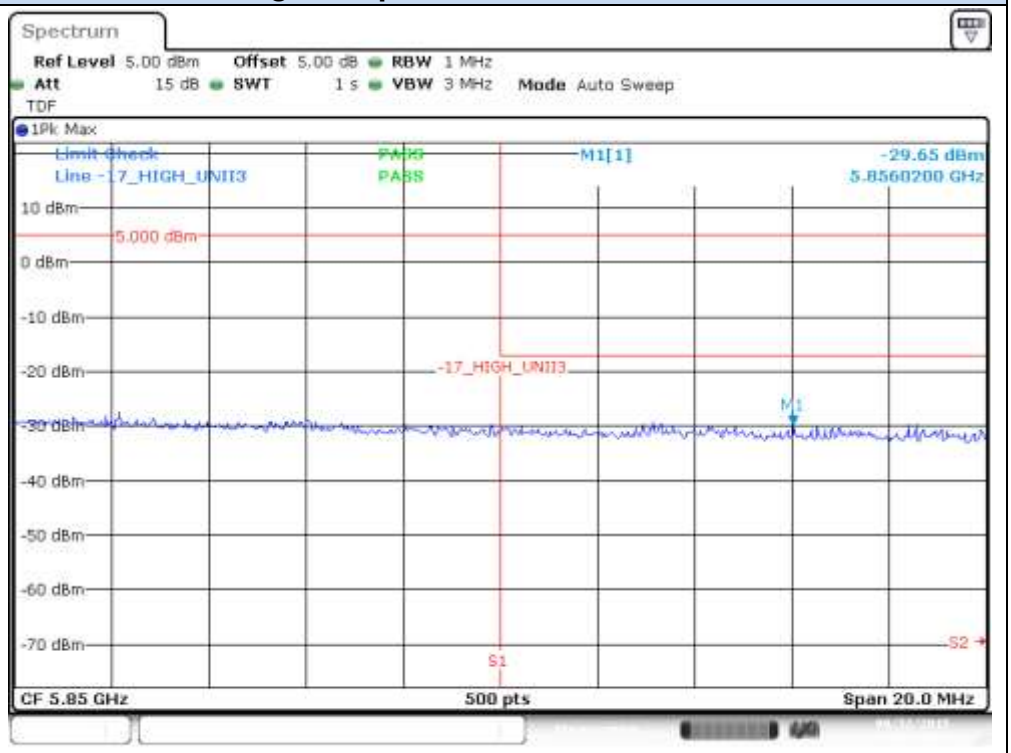




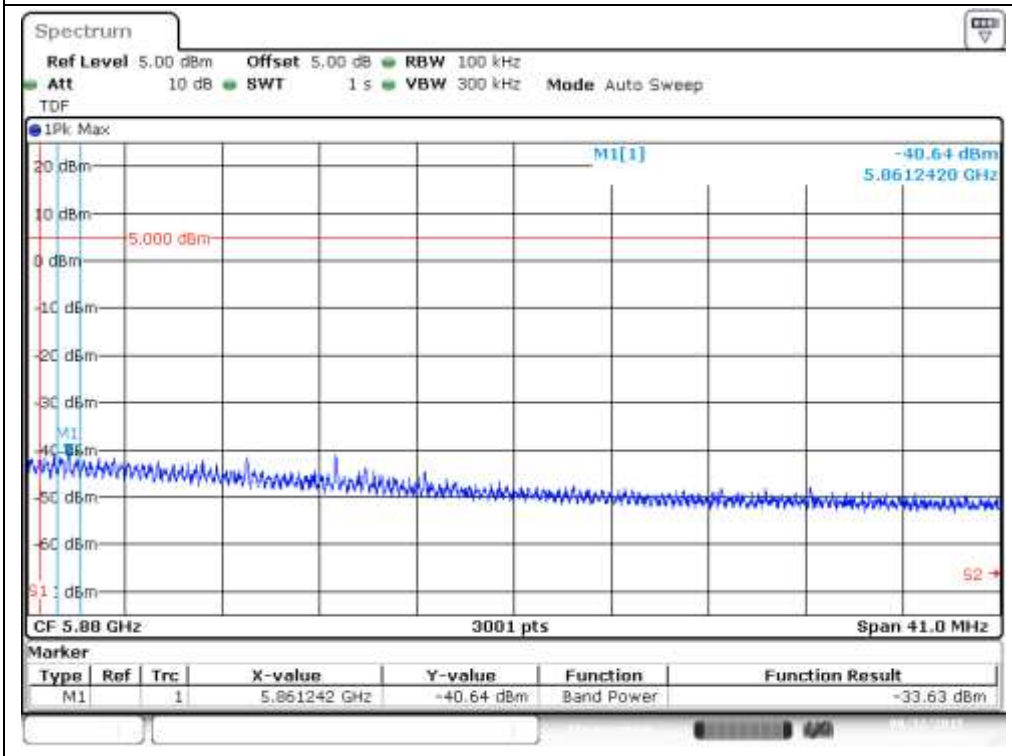
BE Low Freq Section, RMS – CH155ac80



BE High Freq Section, Peak – CH155ac80

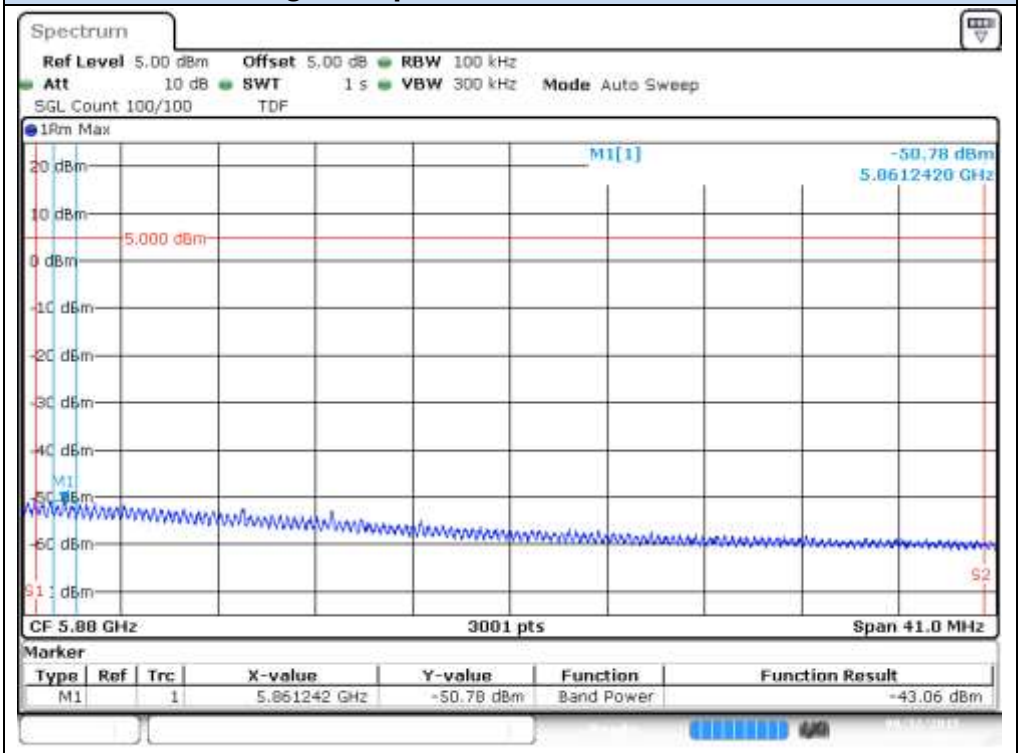


Date: 22.SEP.2015 12:20:45



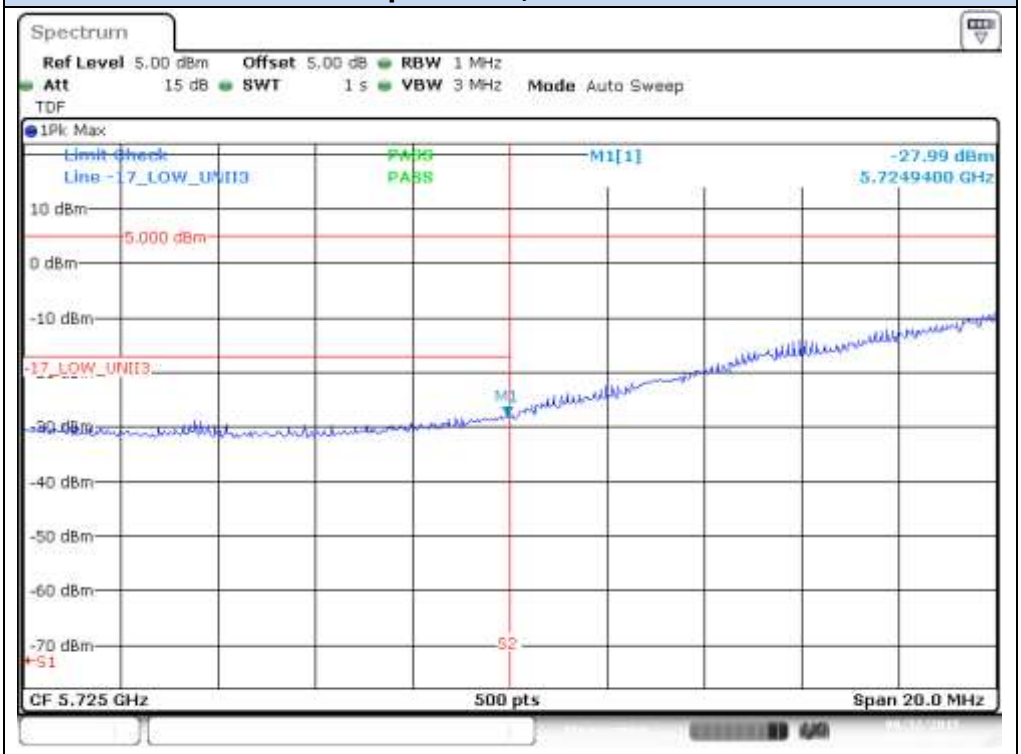
Date: 22.SEP.2015 12:19:23

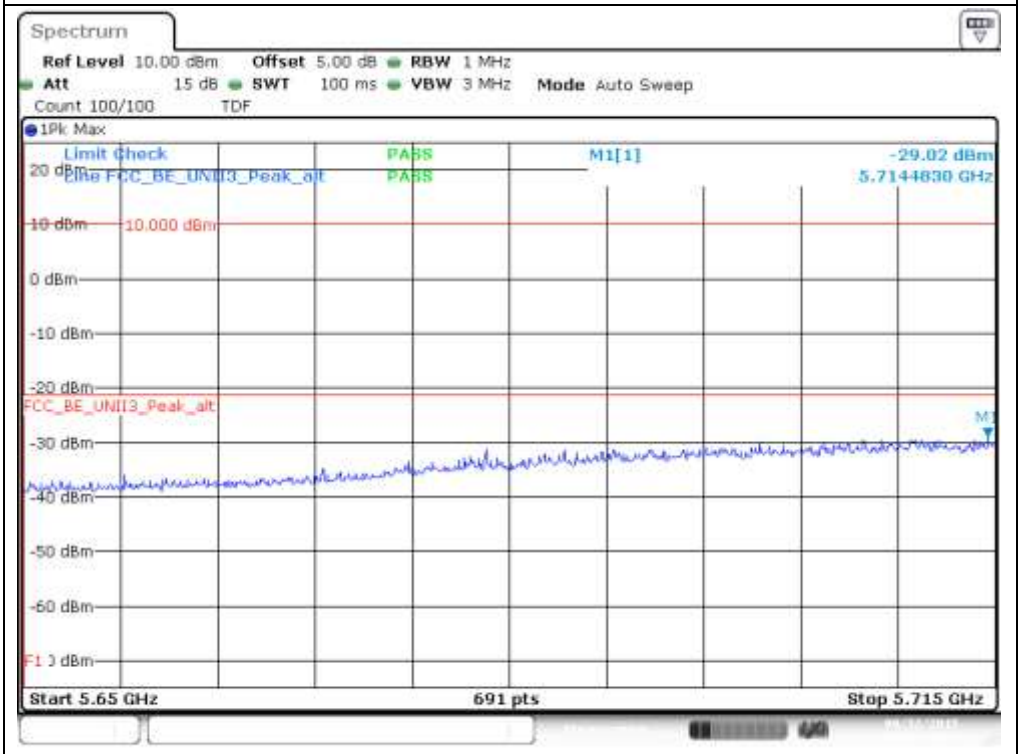
BE High Freq Section, RMS – CH155ac80



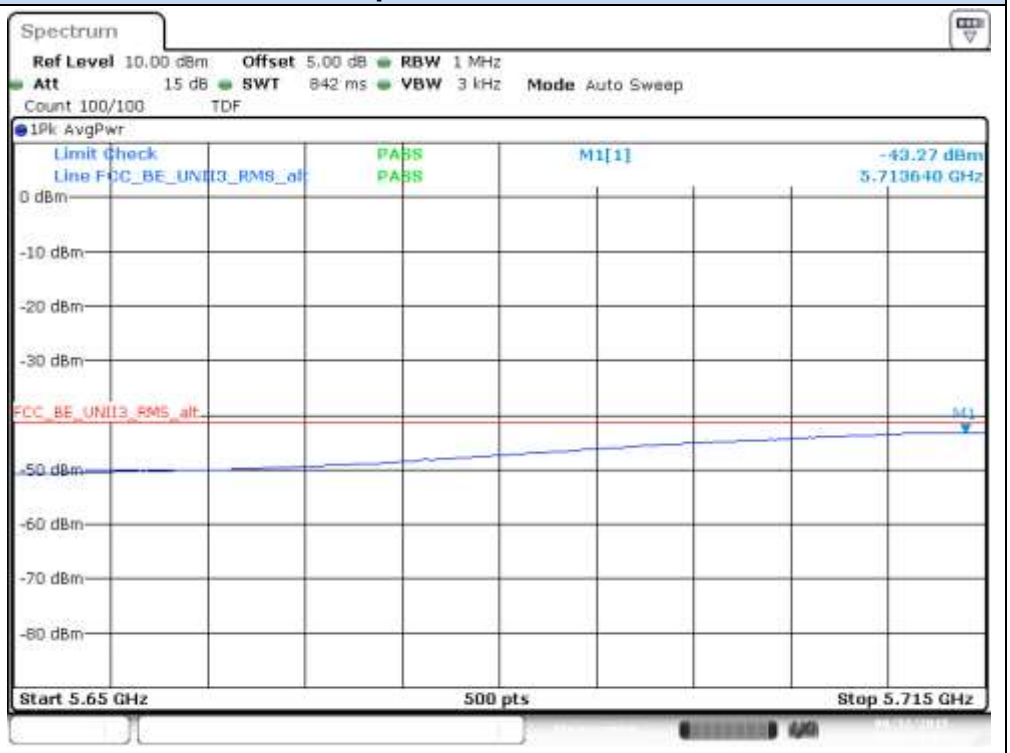
802.11ac80, VHT0 (SISO)- Chain B

BE Low Freq Section, Peak – CH155ac80

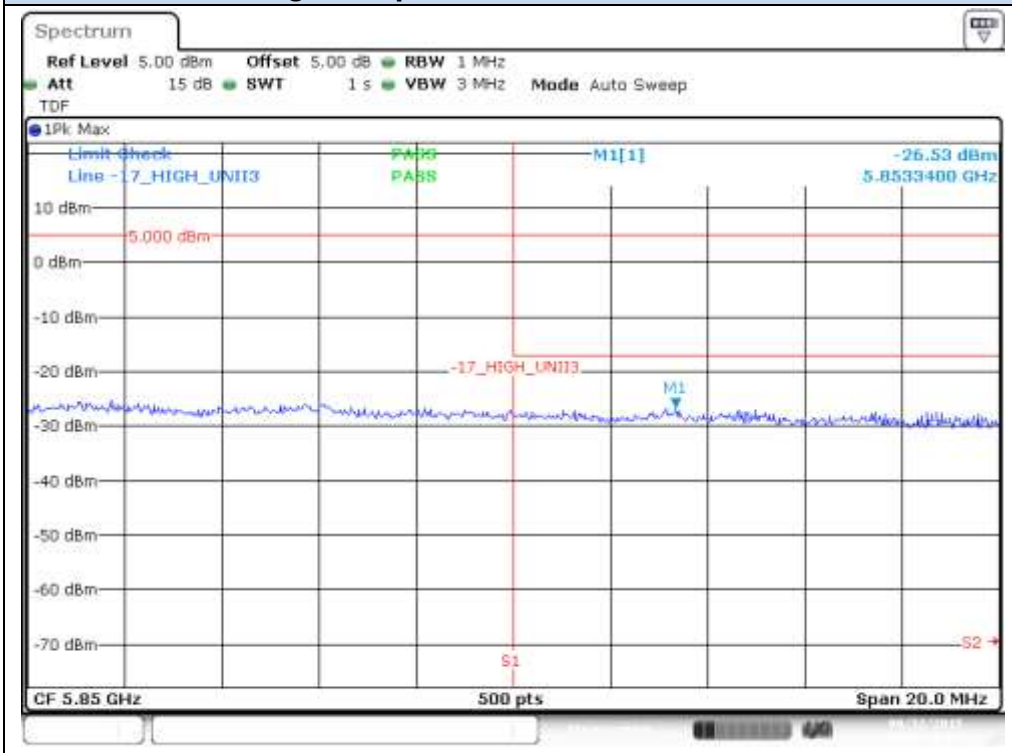




BE Low Freq Section, RMS – CH155ac80



BE High Freq Section, Peak – CH155ac80



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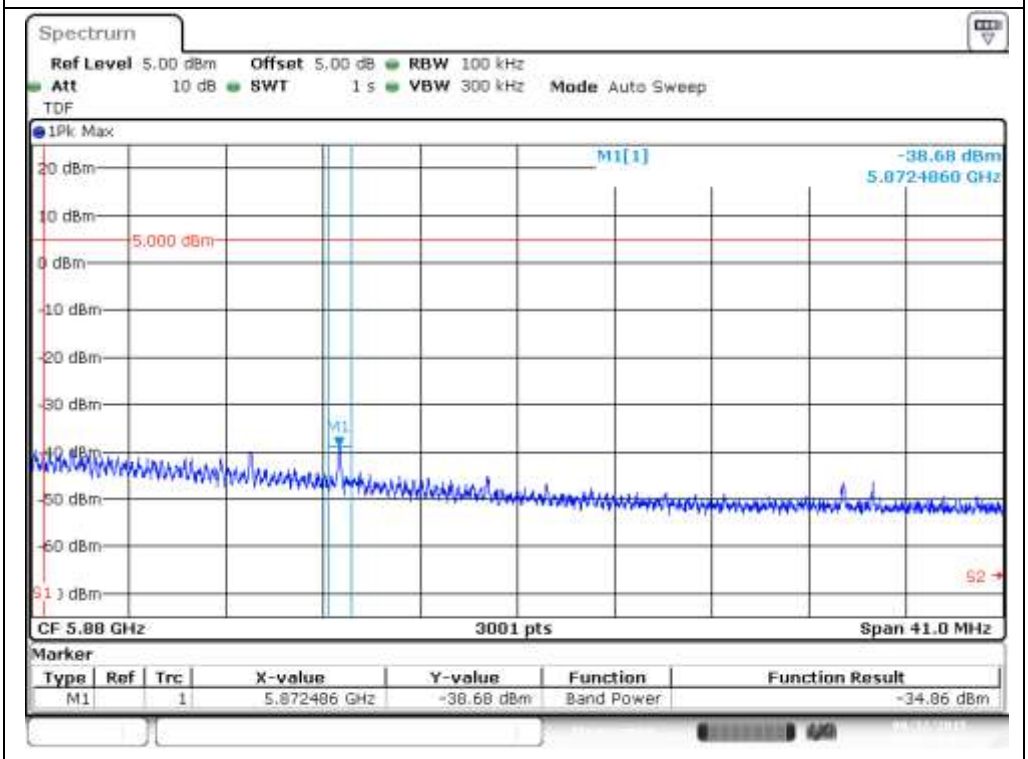

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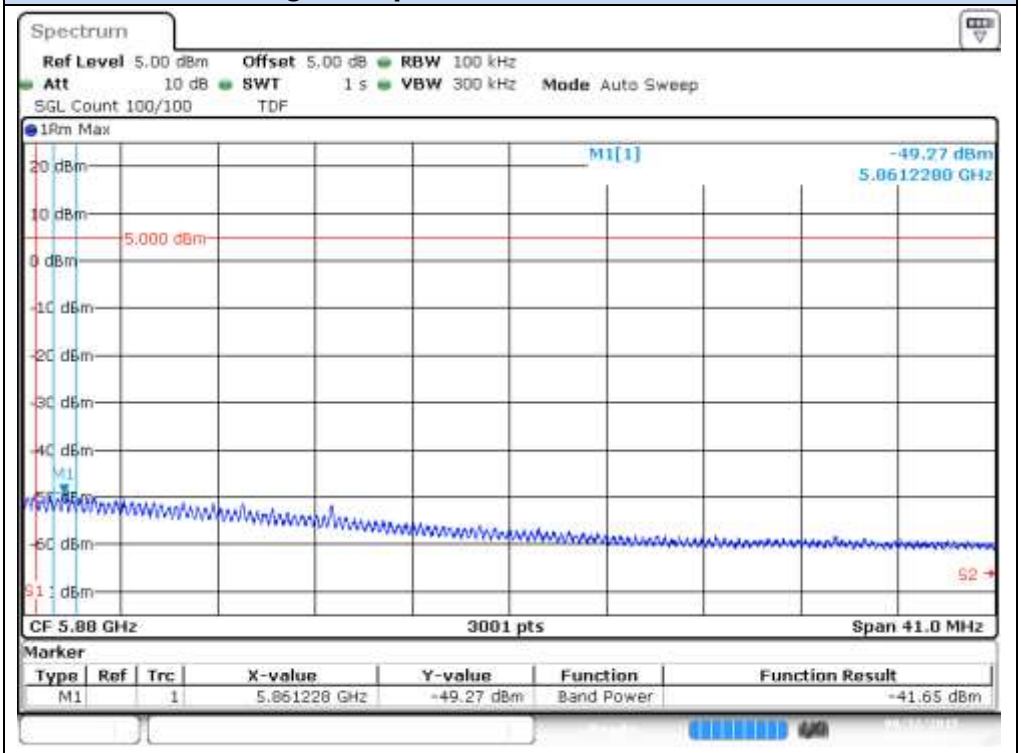
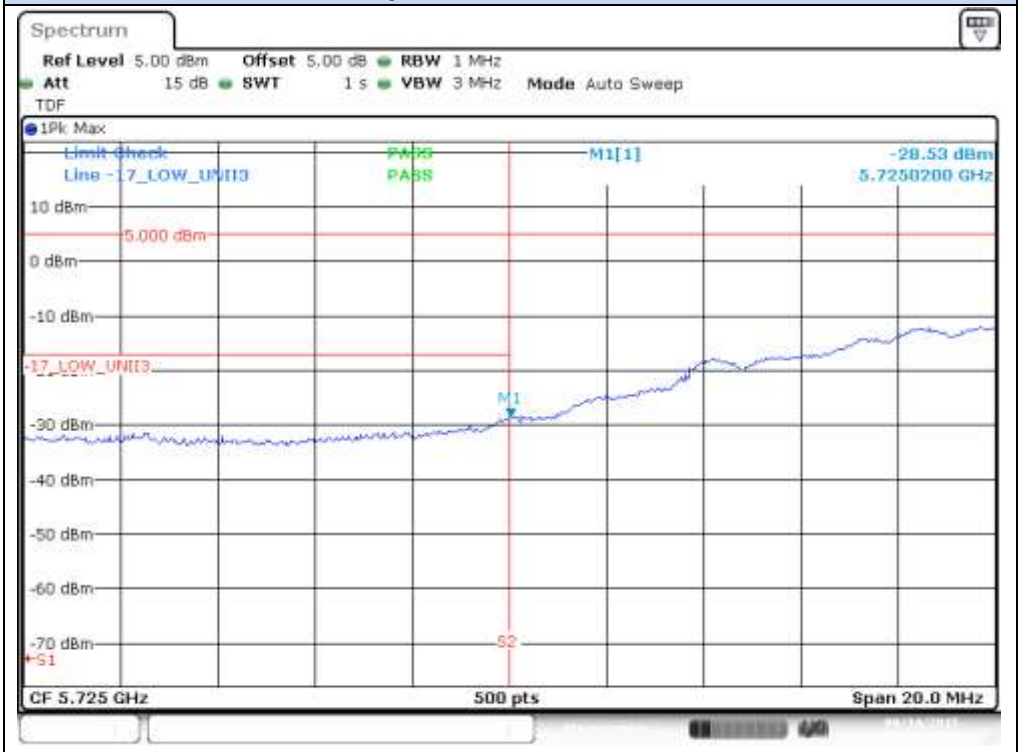
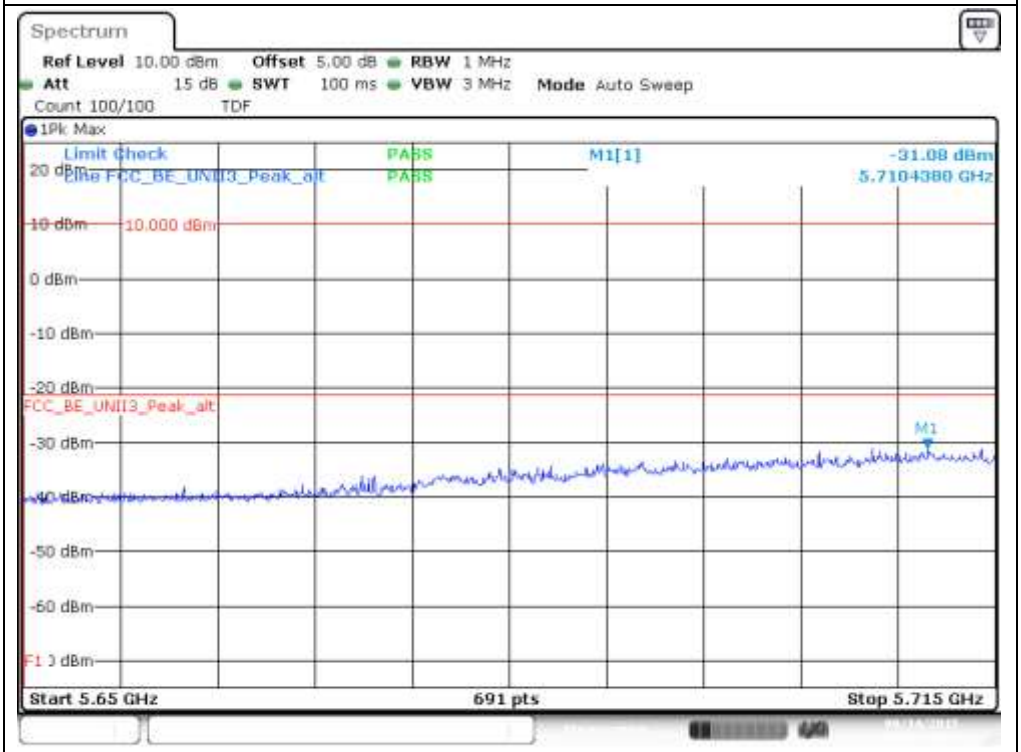
BE High Freq Section, RMS – CH155ac80



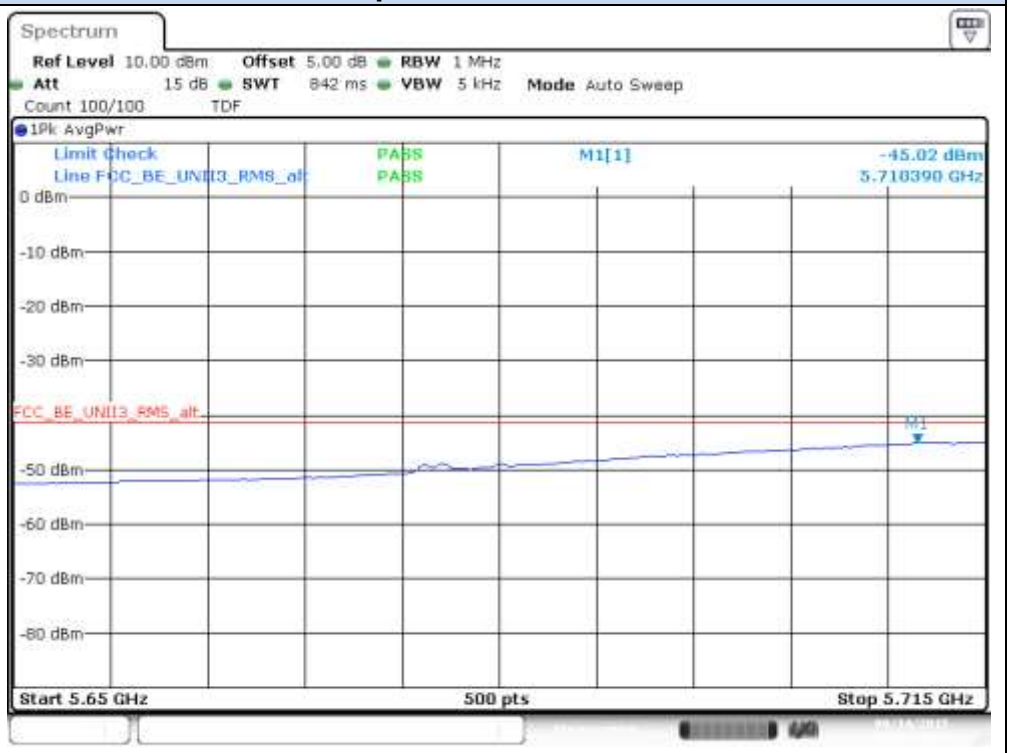
802.11ac80, VHT0 (MIMO)- Chain A

BE Low Freq Section, Peak – CH155ac80

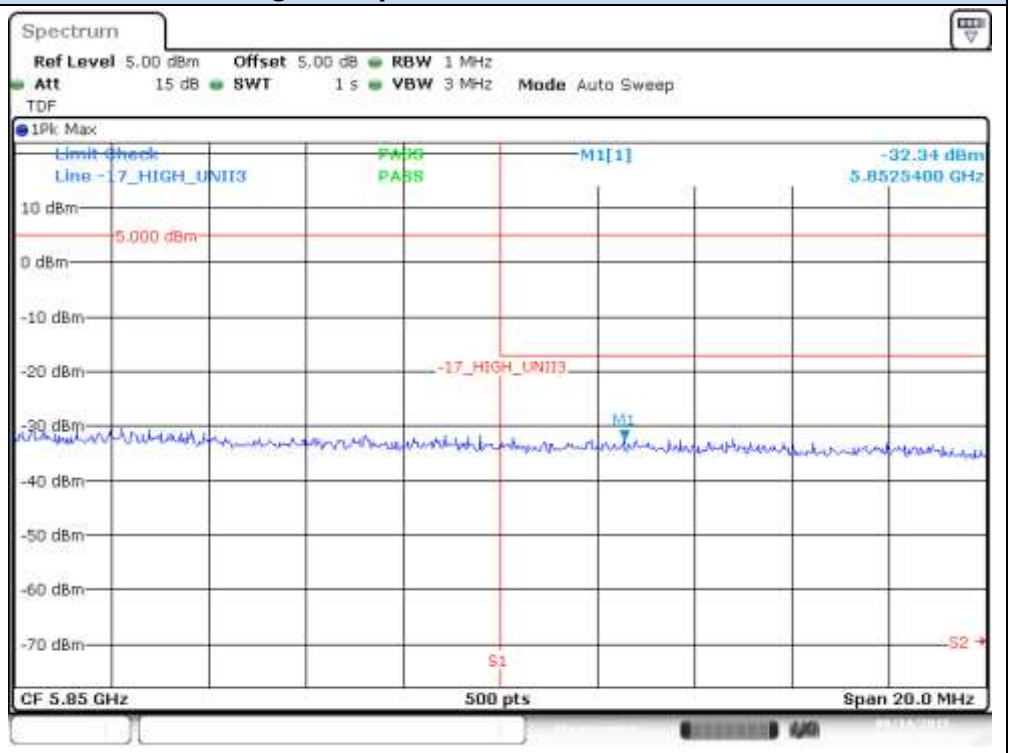




BE Low Freq Section, RMS – CH155ac80



BE High Freq Section, Peak – CH155ac80



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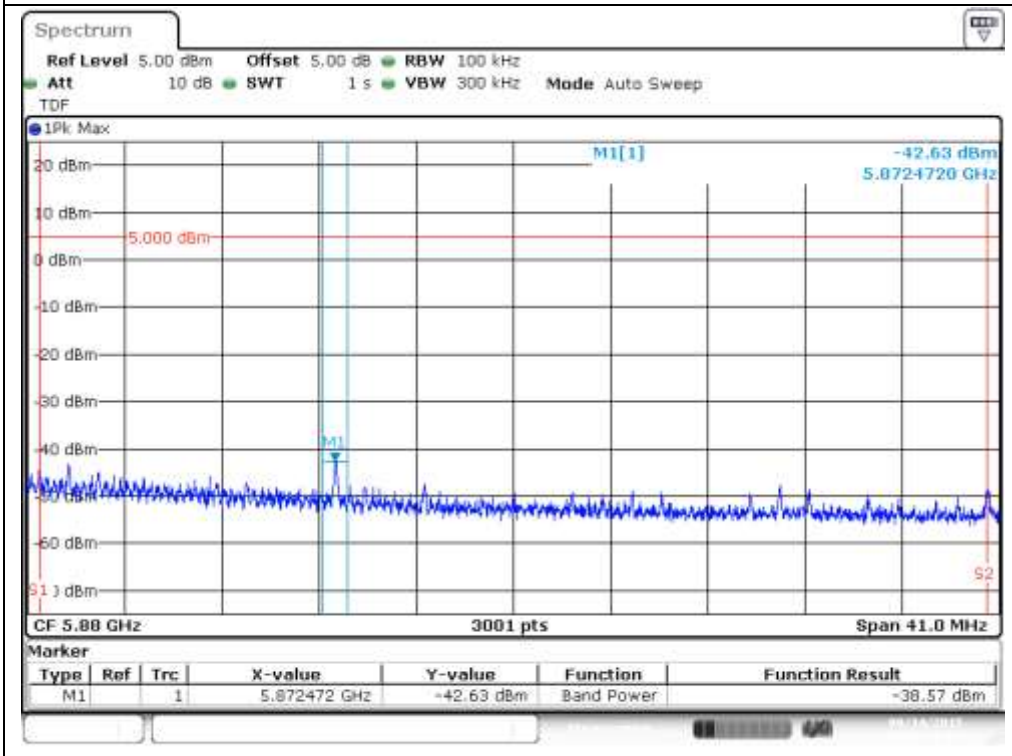
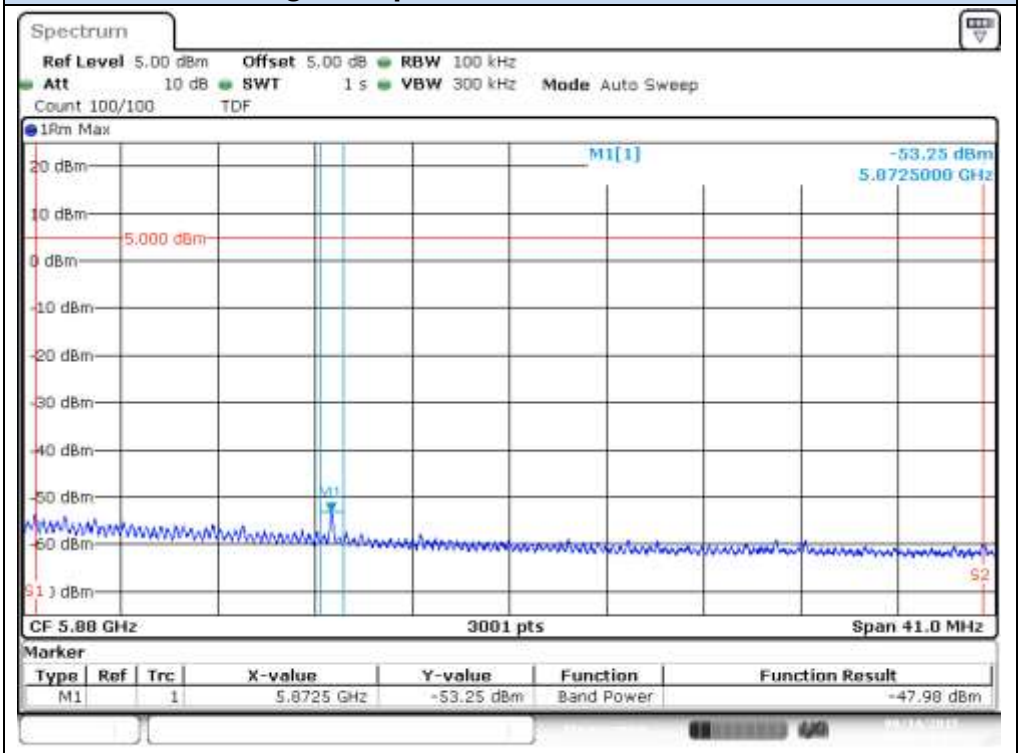


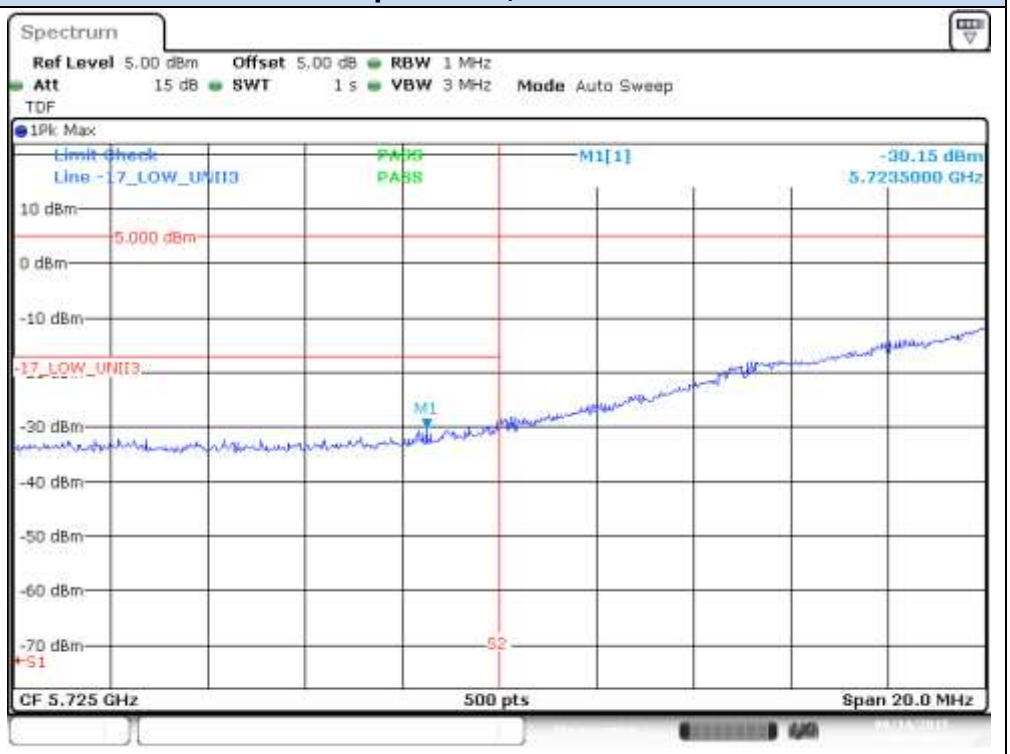
Date: 14.SEP.2015 16:04:29

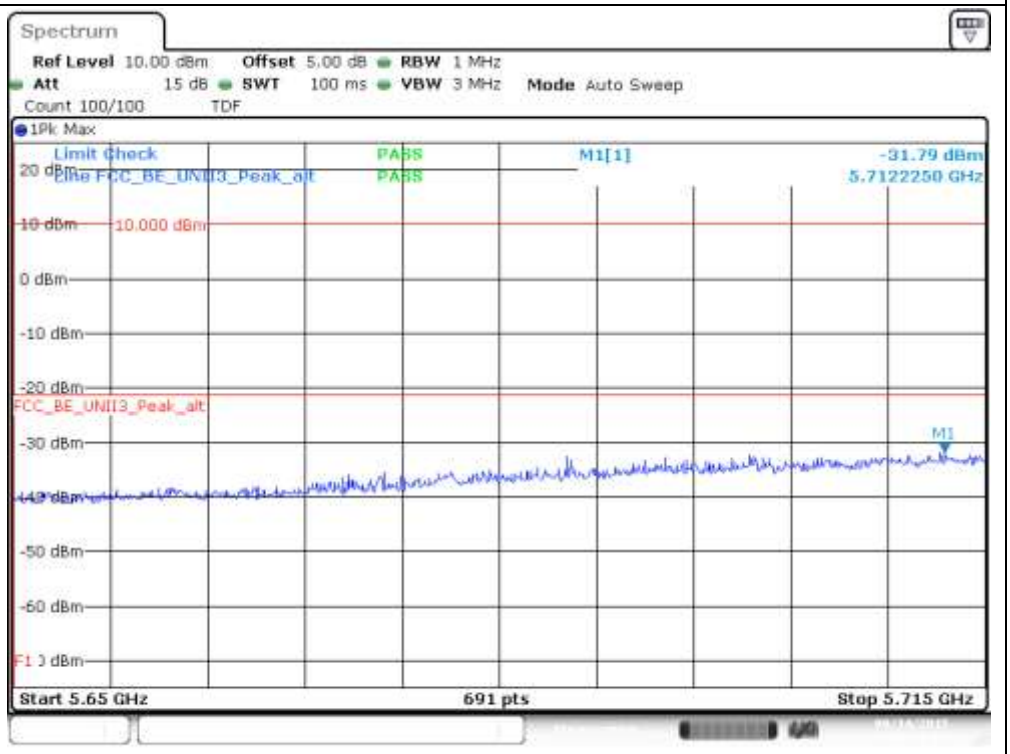
BE High Freq Section, RMS – CH155ac80



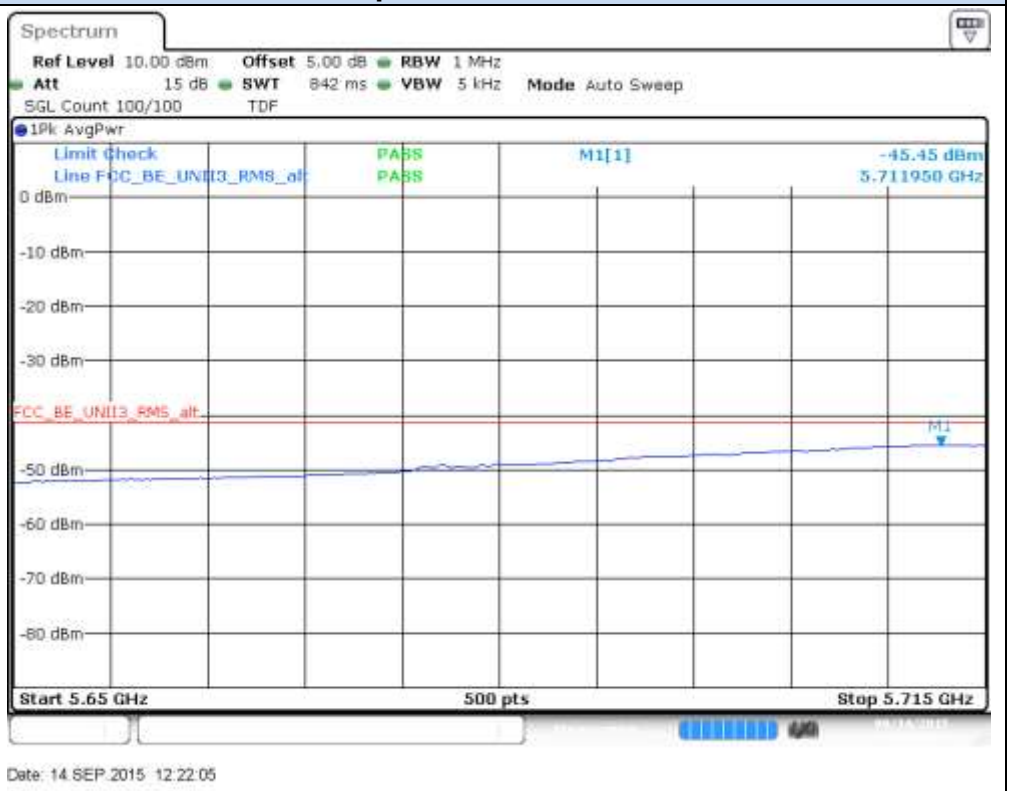
802.11ac80, VHT0 (MIMO)- Chain B

BE Low Freq Section, Peak – CH155ac80

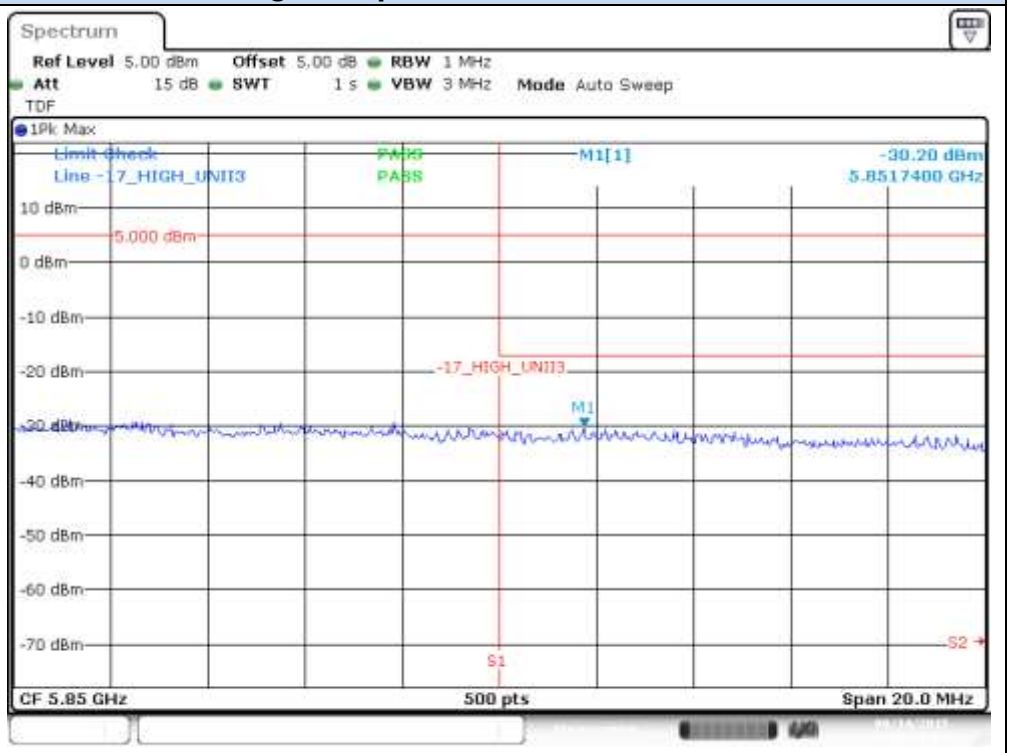




BE Low Freq Section, RMS – CH155ac80



BE High Freq Section, Peak – CH155ac80



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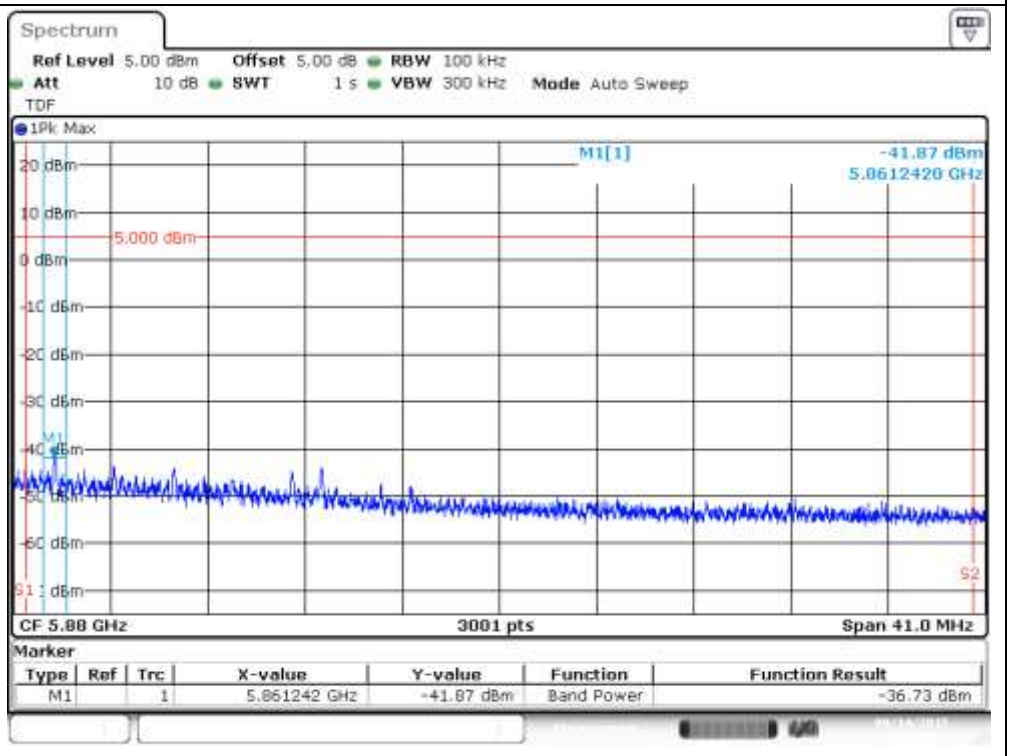
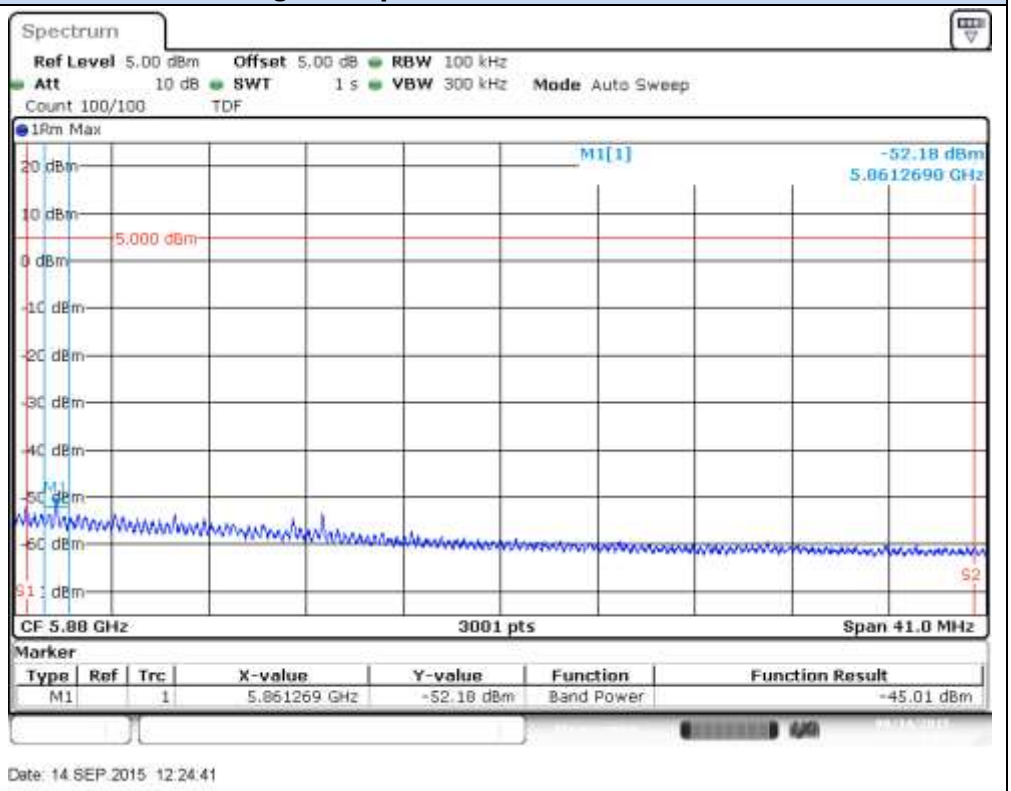


Date: 14.SEP.2015 12:25:05

BE High Freq Section, RMS – CH155ac80



E.4 Radiated spurious emission

Standard references:

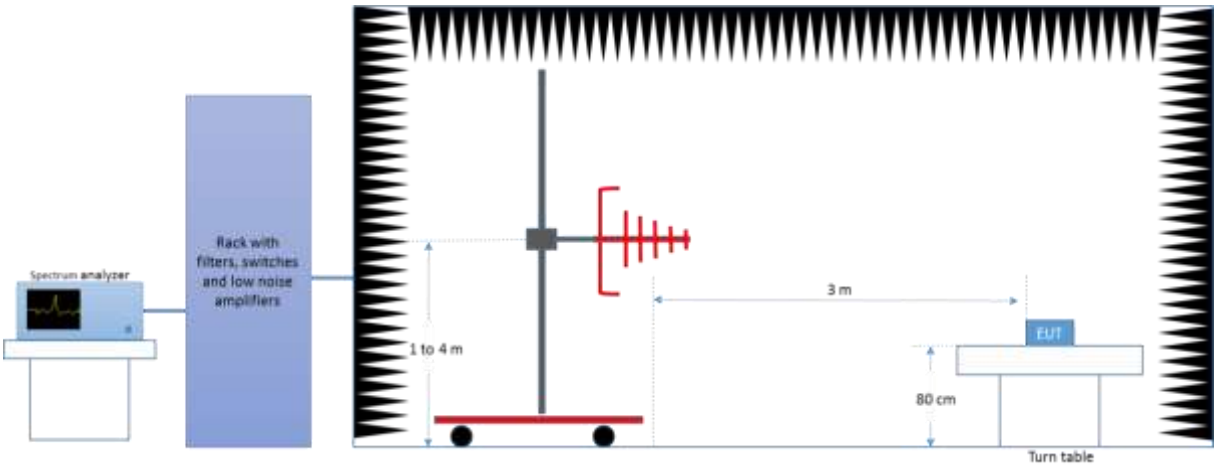
<table>
<tr><th>FCC part</th><th>RSS part</th><th>Limits</th></tr>
<tr><td>15.407 (b) (4)
15.209</td><td>RSS-247
Clause 6.2.4
(2)</td><td>Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a):

<table>
<tr><th>Freq Range (MHz)</th><th>Field Stregth (µV/m)</th><th>Field Stregth (dBµV/m)</th><th>Meas. Distance (m)</th></tr>
<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>
</table>
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.</td></tr>
</table>

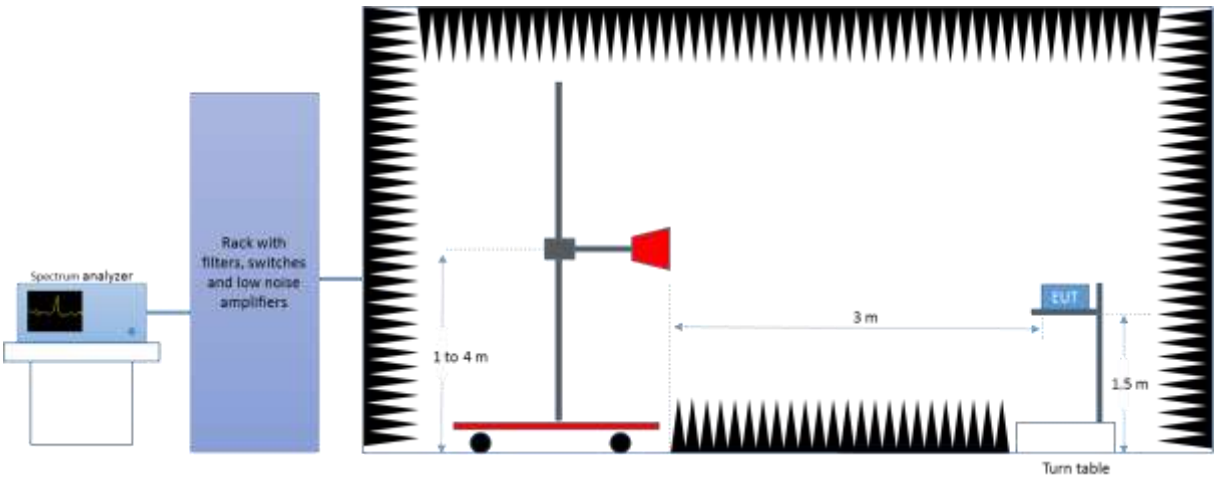
Test procedure:

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 from 1 to 4 meters, the EUT azimuth over 360º and for both Vertical and Horizontal polarizations.
The radiated spurious emissions were measured on the worst case configuration selected from the chapter *E.2 Power Limits. Maximum Output power & Peak power spectral density* and using the lowest, middle and highest channels.

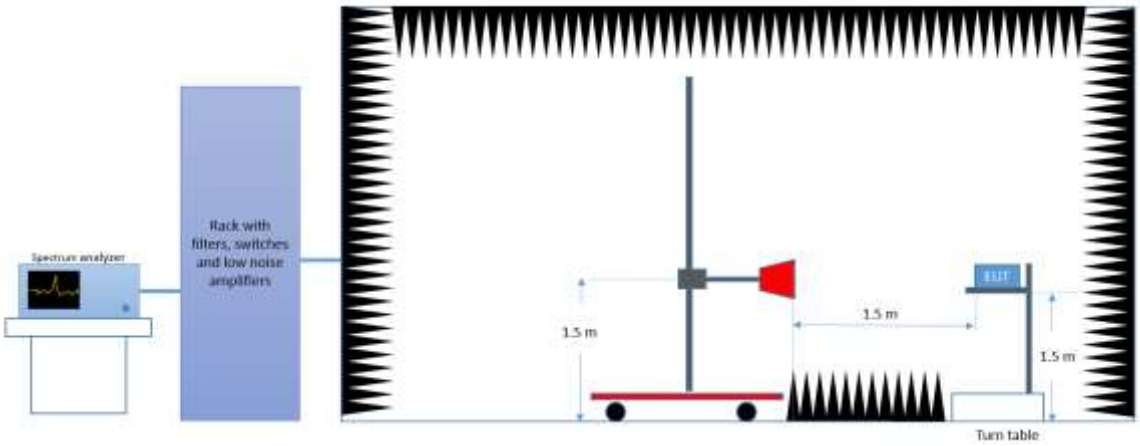
Radiated Setup < 1GHz



Radiated Setup 1 GHz - 18 GHz



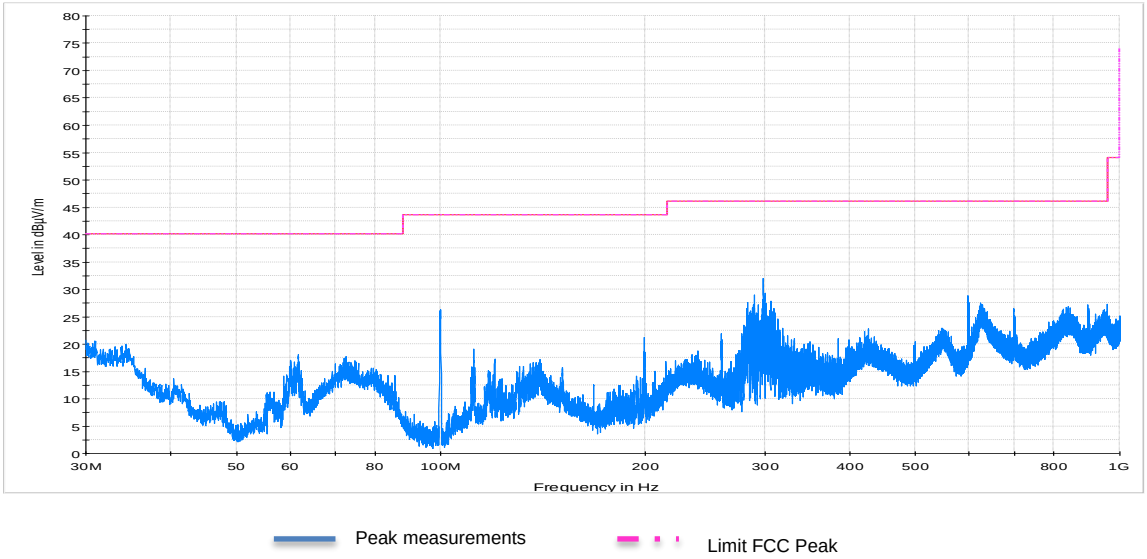
Radiated Setup > 18 GHz



Test Results:

All modes

Radiated Spurious – 30MHz – 1GHz

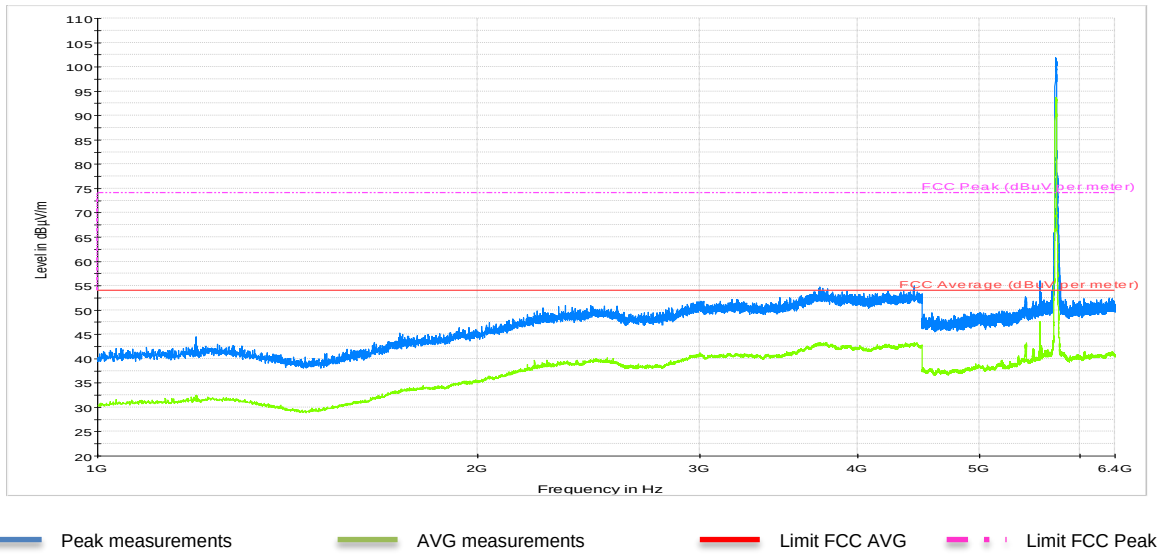


Frequency	MaxPeak	Limit	Margin
MHz	dBµV/m	dBµV/m	dB
99	25.5	43.5	18
298	30.5	46	15.5
598	26.1	46	19.9

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.
Note 2: No spurious signals were found in all modulations and channels tested.
Note 3: This plot is valid for both SISO and MIMO modes.

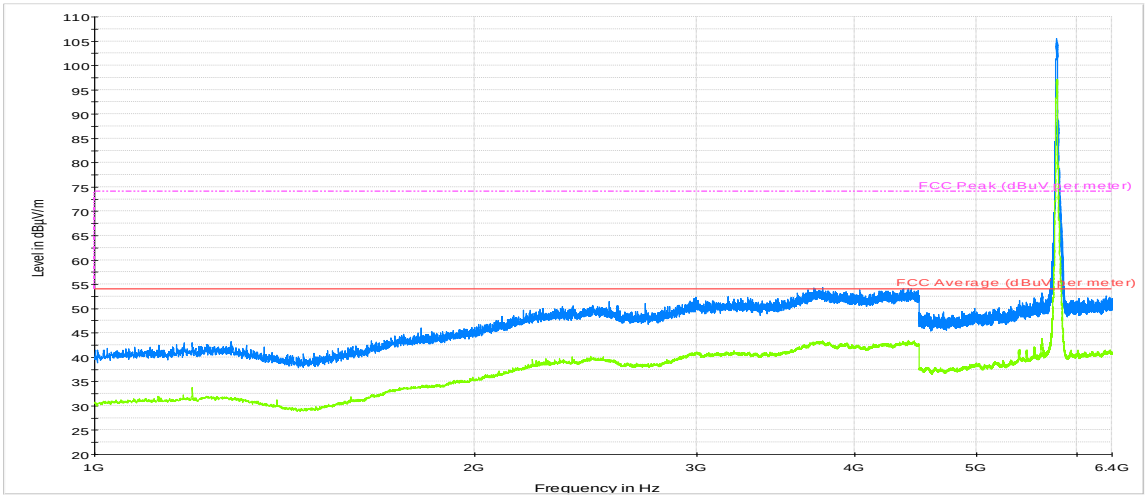
802.11a, 6Mbps, Chain A

Radiated Spurious – 1GHz – 6.4GHz–CH149



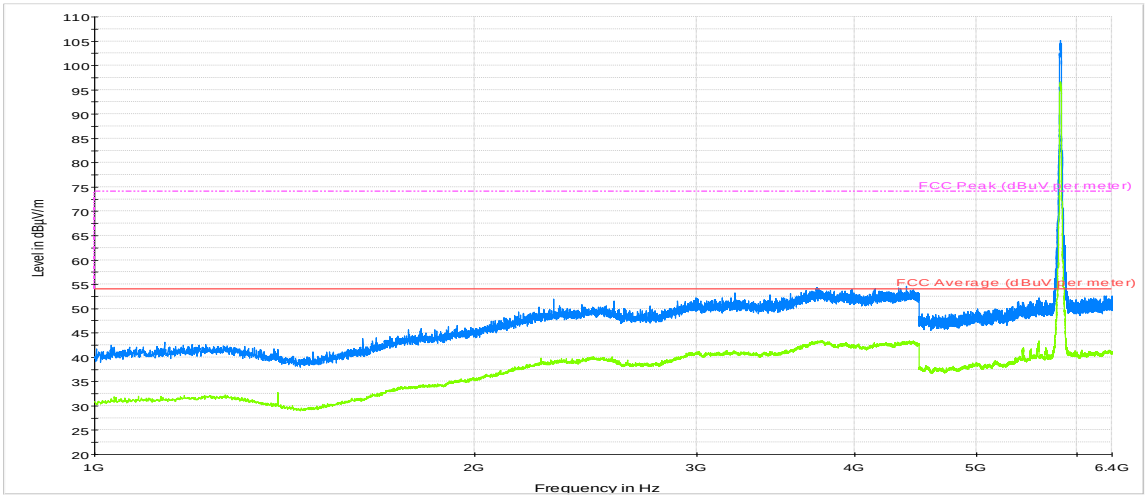
Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
4435	54.4	---	74	19.6
4435	---	42.9	54	11.1

Radiated Spurious – 1GHz – 6.4GHz–CH157



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
4436	54.1	---	74	19.9
4436	---	43.3	54	10.7

Radiated Spurious – 1GHz – 6.4GHz–CH165

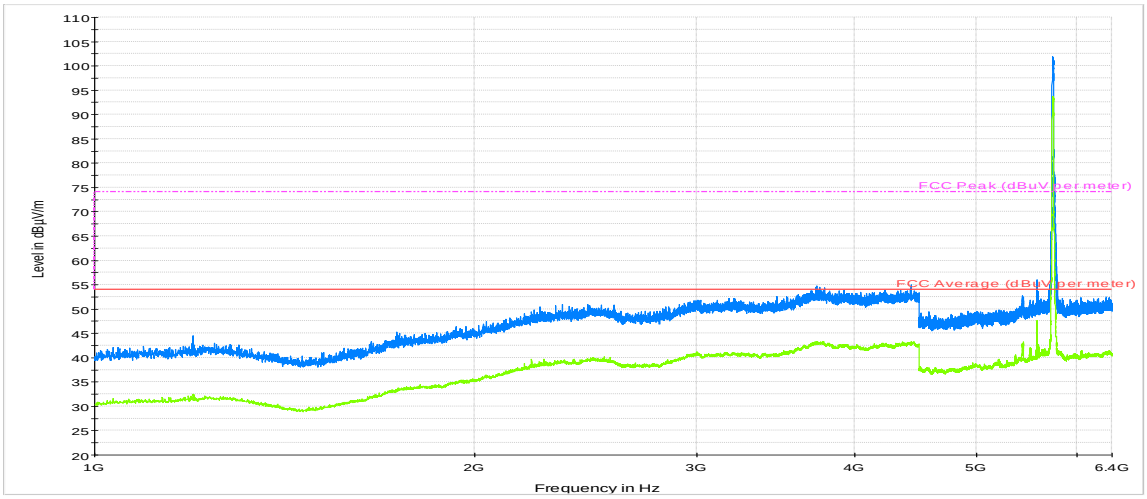


Peak measurements AVG measurements Limit FCC AVG Limit FCC Peak

Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3729	54.3	---	74	19.7
3729	---	43.2	54	10.8

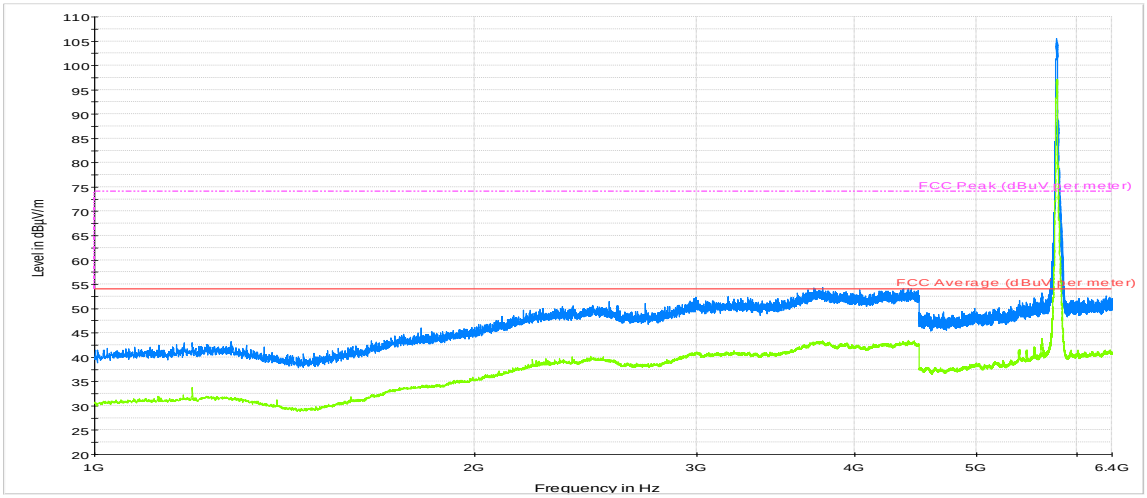
802.11a, 6Mbps, Chain B

Radiated Spurious – 1GHz – 6.4GHz–CH149



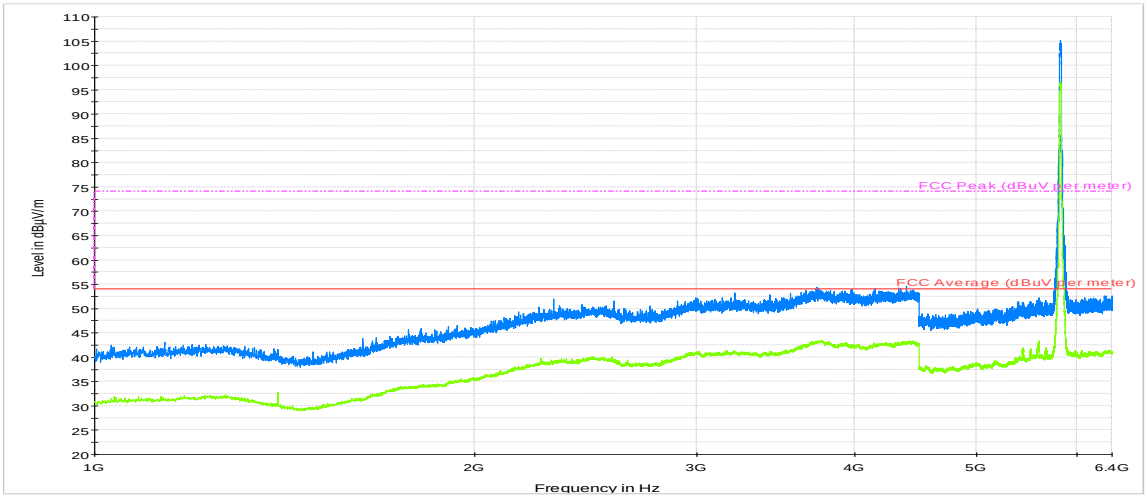
Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
4447	53.5	---	74	20.5
4447	---	43.2	54	10.8

Radiated Spurious – 1GHz – 6.4GHz–CH157



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3736	54.8	---	74	19.2
3736	---	43.3	54	10.7

Radiated Spurious – 1GHz – 6.4GHz–CH165

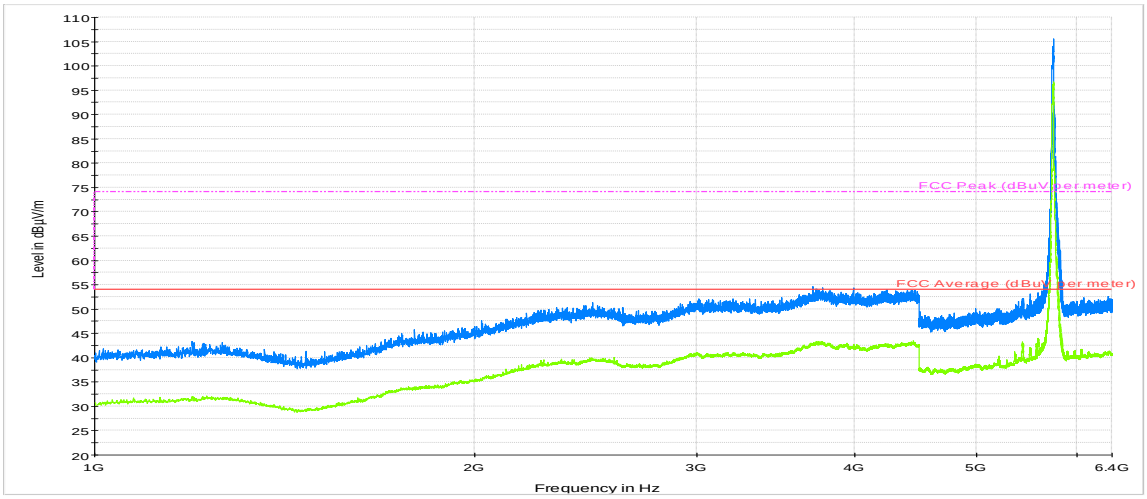


Peak measurements AVG measurements Limit FCC AVG Limit FCC Peak

Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3770	53.3	---	74	20.7
3770	---	43.2	54	10.8

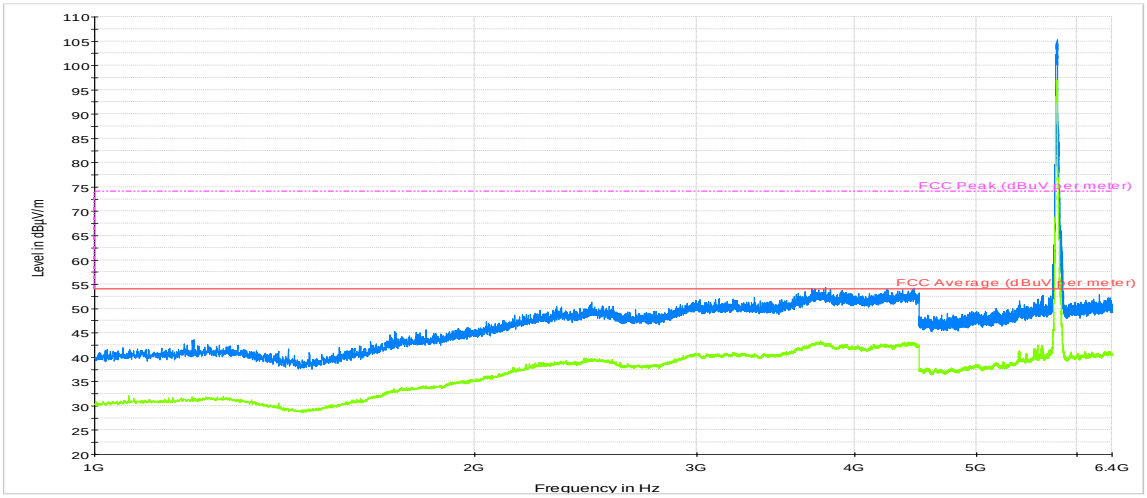
802.11n20, HT0 (SISO), Chain A

Radiated Spurious – 1GHz – 6.4GHz–CH149



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3770	54.4	---	74	19.6
3770	---	43.0	54	11

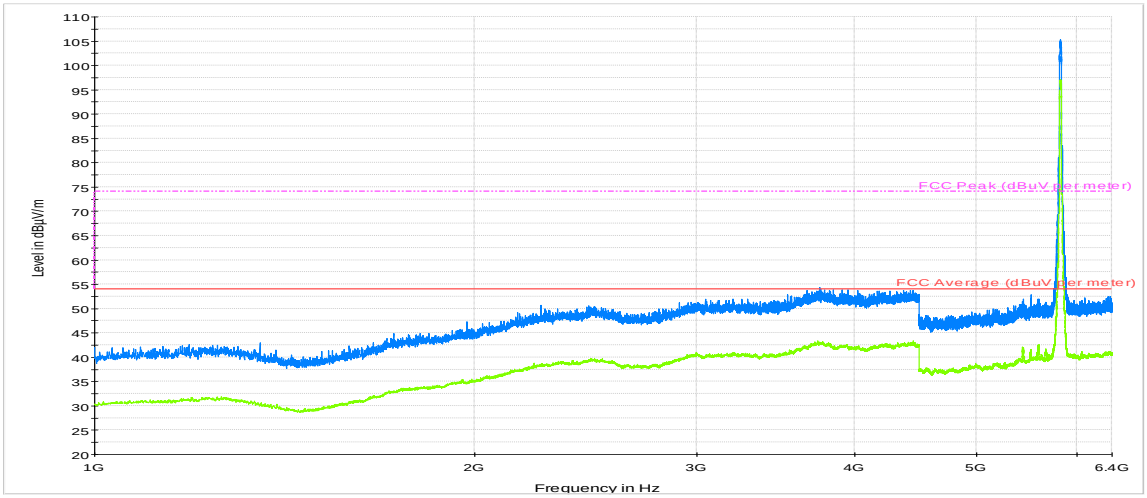
Radiated Spurious – 1GHz – 6.4GHz–CH157



Peak measurements AVG measurements Limit FCC AVG Limit FCC Peak

Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3720	54.5	---	74	19.5
3720	---	42.4	54	11.6

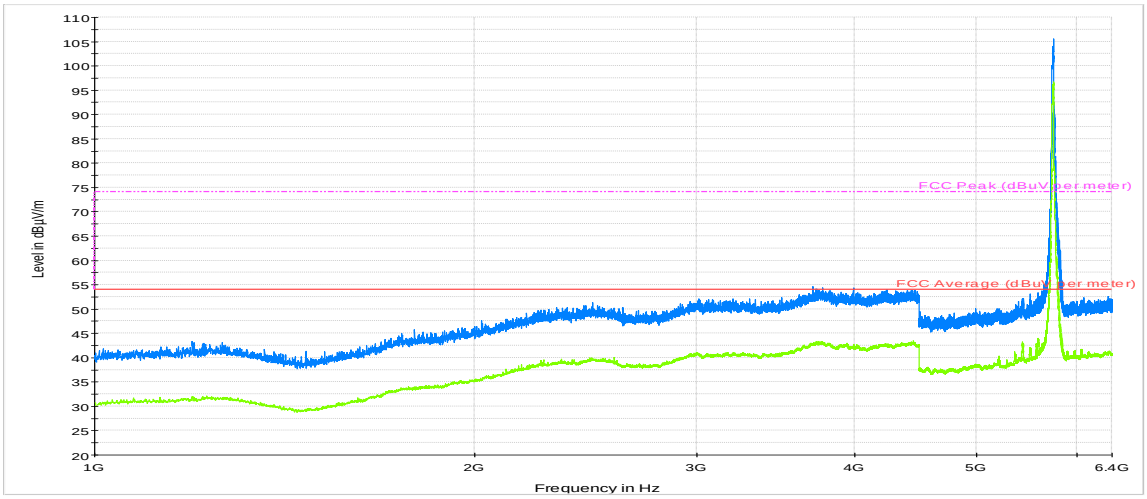
Radiated Spurious – 1GHz – 6.4GHz–CH165



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3753	54.4	---	74	19.6
3753	---	43.2	54	10.8

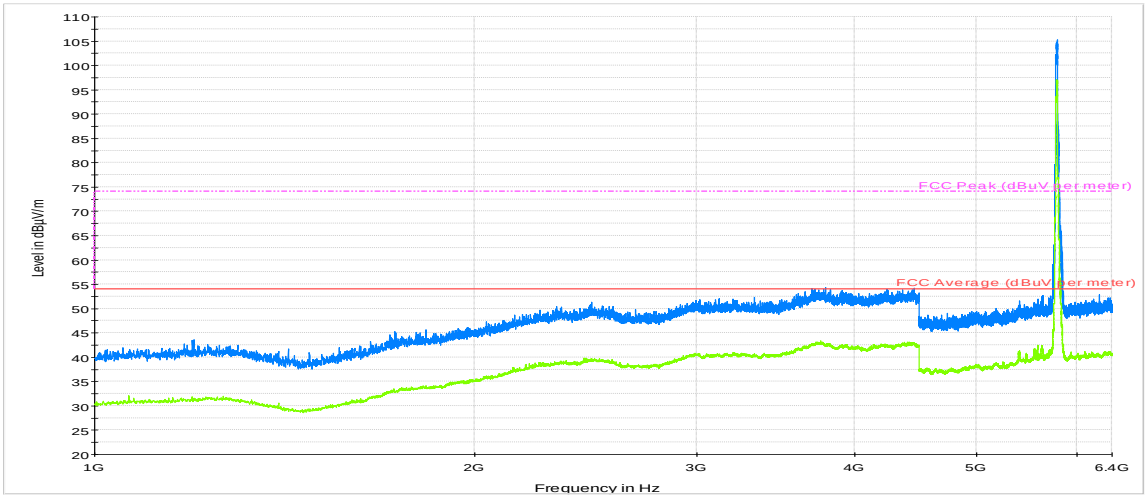
802.11n20, HT0 (SISO), Chain B

Radiated Spurious – 1GHz – 6.4GHz–CH149



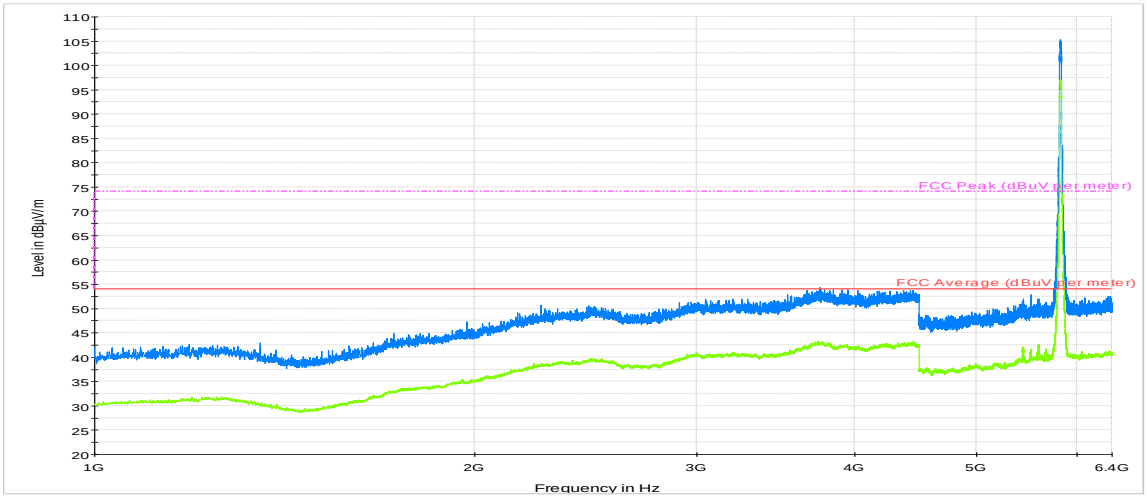
Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3780	54.7	---	74	19.3
3780	---	43.1	54	10.9

Radiated Spurious – 1GHz – 6.4GHz–CH157



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3720	54.5	---	74	19.5
3720	---	42.4	54	11.6

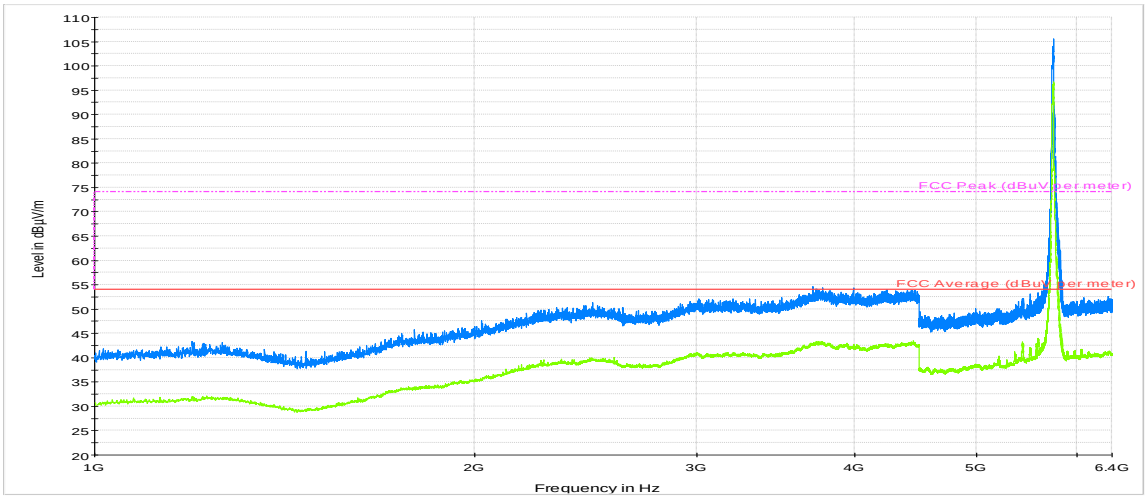
Radiated Spurious – 1GHz – 6.4GHz–CH165



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3729	54.2	---	74	19.8
3729	---	43.1	54	10.9

802.11n20, HT0 (MIMO), Chain A+B

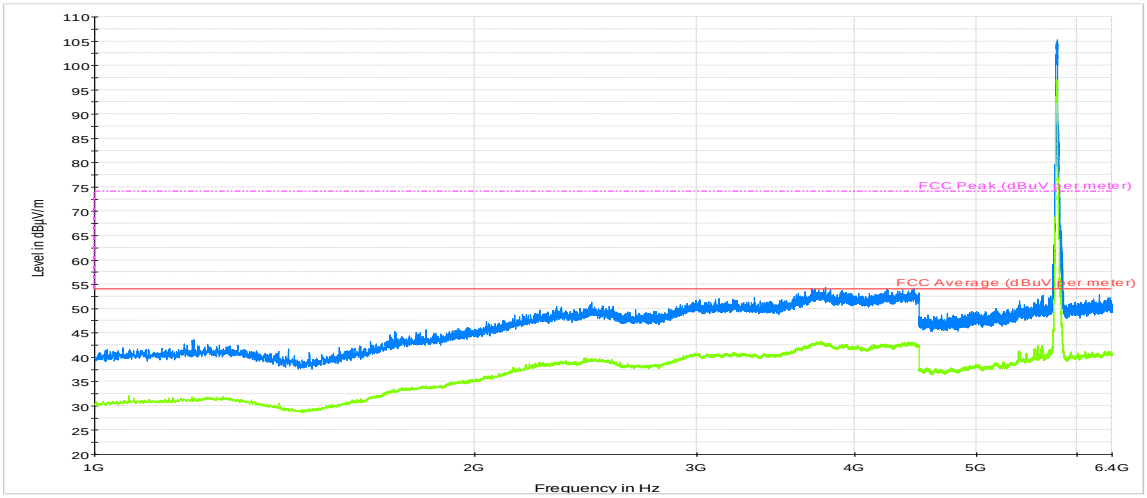
Radiated Spurious – 1GHz – 6.4GHz–CH149



Peak measurements AVG measurements Limit FCC AVG Limit FCC Peak

Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
4453	53.6	---	74	20.4
4453	---	42.7	54	11.3

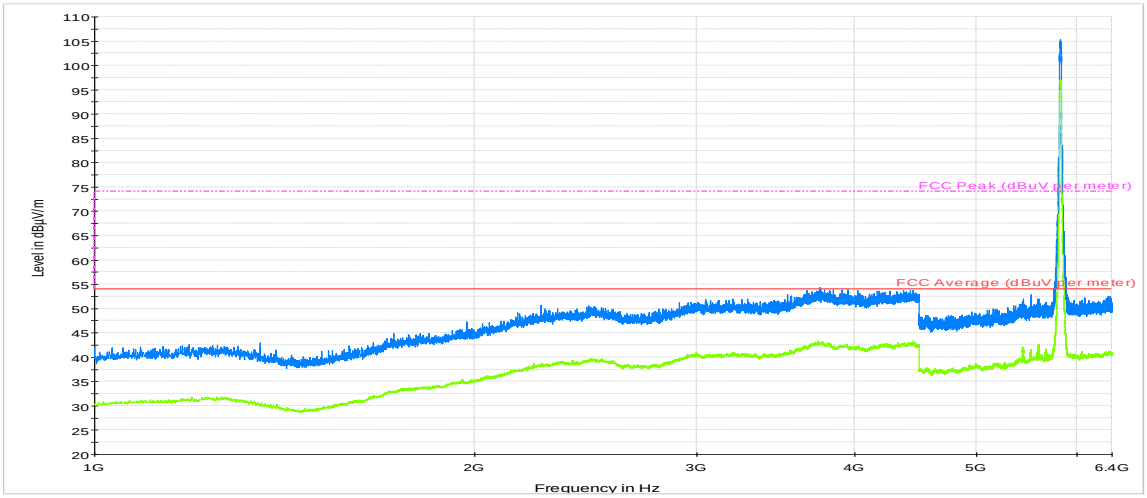
Radiated Spurious – 1GHz – 6.4GHz–CH157



Peak measurements AVG measurements Limit FCC AVG Limit FCC Peak

Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3738	53.0	---	74	21
3738	---	43.0	54	11

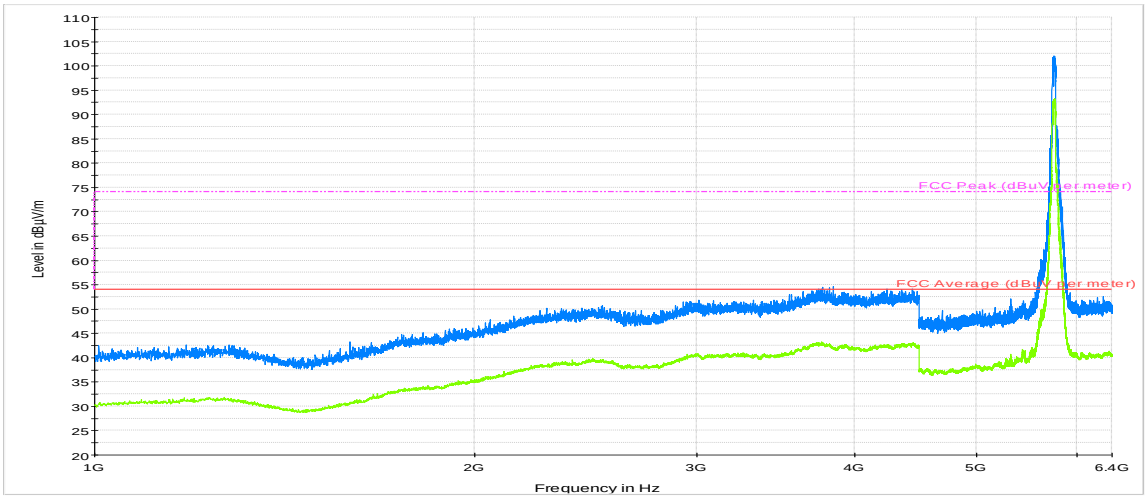
Radiated Spurious – 1GHz – 6.4GHz–CH165



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3737	54.3	---	74	19.7
3737	---	43.1	54	10.9

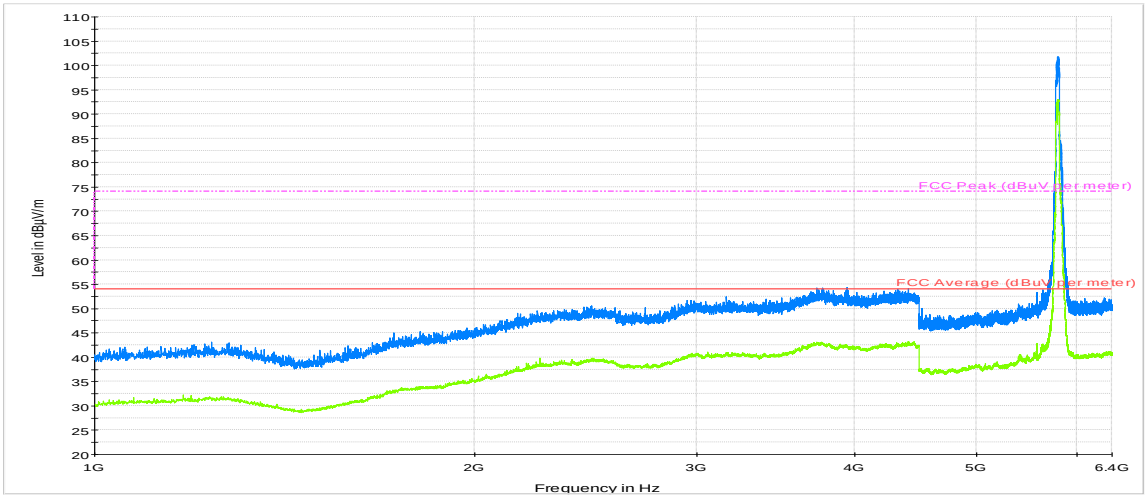
802.11n40, HT0 (SISO), Chain A

Radiated Spurious – 1GHz – 6.4GHz–CH151F



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3740	54.4	---	74	19.6
3740	---	43.0	54	11

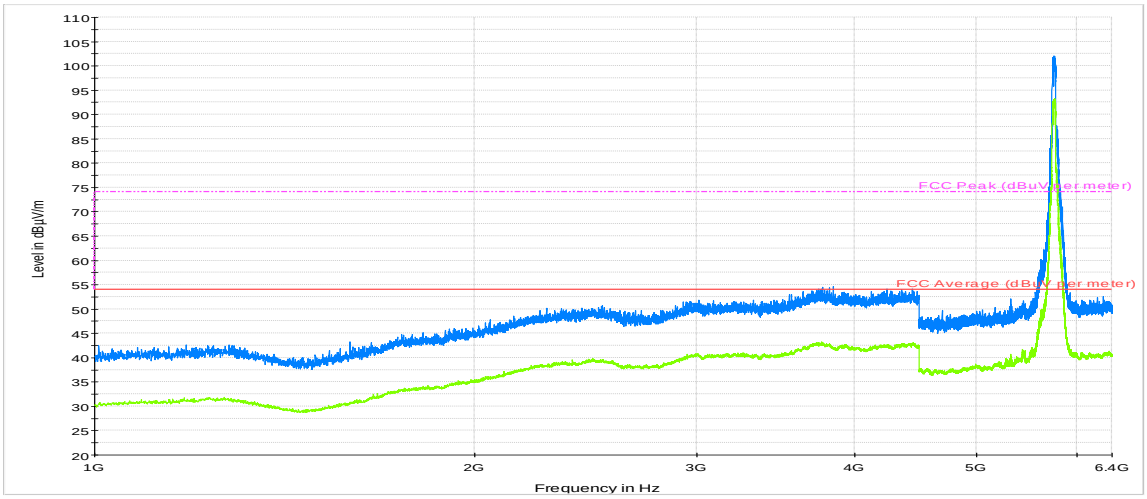
Radiated Spurious – 1GHz – 6.4GHz–CH159F



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3751	53.0	---	74	21
3751	---	42.5	54	11.5

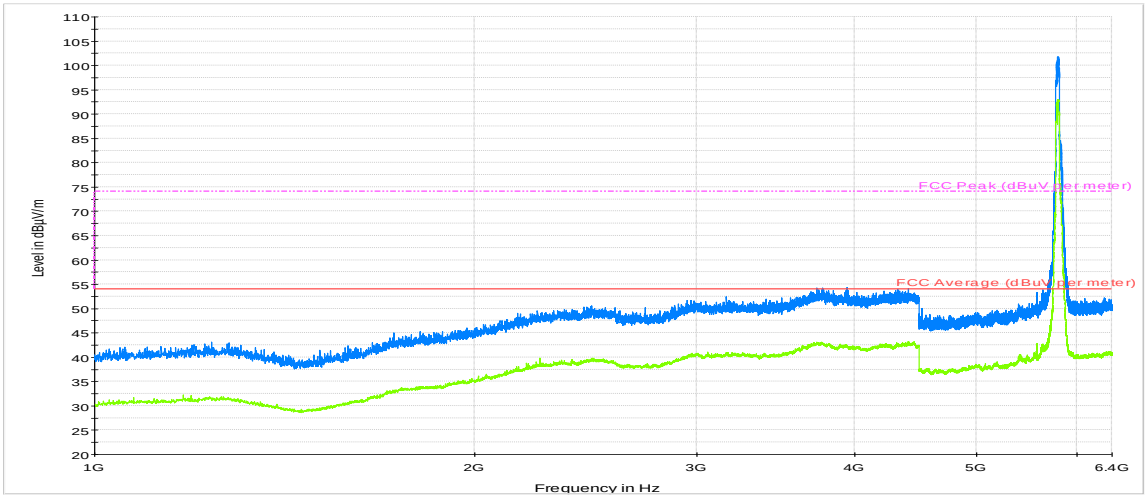
802.11n40, HT0(SISO), Chain B

Radiated Spurious – 1GHz – 6.4GHz–CH151F



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3734	54.3	---	74	19.7
3734	---	43.1	54	10.9

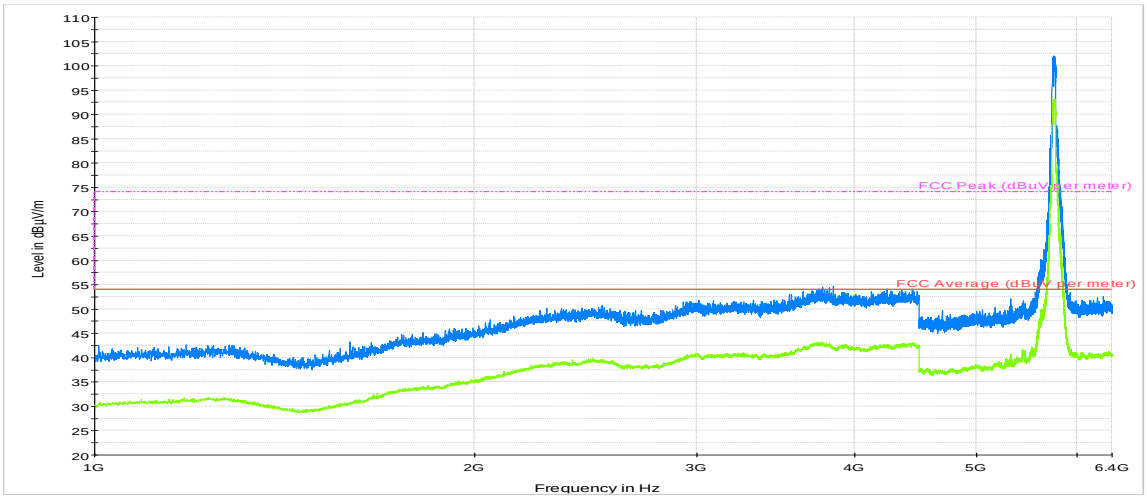
Radiated Spurious – 1GHz – 6.4GHz–CH159F



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3751	54.7	---	74	19.4
3751	---	43.1	54	10.9

802.11n40, HT8 (MIMO), Chain A+B

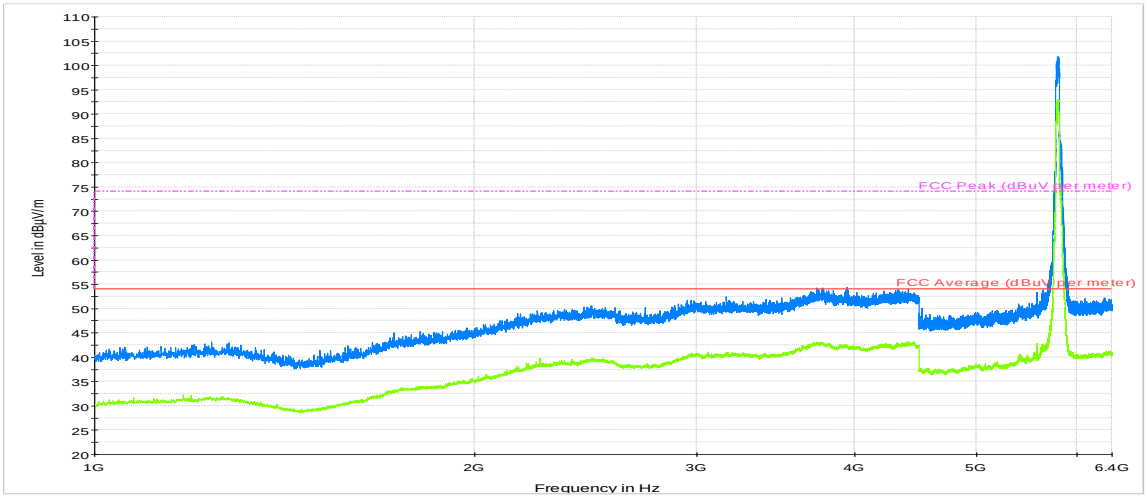
Radiated Spurious – 1GHz – 6.4GHz–CH151F



Peak measurements AVG measurements Limit FCC AVG Limit FCC Peak

Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3743	53.8	---	74	20.2
3743	---	43.2	54	10.8

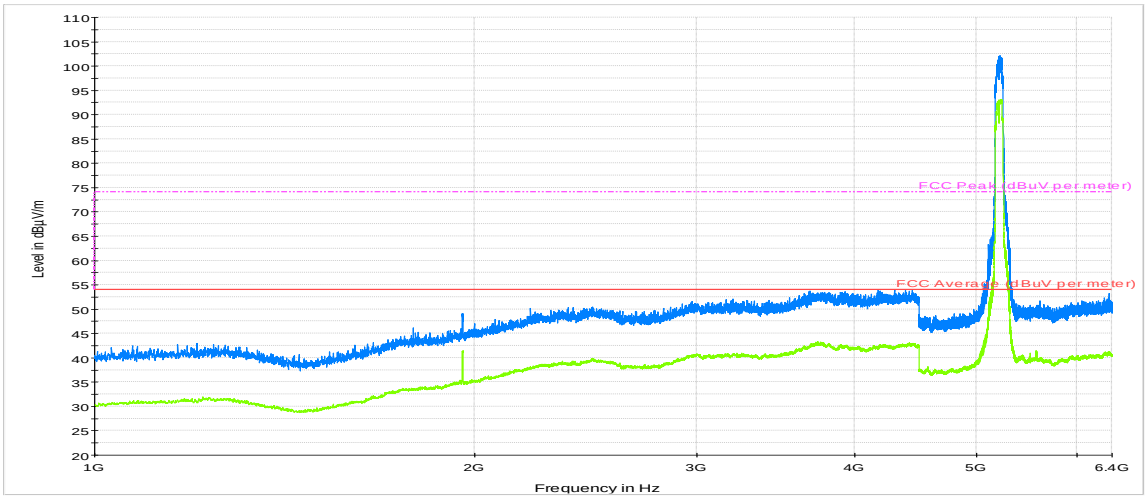
Radiated Spurious – 1GHz – 6.4GHz–CH159F



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
4437	52.5	---	74	21.5
4437	---	42.6	54	11.4

802.11ac80, VHT0 (SISO), Chain A

Radiated Spurious – 1GHz – 6.4GHz–CH155ac80

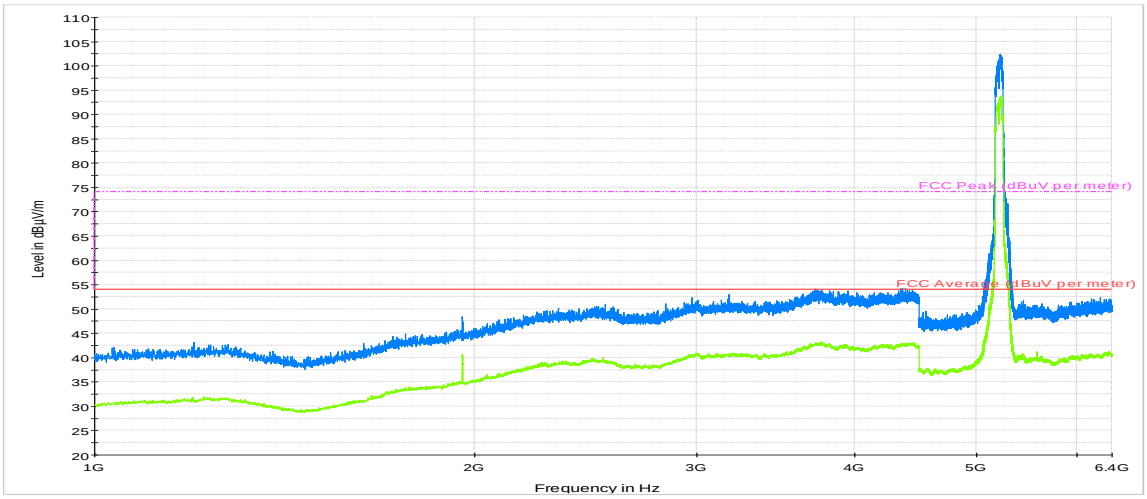


Peak measurements AVG measurements Limit FCC AVG Limit FCC Peak

Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
1956	48.4	---	74	25.6
1956	---	40.3	54	13.7
3736	53.0	---	74	11
3736	---	42.7	54	11.3

802.11ac80, VHT0 (SISO), Chain B

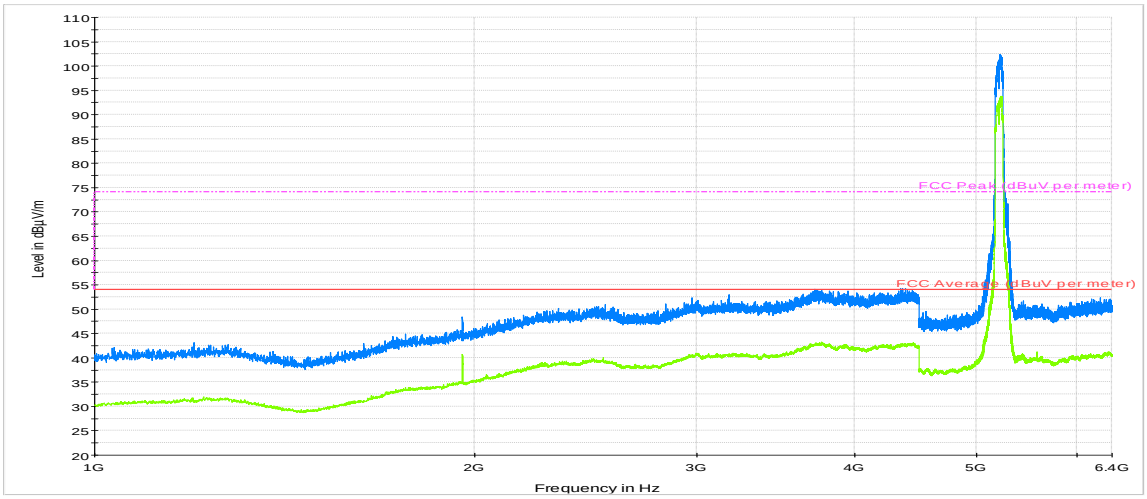
Radiated Spurious – 1GHz – 6.4GHz–CH155ac80



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
1956	48.4	---	74	25.6
1956	---	40.3	54	13.7
3762	54.2	---	74	19.7
3762	---	43.1	54	10.9

802.11ac80, VHT0 (MIMO), Chain A+B

Radiated Spurious – 1GHz – 6.4GHz–CH155ac80

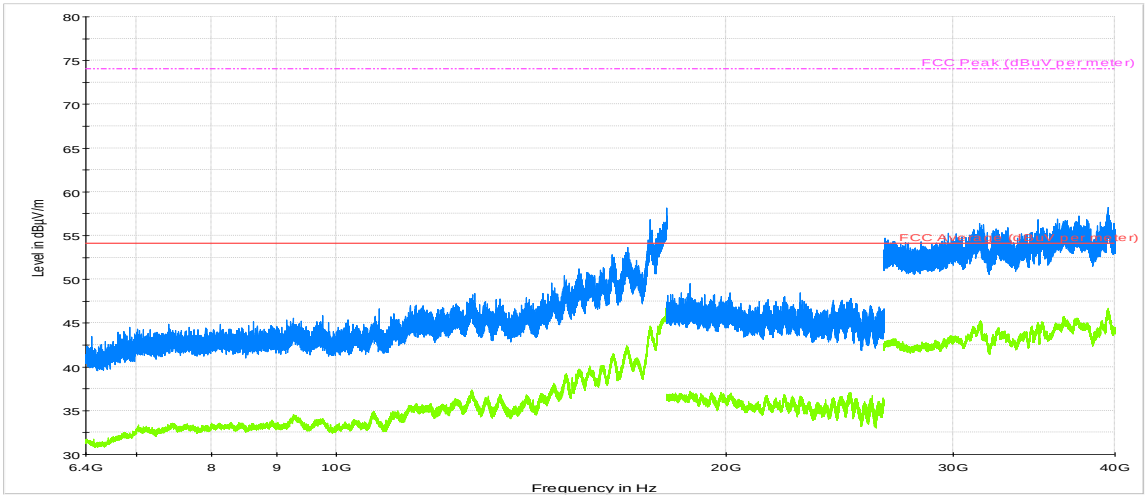


Peak measurements AVG measurements Limit FCC AVG Limit FCC Peak

Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
1956	48.4	---	74	25.6
1956	---	40.3	54	13.7
3800	52.9	---	74	21.1
3800	---	42.2	54	11.8

Radiated Spurious – 6.4GHz to 40GHz

Radiated Spurious – All modes



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/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.