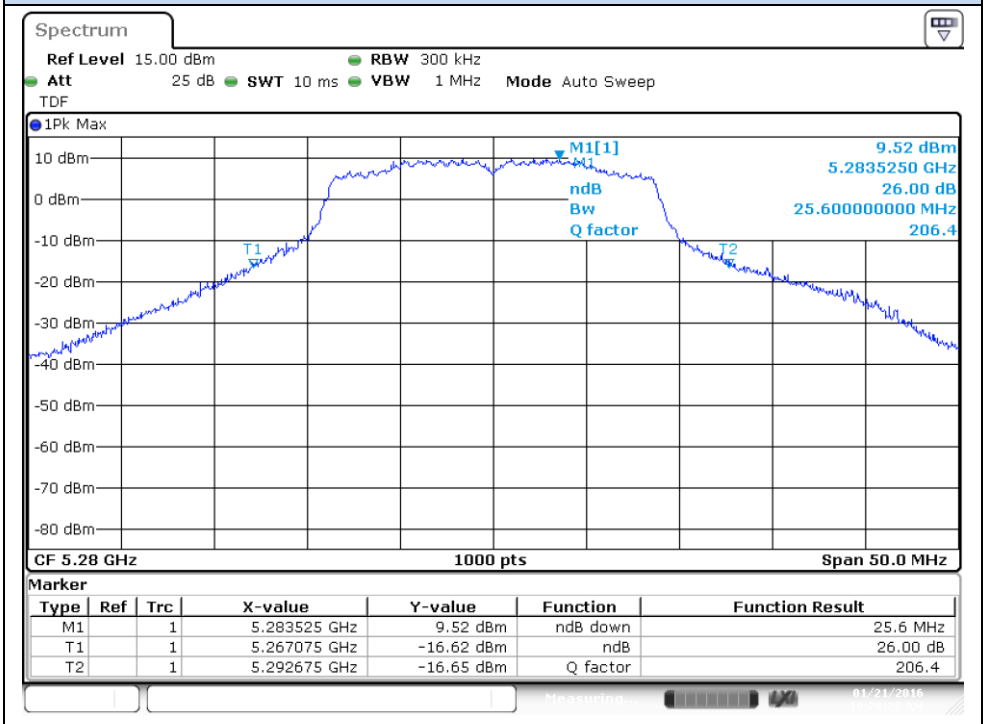
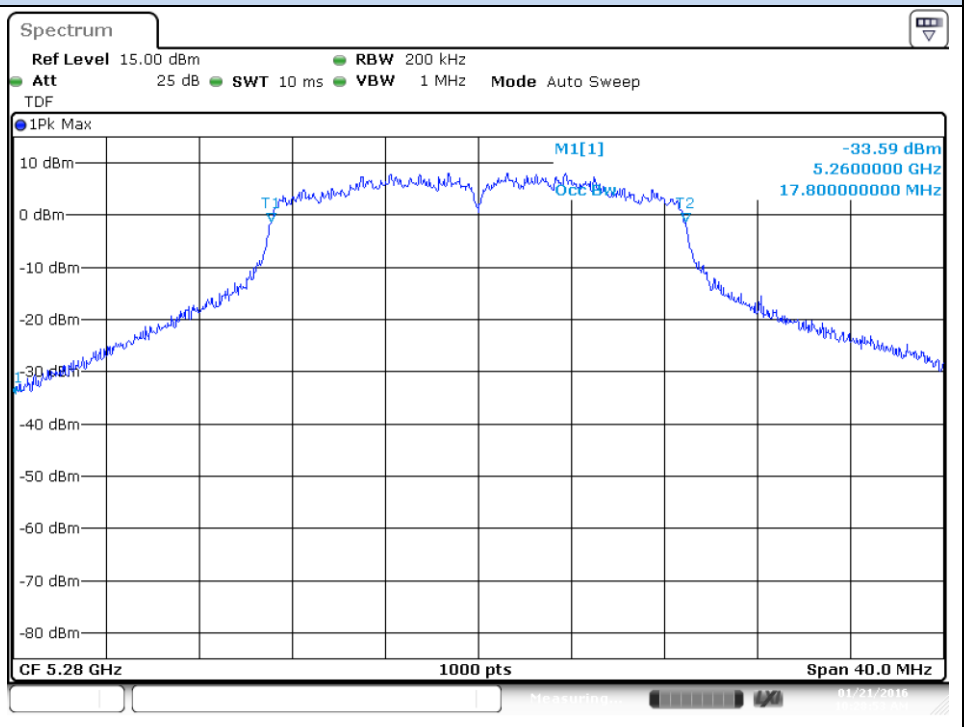
26dB BW – CH56



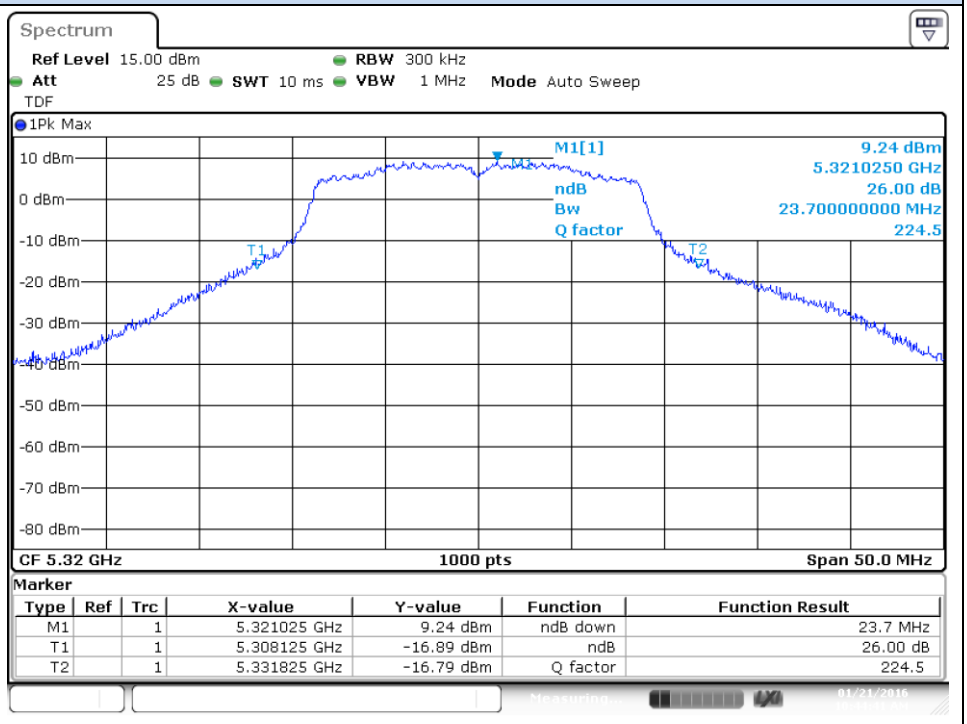
Date: 21.JAN.2016 10:28:28

99% BW – CH56



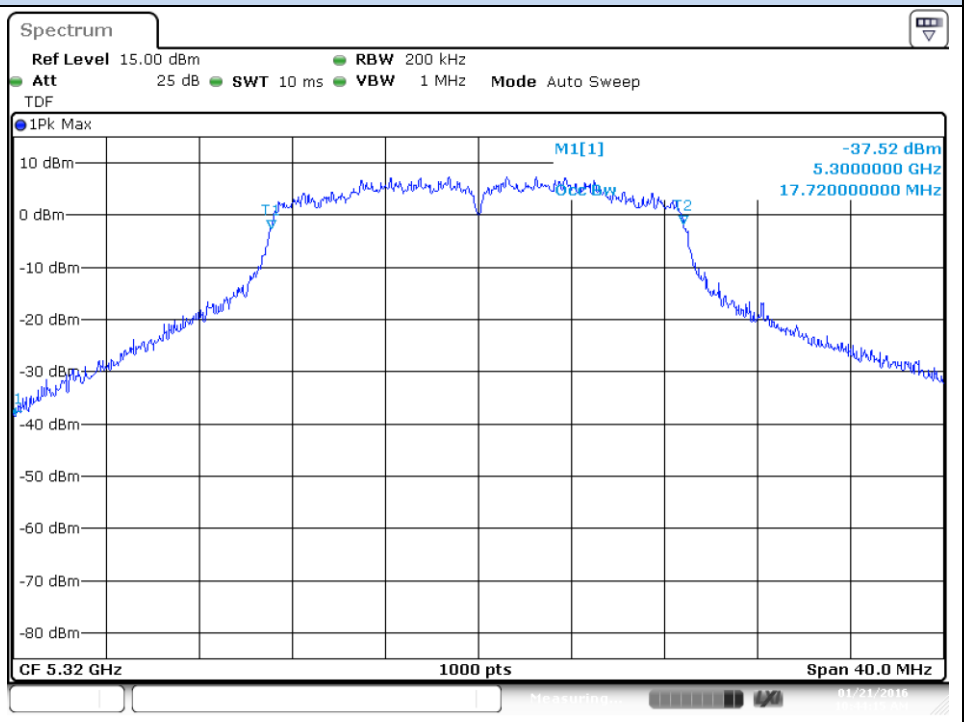
Date: 21.JAN.2016 10:28:53

26dB BW – CH64



Date: 21.JAN.2016 10:44:41

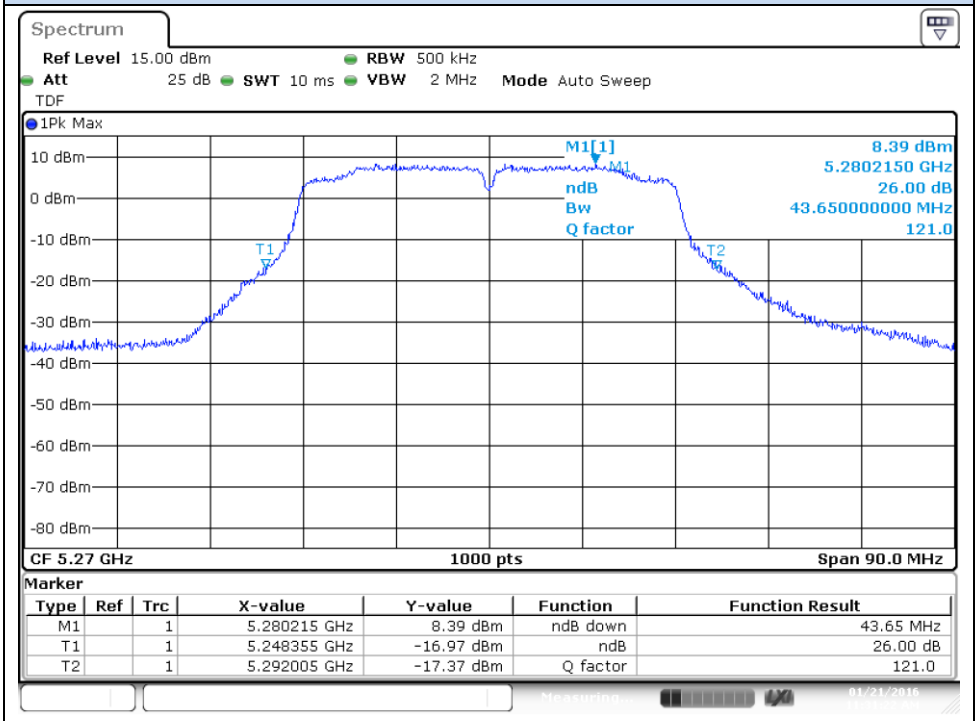
99% BW – CH64



Date: 21.JAN.2016 10:44:16

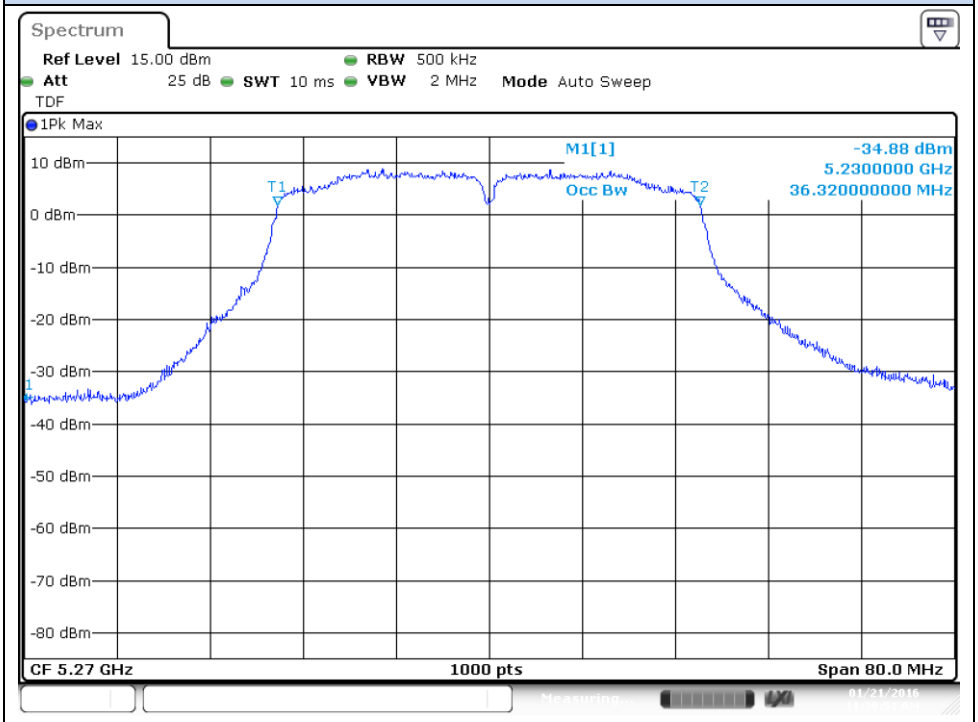
802.11n40, HT0 (SISO) – Chain A

26dB BW – CH54F



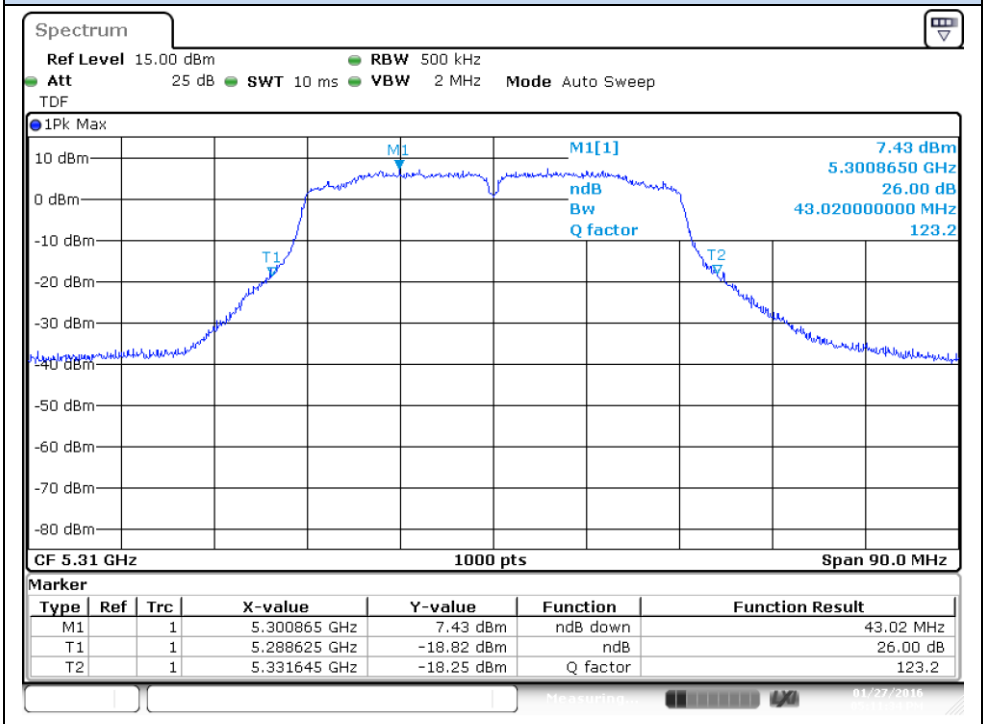
Date: 21.JAN.2016 11:31:23

99% BW – CH54F



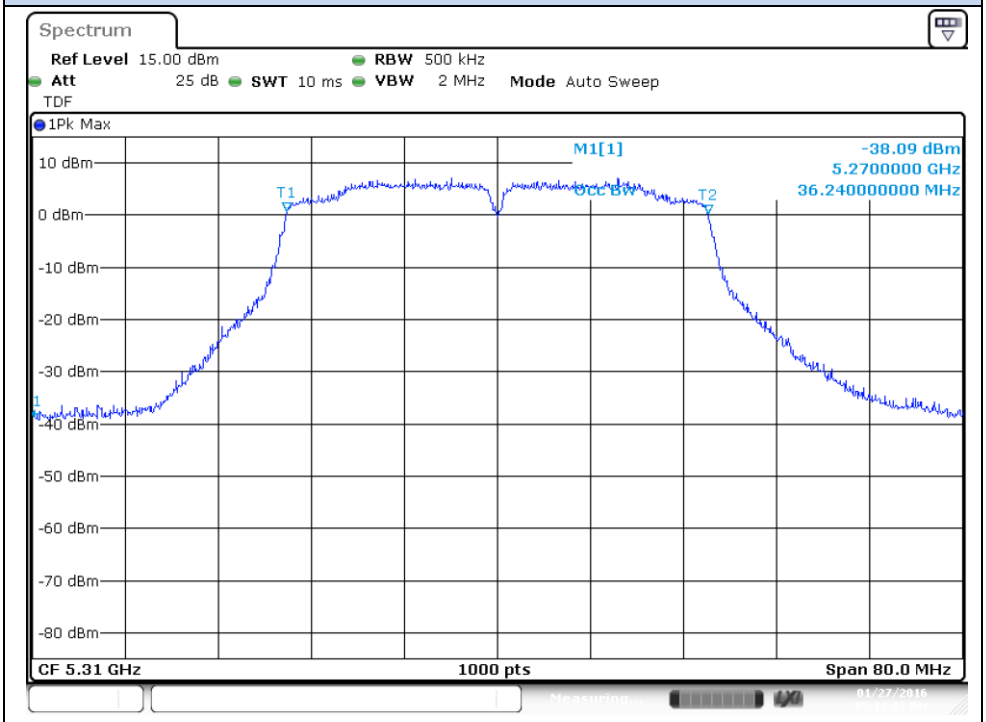
Date: 21.JAN.2016 11:30:51

26dB BW – CH62F



Date: 27.JAN.2016 17:11:34

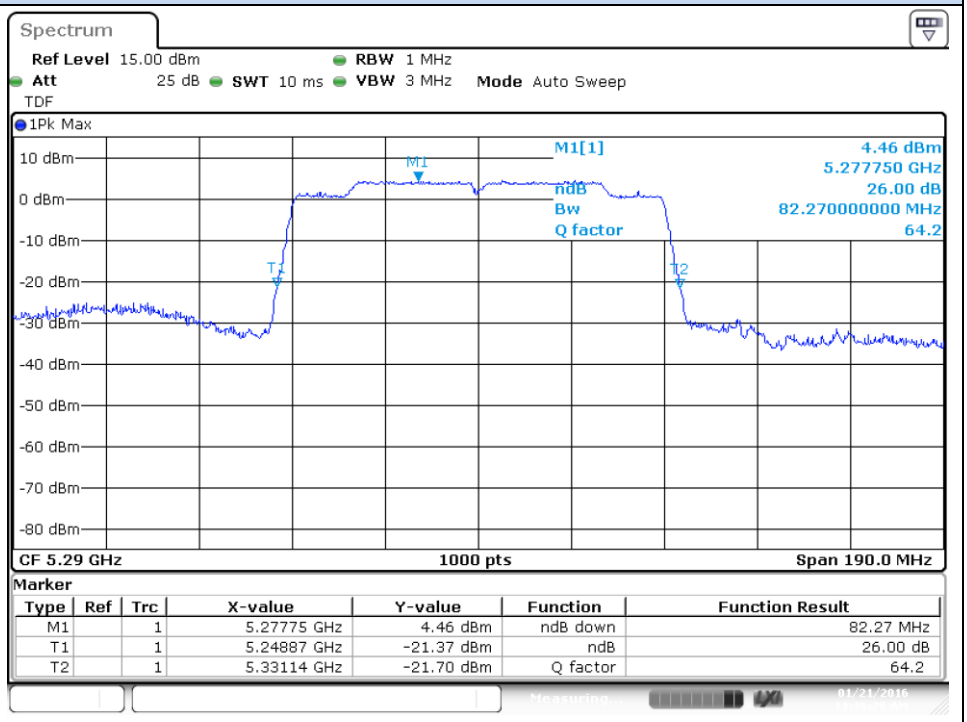
99% BW – CH62F



Date: 27.JAN.2016 17:11:03

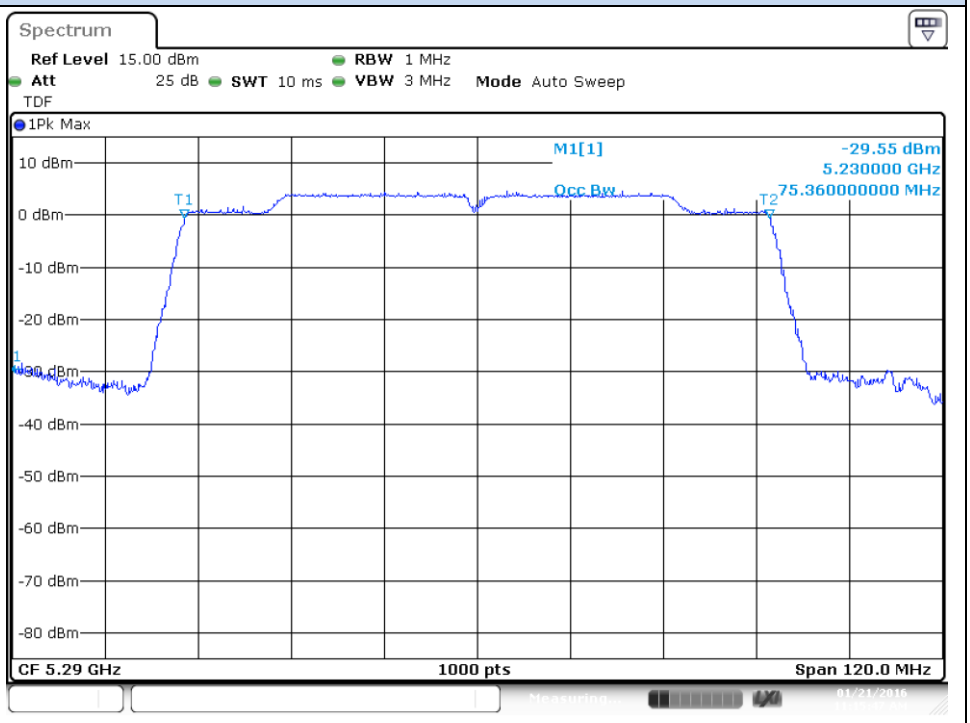
802.11ac80, VHT0 (SISO) – Chain A

26dB BW – CH58ac80



Date: 21.JAN.2016 11:16:28

99% BW – CH58ac80



Date: 21.JAN.2016 11:15:47

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 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:

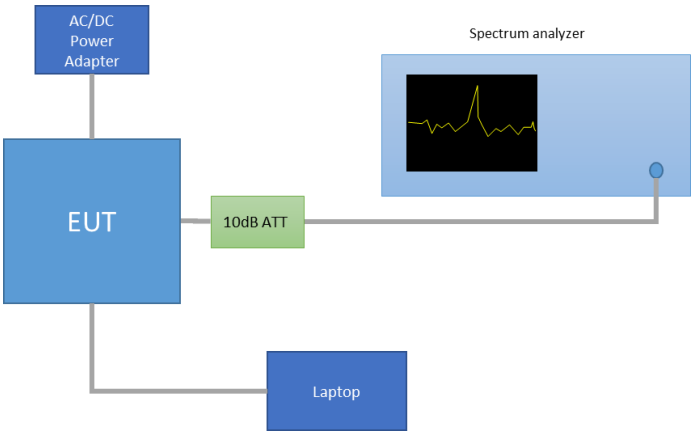
The Maximum Conducted Output Power was measured using the channel integration method according to point E) 2) e) (Method SA-2 Alternative) of KDB 789033 D02.

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

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:

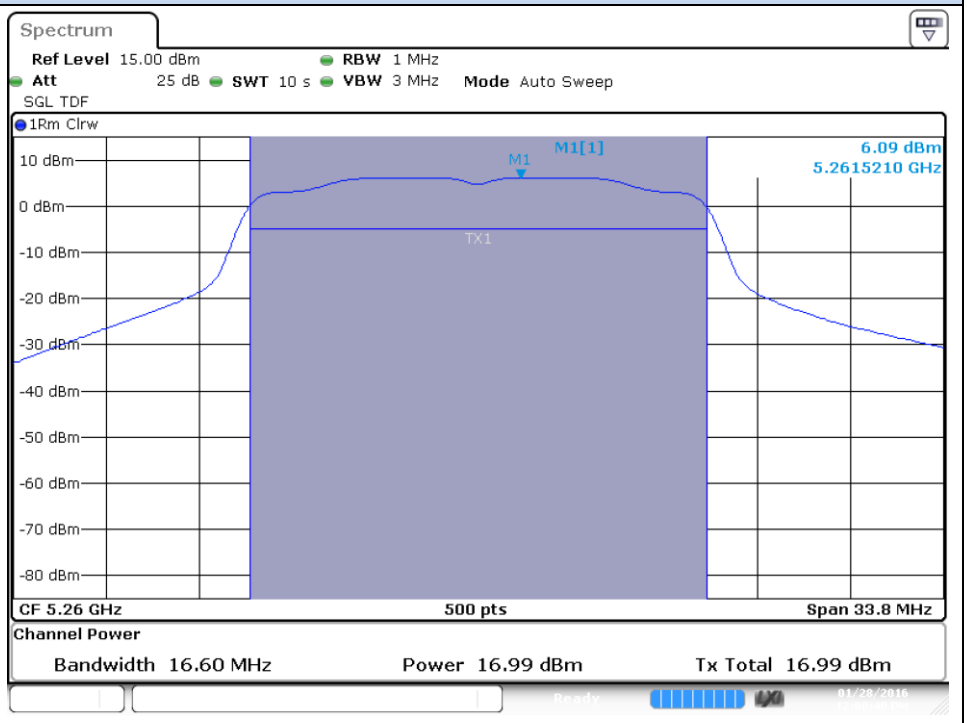
						Power [dBm]				
Mode	**Rate**	**Meas Duty Cycle [%]**	**CH**	**Freq [MHz]**	**Antenna**	**Meas Cond RMS**	**Duty cycle Compensated**	**EIRP**	**PSD Duty cycle Compensated**	**Power (mW)**
802.11a	6Mbps	98.4	52	5260	SISO CHAIN A	16.99	17.06	22.06	6.16	50.82
			56	5280		17.12	17.19	22.19	6.30	**52.37**
			64	5320		16.69	16.76	21.76	5.86	**47.43**
802.11n20	HT0	98.6	52	5260		16.81	16.87	21.87	5.77	48.67
			56	5280		17.19	17.25	22.25	6.14	**53.12**
			64	5320		16.58	16.64	21.64	5.53	**46.16**
802.11n40	HT0	97.1	54F	5270		17.03	17.16	22.16	2.75	**52.00**
			62F	5310		15.57	15.70	20.70	1.26	**37.15**
802.11ac80	VHT0	96.0	58ac80	5290		13.19	13.37	18.37	-4.05	**21.71**

Max Value
Min Value

Results screenshot:

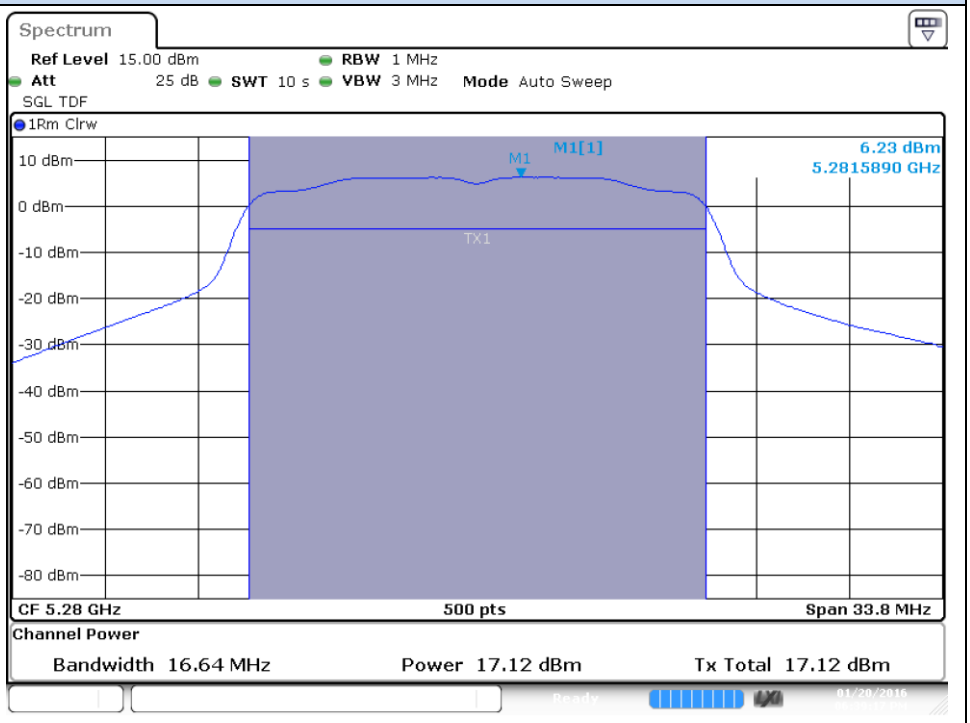
802.11a, 6Mbps

Max Power & PSD, Chain A – CH52



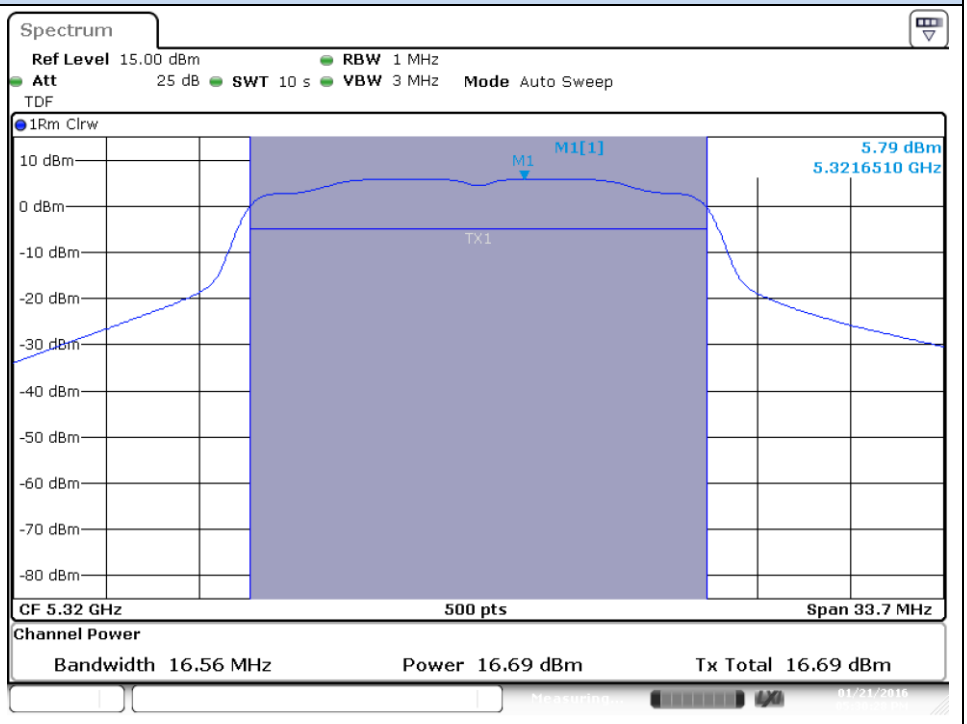
Date: 28.JAN.2016 12:08:40

Max Power & PSD, Chain A – CH56



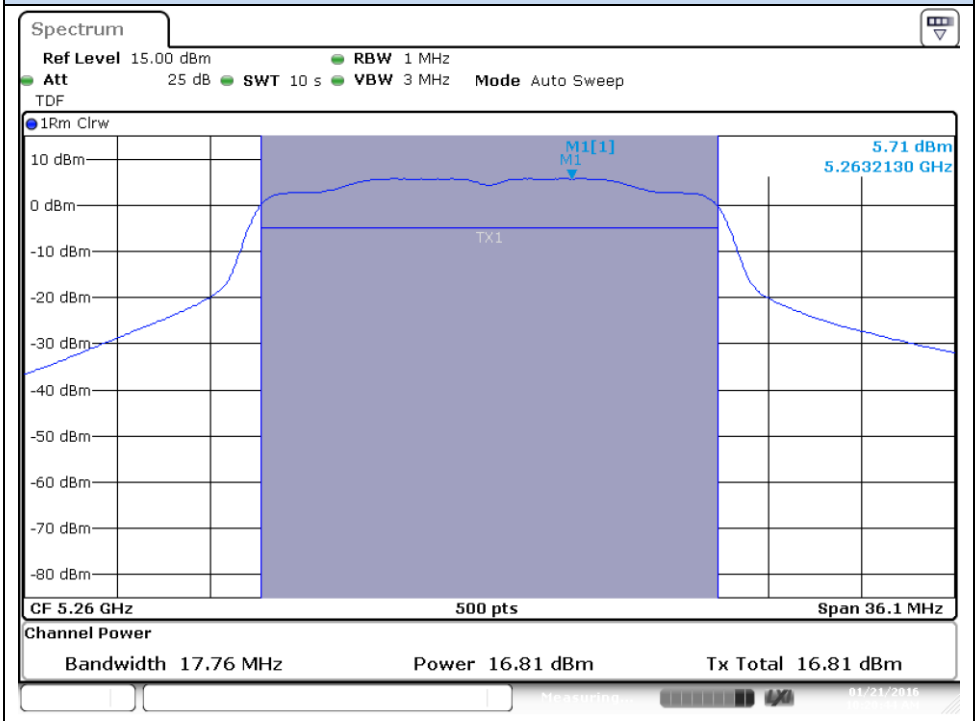
Date: 20.JAN.2016 18:39:17

Max Power & PSD, Chain A – CH64



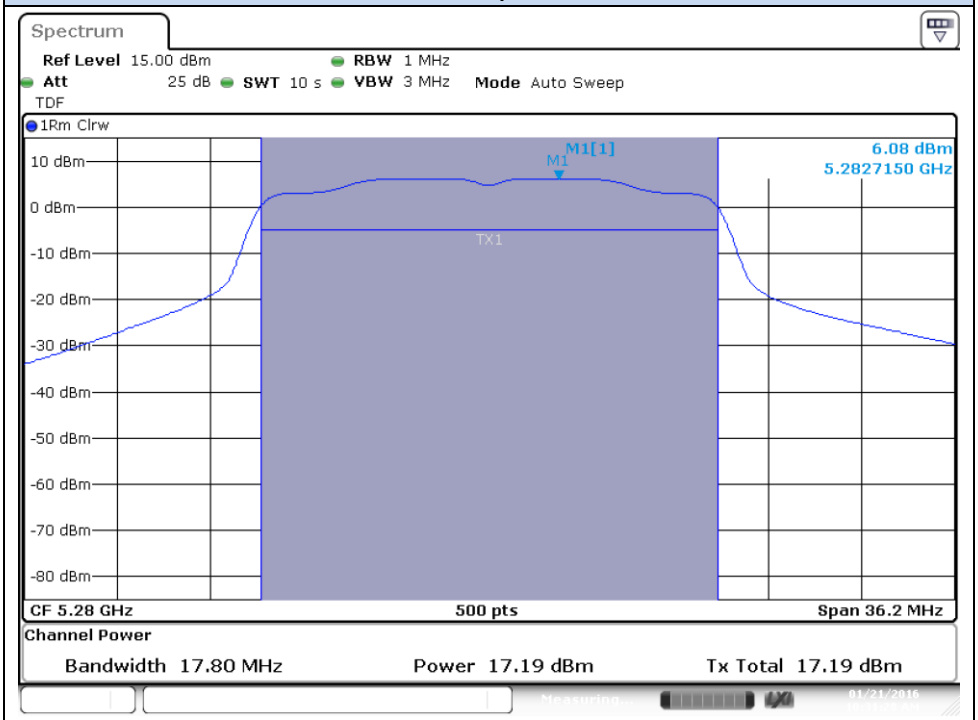
802.11n20, HT0

Max Power & PSD, Chain A – CH52



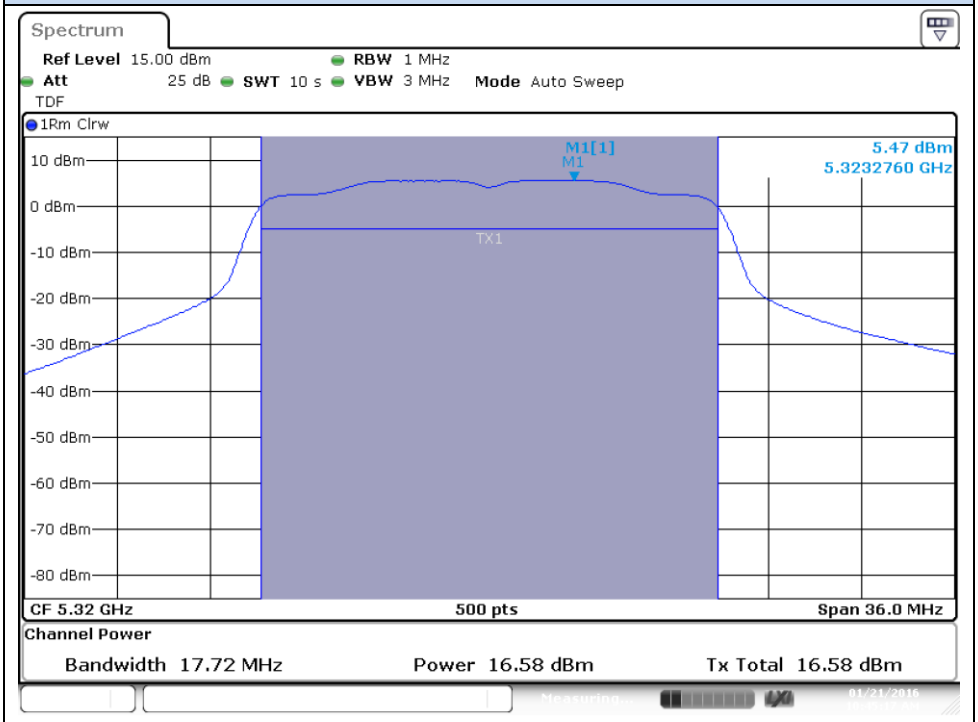
Date: 21.JAN.2016 10:20:44

Max Power & PSD, Chain A – CH56



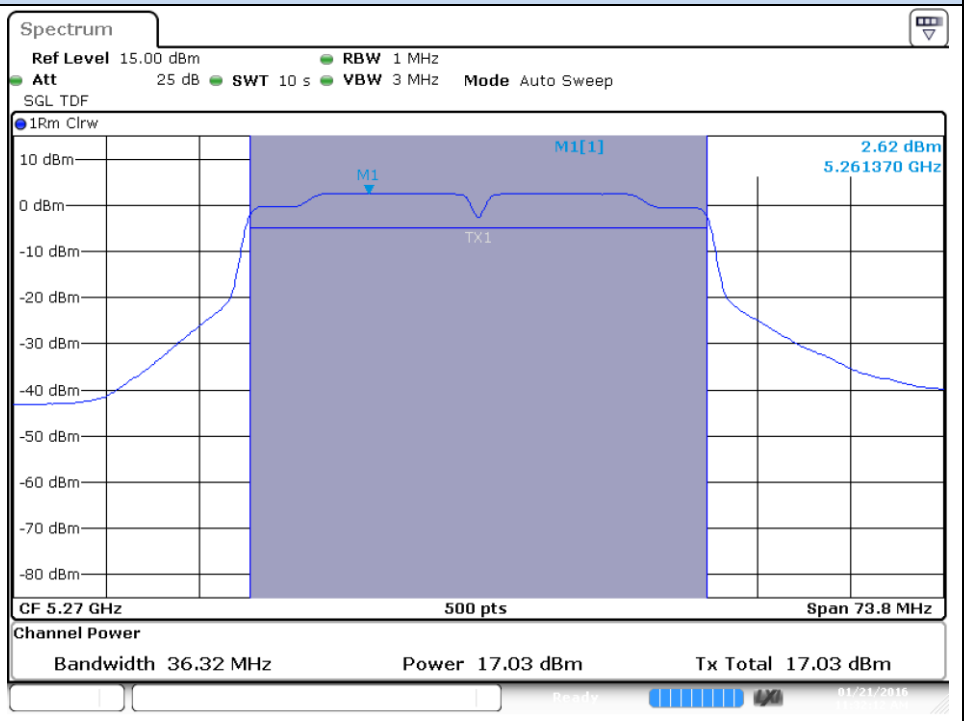
Date: 21.JAN.2016 10:31:28

Max Power & PSD, Chain A – CH64



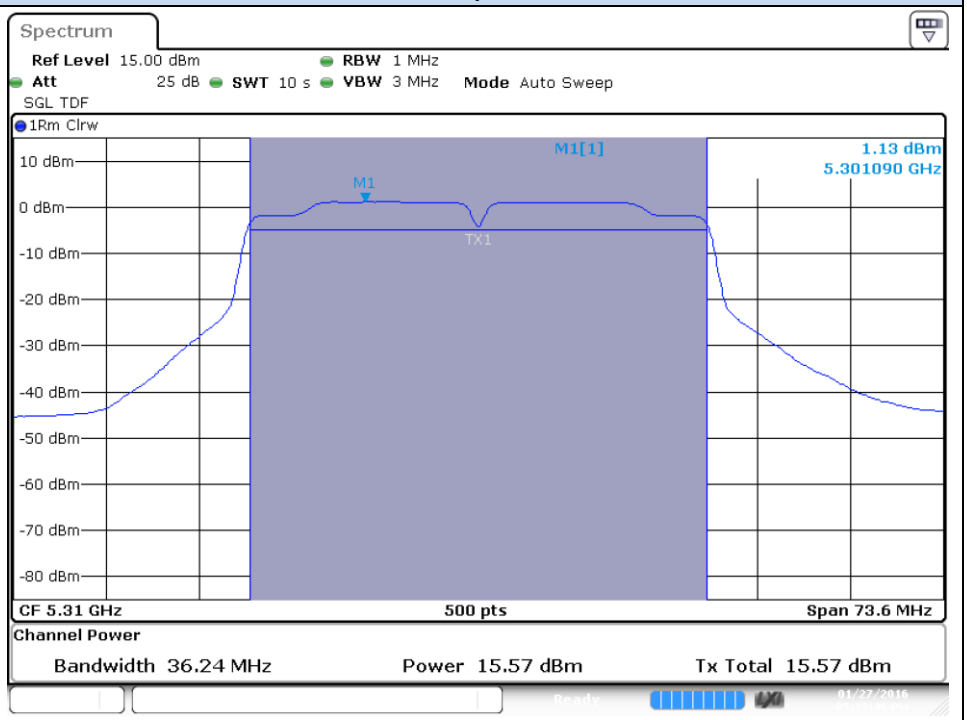
802.11n40, HT0

Max Power & PSD, Chain A – CH54F



Date: 21.JAN.2016 11:32:12

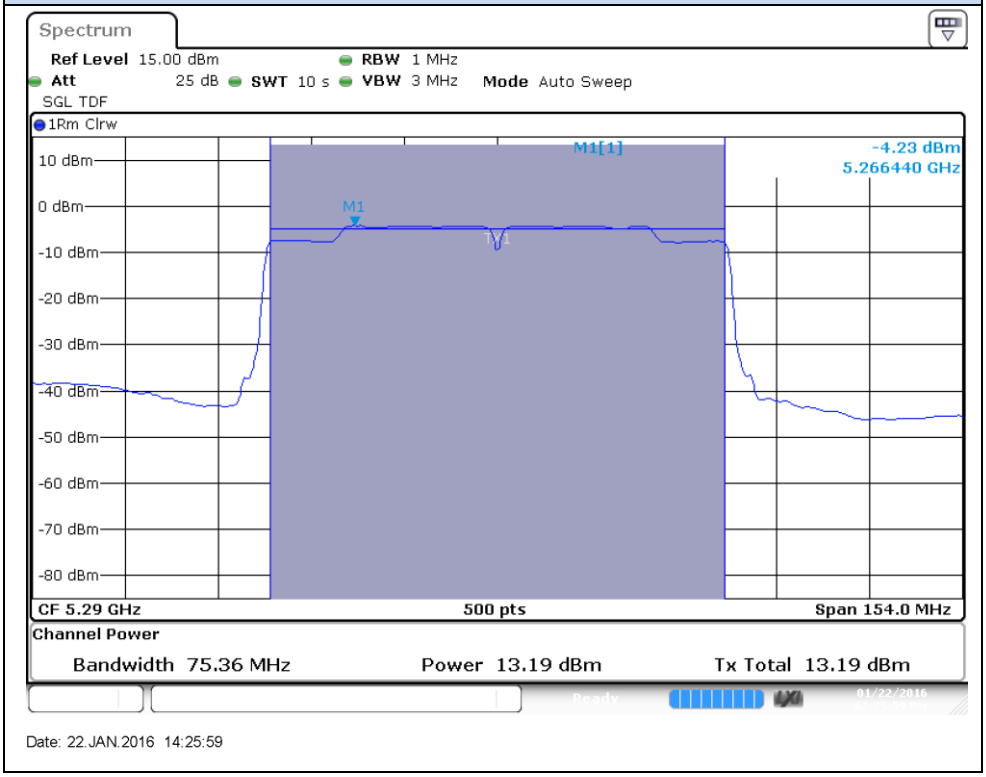
Max Power & PSD, Chain A – CH62F



Date: 27.JAN.2016 17:13:46

802.11ac80, VHT0 (SISO)

Max Power & PSD, Chain A – CH58ac80



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

Test limits:

<table>
<tr><th>FCC part</th><th>RSS part</th><th>Limits</th></tr>
<tr><td>15.407 (b) (2)</td><td>RSS-247 Clause 6.2.2 (2)</td><td>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.</td></tr>
<tr><td>15.209</td><td>RSS-247 Clause 6.2.2 (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>

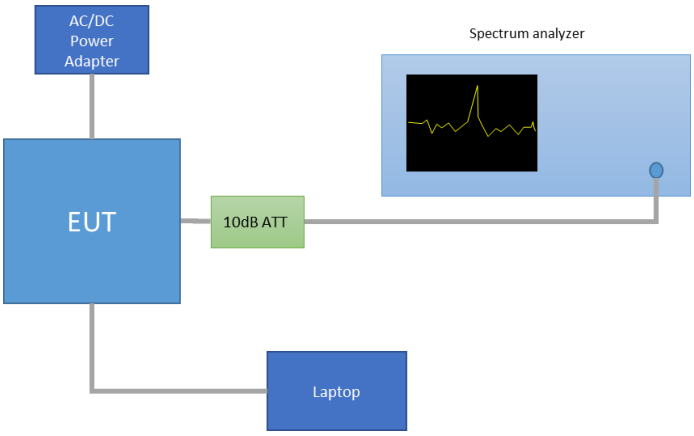
Test procedure:

The 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.



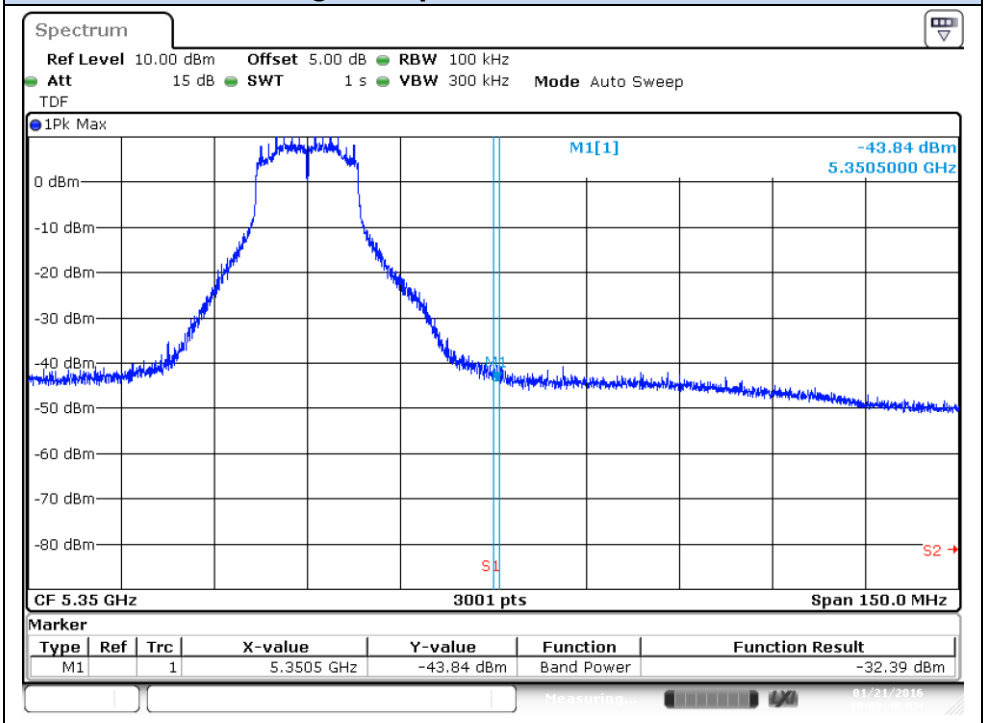
The following limits in dBm were applied for the average detector after the conversion from the limits detailed above in dBµV/m, according to FCC 47 CFR part 15 - Subpart C – §15.209(a). The limits in dBm for peak detector are 20dB above the indicated values in the table.

§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:

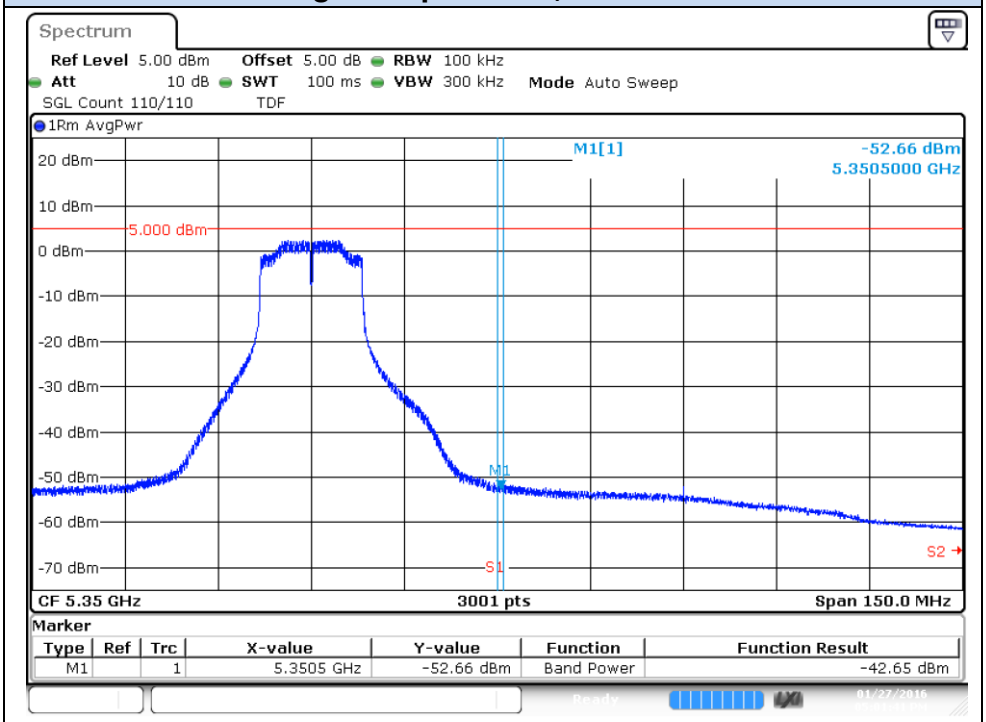
802.11a, 6Mbps – Chain A

BE High Freq Section, Peak – CH64



Date: 21.JAN.2016 10:08:48

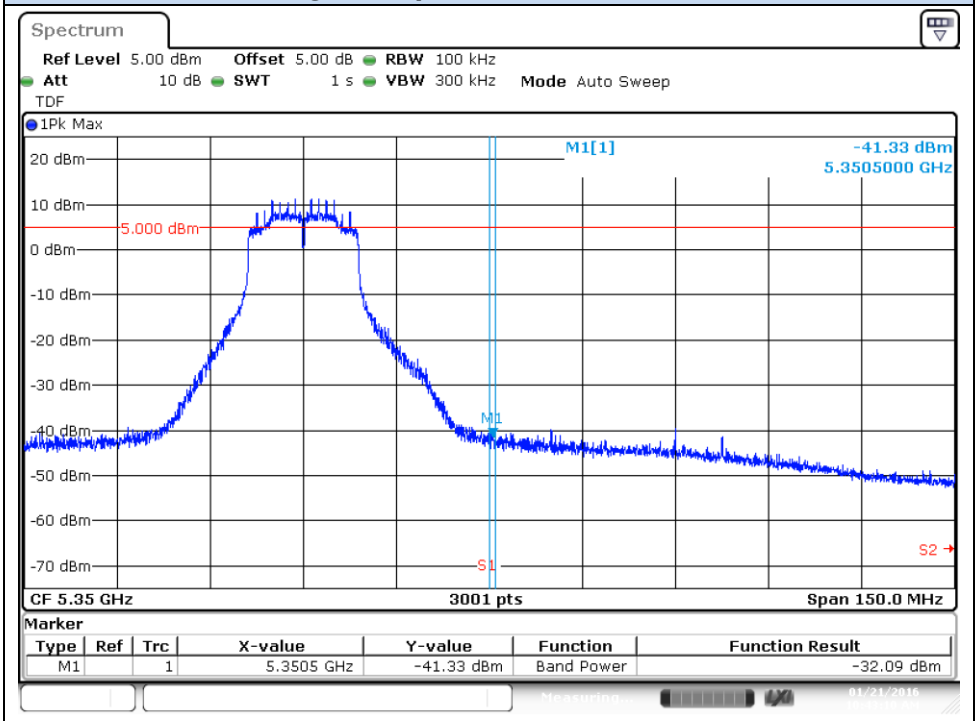
BE High Freq Section, RMS – CH64



Date: 27.JAN.2016 17:01:40

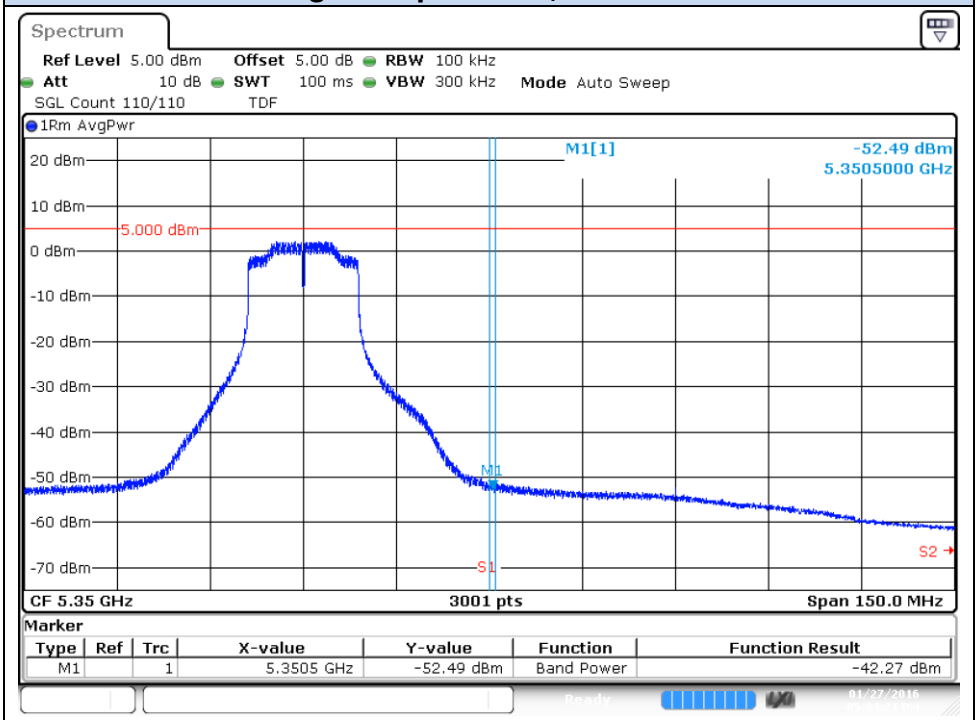
802.11n20, HT0 – Chain A

BE High Freq Section, Peak – CH64



Date: 21.JAN.2016 10:43:11

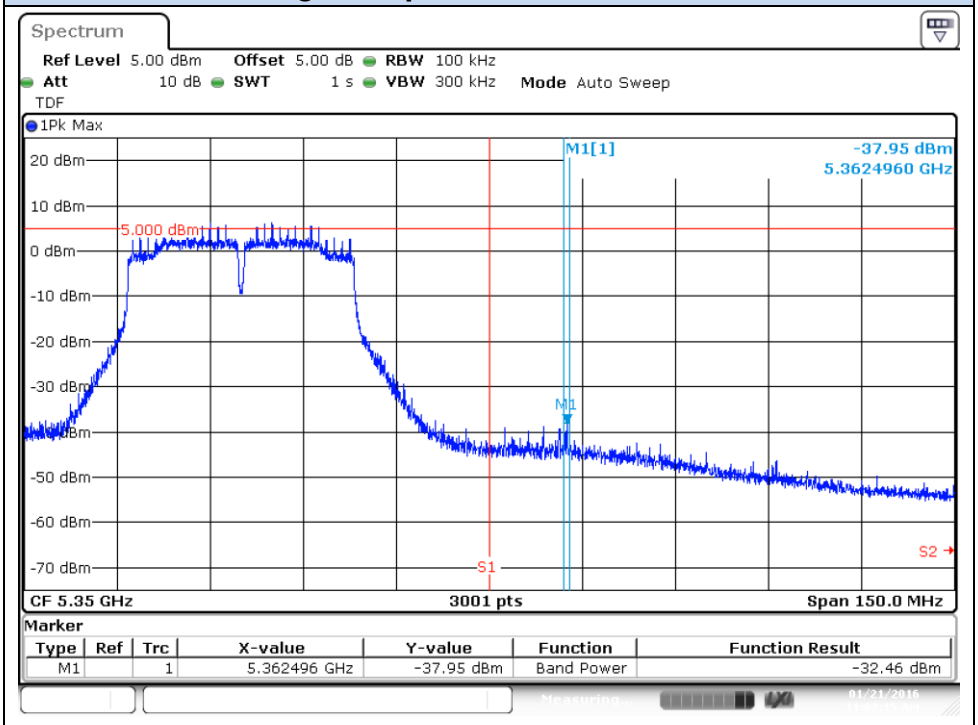
BE High Freq Section, RMS – CH64



Date: 27.JAN.2016 17:04:21

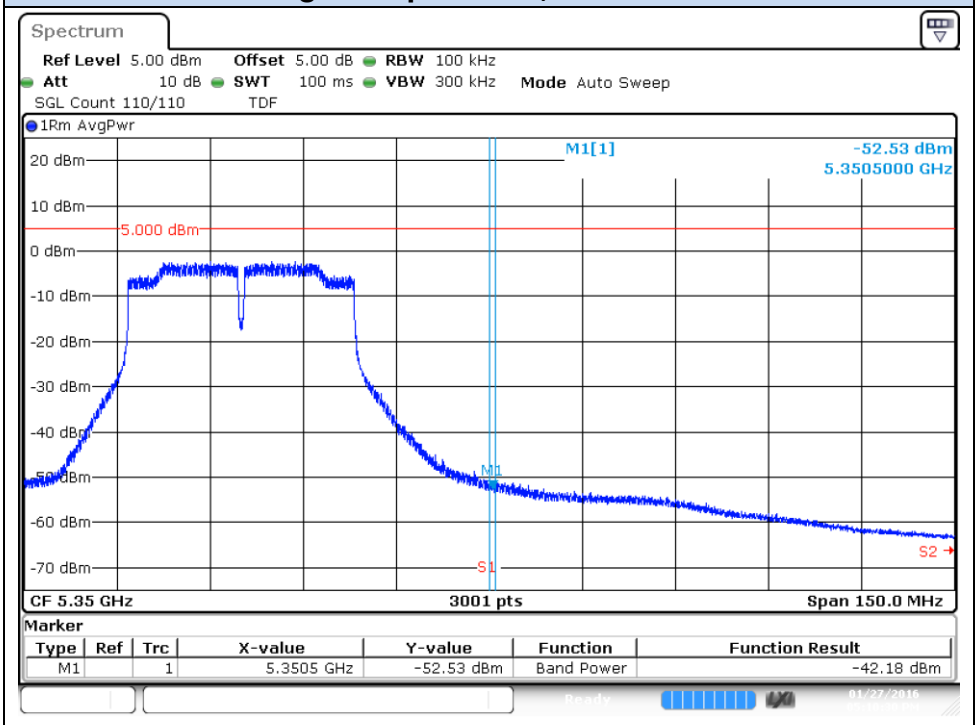
802.11n40, HT0 – Chain A

BE High Freq Section, Peak – CH62F



Date: 21.JAN.2016 11:02:16

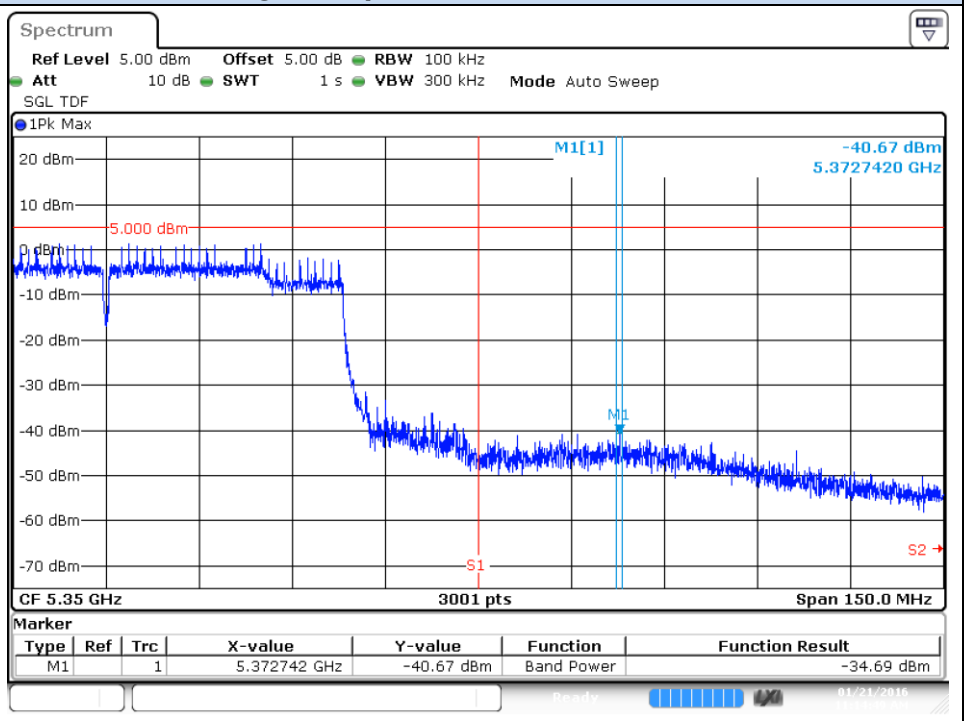
BE High Freq Section, RMS – CH62F



Date: 27.JAN.2016 17:10:31

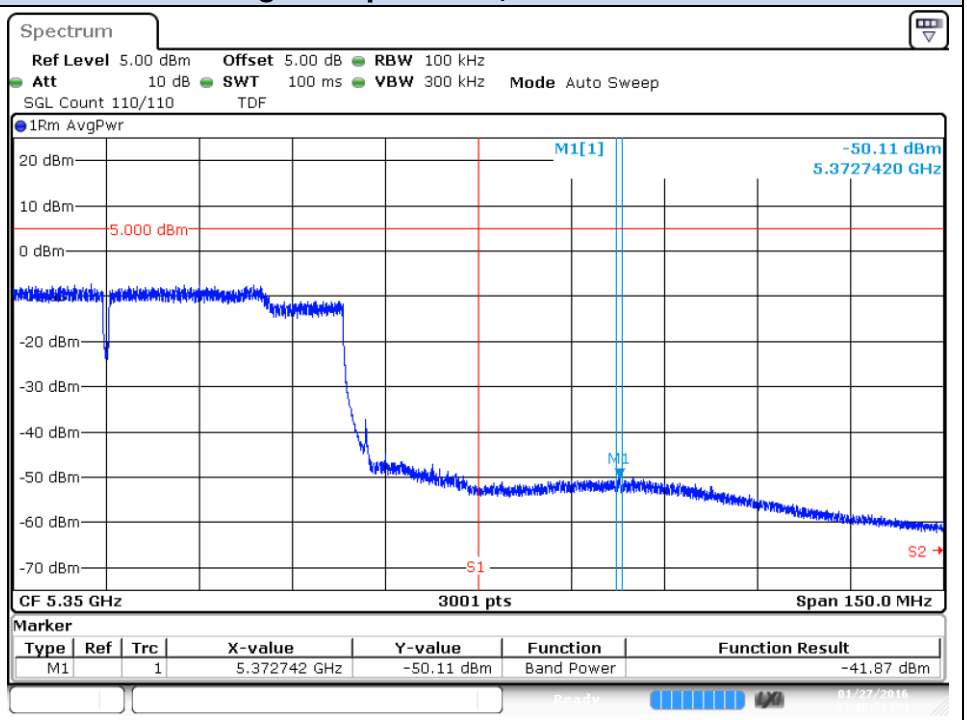
802.11ac80, VHT0 – Chain A

BE High Freq Section, Peak – CH58ac80



Date: 21.JAN.2016 11:14:50

BE High Freq Section, RMS – CH58ac80



Date: 27.JAN.2016 17:18:28

C.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) (2)
15.209</td><td>RSS-247
Clause 6.2.2
(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):

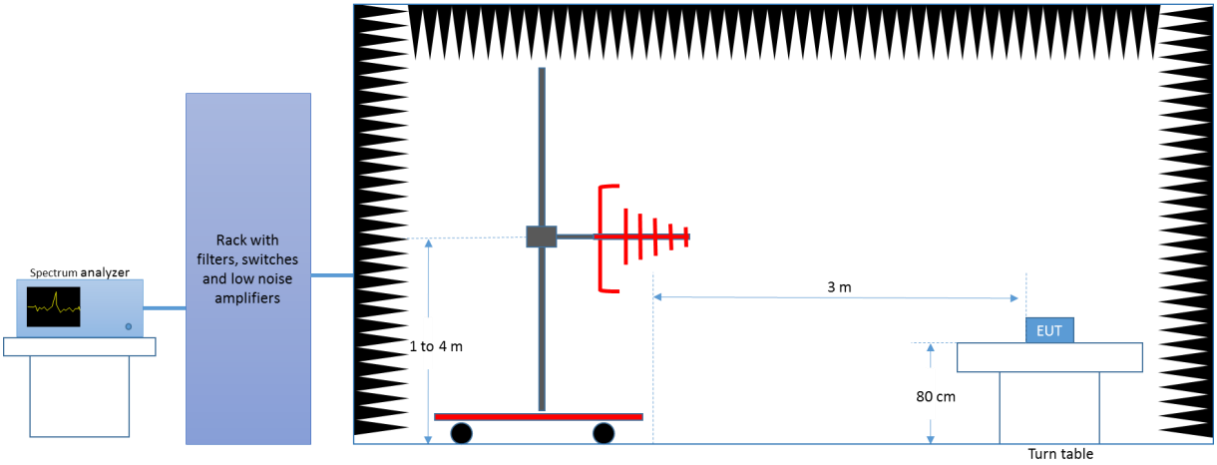
<table>
<tr><th>Freq Range (MHz)</th><th>Field Stregth (µV/m)</th><th>Field Stregth (dBµV/m)</th><th>Meas. Distance (m)</th></tr>
<tr><td>0.009-0.490</td><td>2400/f(kHz)</td><td>-</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/f(kHz)</td><td>-</td><td>300</td></tr>
<tr><td>1.705-30.0</td><td>30</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:

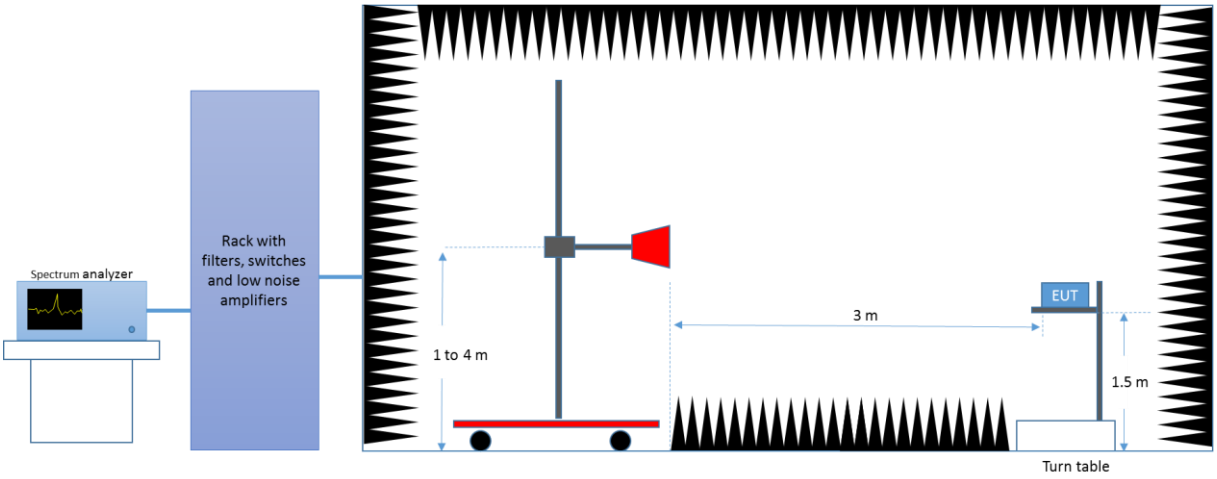
The below setups were used to measure the radiated spurious emissions.
Depending of the frequency range and bands being tested, different antennas and filters were used.
The final measurement is done by varying the antenna height from 1 to 4 meters, the EUT azimuth over 360º and for both Vertical and Horizontal polarizations.
The radiated spurious emissions were measured on the worst case configuration selected from the chapter *0*

Power Limits. Maximum Output power & Peak power spectral density and using the lowest, middle and highest channels.

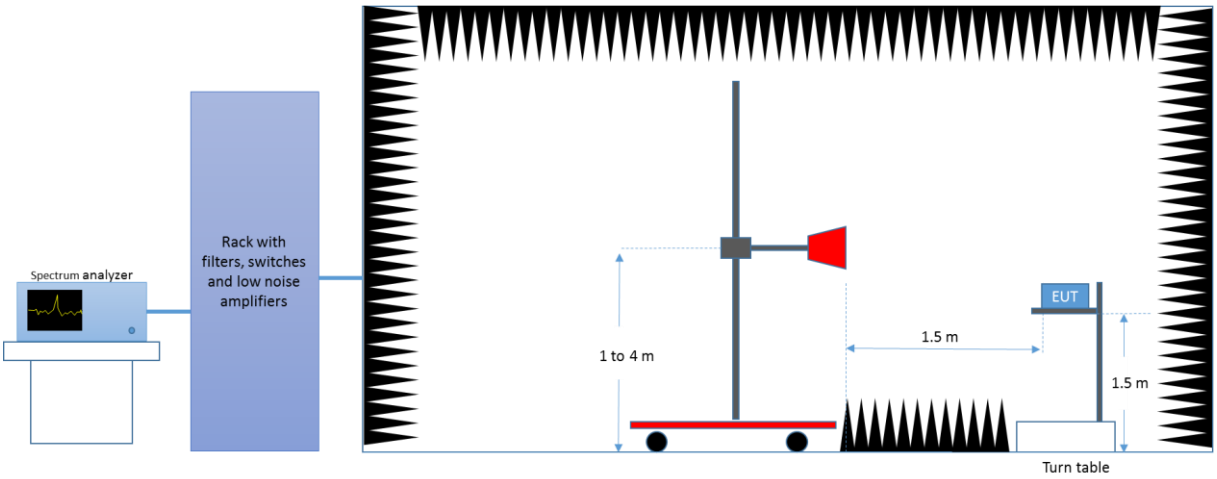
Radiated Setup < 1GHz



Radiated Setup 1 GHz - 18 GHz



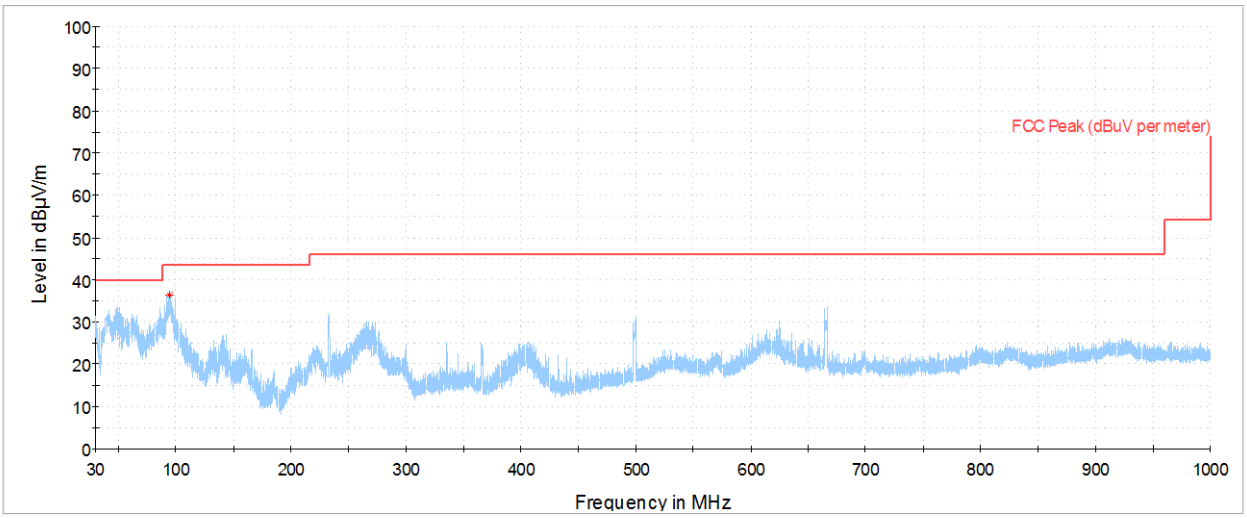
Radiated Setup > 18 GHz



Test Results:

Radiated Spurious – 30MHz to 1GHz

Radiated Spurious – All modes

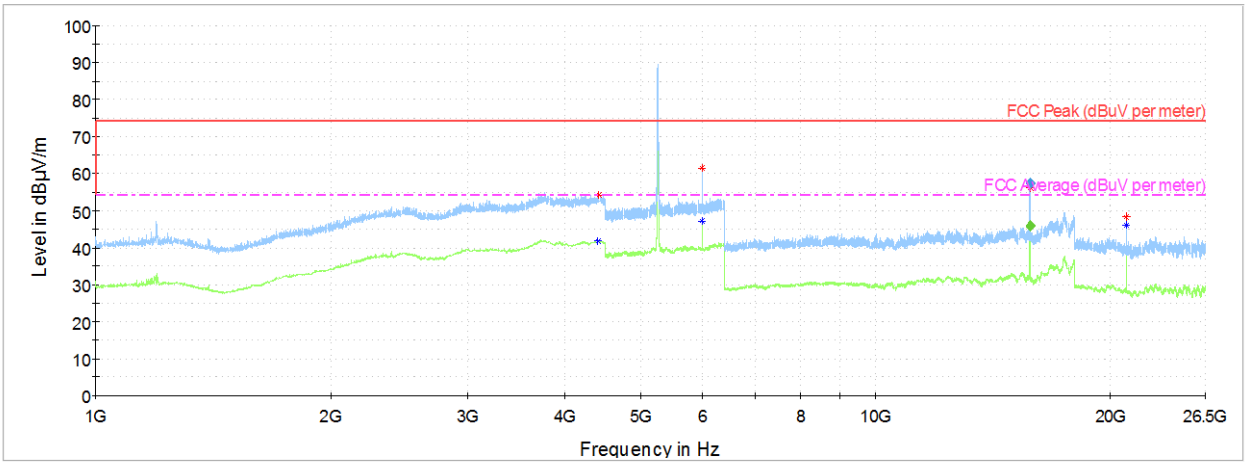


Frequency	MaxPeak	Limit	Margin
MHz	dBm	dBm	dB
94.87	36.40	43.56	7.15

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

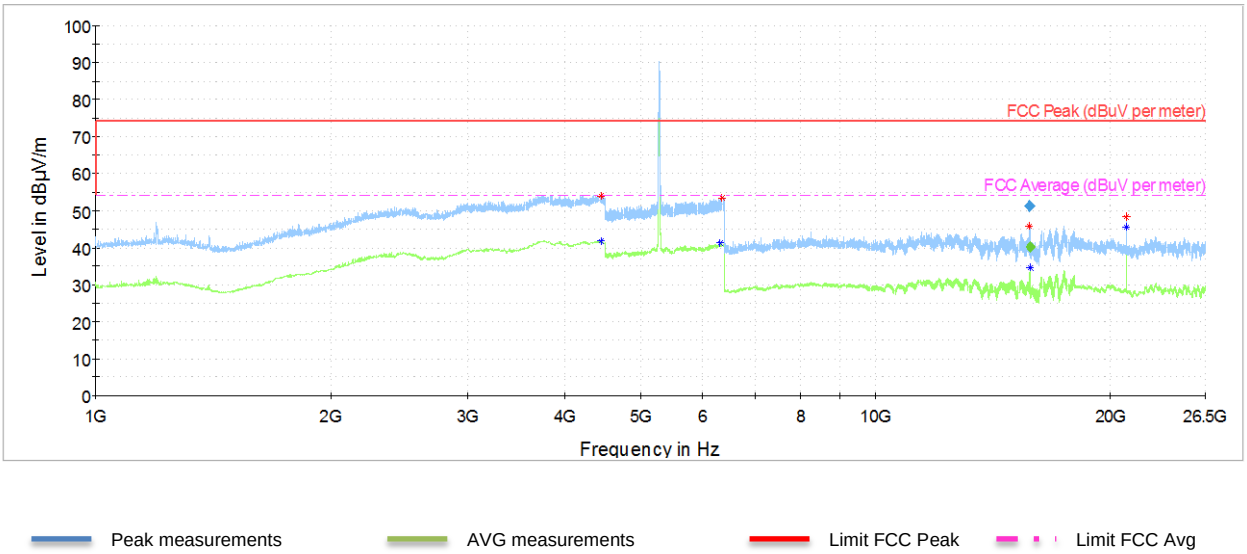
Radiated Spurious – CH52



Peak measurements AVG measurements Limit FCC Peak Limit FCC Avg

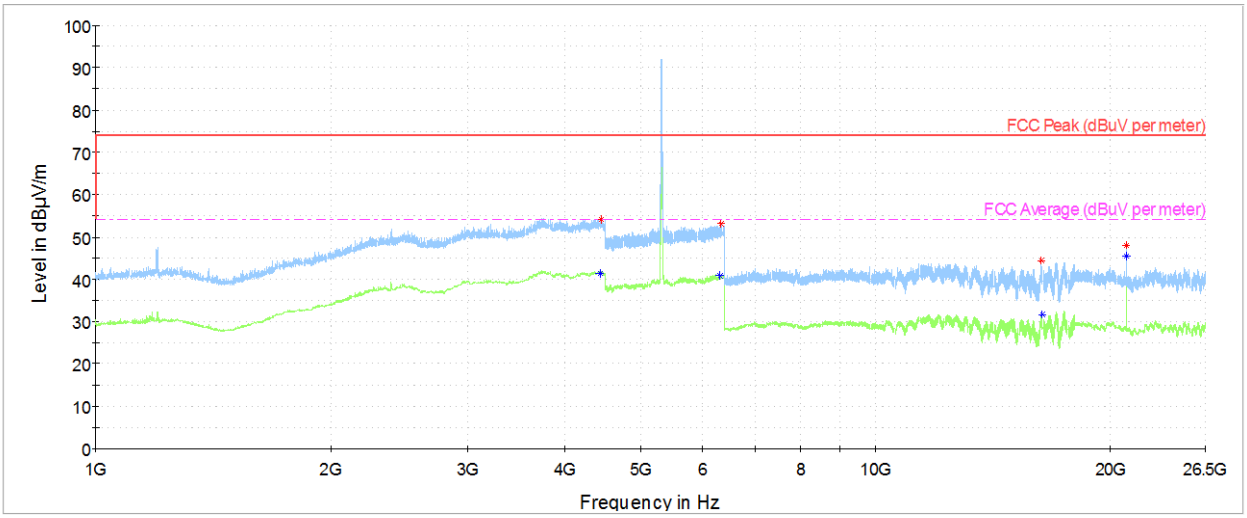
Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
4409.44	---	41.76	54.06	12.29
4418.19	54.16	---	74.06	19.90
5992.28	---	47.24	54.06	6.81
5995.65	61.51	---	74.06	12.55
15777.44	---	45.66	54.06	8.39
15788.46	56.00	---	74.06	18.06
20959.93	48.20	---	74.06	25.86
20959.93	---	46.01	54.06	8.04

Radiated Spurious – CH56



Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
4443.56	53.81	---	74.06	20.25
4453.63	---	41.91	54.06	12.15
6317.70	---	41.13	54.06	12.93
6359.41	53.47	---	74.06	20.58
15774.54	45.87	---	74.06	28.19
15780.34	---	34.61	54.06	19.44
20959.93	---	45.68	54.06	8.38
20959.93	48.38	---	74.06	25.68

Radiated Spurious – CH64

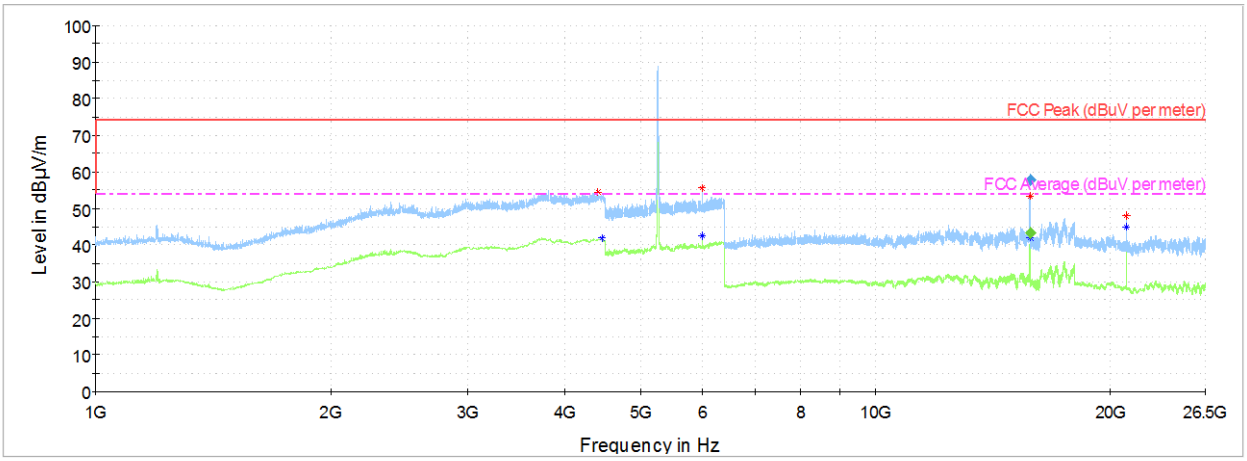


Peak measurements AVG measurements Limit FCC Peak Limit FCC Avg

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
4437.88	---	41.49	54.06	12.57
4447.06	54.18	---	74.06	19.88
6322.27	---	40.79	54.06	13.27
6343.69	53.19	---	74.06	20.87
16317.42	44.43	---	74.06	29.63
16351.06	---	31.77	54.06	22.29
20959.93	---	45.43	54.06	8.63
20959.93	47.99	---	74.06	26.07

1 GHz – 26.5GHz, 802.11n20, Chain A

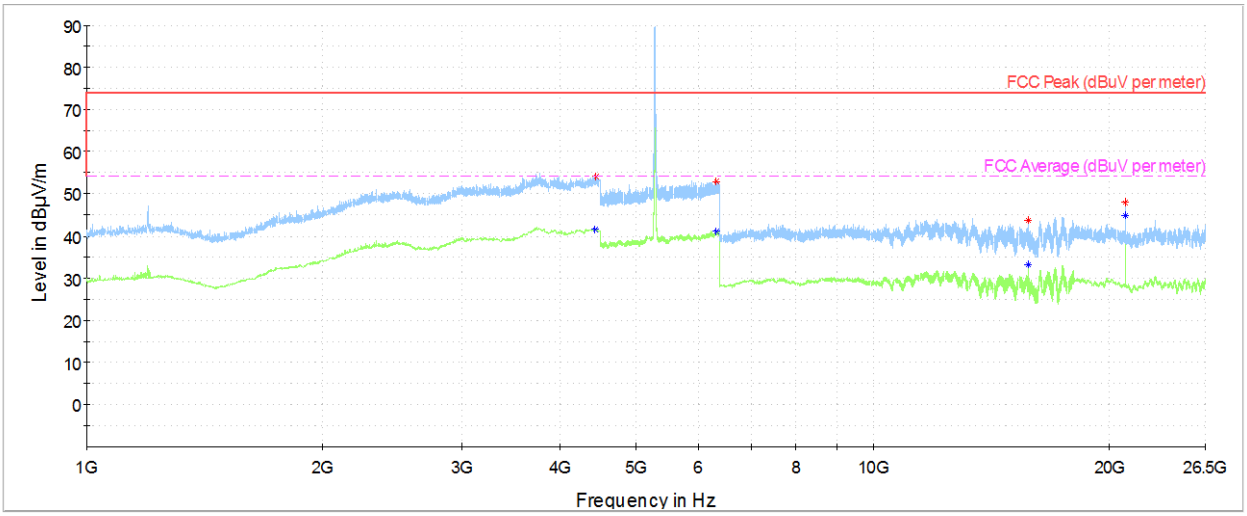
Radiated Spurious – CH52



Peak measurements AVG measurements Limit FCC Peak Limit FCC Avg

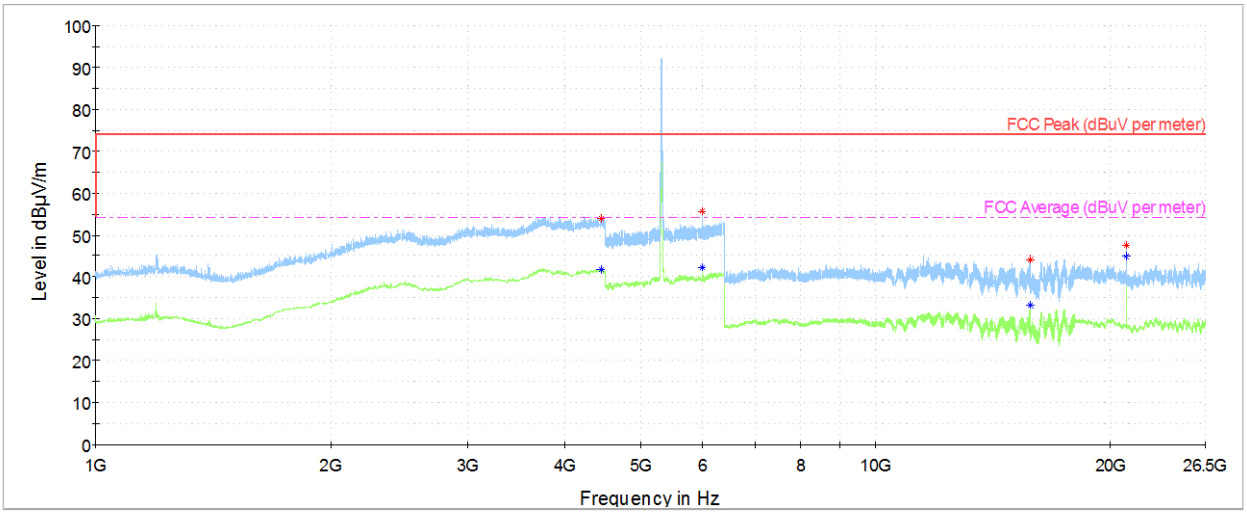
Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
4408.56	54.45	---	74.06	19.61
4455.38	---	42.01	54.06	12.04
5990.55	---	42.45	54.06	11.61
5996.60	55.58	---	74.06	18.47
15783.82	57.78	---	74.06	16.28
15783.82	---	43.25	54.06	10.81
20959.93	---	44.83	54.06	9.23
20959.93	48.02	---	74.06	26.04

Radiated Spurious – CH56



Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
4437.00	---	41.50	54.06	12.56
4441.38	54.03	---	74.06	20.03
6316.14	52.86	---	74.06	21.19
6322.19	---	40.98	54.06	13.07
15780.92	43.73	---	74.06	30.33
15783.82	---	33.29	54.06	20.77
20959.93	47.91	---	74.06	26.15
20959.93	---	44.89	54.06	9.17

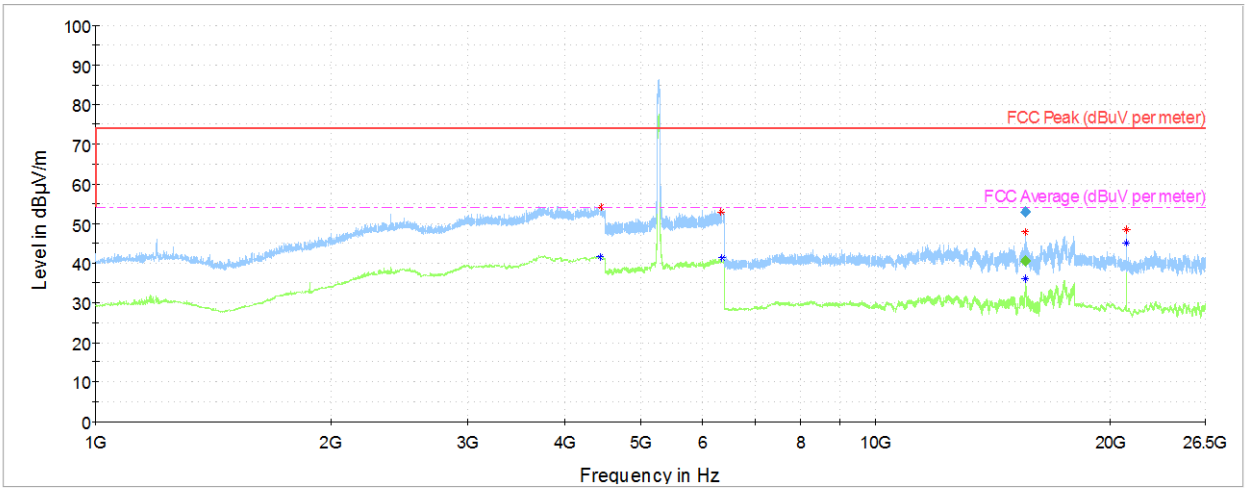
Radiated Spurious – CH64



Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
4445.31	---	41.75	54.06	12.31
4447.06	53.96	---	74.06	20.10
5995.30	---	42.35	54.06	11.71
5995.82	55.59	---	74.06	18.46
15783.82	---	33.16	54.06	20.90
15783.82	44.19	---	74.06	29.87
20959.93	---	44.84	54.06	9.21
20959.93	47.42	---	74.06	26.64

1 GHz – 26.5GHz, 802.11n40, Chain A

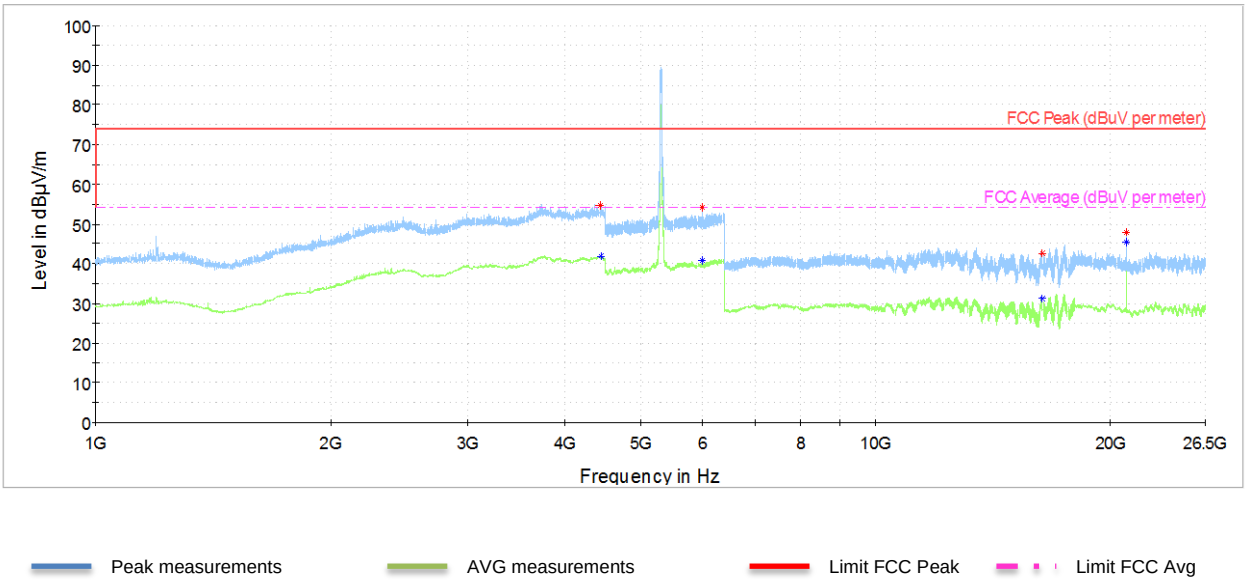
Radiated Spurious – CH54F



Peak measurements AVG measurements Limit FCC Peak Limit FCC Avg

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
4436.56	---	41.57	54.06	12.49
4444.00	54.26	---	74.06	19.79
6334.54	52.92	---	74.06	21.14
6356.82	---	41.19	54.06	12.87
15559.36	---	40.68	54.06	13.38
15579.66	52.81	---	74.06	21.25
20959.93	---	45.07	54.06	8.98
20959.93	48.26	---	74.06	25.80

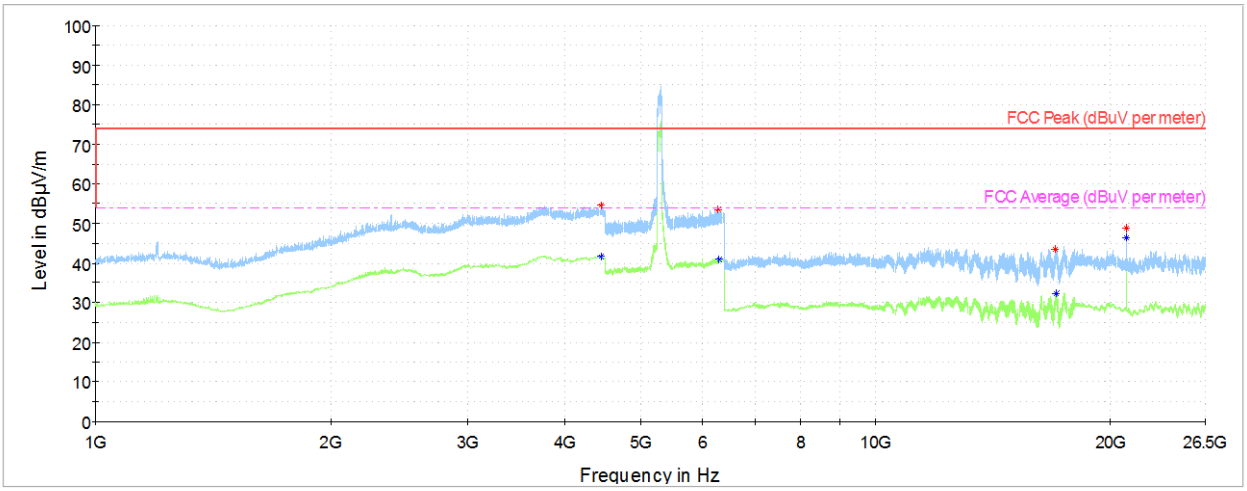
Radiated Spurious – CH62F



Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
4437.00	54.56	---	74.06	19.49
4451.88	---	41.83	54.06	12.23
5987.87	54.14	---	74.06	19.92
5997.11	---	40.70	54.06	13.36
16347.58	42.53	---	74.06	31.53
16351.06	---	31.32	54.06	22.74
20959.93	47.76	---	74.06	26.30
20959.93	---	45.23	54.06	8.83

1 GHz – 26.5GHz, 802.11ac80, Chain A

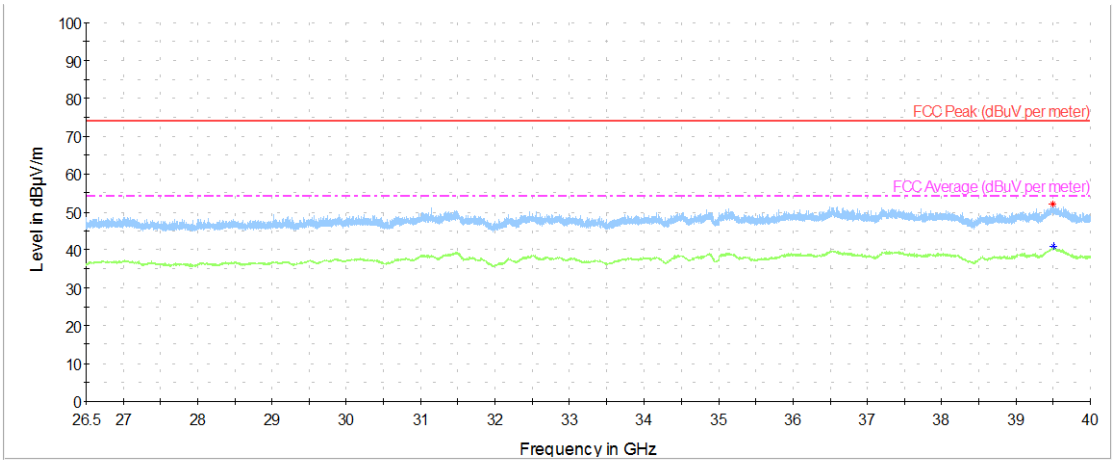
Radiated Spurious – CH58ac80



Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
4440.94	---	41.68	54.06	12.38
4451.88	54.42	---	74.06	19.64
6286.26	53.45	---	74.06	20.61
6310.79	---	40.94	54.06	13.11
17025.02	43.51	---	74.06	30.55
17051.70	---	32.34	54.06	21.72
20959.93	---	46.45	54.06	7.61
20959.93	48.69	---	74.06	25.37

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
39496.87	51.94	---	74.06	22.12
39503.10	---	40.87	54.06	13.19

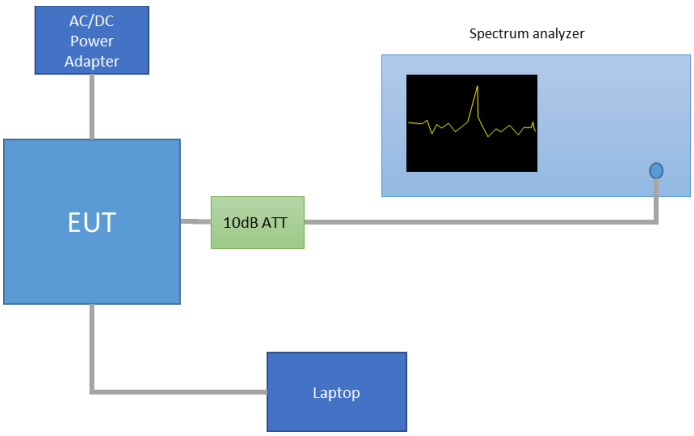
Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

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 5.8 GHz DTS, 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:

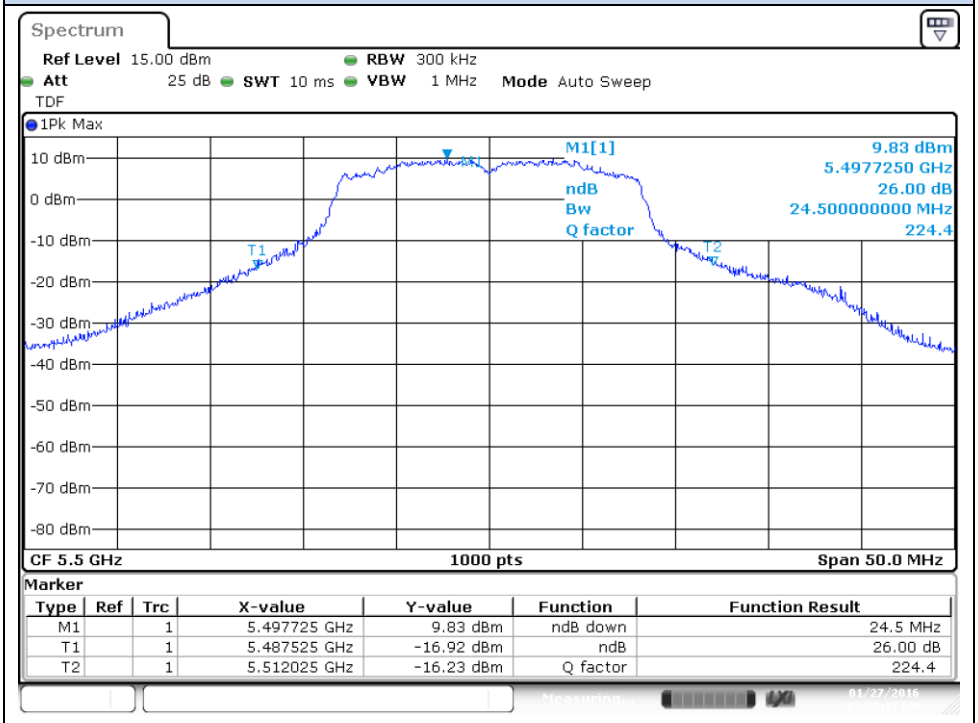
Mode	Rate	Antenna	Channel	Frequency [MHz]	26dB BW [MHz]	99% BW [MHz]
802.11a	6Mbps	SISO CHAIN A	100	5500	24.50	16.60
			120	5600	24.05	16.64
			140	5700	24.65	16.60
802.11n20	HT0	SISO CHAIN A	100	5500	24.70	17.76
			120	5600	24.90	17.76
			140	5700	24.65	17.84
			144*	5720	20.52	17.84
802.11n40	HT0	SISO CHAIN A	102F	5510	42.75	36.16
			118F	5590	44.55	36.24
			134F	5670	45.45	36.32
			142F*	5710	40.60	36.80
802.11ac80	VHT0	SISO CHAIN A	106ac80	5530	82.27	75.36
			122ac80	5610	86.45	75.48
			138ac80*	5690	93.42	77.33

**** Overlapped channels between U-NII-2C and 5.8 GHz DTS***

Results screenshot

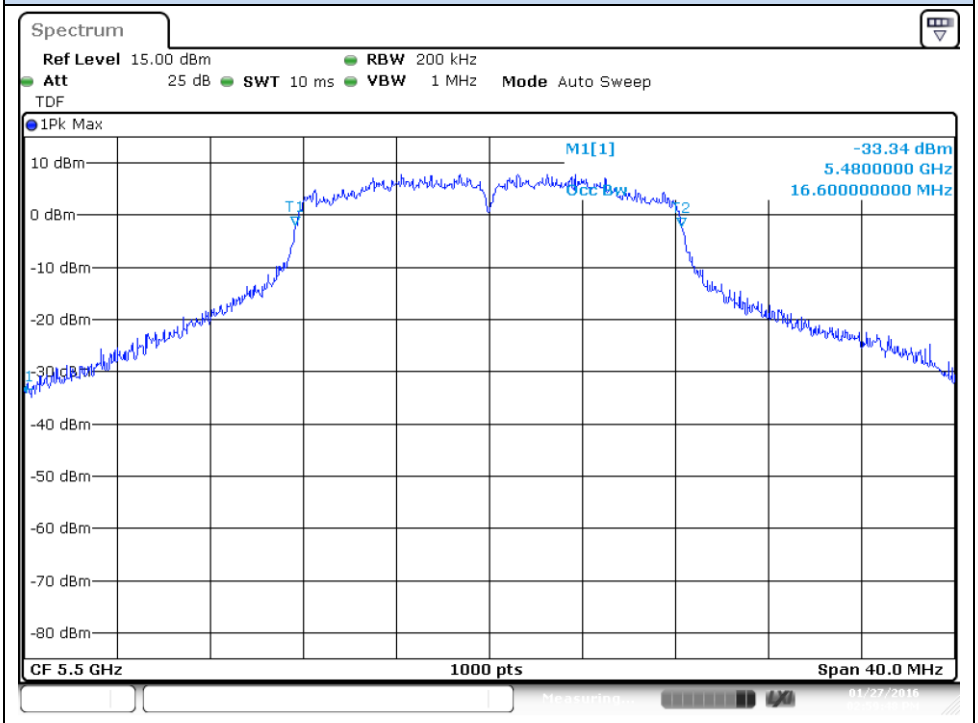
802.11a, 6Mbps – Chain A

26dB BW – CH100



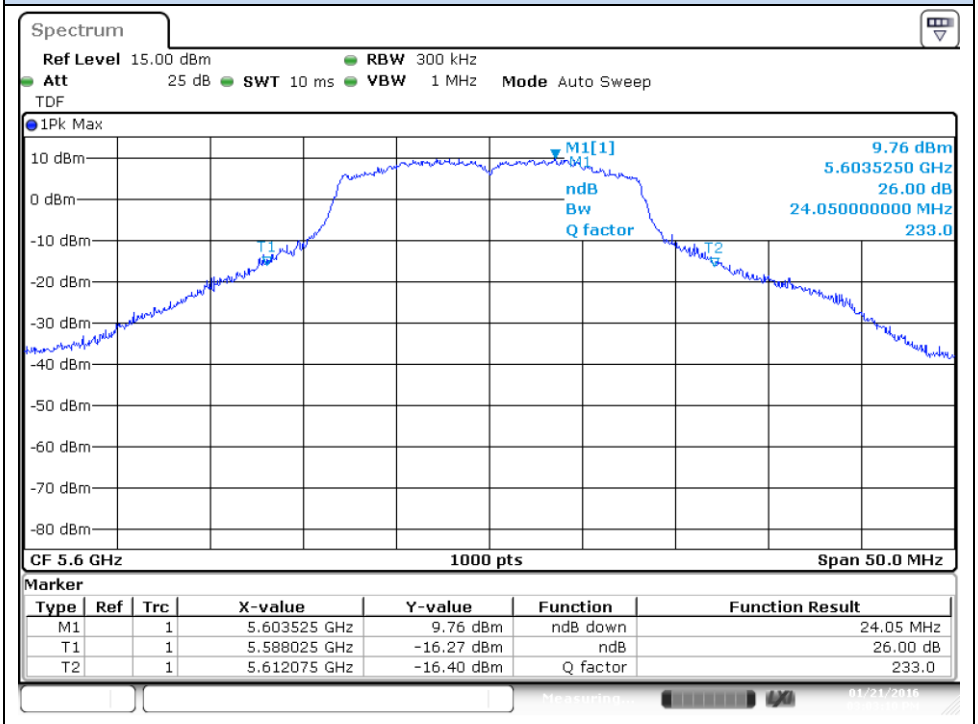
Date: 27.JAN.2016 15:00:17

99% BW – CH100



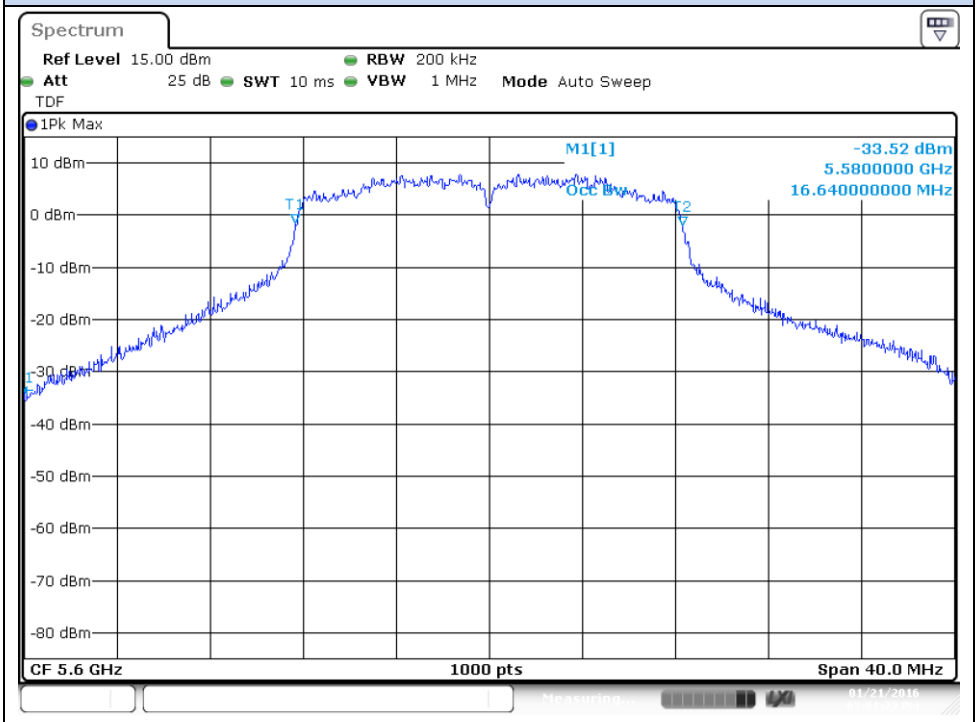
Date: 27.JAN.2016 14:59:48

26dB BW – CH120



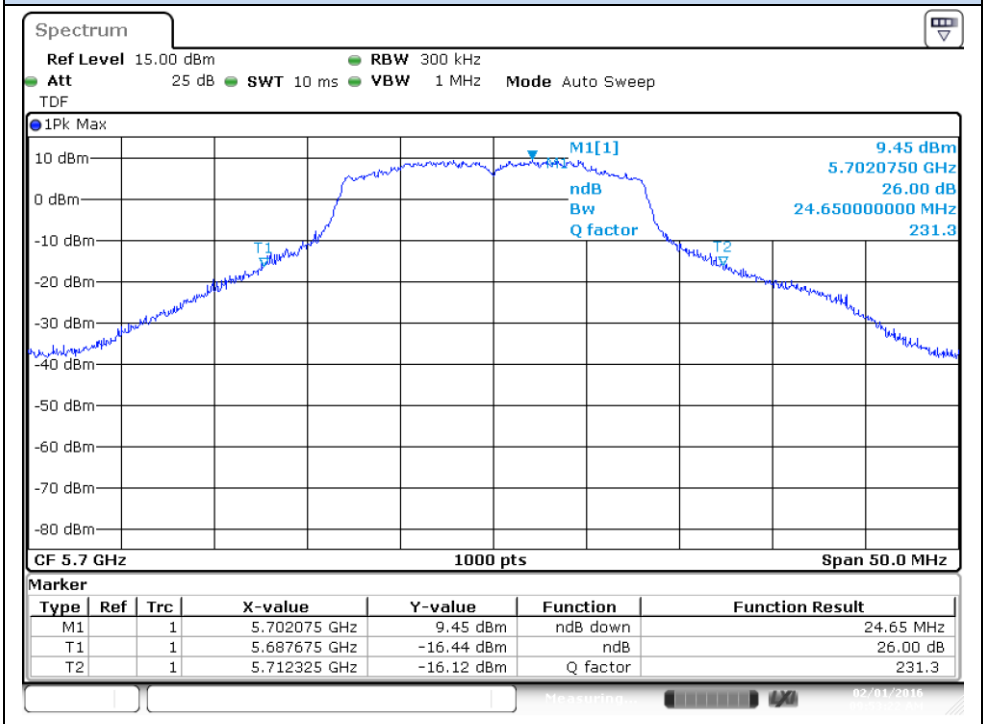
Date: 21.JAN.2016 15:03:10

99% BW – CH120



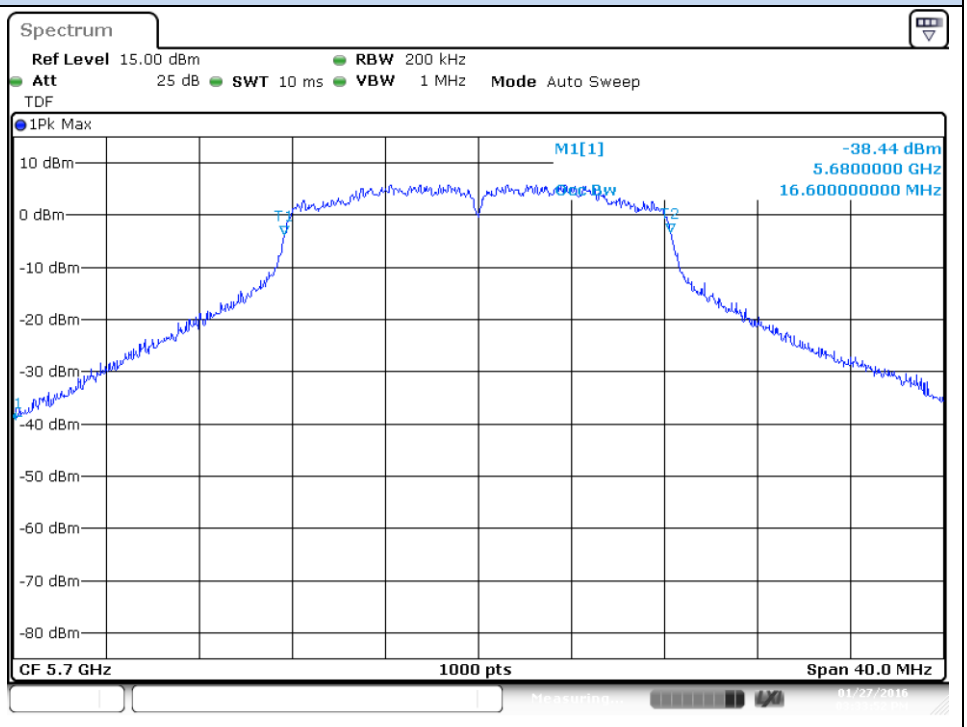
Date: 21.JAN.2016 15:01:23

26dB BW – CH140



Date: 1.FEB.2016 09:53:22

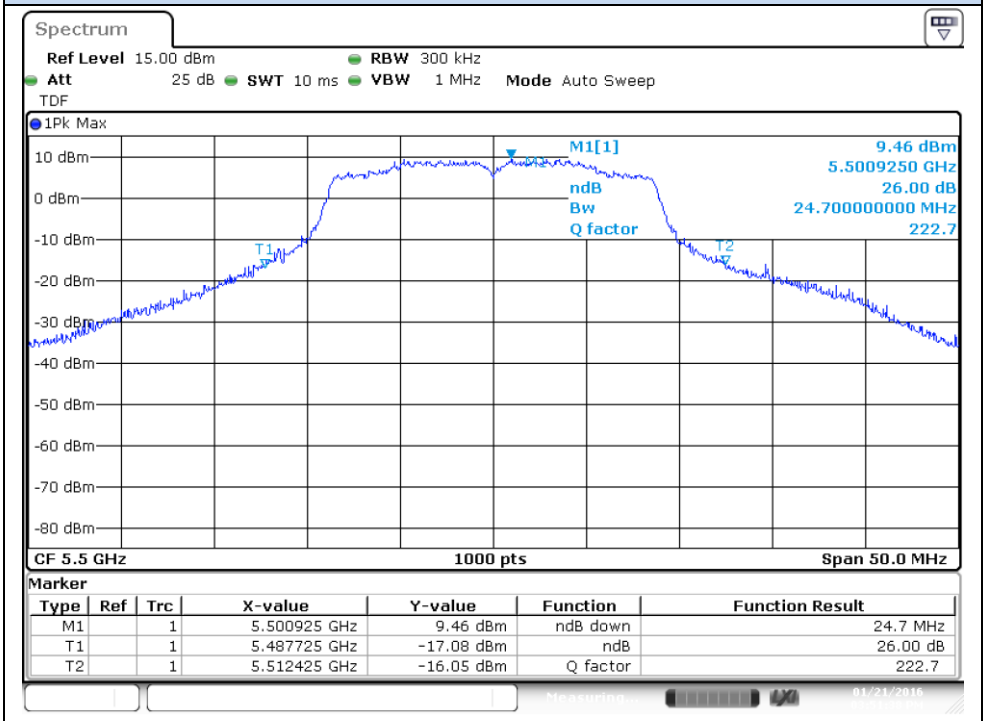
99% BW – CH140



Date: 27.JAN.2016 15:33:52

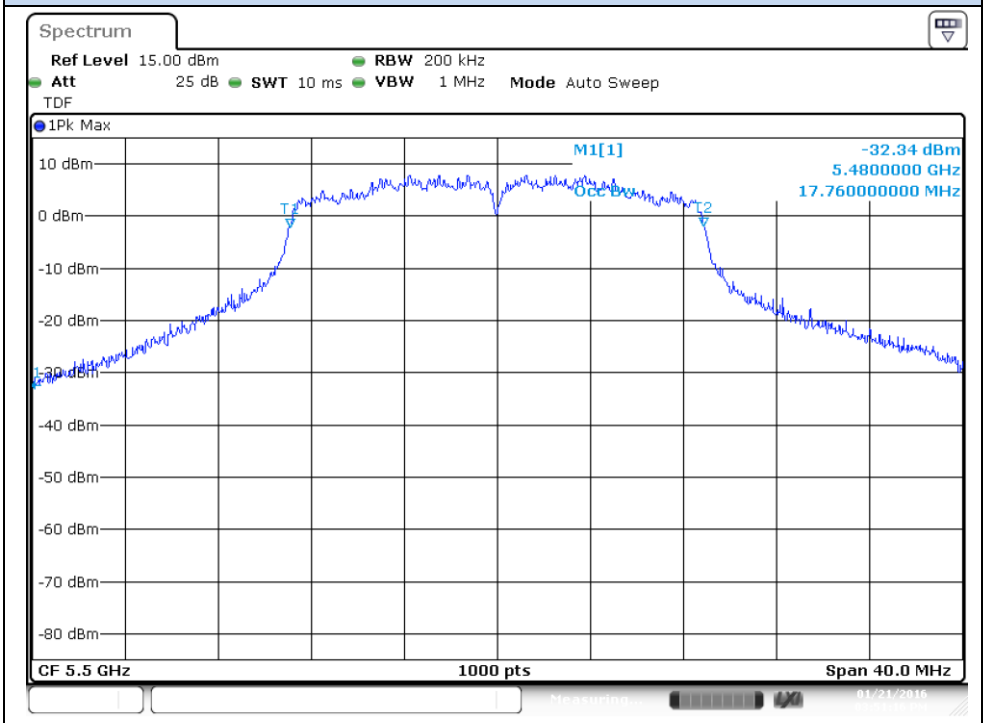
802.11n20, HT0 – Chain A

26dB BW – CH100



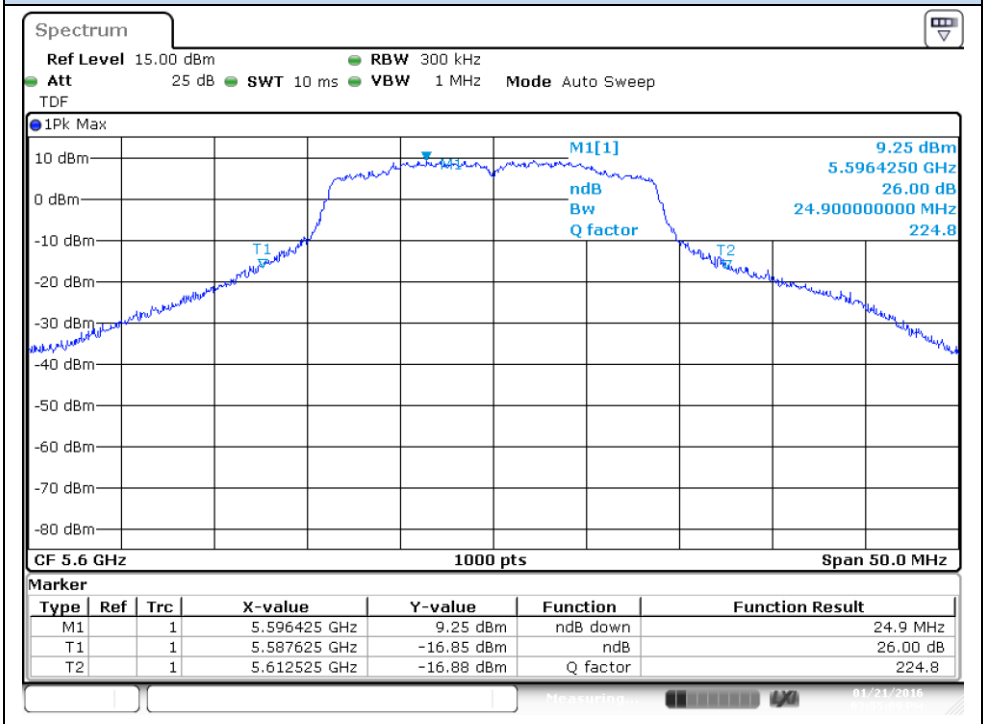
Date: 21.JAN.2016 15:51:38

99% BW – CH100



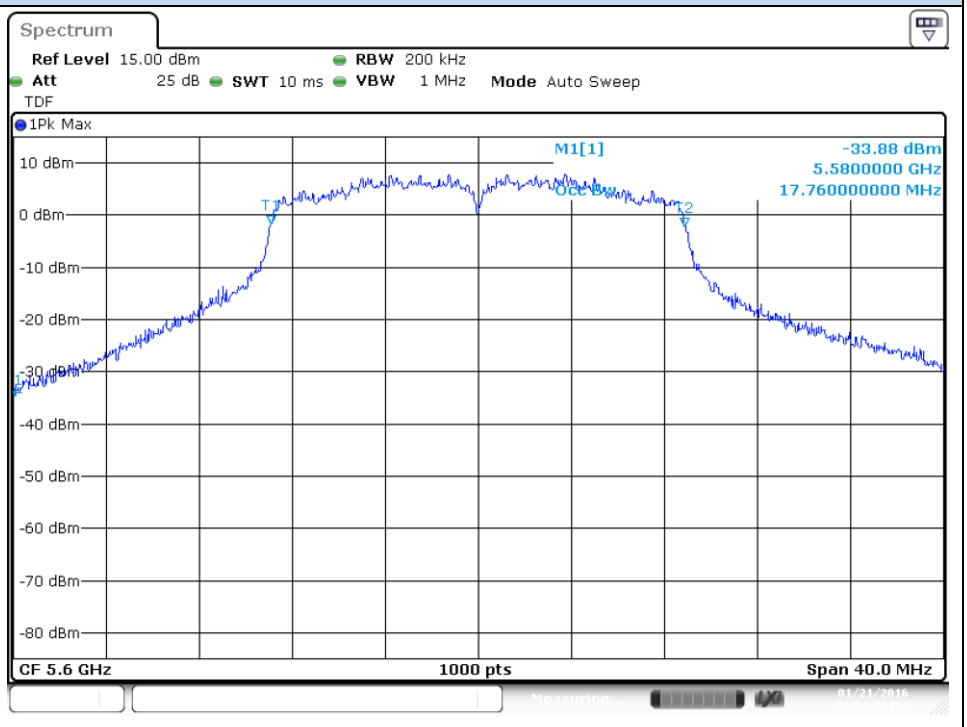
Date: 21.JAN.2016 15:51:15

26dB BW – CH120



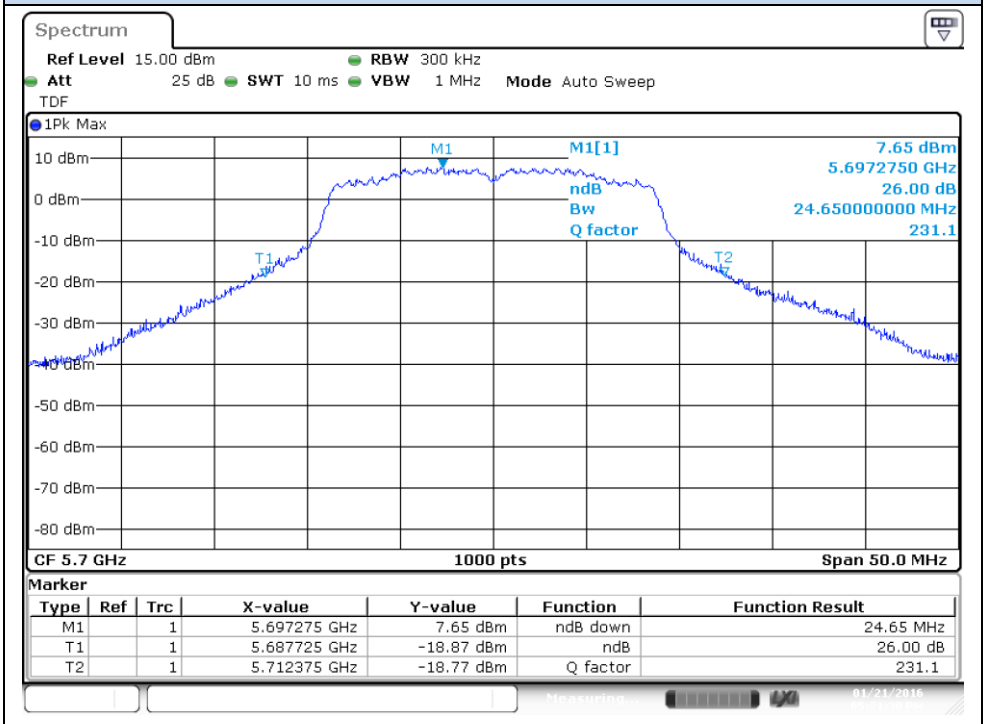
Date: 21.JAN.2016 15:55:09

99% BW – CH120



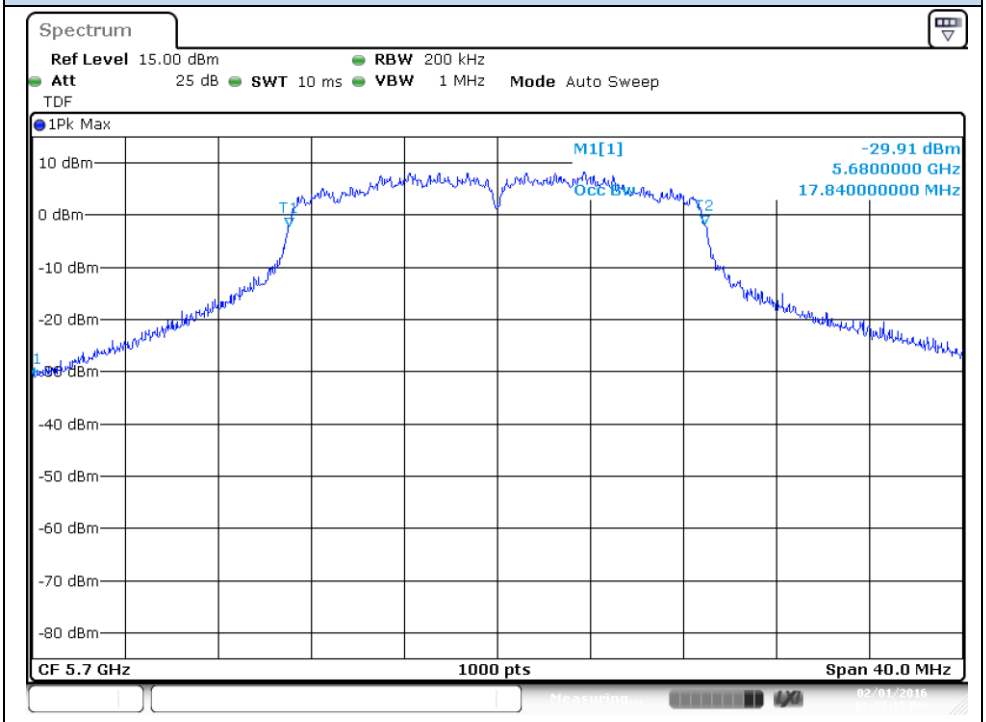
Date: 21.JAN.2016 15:54:36

26dB BW – CH140



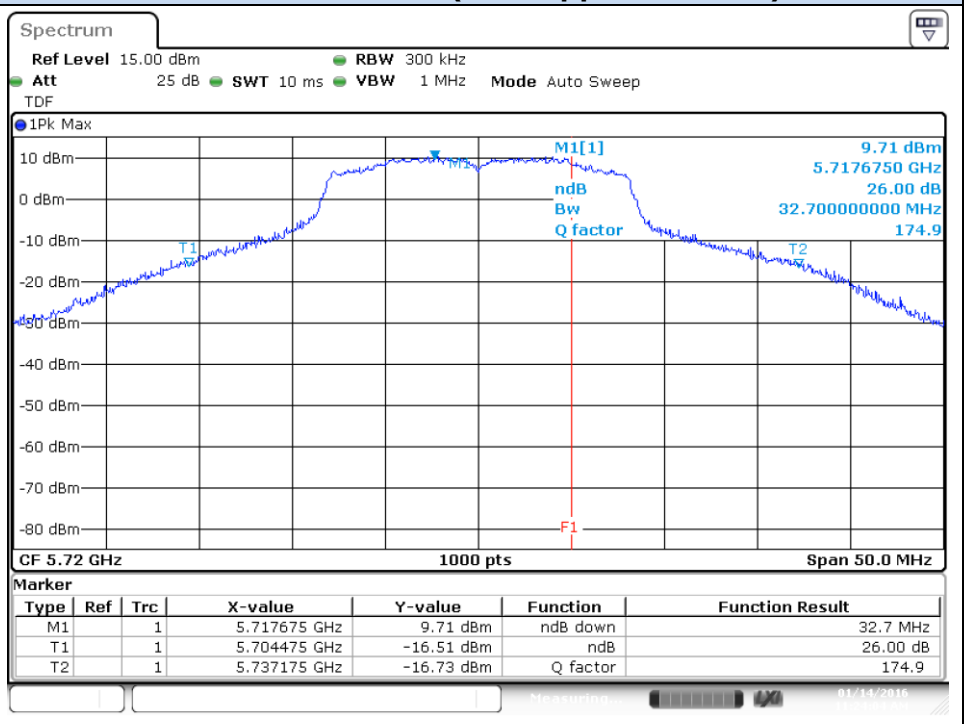
Date: 21.JAN.2016 17:21:30

99% BW – CH140



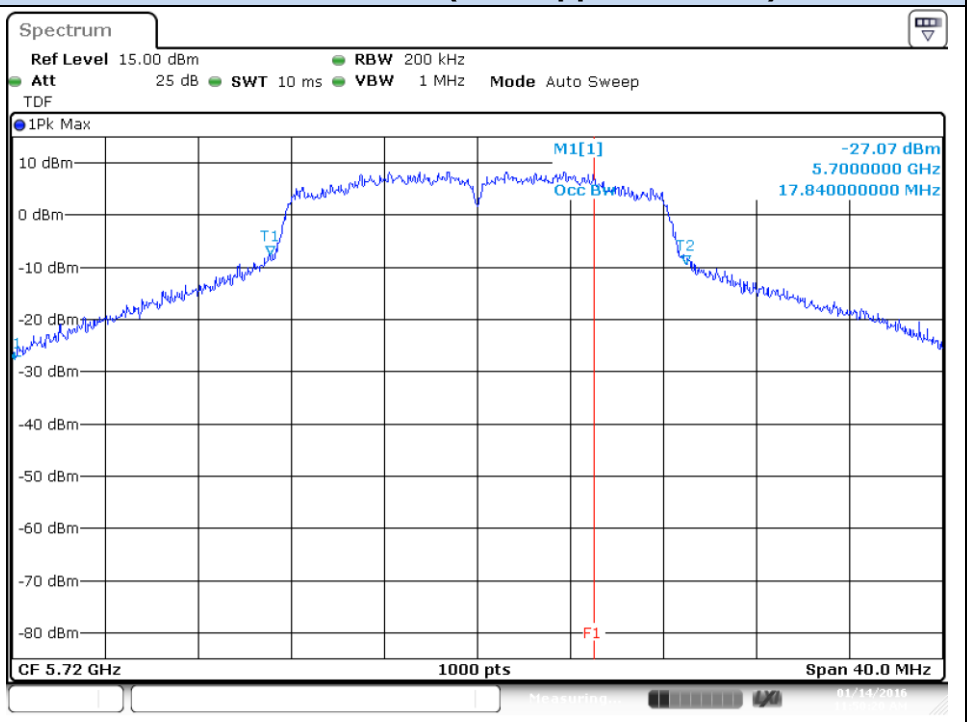
Date: 1.FEB.2016 14:57:15

26dB BW – CH144 (Overlapped Channel)



Date: 14.JAN.2016 11:24:04

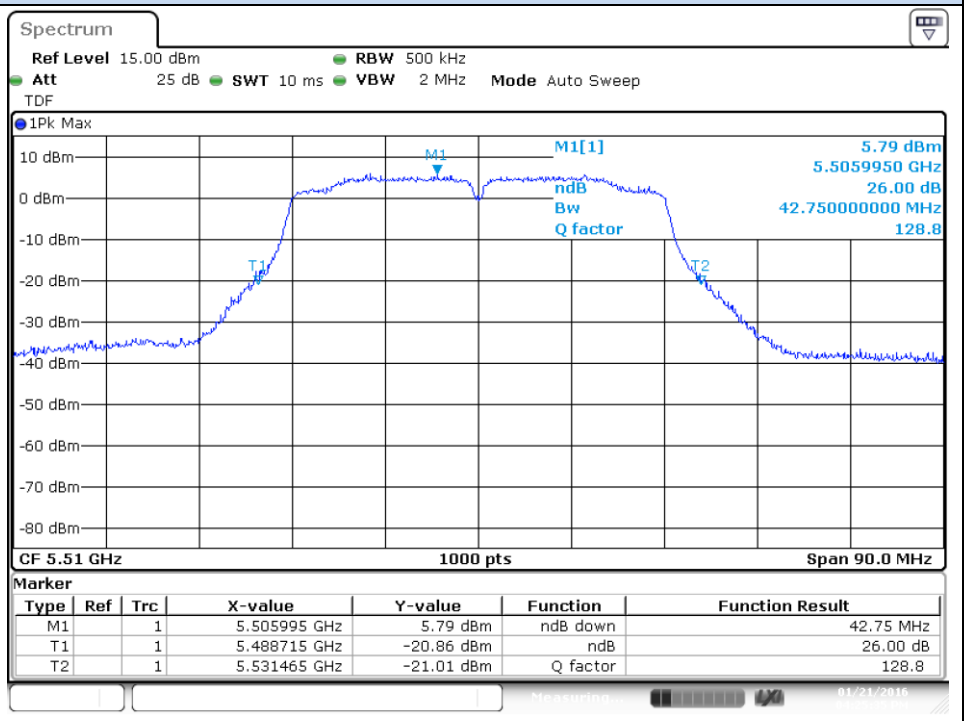
99% BW – CH144 (Overlapped Channel)



Date: 14.JAN.2016 11:50:21

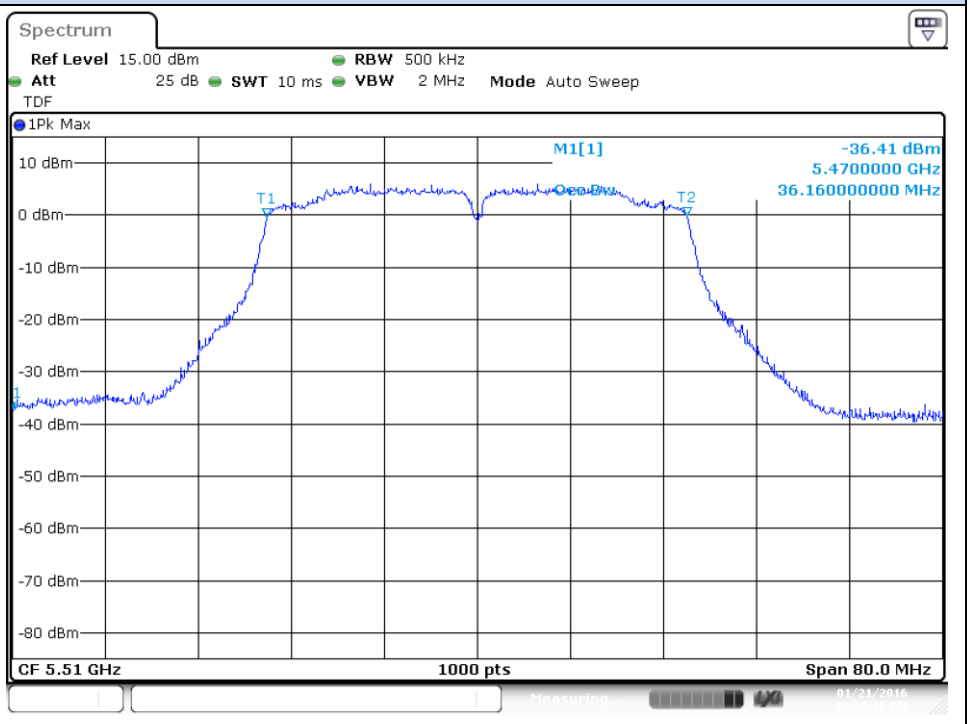
802.11n40, HT0 – Chain A

26dB BW – CH102F



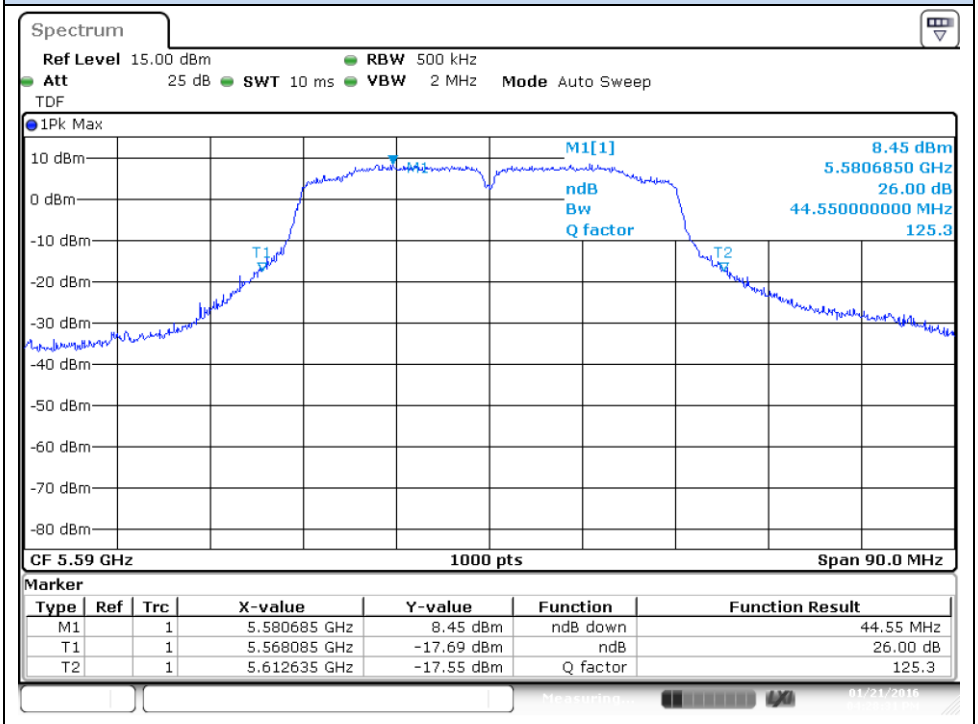
Date: 21.JAN.2016 16:25:35

99% BW – CH102F



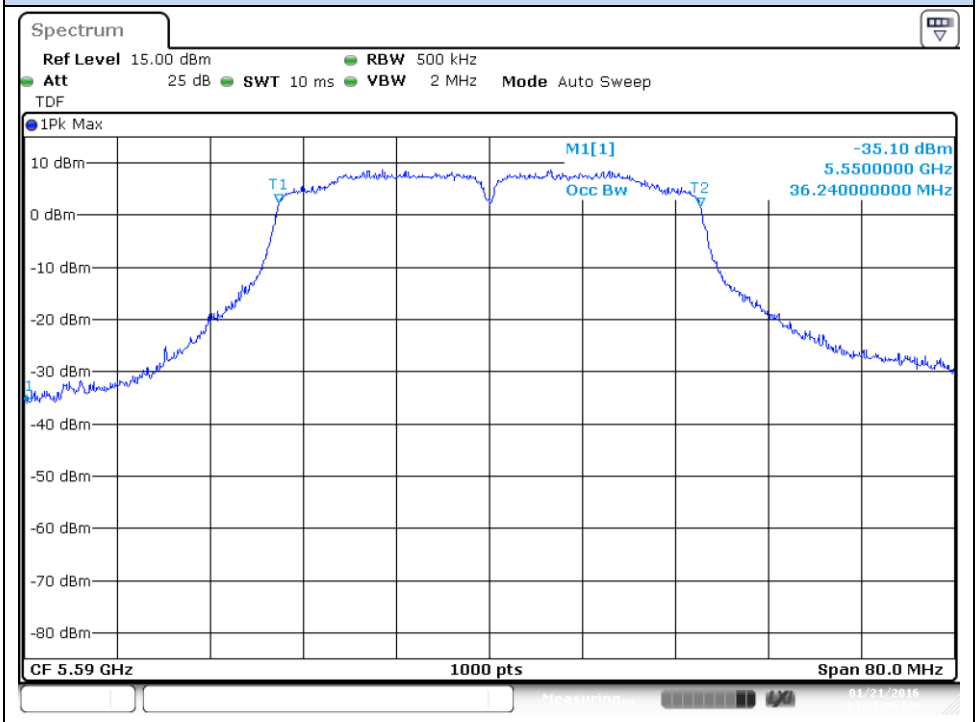
Date: 21.JAN.2016 16:25:10

26dB BW – CH118F



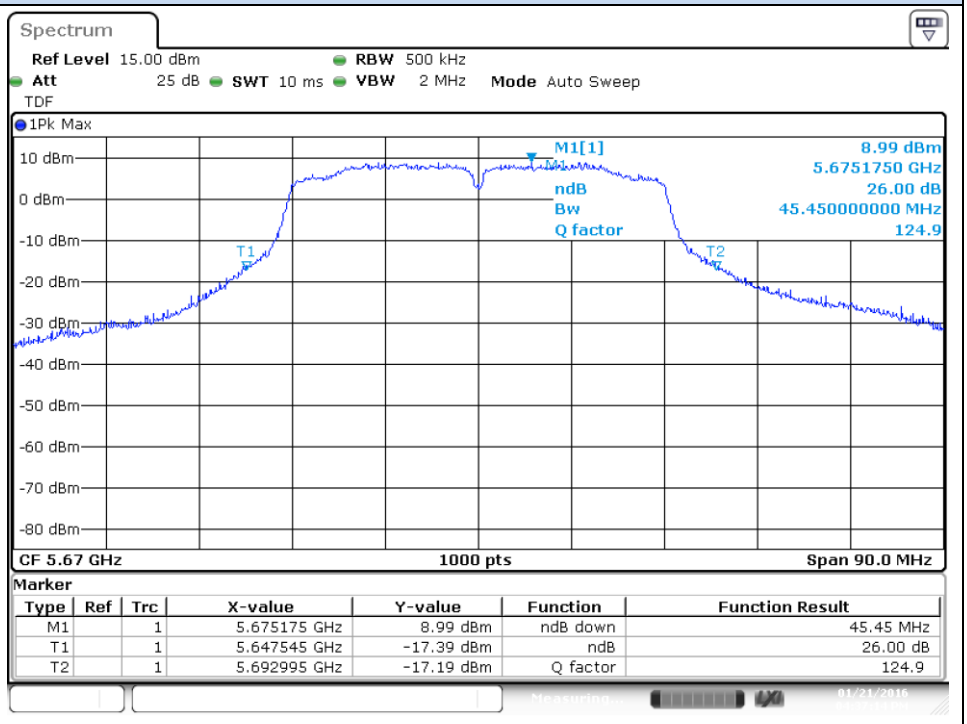
Date: 21.JAN.2016 16:28:31

99% BW – CH118F



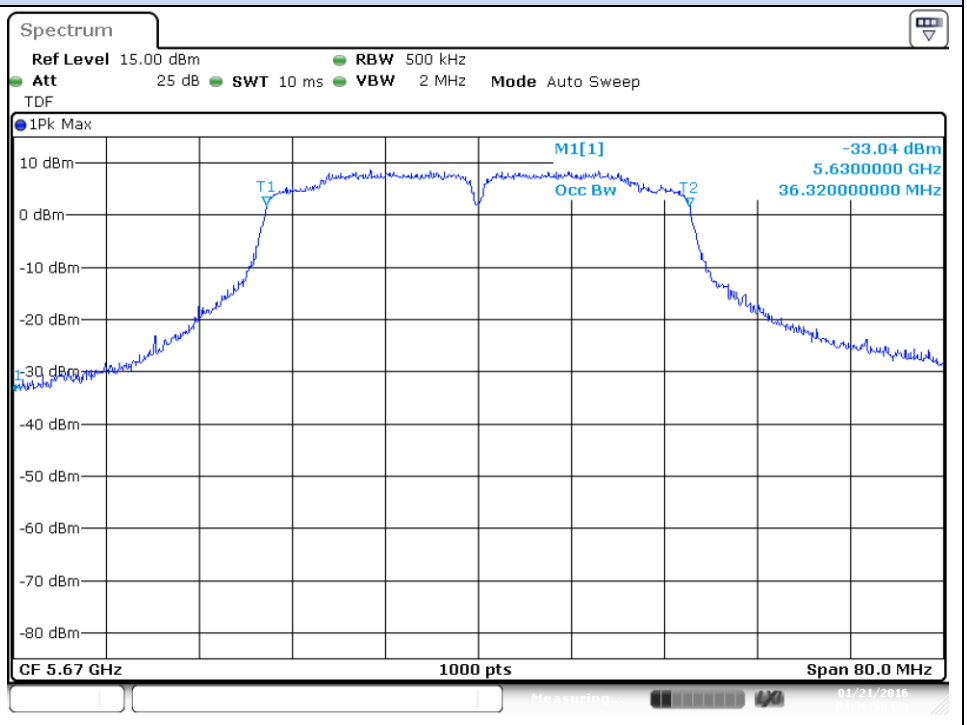
Date: 21.JAN.2016 16:28:06

26dB BW – CH134F



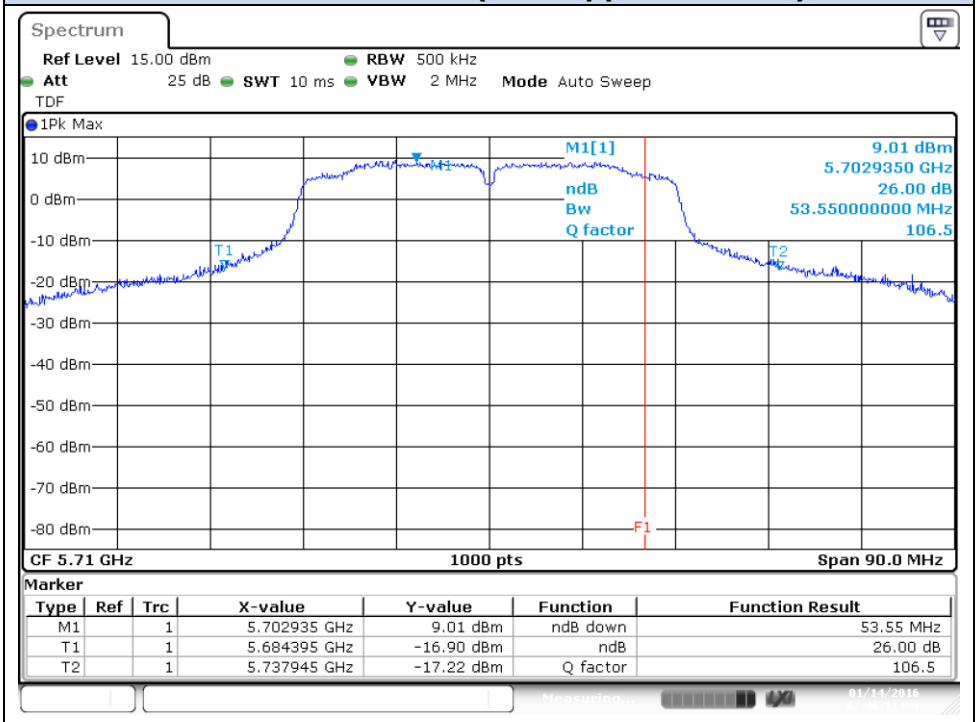
Date: 21.JAN.2016 16:37:14

99% BW – CH134F



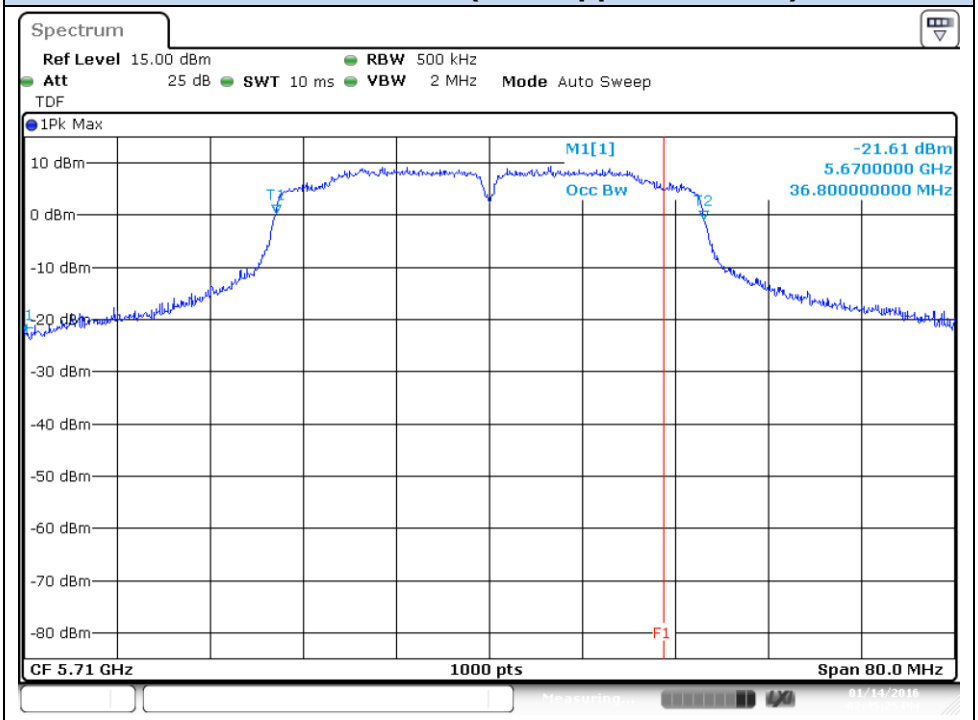
Date: 21.JAN.2016 16:36:51

26dB BW – CH142F (Overlapped Channel)



Date: 14.JAN.2016 14:46:11

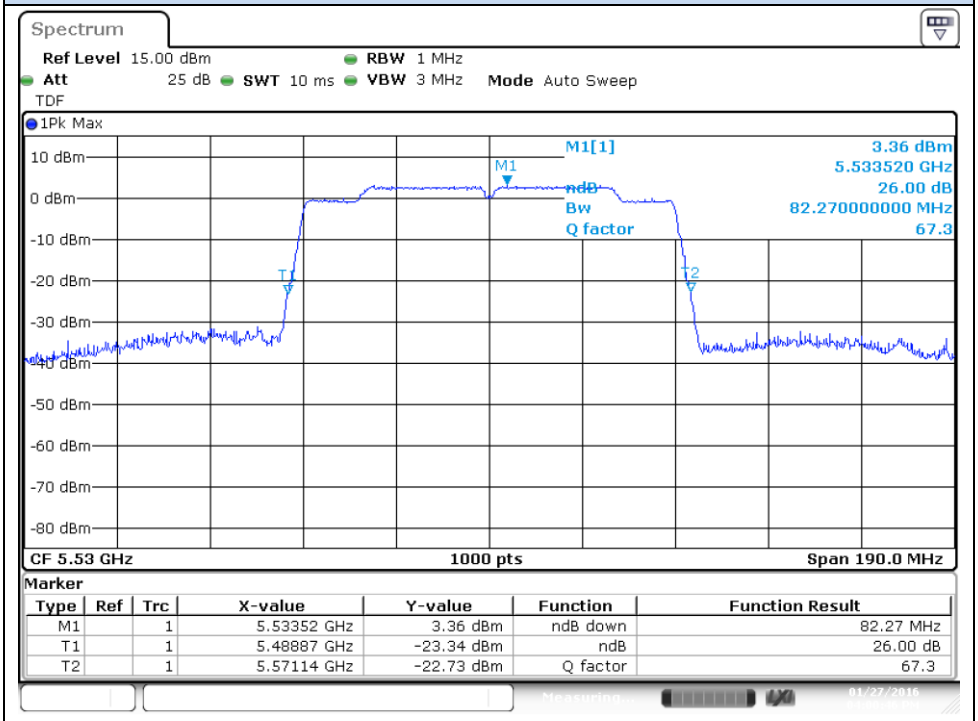
99% BW – CH142F (Overlapped Channel)



Date: 14.JAN.2016 14:45:25

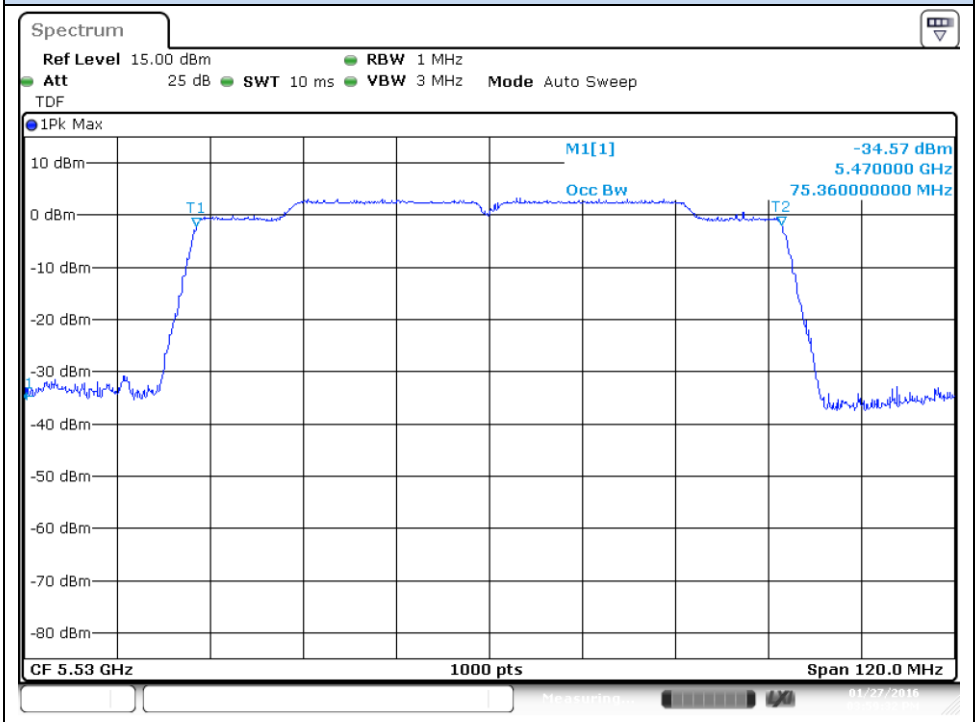
802.11ac80, VHT0 – Chain A

26dB BW – CH106ac80



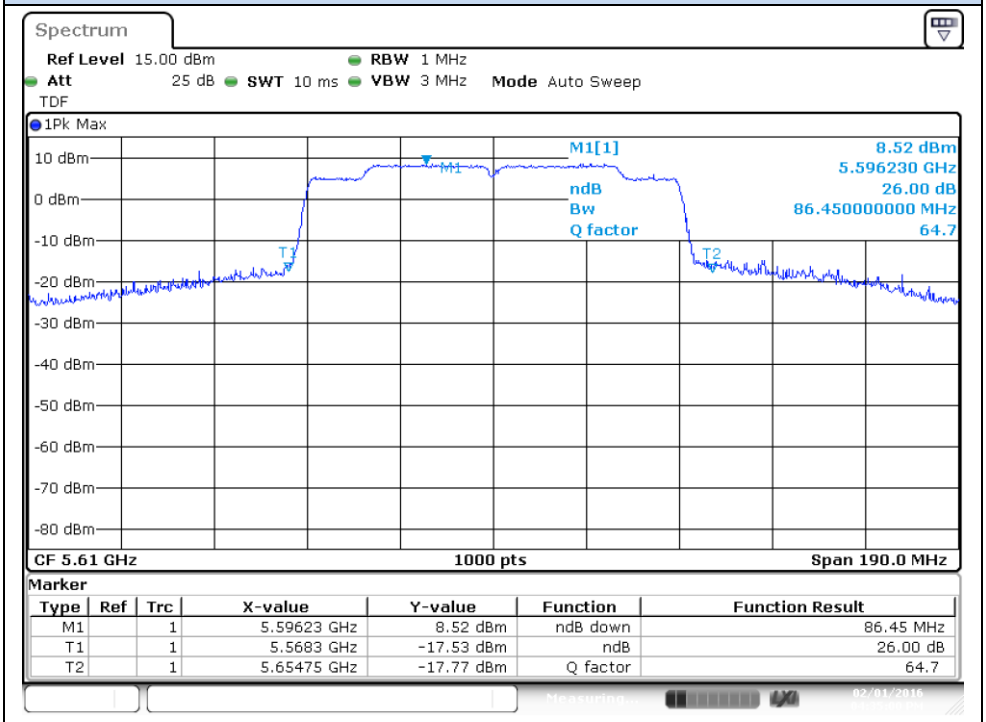
Date: 27.JAN.2016 16:00:47

99% BW – CH106ac80



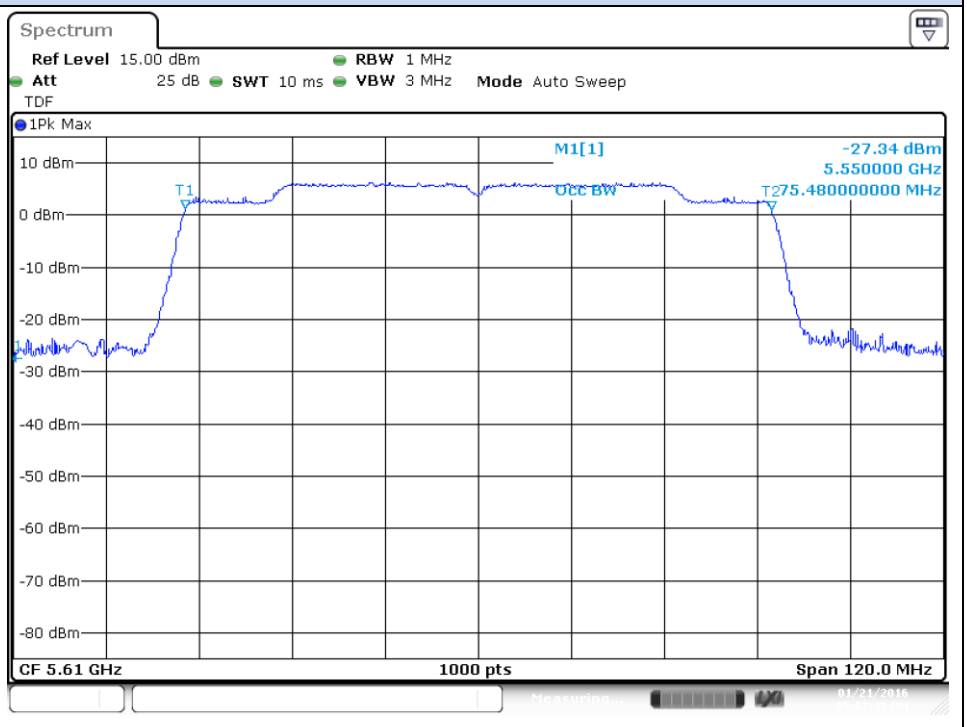
Date: 27.JAN.2016 15:59:32

26dB BW – CH122ac80



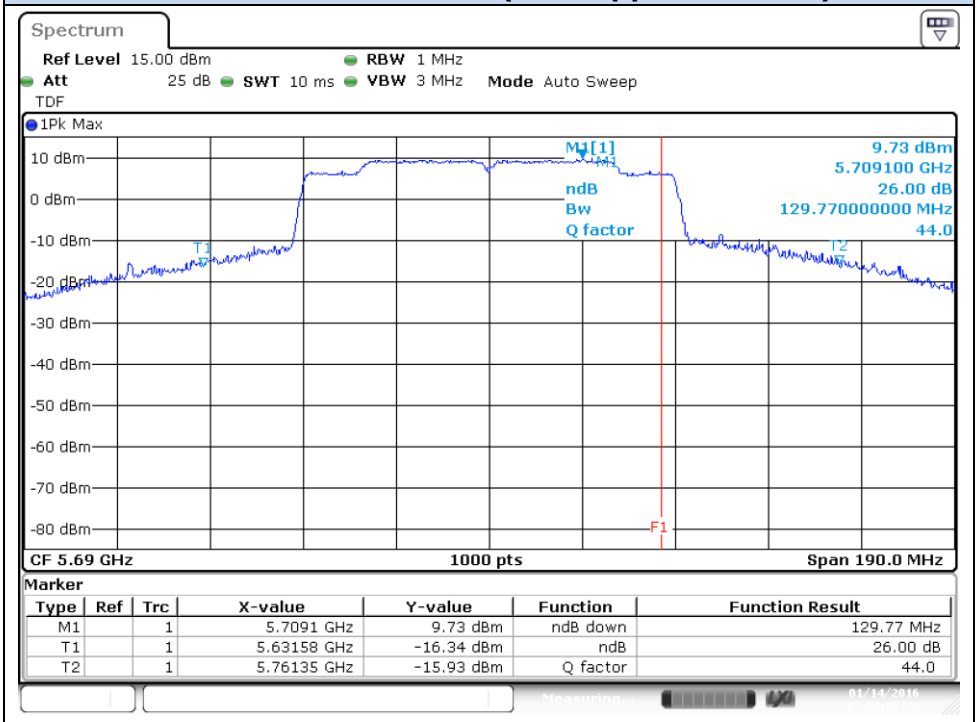
Date: 1.FEB.2016 16:35:00

99% BW – CH122ac80



Date: 21.JAN.2016 17:02:45

26dB BW – CH138ac80 (Overlapped Channel)

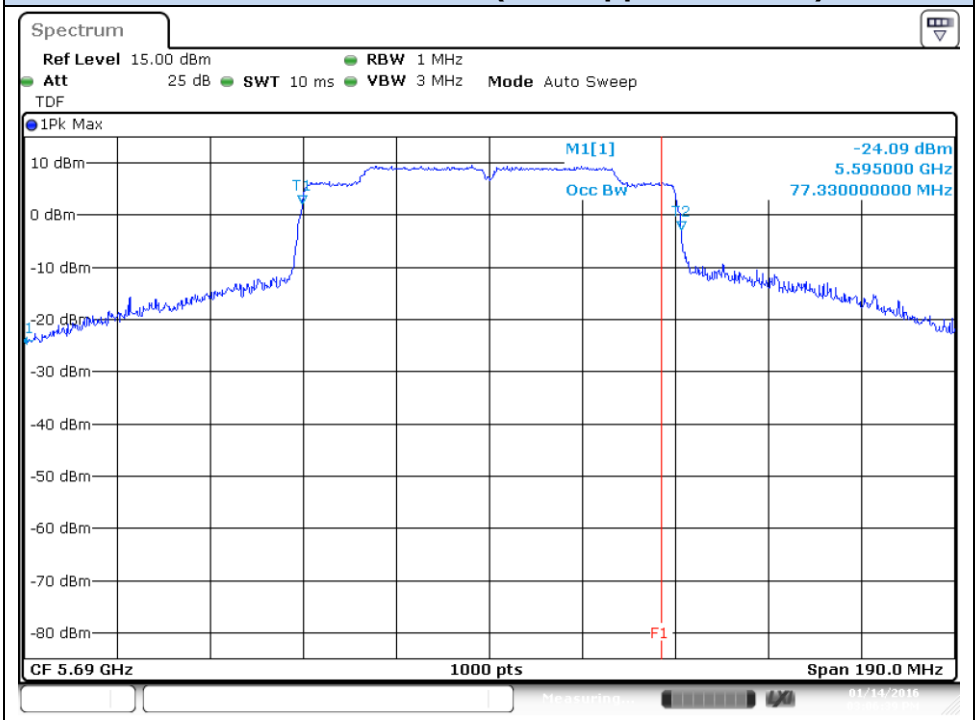


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.7091 GHz	9.73 dBm	ndB down	129.77 MHz
T1		1	5.63158 GHz	-16.34 dBm	ndB	26.00 dB
T2		1	5.76135 GHz	-15.93 dBm	Q factor	44.0

Date: 14.JAN.2016 15:04:19

99% BW – CH138ac80 (Overlapped Channel)



Date: 14.JAN.2016 15:06:39