TESTING CERT #3478.01

TEST REPORT

EUT Description	**WiGig, WLAN and BT, 2x2 PCIe M.2 adapter card**
Brand Name	**Intel® Tri-Band Wireless-AC 18260**
Model Name	**18260NGW, 18260NGW LC**
Serial Number	**WF MAC: 34:13:E8:31:A7:36 / 34:13:E8:06:2F:58** **BT MAC: 34:13:E8:31:A7:3A / 34:13:E8:06:2F:5C** (see section 4)
FCC/IC ID	**FCC ID: PD918260NG** **IC ID: 1000M-18260NG**
Antenna type	**SkyCross WIMAX/WLAN Reference Antenna**
Hardware/Software Version	**HW config: 31.1** **Test SW: DRTU version 1.8.3-01557** **Op SW WiFi: 18.20**
Date of Sample Receipt	**2015-08-18**
Date of Test Start/End	**2015-08-24 / 2015-09-23**
Features	**WiGig + 802.11 a/b/g/n/ac Wireless LAN + BDR/EDR 2.1 + BLE 4.0** (see section 5)

Applicant	**Intel Mobile Communications**
Address	**100 Center Point Circle, Suite 200** **Columbia, South Carolina 29210** **USA**
Contact Person	**Steven Hackett**
Telephone/Fax/ Email	**steven.c.hackett@intel.com**

Reference Standards	**FCC CFR Title 47 Part 15E** **RSS-247 issue 1, RSS-Gen issue 4** (see section 1)

Test Report number	**15081803.TR01**
Revision Control	**Rev. 00**

The test results relate only to the samples tested.
The test report shall not be reproduced in full, without written approval of the laboratory.

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Table of Contents

1. Standards, reference documents and applicable test methods

1. FCC 47 CFR part 15 - Subpart E – Unlicensed National Information Infraestructure Devices.
2. FCC 47 CFR part 15 - Subpart C – §15.209 Radiated emission limits; general requirements.
3. FCC OET KDB 789033 D02 General UNII Test Procedures New Rules – Guidelines for compliance testing of Unlicensed National Information Infrastructure (U-NII) Devices.
4. FCC OET KDB 662911 D01 Multiple Output v02r01 – Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
5. FCC OET KDB 644545 D03 Guidance for IEEE 802.11ac v01 - GUIDANCE FOR IEEE Std 802.11ac™ DEVICES EMISSION TESTING.
6. RSS-247 Issue 1 – Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment.
7. RSS-Gen Issue 4 – General Requirements for Compliance of Radio Apparatus.
8. ANSI C63.10-2009 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

2. General conditions, competences and guarantees

- ✓ Intel Mobile Communications Wireless RF Lab (Intel WRF Lab) is a testing laboratory accredited by the American Association for Laboratory Accreditation (A2LA).
- ✓ Intel Mobile Communications Wireless RF Lab (Intel WRF Lab) is an Accredited Test Firm listed by the FCC, with Designation Number FR0011.
- ✓ Intel Mobile Communications Wireless RF Lab (Intel WRF Lab) is a Registered Test Site listed by IC, with IC Assigned Code 1000Y.
- ✓ Intel WRF Lab only provides testing services and is committed to providing reliable, unbiased test results and interpretations.
- ✓ Intel WRF Lab is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.
- ✓ Intel WRF Lab has developed calibration and proficiency programs for its measurement equipment to ensure correlated and reliable results to its customers.
- ✓ This report is only referred to the item that has undergone the test.
- ✓ This report does not imply an approval of the product by the Certification Bodies or competent Authorities.
- ✓ Complete or partial reproduction of the report cannot be made without written permission of Intel WRF Lab.

3. Environmental Conditions

- ✓ At the site where the measurements were performed the following limits were not exceeded during the tests:

Temperature	24ºC ± 2ºC
Humidity	54% ± 5%

4. Test samples

Sample	Control #	Description	Model	Serial #	Date of reception	Note
#01	15081801.S08	WiFi/BT High End Module	8260NGW	WF MAC: 34:13:E8:42:D2:BD	2015-08-17	Used for conducted tests
	15081801.S16	WiFi/BT High End Module	8260NGW	WF MAC: 34:13:E8:06:31:F2	2015-08-26	
	15081801.S03	Extender board	PCB00495	ASS0495-001, 4950414-064	2015-08-17	
	15081801.S04	Extender board	PCB00432	ASS0432-001, 4950414-064	2015-08-26	
	15051101.S05	Switching power supply SINPRO 5V 6A	SPU60-102	07990499 1249	2015-05-12	
	15081801.S15	Laptop	DELL E5440	BJSYN32	2015-05-20	
#02	15081801.S20	WiFi/BT High End Module	18260NGW	WF MAC 34:13:E8:06:2F:58	2015-08-26	Used for radiated tests
	15081801.S02	Extender board	PCB00432	ASS00432-001, 4322313-048	2015-08-17	
	15040201.S15	Laptop	Dell E5440	9R8YN32	2015-05-12	

NA: Not Applicable

5. EUT features

These are the detailed bands and modes supported by the Equipment Under Test:

WiGig	60GHz (57.24 – 63.72 GHz)
802.11b/g/n	2.4GHz (2400.0 – 2483.5 MHz)
802.11a/n/ac	5.2GHz(5150.0 – 5250.0 MHz) 5.3GHz (5250.0 – 5350.0 MHz) 5.6GHz (5470.0 – 5725.0 MHz) 5.8GHz (5725.0 – 5850.0 MHz)
BDR/EDR 2.1 BLE 4.0	2.4GHz (2400.0 – 2483.5 MHz)

6. Remarks and comments

N/A

7. Test Verdicts summary

7.1. 802.11 a/n/ac – U-NII-1

FCC part	RSS part	Test name	Verdict
15.407 (a) (1)	RSS-247 Clause 6.2.2 (1)	Power Limits. Maximum output power	P
15.407 (a) (1)	RSS-247 Clause 6.2.2 (1)	Peak power spectral density	P
15.407 (b) (1) 15.209	RSS-247 Clause 6.2.2 (2)	Undesirable emissions limits: Band Edge (conducted)	P
15.407 (b) (1) 15.209	RSS-247 Clause 6.2.2 (2)	Undesirable emissions limits (radiated)	P

7.2. 802.11 a/n/ac – U-NII-2A

FCC part	RSS part	Test name	Verdict
15.407 (a) (2)	RSS-247 Clause 6.2.2 (1)	Power Limits. Maximum output power	P
15.407 (a) (2)	RSS-247 Clause 6.2.2 (1)	Peak power spectral density	P
15.407 (b) (2) 15.209	RSS-247 Clause 6.2.2 (2)	Undesirable emissions limits: Band Edge (conducted)	P
15.407 (b) (2) 15.209	RSS-247 Clause 6.2.2 (2)	Undesirable emissions limits (radiated)	P

7.3. 802.11 a/n/ac – U-NII-2C

FCC part	RSS part	Test name	Verdict
15.407 (a) (2)	RSS-247 Clause 6.2.3 (1)	Power Limits. Maximum output power	P
15.407 (a) (2)	RSS-247 Clause 6.2.3 (1)	Peak power spectral density	P
15.407 (b) (3) 15.209	RSS-247 Clause 6.2.3 (2)	Undesirable emissions limits: Band Edge (conducted)	P
15.407 (b) (3) 15.209	RSS-247 Clause 6.2.3 (2)	Undesirable emissions limits (radiated)	P

7.4. 802.11 a/n/ac – U-NII-3

FCC part	RSS part	Test name	Verdict
15.407 (a) (3)	RSS-247 Clause 6.2.4 (1)	Power Limits. Maximum output power	P
15.407 (a) (3)	RSS-247 Clause 6.2.4 (1)	Peak power spectral density	P
15.407 (b) (4) 15.209	RSS-247 Clause 6.2.4 (2)	Undesirable emissions limits: Band Edge (conducted)	P
15.407 (b) (4) 15.209	RSS-247 Clause 6.2.4 (2)	Undesirable emissions limits (radiated)	P

P: Pass
F: Fail
NM: Not Measured
NA: Not Applicable

8. Document Revision History

Revision #	Date	Modified by	Details
Rev. 00	2015-10-09	O.Fargant	First Issue

Annex A. Test & System Description

A.1 Test Conditions

For 802.11a mode the EUT can transmit at both CHAIN A and CHAIN B RF outputs individually, but not simultaneously.

For 802.11n20 (20 MHz channel bandwidth), 802.11n40 (40MHz channel bandwidth) and 802.11ac80 (80MHz channel bandwidth) modes the EUT can transmit at both CHAIN A and CHAIN B RF outputs individually, and also simultaneously.

The conducted RF output power at each chain was adjusted according to the client's supplied Target values (see following table) using the Intel DRTU tool and measuring the power by using a calibrated average power meter. Measured values for adjustment were within -0.2 dB/+0.3 dB from the declared Target values.

U-NII-1

					Conducted Power Target Value (dBm)		
Mode	**BW (MHz)**	**Data Rate**	**CH #**	**Freq. (MHz)**	**SISO Chain A**	**SISO Chain B**	**MIMO at both ports A and B**
802.11a	20	6Mbps	36	5180	18.5	18	-
			40	5200	20	20	-
			48	5240	21	21	-
802.11n	20	HT0 HT8*	36	5180	18	18	16.5
			40	5200	20	20	18
			48	5240	21	21	18
	40	HT0 HT8*	38F	5190	17	16	12
			46F	5230	20	19.5	18
802.11ac	80	VHT0	42ac80	5210	13.5	13.5	11

U-NII-2A

					Conducted Power, Target Value (dBm)		
Mode	**BW (MHz)**	**Data Rate**	**CH #**	**Freq. (MHz)**	**SISO Chain A**	**SISO Chain B**	**MIMO at both ports A and B**
802.11a	20	6Mbps	52	5260	21	21	-
			56	5280	21	21	-
			64	5320	16.5	17	-
802.11n	20	HT0 HT8*	52	5260	21	21	18
			56	5280	20.5	21	18
			64	5320	16.5	16.5	14.5
	40	HT0 HT8*	54F	5270	19.5	20	18
			62F	5310	13	13	12
802.11ac	80	VHT0	58ac80	5290	11.5	12	11

U-NII-2C

Mode	BW (MHz)	Data Rate	CH #	Freq. (MHz)	Conducted Power, Target Value (dBm) SISO Chain A	SISO Chain B	MIMO at both ports A and B
802.11a	20	6Mbps	100	5500	18.5	17.5	-
			104	5520	20.5	20.5	-
			120	5600	21	21	-
			132	5660	20.5	20.5	-
			136	5680	19	18.5	-
			140	5700	14.5	15.5	-
802.11n	20	HT0 HT8*	100	5500	18.5	17	16
			104	5520	20.5	20.5	18
			120	5600	21	21	18
			132	5660	20.5	20	18
			136	5680	18.5	18.5	17.5
			140	5700	14	15	12
			144*	5720	20.5	20.5	17.5
	40	HT0 HT8*	102F	5510	15.5	16	11.5
			110F	5550	20	20	18
			118F	5590	21	21	18
			126F	5630	20	19.5	18
			134F	5670	16.5	16	15.5
			142F*	5670	21	21	18
802.11ac	80	VHT0	106ac80	5530	11.5	13	10.5
			122ac80	5610	17	17	16
			138ac80*	5690	21	21	18

U-NII-3

Mode	BW (MHz)	Data Rate	CH #	Freq. (MHz)	Conducted Power, Target Value (dBm) SISO Chain A	SISO Chain B	MIMO at both ports A and B
802.11a	20	6Mbps	149	5745	17	17	-
			153	5765	20.5	21	-
			157	5785	21	21	-
			161	5805	19	19	-
			165	5825	16.5	16	-
802.11n	20	HT0 HT8*	***144****	5720	13	13	9.5
			149	5745	16	16.5	12.5
			153	5765	20	20.5	18
			157	5785	21	21	18
			161	5805	19	19	18
			165	5825	15.5	16	14.5
	40	HT0 HT8*	***142F****	5670	7	7	4
			151F	5755	15.5	16	13
			159F	5795	17	17	16.5
802.11ac	80	VHT0	***138ac80****	5690	3.5	4	0.5
			155ac80	5775	12.5	13	11.5

Overlapped channels between UNII-2C and UNII-3

* Note: HT8 for MIMO modes only.

The following data rates were selected based on preliminary testing that identified those rates as the worst cases for output power and spurious levels at the band edges:

802.11a → 6Mbps
802.11n20 and 802.11n40 (SISO) → HT0
802.11n20 and 802.11n40 (MIMO) → HT8
802.11ac80 (SISO) → VHT0
802.11ac80 (MIMO) → VHT0

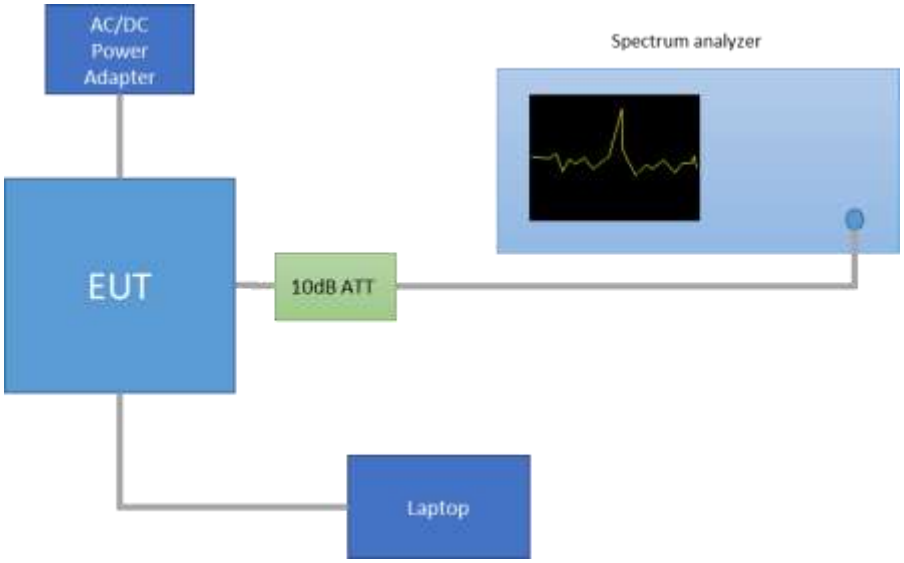
Alternative channels to the lowest and highest channels per band have been also tested for Band Edge compliance.

A.2 Measurement system

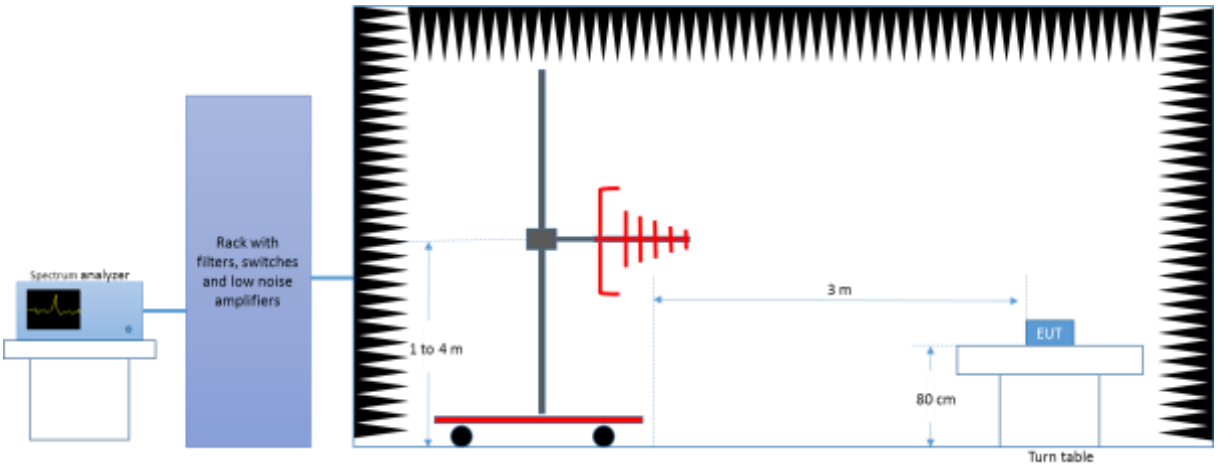
Measurements were performed using the following setups, made in accordance to the general provisions of FCC KDB 789033 D02 General UNII Test Procedures.

The DUT was installed in a test fixture and this test fixture is connected to a laptop computer and AC/DC power adapter. The laptop computer was used to configure the EUT to continuously transmit at a specified output power using all different modes and modulation schemes, using the Intel proprietary tool DRTU.

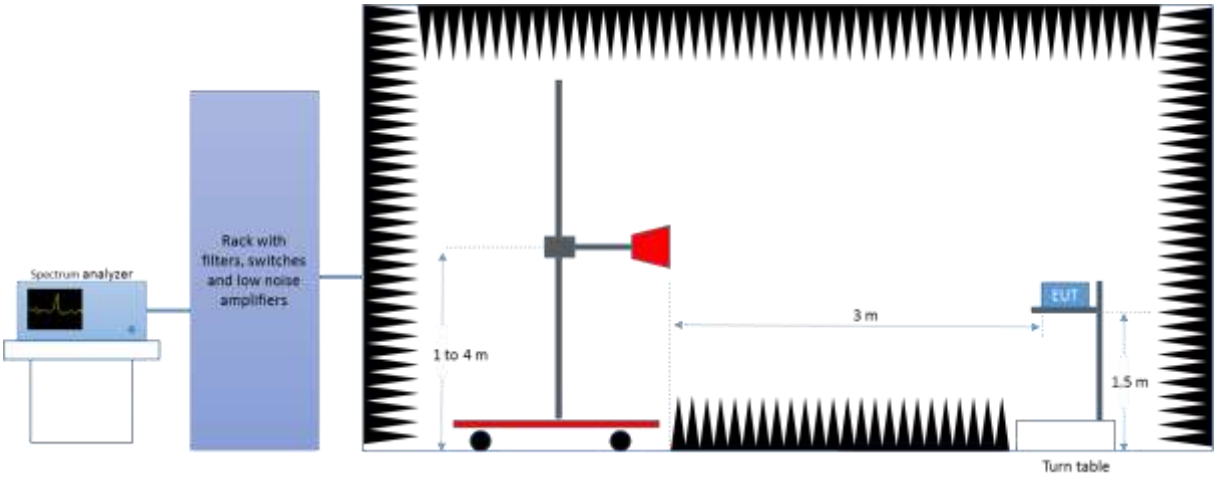
Conducted Setup



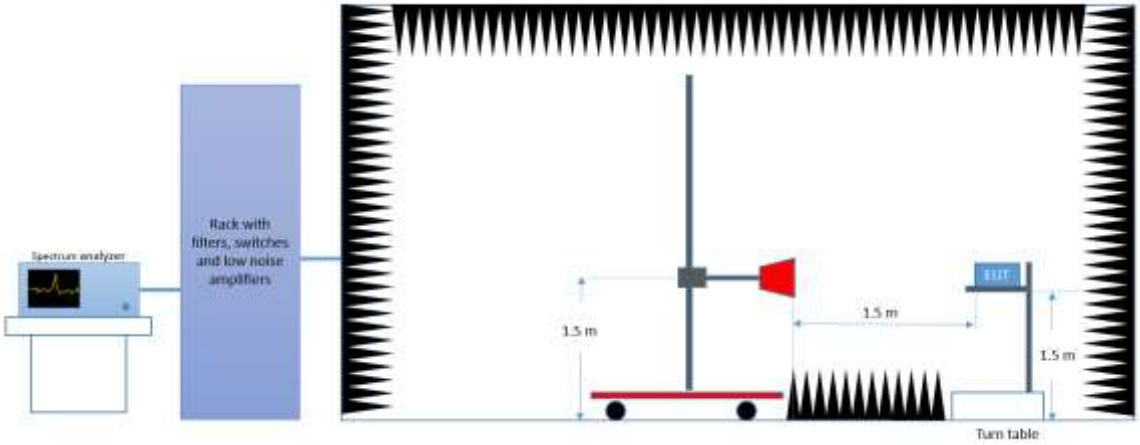
Radiated Setup < 1GHz



Radiated Setup 1 GHz - 18 GHz



Radiated Setup > 18 GHz



A.3 Test Equipment List

Conducted Setup

ID#	Device	Type/Model	Serial Number	Manufacturer	Cal. Date	Cal. Due Date
0310	Spectrum analyzer	FSV40	101425	Rohde & Schwarz	2015-03-25	2017-03-25

Radiated Setup

ID#	Device	Type/Model	Serial Number	Manufacturer	Cal. Date	Cal. Due Date
0133	Spectrum analyzer	FSV40	101358	Rohde & Schwarz	2014-05-09	2016-05-09
0137	Log antenna 30 MHz – 1 GHz	3142E	00156946	ETS Lindgren	2014-03-05	2016-03-05
0138	Hors antenna 1 GHz – 6.4 GHz	3117	00152266	ETS Lindgren	2014-03-04	2016-03-04
0141	Horn Antenna 6.4 GHz – 18 GHz	3117-PA	00157736	ETS Lindgren	2014-06-03	2016-06-03
0248	Horn Antenna 1 GHz – 18 GHz	3117-PA	00167062	ETS Lindgren	2014-08-13	2016-08-13
0139	Horn Antenna 18GHz – 26GHz	114514	00167100	ETS Lindgren	2014-04-25	2016-04-25
0140	Horn Antenna 26GHz – 40GHz	120722	00169638	ETS Lindgren	2014-08-14	2016-08-14
0135	Anechoic chamber	FACT 3	RFD_FA_100	ETS Lindgren	2014-05-06	2016-05-06
0329	Measurement Software	EMC32	1300.7027.00 (100401)	Rohde & Schwarz	N/A	N/A

A.4 Measurement Uncertainty Evaluation

The system uncertainty evaluation is shown in the below table:

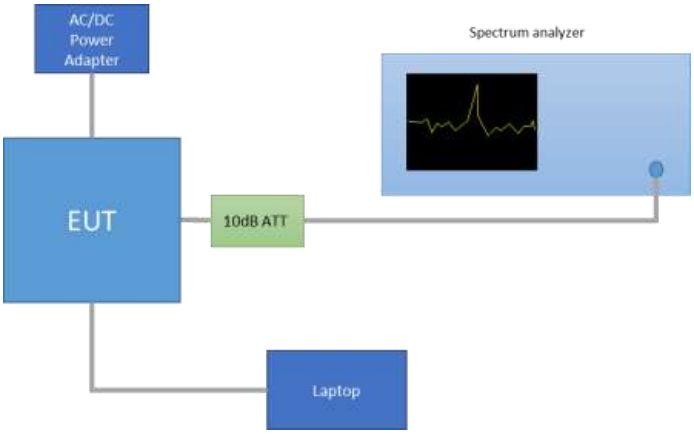
Measurement type	Uncertainty [±dB]
Conducted Power	±1.0
Conducted Spurious Emission	±2.9
Radiated tests <1GHz	±3.8
Radiated tests 1GHz - 40 GHz	±4.7

Annex B. Test Results UNII-1

B.1 26dB & 99% Bandwidth

Test procedure

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



Results tables

Mode	Rate	Antenna	Channel	Frequency [MHz]	26dB BW [MHz]	99% BW [MHz]
802.11a	6Mbps	SISO CHAIN A	36	5180	28.30	17.40
			40	5200	36.40	22.68
			48	5240	39.90	26.68
		SISO CHAIN B	36	5180	26.85	17.04
			40	5200	35.80	22.44
			48	5240	41.35	26.44
802.11n20	HT0	SISO CHAIN A	36	5180	28.30	18.12
			40	5200	36.85	23.76
			48	5240	44.05	27.6
		SISO CHAIN B	36	5180	27.75	18.04
			40	5200	36.05	22.40
			48	5240	42.10	27.12
802.11n20	HT8	MIMO CHAIN A	36	5180	25.75	17.88
			40	5200	32.55	19.64
			48	5240	29.50	18.32
		MIMO CHAIN B	36	5180	25.45	17.88
			40	5200	29.90	19.56
			48	5240	28.70	18.64

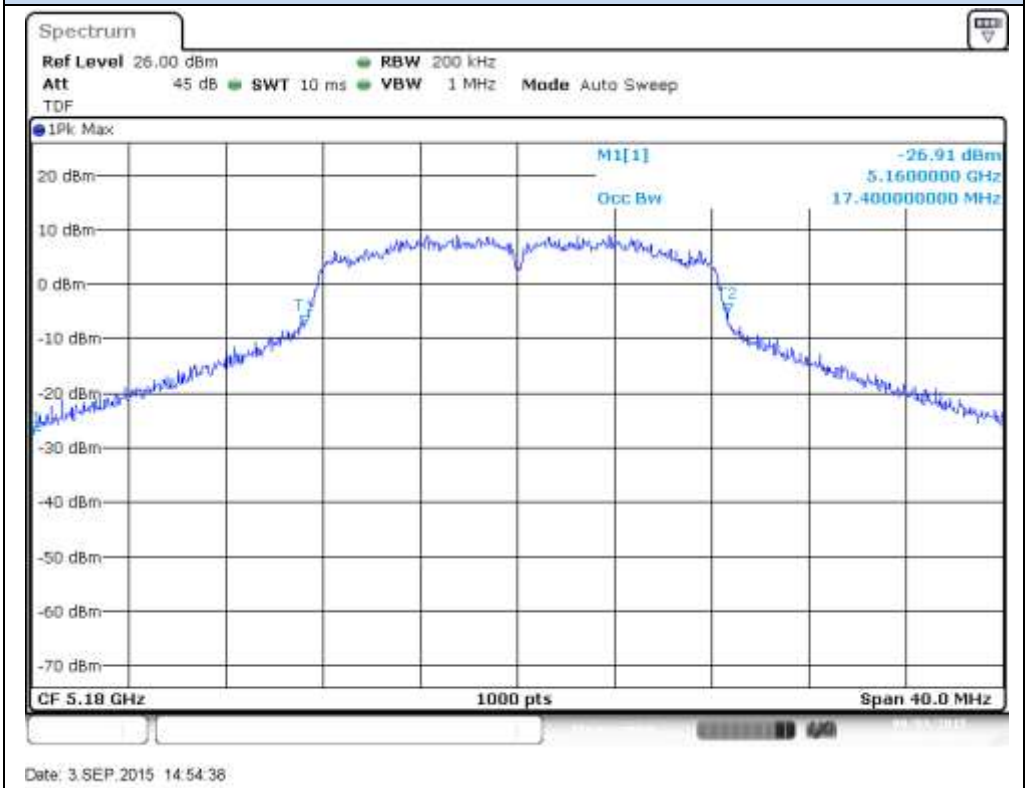
Mode	Rate	Antenna	Channel	Frequency [MHz]	26dB BW [MHz]	99% BW [MHz]
802.11n40	HT0	SISO CHAIN A	38F	5190	46.98	36.48
			46F	5230	57.06	38.16
		SISO CHAIN B	38F	5190	46.26	36.48
			46F	5230	64.08	36.96
	HT8	MIMO CHAIN A	38F	5190	45.63	36.40
			46F	5230	50.04	36.88
		MIMO CHAIN B	38F	5190	44.37	36.16
			46F	5230	48.24	36.48
802.11ac80	VHT0	SISO CHAIN A	42ac80	5210	86.45	75.05
		SISO CHAIN B	42ac80	5210	87.02	75.05
	VHT0	MIMO CHAIN A	42ac80	5210	86.64	75.05
		MIMO CHAIN B	42ac80	5210	85.50	75.05

Results screenshot

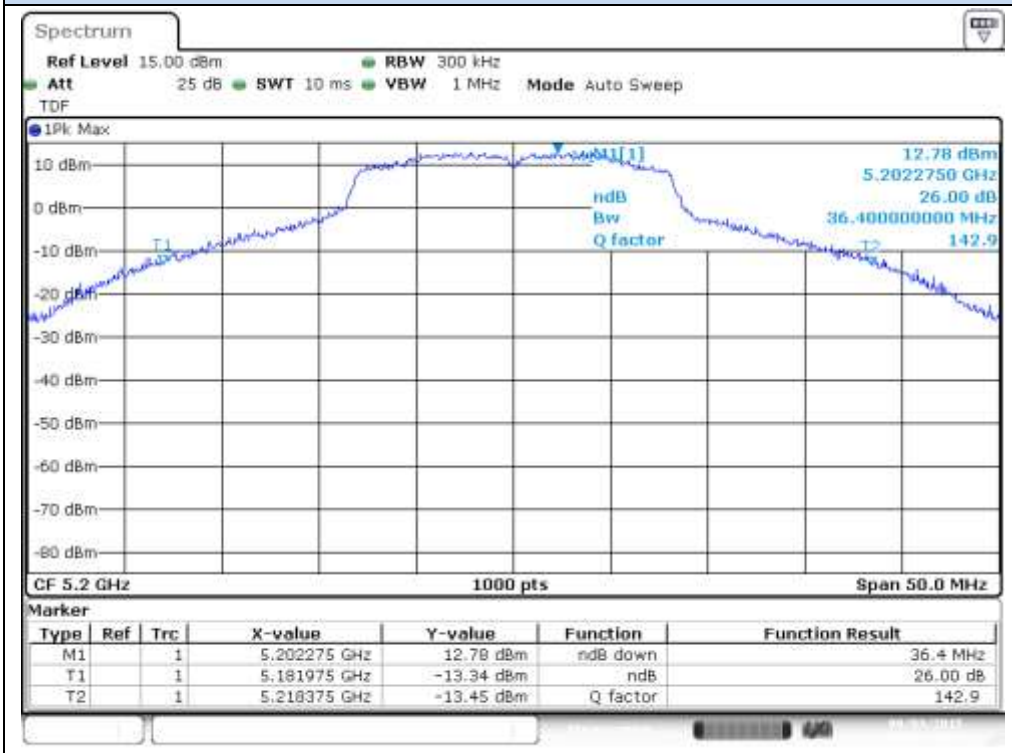
802.11a, 6Mbps – Chain A

26dB BW – CH36

99% BW – CH36



26dB BW – CH40



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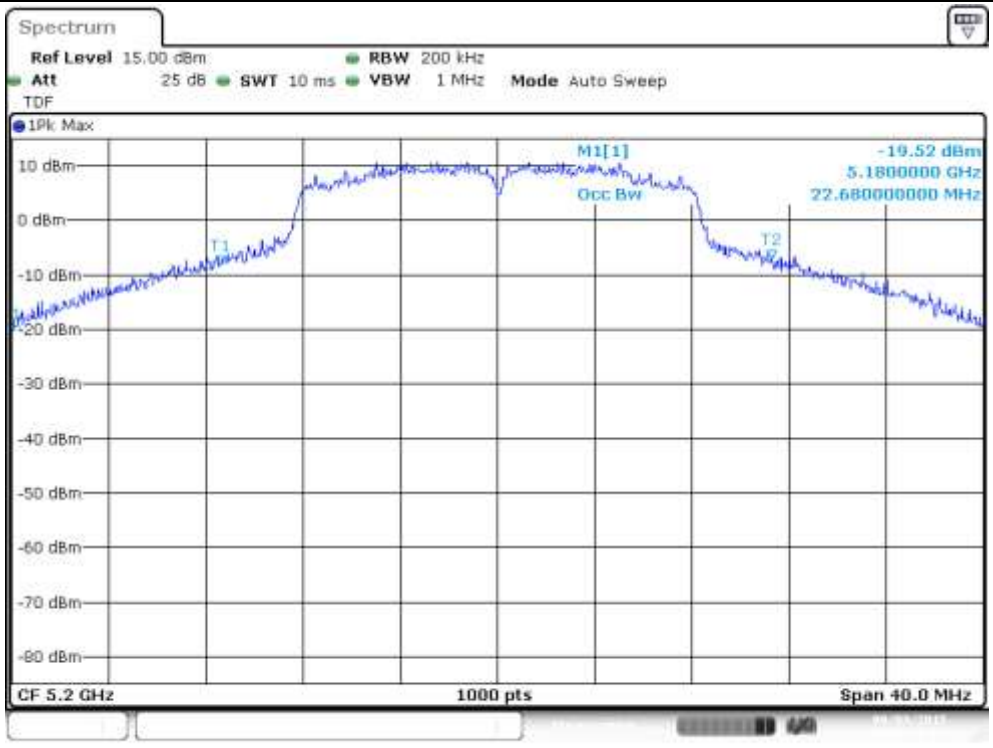
99% BW – CH40



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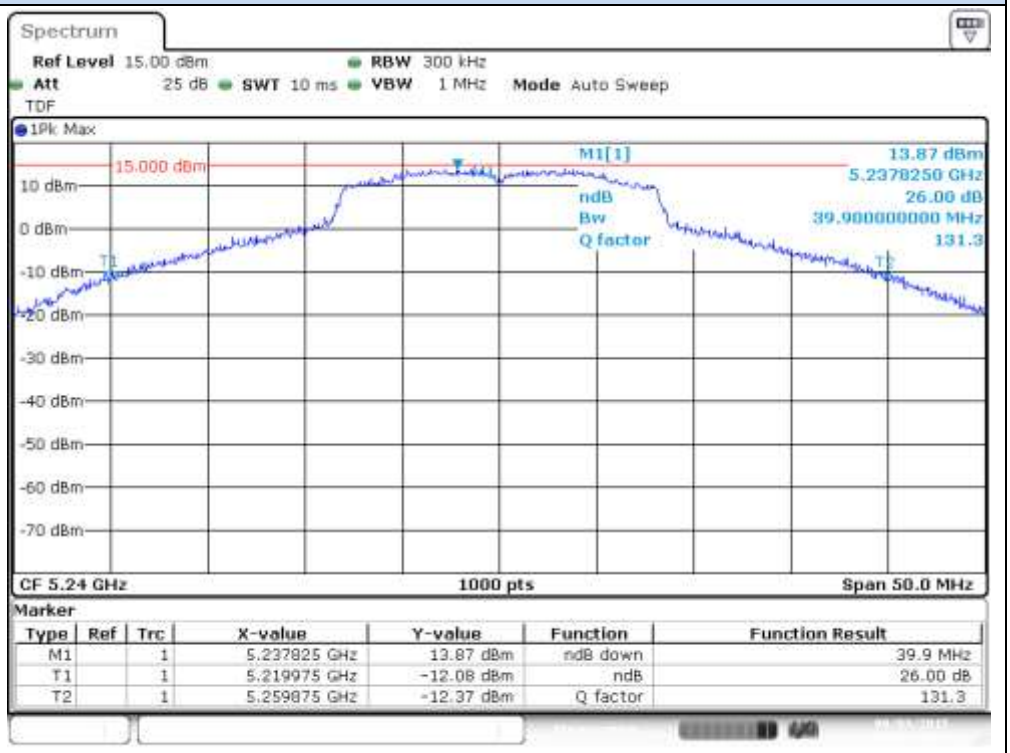
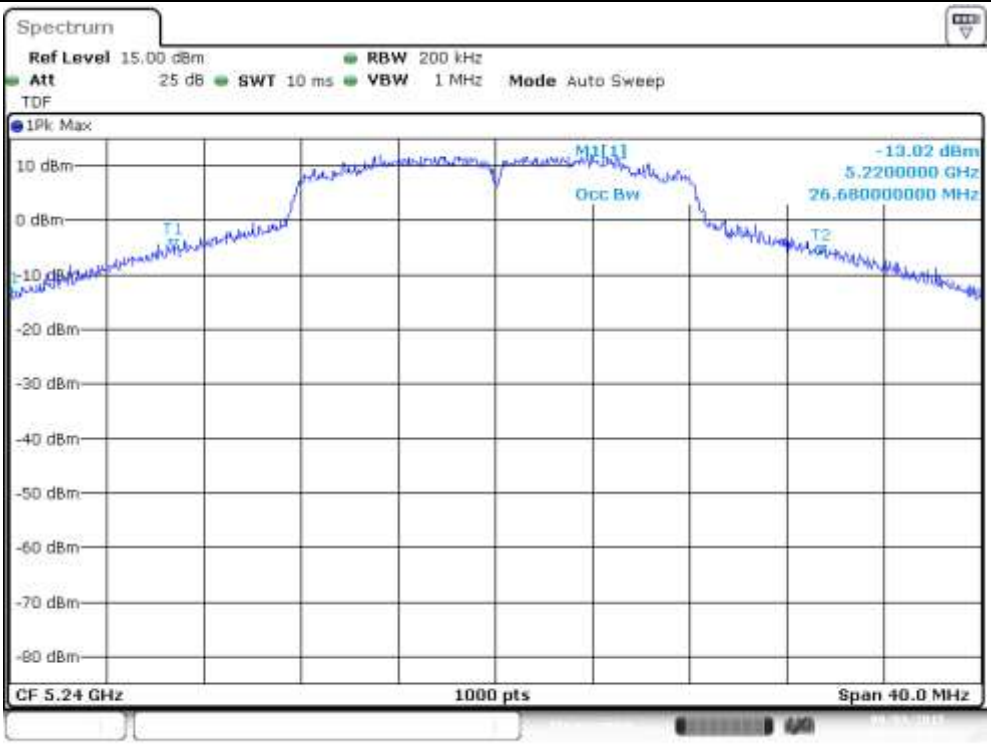
26dB BW – CH48

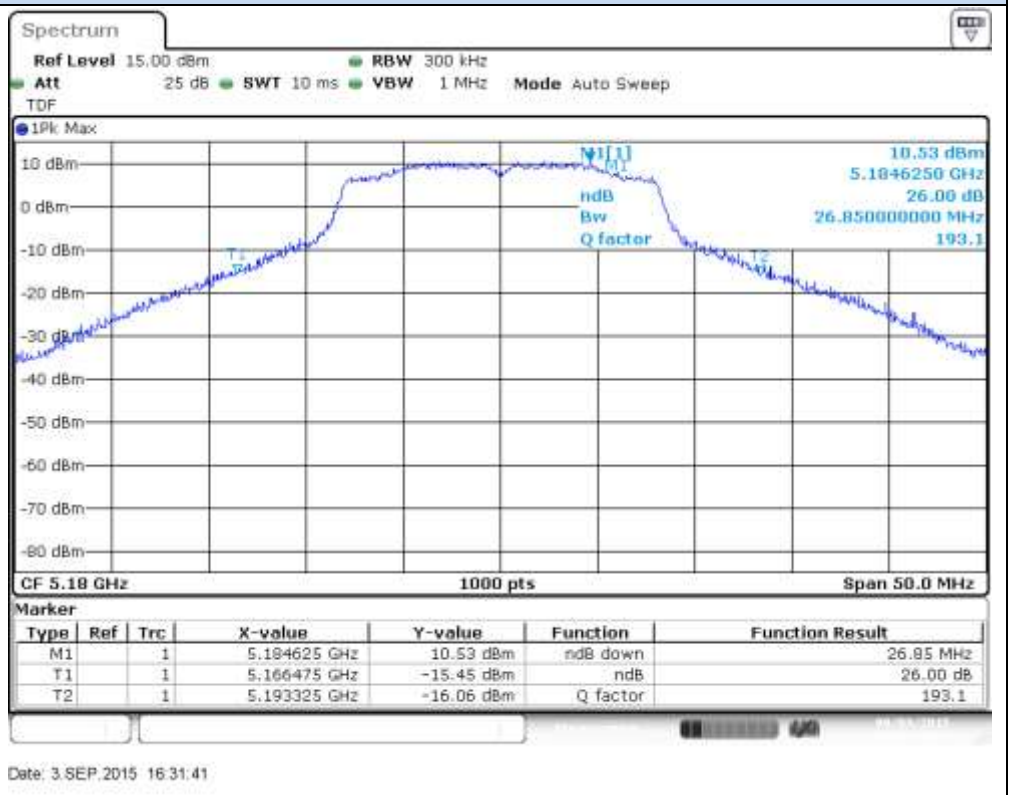


99% BW – CH48

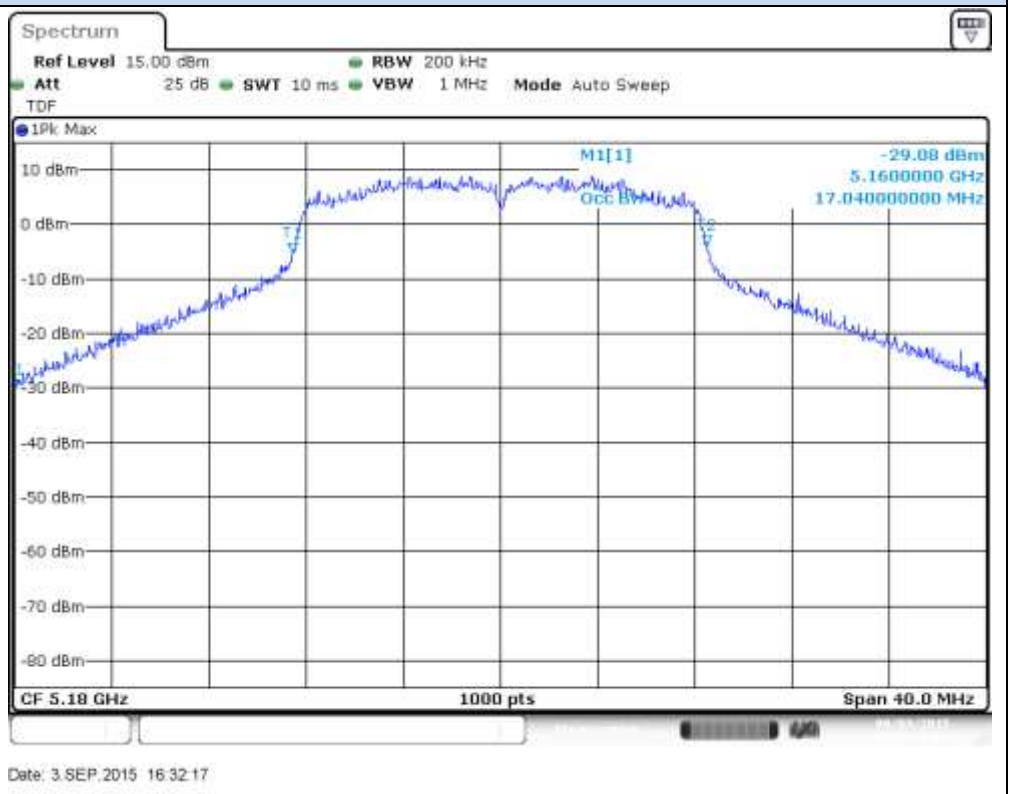


802.11a, 6Mbps – Chain B

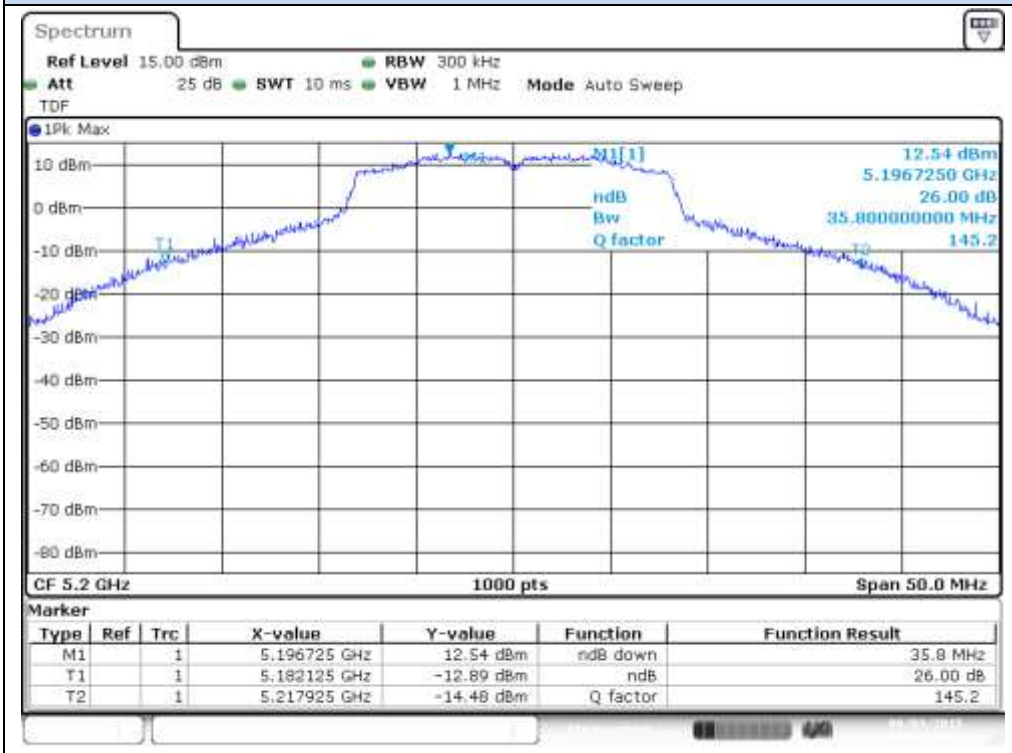
26dB BW – CH36



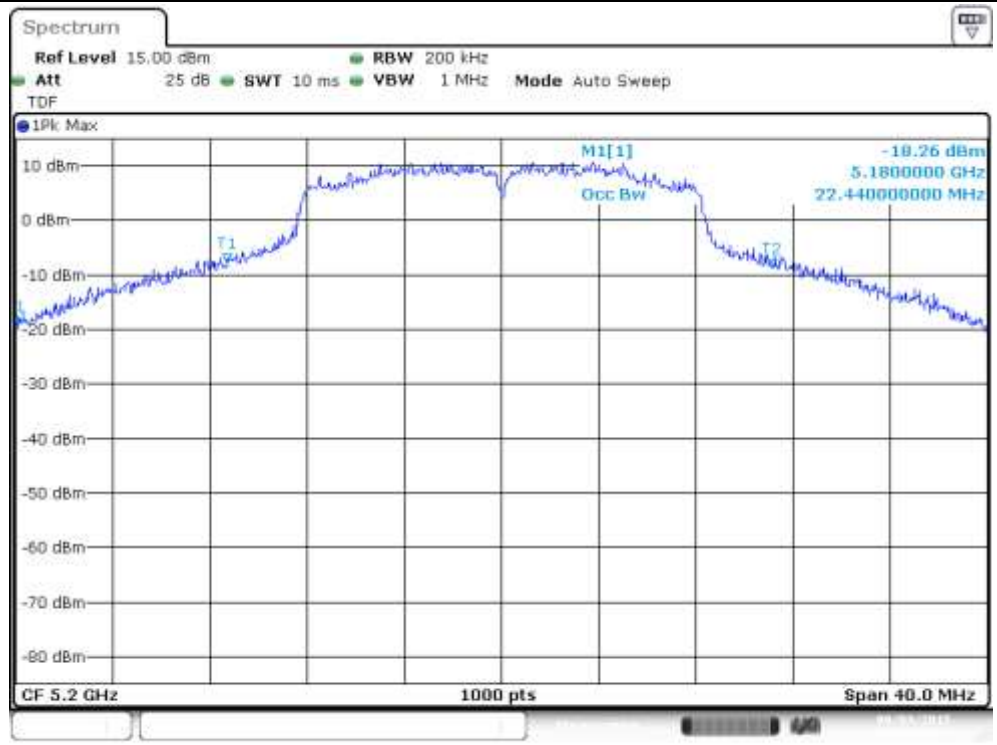
99% BW – CH36



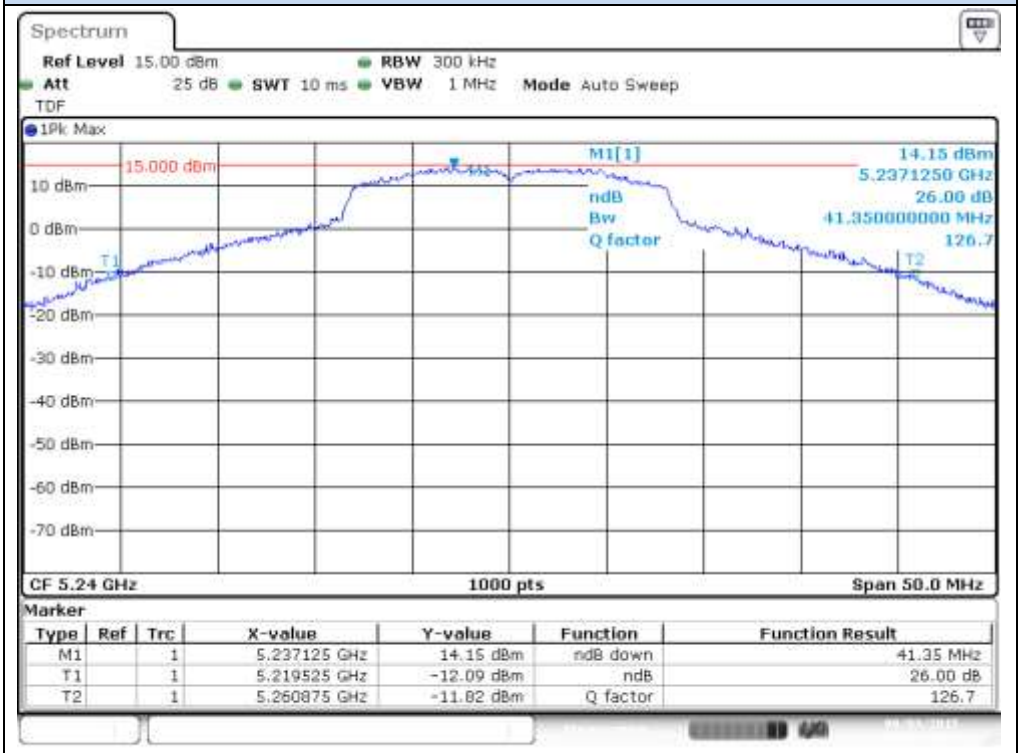
26dB BW – CH40



99% BW – CH40



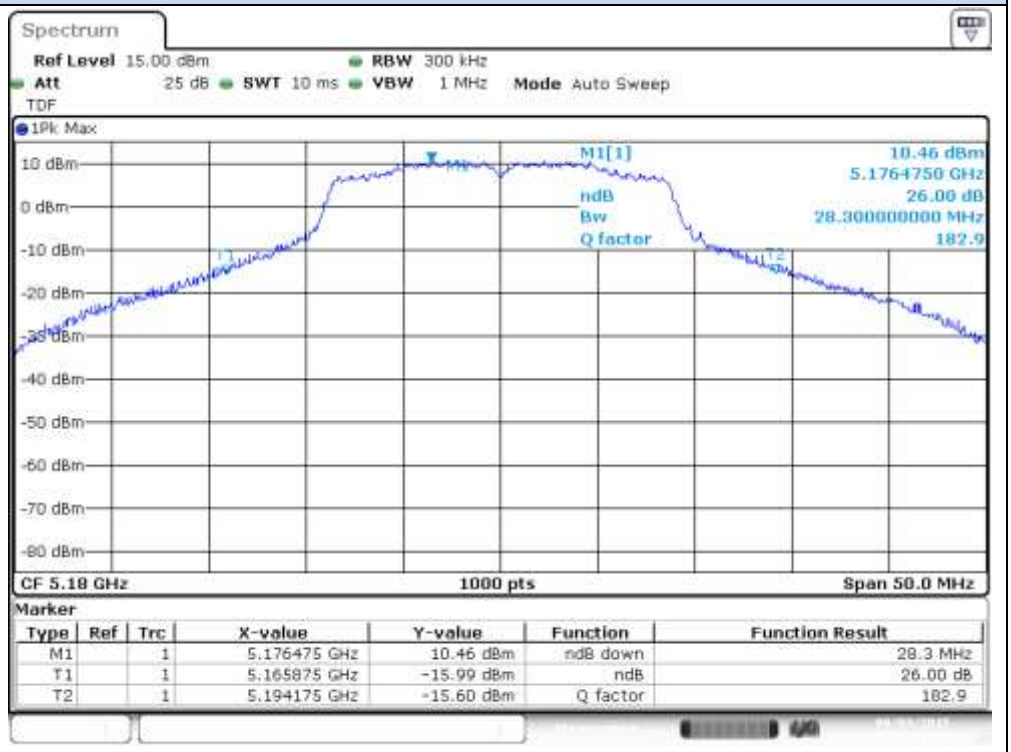
26dB BW – CH48



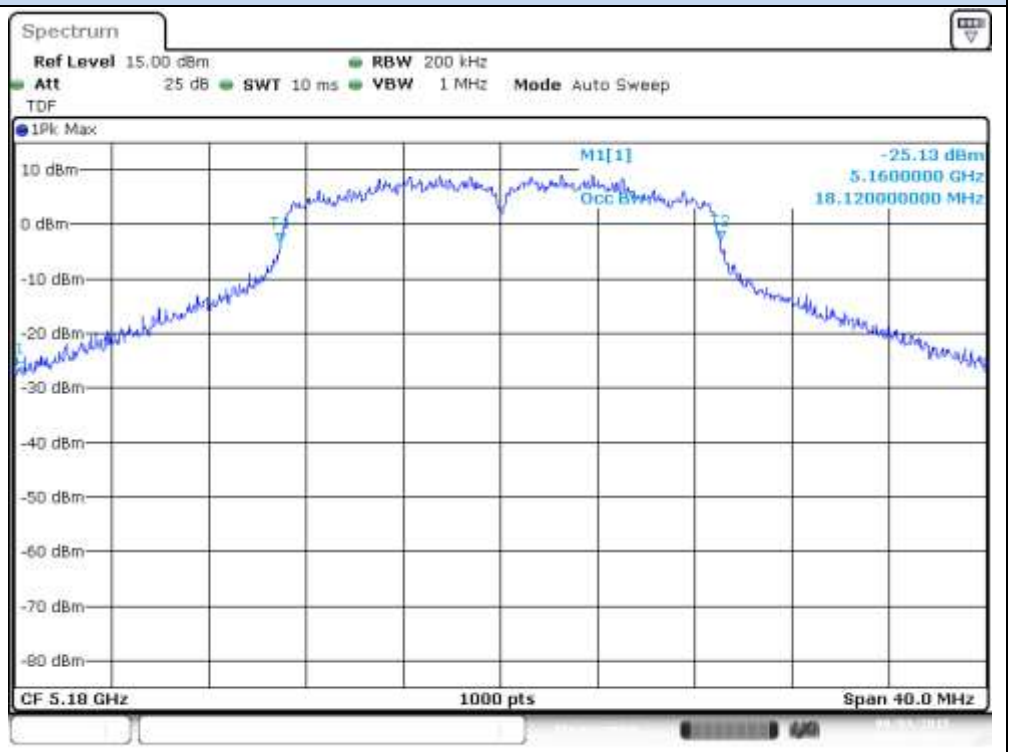
99% BW – CH48

802.11n20, HT0 (SISO) – Chain A

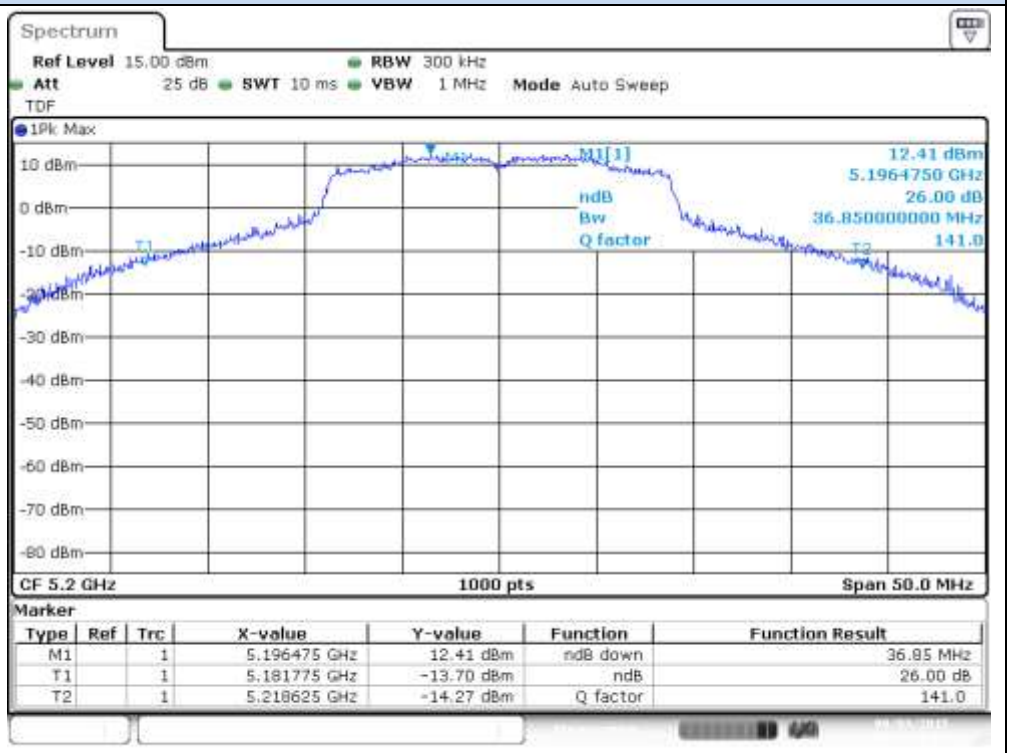
26dB BW – CH36



99% BW – CH36

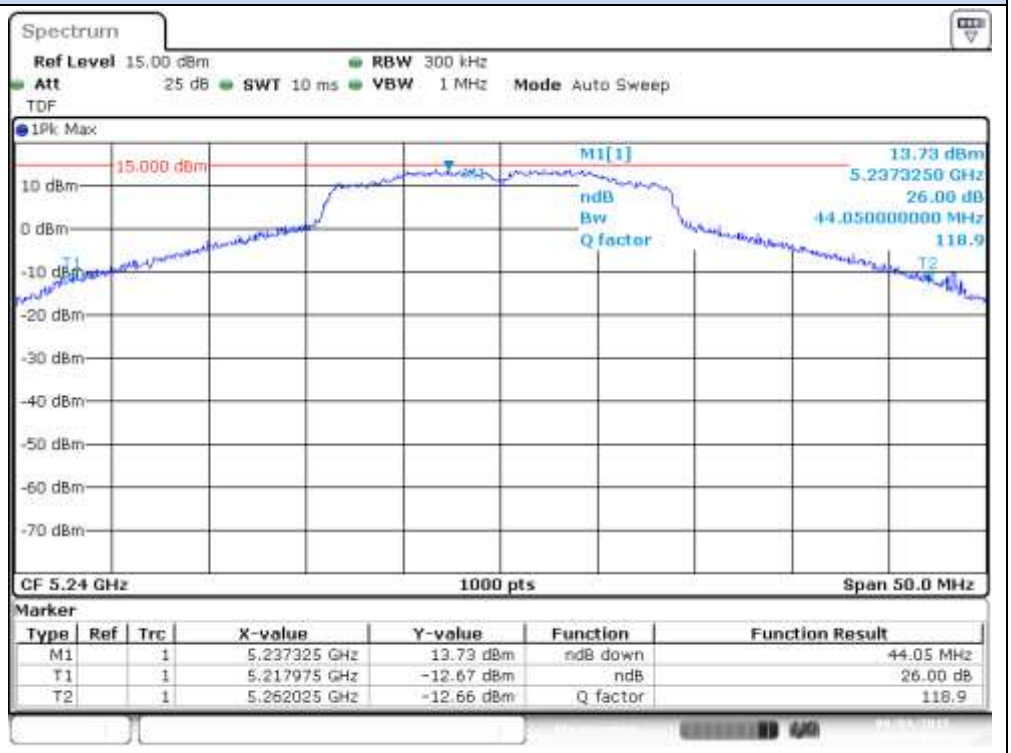


26dB BW – CH40

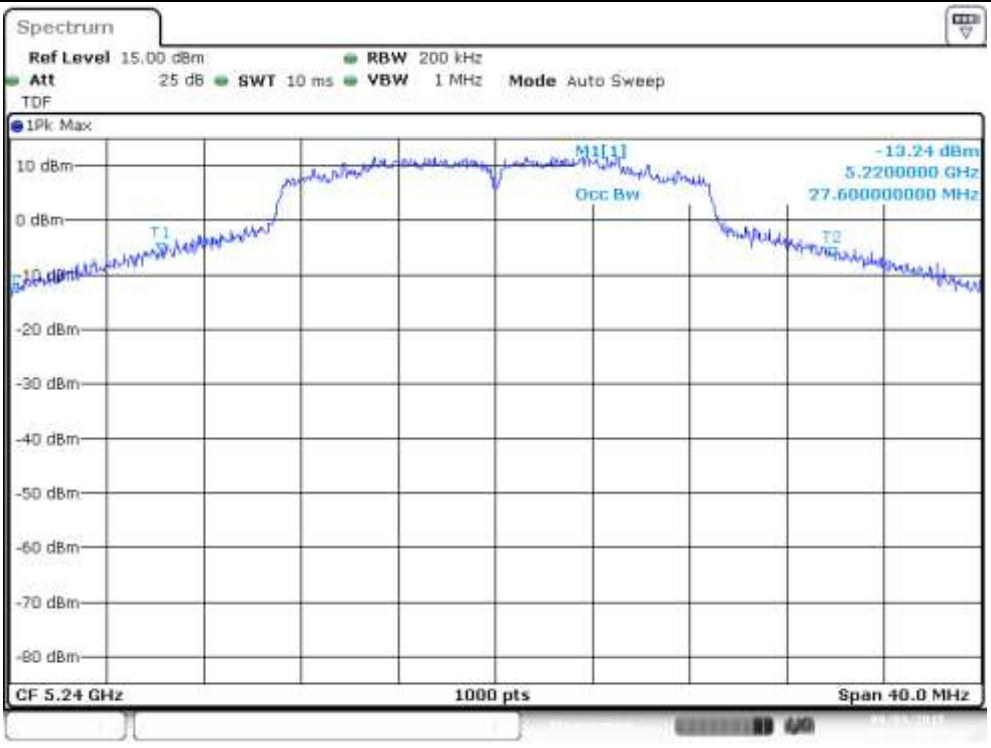


99% BW – CH40

26dB BW – CH48

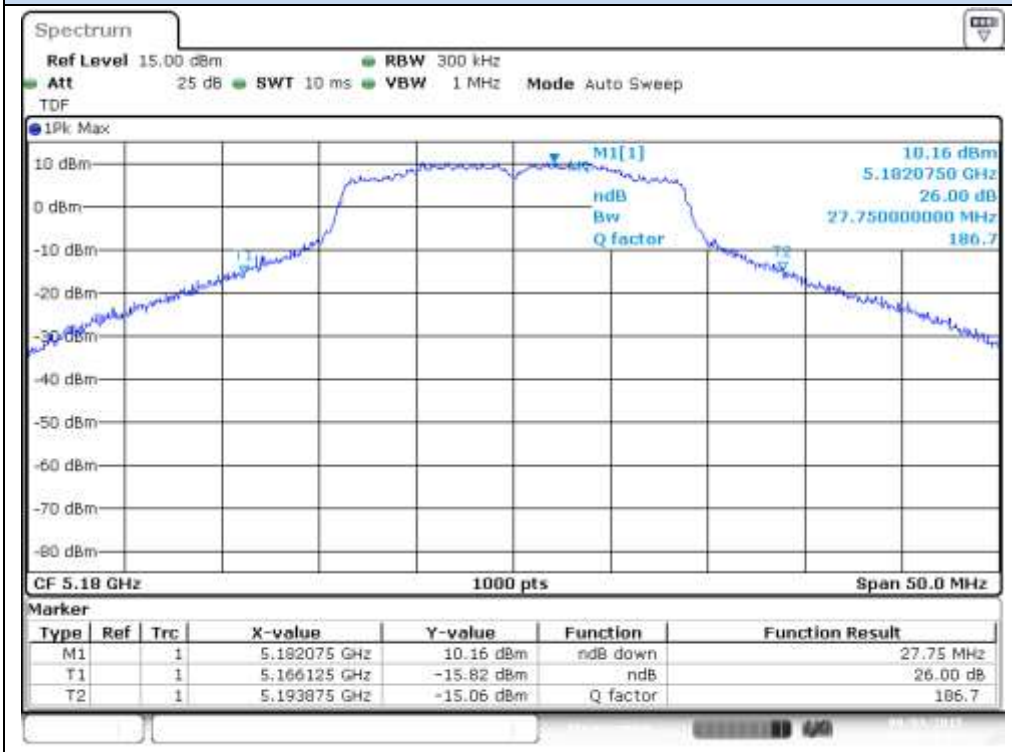


99% BW – CH48

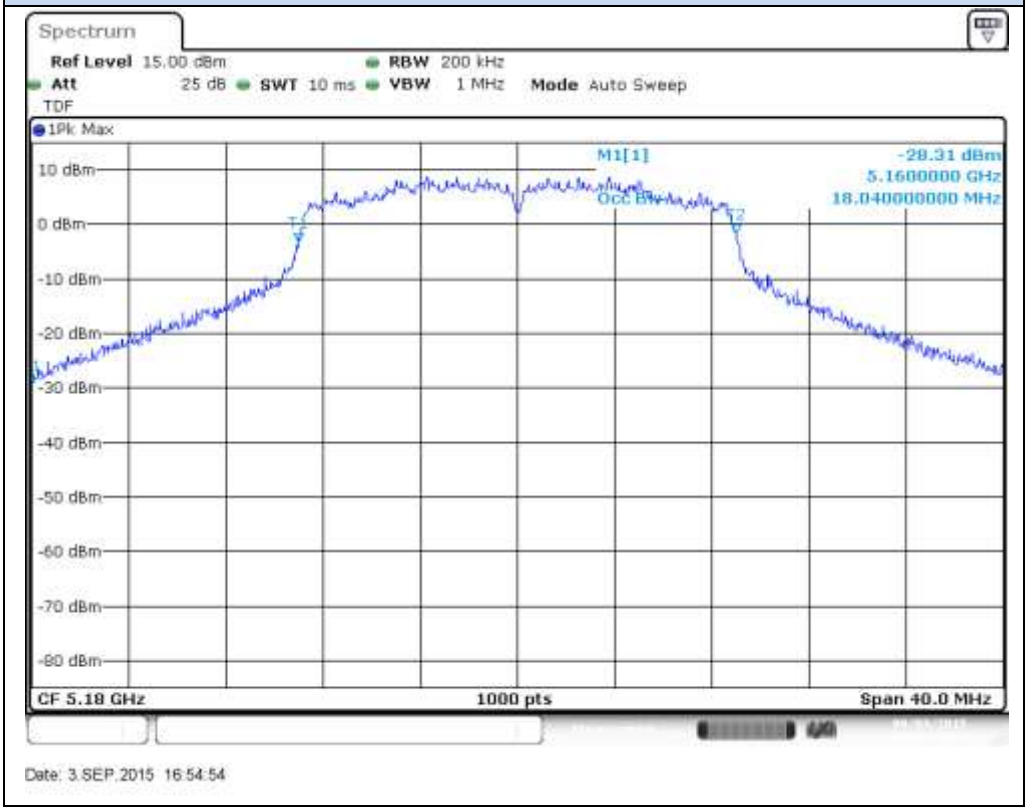


802.11n20, HT0 (SISO) – Chain B

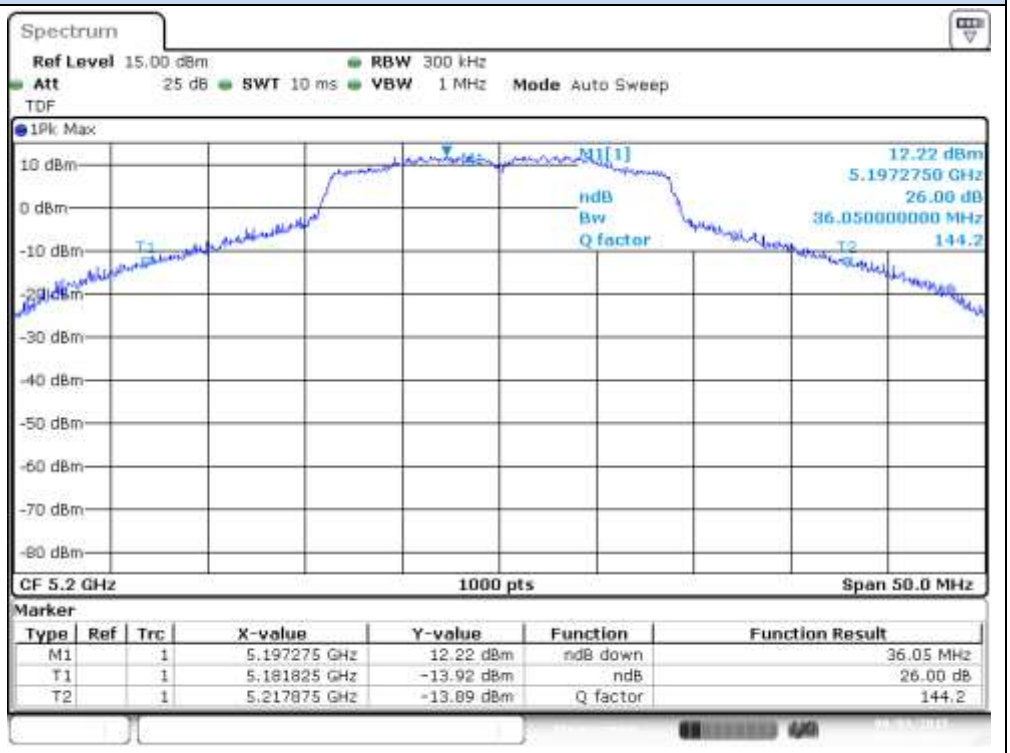
26dB BW – CH36



99% BW – CH36

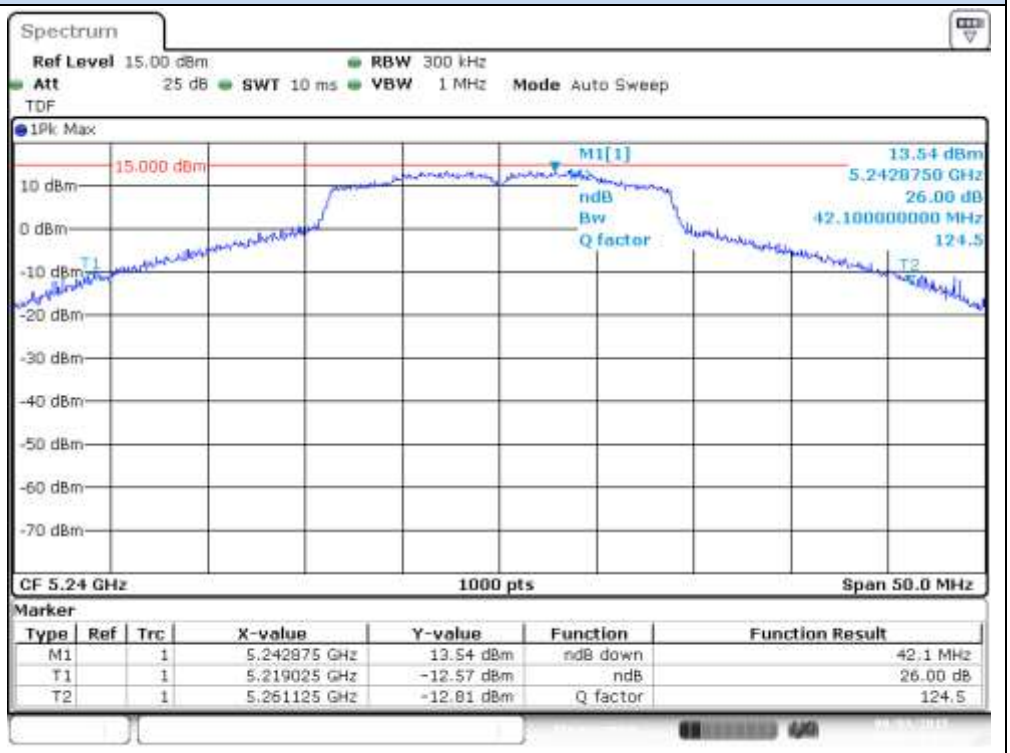


26dB BW – CH40

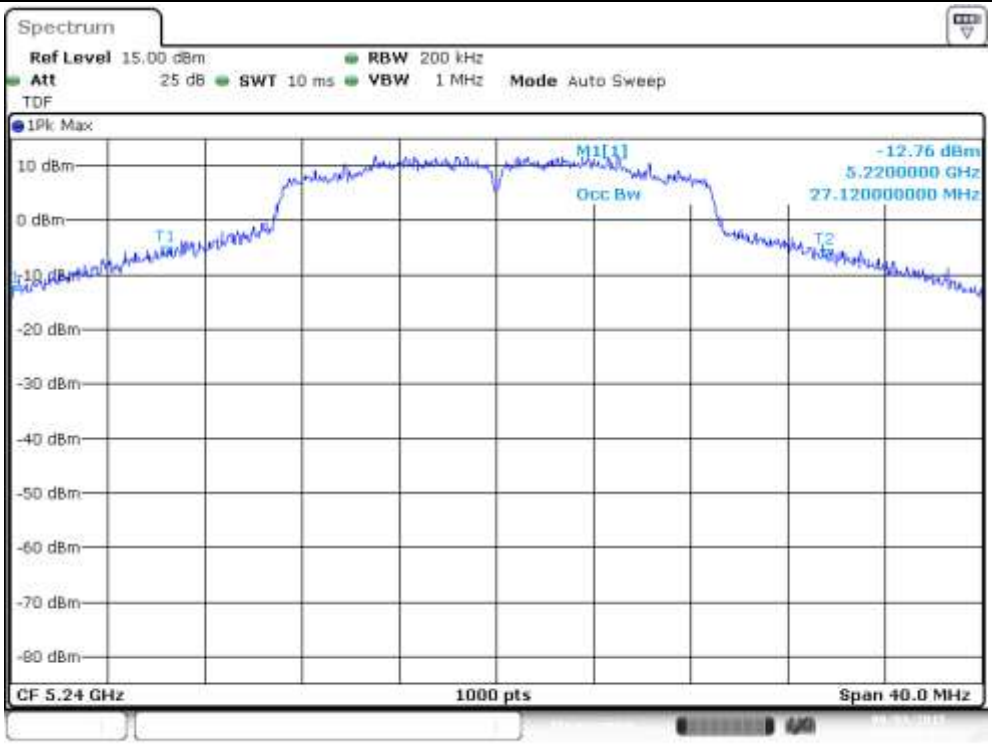


99% BW – CH40

26dB BW – CH48



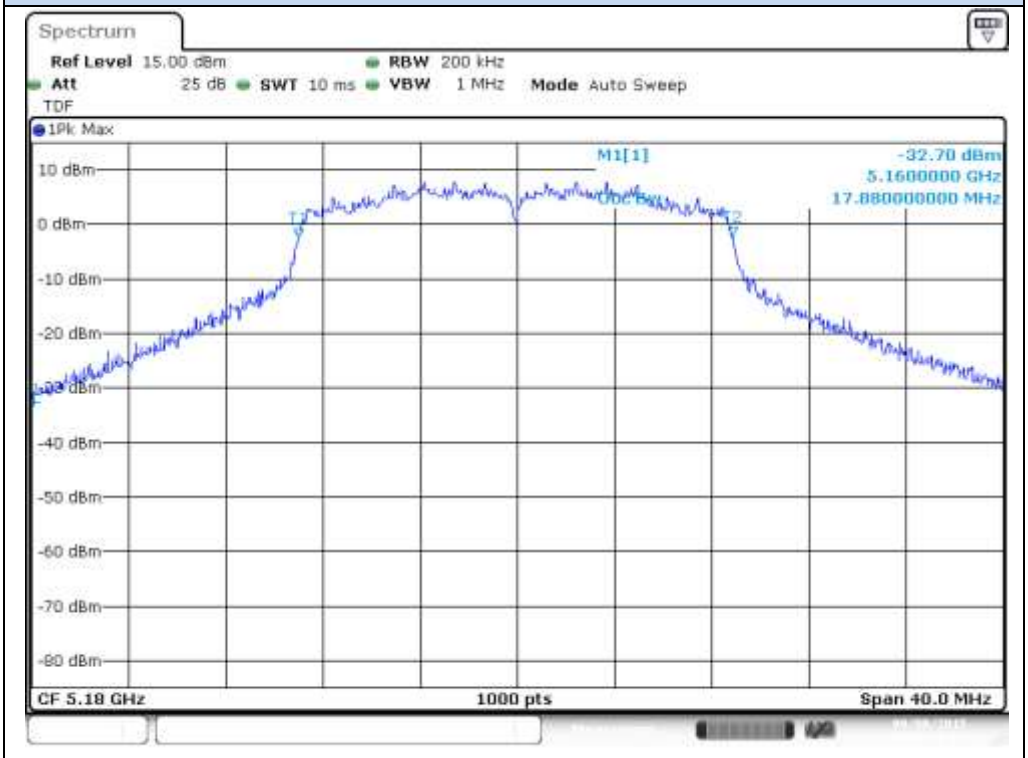
99% BW – CH48



802.11n20, HT8 (MIMO) – Chain A

26dB BW – CH36

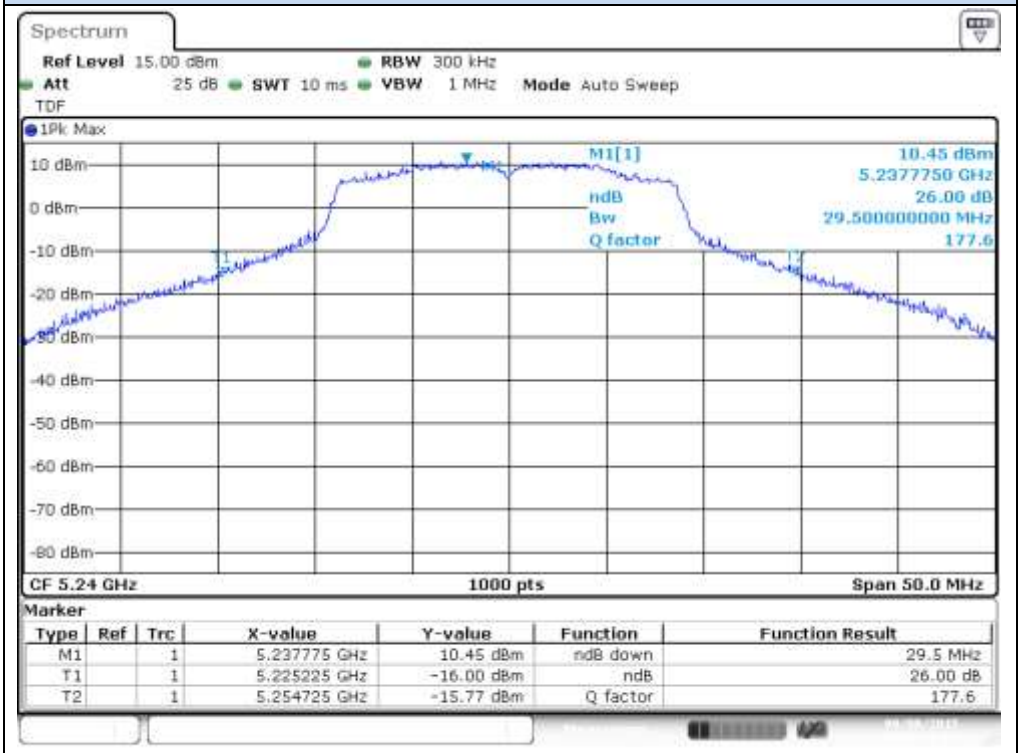
99% BW – CH36



26dB BW – CH40

99% BW – CH40

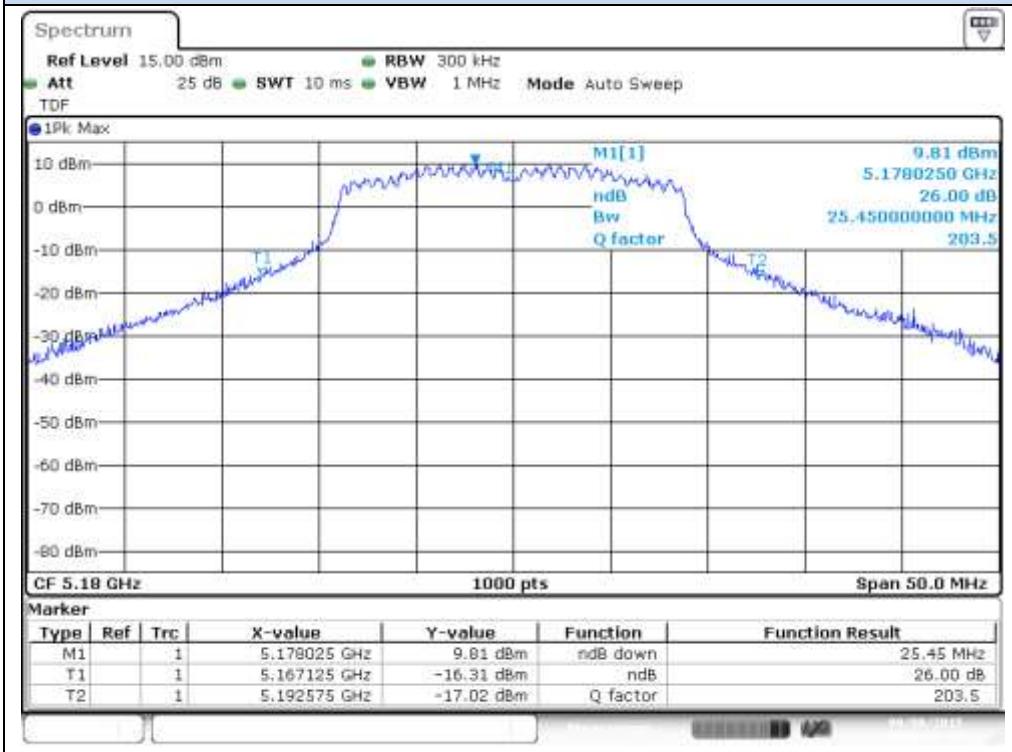
26dB BW – CH48



99% BW – CH48

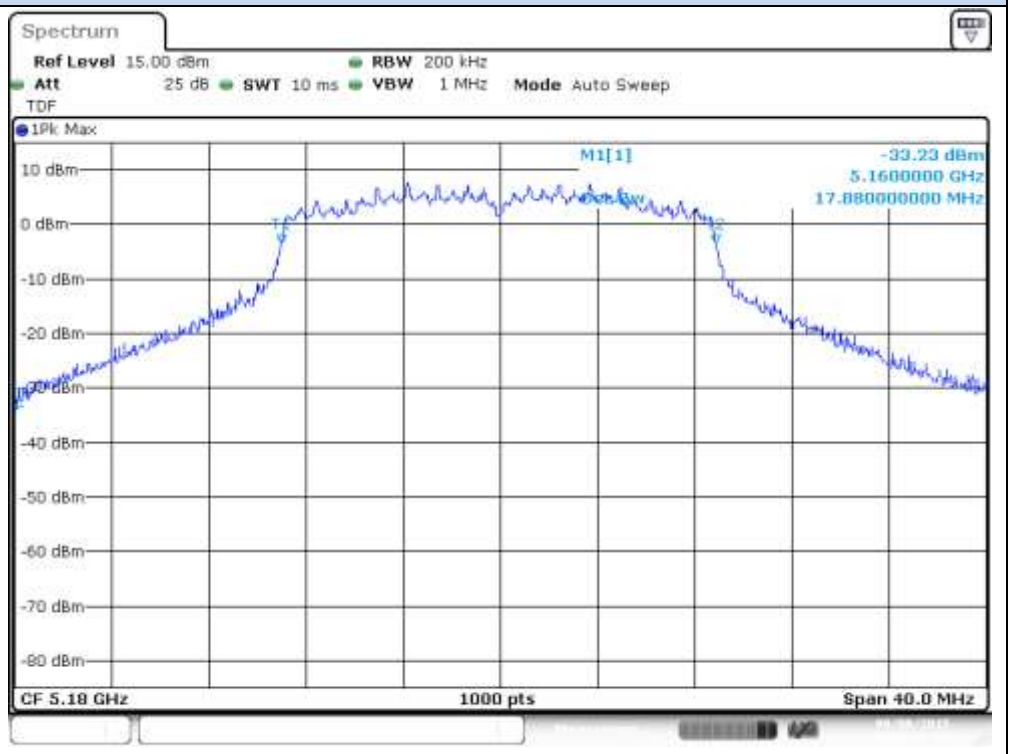
802.11n20, HT8 (MIMO) – Chain B

26dB BW – CH36



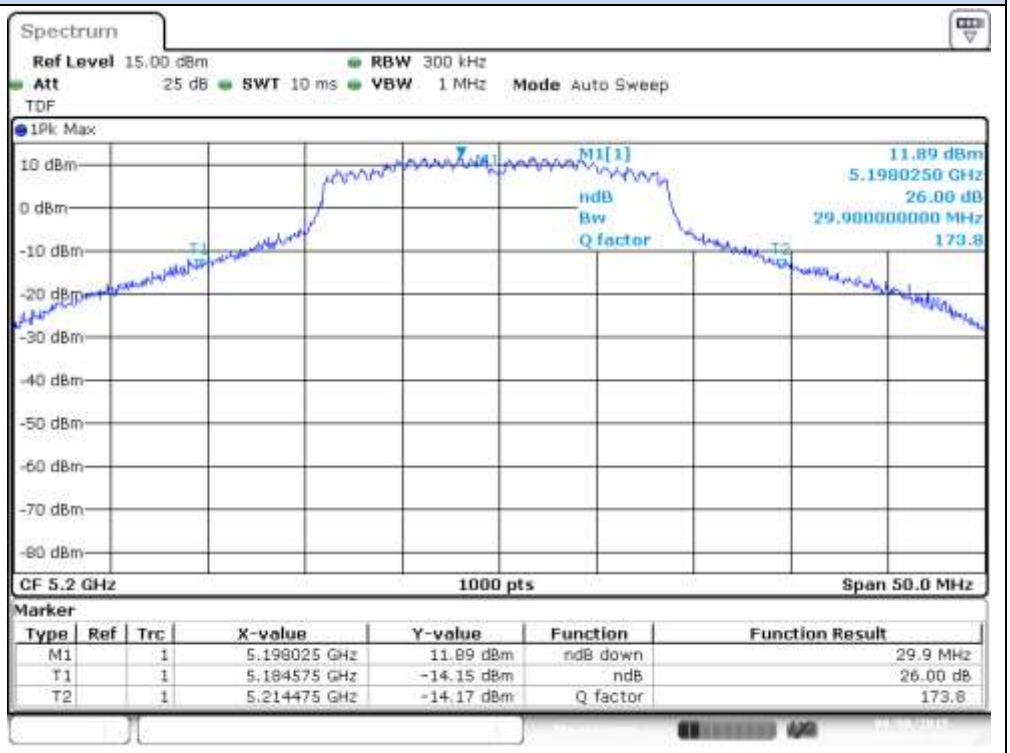
Date: 8.SEP.2015 11:44:15

99% BW – CH36

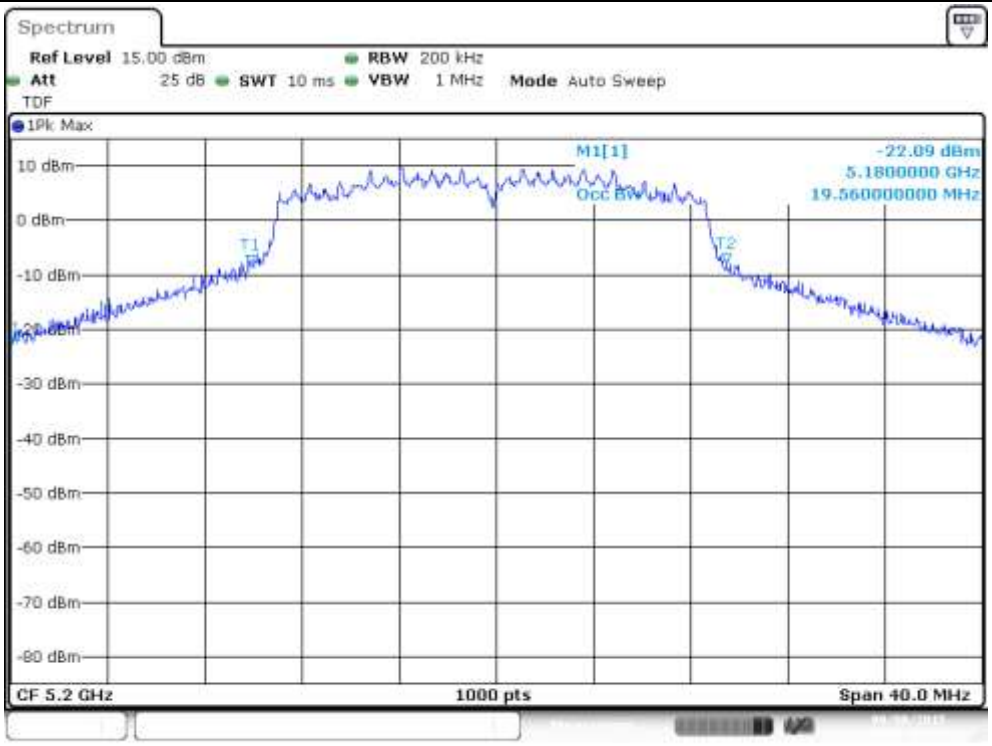


Date: 8.SEP.2015 11:44:55

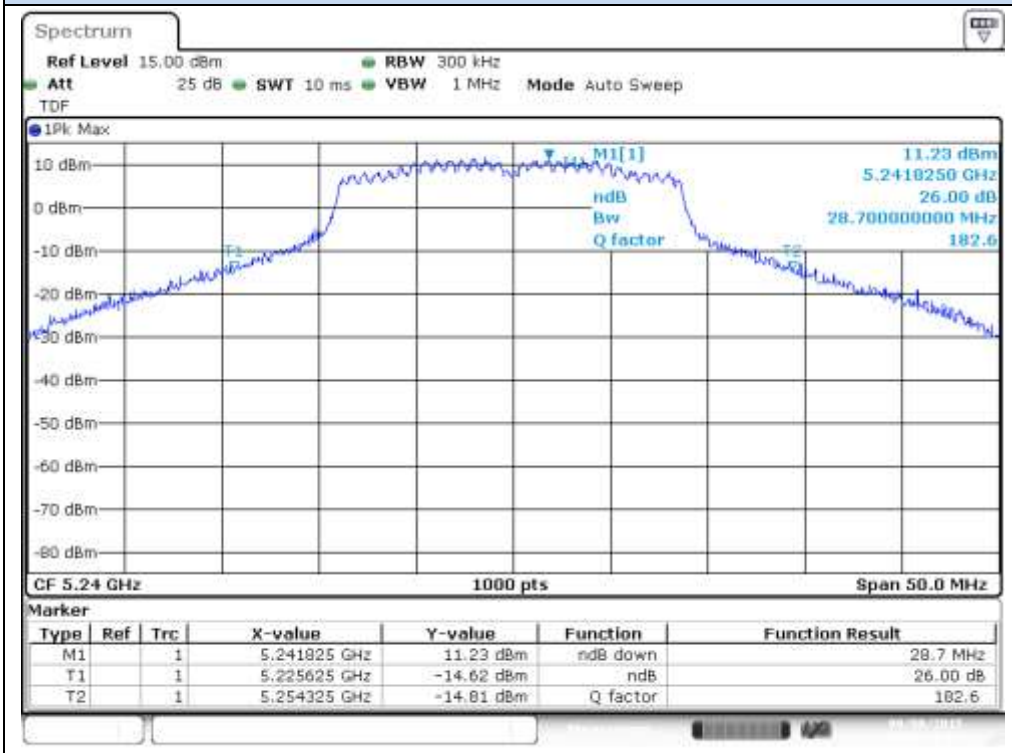
26dB BW – CH40



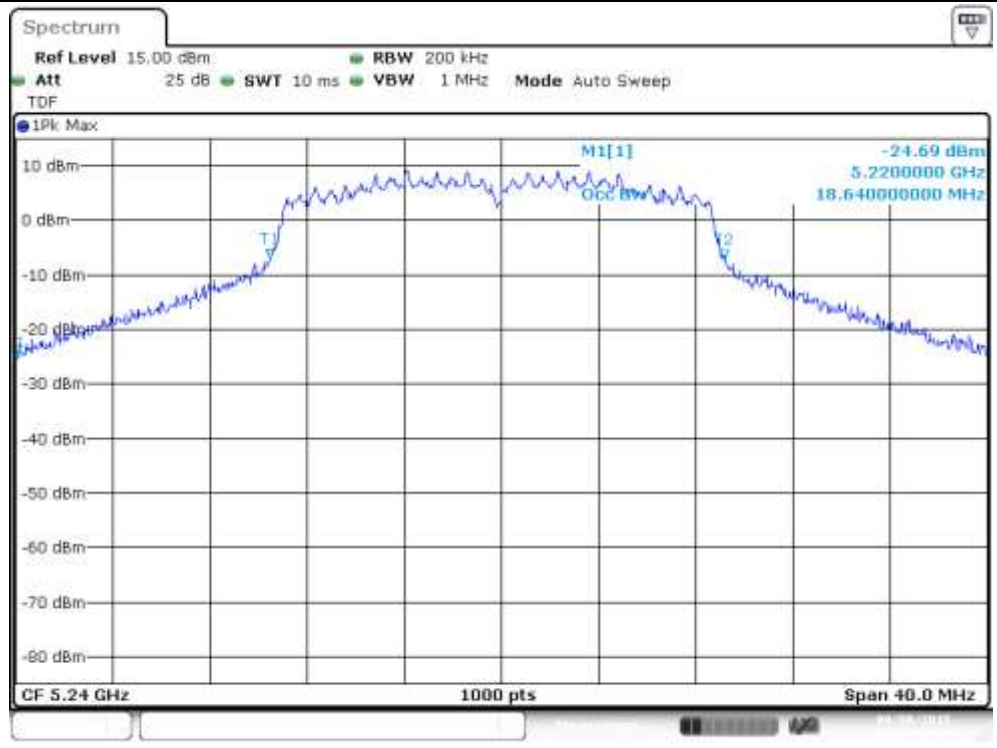
99% BW – CH40



26dB BW – CH48

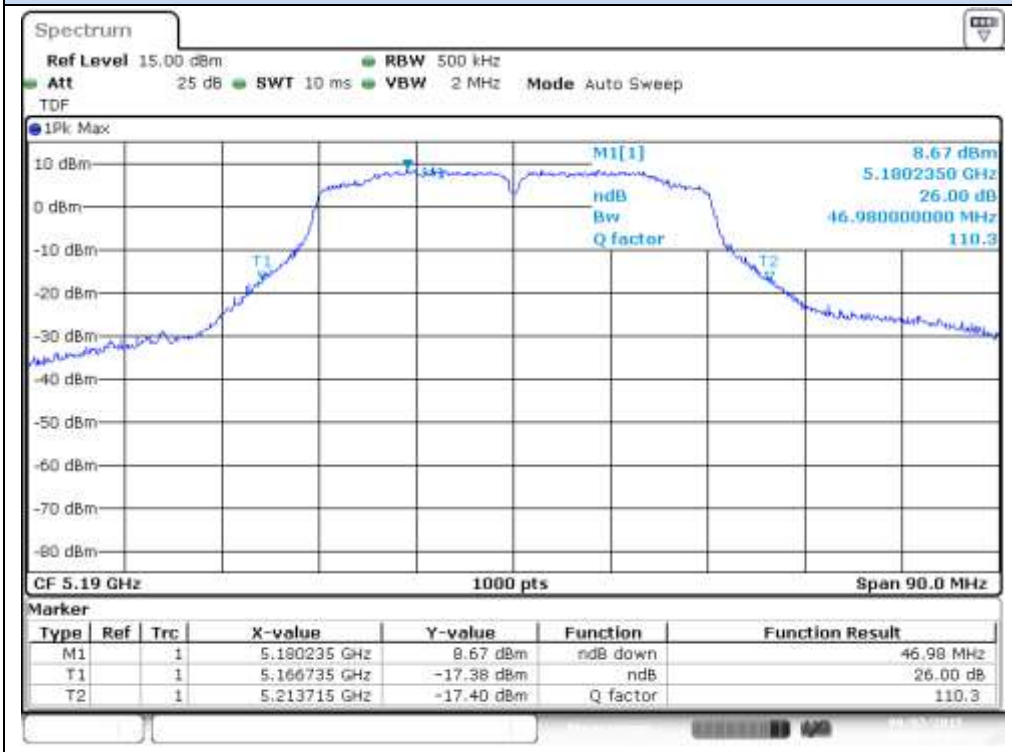


99% BW – CH48



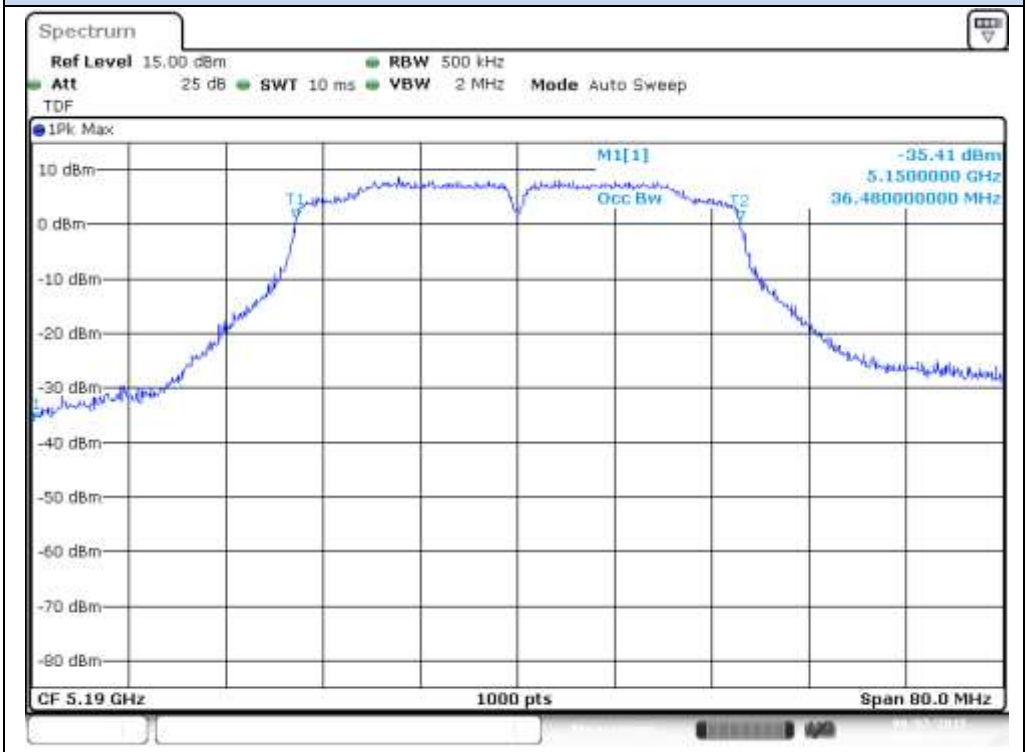
802.11n40, HT0 (SISO) – Chain A

26dB BW – CH38F



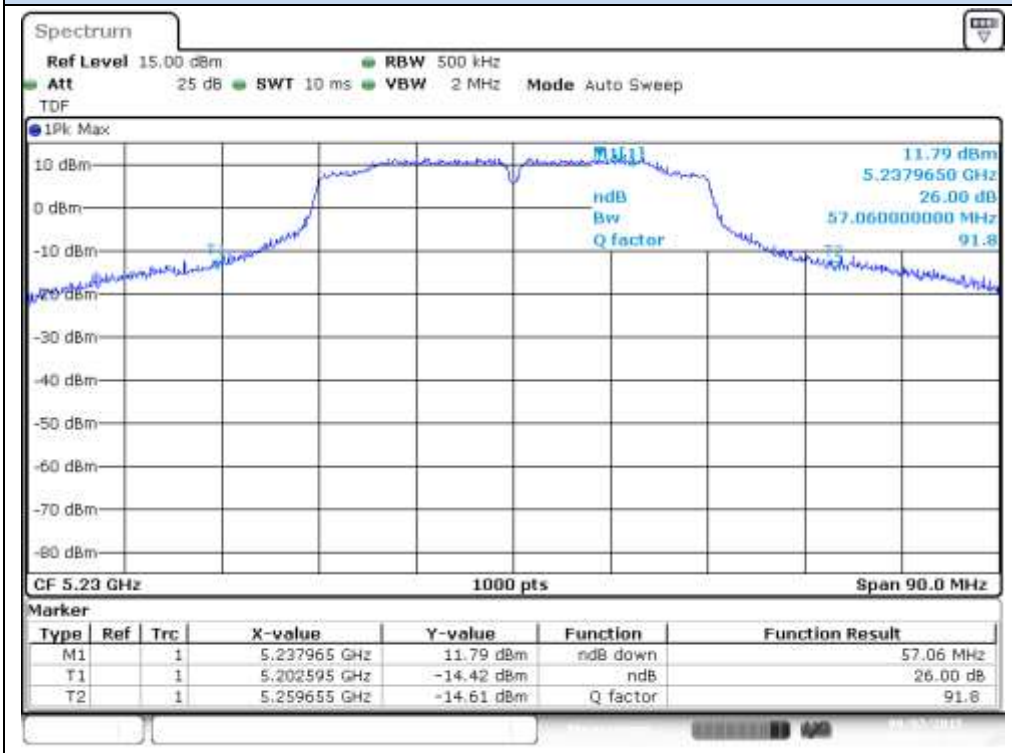
Date: 7.SEP.2015 10:42:24

99% BW – CH38F

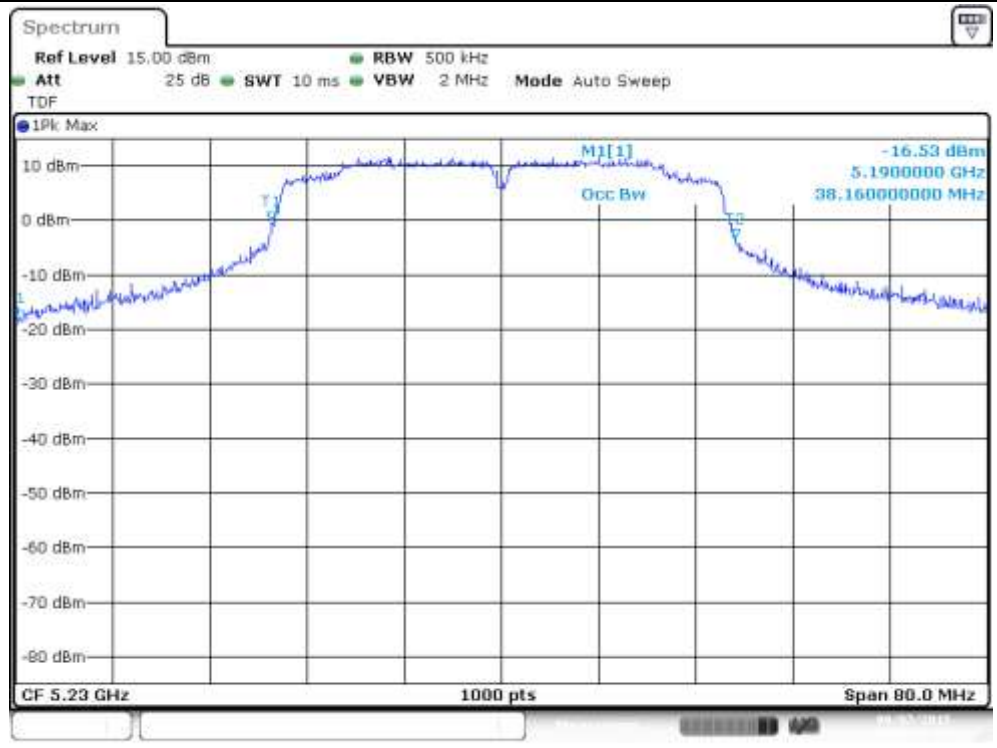


Date: 7.SEP.2015 10:42:50

26dB BW – CH46F



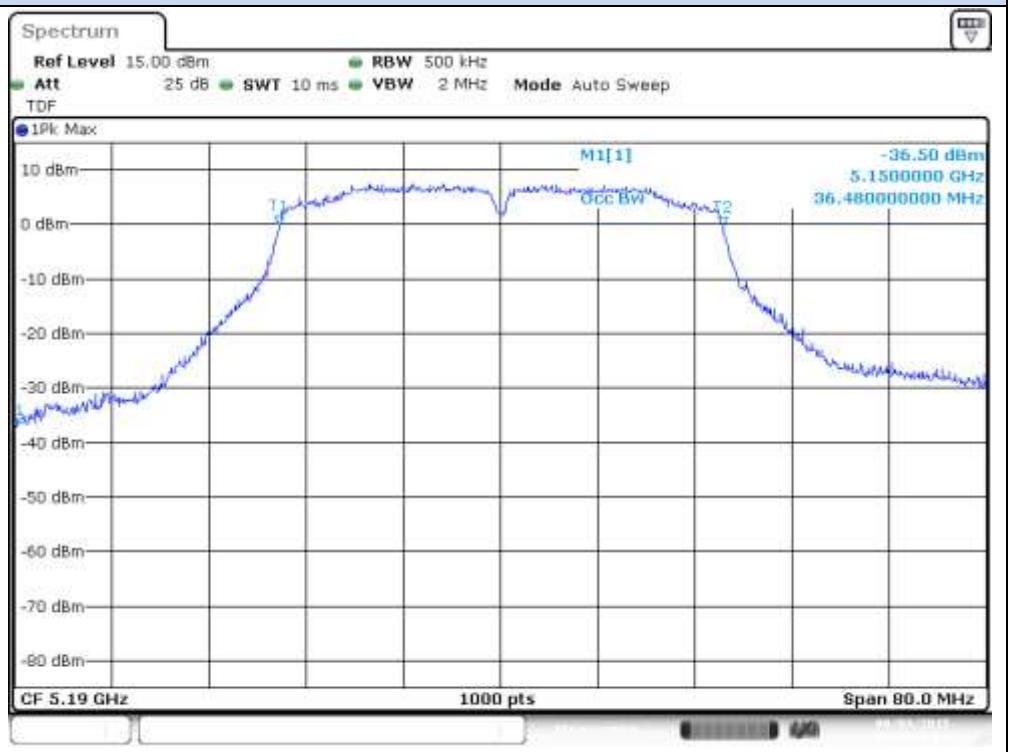
99% BW – CH46F



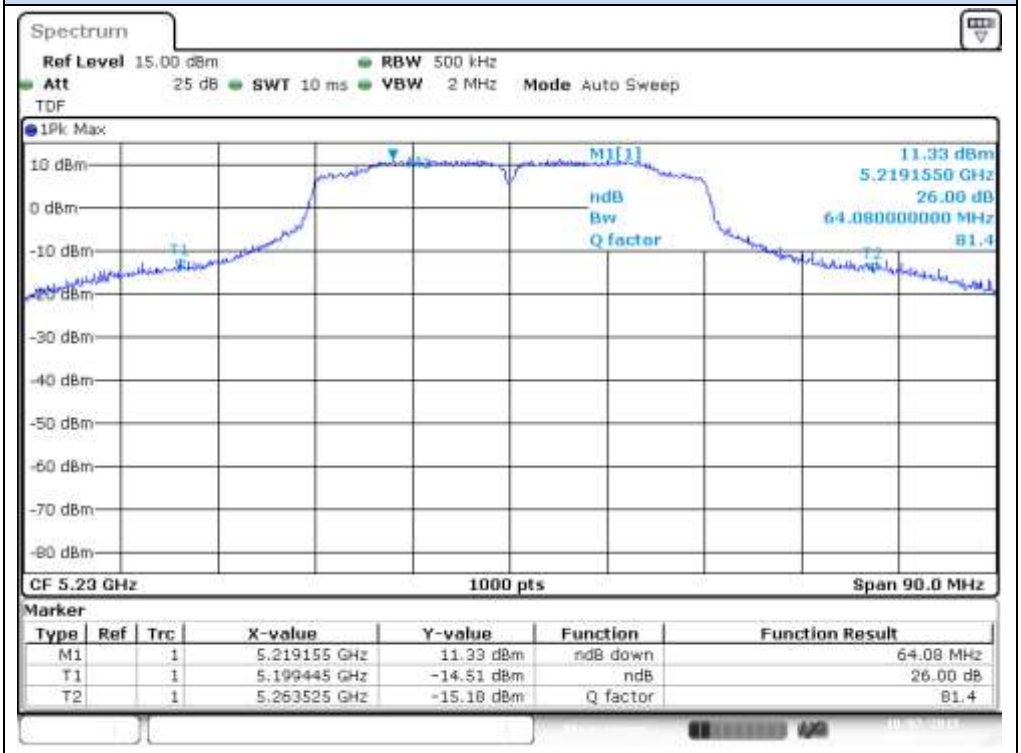
802.11n40, HT0 (SISO) – Chain B

26dB BW – CH38F

99% BW – CH38F



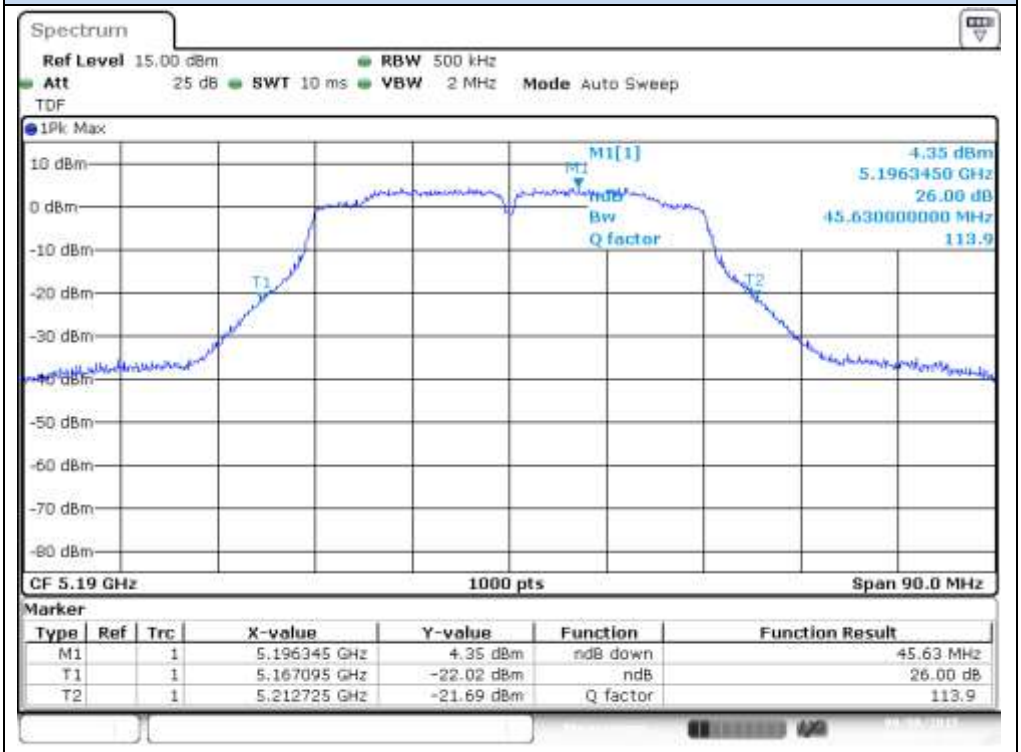
26dB BW – CH46F



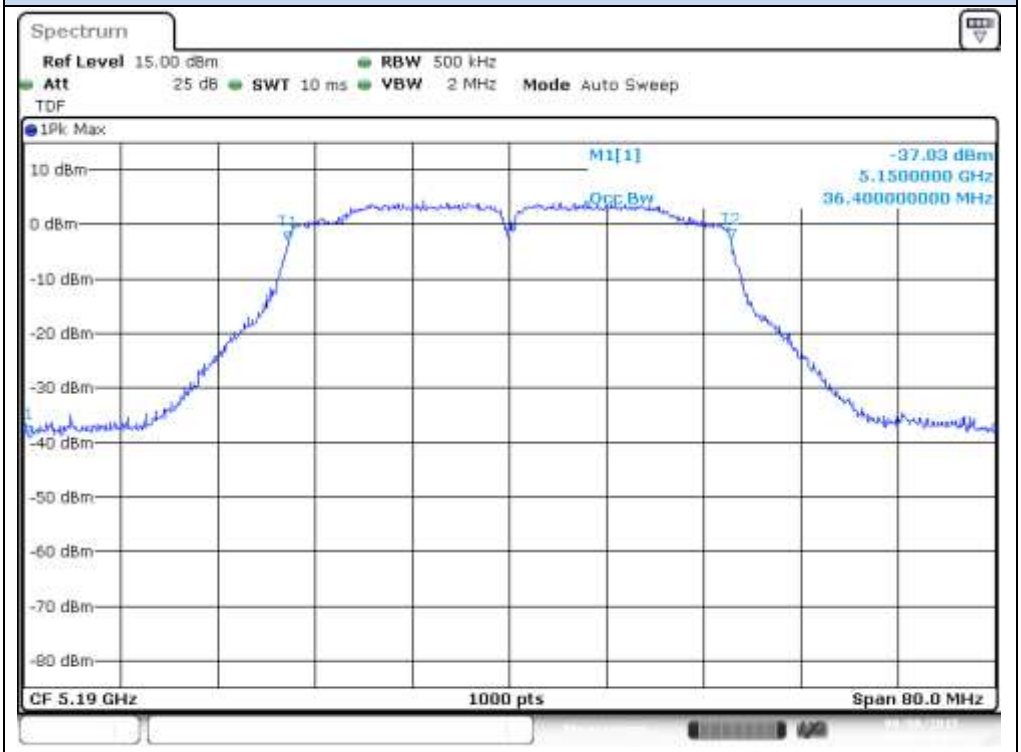
99% BW – CH46F

802.11n40, HT8 (MIMO) – Chain A

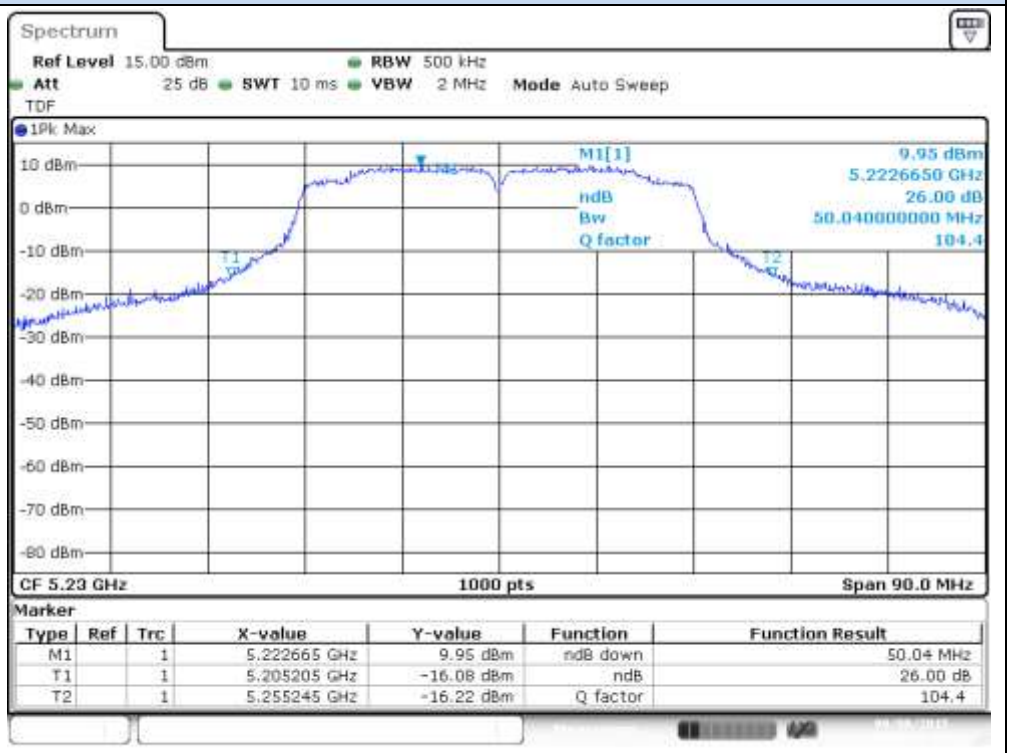
26dB BW – CH38F



99% BW – CH38F



26dB BW – CH46F

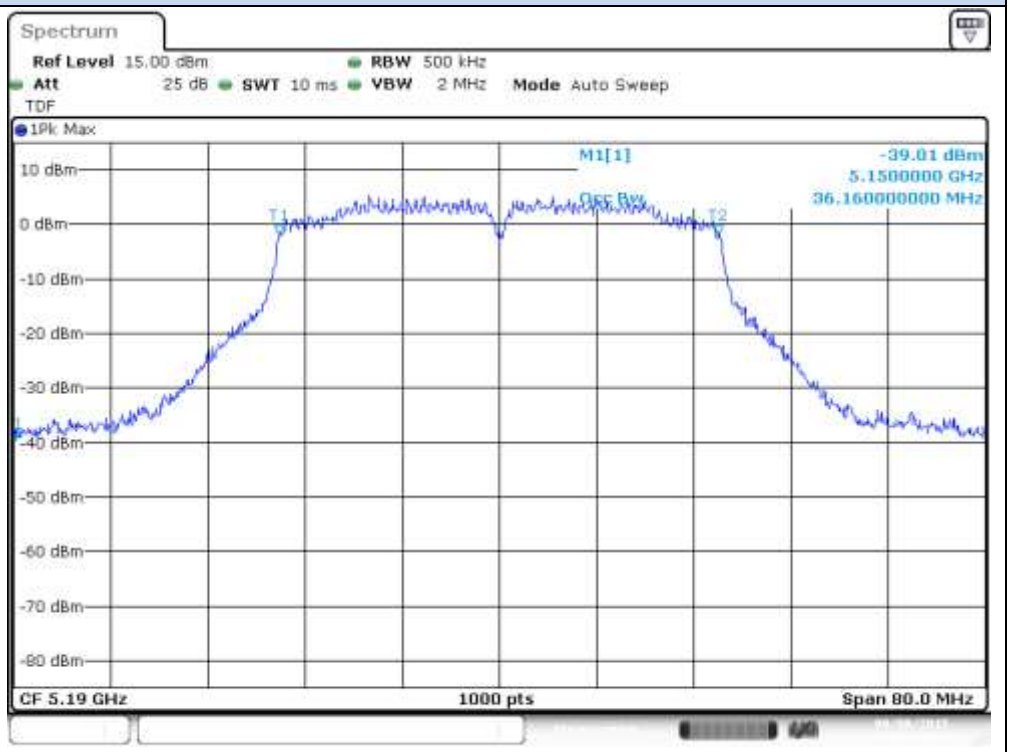


99% BW – CH46F

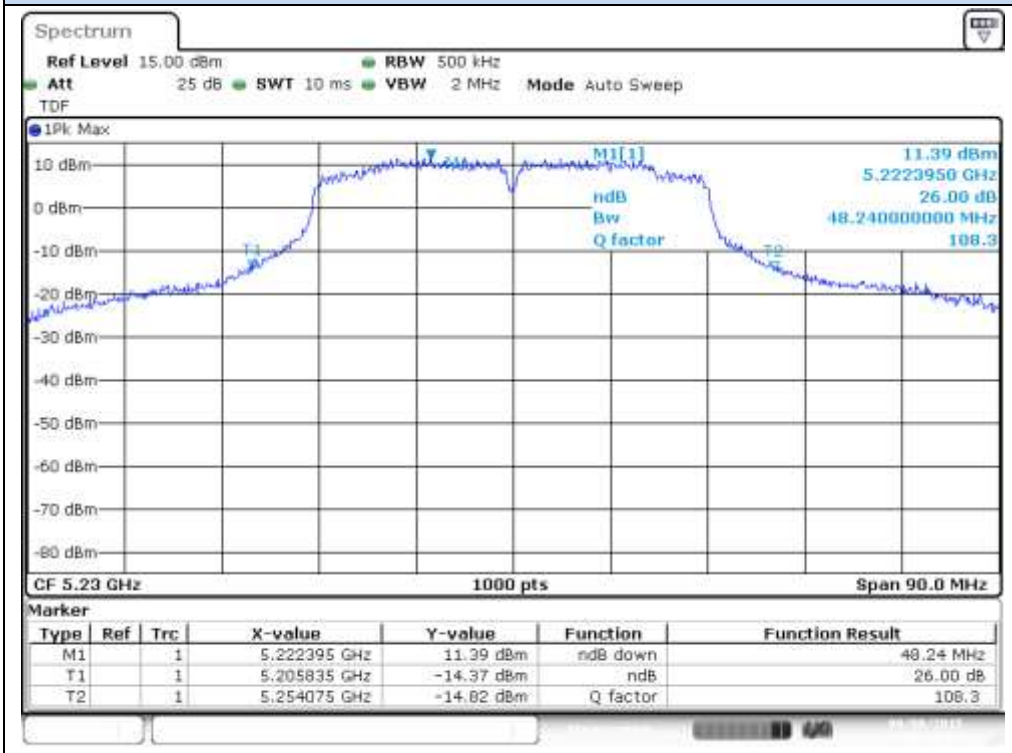
802.11n40, HT8 (MIMO) – Chain B

26dB BW – CH38F

99% BW – CH38F



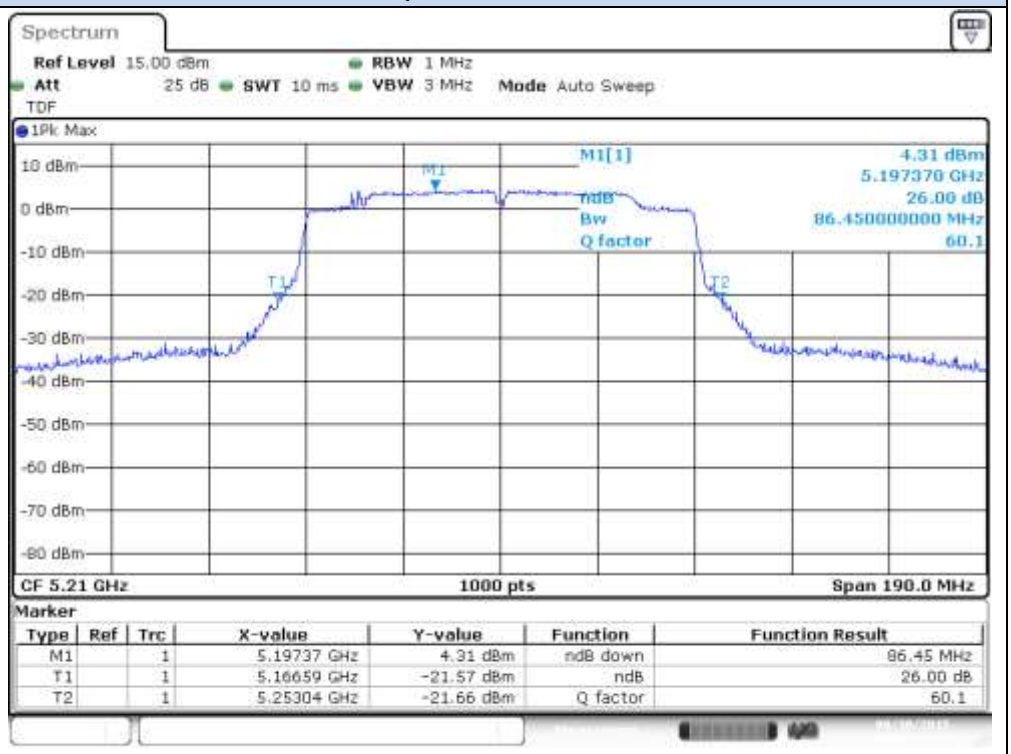
26dB BW – CH46F



99% BW – CH46F

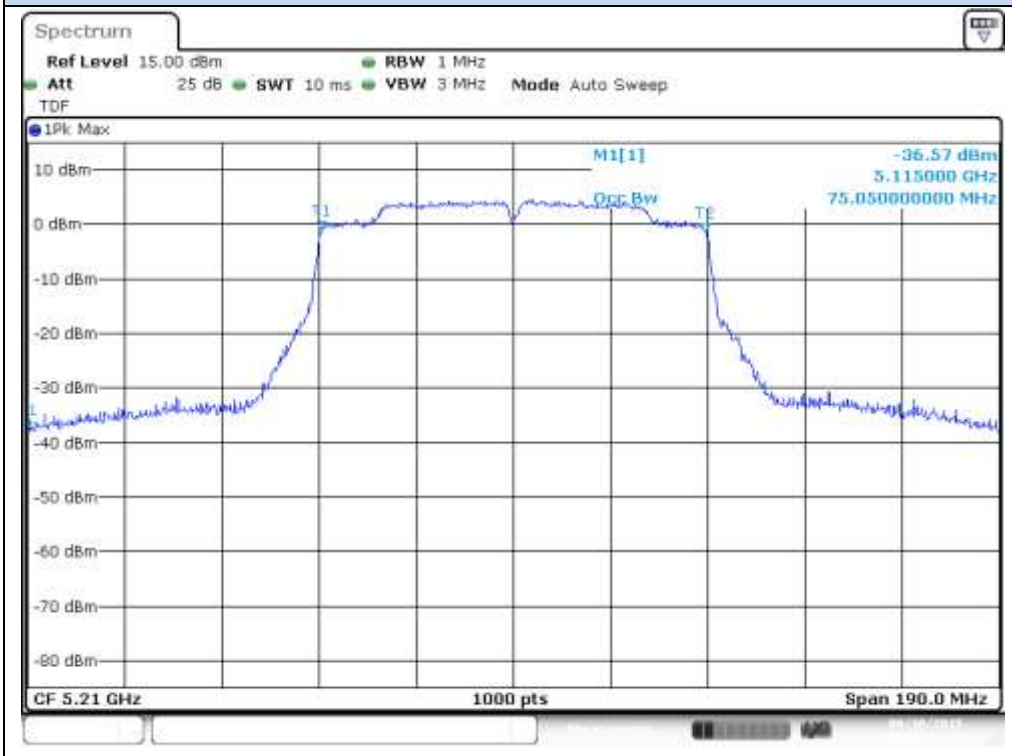
802.11ac80, VHT0 (SISO)

26dB BW, Chain A – CH42ac80



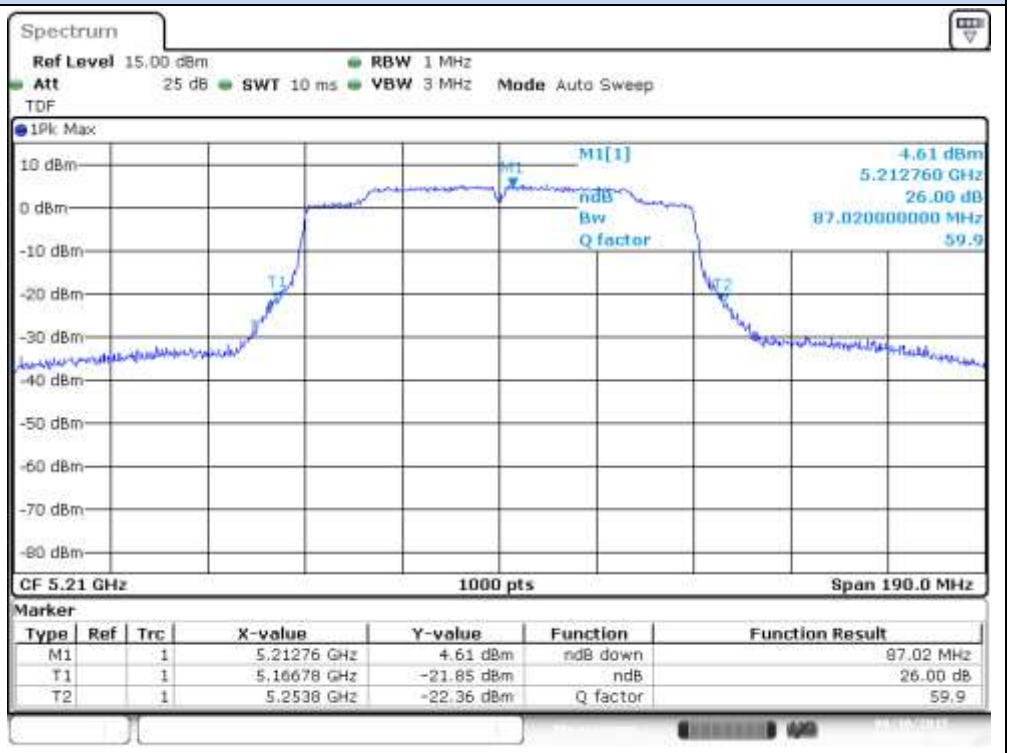
Date: 30.SEP.2015 10:39:02

99% BW, Chain A – CH42ac80

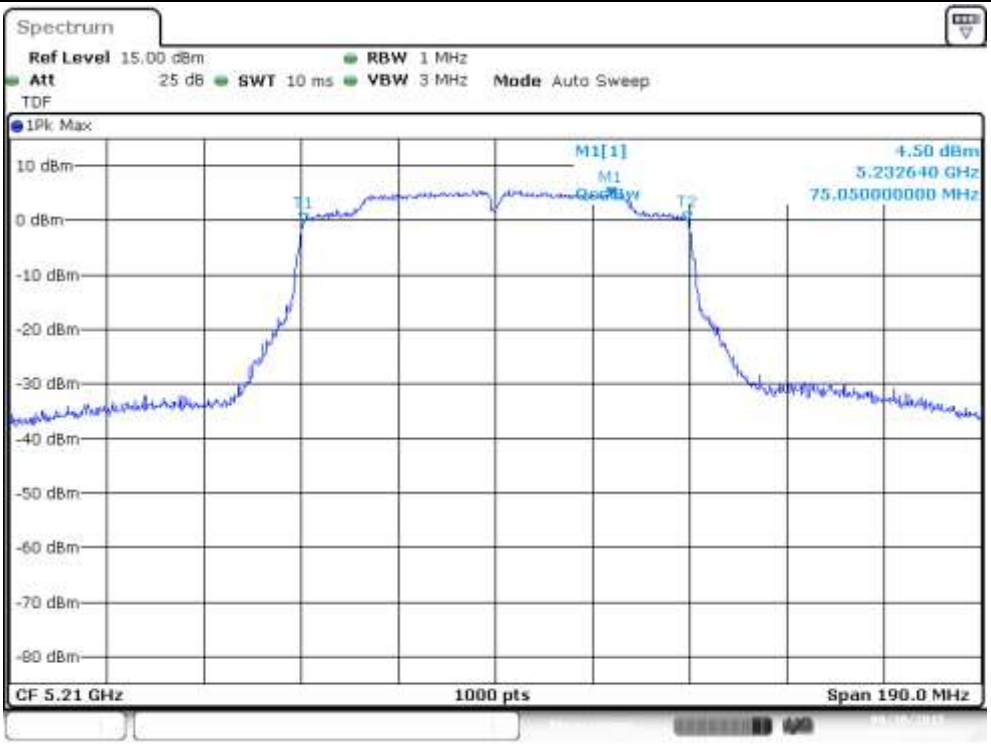


Date: 30.SEP.2015 10:42:39

26dB BW, Chain B – CH42ac80

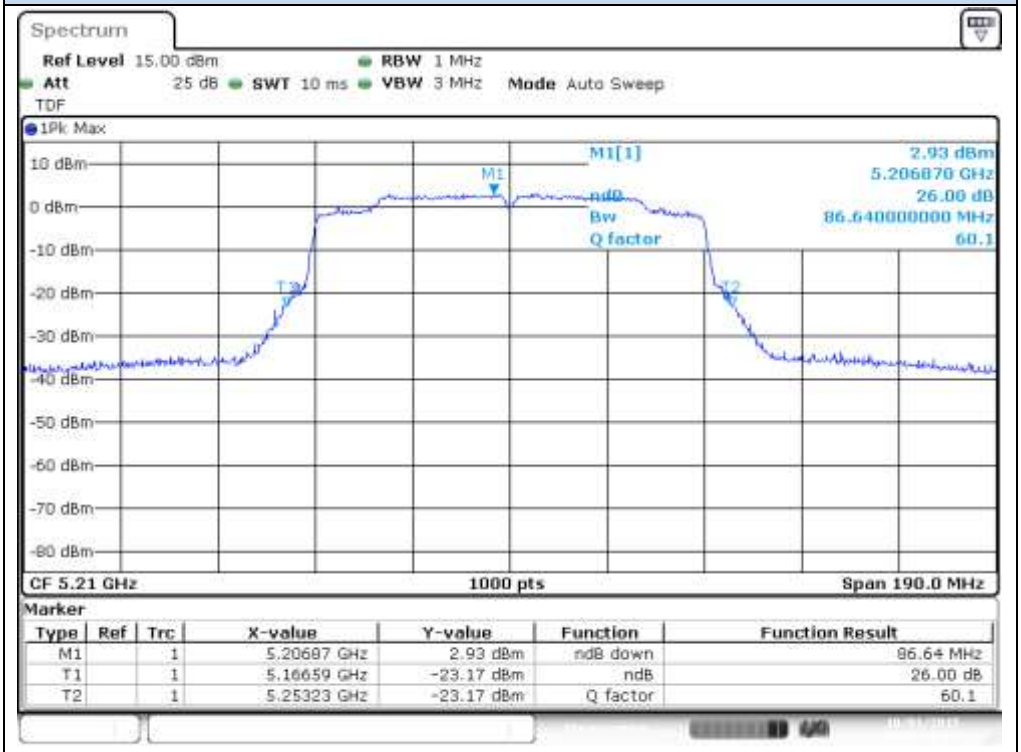


99% BW, Chain B – CH42ac80



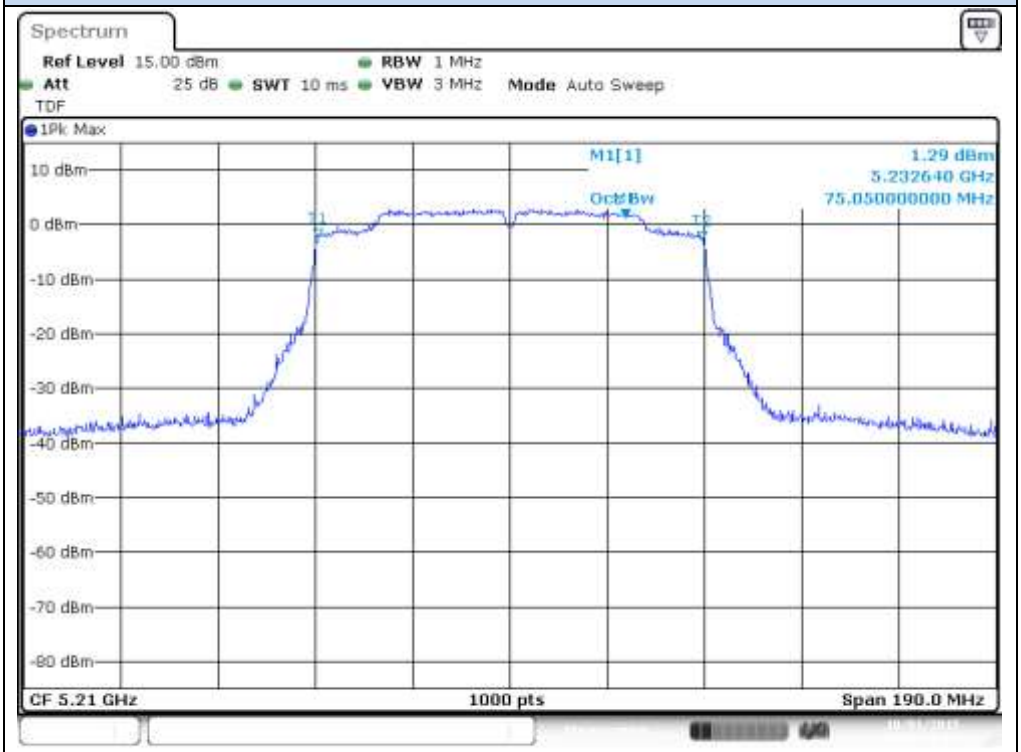
802.11ac80, VHT0 (MIMO)

26dB BW, Chain A – CH42ac80



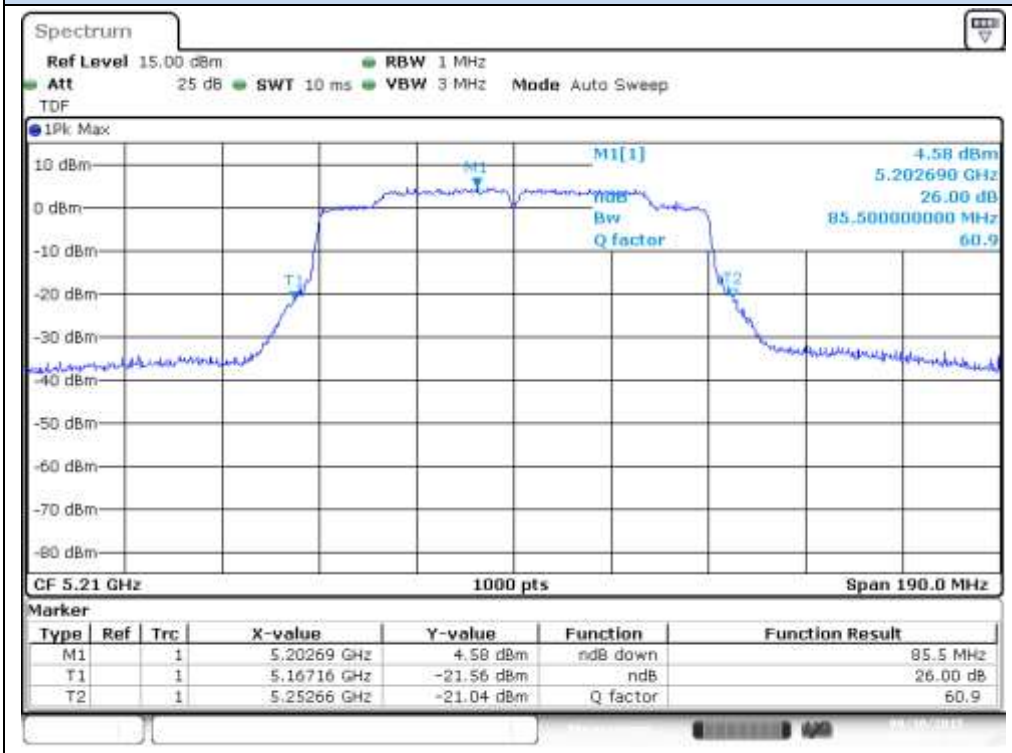
Date: 1.OCT.2015 16:18:16

99% BW, Chain A – CH42ac80



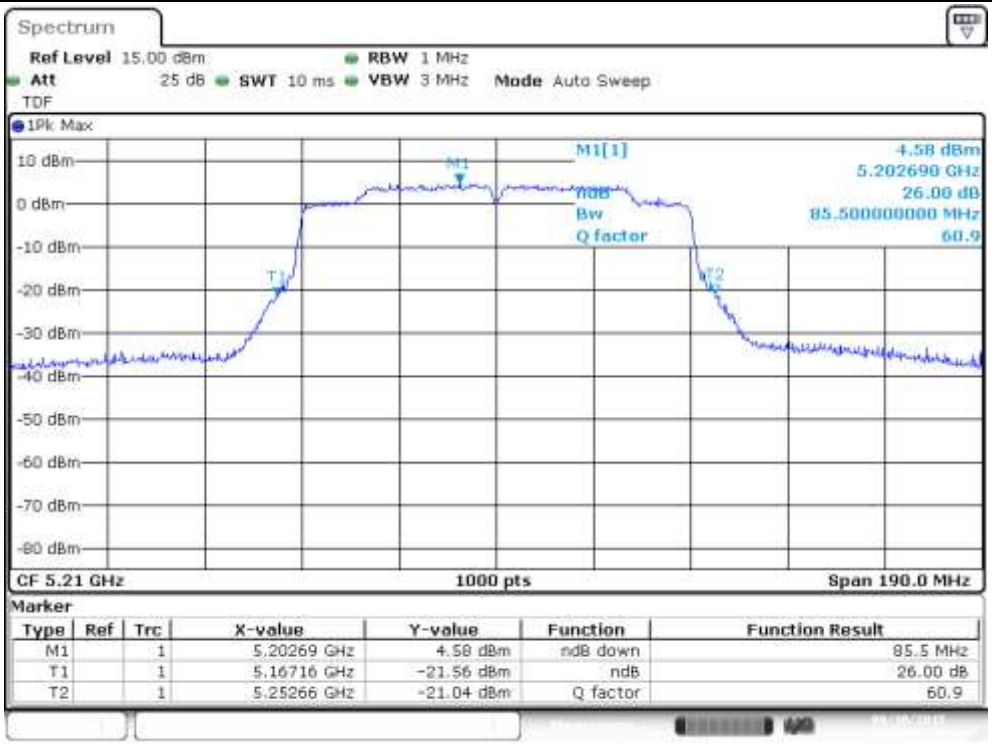
Date: 1.OCT.2015 16:19:21

26dB BW, Chain B – CH42ac80



Date: 30.SEP.2015 11:26:50

99% BW, Chain B – CH42ac80



Date: 30.SEP.2015 11:26:50

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

Test limits

FCC part	Limits
15.407 (a) (1) (iv)	For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

Test procedure

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

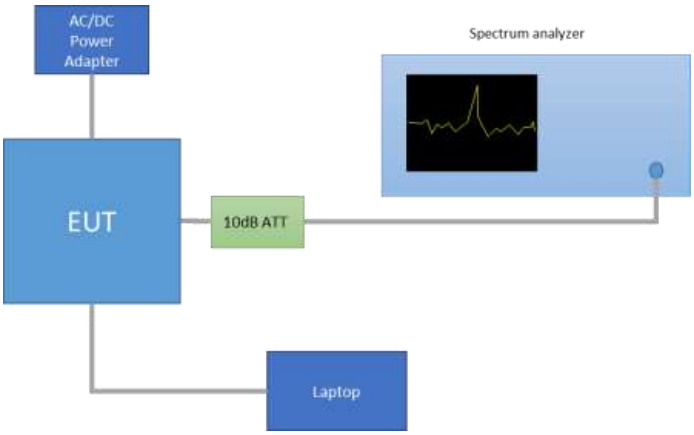
The maximum power spectral density (PSD) was measured using the method according to point F) (Method SA-2 Alternative) of Guidance 789033 D01.

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

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

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

The declared maximum antenna gain is 5dBi.



Results tables

Mode	Rate	Meas. Duty Cycle [%]	CH	Freq. [MHz]	Antenna	Power [dBm]			
						Meas. Cond RMS	Duty cycle Compensated	EIRP	PSD Duty cycle Compensated
802.11a	6Mbps	97.8	36	5180	SISO CHAIN A	18.27	18.37	23.37	7.42
					SISO CHAIN B	18.12	18.22	23.22	7.26
			40	5200	SISO CHAIN A	19.97	20.07	25.07	9.07
					SISO CHAIN B	19.93	20.03	25.03	9.04
			48	5240	SISO CHAIN A	21.1	**21.20**	26.20	10.15
					SISO CHAIN B	21.07	21.17	26.17	10.14
802.11n20	HT0	97.9	36	5180	SISO CHAIN A	18.15	18.24	23.24	7.09
					SISO CHAIN B	17.84	17.93	22.93	6.79
			40	5200	SISO CHAIN A	19.94	20.03	25.03	8.86
					SISO CHAIN B	19.67	19.76	24.76	8.60
			48	5240	SISO CHAIN A	21.05	21.14	26.14	9.92
					SISO CHAIN B	21.08	21.17	26.17	9.94
	HT8	96.3	36	5180	MIMO CHAIN A	16.87	17.03	22.03	5.89
					MIMO CHAIN B	16.46	16.62	21.62	5.49
			40	5200	MIMO CHAIN A	18.68	18.84	23.84	7.70
					MIMO CHAIN B	18.53	18.69	23.69	7.54
			48	5240	MIMO CHAIN A	18.18	18.34	23.34	7.21
					MIMO CHAIN B	18.01	18.17	23.17	7.03
802.11n40	HT0	96.1	38F	5190	SISO CHAIN A	16.69	16.86	16.86	2.39
					SISO CHAIN B	15.84	16.01	16.01	1.56
			46F	5230	SISO CHAIN A	20.04	20.21	20.21	5.74
					SISO CHAIN B	19.63	19.80	19.80	5.35
	HT8	93.4	38F	5190	MIMO CHAIN A	12.69	12.99	17.99	-1.41
					MIMO CHAIN B	11.74	12.04	17.04	-2.33
			46F	5230	MIMO CHAIN A	18.13	18.43	23.43	4.04
					MIMO CHAIN B	18.10	18.40	23.40	3.99
802.11ac80	VHT0	92.2	42ac80	5210	SISO CHAIN A	13.19	13.54	18.54	-3.71
					SISO CHAIN B	13.02	13.37	18.37	-3.85
	VHT0	88.4	42ac80	5210	MIMO CHAIN A	10.84	11.37	16.37	-5.68
					MIMO CHAIN B	11.44	11.97	16.97	-5.13

Max Value

MIMO modes – Combined results					Power [dBm]		
Mode	**Rate**	**Channel**	**Frequency (MHz)**	**Antenna**	**Combined, Duty Cycle compensated**	**EIRP**	**Combined PSD**
802.11n20	HT8	36	5180	MIMO CHAIN A + CHAIN B	19.84	24.84	8.71
		40	5200		**21.78**	26.78	10.64
		48	5240		21.27	26.27	10.14
802.11n40	HT8	38F	5190		15.55	20.55	1.16
		46F	5230		21.42	26.42	7.02
802.11ac80	VHT0	42ac80	5210		14.70	19.70	-2.38

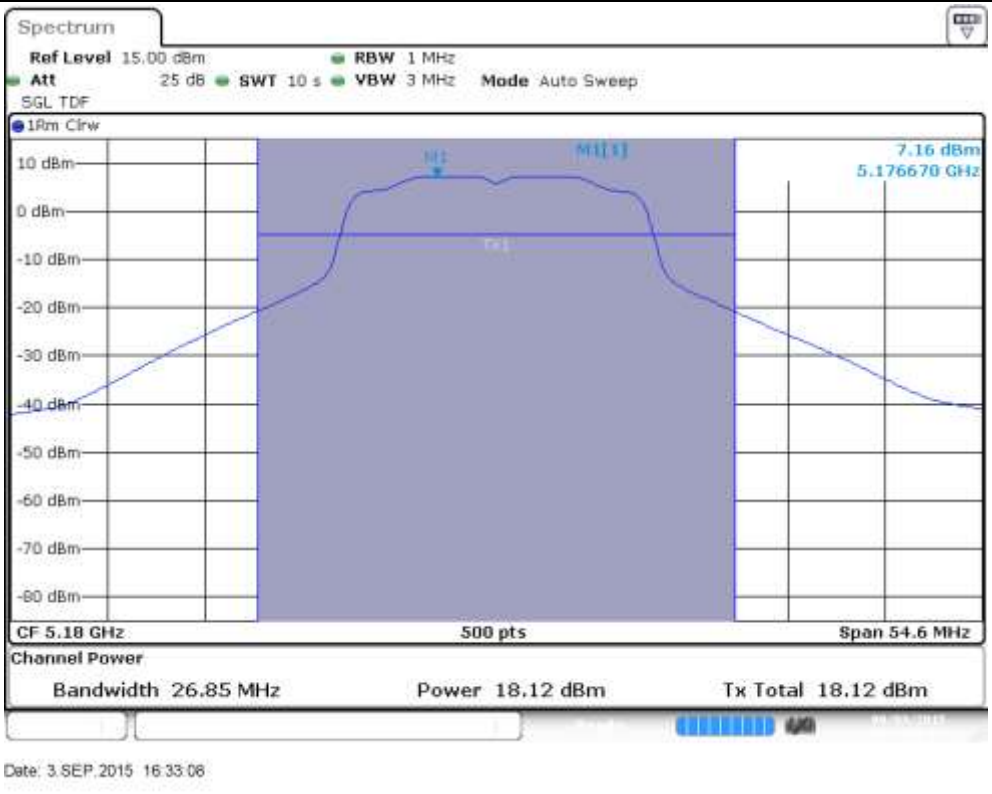
Max Value

Results screenshot

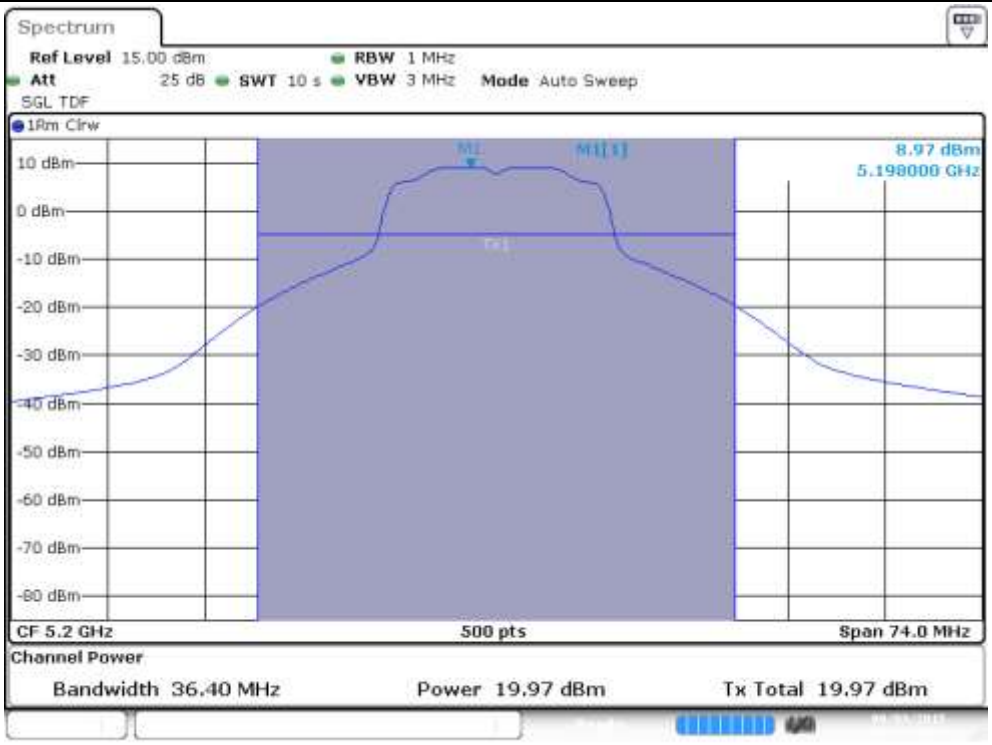
802.11a, 6Mbps

Max Power & PSD, Chain A – CH36

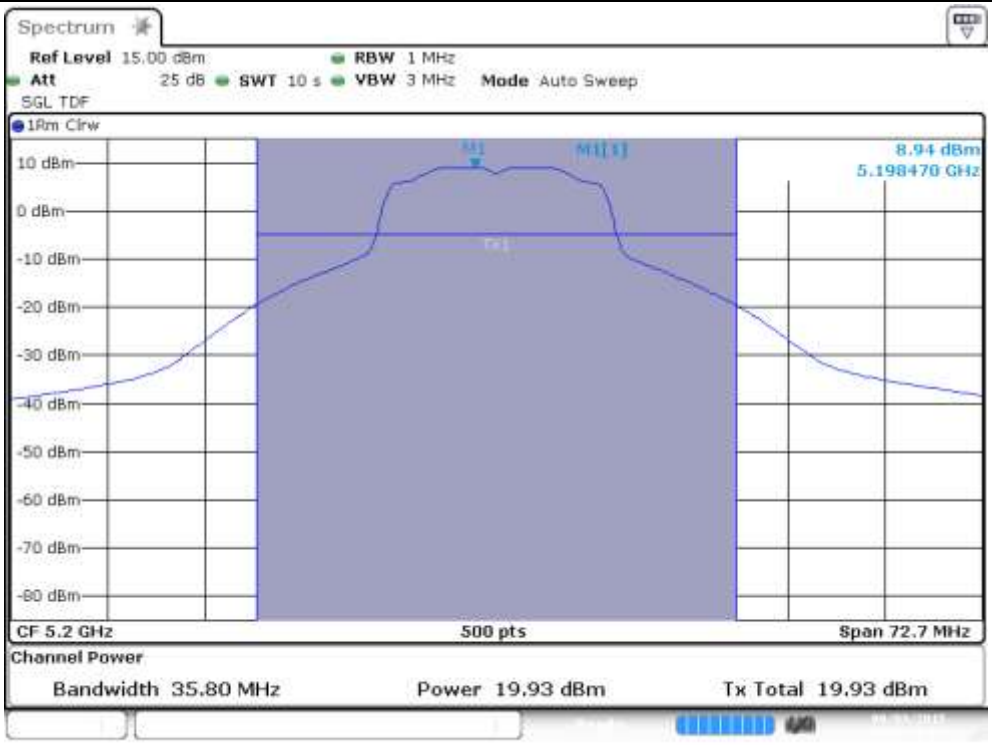
Max Power & PSD, Chain B – CH36



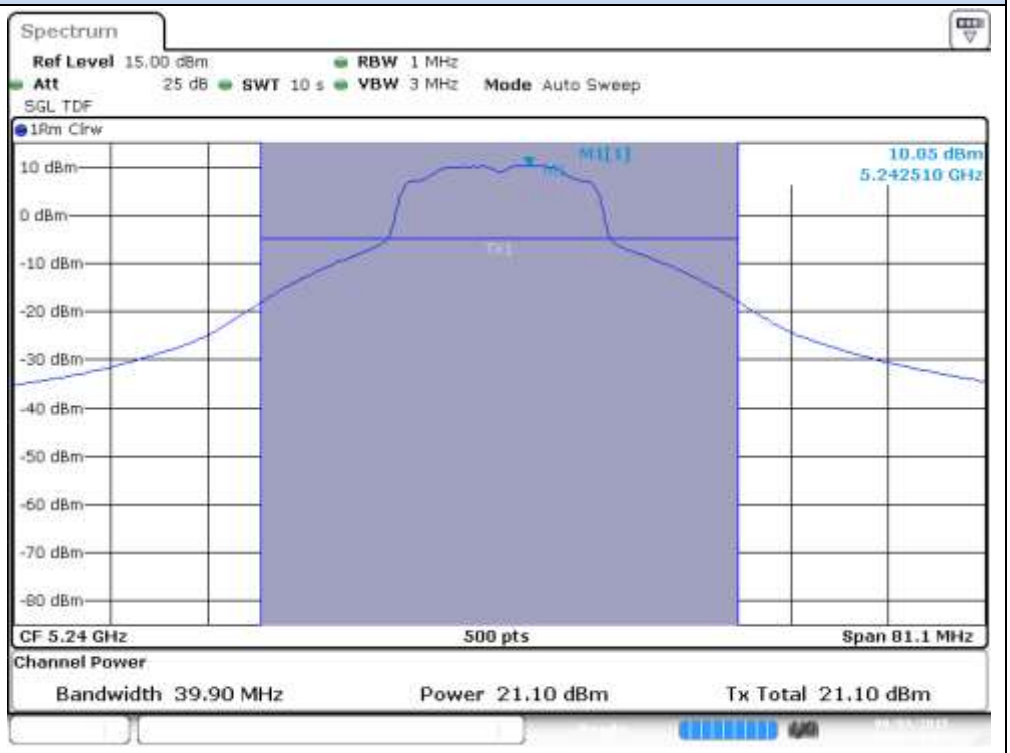
Max Power & PSD, Chain A – CH40



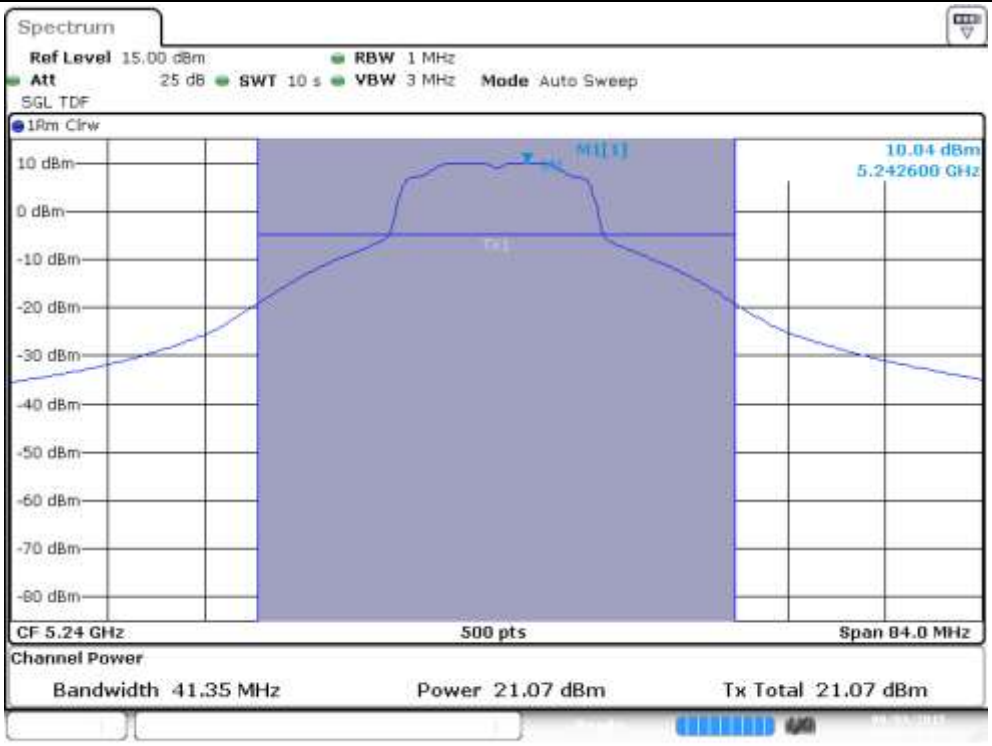
Max Power & PSD, Chain B – CH40



Max Power & PSD, Chain A – CH48

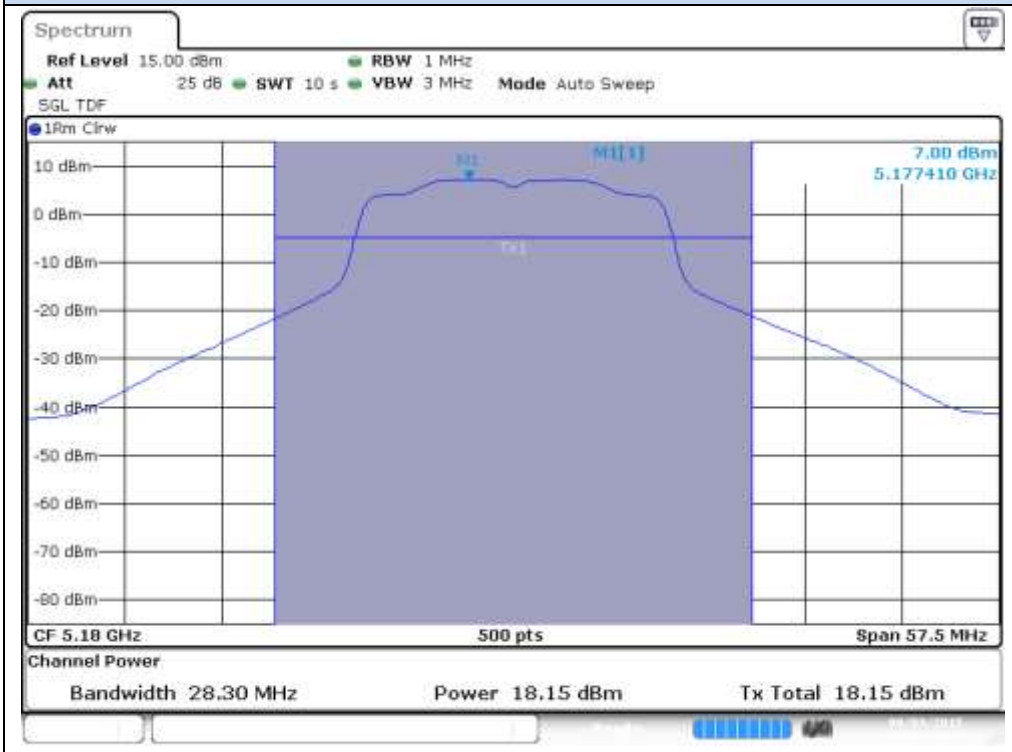


Max Power & PSD, Chain B – CH48

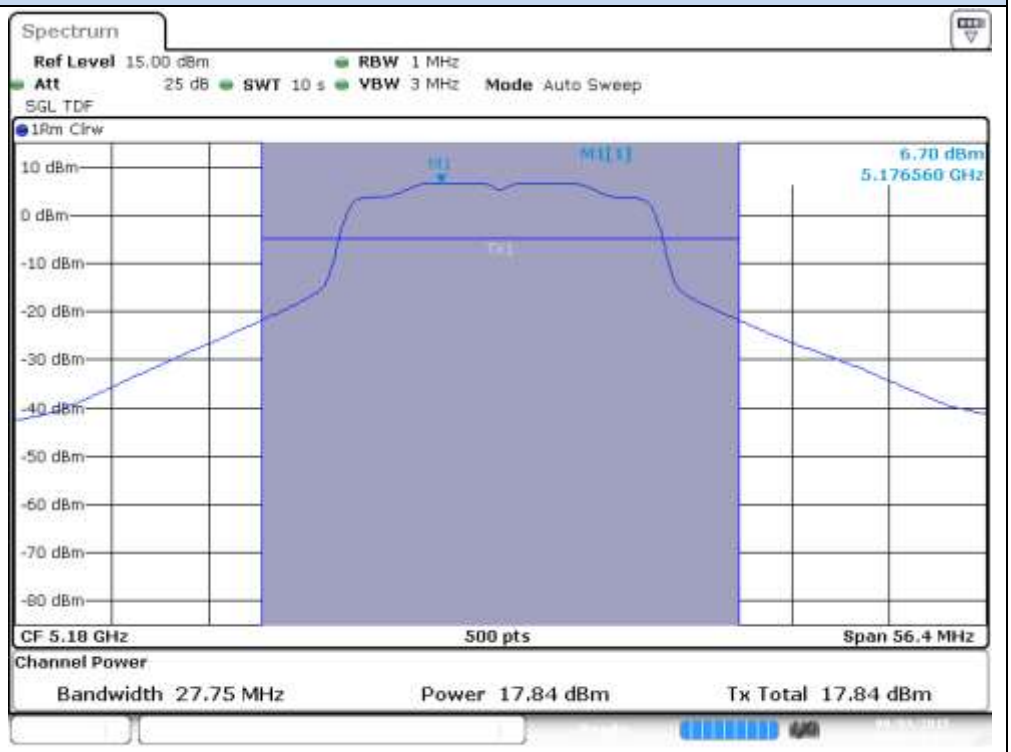


802.11n20, HT0 (SISO)

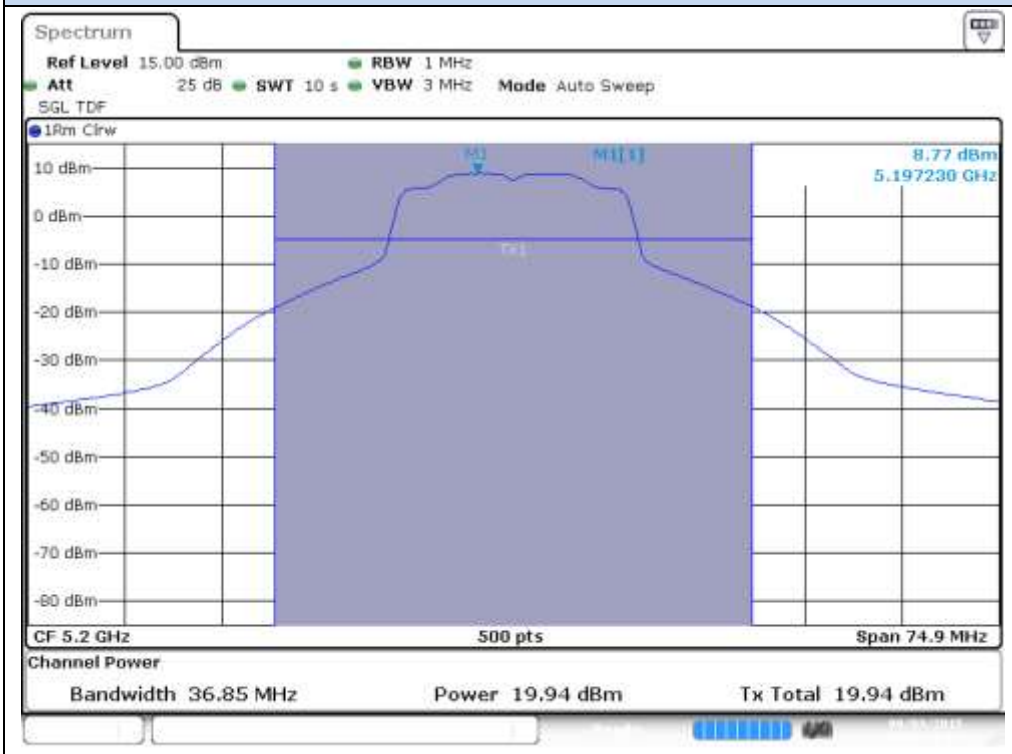
Max Power & PSD, Chain A – CH36



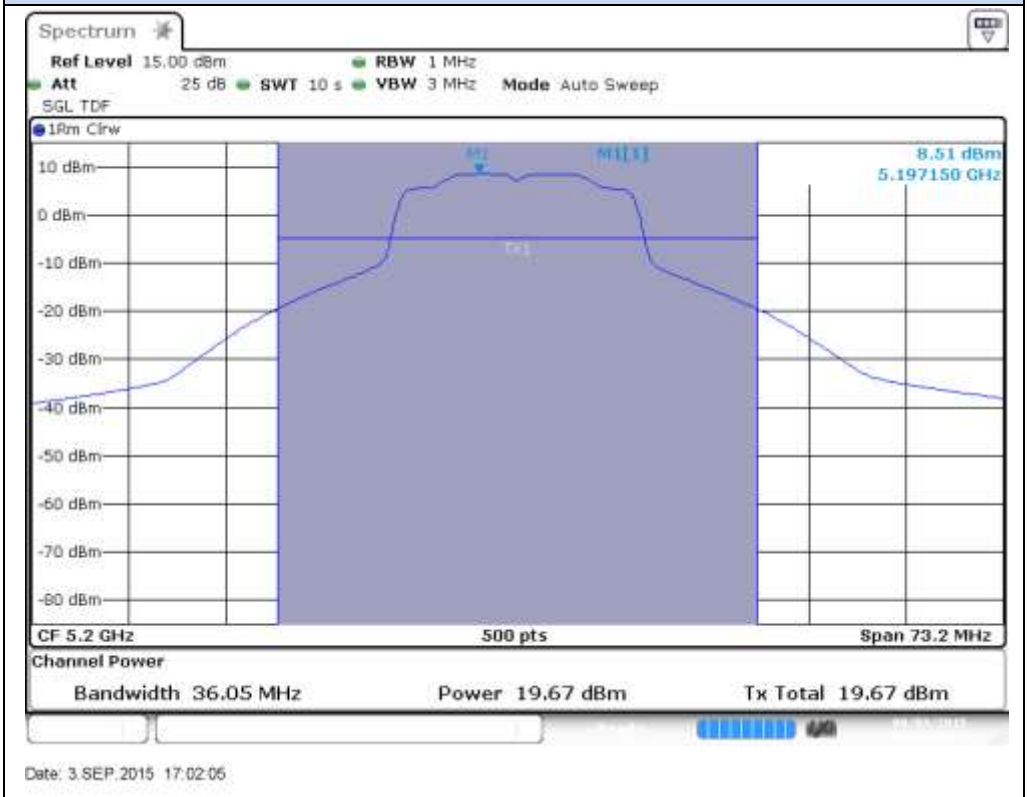
Max Power & PSD, Chain B – CH36



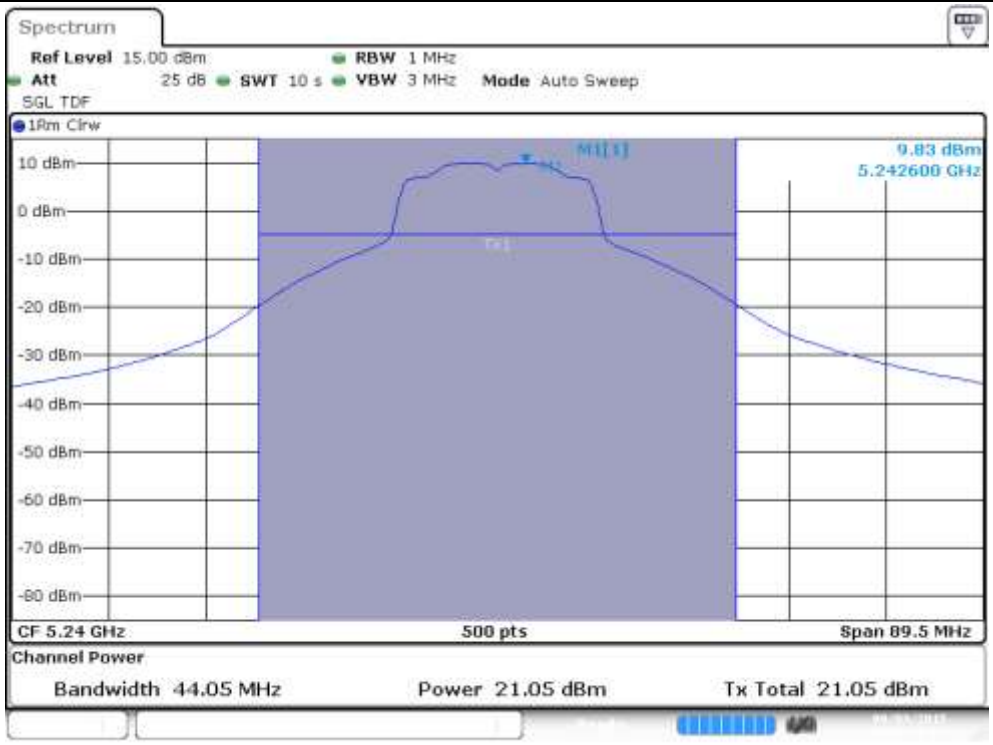
Max Power & PSD, Chain A – CH40



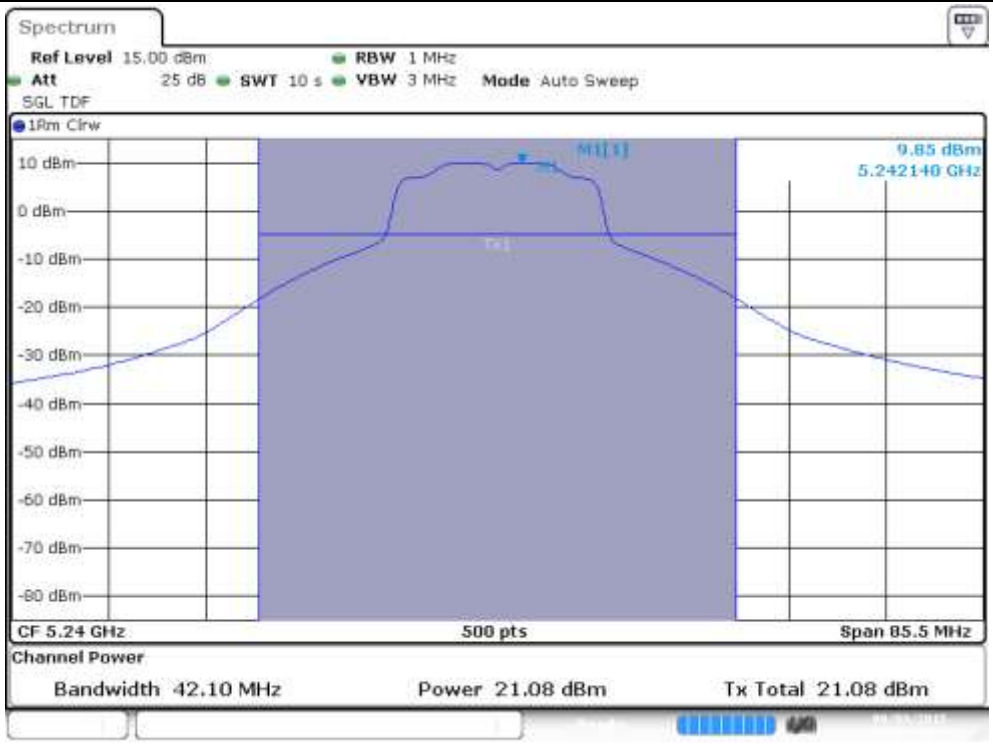
Max Power & PSD, Chain B – CH40



Max Power & PSD, Chain A – CH48

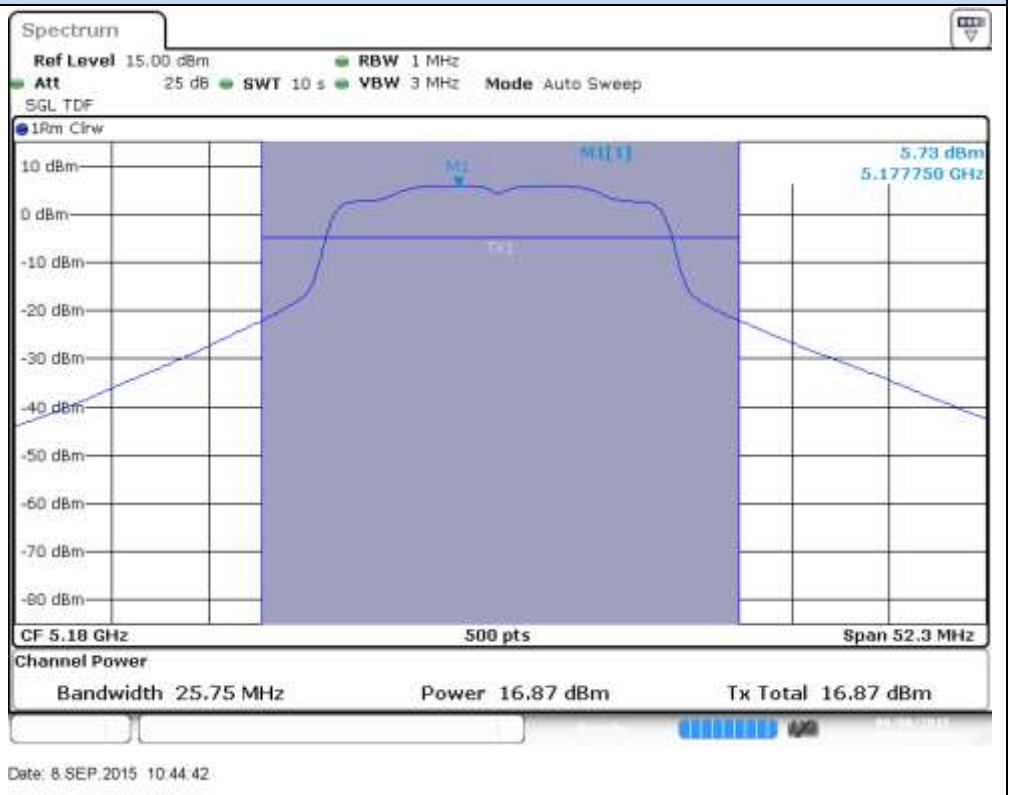


Max Power & PSD, Chain B – CH48



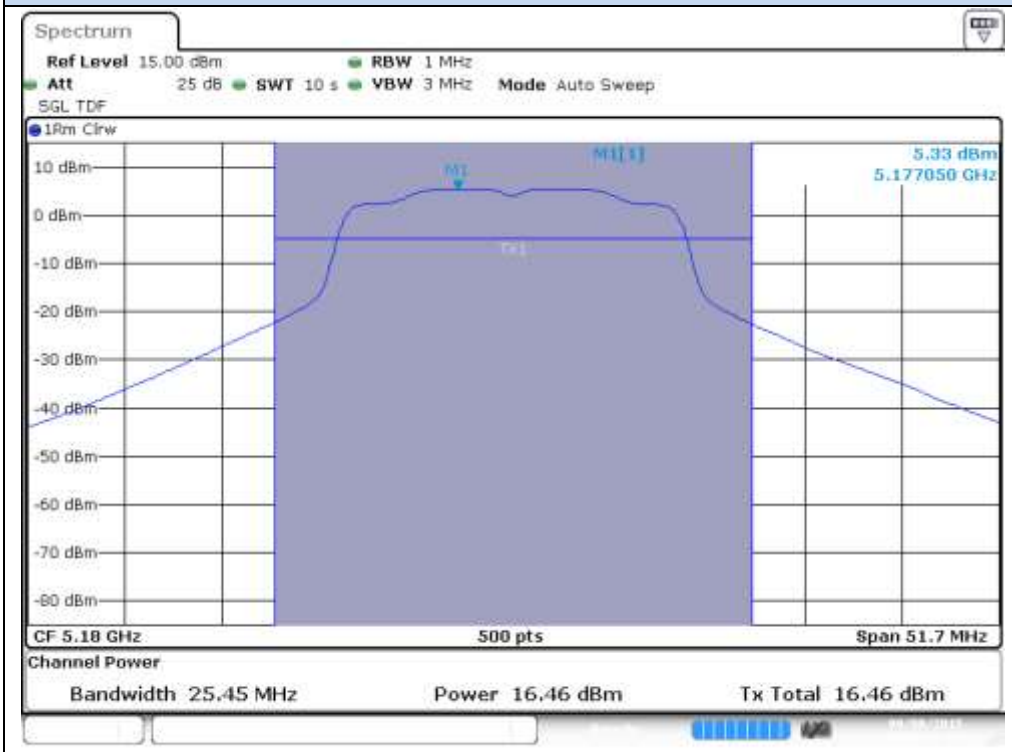
802.11n20, HT8 (MIMO)

Max Power & PSD, Chain A – CH36



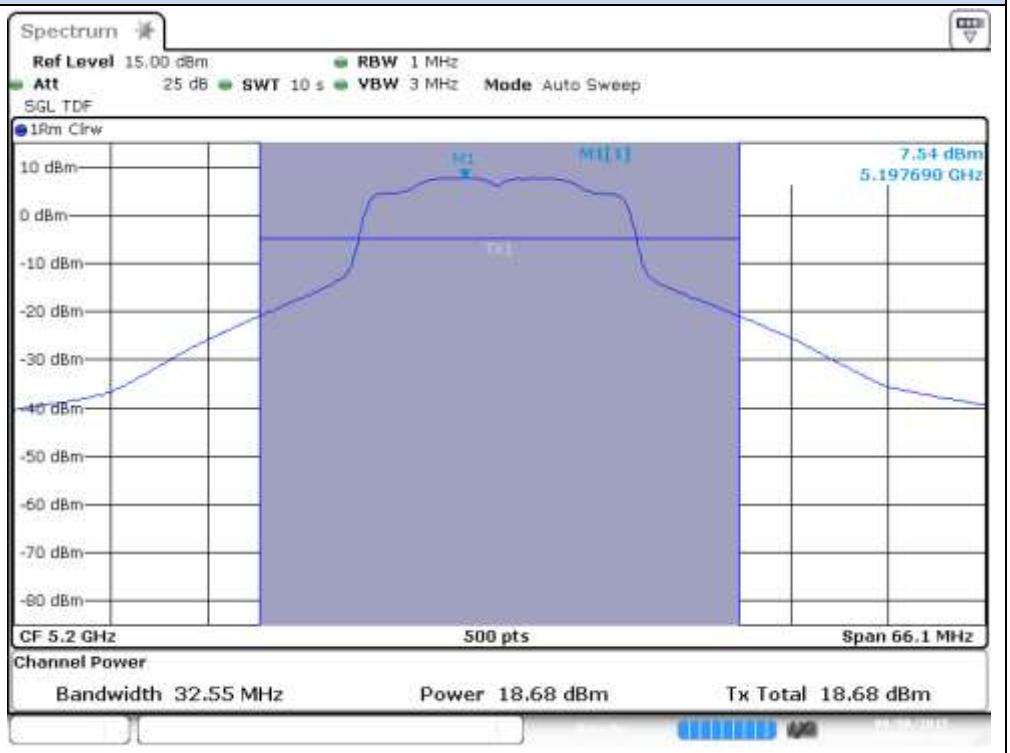
Date: 8.SEP.2015 10:44:42

Max Power & PSD, Chain B – CH36



Date: 8.SEP.2015 11:45:38

Max Power & PSD, Chain A – CH40

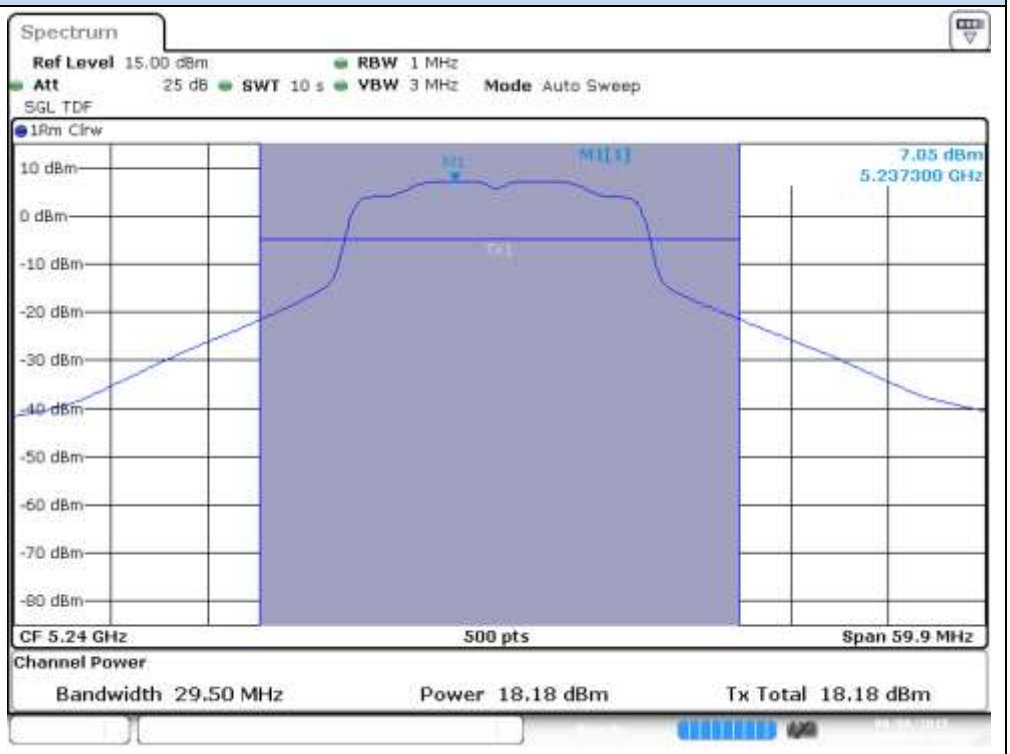


Date: 8.SEP.2015 10:52:27

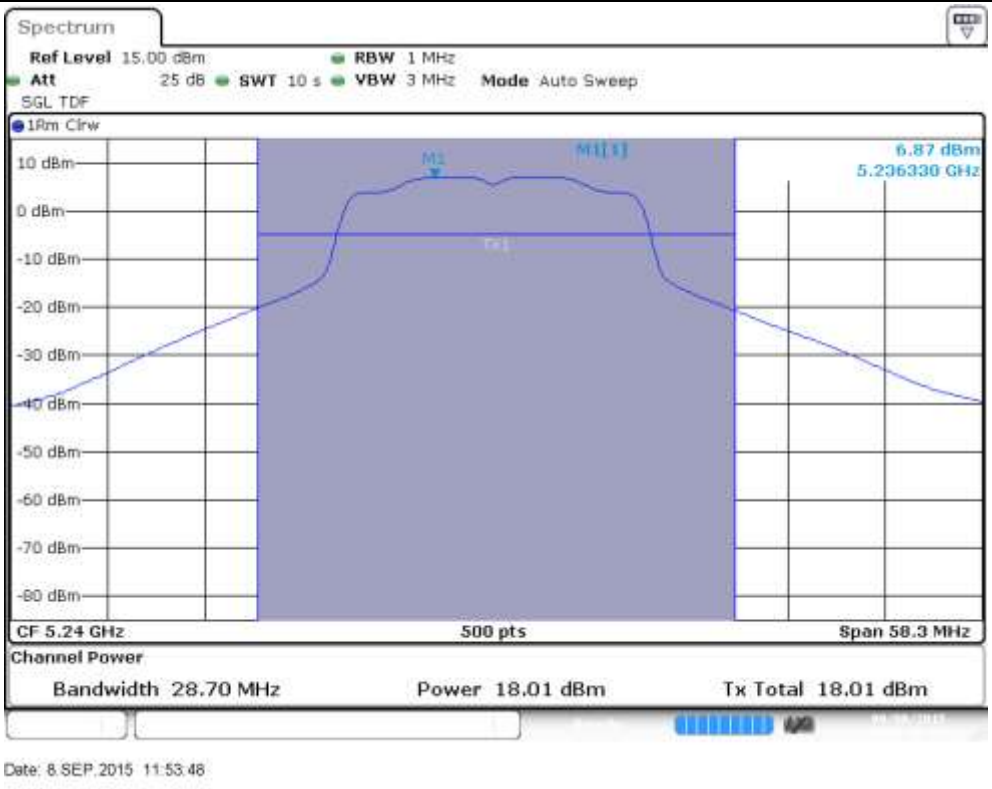
Max Power & PSD, Chain B – CH40

Date: 8.SEP.2015 11:51:22

Max Power & PSD, Chain A – CH48

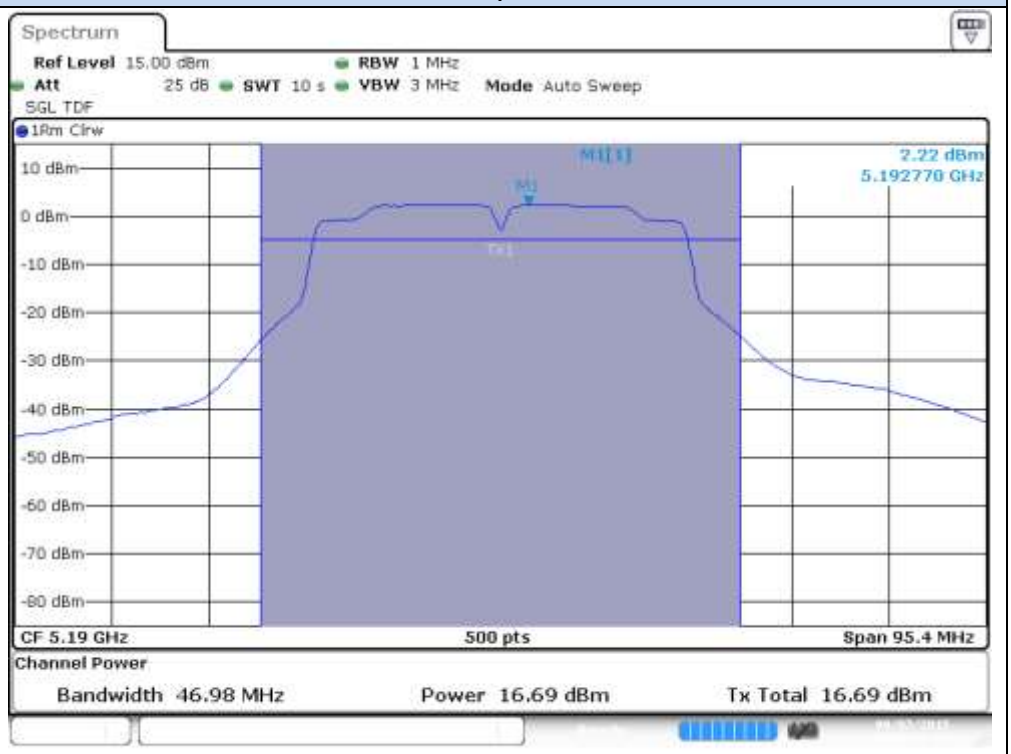


Max Power & PSD, Chain B – CH48



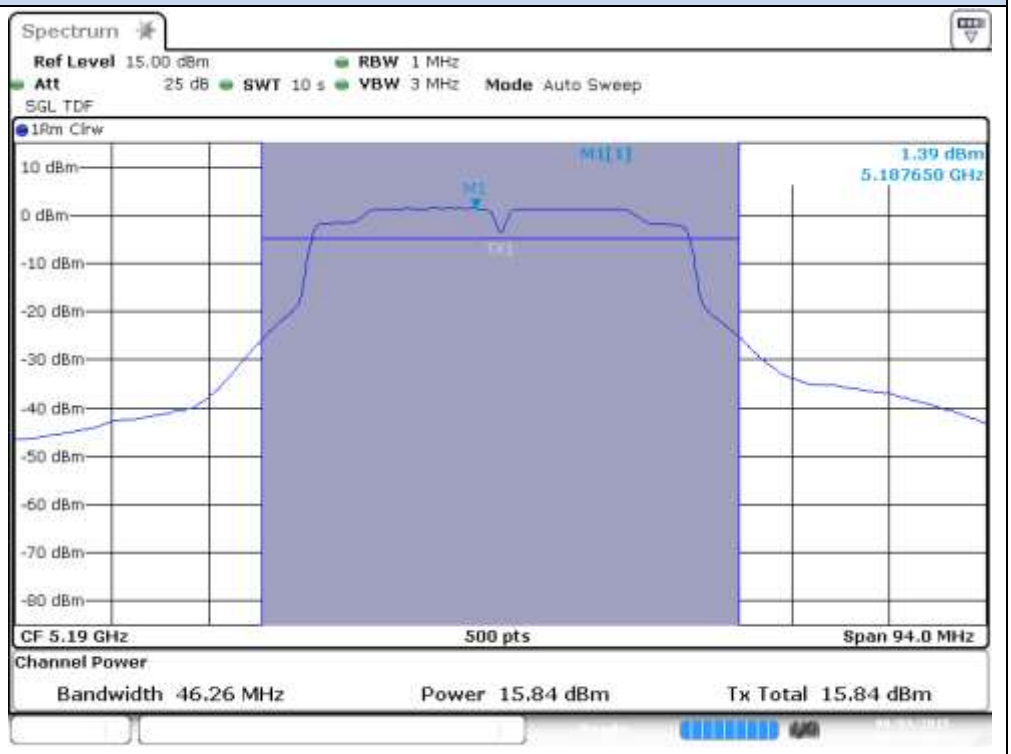
802.11n40, HT0 (SISO)

Max Power & PSD, Chain A – CH38F



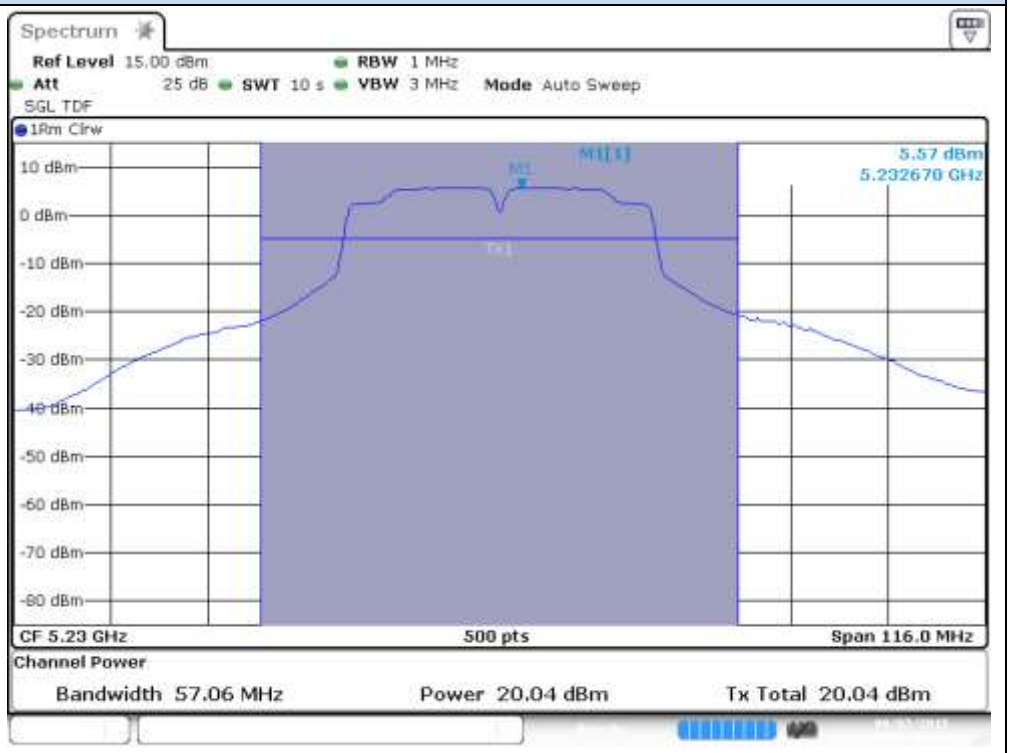
Date: 7.SEP.2015 10:44:19

Max Power & PSD, Chain B – CH38F

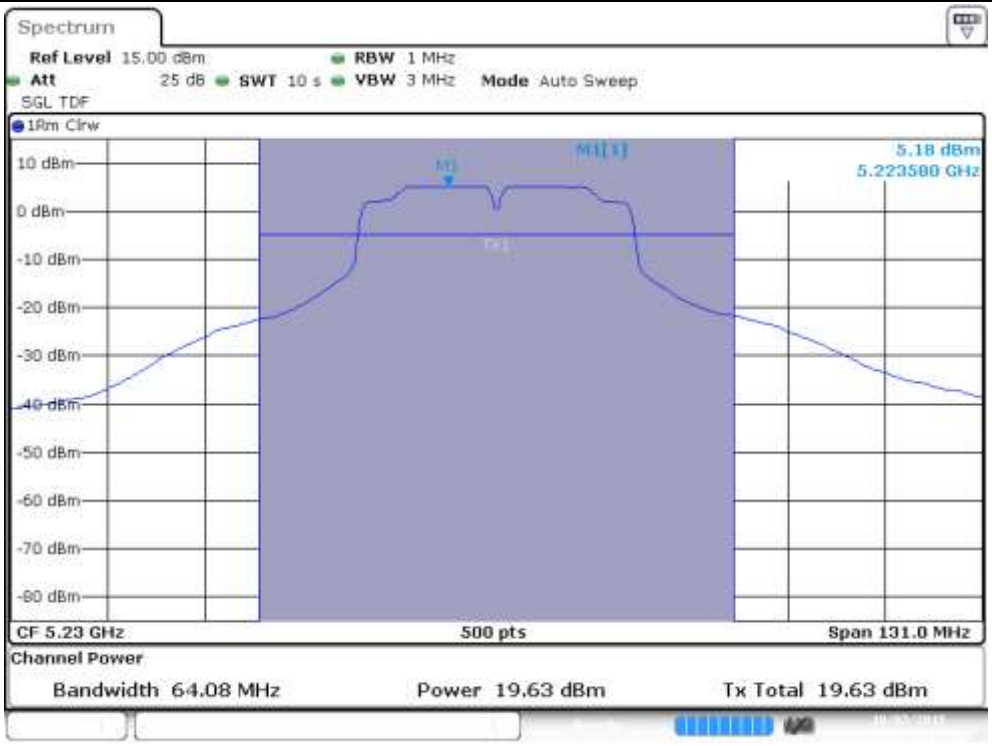


Date: 3.SEP.2015 18:13:48

Max Power & PSD, Chain A – CH46F

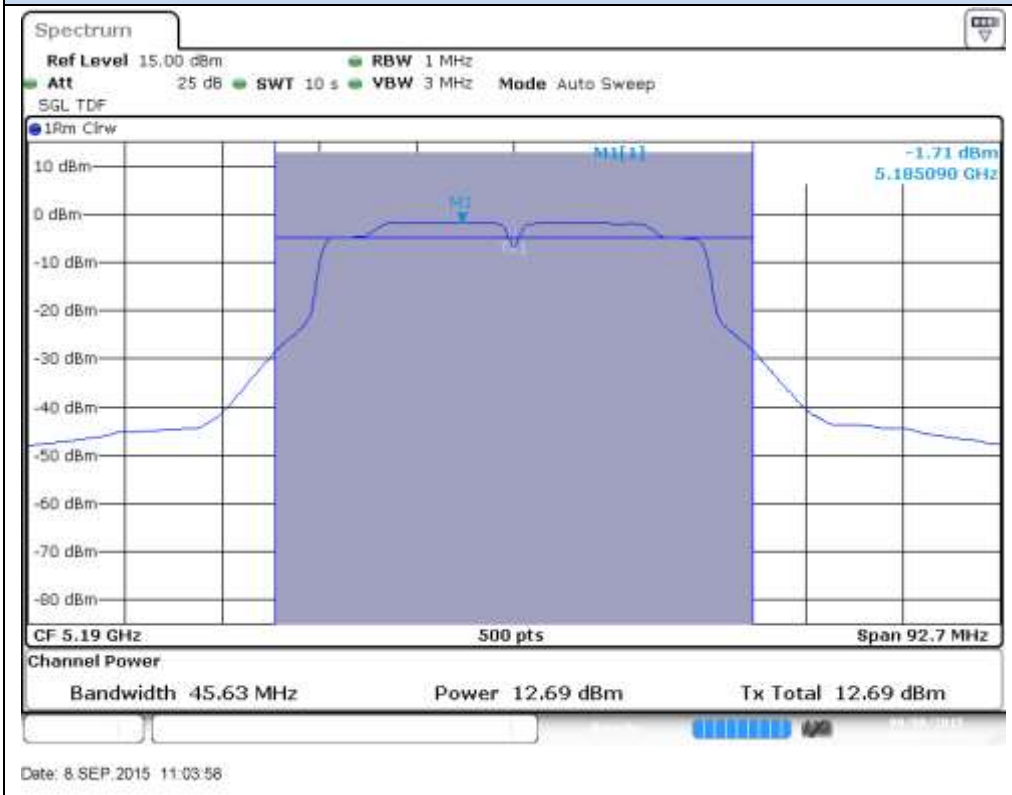


Max Power & PSD, Chain B – CH46F

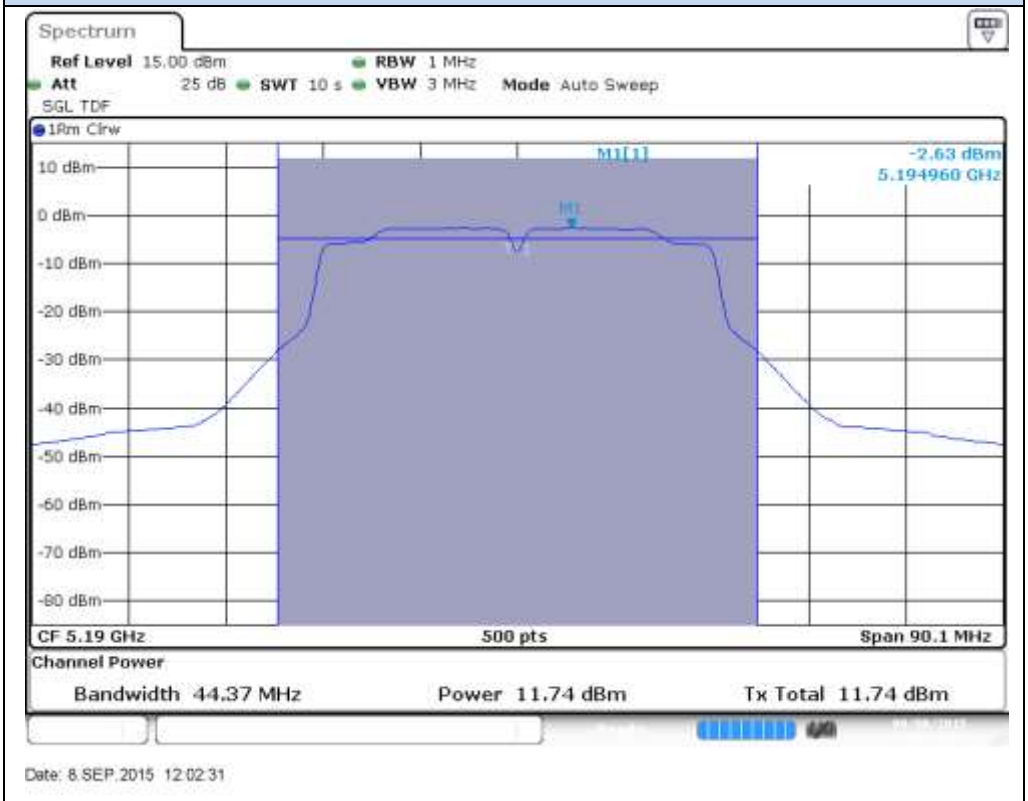


802.11n40, HT8 (MIMO)

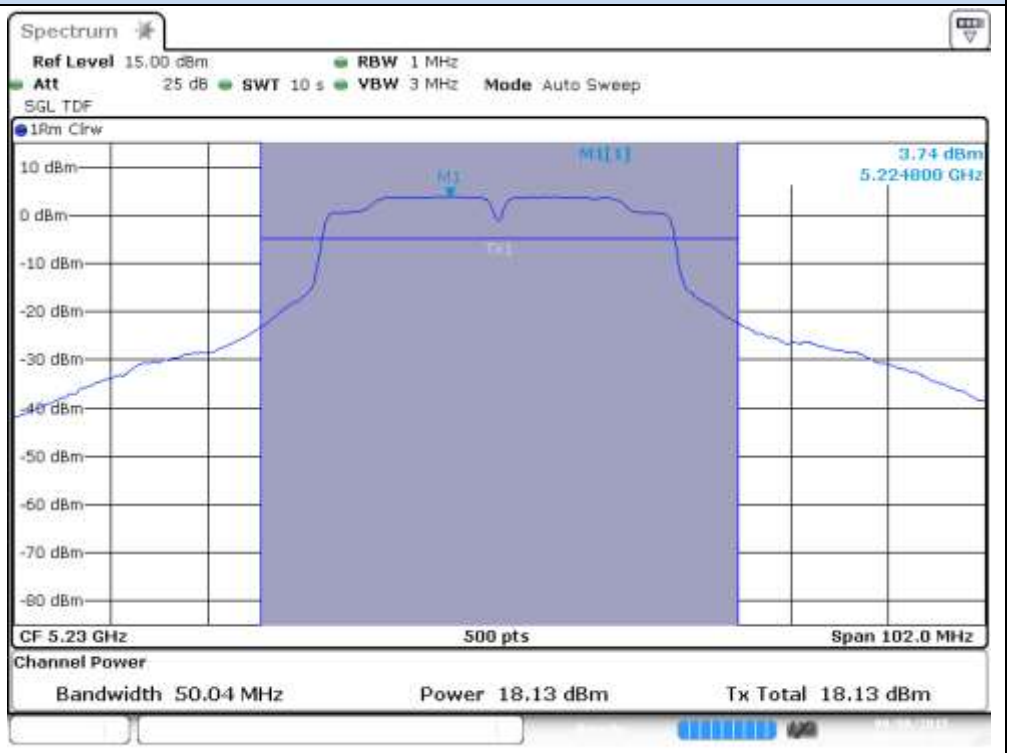
Max Power & PSD, Chain A – CH38F



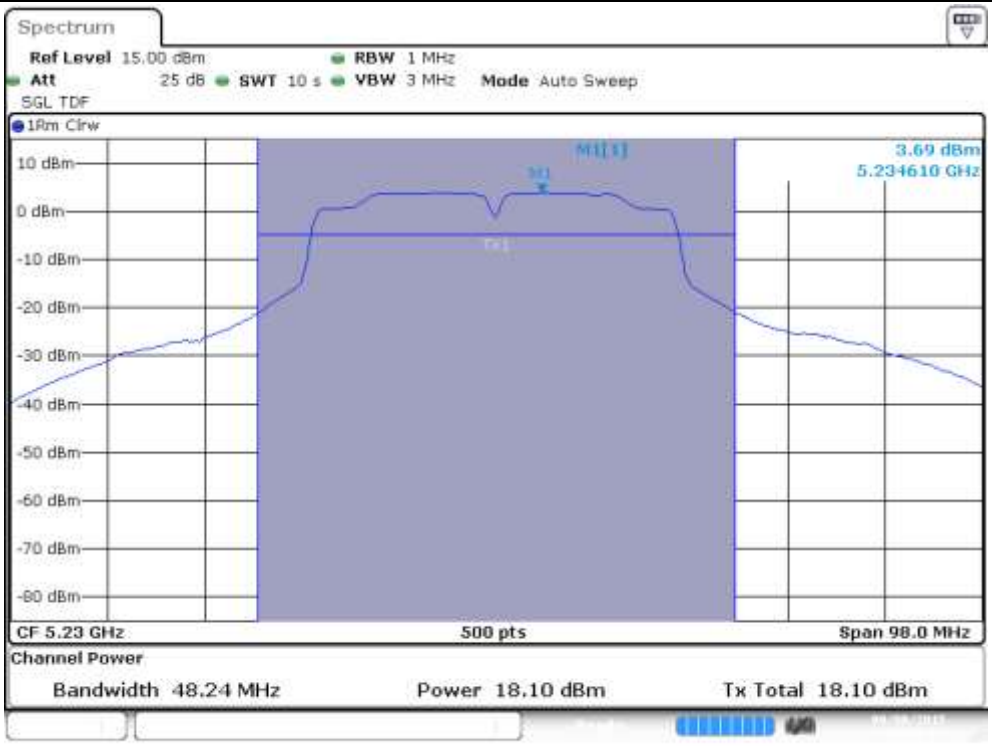
Max Power & PSD, Chain B – CH38F



Max Power & PSD, Chain A – CH46F

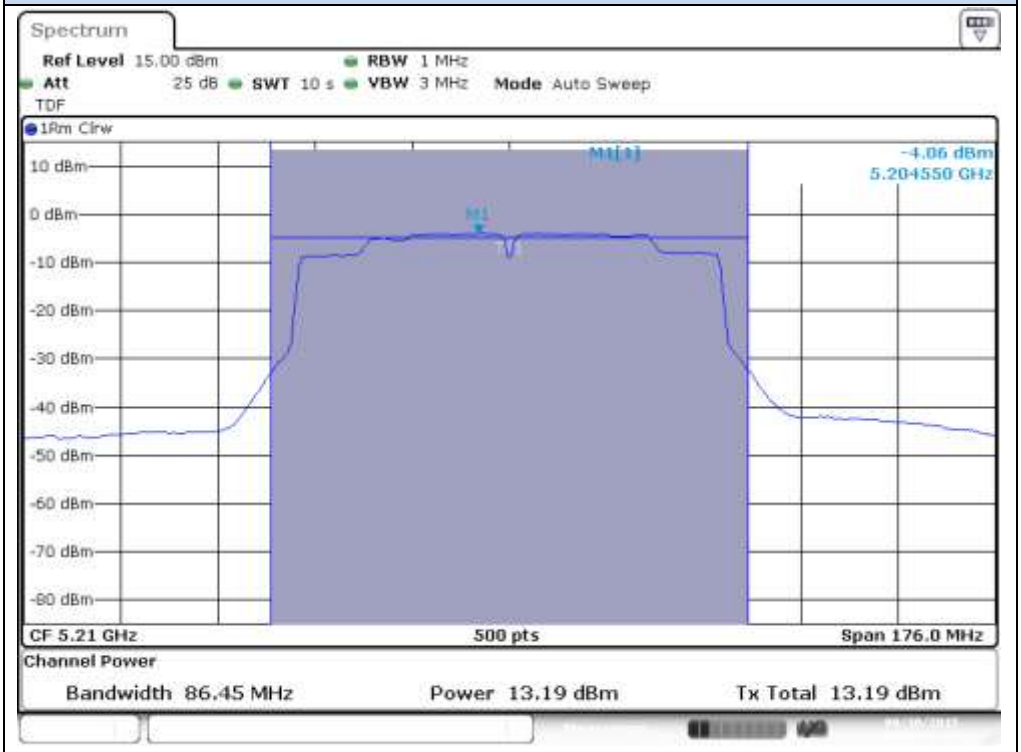


Max Power & PSD, Chain B – CH46F



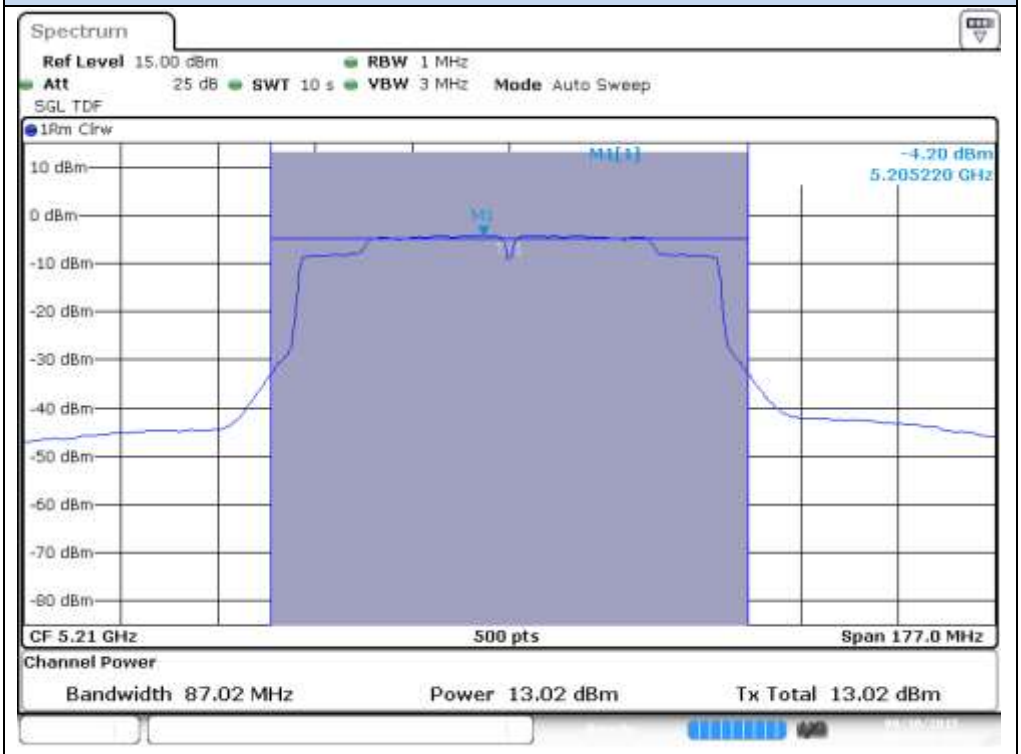
802.11ac80, VHT0 (SISO)

Max Power & PSD, Chain A – CH42ac80



Date: 30.SEP.2015 11:05:33

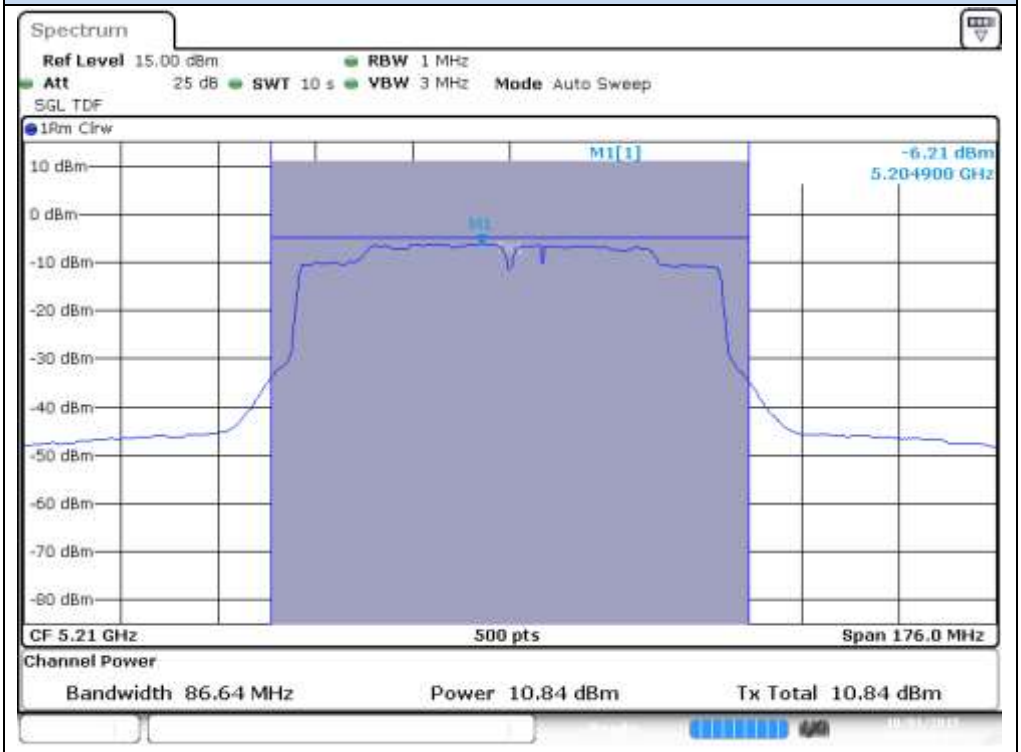
Max Power & PSD, Chain B – CH42ac80



Date: 30.SEP.2015 11:21:49

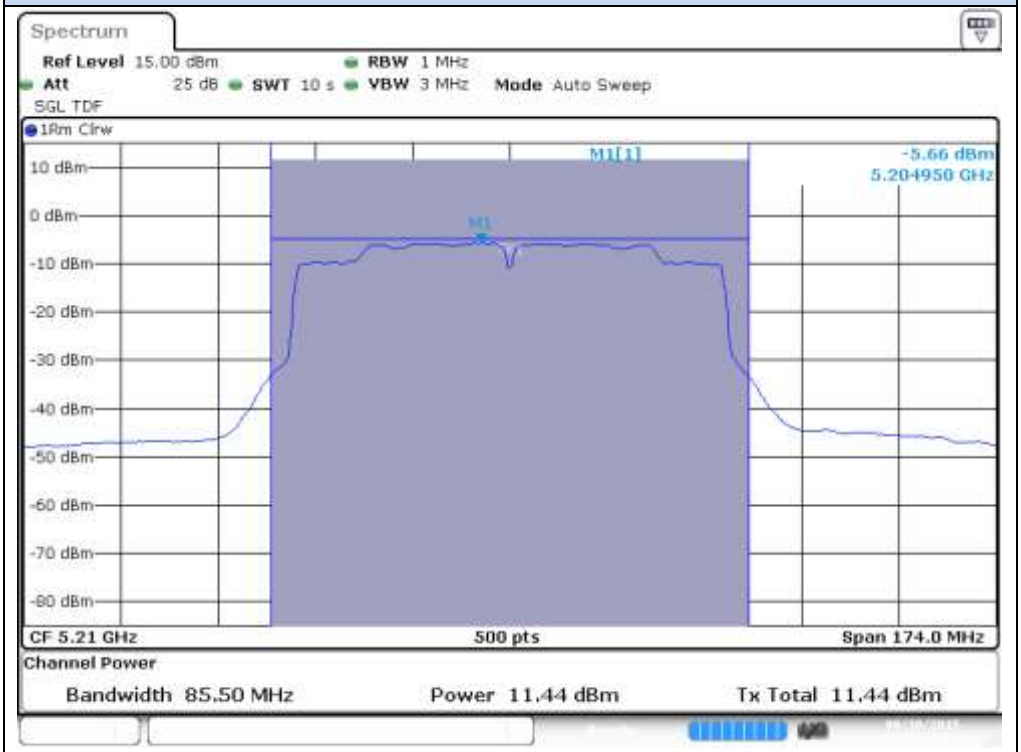
802.11ac80, VHT0 (MIMO)

Max Power & PSD, Chain A – CH42ac80



Date: 1.OCT.2015 16:52:08

Max Power & PSD, Chain B – CH42ac80



Date: 30.SEP.2015 11:28:32

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

Test limits

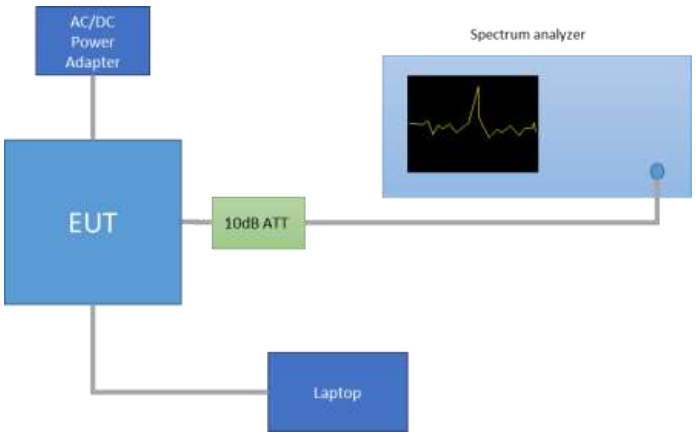
<table>
<tr><th>FCC part</th><th>Limits</th></tr>
<tr><td>15.407 (b) (1)</td><td>For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.</td></tr>
<tr><td>15.209</td><td>Radiated emissions which fall in the restricted 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 the maximum peak output power. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss and the declared Antenna Gain.

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

The declared maximum antenna gain is 5dBi.



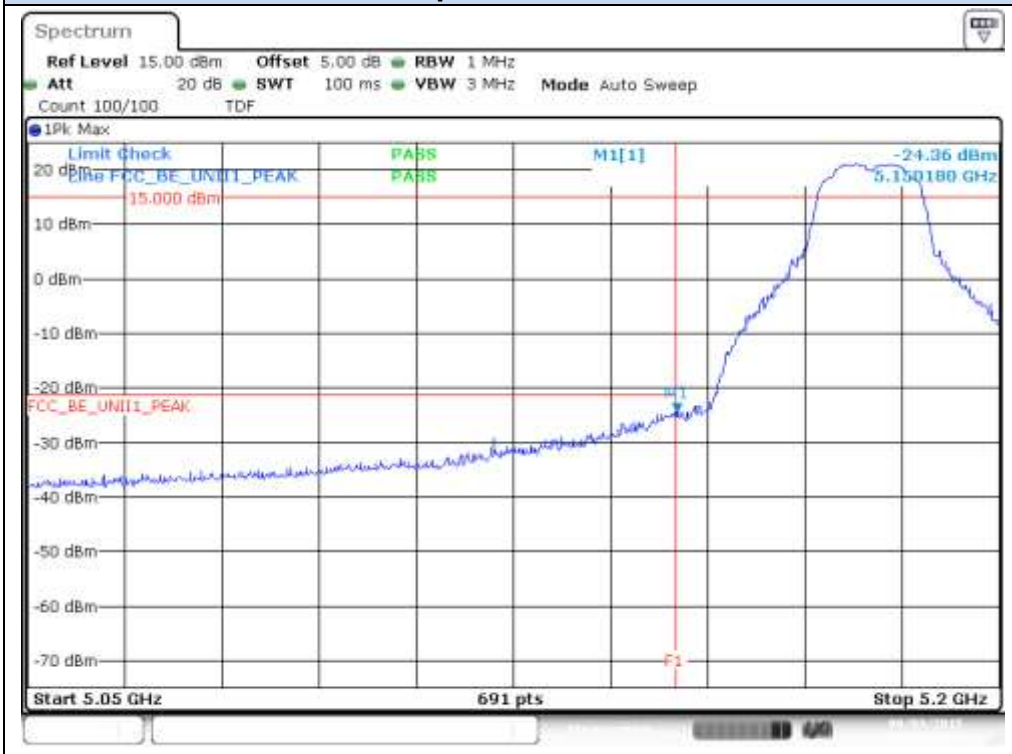
All values reported are converted in dBm, the table below shows the limits of the radiated emission (FCC part 15.209(a)) converted from dBµV/m to dBm.

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

Results Screenshot

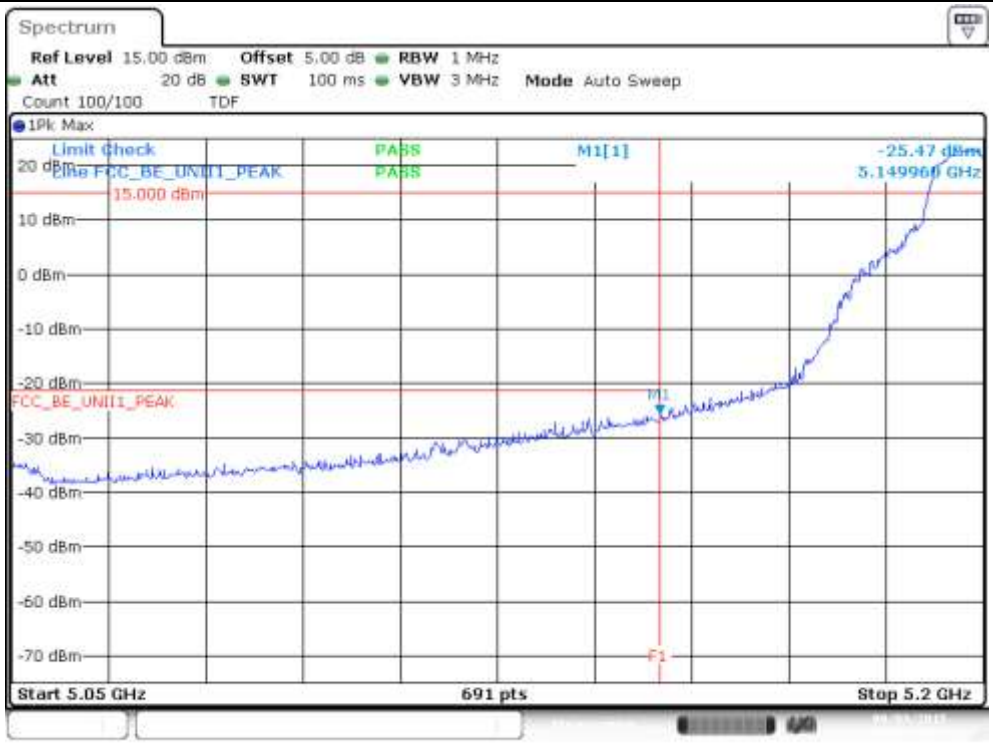
802.11a, 6Mbps – Chain A

BE Low Freq Section, Peak – CH36



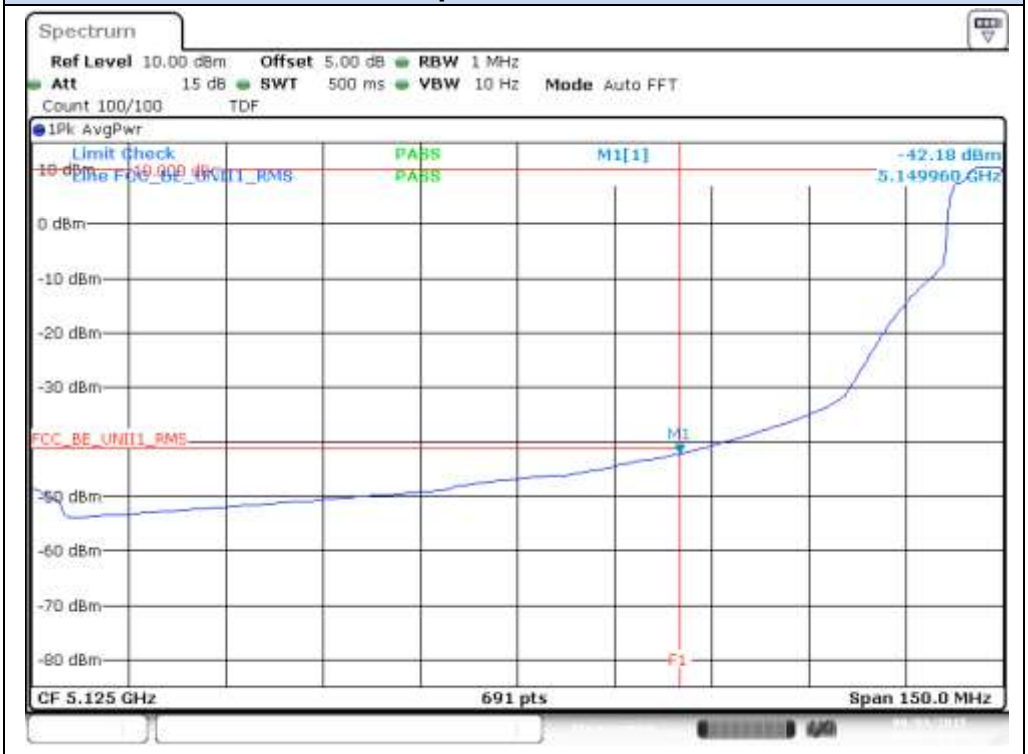
BE Low Freq Section, RMS – CH36

BE Low Freq Section, Peak – CH40



Date: 3.SEP.2015 15:06:32

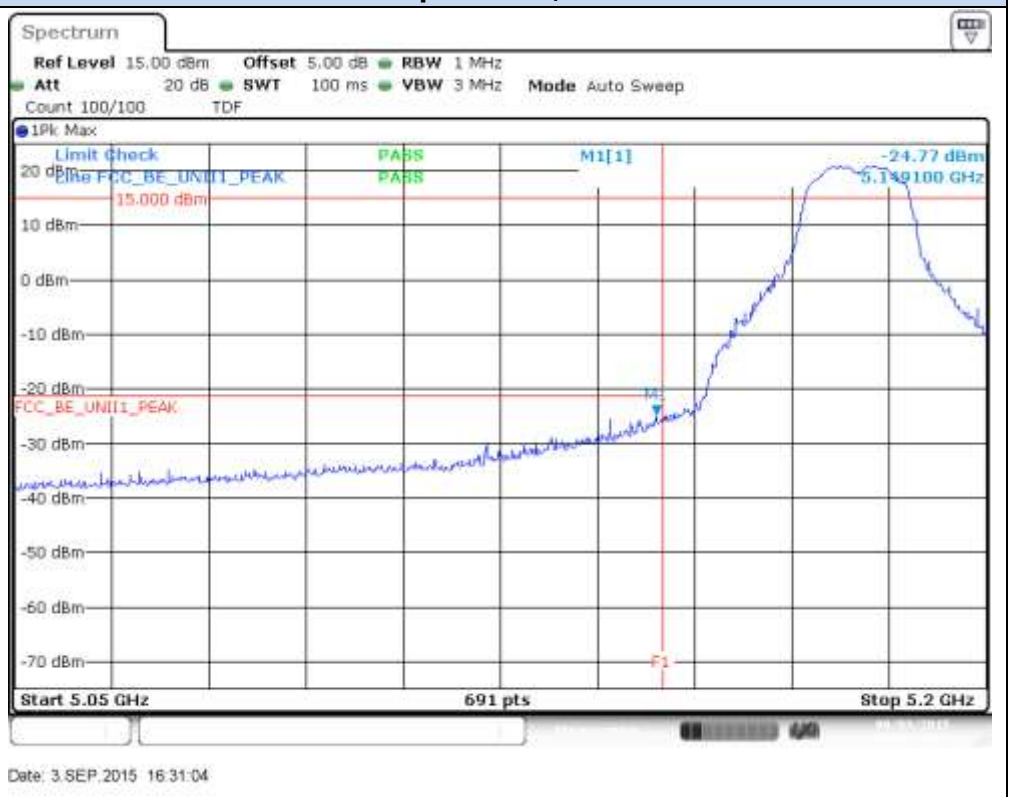
BE Low Freq Section, RMS – CH40



Date: 3.SEP.2015 15:01:49

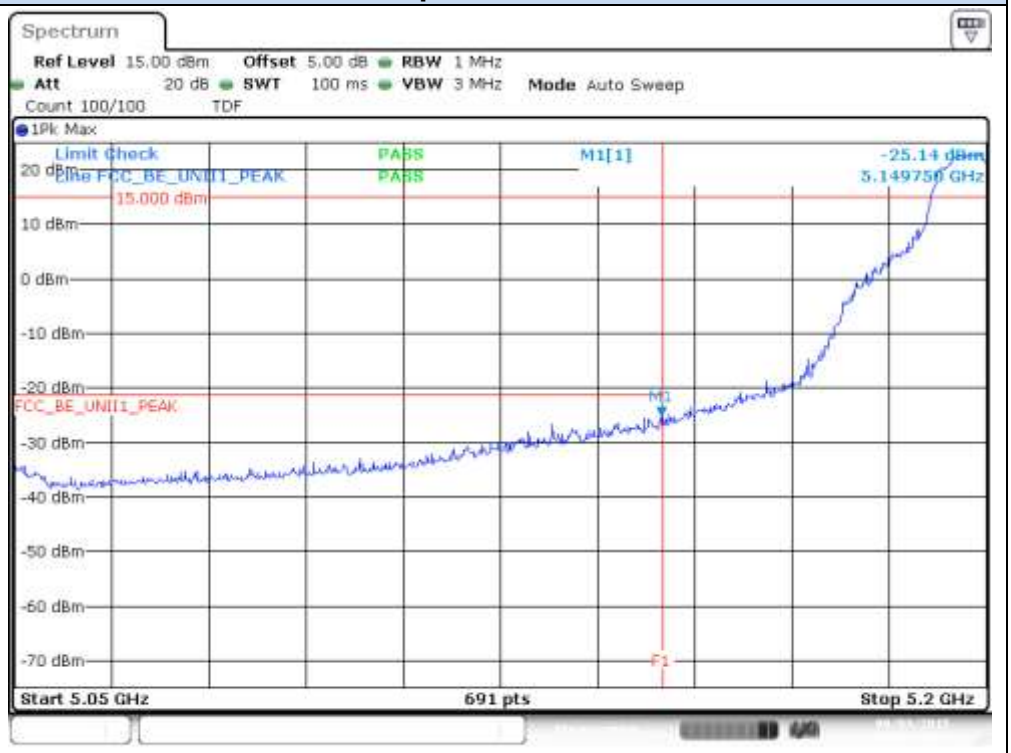
802.11a, 6Mbps – Chain B

BE Low Freq Section, Peak – CH36



BE Low Freq Section, RMS – CH36

BE Low Freq Section, Peak – CH40



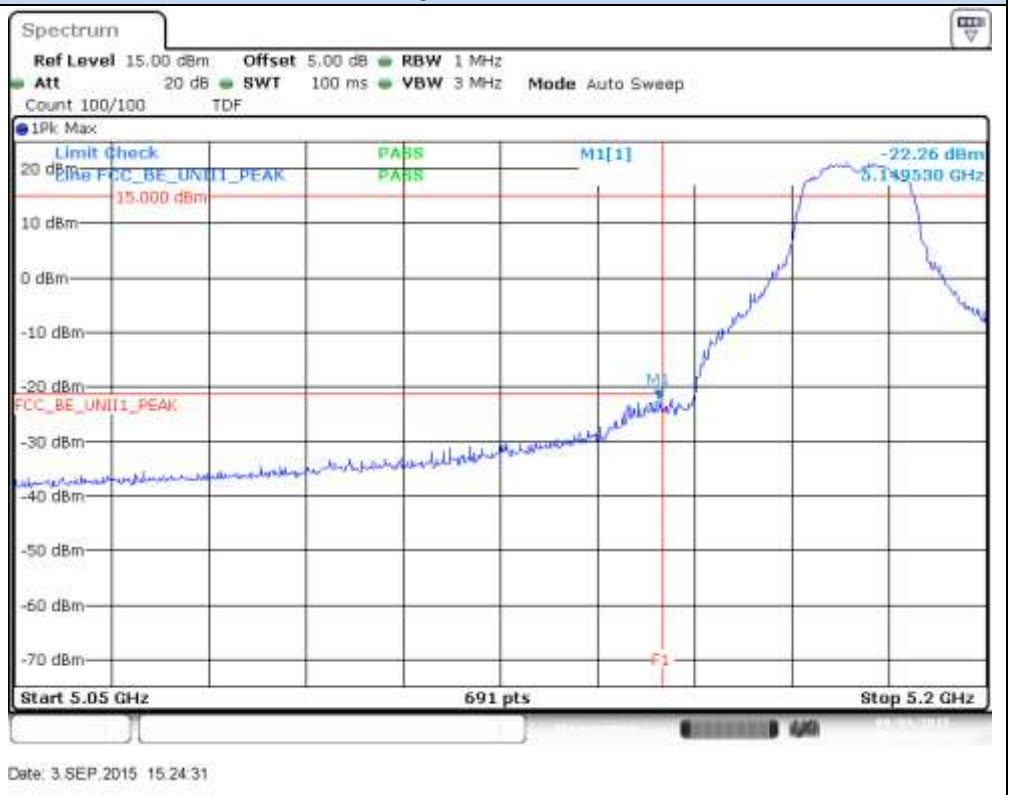
Date: 3.SEP.2015 16:39:27

BE Low Freq Section, RMS – CH40

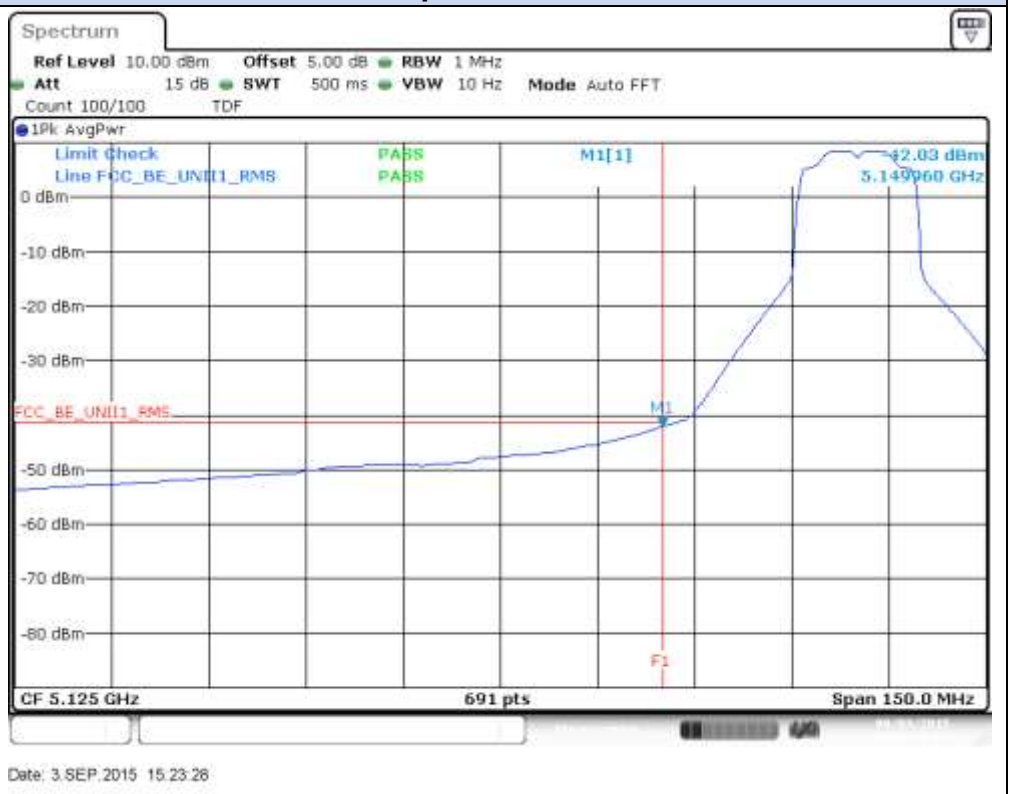
Date: 3.SEP.2015 16:36:52

802.11n20, HT0 (SISO) – Chain A

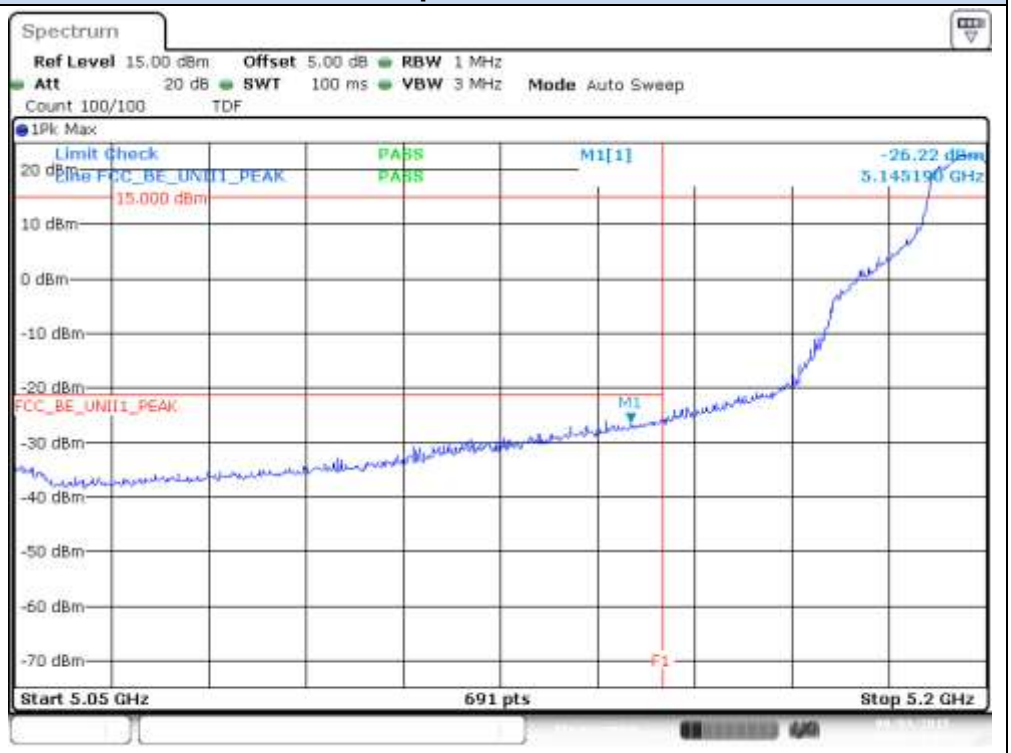
BE Low Freq Section, Peak – CH36



BE Low Freq Section, RMS – CH36



BE Low Freq Section, Peak – CH40



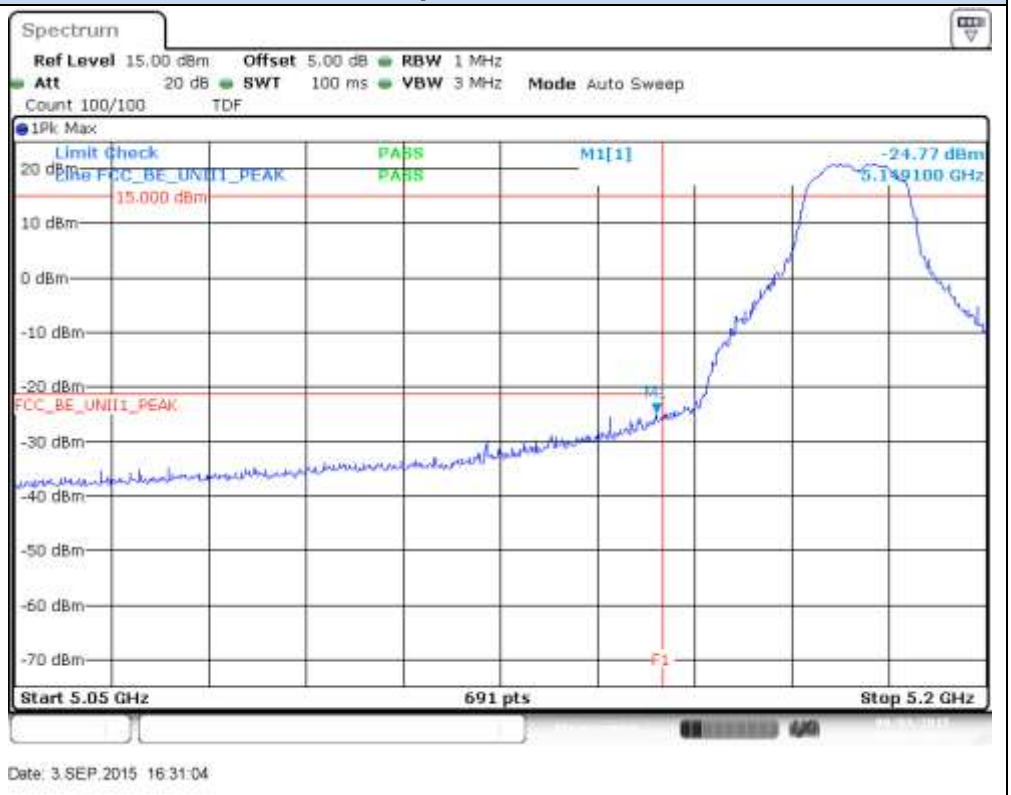
Date: 3.SEP.2015 15:32:40

BE Low Freq Section, RMS – CH40

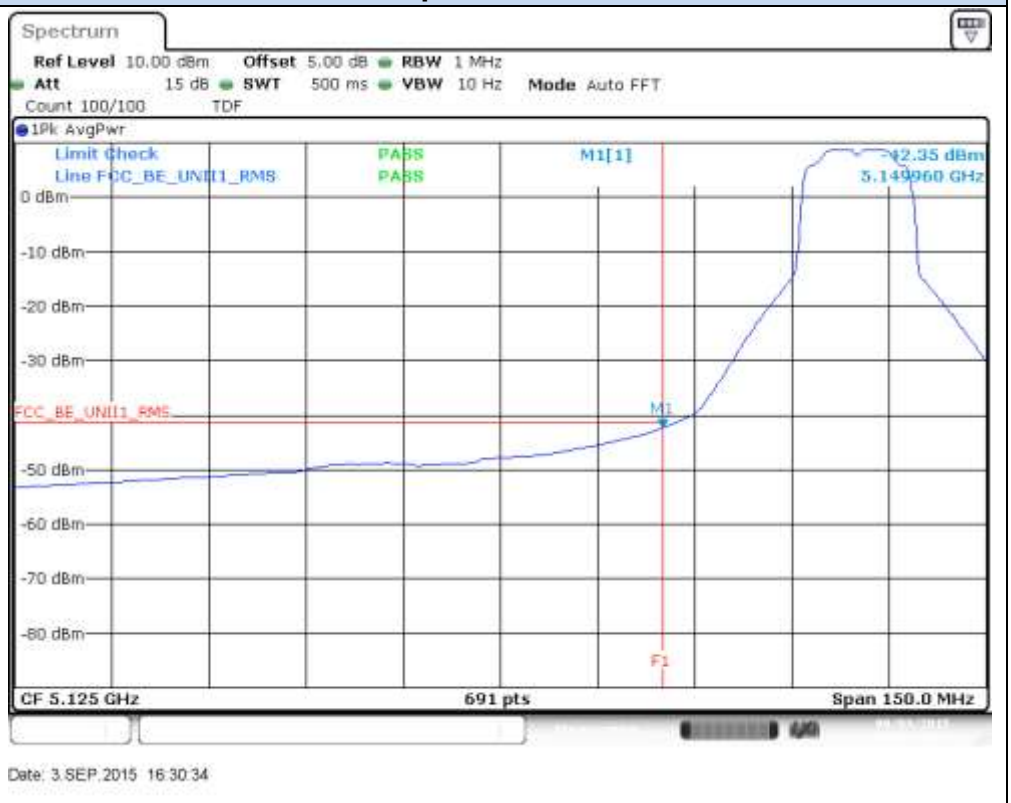
Date: 3.SEP.2015 15:30:30

802.11n20, HT0 (SISO) – Chain B

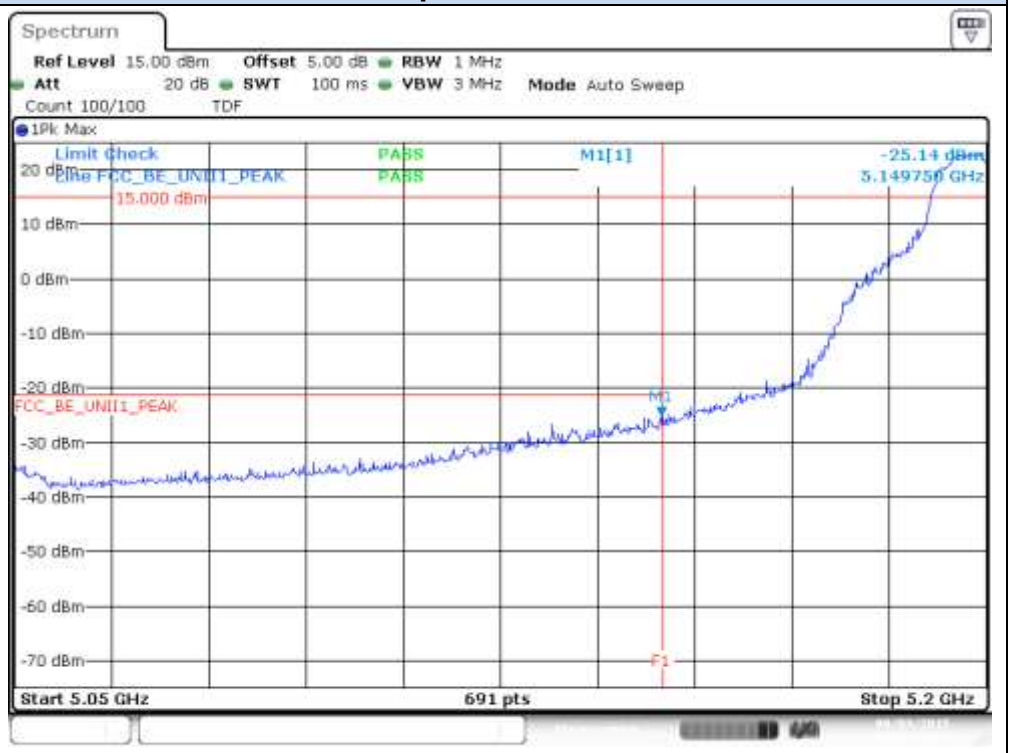
BE Low Freq Section, Peak – CH36



BE Low Freq Section, RMS – CH36



BE Low Freq Section, Peak – CH40



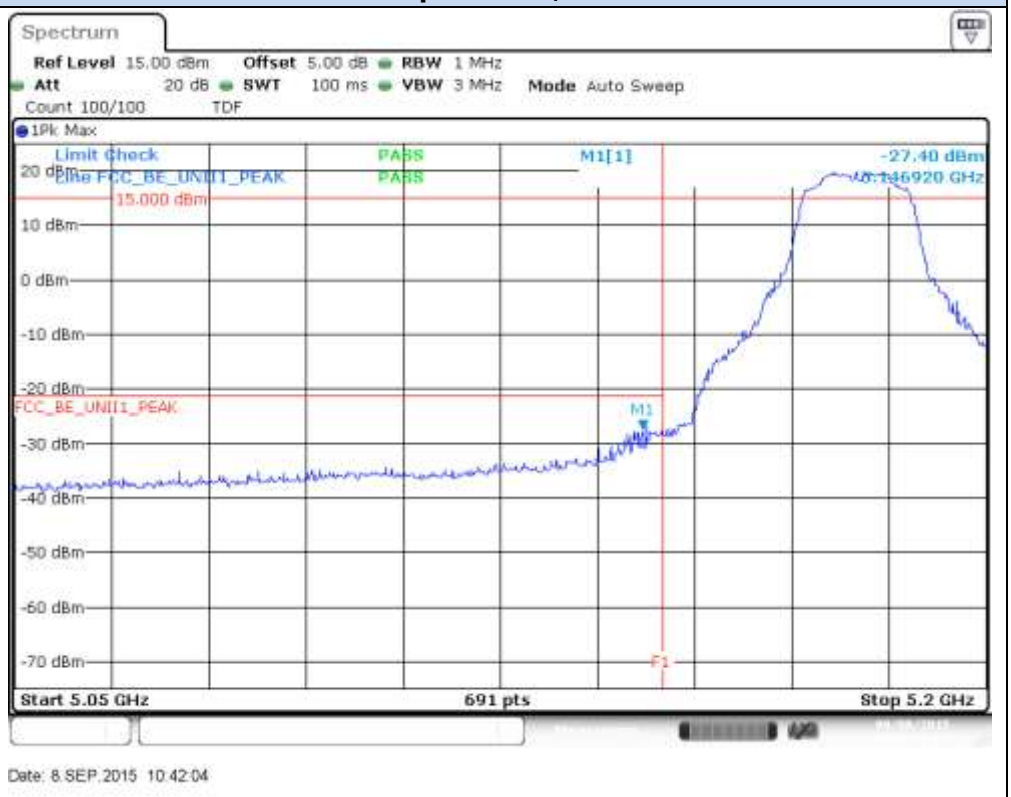
Date: 3.SEP.2015 16:39:27

BE Low Freq Section, RMS – CH40

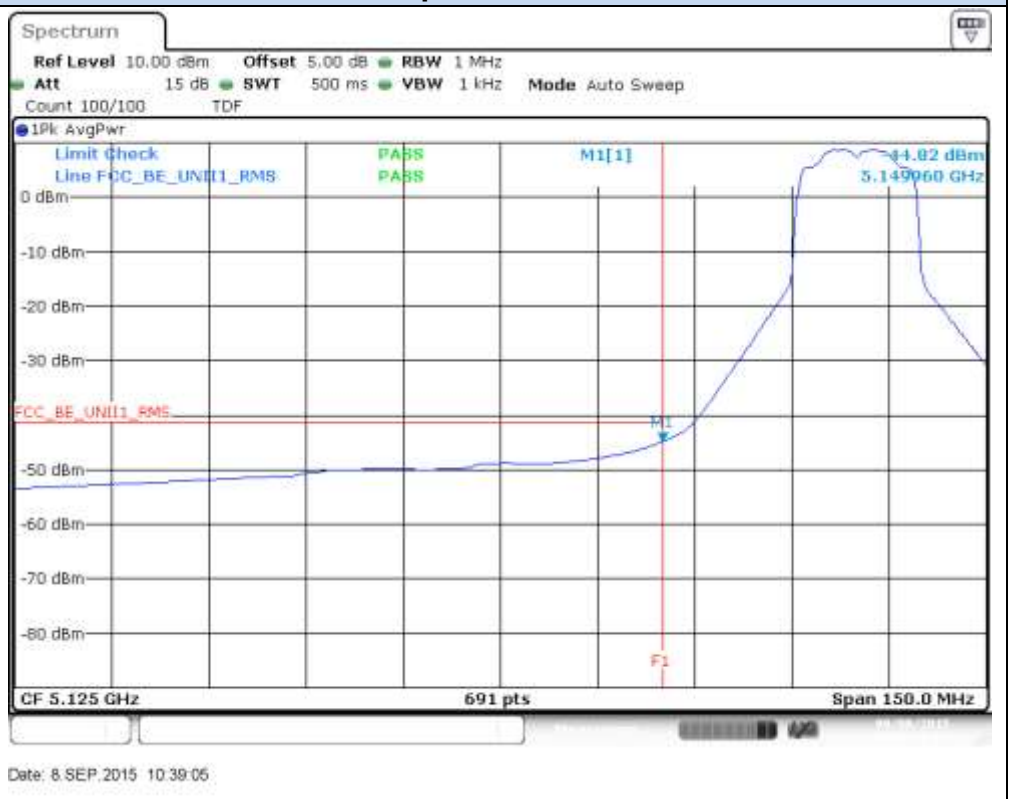
Date: 3.SEP.2015 16:36:52

802.11n20, HT8 (MIMO) – Chain A

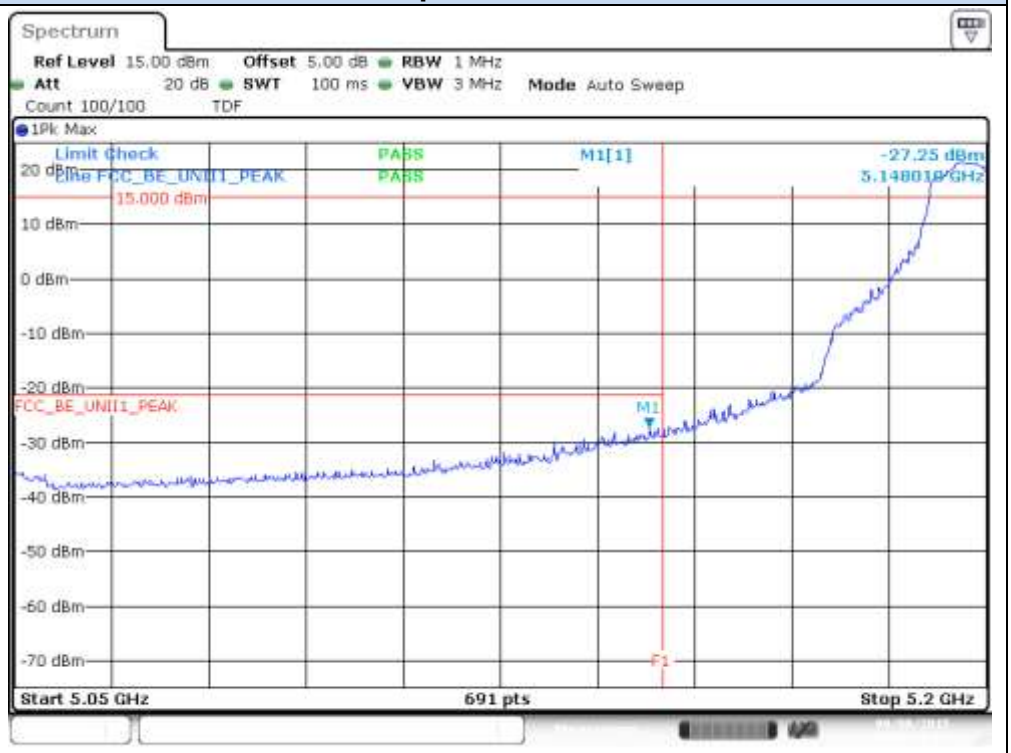
BE Low Freq Section, Peak – CH36



BE Low Freq Section, RMS – CH36

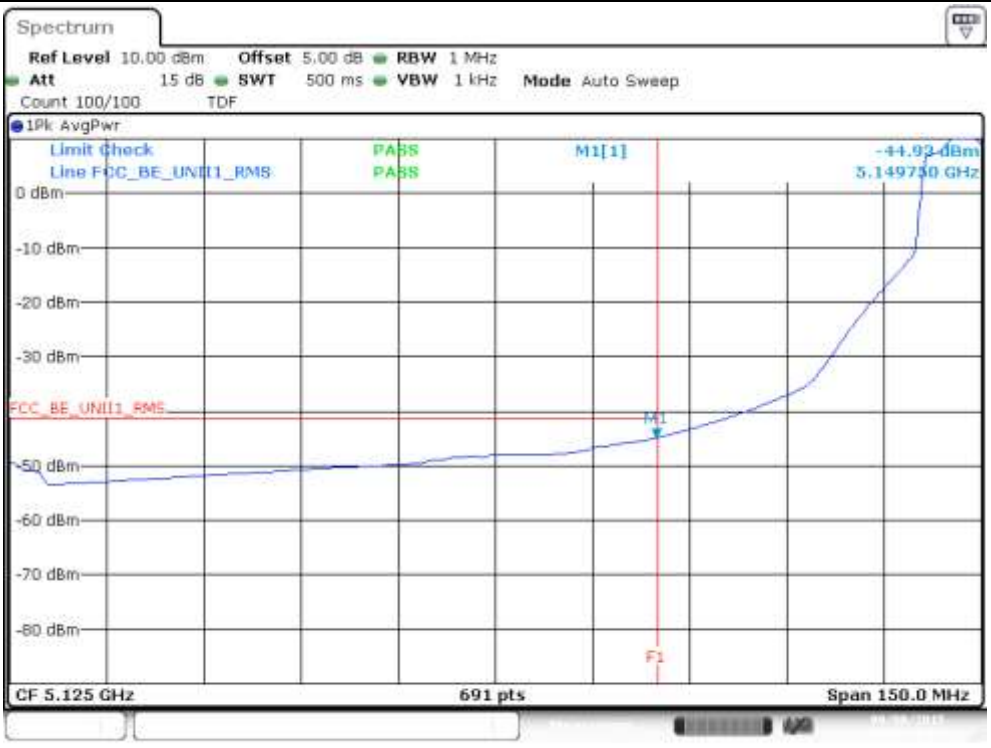


BE Low Freq Section, Peak – CH40



Date: 8.SEP.2015 10:50:41

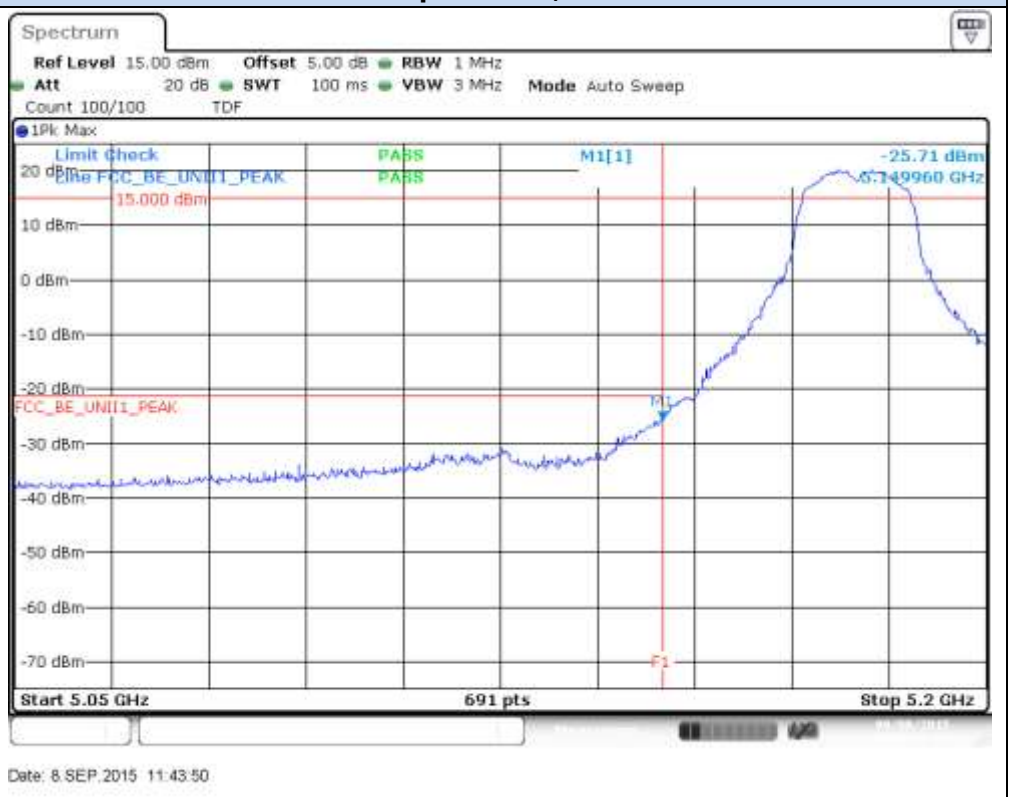
BE Low Freq Section, RMS – CH40



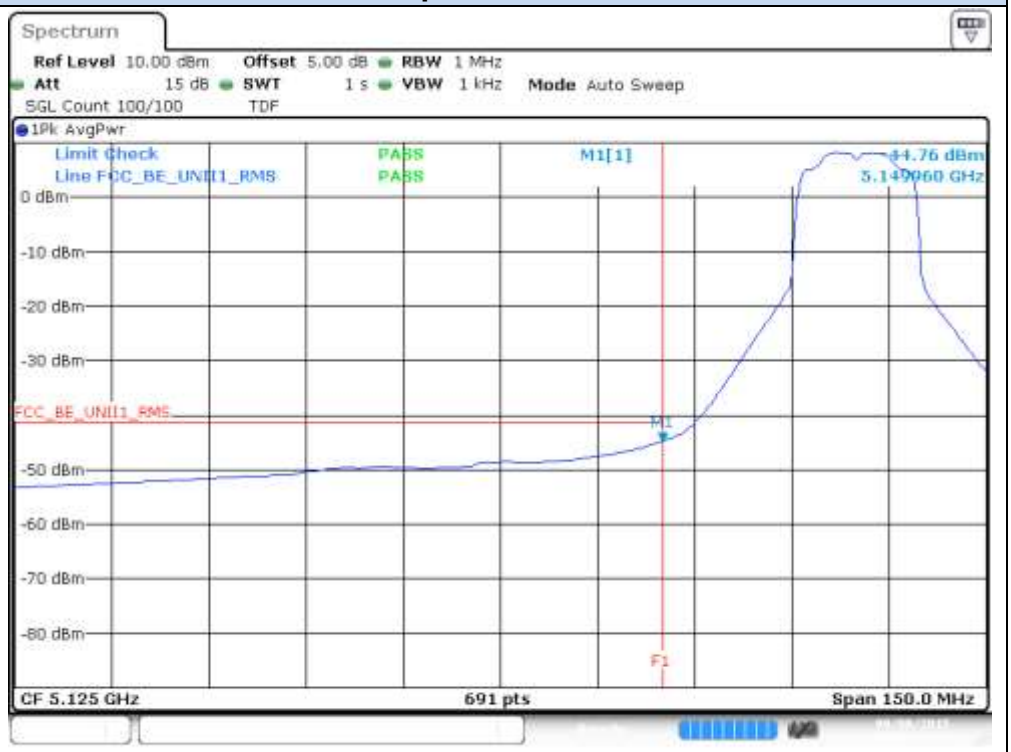
Date: 8.SEP.2015 10:49:51

802.11n20, HT8 (MIMO) – Chain B

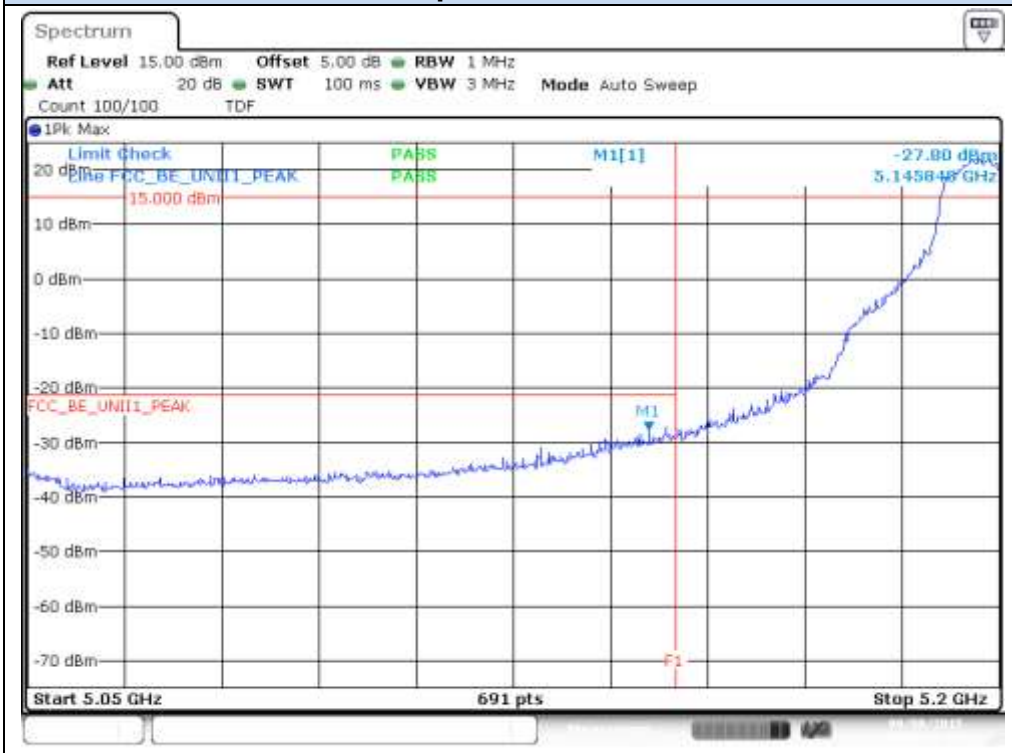
BE Low Freq Section, Peak – CH36



BE Low Freq Section, RMS – CH36

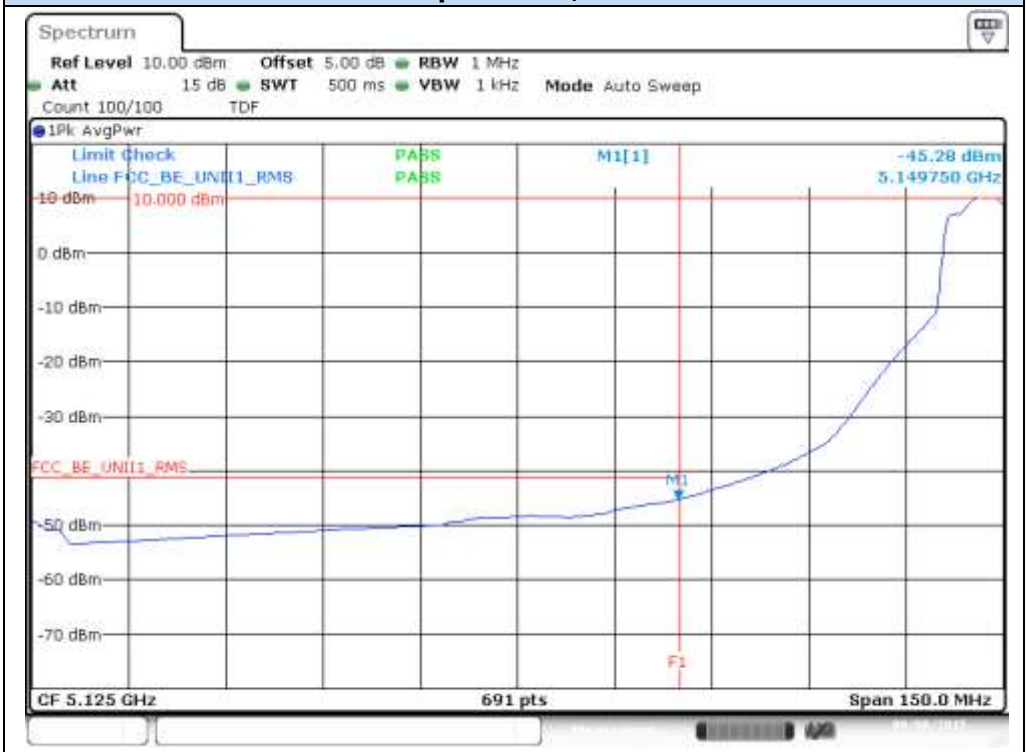


BE Low Freq Section, Peak – CH40



Date: 8.SEP.2015 11:49:58

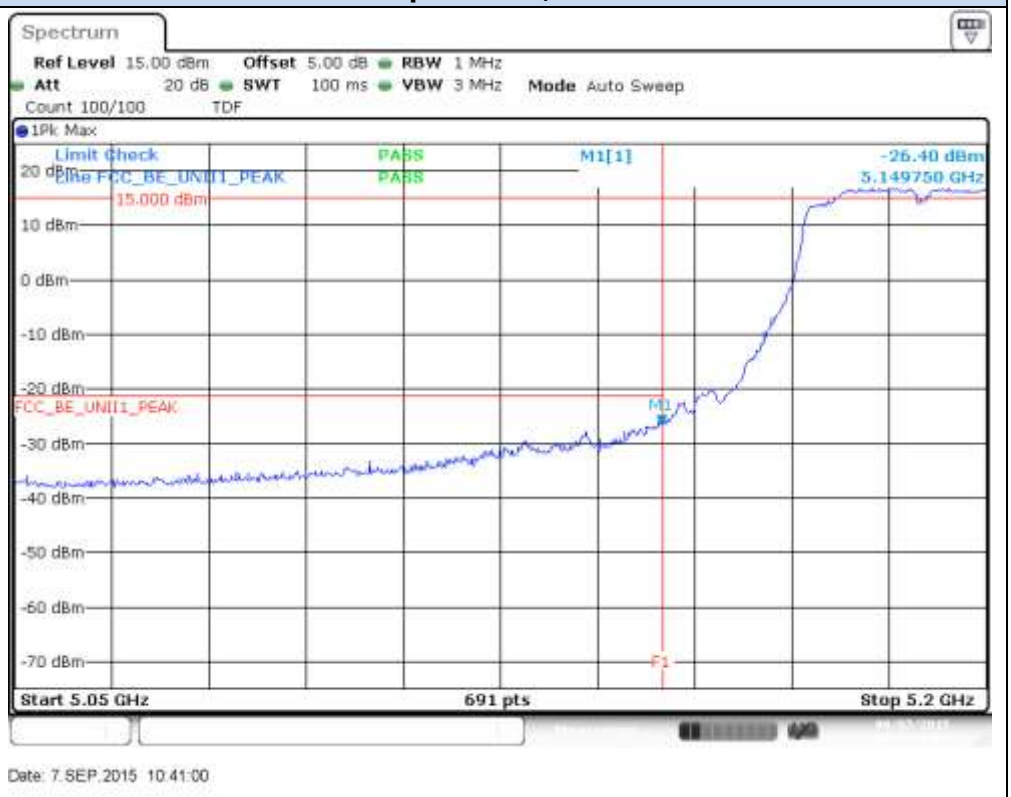
BE Low Freq Section, RMS – CH40



Date: 8.SEP.2015 11:46:22

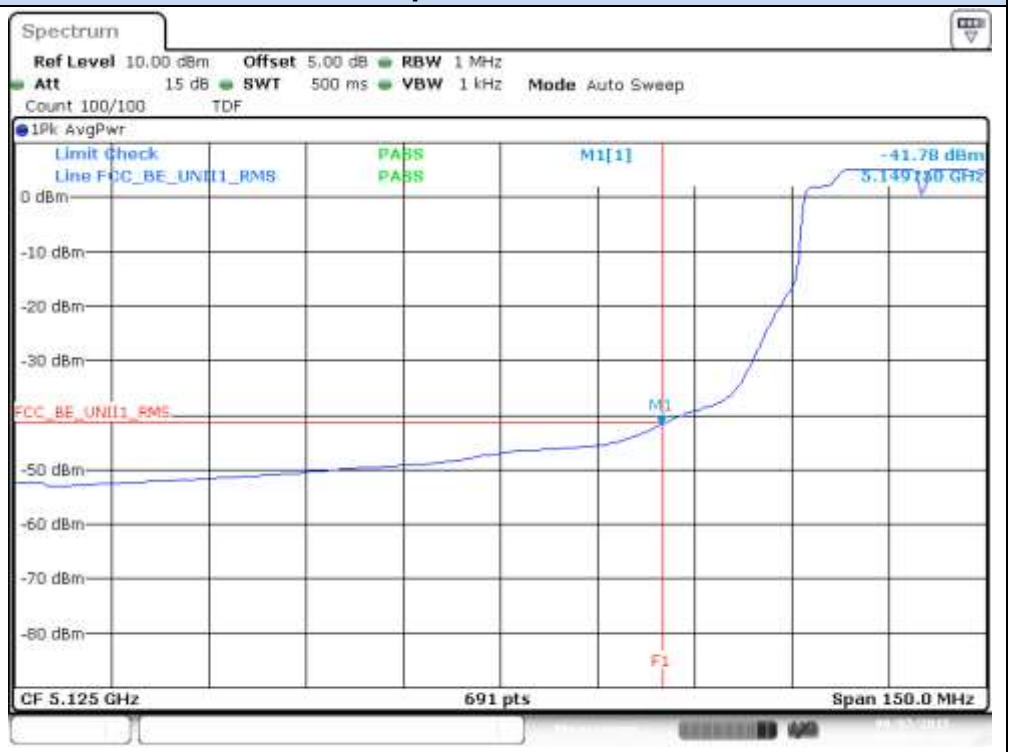
802.11n40, HT0 (SISO) – Chain A

BE Low Freq Section, Peak – CH38F



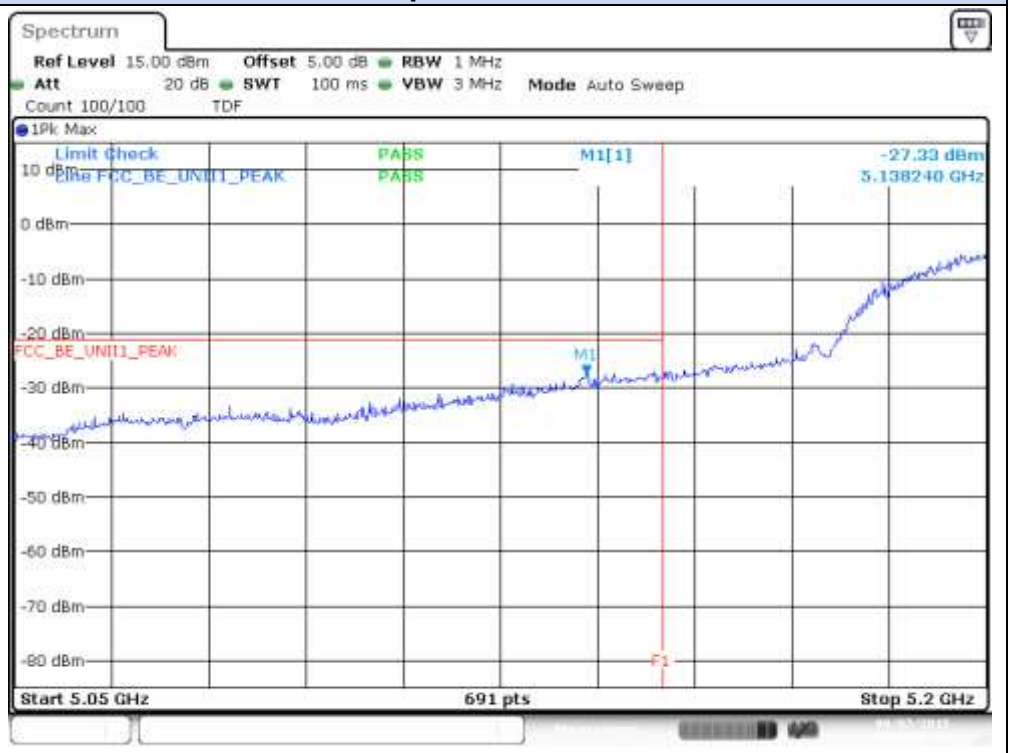
Date: 7.SEP.2015 10:41:00

BE Low Freq Section, RMS – CH38F



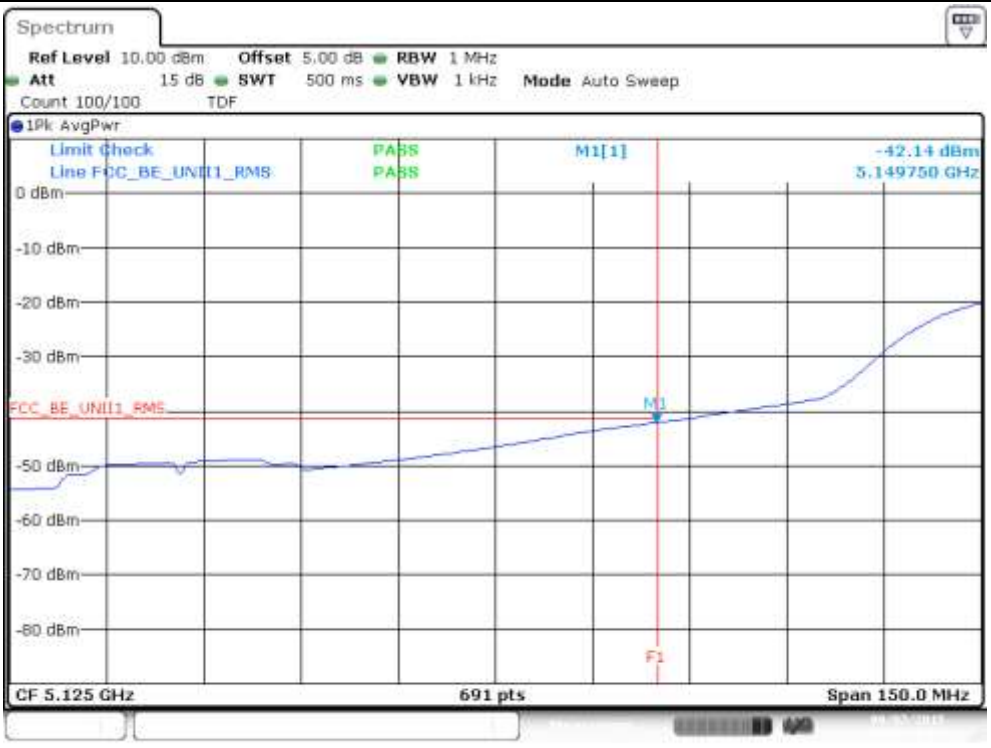
Date: 7.SEP.2015 10:56:39

BE Low Freq Section, Peak – CH46F



Date: 7.SEP.2015 10:49:08

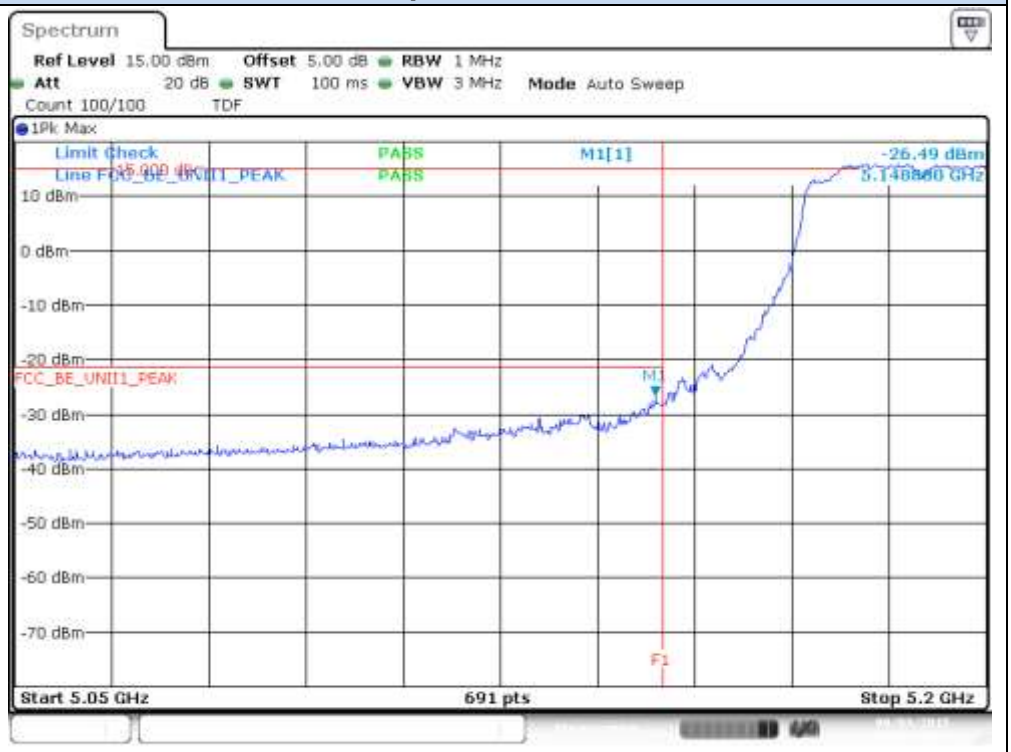
BE Low Freq Section, RMS – CH46F



Date: 7.SEP.2015 10:48:34

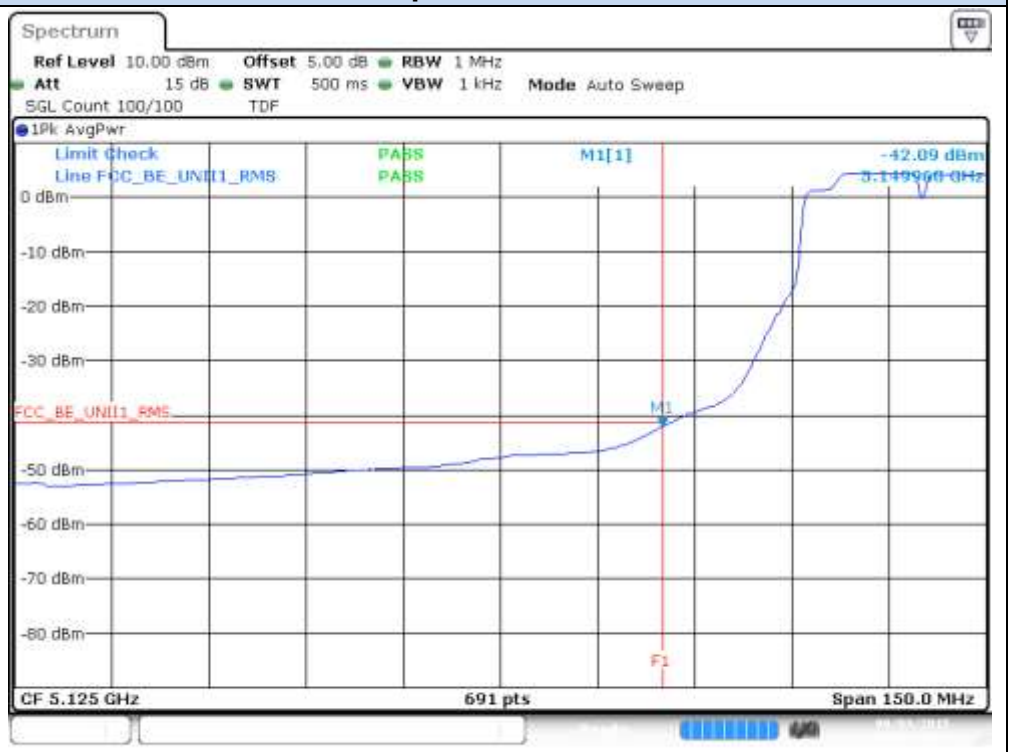
802.11n40, HT0 (SISO) – Chain B

BE Low Freq Section, Peak – CH38F



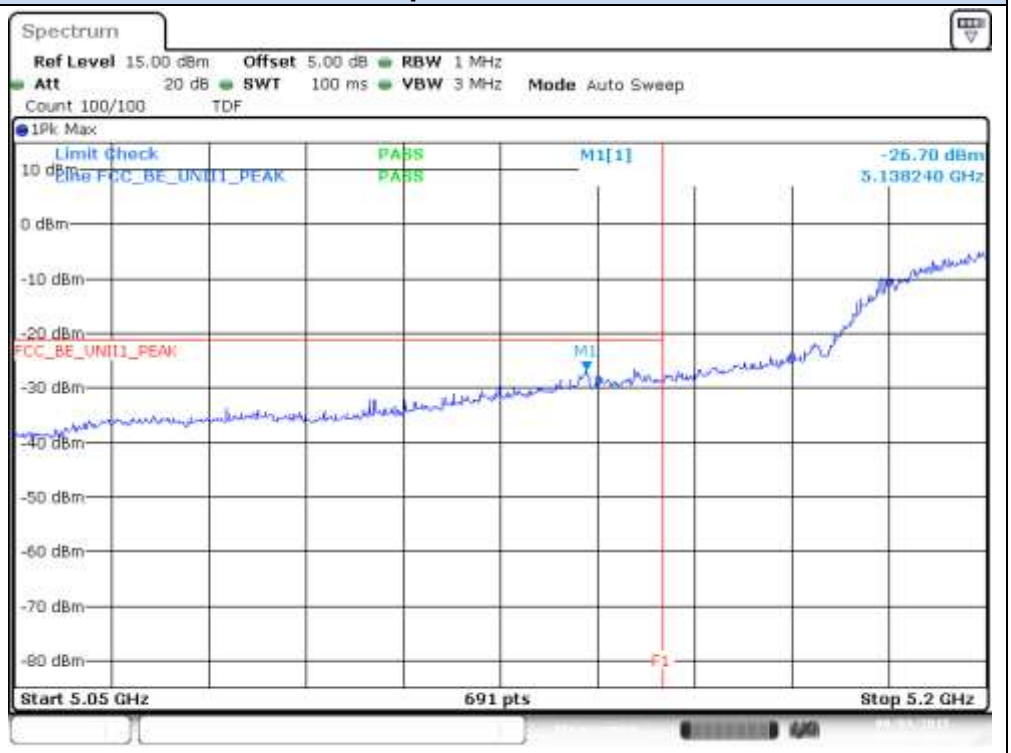
Date: 3.SEP.2015 18:09:37

BE Low Freq Section, RMS – CH38F



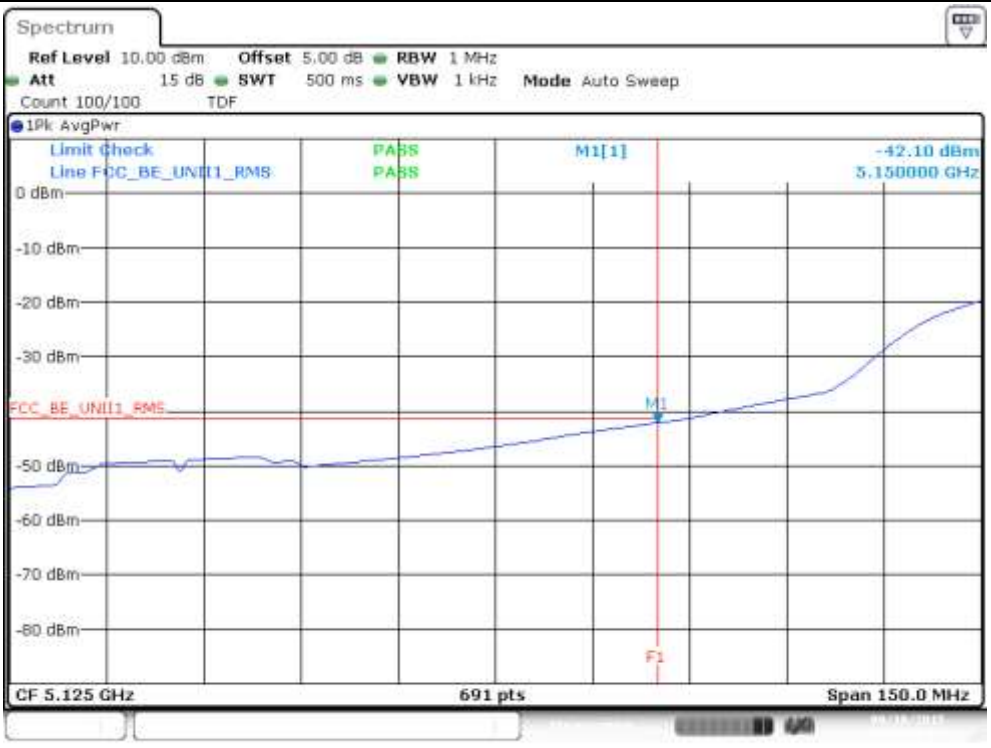
Date: 3.SEP.2015 18:06:05

BE Low Freq Section, Peak – CH46F



Date: 3.SEP.2015 18:54:16

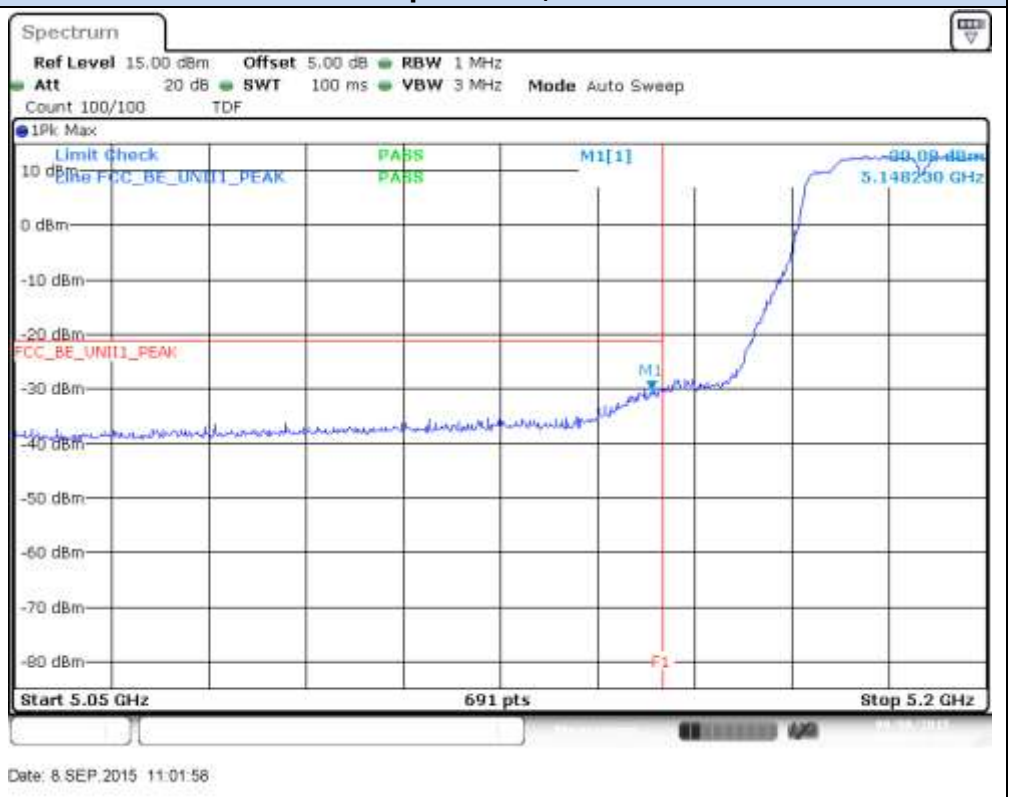
BE Low Freq Section, RMS – CH46F



Date: 18.SEP.2015 15:55:08

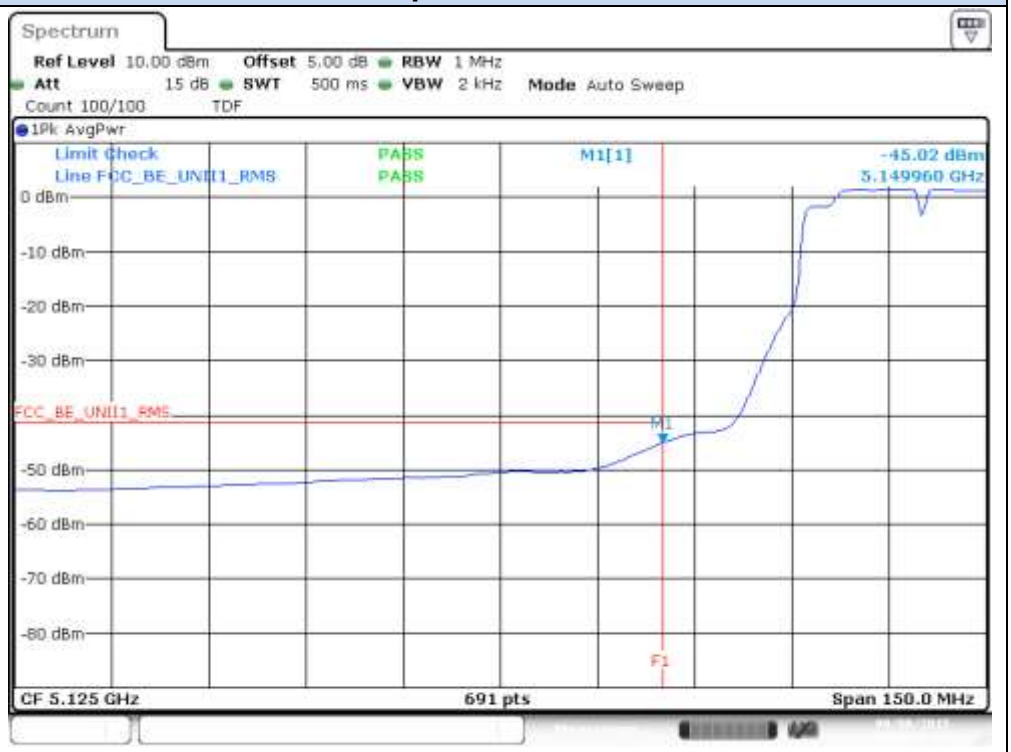
802.11n40, HT8 (MIMO) – Chain A

BE Low Freq Section, Peak – CH38F



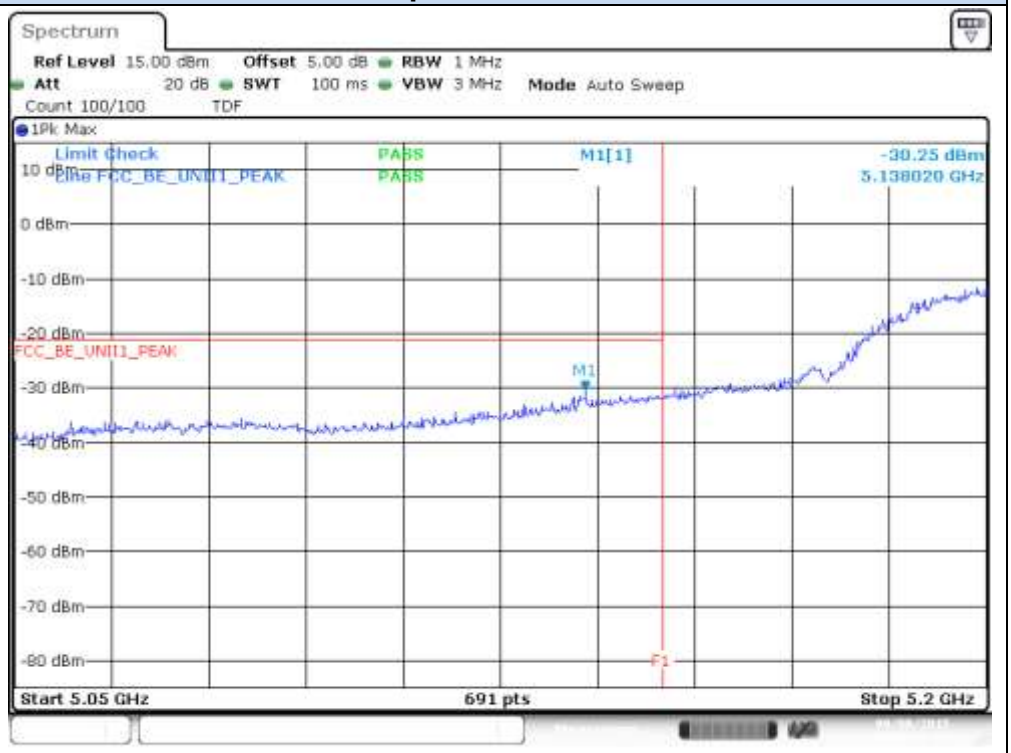
Date: 8.SEP.2015 11:01:58

BE Low Freq Section, RMS – CH38F



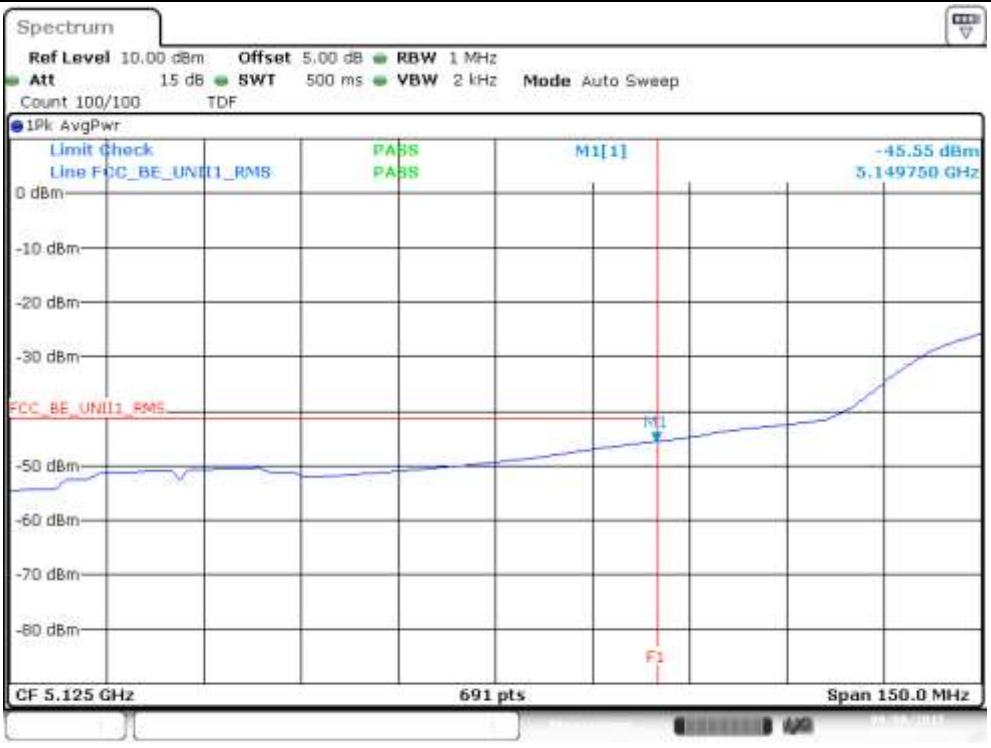
Date: 8.SEP.2015 11:01:16

BE Low Freq Section, Peak – CH46F



Date: 8.SEP.2015 11:29:35

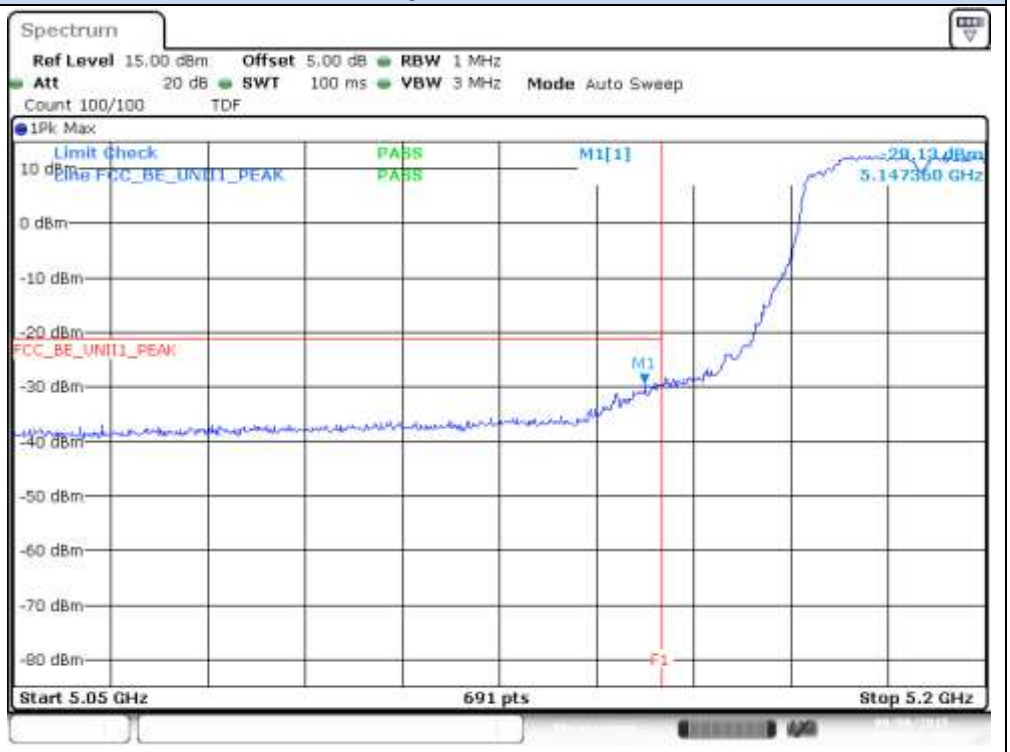
BE Low Freq Section, RMS – CH46F



Date: 8.SEP.2015 11:29:05

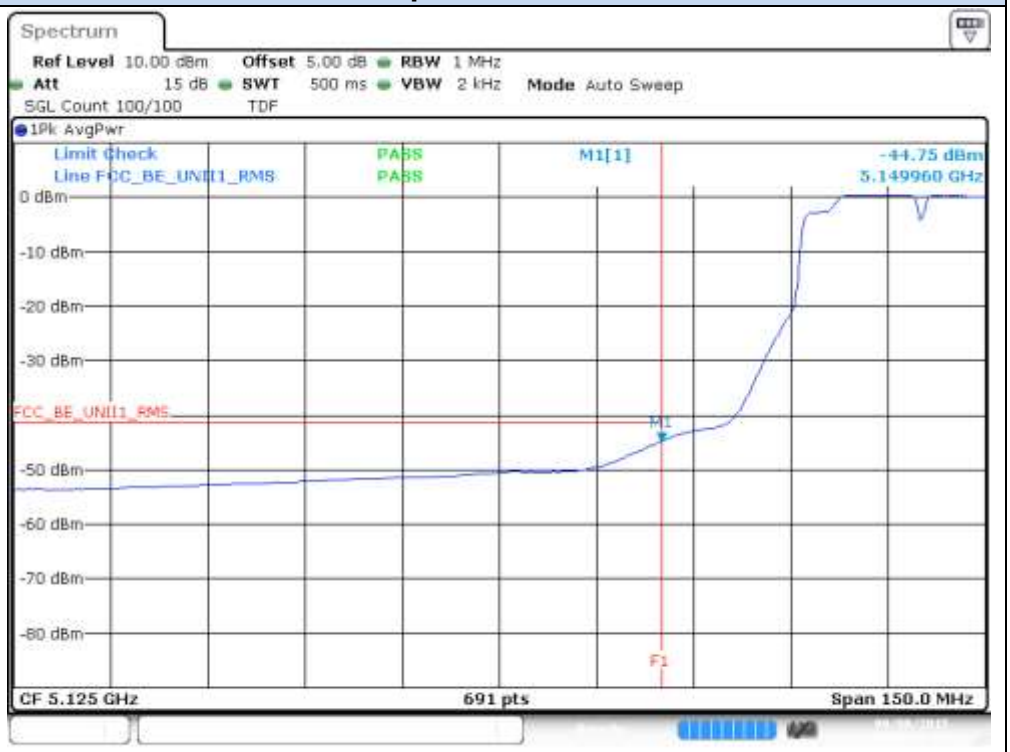
802.11n40, HT8 (MIMO) – Chain B

BE Low Freq Section, Peak – CH38F



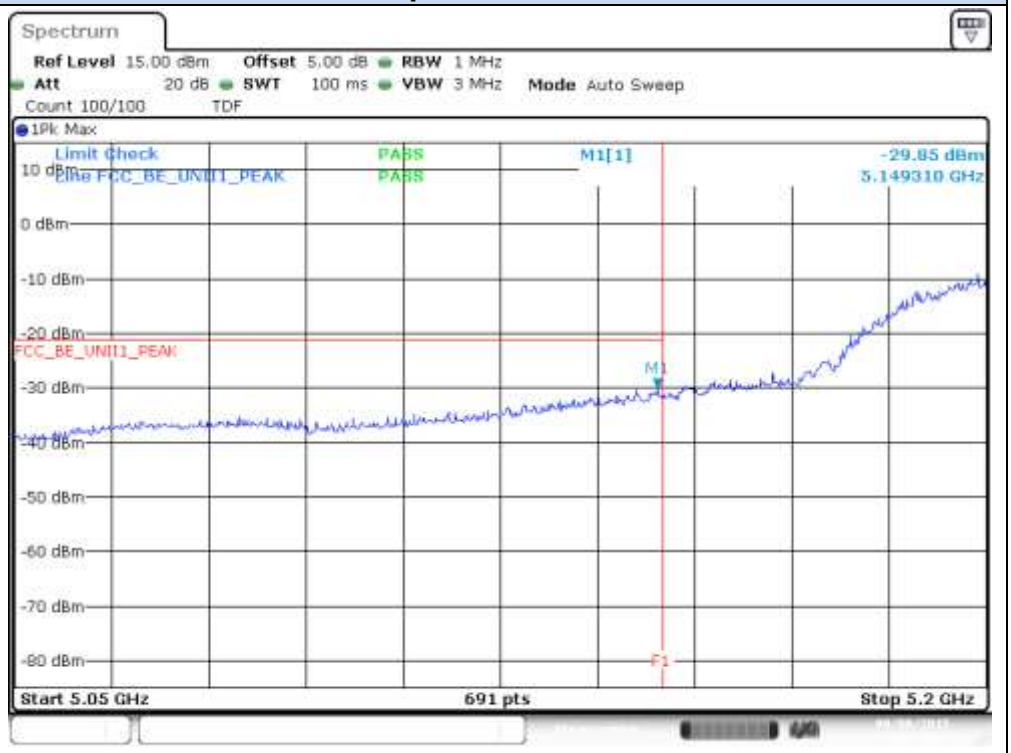
Date: 8.SEP.2015 11:59:59

BE Low Freq Section, RMS – CH38F



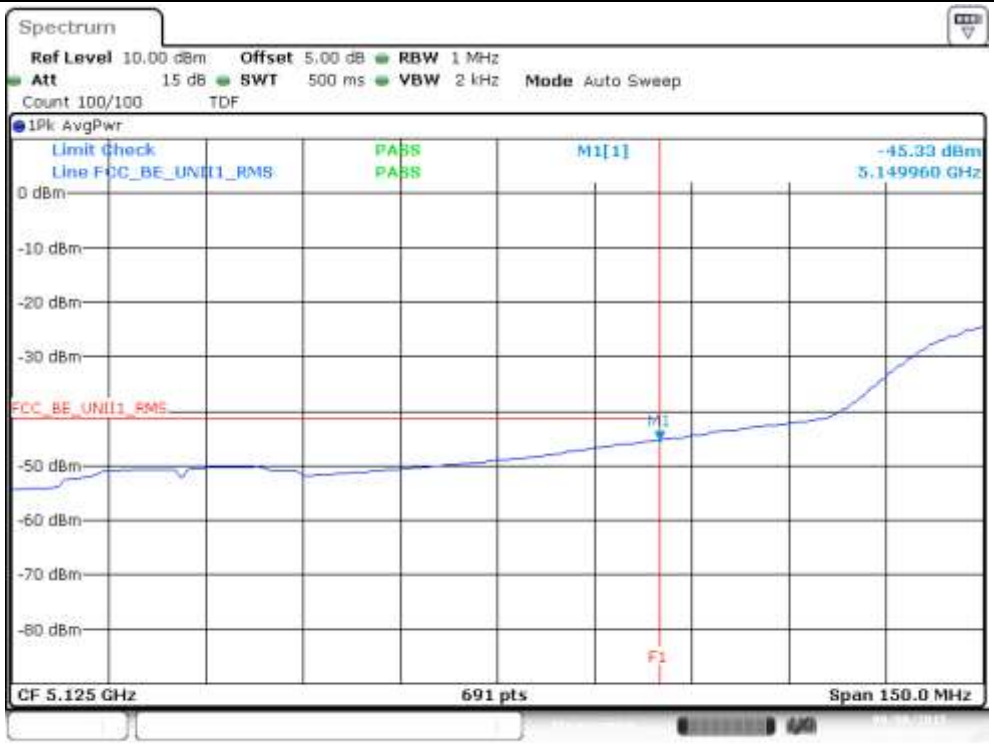
Date: 8.SEP.2015 11:59:18

BE Low Freq Section, Peak – CH46F



Date: 8.SEP.2015 12:06:03

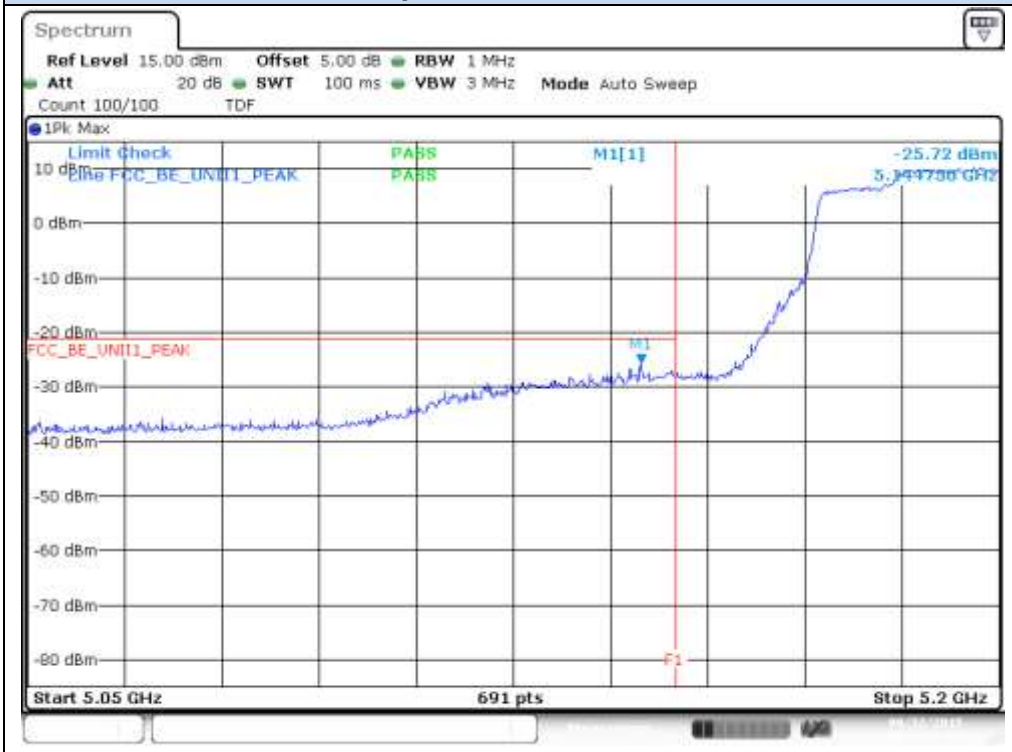
BE Low Freq Section, RMS – CH46F



Date: 8.SEP.2015 12:05:35

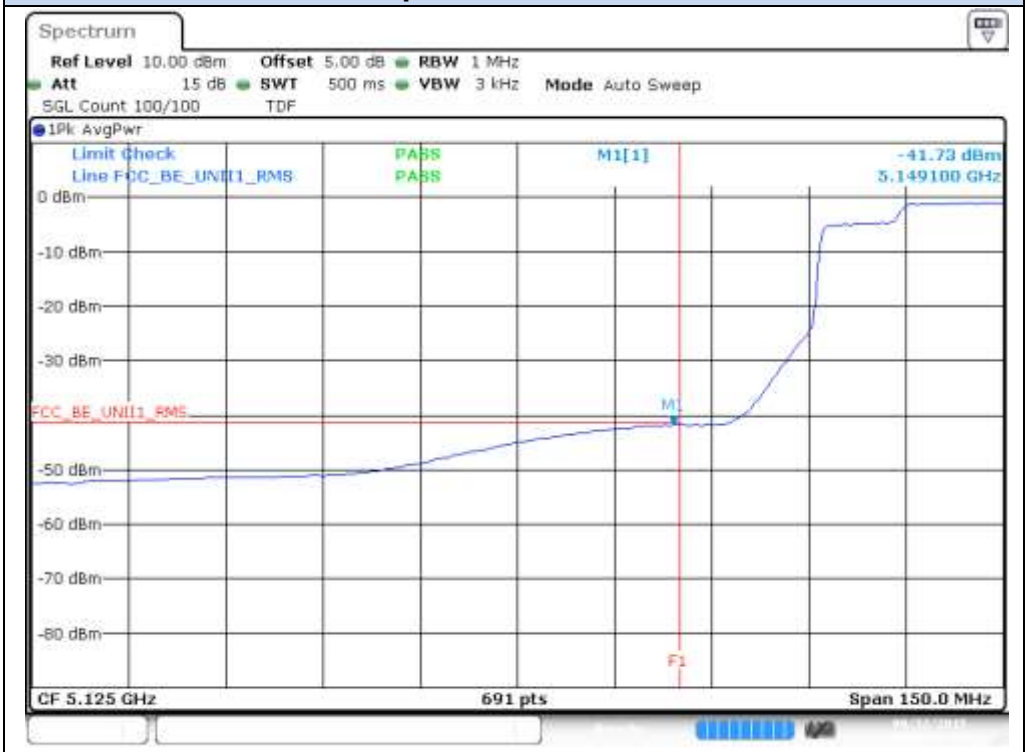
802.11ac80, VHT0 (SISO)- Chain A

BE Low Freq Section, Peak – CH42ac80



Date: 22.SEP.2015 11:31:28

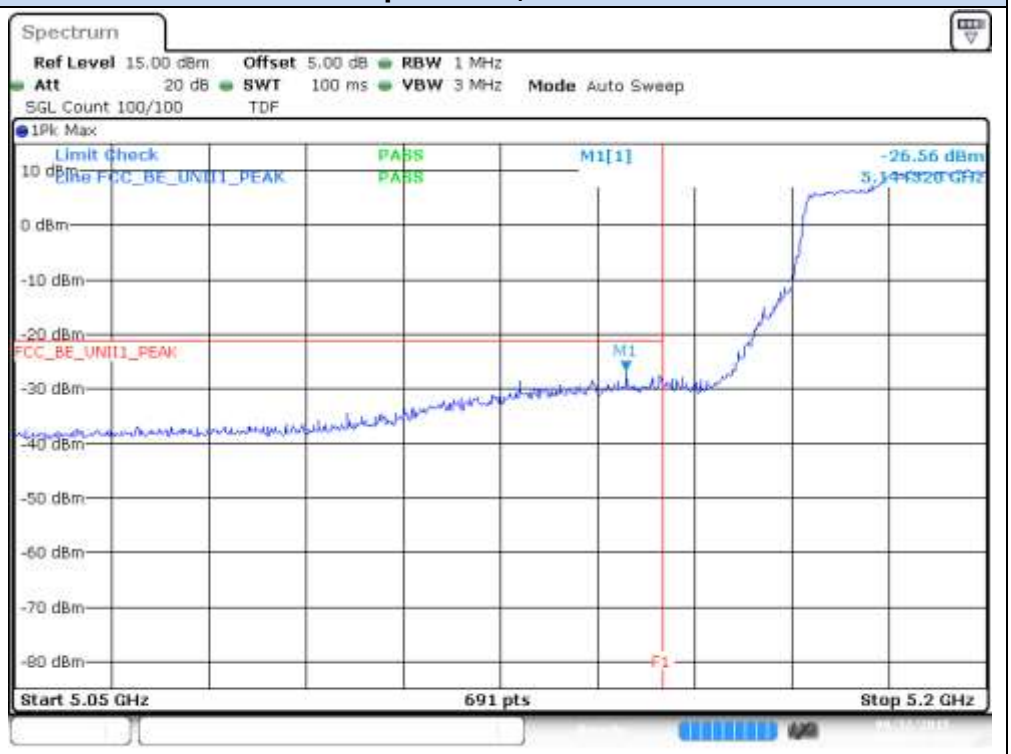
BE Low Freq Section, RMS – CH42ac80



Date: 22.SEP.2015 11:30:30

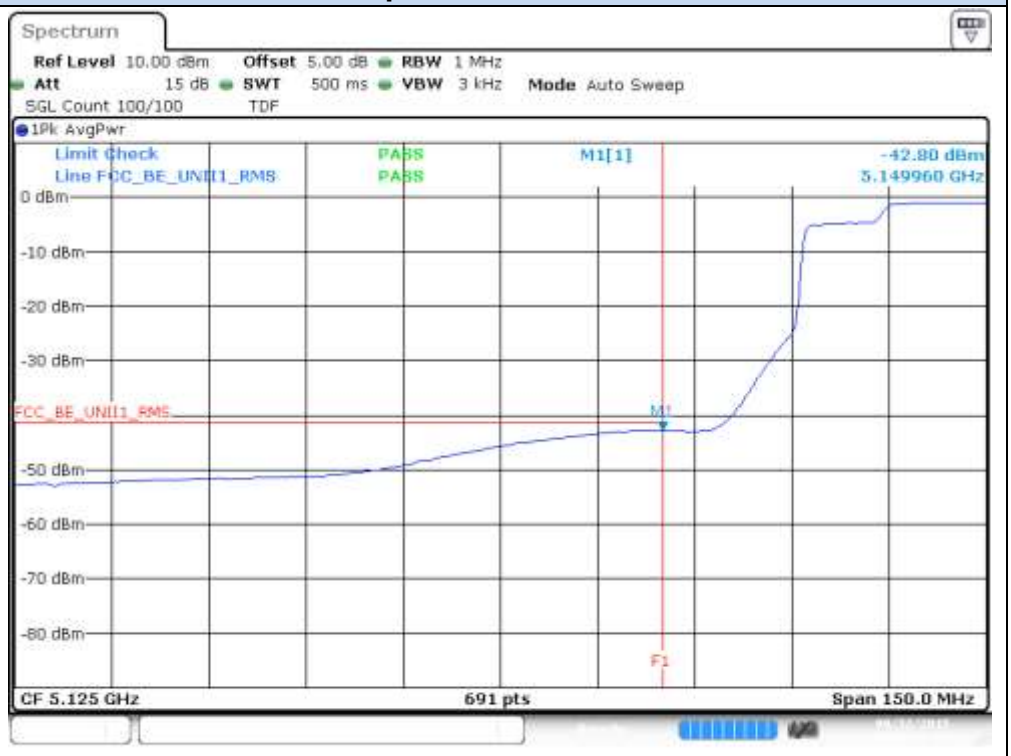
802.11ac80, VHT0 (SISO)- Chain B

BE Low Freq Section, Peak – CH42ac80



Date: 22.SEP.2015 11:20:59

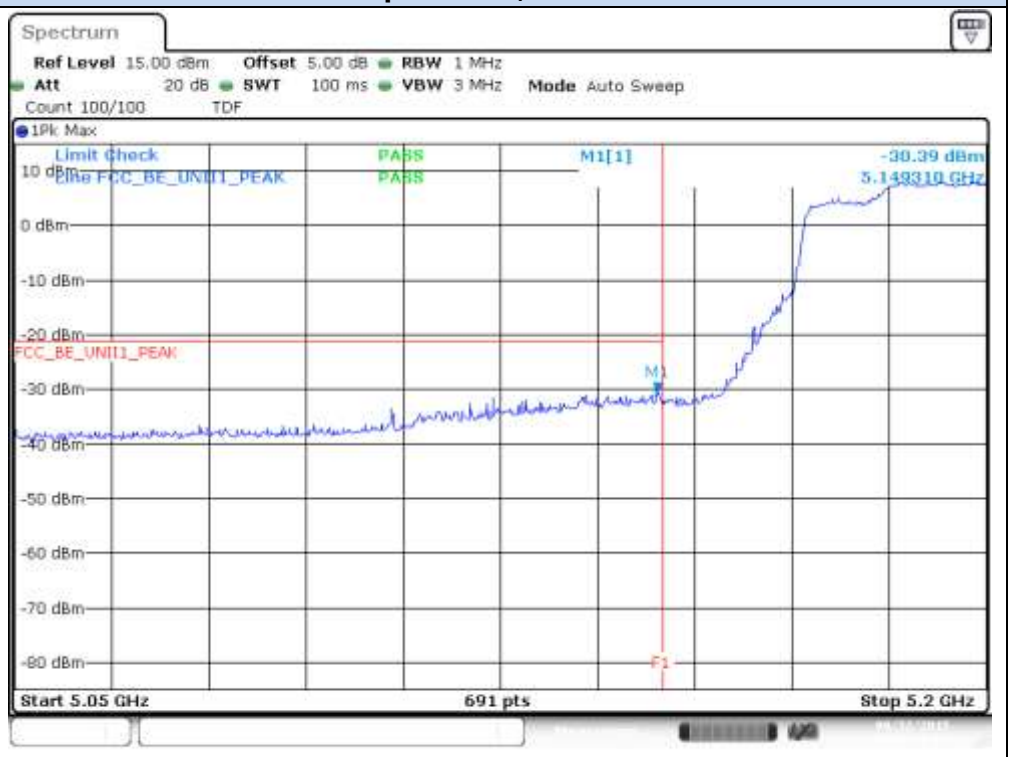
BE Low Freq Section, RMS – CH42ac80



Date: 22.SEP.2015 11:20:10

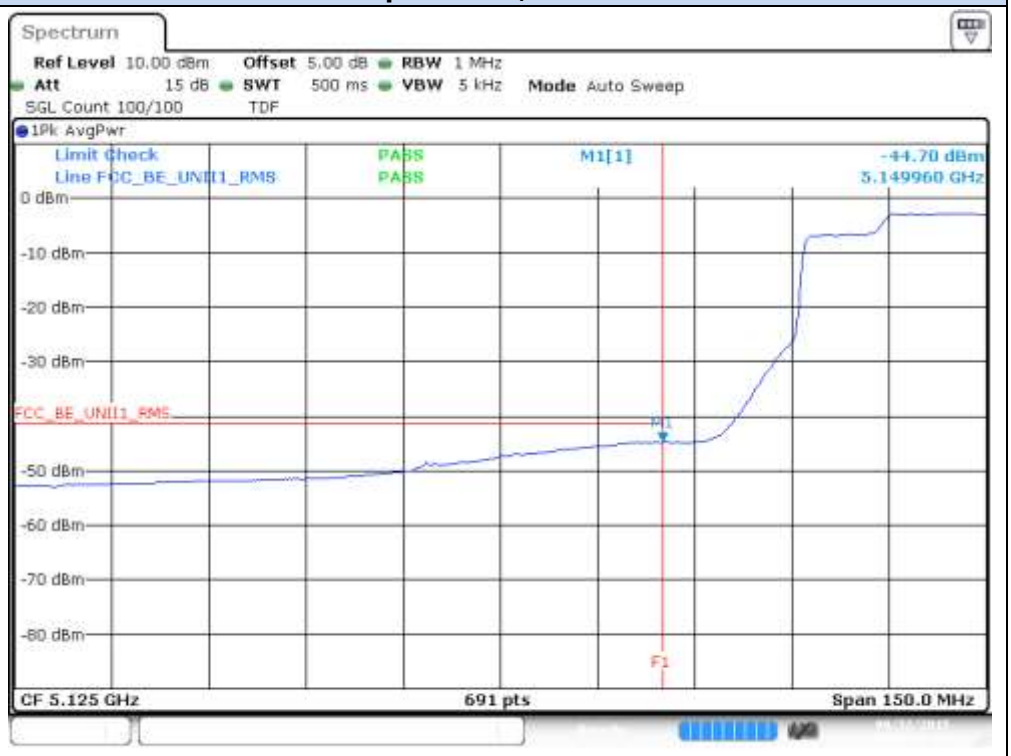
802.11ac80, VHT0 (MIMO)- Chain A

BE Low Freq Section, Peak – CH42ac80



Date: 22.SEP.2015 11:36:12

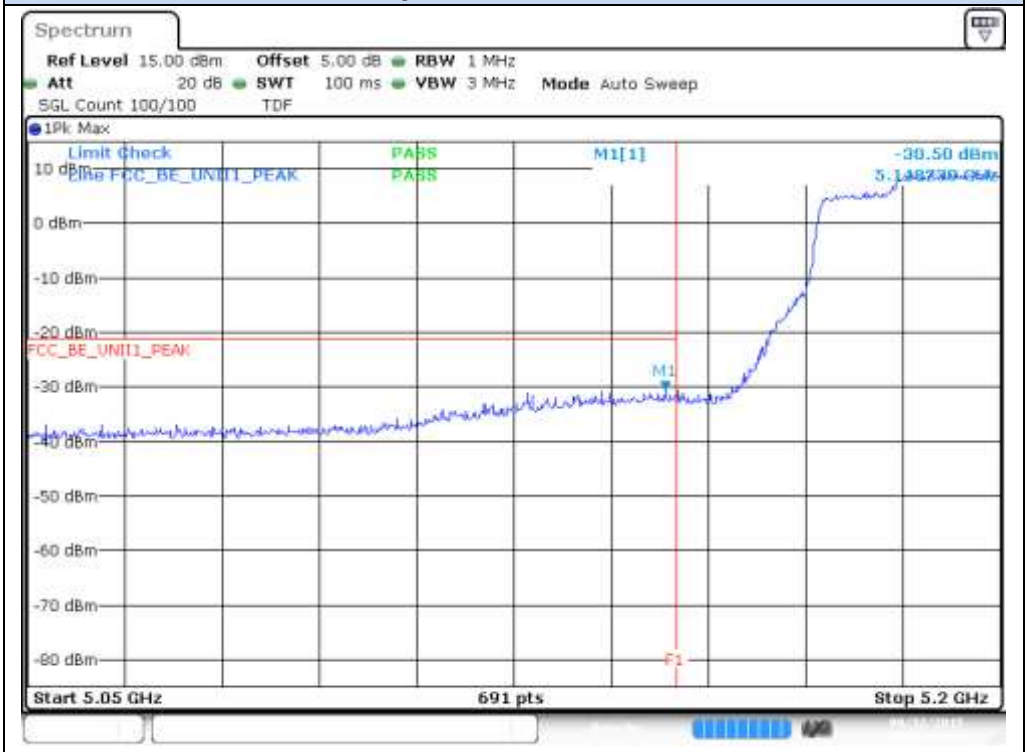
BE Low Freq Section, RMS – CH42ac80



Date: 22.SEP.2015 11:35:29

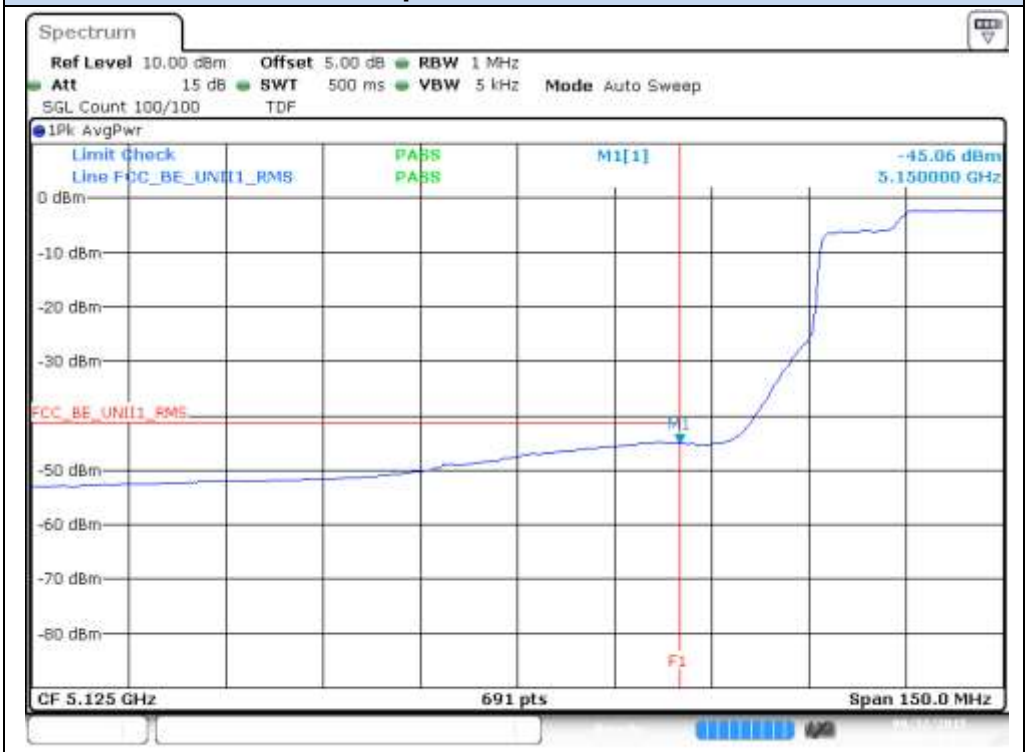
802.11ac80, VHT0 (MIMO)- Chain B

BE Low Freq Section, Peak – CH42ac80



Date: 22.SEP.2015 11:42:36

BE Low Freq Section, RMS – CH42ac80



Date: 22.SEP.2015 11:42:01

B.4 Radiated spurious emission

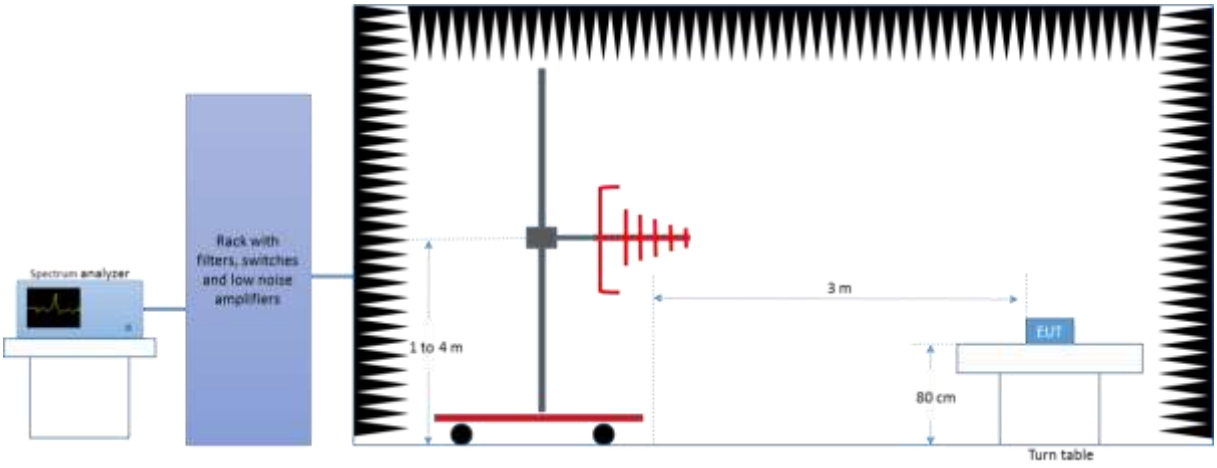
Standard references

FCC part	RSS part	Limits
15.247 (d)	RSS-210 Clause A8.5	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): Freq Range (MHz) / Field Stregth (µV/m) / Field Stregth (dBµV/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 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.

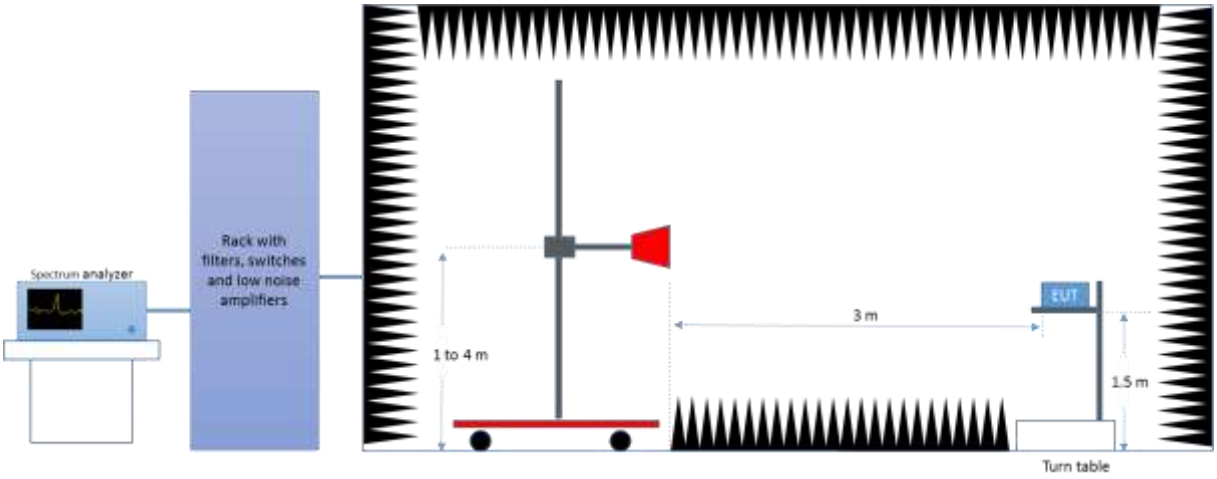
Test procedure

The setup below was 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 emission was measured on the worst case configuration selected from the chapter B.2 and on the low, middle and high channel.

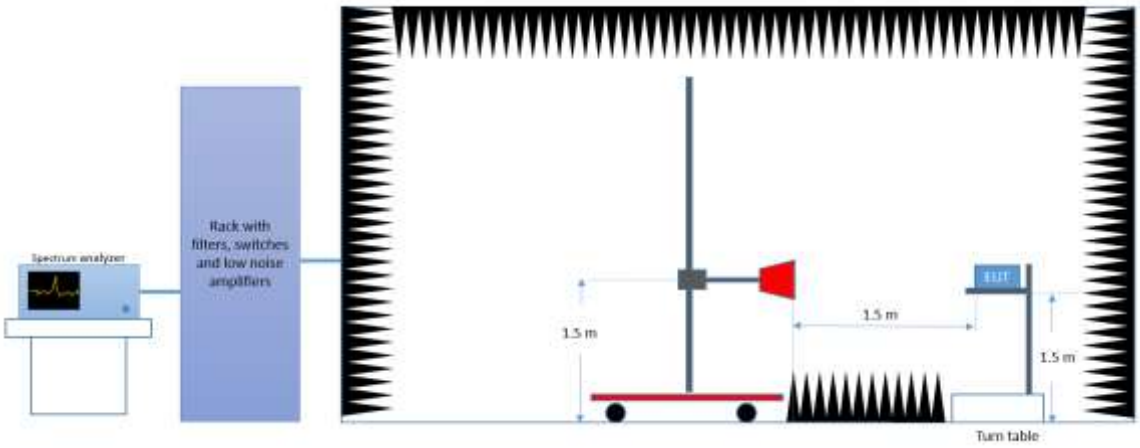
Radiated Setup < 1GHz



Radiated Setup 1 GHz – 18 GHz



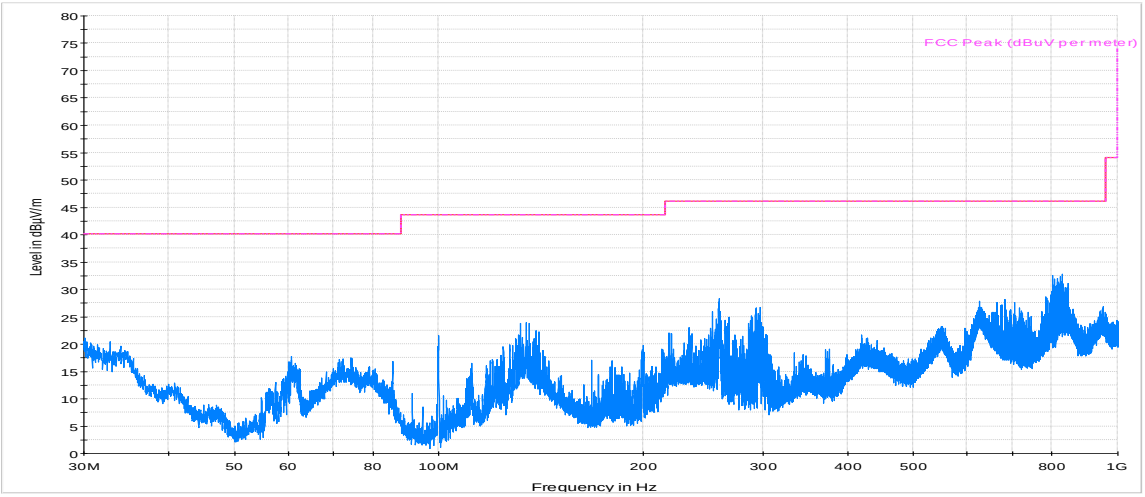
Radiated Setup > 18 GHz



Test Results

All modes

Radiated Spurious 30 MHz – 1 GHz

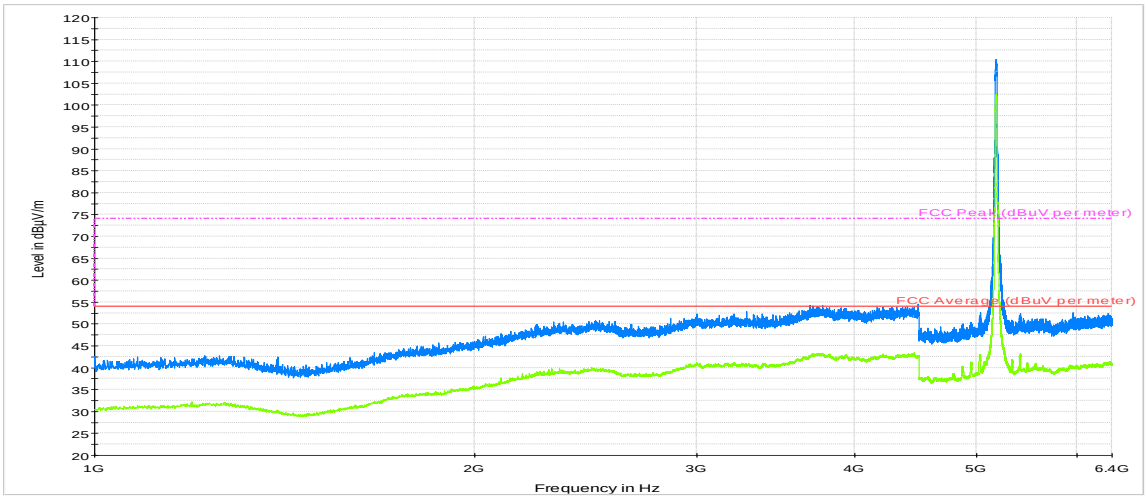


Frequency	MaxPeak	Limit	Margin
MHz	dBµV/m	dBµV/m	dB
258	29.4	46	16.6
805	32.7	46	13.3

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.

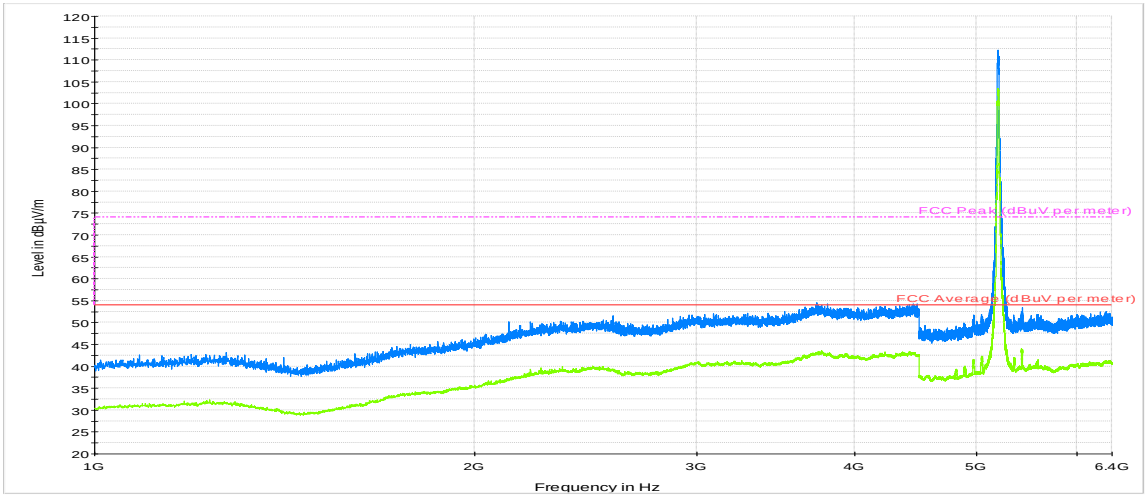
802.11a, Chain A

Radiated Spurious 1 GHz – 6.4GHz – CH36



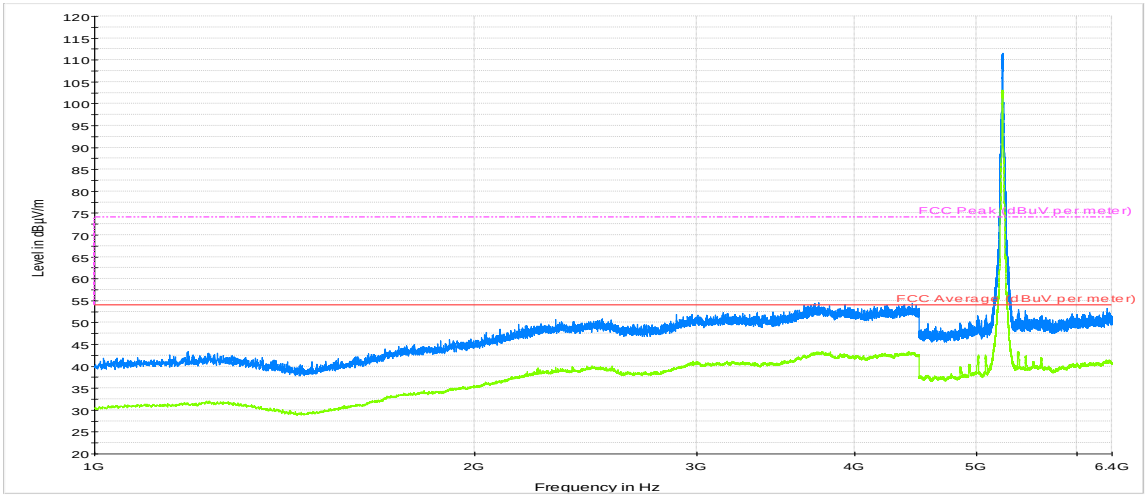
Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
4451	53.8	---	74	20.2
4451	---	43.2	54	10.8

Radiated Spurious 1 GHz – 6.4GHz – CH40



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
4442	53.9	---	74	20.1
4442	---	43.1	54	10.9

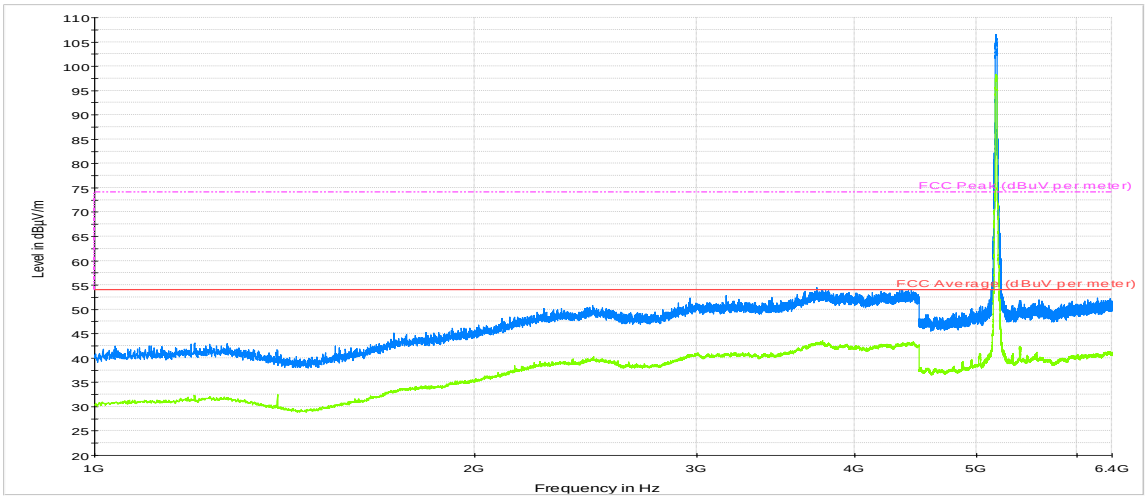
Radiated Spurious 1 GHz – 6.4GHz – CH48



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
4444	54.4	---	74	20.6
4444	---	43.2	54	10.8

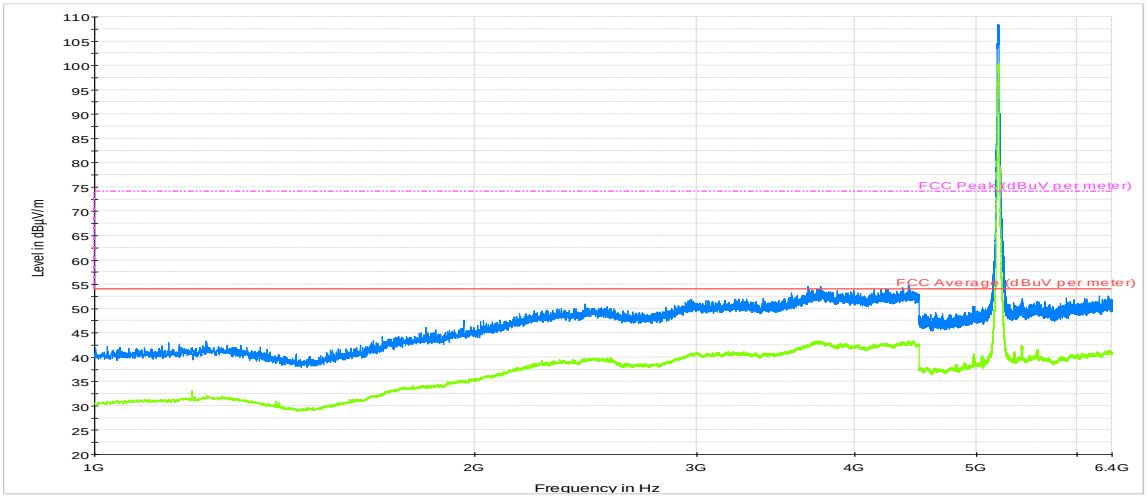
802.11a, Chain B

Radiated Spurious 1 GHz – 6.4GHz – CH36



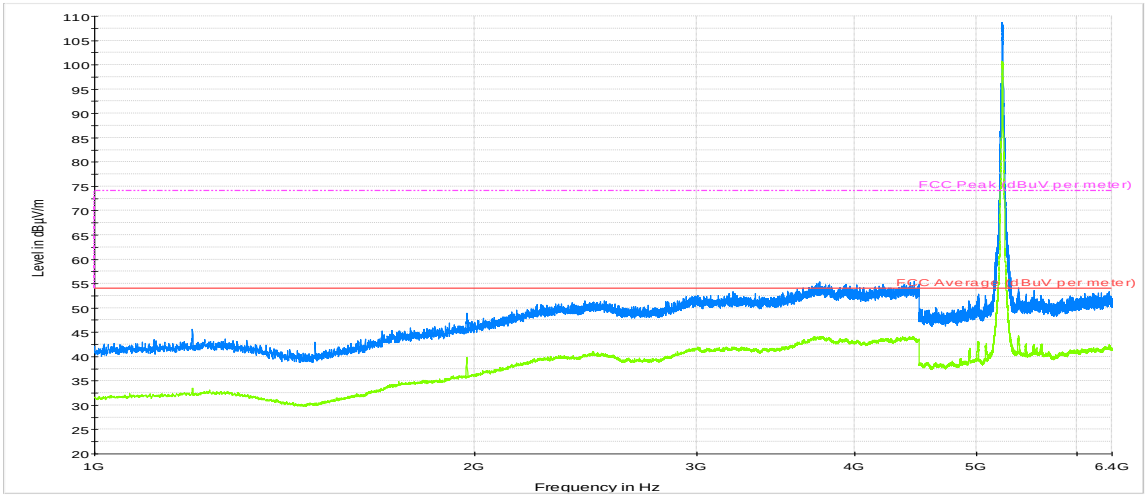
Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
4436	53.9	---	74	20.1
4436	---	43.1	54	10.9

Radiated Spurious 1 GHz – 6.4GHz – CH40



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
4430	53.8	---	74	20.2
4430	---	43.1	54	10.9

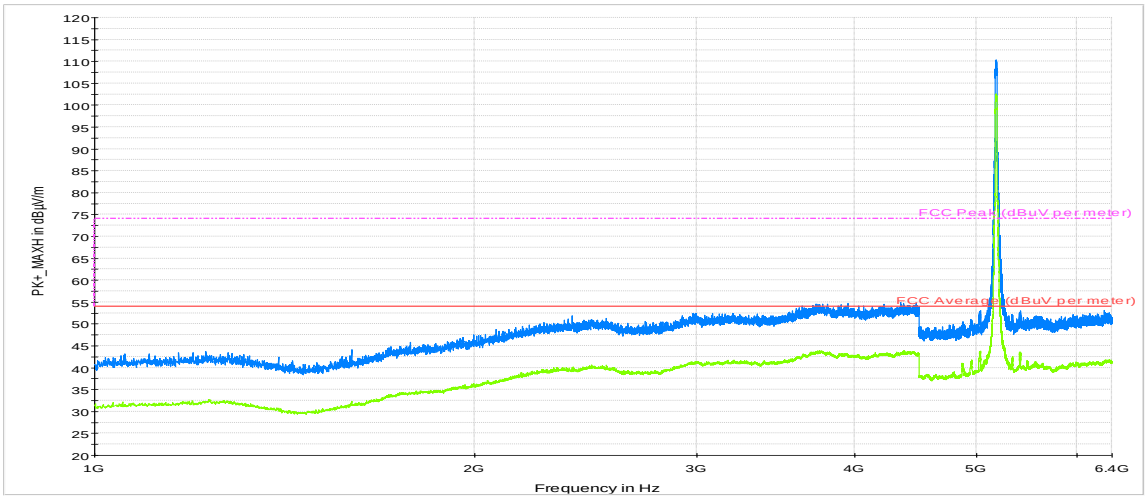
Radiated Spurious 1 GHz – 6.4GHz – CH48



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
1966	45.5	---	74	28.5
1966	---	36.1	54	17.9
4497	53.8	---	74	20.2
4497	---	43.6	54	10.4

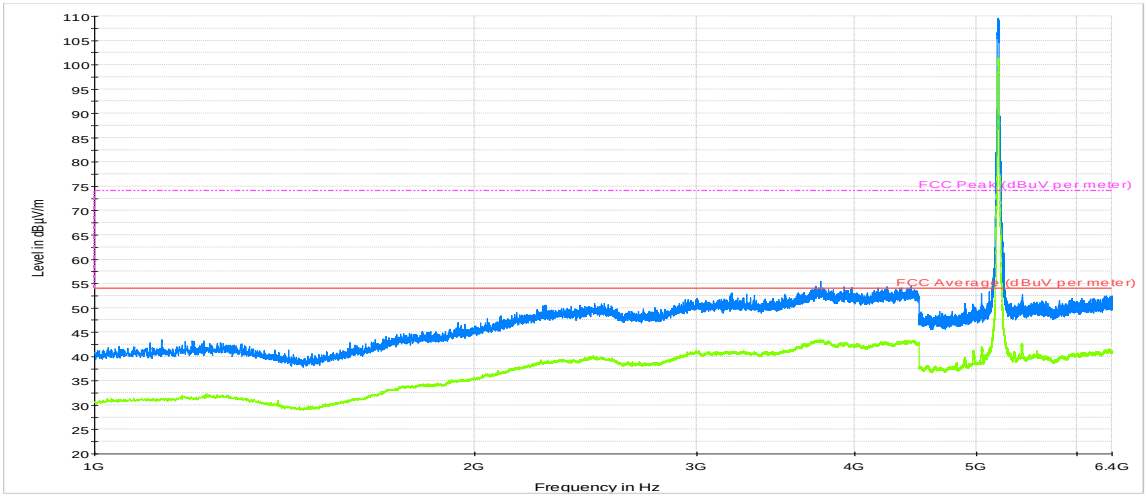
802.11n20, Chain A

Radiated Spurious 1 GHz – 6.4GHz – CH36



Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3765	53.7	---	74	20.3
3765	---	43.8	54	10.2

Radiated Spurious 1 GHz – 6.4GHz – CH40



Peak measurements AVG measurements Limit FCC AVG Limit FCC Peak

Frequency	MaxPeak	RMS	Limit	Margin
MHz	dBµV/m	dBµV/m	dBµV/m	dB
3761	55.5	---	74	18.5
3761	---	42.9	54	11.1