TESTING CERT #3478.01

TEST REPORT

EUT Description	**WLAN and BT, 2x2 PCIe M.2 2230 adapter card**
Brand Name	**Intel® Dual Band Wireless-AC 8265**
Model Name	**8265NGW**
Serial Number	**TA#: H93538-003** **WF MAC: 34:13:E8:52:D9:0B / 34:13:E8:52:D8:F7** **BT MAC: 34:13:E8:52:D9:0F / 34:13:E8:52:D8:FB** (see section 4)
FCC/IC ID	**FCC ID: PD98265NG / PD98265NGU** **IC ID: 1000M-8265NG**
Antenna type	**SkyCross WIMAX/WLAN Reference Antenna**
Hardware/Software Version	**HW: WsP2230 cfg12.1MS** **Test SW: DRTU version 1.8.7-02784** **Op SW: 99.0.19.1**
Date of Sample Receipt	**2016-04-01**
Date of Test Start/End	**2016-04-28 / 2016-05-09**
Features	**802.11 a/b/g/n/ac Wireless LAN + BDR/EDR 2.1 + BLE 4.2** (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 15C** **RSS-247 issue 1, RSS-Gen issue 4** (see section 1)

Test Report number	**160321-01.TR02**
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.

Issued by

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Table of Contents

1. Standards, reference documents and applicable test methods

1. FCC 47 CFR part 15 - Subpart C – §15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
2. FCC 47 CFR part 15 - Subpart C – §15.209 Radiated emission limits; general requirements.
3. FCC OET KDB 558074 D01 DTS Meas Guidance v03r05 – Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247
4. RSS-247 — Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
5. RSS-Gen Issue 4 – General Requirements for Compliance of Radio Apparatus.
6. ANSI C63.10-2013 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

2. General conditions, competences and guarantees

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- ✓ Intel WRF Lab has developed calibration and proficiency programs for its measurement equipment to ensure correlated and reliable results to its customers.
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3. Environmental Conditions

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

Temperature	23ºC ± 2ºC
Humidity	51% ± 5%

4. Test samples

Sample	Control #	Description	Model	Serial #	Date of reception	Note
#01	160321-01.S05	WiFi/BT Module	8265NGW	WF MAC: 34:13:E8:52:D8:F7 BT MAC: 34:13:E8:52:D8:FB	2016-04-01	Used for conducted tests Used for radiated tests (from 18GHz to 25GHz)
	160107-01.S11	Extender board	PC00495	4955013-097	2016-01-07	
	160107-01.S20	AC/DC Adapter	SPU60-102	08741209 1350	2016-01-07	
	15040201.S15	Laptop	DELL Latitude	21238680926	2015-04-15	
#02	160321-01.S03	WiFi/BT Module	8265NGW	WF MAC: 34:13:E8:52:D9:0B, BT MAC: 34:13:E8:52:D9:0F	2015-04-01	Used for radiated tests (from 30MHz to 18 GHz)
	160107-01.S12	Extender board	PC00495	4955013-034	2016-01-07	
	160107-01.S28	Laptop	Latitude E5440	BJSYN32	2016-01-15	

NA: Not Applicable

5. EUT features

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

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 4.2	2.4GHz (2400.0 – 2483.5 MHz)

6. Remarks and comments

N/A

7. Test Verdicts summary

7.1. 802.11 b/g/n 2.4GHz

FCC part	RSS part	Test name	Verdict
15.247 (a) (2)	RSS-247 Clause 5.2 (1)	6dB Bandwidth	P
15.247 (b) (3)	RSS-247 Clause 5.4 (4)	Maximum output power and E.I.R.P.	P
15.247 (d)	RSS-247 Clause 5.5	Out-of-band Emissions (conducted)	P
15.247 (e)	RSS-247 Clause 5.2 (2)	Power spectral density	P
15.247 (d) 15.209	RSS-247 Clause 5.5	Out-of-band Emissions (radiated)	P

7.2. BLE

FCC part	RSS part	Test name	Verdict
15.247 (a) (2)	RSS-247 Clause 5.2 (1)	6dB Bandwidth	P
15.247 (b) (3)	RSS-247 Clause 5.4 (4)	Maximum output and E.I.R.P.	P
15.247 (d)	RSS-247 Clause 5.5	Out-of-band Emissions (conducted)	P
15.247 (e)	RSS-247 Clause 5.2 (2)	Power spectral density	P
15.247 (d) 15.209	RSS-247 Clause 5.5	Out-of-band Emissions (radiated)	P

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

8. Document Revision History

Revision #	Date	Modified by	Details
Rev. 00	2016-05-17	Z. Ouachicha	First issue

Annex A. Test & System Description

A.1 Test Conditions

For 802.11b/g modes 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) modes the EUT can transmit at both CHAIN A and CHAIN B RF outputs individually, and also simultaneously.
For Bluetooth Low Energy mode the EUT can transmit only at CHAIN B RF output.

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 spectrum analyzer with the channel integration method according to point II) E) 2) e) (Method SA-2 Alternative) of KDB 789033 D02.
Measured values for adjustment were within -0.2 dB/+0.3 dB from the declared Target values.

2.4GHz DTS & BLE					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**
802.11b	20	1Mbps	1	2412	18.5	18.0	-
			7	2442	20.0	20.0	-
			11	2462	18.5	19.0	-
			12	2467	14.5	15.5	-
			13	2472	8.0	8.5	-
802.11g	20	6Mbps	1	2412	16.5	18.0	-
			7	2442	20.0	20.5	-
			11	2462	17.0	18.0	-
			12	2467	12.5	12.5	-
			13	2472	-3.0	-2.5	-
802.11n	20	HT0 HT8*	1	2412	16.5	16.5	15.0
			7	2442	20.0	20.5	18.5
			11	2462	16.0	17.0	15.5
			12	2467	12.0	12.0	8.5
			13	2472	-3.0	-3.0	-6.5
802.11n	40	HT0 HT8*	3F	2422	13.0	15.5	13.0
			7F	2442	16.0	16.0	15.0
			9F	2452	15.0	15.0	13.0
			10F	2457	11.5	12.0	10.5
			11F	2462	-4.0	-3.5	-6.5
Bluetooth Low Energy	2	1Mbps	0	2412	-	8.0	-
			19	2440	-	9.0	-
			39	2462	-	9.0	-

* Note: HT8 for MIMO modes only.

Alternative channels to the highest channel have been also tested for Band Edge compliance.

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:

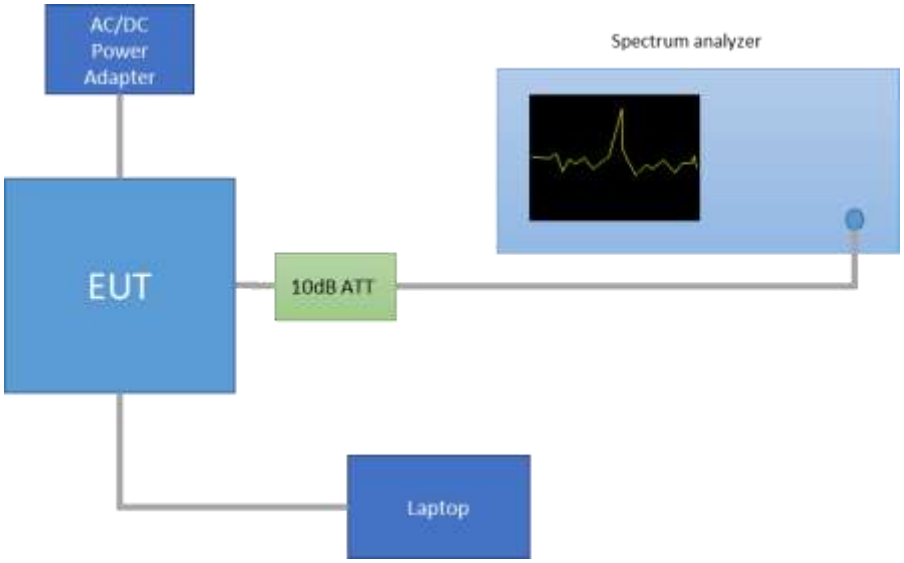
802.11b → 1Mbps
802.11g → 6Mbps
802.11n20 and 802.11n40 (SISO) → HT0
802.11n20 and 802.11n40 (MIMO) → HT8

A.2 Measurement system

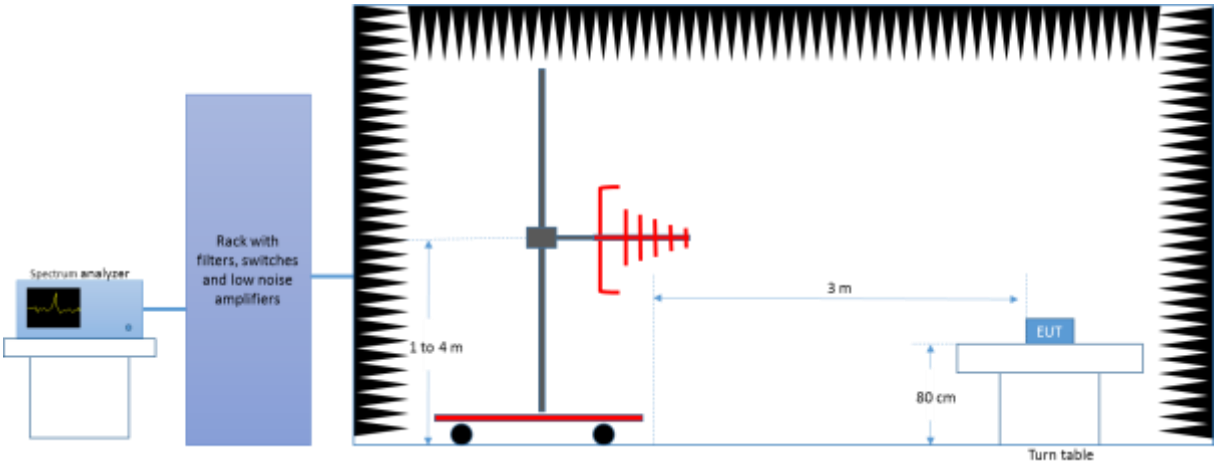
Measurements were performed using the following setups, made in accordance to the general provisions of FCC DTS Measurement KDB 558074 D01 DTS Meas Guidance.

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.

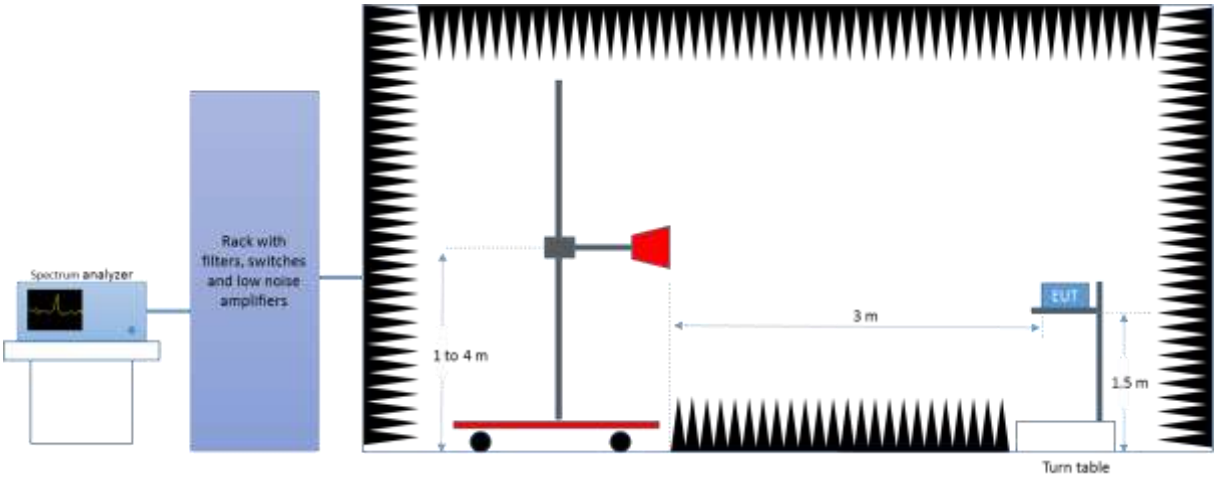
Conducted Setup



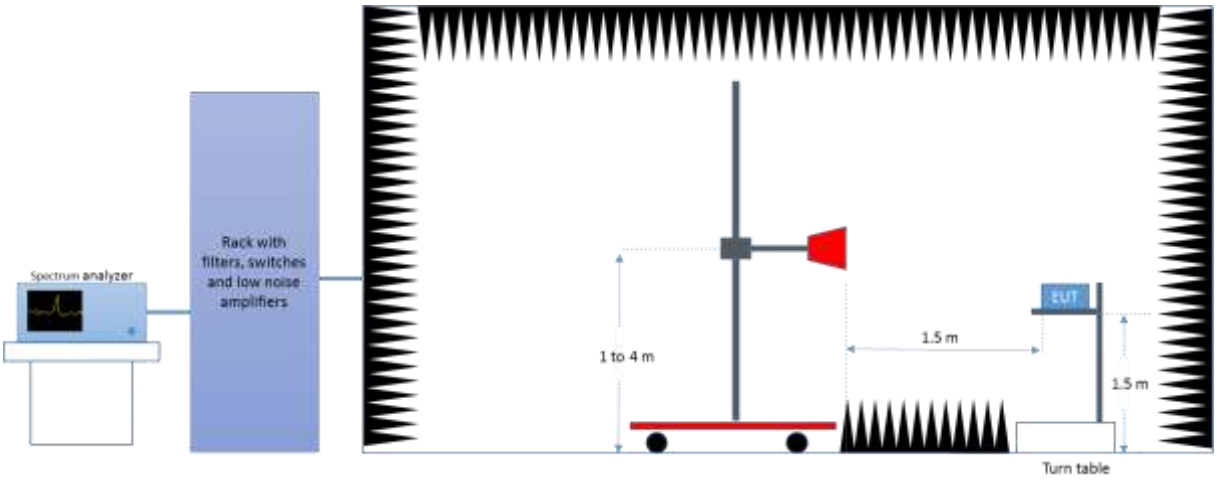
Radiated Setup < 1GHz



Radiated Setup 1GHz - 18GHz



Radiated Setup > 18GHz



A.3 Test Equipment List

Conducted Setup

ID#	Device	Type/Model	Serial Number	Manufacturer	Cal. Date	Cal. Due Date
0318	Spectrum analyzer	FSV30	103310	Rohde & Schwarz	2015-10-01	2017-10-01

Radiated Setup

ID#	Device	Type/Model	Serial Number	Manufacturer	Cal. Date	Cal. Due Date
0133	Spectrum analyzer	FSV40	101358	Rohde & Schwarz	2016-04-15	2018-04-15
0258	Spectrum analyzer	FSV30	101318	Rohde & Schwarz	2016-04-27	2018-04-27
0310	Spectrum analyzer	FSV40	101425	Rohde & Schwarz	2015-03-25	2017-03-25
0137	Log antenna 30 MHz – 1 GHz	3142E	00156946	ETS Lindgren	2015-12-11	2017-12-11
0138	Horn antenna 1 GHz – 6.4 GHz	3117	00157734	ETS Lindgren	2016-03-14	2018-03-14
0343	Horn Antenna 6.4 GHz – 18 GHz	3117-PA	00201542	ETS Lindgren	2015-07-16	2017-07-16
0334	Horn Antenna 10 GHz – 40 GHz	3116C	00169308	ETS Lindgren	2015-07-15	2017-07-15
0139	Horn Antenna 18 GHz - 26.5 GHz	114514	00167100	ETS Lindgren	2014-08-14	2016-08-14
0135	Semi Anechoic chamber	FACT 3	5720	ETS Lindgren	2016-04-13	2016-05-28
0337	Full Anechoic chamber	RFD_FA_100	5996	ETS Lindgren	2015-09-08	2017-09-08
0329	Measurement Software	EMC32	1300.7027.00 (100401)	Rohde & Schwarz	N/A	N/A
N/A	Measurement Software	EMC32	0121096500000013B (009977)	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 test < 1GHz	± 3.8
Radiated test 1GHz - 40 GHz	± 4.7

Annex B. Test Results DTS

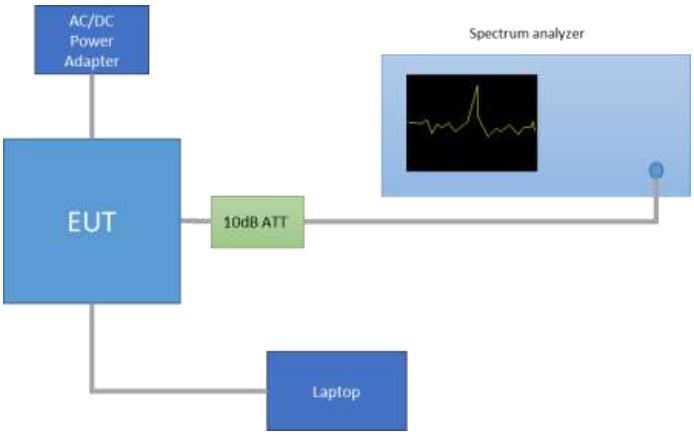
B.1 6dB & 99% Bandwidth

Test limits:

FCC part	RSS part	Limits
15.247 (a) (2)	RSS-247 Clause 5.2 (1)	Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test procedure:

The setup below was used to measure the 6dB & 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]	6dB BW [MHz]	99% BW [MHz]
802.11b	1Mbps	SISO CHAIN A	1	2412	10.08	13.61
			7	2442	**10.11**	**14.08**
			11	2462	10.11	13.79
			12	2467	10.11	13.57
			13	2472	10.11	13.87
		SISO CHAIN B	1	2412	10.08	13.56
			7	2442	10.11	13.70
			11	2462	10.11	13.55
			12	2467	10.11	13.37
			13	2472	10.11	13.86
802.11g	6Mbps	SISO CHAIN A	1	2412	15.51	16.48
			7	2442	15.81	19.12
			11	2462	15.63	16.53
			12	2467	15.63	16.48
			13	2472	15.87	16.51
		SISO CHAIN B	1	2412	15.61	16.55
			7	2442	15.84	**19.51**
			11	2462	15.90	16.53
			12	2467	15.66	16.52
			13	2472	**15.87**	16.52
802.11n20	HT0	SISO CHAIN A	1	2412	16.23	17.71
			7	2442	16.86	**21.15**
			11	2462	16.89	17.69
			12	2467	16.26	17.66
			13	2472	16.83	17.64
		SISO CHAIN B	1	2412	16.23	17.64
			7	2442	**16.92**	19.01
			11	2462	16.92	17.67
			12	2467	16.23	17.67
			13	2472	16.89	17.65
	HT8	MIMO CHAIN A	1	2412	16.63	17.66
			7	2442	17.10	**19.44**
			11	2462	16.59	17.71
			12	2467	16.86	17.71
			13	2472	16.74	17.69
		MIMO CHAIN B	1	2412	17.13	17.63
			7	2442	**17.49**	17.74
			11	2462	16.92	17.67
			12	2467	16.62	17.63
			13	2472	16.86	17.66

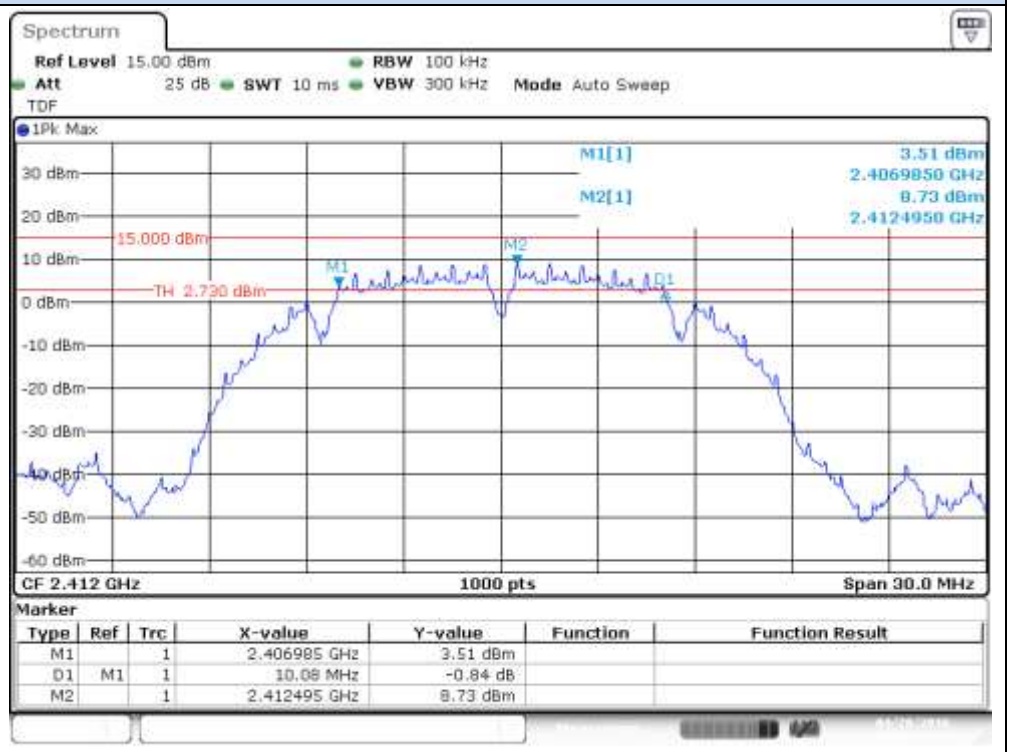
Mode	Rate	Antenna	Channel	Frequency [MHz]	6dB BW [MHz]	99% BW [MHz]
802.11n40	HT0	SISO CHAIN A	3F	2422	33.90	36.26
			7F	2442	35.00	36.27
			9F	2452	32.65	36.22
			10F	2457	35.10	**36.32**
			11F	2462	**35.10**	36.26
		SISO CHAIN B	3F	2422	33.90	36.22
			7F	2442	35.00	36.23
			9F	2452	32.80	36.19
			10F	2457	35.10	36.18
			11F	2462	35.10	36.26
	HT8	MIMO CHAIN A	3F	2422	33.55	36.27
			7F	2442	34.80	**36.31**
			9F	2452	32.95	36.23
			10F	2457	35.10	36.20
			11F	2462	35.10	36.25
		MIMO CHAIN B	3F	2422	33.90	36.10
			7F	2442	34.40	36.08
			9F	2452	34.95	36.17
			10F	2457	35.00	36.18
			11F	2462	**35.15**	36.13

Max Value

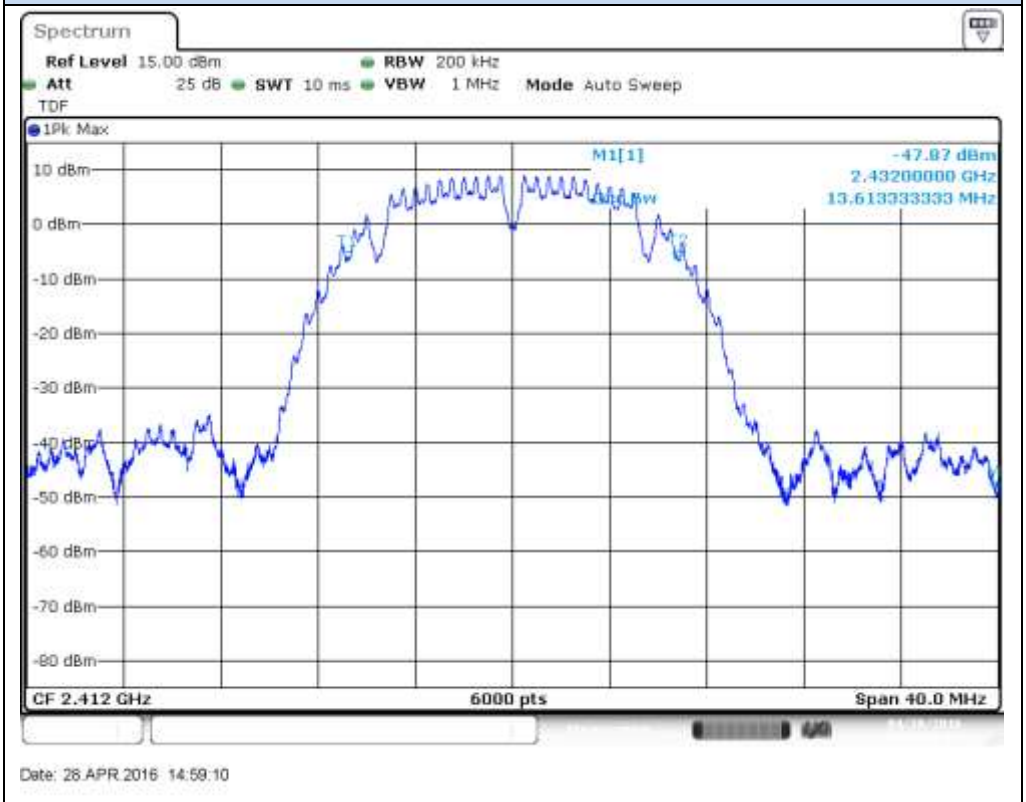
Results screenshot:

802.11b, 1Mbps (SISO) – Chain A

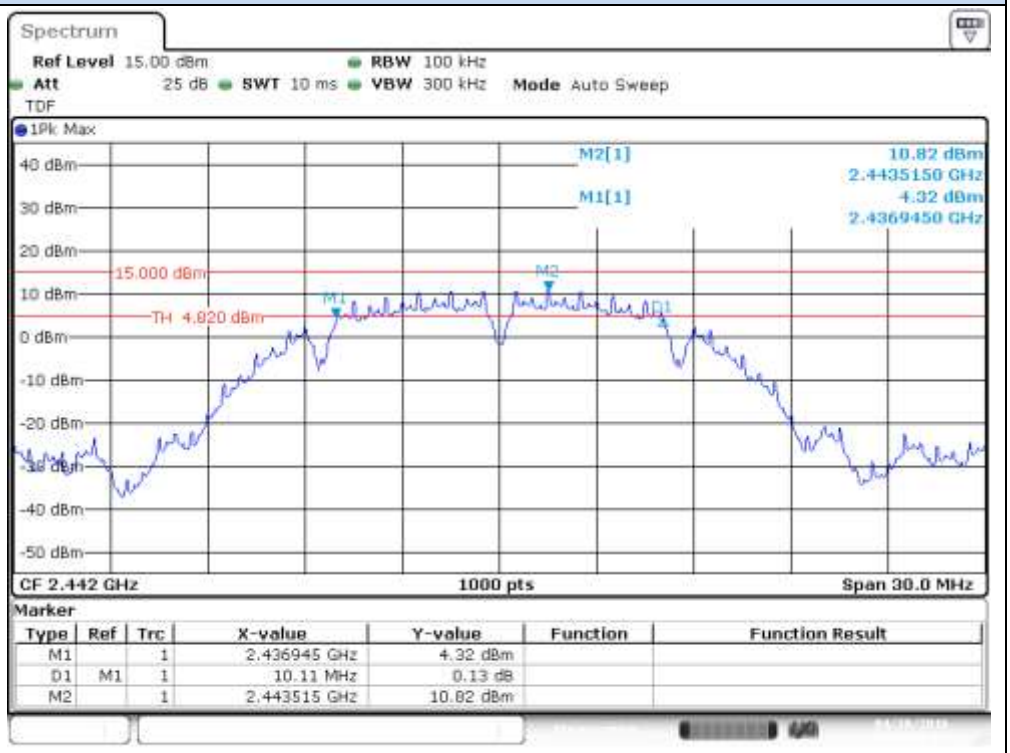
6dB BW – CH1



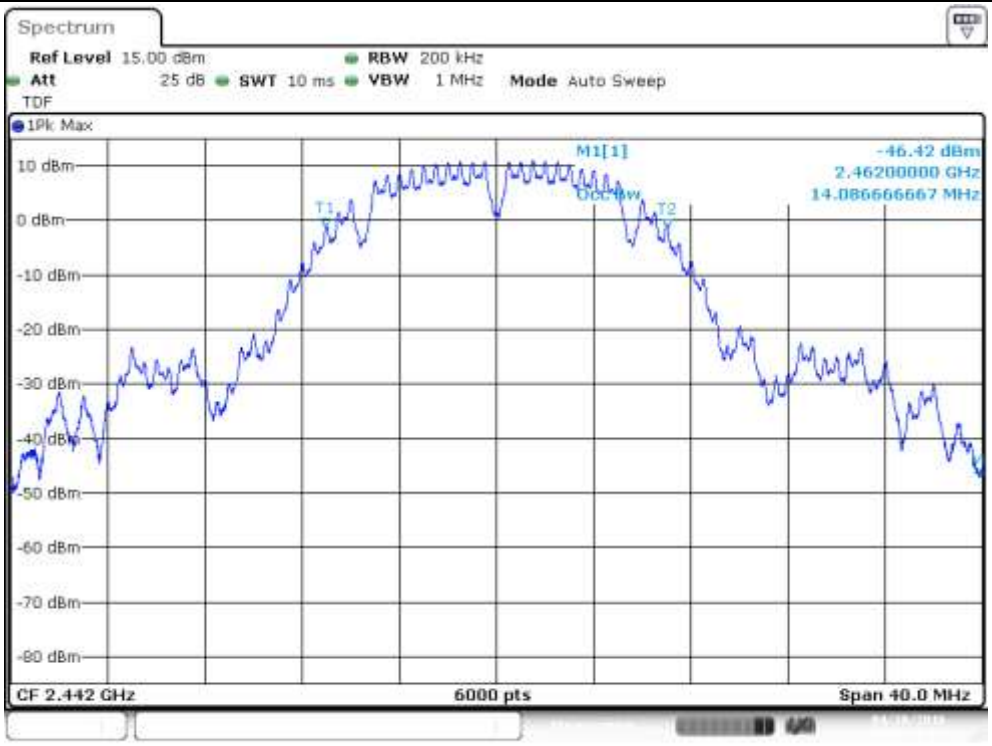
99% BW – CH1



6dB BW – CH7



99% BW – CH7



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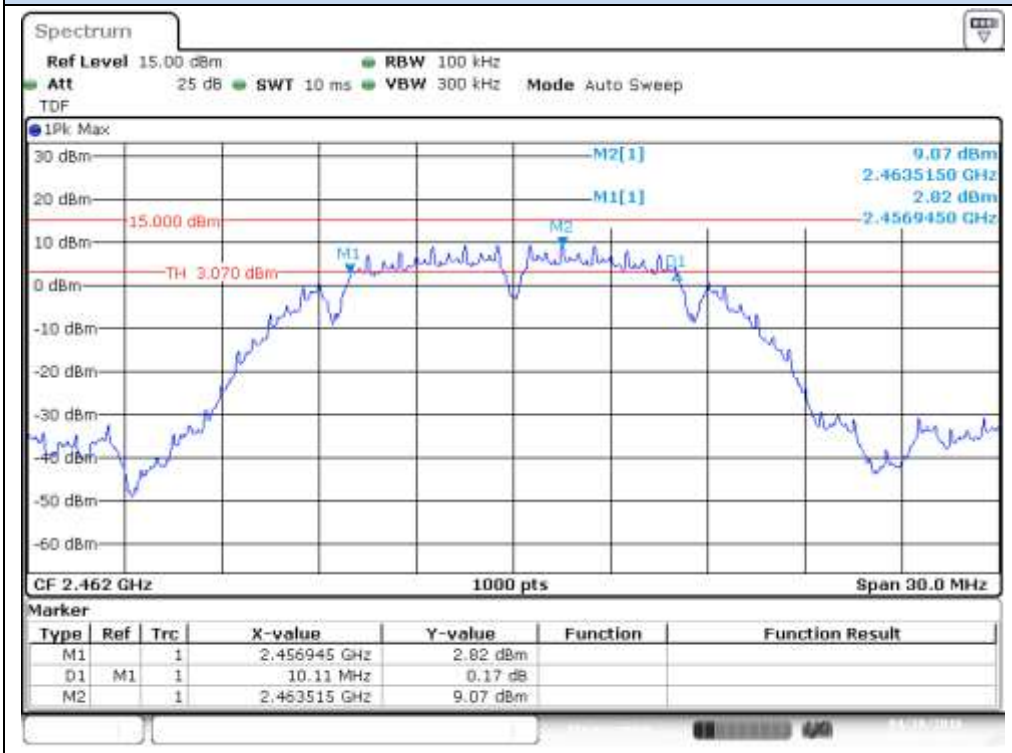

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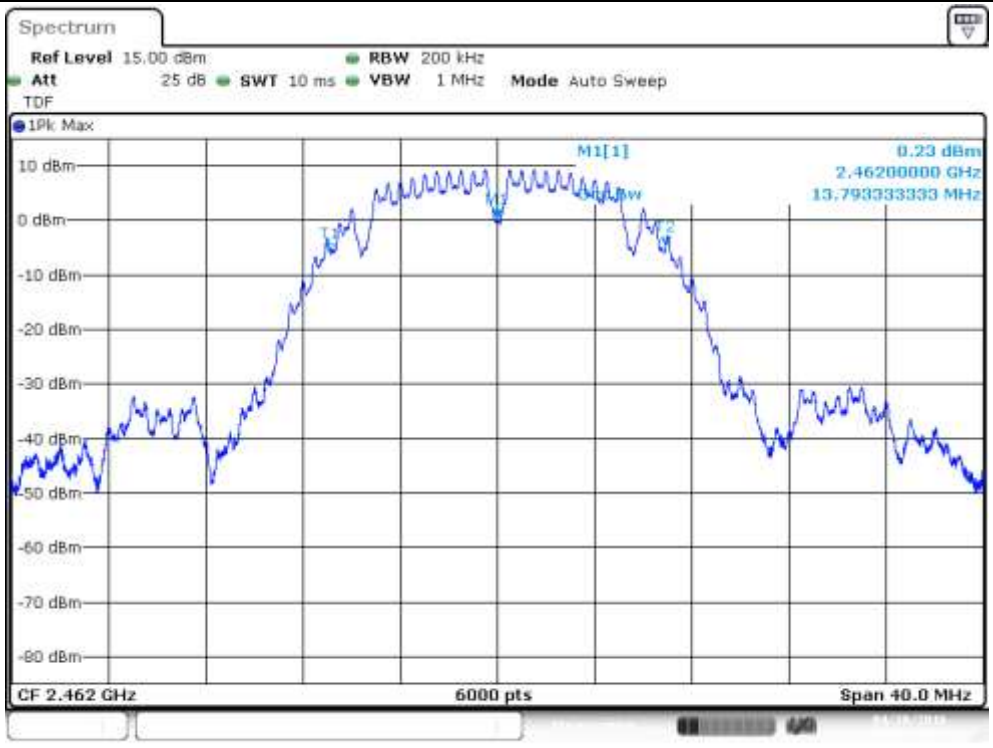

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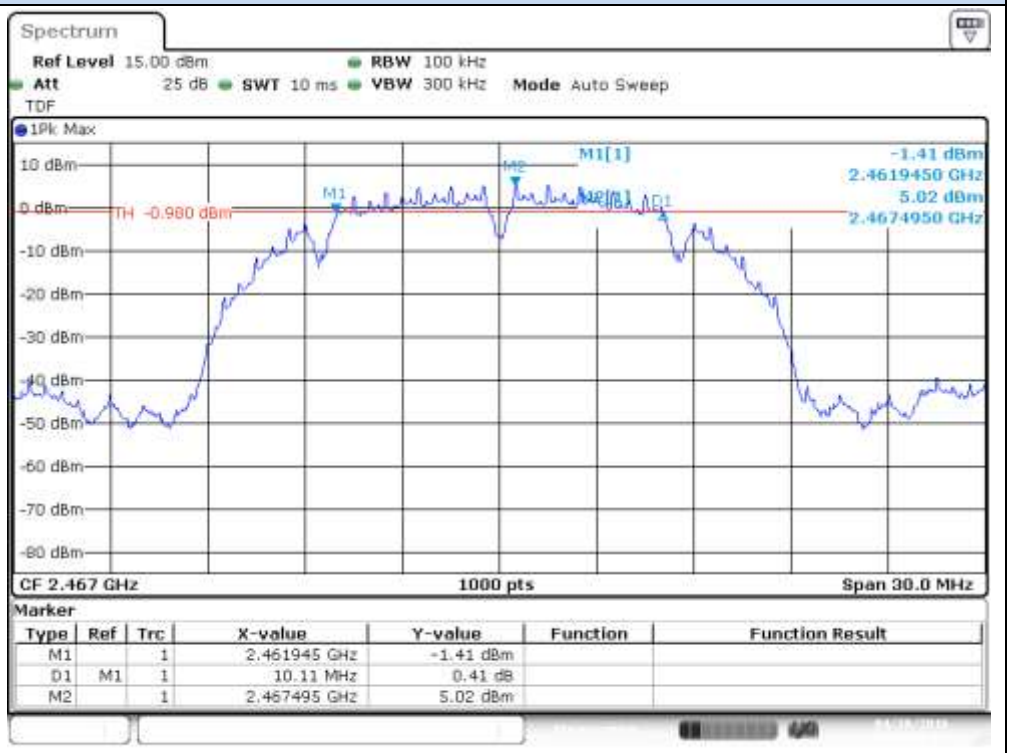
6dB BW – CH12



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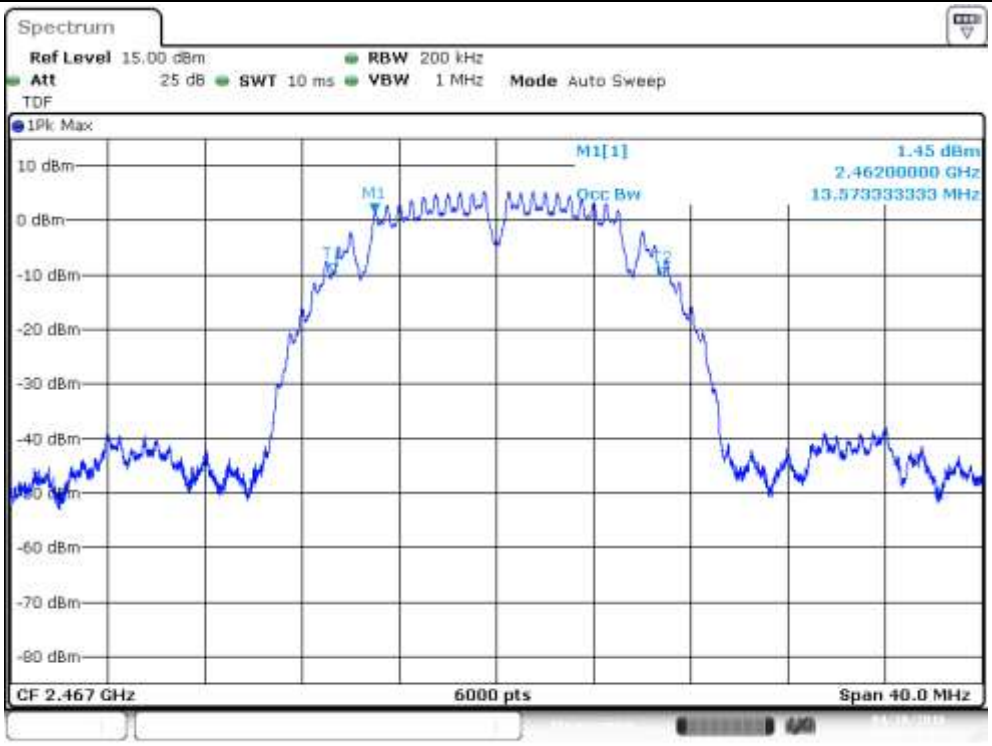
99% BW – CH12



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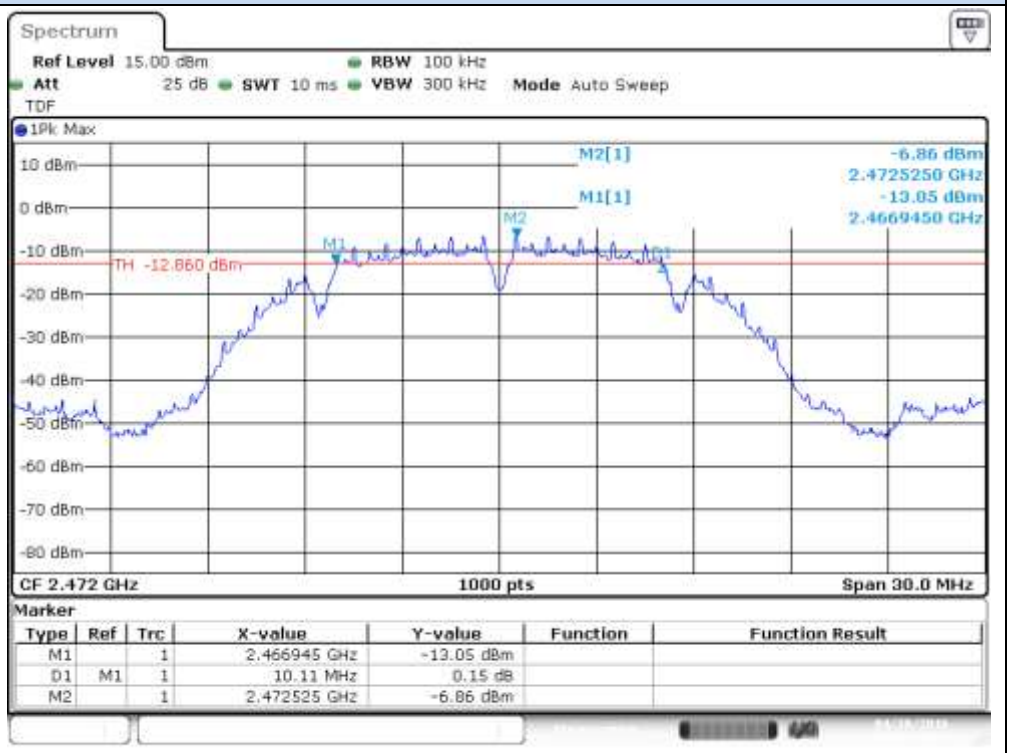

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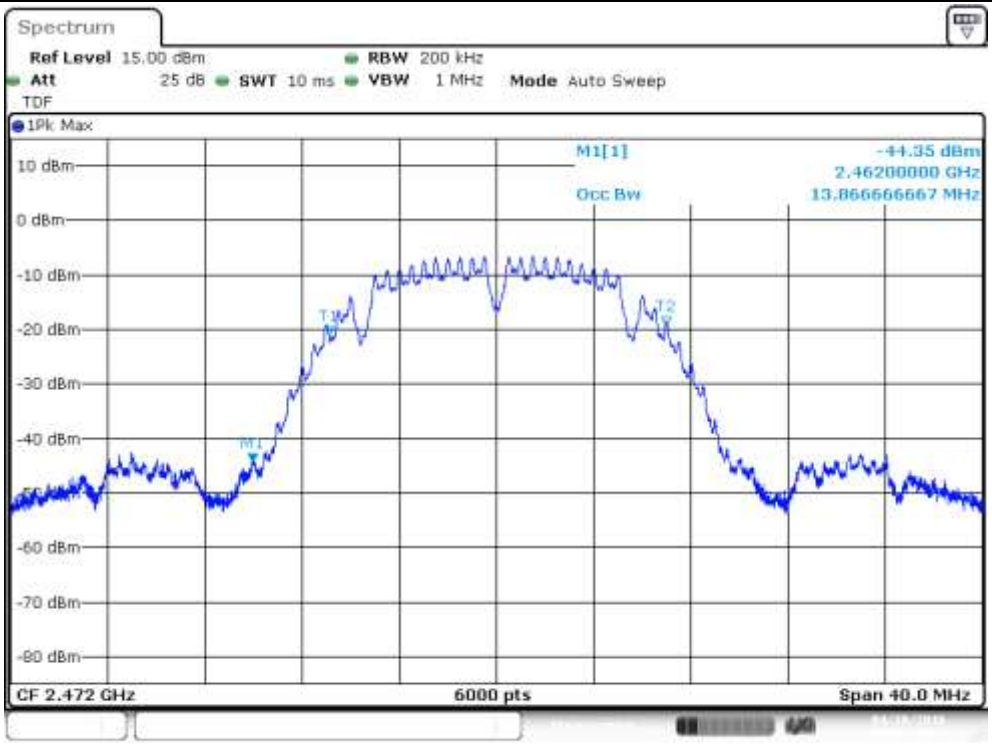
99% BW – CH13



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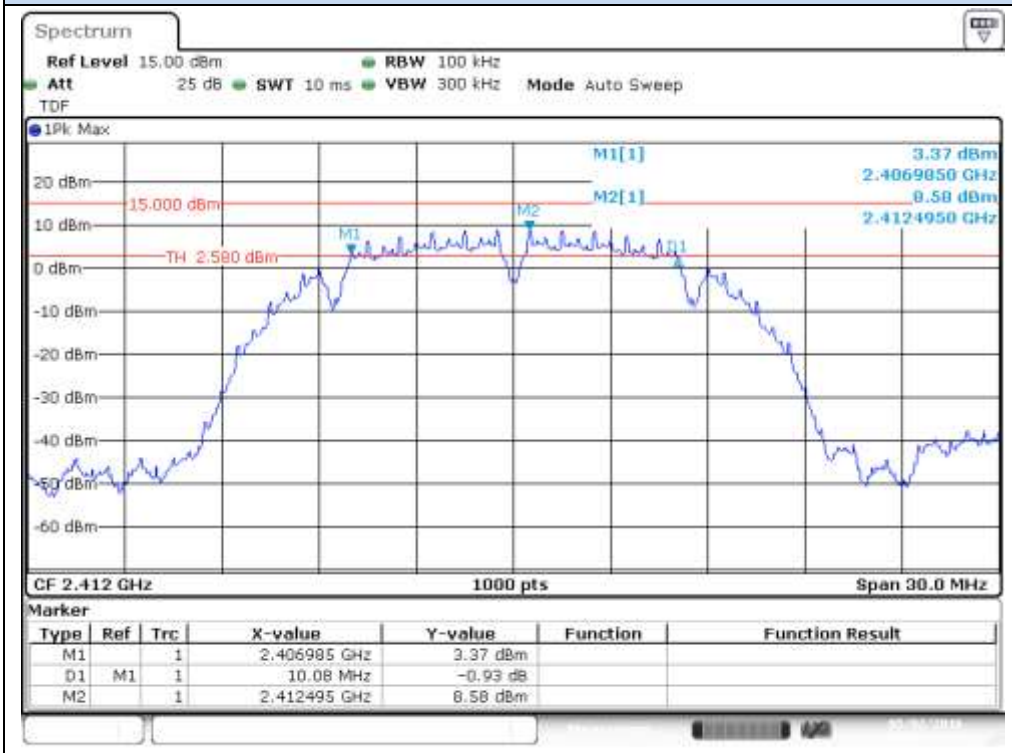
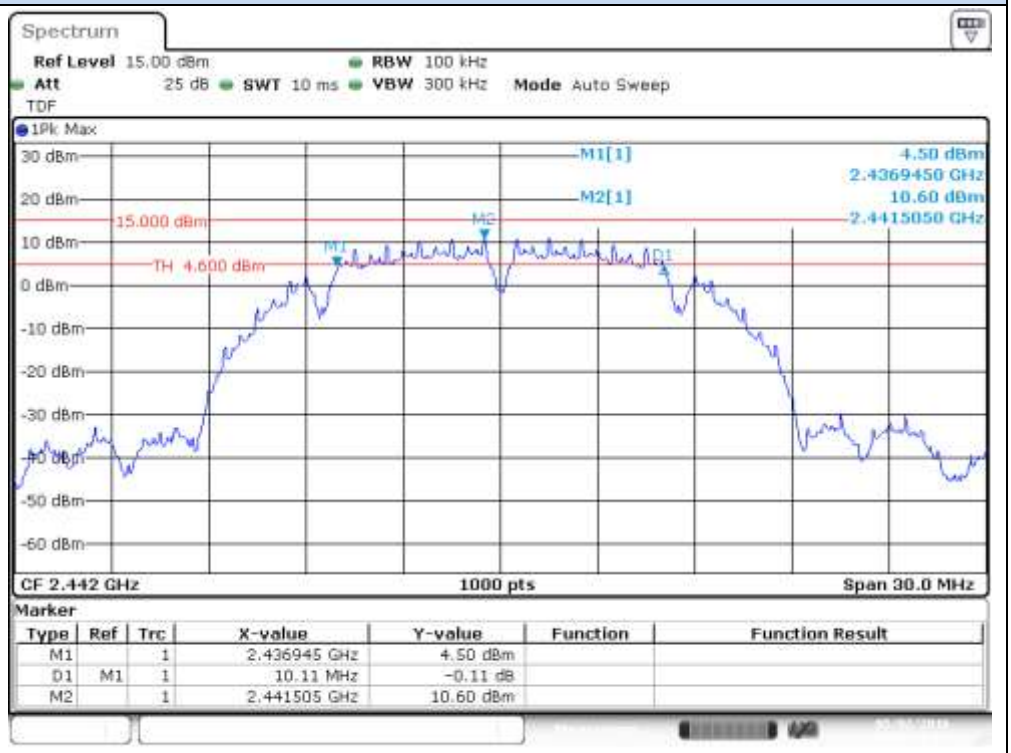
802.11b, 1Mbps (SISO) – Chain B

6dB BW – CH1

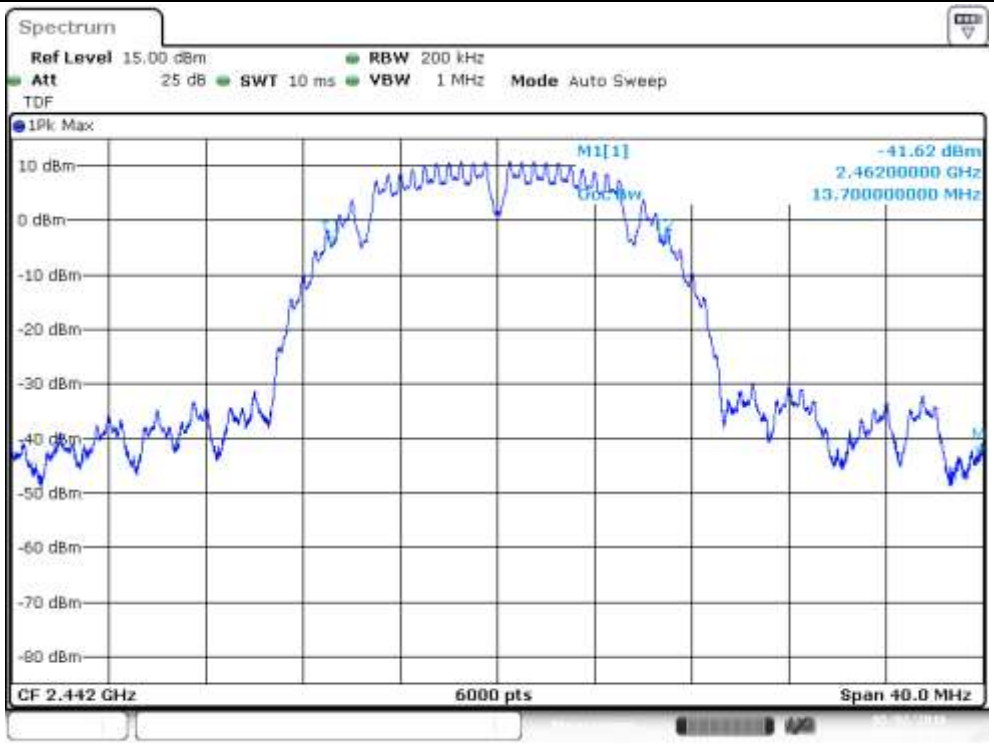


99% BW – CH1

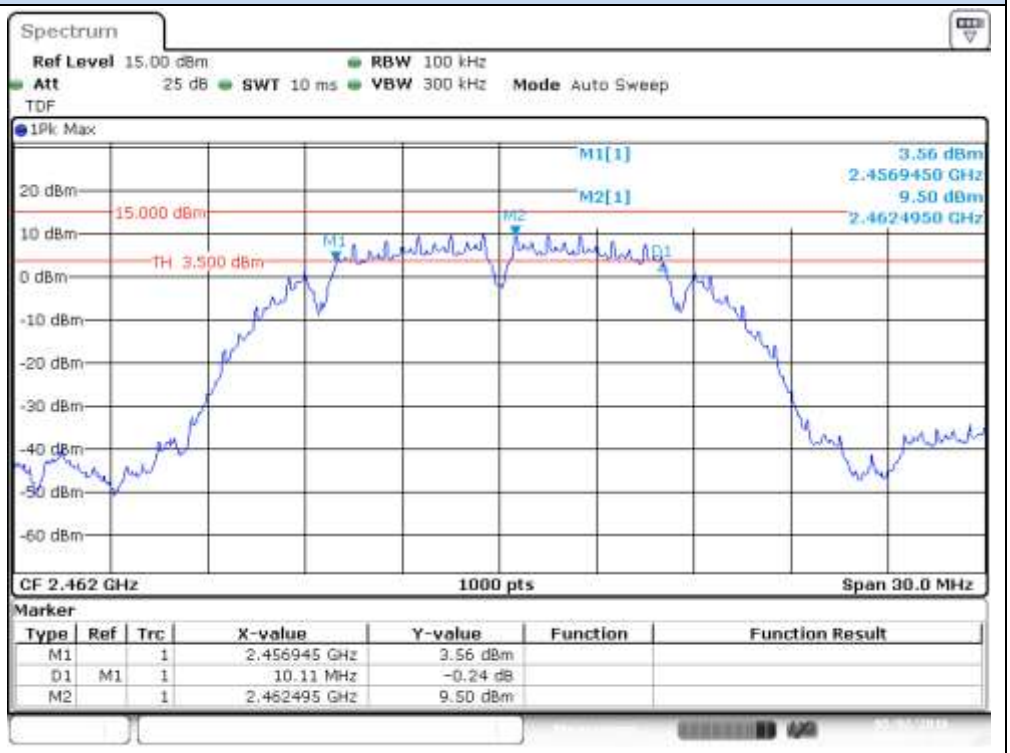
6dB BW – CH7



99% BW – CH7



6dB BW – CH11



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99% BW – CH11

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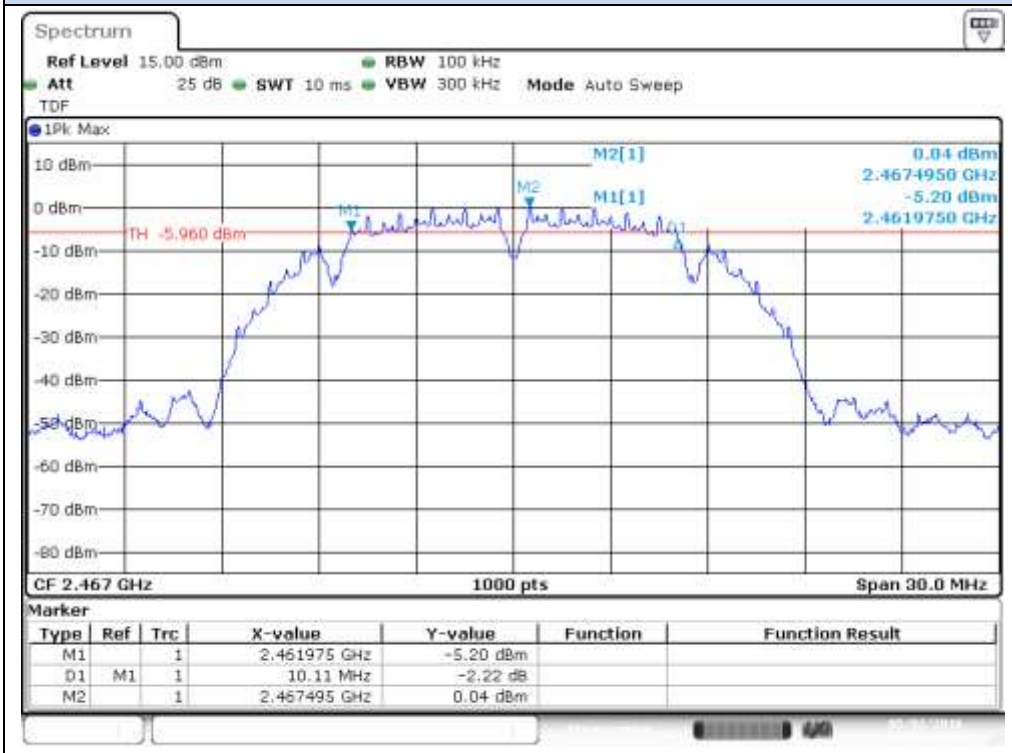
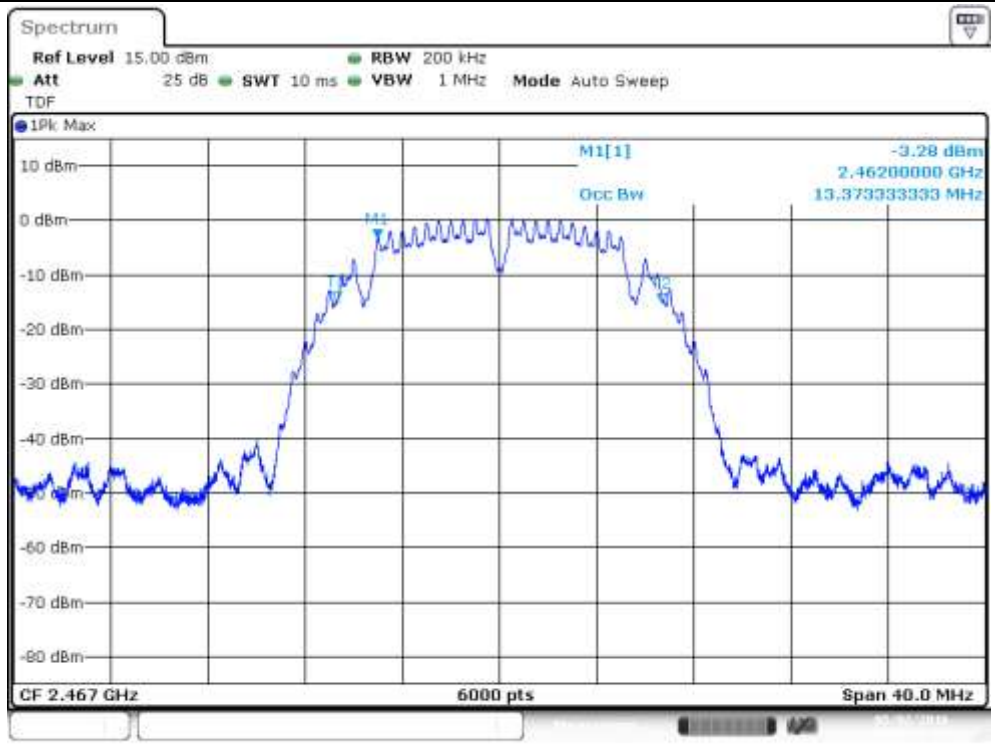
6dB BW – CH12



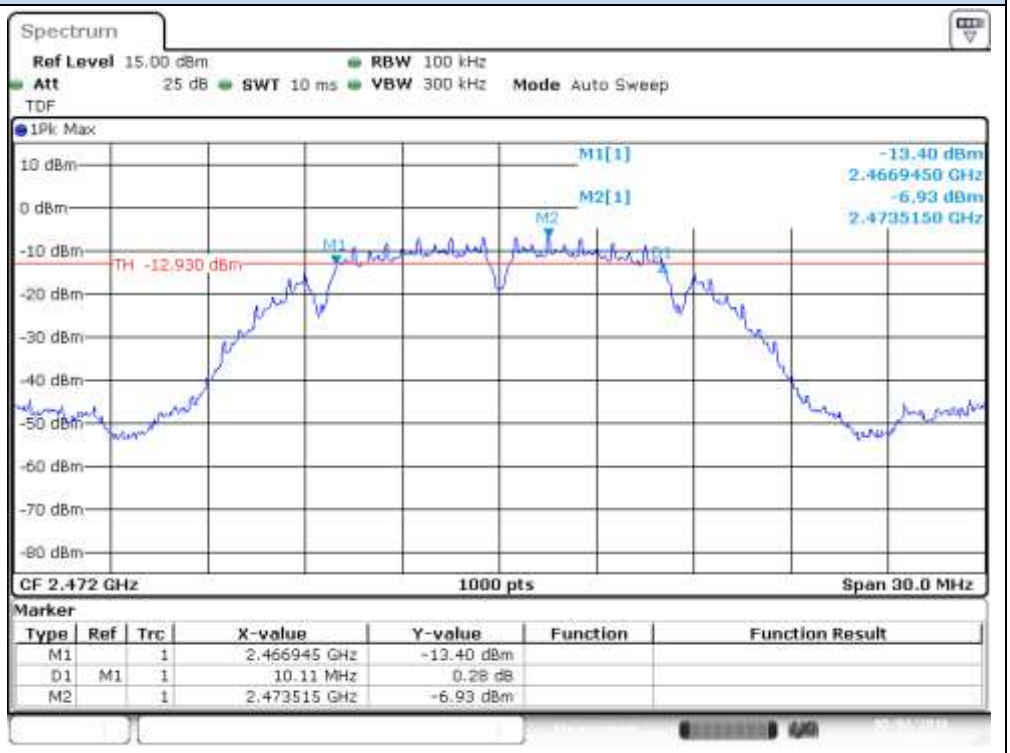
Date: 2.MAY.2016 12:01:07

99% BW – CH12



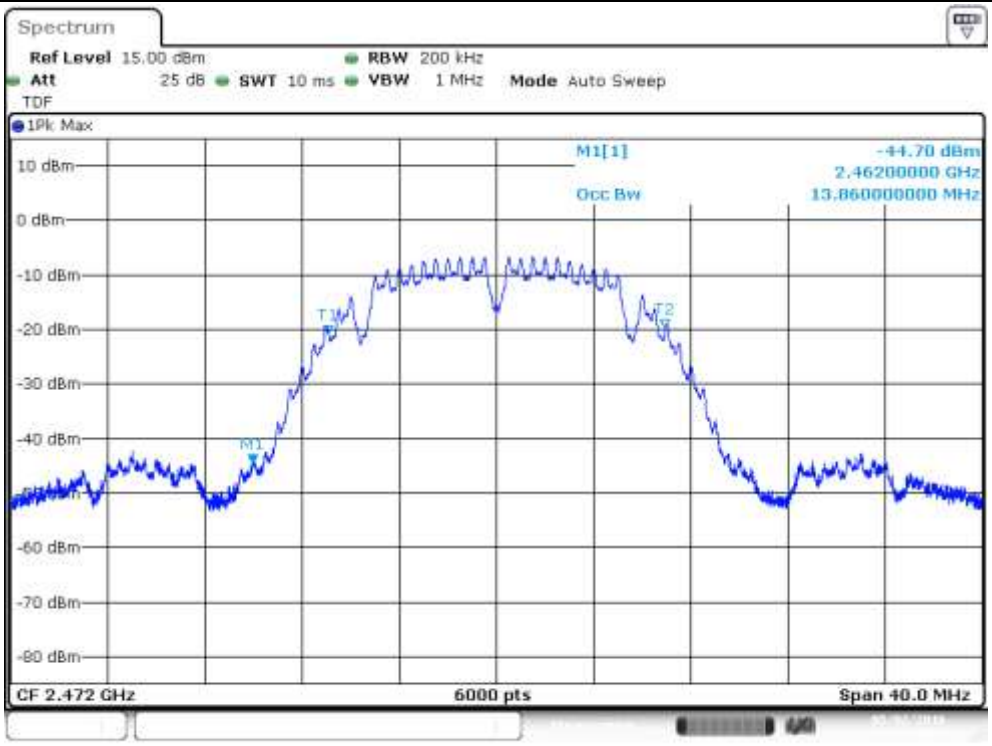
Date: 2.MAY.2016 11:59:03

6dB BW – CH13



Date: 2.MAY.2016 12:13:04

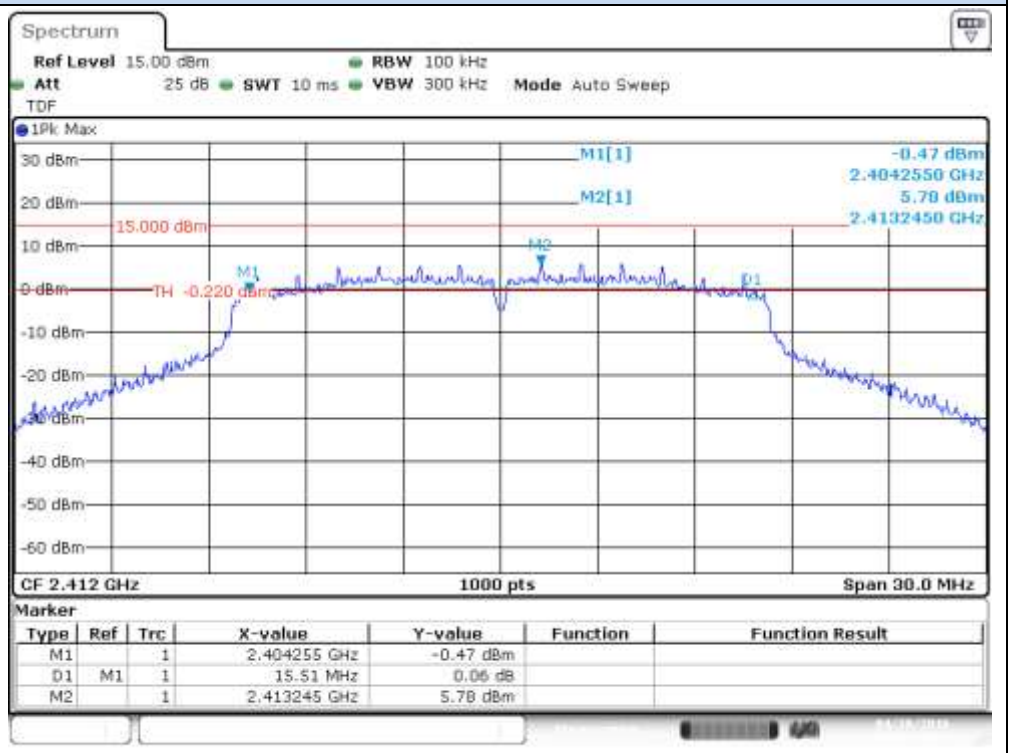
99% BW – CH13



Date: 2.MAY.2016 12:11:45

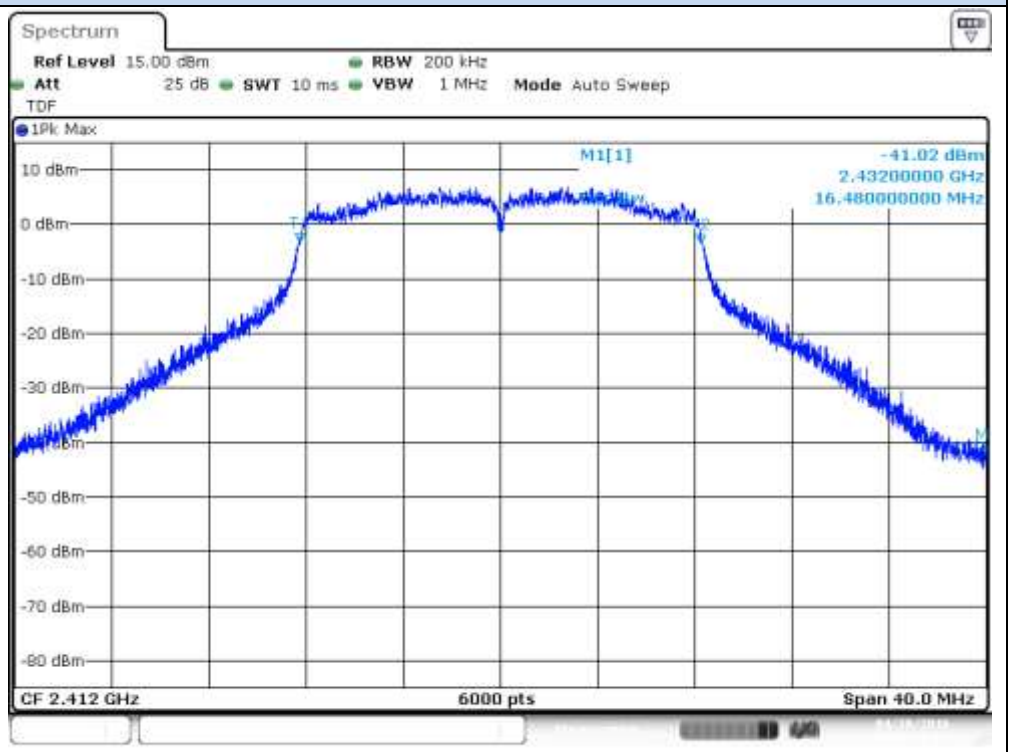
802.11g, 6Mbps (SISO) – Chain A

6dB BW – CH1



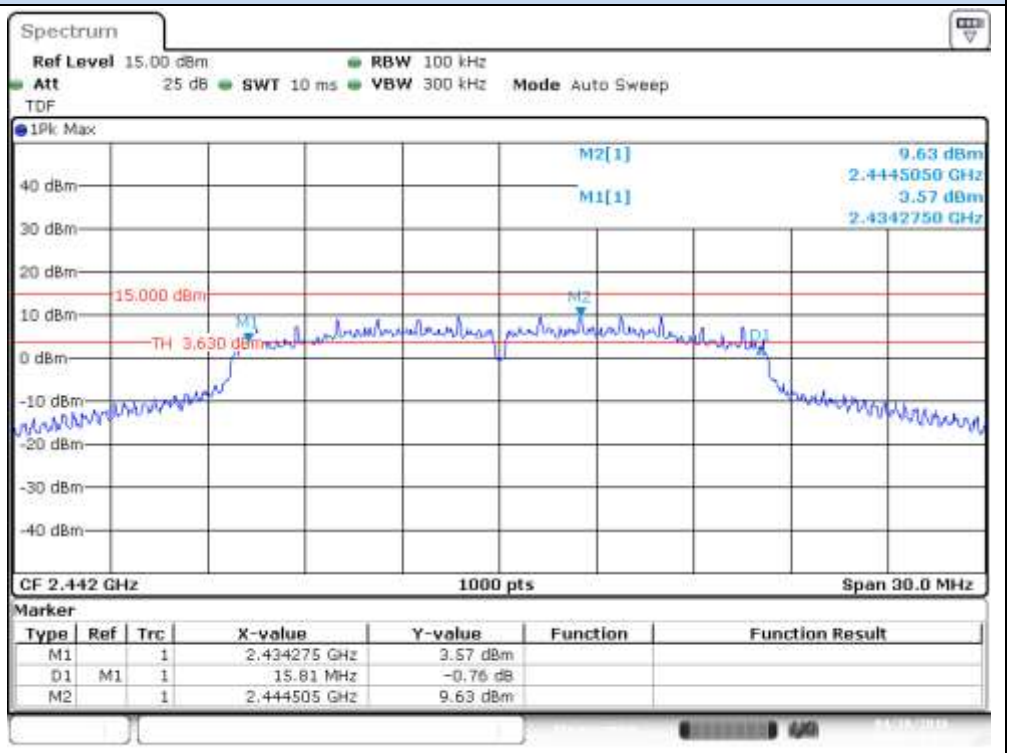
Date: 28.APR.2016 17:09:25

99% BW – CH1



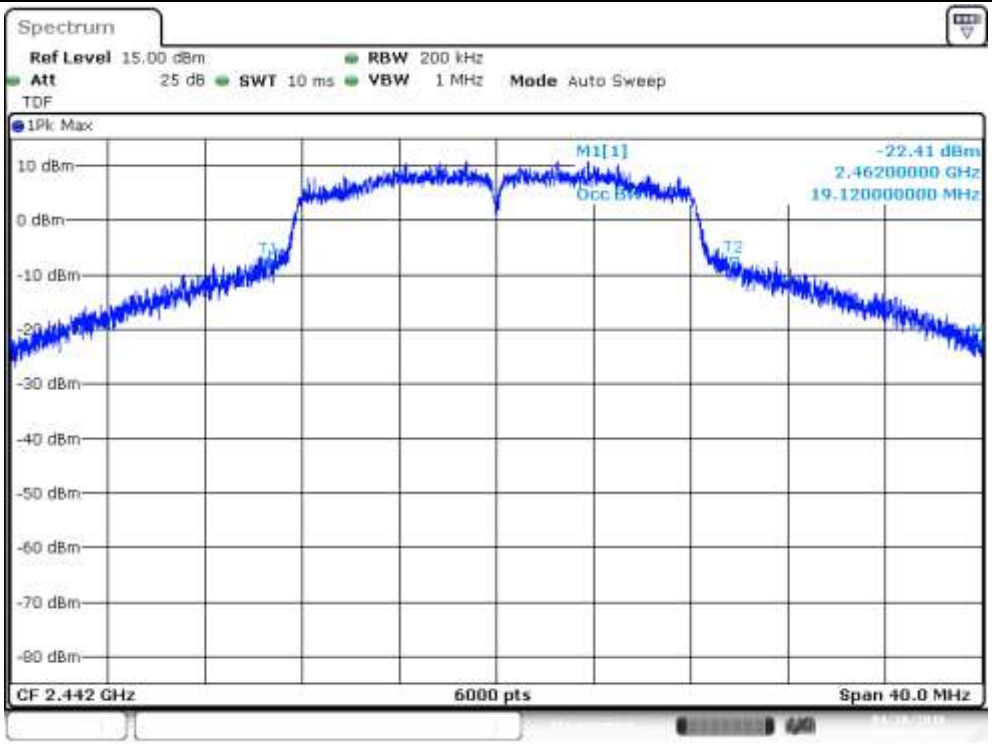
Date: 28.APR.2016 17:08:10

6dB BW – CH7



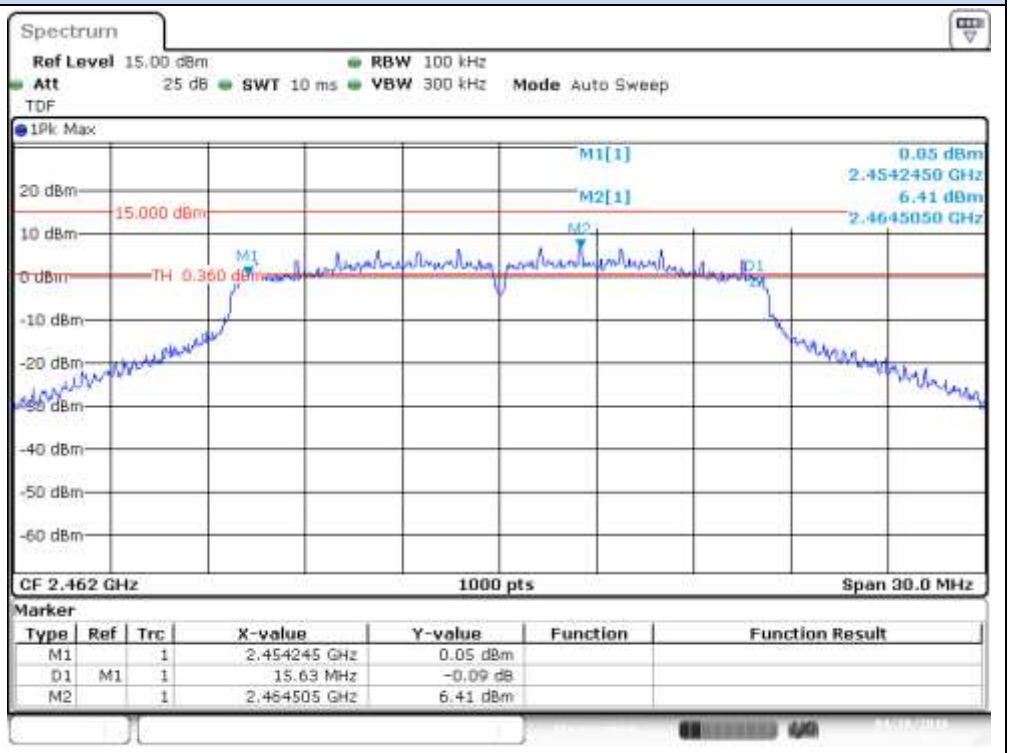
Date: 28.APR.2016 17:21:58

99% BW – CH7



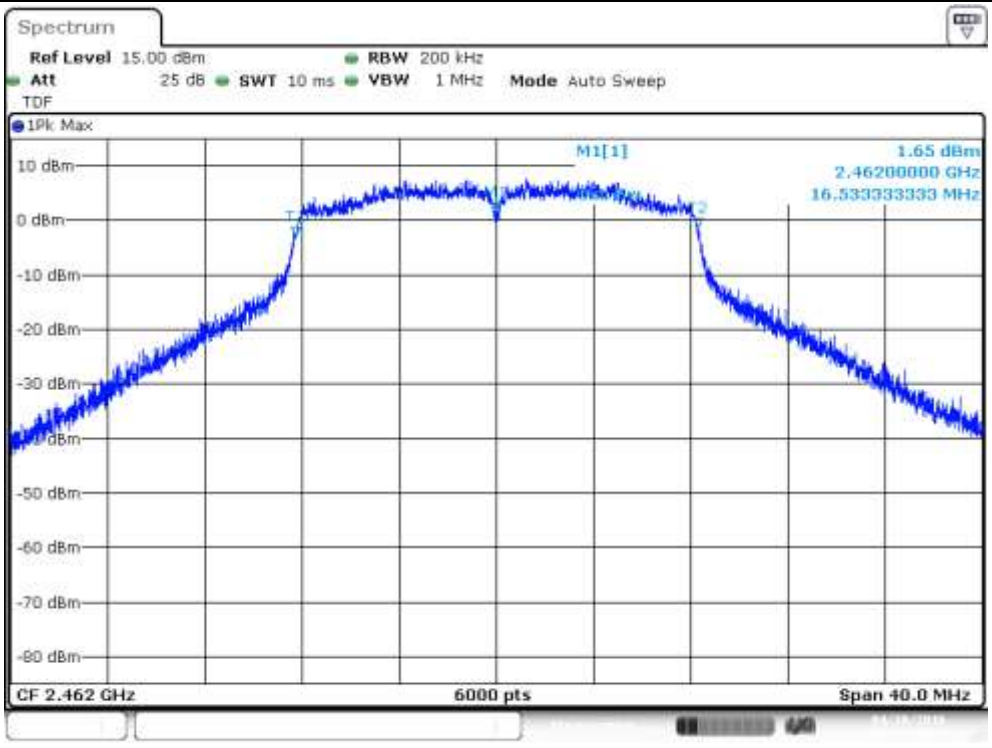
Date: 28.APR.2016 17:20:27

6dB BW – CH11



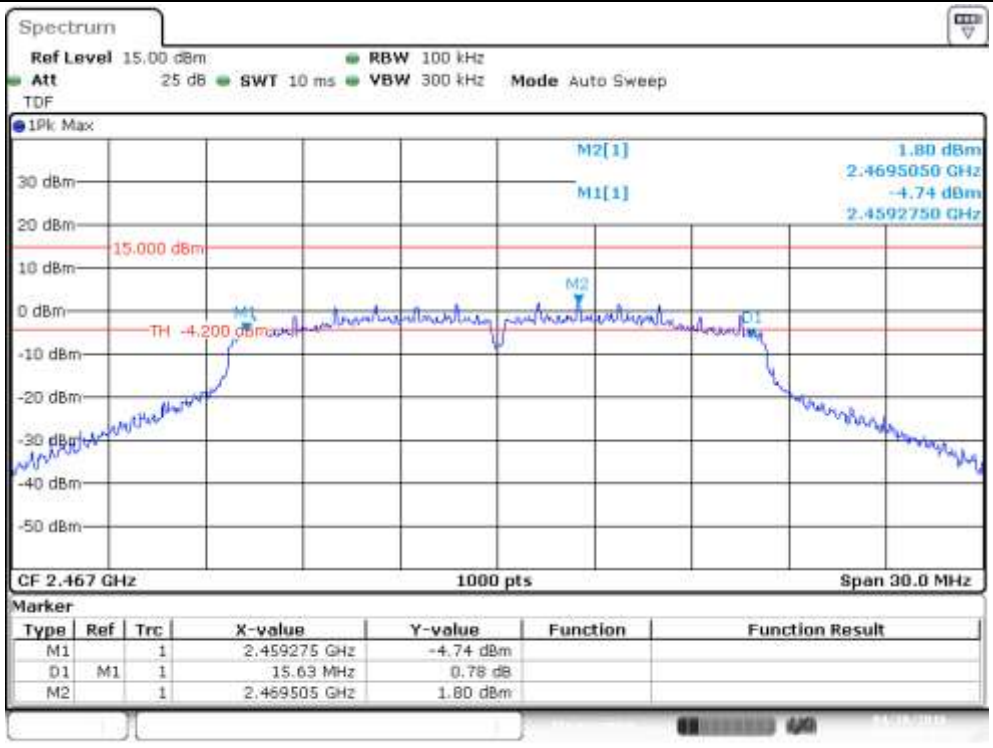
Date: 28.APR.2016 18:13:37

99% BW – CH11



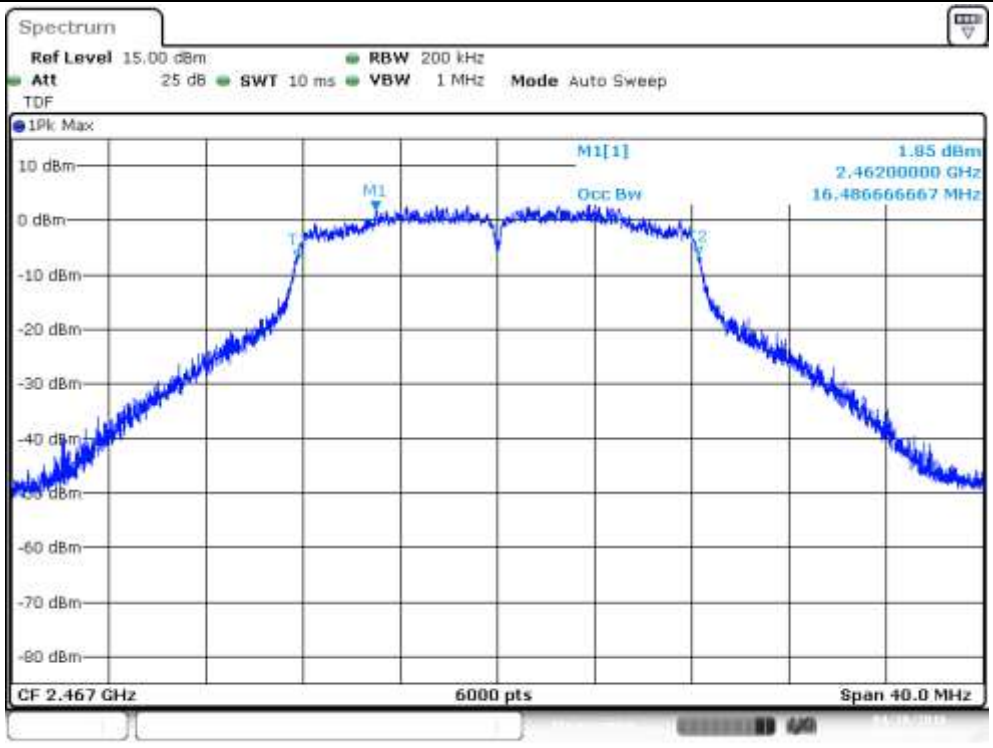
Date: 28.APR.2016 18:11:43

6dB BW – CH12



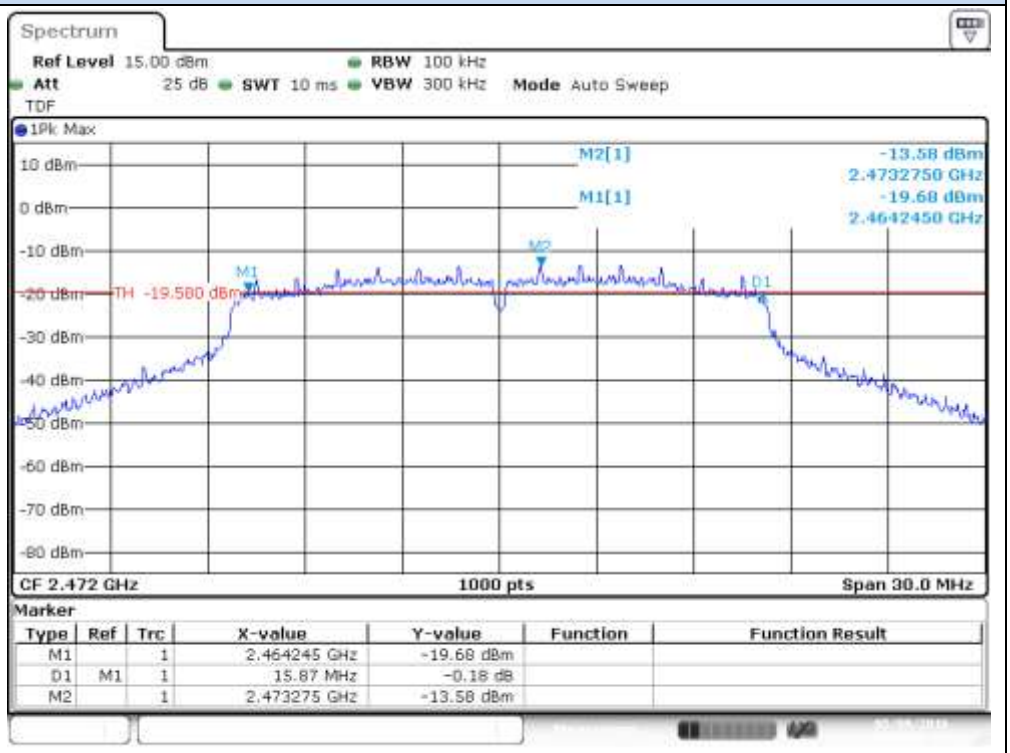
Date: 28.APR.2016 18:28:08

99% BW – CH12



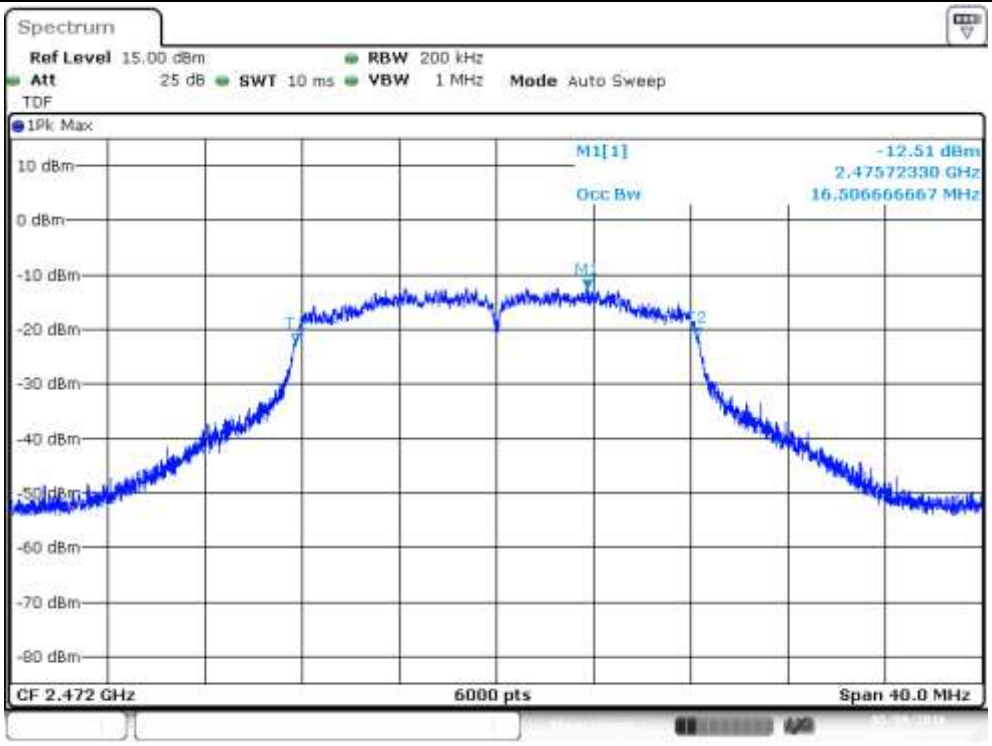
Date: 28.APR.2016 18:25:45

6dB BW – CH13



Date: 9.MAY.2016 11:36:09

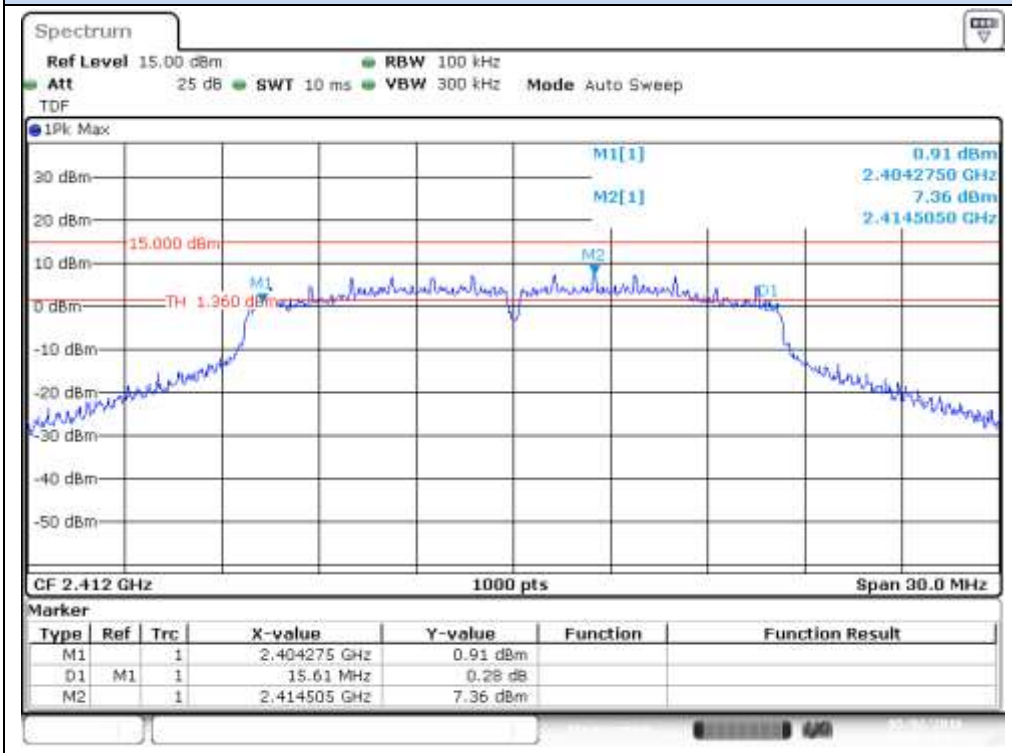
99% BW – CH13



Date: 9.MAY.2016 11:34:24

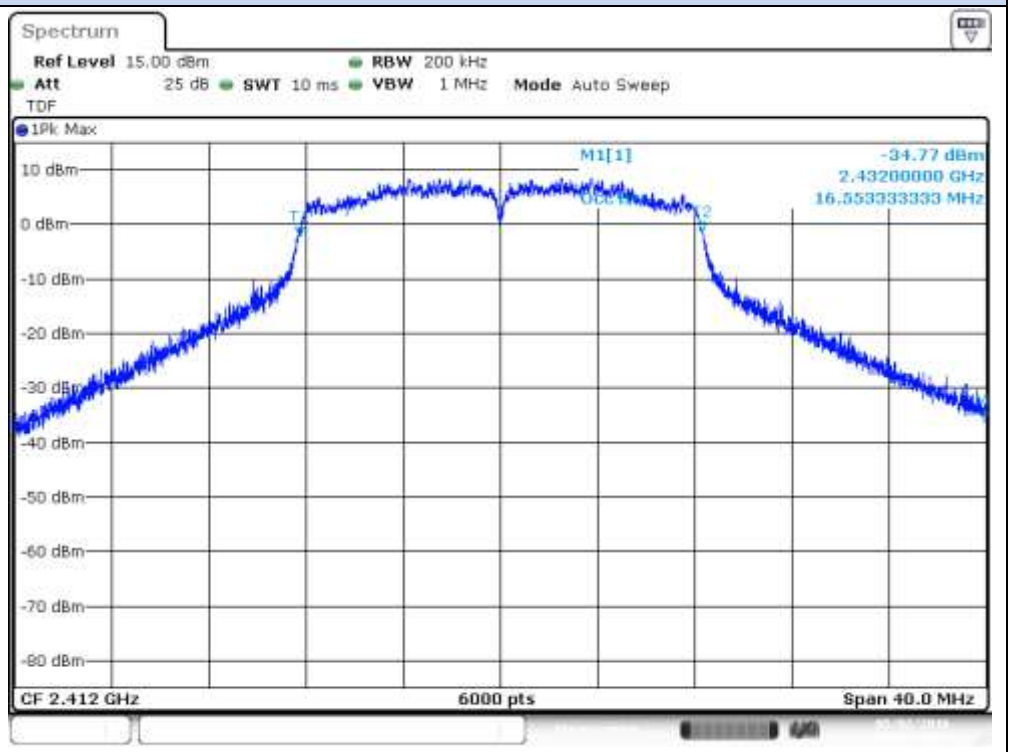
802.11g, 6Mbps (SISO) – Chain B

6dB BW – CH1



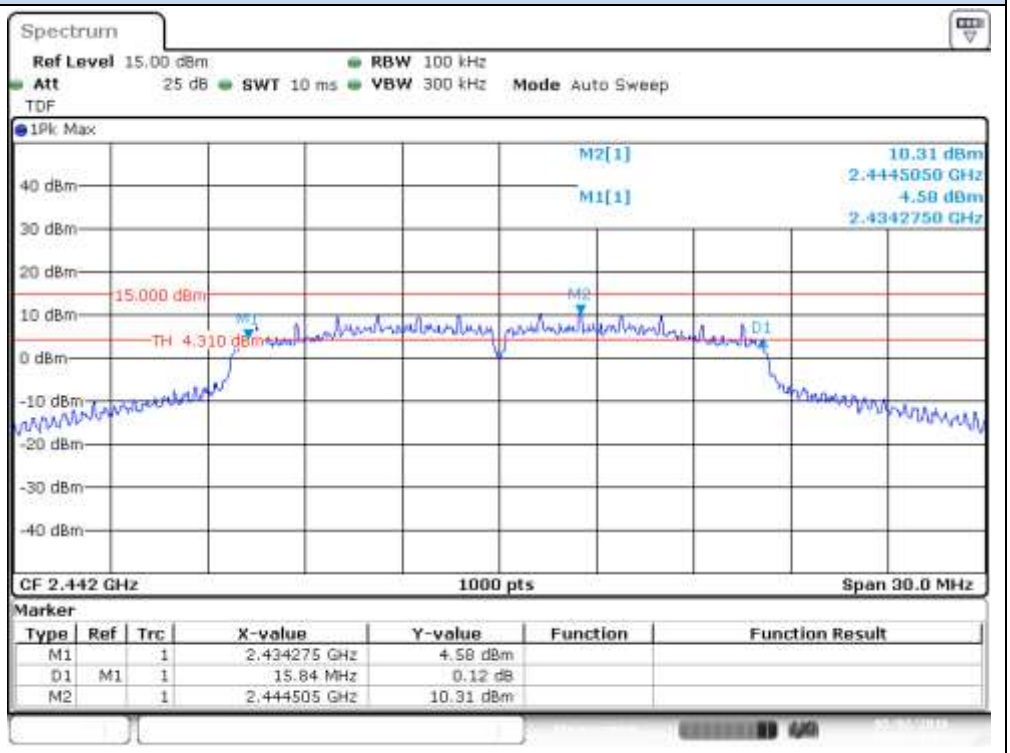
Date: 2.MAY.2016 14:53:48

99% BW – CH1



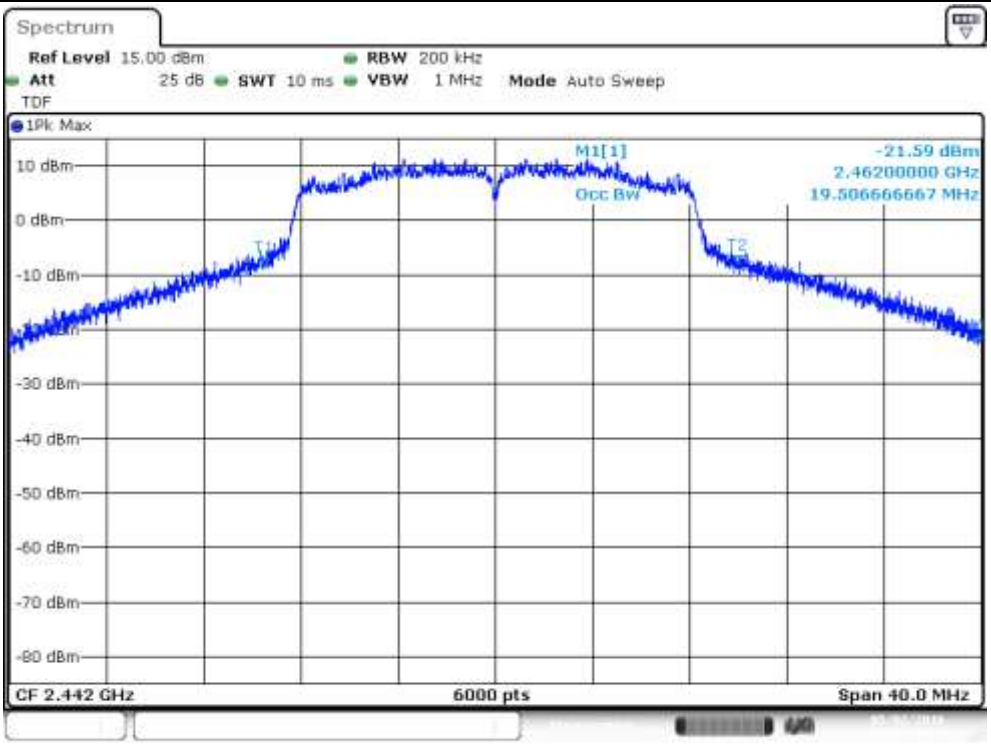
Date: 2.MAY.2016 14:52:42

6dB BW – CH7



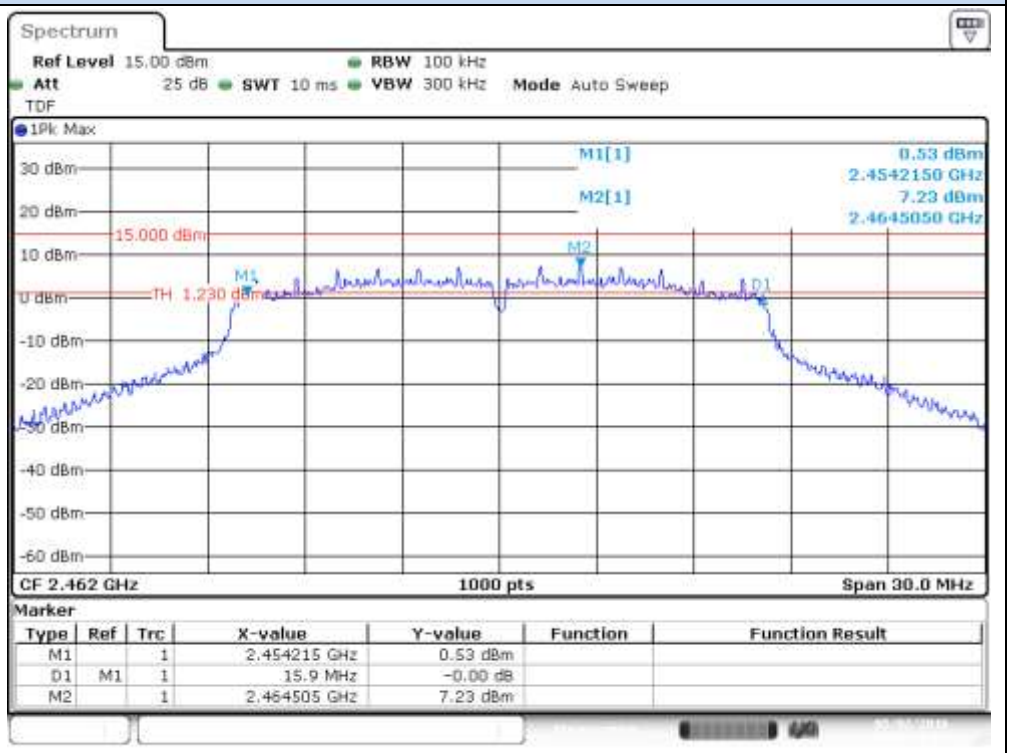
Date: 2.MAY.2016 16:55:58

99% BW – CH7



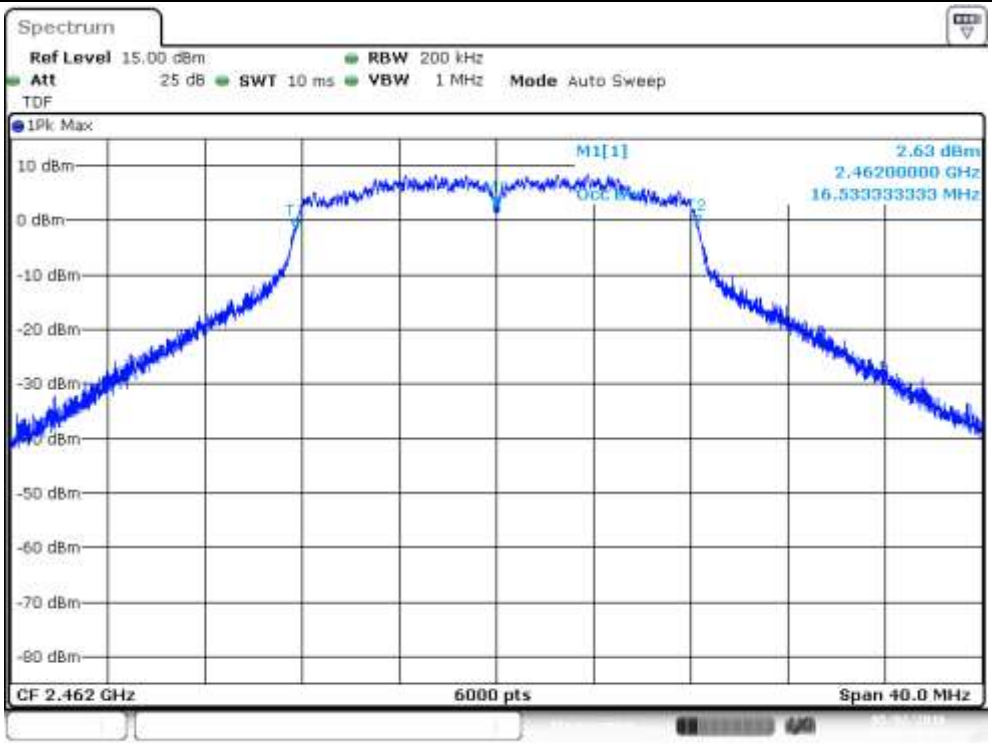
Date: 2.MAY.2016 16:51:46

6dB BW – CH11



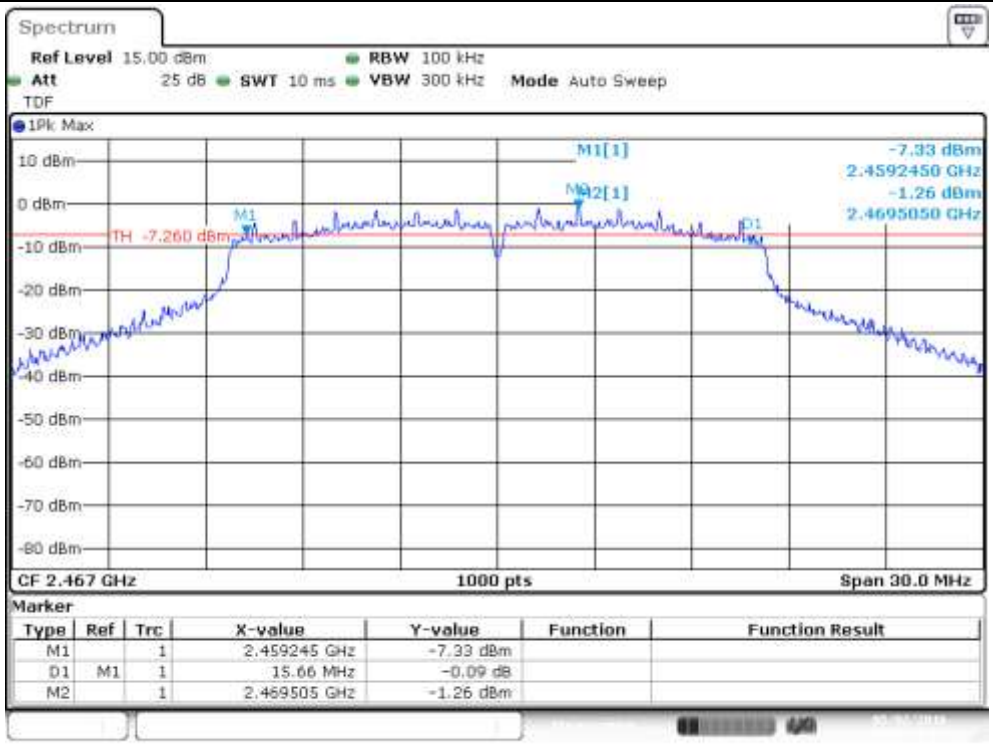
Date: 2.MAY.2016 17:20:37

99% BW – CH11



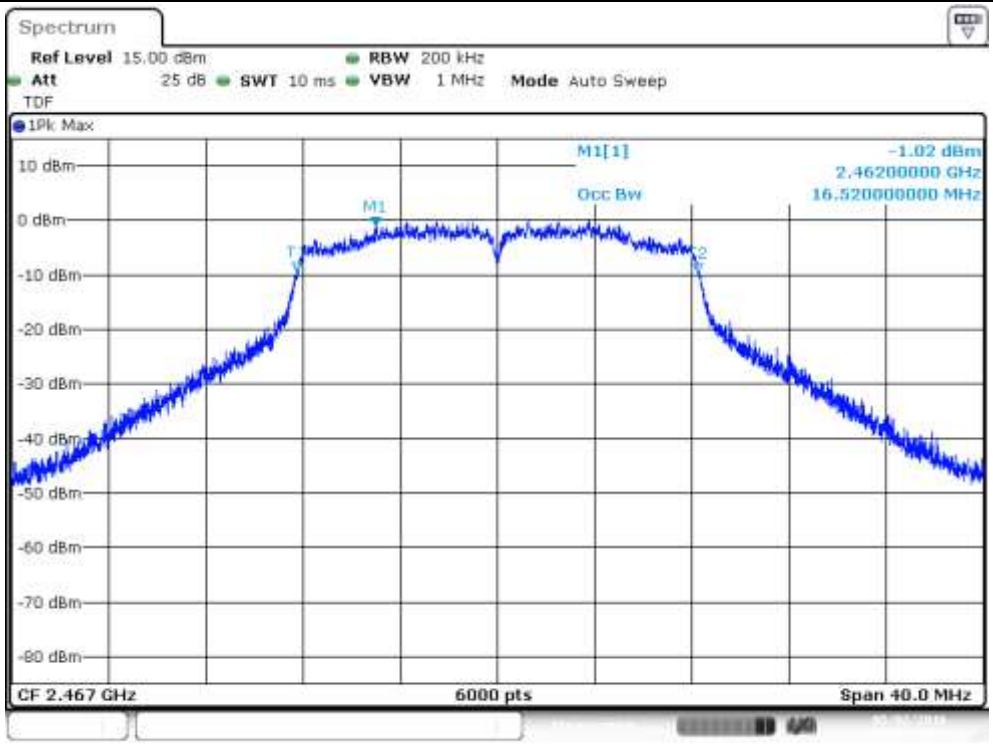
Date: 2.MAY.2016 17:19:19

6dB BW – CH12



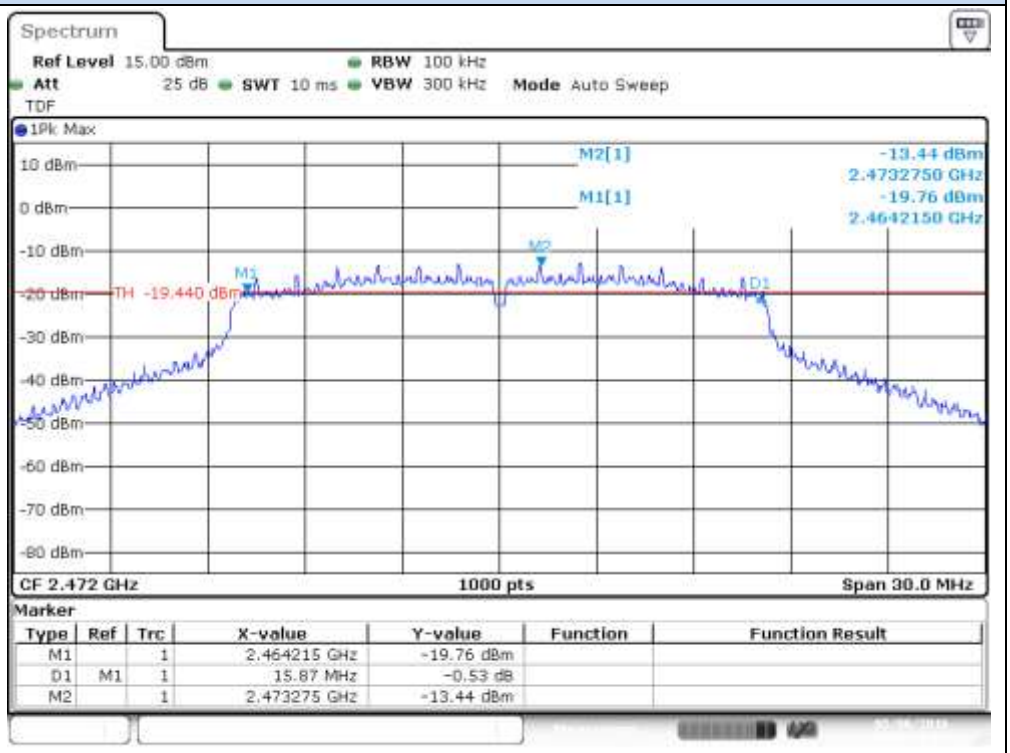
Date: 2.MAY.2016 17:42:31

99% BW – CH12

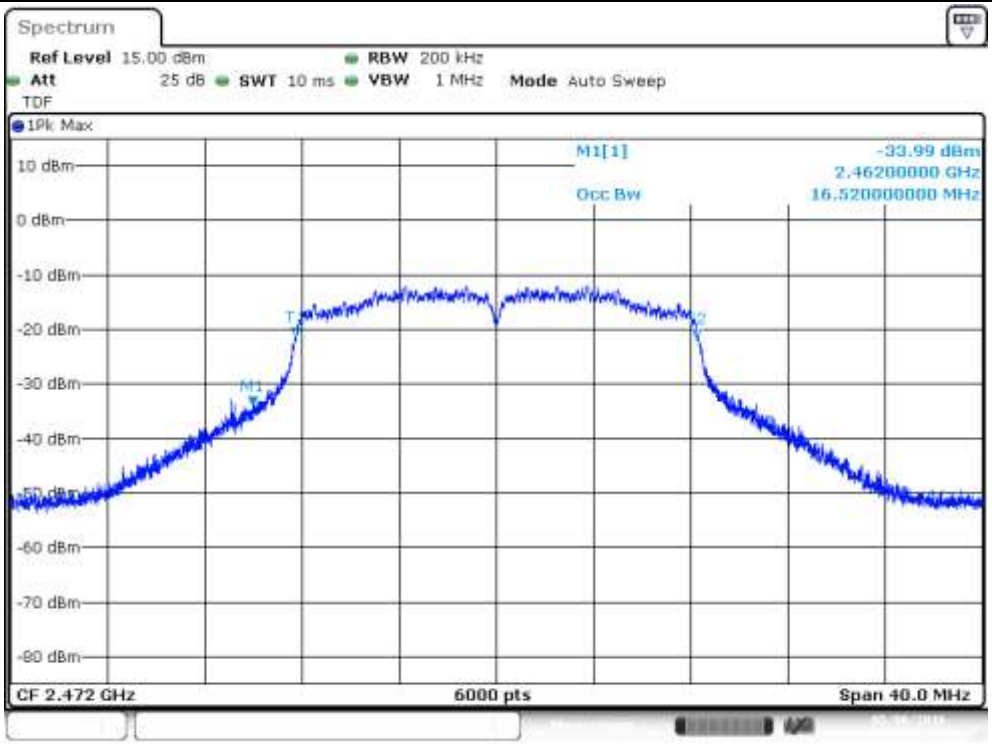


Date: 2.MAY.2016 17:41:23

6dB BW – CH13

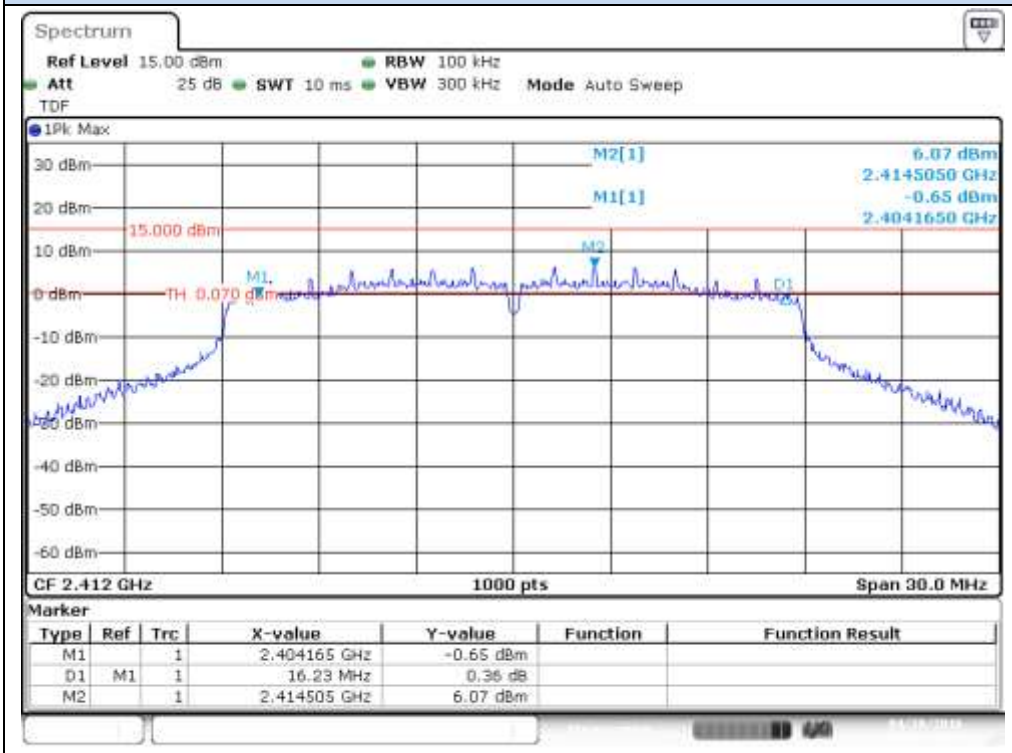


99% BW – CH13



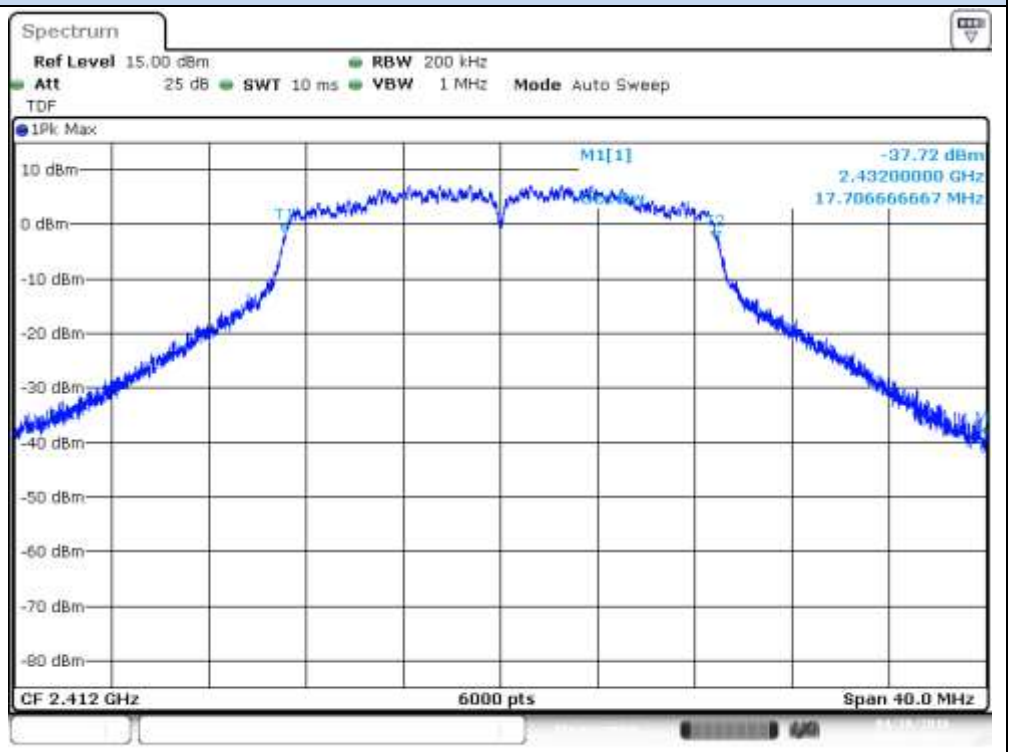
802.11n20, HT0 (SISO) – Chain A

6dB BW – CH1



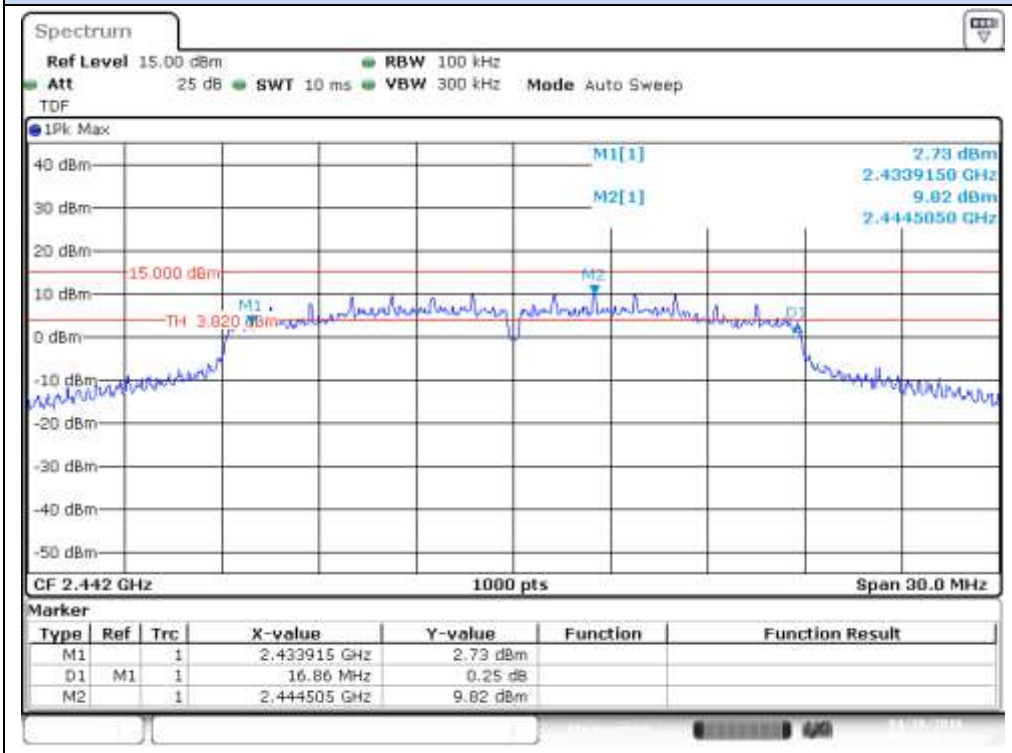
Date: 28.APR.2016 19:05:15

99% BW – CH1



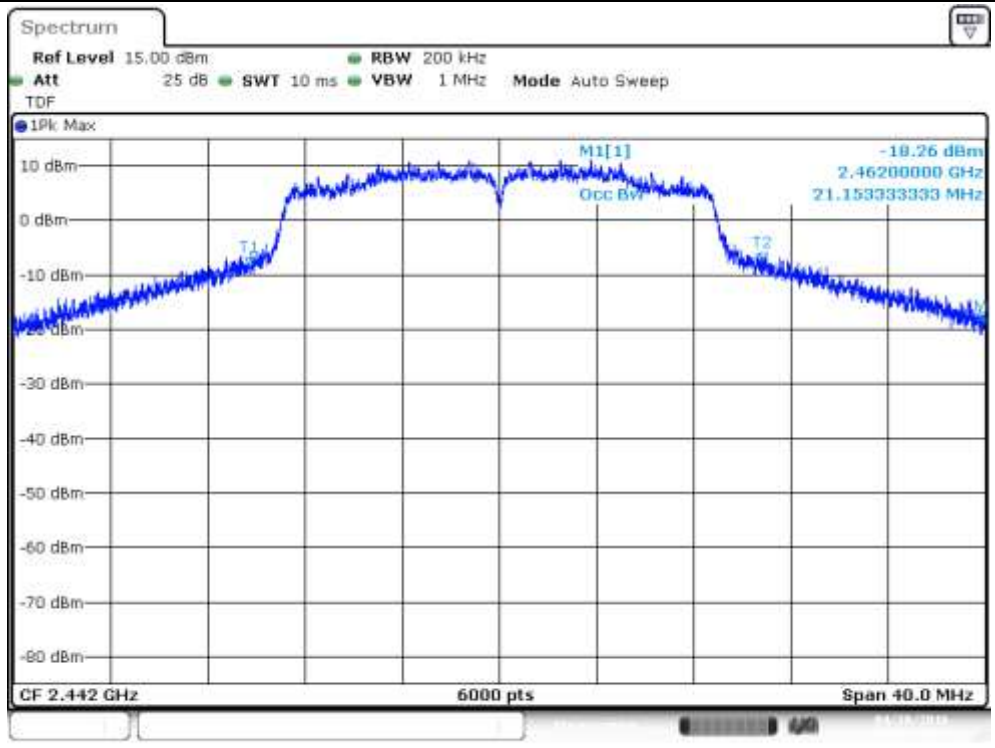
Date: 28.APR.2016 19:02:42

6dB BW – CH7



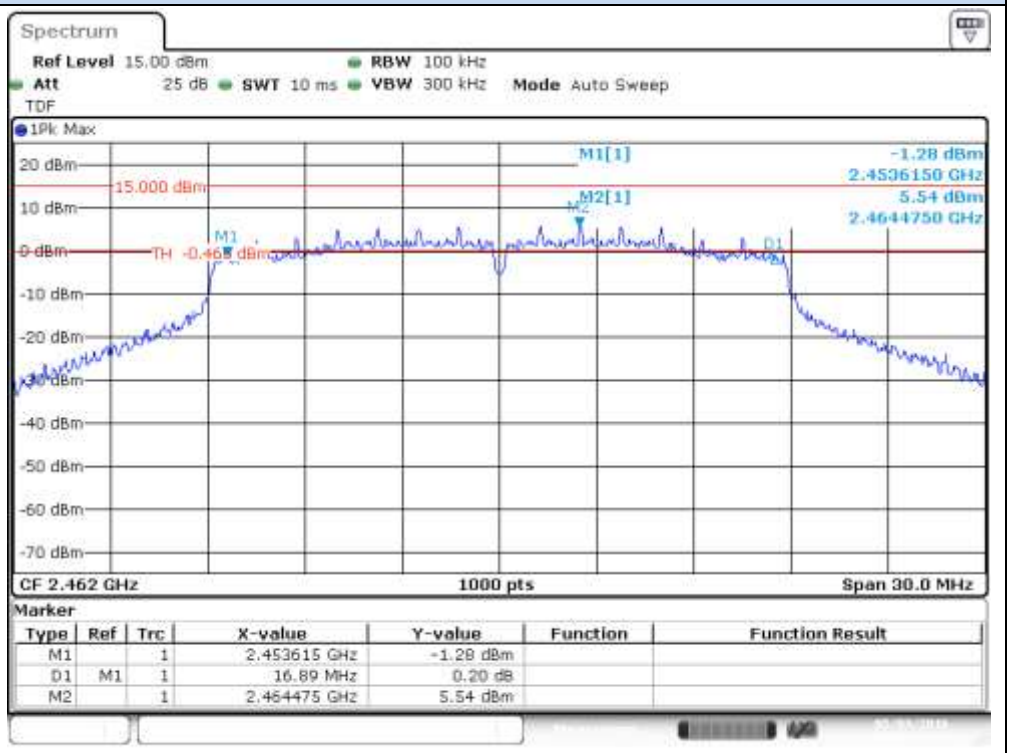
Date: 28.APR.2016 19:12:50

99% BW – CH7

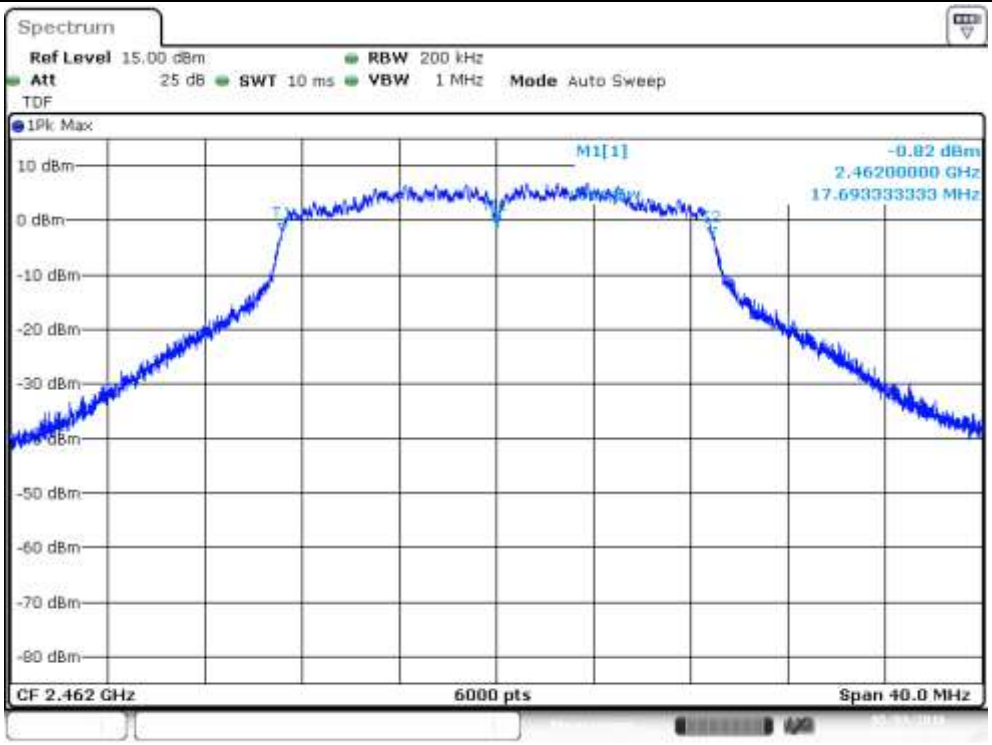


Date: 28.APR.2016 19:10:32

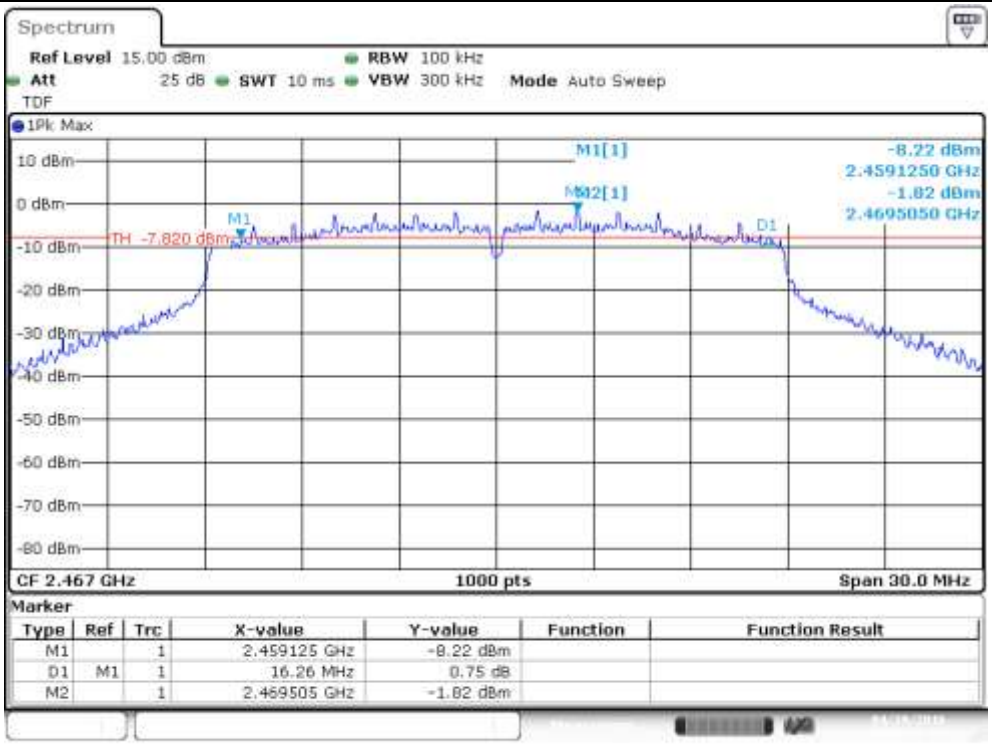
6dB BW – CH11



99% BW – CH11

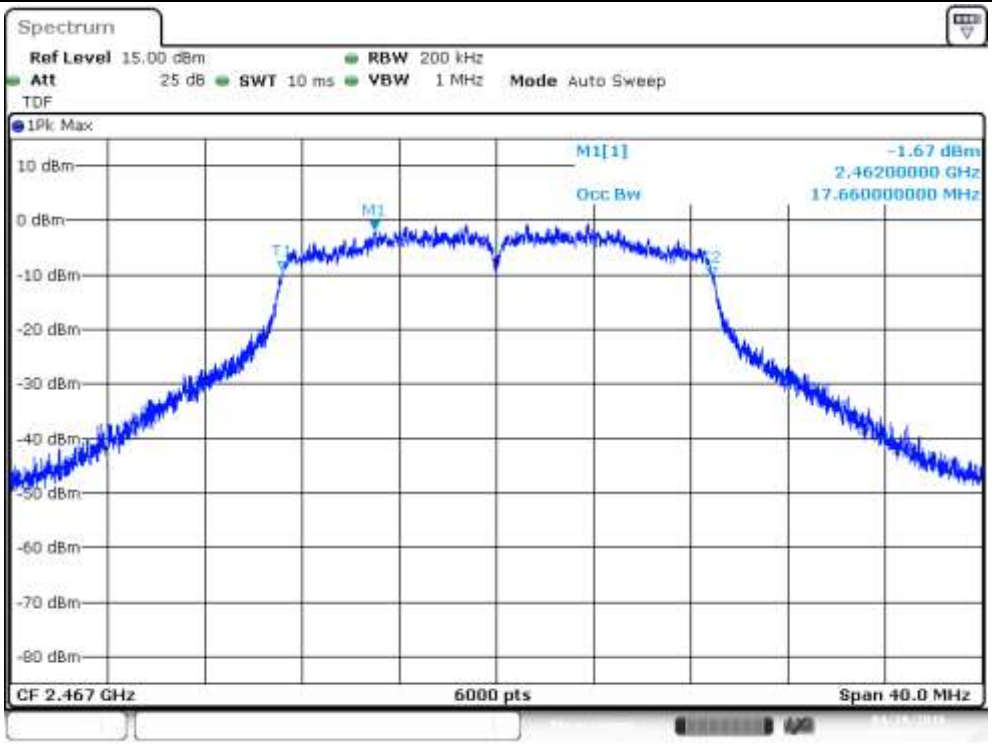


6dB BW – CH12



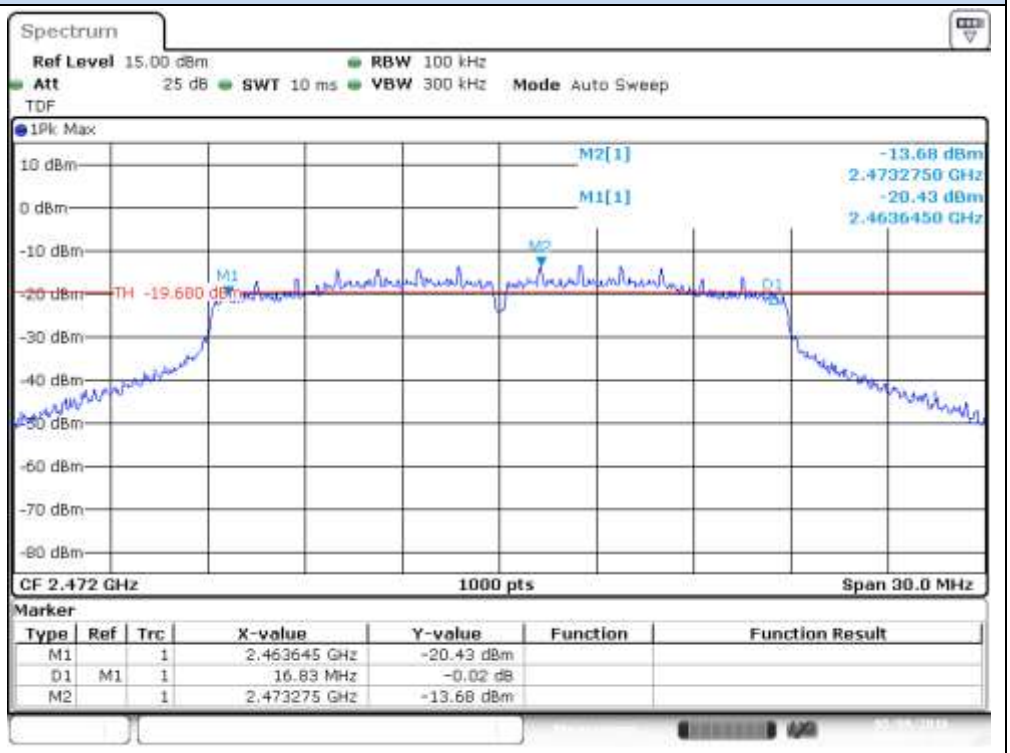
Date: 29.APR.2016 10:26:25

99% BW – CH12

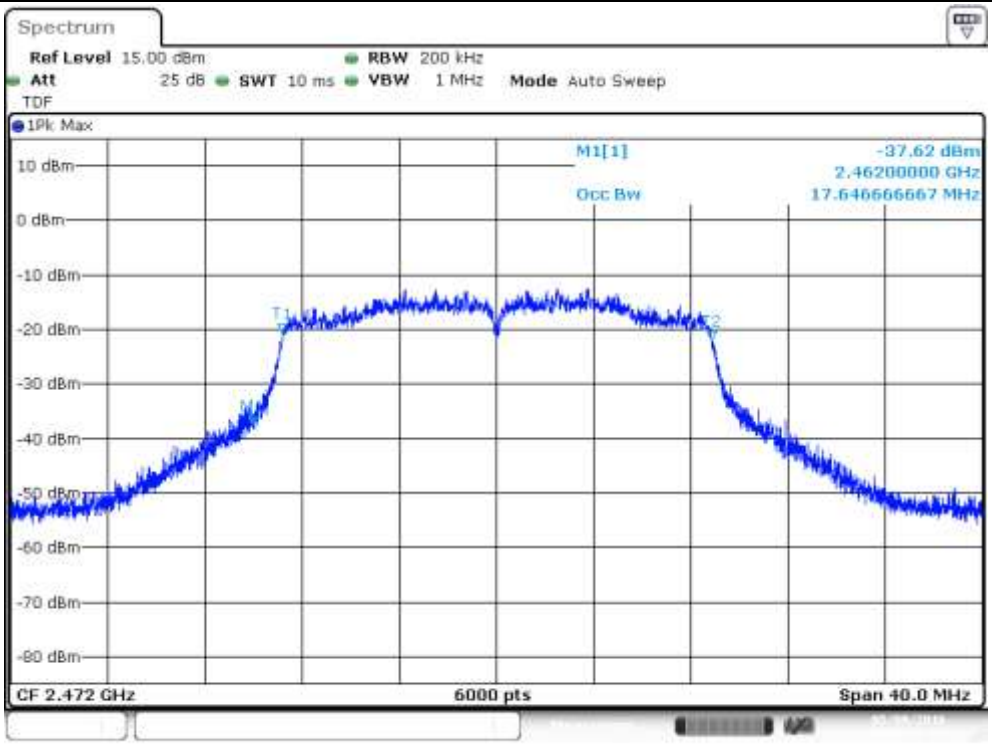


Date: 29.APR.2016 10:24:02

6dB BW – CH13

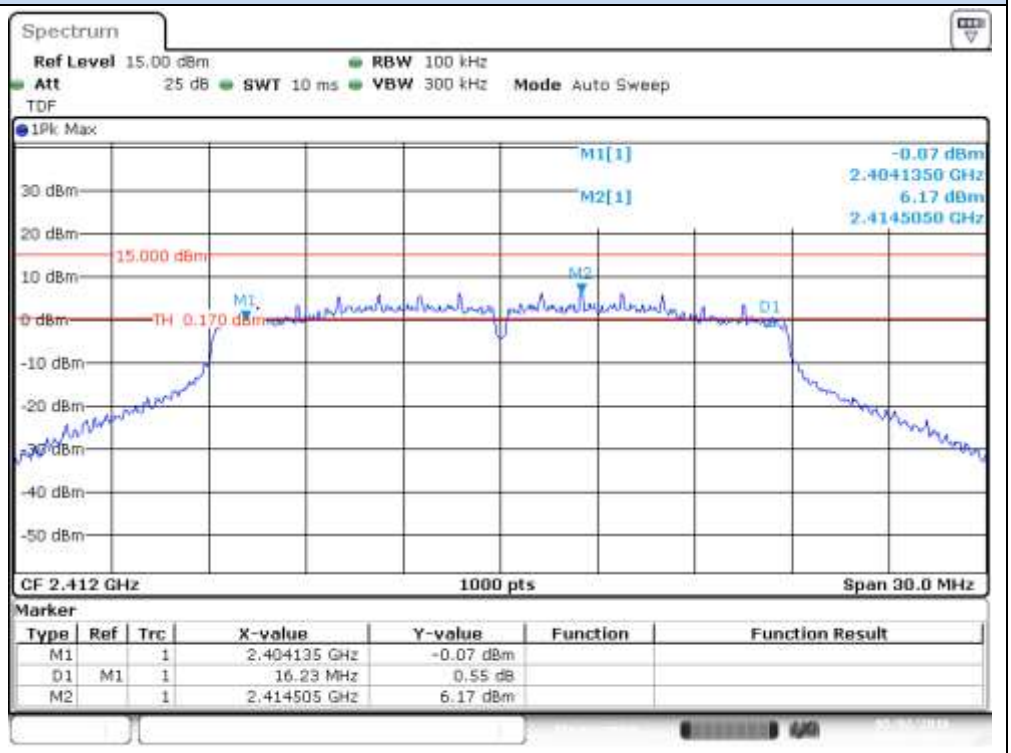


99% BW – CH13



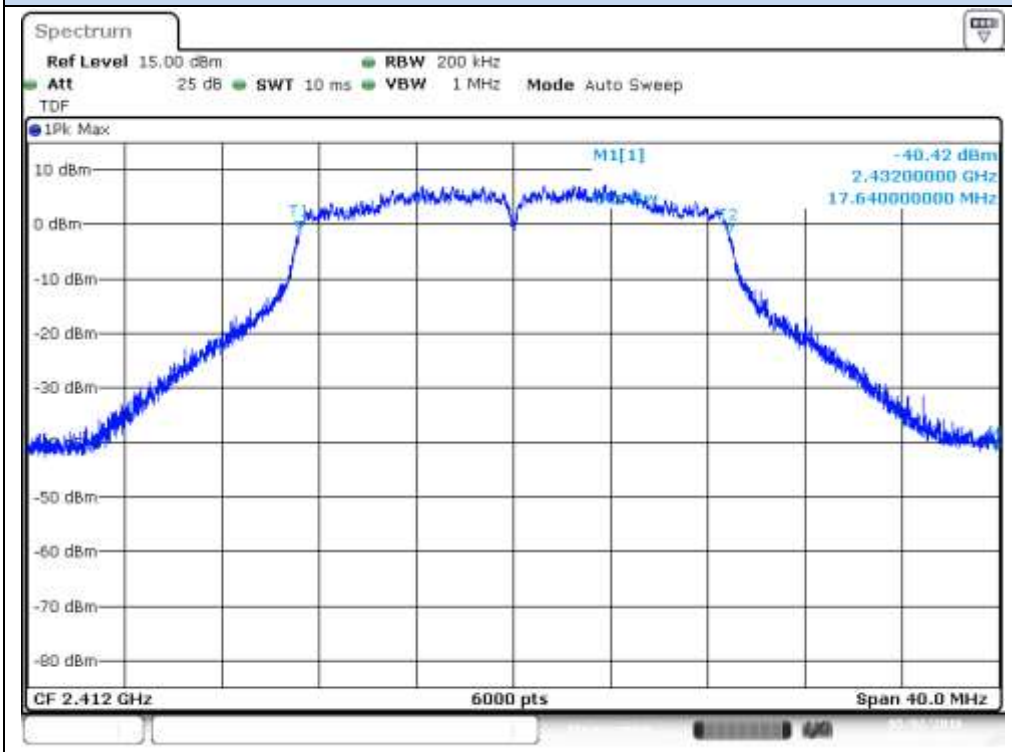
802.11n20, HT0 (SISO) – Chain B

6dB BW – CH1



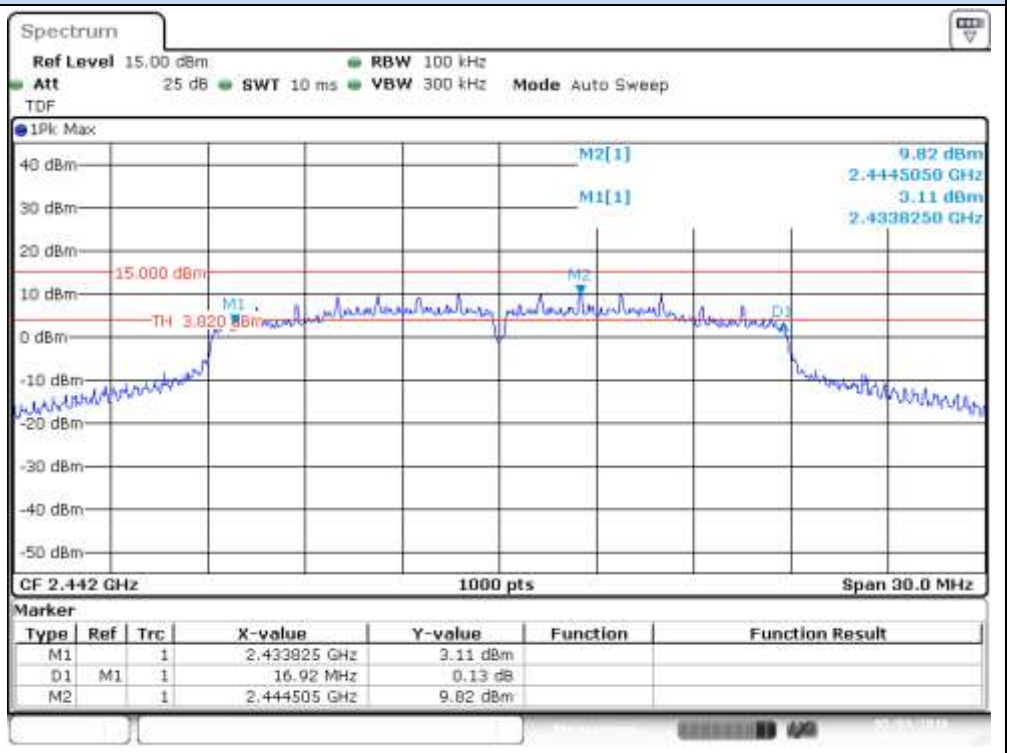
Date: 2.MAY.2016 18:40:45

99% BW – CH1

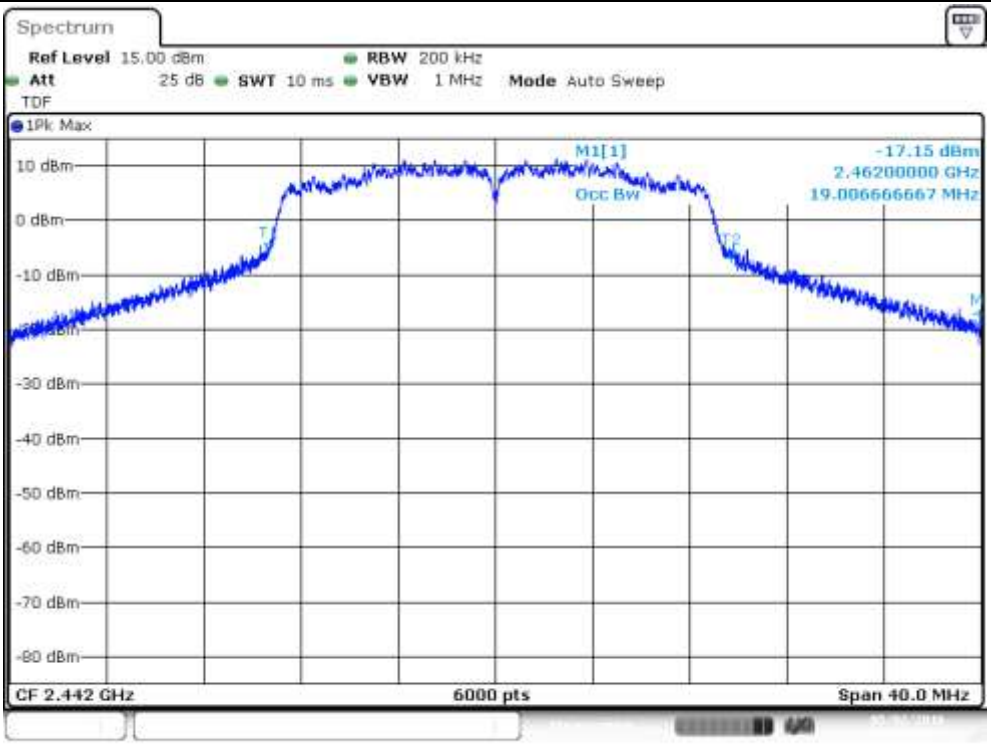


Date: 2.MAY.2016 18:26:24

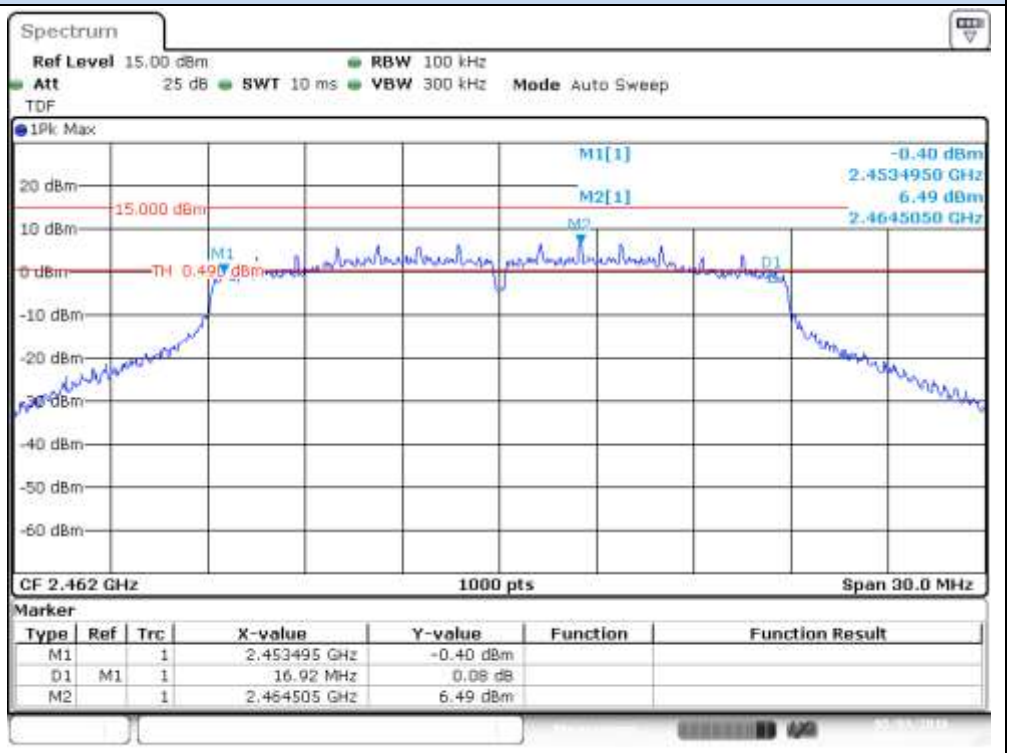
6dB BW – CH7



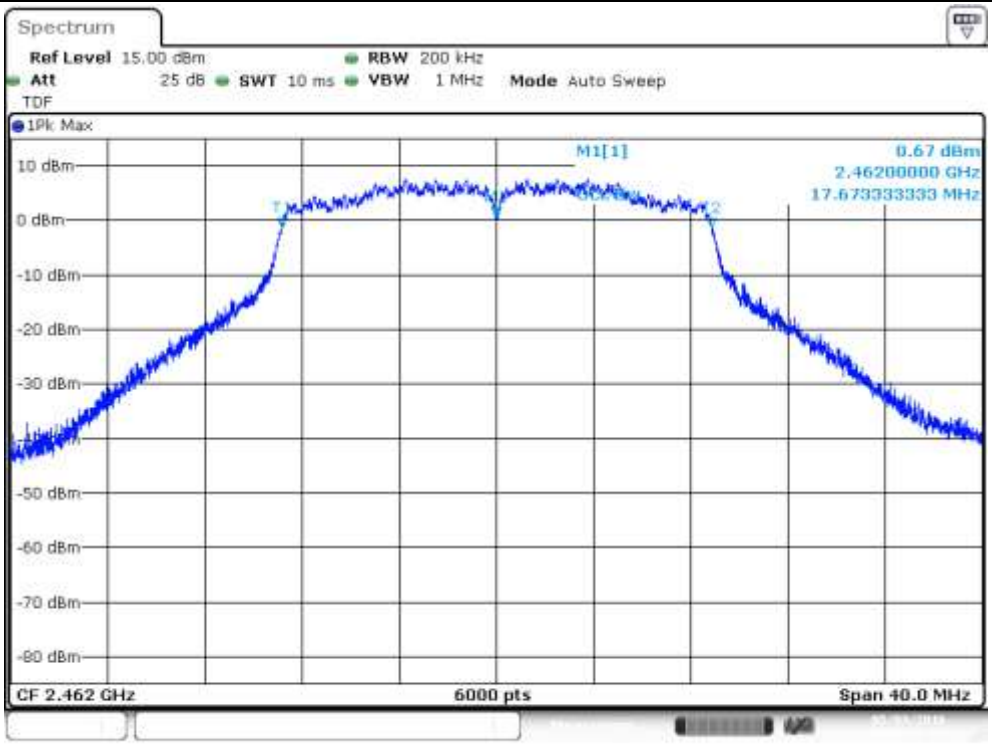
99% BW – CH7



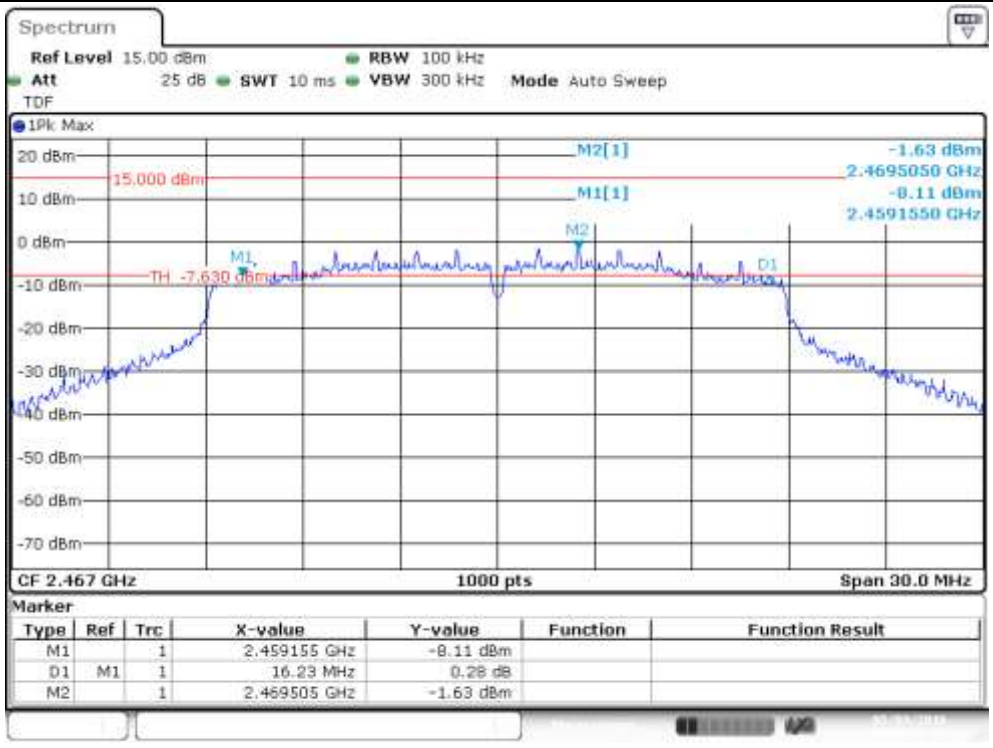
6dB BW – CH11



99% BW – CH11

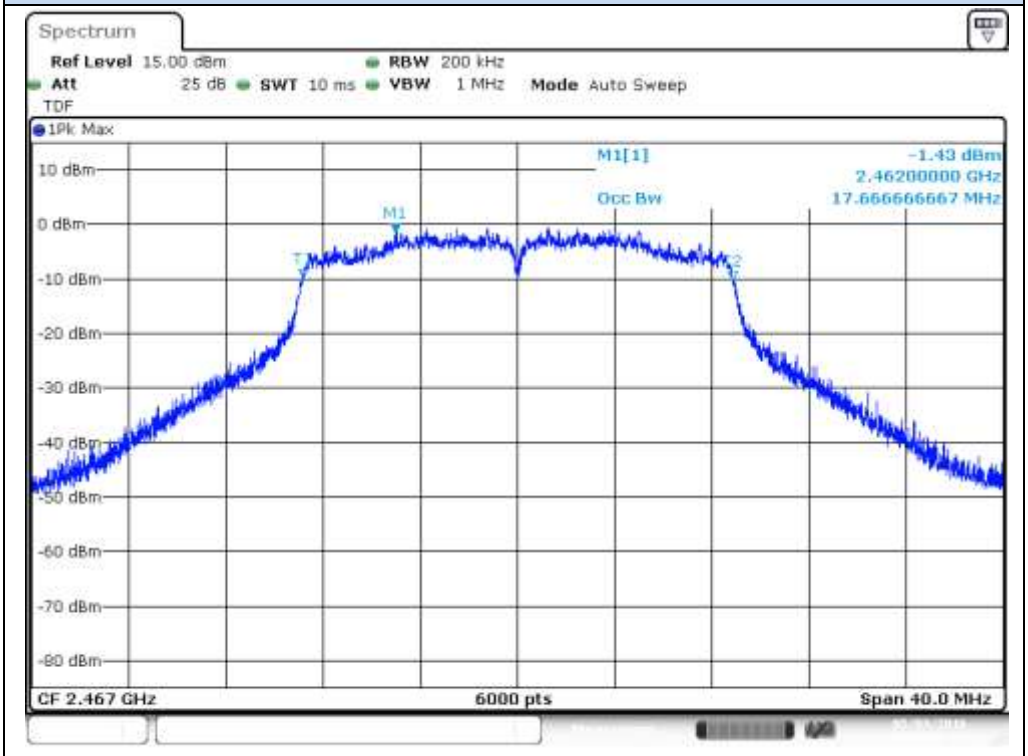


6dB BW – CH12



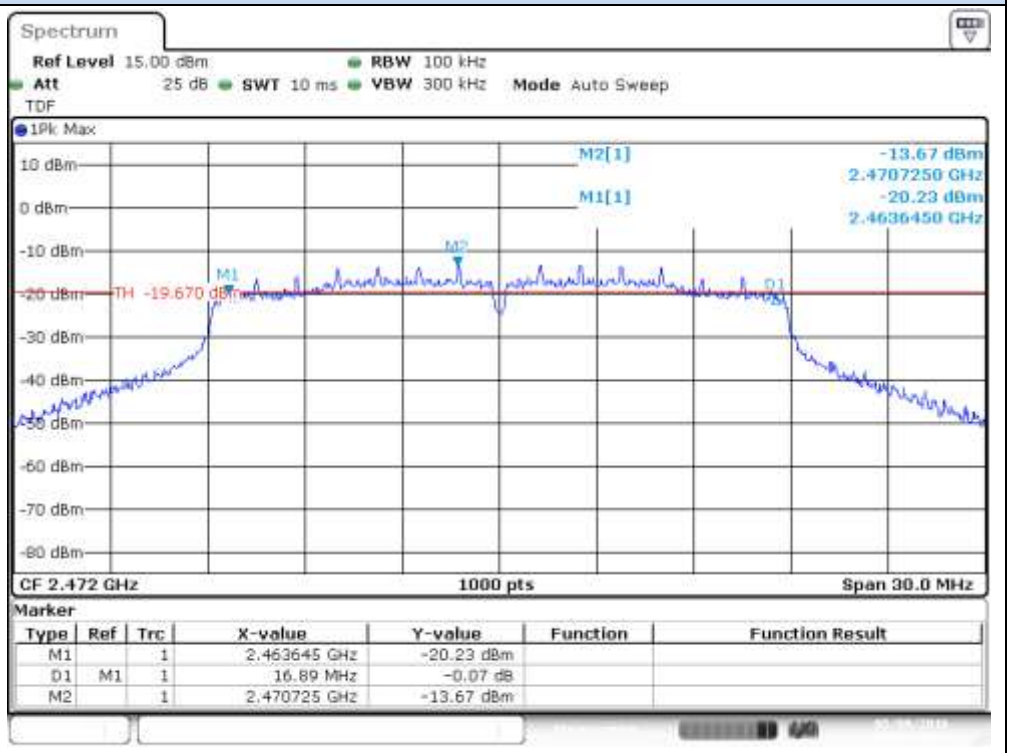
Date: 3.MAY.2016 11:19:49

99% BW – CH12

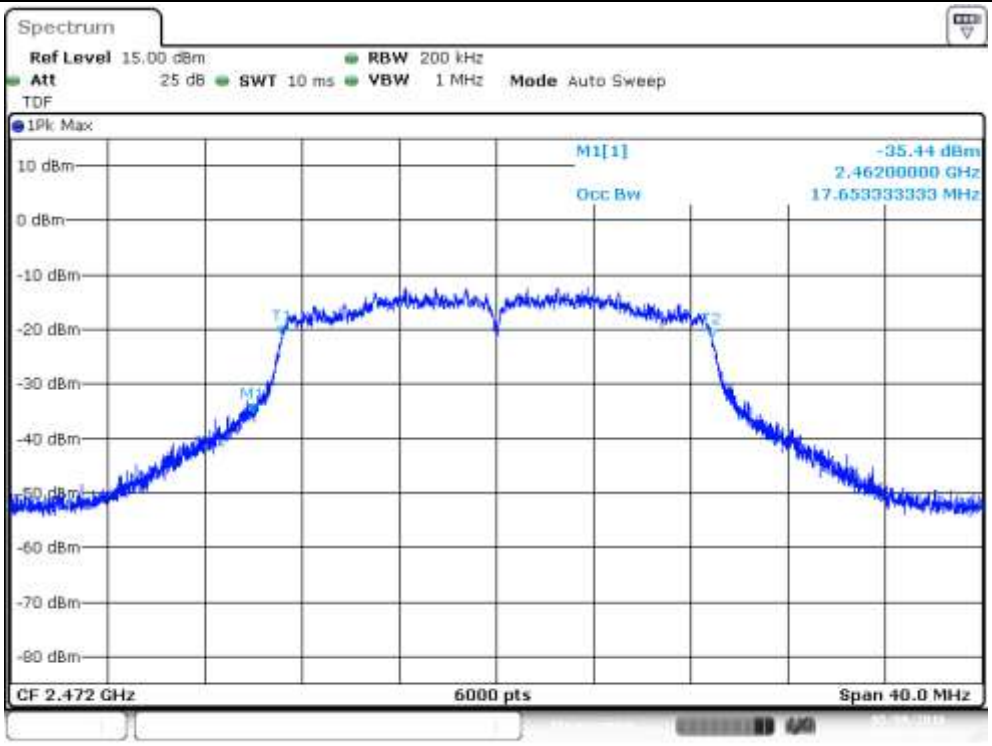


Date: 3.MAY.2016 11:18:08

6dB BW – CH13

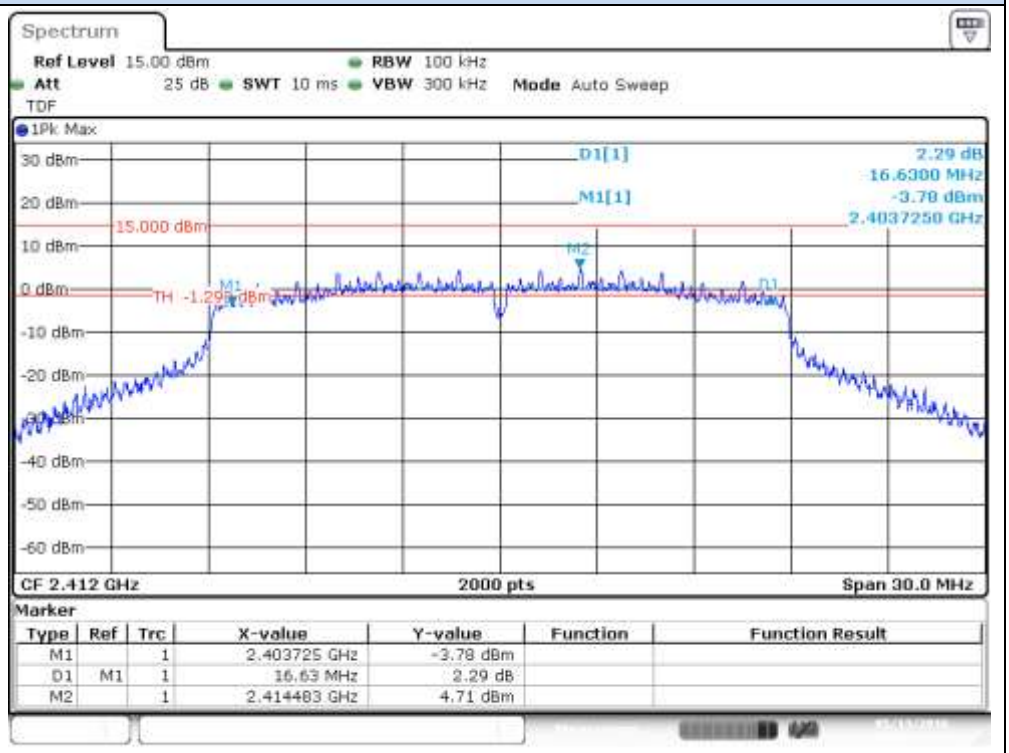


99% BW – CH13

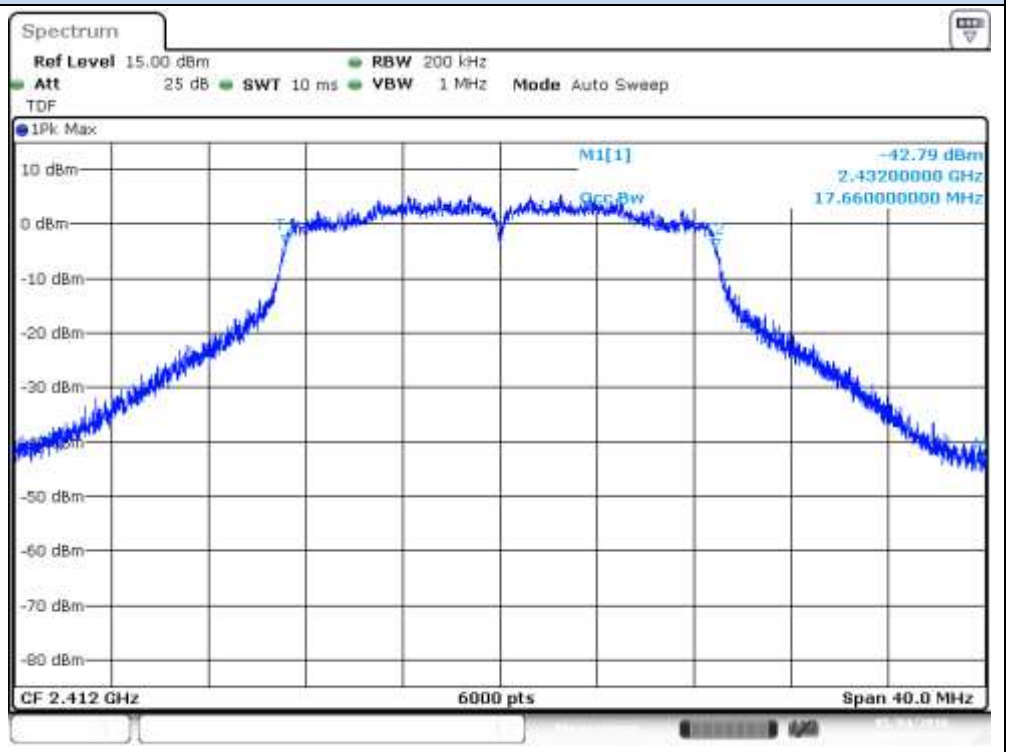


802.11n20, HT0 (MIMO) – Chain A

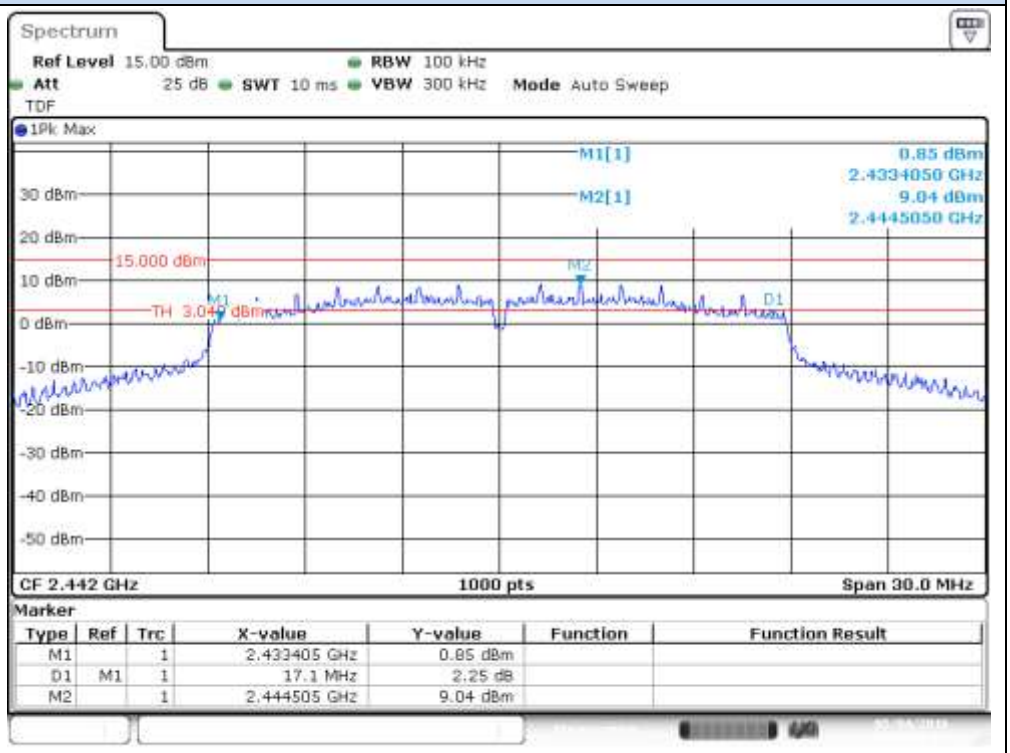
6dB BW – CH1



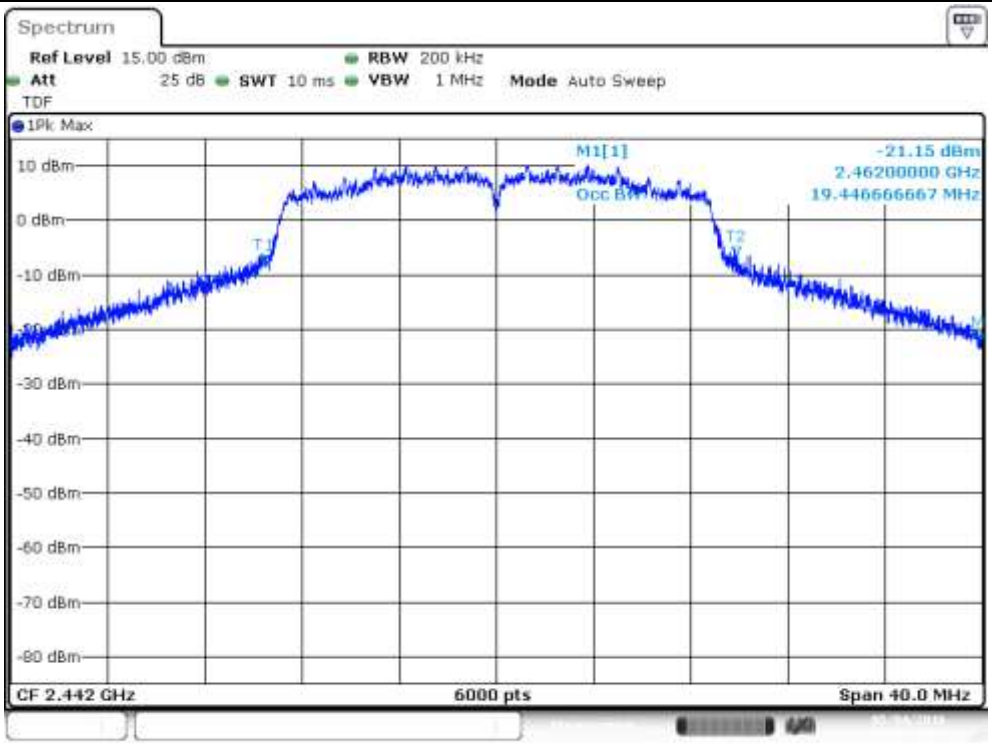
99% BW – CH1



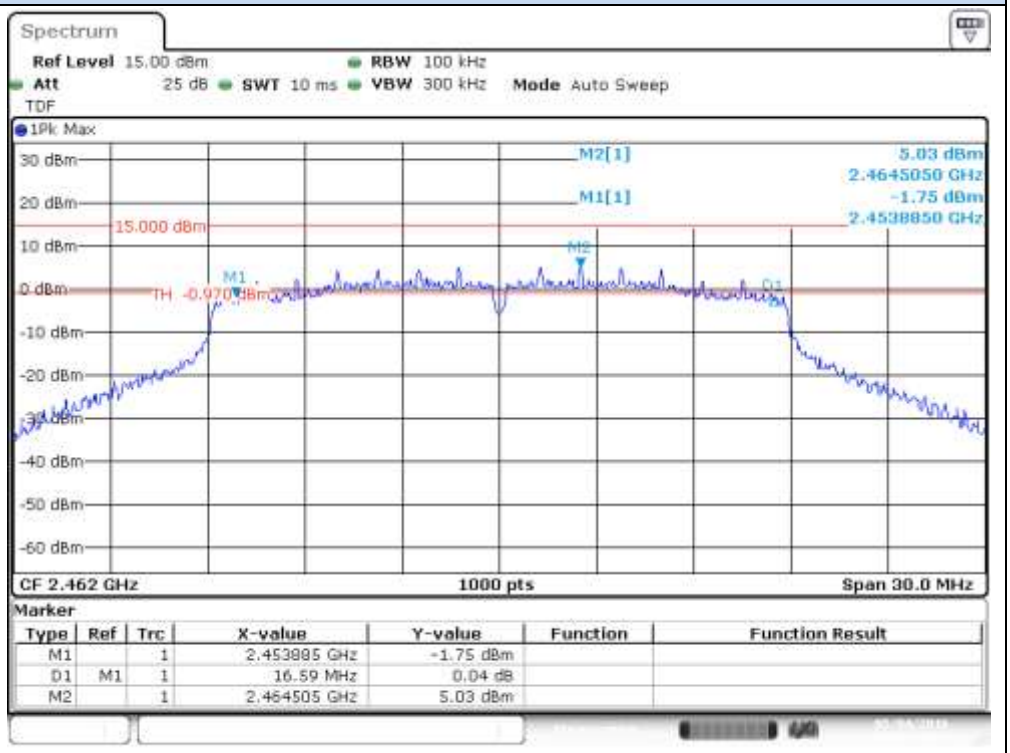
6dB BW – CH7



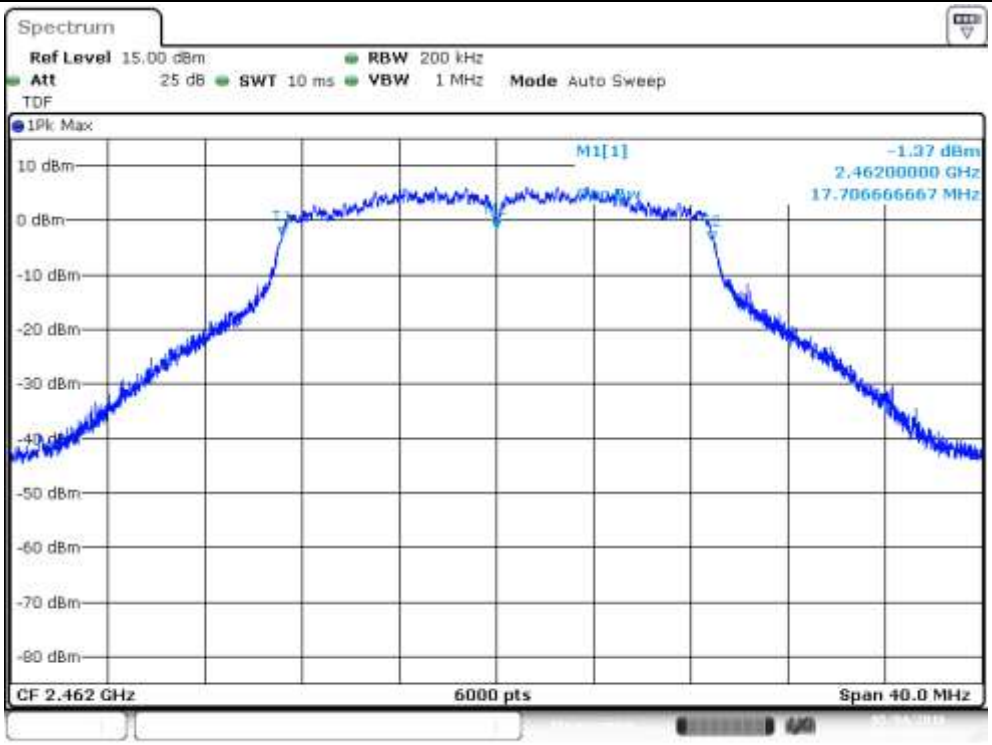
99% BW – CH7



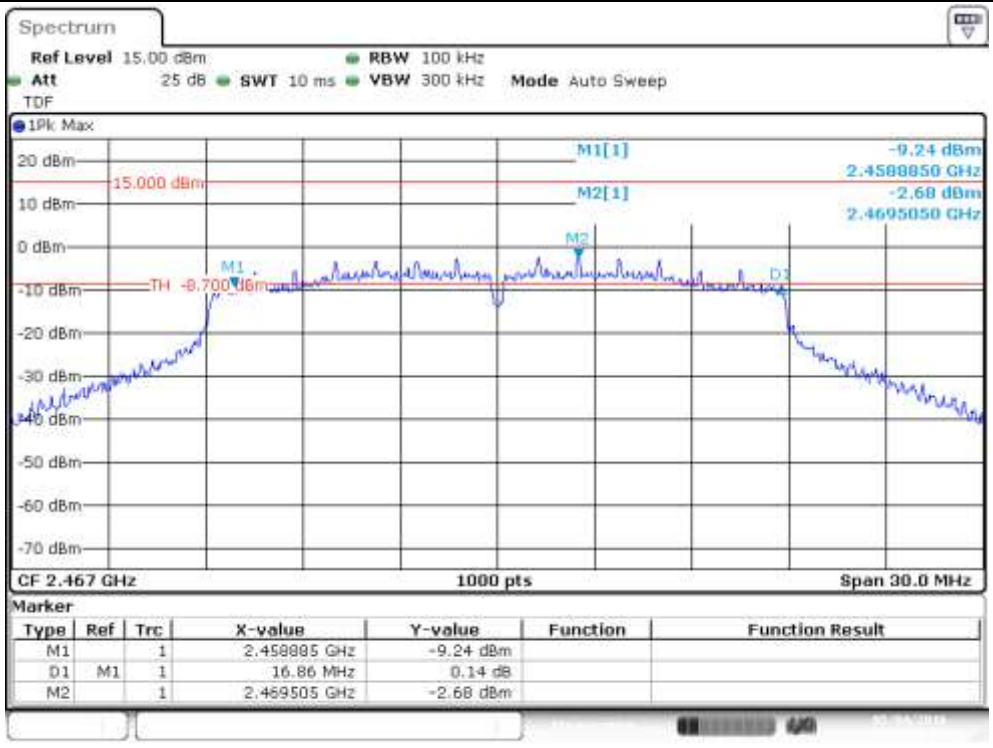
6dB BW – CH11



99% BW – CH11

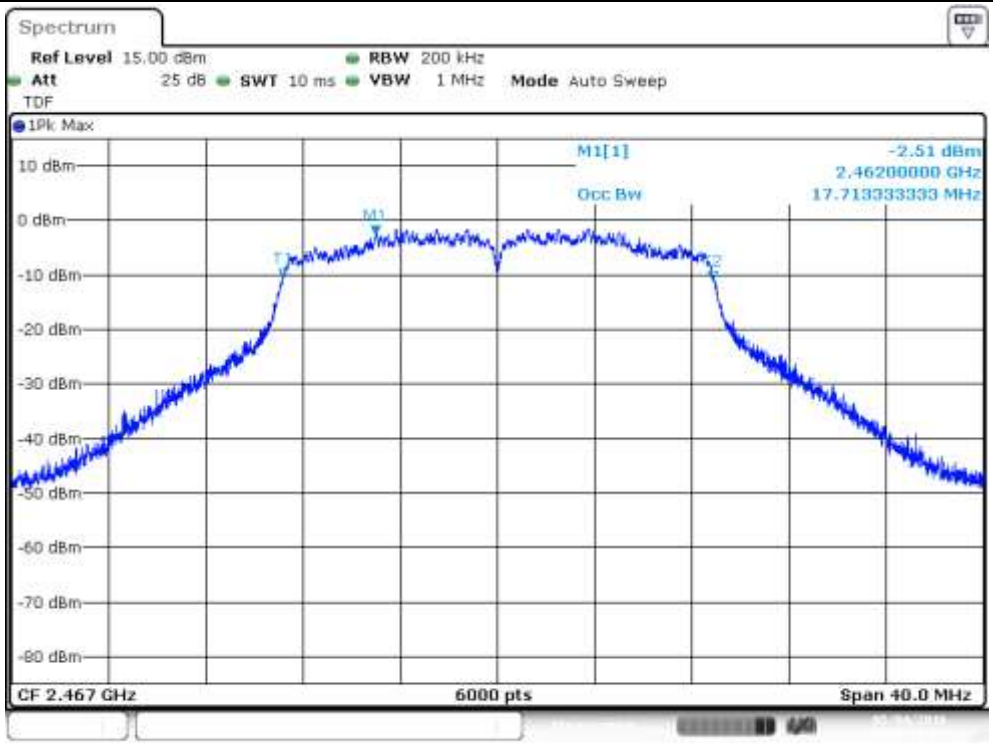


6dB BW – CH12



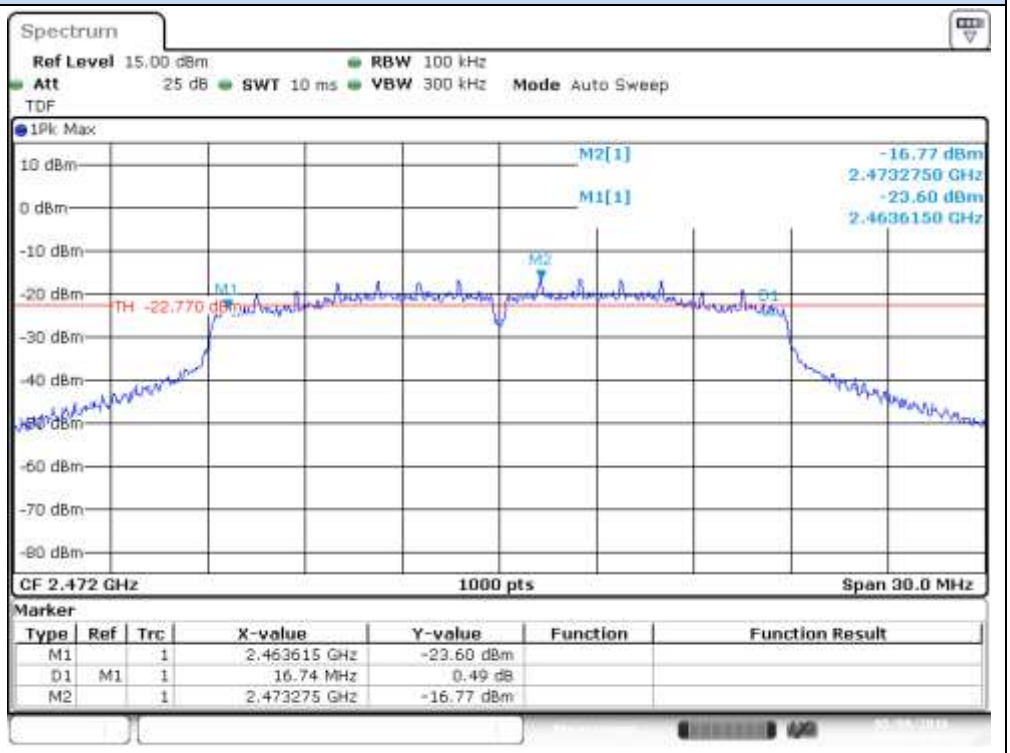
Date: 4.MAY.2016 16:09:00

99% BW – CH12



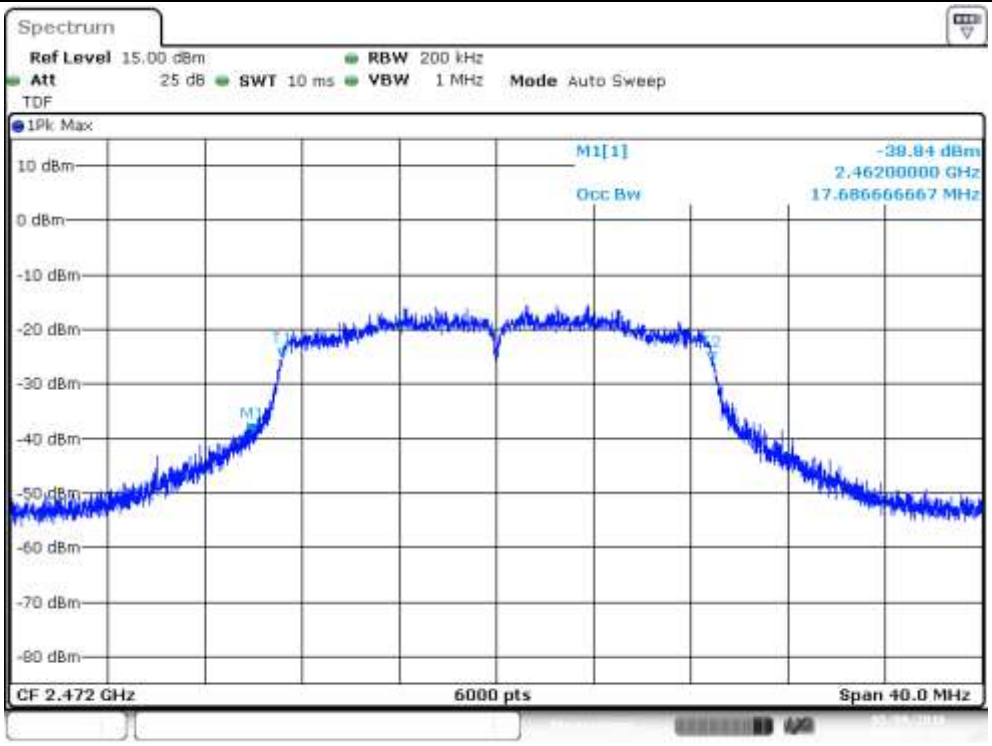
Date: 4.MAY.2016 16:07:49

6dB BW – CH13



Date: 9.MAY.2016 11:54:34

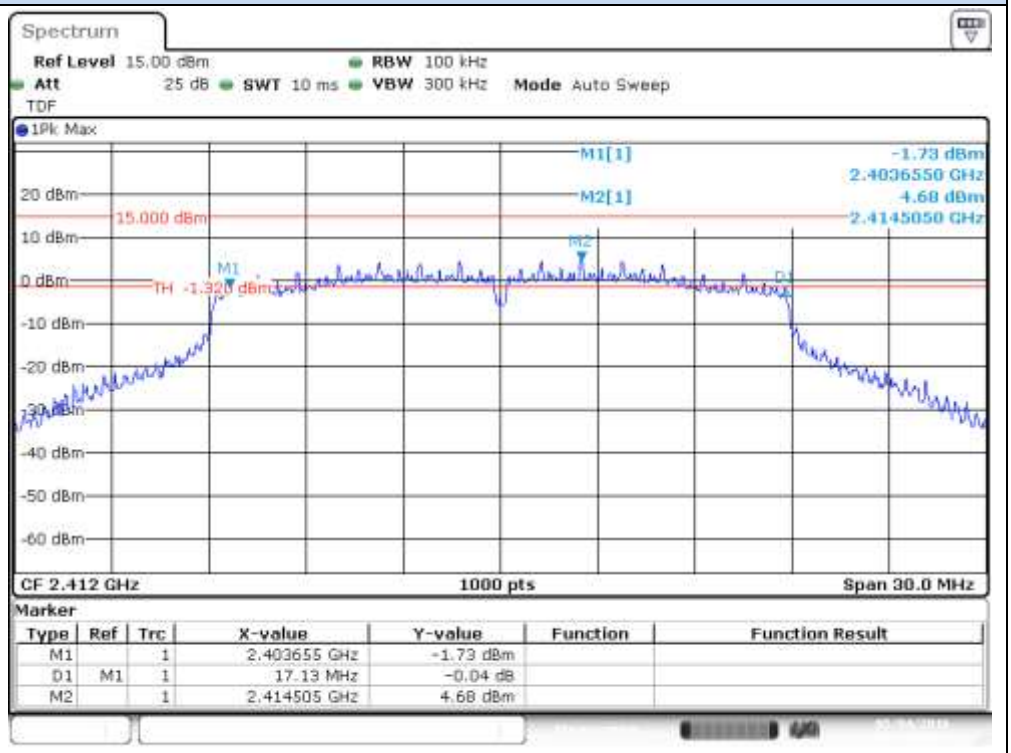
99% BW – CH13



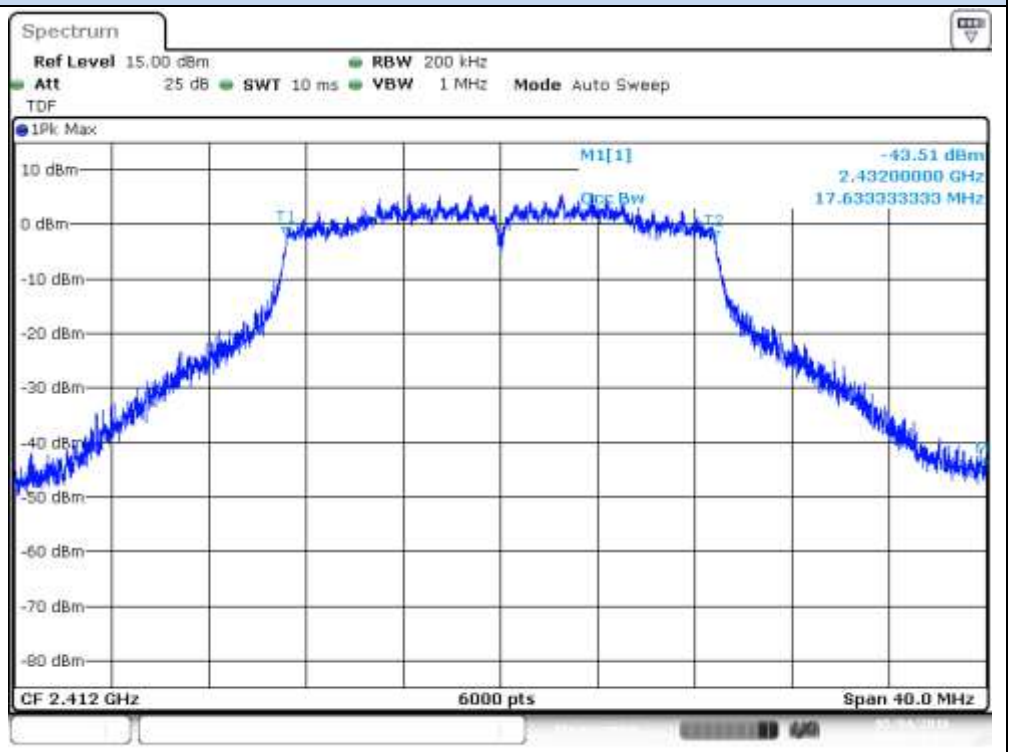
Date: 9.MAY.2016 11:53:17

802.11n20, HT0 (MIMO) – Chain B

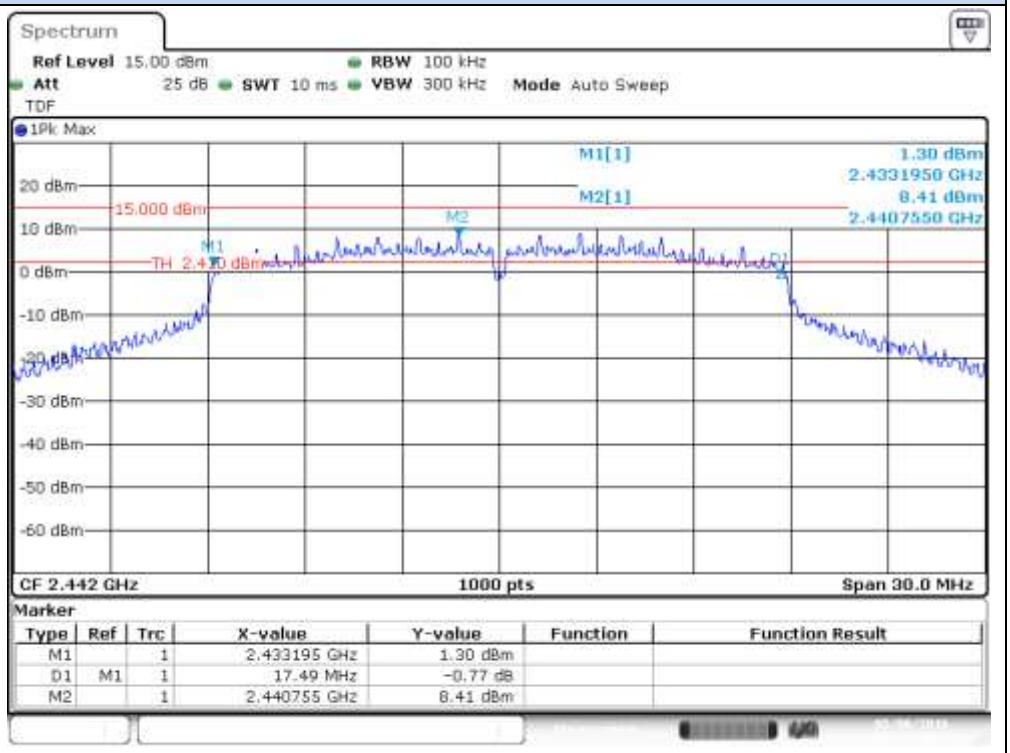
6dB BW – CH1



99% BW – CH1

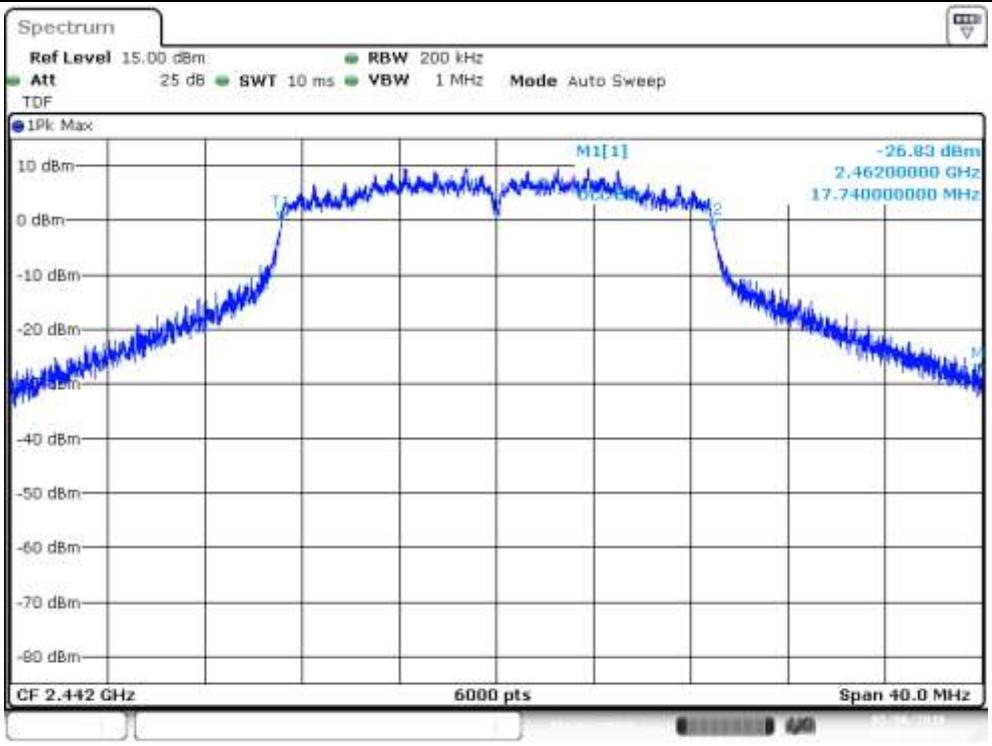


6dB BW – CH7



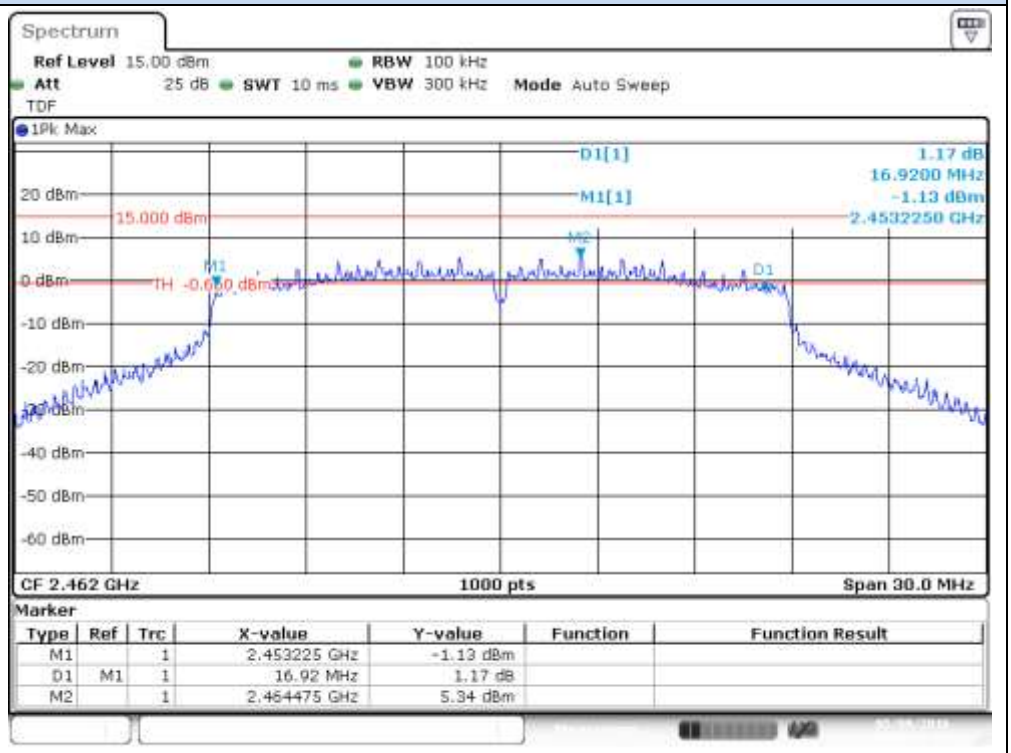
Date: 6.MAY.2016 19:12:35

99% BW – CH7



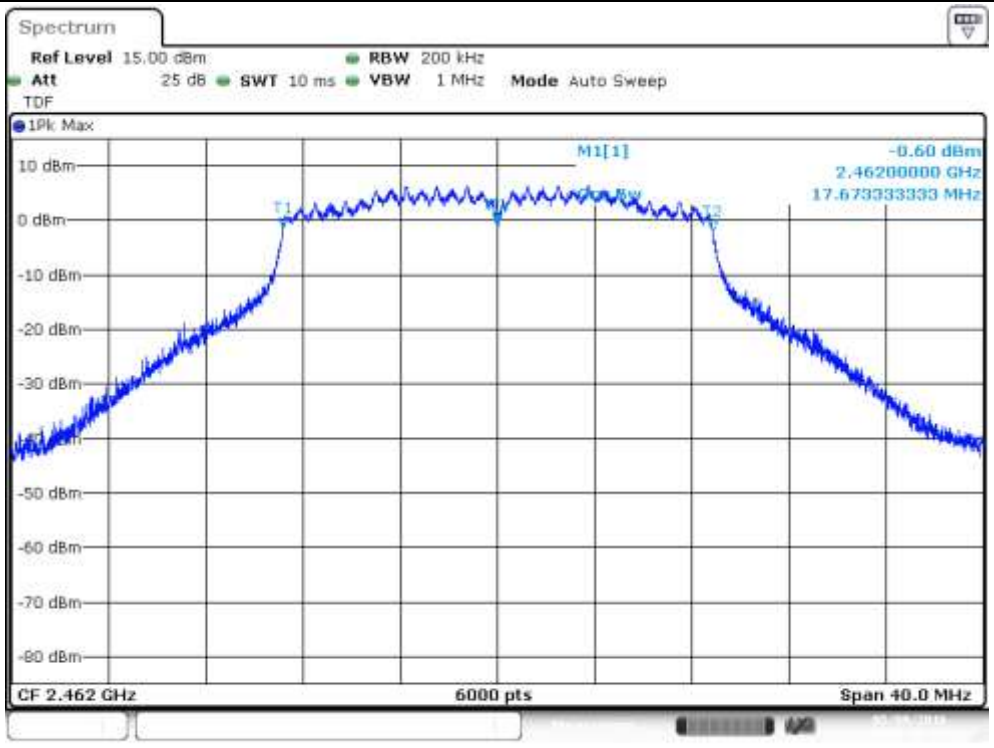
Date: 6.MAY.2016 19:10:52

6dB BW – CH11



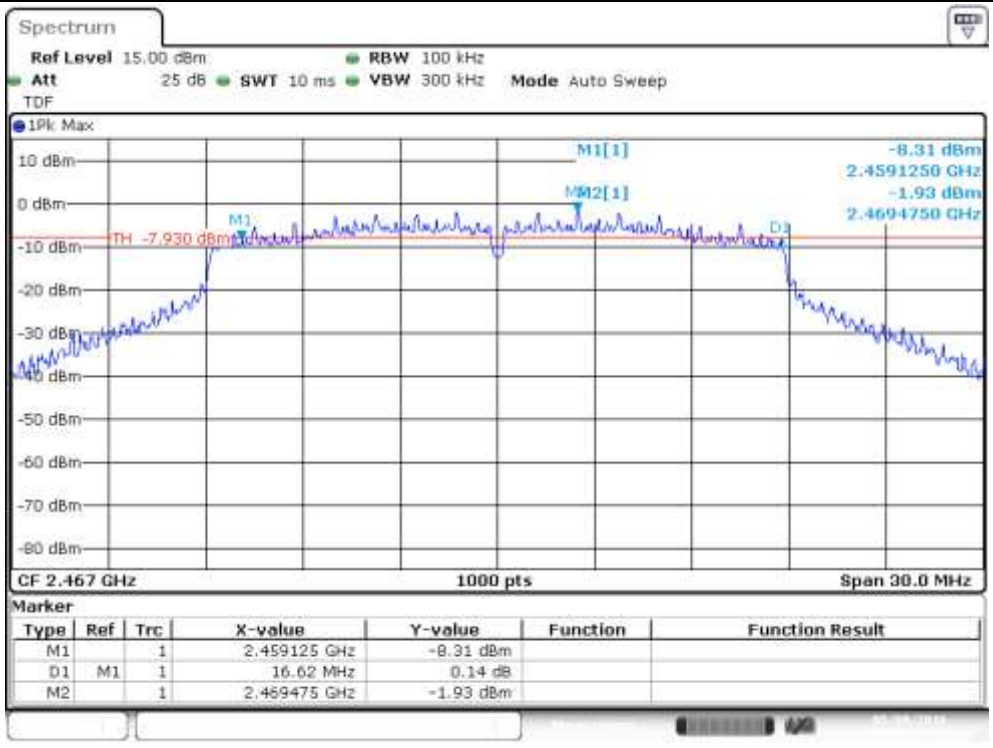
Date: 9.MAY.2016 10:18:17

99% BW – CH11



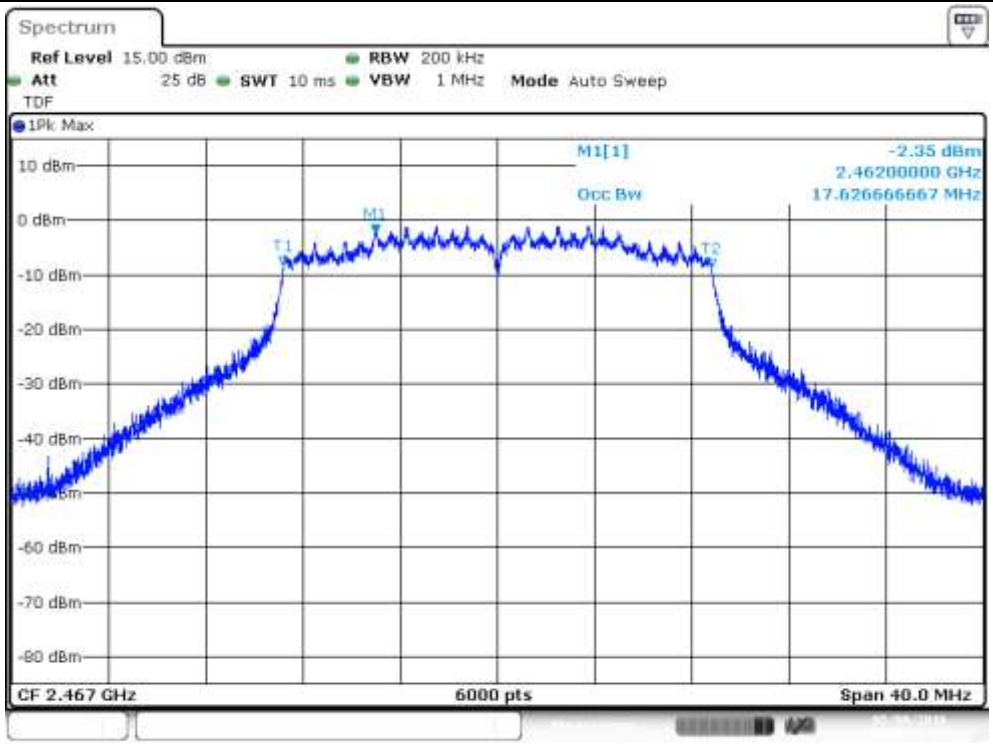
Date: 9.MAY.2016 10:16:48

6dB BW – CH12



Date: 9.MAY.2016 10:42:17

99% BW – CH12



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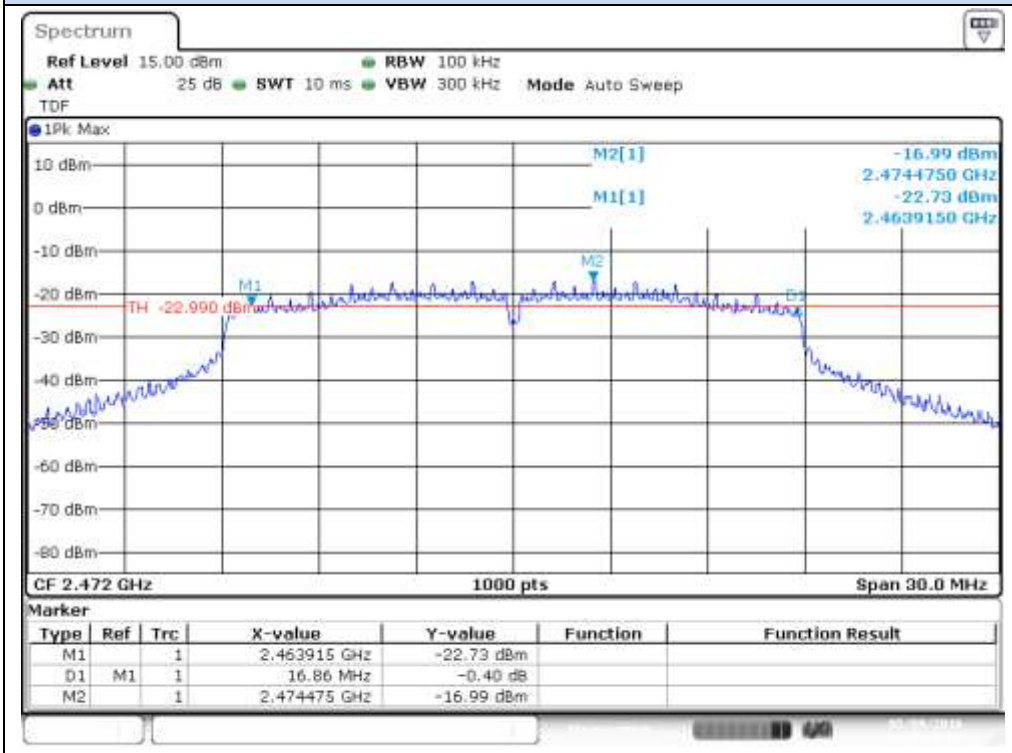
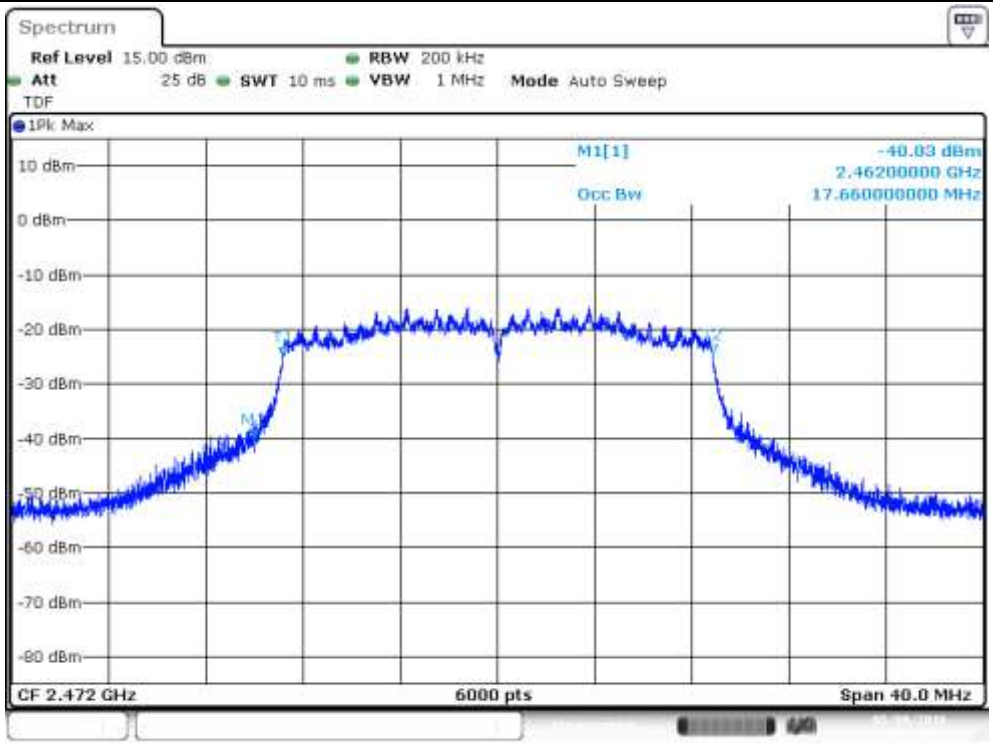
6dB BW – CH13



Date: 9.MAY.2016 12:30:18

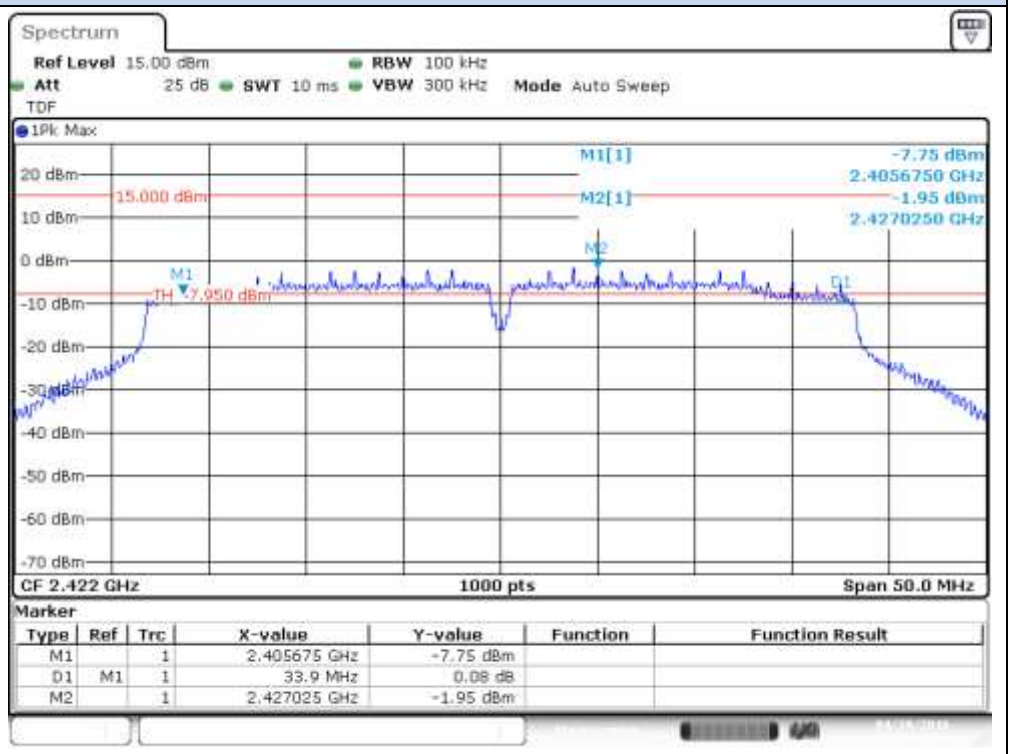
99% BW – CH13



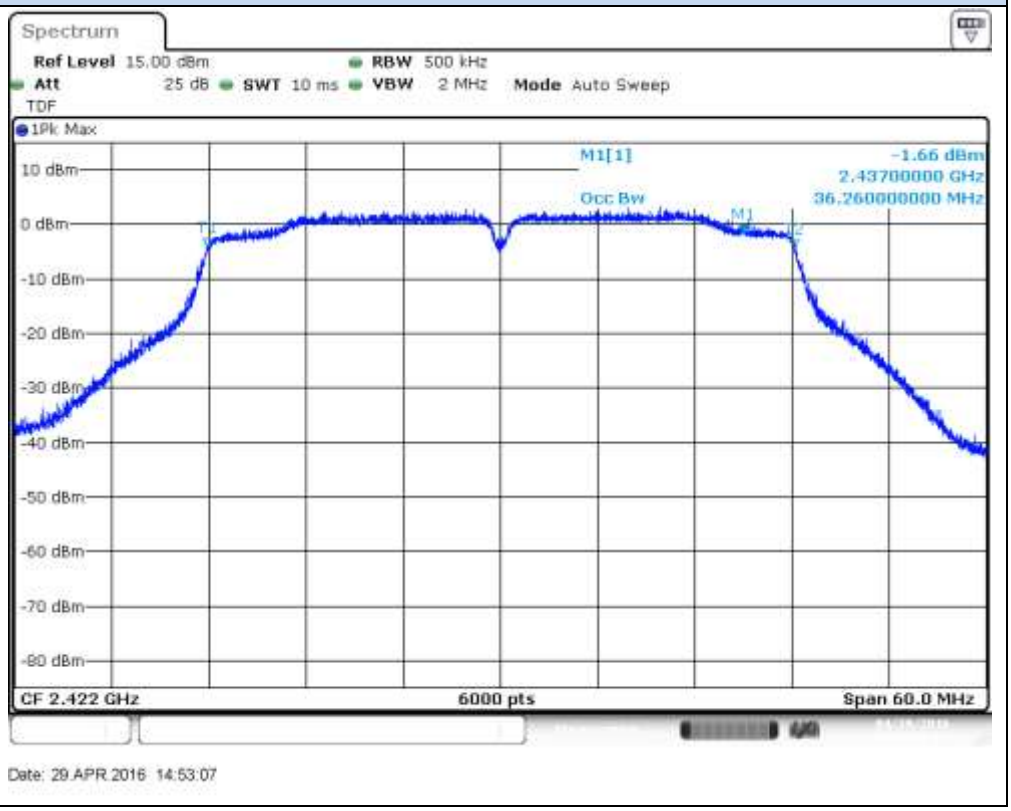
Date: 9.MAY.2016 12:30:42

802.11n40, HT0 (SISO) – Chain A

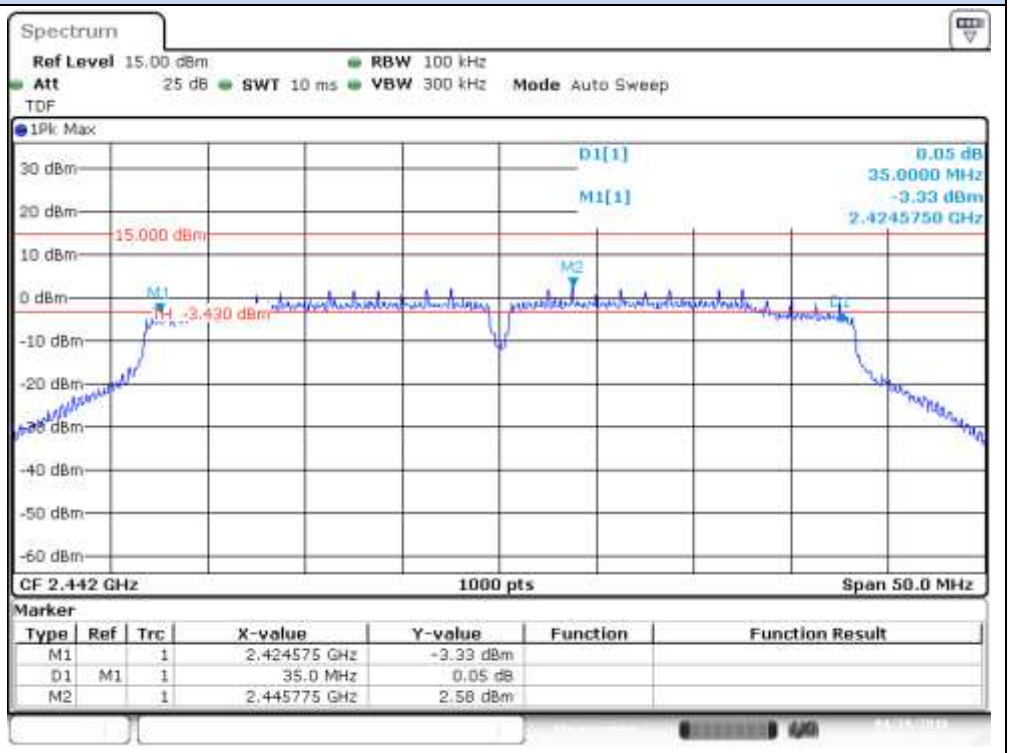
6dB BW – CH3F



99% BW – CH3F

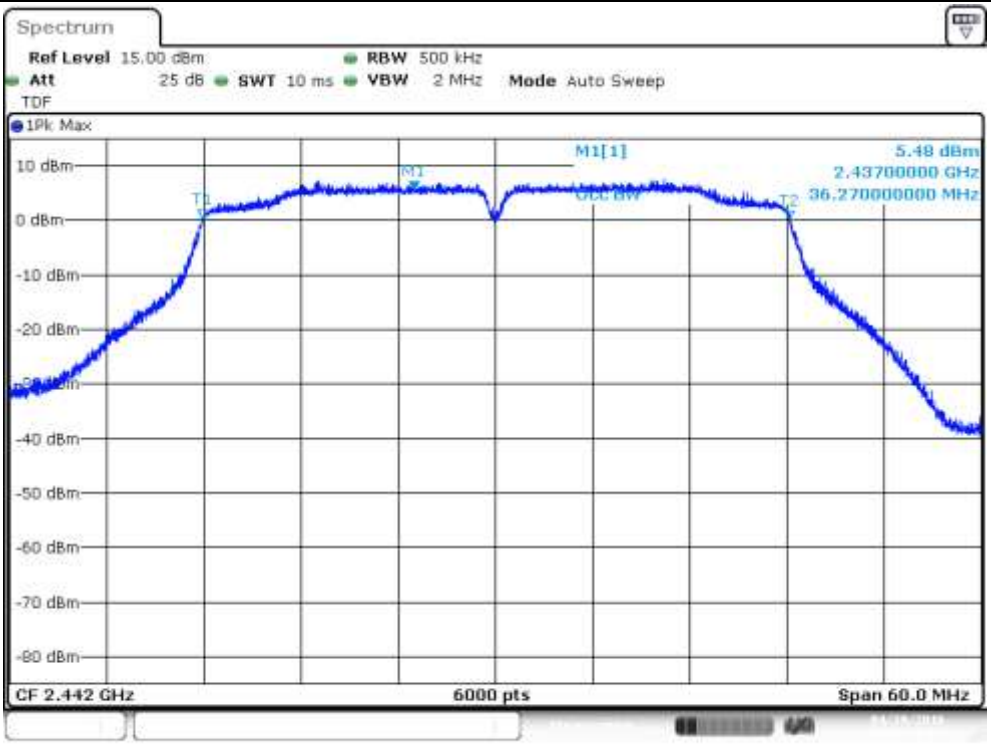


6dB BW – CH7F



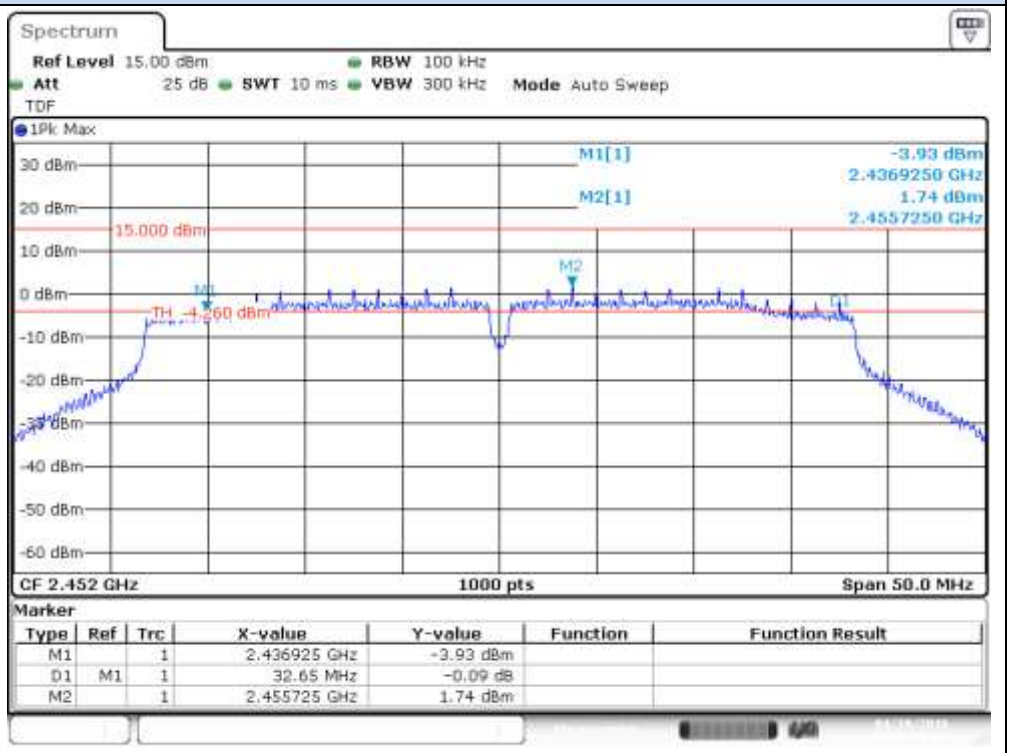
Date: 29.APR.2016 15:30:44

99% BW – CH7F



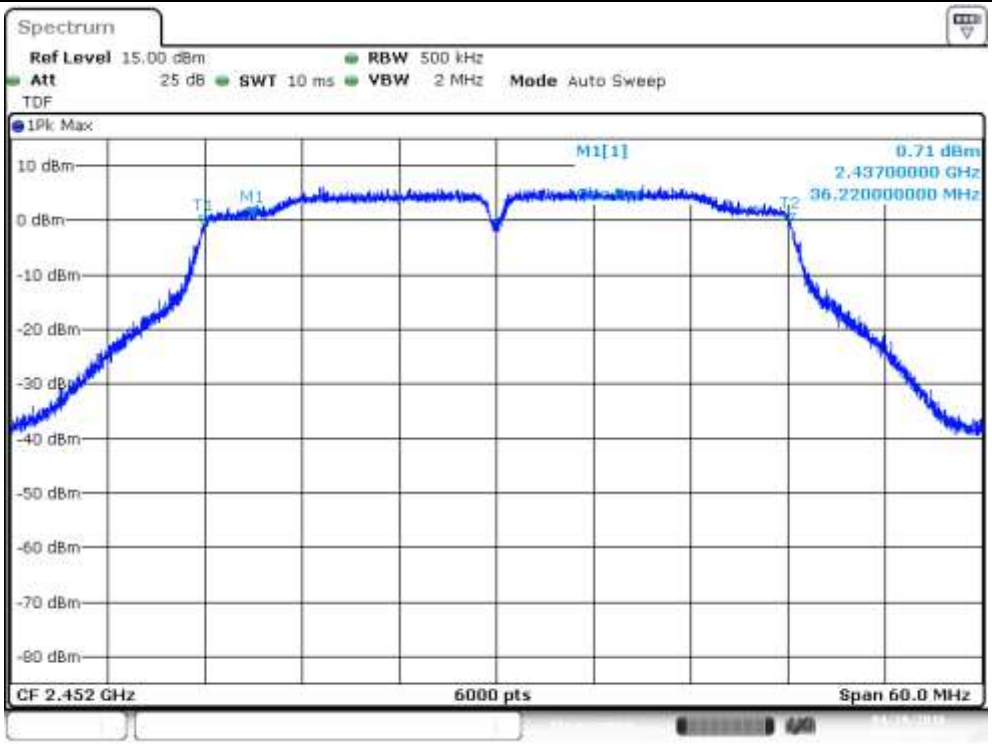
Date: 29.APR.2016 15:27:50

6dB BW – CH9F



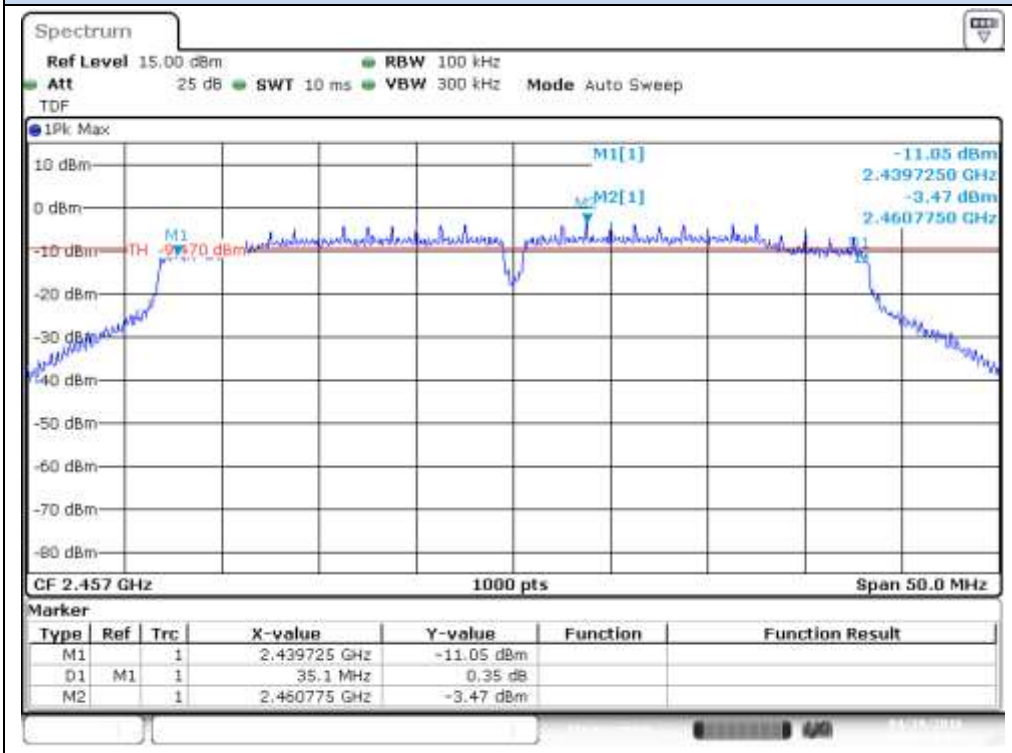
Date: 29.APR.2016 15:43:19

99% BW – CH9F



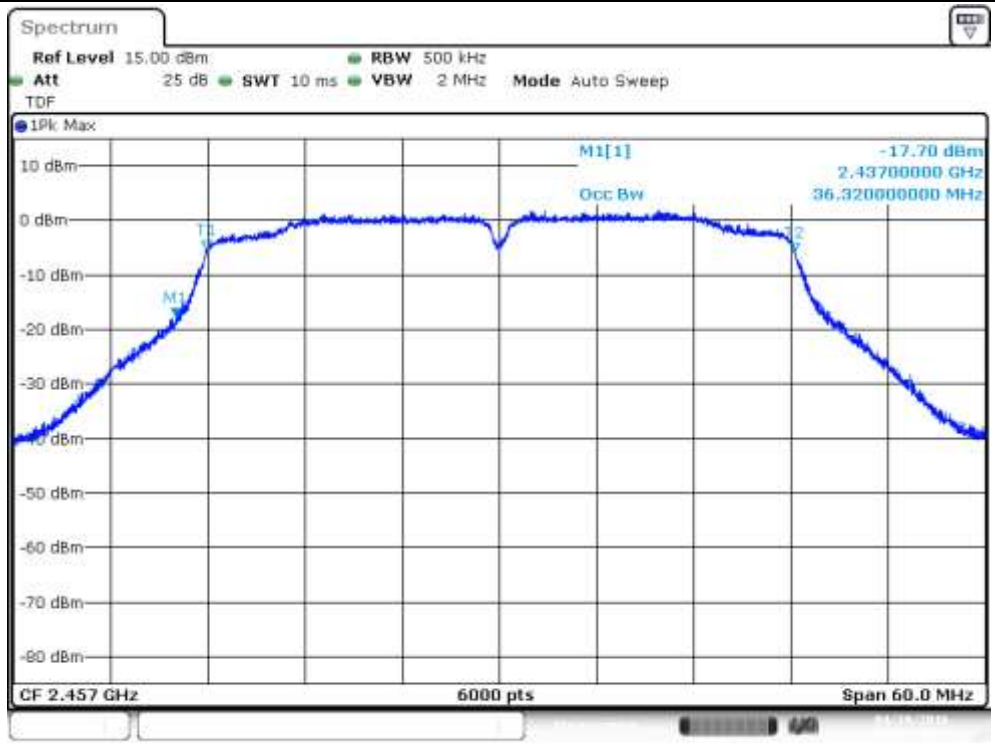
Date: 29.APR.2016 15:43:55

6dB BW – CH10F



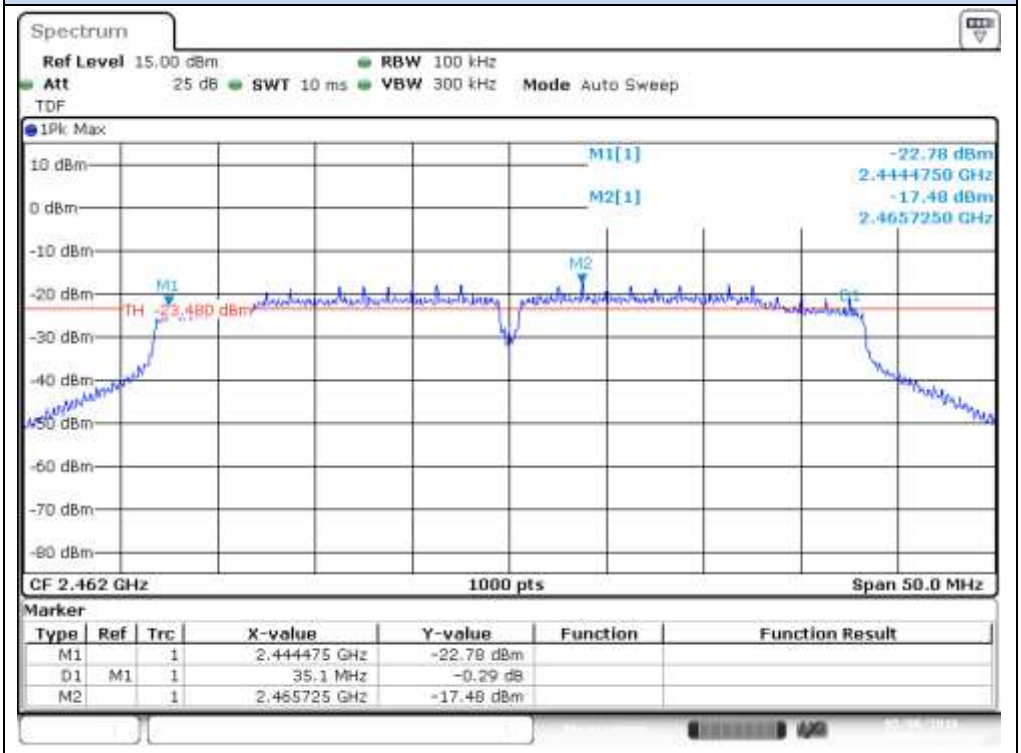
Date: 29.APR.2016 15:53:59

99% BW – CH10F

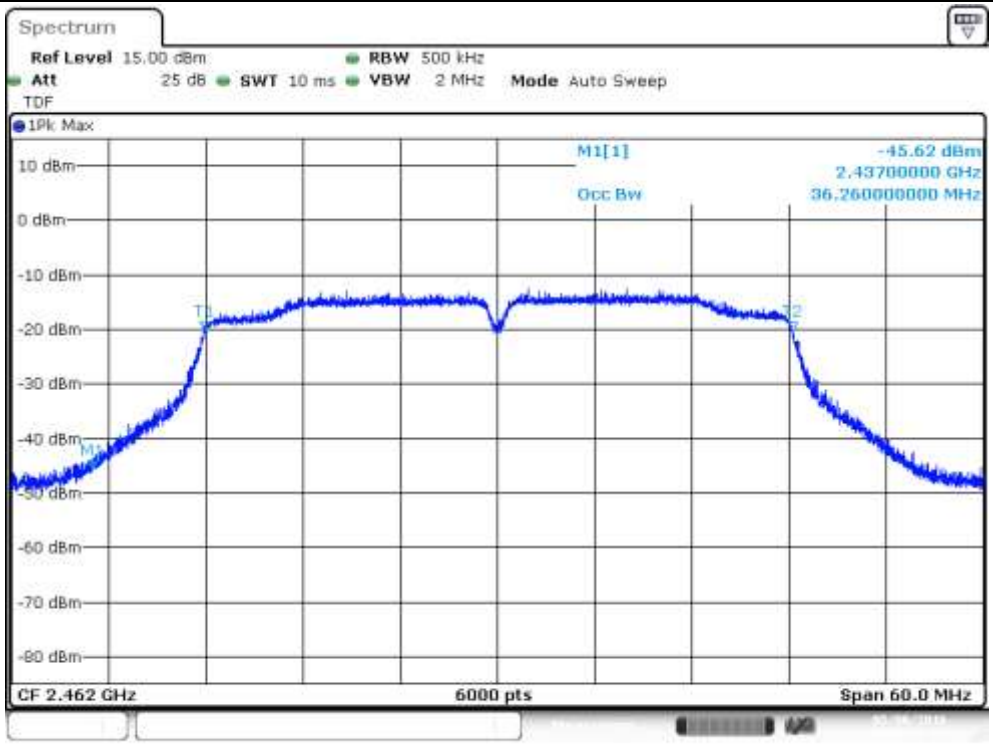


Date: 29.APR.2016 15:51:52

6dB BW – CH11F

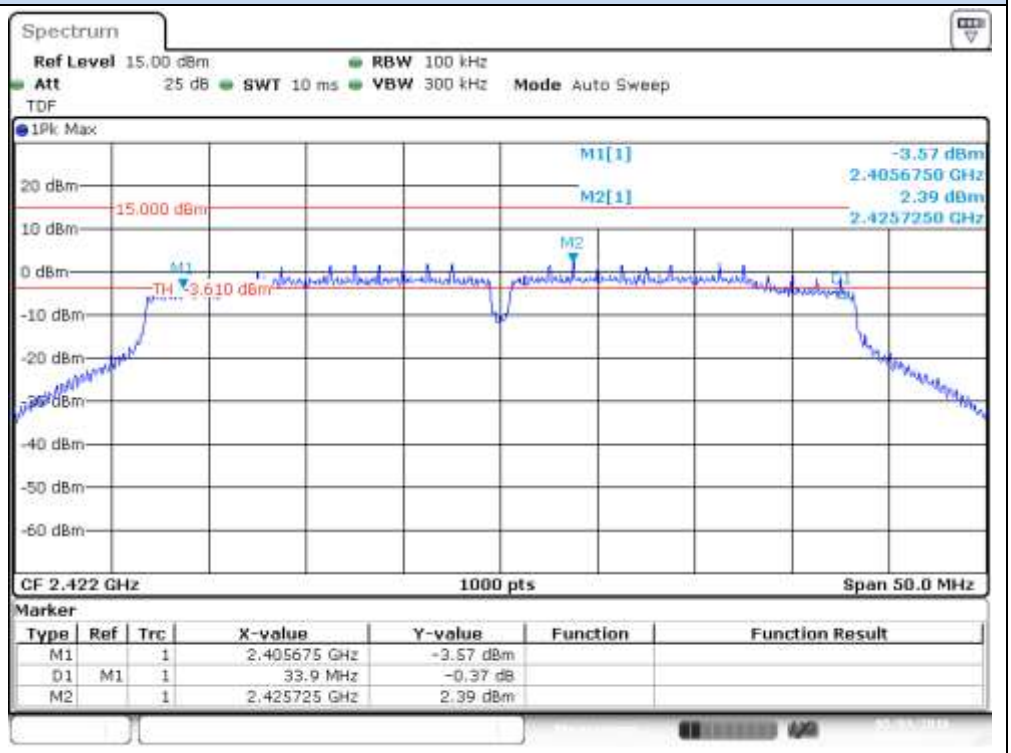


99% BW – CH11F

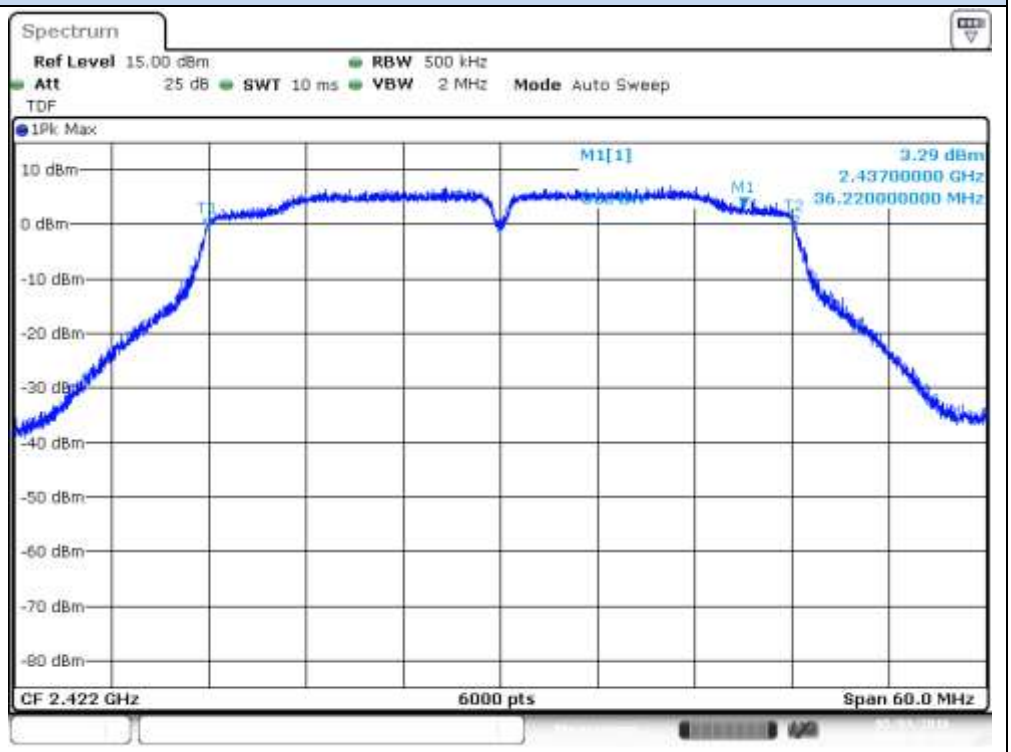


802.11n40, HT0 (SISO) – Chain B

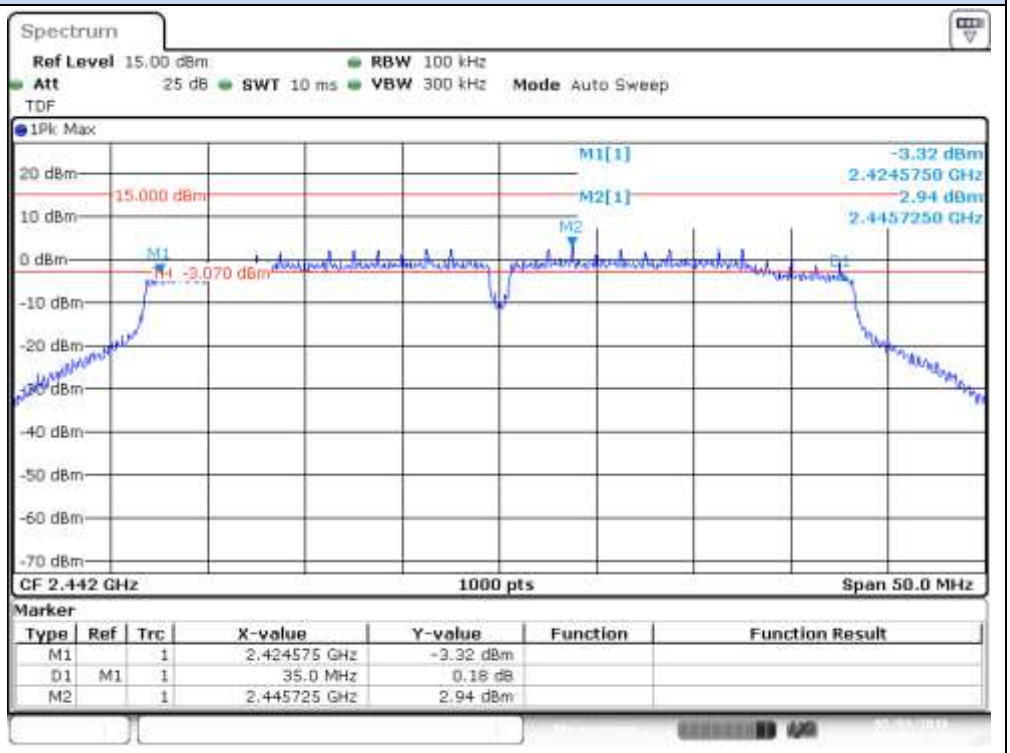
6dB BW – CH3F



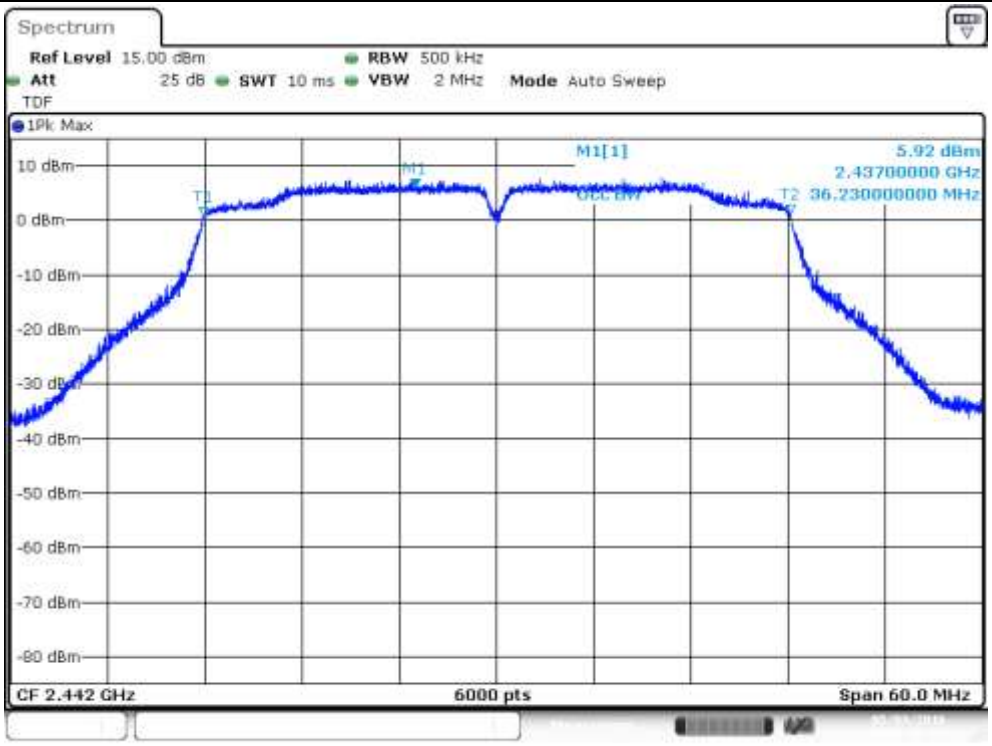
99% BW – CH3F



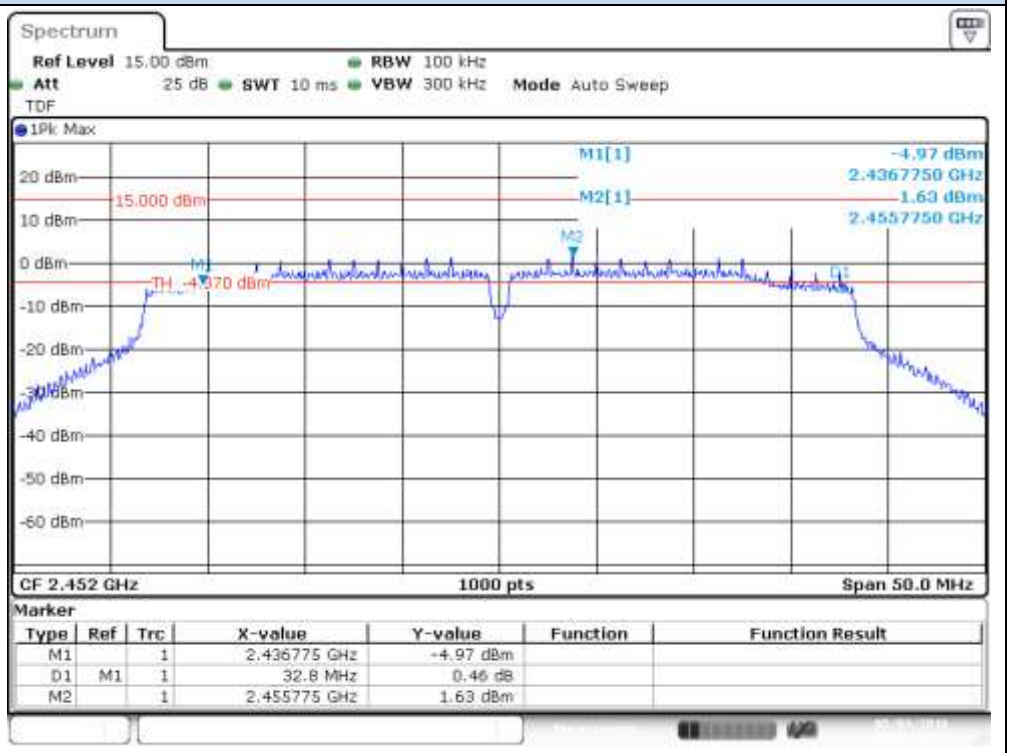
6dB BW – CH7F



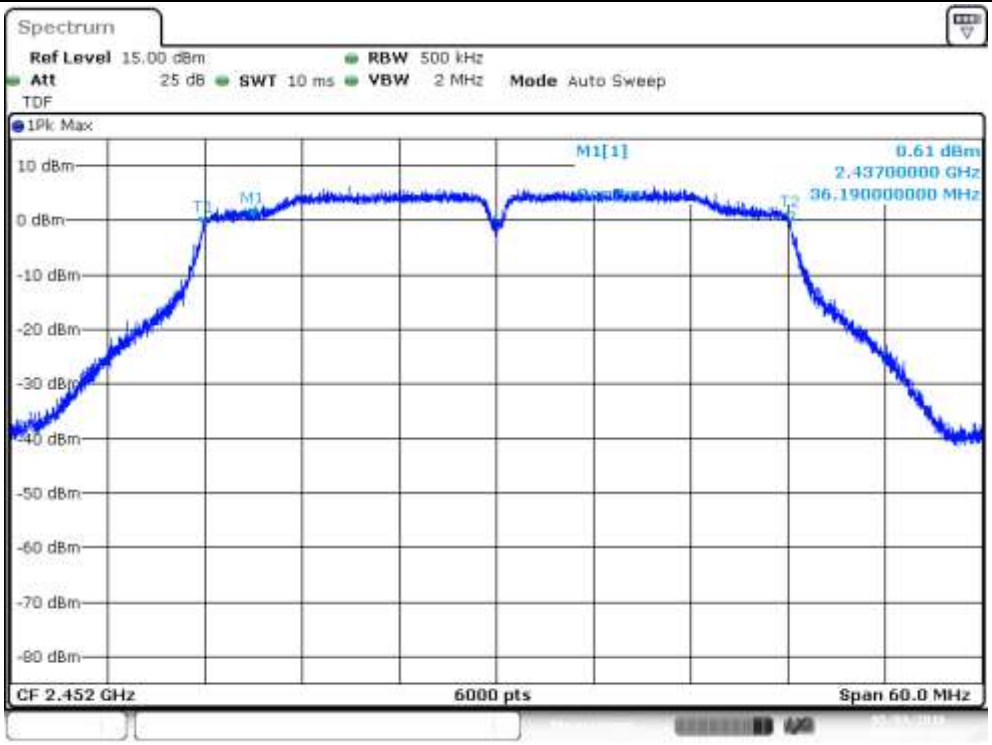
99% BW – CH7F



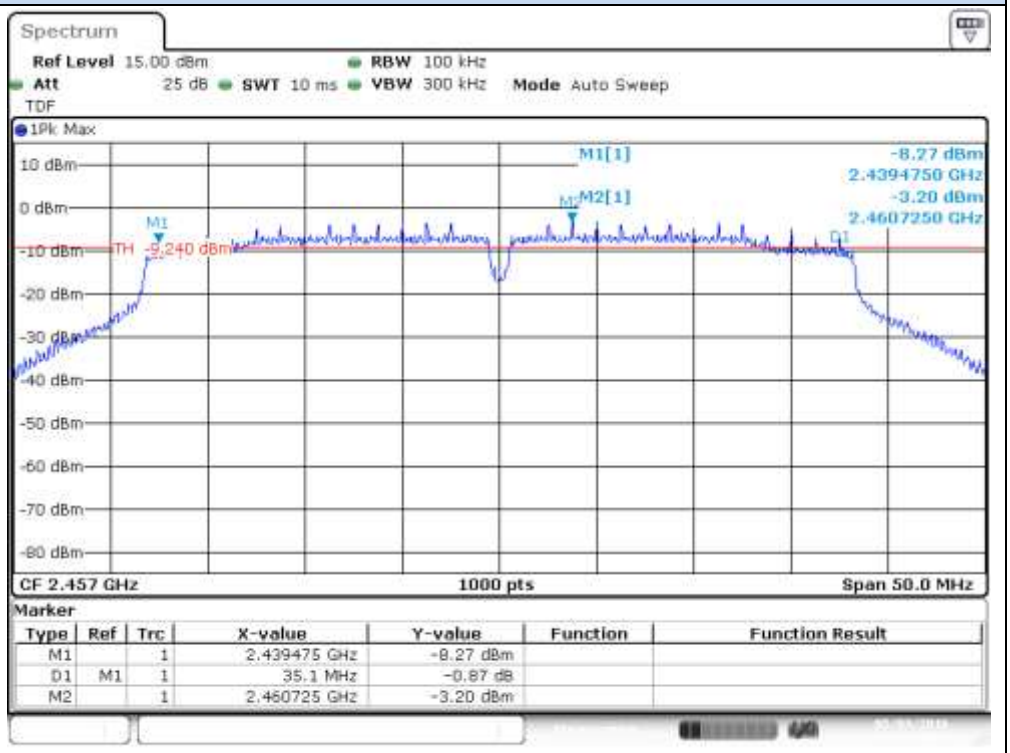
6dB BW – CH9F



99% BW – CH9F

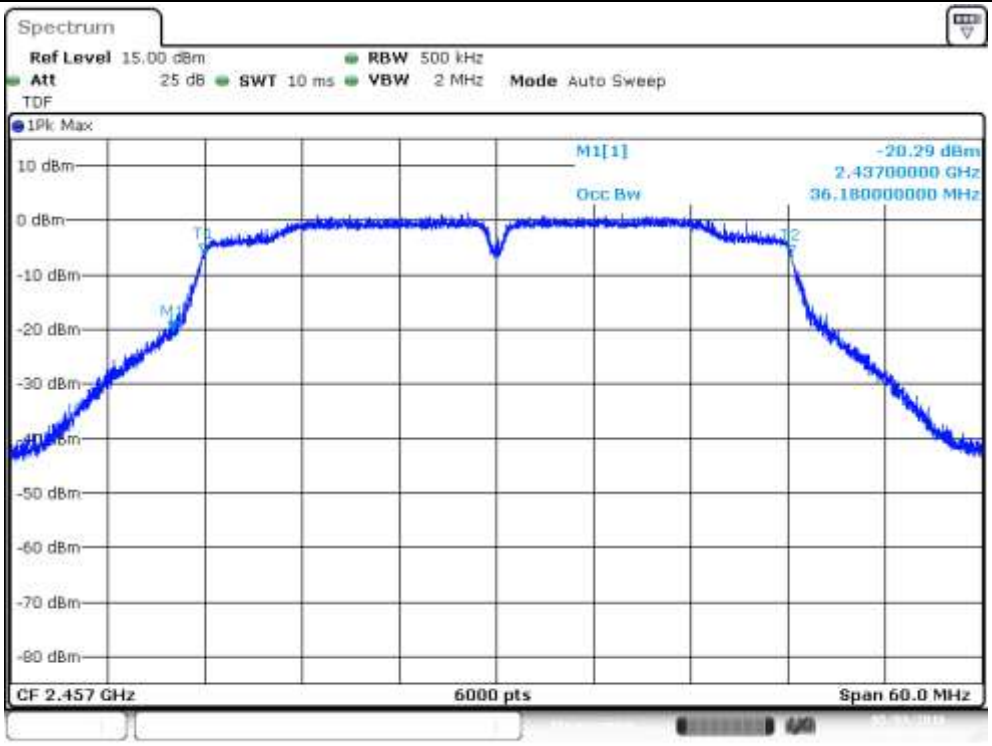


6dB BW – CH10F



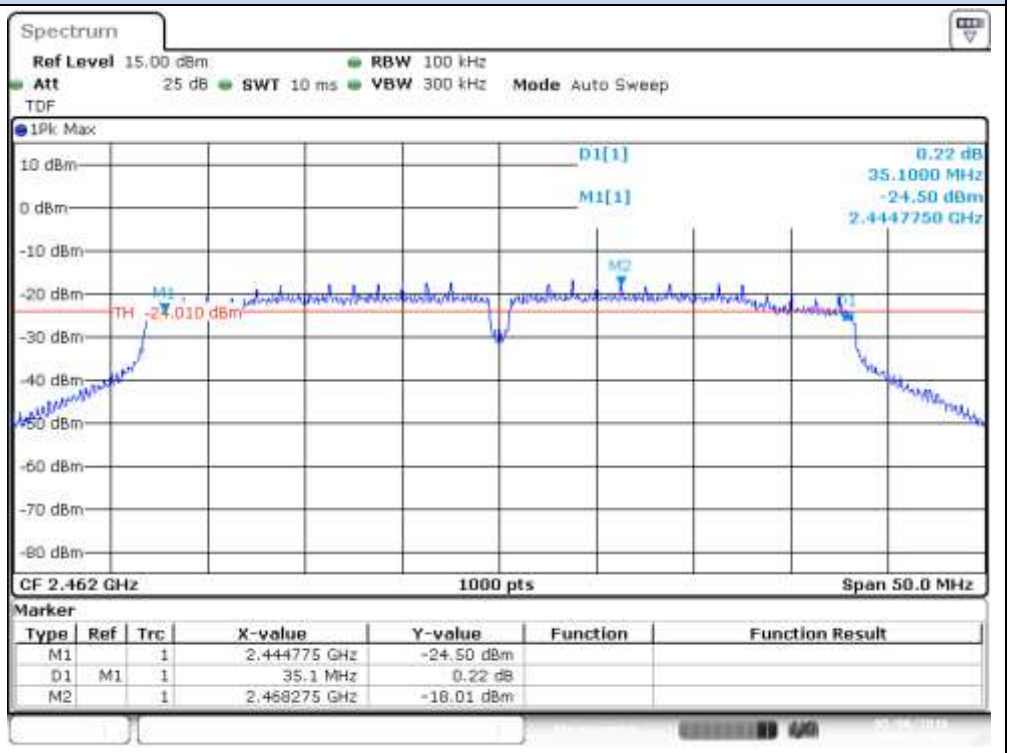
Date: 3.MAY.2016 12:17:43

99% BW – CH10F



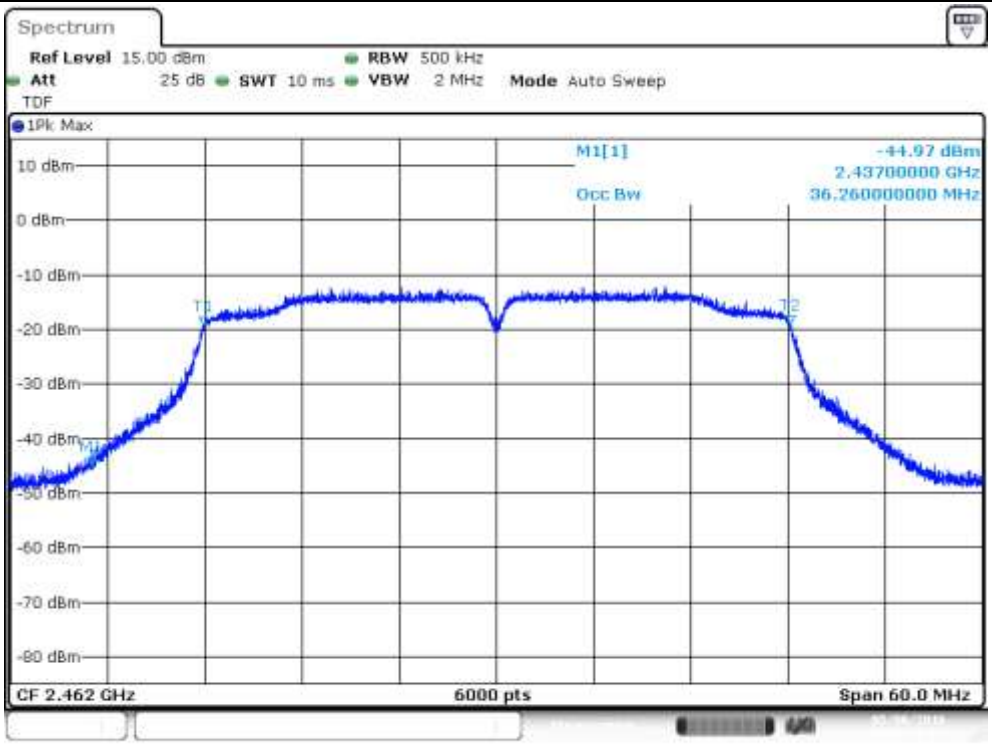
Date: 3.MAY.2016 12:15:44

6dB BW – CH11F



Date: 6.MAY.2016 18:21:26

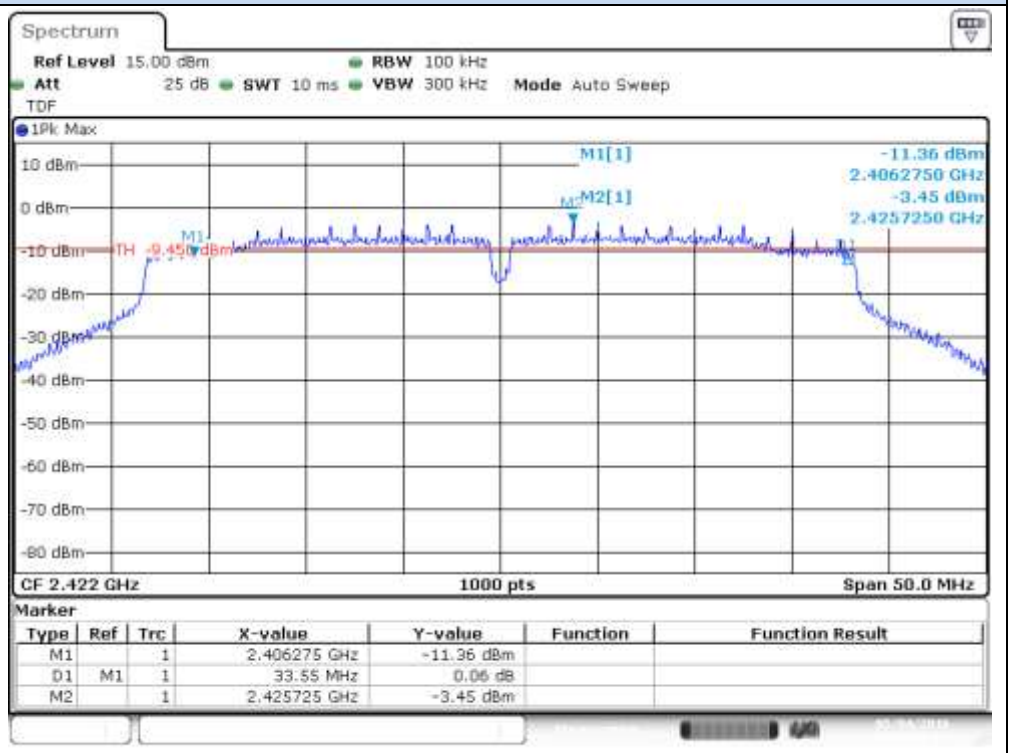
99% BW – CH11F



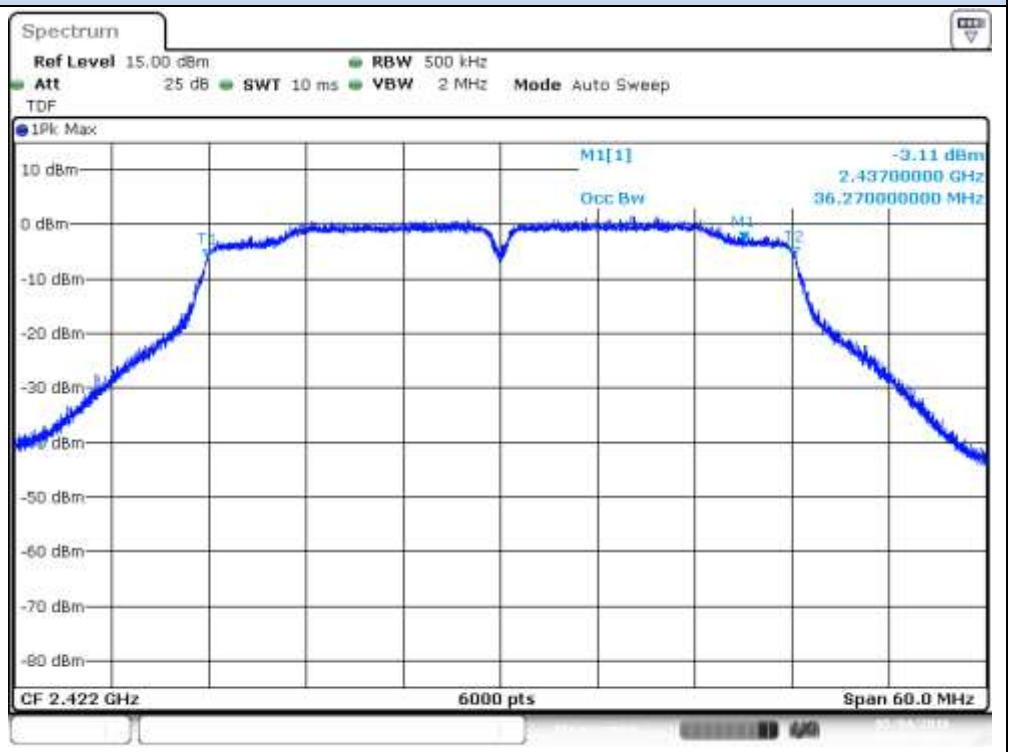
Date: 6.MAY.2016 18:19:46

802.11n40, HT8 (MIMO) – Chain A

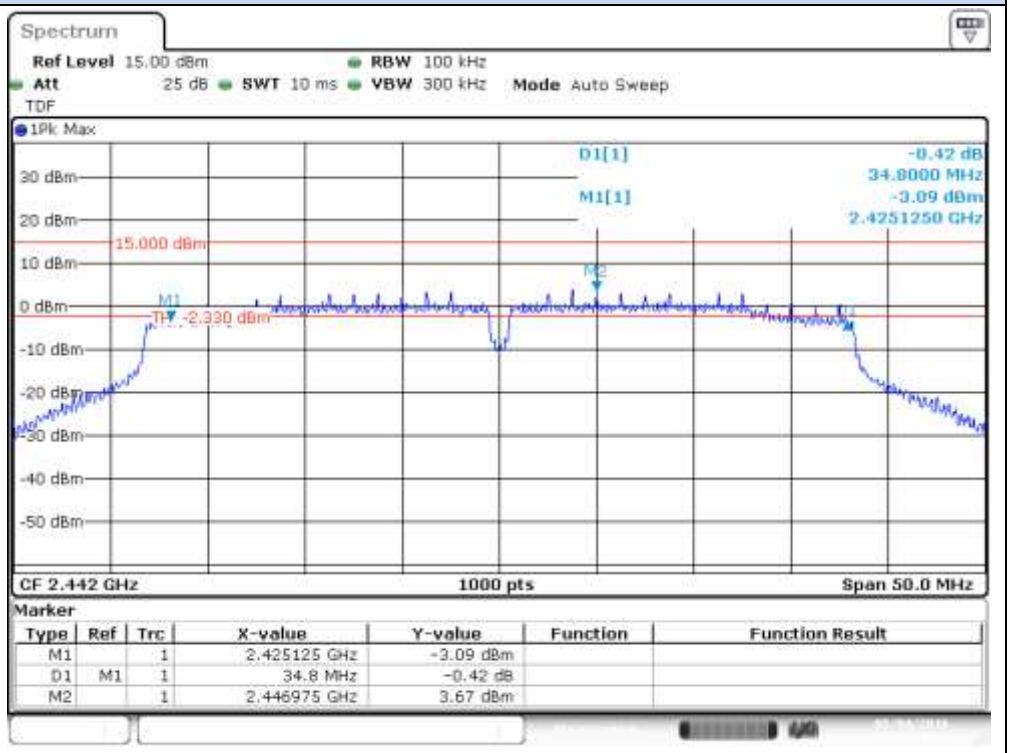
6dB BW – CH3F



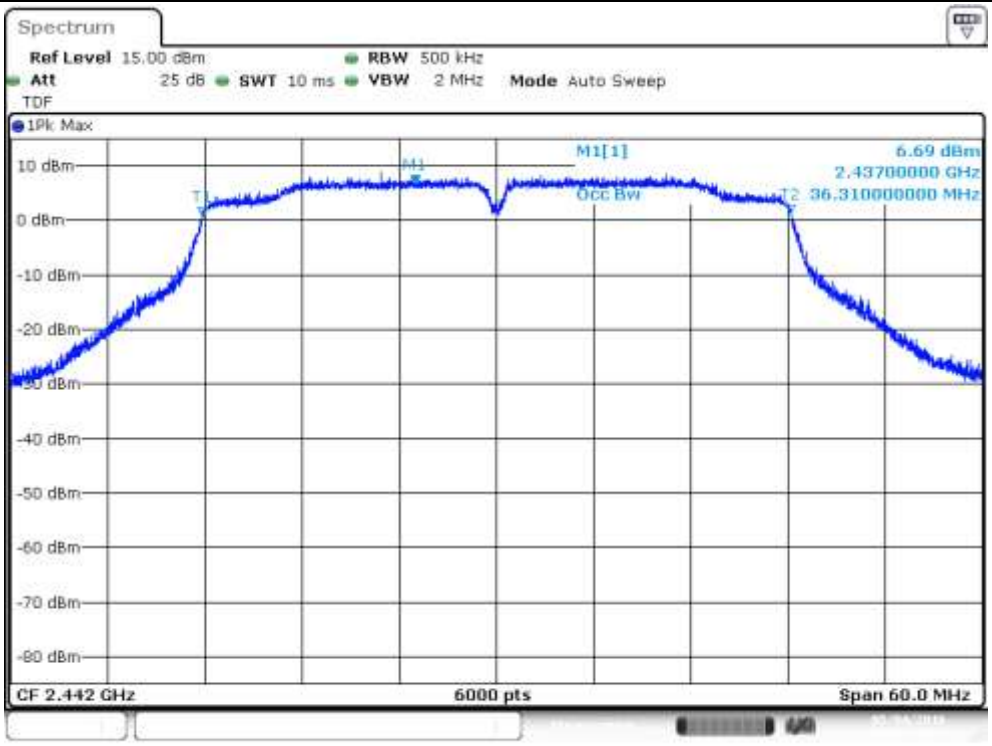
99% BW – CH3F



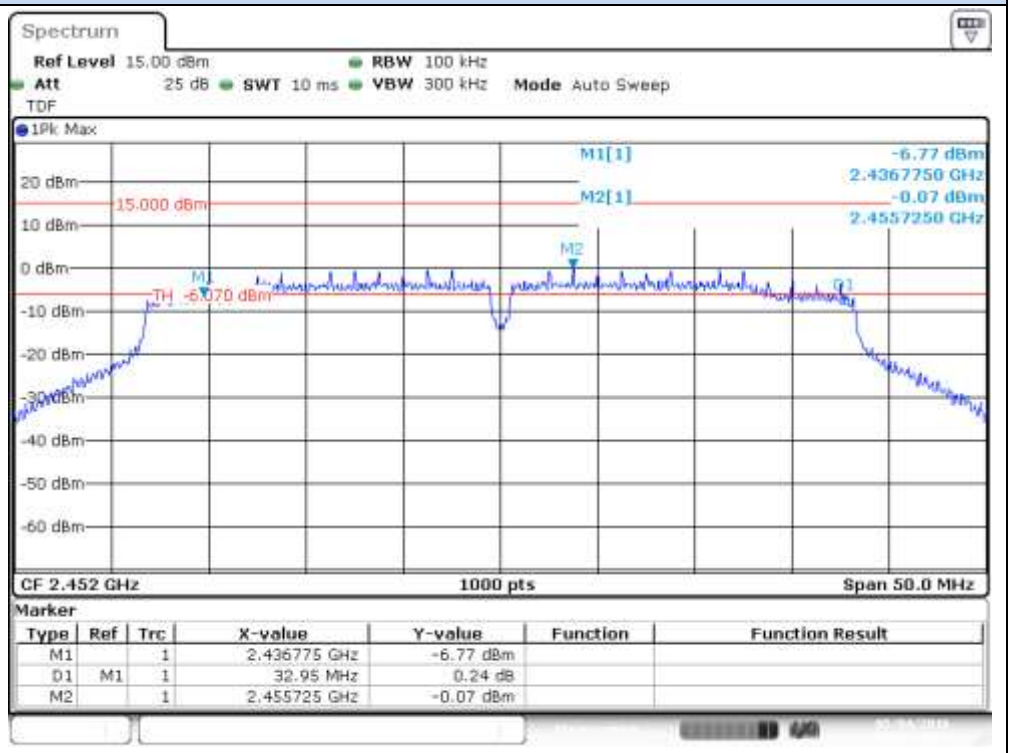
6dB BW – CH7F



99% BW – CH7F

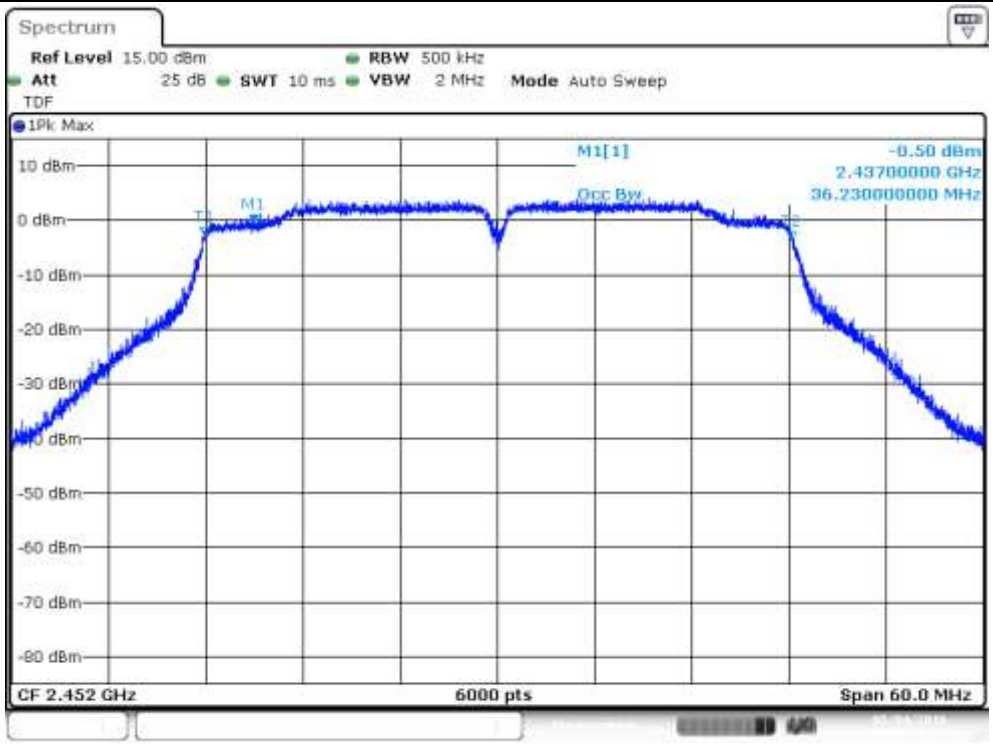


6dB BW – CH9F



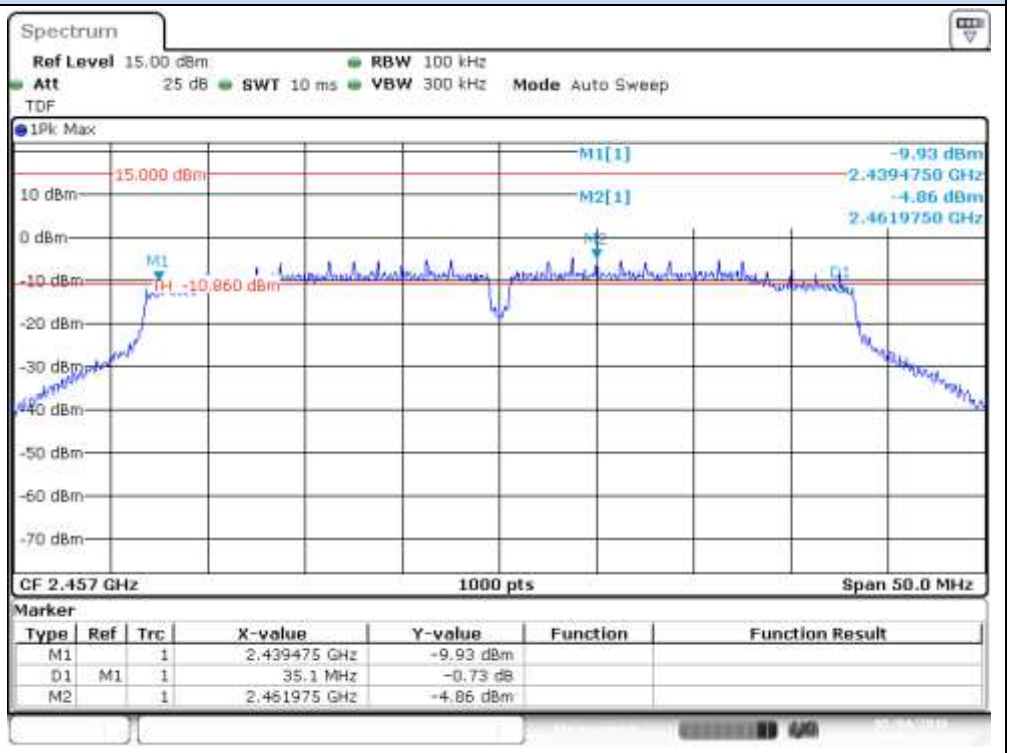
Date: 4.MAY.2016 17:44:48

99% BW – CH9F



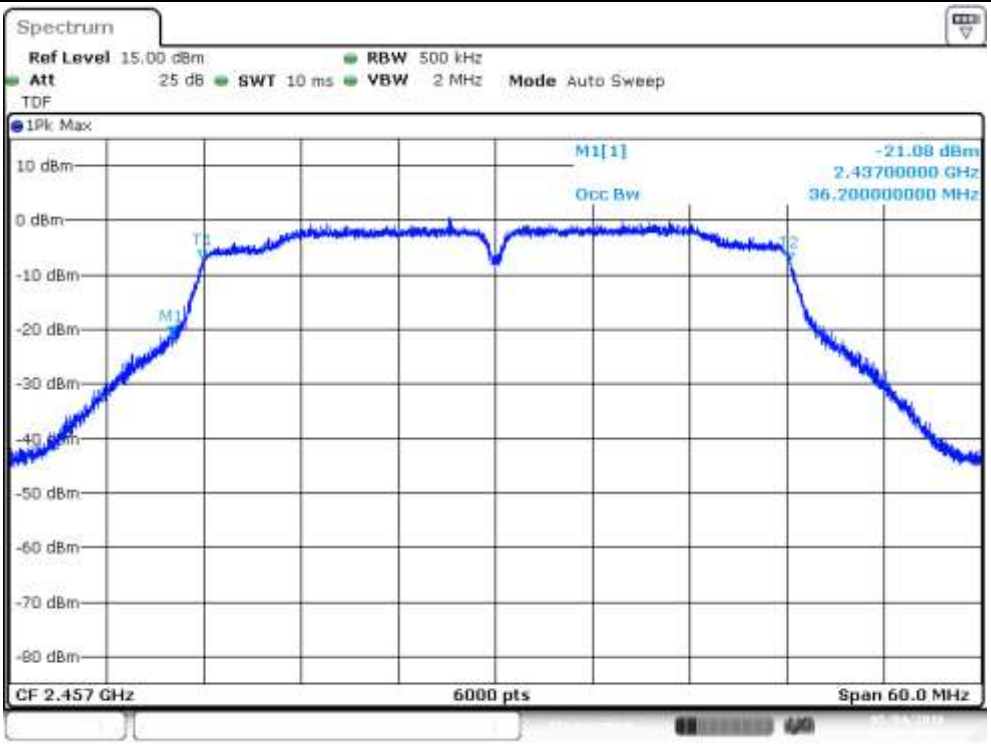
Date: 4.MAY.2016 16:49:40

6dB BW – CH10F



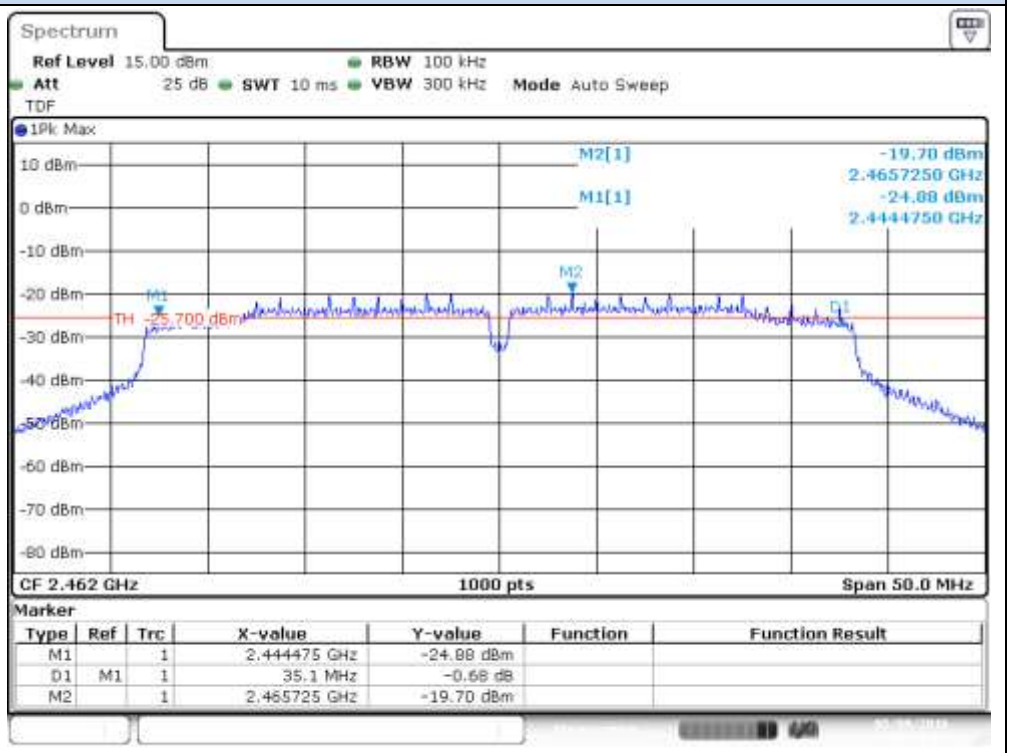
Date: 4.MAY.2016 18:00:46

99% BW – CH10F

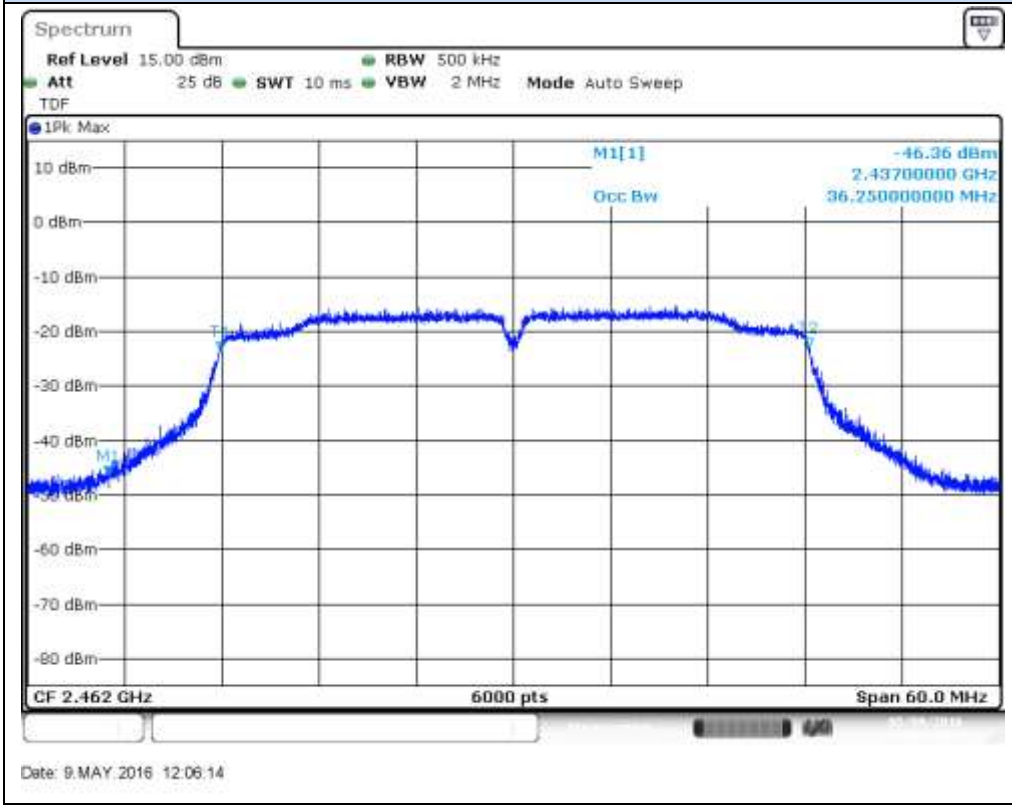


Date: 4.MAY.2016 17:58:30

6dB BW – CH11F

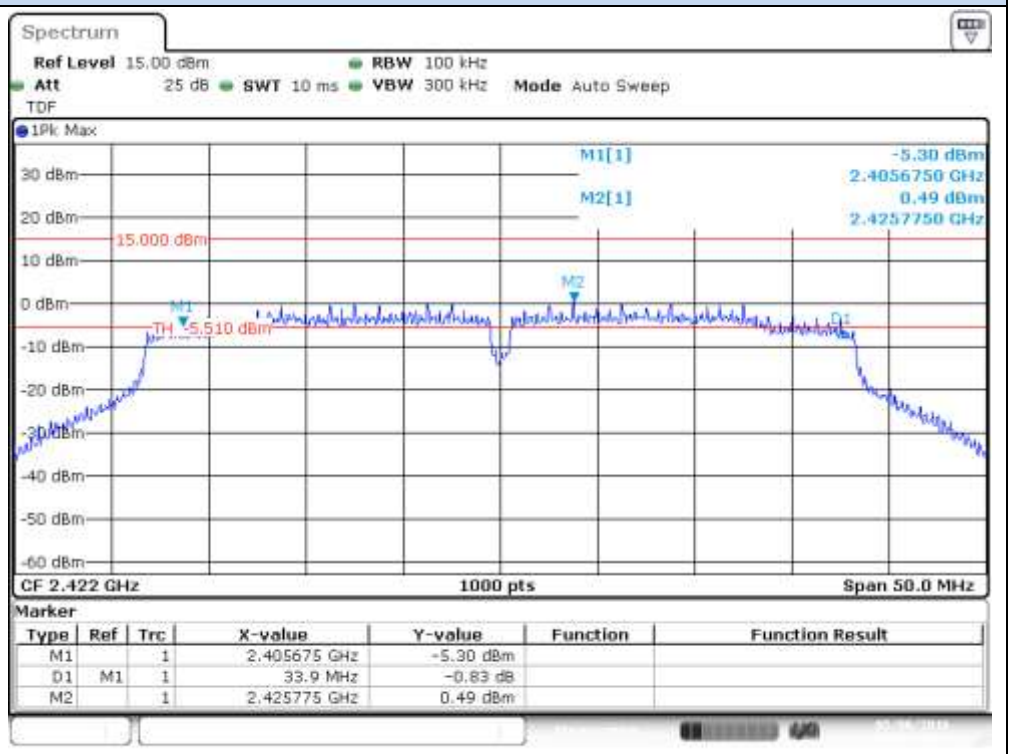


99% BW – CH11F



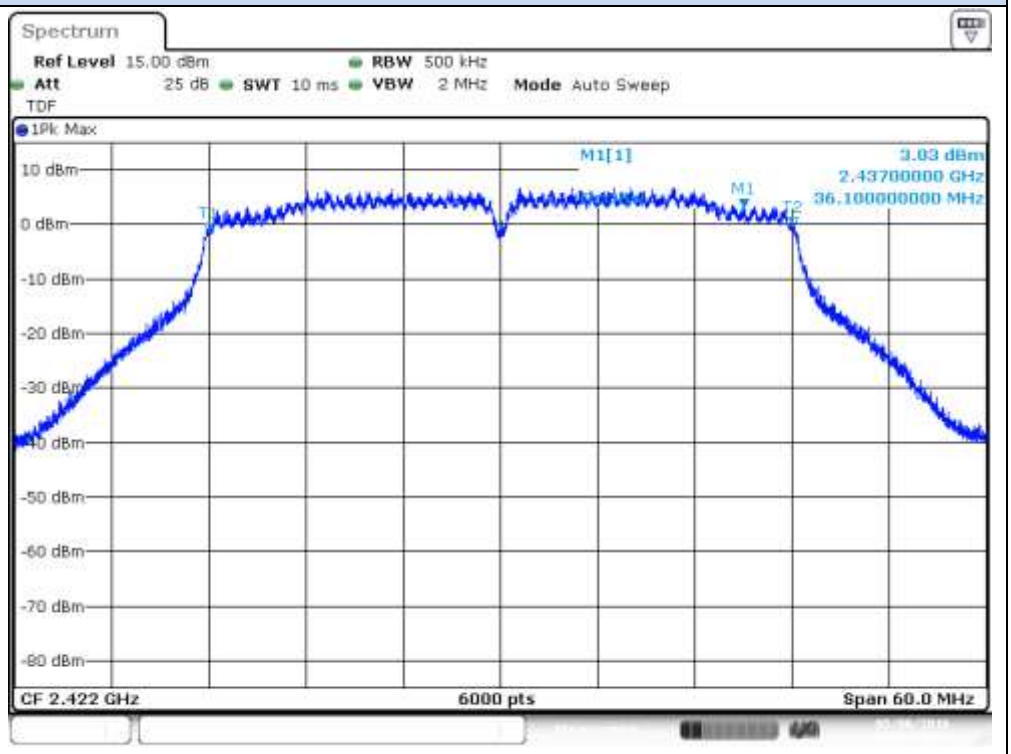
802.11n40, HT8 (MIMO) – Chain B

6dB BW – CH3F



Date: 6.MAY.2016 18:52:16

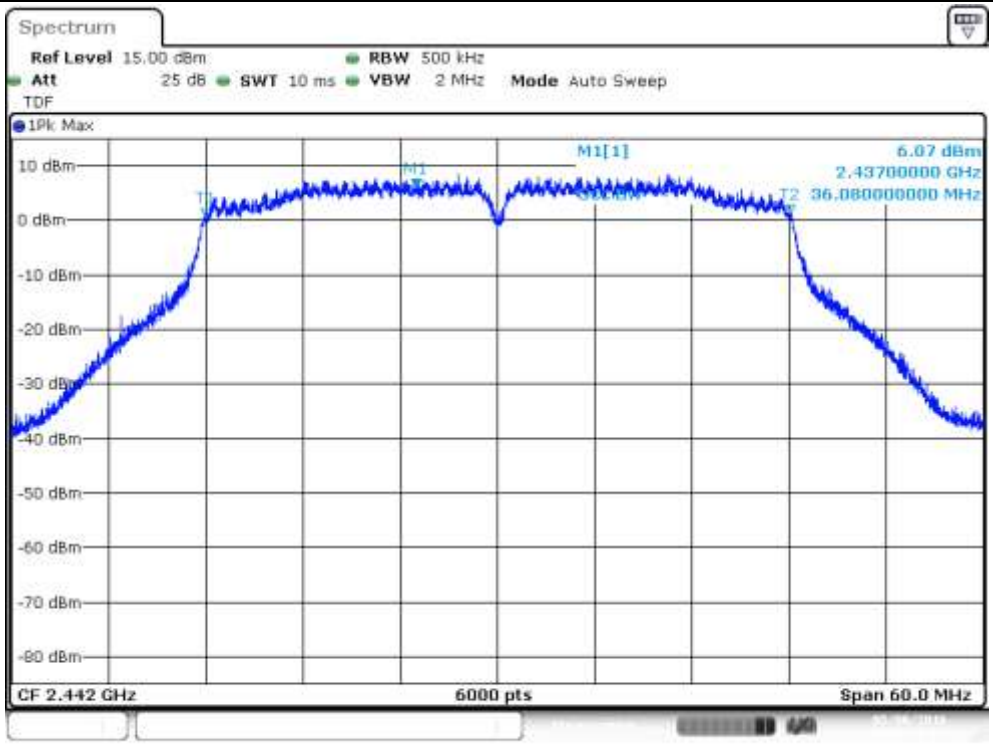
99% BW – CH3F



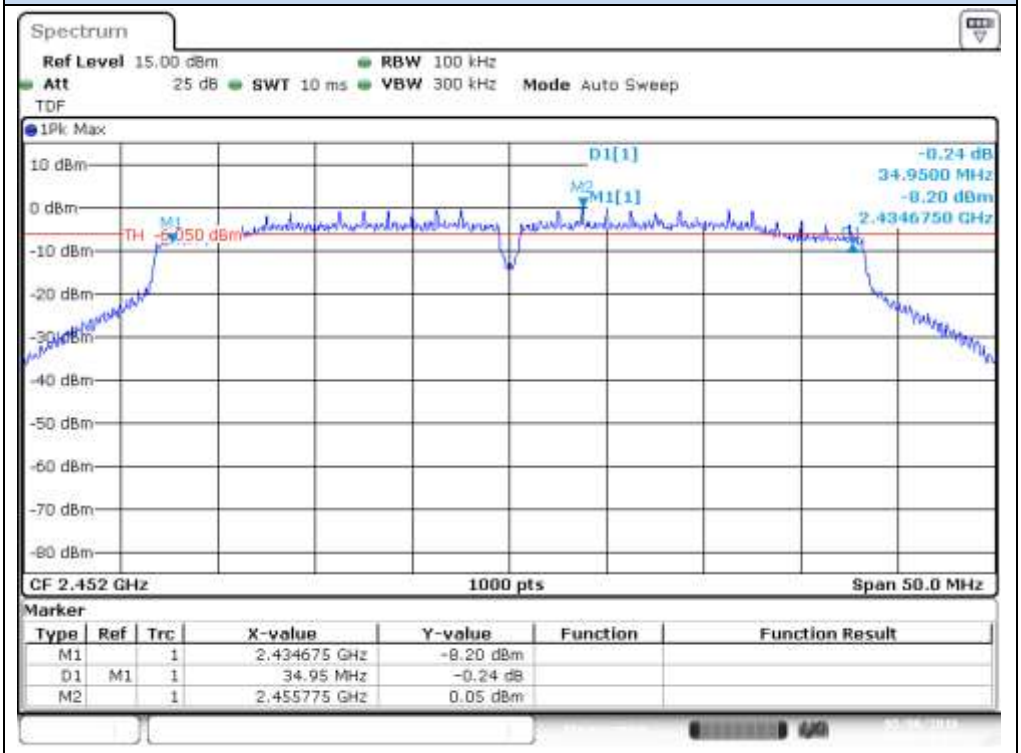
Date: 6.MAY.2016 18:50:57

6dB BW – CH7F

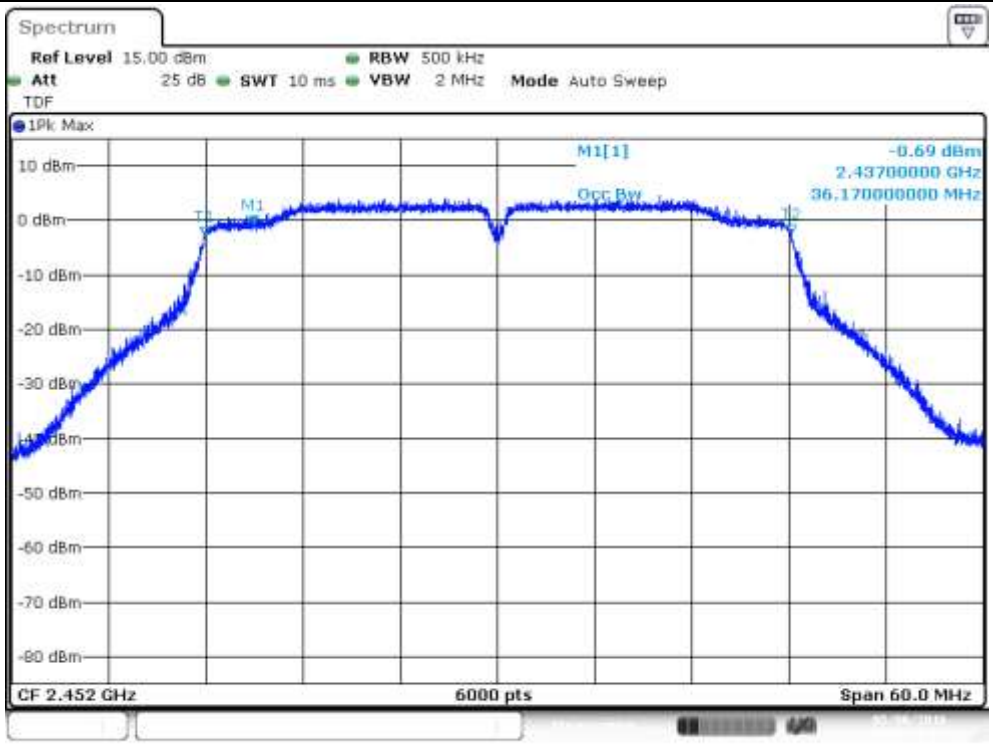
99% BW – CH7F



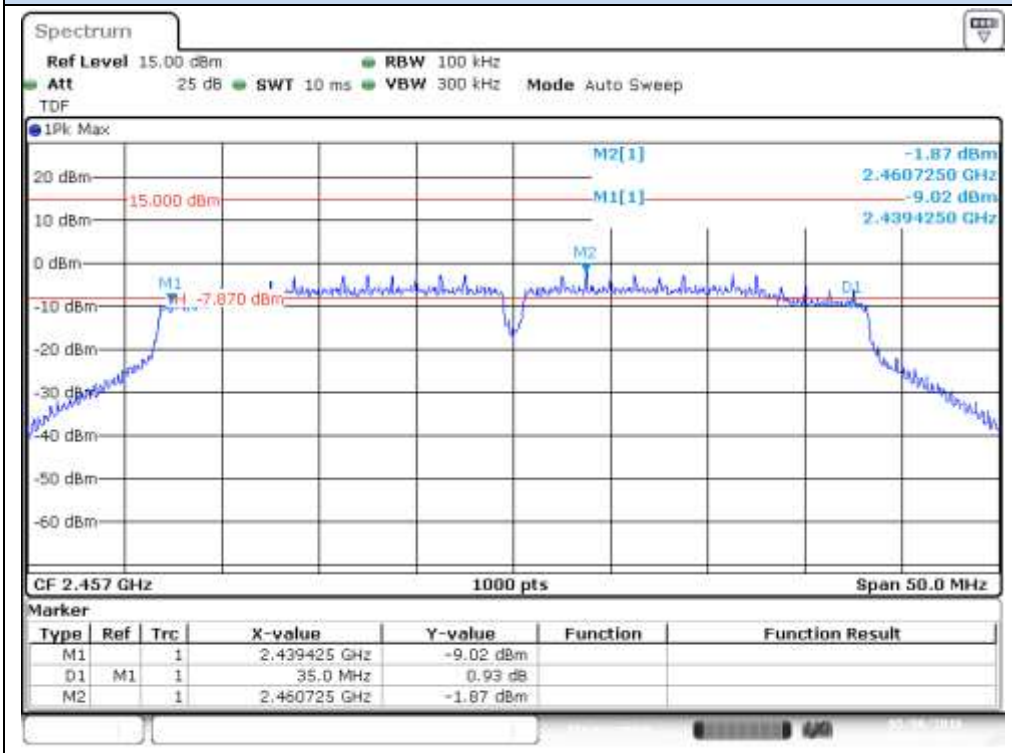
6dB BW – CH9F



99% BW – CH9F

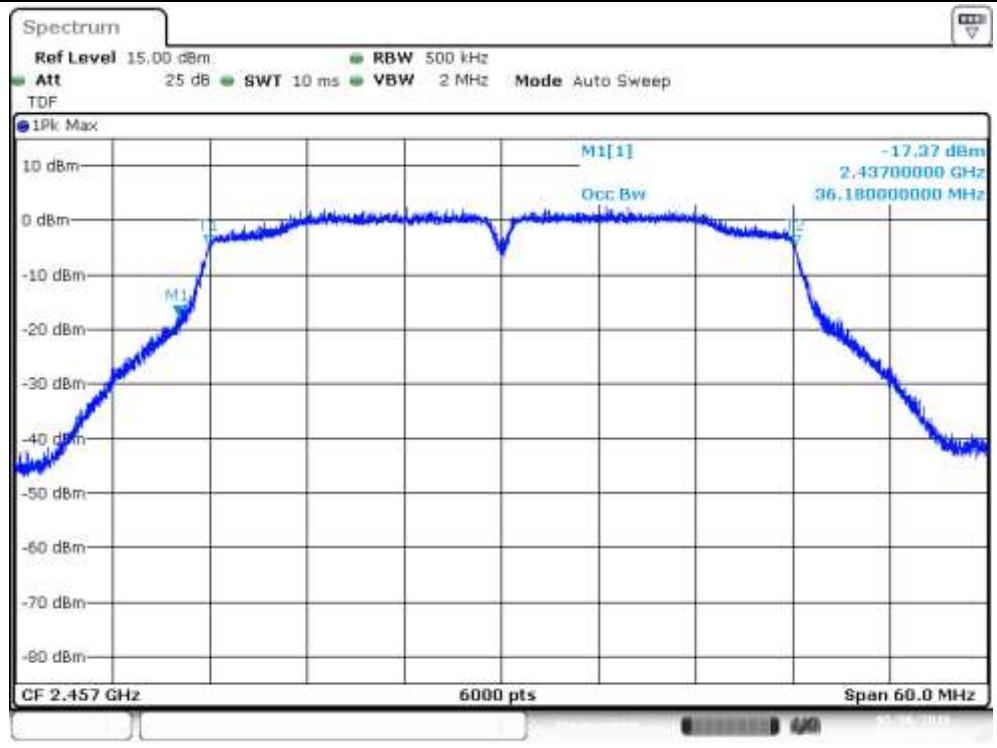


6dB BW – CH10F



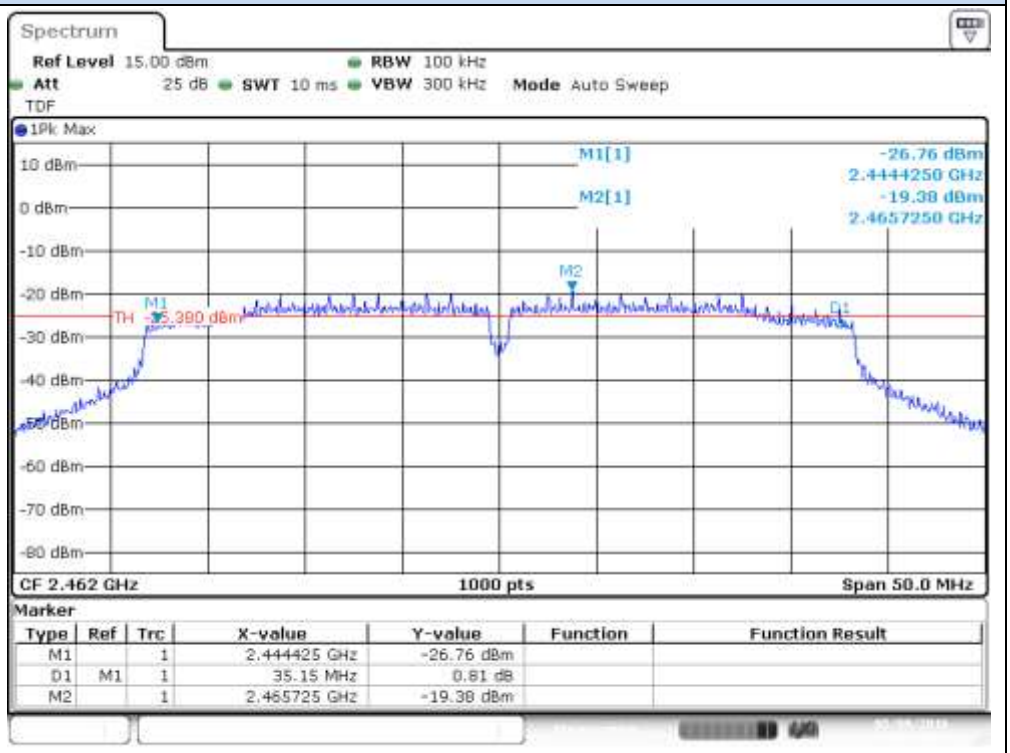
Date: 6.MAY.2016 18:10:35

99% BW – CH10F

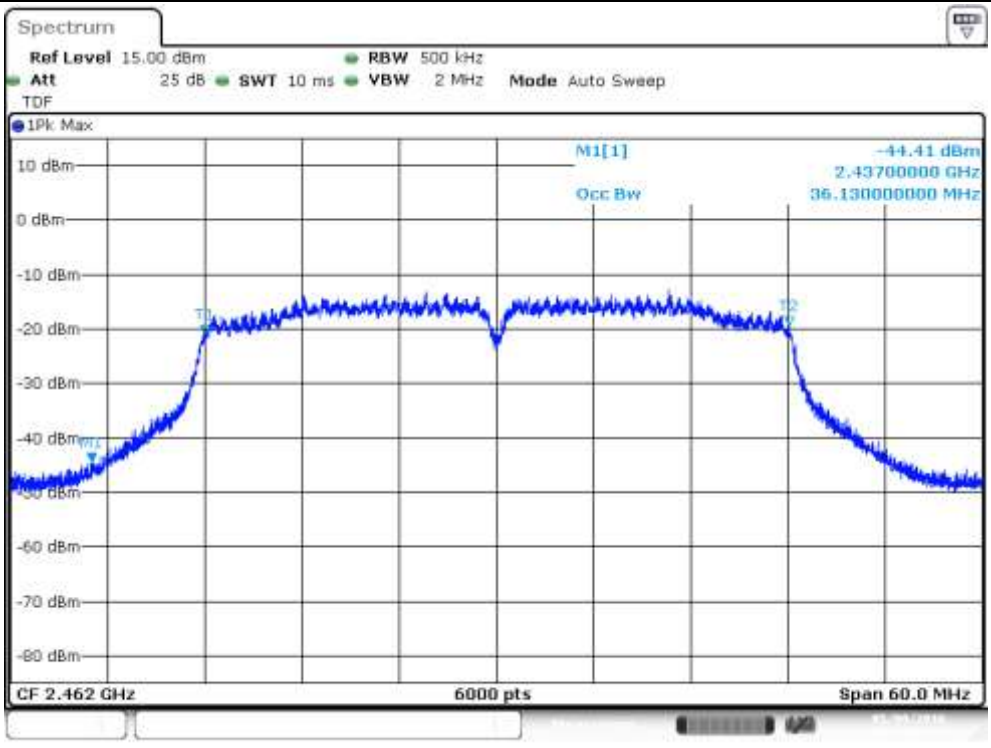


Date: 6.MAY.2016 18:08:43

6dB BW – CH11F



99% BW – CH11F



B.2 Maximum Output Power and antenna gain

Test limits:

FCC part	RSS part	Limits
15.247 (b) (3)	RSS-247 Clause 5.4 (4)	(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi.

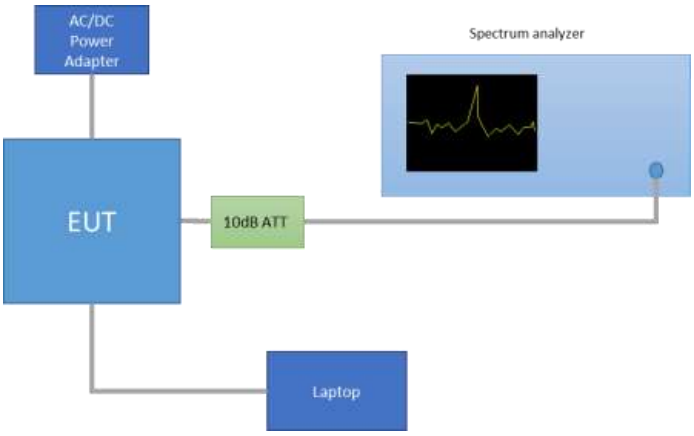
Test procedure:

The Maximum Peak Conducted Output Power was measured using the channel integration method as authorized in chapter 2.0 "*Power limits, definitions and device configuration"* of FCC KDB 558074 D01.

For MIMO mode, according to the measure-and-sum approach defined in FCC KDB 662911 - Guidance for Emission Testing of Transmitters with Multiple Outputs in the Same Band, 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 declared maximum antenna gain is 3dBi.

The setup below was used to measure the maximum conducted 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.



Results tables:

Mode	Rate	Meas. Duty Cycle [%]	CH	Frequency [MHz]	Antenna	Peak Power [dBm]		Peak Output Power [mW]
						Measured Conducted Output power	EIRP	
802.11b	1Mbps	97.4	1	2412	SISO CHAIN A	20.86	23.86	121.90
					SISO CHAIN B	20.75	23.75	118.85
			7	2442	SISO CHAIN A	22.82	25.82	**191.43**
					SISO CHAIN B	22.72	25.72	187.07
			11	2462	SISO CHAIN A	21.23	24.23	133.05
					SISO CHAIN B	21.69	24.69	147.57
			12	2467	SISO CHAIN A	17.05	20.05	50.70
					SISO CHAIN B	17.97	20.97	62.66
			13	2472	SISO CHAIN A	10.45	13.45	**11.09**
					SISO CHAIN B	11.23	14.23	13.27
802.11g	6Mbps	98.1	1	2412	SISO CHAIN A	24.61	27.61	289.07
					SISO CHAIN B	26.22	29.22	418.79
			7	2442	SISO CHAIN A	28.46	31.46	701.46
					SISO CHAIN B	28.89	31.89	**774.46**
			11	2462	SISO CHAIN A	25.07	28.07	321.37
					SISO CHAIN B	26.03	29.03	400.87
			12	2467	SISO CHAIN A	20.40	23.40	109.65
					SISO CHAIN B	20.81	23.81	122.46
			13	2472	SISO CHAIN A	5.38	8.38	**3.45**
					SISO CHAIN B	5.65	8.65	3.67
802.11n20	HT0	96.7	1	2412	SISO CHAIN A	24.66	27.66	292.42
					SISO CHAIN B	24.74	27.74	297.85
			7	2442	SISO CHAIN A	28.55	31.55	716.14
					SISO CHAIN B	28.66	31.66	**734.51**
			11	2462	SISO CHAIN A	24.21	27.21	263.63
					SISO CHAIN B	25.23	28.23	333.43
			12	2467	SISO CHAIN A	20.17	23.17	103.99
					SISO CHAIN B	20.24	23.24	105.68
			13	2472	SISO CHAIN A	5.13	8.13	**3.26**
					SISO CHAIN B	5.17	8.17	3.29
	HT8	97.4	1	2412	MIMO CHAIN A	23.01	26.01	199.99
					MIMO CHAIN B	23.78	26.78	238.78
			7	2442	MIMO CHAIN A	26.49	29.49	445.66
					MIMO CHAIN B	27.44	30.44	**554.63**
			11	2462	MIMO CHAIN A	23.59	26.59	228.56
					MIMO CHAIN B	24.37	27.37	273.53
			12	2467	MIMO CHAIN A	17.27	20.27	53.33
					MIMO CHAIN B	17.17	20.17	52.12
			13	2472	MIMO CHAIN A	2.26	5.26	1.68
					MIMO CHAIN B	2.09	5.09	**1.62**

Mode	Rate	Meas. Duty Cycle [%]	CH	Frequency [MHz]	Antenna	Peak Power [dBm] Maximum Conducted Output Power	EIRP	Peak Output Power [mW]
802.11n40	HT0	97.0	3F	2422	SISO CHAIN A	22.00	25.00	158.49
					SISO CHAIN B	24.29	27.29	268.53
			7F	2442	SISO CHAIN A	24.54	27.54	284.45
					SISO CHAIN B	24.82	27.82	**303.39**
			9F	2452	SISO CHAIN A	23.63	26.63	230.67
					SISO CHAIN B	23.50	26.50	223.87
			10F	2457	SISO CHAIN A	20.50	23.50	112.20
					SISO CHAIN B	20.69	23.69	117.22
			11F	2462	SISO CHAIN A	4.77	7.77	**3.00**
					SISO CHAIN B	4.97	7.97	3.14
	HT8	97.2	3F	2422	MIMO CHAIN A	21.14	24.14	130.02
					MIMO CHAIN B	22.63	25.63	183.23
			7F	2442	MIMO CHAIN A	23.57	26.57	227.51
					MIMO CHAIN B	24.26	27.26	**266.69**
			9F	2452	MIMO CHAIN A	21.78	24.78	150.66
					MIMO CHAIN B	21.94	24.94	156.31
			10F	2457	MIMO CHAIN A	19.09	22.09	81.10
					MIMO CHAIN B	19.65	22.65	92.26
			11F	2462	MIMO CHAIN A	2.12	5.12	**1.63**
					MIMO CHAIN B	2.48	5.48	1.77

Max Value
Min Value

MIMO modes – Combined results

Mode	Rate	Channel	Frequency (MHz)	Antenna	Combined Peak Power [dBm]	EIRP	Combined Peak Power [mW]
802.11n20	HT8	1	2412	MIMO CHAIN A + CHAIN B	26.42	29.42	438.77
		7	2437		30.00	33.00	**1000.00**
		11	2462		27.01	30.01	502.09
		12	2467		20.23	23.23	105.45
		13	2472		5.19	8.19	3.30
802.11n40	HT8	3F	2422		24.96	27.96	313.25
		7F	2437		26.94	29.94	**494.20**
		9F	2452		24.87	27.87	306.98
		10F	2457		22.39	25.39	173.35
		11F	2462		5.31	8.31	3.40

Max Value

Mode	Rate	Meas. Duty Cycle [%]	CH	Frequency [MHz]	Antenna	Average Power* [dBm]			Average Output Power [mW]
						Maximum Conducted Output Power	Maximum Conducted Output Power Duty cycle Compensated	EIRP	
802.11b	1Mbps	97.4	1	2412	SISO CHAIN A	18.15	18.26	21.26	67.03
					SISO CHAIN B	18.08	18.19	21.19	65.95
			7	2442	SISO CHAIN A	20.05	20.16	23.16	103.81
					SISO CHAIN B	19.96	20.07	23.07	101.68
			11	2462	SISO CHAIN A	18.45	18.56	21.56	71.82
					SISO CHAIN B	18.93	19.04	22.04	80.21
			12	2467	SISO CHAIN A	14.23	14.34	17.34	27.18
					SISO CHAIN B	15.16	15.27	18.27	33.67
			13	2472	SISO CHAIN A	7.60	7.71	10.71	5.91
					SISO CHAIN B	8.34	8.45	11.45	7.00
802.11g	6Mbps	98.1	1	2412	SISO CHAIN A	16.34	16.42	19.42	43.89
					SISO CHAIN B	17.89	17.97	20.97	62.71
			7	2442	SISO CHAIN A	19.92	20.00	23.00	100.08
					SISO CHAIN B	20.43	20.51	23.51	112.55
			11	2462	SISO CHAIN A	16.89	16.97	19.97	49.81
					SISO CHAIN B	17.67	17.75	20.75	59.61
			12	2467	SISO CHAIN A	12.11	12.19	15.19	16.57
					SISO CHAIN B	12.53	12.61	15.61	18.25
			13	2472	SISO CHAIN A	-3.08	-3.00	0.00	0.50
					SISO CHAIN B	-2.79	-2.71	0.29	0.54
802.11n20	HT0	96.7	1	2412	SISO CHAIN A	16.45	16.59	19.59	45.65
					SISO CHAIN B	16.53	16.67	19.67	46.50
			7	2442	SISO CHAIN A	20.00	20.14	23.14	103.38
					SISO CHAIN B	20.19	20.33	23.33	108.01
			11	2462	SISO CHAIN A	15.85	15.99	18.99	39.76
					SISO CHAIN B	16.79	16.93	19.93	49.37
			12	2467	SISO CHAIN A	11.82	11.96	14.96	15.72
					SISO CHAIN B	11.92	12.06	15.06	16.09
			13	2472	SISO CHAIN A	-3.36	-3.22	-0.22	0.48
					SISO CHAIN B	-3.15	-3.01	-0.01	0.50
	HT8	97.4	1	2412	MIMO CHAIN A	14.72	14.84	17.84	30.45
					MIMO CHAIN B	14.92	15.04	18.04	31.95
			7	2442	MIMO CHAIN A	18.04	18.16	21.16	65.39
					MIMO CHAIN B	18.82	18.94	21.94	78.42
			11	2462	MIMO CHAIN A	15.25	15.37	18.37	34.40
					MIMO CHAIN B	15.57	15.69	18.69	37.11
			12	2467	MIMO CHAIN A	8.83	8.95	11.95	7.84
					MIMO CHAIN B	8.20	8.32	11.32	6.80
			13	2472	MIMO CHAIN A	-6.43	-6.31	-3.31	0.23
					MIMO CHAIN B	-6.84	-6.72	-3.72	0.21

Mode	Rate	Meas. Duty Cycle [%]	CH	Frequency [MHz]	Antenna	Average Power* [dBm]			Average Output Power [mW]
						Maximum Conducted Output Power	Maximum Conducted Output Power Duty cycle Compensated	EIRP	
802.11n40	HT0	97	3F	2422	SISO CHAIN A	12.98	13.11	16.11	20.48
					SISO CHAIN B	15.42	15.6	18.55	35.92
			7F	2442	SISO CHAIN A	15.70	15.83	18.83	38.31
					SISO CHAIN B	16.06	16.19	19.19	41.62
			9F	2452	SISO CHAIN A	14.88	15.01	18.01	31.72
					SISO CHAIN B	14.83	14.96	17.96	31.36
			10F	2457	SISO CHAIN A	11.52	11.65	14.65	14.63
					SISO CHAIN B	11.96	12.09	15.09	16.19
			11F	2462	SISO CHAIN A	-4.37	-4.24	-1.24	0.38
					SISO CHAIN B	-3.88	-3.75	-0.77	0.42
	HT8	97.2	3F	2422	MIMO CHAIN A	12.31	12.43	15.43	19.02
					MIMO CHAIN B	13.39	13.51	16.51	19.02
			7F	2442	MIMO CHAIN A	14.82	14.94	17.94	21.11
					MIMO CHAIN B	15.12	15.24	18.24	21.11
			9F	2452	MIMO CHAIN A	13.00	13.12	16.12	19.16
					MIMO CHAIN B	13.06	13.18	16.18	19.16
			10F	2457	MIMO CHAIN A	10.35	10.47	13.47	16.76
					MIMO CHAIN B	10.88	11.00	14.00	16.76
			11F	2462	MIMO CHAIN A	-6.66	-6.54	-3.54	-0.43
					MIMO CHAIN B	-6.47	-6.35	-3.35	-0.43

MIMO modes – Combined results

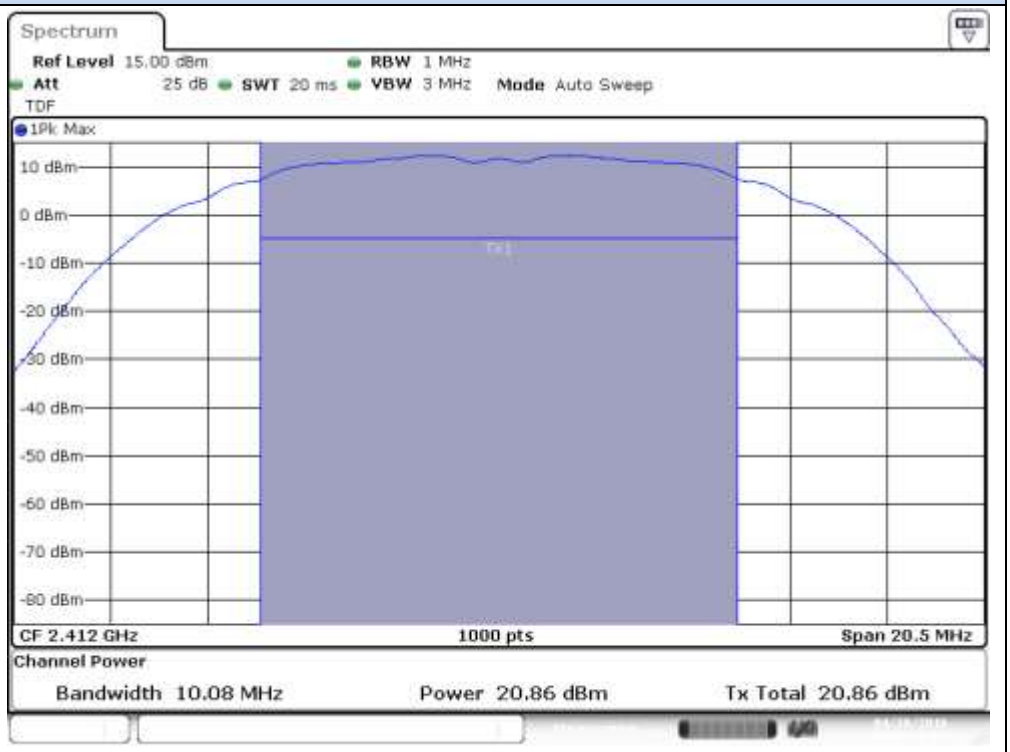
Mode	Rate	Channel	Frequency (MHz)	Antenna	Combined, Duty Cycle compensated RMS	EIRP	Combined RMS Power [mW]
802.11n20	HT8	1	2412	MIMO CHAIN A + CHAIN B	17.95	20.95	62.33
		7	2437		21.57	24.57	143.65
		11	2462		18.54	21.54	71.42
		12	2467		11.65	14.65	14.63
		13	2472		-3.50	-0.50	0.45
802.11n40	HT8	3F	2422		16.02	19.02	39.98
		7F	2437		18.11	21.11	64.67
		9F	2452		16.16	19.16	41.35
		10F	2457		13.76	16.76	23.76
		11F	2462		-3.43	-0.43	0.45

* Output Power Average values are shown for indicative purpose only

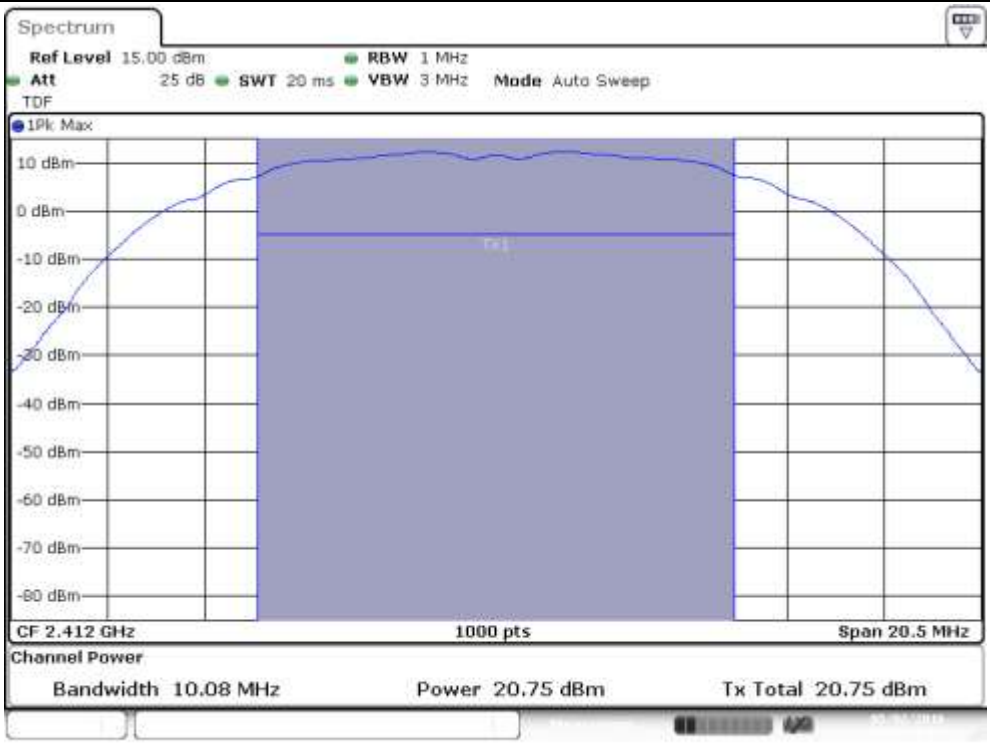
Results screenshot

802.11b, 1Mbps

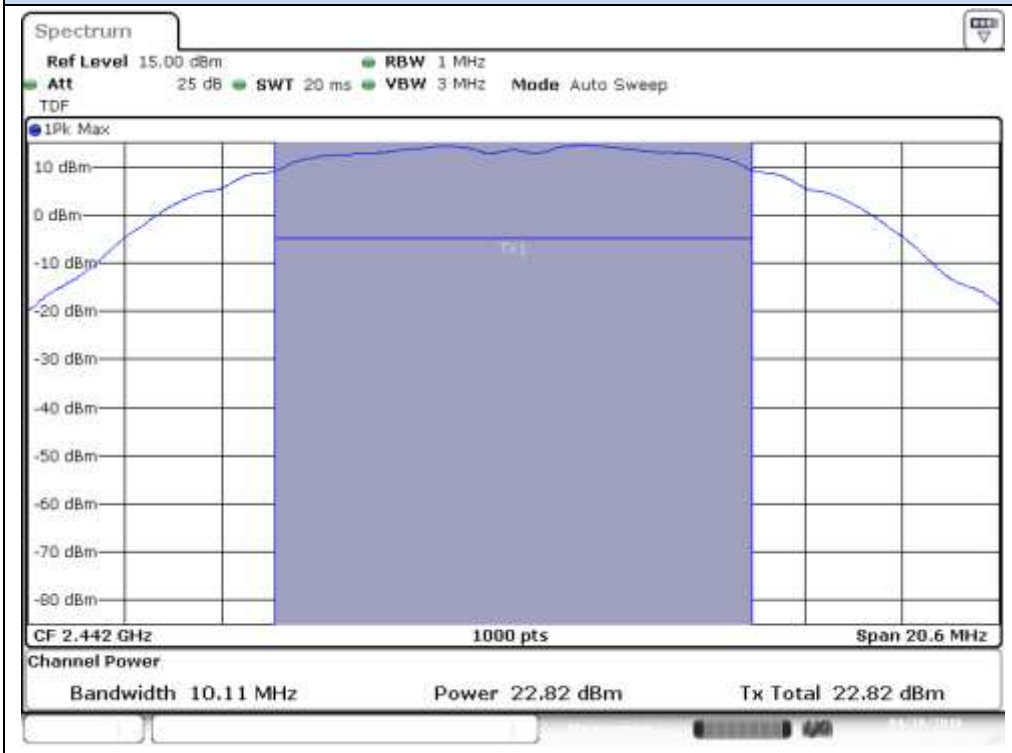
Max Peak Power, Chain A - CH1



Max Peak Power, Chain B – CH1



Max Peak Power, Chain A – CH7



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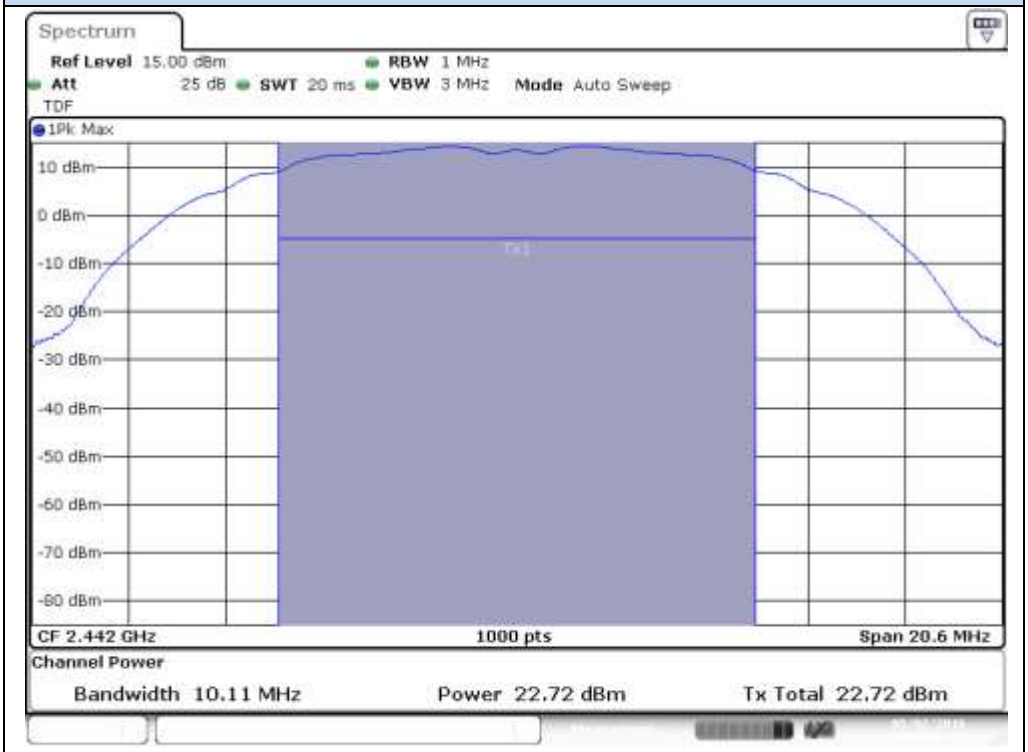
Max Peak Power, Chain B – CH7



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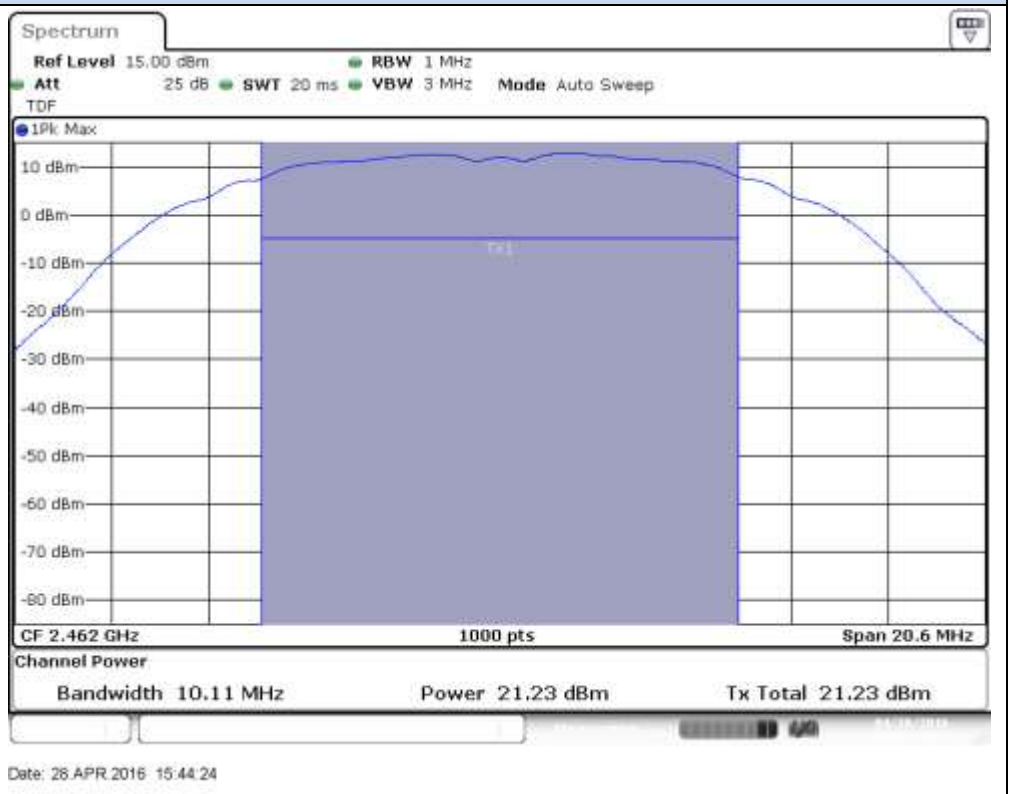
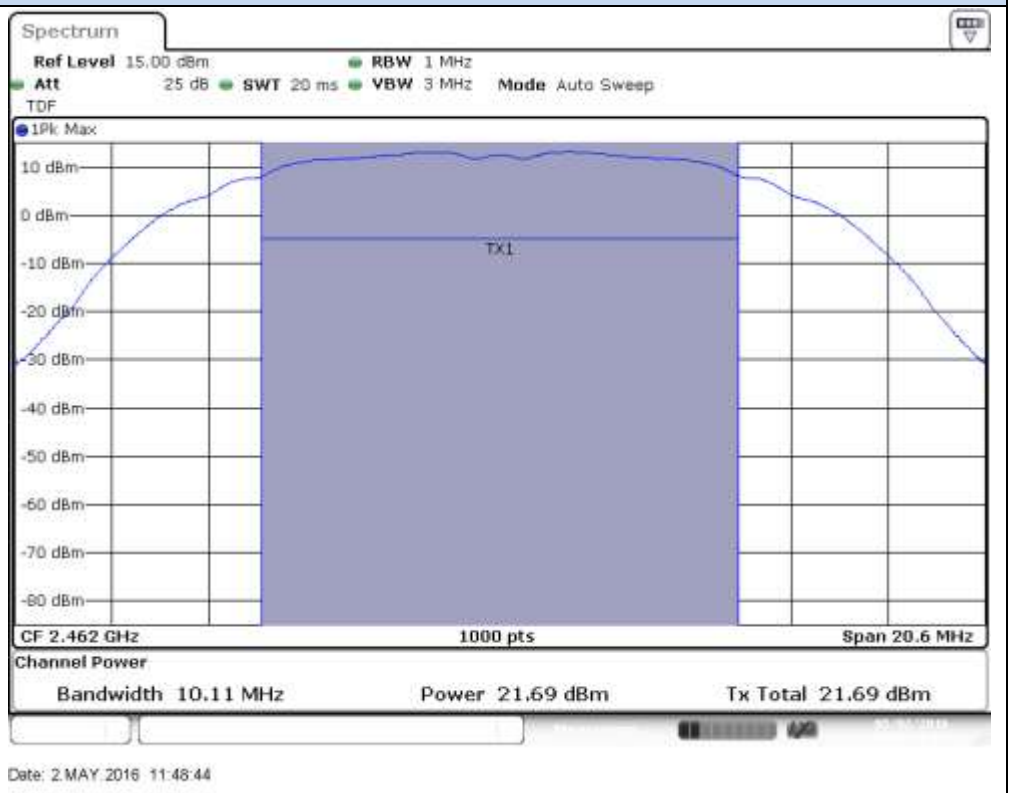
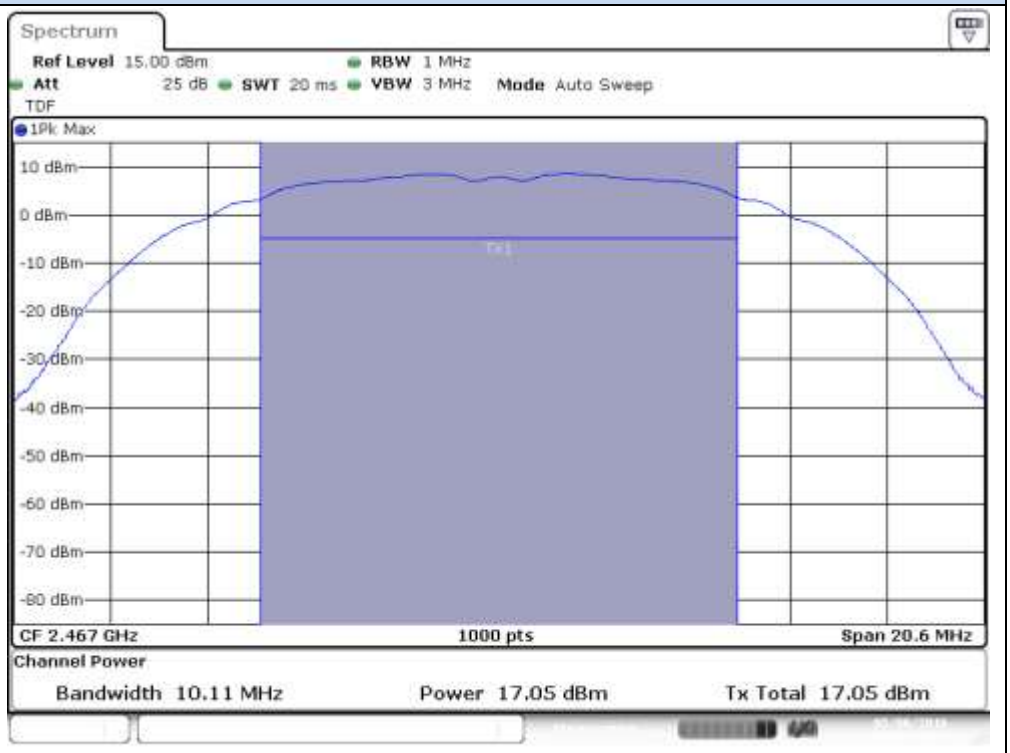
Max Peak Power, Chain A – CH11



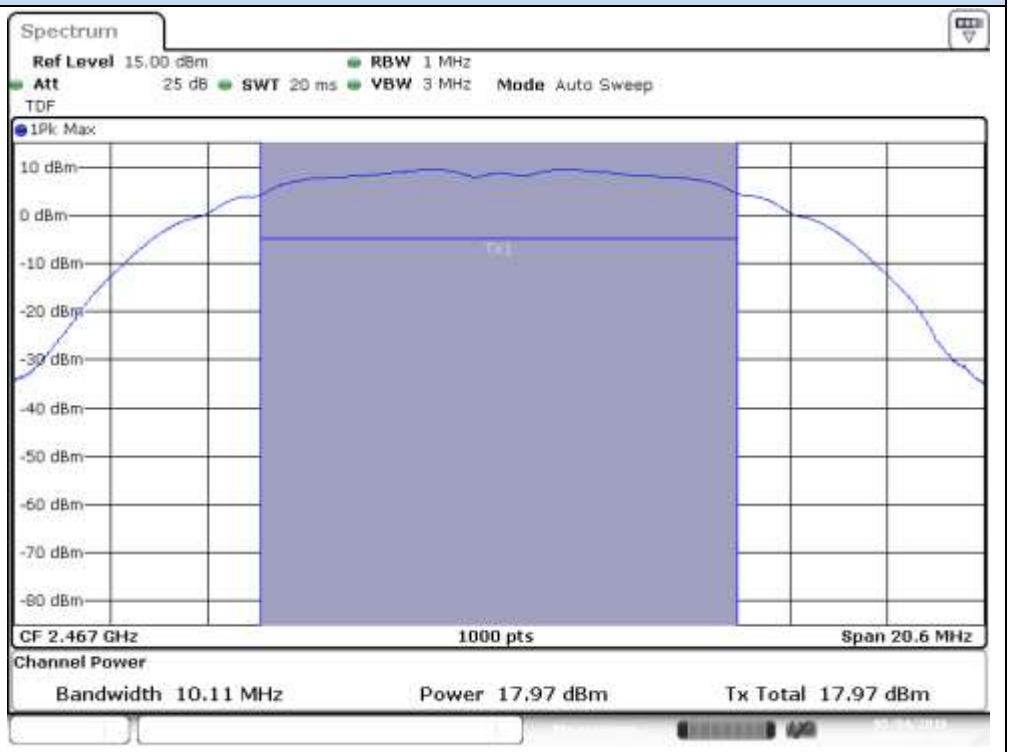
Max Peak Power, Chain B – CH11



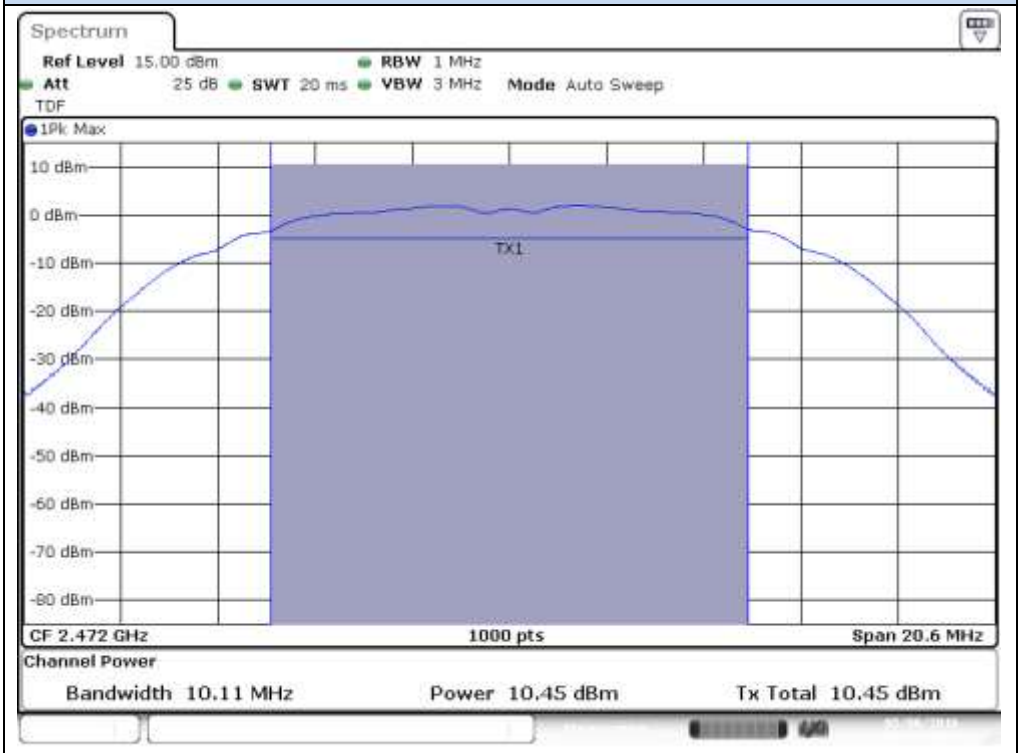
Max Peak Power, Chain A – CH12



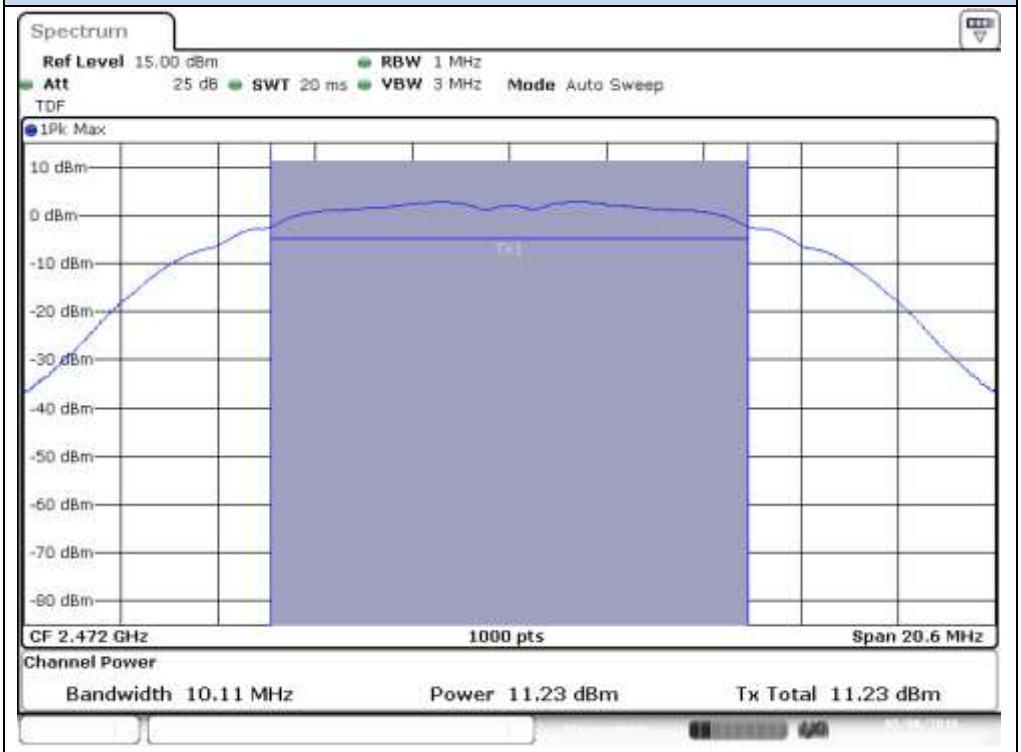
Max Peak Power, Chain B – CH12



Max Peak Power, Chain A – CH13

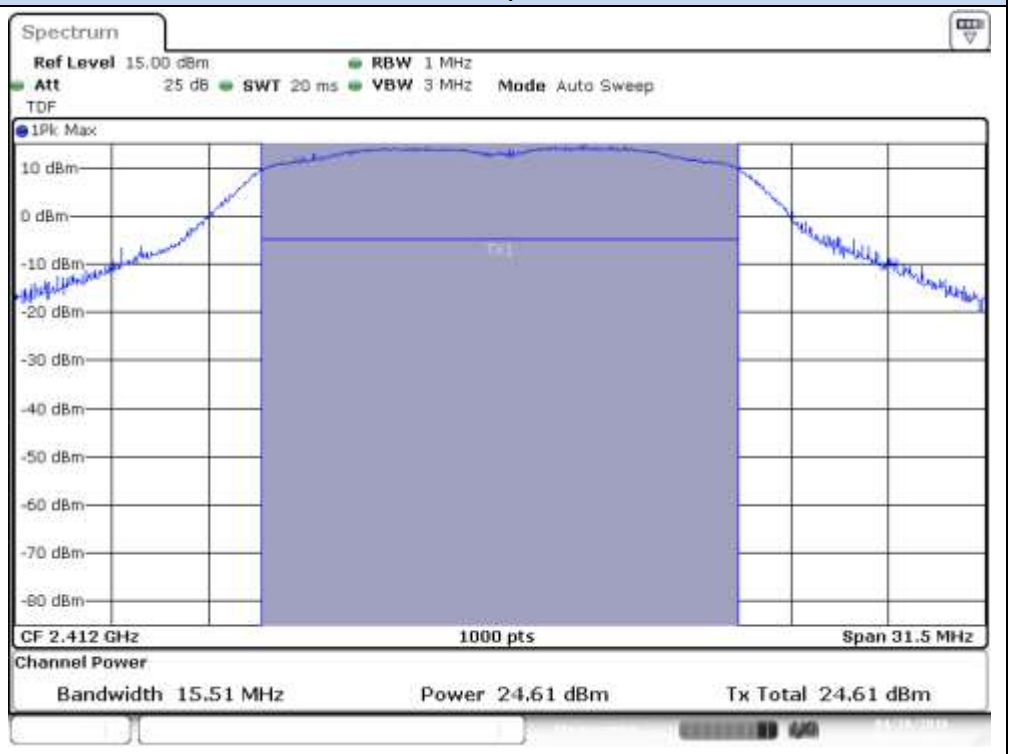


Max Peak Power, Chain B – CH13

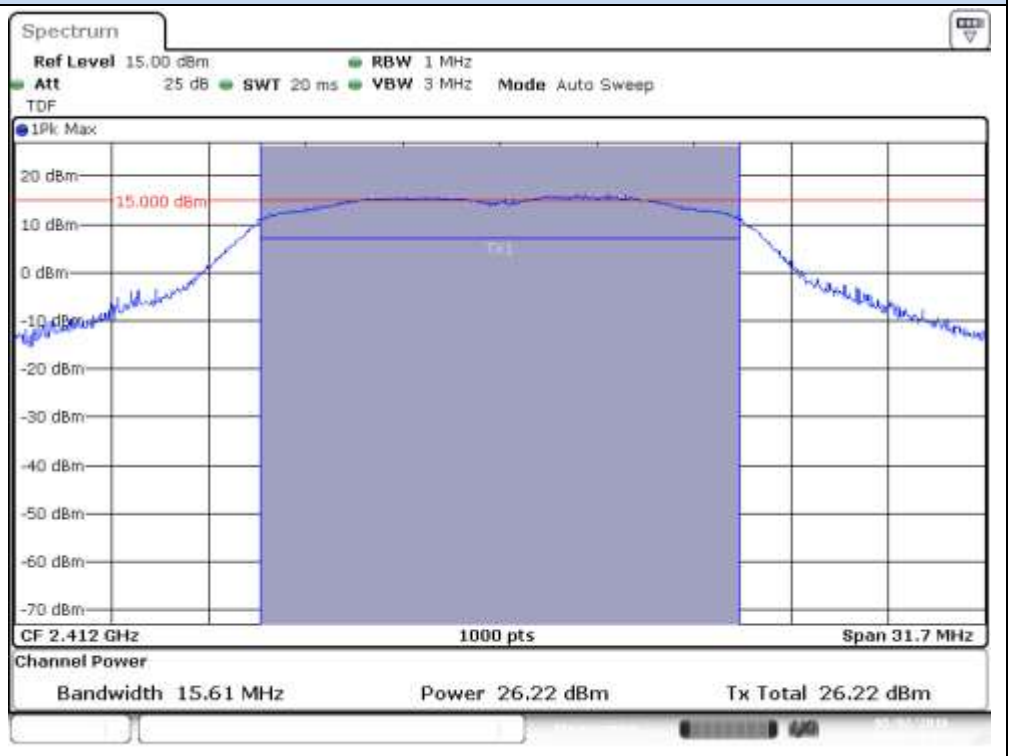


802.11g, 6Mbps

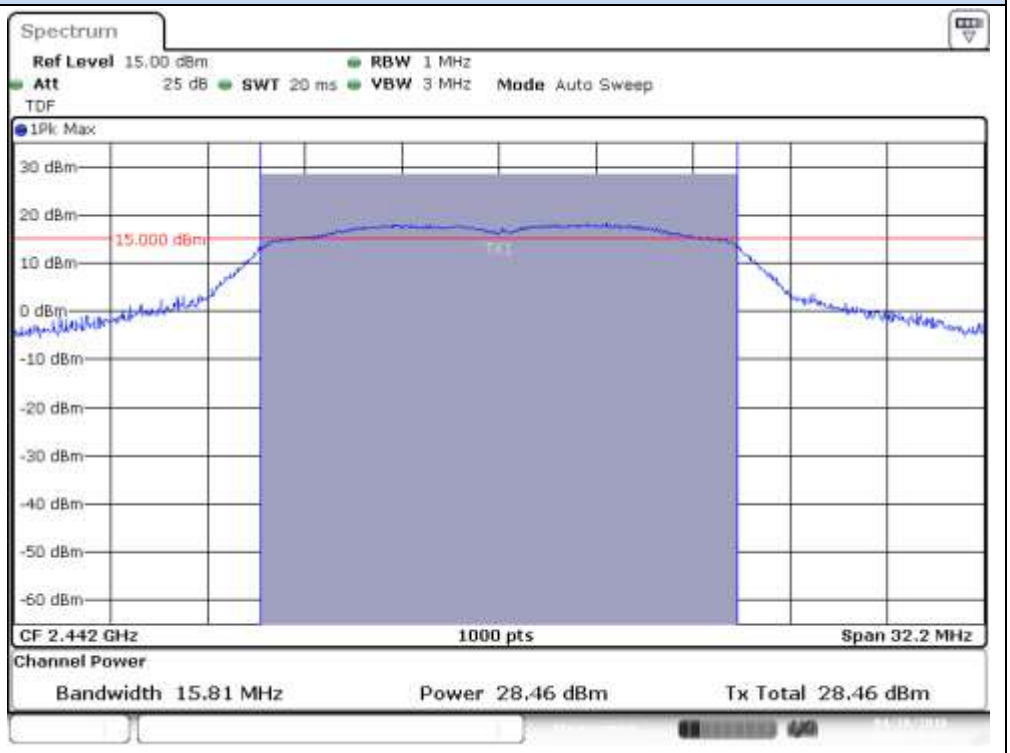
Max Peak Power, Chain A - CH1



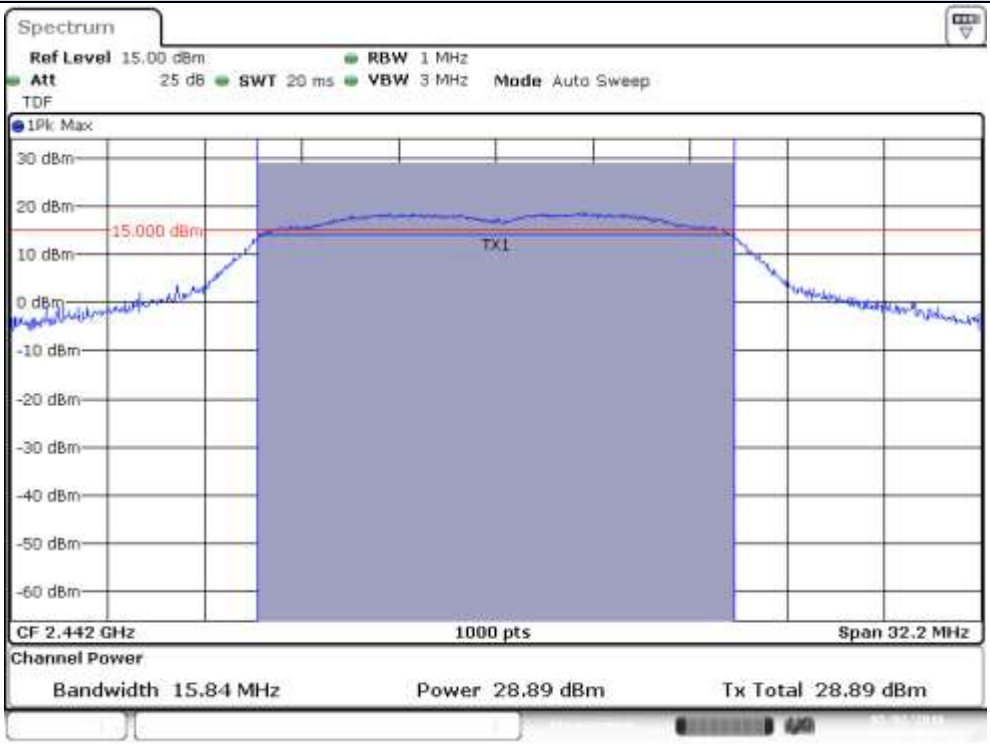
Max Peak Power, Chain B – CH1



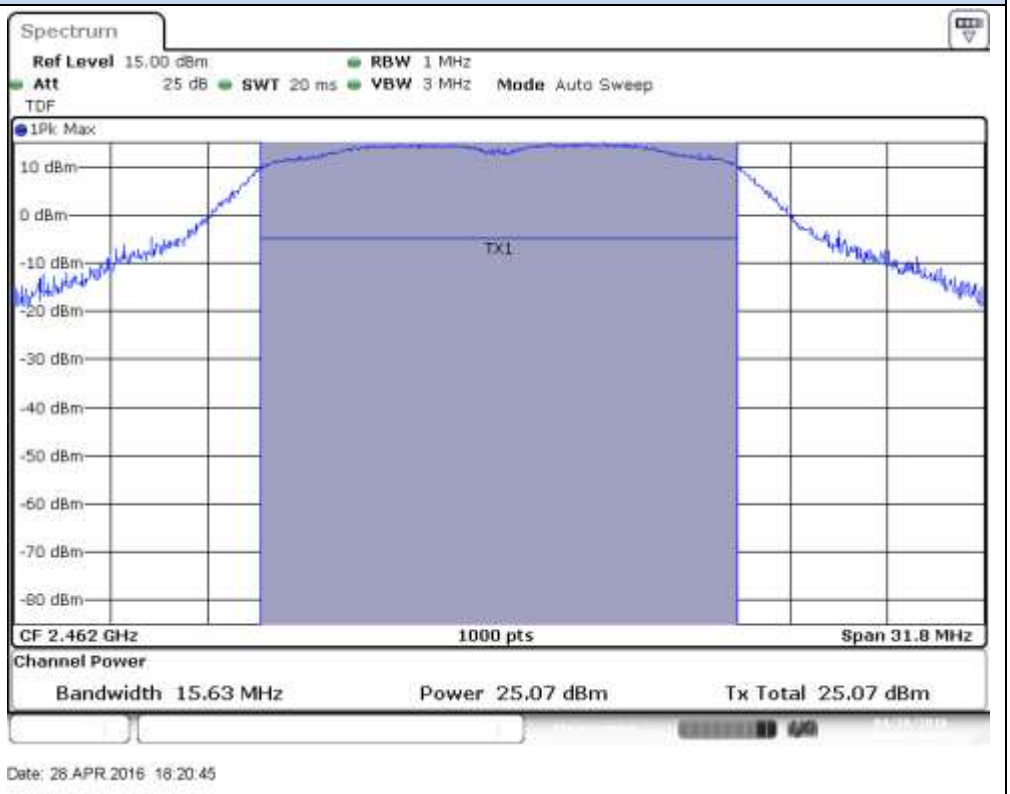
Max Peak Power, Chain A – CH7



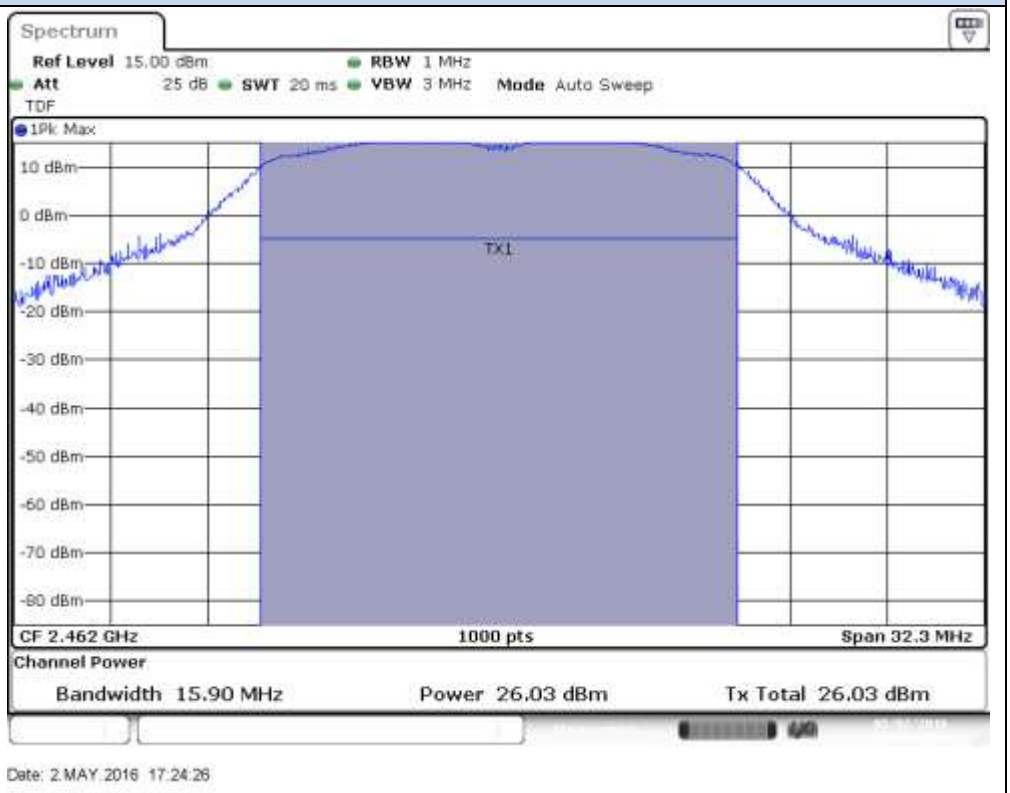
Max Peak Power, Chain B – CH7



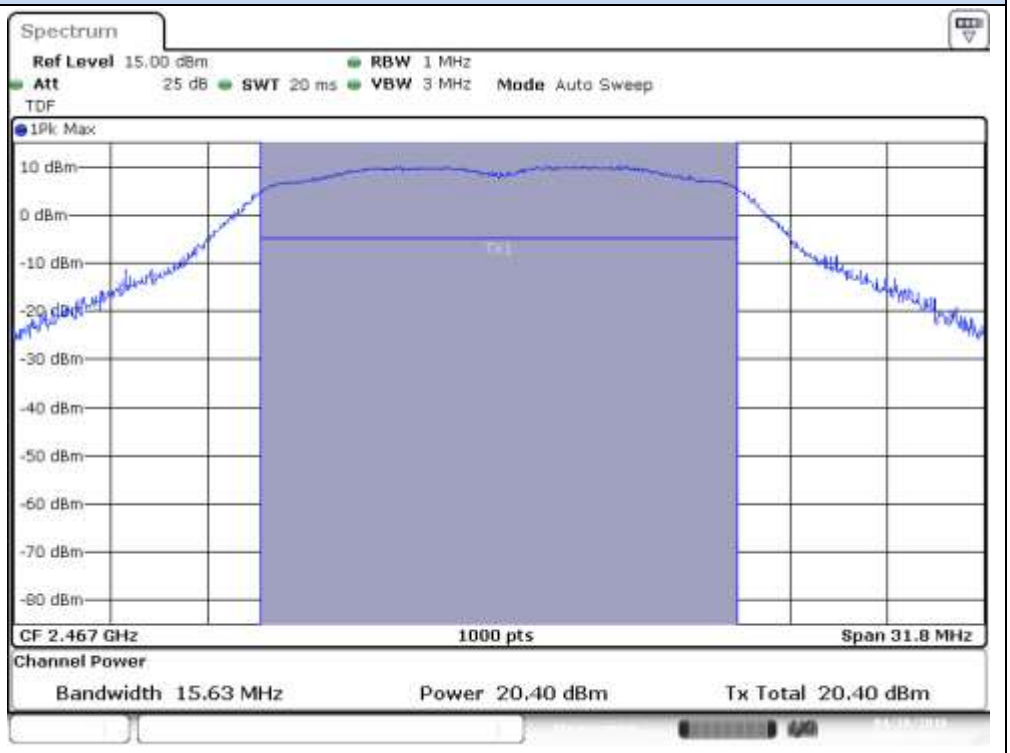
Max Peak Power, Chain A – CH11



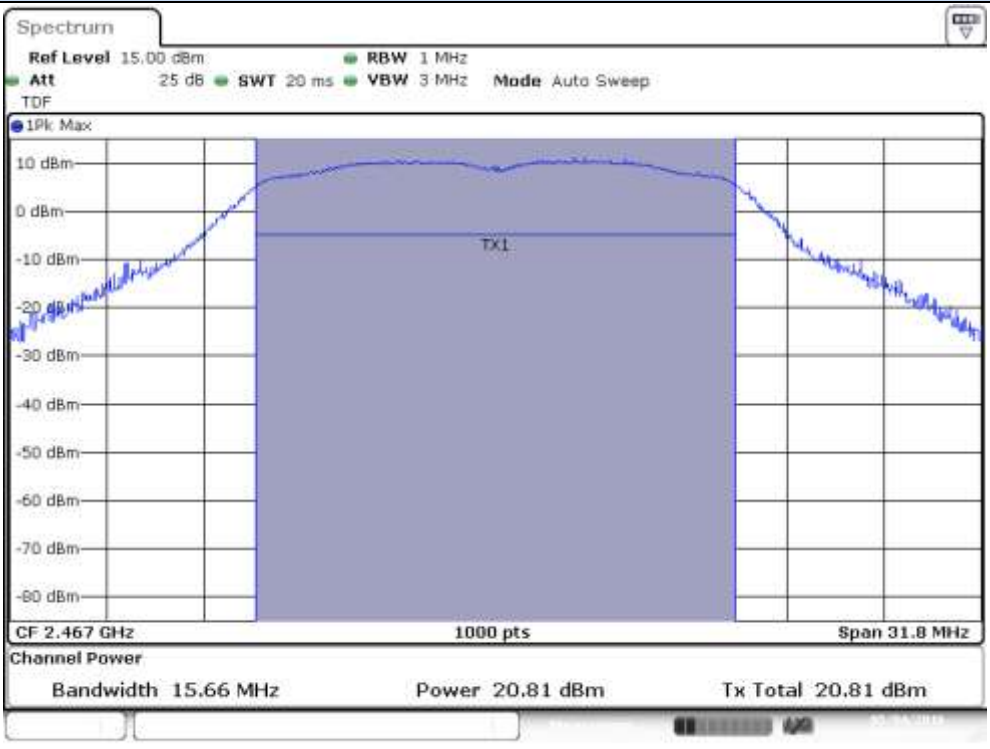
Max Peak Power, Chain B – CH11



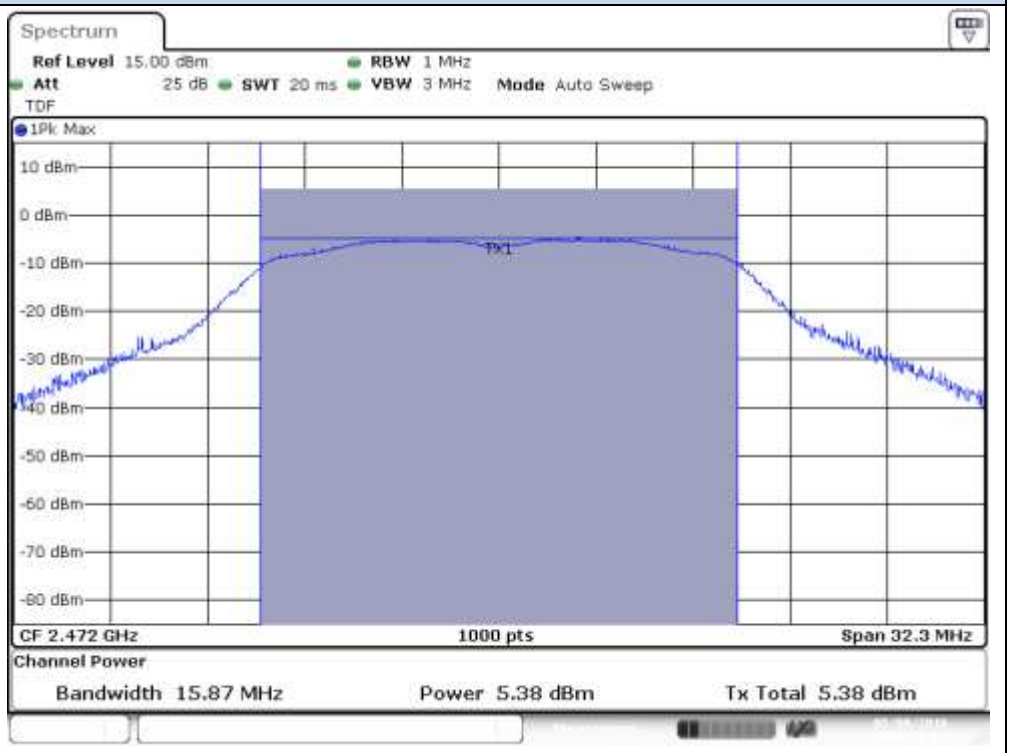
Max Peak Power, Chain A – CH12



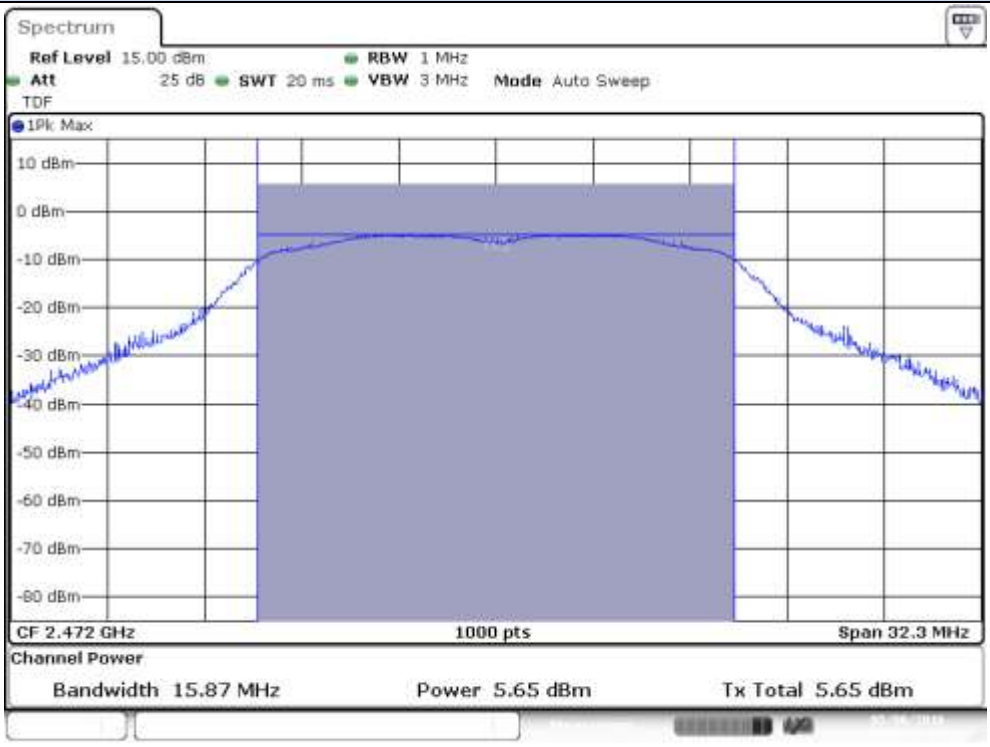
Max Peak Power, Chain B – CH12



Max Peak Power, Chain A – CH13

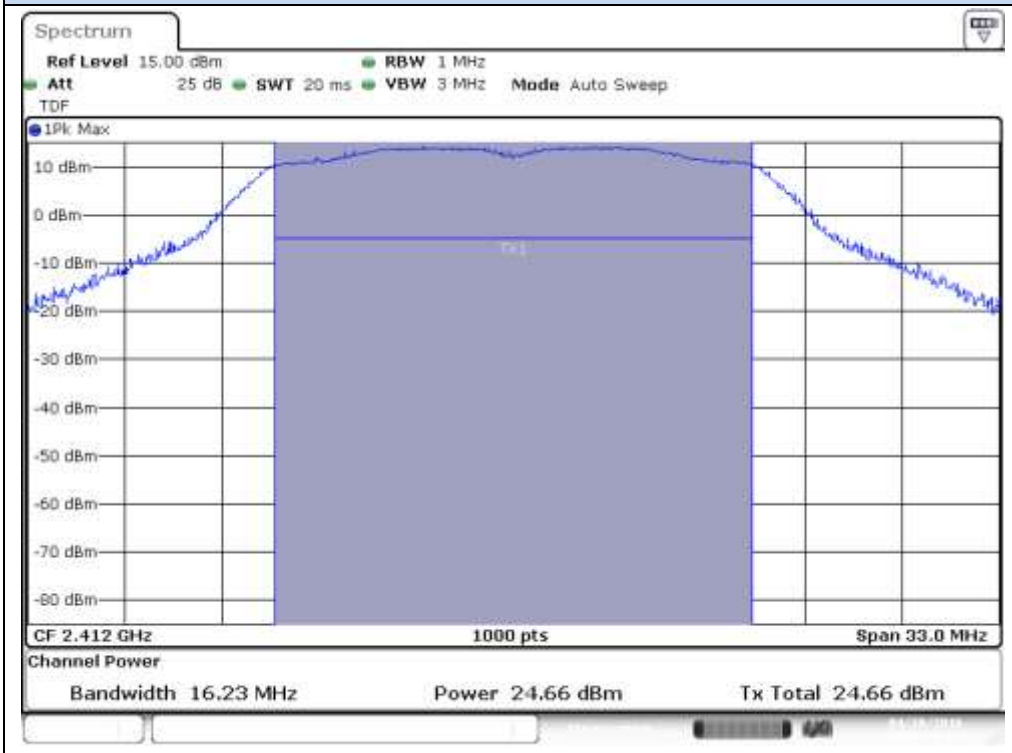


Max Peak Power, Chain B – CH13



802.11n20 (SISO), HT0

Max Peak Power, Chain A - CH1



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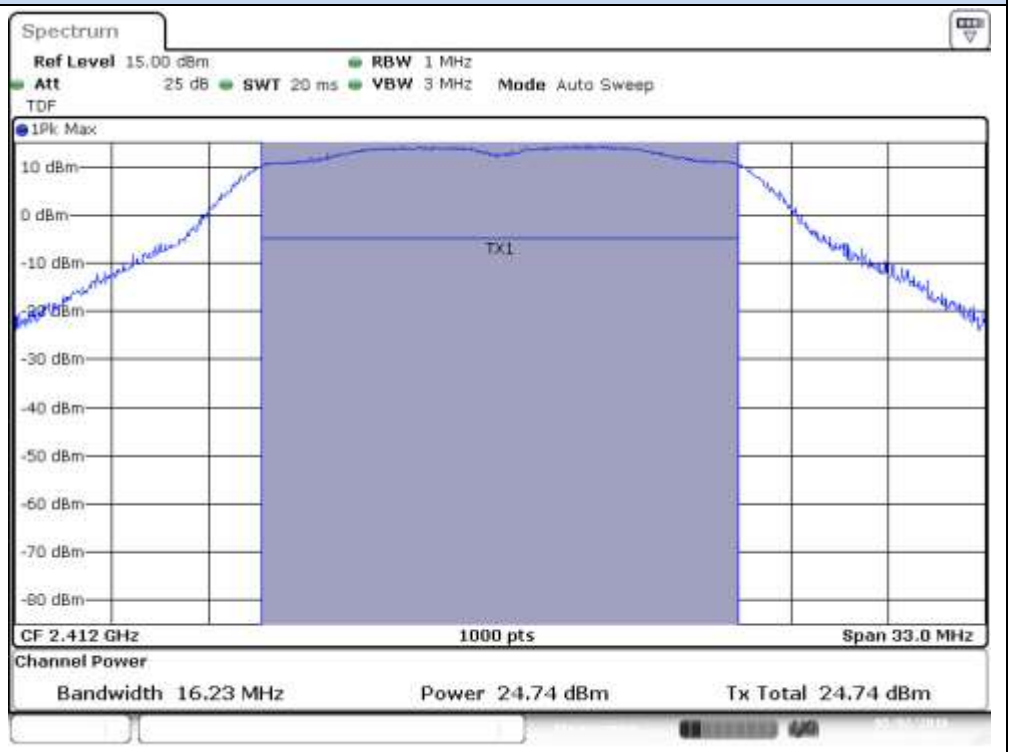
Max Peak Power, Chain B – CH1



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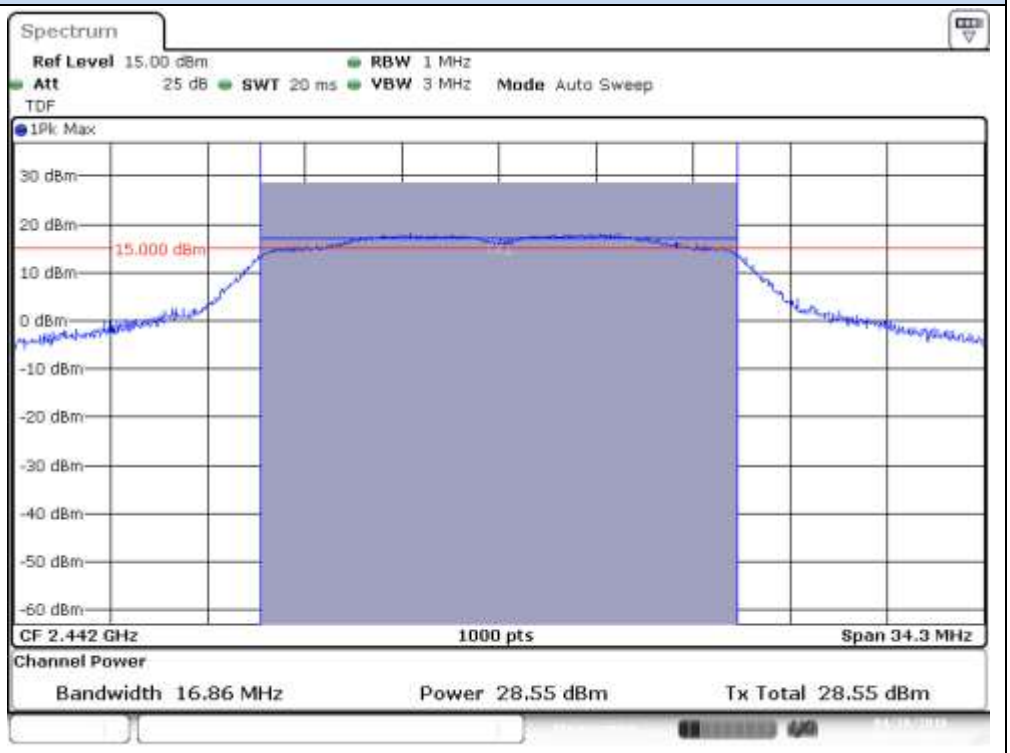
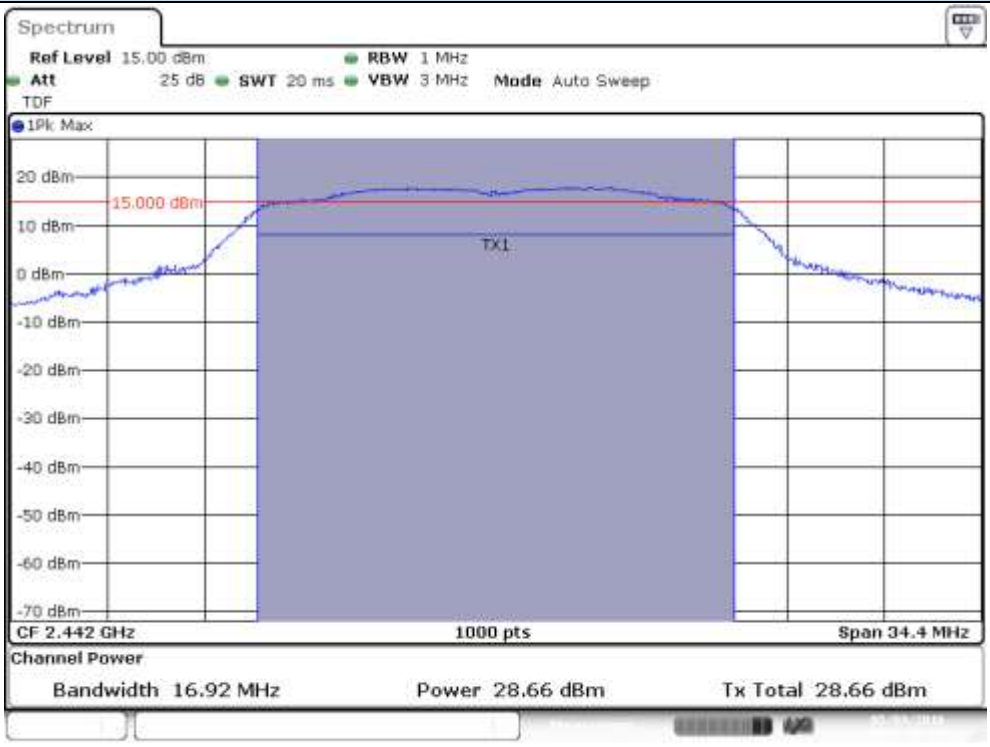
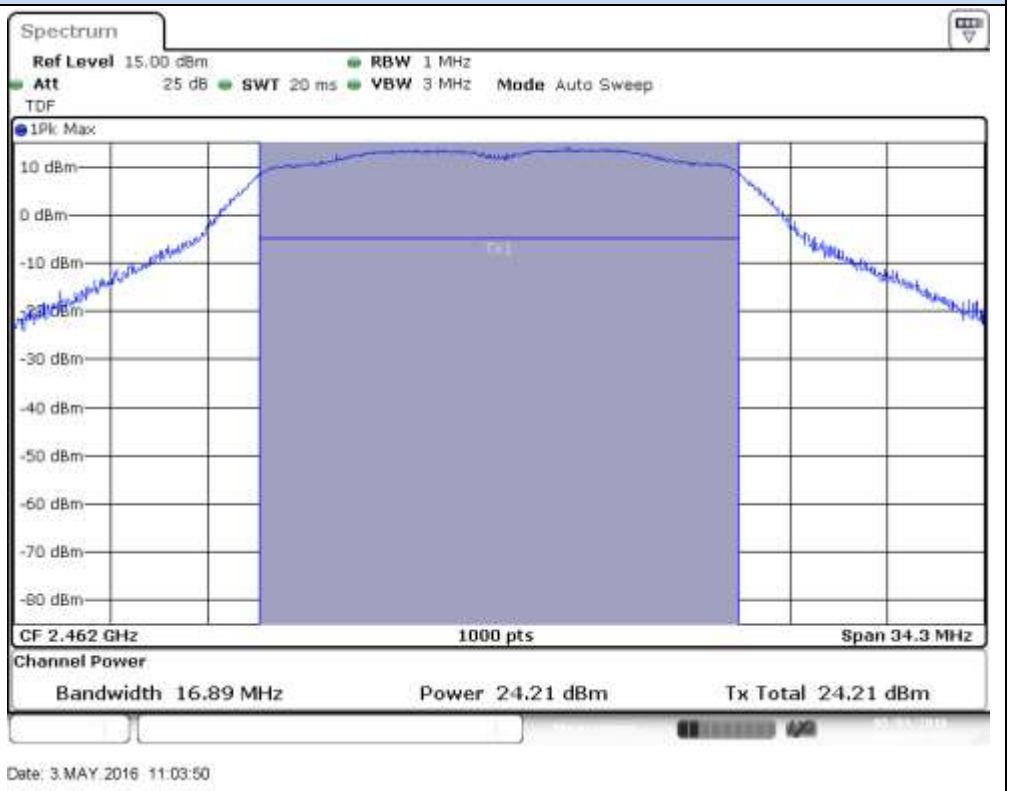
Max Peak Power, Chain A – CH7



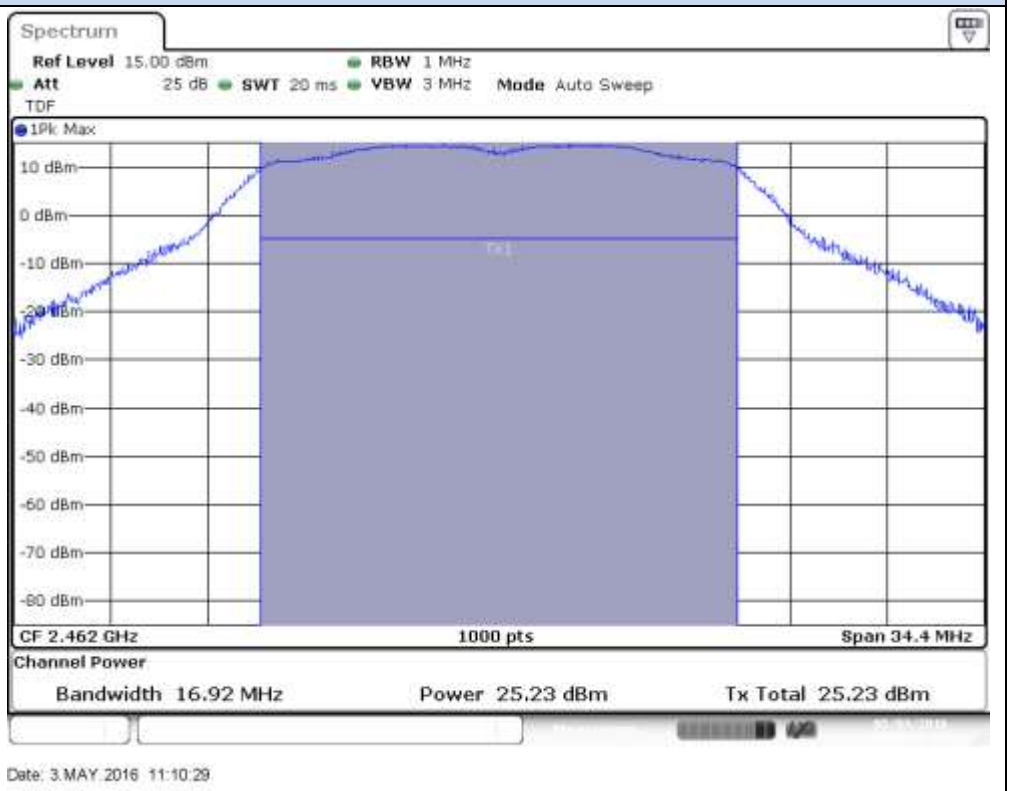
Max Peak Power, Chain B – CH7



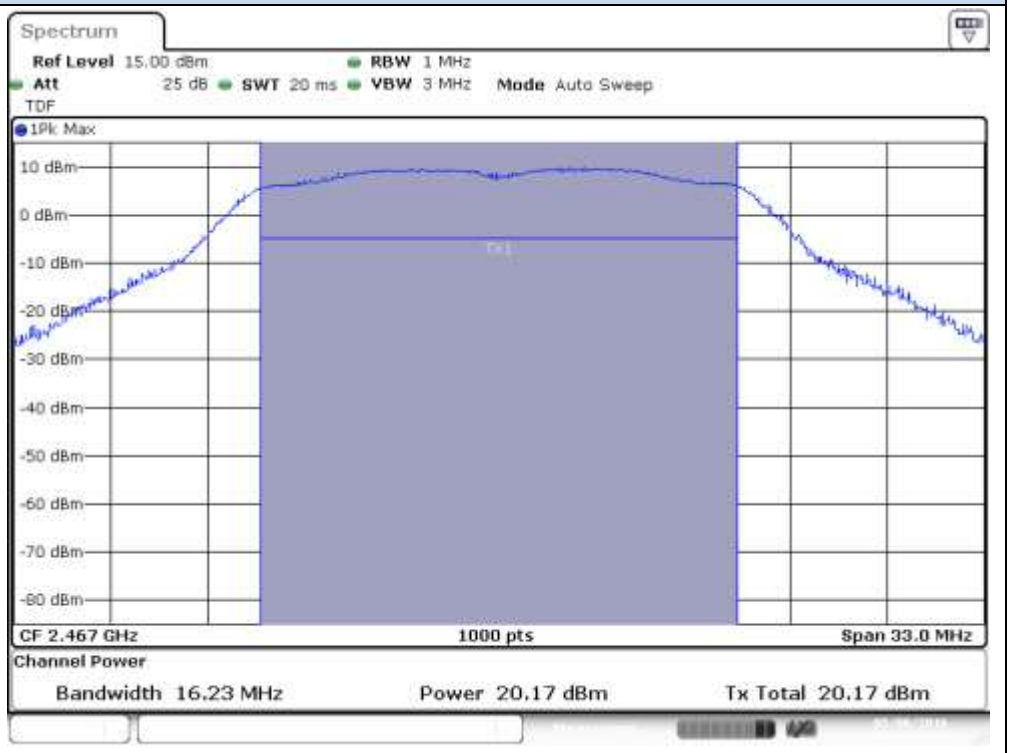
Max Peak Power, Chain A – CH11



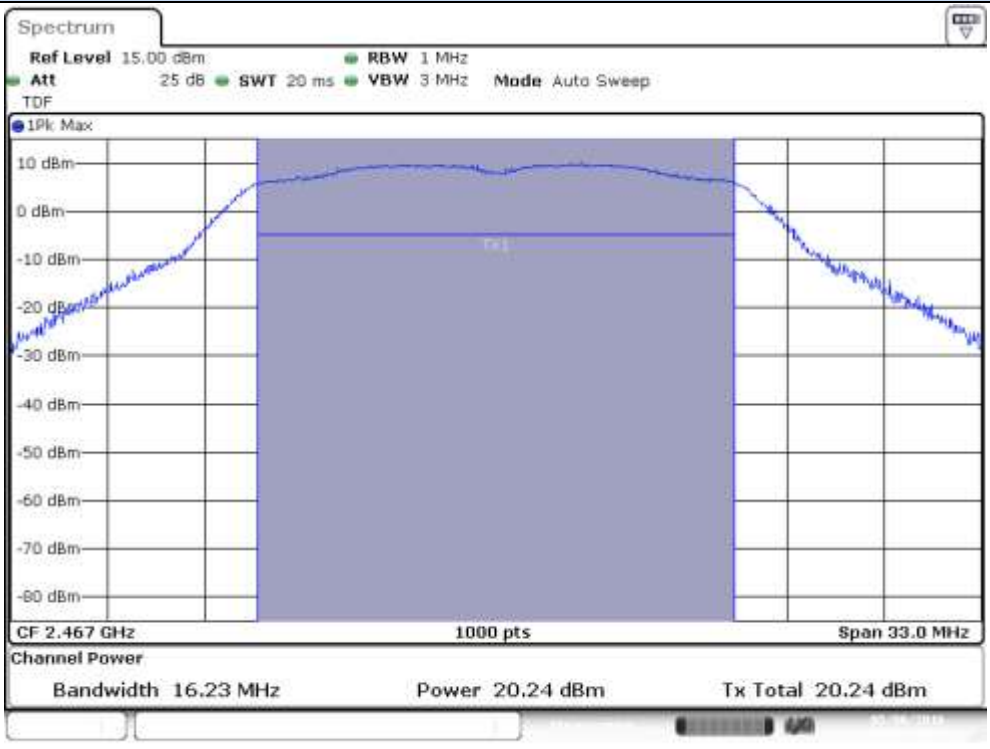
Max Peak Power, Chain B – CH11



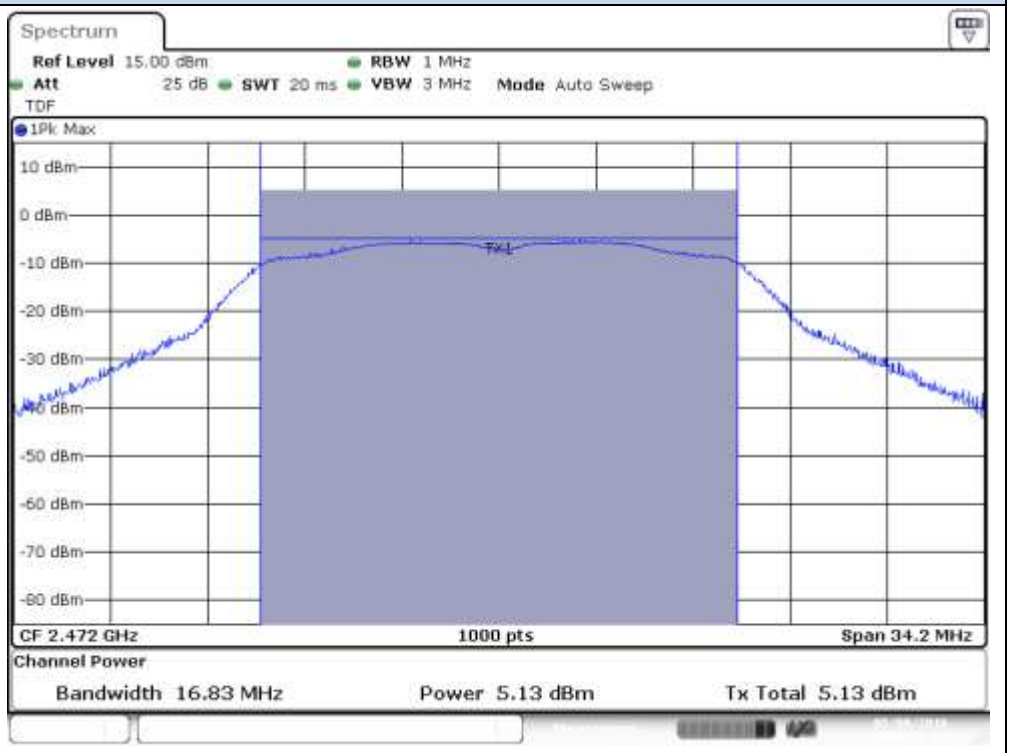
Max Peak Power, Chain A – CH12



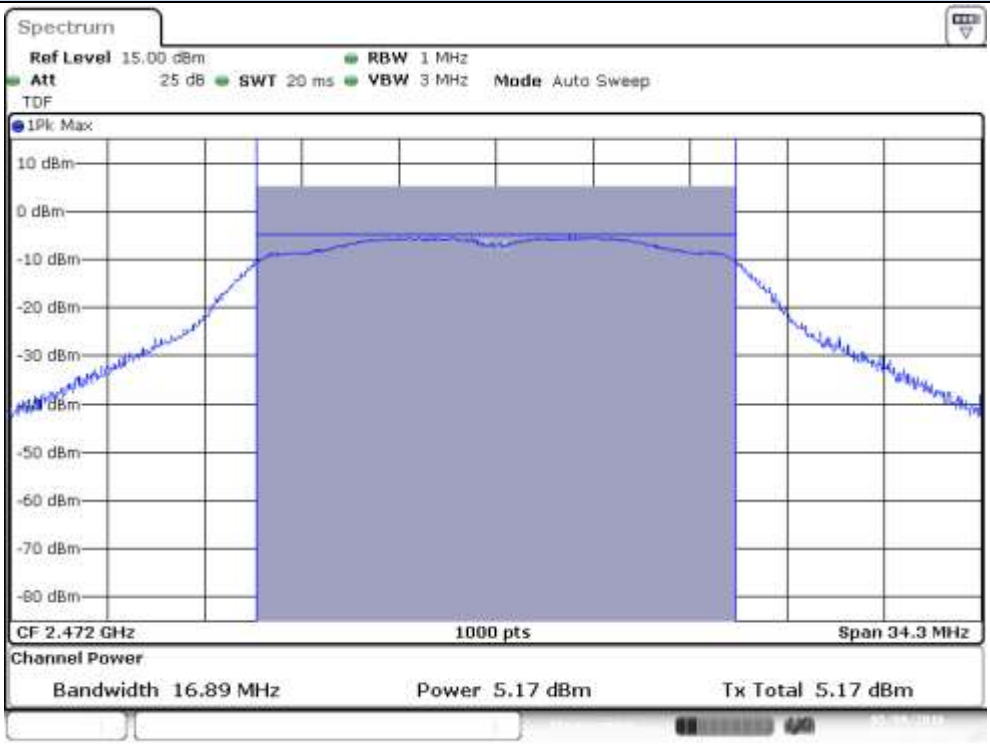
Max Peak Power, Chain B – CH12



Max Peak Power, Chain A – CH13

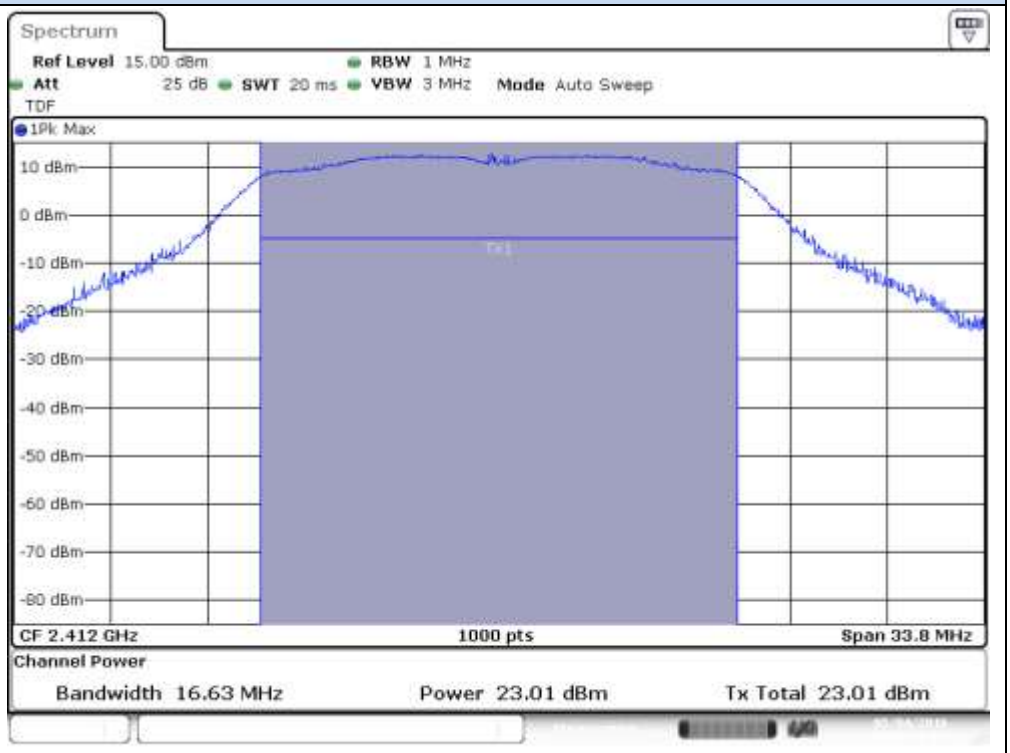


Max Peak Power, Chain B – CH13



802.11n20 (MIMO), HT8

Max Peak Power, Chain A - CH1



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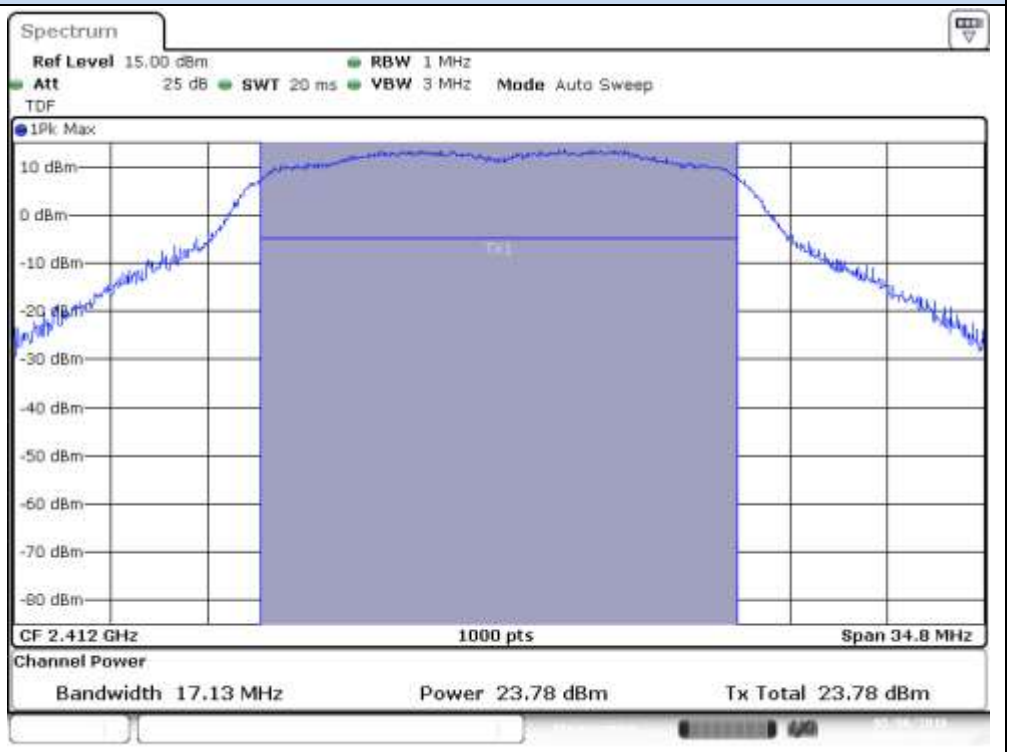
Max Peak Power, Chain B – CH1



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