

# TEST REPORT

EUT Description	WLAN and BT, 2x2 PCIe M.2 1216 SD adapter card, LTE Coexistence
Brand Name	Intel® Wi-Fi 6 AX201
Model Name	AX201D2WL
FCC ID	PD9AX201D2L
ISED ID	1000M-AX201D2L
Date of Test Start/End	2018-10-04 /2018-11-15
Features	802.11ax, Dual Band, 2x2 Wi-Fi + Bluetooth® 5 (see section 5)

Applicant	Intel Mobile Communications
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Reference Standards	FCC CFR Title 47 Part 15 C RSS-247 issue 2, RSS-Gen issue 5 (see section 1)
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Test Report identification	180717-04.TR04
Revision Control	Rev. 00 This test report revision replaces any previous test report revision (see section 8)

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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## 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. ANSI C63.10-2013 – American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.
4. FCC OET KDB 558074 D01 15.247 DTS Meas Guidance v05 – Guidance for Compliance Measurements on Digital Transmission Systems, frequency hopping spread spectrum system, and hybrid system devices operating under section §15.247 of the FCC rules.
5. FCC OET KDB 662911 D01 Multiple Transmitter Output v02r01.
6. RSS-247 Issue 2 – Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
7. RSS-Gen Issue 5 – General Requirements for Compliance of Radio Apparatus.

## 2. General conditions, competences and guarantees

- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is an ISO/IEC 17025:2005 testing laboratory accredited by the American Association for Laboratory Accreditation (A2LA) with the certificate number 3478.01.
- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is an Accredited Test Firm recognized by the FCC, with Designation Number FR0011.
- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is a Registered Test Site listed by ISED, with ISED 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.

## 3. Environmental Conditions

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

Temperature	23 °C ±2 °C
Humidity	58 % ± 10 %

## 4. Test samples

Sample	Control #	Description	Model	Serial #	Date of receipt	Note
#1	180717-04.S06	RF MODULE	AX201D2WL	WFM : 3413E8CA8DC0	2018-10-02	Used for conducted tests
	180522-02.S03	EXTENDER	PCB00651_01	6510818-190	2018-05-31	
	180000-01.S01	ADAPTER	JFP ADAPTER M2	-	2017-08-09	
	170000-01.S04	LAPTOP	LATITUDE E5470	DMRKMC2	2017-05-10	
#2	180717-04.S07	RF MODULE	AX201D2WL	WFM : 3413E8CA8E92	2018-10-02	Radiated Spurious emission from 30 MHz to 6.4 GHz for DTS and from 30MHz to 1 GHz for BLE tests
	180326-01.S03	EXTENDER	PCB00651_01	6510818-198	2018-03-27	
	180000-01.S02	ADAPTER	JFP ADAPTER M2	-	2017-08-09	
	170209-01.S16	LAPTOP	LATITUDE E7470	C1HTPF2	2017-02-09	
#3	180717-04.S08	RF MODULE	AX201D2WL	WFM:3413E8CA8DFC	2018-10-02	Radiated Spurious emission from 6.4 GHz to 26.5 GHz for DTS and from 1 to 26.5GHz for BLE tests
	180717-03.S18	EXTENDER	PCB00651_01	6510817-133	2018-08-21	
	180000-01.S06	ADAPTER	JFP ADAPTER M2	-	2018-08-20	
	170801-01.S10	LAPTOP	LATITUDE E7470	7KNOXF2	2017-09-07	

## 5. EUT Features

Brand Name	Intel® Wi-Fi 6 AX201
Model Name	AX201D2WL
FCC ID	PD9AX201D2L
ISED ID	1000M-AX201D2L
Software Version	OEM DRTU_08048_11_1832_0G
Driver Version	99.0.39.1 (V010.19)
Prototype / Production	Production
Supported Radios	802.11b/g/n/ax 2.4GHz (2400.0 – 2483.5 MHz) 802.11a/n/ac/ax 5.2GHz (5150.0 – 5350.0 MHz) 5.6GHz (5470.0 – 5725.0 MHz) 5.8GHz (5725.0 – 5850.0 MHz) Bluetooth 5 2.4GHz (2400.0 – 2483.5 MHz)
Antenna Information	CHAIN A: PIFA antenna. WiFi 2.4GHz & 5GHz and BT CHAIN B: PIFA antenna. WiFi 2.4GHz & 5GHz
Additional Information	

## 6. Remarks and comments

N/A

## 7. Test Verdicts summary

### 7.1. 802.11 b/g/n/ax 2.4GHz

FCC part	RSS part	Test name	Verdict
15.247 (a) (2)	RSS-247 Clause 5.2 (a)	6dB Bandwidth	P
15.247 (b) (3)	RSS-247 Clause 5.4 (d)	Maximum output power and E.I.R.P	P
15.247 (e)	RSS-247 Clause 5.2 (b)	Power spectral density	P
15.247 (d) 15.209	RSS-247 Clause 5.5 RSS-Gen Clause 8.9	Out-of-band Emission (conducted)	P
15.247 (d) 15.209	RSS-247 Clause 5.5 RSS-Gen Clause 8.9	Out-of-band Emission (radiated)	P

### 7.2. BLE

FCC part	RSS part	Test name	Verdict
15.247 (a) (2)	RSS-247 Clause 5.2 (a)	6dB Bandwidth	P
15.247 (b) (3)	RSS-247 Clause 5.4 (d)	Maximum output power and E.I.R.P.	P
15.247 (e)	RSS-247 Clause 5.2 (b)	Power spectral density	P
15.247 (d) 15.209	RSS-247 Clause 5.5 RSS-Gen Clause 8.9	Out-of-band Emissions (conducted)	P
15.247 (d) 15.209	RSS-247 Clause 5.5 RSS-Gen Clause 8.9	Out-of-band Emissions (radiated)	P

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

## 8. Document Revision History

Revision #	Date	Modified by	Revision Details
Rev. 00	2018-11-16	T.Andriamiharivolamena G. Roustan	First Issue

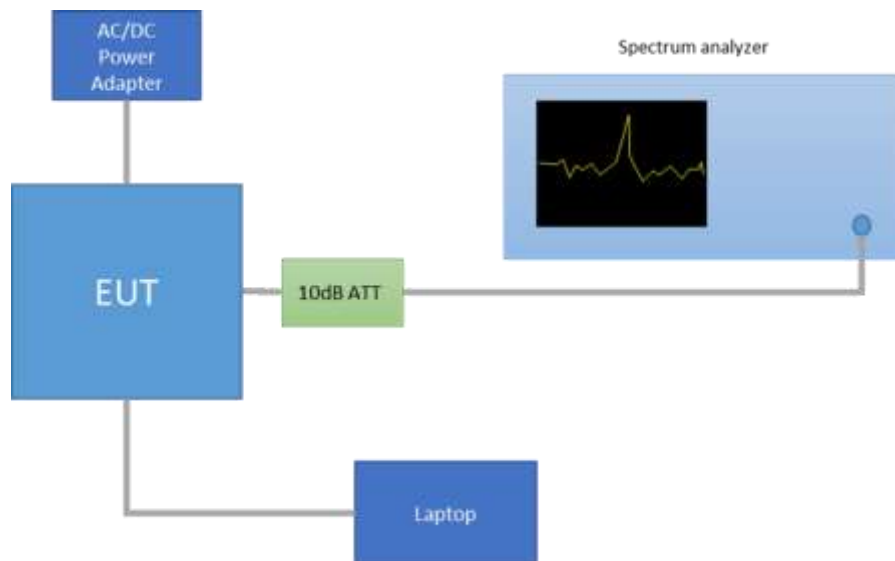
# Annex A. Test & System Description

## A.1 Measurement System

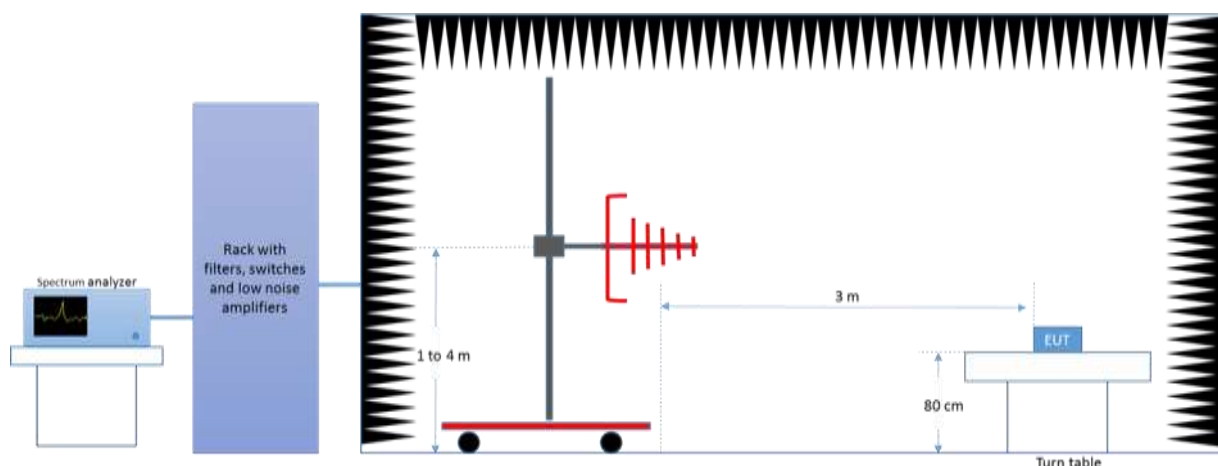
Measurements were performed using the following setups, made in accordance to the general provisions of FCC DTS Measurement KDB 558074 D01 DTS Meas Guidance.

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.

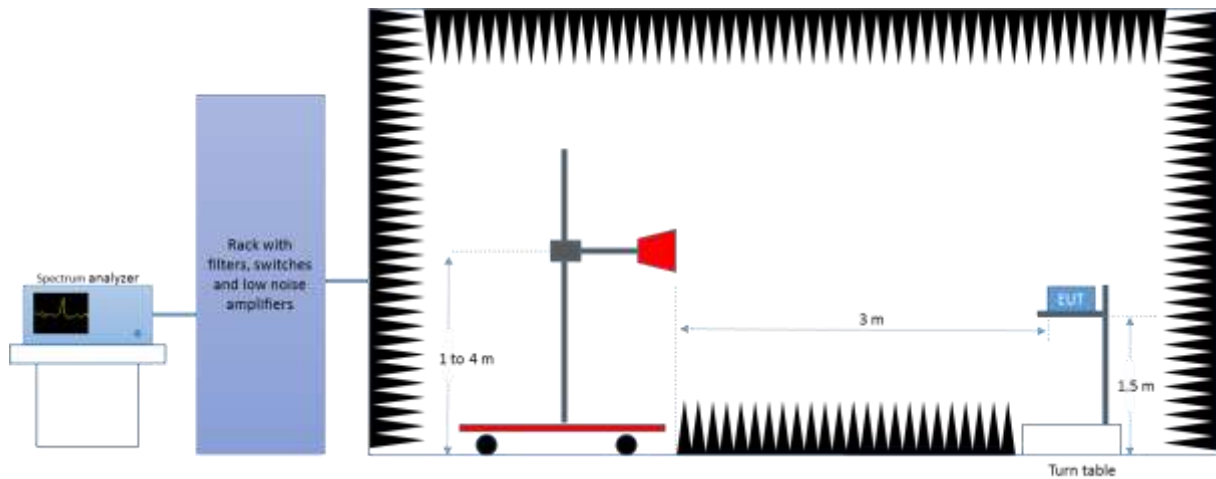
### Conducted Setup



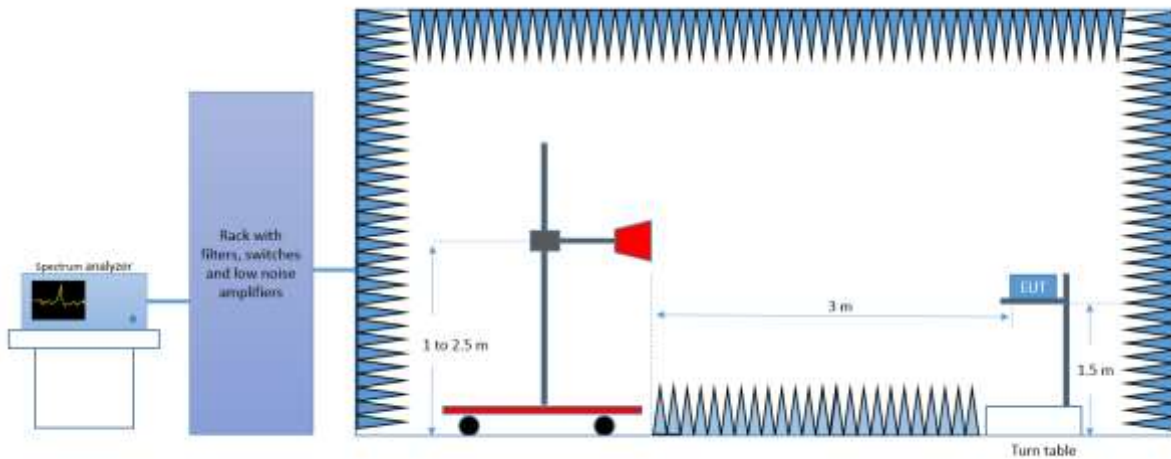
### Radiated Setup 30 MHz - 1GHz



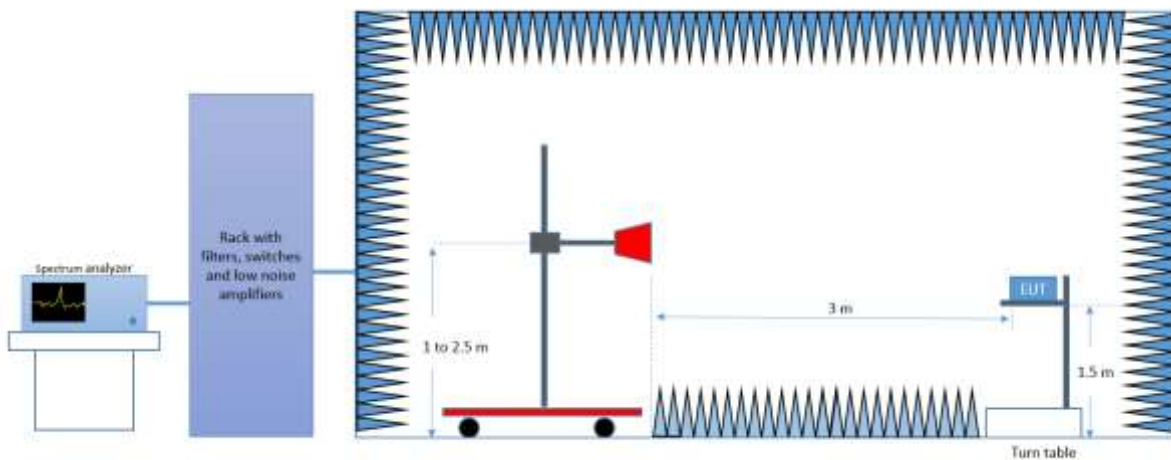
*Radiated Setup 1 GHz – 6.4 GHz ( used for DTS tests)*



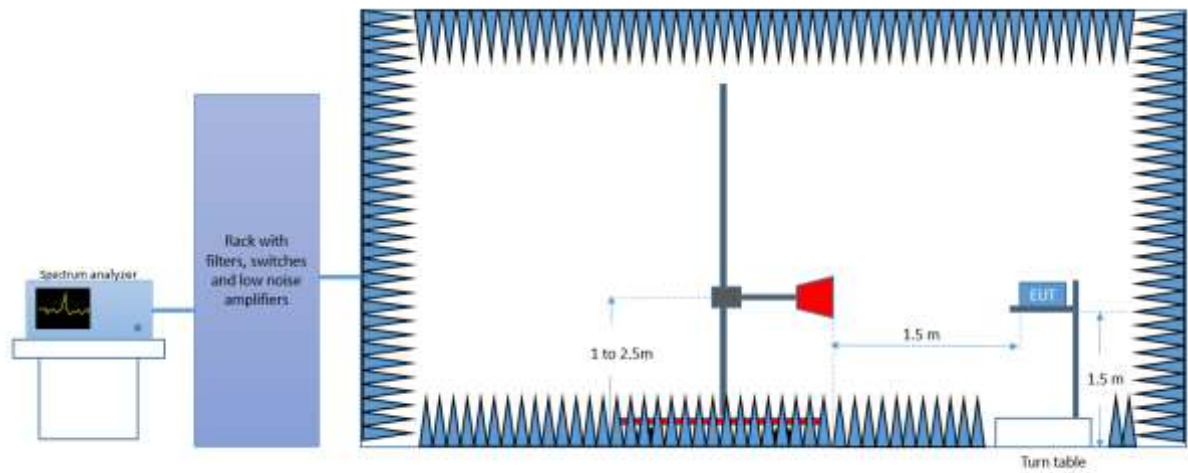
*Radiated Setup 1 GHz – 6.4 GHz (used for BLE tests)*



*Radiated Setup 6.4 GHz – 18 GHz*



*Radiated Setup 18 GHz – 26.5 GHz*





## A.2 Test Equipment List

### Conducted Setup

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
0316	Spectrum analyzer	FSV30	103309	Rohde & Schwarz	2017-09-22	2019-09-22

### Radiated Setup-1

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
0420	Spectrum analyzer	FSV40	101556	Rohde & Schwarz	2018-05-17	2020-05-17
0137	Log antenna 30 MHz – 1 GHz	3142E	00156946	ETS Lindgren	2017-12-19	2019-12-19
0325	Double Ridged Horn Antenna 1 GHz – 18 GHz	3117	00157734	ETS Lindgren	2017-08-22	2019-08-22
0135	Semi Anechoic chamber	FACT 3	5720	ETS Lindgren	2018-04-18	2020-04-18
0530	Measurement Software	EMC32	100623	Rohde & Schwarz	N/A	N/A

N/A: Not Applicable

### Radiated Setup-2

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
0133	Spectrum analyzer	FSV40	101358	Rohde & Schwarz	2018-04-11	2020-04-11
0138	Double Ridged Horn Antenna 1 GHz – 18 GHz	3771	00152266	ETS Lindgren	2018-03-29	2020-03-29
0141	Double Ridged Horn Antenna 1 GHz – 18 GHz	3117	00157736	ETS Lindgren	2018-05-11	2020-05-11
0334	Double Ridged Horn Antenna 18 GHz – 40 GHz	3116C-PA	00196308	ETS Lindgren	2017-08-22	2019-08-22
0337	Full Anechoic chamber	RFD_FA_100	5996	ETS Lindgren	2018-04-17	2020-04-17
0329	Measurement Software	EMC32	100401	Rohde & Schwarz	N/A	N/A

N/A: Not Applicable

### Radiated Setup - shared equipment

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
0616	Power Sensor 50MHz-18GHz	NRP-Z81	104385	Rohde & Schwarz	2018-04-16	2020-04-16
0617	Power Sensor 50MHz-18GHz	NRP-Z81	104386	Rohde & Schwarz	2018-04-16	2020-04-16
0618	Power Sensor 50MHz-18GHz	NRP-Z81	104382	Rohde & Schwarz	2018-04-16	2020-04-16

### A.3 Measurement Uncertainty Evaluation

The system uncertainty evaluation is shown in the below table:

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

# Annex B. Test Results DTS

## B.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 & 802.11ax20 (20 MHz channel bandwidth), 802.11n40 & 802.11ax40 (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 A 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 9.2.2.2 (Method AVGSA-1) of KDB 558074 D01.

Measured values for adjustment were within +/-0.25 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	19.50	20.00	-
			7	2442	21.00	21.00	-
			11	2462	19.50	20.00	-
			12	2467	18.50	18.00	-
			13	2472	15.00	15.50	-
802.11g	20	6Mbps	1	2412	18.50	18.50	-
			7	2442	21.00	21.50	-
			11	2462	18.00	17.50	-
			12	2467	15.00	15.50	-
			13	2472	3.00	2.50	-
802.11n	20	HT0 HT8*	1	2412	18.50	17.50	18.50
			7	2442	21.00	21.00	21.00
			11	2462	17.50	16.50	18.00
			12	2467	15.50	15.50	15.50
			13	2472	3.00	2.50	3.50
802.11n	40	HT0 HT8*	3F	2422	17.00	15.50	16.50
			7F	2442	17.00	17.00	18.00
			9F	2452	15.00	15.00	17.00
			10F	2457	10.50	11.00	13.00
			11F	2462	4.00	4.00	5.50
802.11ax	20	HE0	1	2412	18.50	17.50	18.50
			7	2442	20.00	20.00	20.00
			11	2462	17.00	16.00	17.50
			12	2467	16.00	15.00	16.00
			13	2472	1.50	1.50	3.50
802.11ax	40		3F	2422	17.00	15.50	16.00
			7F	2442	17.00	17.00	18.00
			9F	2452	15.00	15.00	17.00
			10F	2457	10.50	11.00	12.50
			11F	2462	4.50	4.50	6.00
Bluetooth Low Energy	2	1Mbps	0	2412	4.50	-	-
			19	2440	5.00	-	-
			39	2462	5.00	-	-

\* 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:

802.11b → 1Mbps

802.11g → 6Mbps

802.11n20 and 802.11n40 (SISO) → HT0

802.11n20 and 802.11n40 (MIMO) → HT8

802.11ax20 and 802.11ax40 (SISO) → HE0

802.11ax20 and 802.11ax40 (MIMO) → HE0

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

## B.2 Test Results Tables

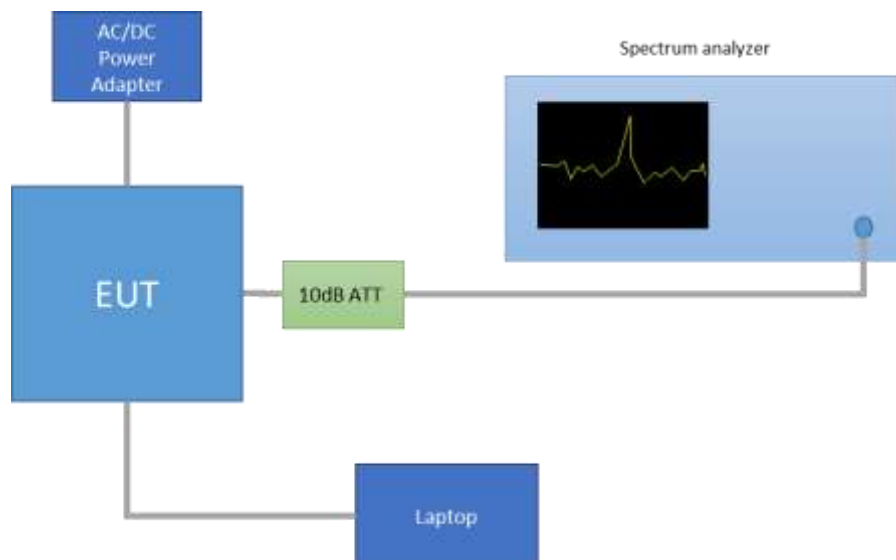
### B.2.1 6dB & 99% Bandwidth

#### Test limits

FCC part	RSS part	Limits
15.247 (a) (2)	RSS-247 Clause 5.2 (a)	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 A	1	2412	10.09	13.39
			7	2442	10.11	14.00
			11	2462	10.06	13.33
			12	2467	9.61	13.62
			13	2472	10.11	13.67
		SISO B	1	2412	10.09	13.45
			7	2442	10.10	13.93
			11	2462	10.09	13.44
			12	2467	10.10	13.69
			13	2472	10.10	13.50
802.11g	6Mbps	SISO A	1	2412	16.08	16.86
			7	2442	16.36	19.97
			11	2462	16.05	16.75
			12	2467	16.30	16.86
			13	2472	16.37	16.69
		SISO B	1	2412	16.33	16.86
			7	2442	16.35	20.89
			11	2462	15.95	16.83
			12	2467	16.34	16.92
			13	2472	16.36	16.65
802.11n20	HT0	SISO A	1	2412	17.19	17.91
			7	2442	17.59	21.17
			11	2462	16.94	17.85
			12	2467	16.95	17.95
			13	2472	17.62	17.84
		SISO B	1	2412	17.57	17.92
			7	2442	17.58	19.76
			11	2462	17.22	17.91
			12	2467	17.58	18.00
			13	2472	17.60	17.82
	HT8	MIMO A	1	2412	17.58	17.89
			7	2442	17.59	18.02
			11	2462	16.33	17.88
			12	2467	17.21	17.95
			13	2472	17.61	17.83
		MIMO B	1	2412	17.91	17.91
			7	2442	17.60	18.02
			11	2462	17.59	17.93
			12	2467	17.61	17.96
			13	2472	17.61	17.73

Max Value

Mode	Rate	Antenna	Channel	Frequency [MHz]	6dB BW [MHz]	99% BW [MHz]
802.11n40	HT0	SISO A	3F	2422	35.46	36.38
			7F	2442	36.18	36.57
			9F	2452	35.58	36.40
			10F	2457	35.49	36.37
			11F	2462	35.71	36.41
		SISO B	3F	2422	36.05	36.41
			7F	2442	36.10	36.55
			9F	2452	34.43	36.41
			10F	2457	35.56	36.44
			11F	2462	36.10	36.43
	HT8	MIMO A	3F	2422	35.46	36.37
			7F	2442	36.13	36.58
			9F	2452	34.71	36.39
			10F	2457	35.49	36.40
			11F	2462	36.05	36.38
		MIMO B	3F	2422	36.09	36.27
			7F	2442	36.37	36.34
			9F	2452	35.75	36.26
			10F	2457	36.18	36.30
			11F	2462	36.11	36.26

Max Value

Mode	Rate	Antenna	Channel	Frequency [MHz]	6dB BW [MHz]	99% BW [MHz]
802.11ax20	HE0	SISO A	1	2412	18.77	19.03
			7	2442	18.87	19.23
			11	2462	18.41	19.00
			12	2467	18.03	19.05
			13	2472	18.99	19.04
		SISO B	1	2412	18.65	19.05
			7	2442	18.75	19.19
			11	2462	18.29	19.06
			12	2467	18.75	19.08
			13	2472	18.94	19.01
		MIMO A	1	2412	18.74	19.01
			7	2442	18.99	19.07
			11	2462	18.27	18.99
			12	2467	18.75	19.07
			13	2472	19.03	19.02
		MIMO B	1	2412	18.76	19.02
			7	2442	18.83	19.05
			11	2462	18.66	19.03
			12	2467	18.96	19.09
			13	2472	18.98	18.99

Max Value



Mode	Rate	Antenna	Channel	Frequency [MHz]	6dB BW [MHz]	99% BW [MHz]
802.11ax40	HE0	SISO A	3F	2422	36.81	37.75
			7F	2442	37.71	37.91
			9F	2452	36.17	37.75
			10F	2457	36.12	37.76
			11F	2462	37.82	37.78
		SISO B	3F	2422	37.17	37.79
			7F	2442	37.38	37.88
			9F	2452	35.99	37.78
			10F	2457	37.70	37.79
			11F	2462	37.47	37.78
		MIMO A	3F	2422	37.64	37.71
			7F	2442	38.07	37.86
			9F	2452	37.40	37.71
			10F	2457	36.96	37.74
			11F	2462	37.76	37.75
		MIMO B	3F	2422	37.87	37.77
			7F	2442	37.90	37.82
			9F	2452	37.46	37.72
			10F	2457	36.12	37.77
			11F	2462	37.88	37.76

Max Value

Mode	Rate	Antenna	Channel	Frequency [MHz]	RU Config	6dB BW [MHz]	99% BW [MHz]
802.11ax20	HE0	SISO A	1	2412	26/0	15.78	18.10
					52/37	17.08	18.07
					106/53	17.10	18.08
		SISO B			26/0	2.00	18.25
					52/37	15.76	18.27
					106/53	17.10	17.96
		MIMO A			26/0	14.50	18.21
					52/37	17.08	17.97
					106/53	17.13	18.09
		MIMO B			26/0	2.09	18.15
					52/37	15.76	18.26
					106/53	17.14	18.09
		SISO A	13	2472	26/8	2.05	18.18
					52/40	15.80	18.16
					106/54	17.13	18.23
		SISO B			26/8	2.03	18.35
					52/40	4.04	18.00
					106/54	15.87	18.05
		MIMO A			26/8	2.06	18.38
					52/40	17.06	18.19
					106/54	18.31	18.25
		MIMO B			26/8	1.99	18.09
					52/40	4.03	17.97
					106/54	17.11	17.99
802.11ax40	HE0	SISO A	3F	2422	242/61	18.42	19.02
		SISO B			242/61	18.36	19.04
		MIMO B			242/61	17.34	19.02
		MIMO A			242/61	18.36	19.06
		SISO A	11F	2462	242/62	18.77	19.11
		SISO B			242/62	18.84	19.08
		MIMO B			242/62	18.78	19.05
		MIMO A			242/62	18.78	19.01

See Section B.3.1 and Section B.3.2 for the screenshot results.

## B.2.2 Maximum Output Power and antenna gain

### Test limits

	Limits
FCC Part 15.247 (b) (3)	<p>(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:</p> <p>(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.</p> <p>(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.</p>
RSS-247 Clause 5.4 (d)	<p>For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).</p> <p>As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling 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 transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.</p>

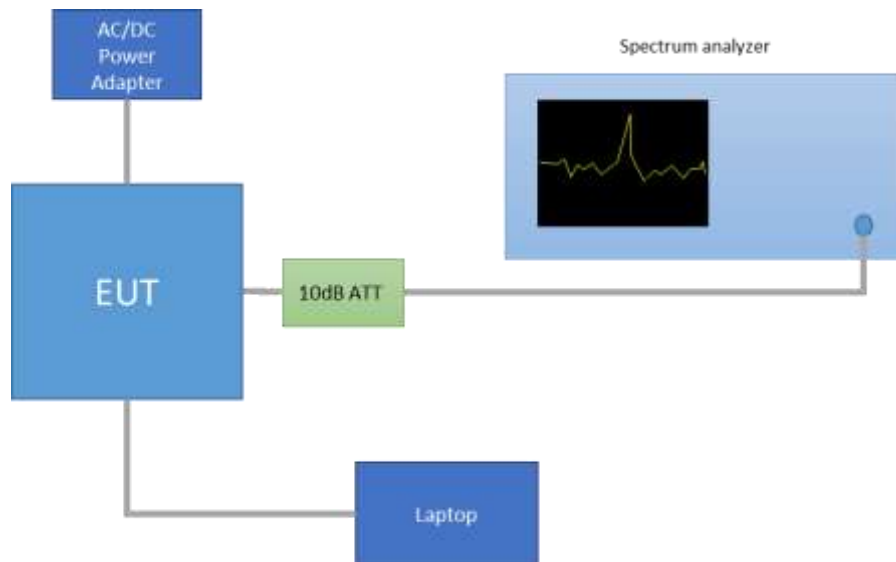
### Test procedure

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 3.24dBi.

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

### Maximum peak conducted output power

Mode	Rate	CH	Freq [MHz]	Antenna	Measured Conducted Output power [dBm]	EIRP [dBm]	EIRP [mW]	Conducted power [mW]
802.11b	1Mbps	1	2412	SISO A	22.42	25.66	368.13	174.58
				SISO B	22.89	26.13	410.20	194.54
		7	2442	SISO A	24.03	27.27	533.33	252.93
				SISO B	24.03	27.27	533.33	252.93
		11	2462	SISO A	22.59	25.83	382.82	181.55
				SISO B	22.86	26.10	407.38	193.20
		12	2467	SISO A	21.44	24.68	293.76	139.32
				SISO B	20.96	24.20	263.03	124.74
		13	2472	SISO A	18.02	21.26	133.66	63.39
				SISO B	18.14	21.38	137.40	65.16
802.11g	6Mbps	1	2412	SISO A	26.71	29.95	988.55	468.81
				SISO B	26.75	29.99	997.70	473.15
		7	2442	SISO A	29.57	32.81	1909.85	905.73
				SISO B	29.88	33.12	2051.16	972.75
		11	2462	SISO A	26.25	29.49	889.20	421.70
				SISO B	26.14	29.38	866.96	411.15
		12	2467	SISO A	23.80	27.04	505.82	239.88
				SISO B	24.05	27.29	535.80	254.10
		13	2472	SISO A	11.05	14.29	26.85	12.74
				SISO B	10.46	13.70	23.44	11.12
802.11n20	HT0	1	2412	SISO A	26.90	30.14	1032.76	489.78
				SISO B	25.88	29.12	816.58	387.26
		7	2442	SISO A	29.54	32.78	1896.71	899.50
				SISO B	29.69	32.93	1963.36	931.11
		11	2462	SISO A	25.99	29.23	837.53	397.19
				SISO B	24.90	28.14	651.63	309.03
		12	2467	SISO A	23.77	27.01	502.34	238.23
				SISO B	23.99	27.23	528.45	250.61
		13	2472	SISO A	11.12	14.36	27.29	12.94
				SISO B	10.75	13.99	25.06	11.89

Max Value

Min Value

Mode	Rate	CH	Freq [MHz]	Antenna	Measured Conducted Output power [dBm]	EIRP [dBm]	EIRP [mW]	Conducted power [mW]
802.11n20	HT8	1	2412	MIMO A	24.62	27.86	610.94	289.73
				MIMO B	23.26	26.50	446.68	211.84
				Combined A+B	27.00	30.24	1057.63	501.57
		7	2442	MIMO A	26.24	29.48	887.16	420.73
				MIMO B	26.87	30.11	1025.65	486.41
				Combined A+B	29.58	32.82	1912.81	907.13
		11	2462	MIMO A	23.71	26.95	495.45	234.96
				MIMO B	23.84	27.08	510.50	242.10
				Combined A+B	26.79	30.03	1005.96	477.07
		12	2467	MIMO A	20.62	23.86	243.22	115.35
				MIMO B	21.37	24.61	289.07	137.09
				Combined A+B	24.02	27.26	532.29	252.43
		13	2472	MIMO A	8.50	11.74	14.93	7.08
				MIMO B	9.32	12.56	18.03	8.55
				Combined A+B	11.94	15.18	32.96	15.63

Max Value

Min Value

Mode	Rate	CH	Freq [MHz]	Antenna	Measured Conducted Output power [dBm]	EIRP [dBm]	EIRP [mW]	Conducted power [mW]
802.11n40	HT0	3F	2422	SISO A	25.87	29.11	814.70	386.37
				SISO B	24.00	27.24	529.66	251.19
		7F	2442	SISO A	25.50	28.74	748.17	354.81
				SISO B	25.70	28.94	783.43	371.54
		9F	2452	SISO A	23.72	26.96	496.59	235.50
				SISO B	23.63	26.87	486.41	230.67
		10F	2457	SISO A	19.10	22.34	171.40	81.28
				SISO B	19.56	22.80	190.55	90.36
		11F	2462	SISO A	12.51	15.75	37.58	17.82
				SISO B	12.45	15.69	37.07	17.58
	HT8	3F	2422	MIMO A	21.88	25.12	325.09	154.17
				MIMO B	22.76	26.00	398.11	188.80
				Combined A+B	25.35	28.59	723.19	342.97
		7F	2442	MIMO A	23.77	27.01	502.34	238.23
				MIMO B	24.34	27.58	572.80	271.64
				Combined A+B	27.07	30.31	1075.14	509.88
		9F	2452	MIMO A	22.81	26.05	402.72	190.99
				MIMO B	22.79	26.03	400.87	190.11
				Combined A+B	25.81	29.05	803.58	381.09
		10F	2457	MIMO A	18.49	21.73	148.94	70.63
				MIMO B	19.04	22.28	169.04	80.17
				Combined A+B	21.78	25.02	317.98	150.80
		11F	2462	MIMO A	11.00	14.24	26.55	12.59
				MIMO B	11.90	15.14	32.66	15.49
				Combined A+B	14.48	17.72	59.20	28.08

Max Value

Min Value

Mode	Rate	CH	Freq [MHz]	Antenna	Measured Conducted Output power [dBm]	EIRP [dBm]	EIRP [mW]	Conducted power [mW]
802.11ax20	HE0	1	2412	SISO A	28.31	31.55	1428.89	677.64
				SISO B	27.10	30.34	1081.43	512.86
		7	2442	SISO A	29.73	32.97	1981.53	939.72
				SISO B	29.82	33.06	2023.02	959.40
		11	2462	SISO A	27.00	30.24	1056.82	501.19
				SISO B	26.02	29.26	843.33	399.94
		12	2467	SISO A	25.82	29.06	805.38	381.94
				SISO B	25.07	28.31	677.64	321.37
		13	2472	SISO A	12.02	15.26	33.57	15.92
				SISO B	11.68	14.92	31.05	14.72
		1	2412	MIMO A	25.83	29.07	807.24	382.82
				MIMO B	24.44	27.68	586.14	277.97
				Combined A+B	28.20	31.44	1393.37	660.80
		7	2442	MIMO A	26.83	30.07	1016.25	481.95
				MIMO B	26.86	30.10	1023.29	485.29
				Combined A+B	29.86	33.10	2039.54	967.24
		11	2462	MIMO A	24.79	28.03	635.33	301.30
				MIMO B	24.20	27.44	554.63	263.03
				Combined A+B	27.52	30.76	1189.96	564.33
		12	2467	MIMO A	22.69	25.93	391.74	185.78
				MIMO B	22.62	25.86	385.48	182.81
				Combined A+B	25.67	28.91	777.22	368.59
		13	2472	MIMO A	10.48	13.72	23.55	11.17
				MIMO B	10.59	13.83	24.15	11.46
				Combined A+B	13.55	16.79	47.71	22.62

Max Value

Min Value



Mode	Rate	CH	Freq [MHz]	Antenna	Measured Conducted Output power [dBm]	EIRP [dBm]	EIRP [mW]	Conducted power [mW]
802.11ax40	HE0	3F	2422	SISO A	27.15	30.39	1093.96	518.80
				SISO B	25.74	28.98	790.68	374.97
		7F	2442	SISO A	27.43	30.67	1166.81	553.35
				SISO B	27.33	30.57	1140.25	540.75
		9F	2452	SISO A	25.38	28.62	727.78	345.14
				SISO B	25.09	28.33	680.77	322.85
		10F	2457	SISO A	20.77	24.01	251.77	119.40
				SISO B	21.05	24.29	268.53	127.35
		11F	2462	SISO A	14.91	18.15	65.31	30.97
				SISO B	15.10	18.34	68.23	32.36
		3F	2422	MIMO A	23.14	26.38	434.51	206.06
				MIMO B	23.89	27.13	516.42	244.91
				Combined A+B	26.54	29.78	950.93	450.97
		7F	2442	MIMO A	25.03	28.27	671.43	318.42
				MIMO B	25.73	28.97	788.86	374.11
				Combined A+B	28.40	31.64	1460.29	692.53
		9F	2452	MIMO A	24.44	27.68	586.14	277.97
				MIMO B	24.10	27.34	542.00	257.04
				Combined A+B	27.28	30.52	1128.14	535.01
		10F	2457	MIMO A	20.19	23.43	220.29	104.47
				MIMO B	19.34	22.58	181.13	85.90
				Combined A+B	22.80	26.04	401.43	190.37
		11F	2462	MIMO A	13.13	16.37	43.35	20.56
				MIMO B	13.54	16.78	47.64	22.59
				Combined A+B	16.35	19.59	90.99	43.15

Max Value

Min Value

Mode	Rate	CH	Freq [MHz]	Antenna	RU Config	Measured Conducted Output power [dBm]	EIRP [dBm]	EIRP [mW]	Conducted power [mW]
802.11ax20	HE0	1	2412	SISO A	26/0	27.97	31.21	1321.30	626.61
					52/37	29.11	32.35	1717.91	814.70
					106/53	29.44	32.68	1853.53	879.02
				SISO B	26/0	27.85	31.09	1285.29	609.54
					52/37	29.03	32.27	1686.55	799.83
					106/53	29.50	32.74	1879.32	891.25
				MIMO A	26/0	26.03	29.27	845.28	400.87
					52/37	27.04	30.28	1066.60	505.82
					106/53	26.41	29.65	922.57	437.52
				MIMO B	26/0	26.45	29.69	931.11	441.57
					52/37	26.76	30.00	1000.00	474.24
					106/53	26.58	29.82	959.40	454.99
		13	2472	SISO A	26/8	4.21	7.45	5.56	2.64
					52/40	5.71	8.95	7.85	3.72
					106/54	7.46	10.70	11.75	5.57
				SISO B	26/8	4.38	7.62	5.78	2.74
					52/40	5.75	8.99	7.93	3.76
					106/54	7.76	11.00	12.59	5.97
				MIMO A	26/8	2.36	5.60	3.63	1.72
					52/40	2.88	6.12	4.09	1.94
					106/54	6.21	9.45	8.81	4.18
				MIMO B	26/8	2.33	5.57	3.61	1.71
					52/40	3.15	6.39	4.36	2.07
					106/54	6.65	9.89	9.75	4.62
802.11ax40	HE0	3F	2422	SISO A	242/61	25.53	28.77	753.36	357.27
				SISO B	242/61	25.85	29.09	810.96	384.59
				MIMO B	242/61	24.32	27.56	570.16	270.40
				MIMO A	242/61	24.40	27.64	580.76	275.42
		11F	2462	SISO A	242/62	12.86	16.10	40.74	19.32
				SISO B	242/62	13.08	16.32	42.85	20.32
				MIMO B	242/62	11.33	14.57	28.64	13.58
				MIMO A	242/62	10.73	13.97	24.95	11.83

Max Value

Min Value

Maximum (Average) conducted output power\*

Mode	Rate	CH	Freq [MHz]	Antenna	Measured average conducted power [dBm]	Maximum** (average) conducted output power [dBm]	EIRP [dBm]	Average Output Power [mW]
802.11b	1Mbps	1	2412	SISO A	19.68	19.68	22.92	92.90
				SISO B	19.97	19.97	23.21	99.31
		7	2442	SISO A	21.08	21.08	24.32	128.23
				SISO B	21.17	21.17	24.41	130.92
		11	2462	SISO A	19.66	19.66	22.90	92.47
				SISO B	19.91	19.91	23.15	97.95
		12	2467	SISO A	18.47	18.47	21.71	70.31
				SISO B	18.09	18.09	21.33	64.42
		13	2472	SISO A	15.05	15.05	18.29	31.99
				SISO B	15.28	15.28	18.52	33.73
802.11g	6Mbps	1	2412	SISO A	18.28	18.40	21.64	69.14
				SISO B	18.40	18.52	21.76	71.08
		7	2442	SISO A	20.92	21.04	24.28	126.98
				SISO B	21.26	21.38	24.62	137.32
		11	2462	SISO A	17.76	17.88	21.12	61.34
				SISO B	17.69	17.81	21.05	60.36
		12	2467	SISO A	15.21	15.33	18.57	34.10
				SISO B	15.60	15.72	18.96	37.30
		13	2472	SISO A	2.89	3.01	6.25	2.00
				SISO B	2.27	2.39	5.63	1.73
802.11n20	HT0	1	2412	SISO A	18.58	18.58	21.82	72.11
				SISO B	17.56	17.56	20.80	57.02
		7	2442	SISO A	20.95	20.95	24.19	124.45
				SISO B	21.14	21.14	24.38	130.02
		11	2462	SISO A	17.59	17.59	20.83	57.41
				SISO B	16.48	16.48	19.72	44.46
		12	2467	SISO A	15.33	15.33	18.57	34.12
				SISO B	15.56	15.56	18.80	35.97
		13	2472	SISO A	2.94	2.94	6.18	1.97
				SISO B	2.63	2.63	5.87	1.83

Mode	Rate	CH	Freq [MHz]	Antenna	Measured average conducted power [dBm]	Maximum** (average) conducted output power [dBm]	EIRP [dBm]	Average Output Power [mW]
802.11n20	HT8	1	2412	MIMO A	16.28	16.28	19.52	42.46
				MIMO B	14.51	14.51	17.75	28.25
				Combined A+B	18.49	18.49	21.73	70.71
		7	2442	MIMO A	17.78	17.78	21.02	59.98
				MIMO B	18.07	18.07	21.31	64.12
				Combined A+B	20.94	20.94	24.18	124.10
		11	2462	MIMO A	15.23	15.23	18.47	33.34
				MIMO B	14.95	14.95	18.19	31.26
				Combined A+B	18.10	18.10	21.34	64.60
		12	2467	MIMO A	12.20	12.20	15.44	16.60
				MIMO B	12.50	12.50	15.74	17.78
				Combined A+B	15.36	15.36	18.60	34.38
		13	2472	MIMO A	0.39	0.39	3.63	1.09
				MIMO B	0.52	0.52	3.76	1.13
				Combined A+B	3.47	3.47	6.71	2.22

Mode	Rate	CH	Freq [MHz]	Antenna	Measured average conducted power [dBm]	Maximum** (average) conducted output power [dBm]	EIRP [dBm]	Average Output Power [mW]
802.11n40	HT0	3F	2422	SISO A	17.14	17.14	20.38	51.76
				SISO B	15.28	15.28	18.52	33.73
		7F	2442	SISO A	16.83	16.83	20.07	48.19
				SISO B	16.99	16.99	20.23	50.00
		9F	2452	SISO A	15.01	15.01	18.25	31.70
				SISO B	14.96	14.96	18.20	31.33
		10F	2457	SISO A	10.87	10.87	14.11	12.22
				SISO B	10.40	10.40	13.64	10.96
		11F	2462	SISO A	4.03	4.03	7.27	2.53
				SISO B	4.06	4.06	7.30	2.55
	HT8	3F	2422	MIMO A	13.12	13.12	16.36	20.51
				MIMO B	13.54	13.54	16.78	22.59
				Combined A+B	16.35	16.35	19.59	43.11
		7F	2442	MIMO A	15.06	15.06	18.30	32.06
				MIMO B	15.20	15.20	18.44	33.11
				Combined A+B	18.14	18.14	21.38	65.18
		9F	2452	MIMO A	14.09	14.09	17.33	25.64
				MIMO B	13.61	13.61	16.85	22.96
				Combined A+B	16.87	16.87	20.11	48.61
		10F	2457	MIMO A	9.78	9.78	13.02	9.51
				MIMO B	9.89	9.89	13.13	9.75
				Combined A+B	12.85	12.85	16.09	19.26
		11F	2462	MIMO A	2.55	2.55	5.79	1.80
				MIMO B	2.89	2.89	6.13	1.95
				Combined A+B	5.73	5.73	8.97	3.74

Mode	Rate	CH	Freq [MHz]	Antenna	Measured average conducted power [dBm]	Maximum** (average) conducted output power [dBm]	EIRP [dBm]	Average Output Power [mW]
802.11ax20	HE0	1	2412	SISO A	18.62	18.62	21.86	72.78
				SISO B	17.37	17.37	20.61	54.58
		7	2442	SISO A	16.12	16.12	19.36	40.93
				SISO B	15.56	15.56	18.80	35.97
		11	2462	SISO A	17.13	17.13	20.37	51.64
				SISO B	16.20	16.20	19.44	41.69
		12	2467	SISO A	15.86	15.86	19.10	38.55
				SISO B	15.16	15.16	18.40	32.81
		13	2472	SISO A	1.73	1.73	4.97	1.49
				SISO B	1.30	1.30	4.54	1.35
		1	2412	MIMO A	16.12	16.12	19.36	40.93
				MIMO B	14.77	14.77	18.01	29.99
				Combined A+B	18.51	18.51	21.75	70.92
		7	2442	MIMO A	17.15	17.15	20.39	51.88
				MIMO B	17.14	17.14	20.38	51.76
				Combined A+B	20.16	20.16	23.40	103.64
		11	2462	MIMO A	14.98	14.98	18.22	31.48
				MIMO B	14.34	14.34	17.58	27.16
				Combined A+B	17.68	17.68	20.92	58.64
		12	2467	MIMO A	12.84	12.84	16.08	19.23
				MIMO B	12.82	12.82	16.06	19.14
				Combined A+B	15.84	15.84	19.08	38.37
		13	2472	MIMO A	0.27	0.27	3.51	1.06
				MIMO B	0.32	0.32	3.56	1.08
				Combined A+B	3.31	3.31	6.55	2.14

Mode	Rate	CH	Freq [MHz]	Antenna	Measured average conducted power [dBm]	Maximum** (average) conducted output power [dBm]	EIRP [dBm]	Average Output Power [mW]
802.11ax40	HEO	3F	2422	SISO A	16.81	16.81	20.05	47.97
				SISO B	15.42	15.42	18.66	34.83
		7F	2442	SISO A	16.91	16.91	20.15	49.09
				SISO B	17.03	17.03	20.27	50.47
		9F	2452	SISO A	15.12	15.12	18.36	32.51
				SISO B	14.84	14.84	18.08	30.48
		10F	2457	SISO A	10.54	10.54	13.78	11.32
				SISO B	10.81	10.81	14.05	12.05
		11F	2462	SISO A	4.46	4.46	7.70	2.79
				SISO B	4.60	4.60	7.84	2.88
		3F	2422	MIMO A	12.89	12.89	16.13	19.45
				MIMO B	13.42	13.42	16.66	21.98
				Combined A+B	16.17	16.17	19.41	41.43
		7F	2442	MIMO A	14.82	14.82	18.06	30.34
				MIMO B	15.28	15.28	18.52	33.73
				Combined A+B	18.07	18.07	21.31	64.07
		9F	2452	MIMO A	14.30	14.30	17.54	26.92
				MIMO B	13.63	13.63	16.87	23.07
				Combined A+B	16.99	16.99	20.23	49.98
		10F	2457	MIMO A	10.00	10.00	13.24	10.00
				MIMO B	8.90	8.90	12.14	7.76
				Combined A+B	12.50	12.50	15.74	17.76
		11F	2462	MIMO A	2.65	2.65	5.89	1.84
				MIMO B	2.87	2.87	6.11	1.94
				Combined A+B	5.77	5.77	9.01	3.78

Mode	Rate	Antenna	CH	Frequency [MHz]	RU Config	Measured average conducted power [dBm]	Maximum ** (average) conducted output power [dBm]	EIRP [dBm]	Average Output Power [mW]
802.11ax20	HE0	SISO A	1	2412	26/0	18.31	18.31	21.55	67.76
					52/37	19.13	19.13	22.37	81.85
					106/53	19.16	19.16	22.40	81.85
		SISO B			26/0	18.36	18.36	21.60	82.41
					52/37	19.09	19.09	22.33	81.10
					106/53	19.15	19.15	22.39	82.22
		MIMO A			26/0	16.58	16.58	19.82	45.50
					52/37	17.22	17.22	20.46	52.72
					106/53	16.31	16.31	19.55	42.76
		MIMO B			26/0	16.88	16.88	20.12	52.72
					52/37	16.73	16.73	19.97	47.10
					106/53	16.25	16.25	19.49	42.17
		SISO A	13	2472	26/8	-7.23	-7.23	-3.99	0.19
					52/40	-5.72	-5.72	-2.48	0.27
					106/54	-3.59	-3.59	-0.35	0.44
		SISO B			26/8	-6.94	-6.94	-3.70	0.20
					52/40	-5.45	-5.45	-2.21	0.29
					106/54	-3.30	-3.30	-0.06	0.47
		MIMO A			26/8	-8.85	-8.85	-5.61	0.13
					52/40	-8.35	-8.35	-5.11	0.15
					106/54	-4.78	-4.78	-1.54	0.33
		MIMO B			26/8	-9.15	-9.15	-5.91	0.12
					52/40	-8.34	-8.34	-5.10	0.15
					106/54	-4.50	-4.50	-1.26	0.35
802.11ax40	HE0	SISO A	3F	2422	242/61	15.71	15.71	18.95	37.24
		SISO B			242/61	15.88	15.88	19.12	38.73
		MIMO B			242/61	14.50	14.50	17.74	28.18
		MIMO A			242/61	14.45	14.45	17.69	27.86
		SISO A	11F	2462	242/62	2.10	2.10	5.34	1.62
		SISO B			242/62	2.18	2.18	5.42	1.65
		MIMO B			242/62	0.88	0.88	4.12	1.22
		MIMO A			242/62	0.26	0.26	3.50	1.06

\* Maximum (average) conducted output power are shown for indicative purpose only.

\*\* Duty cycle compensated

**See Section B.3.3 for the screenshot results.**



## B.2.3 Power Spectral Density

### Test limits

FCC part	RSS part	Limits
15.247 (e)	RSS-247 Clause 5.2 (b)	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

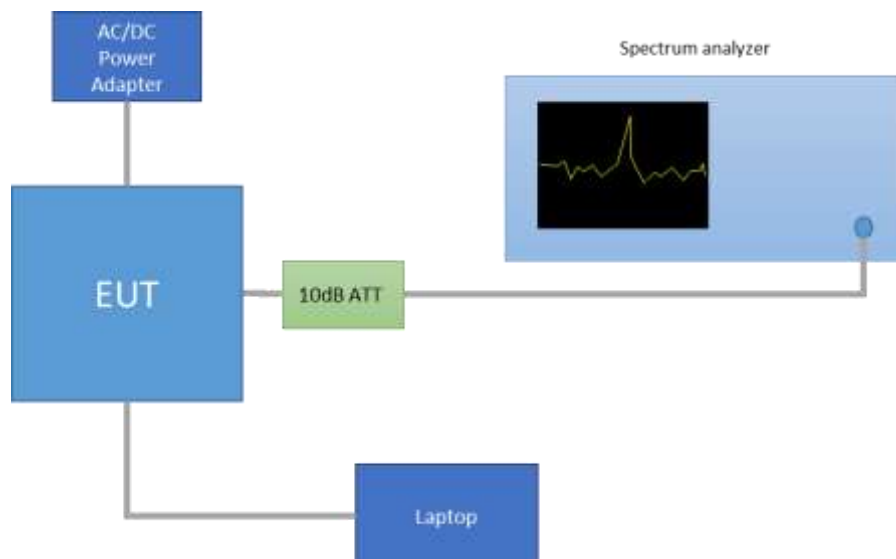
### Test procedure

The peak power spectral density level in the fundamental emission was measured using the *Method PKPSD (peak PSD)* according to section 11.10.2 of ANSI C63.10-2013 – American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices. This method was used for 802.11b, 802.11g, 802.11n20, 802.11n40, 802.11ax20 and 802.11ax40 modes.

For MIMO mode, the *Measure and add  $10 \log(N_{ANT})$  dB*, (where  $N_{ANT}$  is the number of outputs) technique was used according to the Guidance for Emission Testing of Transmitters with Multiple Outputs in the Same Band 662911 D01 Multiple Transmitter Output v02r01.

With this technique, spectrum measurements are performed at each output of the device, and the quantity  $10 \log(N_{ANT})$  dB is added to each spectrum value before comparing to the emission limit. Number of outputs = 2.

The setup below was used to measure the 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.



# Results tables

Mode	Rate	Channel	Frequency [MHz]	Antenna	PSD Peak [dBm/3kHz]
802.11b	1Mbps	1	2412	SISO A	-3.93
				SISO B	-3.57
		7	2442	SISO A	-2.72
				SISO B	-2.65
		11	2462	SISO A	-3.81
				SISO B	-3.67
		12	2467	SISO A	-5.16
				SISO B	-5.71
		13	2472	SISO A	-8.77
				SISO B	-8.52
802.11g	6Mbps	1	2412	SISO A	-4.80
				SISO B	-5.17
		7	2442	SISO A	-2.36
				SISO B	-2.53
		11	2462	SISO A	-5.93
				SISO B	-5.50
		12	2467	SISO A	-7.66
				SISO B	-7.76
		13	2472	SISO A	-21.00
				SISO B	-21.28
802.11n20	HT0	1	2412	SISO A	-4.84
				SISO B	-5.90
		7	2442	SISO A	-2.89
				SISO B	-2.43
		11	2462	SISO A	-6.20
				SISO B	-7.51
		12	2467	SISO A	-7.95
				SISO B	-8.29
		13	2472	SISO A	-21.03
				SISO B	-21.03
802.11n40	HT0	3F	2422	SISO A	-9.56
				SISO B	-11.05
		7F	2442	SISO A	-9.53
				SISO B	-9.89
		9F	2452	SISO A	-11.55
				SISO B	-11.94
		10F	2457	SISO A	-15.70
				SISO B	-16.66
		11F	2462	SISO A	-22.04
				SISO B	-21.74

Max Value

Mode	Rate	Channel	Frequency [MHz]	Antenna	PSD Peak [dBm/3kHz]
802.11ax20	HE0	1	2412	SISO A	-5.63
				SISO B	-7.25
		7	2442	SISO A	-4.51
				SISO B	-4.52
		11	2462	SISO A	-6.76
				SISO B	-7.48
		12	2467	SISO A	-7.80
				SISO B	-9.31
		13	2472	SISO A	-22.16
				SISO B	-22.64
802.11ax40		3F	2422	SISO A	-10.12
				SISO B	-11.63
		7F	2442	SISO A	-10.46
				SISO B	-10.23
		9F	2452	SISO A	-12.74
				SISO B	-12.65
		10F	2457	SISO A	-16.73
				SISO B	-16.70
		11F	2462	SISO A	-22.90
				SISO B	-23.20

Mode	Rate	CH	Frequency [MHz]	RU Config	Antenna	PSD Peak [dBm/3kHz]
802.11ax20	HE0	1	2412	26/0	SISO A	<b>5.31</b>
				52/37		1.40
				106/53		-1.06
				26/0	SISO B	4.12
				52/37		0.92
				106/53		-0.93
		13	2472	26/8	SISO A	-22.07
				52/40		-22.96
				106/54		-24.34
				26/8	SISO B	-22.08
				52/40		-23.61
				106/54		-22.86
802.11ax40	HE0	3F	2422	242/61	SISO A	<b>-8.18</b>
				242/61	SISO B	-9.20
		11F	2462	242/62	SISO A	-21.64
				242/62	SISO B	-22.16

Max Value

MIMO modes					PSD Peak [dBm/3kHz]	
Mode	Rate	CH	Freq. [MHz]	Antenna	Measured Conducted	MIMO Combined +10·log(N <sub>ant</sub> )
802.11n20	HT8	1	2412	CHAIN A	-6.86	-3.85
				CHAIN B	-9.39	-6.38
		7	2442	CHAIN A	-5.92	-2.91
				CHAIN B	-5.53	-2.52
		11	2462	CHAIN A	-7.76	-4.75
				CHAIN B	-8.43	-5.42
		12	2467	CHAIN A	-10.69	-7.68
				CHAIN B	-11.17	-8.16
		13	2472	CHAIN A	-22.88	-19.87
				CHAIN B	-22.84	-19.83
802.11n40	HT8	3F	2422	CHAIN A	-13.53	-10.52
				CHAIN B	-12.19	-9.18
		7F	2442	CHAIN A	-11.40	-8.39
				CHAIN B	-10.46	-7.45
		9F	2452	CHAIN A	-12.25	-9.24
				CHAIN B	-12.04	-9.03
		10F	2457	CHAIN A	-17.06	-14.05
				CHAIN B	-15.53	-12.52
		11F	2462	CHAIN A	-23.78	-20.77
				CHAIN B	-22.78	-19.77

Max Value

MIMO modes					PSD Peak [dBm/3kHz]	
Mode	Rate	CH	Freq. [MHz]	Antenna	Measured Conducted	MIMO Combined +10·log(N <sub>ant</sub> )
802.11ax20	HE0	1	2412	CHAIN A	-8.61	-5.60
				CHAIN B	-9.92	-6.91
		7	2442	CHAIN A	-7.48	-4.47
				CHAIN B	-7.52	-4.51
		11	2462	CHAIN A	-8.72	-5.71
				CHAIN B	-10.00	-6.99
		12	2467	CHAIN A	-10.75	-7.74
				CHAIN B	-11.61	-8.60
		13	2472	CHAIN A	-24.03	-21.02
				CHAIN B	-24.09	-21.08
802.11ax40		3F	2422	CHAIN A	-14.40	-11.39
				CHAIN B	-13.97	-10.96
		7F	2442	CHAIN A	-12.58	-9.57
				CHAIN B	-12.20	-9.19
		9F	2452	CHAIN A	-13.14	-10.13
				CHAIN B	-13.93	-10.92
		10F	2457	CHAIN A	-16.86	-13.85
				CHAIN B	-18.18	-15.17
	11F	2462	CHAIN A	-24.06	-21.05	
			CHAIN B	-24.19	-21.18	

Max Value

MIMO modes						PSD Peak [dBm/3kHz]	
Mode	Rate	Antenna	CH	Frequency [MHz]	RU Config	Measured average conducted power [dBm]	MIMO Combined +10·log(N <sub>ant</sub> )
802.11ax20	HE0	MIMO A	1	2412	26/0	1.67	4.68
					52/37	-0.59	2.42
					106/53	-4.24	-1.23
		MIMO B			26/0	2.74	5.75
					52/37	-1.27	1.74
					106/53	-4.60	-1.59
		MIMO A	13	2472	26/8	-23.57	-20.56
					52/40	-26.12	-23.11
					106/54	-24.99	-21.98
		MIMO B			26/8	-22.97	-19.96
					52/40	-26.34	-23.33
					106/54	-25.66	-22.65
802.11ax40		MIMO A	3F	2422	242/61	-9.72	-6.71
		MIMO B			242/61	-9.06	-6.05
		MIMO A	11F	2462	242/62	-23.54	-20.53
		MIMO B			242/62	-24.53	-21.52

Max Value

See Section B.3.4 for the screenshot results

## B.2.4 Out-of-band emission (conducted)

### Test Limits

FCC part	RSS part	Limits																				
15.247 (d)	RSS-247 Clause 5.5	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.																				
15.209	RSS-Gen Clause 8.9	<p>Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a):</p> <table><tr><th>Freq Range (MHz)</th><th>Field Strength (μV/m)</th><th>Field Strength (dBμV/m)</th><th>Meas. Distance (m)</th></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> <p>The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.</p> <p>For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.</p>	Freq Range (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Meas. Distance (m)	30-88	100	40	3	88-216	150	43.5	3	216-960	200	46	3	Above 960	500	54	3
Freq Range (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Meas. Distance (m)																			
30-88	100	40	3																			
88-216	150	43.5	3																			
216-960	200	46	3																			
Above 960	500	54	3																			

### Test procedure

The setup below was used to measure the out-of-band emissions. The antenna terminal of the EUT is connected to the spectrum analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

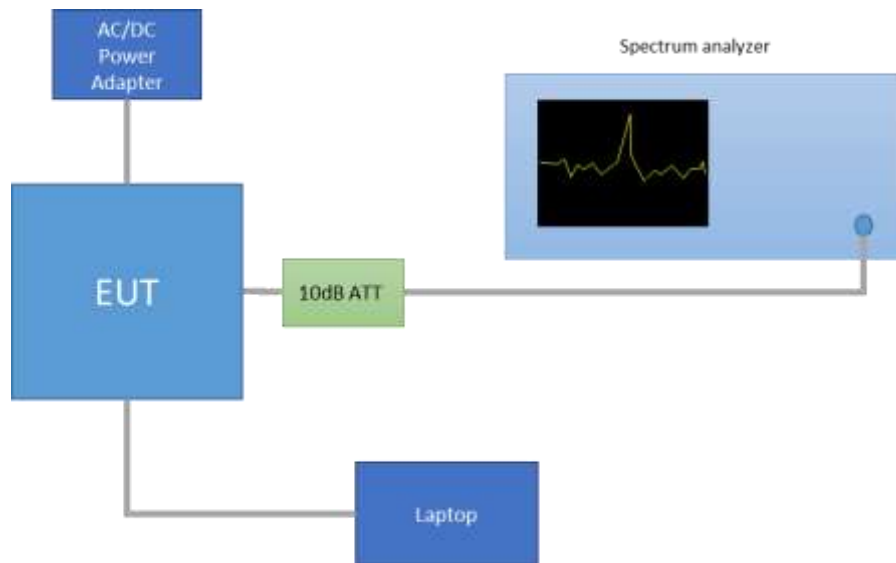
The Band Edge High, was measured using the method according to section 8.7.3 (Integration Method) of KDB 558074 D01 DTS Meas Guidance.

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 3.24dBi.

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

§15.209(a)			Converted values	
Freq Range (MHz)	Distance (m)	Field strength (microvolts/meter)	Field strength (dB microvolts/meter)	Power (dBm)
Above 960	3	500	54.0	-41.2

The setup below was used to measure the out-of-band emissions. 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.



Note: these PSD<sub>Peak</sub> values are shown just as a reference for the compliance of the Out-of-band Measurements. Thus the RBW used for these measurements was 100kHz.

Mode	Rate	Measured Duty Cycle [%]	Channel	Frequency [MHz]	Antenna	PSD Peak [dBm/100kHz]
802.11b	1Mbps	99.41	1	2412	SISO A	10.55
					SISO B	10.86
			7	2437	SISO A	11.77
					SISO B	11.87
			11	2462	SISO A	10.62
					SISO B	10.69
			12	2467	SISO A	9.44
					SISO B	8.74
			13	2472	SISO A	5.70
					SISO B	5.84



Mode	Rate	Measured Duty Cycle [%]	Channel	Frequency [MHz]	Antenna	PSD Peak [dBm/100kHz]
802.11g	6Mbps	97.33	1	2412	SISO A	8.01
					SISO B	8.00
			7	2437	SISO A	10.74
					SISO B	11.10
			11	2462	SISO A	7.58
					SISO B	7.52
			12	2467	SISO A	5.47
					SISO B	5.48
802.11n20	HT0	98.46	1	2412	SISO A	8.13
					SISO B	7.10
			7	2442	SISO A	10.61
					SISO B	10.81
			11	2462	SISO A	7.27
					SISO B	6.35
			12	2467	SISO A	5.41
					SISO B	5.43
	HT8	98.63	13	2472	SISO A	-8.20
					SISO B	-8.52
			1	2412	MIMO A	5.92
					MIMO B	4.02
			7	2442	MIMO A	7.49
					MIMO B	7.41
			11	2462	MIMO A	5.10
					MIMO B	4.83
			12	2467	MIMO A	2.16
					MIMO B	2.38
			13	2472	MIMO A	-10.80
					MIMO B	-10.83

Mode	Rate	Measured Duty Cycle [%]	Channel	Frequency [MHz]	Antenna	PSD Peak [dBm/100kHz]
802.11n40	HT0	98.63	3F	2422	SISO A	3.79
					SISO B	1.70
			7F	2442	SISO A	3.22
					SISO B	3.37
			9F	2452	SISO A	1.28
					SISO B	1.38
			10F	2457	SISO A	-2.46
					SISO B	-2.88
			11F	2462	SISO A	-9.65
					SISO B	-9.48
	HT8	98.43	3F	2422	MIMO A	-0.21
					MIMO B	-0.15
			7F	2442	MIMO A	1.28
					MIMO B	1.73
			9F	2452	MIMO A	0.28
					MIMO B	0.00
			10F	2457	MIMO A	-3.60
					MIMO B	-3.57
			11F	2462	MIMO A	-11.15
					MIMO B	-11.10

Mode	Rate	Measured Duty Cycle [%]	Channel	Frequency [MHz]	Antenna	PSD Peak [dBm/100kHz]
802.11ax20	HE0	98.38	1	2412	SISO A	8.05
					SISO B	6.69
			7	2442	SISO A	9.10
					SISO B	9.47
			11	2462	SISO A	6.54
					SISO B	3.77
			12	2467	SISO A	5.64
					SISO B	4.64
			13	2472	SISO A	-9.72
					SISO B	-9.97
		98.38	1	2412	MIMO A	5.43
					MIMO B	3.96
			7	2442	MIMO A	6.51
					MIMO B	6.37
			11	2462	MIMO A	4.60
					MIMO B	3.77
			12	2467	MIMO A	2.59
					MIMO B	1.60
			13	2472	MIMO A	-11.30
					MIMO B	-11.49
802.11ax40	HE0	98.46	3F	2422	SISO A	3.41
					SISO B	1.75
			7F	2442	SISO A	3.10
					SISO B	3.31
			9F	2452	SISO A	1.33
					SISO B	1.07
			10F	2457	SISO A	-3.04
					SISO B	-2.82
			11F	2462	SISO A	-9.58
					SISO B	-9.79
		98.46	3F	2422	MIMO A	-0.66
					MIMO B	-0.61
			7F	2442	MIMO A	0.98
					MIMO B	1.61
			9F	2452	MIMO A	0.40
					MIMO B	-0.25
			10F	2457	MIMO A	-3.70
					MIMO B	-4.78
			11F	2462	MIMO A	-11.43
					MIMO B	-11.19

Mode	Rate	Measured Duty Cycle [%]	Channel	Frequenc y [MHz]	Antenna	RU Config	PSD Peak [dBm/100kHz]
802.11ax20	HE0	98.38	1	2412	SISO A	26/0	15.09
						52/37	12.52
						106/53	9.35
					SISO B	26/0	15.65
						52/37	13.10
						106/53	10.88
		MIMO A	26/0	13.06			
			52/37	10.65			
			106/53	6.74			
		MIMO B	26/0	13.84			
			52/37	10.09			
			106/53	7.18			
		98.38	13	2472	SISO A	26/8	-10.66
						52/40	-11.93
						106/54	-12.83
					SISO B	26/8	-9.89
						52/40	-11.92
						106/54	-12.05
		MIMO A	26/8	-12.94			
			52/40	-14.70			
			106/54	-14.12			
		MIMO B	26/8	-12.46			
			52/40	-14.47			
			106/54	-13.37			
802.11ax40	HE0	98.46	3F	2422	SISO A	242/61	5.31
		SISO B			242/61	5.50	
		MIMO B			242/61	4.04	
		MIMO A			242/61	3.77	
		98.46	11F	2462	SISO A	242/62	-9.20
		SISO B			242/62	-9.46	
		MIMO B			242/62	-10.48	
		MIMO A			242/62	-11.39	
98.46							

See Section B.3.5, Section B.3.6 and Section B.3.7 for the screenshot results.

## B.2.5 Radiated spurious emission

### Standard references

FCC part	RSS part	Limits			
15.247 (d) 15.209	RSS-247 Clause 5.5 RSS-Gen Clause 8.9	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 Streghth (μV/m)	Field Streghth (dBμV/m)	Meas. Distance (m)
		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 setups below were used to measure the radiated spurious emissions.

Depending of the frequency range and bands being tested, different antennas and filters were used.

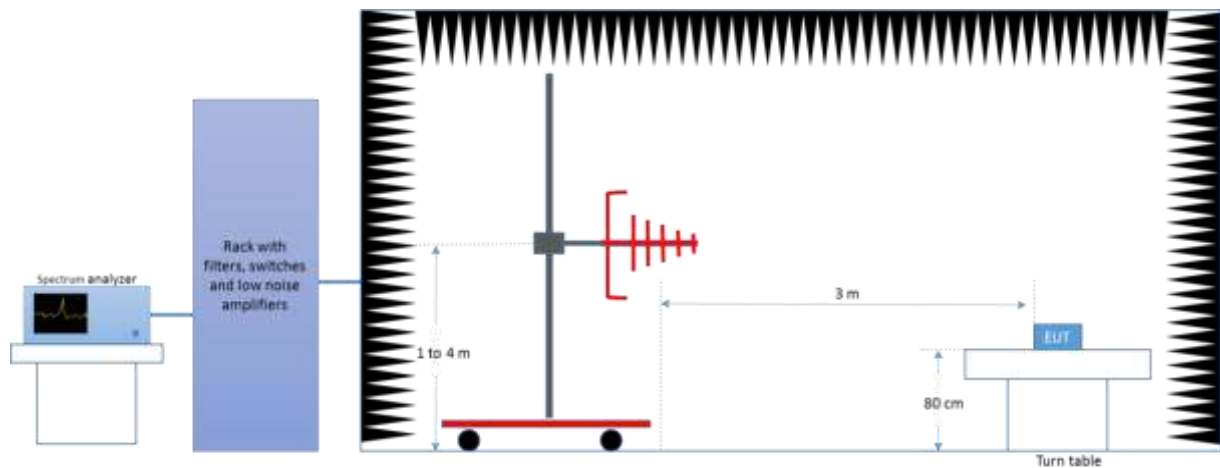
The final measurement is done by varying the antenna height from 1 to 4 meters, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

The radiated spurious emissions were measured on the worst case configuration selected from the chapter B.2.2 and using the lowest, middle and highest channels.

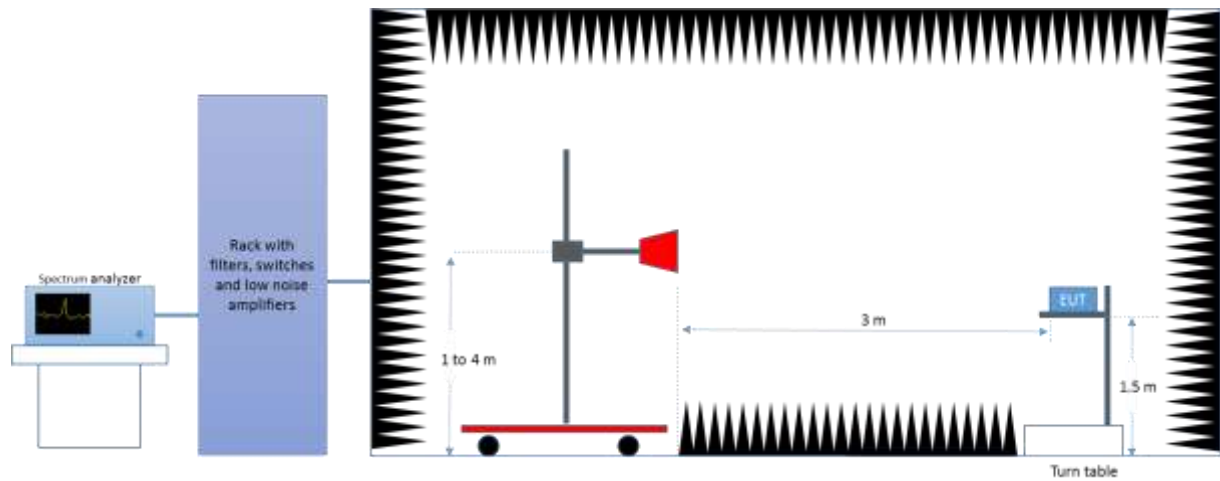
For technologies 802.11ax20 and 802.11ax40, the worst case spurious emission result among the low, mid and high channels tested separately on Chain A and B is used to perform the test on MIMO mode (Chain A+B).

For 802.11n20 and 802.11n40 the worst channel found among all 802.11ax modes mentioned above is chosen to perform the test in Chain A, B, and MIMO (Chain A+B).

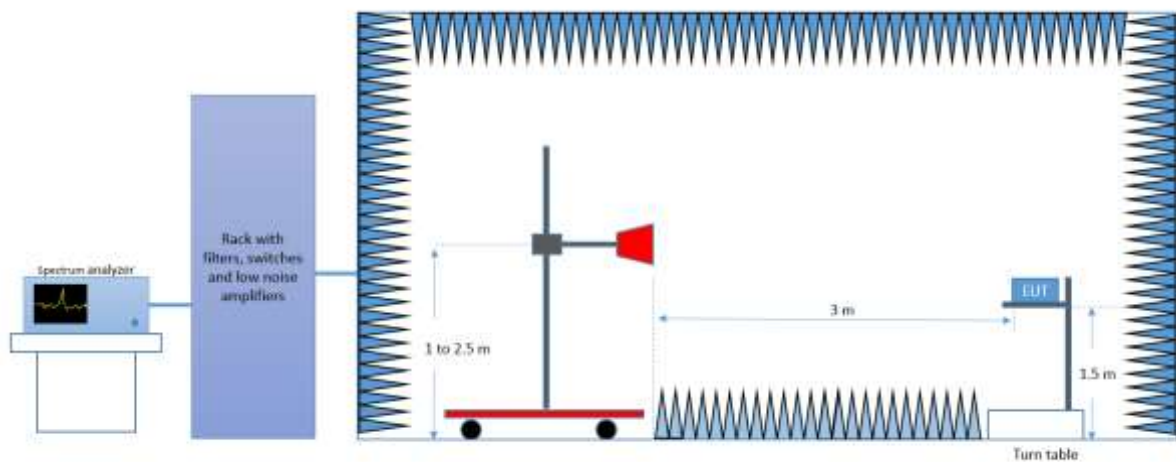
*Radiated Setup 30 MHz - 1GHz*



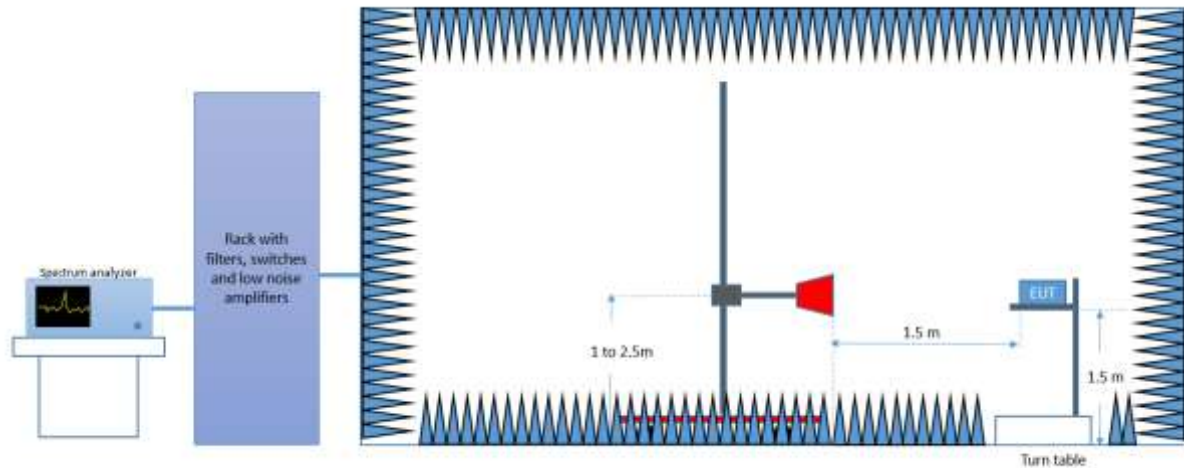
*Radiated Setup 1 GHz – 6.4 GHz*



*Radiated Setup 6.4 GHz – 18 GHz*



## Radiated Setup 18 GHz – 26.5 GHz



### Sample Calculation

The field strength is deduced from the radiated measurement using the following equation:

$$E = 126.8 - 20\log(\lambda) + P - G$$

where

$E$  is the field strength of the emission at the measurement distance, in dB $\mu$ V/m

$P$  is the power measured at the output of the test antenna, in dBm

$\lambda$  is the wavelength of the emission under investigation  $[300/f_{MHz}]$ , in m

$G$  is the gain of the test antenna, in dBi

NOTE – The measured power  $P$  includes all applicable instrument correction factors up to the connection to the test

Antenna e.g. cable losses, amplifier gains.

For field strength measurements made at other than the distance at which the applicable limit is specified, the field strength of the emission at the distance specified by the limit is deduced as follows:

$$E_{SpecLimit} = E_{Meas} + 20\log(D_{Meas}/D_{SpecLimit})$$

where

$E_{SpecLimit}$  is the field strength of the emission at the distance specified by the limit, in dB $\mu$ V/m

$E_{Meas}$  is the field strength of the emission at the measurement distance, in dB $\mu$ V/m

$D_{Meas}$  is the measurement distance, in m

$D_{SpecLimit}$  is the distance specified by the limit, in m

## Test Results

### 30 MHz – 26.5 GHz, 802.11b, 1Mbps, Chain A

#### Radiated Spurious – CH1

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
62.5	30.8	---	40.0	9.2
4824.3	---	42.4	54.0	11.6
4827.3	50.3	---	74.0	23.7
7237.1	51.2	---	74.0	22.8
7238.1	---	39.9	54.0	14.1
25684.8	49.9	---	74.0	24.1
25928.1	---	39.2	54.0	14.8

#### Radiated Spurious – CH7

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
625.1	36.3	---	46.0	9.7
1242.0	53.6	---	74.0	20.4
1243.0	---	32.4	54.0	21.6
7324.6	48.5	---	74.0	25.5
7325.1	---	39.1	54.0	14.9
24242.5	49.8	---	74.0	24.2
25951.0	---	38.8	54.0	15.2

#### Radiated Spurious – CH11

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
528.0	33.9	---	46.0	12.1
1244.5	---	32.3	54.0	21.7
1244.5	53.5	---	74.0	20.5
7384.1	---	37.6	54.0	16.4
9847.6	---	38.2	54.0	15.8
25861.4	49.4	---	74.0	24.6
25955.2	---	39.0	54.0	15.0



## 30 MHz – 26.5 GHz, 802.11b, 1Mbps, Chain B

### Radiated Spurious – CH1

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
624.6	35.0	---	46.0	11.0
1245.0	54.1	---	74.0	19.9
1245.5	---	31.1	54.0	22.9
16746.7	---	41.5	54.0	12.5
16774.3	53.7	---	74.0	20.3
25691.7	49.3	---	74.0	24.8
25892.0	---	39.1	54.0	14.9

### Radiated Spurious – CH7

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
576.0	33.3	---	46.0	12.7
1244.0	---	31.1	54.0	22.9
1244.0	52.4	---	74.0	21.6
16747.2	53.1	---	74.0	20.9
16749.6	---	41.5	54.0	12.5
21211.9	---	38.5	54.0	15.5
25684.0	49.1	---	74.0	24.9

### Radiated Spurious – CH11

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
183.0	29.5	---	43.6	14.1
1240.5	54.4	---	74.0	19.6
1244.5	---	32.6	54.0	21.4
9848.6	---	37.9	54.0	16.1
16730.8	53.4	---	74.0	20.6
25904.7	---	38.8	54.0	15.2
25955.2	49.2	---	74.0	24.8

## 30 MHz – 26.5 GHz, 802.11g, 6Mbps, Chain A

### Radiated Spurious – CH1

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
528.0	36.1	---	46.0	9.9
1240.5	55.0	---	74.0	19.0
1244.0	---	33.3	54.0	20.7
7235.7	---	38.2	54.0	15.8
7238.6	49.4	---	74.0	24.6
25914.3	46.8	---	74.0	27.2
25914.3	---	38.9	54.0	15.1

### Radiated Spurious – CH7

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
528.0	34.7	---	46.0	11.3
1246.5	55.3	---	74.0	18.7
1246.5	---	33.5	54.0	20.5
7322.7	48.6	---	74.0	25.4
7325.6	---	37.9	54.0	16.1
25256.6	50.4	---	74.0	23.6
25945.4	---	38.8	54.0	15.2

### Radiated Spurious – CH11

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
528.0	33.9	---	46.0	12.1
1246.0	---	34.0	54.0	20.0
1246.0	55.6	---	74.0	18.4
16733.7	53.7	---	74.0	20.3
16757.4	---	41.8	54.0	12.2
25952.8	47.5	---	74.0	26.5
25952.8	---	38.9	54.0	15.1

## 30 MHz – 26.5 GHz, 802.11g, 6Mbps, Chain B

### Radiated Spurious – CH1

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
624.0	36.7	---	46.0	9.3
1244.5	---	32.2	54.0	21.8
1247.5	54.7	---	74.0	19.3
16751.6	---	41.7	54.0	12.3
17244.6	53.4	---	74.0	20.6
25954.1	47.3	---	74.0	26.7
25954.1	---	38.7	54.0	15.3

### Radiated Spurious – CH7

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
628.2	35.9	---	46.0	10.1
1245.0	---	33.4	54.0	20.6
1245.0	53.9	---	74.0	20.1
16403.6	53.7	---	74.0	20.3
16753.5	---	41.5	54.0	12.5
25937.4	---	38.6	54.0	15.4
25968.5	49.4	---	74.0	24.6

### Radiated Spurious – CH11

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
576.0	33.4	---	46.0	12.6
1243.0	---	32.9	54.0	21.1
1247.0	54.7	---	74.0	19.3
16439.3	53.0	---	74.0	21.0
16754.5	---	41.5	54.0	12.5
26005.4	46.1	---	74.0	27.9
26005.4	---	38.6	54.0	15.4

### 30 MHz – 26.5 GHz, 802.11n20, HT0, Chain A

#### Radiated Spurious – CH1

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
528.0	34.3	---	46.0	11.7
1243.0	54.1	---	74.0	19.9
1245.0	---	32.4	54.0	21.6
7228.9	48.7	---	74.0	25.3
7232.8	---	37.9	54.0	16.1
25934.0	49.4	---	74.0	24.6
25962.4	---	38.6	54.0	15.4

### 30 MHz – 26.5 GHz, 802.11n20, HT0, Chain B

#### Radiated Spurious – CH1

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
576.0	35.8	---	46.0	10.2
1243.0	55.0	---	74.0	19.0
1243.0	---	32.5	54.0	21.5
16698.4	53.1	---	74.0	20.9
16741.4	---	41.4	54.0	12.6
25884.8	49.5	---	74.0	24.5
25954.9	---	38.8	54.0	15.2

# 30 MHz – 26.5 GHz, 802.11n20, HT0, Chain A+B

## Radiated Spurious – CH1

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
62.5	32.2	---	40.0	7.9
1242.0	---	32.7	54.0	21.3
1242.0	54.6	---	74.0	19.4
16704.7	53.2	---	74.0	20.8
16705.2	---	41.3	54.0	12.7
25925.7	---	38.7	54.0	15.3
25951.8	49.2	---	74.0	24.8

## 30 MHz – 26.5 GHz, 802.11ax20, HE0, Chain A

### Radiated Spurious – CH1

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
576.0	34.1	---	46.0	11.9
1244.5	53.8	---	74.0	20.2
1245.5	---	33.3	54.0	20.7
7210.1	---	45.6	54.0	8.4
7210.6	52.8	---	74.0	21.2
25906.9	49.2	---	74.0	24.8
25952.3	---	38.8	54.0	15.2

### Radiated Spurious – CH7

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
576.0	34.3	---	46.0	11.7
6293.8	55.1	---	74.0	18.9
6319.2	---	43.3	54.0	10.7
7300.5	51.9	---	74.0	22.1
7300.5	---	43.1	54.0	10.9
9734.0	49.5	---	74.0	24.5
9734.5	---	38.0	54.0	16.0
25951.5	47.1	---	74.0	26.9
25951.5	---	38.6	54.0	15.4

### Radiated Spurious – CH11

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
576.0	33.7	---	46.0	12.3
6279.9	54.8	---	74.0	19.2
6287.4	---	42.7	54.0	11.3
7360.9	---	38.1	54.0	15.9
7361.4	50.3	---	74.0	23.7
25941.7	49.8	---	74.0	24.2
25949.6	---	38.8	54.0	15.2

## 30 MHz – 26.5 GHz, 802.11ax20, HE0, Chain B

### Radiated Spurious – CH1

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
576.0	34.1	---	46.0	11.9
1246.0	---	33.0	54.0	21.0
1246.0	55.6	---	74.0	18.4
7210.1	---	50.0	54.0	4.0
7210.6	58.8	---	74.0	15.2
7222.6	---	37.9	54.0	16.1
7228.4	---	38.1	54.0	15.9
7231.8	---	37.8	54.0	16.2
7244.9	---	38.7	54.0	15.3
12016.3	54.3	---	74.0	19.7
12017.3	---	44.4	54.0	9.6
25606.7	49.5	---	74.0	24.5
25939.8	---	38.6	54.0	15.4

### Radiated Spurious – CH7

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
576.0	34.4	---	46.0	11.6
6313.9	---	43.4	54.0	10.6
6326.0	55.4	---	74.0	18.6
7300.5	50.0	---	74.0	24.0
7300.5	---	40.3	54.0	13.7
24239.5	49.3	---	74.0	24.7
25942.7	---	38.6	54.0	15.4

### Radiated Spurious – CH11

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
624.0	35.8	---	46.0	10.2
6318.4	---	43.3	54.0	10.7
6333.1	55.4	---	74.0	18.6
7360.9	---	37.6	54.0	16.4
7361.4	49.1	---	74.0	24.9
25954.1	49.1	---	74.0	24.9
26003.5	---	38.7	54.0	15.3

### 30 MHz – 26.5 GHz, 802.11ax20, HE0, Chain A+B

### Radiated Spurious – CH1

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
576.0	34.4	---	46.0	11.6
1247.5	---	32.9	54.0	21.1
1247.5	55.8	---	74.0	18.2
7210.6	50.5	---	74.0	23.5
7210.6	---	41.4	54.0	12.6
25664.3	49.3	---	74.0	24.7
25946.7	---	38.9	54.0	15.1



### 30 MHz – 26.5 GHz, 802.11n40, HT0, Chain A

#### Radiated Spurious – CH3F

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
624.0	36.2	---	46.0	9.8
1742.0	---	41.9	54.0	12.1
1742.0	48.2	---	74.0	25.8
16734.2	---	41.3	54.0	12.7
16741.4	52.7	---	74.0	21.3
24992.6	49.7	---	74.0	24.3
25953.3	---	38.7	54.0	15.3

### 30 MHz – 26.5 GHz, 802.11n40, HT0, Chain B

#### Radiated Spurious – CH3F

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
625.7	36.3	---	46.0	9.7
1740.5	50.6	---	74.0	23.4
1741.0	---	41.8	54.0	12.2
16738.0	---	41.3	54.0	12.7
16744.8	53.0	---	74.0	21.0
25948.3	49.9	---	74.0	24.1
25957.1	---	39.0	54.0	15.0

# 30 MHz – 26.5 GHz, 802.11n40, HT0, Chain A+B

## Radiated Spurious – CH3F

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
640.0	36.4	---	46.0	9.6
1745.0	---	39.1	54.0	14.9
1745.5	46.3	---	74.0	27.8
16734.2	---	41.7	54.0	12.3
16770.4	53.2	---	74.0	20.8
25928.1	49.7	---	74.0	24.3
25936.6	---	38.5	54.0	15.5

## 30 MHz – 26.5 GHz, 802.11ax40, HE0, Chain A

### Radiated Spurious – CH3F

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
853.1	37.8	---	46.0	8.2
2331.5	---	45.7	54.0	8.3
2331.5	56.7	---	74.0	17.3
7212.0	---	45.6	54.0	8.4
7212.0	52.8	---	74.0	21.2
25940.3	---	38.8	54.0	15.2
25944.8	49.1	---	74.0	24.9

### Radiated Spurious – CH6F

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
528.0	34.4	---	46.0	11.6
1246.5	---	34.0	54.0	20.0
1246.5	54.6	---	74.0	19.4
7256.5	50.0	---	74.0	24.0
7257.0	---	40.2	54.0	13.8
25933.2	49.6	---	74.0	24.4
25955.5	---	38.6	54.0	15.4

### Radiated Spurious – CH9F

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
576.0	33.8	---	46.0	12.2
1247.0	---	32.7	54.0	21.3
1247.0	54.3	---	74.0	19.7
7299.5	53.0	---	74.0	21.0
7301.4	---	43.7	54.0	10.3
25890.1	49.1	---	74.0	24.9
25961.3	---	38.5	54.0	15.5

## 30 MHz – 26.5 GHz, 802.11ax40, HE0, Chain B

### Radiated Spurious – CH3F

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
624.0	35.9	---	46.0	10.1
2331.5	56.7	---	74.0	17.3
2332.5	---	45.0	54.0	9.0
7212.0	---	43.3	54.0	10.7
7213.0	53.6	---	74.0	20.4
25911.1	49.5	---	74.0	24.5
25935.3	---	38.6	54.0	15.4

### Radiated Spurious – CH6F

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
672.0	36.4	---	46.0	9.6
1747.5	---	40.9	54.0	13.2
1747.5	47.6	---	74.0	26.4
16738.5	---	41.2	54.0	12.8
17972.0	53.2	---	74.0	20.8
25954.4	50.5	---	74.0	23.5
25956.5	---	38.5	54.0	15.5

### Radiated Spurious – CH9F

Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
528.0	34.9	---	46.0	11.1
1242.5	54.8	---	74.0	19.2
1245.5	---	32.4	54.0	21.6
7301.9	---	37.7	54.0	16.3
7301.9	48.0	---	74.0	26.0
23979.0	49.1	---	74.0	24.9
25953.1	---	39.0	54.0	15.0

# 30 MHz – 26.5 GHz, 802.11ax40, HE0, Chain A+B

## Radiated Spurious – CH3F

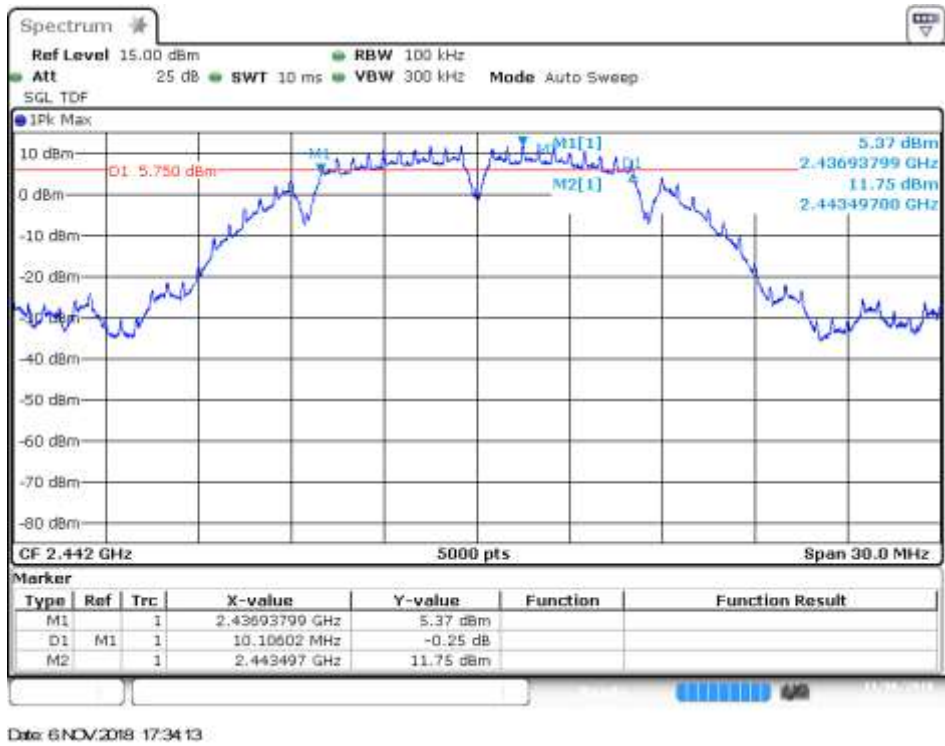
Frequency	MaxPeak	Avg	Limit	Margin
MHz	dBuV/m	dBuV/m	dBuV/m	dB
672.0	36.5	---	46.0	9.5
2332.0	---	45.8	54.0	8.2
2333.0	56.7	---	74.0	17.3
7211.5	51.5	---	74.0	22.5
7212.5	---	41.6	54.0	12.4
24257.9	49.7	---	74.0	24.3
25958.7	---	38.7	54.0	15.3

### B.3 Test Results Screenshot

#### B.3.1 6dB Bandwidth

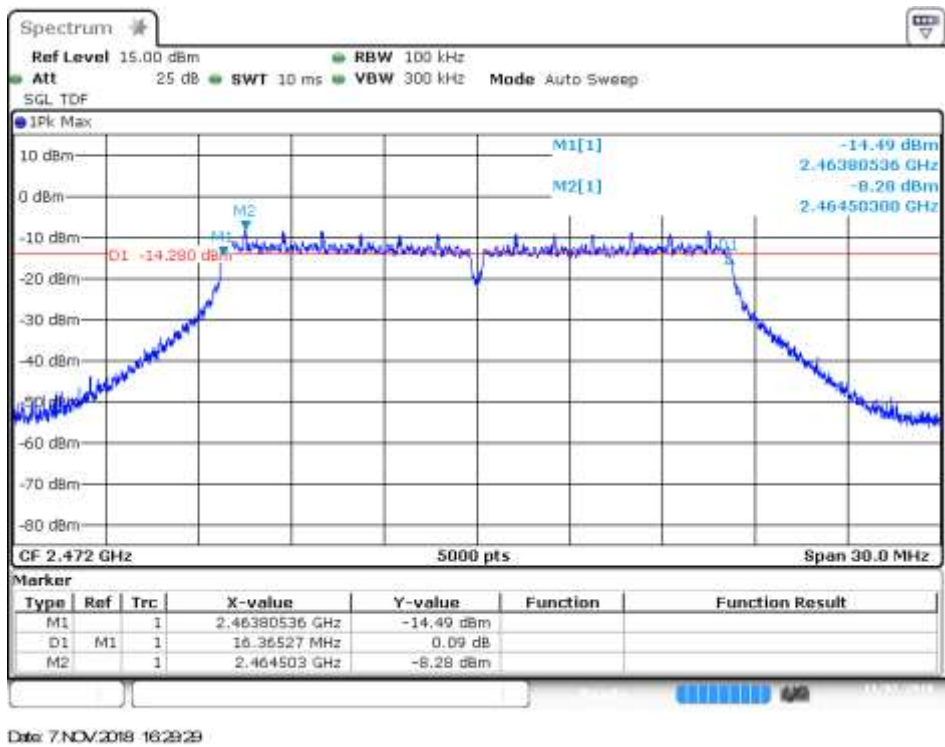
## SISO-A, 802.11b, 1Mbps

Channel 7



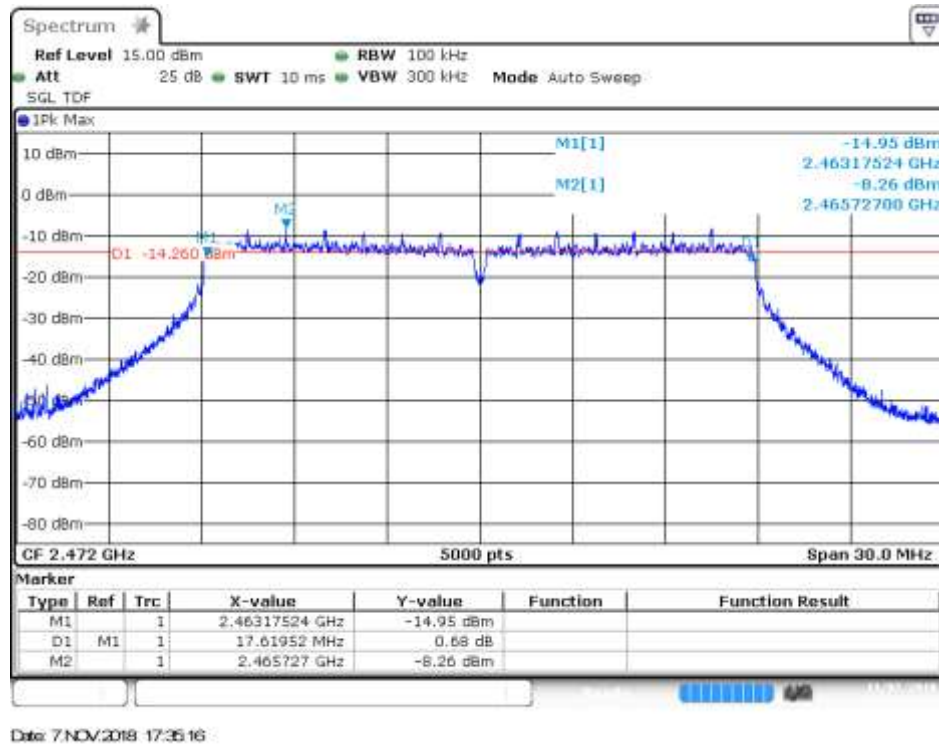
## SISO-A, 802.11g, 6Mbps

Channel 13



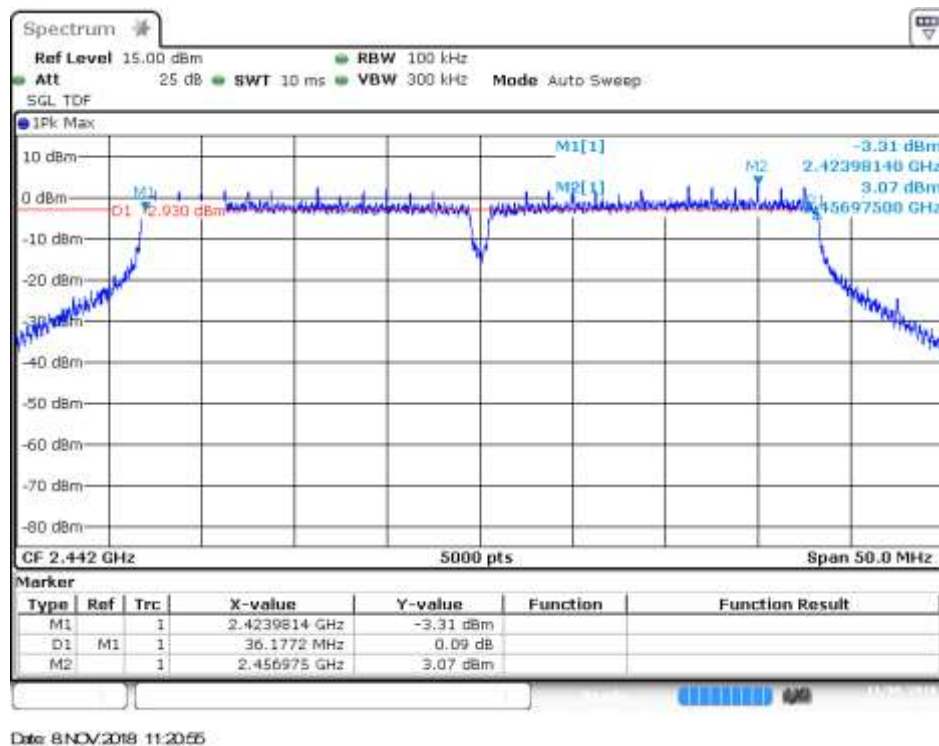
## SISO-A, 802.11n20, HT0

Channel 13



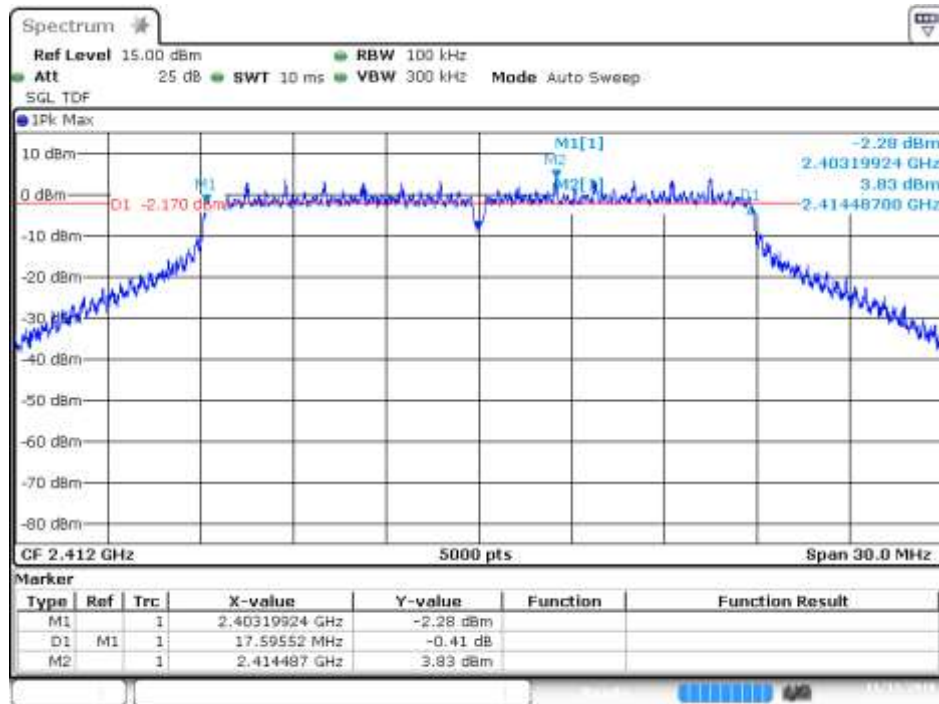
## SISO-A, 802.11n40, HT0

Channel 7F



## MIMO-B, 802.11n20, HT8

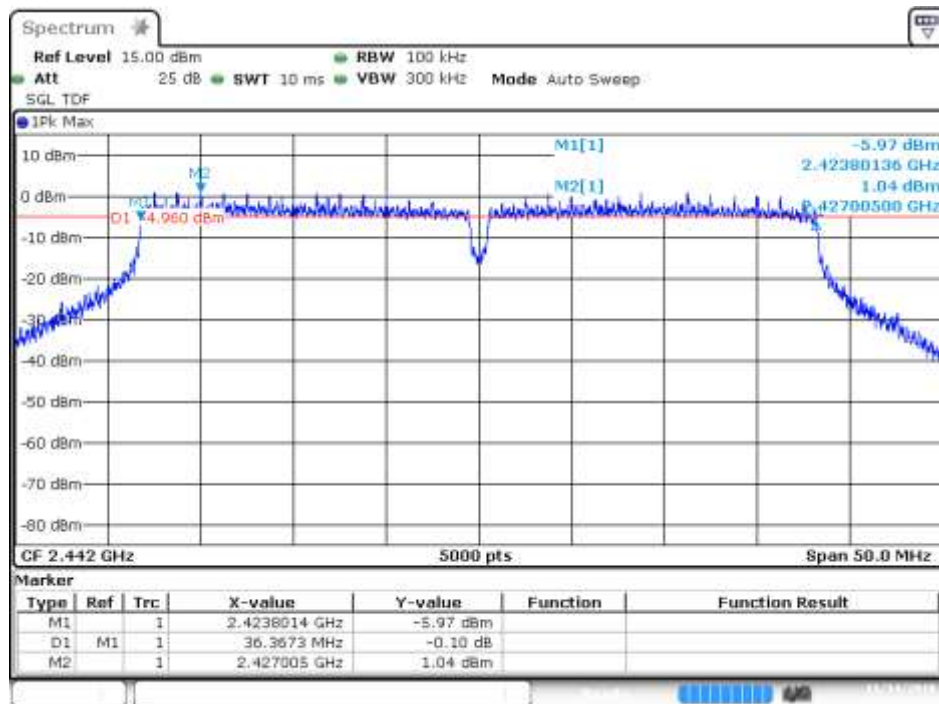
Channel 1



Date: 13 NOV 2018 18:08:36

## MIMO-B, 802.11n40, HT8

Channel 7F

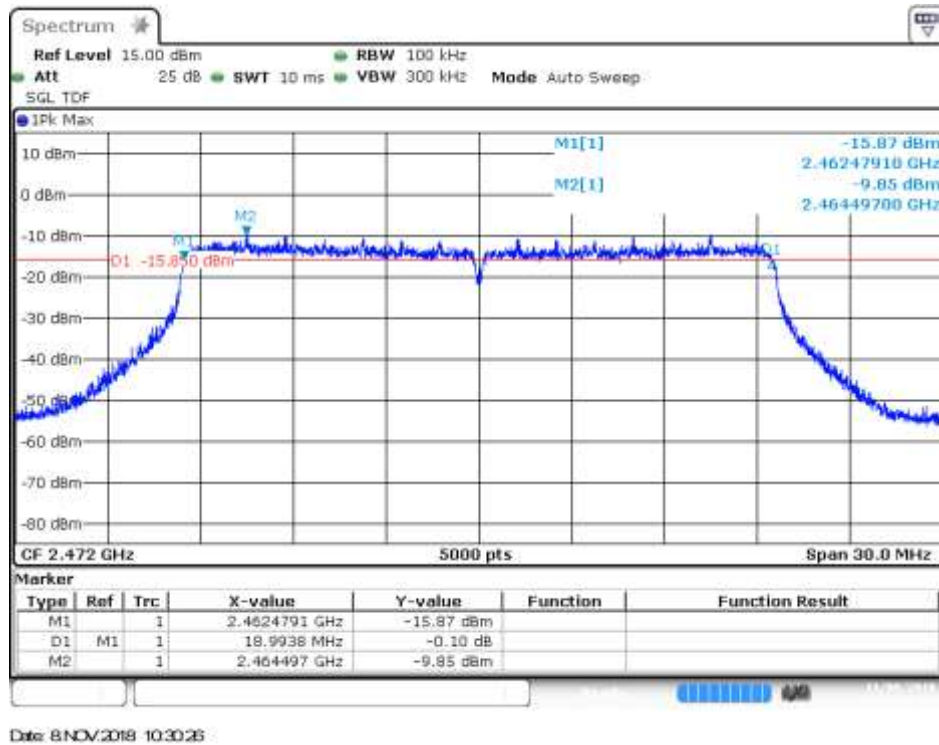


Date: 14 NOV 2018 13:59:29



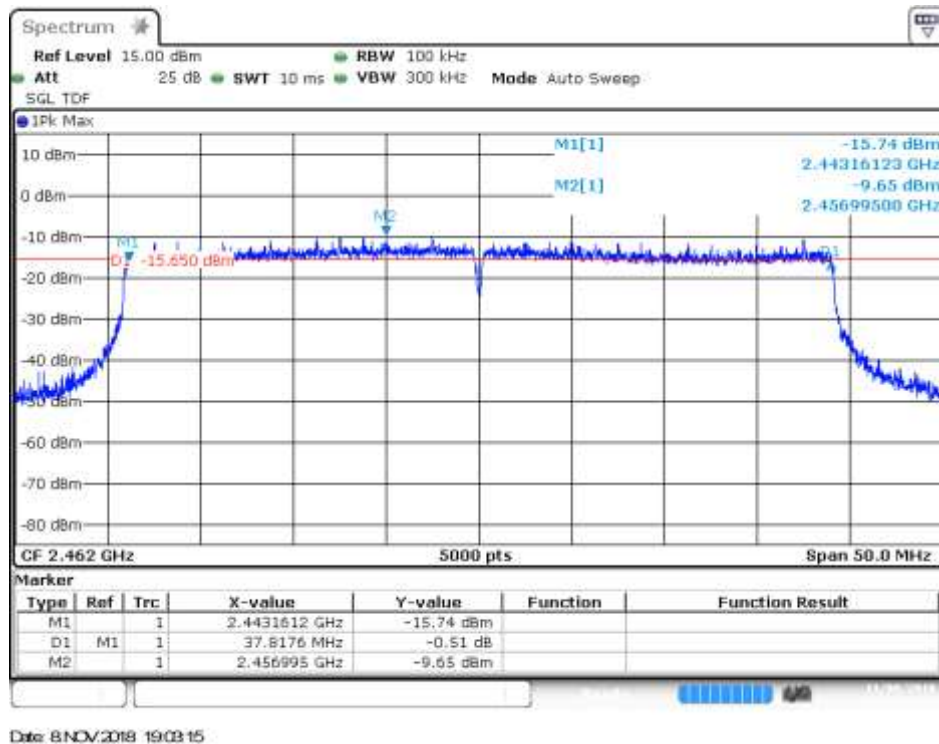
## SISO-A, 802.11ax20, HE0

Channel 13



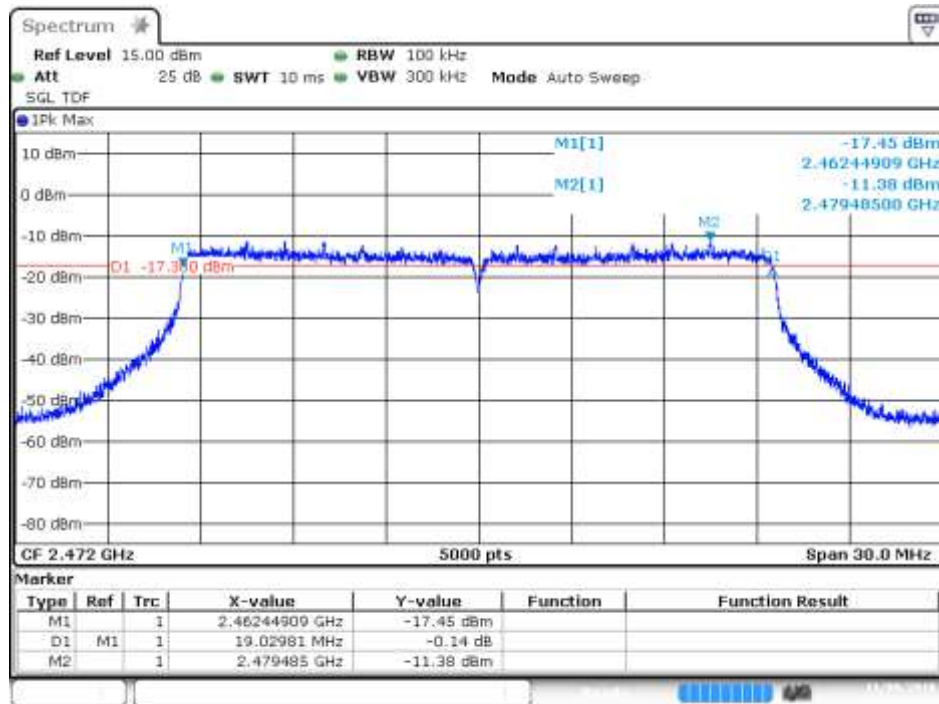
## SISO-A, 802.11ax40, HE0

Channel 11F



## MIMO-A, 802.11ax20, HE0

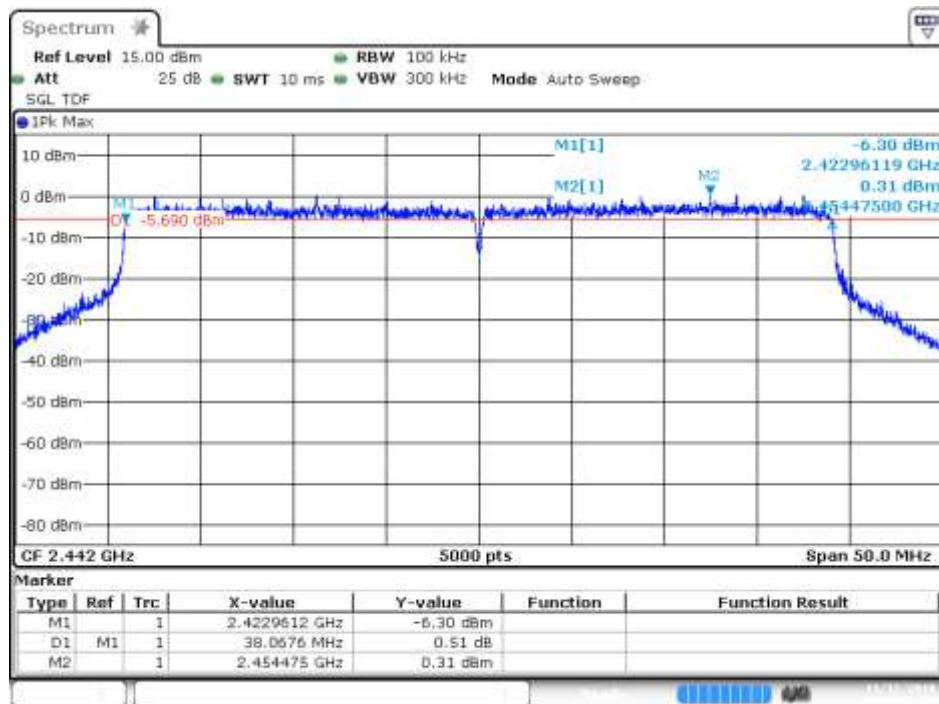
Channel 13



Date: 9 NOV 2018 17:04:31

## MIMO-A, 802.11ax40, HE0

Channel 7F



Date: 12 NOV 2018 11:34:35

### B.3.2 99% Bandwidth

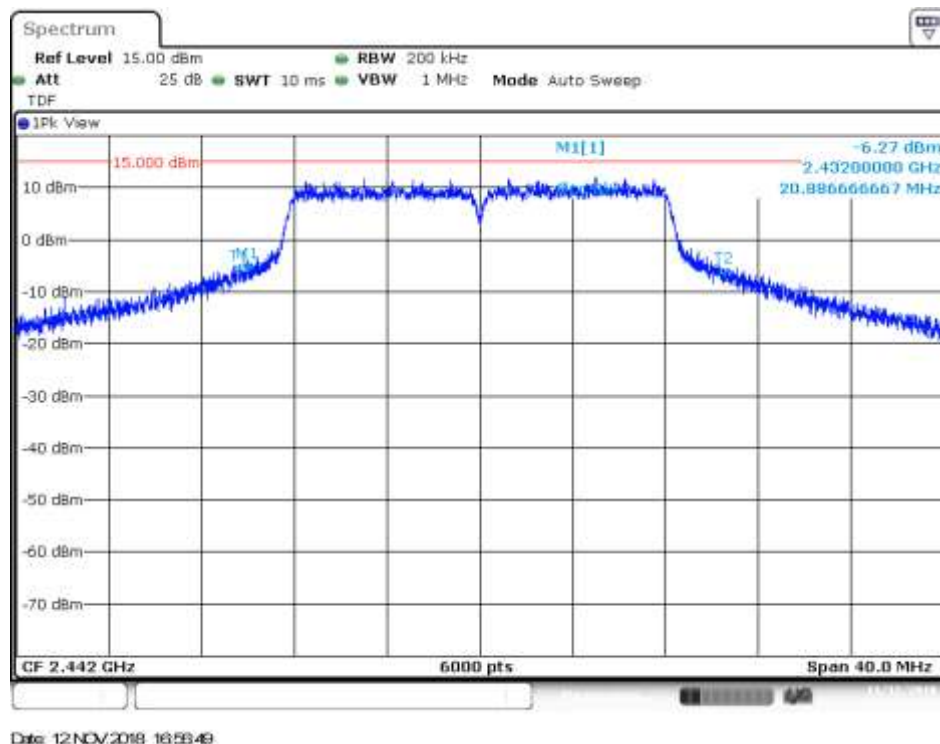
## SISO-A, 802.11b, 1Mbps

Channel 7



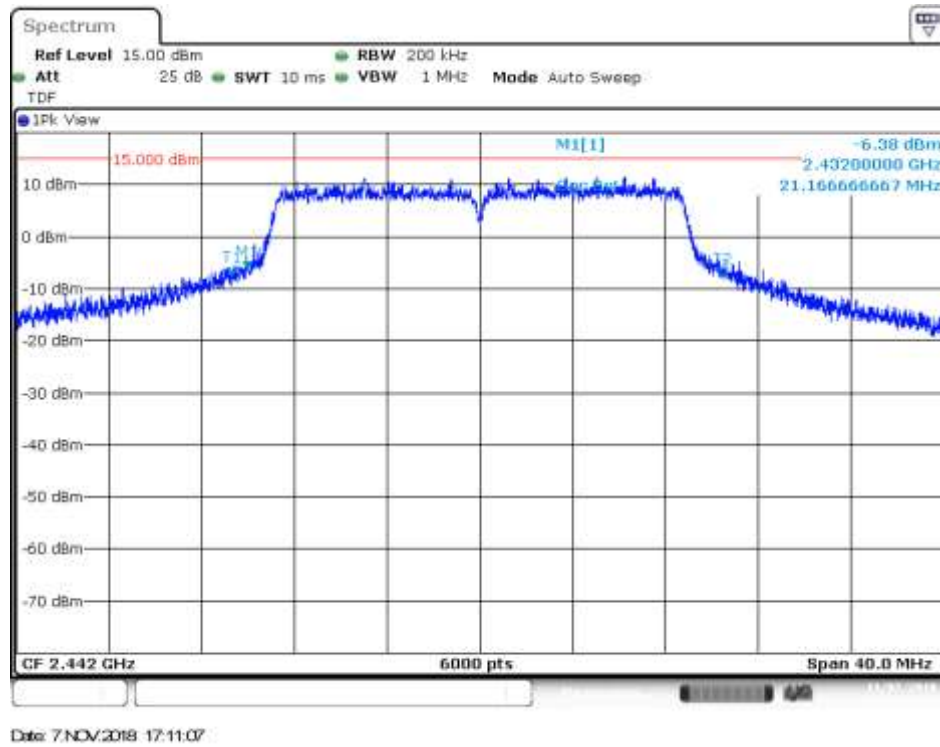
## SISO-B, 802.11g, 6Mbps

Channel 7



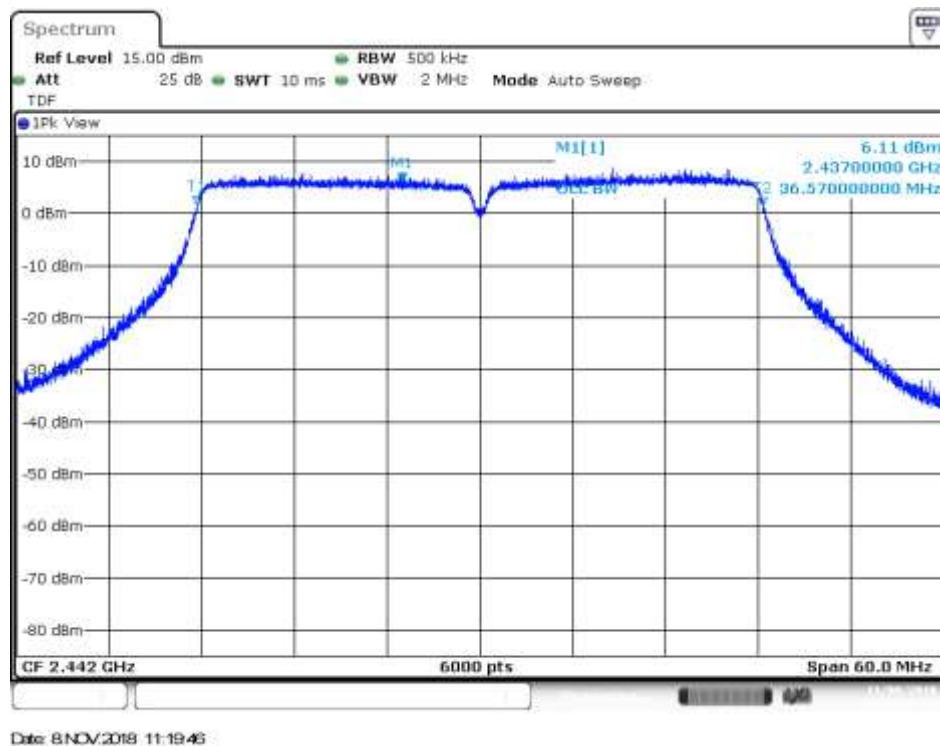
## SISO-A, 802.11n20, HT0

Channel 7



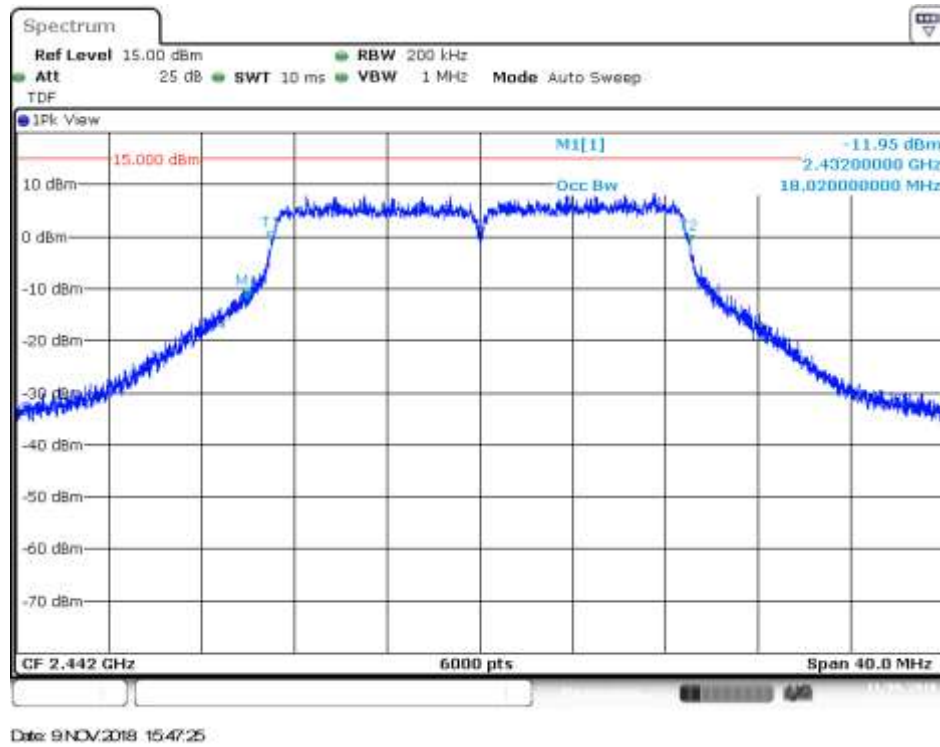
## SISO-A, 802.11n40, HT0

Channel 7F



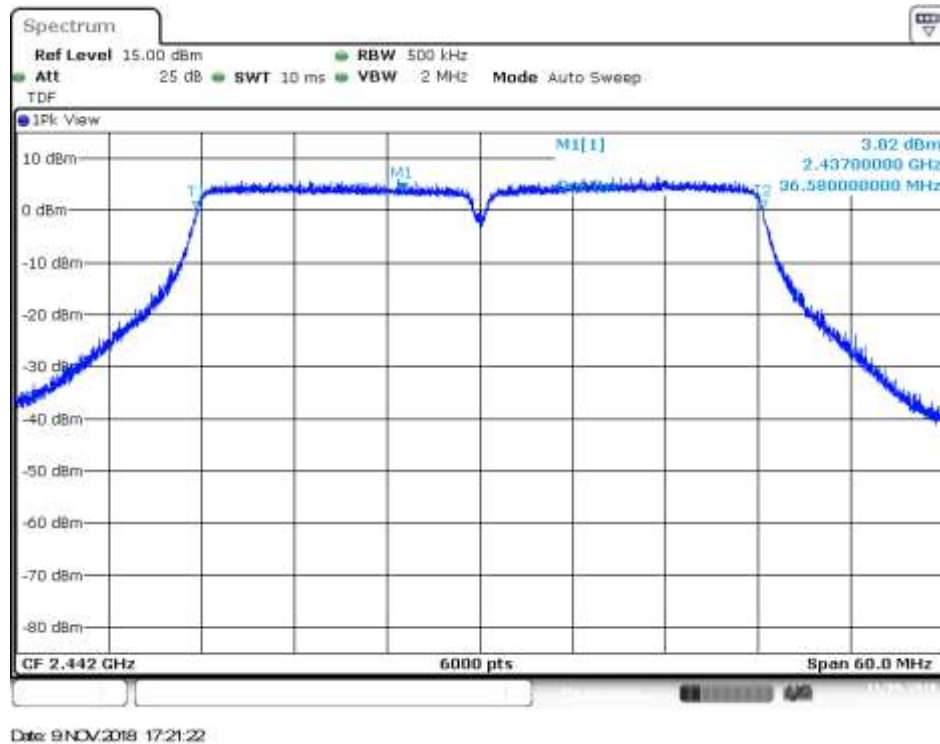
## MIMO-A, 802.11n20, HT8

Channel 7



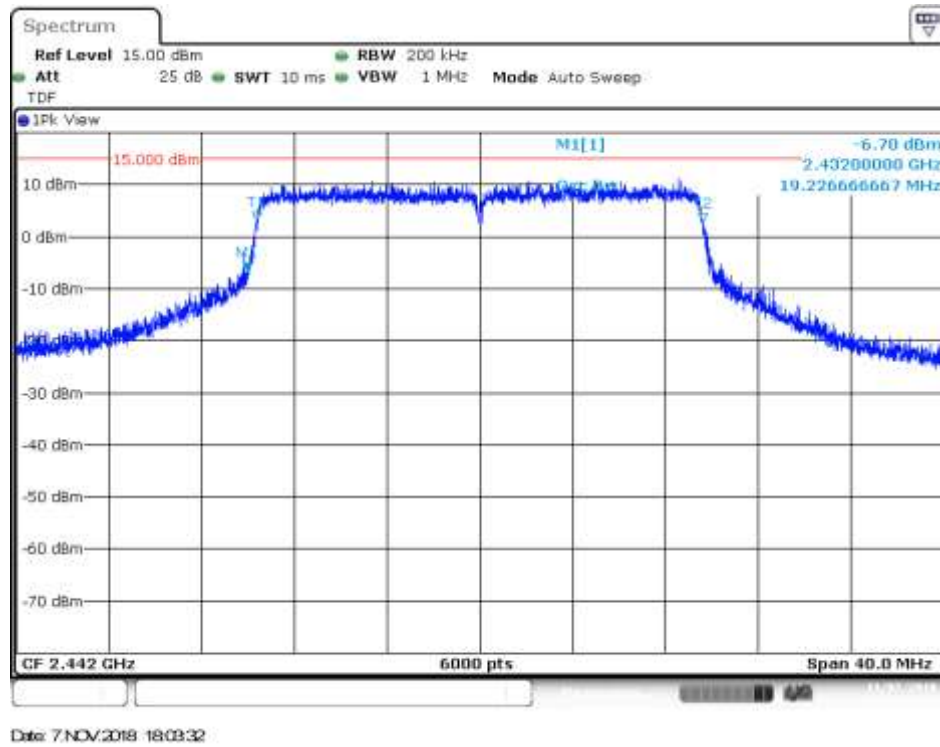
## MIMO-A, 802.11n40, HT8

Channel 7F



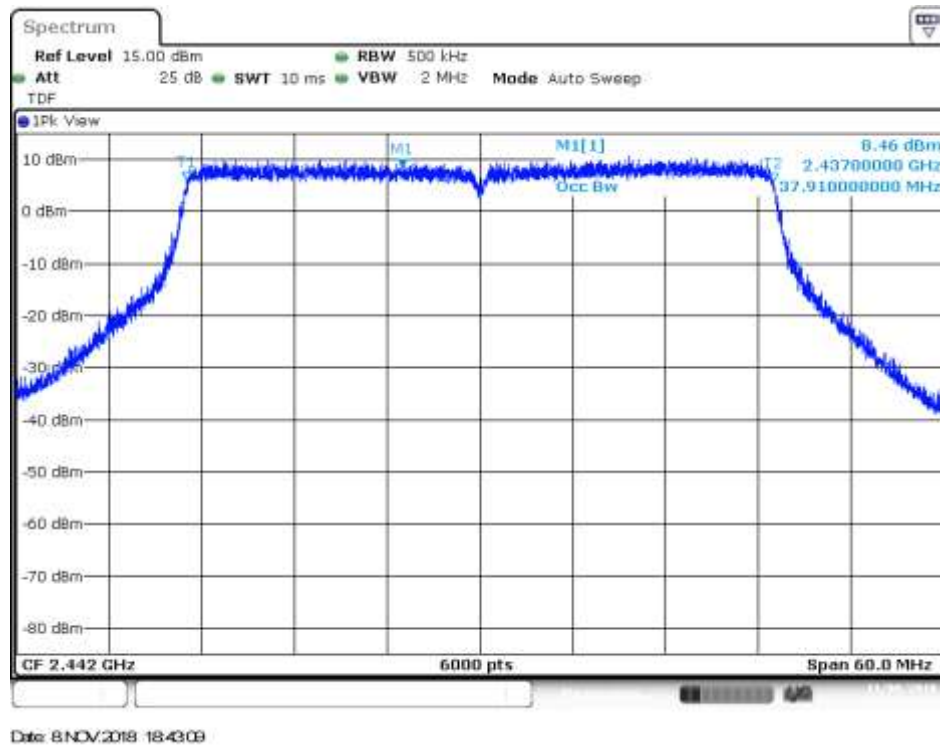
## SISO-A, 802.11ax20, HE0

Channel 7



## SISO-B, 802.11ax40, HE0

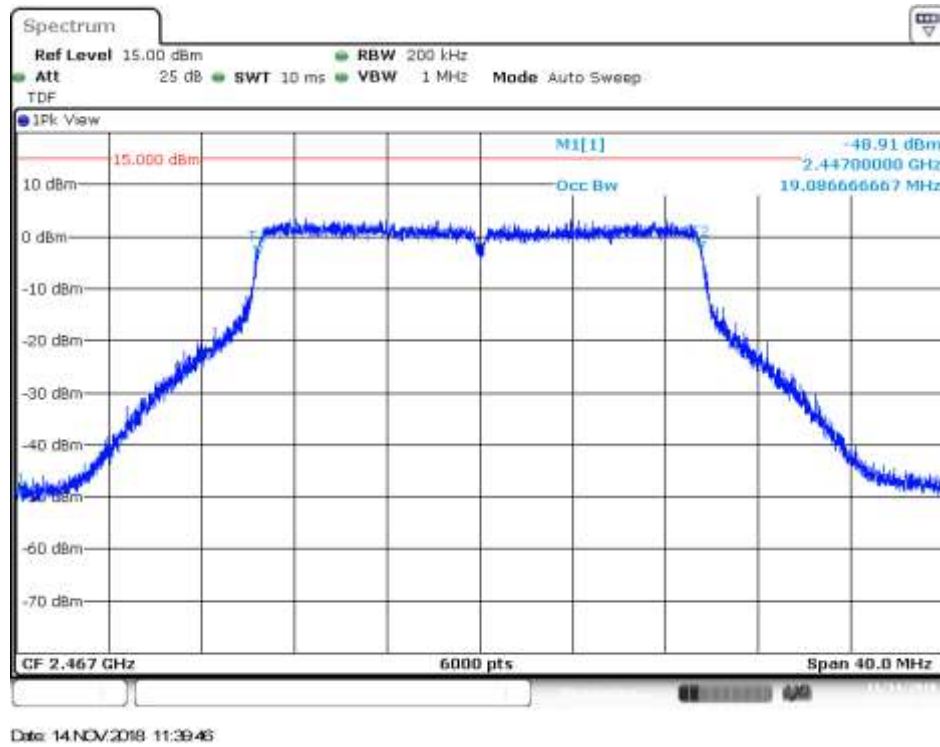
Channel 7F





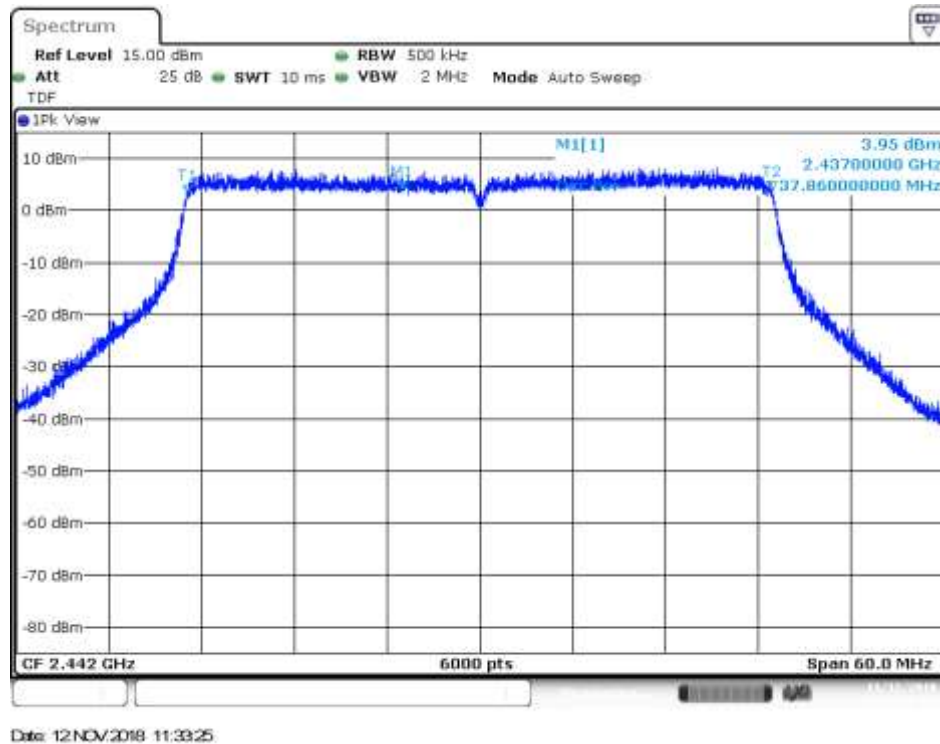
## MIMO-B, 802.11ax20, HE0

Channel 12



## MIMO-A, 802.11ax40, HE0

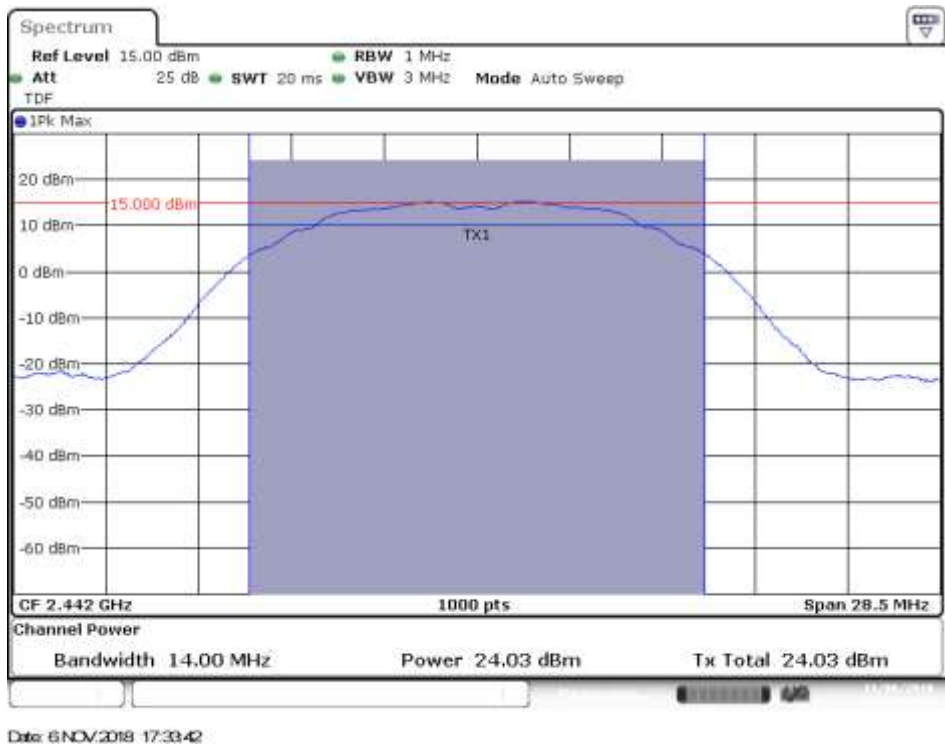
Channel 7F



### B.3.3 Maximum output power and antenna gain

#### SISO-A, 802.11b, 1Mbps

Channel 7



#### SISO-B, 802.11b, 1Mbps

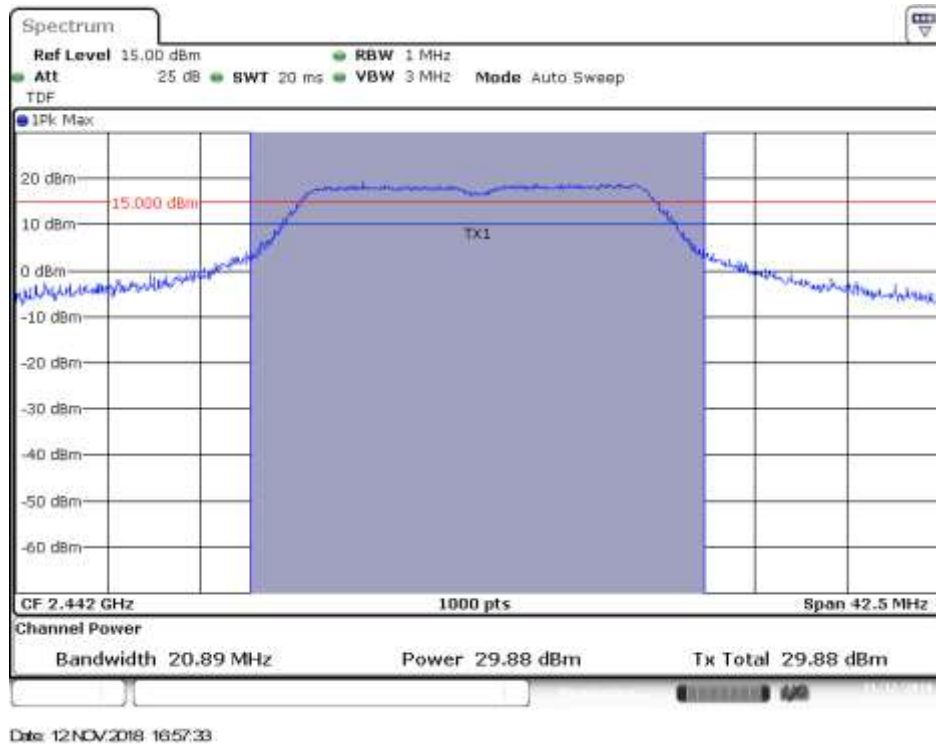
Channel 13





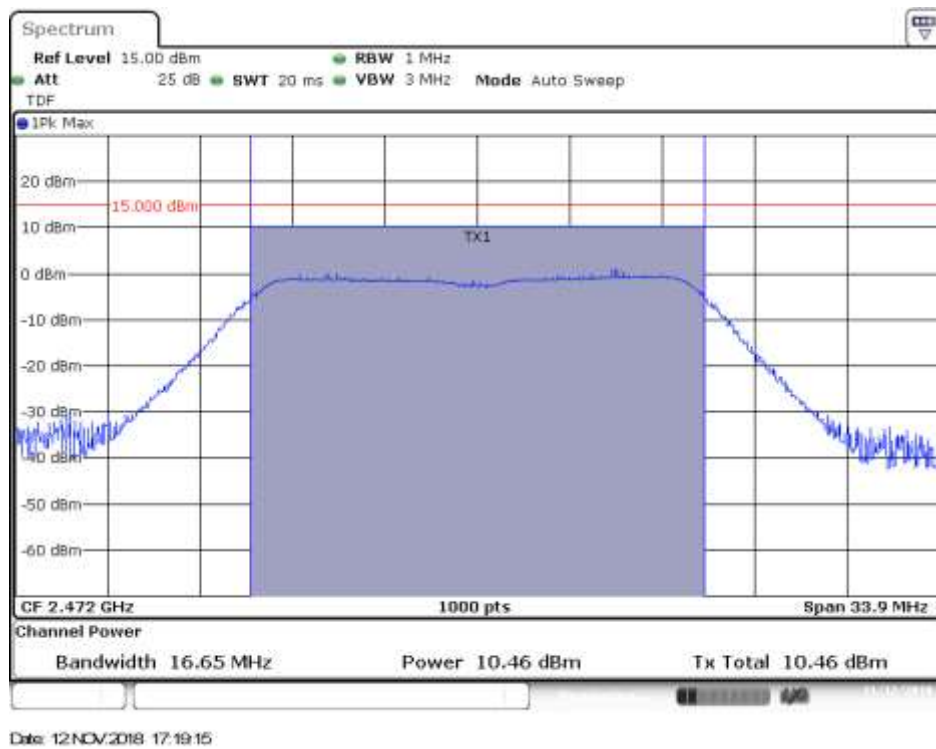
## SISO-B, 802.11g, 6Mbps

Channel 7



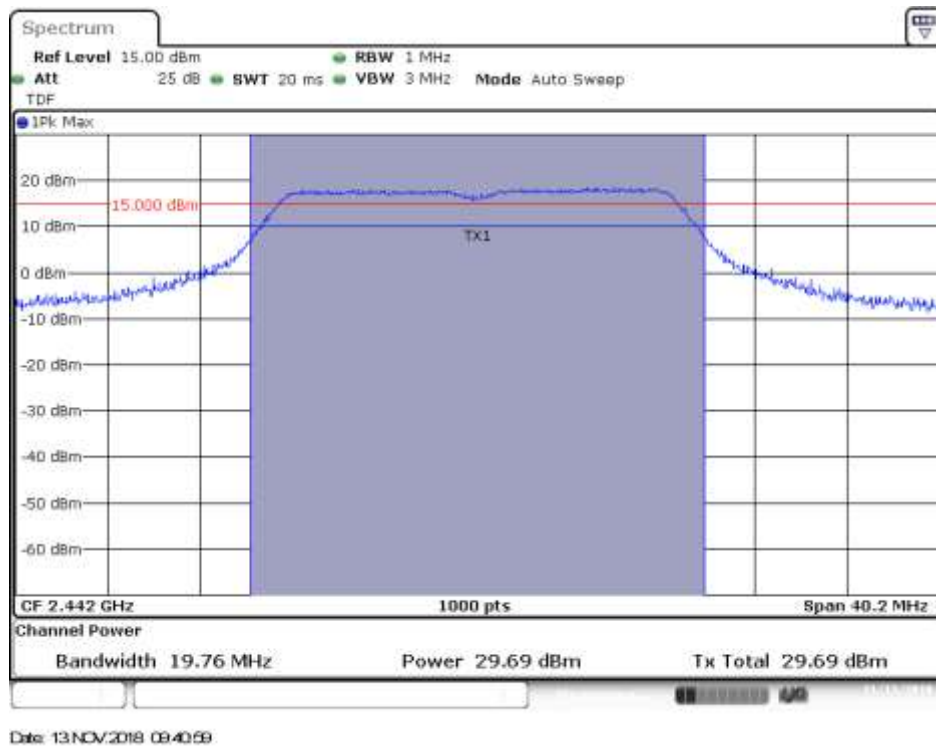
## SISO-B, 802.11g, 6Mbps

Channel 13



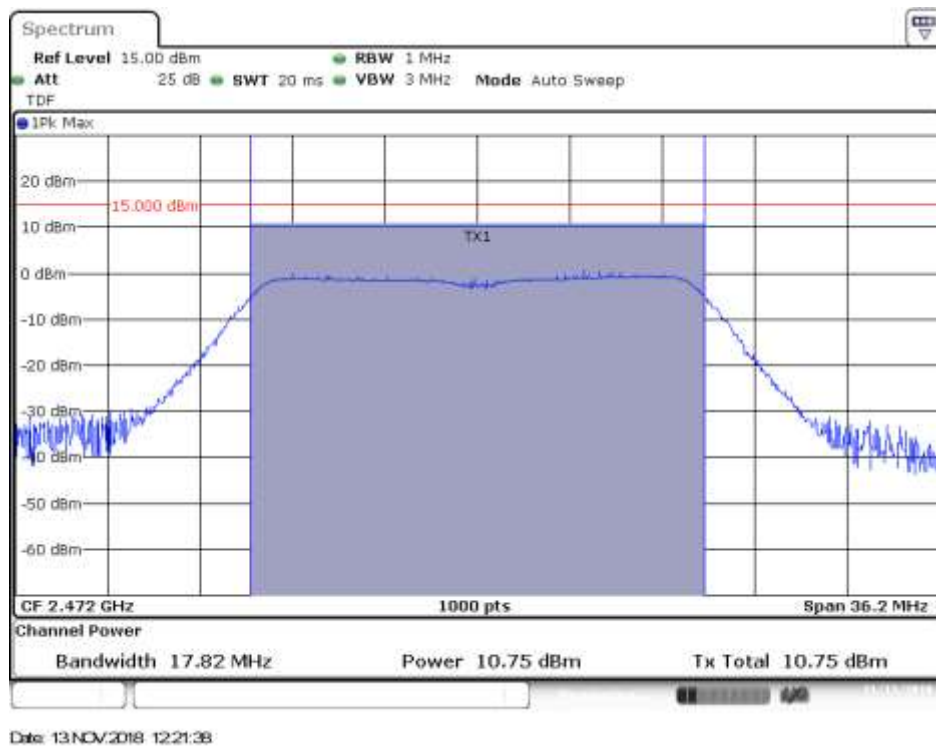
## SISO-B, 802.11n20, HT0

Channel 7



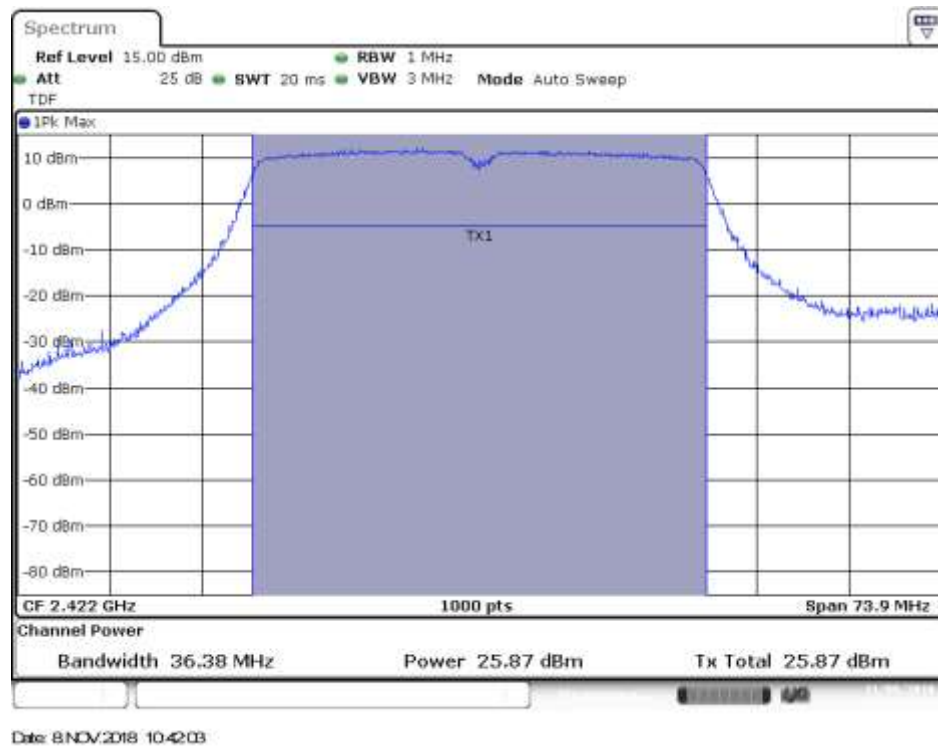
## SISO-B, 802.11n20, HT0

Channel 13



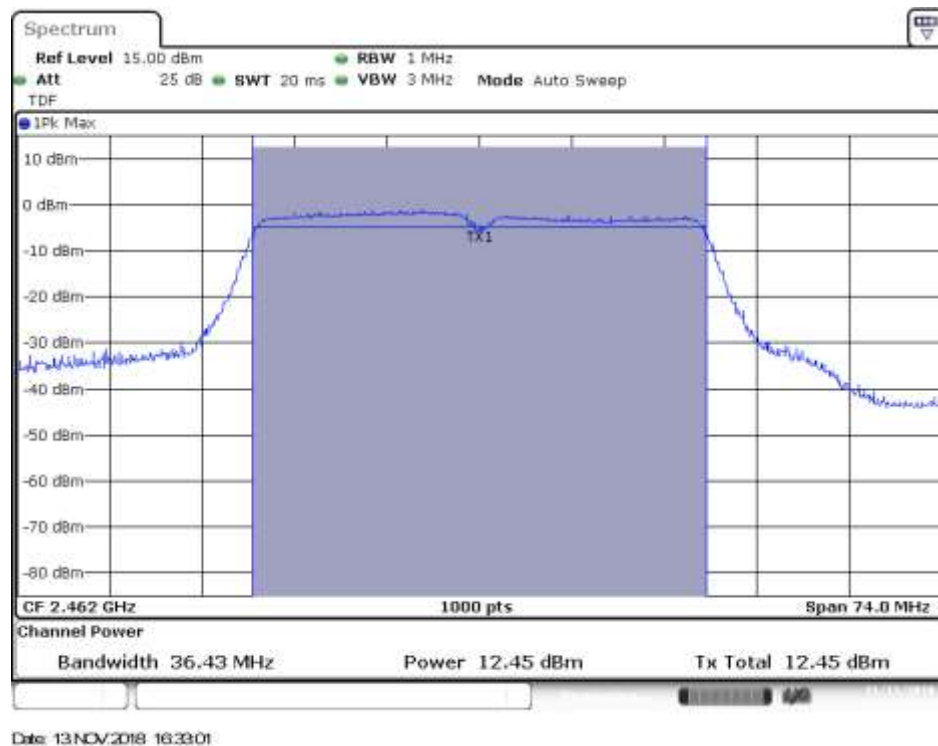
## SISO-A, 802.11n40, HT0

Channel 3F



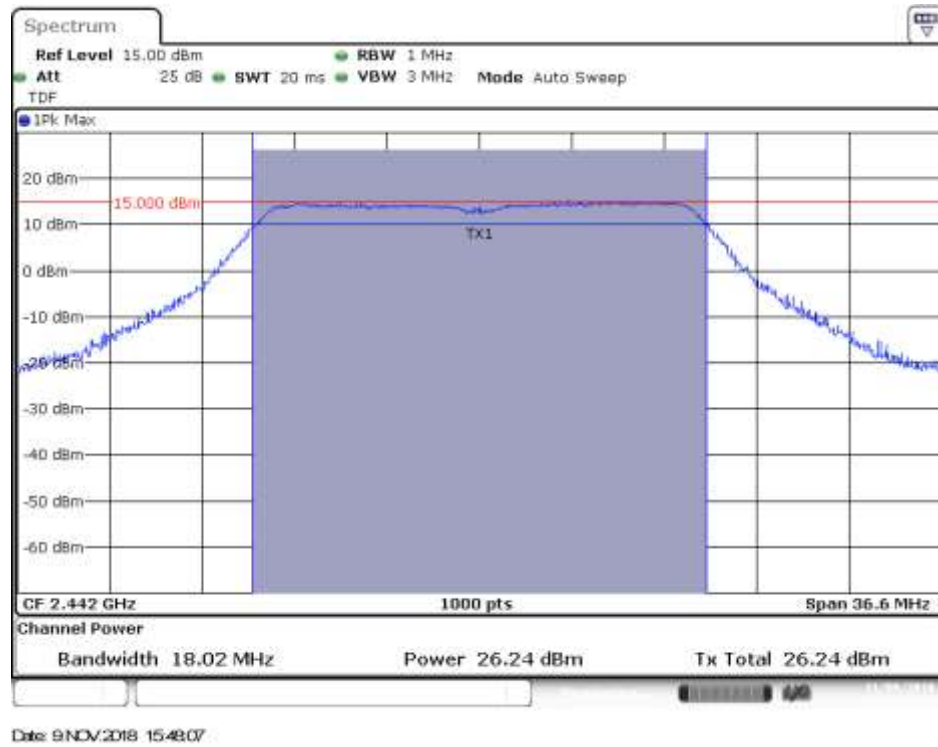
## SISO-B, 802.11n40, HT0

Channel 11F



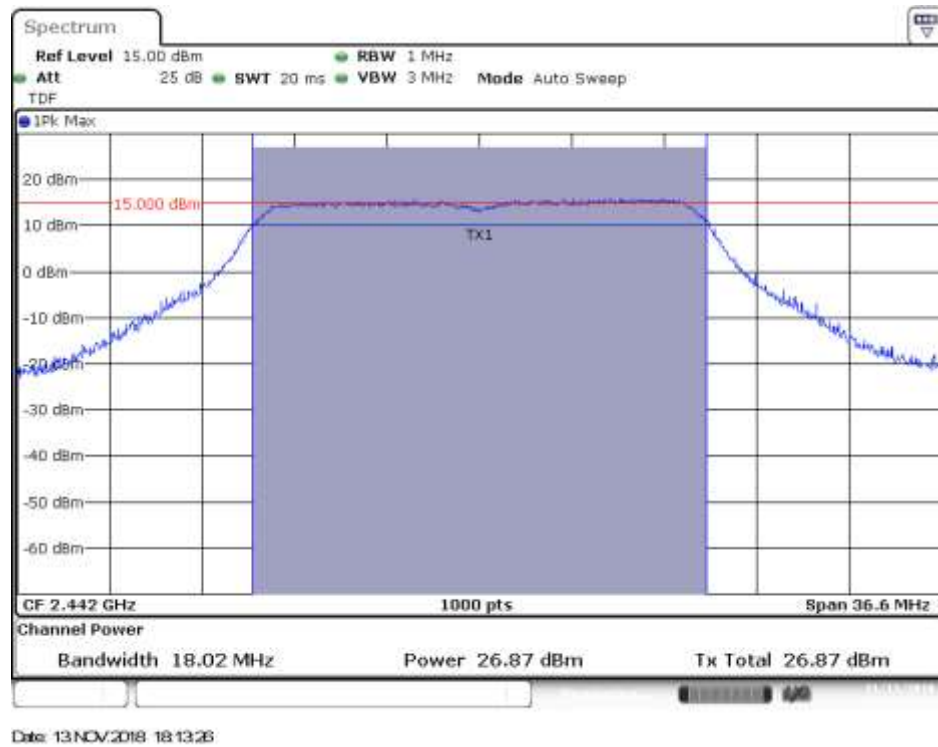
## MIMO-A, 802.11n20, HT8

Channel 7



## MIMO-B, 802.11n20, HT8

Channel 7



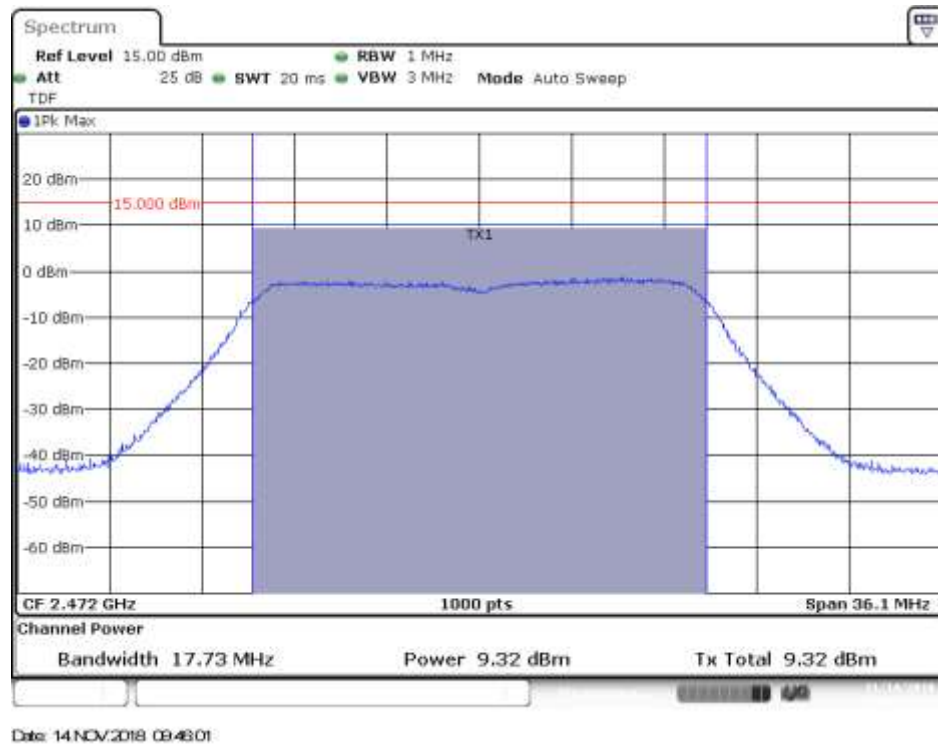
## MIMO-A, 802.11n20, HT8

Channel 13



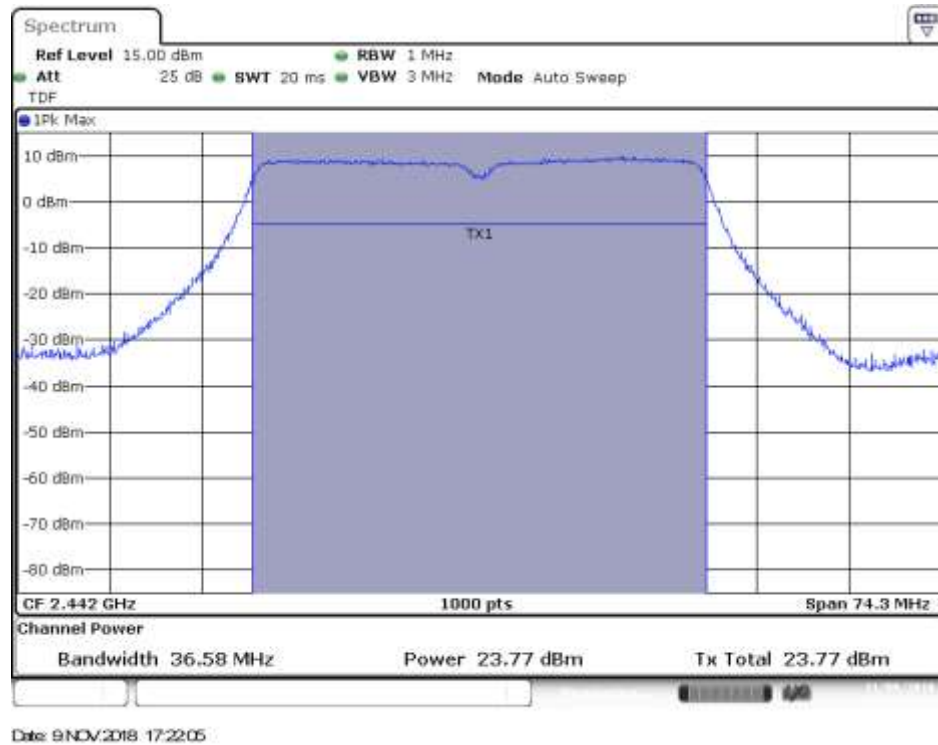
## MIMO-B, 802.11n20, HT8

Channel 13



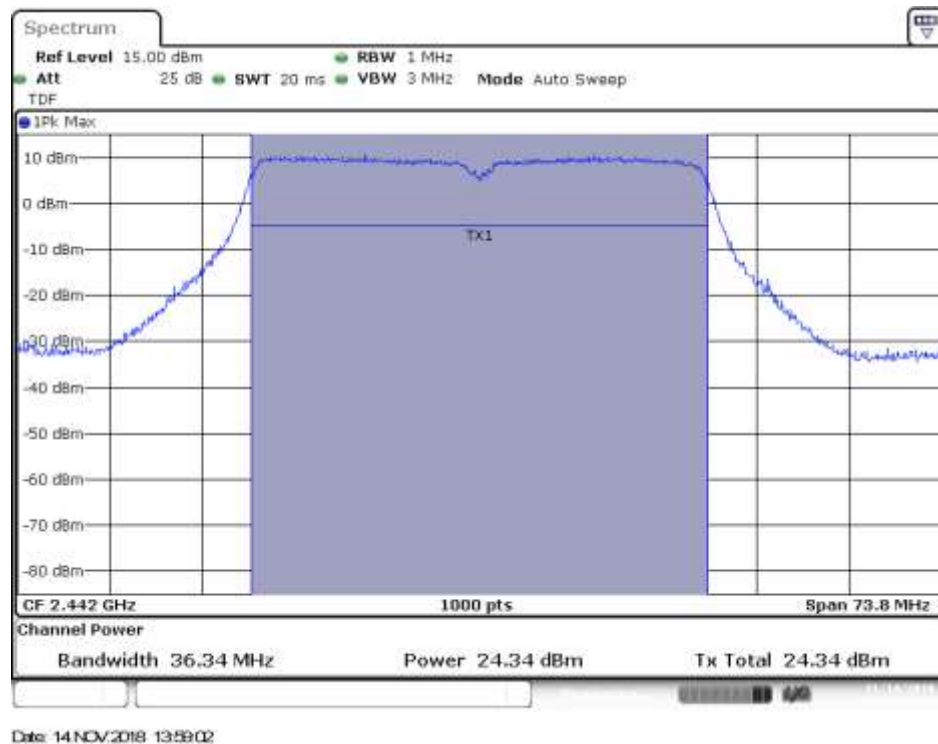
## MIMO-A, 802.11n40, HT8

Channel 7F



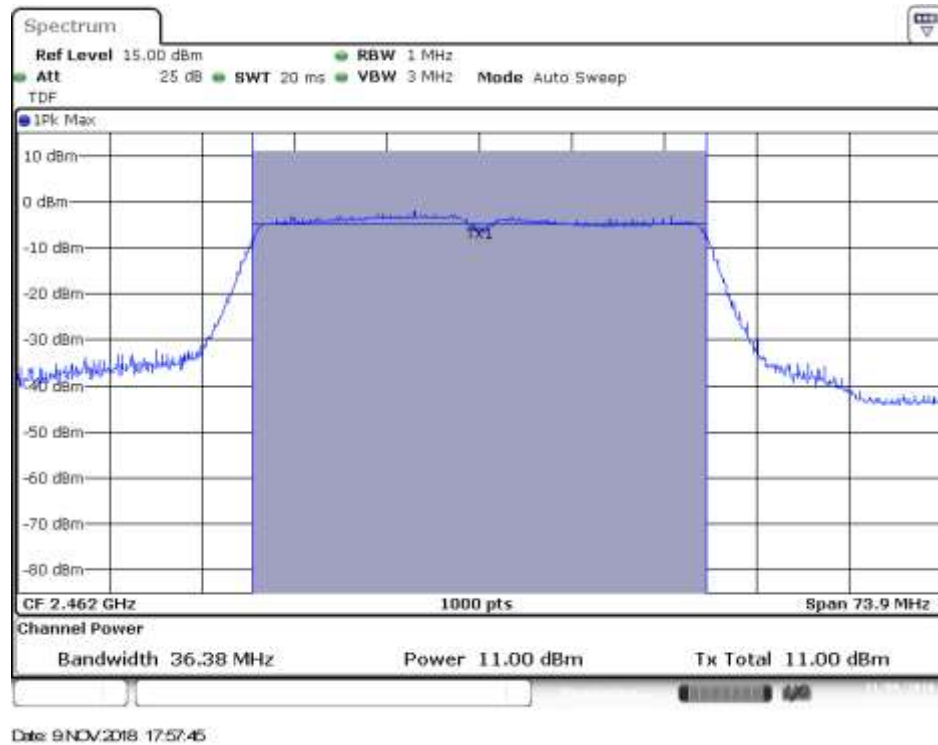
## MIMO-B, 802.11n40, HT8

Channel 7F



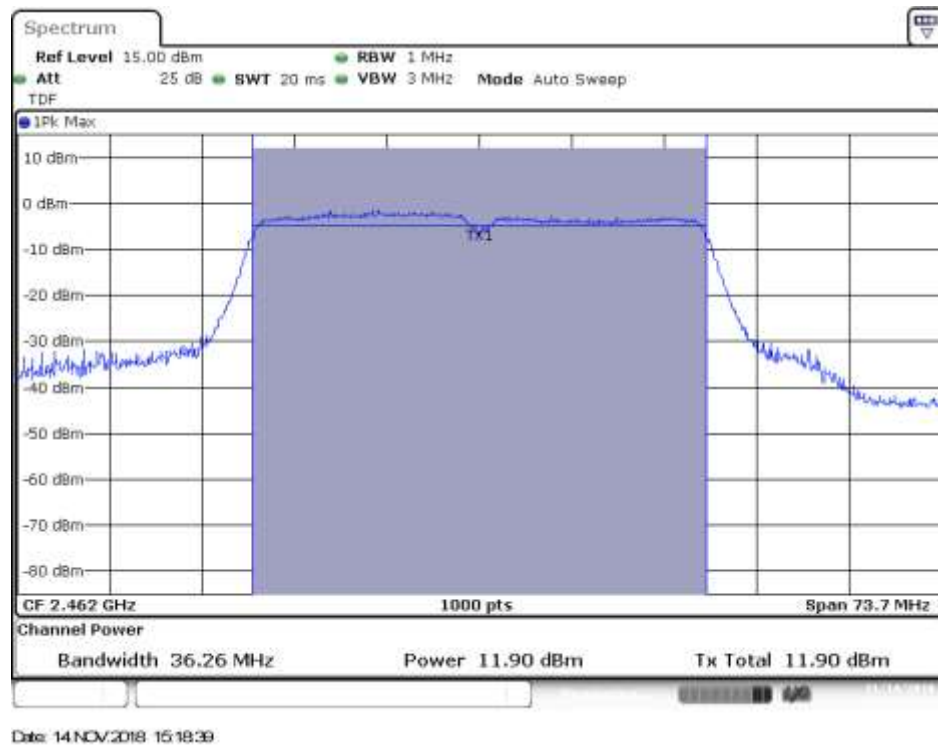
## MIMO-A, 802.11n40, HT8

Channel 11F



## MIMO-B, 802.11n40, HT8

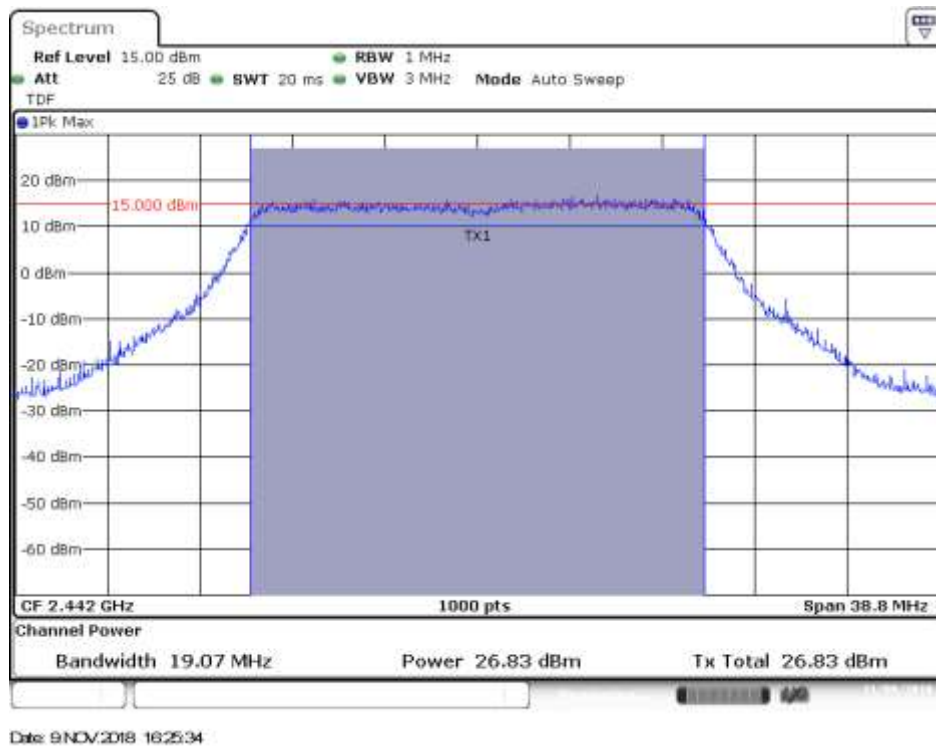
Channel 11F





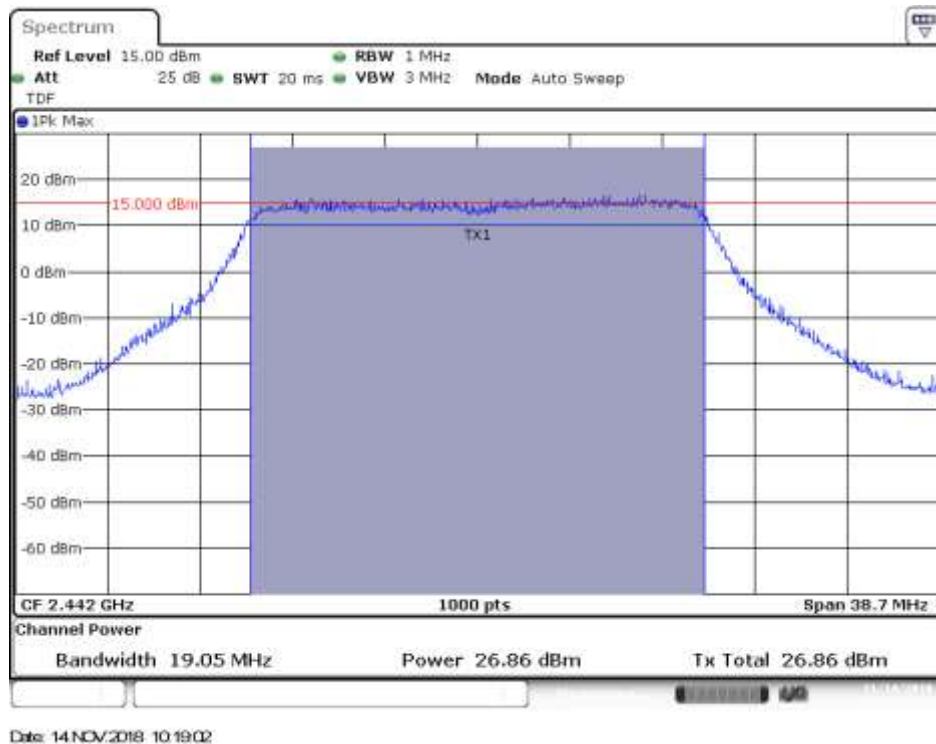
## MIMO-A, 802.11ax20, HE0

Channel 7



## MIMO-B, 802.11ax20, HE0

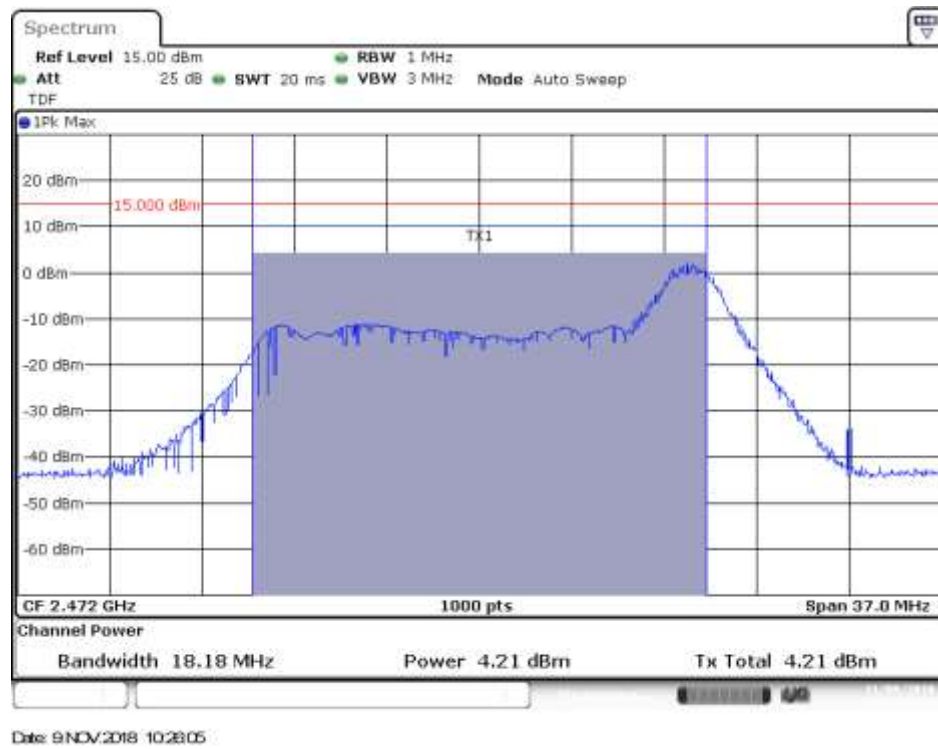
Channel 7





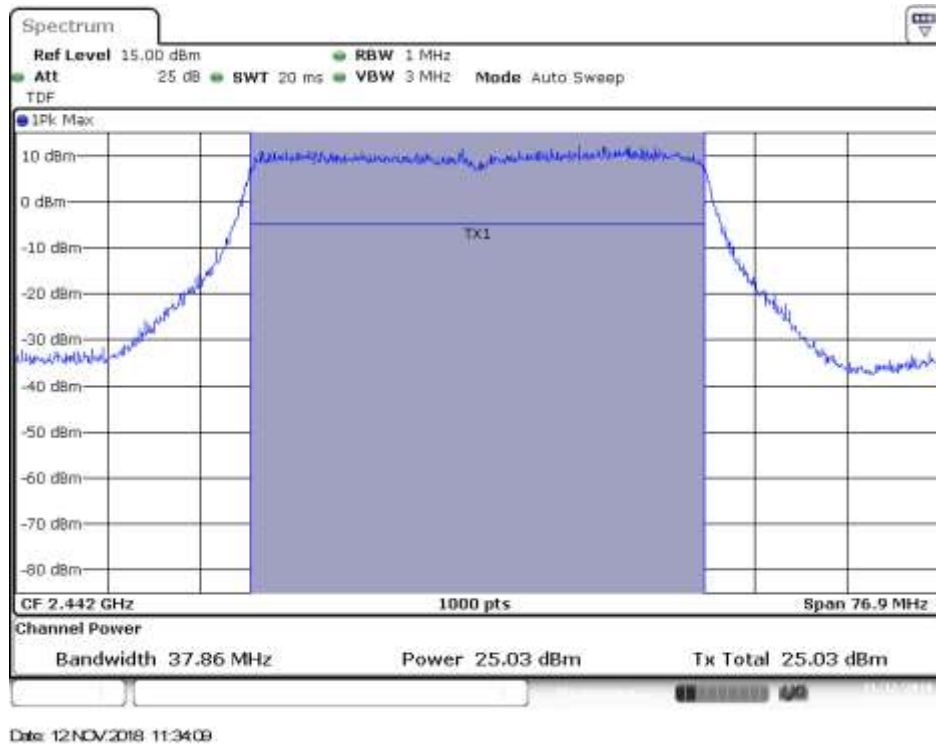
## SISO-A, 802.11ax20, RU26/8, HE0

Channel 13



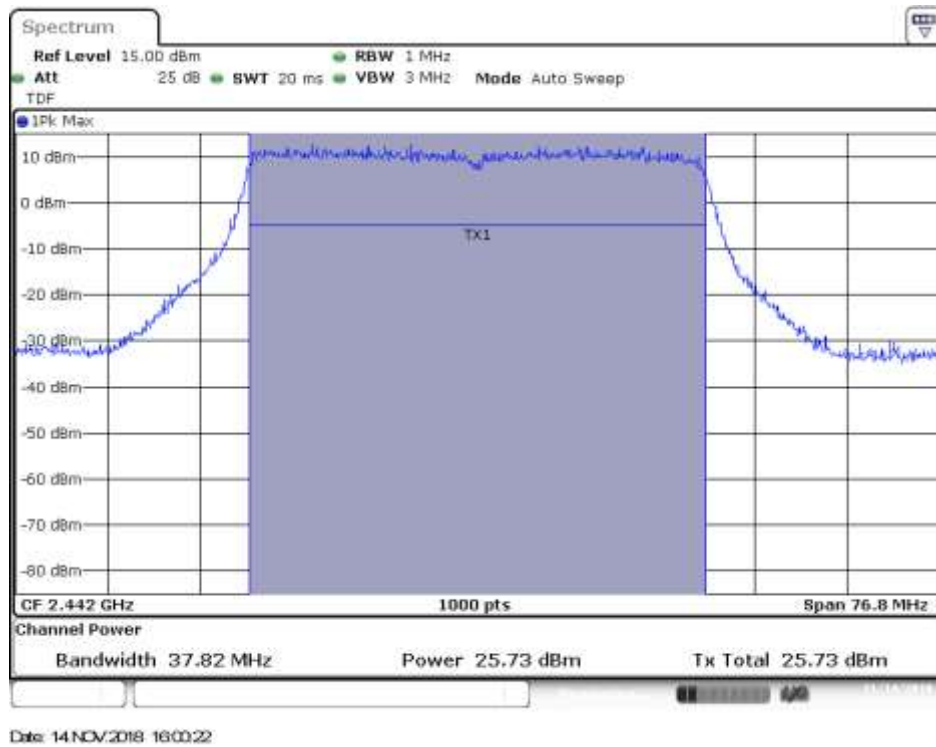
## MIMO-A, 802.11ax40, HE0

Channel 7F



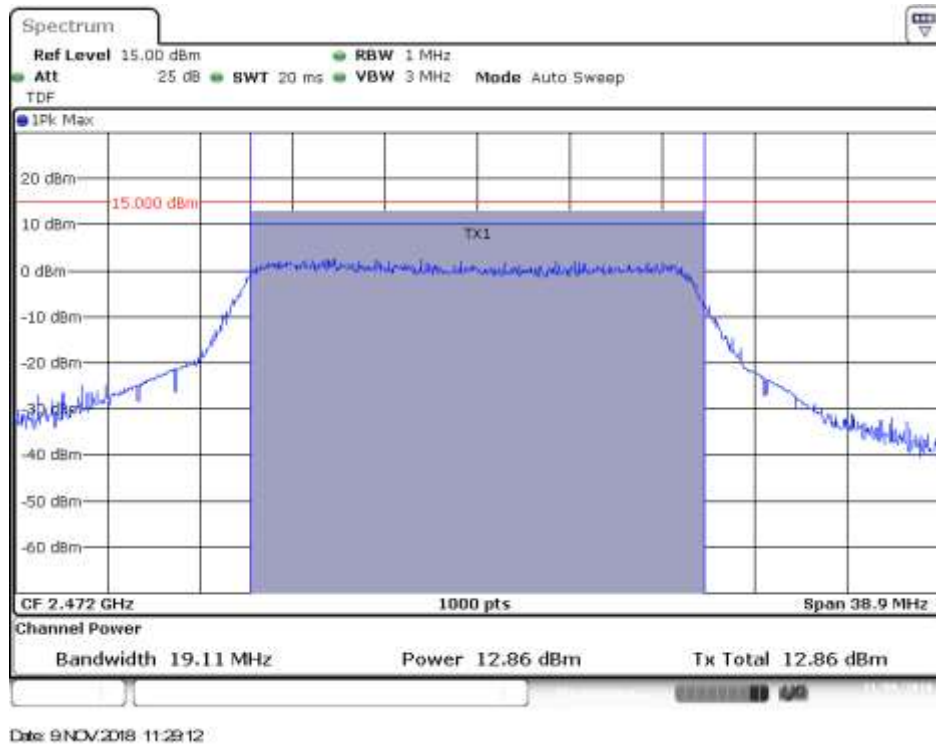
## MIMO-B, 802.11ax40, HE0

Channel 7F



## SISO-A, 802.11ax40, RU 242/62, HE0

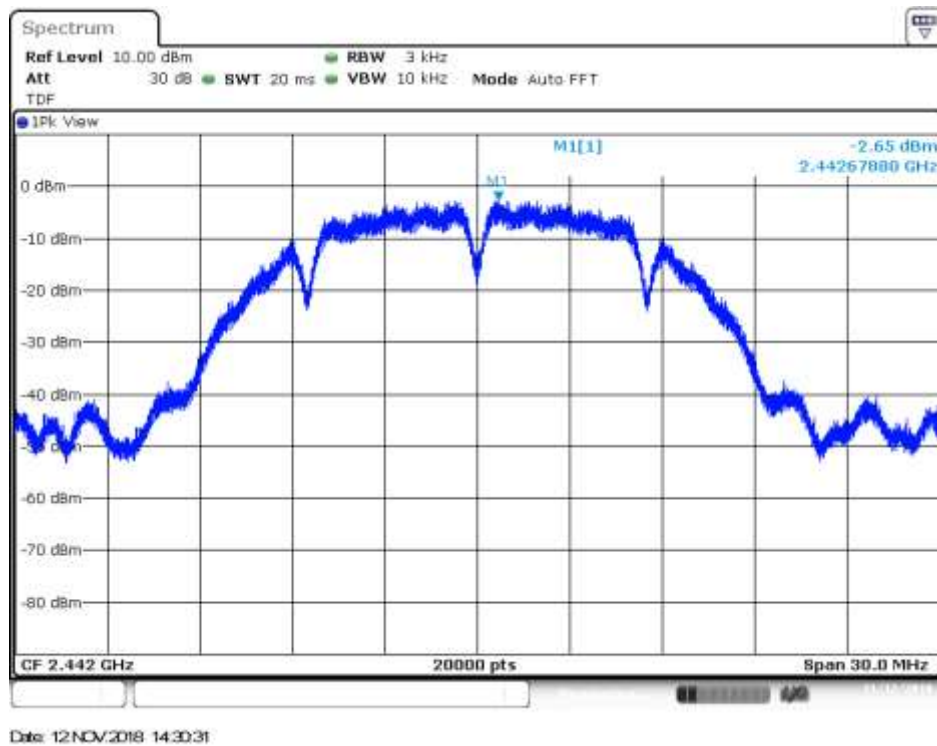
Channel 11F



### B.3.4 Power spectral density

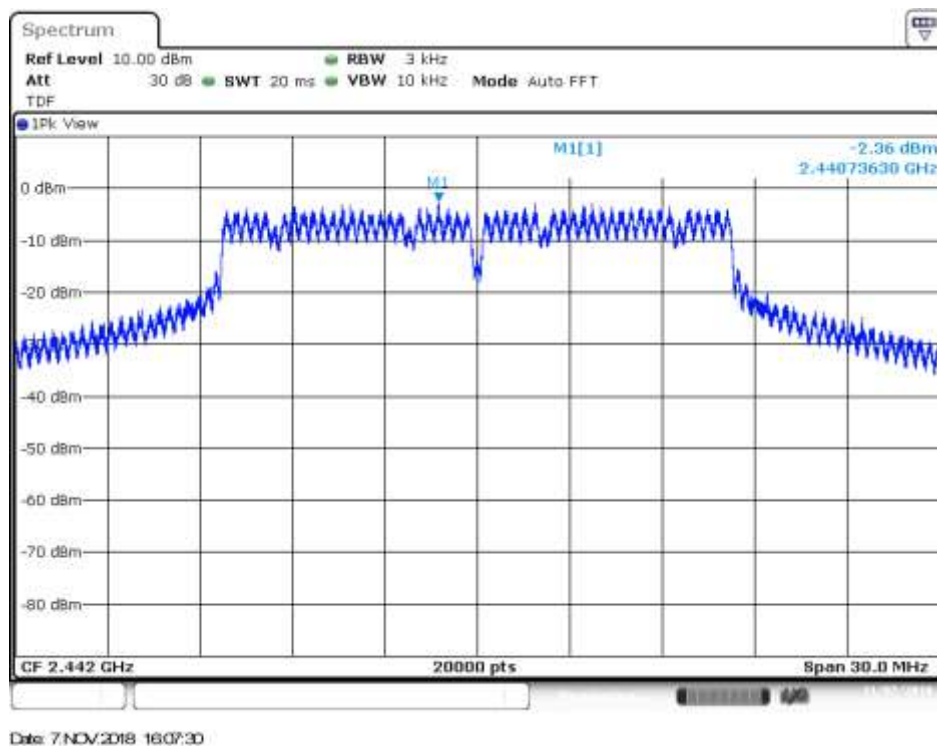
#### SISO-B, 802.11b, 1Mbps

Channel 7



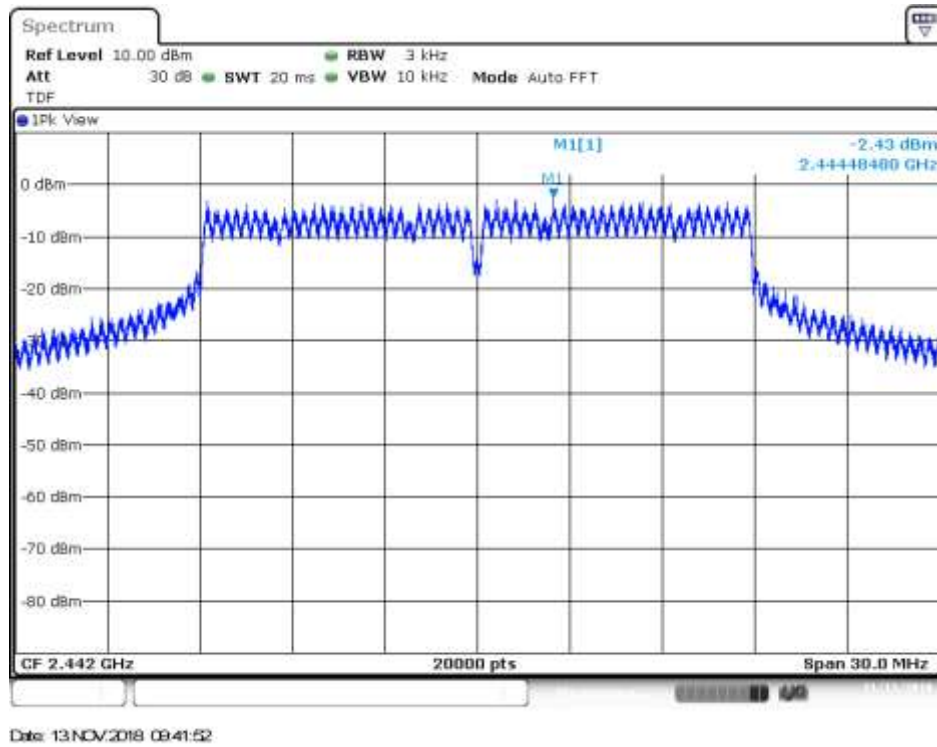
#### SISO-A, 802.11g, 6Mbps

Channel 7



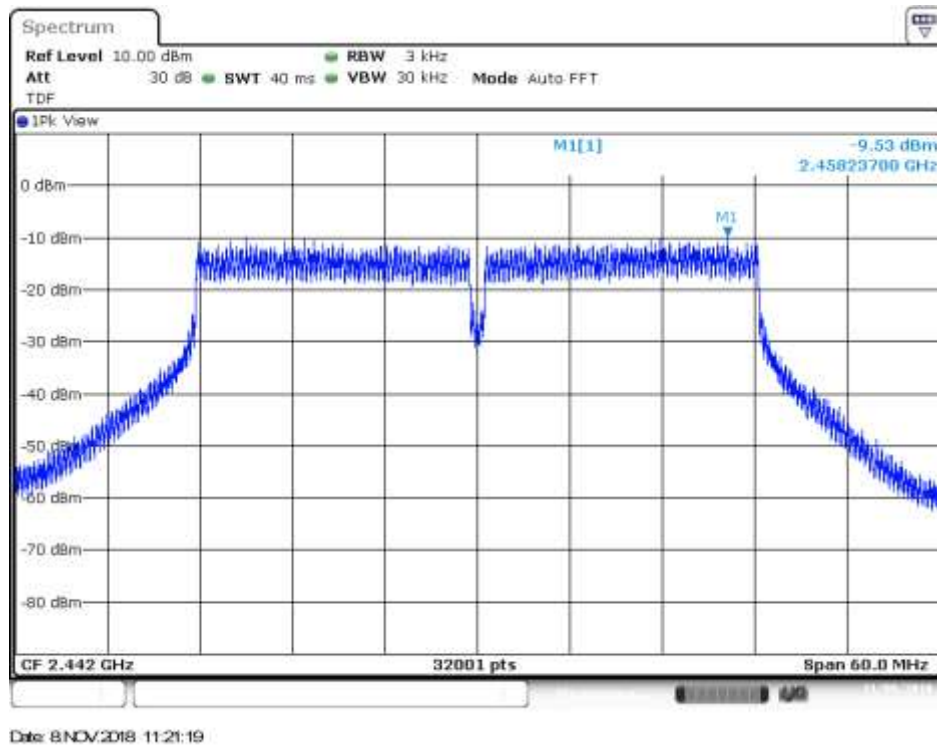
## SISO-B, 802.11n20, HT0

Channel 7



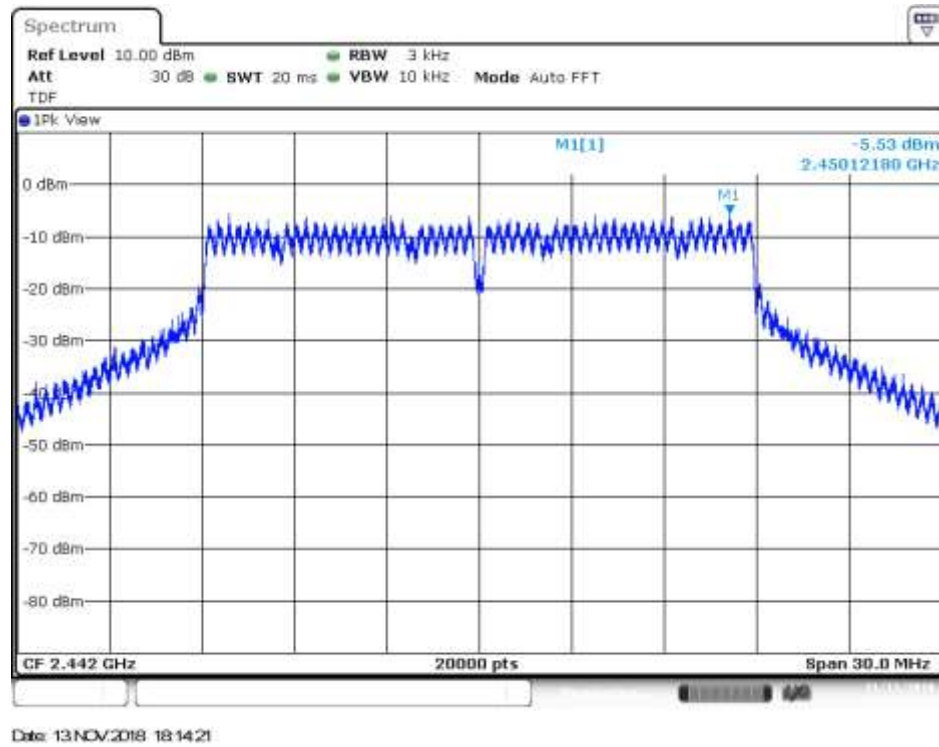
## SISO-A, 802.11n40, HT0

Channel 7F



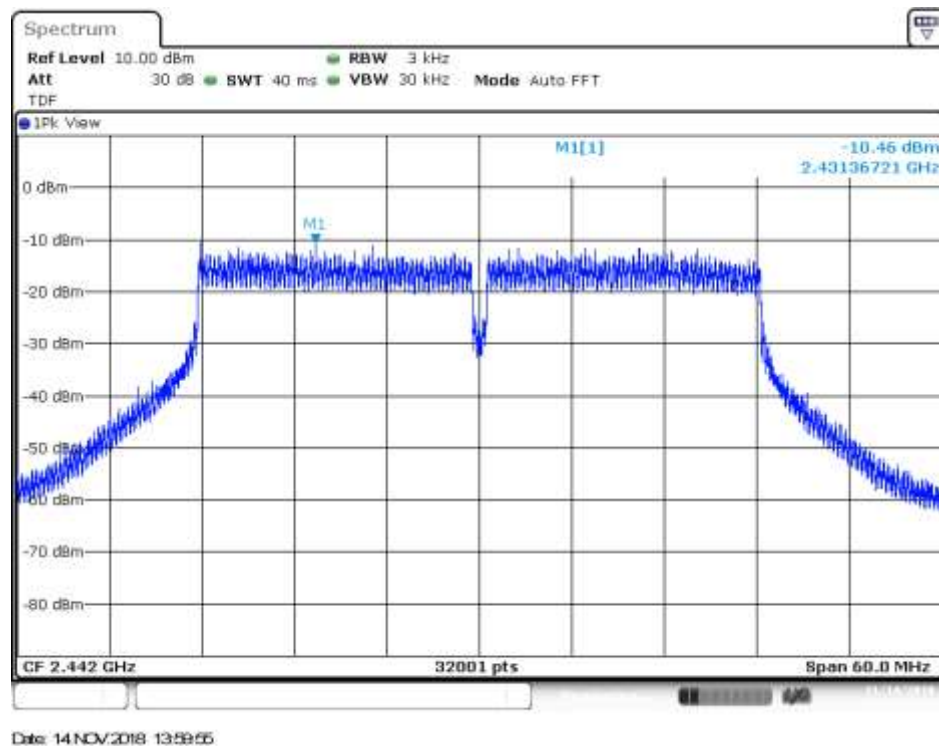
## MIMO-B, 802.11n20, HT8

Channel 7



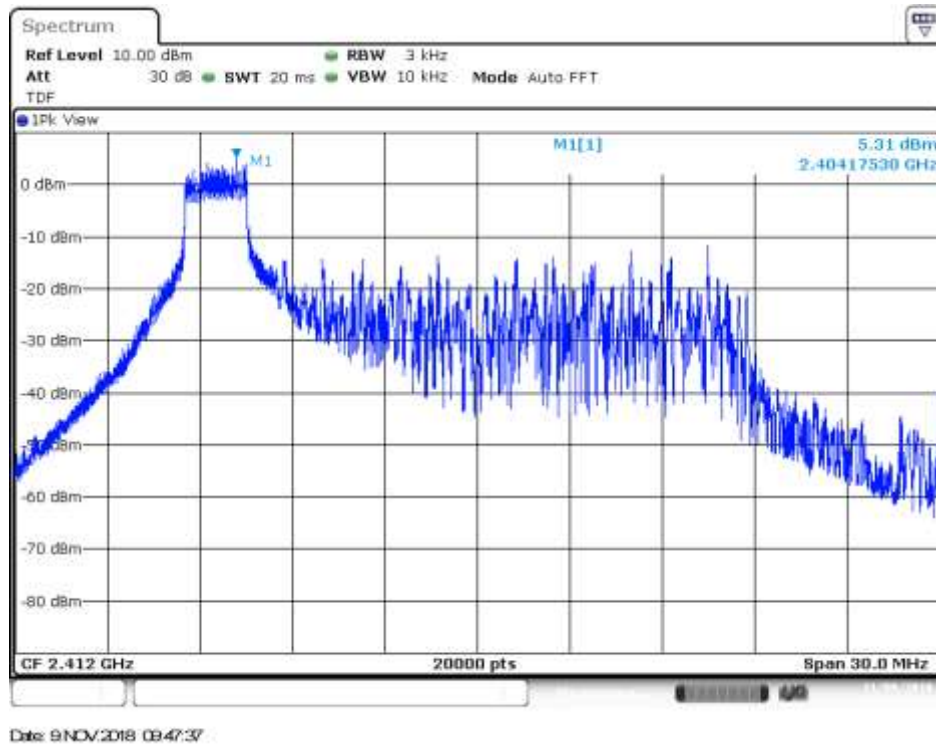
## MIMO-B, 802.11n40, HT8

Channel 7F



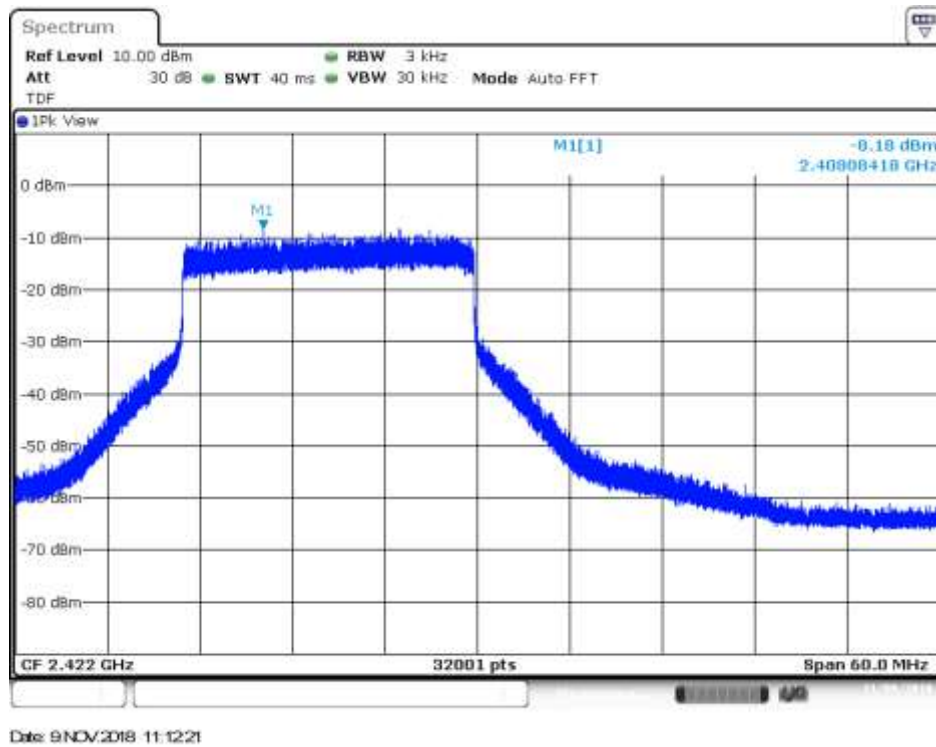
## SISO-A, 802.11ax20, HE0, RU\_26/0

Channel 1



## SISO-A, 802.11ax40, HE0, RU\_242/61

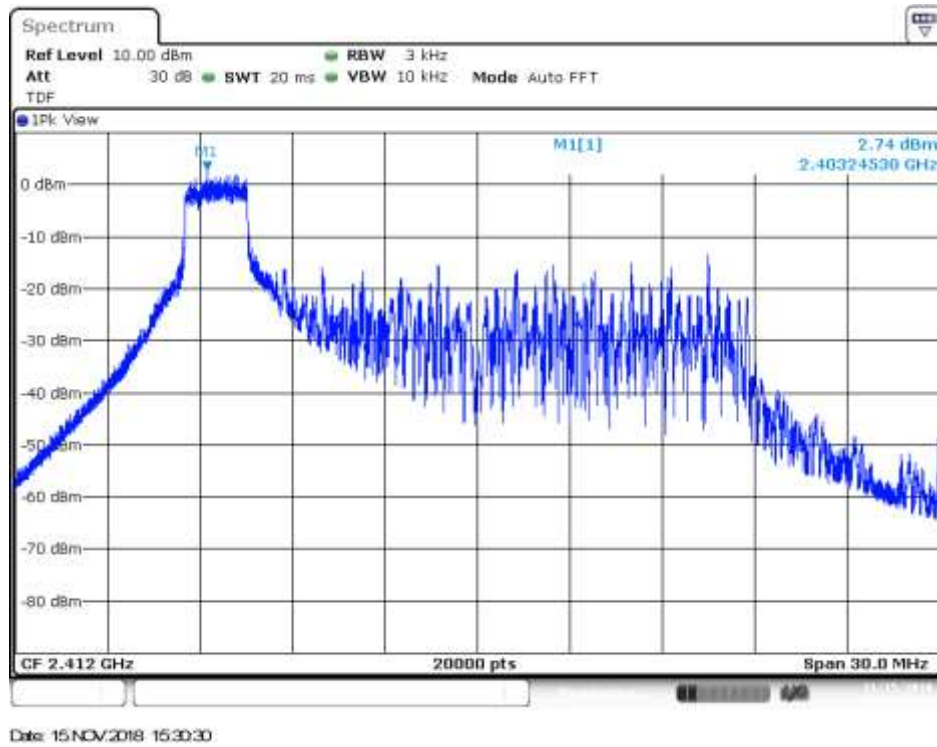
Channel 3F





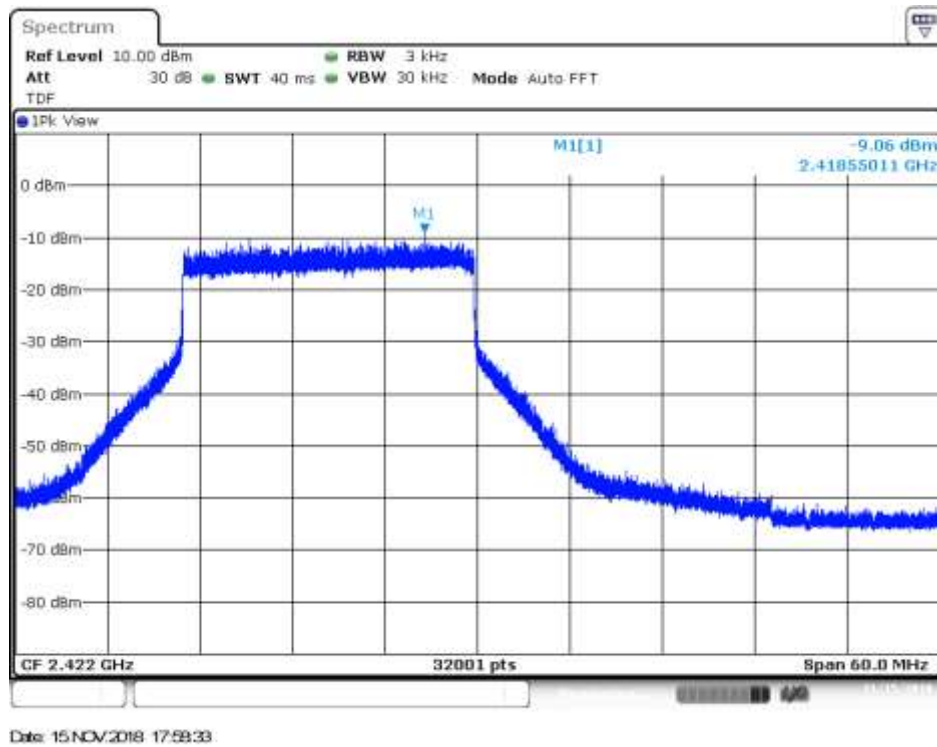
## MIMO-B, 802.11ax20, HE0, RU\_26/0

Channel 7



## MIMO-B, 802.11ax40, HE0, RU\_242/61

Channel 3F



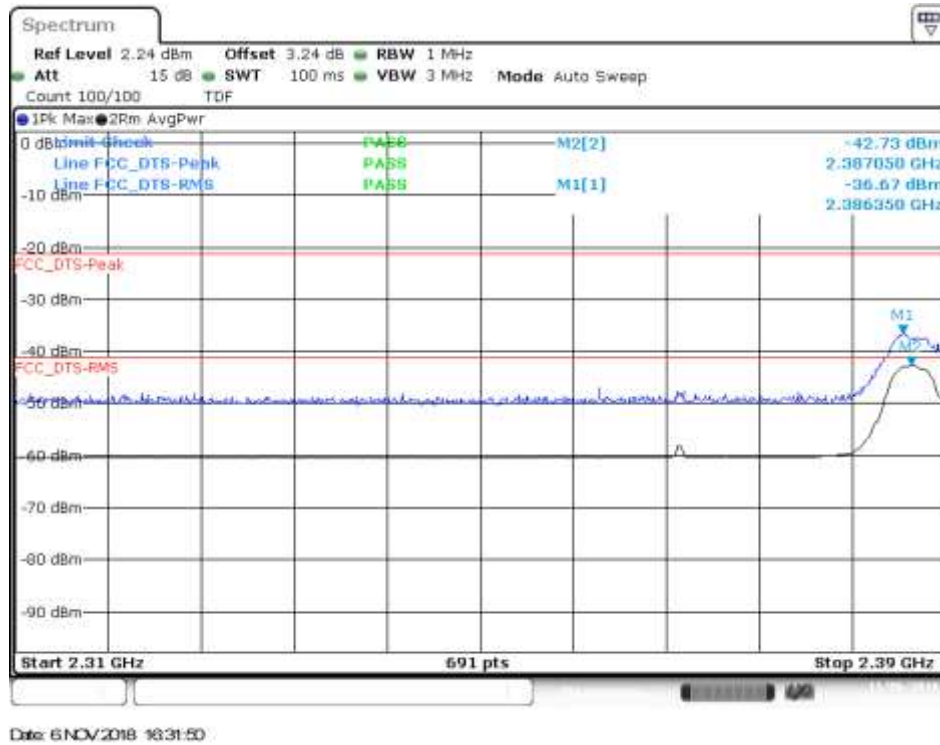


### B.3.5 Out of band emissions - band-edge low (conducted)

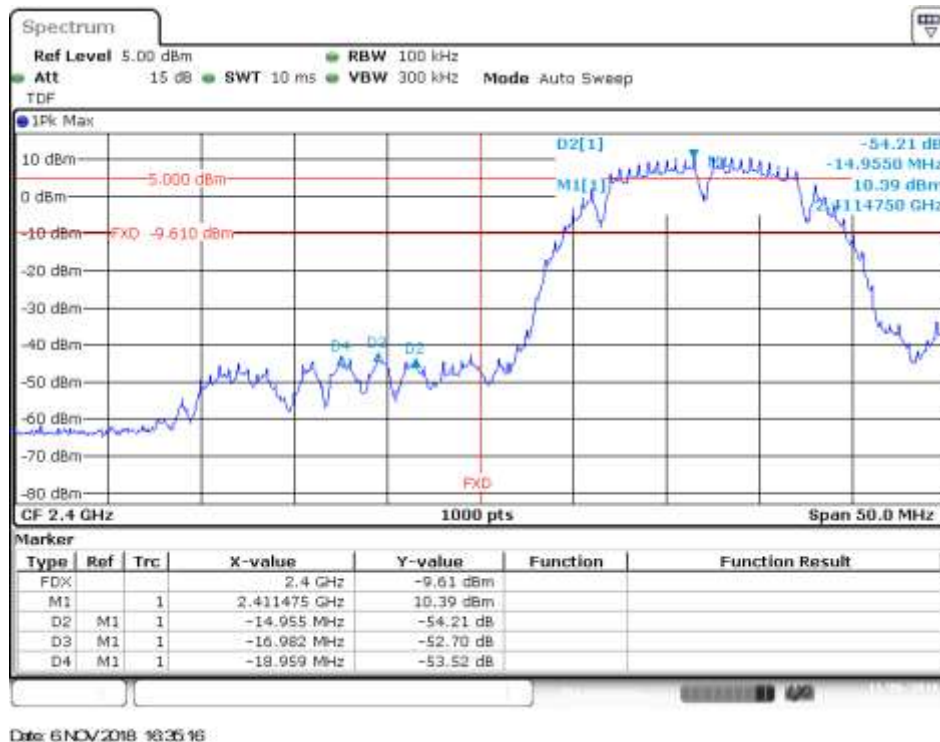
## SISO-A, 802.11b, 1Mbps

Channel 1

BE Low Freq Section



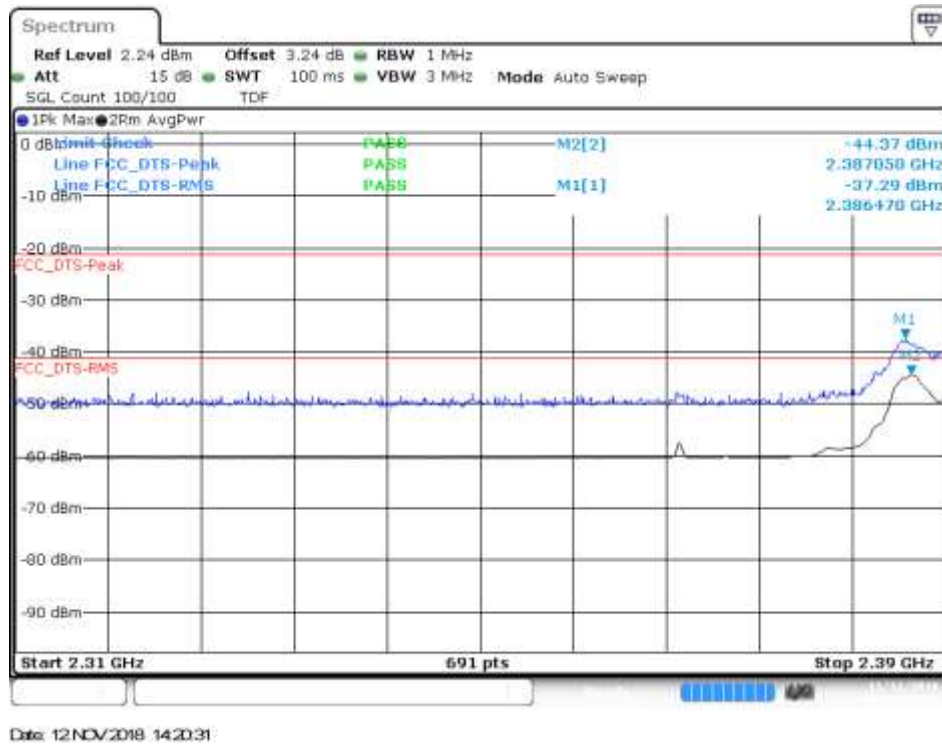
BE Low (Non Restricted)



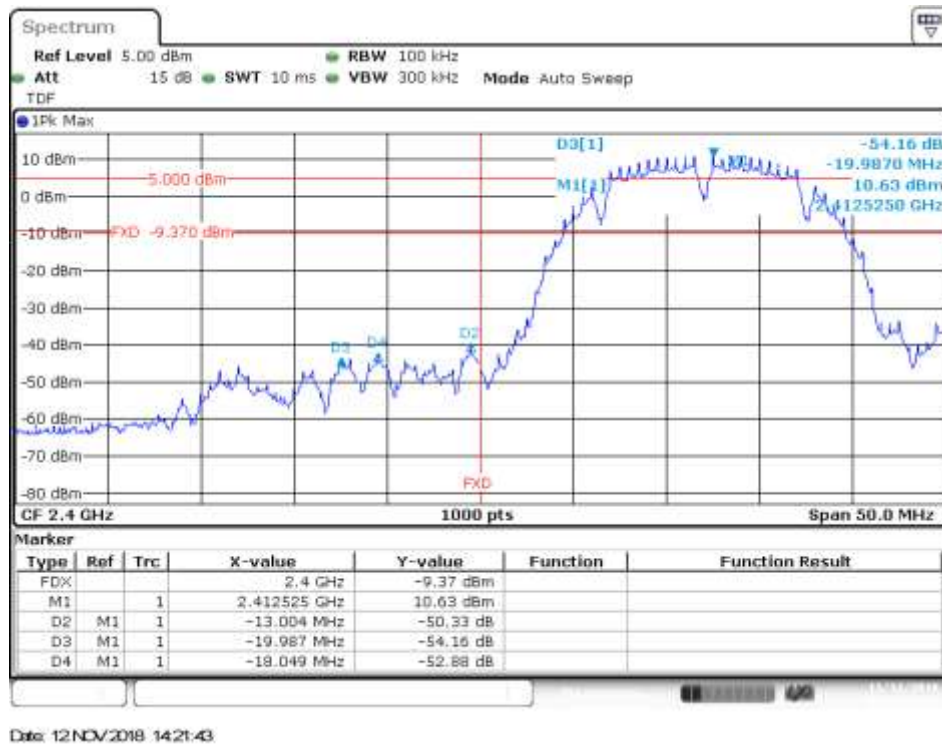
# SISO-B, 802.11b, 1Mbps

Channel 1

BE Low Freq Section



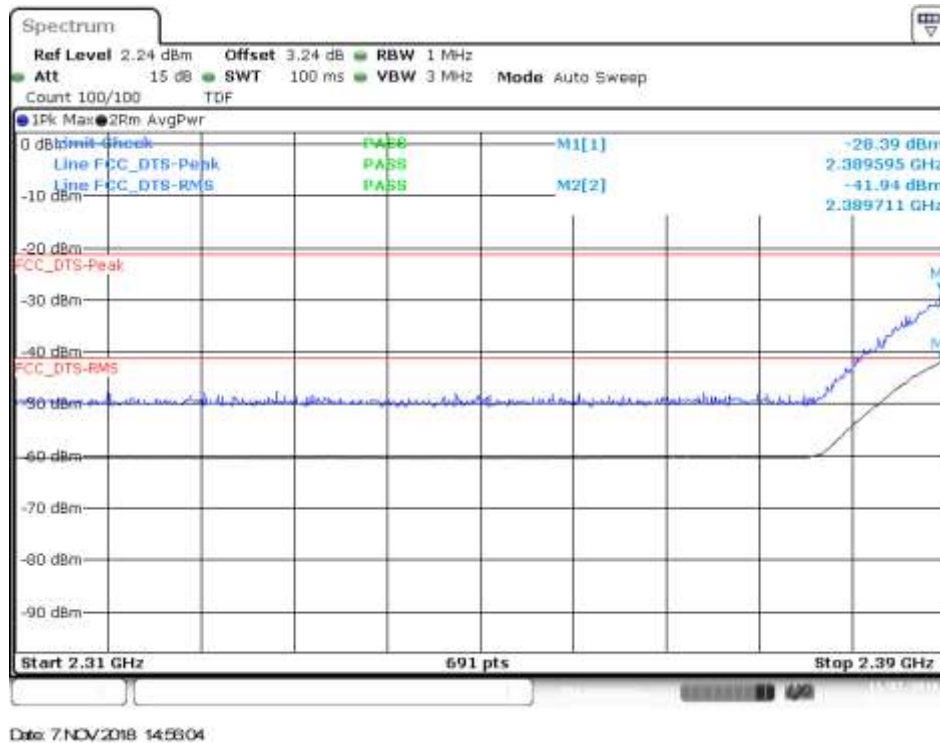
BE Low (Non Restricted)



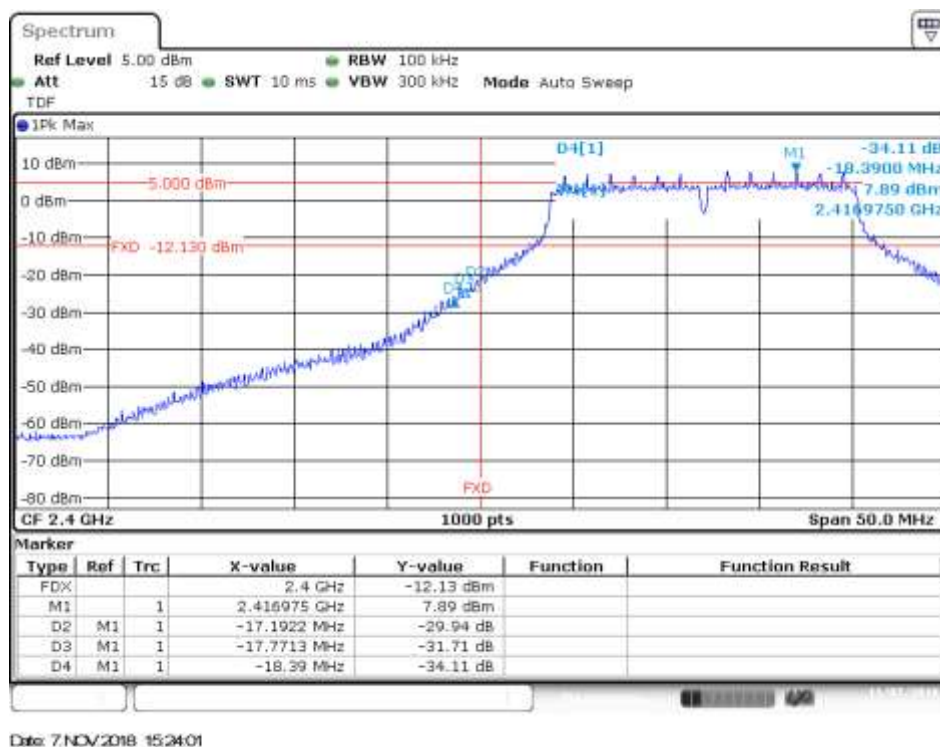
## SISO-A, 802.11g, 6Mbps

Channel 1

BE Low Freq Section



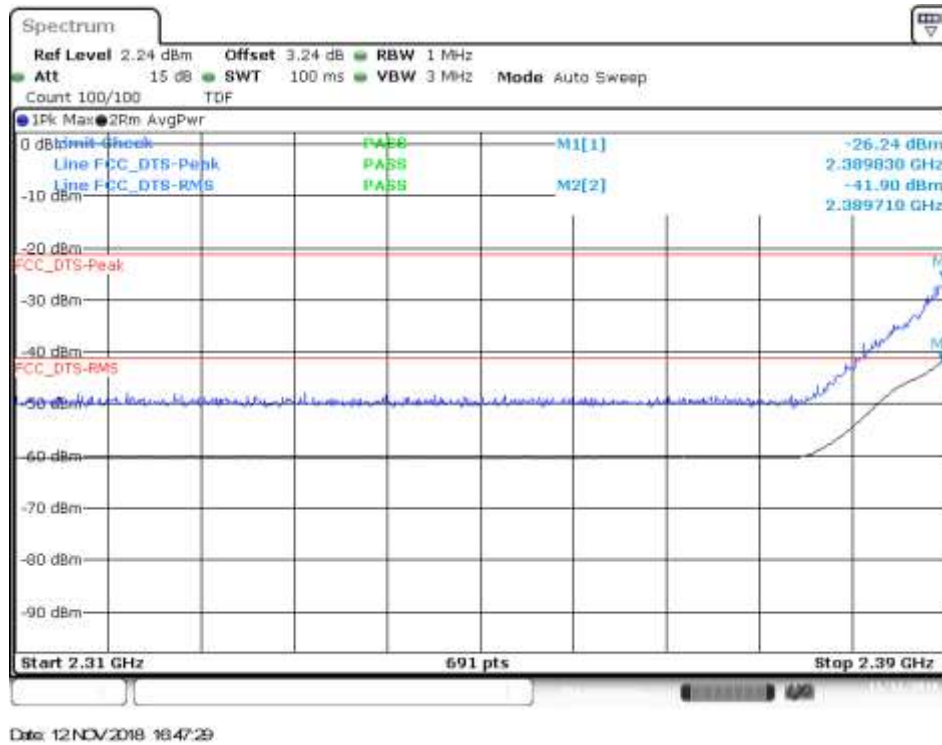
BE Low (Non Restricted)



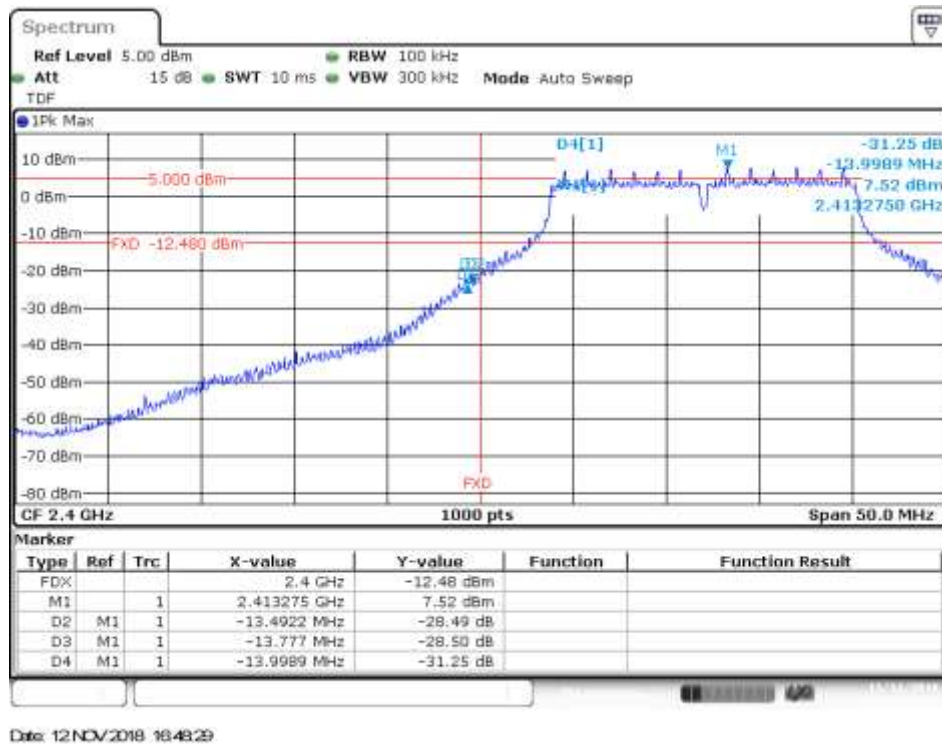
## SISO-B, 802.11g, 6Mbps

Channel 1

BE Low Freq Section



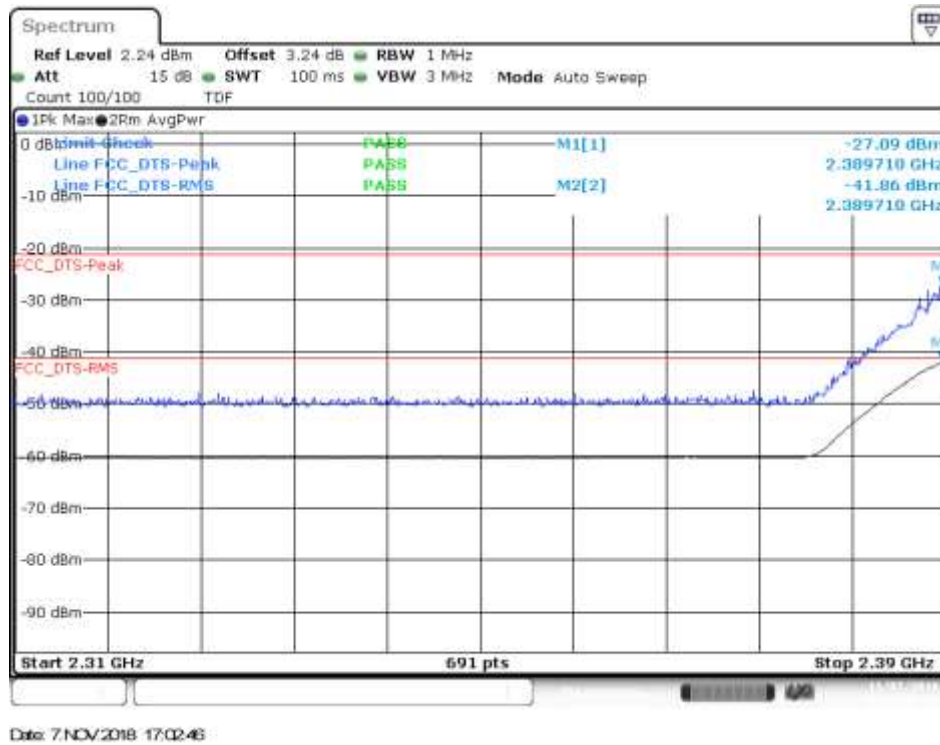
BE Low (Non Restricted)



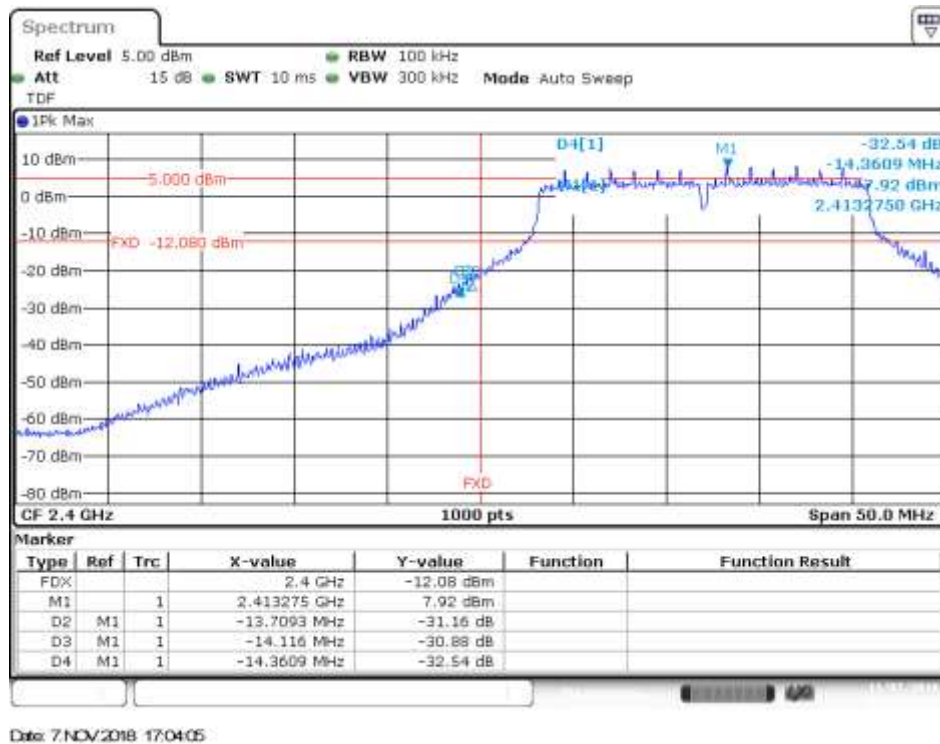
## SISO-A, 802.11n20, HT0

Channel 1

BE Low Freq Section



BE Low (Non Restricted)

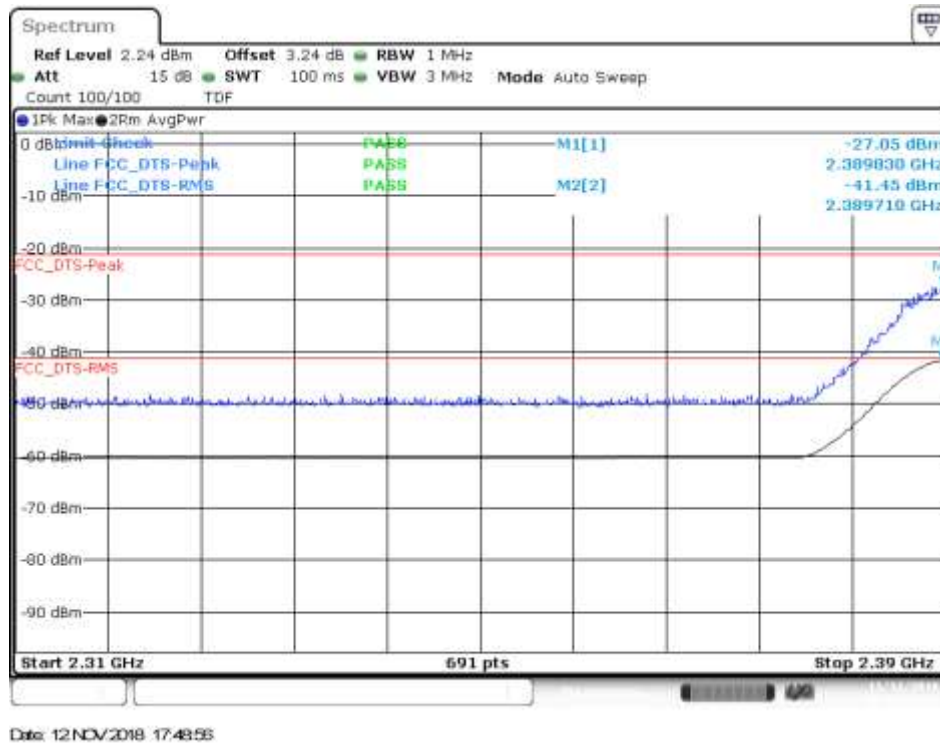




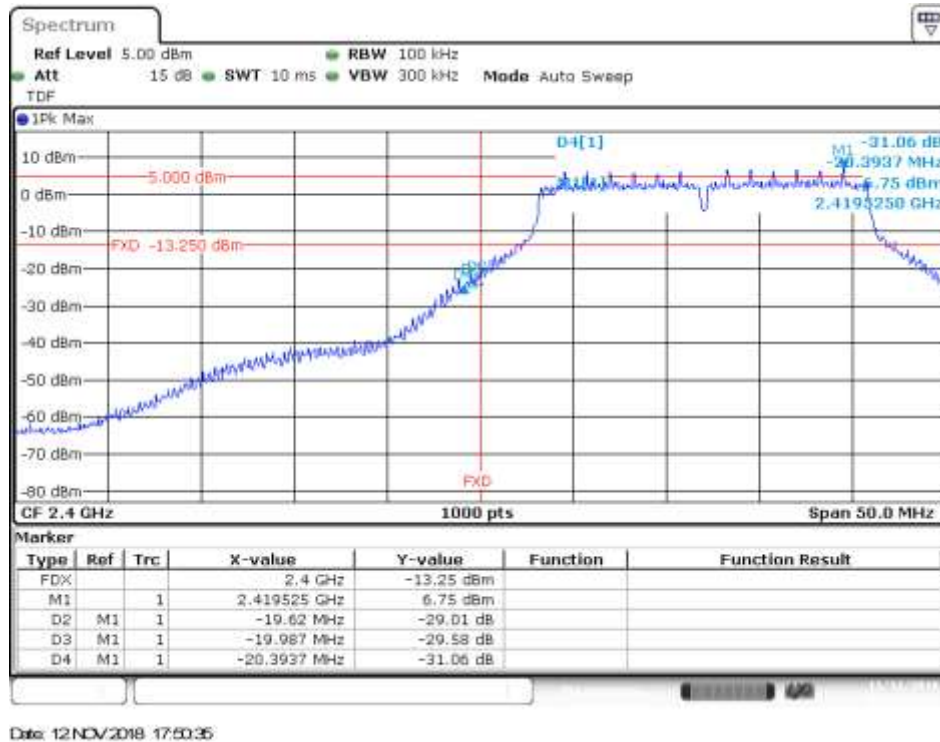
## SISO-B, 802.11n20, HT0

Channel 1

BE Low Freq Section



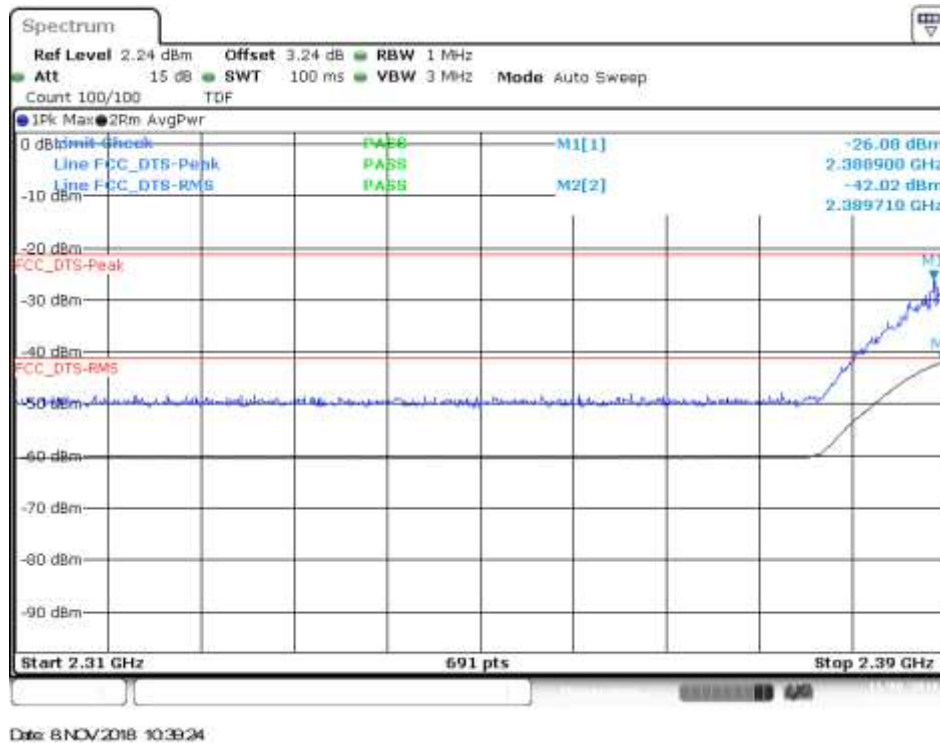
BE Low (Non Restricted)



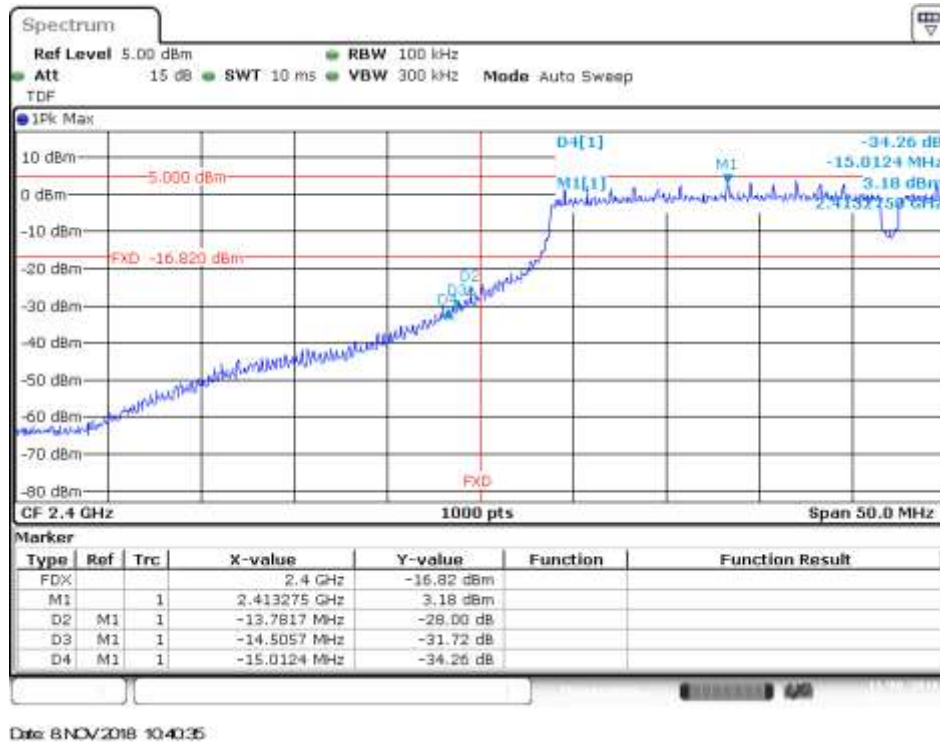
## SISO-A, 802.11n40, HT0

Channel 3F

BE Low Freq Section



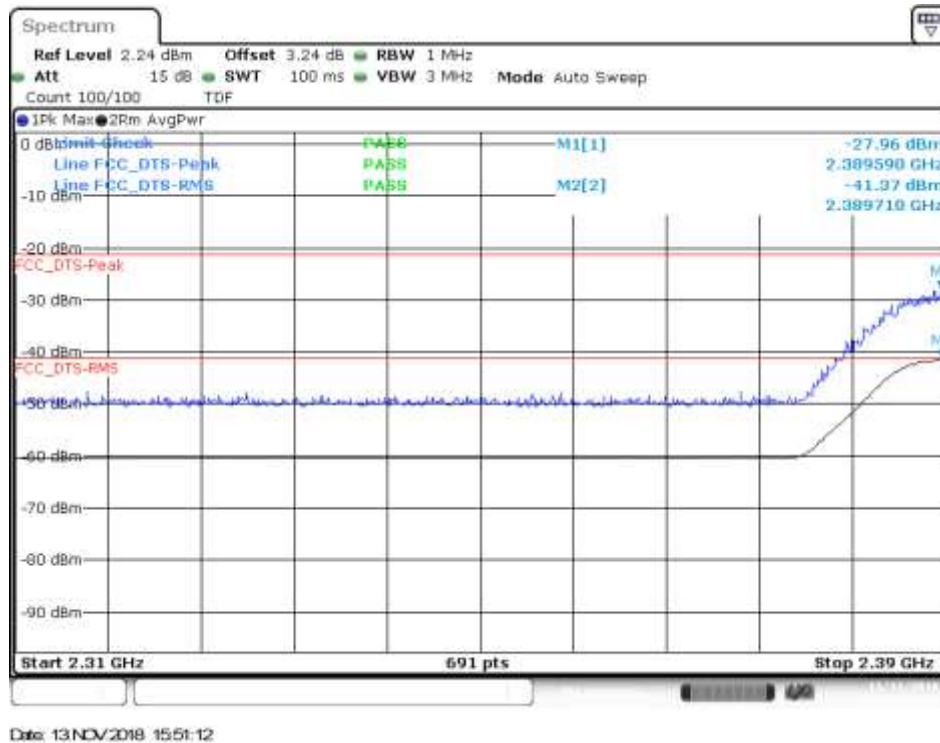
BE Low (Non Restricted)



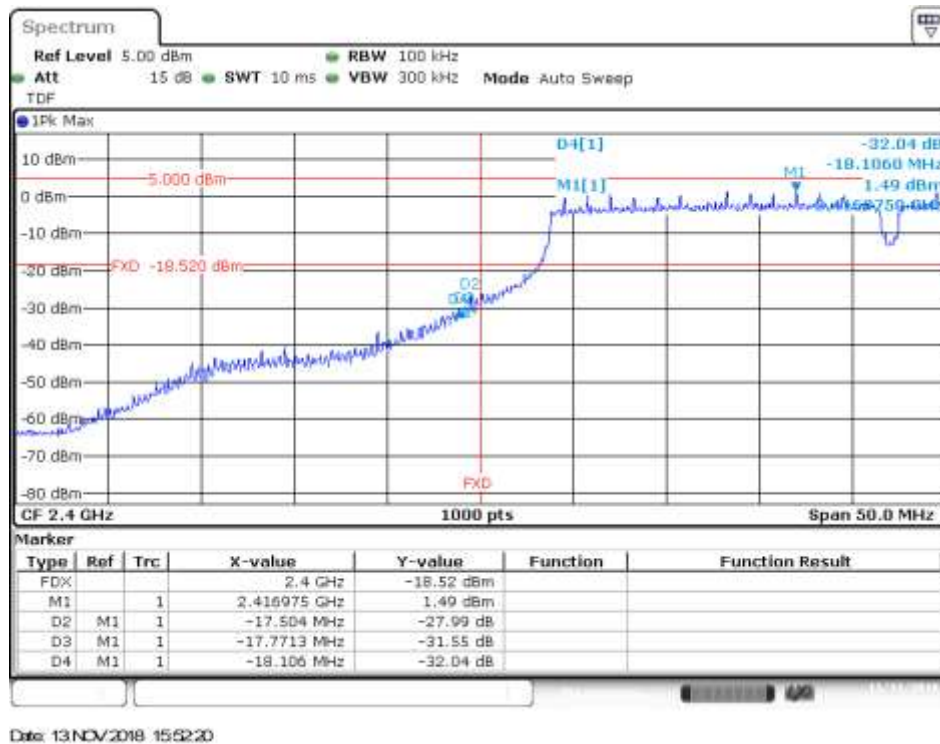
## SISO-B, 802.11n40, HT0

Channel 3F

BE Low Freq Section



BE Low (Non Restricted)

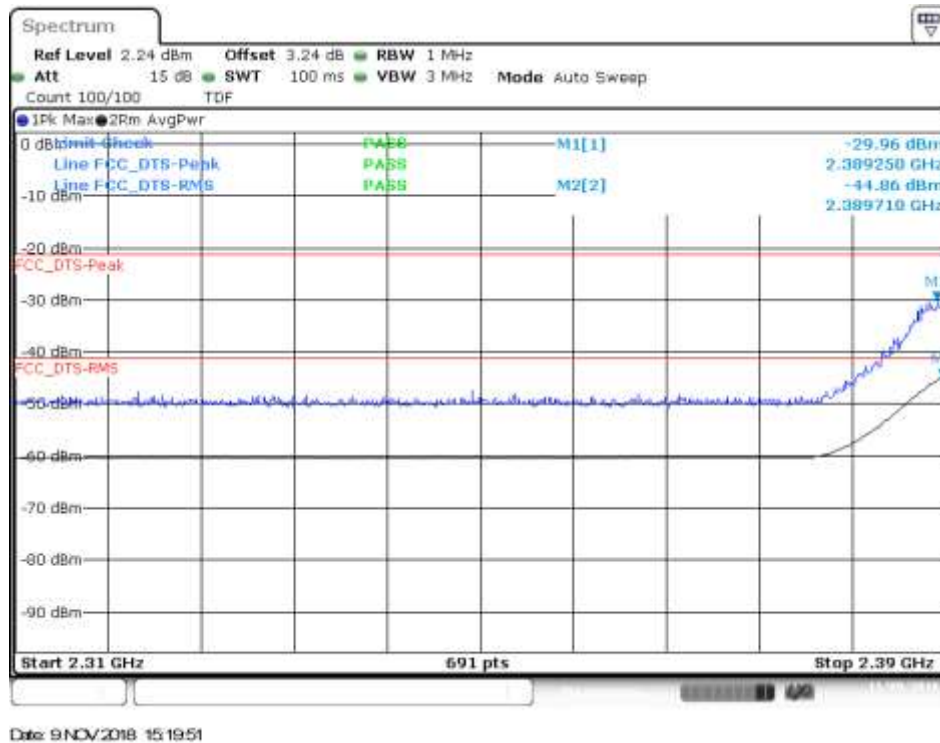




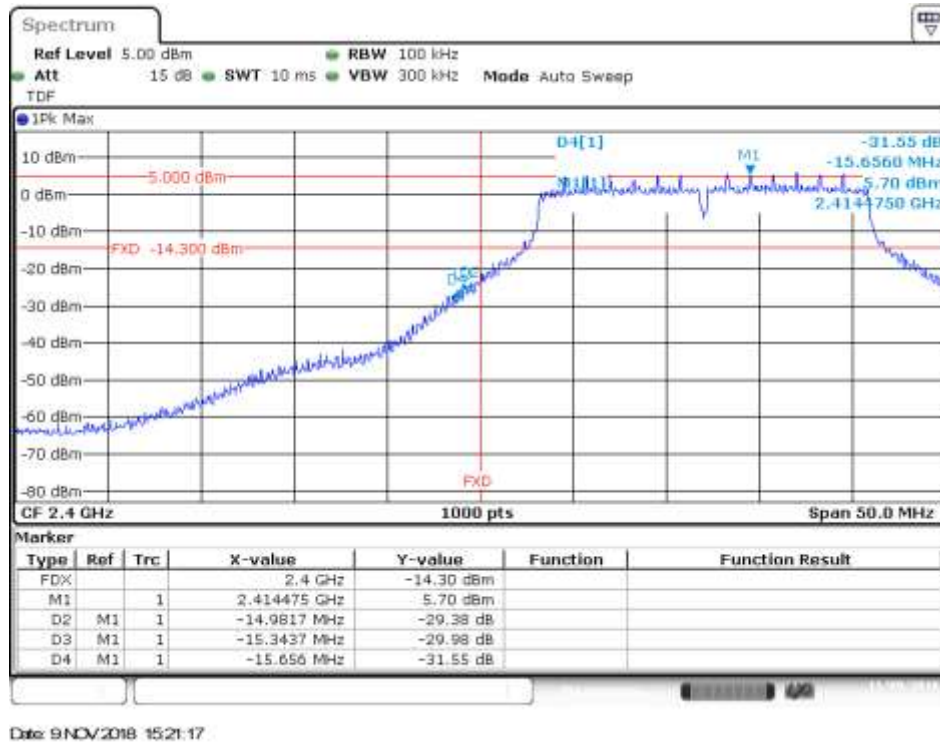
## MIMO-A, 802.11n20, HT8

Channel 1

BE Low Freq Section



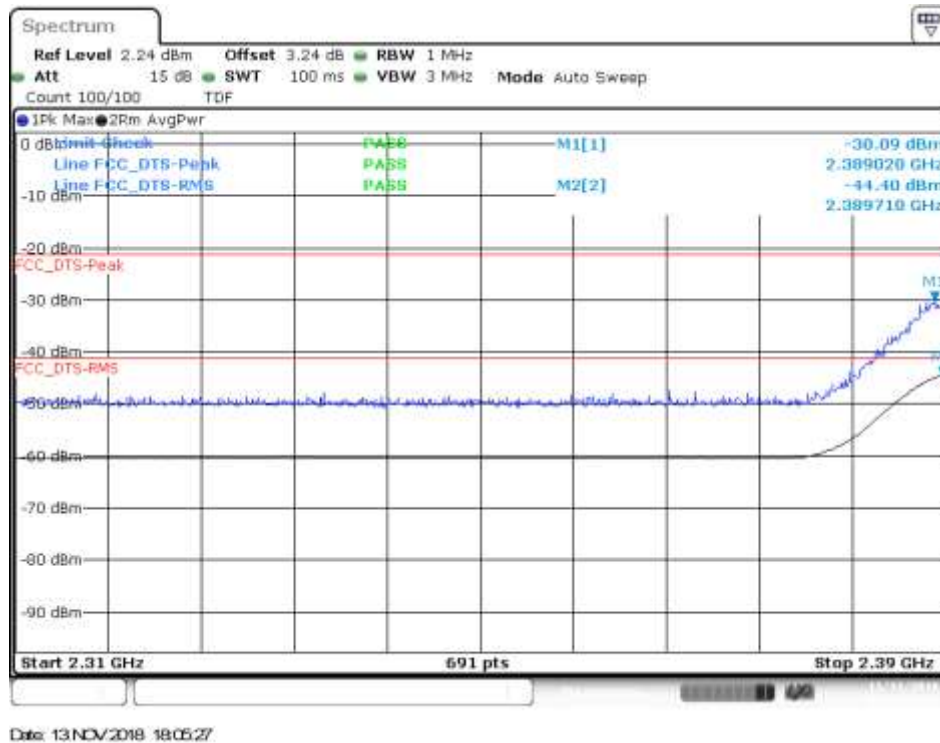
BE Low (Non Restricted)



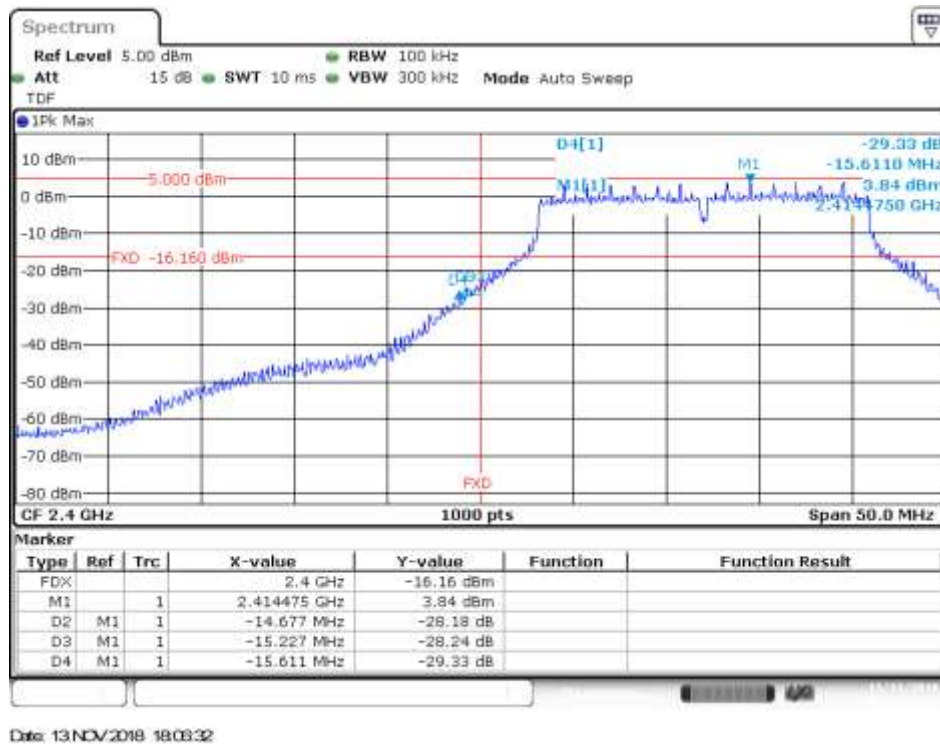
## MIMO-B, 802.11n20, HT8

Channel 1

BE Low Freq Section



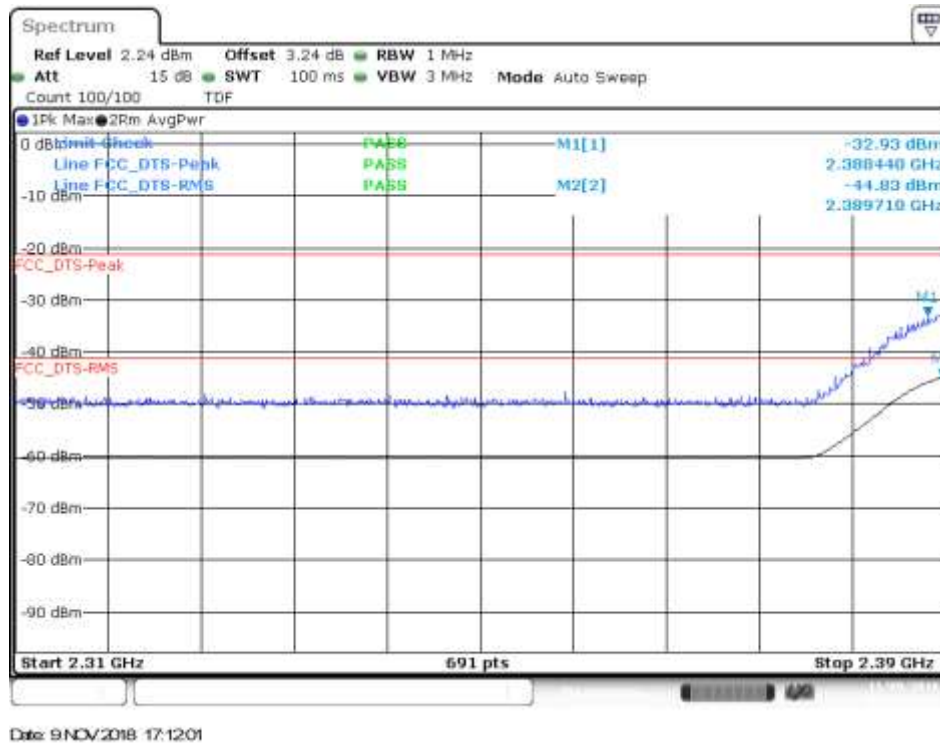
BE Low (Non Restricted)



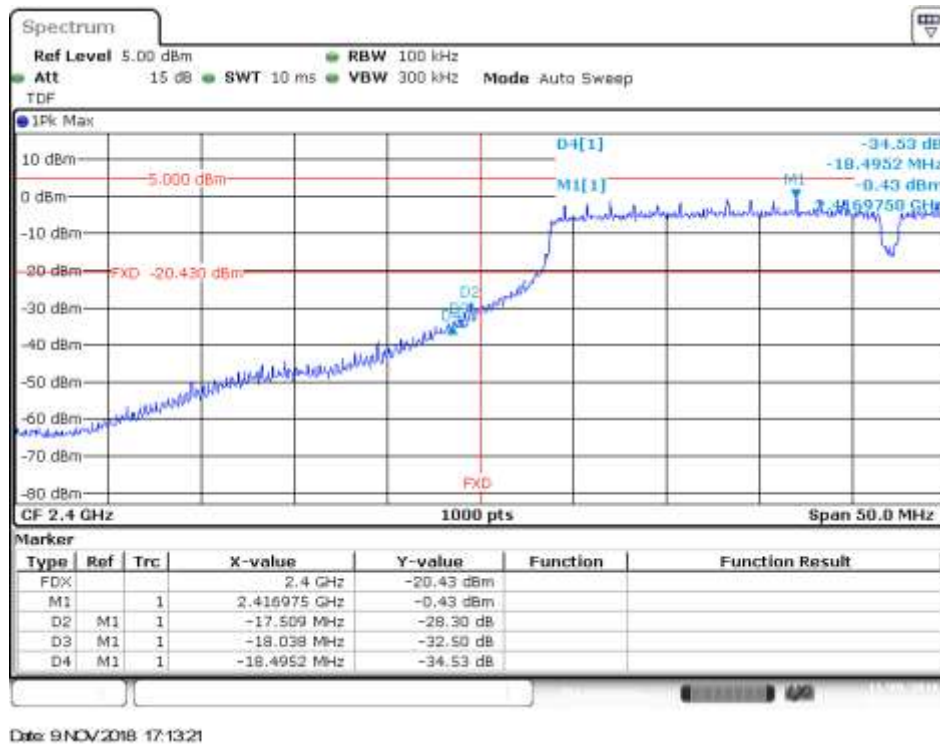
## MIMO-A, 802.11n40, HT8

Channel 3F

BE Low Freq Section



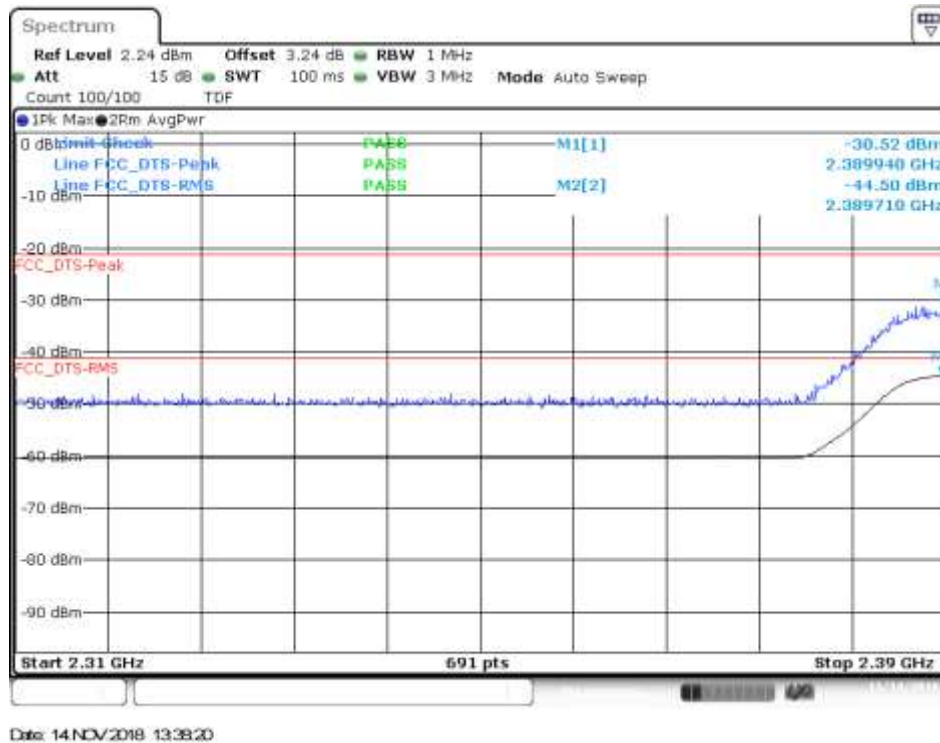
BE Low (Non Restricted)



## MIMO-B, 802.11n40, HT8

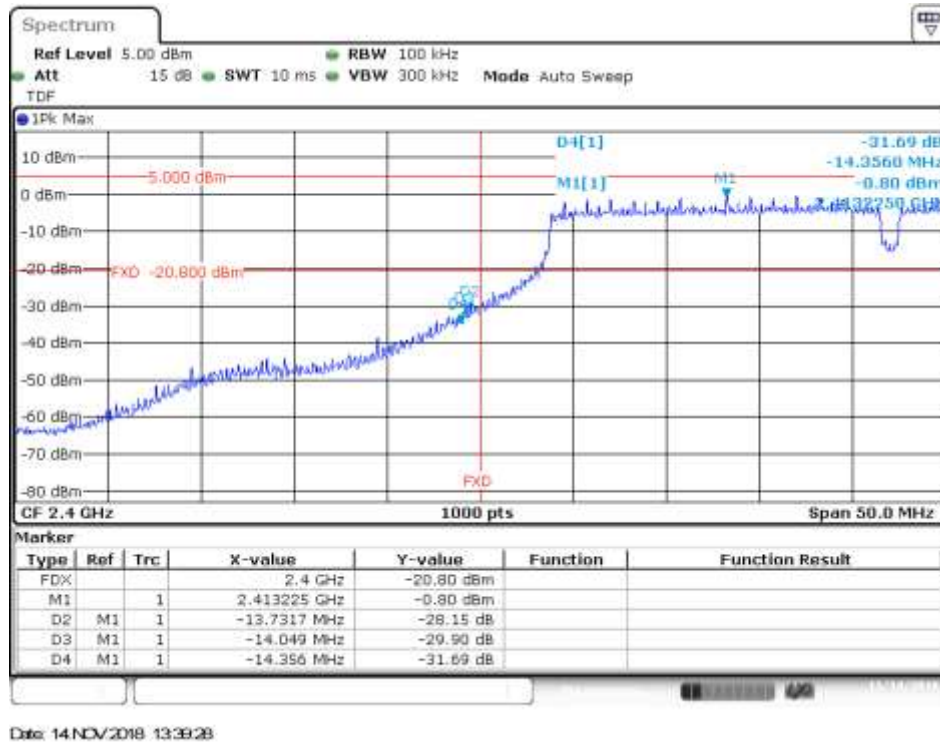
Channel 3F

BE Low Freq Section



Channel 3F

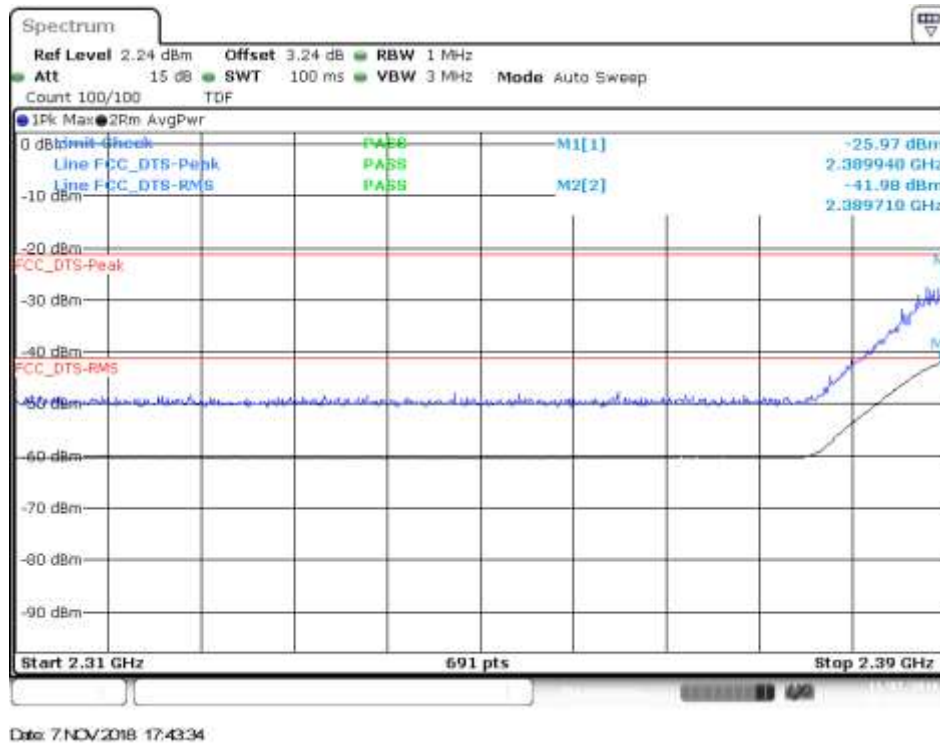
BE Low (Non Restricted)



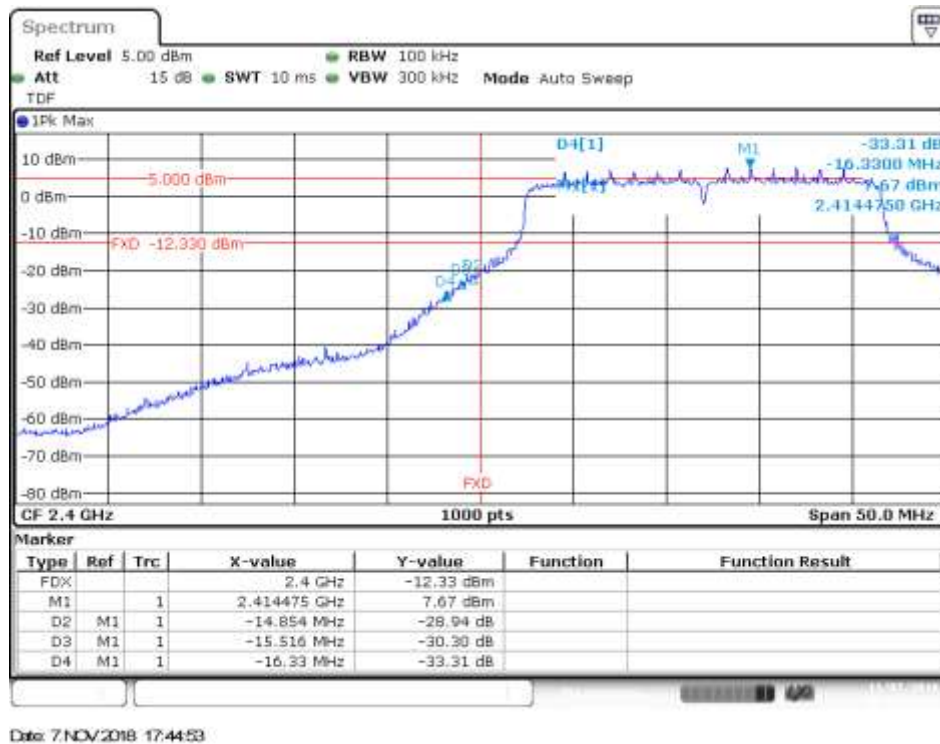
## SISO-A, 802.11ax20, HE0

Channel 1

BE Low Freq Section



BE Low (Non Restricted)

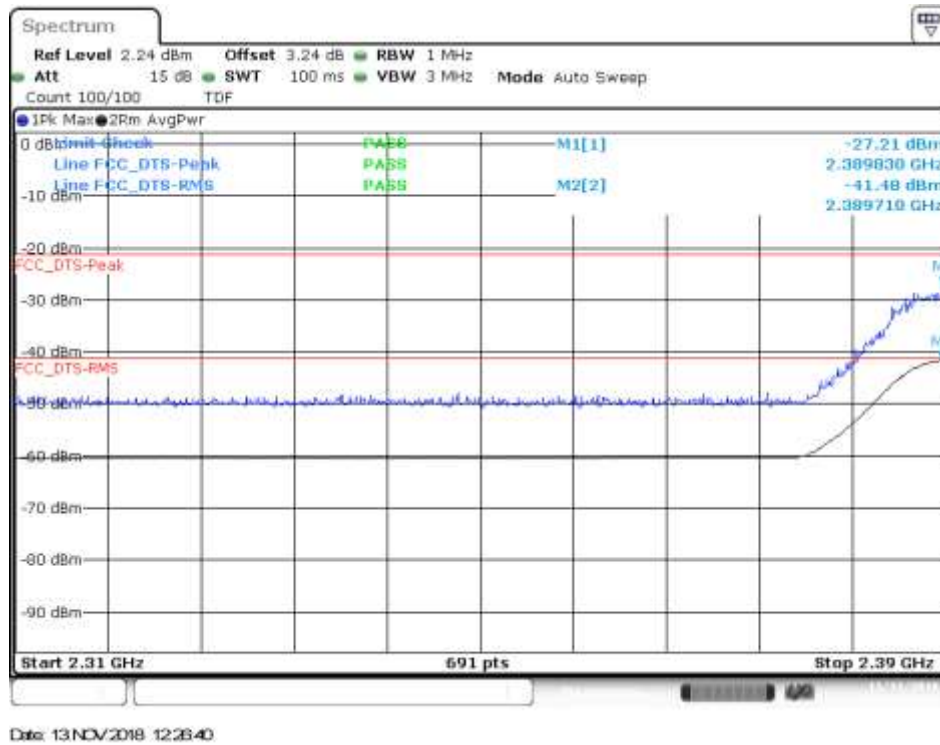




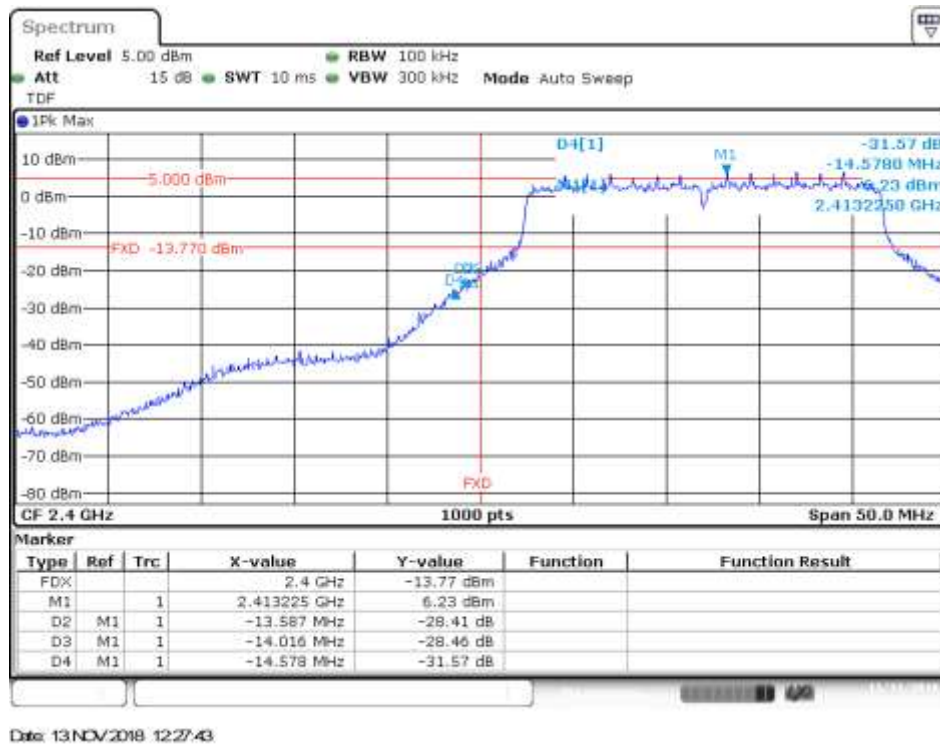
## SISO-B, 802.11ax20, HE0

Channel 1

BE Low Freq Section



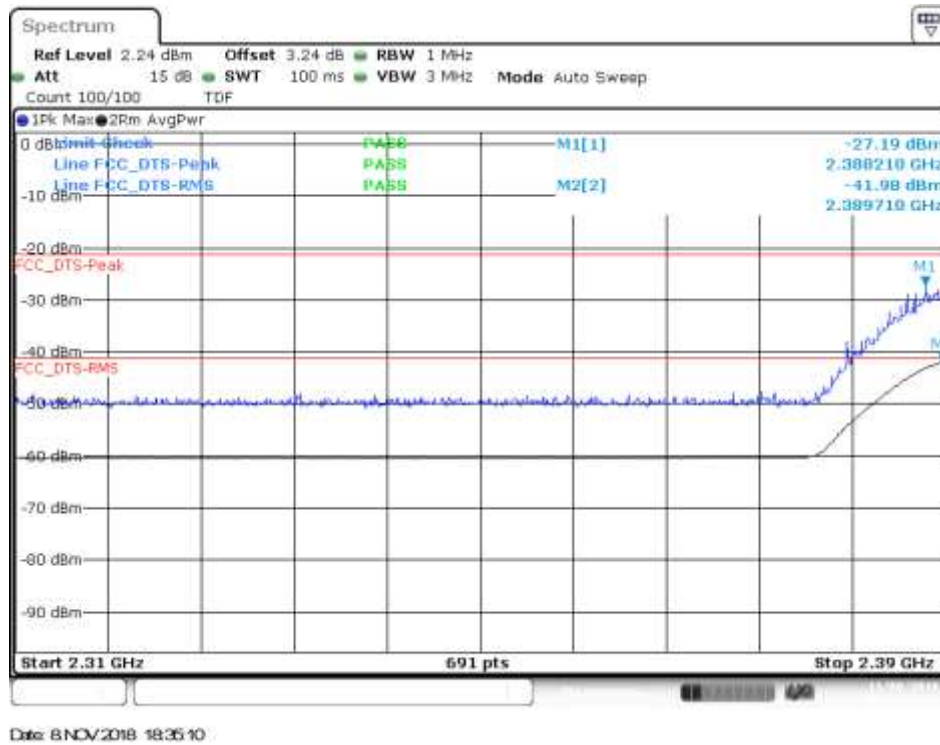
BE Low (Non Restricted)



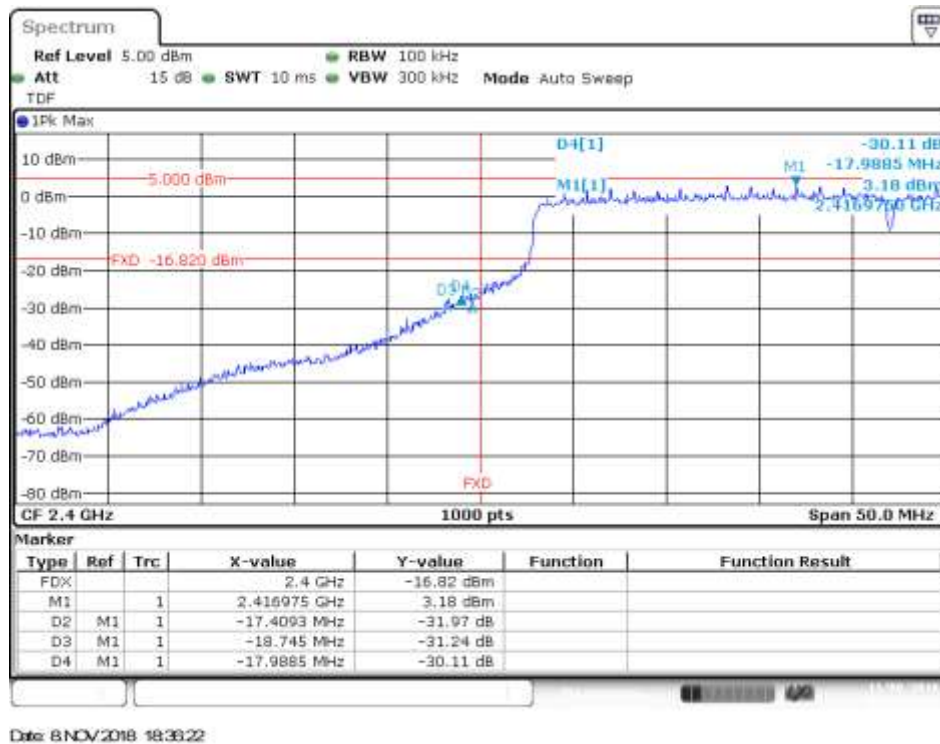
## SISO-A, 802.11ax40, HE0

Channel 3F

BE Low Freq Section



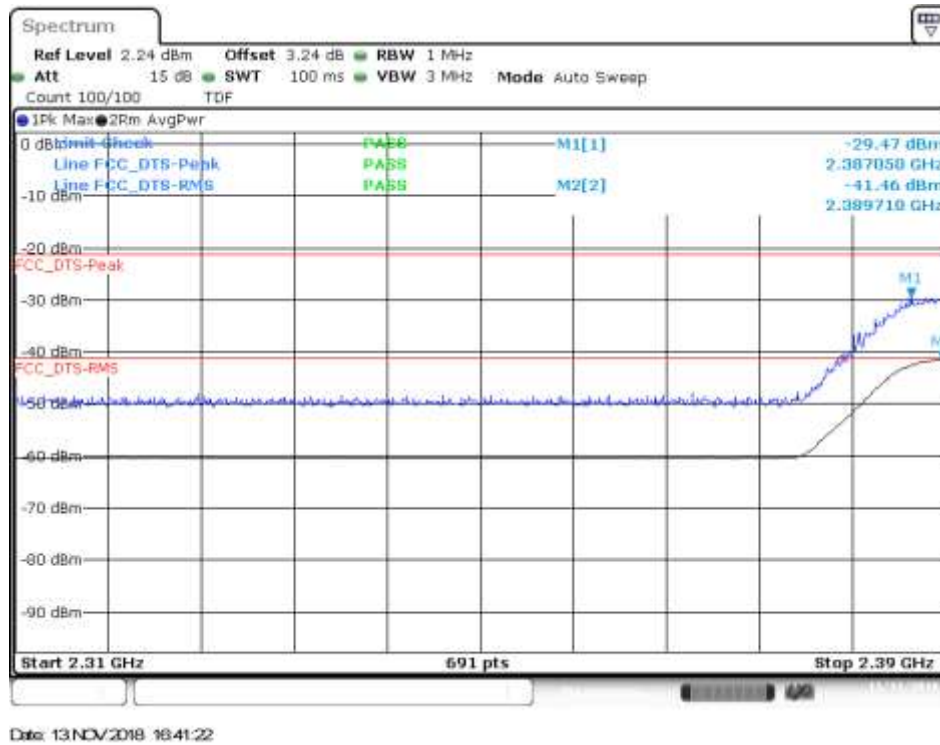
BE Low (Non Restricted)



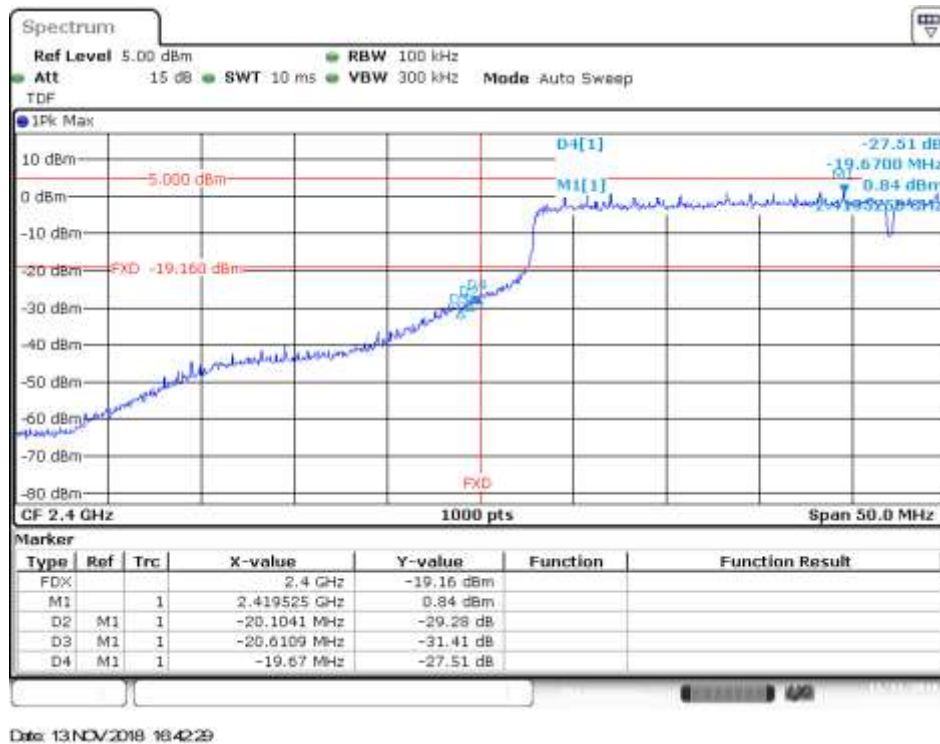
## SISO-B, 802.11ax40, HE0

Channel 3F

BE Low Freq Section



BE Low (Non Restricted)

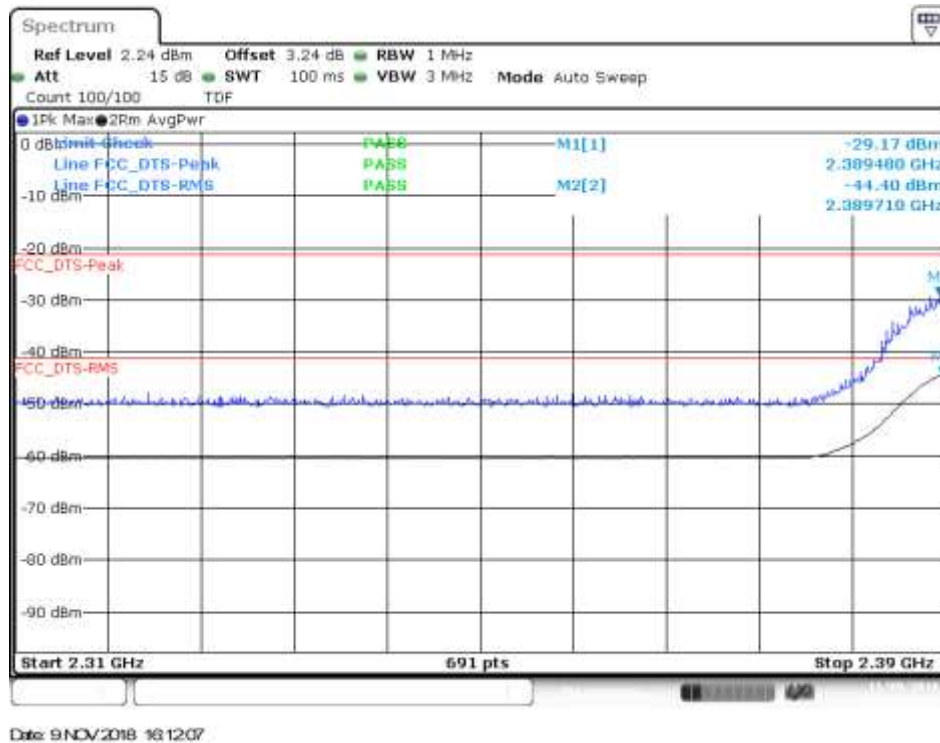




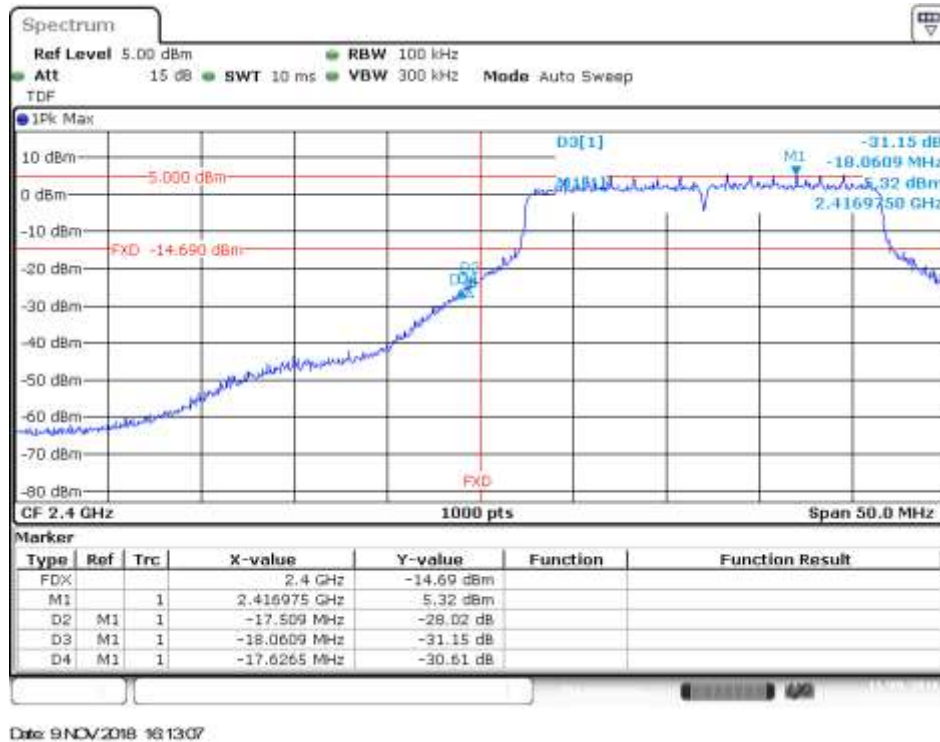
## MIMO-A, 802.11ax20, HE0

Channel 1

BE Low Freq Section



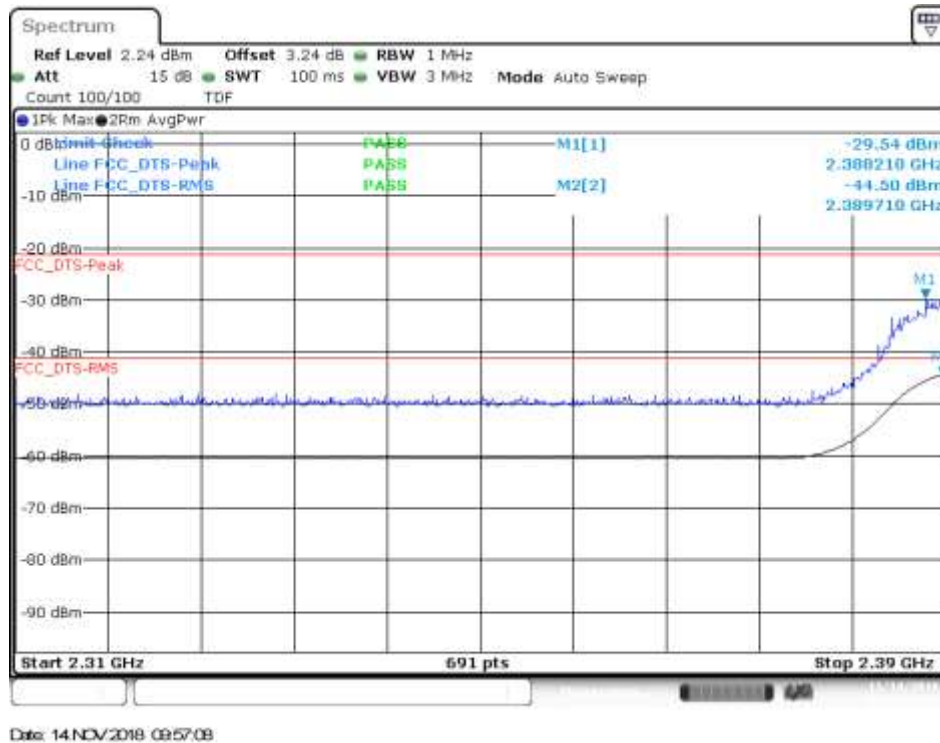
BE Low (Non Restricted)



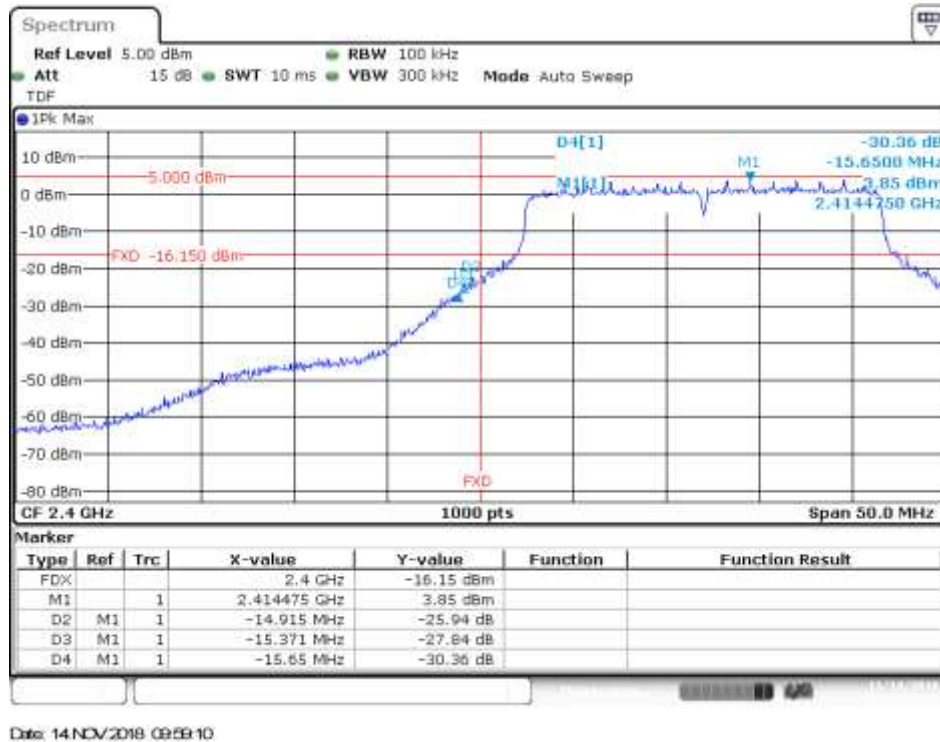
## MIMO-B, 802.11ax20, HE0

Channel 1

BE Low Freq Section



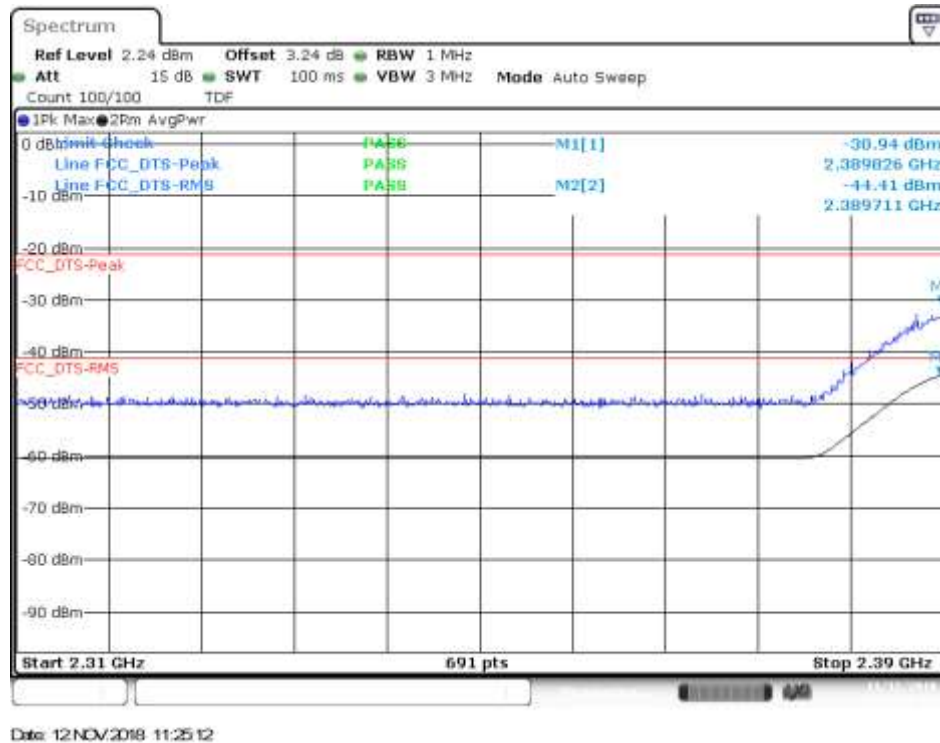
BE Low (Non Restricted)



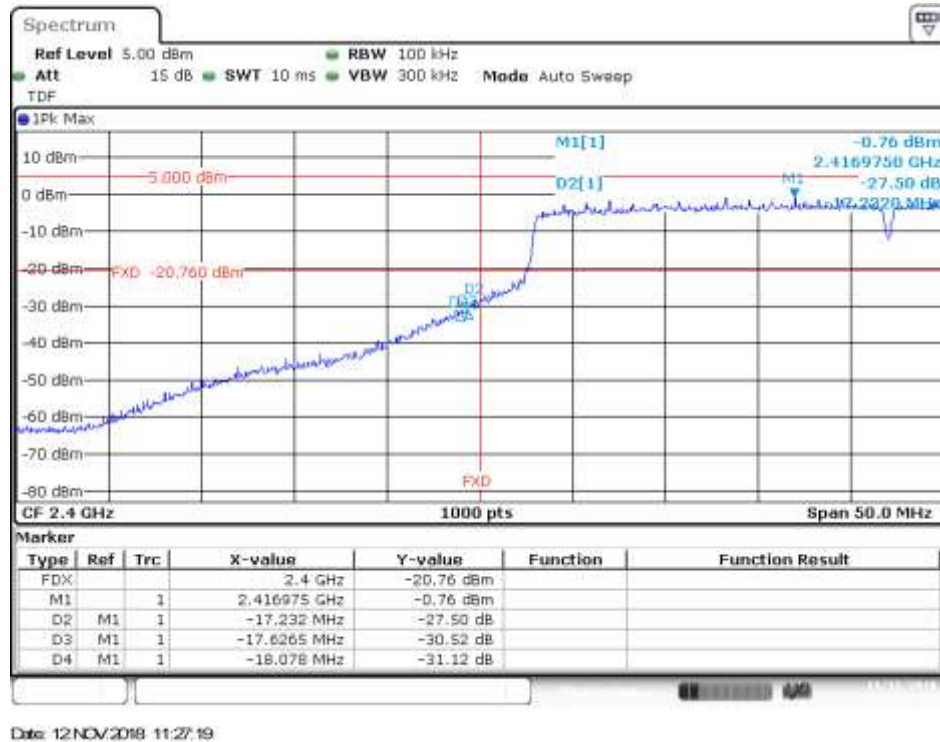
## MIMO-A, 802.11ax40, HE0

Channel 3F

BE Low Freq Section



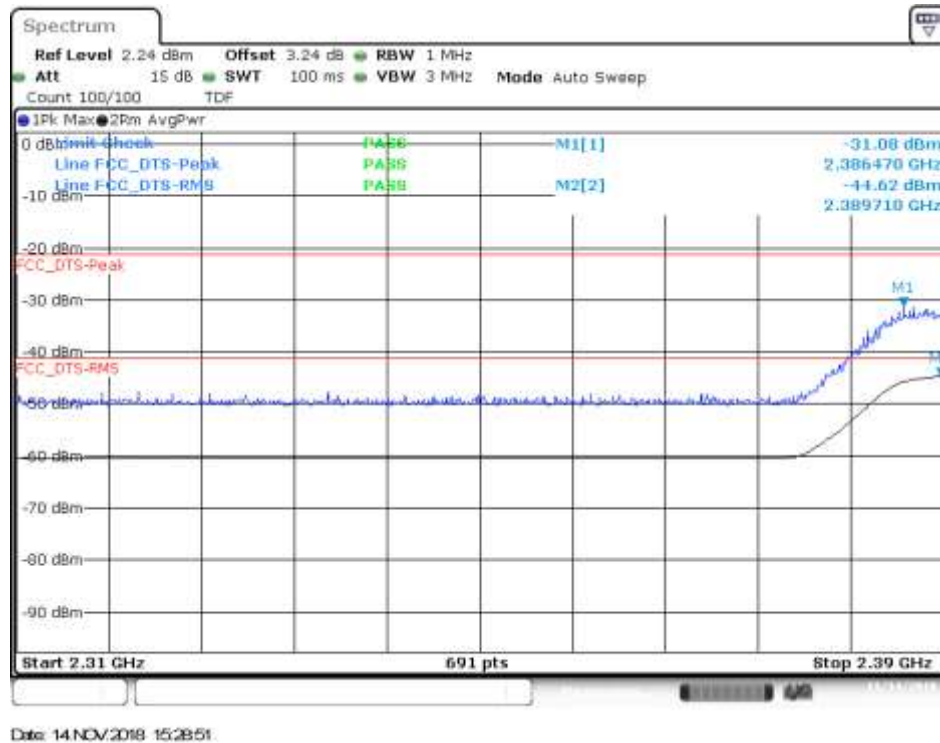
BE Low (Non Restricted)



## MIMO-B, 802.11ax40, HE0

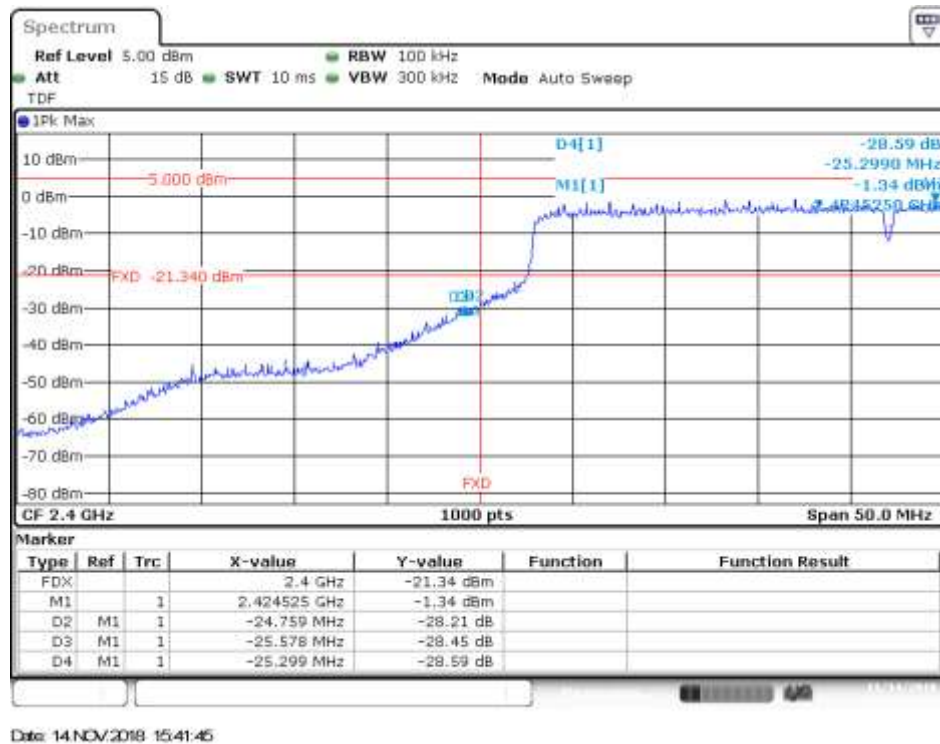
Channel 3F

BE Low Freq Section



Channel 3F

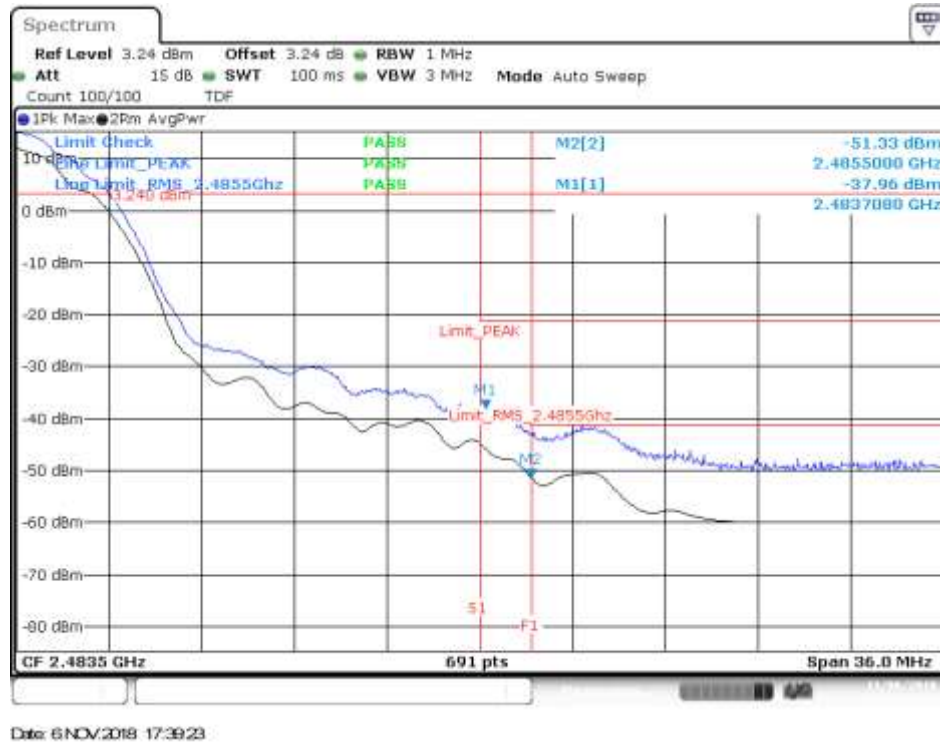
BE Low (Non Restricted)



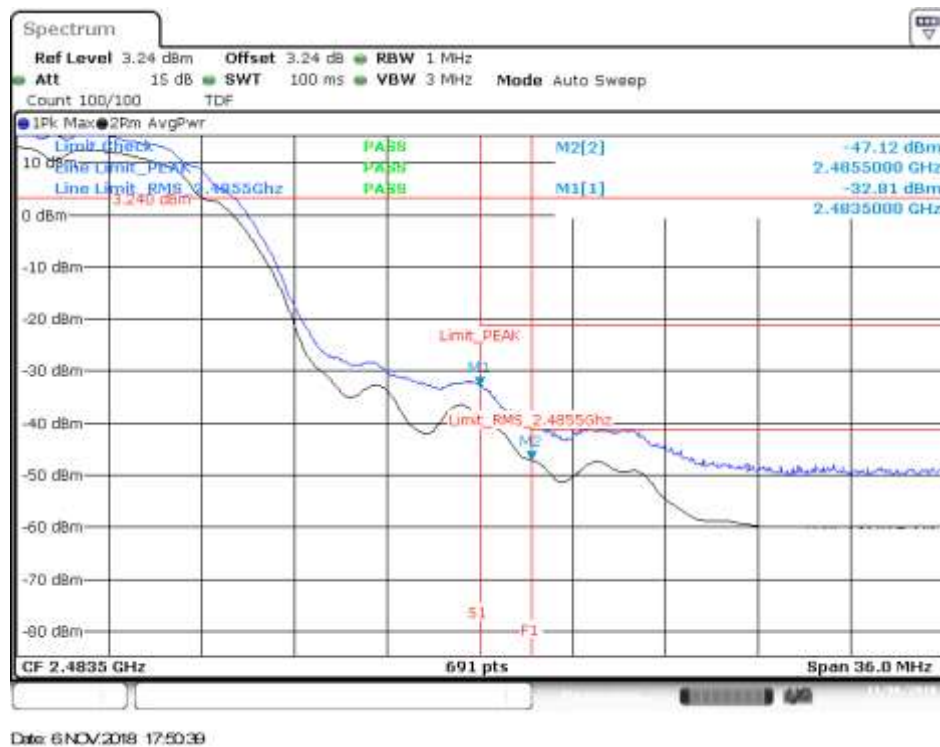
### B.3.6 Out of band emissions - band-edge high (conducted)

## SISO-A, 802.11b, 1Mbps

Channel 11 - BE High Freq Section (restricted)



Channel 12 - BE High Freq Section (restricted)

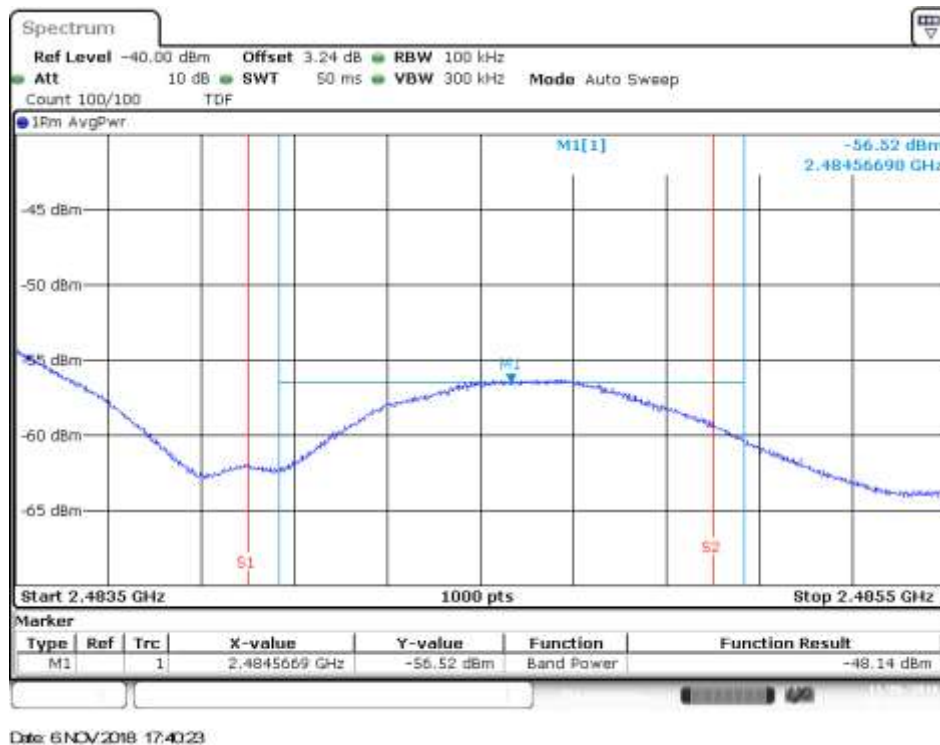




Channel 13 - BE High Freq Section (restricted)

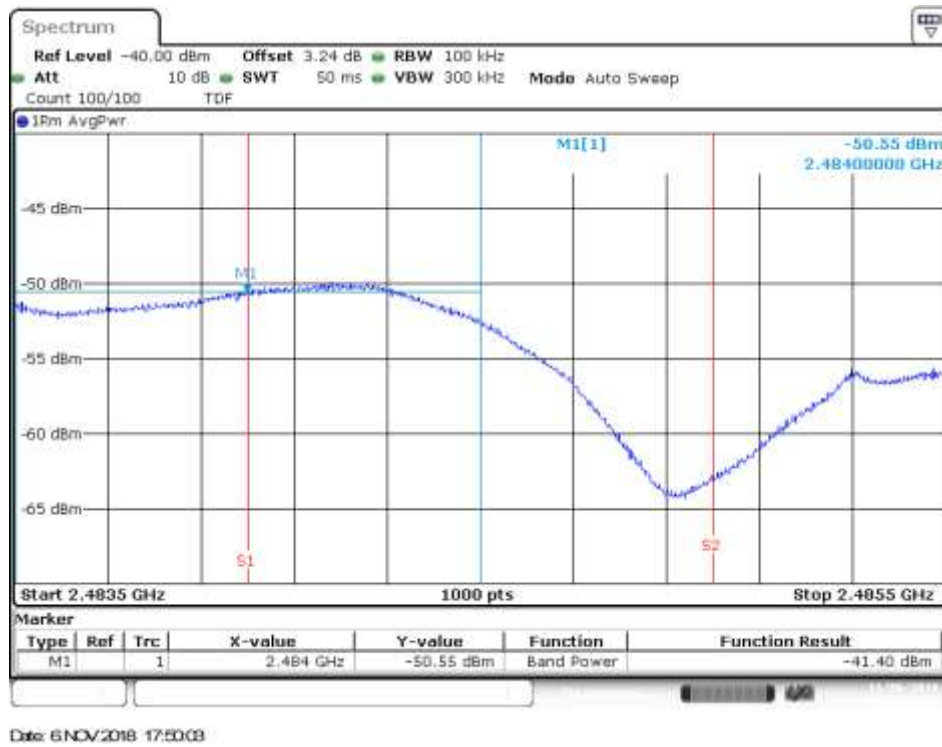


Channel 11 - BE High Freq Section RMS within 2MHz (restricted)

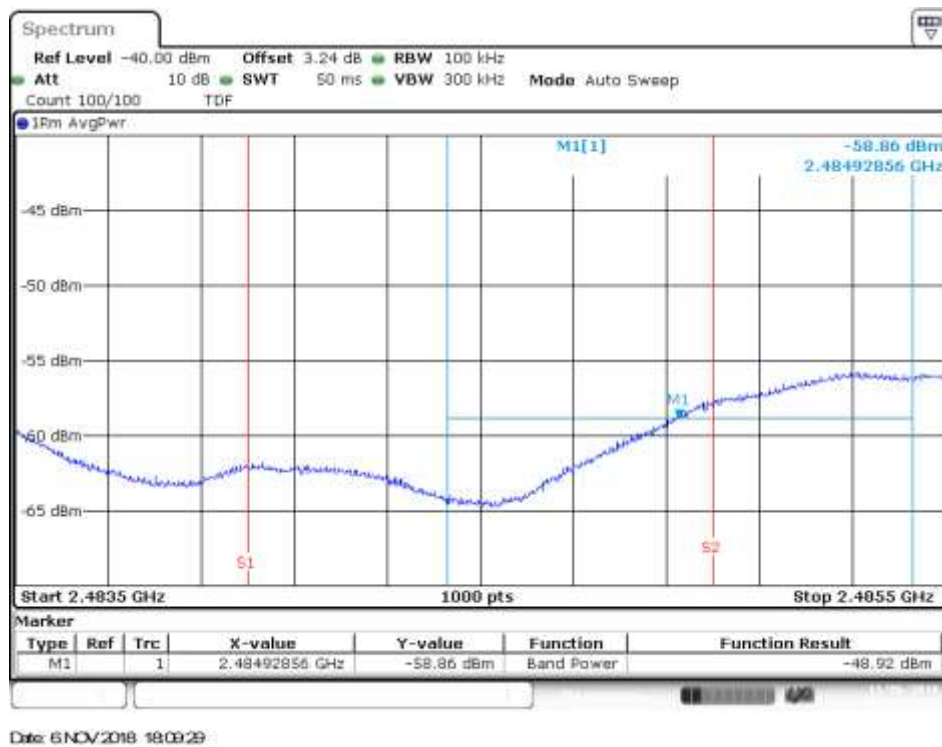


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## Channel 12 - BE High Freq Section RMS within 2MHz (restricted)

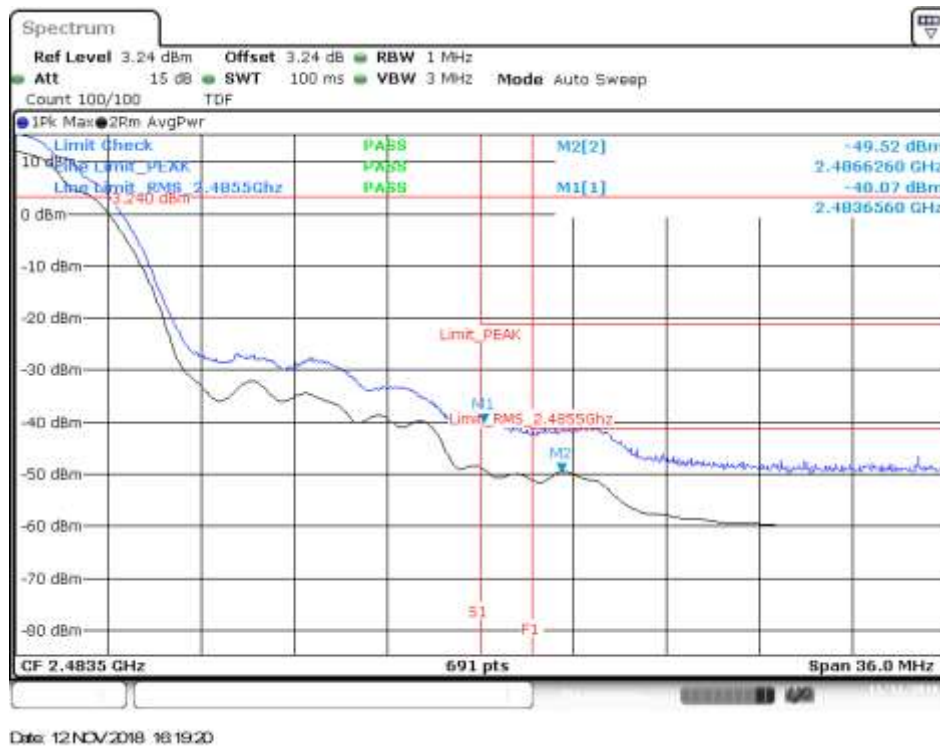


## Channel 13 - BE High Freq Section RMS within 2MHz (restricted)

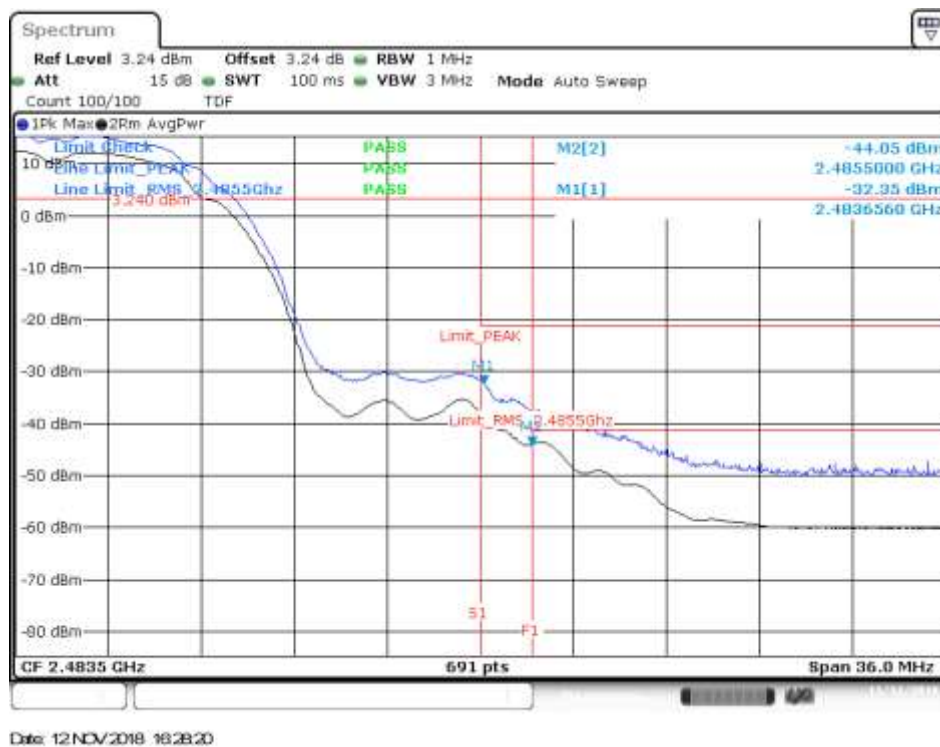


## SISO-B, 802.11b, 1Mbps

Channel 11 - BE High Freq Section (restricted)

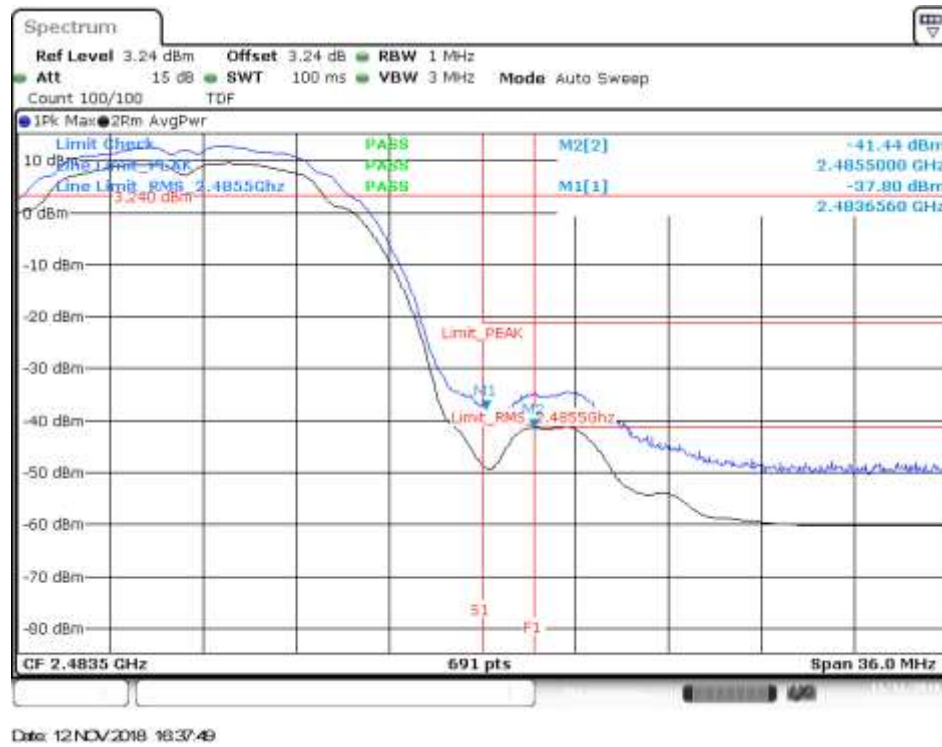


Channel 12 - BE High Freq Section (restricted)

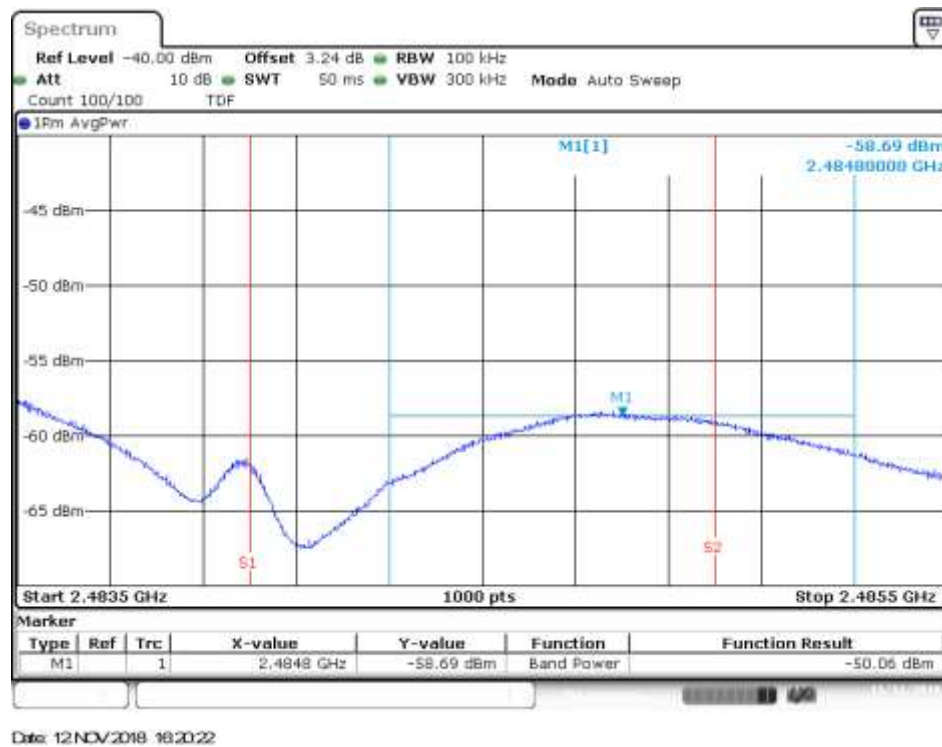




Channel 13 - BE High Freq Section (restricted)

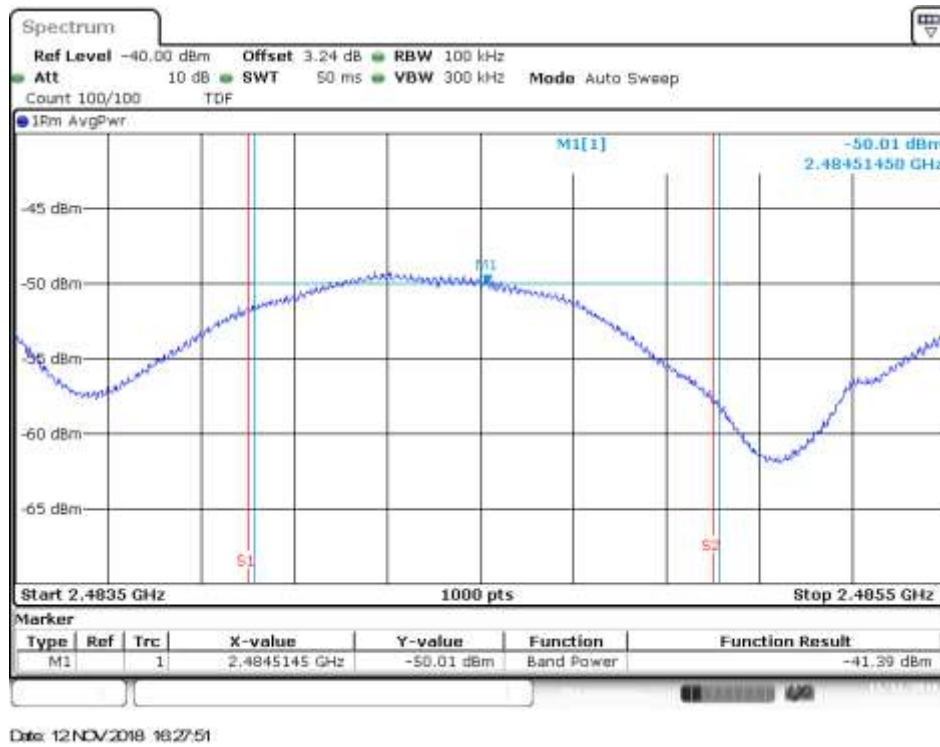


Channel 11 - BE High Freq Section RMS within 2MHz (restricted)

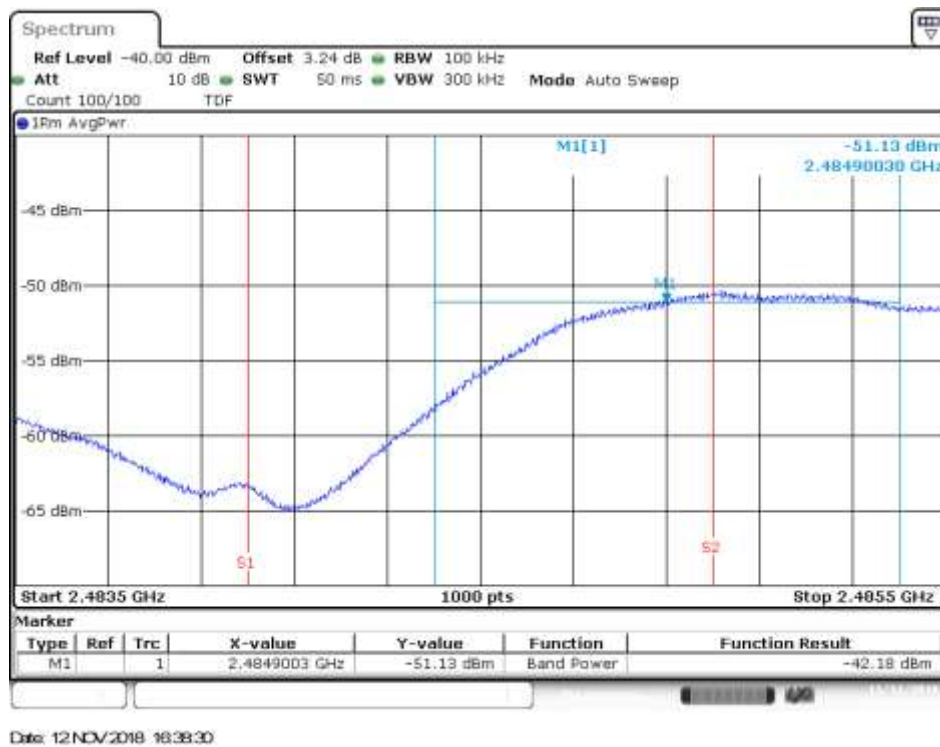


## Test Report N° 180717-04.TR04

## Channel 12 - BE High Freq Section RMS within 2MHz (restricted)

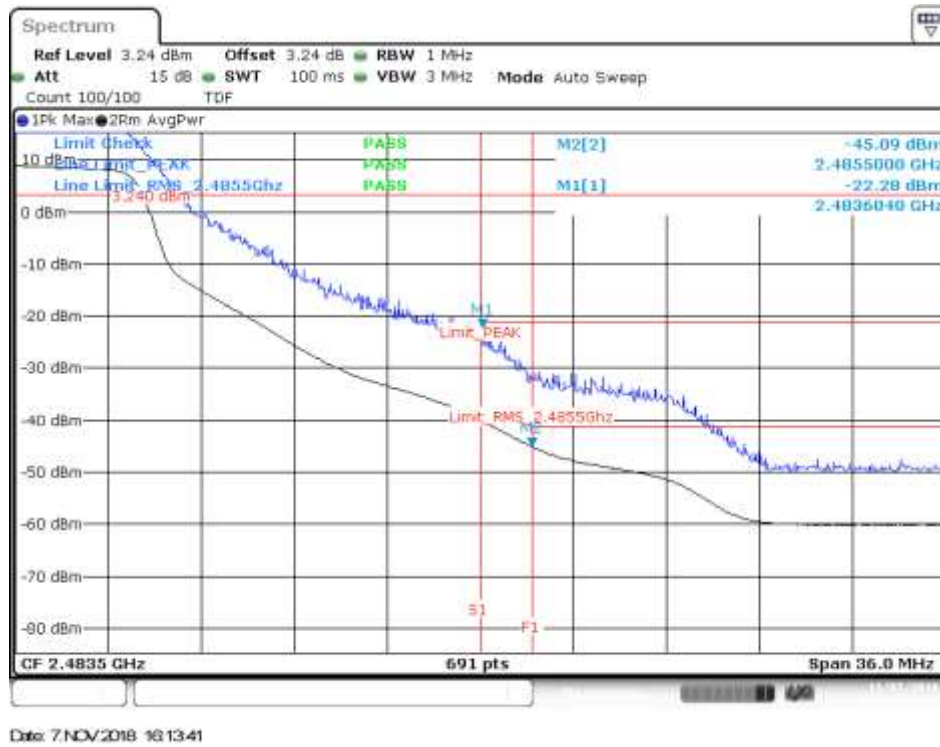


## Channel 13 - BE High Freq Section RMS within 2MHz (restricted)

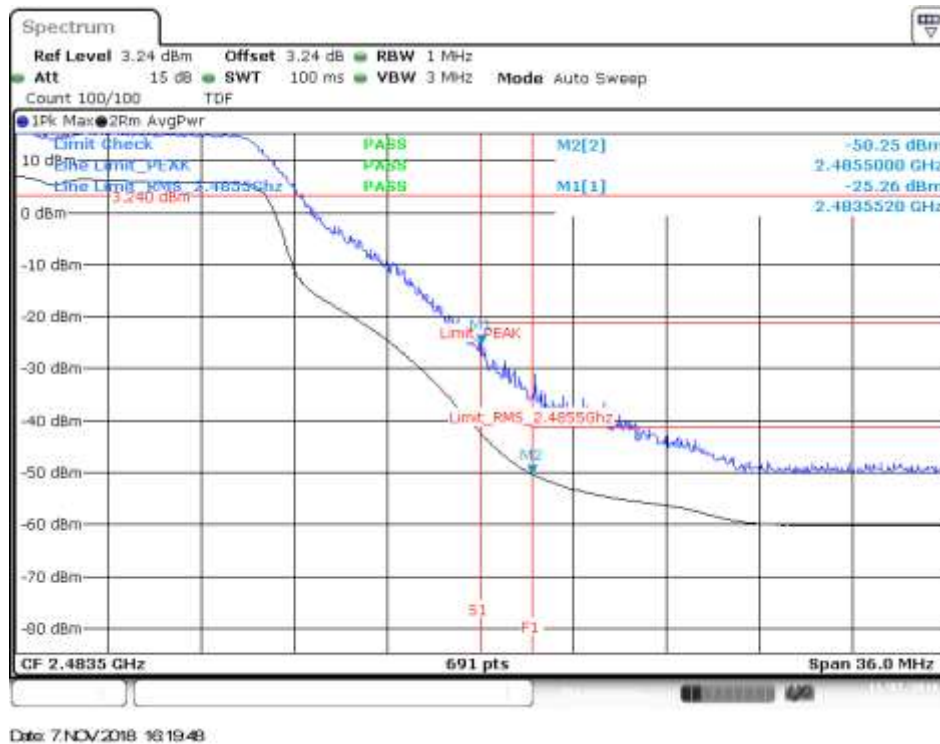


## SISO-A, 802.11g, 6Mbps

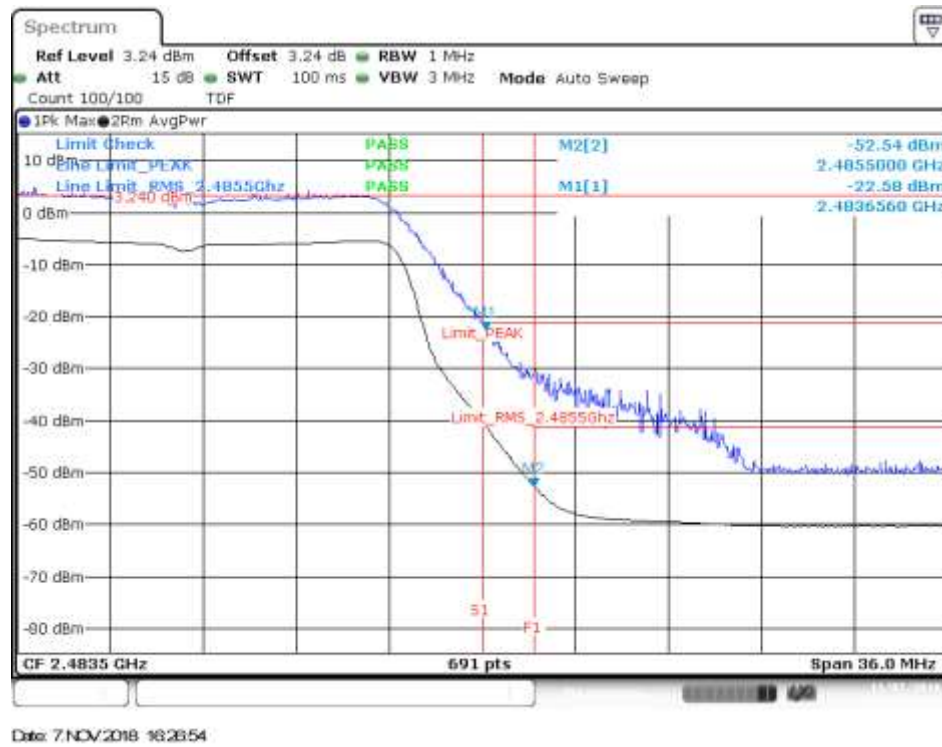
Channel 11 - BE High Freq Section (restricted)



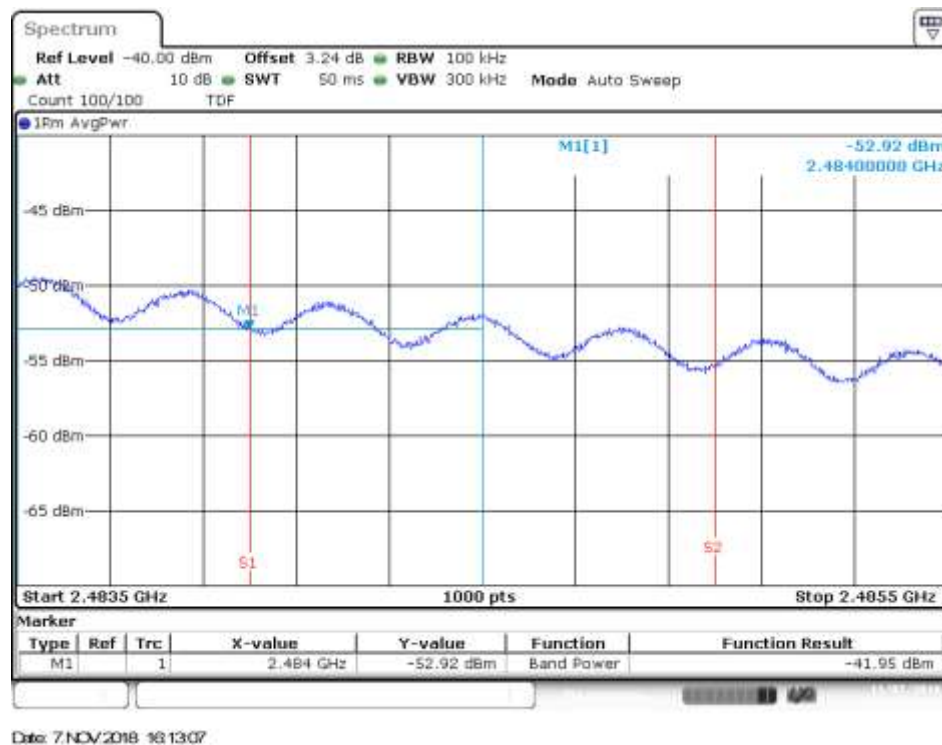
Channel 12 - BE High Freq Section (restricted)



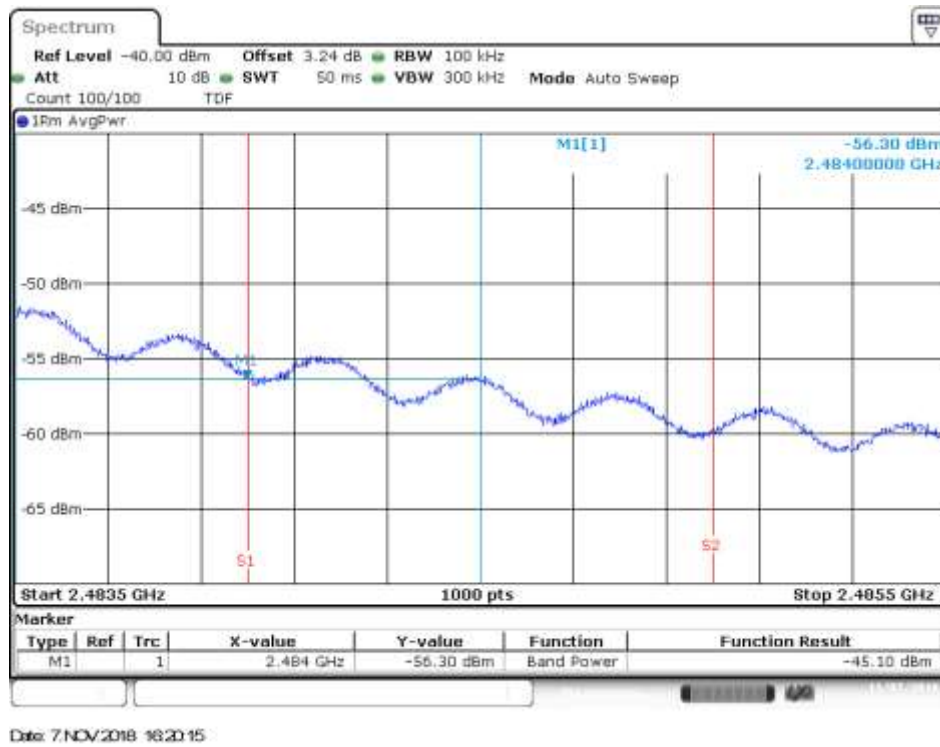
Channel 13 - BE High Freq Section (restricted)



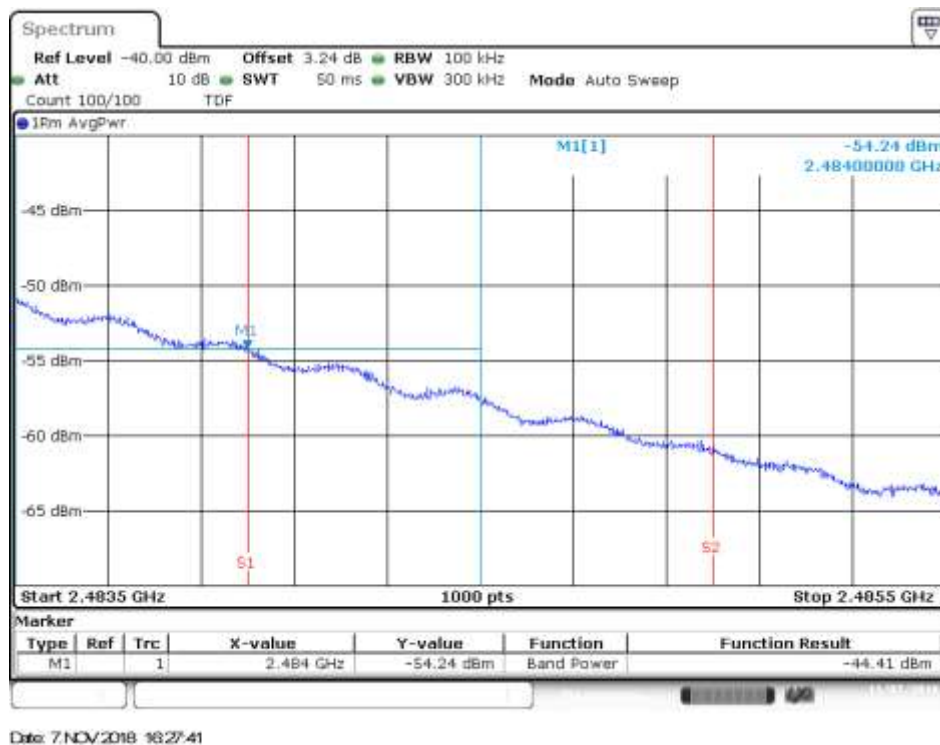
Channel 11 - BE High Freq Section RMS within 2MHz (restricted)



Channel 12 - BE High Freq Section RMS within 2MHz (restricted)



Channel 13 - BE High Freq Section RMS within 2MHz (restricted)

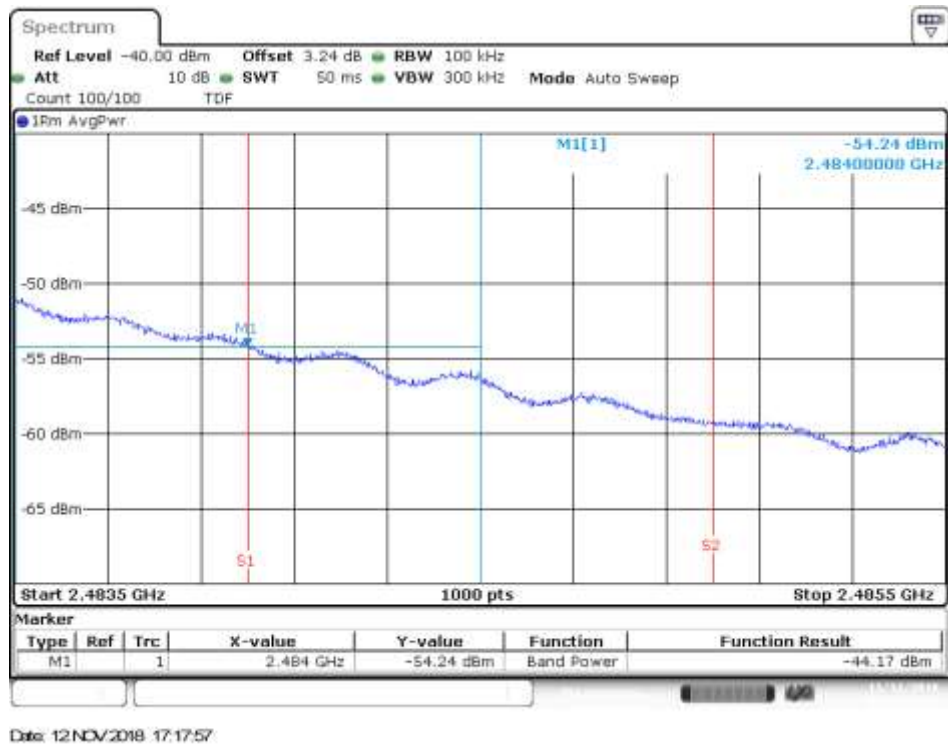




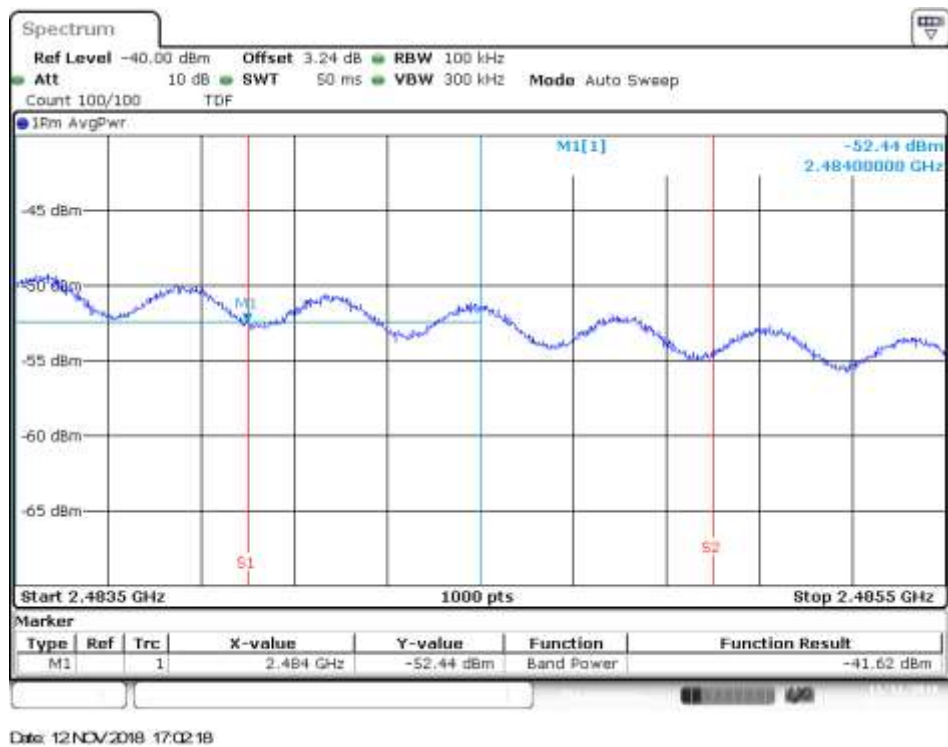


Test Report N° 180717-04.TR04

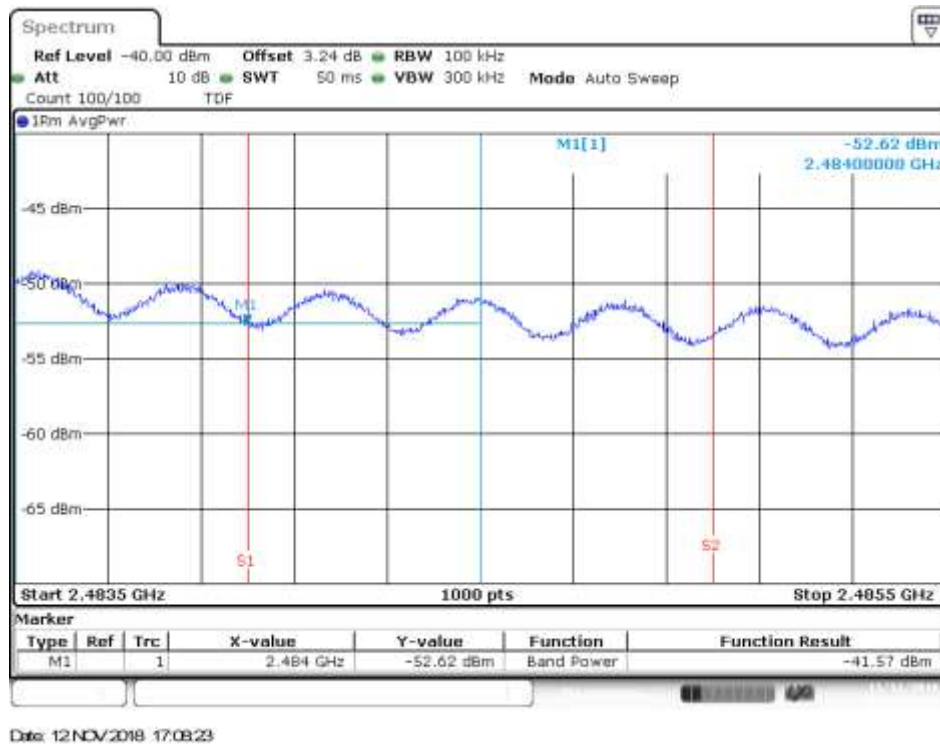
Channel 13 - BE High Freq Section (restricted)



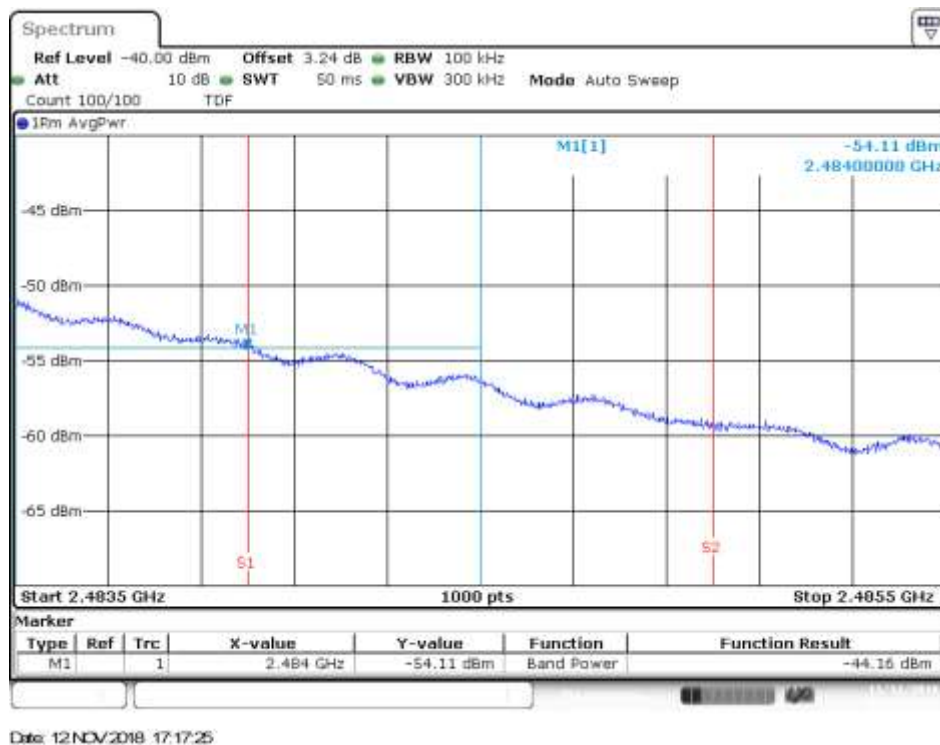
Channel 11 - BE High Freq Section RMS within 2MHz (restricted)



Channel 12 - BE High Freq Section RMS within 2MHz (restricted)



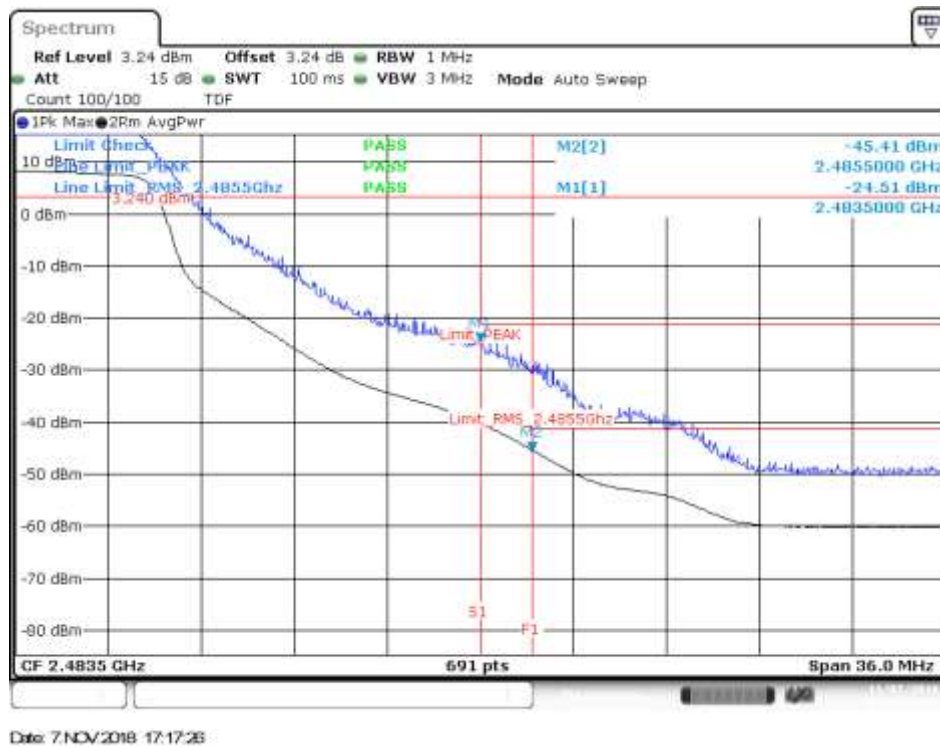
Channel 13 - BE High Freq Section RMS within 2MHz (restricted)



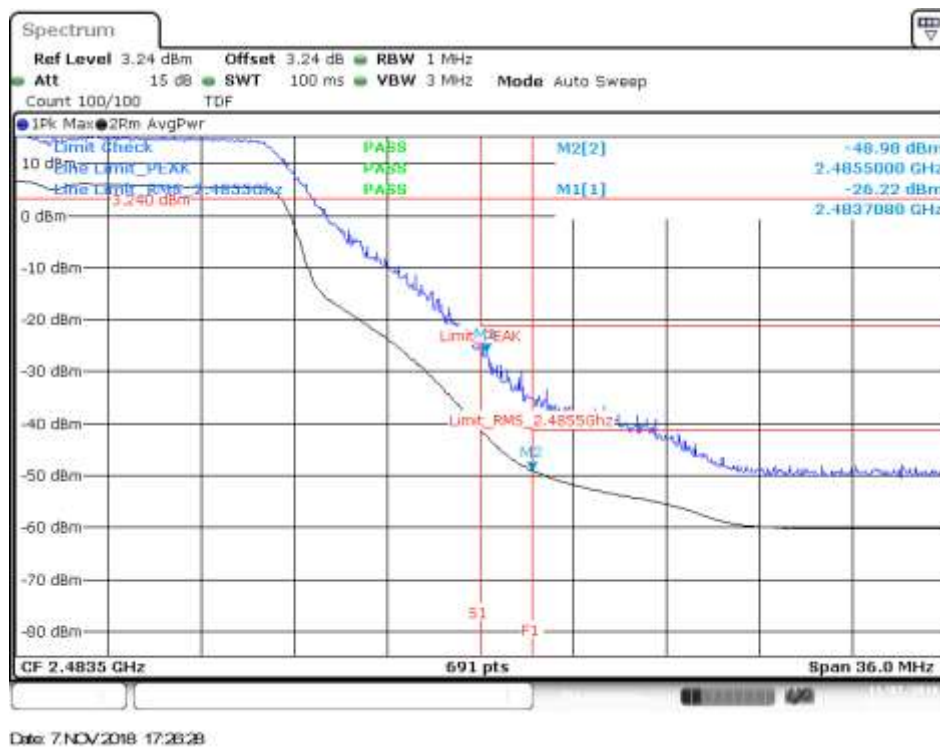


## SISO-A, 802.11n20, HT0

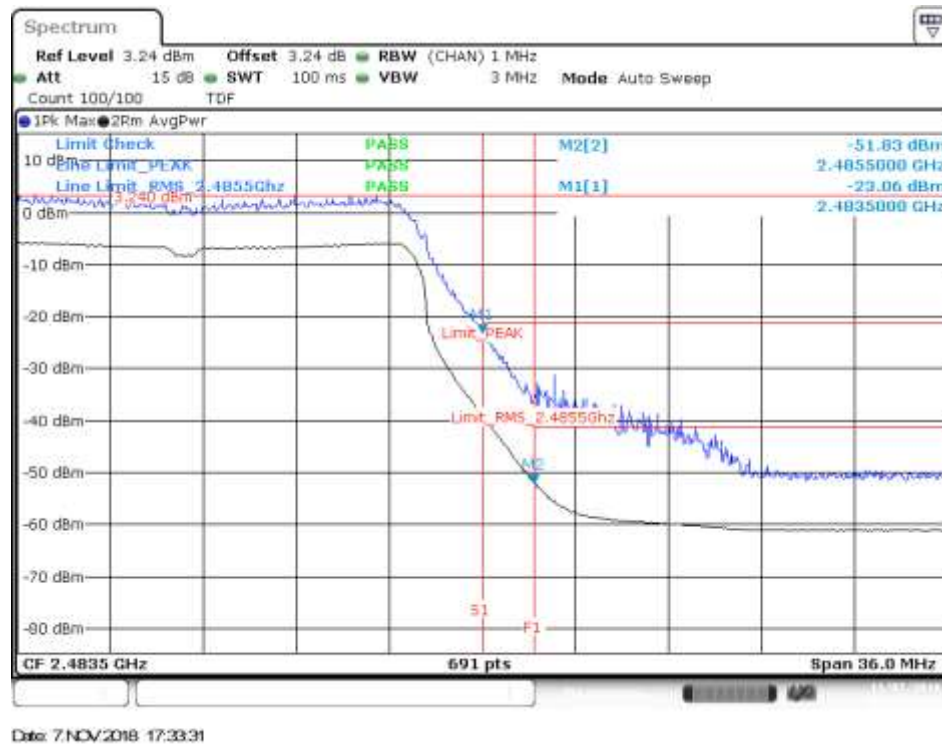
Channel 11 - BE High Freq Section (restricted)



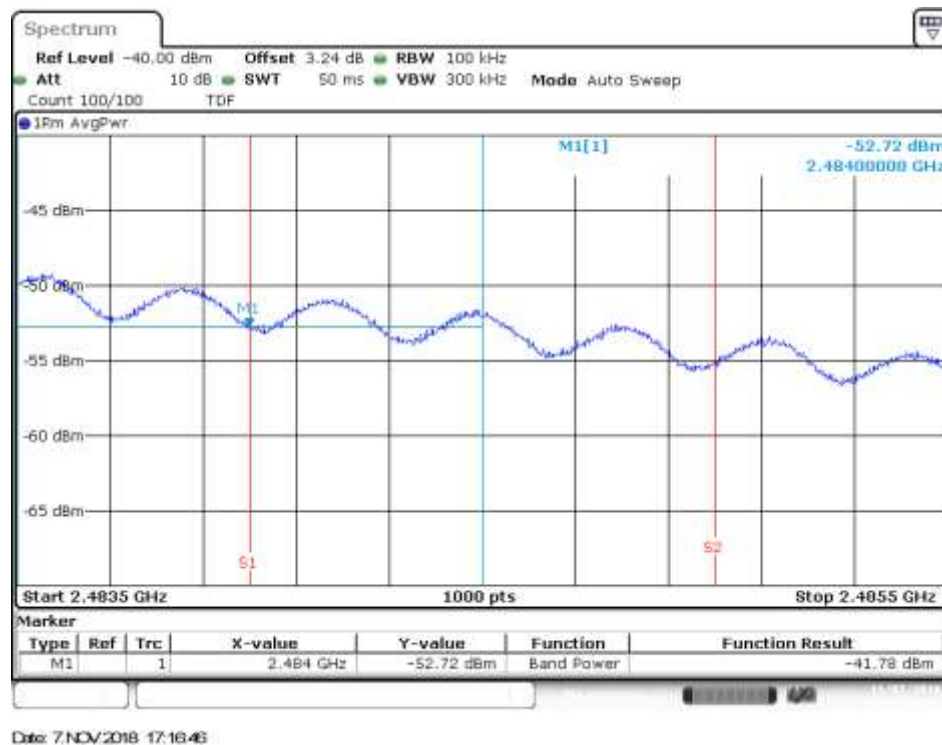
Channel 12 - BE High Freq Section (restricted)



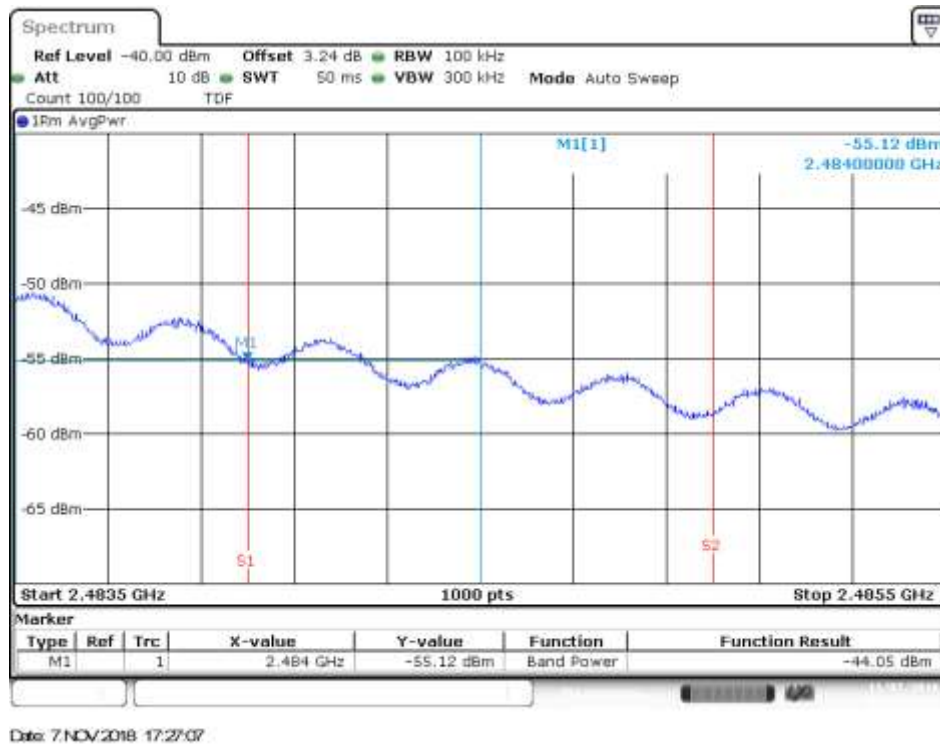
Channel 13 - BE High Freq Section (restricted)



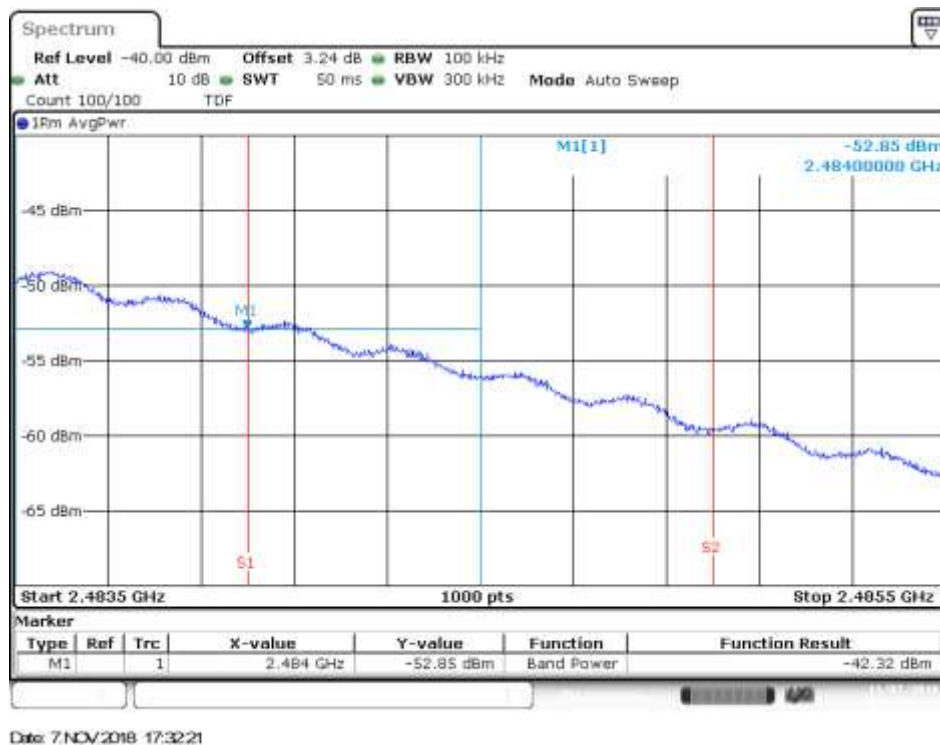
Channel 11 - BE High Freq Section RMS within 2MHz (restricted)



Channel 12 - BE High Freq Section RMS within 2MHz (restricted)

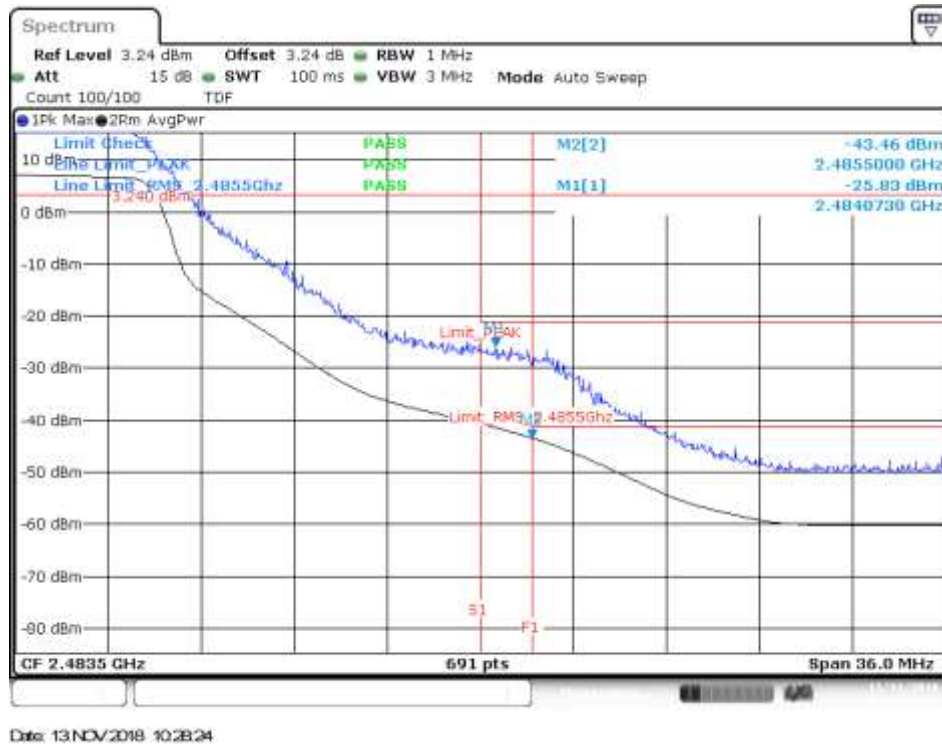


Channel 13 - BE High Freq Section RMS within 2MHz (restricted)

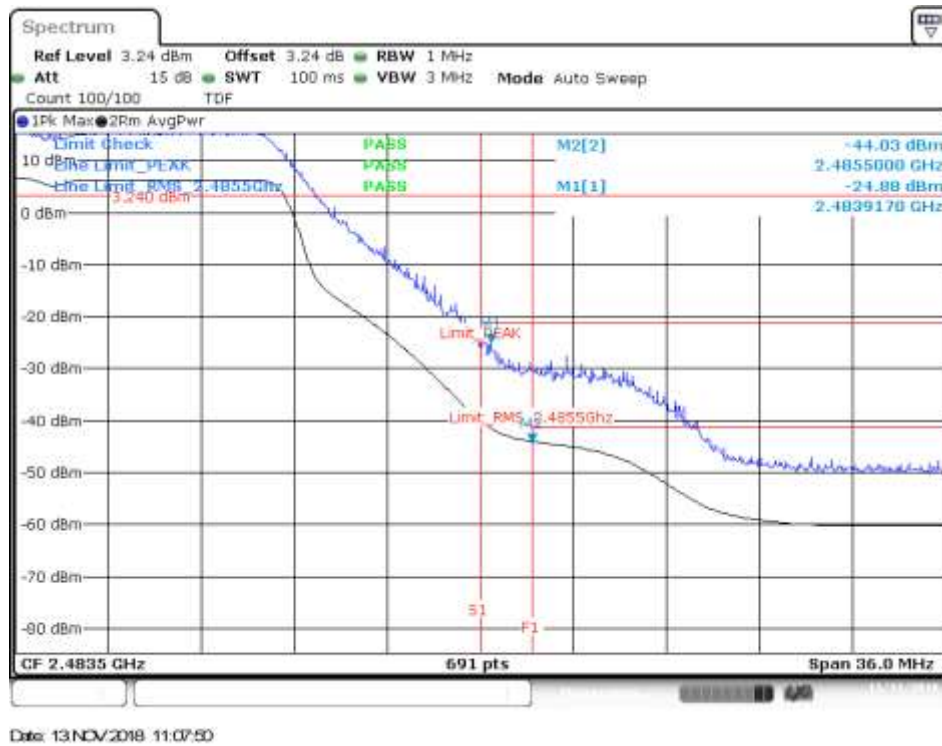


## SISO-B, 802.11n20, HT0

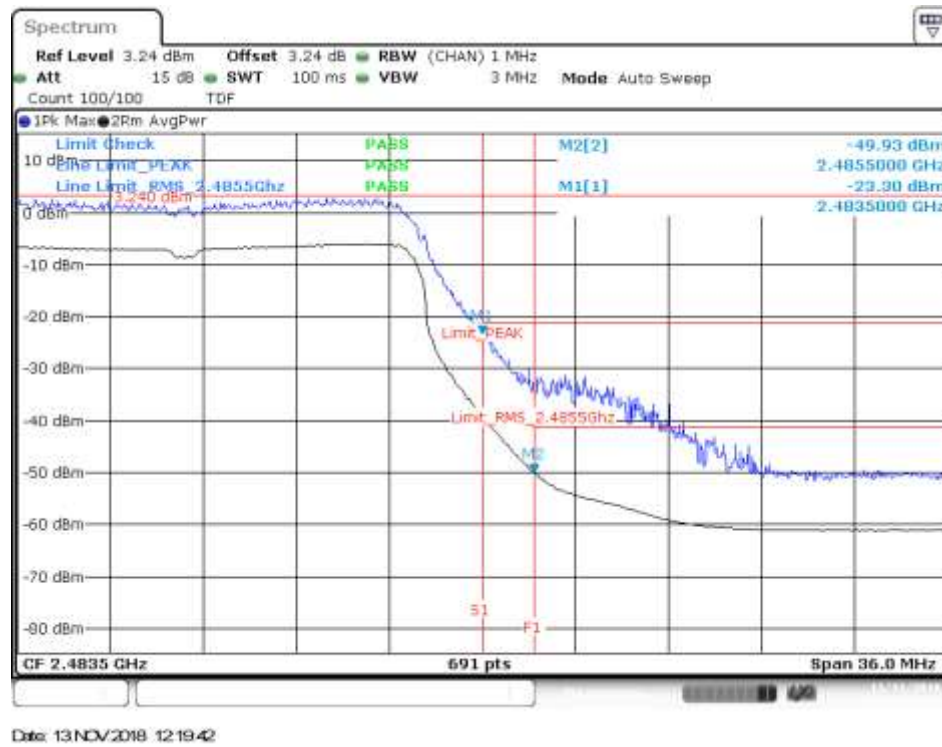
Channel 11 - BE High Freq Section (restricted)



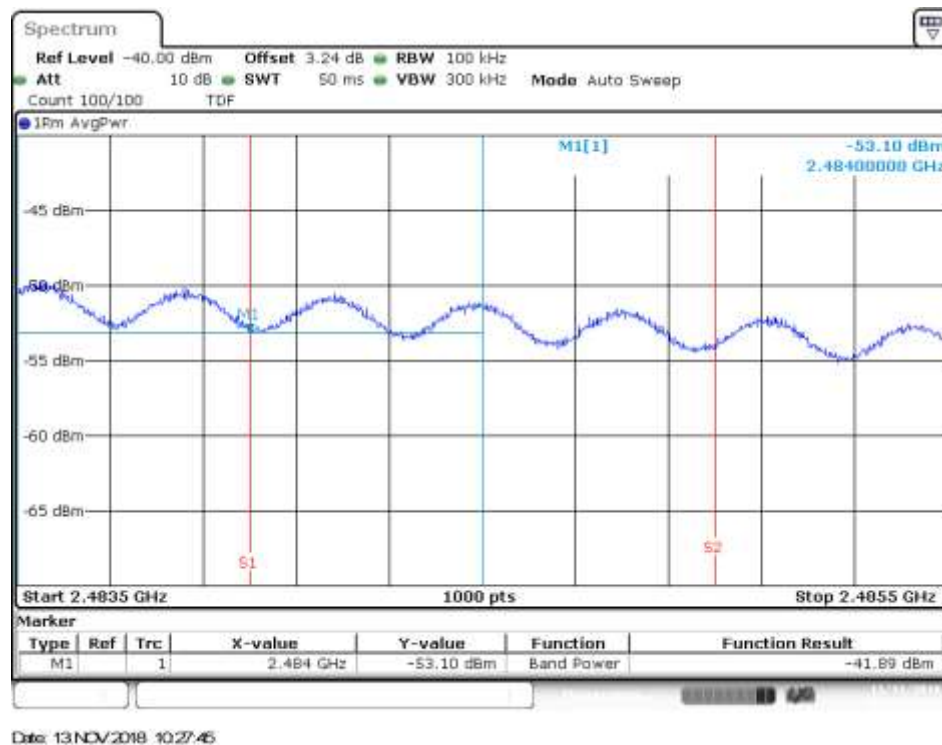
Channel 12 - BE High Freq Section (restricted)



Channel 13 - BE High Freq Section (restricted)



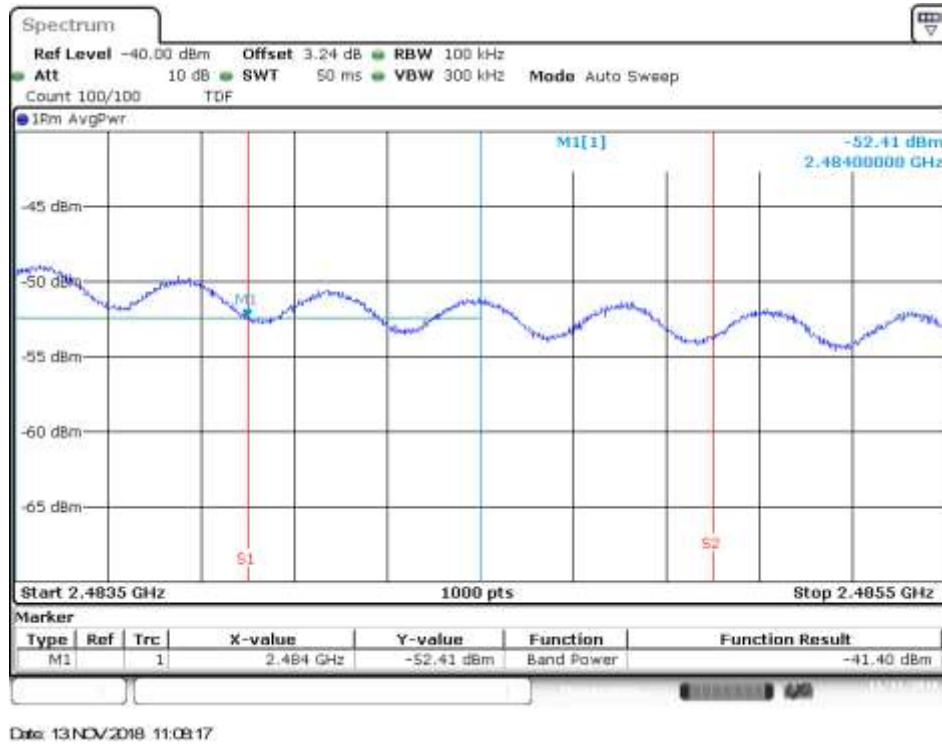
Channel 11 - BE High Freq Section RMS within 2MHz (restricted)



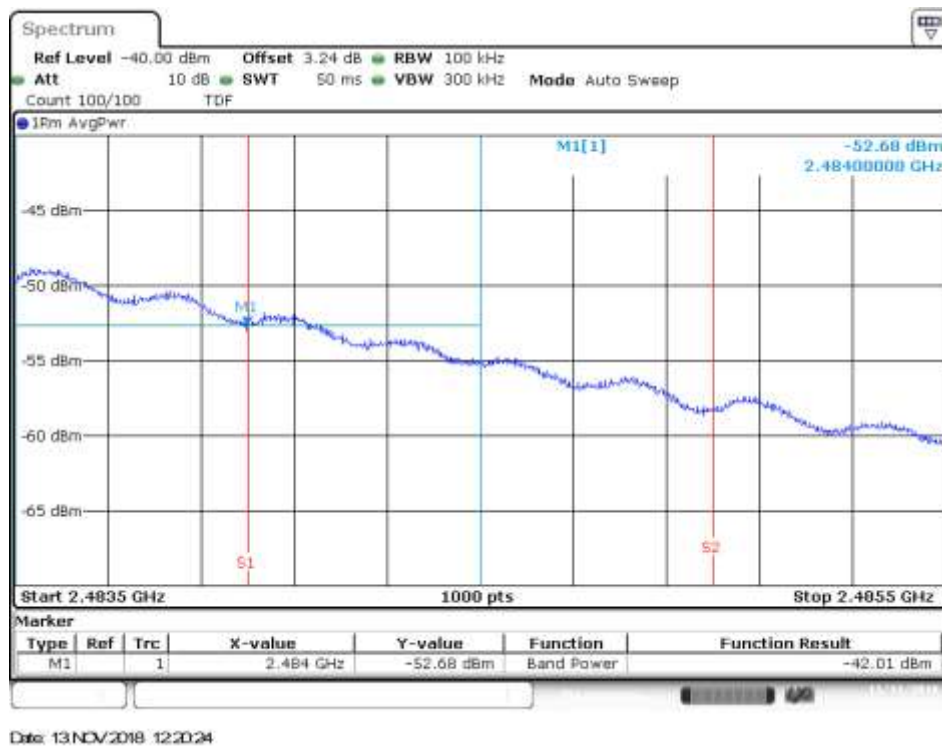


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## Channel 12 - BE High Freq Section RMS within 2MHz (restricted)

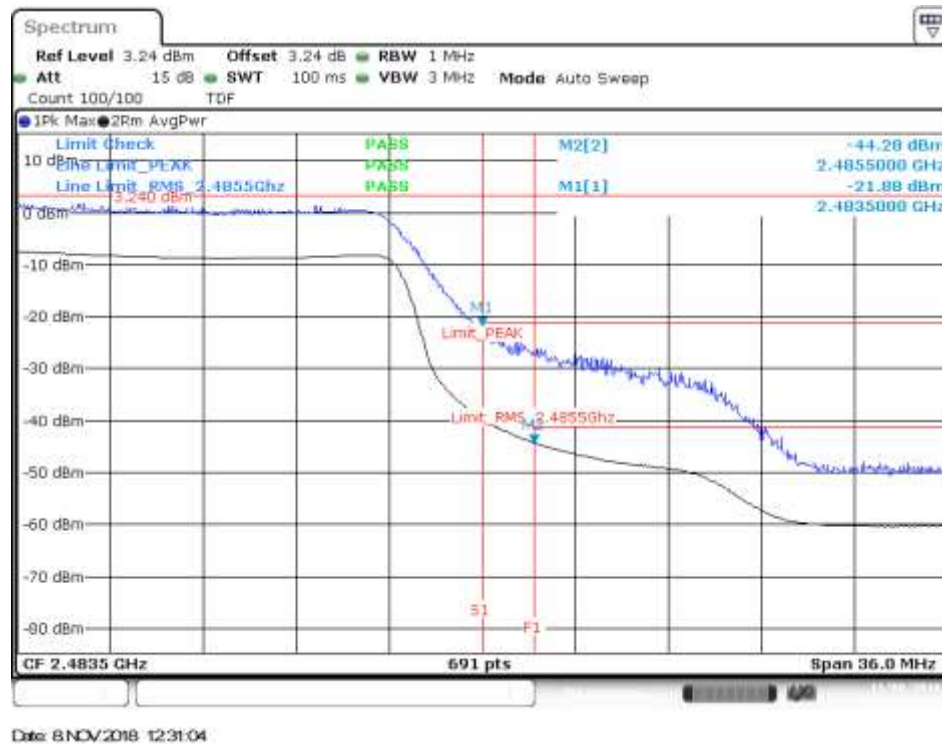


## Channel 13 - BE High Freq Section RMS within 2MHz (restricted)

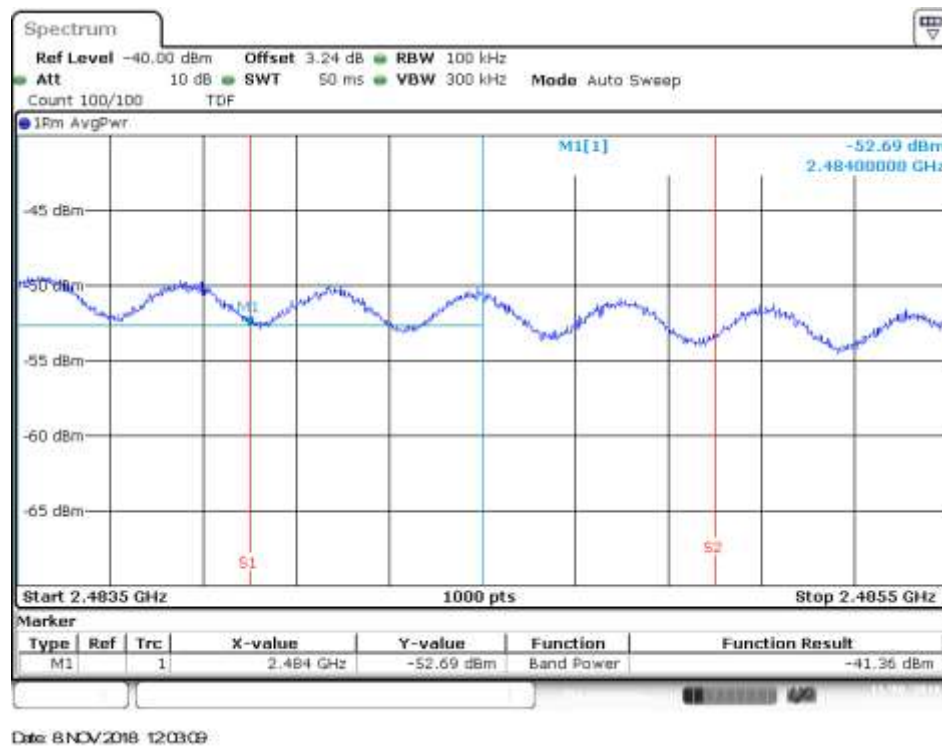




Channel 11F - BE High Freq Section (restricted)

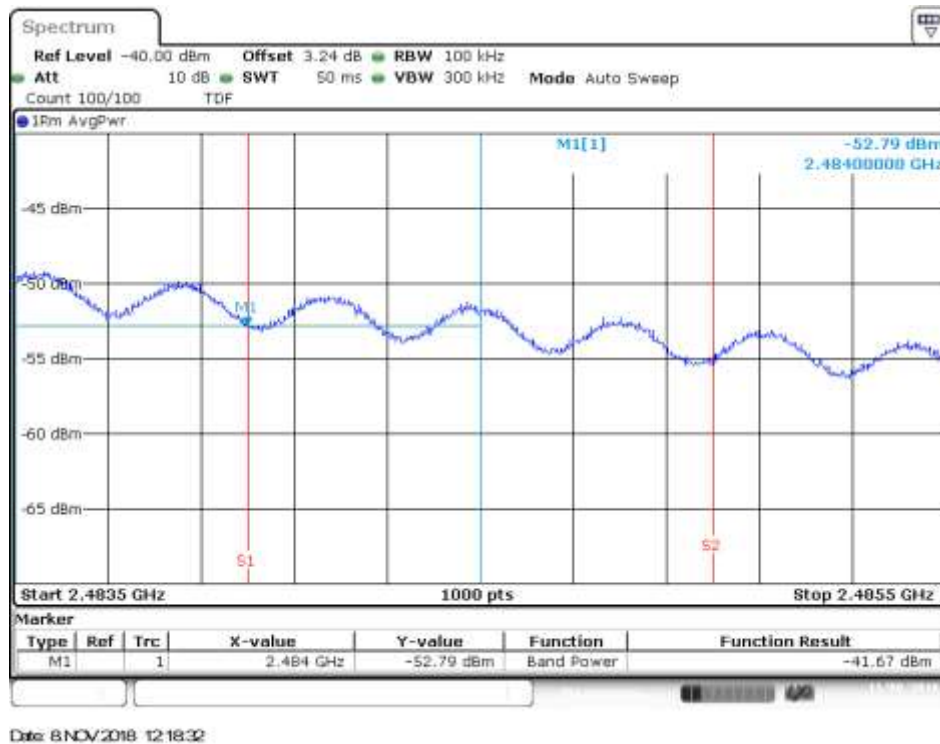


Channel 9F - BE High Freq Section RMS within 2MHz (restricted)

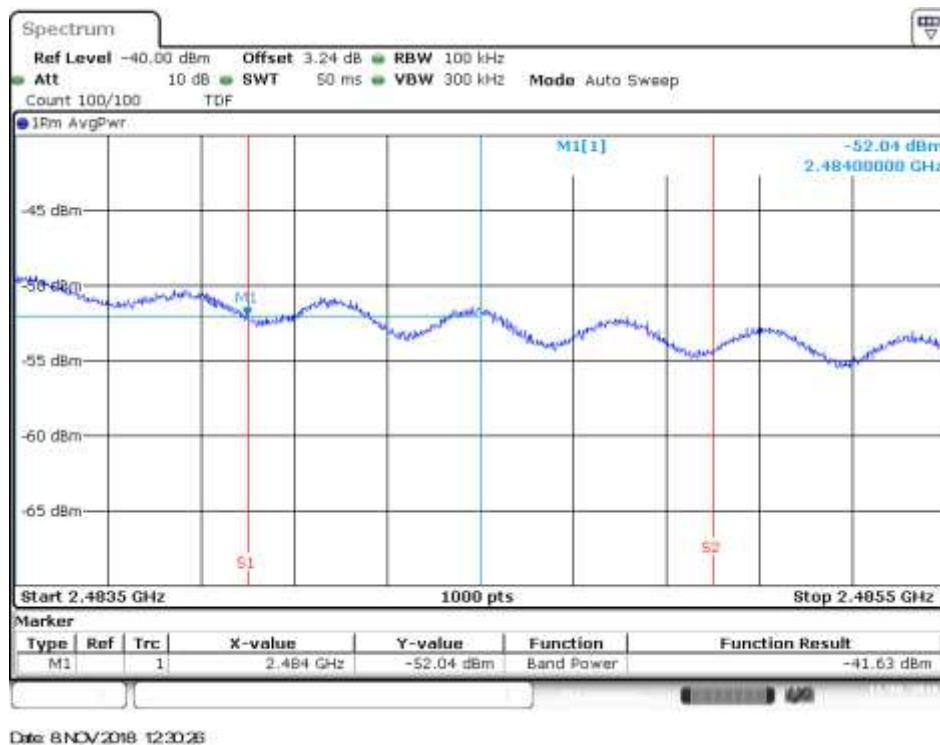




Channel 10F - BE High Freq Section RMS within 2MHz (restricted)

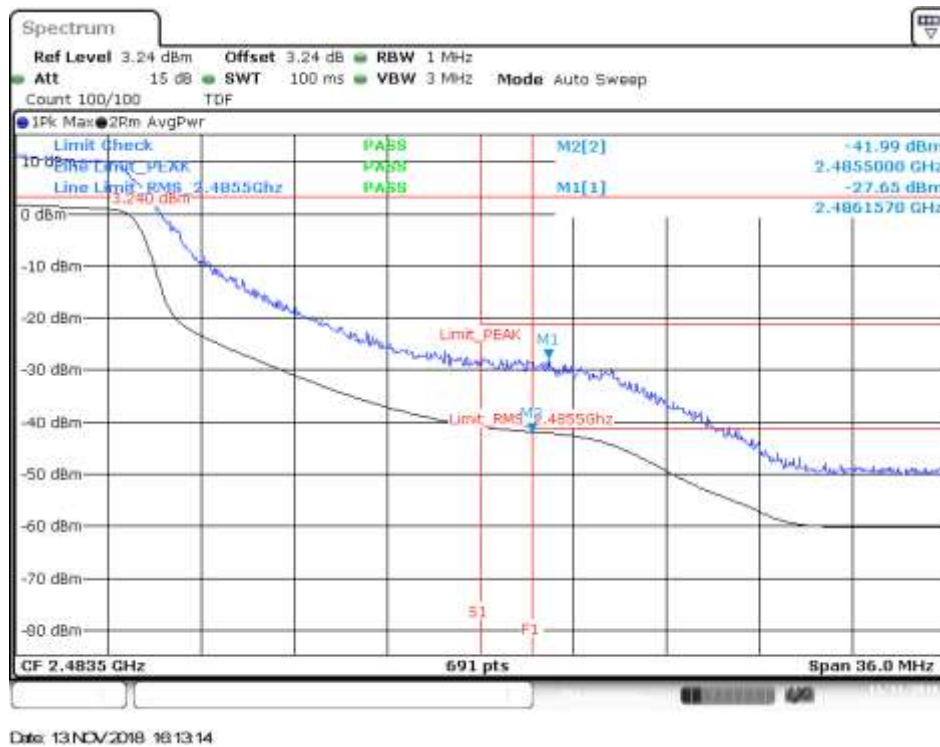


Channel 11F - BE High Freq Section RMS within 2MHz (restricted)

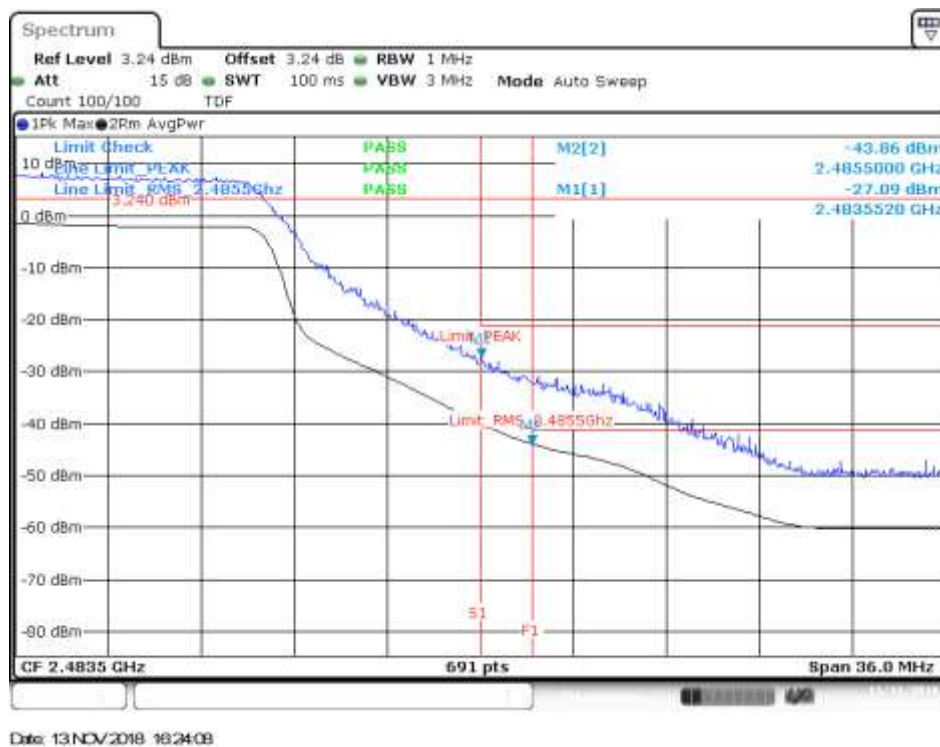


## SISO-B, 802.11n40, HT0

Channel 9F - BE High Freq Section (restricted)



Channel 10F - BE High Freq Section (restricted)



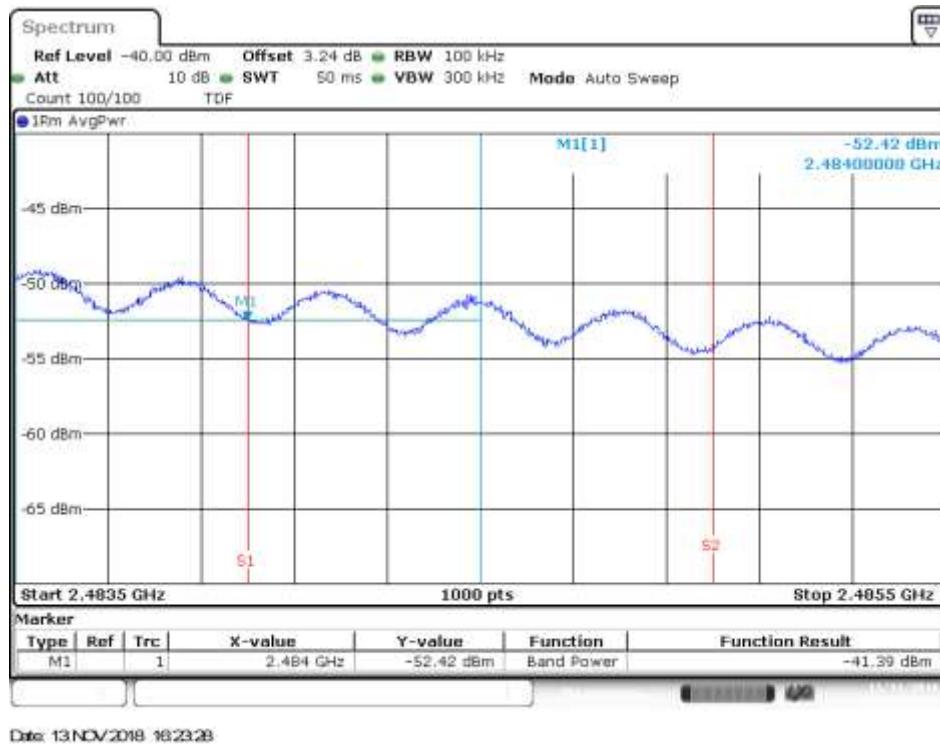
Channel 11F - BE High Freq Section (restricted)



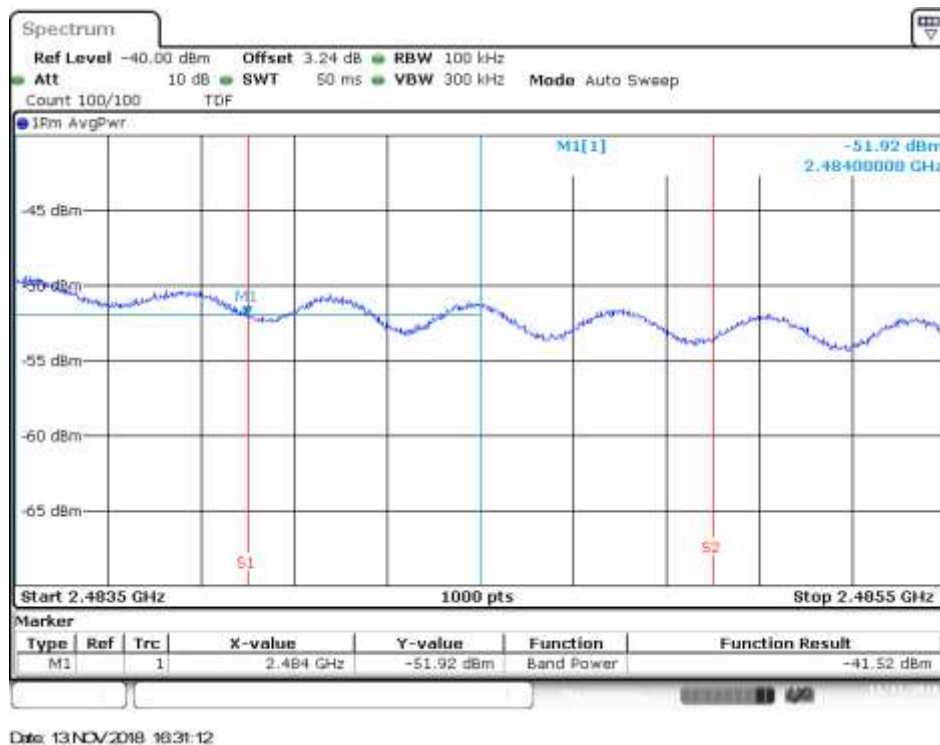
Channel 9F - BE High Freq Section RMS within 2MHz (restricted)



Channel 10F - BE High Freq Section RMS within 2MHz (restricted)

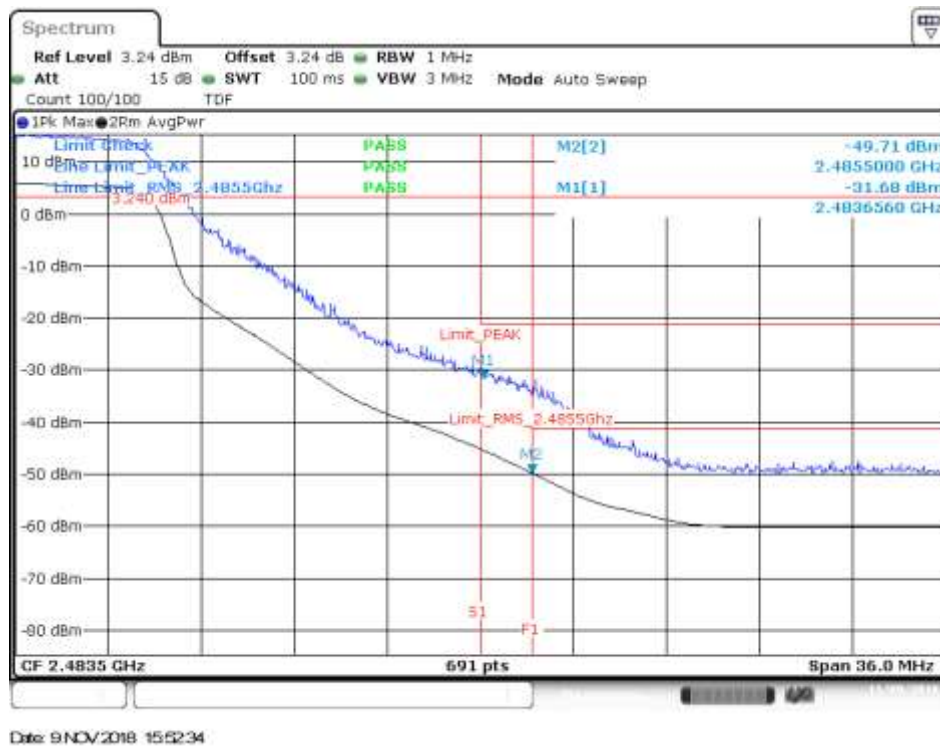


Channel 11F - BE High Freq Section RMS within 2MHz (restricted)

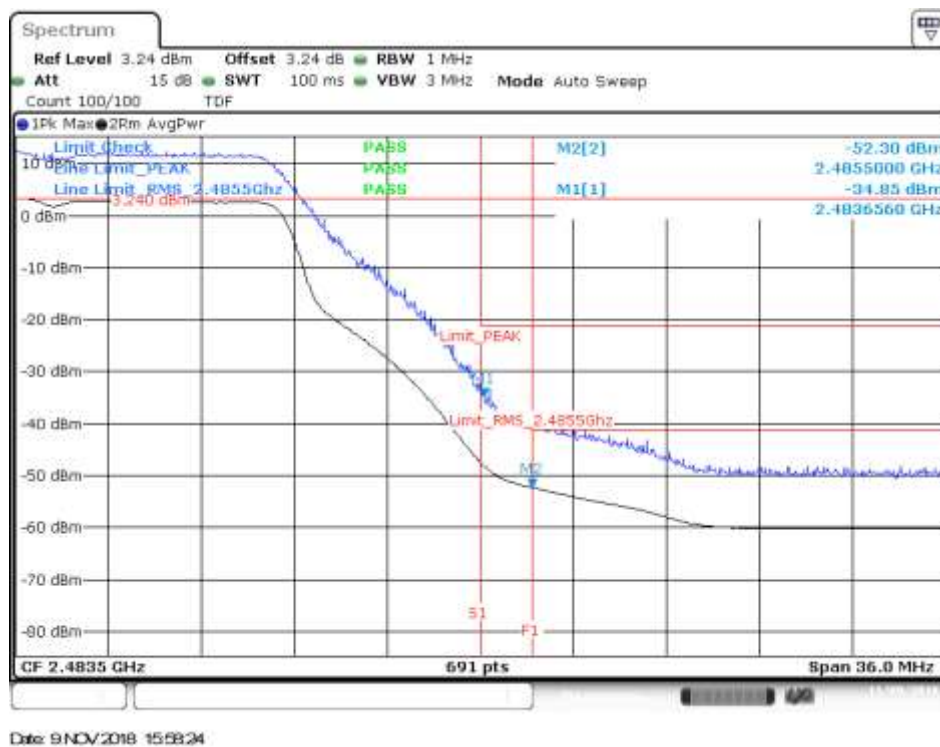


## MIMO-A, 802.11n20, HT8

Channel 11 - BE High Freq Section (restricted)

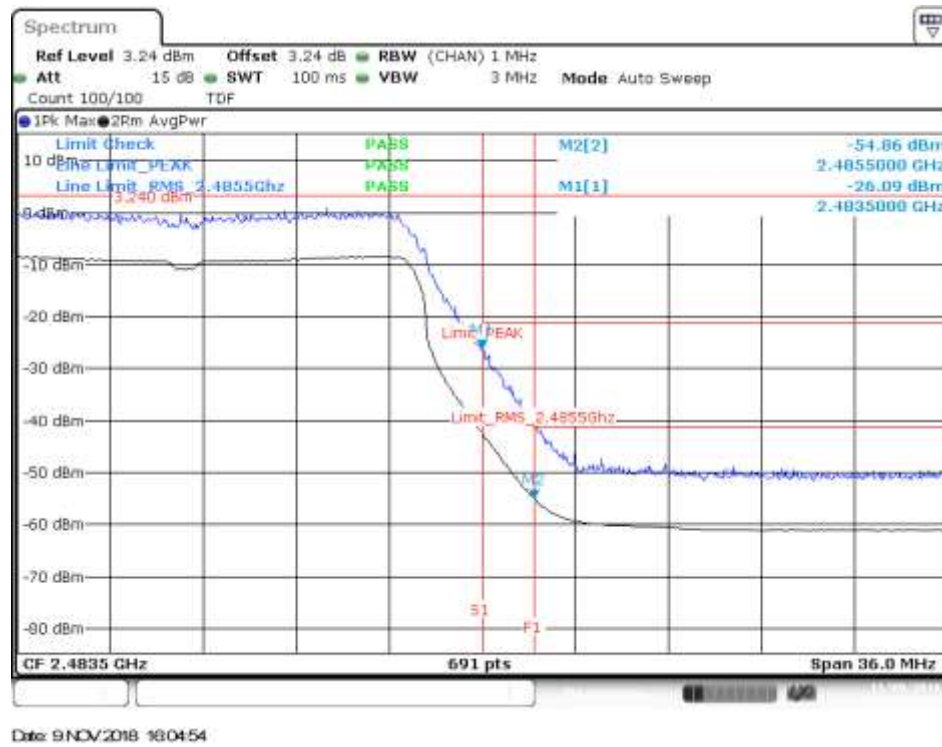


Channel 12 - BE High Freq Section (restricted)

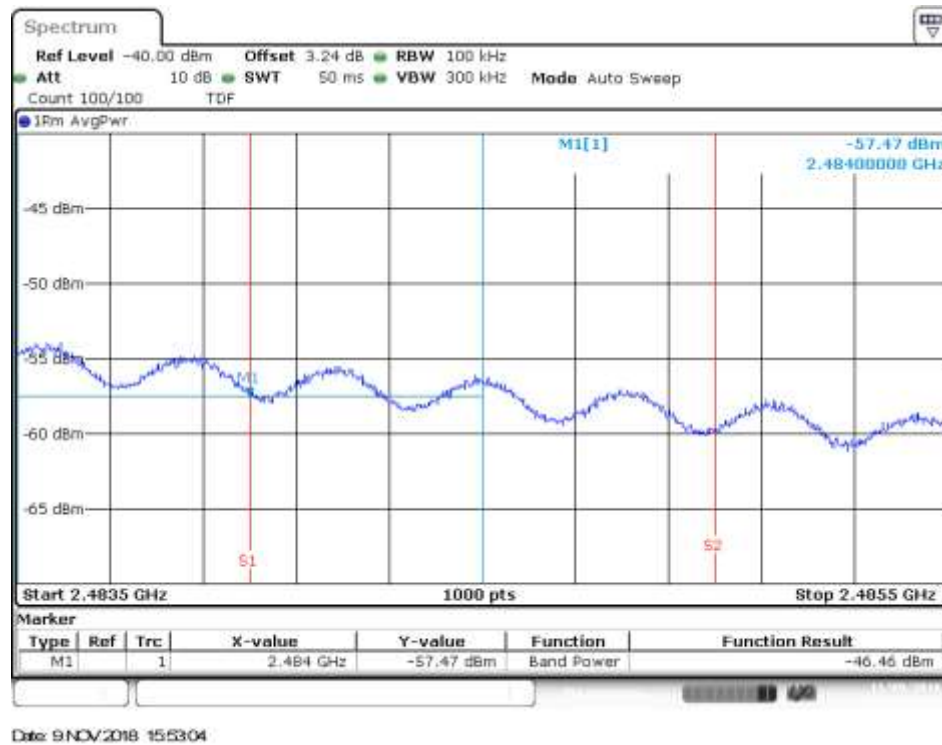




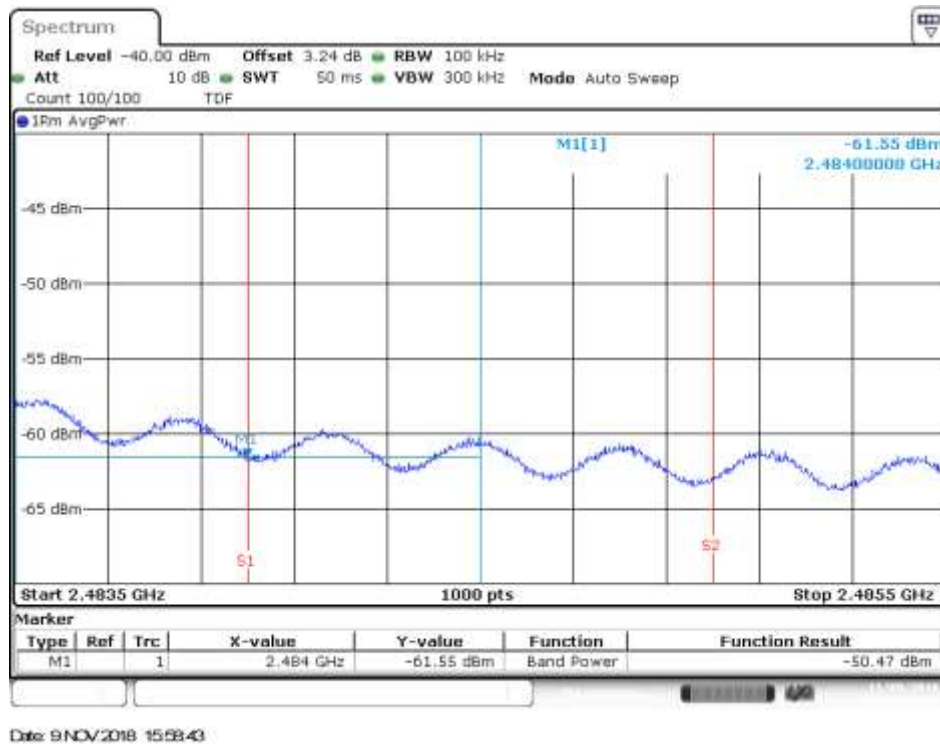
Channel 13 - BE High Freq Section (restricted)



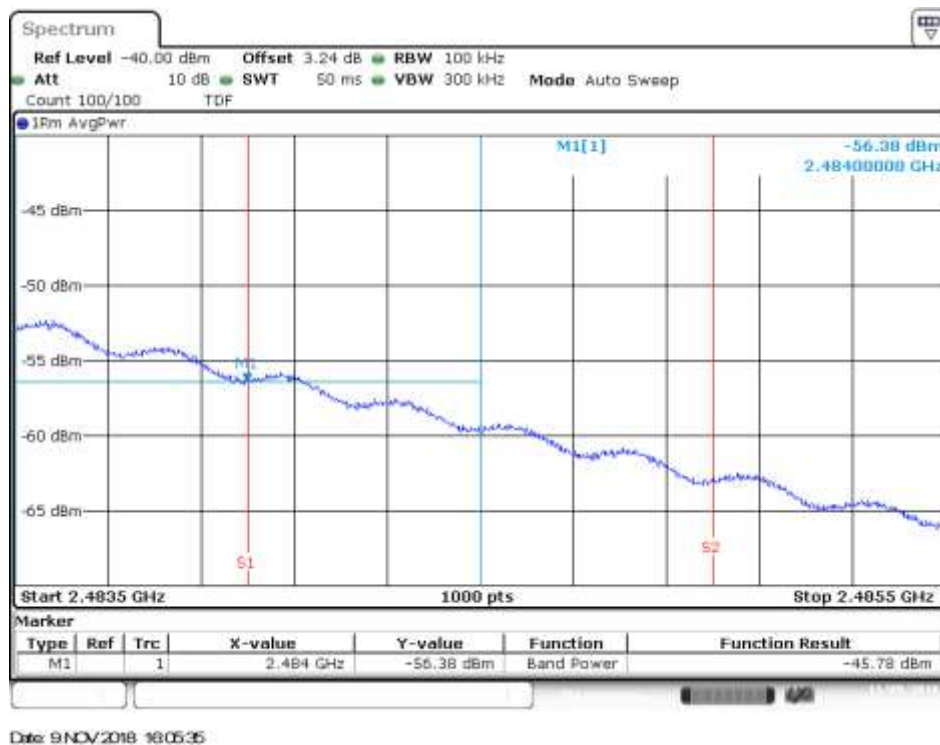
Channel 11 - BE High Freq Section RMS within 2MHz (restricted)



Channel 12 - BE High Freq Section RMS within 2MHz (restricted)

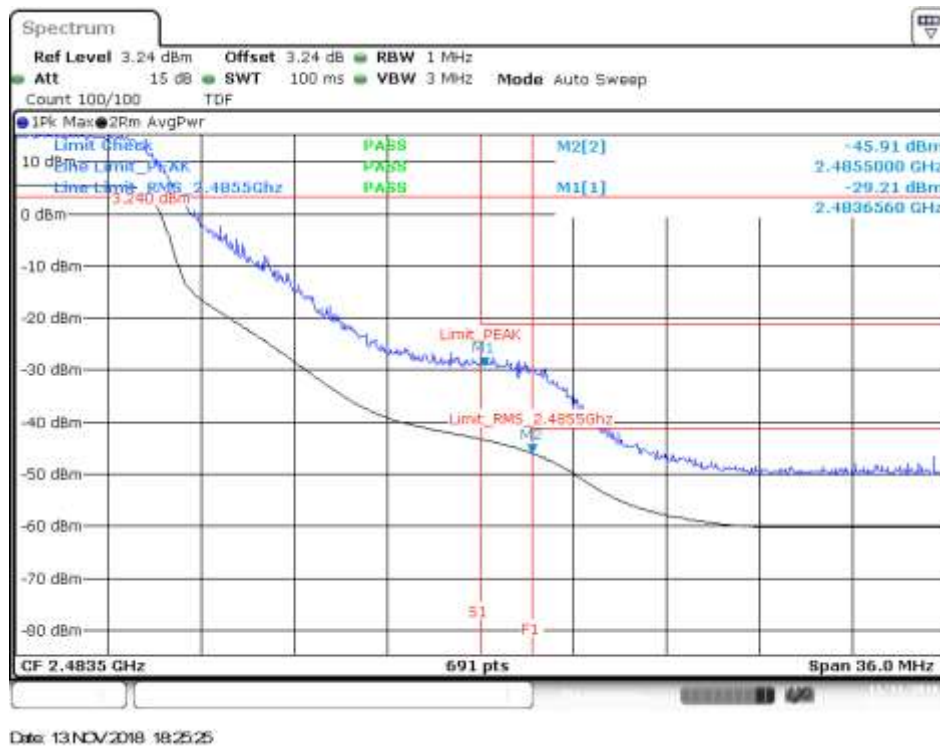


Channel 13 - BE High Freq Section RMS within 2MHz (restricted)

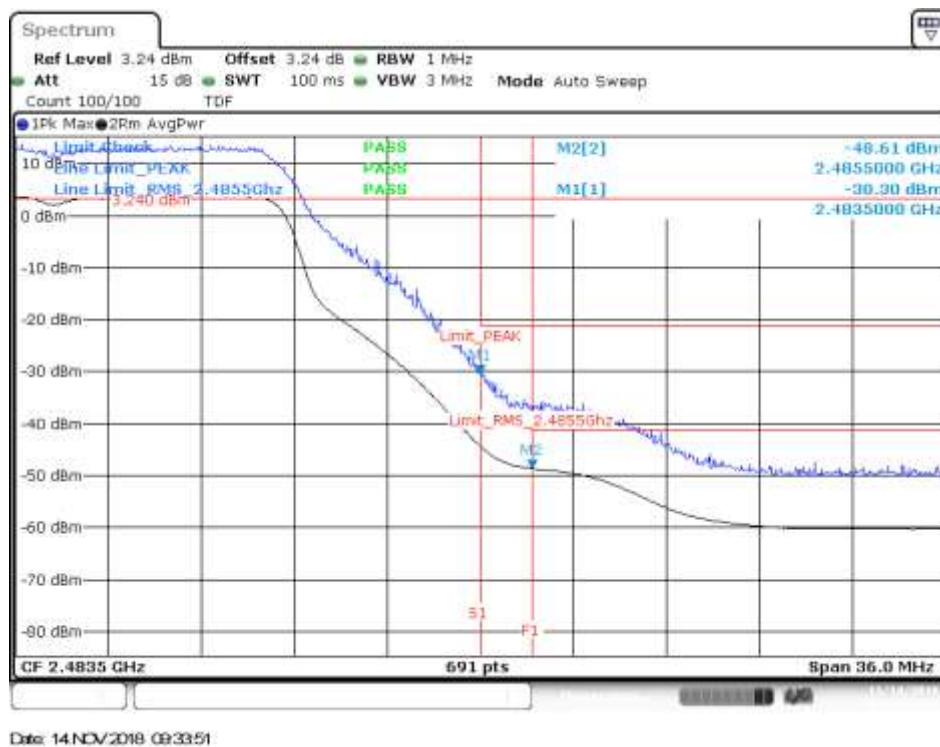


## MIMO-B, 802.11n20, HT8

Channel 11 - BE High Freq Section (restricted)

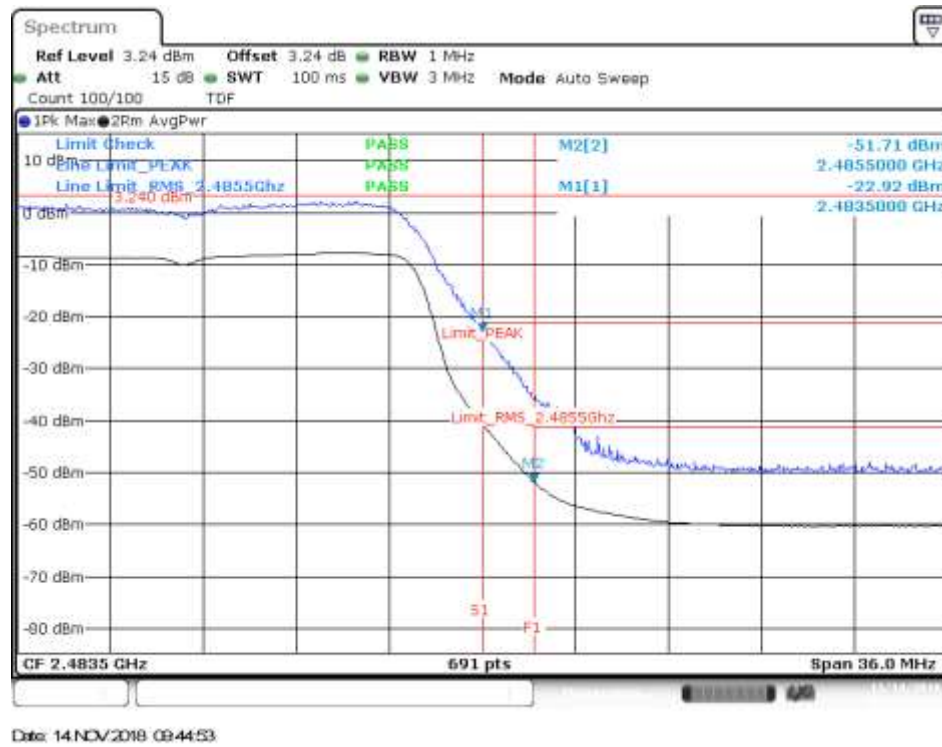


Channel 12 - BE High Freq Section (restricted)

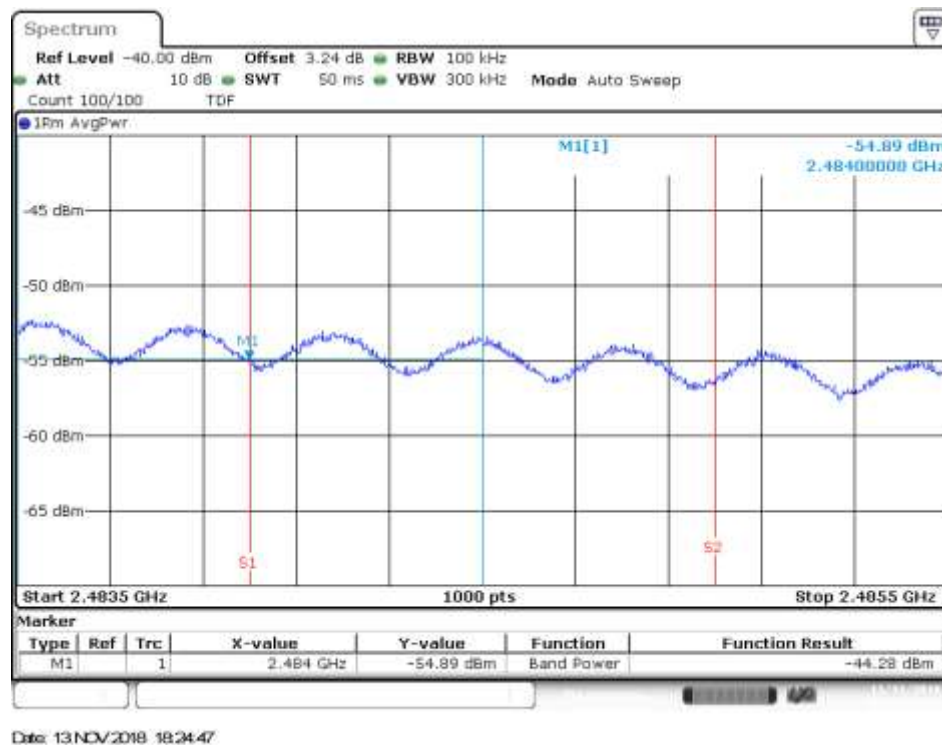




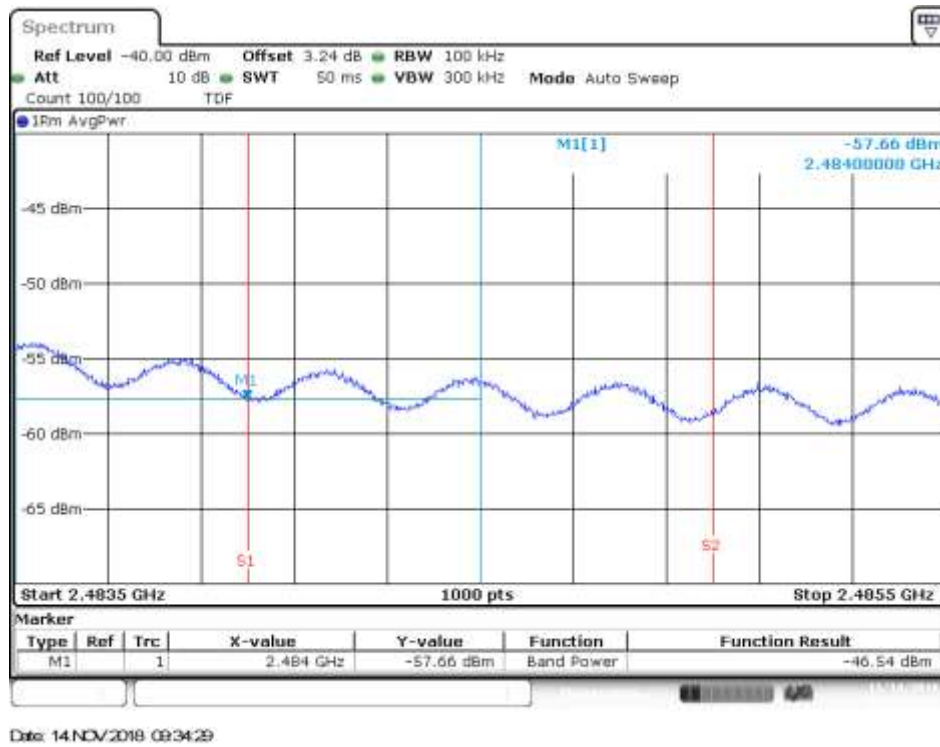
Channel 13 - BE High Freq Section (restricted)



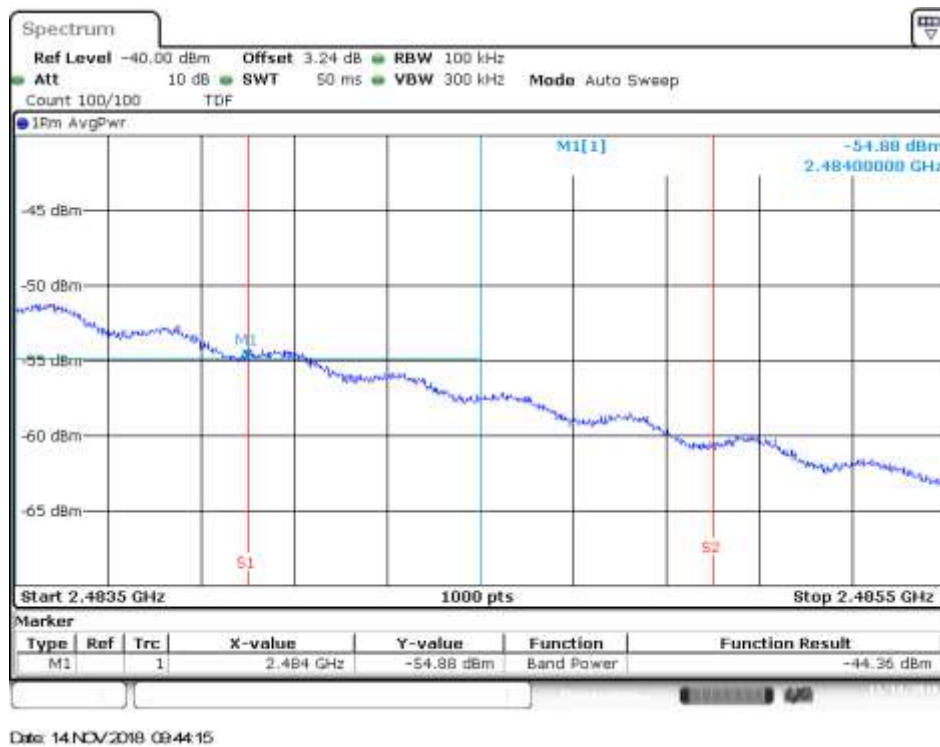
Channel 11 - BE High Freq Section RMS within 2MHz (restricted)



Channel 12 - BE High Freq Section RMS within 2MHz (restricted)

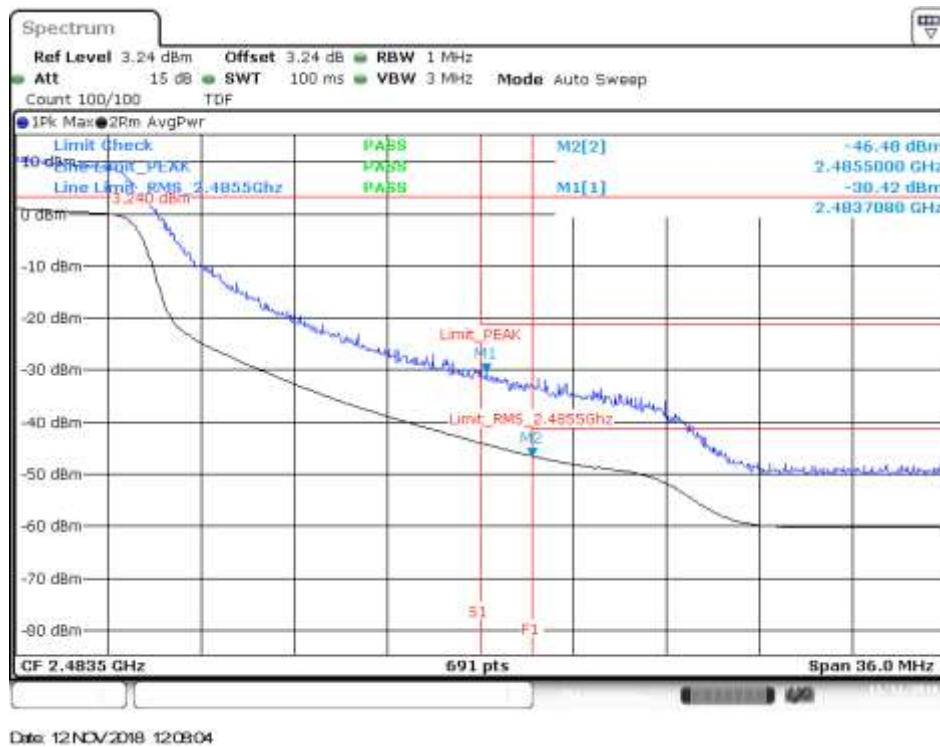


Channel 13 - BE High Freq Section RMS within 2MHz (restricted)

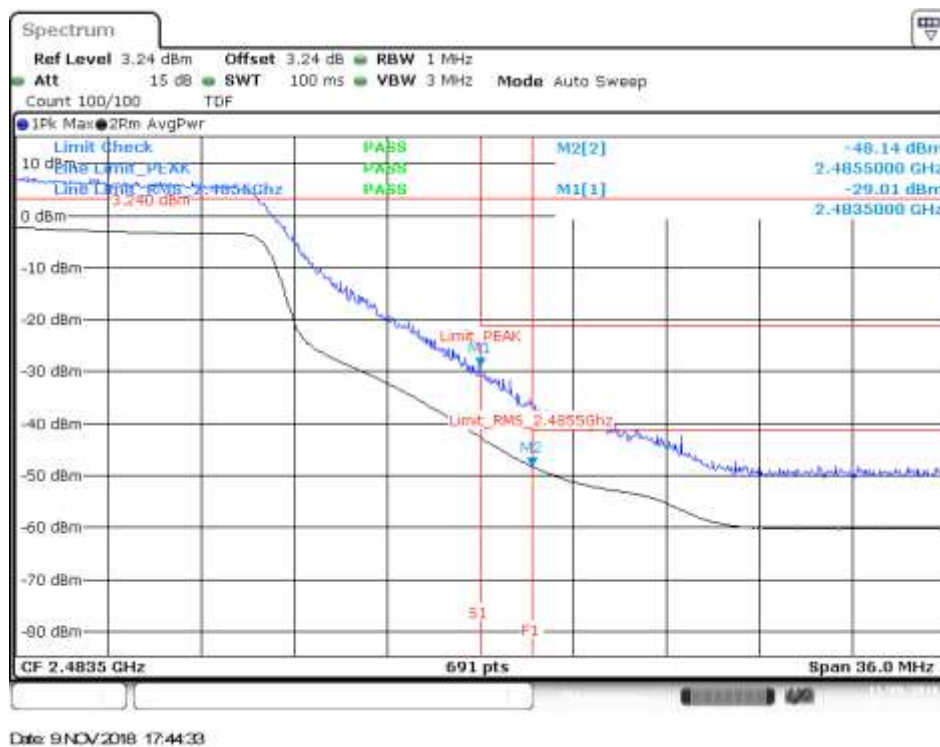


## MIMO-A, 802.11n40, HT8

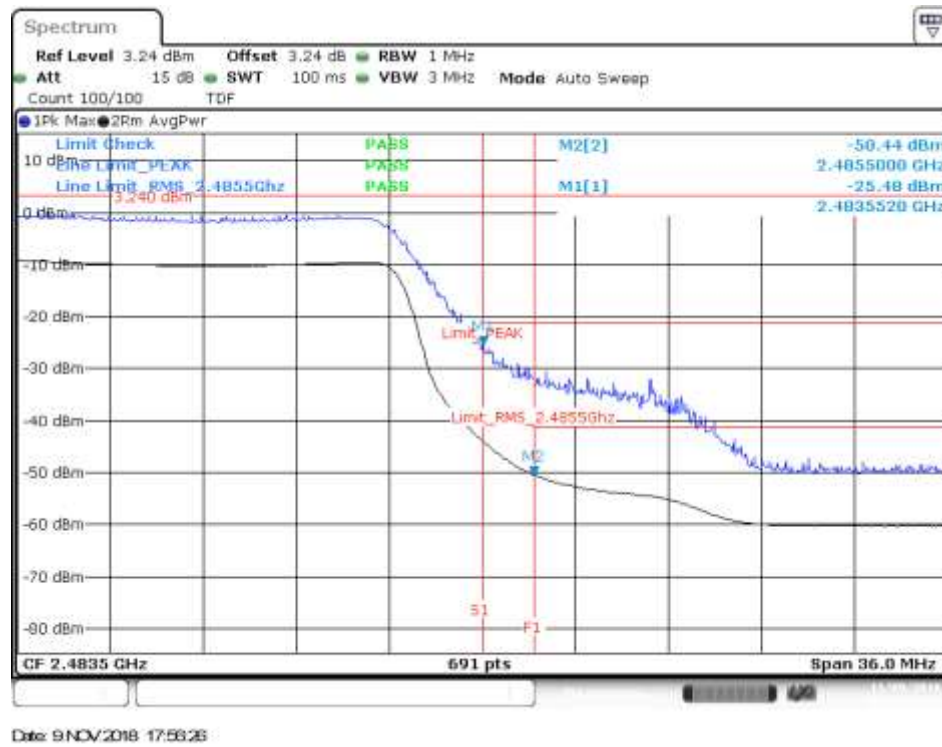
Channel 9F - BE High Freq Section (restricted)



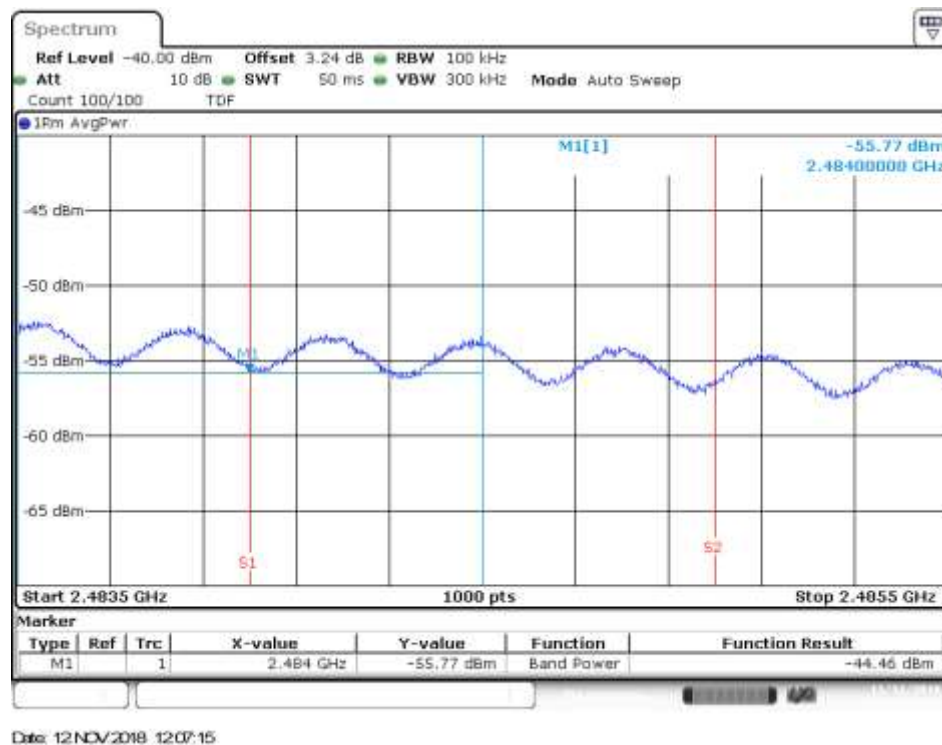
Channel 10F - BE High Freq Section (restricted)



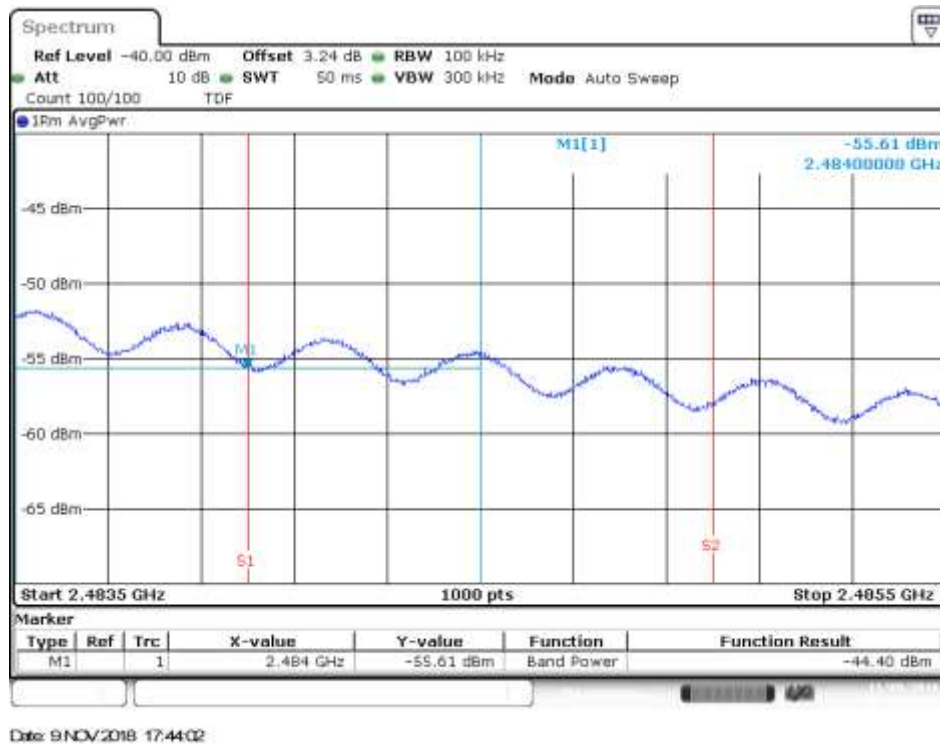
Channel 11F - BE High Freq Section (restricted)



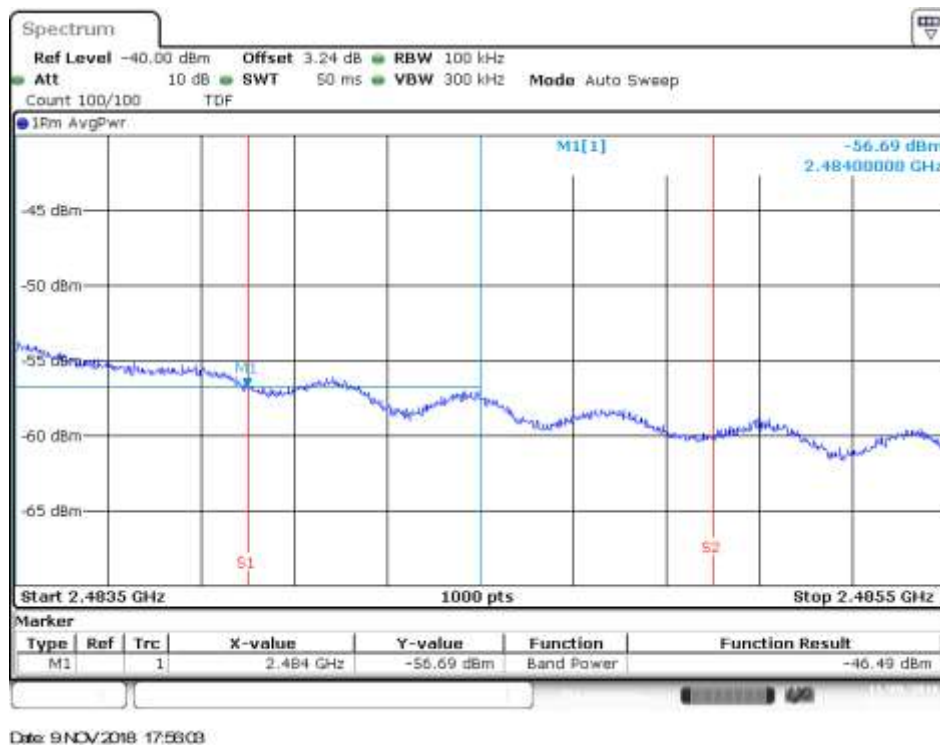
Channel 9F - BE High Freq Section RMS within 2MHz (restricted)



Channel 10F - BE High Freq Section RMS within 2MHz (restricted)



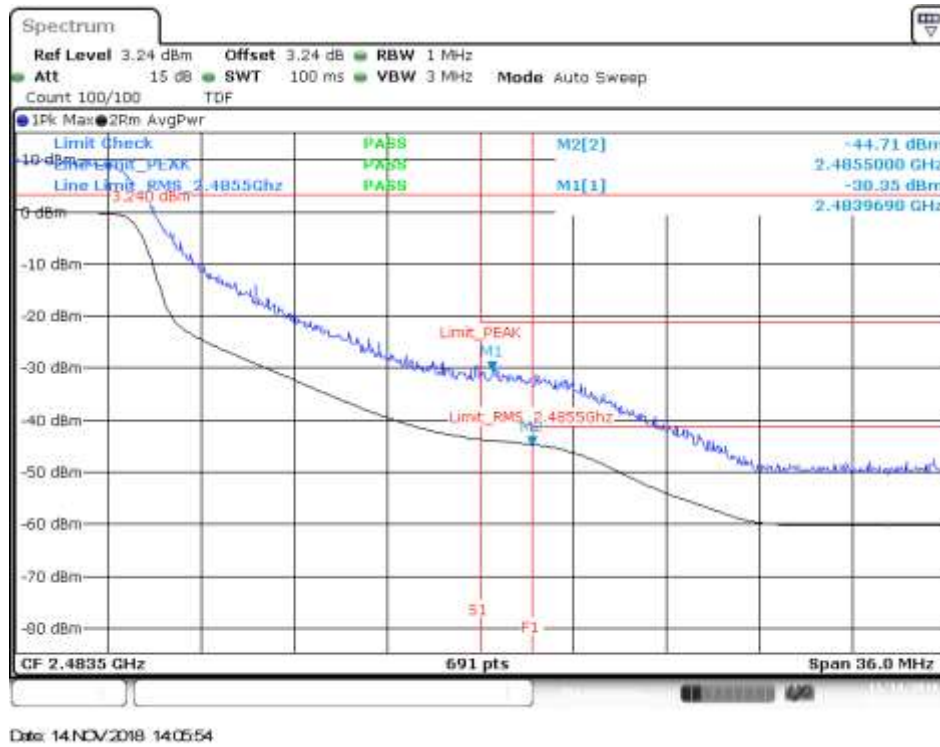
Channel 11F - BE High Freq Section RMS within 2MHz (restricted)



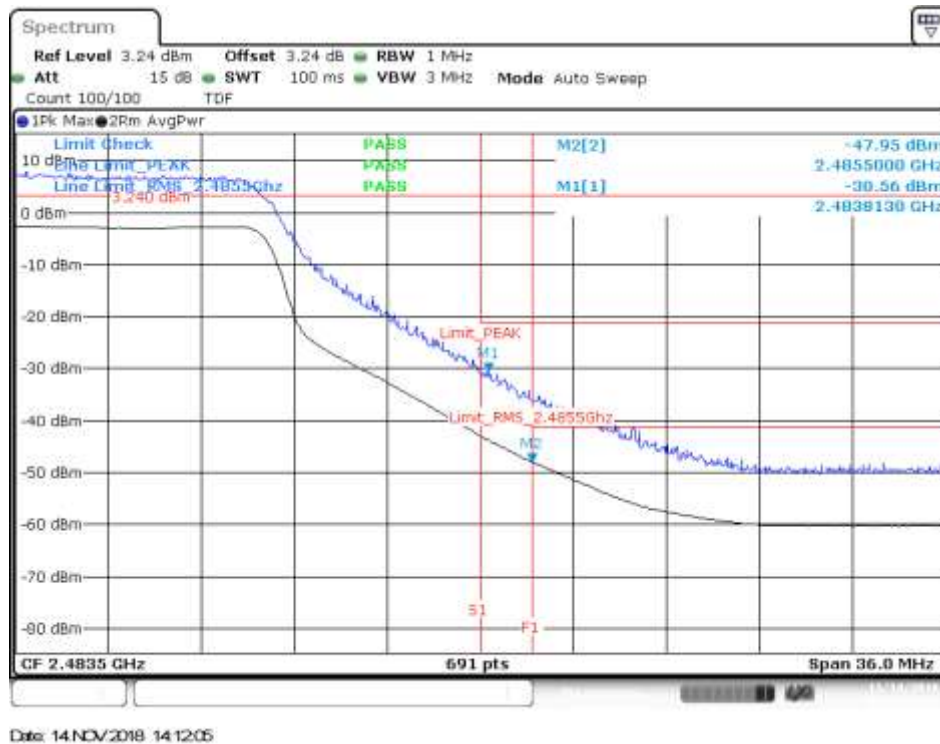


## MIMO-B, 802.11n40, HT8

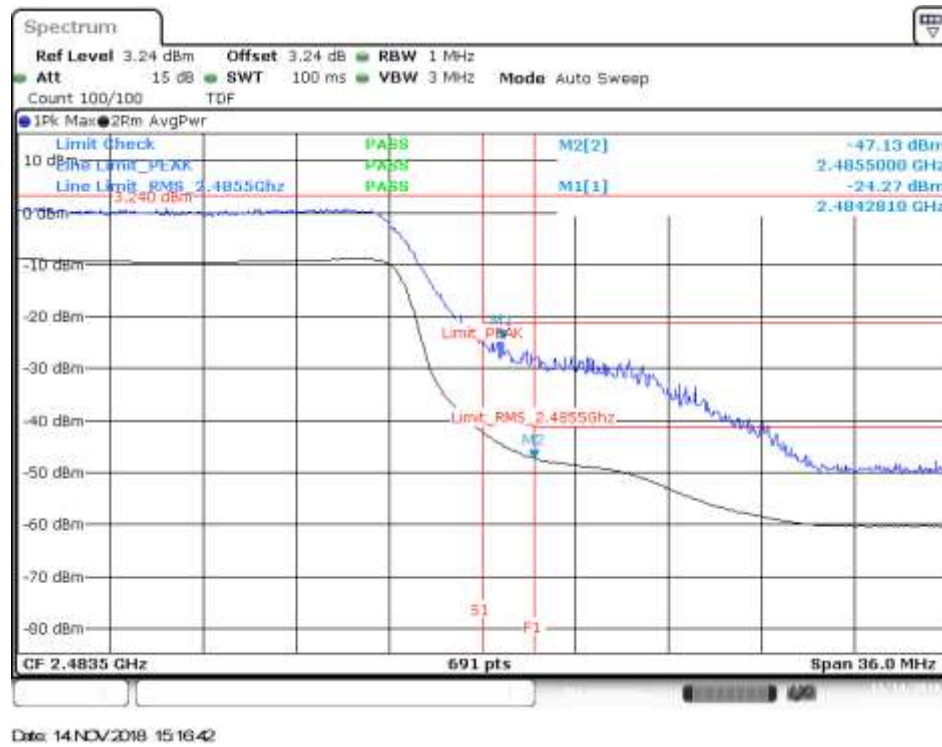
Channel 9F - BE High Freq Section (restricted)



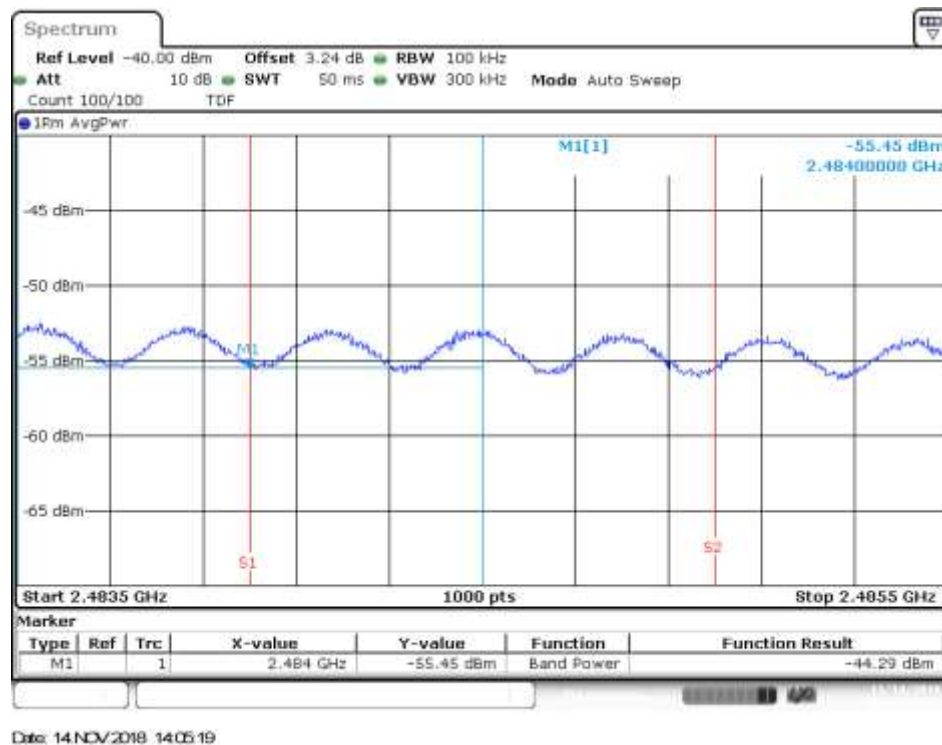
Channel 10F - BE High Freq Section (restricted)



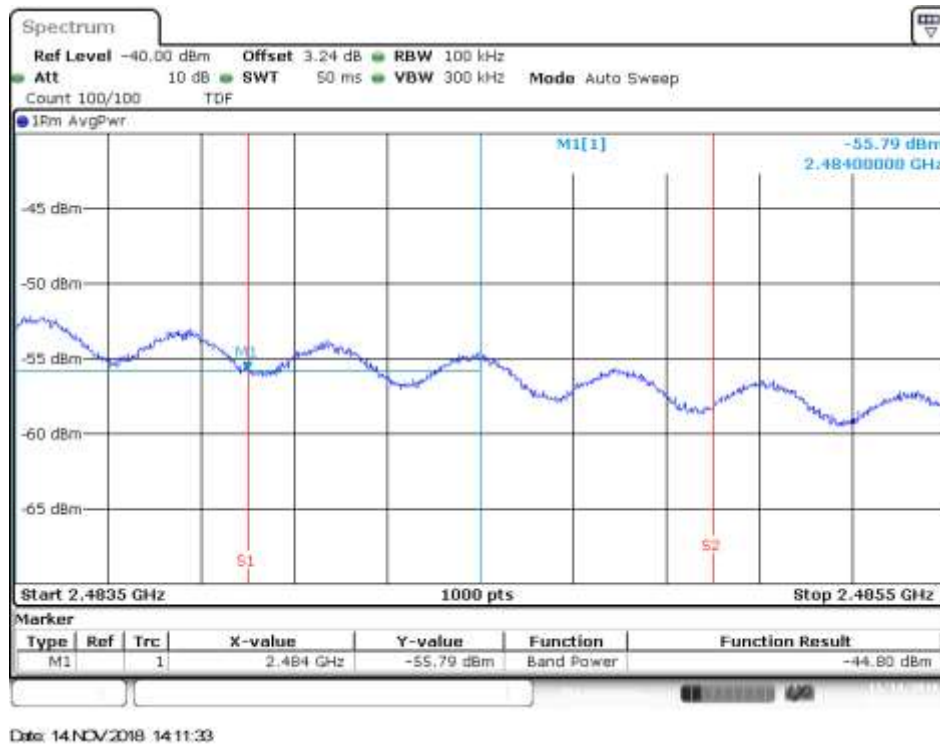
Channel 11F - BE High Freq Section (restricted)



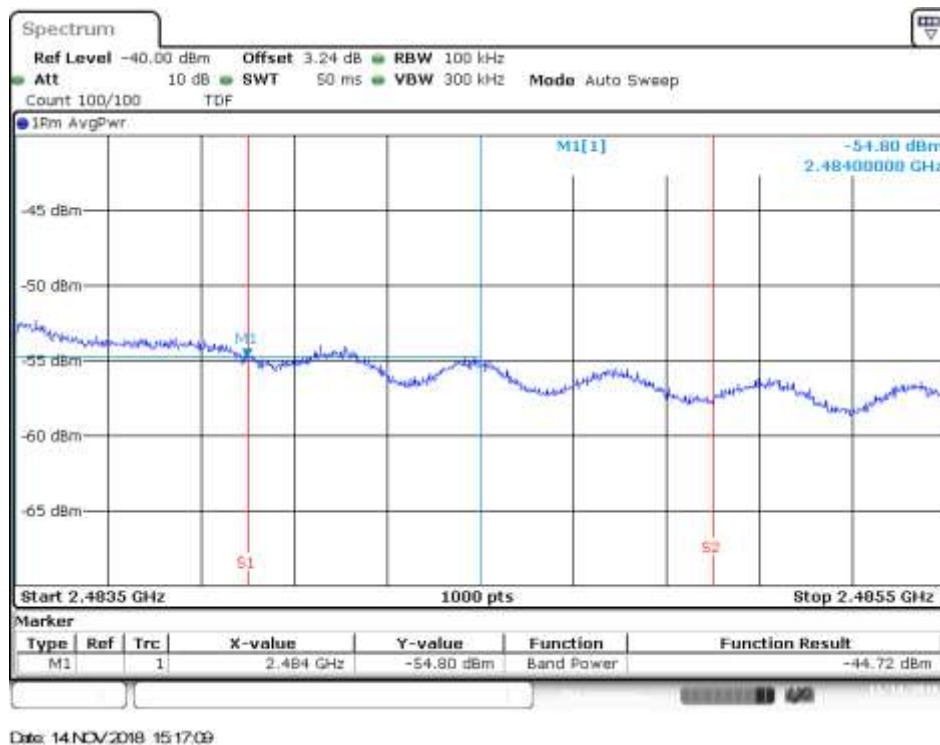
Channel 9F - BE High Freq Section RMS within 2MHz (restricted)



Channel 10F - BE High Freq Section RMS within 2MHz (restricted)



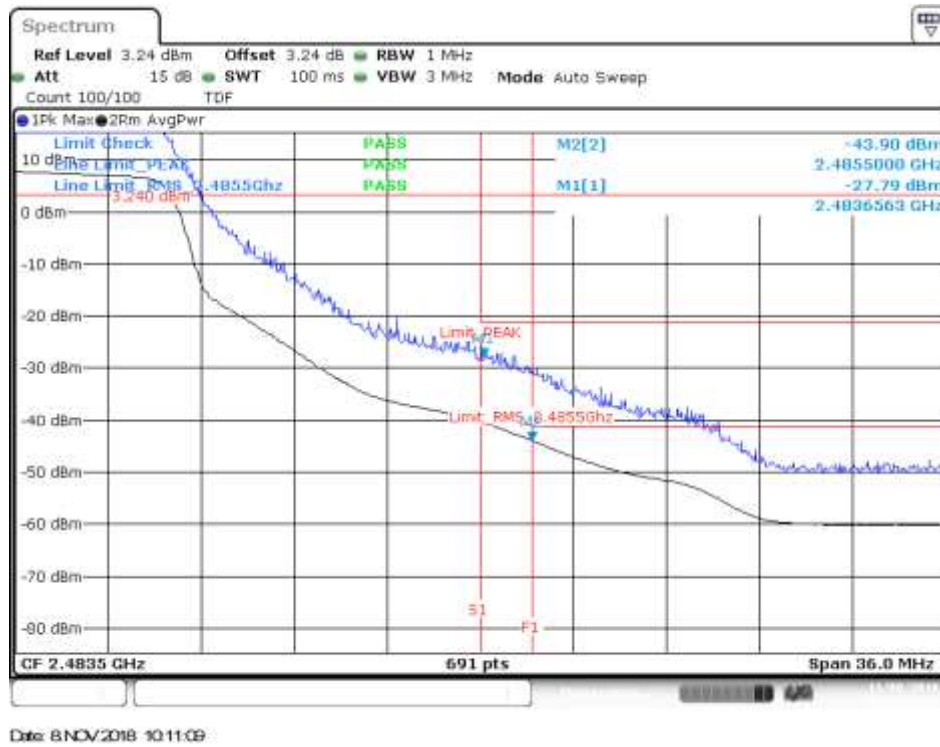
Channel 11F - BE High Freq Section RMS within 2MHz (restricted)





## SISO-A, 802.11ax20, HE0

Channel 11 - BE High Freq Section (restricted)



Channel 12 - BE High Freq Section (restricted)

