FCC Part 15.247

TEST REPORT

For

DT Research Inc.

6F., NO.1, Ning-Po E. Street, Taipei 100, Taiwan.

FCC ID: YE3800J
Model:DT395CR, Atlas 91i

Report Type:	**Product Type:**
Original Report	Mobile Tablet

Report Producer:	Kaylee Chiang
Report Number:	RTWD161214002-00A
Report Date:	2017-01-07
Reviewed By:	Jerry Chang

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REVISION HISTORY

Revision	Issue Date	Description
1.0	2017.01. 07	Original

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1 General Information

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	DT Research Inc. 6F., NO. 1, Ning-Po E. Street, Taipei 100, Taiwan
Manufacturer:	DT Research Inc. 6F., NO. 1, Ning-Po E. Street, Taipei 100, Taiwan
Product:	Mobile Tablet
Model:	DT395CR, Atlas 91i
Trade Name:	DT Research Inc.
Frequency Range:	IEEE 802.11b/g / IEEE 802.11n HT20 MHz Mode: 2412 ~ 2462 MHz IEEE 802.11n HT40 MHz Mode: 2422 ~ 2452 MHz
Transmit Power:	IEEE 802.11b Mode: 17.42 dBm (0.055W) IEEE 802.11g Mode: 20.88 dBm (0.122W) IEEE 802.11n HT20 MHz Mode: 20.52 dBm (0.112W) IEEE 802.11n HT40 MHz Mode: 21.47 dBm (0.140W) BT BLE Mode: 6.11 dBm (0.00408W)
Modulation Technique:	IEEE 802.11b: DSSS IEEE 802.11g: OFDM IEEE 802.11n HT20 MHz Mode: OFDM IEEE 802.11n HT40 MHz Mode: OFDM BT BLE Mode: GFSK
Transmit Data Rate:	IEEE 802.11b Mode: 11, 5.5, 2, 1 Mbps IEEE 802.11g Mode: 54, 48, 36, 24, 18, 12, 11 , 9, 6Mbps IEEE 802.11n HT 20 MHz Channel mode: 6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps IEEE 802.11n HT 40 MHz Channel mode: 13.5, 15,27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps BT BLE Mode: 1 Mbps
Number of Channels:	IEEE 802.11b/g / IEEE 802.11n HT20 MHz Mode: 11 Channels IEEE 802.11n HT40 MHz Mode: 7 Channels BT BLE Mode: 40 Channels
Antenna Specification:	PCB Antenna/Main Gain:4.1 dBi PCB Antenna/Aux Gain: 4.2 dBi
Voltage Range:	I/P: 100-240Vac, 1.7A O/P: 19Vdc, 3.42A
Date of Test:	Dec 20, 2016~Jan 04, 2017

**All measurement and test data in this report was gathered from production sample serial number: 161214002 (Assigned by BACL, Taiwan) The EUT supplied by the applicant was received on 2016-12-07.*

Model Difference: The major electrical and mechanical constructions of series models are identical to the basic model, except different model name and colors. The model, DT395CR is the testing sample, and the final test data are shown on this test report.

1.2 Objective

This report is prepared on behalf of *DT Research Inc.*in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commission's rules.

The tests were performed in order to determine the Bluetooth BLE mode of EUT compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

1.3 Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS, and FCC Part 15.407 NII submission with FCC ID:YE3800J

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

1.5 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Taiwan) to collect test data is located on the 70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

Test site at Bay Area Compliance Laboratories Corp. (Taiwan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.10.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 431084. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

2 System Test Configuration

2.1 Description of Test Configuration

For WIFI mode, 11 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

For 802.11 b/g/n20 Modeswere testd with channel 1,6 and 11
For 802.11n40 Mode were testd with channel 3,6 and 9

The device supports SISO at all modes and MIMO at 802.11n modes

For BT BLE mode, 40 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2402	21	2442
2	2404	--	--
3	2406	--	--
4	2408	38	2476
--	--	39	2478
20	2440	40	2480

For BLE Mode were testd with channel 1,20and 40

2.2 Equipment Modifications

No modification was made to the EUT

2.3 EUT Exercise Software

Used“Diagnostics and Regulatory Testing Utilityv1.7.4-1041”software.
WIFI

Test Software Version		Engineering Mode		
		Chain0		
Test Frequency		Low	Mid	High
Power Level Setting	B Mode SISO	14	14	14
	G Mode SISO	10.5	13	8
	N20 Mode SISO	10.5	13	9
	N40 Mode SISO	12	14	10
	N20 Mode MIMO	9.5	10	8

	N40 Mode MIMO	8	10.5	7.5
		Chain 1		
Test Frequency		Low	Mid	High
Power Level Setting	B Mode SISO	13.5	13.5	12.5
	G Mode SISO	11.5	11.5	8
	N20 Mode SISO	11	12	8.5
	N40 Mode SISO	11	13	8
	N20 Mode MIMO	9.5	10	8
	N40 Mode MIMO	8	10.5	7.5

BLE

Test Software Version		Engineering Mode		
Test Frequency		2402MHz	2440MHz	2480MHz
Power Level Setting	GFSK	0	0	0

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.
The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates bandwidths, and modulations.

802.11b:1Mbps
802.11g:6Mbps
802.11n ht20 SISO:MCS0
802.11n ht20 MIMO: MCS8
802.11n ht40 SISO: MCS0
802.11n ht40 MIMO: MCS8

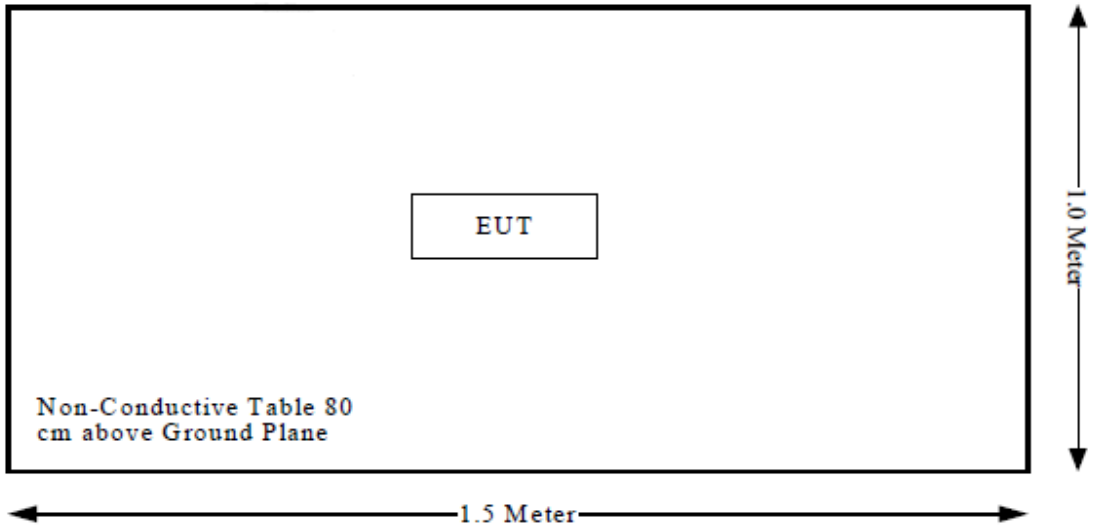
2.4 Support Equipment List and Details

Description	Manufacturer	Model Number	BSMI	FCC ID	S/N
N/A	N/A	N/A	N/A	N/A	N/A

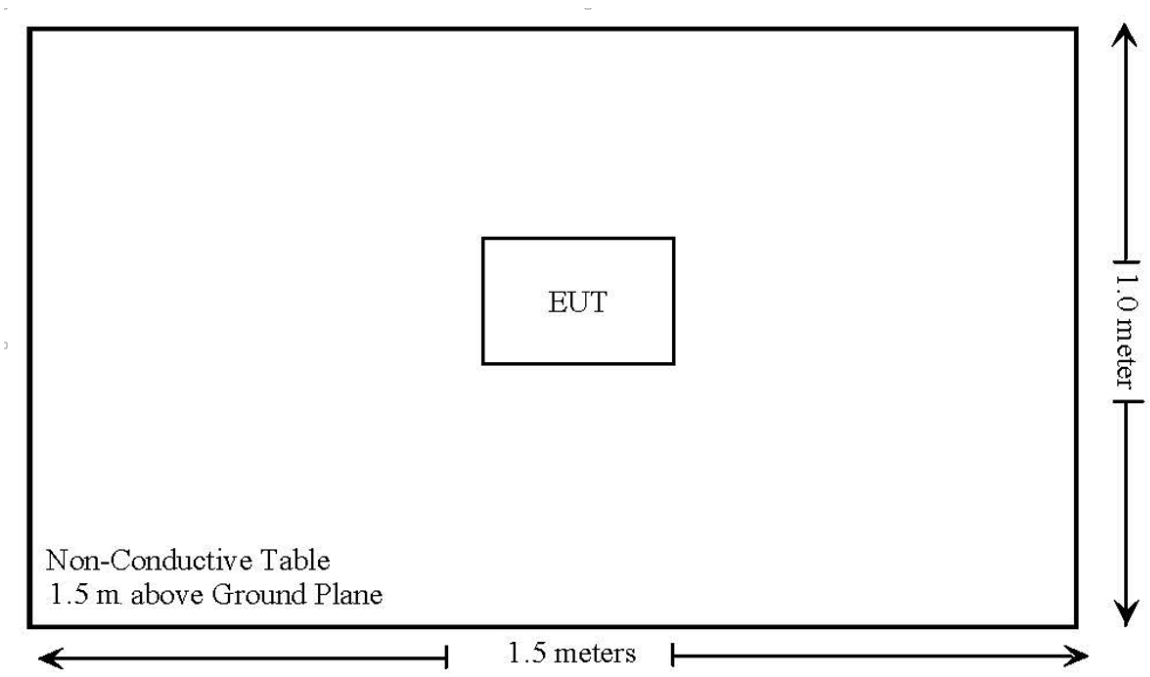
2.5 Block Diagram of Test Setup

See test photographs attached in Exhibit A for the actual connections between EUT and support equipment.

Below 1GHz:



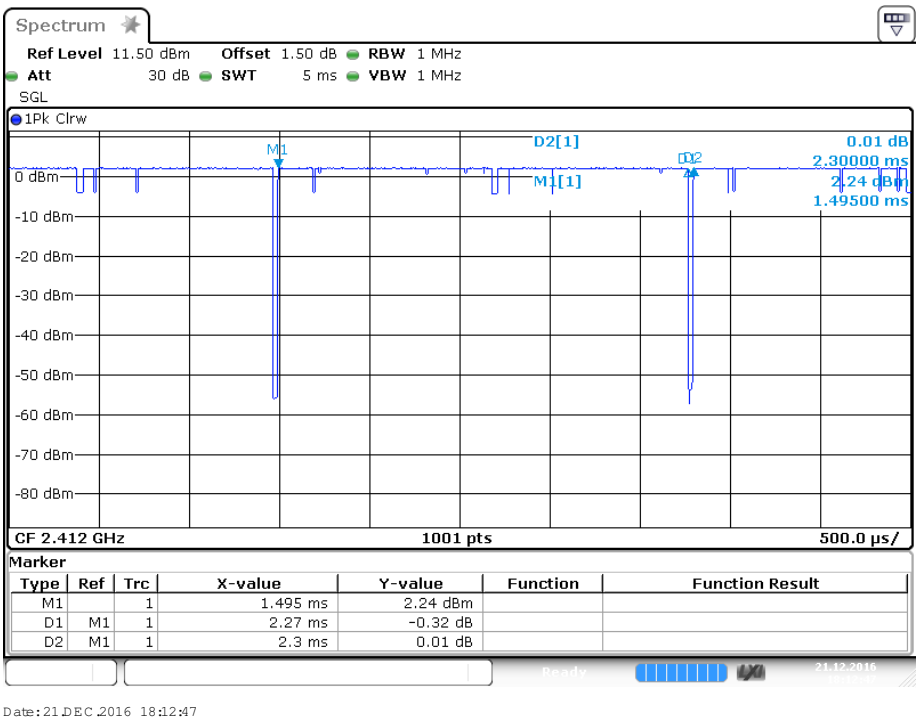
Above 1GHz:



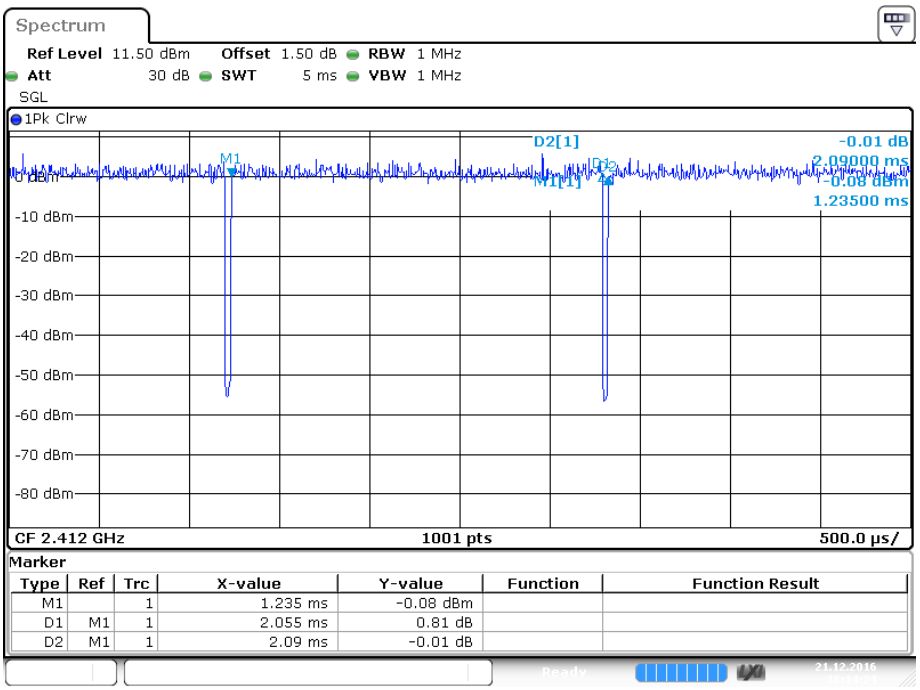
2.6 Duty Cycle

Duty cycle of test signal is < 98%, duty factor shall be considered.
B Mode: Duty cycle = 0.99
G Mode: Duty cycle = 0.98
N20 Mode: Duty cycle = 0.98
N40 Mode: Duty cycle = 0.98
BLE: Duty cycle = 0.62, Duty factor = 10 * log(1/x) = 2.07 , SA VBW setting 3kHz

B Mode



G Mode



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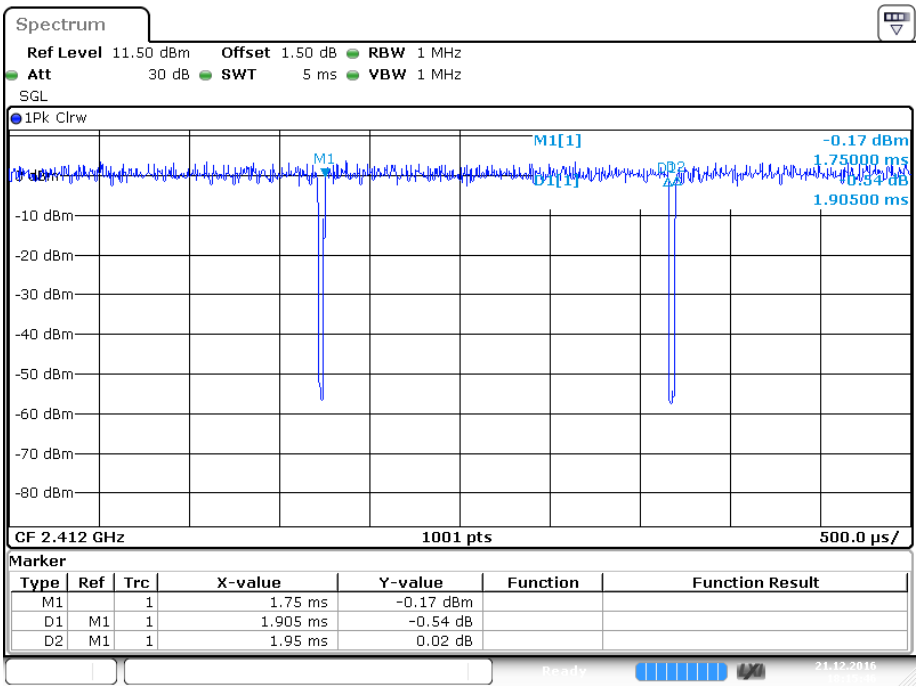
N20 Mode



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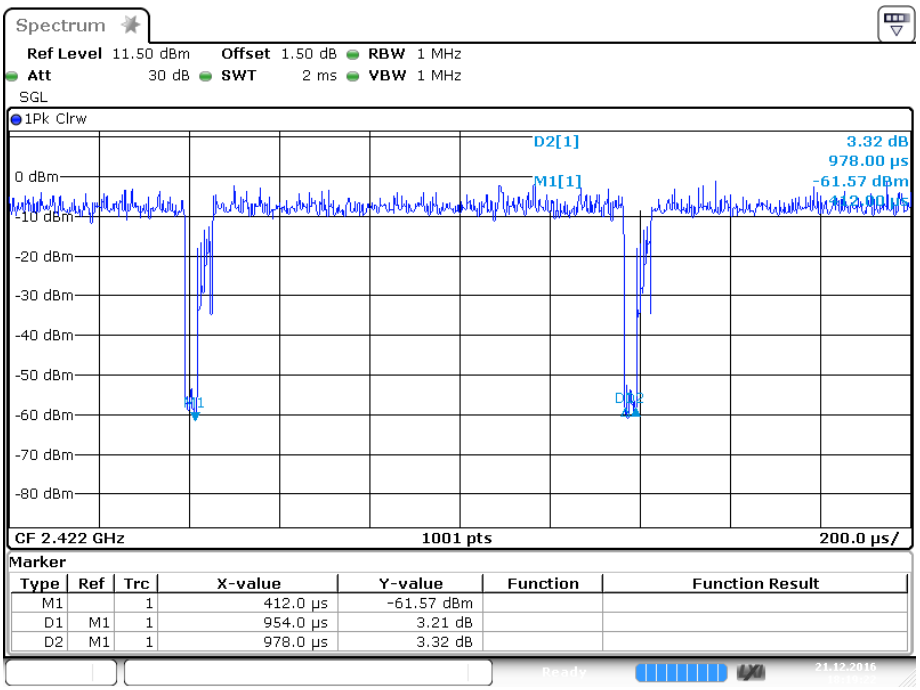
N40 Mode



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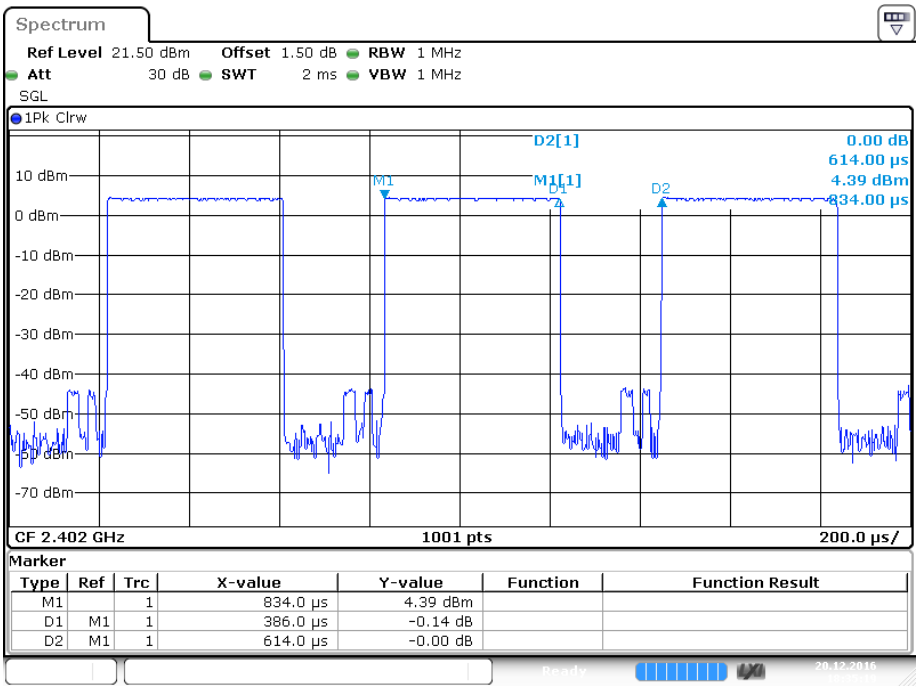
BLE Mode



Date: 20.DEC.2016 18:35:19

3 Summary of Test Results

FCC Rules	Description of Test	Result
§15.247(i),§2.1093	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209,§15.247(d)	Spurious Emissions	Compliance
§15.247(a)(2)	6 dB Emission Bandwidth	Compliance
§15.247(b)(3)	Maximum Peak Output Power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

4 FCC §15.247(i)&2.1093- RF EXPOSURE

4.1 Applicable Standard

According to FCC §15.247(i)

Systems operating under the provisions of this section shallbe operated in a manner that ensure that the public is not exposed to radio frequency energy level in excessof the Commission's guideline.

According to KDB 447498 D01 General RF Exposure Guidance, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances
≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] ·
[√ f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

1. f(GHz) is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.
4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SARtest Exclusion.

4.2 RF Exposure Evaluation Result

The SAR data please refer to the SAR report, report No.:RTWD161214002-00E.

5 FCC §15.203– Antenna Requirements

5.1 Applicable Standard

According to § 15.203,

An intentional radiator shall be designed to ensure that no antenna other than thatfurnished by the responsible party shall be used with the device. The use of a permanently attachedantenna or of an antenna that uses a unique coupling to the intentional radiator shall be consideredsufficient to comply with the provisions of this section. The manufacturer may design the unit so that abroken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connectoris prohibited.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna does not exceed 6 dBi.

5.2 Antenna List and Details

The EUT has two internal antenna arrangement for WLAN, and the Bluetooth use the AUX antenna in common, fulfill the requirement of this section. The antenna parameters please refer below table.

Antenna Type	Manufacturer	Model	Type	Antenna Gain	Result
Main	Taiwan AnJie Electronics Co.,Ltd	DT395CR	PCB Antenna	4.1 dBi	Compliance
Aux.	Taiwan AnJie Electronics Co.,Ltd	DT395CR	PCB Antenna	4.2 dBi	Compliance

The EUT has one integral antenna arrangement, which was permanently attached; fulfill the requirement of this section. Please refer to the internal photos.

6 FCC §15.207(a) –AC Line Conducted Emissions

6.1 Applicable Standard

According to §15.207

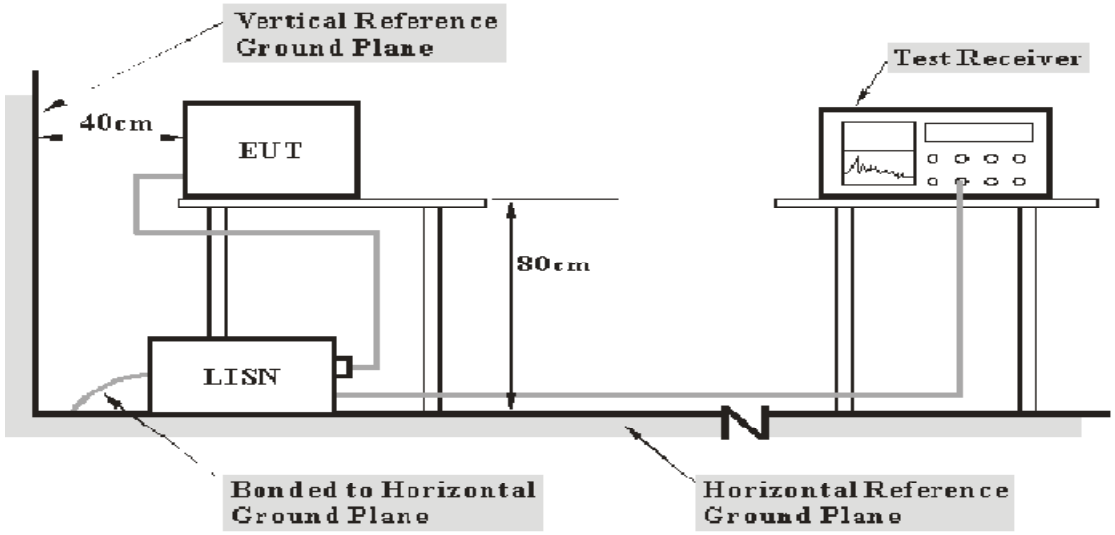
6.2 Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN/ISN and receiver, LISN/ISN voltage division factor, LISN/ISN VDF frequency interpolation and receiver related input quantities, etc.
Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Taiwan) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Table 1 – Values of U_{cispr}

Measurement	U_{cispr}
Conducted disturbance at mains port using AMN (150 kHz to 30 MHz)	2.71B

6.3 EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.207 limits.
The spacing between the peripherals was 10 cm.

6.4 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

6.5 Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

6.6 Corrected Factor & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$

Herein,

V_C: corrected voltage amplitude

V_R: reading voltage amplitude

A_C: attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

The "**Over Limit**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Over Limit =Level – Limit Line

6.7 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
LISN	Rohde & Schwarz	ENV216	101248	2016/7/27	2017/7/26
LISN	EMCO	3816/2	75848	2016/8/4	2017/8/3
EMI Test Receiver	Rohde & Schwarz	ESCI	100540	2016/7/22	2017/7/21
Pulse Limiter	Rohde & Schwarz	ESH3Z2	TXZEM025	2016/8/19	2017/8/18
RF Cable	EMEC	EM-CB5D	001	2016/7/27	2017/7/26
Software	AUDIX	E3	V9.150826k	N.C.R	N.C.R

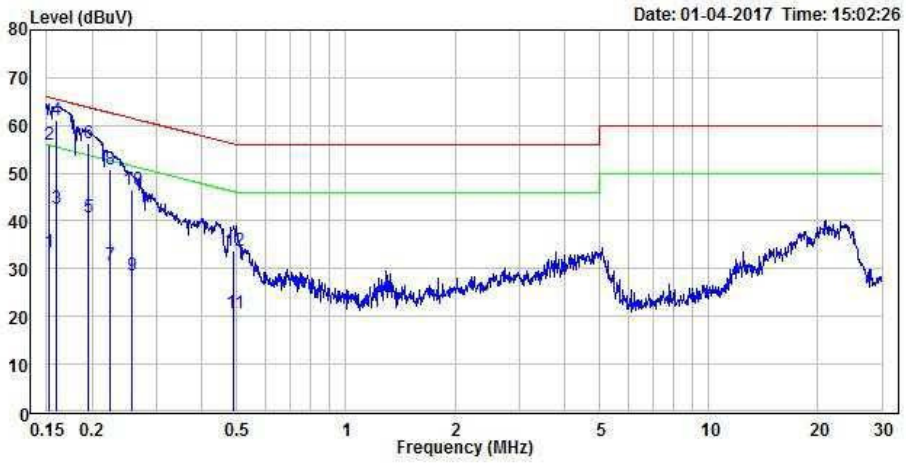
6.8 Test Data

Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	55 %
ATM Pressure:	1010 hPa

The testing was performed by David Hsu on 2017-01-04.

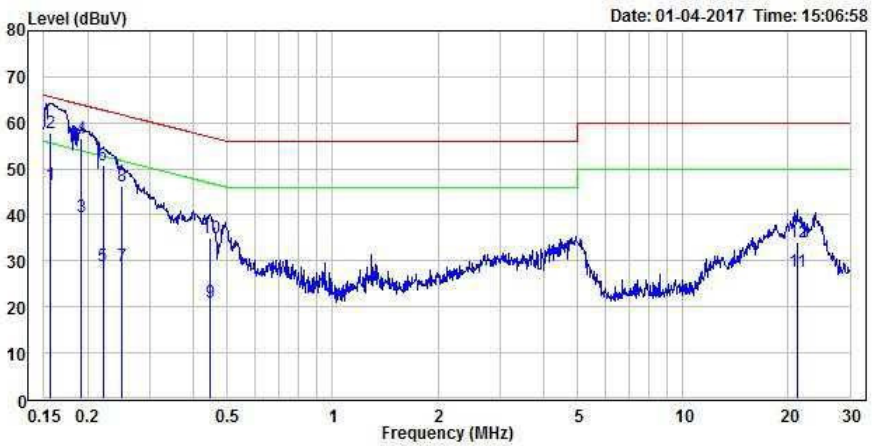
Test Mode: Transmitting
AC120 V, 60 Hz, Line:



Condition: Line
EUT :
Mode :
Note : 120V/60Hz

	Freq	Level	Limit Line	Over Limit	Factor	Read Level	Remark	Pol/Phase
	MHz	dBuV	dBuV	dB	dB	dBuV		
1	0.152	33.45	55.90	-22.45	19.56	13.89	Average	Line
2	0.152	55.98	65.90	-9.92	19.56	36.42	QP	Line
3	0.160	42.57	55.47	-12.90	19.56	23.01	Average	Line
4	0.160	61.27	65.47	-4.20	19.56	41.71	QP	Line
5	0.194	40.62	53.84	-13.22	19.58	21.04	Average	Line
6	0.194	56.17	63.84	-7.67	19.58	36.59	QP	Line
7	0.224	30.87	52.68	-21.81	19.57	11.30	Average	Line
8	0.224	50.93	62.68	-11.75	19.57	31.36	QP	Line
9	0.257	28.58	51.52	-22.94	19.56	9.02	Average	Line
10	0.257	46.68	61.52	-14.84	19.56	27.12	QP	Line
11	0.491	20.57	46.15	-25.58	19.55	1.02	Average	Line
12	0.491	33.86	56.15	-22.29	19.55	14.31	QP	Line

AC120 V, 60 Hz, Neutral:



Condition: Neutral
EUT :
Mode :
Note : 120V/60Hz

	Freq	Level	Limit Line	Over Limit	Factor	Read Level	Remark	Pol/Phase
	MHz	dBuV	dBuV	dB	dB	dBuV		
1	0.156	46.43	55.67	-9.24	19.55	26.88	Average	Neutral
2	0.156	57.79	65.67	-7.88	19.55	38.24	QP	Neutral
3	0.191	39.69	53.98	-14.29	19.53	20.16	Average	Neutral
4	0.191	56.44	63.98	-7.54	19.53	36.91	QP	Neutral
5	0.221	29.00	52.78	-23.78	19.52	9.48	Average	Neutral
6	0.221	50.72	62.78	-12.06	19.52	31.20	QP	Neutral
7	0.250	28.88	51.76	-22.88	19.52	9.36	Average	Neutral
8	0.250	46.19	61.76	-15.57	19.52	26.67	QP	Neutral
9	0.448	20.98	46.91	-25.93	19.54	1.44	Average	Neutral
10	0.448	34.90	56.91	-22.01	19.54	15.36	QP	Neutral
11	21.196	27.67	50.00	-22.33	20.03	7.64	Average	Neutral
12	21.196	34.20	60.00	-25.80	20.03	14.17	QP	Neutral

7 FCC §15.209, §15.205 , §15.247(d)– Spurious Emissions

7.1 Applicable Standard

FCC§15.247 (d); §15.209; §15.205

7.2 Measurement Uncertainty

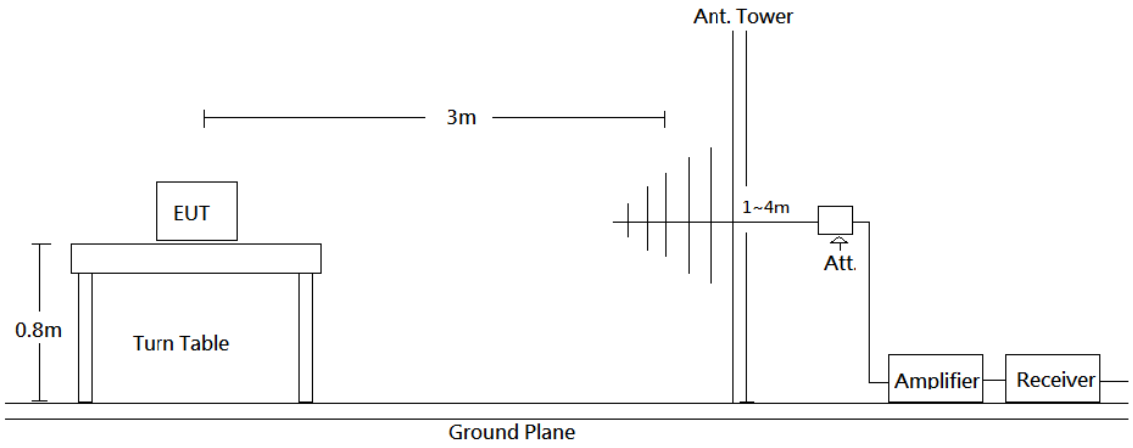
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Taiwan) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report.

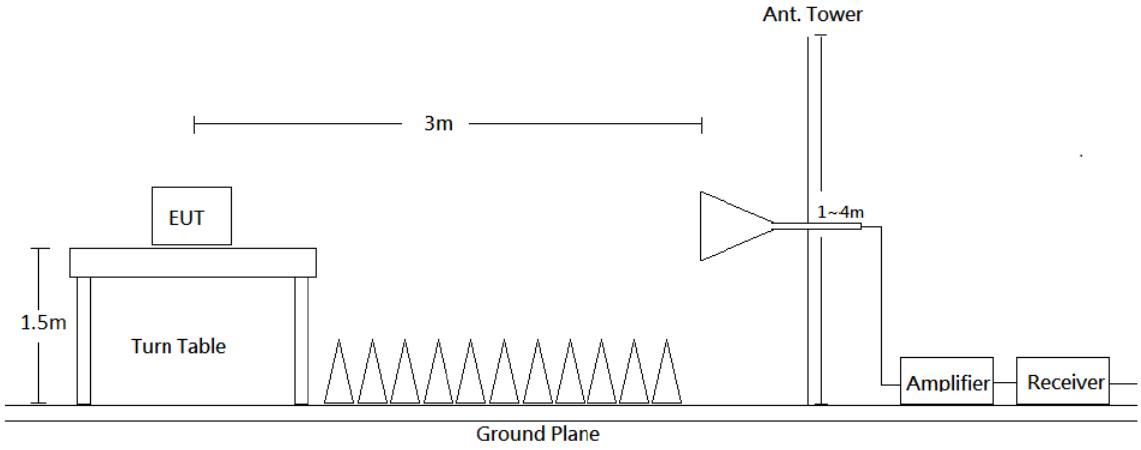
Frequency	Measurement uncertainty
30 MHz~200 MHz	4.21 dB (k=2, 95% level of confidence)
200 MHz~1 GHz	4.41 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	4.51 dB (k=2, 95% level of confidence)
6 GHz~18 GHz	4.88 dB (k=2, 95% level of confidence)
18 GHz~26 GHz	4.30 dB (k=2, 95% level of confidence)
26 GHz~40 GHz	4.30 dB (k=2, 95% level of confidence)

7.3 EUT Setup

Blow 1 GHz:



Above 1GHz:



Radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.209 and FCC 15.247 Limits.

7.4 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 26.5 GHz. During the radiated emission test, the EMI test receiver was set with the following configurations measurement method 6.3 in ANSI C63.10.

Set RBW = 1 MHz, VBW= 3MHz for f > 1 GHz for peak measurement. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Frequency Range	RBW	VBW	IF BW	Detector	Duty cycle
30-1000 MHz	100 kHz	300 kHz	120 kHz	QP	
Above 1 GHz	1 MHz	3 MHz	/	PK	
	1 MHz	10 Hz	/	Ave	>98%
	1 MHz	1/T	/	Ave	<98%

7.5 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

7.6 Corrected Factor & Margin Calculation

The Correct Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Result –Limit

7.7 Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.209 Limit. Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$Lm + U(Lm) \leq Llim + Ucispr$

In BACL, U(Lm) is less than Ucispr, if Lm is less than Llim, it implies that the EUT complies with the limit.

7.8 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Broadband Antenna	Sunol Sciences	JB6	A050115	2016/11/16	2017/11/15
Amplifier	Sonoma	310N	130602	2016/7/15	2017/7/14
EMI Test Receiver	Rohde & Schwarz	ESR7	101419	2016/11/3	2017/11/2
Mircoflex Cable	UTIFLEX	UFB311A-Q-1440-300300	220490-006	2016/11/3	2017/11/2
Mircoflex Cable	UTIFLEX	UFB197C-1-2362-70U-70U	225757-001	2016/7/15	2017/7/14
Mircoflex Cable	UTIFLEX	UFA210A-1-3149-300300	MFR64639 226389-001	2016/12/1	2017/11/30
Turn Table	Champro	TT-2000	060772-T	N.C.R	N.C.R
Antenna Tower	Champro	AM-BS-4500-B	060772-A	N.C.R	N.C.R
Controller	Champro	EM1000	060772	N.C.R	N.C.R
Software	Farad	EZ_EMC	BACL-03A1	N.C.R	N.C.R
Horn Antenna	EMCO	3115	9311-4158	2016/5/10	2017/5/9
Horn Antenna	ETS-Lindgren	3116	00062638	2016/9/5	2017/9/4
Preamplifier	EMEC	EM01G18G	060657	2016/12/13	2017/12/12
Preamplifier	EMEC	EM18G40G	060656	2016/12/13	2017/12/12
Spectrum Analyzer	Rohde & Schwarz	FSEK30	825084/006	2016/7/14	2017/7/13
Mircoflex Cable	ROSNAL	K1K50-UP0264-K1K50-80CM	160309-2	2016/3/24	2017/3/23
Mircoflex Cable	ROSNAL	K1K50-UP0264-K1K50-450CM	160309-1	2016/3/24	2017/3/23
Spectrum Analyzer	Rohde & Schwarz	FSV40	101203	2016/7/14	2017/7/13
Cable	WOKEN	SFL402	00100A1F6A192S	N.C.R	N.C.R

***Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Taiwan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

7.9 Test Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	55 %
ATM Pressure:	1010 hPa

The testing was performed by David Hsu on2016-12-20 to 2016-12-23.

7.10 Test Results

Mode: Test Mode WIF+BLE (30MHz ~1GHz)

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(˚)	
1	135.7300	37.00	-10.77	26.23	43.50	-17.27	100	76	QP
2	311.3000	36.09	-9.59	26.50	46.00	-19.50	100	73	QP
3	353.0100	35.85	-8.71	27.14	46.00	-18.86	100	315	QP
4	414.1200	38.14	-7.39	30.75	46.00	-15.25	100	156	QP
5	737.1300	39.26	-2.07	37.19	46.00	-8.81	100	235	QP
6	960.2300	35.36	2.92	38.28	54.00	-15.72	100	39	QP

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(˚)	
1	109.5400	40.53	-12.07	28.46	43.50	-15.04	100	351	QP
2	299.6600	31.32	-9.84	21.48	46.00	-24.52	100	317	QP
3	529.5500	32.10	-5.29	26.81	46.00	-19.19	100	320	QP
4	721.6100	28.98	-2.38	26.60	46.00	-19.40	100	236	QP
5	892.3300	33.57	1.25	34.82	46.00	-11.18	100	27	QP
6	966.0500	25.96	3.07	29.03	54.00	-24.97	100	224	QP

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

B Mode (1GHz ~25GHz)
2412MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(˚)	
1	2390.000	58.31	-4.89	53.42	74.00	-20.58	100	360	peak
2	2390.000	46.66	-4.89	41.77	54.00	-12.23	100	360	AVG
3	2412.000	101.61	-4.84	96.77	NA	NA	100	360	peak
4	2412.000	98.30	-4.84	93.46	NA	NA	100	360	AVG
5	4824.000	44.43	1.05	45.48	74.00	-28.52	100	194	peak
6	4824.000	35.09	1.05	36.14	54.00	-17.86	100	194	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(˚)	
1	2390.000	57.15	-4.89	52.26	74.00	-21.74	100	107	peak
2	2390.000	45.20	-4.89	40.31	54.00	-13.69	100	107	AVG
3	2412.000	96.87	-4.84	92.03	NA	NA	100	107	peak
4	2412.000	93.45	-4.84	88.61	NA	NA	100	107	AVG
5	4824.000	45.38	1.05	46.43	74.00	-27.57	100	111	peak
6	4824.000	36.44	1.05	37.49	54.00	-16.51	100	111	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

2437MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2437.000	101.37	-4.78	96.59	NA	NA	100	1	peak
2	2437.000	98.62	-4.78	93.84	NA	NA	100	1	AVG
3	4874.000	41.36	1.23	42.59	74.00	-31.41	100	247	peak
4	4874.000	32.32	1.23	33.55	54.00	-20.45	100	247	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2437.000	96.42	-4.78	91.64	NA	NA	100	107	peak
2	2437.000	93.77	-4.78	88.99	NA	NA	100	107	AVG
3	4874.000	40.88	1.23	42.11	74.00	-31.89	100	226	peak
4	4874.000	31.83	1.23	33.06	54.00	-20.94	100	226	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

2462 MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (˚)	Remark
1	2462.000	101.71	-4.72	96.99	NA	NA	100	359	peak
2	2462.000	98.57	-4.72	93.85	NA	NA	100	359	AVG
3	2483.500	58.10	-4.69	53.41	74.00	-20.59	100	359	peak
4	2483.500	48.51	-4.69	43.82	54.00	-10.18	100	359	AVG
5	4924.000	43.00	1.40	44.40	74.00	-29.60	100	178	peak
6	4924.000	33.80	1.40	35.20	54.00	-18.80	100	178	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (˚)	Remark
1	2462.000	96.24	-4.72	91.52	NA	NA	100	260	peak
2	2462.000	93.20	-4.72	88.48	NA	NA	100	260	AVG
3	2483.500	57.77	-4.69	53.08	74.00	-20.92	100	260	peak
4	2483.500	46.10	-4.69	21.41	54.00	-32.59	100	260	AVG
5	4924.000	46.41	1.40	47.81	74.00	-26.19	100	301	peak
6	4924.000	38.88	1.40	40.28	54.00	-13.72	100	301	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

G Mode (1GHz ~25GHz)
2412MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	2390.000	60.93	-4.89	56.04	74.00	-17.96	100	360	peak
2	2390.000	49.68	-4.89	44.79	54.00	-9.21	100	360	AVG
3	2412.000	104.23	-4.84	99.39	NA	NA	100	360	peak
4	2412.000	94.97	-4.84	90.13	NA	NA	100	360	AVG
5	4824.000	40.80	1.05	41.85	74.00	-32.15	100	270	peak
6	4824.000	27.10	1.05	28.15	54.00	-25.85	100	270	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	2390.000	57.72	-4.89	52.83	74.00	-21.17	100	330	peak
2	2390.000	45.81	-4.89	40.92	54.00	-13.08	100	330	AVG
3	2412.000	100.57	-4.84	95.73	NA	NA	100	330	peak
4	2412.000	90.94	-4.84	86.10	NA	NA	100	330	AVG
5	4824.000	41.47	1.05	42.52	74.00	-31.48	100	156	peak
6	4824.000	28.45	1.05	29.50	54.00	-24.50	100	156	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

2437MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2437.000	104.03	-4.78	99.25	NA	NA	100	1	peak
2	2437.000	94.70	-4.78	89.92	NA	NA	100	1	AVG
3	4874.000	39.96	1.23	41.19	74.00	-32.81	100	128	peak
4	4874.000	25.77	1.23	27.00	54.00	-27.00	100	128	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2437.000	97.66	-4.78	92.88	NA	NA	100	328	peak
2	2437.000	88.46	-4.78	83.68	NA	NA	100	328	AVG
3	4874.000	40.63	1.23	41.86	74.00	-32.14	100	326	peak
4	4874.000	27.67	1.23	28.90	54.00	-25.10	100	326	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

2462 MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2462.000	98.81	-4.72	94.09	NA	NA	100	359	peak
2	2462.000	89.32	-4.72	84.60	NA	NA	100	359	AVG
3	2483.500	58.56	-4.69	53.87	74.00	-20.13	100	359	peak
4	2483.500	46.73	-4.69	42.04	54.00	-11.96	100	359	AVG
5	4924.000	39.67	1.40	41.07	74.00	-32.93	100	50	peak
6	4924.000	27.66	1.40	29.06	54.00	-24.94	100	50	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2462.000	93.45	-4.72	88.73	NA	NA	100	327	peak
2	2462.000	84.59	-4.72	79.87	NA	NA	100	327	AVG
3	2483.500	57.73	-4.69	53.04	74.00	-20.96	100	327	peak
4	2483.500	46.02	-4.69	41.33	54.00	-12.67	100	327	AVG
5	4924.000	40.33	1.40	41.73	74.00	-32.27	100	253	peak
6	4924.000	27.19	1.40	28.59	54.00	-25.41	100	253	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

N20 Mode (1GHz ~25GHz) (Per pretest, MIMO mode was the worst and reported below:)
2412MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2390.000	57.78	-4.89	52.89	74.00	-21.11	100	286	peak
2	2390.000	46.44	-4.89	41.55	54.00	-12.45	100	286	AVG
3	2412.000	100.50	-4.84	95.66	NA	NA	100	286	peak
4	2412.000	88.35	-4.84	83.51	NA	NA	100	286	AVG
5	4824.000	40.54	1.05	41.59	74.00	-32.41	100	264	peak
6	4824.000	28.02	1.05	29.07	54.00	-24.93	100	264	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2390.000	57.61	-4.89	52.72	74.00	-21.28	100	328	peak
2	2390.000	45.72	-4.89	40.83	54.00	-13.17	100	328	AVG
3	2412.000	97.60	-4.84	92.76	NA	NA	100	328	peak
4	2412.000	87.11	-4.84	82.27	NA	NA	100	328	AVG
5	4824.000	40.90	1.05	41.95	74.00	-32.05	100	123	peak
6	4824.000	27.79	1.05	28.84	54.00	-25.16	100	123	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

2437MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2437.000	102.65	-4.78	97.87	NA	NA	100	288	peak
2	2437.000	90.72	-4.78	85.94	NA	NA	100	288	AVG
3	4874.000	39.62	1.23	40.85	74.00	-33.15	100	254	peak
4	4874.000	27.39	1.23	28.62	54.00	-25.38	100	254	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2437.000	98.78	-4.78	94.00	NA	NA	100	328	peak
2	2437.000	87.52	-4.78	82.74	NA	NA	100	328	AVG
3	4874.000	39.74	1.23	40.97	74.00	-33.03	100	296	peak
4	4874.000	27.31	1.23	28.54	54.00	-25.46	100	296	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

2462 MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2462.000	99.75	-4.72	95.03	NA	NA	100	1	peak
2	2462.000	88.39	-4.72	83.67	NA	NA	100	1	AVG
3	2483.500	60.87	-4.69	56.18	74.00	-17.82	100	1	peak
4	2483.500	47.27	-4.69	42.58	54.00	-11.42	100	1	AVG
5	4924.000	40.13	1.40	41.53	74.00	-32.47	100	325	peak
6	4924.000	27.44	1.40	28.84	54.00	-25.16	100	325	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2462.000	97.94	-4.72	93.22	NA	NA	100	104	peak
2	2462.000	85.45	-4.72	80.73	NA	NA	100	104	AVG
3	2483.500	61.61	-4.69	56.92	74.00	-17.08	100	104	peak
4	2483.500	47.63	-4.69	42.94	54.00	-11.06	100	104	AVG
5	4924.000	40.39	1.40	41.79	74.00	-32.21	100	250	peak
6	4924.000	28.71	1.40	30.11	54.00	-23.89	100	250	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

N40 Mode (1GHz ~25GHz) (Per pretest, MIMO mode was the worst and reported below:)
2422MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2390.000	58.84	-4.89	53.95	74.00	-20.05	100	288	peak
2	2390.000	46.85	-4.89	41.96	54.00	-12.04	100	288	AVG
3	2422.000	97.16	-4.81	92.35	NA	NA	100	288	peak
4	2422.000	83.37	-4.81	78.56	NA	NA	100	288	AVG
5	4844.000	40.04	1.12	41.16	74.00	-32.84	100	308	peak
6	4844.000	28.90	1.12	30.02	54.00	-23.98	100	308	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2390.000	58.21	-4.89	53.32	74.00	-20.68	100	327	peak
2	2390.000	46.39	-4.89	41.50	54.00	-12.50	100	327	AVG
3	2422.000	94.08	-4.81	89.27	NA	NA	100	327	peak
4	2422.000	83.35	-4.81	78.54	NA	NA	100	327	AVG
5	4844.000	39.97	1.12	41.09	74.00	-32.91	100	88	peak
6	4844.000	27.82	1.12	28.94	54.00	-25.06	100	88	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

2437MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2437.000	99.60	-4.78	94.82	NA	NA	100	284	peak
2	2437.000	86.79	-4.78	82.01	NA	NA	100	284	AVG
3	4874.000	40.34	1.23	41.57	74.00	-32.43	100	42	peak
4	4874.000	28.29	1.23	29.52	54.00	-24.48	100	42	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2437.000	96.78	-4.78	92.00	NA	NA	100	328	peak
2	2437.000	84.61	-4.78	79.83	NA	NA	100	328	AVG
3	4874.000	40.03	1.23	41.26	74.00	-32.74	100	24	peak
4	4874.000	27.46	1.23	28.69	54.00	-25.31	100	24	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

2452 MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2452.000	96.81	-4.75	92.06	NA	NA	100	283	peak
2	2452.000	83.88	-4.75	79.13	NA	NA	100	283	AVG
3	2483.500	59.94	-4.69	55.25	74.00	-18.75	100	283	peak
4	2483.500	48.98	-4.69	44.29	54.00	-9.71	100	283	AVG
5	4904.000	40.19	1.33	41.52	74.00	-32.48	100	0	peak
6	4904.000	27.40	1.33	28.73	54.00	-25.27	100	0	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2452.000	94.00	-4.75	89.25	NA	NA	100	329	peak
2	2452.000	81.82	-4.75	77.07	NA	NA	100	329	AVG
3	2483.500	60.31	-4.69	55.62	74.00	-18.38	100	329	peak
4	2483.500	48.52	-4.69	43.83	54.00	-10.17	100	329	AVG
5	4904.000	40.84	1.33	42.17	74.00	-31.83	100	69	peak
6	4904.000	27.21	1.33	28.54	54.00	-25.46	100	69	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

BLE Mode (1GHz ~25GHz)
2402MHz

Horizontal

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	2390.000	56.88	-4.89	51.99	74.00	-22.01	100	182	peak
2	2390.000	45.38	-4.89	40.49	54.00	-13.51	100	182	AVG
3	2402.000	95.06	-4.86	90.20	NA	NA	100	182	peak
4	2402.000	93.05	-4.86	88.19	NA	NA	100	182	AVG
5	4804.000	41.04	0.98	42.02	74.00	-31.98	100	147	peak
6	4804.000	32.68	0.98	33.66	54.00	-20.34	100	147	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	2390.000	56.69	-4.89	51.80	74.00	-22.20	100	27	peak
2	2390.000	45.58	-4.89	40.69	54.00	-13.31	100	27	AVG
3	2402.000	92.22	-4.86	87.36	NA	NA	100	27	peak
4	2402.000	93.08	-4.86	88.22	NA	NA	100	27	AVG
5	4804.000	40.55	0.98	41.53	74.00	-32.47	100	234	peak
6	4804.000	32.92	0.98	33.90	54.00	-20.10	100	234	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

2440MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2440.000	95.04	-4.78	90.26	NA	NA	100	162	peak
2	2440.000	94.54	-4.78	89.76	NA	NA	100	162	AVG
3	4880.000	40.61	1.24	41.85	74.00	-32.15	100	289	peak
4	4880.000	31.47	1.24	32.71	54.00	-21.29	100	289	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	2440.000	92.20	-4.78	87.42	NA	NA	100	352	peak
2	2440.000	91.05	-4.78	86.27	NA	NA	100	352	AVG
3	4880.000	39.86	1.24	41.10	74.00	-32.90	100	309	peak
4	4880.000	31.28	1.24	32.52	54.00	-21.48	100	309	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

2480 MHz

Horizontal

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (˚)	Remark
1	2480.000	95.76	-4.68	91.08	NA	NA	100	152	peak
2	2480.000	94.95	-4.68	90.27	NA	NA	100	152	AVG
3	2483.500	56.92	-4.69	52.23	74.00	-21.77	100	152	peak
4	2483.500	46.11	-4.69	41.42	54.00	-12.58	100	152	AVG
5	4960.000	39.91	1.51	41.42	74.00	-32.58	100	95	peak
6	4960.000	29.17	1.51	30.68	54.00	-23.32	100	95	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Vertical

No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (˚)	Remark
1	2480.000	94.10	-4.68	89.42	NA	NA	100	25	peak
2	2480.000	93.30	-4.68	88.62	NA	NA	100	25	AVG
3	2483.500	58.66	-4.69	53.97	74.00	-20.03	100	25	peak
4	2483.500	45.65	-4.69	40.96	54.00	-13.04	100	25	AVG
5	4960.000	39.20	1.51	40.71	74.00	-33.29	100	201	peak
6	4960.000	29.71	1.51	31.22	54.00	-22.78	100	201	AVG

Note: Result = Reading + Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
The other emission levels were very low against the limit.

Conducted Spurious Emissions:

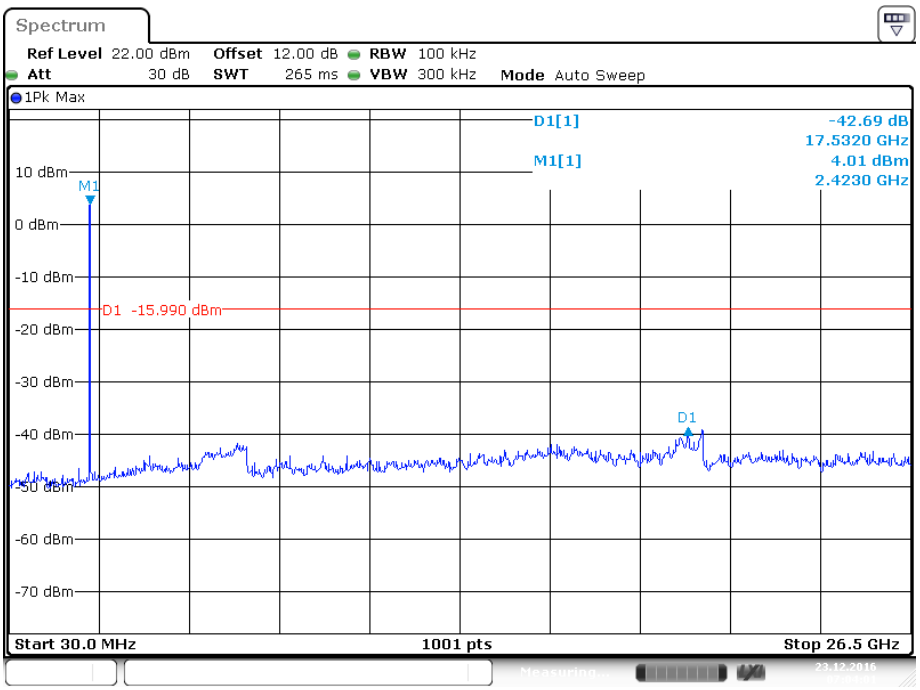
WIFI

Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)		Limit (dBc)	RESULT
		Chain 0	Chain 1		
B Mode					
Low	2412	42.69	44.78	≥ 20	PASS
Mid	2437	43.42	44.86	≥ 20	PASS
High	2462	44.38	44.73	≥ 20	PASS
G Mode					
Low	2412	38.65	37.14	≥ 20	PASS
Mid	2437	42.41	38.91	≥ 20	PASS
High	2462	40.93	36.05	≥ 20	PASS
N20 Mode					
Low	2412	38.18	39.40	≥ 20	PASS
Mid	2437	40.84	37.88	≥ 20	PASS
High	2462	36.81	35.86	≥ 20	PASS
N40 Mode					
Low	2422	37.39	36.26	≥ 20	PASS
Mid	2437	37.18	35.76	≥ 20	PASS
High	2452	36.18	34.57	≥ 20	PASS

BLE

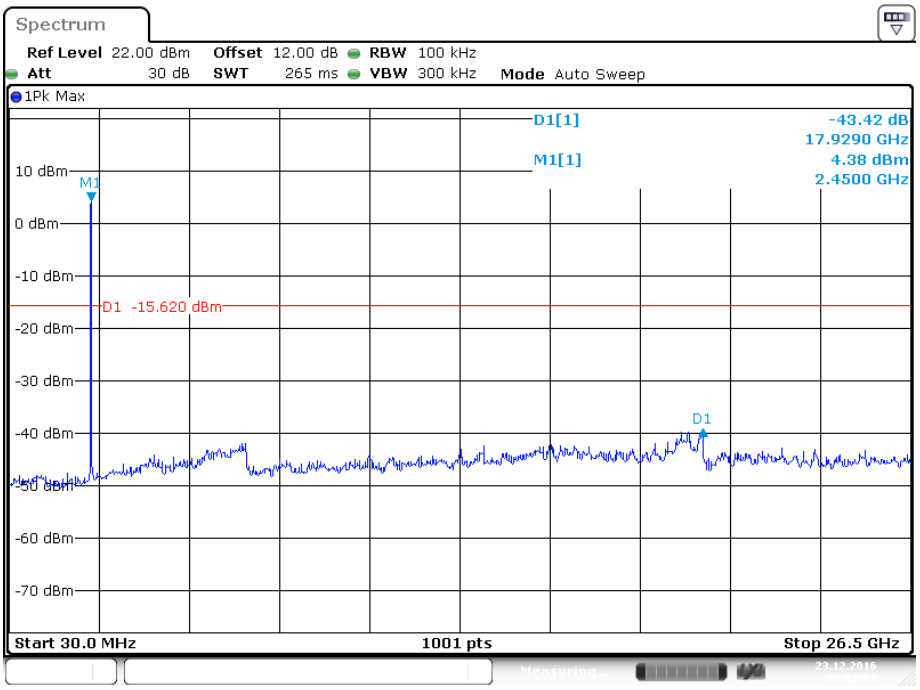
Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	RESULT
Low	2402	46.34	≥ 20	PASS
Mid	2440	48.79	≥ 20	PASS
High	2480	48.49	≥ 20	PASS

Low Channel (B Mode / Chain 0)



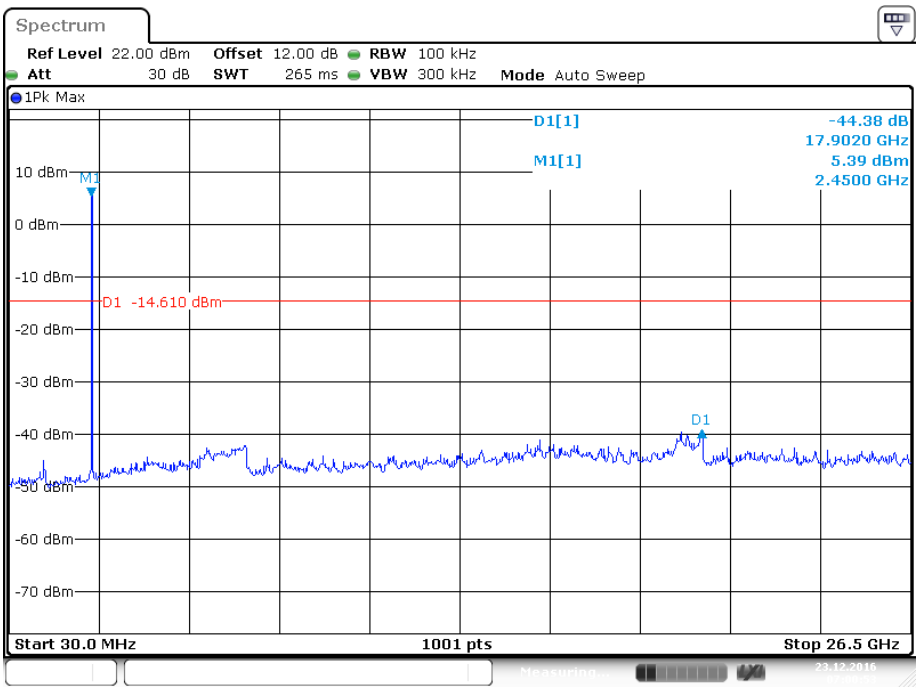
Date: 23.DEC.2016 07:04:01

Middle Channel (B Mode / Chain 0)



Date: 23.DEC.2016 07:02:53

High Channel(B Mode / Chain 0)



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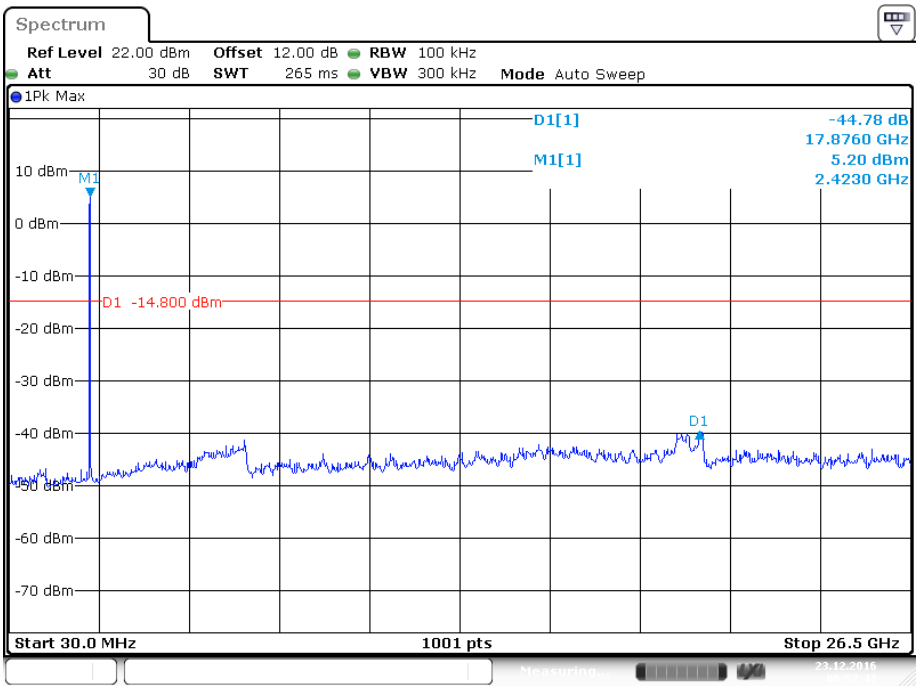
Low Channel (B Mode / Chain 1)



Date: 23.DEC.2016 06:52:43

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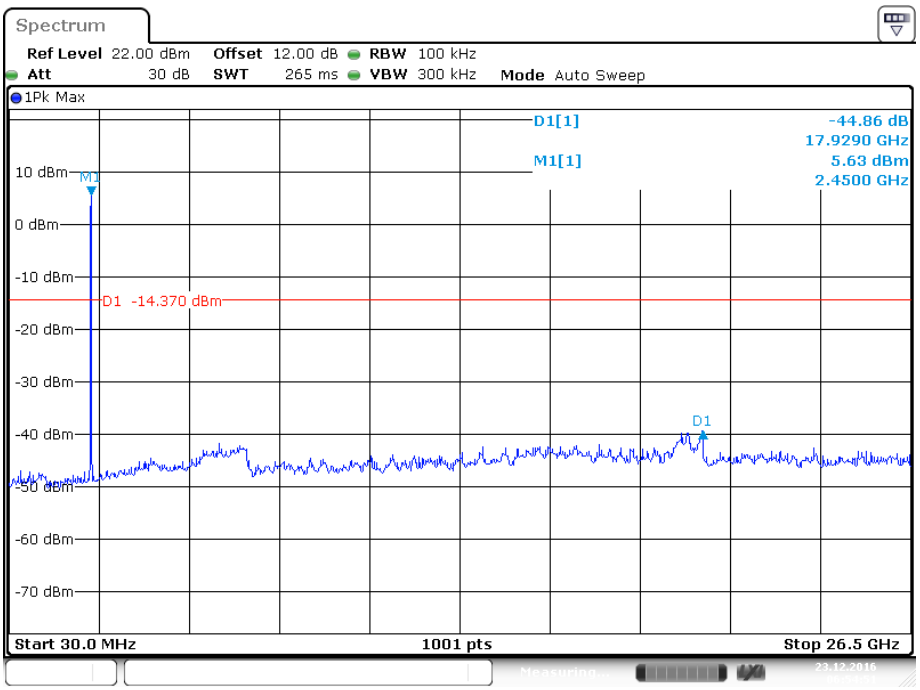

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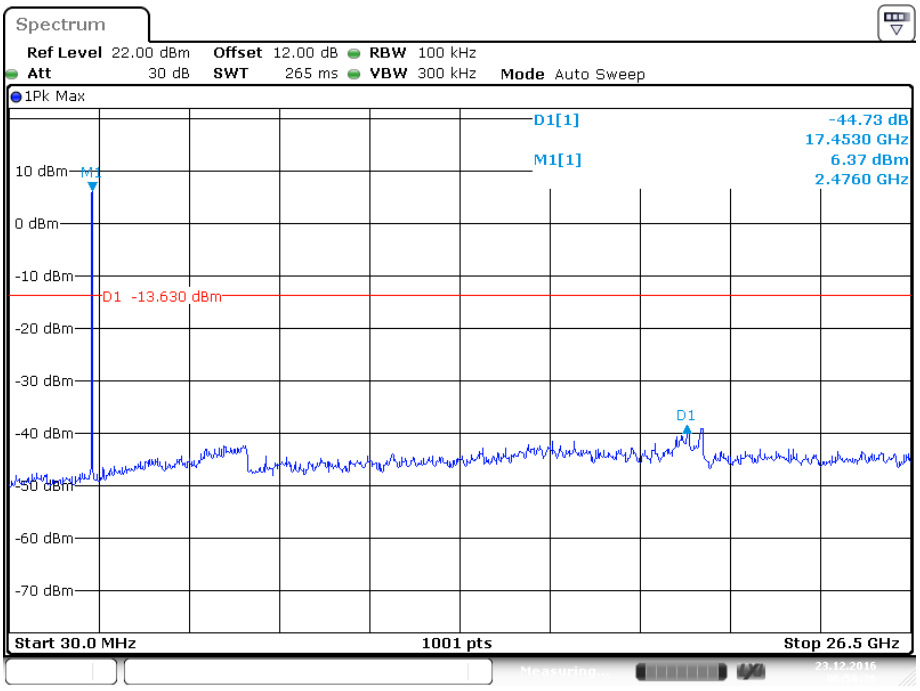

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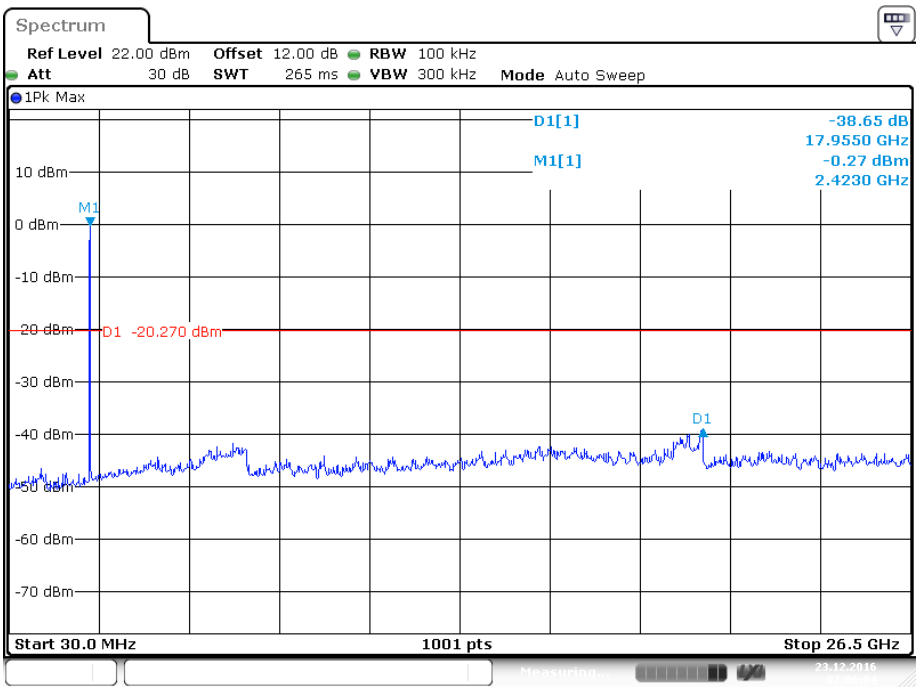
Low Channel (G Mode / Chain 0)



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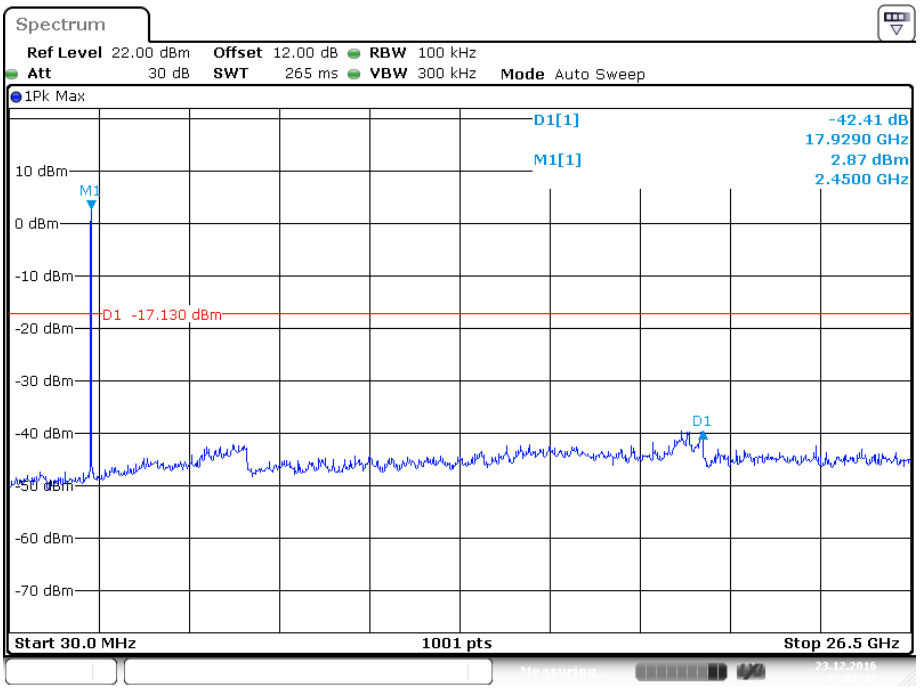

Date: 23.DEC.2016 07:07:43

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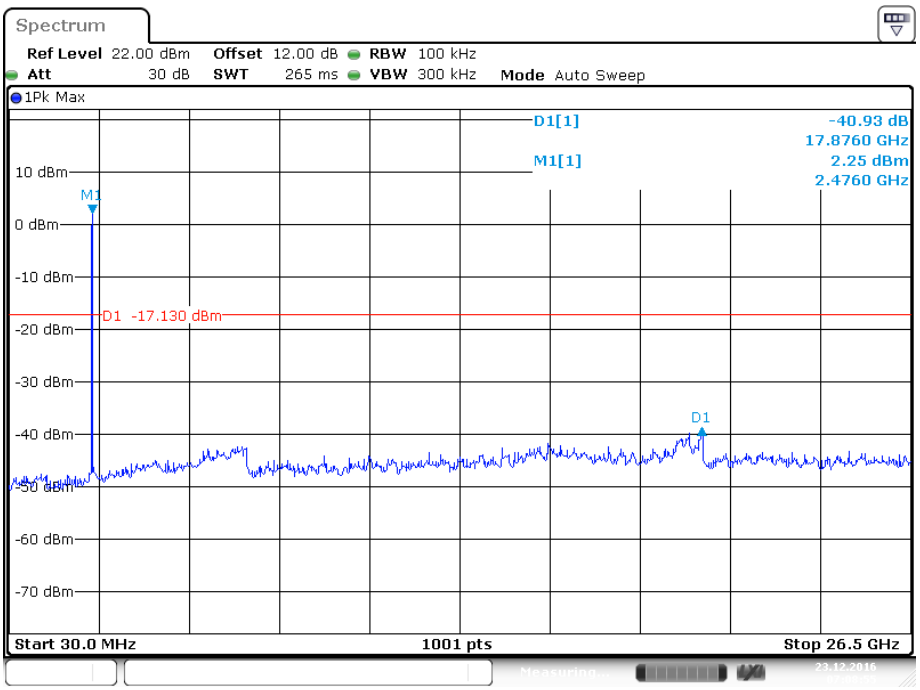
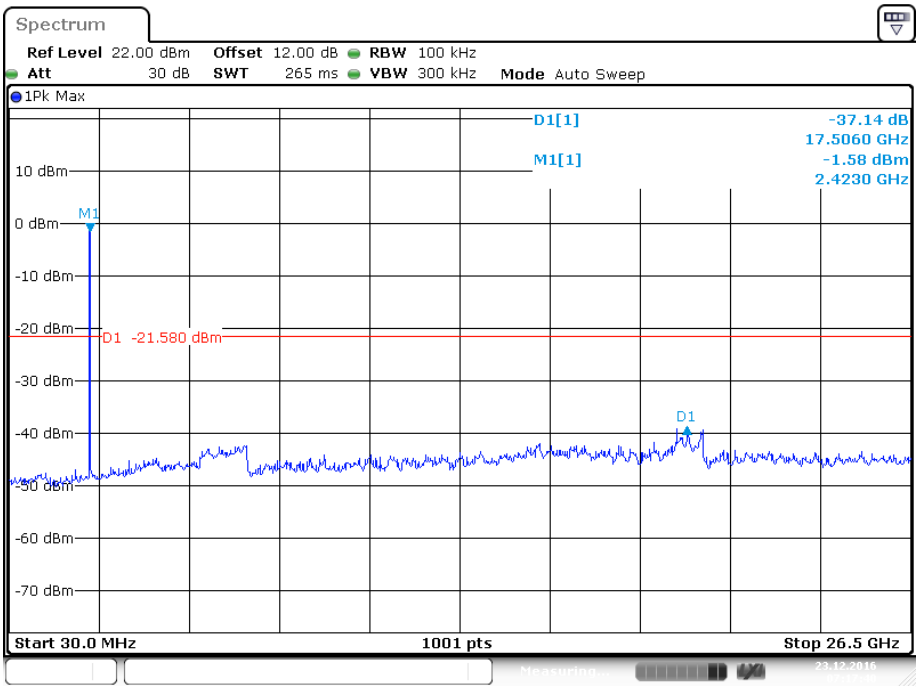


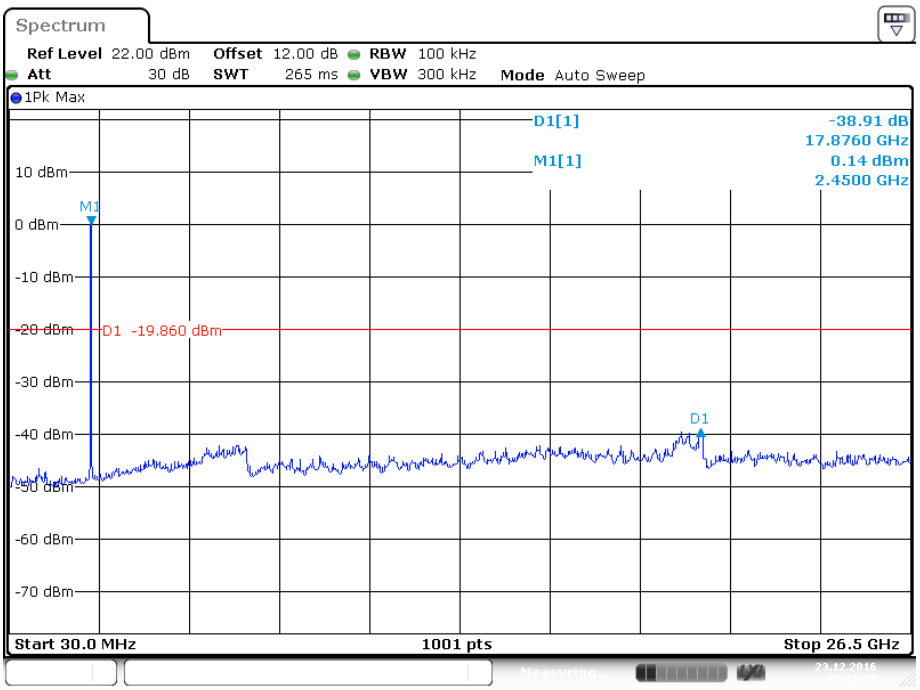
Date: 23.DEC.2016 07:08:55

Low Channel (G Mode / Chain 1)



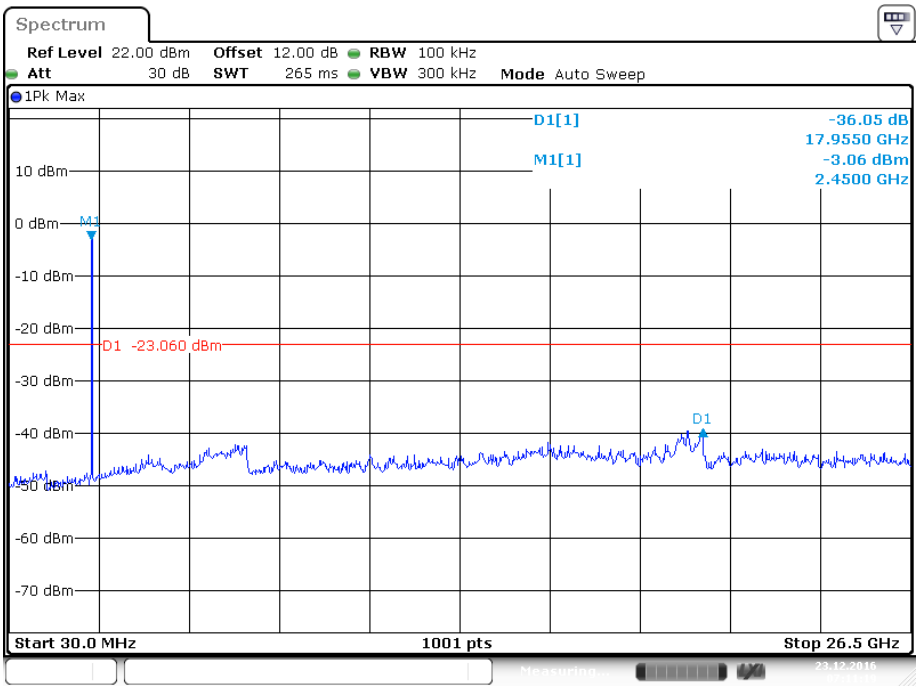
Date: 23.DEC.2016 07:17:41

Middle Channel (G Mode / Chain 1)



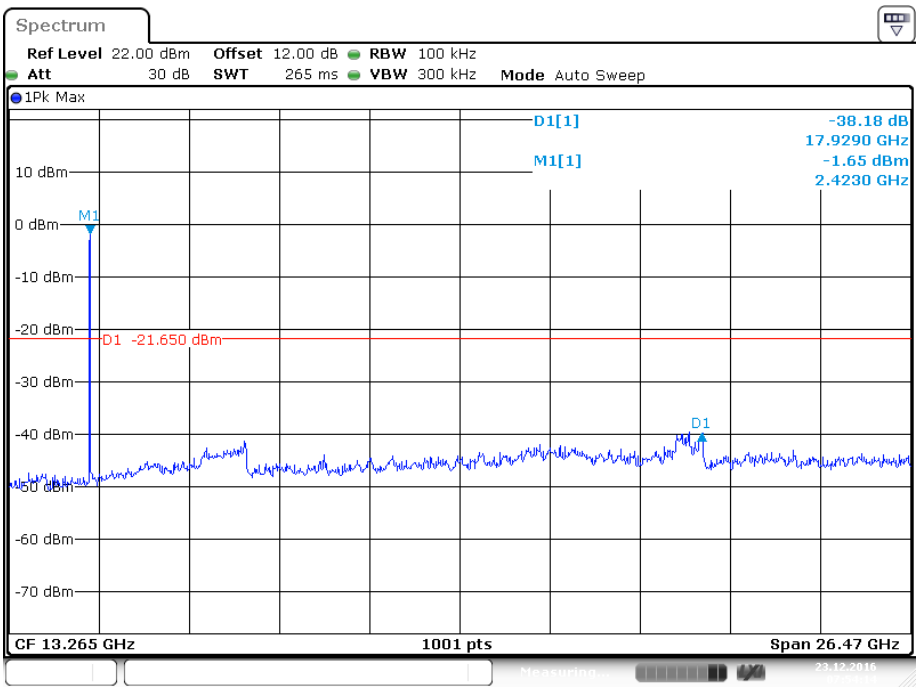
Date: 23.DEC.2016 07:12:58

High Channel (G Mode / Chain 1)



Date: 23.DEC.2016 07:11:20

Low Channel (N20 Mode / Chain 0)



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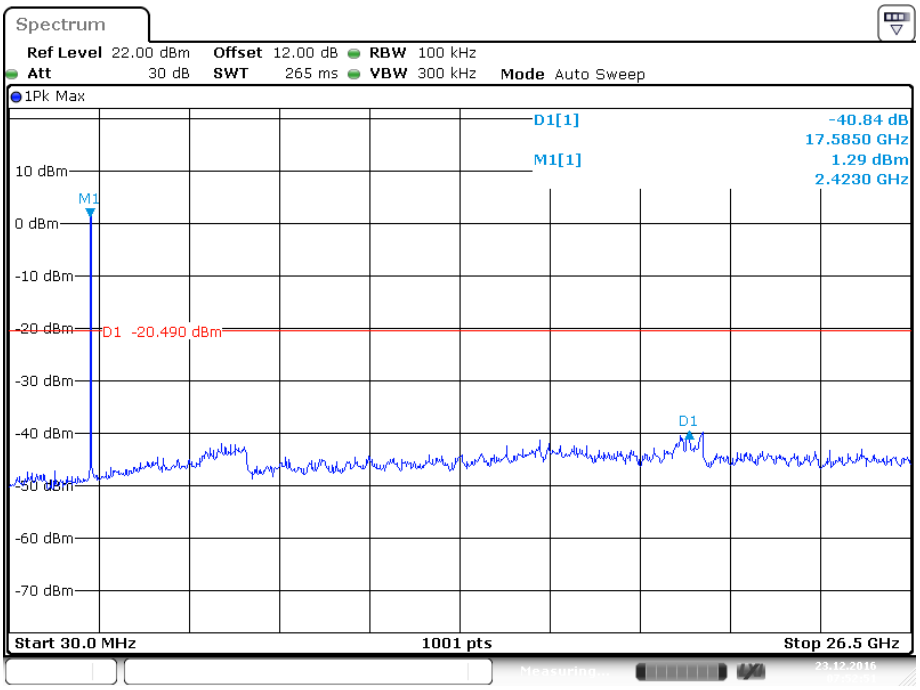
Middle Channel (N20 Mode / Chain 0)



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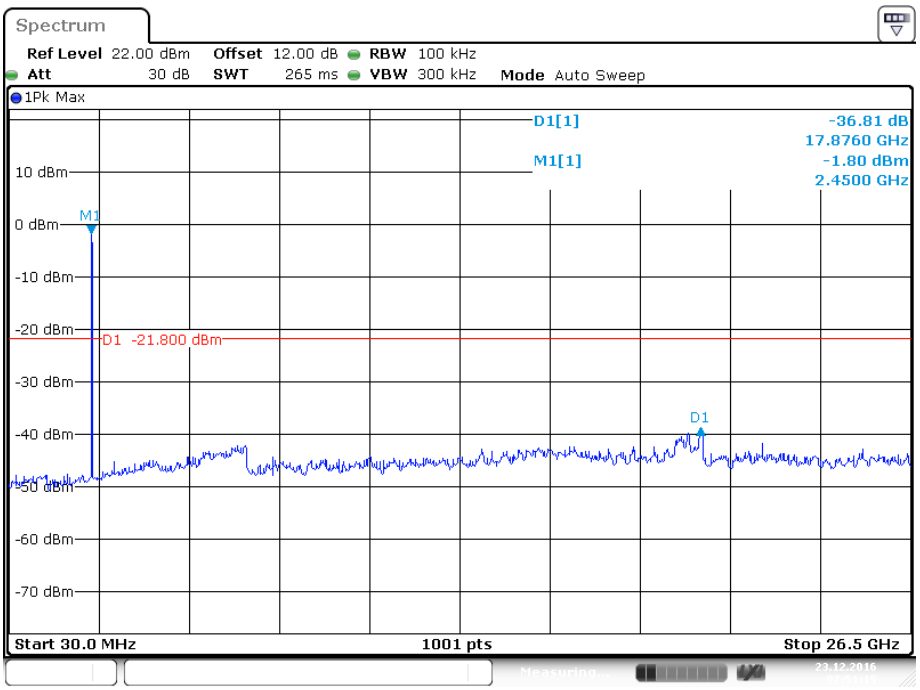
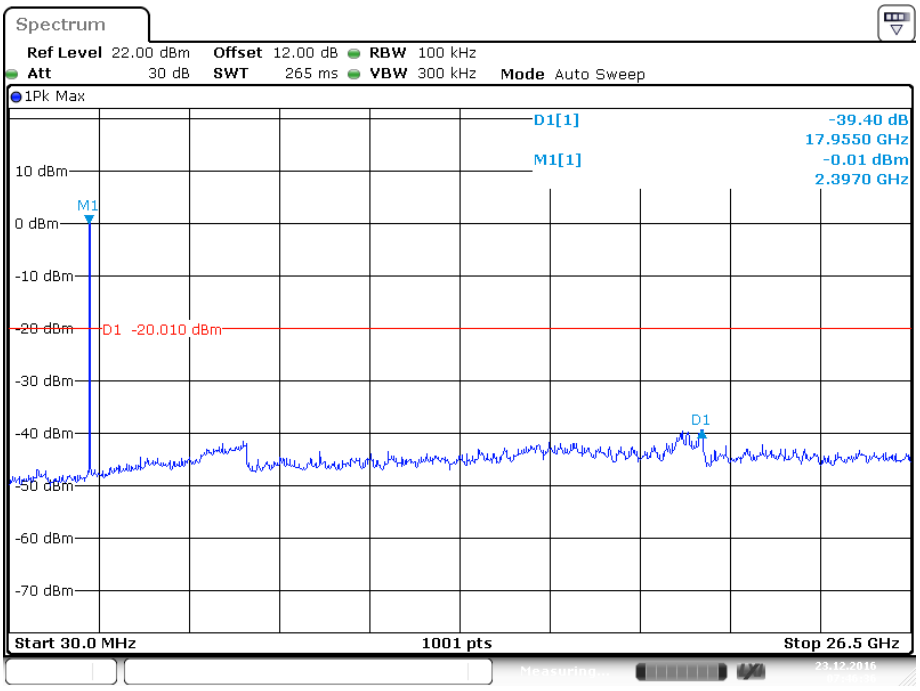
High Channel (N20 Mode / Chain 0)



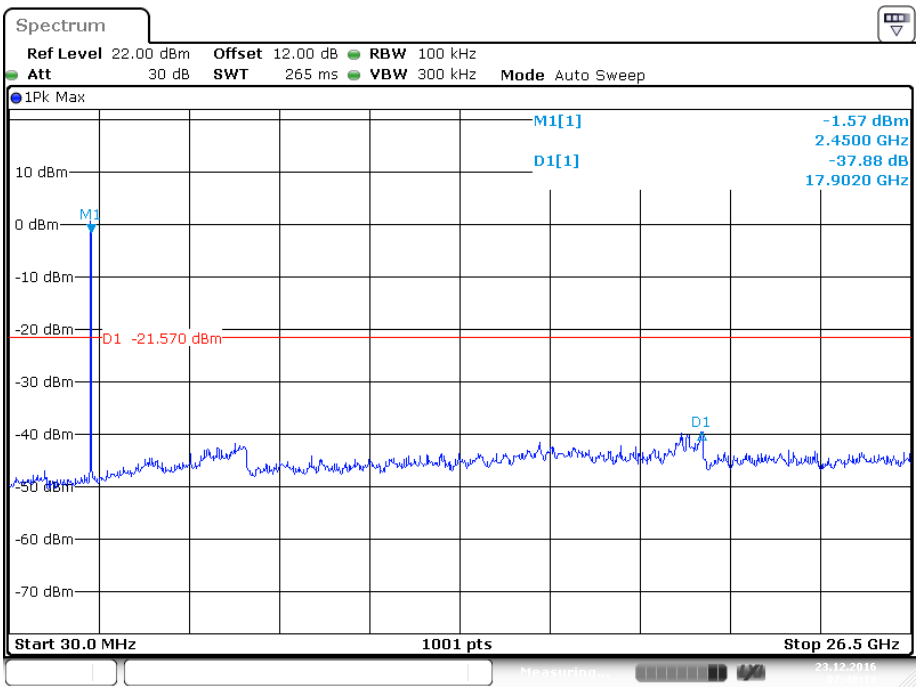
Date: 23.DEC.2016 07:51:16

Low Channel (N20 Mode / Chain 1)



Date: 23.DEC.2016 07:46:37

Middle Channel (N20 Mode / Chain 1)



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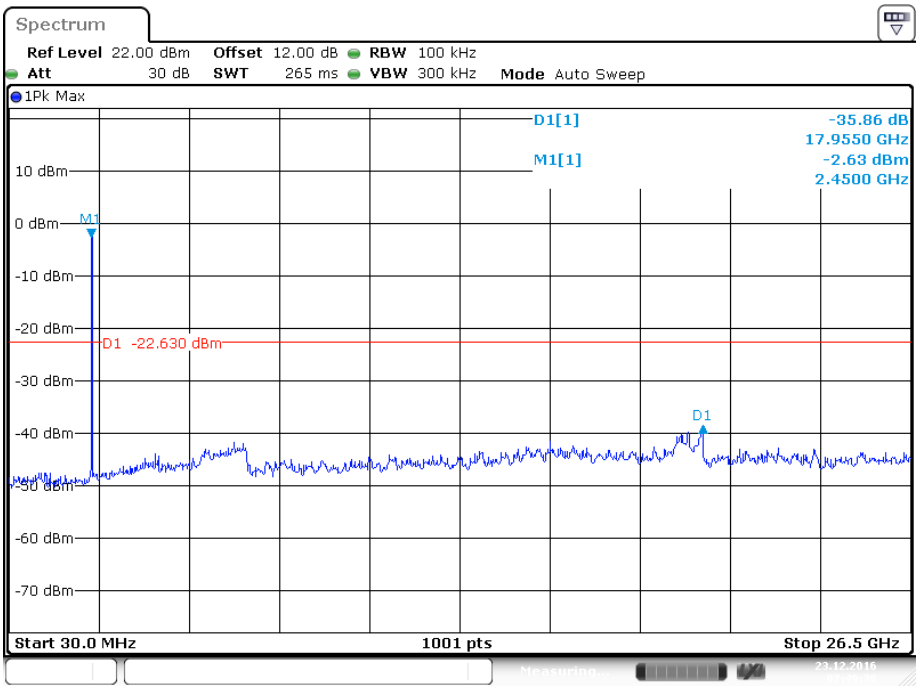
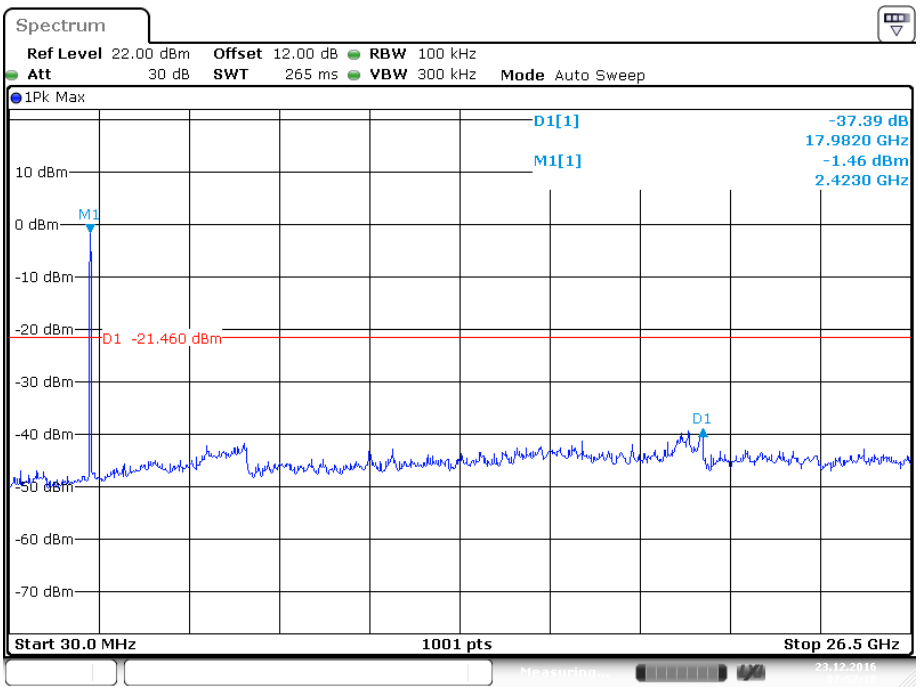
High Channel (N20 Mode / Chain 1)



Date: 23.DEC.2016 07:49:38

Low Channel (N40 Mode / Chain 0)



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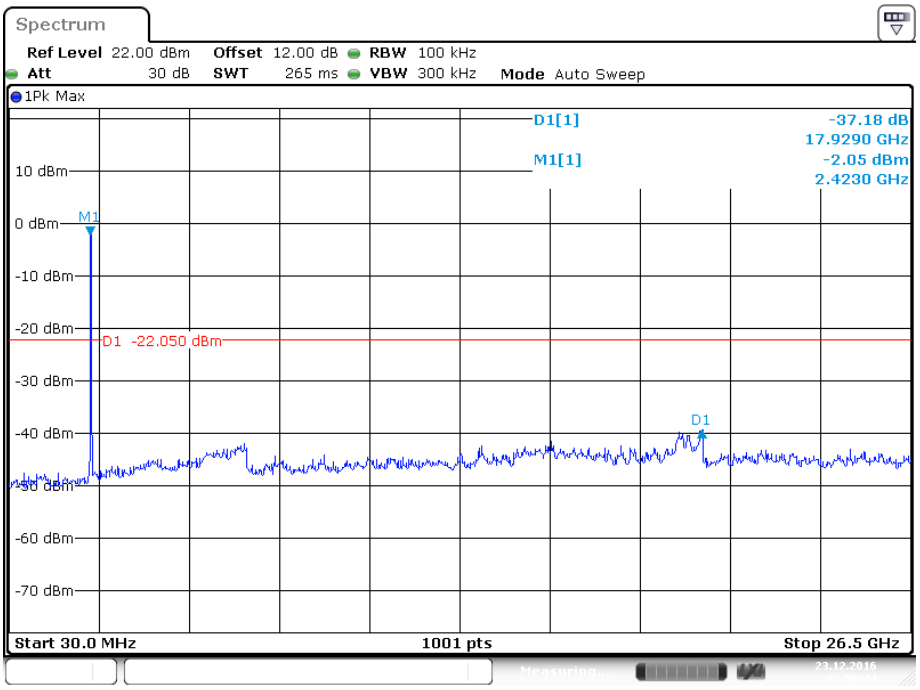
Middle Channel (N40 Mode / Chain 0)



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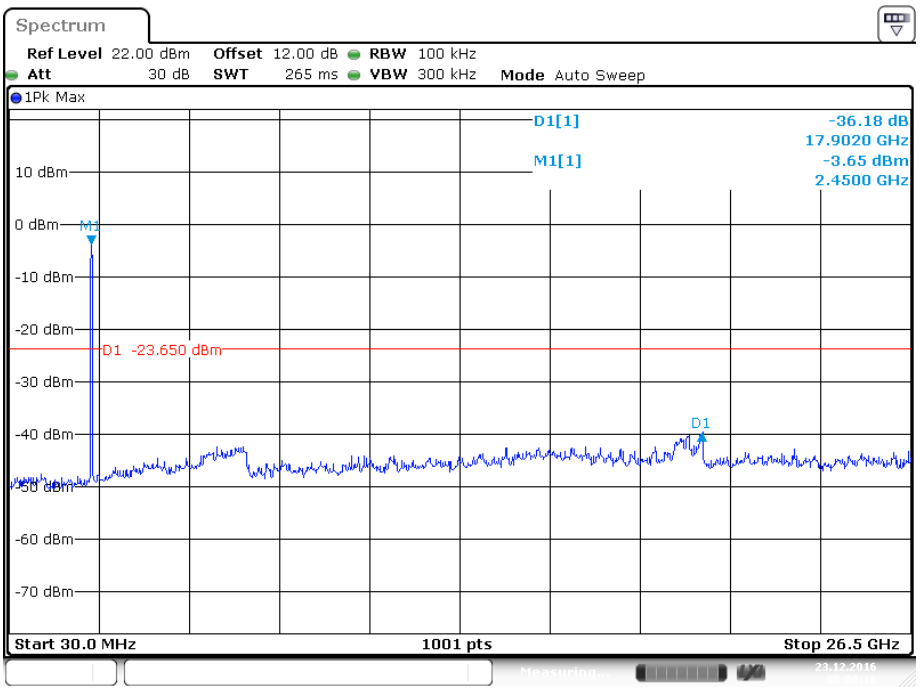
High Channel (N40 Mode / Chain 0)



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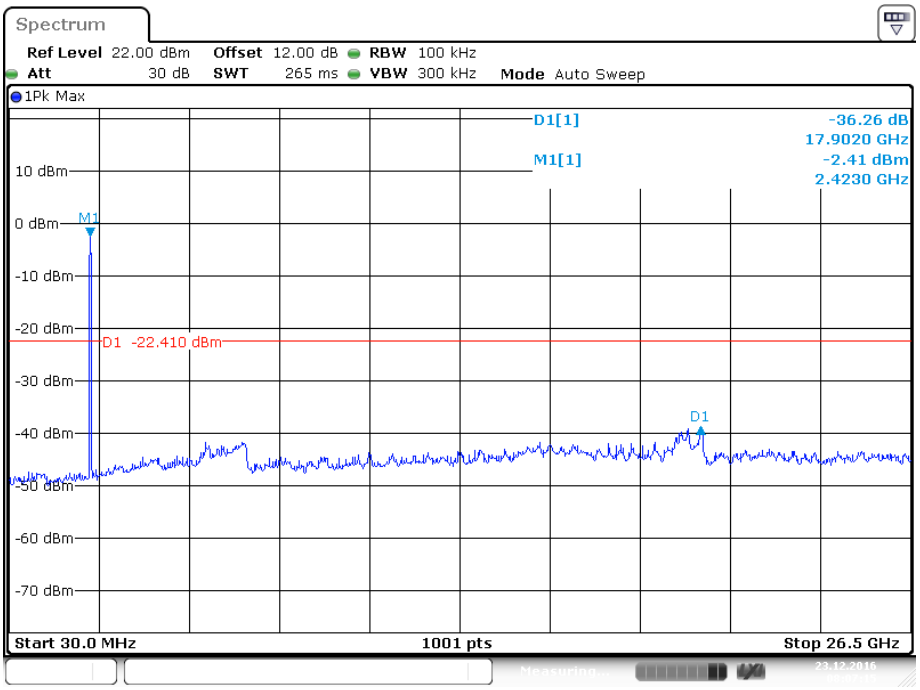
Low Channel (N40 Mode / Chain 1)



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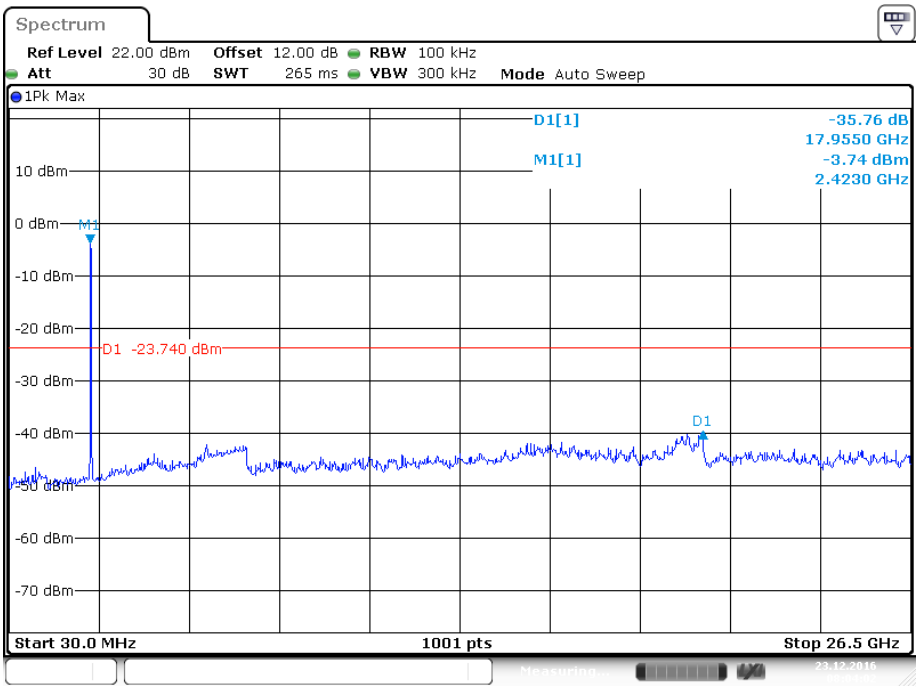
Middle Channel (N40 Mode / Chain 1)



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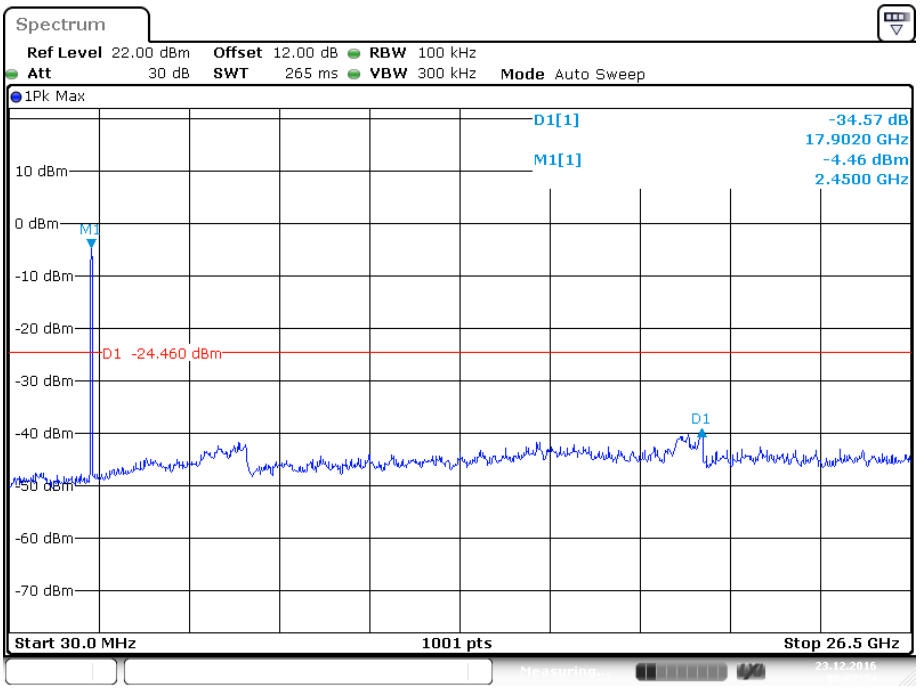
High Channel (N40 Mode / Chain 1)



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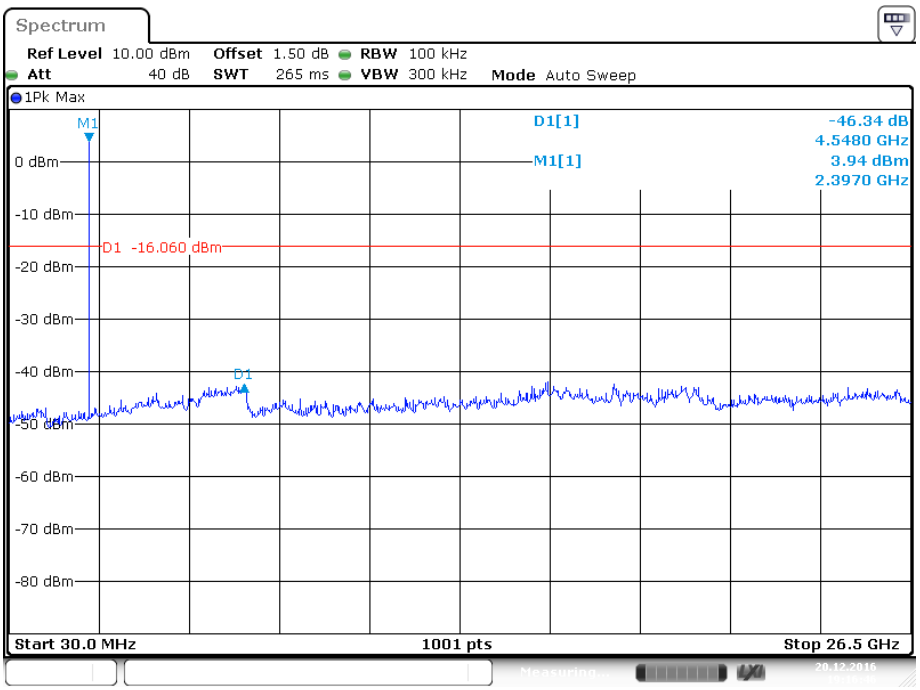
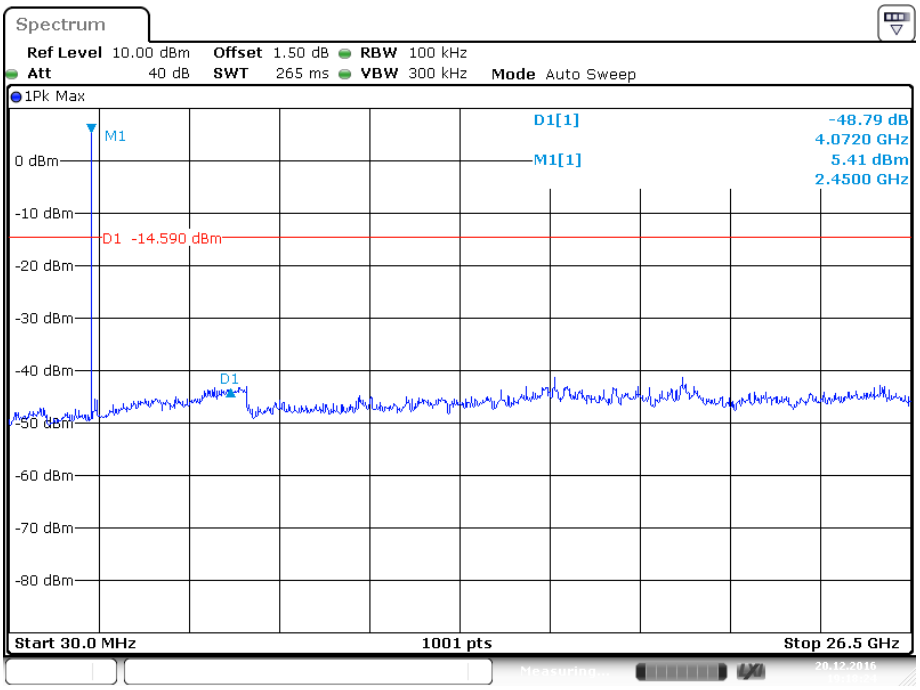
Low Channel(BLE)



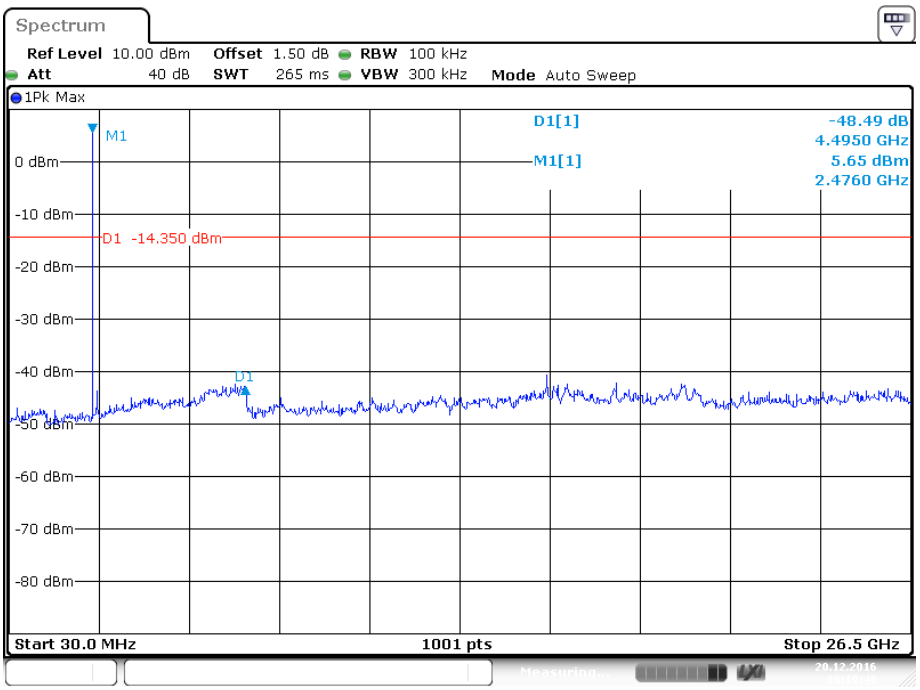
Date: 20.DEC.2016 19:16:46

Middle Channel(BLE)



Date: 20.DEC.2016 19:18:25

High Channel(BLE)



Date: 20.DEC.2016 19:19:49

8 FCC §15.247(a)(2)– 6 dB Emission Bandwidth

8.1 Applicable Standard

According to FCC §15.247(a)(2).

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

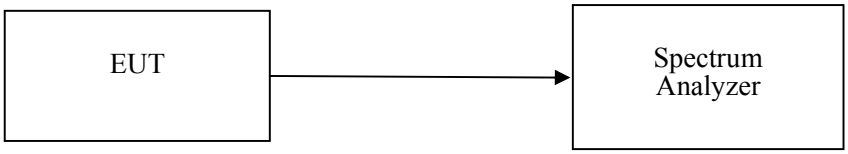
8.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.

3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.

4. Repeat above procedures until all frequencies measured were complete.



8.3 Test Equipment List and Details

Descriptions	Manufacturers	Models	Serial Numbers	Calibration Date	Calibration Due Date
Spectrum Analyzer	Rohde & Schwarz	FSV40	101203	2016/7/14	2017/7/13
Cable	WOKEN	SFL402	00100A1F6A192S	N.C.R	N.C.R

***Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Taiwan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

8.4 Test Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	55 %
ATM Pressure:	1010 hPa

The testing was performed by David Hsu on 2016-12-20 to 2016-12-22.

8.5 Test Results

WIFI

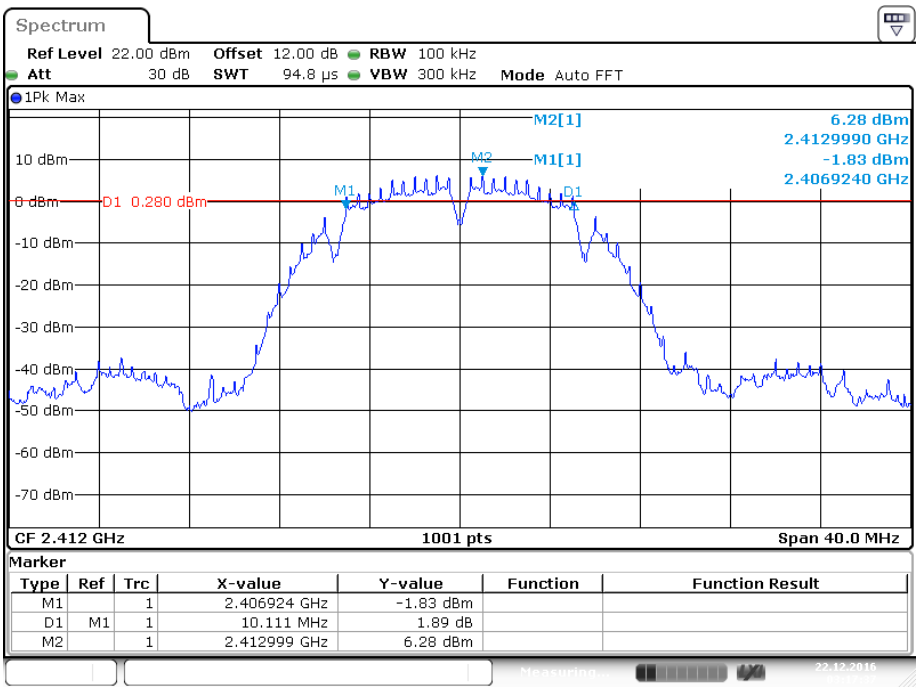
Channel	Frequency (MHz)	6 dB OBW (MHz)		Limit (MHz)	RESULT
		Chain 0	Chain 1		
B Mode					
Low	2412	10.11	10.11	≥ 0.5	PASS
Mid	2437	10.13	10.13	≥ 0.5	PASS
High	2462	10.10	10.11	≥ 0.5	PASS
G Mode					
Low	2412	15.93	15.78	≥ 0.5	PASS
Mid	2437	15.80	15.80	≥ 0.5	PASS
High	2462	15.77	15.77	≥ 0.5	PASS
N20 Mode					
Low	2412	15.94	15.14	≥ 0.5	PASS
Mid	2437	15.80	17.28	≥ 0.5	PASS
High	2462	17.05	15.46	≥ 0.5	PASS
N40 Mode					
Low	2422	35.12	35.51	≥ 0.5	PASS
Mid	2437	35.44	35.44	≥ 0.5	PASS
High	2452	35.12	35.51	≥ 0.5	PASS

BLE

Channel	Frequency (MHz)	6 dB OBW (MHz)	Limit (MHz)	Result
Low	2402	0.65	> 0.5	Compliance
Middle	2440	0.66	> 0.5	Compliance
High	2480	0.67	> 0.5	Compliance

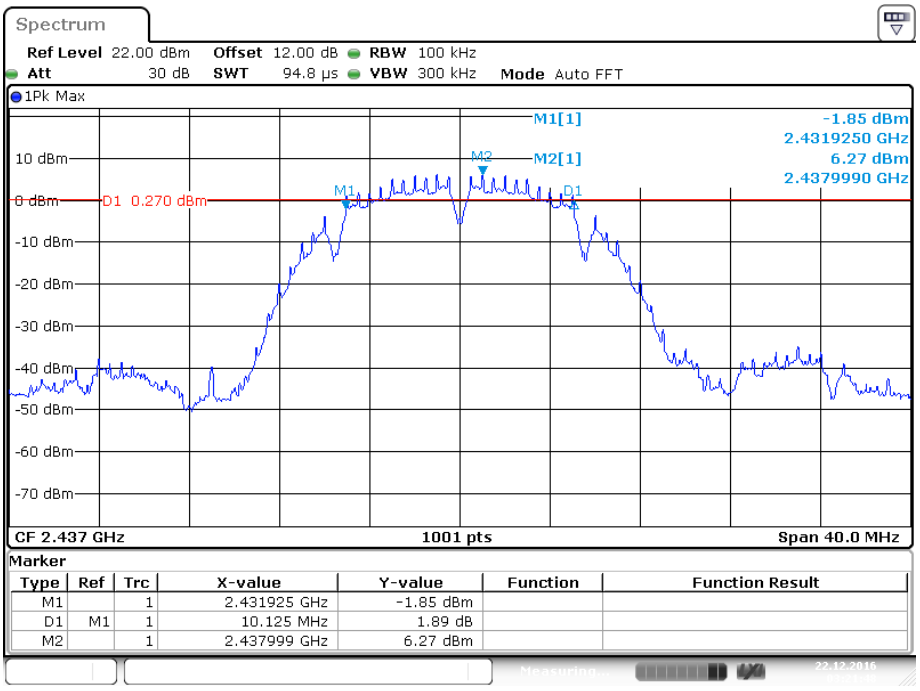
Please refer to the following plots

Low Channel (B Mode / Chain 0)



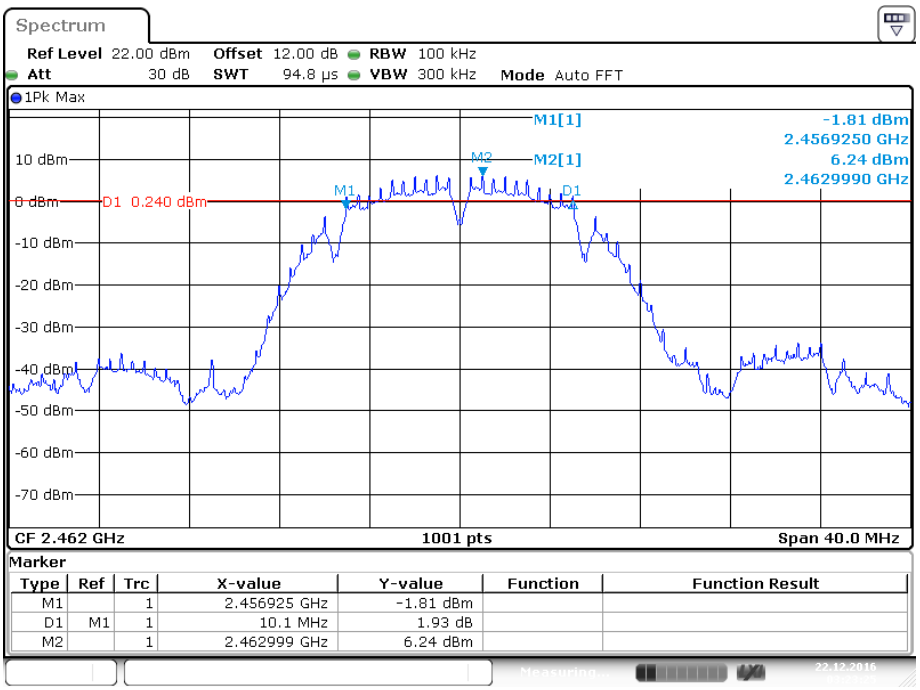
Date: 22.DEC.2016 03:17:38

Middle Channel (B Mode / Chain 0)



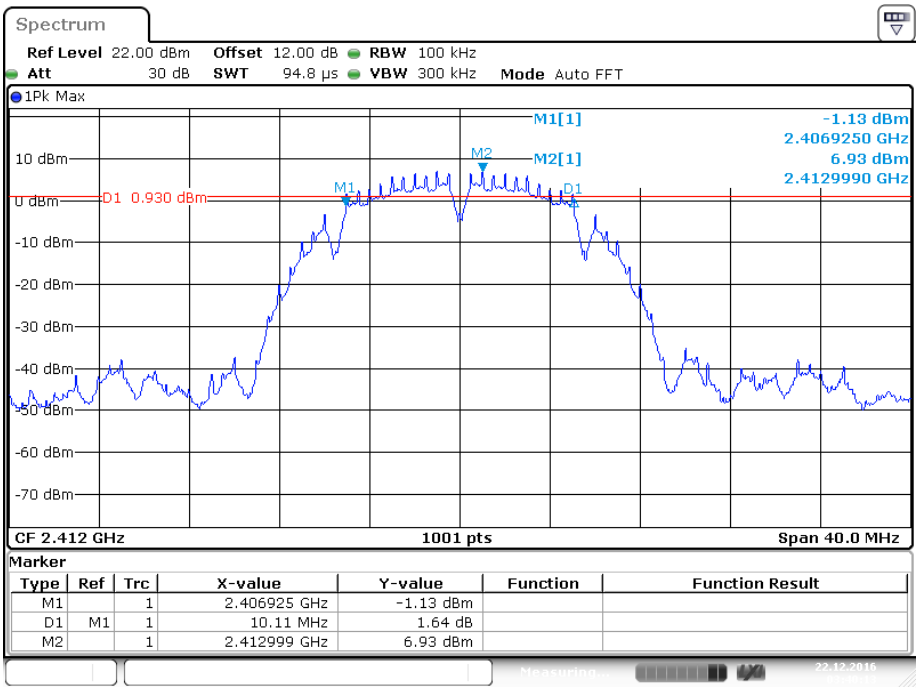
Date: 22.DEC.2016 03:21:48

High Channel (B Mode / Chain 0)



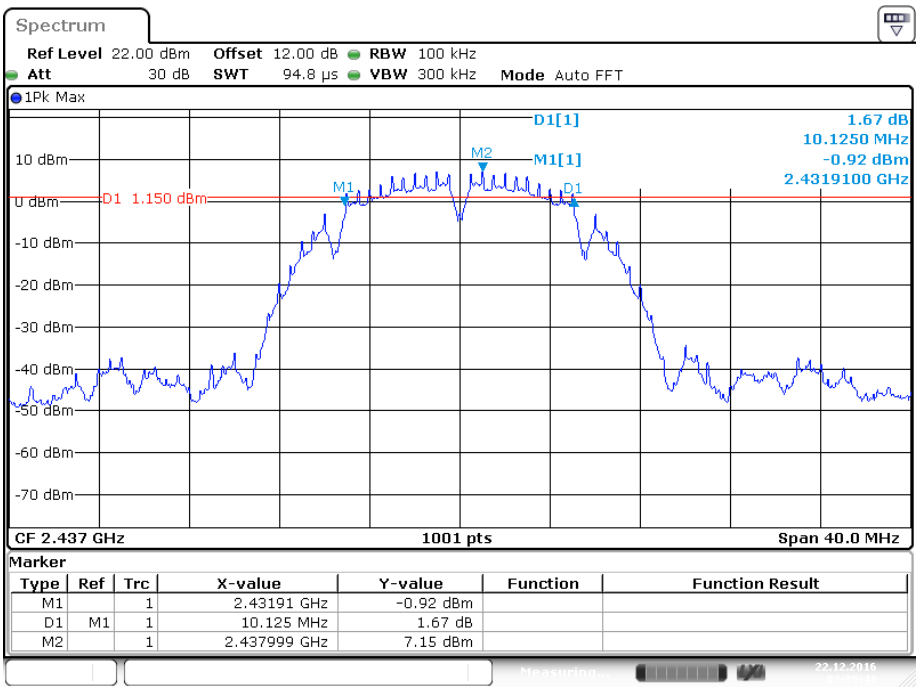
Date: 22.DEC.2016 03:23:26

Low Channel (B Mode / Chain 1)



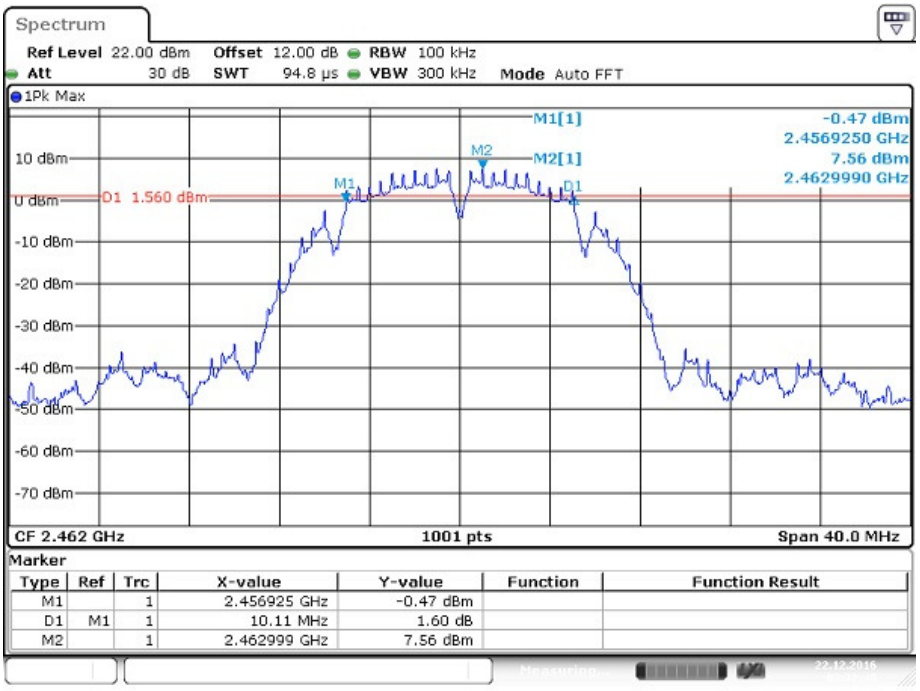
Date: 22.DEC.2016 03:40:13

Middle Channel (B Mode / Chain 1)



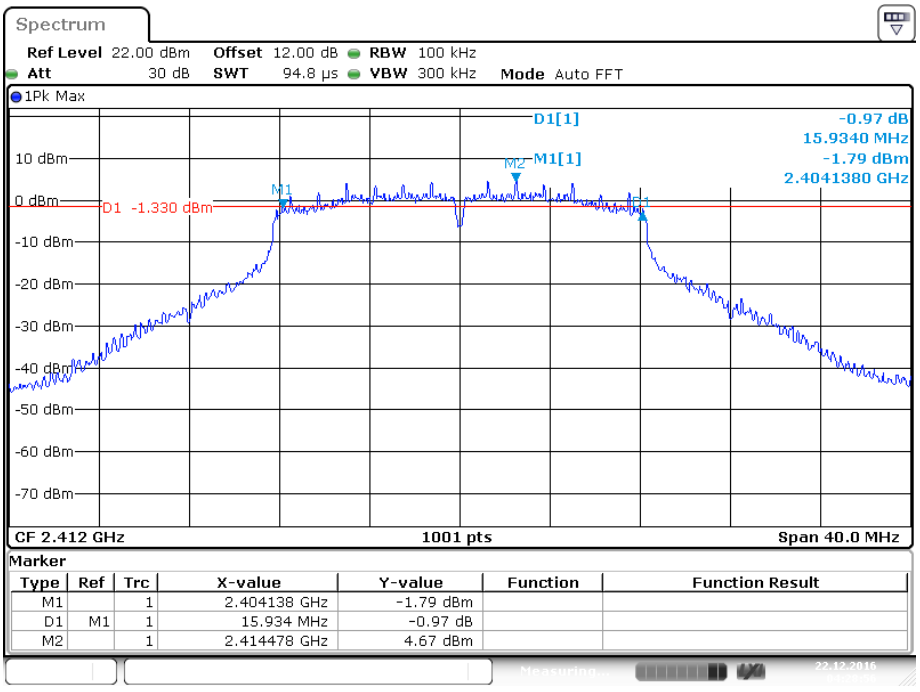
Date: 22.DEC.2016 03:35:41

High Channel (B Mode / Chain 1)



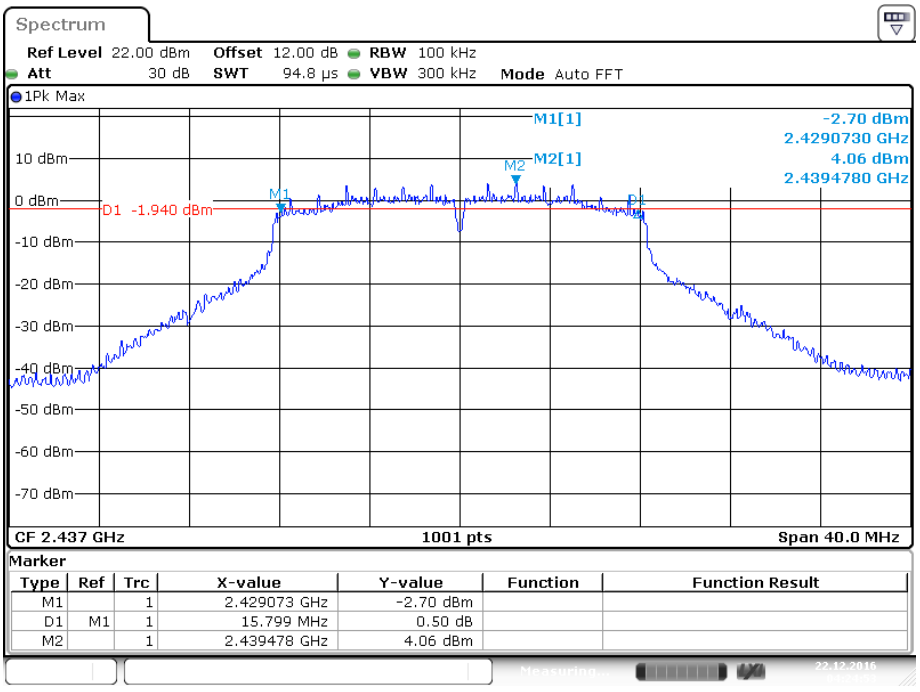
Date: 22.DEC.2016 03:37:40

Low Channel (G Mode / Chain 0)



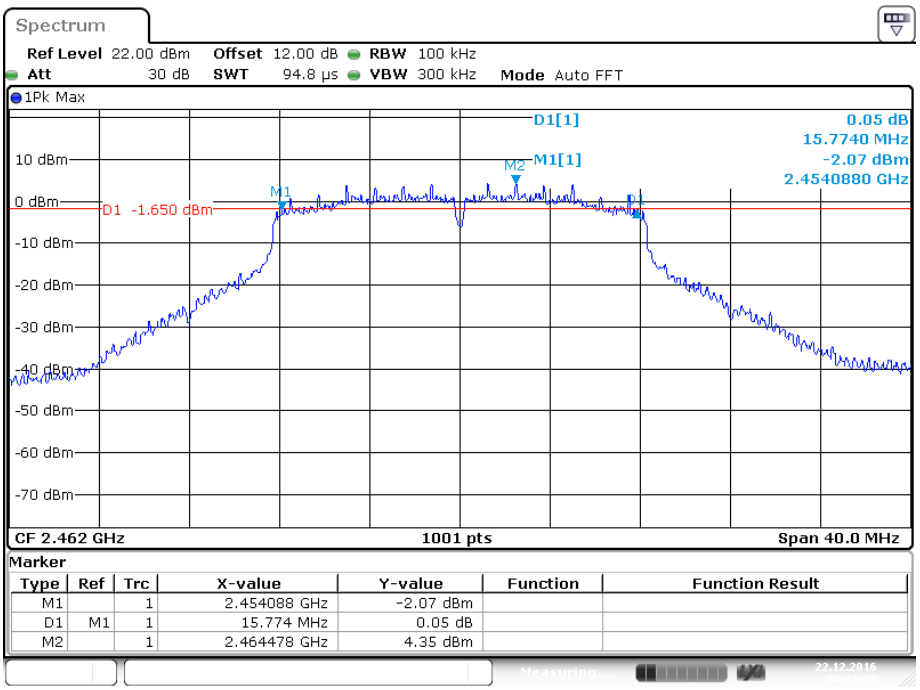
Date: 22.DEC.2016 04:28:56

Middle Channel (G Mode / Chain 0)



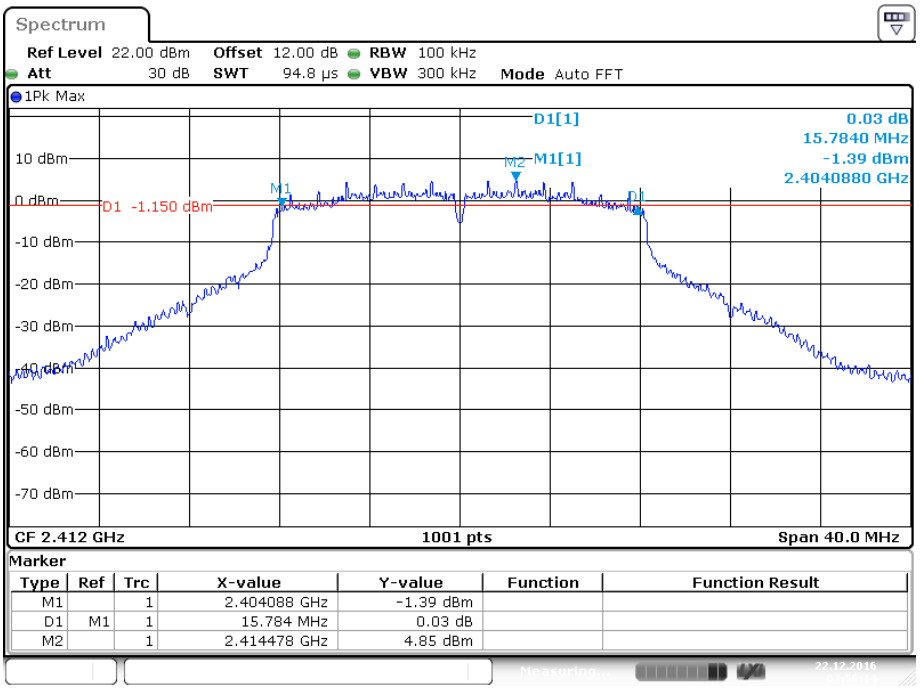
Date: 22.DEC.2016 04:24:54

High Channel (G Mode / Chain 0)



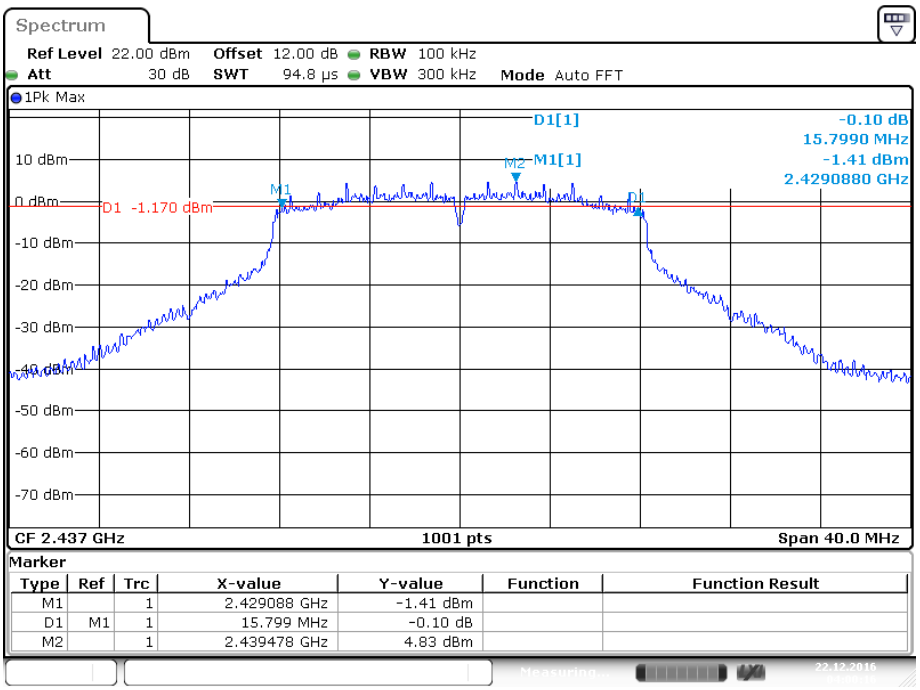
Date: 22.DEC.2016 04:22:31

Low Channel (G Mode / Chain 1)



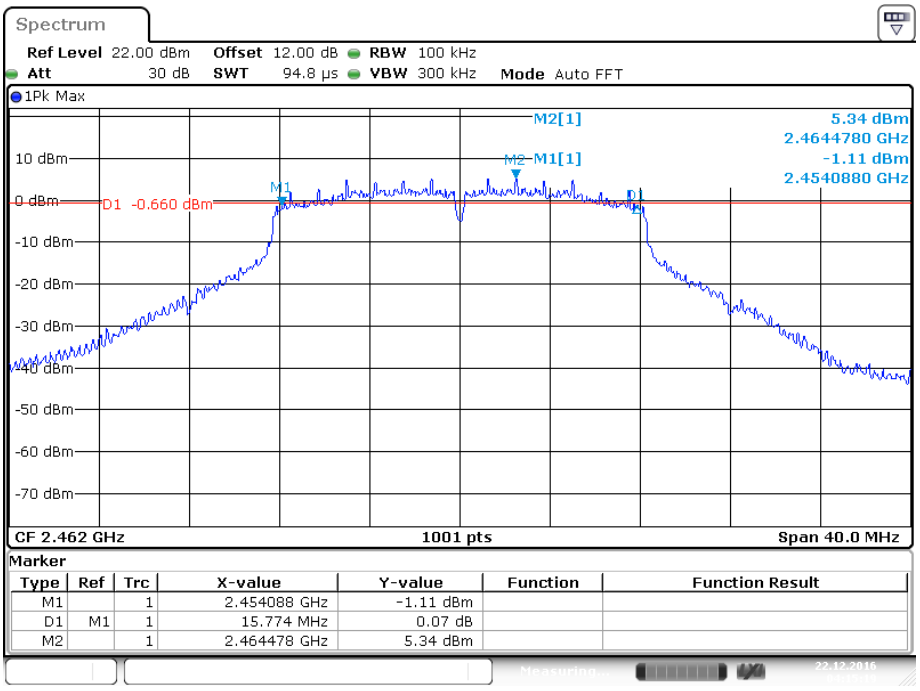
Date: 22.DEC.2016 03:56:15

Middle Channel (G Mode / Chain 1)



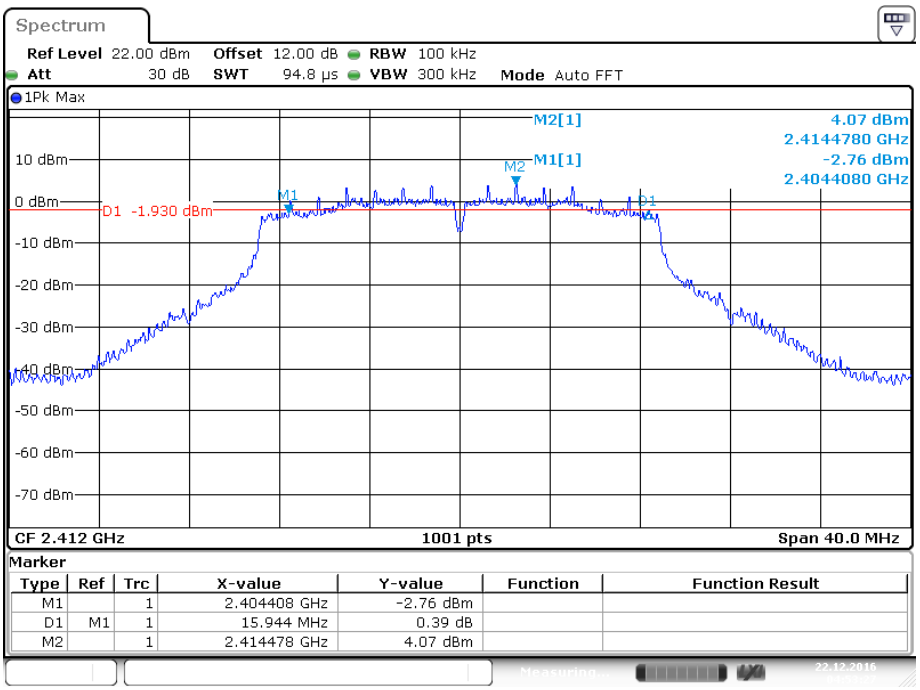
Date: 22.DEC.2016 04:00:16

High Channel (G Mode / Chain 1)



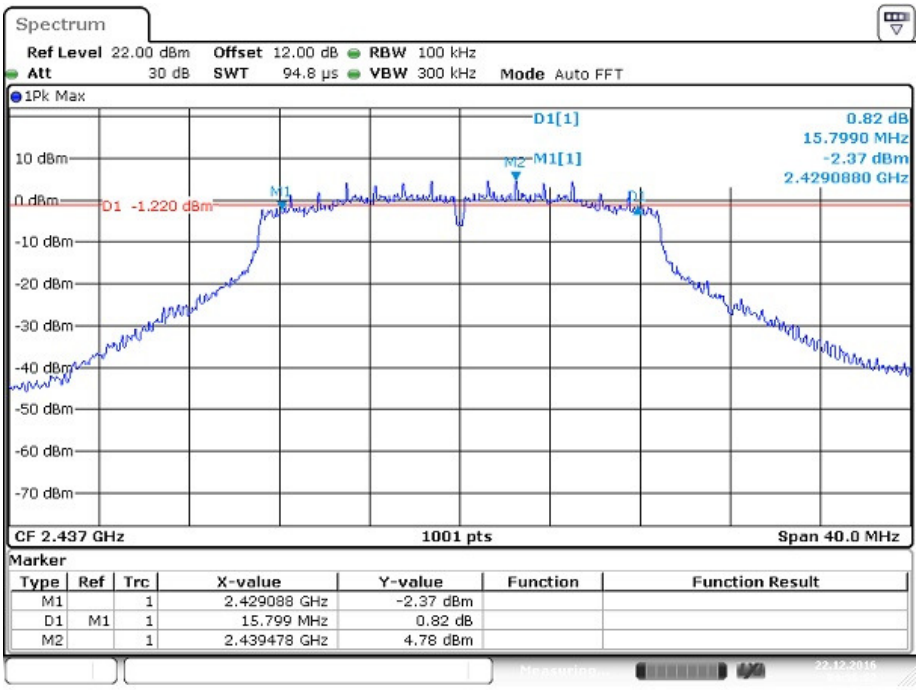
Date: 22.DEC.2016 04:15:19

Low Channel (N20 Mode / Chain 0)



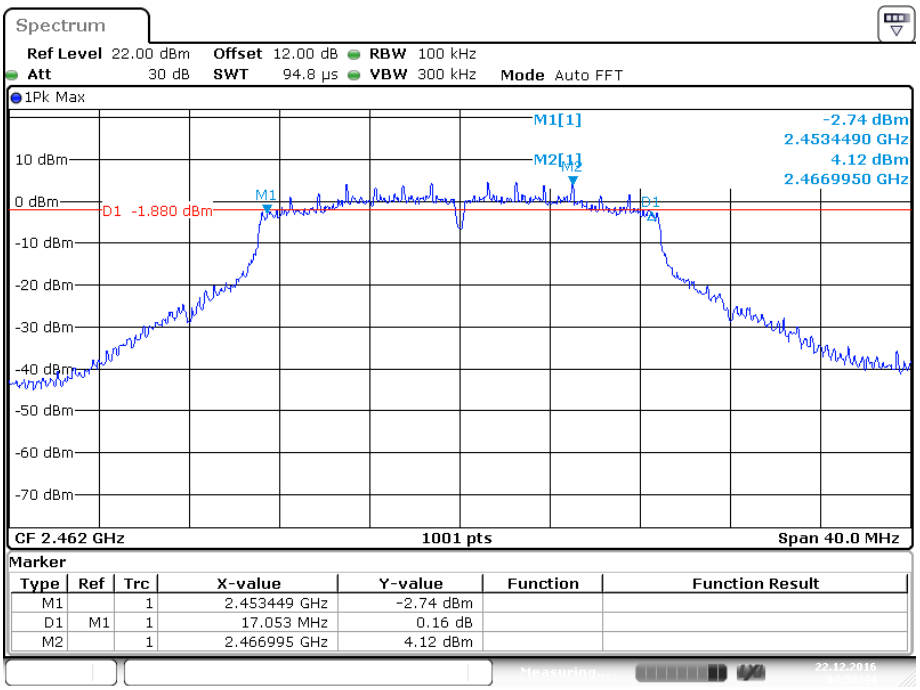
Date: 22.DEC.2016 04:53:27

Middle Channel (N20 Mode / Chain 0)



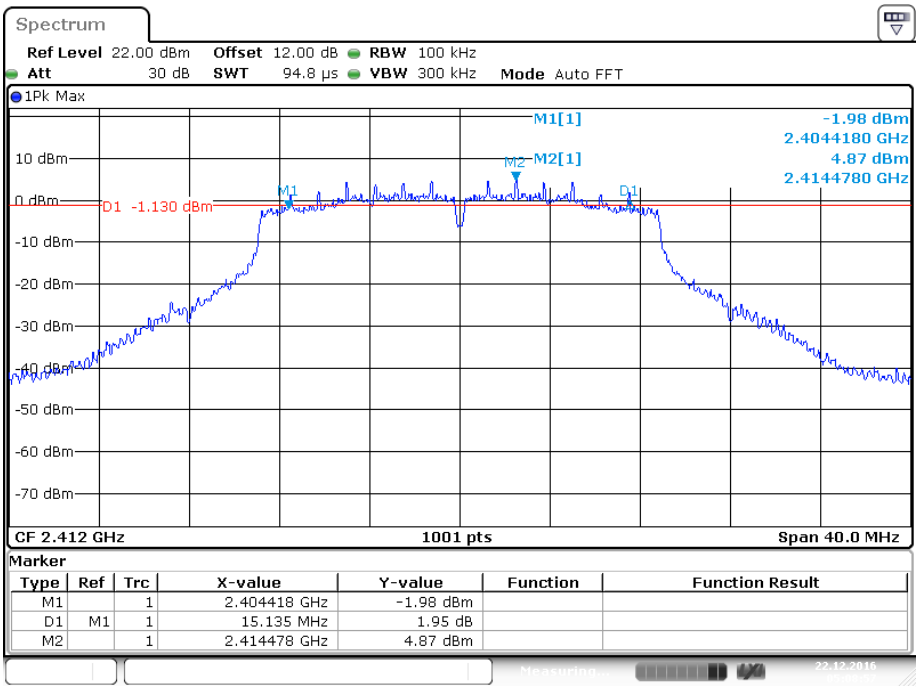
Date: 22.DEC.2016 04:56:52

High Channel (N20 Mode / Chain 0)



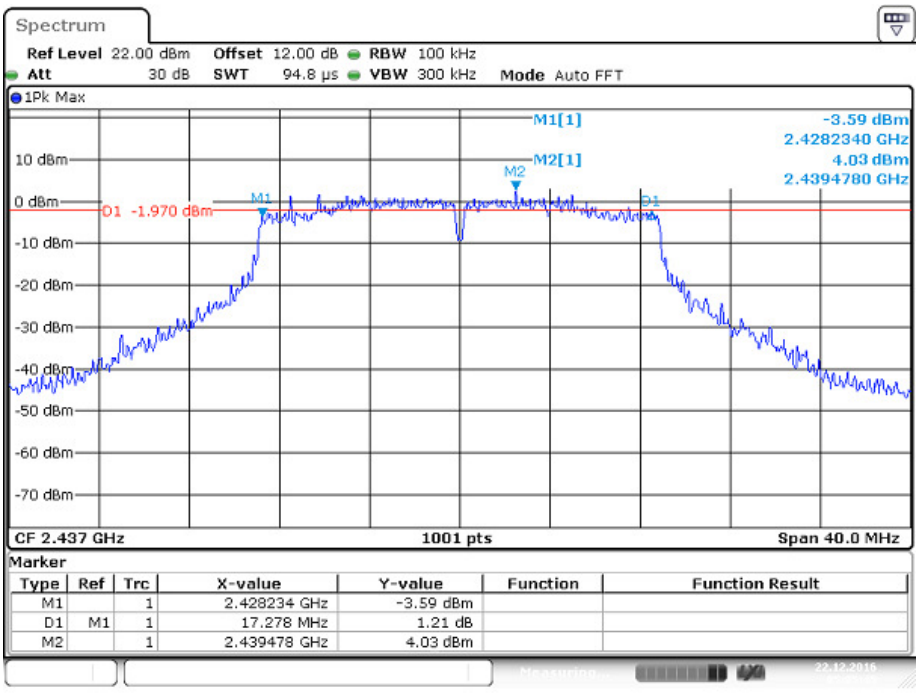
Date: 22.DEC.2016 04:58:45

Low Channel (N20 Mode / Chain 1)



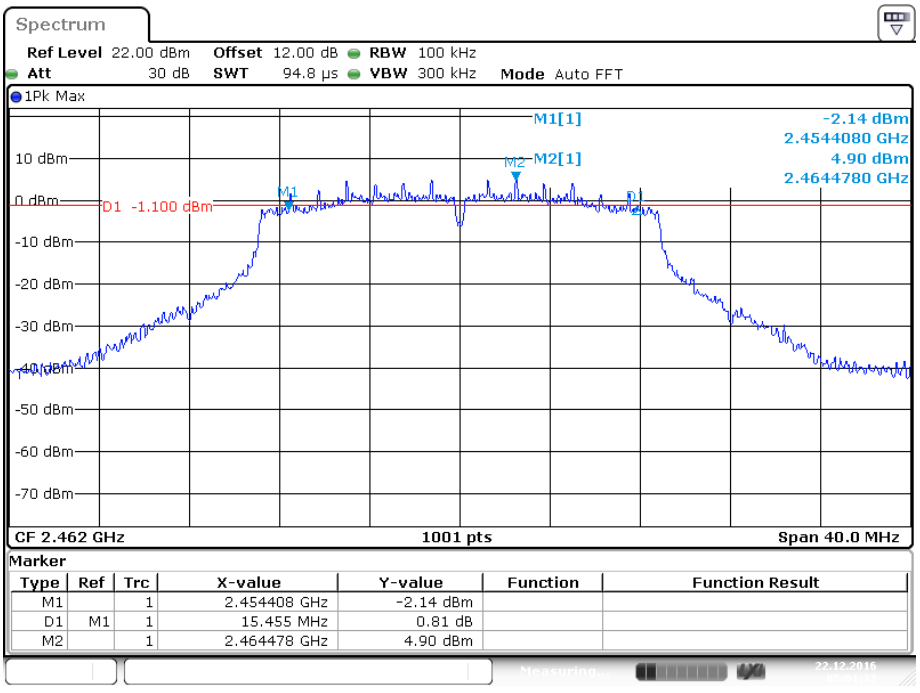
Date: 22.DEC.2016 05:08:57

Middle Channel (N20 Mode / Chain 1)



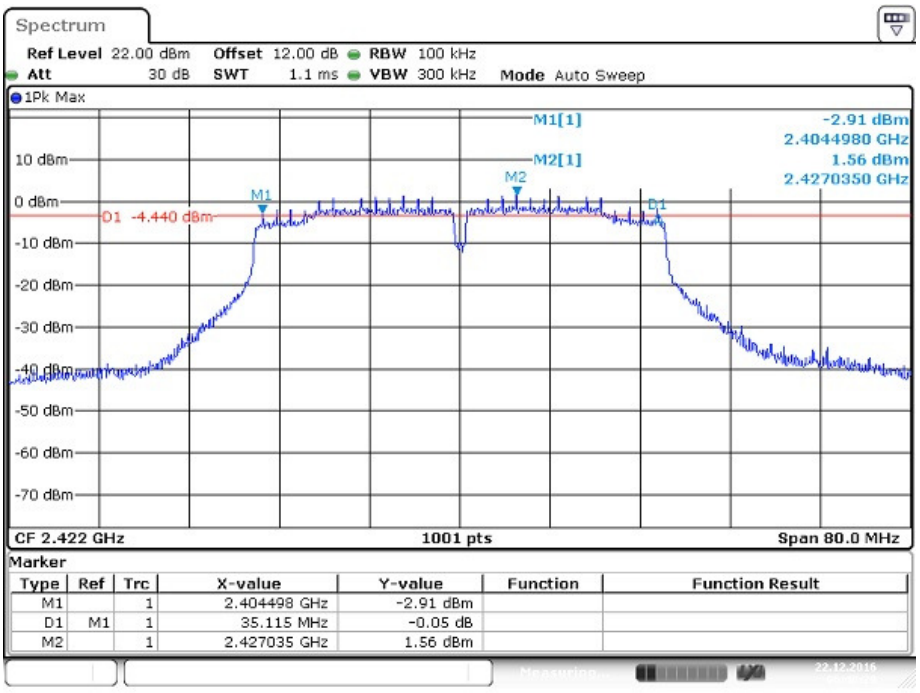
Date: 22.DEC.2016 05:05:45

High Channel (N20 Mode / Chain 1)



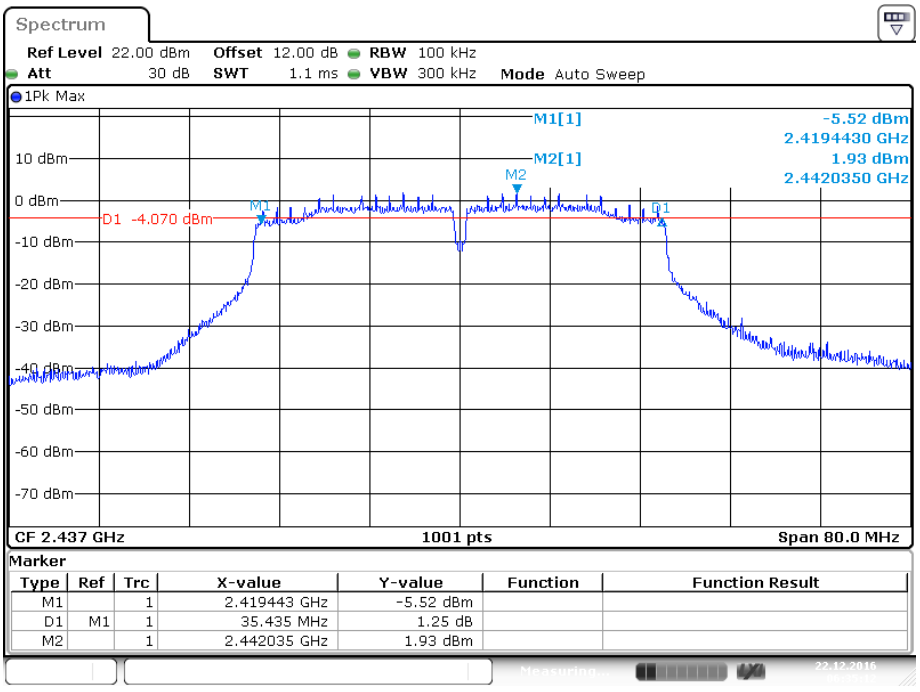
Date: 22.DEC.2016 05:01:33

Low Channel (N40 Mode / Chain 0)



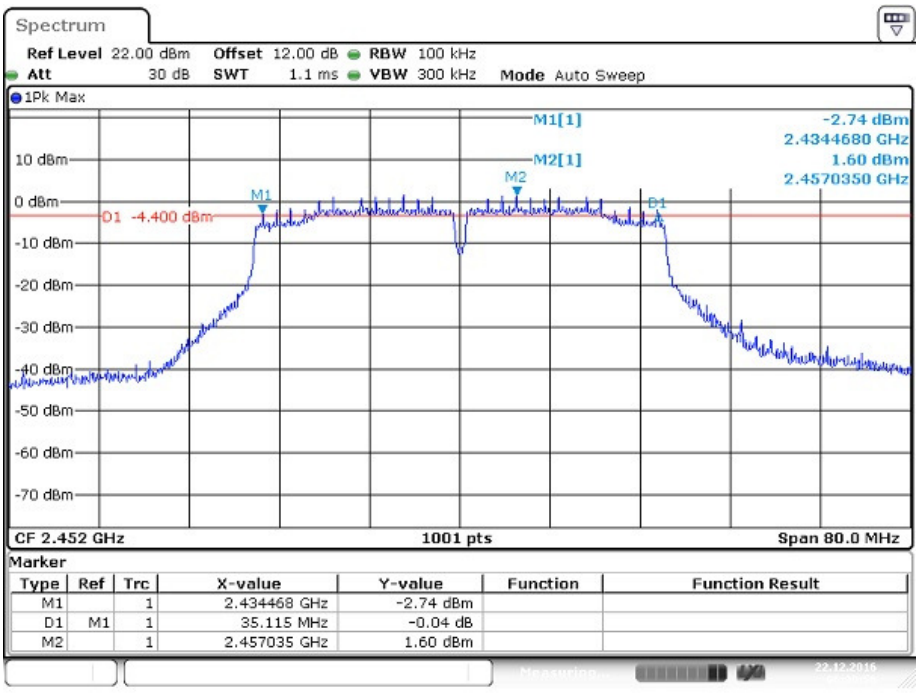
Date: 22.DEC.2016 06:40:29

Middle Channel (N40 Mode / Chain 0)



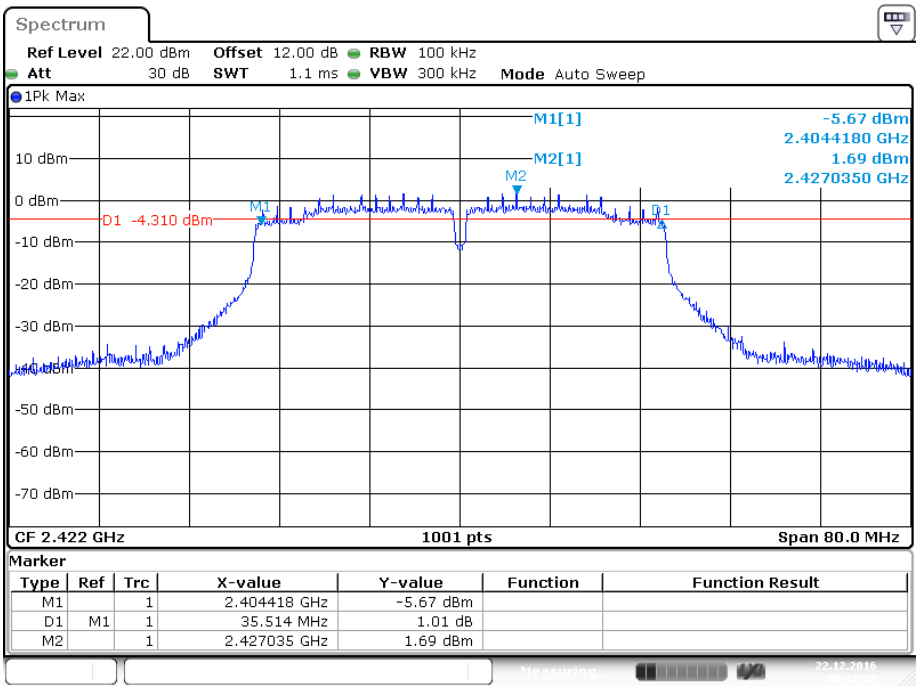
Date: 22.DEC.2016 06:35:12

High Channel (N40 Mode / Chain 0)



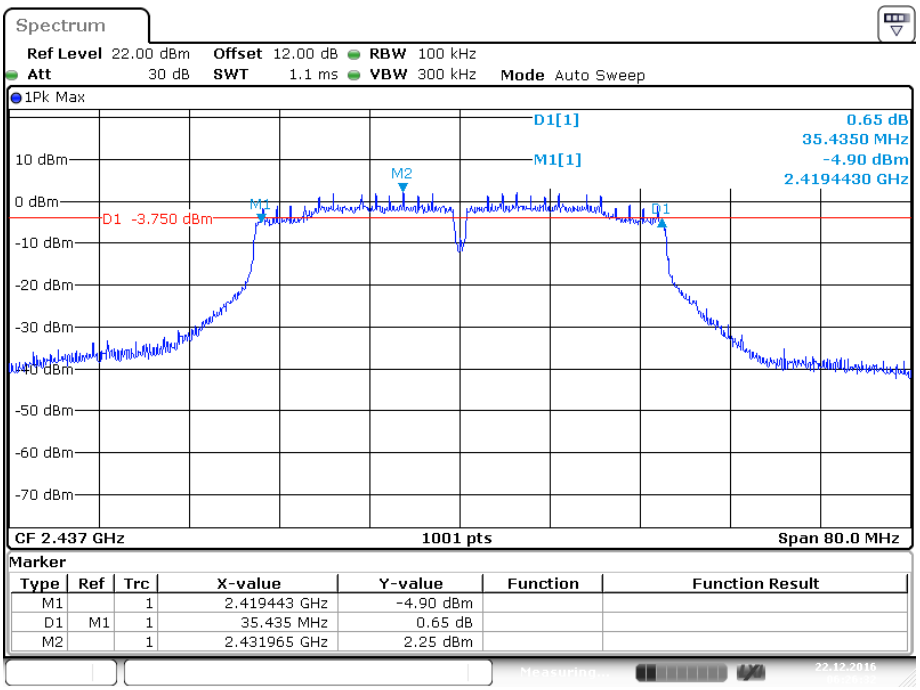
Date: 22.DEC.2016 06:30:56

Low Channel (N40 Mode / Chain 1)



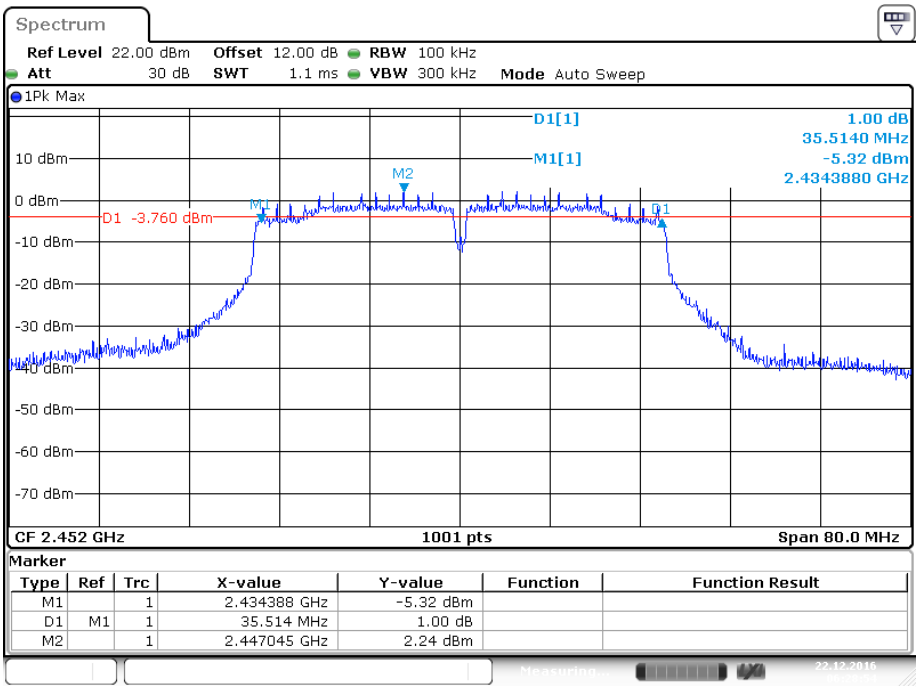
Date: 22.DEC.2016 06:17:32

Middle Channel (N40 Mode / Chain 1)



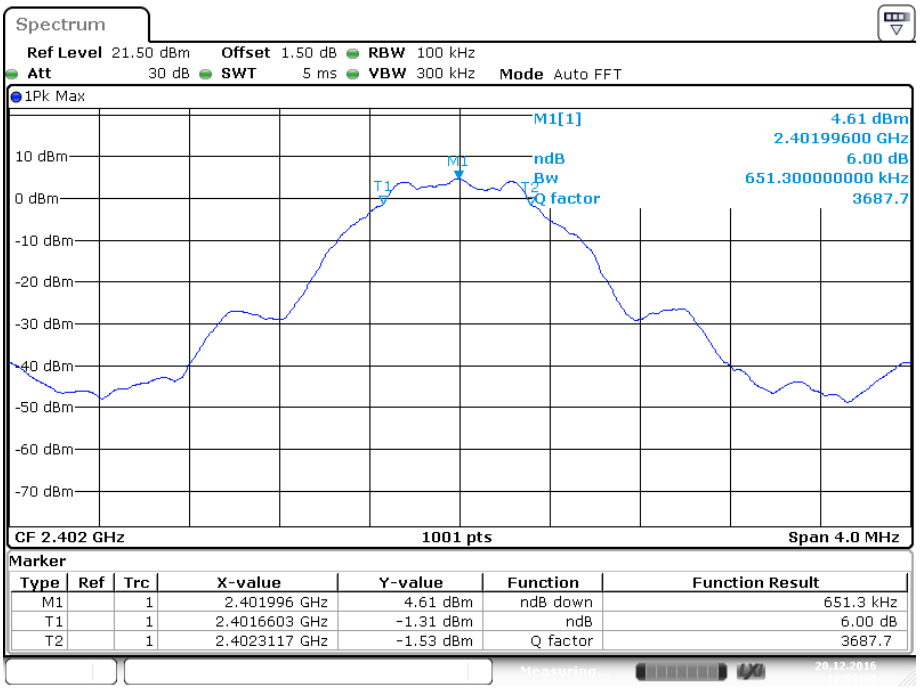
Date: 22.DEC.2016 06:26:32

High Channel (N40 Mode / Chain 1)



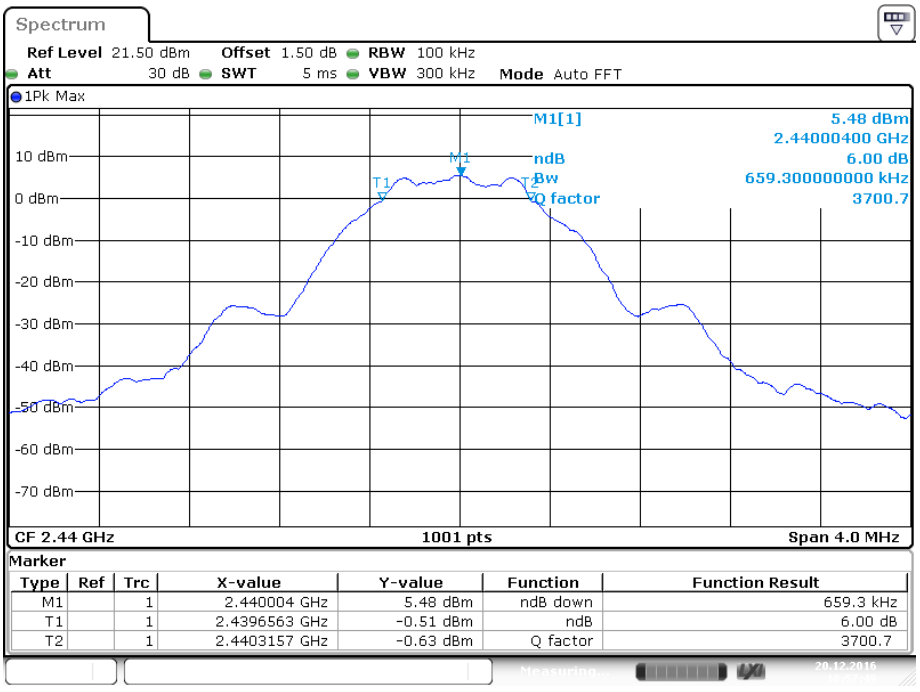
Date: 22.DEC.2016 06:28:54

Low Channel (BLE)



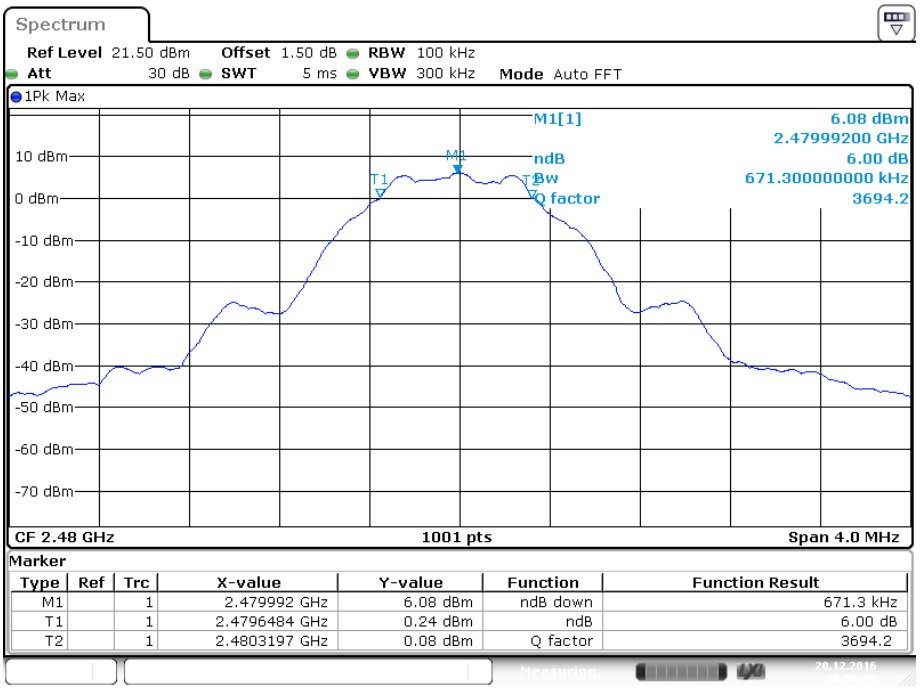
Date: 20.DEC.2016 18:59:29

Middle Channel (BLE)



Date: 20.DEC.2016 18:57:50

High Channel (BLE)



Date: 20.DEC.2016 18:56:31

9 FCC §15.247(b)(3)– Maximum Output Power

9.1 Applicable Standard

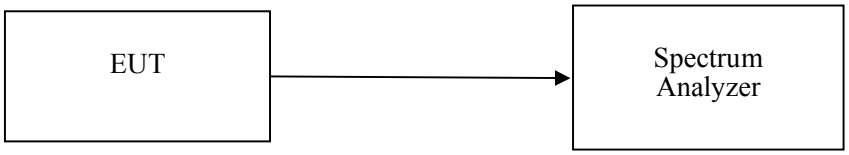
According to FCC §15.247(b)(3).

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. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

9.2 Test Procedure

Wifi according to ANSI C63.10-2013 chapter 11.9.1.2 & 11.9.2.2.2
BLE according to ANSI C63.10-2013 chapter 11.9.1.1

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to an EMI Test Receiver.
3. Add a correction factor to the display.



9.3 Test Equipment List and Details

Descriptions	Manufacturers	Models	Serial Numbers	Calibration Date	Calibration Due Date
Spectrum Analyzer	Rohde & Schwarz	FSV40	101203	2016/7/14	2017/7/13
Cable	WOKEN	SFL402	00100A1F6A192S	N.C.R	N.C.R

***Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Taiwan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

9.4 Test Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	55 %
ATM Pressure:	1010 hPa

The testing was performed by David Hsu on 2016-12-20 to 2016-12-22.

9.5 Test Results

SISO Mode

Channel	Frequency (MHz)	Conducted Peak Output Power (dBm)		Limit (dBm)	RESULT
		Chain 0	Chain 1		
B Mode					
Low	2412	17.42	17.25	30	PASS
Mid	2437	17.41	16.51	30	PASS
High	2462	17.35	17.01	30	PASS
G Mode					
Low	2412	18.37	18.60	30	PASS
Mid	2437	20.88	19.60	30	PASS
High	2462	16.83	16.75	30	PASS
N20 Mode					
Low	2412	18.21	18.79	30	PASS
Mid	2437	20.52	19.91	30	PASS
High	2462	16.83	16.88	30	PASS
N40 Mode					
Low	2422	18.39	18.69	30	PASS
Mid	2437	21.47	20.61	30	PASS
High	2452	17.61	16.14	30	PASS

Channel	Frequency (MHz)	Conducted Average Output Power (dBm)		Limit (dBm)	RESULT
		Chain 0	Chain 1		
B Mode					
Low	2412	15.35	15.18	30	PASS
Mid	2437	15.34	14.67	30	PASS
High	2462	15.14	14.69	30	PASS
G Mode					
Low	2412	15.48	15.71	30	PASS
Mid	2437	17.82	16.57	30	PASS
High	2462	14.02	13.83	30	PASS
N20 Mode					
Low	2412	15.41	15.90	30	PASS
Mid	2437	17.70	17.10	30	PASS
High	2462	13.94	13.88	30	PASS
N40 Mode					
Low	2422	15.56	15.94	30	PASS
Mid	2437	18.70	17.86	30	PASS
High	2452	14.69	13.37	30	PASS

MIMO Mode

Channel	Frequency (MHz)	Conducted Peak Output Power (dBm)			Limit (dBm)	RESULT
		Chain 0	Chain 1	Total		
N20 Mode						
Low	2412	16.55	16.54	19.56	30	PASS
Mid	2437	18.53	18.36	21.46	30	PASS
High	2462	15.68	16.56	19.15	30	PASS
N40 Mode						
Low	2422	15.01	15.96	18.52	30	PASS
Mid	2437	18.32	18.62	21.48	30	PASS
High	2452	15.03	16.06	18.59	30	PASS
Channel	Frequency (MHz)	Conducted Average Output Power (dBm)			Limit (dBm)	RESULT
		Chain 0	Chain 1	Total		
N20 Mode						
Low	2412	13.55	13.75	16.66	30	PASS
Mid	2437	15.41	15.53	18.48	30	PASS
High	2462	13.02	13.88	16.48	30	PASS
N40 Mode						
Low	2422	12.27	13.24	15.79	30	PASS
Mid	2437	14.94	15.57	18.28	30	PASS
High	2452	12.22	13.40	15.86	30	PASS

The device is a client device. the 2 antenna maximum antenna gain are 4.2dBi, and employed Cyclic Delay

Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power measurements on the devices:

Array Gain = 0 dB for NANT ≤4;.

So:

Directional gain = GANT + Array Gain = 4.2+0 =4.2 dBi ＜6 dBi

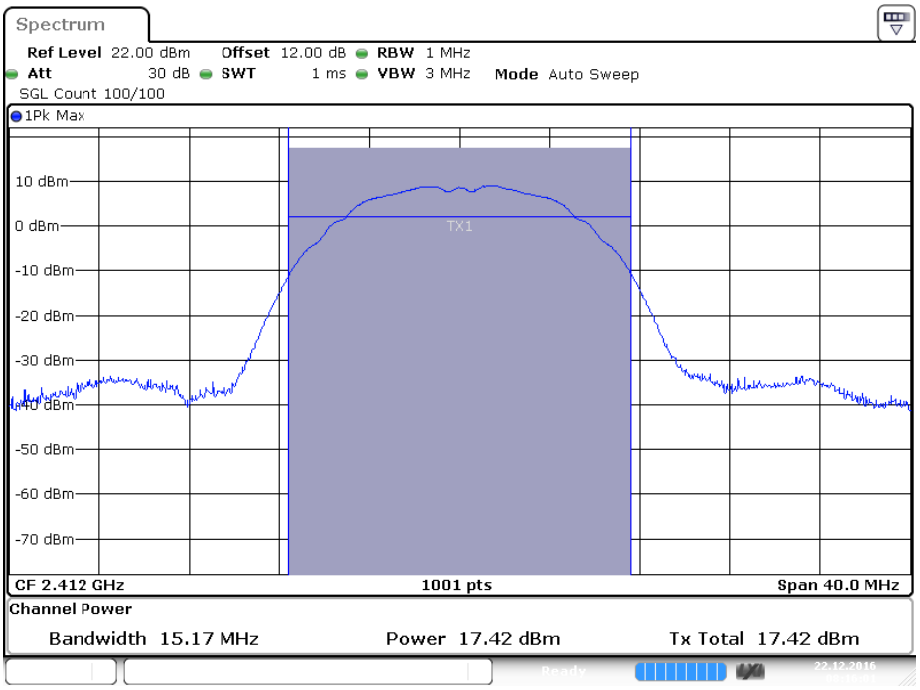
BLE

Channel	Frequency (MHz)	Conducted Output Power (dBm)	Conducted Output Power (W)	Limit (dBm)	Result
Low	2402	4.63	0.00290	30	Compliance
Middle	2440	5.57	0.00361	30	Compliance
High	2480	6.11	0.00408	30	Compliance

Please refer to the following plots

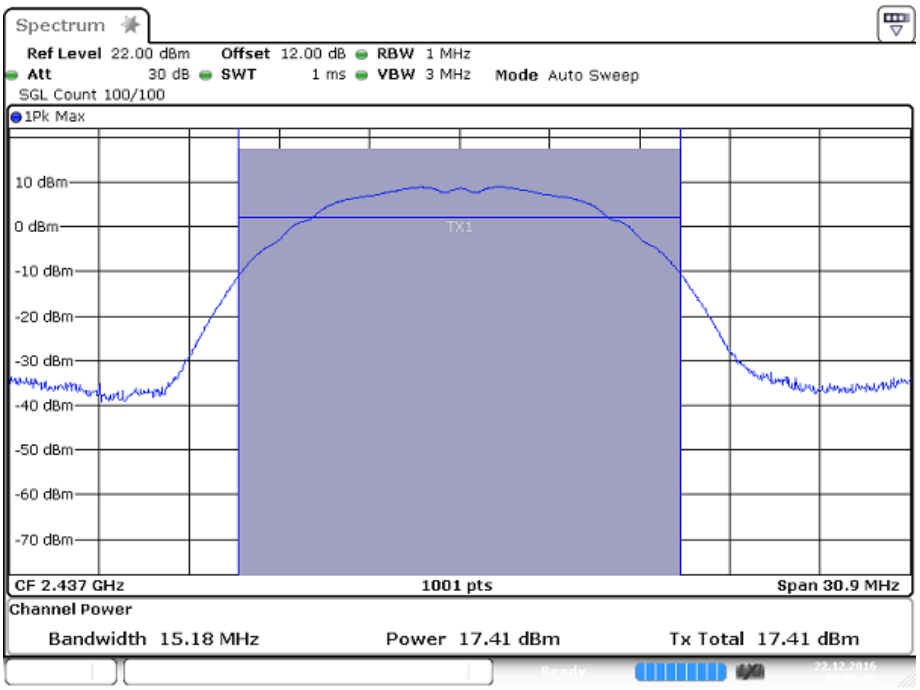
Conducted Peak Output Power

Low Channel (B-SISO Mode / Chain 0)



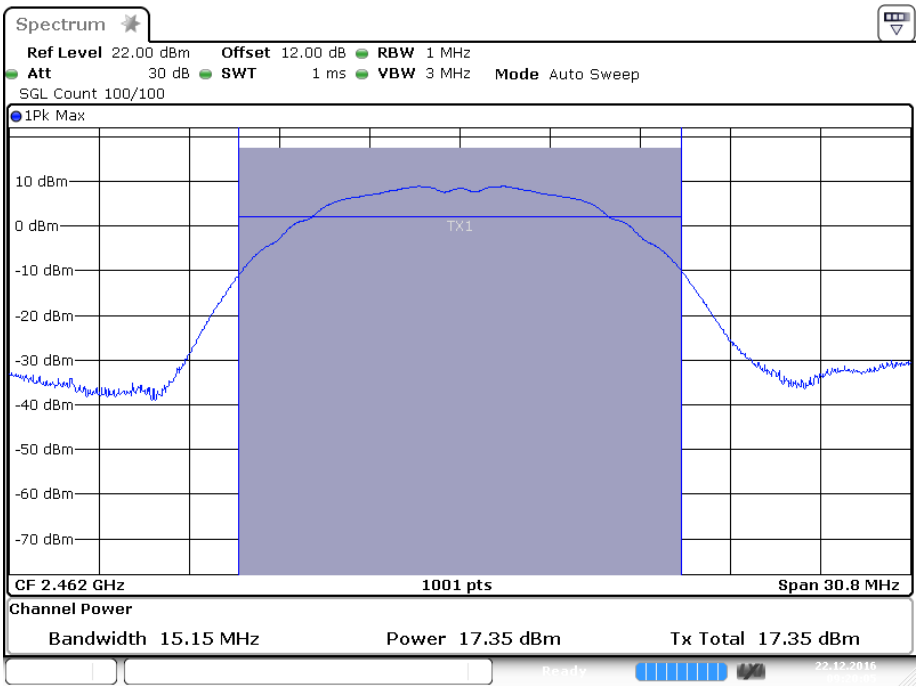
Date: 22.DEC.2016 08:16:01

Middle Channel (B-SISO Mode / Chain 0)



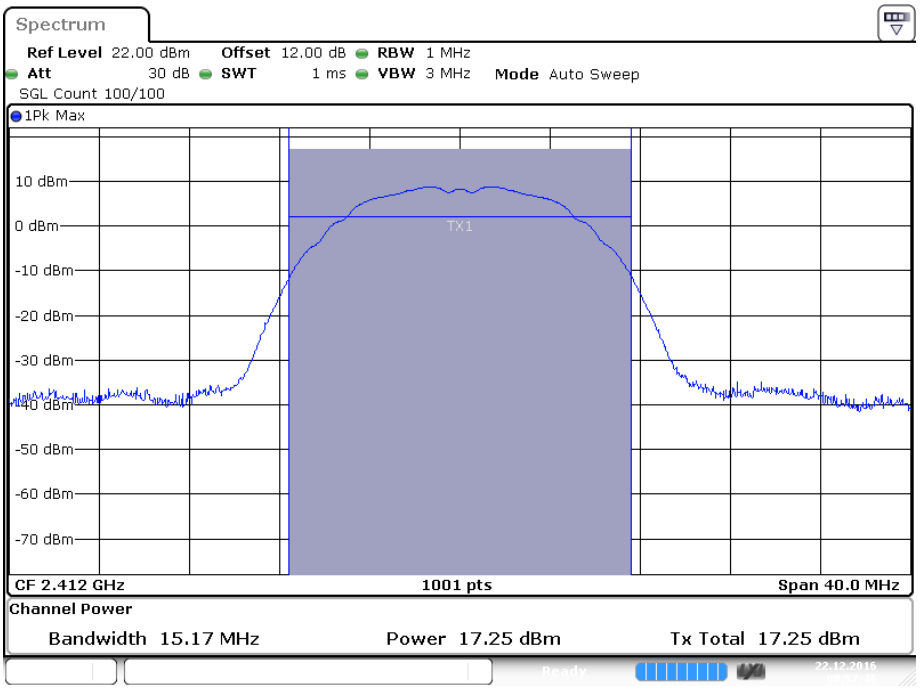
Date: 22.DEC.2016 09:09:10

High Channel (B-SISO Mode / Chain 0)



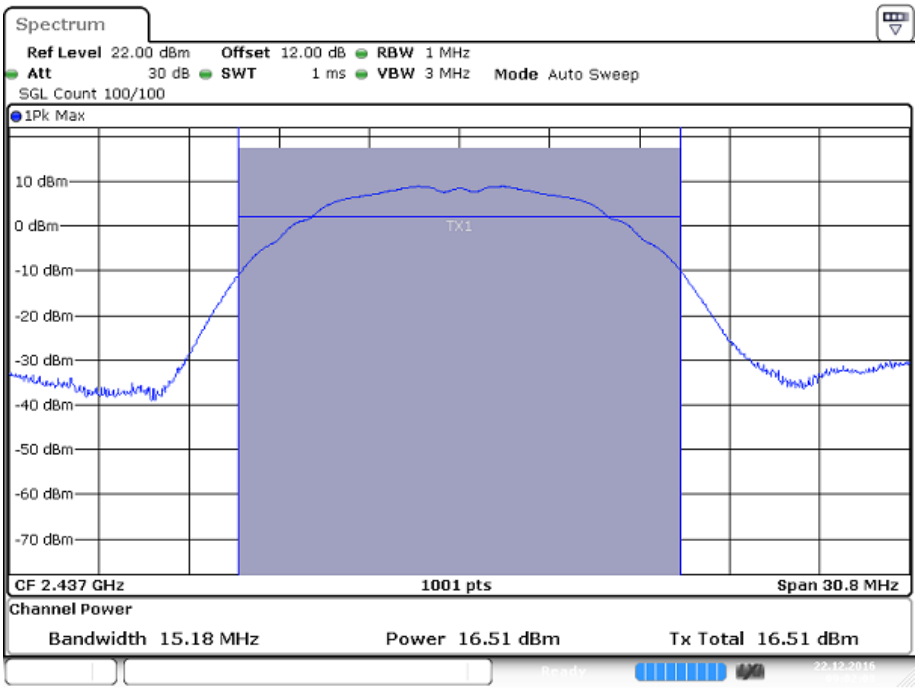
Date: 22.DEC.2016 09:20:05

Low Channel (B-SISO Mode / Chain 1)



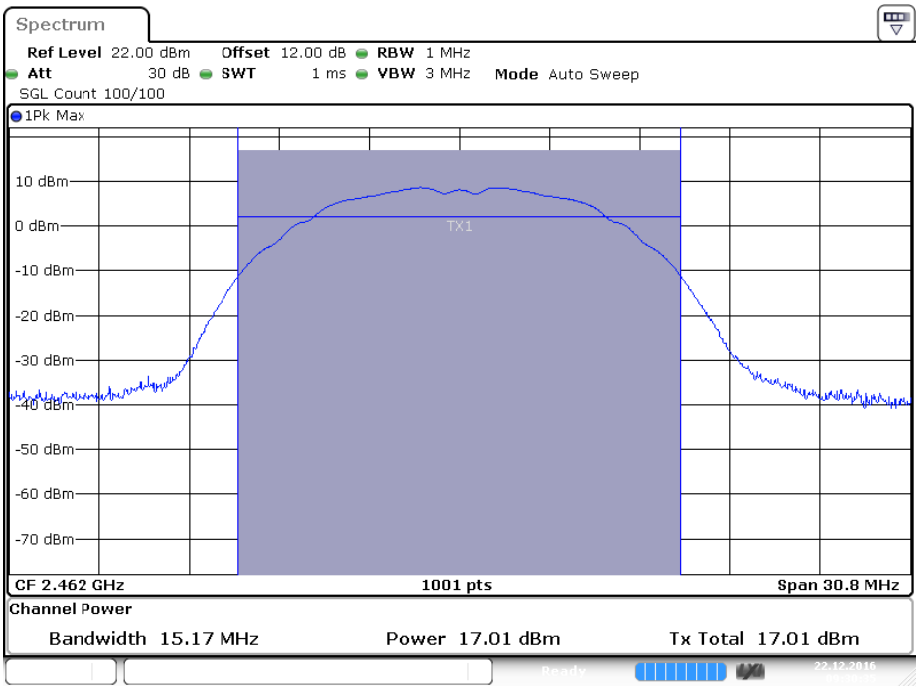
Date: 22.DEC.2016 08:57:47

Middle Channel (B-SISO Mode / Chain 1)



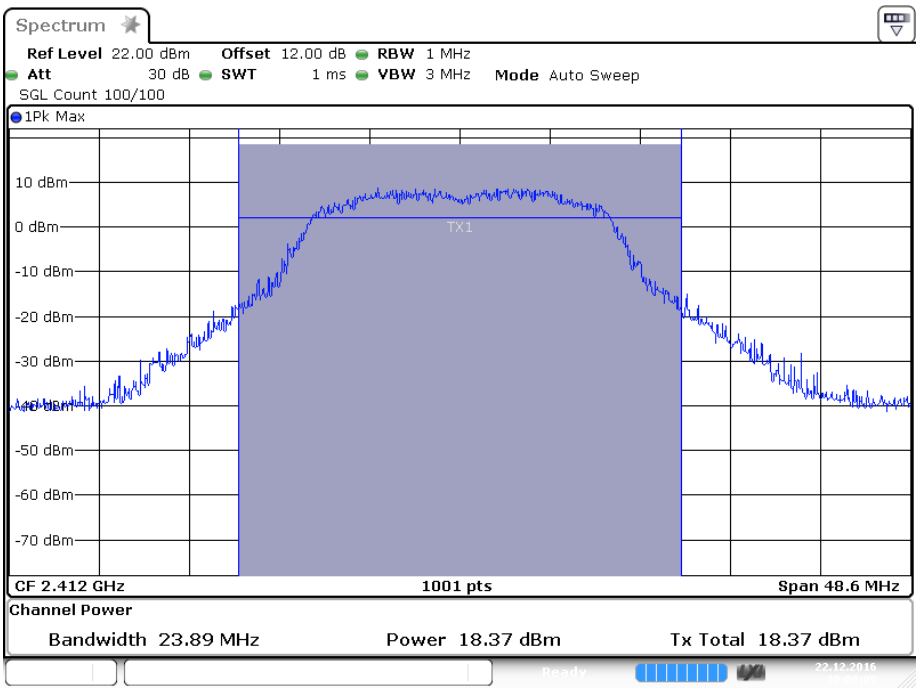
Date: 22.DEC.2016 09:02:08

High Channel (B-SISO Mode / Chain 1)



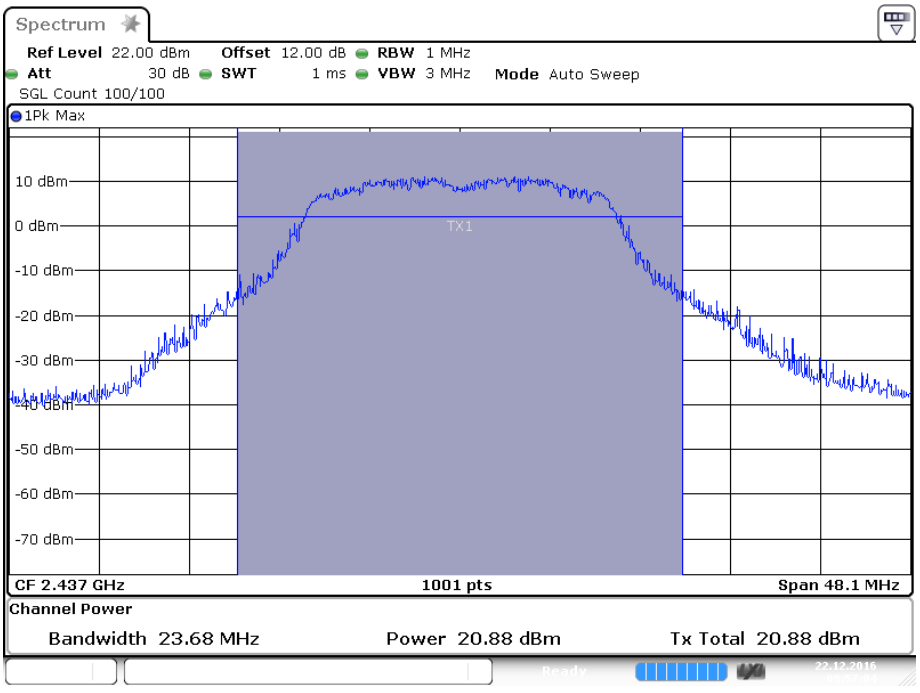
Date: 22.DEC.2016 09:30:35

Low Channel (G-SISO Mode / Chain 0)



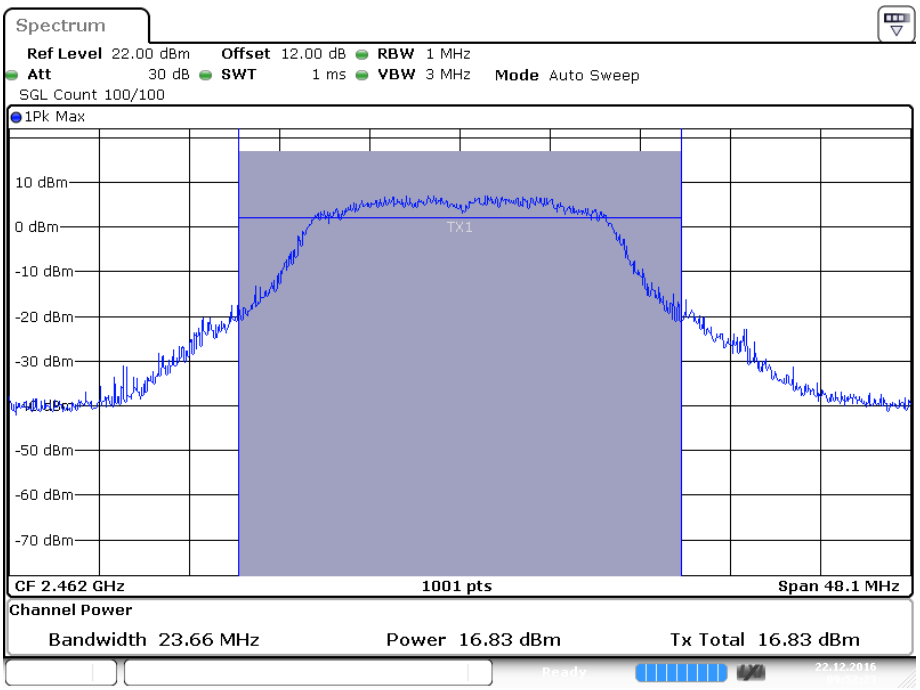
Date: 22.DEC.2016 10:00:06

Middle Channel (G-SISO Mode / Chain 0)



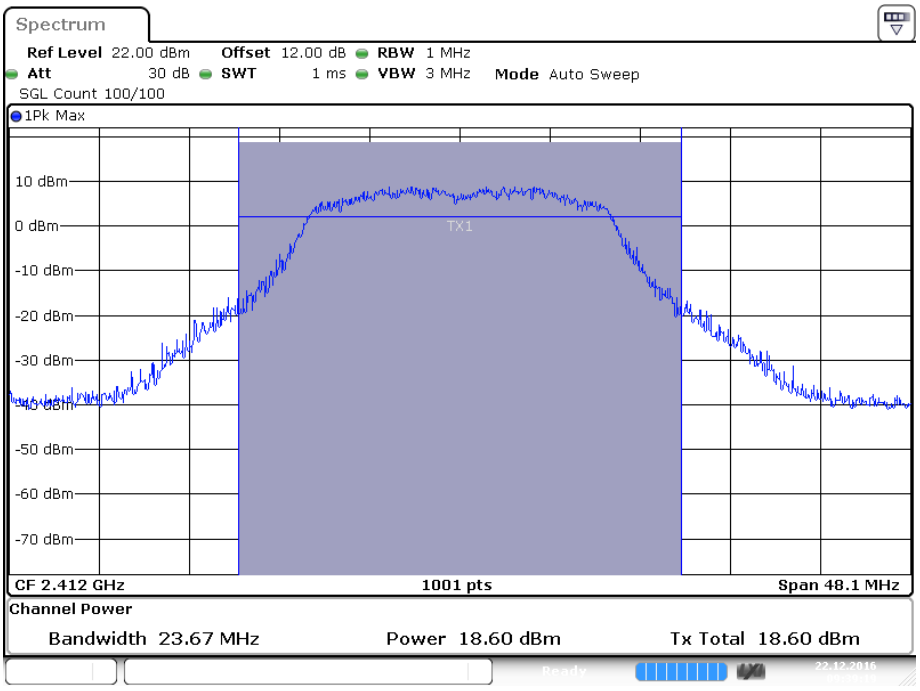
Date: 22.DEC.2016 09:57:03

High Channel (G-SISO Mode / Chain 0)



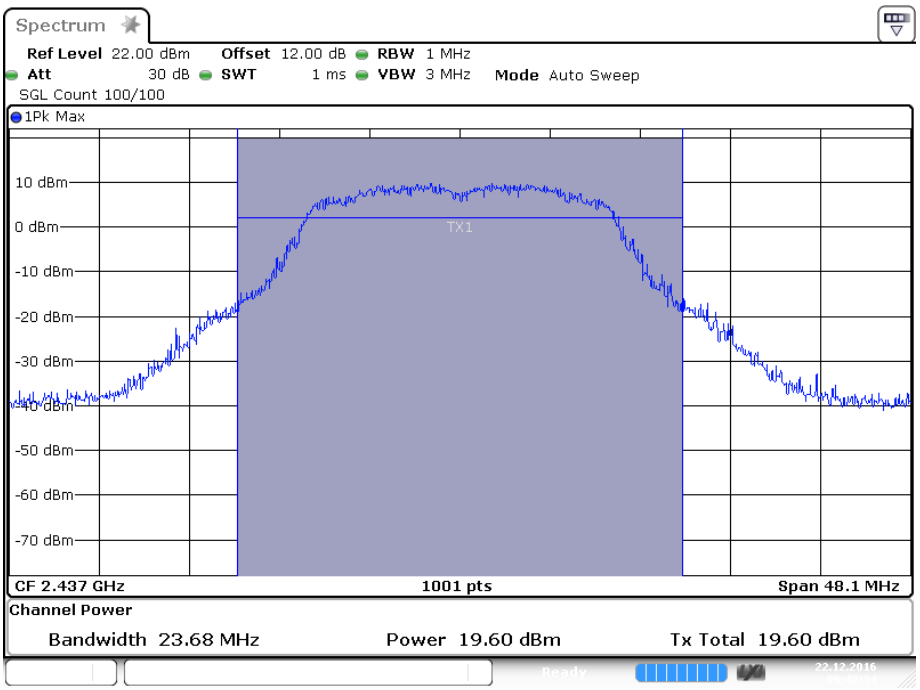
Date: 22.DEC.2016 09:52:23

Low Channel (G-SISO Mode / Chain 1)



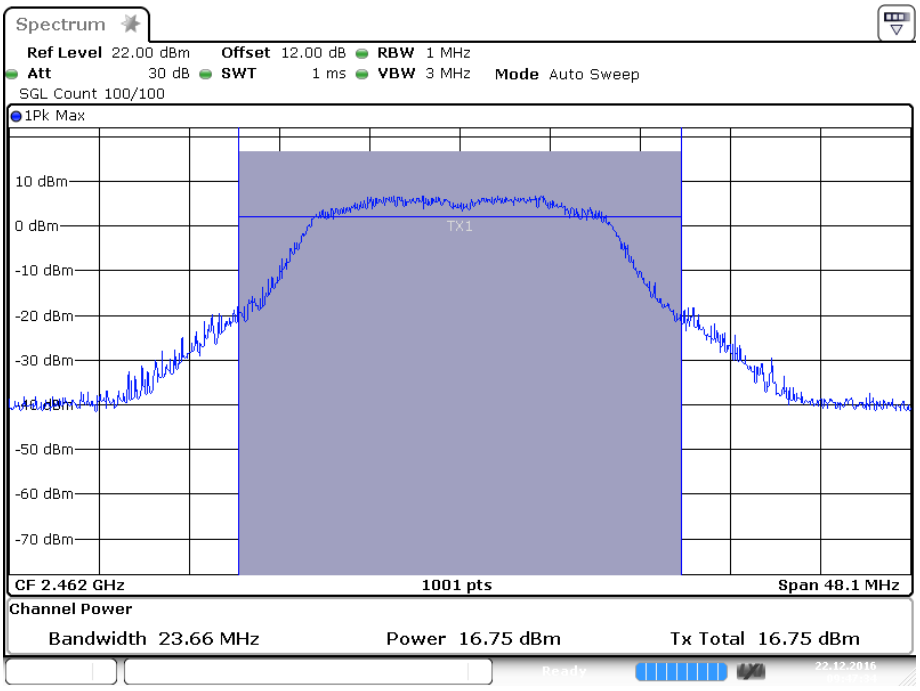
Date: 22.DEC.2016 09:39:20

Middle Channel (G-SISO Mode / Chain 1)



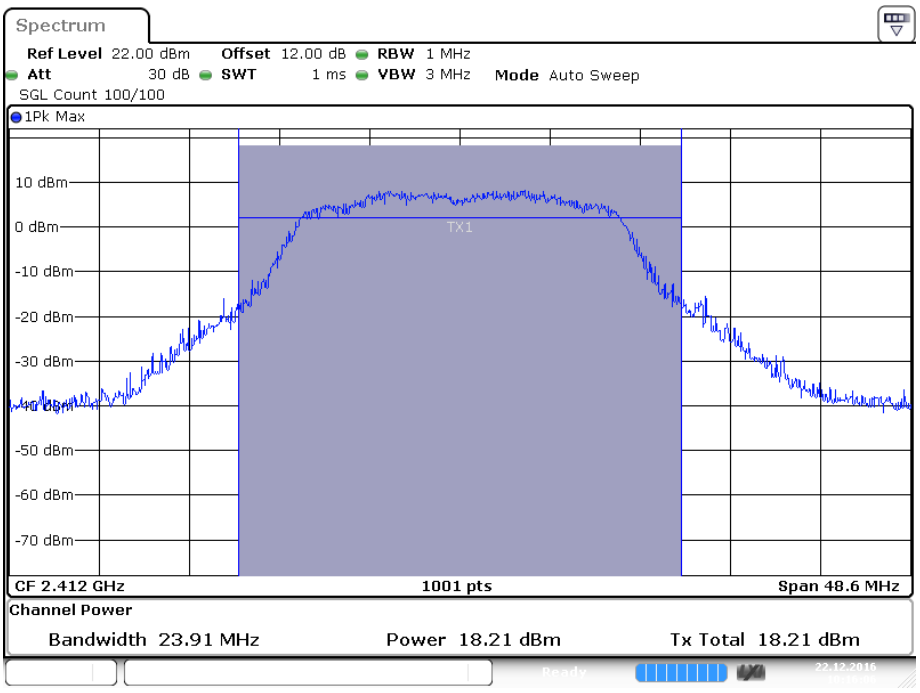
Date: 22.DEC.2016 09:42:35

High Channel (G-SISO Mode / Chain 1)



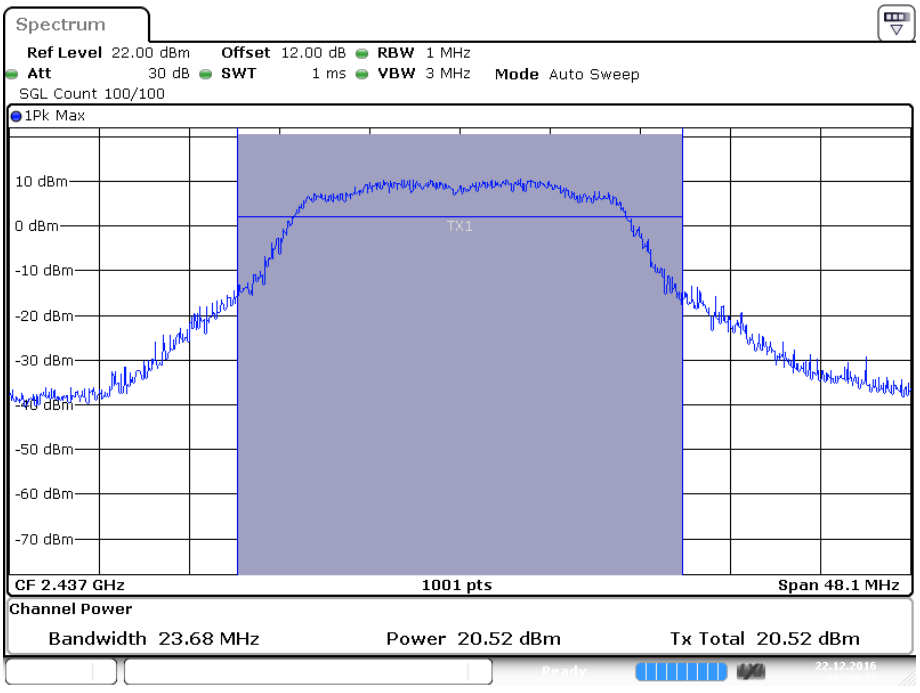
Date: 22.DEC.2016 09:47:34

Low Channel (N20-SISO Mode / Chain 0)



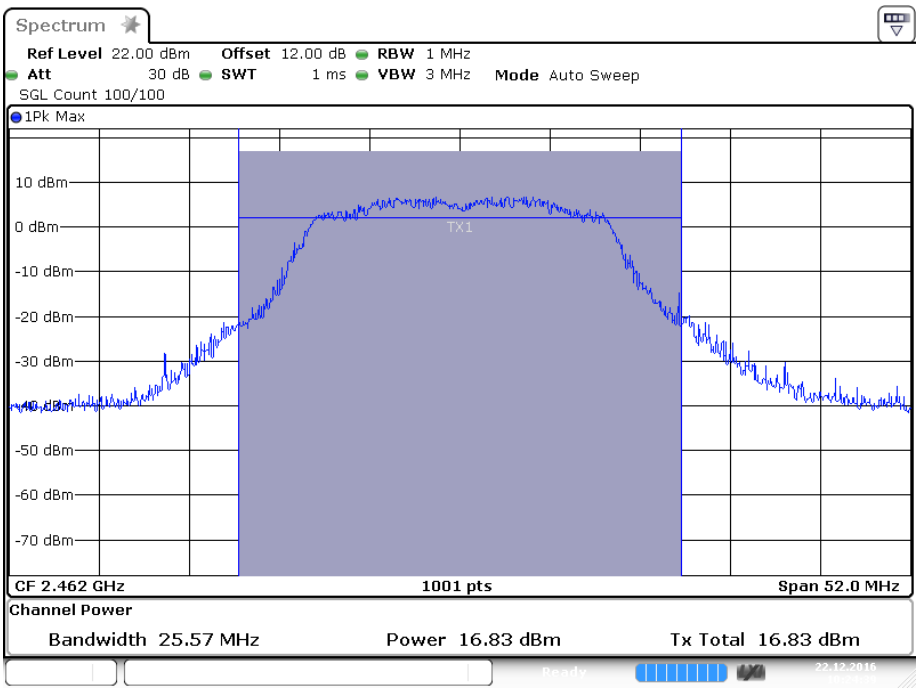
Date: 22.DEC.2016 10:16:07

Middle Channel (N20-SISO Mode / Chain 0)



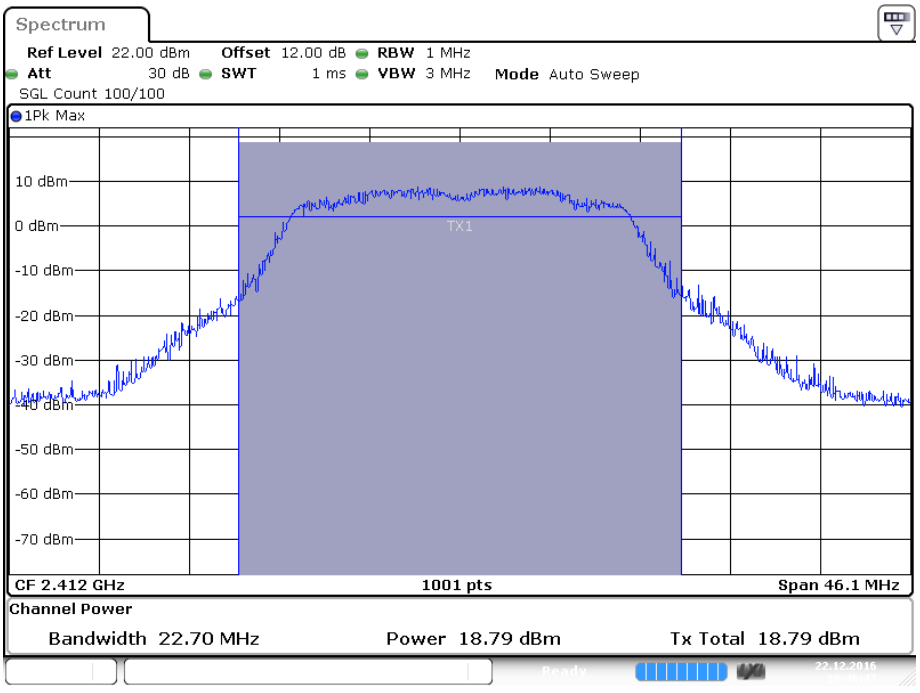
Date: 22.DEC.2016 10:20:32

High Channel (N20-SISO Mode / Chain 0)



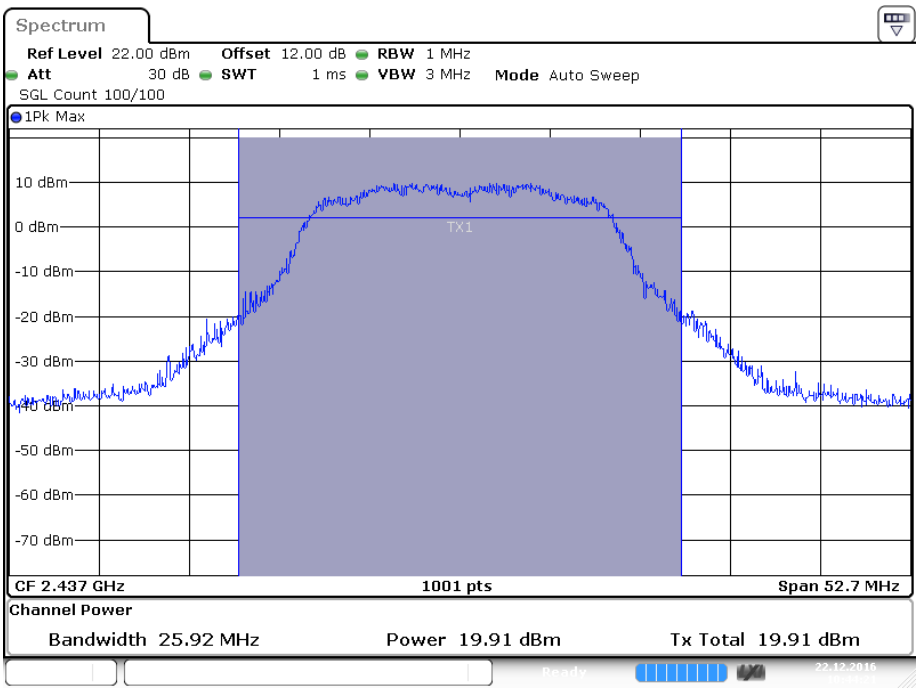
Date: 22.DEC.2016 10:24:40

Low Channel (N20-SISO Mode / Chain 1)



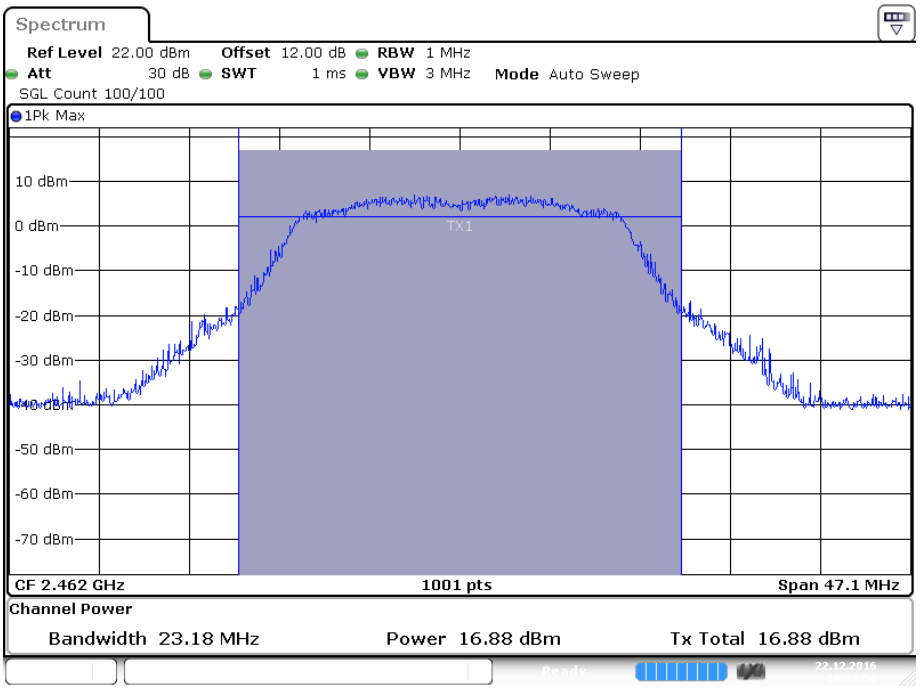
Date: 22.DEC.2016 10:46:47

Middle Channel (N20-SISO Mode / Chain 1)



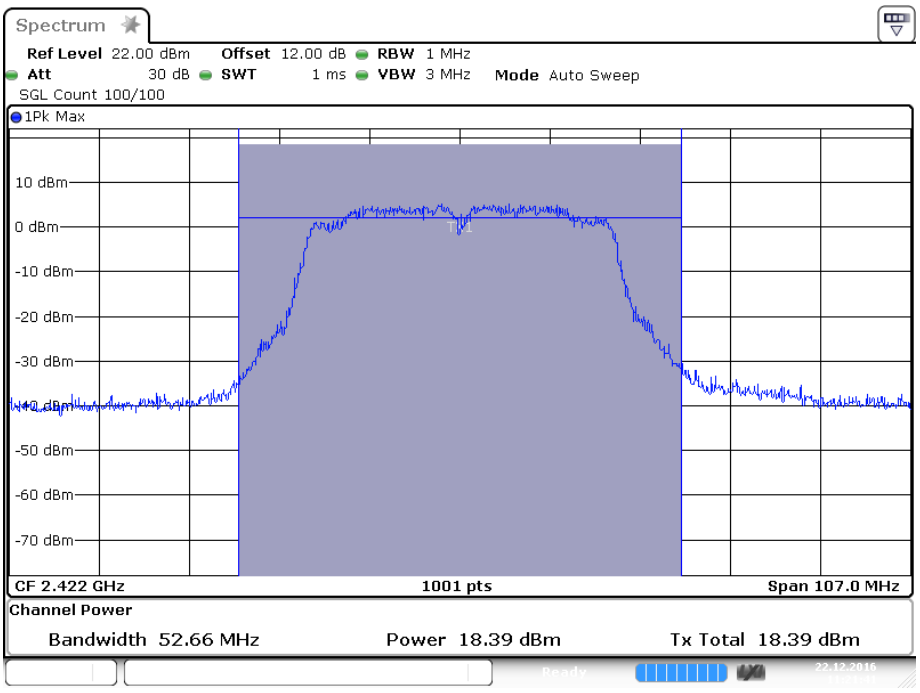
Date: 22.DEC.2016 10:44:21

High Channel (N20-SISO Mode / Chain 1)



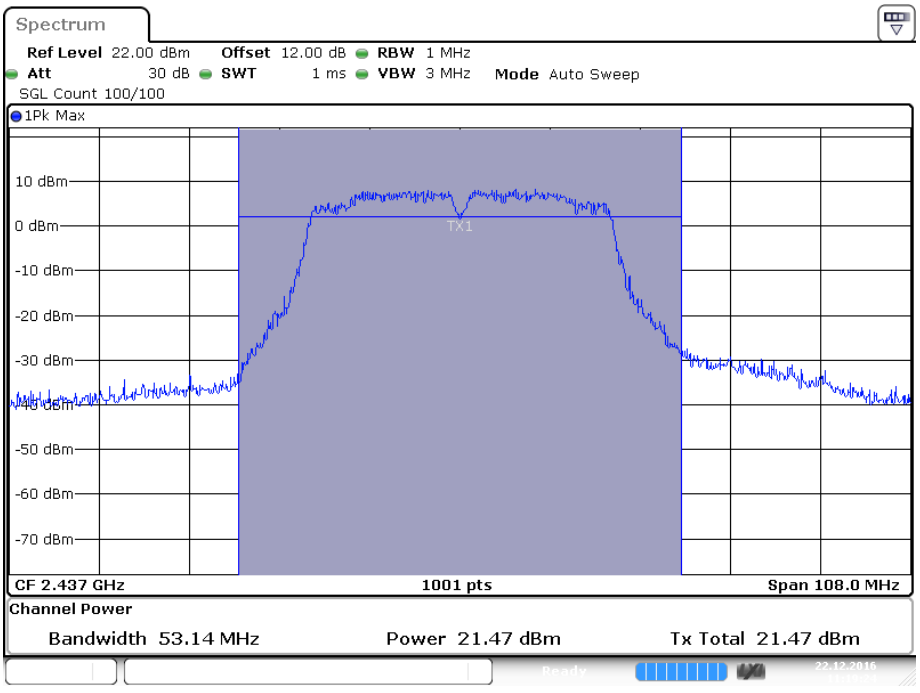
Date: 22.DEC.2016 10:38:56

Low Channel (N40-SISO Mode / Chain 0)



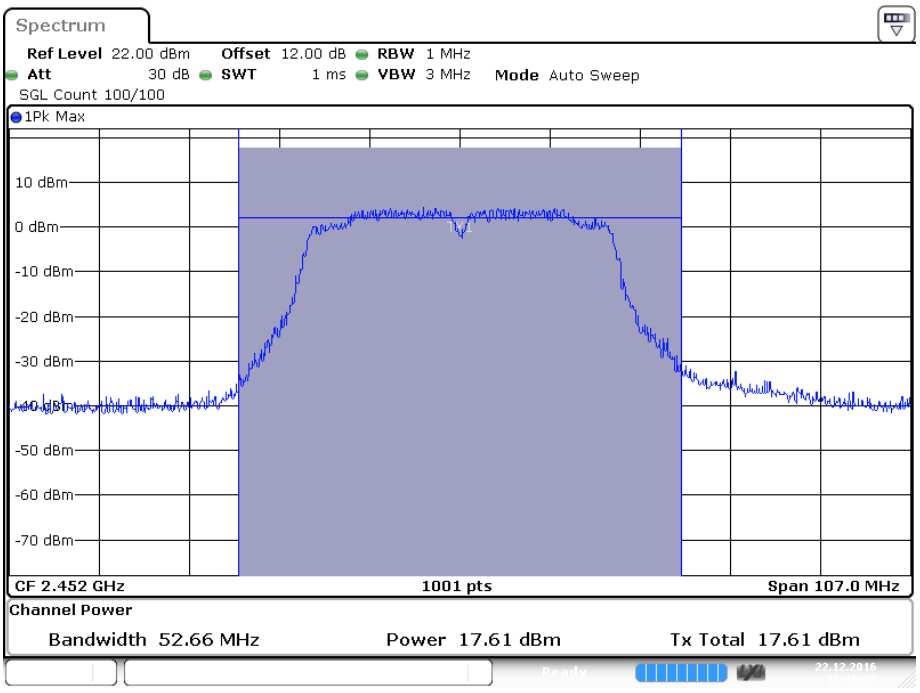
Date: 22.DEC.2016 11:21:41

Middle Channel (N40-SISO Mode / Chain 0)



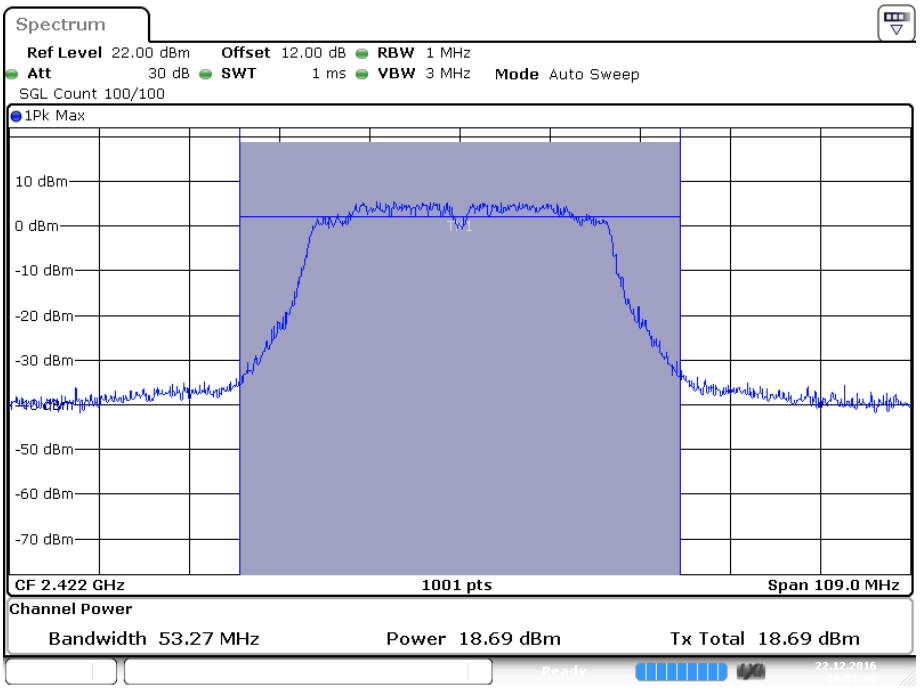
Date: 22.DEC.2016 11:19:24

High Channel (N40-SISO Mode / Chain 0)



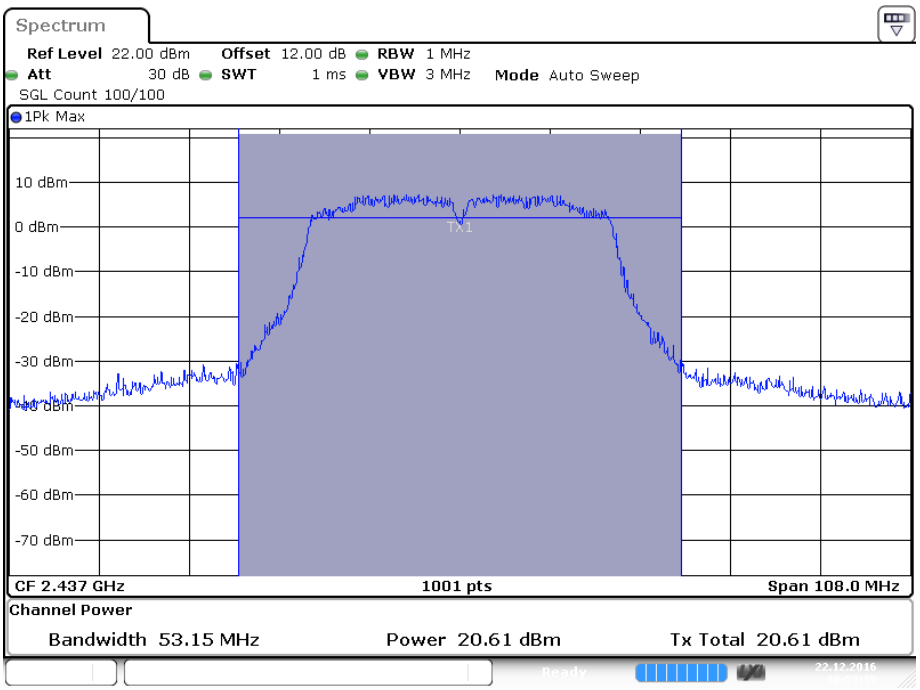
Date: 22.DEC.2016 11:16:22

Low Channel (N40-SISO Mode / Chain 1)



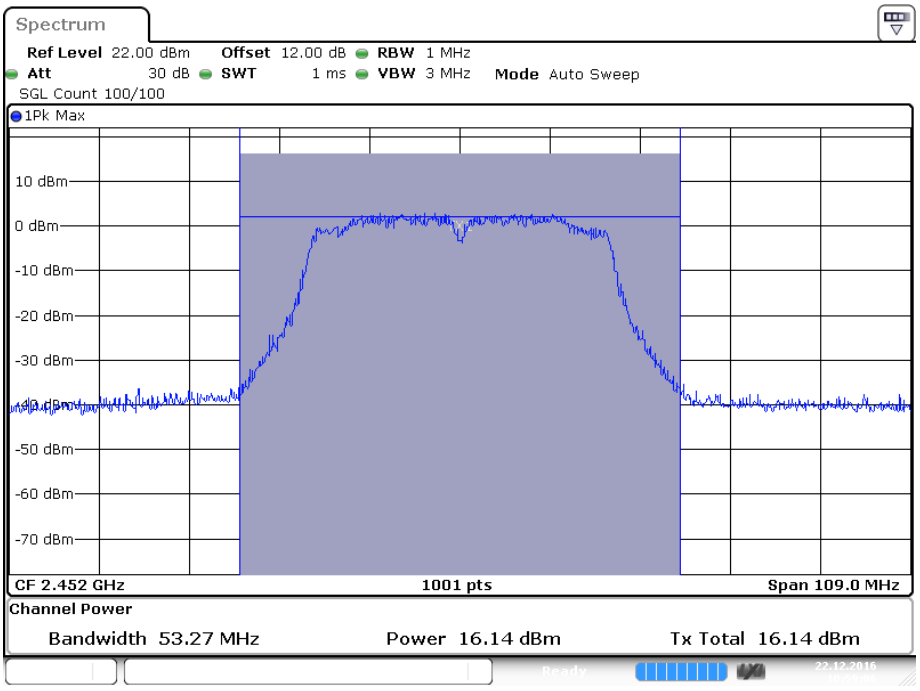
Date: 22.DEC.2016 10:51:09

Middle Channel (N40-SISO Mode / Chain 1)



Date: 22.DEC.2016 10:53:36

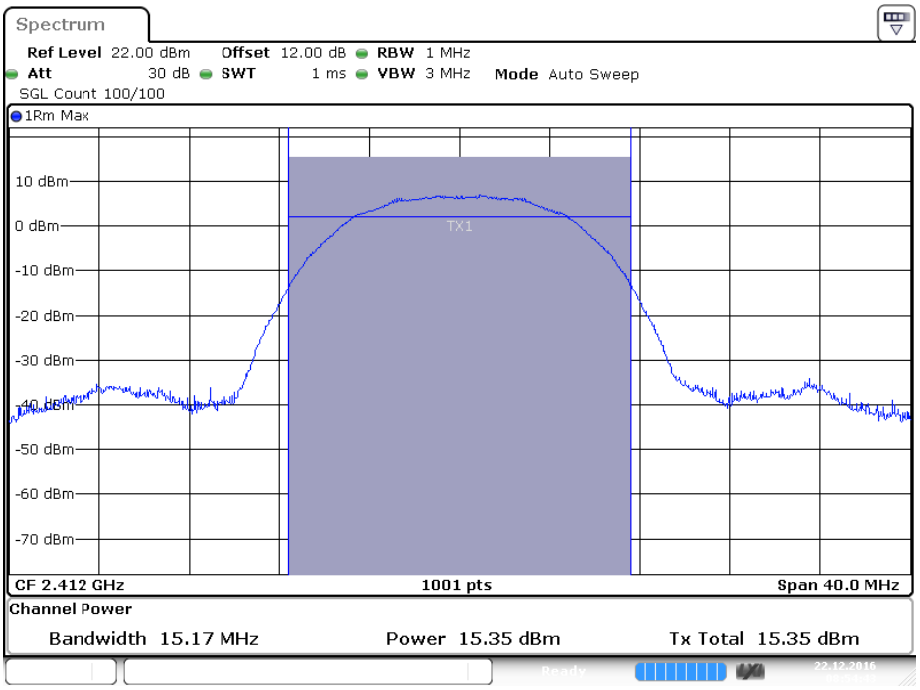
High Channel (N40-SISO Mode / Chain 1)



Date: 22.DEC.2016 10:59:06

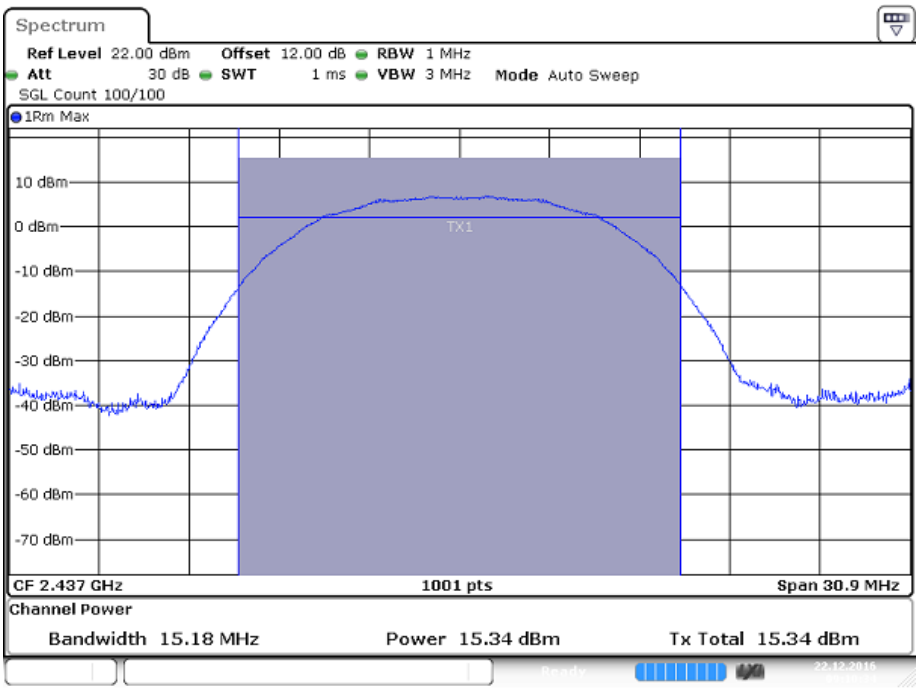
Conducted Average Output Power

Low Channel (B-SISO Mode / Chain 0)



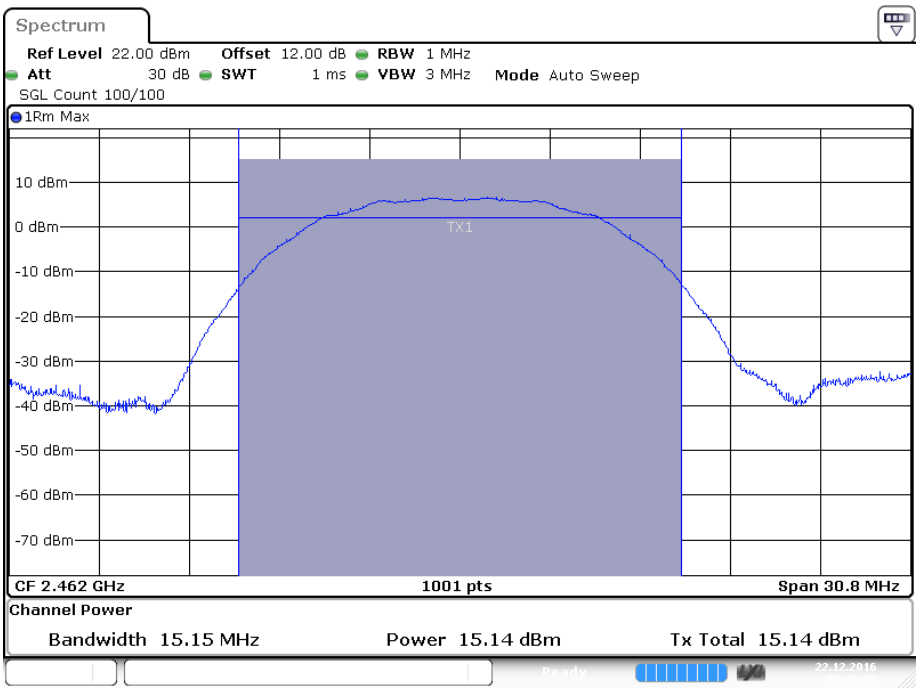
Date: 22.DEC.2016 08:54:43

Middle Channel (B-SISO Mode / Chain 0)



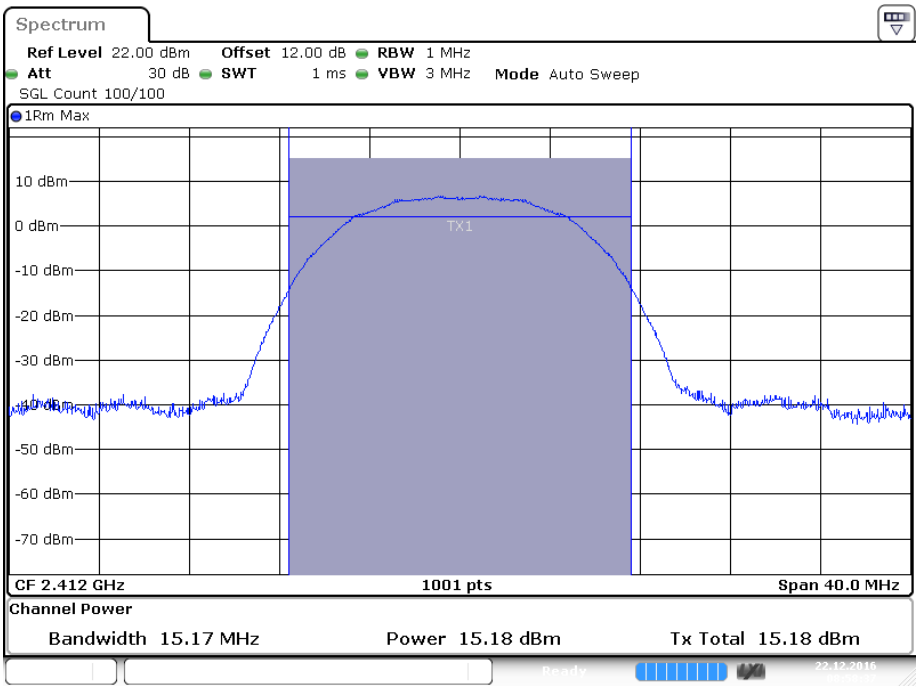
Date: 22.DEC.2016 09:10:34

High Channel (B-SISO Mode / Chain 0)



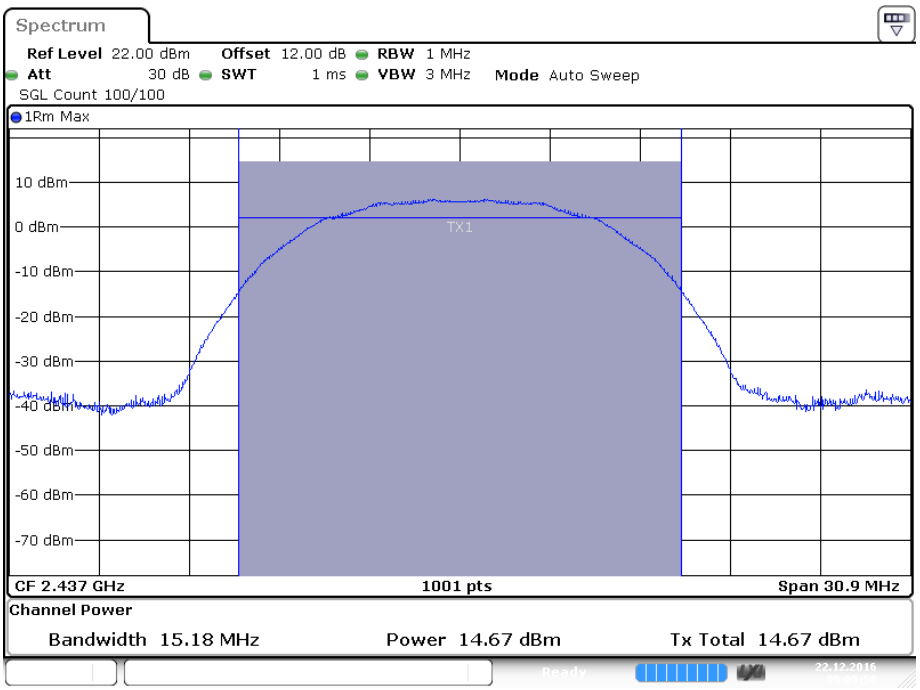
Date: 22.DEC.2016 09:20:34

Low Channel (B-SISO Mode / Chain 1)



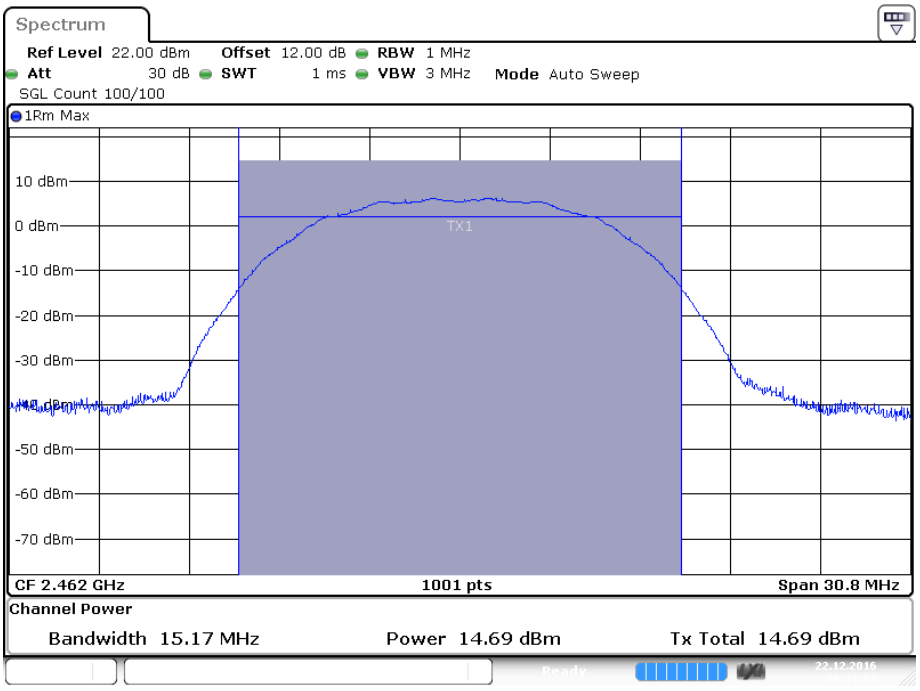
Date: 22.DEC.2016 08:58:37

Middle Channel (B-SISO Mode / Chain 1)



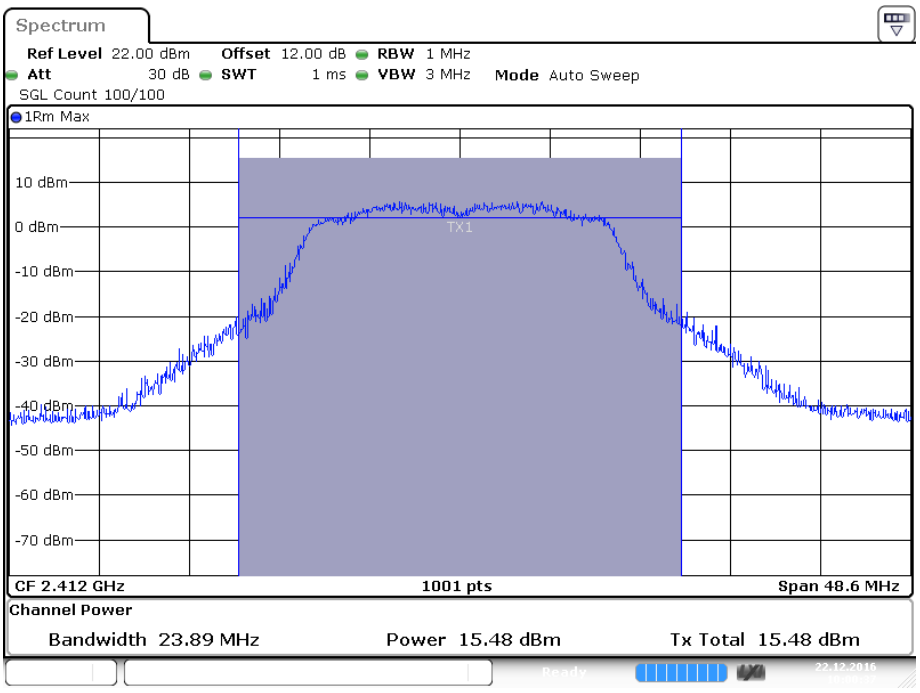
Date: 22.DEC.2016 09:05:59

High Channel (B-SISO Mode / Chain 1)



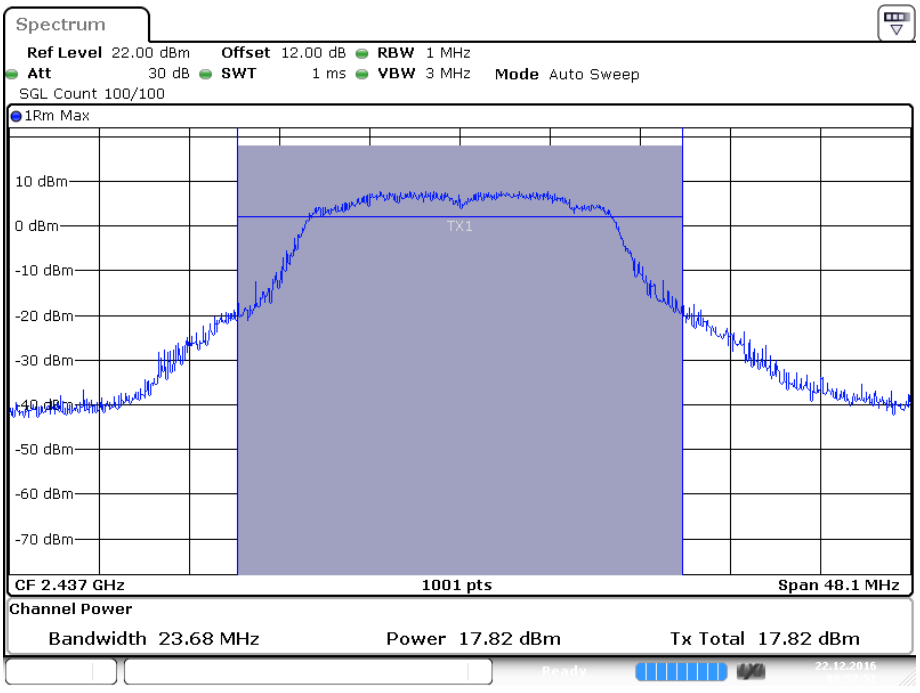
Date: 22.DEC.2016 09:31:08

Low Channel (G-SISO Mode / Chain 0)



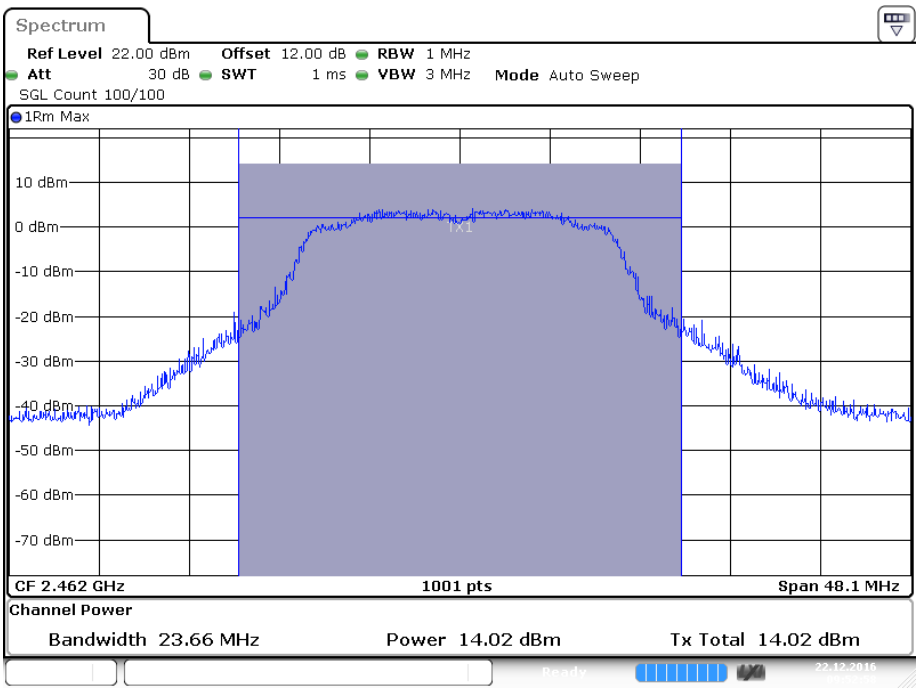
Date: 22.DEC.2016 10:00:38

Middle Channel (G-SISO Mode / Chain 0)



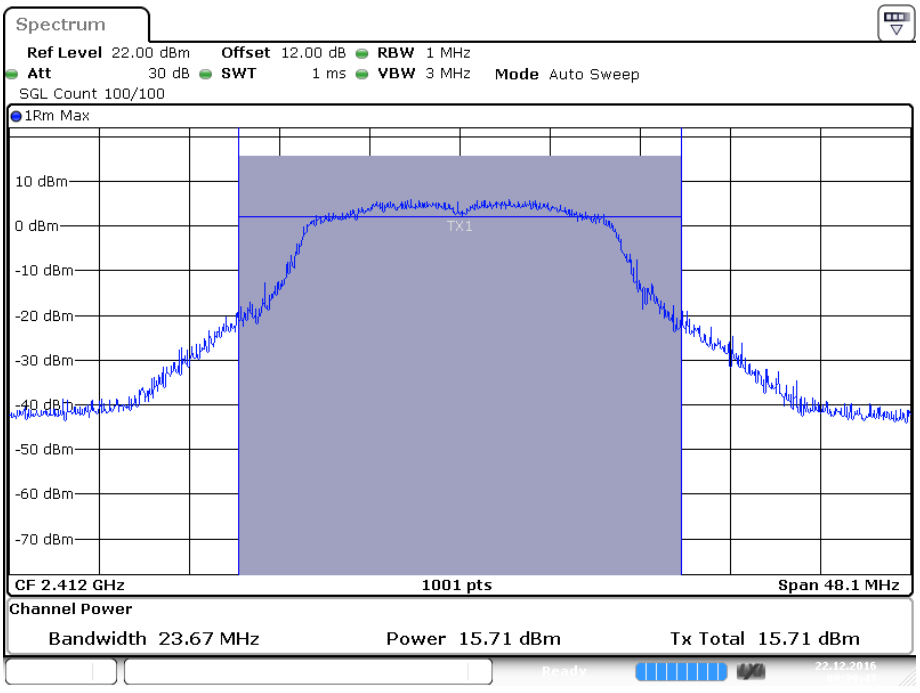
Date: 22.DEC.2016 09:57:52

High Channel (G-SISO Mode / Chain 0)



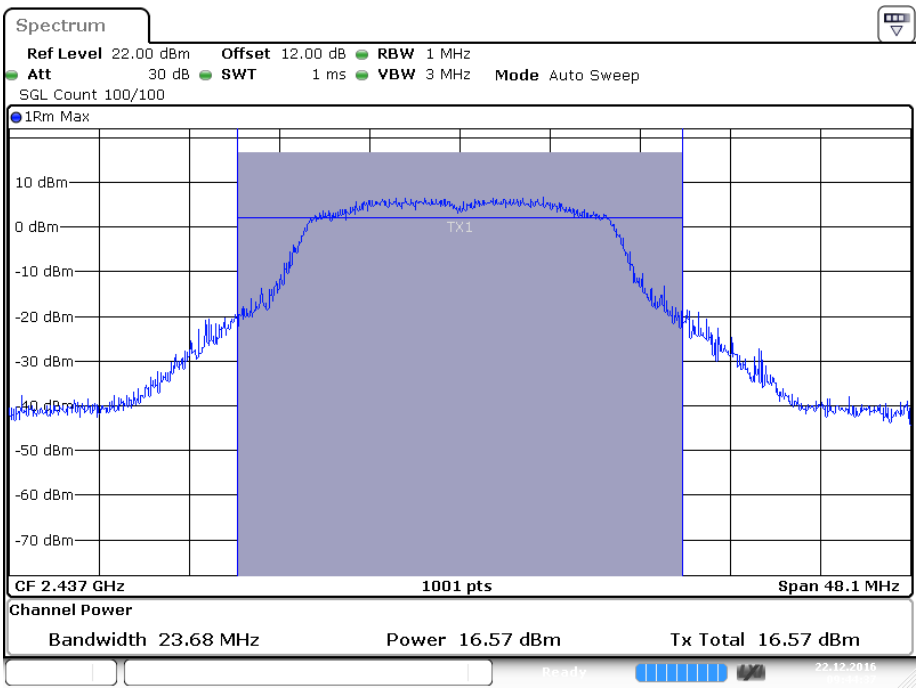
Date: 22.DEC.2016 09:52:59

Low Channel (G-SISO Mode / Chain 1)



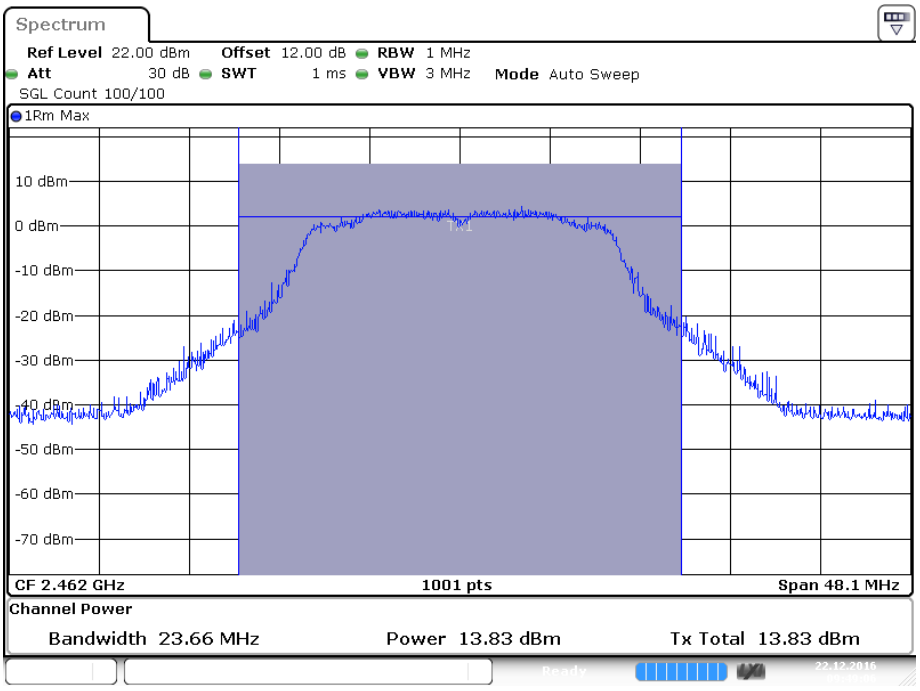
Date: 22.DEC.2016 09:39:48

Middle Channel (G-SISO Mode / Chain 1)



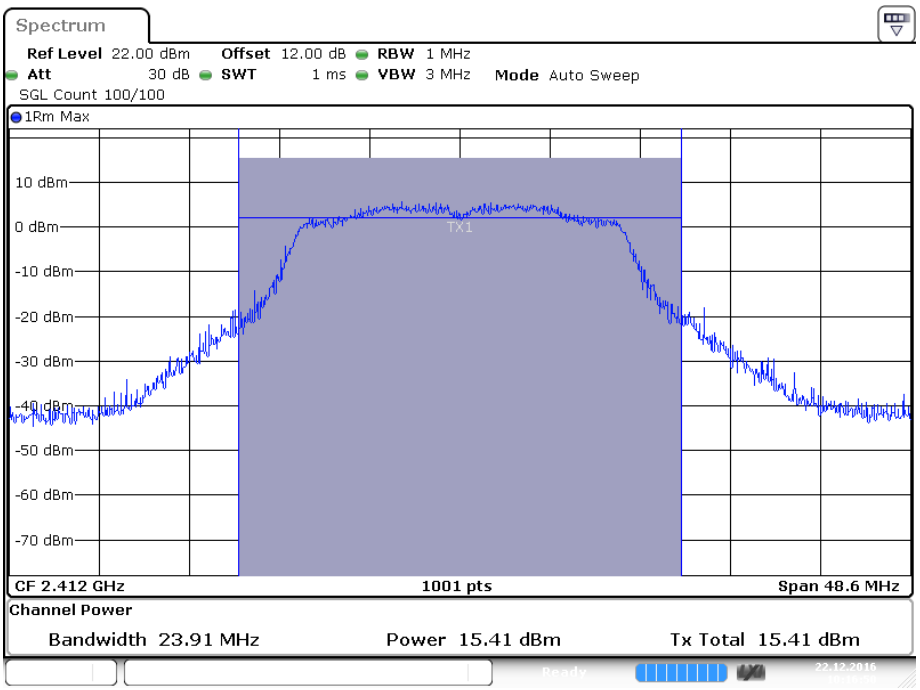
Date: 22.DEC.2016 09:44:38

High Channel (G-SISO Mode / Chain 1)



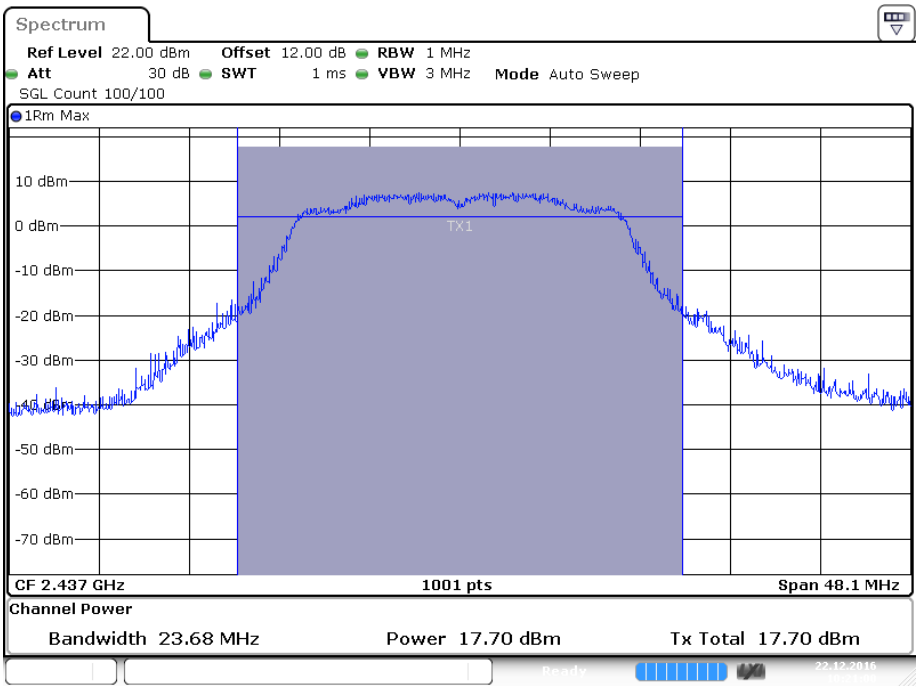
Date: 22.DEC.2016 09:49:06

Low Channel (N20-SISO Mode / Chain 0)



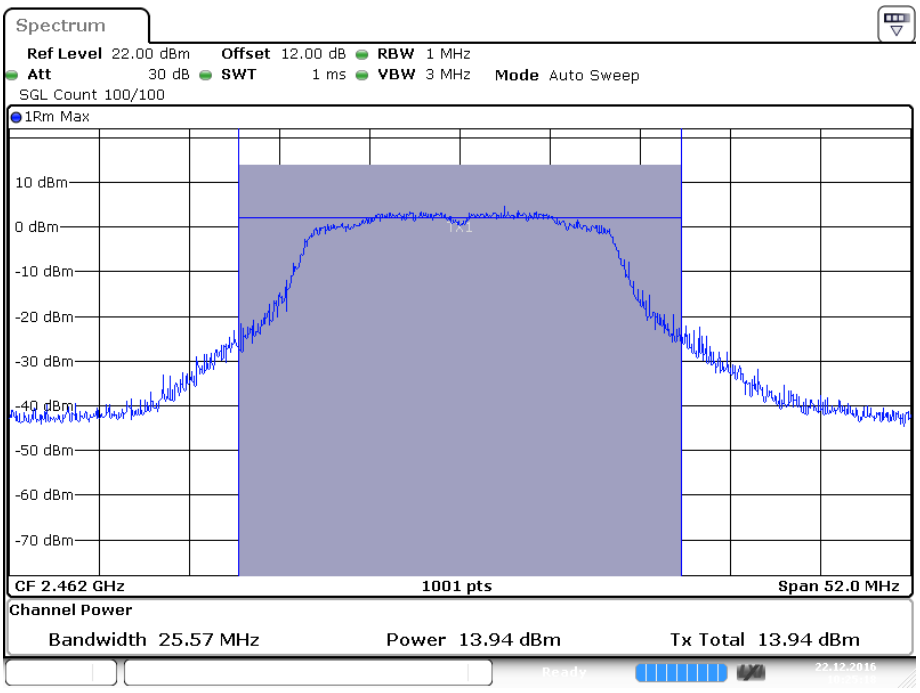
Date: 22.DEC.2016 10:16:50

Middle Channel (N20-SISO Mode / Chain 0)



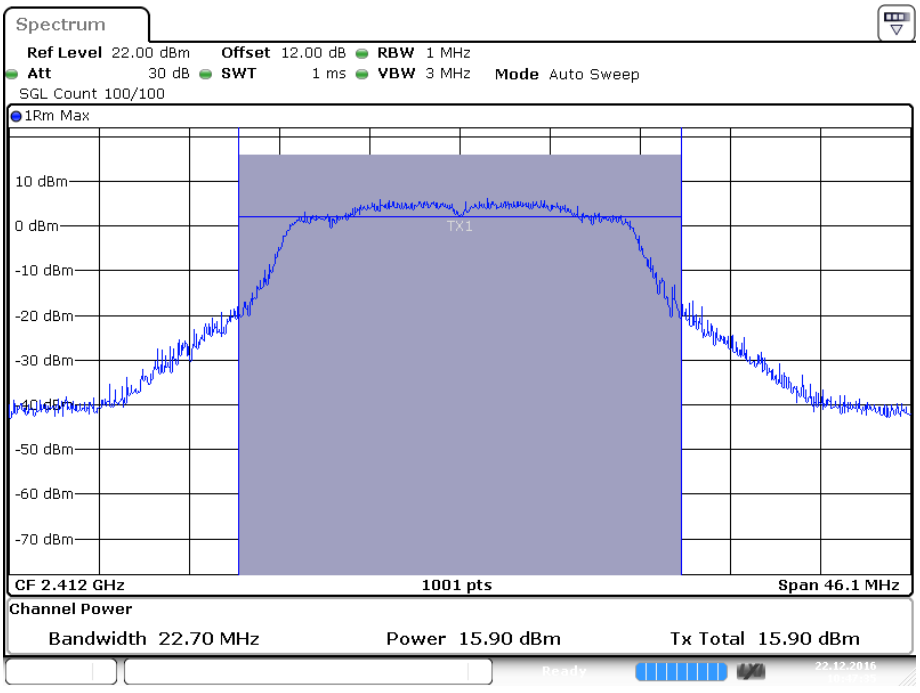
Date: 22.DEC.2016 10:21:00

High Channel (N20-SISO Mode / Chain 0)



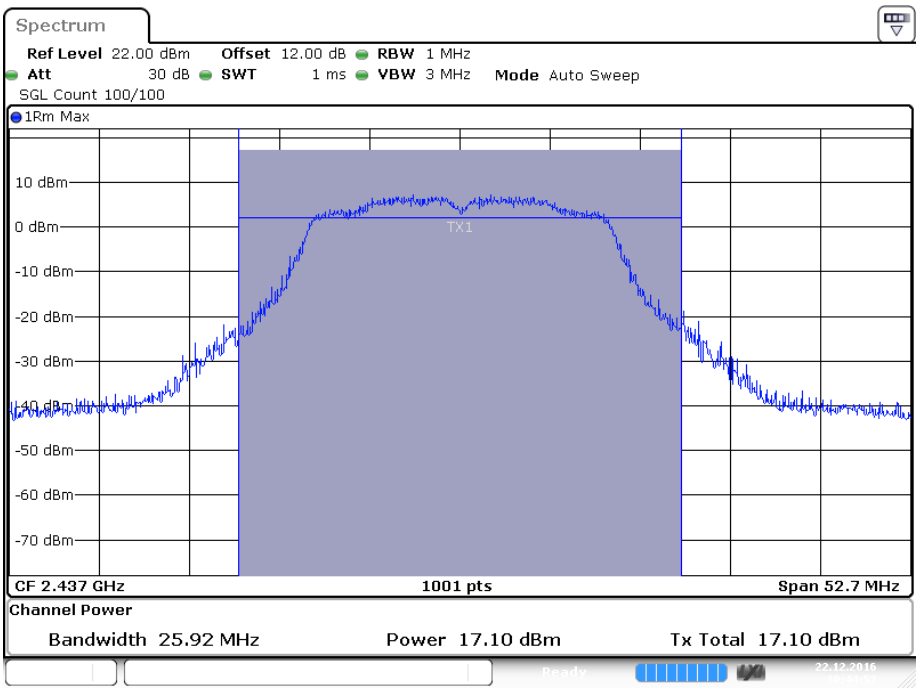
Date: 22.DEC.2016 10:25:18

Low Channel (N20-SISO Mode / Chain 1)



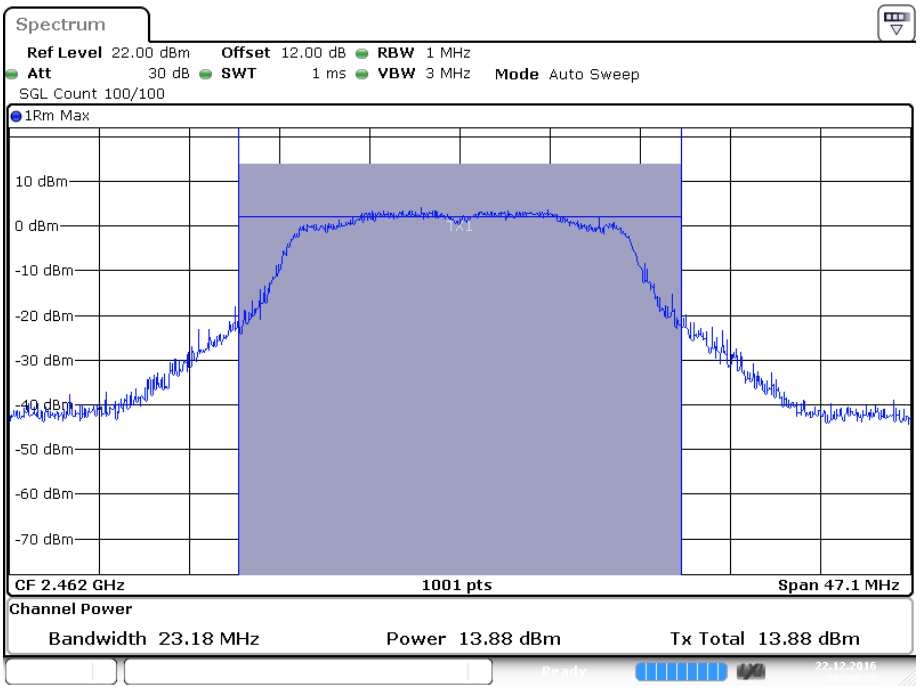
Date: 22.DEC.2016 10:47:36

Middle Channel (N20-SISO Mode / Chain 1)



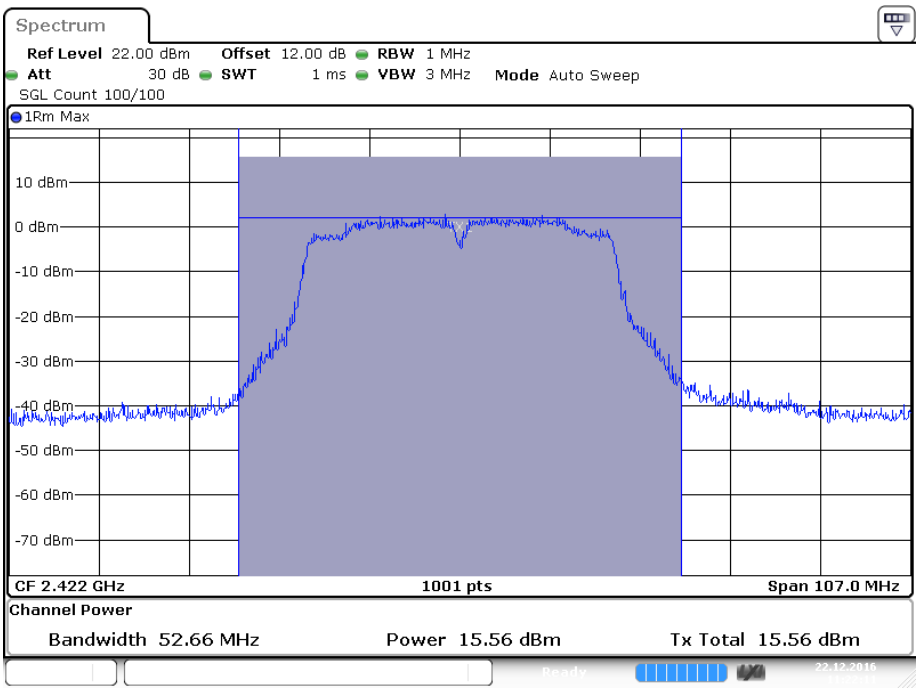
Date: 22.DEC.2016 10:44:52

High Channel (N20-SISO Mode / Chain 1)



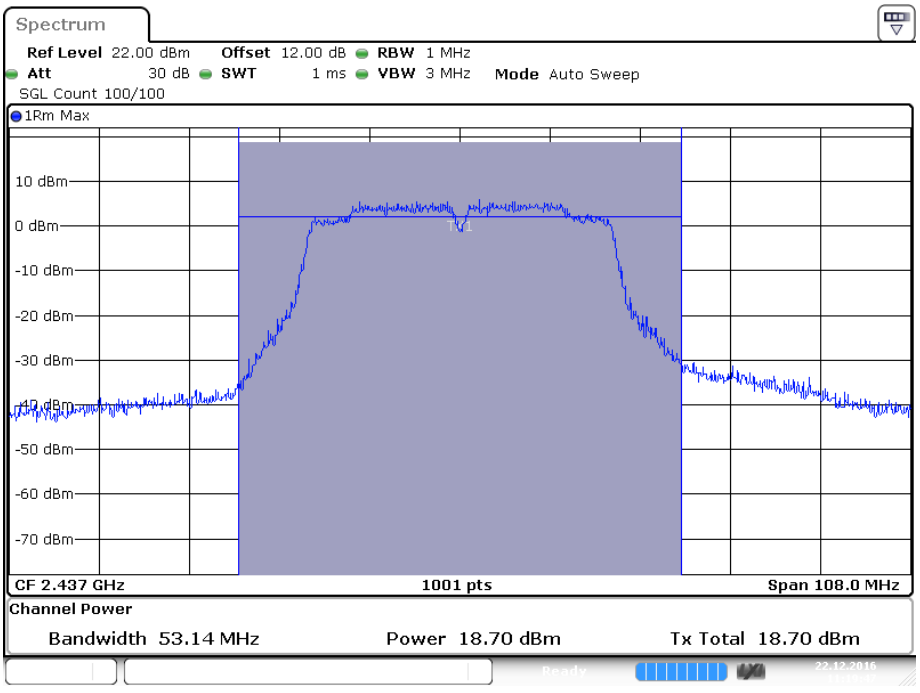
Date: 22.DEC.2016 10:39:28

Low Channel (N40-SISO Mode / Chain 0)



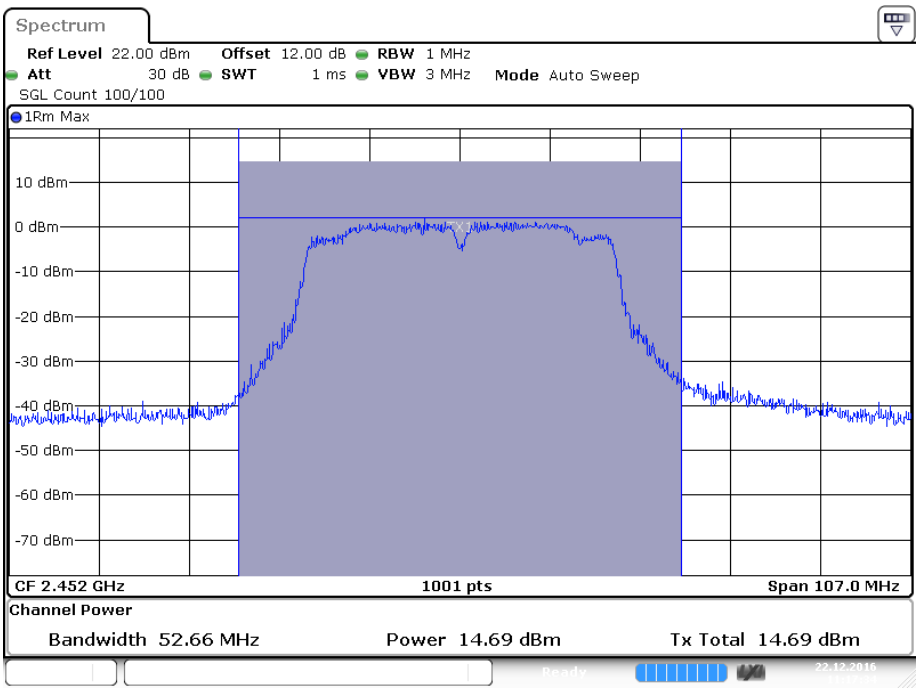
Date: 22.DEC.2016 11:22:11

Middle Channel (N40-SISO Mode / Chain 0)



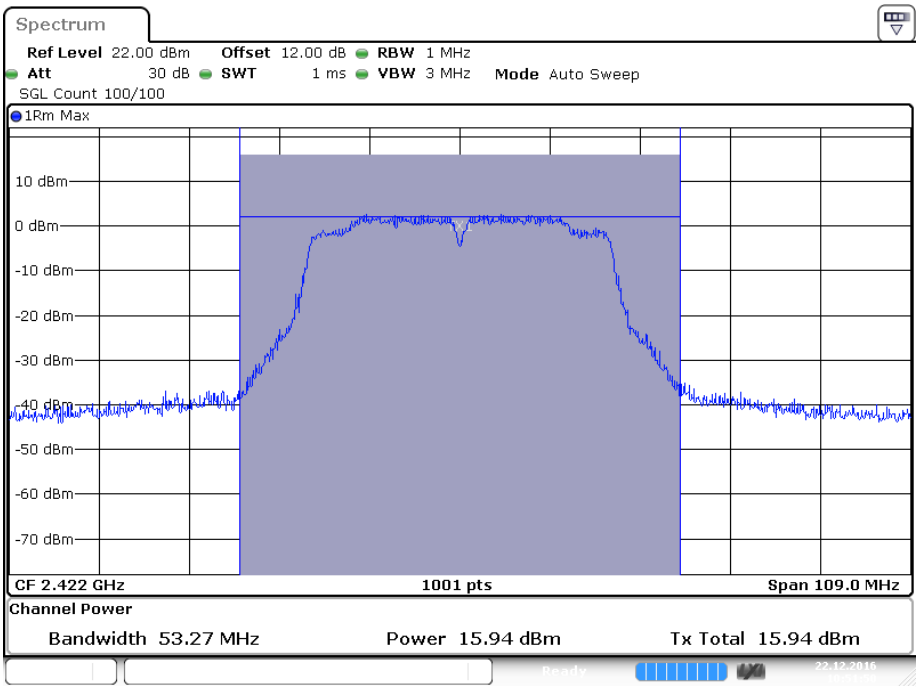
Date: 22.DEC.2016 11:19:47

High Channel (N40-SISO Mode / Chain 0)



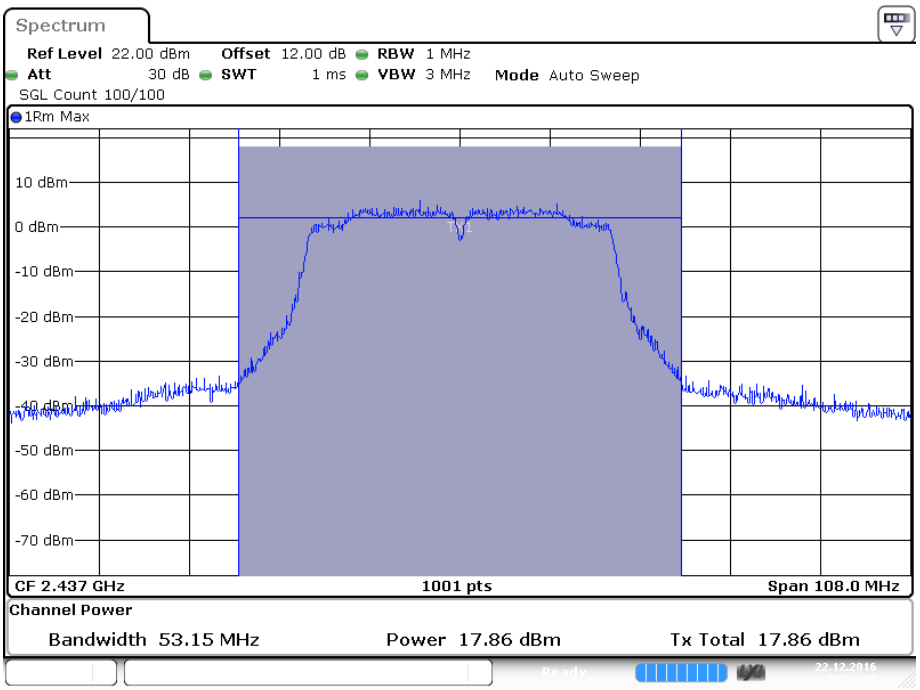
Date: 22.DEC.2016 11:17:35

Low Channel (N40-SISO Mode / Chain 1)



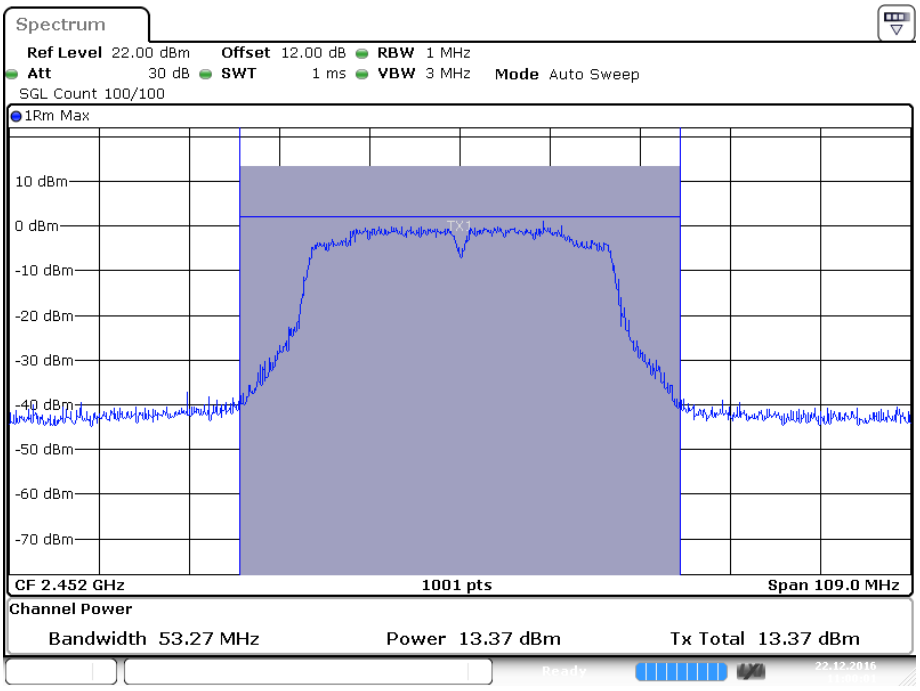
Date: 22.DEC.2016 10:51:50

Middle Channel (N40-SISO Mode / Chain 1)



Date: 22.DEC.2016 10:54:31

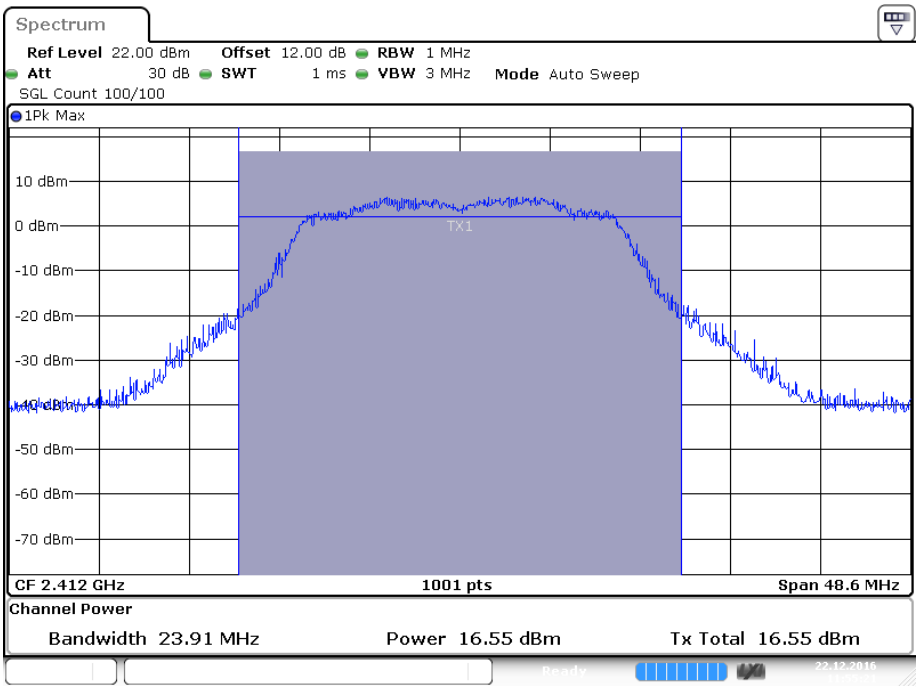
High Channel (N40-SISO Mode / Chain 1)



Date: 22.DEC.2016 11:00:01

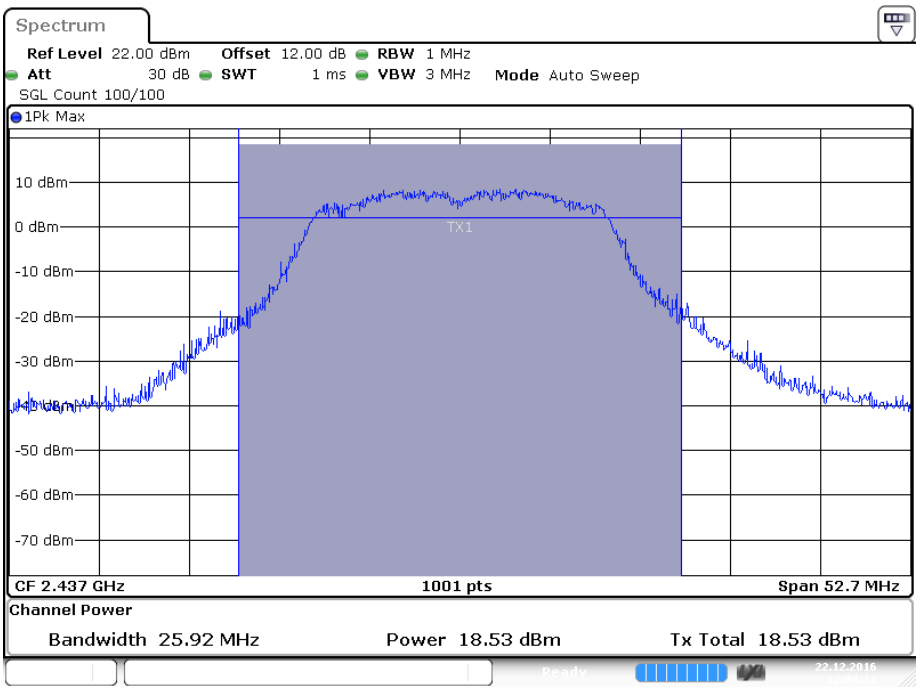
Conducted Peak Output Power

Low Channel (N20-MIMO Mode / Chain 0)



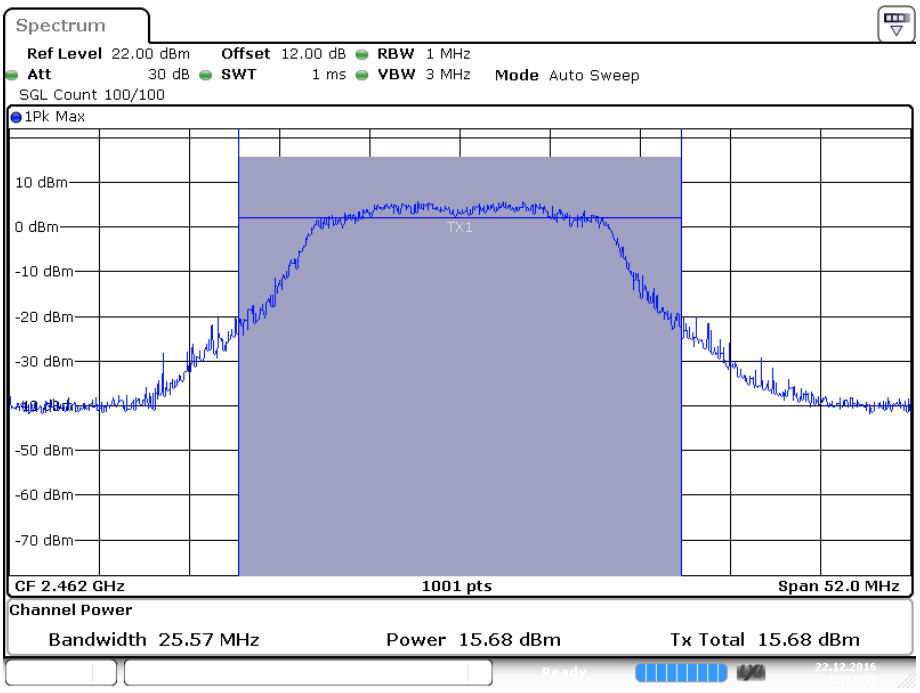
Date: 22.DEC.2016 11:55:21

Middle Channel (N20-MIMO Mode / Chain 0)



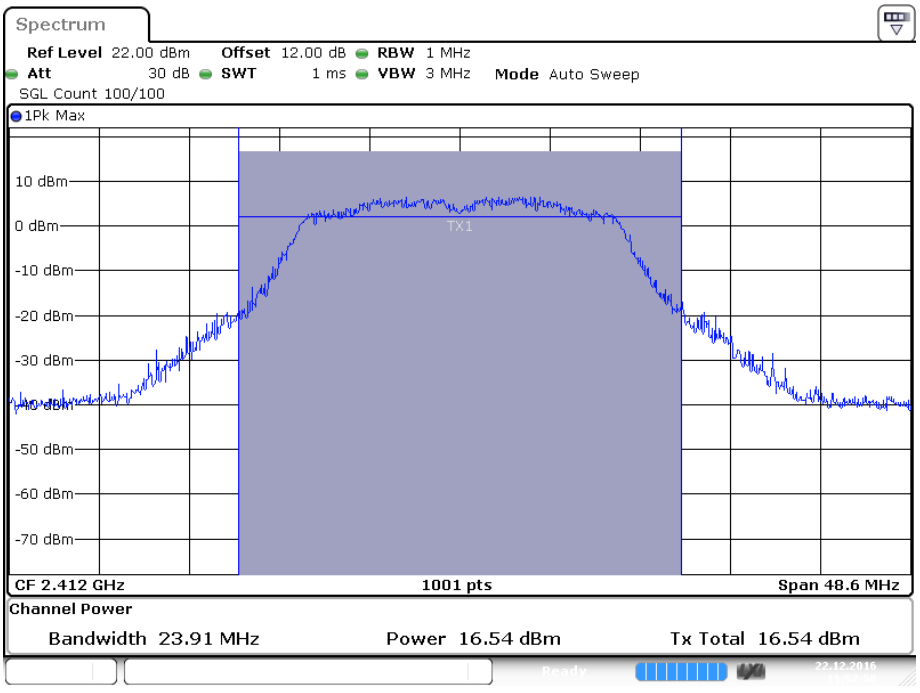
Date: 22.DEC.2016 12:04:12

High Channel (N20-MIMO Mode / Chain 0)



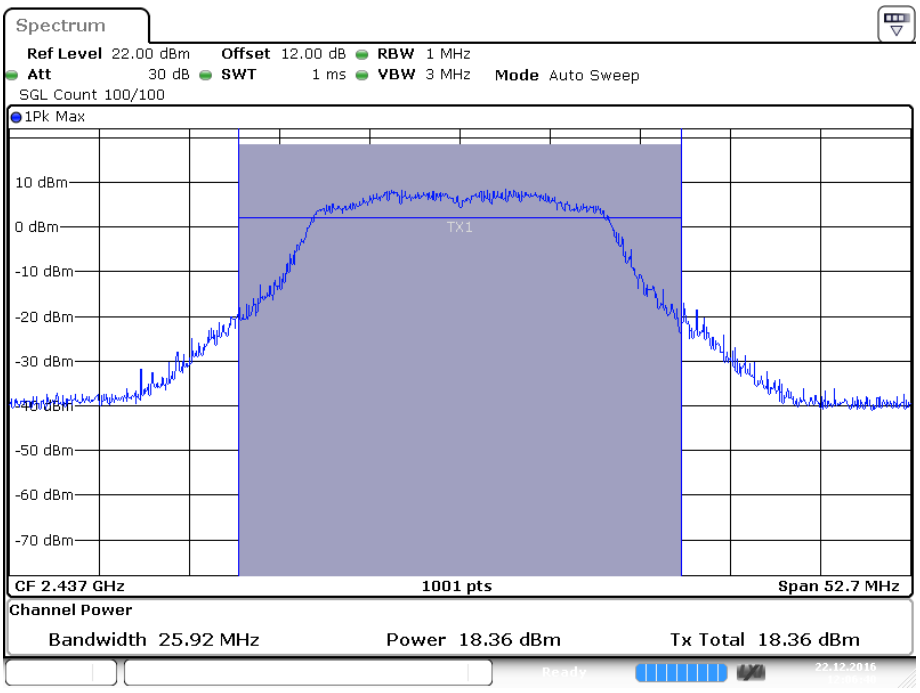
Date: 22.DEC.2016 12:12:58

Low Channel (N20-MIMO Mode / Chain 1)



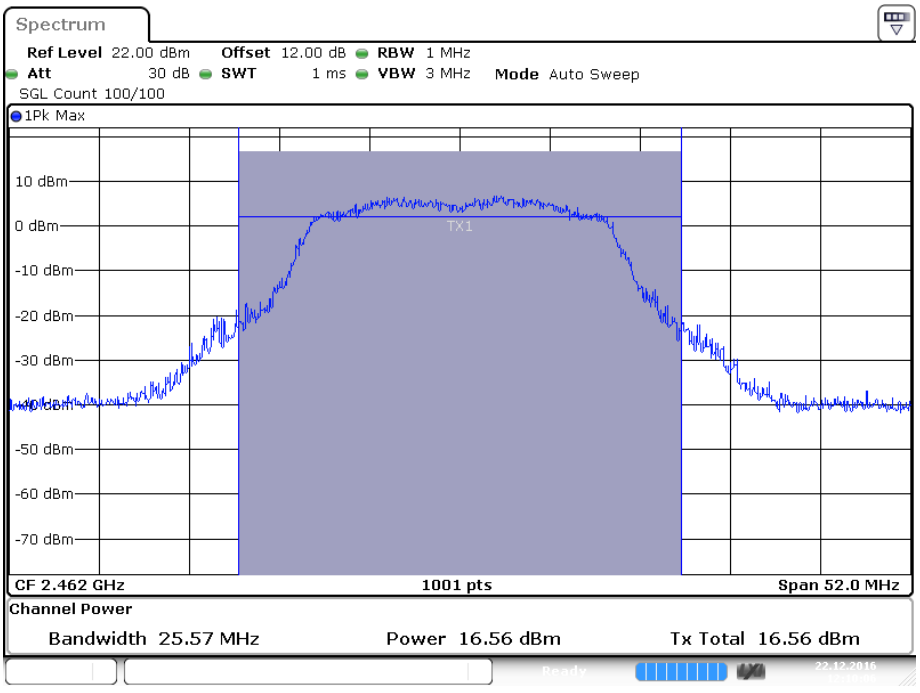
Date: 22.DEC.2016 11:57:50

Middle Channel (N20-MIMO Mode / Chain 1)



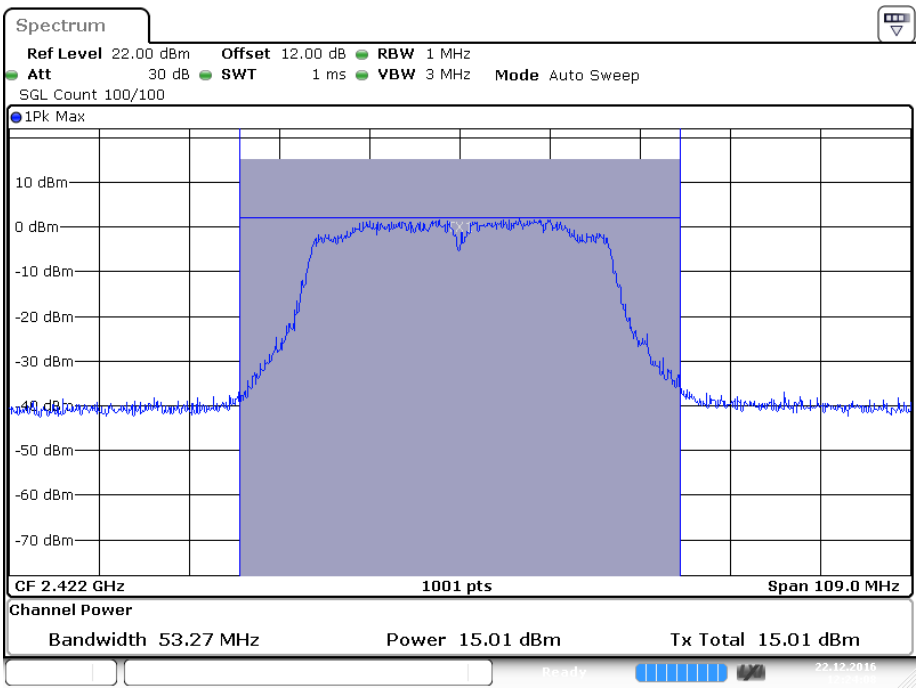
Date: 22.DEC.2016 12:06:40

High Channel (N20-MIMO Mode / Chain 1)



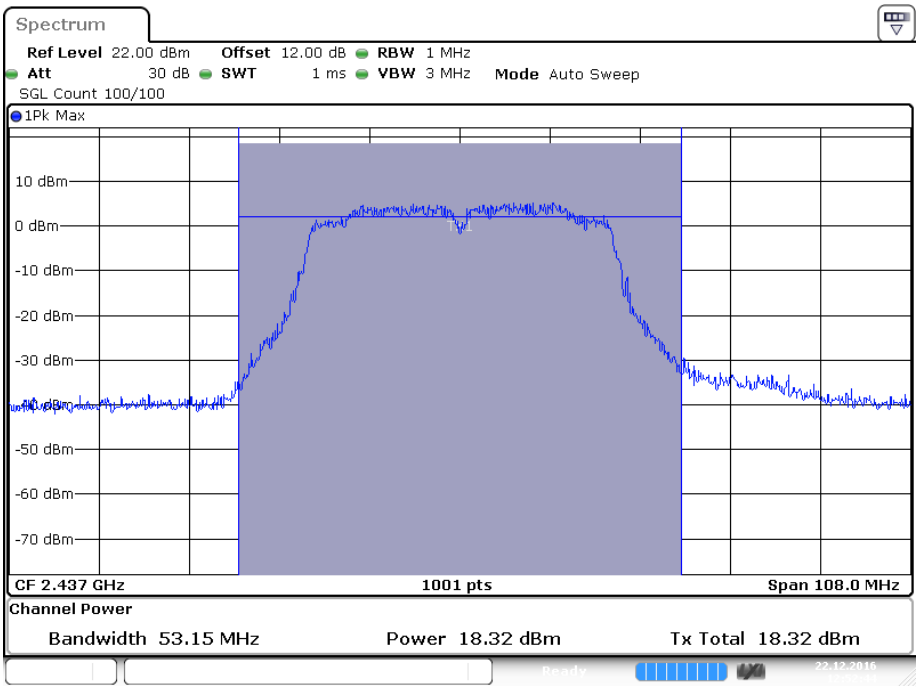
Date: 22.DEC.2016 12:10:06

Low Channel (N40-MIMO Mode / Chain 0)



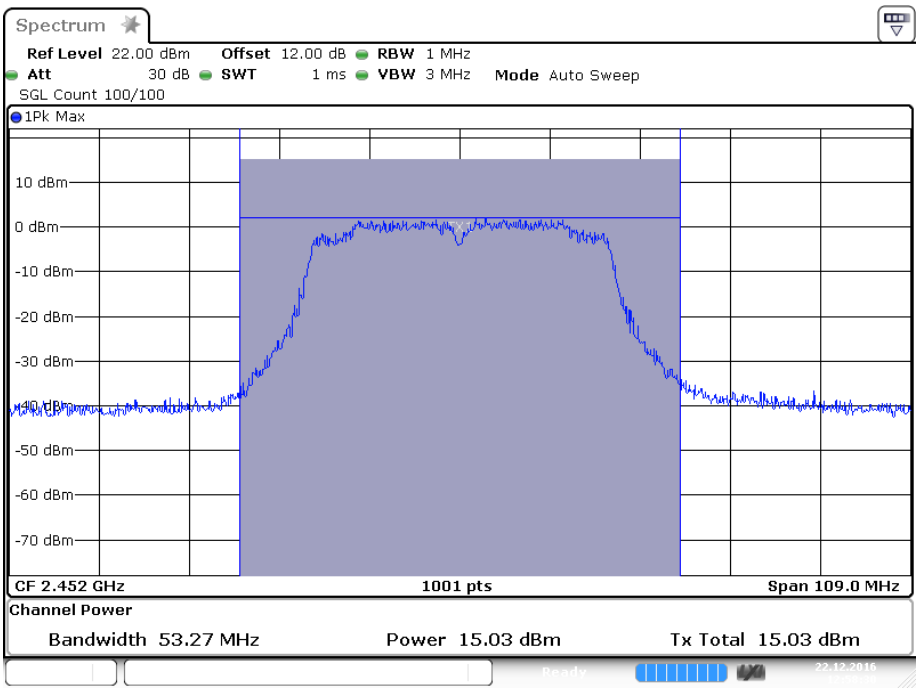
Date: 22.DEC.2016 12:24:09

Middle Channel (N40-MIMO Mode / Chain 0)



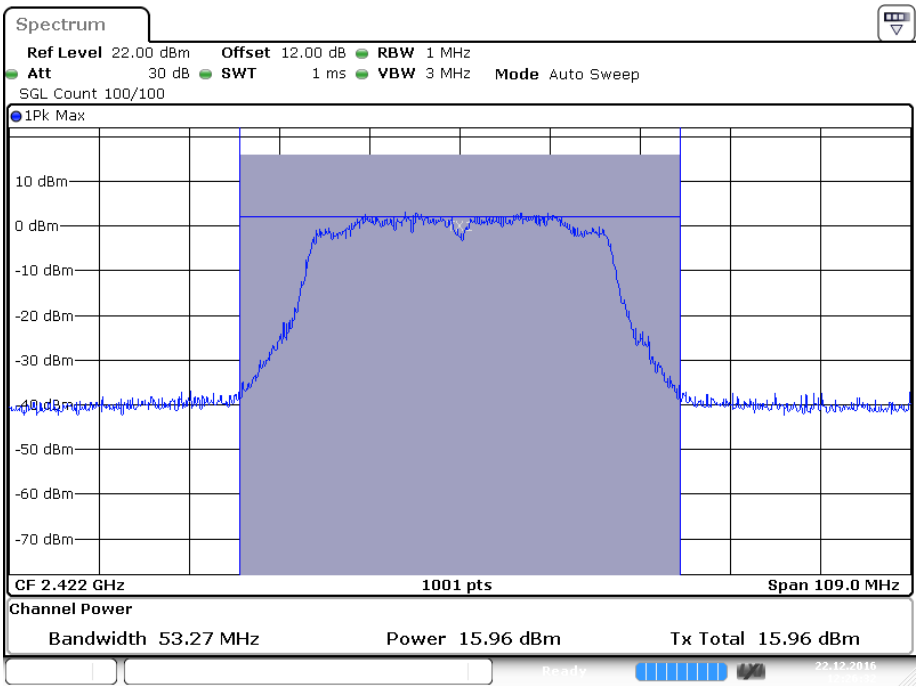
Date: 22.DEC.2016 12:52:45

High Channel (N40-MIMO Mode / Chain 0)



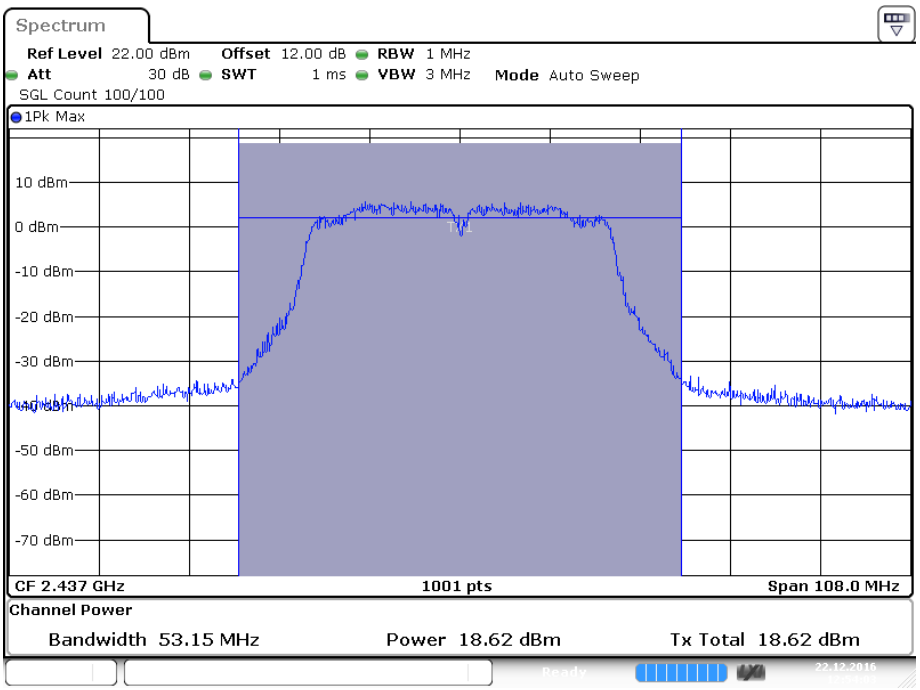
Date: 22.DEC.2016 12:58:30

Low Channel (N40-MIMO Mode / Chain 1)



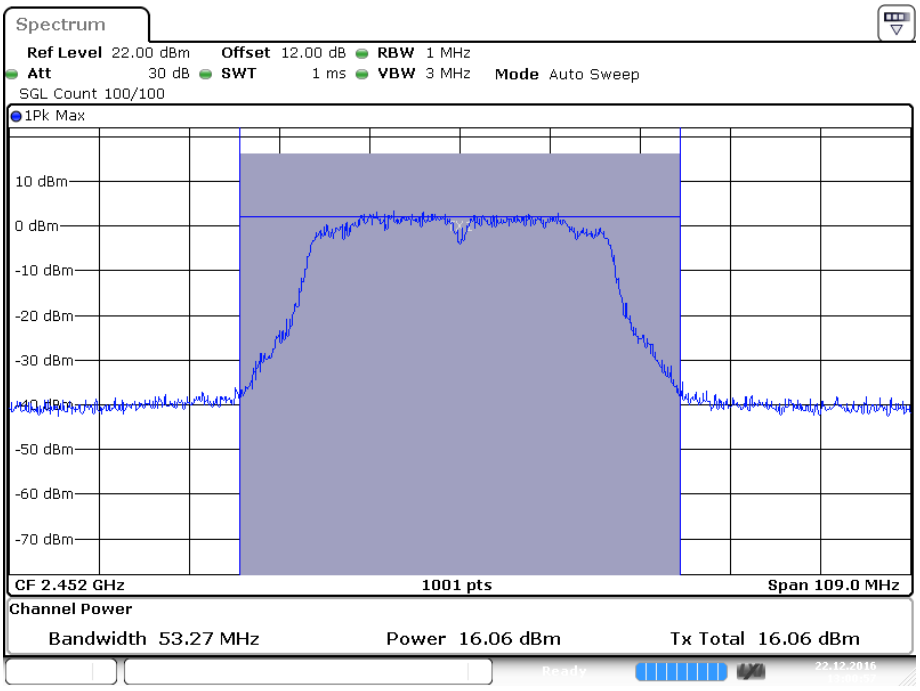
Date: 22.DEC.2016 12:26:33

Middle Channel (N40-MIMO Mode / Chain 1)



Date: 22.DEC.2016 12:54:04

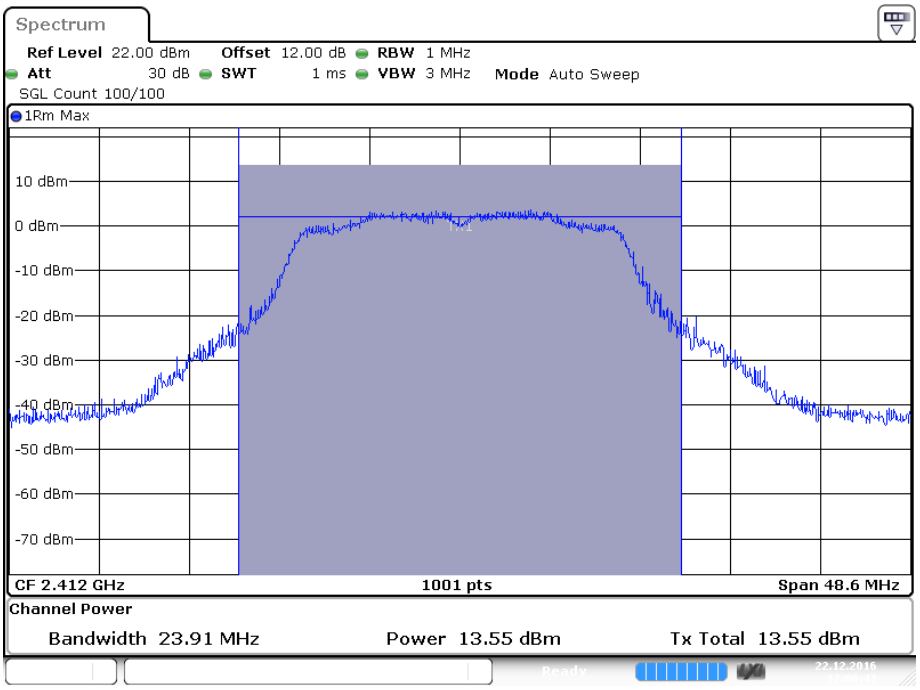
High Channel (N40-MIMO Mode / Chain 1)



Date: 22.DEC.2016 13:00:57

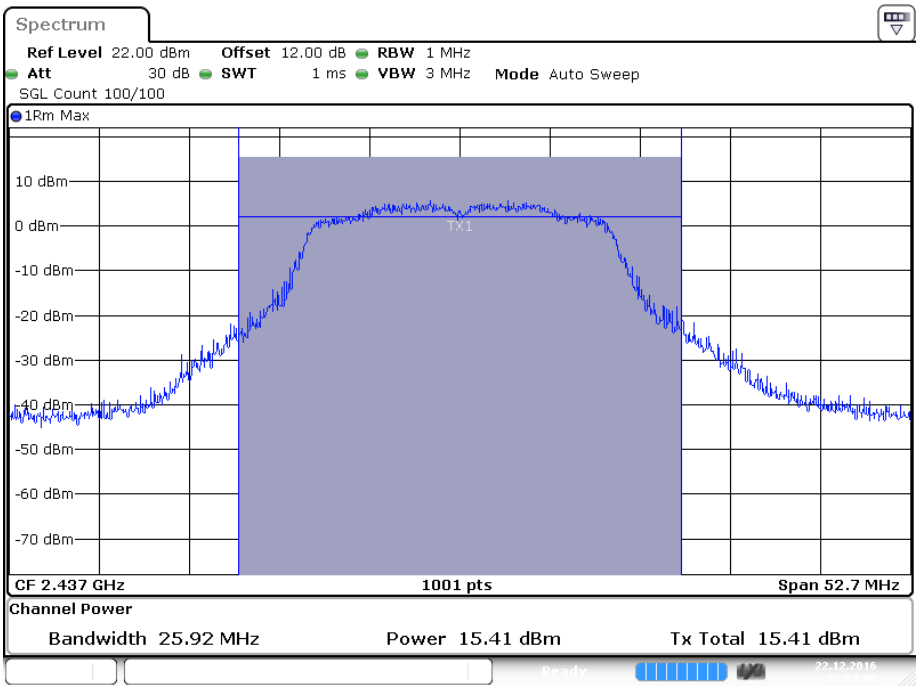
Conducted Average Output Power

Low Channel (N20-MIMO Mode / Chain 0)



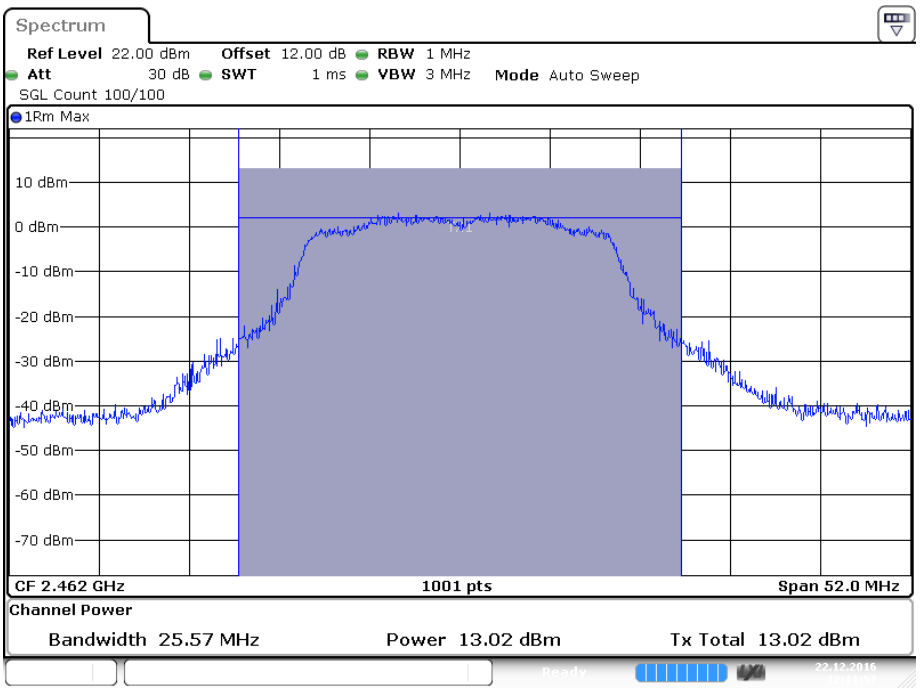
Date: 22.DEC.2016 12:00:43

Middle Channel (N20-MIM Mode / Chain 0)



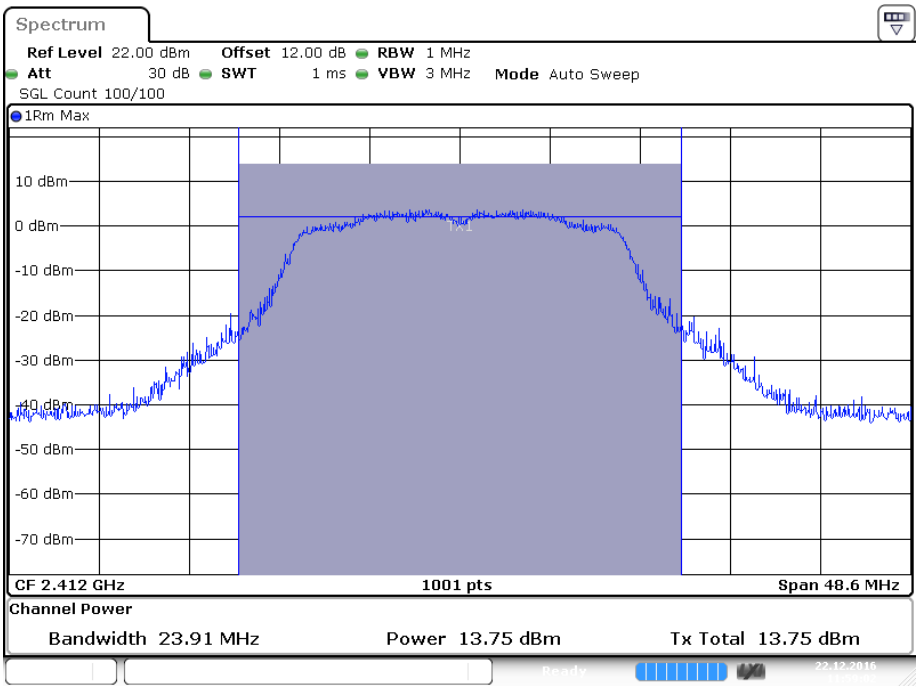
Date: 22.DEC.2016 12:04:47

High Channel (N20-MIMO Mode / Chain 0)



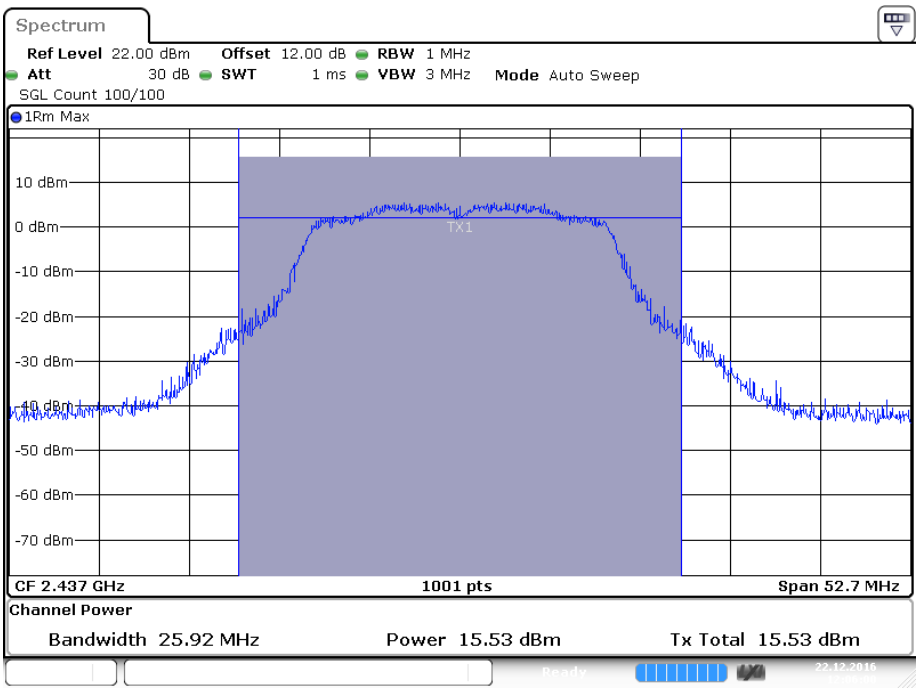
Date: 22.DEC.2016 12:11:58

Low Channel (N20-MIMO Mode / Chain 1)



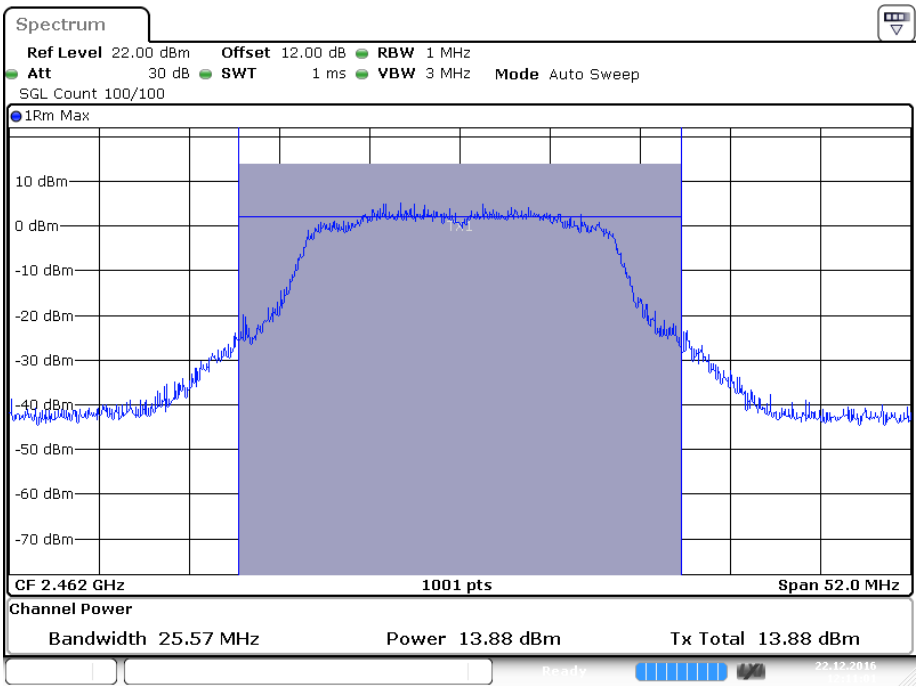
Date: 22.DEC.2016 11:59:02

Middle Channel (N20-MIMO Mode / Chain 1)



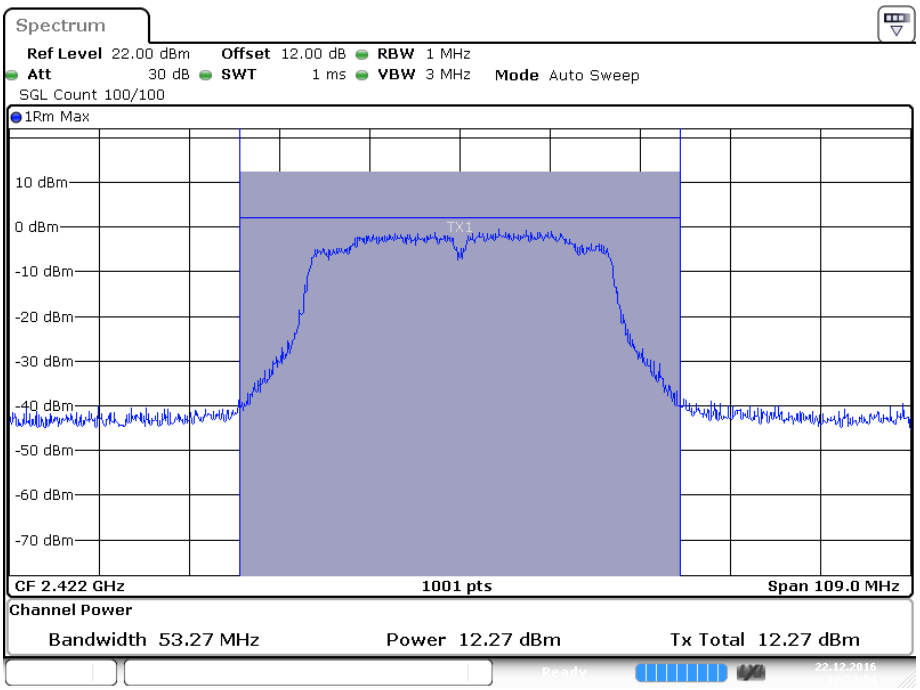
Date: 22.DEC.2016 12:06:01

High Channel (N20-MIMO Mode / Chain 1)



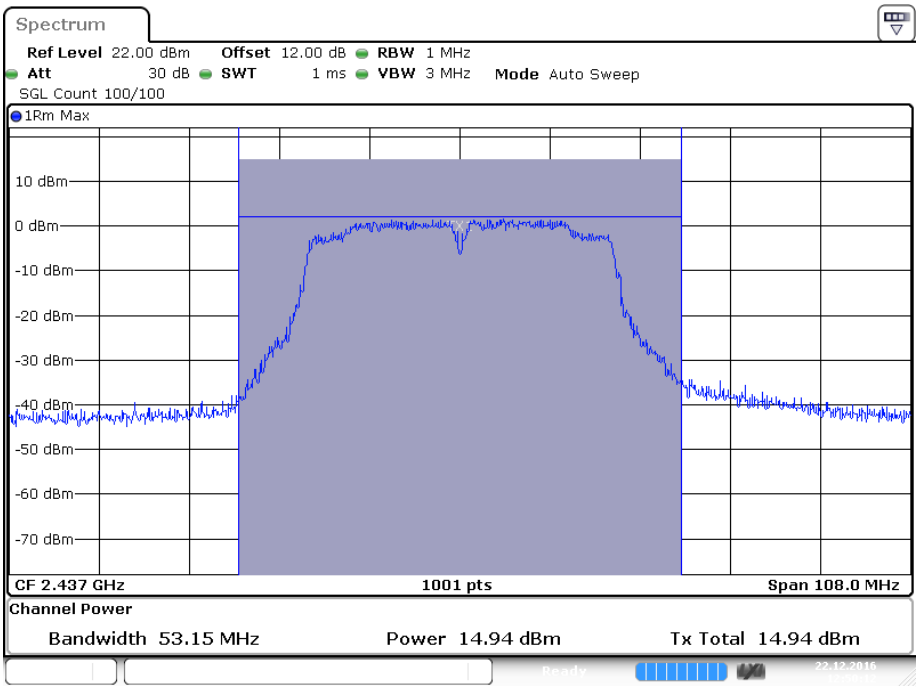
Date: 22.DEC.2016 12:11:01

Low Channel (N40-MIMO Mode / Chain 0)



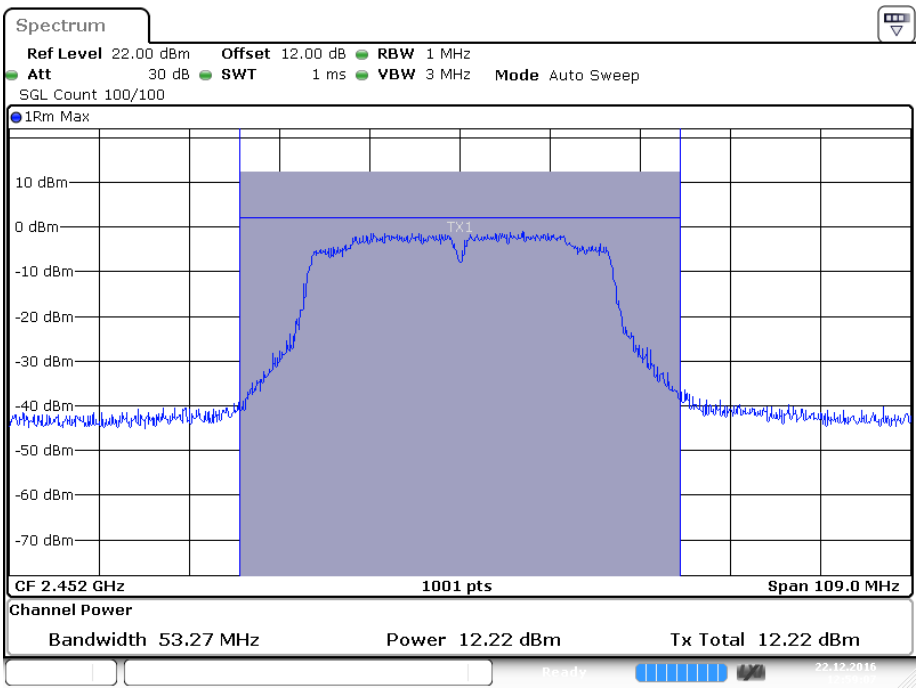
Date: 22.DEC.2016 12:24:54

Middle Channel (N40-MIMO Mode / Chain 0)



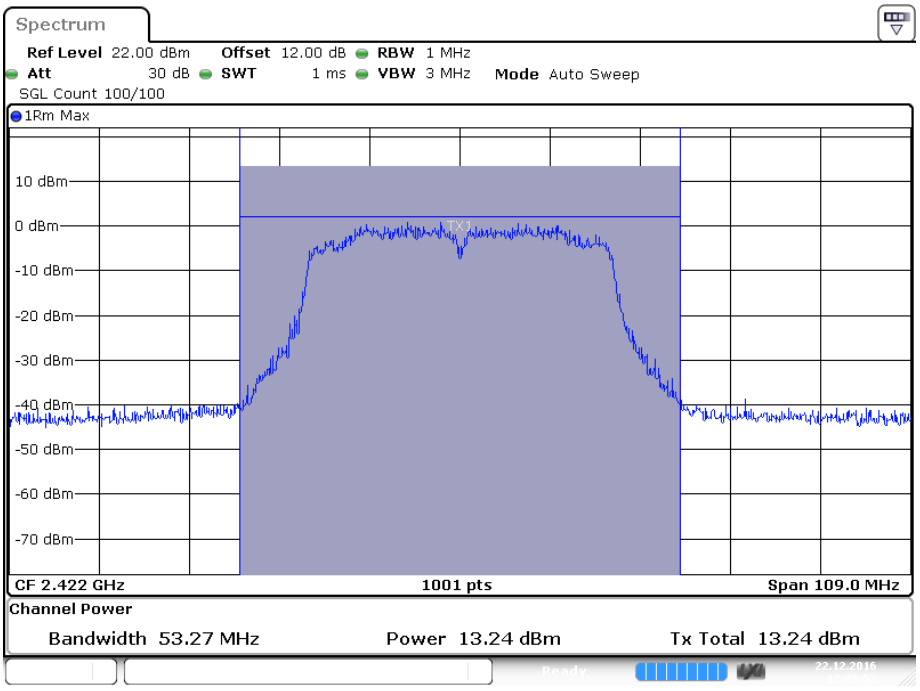
Date: 22.DEC.2016 12:50:12

High Channel (N40-MIMO Mode / Chain 0)



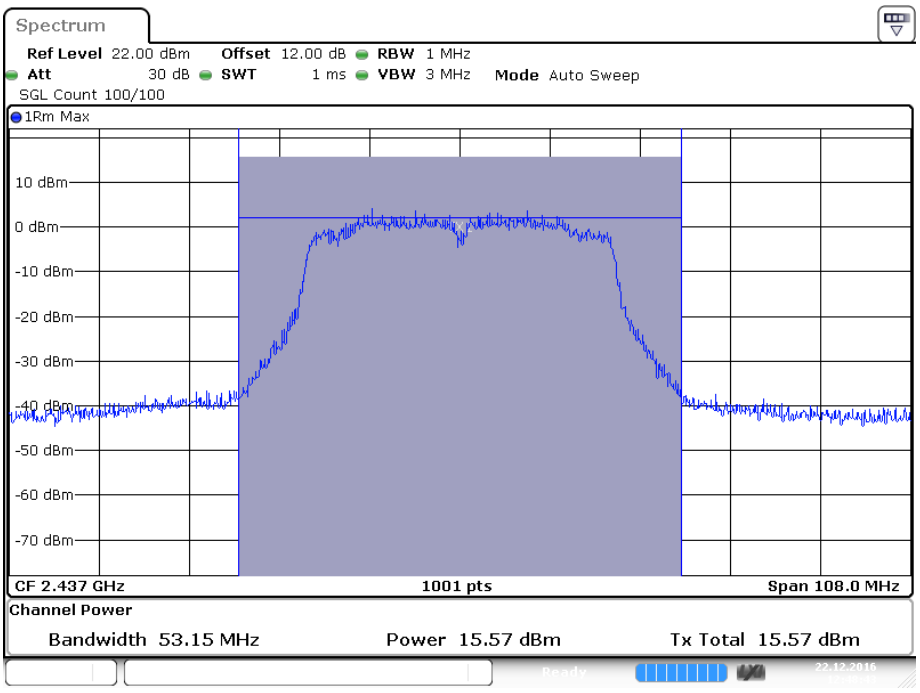
Date: 22.DEC.2016 12:59:08

Low Channel (N40-MIMO Mode / Chain 1)



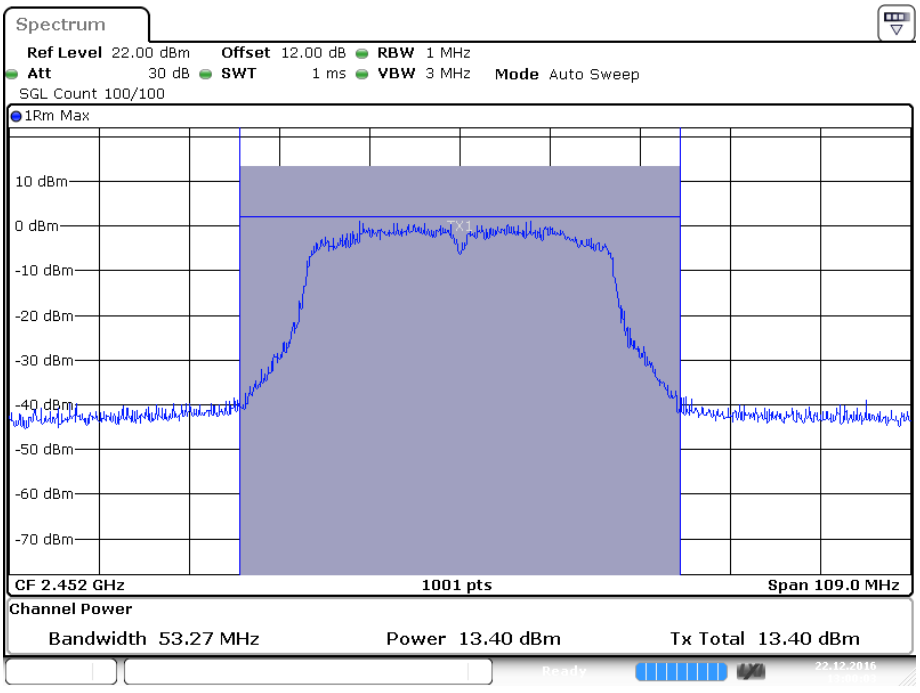
Date: 22.DEC.2016 12:25:52

Middle Channel (N40-MIMO Mode / Chain 1)



Date: 22.DEC.2016 12:48:43

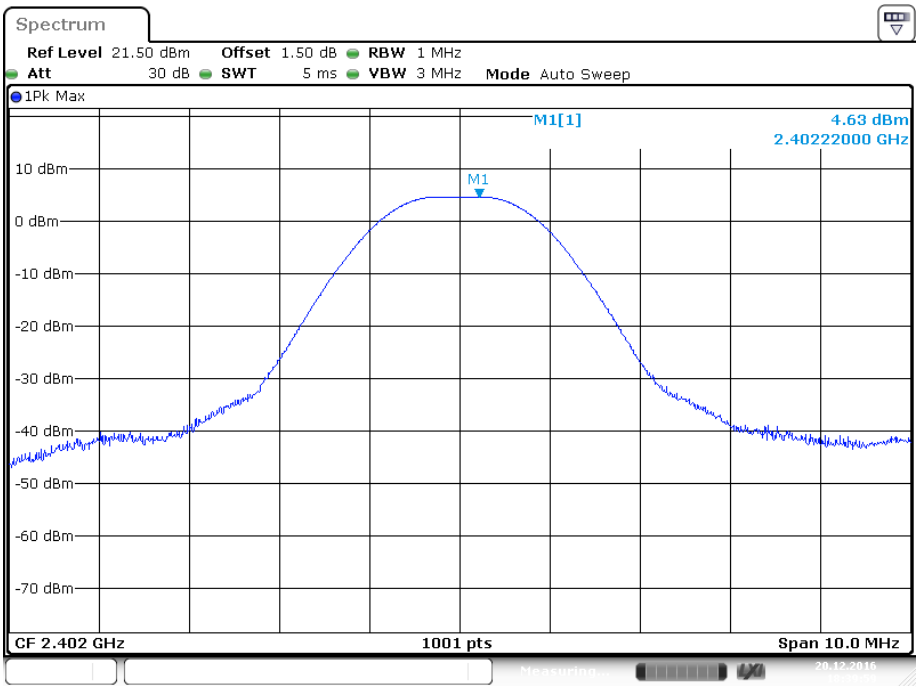
High Channel (N40-MIMO Mode / Chain 1)



Date: 22.DEC.2016 13:00:04

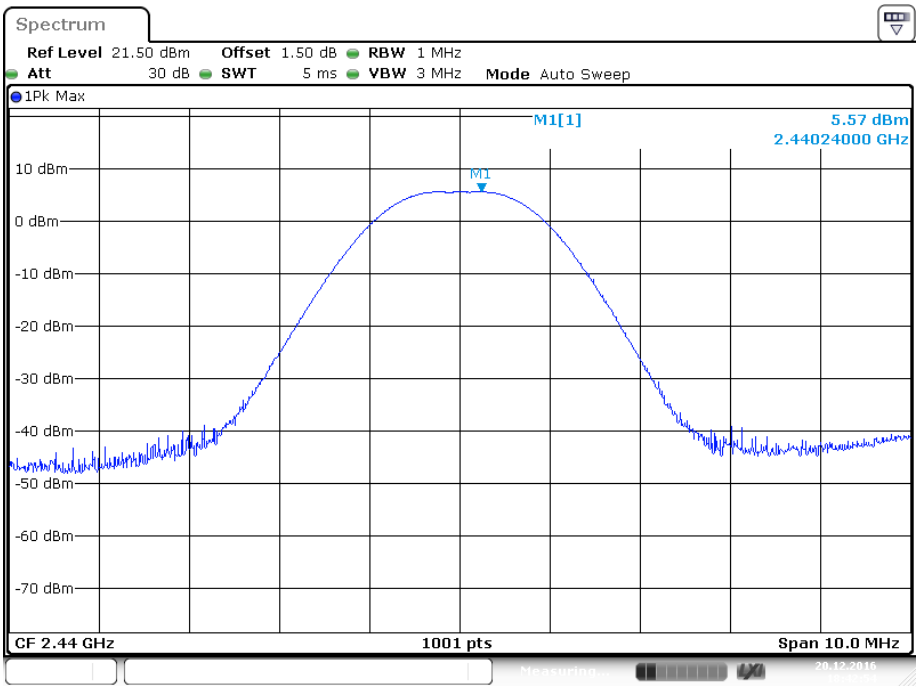
Conducted Peak Output Power

Low Channel (BLE)



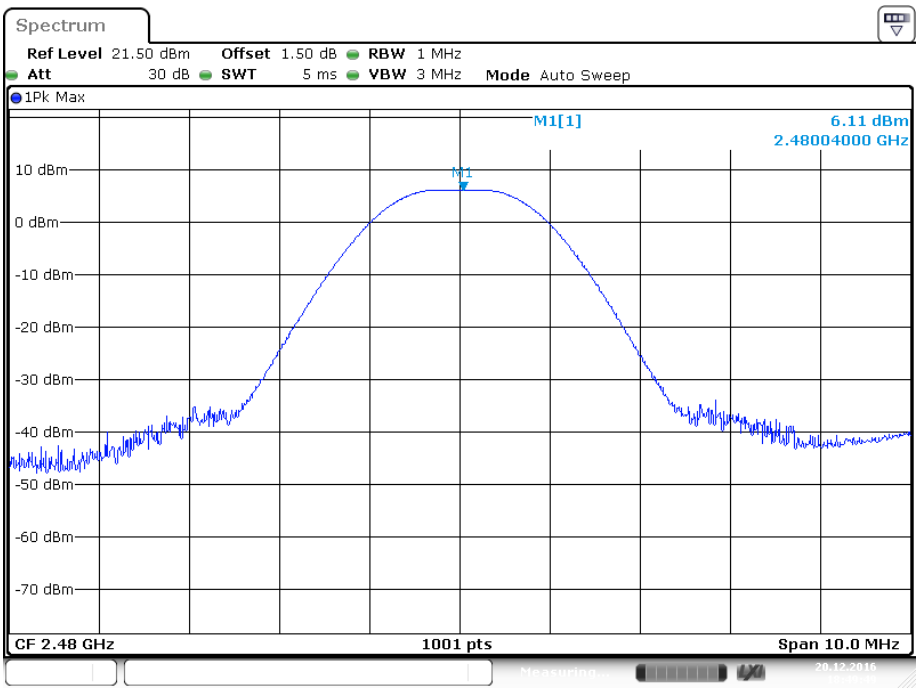
Date: 20.DEC.2016 18:40:00

Middle Channel (BLE)



Date: 20.DEC.2016 18:42:54

High Channel (BLE)



Date: 20.DEC.2016 18:49:48

10 FCC §15.247(d) –100 kHz Bandwidth of Frequency Band Edge

10.1 Applicable Standard

According to FCC §15.247(d).

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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, 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) (see §15.205(c)).

10.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signalfrom an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect itsantenna terminal to measurement instrument via a low loss cable. Then set it to any one measuredfrequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency spanincluding 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot thegraph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

10.3 Test Equipment List and Details

Descriptions	Manufacturers	Models	Serial Numbers	Calibration Date	Calibration Due Date
Spectrum Analyzer	Rohde & Schwarz	FSV40	101203	2016/7/14	2017/7/13
Cable	WOKEN	SFL402	00100A1F6A192S	N.C.R	N.C.R

***Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Taiwan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

10.4 Test Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	55 %
ATM Pressure:	1010 hPa

The testing was performed by David Hsu on 2016-12-20 to 2016-12-23.

10.5 Test Results

WIFI

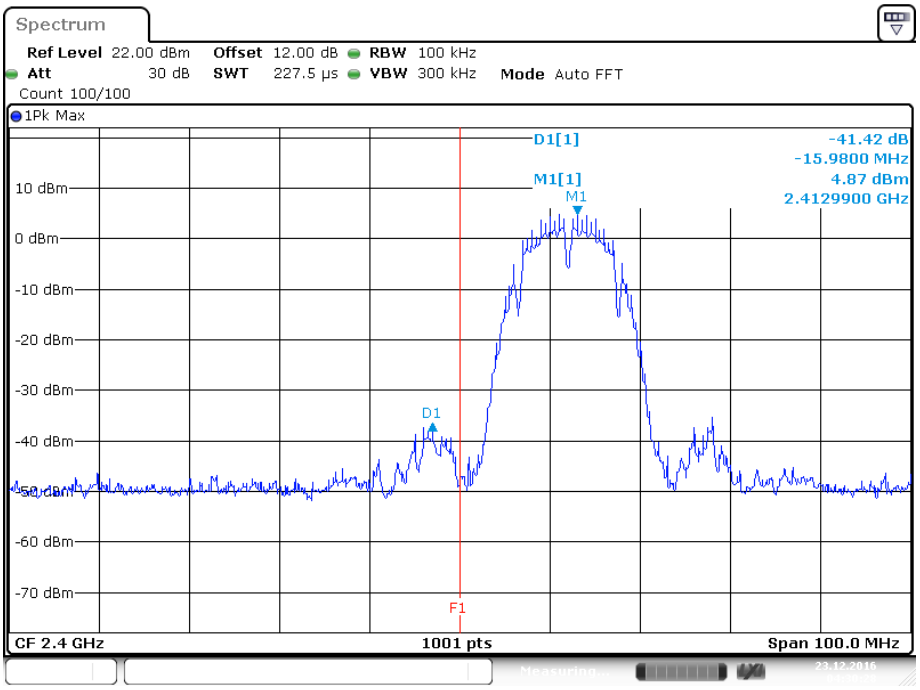
Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)		Limit (dBc)	RESULT
		Chain 0	Chain 1		
B Mode					
Low	2412	41.42	47.85	≥ 20	PASS
High	2462	49.02	52.43	≥ 20	PASS
G Mode					
Low	2412	30.62	30.62	≥ 20	PASS
High	2462	43.32	45.72	≥ 20	PASS
N20 Mode					
Low	2412	31.78	29.68	≥ 20	PASS
High	2462	46.63	48.42	≥ 20	PASS
N40 Mode					
Low	2422	32.39	31.24	≥ 20	PASS
High	2452	38.28	41.49	≥ 20	PASS

BLE

Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	RESULT
Low	2402	44.08	≥ 20	PASS
High	2480	48.38	≥ 20	PASS

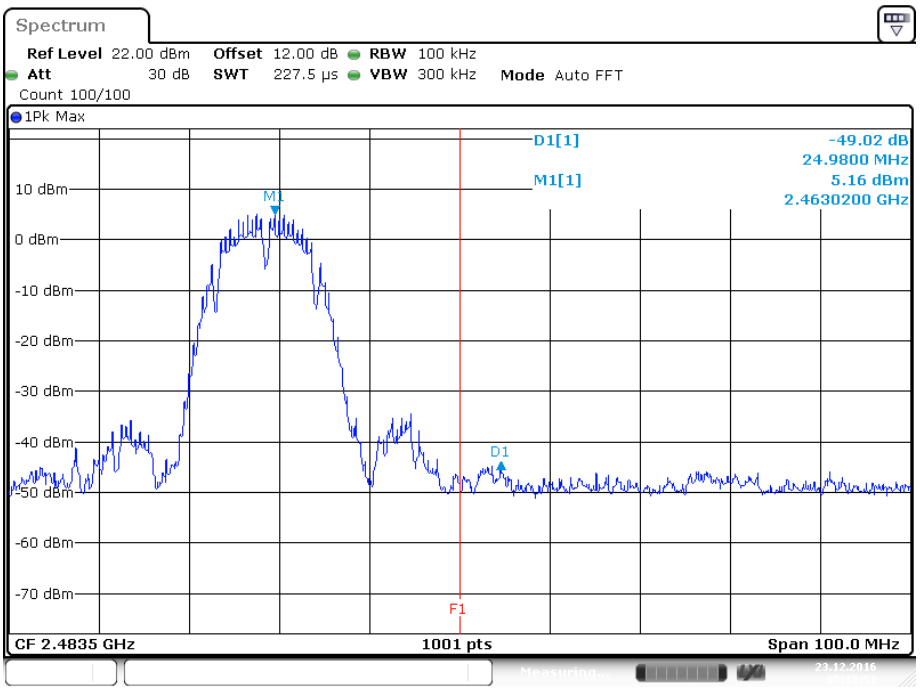
Please refer to the following plots

Band Edge, CH low (B Mode / Chain 0)



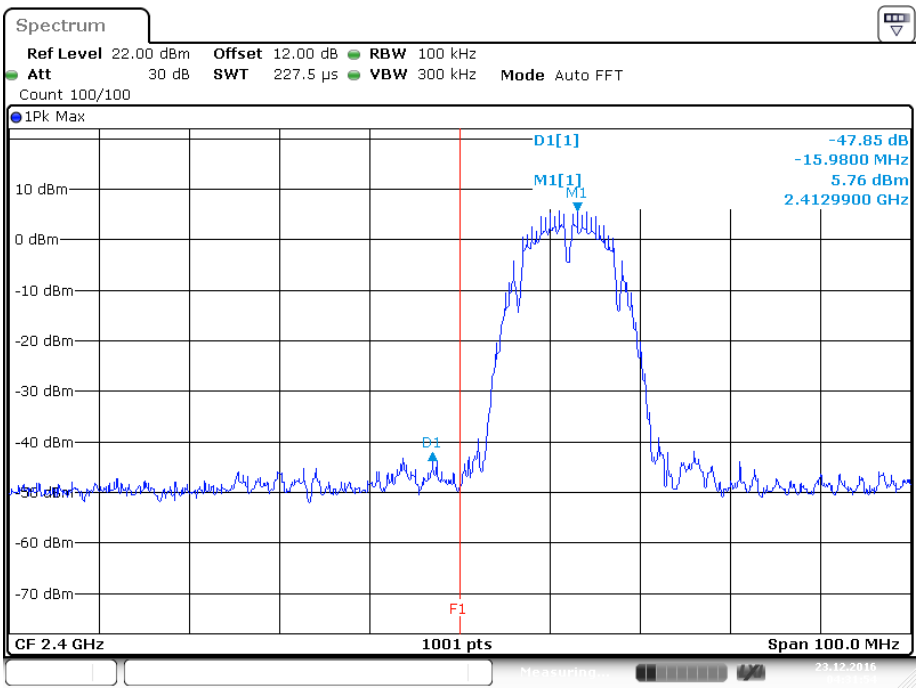
Date: 23.DEC.2016 04:30:28

Band Edge, CH High(B Mode / Chain 0)



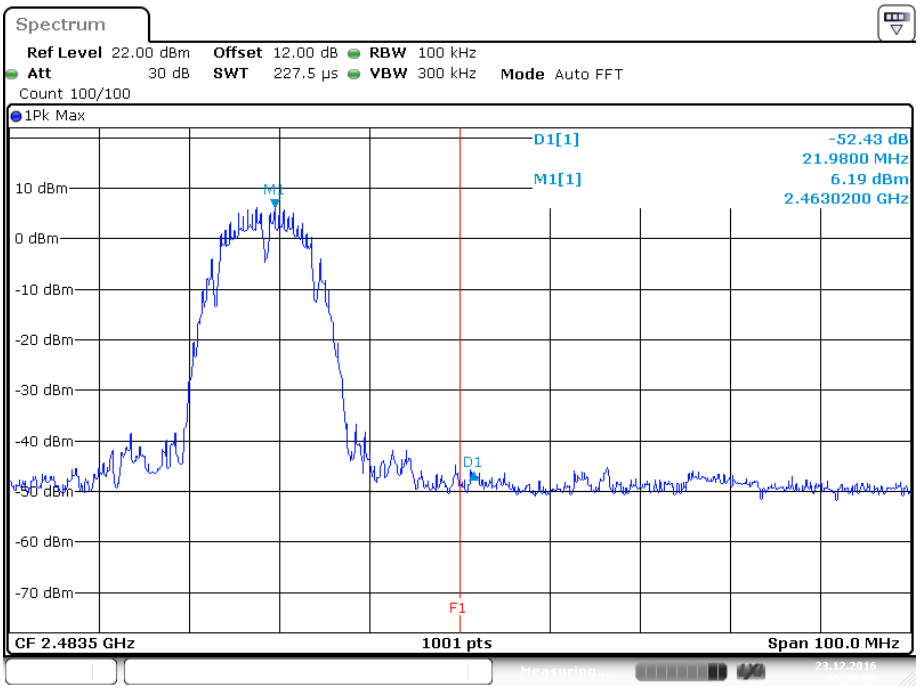
Date: 23.DEC.2016 05:18:51

Band Edge, CH low (B Mode / Chain 1)



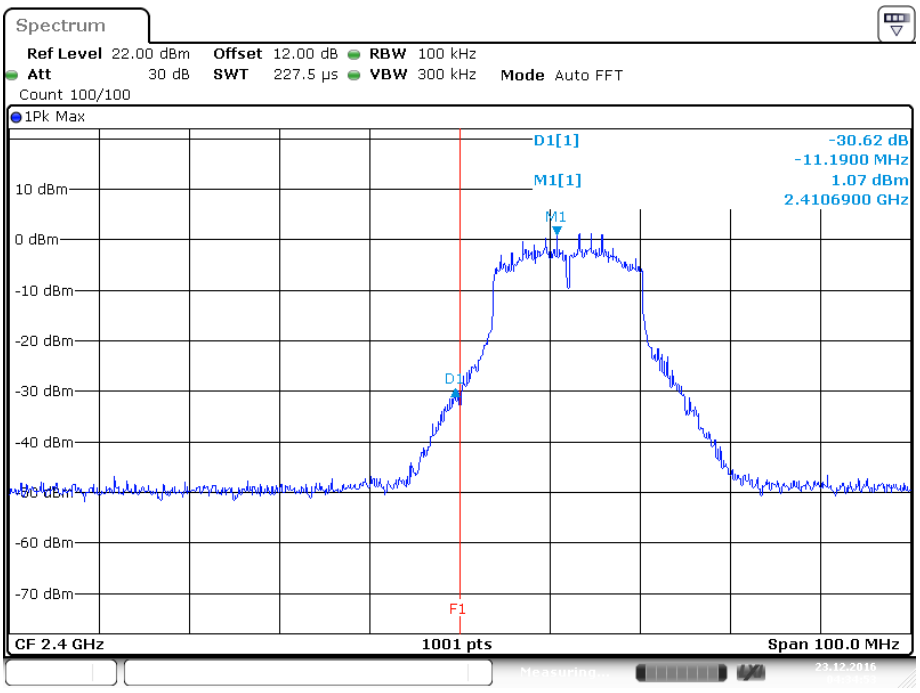
Date: 23.DEC.2016 04:31:54

Band Edge, CH High(B Mode / Chain 1)



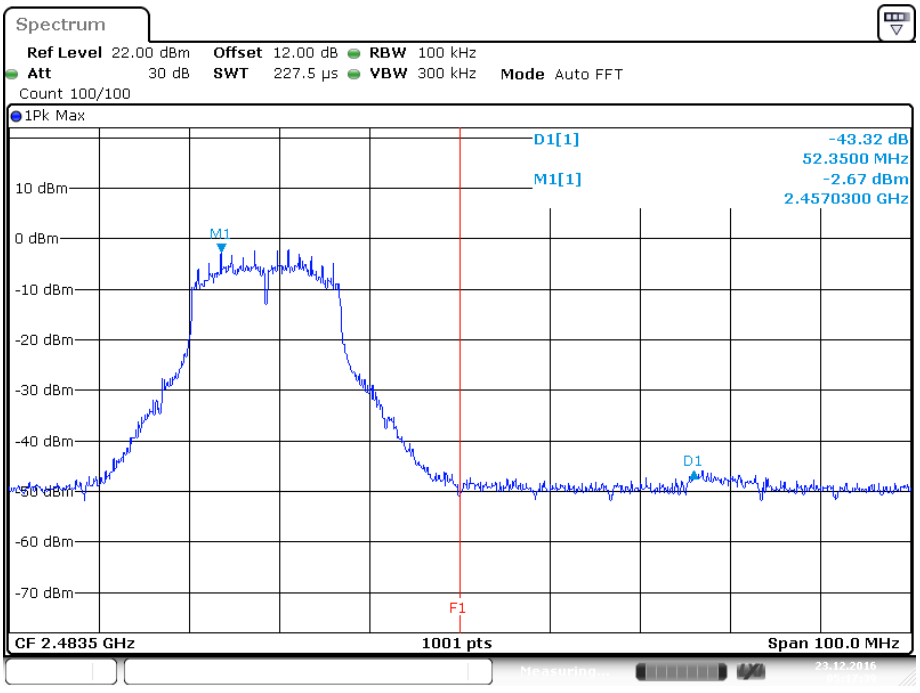
Date: 23.DEC.2016 05:20:06

Band Edge, CH low (G Mode / Chain 0)



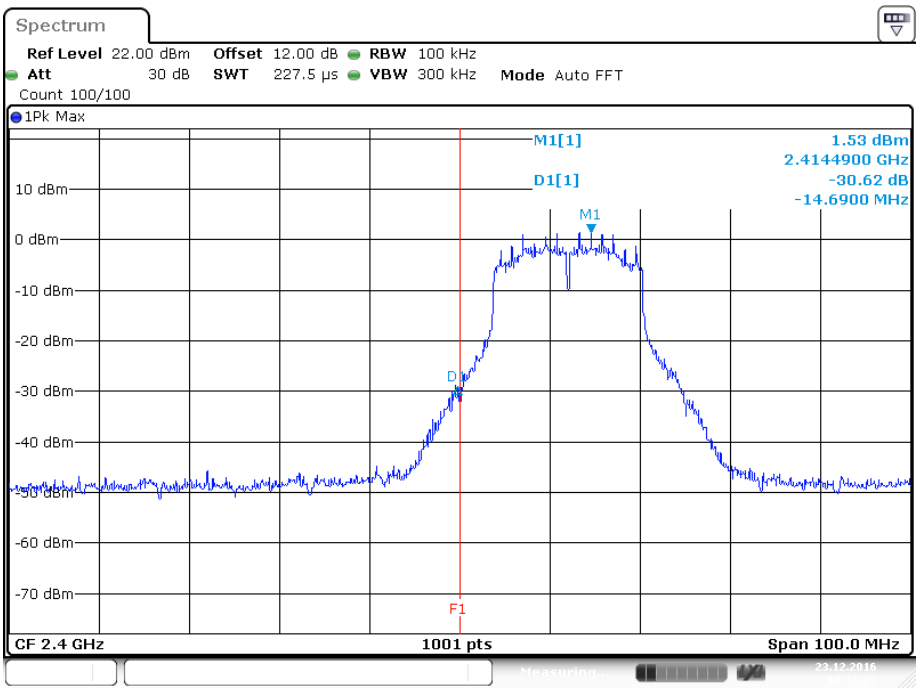
Date: 23.DEC.2016 04:34:54

Band Edge, CH High(G Mode / Chain 0)



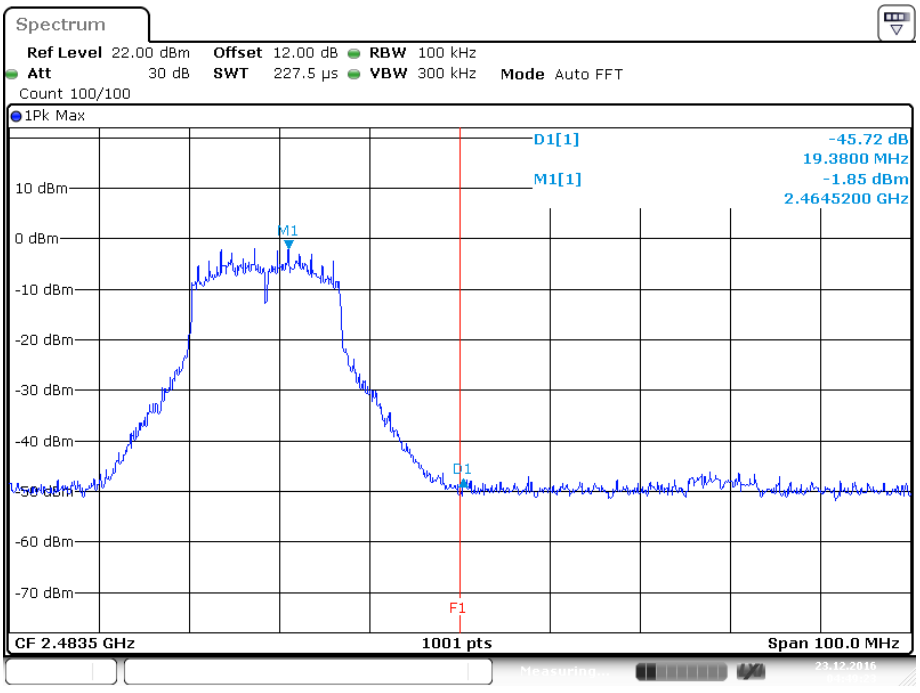
Date: 23.DEC.2016 05:17:39

Band Edge, CH low (G Mode / Chain 1)



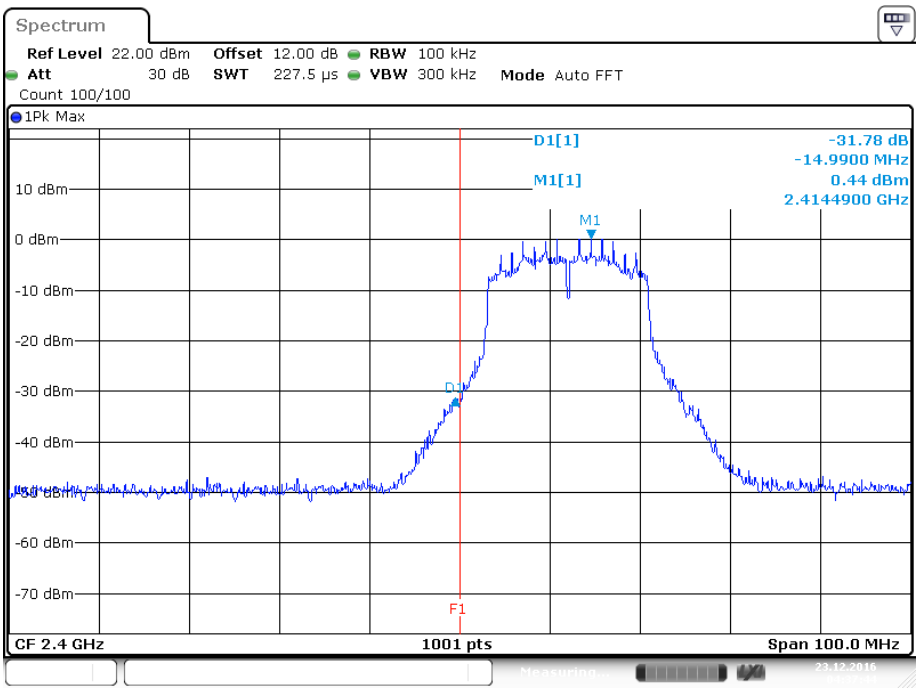
Date: 23.DEC.2016 04:33:25

Band Edge, CH High(G Mode / Chain 1)



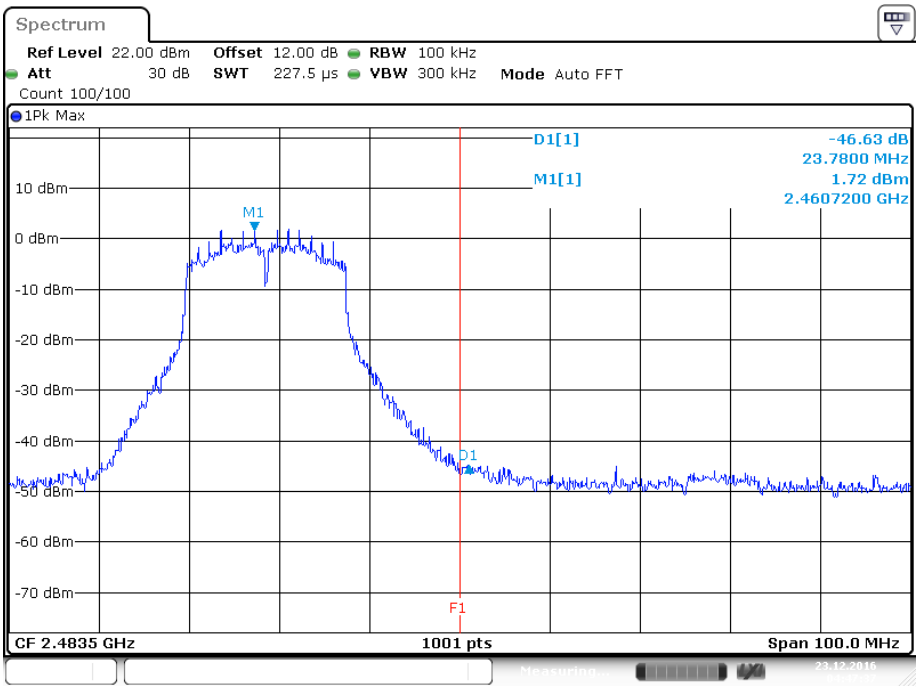
Date: 23.DEC.2016 04:49:24

Band Edge, CH low (N20 Mode / Chain 0)



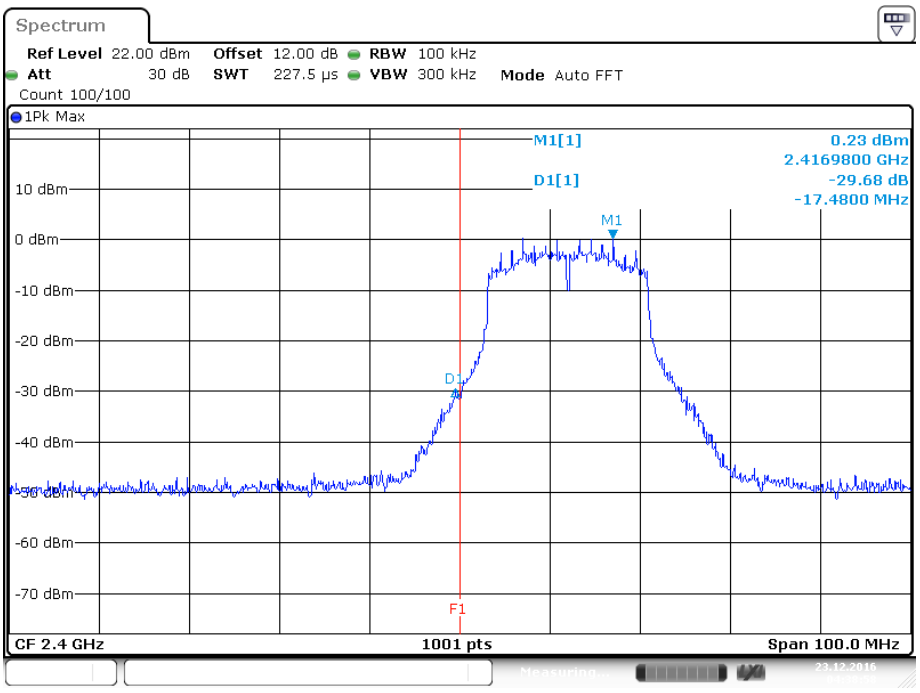
Date: 23.DEC.2016 04:37:44

Band Edge, CH High(N20 Mode / Chain 0)



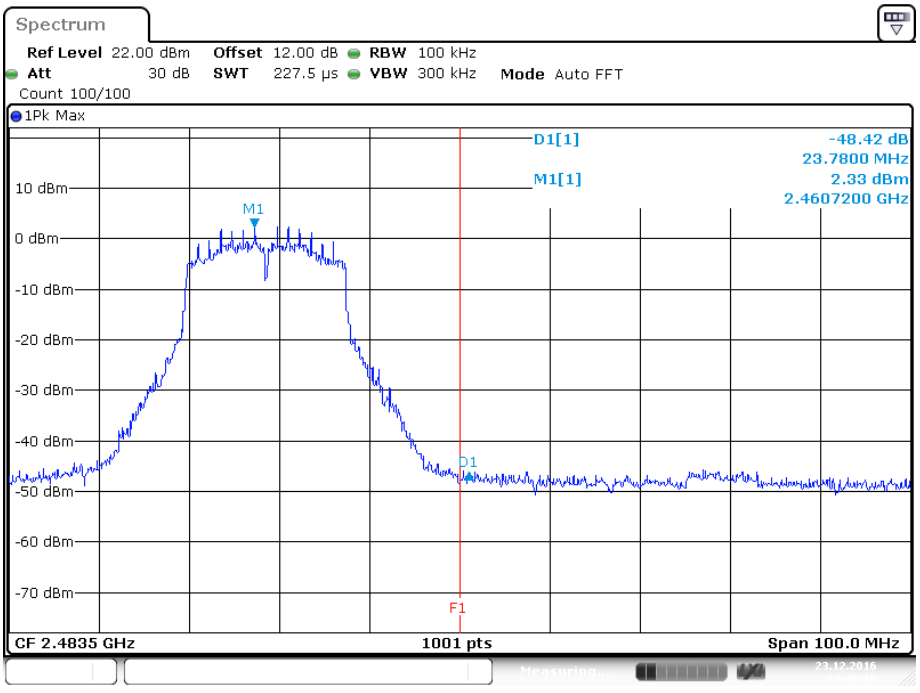
Date: 23.DEC.2016 04:47:38

Band Edge, CH low (N20 Mode / Chain 1)



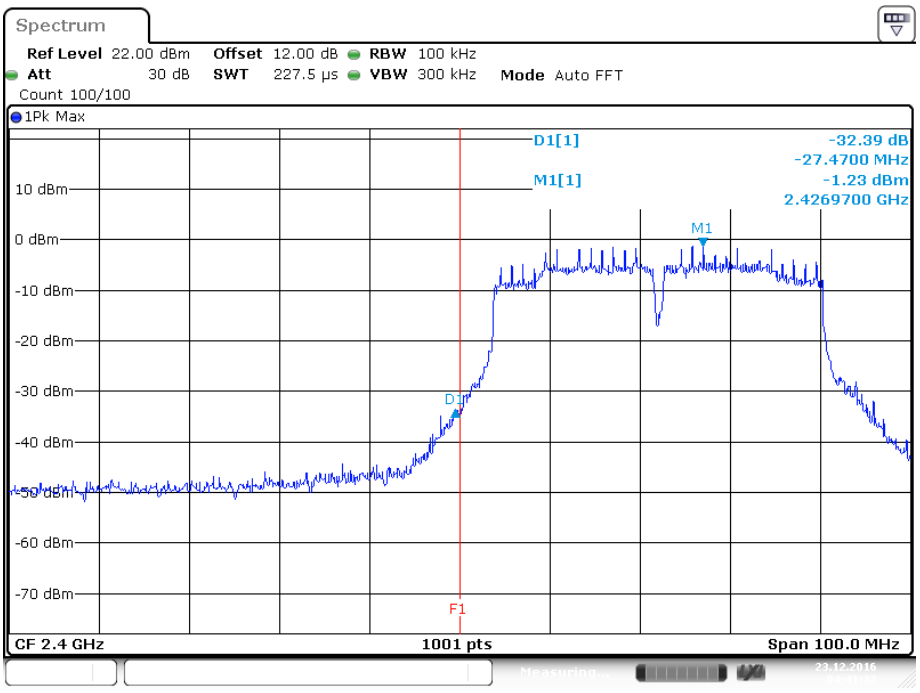
Date: 23.DEC.2016 04:38:58

Band Edge, CH High(N20 Mode / Chain 1)



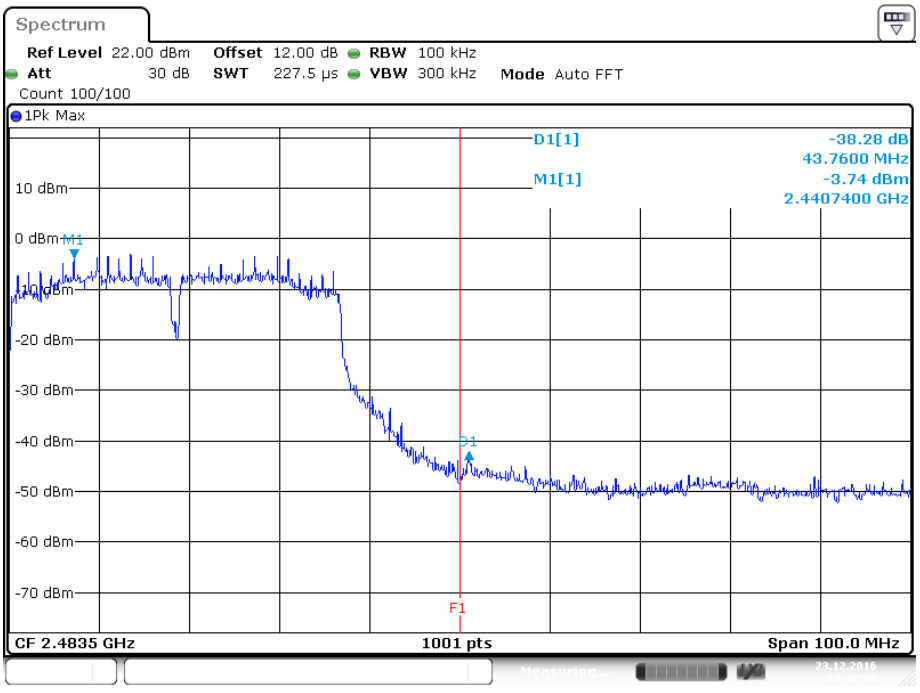
Date: 23.DEC.2016 04:46:26

Band Edge, CH low (N40 Mode / Chain 0)



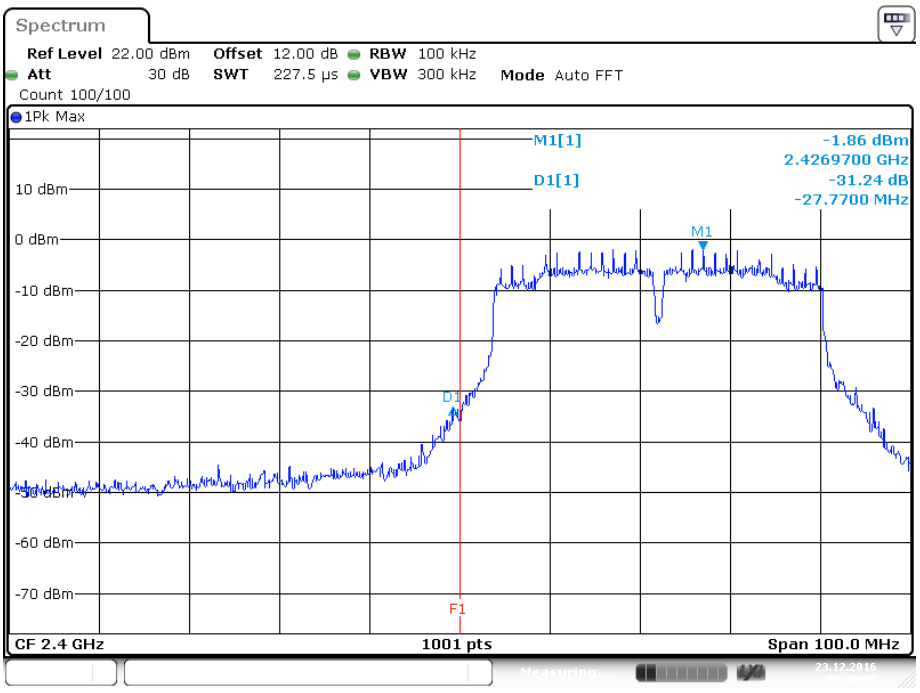
Date: 23.DEC.2016 04:41:33

Band Edge, CH High(N40 Mode / Chain 0)



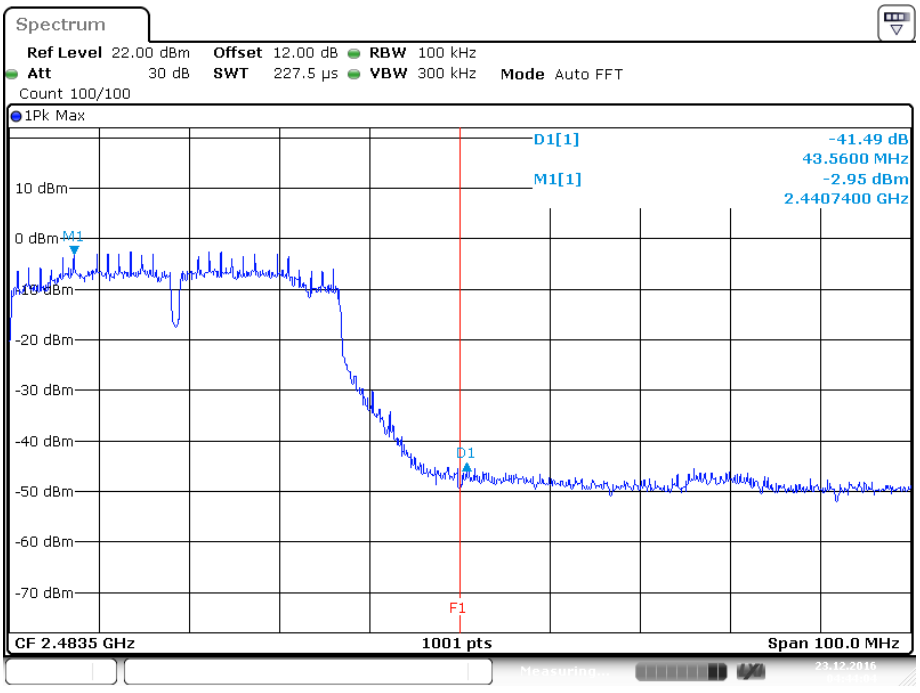
Date: 23.DEC.2016 04:42:59

Band Edge, CH low (N40 Mode / Chain 1)



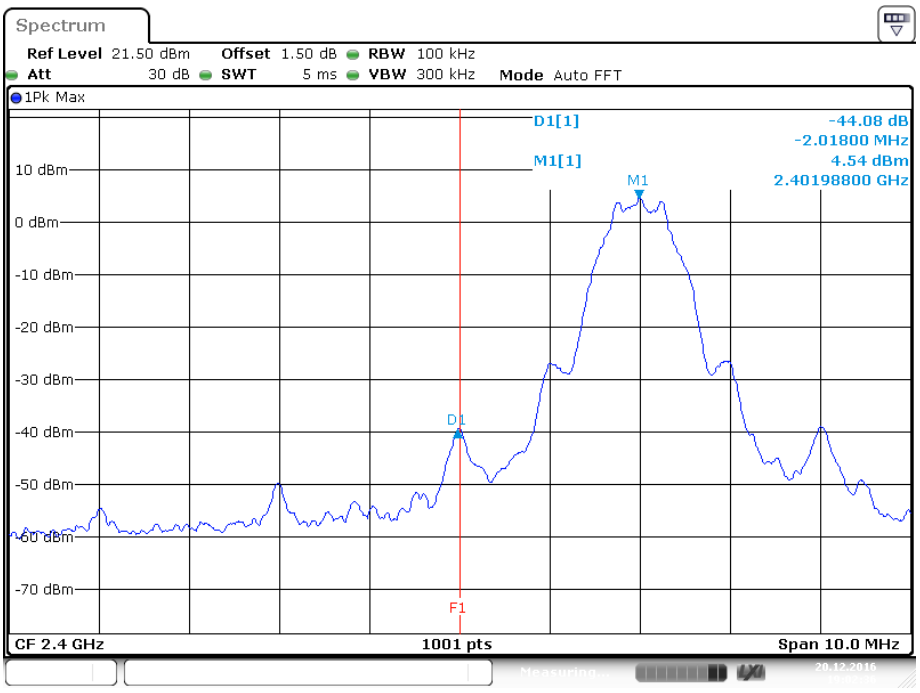
Date: 23.DEC.2016 04:40:07

Band Edge, CH High(N40 Mode / Chain 1)



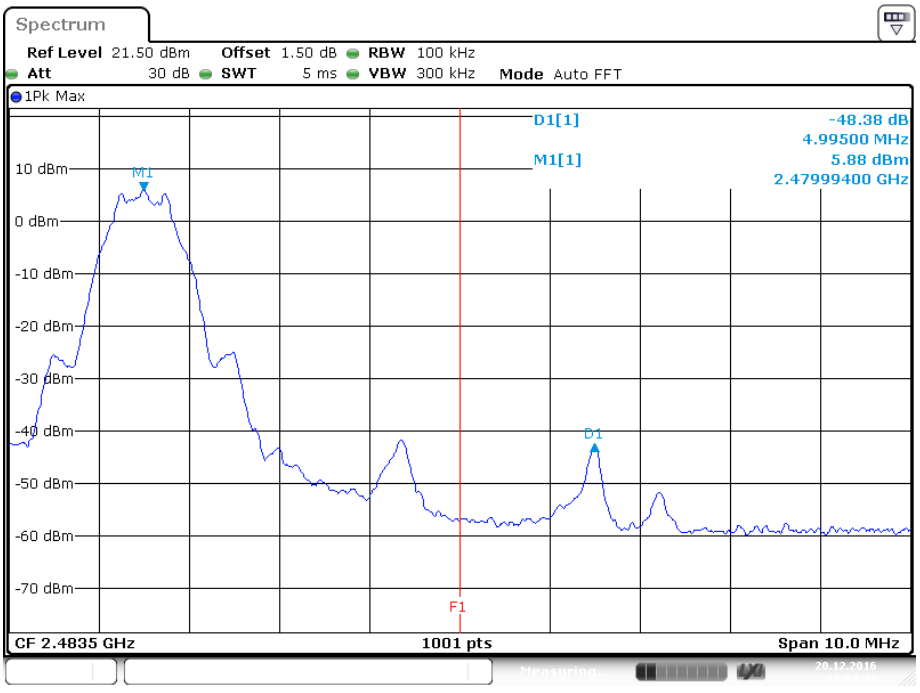
Date: 23.DEC.2016 04:44:05

Band Edge, CH low (BLE)



Date: 20.DEC.2016 19:02:36

Band Edge, CH High (BLE)



Date: 20.DEC.2016 19:04:48

11 FCC §15.247(e)– Power Spectral Density

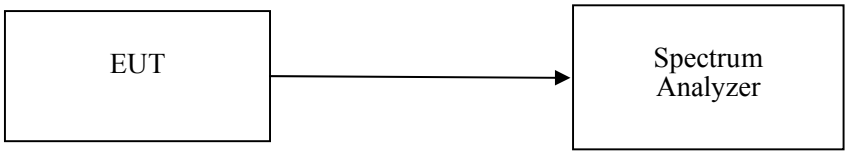
11.1 Applicable Standard

According to FCC §15.247(e).

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.

11.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signalfrom an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT andconnect its antenna terminal to measurement instrument via a low loss cable. Then set it to any onemeasured frequency within its operating range, and make sure the instrument is operated in its linearrange.
3. Adjust the center frequency of SA on any frequency be measured and set SA to 1.5MHz span mode.And then, set RBW and VBW of spectrum analyzer to proper value. (DTS)
4. Repeat above procedures until all frequencies measured were complete.



Test Equipment List and Details

Descriptions	Manufacturers	Models	Serial Numbers	Calibration Date	Calibration Due Date
Spectrum Analyzer	Rohde & Schwarz	FSV40	101203	2016/7/14	2017/7/13
Cable	WOKEN	SFL402	00100A1F6A192S	N.C.R	N.C.R

***Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Taiwan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

11.3 Test Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	55 %
ATM Pressure:	1010 hPa

The testing was performed by David Hsu on2016-20-20 to 2016-12-23.

11.4 Test Results

Test Mode: Transmitting

WIFI

Note: for 802.11n mode, per output power test, the SISO mode was the worst at each antenna chain, so only SISO mode was test for this item, and used to evaluate MIMO mode compliance.

Test Result: Compliant. Please refer to the following table and plots

Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)			Limit (MHz)	RESULT
		Chain 0	Chain 1	Total		
B Mode						
Low	2412	-9.22	-9.43	N/A	8	PASS
Mid	2437	-8.95	-9.53	N/A	8	PASS
High	2462	-9.08	-9.77	N/A	8	PASS
G Mode						
Low	2412	-14.10	-12.19	N/A	8	PASS
Mid	2437	-11.69	-11.67	N/A	8	PASS
High	2462	-15.98	-12.77	N/A	8	PASS
N20 Mode						
Low	2412	-12.63	-12.43	-9.52	6.79	PASS
Mid	2437	-11.91	-11.67	-8.78	6.79	PASS
High	2462	-13.57	-14.89	-11.19	6.79	PASS
N40 Mode						
Low	2422	-15.09	-15.12	-12.09	6.79	PASS
Mid	2437	-13.98	-14.09	-11.02	6.79	PASS
High	2452	-17.12	-17.54	-14.32	6.79	PASS

The device is a client device. the 2 antenna maximum antenna gain are 4.2dBi, and employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density (PSD) measurements on the devices:

Array Gain = 10 log(NANT/NSS) dB.

So:

Directional gain = GANT + Array Gain = 4.2+10*log(2) =7.21 dBi

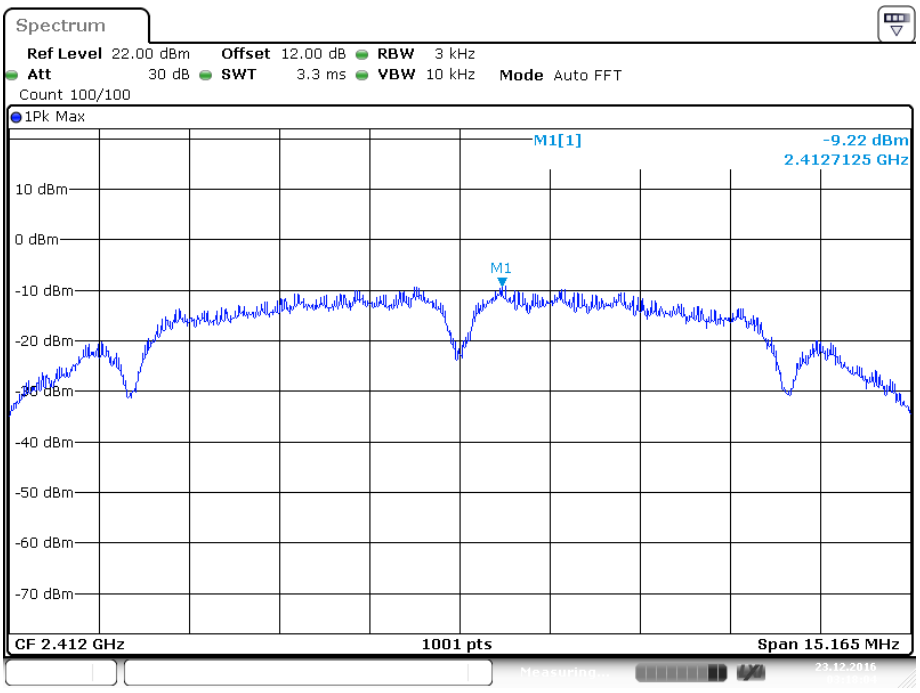
The Power density Limits was reduce 1.21dB

BLE

Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Result
Low	2402	-11.33	8	Compliance
Middle	2440	-10.34	8	Compliance
High	2480	-9.33	8	Compliance

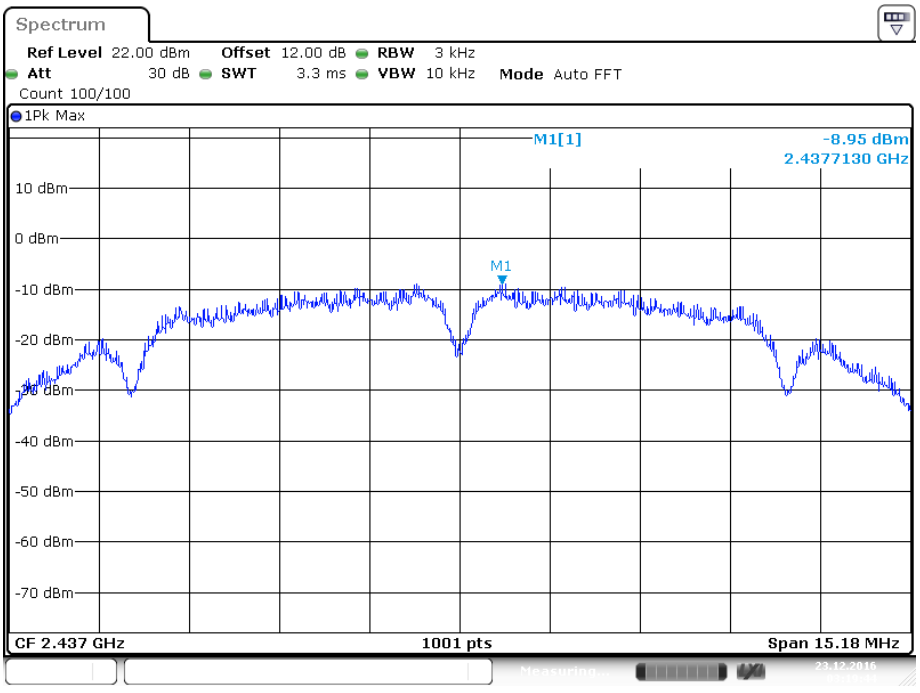
Please refer to the following plots

Low Channel (B Mode / Chain 0)



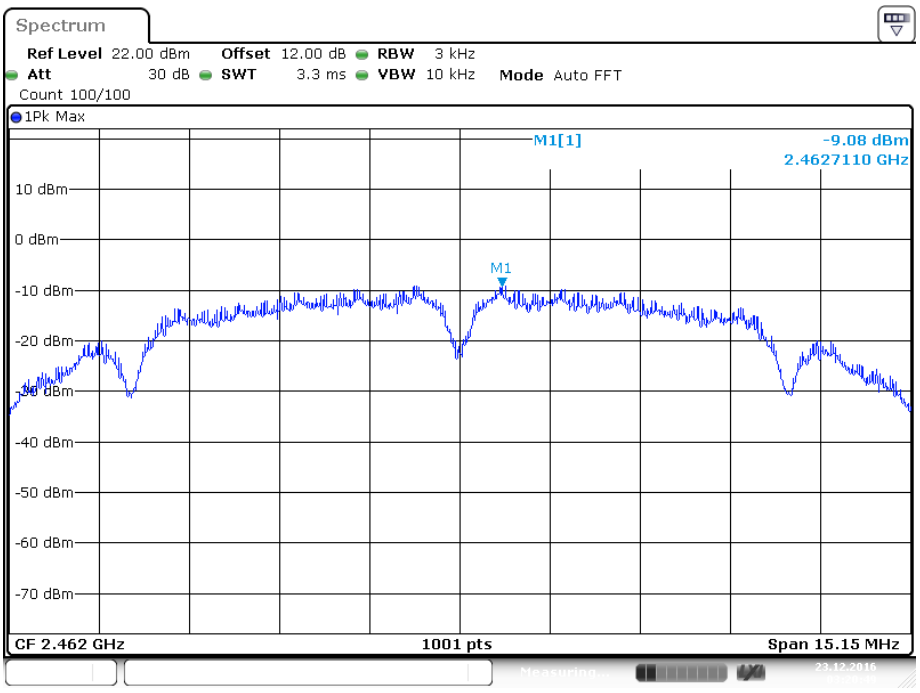
Date: 23.DEC.2016 03:18:04

Middle Channel (B Mode / Chain 0)



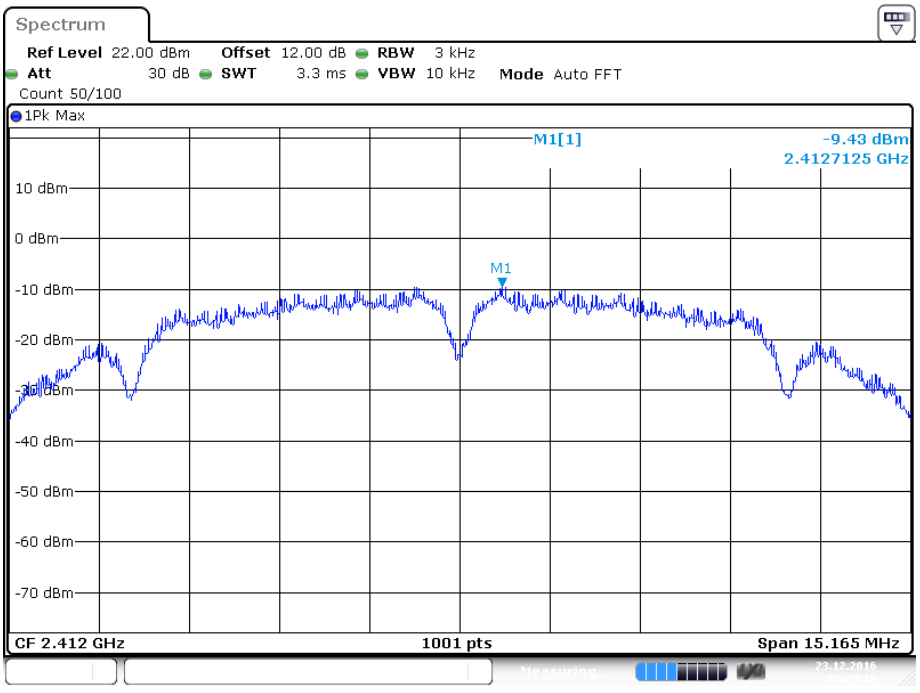
Date: 23.DEC.2016 03:19:45

High Channel (B Mode / Chain 0)



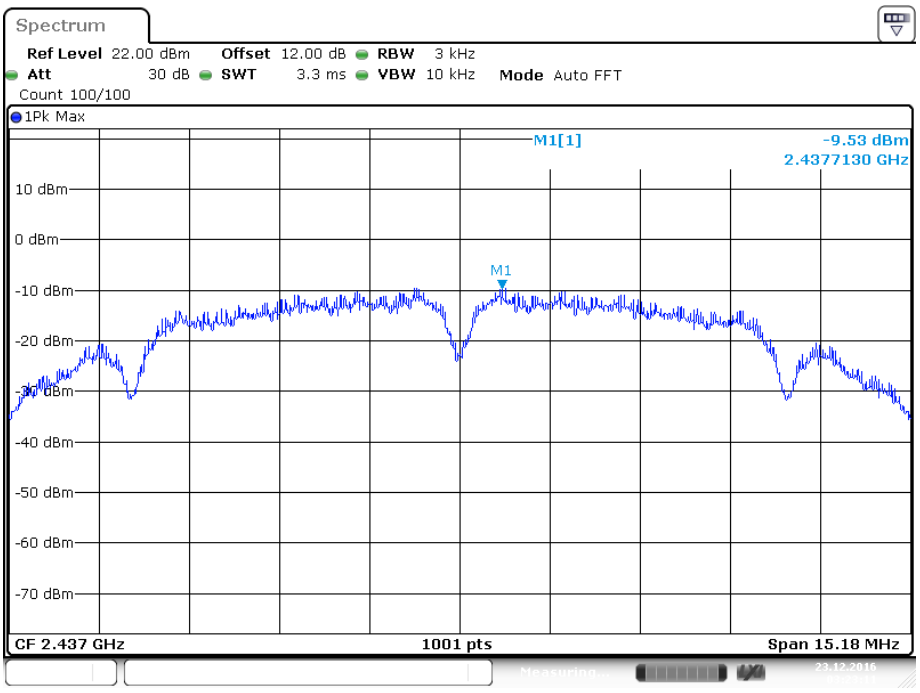
Date: 23.DEC.2016 03:20:49

Low Channel (B Mode / Chain 1)



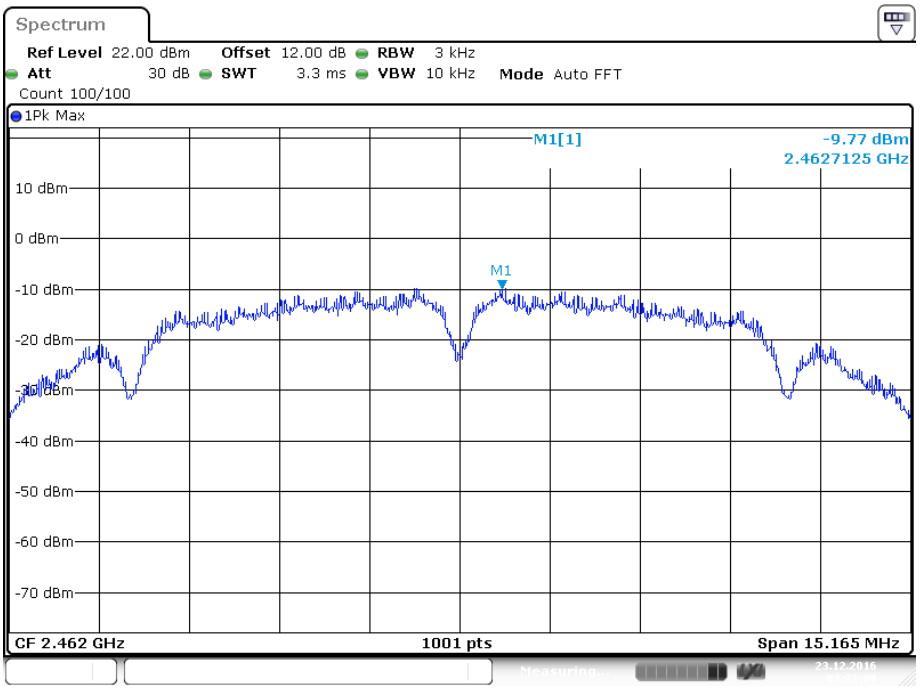
Date: 23.DEC.2016 03:24:16

Middle Channel (B Mode / Chain 1)



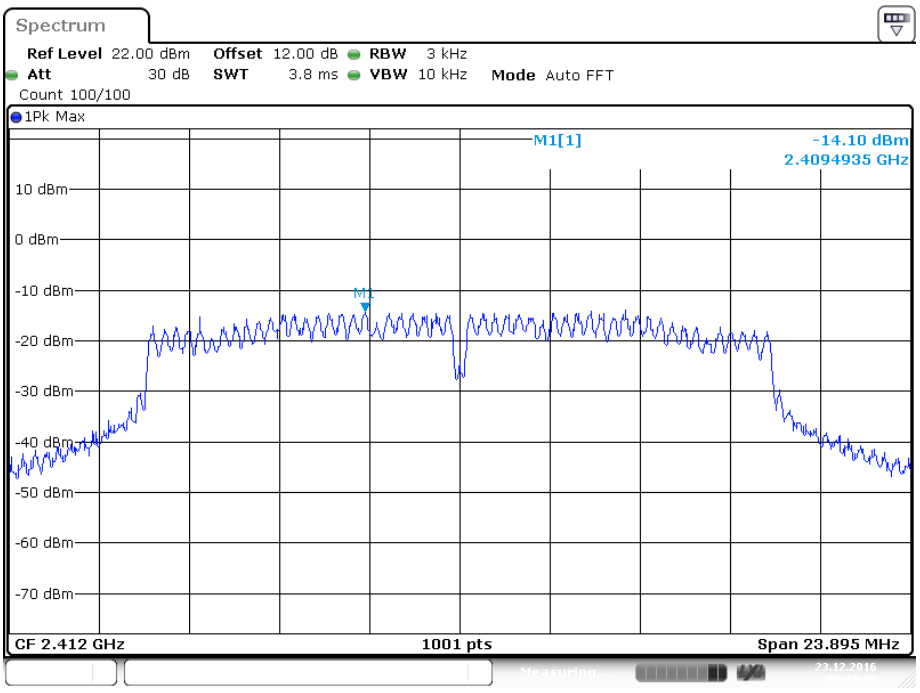
Date: 23.DEC.2016 03:23:11

High Channel (B Mode / Chain 1)



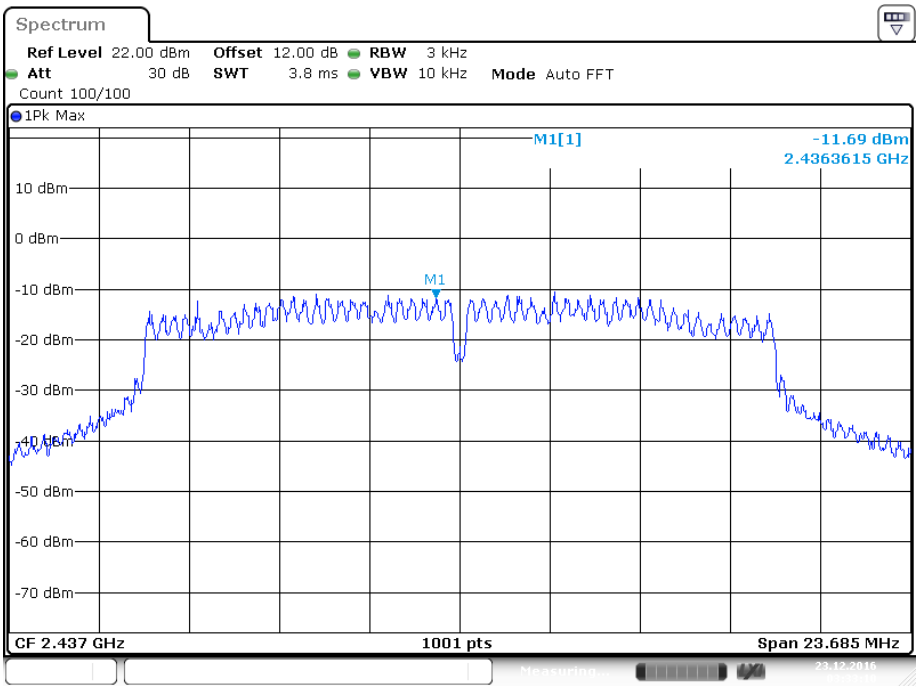
Date: 23.DEC.2016 03:22:10

Low Channel (G Mode / Chain 0)



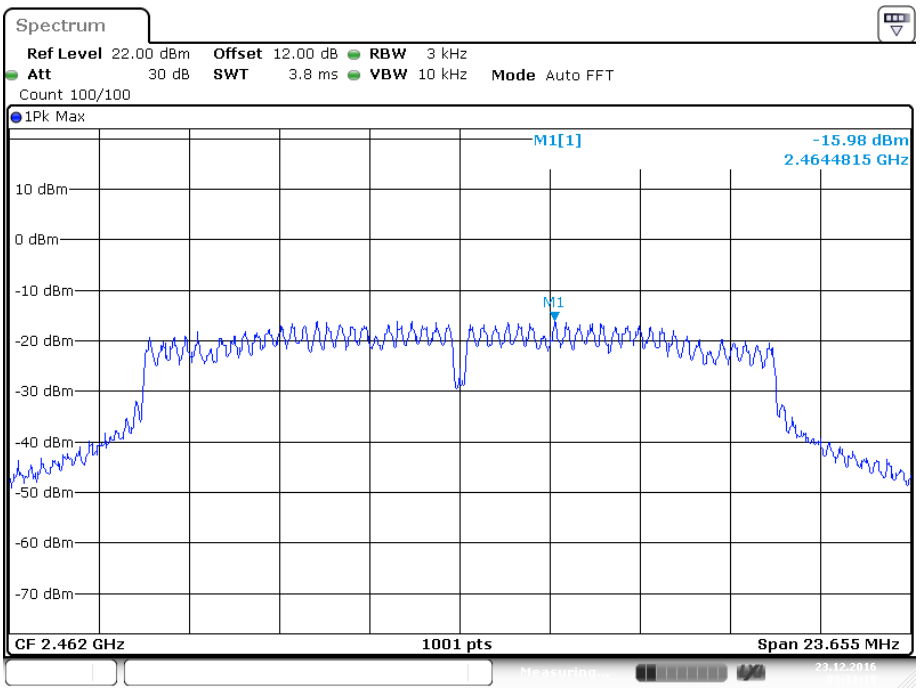
Date: 23.DEC.2016 03:34:24

Middle Channel (G Mode / Chain 0)



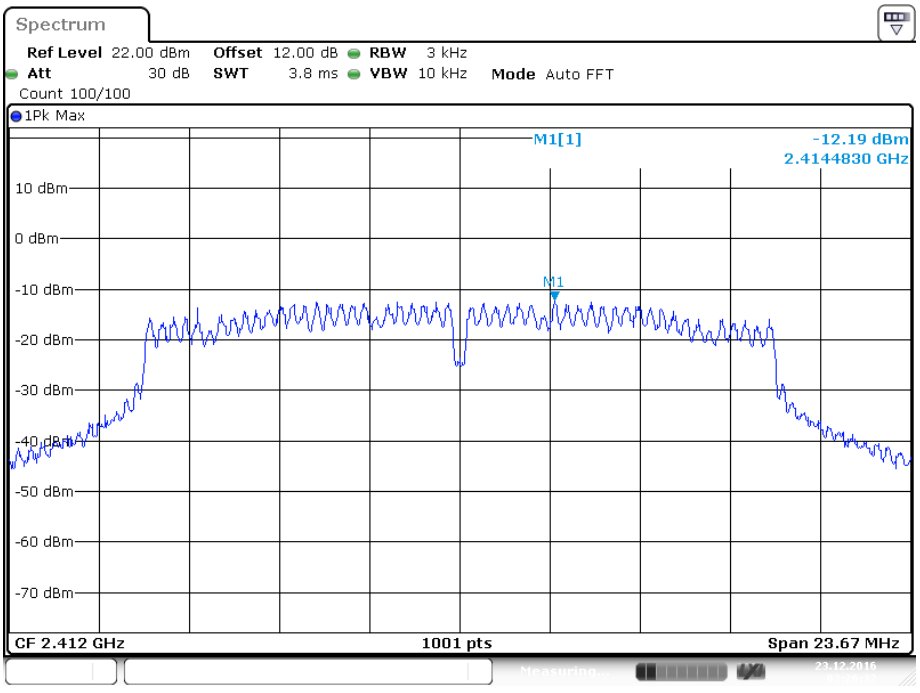
Date: 23.DEC.2016 03:33:11

High Channel (G Mode / Chain 0)



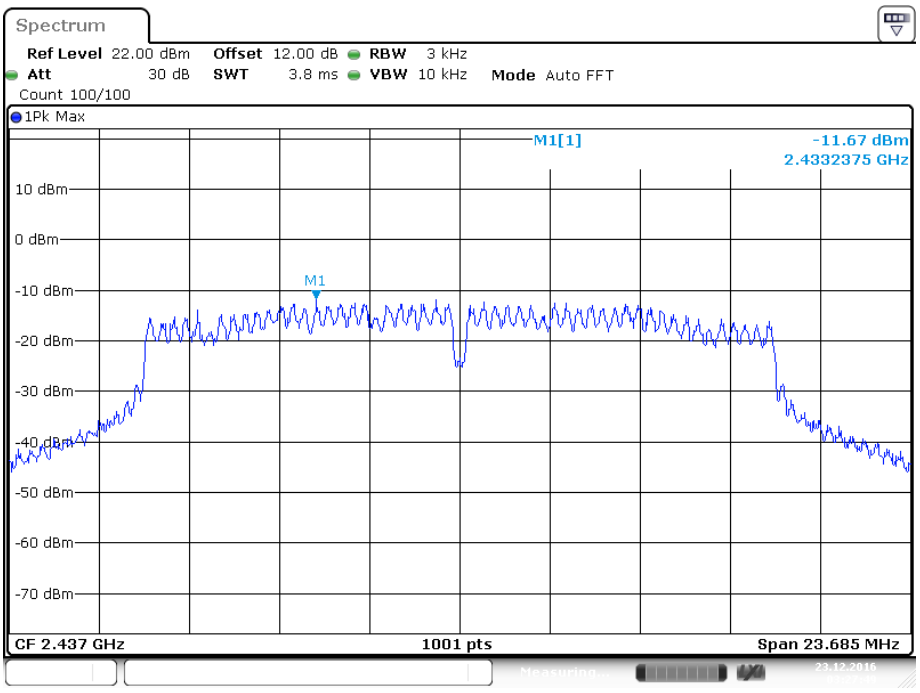
Date: 23.DEC.2016 03:31:15

Low Channel (G Mode / Chain 1)



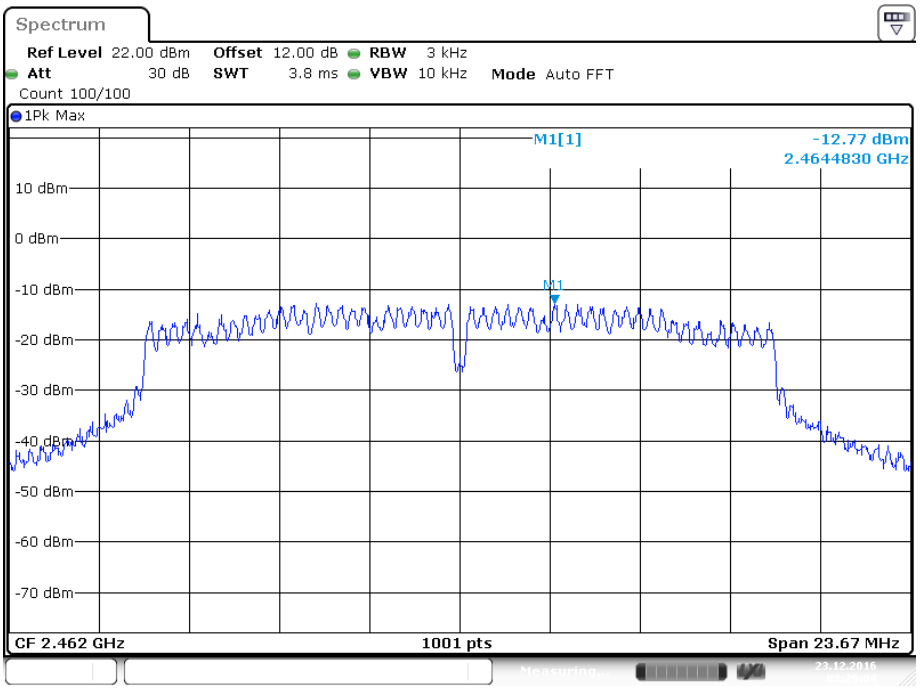
Date: 23.DEC.2016 03:26:32

Middle Channel (G Mode / Chain 1)



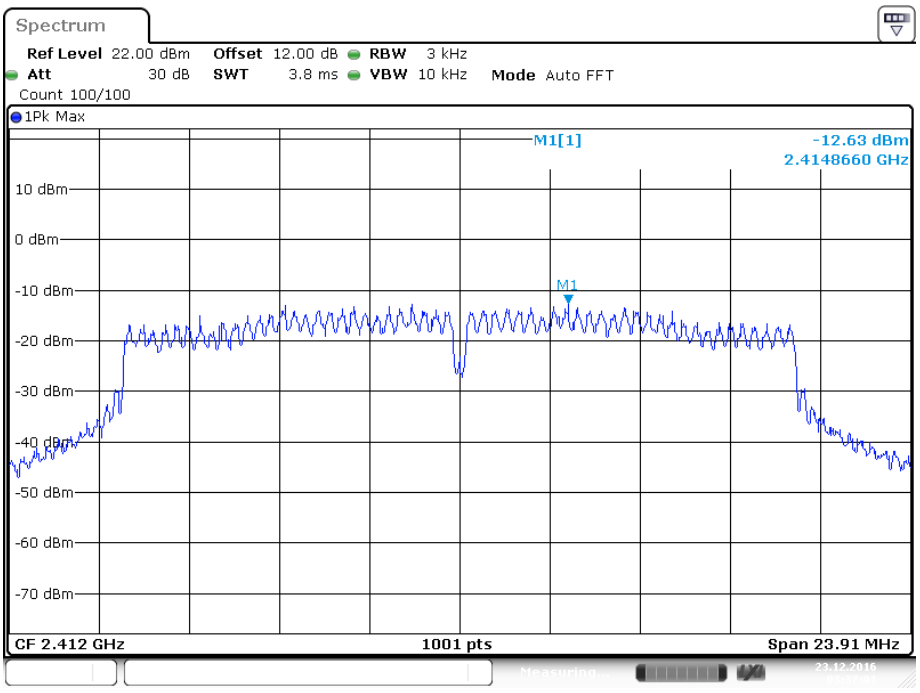
Date: 23.DEC.2016 03:27:49

High Channel (G Mode / Chain 1)



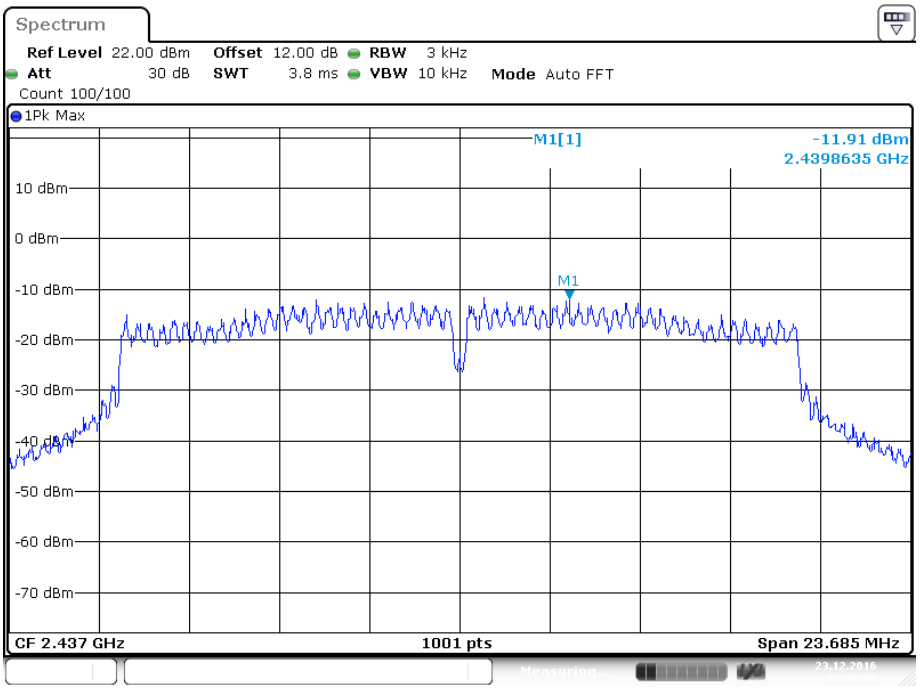
Date: 23.DEC.2016 03:29:04

Low Channel (N20 Mode / Chain 0)



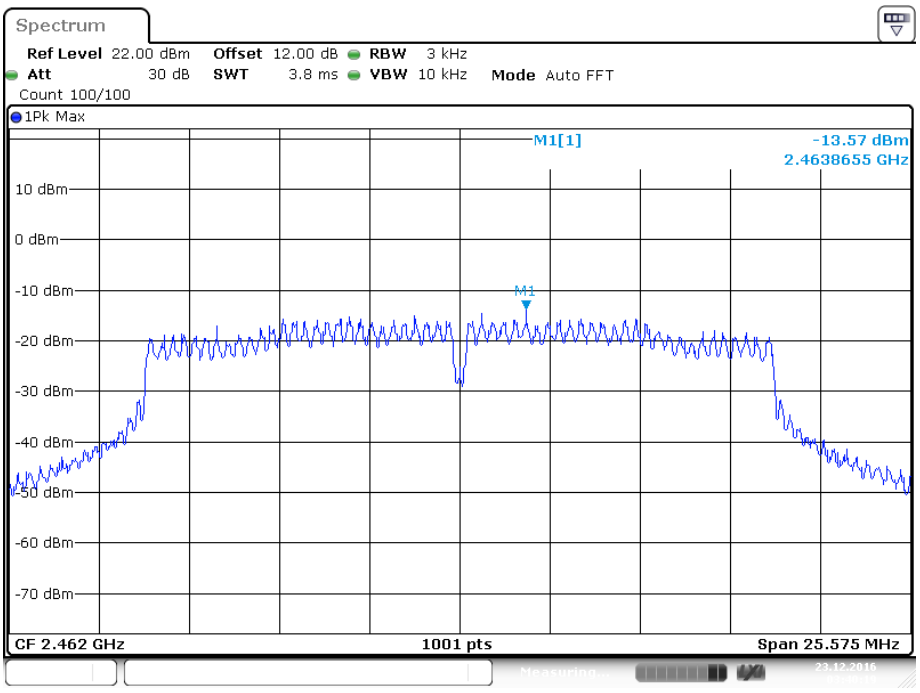
Date: 23.DEC.2016 03:37:02

Middle Channel (N20 Mode / Chain 0)



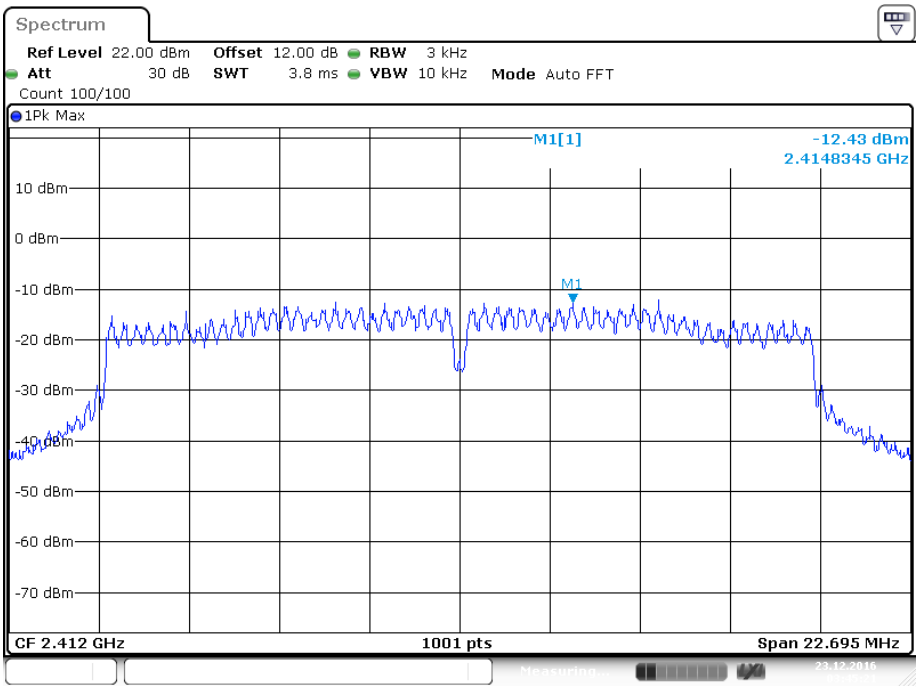
Date: 23.DEC.2016 03:38:35

High Channel (N20 Mode / Chain 0)



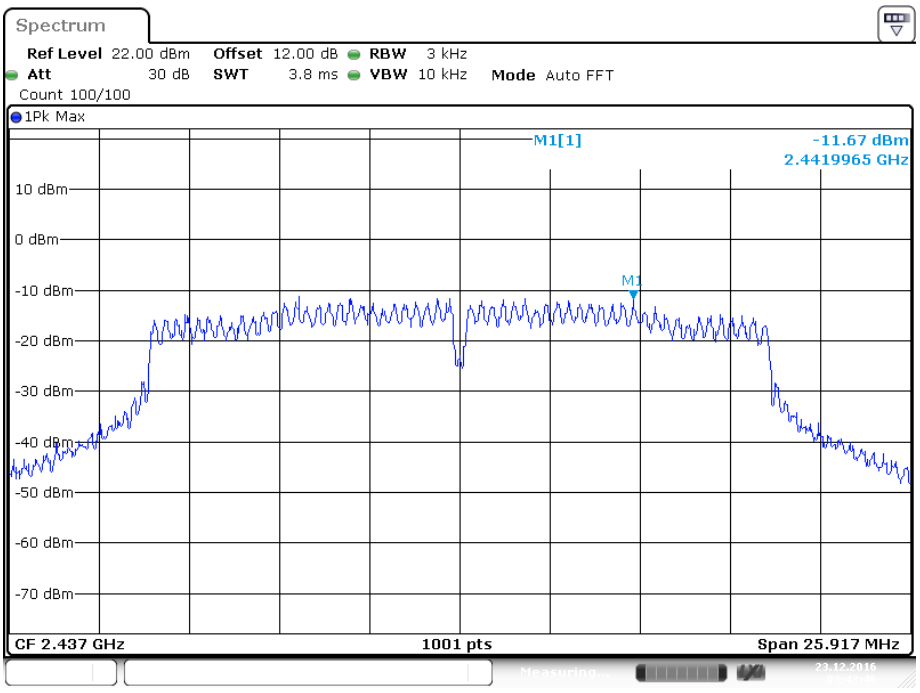
Date: 23.DEC.2016 03:40:20

Low Channel (N20 Mode / Chain 1)



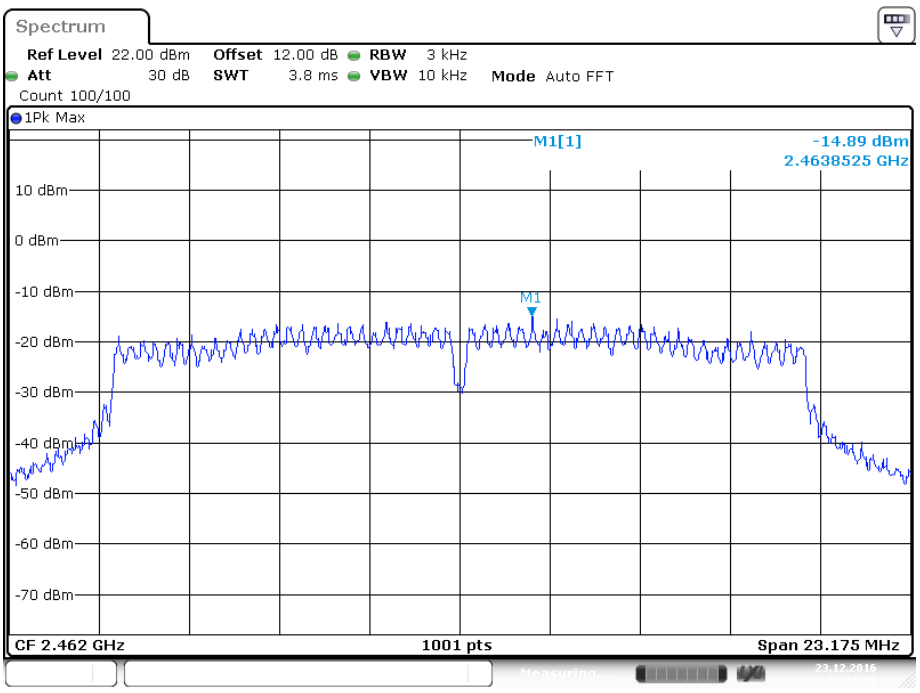
Date: 23.DEC.2016 03:45:22

Middle Channel (N20 Mode / Chain 1)



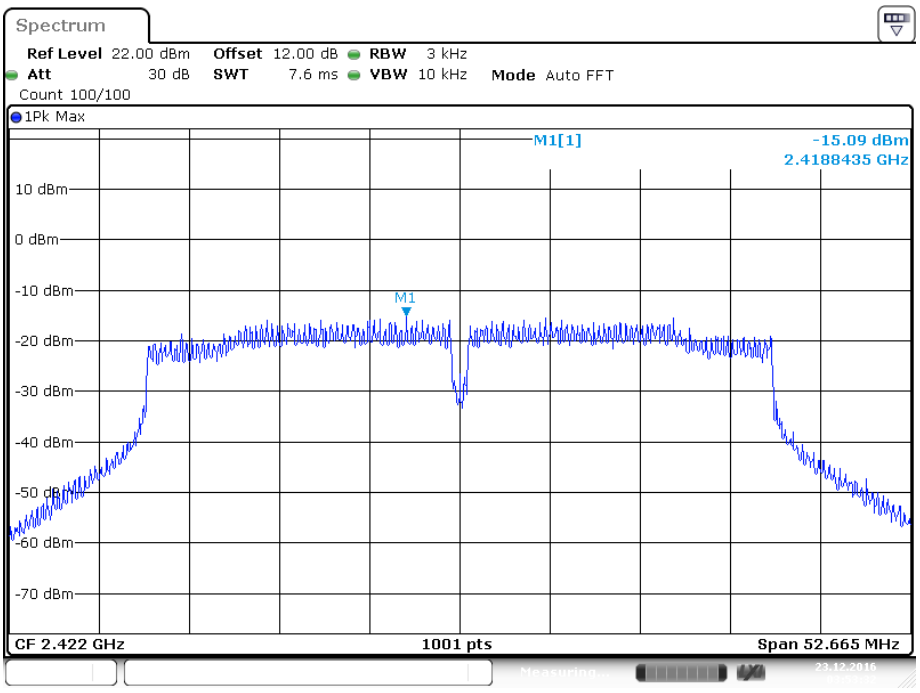
Date: 23.DEC.2016 03:43:46

High Channel (N20 Mode / Chain 1)



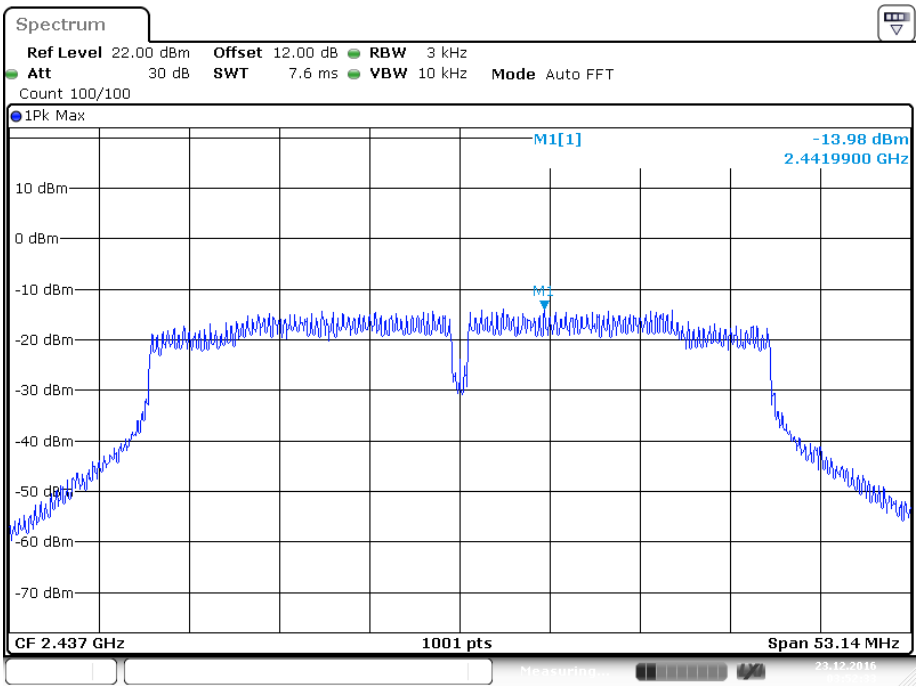
Date: 23.DEC.2016 03:41:31

Low Channel (N40 Mode / Chain 0)



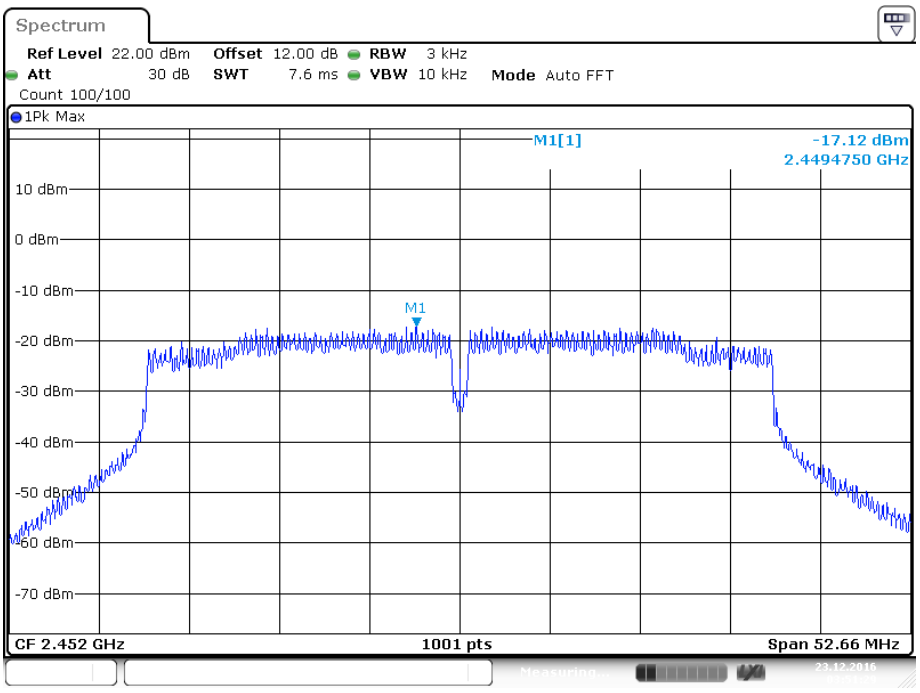
Date: 23.DEC.2016 03:53:33

Middle Channel (N40 Mode / Chain 0)



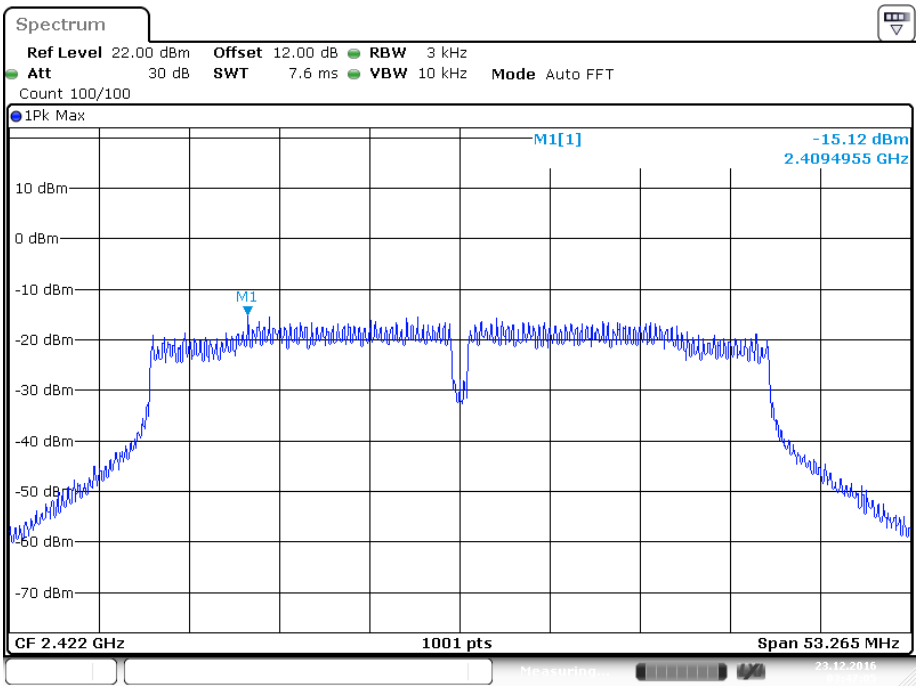
Date: 23.DEC.2016 03:52:33

High Channel (N40 Mode / Chain 0)



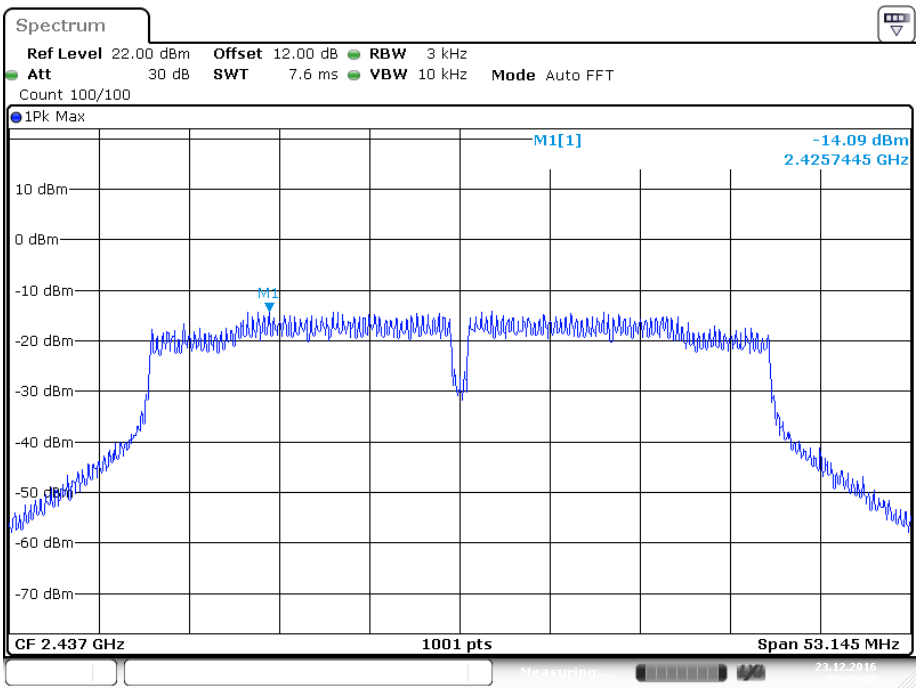
Date: 23.DEC.2016 03:51:30

Low Channel (N40 Mode / Chain 1)



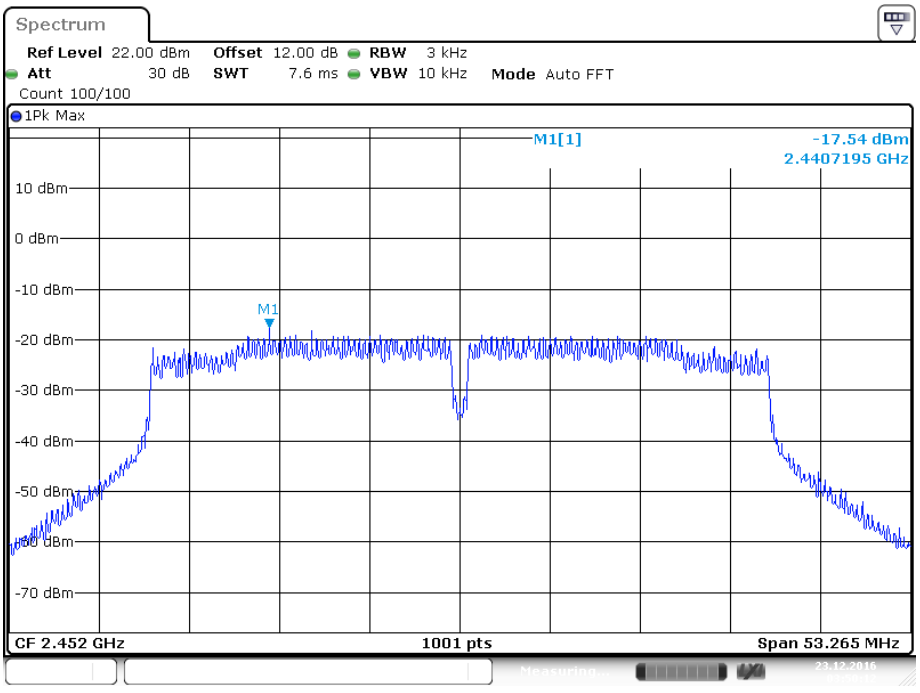
Date: 23.DEC.2016 03:47:05

Middle Channel (N40 Mode / Chain 1)



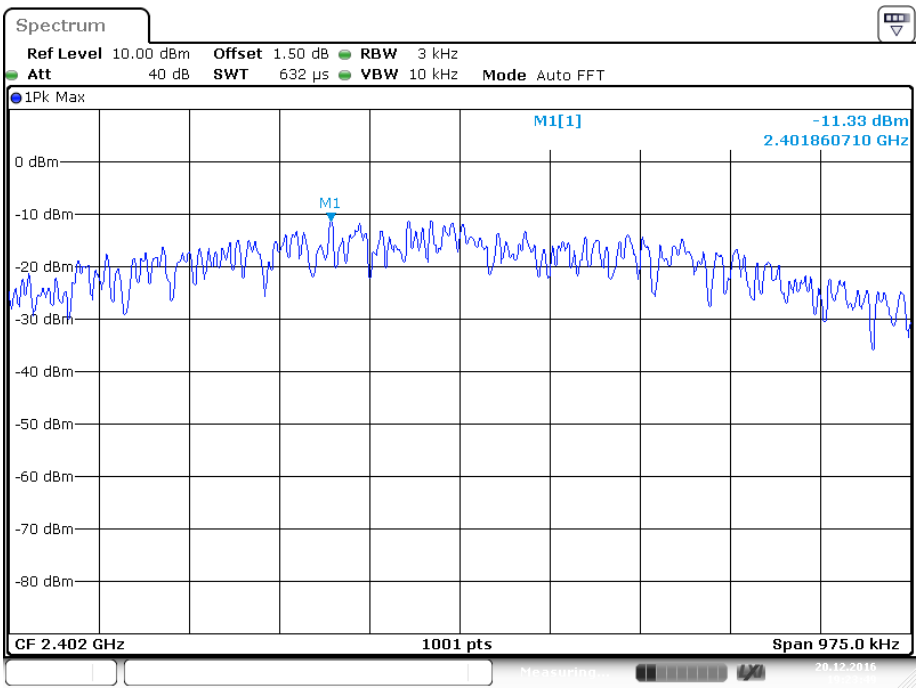
Date: 23.DEC.2016 03:49:01

High Channel (N40 Mode / Chain 1)



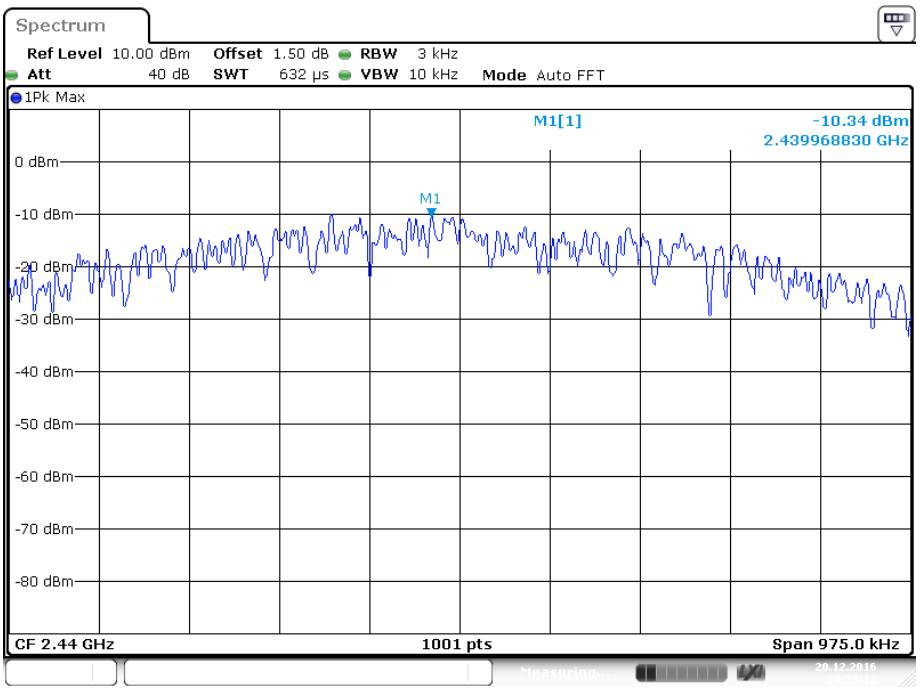
Date: 23.DEC.2016 03:50:13

Low Channel (BLE)



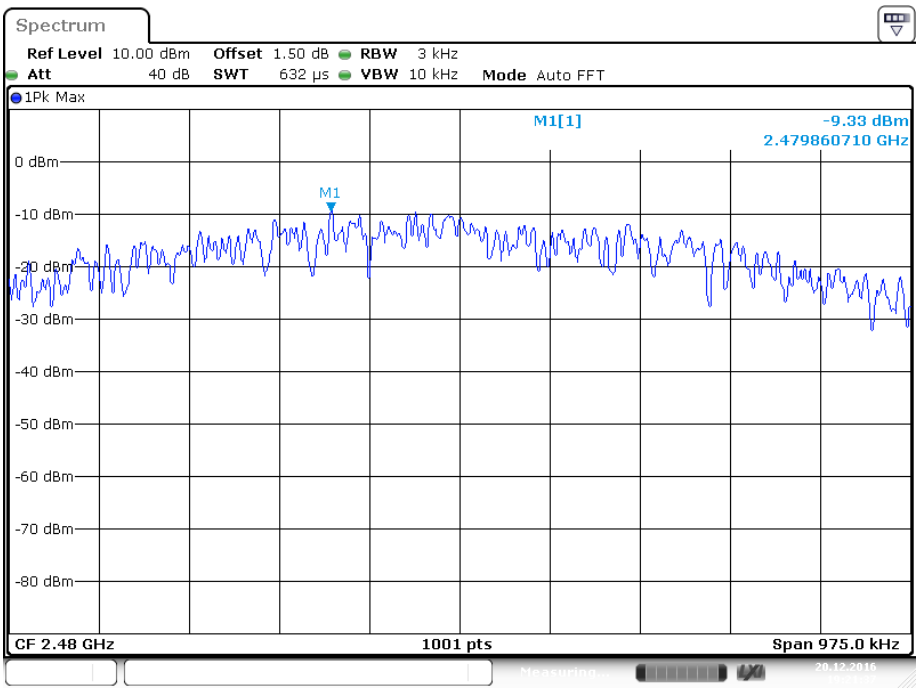
Date: 20.DEC.2016 19:23:49

Middle Channel (BLE)



Date: 20.DEC.2016 19:23:13

High Channel (BLE)



Date: 20.DEC.2016 19:21:37

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