TÜVRheinland®
Electronic Products and Services (EPS) B.V.

Test Report No.:	**12121201.fcc01**	*Page 1 of 263*	
Client:	**Intel Corporation** 100 Center Point Circle Suite 200 Columbia, SC 29210 USA		
Test Item:	**Digital Transmission System (DTS)** **Wireless Network Adapter Module**		
Identification:	**7260NGW**	*MAC address:*	**001500B6698F**
Project No.:	**12121201**	*Date of Receipt:*	**January 07, 2013**
Testing Location:	**TÜV Rheinland EPS B.V.** Eiberkamp 10 9351VT Leek		
Test Specification:	FCC 47 CFR Part 15, Subpart C, Section 15.247 (10-1-12 Edition) RSS-Gen (issue 3, December 2010) an RSS-210 (Issue 8, December 2010) ANSI C63.10:2009 KDB Publication No. 558074 D01: Measurement of Digital Transmission Systems Operating under Section 15.247 (10/4/12)		
Test Result:	*The test item **passed** the test specification(s).*		
Testing Laboratory:	**TÜV Rheinland EPS B.V.** Eiberkamp 10 9351 VT Leek		

Tested by:			*Reviewed by:*		
2013-03-22	R. van der Meer / Inspector		2013-03-22	O. Hoekstra / Reviewer	
Date	*Name/Position*	*Signature*	*Date*	*Name/Position*	*Signature*

Other Aspects:-.

Abbreviations: ***P(ass) = passed***
F(ail) = failed
N/A = not applicable
N/T = not tested

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The test results relate only to the item(s) tested.

TEST SUMMARY

5.1.1 VOLTAGE REQUIREMENTS
RESULT: PASS

5.1.2 ANTENNA REQUIREMENTS
RESULT: PASS

5.1.3 RESTRICTED BANDS OF OPERATION
RESULT: PASS

5.2.1 CONDUCTED MEASUREMENTS AT ANTENNA PORT
RESULT: PASS

5.2.2 6DB AND 99% BANDWIDTH
RESULT: PASS

5.2.3 PEAK POWER SPECTRAL DENSITY
RESULT: PASS

5.2.4 BAND EDGE CONDUCTED EMISSIONS
RESULT: Pass

5.2.5 RADIATED SPURIOUS EMISSIONS OF TRANSMITTER
RESULT: PASS

5.2.6 RADIATED SPURIOUS EMISSIONS OF TRANSMITTER IN RESTRICTED BANDS
RESULT: PASS

5.3.1 AC POWER LINE CONDUCTED EMISSION OF TRANSMITTER
RESULT: PASS

Contents

1. General Remarks

1.1 Complementary Materials

There is no attachment to this test report.

2. Test Sites

2.1 Test Facilities

The Federal Communications Commission and Industry Canada has reviewed the technical characteristics of the test facilities at TÜV Rheinland EPS B.V., located in Leek, 9351VT Eiberkamp 10, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948.

The description of the test facilities has been filed at the Office of the Federal Communications Commission under registration number 90828. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The description of the test facilities has been filed to Industry Canada under registration number 2932G-2. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

Normal test conditions:

Temperature (*) : +15°C to +35°C
Relative humidity(*) : 20 % to 75 %
Supply voltage : 120VAC/60Hz
Air pressure : 950 – 1050 hPa

When it was impracticable to carry out the tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests are stated separately.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Model Name	Inventory number	Calibration date (mm/yyyy)	Calibration due date (mm/yyyy)
For Antenna Port Conducted Emission					
Spectrum Analyzer	Rohde & Schwarz	FSP40	99538	11/2012	11/2013
Temperature-Humiditymeter	Extech	SD500	99857	02/2012	02/2014
Spectrum Analyzer	Rohde & Schwarz	FSV	99733	05/2012	05/2013
For Radiated Emission					
Measurement Receiver	Rohde & Schwarz	ESCI	99699	03-26/2012	03-26/2013
RF Cable S-AR	Gigalink	APG0500	99858	02/2013	02/2014
Controller	Maturo	SCU/088/ 8090811	99861	N/A	N/A
Controller	EMCS	DOC202	99608	N/A	N/A
Controller	Heinrich Deisel	4630-100	99107	N/A	N/A
Test facility	Comtest	FCC listed: 90828	99580	12/2011	12/2014
Spectrum Analyzer	Rohde & Schwarz	FSP40	99538	11/2012	11/2013
Controller	EMCS	DOC202	99608	N/A	N/A
Antenna mast	EMCS	AP-4702C	99609	N/A	N/A
Temperature-Humiditymeter	Extech	SD500	99855	02/2012	02/2014
Guidehorn 1-18 GHz	EMCO	3115	12484	04/2012	04/2013
Guidehorn 18-40 GHz	EMCO	RA42-K-F-4B-C	12488	04/2012	04/2013
Biconilog Testantenna	Chase	CBL 6111B	15633	01/2013	01/2014
2.4 GHz bandreject filter	BSC	XN-1783	14450	N/A	N/A
Bandpass filter 4-10 GHz	Reactel	7AS-7G-6G-511	99076	N/A	N/A
Bandpass filter 10-26 GHz	Reactel	9HS-10G/26.5G-S11	99136	N/A	N/A
Preamplifier 0.5 - 18 GHz	Miteq	AMF-5D-005180-28-13p	99596	N/A	N/A
Filterbox	EMCS	RFS06S	99606	10/2012	10/2013

Conformance of the used measurement and test equipment with the requirements of ISO/IEC 17025:2005 has been confirmed before testing.

2.3 Measurement Uncertainty

Table 2: Emission Measurement Uncertainty

Measurement Type	Frequency	Uncertainty
Antenna Port Conducted Emission	< 1GHz	±0.5dB
	> 1GHz	±0.7dB
Radiated Emission	150kHz - 30MHz	±5.0dB
	30MHz - 1GHz	±5.0dB
	> 1GHz	±5.5dB

3. General Product Information

3.1 Product Function and Intended Use

The brand Intel model 7260NGW, hereafter referred to as EUT, is a PCIe small form factor IEEE 802.11a/b/g/n/ac + Bluetooth wireless network adapter module. The module will support MIMO (2x2) for 802.11n/ac modes and MISO (1x2) for 802.11a/b/g modes and utilizes DSSS and OFDM modulation techniques. Bluetooth operates with basic, EDR and BLE modes as SISO (1x1). When Bluetooth is operational WiFi operates as SISO (1x1).

The module is sold under two different FCC ID numbers under the same model number (see table below). The FCC ID ending in "U" is intended to allow user installation conditions and host systems must be provided with a BiOS locking feature to provide mutual authentication between module and host devices.

Brand	Model Number	Description	FCC/IC IDs
Intel	7260NGW	802.11a/b/g/n/ac + BT wireless network adapter module	PD97260NG PD97260NGU 1000M-7260NG

The content of this report and measurement results have not been changed other than the way of presenting the data.

3.2 System Details

Details and an overview of the system and all of its components, as it has been tested, may be found below.

EUT	:	Wireless Network Adapter Module - Digital Transmission System (DTS)
Manufacturer	:	Intel Corporation
Brand	:	Intel
Model(s)	:	7260NGW
MAC address	:	001500B6698F
Voltage input rating	:	+3.3 V
Voltage output rating	:	--
Current input rating	:	--
Antenna	:	AUX3
Operating frequency	:	2412MHz-2462MHz, 5180MHz-5320MHz, 5500MHz-5700MHz, 5745MHz-5825MHz and 2402MHz-2480MHz.
Modulation	:	DSSS and OFDM
Remarks	:	n.a.

Table 3: Interfaces present on the EUT

No.	Port	From	To	Remarks
1.	Mains	Mains	Laptop (AUX1)	Through a AC/DC power supply
2.	Mains	Mains	Test jig (AUX2)	Through a AC/DC power supply
3.	Data com.	Laptop USB	Fixture USB	--
4.	Antenna port	EUT	Reference antennas (AUX3)	--

3.3 Countermeasures to achieve EMC Compliance

No additional measures were employed to achieve compliance.

WiFi 2.4 GHz (802.11b/g/n20/n40)

4. Test Set-up and Operation Modes

4.1 Test Methodology

The test methodology used is based on the requirements of RSS-GEN, RSS-210, 47 CFR Part 15, Sections 15.31, 15.33, 15.35, 15.205, 15.207, 15.209, 15.247 and ANSI C63.10:2009

KDB Publication No. 558074 D01: Measurement of Digital Transmission Systems Operating under Section 15.247.

The test methods, which have been used, are based on ANSI C63.10-2009.

For details, see under each test item.

4.2 Operation Modes

Modulation	Duty cycle	Antenna	Test frequencies (MHz)					
			Lowest	Power setting	Middle	Power setting	Highest	Power setting
1 Mb DSSS	0.99	1	2412	15.0	2437	15.0	2462	15.5
1 Mb DSSS	0.98	2	2412	17.5	2437	17.0	2462	17.0
6 Mb OFDM	0.99	1	2412	12.0	2437	17.5	2462	14.0
6 Mb OFDM	0.92	2	2412	14.0	2437	19.0	2462	14.5
HT4 - 20 MHz	0.99	1	2412	12.0	2437	18.5	2462	13.5
HT4 - 20 MHz	0.99	2	2412	13.5	2437	19.0	2462	14.5
HT8 - 20 MHz	0.98	1+2	2412	10.5/10.5	2437	11.0/11.0	2462	9.5/9.5
HT4 - 40 MHz	0.85	1	2422	9.5	2437	18.5	2452	13.0
HT4 - 40 MHz	0.85	2	2422	12.0	2437	19.0	2452	14.5/10.0
HT8 - 40 MHz	0.80	1+2	2422	6.5/11.0	2437	19.0/11.0	2452	10.0

Testing was performed at the lowest operating frequency, at the operating frequency in the middle of the specified frequency band and at the highest operating frequency. These operation modes were selected after review of the capabilities and characteristics of the EUT.
Antenna ports are also referred to as Chain A and Chain B, where chain A refers to Antenna-port 2 and Chain B refers to Antenna-port 1.
The data rates of 1Mb/s for 802.11b, 6Mb/s for 802.11g, HT4 (SISO)/HT8 (MIMO) for 802.11n20 and n40 were selected based on preliminary testing that identified those rates corresponding to the worst cases for output power and band edge levels at restricted bands.

The test software (see section 4.4) was used to define the following two operational modes of the EUT:

- Operational mode 1: Continuous transmit a data pattern with a duty cycle less than 100%.
- Operational mode 2: Continuous receive.

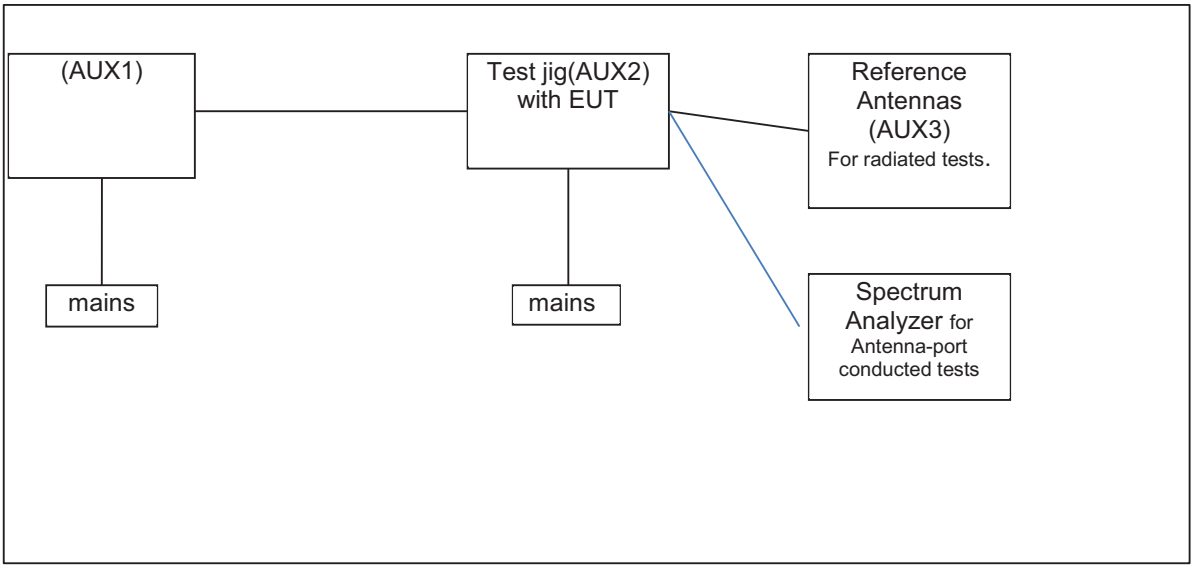
4.3 Physical Configuration for Testing

The EUT was installed into a test-fixture that interfaced to a laptop computer and dc power supply. The laptop computer was used to configure the EUT to continuously transmit at a specified output power and channel or continuously receive on the channel as specified in the testdata. See section 4.5 for Auxiliary details.

The EUT was tested on a stand-alone basis (only attached to the test jig) and the test system was configured in a typical fashion (as a customer would normally use it).

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.10-2009.

Figure 1: Test Setup Diagram



Notes:

For more details, refer to the document: Test Set-Up Photographs document.

4.4 Test Software

A continuous transmit or receive mode could be initiated by using test software as supplied by Intel Corporation. The test software was used to define various different operational modes of the EUT for the purpose of compliance testing. The version of the test software, as supplied by Intel Corporation and used during all tests is:

Test software : DRTU 1.6.0-0510
Driver : 16.0.0.17

This software was running on a laptop computer (AUX1). It was used to enable the test operation modes listed in section 4.2 as appropriate.

4.5 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

1. AUX1
   - Product: Laptop Computer
   - Brand: Lenovo
   - Model: 9456-HTG
   - Serial Number: L3-BF847 07/02
   - Remark: property applicant, host for testsoftware and AUX2

2. AUX2
   - Product: Test Jig
   - Brand: Intel
   - Model: NGFF Extension Rev. 01
   - Rated Voltage: 3.3 Vdc
   - Antenna: Internal, integrated on the PCB
   - Remarks: used for Antenna-port conducted tests

3. AUX3
   - Product: Reference antennas
   - Manufacturer: SkyCross Electronics (Shenzen) Co.,Ltd
   - Brand: SkyCross Electronics (Shenzen) Co.,Ltd
   - Gain at 2G4: 3.0 dBi (declared by applicant)
   - Remarks: used for radiated tests

5. Test Results

5.1 Technical Requirements

5.1.1 Voltage Requirements

RESULT: PASS

Requirements:

FCC 15.31(e)

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

Verdict:

The EUT has an internal voltage regulator to supply the RF circuit. Hence it complies with the power supply requirements.

5.1.2 Antenna Requirements

RESULT: PASS

Requirements:

FCC 15.203 and IC RSS-Gen section 7.1.2

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Verdict:

The EUT has two non standard PIFA antenna connectors which complies with the requirements.

5.1.3 Restricted Bands of Operation

RESULT: PASS

Requirements:

FCC 15.205 and IC RSS-Gen section 7.2.2

Only spurious emissions are permitted in any of the restricted frequency bands, unless otherwise specified.

Verdict:

The EUT operation frequency range is 2412 MHz - 2462 MHz. Therefore only spurious emissions may be found in the restricted bands of operation and the EUT complies with the restricted frequency band requirement.

5.2 Conducted Measurements at Antenna Port

5.2.1 Conducted Output Power

RESULT: PASS

Date of testing: 2013-01-14 & 2013-03-15

Requirements:

FCC 15.247(b)(3)

For systems using digital modulation in the 2400-2483.5 MHz band, the maximum peak output power is 1W (+30dBm).
RSS-Gen: the e.i.r.p. shall not exceed 4 W (36 dBm).

Test procedure:

ANSI C63.10:2009
KDB Publication No. 558074 D01: Measurement of Digital Transmission Systems Operating under Section 15.247.

The Peak Conducted Output Power was measured using the channel integration method according to option 2 in KDB 558074 D01.

The maximum peak output power (conducted) was measured at the antenna connector with a spectrum analyzer. The final measurement takes into account the loss generated by all the involved cables.

In the measure-and-sum approach for MIMO mode, the conducted emission level (*e.g.,* transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the EUT. Summing is performed in linear power units (mW—not dBm).

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power. For MIMO mode, the Guidance on directional Gain calculations according to the *Guidance for Emission Testing of Transmitters with Multiple Outputs in the Same Band 662911 D01 Multiple Transmitter Output v01r02 dated 9/26/2012* was used.
The number of transmit antennas (NANT) are 2 and the number of spatial streams (Nss) are 2 and therefore the Array Gain is 0 dB.

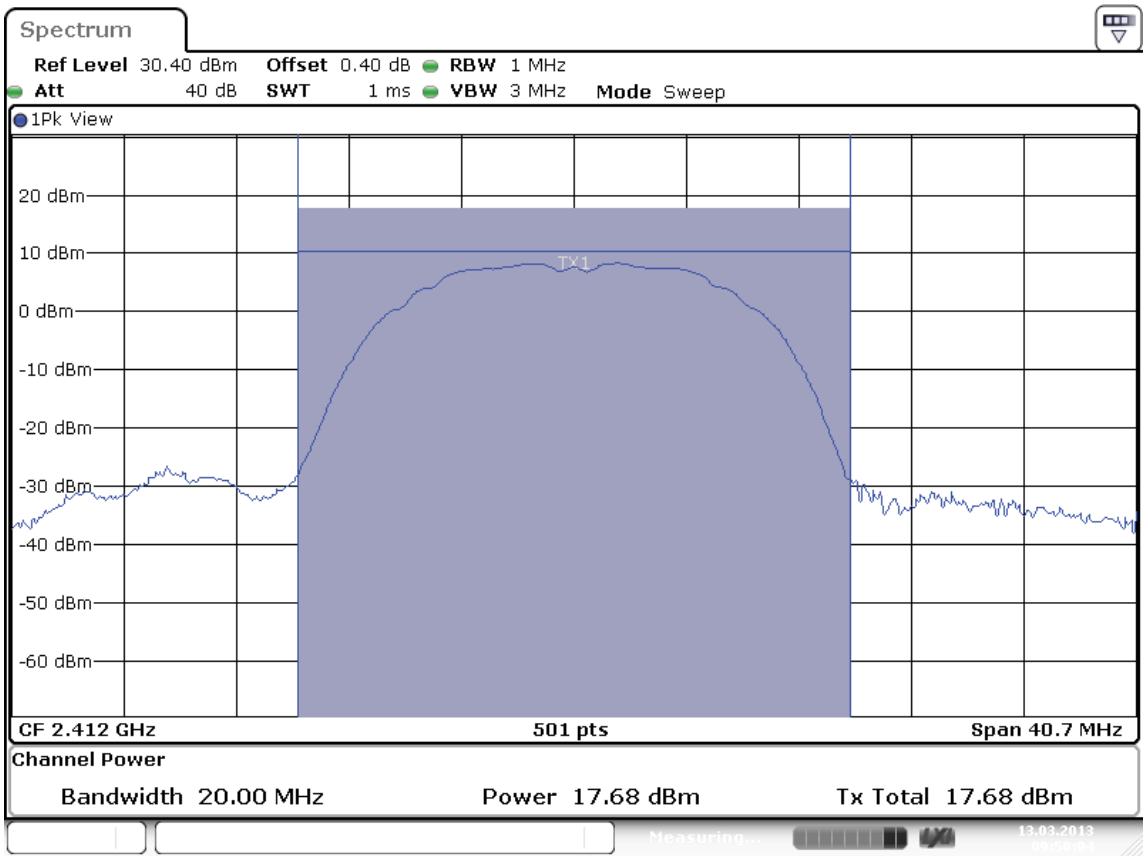
Notes: mW = 10 ^ (dBm/10)
dBm = 10 x log(mW)

plots : Peak power plots,
Figures 1a, 1b and 1c, through 10a,10b,10c showing plots of the Peak Power outputs, correction factors included in the reading.

Conducted Output Power

Operation mode: 1Mb DSSS, Antenna 1

Freq-uency [MHz]	Output Power [dBm]	Output Power [mW]	Limit [dBm]	Limit [mW]	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Plot number
2412	17.7	58.9	+30	1000	3.0	20.7	117.5	1a
2437	17.7	58.9	+30	1000	3.0	20.7	117.5	1b
2462	17.6	57.5	+30	1000	3.0	20.6	114.8	1c



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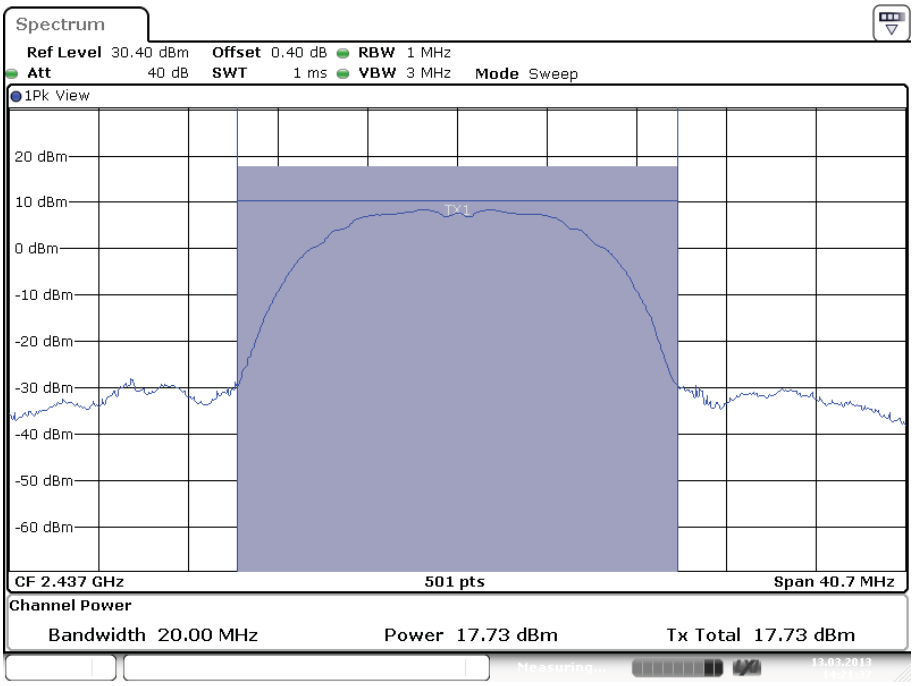
Plot 1a



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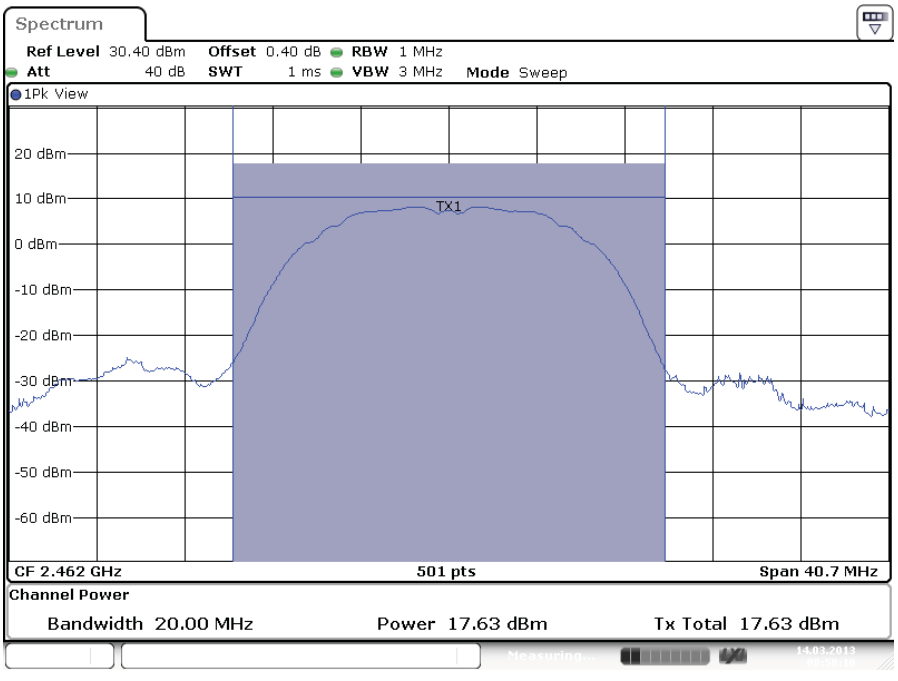
Plot 1b

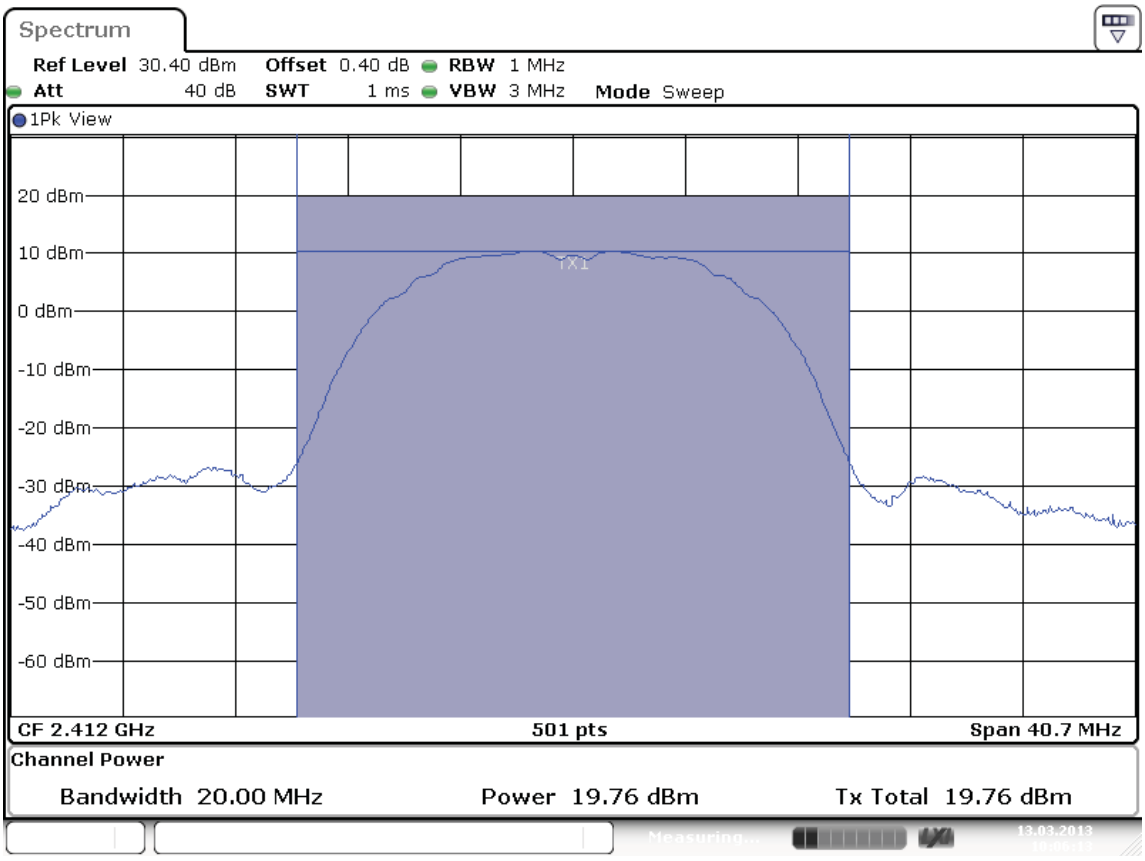


Date: 14.MAR.2013 08:58:10

Plot 1c

Operation mode: 1Mb DSSS, Antenna 2

Frequency [MHz]	Output Power [dBm]	Output Power [mW]	Limit [dBm]	Limit [mW]	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Plot number
2412	19.8	95.5	+30	1000	3.0	22.8	190.5	2a
2437	19.6	91.2	+30	1000	3.0	22.6	182.0	2b
2462	19.2	8.32	+30	1000	3.0	22.2	166.0	2c



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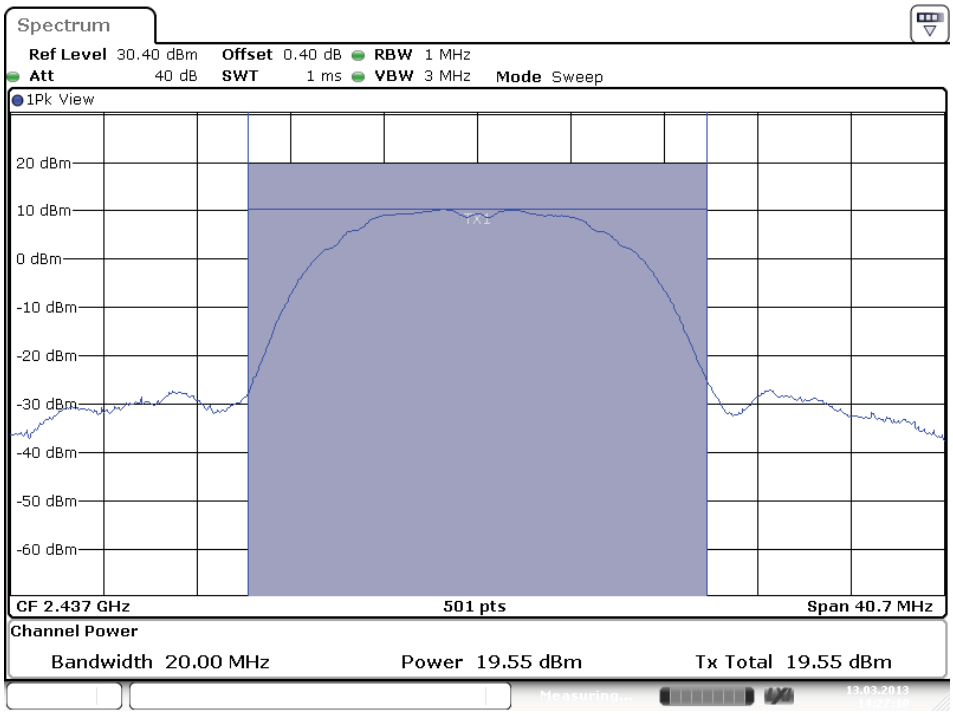
Plot 2a



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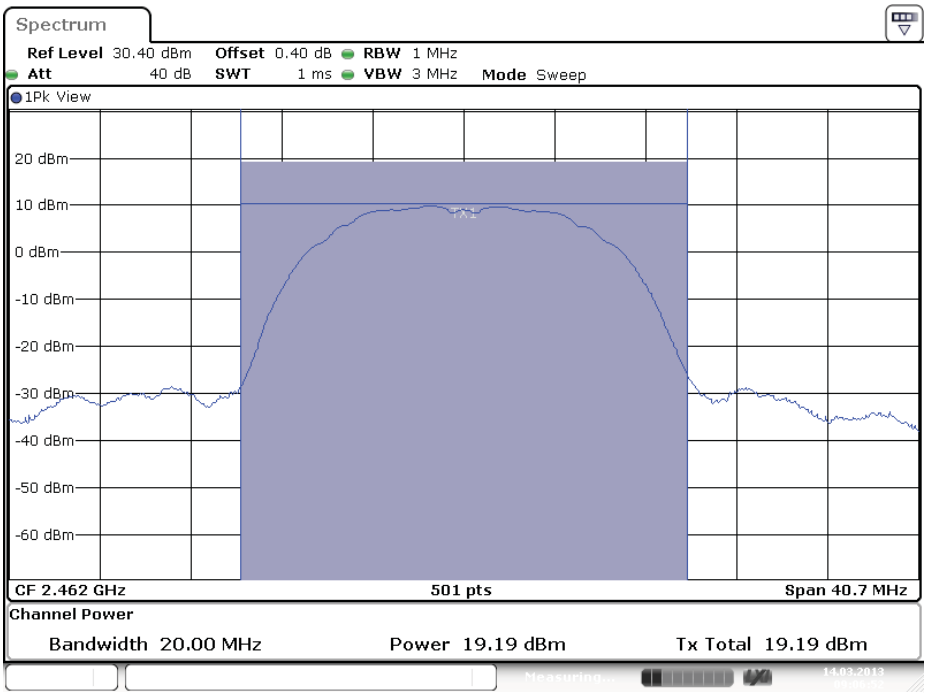
Plot 2b



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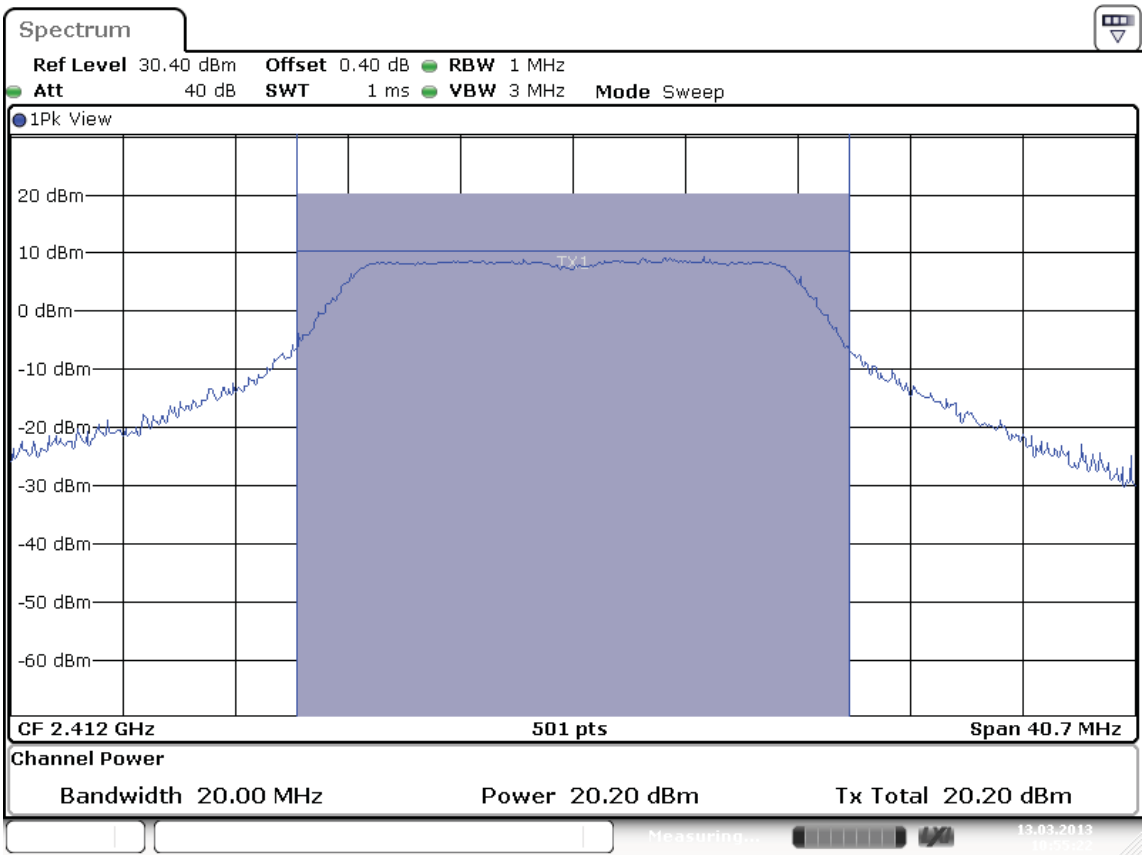
Plot 2c

Operation mode: 6 Mb OFDM, Antenna 1

Freq-uency [MHz]	Output Power [dBm]	Output Power [mW]	Limit [dBm]	Limit [mW]	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Plot number
2412	20.2	104.7	+30	1000	3.0	23.2	208.9	3a
2437	23.8	239.9	+30	1000	3.0	26.8	478.6	3b
2462	22.0	158.5	+30	1000	3.0	25.0	316.2	3c



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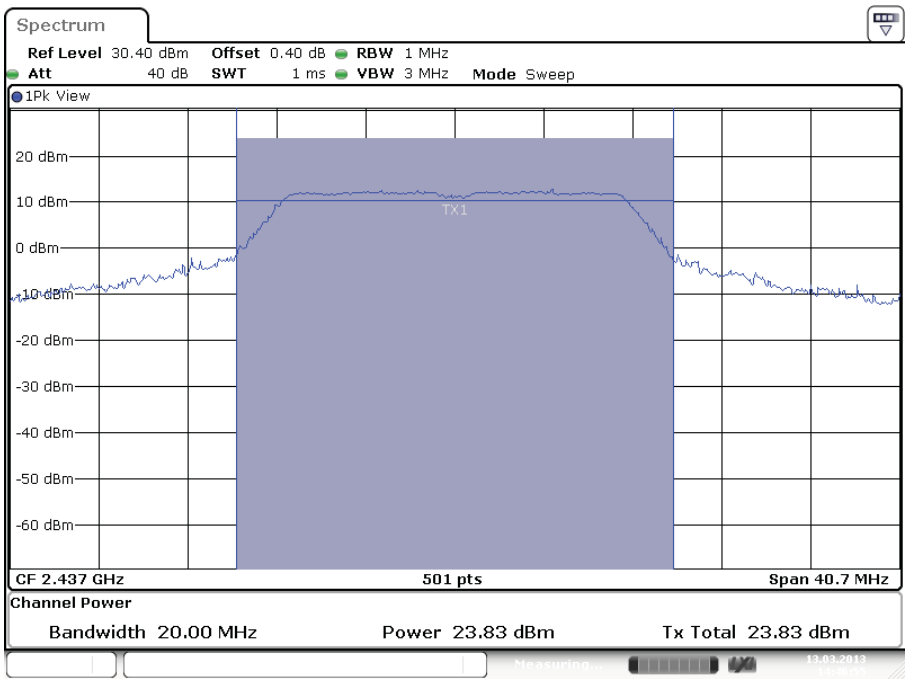
Plot 3a



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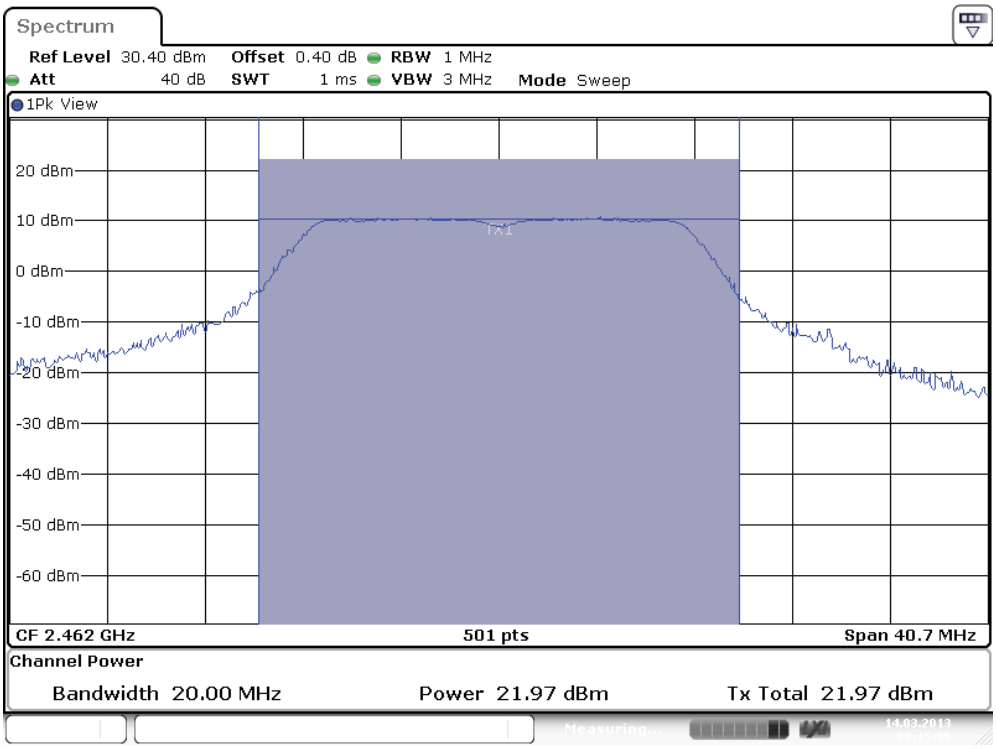
Plot 3b

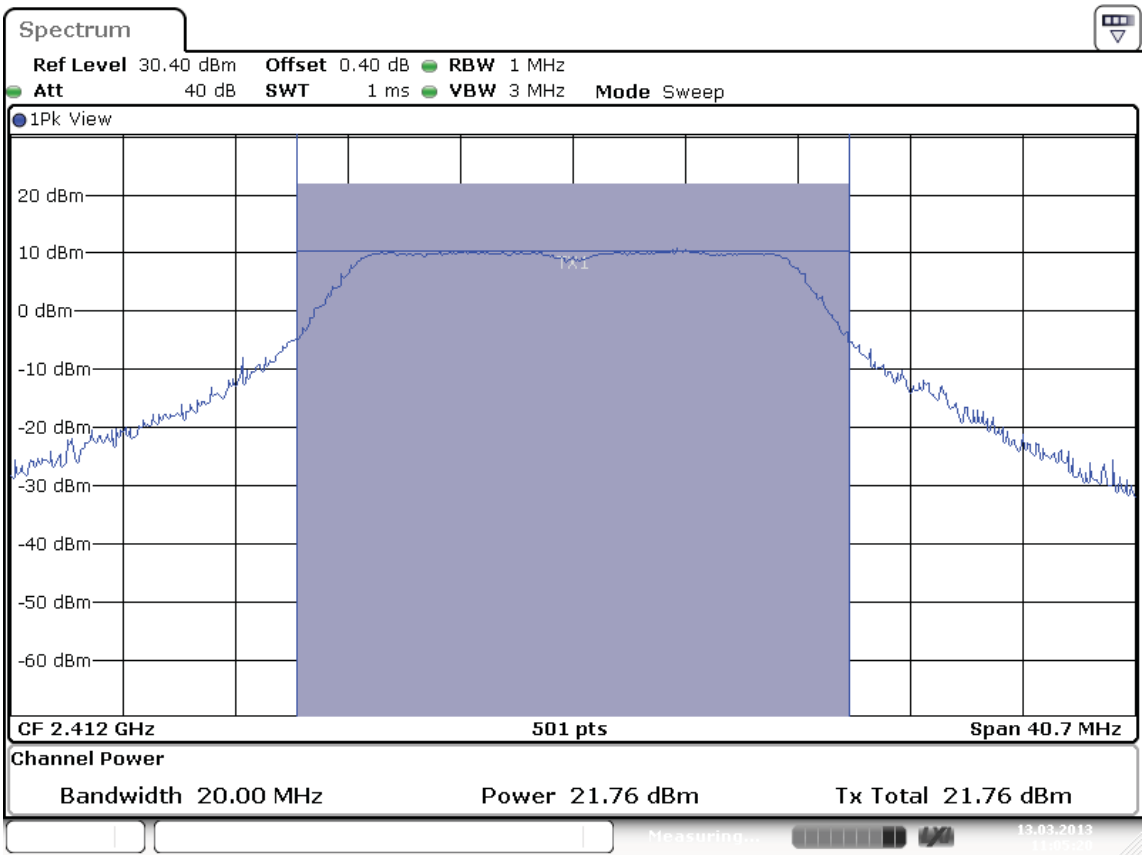


Date: 14.MAR.2013 09:15:36

Plot 3c

Operation mode: 6Mb OFDM, Antenna 2

Freq-uency [MHz]	Output Power [dBm]	Output Power [mW]	Limit [dBm]	Limit [mW]	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Plot number
2412	21.8	151.4	+30	1000	3.0	24.8	302.0	4a
2437	25.0	316.2	+30	1000	3.0	28.0	631.0	4b
2462	22.7	186.2	+30	1000	3.0	25.7	371.5	4c



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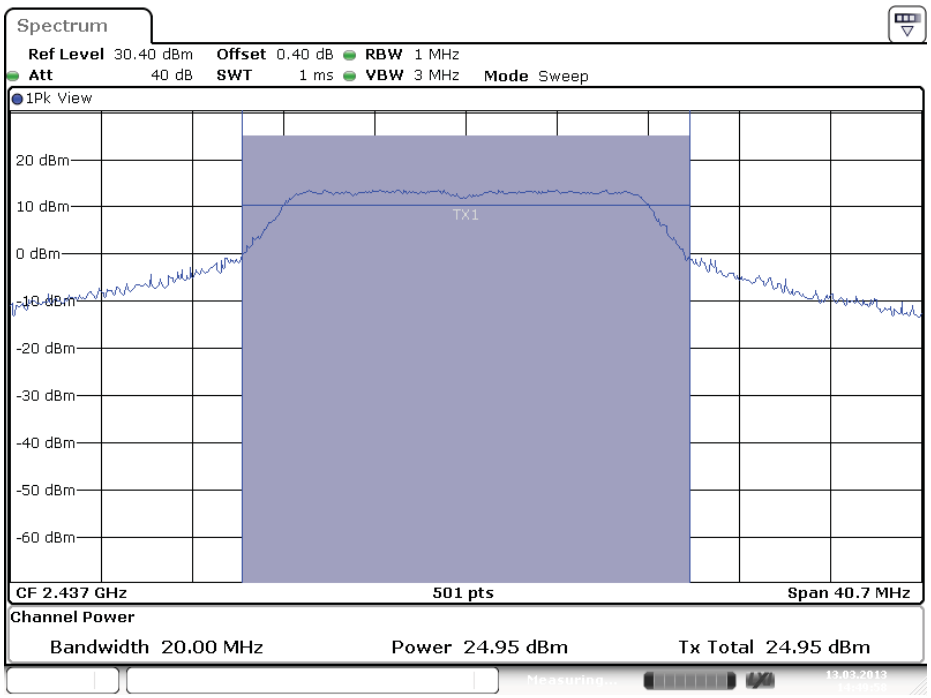
Plot 4a



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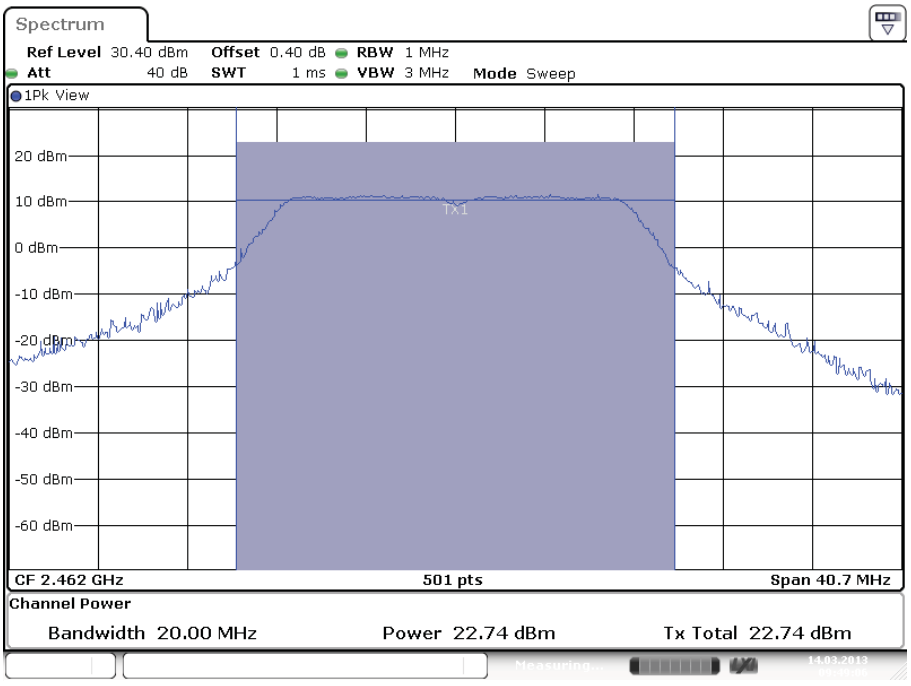
Plot 4b



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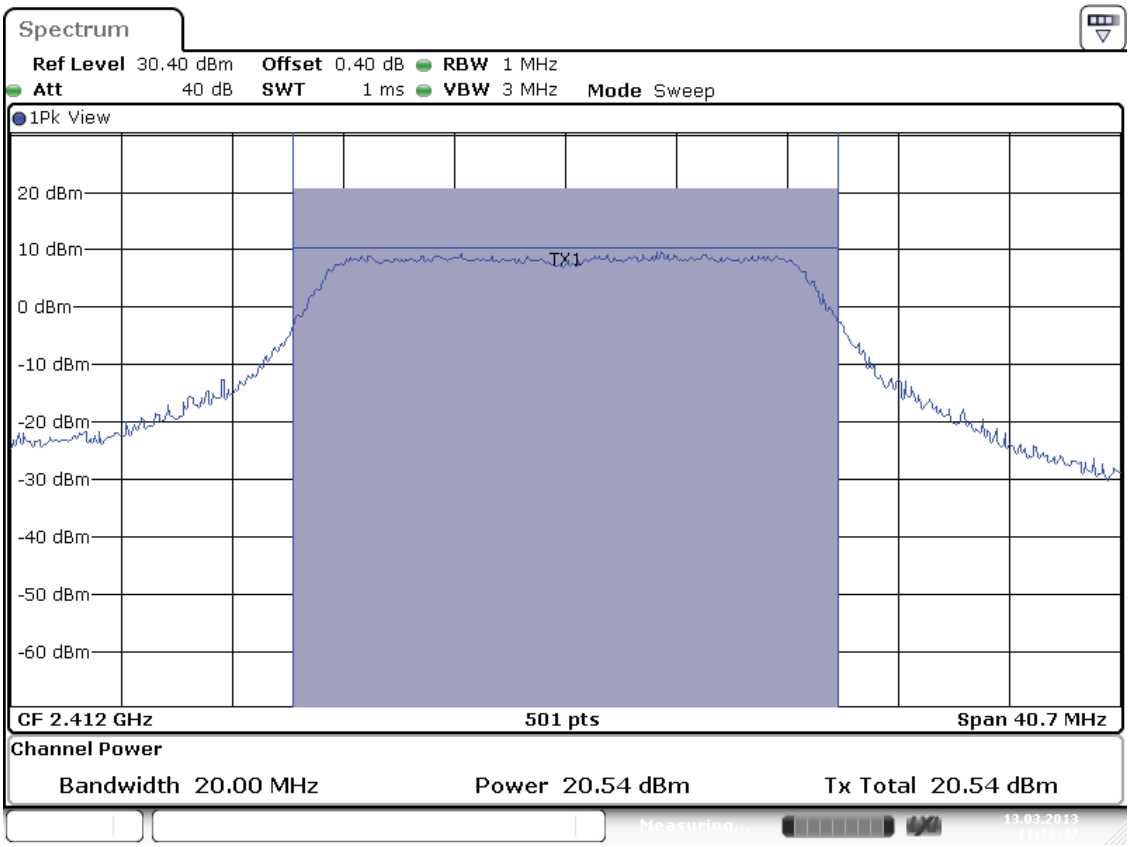
Plot 4c

Operation mode: HT4-20 MHz, Antenna 1

Freq-uency [MHz]	Output Power [dBm]	Output Power [mW]	Limit [dBm]	Limit [mW]	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Plot number
2412	20.5	112.2	+30	1000	3.0	23.5	223.9	5a
2437	23.8	239.9	+30	1000	3.0	26.8	478.6	5b
2462	22.2	166.0	+30	1000	3.0	25.2	331.1	5c



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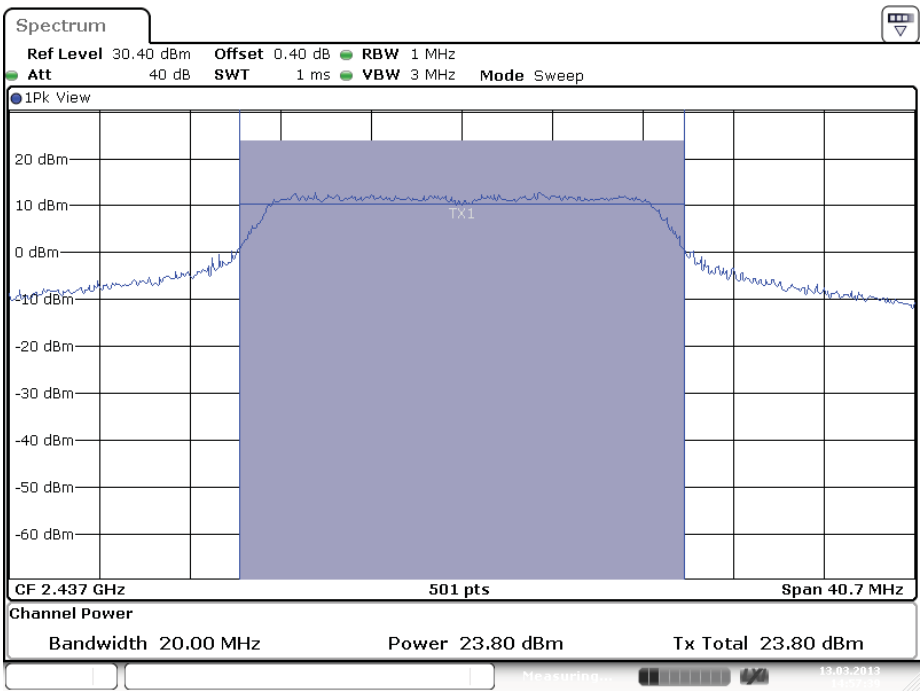
Plot 5a



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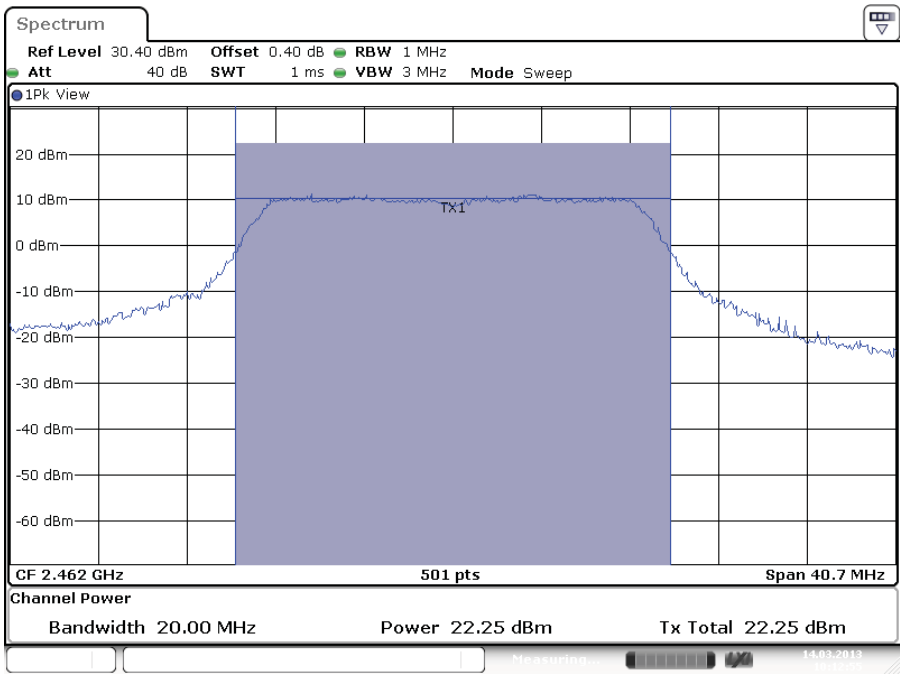
Plot 5b



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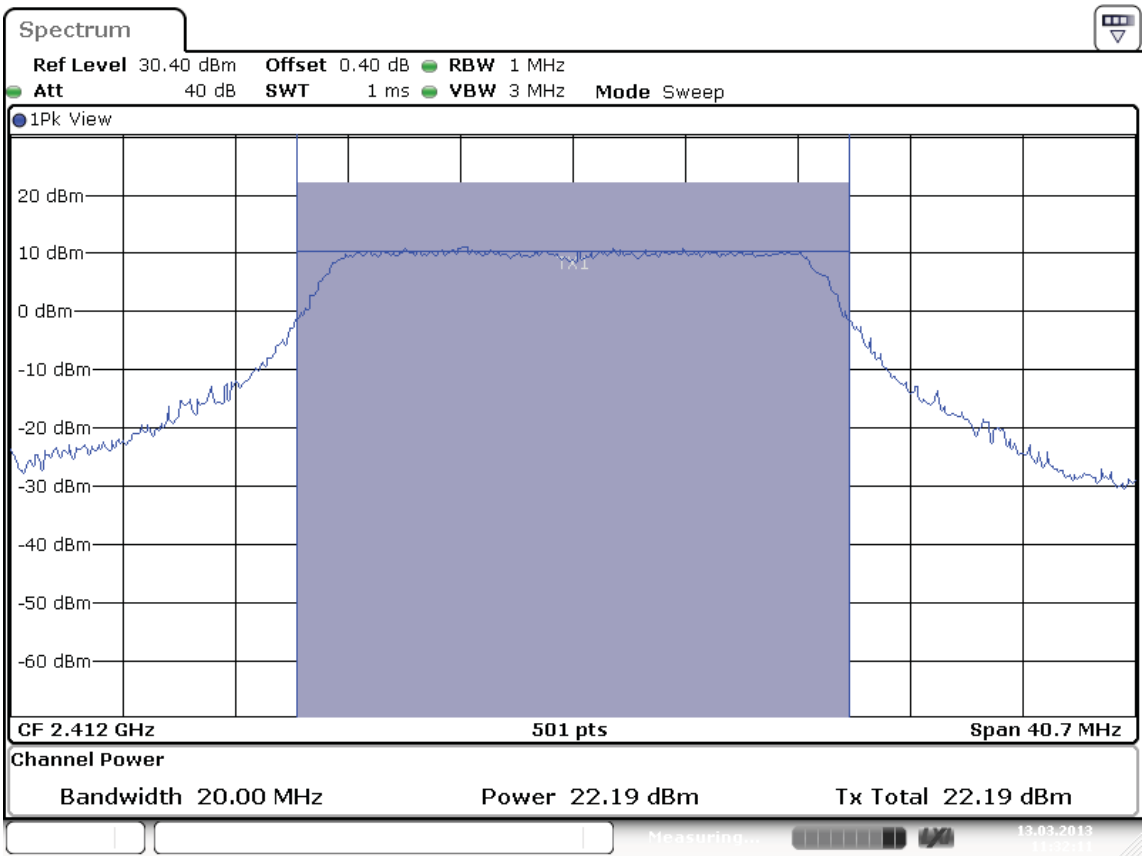
Plot 5c

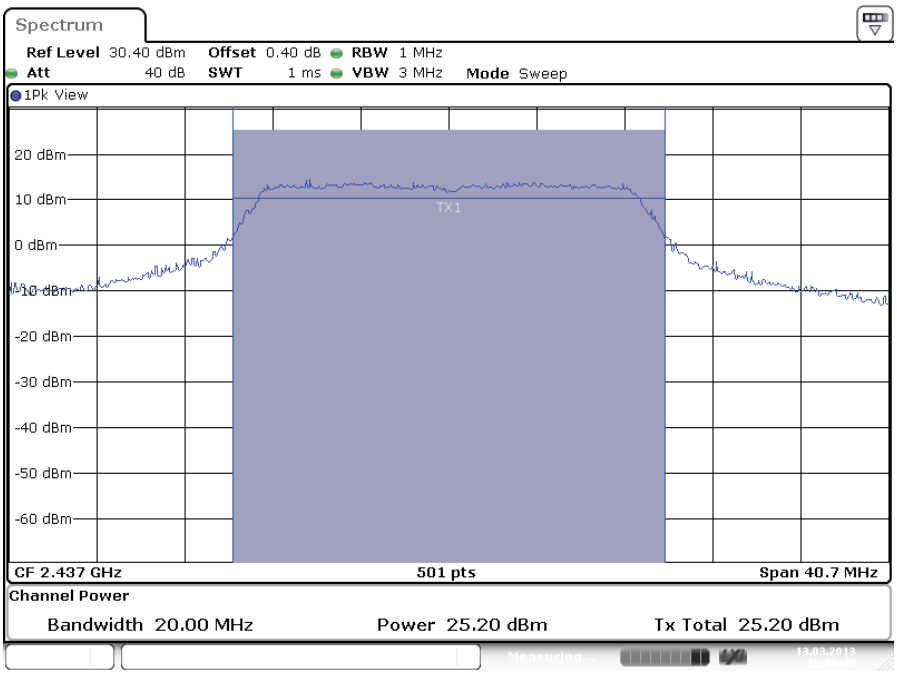
Operation mode: HT4-20 MHz, Antenna 2

Freq-uency [MHz]	Output Power [dBm]	Output Power [mW]	Limit [dBm]	Limit [mW]	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Plot number
2412	22.2	166.0	+30	1000	3.0	25.2	331.1	6a
2437	25.2	331.1	+30	1000	3.0	28.2	660.7	6b
2462	23.1	204.2	+30	1000	3.0	26.1	407.4	6c



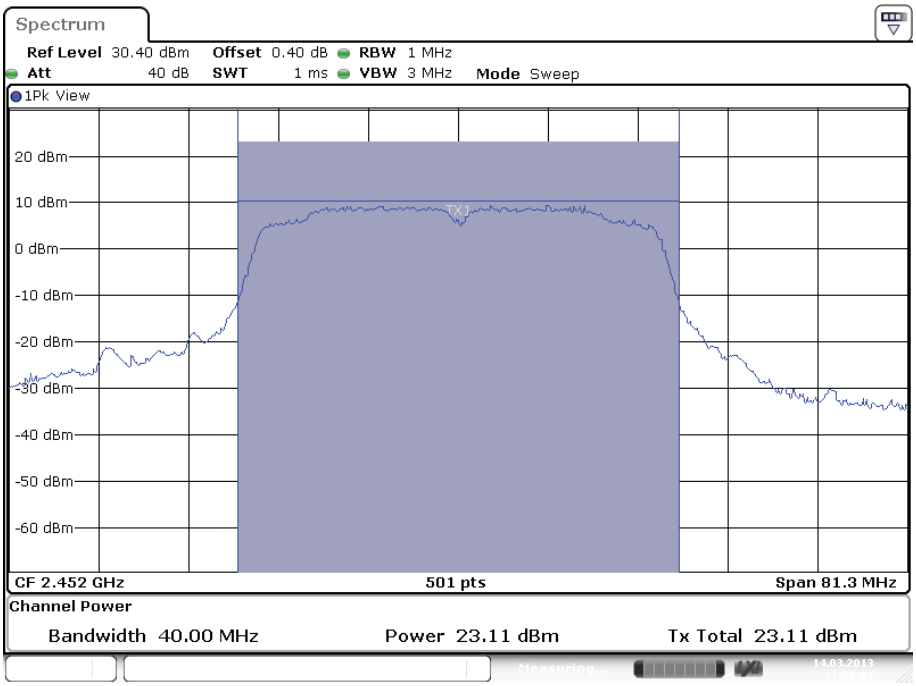
Date: 13.MAR.2013 11:32:11

Plot 6a



Date: 13.MAR.2013 15:09:43

Plot 6b

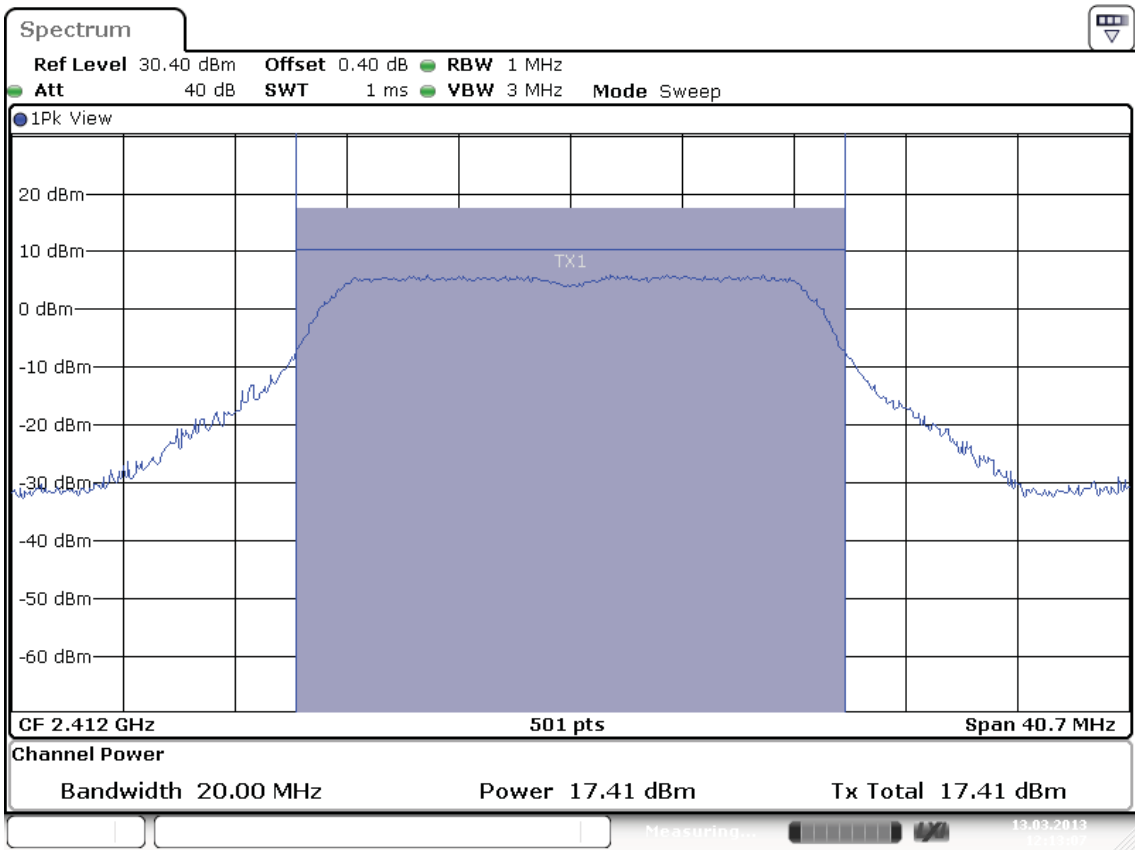


Date: 14.MAR.2013 13:25:02

Plot 6c

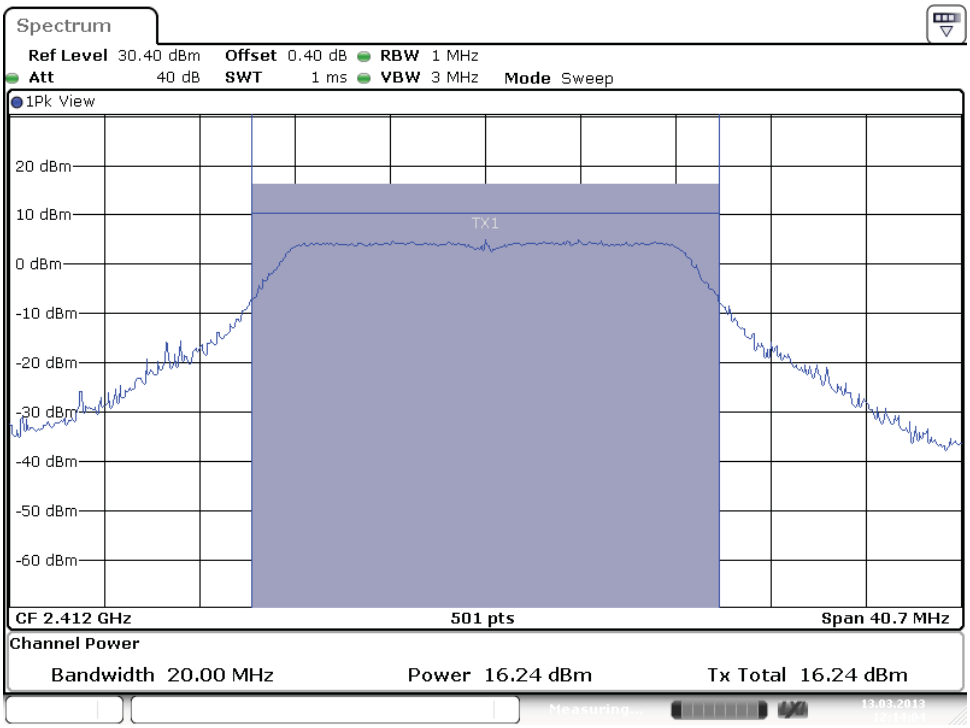
Operation mode: HT8-20 MHz, Antenna 1+2

Freq-uency [MHz]	Output Power Antenna 1 [dBm]	Output Power Antenna 2 [dBm]	Limit [dBm]	Limit [mW]	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Plot number
2412	17.4	16.2	+30	1000	3.0	22.9	192.8	7a
2437	19.4	18.3	+30	1000	3.0	24.9	308.7	7b
2462	18.4	17.0	+30	1000	3.0	23.8	238.0	7c



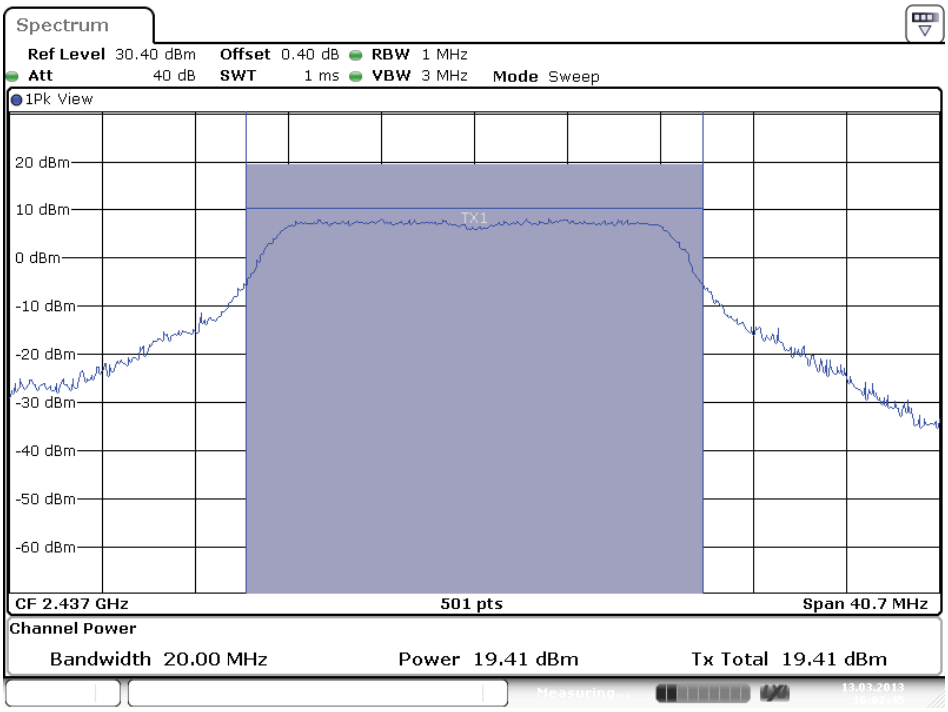
Date: 13.MAR.2013 12:13:07

Plot 7a-1 Antenna 1



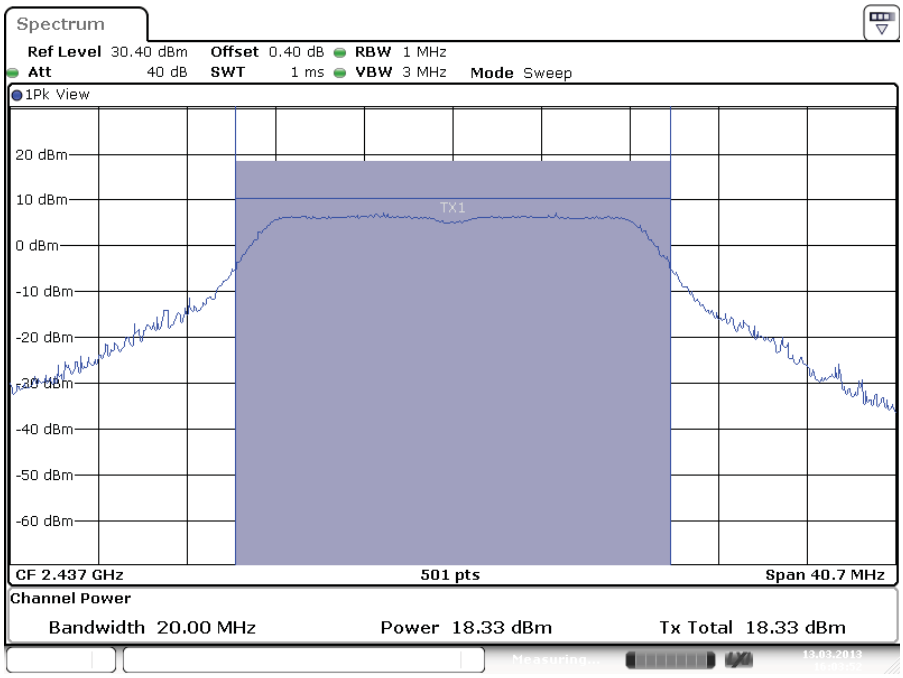
Date: 13.MAR.2013 12:14:04

Plot 7a-2 Antenna 2



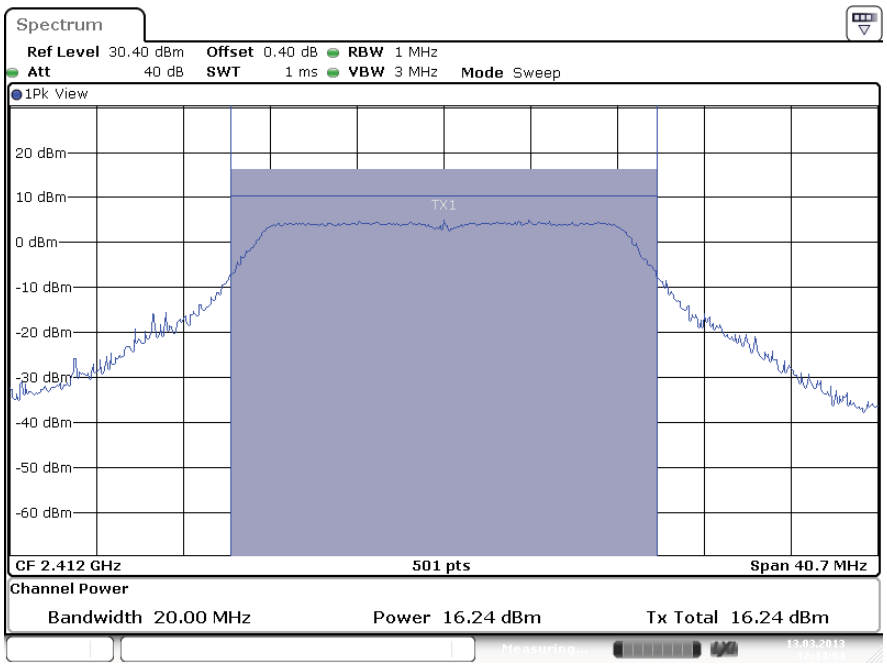
Date: 13.MAR.2013 16:02:45

Plot 7b-1 Antenna 1



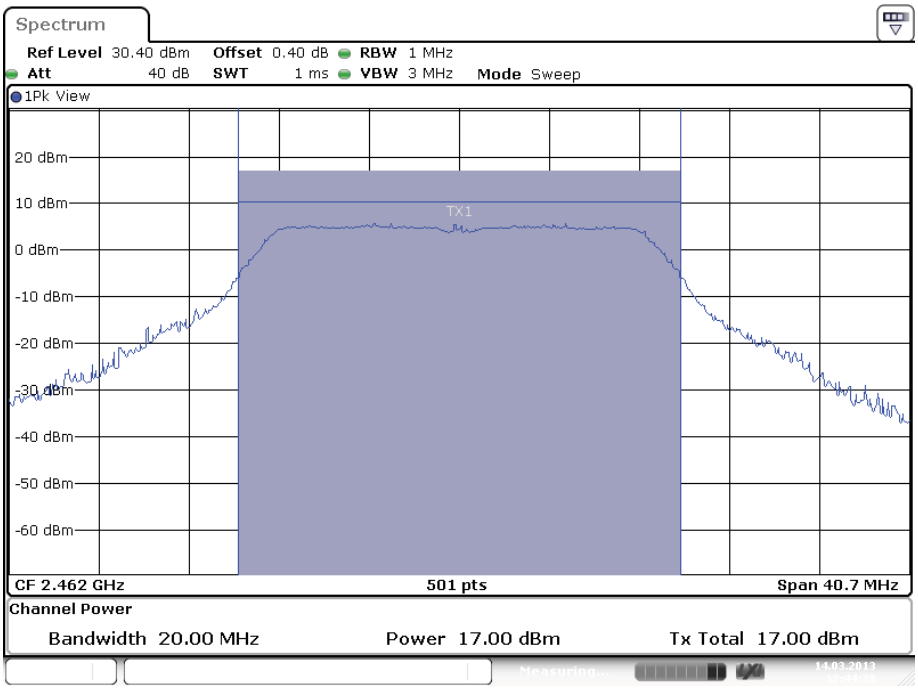
Date: 13.MAR.2013 16:03:52

Plot 7b-2 Antenna 2



Date: 13.MAR.2013 12:14:04

Plot 7c-1 Antenna 1

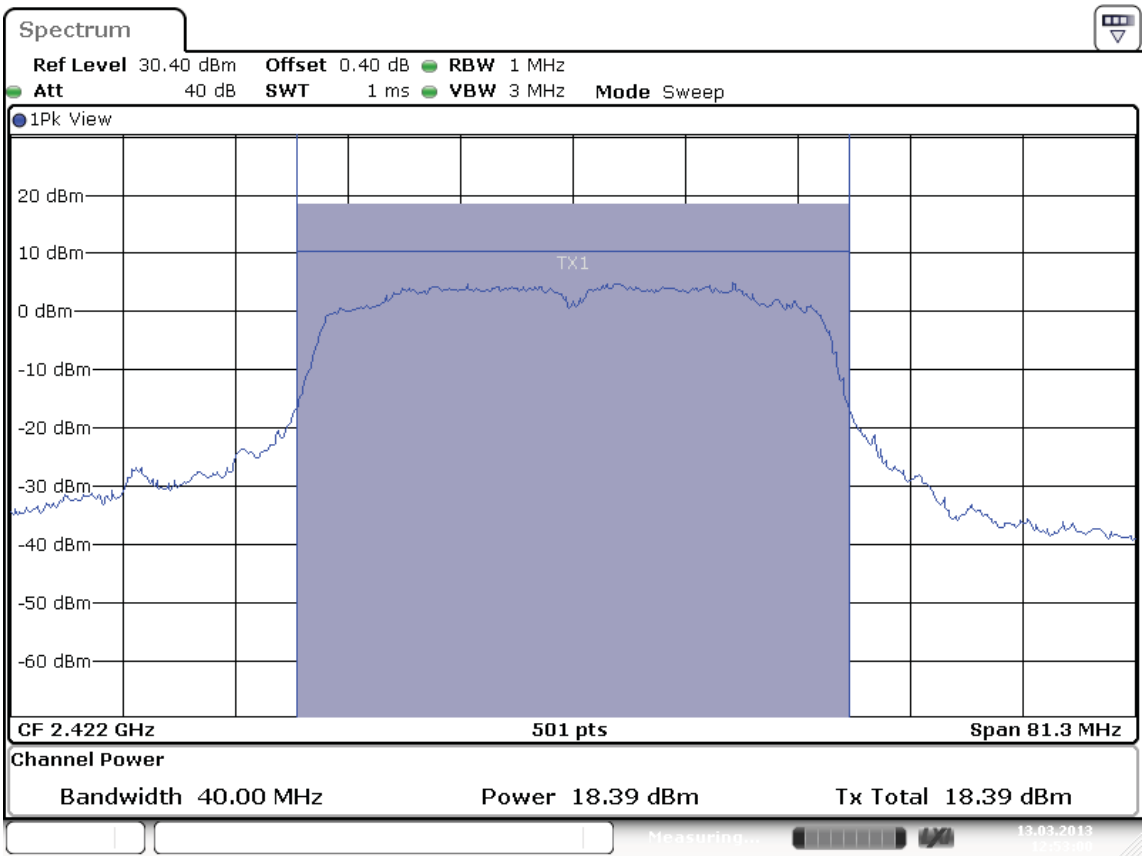


Date: 14.MAR.2013 12:44:38

Plot 7c-2 Antenna 2

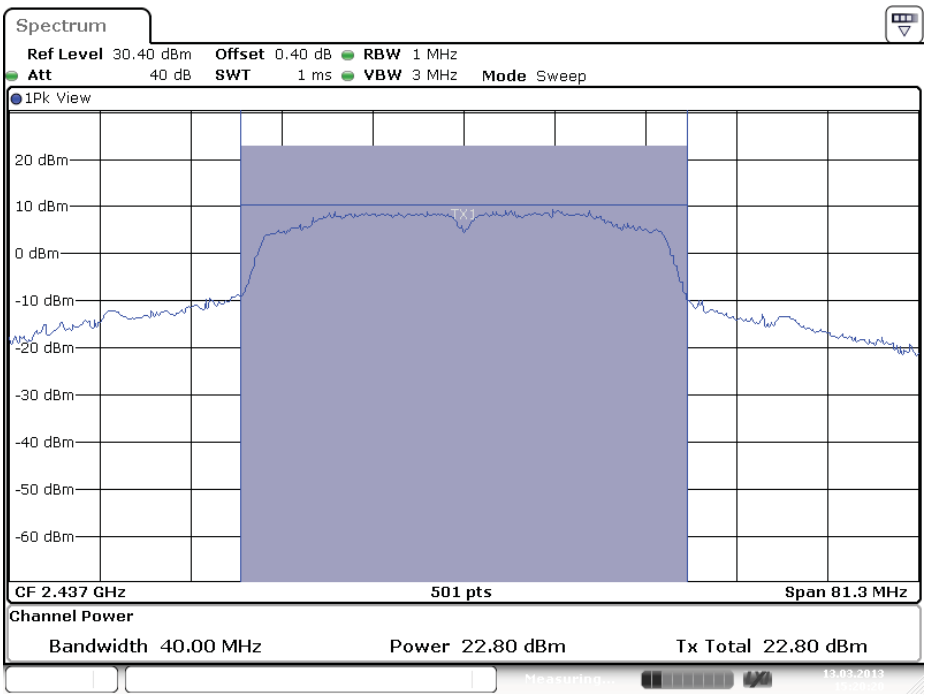
Operation mode: HT4-40 MHz wide, Antenna 1

Freq-uency [MHz]	Output Power [dBm]	Output Power [mW]	Limit [dBm]	Limit [mW]	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Plot number
2422	18.4	69.2	+30	1000	3.0	21.4	138.0	8a
2437	22.8	190.5	+30	1000	3.0	25.8	380.2	8b
2452	21.4	138.0	+30	1000	3.0	24.4	275.4	8c



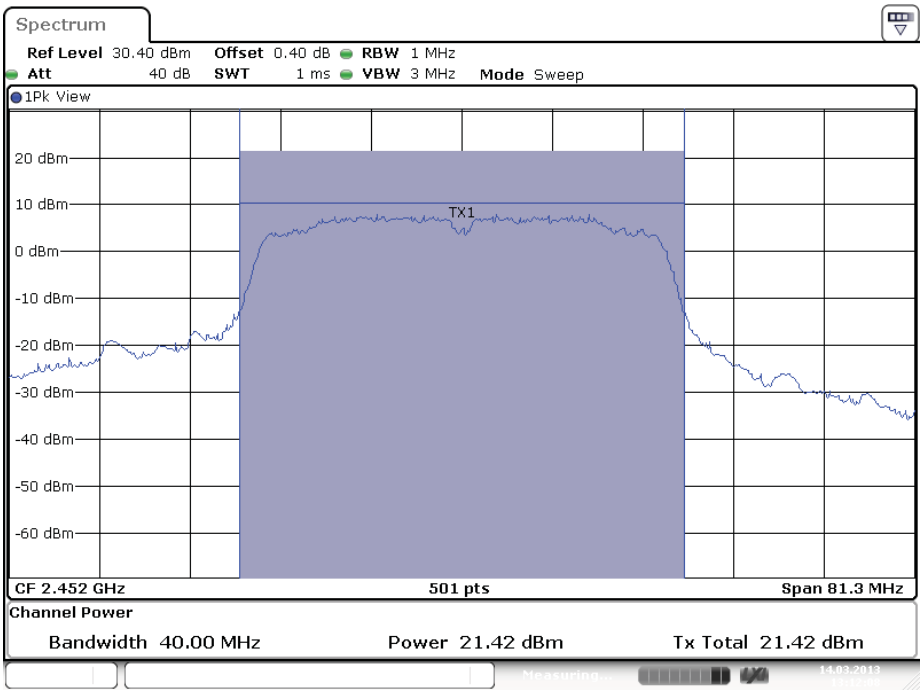
Date: 13.MAR.2013 12:53:00

Plot 8a



Date: 13.MAR.2013 15:20:20

Plot 8b

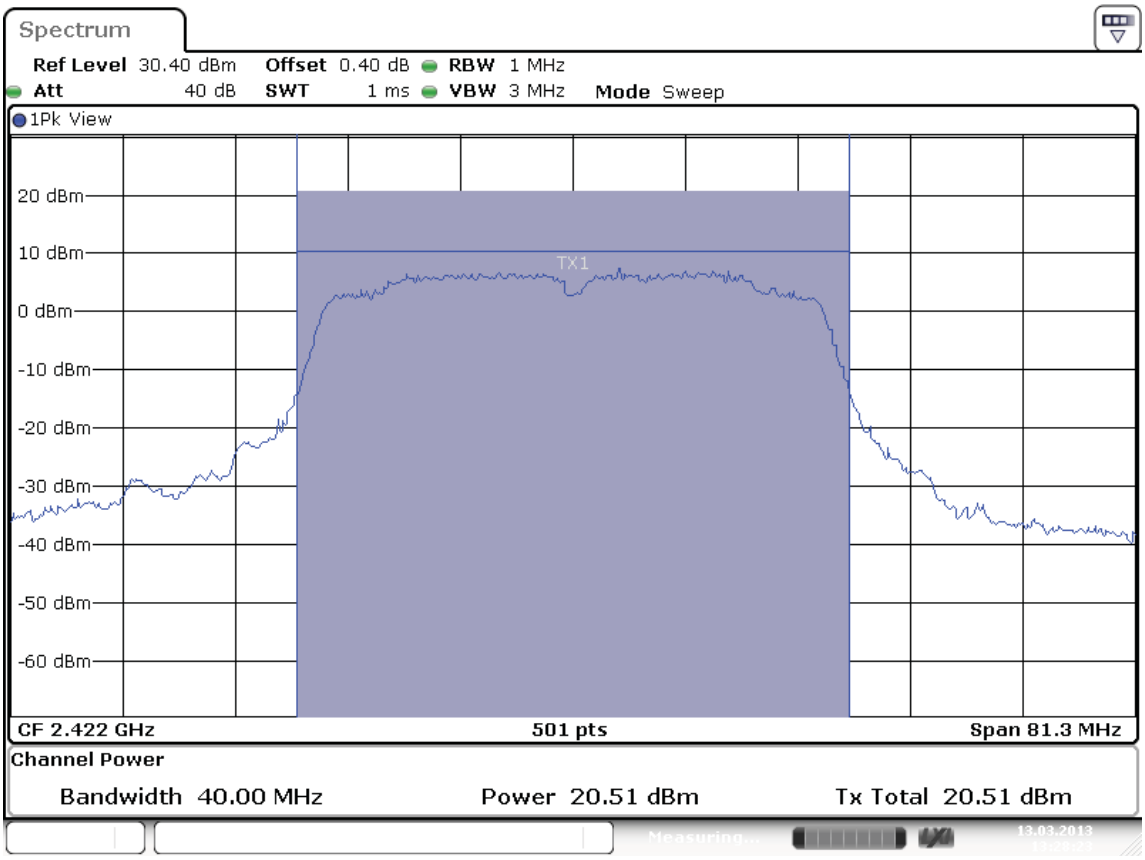


Date: 14.MAR.2013 13:12:09

Plot 8c

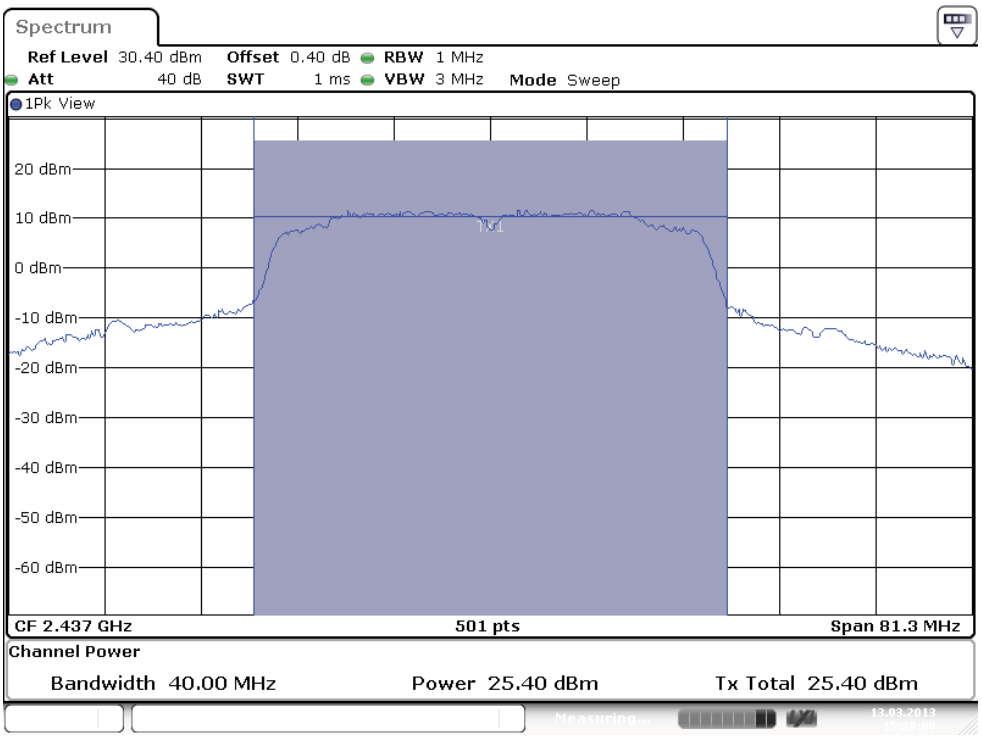
Operation mode: HT4-40 MHz wide, Antenna 2

Freq-uency [MHz]	Output Power [dBm]	Output Power [mW]	Limit [dBm]	Limit [mW]	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Plot number
2422	20.5	112.2	+30	1000	3.0	23.5	223.9	9a
2437	25.4	346.7	+30	1000	3.0	28.4	691.8	9b
2452	23.1	204.2	+30	1000	3.0	26.1	407.4	9c



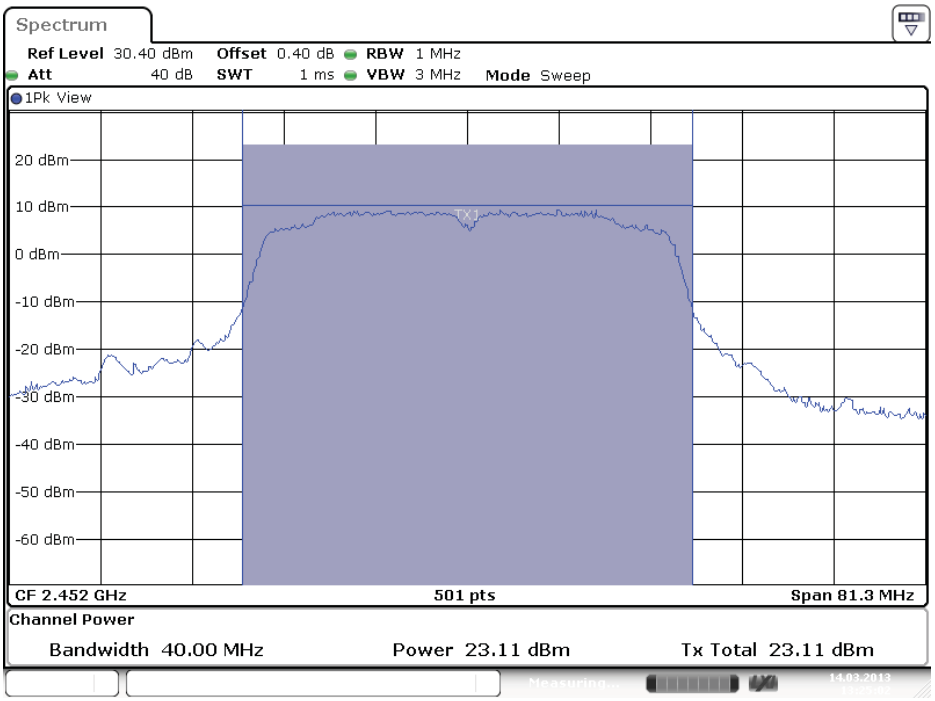
Date: 13.MAR.2013 13:28:24

Plot 9a



Date: 13.MAR.2013 15:28:00

Plot 9b

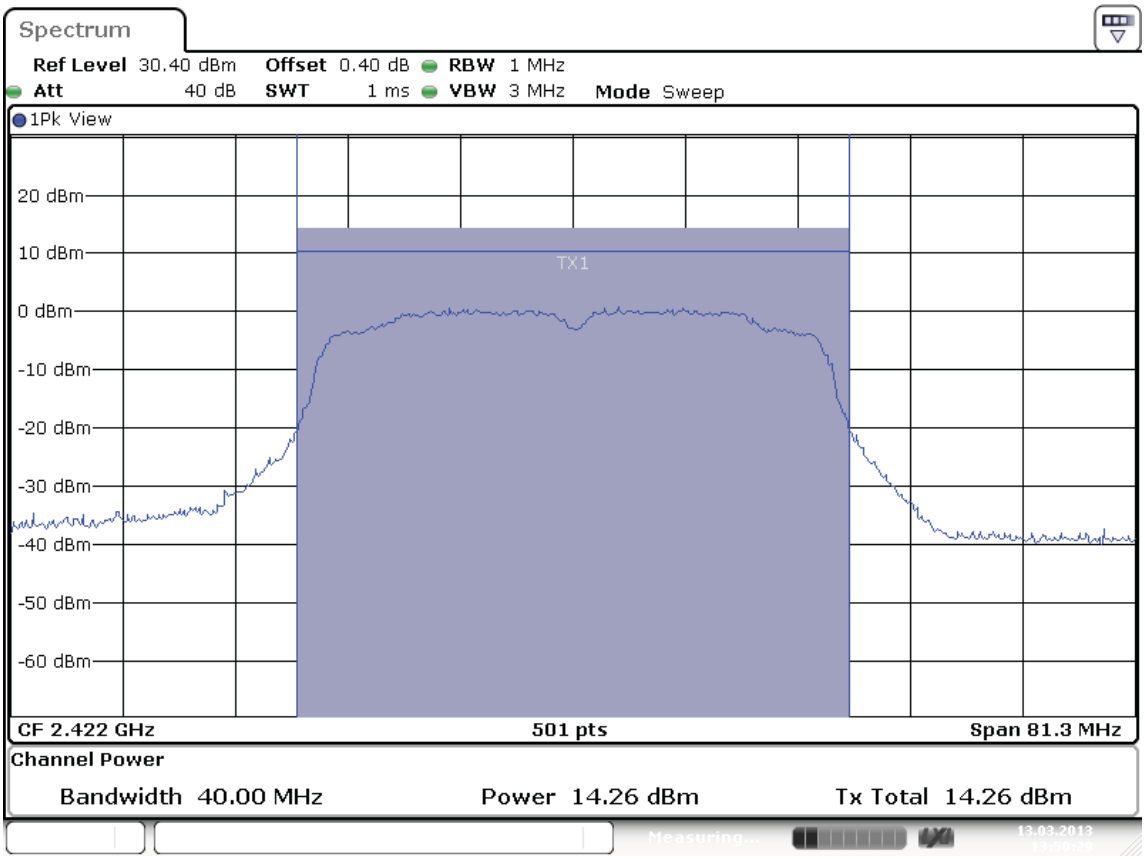


Date: 14.MAR.2013 13:25:02

Plot 9c

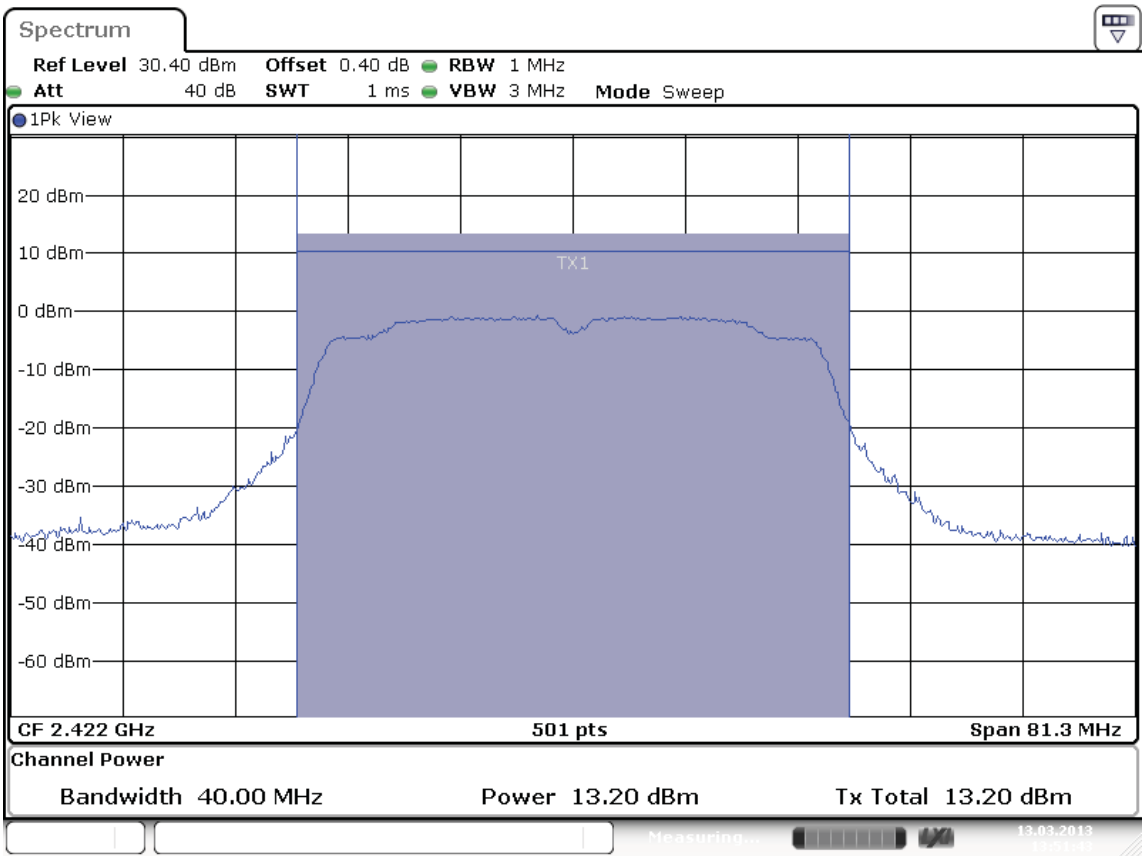
Operation mode: HT8-40 MHz wide, Antenna 1+2

Freq-uency [MHz]	Output Power Antenna 1 [dBm]	Output Power Antenna 2 [dBm]	Limit [dBm]	Limit [mW]	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Plot number
2422	14.3	13.2	+30	1000	3.0	19.8	95.4	10a
2437	19.3	18.0	+30	1000	3.0	24.7	295.7	10b
2452	18.4	17.0	+30	1000	3.0	23.8	238.0	10c



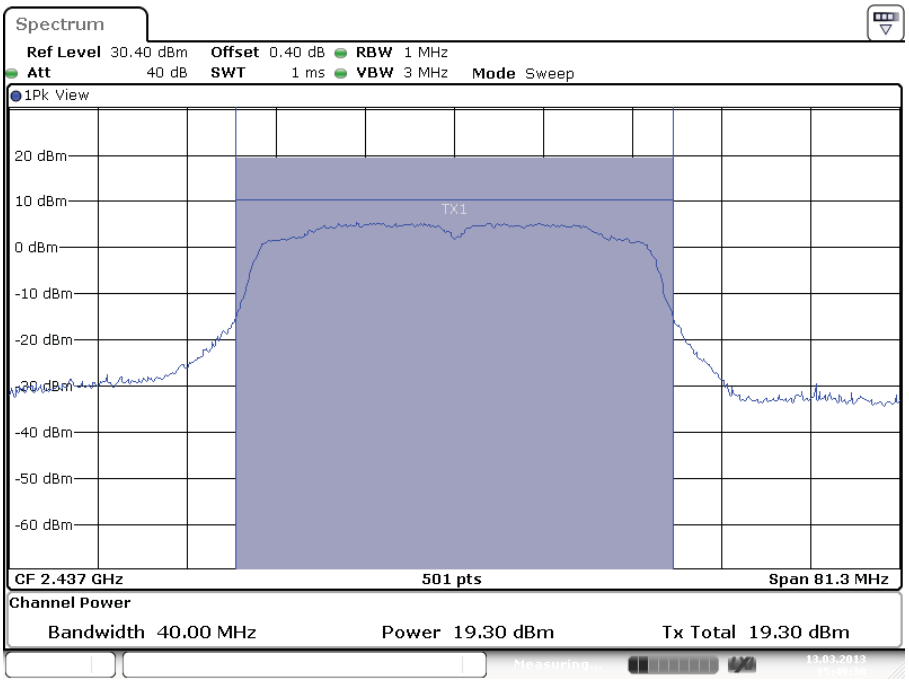
Date: 13.MAR.2013 13:50:29

Plot 10a-1



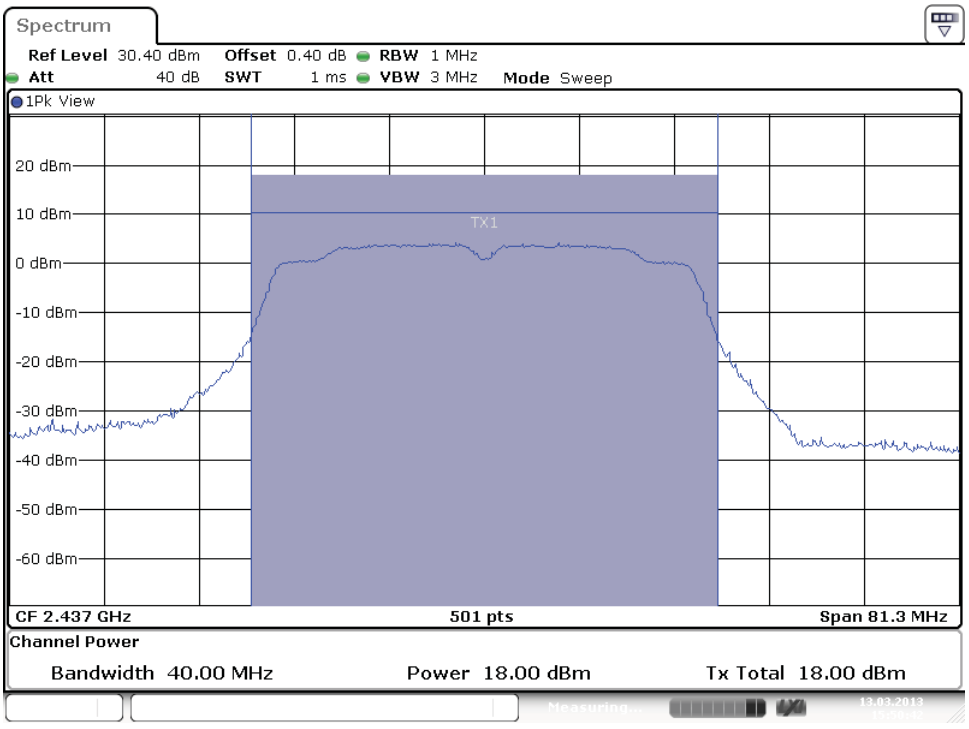
Date: 13.MAR.2013 13:51:43

Plot 10a-2



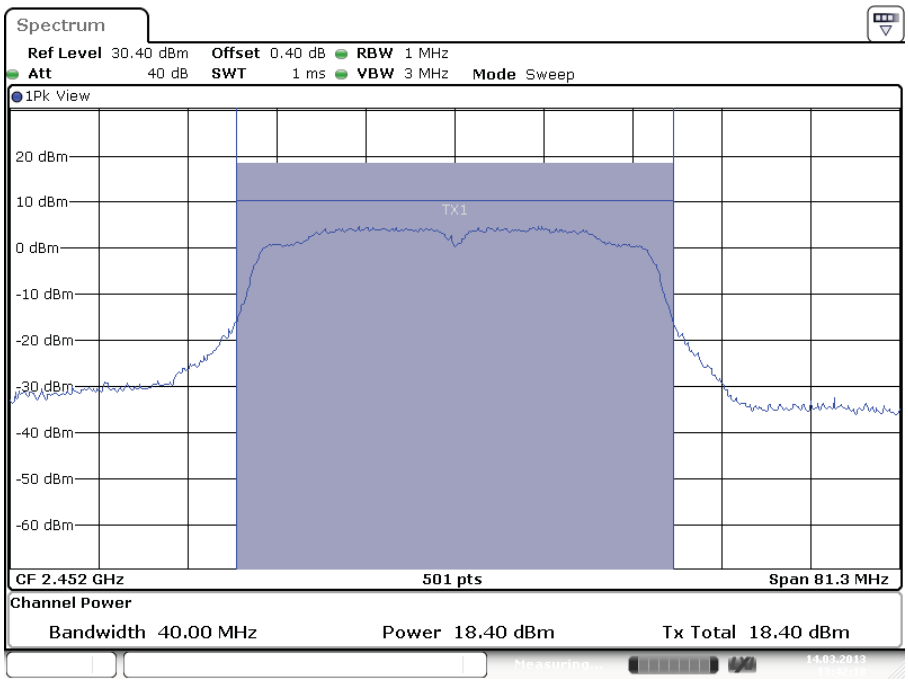
Date: 13.MAR.2013 15:49:30

Plot 10b-1



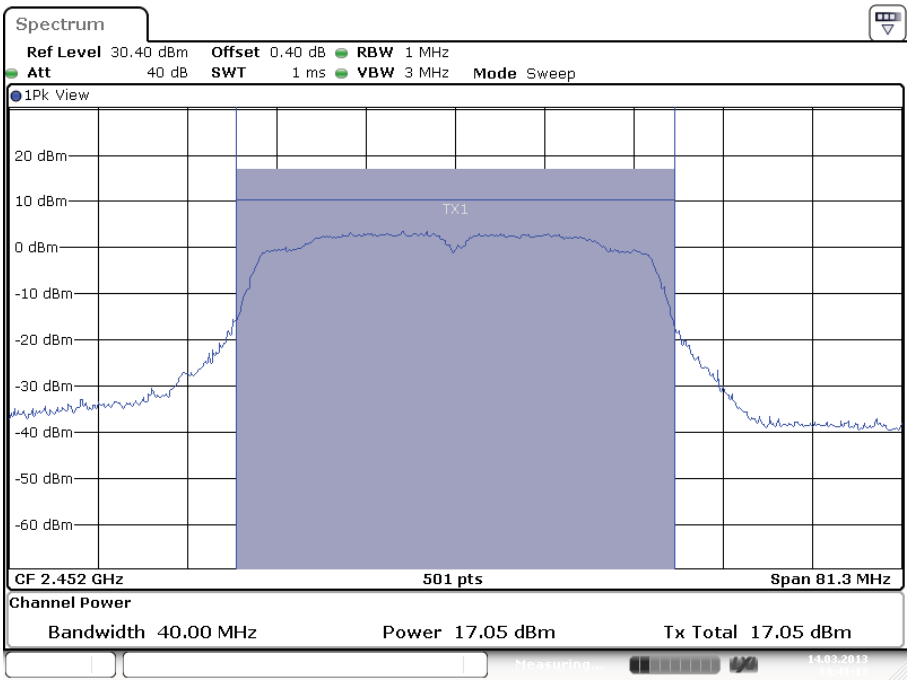
Date: 13.MAR.2013 15:50:42

Plot 10b-2



Date: 14.MAR.2013 13:42:18

Plot 10c-1



Date: 14.MAR.2013 13:41:13

Plot 10c-2

5.2.2 6dB and 99% Bandwidth

RESULT: PASS

Date of testing: 2013-01-09 and 2013-03-13

Requirements:

FCC 15.247(a)(2) an RSS-210 Section A8.2(a)
For systems using digital modulation in the 2400-2483.5MHz band, the 6dB bandwidth shall be at least 500kHz.

For 99% Bandwidth: RSS-Gen Section 4.6.1: No requirement is given.

Test procedure 6dB bandwidth:

ANSI C63.10:2009
KDB Publication No. 558074 D01: Measurement of Digital Transmission Systems Operating under Section 15.247.

A spectrum analyzer was connected to the antenna port of the EUT. The spectrum analyzer resolution bandwidth was set to 100kHz, video bandwidth to 300kHz and the span wide enough to capture the modulated carrier.

For 99% Bandwidth:

ANSI C63.10-2009 and RSS-Gen.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission sideskirts. The resolution bandwidth shall be set as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual.

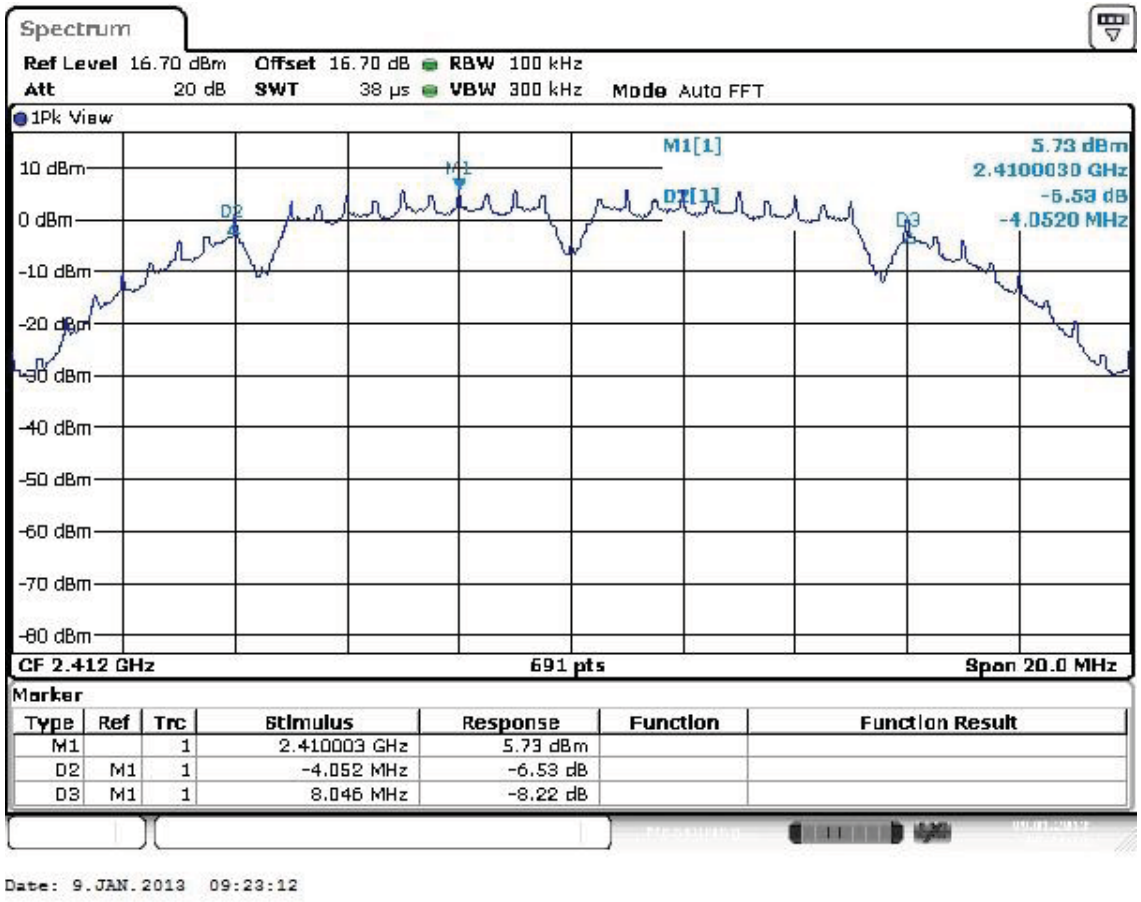
A spectrum analyzer was connected to the antenna port of the EUT. The spectrum analyzer resolution bandwidth was set to 1% of the selected span, Video bandwidth was set to 3 times the resolution bandwidth. The span was set to capture the whole modulation process. The Spectrum analyzers automated function for 99% BW was used.

Plots shown on the next pages are of the 6 dB bandwidth.

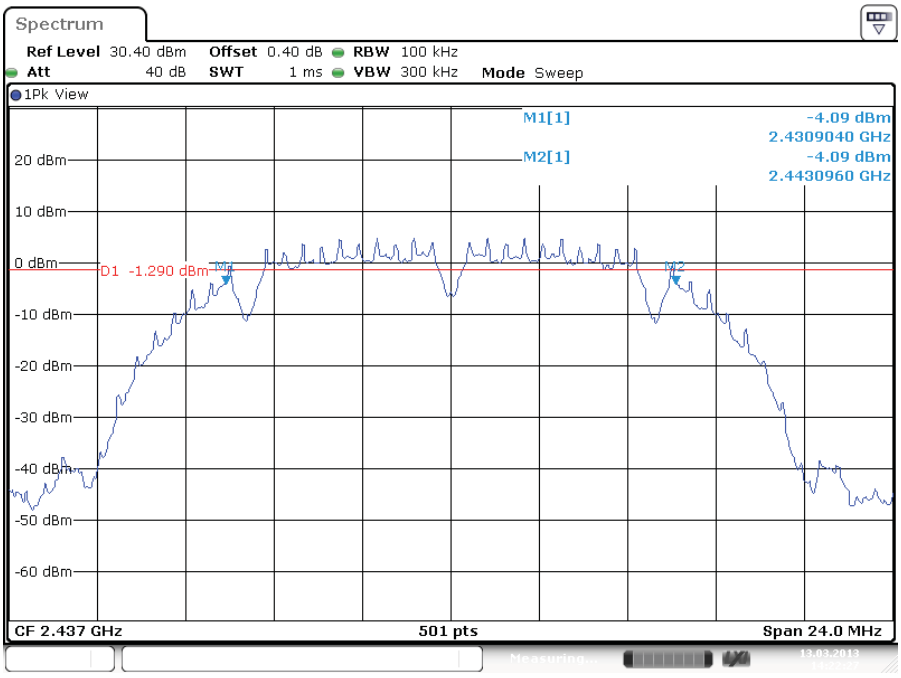
6dB Bandwidth

Operation mode: 1Mb DSSS, Antenna 1

Operating Frequency [MHz]	99% Bandwidth [kHz]	6dB Bandwidth [kHz]	Limit [kHz]	Plot number
2412	14290	12098	500	A
2437	14084	12192	500	B
2462	14210	11162	500	C

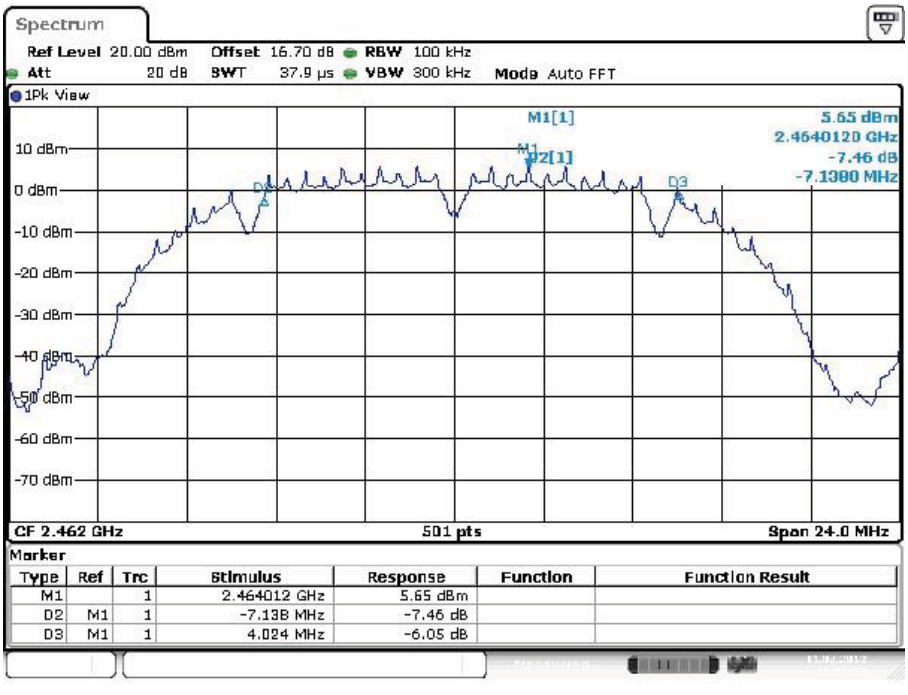


Plot A



Date: 13.MAR.2013 14:22:27

Plot B

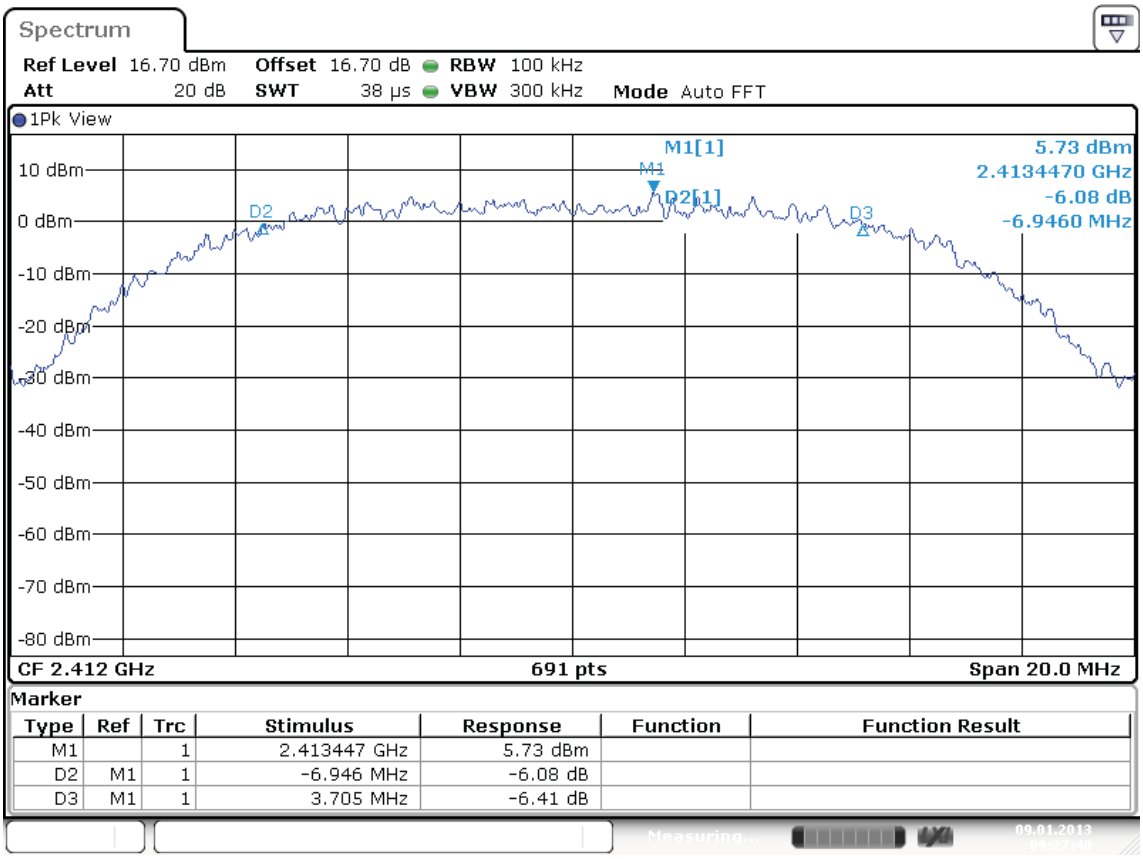


Date: 11.FEB.2013 10:08:52

Plot C

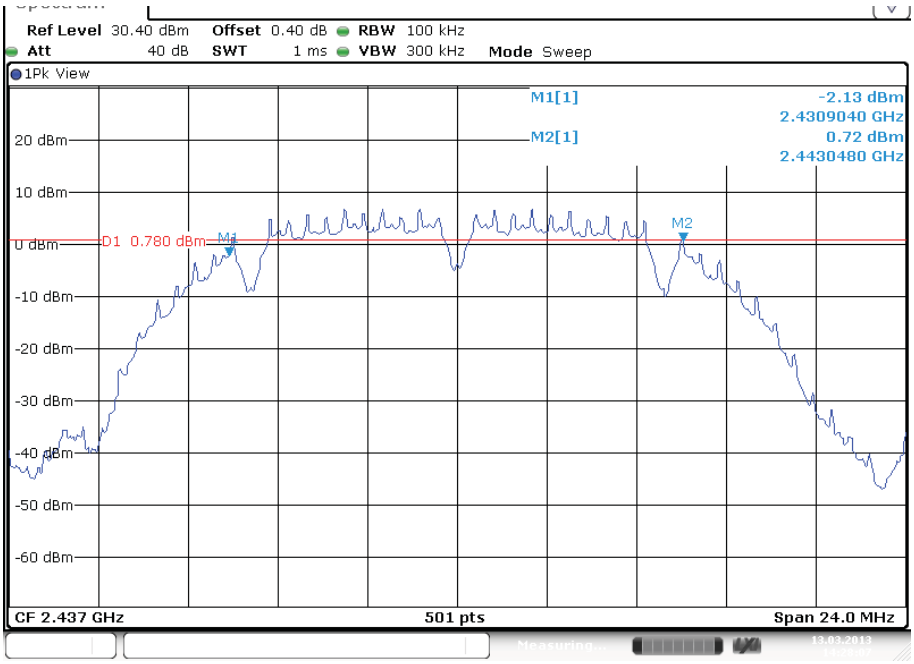
Operation mode: 1Mb DSSS, Antenna 2

Operating Frequency [MHz]	99% Bandwidth [kHz]	6dB Bandwidth [kHz]	Limit [kHz]	Plot number
2412	14120	10651	500	A
2437	14179	12144	500	B
2462	14210	10970	500	C



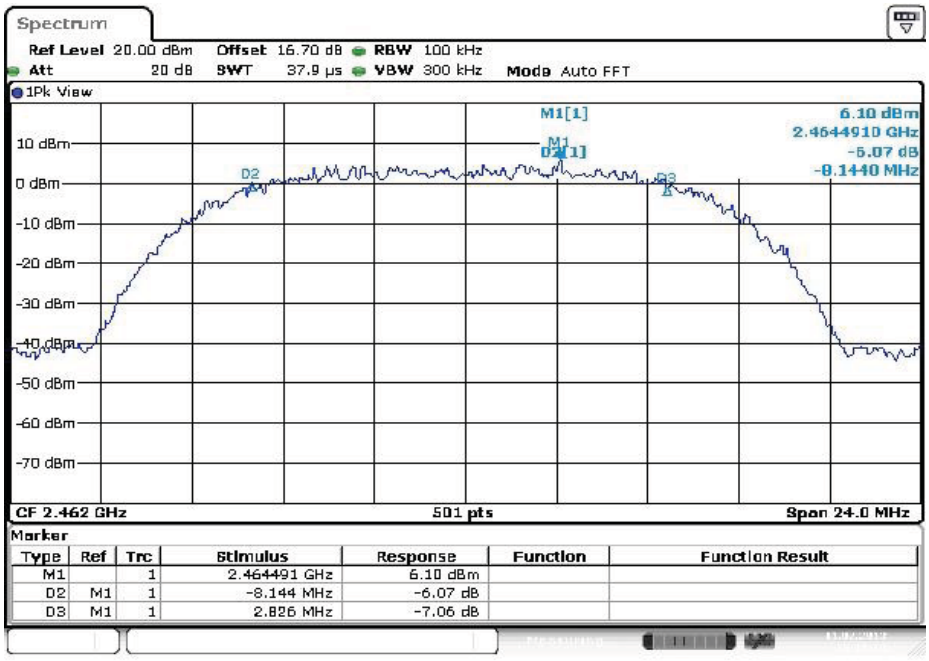
Date: 9.JAN.2013 09:27:40

Plot A



Date: 13.MAR.2013 14:28:07

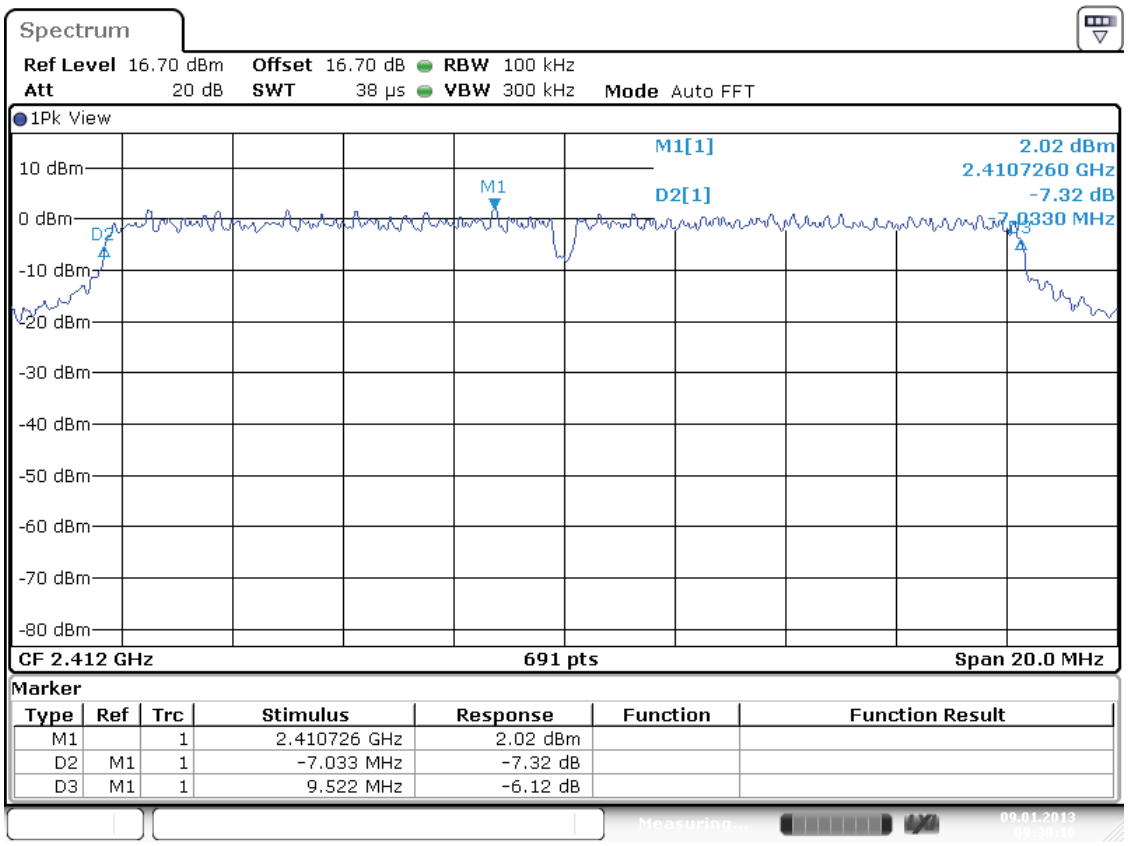
Plot B &C



Date: 11.FEB.2013 10:17:11

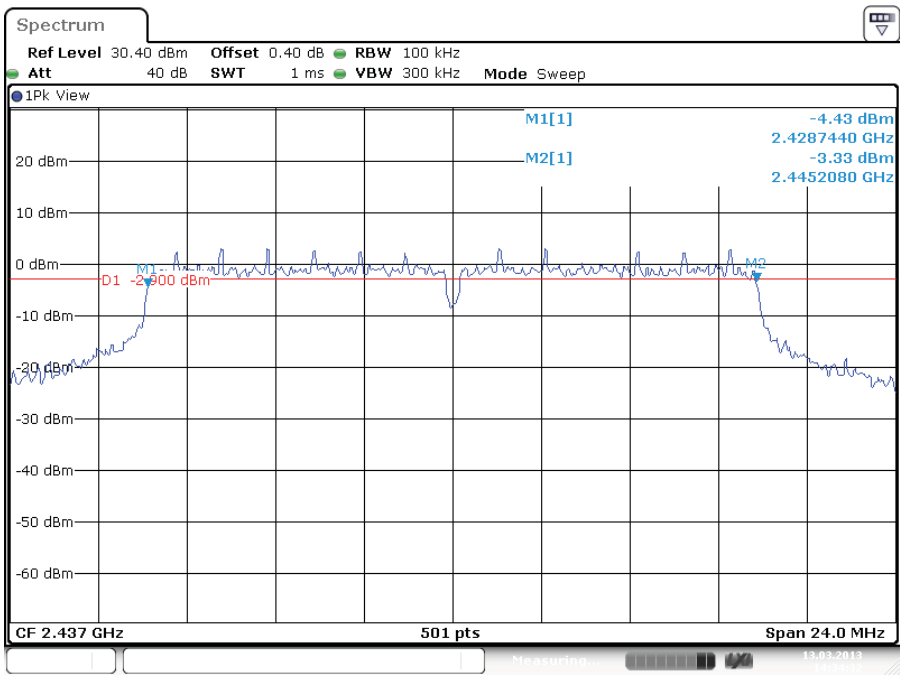
Operation mode: 6 Mb OFDM, Antenna 1

Operating Frequency [MHz]	99% Bandwidth [kHz]	6dB Bandwidth [kHz]	Limit [kHz]	Plot number
2412	17330	16555	500	A
2437	16623	16464	500	B
2462	17010	16806	500	C



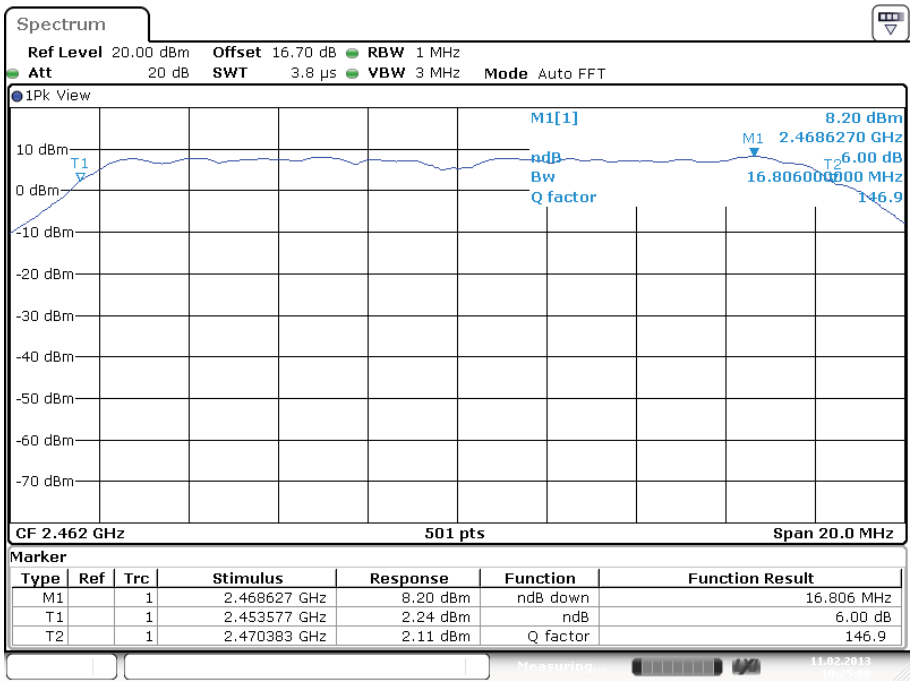
Date: 9.JAN.2013 09:30:16

Plot A



Date: 13.MAR.2013 14:34:33

Plot B



Marker

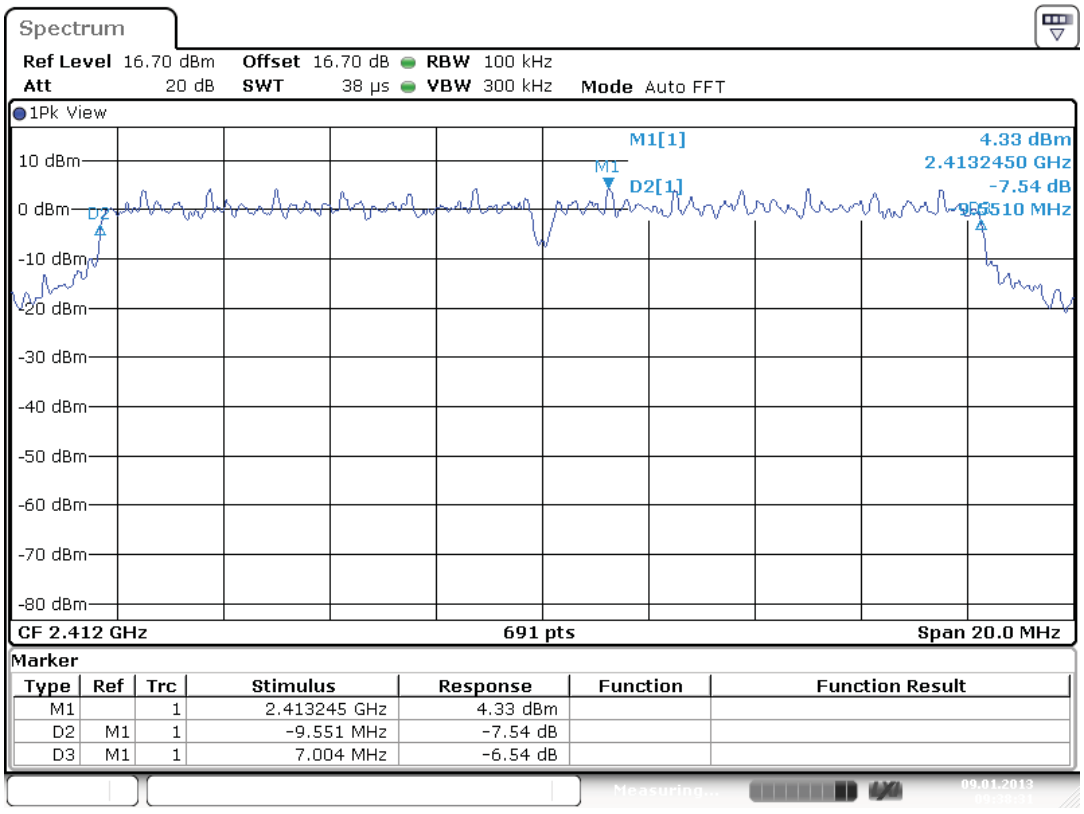
Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	2.468627 GHz	8.20 dBm	ndB down	16.806 MHz
T1		1	2.453577 GHz	2.24 dBm	ndB	6.00 dB
T2		1	2.470383 GHz	2.11 dBm	Q factor	146.9

Date: 11.FEB.2013 10:25:00

Plot C

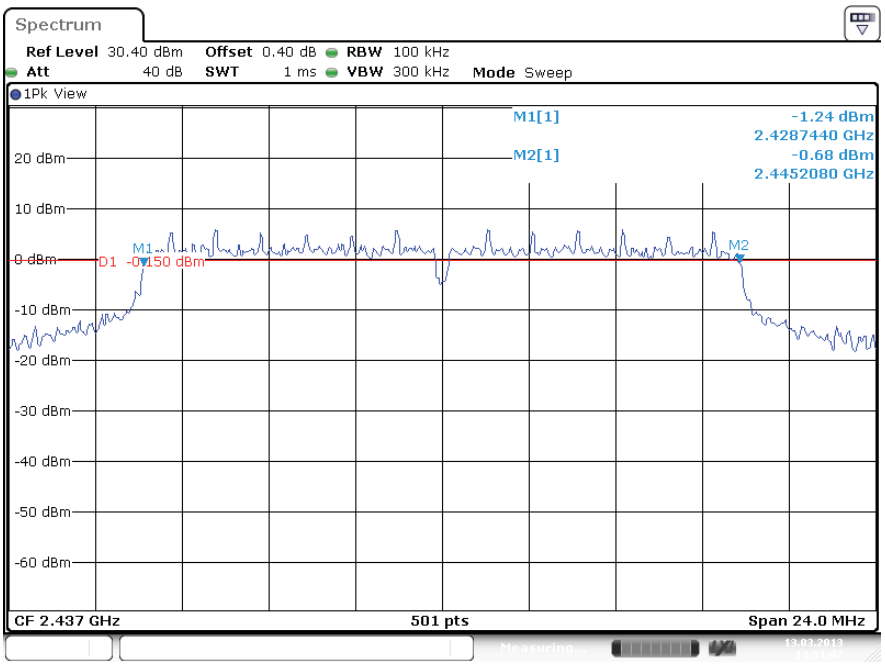
Operation mode: 6 Mb OFDM, Antenna 2

Operating Frequency [MHz]	99% Bandwidth [kHz]	6dB Bandwidth [kHz]	Limit [kHz]	Plot number
2412	17410	16555	500	A
2437	17437	16464	500	B
2462	17010	16527	500	C



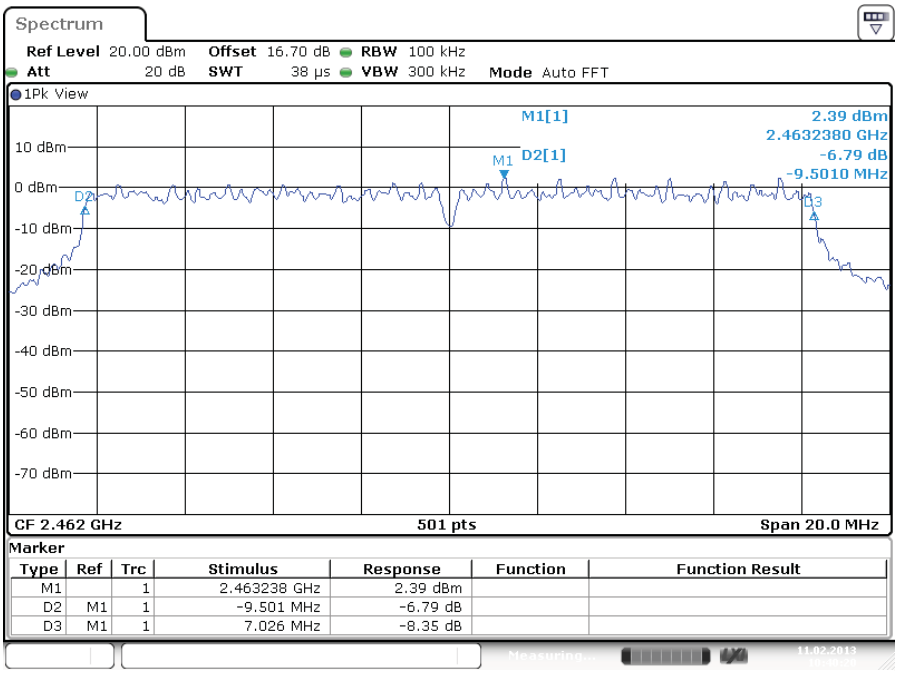
Date: 9.JAN.2013 09:38:31

Plot A



Date: 13.MAR.2013 14:51:07

Plot B



Marker

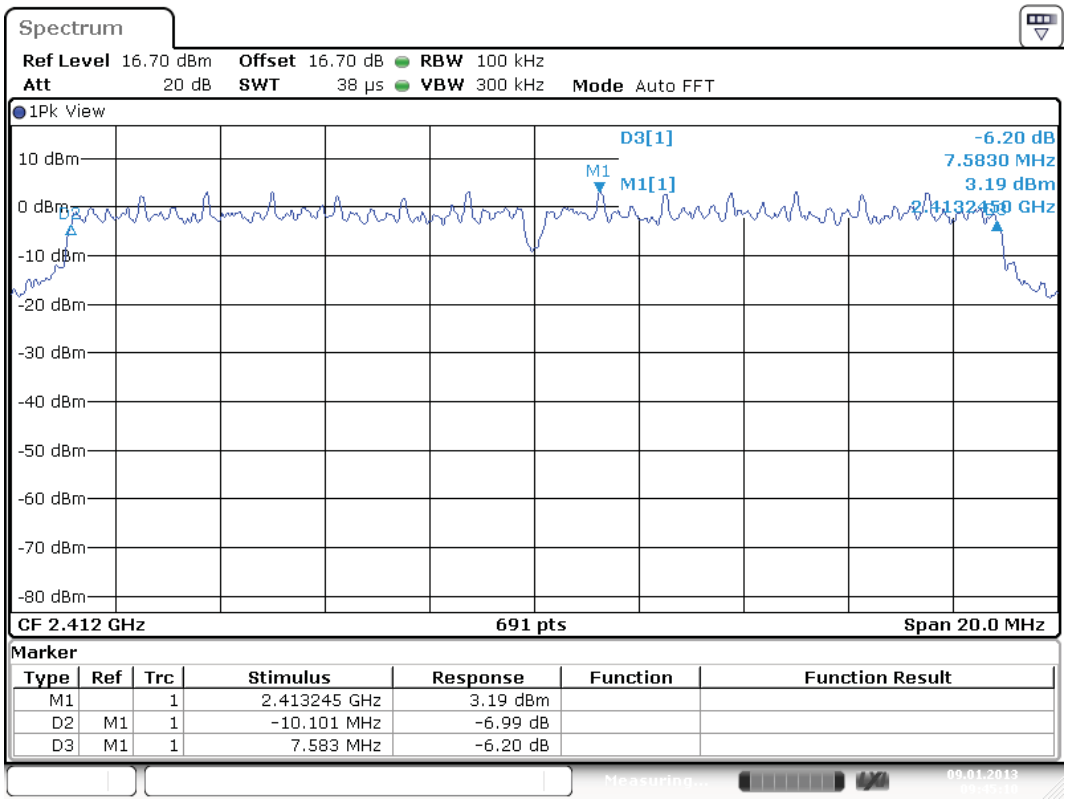
Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	2.463238 GHz	2.39 dBm		
D2	M1	1	-9.501 MHz	-6.79 dB		
D3	M1	1	7.026 MHz	-8.35 dB		

Date: 11.FEB.2013 10:40:20

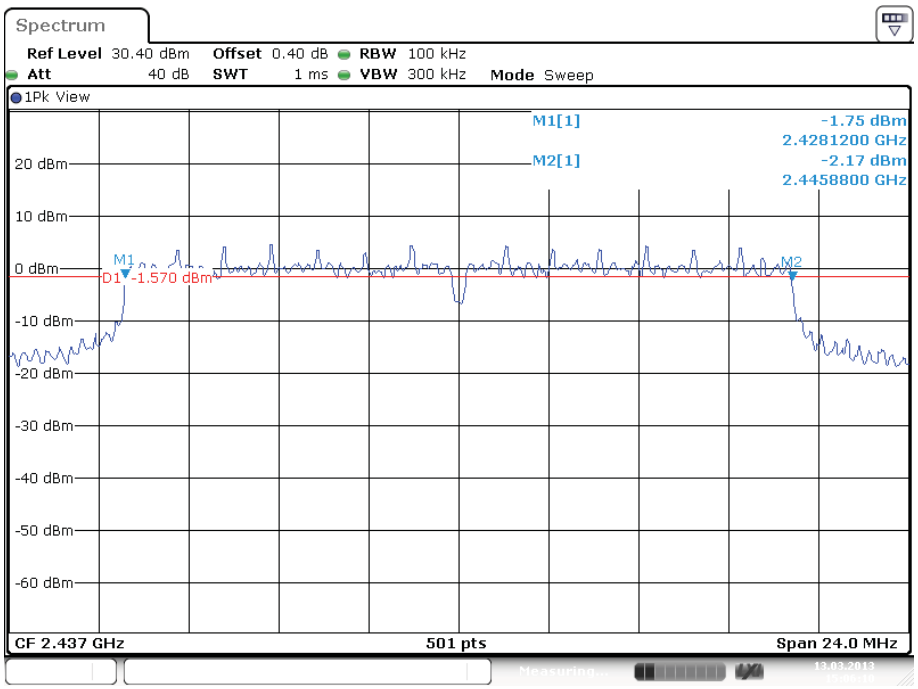
Plot C

Operation mode: HT4-20 MHz, Antenna 1

Operating Frequency [MHz]	99% Bandwidth [kHz]	6dB Bandwidth [kHz]	Limit [kHz]	Plot number
2412	18040	17684	500	A
2437	17964	17740	500	B
2462	20990	17725	500	C

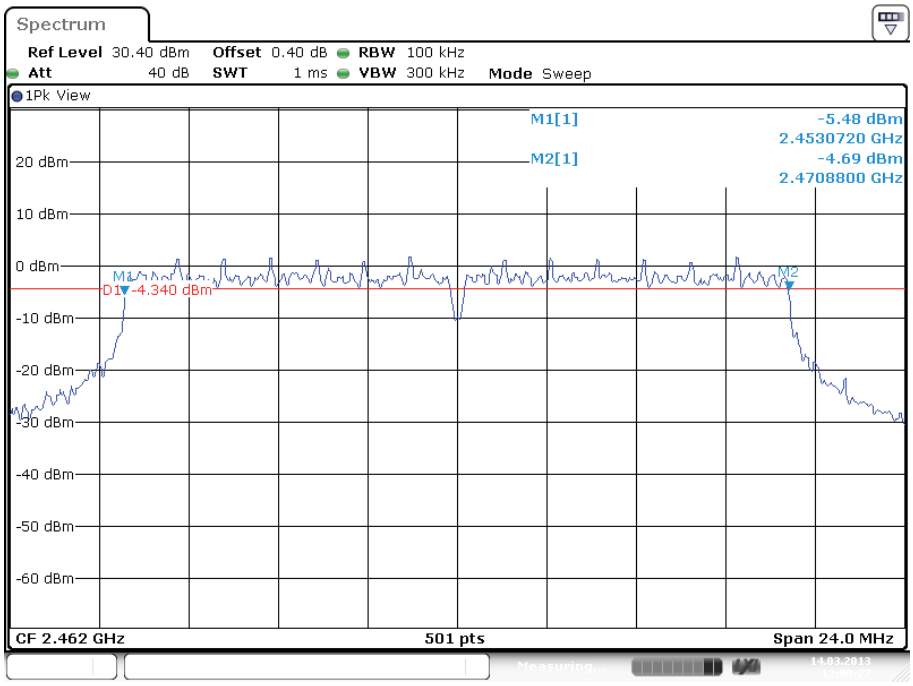


Date: 9.JAN.2013 09:45:10



Date: 13.MAR.2013 15:06:10

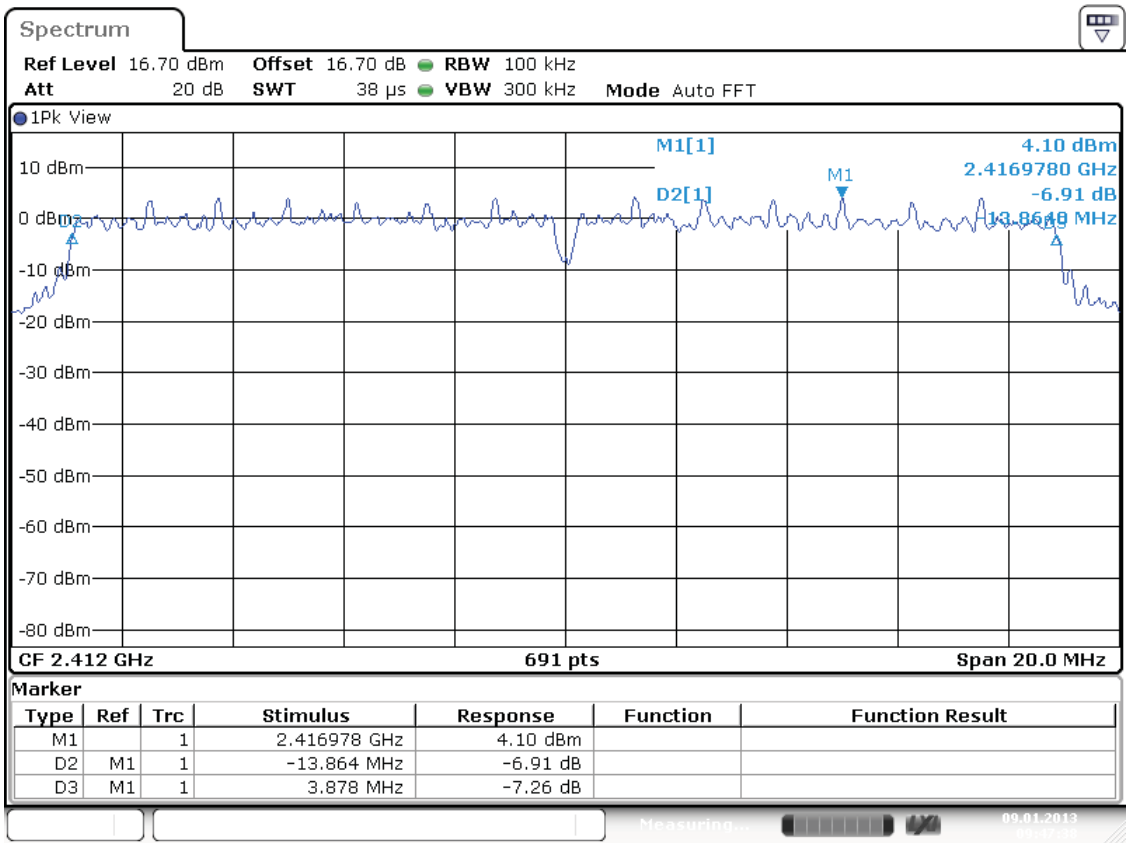
Plot B & C



Date: 14.MAR.2013 12:00:27

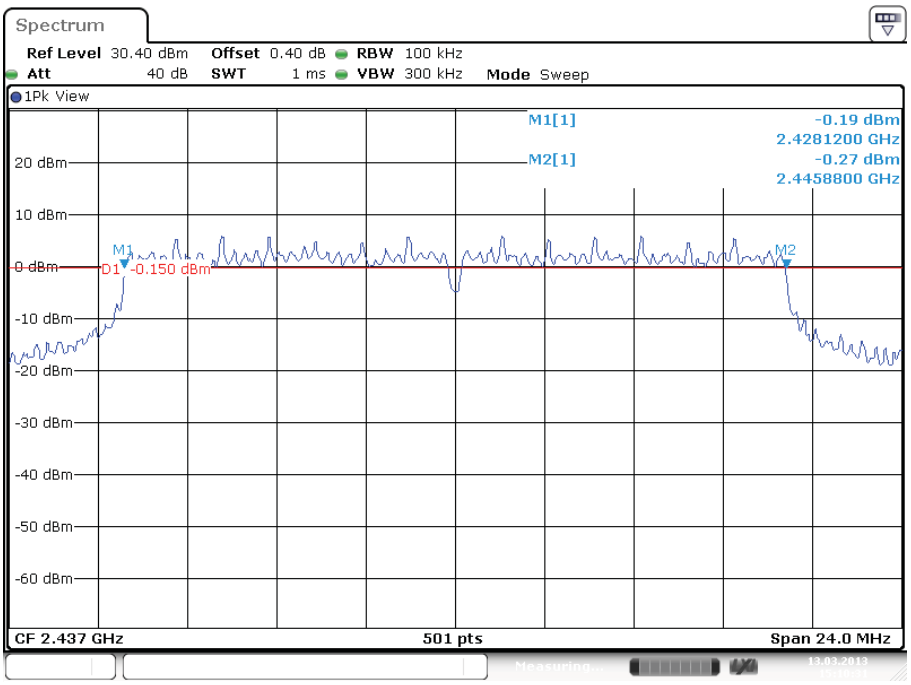
Operation mode: HT4-20 MHz, Antenna 2

Operating Frequency [MHz]	99% Bandwidth [kHz]	6dB Bandwidth [kHz]	Limit [kHz]	Plot number
2412	18120	17742	500	A
2437	17820	17760	500	B
2462	17960	17805	500	C



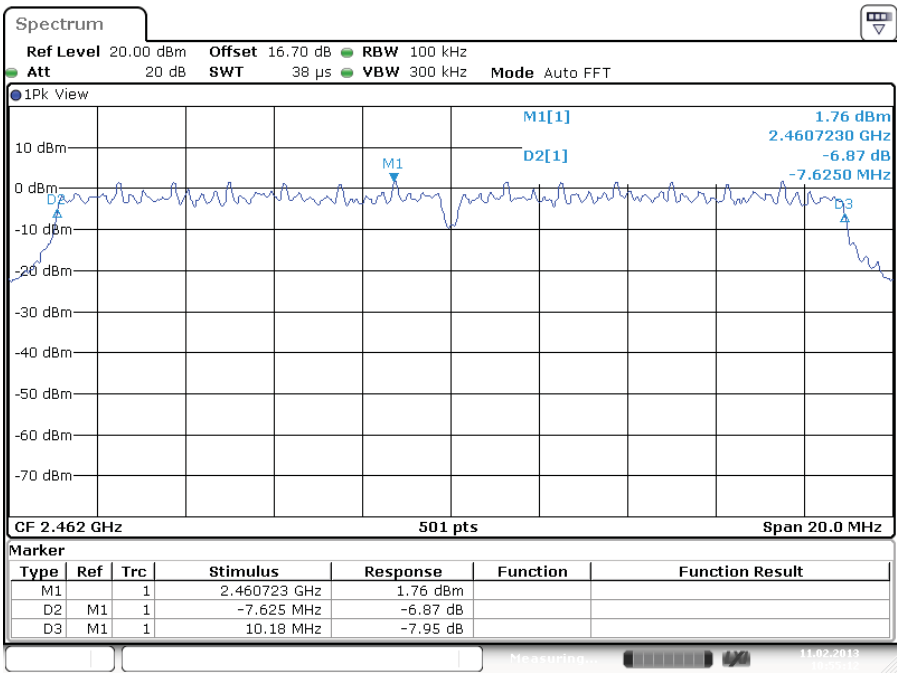
Date: 9.JAN.2013 09:47:38

Plot A



Date: 13.MAR.2013 15:10:32

Plot B

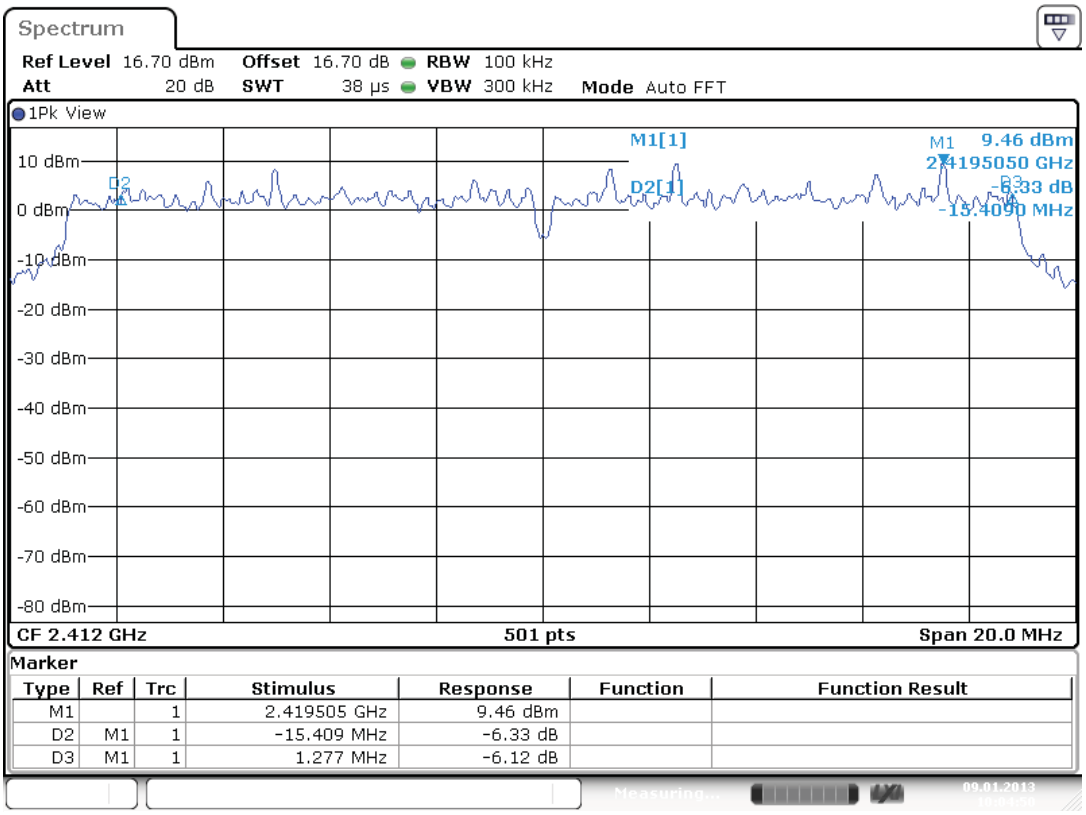


Date: 11.FEB.2013 10:55:12

Plot C

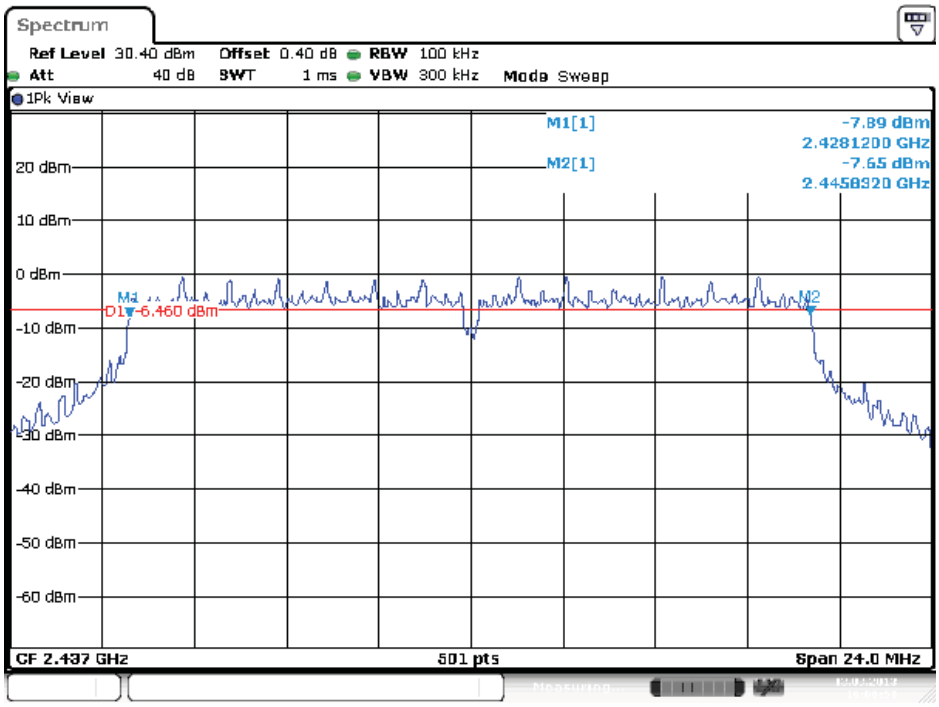
Operation mode: HT8-20 MHz, Antenna 1+2

Operating Frequency [MHz]	99% Bandwidth [kHz]	6dB Bandwidth [kHz]	Limit [kHz]	Plot number
2412	17960	16686	500	A
2437	17725	17712	500	B
2462	18040	17644	500	C

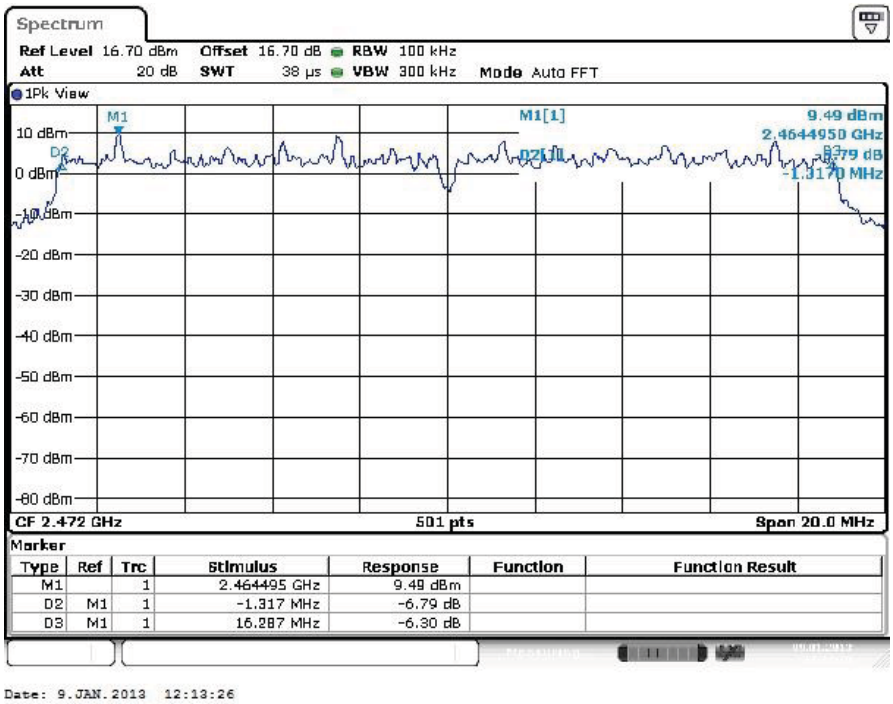


Date: 9.JAN.2013 10:04:50

Plot A


Spectrum
Ref Level 30.40 dBm Offset 0.40 dB RBW 100 kHz
Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep
1Pk View
M1[1] -7.89 dBm
2.4281200 GHz
M2[1] -7.65 dBm
2.4458920 GHz
D1 -6.460 dBm
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 2.437 GHz
501 pts
Span 24.0 MHz
Date: 13.MAR.2013 16:06:53

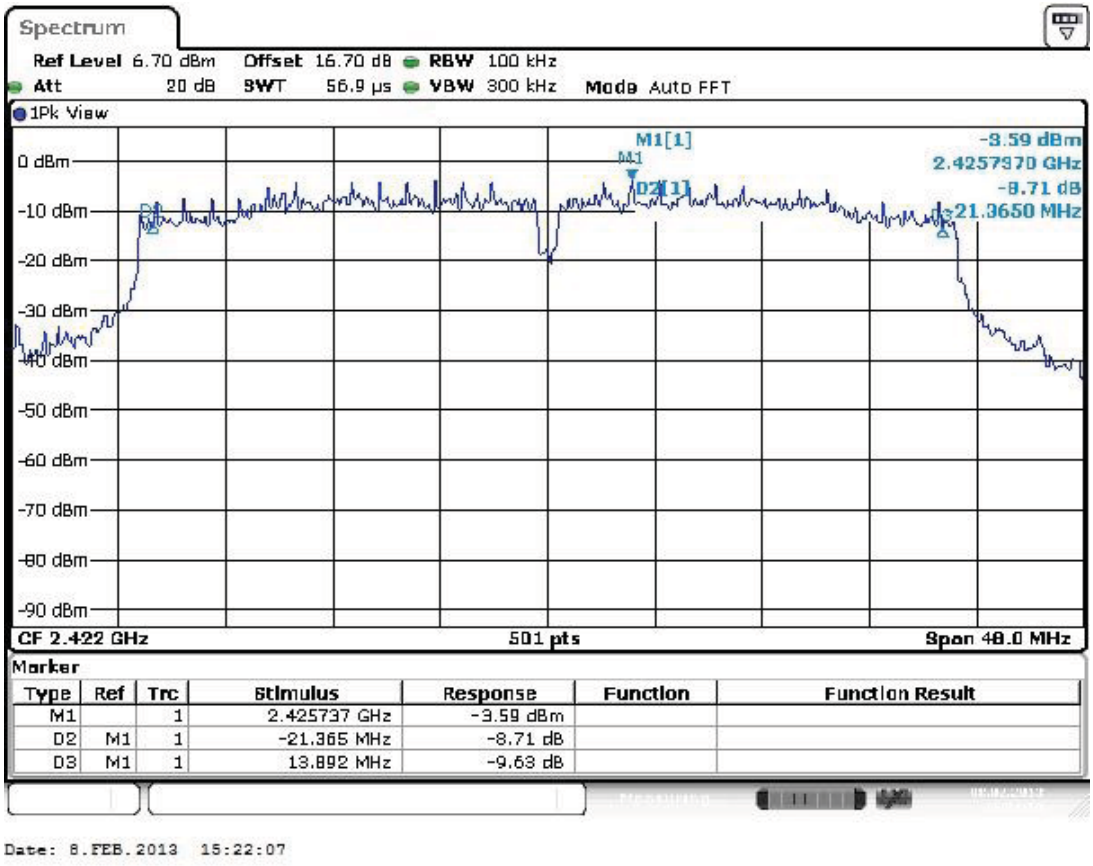
Plot B


Spectrum
Ref Level 16.70 dBm Offset 16.70 dB RBW 100 kHz
Att 20 dB SWT 38 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1
M1[1] 9.49 dBm
2.4644950 GHz
D2[1] -6.79 dB
-1.3170 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.472 GHz
501 pts
Span 20.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.464495 GHz 9.49 dBm
D2 M1 1 -1.317 MHz -6.79 dB
D3 M1 1 16.287 MHz -6.30 dB
Date: 9.JAN.2013 12:13:26

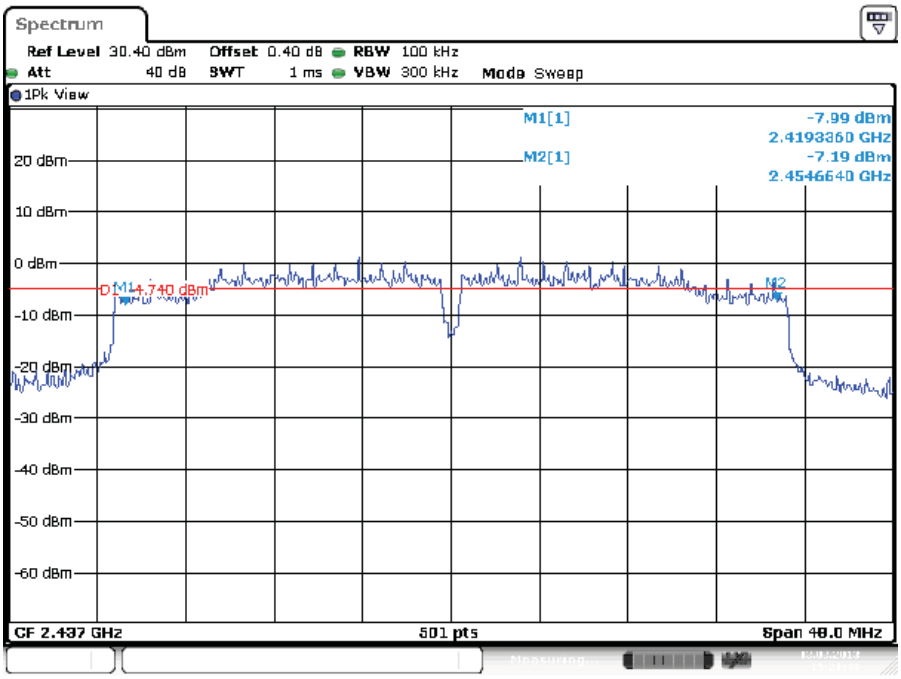
Plot C

Operation mode: HT4-40 MHz wide, Antenna 1

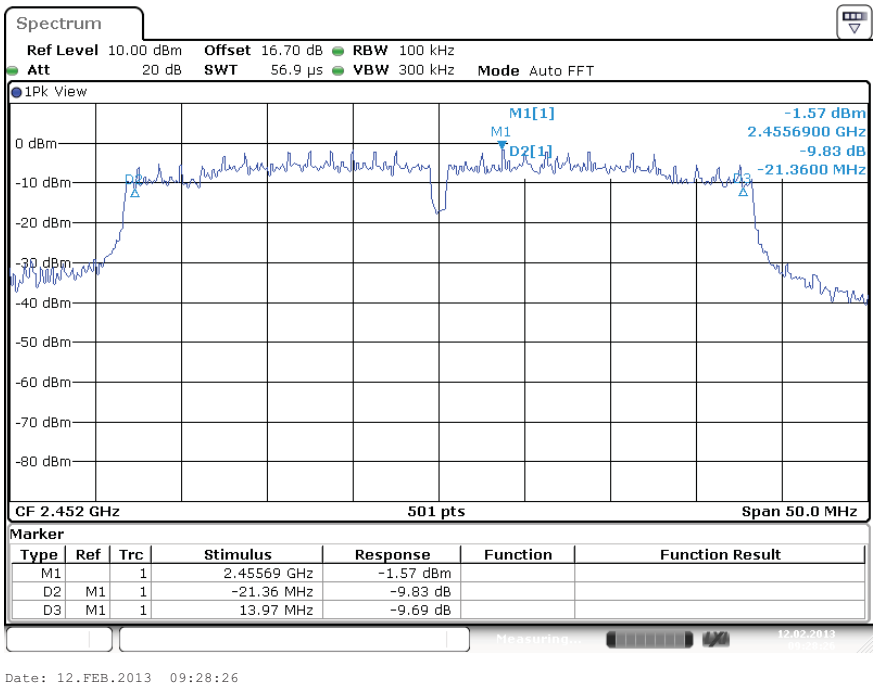
Operating Frequency [MHz]	99% Bandwidth [kHz]	6dB Bandwidth [kHz]	Limit [kHz]	Plot number
2422	36090	35330	500	A
2437	36216	35328	500	B
2452	36410	35330	500	C



Plot A


Spectrum
Ref Level 30.40 dBm Offset 0.40 dB RBW 100 kHz
Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep
1Pk View
M1[1] -7.99 dBm
2.4193360 GHz
M2[1] -7.19 dBm
2.4546640 GHz
D1 M1 1.740 dBm
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 2.437 GHz
501 pts
Span 48.0 MHz
Date: 13.MAR.2013 15:21:47

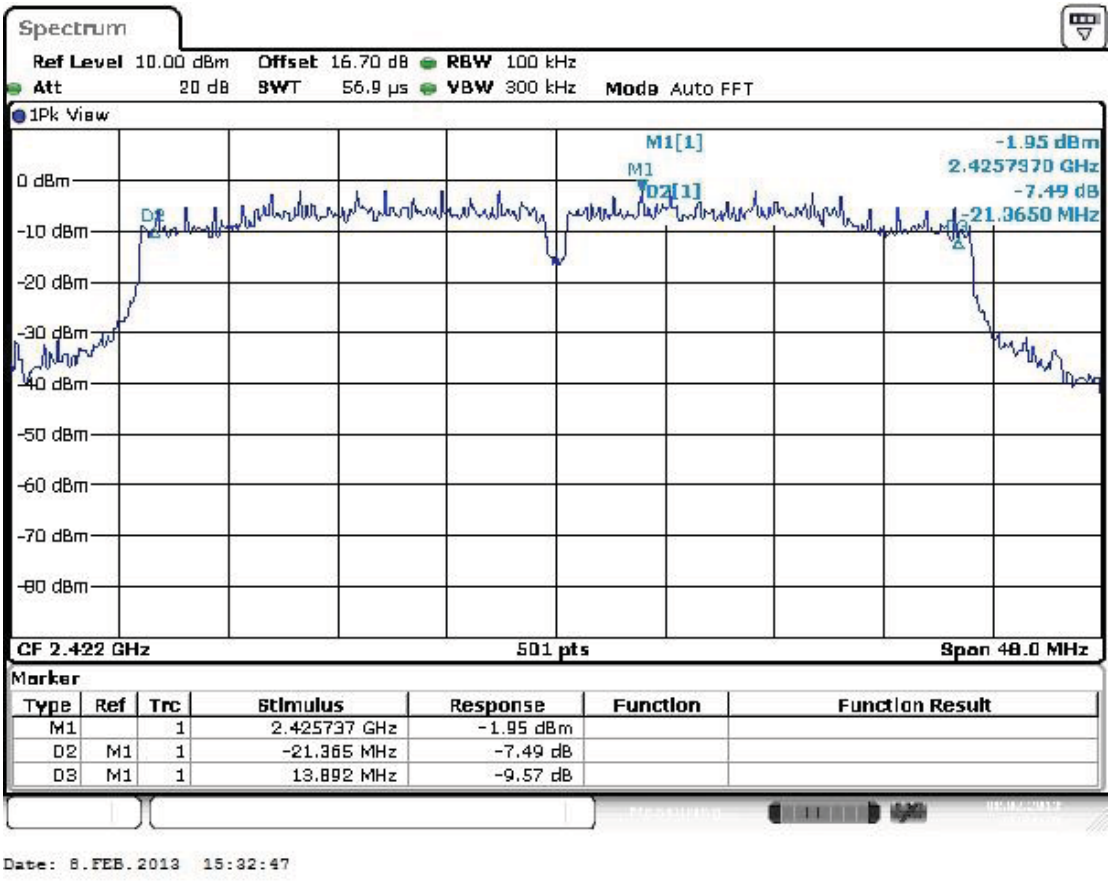
Plot B


Spectrum
Ref Level 10.00 dBm Offset 16.70 dB RBW 100 kHz
Att 20 dB SWT 56.9 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] -1.57 dBm
2.4556900 GHz
D2[1] -9.83 dB
-21.3600 MHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.452 GHz
501 pts
Span 50.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.45569 GHz -1.57 dBm
D2 M1 1 -21.36 MHz -9.83 dB
D3 M1 1 13.97 MHz -9.69 dB
Date: 12.FEB.2013 09:28:26

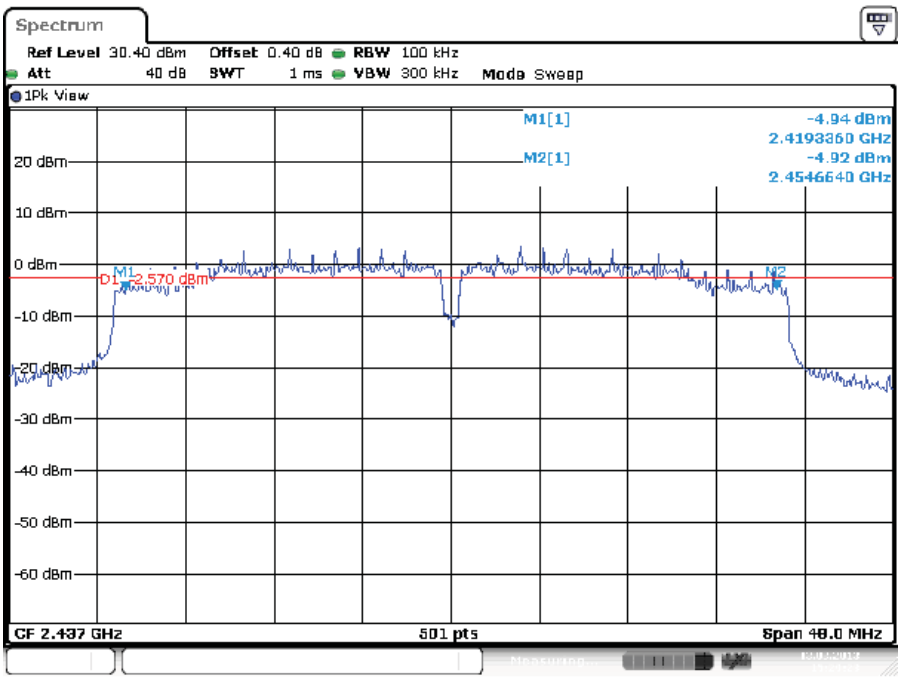
Plot C

Operation mode: HT4-40 MHz wide, Antenna 2

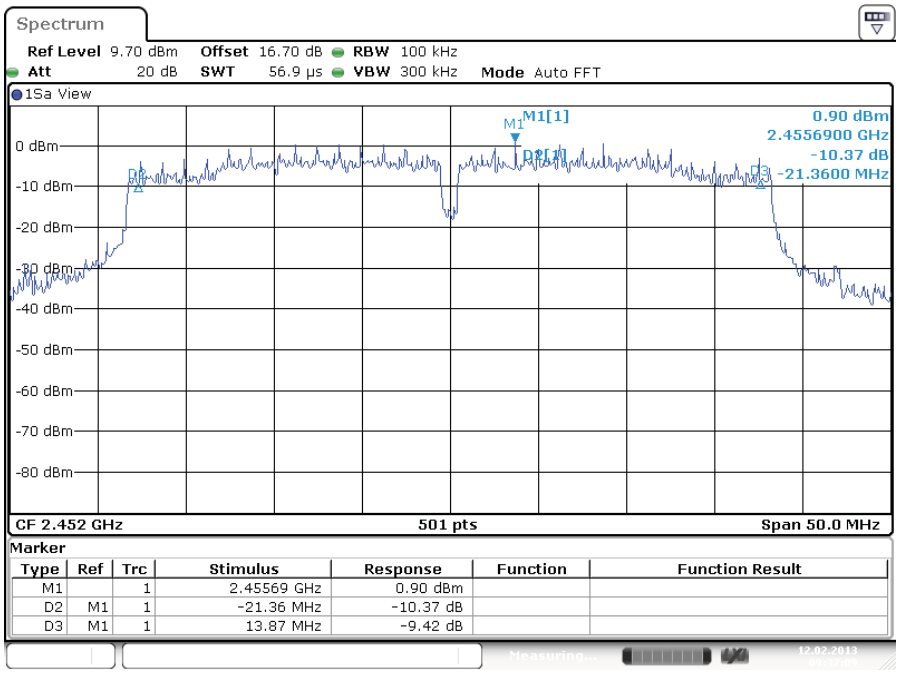
Operating Frequency [MHz]	99% Bandwidth [kHz]	6dB Bandwidth [kHz]	Limit [kHz]	Plot number
2422	35930	34030	500	A
2437	36024	35328	500	B
2452	35930	35230	500	C



Plot A


Spectrum
Ref Level 30.40 dBm Offset 0.40 dB RBW 100 kHz
Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep
1Pk View
M1[1] -4.94 dBm
2.4193860 GHz
M2[1] -4.92 dBm
2.4546640 GHz
D1 M1 -2.570 dBm
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 2.437 GHz
501 pts
Span 48.0 MHz
Date: 13.MAR.2013 15:29:23

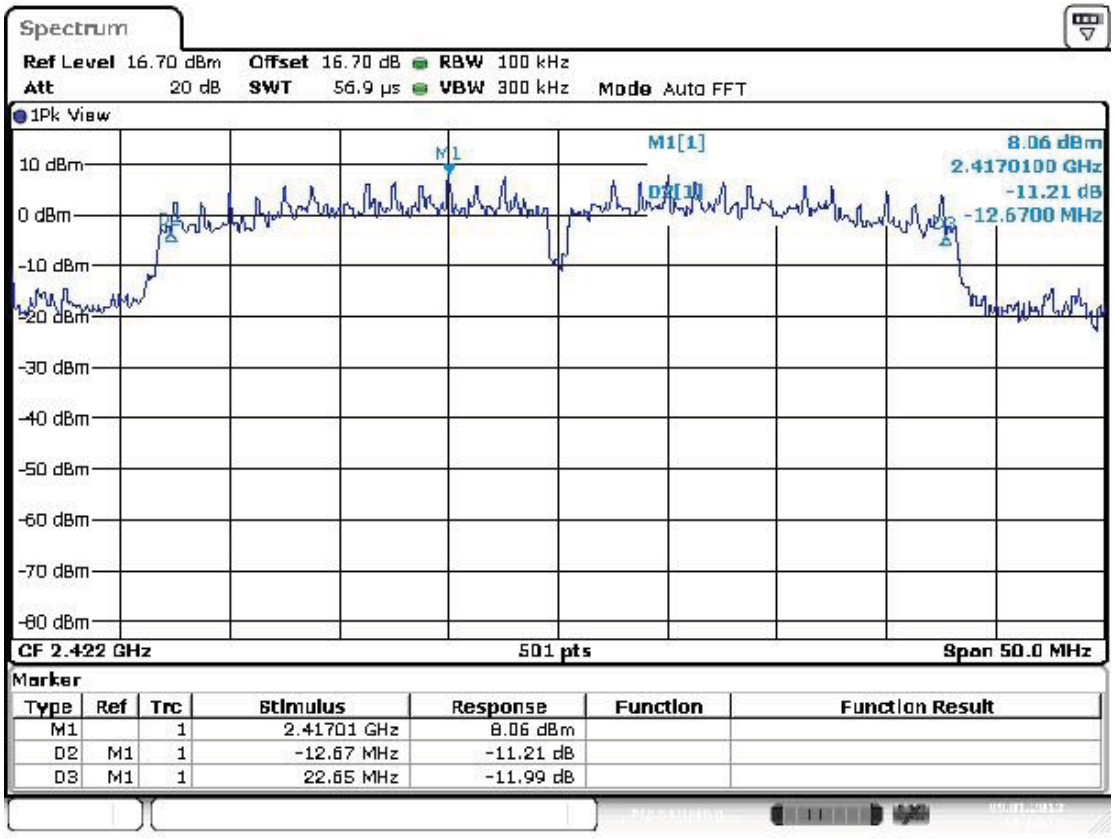
Plot B


Spectrum
Ref Level 9.70 dBm Offset 16.70 dB RBW 100 kHz
Att 20 dB SWT 56.9 µs VBW 300 kHz Mode Auto FFT
1Sa View
M1[1] 0.90 dBm
2.4556900 GHz
D2[1] -10.37 dB
D3 -21.3600 MHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.452 GHz
501 pts
Span 50.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.45569 GHz 0.90 dBm
D2 M1 1 -21.36 MHz -10.37 dB
D3 M1 1 13.87 MHz -9.42 dB
Date: 12.FEB.2013 09:37:10

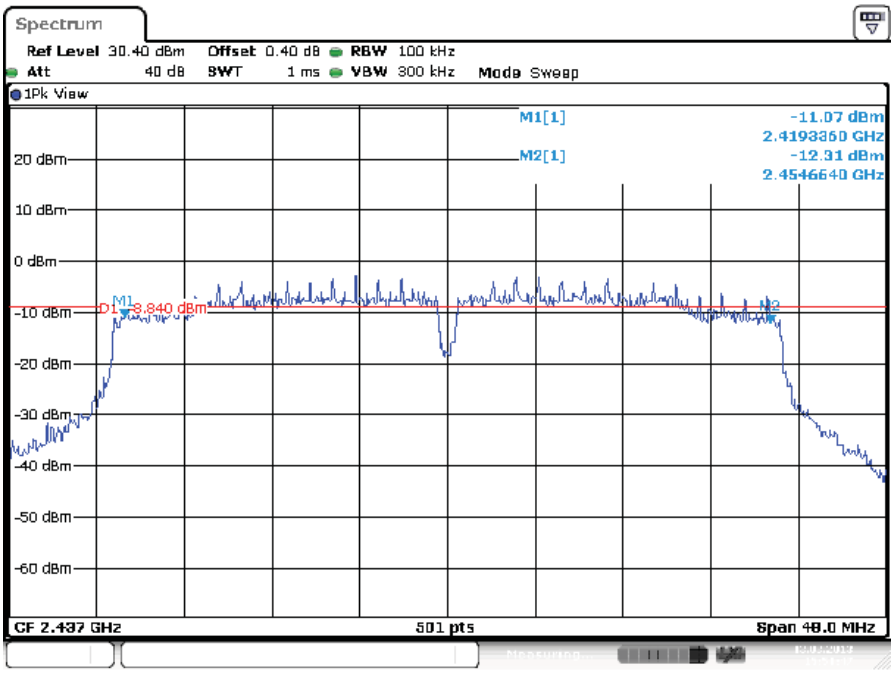
Plot C

Operation mode: HT8-40 MHz wide, Antenna 1+2

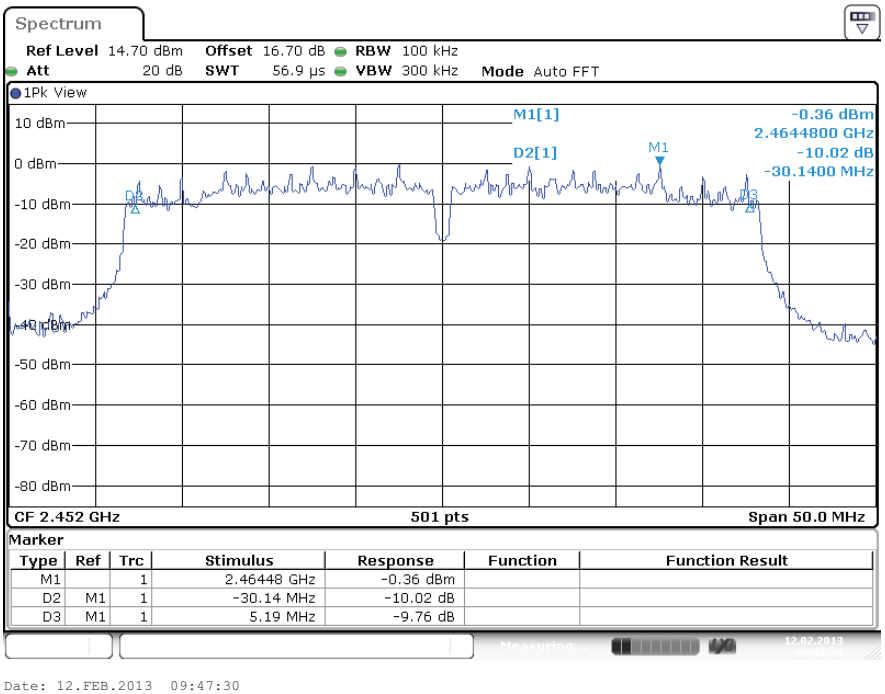
Operating Frequency [MHz]	99% Bandwidth [kHz]	6dB Bandwidth [kHz]	Limit [kHz]	Plot number
2422	35930	35320	500	A
2437	35737	35328	500	B
2452	36090	35330	500	C



Plot A


Spectrum
Ref Level 30.40 dBm Offset 0.40 dB RBW 100 kHz
Att 40 dB SWT 1 ms VBW 300 kHz Mode Sweep
1Pk View
M1[1] -11.07 dBm
2.4193360 GHz
M2[1] -12.31 dBm
2.4546640 GHz
D1 3.840 dBm
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 2.437 GHz
501 pts
Span 48.0 MHz
Date: 13.MAR.2013 15:51:48

Plot B


Spectrum
Ref Level 14.70 dBm Offset 16.70 dB RBW 100 kHz
Att 20 dB SWT 56.9 µs VBW 300 kHz Mode Auto FFT
1Pk View
M1[1] -0.36 dBm
2.4644800 GHz
D2[1] -10.02 dB
-30.1400 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.452 GHz
501 pts
Span 50.0 MHz
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 2.46448 GHz -0.36 dBm
D2 M1 1 -30.14 MHz -10.02 dB
D3 M1 1 5.19 MHz -9.76 dB
Date: 12.FEB.2013 09:47:30

Plot C

5.2.3 Peak Power Spectral Density

RESULT: PASS

Date of testing: 2013-01-12 / 2013-03-14

Requirements:

FCC 15.247(e) and RSS-210 section A8.2(b)

For digitally modulated systems, the power spectral density (PSD) conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

Test procedure:

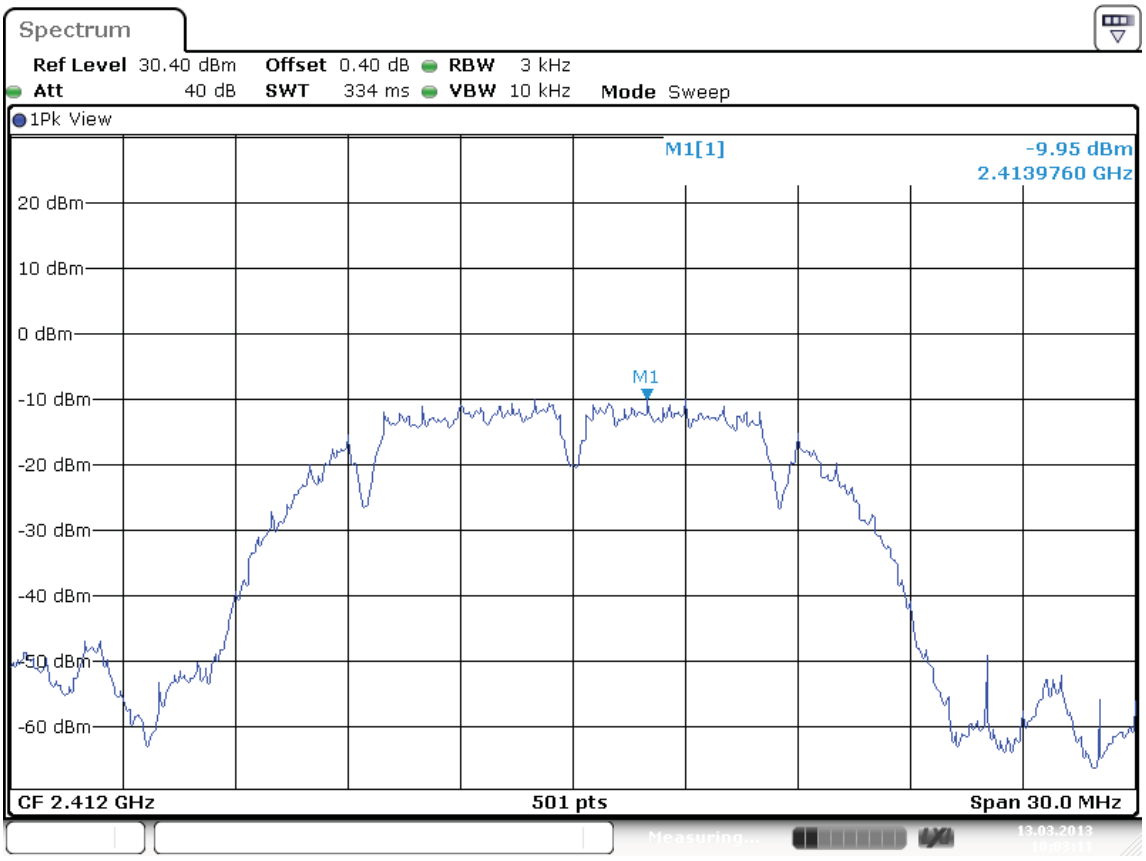
ANSI C63.10:2009
KDB Publication No. 558074 D01: Measurement of Digital Transmission Systems Operating under Section 15.247.

The Peak PSD Option 1 procedure was used. A spectrum analyzer was connected to the antenna port of the EUT. The analyzer resolution bandwidth was set to 3kHz and the video bandwidth was set to 10kHz. The sweep time was set to auto couple and the trace was allowed to stabilize before making the final measurement. By using the Peak marker function the maximum amplitude was determined. The final measurement takes into account the loss generated by all the involved cables.

Peak Power Spectral Density

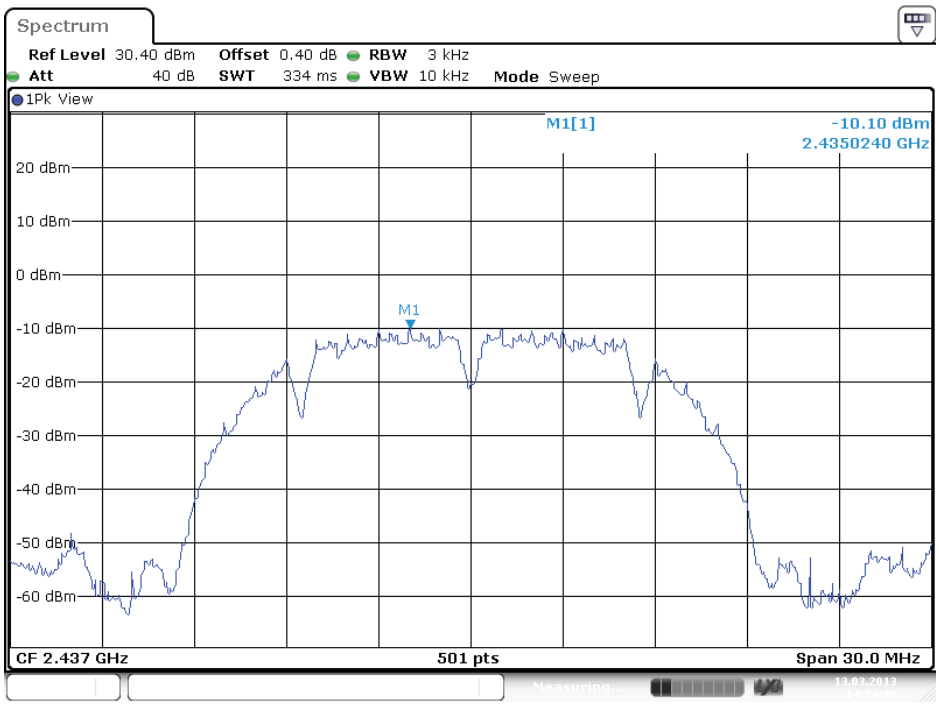
Operation mode: 1Mb DSSS, Antenna 1

Operating Frequency [MHz]	Max PSD [dBm]	Limit [dBm]	Verdict [Pass/Fail]	Plot
2412	-9.95	8	Pass	A
2437	-10.10	8	Pass	B
2462	-10.61	8	Pass	C



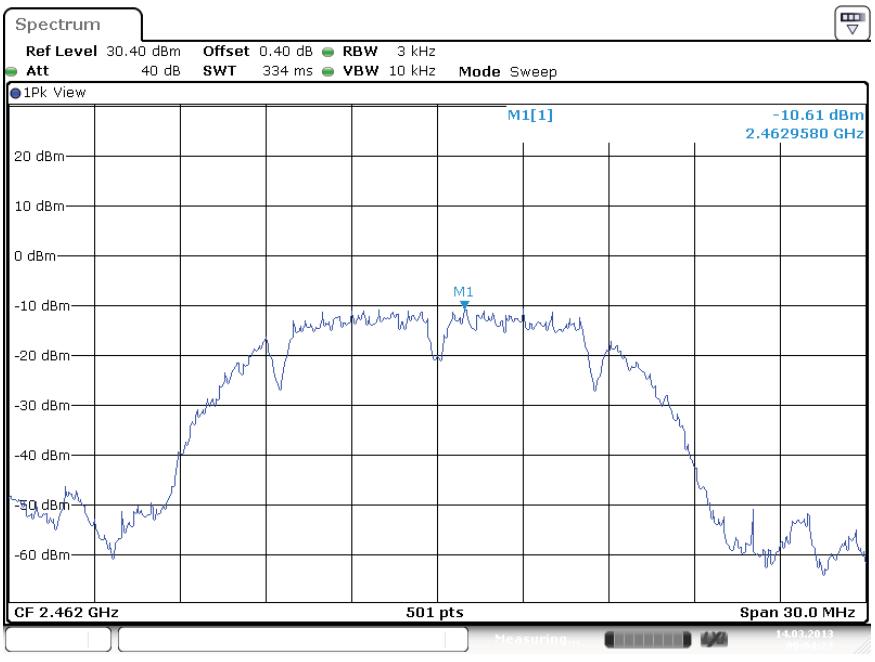
Date: 13.MAR.2013 10:03:11

Plot A:



Date: 13.MAR.2013 14:24:32

B

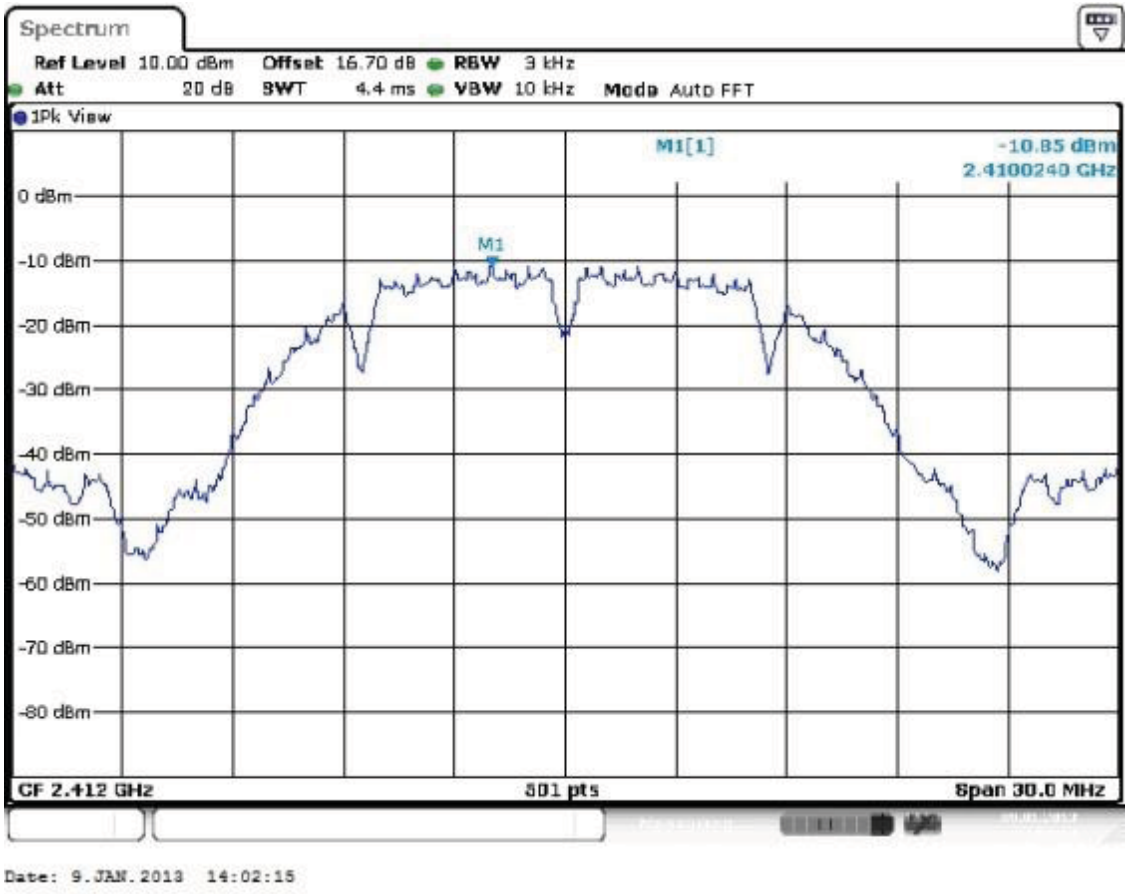


Date: 14.MAR.2013 09:04:23

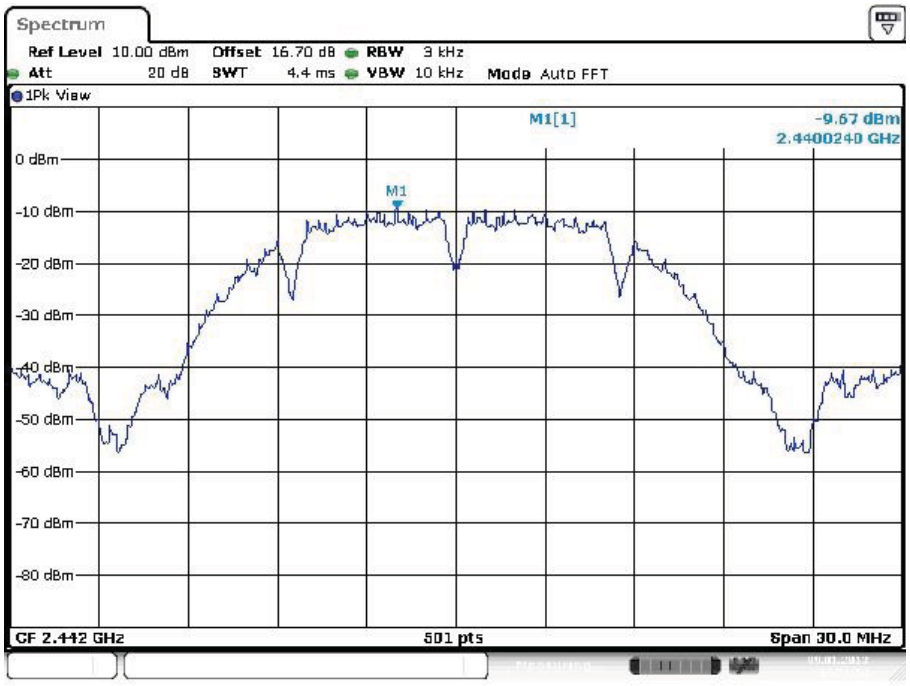
C

Operation mode: 1Mb DSSS, Antenna 2

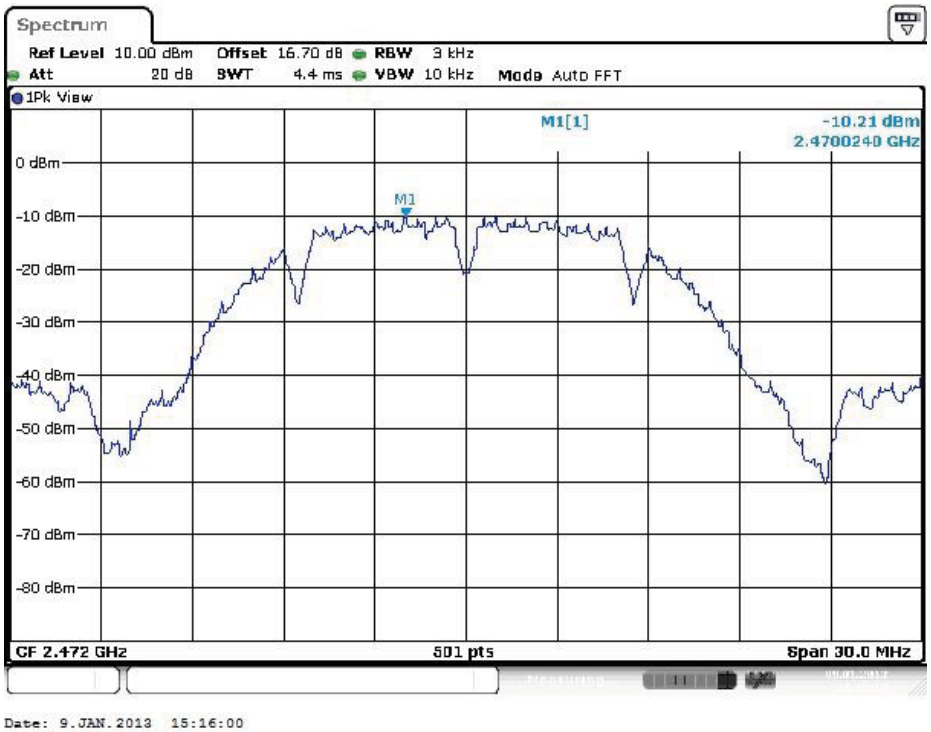
Operating Frequency [MHz]	Max PSD [dBm]	Limit [dBm]	Verdict [Pass/Fail]	Plot
2412	-10.85	8	Pass	A
2442	-9.67	8	Pass	B
2462	-10.21	8	Pass	C



Plot A:


Spectrum
Ref Level 10.00 dBm Offset 16.70 dB RBW 3 kHz
Att 20 dB SWT 4.4 ms VBW 10 kHz Mode Auto FFT
1Pk View
M1[1] -9.67 dBm
2.4400240 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.442 GHz
501 pts
Span 30.0 MHz
Date: 9.JAN.2013 14:58:54

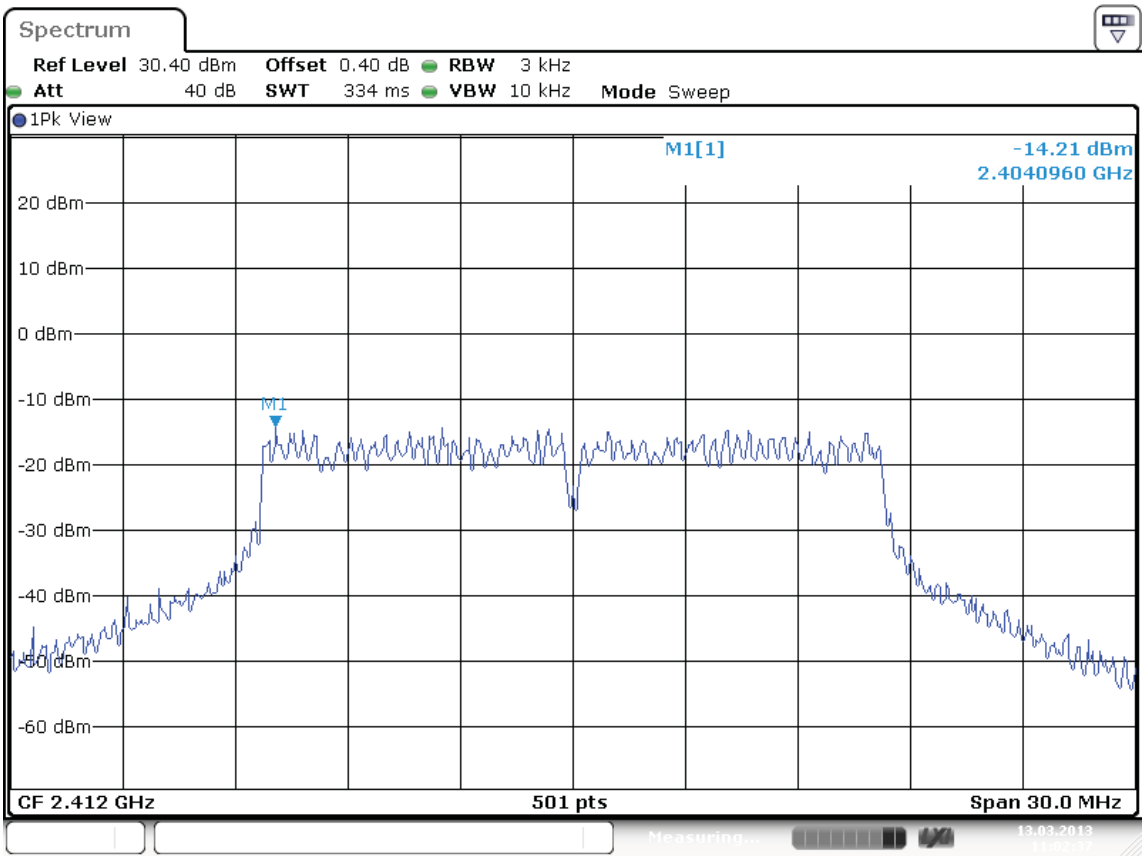
B


Spectrum
Ref Level 10.00 dBm Offset 16.70 dB RBW 3 kHz
Att 20 dB SWT 4.4 ms VBW 10 kHz Mode Auto FFT
1Pk View
M1[1] -10.21 dBm
2.4700240 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.472 GHz
501 pts
Span 30.0 MHz
Date: 9.JAN.2013 15:16:00

C

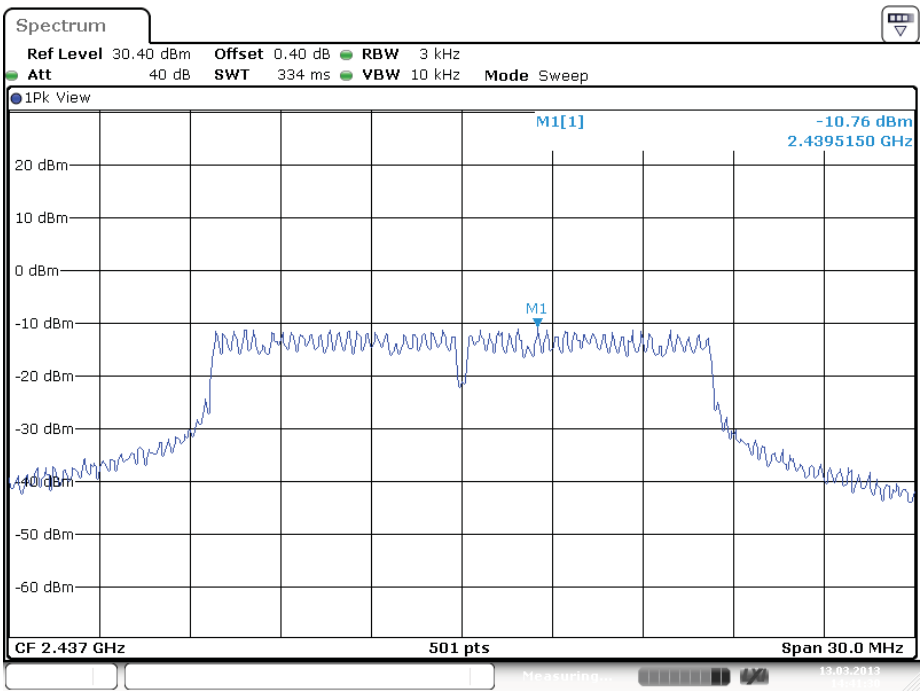
Operation mode: 6 Mb OFDM, Antenna 1

Operating Frequency [MHz]	Max PSD [dBm]	Limit [dBm]	Verdict [Pass/Fail]	Plot
2412	-14.21	8	Pass	A
2437	-10.76	8	Pass	B
2462	-11.39	8	Pass	C



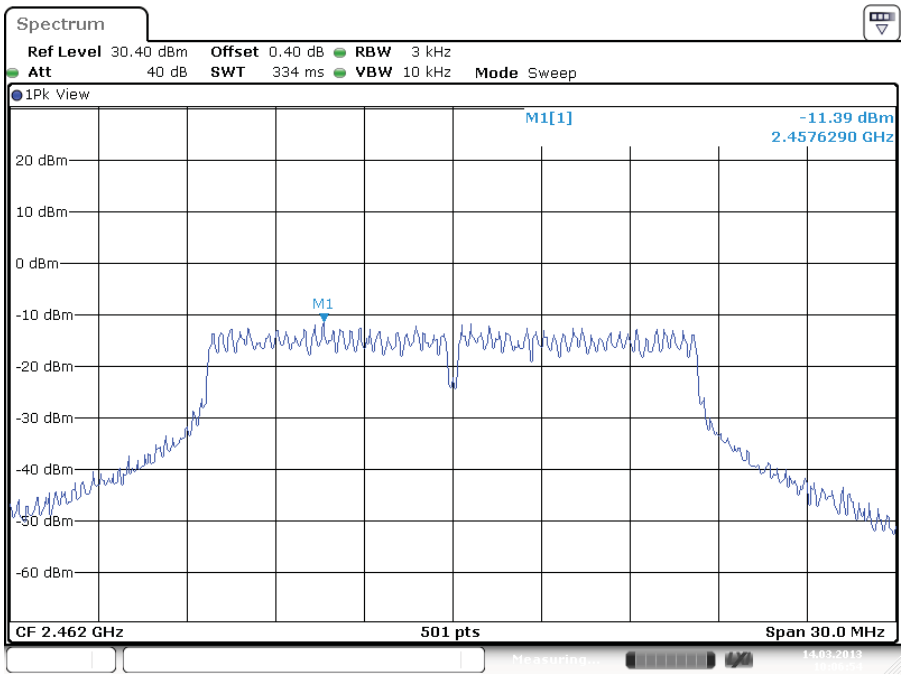
Date: 13.MAR.2013 11:02:38

Plot A



Date: 13.MAR.2013 14:41:30

Plot B



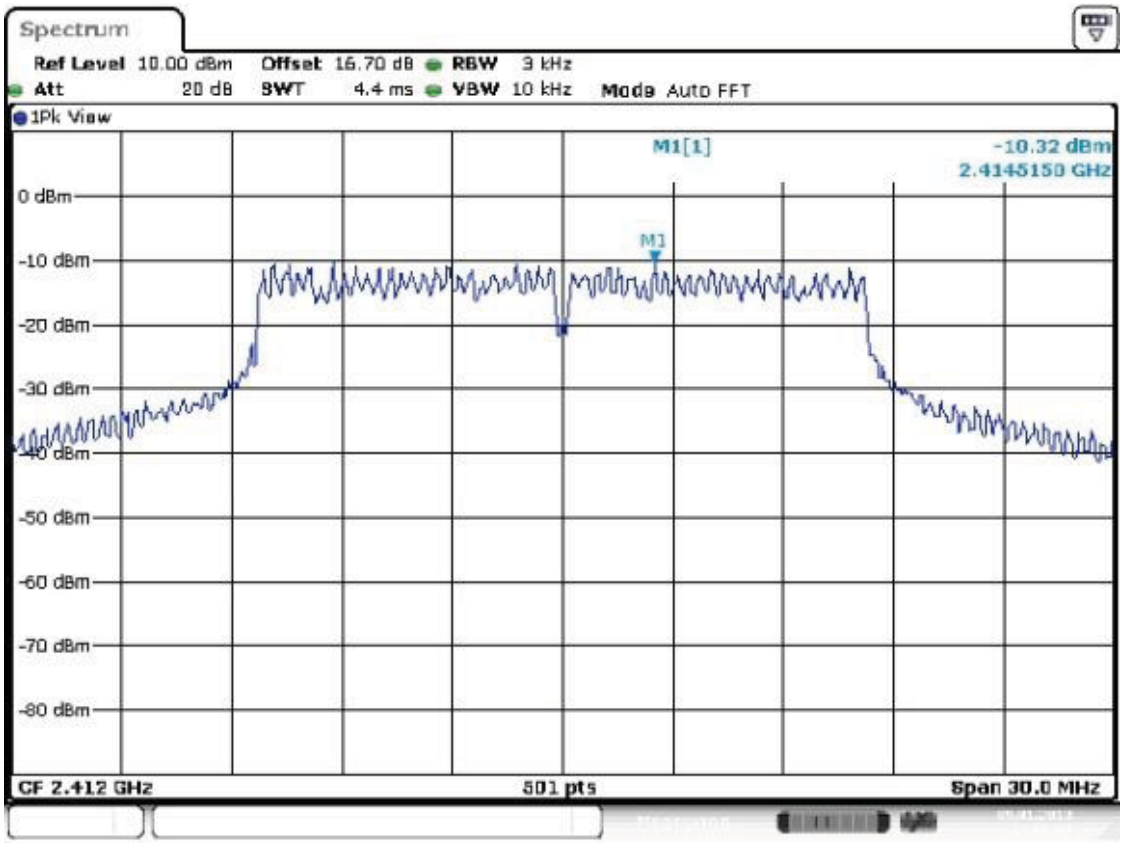
Date: 14.MAR.2013 10:06:55

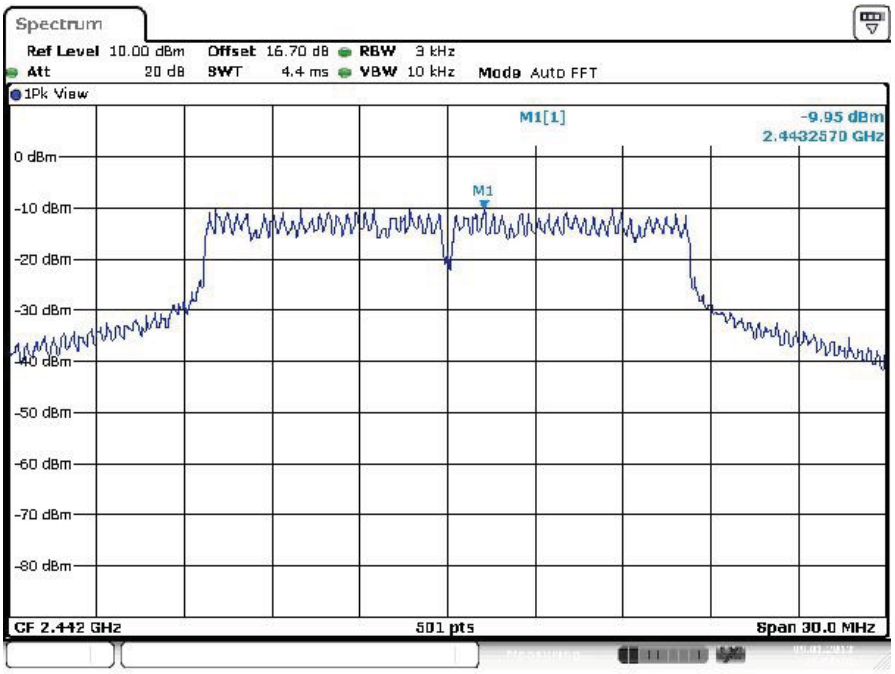
Plot C

Operation mode: 6 Mb OFDM, Antenna 2

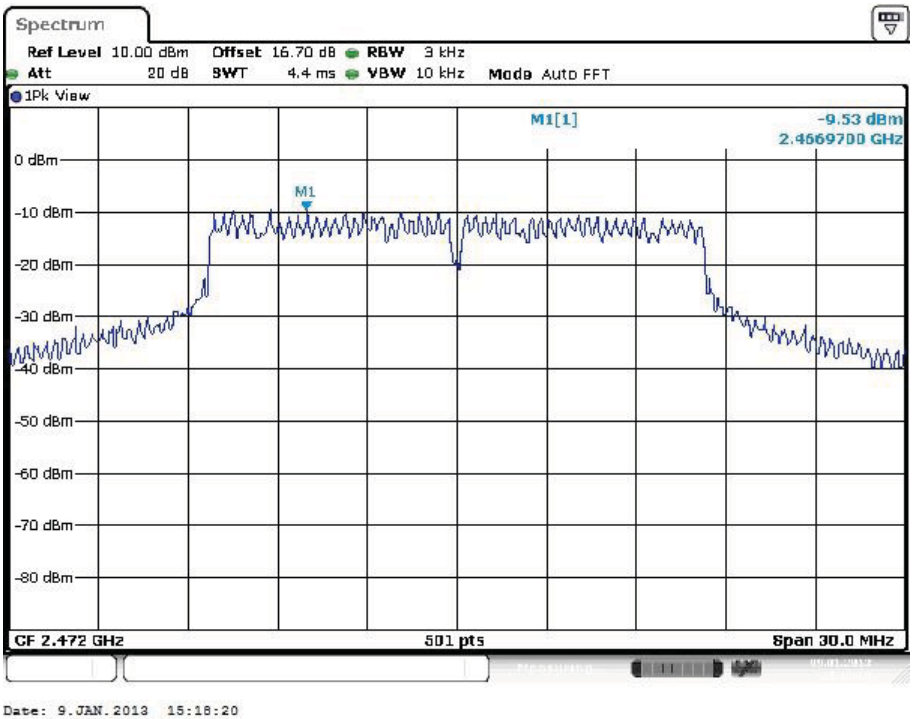
Operating Frequency [MHz]	Max PSD [dBm]	Limit [dBm]	Verdict [Pass/Fail]	Plot
2412	-10.32	8	Pass	A
2437	-9.95	8	Pass	B
2462	-9.53	8	Pass	C

Plot A:




Spectrum
Ref Level 10.00 dBm Offset 16.70 dB RBW 3 kHz
Att 20 dB SWT 4.4 ms VBW 10 kHz Mode Auto FFT
1Pk View
M1[1] -9.95 dBm
2.4432570 GHz
M1
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.442 GHz
501 pts
Span 30.0 MHz
Date: 9.JAN.2013 15:01:22

Plot B

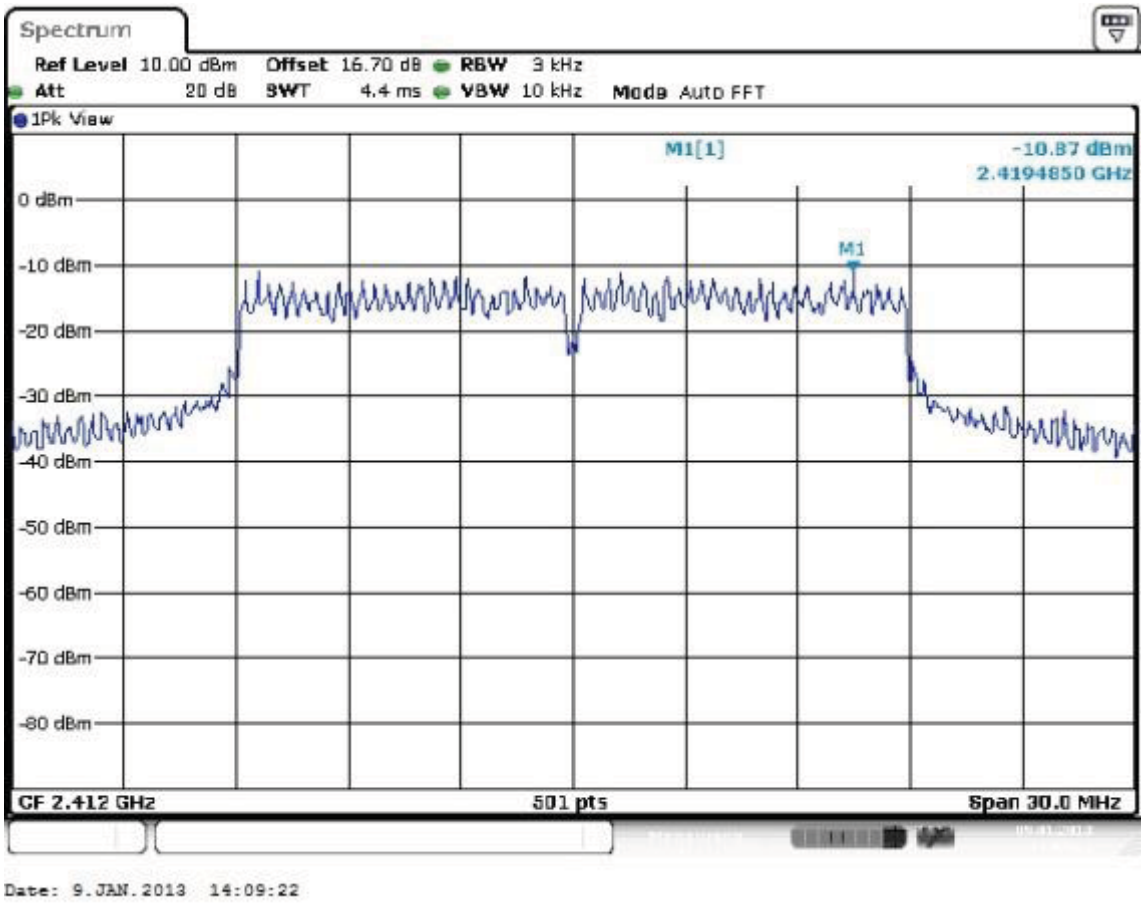

Spectrum
Ref Level 10.00 dBm Offset 16.70 dB RBW 3 kHz
Att 20 dB SWT 4.4 ms VBW 10 kHz Mode Auto FFT
1Pk View
M1[1] -9.53 dBm
2.4669700 GHz
M1
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.472 GHz
501 pts
Span 30.0 MHz
Date: 9.JAN.2013 15:18:20

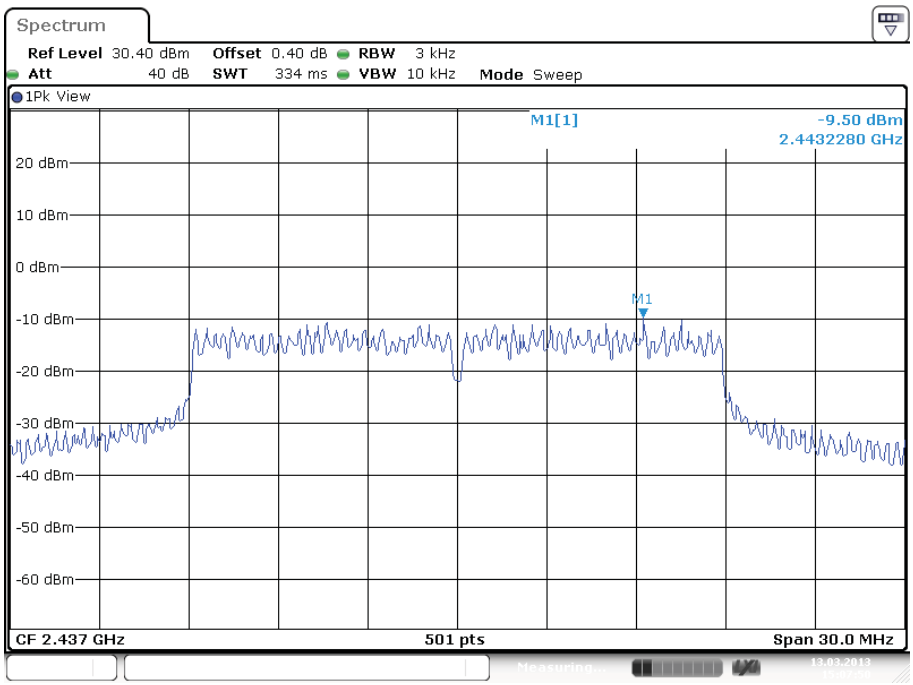
Plot C

Operation mode: HT4-20 MHz, Antenna 1

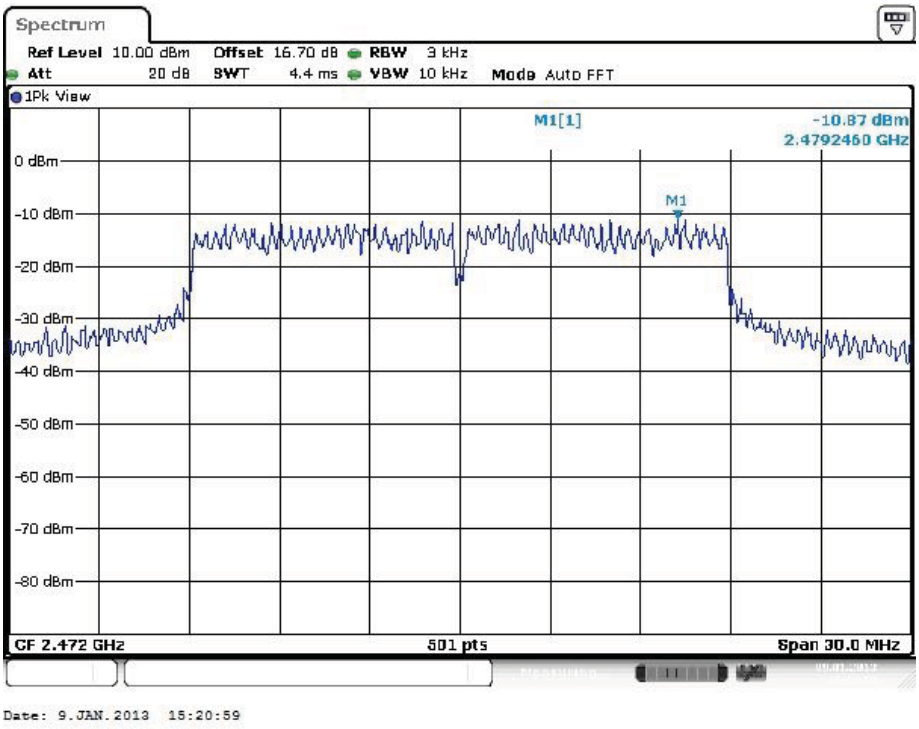
Operating Frequency [MHz]	Max PSD [dBm]	Limit [dBm]	Verdict [Pass/Fail]	Plot
2412	-10.87	8	Pass	A
2437	-9.50	8	Pass	B
2462	-10.87	8	Pass	C

Plot A




Spectrum
Ref Level 30.40 dBm Offset 0.40 dB RBW 3 kHz
Att 40 dB SWT 334 ms VBW 10 kHz Mode Sweep
1Pk View
M1[1] -9.50 dBm
2.4432280 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
CF 2.437 GHz
501 pts
Span 30.0 MHz
Date: 13.MAR.2013 15:07:51

Plot B

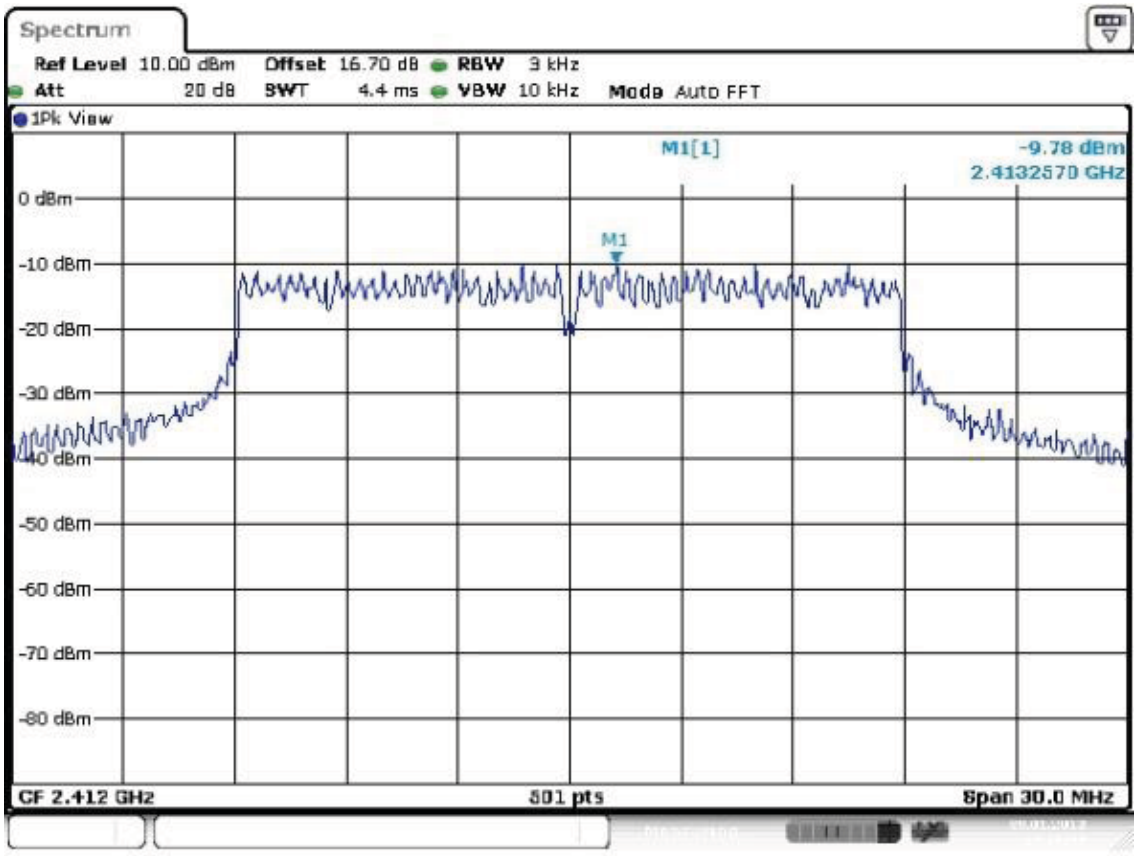

Spectrum
Ref Level 10.00 dBm Offset 16.70 dB RBW 3 kHz
Att 20 dB SWT 4.4 ms VBW 10 kHz Mode Auto FFT
1Pk View
M1[1] -10.87 dBm
2.4792460 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.472 GHz
501 pts
Span 30.0 MHz
Date: 9.JAN.2013 15:20:59

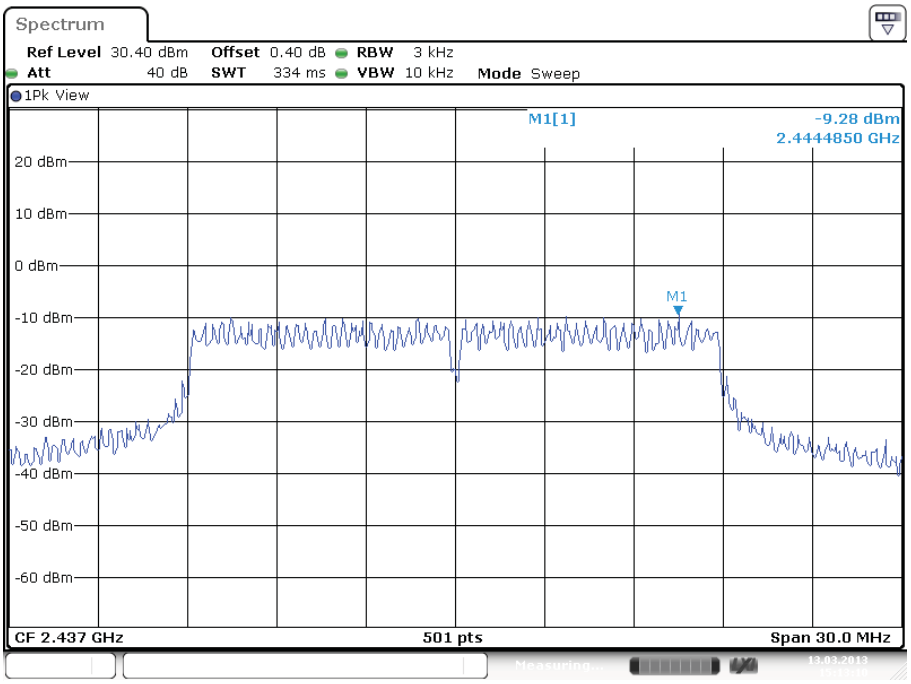
Plot C

Operation mode: HT4-20 MHz, Antenna 2

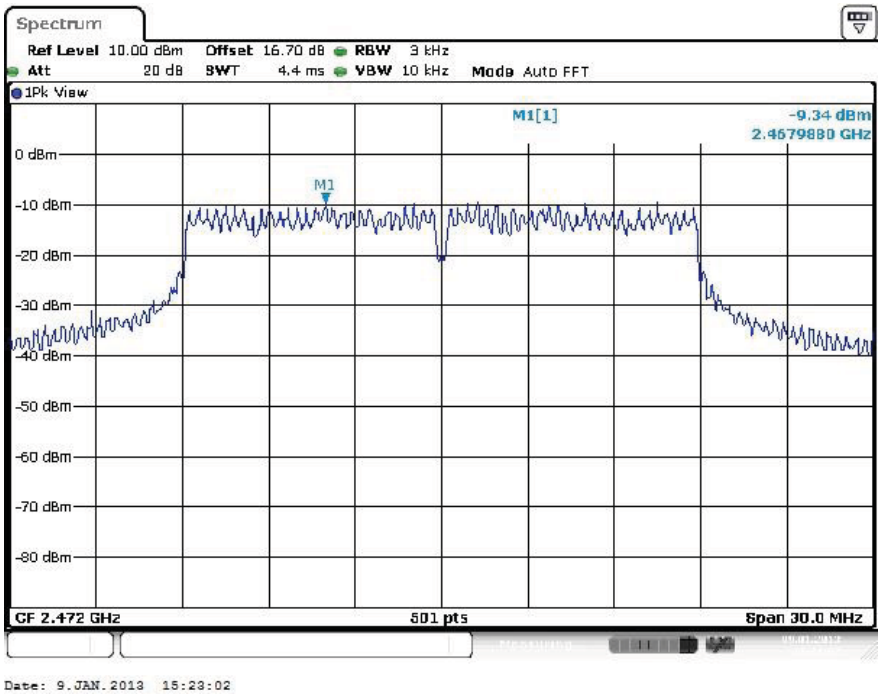
Operating Frequency [MHz]	Max PSD [dBm]	Limit [dBm]	Verdict [Pass/Fail]	Plot
2412	-9.78	8	Pass	A
2437	-9.28	8	Pass	B
2462	-9.34	8	Pass	C

Plot A




Spectrum
Ref Level 30.40 dBm Offset 0.40 dB RBW 3 kHz
Att 40 dB SWT 334 ms VBW 10 kHz Mode Sweep
1Pk View
M1[1] -9.28 dBm
2.4444850 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
CF 2.437 GHz 501 pts Span 30.0 MHz
Measuring...
13.03.2013
Date: 13.MAR.2013 15:13:10

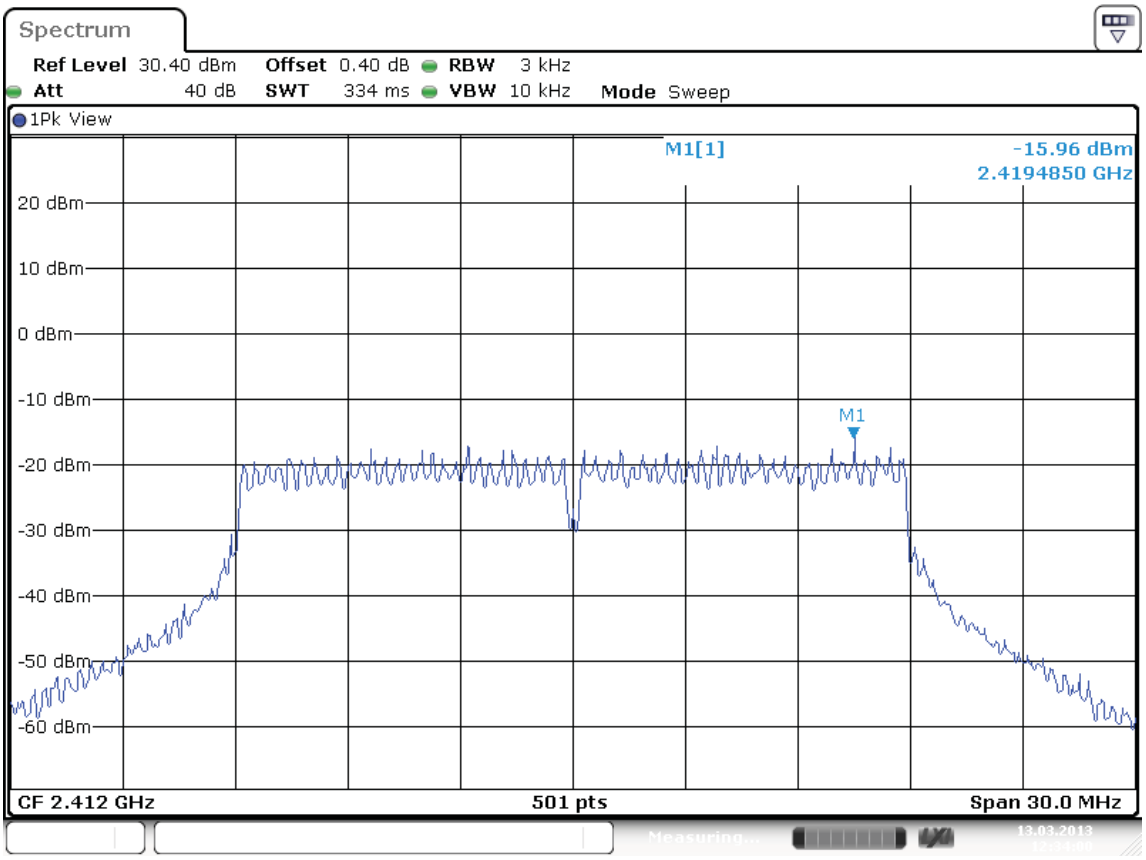
Plot B


Spectrum
Ref Level 10.00 dBm Offset 16.70 dB RBW 3 kHz
Att 20 dB SWT 4.4 ms VBW 10 kHz Mode Auto FFT
1Pk View
M1[1] -9.34 dBm
2.4679880 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.472 GHz 501 pts Span 30.0 MHz
Measuring...
Date: 9.JAN.2013 15:23:02

Plot C

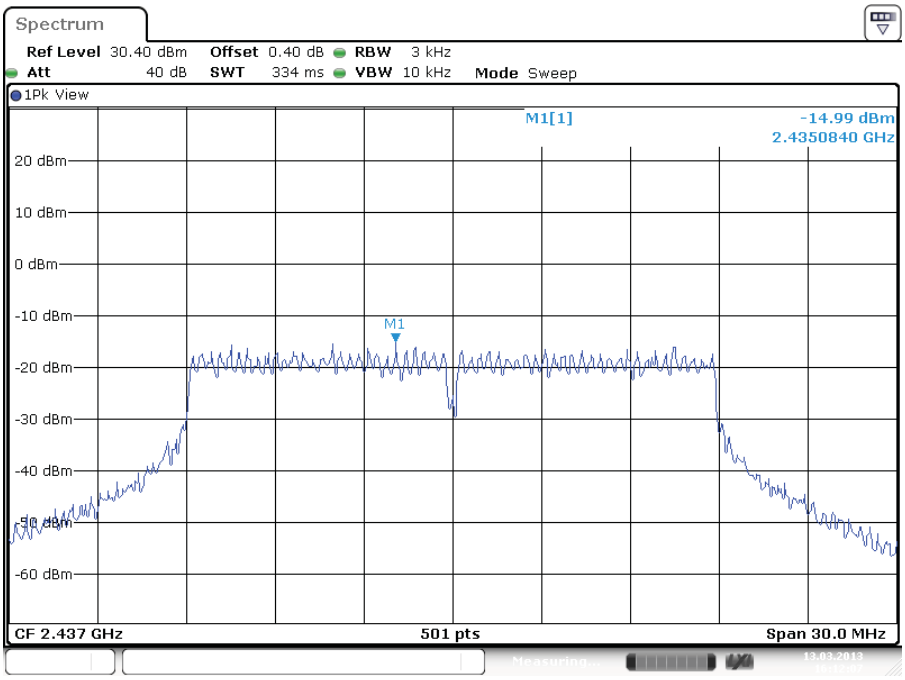
Operation mode: HT8-20 MHz, Antenna 1+2

Operating Frequency [MHz]	Max PSD [dBm]	Limit [dBm]	Verdict [Pass/Fail]	Plot
2412	-15.96	8	Pass	A
2437	-14.99	8	Pass	B
2462	-16.53	8	Pass	C



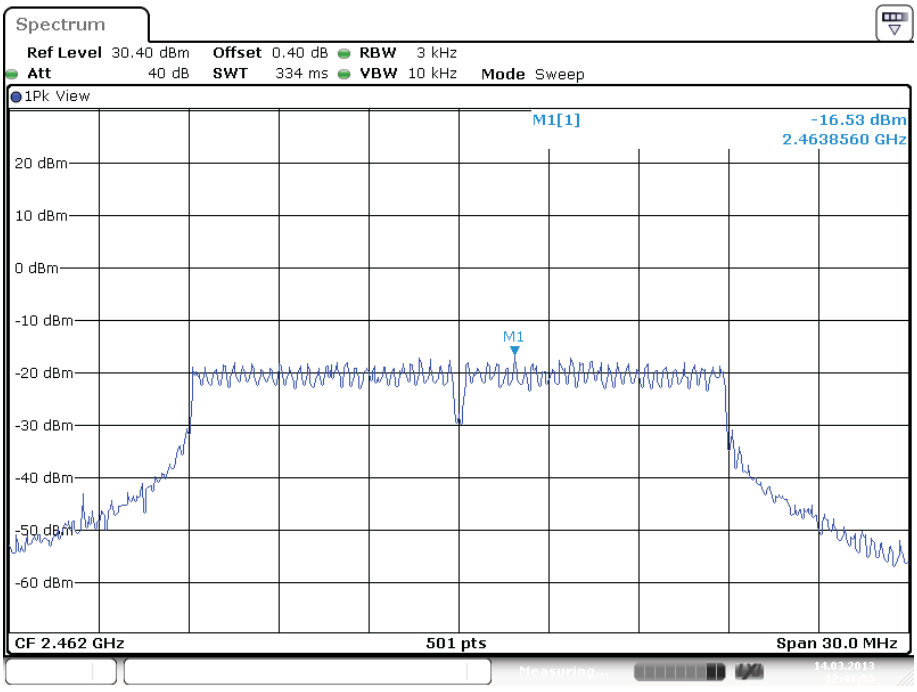
Date: 13.MAR.2013 12:34:00

Plot A



Date: 13.MAR.2013 16:12:08

Plot B

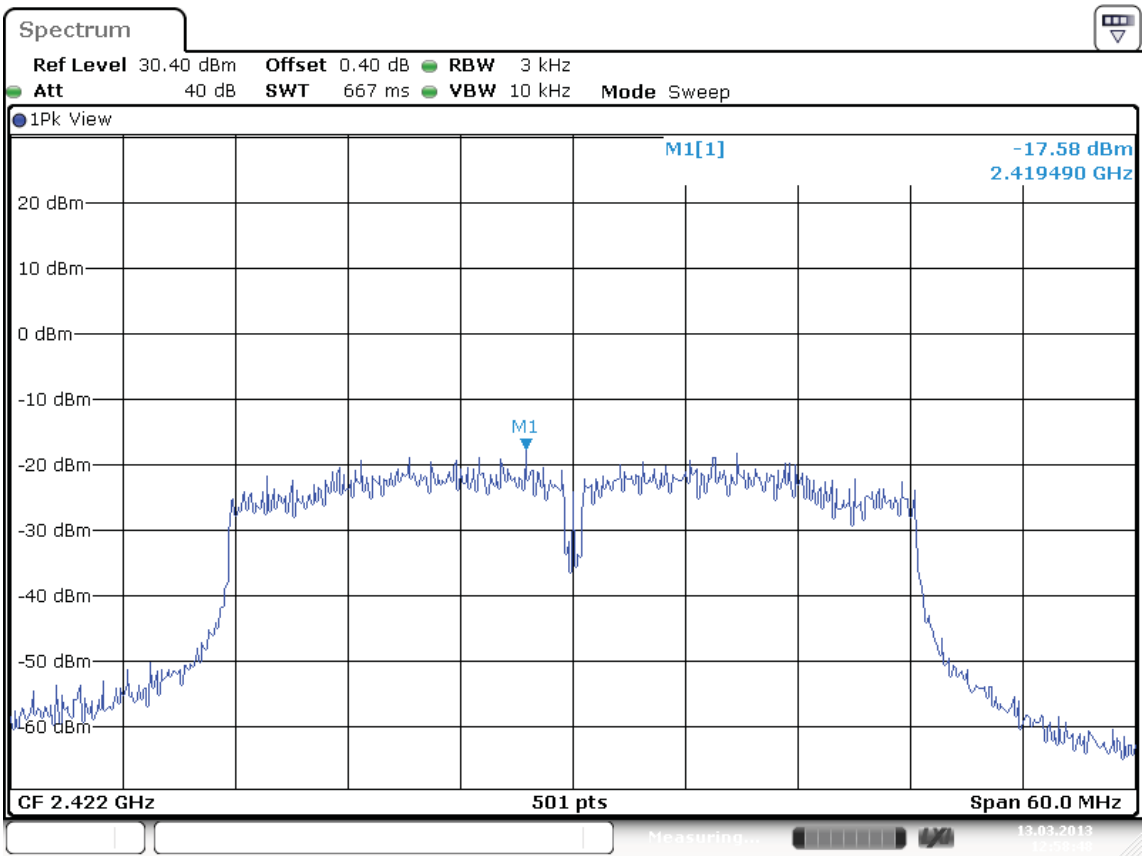


Date: 14.MAR.2013 12:41:56

Plot C

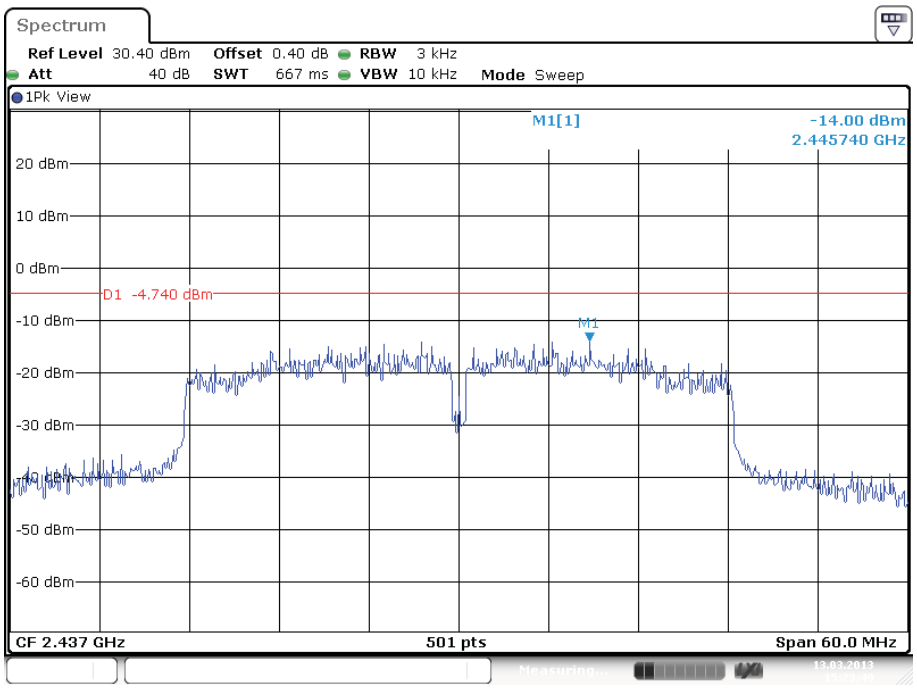
Operation mode: HT4-40 MHz wide, Antenna 1

Operating Frequency [MHz]	Max PSD [dBm]	Limit [dBm]	Verdict [Pass/Fail]	Plot
2422	-17.58	8	Pass	A
2437	-14.00	8	Pass	B
2452	-14.68	8	Pass	C



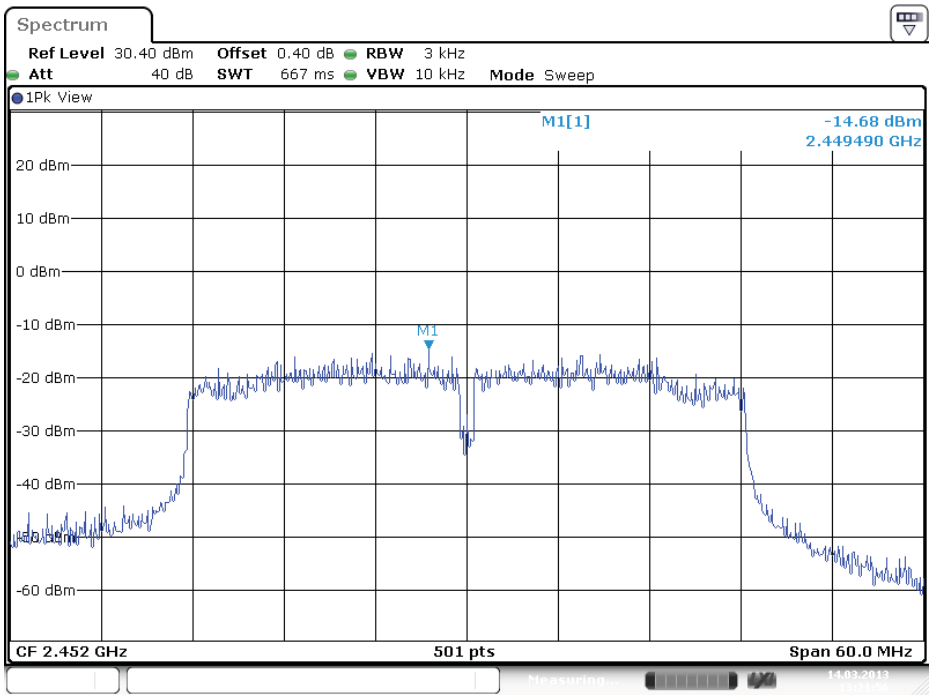
Date: 13.MAR.2013 12:58:49

Plot A



Date: 13.MAR.2013 15:23:49

Plot B

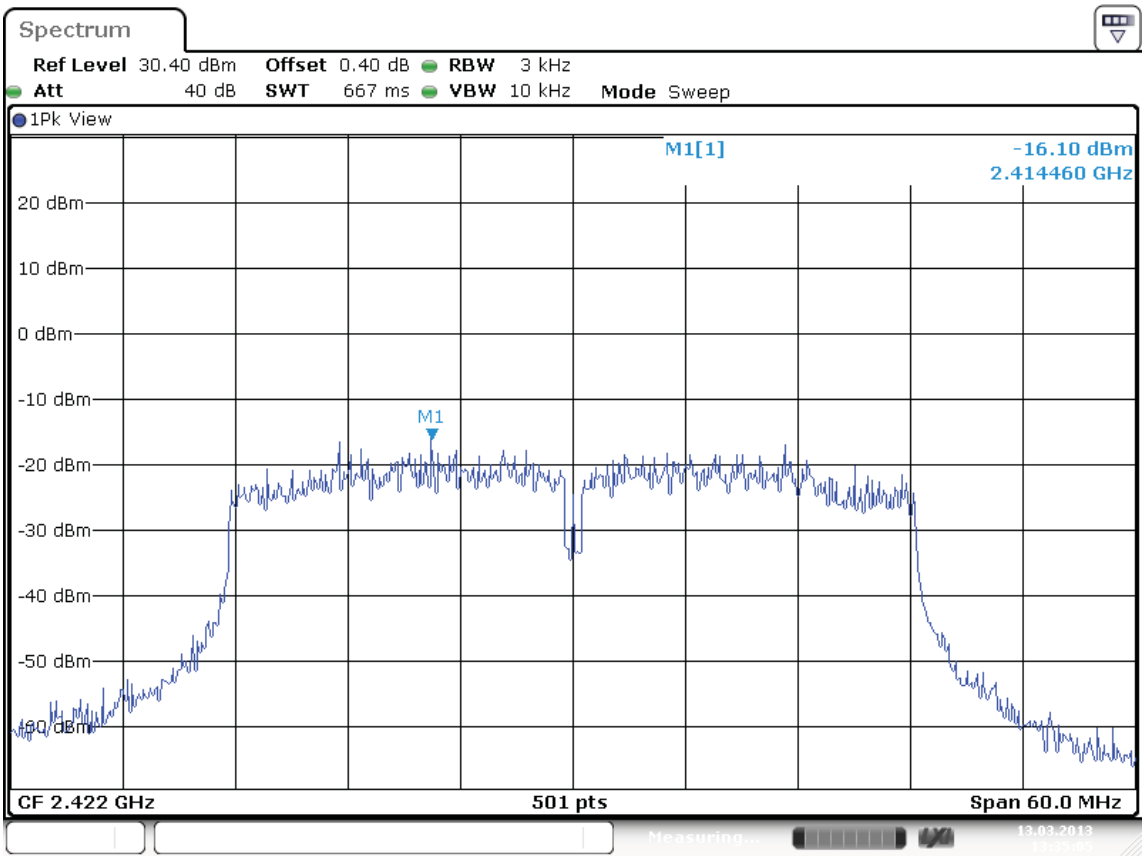


Date: 14.MAR.2013 13:21:56

Plot C

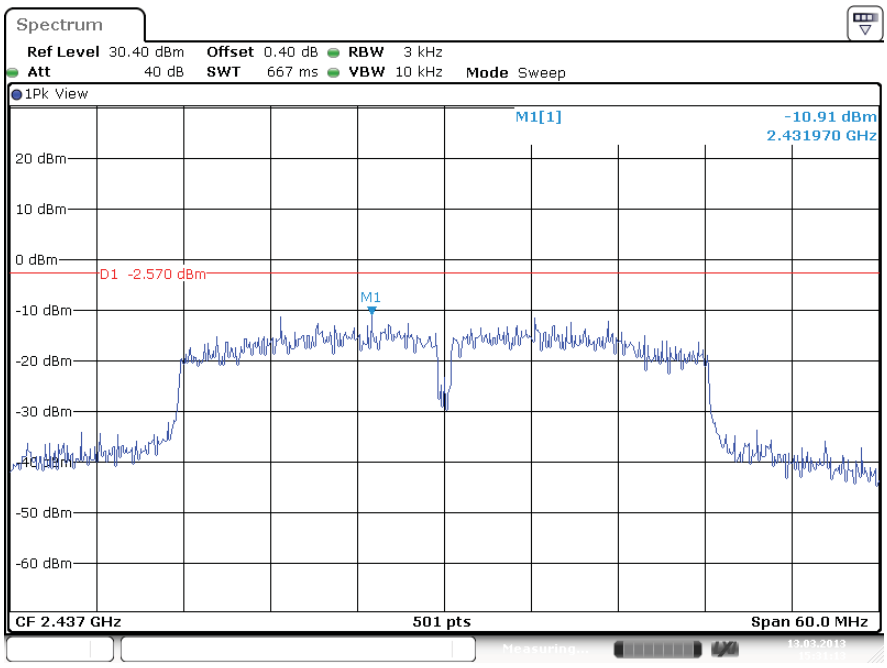
Operation mode: HT4-40 MHz wide, Antenna 2

Operating Frequency [MHz]	Max PSD [dBm]	Limit [dBm]	Verdict [Pass/Fail]	Plot
2422	-16.10	8	Pass	A
2437	-10.91	8	Pass	B
2452	-13.95	8	Pass	C



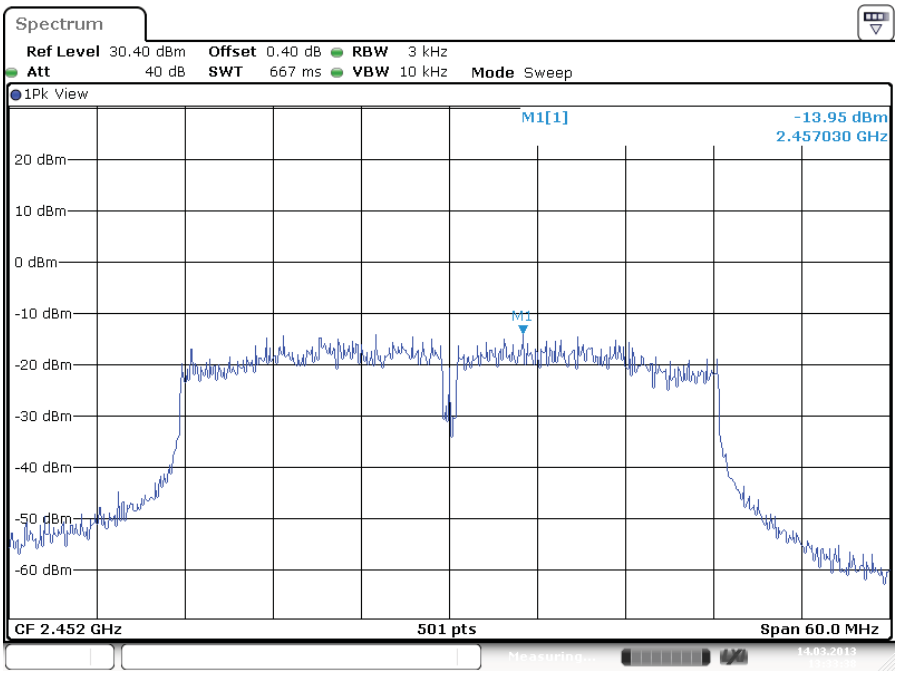
Date: 13.MAR.2013 13:35:05

Plot A



Date: 13.MAR.2013 15:31:13

Plot B

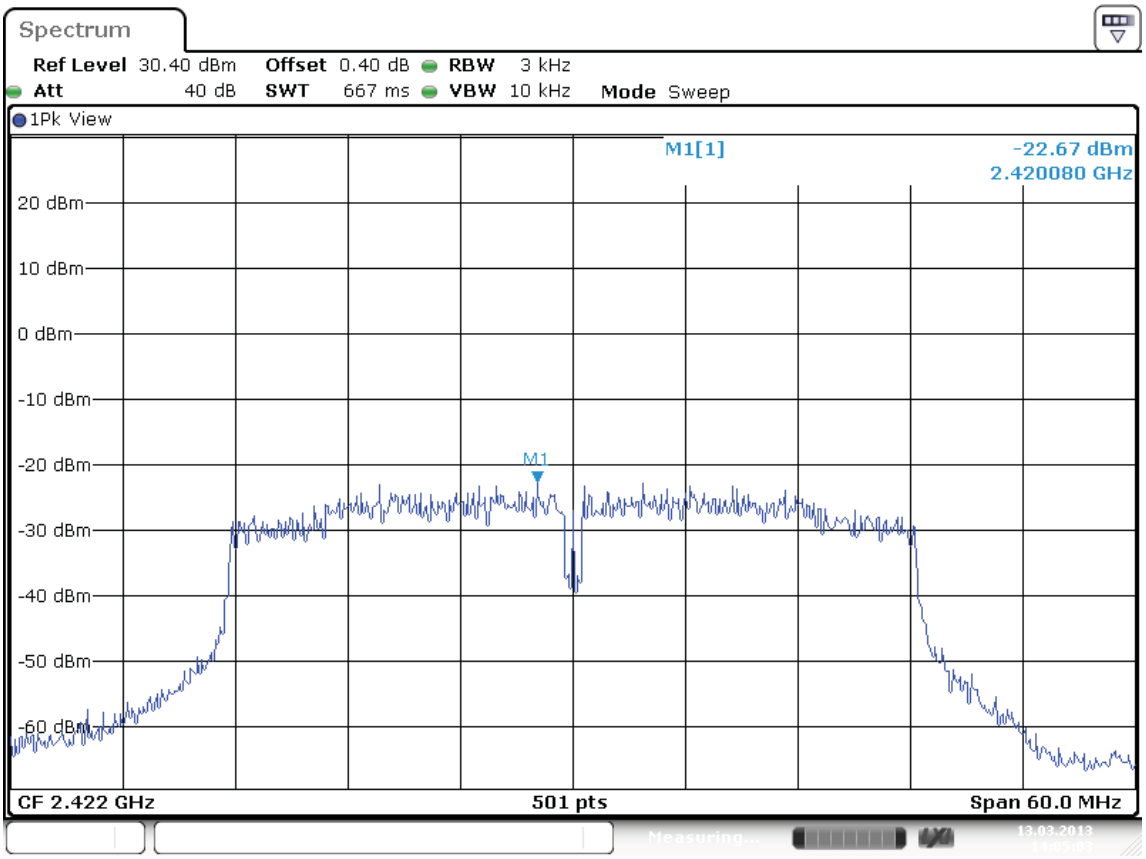


Date: 14.MAR.2013 13:33:38

Plot C

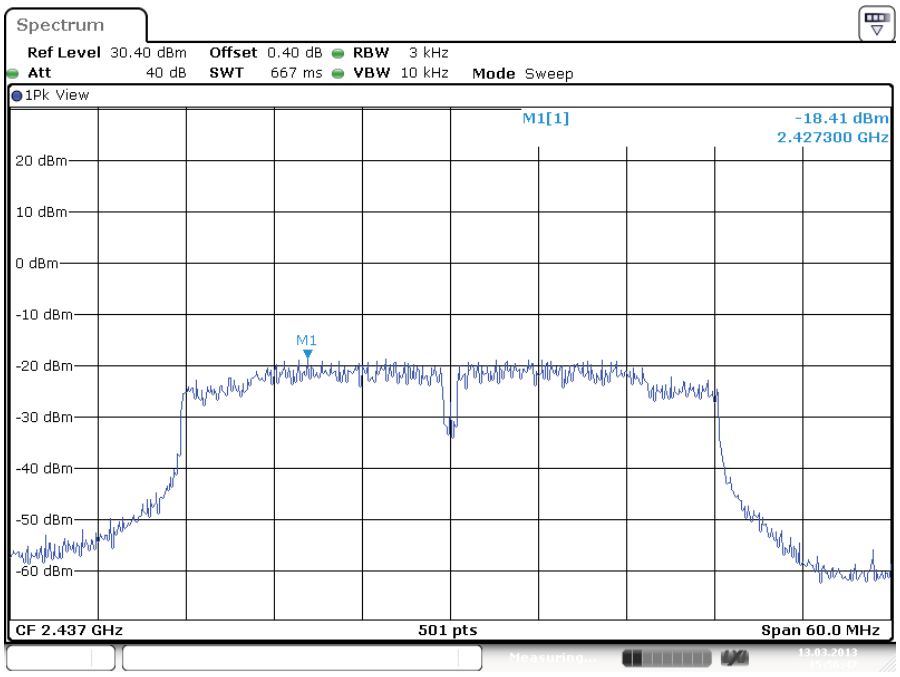
Operation mode: HT8-40 MHz wide, Antenna 1+2

Operating Frequency [MHz]	Max PSD [dBm]	Limit [dBm]	Verdict [Pass/Fail]	Plot
2422	-22.67	8	Pass	A
2437	-18.41	8	Pass	B
2452	-18.68	8	Pass	C



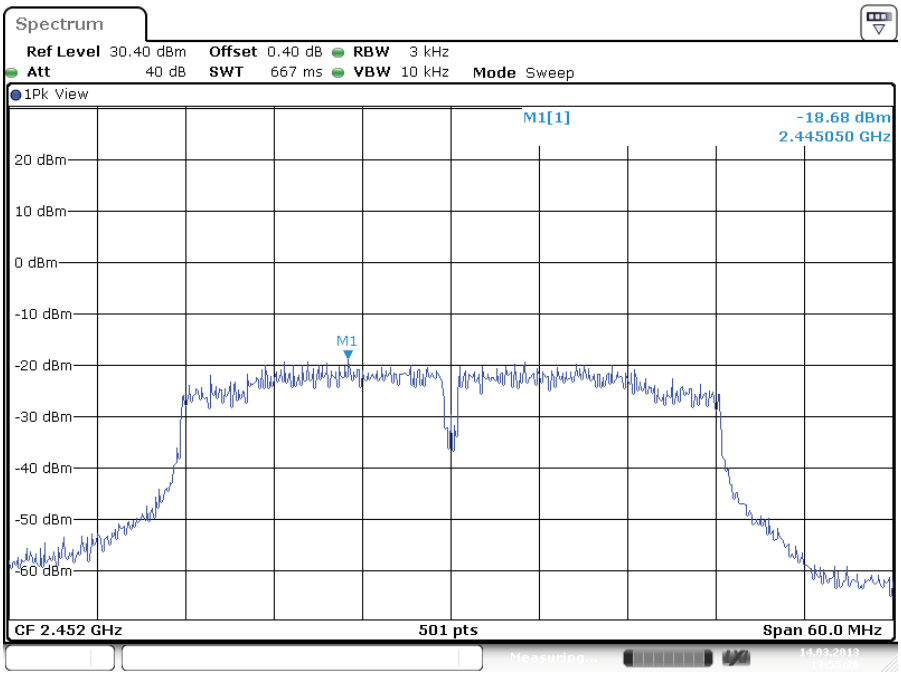
Date: 13.MAR.2013 14:05:03

Plot A



Date: 13.MAR.2013 15:56:47

Plot B



Date: 14.MAR.2013 13:55:27

Plot C

5.2.4 Band Edge Conducted Emissions

RESULT: Pass

Date of testing: 2013-01-12

Requirements:

FCC 15.205, FCC 15.209, FCC 15.247(d) and RSS-210 section A8.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

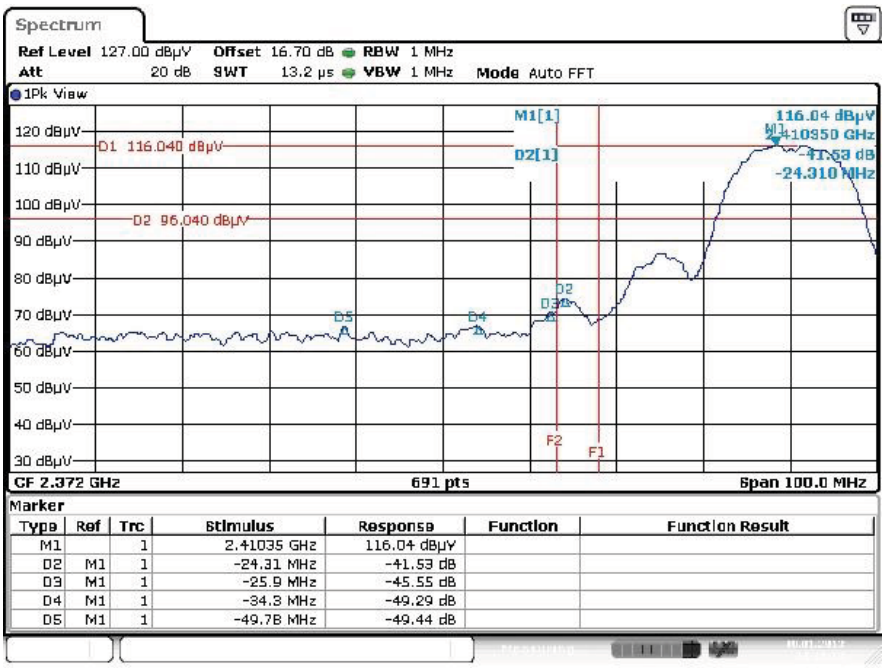
Test procedure:

ANSI C63.10:2009
KDB Publication No. 558074 D01: Measurement of Digital Transmission Systems Operating under Section 15.247.

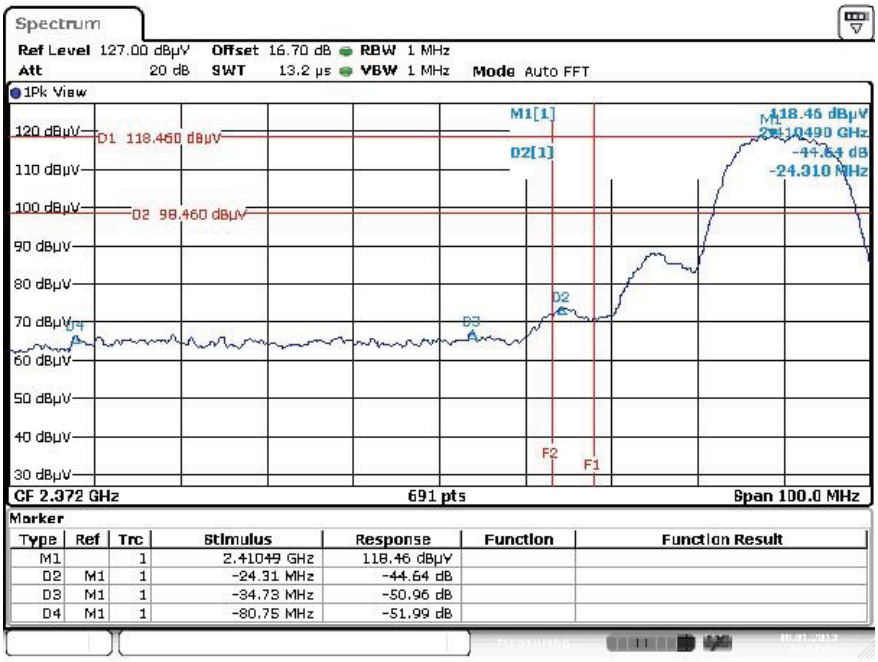
Measurements were performed using a spectrum analyzer with a suitable span to encompass the peak of the fundamental and using the following settings:
RBW = 100kHz, VBW = 300kHz.

The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

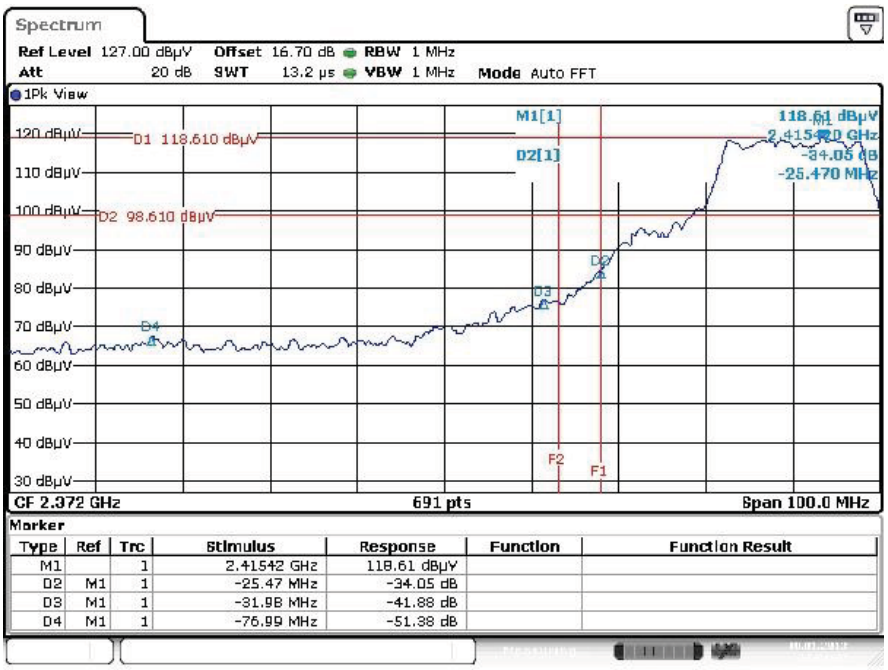
Results: All out of band spurious emissions are more than 20 dB below the fundamental.
See the figures on the following pages.



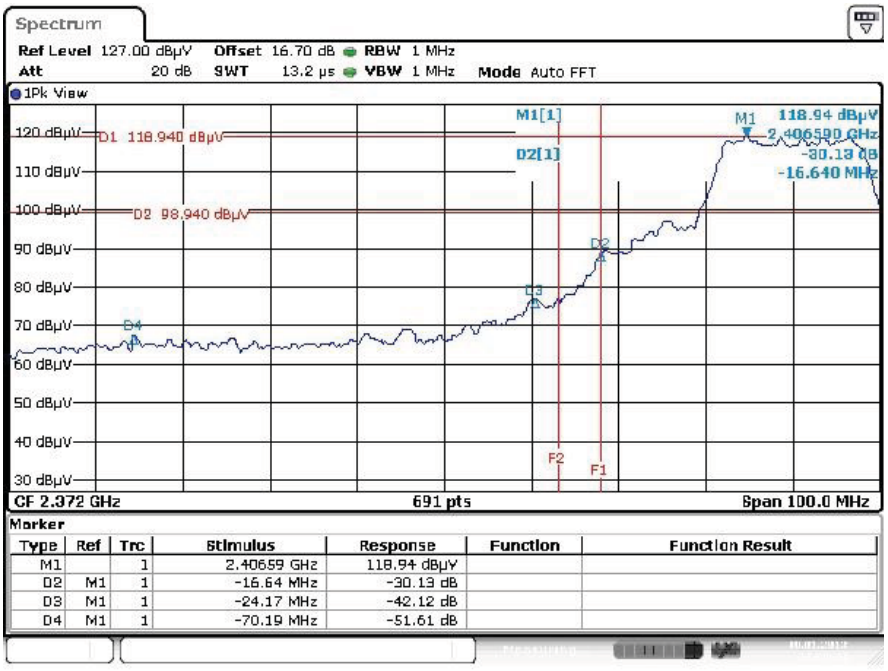
Band Edge Conducted Emission, Spectral Diagram, 2412 MHz- 1Mb DSSS- Antenna 1



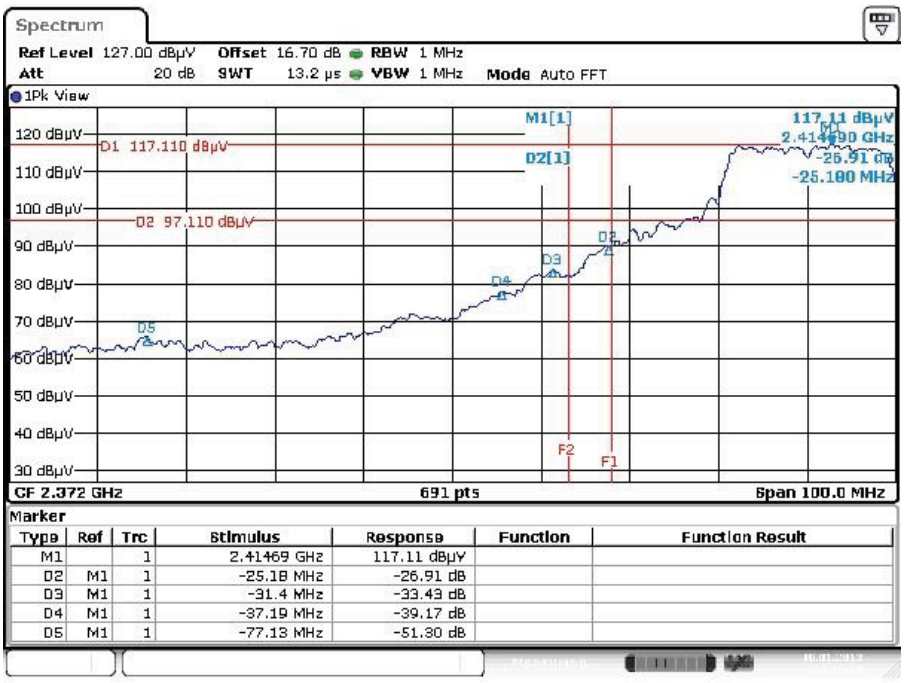
Band Edge Conducted Emission, Spectral Diagram, 2412 MHz-1Mb DSSS- Antenna 2



Band Edge Conducted Emission, Spectral Diagram, 2412 MHz-6Mb OFDM- Antenna 2

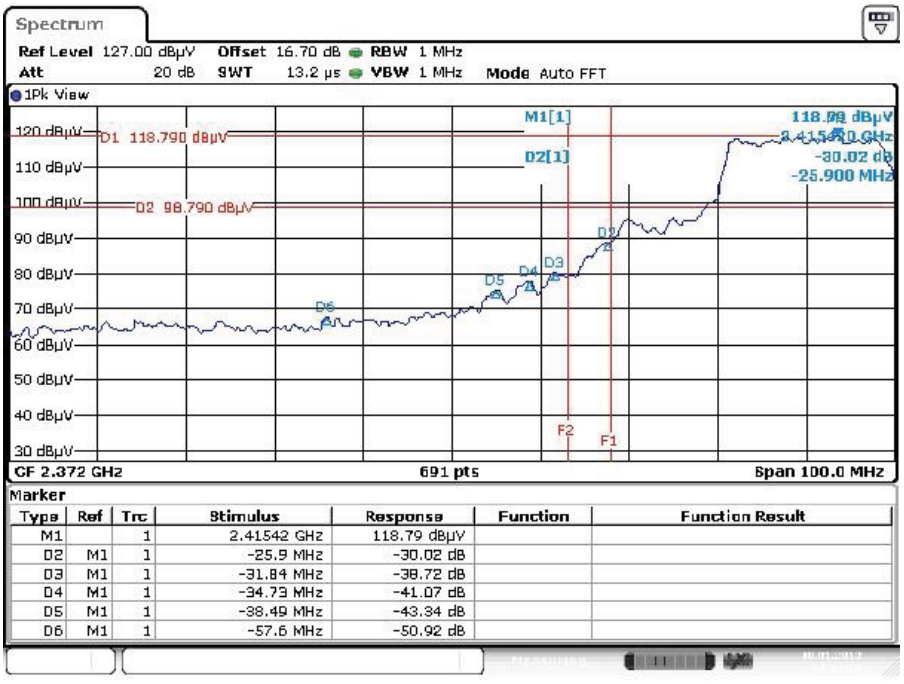


Band Edge Conducted Emission, Spectral Diagram, 2412 MHz-6Mb OFDM- Antenna 1



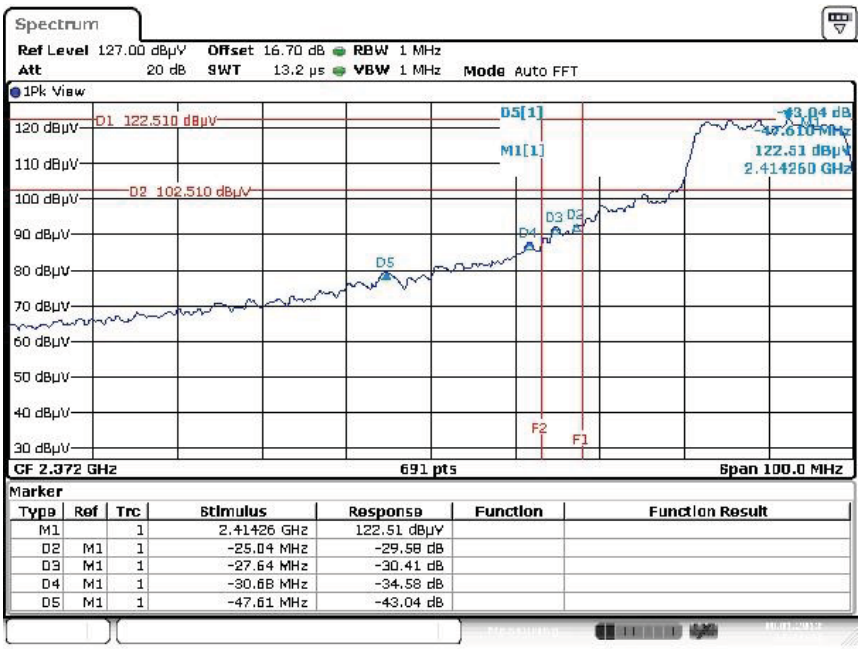
Date: 10.JAN.2013 10:16:28

Band Edge Conducted Emission, Spectral Diagram, 2412 MHz-HT4-20MHz- Antenna 1



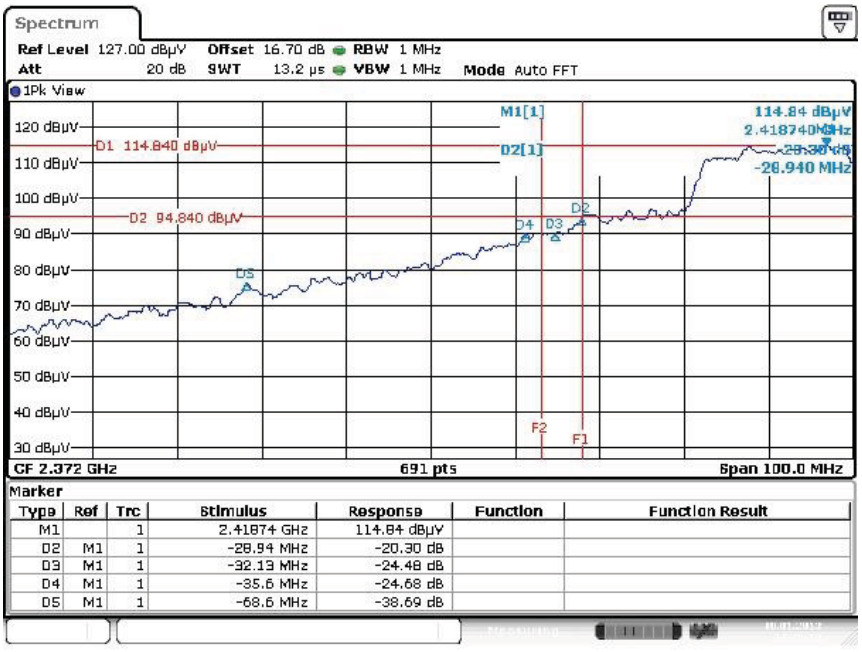
Date: 10.JAN.2013 10:12:19

Band Edge Conducted Emission, Spectral Diagram, 2412 MHz-HT4-20MHz- Antenna 2



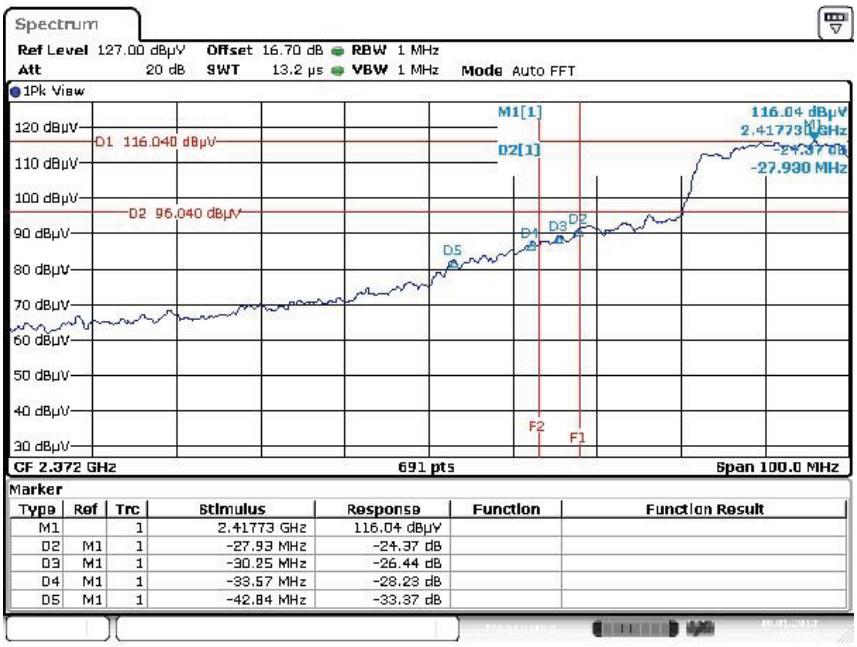
Date: 10.JAN.2013 11:21:44

Band Edge Conducted Emission, Spectral Diagram, 2412 MHz-HT8-20MHz- Antenna 1+2

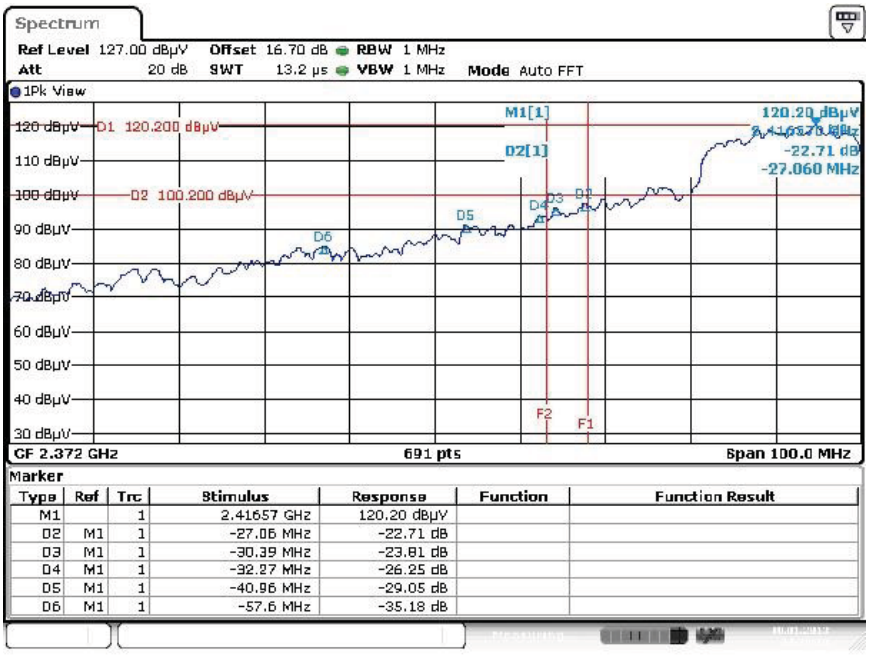


Date: 10.JAN.2013 11:25:59

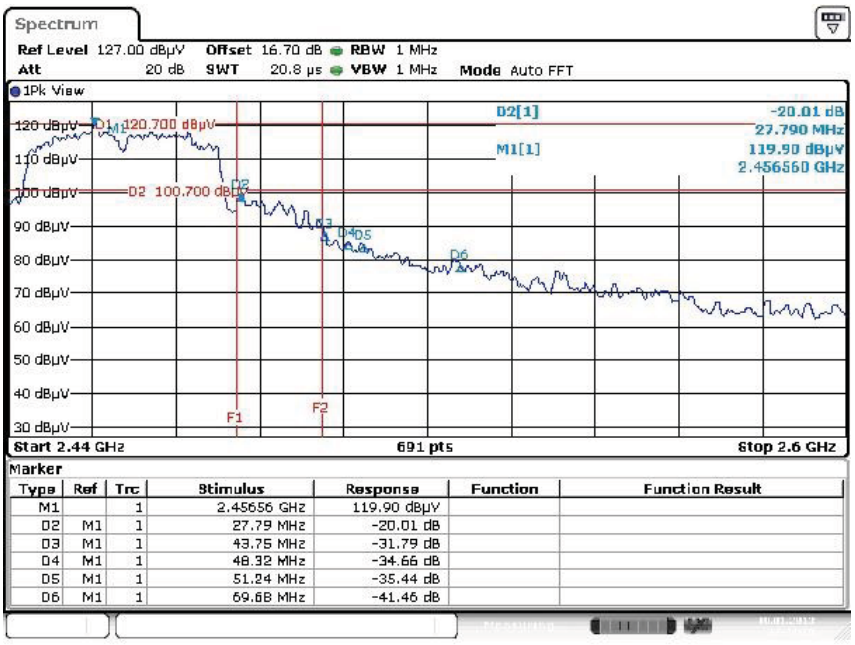
Band Edge Conducted Emission, Spectral Diagram, 2422 MHz-HT4-40MHz- Antenna 1



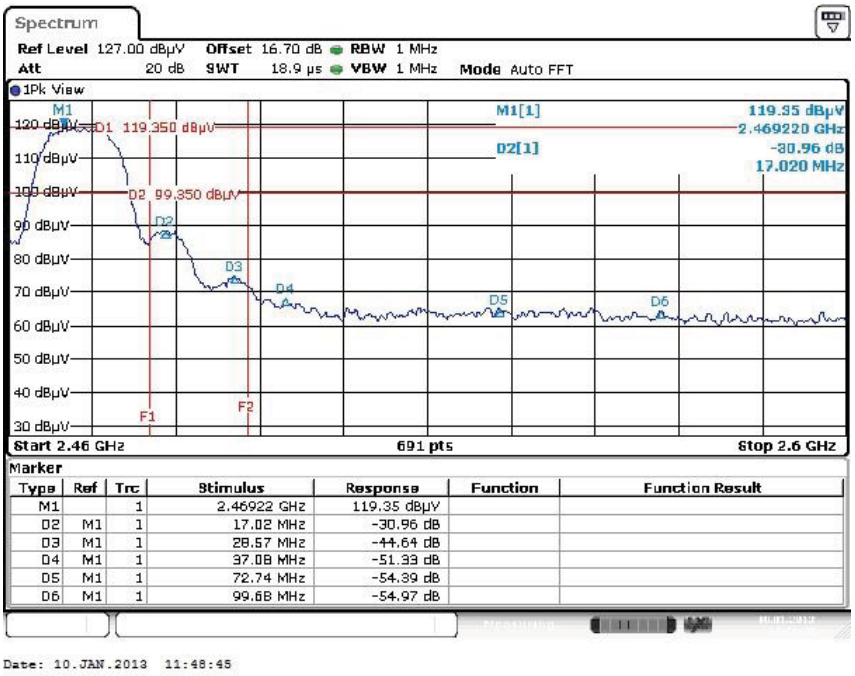
Band Edge Conducted Emission, Spectral Diagram, 2422 MHz HT4-40MHz, Antenna 2



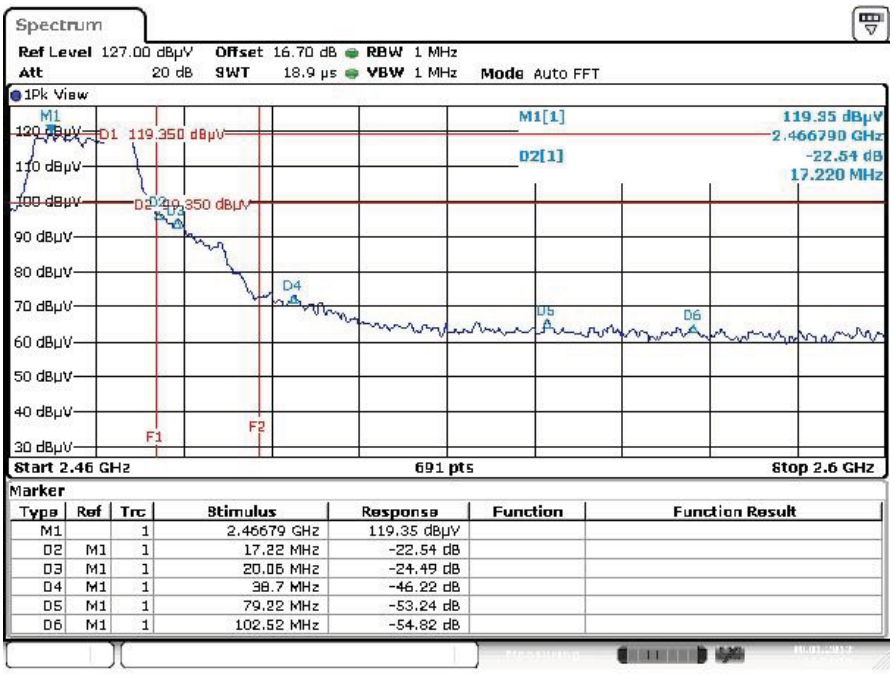
Band Edge Conducted Emission, Spectral Diagram, 2422 MHz HT8-40MHz, Antenna 1+2



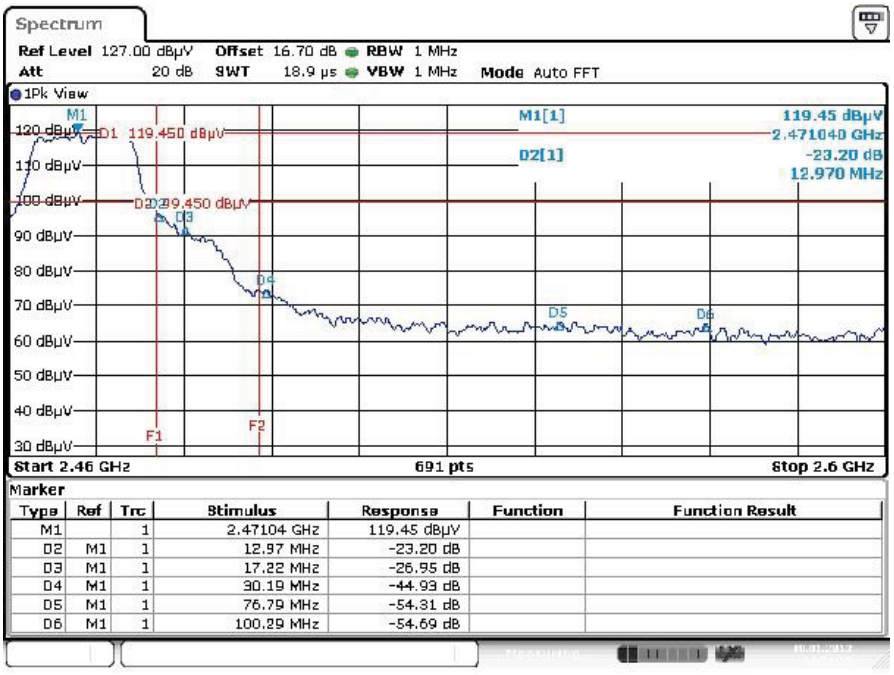
Band Edge Conducted Emission, Spectral Diagram, 2462 MHz- 1Mb DSSS- Antenna 1



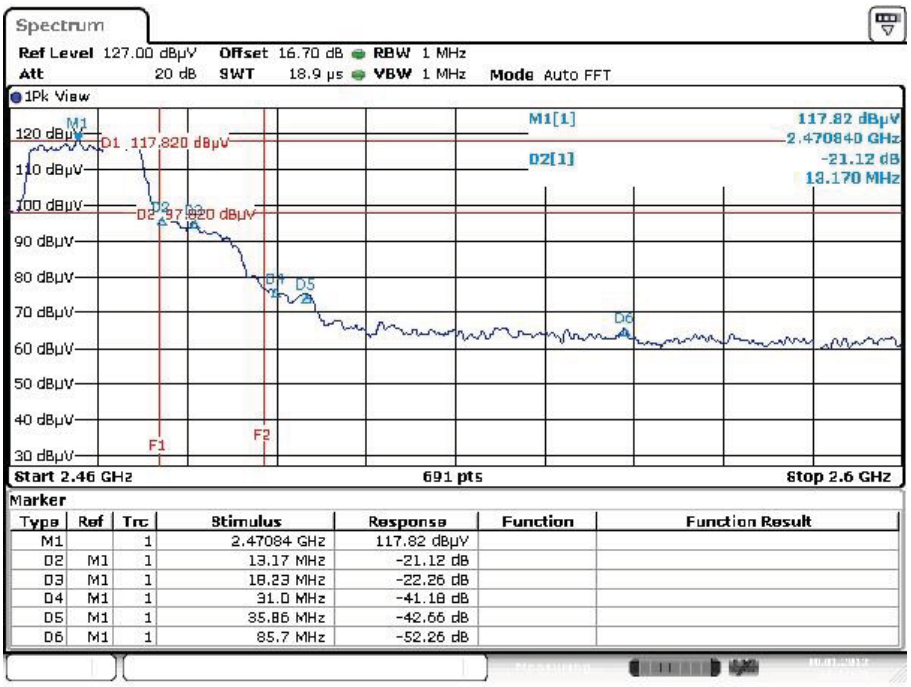
Band Edge Conducted Emission, Spectral Diagram, 2462 MHz- 1Mb DSSS- Antenna 2



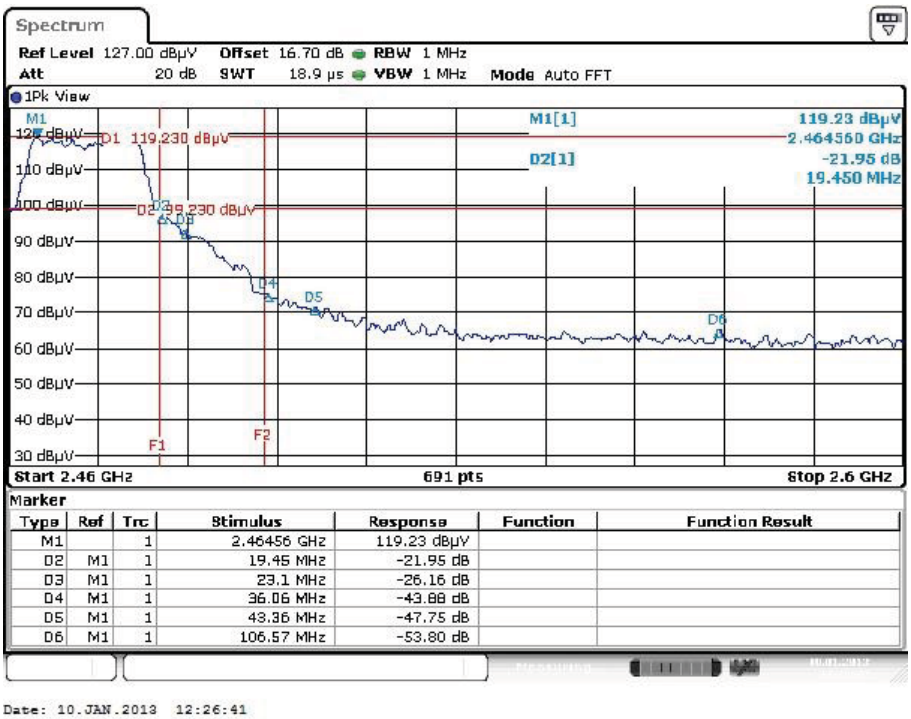
Band Edge Conducted Emission, Spectral Diagram, 2462 MHz- 6Mb OFDM- Antenna 1



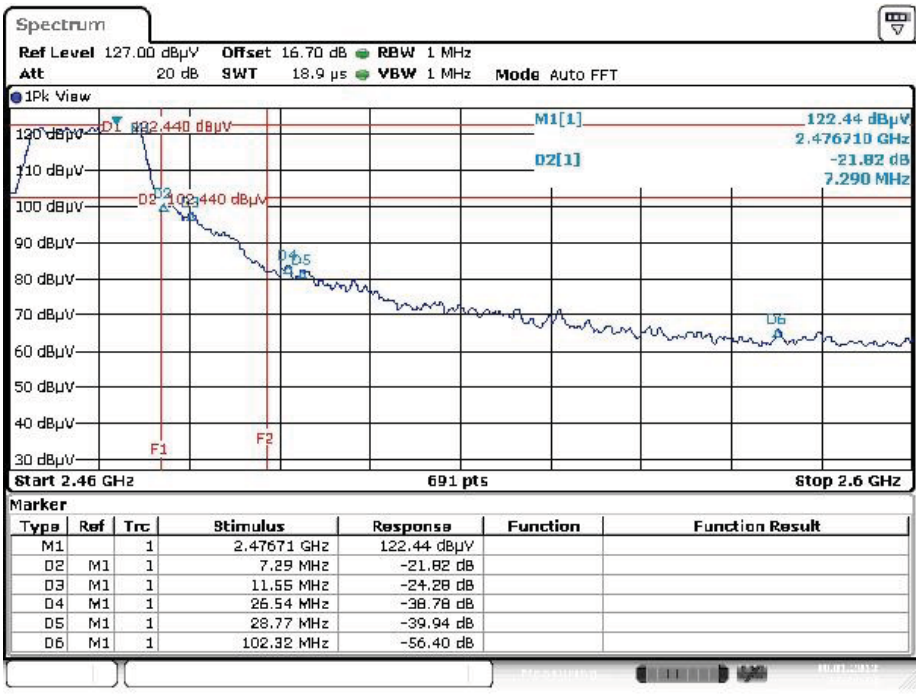
Band Edge Conducted Emission, Spectral Diagram, 2462 MHz- 6Mb OFDM- Antenna 2



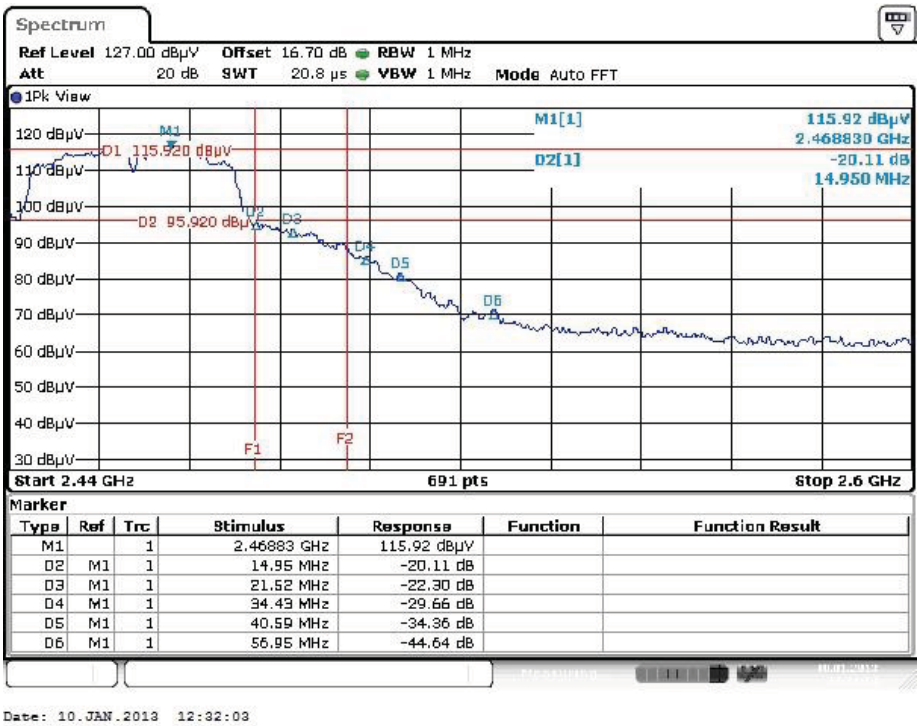
Band Edge Conducted Emission, Spectral Diagram, 2462 MHz- HT4-20MHz- Antenna 1



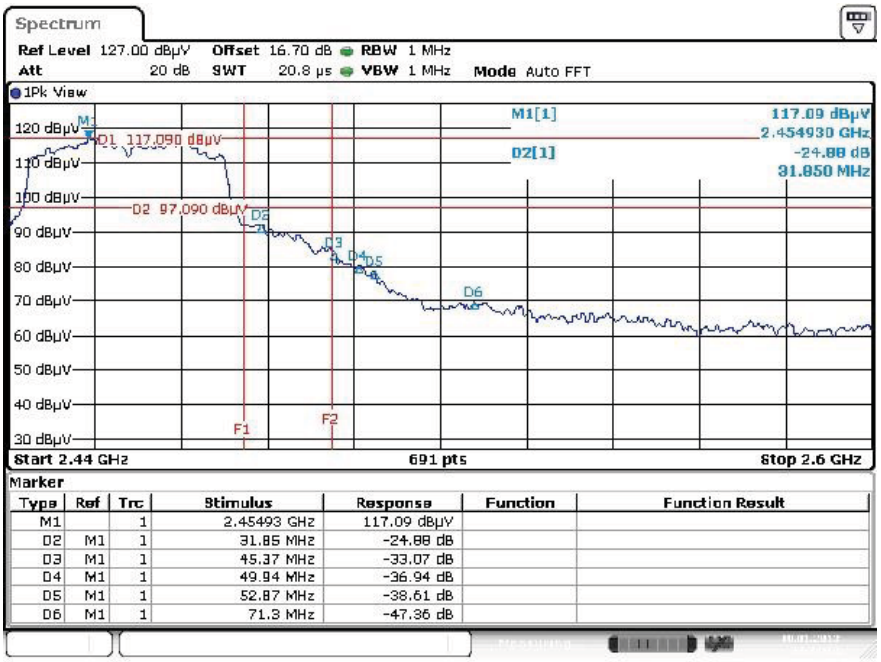
Band Edge Conducted Emission, Spectral Diagram, 2462 MHz- HT4-20MHz- Antenna 2



Band Edge Conducted Emission, Spectral Diagram, 2462 MHz- HT8-20MHz- Antenna 1+2



Band Edge Conducted Emission, Spectral Diagram, 2452 MHz- HT4-40MHz- Antenna 1

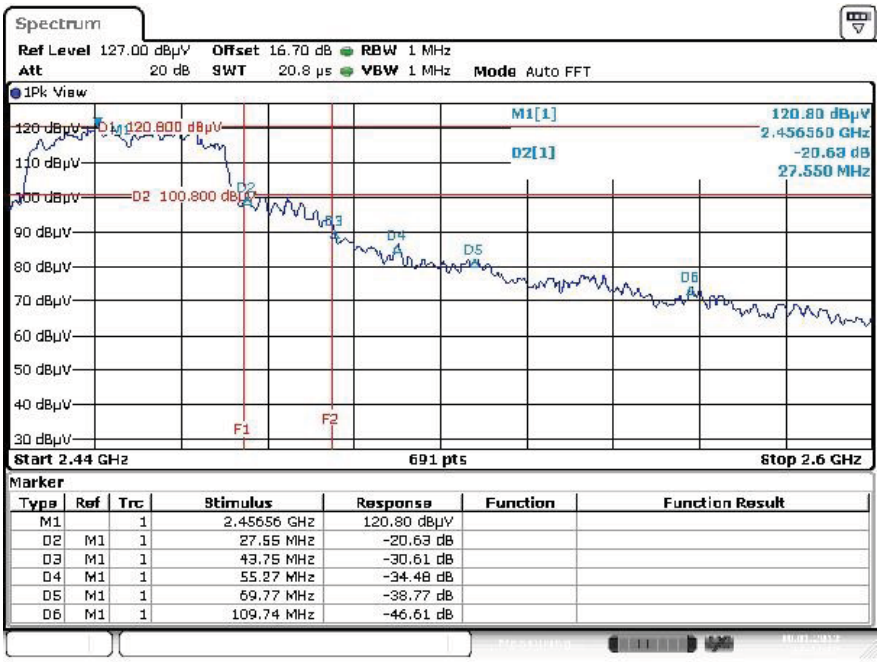


Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	2.45493 GHz	117.09 dBµV		
D2	M1	1	31.85 MHz	-24.88 dB		
D3	M1	1	45.37 MHz	-33.07 dB		
D4	M1	1	49.94 MHz	-36.94 dB		
D5	M1	1	52.87 MHz	-38.61 dB		
D6	M1	1	71.3 MHz	-47.36 dB		

Date: 10.JAN.2013 12:34:31

Band Edge Conducted Emission, Spectral Diagram, 2452 MHz- HT4-40MHz- Antenna 2



Marker

Type	Ref	Trc	Stimulus	Response	Function	Function Result
M1		1	2.45656 GHz	120.80 dBµV		
D2	M1	1	27.55 MHz	-20.63 dB		
D3	M1	1	43.75 MHz	-30.61 dB		
D4	M1	1	55.27 MHz	-34.48 dB		
D5	M1	1	69.77 MHz	-38.77 dB		
D6	M1	1	109.74 MHz	-46.61 dB		

Date: 10.JAN.2013 12:44:07

Band Edge Conducted Emission, Spectral Diagram, 2452 MHz- HT8-40MHz- Antenna 1+2

5.2.5 Radiated Spurious Emissions of Transmitter

RESULT: PASS

Date of testing: 2012-01-10

Frequency range: 30MHz - 25GHz

Requirements:

FCC 15.205, FCC 15.209 and FCC 15.247(d) and RSS-Gen

Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a), must comply with the radiated emission limits specified in FCC 15.209(a).

Radiated emissions which fall outside the operation frequency band and outside restricted bands shall either meet the limit specified in FCC 15.209(a) or be attenuated at least 20dB below the power level in the 100kHz bandwidth within the band that contains the highest level of the desired power (the less severe limit applies).

Test procedure:

ANSI C63.10-2009. ANSI C63.10:2009
KDB Publication No. 558074 D01: Measurement of Digital Transmission Systems Operating under Section 15.247.

The EUT was placed on a nonconductive turntable 0.8m above the ground plane. Before final measurements of radiated emissions were performed, the EUT was scanned to determine its emission spectrum profile. The physical arrangement of the test system, the associated cabling and the EUT orientation (X, Y, Z) were varied in order to ensure that maximum emission amplitudes were attained.

The spectrum was examined from 30MHz to the 10th harmonic of the highest fundamental transmitter frequency (25GHz). Final radiated emission measurements were made at 3m distance.

At each frequency where a spurious emission was found, the EUT was rotated 360° and the antenna was raised and lowered from 1 to 4m in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations.

The highest emission amplitudes relative to the appropriate limit were recorded in this report. Field strength values of radiated emissions at frequencies not listed in the tables are more than 20 dB below the applicable limit.

Correction factors are incorporated in the spectrum analyzers as an automated function.
Refer to section 4.2 for the power settings and modes.
Correction factors includes: antenna factor, cable loss and pre-amplifier gain.

Radiated Emission, Quasi Peak Data, 30MHz - 1GHz, Horizontal and Vertical Antenna Orientations

Freq. [MHz]	Antenna Orientation	Reading QP [dBµV]	Factor [dB(1/m)]	Level QP [dBµV/m]	Limit [dBµV/m]	Margin QP [dB]
66.86	Vertical	15.1	5.4	20.5	40.0	19.5
111.48	Vertical	13.6	11.4	25.0	43.5	18.5
253.10	Vertical	13.7	14.2	27.9	46.0	18.1
774.96	Vertical	14.7	24.8	39.5	46.0	6.5
844.80	Vertical	15.3	26.1	41.4	46.0	4.6
922.40	Vertical	15.4	27.6	43.0	46.0	3.0

Note: - Level QP = Reading QP + Factor
- Tested in modes as described in section 4.2, highest values noted.
Preliminary measurements indicated that the radiated emissions from EUT were not affected by the EUT's operating frequency or mode (transmit versus receive mode).
- Quasi Peak detector used with a bandwidth of 120 kHz

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2412 MHz - 1 Mb DSSS – Antenna 2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6933	Vertical	Av	48.74	54	5.26
17649	Vertical	Av	49.89	54	4.11
18147	Vertical	Av	50.24	54	3.76
6933	Vertical	Pk	48.74	74	25.26
17649	Vertical	Pk	49.89	74	24.11
18147	Vertical	Pk	50.24	74	23.76

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2412 MHz - 1 Mb DSSS – Antenna 1

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
13811	Vertical	Av	48.96	54	5.04
17250	Vertical	Av	50.13	54	3.87
18097	Vertical	Av	51.07	54	2.93
13811	Vertical	Pk	48.96	74	25.04
17250	Vertical	Pk	50.13	74	23.87
18097	Vertical	Pk	51.07	74	22.93

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 40GHz, Horizontal and Vertical Antenna Orientations, 2412 MHz - 6 Mb OFDM – Antenna 2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6983	Vertical	Av	47.52	54	6.48
17250	Vertical	Av	50.70	54	3.30
18147	Vertical	Av	50.49	54	3.51
6983	Vertical	Pk	47.52	74	26.48
17250	Vertical	Pk	50.70	74	23.30
18147	Vertical	Pk	50.49	74	23.51

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2412 MHz - 6 Mb OFDM – Antenna 1

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6983	Vertical	Av	48.11	54	5.89
17250	Horizontal	Av	50.38	54	3.62
18097	Vertical	Av	50.75	54	3.25
6983	Vertical	Pk	48.11	74	25.89
17250	Horizontal	Pk	50.38	74	23.62
18097	Vertical	Pk	50.75	74	23.25

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2412 MHz – HT4-20 MHz – Antenna 1

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6983	Vertical	Av	48.11	54	5.89
17250	Vertical	Av	50.38	54	3.62
18097	Vertical	Av	50.75	54	3.25
6983	Vertical	Pk	48.11	74	25.89
17250	Vertical	Pk	50.38	74	23.62
18097	Vertical	Pk	50.75	74	23.25

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2412 MHz – HT4-20 MHz – Antenna 2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6983	Vertical	Av	48.27	54	5.73
17250	Vertical	Av	50.40	54	3.60
18097	Vertical	Av	50.40	54	3.60
6983	Vertical	Pk	48.27	74	25.73
17250	Vertical	Pk	50.40	74	23.30
18097	Vertical	Pk	50.40	74	23.60

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2412 MHz – HT8-20 MHz – Antenna 1+2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
14160	Vertical	Av	49.20	54	4.80
17250	Vertical	Av	50.70	54	3.30
18097	Vertical	Av	49.12	54	4.88
14160	Vertical	Pk	49.20	74	24.80
17250	Vertical	Pk	50.70	74	23.30
18097	Vertical	Pk	49.12	74	24.88

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2422 MHz – HT4-40 MHz – Antenna 1

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
14160	Vertical	Av	49.01	54	4.99
17250	Vertical	Av	50.63	54	3.37
18097	Vertical	Av	51.45	54	2.55
14160	Vertical	Pk	49.01	74	24.99
17250	Vertical	Pk	50.63	74	23.37
18097	Vertical	Pk	51.45	74	22.55

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2422 MHz – HT4-40 MHz – Antenna 2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
14160	Vertical	Av	48.07	54	5.93
17250	Vertical	Av	49.56	54	4.44
18097	Vertical	Av	50.73	54	3.27
14160	Vertical	Pk	48.07	74	25.93
17250	Vertical	Pk	49.56	74	24.44
18097	Vertical	Pk	50.73	74	23.27

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2422 MHz – HT8-40 MHz – Antenna 1+2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
17250	Vertical	Av	49.79	54	4.21
18097	Vertical	Av	50.73	54	3.27
18745	Horizontal	Av	50.48	54	3.52
17250	Vertical	Pk	49.79	74	24.21
18097	Vertical	Pk	50.73	74	23.27
18745	Horizontal	Pk	50.48	74	23.52

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2437 MHz - 1 Mb DSSS – Antenna 2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
16104	Vertical	Av	49.19	54	4.81
17250	Vertical	Av	49.67	54	4.33
18047	Vertical	Av	50.35	54	3.65
16104	Vertical	Pk	49.19	74	24.81
17250	Vertical	Pk	49.67	74	24.33
18047	Vertical	Pk	50.35	74	23.65

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2437 MHz - 1 Mb DSSS – Antenna 1

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6933	Vertical	Av	48.80	54	5.20
17250	Vertical	Av	49.84	54	4.16
18097	Vertical	Av	50.22	54	3.78
6933	Vertical	Pk	48.80	74	25.20
17250	Vertical	Pk	49.84	74	24.16
18097	Vertical	Pk	50.22	74	23.78

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2437 MHz - 6 Mb OFDM – Antenna 2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6983	Vertical	Av	47.97	54	6.03
17250	Vertical	Av	49.79	54	4.21
18097	Vertical	Av	51.50	54	2.50
6983	Vertical	Pk	47.97	74	26.03
17250	Vertical	Pk	49.79	74	24.21
18097	Vertical	Pk	51.50	74	22.50

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2437 MHz - 54 Mb OFDM – Antenna 1

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6983	Vertical	Av	47.49	54	6.51
17250	Horizontal	Av	49.62	54	4.38
18097	Vertical	Av	50.61	54	3.39
6983	Vertical	Pk	47.49	74	26.51
17250	Horizontal	Pk	49.62	74	24.38
18097	Vertical	Pk	50.61	74	23.39

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2437 MHz – HT4-20 MHz – Antenna 1

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6983	Vertical	Av	47.96	54	6.04
17250	Vertical	Av	50.75	54	3.25
18097	Vertical	Av	50.16	54	3.84
6983	Vertical	Pk	47.96	74	26.04
17250	Vertical	Pk	50.75	74	23.25
18097	Vertical	Pk	50.16	74	23.84

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2437 MHz – HT4-20 MHz – Antenna 2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6983	Horizontal	Av	47.38	54	6.62
17250	Vertical	Av	50.78	54	3.22
18097	Vertical	Av	50.81	54	3.19
6983	Horizontal	Pk	47.38	74	26.62
17250	Vertical	Pk	50.78	74	23.22
18097	Vertical	Pk	50.81	74	23.19

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2437 MHz – HT8-20 MHz – Antenna 1+2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6983	Vertical	Av	48.48	54	5,52
17250	Vertical	Av	50.39	54	3,61
18097	Vertical	Av	50.69	54	3,31
6983	Vertical	Pk	48.48	74	25,52
17250	Vertical	Pk	50.39	74	23,61
18097	Vertical	Pk	50.69	74	23,31

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2437 MHz – HT4-40 MHz – Antenna 1

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6983	Vertical	Av	49,45	54	4,55
17250	Vertical	Av	51,04	54	2,96
18097	Vertical	Av	51,53	54	2,47
6983	Vertical	Pk	49,45	74	24,55
17250	Vertical	Pk	51,04	74	22,96
18097	Vertical	Pk	51,53	74	22,47

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2437 MHz – HT4-40 MHz – Antenna 2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
14160	Vertical	Av	48,73	54	5,27
17250	Vertical	Av	50,50	54	3,50
18097	Vertical	Av	51,03	54	2,97
14160	Vertical	Pk	48,73	74	25,27
17250	Vertical	Pk	50,50	74	23,50
18097	Vertical	Pk	51,03	74	22,97

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2437 MHz – HT8-40 MHz – Antenna 1+2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
18695	Vertical	Av	49,72	54	4,28
17250	Vertical	Av	50,22	54	3,78
18097	Horizontal	Av	50,20	54	3,80
18695	Vertical	Pk	49,72	74	24,28
17250	Vertical	Pk	50,22	74	23,78
18097	Horizontal	Pk	50,20	74	23,80

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2462 MHz - 1 Mb DSSS – Antenna 2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
17250	Vertical	Av	49,25	54	4,75
18097	Vertical	Av	50,21	54	3,79
19642	Horizontal	Av	50,31	54	3,69
17250	Vertical	Pk	49,25	74	24,75
18097	Vertical	Pk	50,21	74	23,79
19642	Horizontal	Pk	50,31	74	23,69

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2462 MHz - 1 Mb DSSS – Antenna 1

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
16452	Vertical	Av	50,05	54	3,95
17250	Vertical	Av	50,82	54	3,18
18097	Vertical	Av	51,77	54	2,23
16452	Vertical	Pk	50,05	74	23,95
17250	Vertical	Pk	50,82	74	23,18
18097	Vertical	Pk	51,77	74	22,23

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2462 MHz - 6 Mb OFDM – Antenna 2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
7033	Horizontal	Av	48,79	54	5,21
17250	Vertical	Av	49,51	54	4,49
18097	Vertical	Av	49,83	54	4,17
7033	Horizontal	Pk	48,79	74	25,21
17250	Vertical	Pk	49,51	74	24,49
18097	Vertical	Pk	49,83	74	24,17

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2462 MHz - 6 Mb OFDM – Antenna 1

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6983	Vertical	Av	48,67	54	5,33
17250	Horizontal	Av	49,90	54	4,10
18097	Vertical	Av	49,90	54	4,10
6983	Vertical	Pk	48,67	74	25,33
17250	Horizontal	Pk	49,90	74	24,10
18097	Vertical	Pk	49,90	74	24,10

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2462 MHz – HT4-20 MHz – Antenna 1

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
16502	Vertical	Av	49,16	54	4,84
17250	Vertical	Av	50,19	54	3,81
18097	Vertical	Av	49,78	54	4,22
16502	Vertical	Pk	49,16	74	24,84
17250	Vertical	Pk	50,19	74	23,81
18097	Vertical	Pk	49,78	74	24,22

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2462 MHz – HT4-20 MHz – Antenna 2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6983	Vertical	Av	48,96	54	5,04
17250	Vertical	Av	50,26	54	3,74
18097	Vertical	Av	51,25	54	2,75
6983	Vertical	Pk	48,96	74	25,04
17250	Vertical	Pk	50,26	74	23,74
18097	Vertical	Pk	51,25	74	22,75

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz.

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2462 MHz – HT8-20 MHz – Antenna 1+2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6933	Horizontal	Av	48,64	54	5,36
17250	Vertical	Av	49,64	54	4,36
18047	Vertical	Av	50,36	54	3,64
6933	Horizontal	Pk	48,64	74	25,36
17250	Vertical	Pk	49,64	74	24,36
18047	Vertical	Pk	50,36	74	23,64

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2452 MHz – HT4-40 MHz – Antenna 1

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6933	Vertical	Av	47,79	54	6,21
17250	Vertical	Av	51,01	54	2,99
18097	Vertical	Av	50,90	54	3,10
6933	Vertical	Pk	47,79	74	26,21
17250	Vertical	Pk	51,01	74	22,99
18097	Vertical	Pk	50,90	74	23,10

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2452 MHz – HT4-40 MHz – Antenna 2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
6933	Vertical	Av	48,34	54	5,66
17250	Vertical	Av	49,87	54	4,13
18097	Vertical	Av	49,57	54	4,43
6933	Vertical	Pk	48,34	74	25,66
17250	Vertical	Pk	49,87	74	24,13
18097	Vertical	Pk	49,57	74	24,43

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz

Radiated Emission, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2452 MHz – HT8-40 MHz – Antenna 1+2

Freq. [MHz]	Antenna Orientation	Detector	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
7381	Vertical	Av	48,04	54	5,96
17250	Vertical	Av	49,86	54	4,14
18097	Vertical	Av	51,19	54	2,81
7381	Vertical	Pk	48,04	74	25,96
17250	Vertical	Pk	49,86	74	24,14
18097	Vertical	Pk	51,19	74	22,81

Note: - Peak (Pk) value already within Average (Av) limits, therefor Av not retested.
Peak values also noted as Av value to show compliance with Av limit.
- Peak detector used with a bandwidth of 1 MHz

5.2.6 Radiated Spurious Emissions of Transmitter in restricted bands

RESULT: PASS

Date of testing: 2013-01-10 and 2013-02-04

Frequency range: 4.5-5.15 GHz and 5.35-5.46 GHz

Requirements:

FCC 15.205, FCC 15.209 and FCC 15.247(d) and RSS-Gen

Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a), must comply with the radiated emission limits specified in FCC 15.209(a).

Test procedure:

ANSI C63.10-2009.
The EUT was placed on a nonconductive turntable 0.8m above the ground plane. Before final measurements of radiated emissions were performed, the EUT was scanned to determine its emission spectrum profile. The physical arrangement of the test system, the associated cabling and the EUT orientation (X, Y, Z) were varied in order to ensure that maximum emission amplitudes were attained.

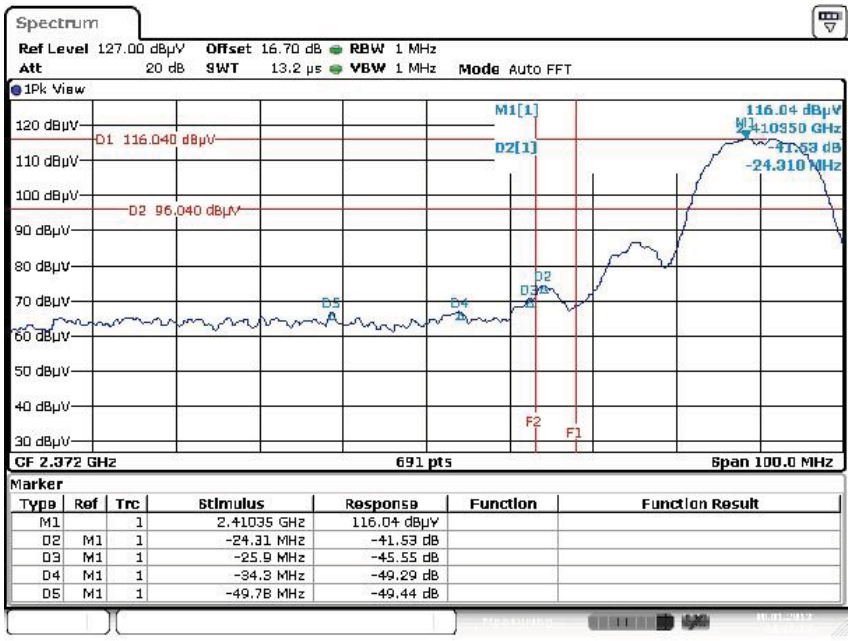
The spectrum was examined from 4.5-5.15 GHz and 5.35-5.46 GHz. Final radiated emission measurements were made at 3m distance.

At each frequency where a spurious emission was found, the EUT was rotated 360° and the antenna was raised and lowered from 1 to 4m in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations.

The highest emission amplitudes relative to the appropriate limit were recorded in this report. Field strength values of radiated emissions at frequencies not listed in the tables are more than 20 dB below the applicable limit.

Correction factors are incorporated in the spectrum analyzers as an automated function.
Refer to section 4.2 for the power settings and modes.
Correction factors includes: antenna factor, cable loss and pre-amplifier gain.

Operation mode: 1Mb DSSS, Antenna 2



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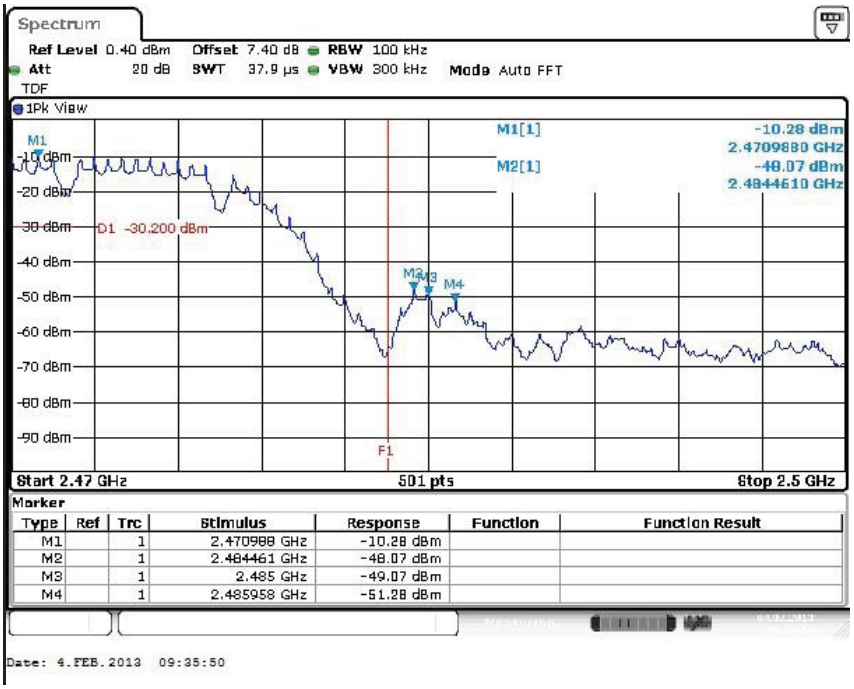
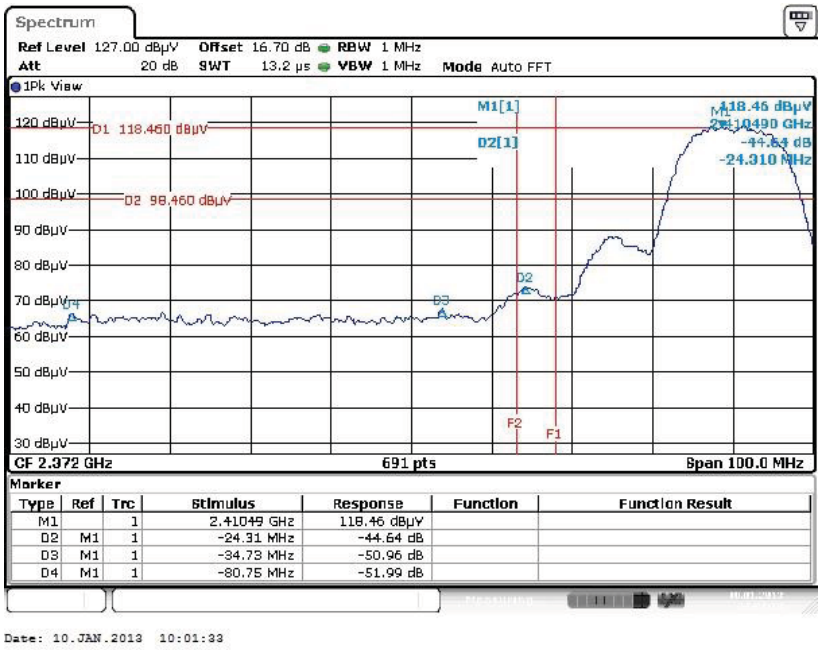


High Channel

Operation mode: 1Mb DSSS, Antenna 1



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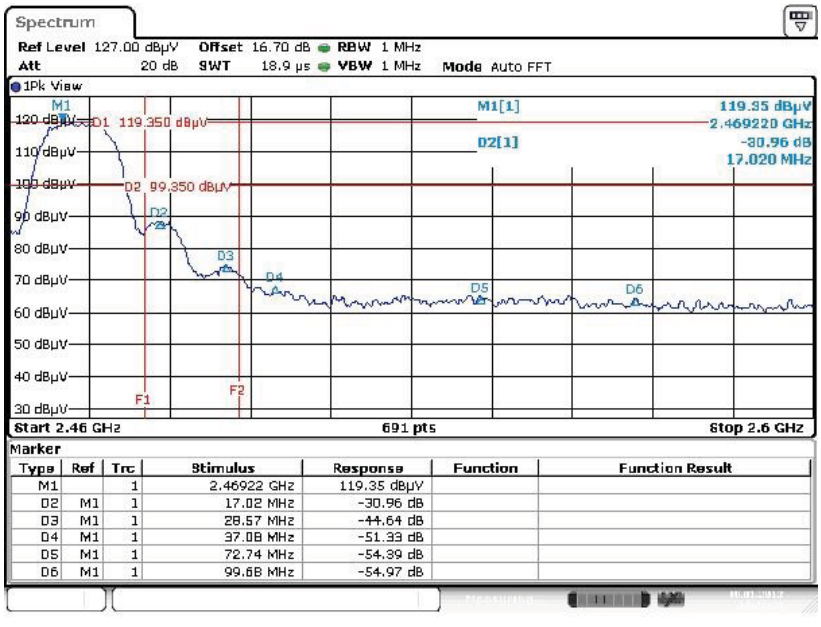
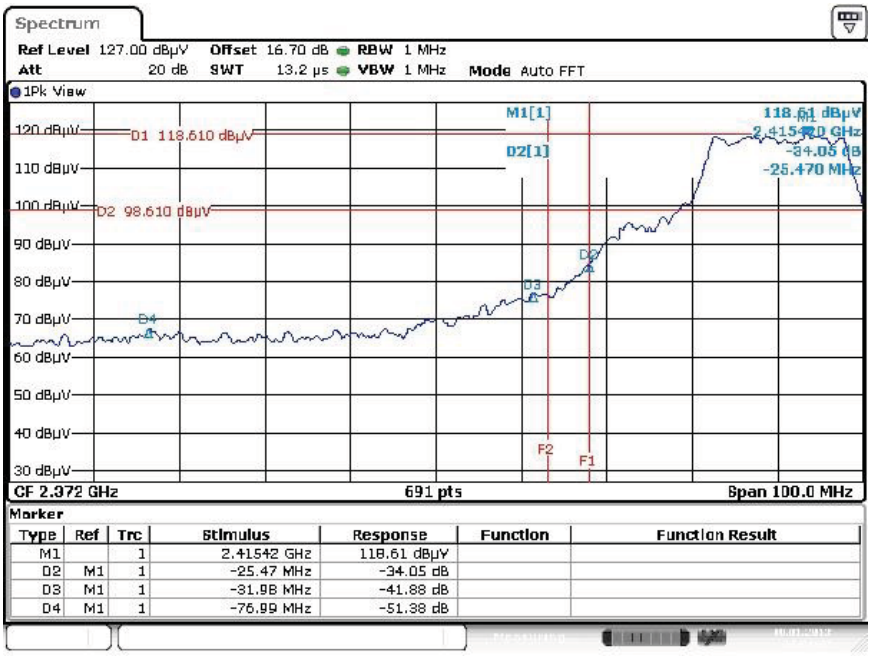


High Channel

Operation mode: 6 Mb OFDM, Antenna 2



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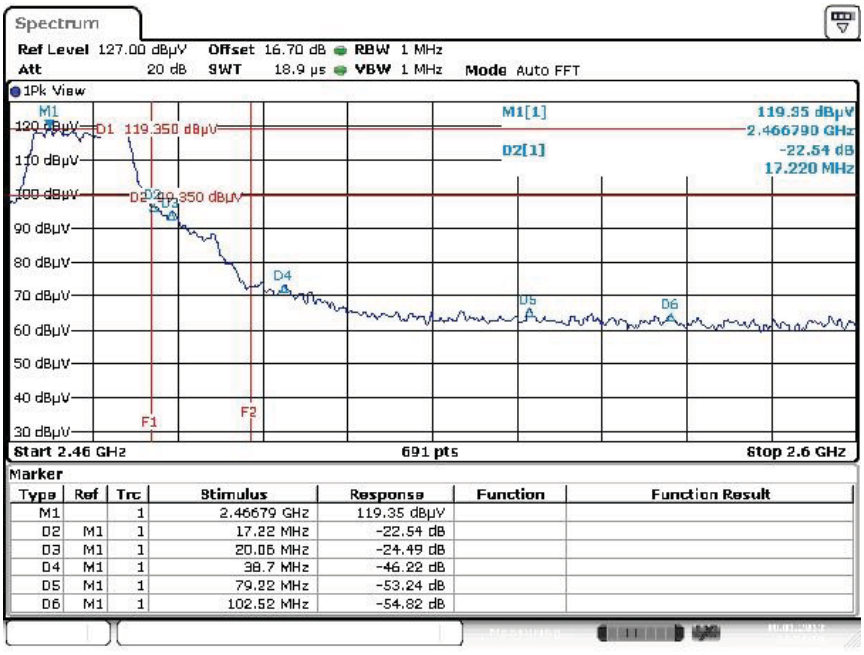
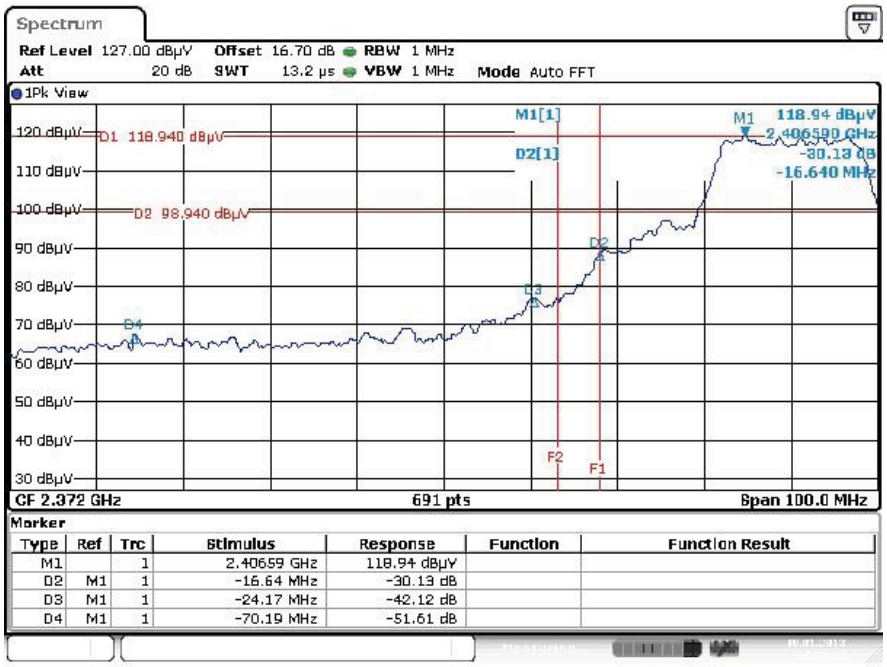
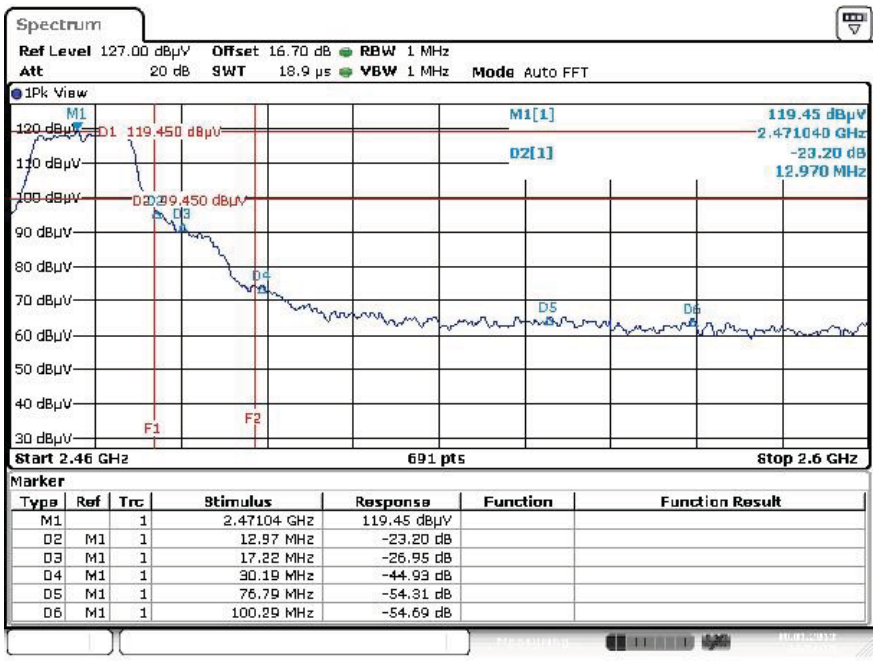


High Channel

Operation mode: 6Mb OFDM, Antenna 1

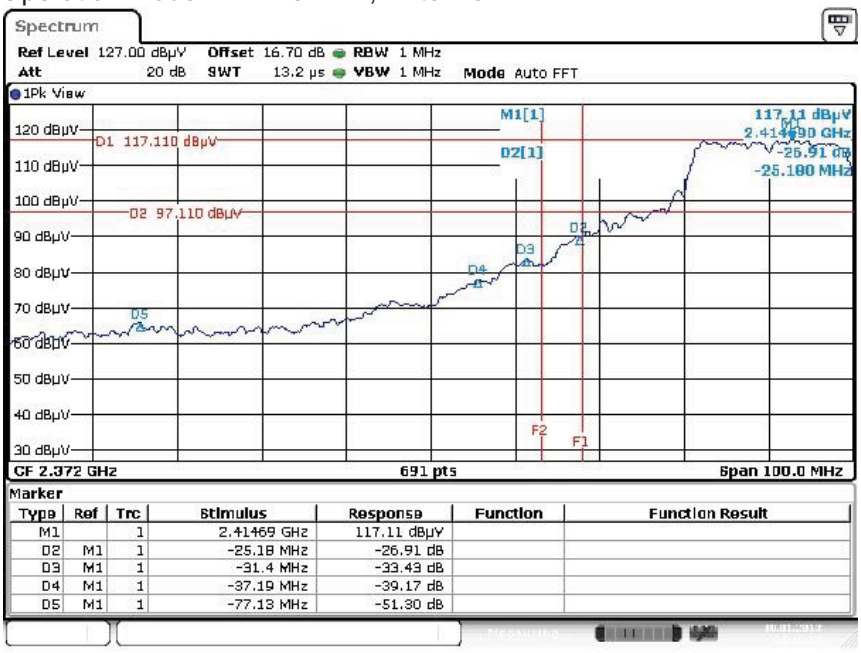


Low Channel

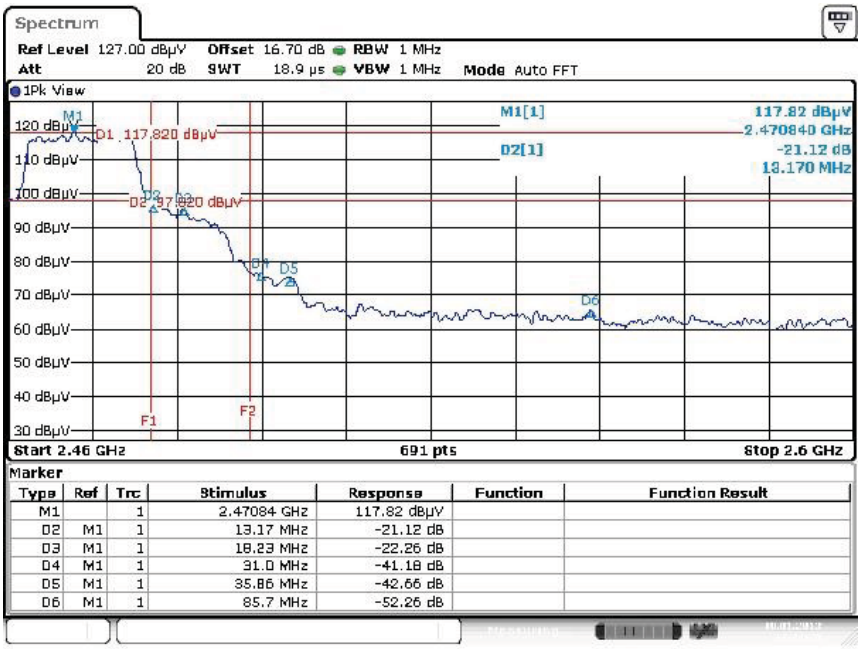


High Channel

Operation mode: HT4-20 MHz, Antenna 1

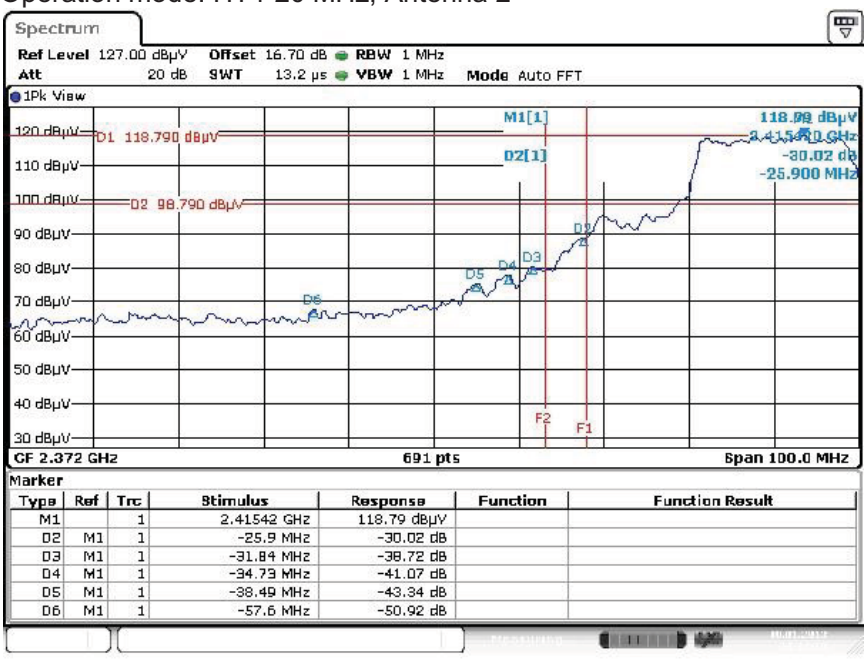


Low Channel



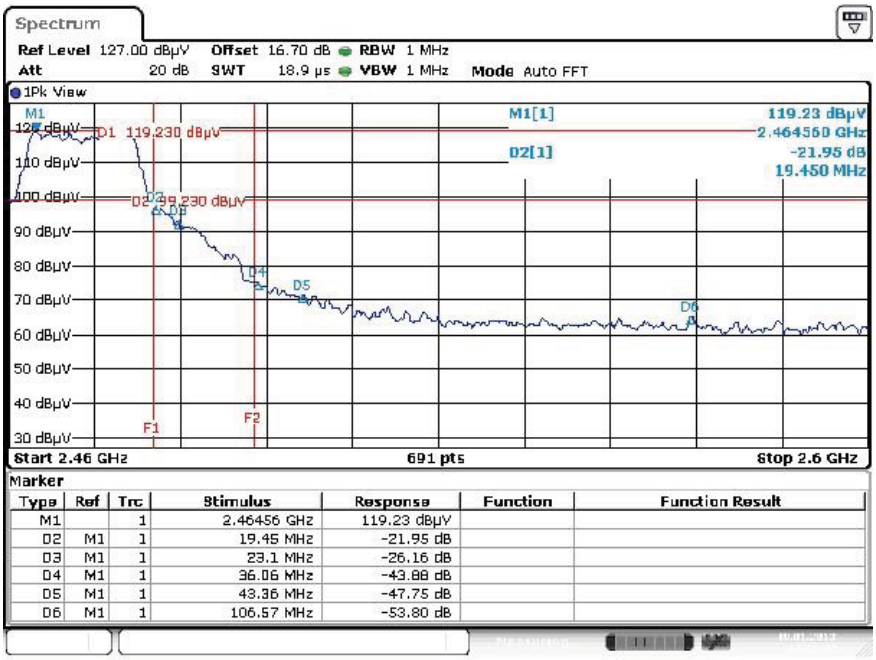
High Channel

Operation mode: HT4-20 MHz, Antenna 2



Date: 10.JAN.2013 10:12:19

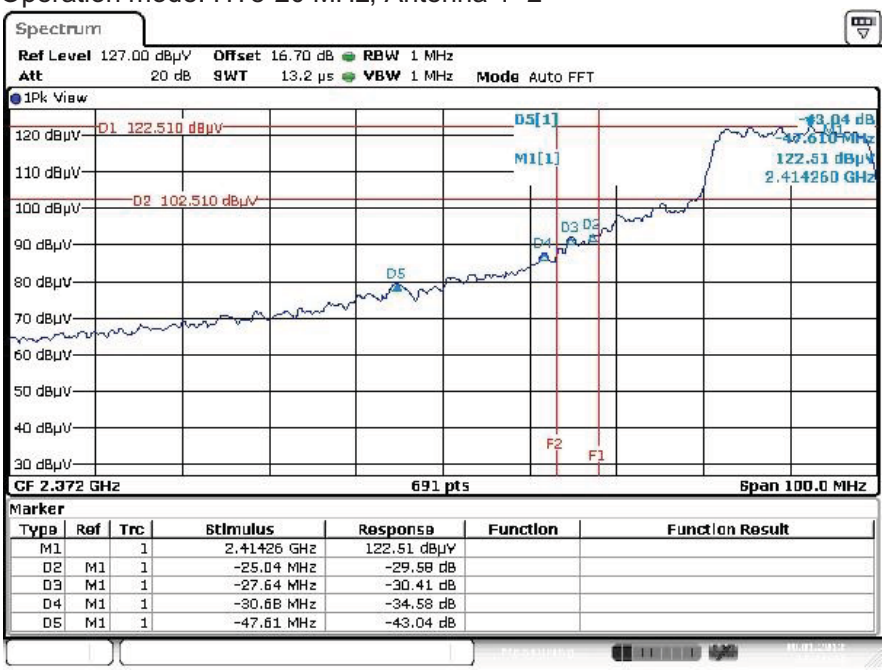
Low Channel



Date: 10.JAN.2013 12:26:41

High Channel

Operation mode: HT8-20 MHz, Antenna 1+2



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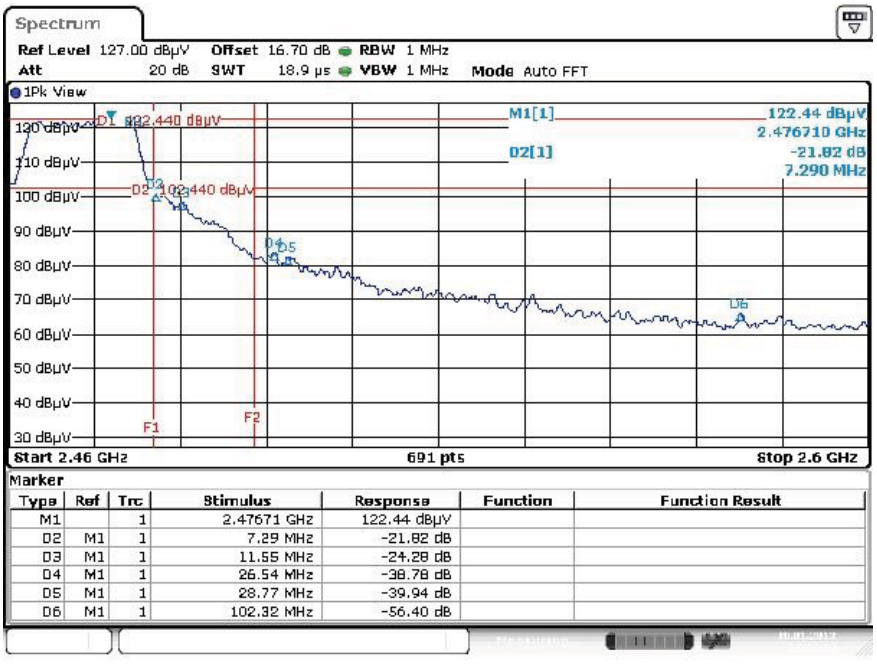
Low Channel



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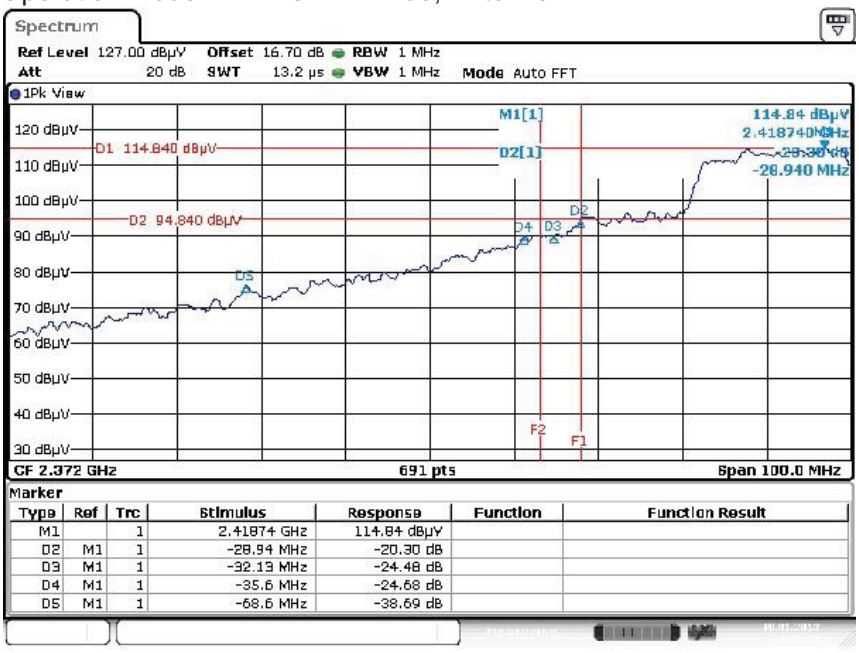
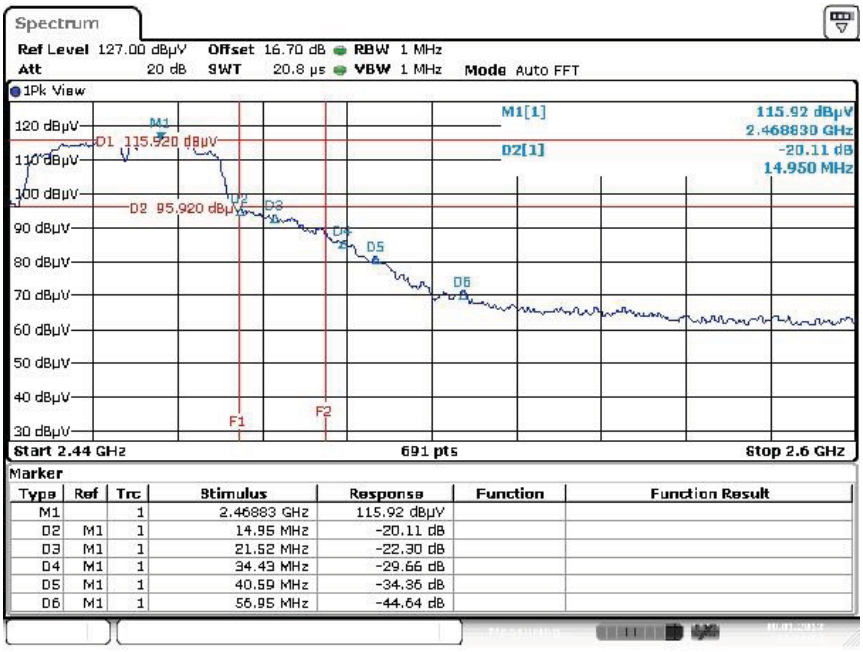
High Channel

Operation mode: HT4-40 MHz wide, Antenna 1



Date: 10.JAN.2013 11:25:59

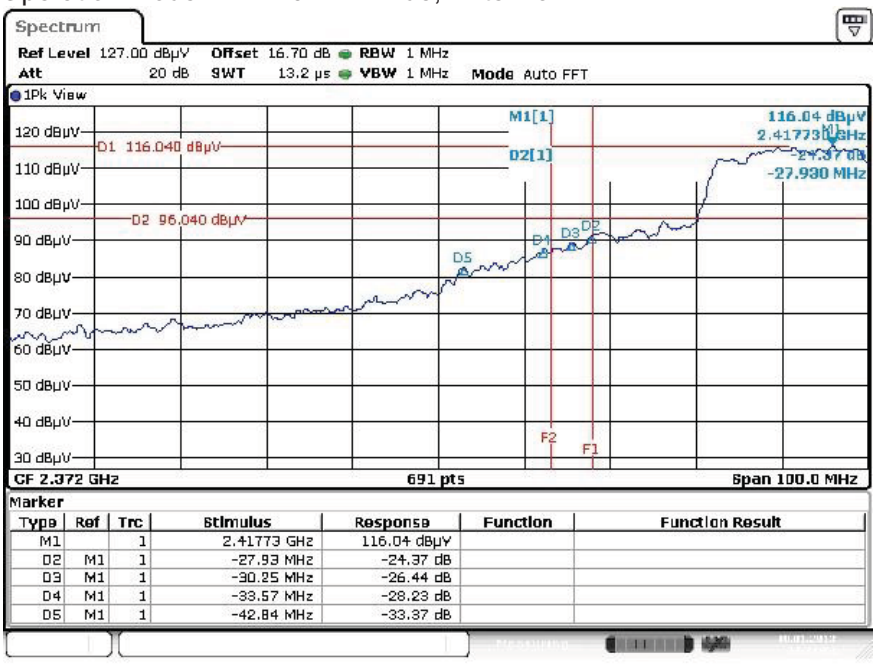
Low Channel



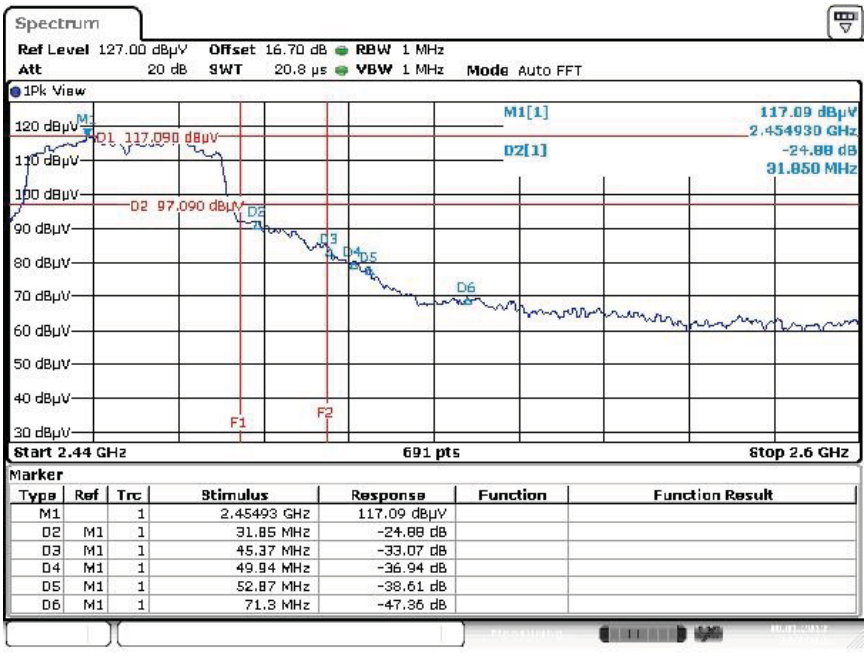
Date: 10.JAN.2013 12:32:03

High Channel

Operation mode: HT4-40 MHz wide, Antenna 2

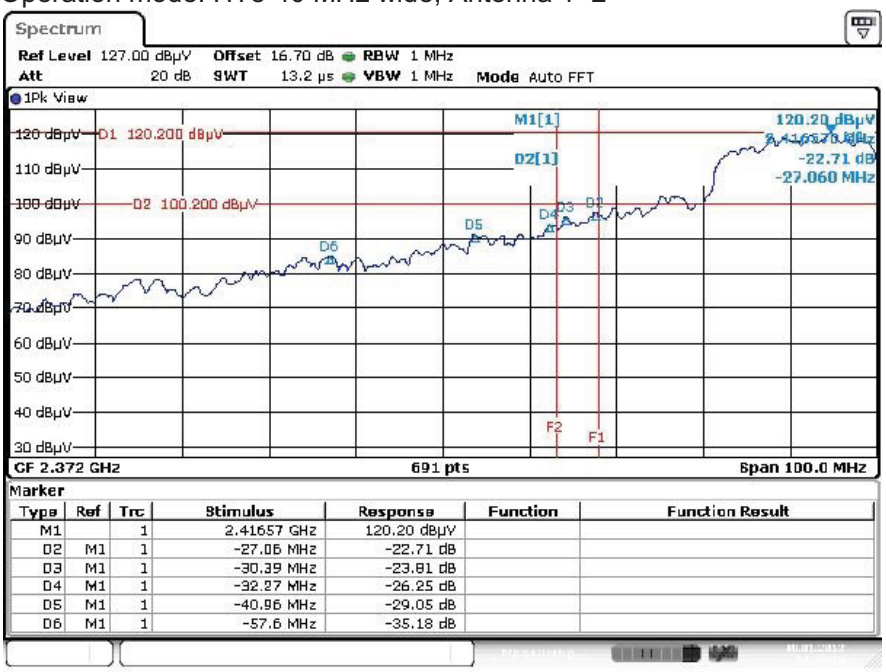


Low Channel



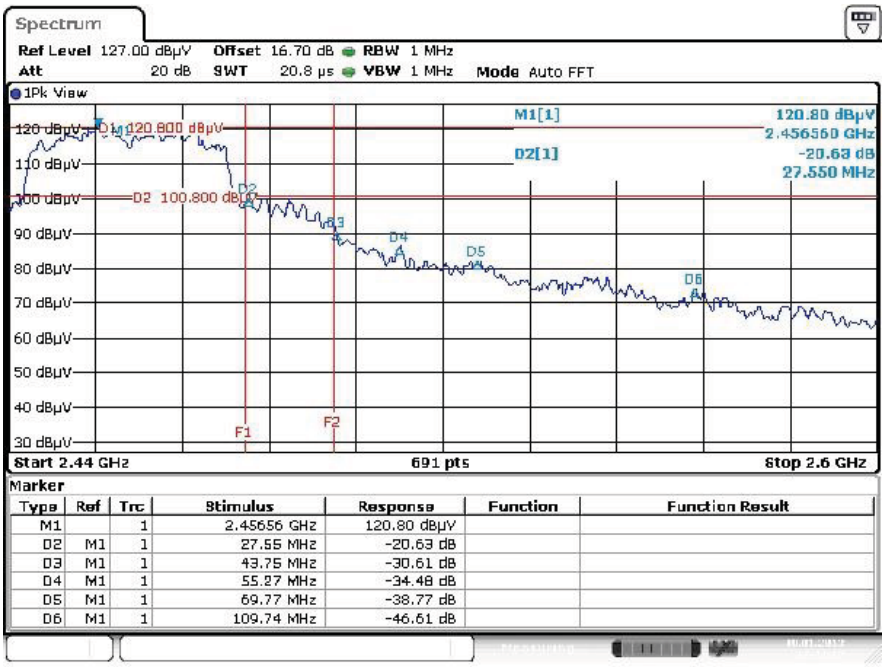
High Channel

Operation mode: HT8-40 MHz wide, Antenna 1+2



Date: 10.JAN.2013 11:36:09

Low Channel



Date: 10.JAN.2013 12:44:07

High Channel

5.3 Spurious emissions in receive mode

RESULT: Pass

Date of testing: 2013-01-10

Requirements: RSS-Gen

Radiated emissions from receiver shall not exceed the radiated limits in the table below.

Freq. [MHz]	Detector	Measurement Bandwidth	Limit [dBµV/m]
30 – 88	Qp	120 kHz	40.0
88 – 216	Qp	120 kHz	43.5
216 – 960	Qp	120 kHz	46.0
Above 916	Av	1 MHz	54.0

Test procedure: ANSI C63.10-2009 and RSS-Gen section 4.10

The EUT was placed on a nonconductive turntable 0.8m above the ground plane. Before final measurements of radiated emissions were performed, the EUT was scanned to determine its emission spectrum profile. The physical arrangement of the test system, the associated cabling and the EUT orientation (X, Y, Z) were varied in order to ensure that maximum emission amplitudes were attained.
The spectrum was examined from 30 MHz to 7500 MHz. Emission measurements were made at 3m distance.
At each frequency where a spurious emission was found, the EUT was rotated 360° and the antenna was raised and lowered from 1 to 4m in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations.
The 6 highest emission amplitudes relative to the appropriate limit were recorded in this report. Field strength values of radiated emissions at frequencies not listed in the tables are more than 20 dB below the applicable limit.
Correction factors are incorporated in the spectrum analyzers as an automated function. Correction factors includes: antenna factor, cable loss and pre-amplifier gain.

Results:

Freq. [MHz]	Antenna Orientation	Detector/ Bandwidth	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]
47.1	Vertical	Qp / 120 kHz	37.4	40.0	-2.6
64.9	Vertical	Qp / 120 kHz	36.7	43.5	-6.8
237.5	Vertical	Qp / 120 kHz	32.4	46.0	-13.6
466.0	Vertical	Qp / 120 kHz	35.2	46.0	-10.8
4824	Vertical	Av / 1 MHz	38.9	54.0	-15.1
6436	Vertical	Av / 1 MHz	36.4	54.0	-17.6

Note: - tested up to 3 times highest tunable frequency (which is 2462 MHz), up to 7.5 GHz.
- the EUT was tested in receive mode, set at center frequency of 2437 MHz.
- tested with DSSS, OFDM modes, worst case values noted

5.4 AC Power Line Conducted Measurements

5.4.1 AC Power Line Conducted Emission of Transmitter

AC power line conducted emissions are included in the Part 15B/ICES-003 testreport. Refer to documentnumber 13e_PD97260NG_Testreport_FCC-15B-ICES003.

WiFi 5.725 – 5.825 GHz (802.11a/n20/n40/ac80)

6. Test Set-up and Operation Modes

6.1 Test Methodology

The test methodology used is based on the requirements of RSS-GEN, RSS-210, 47 CFR Part 15, Sections 15.31, 15.33, 15.35, 15.205, 15.207, 15.209, 15.247 and ANSI C63.10:2009

KDB Publication No. 558074 D01: Measurement of Digital Transmission Systems Operating under Section 15.247.

The test methods, which have been used, are based on ANSI C63.10: 2009. For details, see under each test item.

6.2 Operation Modes

Modulation	Duty cycle	Antenna	Test frequencies (MHz)					
			Lowest	Power/ Gain control setting	Middle	Power/ Gain control setting	Highest	Power/ Gain control setting
6 Mb OFDM	0.99	1	5745	18.0 dBm	5785	17.5 dBm	5825	18.0 dBm
6 Mb OFDM	0.99	2	5745	31.0	5785	32.5	5825	31.5
HT4 - 20 MHz	0.94	1	5745	11.0 dBm	5785	10.5 dBm	5825	11.0 dBm
HT4 - 20 MHz	0.94	2	5745	11.0 dBm	5785	10.5 dBm	5825	11.0 dBm
HT8 - 20 MHz	0.98	1+2	5745	27.0	5785	27.5 / 27.5	5825	27.5
HT4 - 40 MHz	0.89	1	5755	17.5 dBm	--	--	5795	11.0 dBm
HT4 - 40 MHz	0.89	2	5755	17.5 dBm	--	--	5795	11.0 dBm
HT8 - 40 MHz	0.96	1+2	5755	11.5/11.5 dBm	--	--	5795	28.0/ 28.0
VHT6 – 80 MHz	0.79	1	--	--	5775	14.0 dBm	--	--
VHT6 – 80 MHz	0.79	2	--	--	5775	14.0 dBm	--	--
VHT6 – 80 MHz	0.79	1+2	--	--	5775	27.0/27.0	--	--

Power setting was established by either ‘Power Control” or “Gain Control” in the software as defined in section 4.4.
Testing was performed at the lowest operating frequency, at the operating frequency in the middle of the specified frequency band and at the highest operating frequency. These operation modes were selected after review of the capabilities and characteristics of the EUT.
Antenna ports are also referred to as Chain A and Chain B, where chain A refers to Antenna-port 2 and Chain B refers to Antenna-port 1. Gain control setting is for both chains equal were applicable.
The data rates of 6Mb/s for 802.11a, HT4 (SISO)/HT8 (MIMO) for 802.11n20 and n40, and VHT6 (SISO)/(MIMO) for 802.11 ac80 were selected based on preliminary testing that identified those rates corresponding to the worst cases for output power and spurious levels at the band edges.

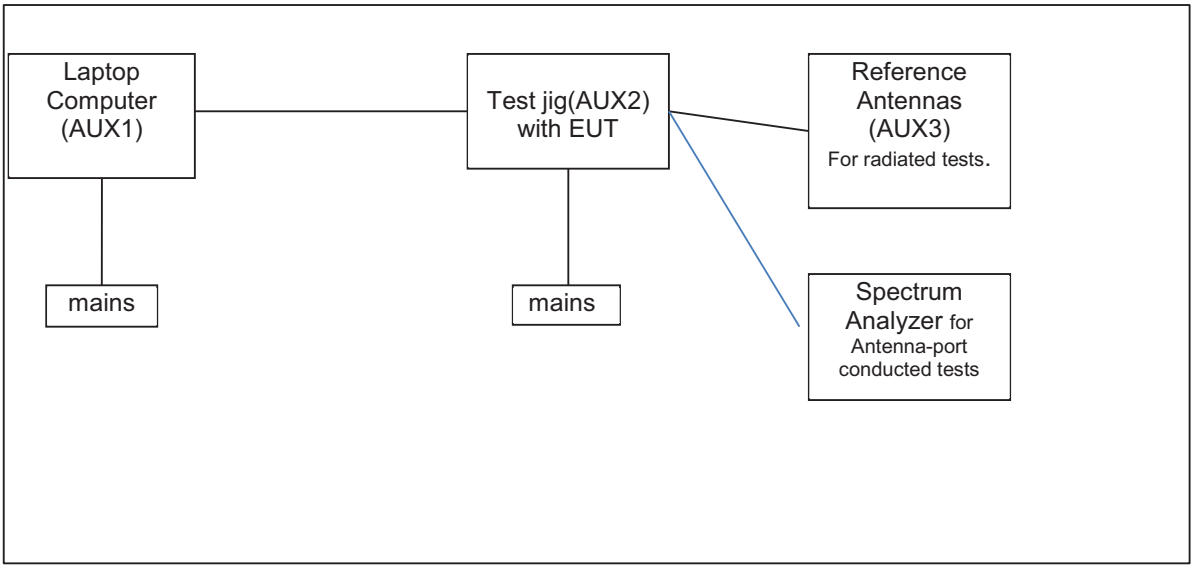
6.3 Physical Configuration for Testing

The EUT was installed into a test-fixture that interfaced to a laptop computer and dc power supply. The laptop computer was used to configure the EUT to continuously transmit at a specified output power and channel or continuously receive on the channel as specified in the testdata. See section 4.5 for Auxiliary details.

The EUT was tested on a stand-alone basis (only attached to the test jig) and the test system was configured in a typical fashion (as a customer would normally use it).

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.10: 2009.

Figure 3: Test Setup Diagram



Notes:

For more details, refer to the document: Test Set-Up Photographs document.