

## TEST REPORT

Test report no.: 1-5579/12-02-13-B



### Testing laboratory

**CETECOM ICT Services GmbH**  
Untertuerkheimer Strasse 6 – 10  
66117 Saarbruecken / Germany  
Phone: + 49 681 5 98 - 0  
Fax: + 49 681 5 98 - 9075  
Internet: <http://www.cetecom.com>  
e-mail: [ict@cetecom.com](mailto:ict@cetecom.com)

#### Accredited Testing Laboratory:

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS). The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01  
Area of Testing: Radio/Satellite Communications

### Applicant

**Research In Motion Limited**  
305 Phillip Street  
Waterloo, ON N2L 3W8 / CANADA  
Phone: +1 51 98 88 74 65  
Fax: +1 51 98 88 69 06  
Contact: Masud Attayi  
e-mail: [mattayi@rim.com](mailto:mattayi@rim.com)  
Phone: +1 51 98 88 74 65

### Manufacturer

**Research In Motion Limited**  
305 Phillip Street  
Waterloo, ON N2L 3W8 / CANADA

### Test standard/s

47 CFR Part 15	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices
RSS - 210 Issue 8	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

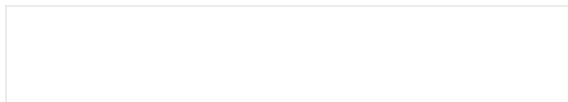
For further applied test standards please refer to section 3 of this test report.

### Test Item

<b>Kind of test item:</b>	<b>Blackberry GSM Phones</b>
<b>Model name:</b>	<b>RFM121LW</b>
<b>FCC ID:</b>	<b>L6ARFM120LW</b>
<b>IC:</b>	<b>2503A-RFM120LW</b>
<b>Frequency:</b>	ISM band 2400 MHz to 2483.5 MHz (lowest channel 2412 MHz, highest channel 2462 MHz)
<b>Technology tested:</b>	WLAN (DSSS / b – mode; OFDM / g – & n – mode)
<b>Antenna:</b>	Integrated antenna
<b>Power Supply:</b>	3.8 V DC by Li - Ion battery
<b>Temperature Range:</b>	No extreme conditions needed!

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

### Test report authorised:



Stefan Bös  
Senior Testing Manager

### Test performed:



Marco Bertolino  
Testing Manager

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## 2 General information

### 2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

### 2.2 Application details

Date of receipt of order:	2013-01-04
Date of receipt of test item:	2013-03-12
Start of test:	2013-03-12
End of test:	2013-03-15
Person(s) present during the test:	-/-

## 3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	2012-10	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices
RSS - 210 Issue 8	2010-12	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

### 3.1 Measurement guidance

DTS : KDB 558074	2012-04	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247
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#### 4 Test environment

Temperature:	$T_{nom}$	+22 °C during room temperature tests
	$T_{max}$	-/- °C during high temperature tests
	$T_{min}$	-/- °C during low temperature tests
Relative humidity content:		42 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	$V_{nom}$	3.8 V DC by Li - Ion battery
	$V_{max}$	-/- V
	$V_{min}$	-/- V

#### 5 Test item

Kind of test item	:	<b>Blackberry GSM Phones</b>
Type identification	:	<b>RFM121LW</b>
S/N serial number	:	Radiated unit: IMEI 990002430036416; PIN 303E5B59 IMEI 990002430036317; PIN 303E5B4F Conducted unit: IMEI 990002430036333; PIN 303E5851
HW hardware status	:	<b>CER-53013-001Rev2-905-00</b>
SW software status	:	<b>127.0.1.4429</b>
Frequency band [MHz]	:	<b>ISM band 2400 MHz to 2483.5 MHz (Lowest channel 2412 MHz; highest channel 2462 MHz)</b>
Type of radio transmission	:	<b>DSSS, OFDM</b>
Use of frequency spectrum	:	
Type of modulation	:	<b>BPSK, QPSK, 16 – QAM, 64 – QAM</b>
Number of channels	:	<b>11</b>
Antenna	:	<b>Integrated antenna</b>
Power supply	:	<b>3.8 V DC by Li - Ion battery</b>
Temperature range	:	<b>Not needed – normal test conditions only!</b>

#### 5.1 Additional information

Test setup- and EUT-photos are included in test reports: 1-5579/12-02-01\_AnnexA  
1-5579/12-02-01\_AnnexD

#### 6 Test laboratories sub-contracted

None

## 7 Summary of measurement results

- No deviations from the technical specifications were ascertained  
 There were deviations from the technical specifications ascertained

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR Part 15 RSS 210, Issue 8	Passed	2013-06-11	Reduced tests according to manufacturer test plan!

Test specification clause	Test case	Temperature conditions	Power source voltages	Mode	Pass	Fail	NA	NP	Remark
§15.247(b)(4) RSS 210 / A8.4(2)	Antenna gain	Nominal	Nominal	DSSS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
RSS GEN 4.7	Frequency deviation	Nominal	Nominal	OFDM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	not rated
		Low	Low		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		High	High		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
§15.247(e) RSS 210 / A8.2(b)	Power spectral density	Nominal	Nominal	DSSS OFDM g & n	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	complies
§15.247(a)(2) RSS 210 / A8.2(a)	Spectrum bandwidth - 6dB bandwidth	Nominal	Nominal	DSSS OFDM g & n	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	complies
§15.247(a)(2) RSS 210 / A8.2(a)	Spectrum bandwidth - 20dB bandwidth	Nominal	Nominal	DSSS OFDM g & n	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	-/-
§15.247(b)(3) RSS-210 / A8.4(4)	Maximum output power	Nominal	Nominal	DSSS OFDM g & n	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	complies
§15.247(d) RSS-210 / A8.5	Band edge compliance conducted	Nominal	Nominal	DSSS OFDM g & n	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	complies
§15.205 RSS-210 / A8.5	Band edge compliance radiated	Nominal	Nominal	DSSS OFDM g & n	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	complies
§15.247(d) RSS-210 / A8.5	TX spurious emissions conducted	Nominal	Nominal	DSSS OFDM g & n	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	complies
§15.247(d) RSS-210 / A8.5	TX spurious emissions radiated	Nominal	Nominal	DSSS OFDM g & n	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	complies
§15.109 RSS-Gen	RX spurious emissions radiated	Nominal	Nominal	-/-	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.209(a) RSS-Gen	TX spurious emissions radiated < 30 MHz	Nominal	Nominal	DSSS OFDM g & n	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	complies
§15.107(a)	Conducted emissions < 30 MHz	Nominal	Nominal	DSSS OFDM g & n	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	complies

**Note:** NA = Not Applicable; NP = Not Performed

## 8 RF measurements

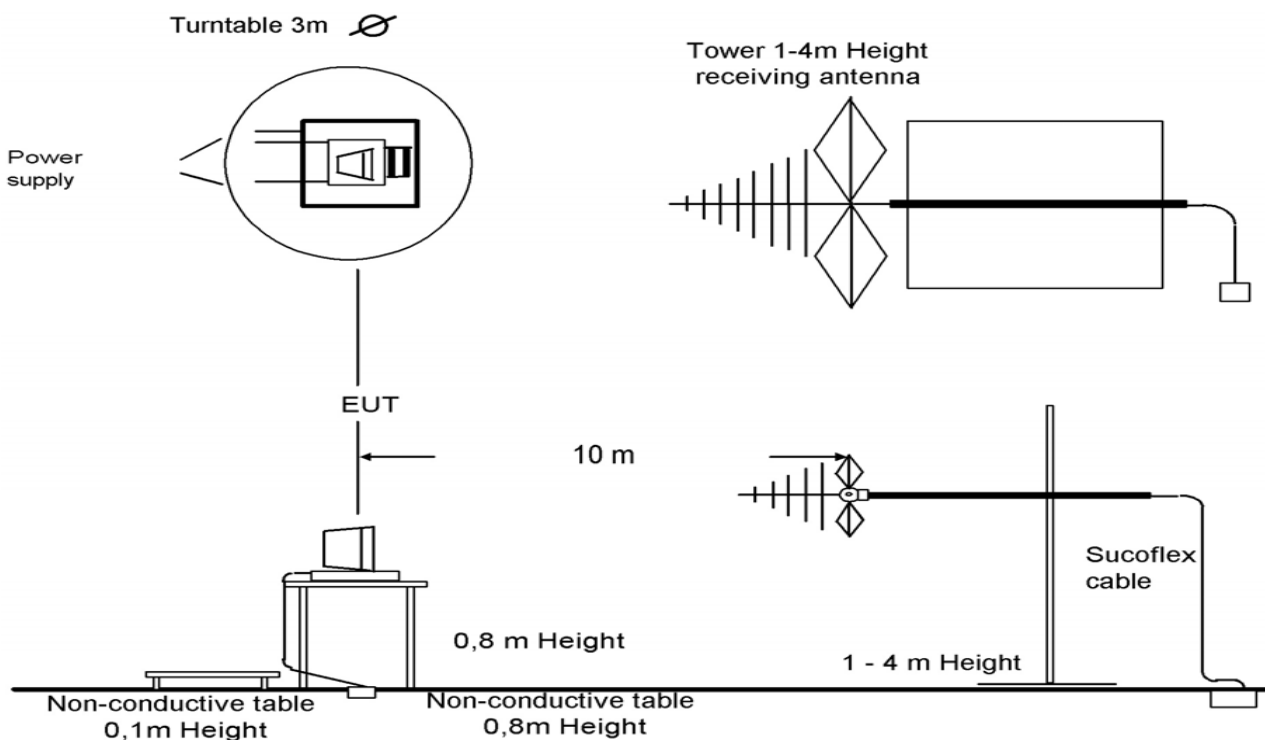
### 8.1 Description of test setup

#### 8.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63.2-1996 clause 15 and ANSI C63.4-2009 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63-4-2009 clause 4.2.

Antennas are confirmed with ANSI C63.2-1996 item 15.

Semi anechoic chamber



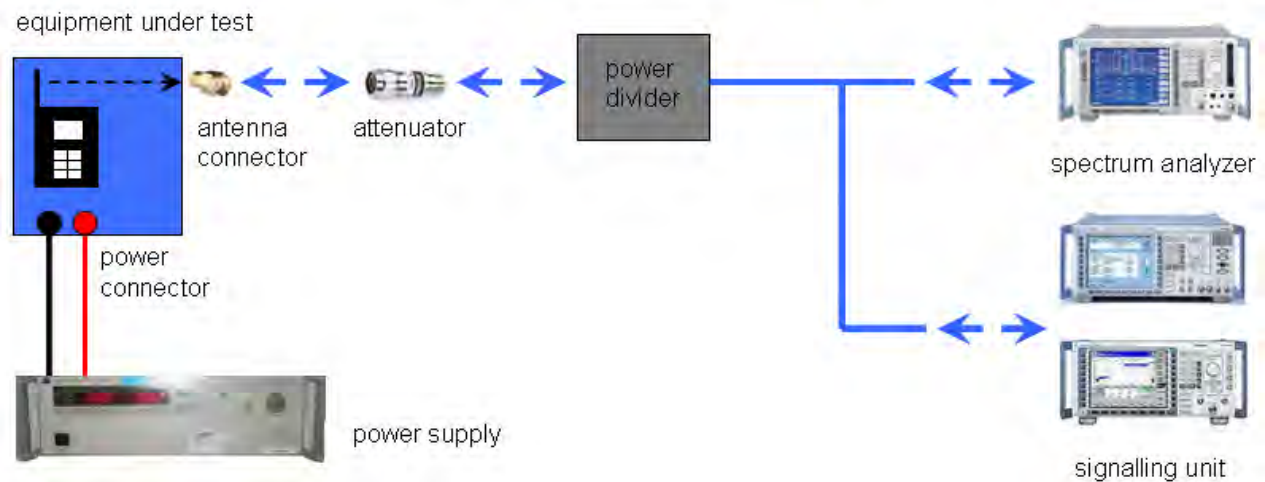
Picture 1: Diagram radiated measurements

9 kHz - 30 MHz:	active loop antenna
30 MHz – 1 GHz:	tri-log antenna
> 1 GHz:	horn antenna

The EUT is powered by an external power supply with nominal voltage. The signalling is performed from outside the chamber with a signalling unit (CMU200 or other) by air link using signalling antenna.

### 8.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is first 10dB attenuated before it is power divided (~6dB loss per branch). One of the signal paths is connected to the communication base Station (CMU200 or other), the other one is connected to the spectrum analyzer. The specific losses for both signal paths are first checked within a calibration. The measurement readings on the signalling unit/spectrum analyzer are corrected by the specific test set-up loss. The attenuator, power divider, signalling unit and the spectrum analyzer are impedance matched on 50 Ohm.



Picture 2: Diagram conducted measurements

### 8.2 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: None

- Test mode:
- No test mode available.  
lperf was used to ping another device with the largest support packet size
  - Special software is used.  
EUT is transmitting pseudo random data by itself

## 9 Measurement results

### 9.1 Output power verification (conducted)

Not performed! Tests according to manufacturer test plan!

### 9.2 Antenna gain

Not performed! Tests according to manufacturer test plan!



### 9.3 Frequency deviation

**Description:**

Frequency deviation from the defined centre frequency.

**Measurement:**

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 kHz
Video bandwidth:	≥ 3 x RBW
Span:	10 kHz
Trace-Mode:	Max hold (allow trace to fully stabilize)

**Results:**

Frequency deviation				
Frequency	Input voltage	Temperature	TX mode	Frequency error / ppm
2412 MHz	3.6 V DC	20 C°	Modulated carrier OFDM - mode	48 kHz / 19.90
	4.1 V DC	20 C°		0 kHz / 0.00
	4.35 V DC	20 C°		24 kHz / 9.95
	3.6 V DC	-20 C°		0 kHz / 0.00
	4.1 V DC	-20 C°		-12 kHz / -4.98
	4.35 V DC	-20 C°		48 kHz / 19.90
	3.6 V DC	+55 C°		36 kHz / -14.93
	4.1 V DC	+55 C°		-36 kHz / -14.93
	4.35 V DC	+55 C°		-36 kHz / -14.93
2437 MHz	3.6 V DC	20 C°	Modulated carrier OFDM - mode	0 kHz / 0.00
	4.1 V DC	20 C°		-12 kHz / -4.90
	4.35 V DC	20 C°		0 kHz / 0.00
	3.6 V DC	-20 C°		0 kHz / 0.00
	4.1 V DC	-20 C°		24 kHz / 9.85
	4.35 V DC	-20 C°		48 kHz / 19.70
	3.6 V DC	+55 C°		12 kHz / 4.92
	4.1 V DC	+55 C°		-36 / -14.77
	4.35 V DC	+55 C°		0 kHz / 0.00
2462 MHz	3.6 V DC	20 C°	Modulated carrier OFDM - mode	24 kHz / 9.75
	4.1 V DC	20 C°		-12 kHz / -4.87
	4.35 V DC	20 C°		12 kHz / 4.87
	3.6 V DC	-20 C°		0 kHz / 0.00
	4.1 V DC	-20 C°		0 kHz / 0.00
	4.35 V DC	-20 C°		48 kHz / 19.50
	3.6 V DC	+55 C°		0 kHz / 0.00
	4.1 V DC	+55 C°		-12 kHz / -4.87
	4.35 V DC	+55 C°		-48 kHz / -19.50
Measurement uncertainty = RBW				

**Result:** Not rated

## 9.4 Maximum output power

### Description:

Measurement of the maximum output power conducted and radiated. The measurements are performed using the data rate producing the highest conducted output power. The determination of these data rates was performed at the beginning of the tests.

### Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	3 MHz / 10 MHz (at least 1 MHz)
Video bandwidth:	≥ 3 x RBW (or maximum of available setting)
Span:	> DTS bandwidth
Trace-Mode:	Max hold (allow trace to fully stabilize)

### Limits:

FCC	IC
Maximum Output Power	
Conducted: 1.0 W – Antenna Gain max. 6 dBi	

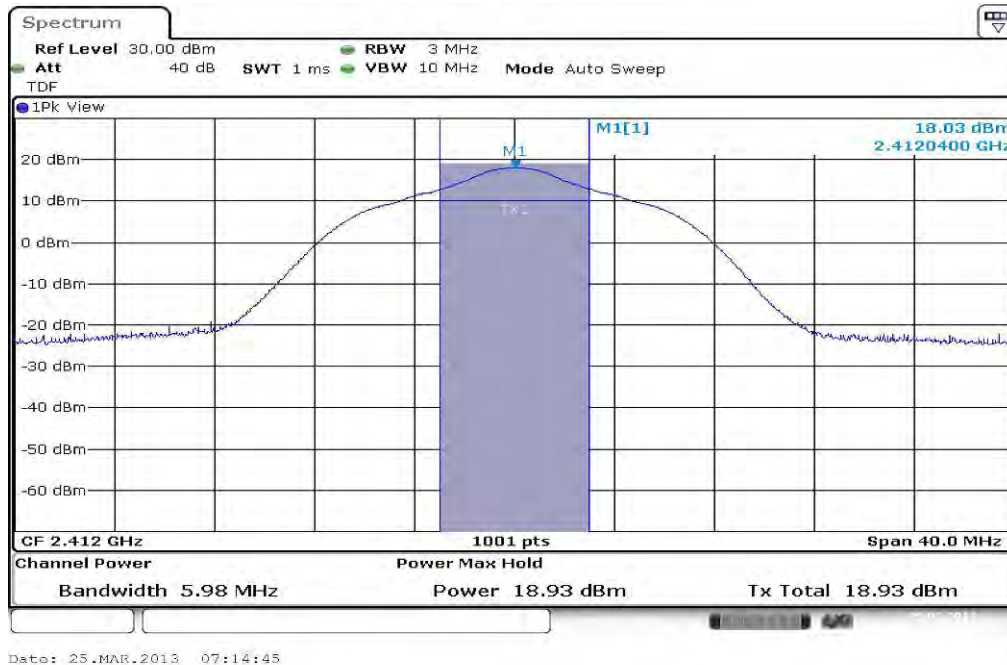
**Results:**

Technology / data rate Frequency	Maximum Output Power [dBm]		
	2412 MHz	2437 MHz	2462 MHz
DSSS / b – mode, 1 Mbps Peak Output Power Conducted	18.93	19.33	19.20
DSSS / b – mode, 5.5 Mbps Peak Output Power Conducted	18.98	19.38	19.14
DSSS / b – mode, 11 Mbps Peak Output Power Conducted	20.38	20.76	20.60
OFDM / g – mode, 6 Mbps Peak Output Power Conducted	24.09	24.50	21.21
OFDM / g – mode, 24 Mbps Peak Output Power Conducted	23.48	23.88	20.50
OFDM / g – mode, 54 Mbps Peak Output Power Conducted	23.53	23.86	20.58
OFDM / n – mode, MCS 0 Peak Output Power Conducted	23.92	24.30	21.07
OFDM / n – mode, MCS 4 Peak Output Power Conducted	23.37	23.71	20.32
OFDM / n – mode, MCS 7 Peak Output Power Conducted	22.12	22.46	20.37
Measurement uncertainty	± RBW		

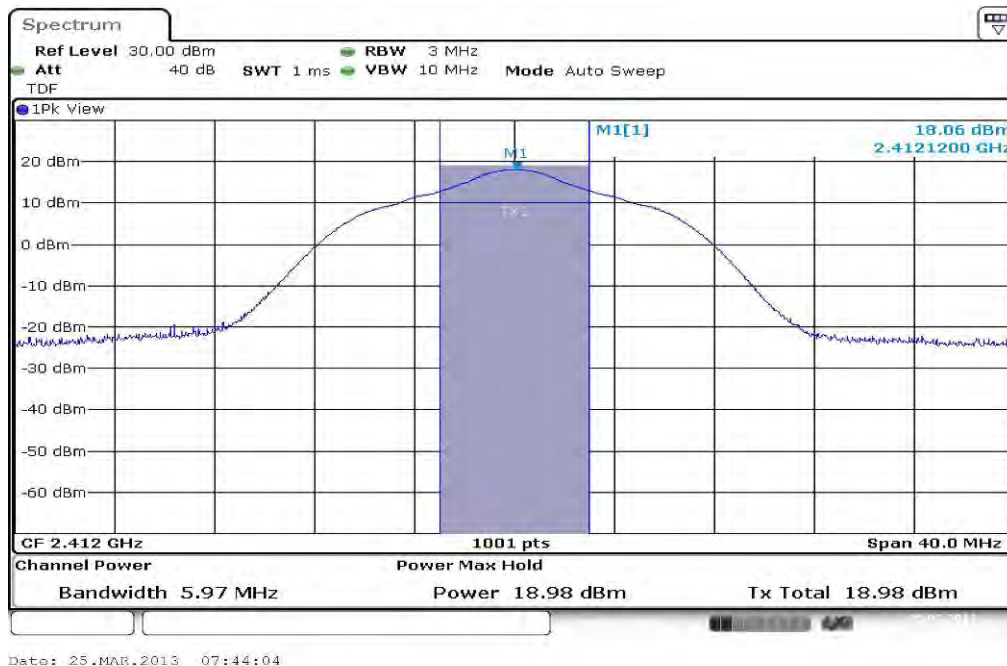
**Result:** Passed

**Plots:**

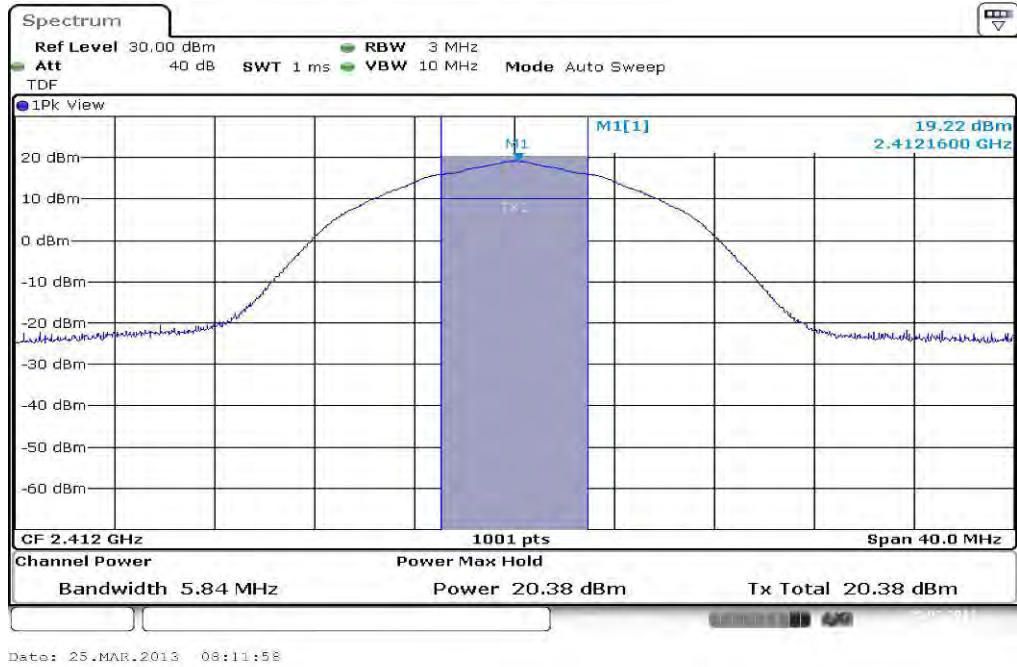
**Plot 1:** lowest channel, b – mode, 1 Mbps



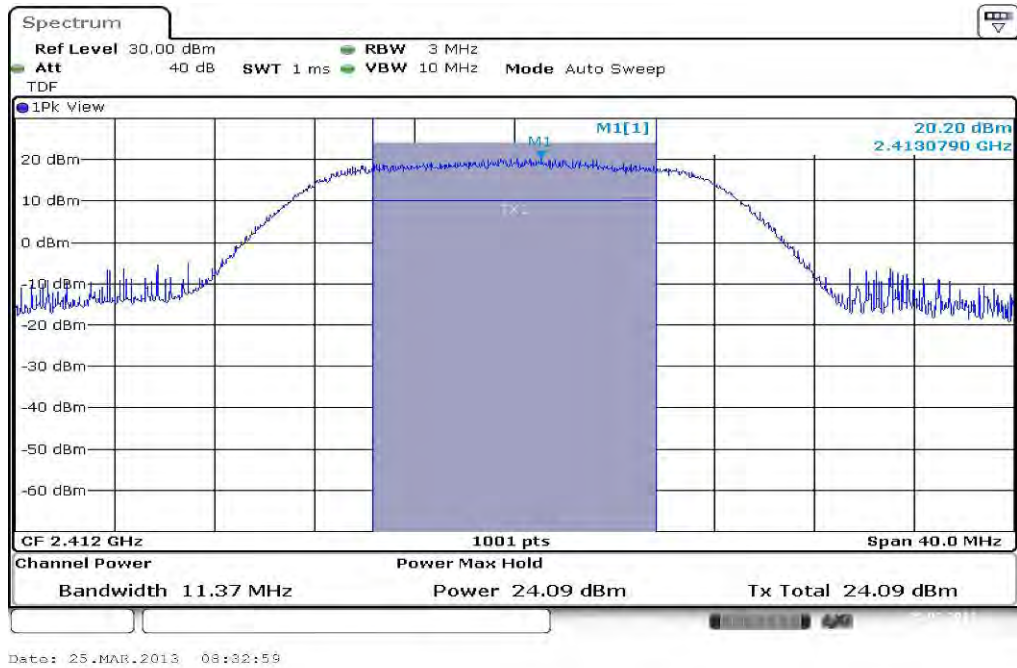
**Plot 2:** lowest channel, b – mode, 5.5 Mbps



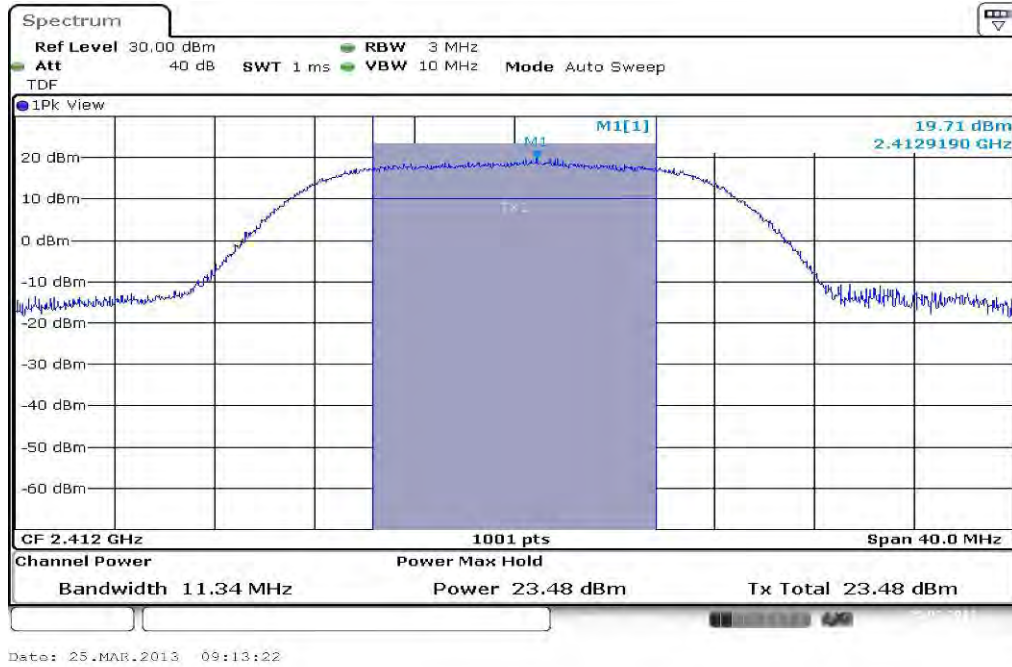
Plot 3: lowest channel, b – mode, 11 Mbps



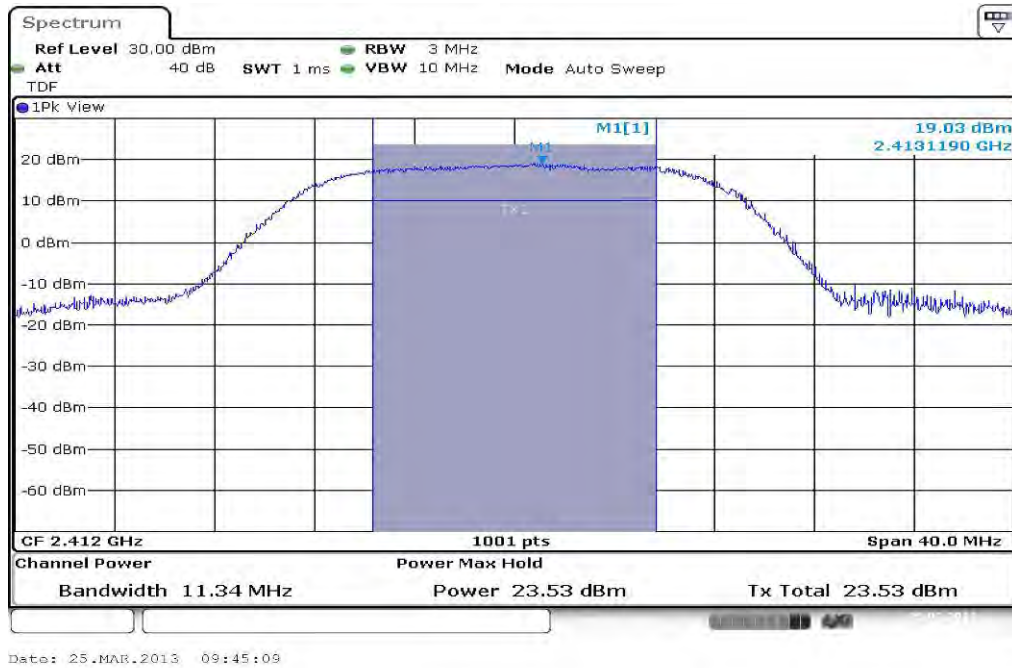
Plot 4: lowest channel, g – mode, 6 Mbps



Plot 5: lowest channel, g – mode, 24 Mbps

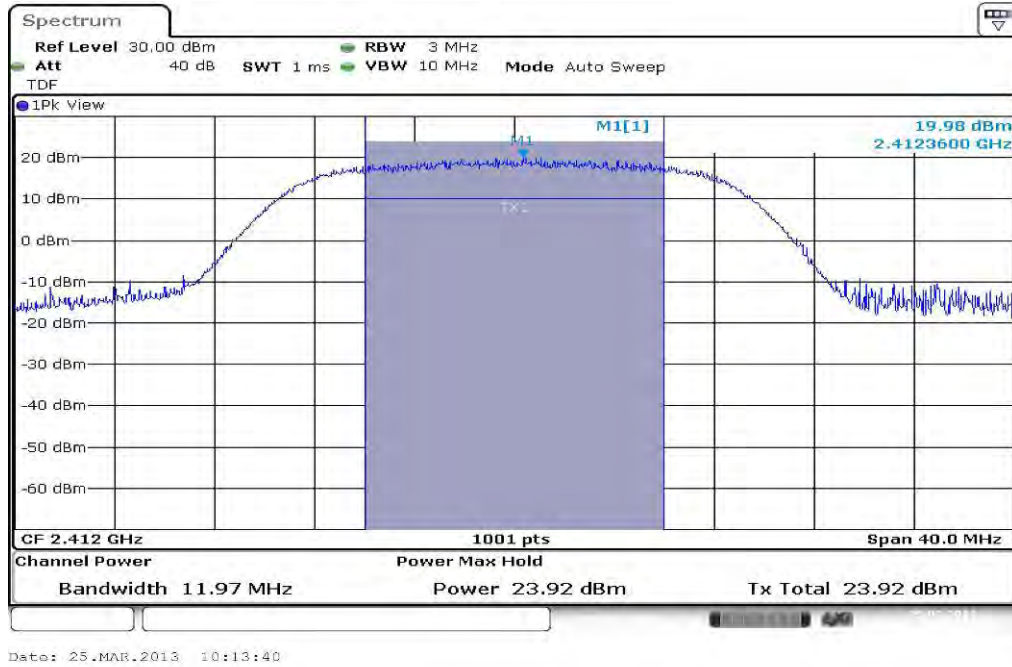


Plot 6: lowest channel, g – mode, 54 Mbps

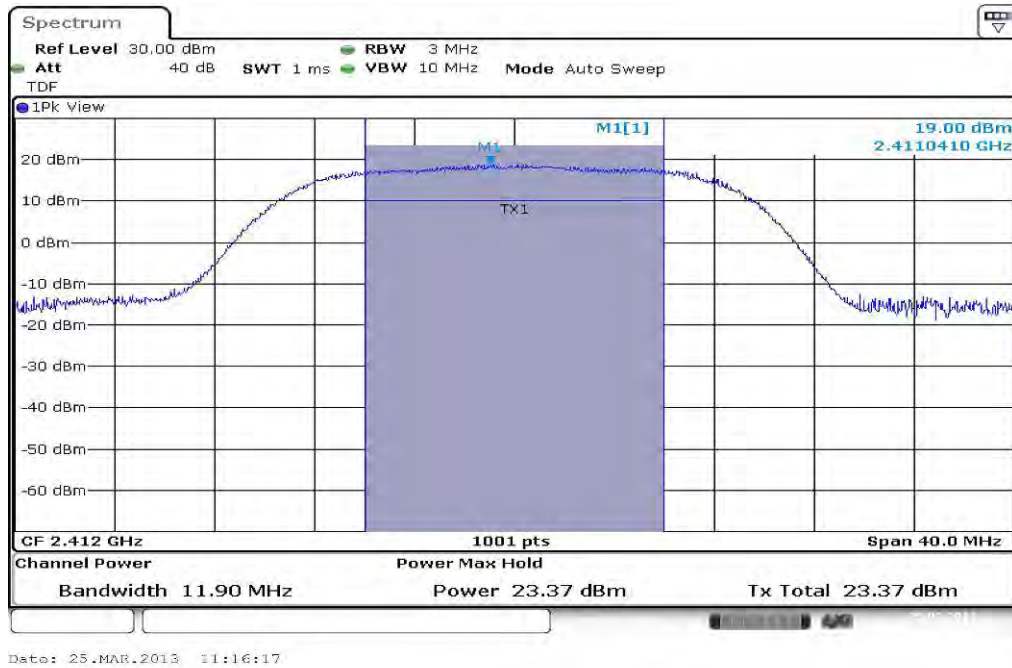




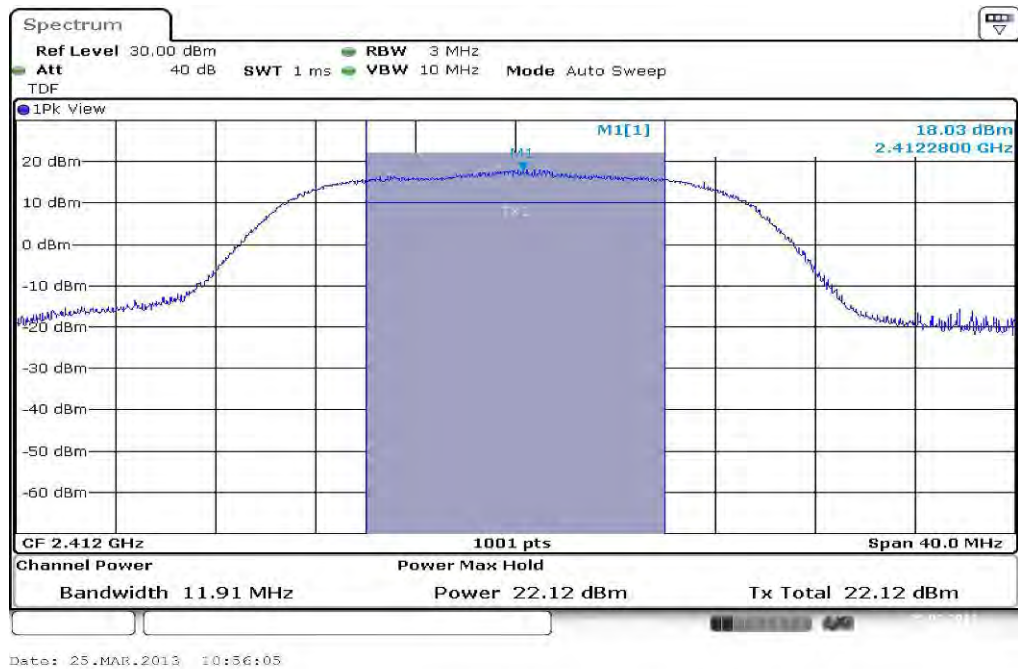
Plot 7: lowest channel, n – mode, MCS 0



Plot 8: lowest channel, n – mode, MCS 4

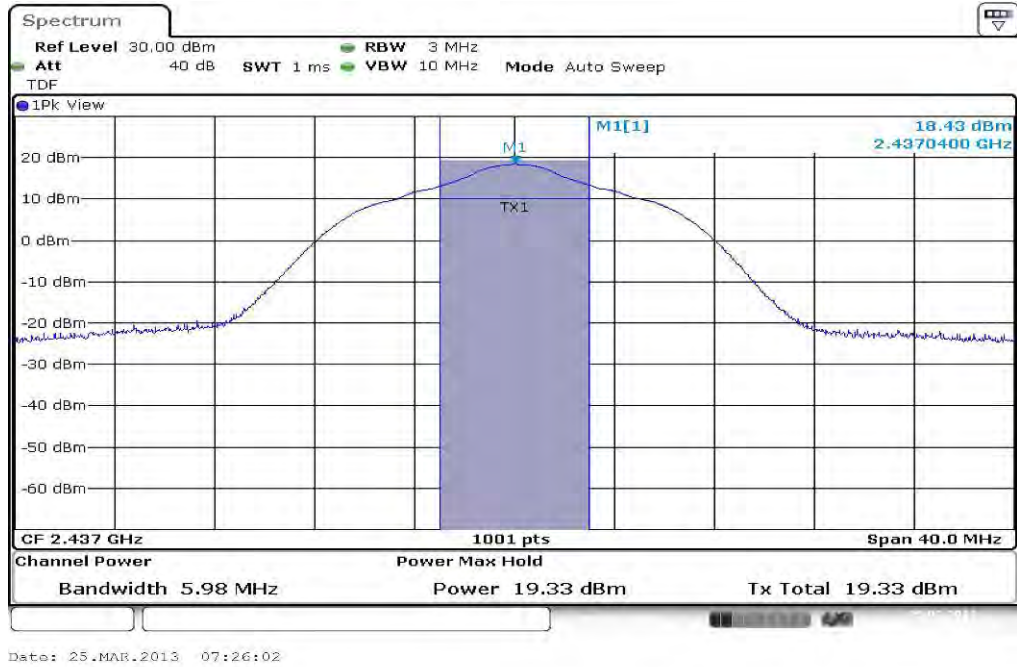


Plot 9: lowest channel, n – mode, MCS 7

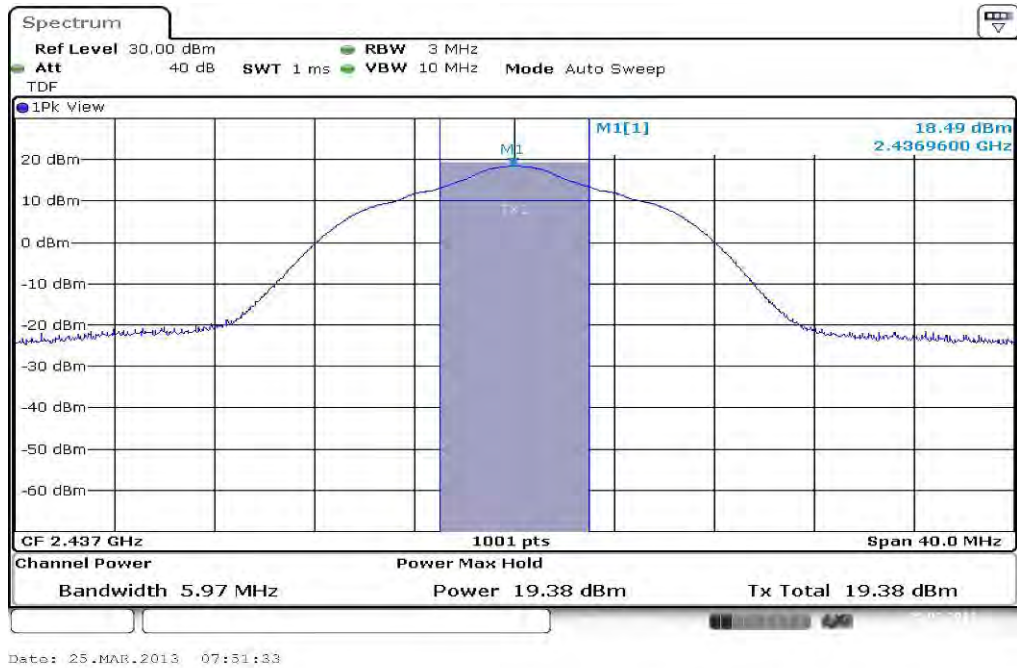




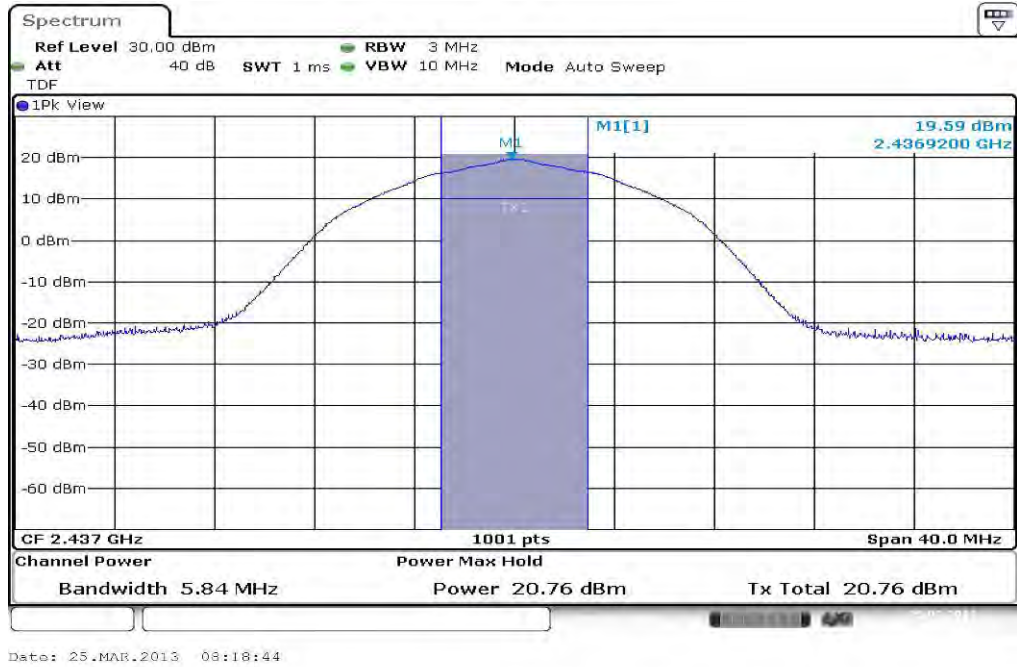
Plot 10: middle channel, b – mode, 1 Mbps



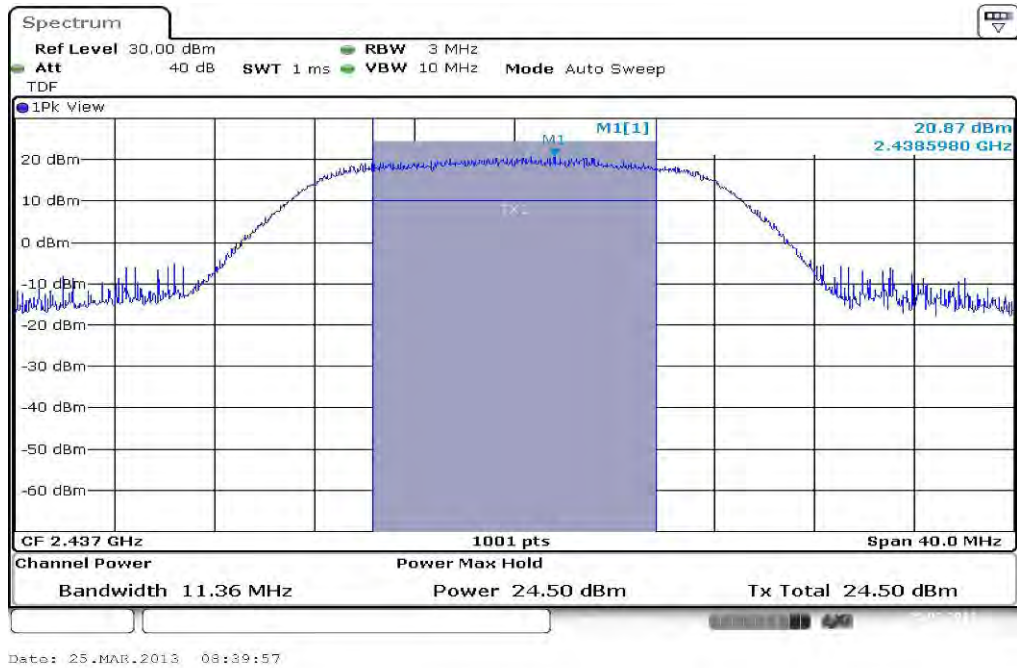
Plot 11: middle channel, b – mode, 5.5 Mbps



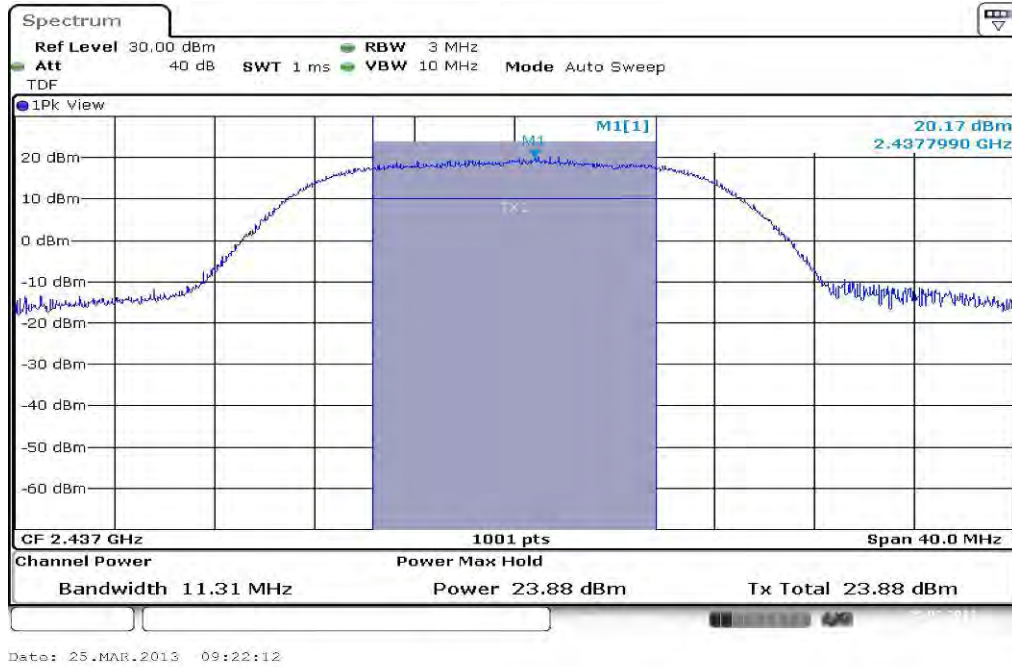
Plot 12: middle channel, b – mode, 11 Mbps



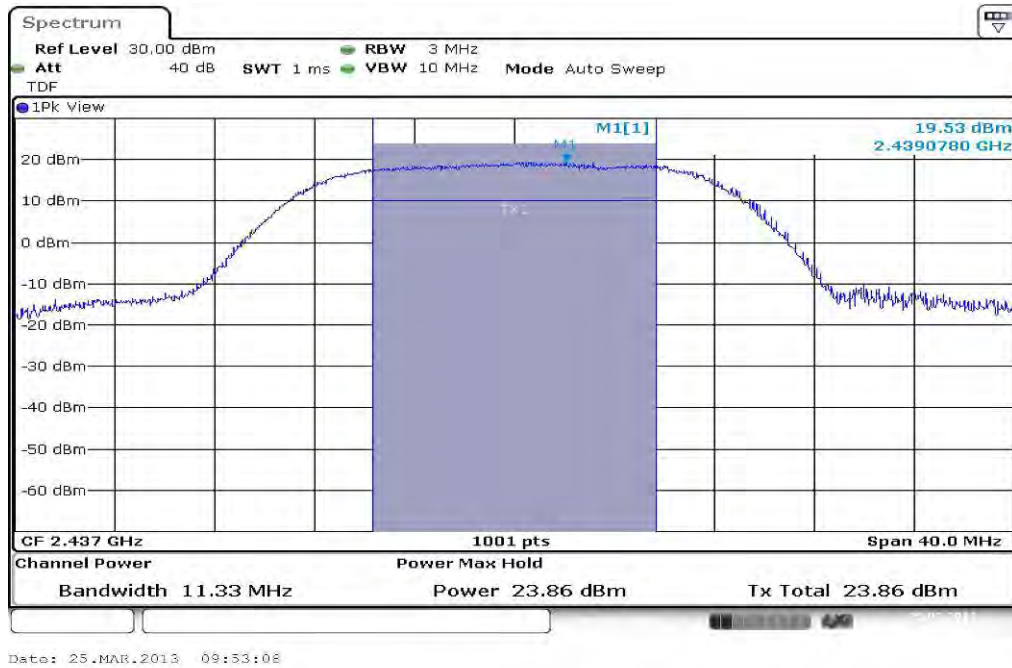
Plot 13: middle channel, g – mode, 6 Mbps



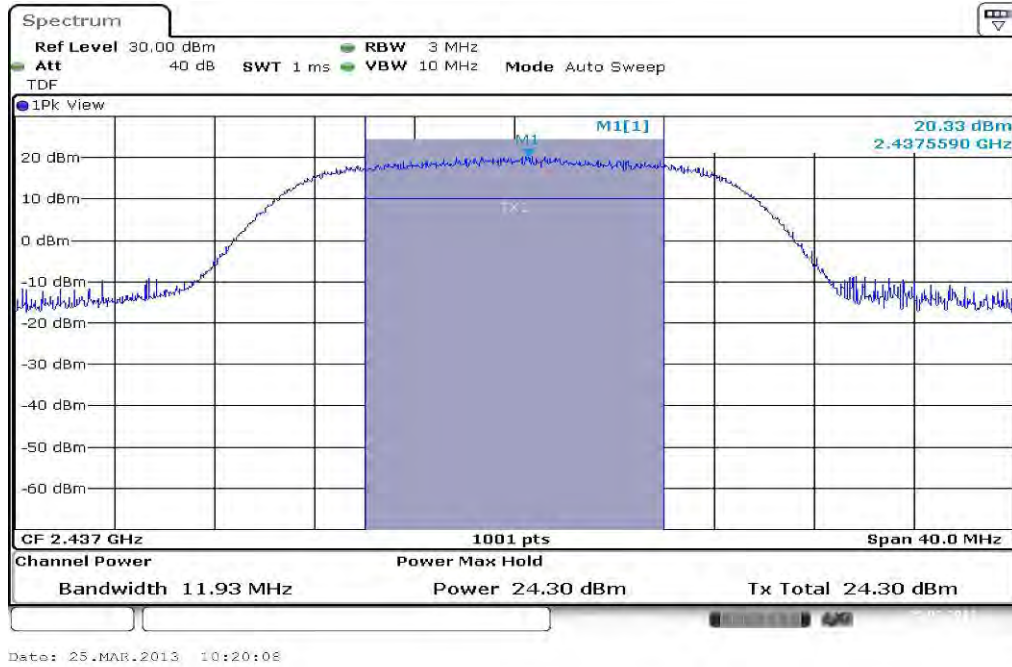
Plot 14: middle channel, g – mode, 24 Mbps



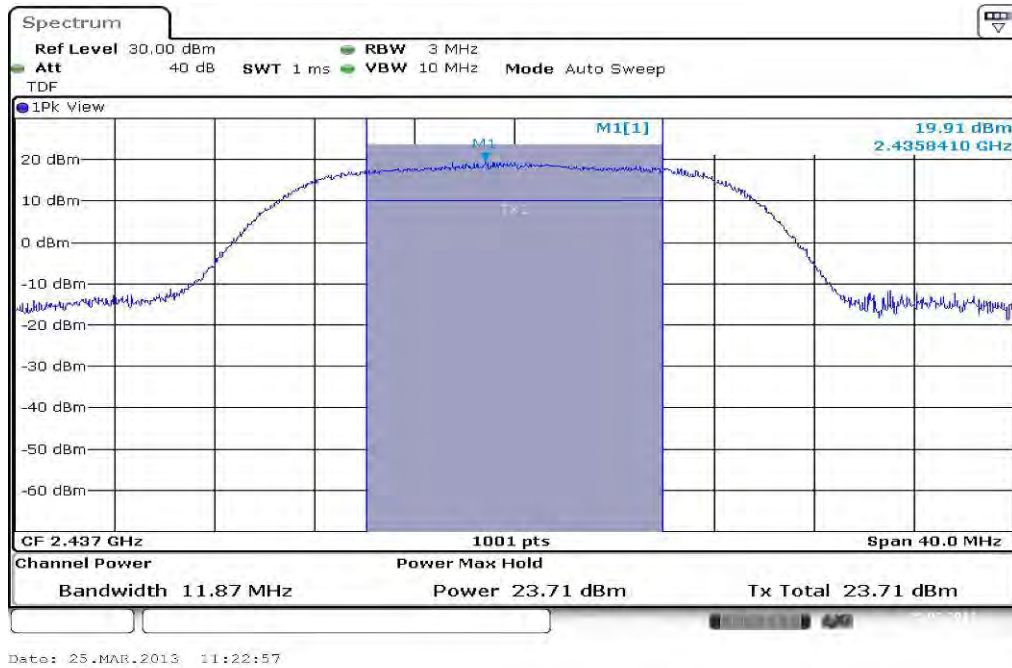
Plot 15: middle channel, g – mode, 54 Mbps



Plot 16: middle channel, n – mode, MCS 0

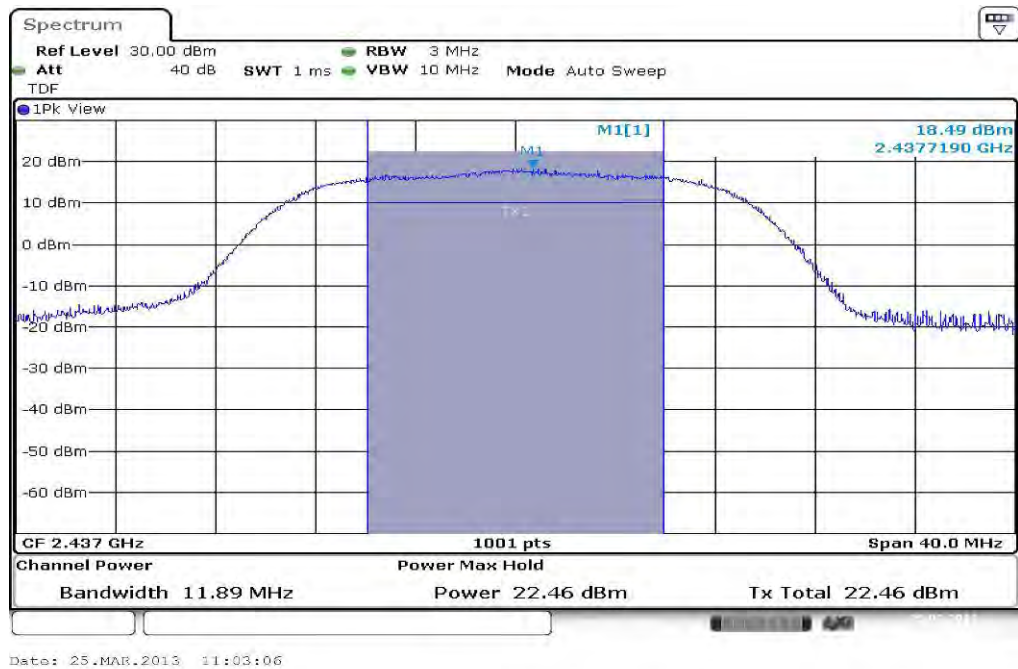


Plot 17: middle channel, n – mode, MCS 4

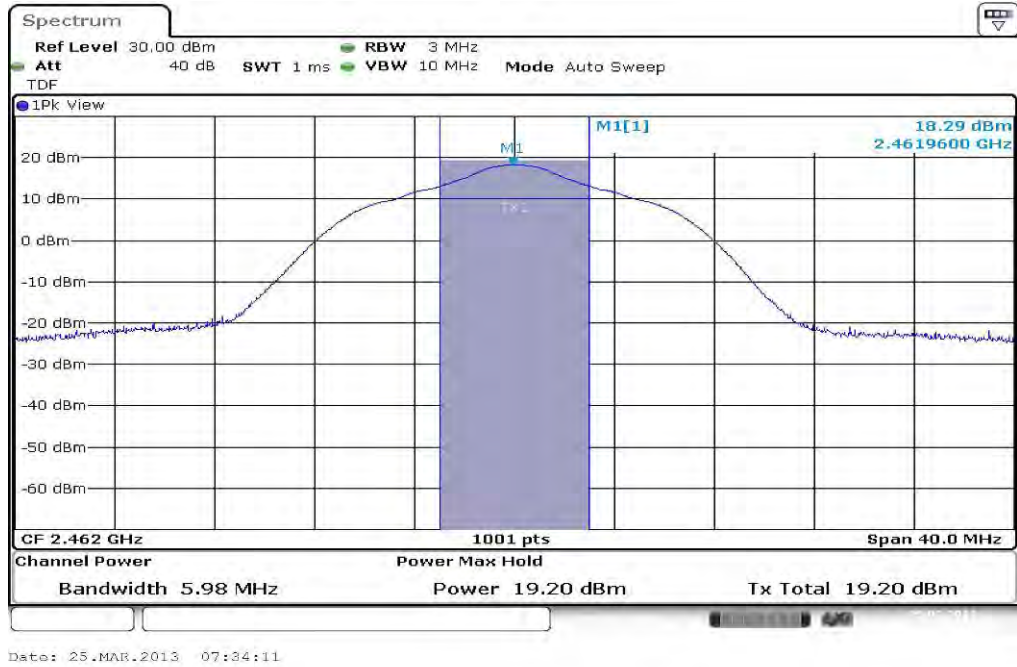




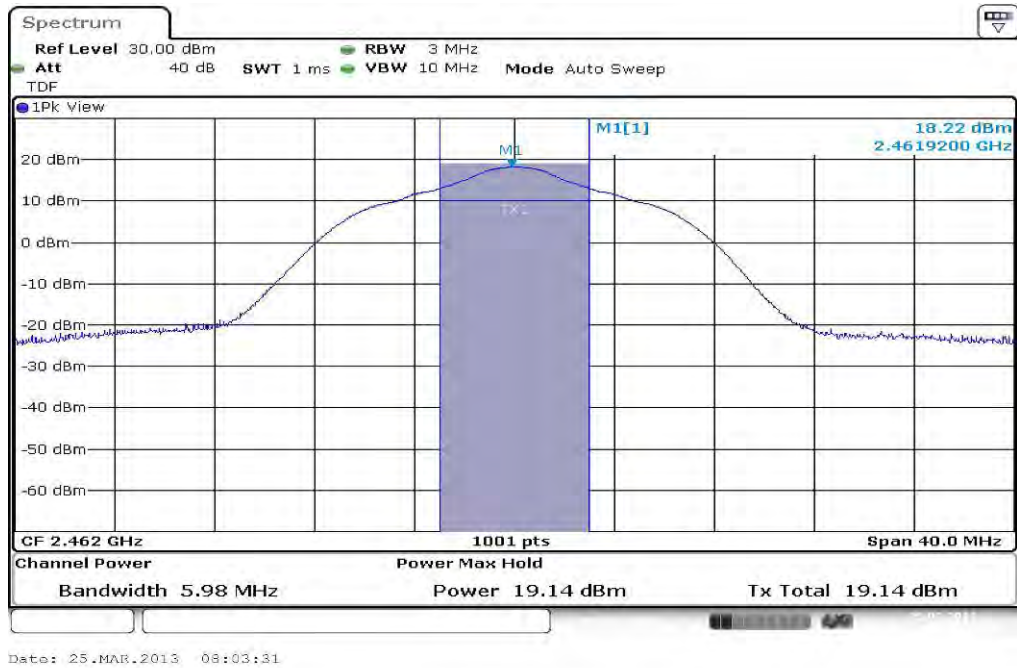
Plot 18: middle channel, n – mode, MCS 7



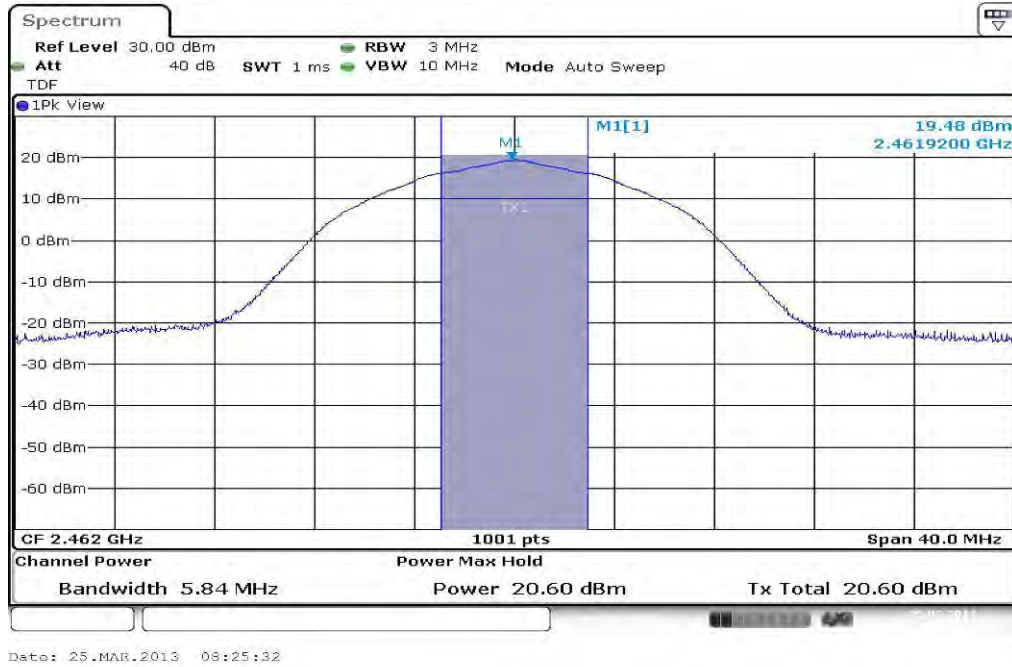
Plot 19: highest channel, b – mode, 1 Mbps



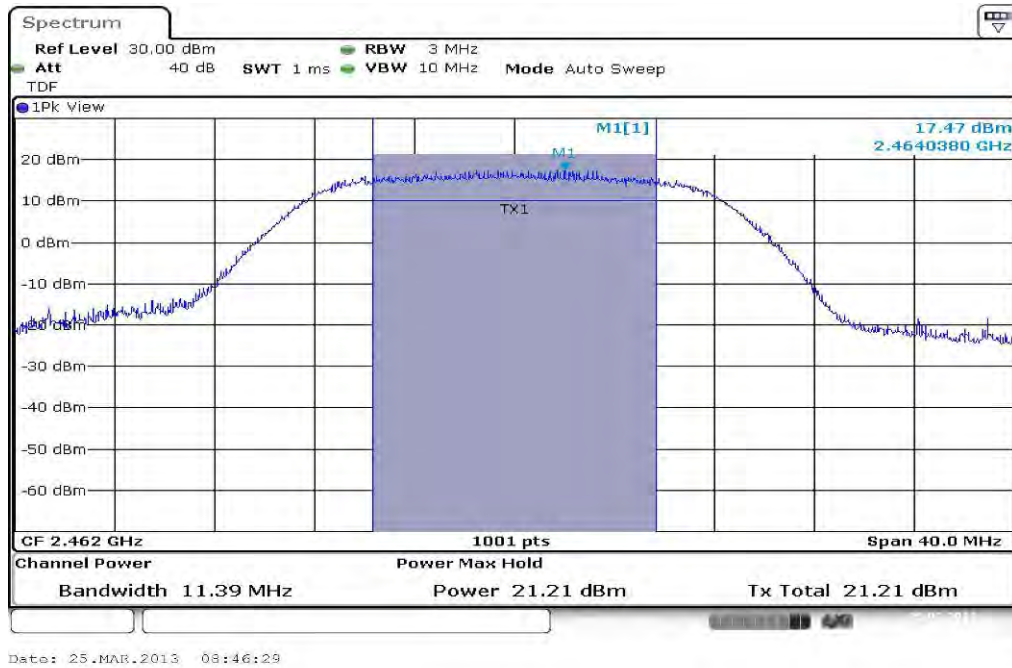
Plot 20: highest channel, b – mode, 5.5 Mbps



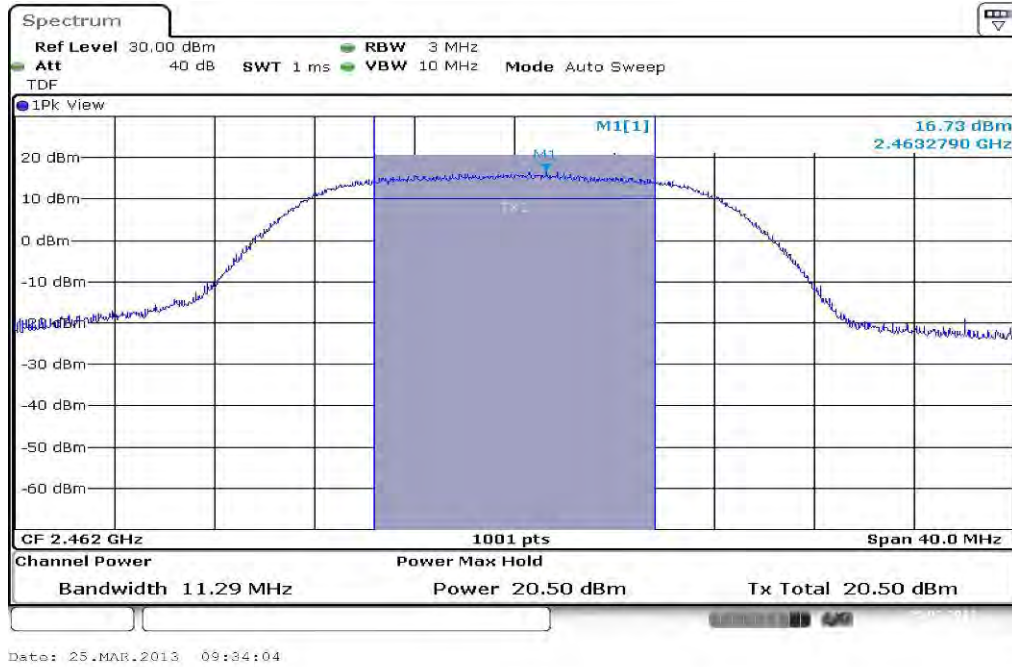
Plot 21: highest channel, b – mode, 11 Mbps



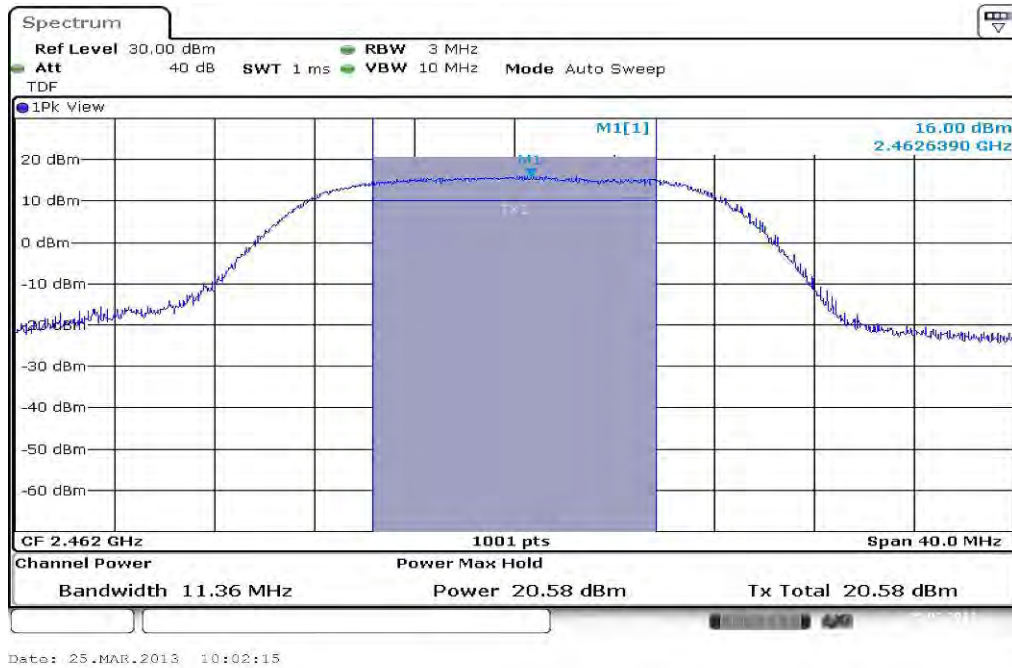
Plot 22: highest channel, g – mode, 6 Mbps



Plot 23: highest channel, g – mode, 24 Mbps

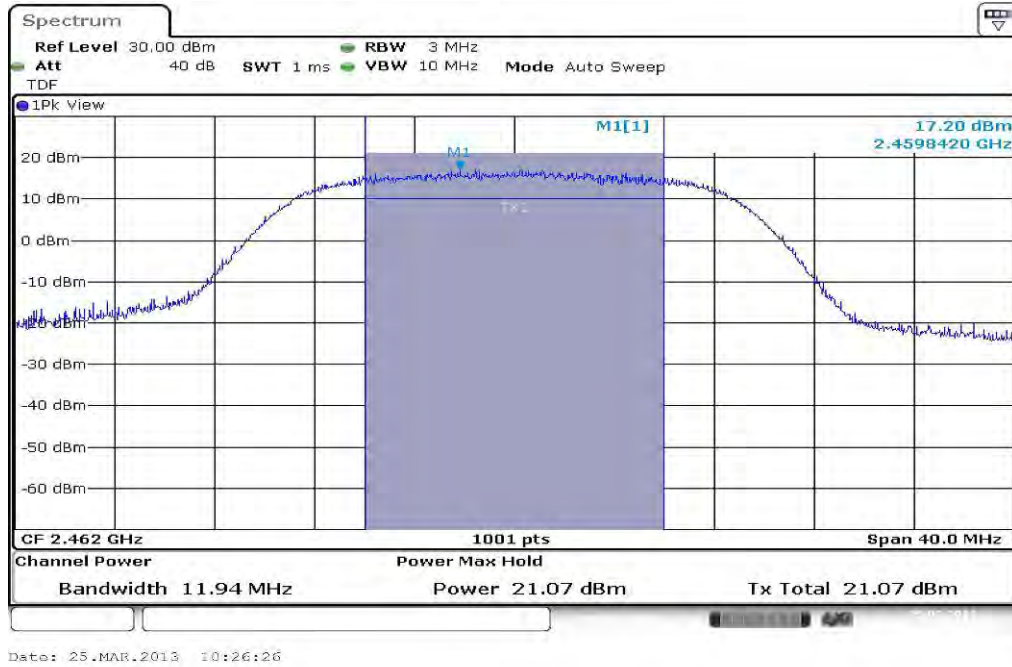


Plot 24: highest channel, g – mode, 54 Mbps

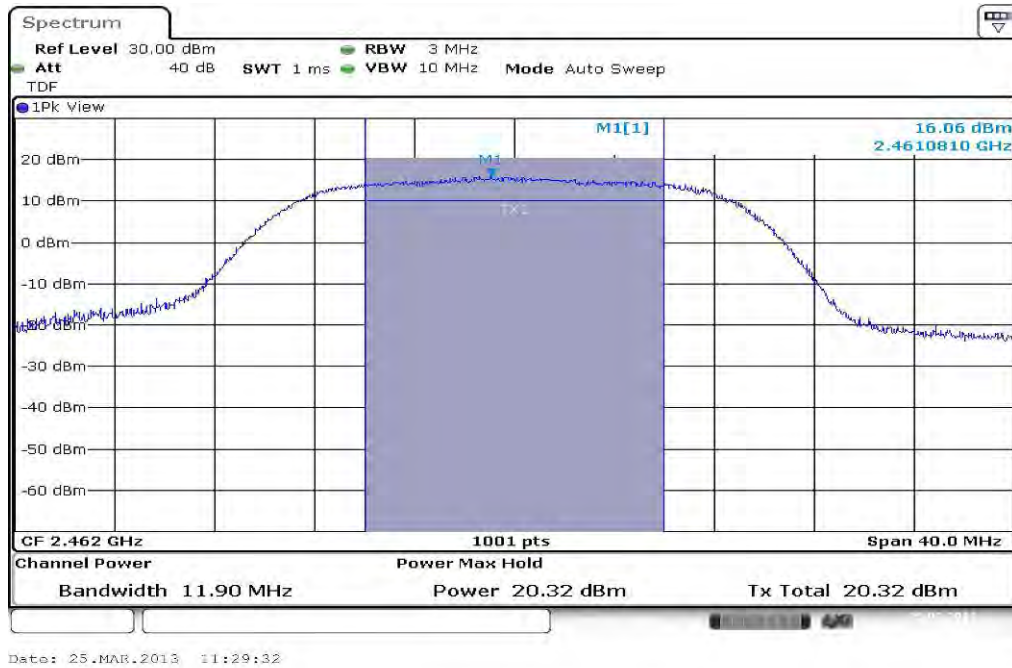




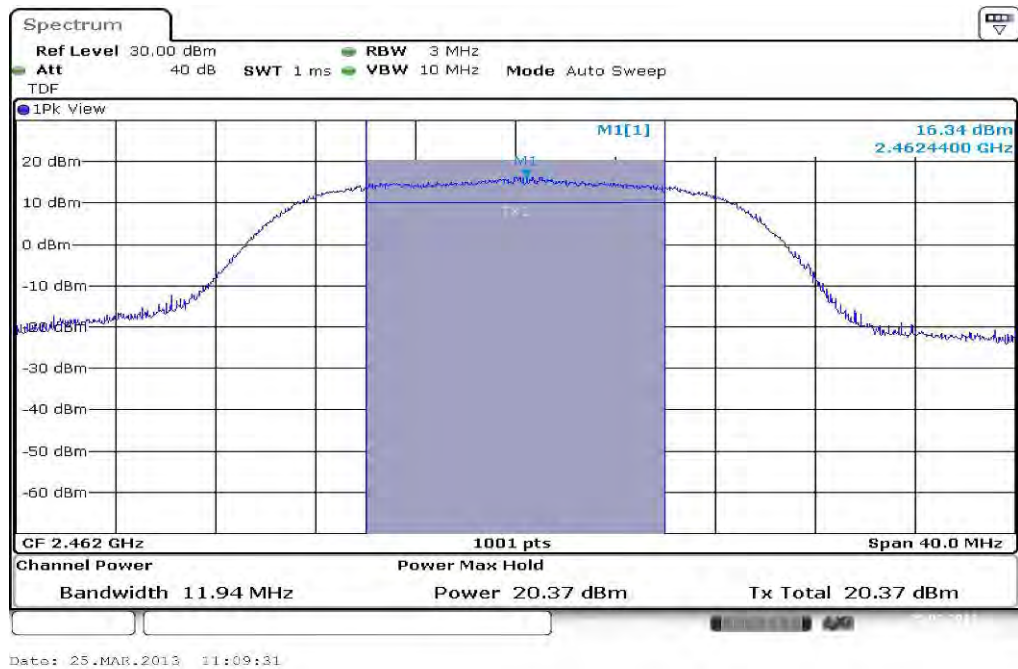
Plot 25: highest channel, n – mode, MCS 0



Plot 26: highest channel, n – mode, MCS 4



Plot 27: highest channel, n – mode, MCS 7



## 9.5 Power spectral density

### Description:

Measurement of the power spectral density of a digital modulated system. The measurement is repeated for both modulations at the lowest, middle and highest channel.

### Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	≥ 3 kHz
Video bandwidth:	≥ 3 x RBW
Span:	1.5 times of the DTS BW
Trace-Mode:	Max hold (allow trace to fully stabilize)

### Limits:

FCC	IC
Power Spectral Density	
8 dBm (conducted)	

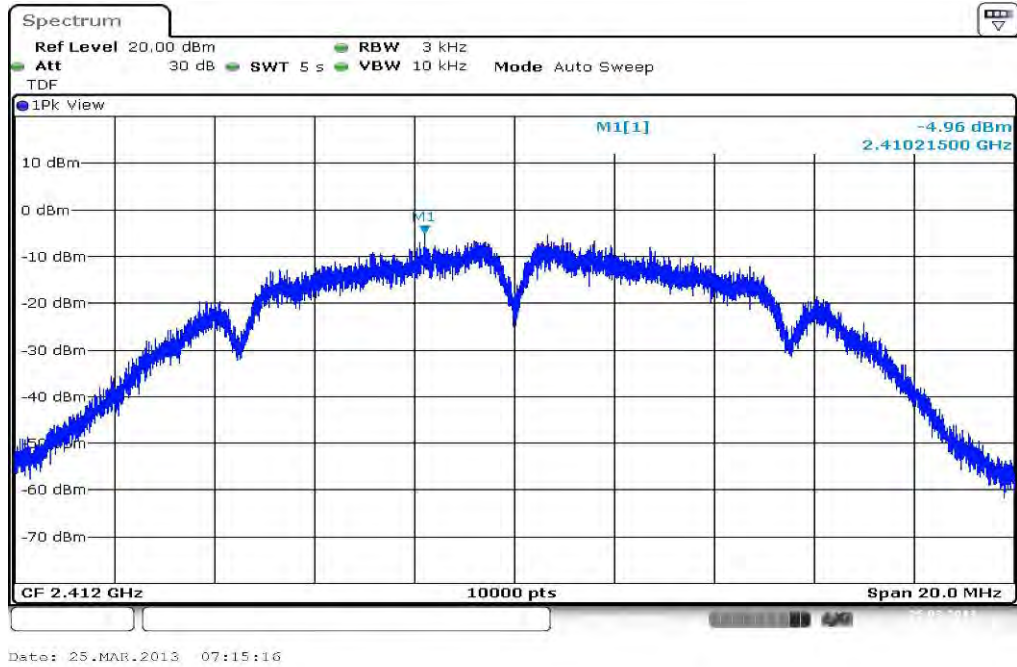
### Results:

Technology / data rate Frequency	Power Spectral density [dBm]		
	2412 MHz	2437 MHz	2462 MHz
DSSS / b – mode, 1 Mbps	-4.96	-4.36	-5.40
DSSS / b – mode, 5.5 Mbps	-5.26	-5.12	-4.97
DSSS / b – mode, 11 Mbps	-6.45	-5.54	-6.52
OFDM / g – mode, 6 Mbps	-10.24	-9.36	-12.32
OFDM / g – mode, 24 Mbps	-8.88	-8.96	-12.02
OFDM / g – mode, 54 Mbps	-9.75	-10.40	-13.37
OFDM / n – mode, MCS 0	-10.27	-10.52	-13.62
OFDM / n – mode, MCS 4	-11.19	-10.71	-13.94
OFDM / n – mode, MCS 7	-12.65	-11.89	-13.68
Measurement uncertainty	± RBW		

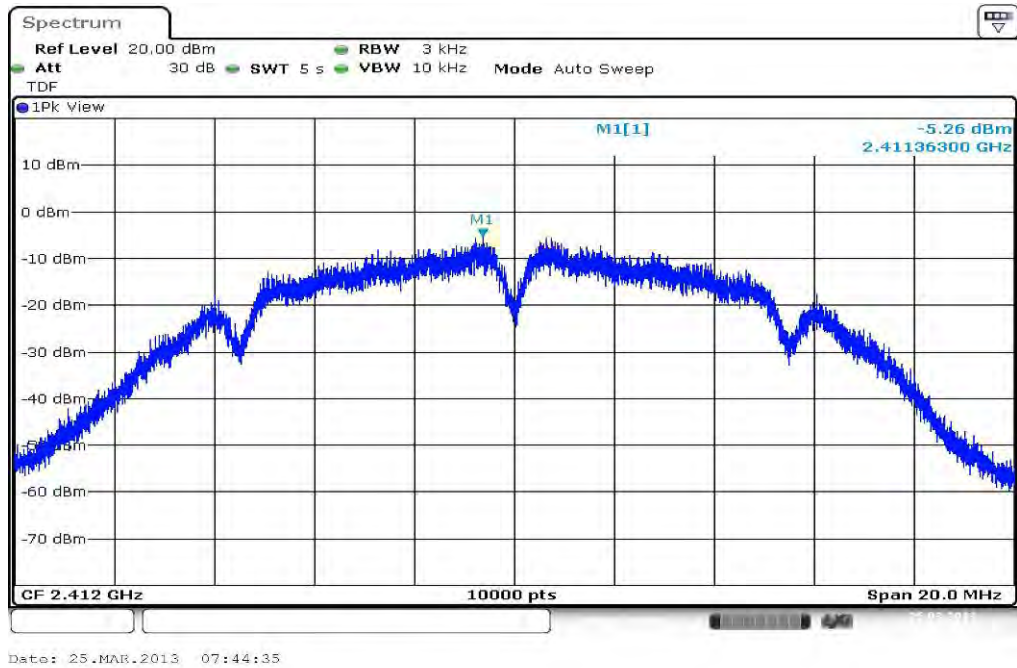
**Result: Passed**

**Plots:**

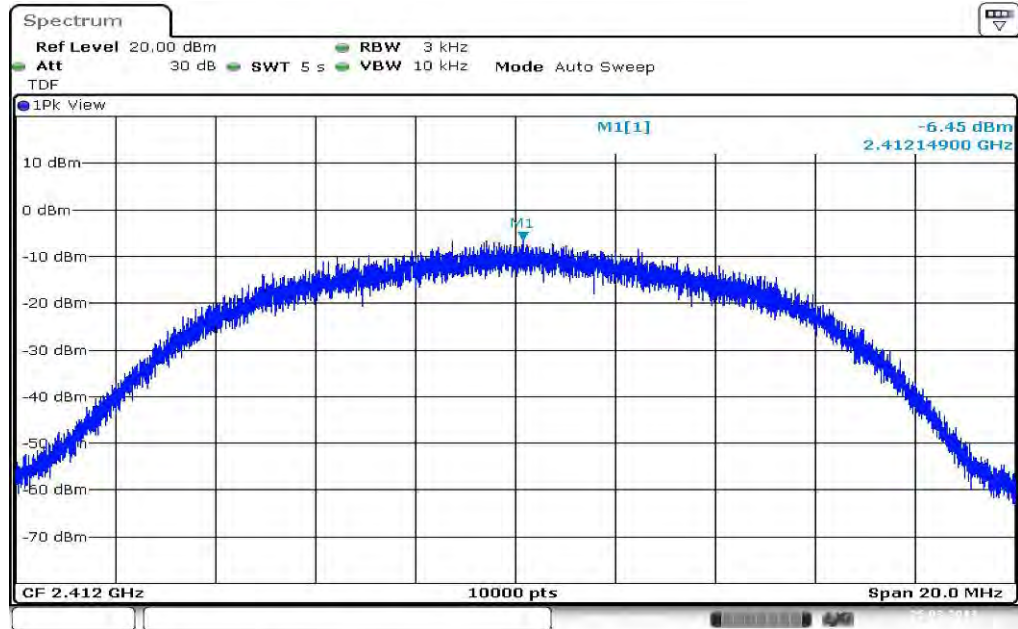
**Plot 1:** lowest channel, b – mode, 1 Mbps



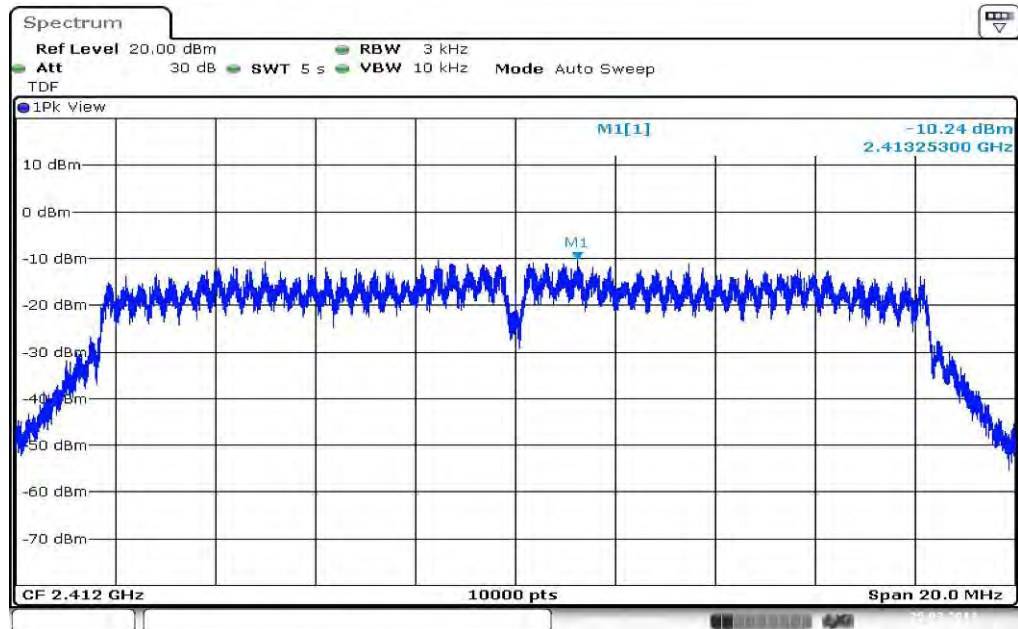
**Plot 2:** lowest channel, b – mode, 5.5 Mbps



Plot 3: lowest channel, b – mode, 11 Mbps

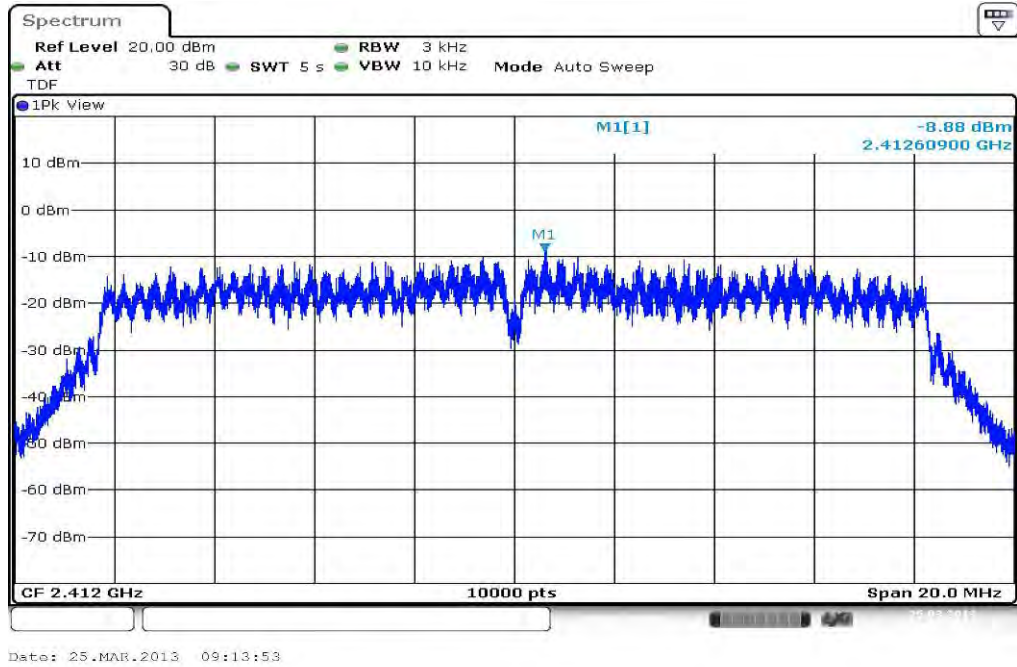


Plot 4: lowest channel, g – mode, 6 Mbps

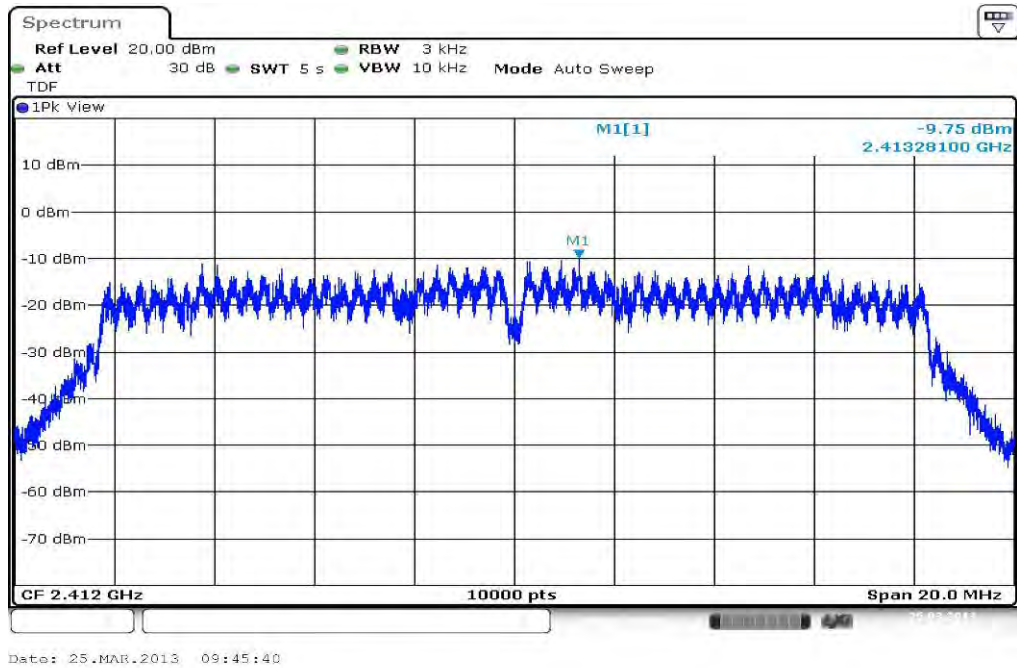




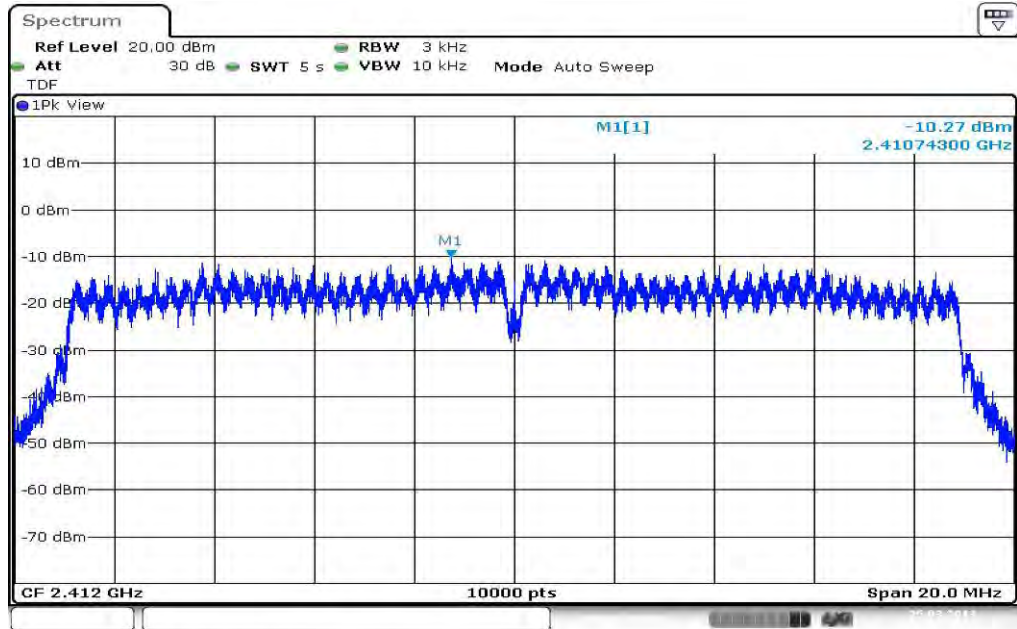
Plot 5: lowest channel, g – mode, 24 Mbps



Plot 6: lowest channel, g – mode, 54 Mbps

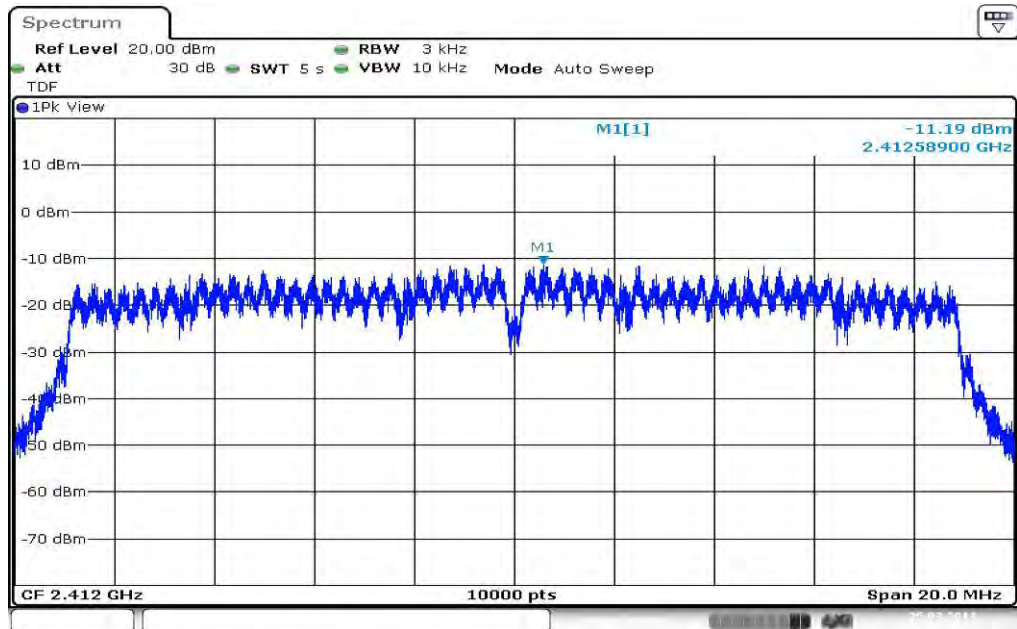


Plot 7: lowest channel, n – mode, MCS 0



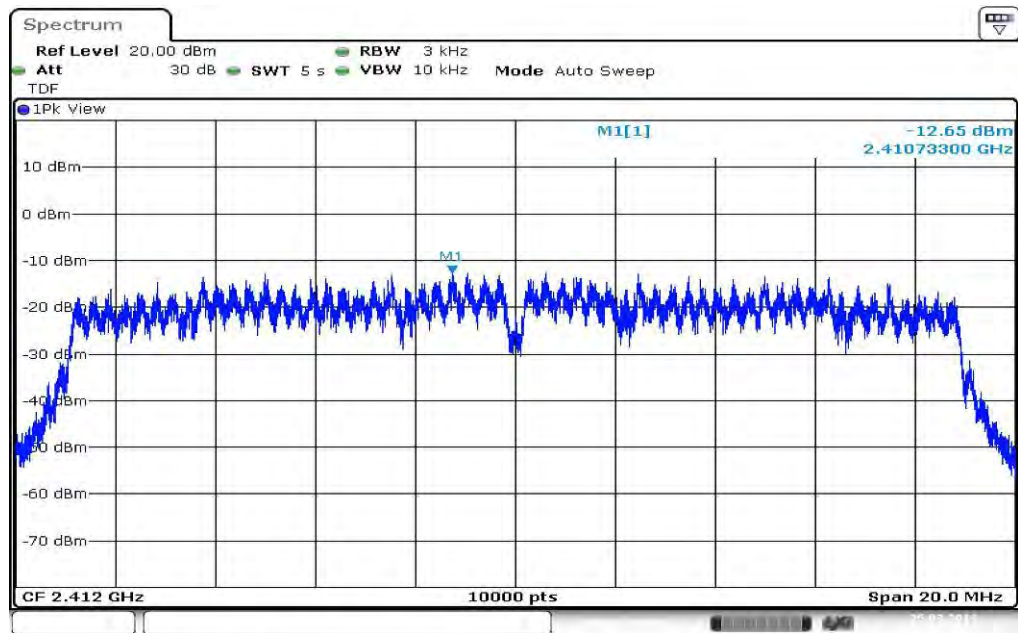
Date: 25.MAR.2013 10:14:12

Plot 8: lowest channel, n – mode, MCS 4



Date: 25.MAR.2013 11:16:48

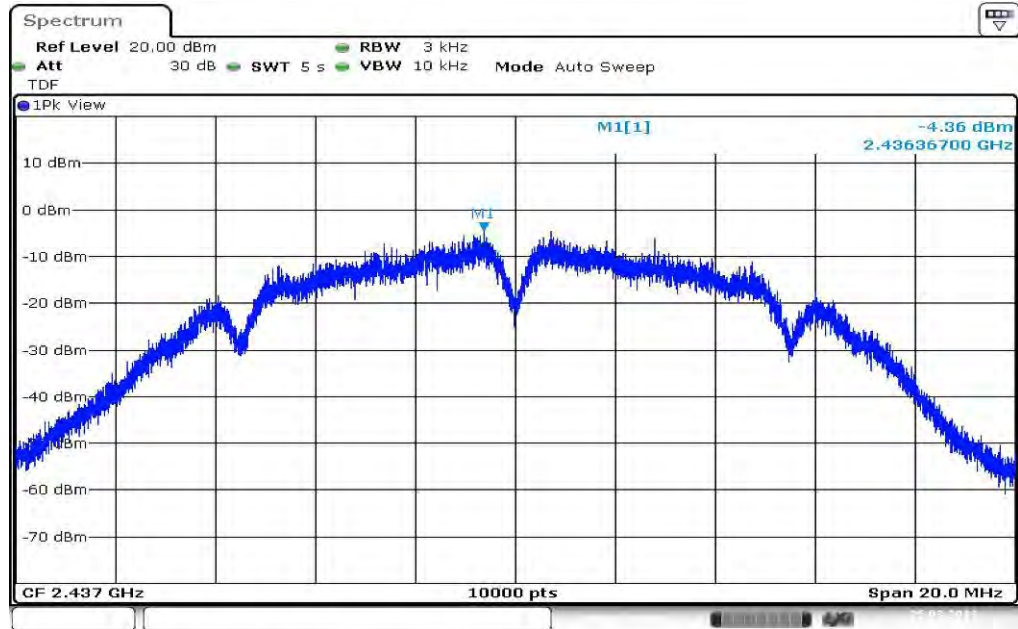
Plot 9: lowest channel, n – mode, MCS 7



Date: 25.MAR.2013 10:56:37

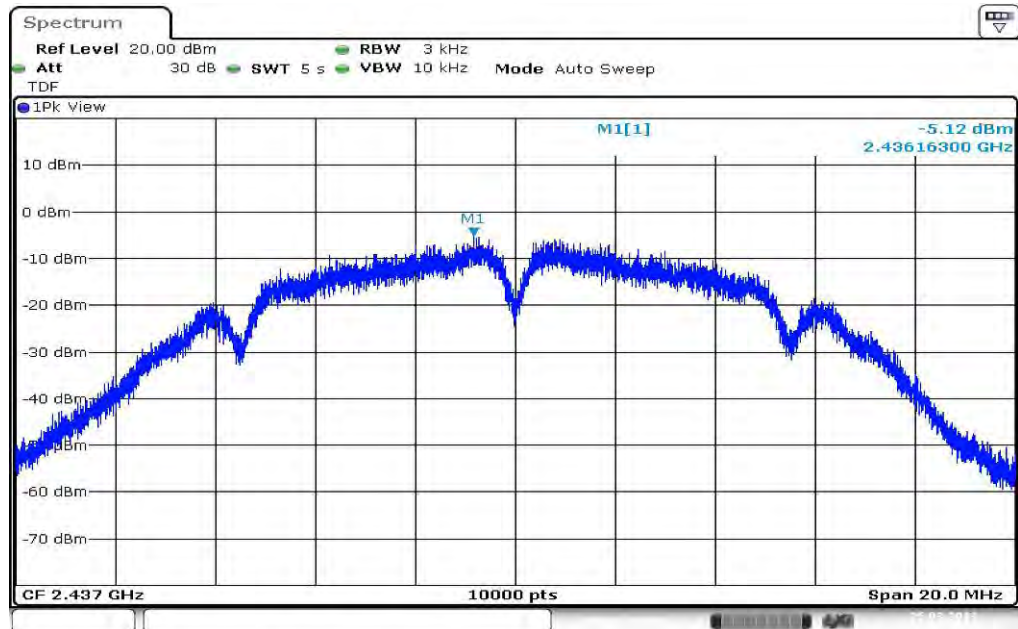


Plot 10: middle channel, b – mode, 1 Mbps



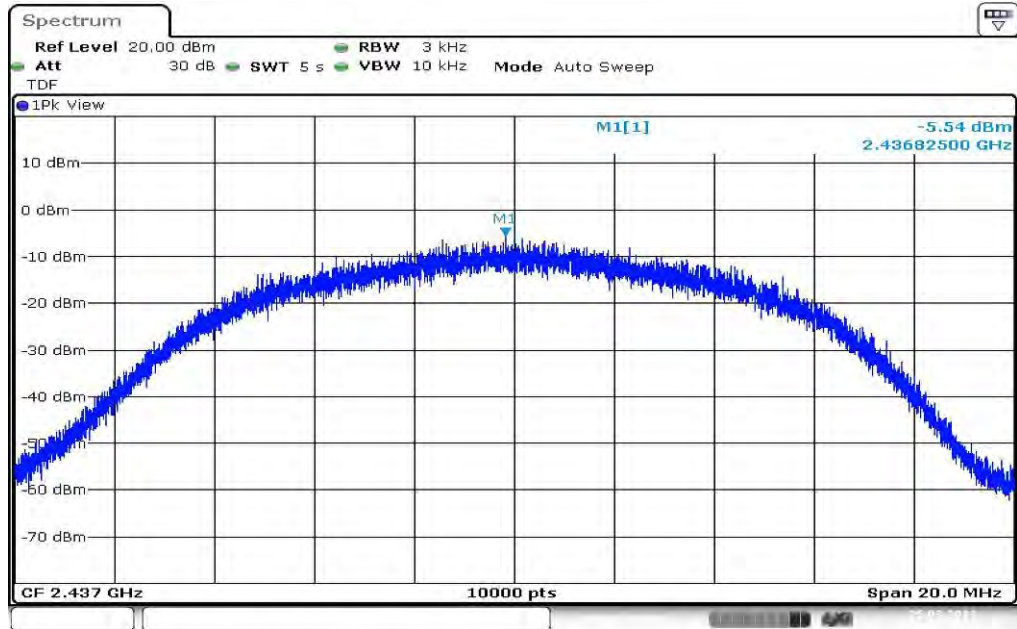
Date: 25.MAR.2013 07:26:34

Plot 11: middle channel, b – mode, 5.5 Mbps



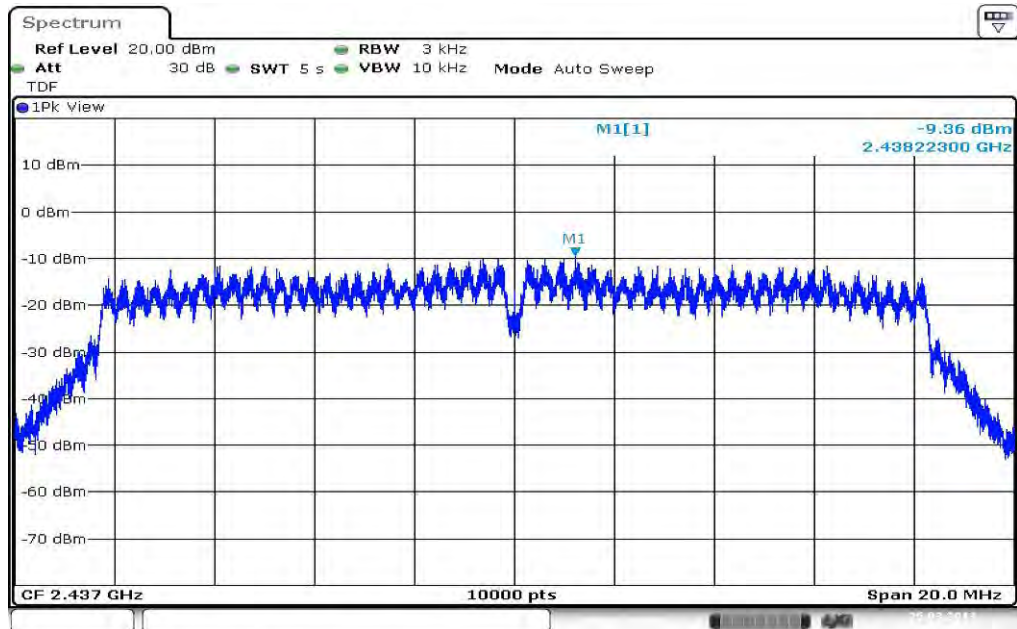
Date: 25.MAR.2013 07:52:05

Plot 12: middle channel, b – mode, 11 Mbps



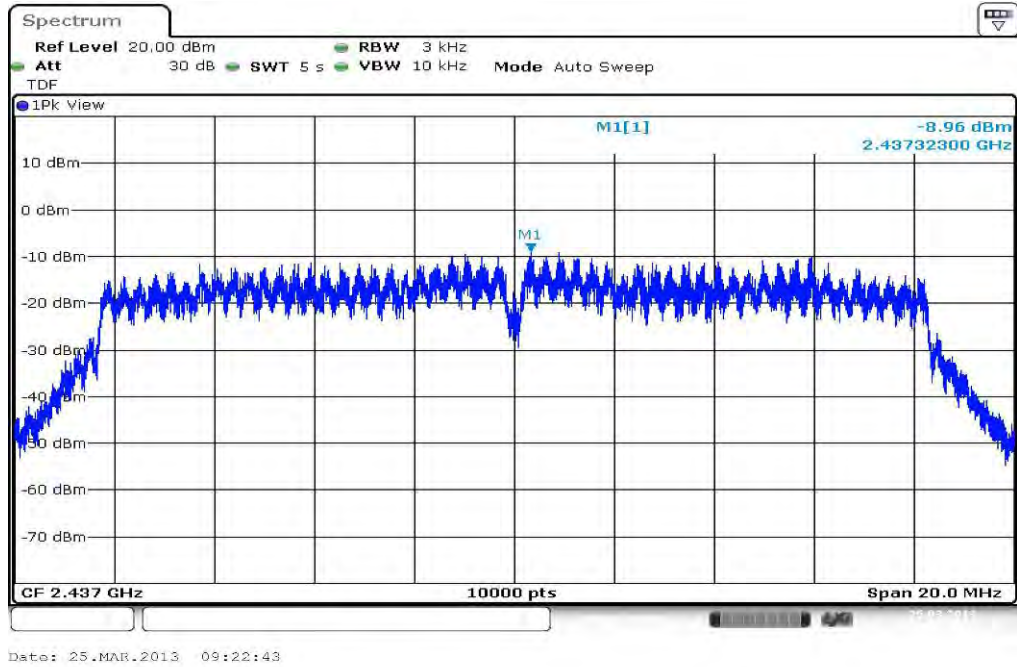
Date: 25.MAR.2013 08:19:15

Plot 13: middle channel, g – mode, 6 Mbps

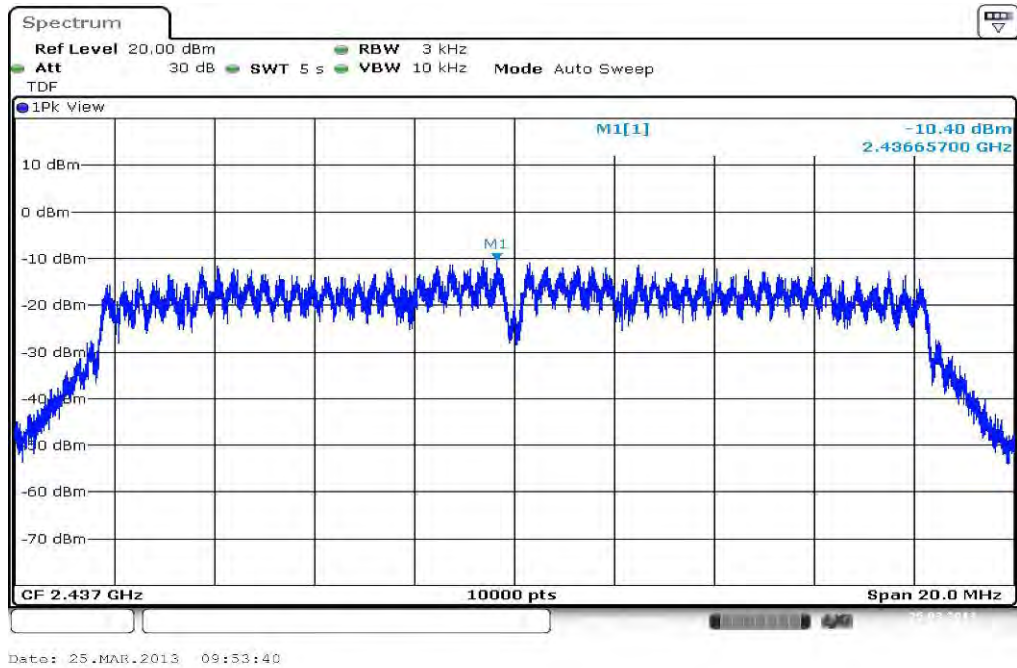


Date: 25.MAR.2013 08:40:29

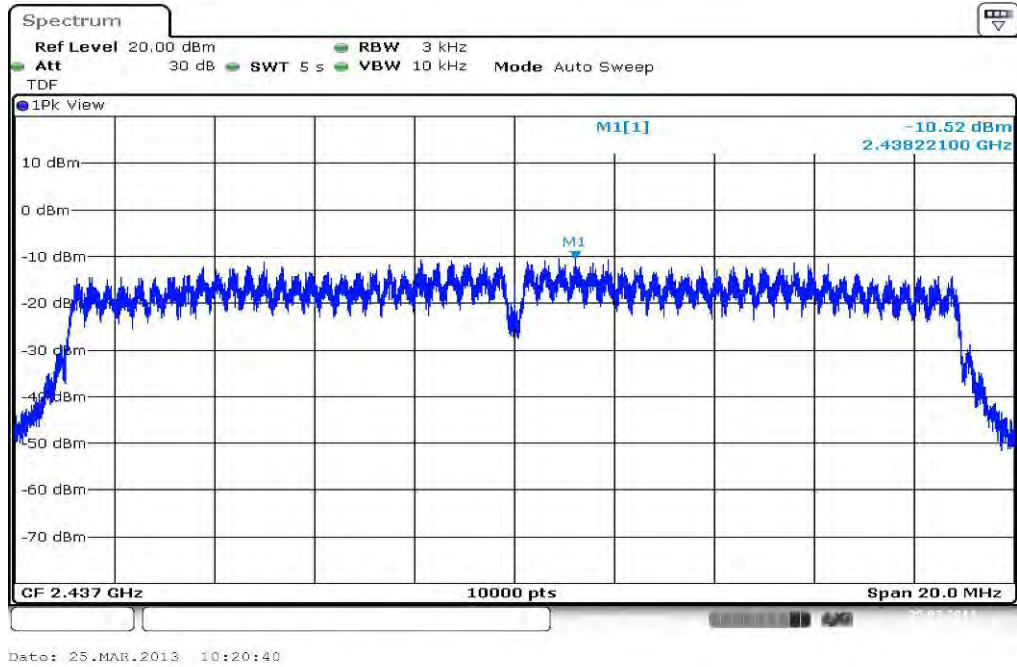
Plot 14: middle channel, g – mode, 24 Mbps



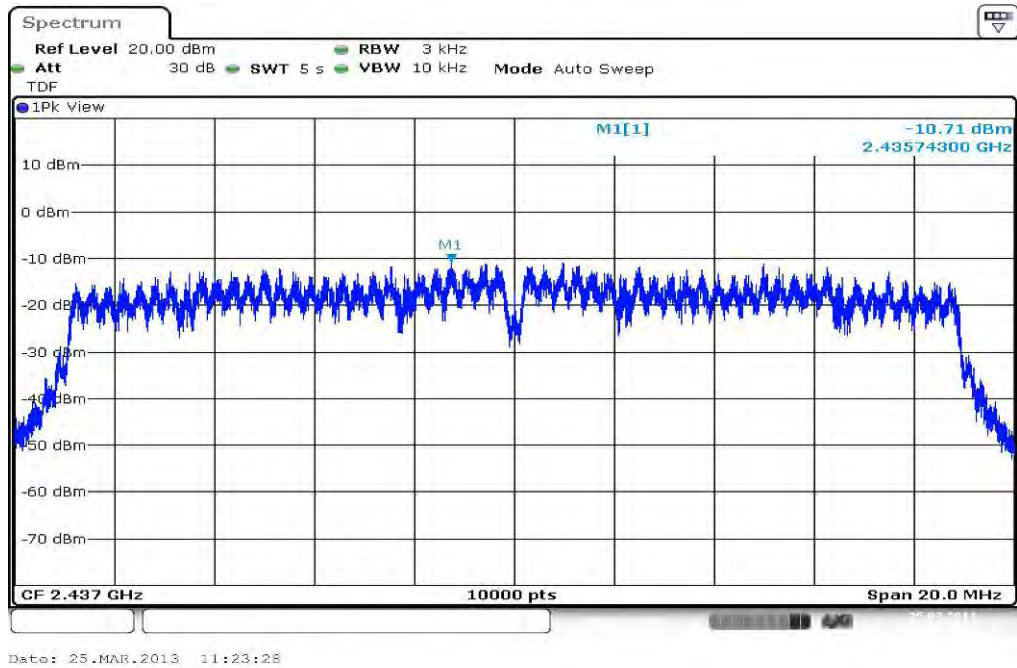
Plot 15: middle channel, g – mode, 54 Mbps



Plot 16: middle channel, n – mode, MCS 0

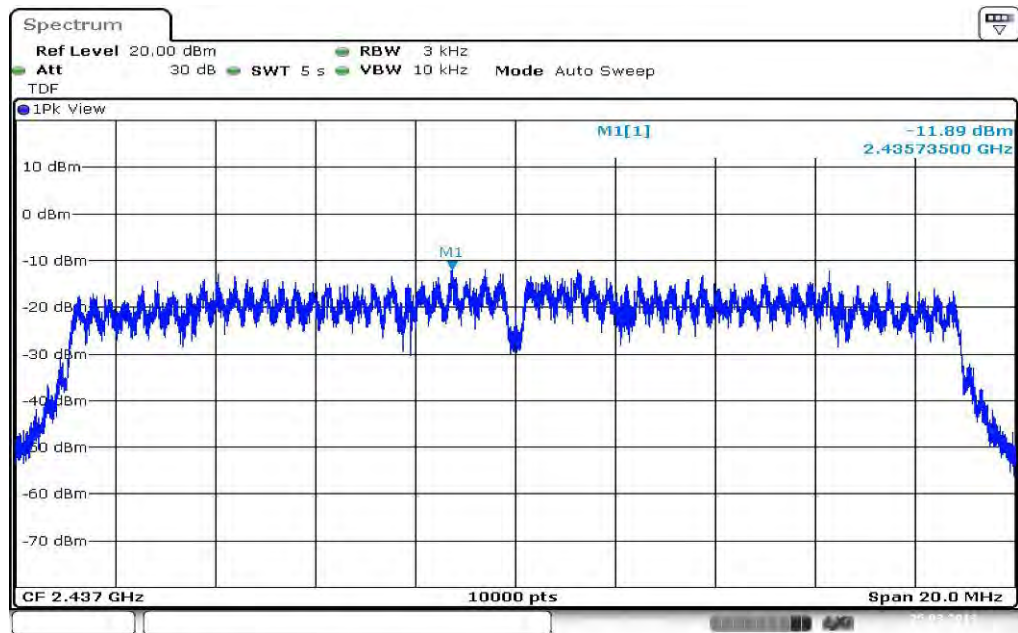


Plot 17: middle channel, n – mode, MCS 4



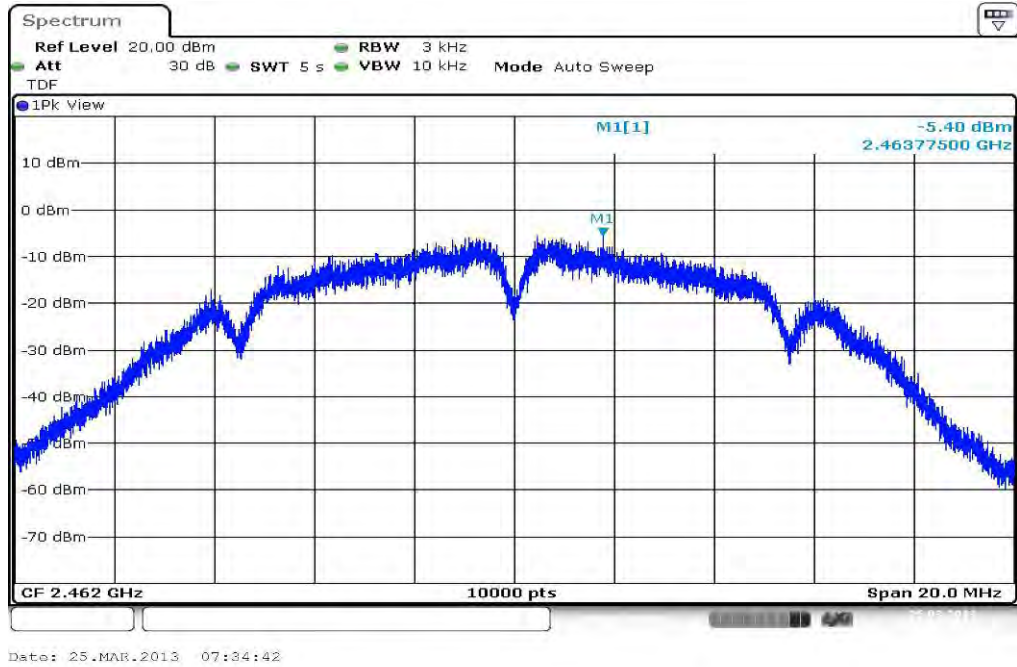


Plot 18: middle channel, n – mode, MCS 7

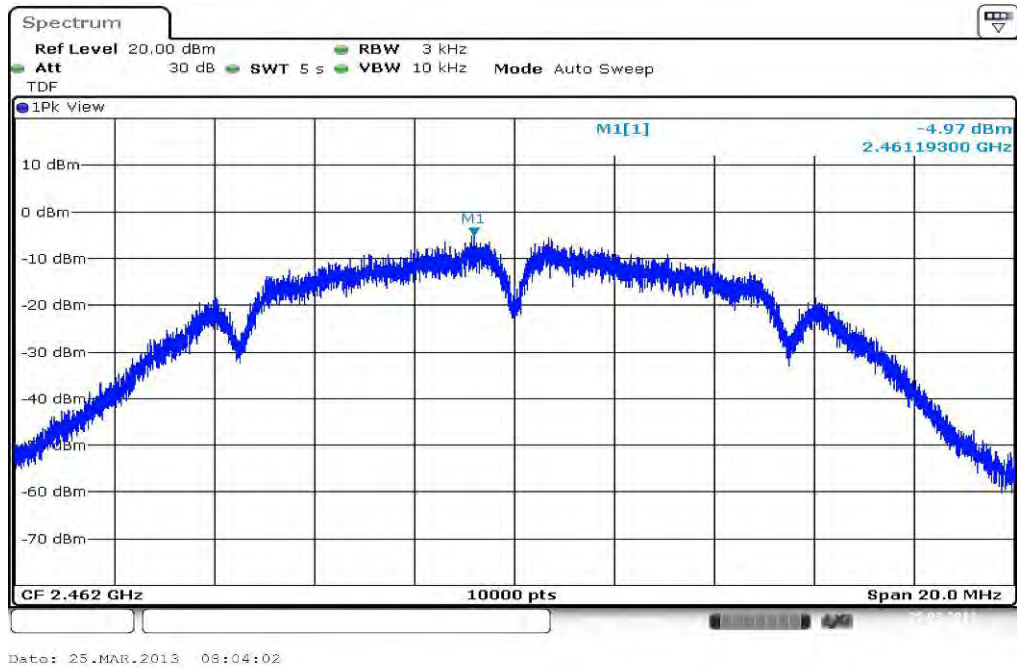


Date: 25.MAR.2013 11:03:37

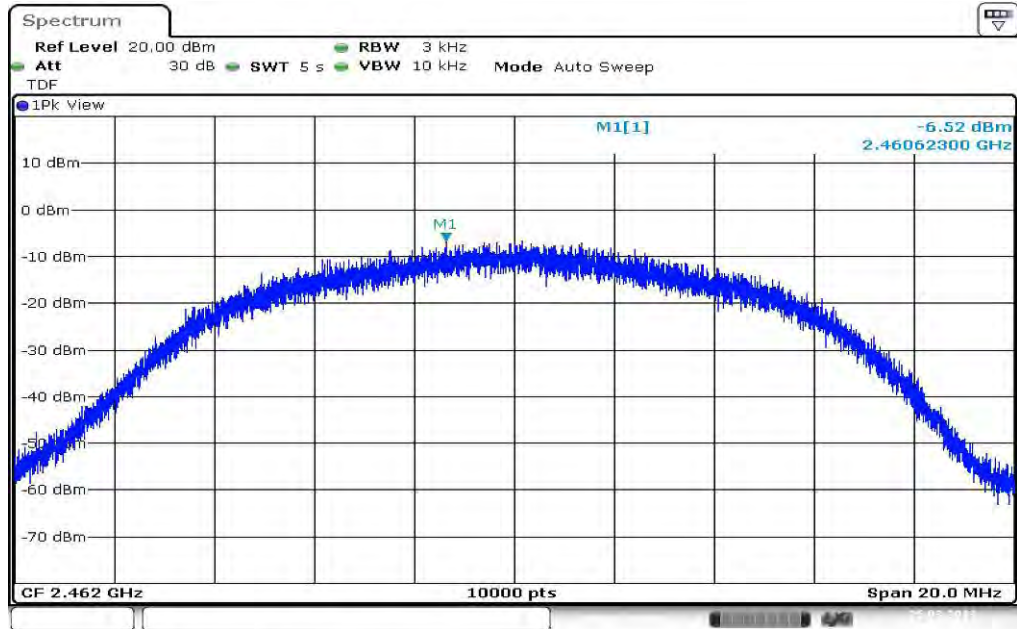
Plot 19: highest channel, b – mode, 1 Mbps



Plot 20: highest channel, b – mode, 5.5 Mbps

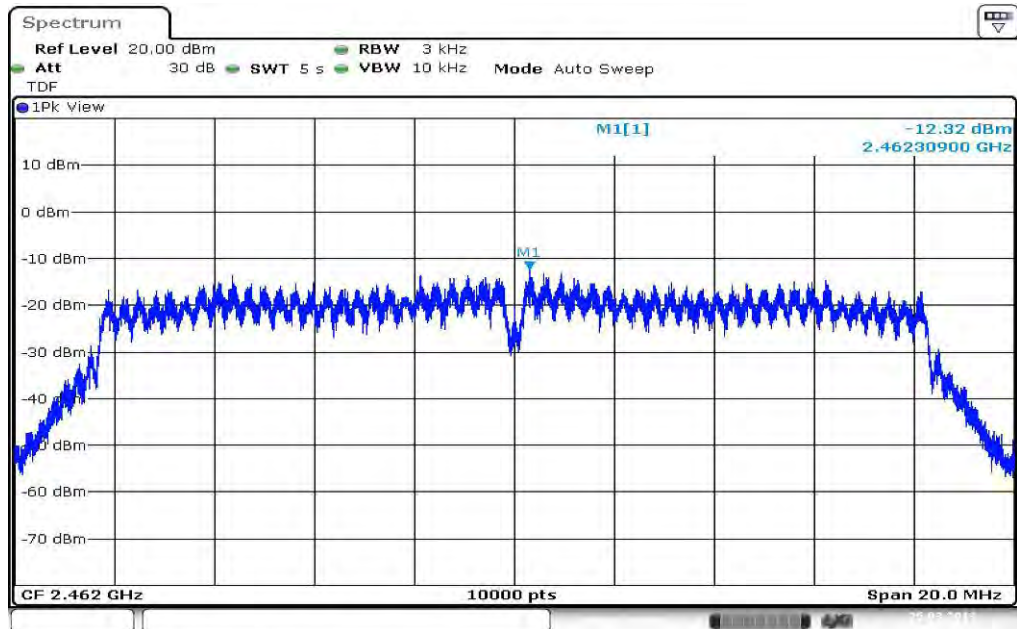


Plot 21: highest channel, b – mode, 11 Mbps



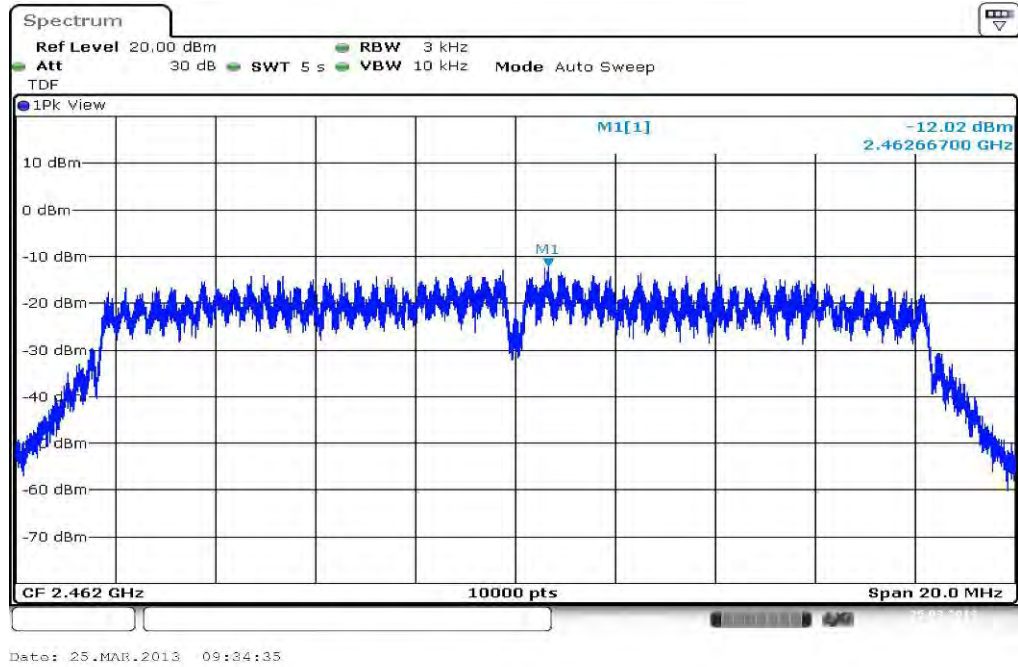
Date: 25.MAR.2013 08:26:04

Plot 22: highest channel, g – mode, 6 Mbps

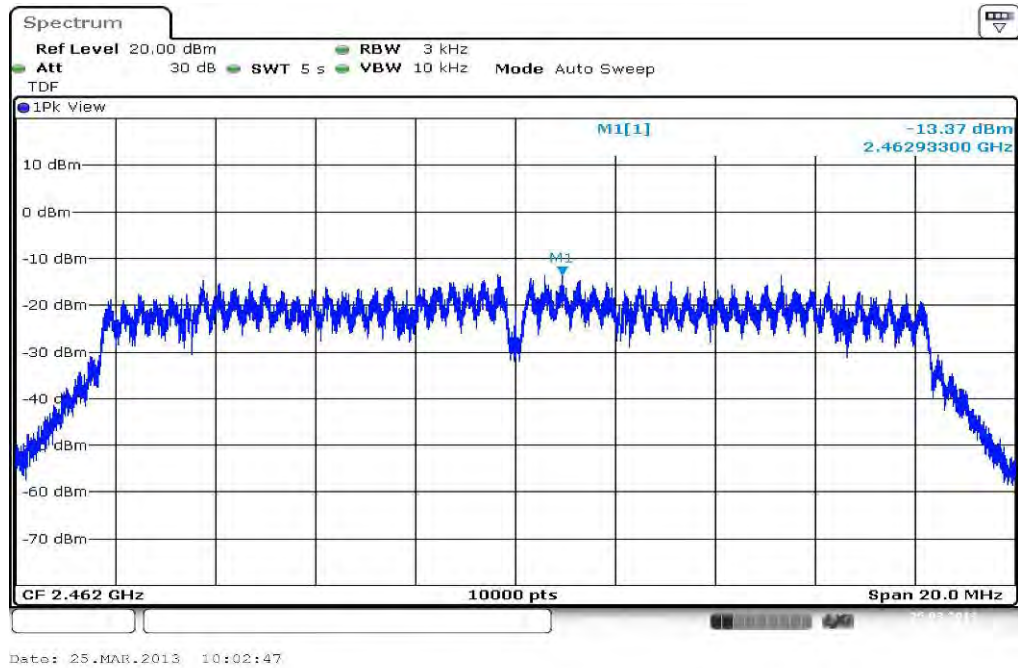


Date: 25.MAR.2013 08:47:00

Plot 23: highest channel, g – mode, 24 Mbps

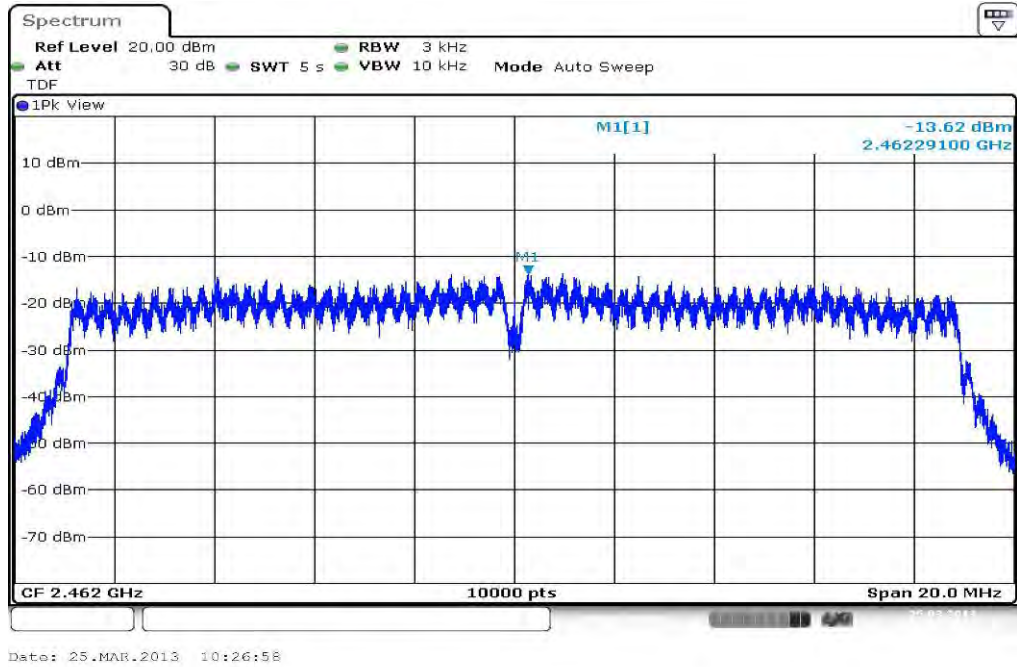


Plot 24: highest channel, g – mode, 54 Mbps

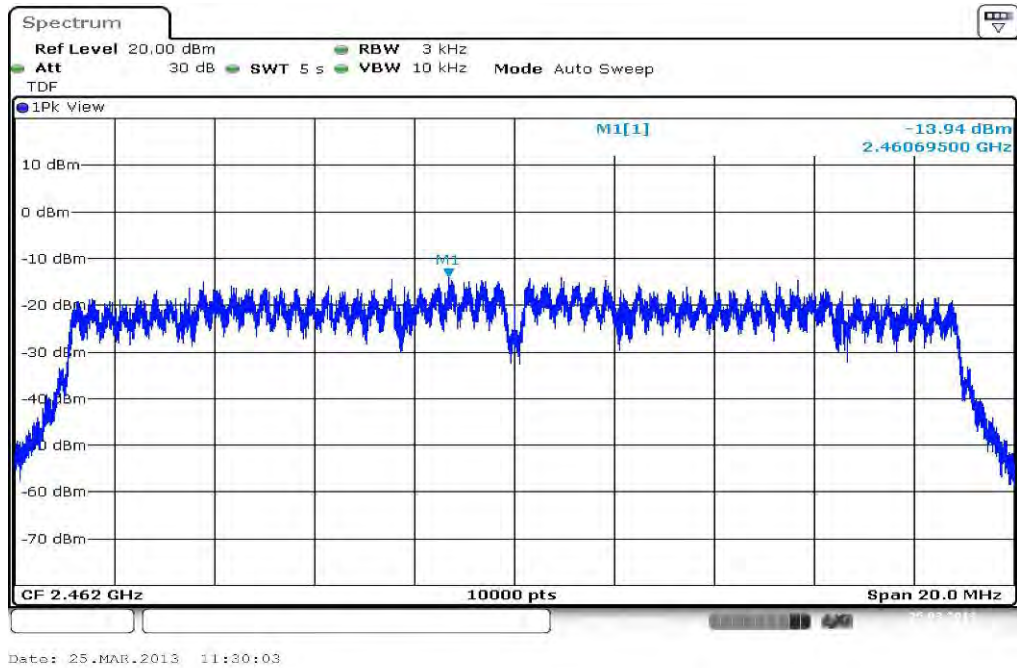




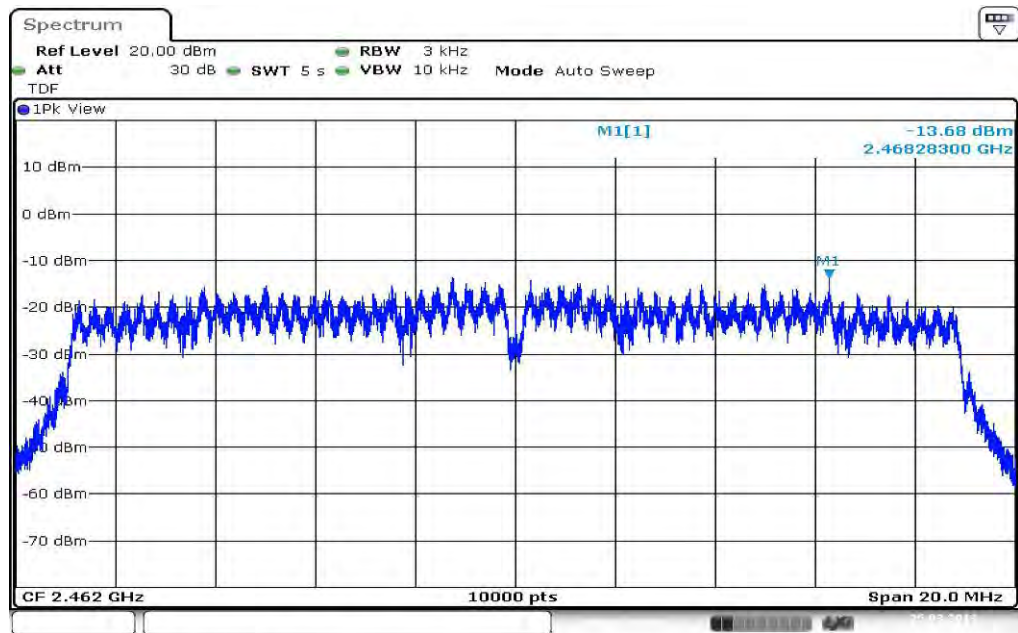
Plot 25: highest channel, n – mode, MCS 0



Plot 26: highest channel, n – mode, MCS 4



Plot 27: highest channel, n – mode, MCS 7



Date: 25.MAR.2013 11:10:03

## 9.6 Spectrum bandwidth – 6 dB

### Description:

Measurement of the 6 dB bandwidth of the modulated signal.

### Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 - 5% of the DTS BW but not exceed 100 kHz
Video bandwidth:	≥ 3 x RBW
Span:	Complete signal
Trace-Mode:	Max hold (allow trace to stabilize)

### Limits:

FCC	IC
Spectrum Bandwidth – 6 dB	
Systems using digital modulation techniques may operate in the 2400–2483.5 MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.	

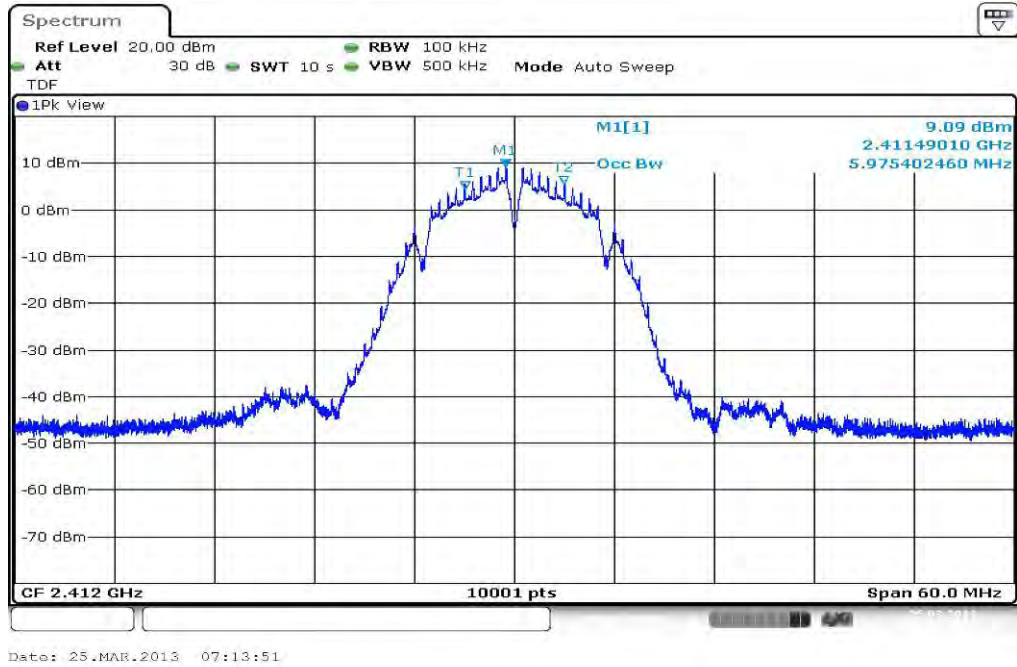
### Results:

Modulation Frequency	6 dB bandwidth [MHz]		
	2412 MHz	2437 MHz	2462 MHz
DSSS / b – mode, 1 Mbps	5.98	5.98	5.98
DSSS / b – mode, 5.5 Mbps	5.97	5.97	5.98
DSSS / b – mode, 11 Mbps	5.84	5.84	5.84
OFDM / g – mode, 6 Mbps	11.37	11.36	11.37
OFDM / g – mode, 24 Mbps	11.34	11.31	11.29
OFDM / g – mode, 54 Mbps	11.34	11.33	11.36
OFDM / n – mode, MCS 0	11.97	11.93	11.94
OFDM / n – mode, MCS 4	11.90	11.87	11.90
OFDM / n – mode, MCS 7	11.91	11.89	11.94
Measurement uncertainty	± RBW		

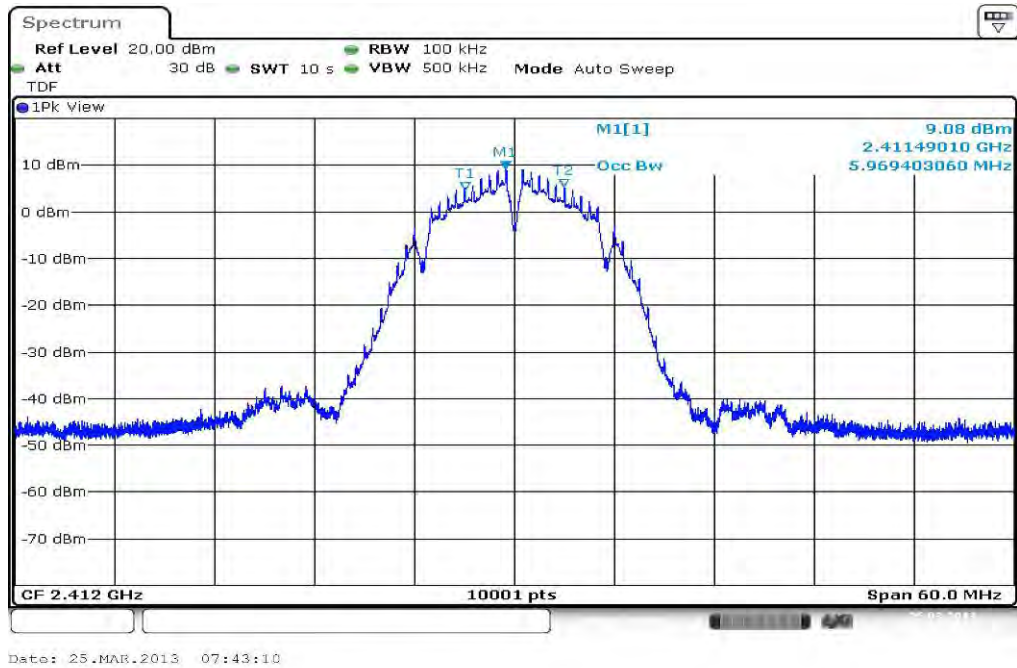
**Result:** Passed

**Plots:**

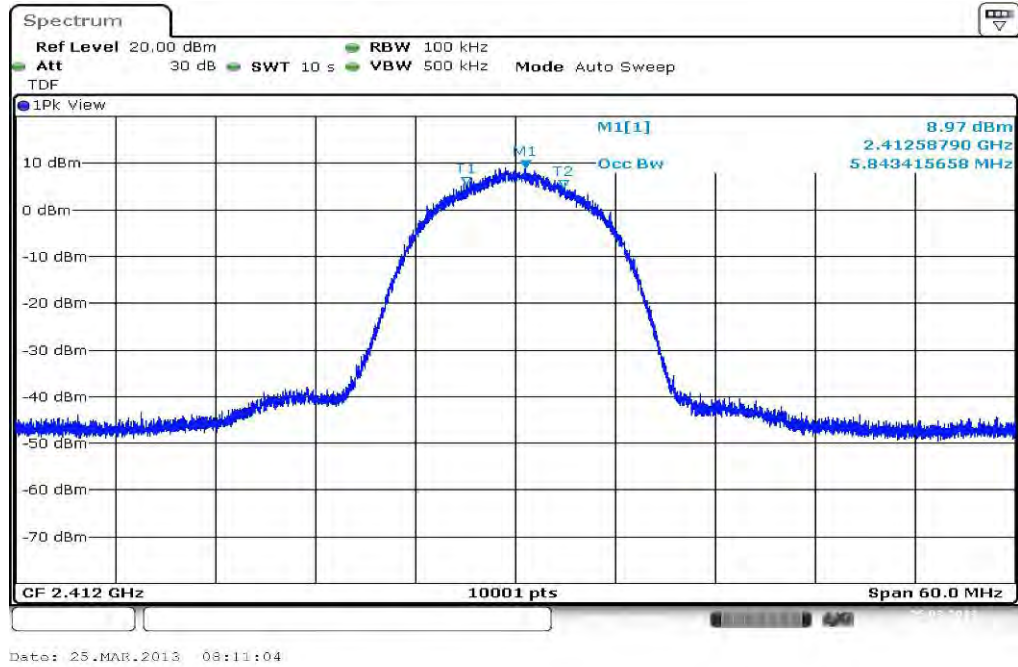
**Plot 1:** lowest channel, b – mode, 1 Mbps



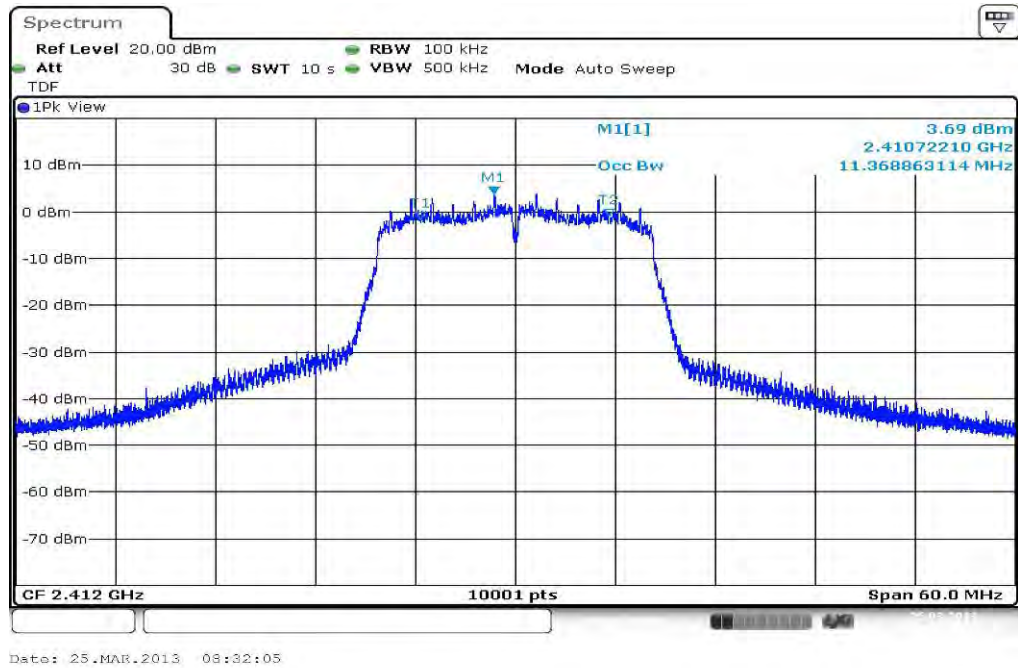
**Plot 2:** lowest channel, b – mode, 5.5 Mbps



Plot 3: lowest channel, b – mode, 11 Mbps

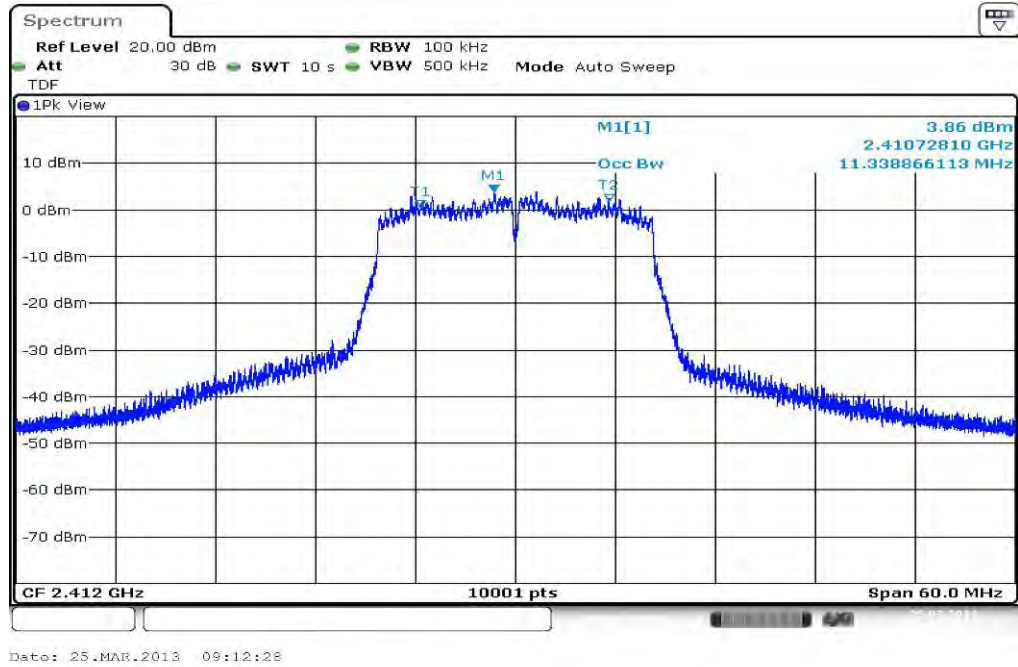


Plot 4: lowest channel, g – mode, 6 Mbps

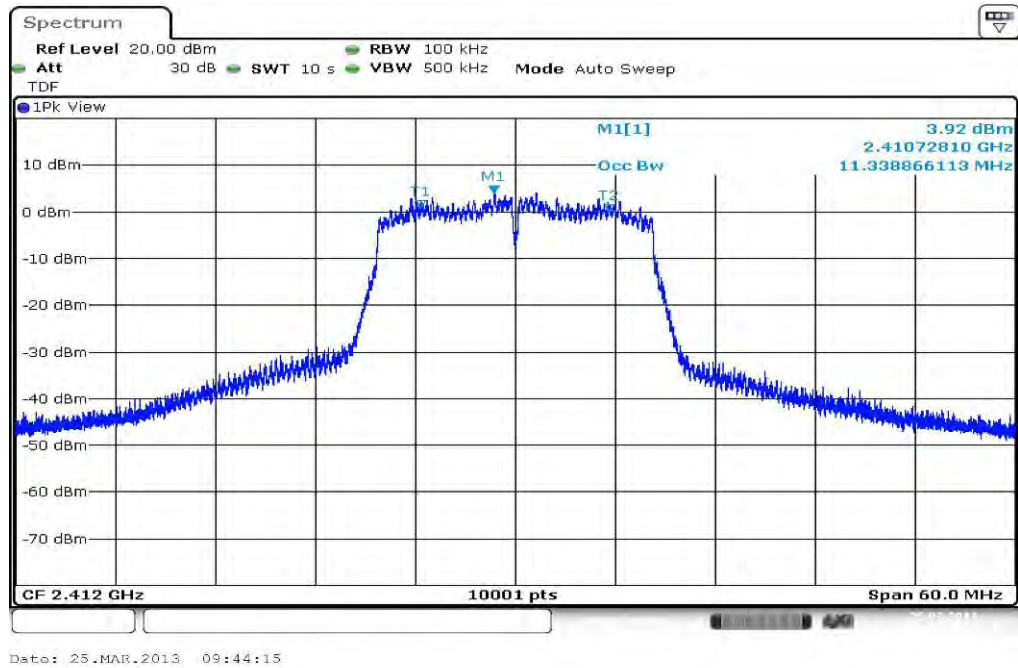




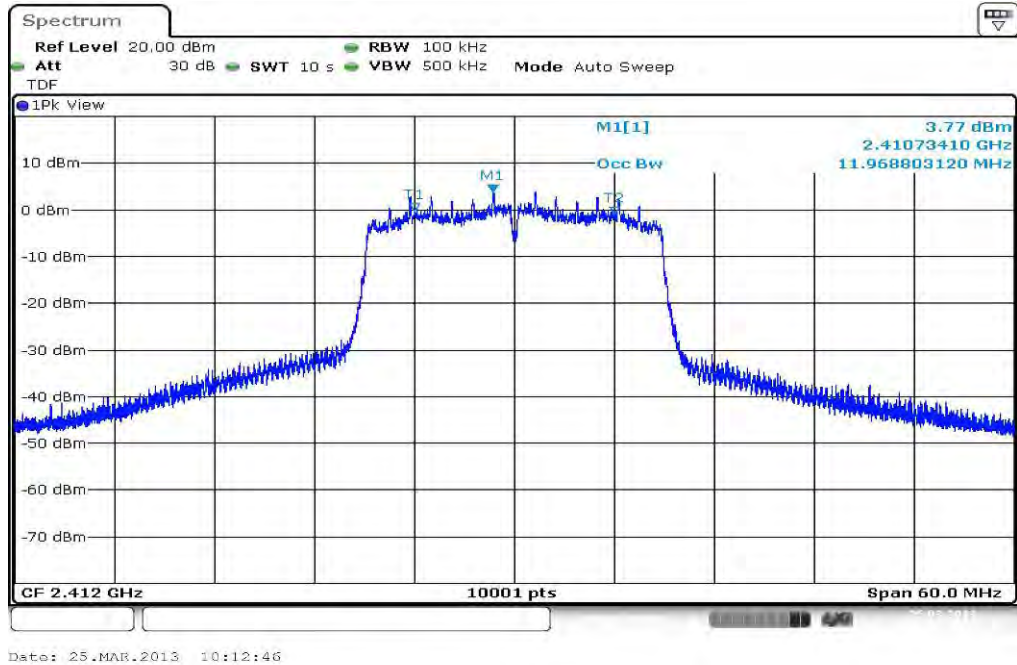
Plot 5: lowest channel, g – mode, 24 Mbps



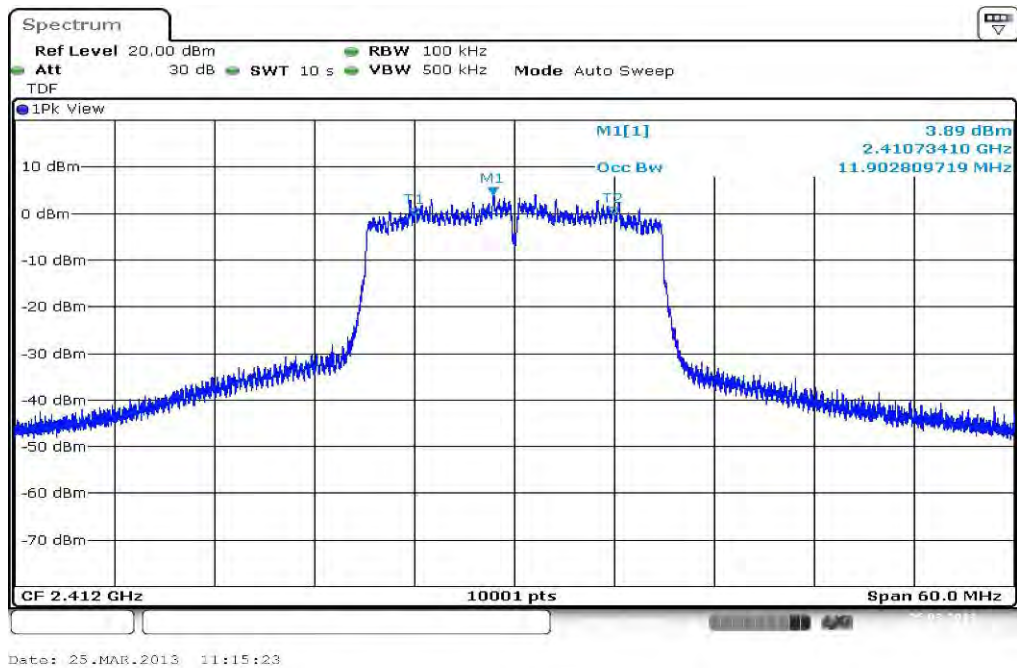
Plot 6: lowest channel, g – mode, 54 Mbps



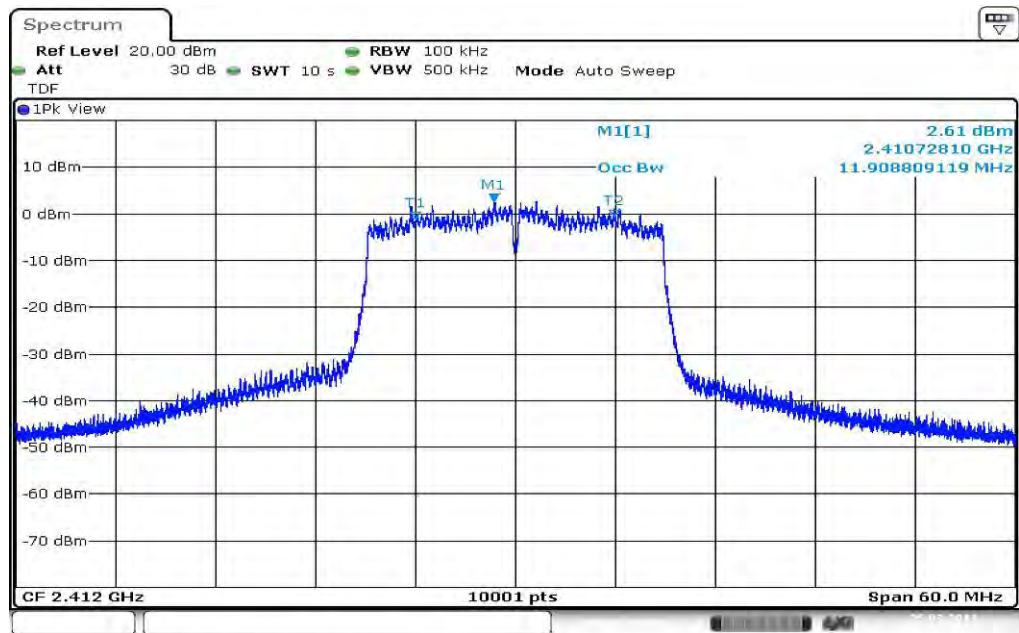
Plot 7: lowest channel, n – mode, MCS 0



Plot 8: lowest channel, n – mode, MCS 4

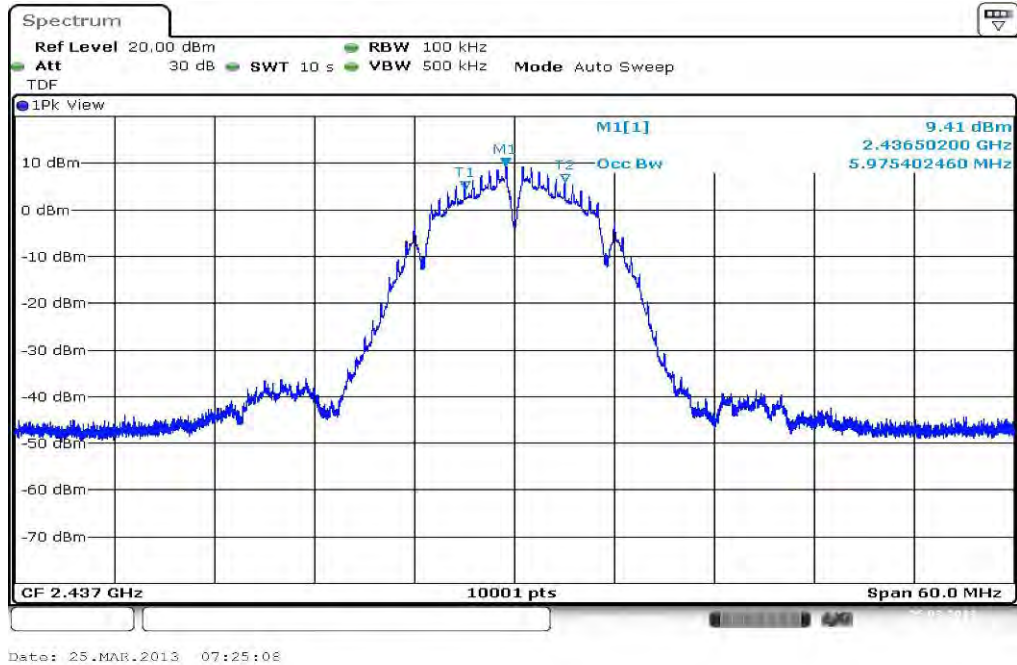


Plot 9: lowest channel, n – mode, MCS 7

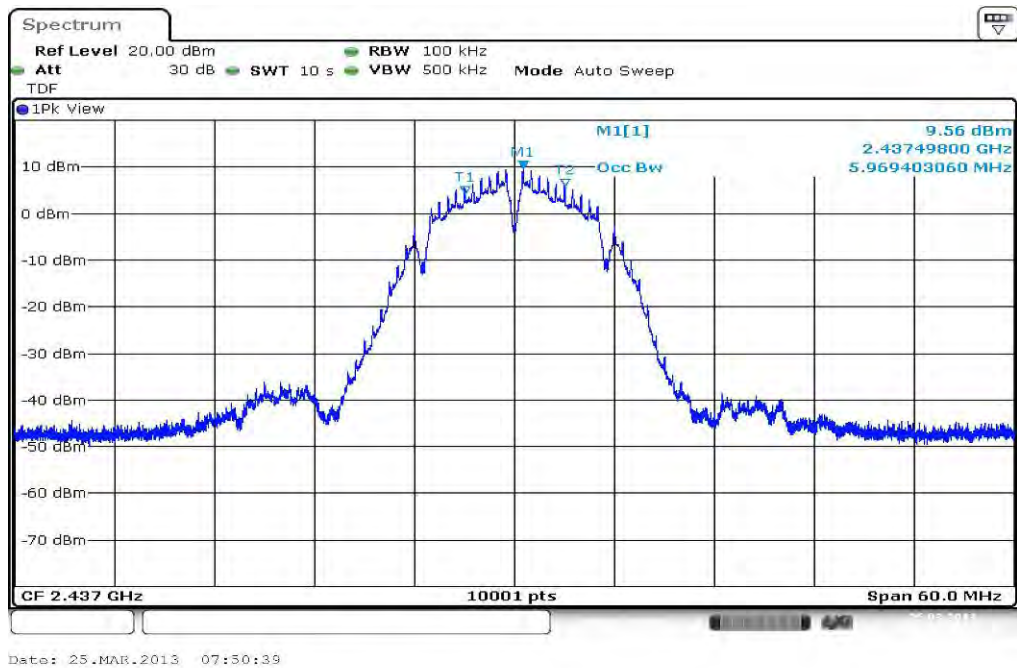


Date: 25.MAR.2013 10:55:11

Plot 10: middle channel, b – mode, 1 Mbps

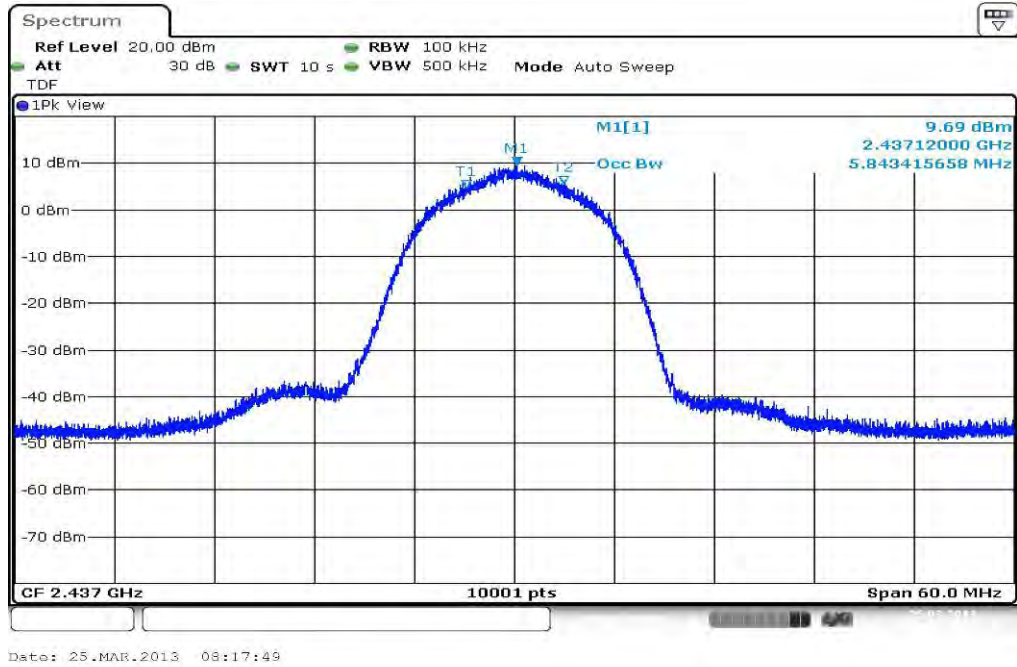


Plot 11: middle channel, b – mode, 5.5 Mbps

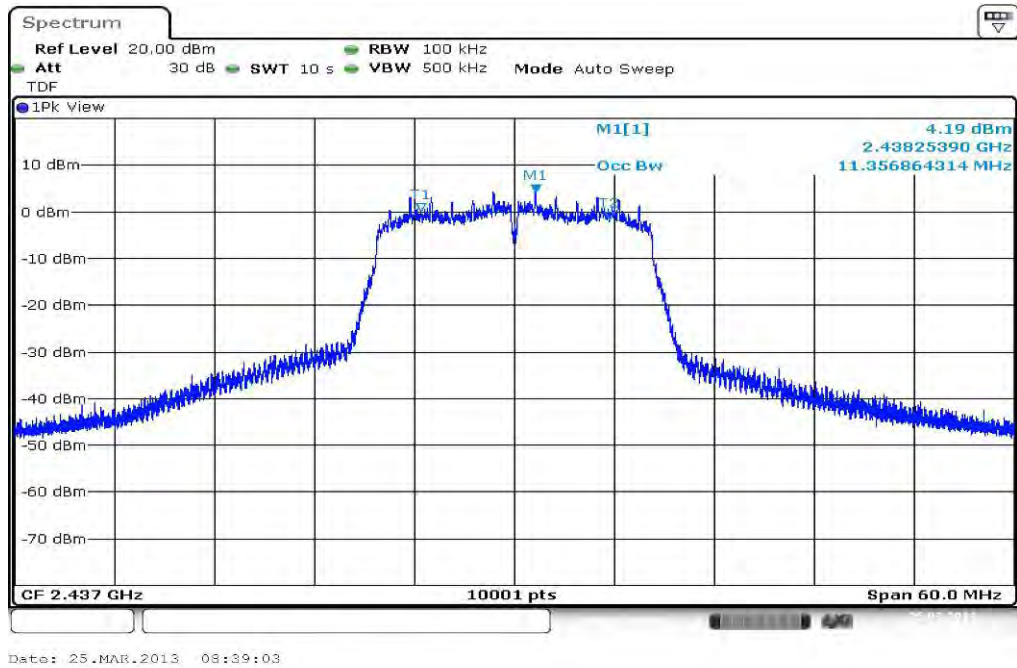




Plot 12: middle channel, b – mode, 11 Mbps

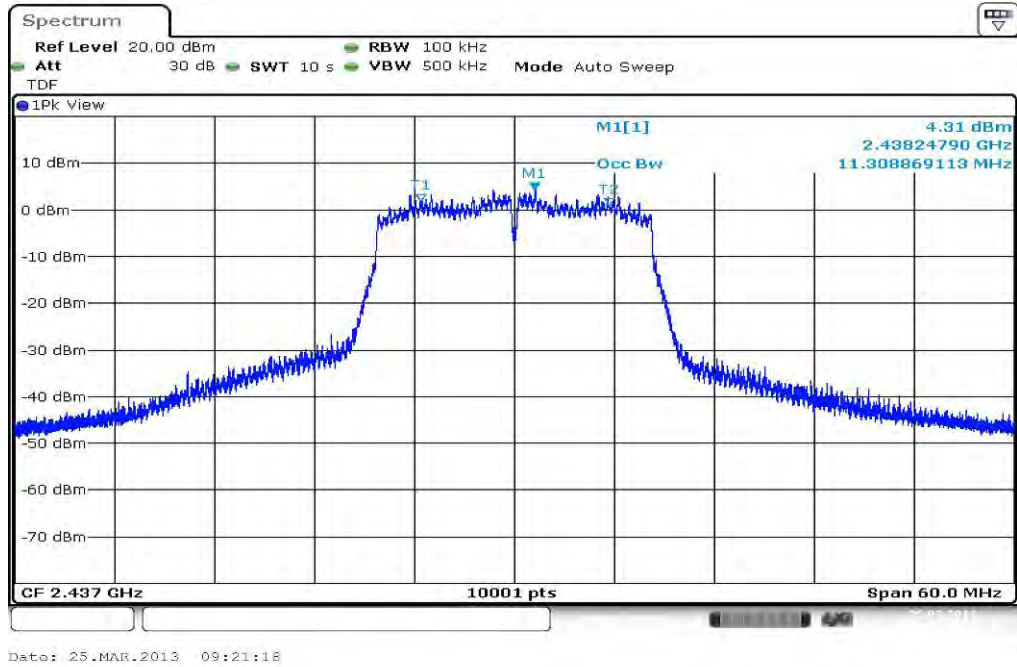


Plot 13: middle channel, g – mode, 6 Mbps

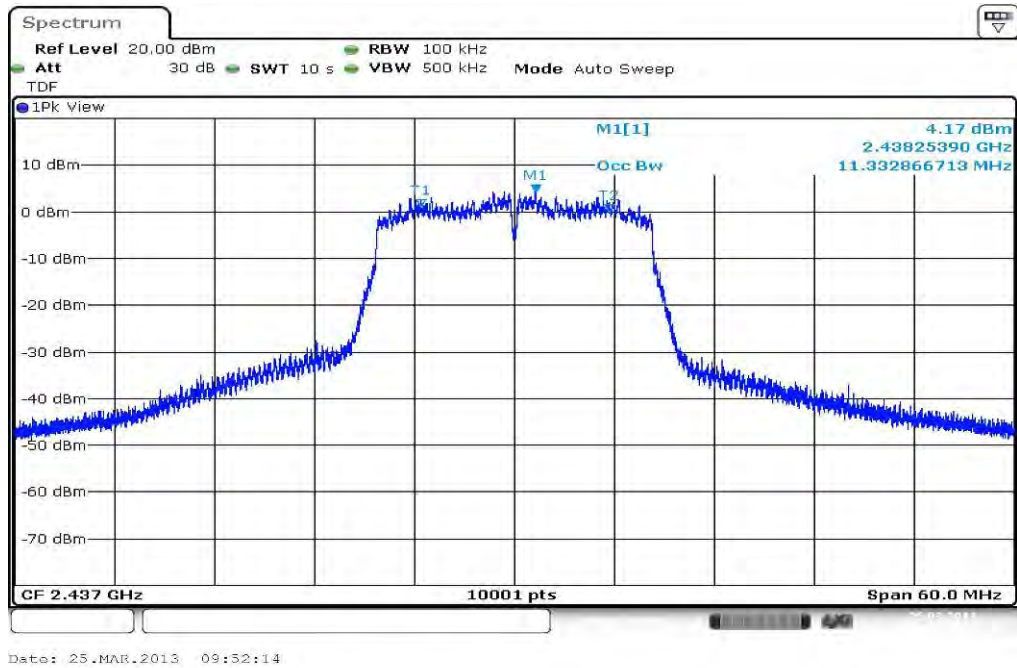




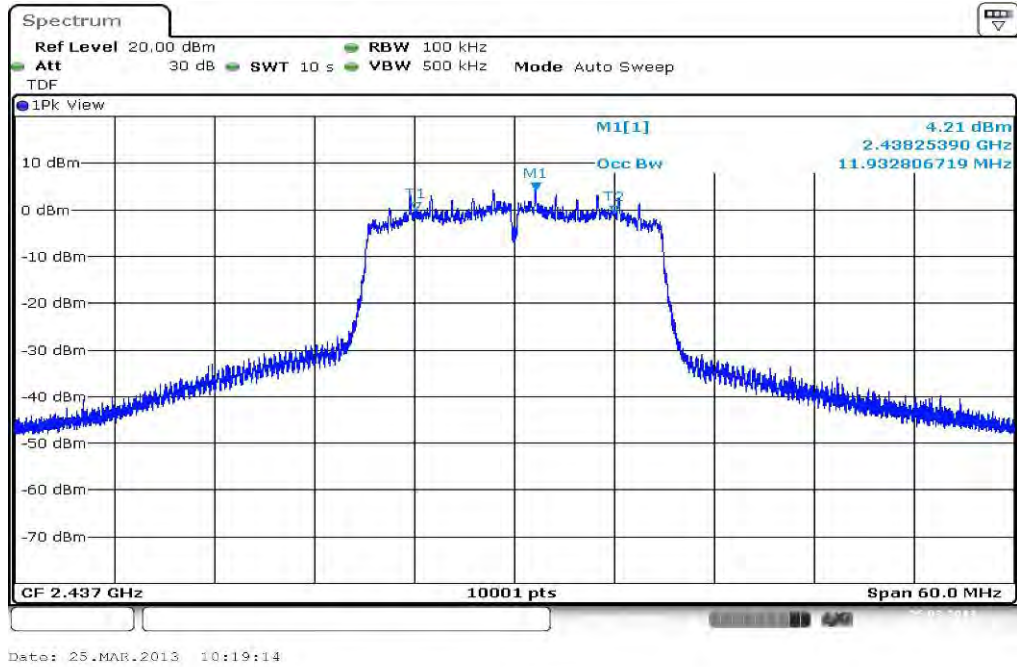
Plot 14: middle channel, g – mode, 24 Mbps



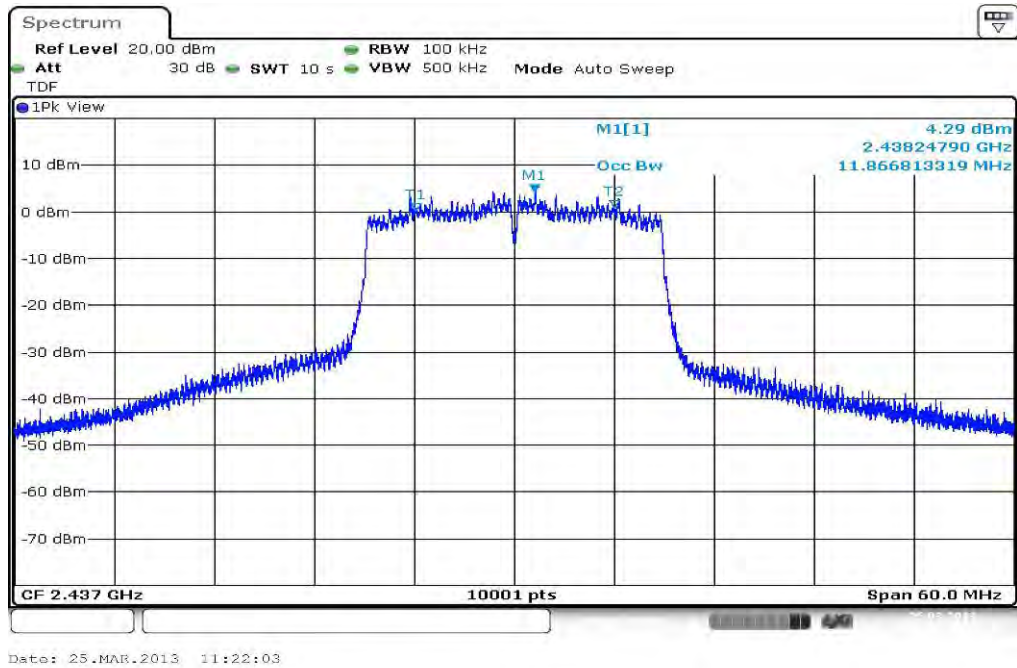
Plot 15: middle channel, g – mode, 54 Mbps



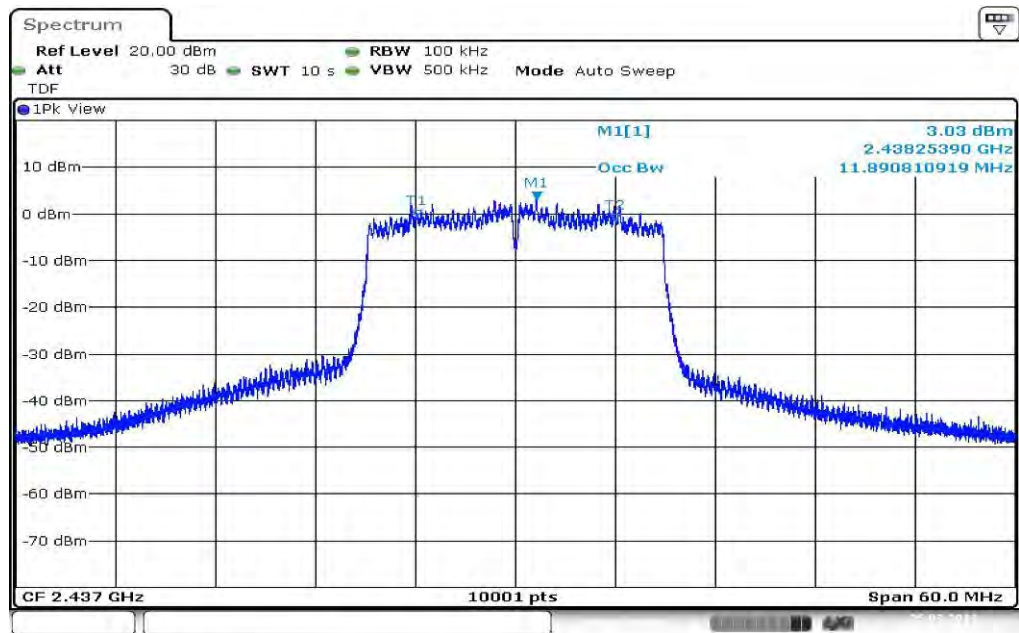
Plot 16: middle channel, n – mode, MCS 0



Plot 17: middle channel, n – mode, MCS 4

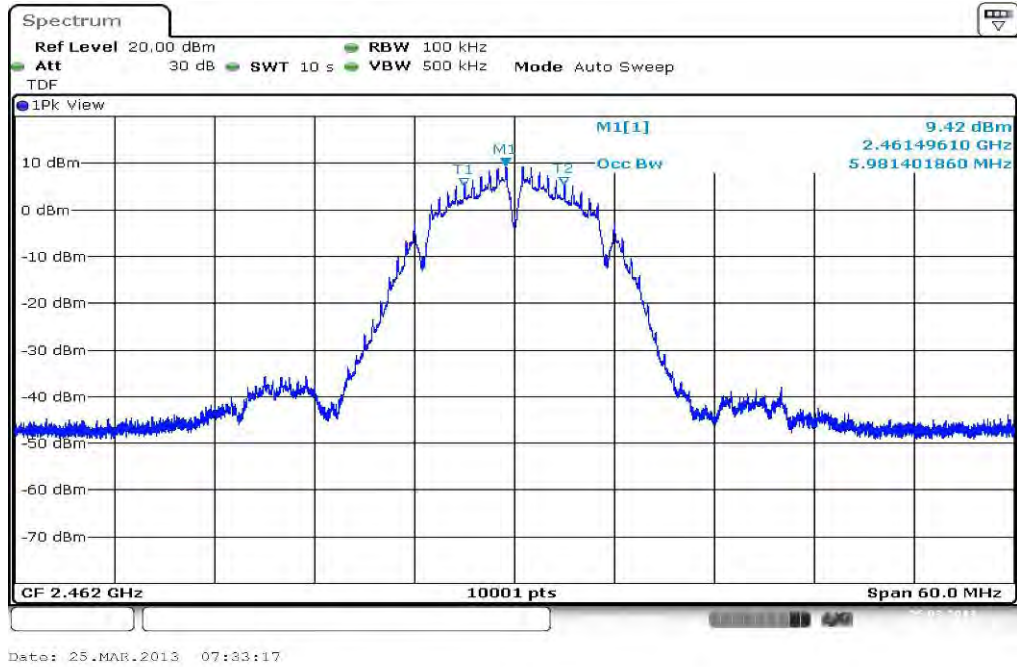


Plot 18: middle channel, n – mode, MCS 7

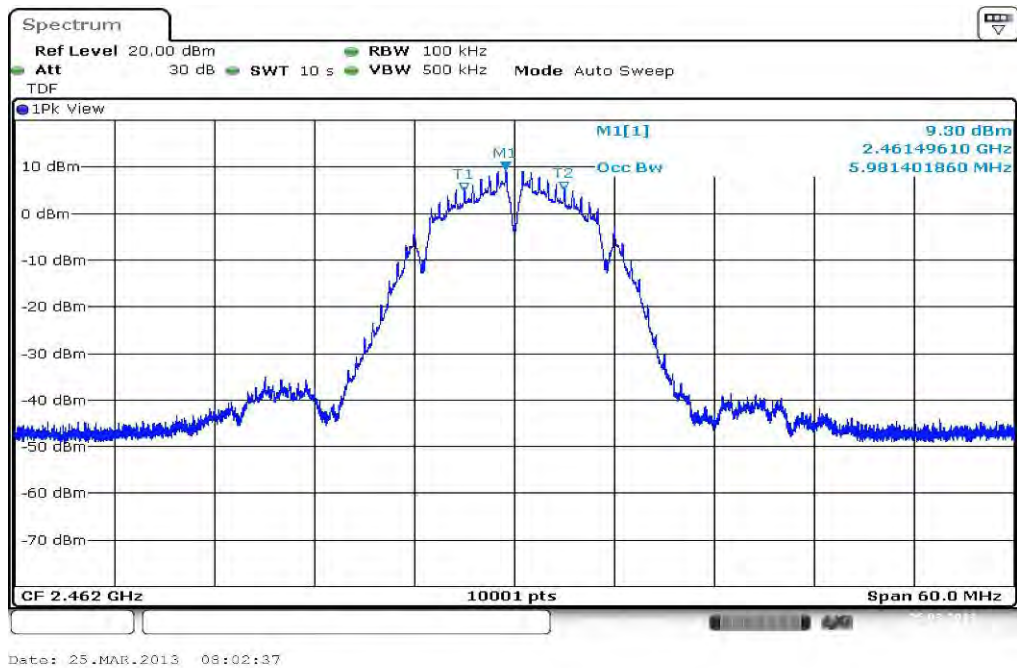


Date: 25.MAR.2013 11:02:12

Plot 19: highest channel, b – mode, 1 Mbps

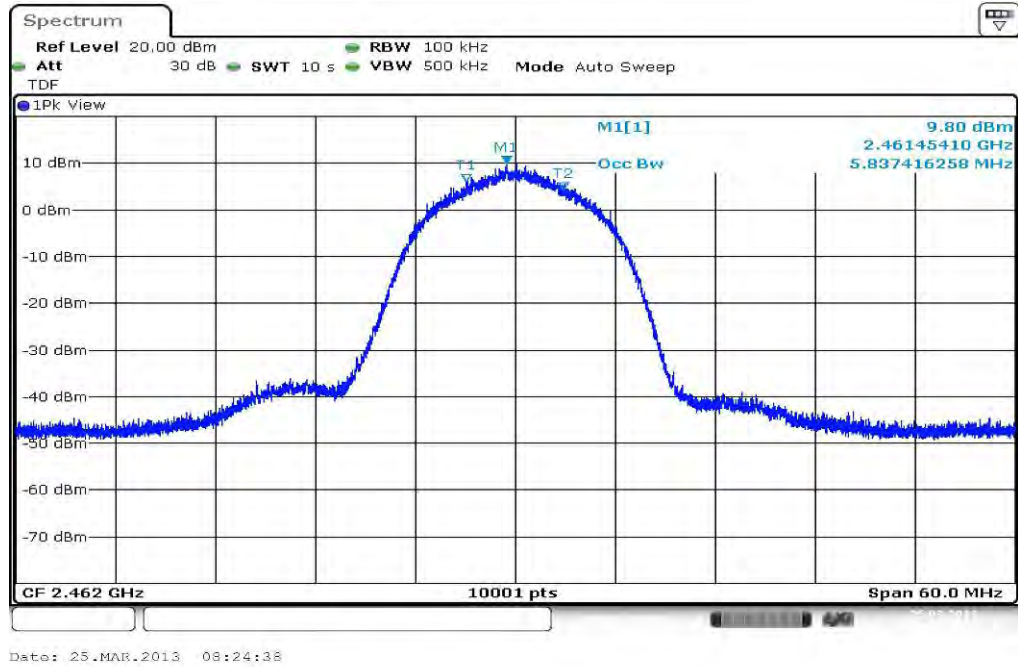


Plot 20: highest channel, b – mode, 5.5 Mbps

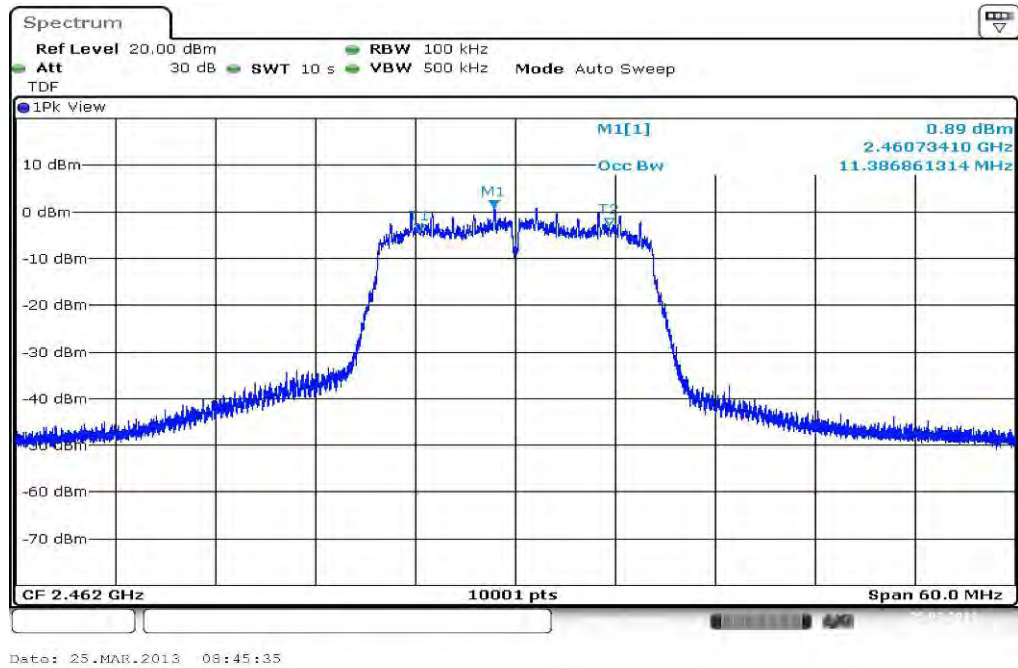




Plot 21: highest channel, b – mode, 11 Mbps

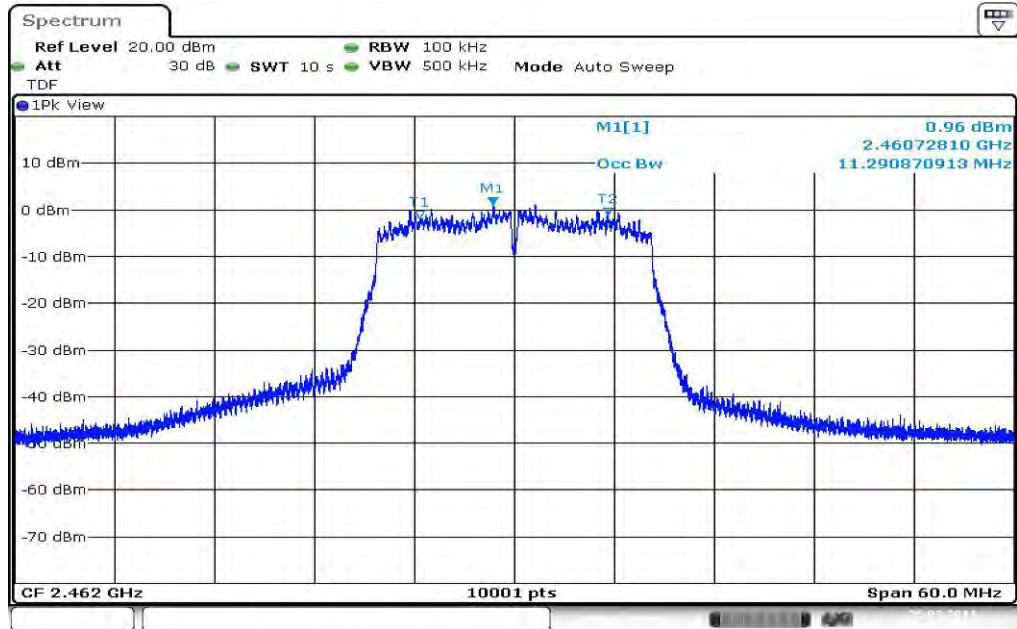


Plot 22: highest channel, g – mode, 6 Mbps



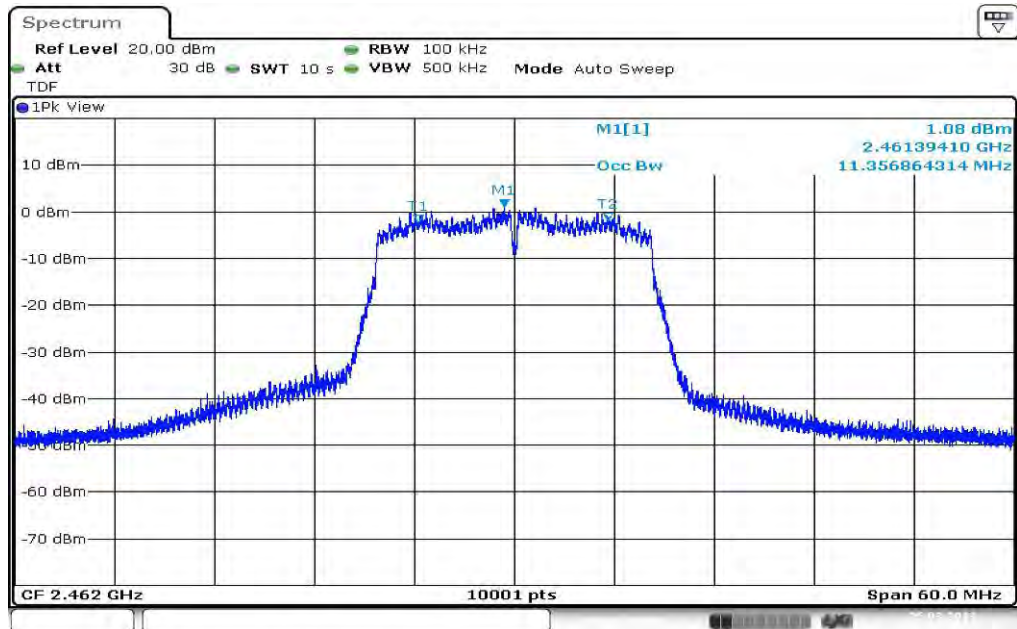


Plot 23: highest channel, g – mode, 24 Mbps



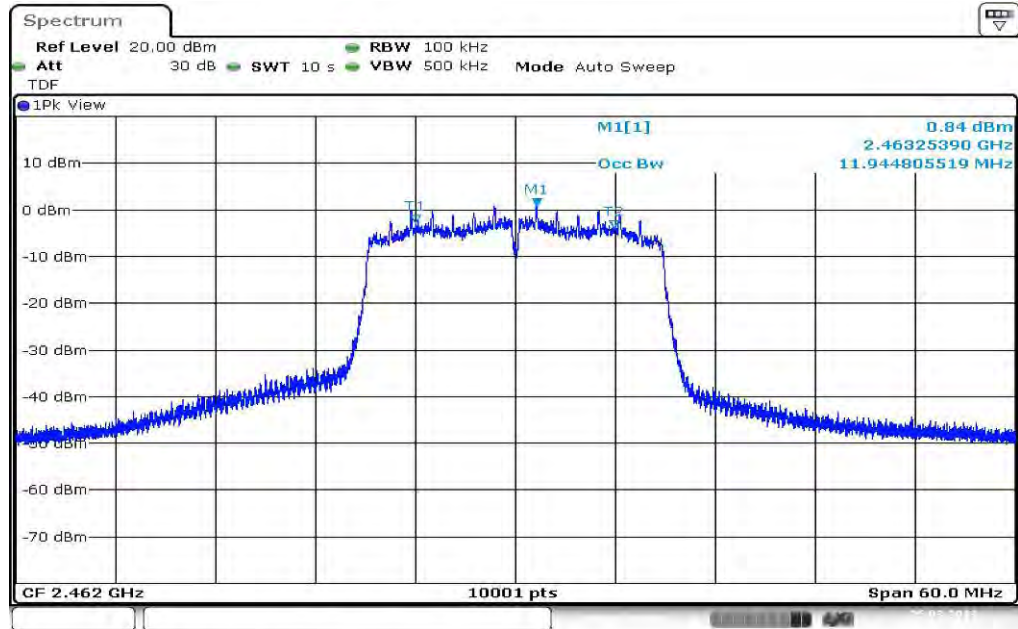
Date: 25.MAR.2013 09:33:10

Plot 24: highest channel, g – mode, 54 Mbps



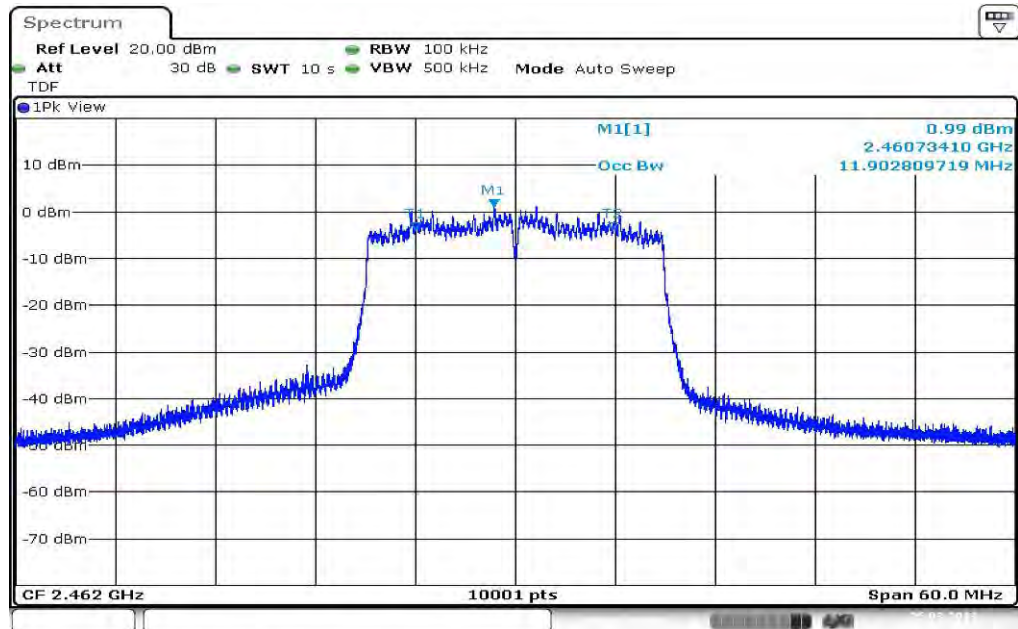
Date: 25.MAR.2013 10:01:21

Plot 25: highest channel, n – mode, MCS 0



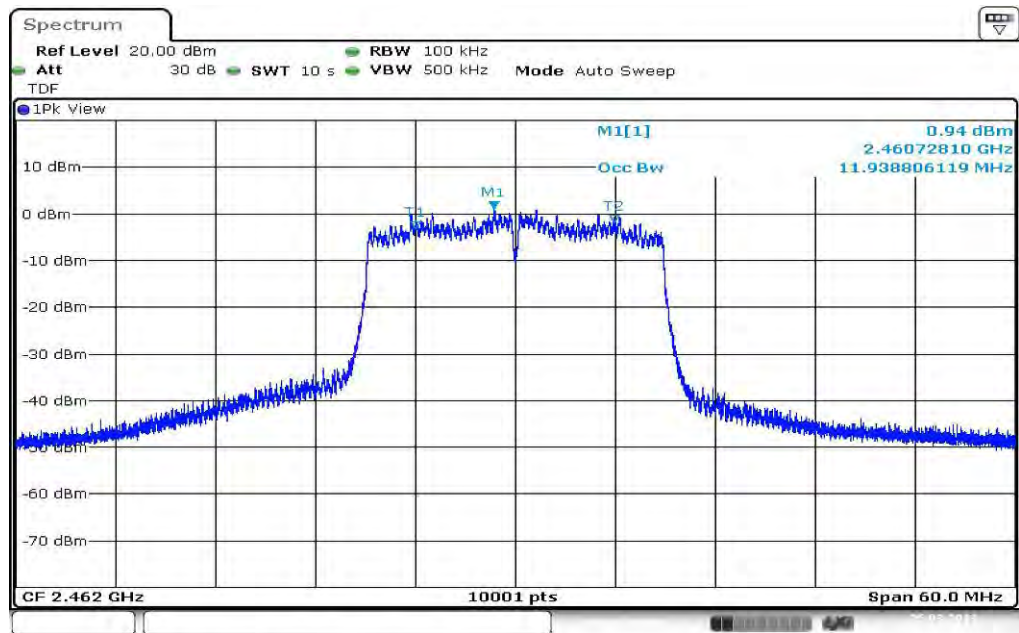
Date: 25.MAR.2013 10:25:32

Plot 26: highest channel, n – mode, MCS 4



Date: 25.MAR.2013 11:28:38

Plot 27: highest channel, n – mode, MCS 7



Date: 25.MAR.2013 11:08:37

## 9.7 Spectrum bandwidth – 20 dB

Not performed! Tests according to manufacturer test plan!

## 9.8 Band edge compliance conducted

### Description:

Measurement of the conducted band edge compliance. EUT is measured at the lower and upper band edge in both modes.

### Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 kHz
Video bandwidth:	500 kHz
Span:	Lower Band Edge: 2300 – 2425 MHz Upper Band Edge: 2450 – 2550 MHz
Trace-Mode:	Max hold

### Limits:

FCC	IC
Band Edge Compliance Conducted	
<p>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. Attenuation below the general limits specified in Section 15.209(a) is not required.</p>	

### Results:

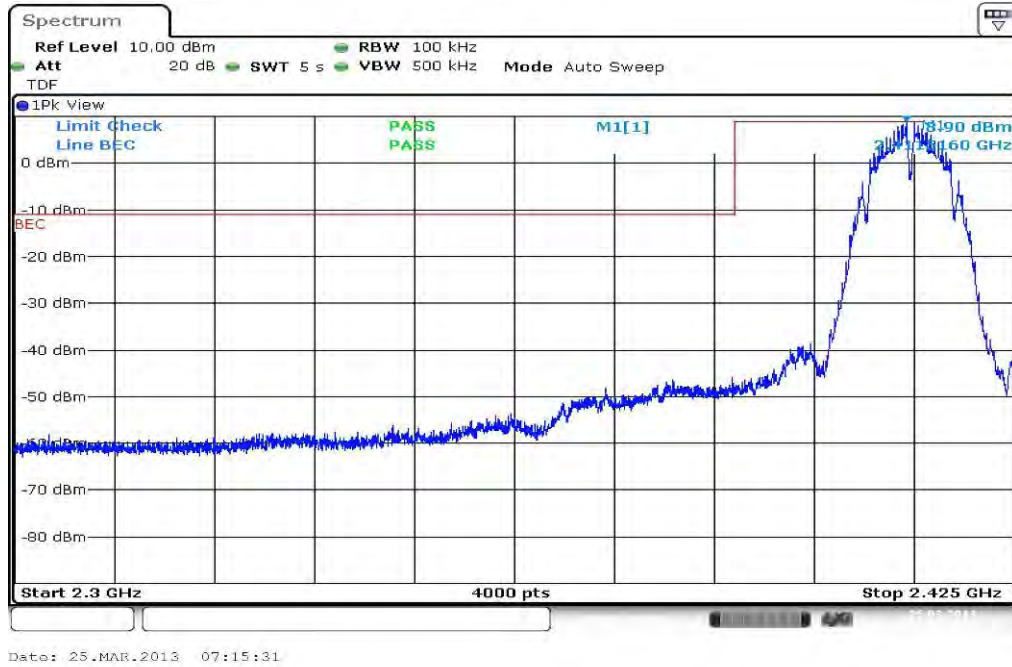
Scenario Modulation	Band Edge Compliance Conducted [dB]		
	DSSS / b – mode	OFDM / g – mode	OFDM / n – mode
Lower Band Edge – Channel 1	> 20 dB	> 20 dB	> 20 dB
Upper Band Edge – Channel 11	> 20 dB	> 20 dB	> 20 dB
Measurement uncertainty	± 1.5 dB		

**Result: Passed**

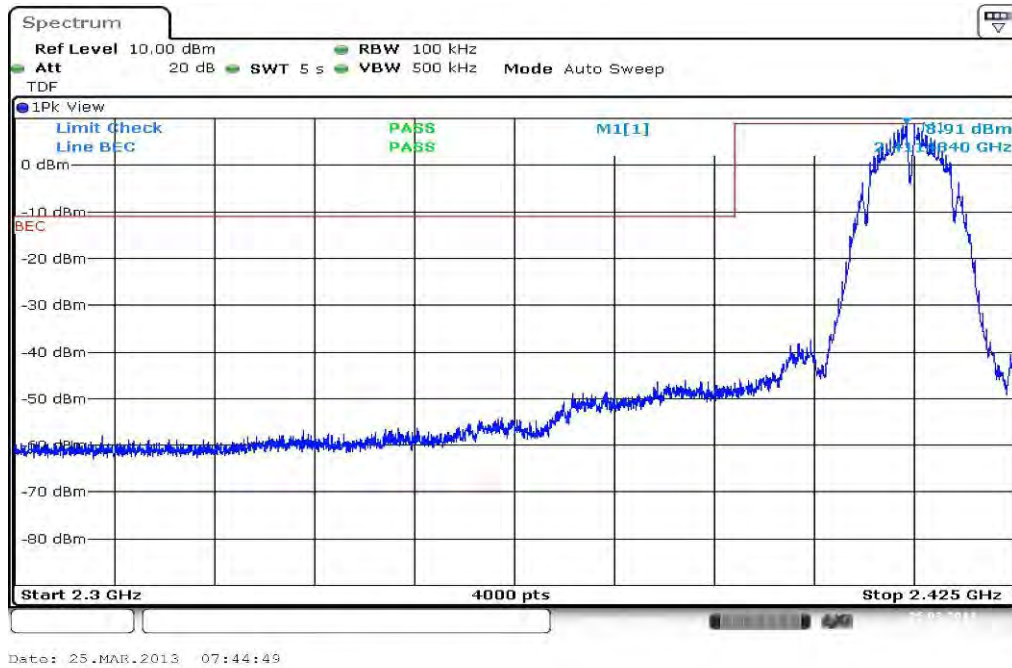


**Plots:**

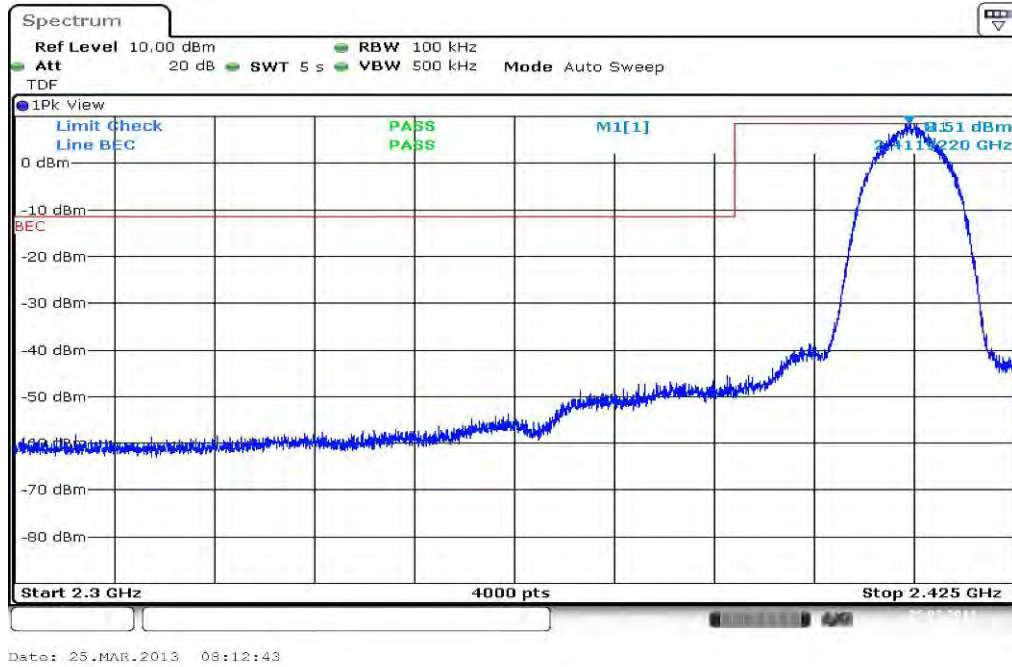
**Plot 1:** lowest channel, b – mode, 1 Mbps



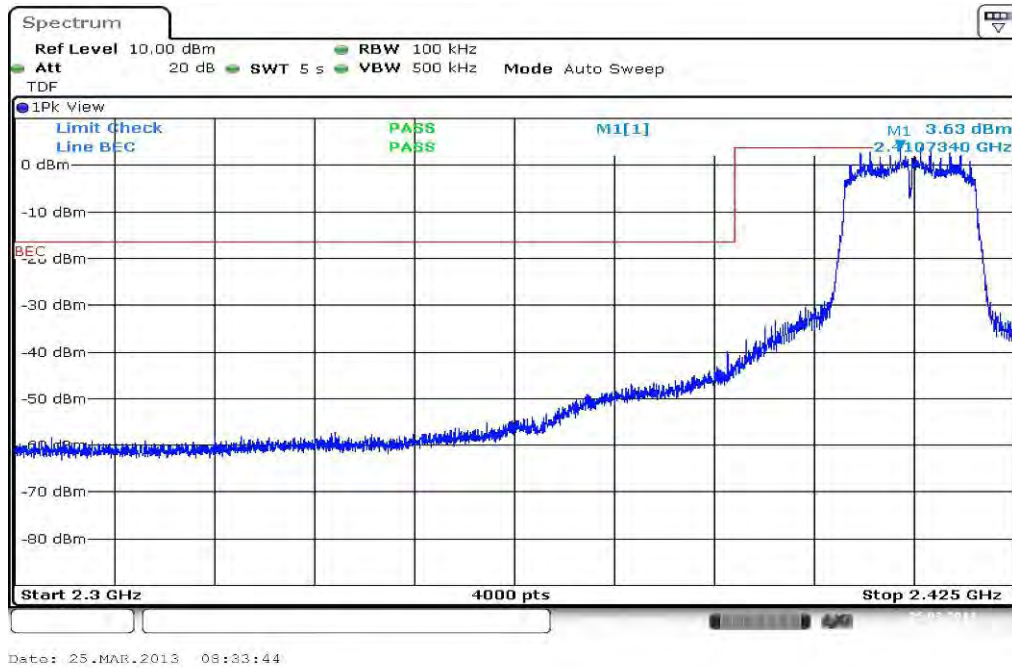
**Plot 2:** lowest channel, b – mode, 5.5 Mbps



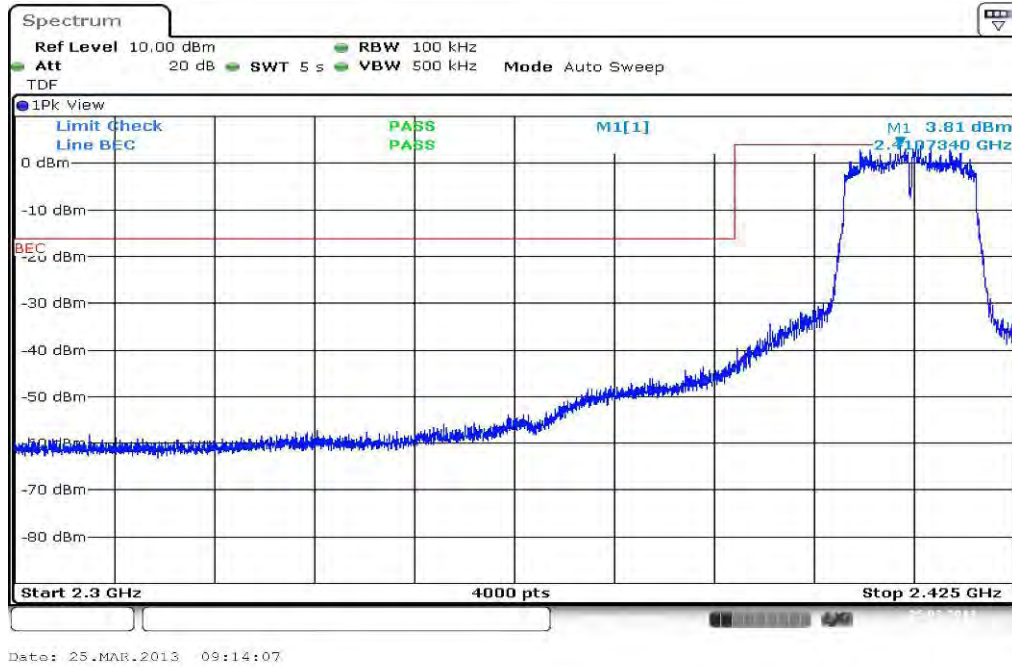
Plot 3: lowest channel, b – mode, 11 Mbps



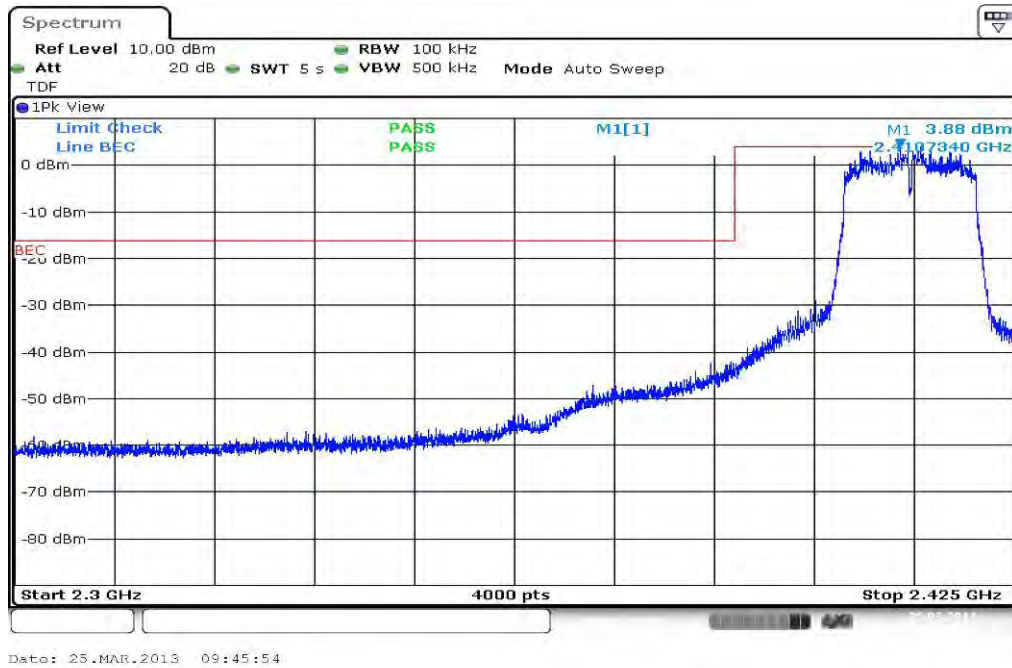
Plot 4: lowest channel, g – mode, 6 Mbps



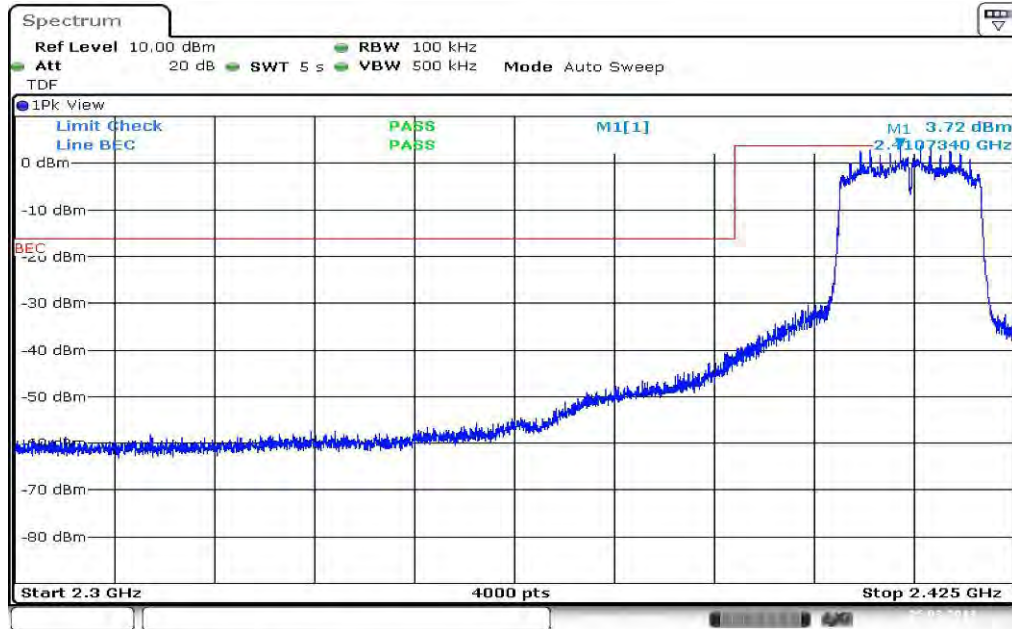
Plot 5: lowest channel, g – mode, 24 Mbps



Plot 6: lowest channel, g – mode, 54 Mbps

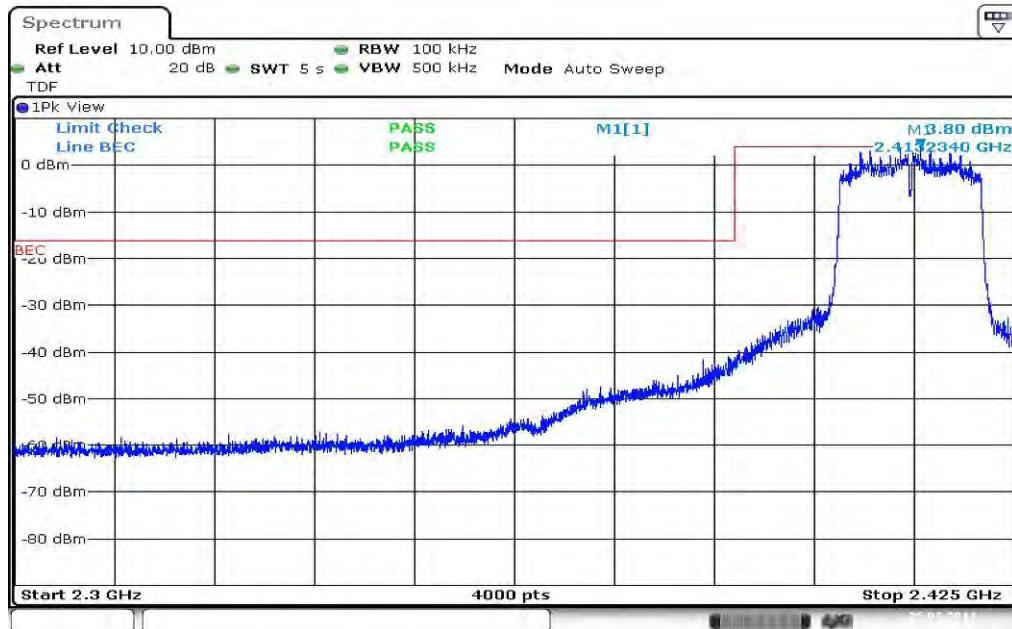


Plot 7: lowest channel, n – mode, MCS 0



Date: 25.MAR.2013 10:14:25

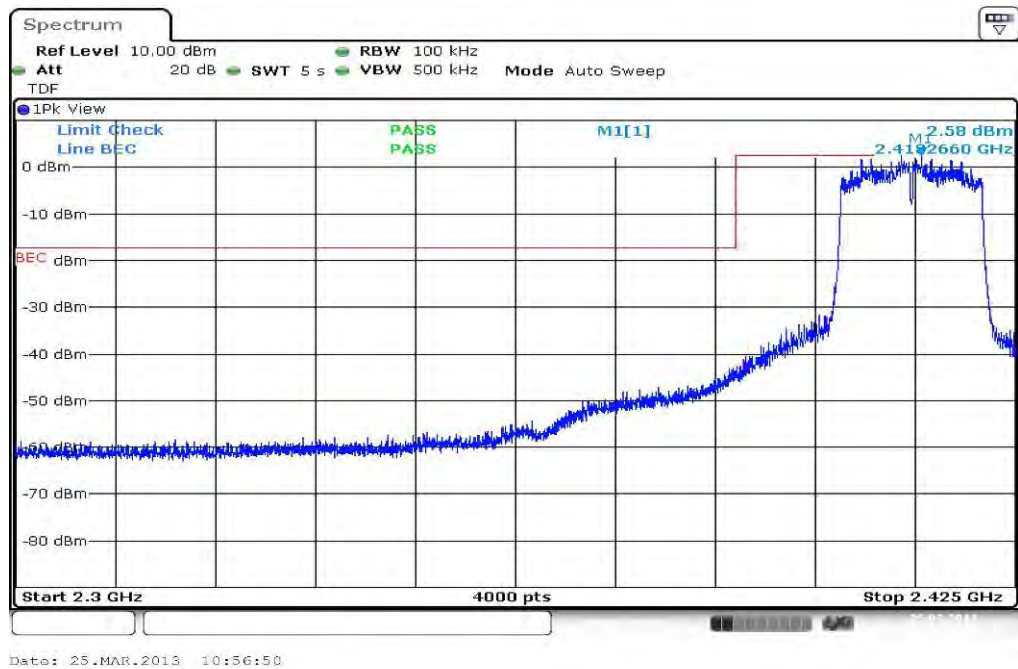
Plot 8: lowest channel, n – mode, MCS 4



Date: 25.MAR.2013 11:17:02



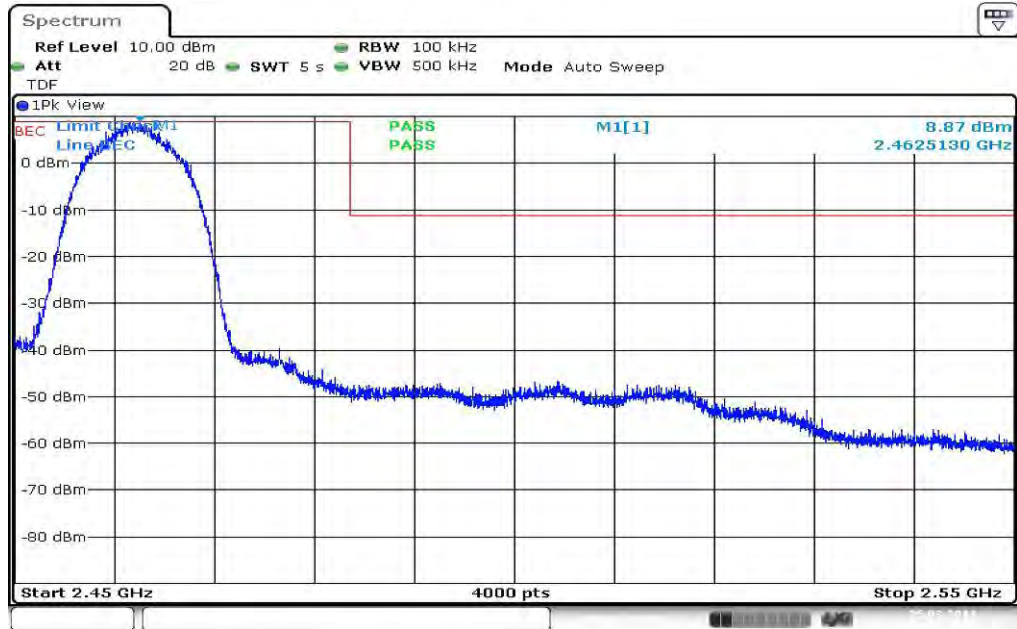
Plot 9: lowest channel, n – mode, MCS 7





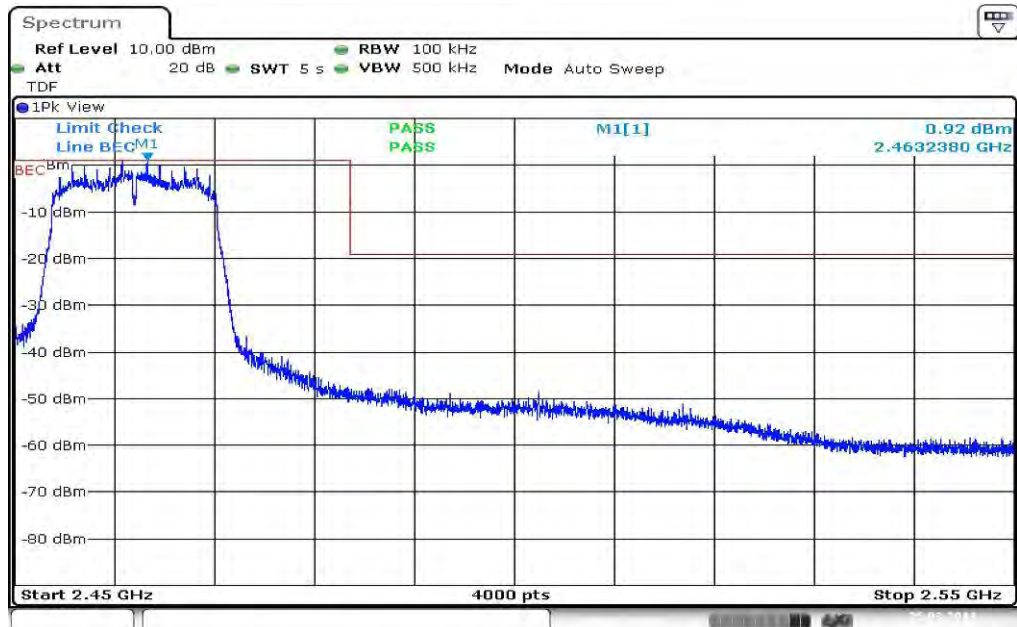


Plot 12: highest channel, b – mode, 11 Mbps



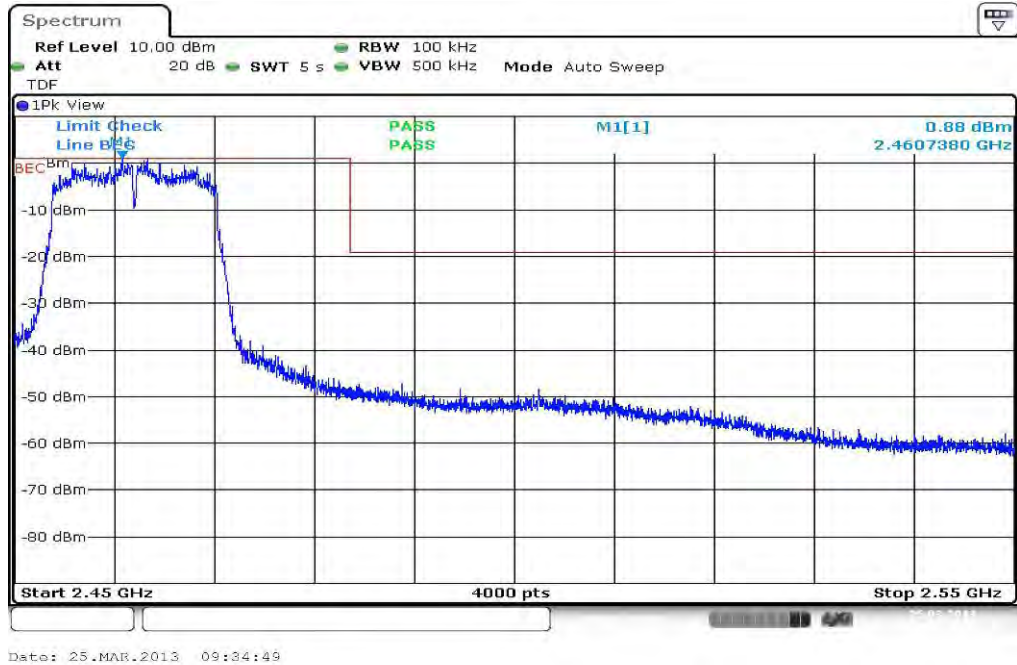
Date: 25.MAR.2013 08:26:17

Plot 13: highest channel, g – mode, 6 Mbps

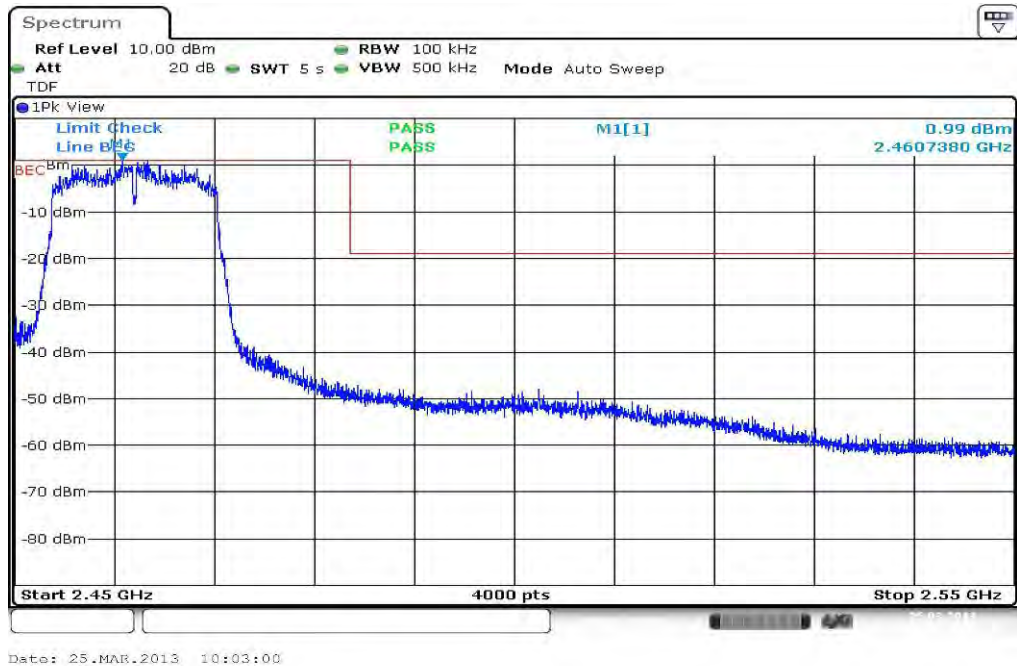


Date: 25.MAR.2013 08:47:14

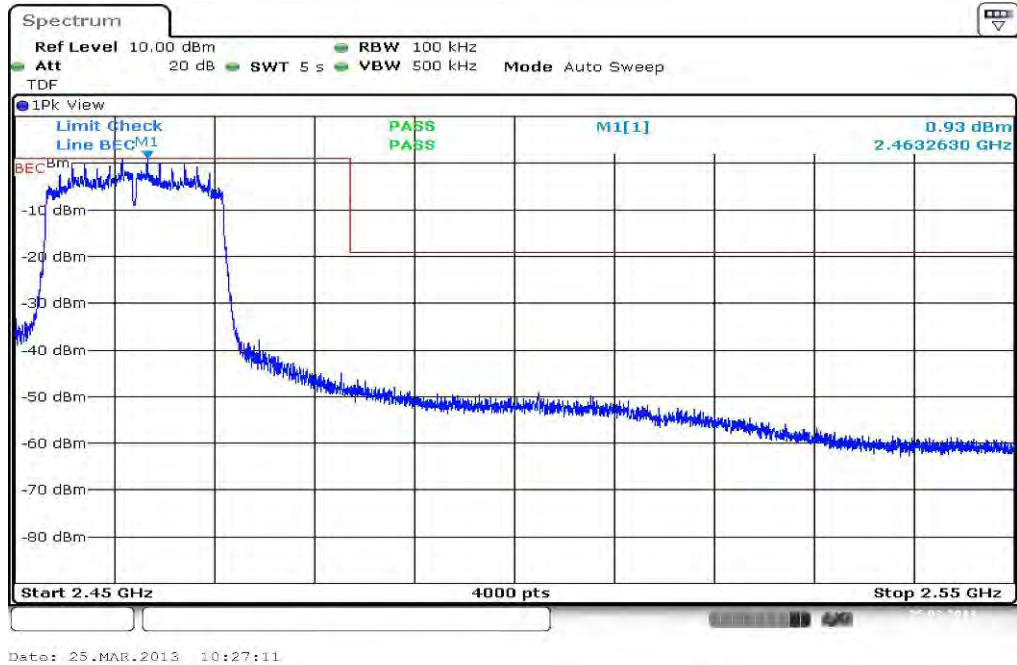
Plot 14: highest channel, g – mode, 24 Mbps



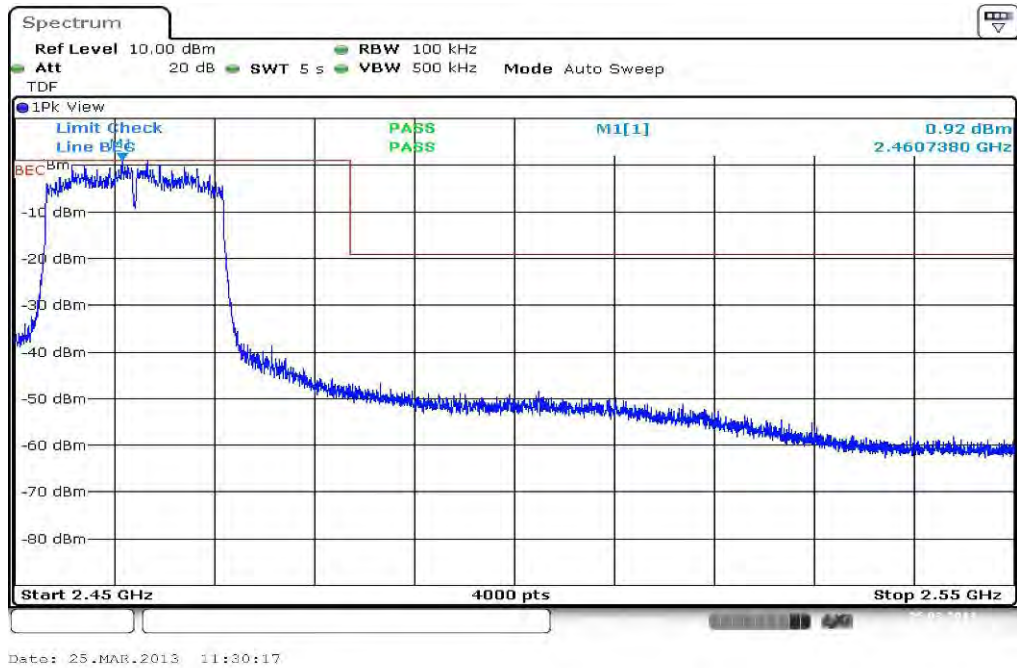
Plot 15: highest channel, g – mode, 54 Mbps



Plot 16: highest channel, n – mode, MCS 0

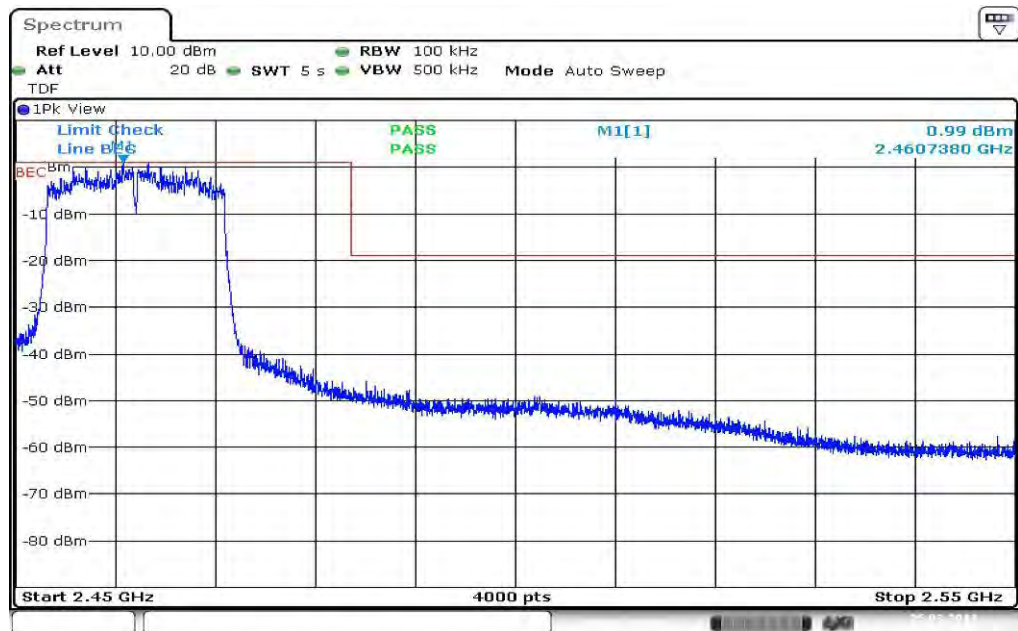


Plot 17: highest channel, n – mode, MCS 4





Plot 18: highest channel, n – mode, MCS 7



Date: 25.MAR.2013 11:10:16



## 9.9 Band edge compliance radiated

### Description:

Measurement of the radiated band edge compliance. The EUT is turned in the position that results in the maximum level at the band edge. Then a sweep over the corresponding restricted band is performed. The EUT is set to channel 1 for the lower restricted band and to channel 11 for the upper restricted band. The measurement is repeated for all modulations. Measurement distance is 3m.

### Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz / 1 MHz
Video bandwidth:	1 MHz / 10 Hz
Span:	See plot!
Trace-Mode:	Max Hold

### Limits:

FCC	IC
Band Edge Compliance Radiated	
<p>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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).</p>	
54 dBµV/m AVG 74 dBµV/m PEAK	

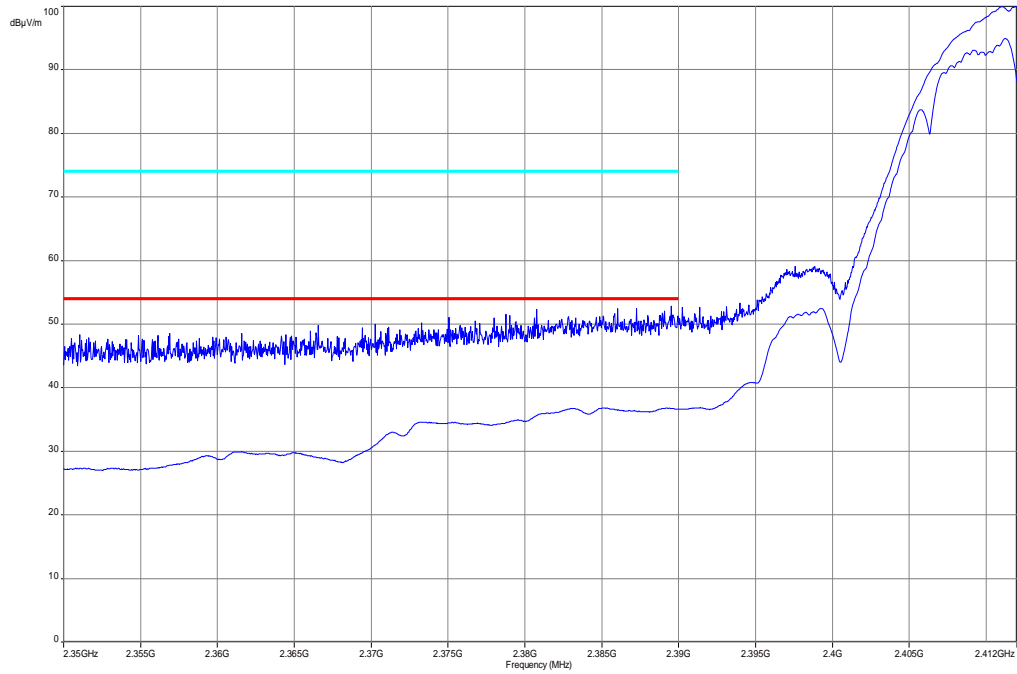
### Results:

Scenario Modulation	Band Edge Compliance Radiated [dB]		
	DSSS / b – mode	OFDM / g – mode	OFDM / n – mode
Lower Band Edge – Channel 1	> 20 dB (Peak) > 15 dB (AVG)	> 12 dB (Peak) > 10 dB (AVG)	> 8 dB (Peak) > 8 dB (AVG)
Upper Band Edge – Channel 11	> 20 dB (Peak) > 14 dB (AVG)	> 12 dB (Peak) > 10 dB (AVG)	> 8 dB (Peak) > 8 dB (AVG)
Measurement uncertainty	± 3 dB		

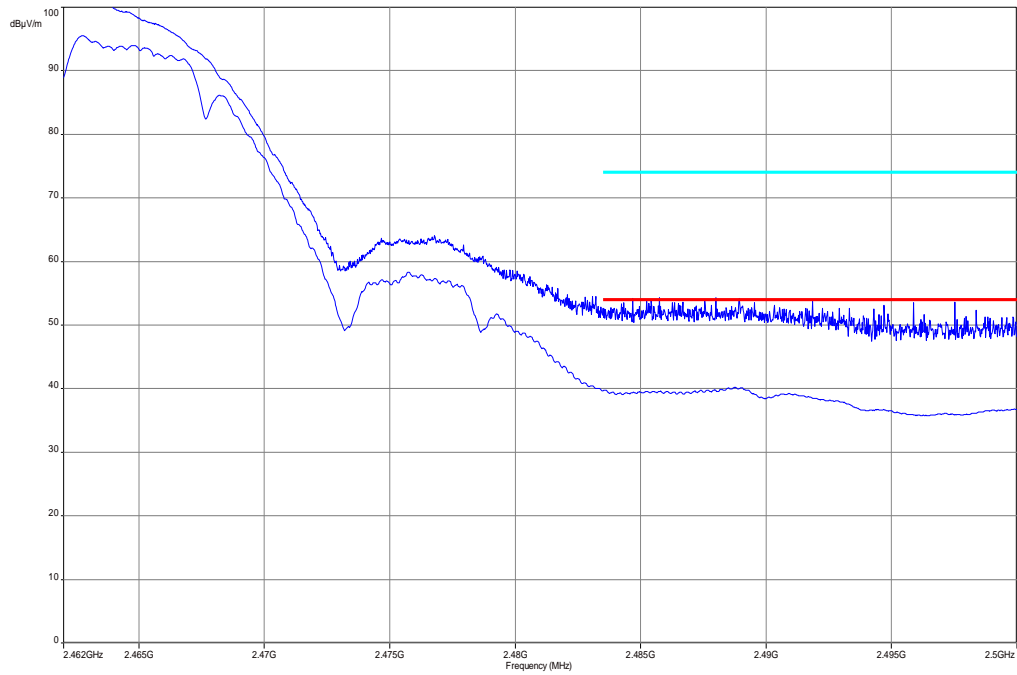
**Result:** Passed

**Plots: DSSS/ b – mode peak / average**

**Plot 1: TX mode, lower band edge, vertical & horizontal polarization**

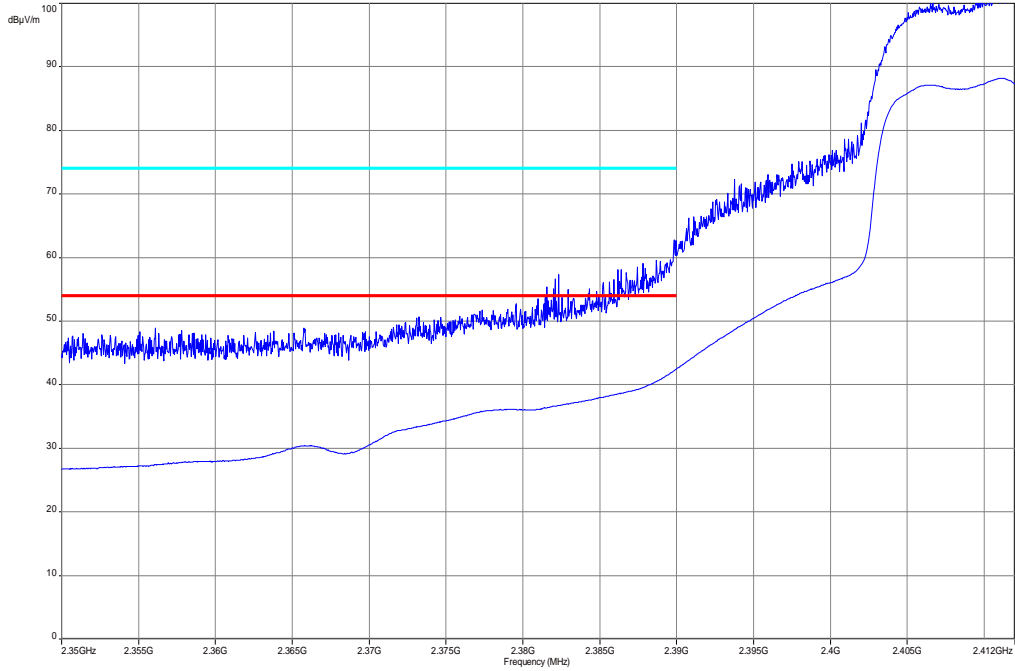


**Plot 2: TX mode, upper band edge, vertical & horizontal polarization**

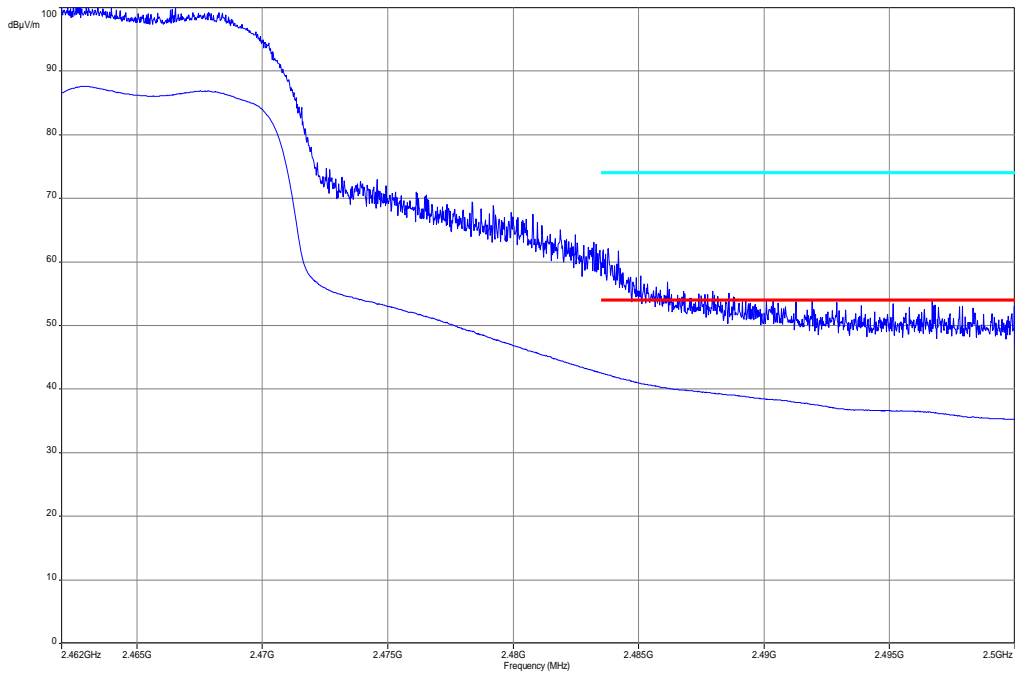


**Plots: OFDM / g – mode peak / average**

**Plot 1: TX mode, lower band edge, vertical & horizontal polarization**

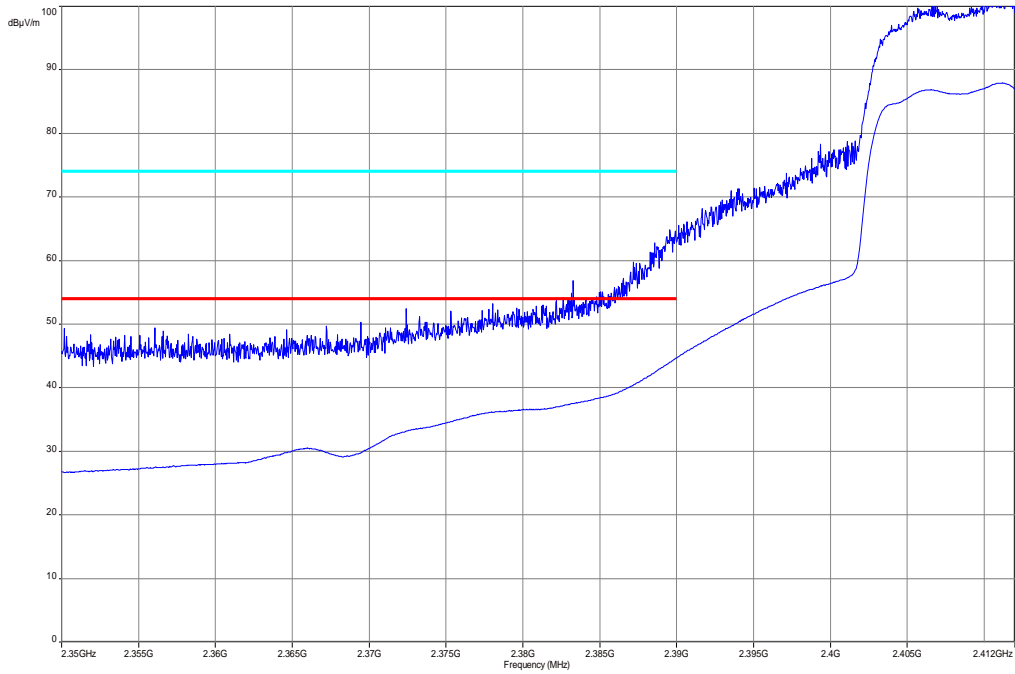


**Plot 2: TX mode, upper band edge, vertical & horizontal polarization**

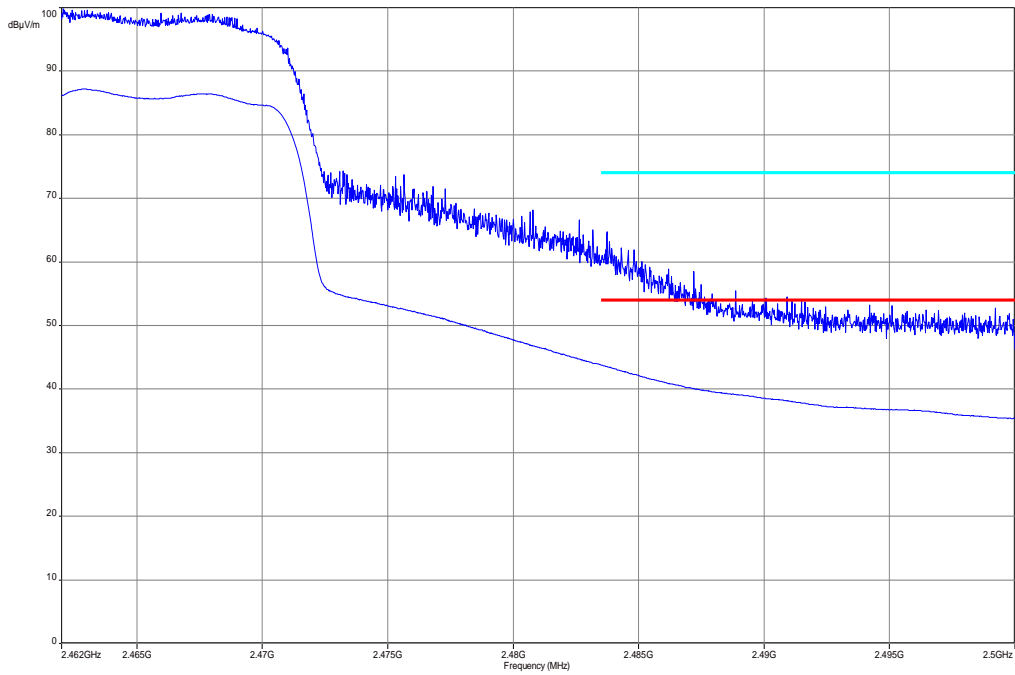


**Plots: OFDM / n – mode peak / average**

**Plot 1: TX mode, lower band edge, vertical & horizontal polarization**



**Plot 2: TX mode, upper band edge, vertical & horizontal polarization**



### 9.10 TX spurious emissions conducted

Measurement parameter:

Measurement parameter	
Detector:	Peak
Sweep time:	See plots!
Resolution bandwidth:	f <= 1GHz : 1 MHz f > 1GHz : 1 MHz
Video bandwidth:	f <= 1GHz : 10 kHz f > 1GHz : 10 kHz
Span:	See plots!
Trace-Mode:	Max Hold
Additional EUT parameters:	Test mode (modulated carrier) Max power

Results:

DSSS b – mode	lowest channel 2412 MHz		middle channel 2437 MHz		highest channel 2462 MHz	
	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]
Found peaks:	No critical peaks found (see plots)!					
OFDM g – mode	lowest channel 2412 MHz		middle channel 2437 MHz		highest channel 2462 MHz	
	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]
Found peaks:	No critical peaks found (see plots)!					
OFDM n – mode HT20	lowest channel 2412 MHz		middle channel 2437 MHz		highest channel 2462 MHz	
	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]	F [MHz]	Level [dBm]
Found peaks:	No critical peaks found (see plots)!					

Limit:

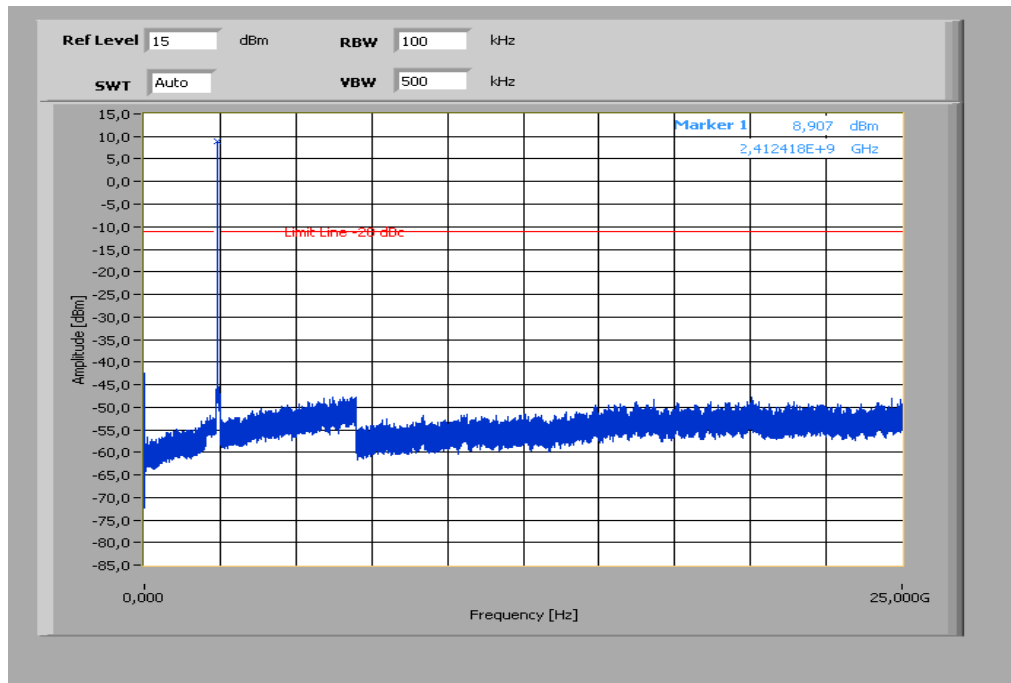
<b>Limit</b>	30 MHz ≥ f ≤ 2387 MHz: 2.5 μW (-26.02 dBm) 2387 MHz ≥ f ≤ 2400 MHz: 25 μW (-16.02 dBm) 2483.5 MHz ≥ f ≤ 2496.5 MHz: 25 μW (-16.02 dBm) 2496.5 MHz ≥ f ≤ 12.5 GHz: 2.5 μW (-26.02 dBm)
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Result: **Passed**

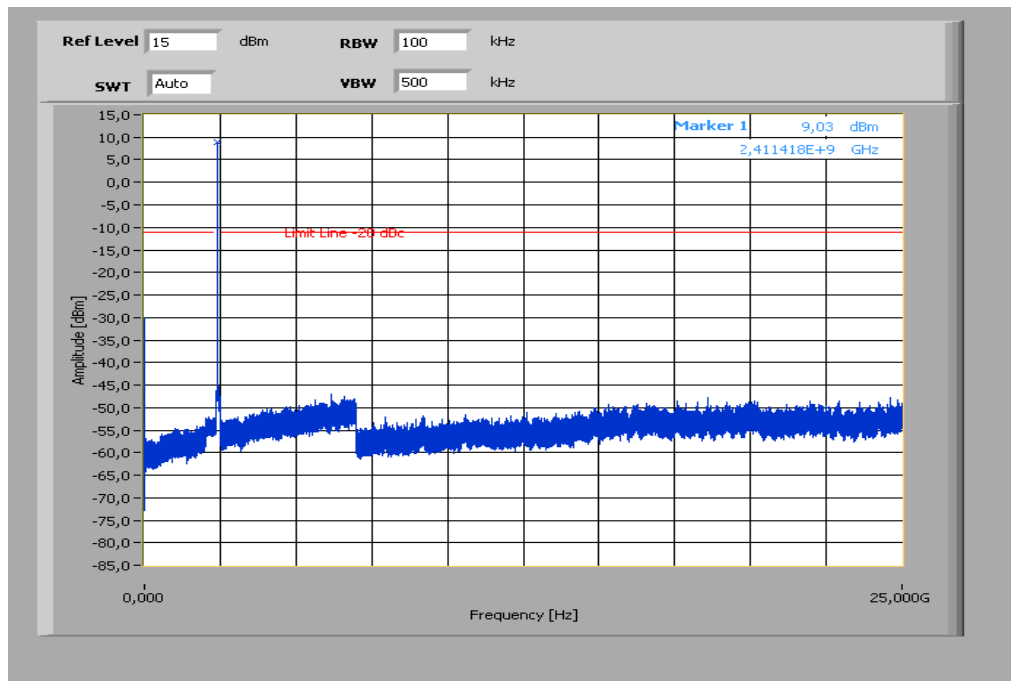


**Plots:**

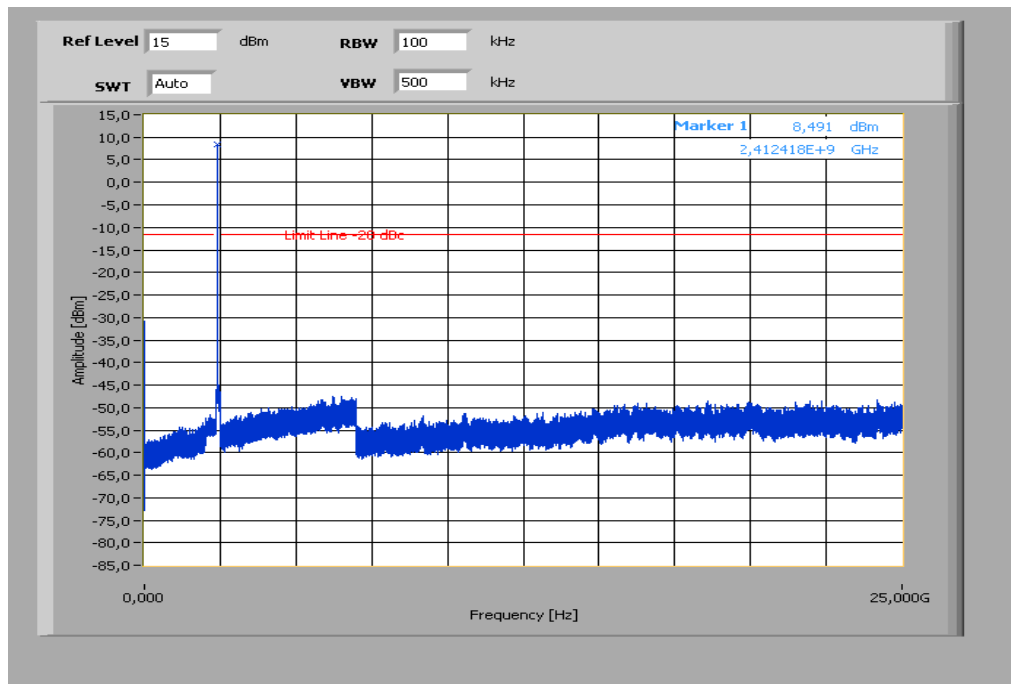
**Plot 1:** lowest channel, b – mode, 1 Mbps



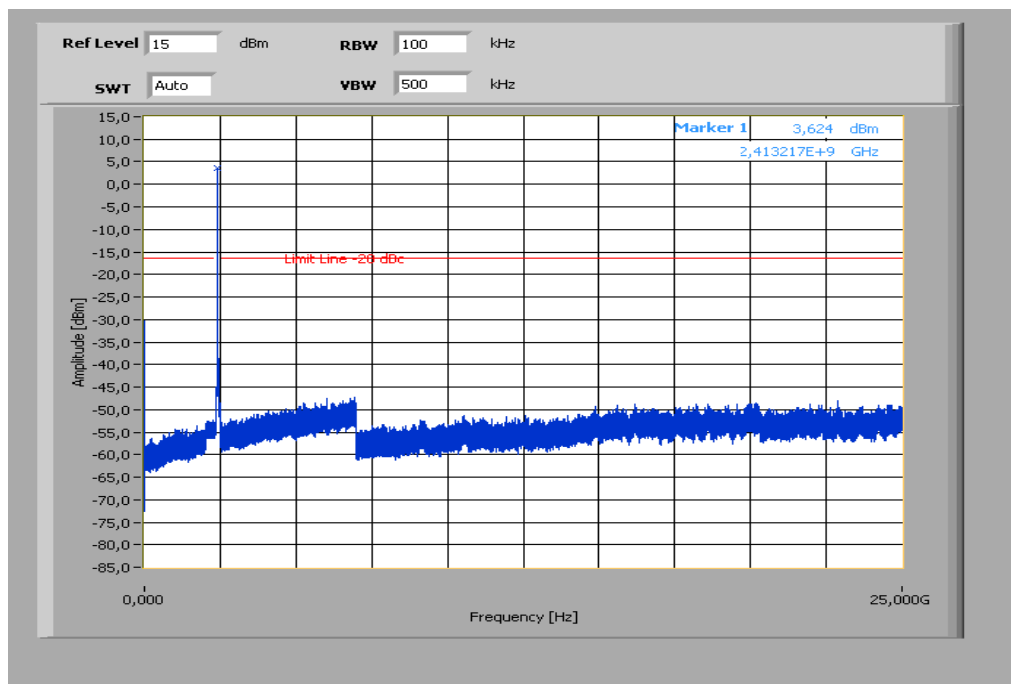
**Plot 2:** lowest channel, b – mode, 5.5 Mbps



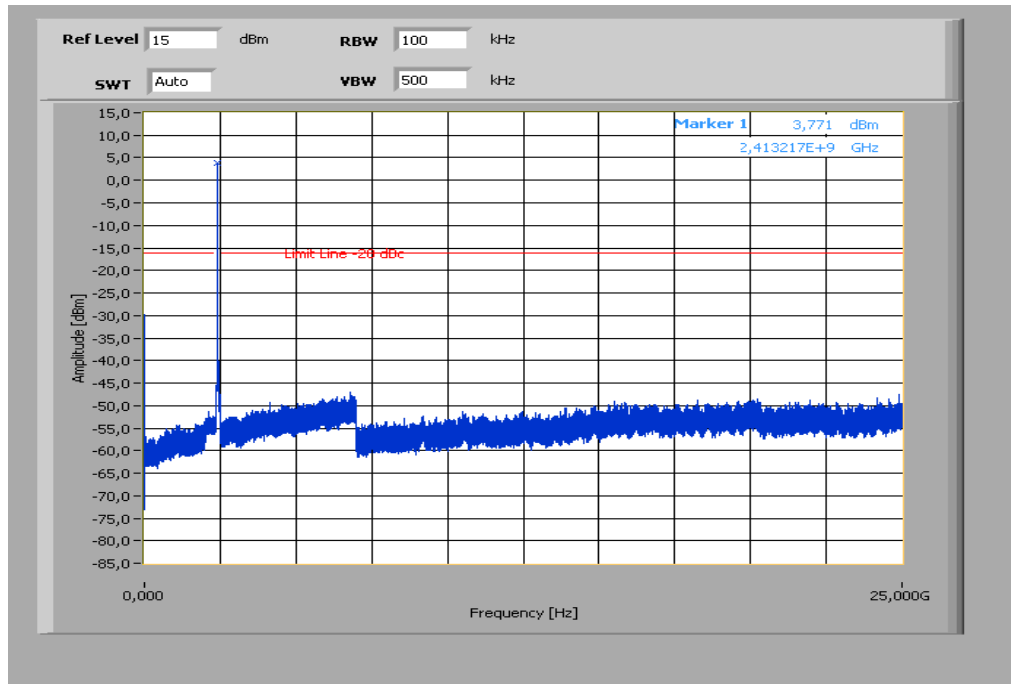
**Plot 3:** lowest channel, b – mode, 11 Mbps



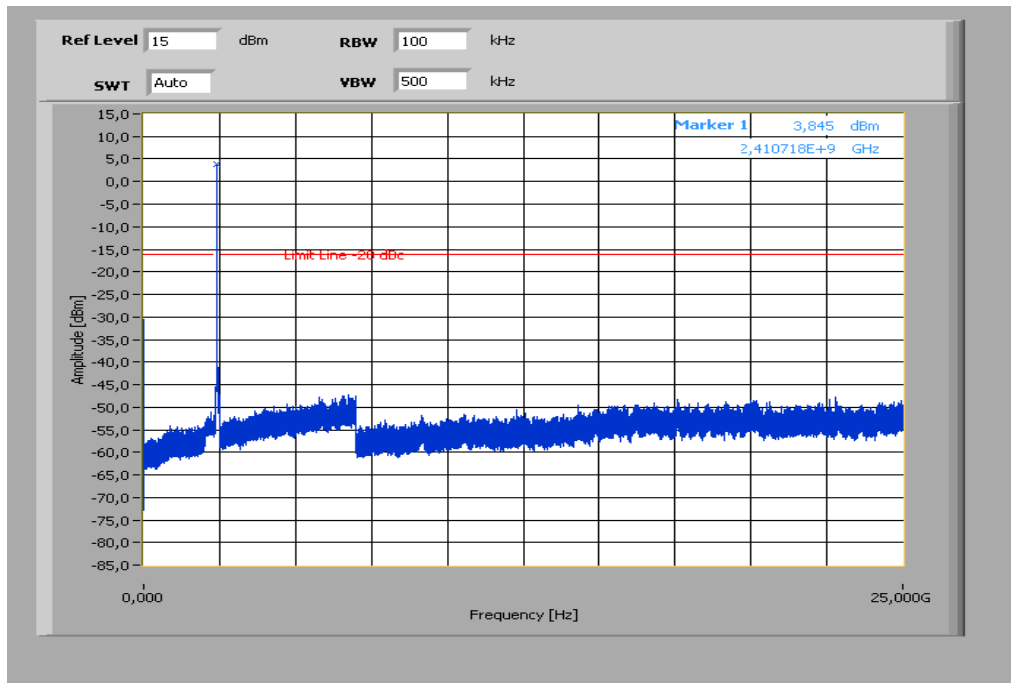
**Plot 4:** lowest channel, g – mode, 6 Mbps



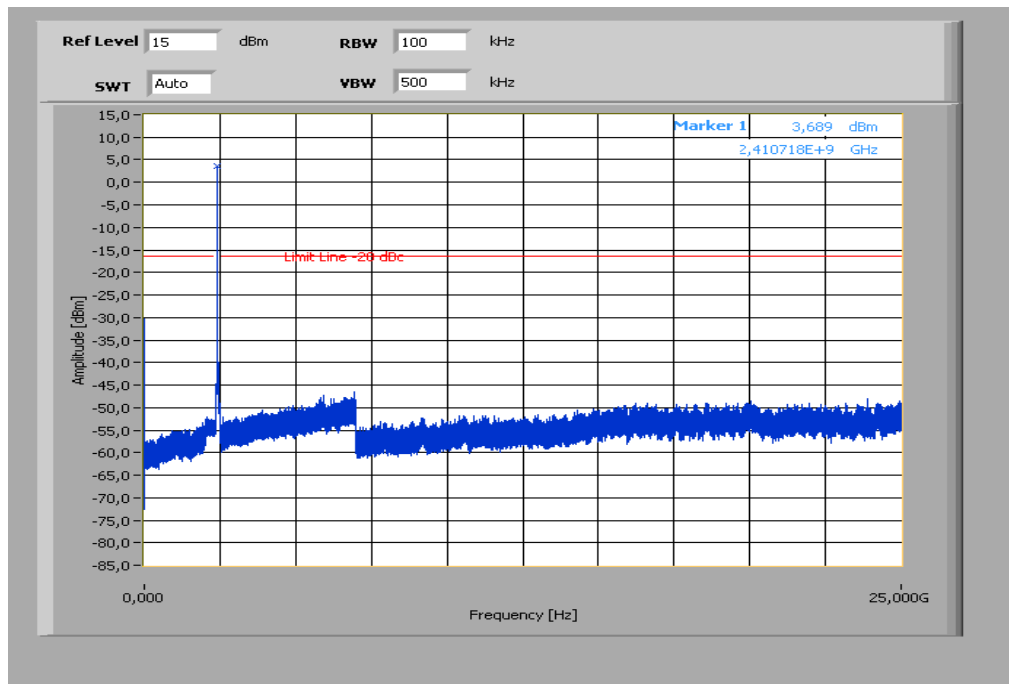
Plot 5: lowest channel, g – mode, 24 Mbps



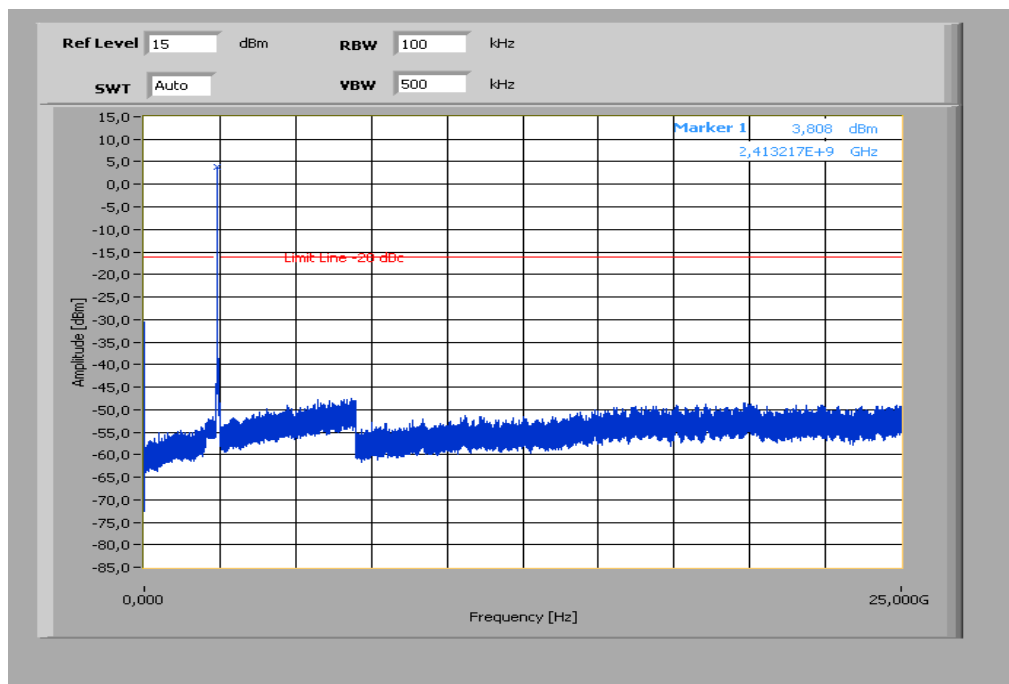
Plot 6: lowest channel, g – mode, 54 Mbps



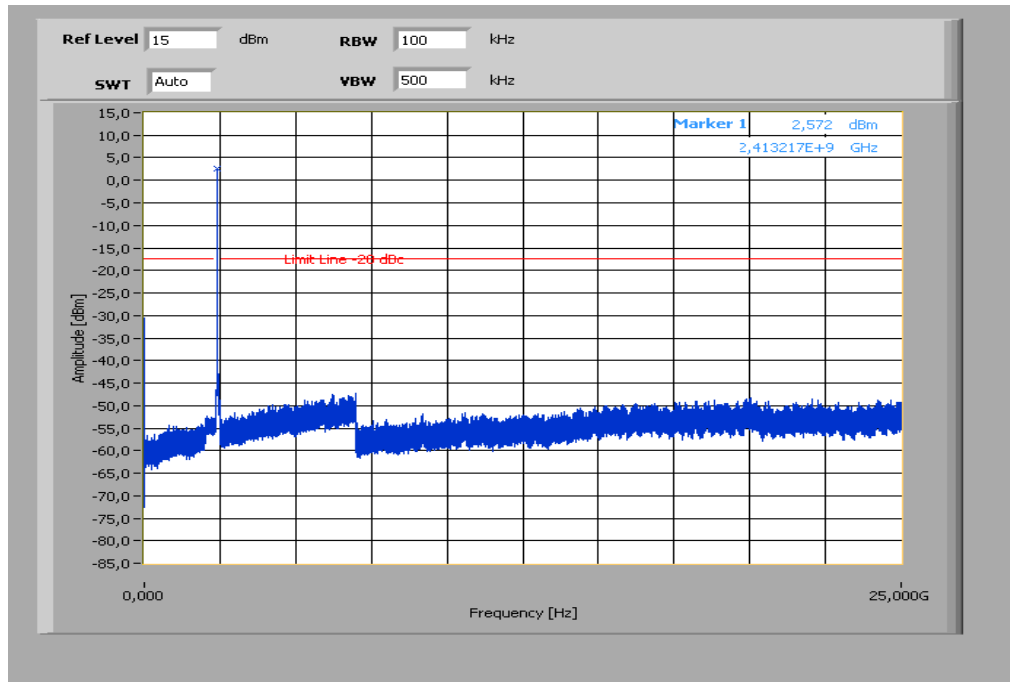
**Plot 7:** lowest channel, n – mode, MCS 0



**Plot 8:** lowest channel, n – mode, MCS 4

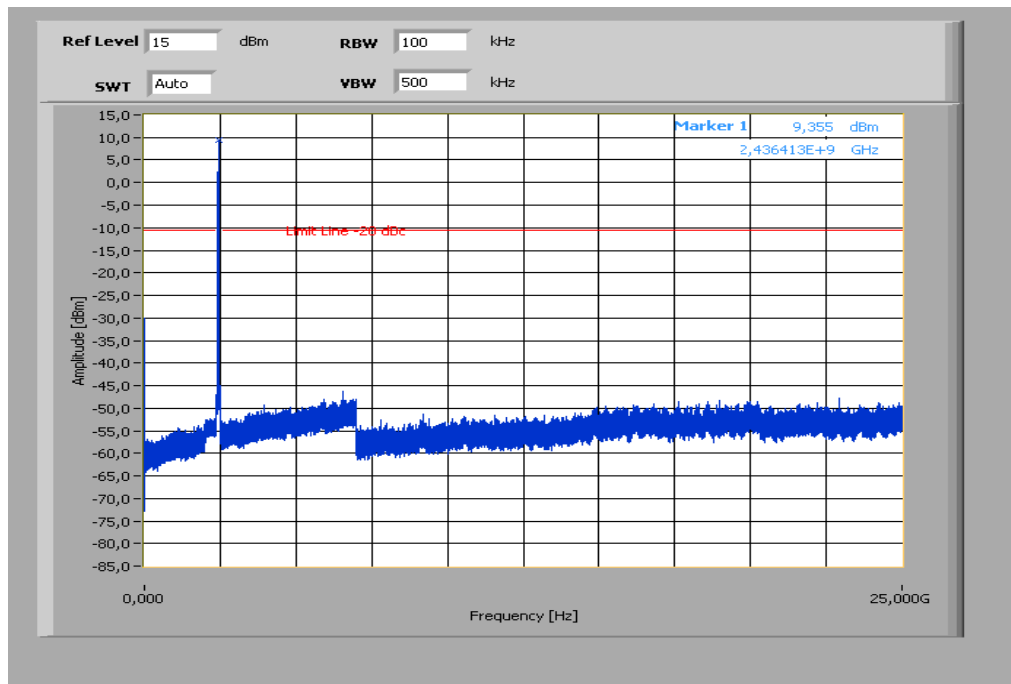


Plot 9: lowest channel, n – mode, MCS 7

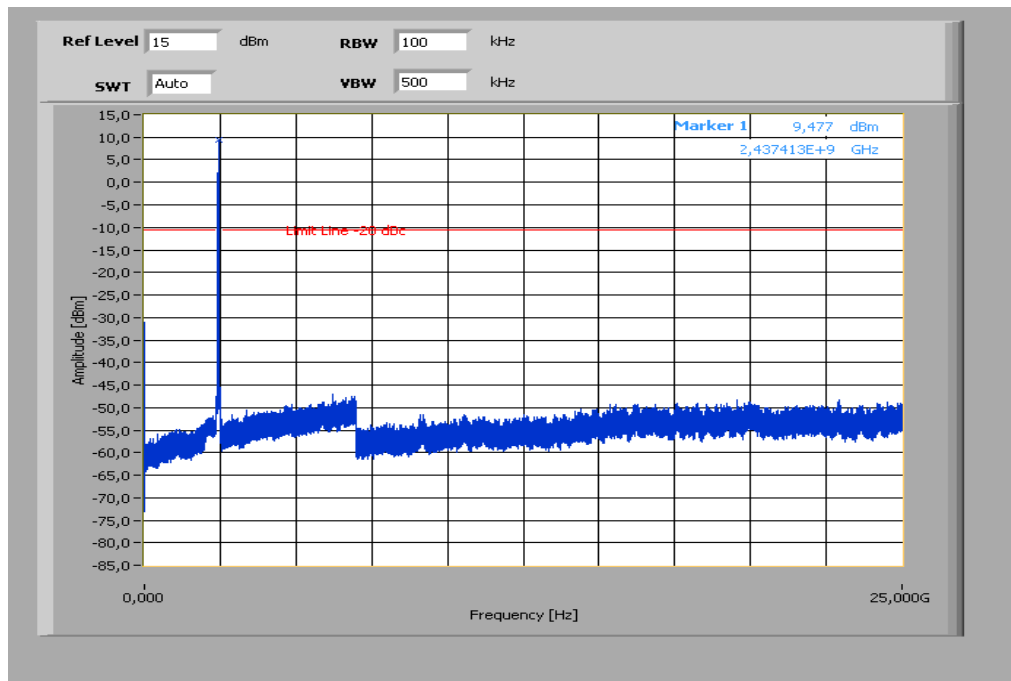




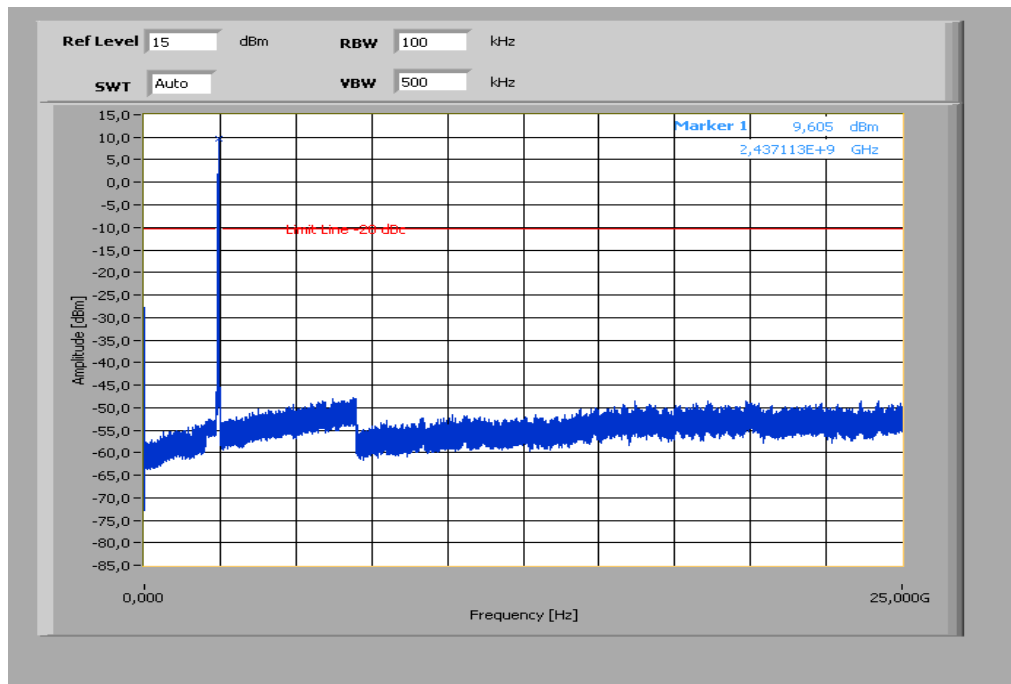
**Plot 10:** middle channel, b – mode, 1 Mbps



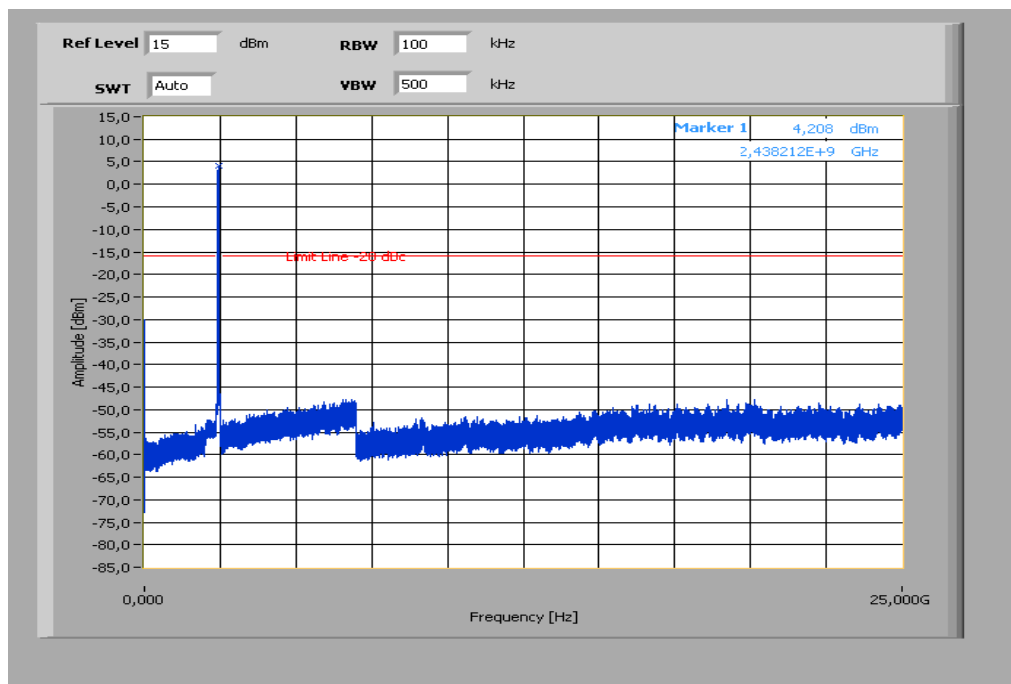
**Plot 11:** middle channel, b – mode, 5.5 Mbps



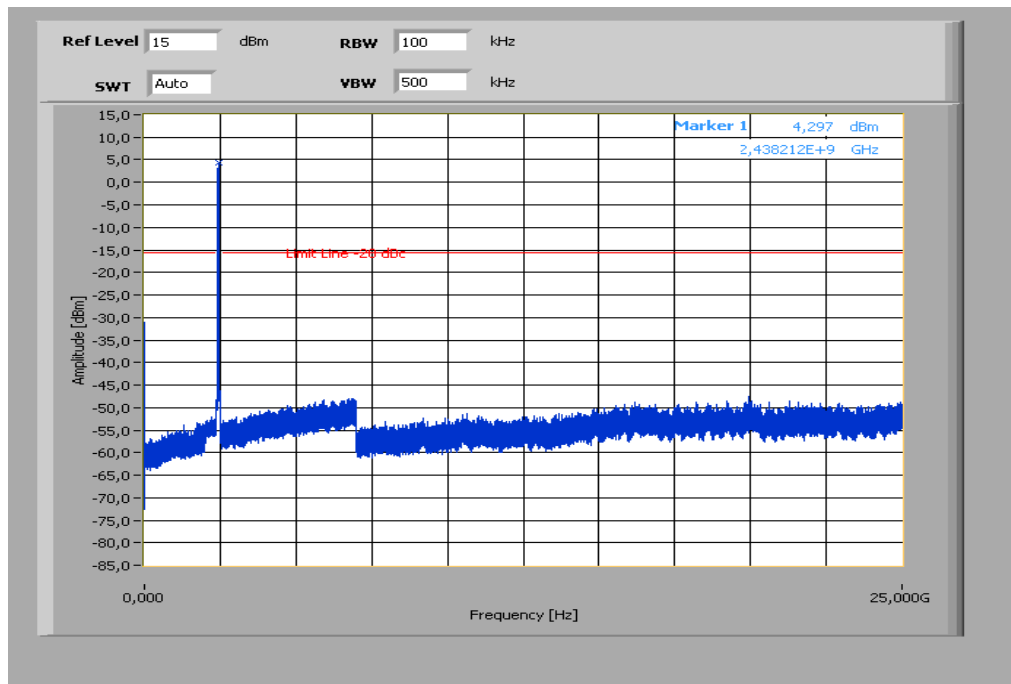
**Plot 12:** middle channel, b – mode, 11 Mbps



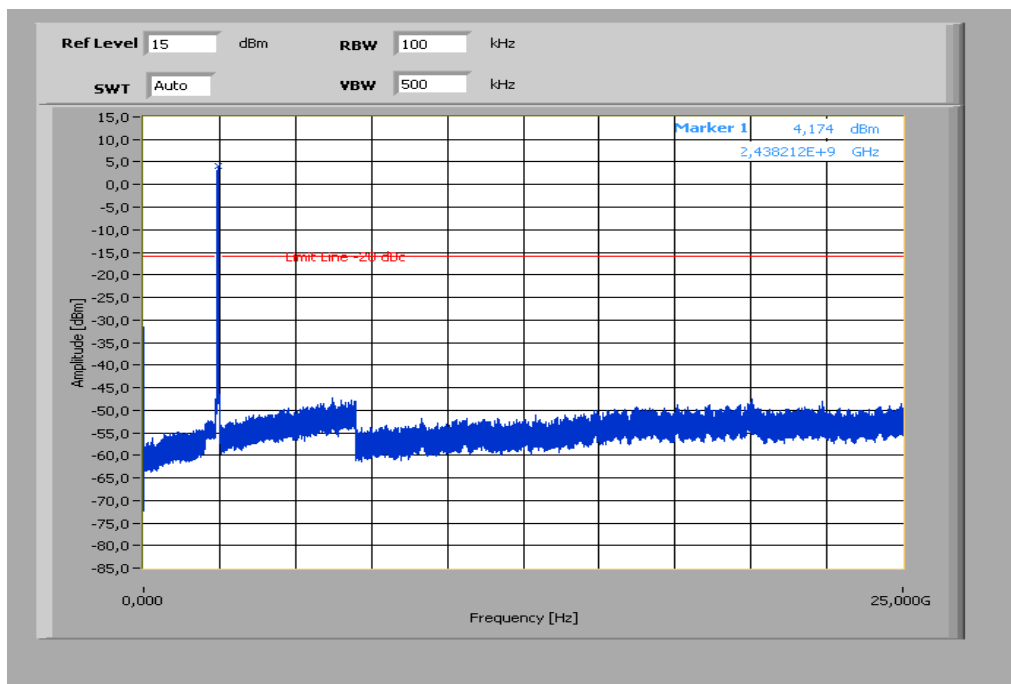
**Plot 13:** middle channel, g – mode, 6 Mbps



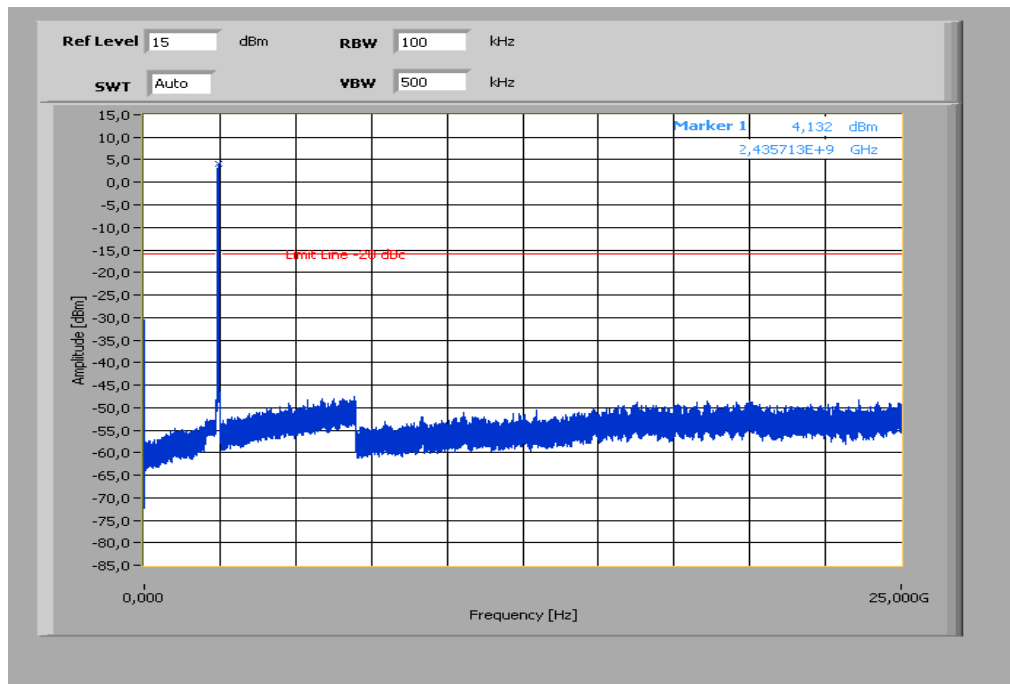
Plot 14: middle channel, g – mode, 24 Mbps



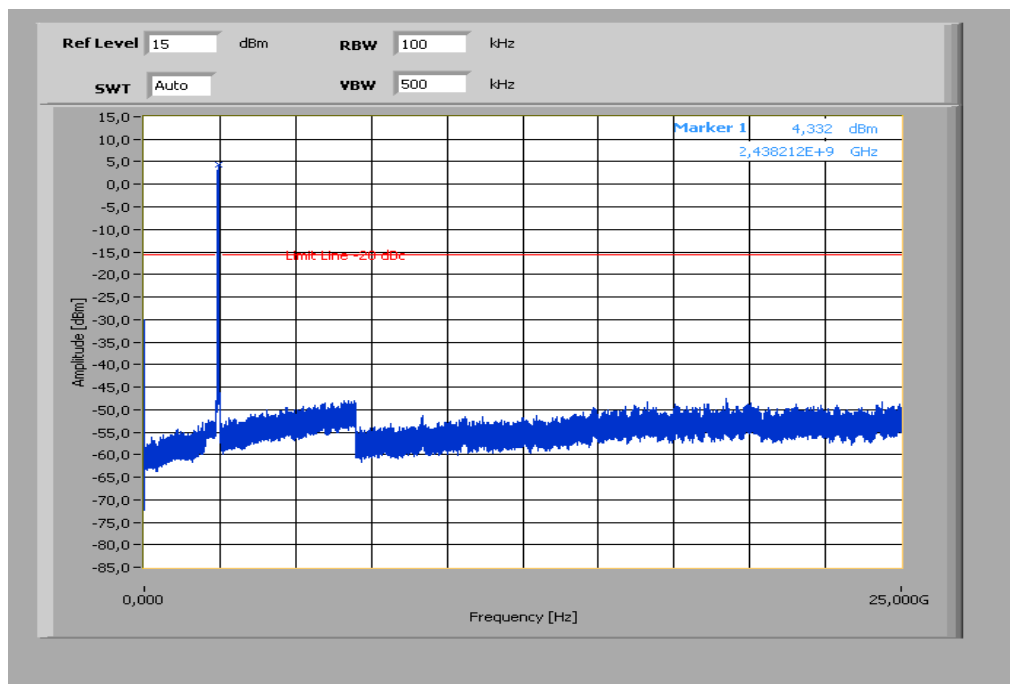
Plot 15: middle channel, g – mode, 54 Mbps



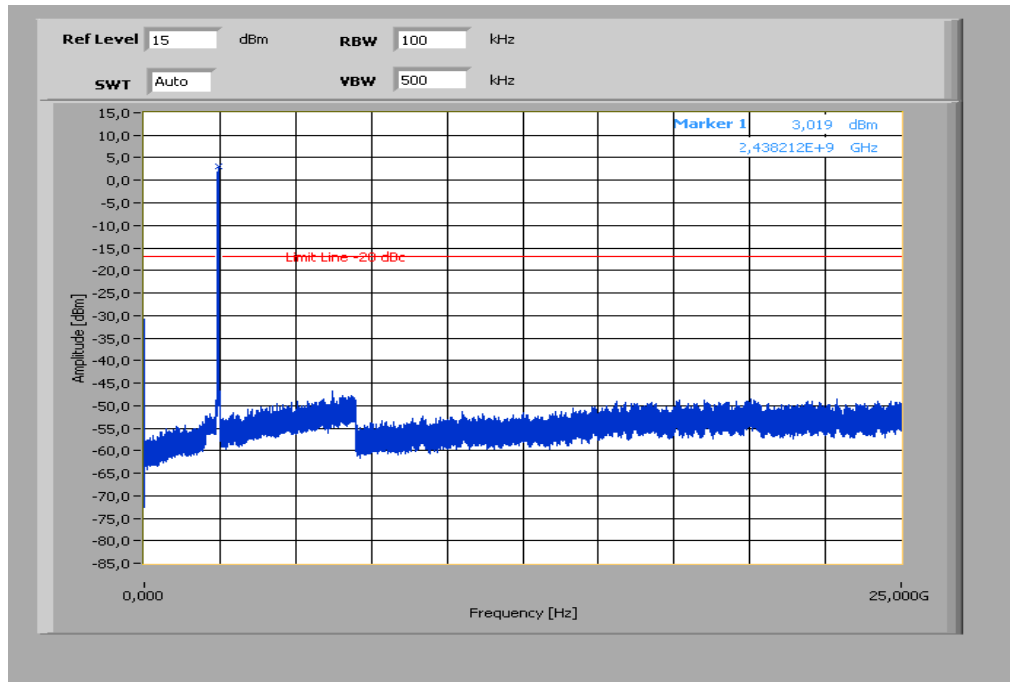
Plot 16: middle channel, n – mode, MCS 0



Plot 17: middle channel, n – mode, MCS 4

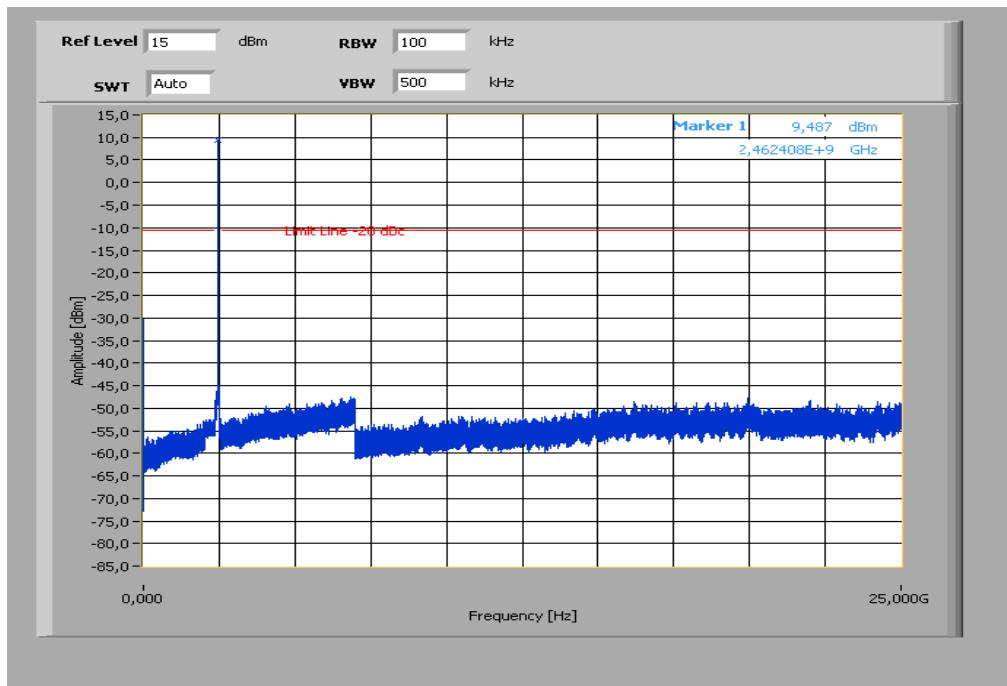


Plot 18: middle channel, n – mode, MCS 7

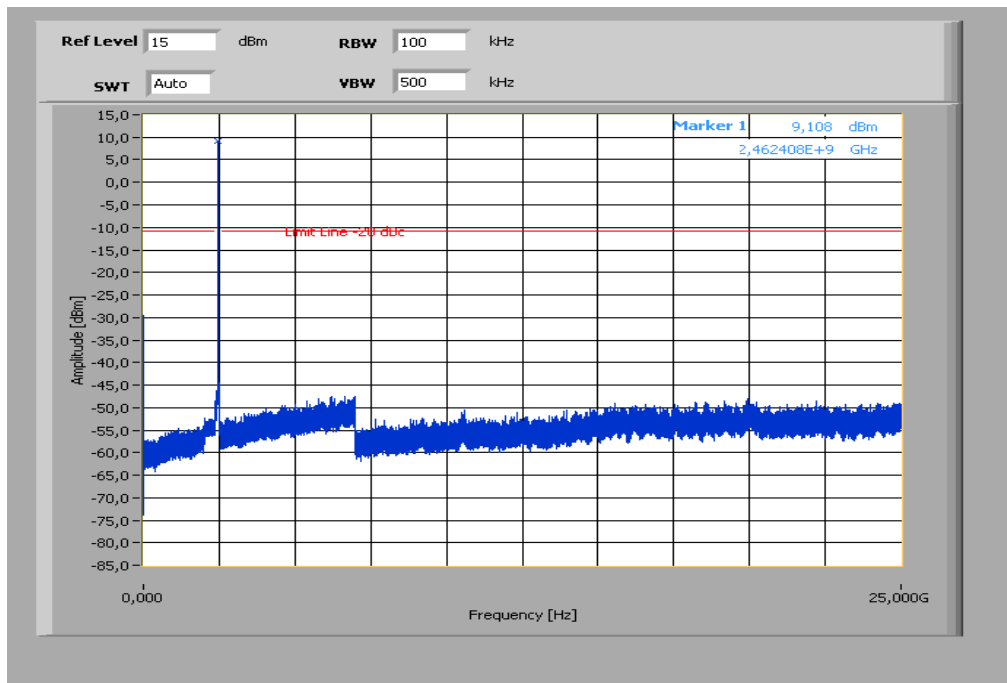




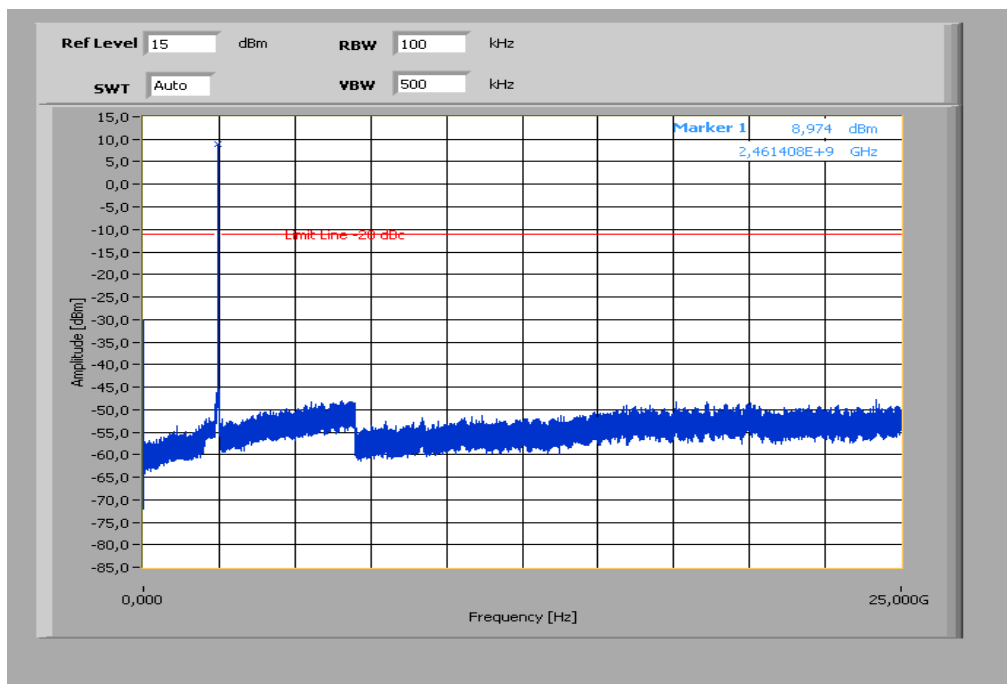
Plot 19: highest channel, b – mode, 1 Mbps



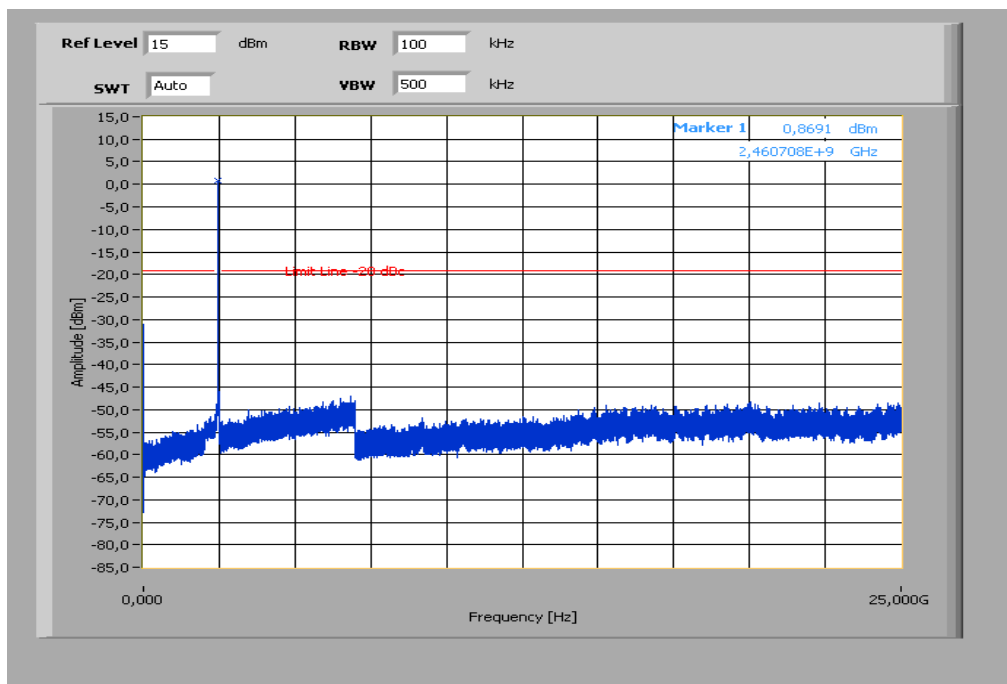
Plot 20: highest channel, b – mode, 5.5 Mbps



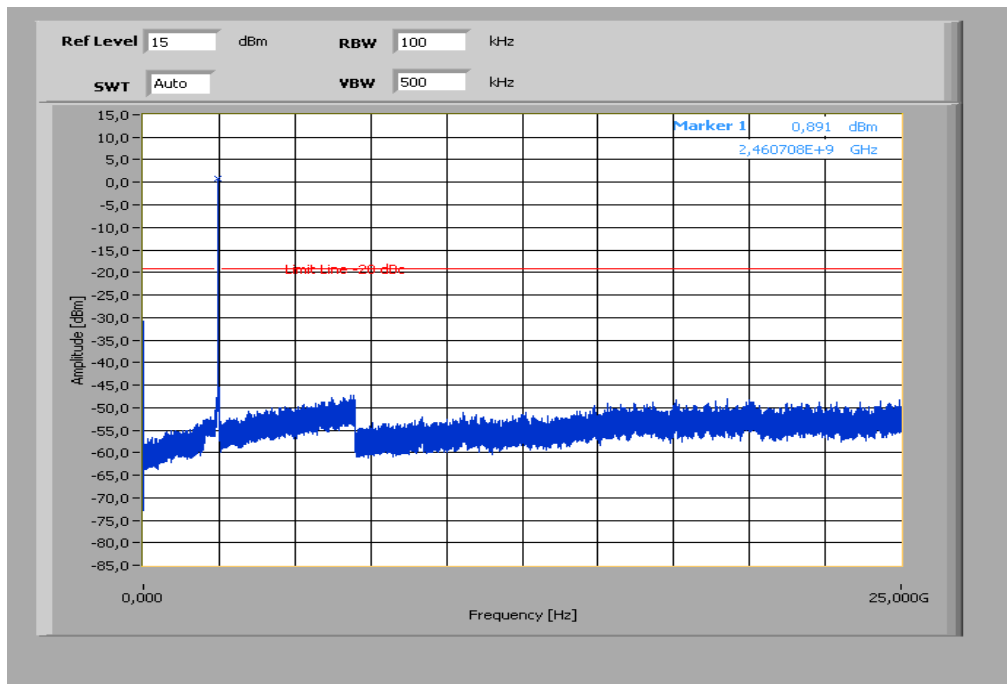
Plot 21: highest channel, b – mode, 11 Mbps



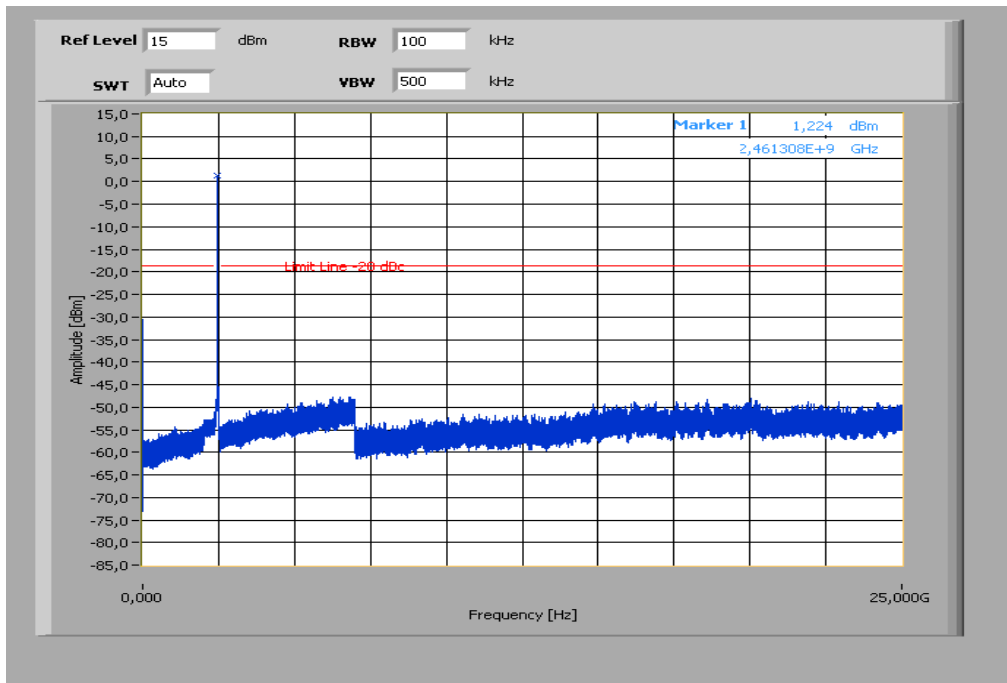
Plot 22: highest channel, g – mode, 6 Mbps



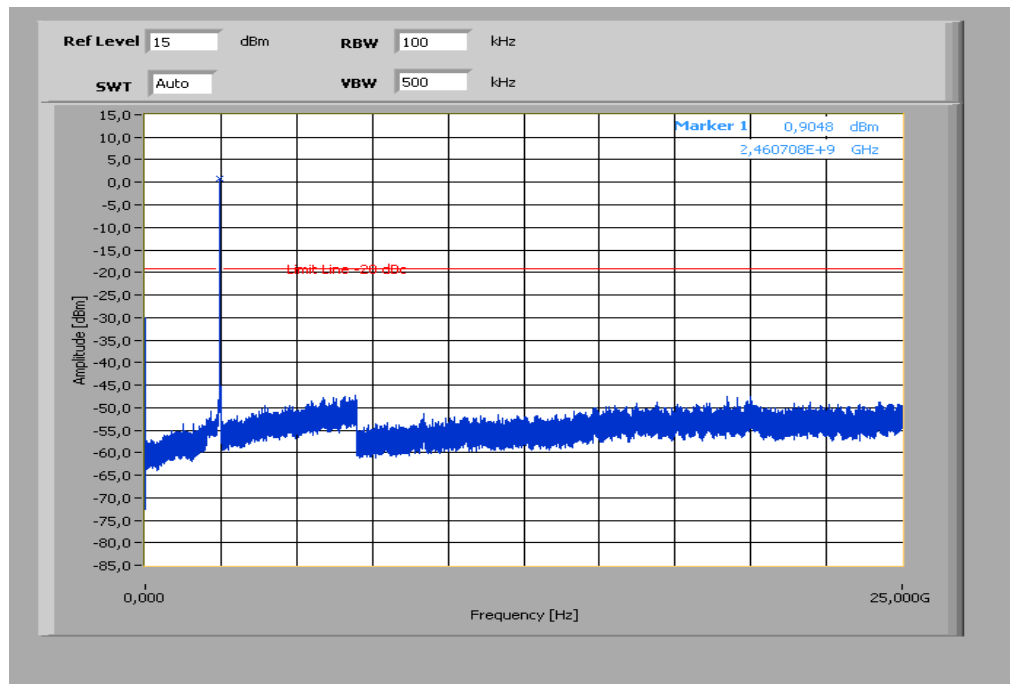
Plot 23: highest channel, g – mode, 24 Mbps



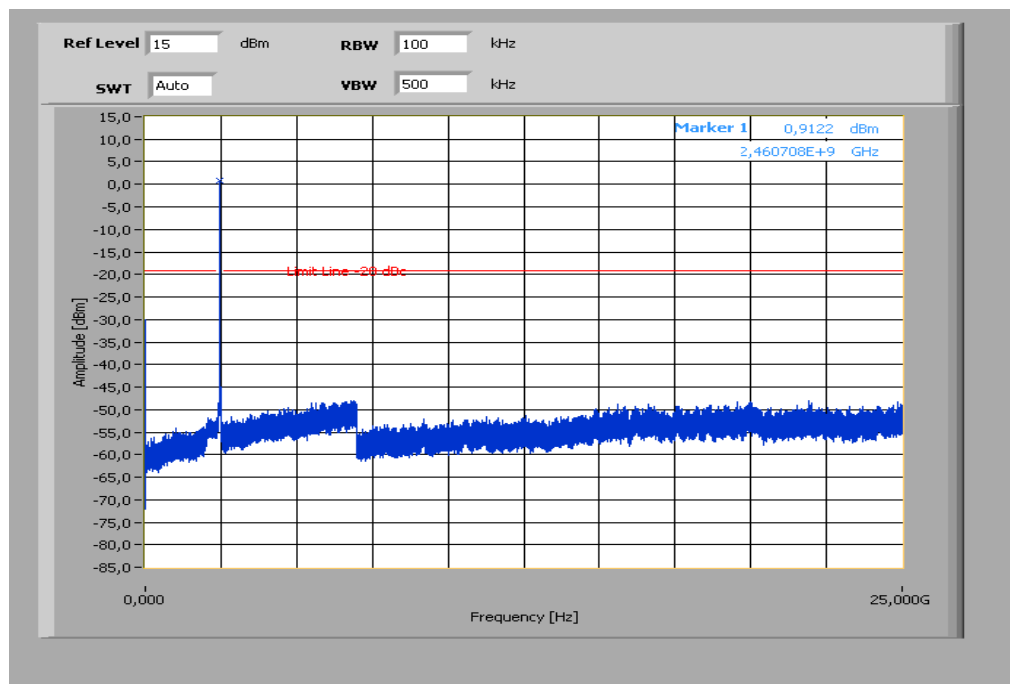
Plot 24: highest channel, g – mode, 54 Mbps



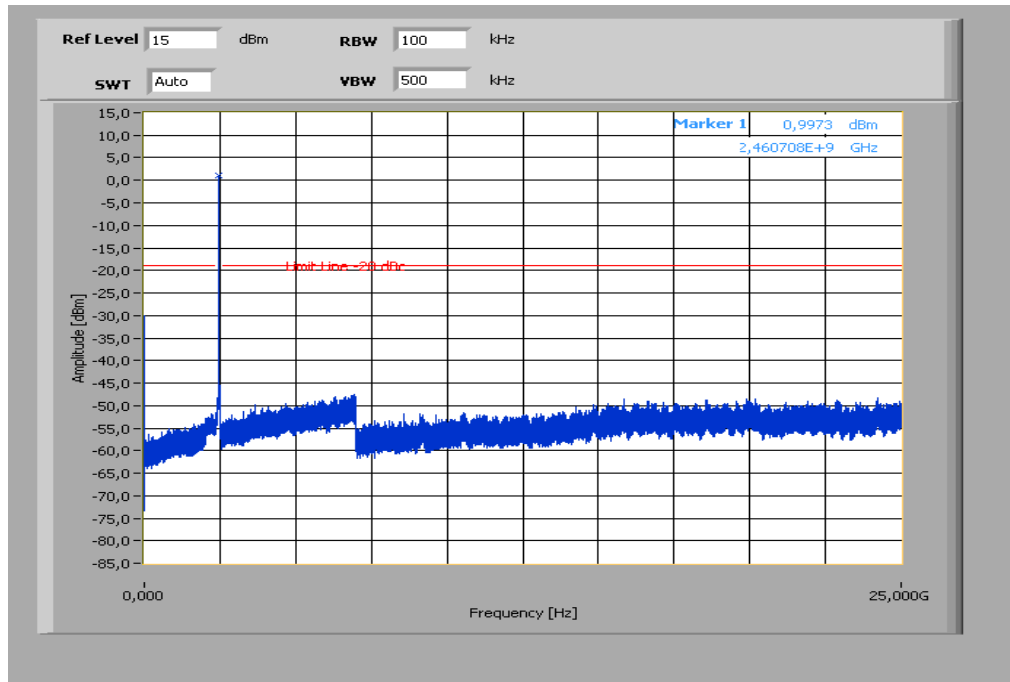
Plot 25: highest channel, n – mode, MCS 0



Plot 26: highest channel, n – mode, MCS 4



Plot 27: highest channel, n – mode, MCS 7





### 9.11 TX spurious emissions radiated

**Description:**

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at channel 1, 7 and 11. The measurement is repeated for all modulations.

**Measurement:**

Measurement parameter	
Detector:	Peak / Quasi Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz
Video bandwidth:	Sweep: 100 kHz Remeasurement: 10 Hz / 3 MHz
Span:	30 MHz to 25 GHz
Trace-Mode:	Max Hold
Measured Modulation	<input checked="" type="checkbox"/> DSSS b – mode <input checked="" type="checkbox"/> OFDM g – mode <input checked="" type="checkbox"/> OFDM n – mode

The modulation with the highest output power was used to perform the transmitter spurious emissions. If spurious were detected a re-measurement was performed on the detected frequency with each modulation.

**Limits:**

FCC	IC	
TX Spurious Emissions Radiated		
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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).		
Frequency (MHz)	Field Strength (dBµV/m)	Measurement distance
30 - 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

**Results: DSSS / b – mode**

TX Spurious Emissions Radiated [dBµV/m]								
DSSS / b – mode								
2412 MHz			2442 MHz			2462 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
All detected emissions measured with a peak detector are below the average limit!			All detected emissions measured with a peak detector are below the average limit!			All detected emissions measured with a peak detector are below the average limit!		
Measurement uncertainty			± 3 dB					

**Result: Passed**

**Results: OFDM / g – mode**

TX Spurious Emissions Radiated [dBµV/m]								
OFDM / g – mode								
2412 MHz			2442 MHz			2462 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
All detected emissions measured with a peak detector are below the average limit!			All detected emissions measured with a peak detector are below the average limit!			All detected emissions measured with a peak detector are below the average limit!		
Measurement uncertainty			± 3 dB					

**Result: Passed**

**Results: OFDM / n – mode**

TX Spurious Emissions Radiated [dBµV/m]								
OFDM / n – mode								
2412 MHz			2442 MHz			2462 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.			For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
All detected emissions measured with a peak detector are below the average limit!			All detected emissions measured with a peak detector are below the average limit!			All detected emissions measured with a peak detector are below the average limit!		
Measurement uncertainty			± 3 dB					

**Result: Passed**

**Plots: DSSS / b – mode**

**Plot 1:** Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

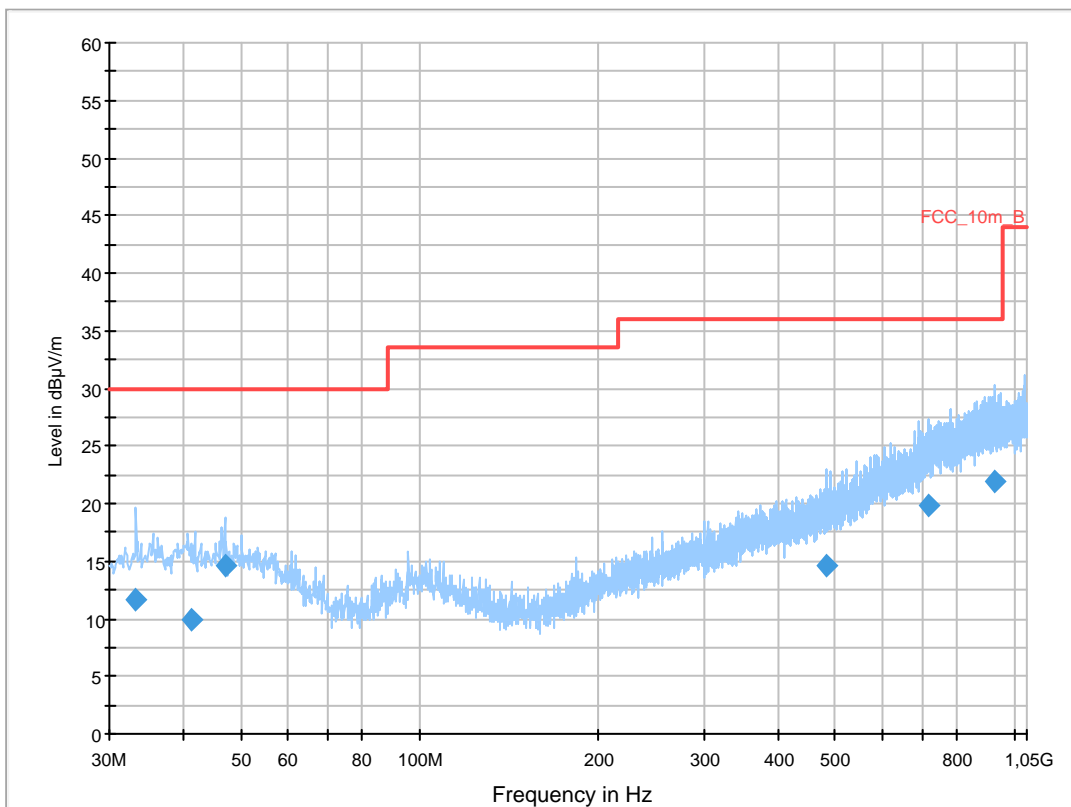
**Common Information**

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan b mode CH1  
 Operator Name: Wolsdorfer  
 Comment: battery powered

**Scan Setup: STAN\_Fin [EMI radiated]**

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

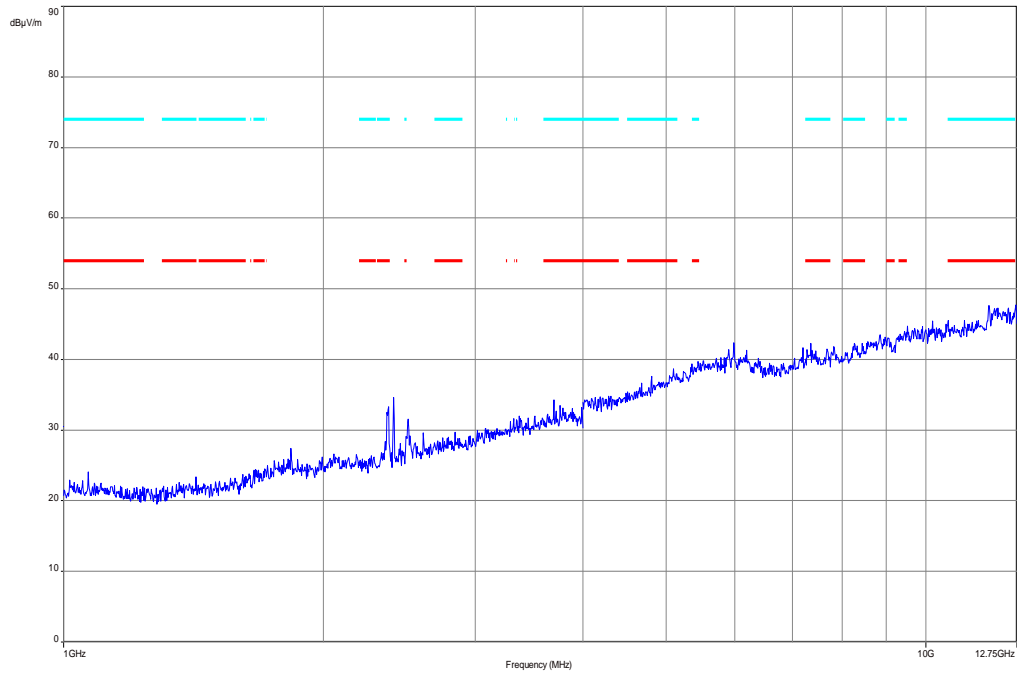
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



**Final Result 1**

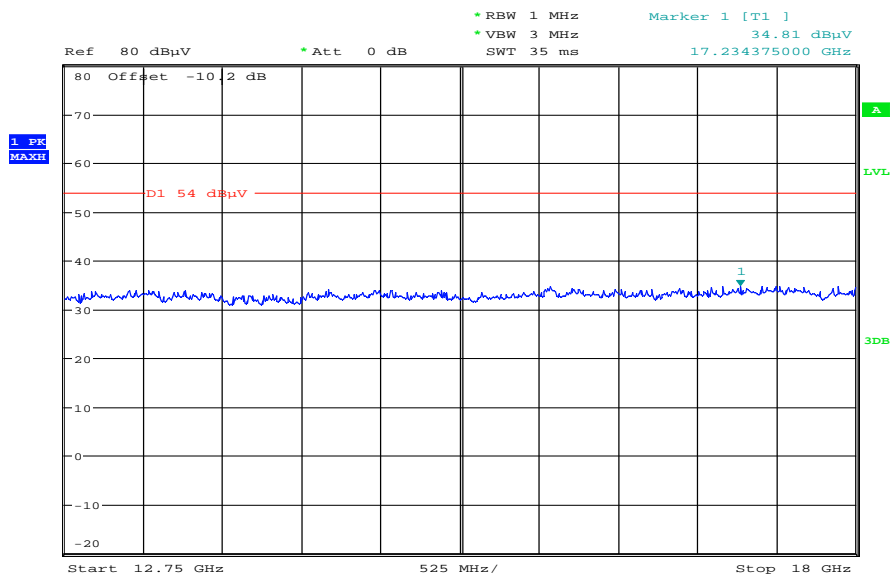
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
33.284550	11.7	1000.0	120.000	170.0	V	280.0	12.9	18.3	30.0	
41.273700	9.9	1000.0	120.000	170.0	V	10.0	13.4	20.1	30.0	
46.966050	14.6	1000.0	120.000	104.0	V	280.0	13.3	15.4	30.0	
483.574950	14.6	1000.0	120.000	170.0	V	260.0	18.4	21.4	36.0	
718.480350	19.8	1000.0	120.000	170.0	V	-5.0	22.9	16.2	36.0	
928.060800	21.9	1000.0	120.000	121.0	H	100.0	25.3	14.1	36.0	

**Plot 2:** Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



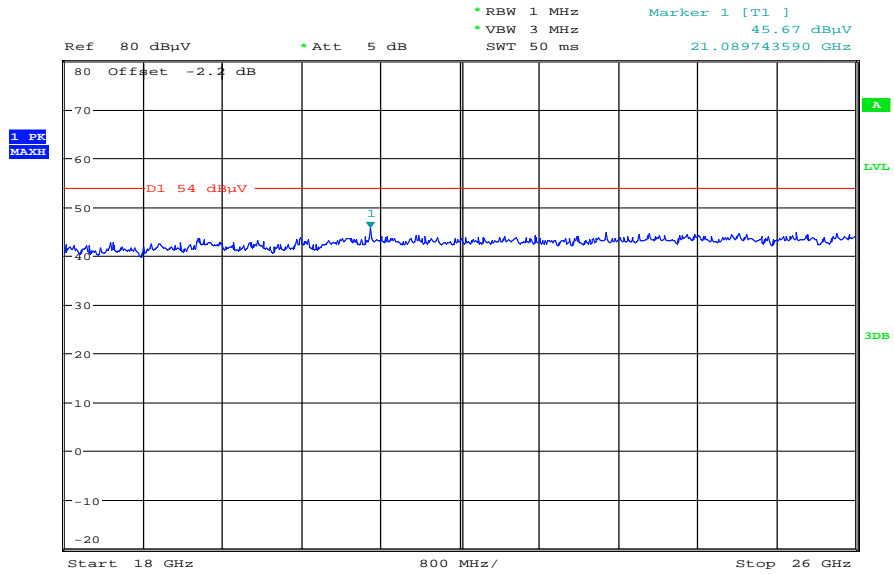
The carrier signal is notched with a 2.4 GHz band rejection filter.

**Plot 3:** Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:17:58

Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:33:10

Plot 5: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization

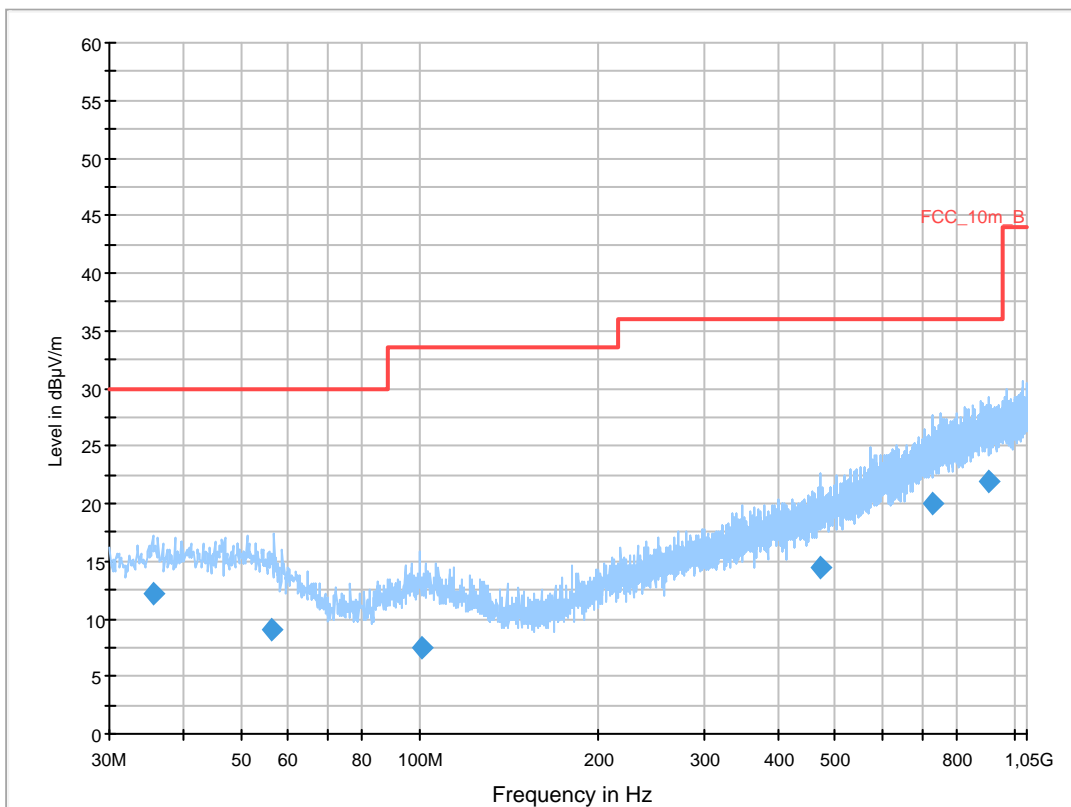
### Common Information

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan b mode CH7  
 Operator Name: Wolsdorfer  
 Comment: battery powered

### Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

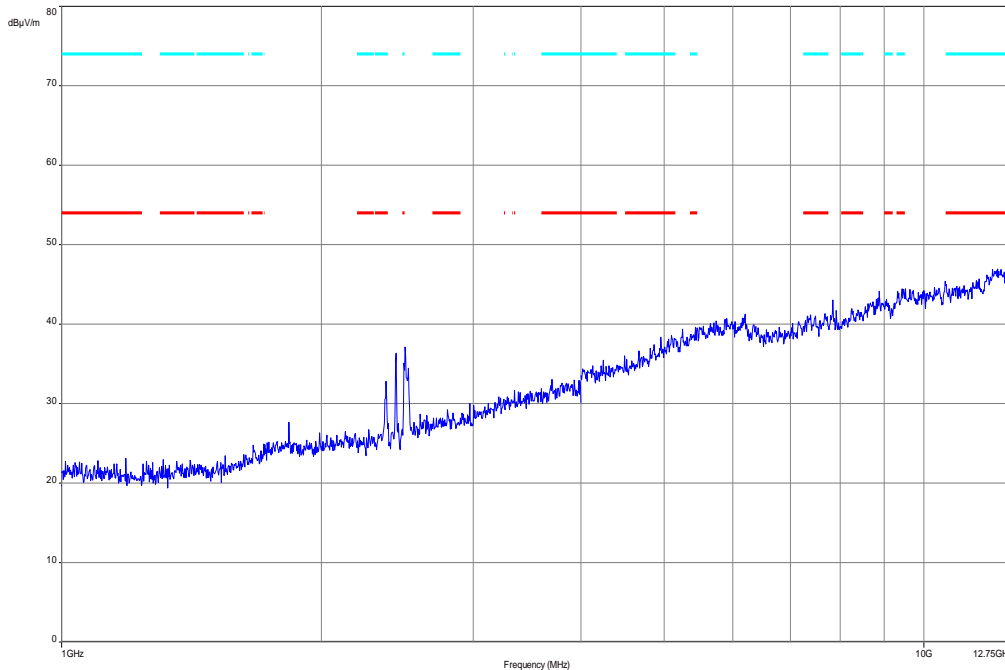


### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.449350	12.2	1000.0	120.000	170.0	V	177.0	13.1	17.8	30.0	
56.329050	9.1	1000.0	120.000	170.0	V	190.0	12.5	20.9	30.0	
100.484550	7.5	1000.0	120.000	170.0	H	10.0	11.9	26.0	33.5	
473.482800	14.4	1000.0	120.000	170.0	V	280.0	18.2	21.6	36.0	
727.653900	20.0	1000.0	120.000	98.0	H	-3.0	23.1	16.0	36.0	
909.418050	21.9	1000.0	120.000	170.0	V	-10.0	25.2	14.1	36.0	

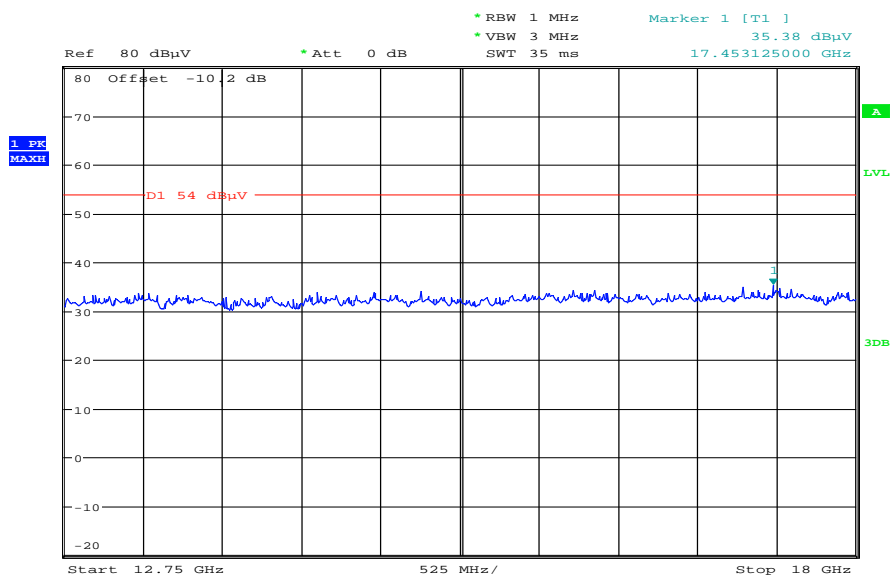


**Plot 6:** Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



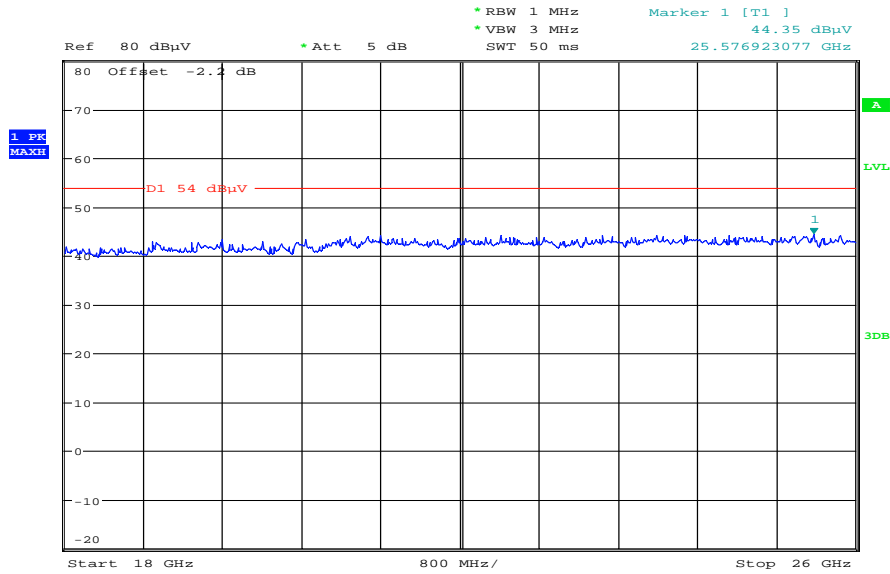
The carrier signal is notched with a 2.4 GHz band rejection filter.

**Plot 7:** Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:18:57

Plot 8: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:34:32

Plot 9: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

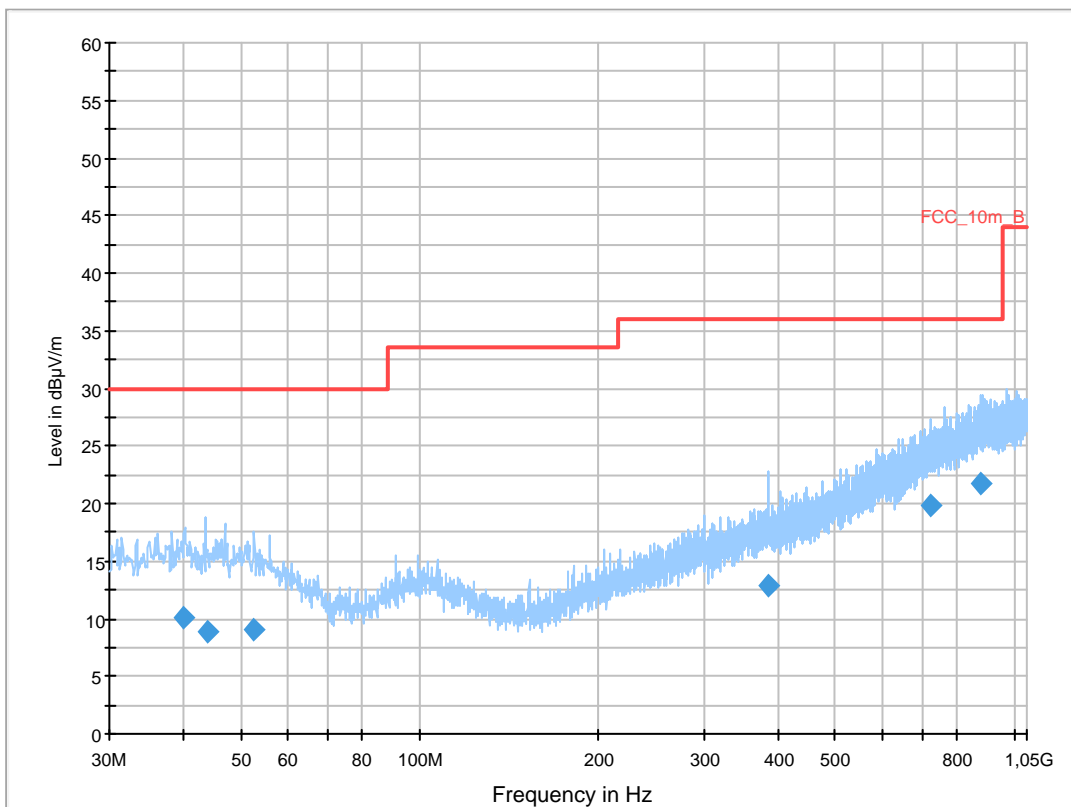
### Common Information

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan b mode CH11  
 Operator Name: Wolsdorfer  
 Comment: battery powered

### Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

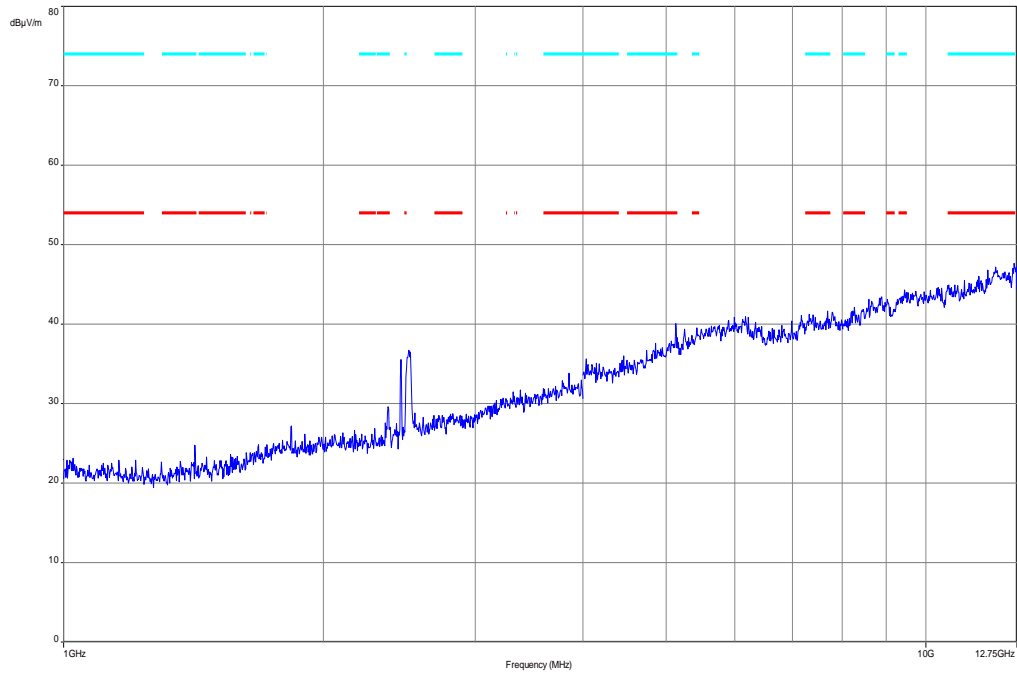
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



### Final Result 1

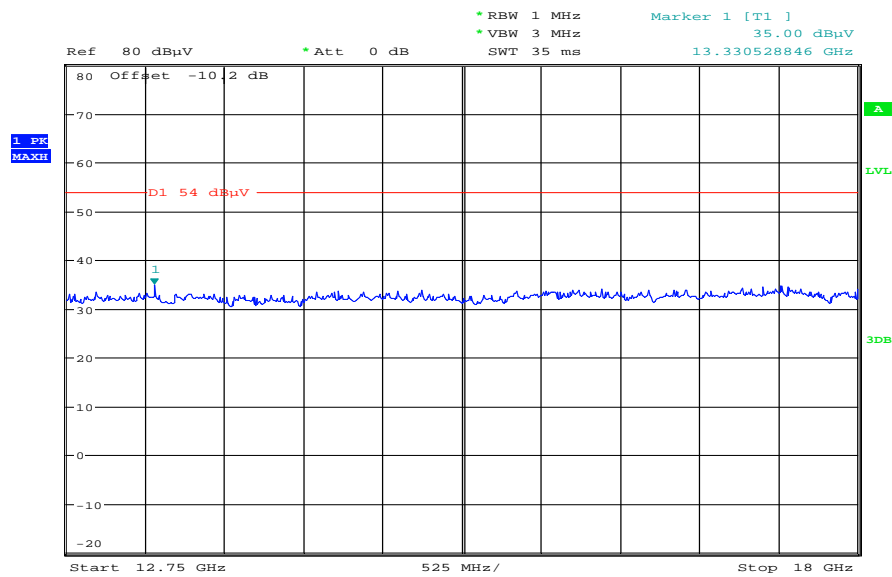
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
39.962550	10.1	1000.0	120.000	170.0	V	180.0	13.4	19.9	30.0	
43.997100	8.9	1000.0	120.000	170.0	H	170.0	13.3	21.1	30.0	
52.546950	9.0	1000.0	120.000	170.0	V	-10.0	13.1	21.0	30.0	
385.206600	12.8	1000.0	120.000	170.0	H	190.0	16.7	23.2	36.0	
721.086000	19.9	1000.0	120.000	170.0	H	10.0	23.0	16.1	36.0	
876.768000	21.8	1000.0	120.000	153.0	V	182.0	24.9	14.2	36.0	

**Plot 10:** Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



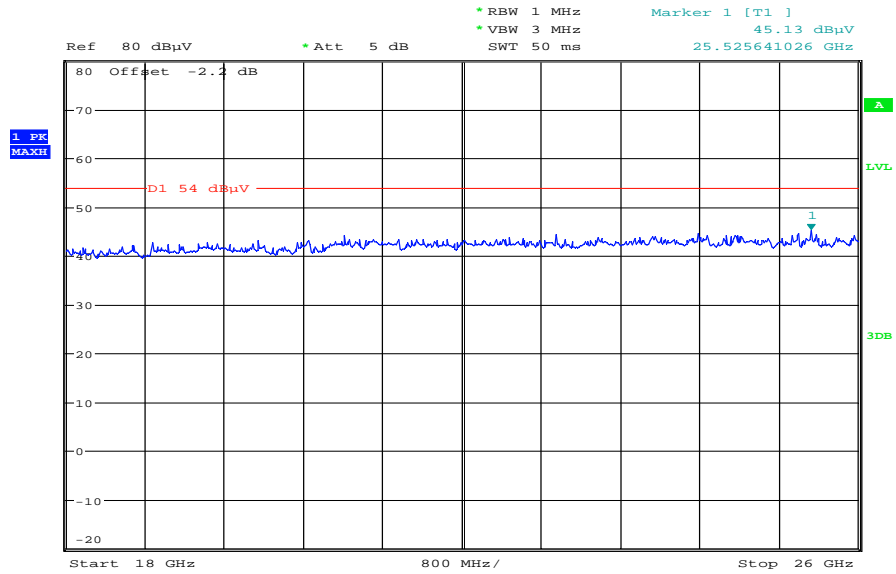
The carrier signal is notched with a 2.4 GHz band rejection filter.

**Plot 11:** Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:20:13

Plot 12: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:35:29

**Plots: OFDM / g – mode**

**Plot 1:** Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

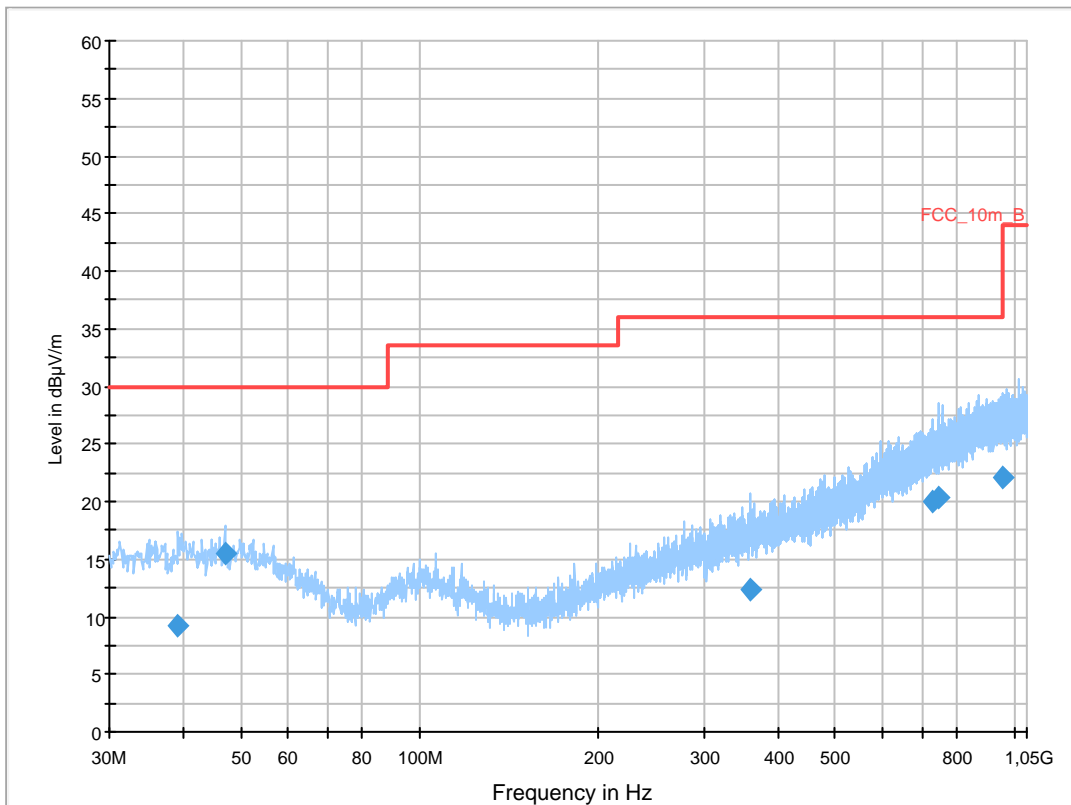
**Common Information**

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan g mode CH1  
 Operator Name: Wolsdorfer  
 Comment: battery powered

**Scan Setup: STAN\_Fin [EMI radiated]**

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

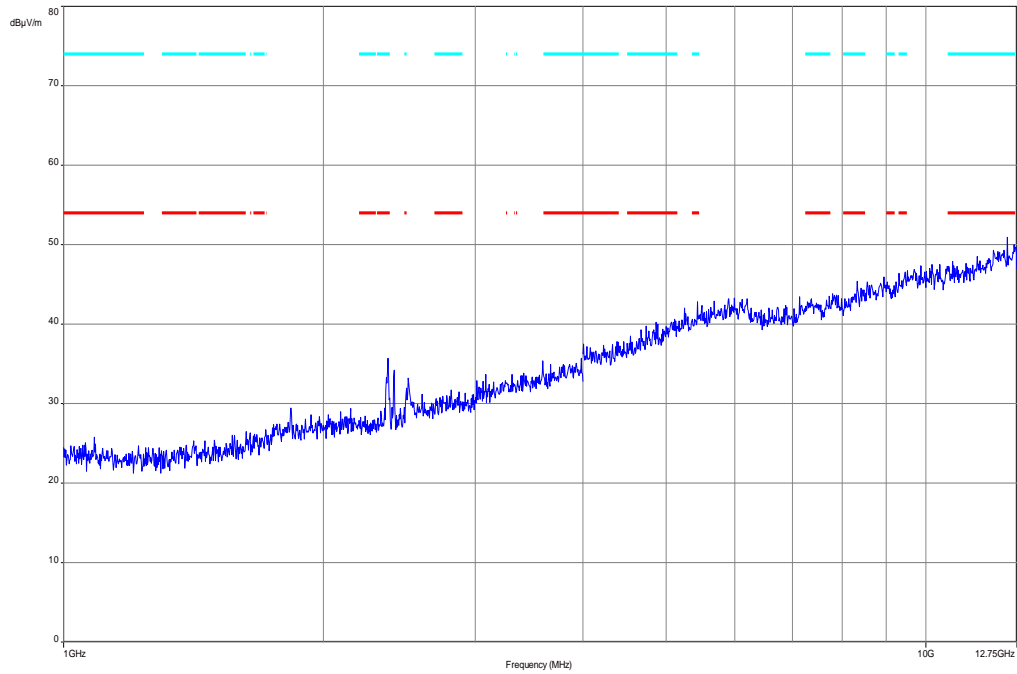


**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
39.162750	9.3	1000.0	120.000	120.0	V	260.0	13.4	20.7	30.0	
46.988550	15.5	1000.0	120.000	98.0	V	92.0	13.3	14.5	30.0	
359.280450	12.3	1000.0	120.000	170.0	V	261.0	16.2	23.7	36.0	
730.189650	20.0	1000.0	120.000	170.0	H	280.0	23.2	16.0	36.0	
745.066650	20.4	1000.0	120.000	98.0	V	-3.0	23.5	15.6	36.0	
958.862400	22.1	1000.0	120.000	120.0	H	170.0	25.4	13.9	36.0	

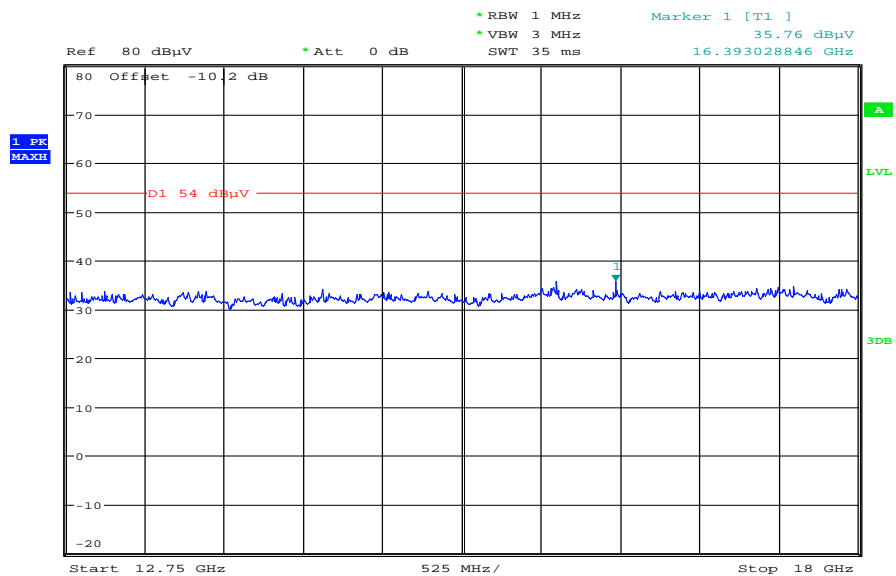


**Plot 2:** Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



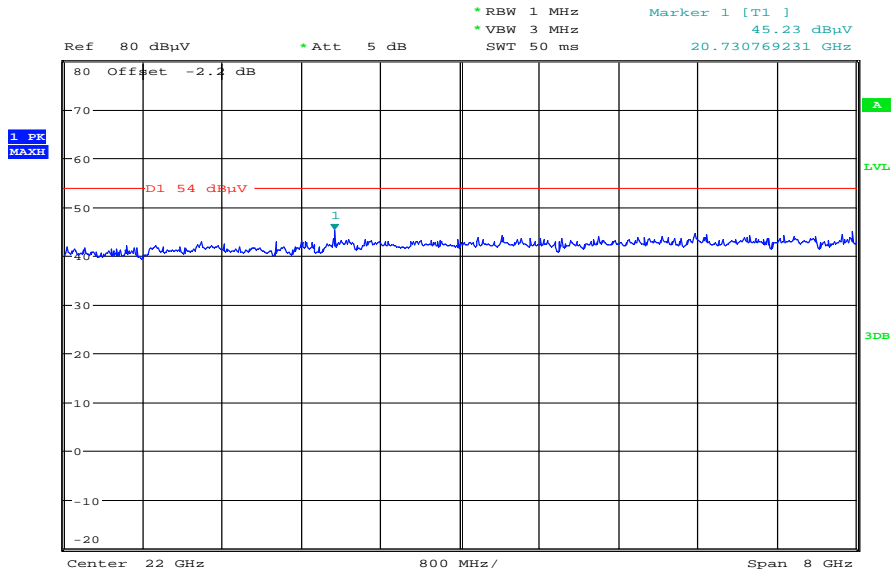
The carrier signal is notched with a 2.4 GHz band rejection filter.

**Plot 3:** Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:21:37

Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 10:19:11

Plot 5: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization

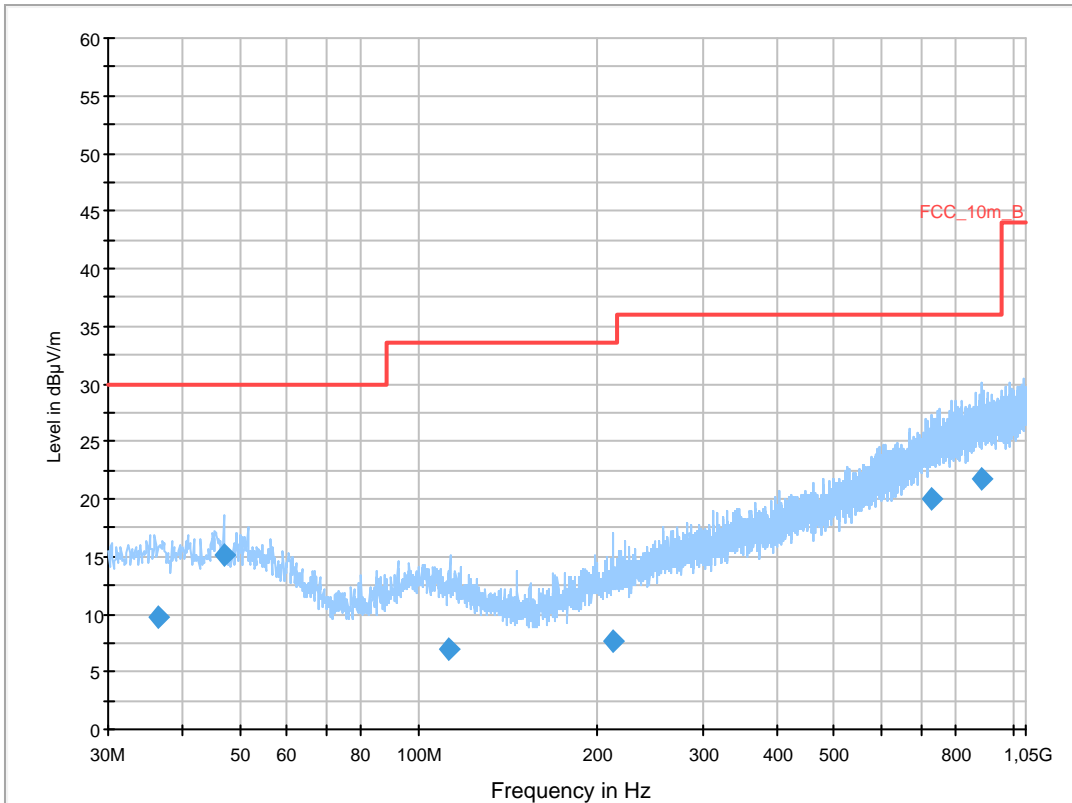
### Common Information

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan g mode CH7  
 Operator Name: Wolsdorfer  
 Comment: battery powered

### Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)  
 Level Unit: dBµV/m

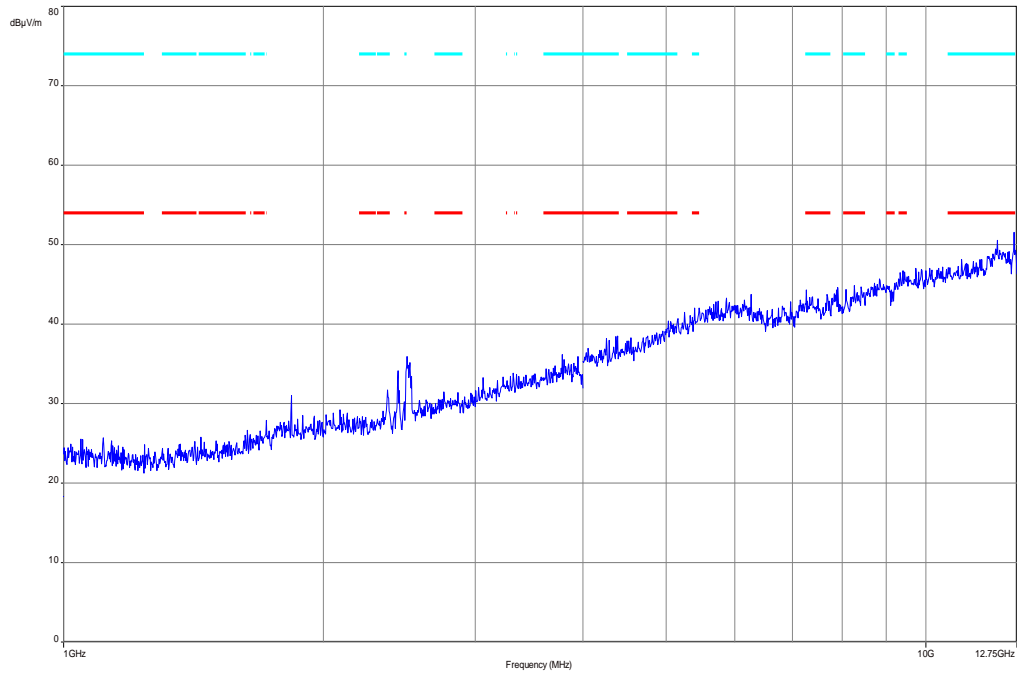
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



### Final Result 1

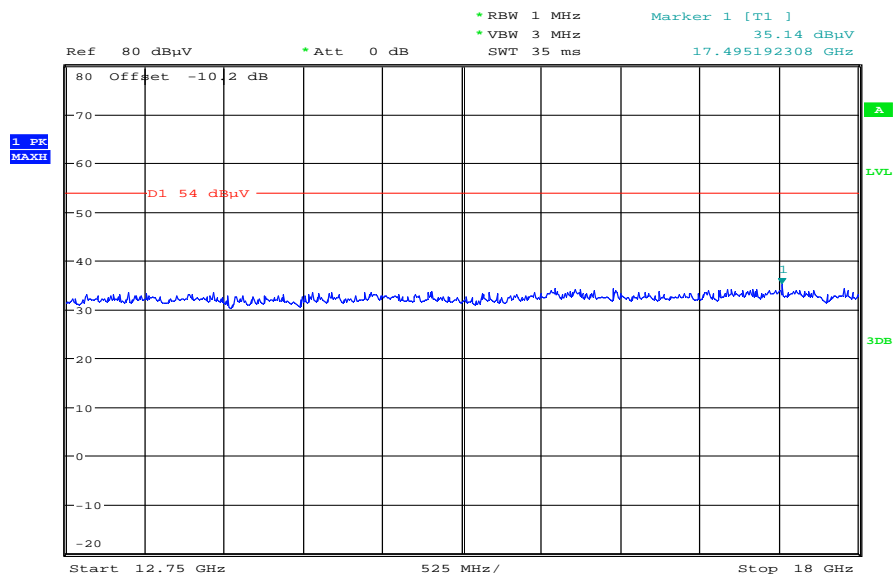
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
36.399000	9.8	1000.0	120.000	170.0	H	10.0	13.1	20.2	30.0	
46.979100	15.1	1000.0	120.000	98.0	V	170.0	13.3	14.9	30.0	
112.564650	7.0	1000.0	120.000	98.0	V	100.0	10.8	26.5	33.5	
212.266950	7.7	1000.0	120.000	98.0	H	170.0	12.1	25.8	33.5	
730.870200	20.0	1000.0	120.000	170.0	H	85.0	23.2	16.0	36.0	
887.715750	21.8	1000.0	120.000	98.0	H	260.0	25.0	14.2	36.0	

**Plot 6:** Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



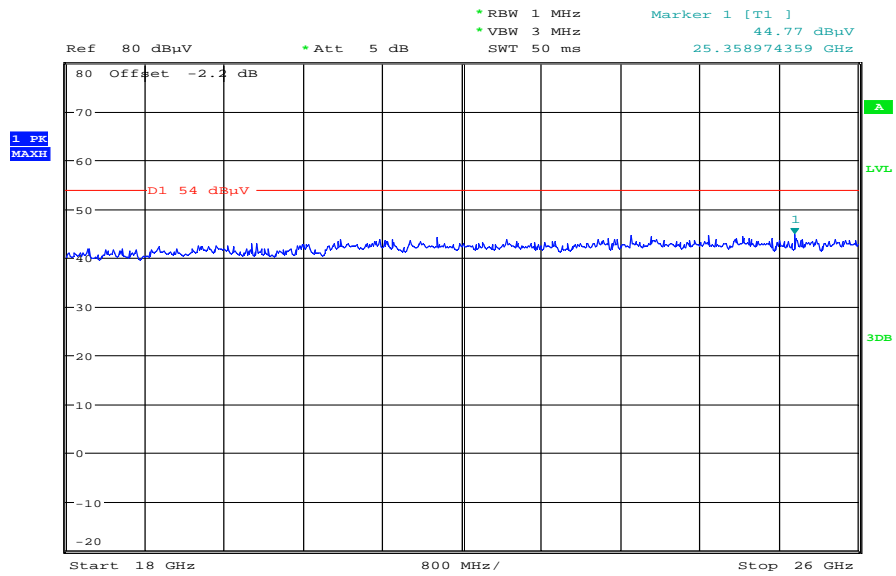
The carrier signal is notched with a 2.4 GHz band rejection filter.

**Plot 7:** Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:22:58

Plot 8: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:37:58

Plot 9: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

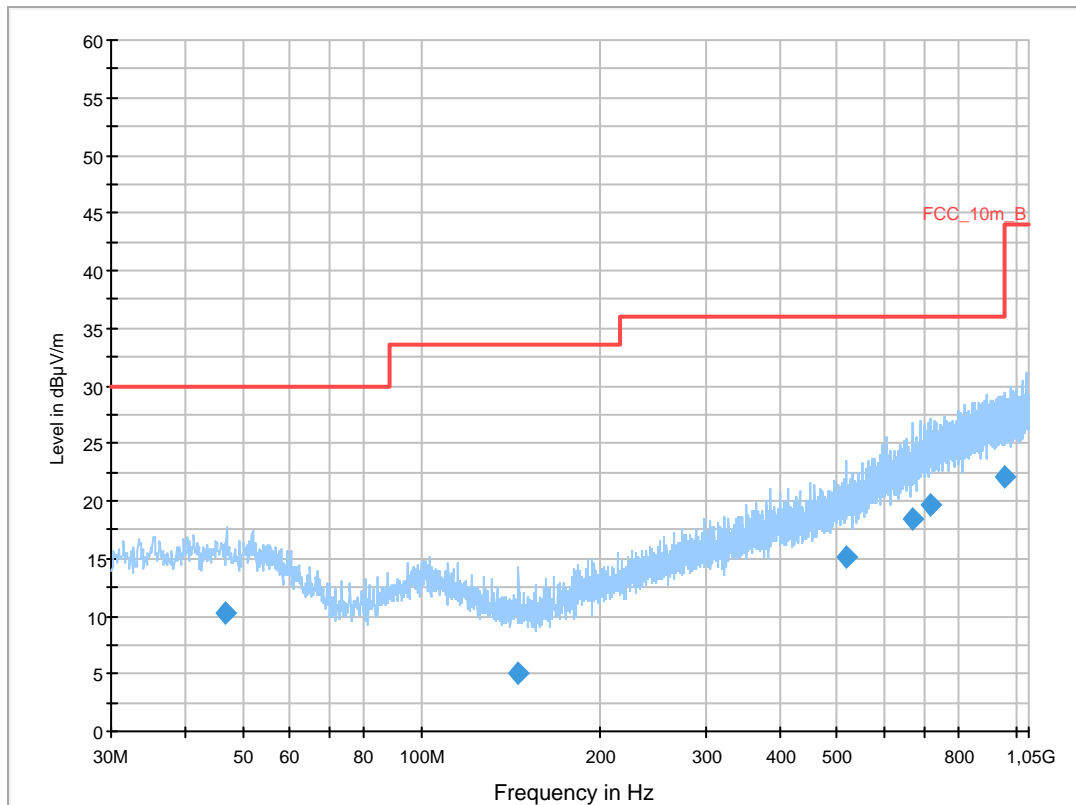
### Common Information

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan g mode CH11  
 Operator Name: Wolsdorfer  
 Comment: battery powered

### Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)  
 Level Unit: dBµV/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

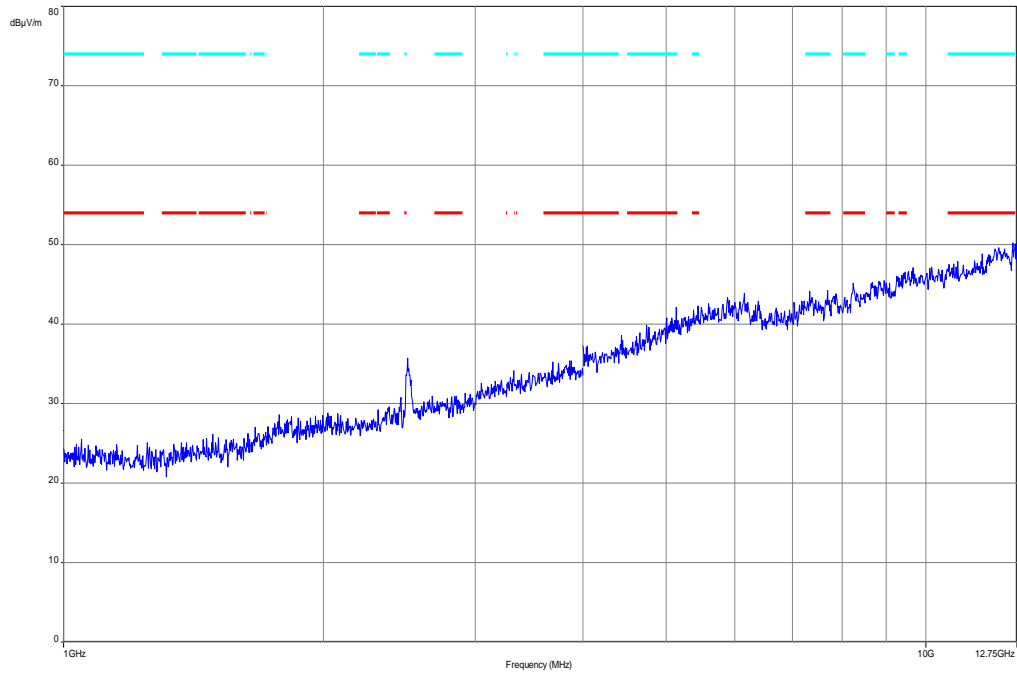


### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
46.724550	10.2	1000.0	120.000	98.0	V	175.0	13.3	19.8	30.0	
145.589250	5.0	1000.0	120.000	98.0	V	280.0	8.8	28.5	33.5	
517.640700	15.1	1000.0	120.000	98.0	V	183.0	18.9	20.9	36.0	
670.076250	18.4	1000.0	120.000	163.0	H	280.0	21.7	17.6	36.0	
716.510850	19.7	1000.0	120.000	98.0	V	267.0	22.9	16.3	36.0	
954.057300	22.1	1000.0	120.000	170.0	V	-10.0	25.4	13.9	36.0	

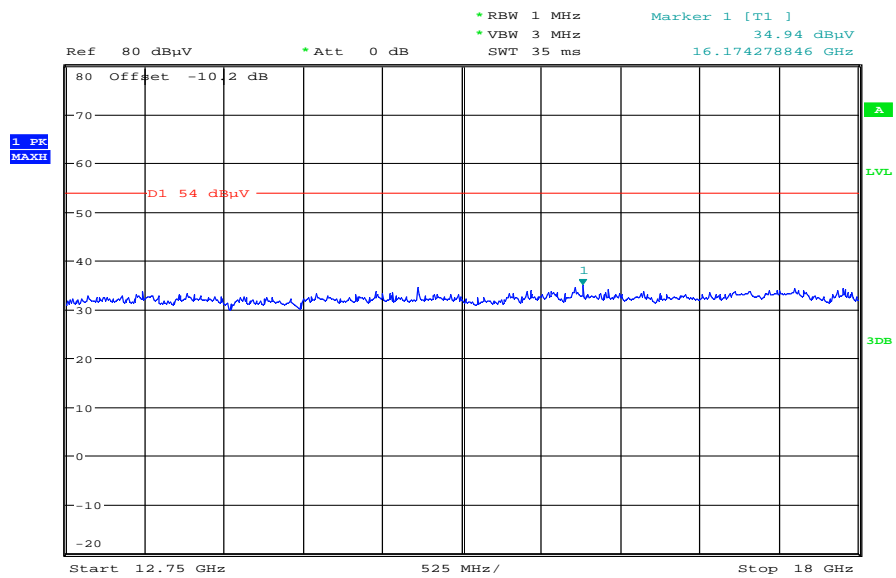


**Plot 10:** Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



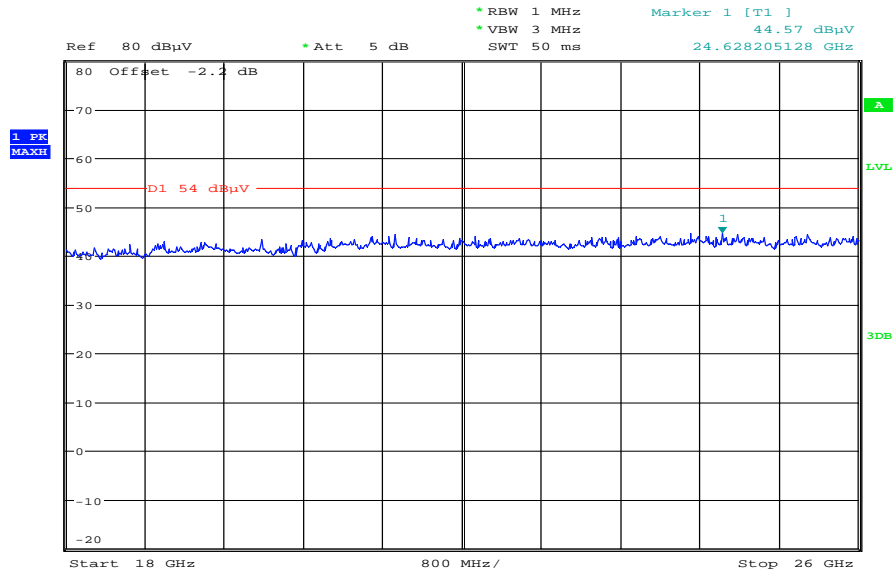
The carrier signal is notched with a 2.4 GHz band rejection filter.

**Plot 11:** Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:24:52

Plot 12: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:39:06

**Plots: OFDM / n – mode**

**Plot 1:** Lowest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

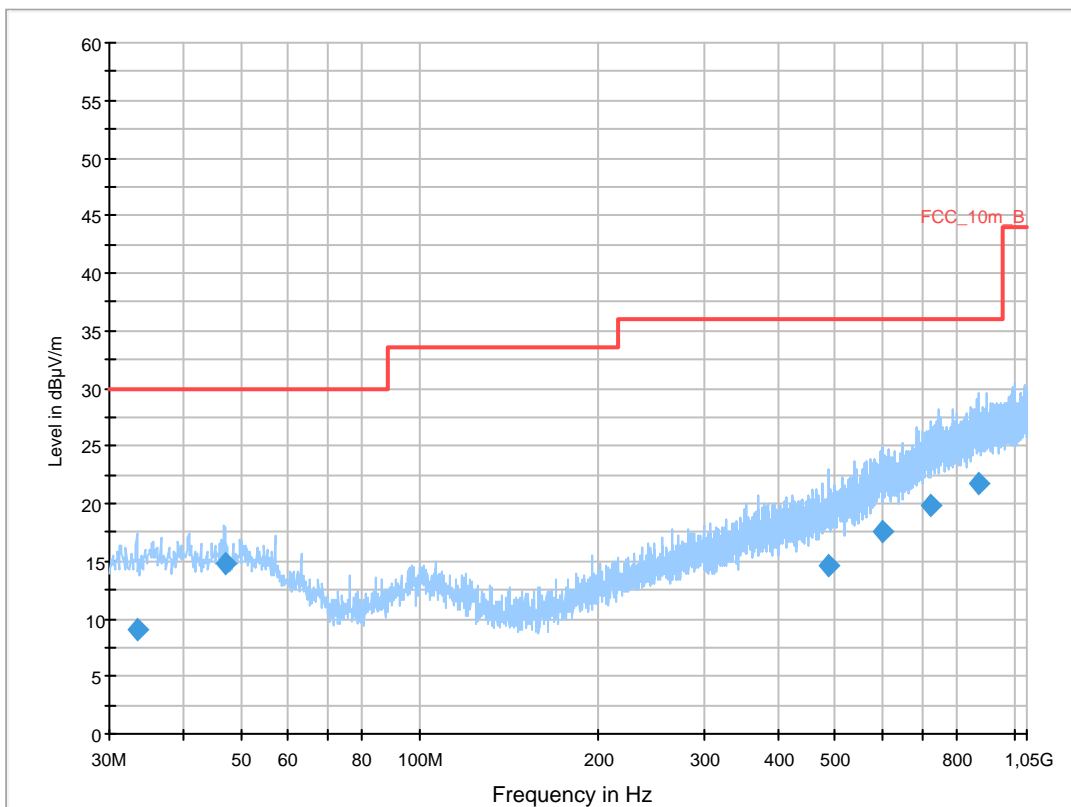
**Common Information**

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan n mode CH1 mcs0  
 Operator Name: Wolsdorfer  
 Comment: battery powered

**Scan Setup: STAN\_Fin [EMI radiated]**

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

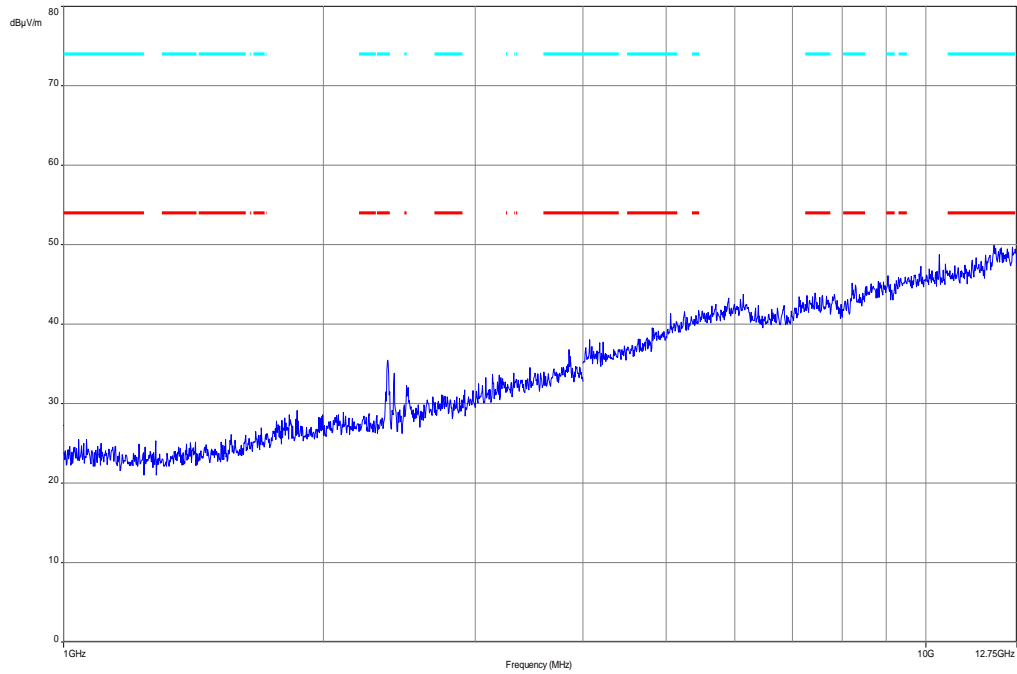
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



**Final Result 1**

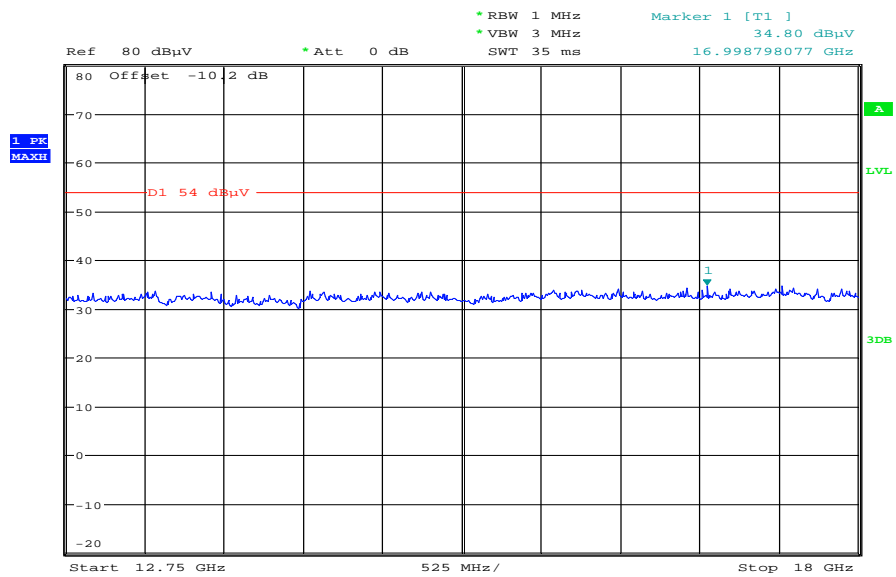
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
33.515700	9.1	1000.0	120.000	141.0	V	190.0	12.9	20.9	30.0	
46.985850	14.8	1000.0	120.000	120.0	V	100.0	13.3	15.2	30.0	
488.124150	14.6	1000.0	120.000	170.0	V	265.0	18.5	21.4	36.0	
602.111100	17.5	1000.0	120.000	155.0	H	270.0	20.8	18.5	36.0	
725.955600	19.9	1000.0	120.000	170.0	H	-5.0	23.1	16.1	36.0	
871.845300	21.7	1000.0	120.000	98.0	H	190.0	24.8	14.3	36.0	

**Plot 2:** Lowest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



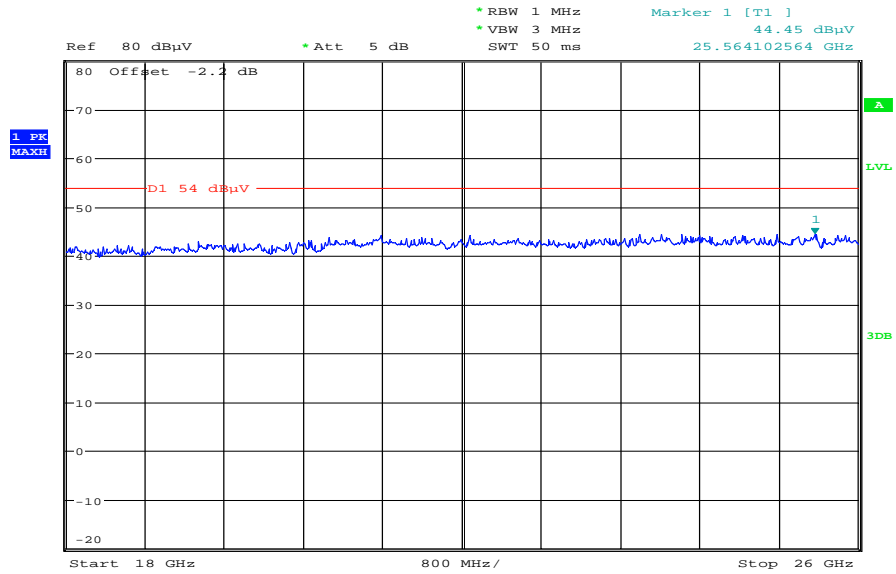
The carrier signal is notched with a 2.4 GHz band rejection filter.

**Plot 3:** Lowest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:26:40

Plot 4: Lowest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:40:54

Plot 5: Middle channel, 30 MHz to 1 GHz, vertical & horizontal polarization

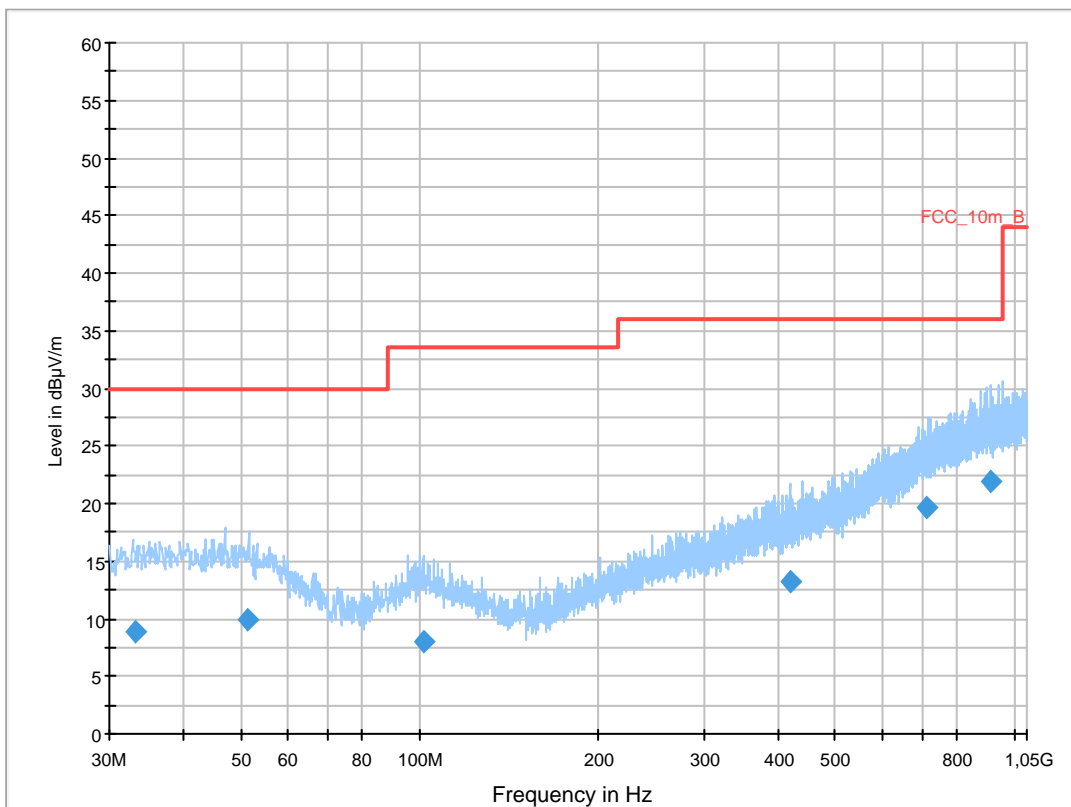
### Common Information

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan n mode CH7 mcs0  
 Operator Name: Wolsdorfer  
 Comment: battery powered

### Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

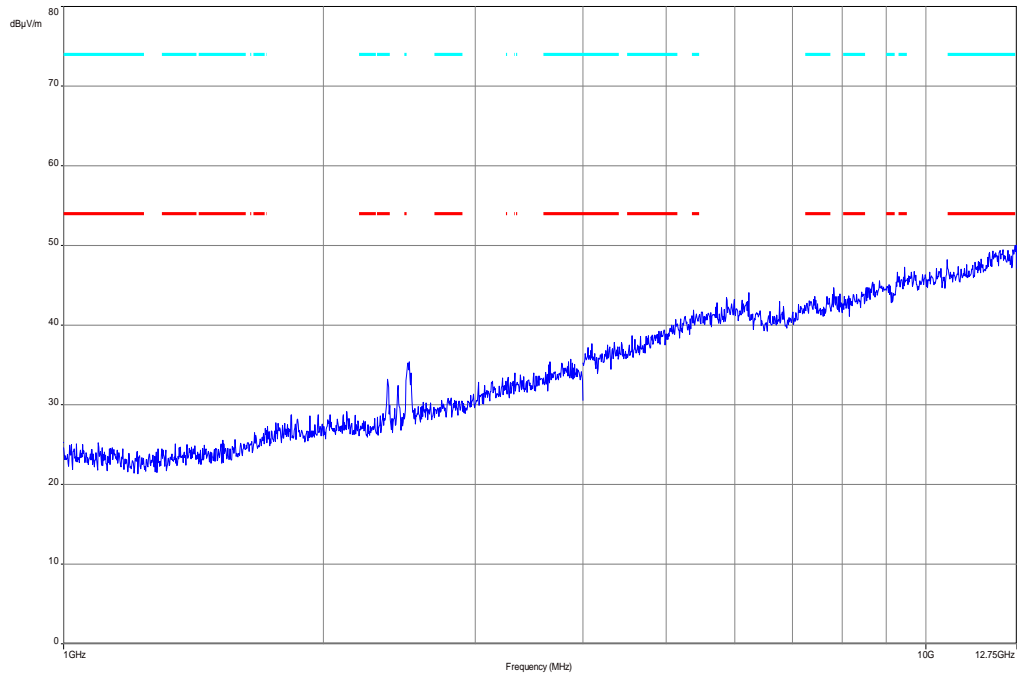
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



### Final Result 1

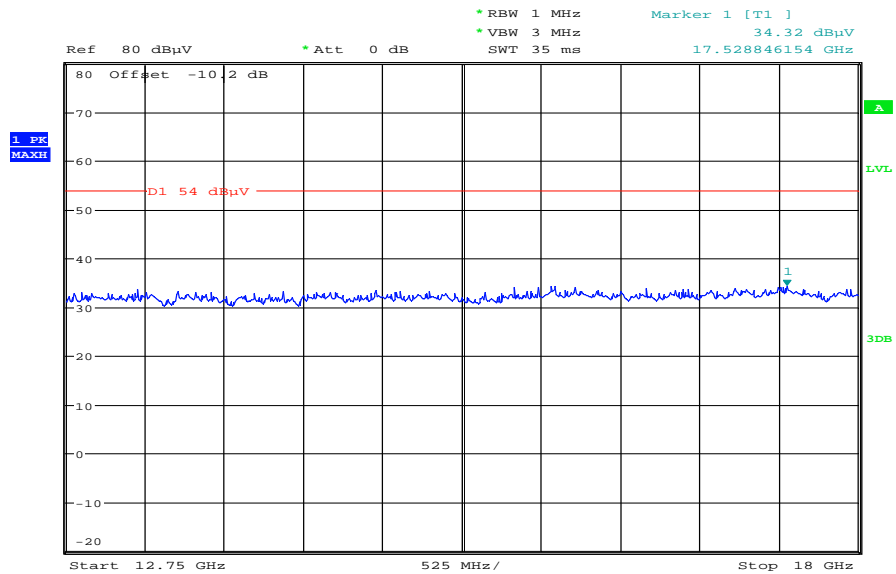
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
33.219150	8.9	1000.0	120.000	170.0	H	10.0	12.8	21.1	30.0	
51.089400	9.9	1000.0	120.000	170.0	V	272.0	13.3	20.1	30.0	
101.636700	7.9	1000.0	120.000	170.0	V	261.0	11.8	25.6	33.5	
419.057250	13.2	1000.0	120.000	170.0	H	10.0	17.2	22.8	36.0	
714.875100	19.6	1000.0	120.000	170.0	V	190.0	22.9	16.4	36.0	
913.422000	21.9	1000.0	120.000	122.0	H	87.0	25.2	14.1	36.0	

**Plot 6:** Middle channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



The carrier signal is notched with a 2.4 GHz band rejection filter.

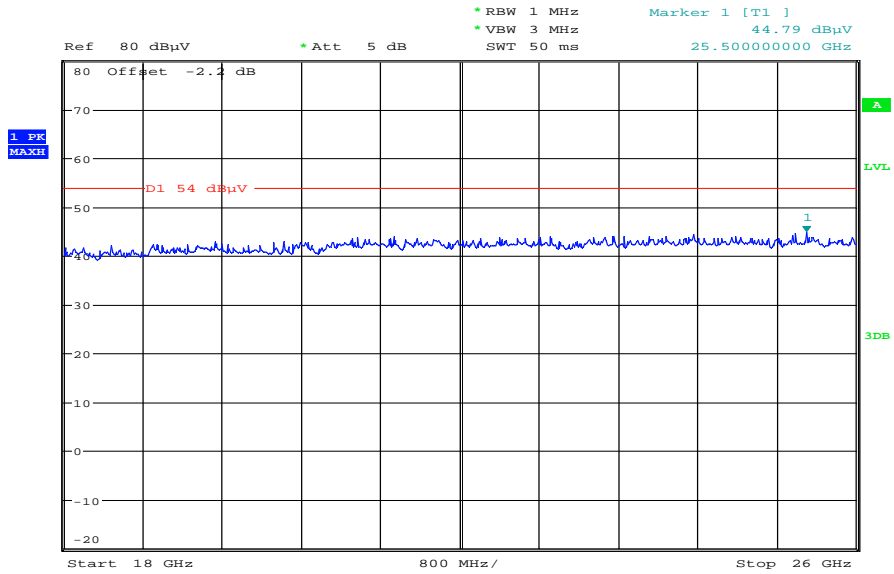
**Plot 7:** Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:27:48



Plot 8: Middle channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:41:56

Plot 9: Highest channel, 30 MHz to 1 GHz, vertical & horizontal polarization

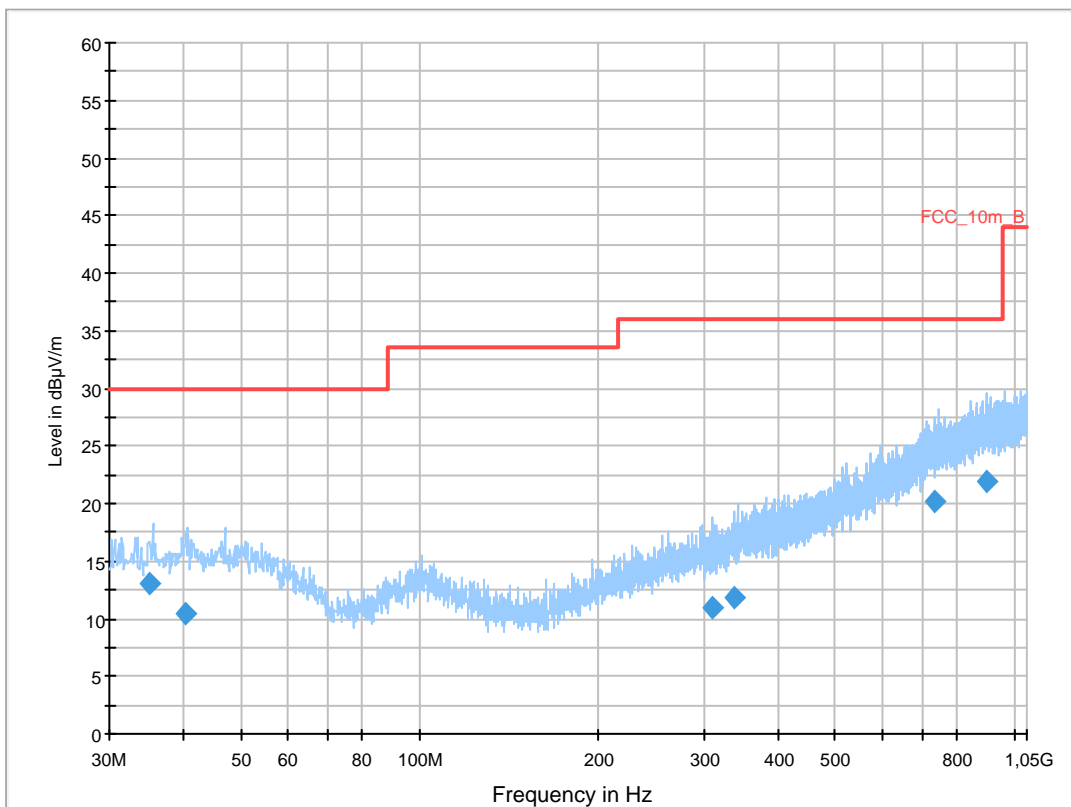
### Common Information

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 C class B @ 10 m  
 Operating Conditions: w-lan n mode CH11 mcs0  
 Operator Name: Wolsdorfer  
 Comment: battery powered

### Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

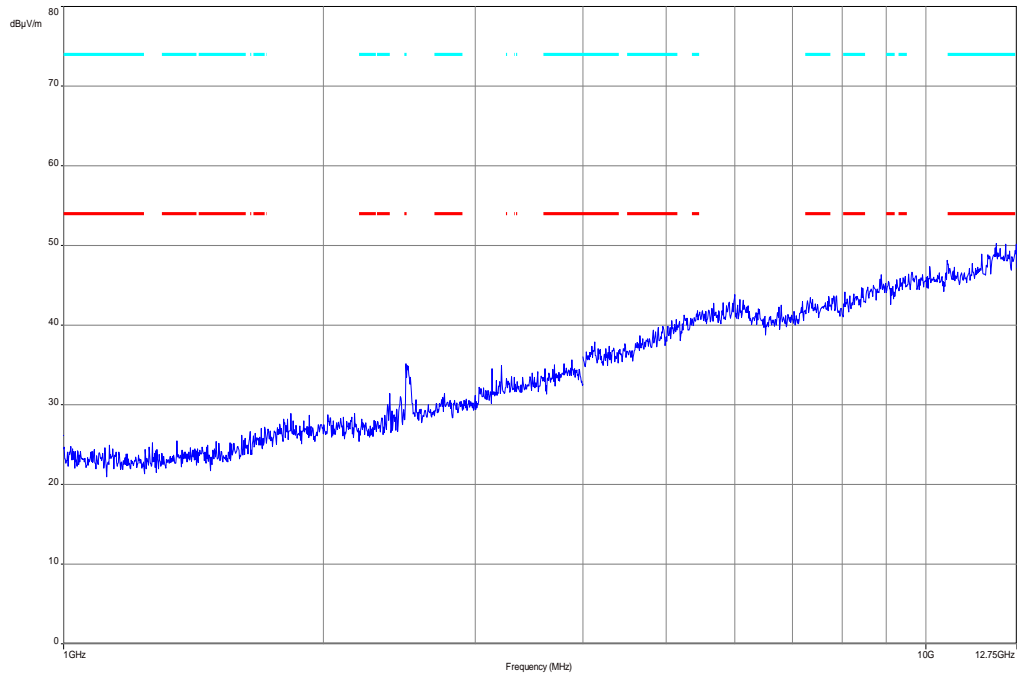
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



### Final Result 1

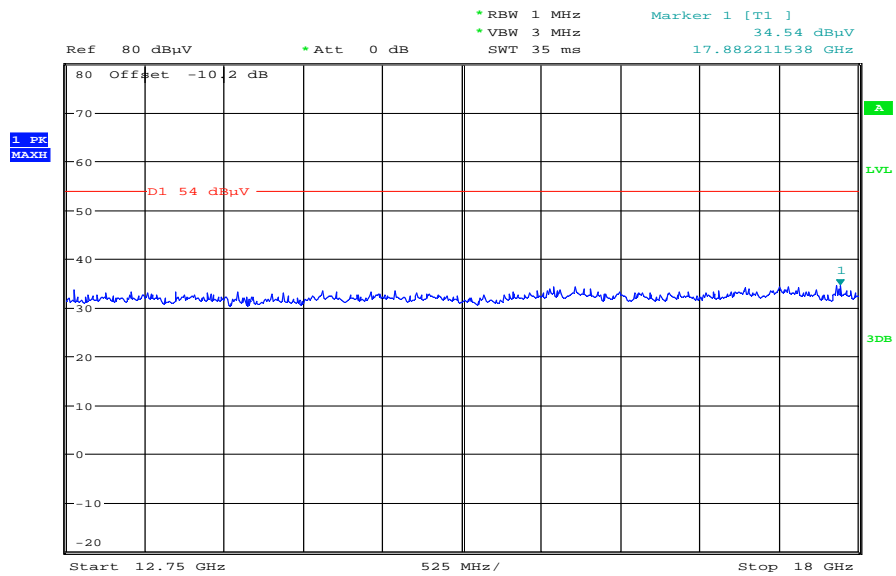
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.022000	13.0	1000.0	120.000	98.0	V	190.0	13.0	17.0	30.0	
40.397700	10.4	1000.0	120.000	170.0	V	272.0	13.4	19.6	30.0	
310.098450	10.9	1000.0	120.000	170.0	V	10.0	14.8	25.1	36.0	
338.662650	11.8	1000.0	120.000	170.0	H	190.0	15.7	24.2	36.0	
733.841850	20.1	1000.0	120.000	170.0	H	190.0	23.3	15.9	36.0	
899.770050	21.8	1000.0	120.000	170.0	V	92.0	25.2	14.2	36.0	

**Plot 10:** Highest channel, 1 GHz to 12.75 GHz, vertical & horizontal polarization



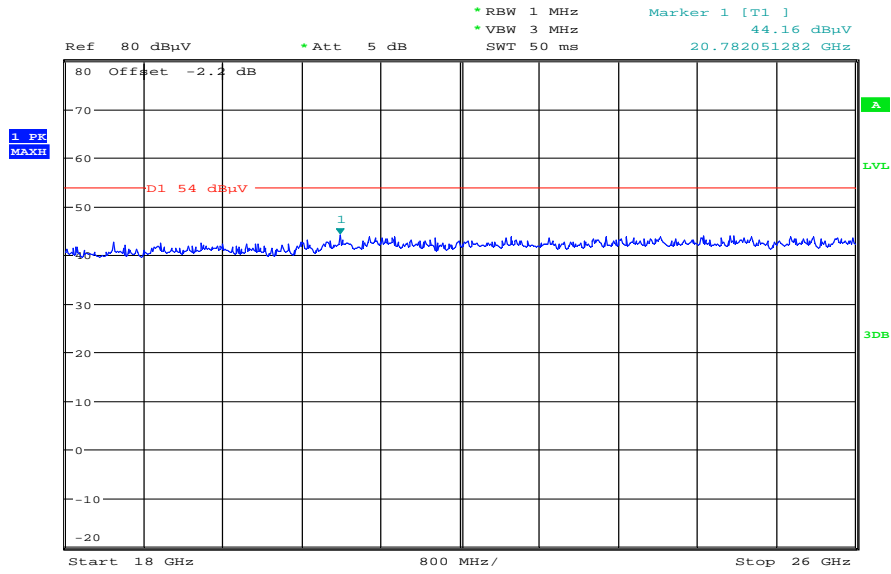
The carrier signal is notched with a 2.4 GHz band rejection filter.

**Plot 11:** Highest channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:29:01

Plot 12: Highest channel, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 11:42:45

## 9.12 RX spurious emissions radiated

### Description:

Measurement of the radiated spurious emissions in idle/receive mode. The results are valid for both modes.

### Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak / RMS
Sweep time:	Auto
Resolution bandwidth:	F > 1 GHz: 1 MHz F < 1 GHz: 100 kHz
Video bandwidth:	Sweep: 100 kHz Remeasurement: 10 Hz / 3 MHz
Span:	30 MHz to 25 GHz
Trace-Mode:	Max Hold

### Limits:

FCC		IC
RX Spurious Emissions Radiated		
Frequency (MHz)	Field Strength (dB $\mu$ V/m)	Measurement distance
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
Above 960	54.0	3

### Results:

RX Spurious Emissions Radiated [dB $\mu$ V/m]		
F [MHz]	Detector	Level [dB $\mu$ V/m]
For emissions below 1 GHz, please take a look at the table below the 1 GHz plot.		
Measurement uncertainty	± 3 dB	

**Result: Passed.**

**Plots: RX / Idle – mode**

**Plot 1:** 30 MHz to 1 GHz, vertical & horizontal polarization

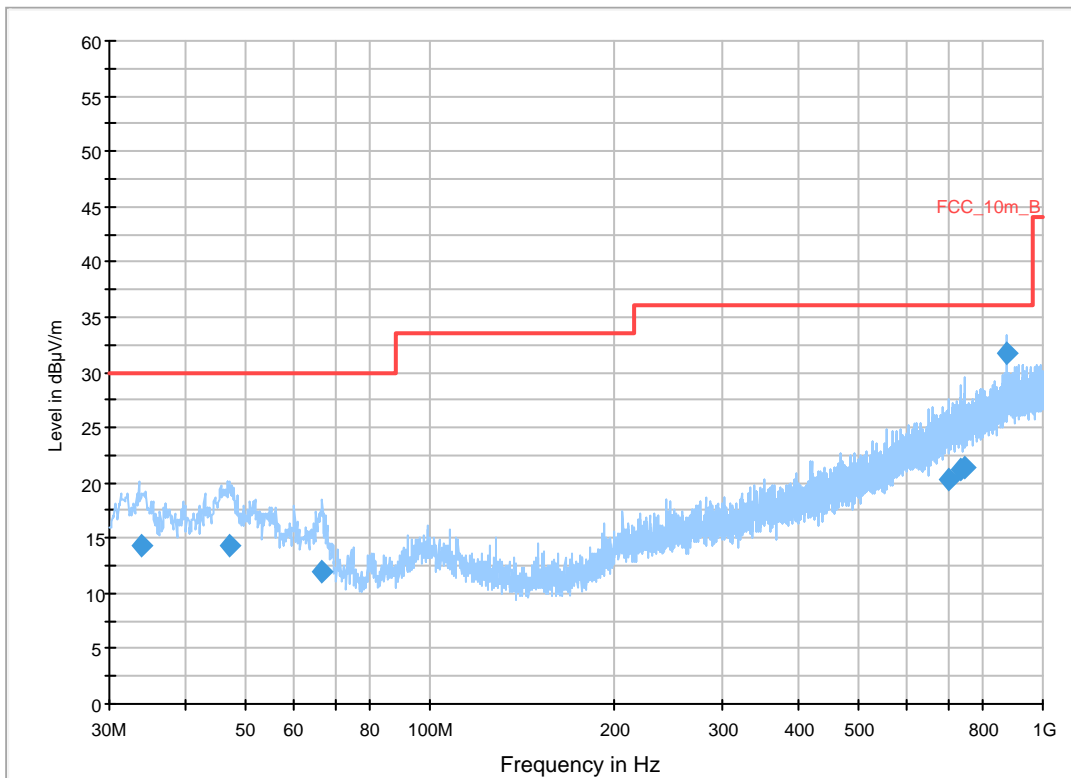
**Common Information**

EUT: RFM121LW  
 Serial Number: lmei:990002430036317  
 Test Description: FCC part 15 B class B @ 10 m  
 Operating Conditions: Idle + charging  
 Operator Name: Wolsdorfer  
 Comment: AC: 115 V / 60 Hz

**Scan Setup: GSM\_N85\_Fin [EMI radiated]**

Hardware Setup: Electric Field (N850)  
 Receiver: [ESCI 3]  
 Level Unit: dBµV/m

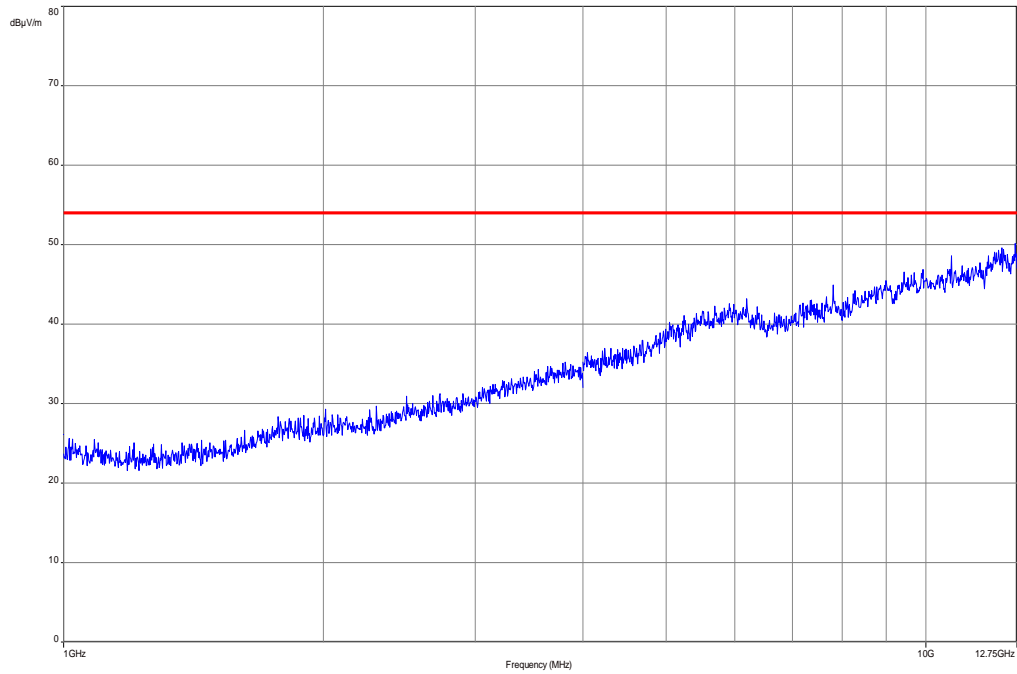
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 1 GHz	60 kHz	QPK	120 kHz	5 s	20 dB
GSM_850TCH					



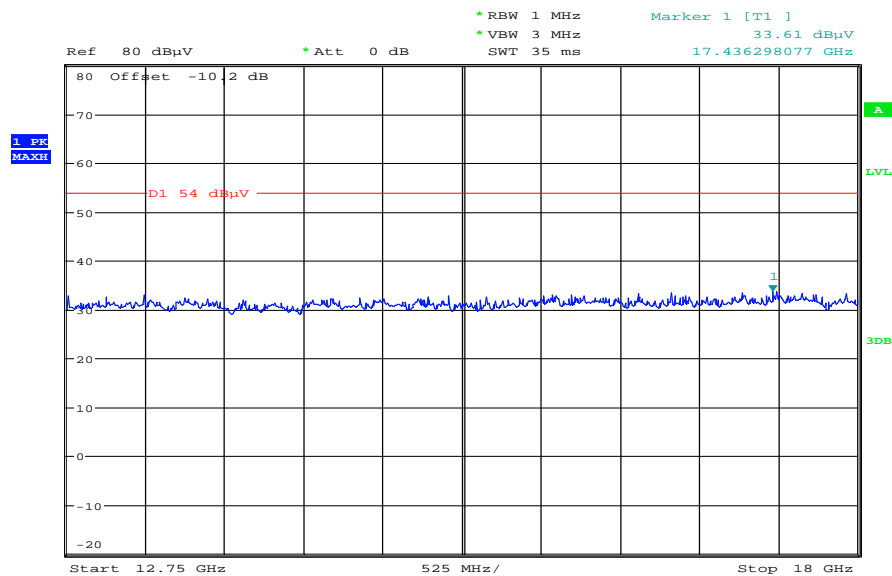
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
33.720550	14.3	5000.0	120.000	185.0	V	253.0	13.0	15.7	30.0	
47.292000	14.3	5000.0	120.000	145.0	V	127.0	13.4	15.7	30.0	
66.778650	12.0	5000.0	120.000	400.0	V	214.0	10.1	18.0	30.0	
701.084300	20.4	5000.0	120.000	239.0	H	232.0	23.1	15.6	36.0	
736.429550	21.2	5000.0	120.000	200.0	H	117.0	24.0	14.8	36.0	
744.357000	21.3	5000.0	120.000	200.0	H	185.0	24.1	14.7	36.0	
876.072550	31.8	5000.0	120.000	100.0	H	228.0	25.8	4.2	36.0	

Plot 2: 1 GHz to 12.75 GHz, vertical & horizontal polarization



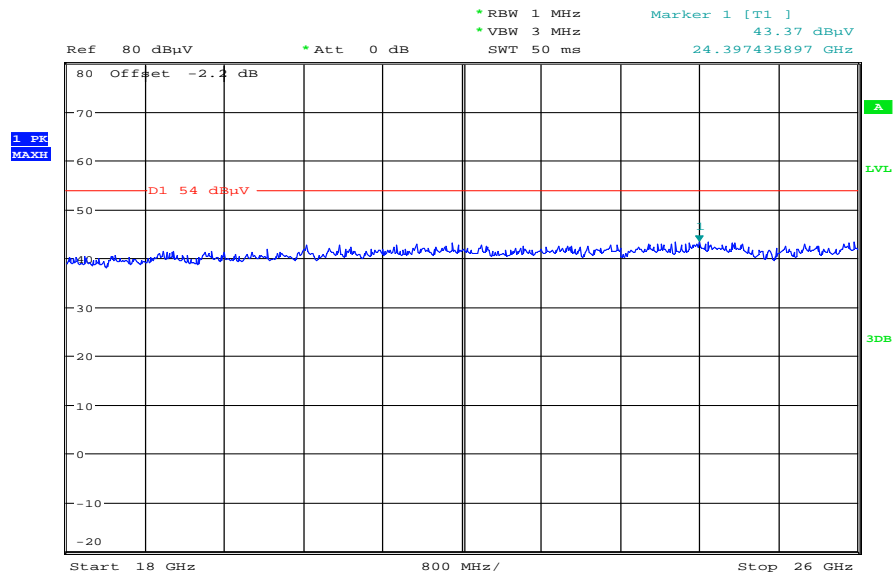
Plot 3: 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 16:25:55



Plot 4: 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 16:26:54

### 9.13 Spurious emissions radiated < 30 MHz

Not performed! Tests according to manufacturer test plan!

### 9.14 Spurious emissions conducted < 30 MHz

**Description:**

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 6. This measurement is repeated for DSSS and OFDM modulation. If critical peaks are found channel 1 and channel 11 will be measured too. The measurement is performed with the data rate producing the highest output power. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

**Measurement:**

Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

**Limits:**

FCC		IC	
TX Spurious Emissions Conducted < 30 MHz			
Frequency (MHz)	Quasi-Peak (dBµV/m)	Average (dBµV/m)	
0.15 – 0.5	66 to 56*	56 to 46*	
0.5 – 5	56	46	
5 – 30.0	60	50	

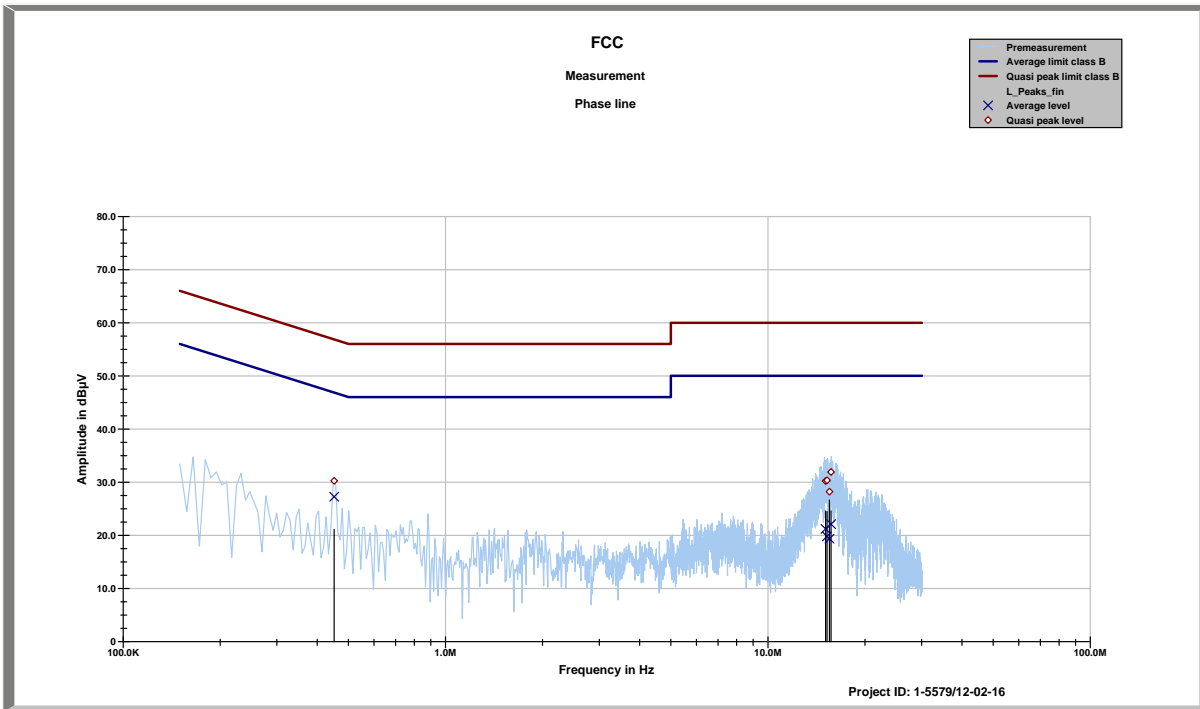
\*Decreases with the logarithm of the frequency

**Results:**

TX Spurious Emissions Conducted < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
All detected peak values are below the average limits.		
Measurement uncertainty	± 3 dB	

**Result: Passed**

**Plots:**



FCC

Phase line tbl

Project ID: 1-5579/12-02-16

01:35:41 PM, Thursday, February 28, 2013

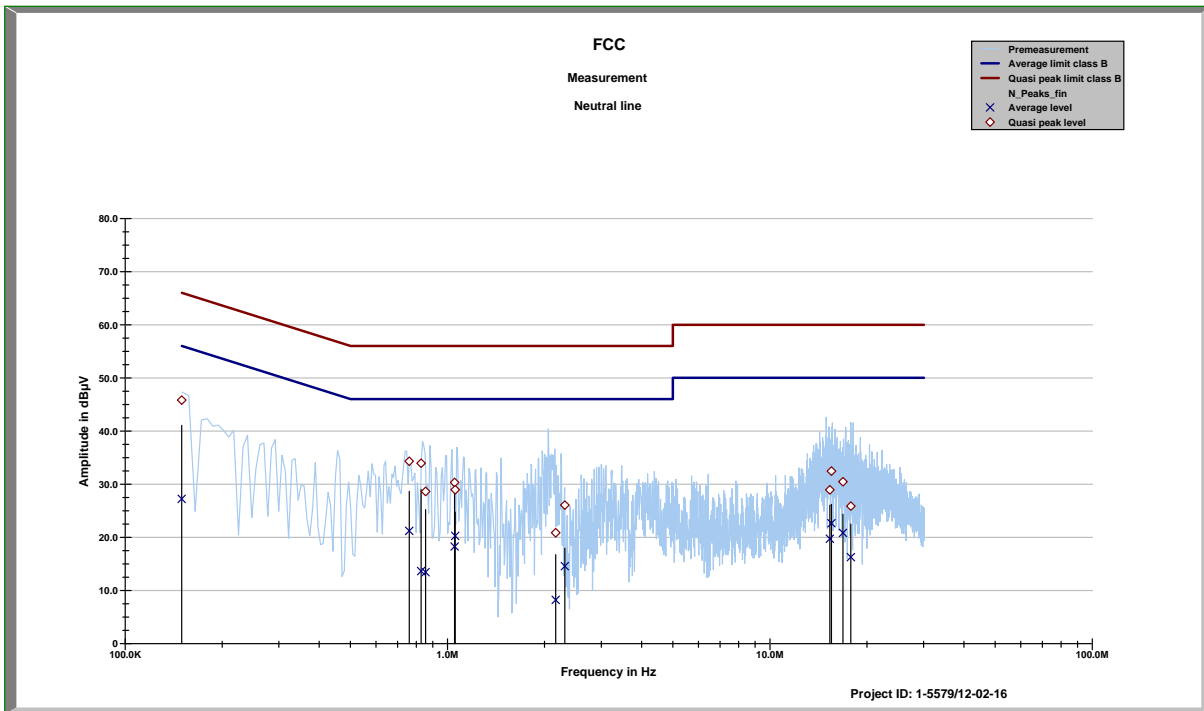
Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.45148	30.26	26.59	27.25	20.13
15.074	30.21	29.79	21.22	28.78
15.241	30.33	29.67	19.81	30.19
15.517	28.19	31.81	19.36	30.64
15.689	31.91	28.09	22.10	27.90

Project ID - 1-5579/12-02-16

EUT - RFM121LW

Serial Number - 990002430024636

Operating mode - W-LAN b-mode + charging; 115V AC/60Hz



FCC  
Neutral line tbl

Project ID: 1-5579/12-02-16

01:35:41 PM, Thursday, February 28, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.14985	45.82	NAN	27.23	NAN
0.76069	34.30	21.70	21.21	24.79
0.828	33.94	22.06	13.66	32.34
0.85469	28.64	27.36	13.45	32.55
1.05167	30.31	25.69	18.27	27.73
1.05554	28.95	27.05	20.27	25.73
2.1652	20.87	35.13	8.22	37.78
2.3106	26.07	29.93	14.58	31.42
15.332	28.93	31.07	19.72	30.28
15.507	32.45	27.55	22.65	27.35
16.834	30.46	29.54	20.83	29.17
17.809	25.87	34.13	16.28	33.72

Project ID - 1-5579/12-02-16  
 EUT - RFM121LW  
 Serial Number - 990002430024636  
 Operating mode - W-LAN b-mode + charging; 115V AC/60Hz

## 10 Test equipment and ancillaries used for tests

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Labor/Item).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
2	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
3	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B597 9	300000210	ne		
4	n. a.	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	09.01.2013	09.01.2014
5	n. a.	Analyzer- Reference- System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	k	14.07.2011	14.07.2013
6	n. a.	Amplifier	JS42- 00502650- 28-5A	MITEQ	1084532	300003379	ev		
7	n. a.	Antenna Tower	Model 2175	ETS- LINDGREN	64762	300003745	izw		
8	n. a.	Positioning Controller	Model 2090	ETS- LINDGREN	64672	300003746	izw		
9	n. a.	Turntable Interface-Box	Model 105637	ETS- LINDGREN	44583	300003747	izw		
10	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbe ck	295	300003787	k	12.04.2012	12.04.2014
11	n. a.	Spectrum- Analyzer	FSU26	R&S	200809	300003874	k	16.01.2013	16.01.2014
12	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	12.01.2012	12.01.2015
13	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	11.05.2011	11.05.2013
14	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
15	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
16	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
17	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
18	9	Isolating Transformer	MPL IEC625 Bus Regeltrennt ravo	Erfi	91350	300001155	ne		
19	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
20	n. a.	Amplifier	js42- 00502650- 28-5a	Parzich GMBH	928979	300003143	ne		
21	n. a.	Band Reject filter	WRCG240 0/2483- 2375/2505- 50/10SS	Wainwright	11	300003351	ev		
22	n. a.	TRILOG Broadband Test-Antenna	VULB9163	Schwarzbe ck	371	300003854	vIKI!	14.10.2011	14.10.2014

		30 MHz - 3 GHz							
23	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405	k	21.02.2013	21.02.2014
24	11b	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
25	A025	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda		300000786	ne		
26	A027	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda		300000486	ne		
27	n. a.	Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	7911	300001752	ne		
28	n. a.	Broadband Low Noise Amplifier 18-50 GHz	CBL18503 070-XX	CERNEX	19338	300004273	ne		
29	n. a.	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004517	k	22.10.2012	22.10.2013

**Agenda:** Kind of Calibration

k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
vkI!	Attention: extended calibration interval	*	next calibration ordered / currently in progress
NK!	Attention: not calibrated		

## 11 Observations

No observations exceeding those reported with the single test cases have been made.



**Annex A Document history**

Version	Applied changes	Date of release
1.0	Initial release	2013-03-27
-A	Addition of PIN	2013-04-02
-B	Changed standard version	2013-04-04

**Annex B Further information****Glossary**

AVG	-	Average
DUT	-	Device under test
EMC	-	Electromagnetic Compatibility
EN	-	European Standard
EUT	-	Equipment under test
ETSI	-	European Telecommunications Standard Institute
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	Not applicable
PP	-	Positive peak
QP	-	Quasi peak
S/N	-	Serial number
SW	-	Software

**Annex C Accreditation Certificate**

Front side of certificate

Back side of certificate

**DAkKS**  
Deutsche  
Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH  
Befehlens gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV  
Unterzeichnerin der Multilateralen Abkommen  
von EA, ILAC und IAF zur gegenseitigen Anerkennung

**Akkreditierung**

Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium  
**CETECOM ICT Services GmbH**  
Untertürkheimer Straße 6-10, 66117 Saarbrücken

die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen durchzuführen:

- Drahtgebundene Kommunikation einschließlich xDSL
- VoIP und DECT
- Akustik
- Funk einschließlich WLAN
- Short Range Devices (SRD)
- RFID
- WiMax und Richtfunk
- Mobilfunk (GSM / DCS, Over the Air (OTA) Performance)
- Elektromagnetische Verträglichkeit (EMV) einschließlich Automotive
- Produktsicherheit
- SARS und Hearing Aid Compatibility (HAC)
- Umweltsimulation
- Smart Card Terminals
- Bluetooth
- Wi-Fi Services

Die Akkreditierungsurkunde gilt nur in Verbindung mit dem Bescheid vom 18.01.2013 mit der Akkreditierungsnummer D-PL-12076-01 und ist gültig 17.01.2018. Sie besteht aus diesem Deckblatt, der Rückseite des Deckblatts und der folgenden Anlage mit insgesamt 80 Seiten.

Registrierungsnummer der Urkunde: D-PL-12076-01-01

Frankfurt am Main, 18.01.2013

Im Auftrag  
Dagmar Pflüger  
Abteilungsleiter

Deutsche Akkreditierungsstelle GmbH

Standort Berlin Spittelmarkt 10 10117 Berlin	Standort Frankfurt am Main Gartenstraße 6 60594 Frankfurt am Main	Standort Braunschweig Rundschloß 100 38116 Braunschweig
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IAF: [www.iaf.ru](http://www.iaf.ru)

**Note:**

The current certificate including annex is published on our website (see link below) or may be received from CETECOM ICT Services on request.

<http://www.cetecom.com/eu/de/cetecom-group/europa/deutschland-saarbruecken/akkreditierungen.html>