
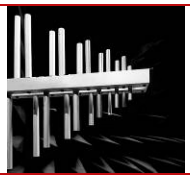
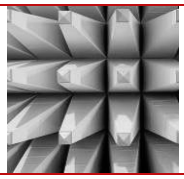

CETECOM™
CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test report no.: 1-5579/12-02-33-B

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-01

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

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
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

Kind of test item:	**Blackberry GSM Phones**
Model name:	**RFM121LW**
FCC ID:	**L6ARFM120LW**
IC:	**2503A-RFM120LW**
Frequency:	ISM band 5725 MHz to 5850 MHz (lowest channel 5745 MHz, highest channel 5825 MHz)
Technology tested:	WLAN (OFDM / a – & n – mode)
Antenna:	Integrated antenna
Power Supply:	3.8 V DC by Li - Ion battery
Temperature Range:	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:

cn=Stefan Boes, o=CETECOM ICT Services GmbH, ou=BOE-111011, email=Stefan.Boes@cetecom.com, c=DE
2013.06.13 09:43:31 +02'00'

Stefan Bös
Senior Testing Manager

Test performed:

cn=Marco Bertolino, o=CETECOM ICT Services GmbH, ou=BTL-100826, email=marco.bertolino@cetecom.com, c=DE
2013.06.13 08:39:40 +02'00'

Marco Bertolino
Testing Manager

1 Table of contents

2 General information

2.1 Notes and disclaimer

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2.2 Application details

Date of receipt of order:	2013-01-04
Date of receipt of test item:	2013-03-12
Start of test:	2013-03-25
End of test:	2013-03-27
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

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	**:**	**Blackberry GSM Phones**
Type identification	**:**	**RFM121LW**
S/N serial number	**:**	**Radiated unit: IMEI 990002430036416; PIN 303E5B59** **IMEI 990002430036317; PIN 303E5B4F** **Conducted unit: IMEI 990002430036333; PIN 303E5851**
HW hardware status	**:**	**CER-53013-001Rev2-905-00**
SW software status	**:**	**127.0.1.4429**
Frequency band [MHz]	**:**	**ISM band 5725 MHz to 5850 MHz** **(Lowest channel 5745 MHz; highest channel 5825 MHz)**
Type of radio transmission **Use of frequency spectrum**	**:** **:**	**OFDM**
Type of modulation	**:**	**QPSK, 16 – QAM, 64 – QAM**
Number of channels	**:**	**5**
Antenna	**:**	**Integrated antenna**
Power supply	**:**	**3.8 V DC by Li - Ion battery**
Temperature range	**:**	**Not needed – normal test conditions only!**

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	OFDM	☐	☐	☐	☒	
RSS GEN 4.7	Frequency deviation	Nominal	Nominal	OFDM	☐	☐	☐	☐	not rated
§15.247(e) RSS 210 / A8.2(b)	Power spectral density	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.247(a)(2) RSS 210 / A8.2(a)	Spectrum bandwidth - 6dB bandwidth	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.247(a)(2) RSS 210 / A8.2(a)	Spectrum bandwidth - 20dB bandwidth	Nominal	Nominal	OFDM	☐	☐	☐	☒	-/-
§15.247(b)(3) RSS-210 / A8.4(4)	Maximum output power	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.247(d) RSS-210 / A8.5	Band edge compliance conducted	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
According to FCC Part 15.407	Band edge compliance radiated	Nominal	Nominal	OFDM	☐	☐	☐	☐	not rated
§15.247(d) RSS-210 / A8.5	TX spurious emissions conducted	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.247(d) RSS-210 / A8.5	TX spurious emissions radiated	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.109 RSS-Gen	RX spurious emissions radiated	Nominal	Nominal	-/-	☐	☐	☐	☒	-/-
§15.209(a) RSS-Gen	TX spurious emissions radiated < 30 MHz	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies
§15.107(a)	Conducted emissions < 30 MHz	Nominal	Nominal	OFDM	☒	☐	☐	☐	complies

Note: NA = Not Applicable; NP = Not Performed

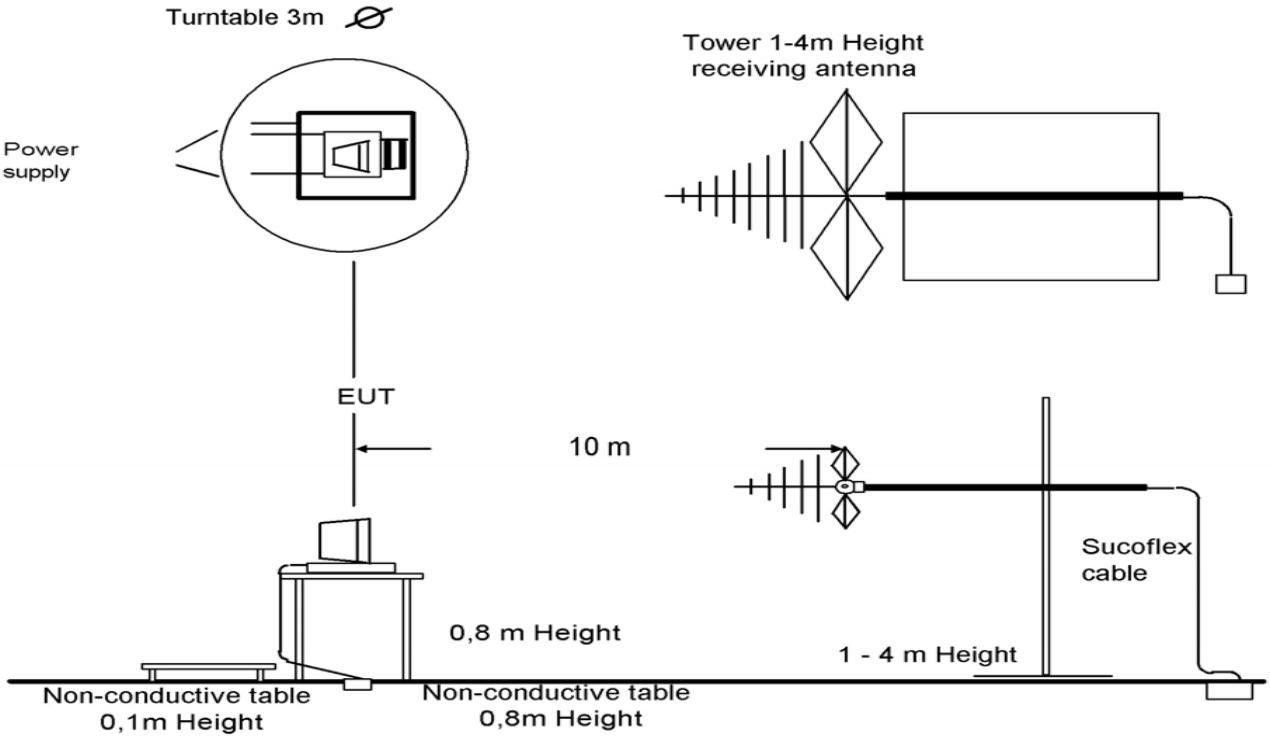
8 RF measurements

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. 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. Antennas are confirmed with ANSI C63.

Semi anechoic chamber



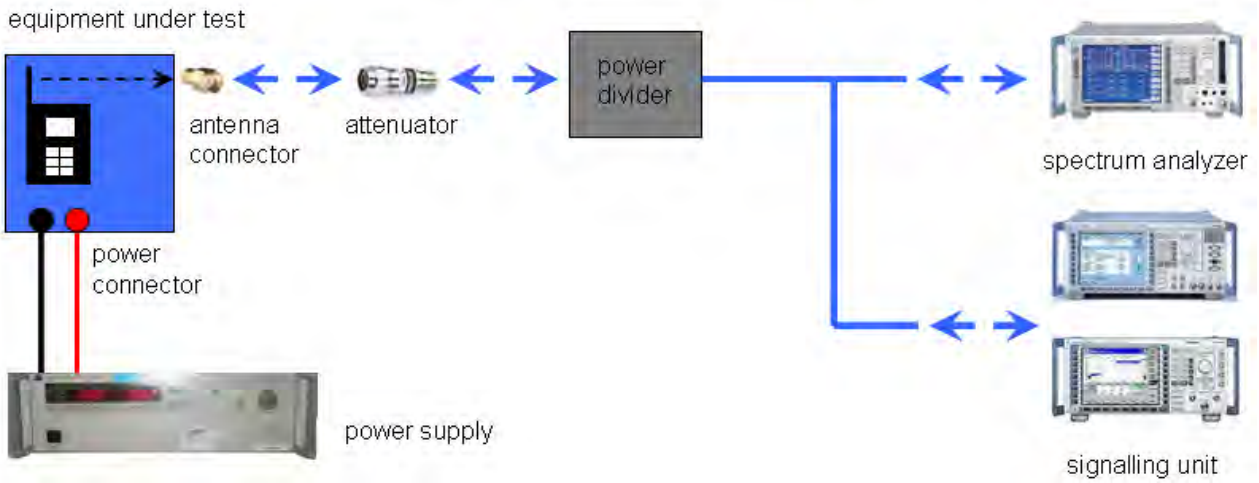
Picture 1: Diagram radiated measurements

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.
Iperf 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
5745 MHz	3.6 V DC	20 C°	Modulated carrier OFDM - mode	-12.0 kHz / -2.09
	4.1 V DC	20 C°		-13.6 kHz / -2.37
	4.35 V DC	20 C°		-14.4 kHz / -2.51
	3.6 V DC	-20 C°		23.6 kHz / 4.11
	4.1 V DC	-20 C°		-30.8 kHz / -5.36
	4.35 V DC	-20 C°		-31.0 kHz / -5.40
	3.6 V DC	+55 C°		-30.8 kHz / -5.36
	4.1 V DC	+55 C°		24.6 kHz / 4.28
	4.35 V DC	+55 C°		24.8 kHz / 4.32
5785 MHz	3.6 V DC	20 C°	Modulated carrier OFDM - mode	-19.0 kHz / -3.28
	4.1 V DC	20 C°		-13.0 kHz / -2.25
	4.35 V DC	20 C°		-17.0 kHz / -2.94
	3.6 V DC	-20 C°		20.9 kHz / 3.61
	4.1 V DC	-20 C°		-30.0 kHz / -5.19
	4.35 V DC	-20 C°		-31.0 kHz / -5.36
	3.6 V DC	+55 C°		-28.0 kHz / -4.84
	4.1 V DC	+55 C°		24.0 kHz / 4.15
	4.35 V DC	+55 C°		24.8 kHz / 4.29
5825 MHz	3.6 V DC	20 C°	Modulated carrier OFDM - mode	-14.2 kHz / -2.44
	4.1 V DC	20 C°		-14.6 kHz / -2.51
	4.35 V DC	20 C°		-14.0 kHz / -2.51
	3.6 V DC	-20 C°		24.4 kHz / 4.19
	4.1 V DC	-20 C°		25.0 kHz / 4.29
	4.35 V DC	-20 C°		24.4 kHz / 4.19
	3.6 V DC	+55 C°		-31.6 kHz / -5.42
	4.1 V DC	+55 C°		-30.8 kHz / -5.29
	4.35 V DC	+55 C°		-30.0 kHz / -5.15
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	

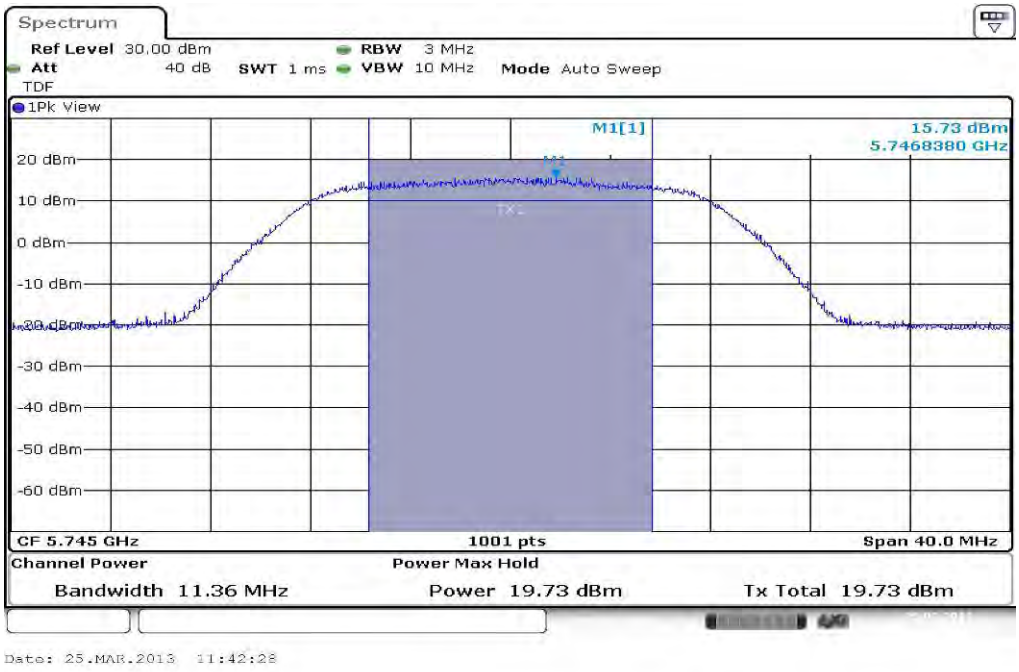
Results:

Technology / data rate Frequency	Maximum Output Power [dBm]		
	5745 MHz	5785 MHz	5825 MHz
OFDM / a – mode, 6 Mbps Peak Output Power Conducted	19.73	19.63	19.54
OFDM / a – mode, 24 Mbps Peak Output Power Conducted	18.91	19.01	18.93
OFDM / a – mode, 54 Mbps Peak Output Power Conducted	18.84	19.03	18.88
OFDM / n – mode, MCS 0 Peak Output Power Conducted	19.51	19.71	19.59
OFDM / n – mode, MCS 4 Peak Output Power Conducted	18.90	19.06	18.83
OFDM / n – mode, MCS 7 Peak Output Power Conducted	18.70	18.88	18.81
Measurement uncertainty	± RBW		

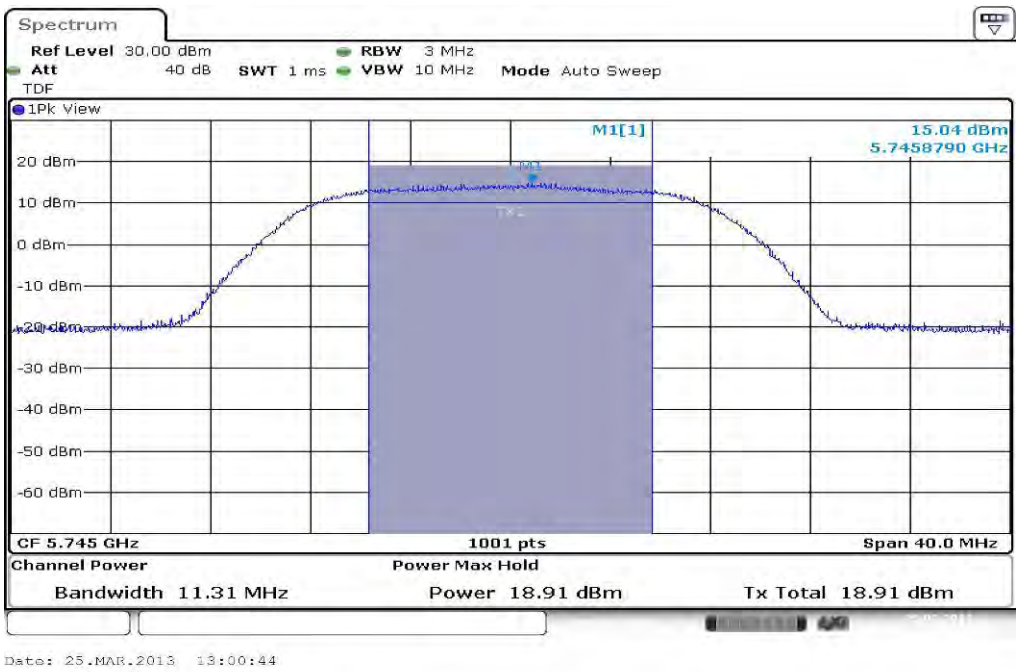
Result: **Passed**

Plots:

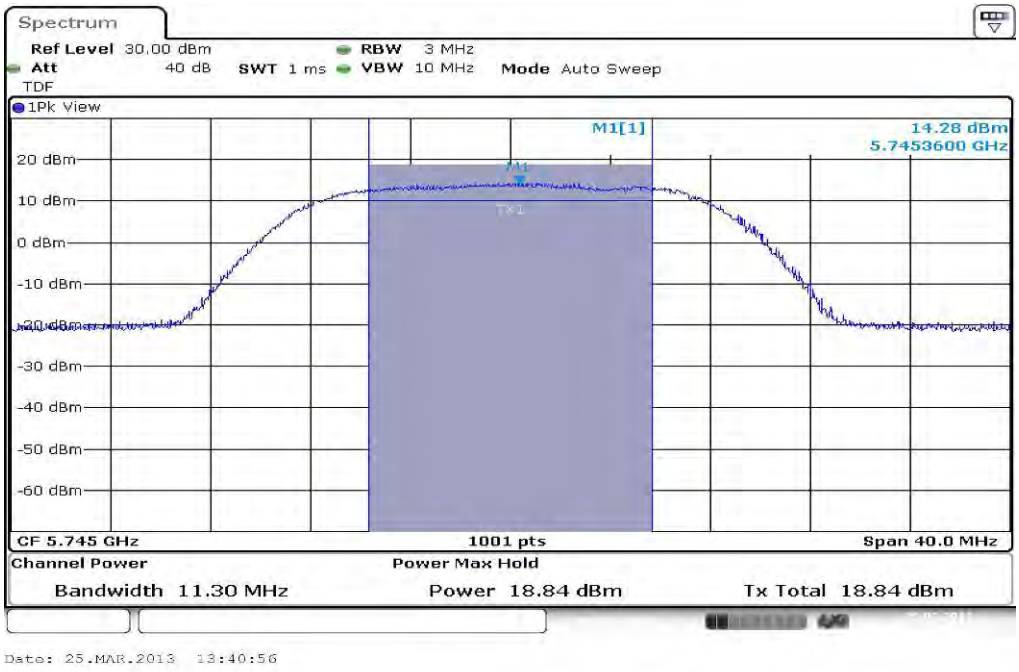
Plot 1: lowest channel, a – mode, 6 Mbps



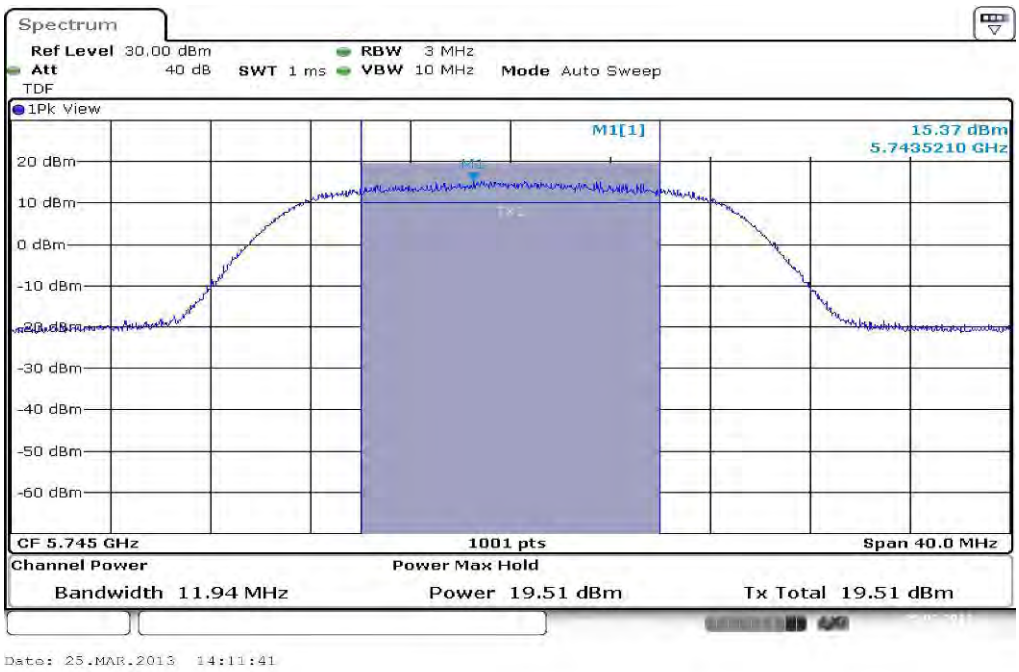
Plot 2: lowest channel, a – mode, 24 Mbps



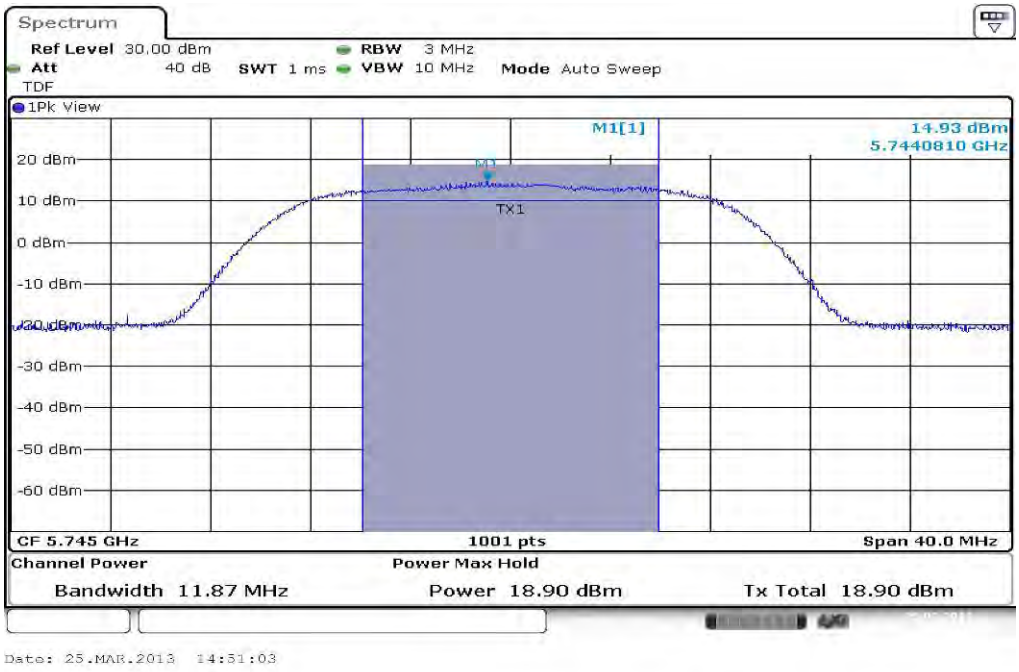
Plot 3: lowest channel, a – mode, 54 Mbps



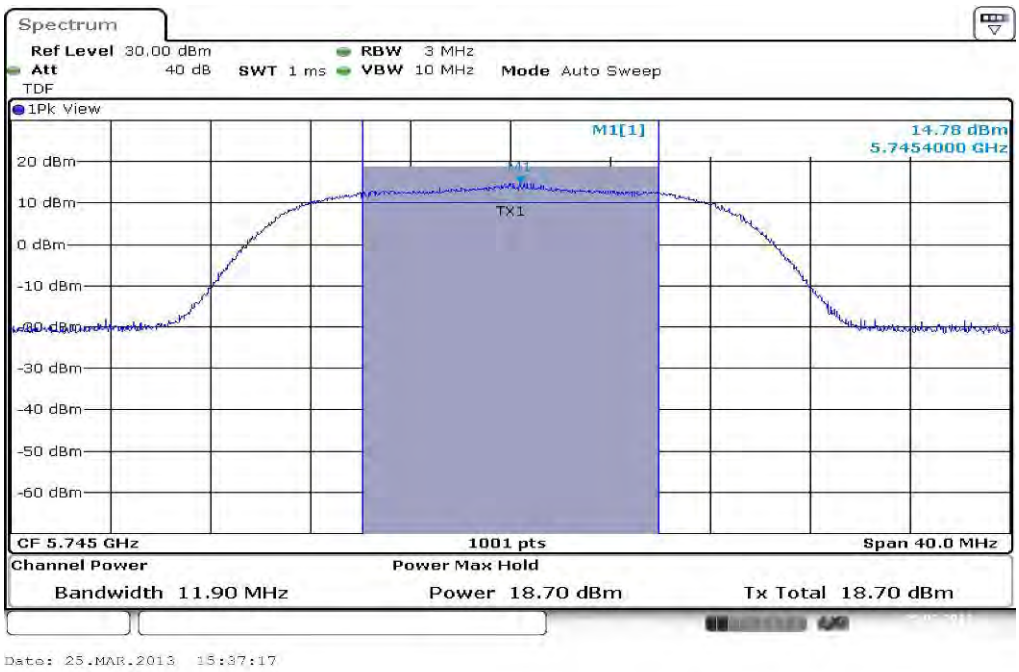
Plot 4: lowest channel, n – mode, MCS 0



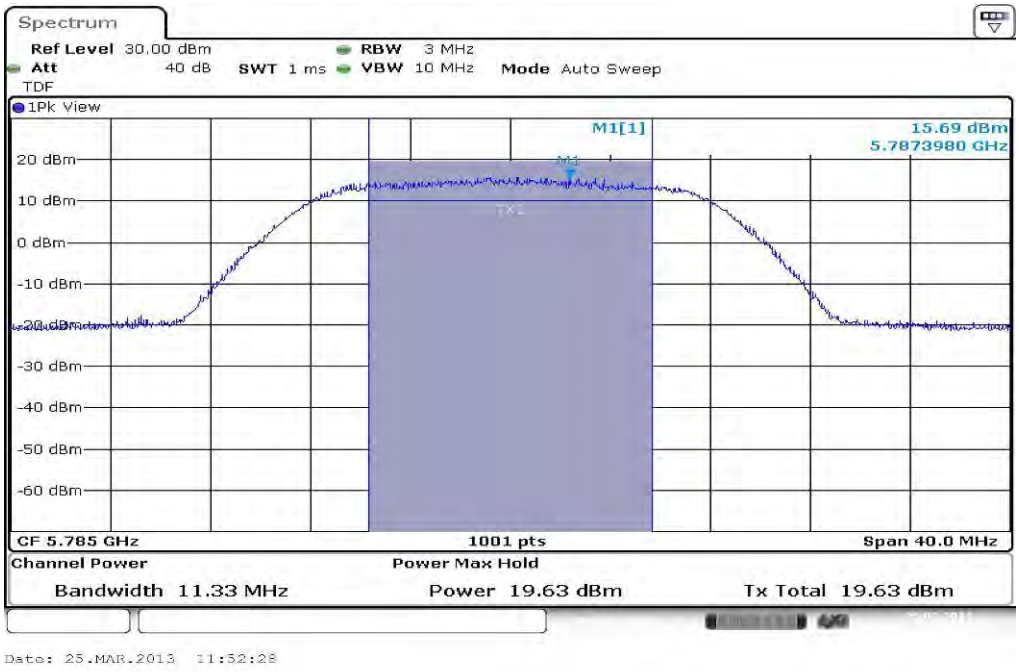
Plot 5: lowest channel, n – mode, MCS 4



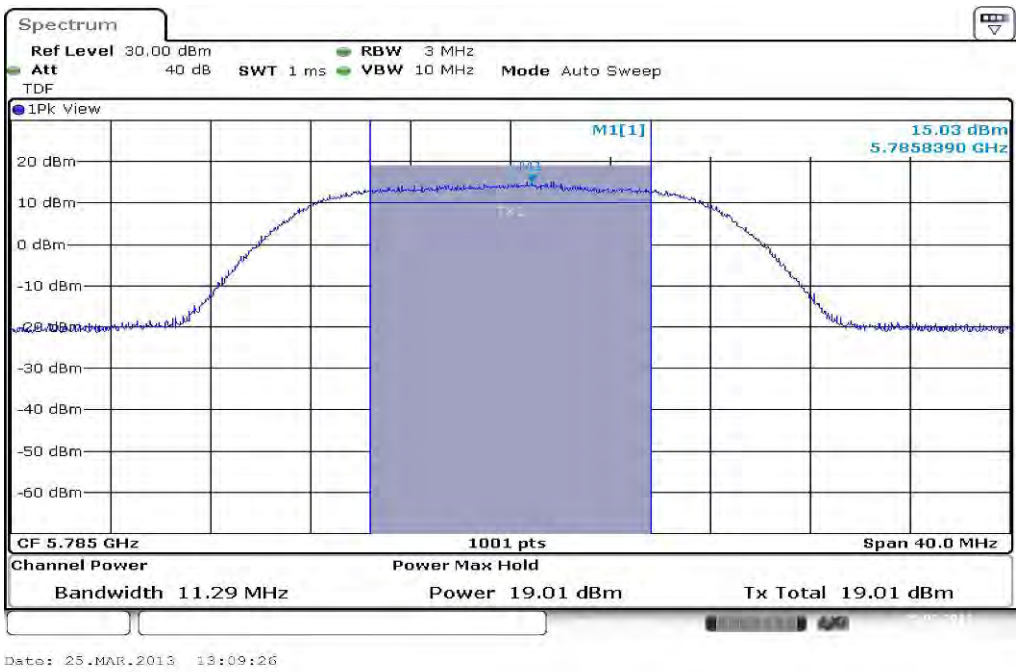
Plot 6: lowest channel, n – mode, MCS 7



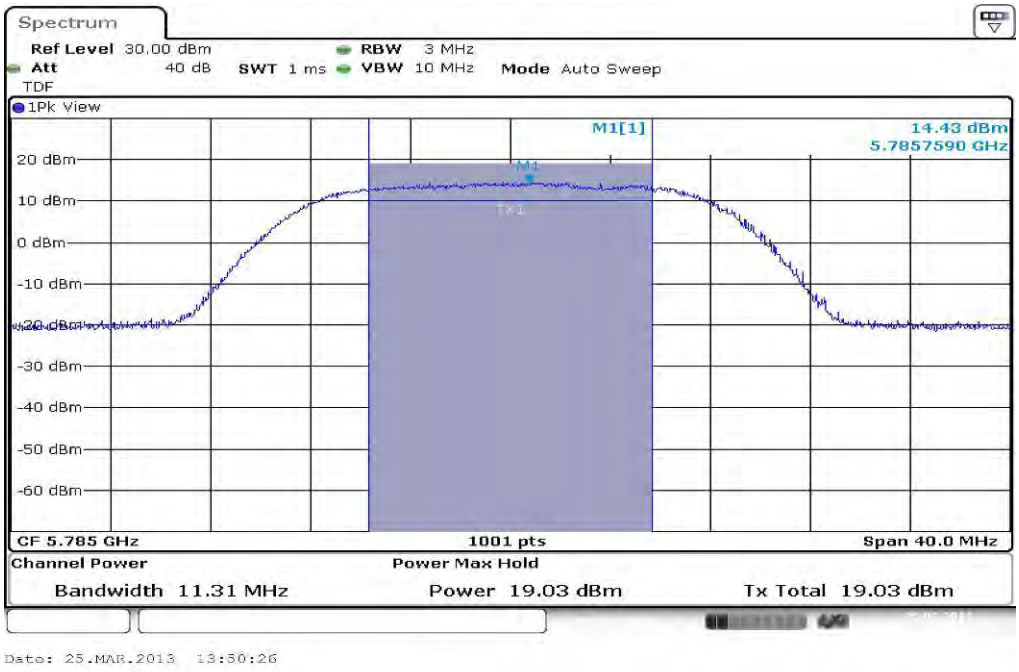
Plot 7: middle channel, a – mode, 6 Mbps



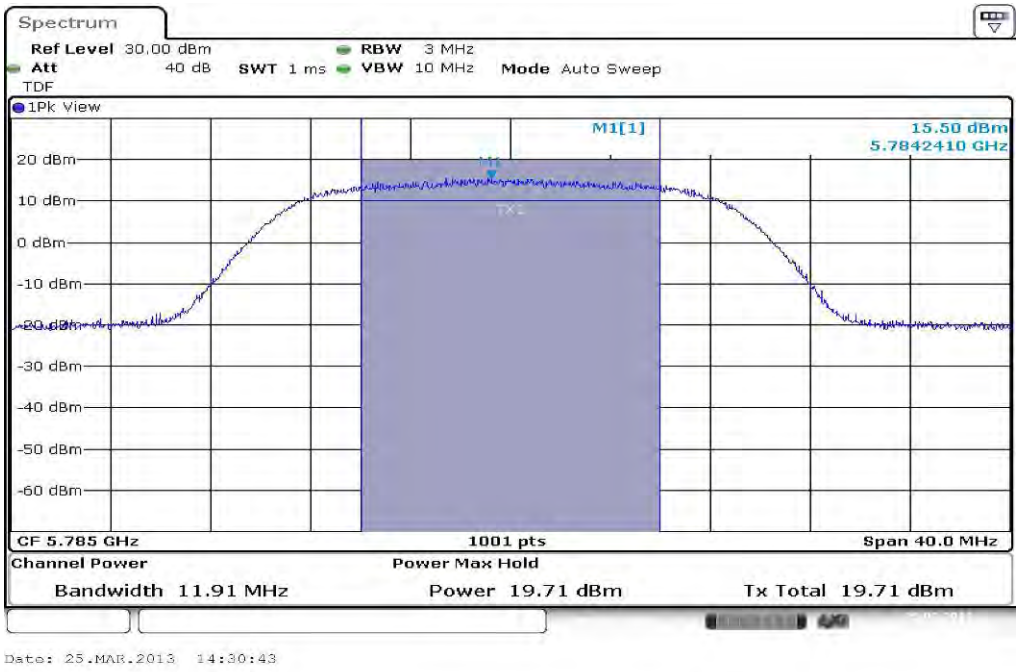
Plot 8: middle channel, a – mode, 24 Mbps



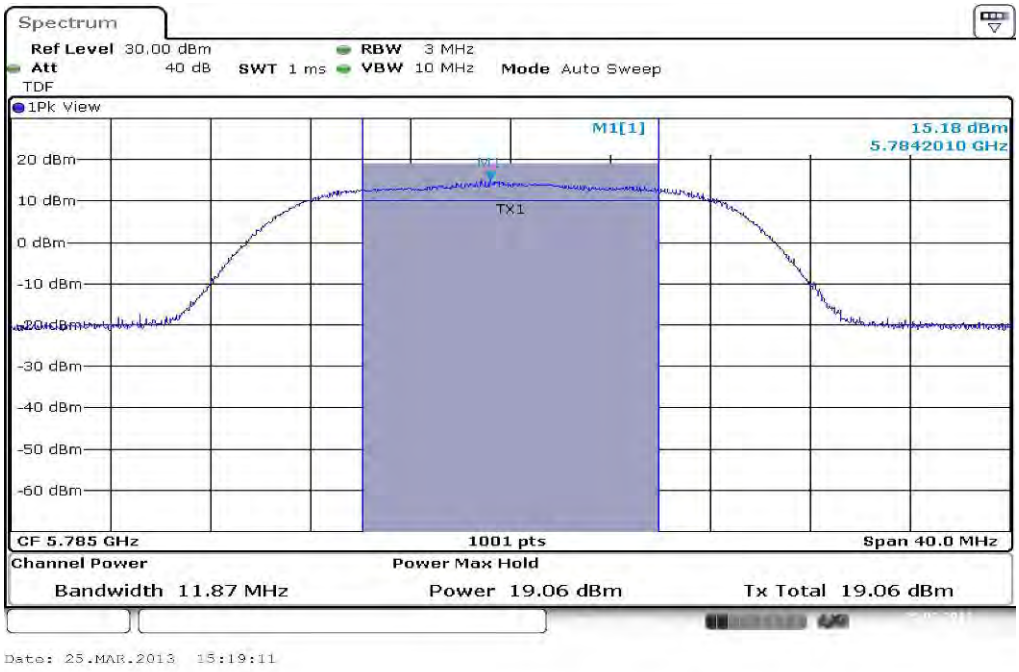
Plot 9: middle channel, a – mode, 54 Mbps



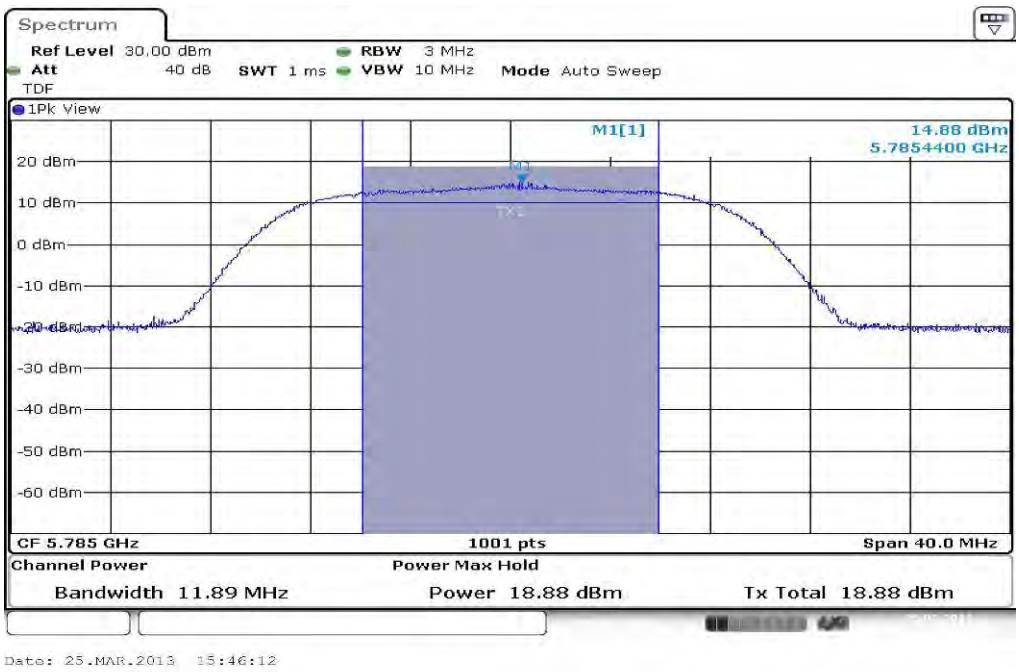
Plot 10: middle channel, n – mode, MCS 0



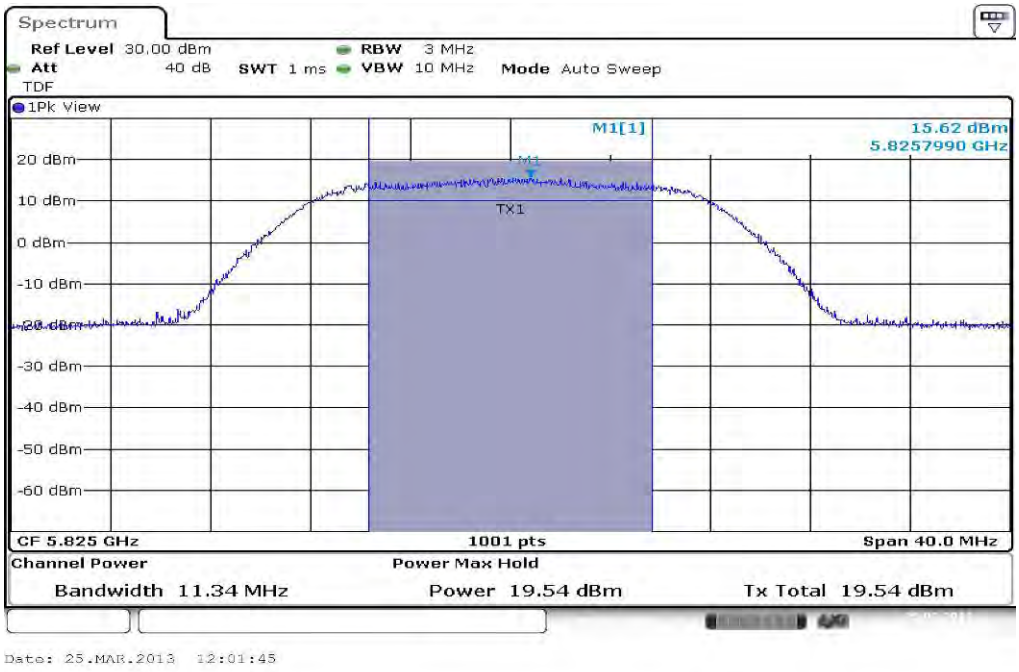
Plot 11: middle channel, n – mode, MCS 4



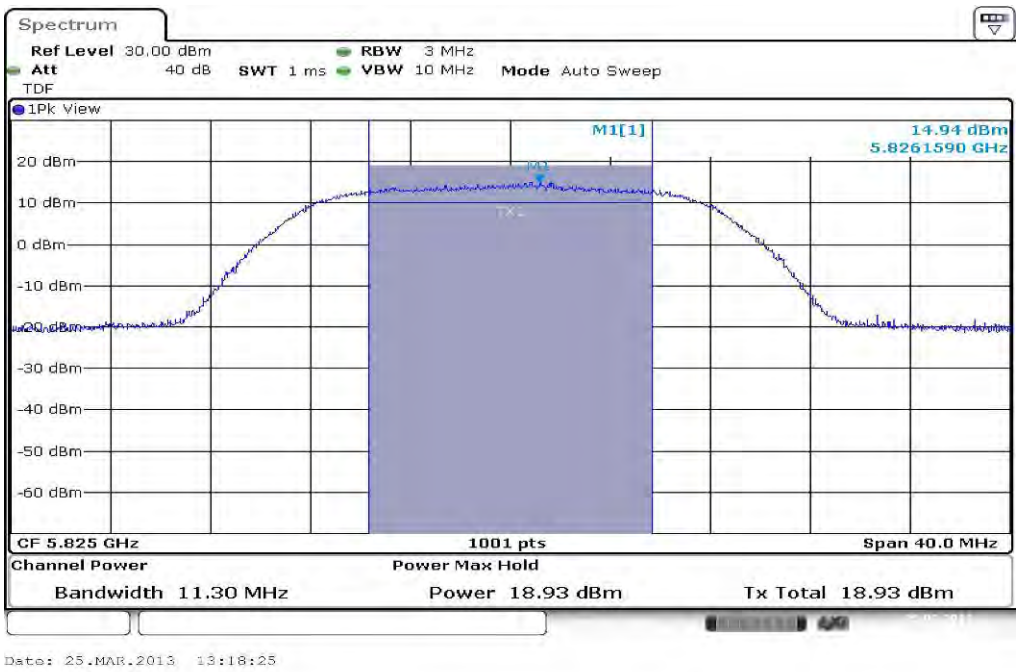
Plot 12: middle channel, n – mode, MCS 7



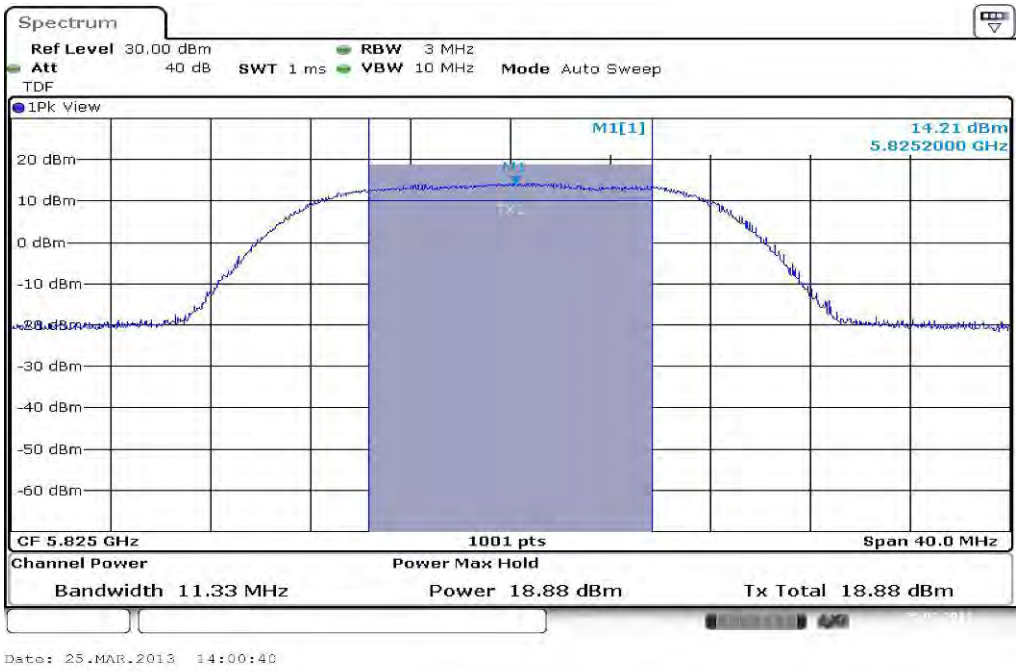
Plot 13: highest channel, a – mode, 6 Mbps



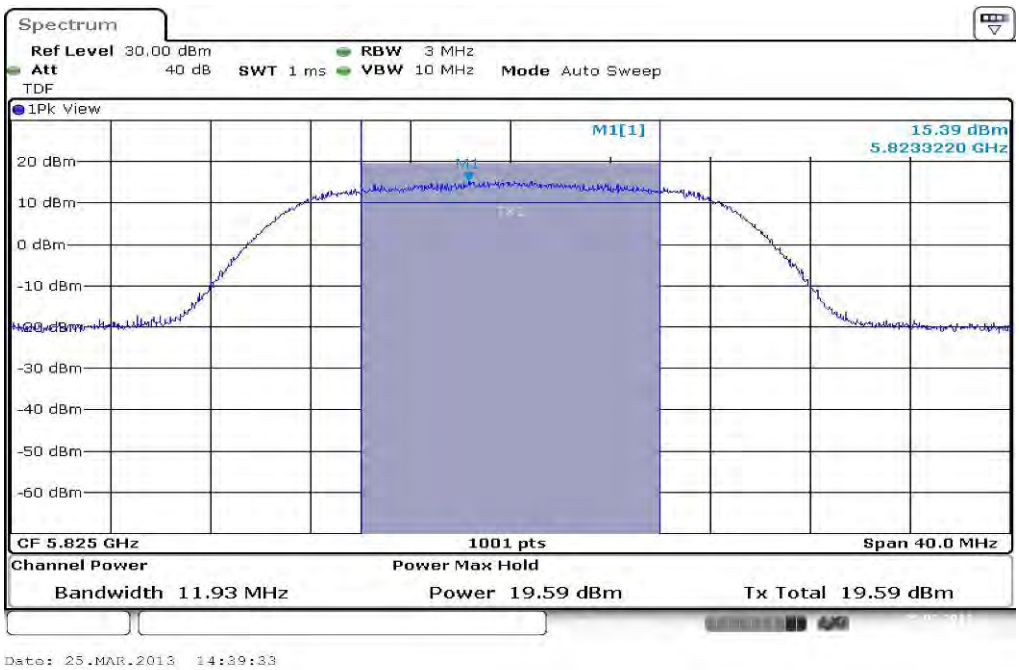
Plot 14: highest channel, a – mode, 24 Mbps



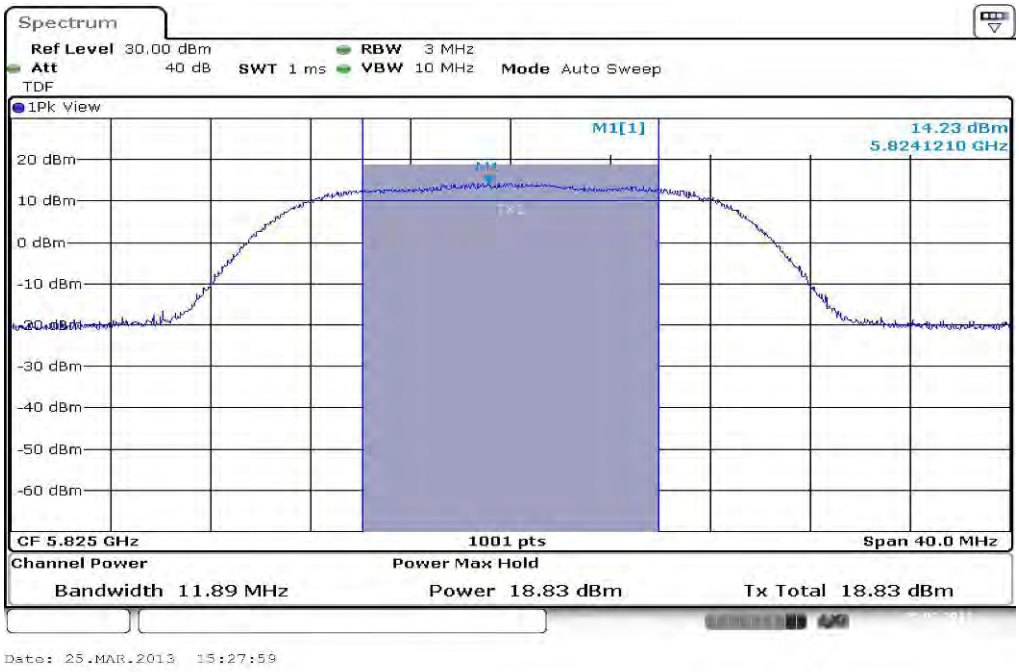
Plot 15: highest channel, a – mode, 54 Mbps



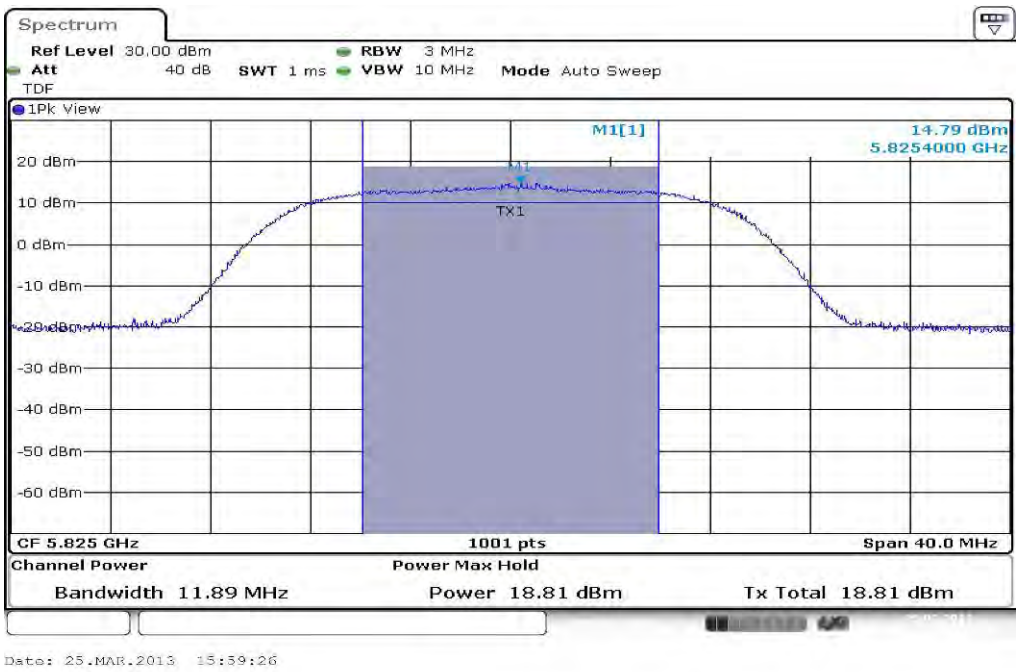
Plot 16: highest channel, n – mode, MCS 0



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



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



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)
Bandwidth correction:	Peak

Limits:

FCC	IC
Power Spectral Density	
8 dBm (conducted)	

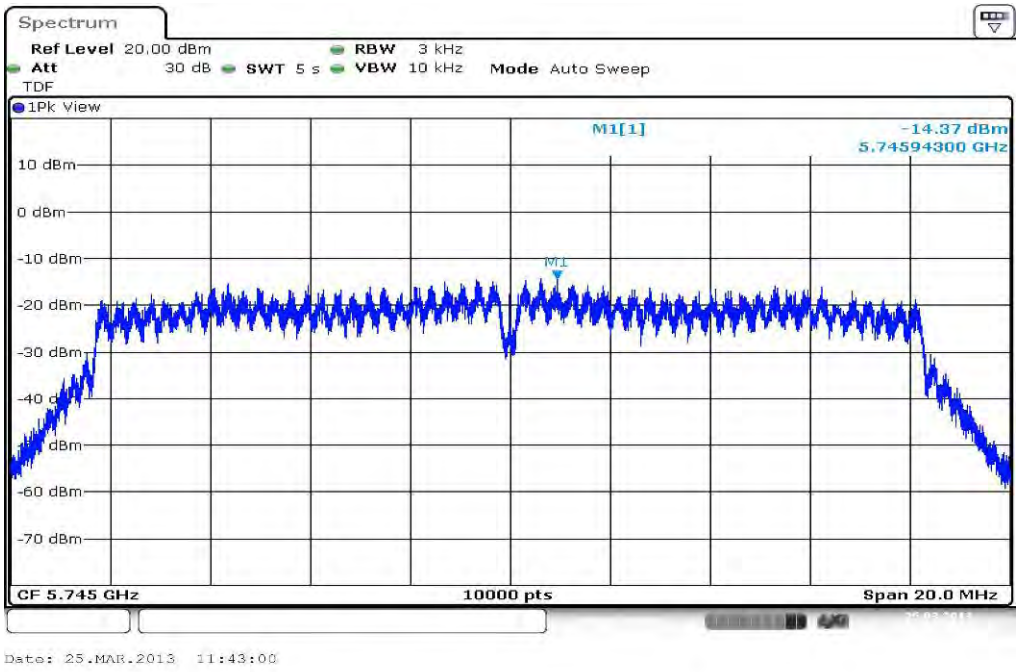
Results:

Technology / data rate	Power Spectral density [dBm]		
Frequency	5745 MHz	5785 MHz	5825 MHz
OFDM / a – mode, 6 Mbps	-14.37	-14.39	-14.18
OFDM / a – mode, 24 Mbps	-13.01	-12.89	-14.32
OFDM / a – mode, 54 Mbps	-15.02	-13.04	-15.05
OFDM / n – mode, MCS 0	-14.37	-13.68	-13.93
OFDM / n – mode, MCS 4	-15.25	-14.77	-14.18
OFDM / n – mode, MCS 7	-14.84	-14.53	-14.32
Measurement uncertainty	± RBW		

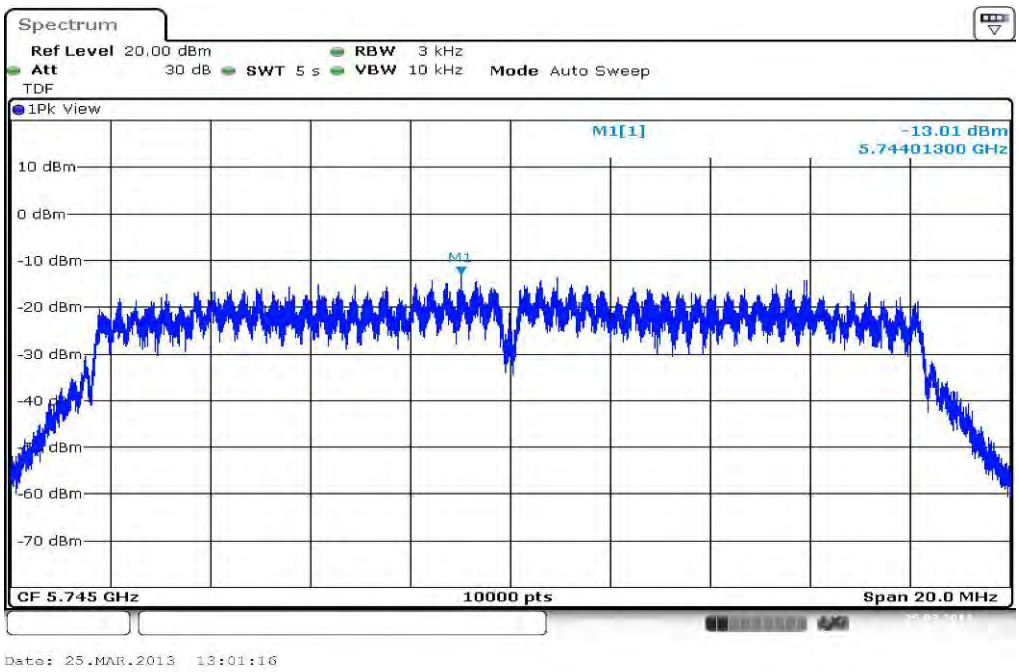
Result: Passed

Plots:

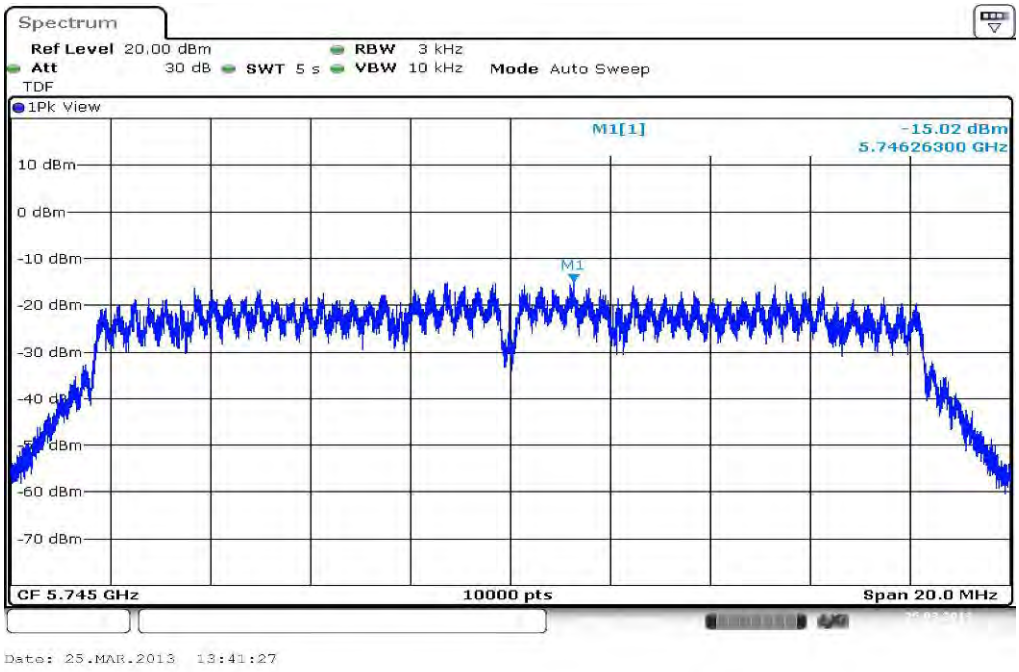
Plot 1: lowest channel, a – mode, 6 Mbps



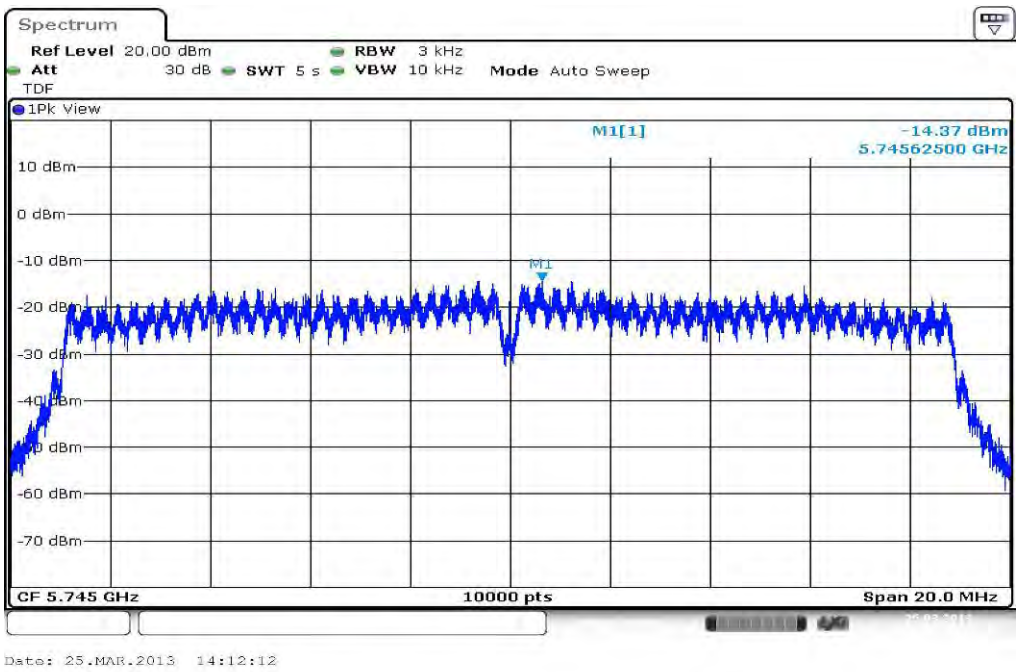
Plot 2: lowest channel, a – mode, 24 Mbps



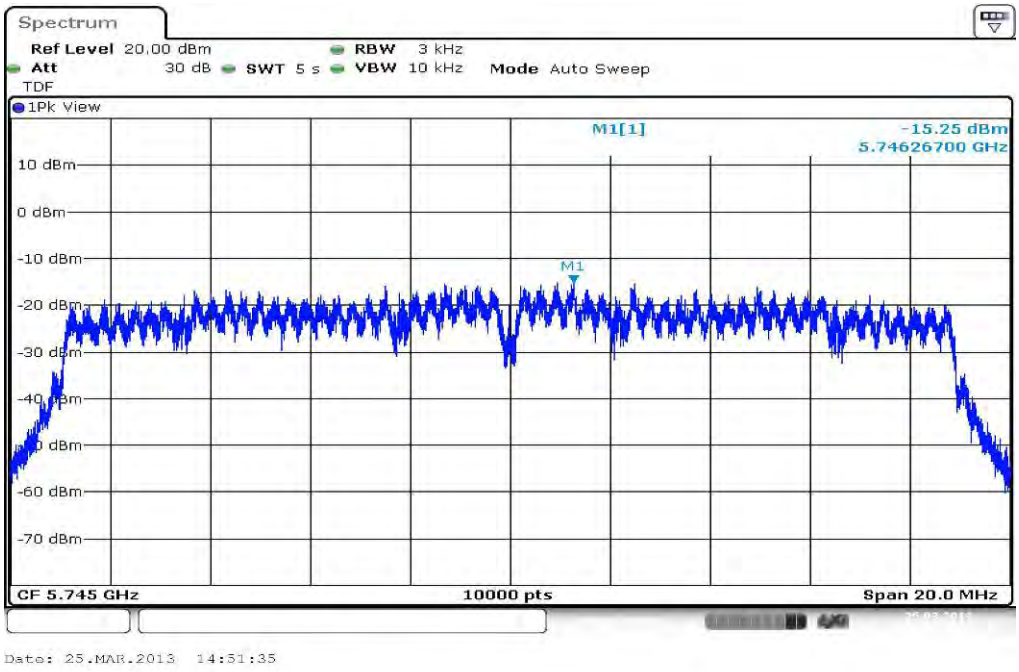
Plot 3: lowest channel, a – mode, 54 Mbps



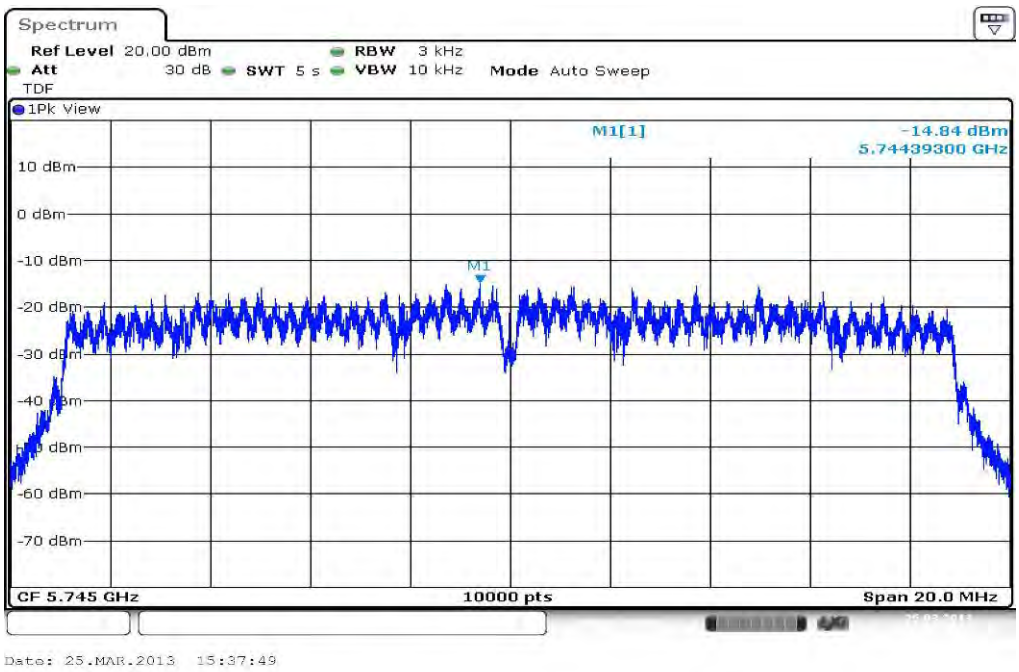
Plot 4: lowest channel, n – mode, MCS 0



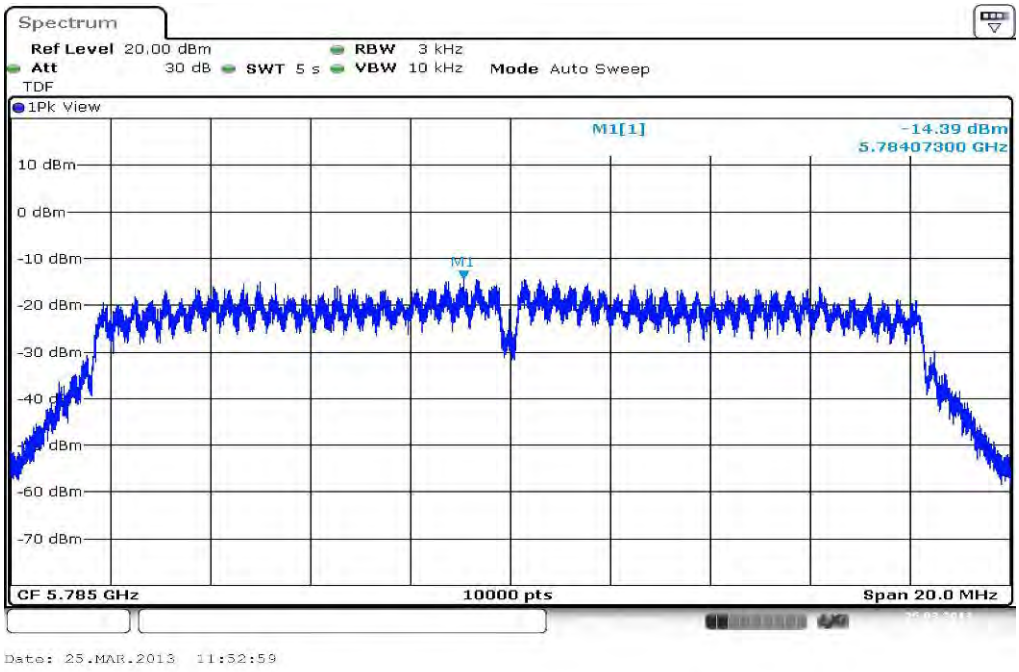
Plot 5: lowest channel, n – mode, MCS 4



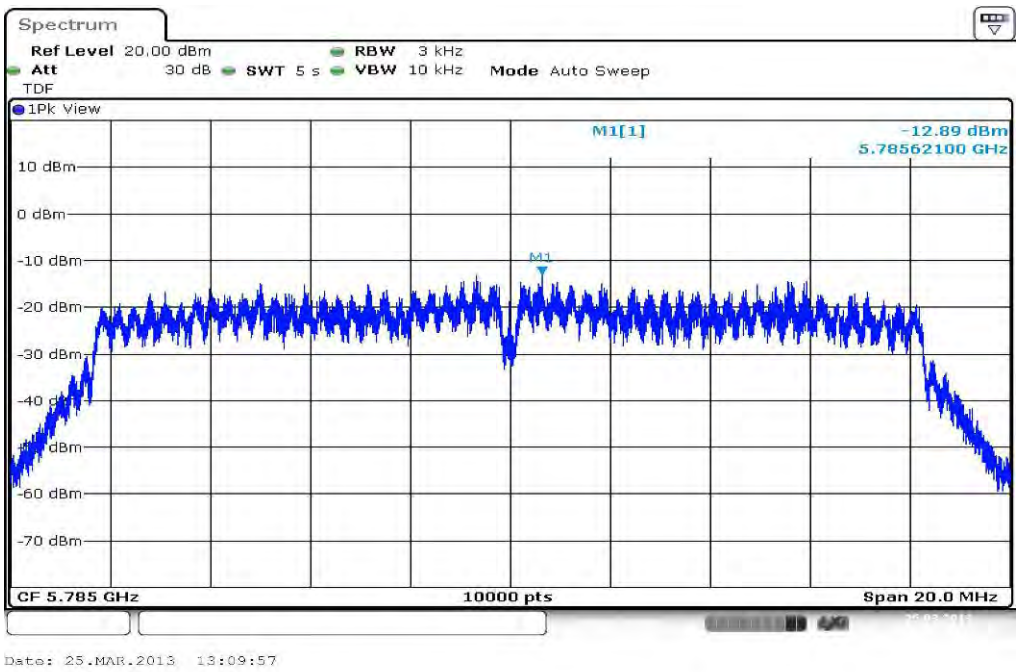
Plot 6: lowest channel, n – mode, MCS 7



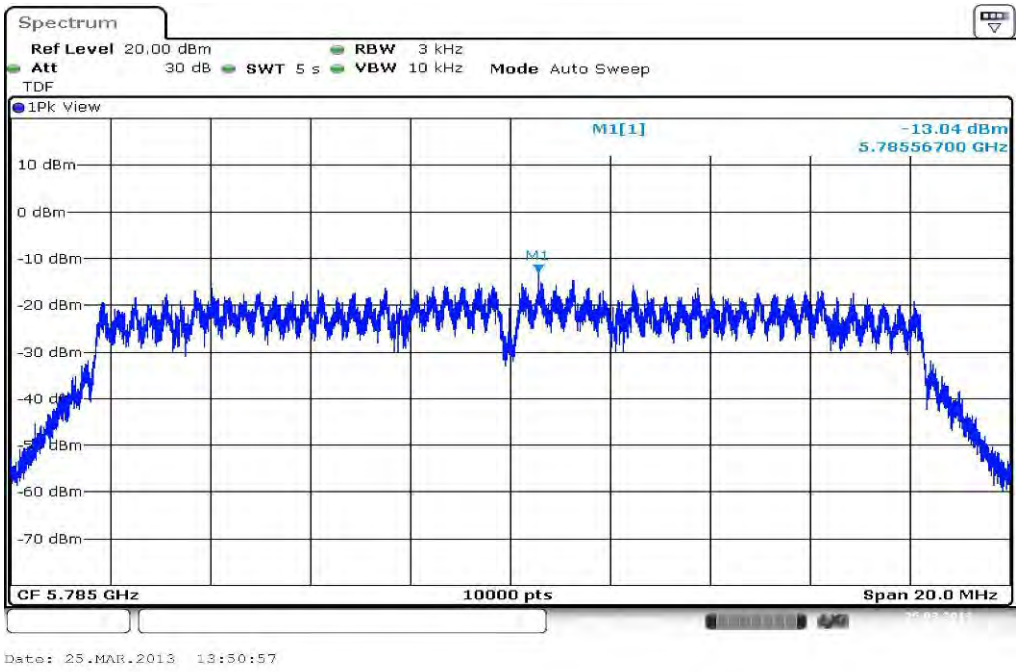
Plot 7: middle channel, a – mode, 6 Mbps



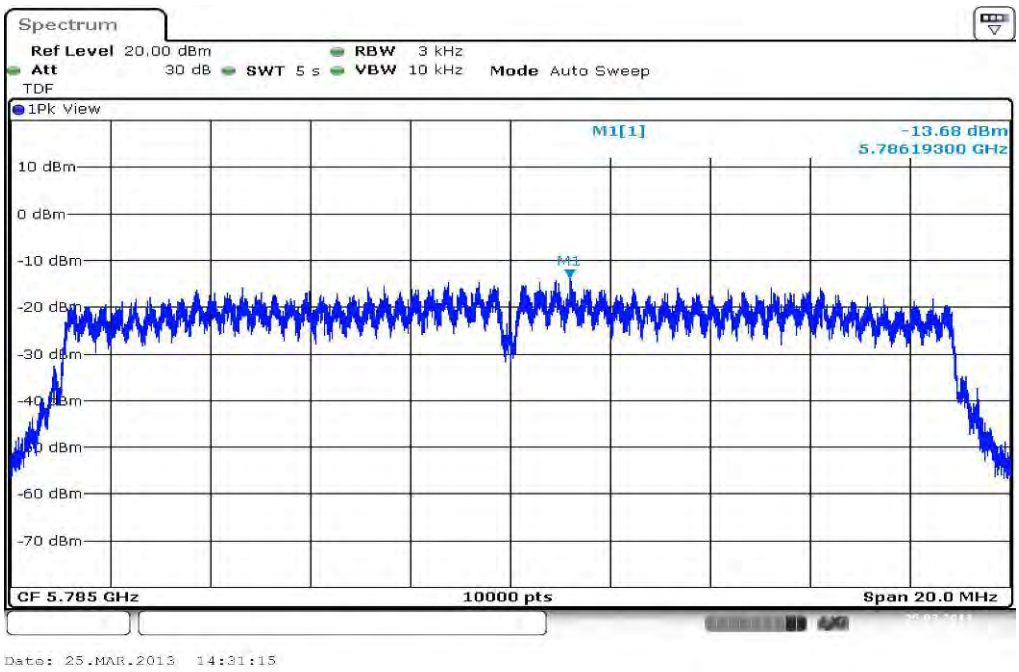
Plot 8: middle channel, a – mode, 24 Mbps



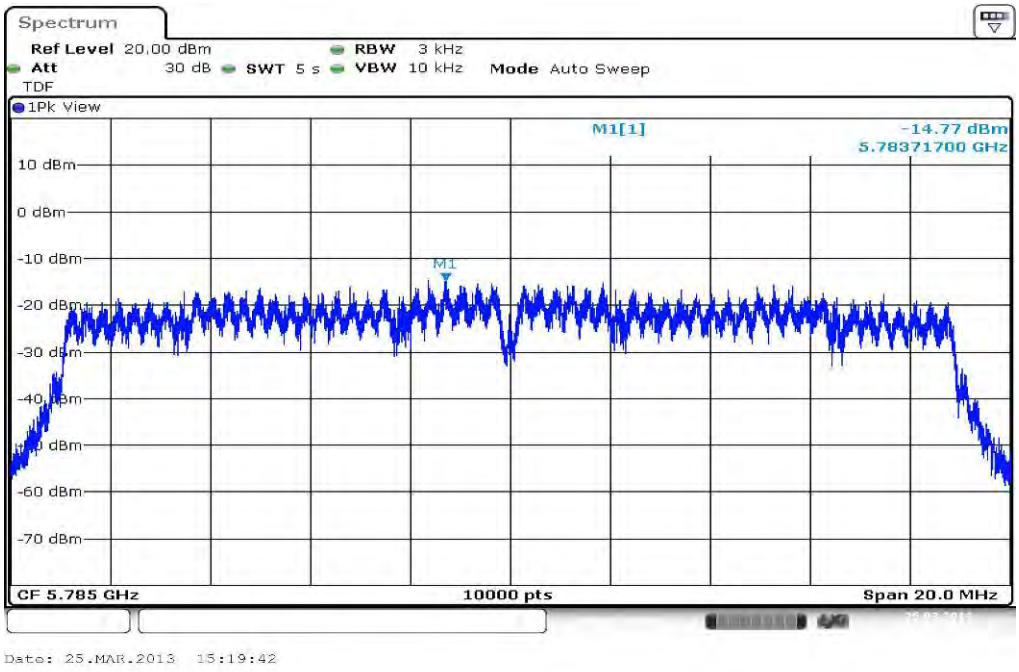
Plot 9: middle channel, a – mode, 54 Mbps



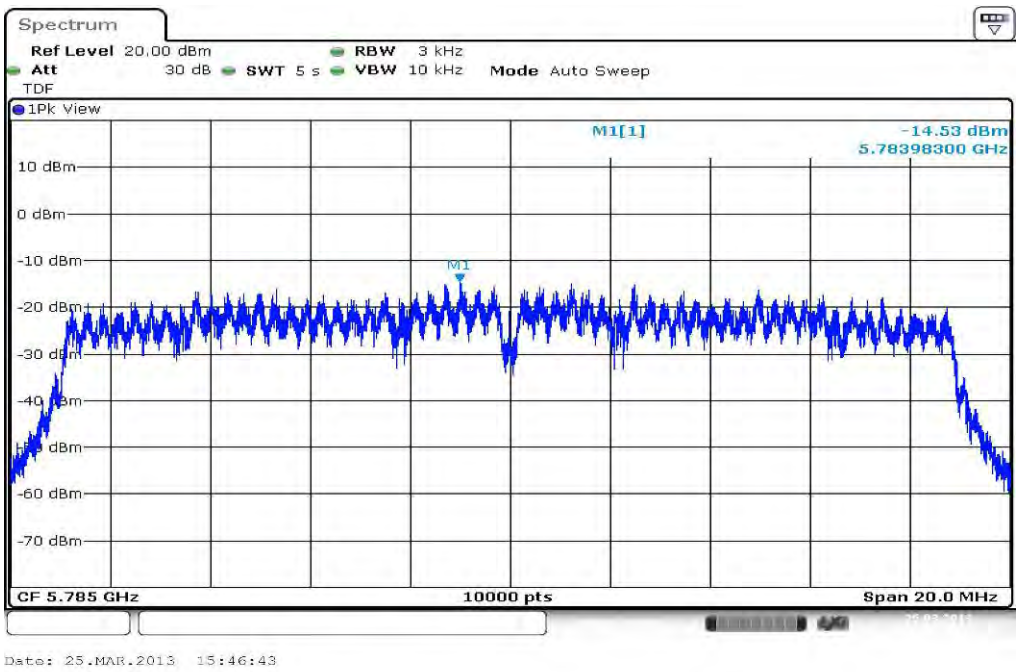
Plot 10: middle channel, n – mode, MCS 0



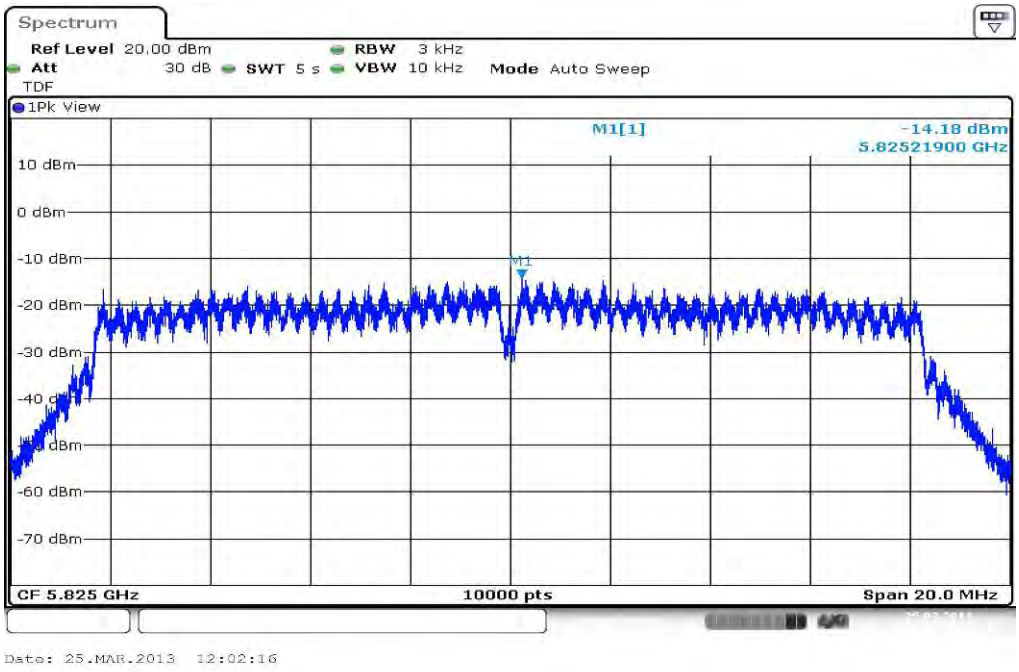
Plot 11: middle channel, n – mode, MCS 4



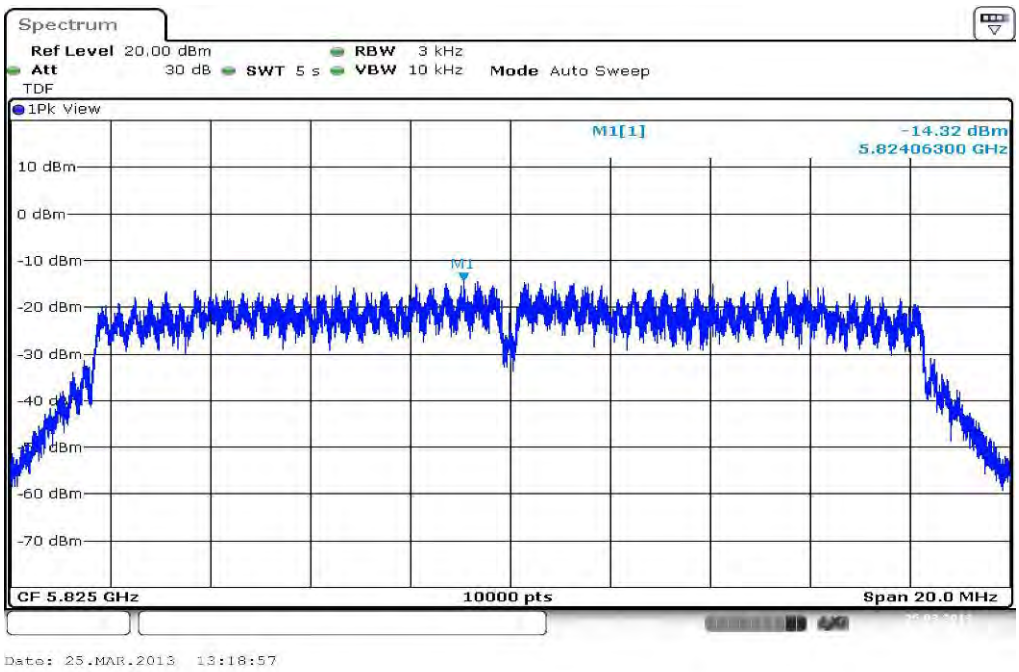
Plot 12: middle channel, n – mode, MCS 7



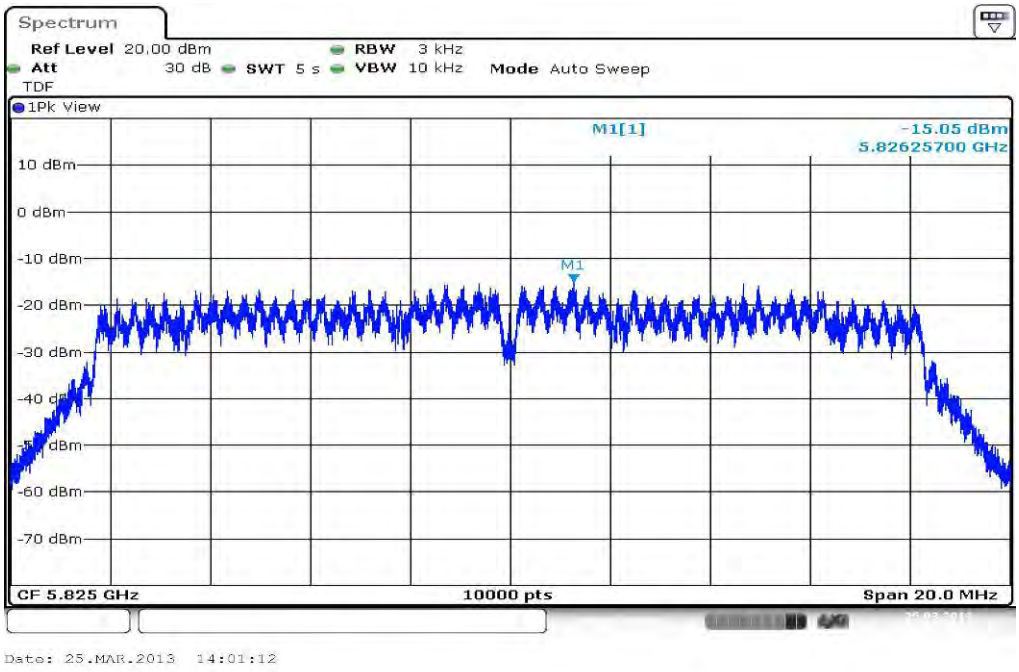
Plot 13: highest channel, a – mode, 6 Mbps



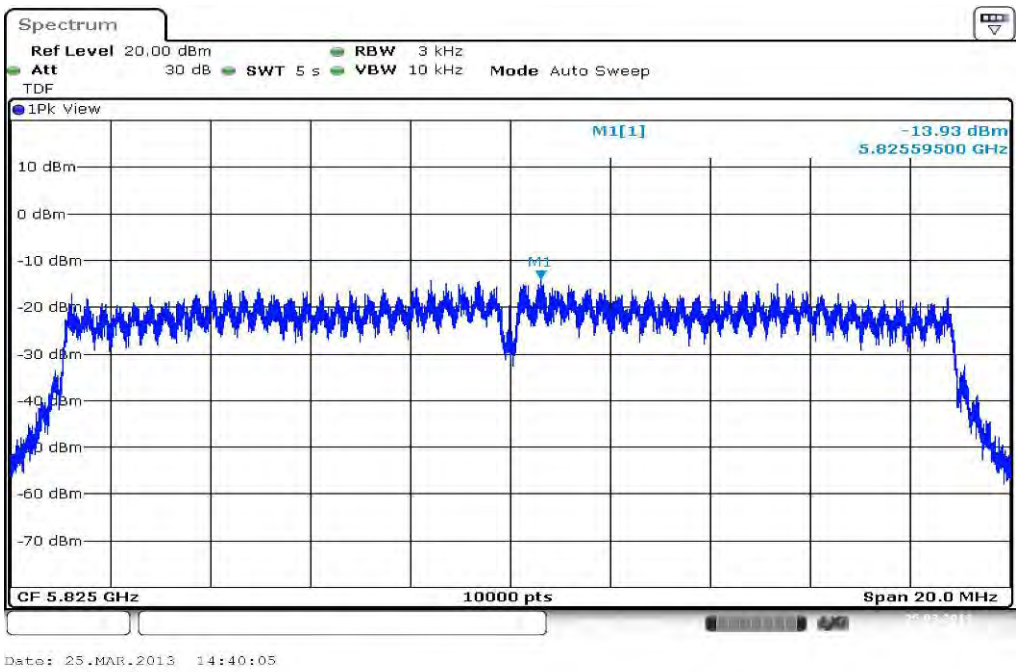
Plot 14: highest channel, a – mode, 24 Mbps



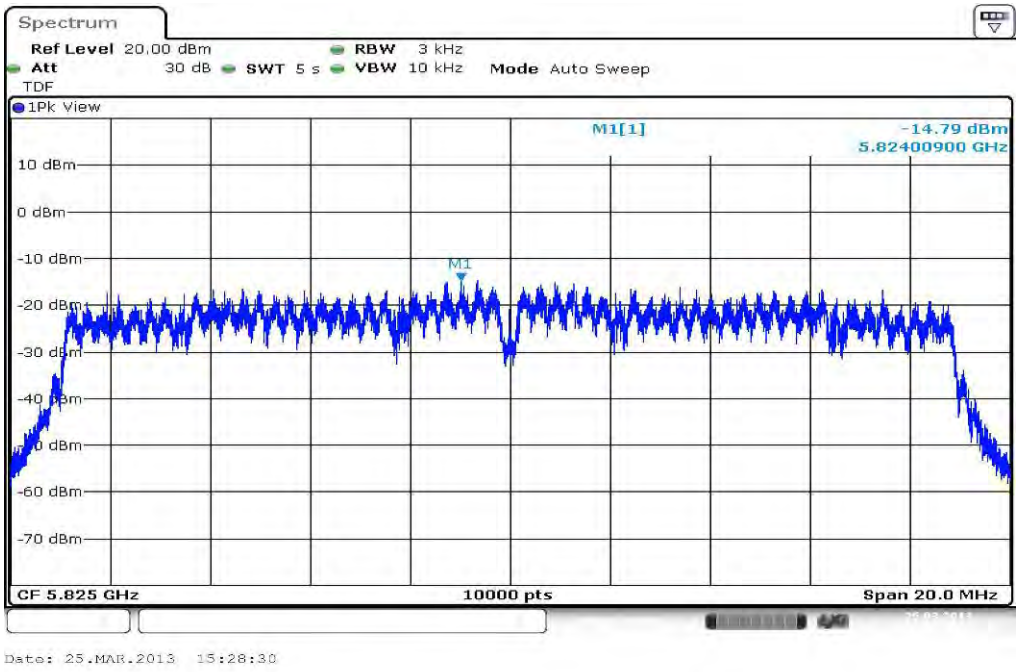
Plot 15: highest channel, a – mode, 54 Mbps



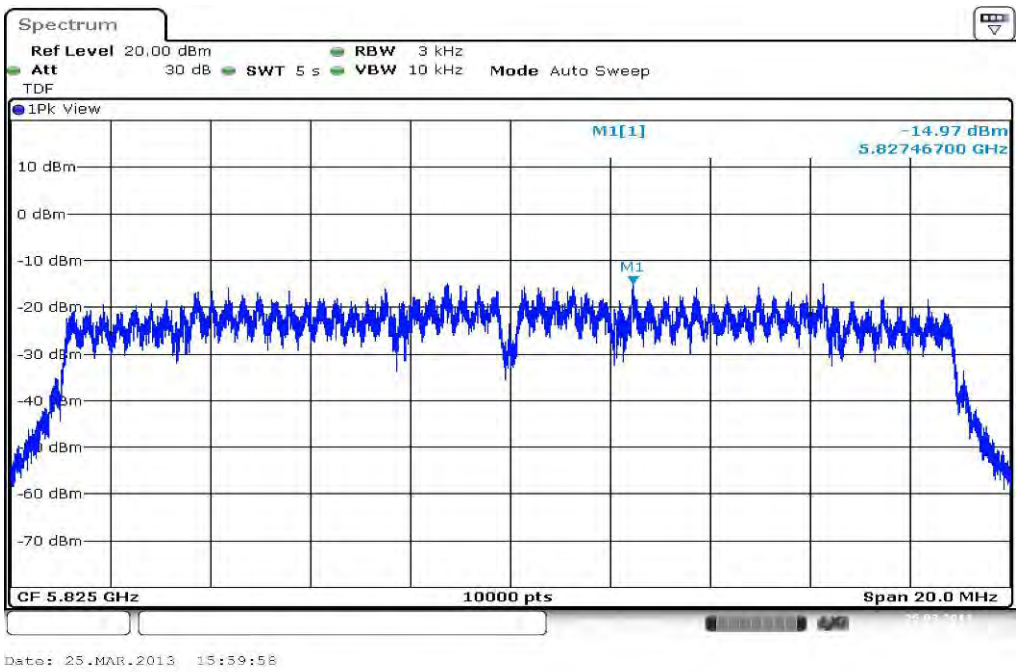
Plot 16: highest channel, n – mode, MCS 0



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



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



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 5725 – 5825 MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.	

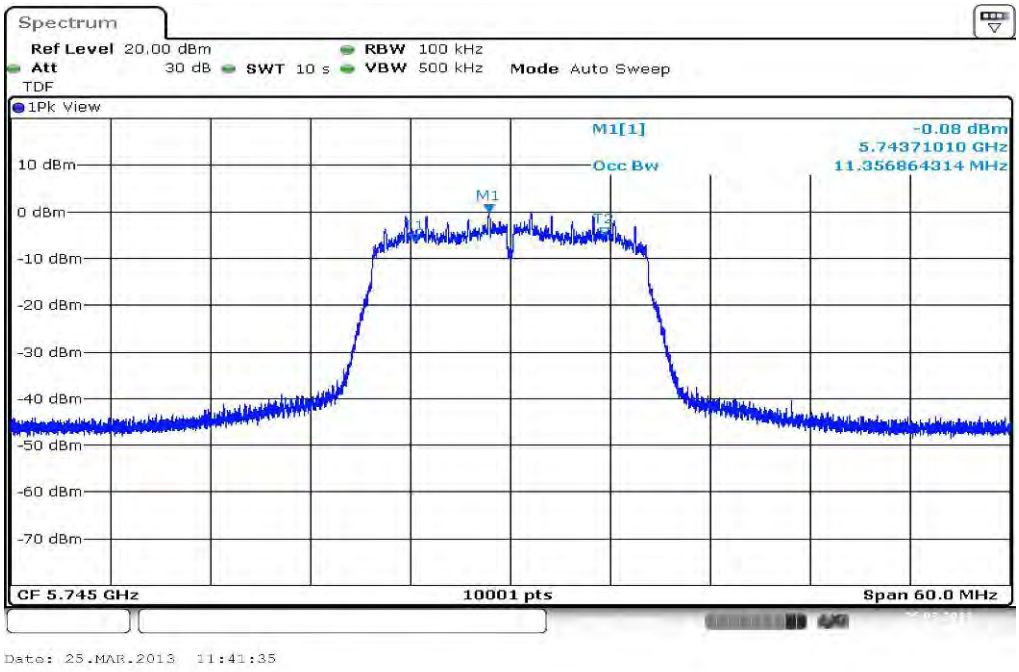
Results:

Modulation	6 dB bandwidth [MHz]		
Frequency	5725 MHz	5785 MHz	5825 MHz
OFDM / a – mode, 6 Mbps	11.36	11.33	11.34
OFDM / a – mode, 24 Mbps	11.31	11.29	11.30
OFDM / a – mode, 54 Mbps	11.30	11.31	11.33
OFDM / n – mode, MCS 0	11.94	11.91	11.93
OFDM / n – mode, MCS 4	11.87	11.87	11.89
OFDM / n – mode, MCS 7	11.90	11.89	11.89
Measurement uncertainty	± RBW		

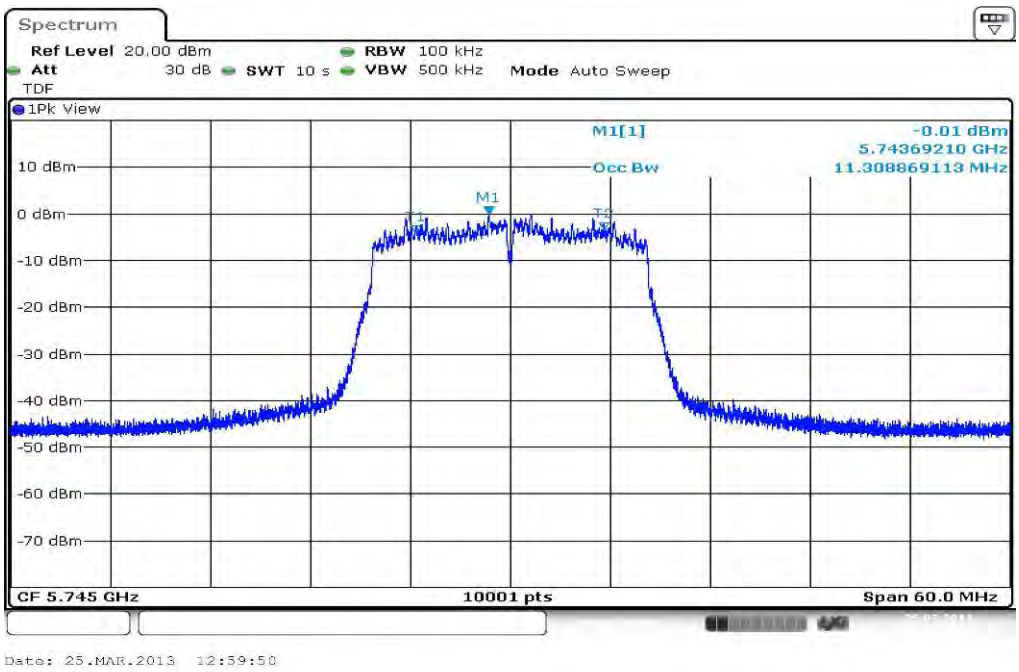
Result: Passed

Plots:

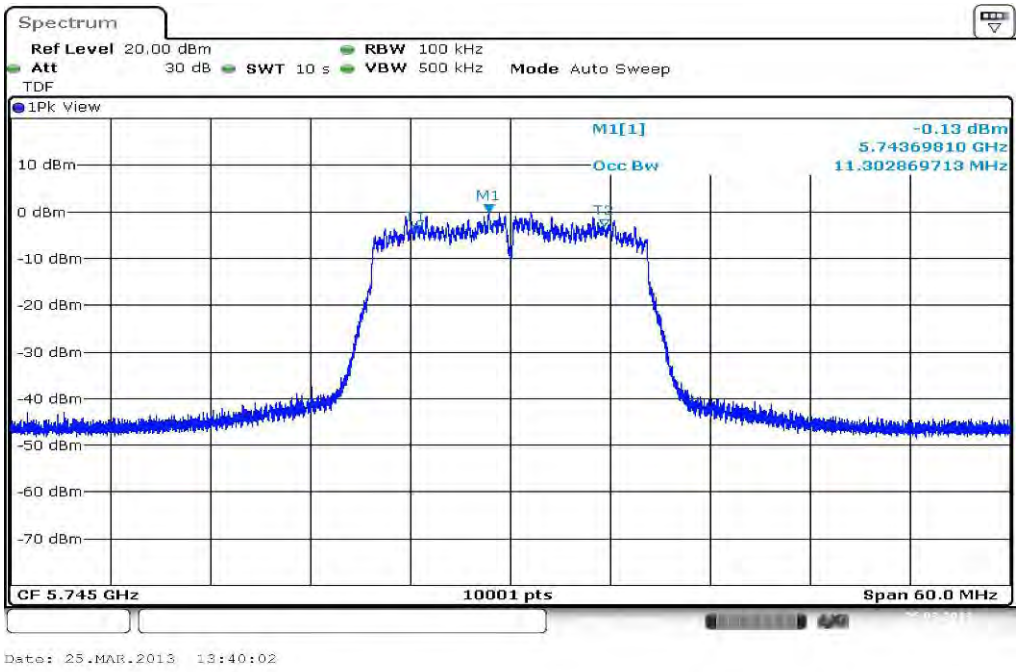
Plot 1: lowest channel, a – mode, 6 Mbps



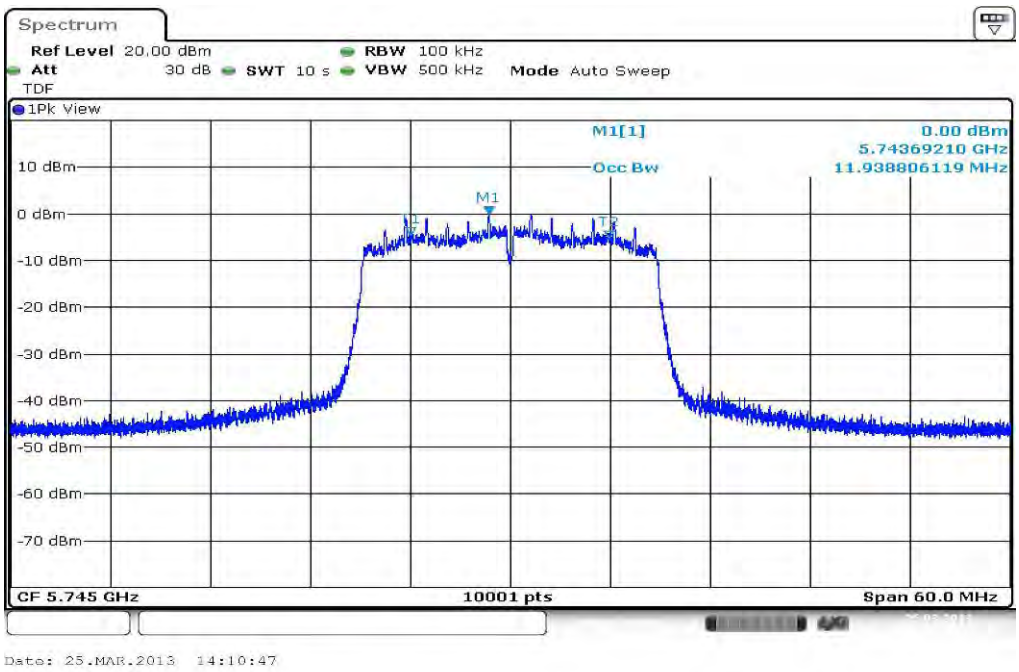
Plot 2: lowest channel, a – mode, 24 Mbps



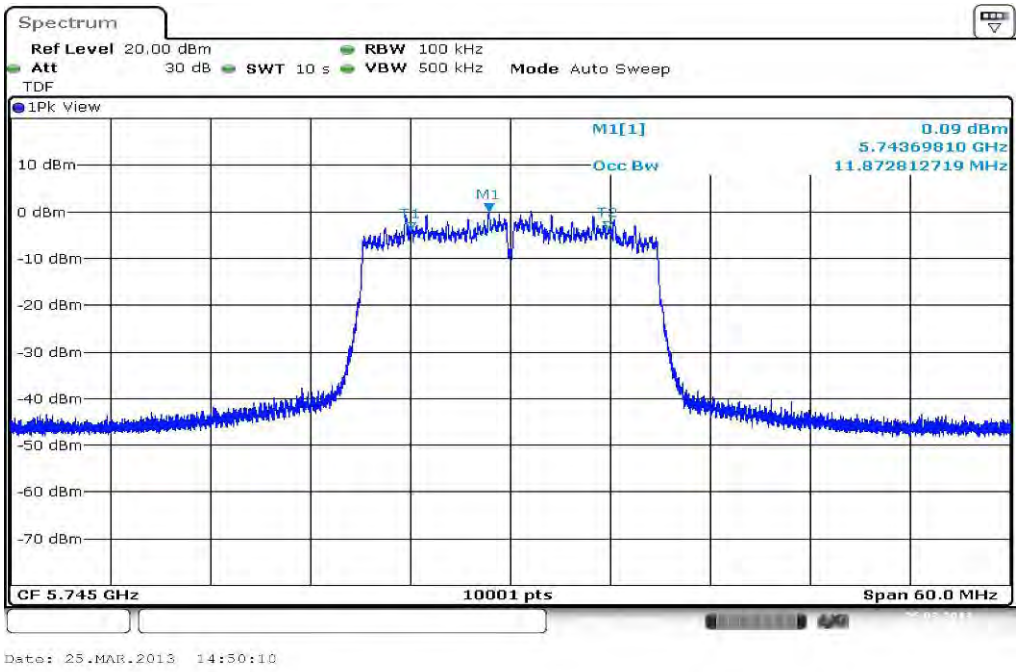
Plot 3: lowest channel, a – mode, 54 Mbps



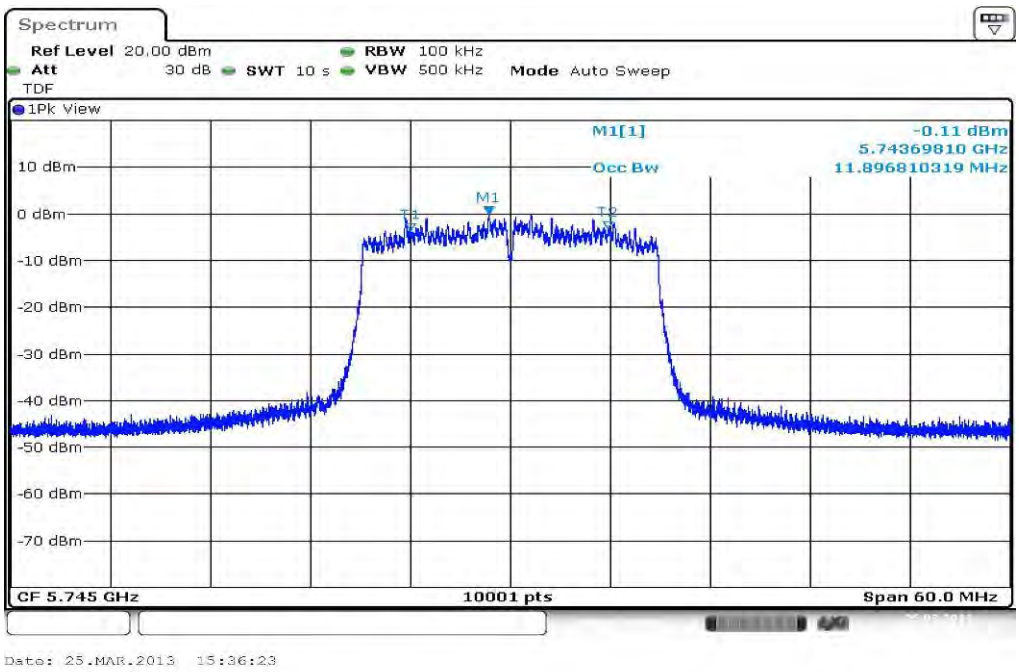
Plot 4: lowest channel, n – mode, MCS 0



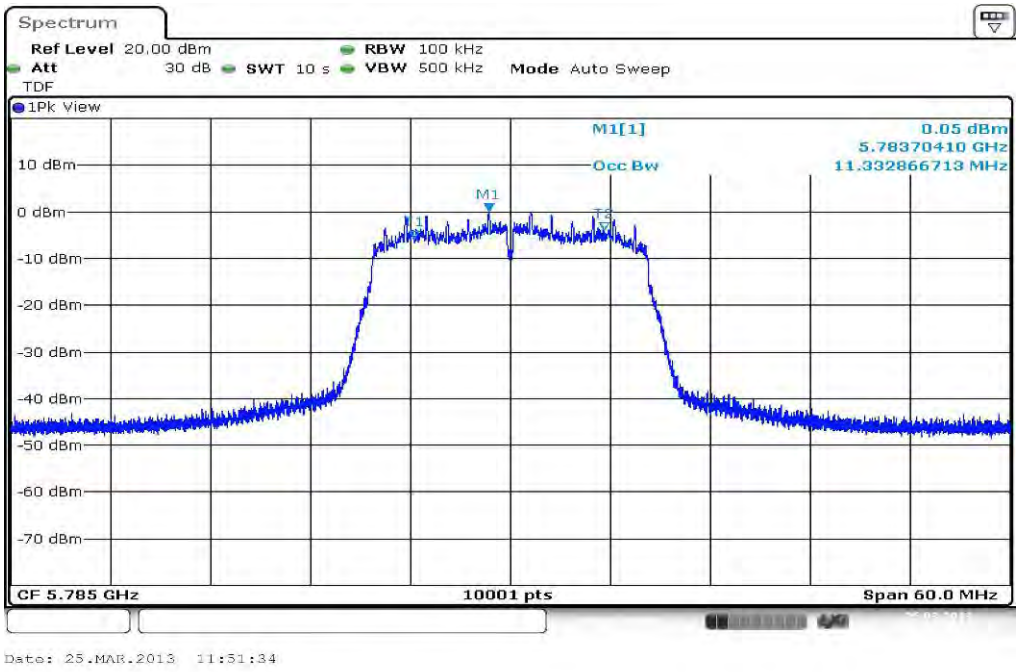
Plot 5: lowest channel, n – mode, MCS 4



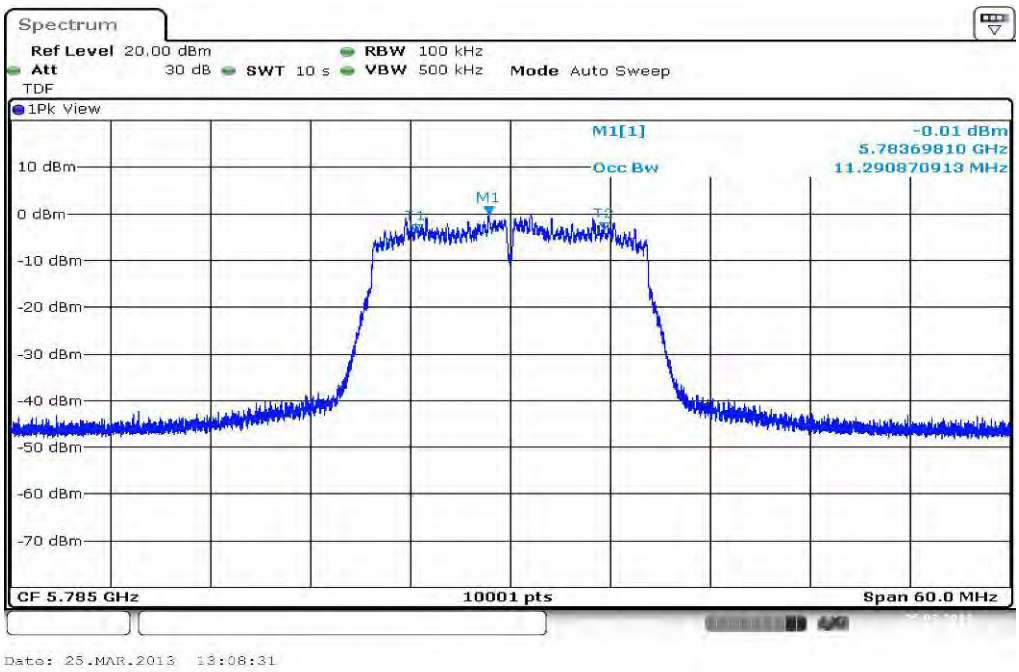
Plot 6: lowest channel, n – mode, MCS 7



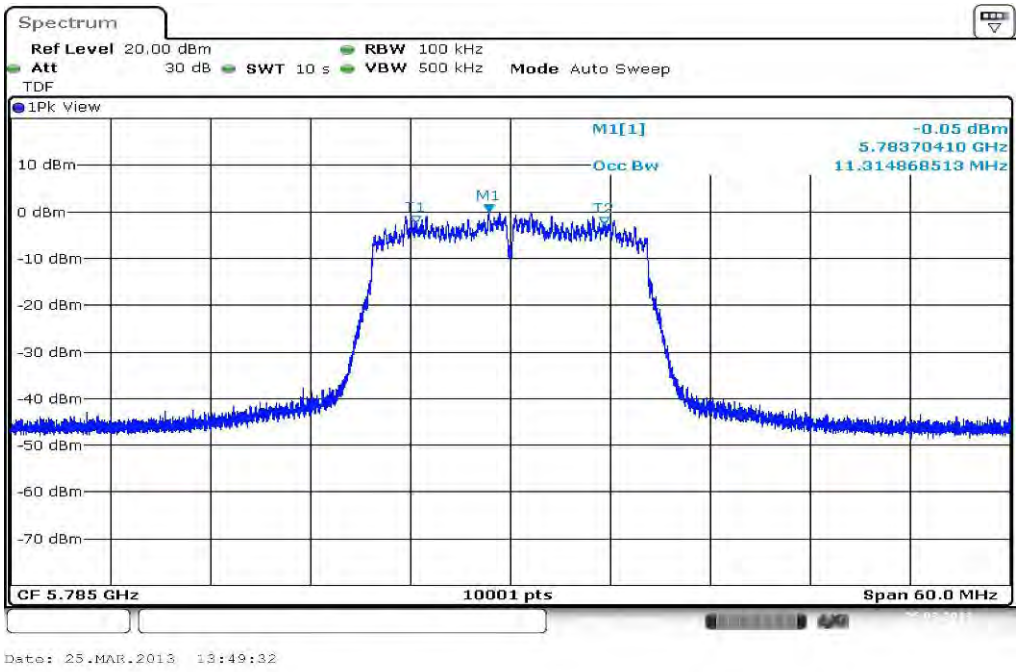
Plot 7: middle channel, a – mode, 6 Mbps



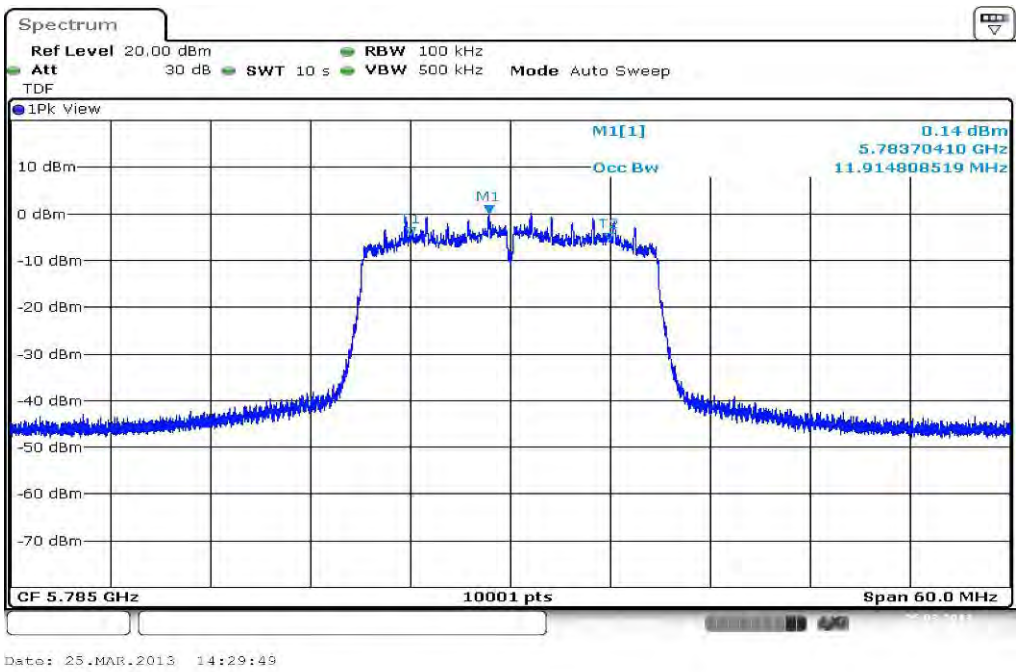
Plot 8: middle channel, a – mode, 24 Mbps



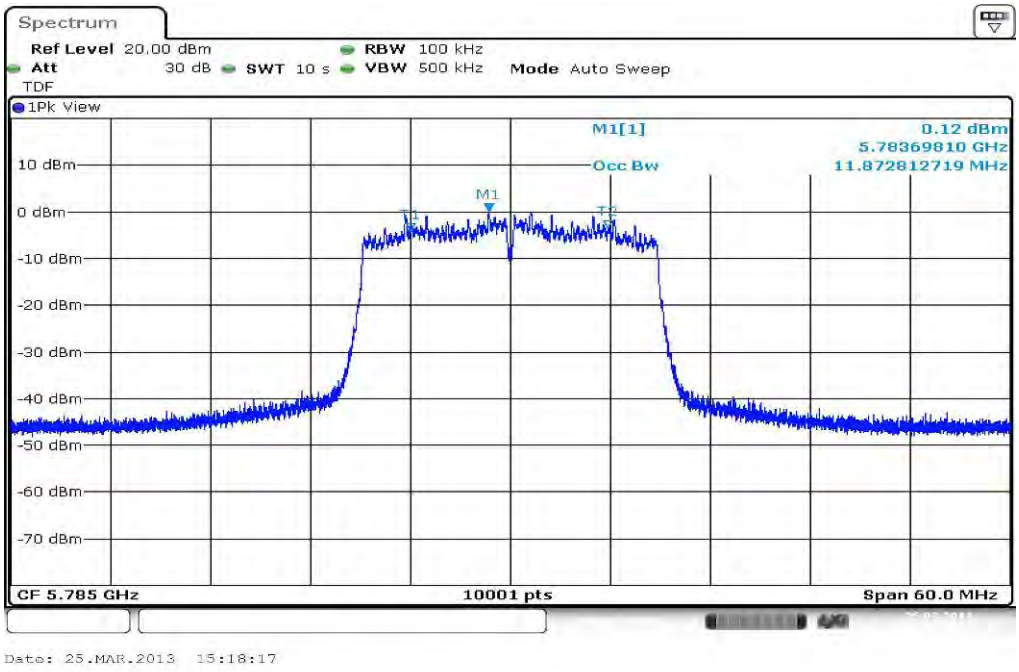
Plot 9: middle channel, a – mode, 54 Mbps



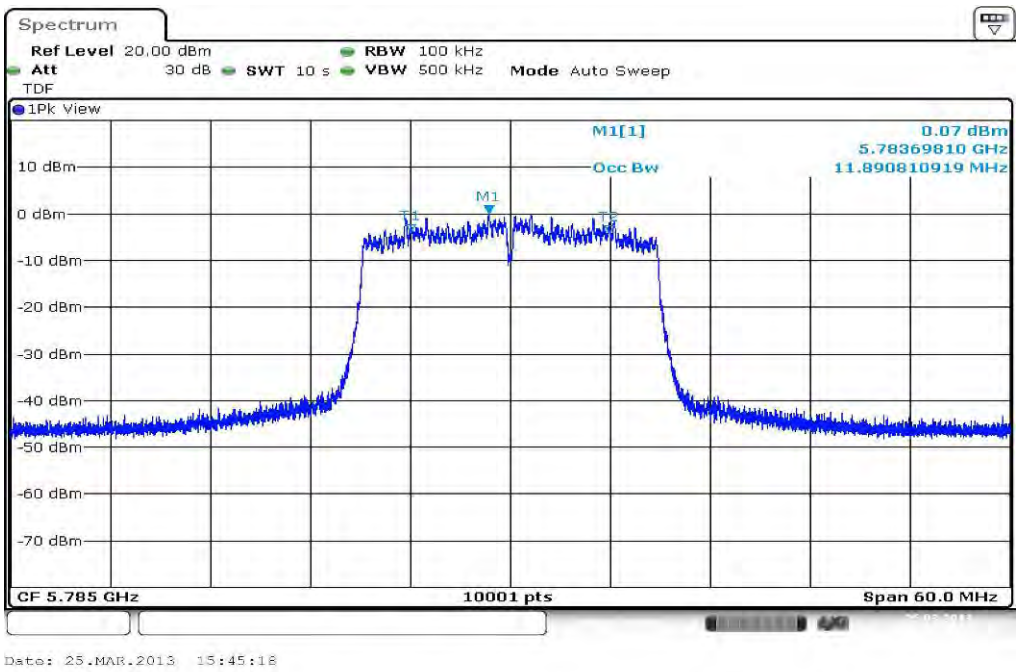
Plot 10: middle channel, n – mode, MCS 0



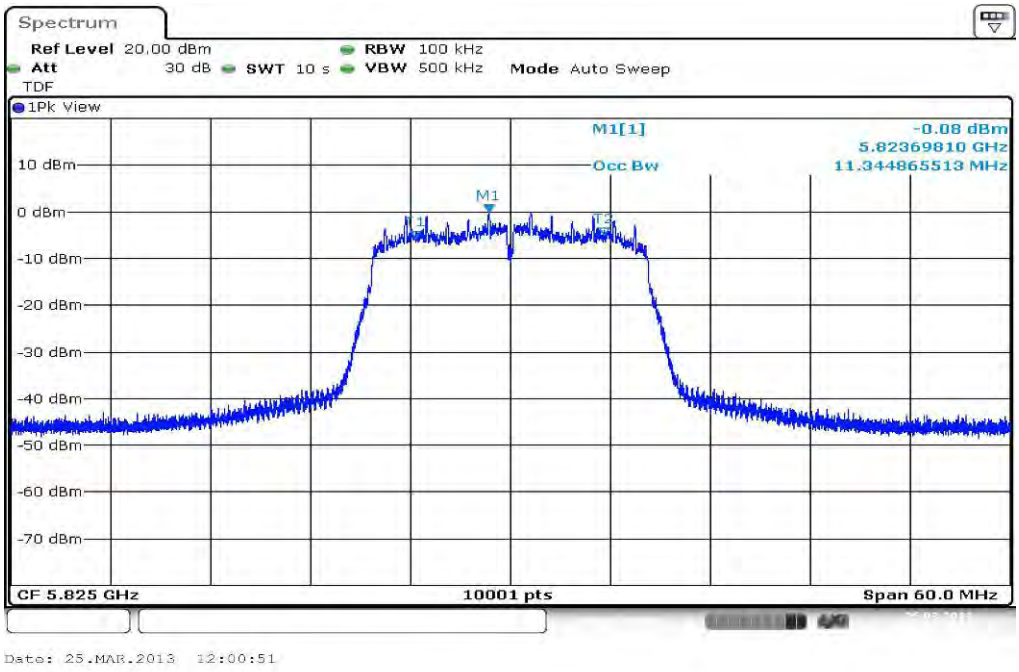
Plot 11: middle channel, n – mode, MCS 4



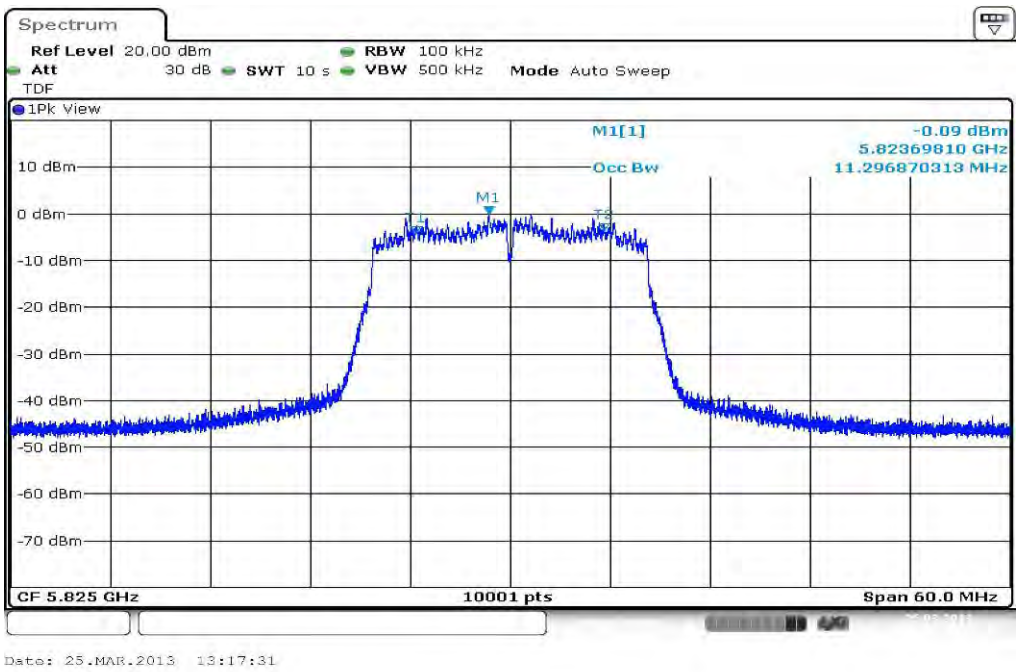
Plot 12: middle channel, n – mode, MCS 7



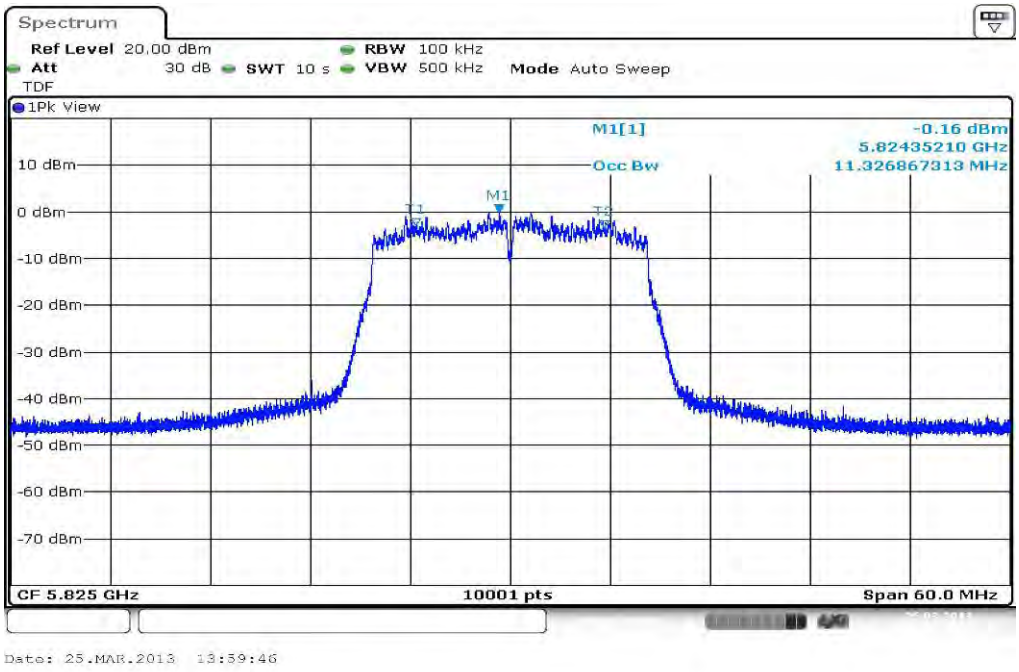
Plot 13: highest channel, a – mode, 6 Mbps



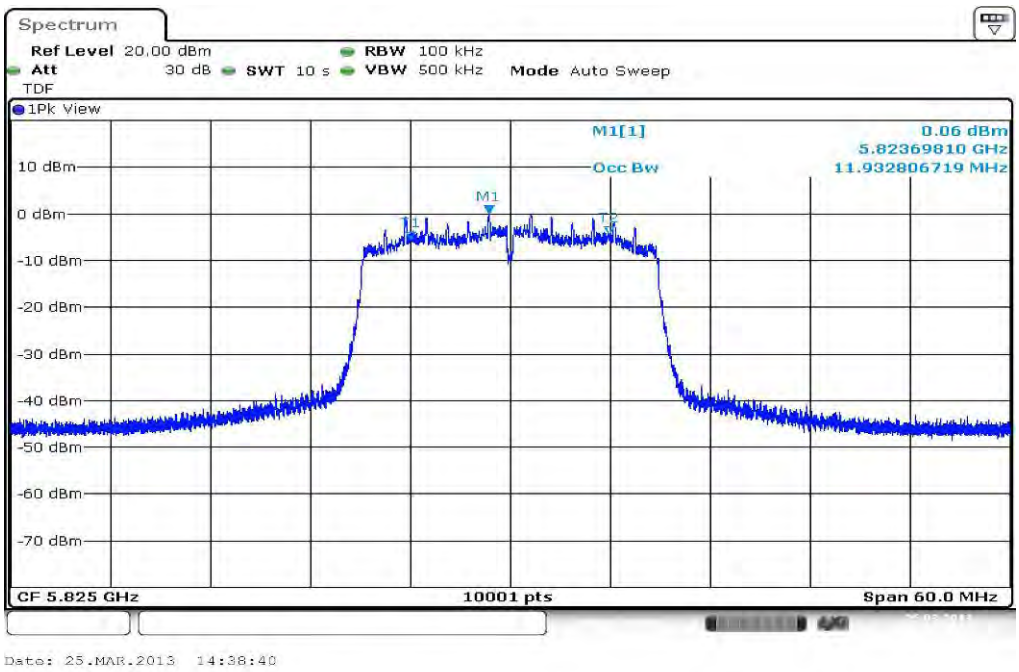
Plot 14: highest channel, a – mode, 24 Mbps



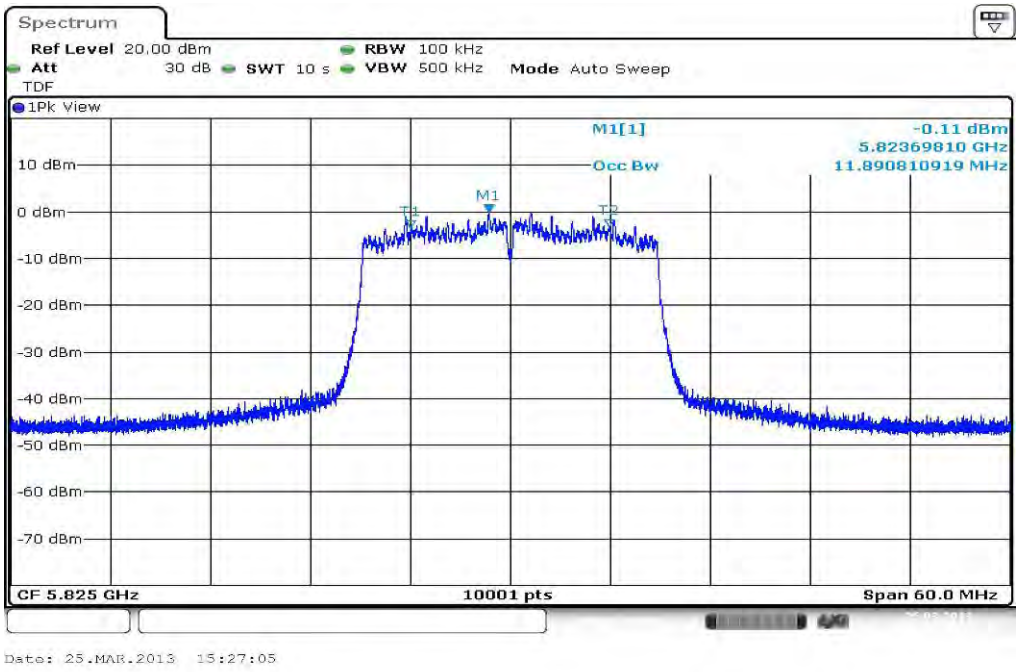
Plot 15: highest channel, a – mode, 54 Mbps



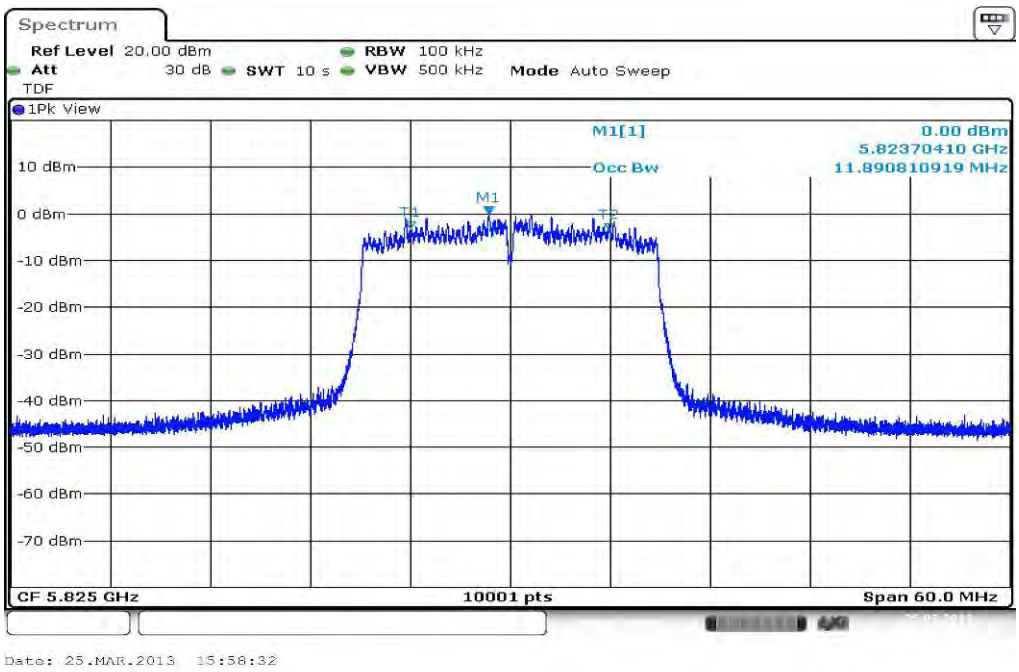
Plot 16: highest channel, n – mode, MCS 0



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



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



9.7 Spectrum bandwidth – 20 dB

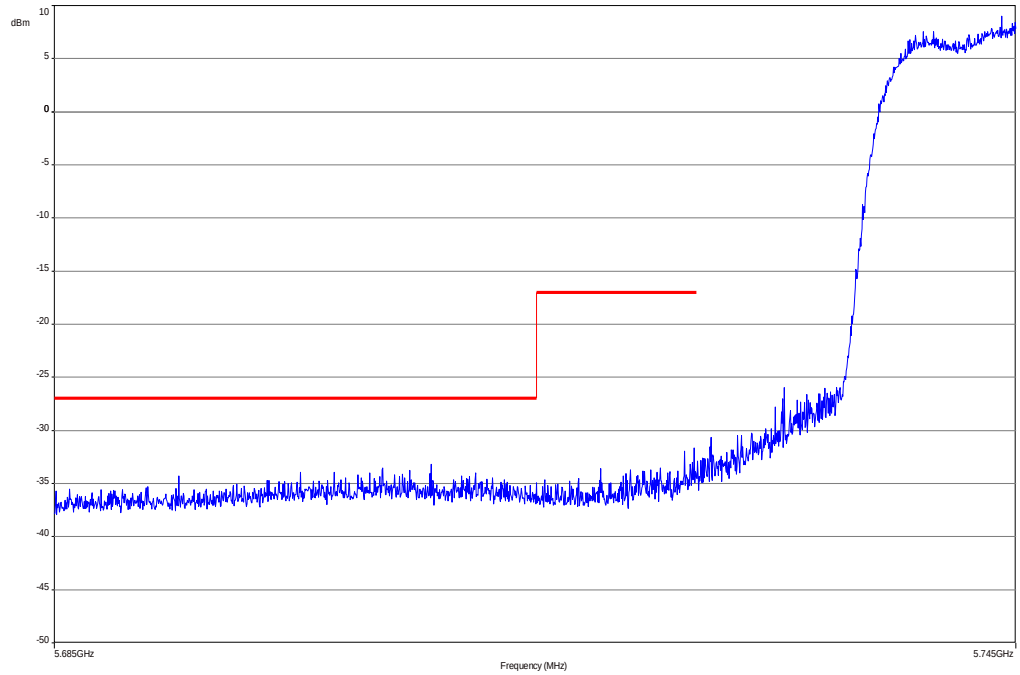
Not performed! Tests according to manufacturer test plan!

9.8 Band edge compliance conducted

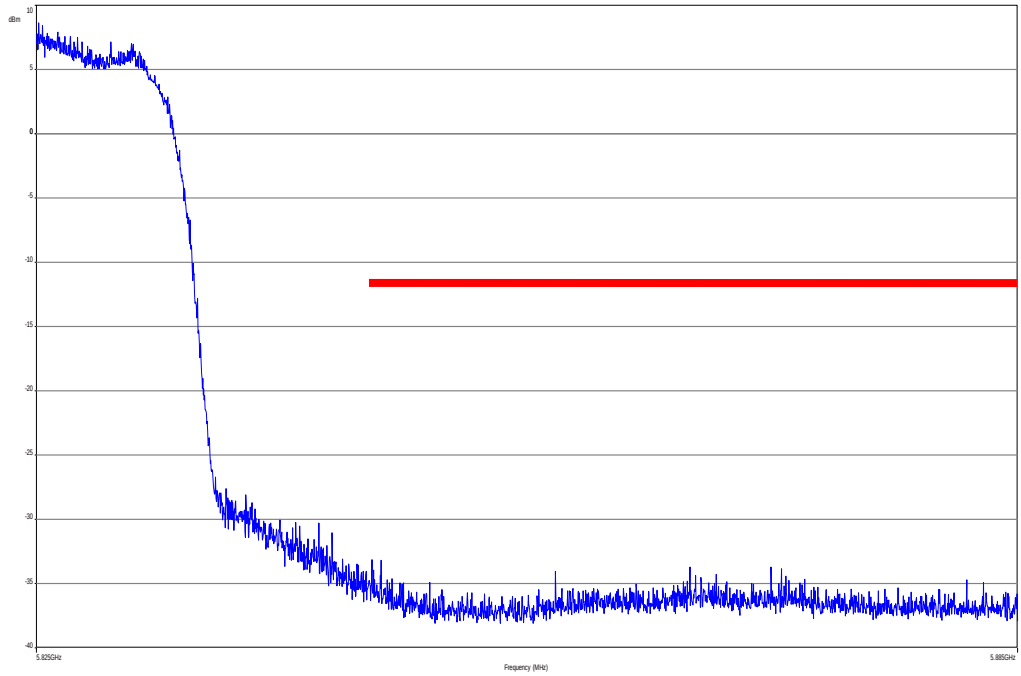
Not performed! Tests according to manufacturer test plan!

9.9 Band edge compliance radiated

Plot 1: Lower band edge, OFDM / a – mode, Limit acc. costumer demand Part 15.407

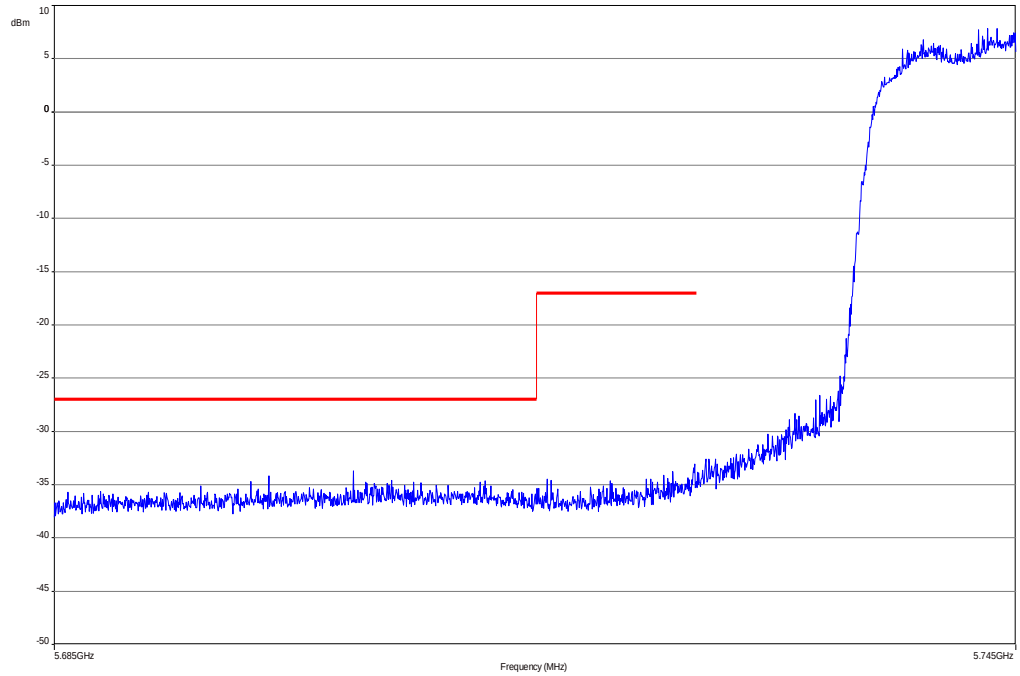


Plot 2: Upper band edge, OFDM / a – mode, Limit acc. costumer demand Part 15.247 (d) (conducted limit)

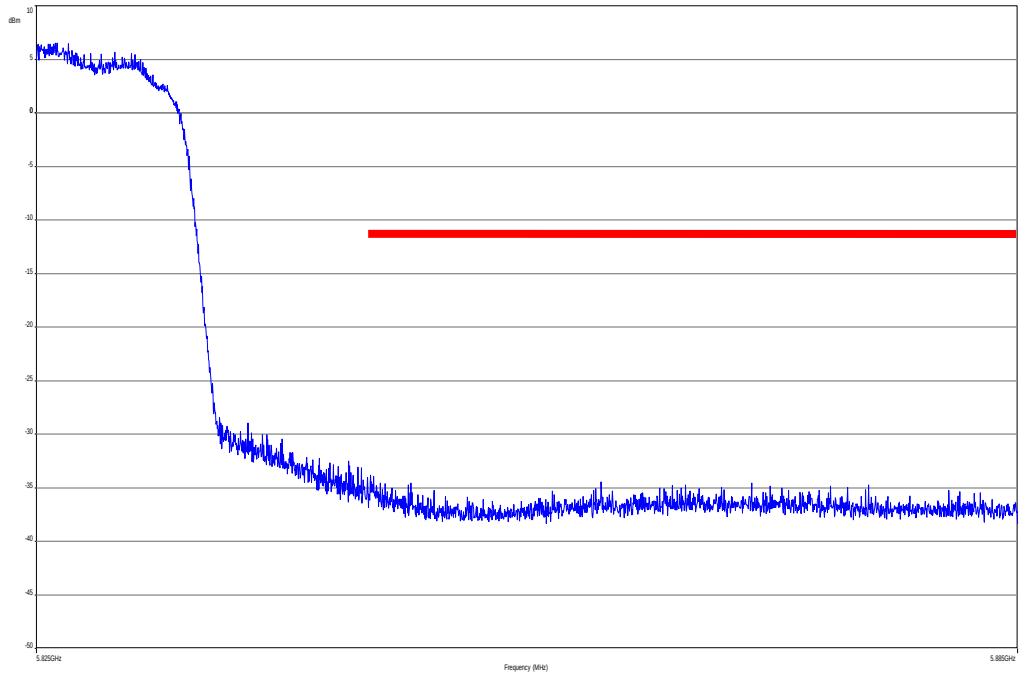


All out of band emissions on the bandedge are below 20 dBc

Plot 3: Lower band edge, OFDM / n – mode HT20, Limit acc. costumer demand Part 15.407



Plot 4: Upper band edge, OFDM / n – mode HT20, Limit acc. costumer demand Part 15.247 (d) (conducted limit)



All out of band emissions on the bandedge are below 20 dBc

Result: **Not rated**

9.10 TX spurious emissions conducted

Description:

Measurement of the conducted spurious emissions in transmit mode The measurement is performed at the lowest, middle and highest channel. The measurement is repeated for all modulations.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	1s / 100 MHz
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 100 kHz
Video bandwidth:	F < 1 GHz: 500 kHz F > 1 GHz: 500 kHz
Span:	9 kHz to 25 GHz
Trace-Mode:	Max Hold

Limits:

FCC	IC
TX Spurious Emissions Conducted	
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	

Results: OFDM / a – mode

TX Spurious Emissions Conducted					
OFDM / a – mode					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
5745		See plots!	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5785		See plots!	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5825		See plots!	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
Measurement uncertainty		± 3 dB			

Result: **Passed**

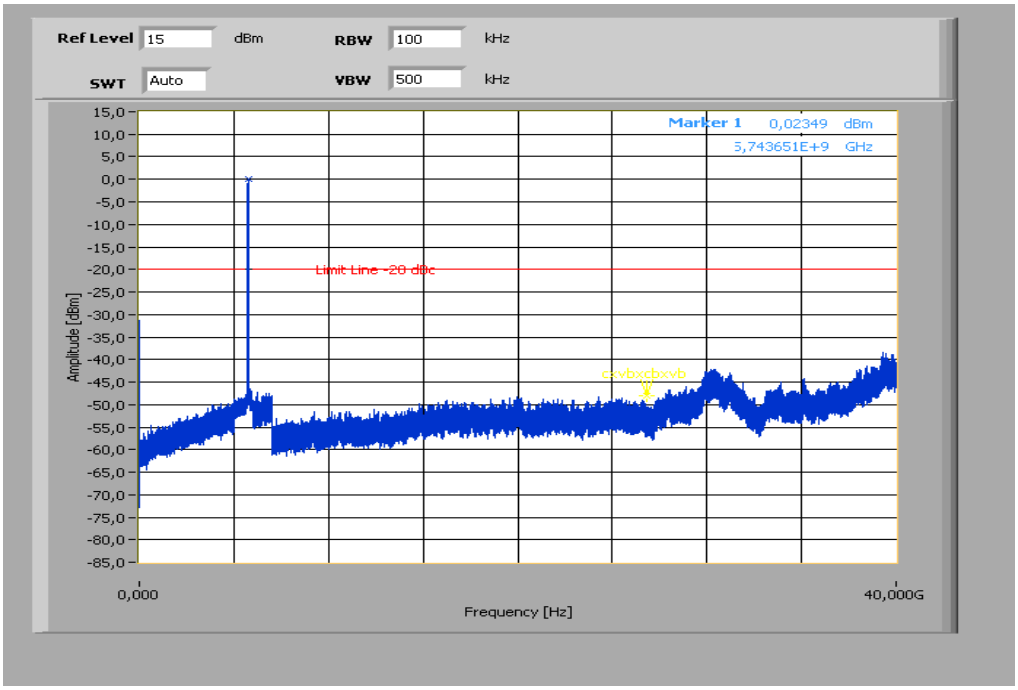
Results: OFDM / n – mode HT20

TX Spurious Emissions Conducted					
OFDM / n – mode HT20					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
5745		See plots!	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5785		See plots!	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
5825		See plots!	30 dBm		Operating frequency
No critical peaks detected. All detected emissions are below the -20 dBc criteria.			-20 dBc (peak) -30 dBc (average)		complies
Measurement uncertainty		± 3 dB			

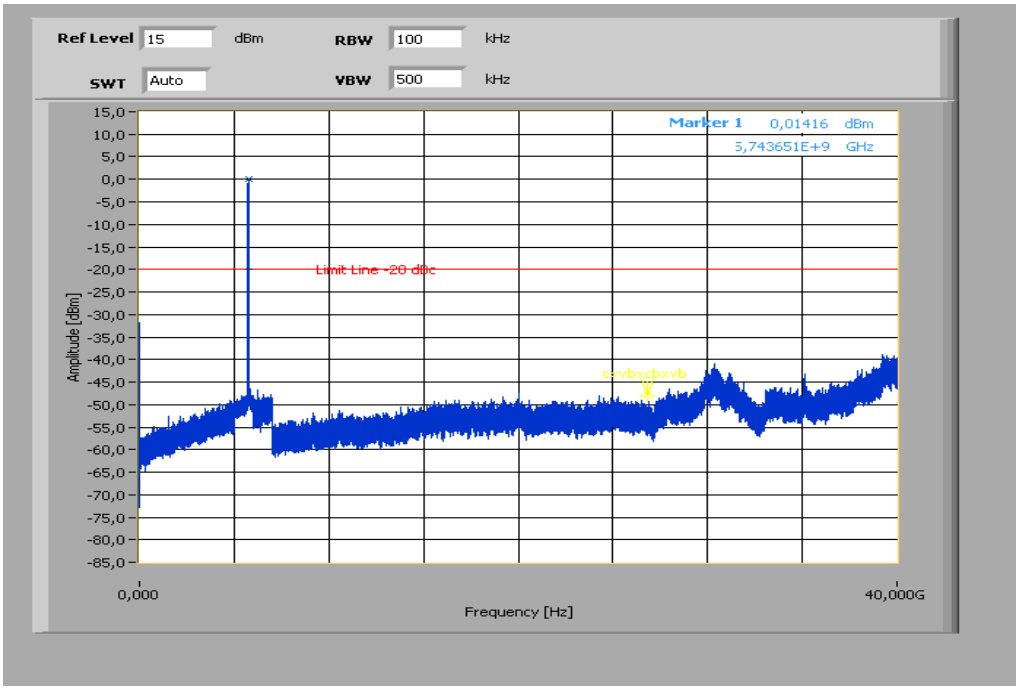
Result: **Passed**

Plots:

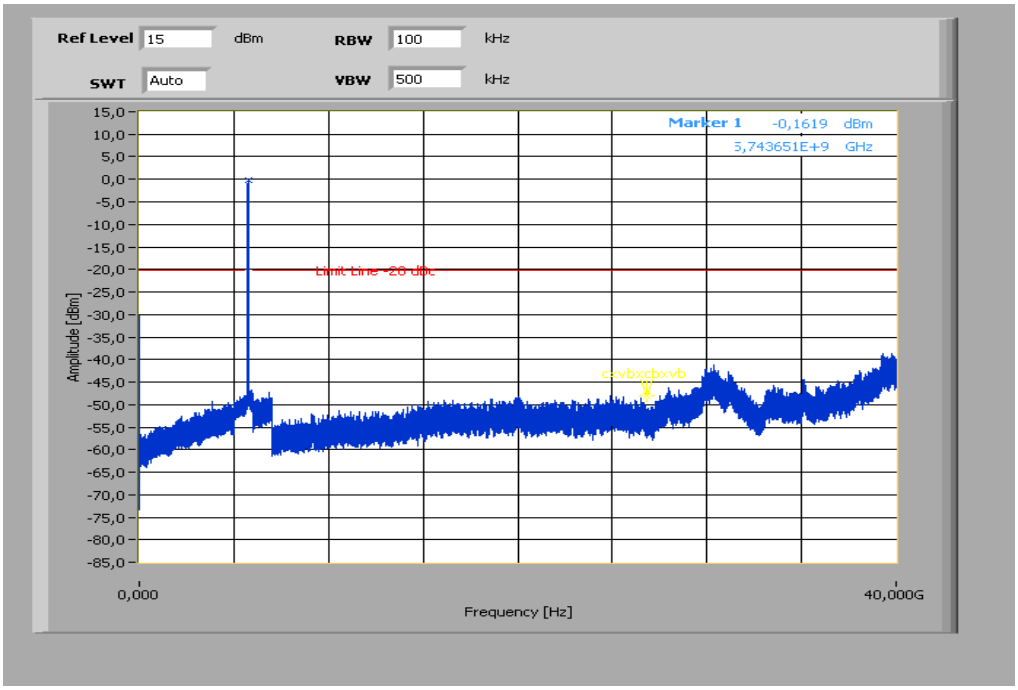
Plot 1: lowest channel, a – mode, 6 Mbps



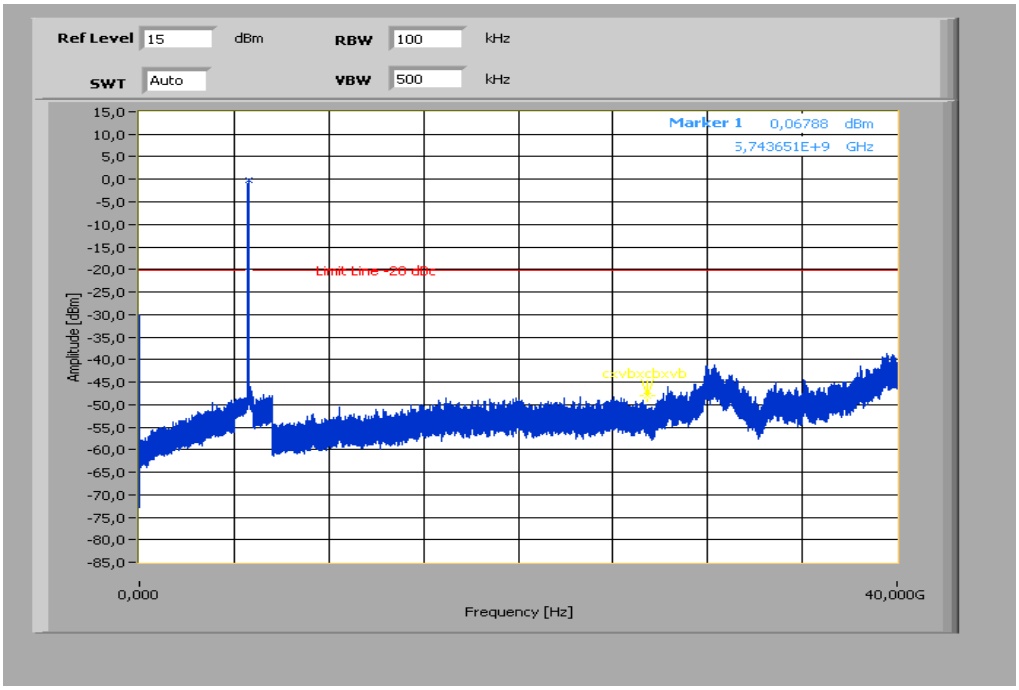
Plot 2: lowest channel, a – mode, 24 Mbps



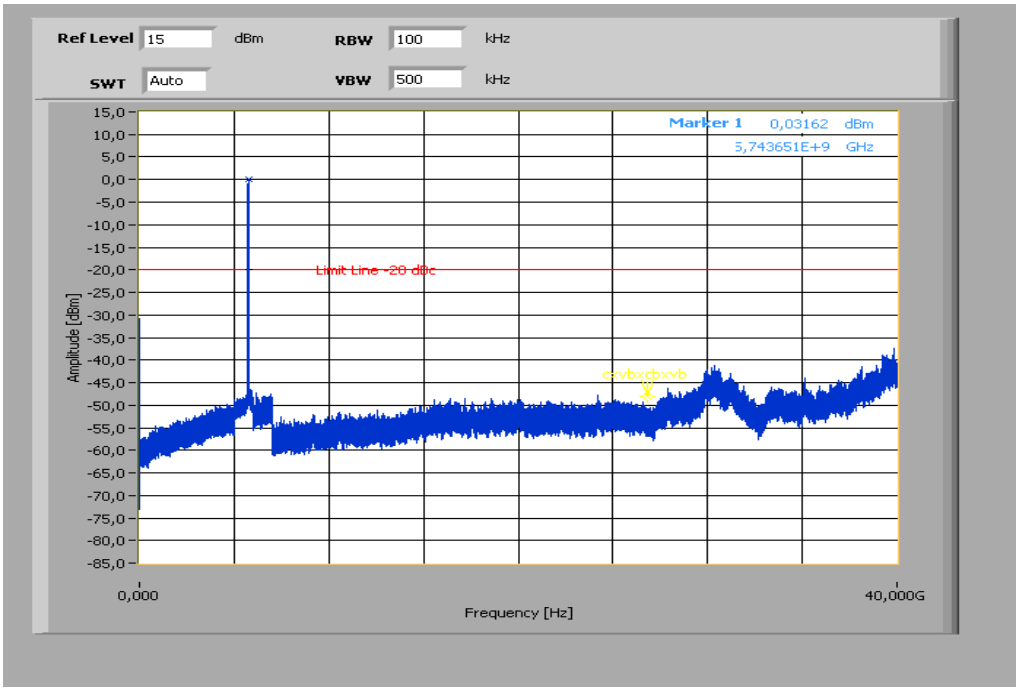
Plot 3: lowest channel, a – mode, 54 Mbps



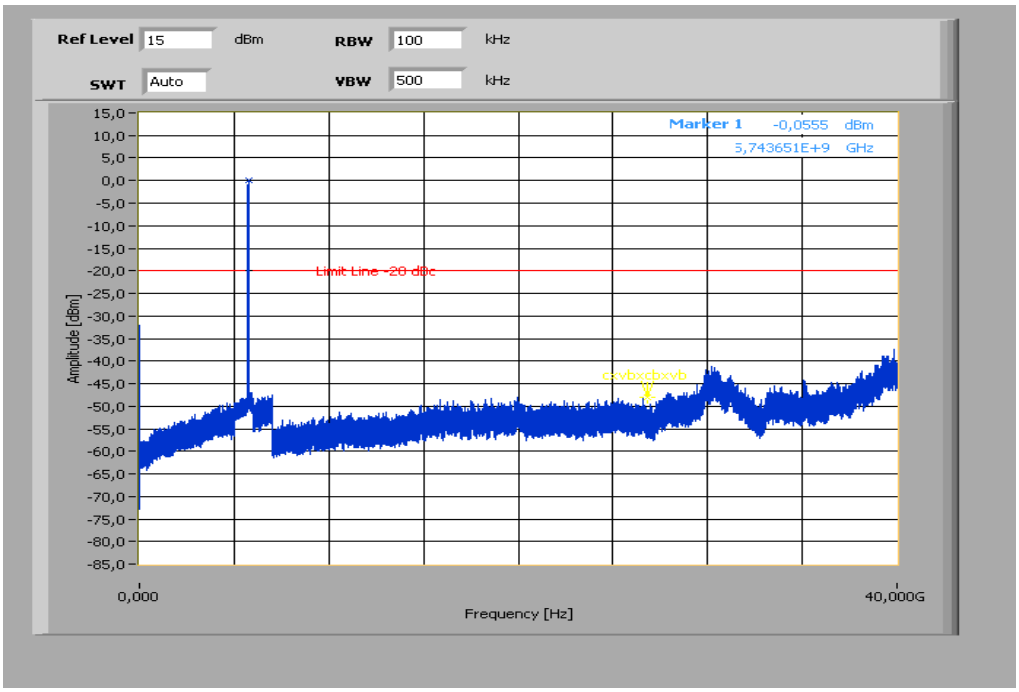
Plot 4: lowest channel, n – mode, MCS 0



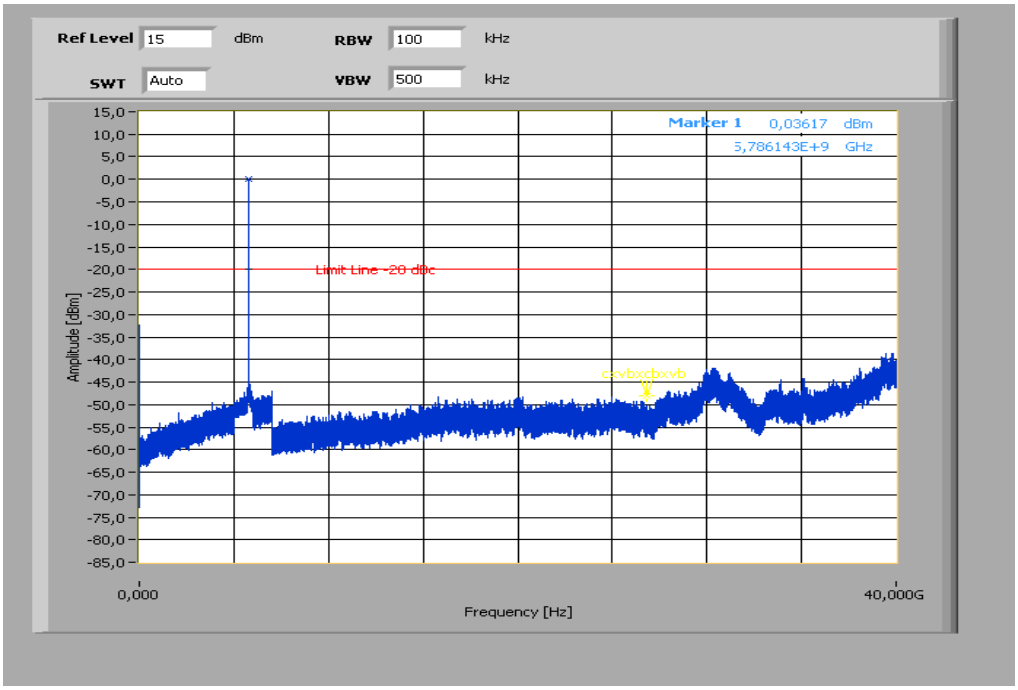
Plot 5: lowest channel, n – mode, MCS 4



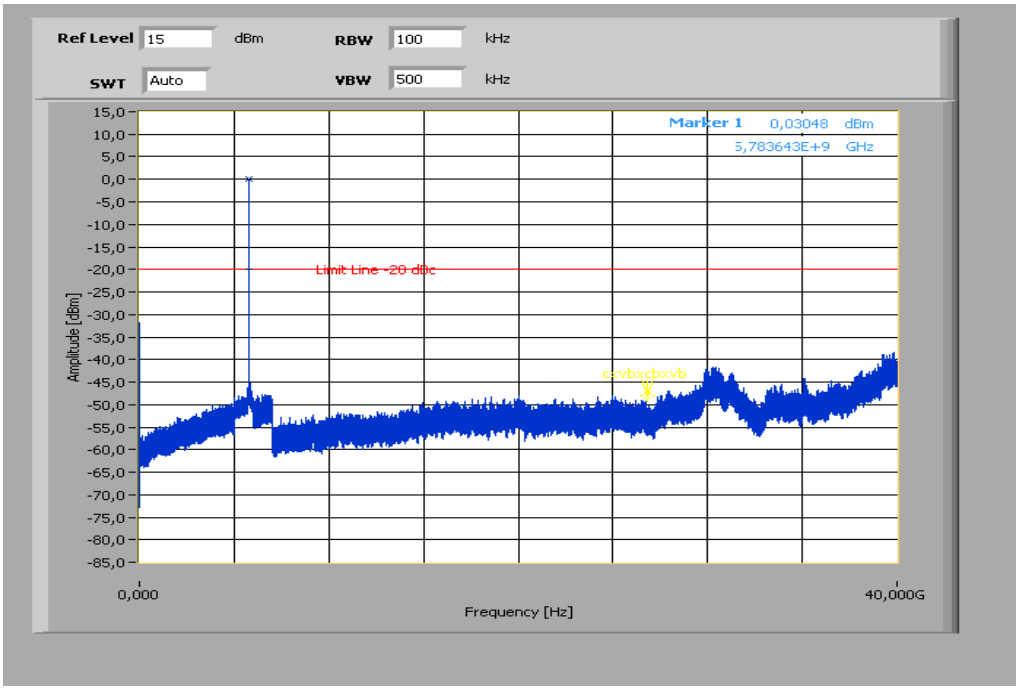
Plot 6: lowest channel, n – mode, MCS 7



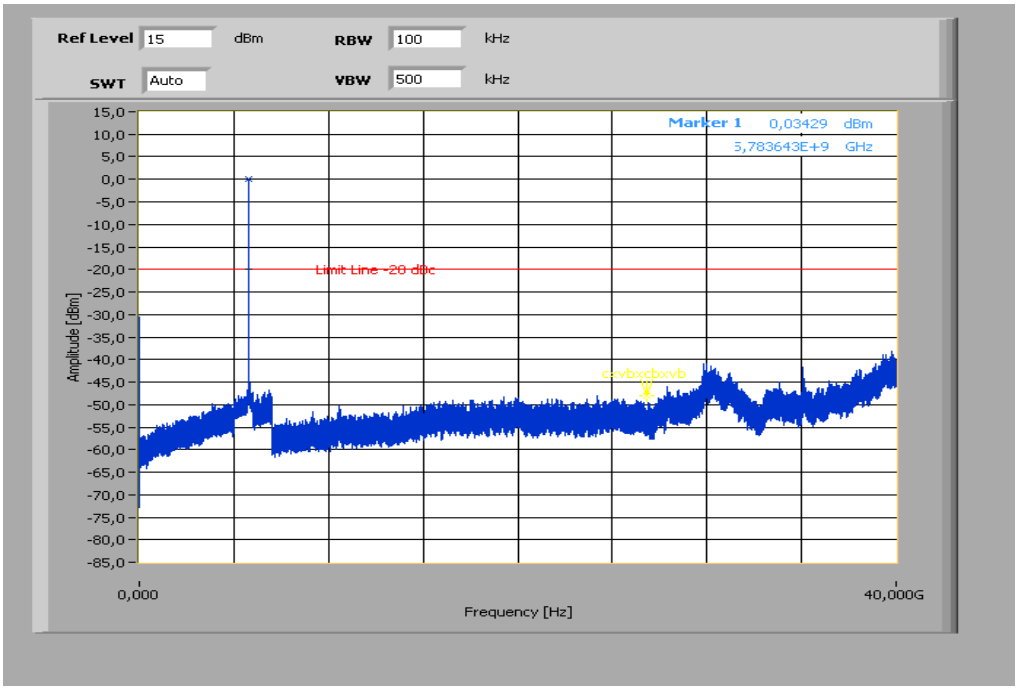
Plot 7: middle channel, a – mode, 6 Mbps



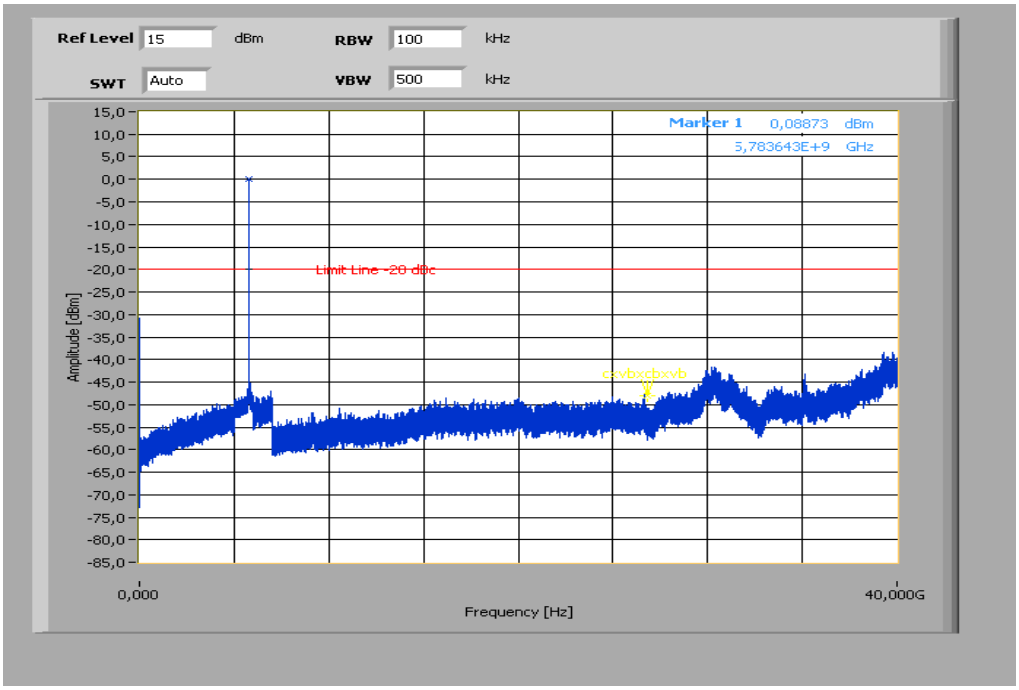
Plot 8: middle channel, a – mode, 24 Mbps



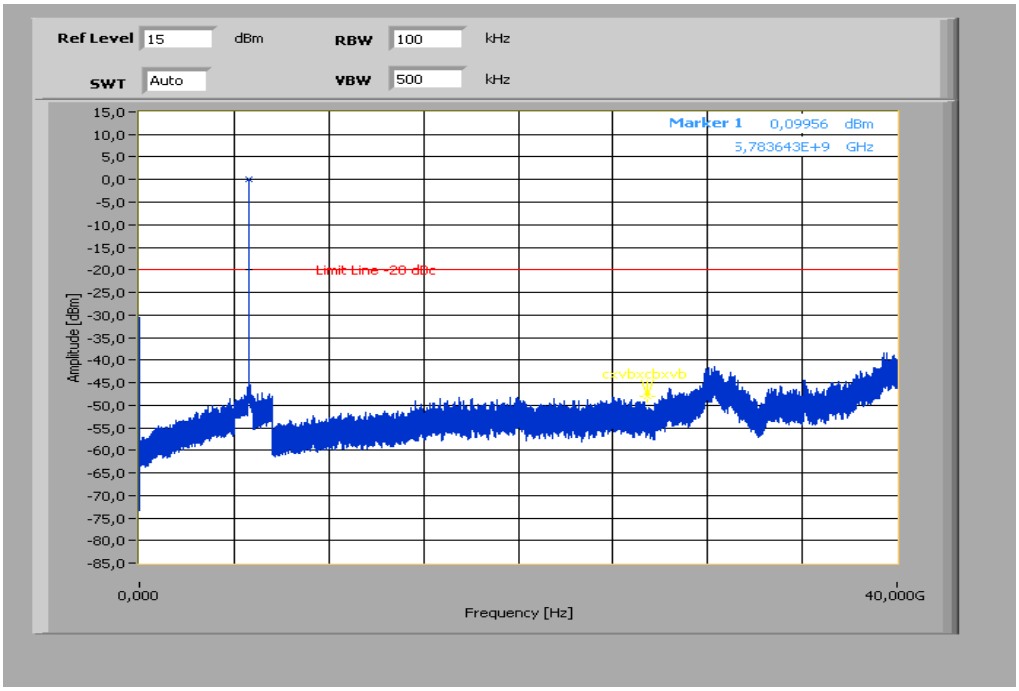
Plot 9: middle channel, a – mode, 54 Mbps



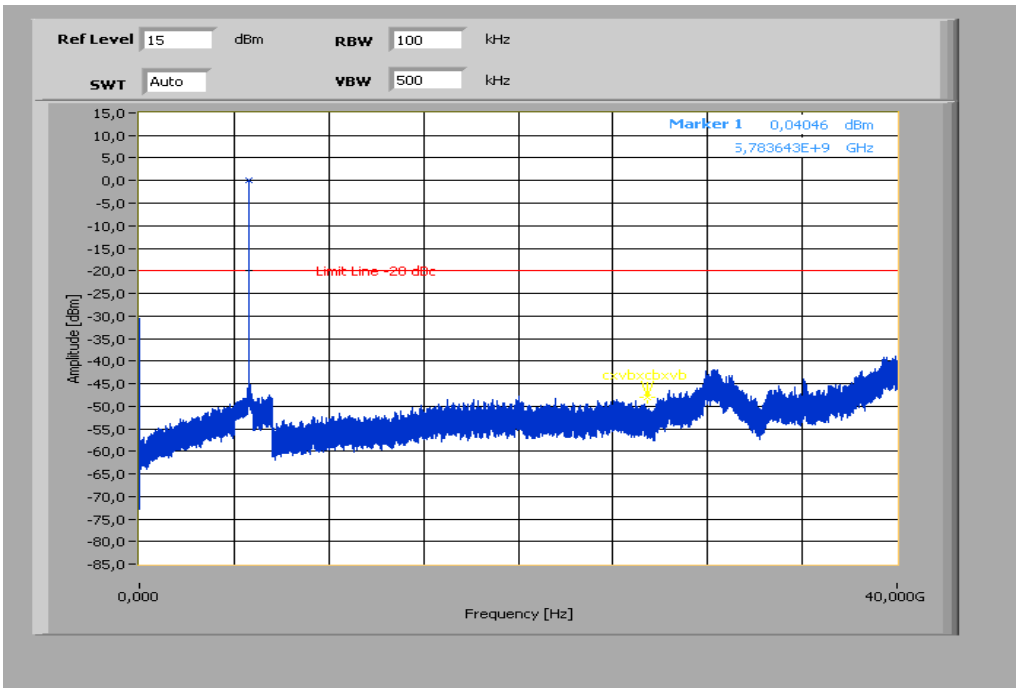
Plot 10: middle channel, n – mode, MCS 0



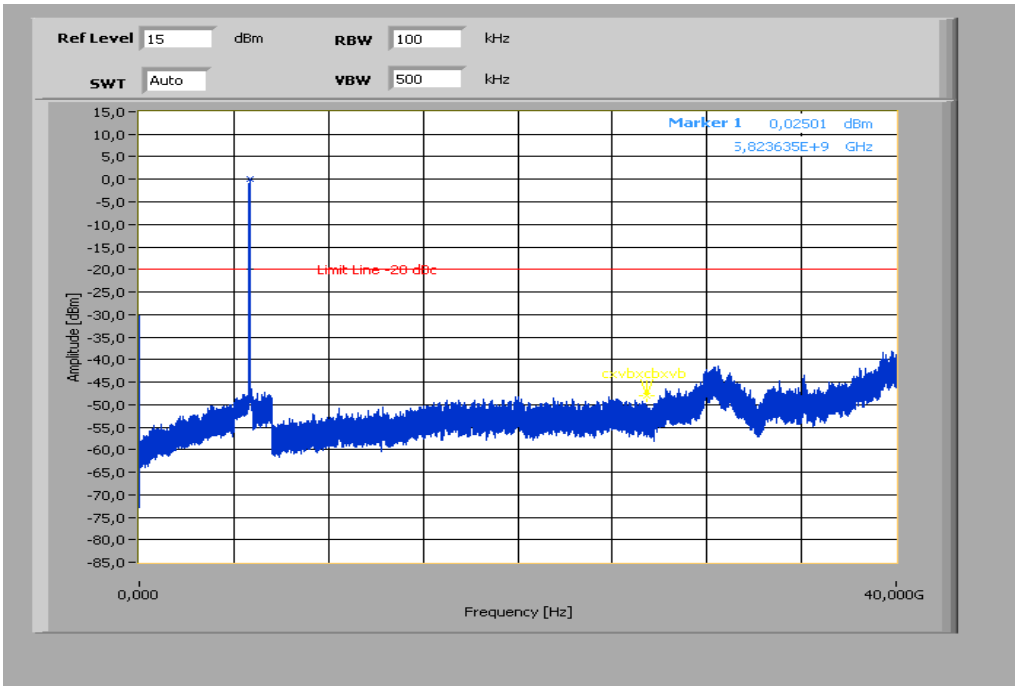
Plot 11: middle channel, n – mode, MCS 4



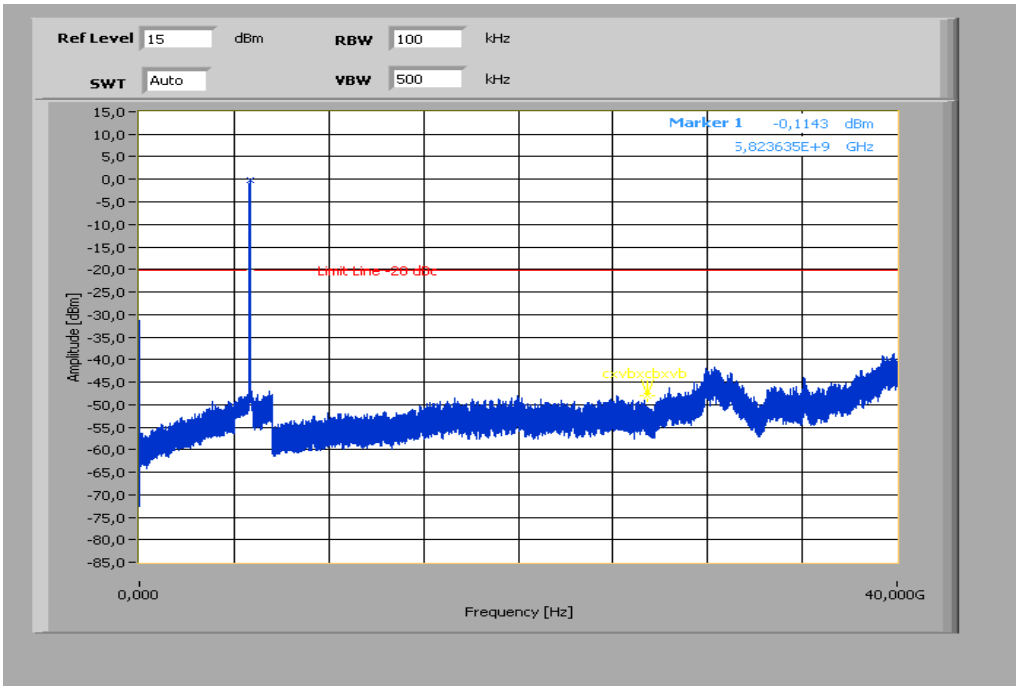
Plot 12: middle channel, n – mode, MCS 7



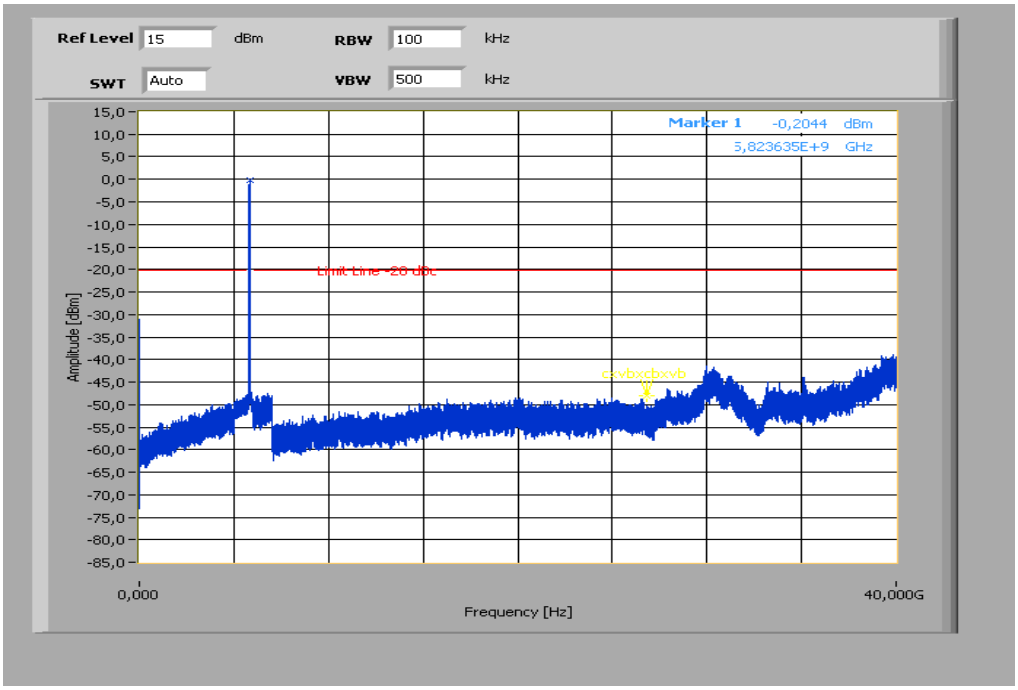
Plot 13: highest channel, a – mode, 6 Mbps



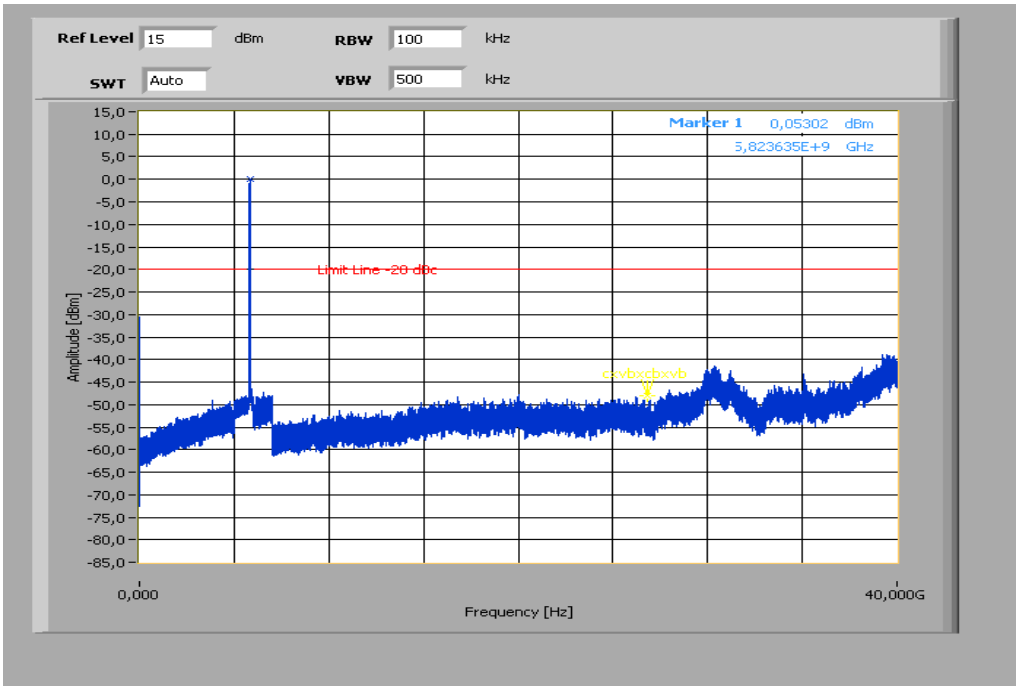
Plot 14: highest channel, a – mode, 24 Mbps



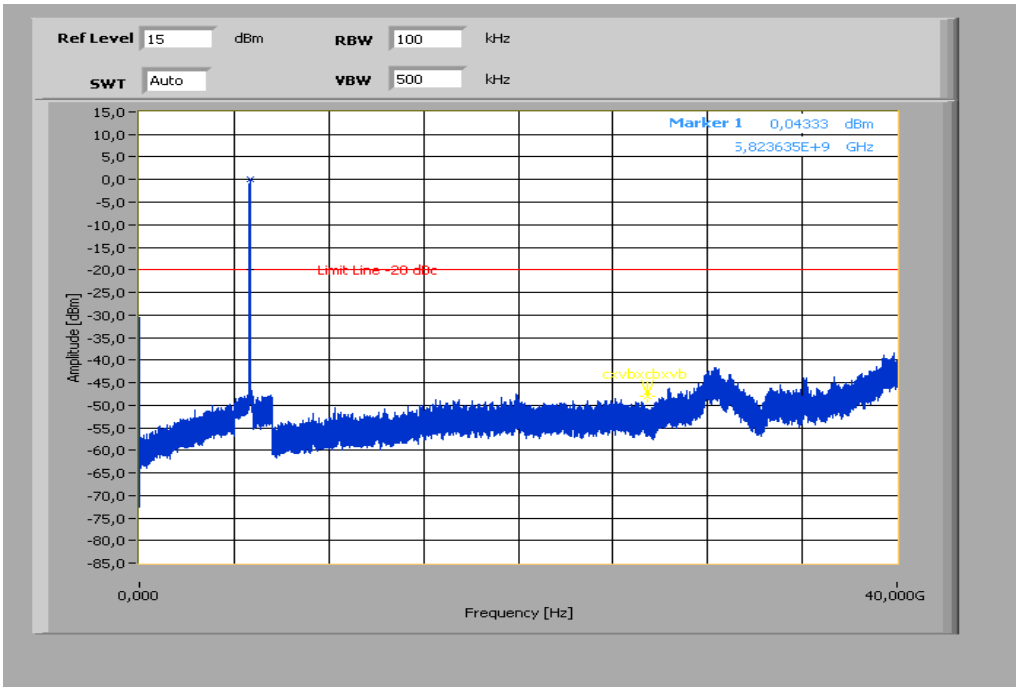
Plot 15: highest channel, a – mode, 54 Mbps



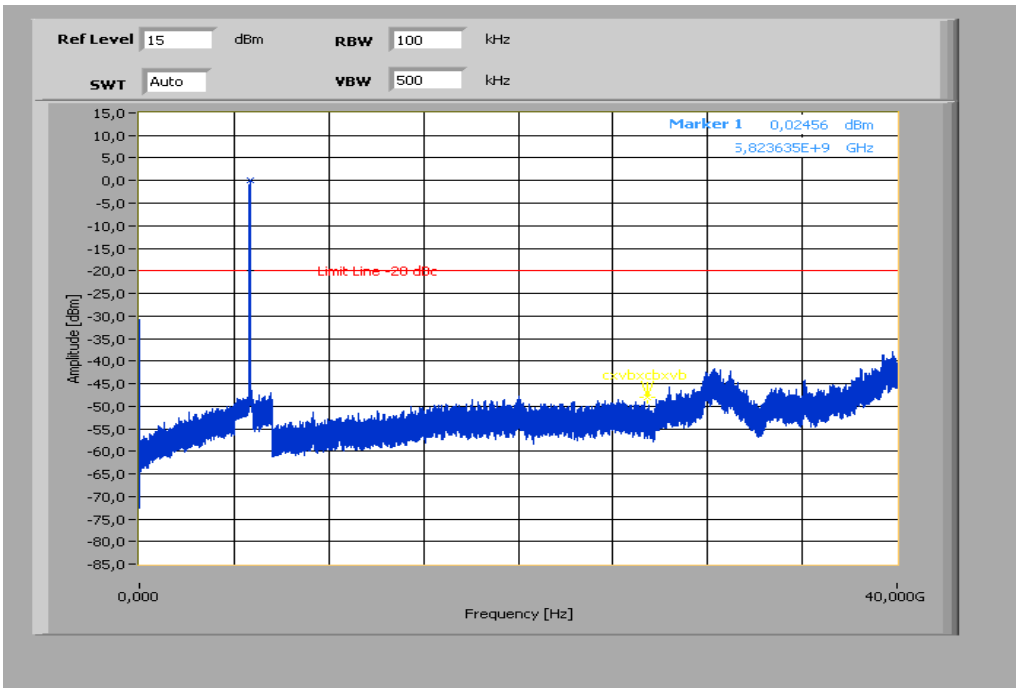
Plot 16: highest channel, n – mode, MCS 0



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



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



9.11 TX spurious emissions radiated

Description:

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at the lowest, middle and highest channel. 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	☒ OFDM a – mode ☒ OFDM n – mode HT20 ☒ OFDM n – mode HT40

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: OFDM / a – mode

TX Spurious Emissions Radiated [dBµV/m]								
OFDM / a – mode								
5745 MHz			5785 MHz			5825 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 peak emissions above 1 GHz are below the average limit!			All detected peak emissions above 1 GHz are below the average limit!			All detected peak emissions above 1 GHz are below the average limit!		
Measurement uncertainty			± 3 dB					

Result: **Passed**

Results: OFDM / n – mode HT20

TX Spurious Emissions Radiated [dBµV/m]								
OFDM / n – mode HT20								
5745 MHz			5785 MHz			5825 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 peak emissions above 1 GHz are below the average limit!			All detected peak emissions above 1 GHz are below the average limit!			All detected peak emissions above 1 GHz are below the average limit!		
Measurement uncertainty			± 3 dB					

Result: **Passed**

Plots: OFDM / a – mode

Plot 1: Channel 149, 30 MHz to 1 GHz, vertical & horizontal polarization

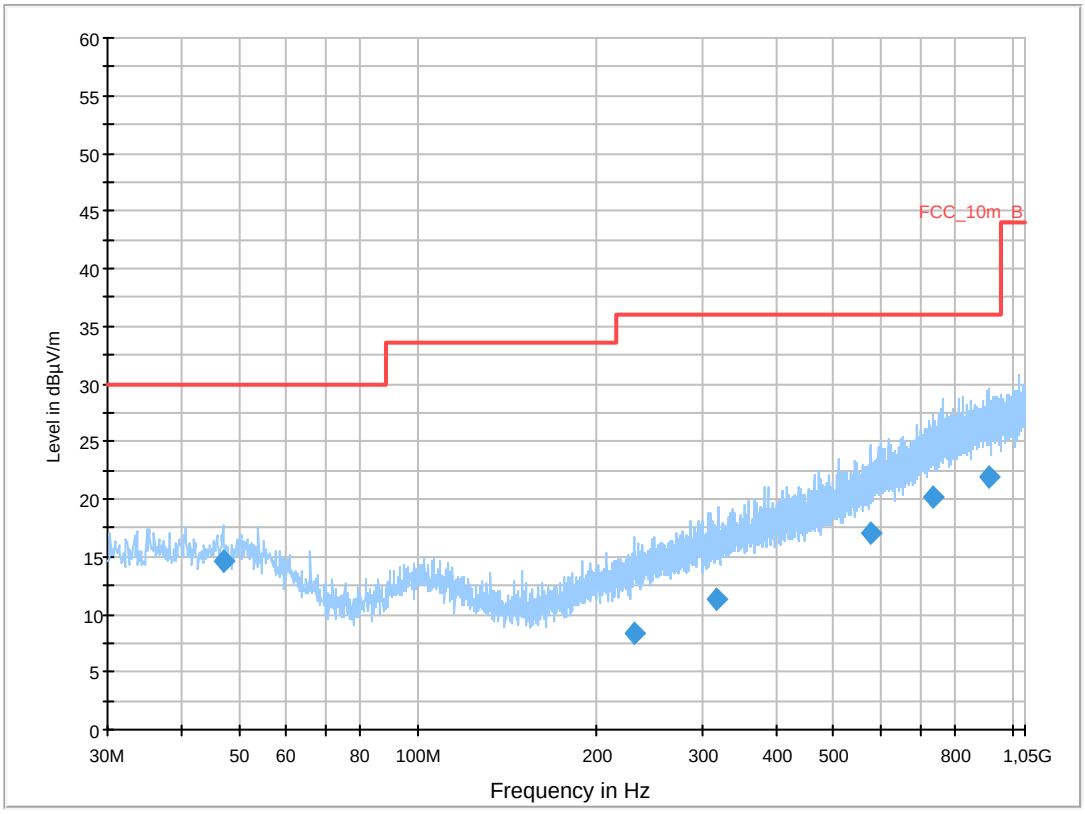
Common Information

EUT:	RFM121LW
Serial Number:	Imei:990002430036317
Test Description:	FCC part 15 C class B @ 10 m
Operating Conditions:	w-lan a mode CH149 6Mbps
Operator Name:	Wolsdorfer
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

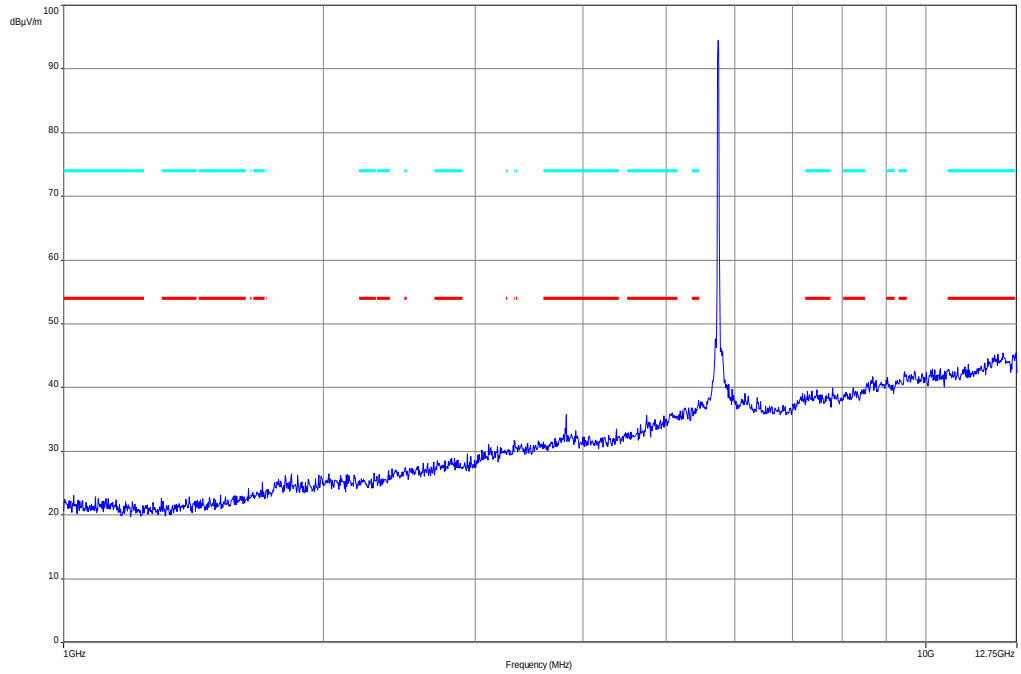
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



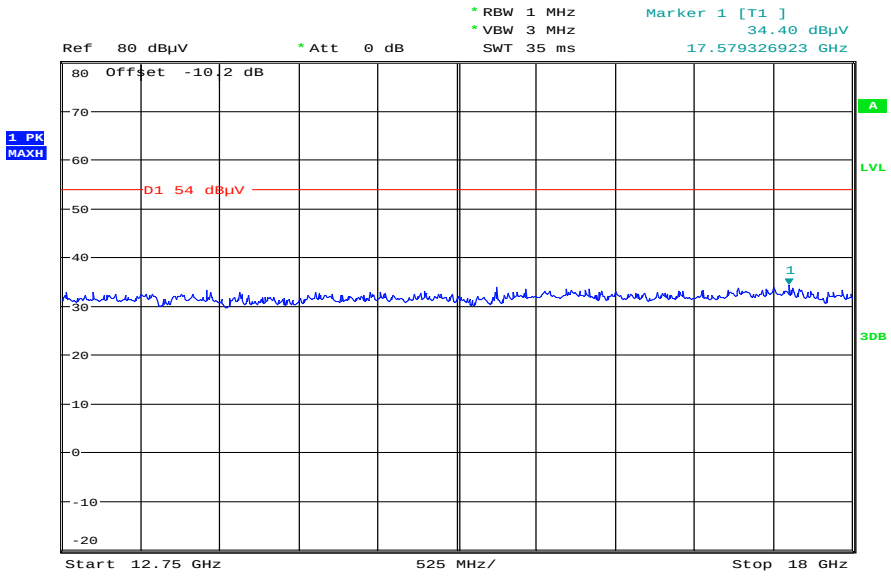
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
47.026050	14.6	1000.0	120.000	98.0	V	88.0	13.3	15.4	30.0	
231.219300	8.3	1000.0	120.000	170.0	H	280.0	12.7	27.7	36.0	
318.788100	11.3	1000.0	120.000	170.0	V	0.0	15.1	24.7	36.0	
578.797650	17.0	1000.0	120.000	98.0	H	280.0	20.2	19.0	36.0	
734.597700	20.1	1000.0	120.000	132.0	H	10.0	23.3	15.9	36.0	
912.604200	22.0	1000.0	120.000	170.0	H	260.0	25.2	14.0	36.0	

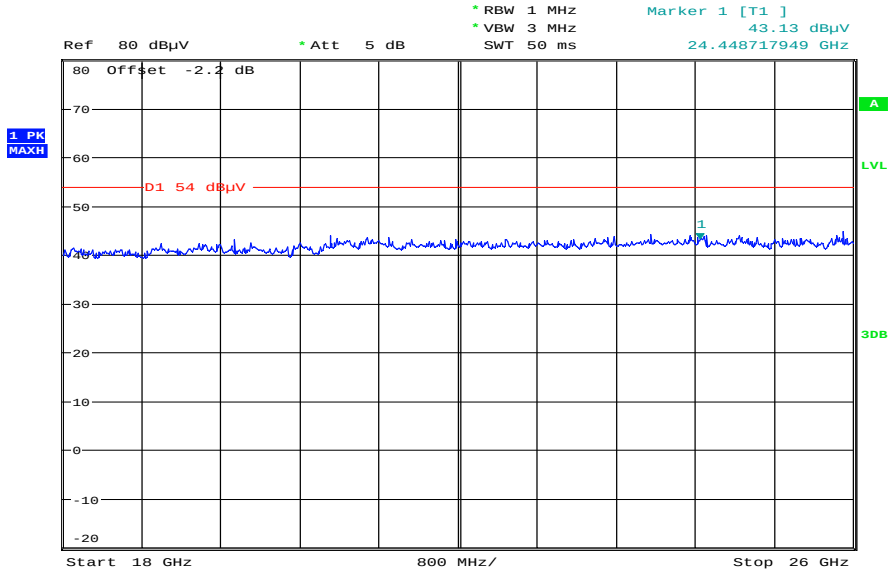
Plot 2: Channel 149, 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 3: Channel 149, 12.75 GHz to 18 GHz, vertical & horizontal polarization

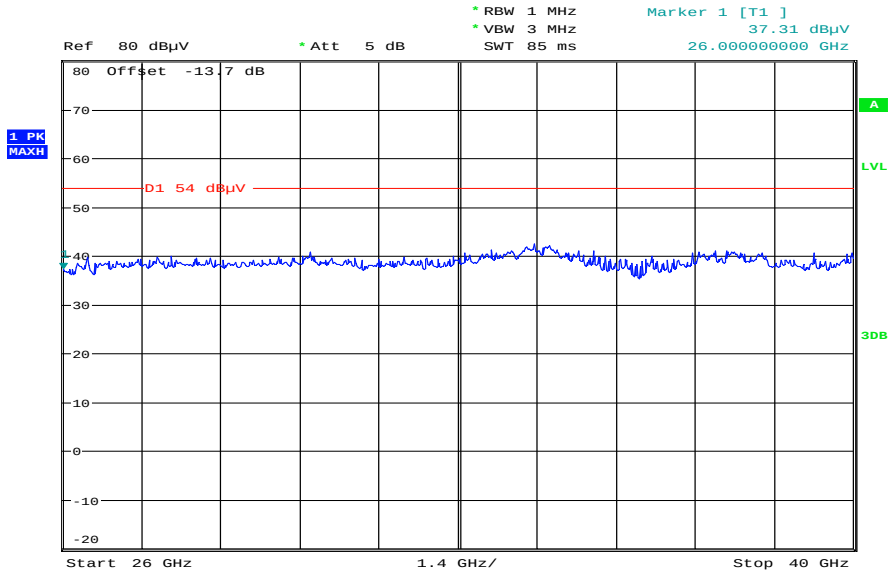


Plot 4: Channel 149, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 13:52:53

Plot 5: Channel 149, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:00:17

Plot 6: Channel 157, 30 MHz to 1 GHz, vertical & horizontal polarization

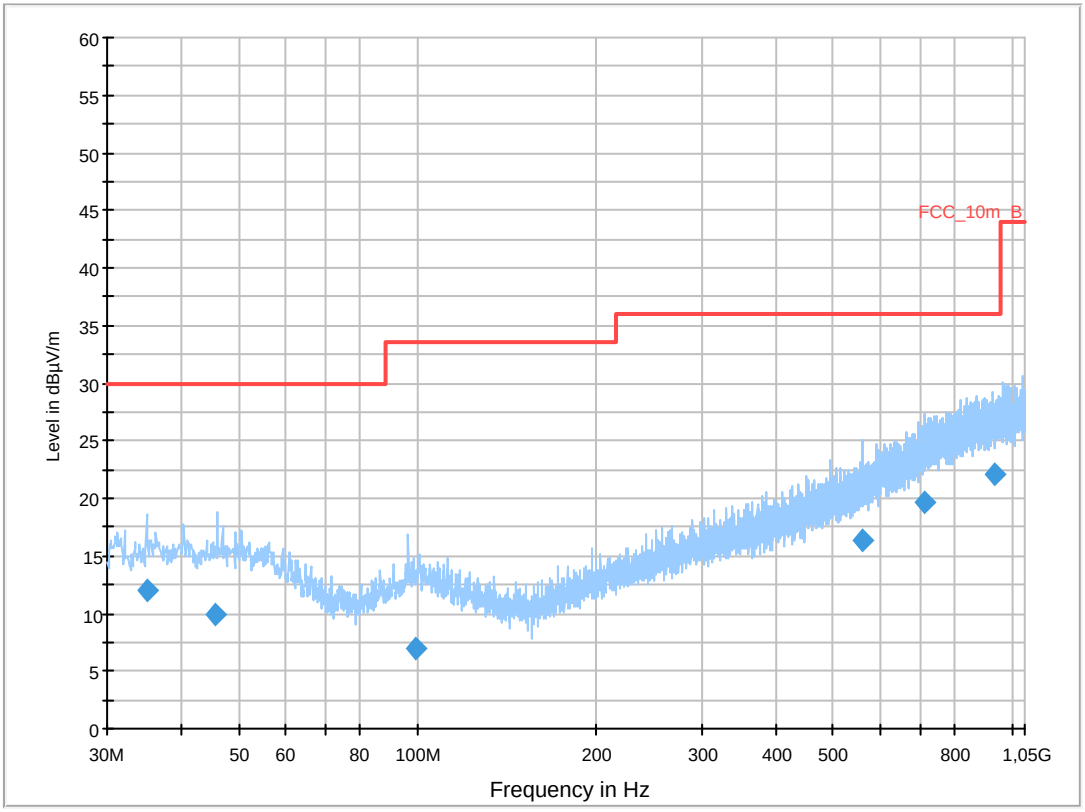
Common Information

EUT:	RFM121LW
Serial Number:	Imei:990002430036317
Test Description:	FCC part 15 C class B @ 10 m
Operating Conditions:	w-lan a mode CH157 6Mbps
Operator Name:	Wolsdorfer
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

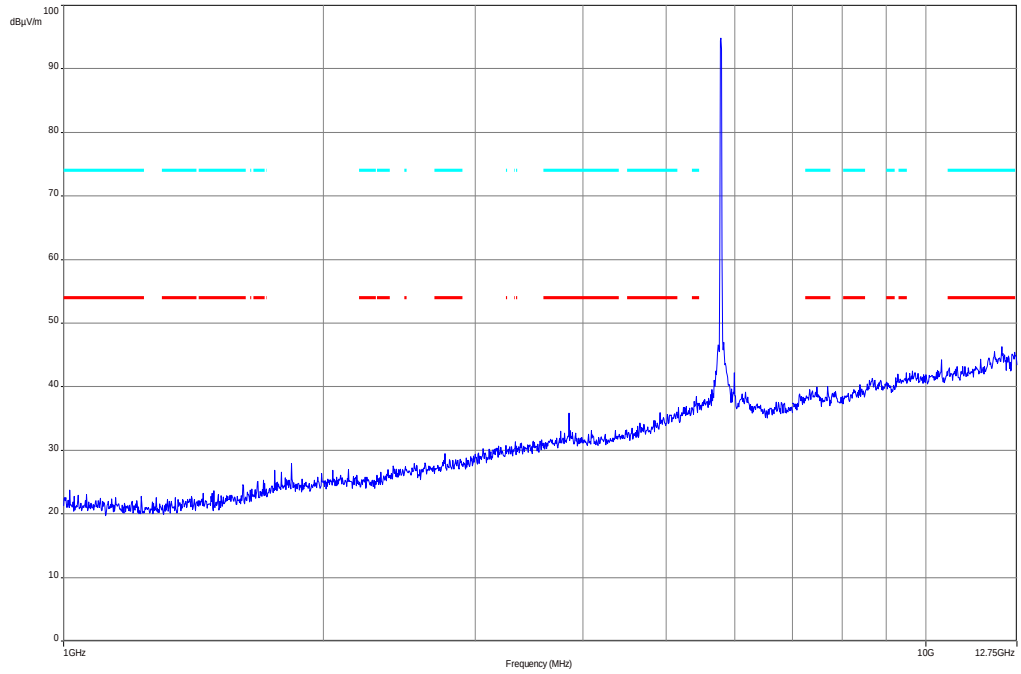
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



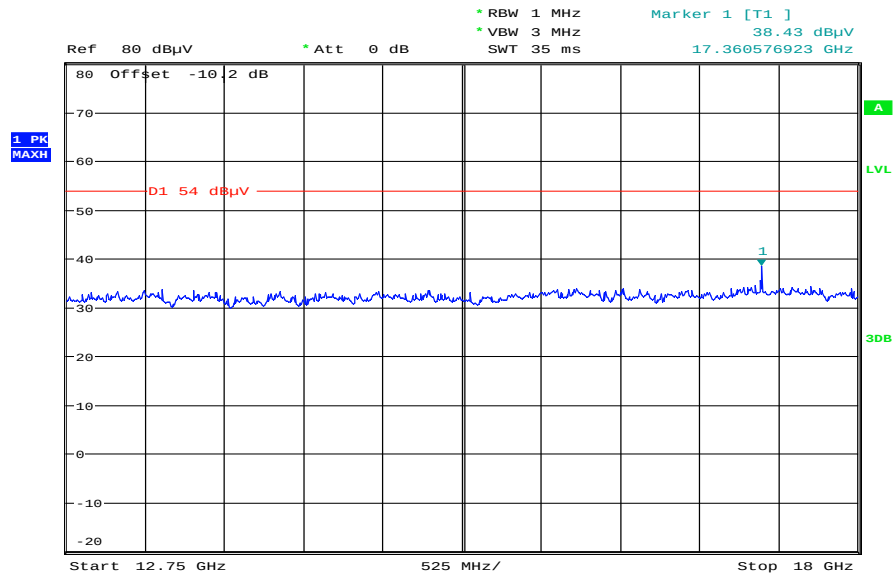
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.047200	12.0	1000.0	120.000	161.0	V	260.0	13.0	18.0	30.0	
45.593550	10.0	1000.0	120.000	120.0	V	180.0	13.3	20.0	30.0	
99.085950	7.0	1000.0	120.000	170.0	H	100.0	11.8	26.5	33.5	
560.092800	16.4	1000.0	120.000	170.0	V	190.0	19.7	19.6	36.0	
713.886450	19.7	1000.0	120.000	170.0	H	268.0	22.8	16.3	36.0	
931.351650	22.1	1000.0	120.000	105.0	H	260.0	25.3	13.9	36.0	

Plot 7: Channel 157, 1 GHz to 12.75 GHz, vertical & horizontal polarization

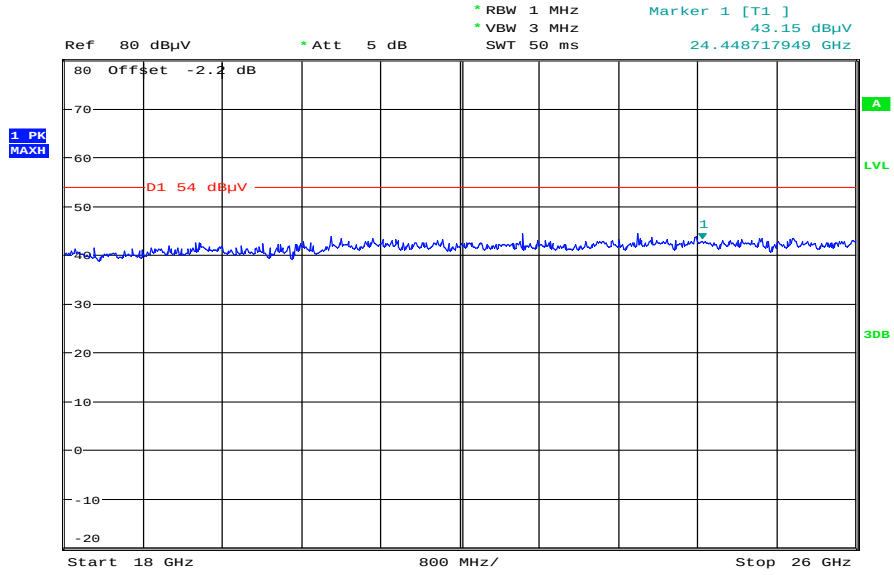


Plot 8: Channel 157, 12.75 GHz to 18 GHz, vertical & horizontal polarization



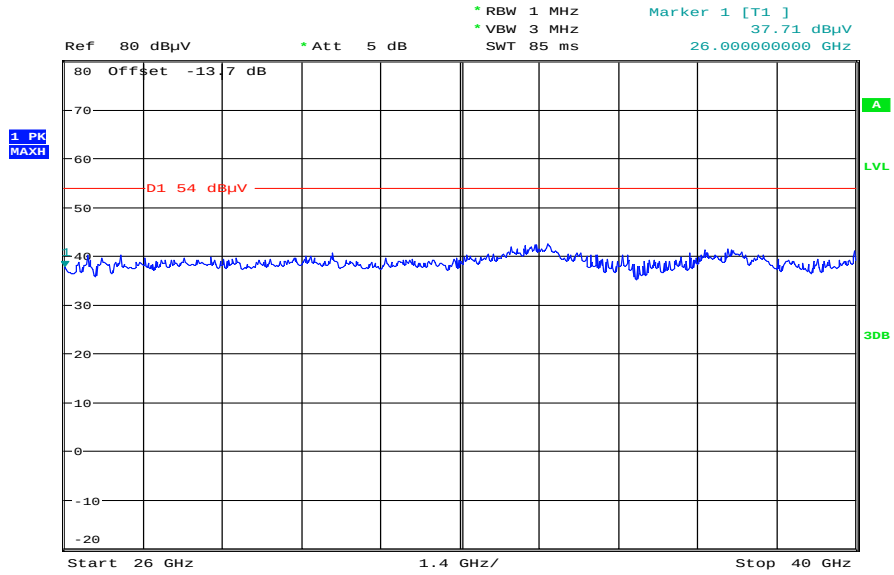
Date: 25.MAR.2013 14:20:00

Plot 9: Channel 157, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 13:53:48

Plot 10: Channel 157, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:01:23

Plot 11: Channel 165, 30 MHz to 1 GHz, vertical & horizontal polarization

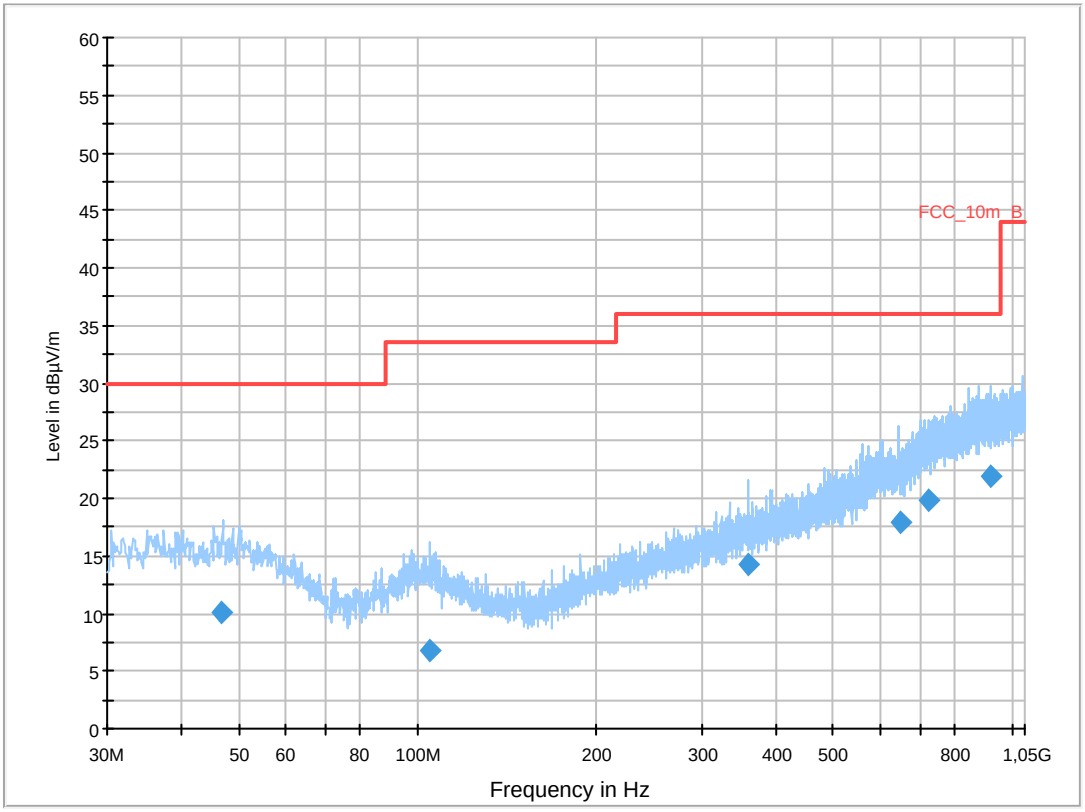
Common Information

EUT:	RFM121LW
Serial Number:	Imei:990002430036317
Test Description:	FCC part 15 C class B @ 10 m
Operating Conditions:	w-lan a mode CH165 6Mbps
Operator Name:	Wolsdorfer
Comment:	battery powered

Scan Setup: STAN_Fin [EMI radiated]

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

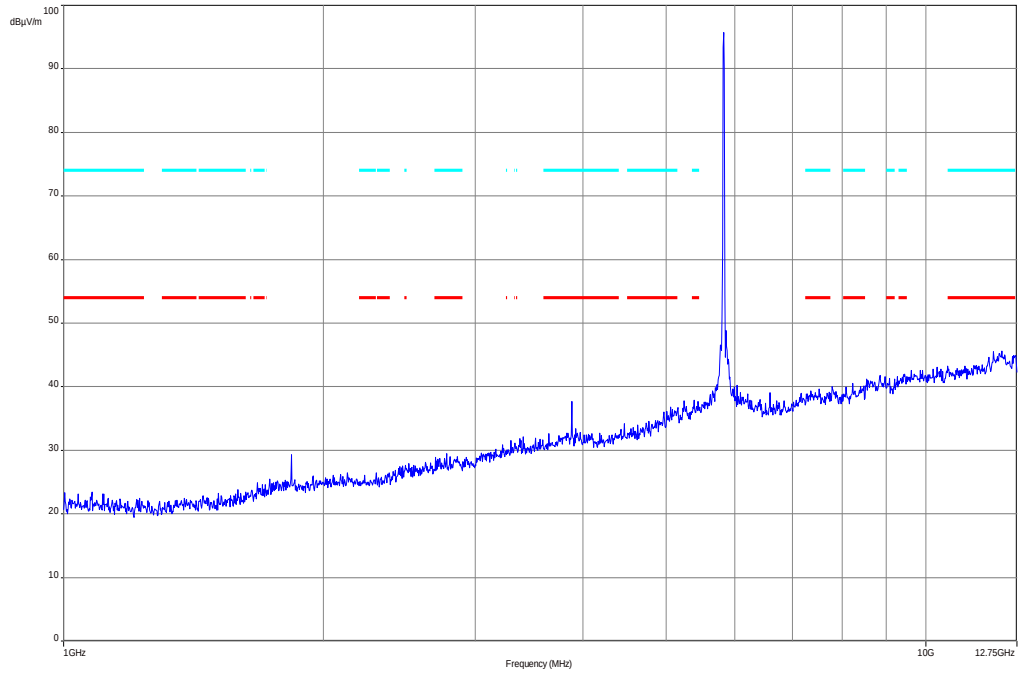
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



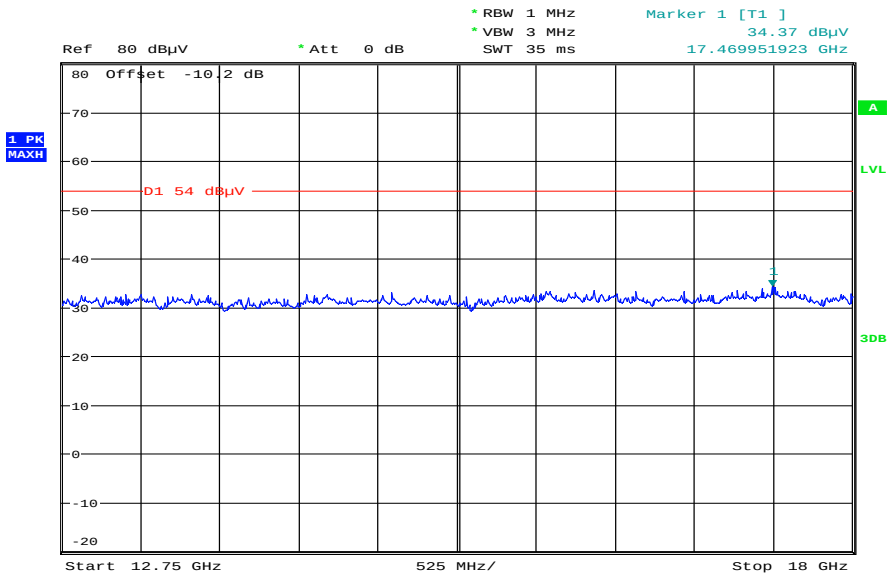
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
46.846800	10.1	1000.0	120.000	98.0	V	175.0	13.3	19.9	30.0	
104.746650	6.7	1000.0	120.000	170.0	H	261.0	11.5	26.8	33.5	
360.006750	14.3	1000.0	120.000	170.0	V	-2.0	16.2	21.7	36.0	
646.434000	17.8	1000.0	120.000	170.0	V	-10.0	21.1	18.2	36.0	
725.281650	19.8	1000.0	120.000	170.0	H	100.0	23.1	16.2	36.0	
921.847350	21.8	1000.0	120.000	170.0	H	88.0	25.3	14.2	36.0	

Plot 12: Channel 165, 1 GHz to 12.75 GHz, vertical & horizontal polarization

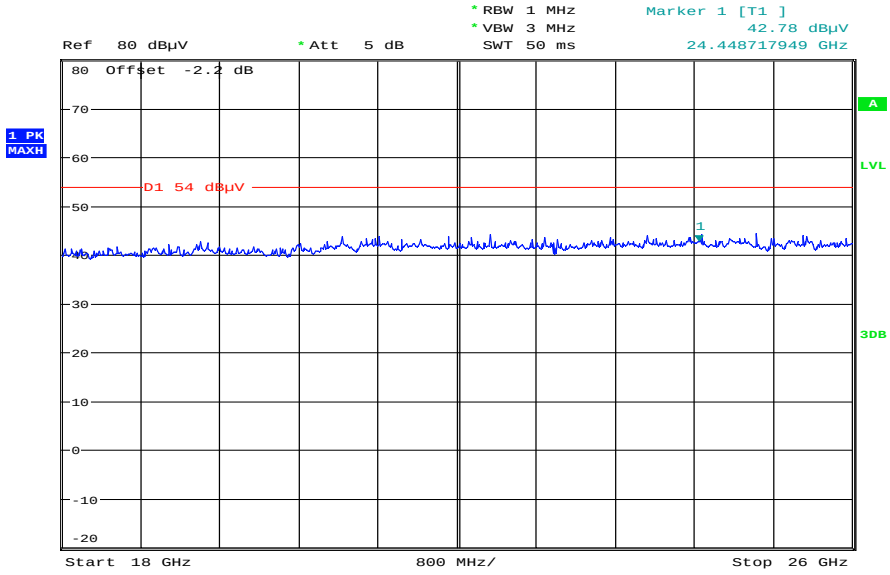


Plot 13: Channel 165, 12.75 GHz to 18 GHz, vertical & horizontal polarization



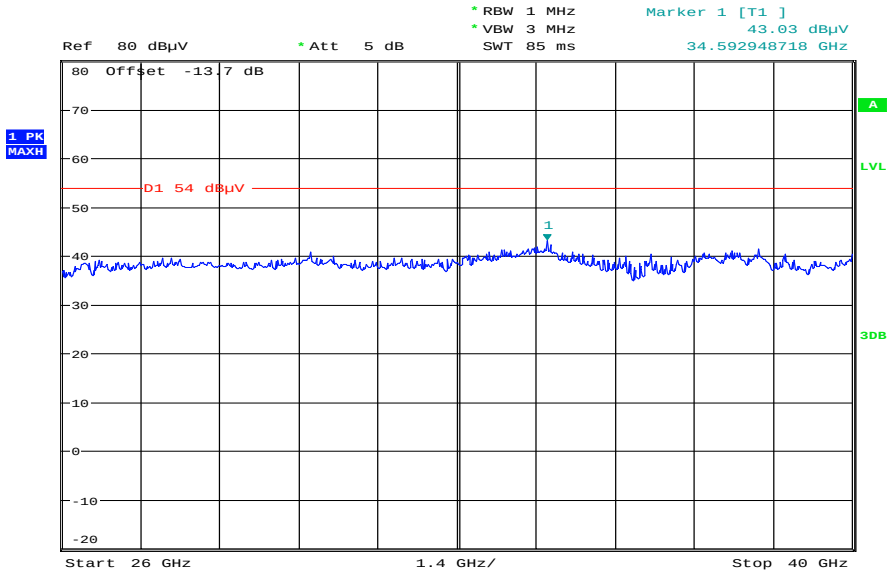
Date: 25.MAR.2013 13:37:26

Plot 14: Channel 165, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 13:54:38

Plot 15: Channel 165, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:02:16

Plots: OFDM / n – mode HT20

Plot 1: Channel 149, 30 MHz to 1 GHz, vertical & horizontal polarization

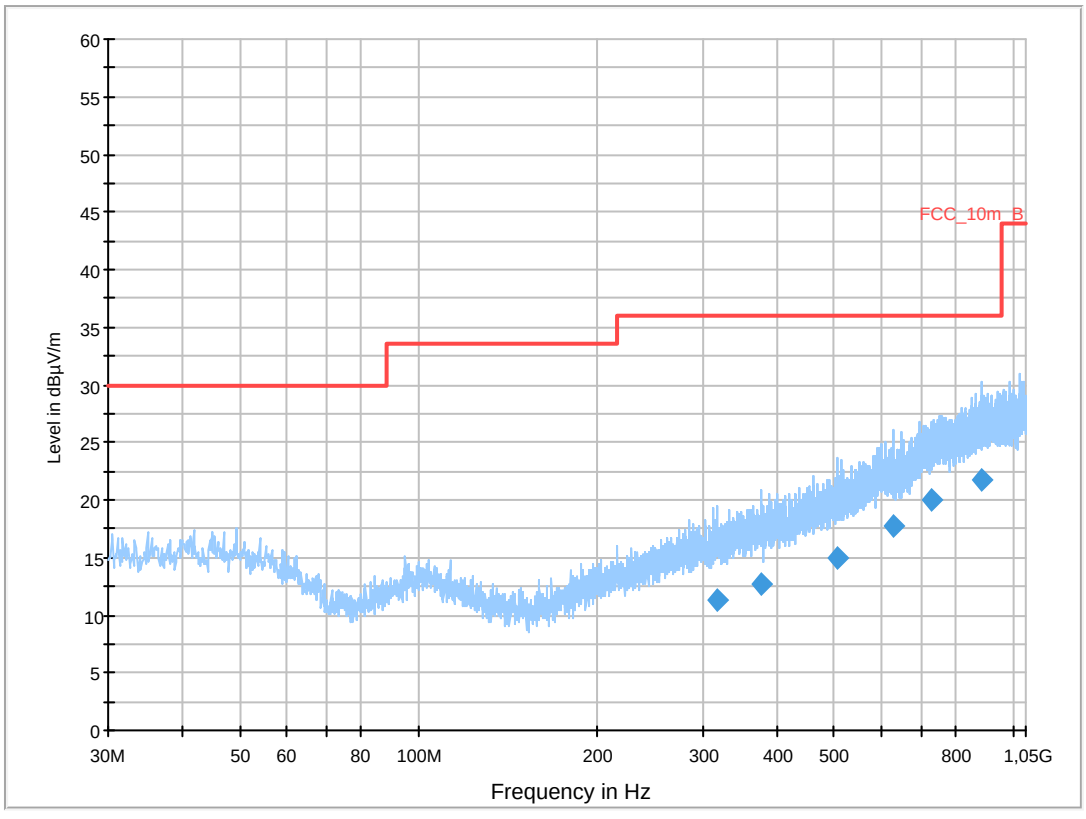
Common Information

EUT:	RFM121LW
Serial Number:	Imei:990002430036317
Test Description:	FCC part 15 C class B @ 10 m
Operating Conditions:	w-lan n mode CH149 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

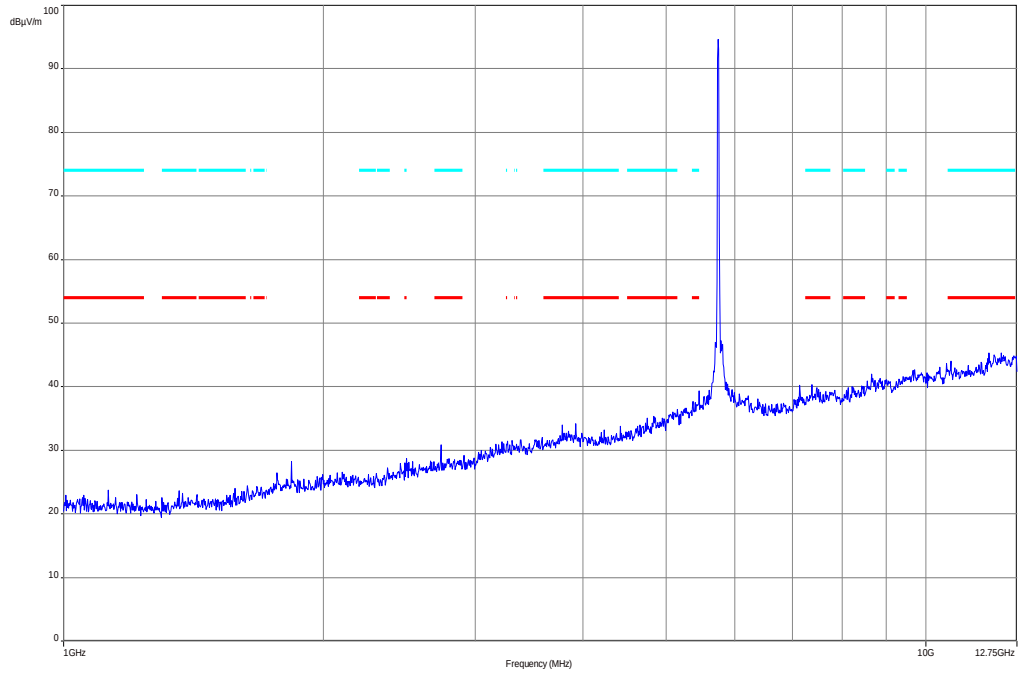
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



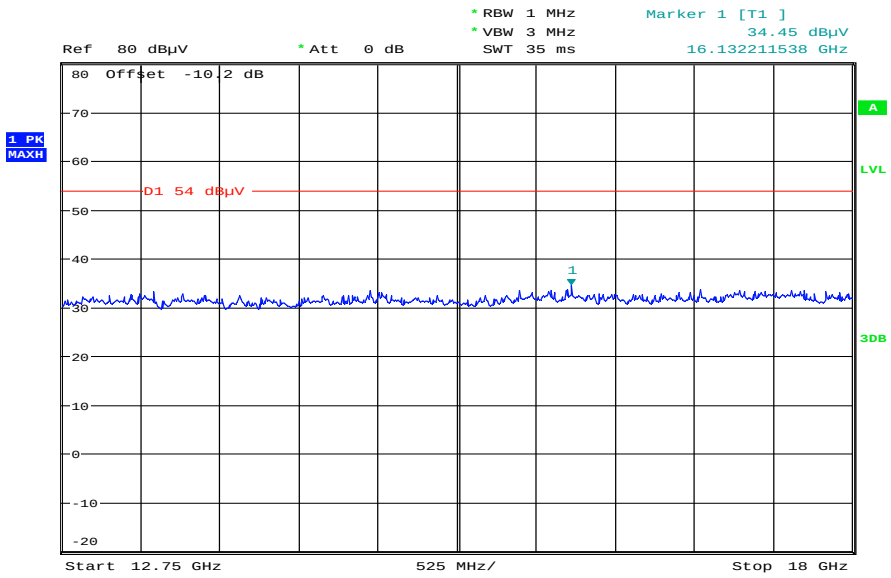
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
318.366900	11.3	1000.0	120.000	170.0	H	0.0	15.1	24.7	36.0	
378.229050	12.6	1000.0	120.000	170.0	H	260.0	16.5	23.4	36.0	
506.622750	14.9	1000.0	120.000	153.0	V	0.0	18.8	21.1	36.0	
627.068250	17.7	1000.0	120.000	170.0	V	177.0	21.0	18.3	36.0	
728.218800	20.0	1000.0	120.000	170.0	V	190.0	23.2	16.0	36.0	
886.753350	21.8	1000.0	120.000	170.0	V	100.0	25.0	14.2	36.0	

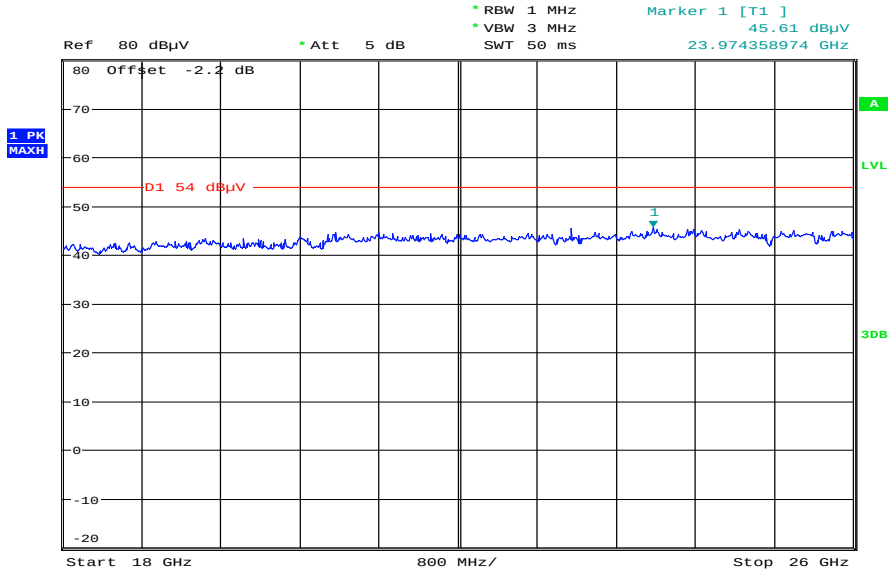
Plot 2: Channel 149, 1 GHz to 12.75 GHz, vertical & horizontal polarization



Plot 3: Channel 149, 12.75 GHz to 18 GHz, vertical & horizontal polarization

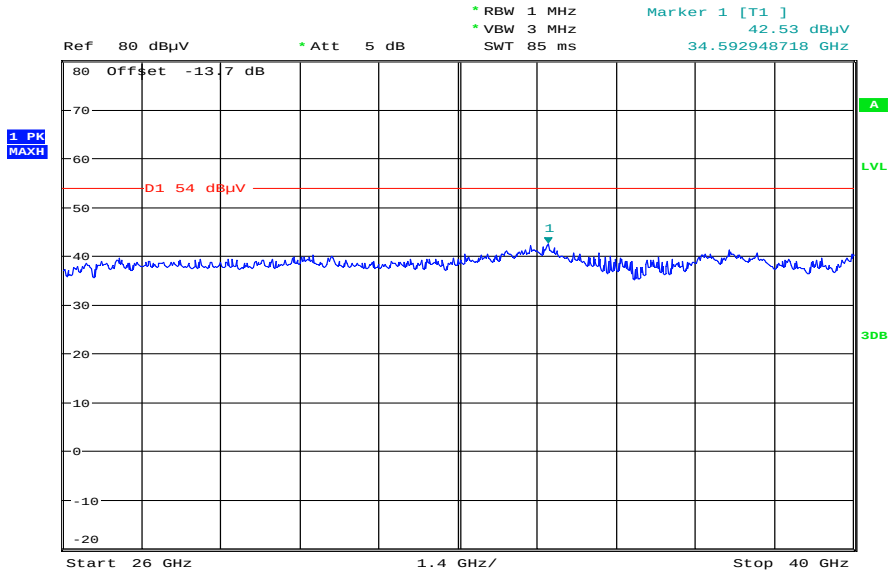


Plot 4: Channel 149, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:17:35

Plot 5: Channel 149, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:03:29

Plot 6: Channel 157, 30 MHz to 1 GHz, vertical & horizontal polarization

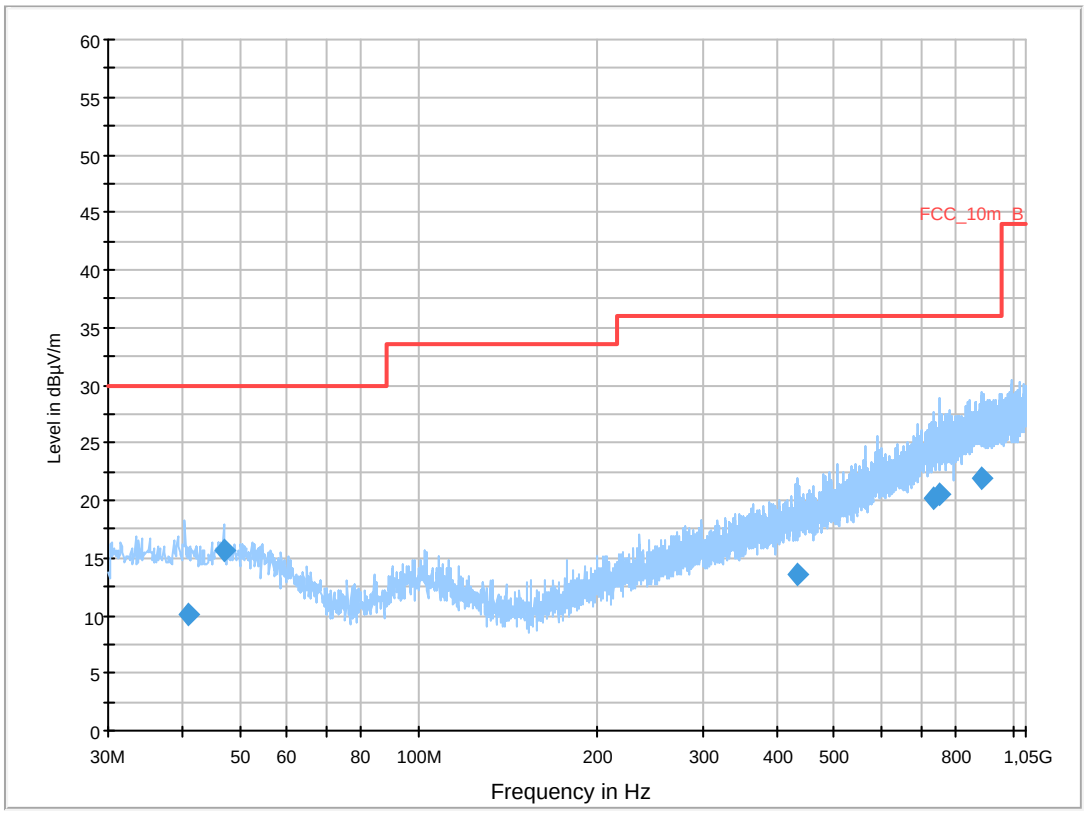
Common Information

EUT:	RFM121LW
Serial Number:	Imei:990002430036317
Test Description:	FCC part 15 C class B @ 10 m
Operating Conditions:	w-lan n mode CH157 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

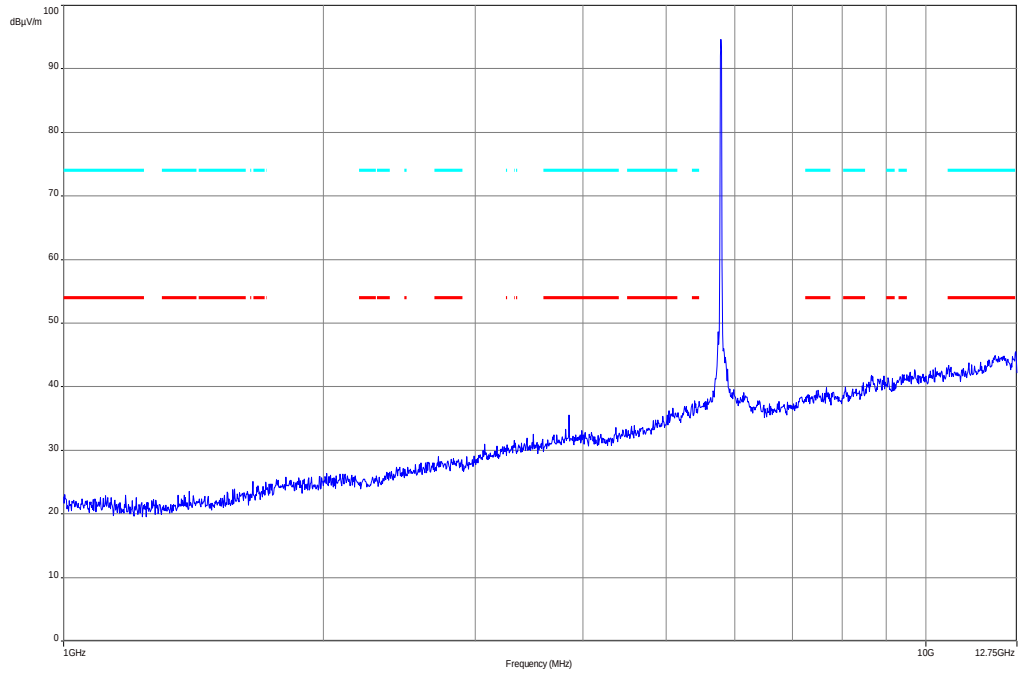
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



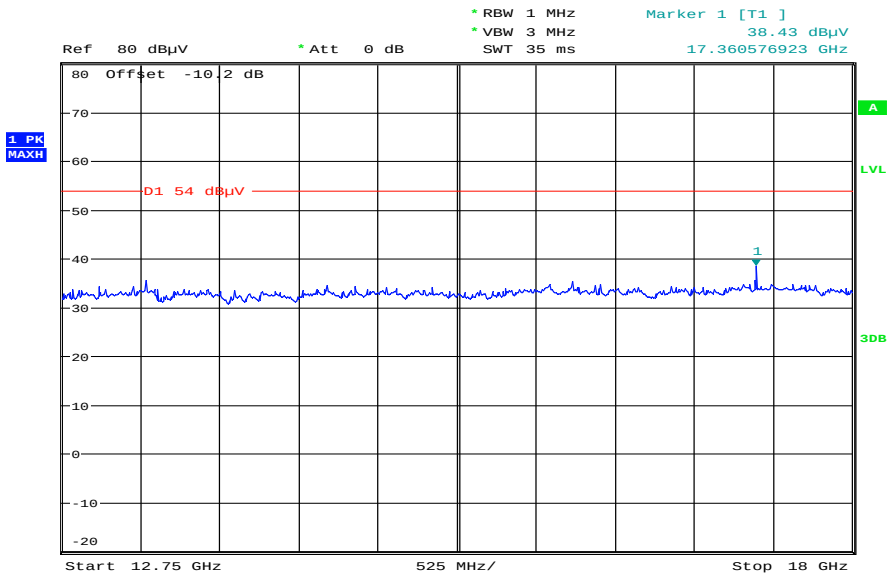
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
40.836000	10.1	1000.0	120.000	143.0	H	90.0	13.4	19.9	30.0	
47.005650	15.7	1000.0	120.000	104.0	V	270.0	13.3	14.3	30.0	
432.601500	13.6	1000.0	120.000	170.0	V	100.0	17.4	22.4	36.0	
734.373600	20.2	1000.0	120.000	170.0	V	85.0	23.3	15.8	36.0	
750.992100	20.5	1000.0	120.000	170.0	H	265.0	23.7	15.5	36.0	
886.612200	21.9	1000.0	120.000	170.0	V	280.0	25.0	14.1	36.0	

Plot 7: Channel 157, 1 GHz to 12.75 GHz, vertical & horizontal polarization

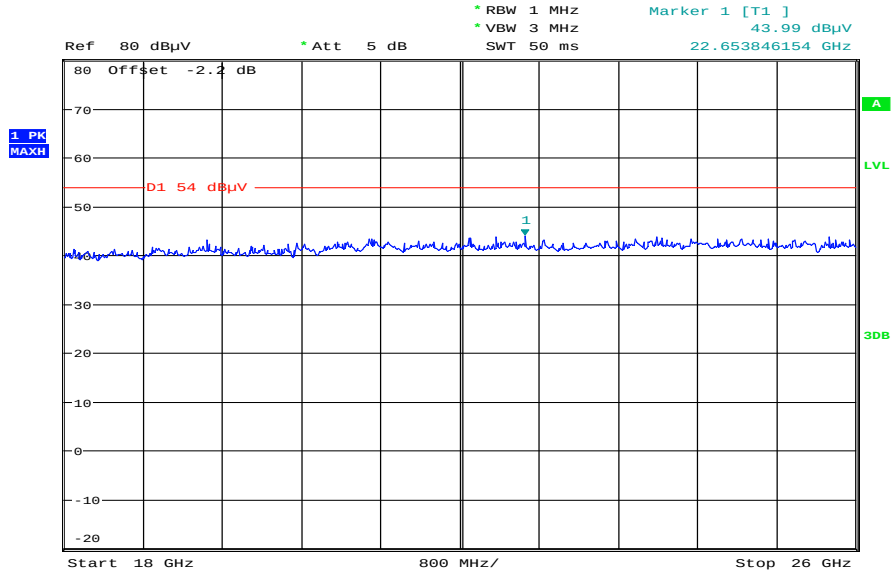


Plot 8: Channel 157, 12.75 GHz to 18 GHz, vertical & horizontal polarization



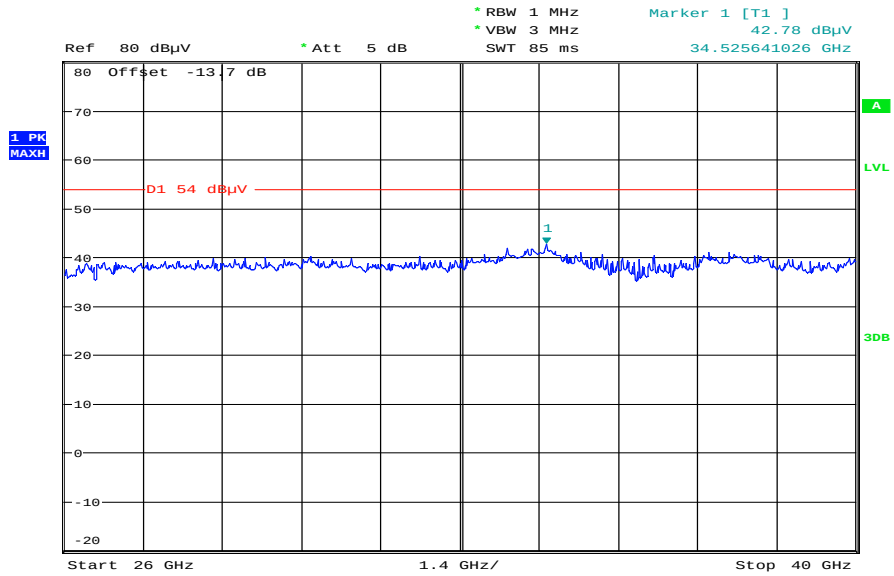
Date: 25.MAR.2013 14:42:17

Plot 9: Channel 157, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 13:57:01

Plot 10: Channel 157, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:04:34

Plot 11: Channel 165, 30 MHz to 1 GHz, vertical & horizontal polarization

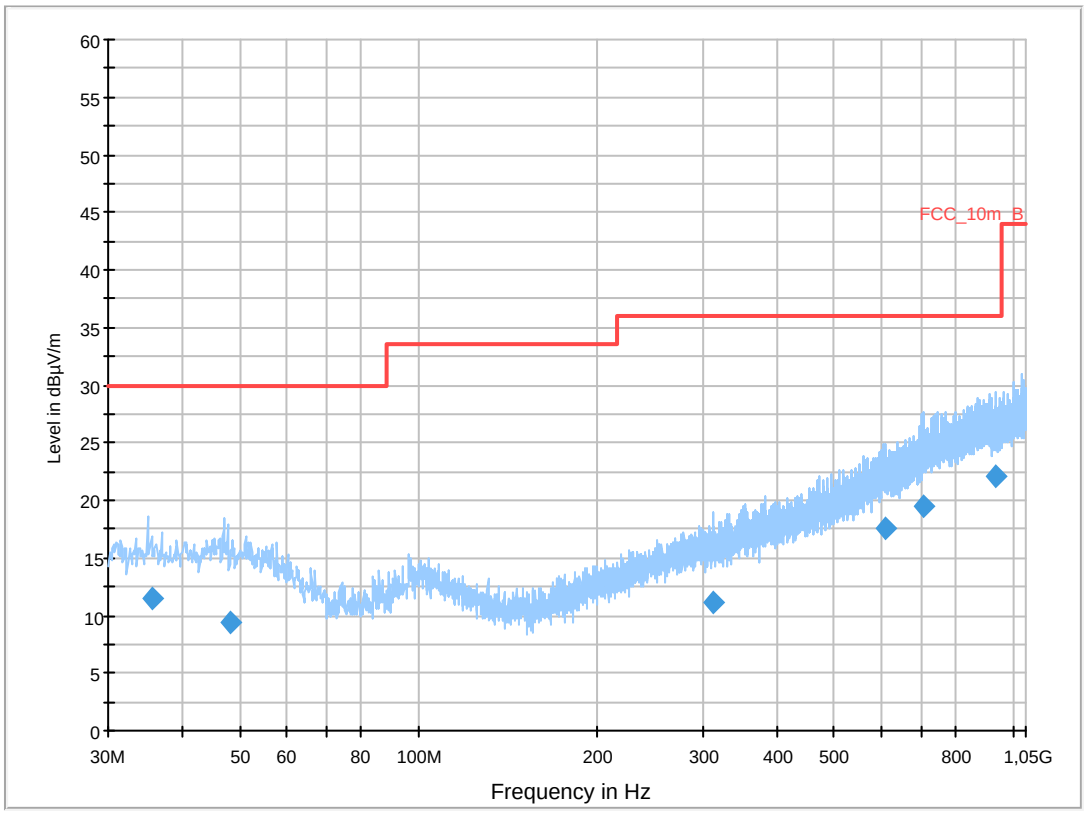
Common Information

EUT:	RFM121LW
Serial Number:	Imei:990002430036317
Test Description:	FCC part 15 C class B @ 10 m
Operating Conditions:	w-lan n mode CH165 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

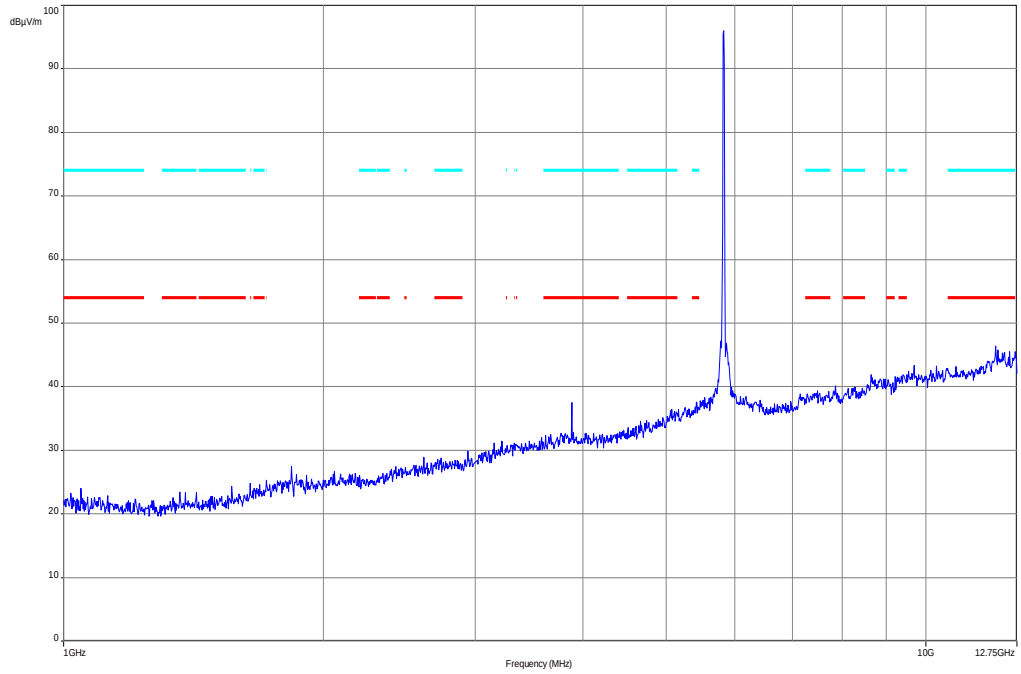
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



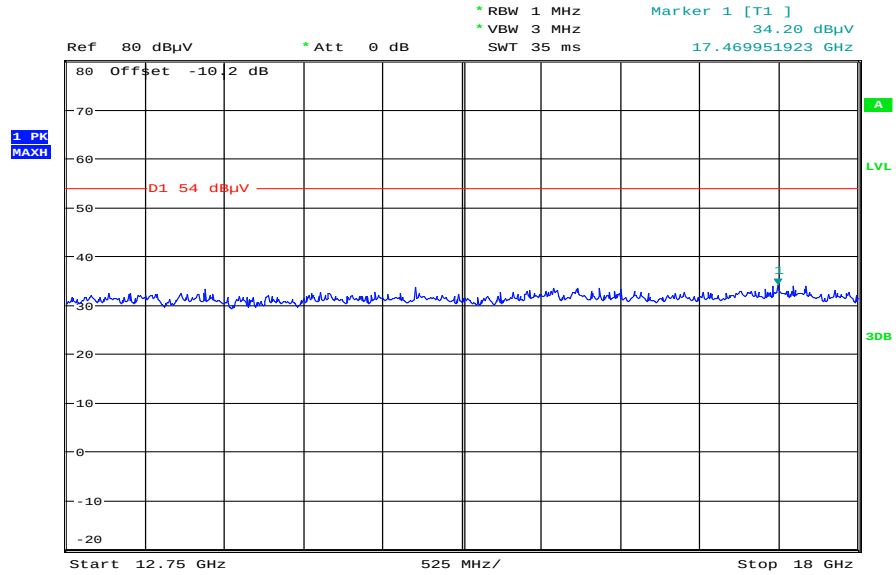
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
35.507850	11.4	1000.0	120.000	170.0	V	100.0	13.1	18.6	30.0	
47.987550	9.4	1000.0	120.000	120.0	V	100.0	13.3	20.6	30.0	
311.710050	11.0	1000.0	120.000	121.0	V	270.0	14.9	25.0	36.0	
608.257350	17.6	1000.0	120.000	170.0	H	182.0	20.9	18.4	36.0	
705.124350	19.5	1000.0	120.000	170.0	V	274.0	22.6	16.5	36.0	
931.684800	22.0	1000.0	120.000	170.0	H	-2.0	25.3	14.0	36.0	

Plot 12: Channel 165, 1 GHz to 12.75 GHz, vertical & horizontal polarization

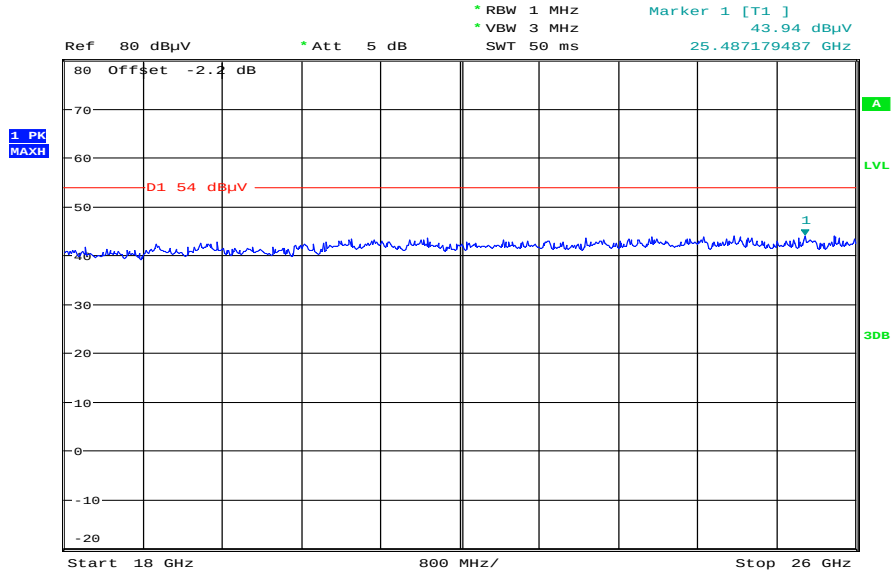


Plot 13: Channel 165, 12.75 GHz to 18 GHz, vertical & horizontal polarization



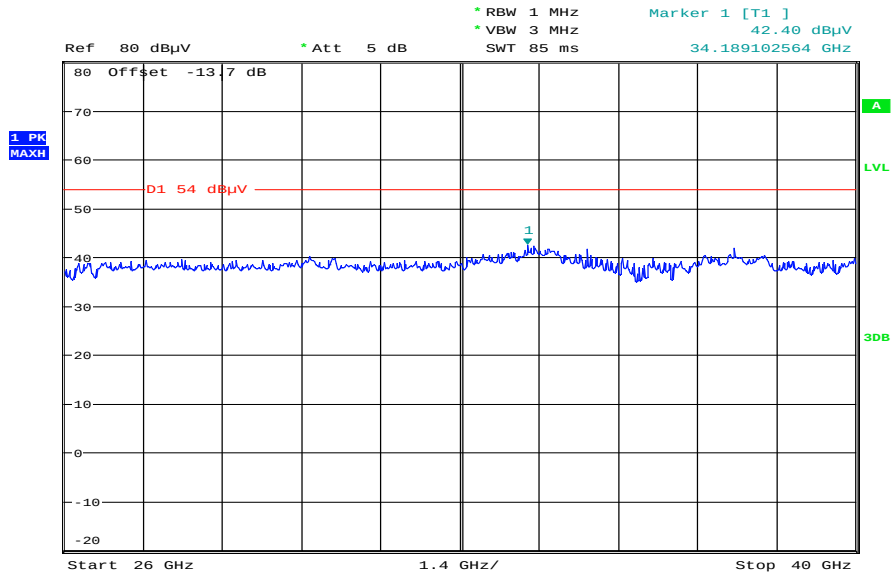
Date: 25.MAR.2013 13:41:57

Plot 14: Channel 165, 18 GHz to 26 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 13:58:03

Plot 15: Channel 165, 26 GHz to 40 GHz, vertical & horizontal polarization



Date: 25.MAR.2013 14:05:25

9.12 RX spurious emissions radiated

Not performed! Tests according to manufacturer test plan!

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 mid channel. If critical peaks are found the lowest channel and the highest channel 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 re-measured 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

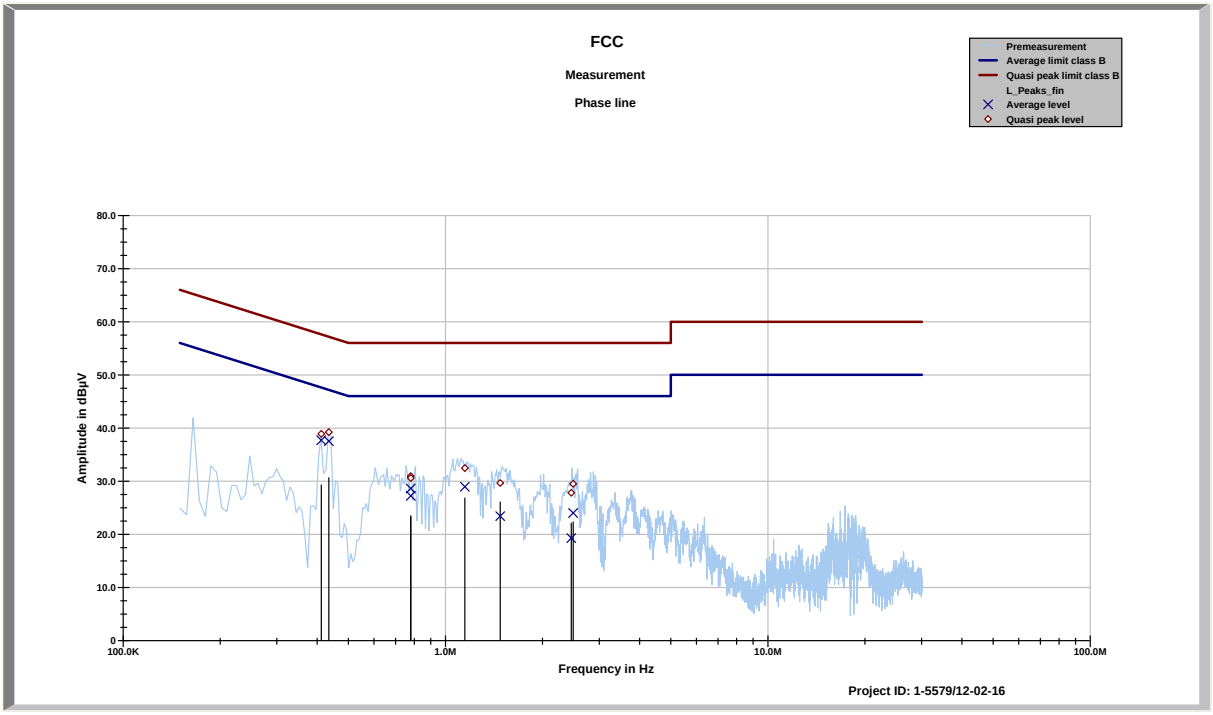
*Decreases with the logarithm of the frequency

Results:

TX Spurious Emissions Conducted < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
No critical peaks detected. All detected peak values are below the average limits.		
Measurement uncertainty	± 3 dB	

Result: **Passed**

Plots:



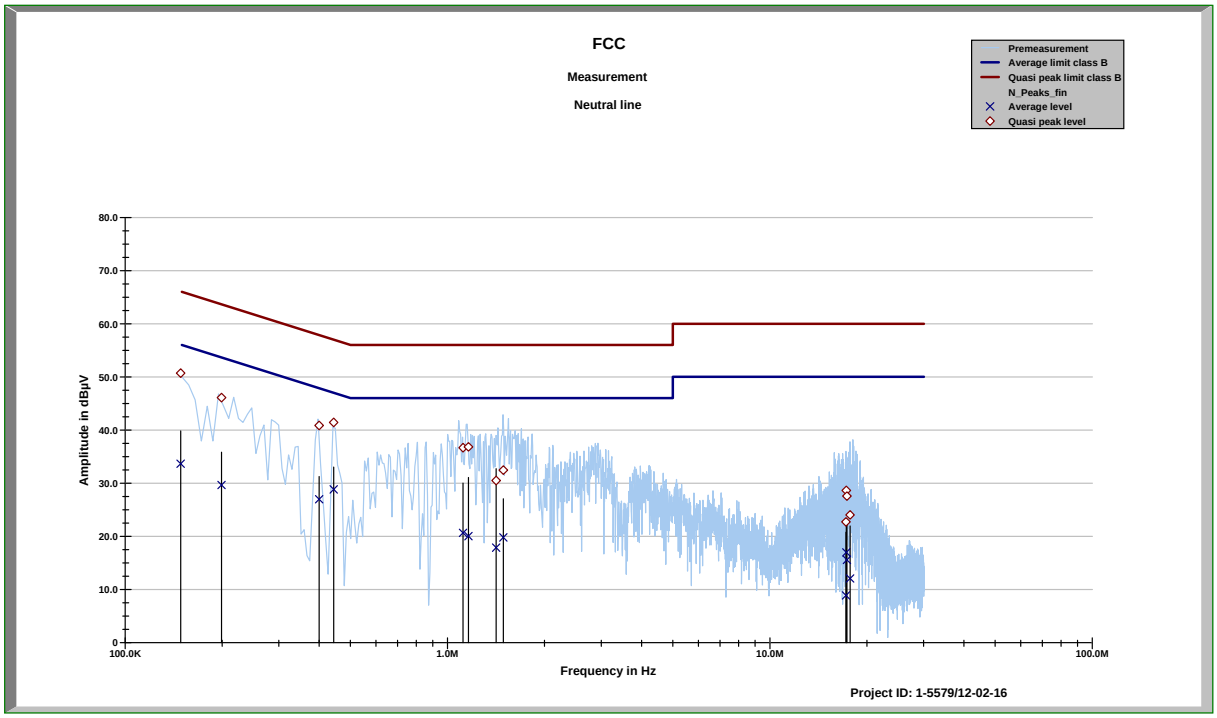
FCC
Phase line tbl

Project ID: 1-5579/12-02-33

01:58:36 PM, Thursday, February 28, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.41168	38.89	18.72	37.71	10.82
0.43466	39.23	17.94	37.54	10.33
0.77974	30.94	25.06	28.63	17.37
0.7807	30.59	25.41	27.23	18.77
1.14802	32.45	23.55	28.94	17.06
1.4781	29.66	26.34	23.42	22.58
2.4551	27.82	28.18	19.29	26.71
2.4866	29.49	26.51	24.01	21.99

Project ID - 1-5579/12-02-33
EUT - RFM121LW
Serial Number - 990002430024636
Operating mode - W-LAN a-mode + 2x charging; 115V AC/60Hz



FCC
Neutral line tbl

Project ID: 1-5579/12-02-33

01:58:36 PM, Thursday, February 28, 2013

Frequency	Quasi peak level	Margin quasi peak	Average level	Margin average
MHz	dBµV	dBµV	dBµV	dBµV
0.14874	50.70	NAN	33.66	NAN
0.19902	46.09	17.56	29.65	24.95
0.39975	40.86	16.99	26.97	21.89
0.4435	41.43	15.56	28.84	18.78
1.11728	36.67	19.33	20.65	25.35
1.161	36.83	19.17	20.04	25.96
1.4156	30.48	25.52	17.87	28.13
1.4896	32.45	23.55	19.79	26.21
17.204	22.72	37.28	8.86	41.14
17.237	28.63	31.37	16.97	33.03
17.317	27.57	32.43	15.58	34.42
17.716	24.04	35.96	12.07	37.93

Project ID - 1-5579/12-02-33
EUT - RFM121LW
Serial Number - 990002430024636
Operating mode - W-LAN a-mode + 2x 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	vlKI!	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.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbe ck	371	300003854	vlKI!	14.10.2011	14.10.2014
22	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologi es	MY51210197	300004405	k	21.02.2013	21.02.2014

23	CR 79	Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	7911	300001751	ne		
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.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	Ve	09.10.2012	09.10.2014
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
vlkI!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

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	2013-03-28
-A	Addition of PIN	2013-04-03
-A	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

DAkkS
Deutsche Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Beliehene 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
SAR 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
Dr.-Ing. (FH) Ralf Egner
Abteilungsleiter

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Back side of certificate

Deutsche Akkreditierungsstelle GmbH

Standort Berlin
Spittelmarkt 10
10117 Berlin

Standort Frankfurt am Main
Gartenstraße 6
60594 Frankfurt am Main

Standort Braunschweig
Bundesallee 100
38116 Braunschweig

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Die Akkreditierung erfolgte gemäß des Gesetzes über die Akkreditierungsstelle (AkkStelleG) vom 31. Juli 2009 (BGBl. I S. 2625) sowie der Verordnung (EG) Nr. 765/2008 des Europäischen Parlaments und des Rates vom 9. Juli 2008 über die Vorschriften für die Akkreditierung und Marktüberwachung im Zusammenhang mit der Vermarktung von Produkten (Abl. L 218 vom 9. Juli 2008, S. 30).
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ILAC: www.ilac.org
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Note:

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

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