

## TEST REPORT

Test report no.: 1-3791/11-01-12-A



### Testing laboratory

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#### 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

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### Manufacturer

**Sennheiser electronic GmbH & Co. KG**  
 Am Labor 1  
 30900 Wedemark / GERMANY

### 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:** Wireless conference system  
**Model name:** ADN-W AM-US  
**FCC ID:** DMOADNWAM  
**IC:** 2099A-ADNWAM  
 Frequency: ISM band 2400 MHz to 2483.5 MHz  
 (lowest channel 2412 MHz;  
 highest channel 2472 MHz)  
 Technology tested: Proprietary wireless audio transmission system  
 Antenna: External rod. antennas  
 Power Supply: 52.8 V DC by POE power supply  
 Temperature Range: +5°C to +45°C



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:

p.o.

Marco Bertolino  
 Testing Manager

### Test performed:

Andreas Luckenbill  
 Expert

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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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### 2.2 Application details

Date of receipt of order:	2011-09-30
Date of receipt of test item:	2013-02-26
Start of test:	2013-02-26
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	2010-10	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
	$T_{max}$	+45 °C during high temperature tests
	$T_{min}$	+5 °C during low temperature tests
Relative humidity content:		42 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	$V_{nom}$	52.8 V DC by POE power supply
	$V_{max}$	54.0 V
	$V_{min}$	33.0 V

#### 5 Test item

Kind of test item	:	Wireless conference system
Type identification	:	ADN-W AM-US
S/N serial number	:	Conducted / radiated units: 1462100048; 1462100049 (EUT)
HW hardware status	:	FPGA: 2_8_5_prod2/ AM1.bin
SW software status	:	ADNW_TERMINAL.EXE from 16.11.2012; APP:001120
Frequency band [MHz]	:	ISM band 2400 MHz to 2483.5 MHz (lowest channel 2412 MHz; highest channel 2472 MHz)
Type of radio transmission	:	OFDM
Use of frequency spectrum	:	
Type of modulation	:	QPSK with coding rate 1/2
Number of channels	:	13
Antenna	:	External rod. antennas
Power supply	:	52.8 V DC by POE power supply
Temperature range	:	+5°C to +45 °C

#### 5.1 Additional information

Test setup - and EUT - photos are included in the following test reports:

External EUT photos: 1-3791/12-01-01\_AnnexA  
 Internal EUT photos: 1-3791/12-01-01\_AnnexB  
 Test setup: 1-3791/12-01-01\_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	2013-08-02	-/-

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)	System gain	Nominal	Nominal	OFDM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.247(e) RSS 210 / A8.2(b)	Power spectral density	Nominal	Nominal	OFDM	<input checked="" 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	OFDM	<input checked="" 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	OFDM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.247(b)(3) RSS-210 / A8.4(4)	Maximum output power	Nominal	Nominal	OFDM	<input checked="" 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	OFDM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.205 RSS-210 / A8.5	Band edge compliance radiated	Nominal	Nominal	OFDM	<input checked="" 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	OFDM	<input checked="" 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	OFDM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.109 RSS-Gen	Unintentional radiator 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	OFDM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.107(a)	Conducted emissions < 30 MHz	Nominal	Nominal	OFDM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies

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

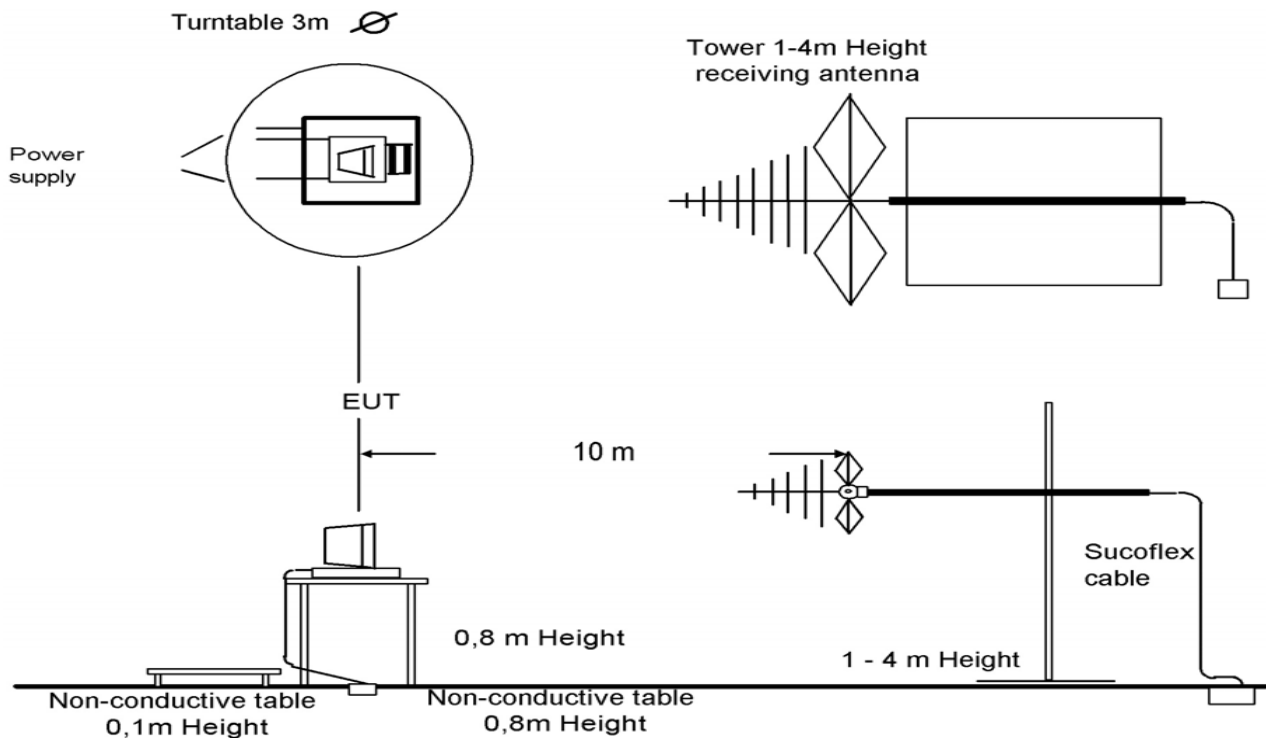
## 8 RF measurements

### 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. 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



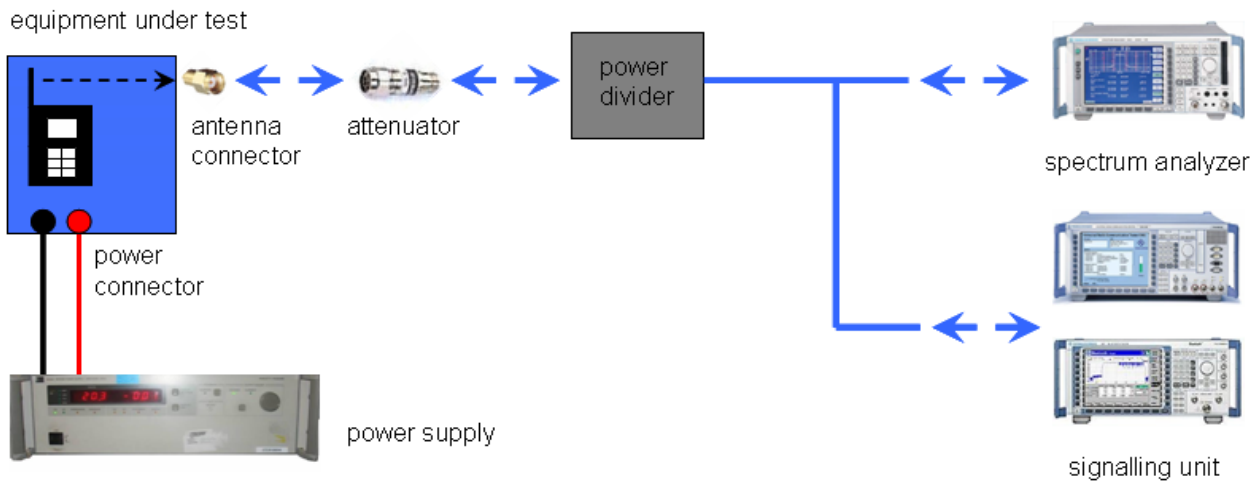
Picture 1: Diagram radiated measurements

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: ANT\_AM1

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

### 8.3 RSP100 test report cover sheet / performance test data

Test report number	:	1-3791/11-01-12-A				
Equipment model number	:	ADN-W AM-US				
Certification number	:	2099A-ADNWAM				
Manufacturer (complete address)	:	Sennheiser electronic GmbH & Co. KG Am Labor 1 30900 Wedemark / GERMANY				
Tested to radio standards specification no.	:	RSS 210, Issue 8				
Open area test site IC No.	:	IC 3462C-1				
Frequency range	:	ISM band 2400 MHz to 2483.5 MHz				
Conducted values:						
RF-power [W] (max.)	:	Band	OFDM antenna port 1		OFDM antenna port 2	
		2412 – 2472 MHz	13.77 mW		12.02 mW	
		2422 – 2462 MHz	-/-	-/-	-/-	-/-
		Radiated values:				
		Band	OFDM antenna port 1		OFDM antenna port 2	
		2412 – 2472 MHz	53.70 mW		47.32 mW	
2422 – 2462 MHz	-/-	-/-	-/-	-/-		
Occupied bandwidth (99%-BW) [kHz] / Emission designator (TRC-43)	:	Band	OFDM antenna port 1		OFDM antenna port 2	
		2412 – 2472 MHz	16.35 MHz / 16M4G7D		16.35 MHz / 16M4G7D	
		2422 – 2462 MHz	-/-	-/-	-/-	-/-
Type of modulation	:	OFDM technology with QPSK modulation.				
Antenna information	:	External rod. antennas				
Transmitter spurious (worst case) [dB $\mu$ V/m @ 3m]:	:	50.9 @ 11.85 GHz (peak)				

#### ATTESTATION:

#### DECLARATION OF COMPLIANCE:

I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

#### Laboratory manager:

2013-08-02

Andreas Luckenbill

Date

Name

Signature



## 9 Measurement results

### 9.1 System gain

#### Measurement:

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

#### Measurement parameters:

Measurement parameter	
Detector:	Peak
Sweep time:	5 s
Resolution bandwidth:	3 MHz
Video bandwidth:	3 MHz
Trace-Mode:	Max hold

#### Limits:

FCC	IC
Antenna Gain	
6 dBi or below 36 dBm	

#### Results:

$T_{nom}$	$V_{nom}$	lowest channel 2412 MHz	middle channel 2442 MHz	highest channel 2472 MHz
Conducted power [dBm] Measured with OFDM		6.26	6.44	6.25
Radiated power [dBm] Measured with OFDM		11.10	11.40	12.20
Gain [dBi] Calculated		4.84	4.96	5.95
Measurement uncertainty			± 1.5 dB (cond.) / ± 3 dB (rad.)	

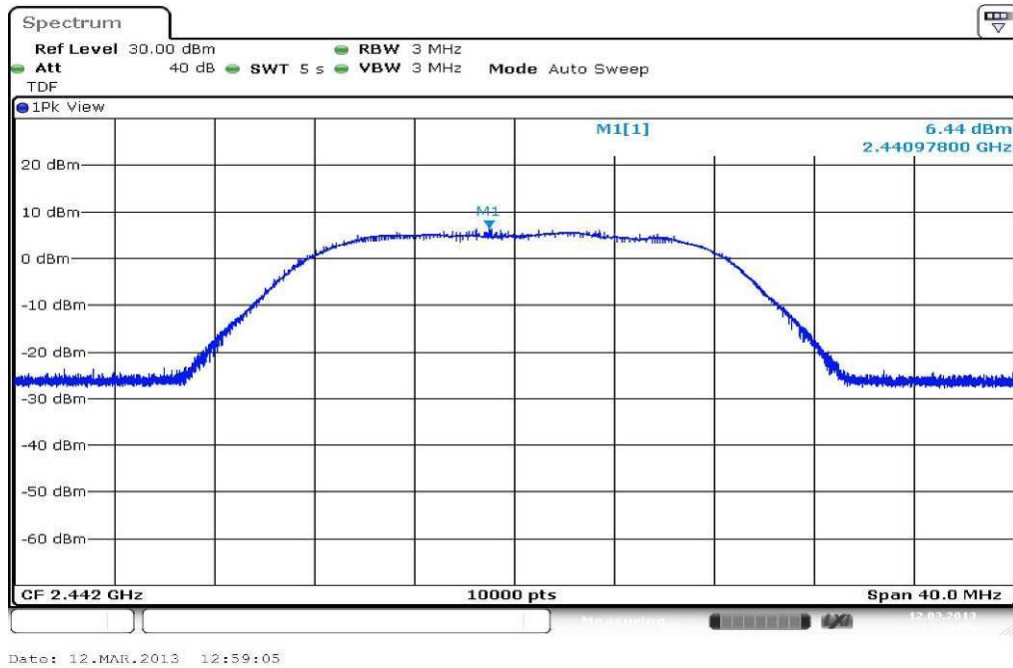
**Result: Passed**

**Plots: OFDM**

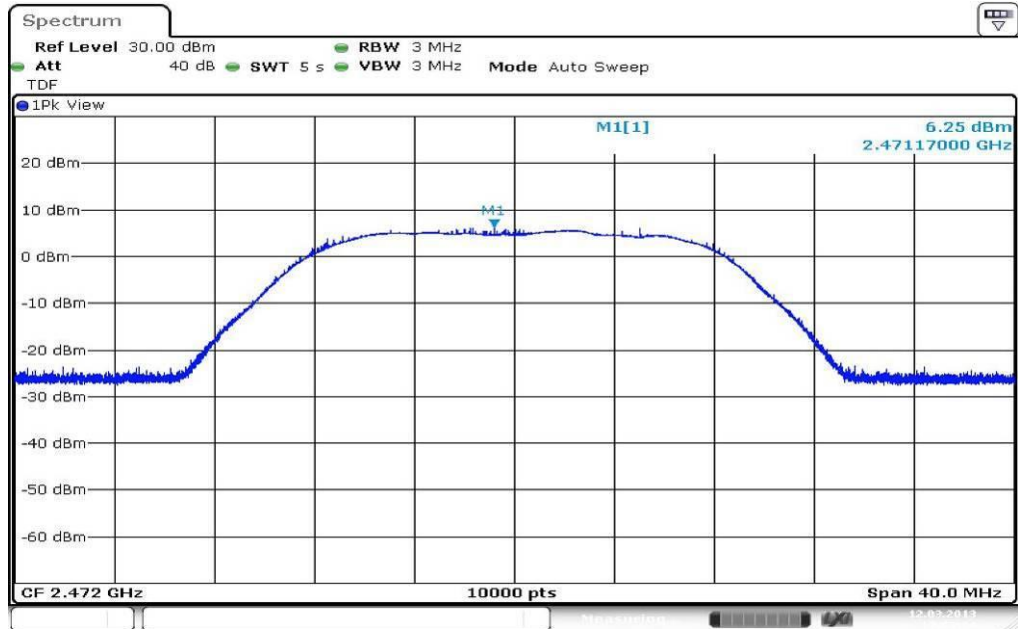
**Plot 1: TX mode, lowest channel**



**Plot 2: TX mode, middle channel**



Plot 3: TX mode, highest channel



## 9.2 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: OFDM, antenna port 1

OFDM antenna port 1 Frequency	Maximum Output Power [dBm]		
	2412 MHz	2442 MHz	2472 MHz
Peak Output Power Conducted	11.19	11.39	11.35
Output Power Radiated – EIRP*)	16.03	16.35	17.30
Measurement uncertainty	± 1.5 dB (cond.) / ± 3 dB (rad.)		

\*) calculated with Antenna gain

**Result: Passed**

**Results: OFDM, antenna port 2**

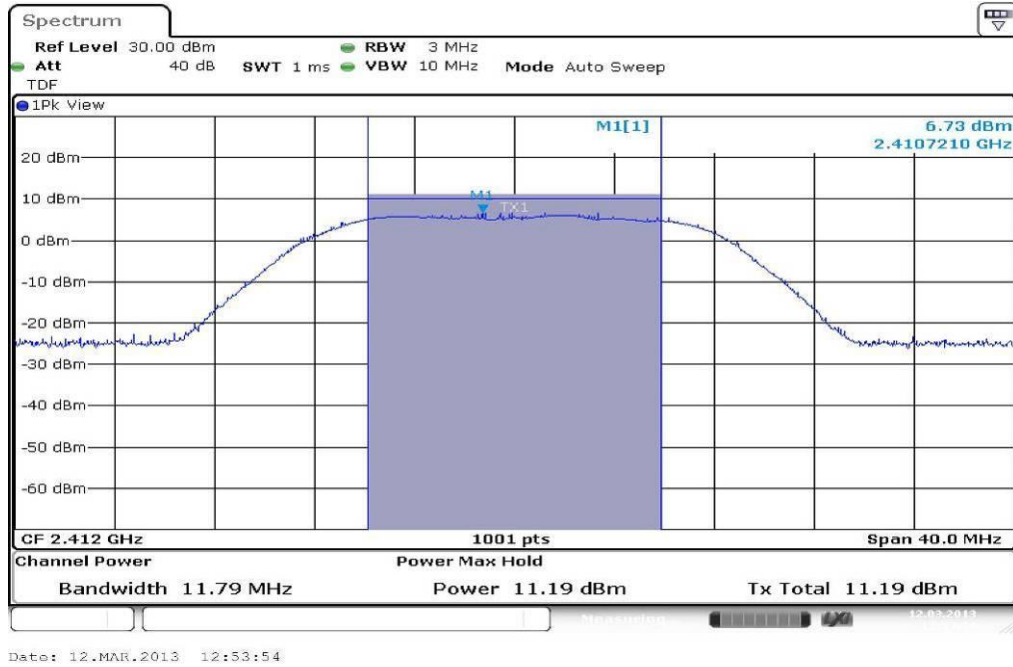
OFDM antenna port 2 Frequency	Maximum Output Power [dBm]		
	2412 MHz	2442 MHz	2472 MHz
Peak Output Power Conducted	10.32	10.67	10.80
Output Power Radiated – EIRP*)	15.16	15.63	16.75
Measurement uncertainty	± 1.5 dB (cond.) / ± 3 dB (rad.)		

\*) calculated with Antenna gain

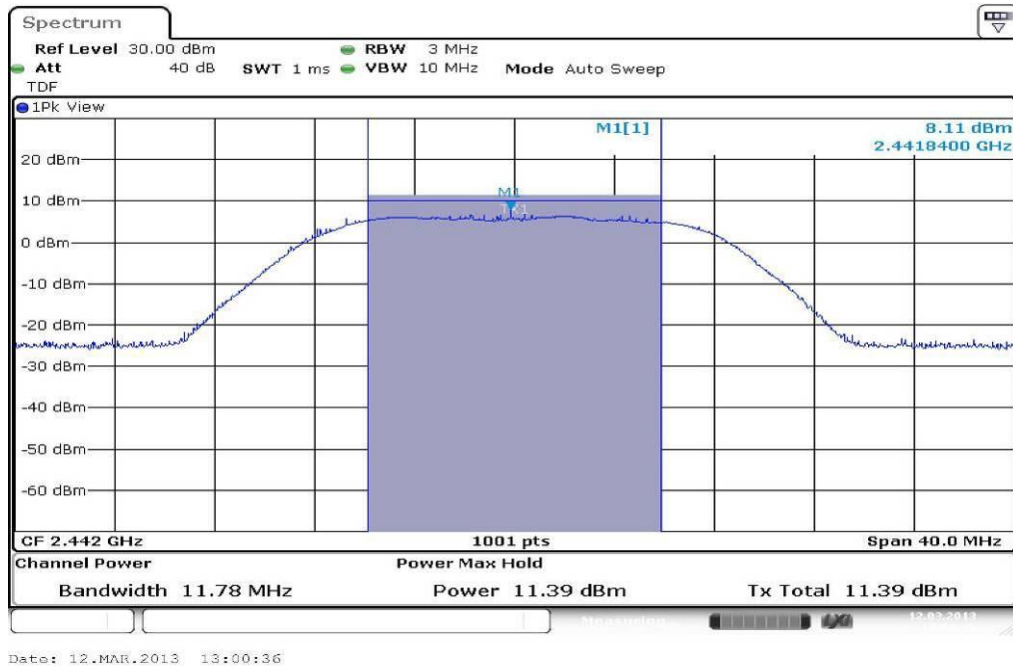
**Result: Passed**

**Plots: OFDM, antenna port 1**

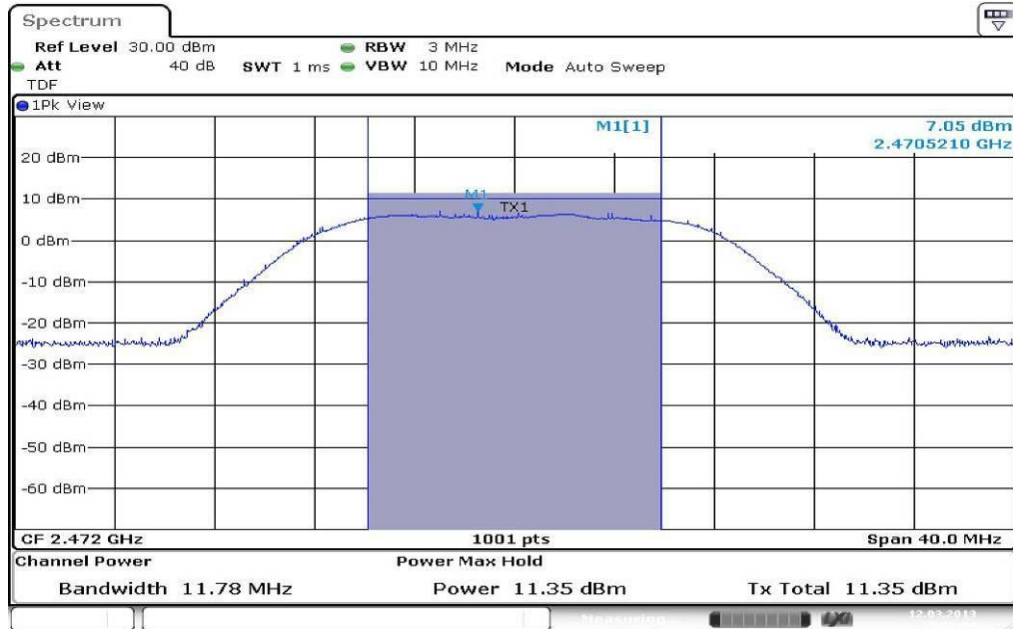
**Plot 1: TX mode, lowest channel**



**Plot 2: TX mode, middle channel**



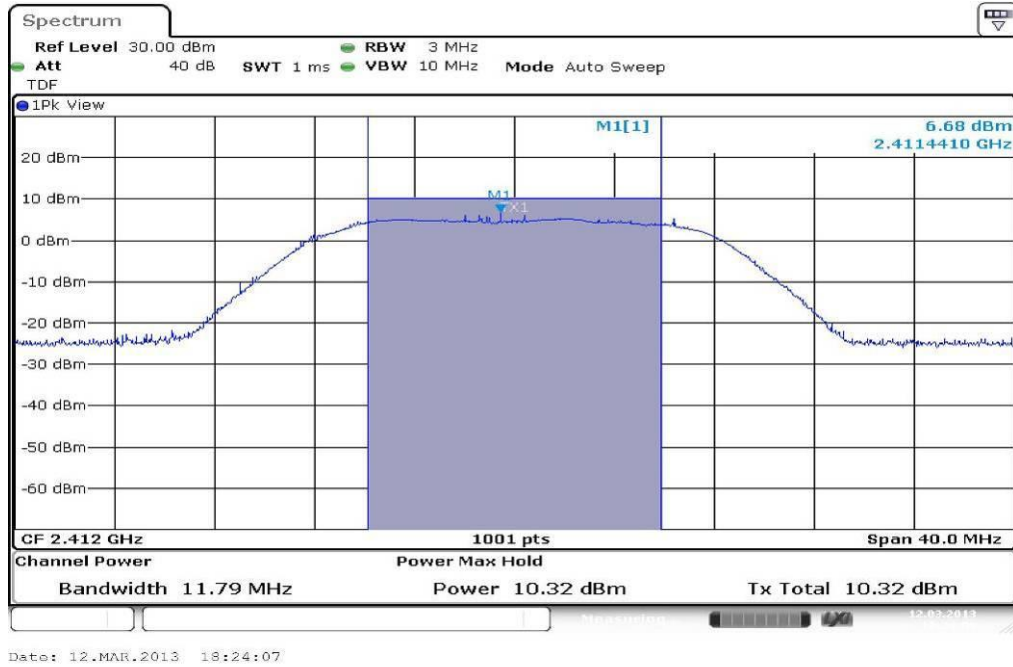
Plot 3: TX mode, highest channel



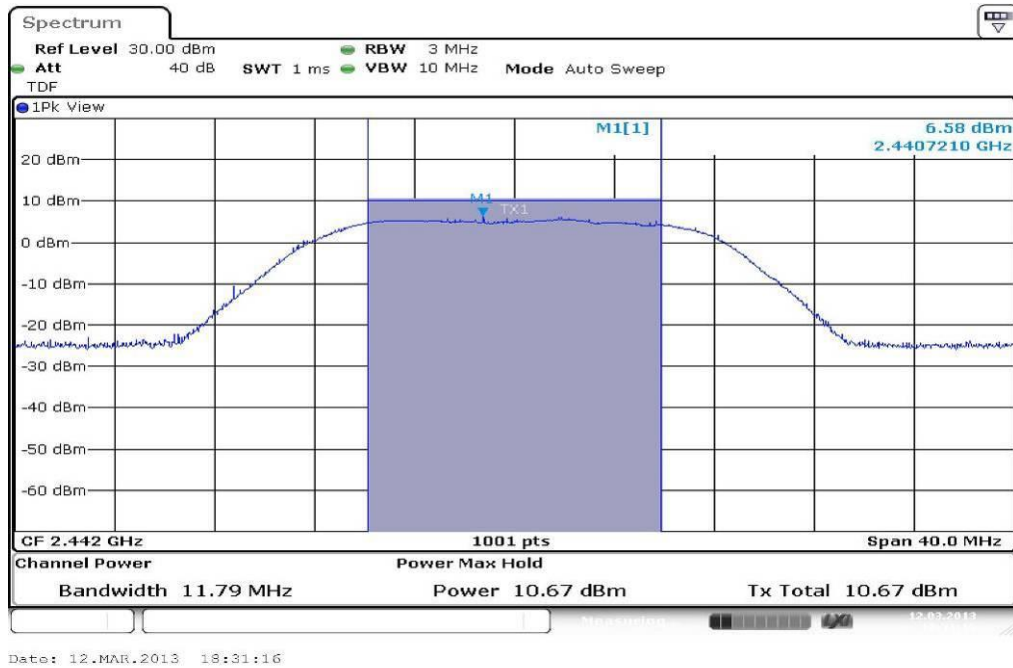
Date: 12.MAR.2013 18:07:05

**Plots: OFDM, antenna port 2**

**Plot 1: TX mode, lowest channel**

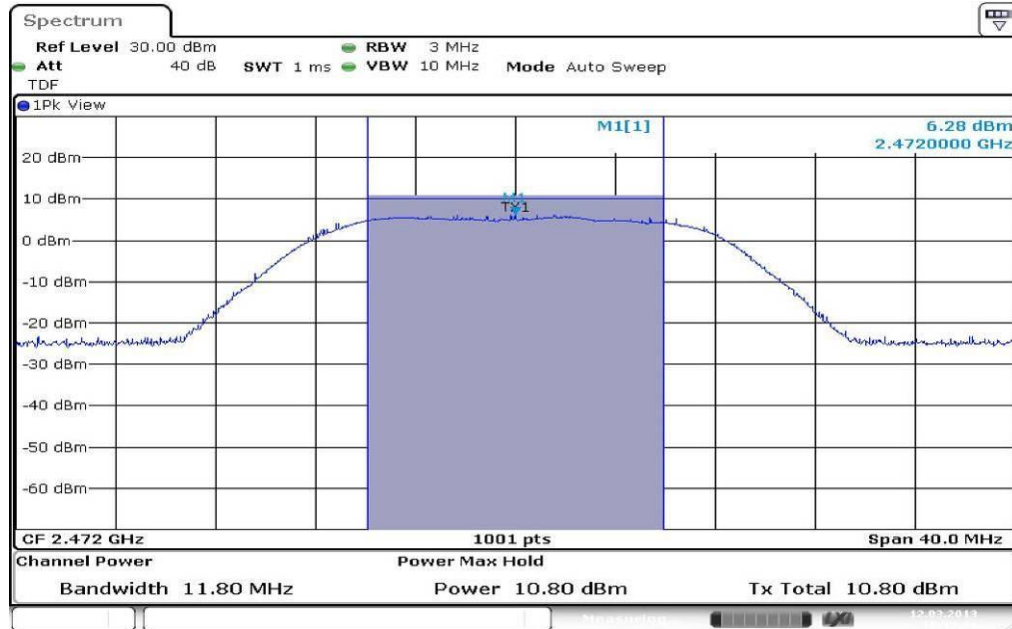


**Plot 2: TX mode, middle channel**





Plot 3: TX mode, highest channel



Date: 12.MAR.2013 18:37:30

### 9.3 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:	$\geq 3$ kHz
Video bandwidth:	$\geq 3 \times$ 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)	

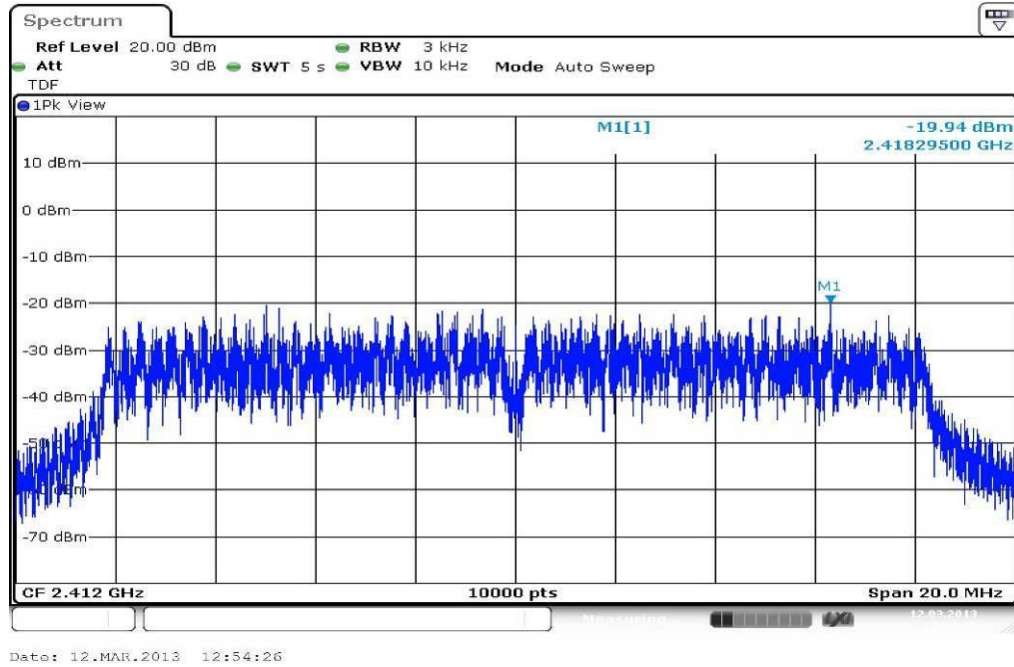
#### Results:

Modulation Frequency	Power Spectral density [dBm]		
	2412 MHz	2442 MHz	2472 MHz
OFDM - antenna port 1	-19.94	-19.80	-19.82
OFDM - antenna port 2	-20.79	-20.55	-20.43
Measurement uncertainty	$\pm 1.5$ dB		

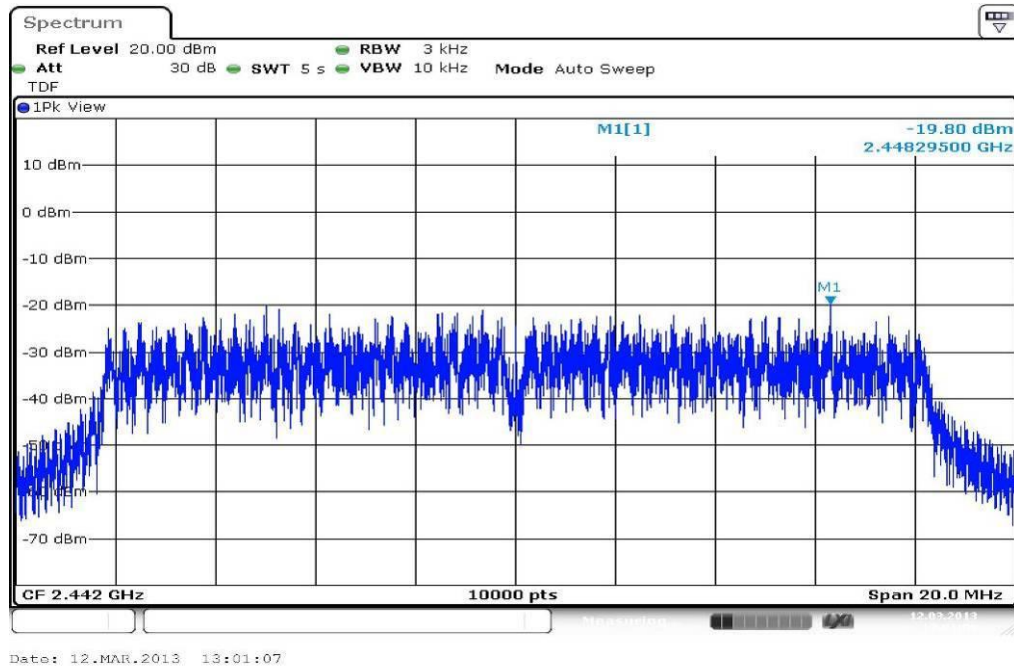
**Result: Passed**

**Plots: OFDM, antenna port 1**

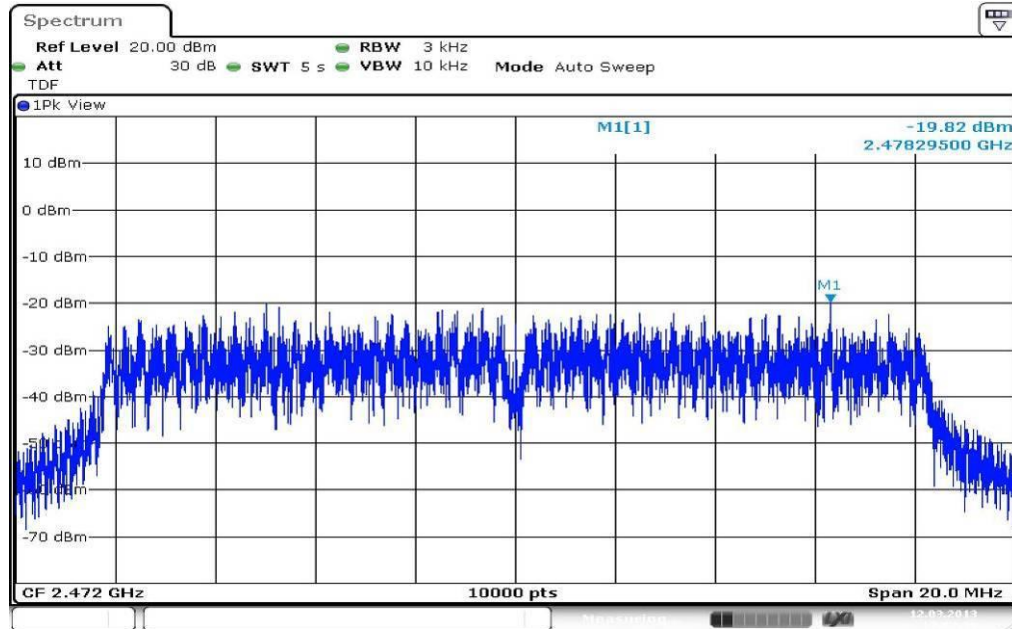
**Plot 1: TX mode, lowest channel**



**Plot 2: TX mode, middle channel**



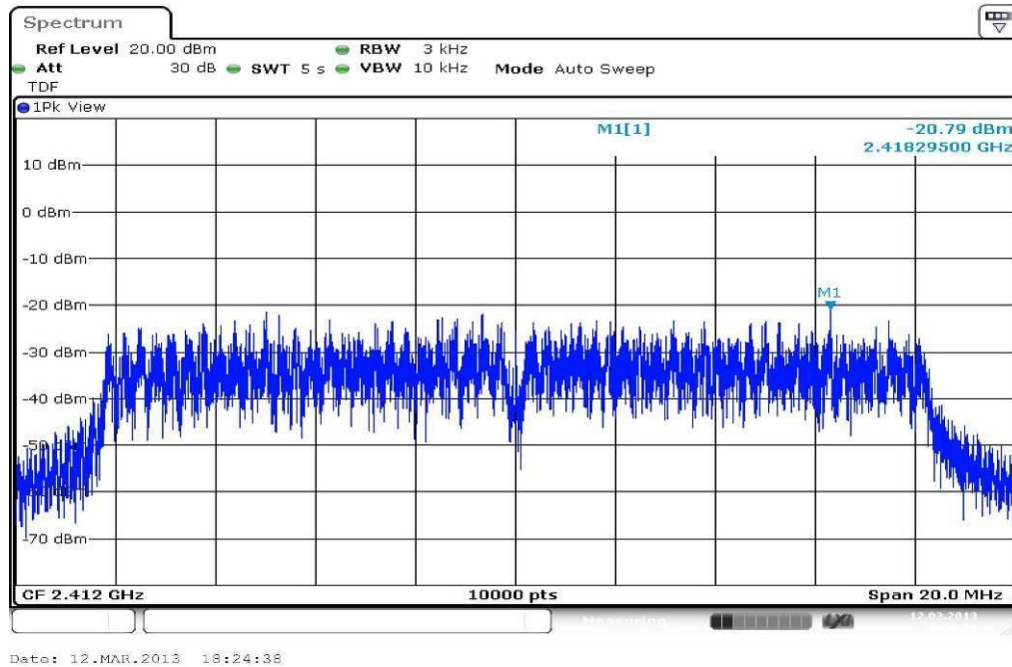
Plot 3: TX mode, highest channel



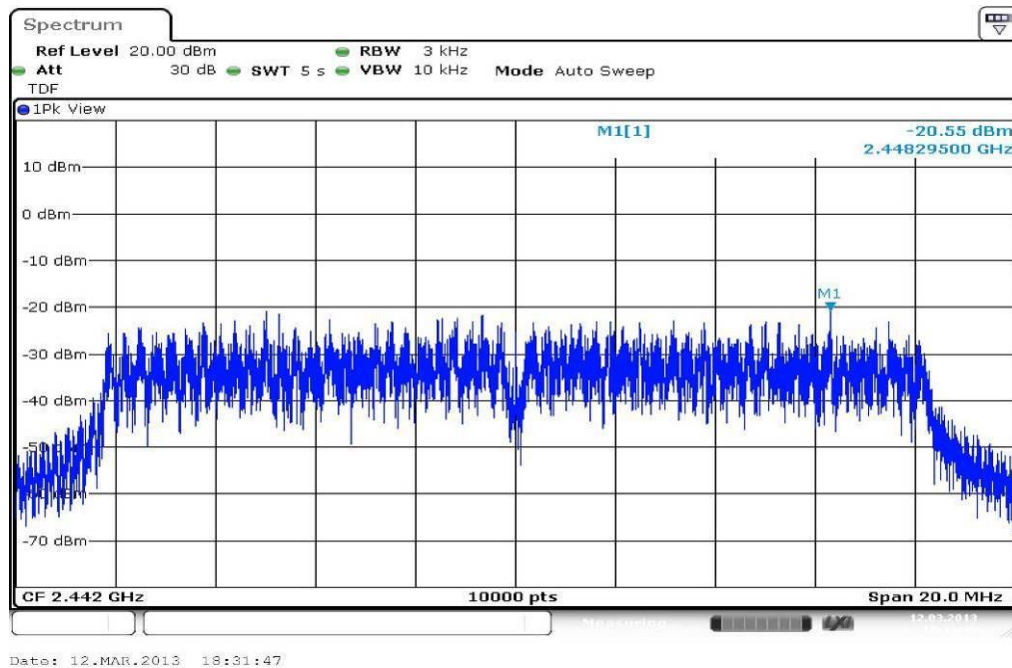
Date: 12.MAR.2013 18:07:36

**Plots: OFDM, antenna port 2**

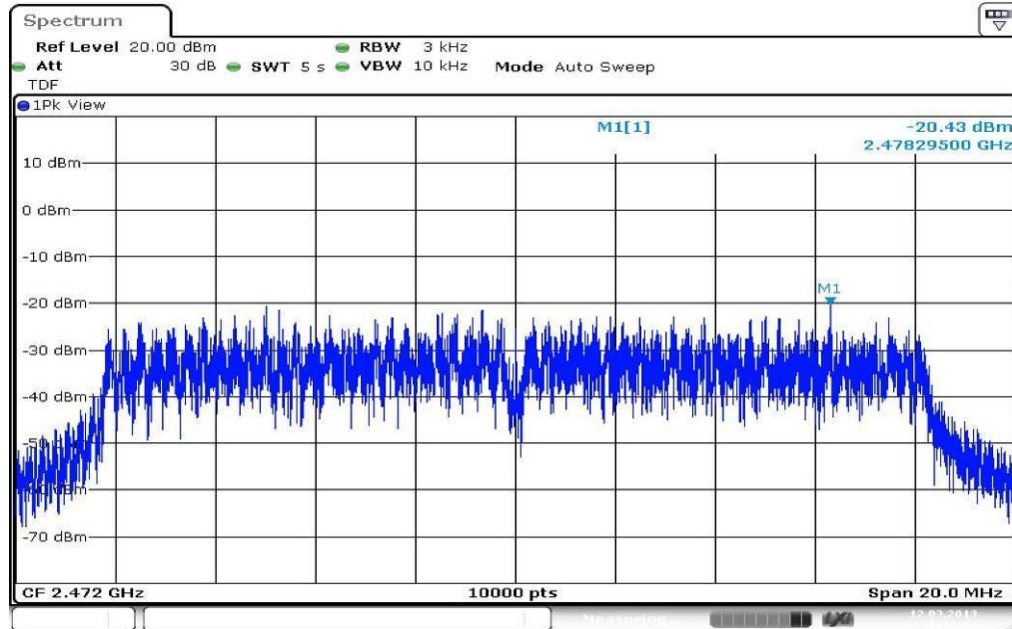
**Plot 1: TX mode, lowest channel**



**Plot 2: TX mode, middle channel**



Plot 3: TX mode, highest channel



Date: 12.MAR.2013 18:38:01

## 9.4 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.	

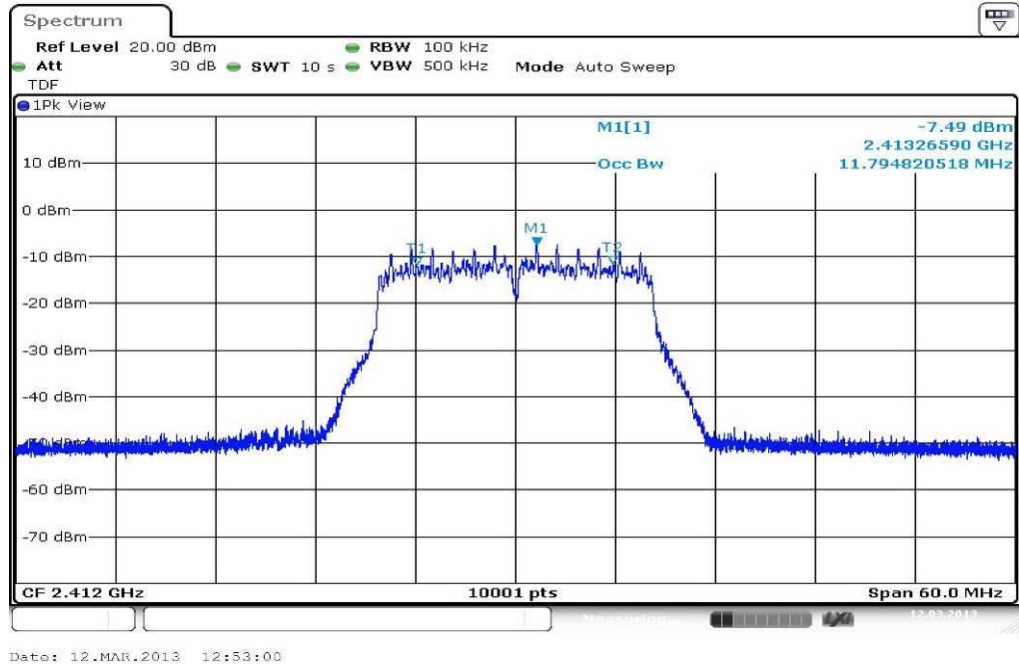
**Results:**

Modulation	6 dB bandwidth [MHz]		
	2412 MHz	2442 MHz	2472 MHz
Frequency			
OFDM - antenna port 1	11.79	11.78	11.78
OFDM - antenna port 2	11.79	11.79	11.80
Measurement uncertainty	± RBW		

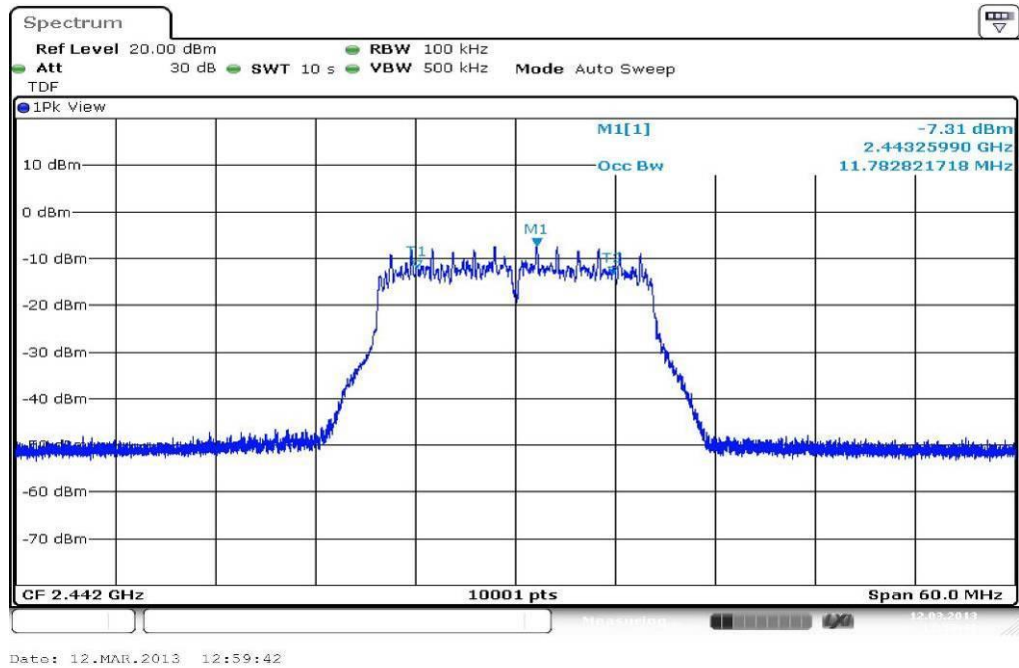
**Result:** Passed

**Plots: OFDM, antenna port 1**

**Plot 1: TX mode, lowest channel**

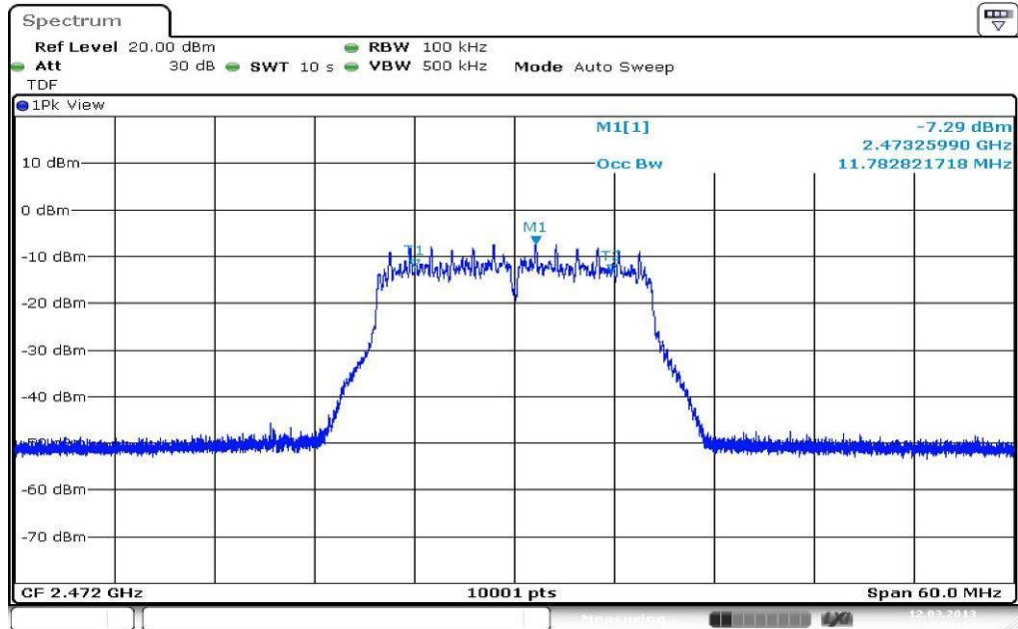


**Plot 2: TX mode, middle channel**





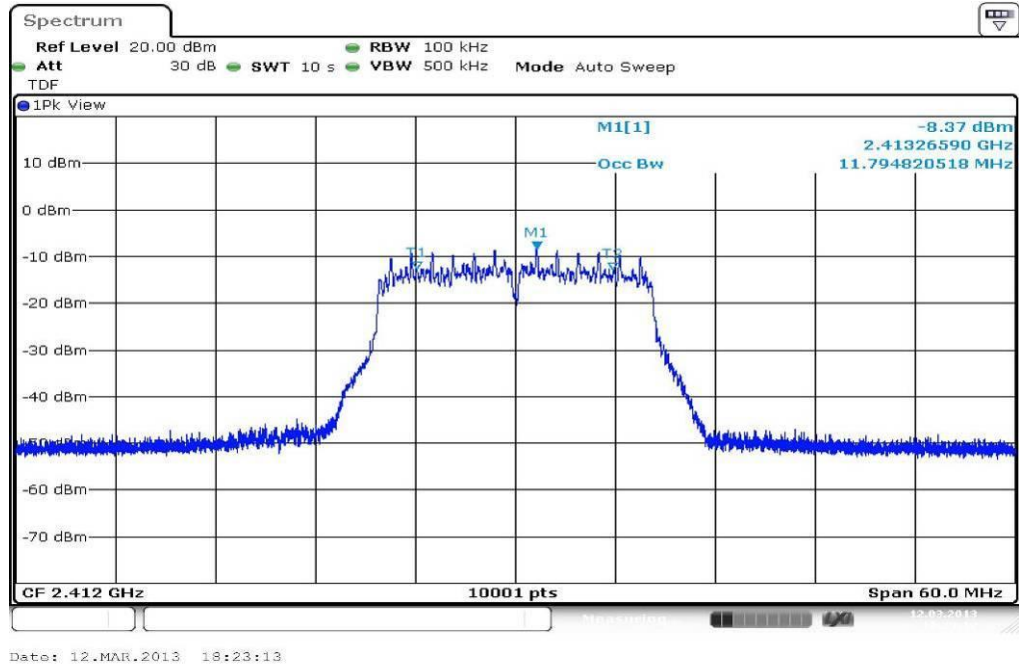
Plot 3: TX mode, highest channel



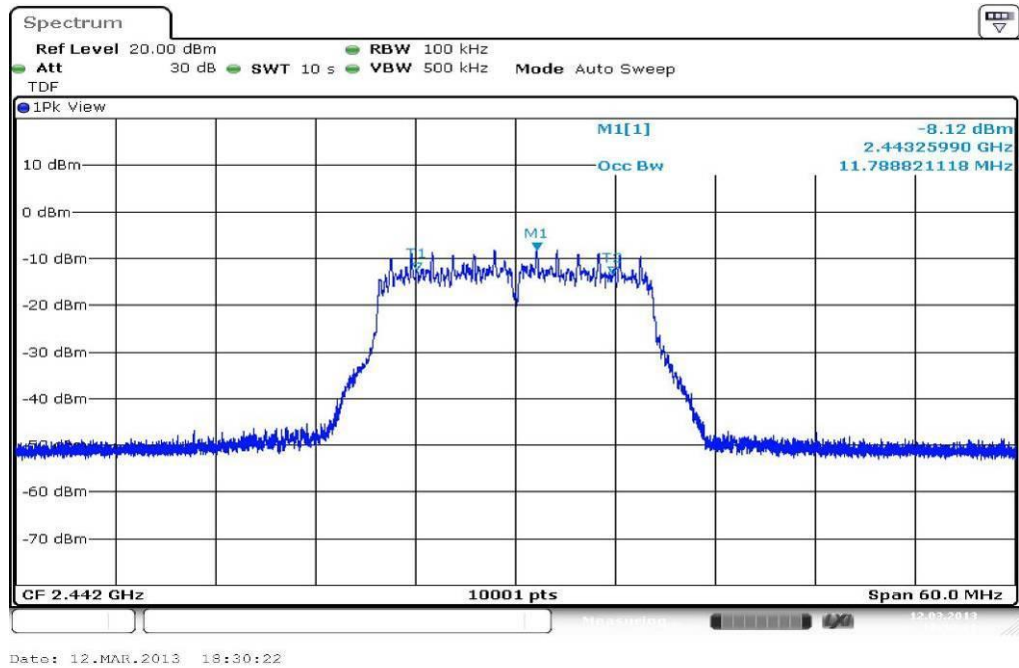
Date: 12.MAR.2013 13:06:11

**Plots: OFDM, antenna port 2**

**Plot 1: TX mode, lowest channel**



**Plot 2: TX mode, middle channel**





## 9.5 Spectrum bandwidth – 20 dB

**Description:**

Measurement of the 20 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 – 20 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.	

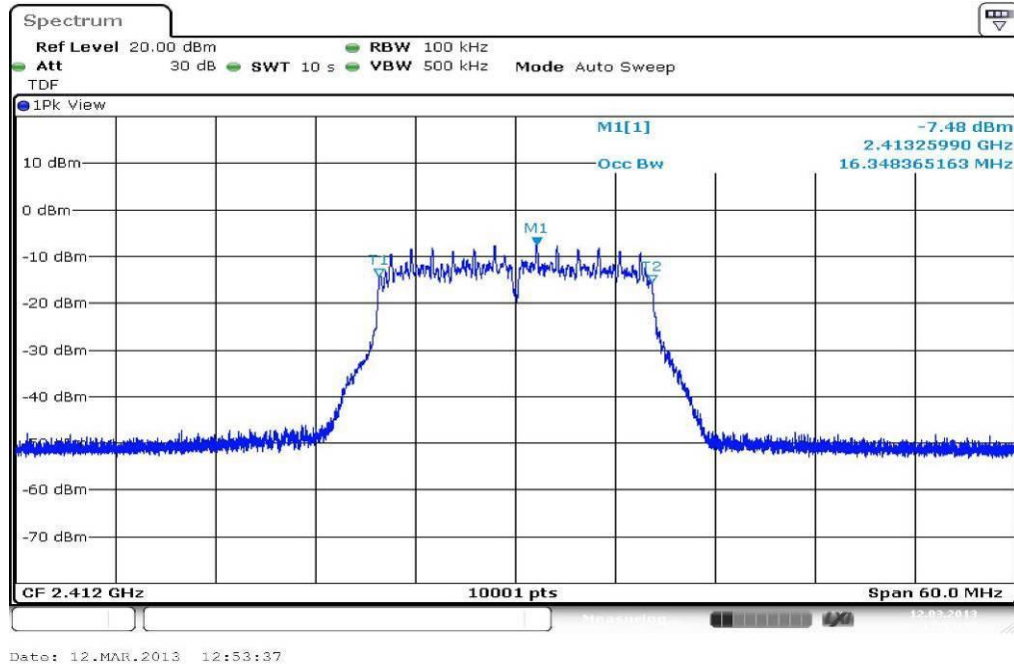
**Results:**

Modulation	20 dB bandwidth [MHz]		
	2412 MHz	2442 MHz	2472 MHz
Frequency			
OFDM - antenna port 1	16.35	16.34	16.34
OFDM - antenna port 2	16.35	16.35	16.35
Measurement uncertainty	± RBW		

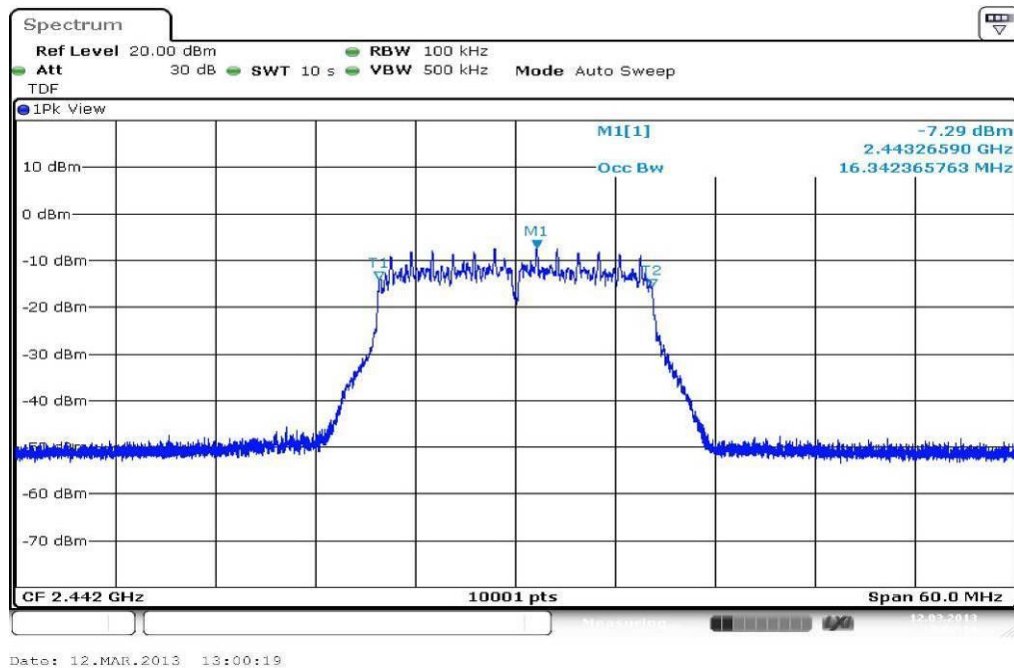
**Result:** Passed

**Plots: OFDM, antenna port 1**

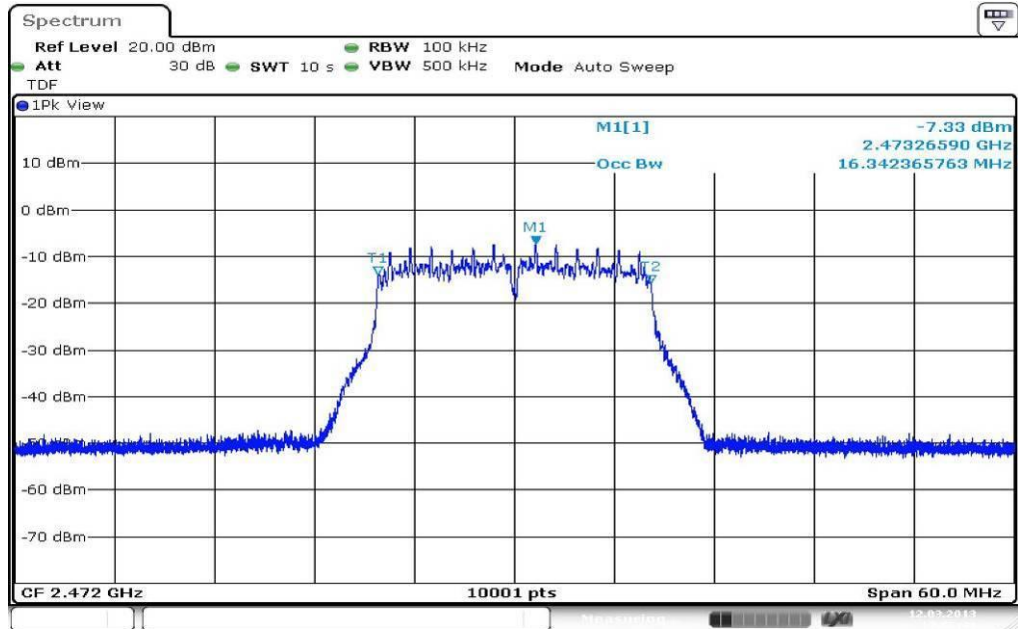
**Plot 1: TX mode, lowest channel**



**Plot 2: TX mode, middle channel**



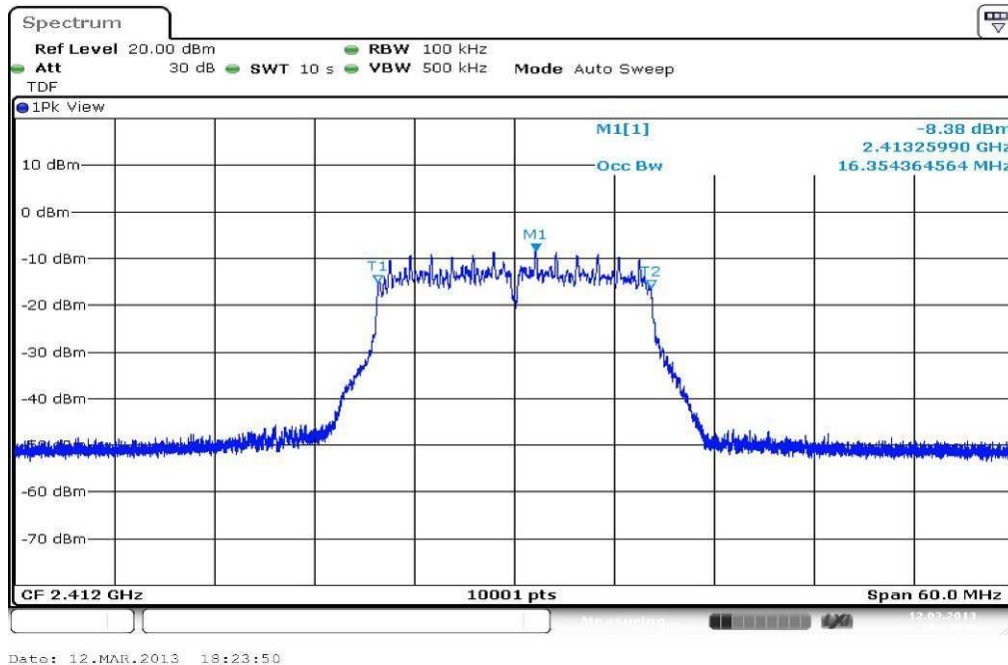
Plot 3: TX mode, highest channel



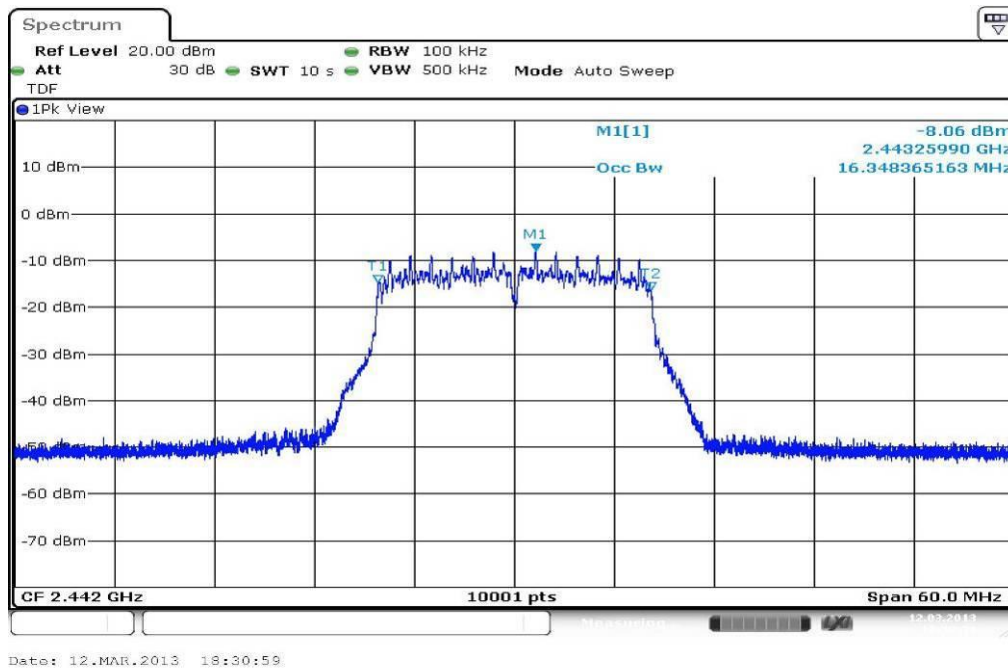
Date: 12.MAR.2013 13:06:48

**Plots: OFDM, antenna port 2**

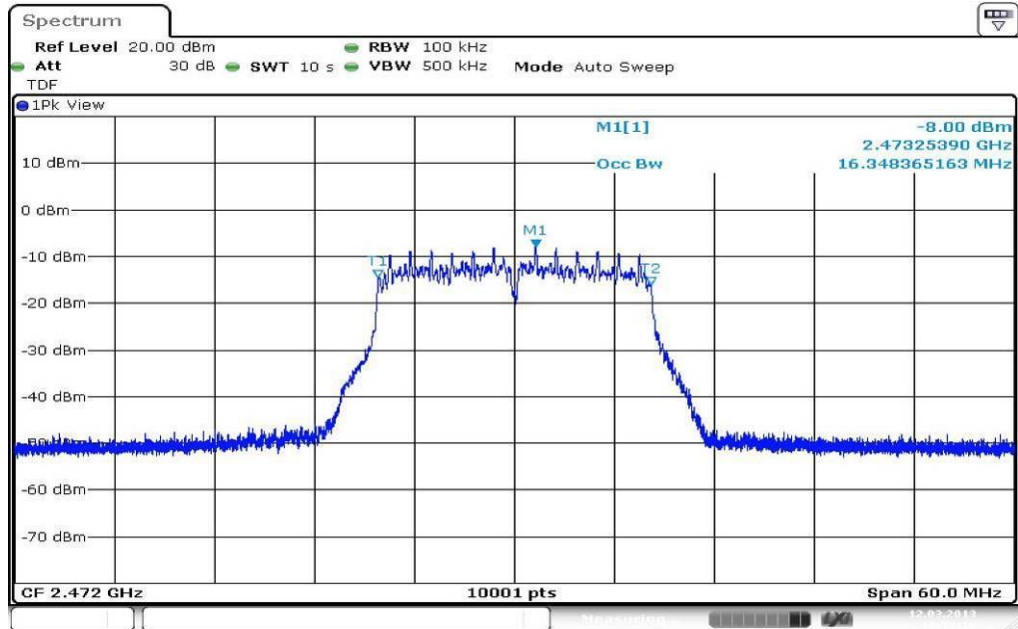
**Plot 1: TX mode, lowest channel**



**Plot 2: TX mode, middle channel**



Plot 3: TX mode, highest channel



Date: 12.MAR.2013 18:37:13



## 9.6 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>	

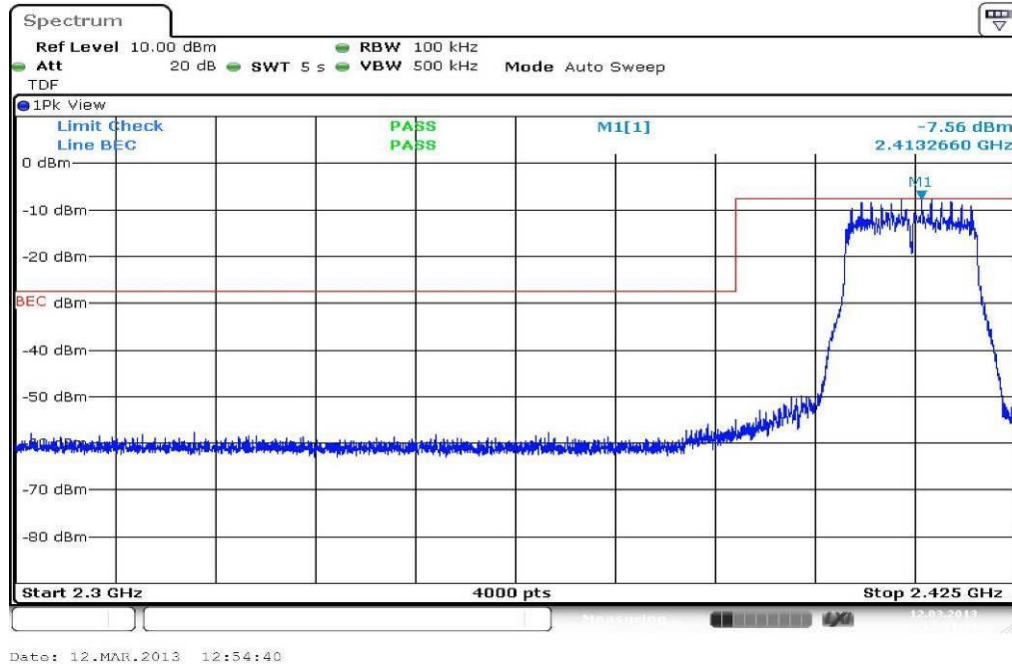
### Results:

Scenario Modulation	Band Edge Compliance Conducted [dB]		
	OFDM - antenna port 1	OFDM - antenna port 2	-/-
Lower Band Edge	> 20 dB	> 20 dB	-/-
Upper Band Edge	> 20 dB	> 20 dB	-/-
Measurement uncertainty	± 1.5 dB		

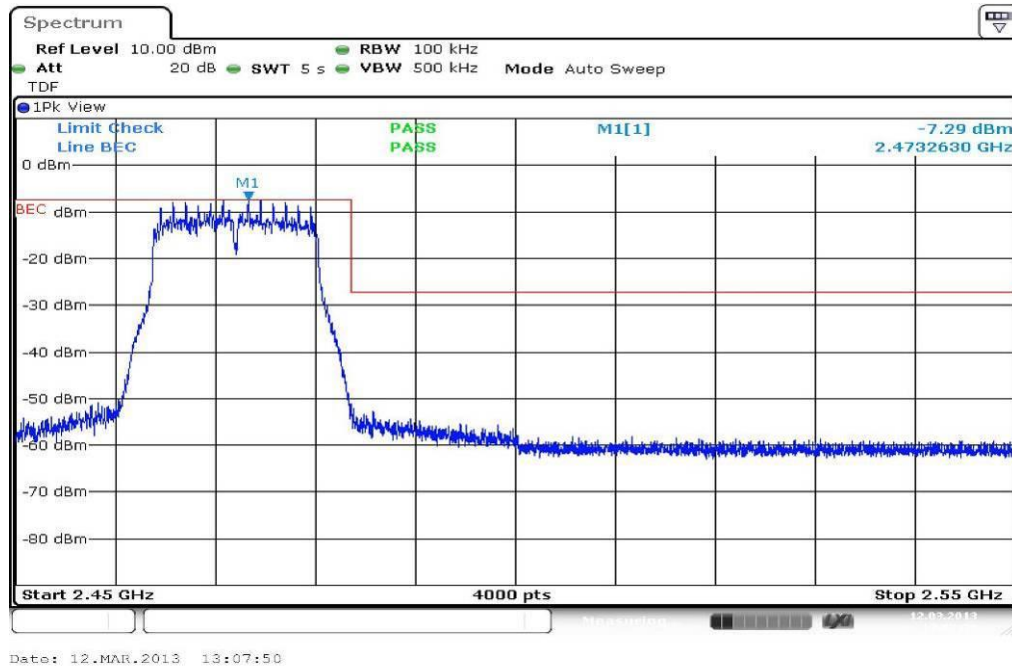
**Result: Passed**

**Plots: OFDM, antenna port 1**

**Plot 1: TX mode, lower band edge**

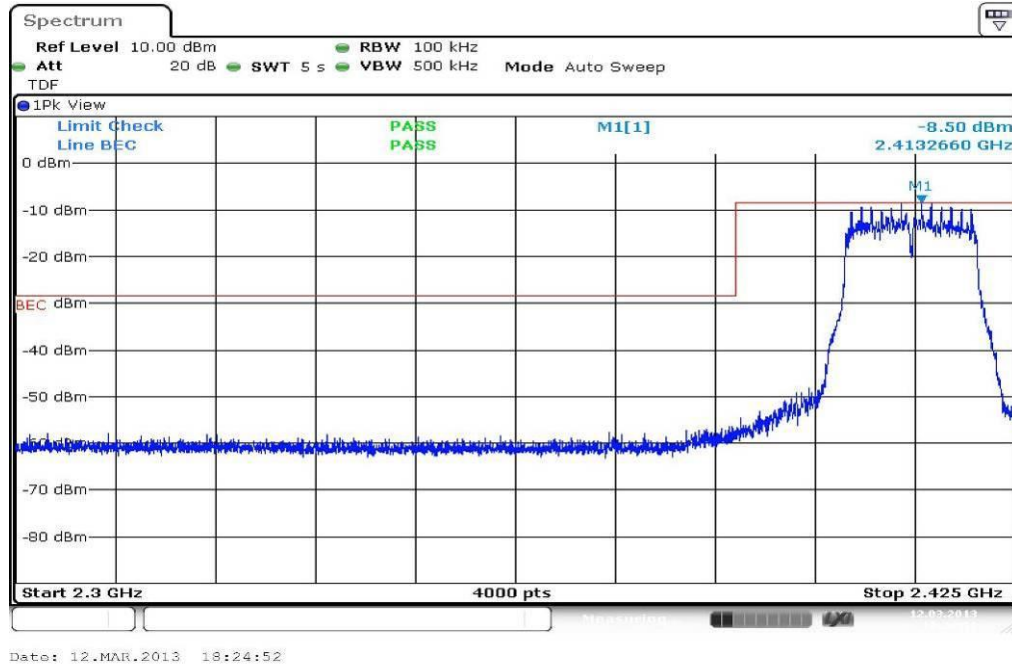


**Plot 2: TX mode, upper band edge**

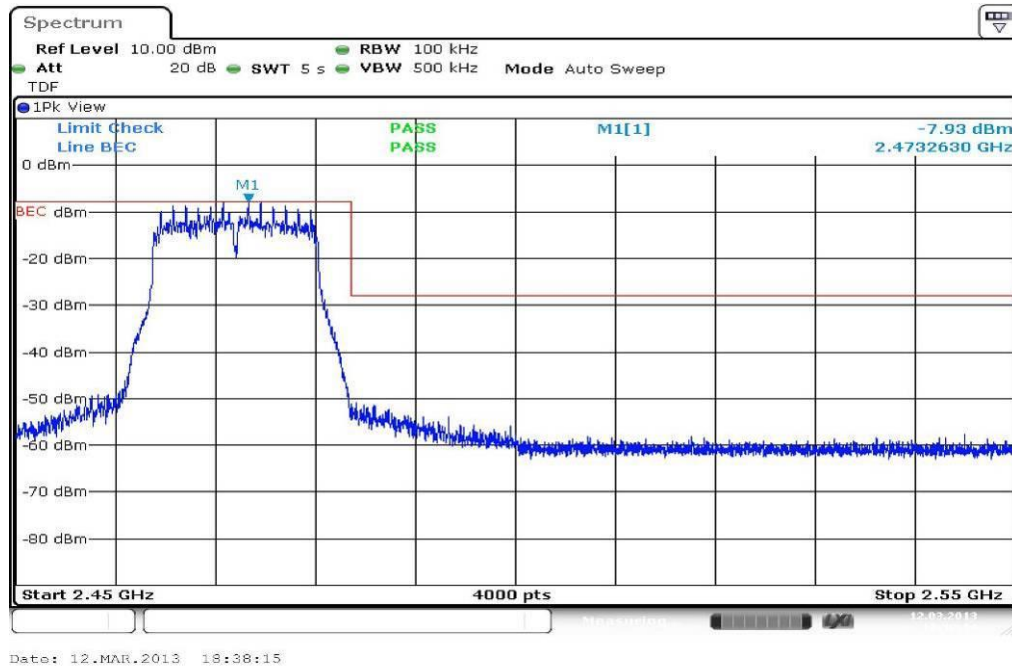


**Plots: OFDM, antenna port 2**

**Plot 1: TX mode, lower band edge**



**Plot 2: TX mode, upper band edge**



## 9.7 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 13 for the upper restricted band. The measurement is repeated for all modulations. Measurement distance is 3 m.

### 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 dB $\mu$ V/m AVG	

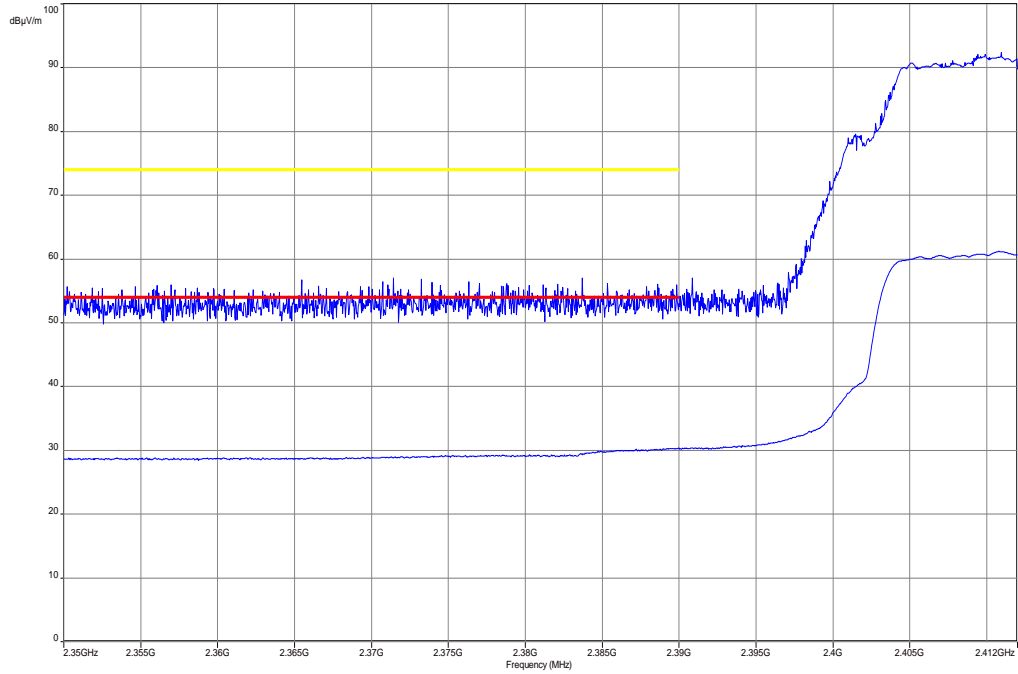
### Results:

Scenario Modulation	Band Edge Compliance Conducted [dB]		
	OFDM - antenna port 1	OFDM - antenna port 2	-/-
Lower Band Edge	> 15 dB (Peak) > 15 dB (AVG)	> 15 dB (Peak) > 15 dB (AVG)	-/-
Upper Band Edge	> 15 dB (Peak) > 15 dB (AVG)	> 15 dB (Peak) > 15 dB (AVG)	-/-
Measurement uncertainty	± 3 dB		

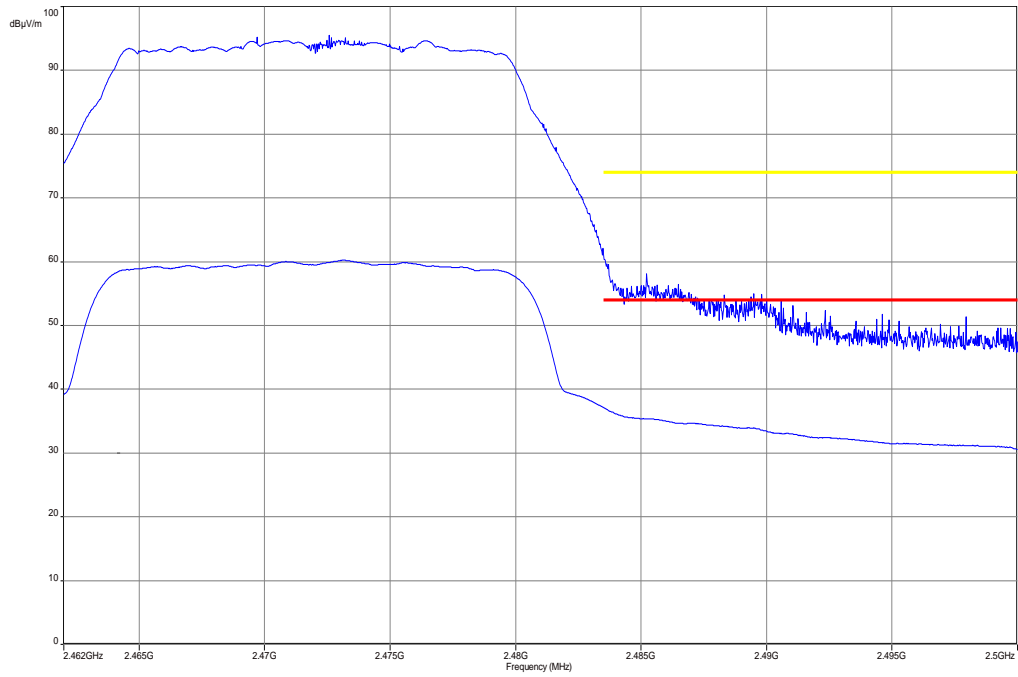
**Result: Passed**

**Plots: OFDM, antenna port 1, peak / average**

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



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



## 9.8 TX spurious emissions conducted

### Description:

Measurement of the conducted spurious emissions in transmit mode. The measurement is performed at channel 1, 7 and 13. The measurement is repeated for all modulations.

### Measurement:

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

### Limits:

FCC	IC
TX Spurious Emissions 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>	

**Plots: OFDM, antenna port 1**

TX Spurious Emissions Conducted					
OFDM antenna port 1					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2412		-7.60	30 dBm		Operating frequency
No spurious emissions detected.			-20 dBc (peak)		complies
			-30 dBc (average)		
2442		-7.31	30 dBm		Operating frequency
No spurious emissions detected.			-20 dBc (peak)		complies
			-30 dBc (average)		
2472		-7.30	30 dBm		Operating frequency
No spurious emissions detected.			-20 dBc (peak)		complies
			-30 dBc (average)		
Measurement uncertainty			± 3 dB		

**Result: Passed**

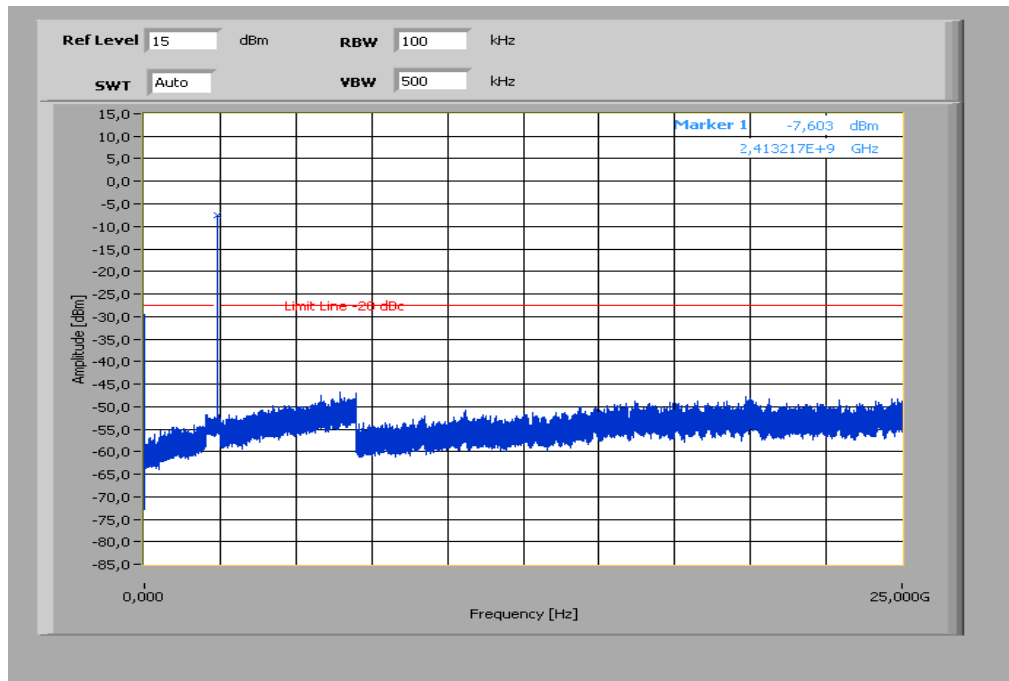
**Plots: OFDM, antenna port 2**

TX Spurious Emissions Conducted					
OFDM antenna port 2					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2412		-8.44	30 dBm		Operating frequency
No spurious emissions detected.			-20 dBc (peak)		complies
			-30 dBc (average)		
2442		-8.02	30 dBm		Operating frequency
No spurious emissions detected.			-20 dBc (peak)		complies
			-30 dBc (average)		
2472		-8.02	30 dBm		Operating frequency
No spurious emissions detected.			-20 dBc (peak)		complies
			-30 dBc (average)		
Measurement uncertainty			± 3 dB		

**Result: Passed**

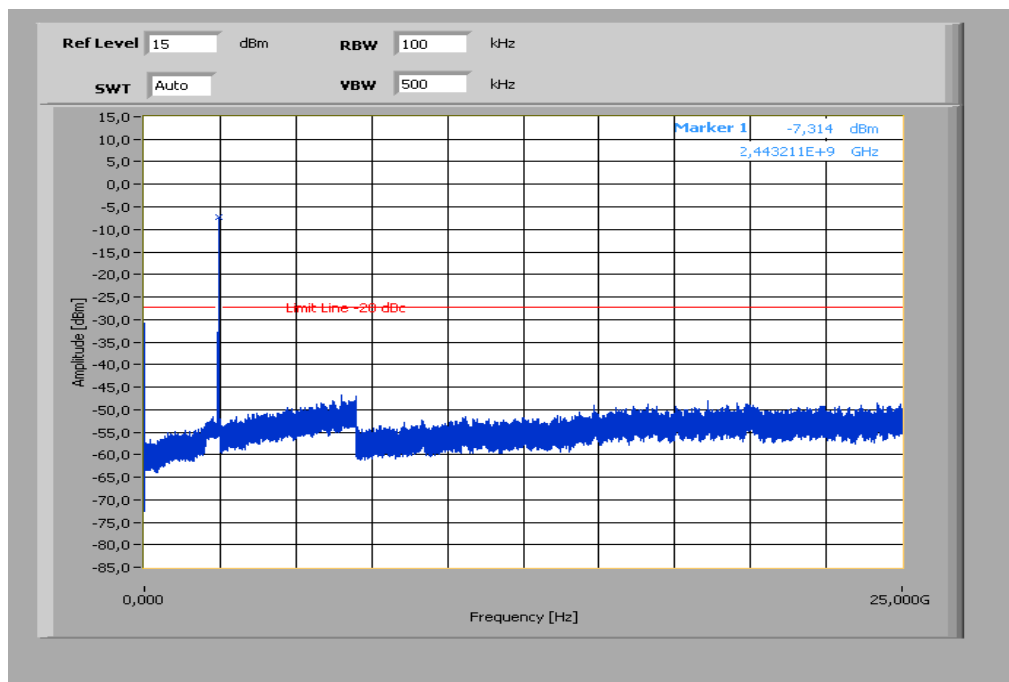
**Plots: OFDM, antenna port 1**

**Plot 1: TX mode, lowest channel, up to 25 GHz**



The peak at the beginning of the plot is the LO from the SA.

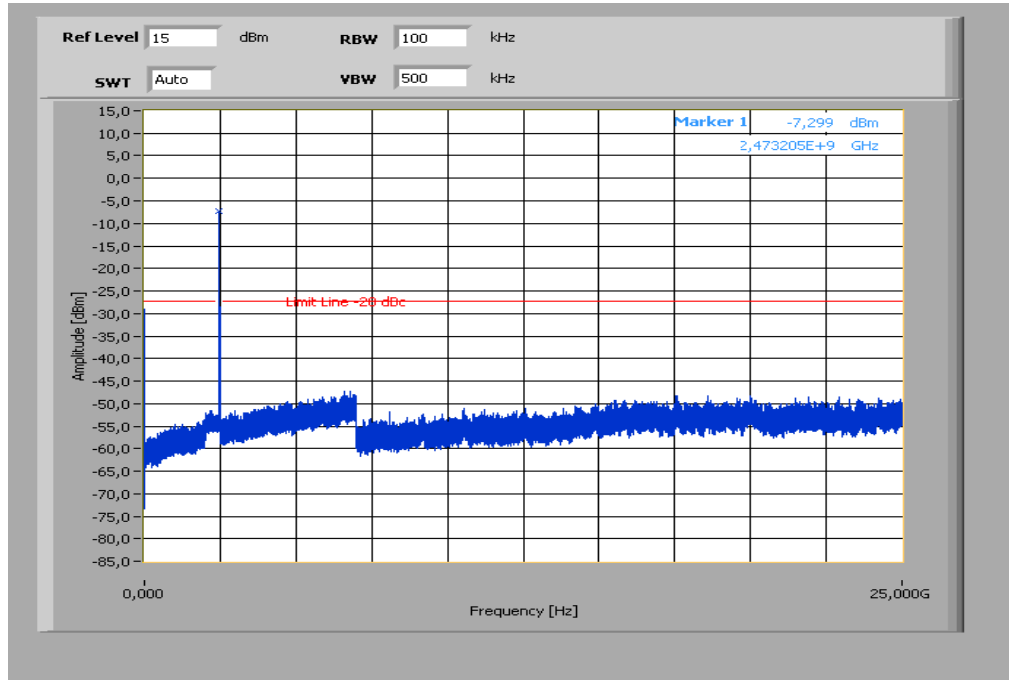
**Plot 2: TX mode, middle channel, up to 25 GHz**



The peak at the beginning of the plot is the LO from the SA.



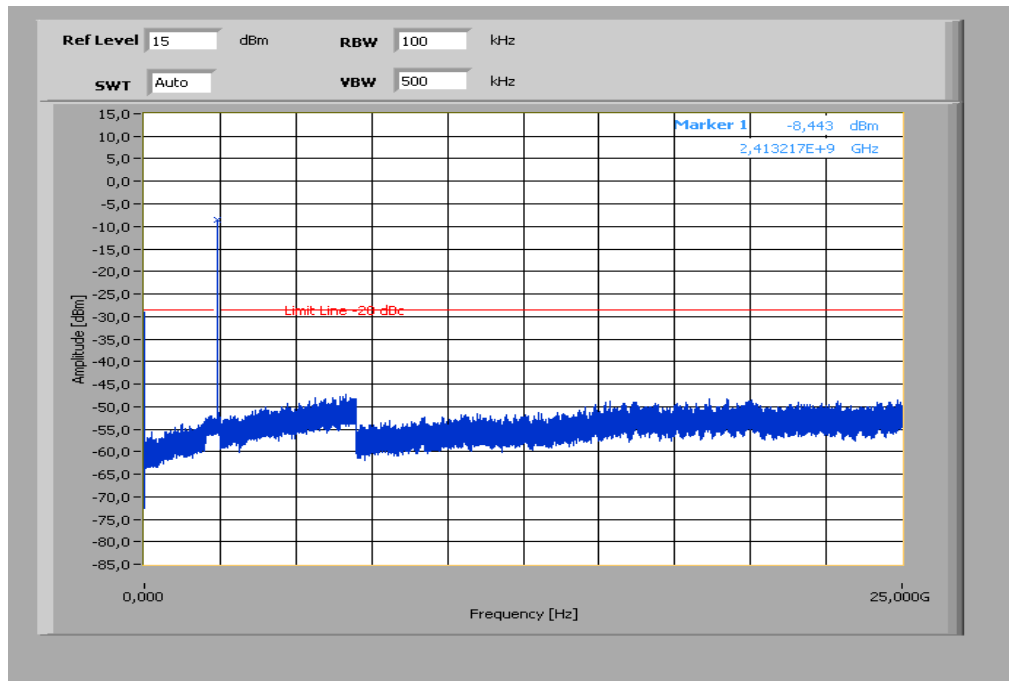
Plot 3: TX mode, highest channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

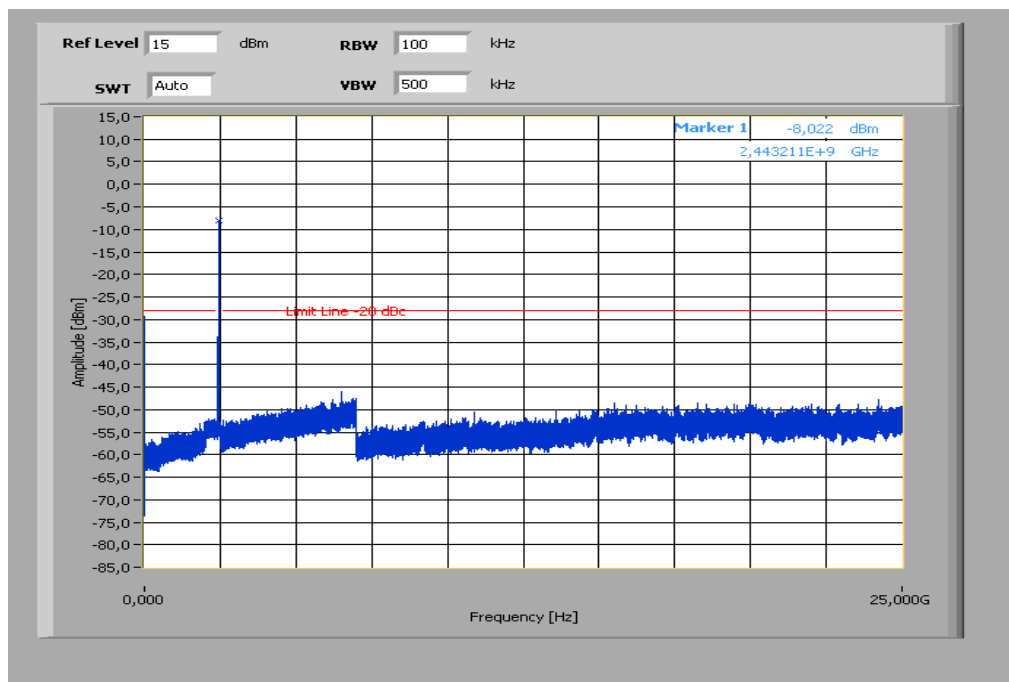
**Plots: OFDM, antenna port 2**

**Plot 1: TX mode, lowest channel, up to 25 GHz**



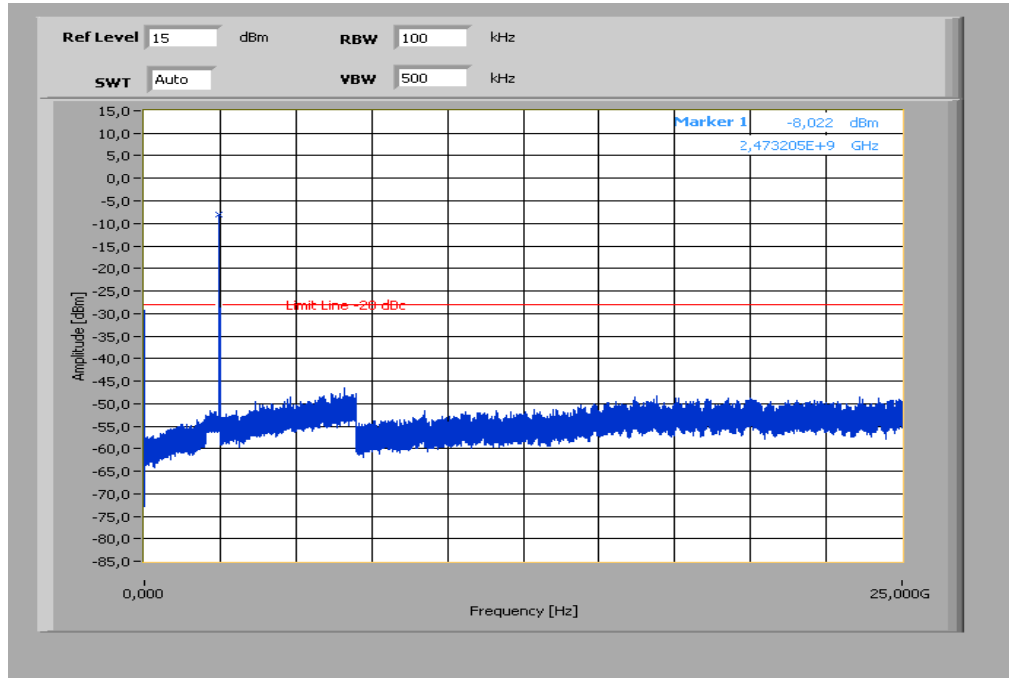
The peak at the beginning of the plot is the LO from the SA.

**Plot 2: TX mode, middle channel, up to 25 GHz**



The peak at the beginning of the plot is the LO from the SA.

**Plot 3:** TX mode, highest channel, up to 25 GHz



The peak at the beginning of the plot is the LO from the SA.

## 9.9 TX spurious emissions radiated

### Description:

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at channel 1, 7 and 13. 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"/> OFDM

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		
<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 §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).</p>		
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: OFDM, antenna port 1**

TX Spurious Emissions Radiated [dBµV/m]								
Antenna port 1								
2412 MHz			2442 MHz			2472 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 between 1 GHz and 12.75 GHz are more than 10 dB below the average limit.			All detected peak emissions between 1 GHz and 12.75 GHz are more than 10 dB below the average limit.			All detected peak emissions between 1 GHz and 12.75 GHz are more than 10 dB below the average limit.		
For emissions above 12.75 GHz, please take a look at the plots.			For emissions above 12.75 GHz, please take a look at the plots.			For emissions above 12.75 GHz, please take a look at the plots.		
Measurement uncertainty			± 3 dB					

**Result: Passed**

**Results: OFDM, antenna port 2**

TX Spurious Emissions Radiated [dBµV/m]								
Antenna port 2								
-/-			2442 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.			-/-		
-/-			All detected peak emissions between 1 GHz and 12.75 GHz are more than 10 dB below the average limit.			-/-		
-/-			For emissions above 12.75 GHz, please take a look at the plots.			-/-		
Measurement uncertainty			± 3 dB					

**Result: Passed**

**Note:**

The antenna port 1 shows the same behaviour as antenna port 2 and is measured to see the fulfilment according to the FCC Part 15.247 standard.

**Plots: OFDM, antenna port 1**

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

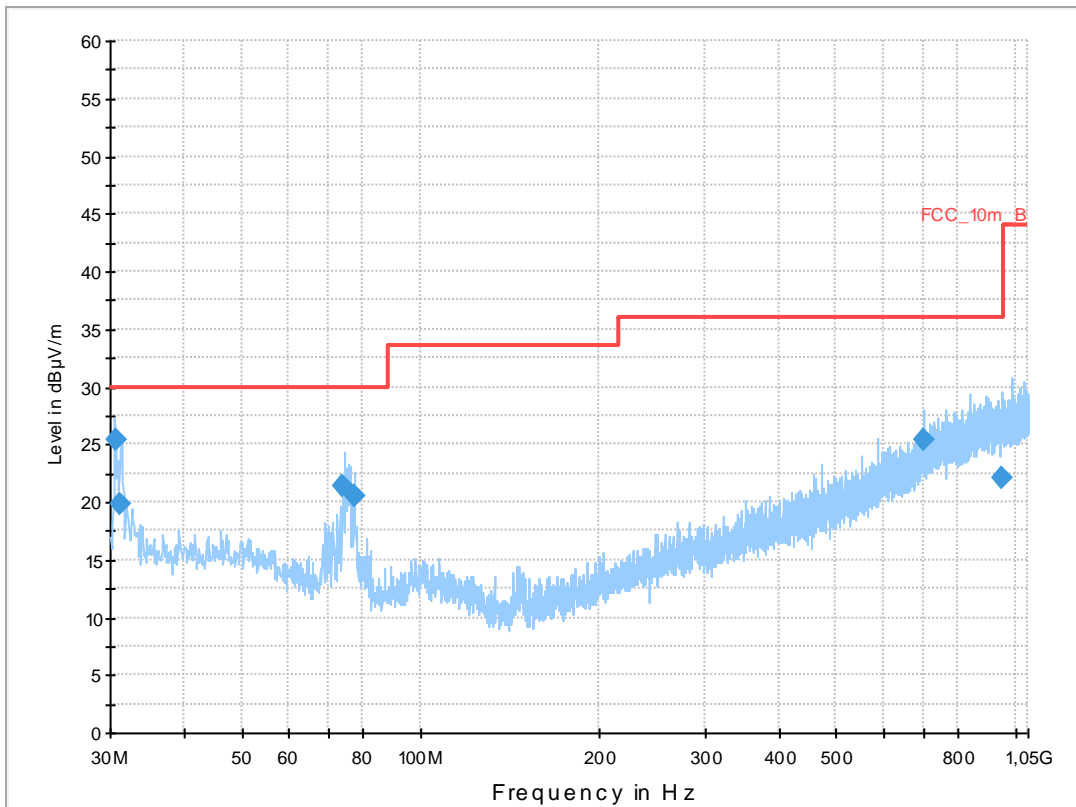
**Common Information**

EUT: ADN-W AM FM02  
 Serial Number: 1462100049  
 Test Description: FCC part 15 class B @ 10m  
 Operating Conditions: TX 2412 MHz | Ant. 1  
 Operator Name: Hennemann  
 Comment: powered by main unit

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

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

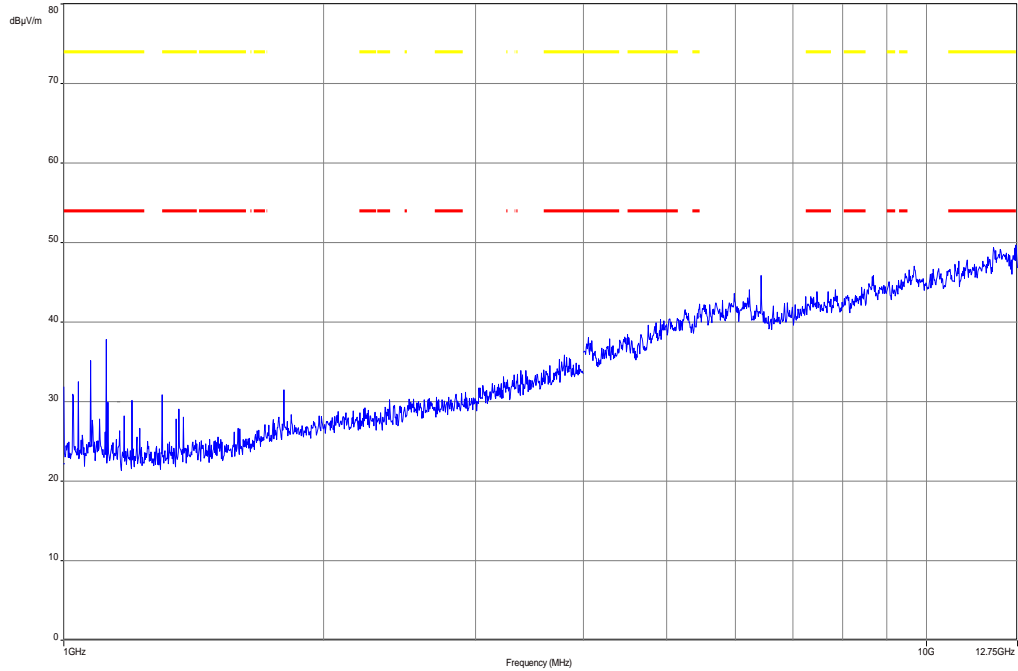
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



**Final Result 1**

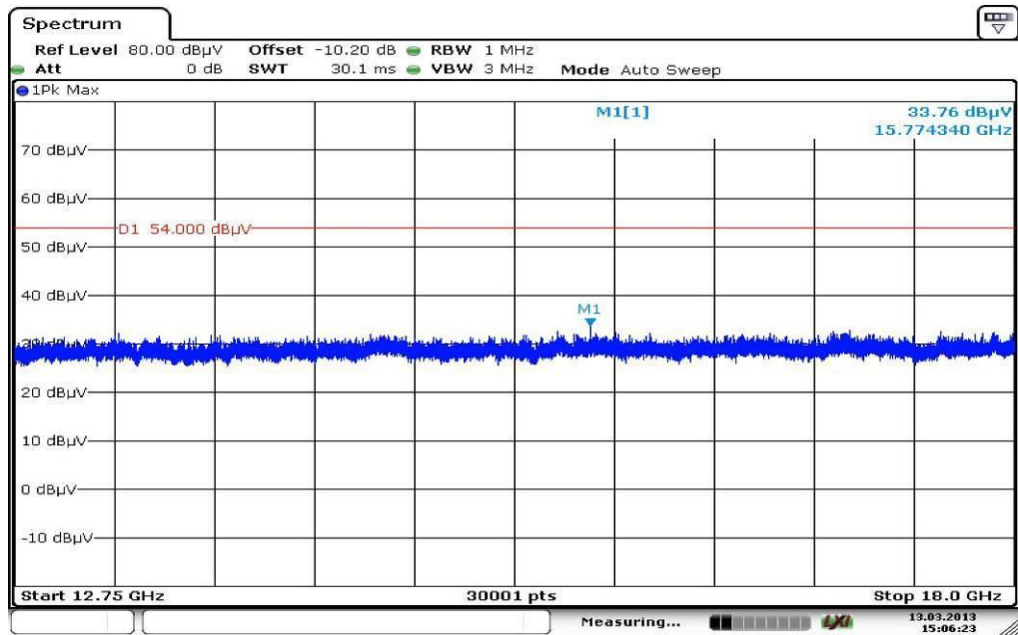
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
30.613552	25.4	1000.0	120.000	170.0	V	90.0	12.6	4.6	30.0	
31.201200	19.8	1000.0	120.000	120.0	V	-10.0	12.6	10.2	30.0	
73.946400	21.4	1000.0	120.000	170.0	V	90.0	9.2	8.6	30.0	
77.208000	20.5	1000.0	120.000	161.0	V	-10.0	9.1	9.5	30.0	
699.993450	25.4	1000.0	120.000	170.0	H	280.0	22.5	10.6	36.0	
951.890250	22.1	1000.0	120.000	160.0	H	100.0	25.4	13.9	36.0	

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

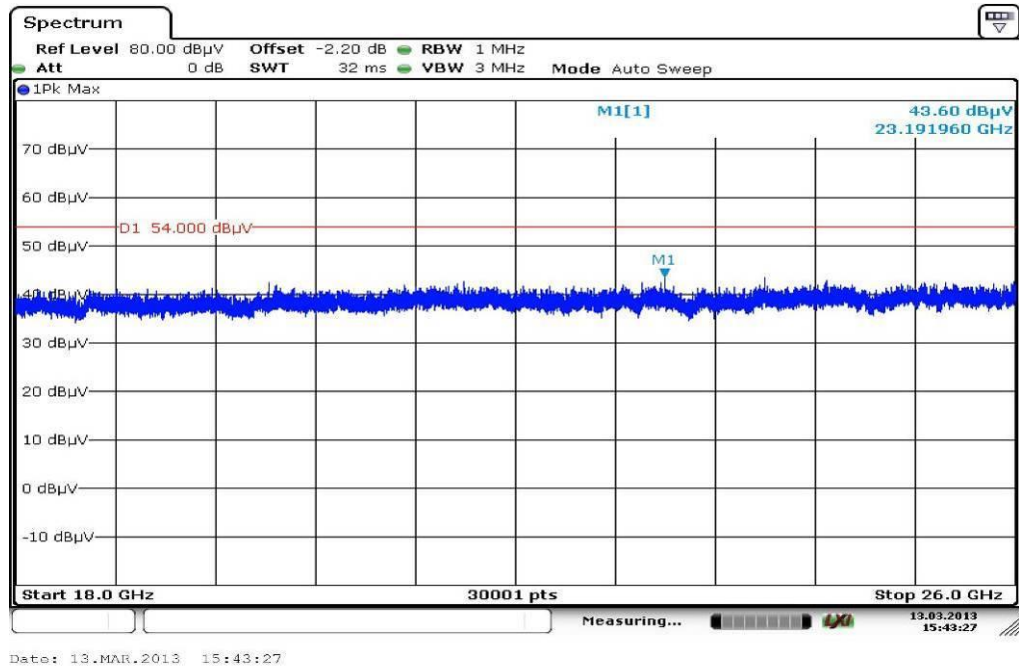


The carrier signal is notched with a 2.4 GHz band rejection filter.

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



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





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

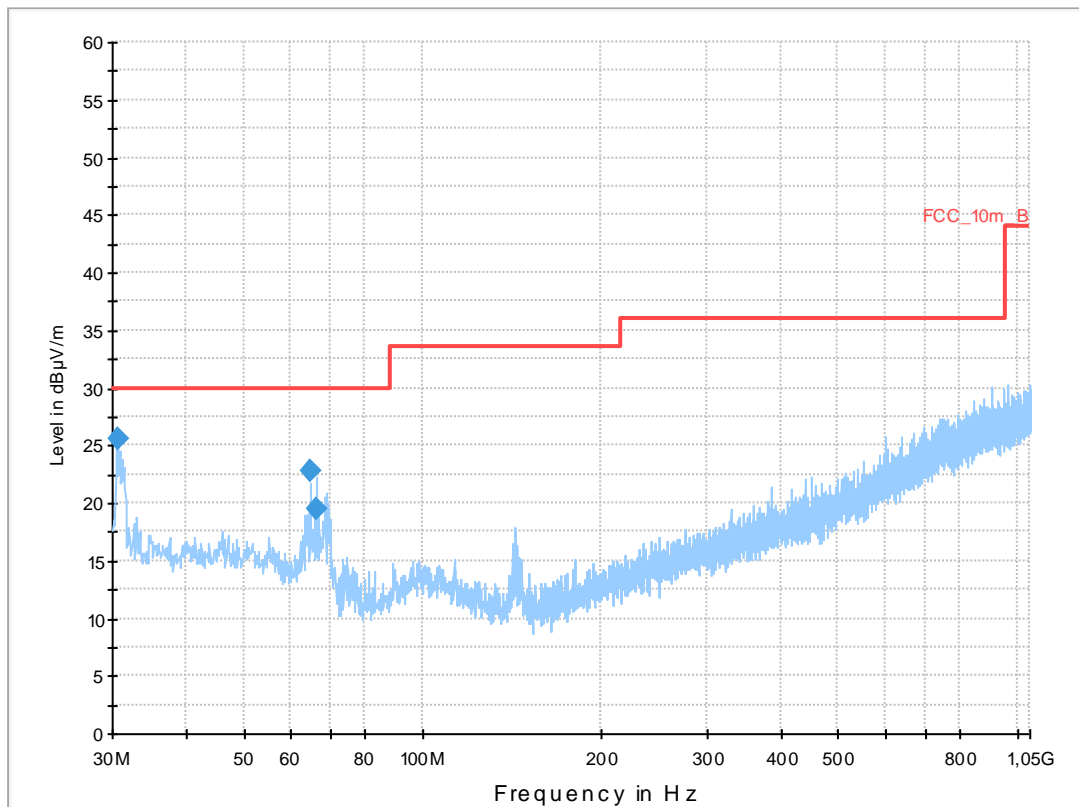
### Common Information

EUT: ADN-W AM FM02  
 Serial Number: 1462100049  
 Test Description: FCC part 15 class B @ 10m  
 Operating Conditions: TX 2442 MHz | Ant. 1  
 Operator Name: Hennemann  
 Comment: powered by main unit

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

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESCI 3]  
 Level Unit: dB $\mu$ V/m

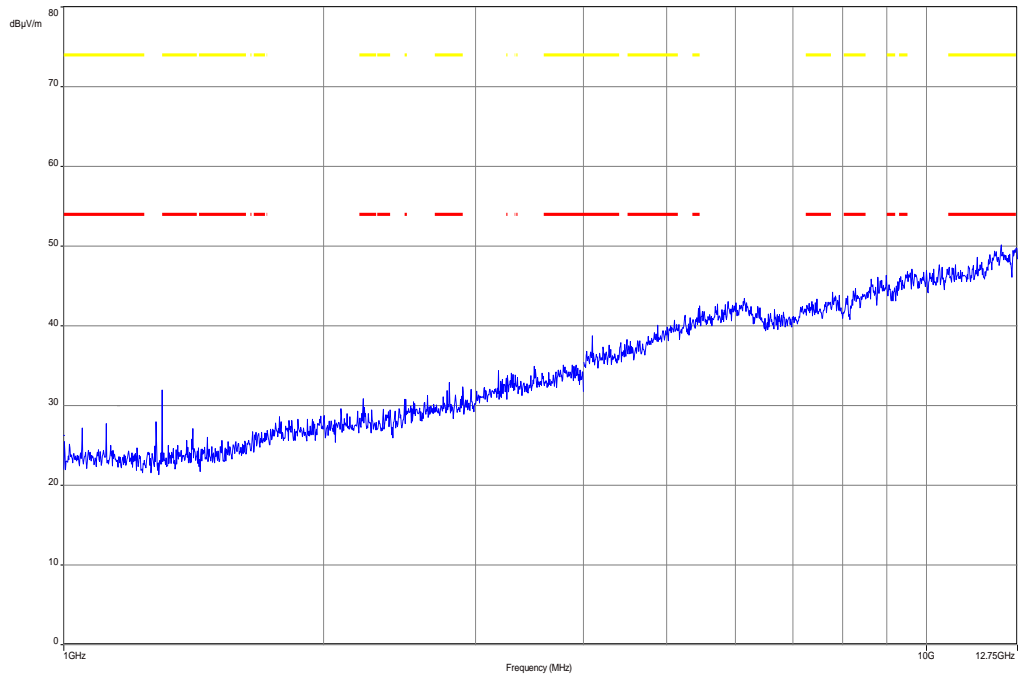
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



### Final Result 1

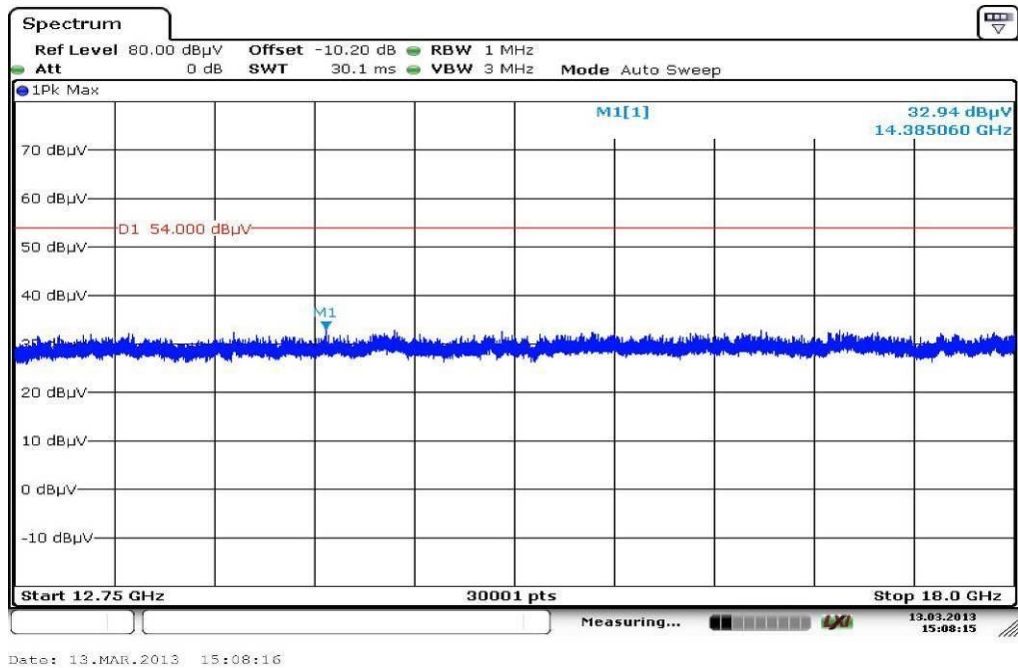
Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)	Comment
30.628815	25.6	1000.0	120.000	105.0	V	100.0	12.6	4.4	30.0	
64.792350	22.8	1000.0	120.000	170.0	V	2.0	10.5	7.2	30.0	
66.233250	19.4	1000.0	120.000	170.0	V	268.0	10.1	10.6	30.0	

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

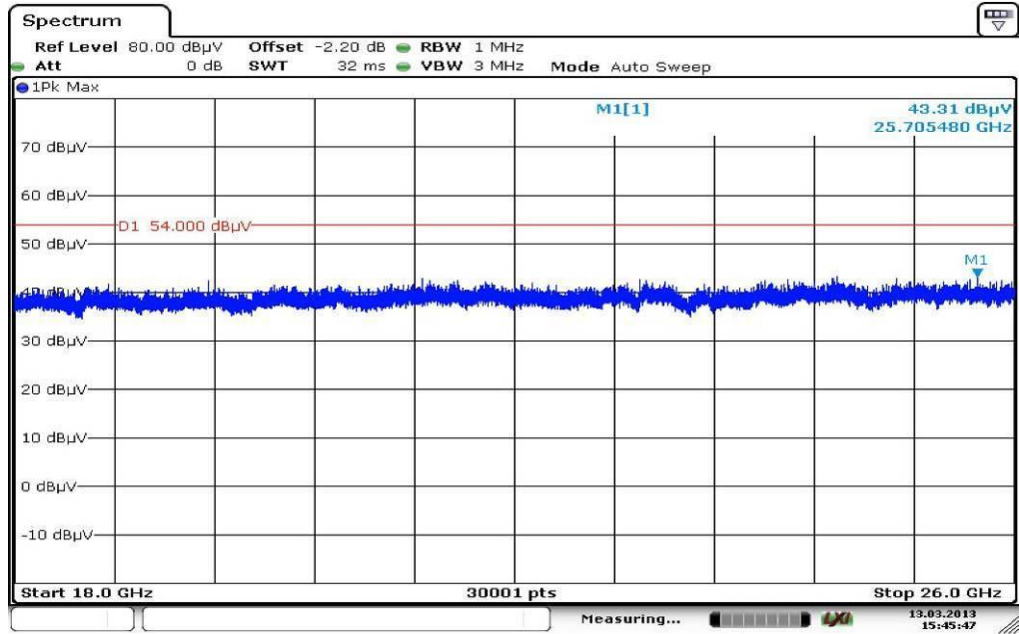


The carrier signal is notched with a 2.4 GHz band rejection filter.

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



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



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

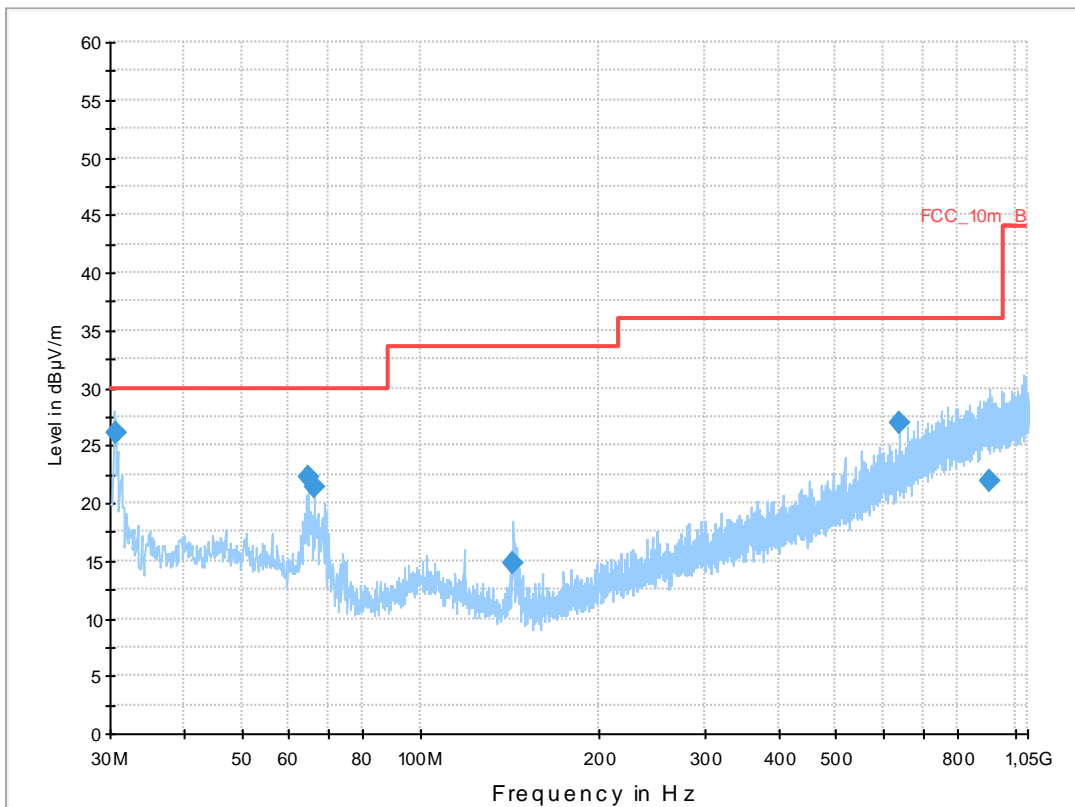
### Common Information

EUT: ADN-W AM FM02  
 Serial Number: 1462100049  
 Test Description: FCC part 15 class B @ 10m  
 Operating Conditions: TX 2472 MHz | Ant. 1  
 Operator Name: Hennemann  
 Comment: powered by main unit

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

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

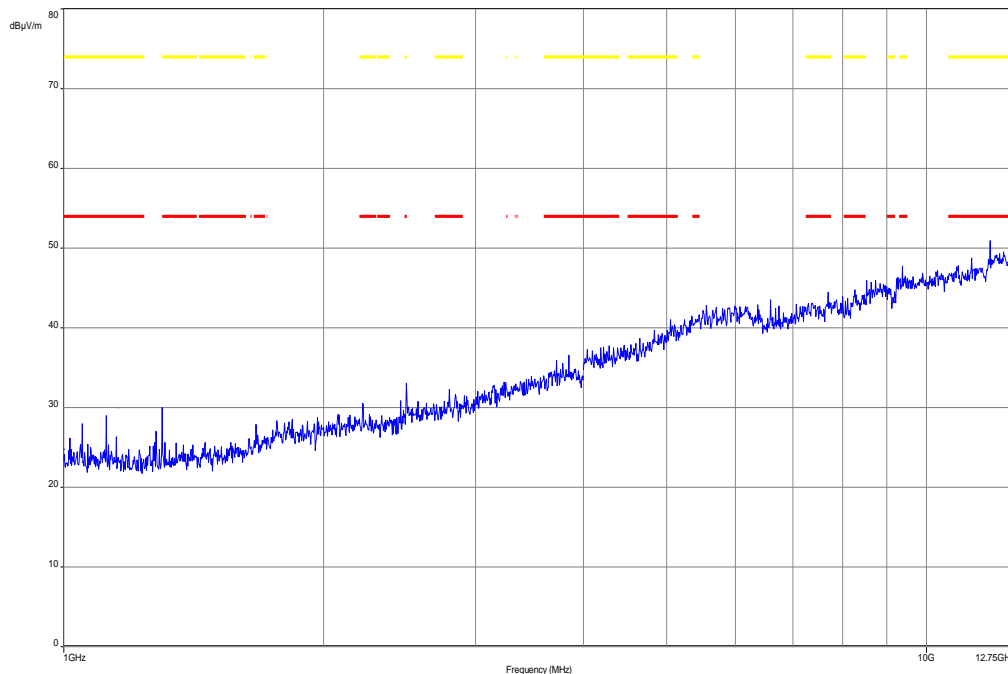
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



### Final Result 1

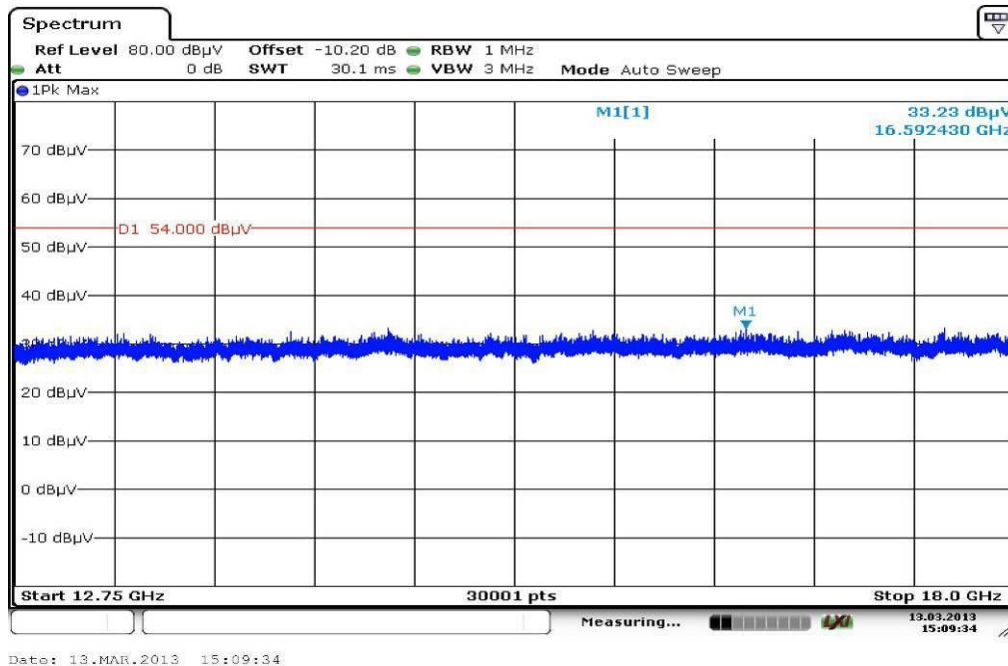
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
30.603146	26.0	1000.0	120.000	143.0	V	100.0	12.6	4.0	30.0	
64.813500	22.2	1000.0	120.000	170.0	V	85.0	10.5	7.8	30.0	
66.273450	21.4	1000.0	120.000	170.0	V	190.0	10.1	8.6	30.0	
143.289600	14.9	1000.0	120.000	104.0	V	0.0	8.7	18.6	33.5	
640.008600	26.9	1000.0	120.000	170.0	H	272.0	21.0	9.1	36.0	
908.769450	21.9	1000.0	120.000	143.0	V	85.0	25.2	14.1	36.0	

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

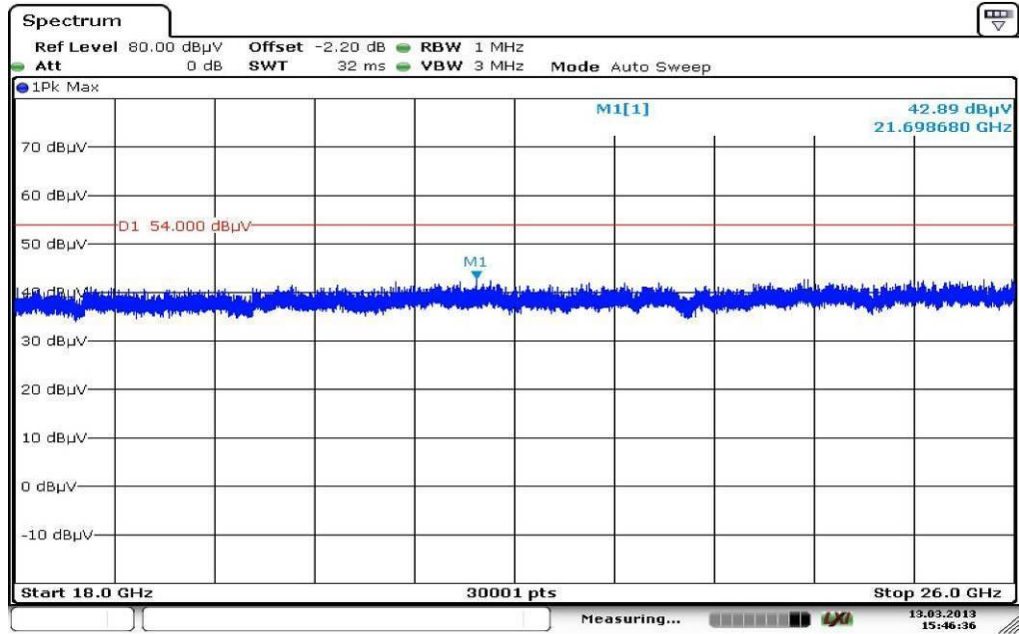


The carrier signal is notched with a 2.4 GHz band rejection filter.

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



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



**Plots: OFDM, antenna port 2**

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

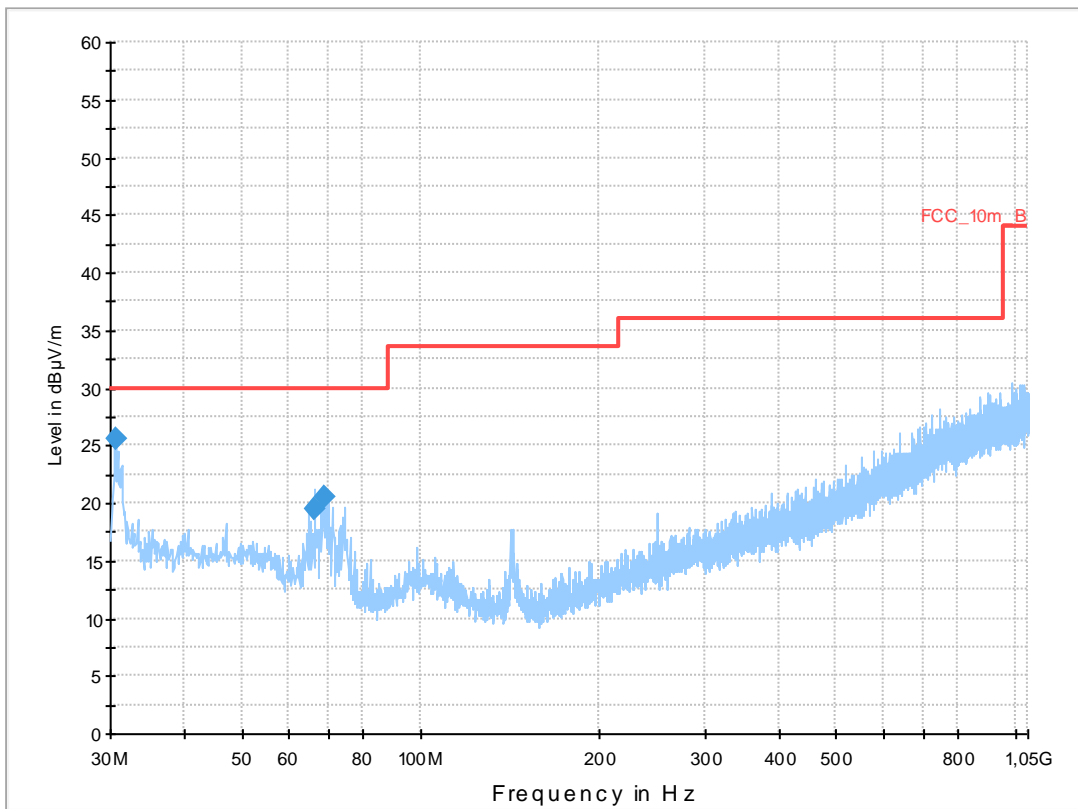
**Common Information**

EUT: ADN-W AM FM02  
 Serial Number: 1462100049  
 Test Description: FCC part 15 class B @ 10m  
 Operating Conditions: TX 2442 MHz | Ant. 2  
 Operator Name: Hennemann  
 Comment: powered by main unit

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

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

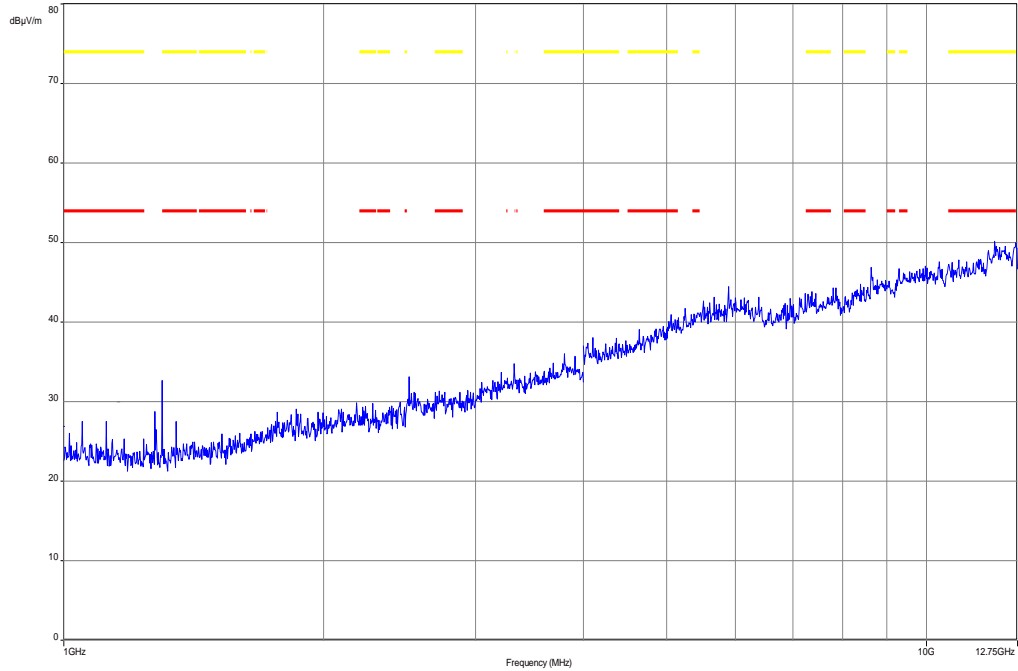
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



**Final Result 1**

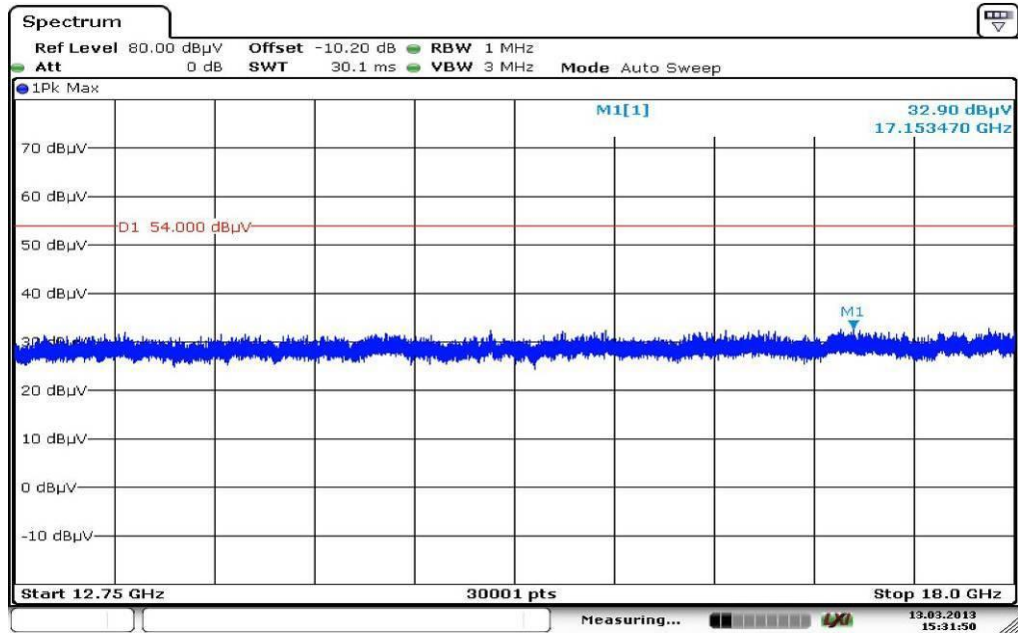
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
30.606892	25.6	1000.0	120.000	155.0	V	90.0	12.6	4.4	30.0	
66.256200	19.5	1000.0	120.000	170.0	V	280.0	10.1	10.5	30.0	
68.994150	20.6	1000.0	120.000	170.0	V	170.0	9.5	9.4	30.0	

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



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

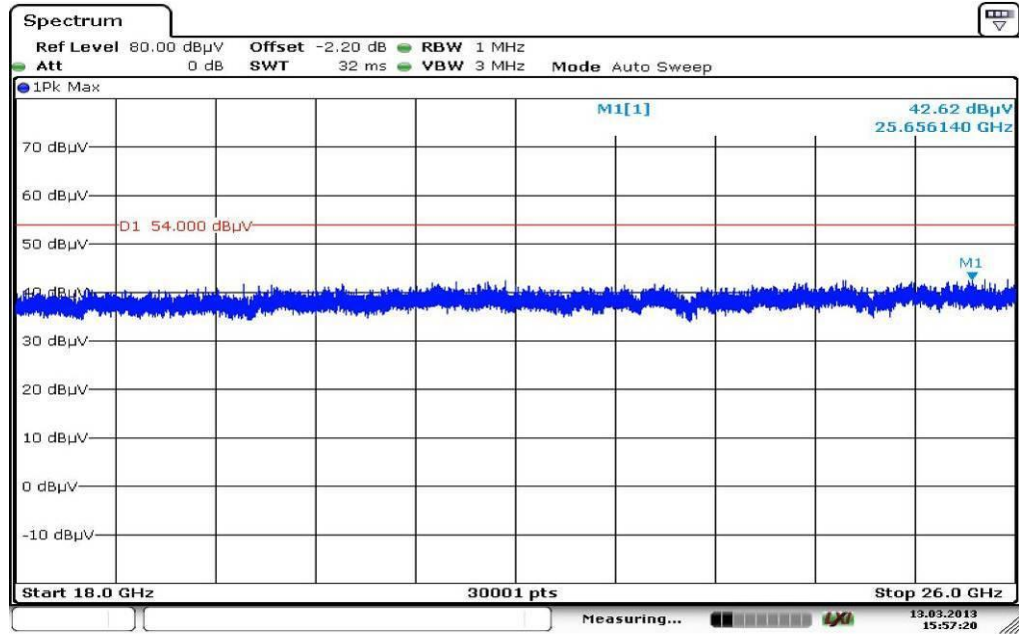
**Plot 3:** Middle channel, 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 13.MAR.2013 15:31:49



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



Date: 13.MAR.2013 15:57:21

## 9.10 Unintentional radiator 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	
Unintentional radiator 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:

Unintentional radiator 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.		
All detected peak emissions between 1 GHz and 12.75 GHz are more than 10 dB below the average limit.		
For emissions above 12.75 GHz, please take a look at the plots.		
Measurement uncertainty	± 3 dB	

**Result: Passed.**

**Plots:**

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

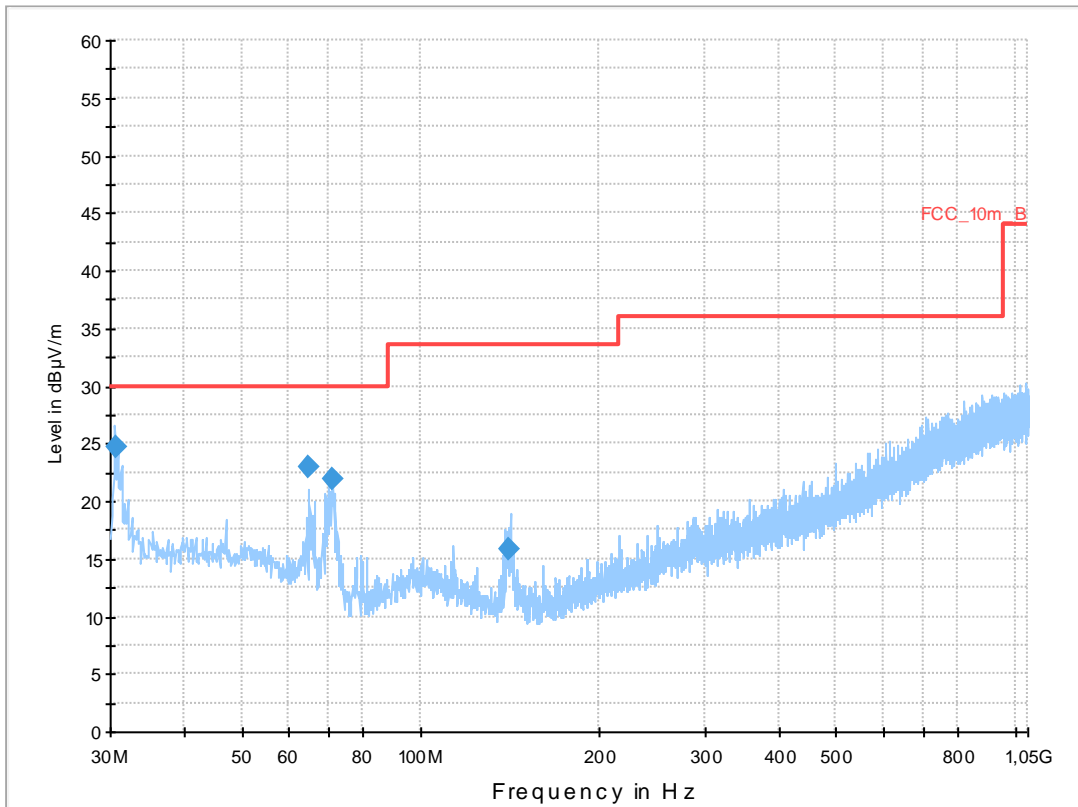
**Common Information**

EUT: ADN-W AM FM02  
 Serial Number: 1462100048  
 Test Description: FCC part 15 class B @ 10m  
 Operating Conditions: RX | Ant. 1  
 Operator Name: Hennemann  
 Comment: powered by main unit

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

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

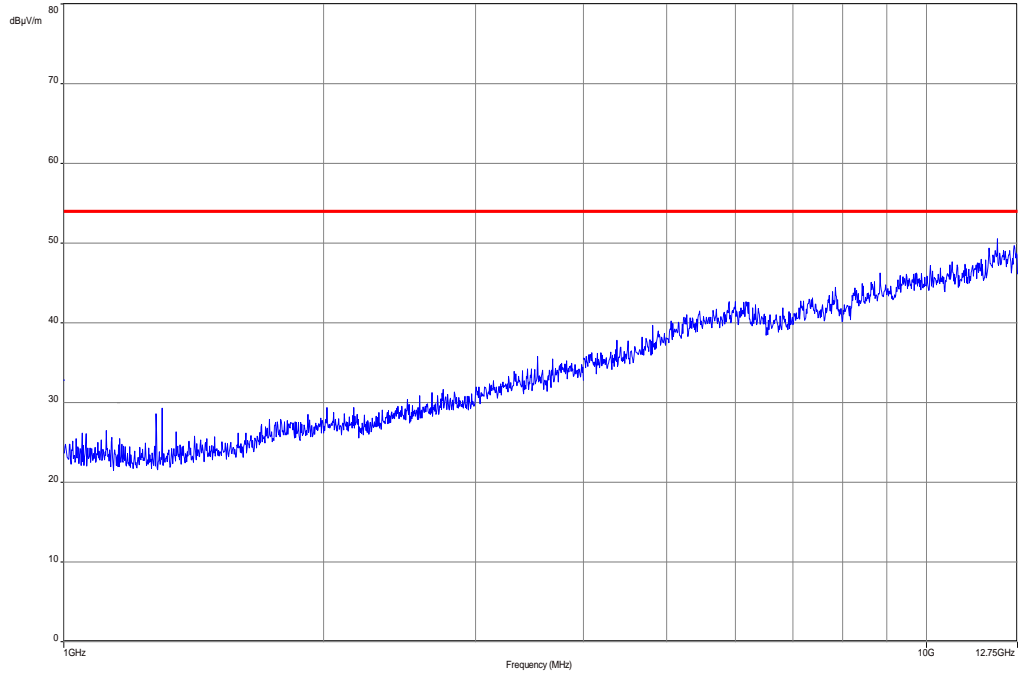
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



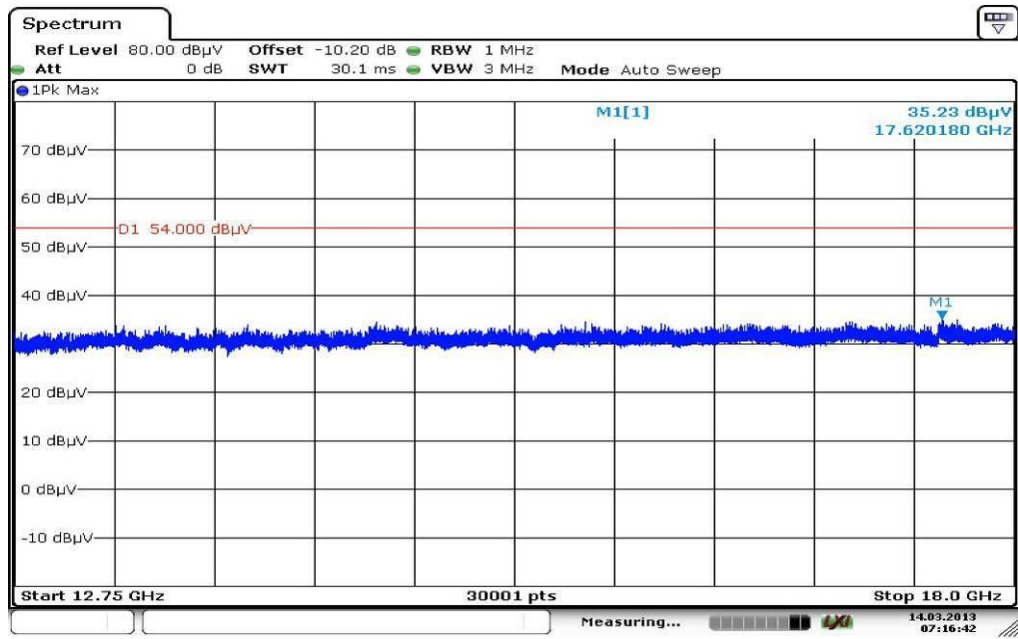
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
30.631590	24.7	1000.0	120.000	98.0	V	88.0	12.6	5.3	30.0	
64.795950	22.9	1000.0	120.000	163.0	V	88.0	10.5	7.1	30.0	
70.813500	21.9	1000.0	120.000	152.0	V	260.0	9.3	8.1	30.0	
141.150900	15.8	1000.0	120.000	111.0	V	261.0	8.7	17.7	33.5	

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

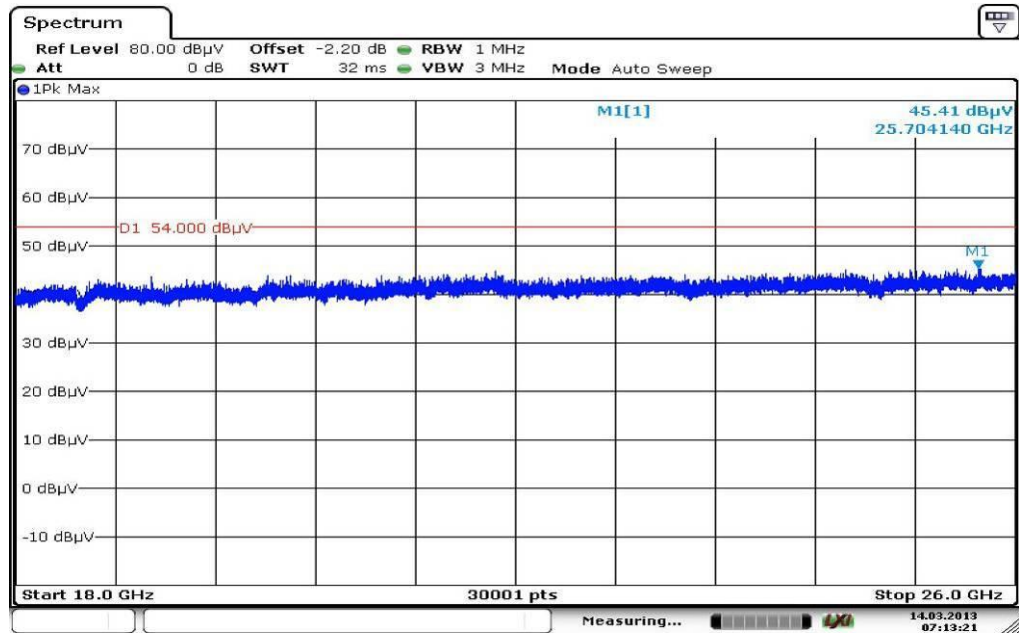


Plot 3: 12.75 GHz to 18 GHz, vertical & horizontal polarization



Date: 14.MAR.2013 07:16:42

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



Date: 14.MAR.2013 07:13:22

### 9.11 Spurious emissions radiated < 30 MHz

**Description:**

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 7. This measurement is representative for all channels and modes. If critical peaks are found channel 1 and channel 13 will be measured too. The measurement is performed with the data rate producing the highest output power. The limits are recalculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

**Measurement:**

Measurement parameter	
Detector:	Peak / Quasi Peak
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
Spurious Emissions Radiated < 30 MHz		
Frequency (MHz)	Field Strength (dBµV/m)	Measurement distance
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30

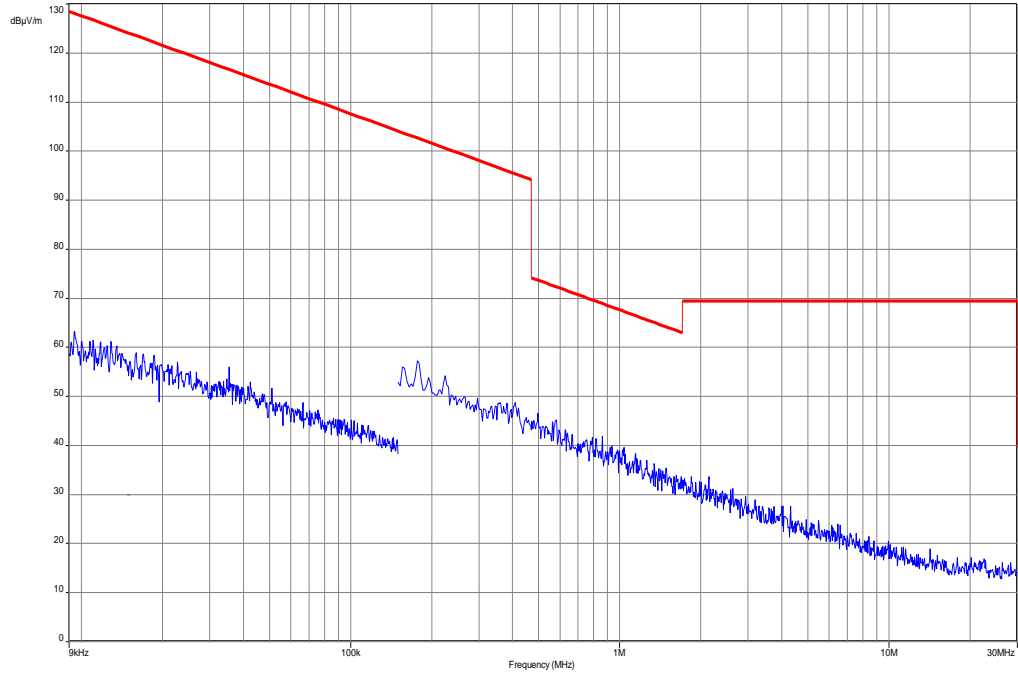
**Results:**

Spurious Emissions Radiated < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
No peaks detected.		
Measurement uncertainty	± 3 dB	

**Result: Passed**

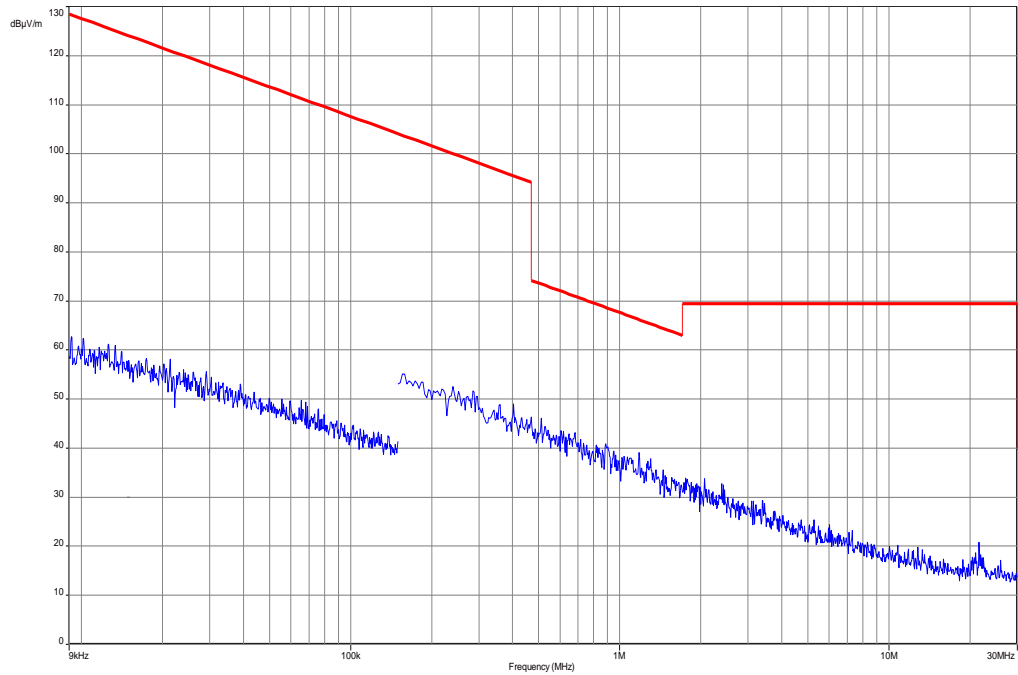
**Plots: TX mode**

**Plot 1: 9 kHz to 30 MHz**



**Plots: RX / Idle – mode**

**Plot 1: 9 kHz to 30 MHz**



## 9.12 Spurious emissions conducted < 30 MHz

### Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 7. This measurement is repeated for DSSS and OFDM modulation. If critical peaks are found channel 1 and channel 13 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	
Spurious Emissions Conducted < 30 MHz			
Frequency (MHz)	Quasi-Peak (dB $\mu$ V/m)	Average (dB $\mu$ V/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:

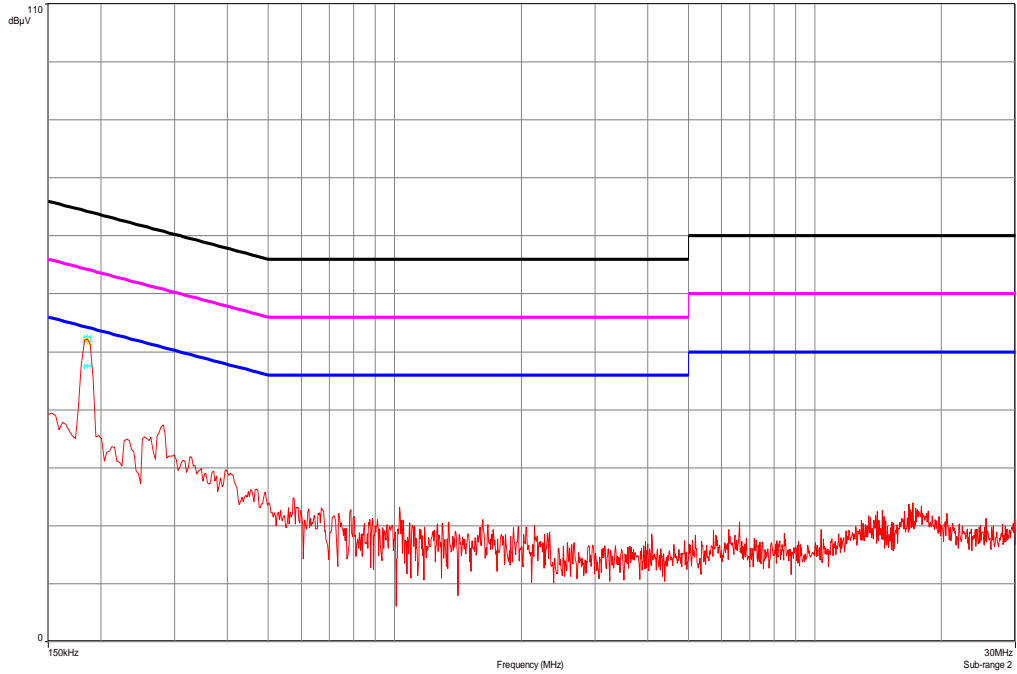
Spurious Emissions Conducted < 30 MHz [dB $\mu$ V/m]		
F [MHz]	Detector	Level [dB $\mu$ V/m]
All detected peaks are below the limit. Please take a look at zoomed plots.		
Measurement uncertainty	± 3 dB	

**Result: Passed**

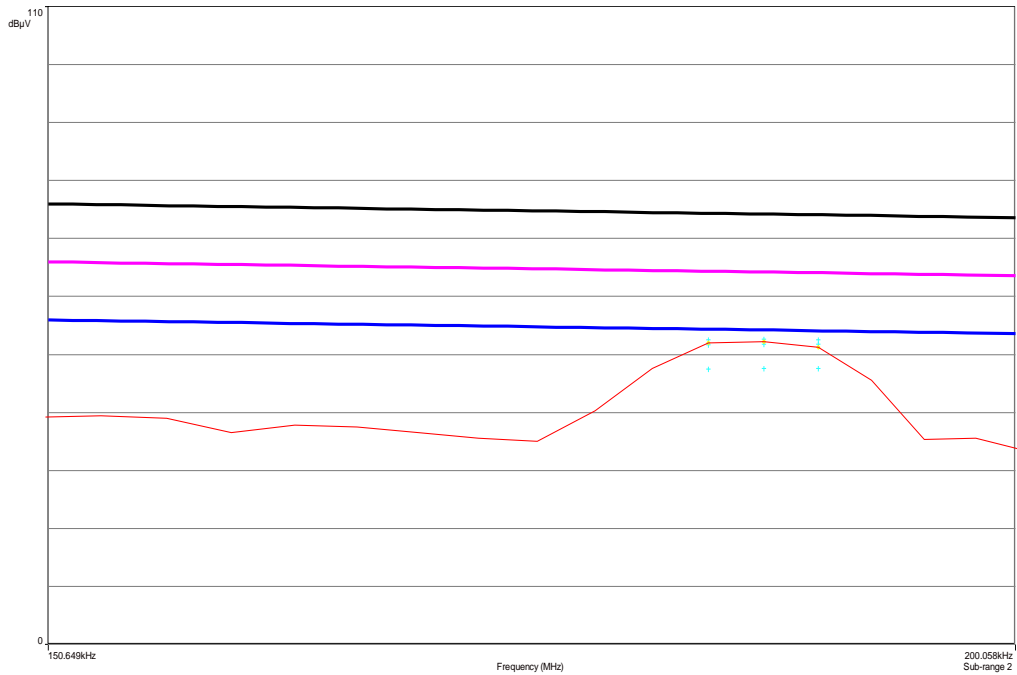


**Plots:**

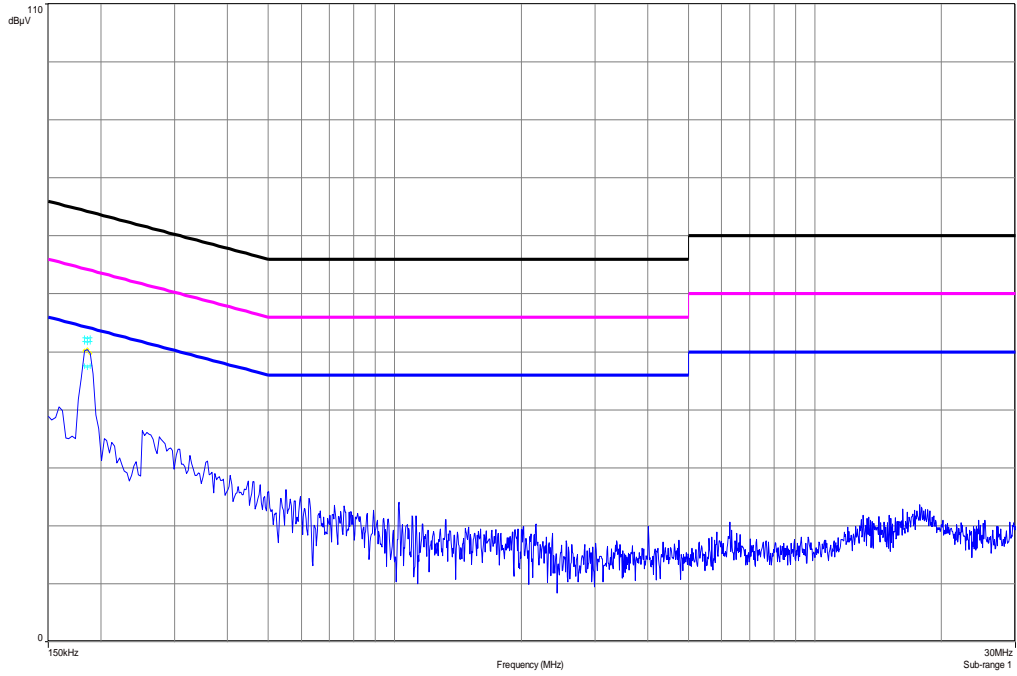
**Plot 1:** TX mode, 150 kHz to 30 MHz, phase line



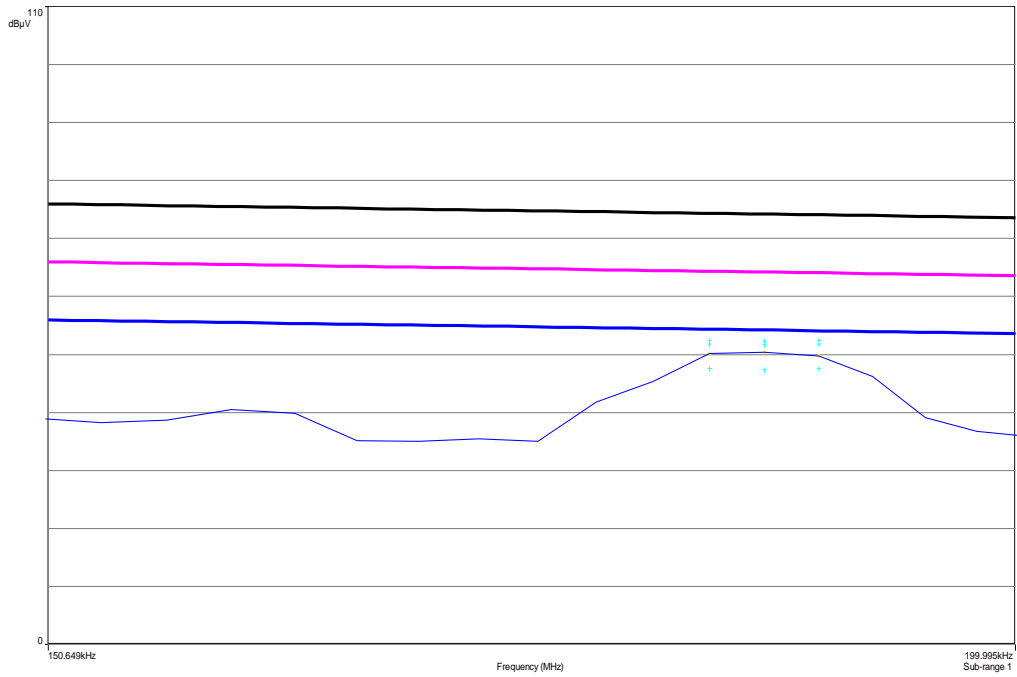
**Plot 2:** TX mode, 150 kHz to 30 MHz, phase line, zoomed



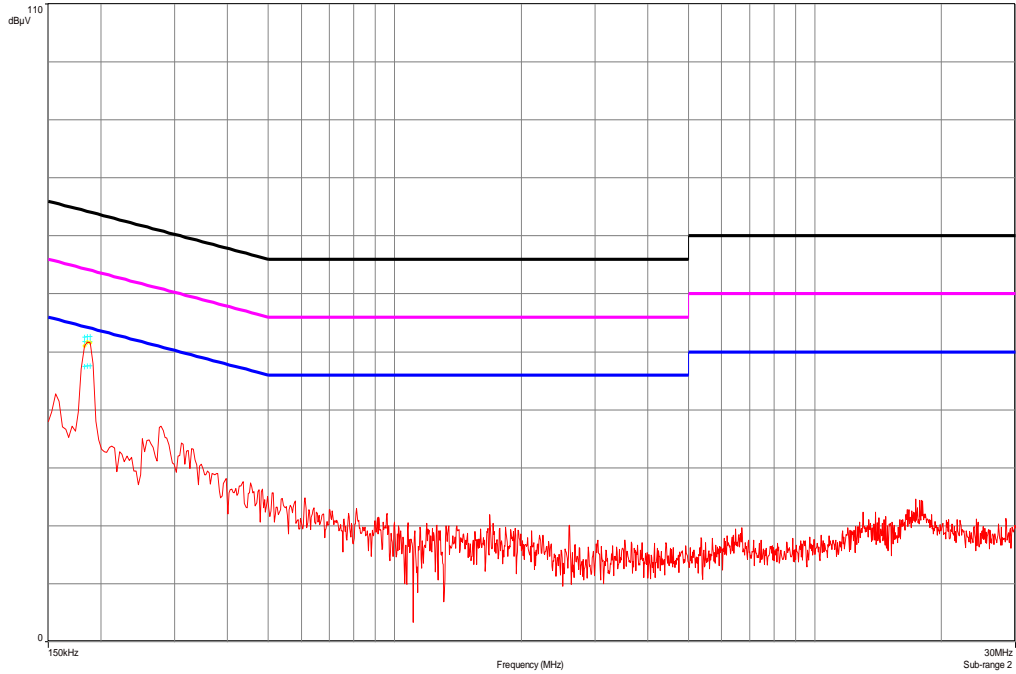
Plot 3: TX mode, 150 kHz to 30 MHz, neutral line



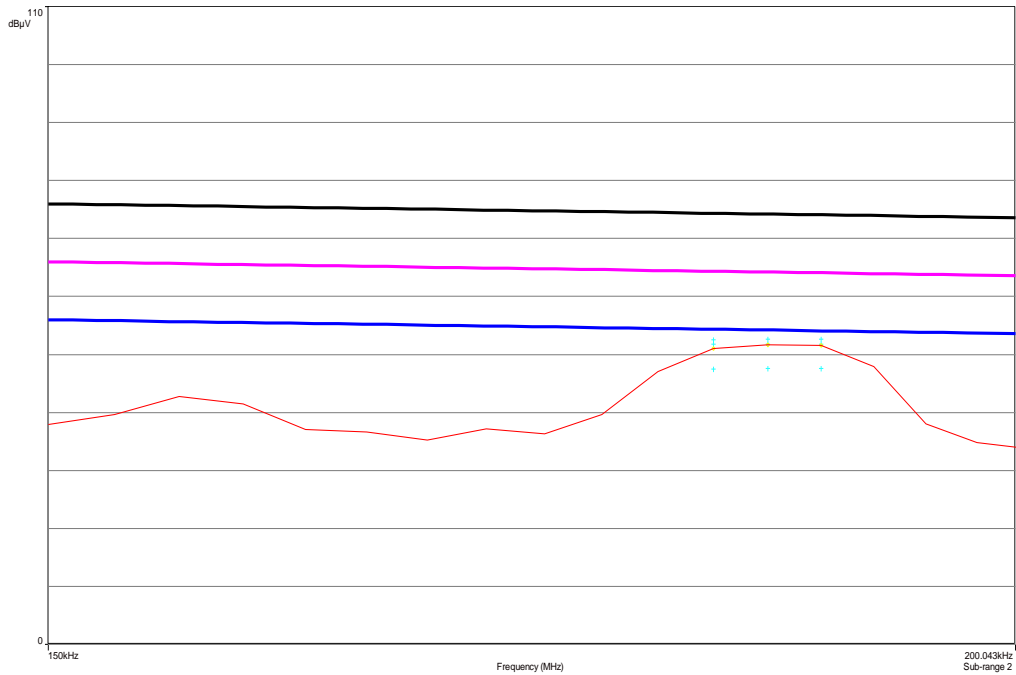
Plot 4: TX mode, 150 kHz to 30 MHz, neutral line, zoomed



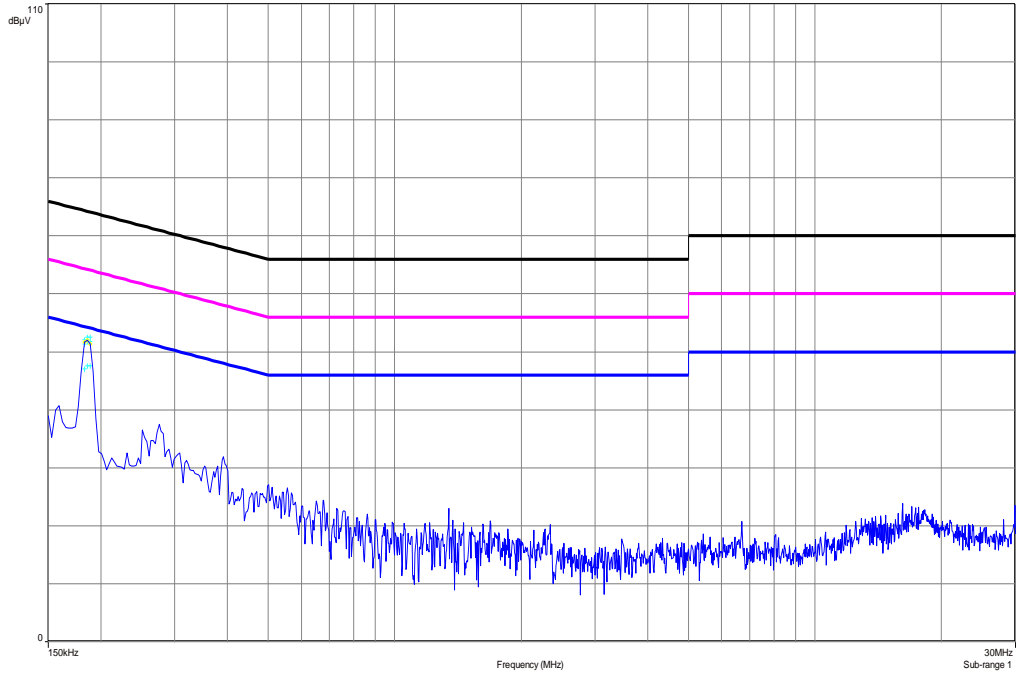
Plot 5: RX / Idle – mode, 150 kHz to 30 MHz, phase line



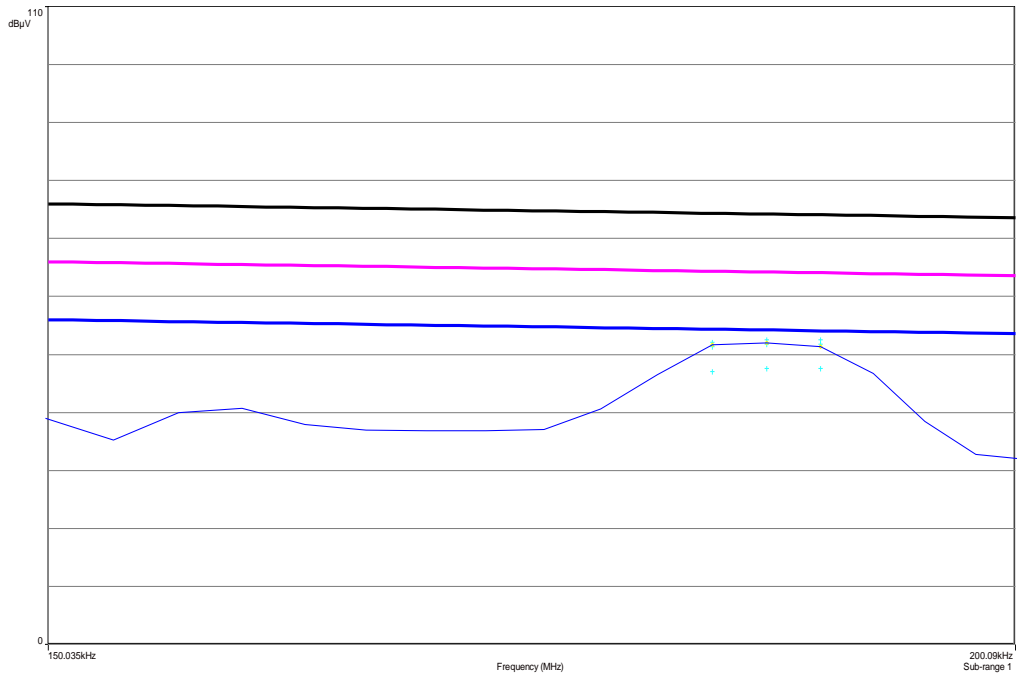
Plot 6: RX / Idle – mode, 150 kHz to 30 MHz, phase line, zoomed



**Plot 7:** RX / Idle – mode, 150 kHz to 30 MHz, neutral line



**Plot 8:** RX / Idle – mode, 150 kHz to 30 MHz, neutral line, zoomed



## 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	16.01.2015
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.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	Ve	09.10.2012	09.10.2014
28	n. a.	Signal Analyzer 40 GHz	FSV40	R&S	101042	300004xxx	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
vk!	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	2013-03-20
-A	Correition of a typo in RSP100 sheet	2013-08-02

**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



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 / GPRS, 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  
 Bitte Hinweise auf der Rückseite

Im Auftrag  
 Dr. Jörg (FH) von Egener  
 Abteilungsleiter

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Deutsche Akkreditierungsstelle GmbH

Standort Berlin Spittelmarkt 10 10117 Berlin	Standort Frankfurt am Main Gartenstraße 6 60094 Frankfurt am Main	Standort Braunschweig Rundesallee 100 38116 Braunschweig
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 und des Rates vom 9. Juli 2008 über die Vorschriften für die Akkreditierung und Marktüberwachung  
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 ILAC: [www.ilac.org](http://www.ilac.org)  
 IAF: [www.iaf.eu](http://www.iaf.eu)

**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>