



## Accredited testing-laboratory

**DAR registration number: DAT-P-176/94-D1**

**Federal Motor Transport Authority (KBA)  
DAR registration number: KBA-P 00070-97**

**Recognized by the Federal Communications Commission**

**Anechoic chamber registration no.: 90462 (FCC)**

**Anechoic chamber registration no.: 3462C-1 (IC)**

**Certification ID: DE 0001**

**Accreditation ID: DE 0002**

**Accredited Bluetooth® Test Facility (BQTF)**

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**Test report no. : 1-0685-01-05/08-C**  
**Type identification : MMS+WLAN a/b/g Modul für Monitore**  
**Applicant : Philips Medizin Systeme Böblingen GmbH**  
**FCC ID : PQC-WLANBV1**  
**IC Certification No : 3549C-WLANBV1**  
**Test standards : 47 CFR Part 15**  
**RSS - 210 Issue 7**

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## 1 General information

### 1.1 Notes

The test results of this test report relate exclusively to the test item specified in 3.1.1. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

**Test laboratory manager:**

2009-02-18	Stefan Bös	
Date	Name	Signature

2009-02-18	Marco Bertolino	
Date	Name	Signature

**Technical responsibility for area of testing:**

2009-02-18	Michael Berg	
Date	Name	Signature

## 1.2 Testing laboratory

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 - 10

66117 Saarbrücken

Germany

Phone: + 49 681 5 98 - 0

Fax: + 49 681 5 98 - 9075

e-mail: info@ICT.cetecom.de

Internet: http://www.cetecom-ict.de

State of accreditation: The test laboratory (area of testing) is accredited according to  
DIN EN ISO/IEC 17025  
DAR registration number: DAT-P-176/94-D1

Accredited by: Federal Motor Transport Authority (KBA)  
DAR registration number: KBA-P 00070-97

Testing location, if different from CETECOM ICT Services GmbH:

Name :  
Street :  
Town :  
Country :  
Phone :  
Fax :

## 1.3 Details of applicant

<b>Name:</b>	<b>Philips Medizin Systeme Böblingen GmbH</b>
<b>Street:</b>	<b>Hewlett-Packard-Strasse 2</b>
<b>Town:</b>	<b>71034 Böblingen</b>
<b>Country:</b>	<b>Germany</b>
<b>Telephone:</b>	<b>-/-</b>
<b>Fax:</b>	<b>+49-7031-463 2944</b>
<b>Contact:</b>	<b>Herrn Stefan Breuer</b>
<b>E-mail:</b>	<b>stefan.breuer@philips.com</b>
<b>Telephone:</b>	<b>+49-7031-463 2321</b>

## 1.4 Application details

<b>Date of receipt of order:</b>	<b>2008-09-15</b>
<b>Date of receipt of test item:</b>	<b>2008-09-15</b>
<b>Date of start test:</b>	<b>2008-09-15</b>
<b>Date of end test:</b>	<b>2009-02-17</b>
<b>Persons(s) who have been present during the test:</b>	<b>-/-</b>

## 2 Test standard/s:

47 CFR Part 15	2007-09	Title 47 of the Code of Federal Regulations; Chapter I- Federal Communications Commission subchapter A - general, Part 15-Radio frequency devices
RSS - 210 Issue 7	2007-06	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

### 3 Technical tests

#### 3.1 Details of manufacturer

Name:	Philips Medizin Systeme Böblingen GmbH
Street:	Hewlett-Packard-Strasse 2
Town:	71034 Böblingen
Country:	Germany

##### 3.1.1 Test item

Kind of test item	:	Module for healthcare monitoring systems
Type identification	:	MMS+WLAN a/b/g Modul für Monitore
S/N serial number	:	FH 830 000187
HW hardware status	:	0839
SW software status	:	-/-
Frequency Band [MHz]	:	ISM 2.400 - 2.483,5
Type of Modulation	:	DSSS & OFDM
Number of channels	:	11
Antenna	:	Tri-band rod antenna*
Power Supply	:	5 V / 500 mA DC over USB interface
Temperature Range	:	-20 °C to +55 °C

\*Worst case antenna declared by the manufacturer. For more information please take a look at clause 5.2. For the used power settings please take a look at clause 5.3.

**Max. power radiated:** 22.58 dBm DSSS / WLAN b mode  
**Max. power conducted:** 19.28 dBm DSSS / WLAN b mode

**Max. power radiated:** 26.05 dBm OFDM / WLAN g mode  
**Max. power conducted:** 22.75 dBm OFDM / WLAN g mode

**FCC ID:** PQC-WLANBV1  
**IC:** 3549C-WLANBV1

**3.1.2 Additional EUT information For IC Canada (appendix 2)**

IC Registration Number:	3549C-WLANBV1
Model Name:	MMS+WLAN a/b/g Modul für Monitore
Manufacturer (complete Address):	Philips Medizin Systeme Böblingen GmbH Hewlett-Packard-Strasse 2 71034 Böblingen Germany
Tested to Radio Standards Specification (RSS) No.:	RSS-210 Issue 7
Open Area Test Site Industry Canada Number:	IC 3462C-1
Frequency Range (or fixed frequency) [MHz]:	ISM Band 2400 – 2483.5 MHz
RF: Power [W] (max):	<u>DSSS:</u> Rad. EIRP: 181.13 mW Conducted : 84.72 mW  <u>OFDM:</u> Rad. EIRP: 402.72 mW Conducted : 188.36 mW
Antenna Type:	Tri-band rod antenna
Occupied Bandwidth (99% BW) [kHz]:	DSSS: 18.08 MHz OFDM: 18.85 MHz
Type of Modulation:	DSSS & OFDM
Emission Designator (TRC-43):	18M1G7D (DSSS) 18M8G7D (OFDM)
Transmitter Spurious (worst case) [dBµV/m in 3m]:	45.31
Receiver Spurious (worst case) [dBµV/m in 3m]:	45.29

**ATTESTATION:**

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

Signature:



Test engineer: Stefan Bös  
Date: 2009-02-18

Signature:



Test engineer: Marco Bertolino  
Date: 2009-02-18

### 3.1.3 RF Technical Brief Cover Sheet acc. To RSS-102

All Fields must be completed with the requested information or the following codes: N/A for Not Applicable, N/P for Not Performed or N/V for Not Available. Where applicable, check appropriate box.

1. COMPANY NUMBER:           **3549C**
2. MODEL NUMBER:           **MMS+WLAN a/b/g Modul für Monitore**
3. MANUFACTURER:           **Philips Medizin Systeme Böblingen GmbH**
4. TYPE OF EVALUATION:    **(c) RF Evaluation**

- Evaluated against exposure limits: General Public Use  Controlled Use
  - Duty cycle used in evaluation: 99 %
  - Standard used for evaluation: RSS-102 Issue 2 (2005-11)
  - Measurement distance: 0.20 m
  - RF value: 0.8 V/m  A/m  W/m<sup>2</sup>
- Measured  Computed  Calculated

#### Declaration of RF Exposure Compliance

#### ATTESTATION:

I attest that the information provided in this test report is correct; that a Technical Brief was prepared and the information it contains is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed and that the device meets the SAR and/or RF exposure limits of RSS-102.

Name:           Dipl.-Ing. (FH) Stefan Bös  
Title:           Project engineer  
Company:       Cetecom ICT Services GmbH

Name:           Dipl.-Ing. (FH) Marco Bertolino  
Title:           Engineer  
Company:       Cetecom ICT Services GmbH



### 3.1.4 EUT operating modes

EUT operating mode no. *)	Description of operating modes	Additional information
Op. 0	normal mode	normal temperature and power source conditions
Op. 1		low temperature, low power source conditions
Op. 2		low temperature, high power source conditions
Op. 3		high temperature, low power source conditions
Op. 4		high temperature, high power source conditions

\*) EUT operating mode no. is used to simplify the test plan

### 3.1.5 Extreme conditions testing values

Description	Shortcut	Unit	Value
Nominal Temperature	T <sub>nom</sub>	°C	20
Nominal Humidity	H <sub>nom</sub>	%	56
Nominal Power Source	V <sub>nom</sub>	V	5

Type of power source: DC over USB interface

Deviations from these values are reported in chapter 2

#### 4 Summary of Measurement Results and list of all performed test cases

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

TC identifier	Description	verdict	date	Remark
RF-Testing	FCC Part 15 §15.247 - CANADA RSS-210	passed	2009-02-18	-/-

Test Specification Clause	Test Case	Pass	Fail	Not applicable	Not performed
None	Antenna Gain	Yes			
§15.247 (e)	Peak power spectral density	Yes			
§15.247(a)(2)	Spectrum Bandwidth of a DSSS System / 6dB BW	Yes			
§15.247(a)(2)	Spectrum Bandwidth of a DSSS System / 20dB BW	Yes			
§ 15.247 (b)(3)	Maximum output power (conducted)	Yes			
§ 15.247 (b)(3)	Max. peak output power (radiated)	Yes			
§15.247 (d)	Band-edge compliance of conducted emissions	Yes			
§15.205	Band-edge compliance of radiated emissions	Yes			
§15.247 (d)	Spurious Emission - conducted (Transmitter)	Yes			
§ 15.209	Spurious Emission -radiated (Transmitter)	Yes			
§ 15.109	Spurious Emissions-radiated (Receiver)	Yes			
§ 15.209	Spurious Emissions-radiated <30 MHz	Yes			
§ 15.107/207	Conducted Emissions <30 MHz	Yes			

## 5 RF measurement testing

### 5.1 Description of test set-up

#### 5.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 20 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber.

The receiving antennas are confirmed with specifications ANSI C63.2-1996 clause 15 and ANSI C63.4-2003 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test set-ups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received.

The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.4-2003 clause 4.2.

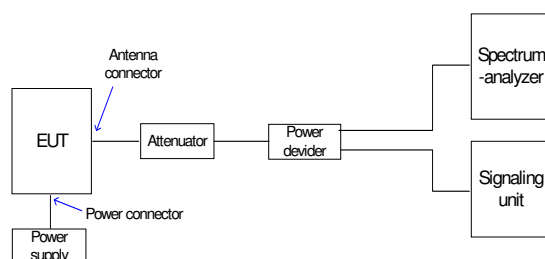
Antennas are confirmed with ANSI C63.2-1996 item 15.

- 9 kHz - 150 MHz: Quasi Peak measurement, 200 Hz Bandwidth, passive loop antenna.
- 150 kHz - 30 MHz: Quasi Peak measurement, 9 kHz Bandwidth, passive loop antenna.
- 30 MHz - 200 MHz: Quasi Peak measurement, 120 kHz Bandwidth, biconical antenna
- 200MHz - 1GHz: Quasi Peak measurement, 120 kHz Bandwidth, log periodic antenna
- >1GHz: Average, RBW 1MHz, VBW 10 Hz, wave guide horn

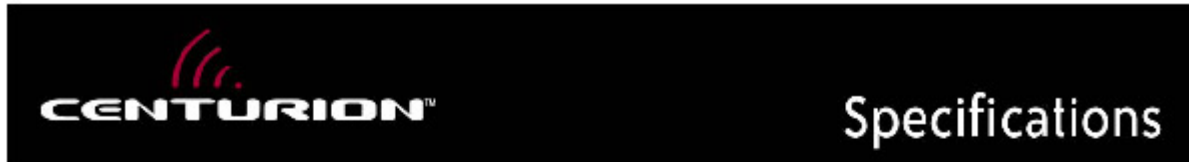
All measurement settings are according to FCC 15.209 and 15.207

#### 5.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is connected to the spectrum analyzer. The specific losses for signal path are first checked within a calibration. The measurement readings on the 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.



5.2 Referenced Documents



**WTS - WLAN Tri-band Small Diameter**

External Antenna – Connector Mount

Model Number:  
**WTS2450-RPSMA**

**Specifications:**

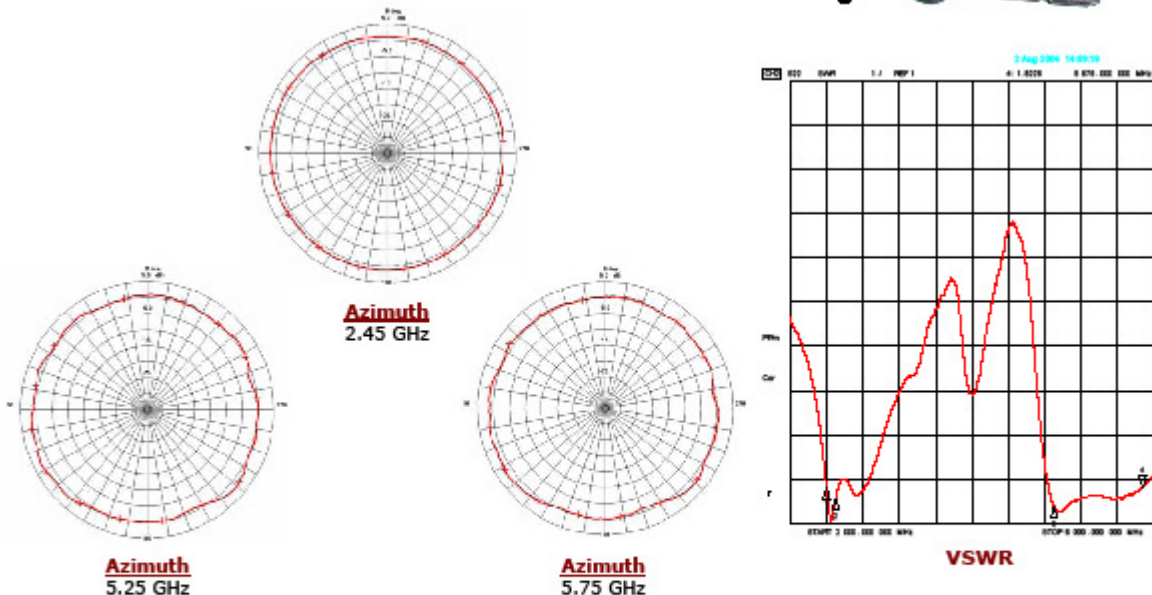
- Covers 2.4 to 2.5 GHz for 802.11b, and 4.9 to 6 GHz for 802.11a and all US, European, and Japanese WLAN applications
- Omni-directional patterns at all frequencies with increased gain in upper bands for optimal coverage

<b>Frequency</b>	2.4 – 2.5 GHz 4.9 – 5.875 GHz
<b>Gain</b>	2.5 dBi (2.45 GHz) 3.6 dBi (4.9 GHz) 3.0 dBi (5.25 GHz) 3.4 dBi (5.875 GHz)
<b>Polarization</b>	Vertical, Omnidirectional
<b>Nominal Impedance</b>	50 ohms
<b>VSWR</b>	2:1 max across all bands
<b>Size</b>	95.9 mm (180°) or 75.4 mm (90°) x 9.3 mm diameter



**Cable and Connector:**

Model #	Part #	Connector
WTS2450-RPSMA	MAF94051	RP-SMA



Specifications subject to change without notice.

WTS RPSMA - a - 9/15/04



3425 N.44<sup>th</sup> Street, LINCOLN, NE 68504 USA  
 SALES PHONE: 800.228.4563  
 PHONE: 402.467.4491 • FAX: 402.467.4528  
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Test report: 1-0685-01-15 delta measurement antenna 2

Test report: 1-0685-01-16 delta measurement antenna 3

### 5.3 Additional comments

The followings power settings are declared by the manufacture. All measurements are performed with the specified settings.

# target power file for AR6000 802.11a/b/g with super a/g TB111 Reference Design card

# 11a Target Power table:

# Rules:

- # 1. up to a maximum of 8 test frequencies
- # 2. test frequencies DO NOT need to cover the entire range of 5180-5850. It is allowed to provide data for a smaller range. for all channels outside of test frequencies range, target power will be assumed 0dB.
- # 3. specify mask/PER limited target power for various rates

#BEGIN\_11a\_TARGET\_POWER\_TABLE

# test_frequencies	6-24_target	36_target	48_target	54_target
5180	15	15	15	15
5240	15	15	15	15
5320	15	15	15	15
5440	15	15	15	15
5460	15	15	15	15
5500	15	15	15	15
5700	15	15	15	15
5745	15	15	15	15

#END\_11a\_TARGET\_POWER\_TABLE

# 11b Target Power table:

# Rules:

- # 1. Need to define exactly 2 test frequencies in 2.412 - 2.484 G range.
- # 2. test frequencies DO NOT need to cover the entire range of 2412-2484. It is allowed to provide data for a smaller range. for all channels outside of test frequencies range, target power will be assumed 0dB.
- # 3. specify mask/PER limited target power for various rates

#BEGIN\_11b\_TARGET\_POWER\_TABLE

# test_frequencies	1_target	2_target	5.5_target	11_target
2412	15	15	15	15
2484	15	15	15	15

#END\_11b\_TARGET\_POWER\_TABLE

# ofdm@2p4 Target Power table:

# Rules:

- # 1. up to a maximum of 3 test frequencies in 2.412 - 2.484 G range
- # 2. test frequencies DO NOT need to cover the entire range of 2412-2484. It is allowed to provide data for a smaller range. for all channels outside of test frequencies range, target power will be assumed 0dB.
- # 3. specify mask/PER limited target power for various rates

#BEGIN\_11g\_TARGET\_POWER\_TABLE

# test_frequencies	6-24_target	36_target	48_target	54_target
2412	15	15	15	15
2437	15	15	15	15
2472	15	15	15	15

#END\_11g\_TARGET\_POWER\_TABLE

# Test Groups:

# Rules:

- # 1. Specify up to 8 band edges for each test group.
- # 2. If no backoff desired at a band edge, give a large number (e.g. 30) so
- # that the driver determined limit becomes the target power.
- #

#BEGIN\_TEST\_GROUPS

# Test Group 1: US and CANADA (FCC)

#	test_group_code	BE1	BE2	BE3	BE4	BE5	BE6	BE7	BE8	
	0x10	5180	5200	5260	5320	5500	5520	5700	5745	
		11	11	15	15	17	17	17	17	# Band Edge Max Power
		0	1	1	0	0	1	0	1	# in-band flag

# Test Group 3: US and CANADA (FCC) 802.11b mode CTL

#	test_group_code	BE1	BE2	BE3	
	0x11	2412	2437	2442	
		17	18	17	# Band Edge Max Power
		1	0	1	# in-band flag

# Test Group 4: US and CANADA (FCC) 802.11g mode CTL

#	test_group_code	BE1	BE2	BE3	BE4	
	0x12	2412	2417	2457	2462	
		16	18	18	17	# Band Edge Max Power
		0	1	0	0	# in-band flag

# Test Group 6: JAPAN (MKK)

#	test_group_code	BE1	BE2	
	0x40	5170	5230	
		17	17	# Band Edge Max Power
		0	0	# in-band flag

# Test Group 7: EUROPE (ETSI)

#	test_group_code	BE1	BE2	BE3	BE4	BE5	BE6	BE7	
	0x30	5180	5320	5500	5700	5745	5765	5825	
		17	17	17	17	17	17	17	# Band Edge Max Power
		0	0	0	0	0	1	0	# in-band flag

# Test Group 8: EUROPE (ETSI) 802.11b mode CTL

#	test_group_code	BE1	BE2	BE3	
	0x31	2412	2417	2472	
		16	16	16	# Band Edge Max Power
		0	1	0	# in-band flag

#END\_TEST\_GROUPS

#### 5.4 Manufacturer's Declaration

The manufacturer attests that the power settings used for testing are part of the firmware and cannot be changed by the user or host. These settings are specific for different countries and are related to the local requirements. The following measurements were performed with the specific power settings fulfilling the requirements of the FCC- and IC- rules.

#### 5.5 Antenna gain

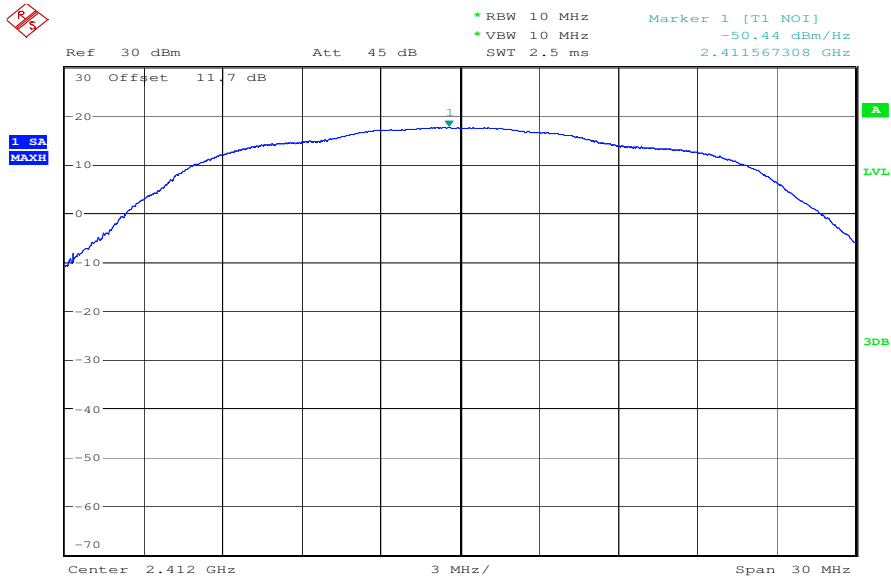
The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

	low channel 2412 MHz	mid channel 2437 MHz	high channel 2462 MHz
Conducted power [dBm] <i>(measured)</i>	18.08	<b>19.28</b>	17.61
Radiated power [dBm] <i>(measured)</i>	21.43	<b>22.58</b>	20.48
Gain [dBi] <i>(calculated)</i>	<b>3.35</b>	3.30	2.87

5.6 Peak Power Spectral density (digitally modulated systems) §15.247(e)

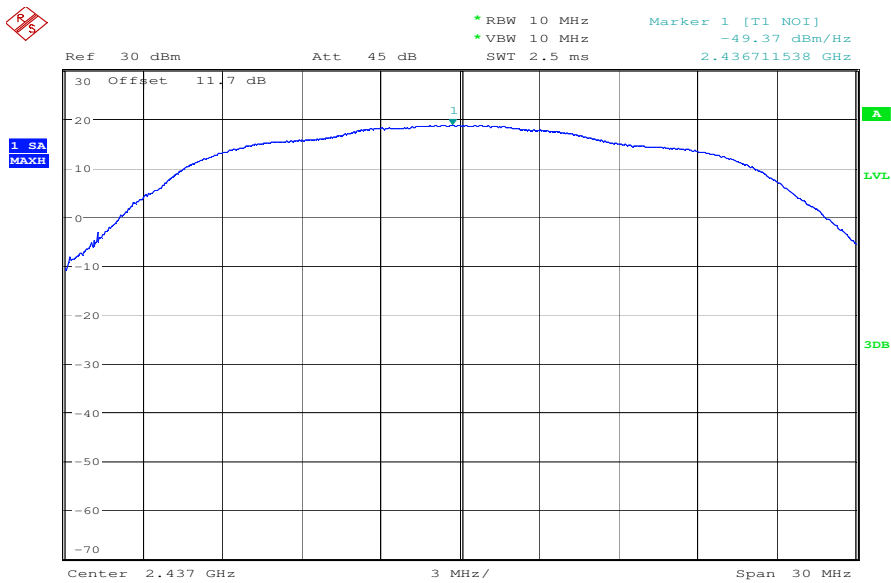
DSSS

Plot 1: channel 1 (result calculated by the Signal analyzer FSIQ 26 from Rohde & Schwarz)



Date: 9.JAN.2009 07:22:25

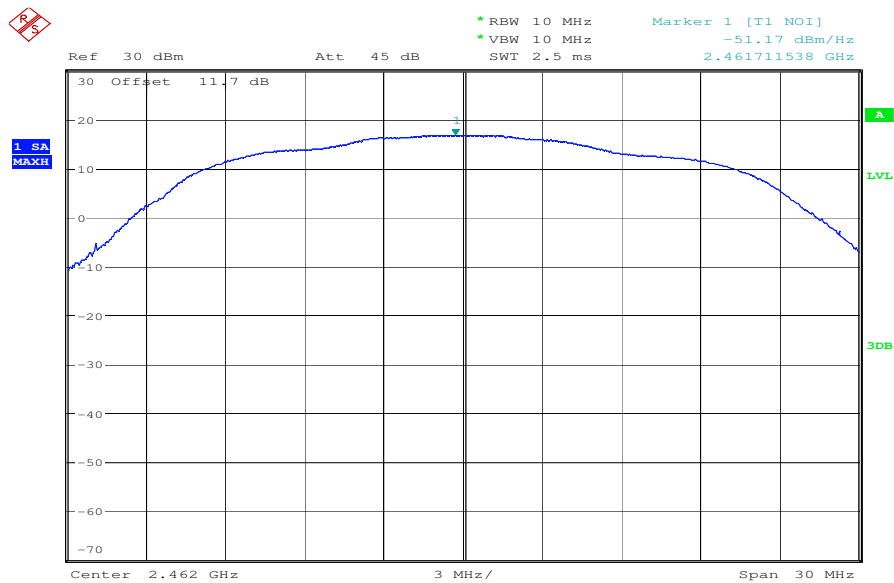
Plot 2: channel 6 (result calculated by the Signal analyzer FSIQ 26 from Rohde & Schwarz)



Date: 9.JAN.2009 07:24:15



Plot 3: channel 11 (result calculated by the Signal analyzer FSIQ 26 from Rohde & Schwarz)



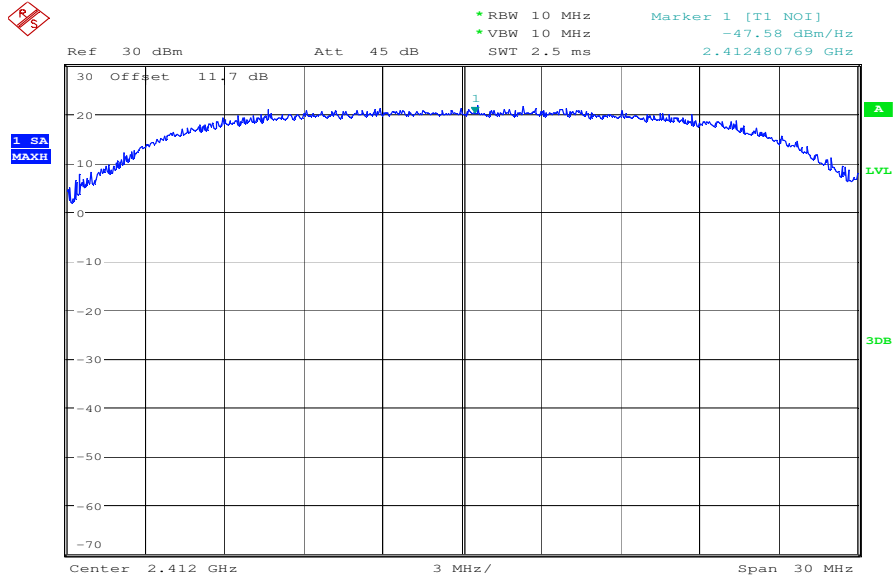
Date: 9.JAN.2009 07:26:34

Results:    Plot 1: Power density: - 50.44 dBm/Hz = - 15.64 dBm / 3 kHz  
 Plot 2: Power density: - 49.37 dBm/Hz = - 14.57 dBm / 3 kHz  
 Plot 3: Power density: - 51.17 dBm/Hz = - 16.37 dBm / 3 kHz

Correction factor from dBm / Hz to dBm / 3 kHz is +34.8 dB

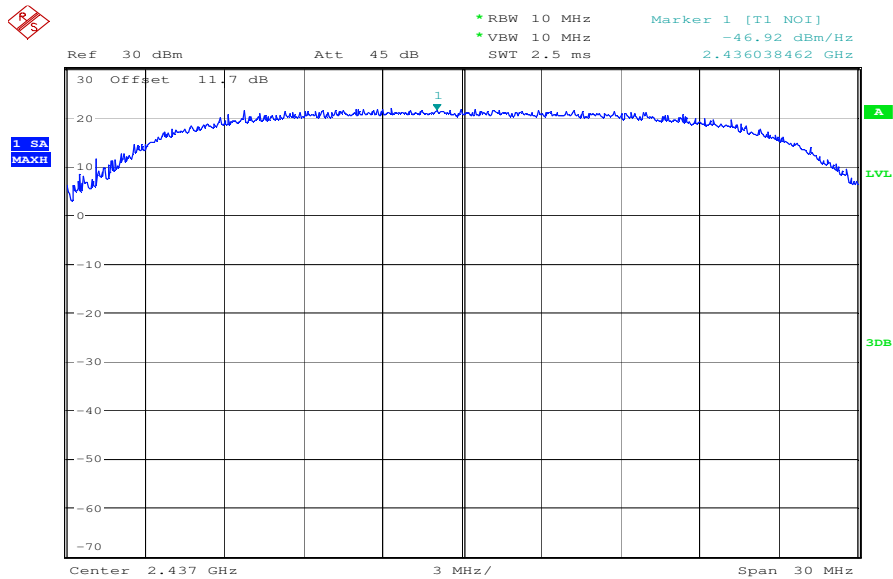
**OFDM**

Plot 1: channel 1 (result calculated by the Signal analyzer FSIQ 26 from Rohde & Schwarz)



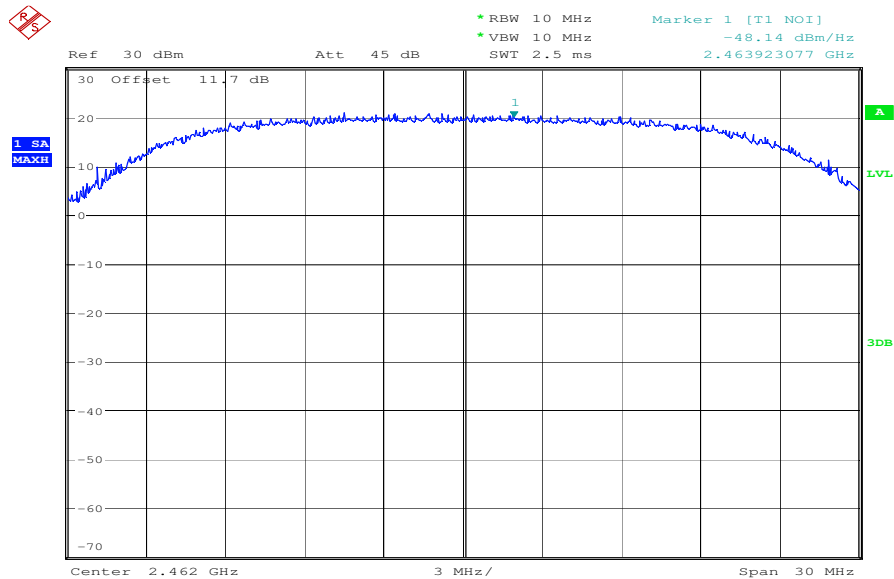
Date: 9.JAN.2009 07:32:53

Plot 2: channel 6 (result calculated by the Signal analyzer FSIQ 26 from Rohde & Schwarz)



Date: 9.JAN.2009 07:30:38

Plot 3: channel 11 (result calculated by the Signal analyzer FSIQ 26 from Rohde & Schwarz)



Date: 9.JAN.2009 07:28:45

Results: Plot 1: Power density: - 47.58 dBm/Hz = - 12.78 dBm / 3 kHz  
 Plot 2: Power density: - 46.92 dBm/Hz = - 12.12 dBm / 3 kHz  
 Plot 3: Power density: - 48.14 dBm/Hz = - 13.34 dBm / 3 kHz

Correction factor from dBm/Hz to dBm/3 kHz is +34.8 dB

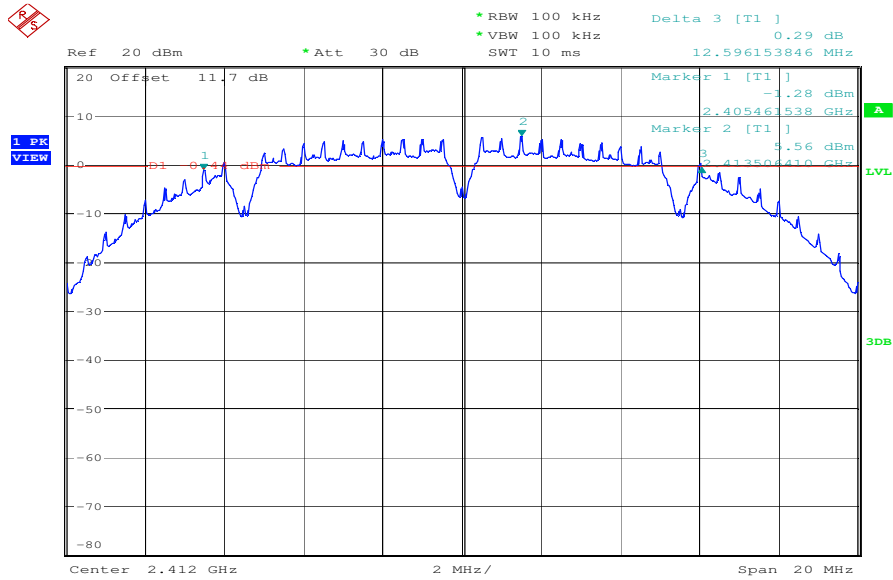
Limits:

<p>Under normal test conditions only</p>	<p>For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission</p>
--	--

### 5.7 Spectrum Bandwidth of a DSSS System / 6 dB Bandwidth §15.247(a)(2)

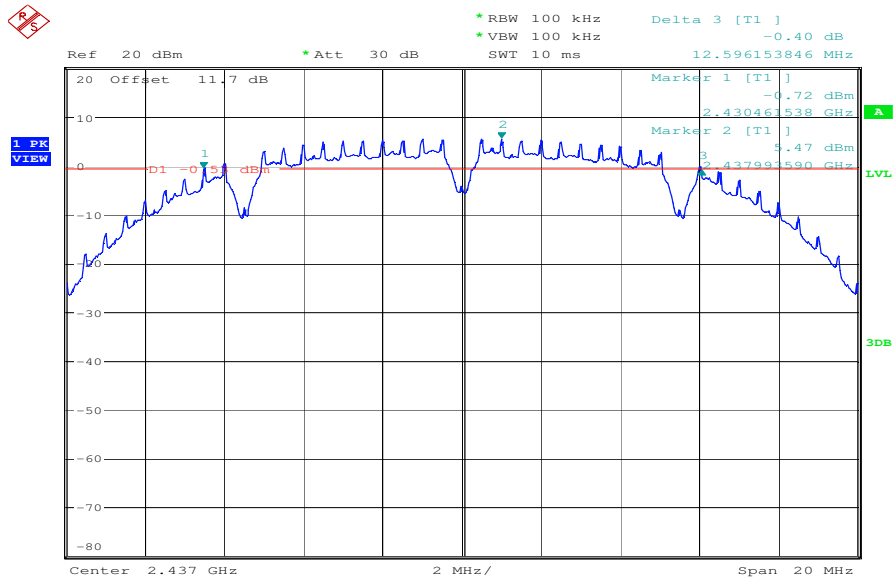
#### DSSS

Plot 1: channel 1



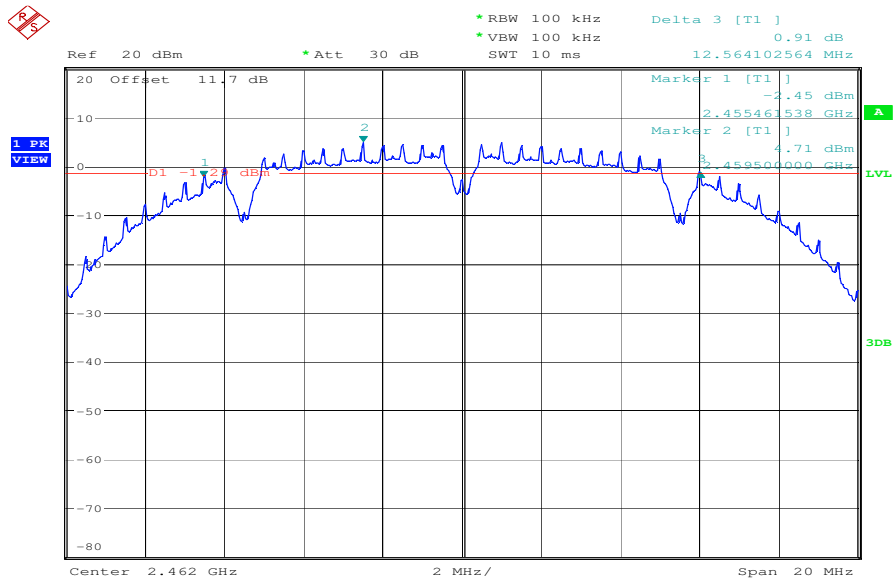
Date: 9.JAN.2009 08:29:30

Plot 2: channel 6



Date: 9.JAN.2009 08:26:59

Plot 3: channel 11



Date: 9.JAN.2009 08:21:40

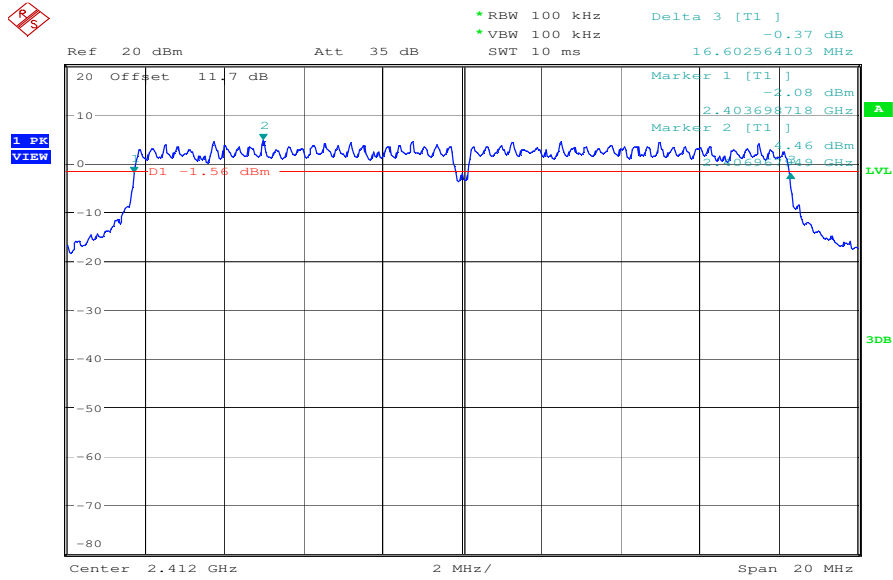
Results:

Test conditions		6 dB BANDWIDTH [MHz]		
Frequency [MHz]		2412	2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	<b>12.596</b>	<b>12.596</b>	12.564
Measurement uncertainty		± 10 kHz		

RBW: 100 kHz / VBW 100 kHz

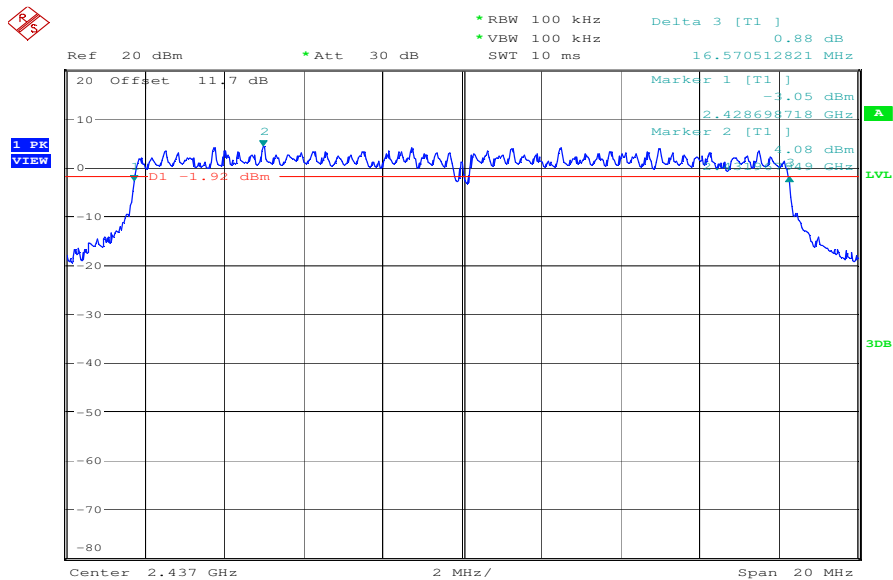
**OFDM**

Plot 1: channel 1



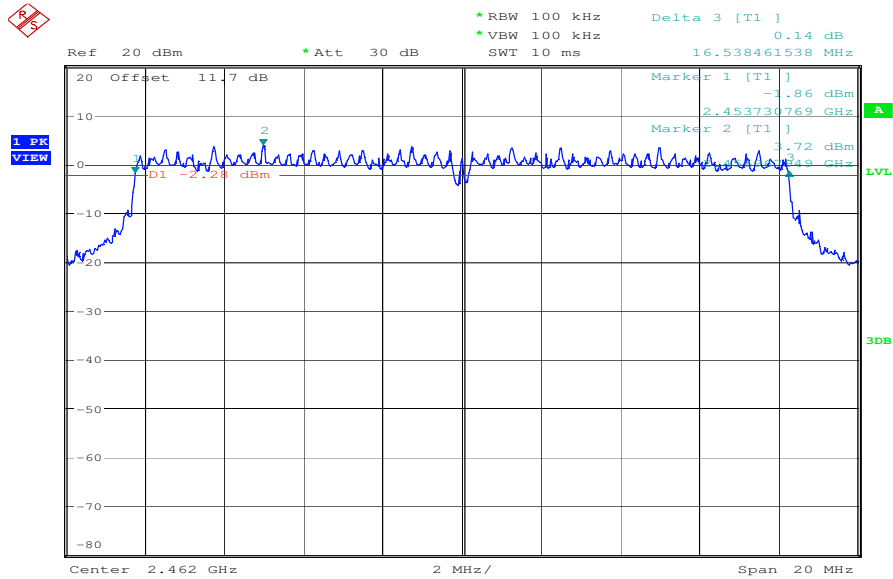
Date: 9.JAN.2009 08:09:39

Plot 2: channel 6



Date: 9.JAN.2009 08:13:59

Plot 3: channel 11



Date: 9.JAN.2009 08:16:35

Results:

Test conditions		6 dB BANDWIDTH [MHz]		
Frequency [MHz]		2412	2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	<b>16.603</b>	16.571	16.538
Measurement uncertainty		± 10 kHz		

RBW: 100 kHz / VBW 100 kHz

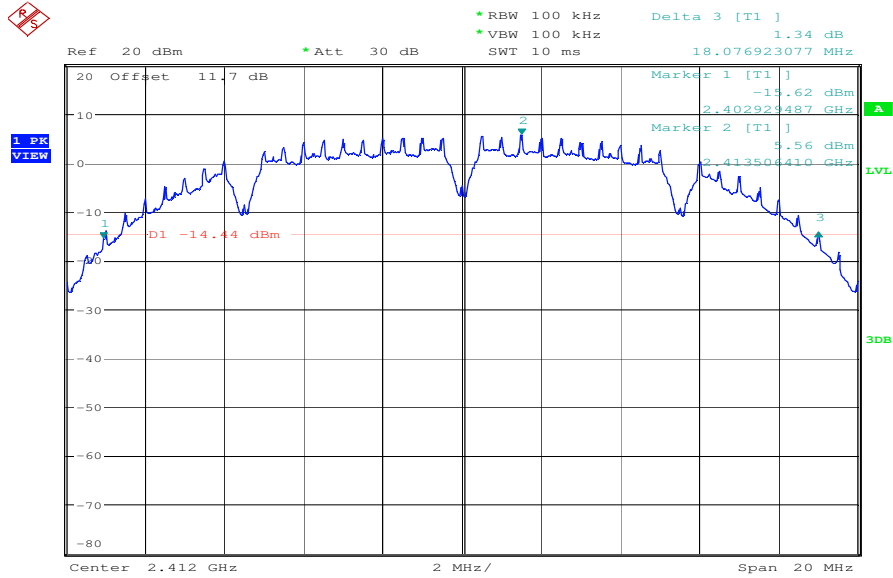
Limits:

Under normal test conditions only	> 500 kHz
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### 5.8 Spectrum Bandwidth of a DSSS System / 20 dB Bandwidth

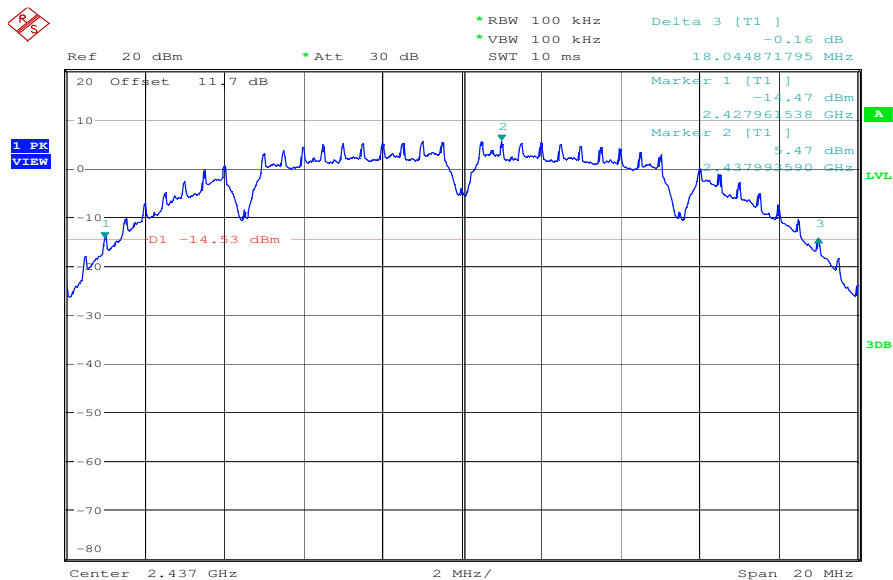
#### DSSS

Plot 1: channel 1



Date: 9.JAN.2009 08:30:15

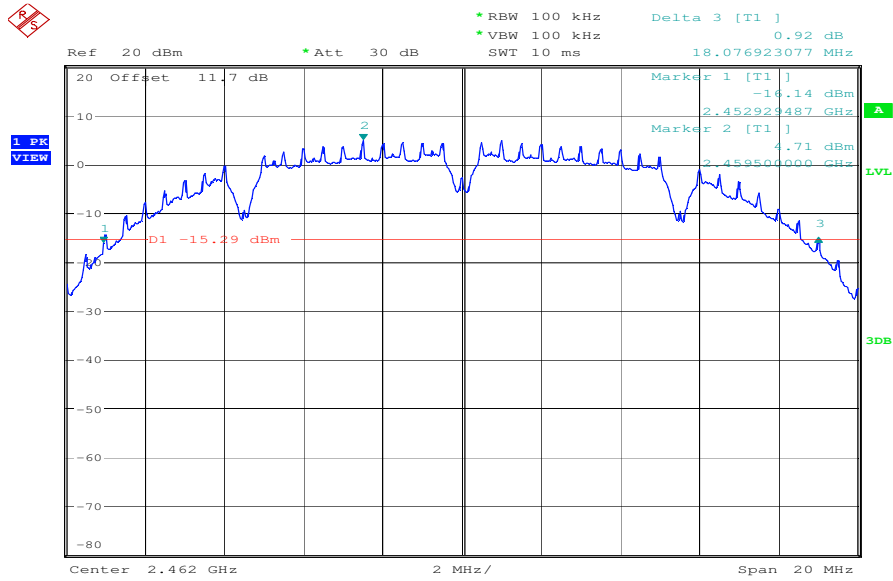
Plot 2: channel 6



Date: 9.JAN.2009 08:27:43



Plot 3: channel 11



Date: 9.JAN.2009 08:23:41

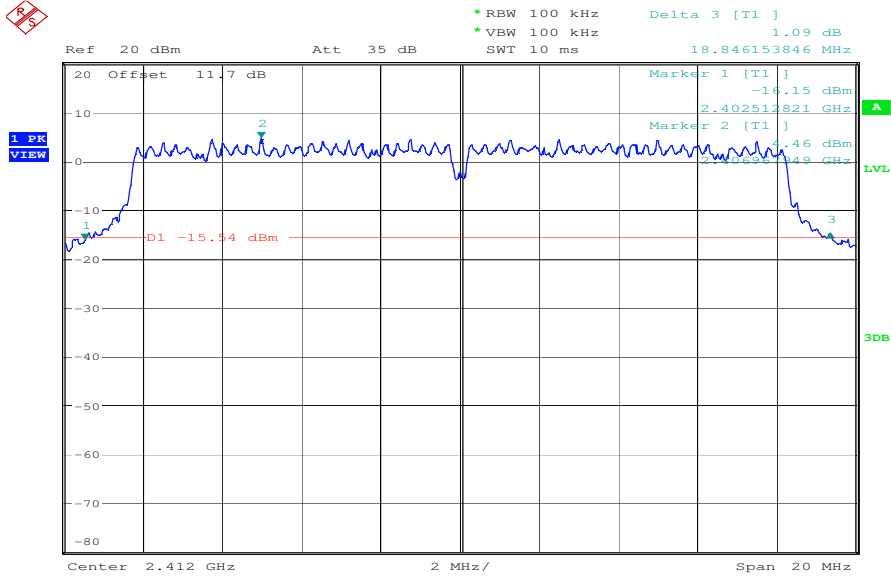
Results:

Test conditions		20 dB BANDWIDTH [MHz]		
		2412	2437	2462
Frequency [MHz]		2412	2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	<b>18.077</b>	18.045	<b>18.077</b>
Measurement uncertainty		± 10 kHz		

RBW: 100 kHz / VBW 100 kHz

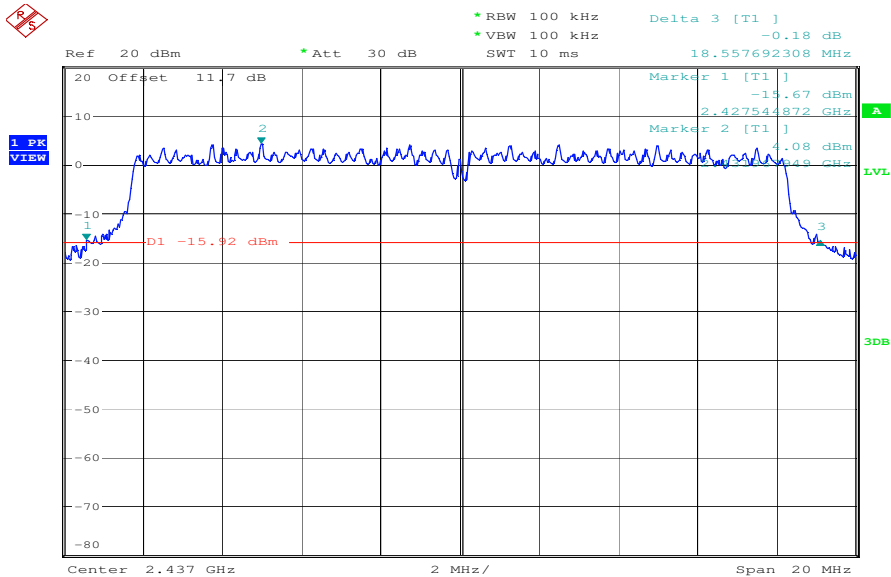
**OFDM**

Plot 1: channel 1



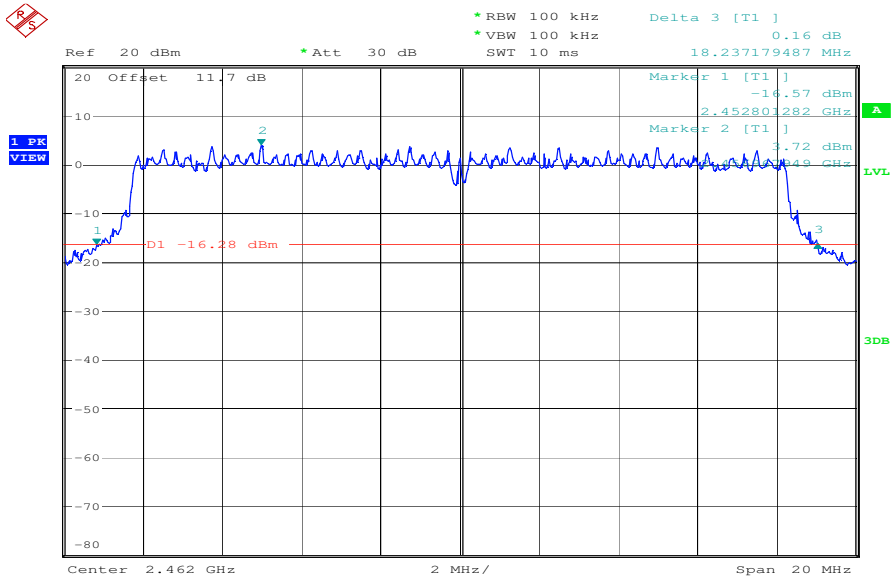
Date: 9.JAN.2009 08:10:56

Plot 2: channel 6



Date: 9.JAN.2009 08:14:44

Plot 3: channel 11



Date: 9.JAN.2009 08:17:28

Results:

Test conditions		20 dB BANDWIDTH [MHz]		
Frequency [MHz]		2412	2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	<b>18.846</b>	18.668	18.237
Measurement uncertainty		± 10 kHz		

RBW: 100 kHz / VBW 100 kHz

**5.9 Maximum output power (conducted) §15.247 (b)(3)**

**DSSS**

Results:

Test conditions		Max. peak output power [dBm]			
Frequency [MHz]		2412		2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	PK	18.08	<b>19.28</b>	17.61
Measurement uncertainty		±3dB			

RBW / VBW: 50 / 30 MHz

**OFDM**

Results:

Test conditions		Max. peak output power [dBm]			
Frequency [MHz]		2412		2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	PK	22.13	<b>22.75</b>	22.15
Measurement uncertainty		±3dB			

RBW / VBW: 50 / 30 MHz

Remark:

The correction factor is calculated by  $10 \times \log(\text{measured BW} / \text{used BW})$  [dB]

Limits:

Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt / 30 dBm
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### MPE calculation

These equations are generally accurate in the far field of an antenna but will over predict power density in the near field, where they could be used for making a “worst case” prediction.

$$S = PG/4\pi R^2$$

where S = power density ( in appropriate units, e.g. mW/cm<sup>2</sup>)  
P = power input to the antenna (in appropriate units e.g. mW)  
G = power gain of the antenna in the direction of interest relative to the isotropic radiator  
R = distance to the centre of radiation of the antenna (appropriate units e.g. cm)

Or

$$S = EIRP/4\pi R^2$$

where EIRP = equivalent isotropically radiated power

#### Calculation:

(Calculated for max. EIRP)

EIRP: 26.05 dBm (402.72 mW)

calculated at distance of 20 cm:

$$\text{power density} = 402.72 / 4\pi 20^2 = 0.08 \text{ mW/ cm}^2$$

Limit:

1mW/ cm<sup>2</sup> is the reference level for general public exposure according to the OET Bulletin 65,  
Edition 97-01 Table 1.

**5.10 Max. peak output power (radiated) §15.247 (b)(3)**

**DSSS**

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2412	2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	21.43	<b>22.58</b>	20.48
Measurement uncertainty		±3dB		

RBW / VBW: 10 MHz

Measured at a distance of 3m

**OFDM**

Results:

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2412	2437	2462
T <sub>nom</sub>	V <sub>nom</sub>	25.48	<b>26.05</b>	25.02
Measurement uncertainty		±3dB		

RBW / VBW: 10 MHz

Measured at a distance of 3m

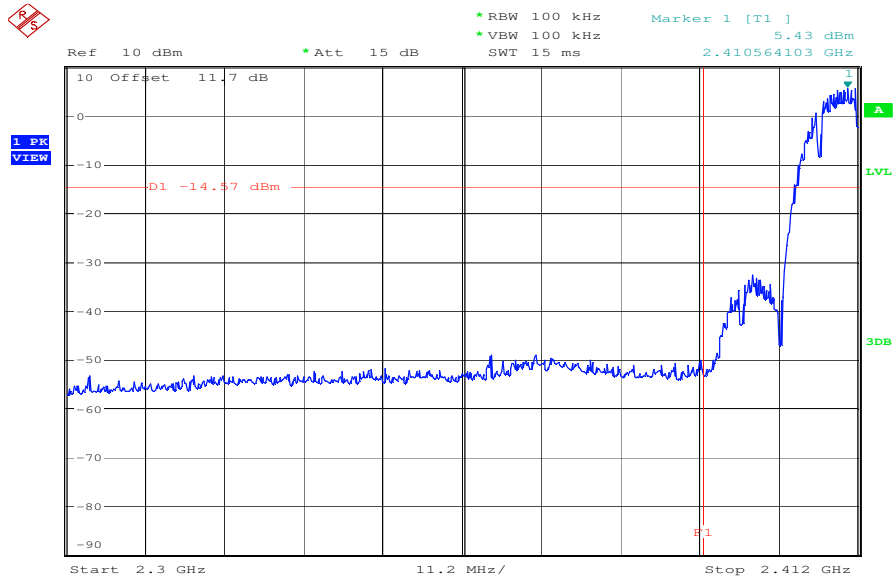
Limits:

Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt
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### 5.11 Band-edge compliance of conducted emissions §15.247 (d)

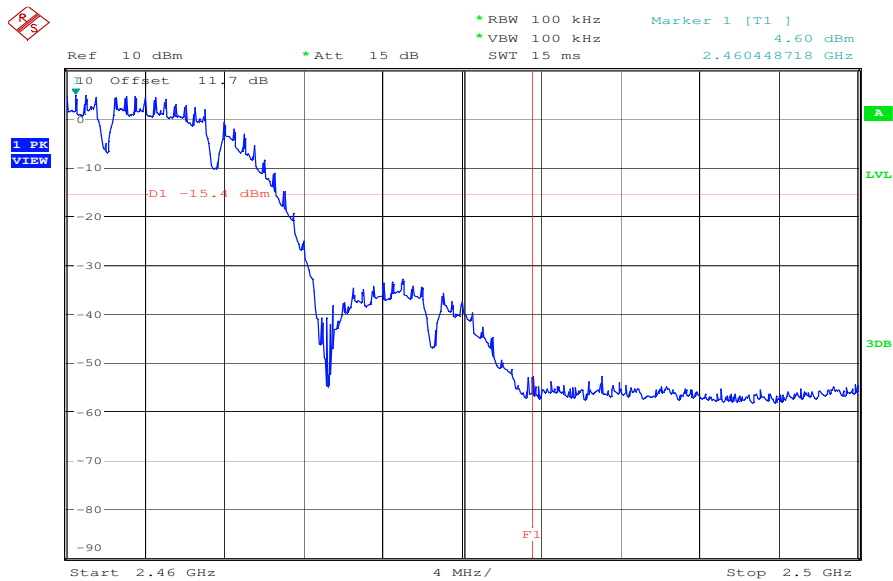
#### DSSS

Plot 1: lowest channel



Date: 9.JAN.2009 08:55:28

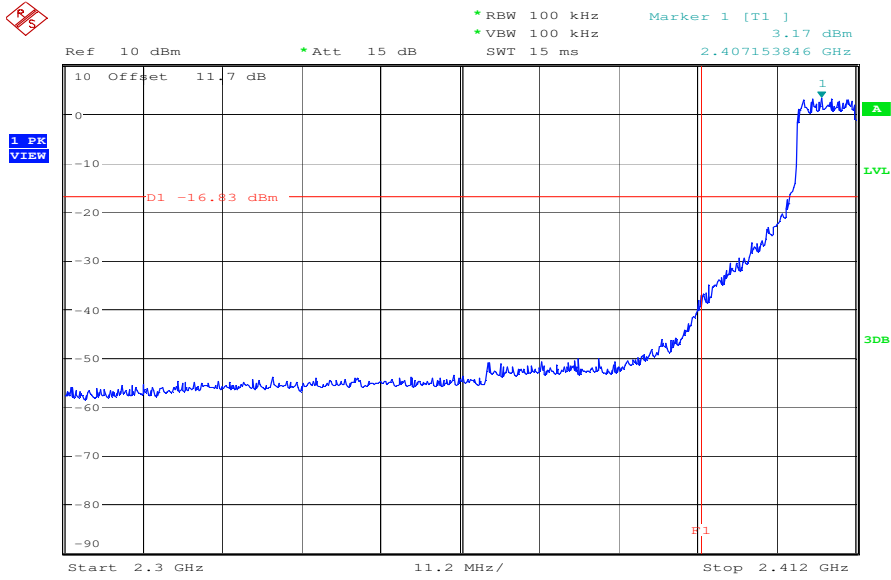
Plot 2: highest channel



Date: 9.JAN.2009 09:05:51

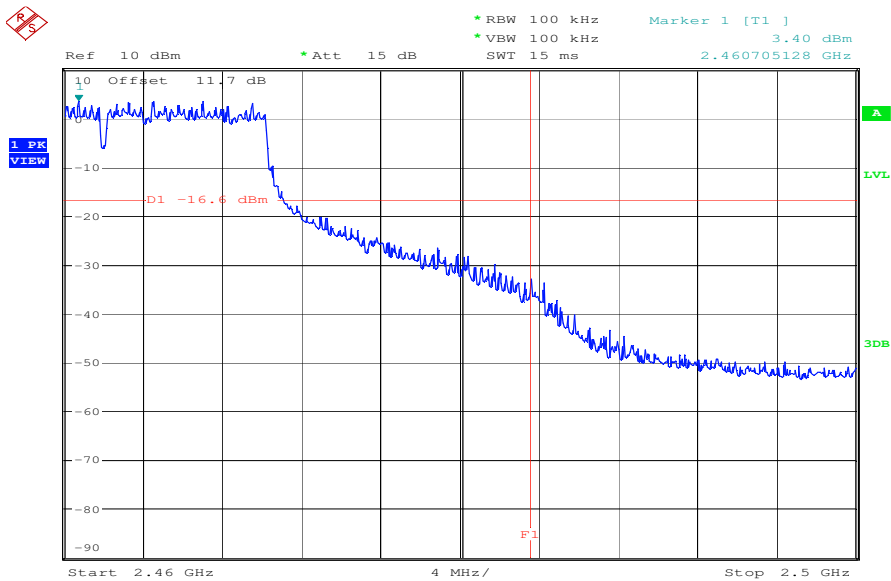
**OFDM**

Plot 1: lowest channel



Date: 9.JAN.2009 08:58:02

Plot 2: highest channel



Date: 9.JAN.2009 09:02:40



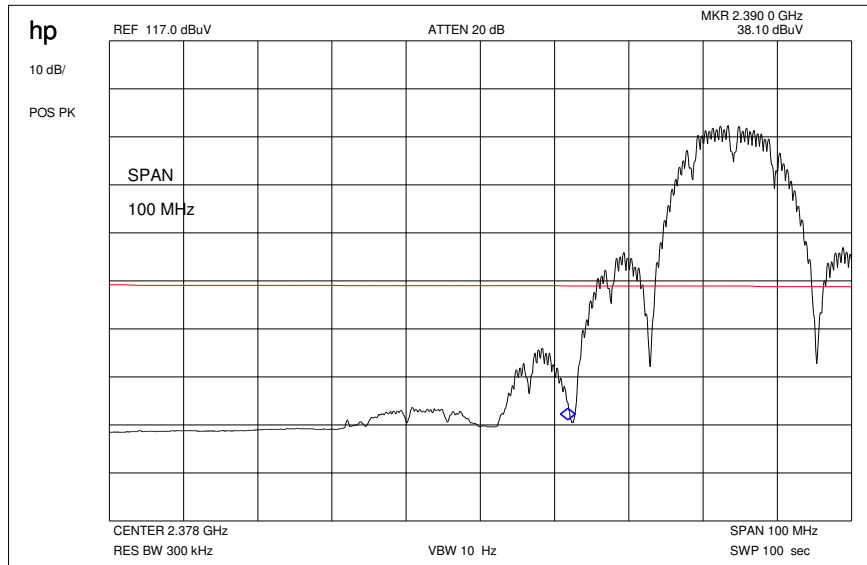
Limits:

<p>Under normal test conditions only</p>	<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>
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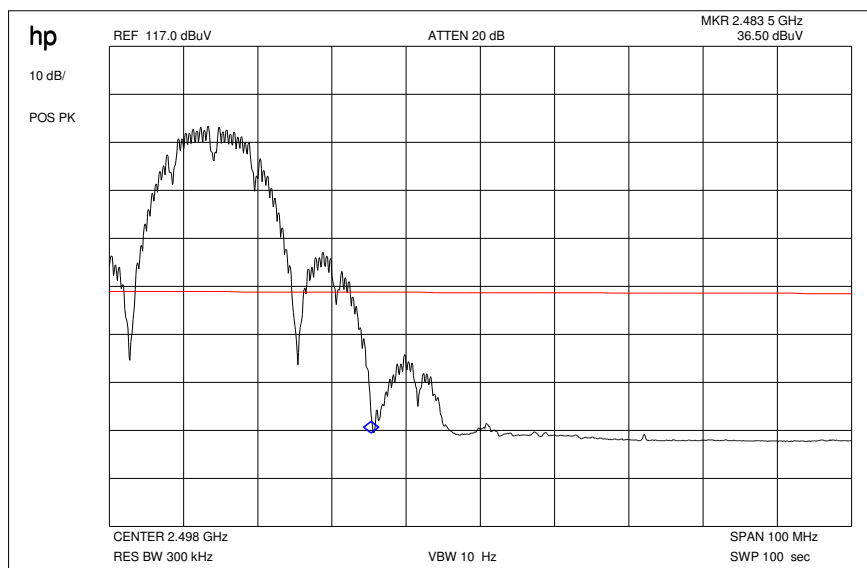
### 5.12 Band-edge compliance of radiated emissions §15.205

#### DSSS

Plot 1: low channel, 2412 MHz

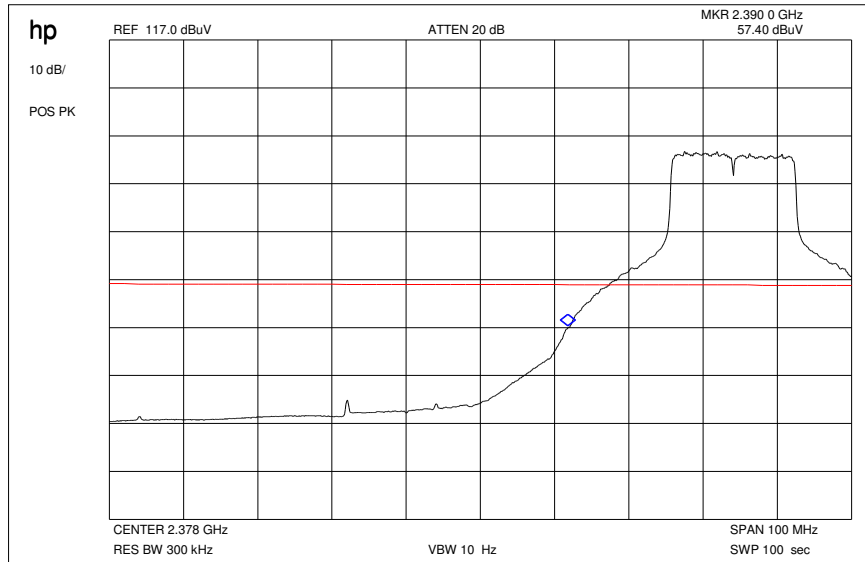


Plot 2: high channel, 2462 MHz

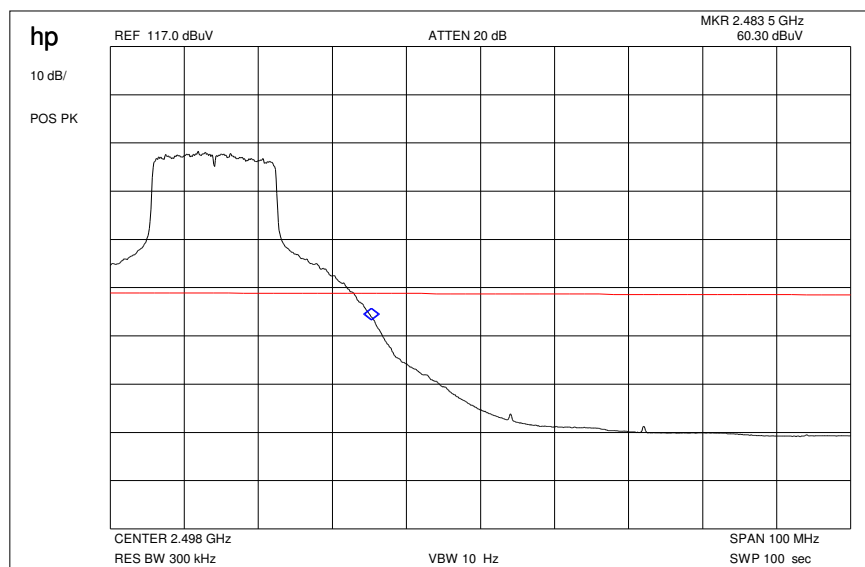


**OFDM**

Plot 1: low channel, 2412 MHz



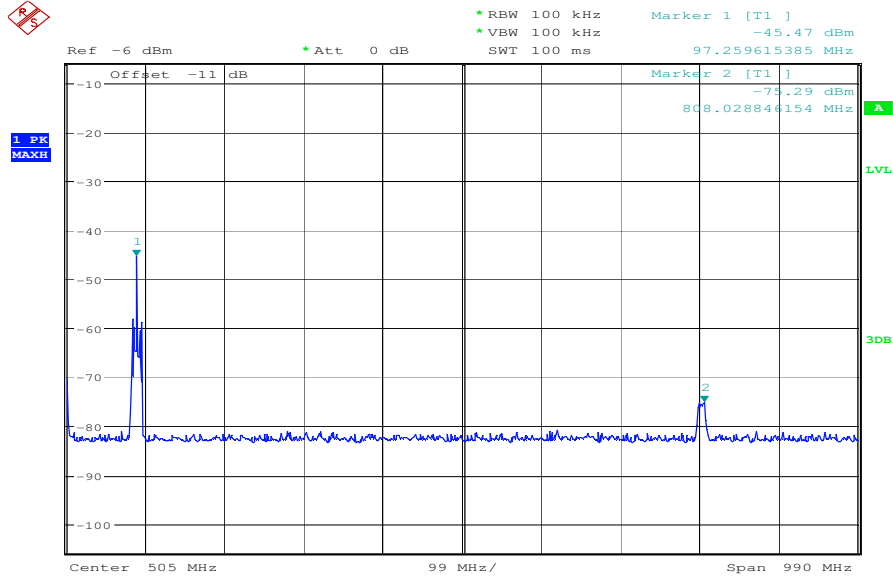
Plot 2: high channel, 2462 MHz



5.13 Spurious Emissions - conducted (Transmitter) §15.247 (c)

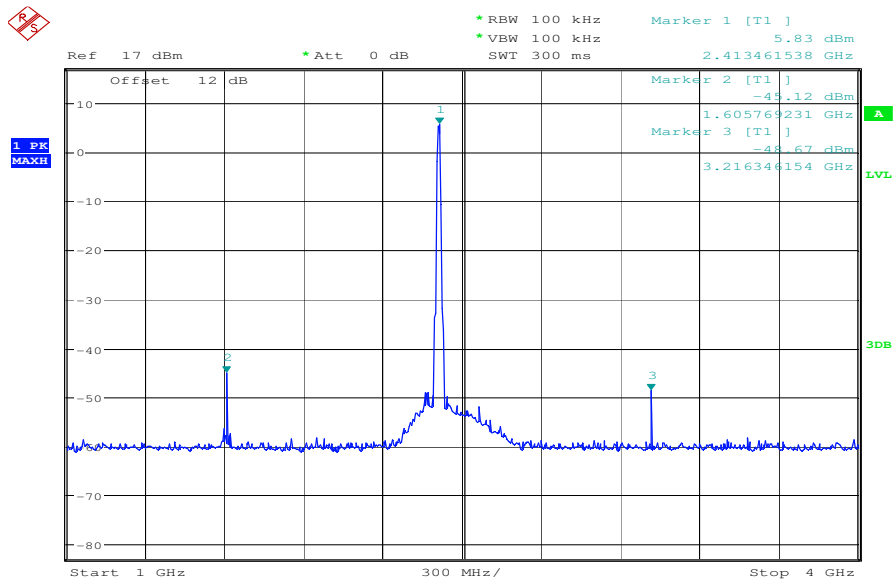
DSSS

Plot 1: Lowest Channel, 2412 MHz



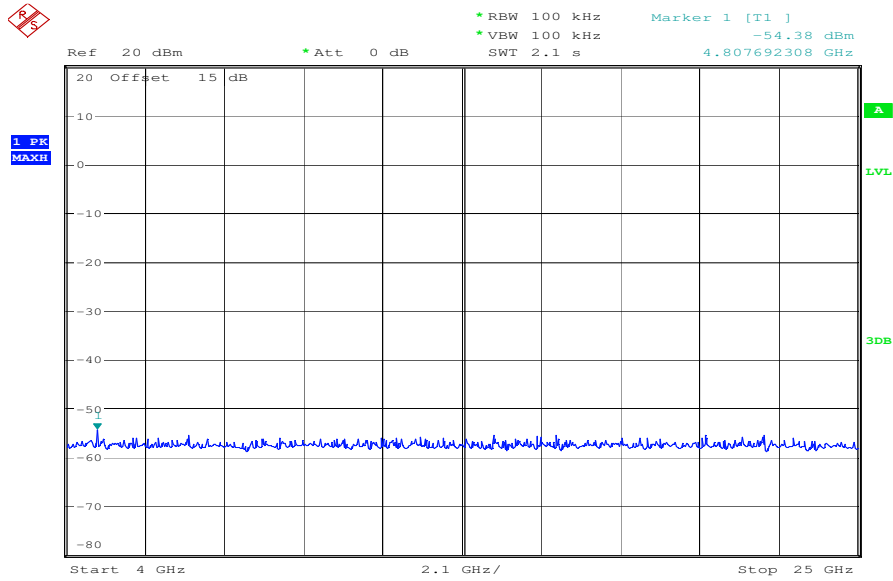
Date: 9.JAN.2009 09:24:35

Plot 2: Lowest Channel, 2412 MHz



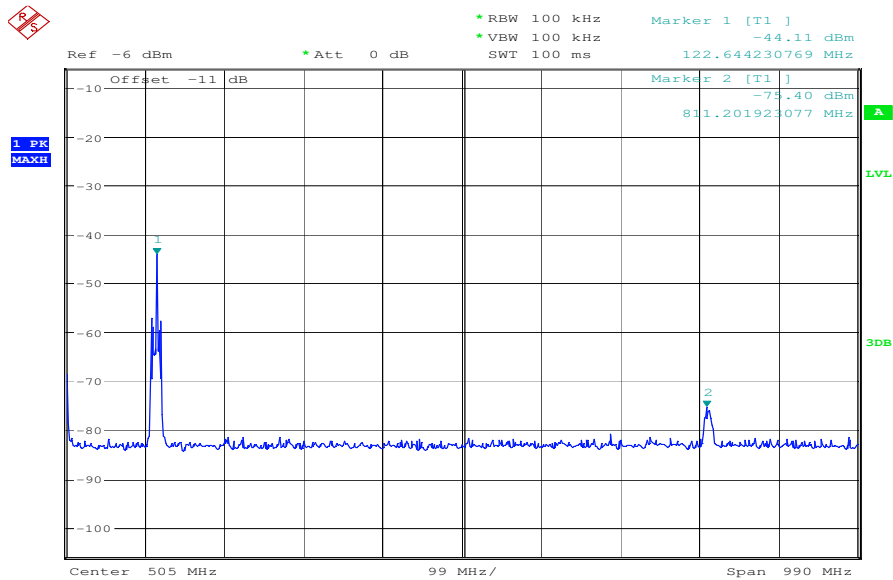
Date: 9.JAN.2009 09:37:23

Plot 3: Lowest Channel, 2412 MHz



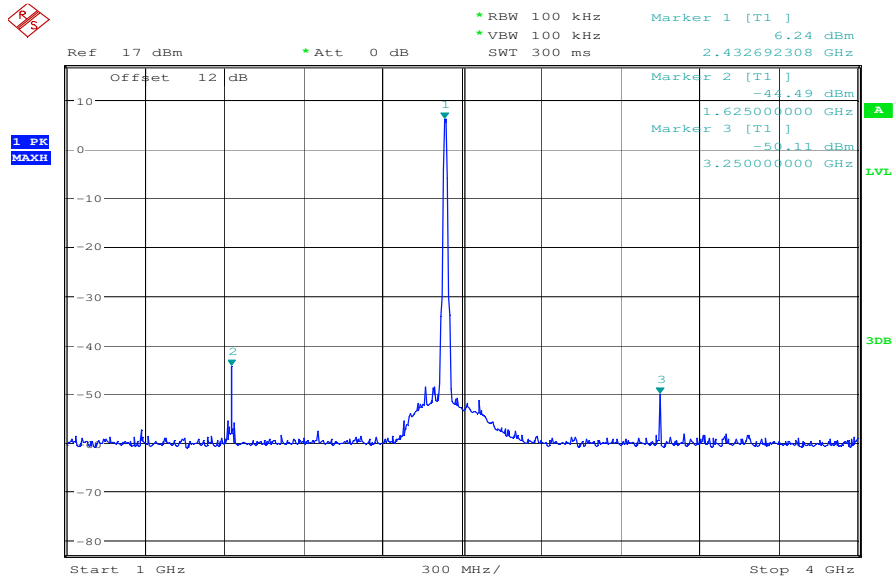
Date: 9.JAN.2009 10:40:38

Plot 4: Middle Channel, 2437 MHz



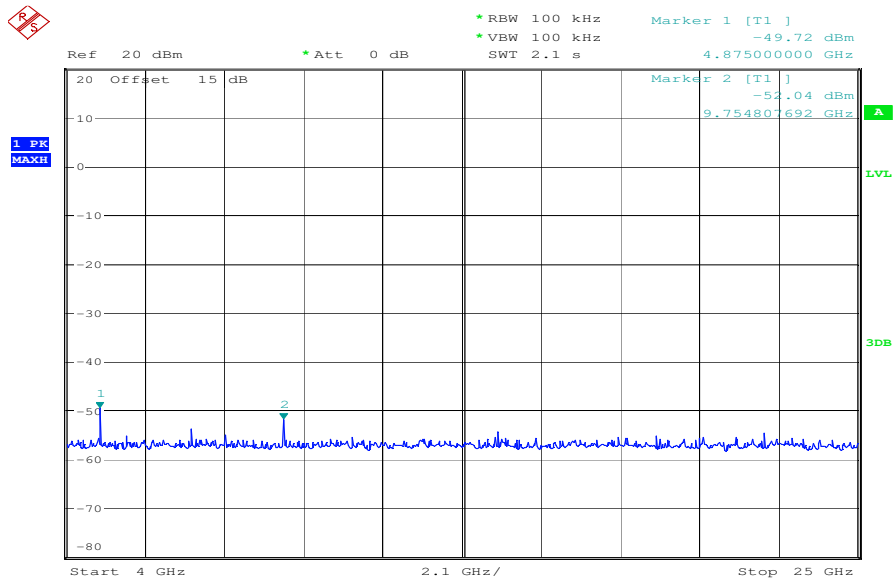
Date: 9.JAN.2009 09:27:20

Plot 5: Middle Channel, 2437 MHz



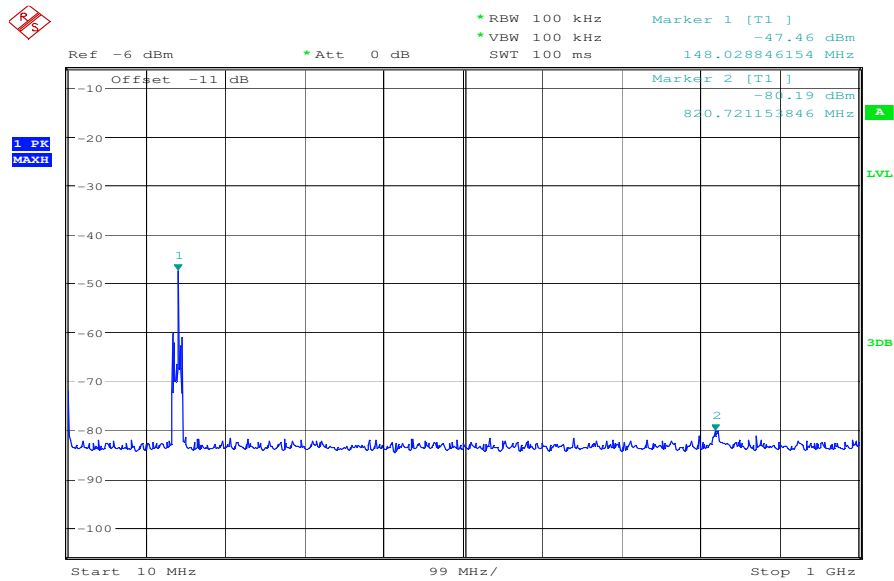
Date: 9.JAN.2009 09:39:48

Plot 6: Middle Channel, 2437 MHz



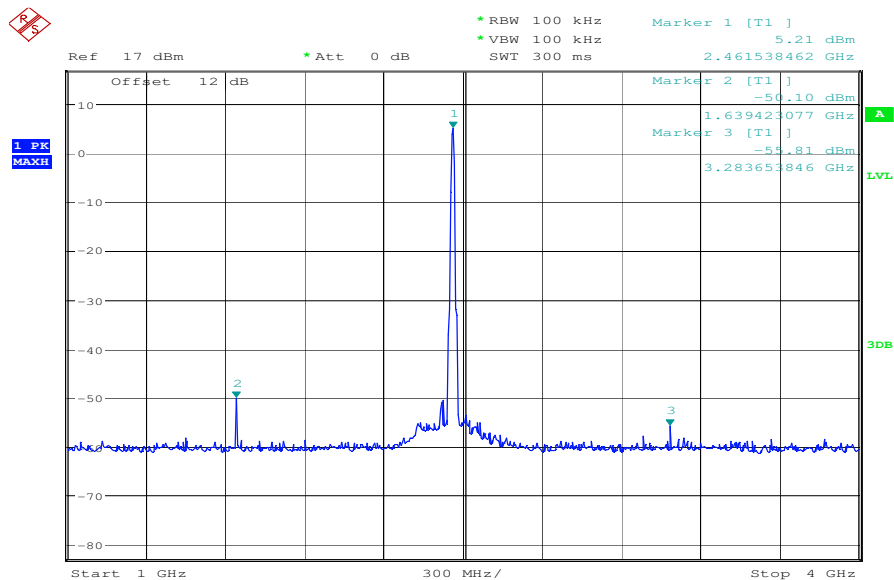
Date: 9.JAN.2009 10:42:58

Plot 7: Highest Channel, 2462 MHz



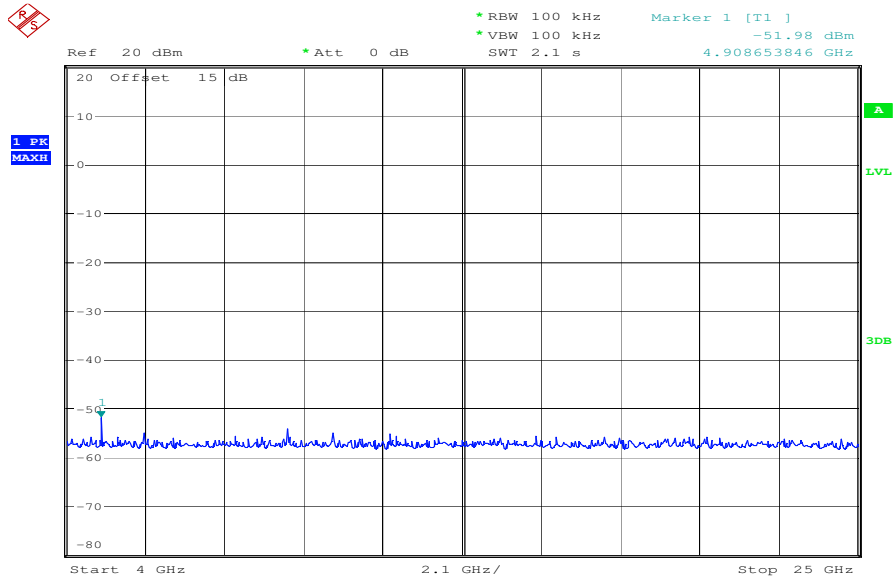
Date: 9.JAN.2009 09:28:57

Plot 8: Highest Channel, 2462 MHz



Date: 9.JAN.2009 09:42:06

Plot 9: Highest Channel, 2462 MHz



Date: 9.JAN.2009 11:16:54

Result & Limits:

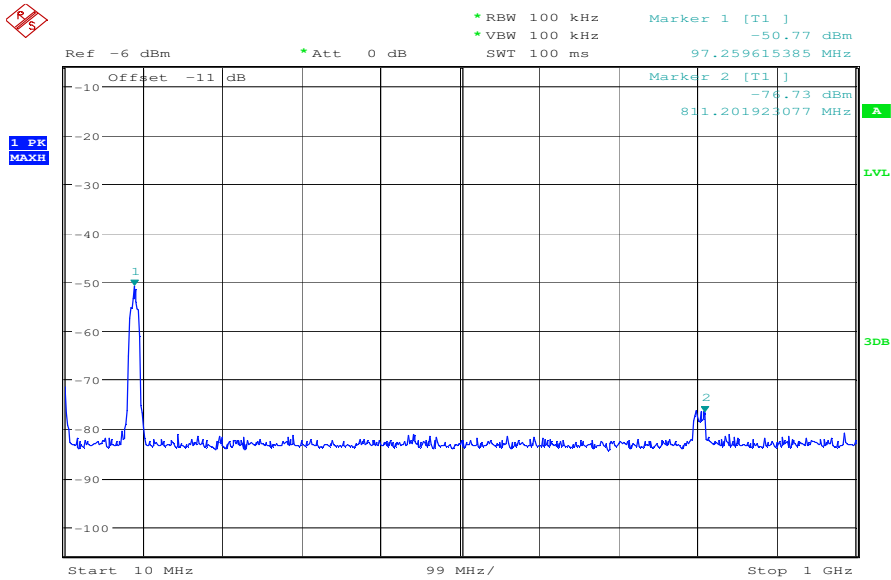
Emission Limitations					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2412		5.83	30 dBm		Operating frequency
All unwanted spurious emissions are below the -20 dBc limit.			-20 dBc		passed
2437		6.24	30 dBm		Operating frequency
All unwanted spurious emissions are below the -20 dBc limit.			-20 dBc		passed
2462		5.21	30 dBm		Operating frequency
All unwanted spurious emissions are below the -20 dBc limit.			-20 dBc		passed
Measurement uncertainty		± 3dB			

F < 1 GHz: RBW: 100 kHz VBW: 100 kHz  
 F > 1 GHz: RBW: 1 MHz VBW: 1 MHz



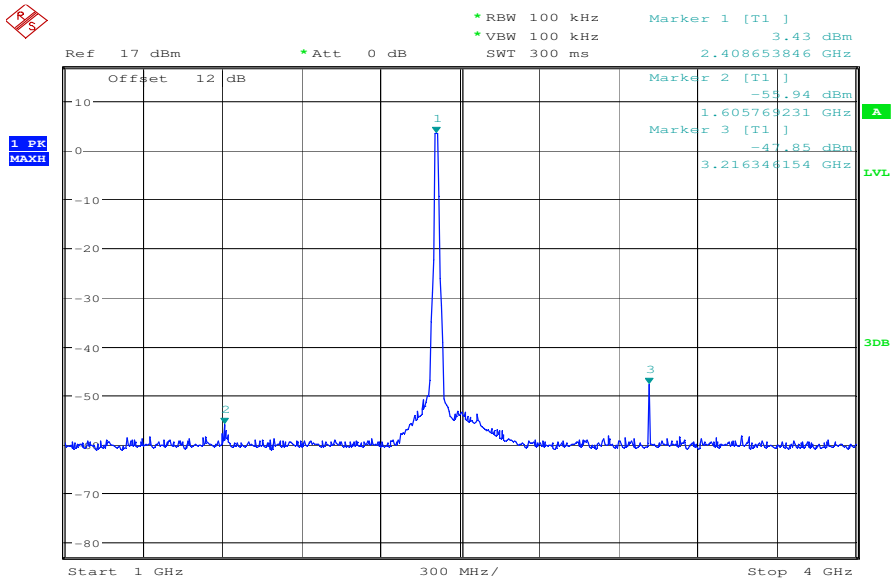
**OFDM**

Plot 1: Lowest Channel, 2412 MHz



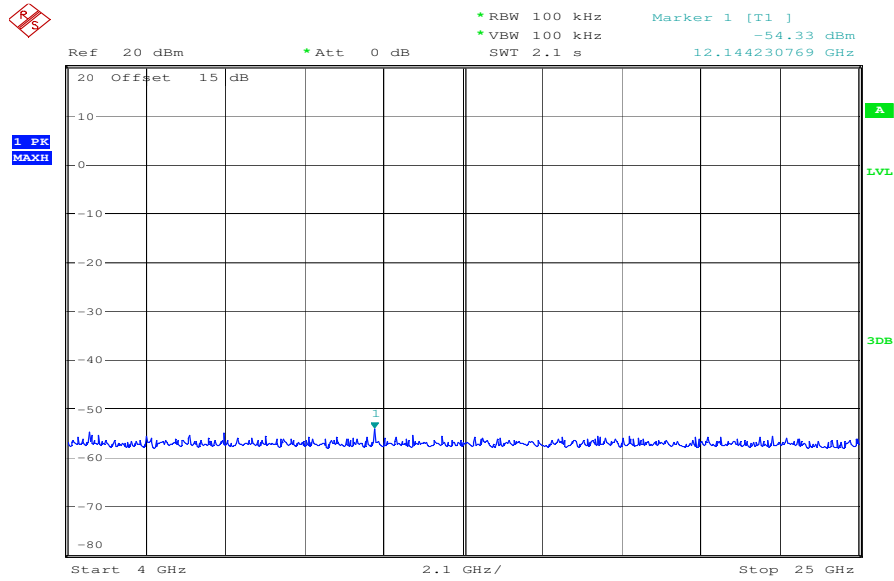
Date: 9.JAN.2009 09:34:26

Plot 2: Lowest Channel, 2412 MHz



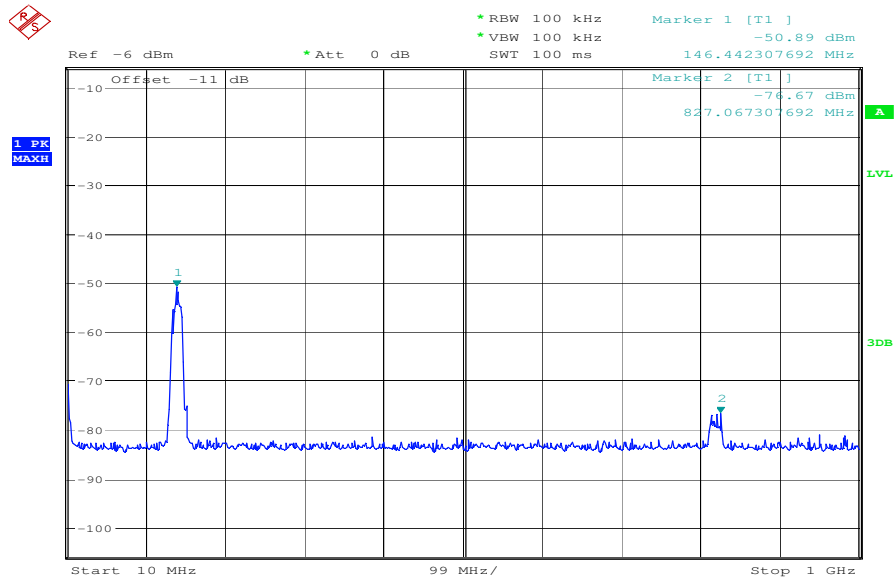
Date: 9.JAN.2009 10:37:32

Plot 3: Lowest Channel, 2412 MHz



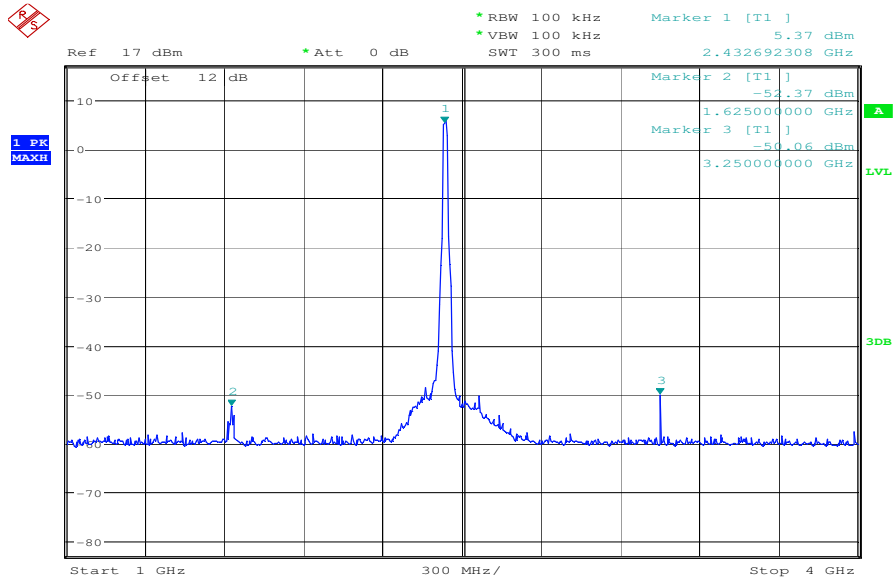
Date: 9.JAN.2009 10:39:26

Plot 4: Middle Channel, 2437 MHz



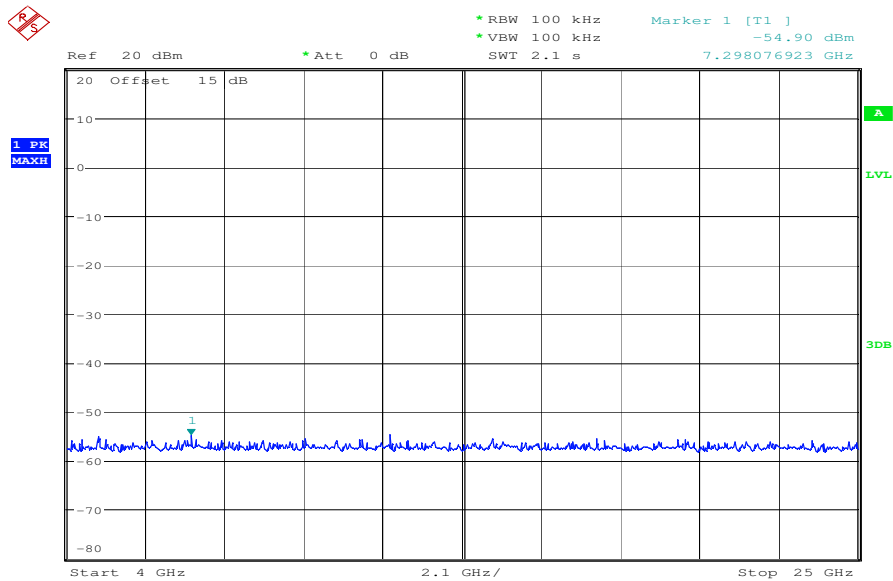
Date: 9.JAN.2009 09:32:27

Plot 5: Middle Channel, 2437 MHz



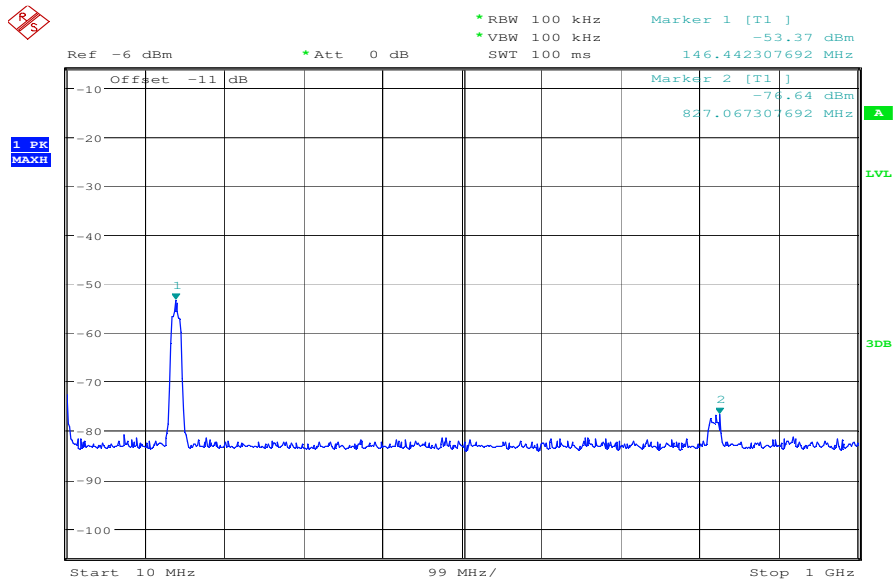
Date: 9.JAN.2009 09:47:14

Plot 6: Middle Channel, 2437 MHz



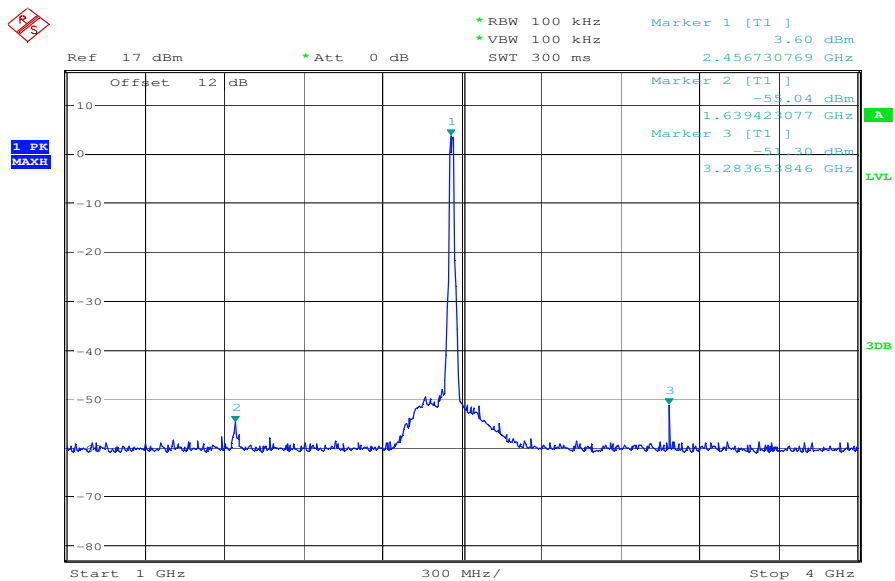
Date: 9.JAN.2009 11:14:30

Plot 7: Highest Channel, 2462 MHz



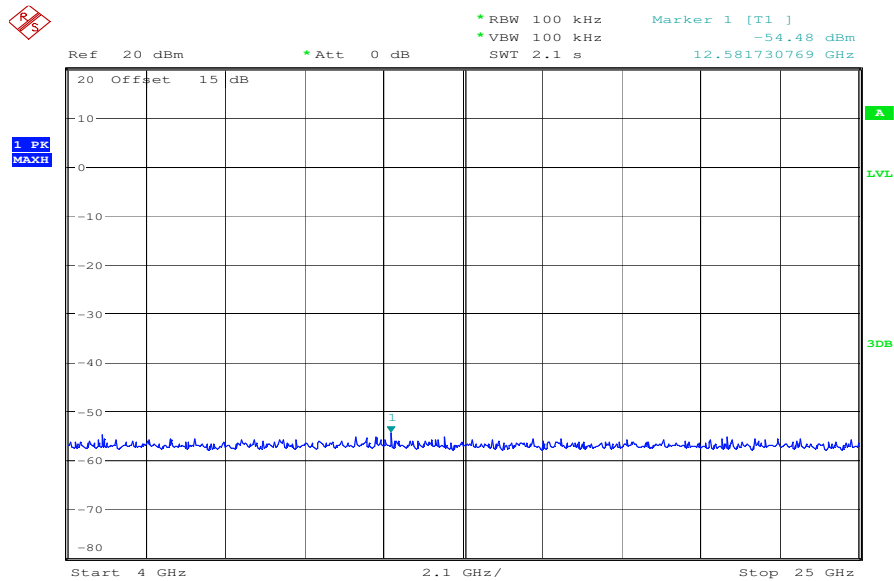
Date: 9.JAN.2009 09:30:52

Plot 8: Highest Channel, 2462 MHz



Date: 9.JAN.2009 09:43:43

Plot 9: Highest Channel, 2462 MHz



Date: 9.JAN.2009 11:16:13

Result & Limits:

Emission Limitations					
f [MHz]		amplitude of emission [dBm]	limit max. allowed emission power	actual attenuation below frequency of operation [dB]	results
2412		3.43	30 dBm		Operating frequency
All unwanted spurious emissions are below the -20 dBc limit.			-20 dBc		passed
2437		5.37	30 dBm		Operating frequency
All unwanted spurious emissions are below the -20 dBc limit.			-20 dBc		passed
2462		3.60	30 dBm		Operating frequency
All unwanted spurious emissions are below the -20 dBc limit.			-20 dBc		passed
Measurement uncertainty		± 3dB			

F < 1 GHz: RBW: 100 kHz VBW: 100 kHz  
 F > 1 GHz: RBW: 1 MHz VBW: 1 MHz

Under normal test conditions only	In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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)).
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Note: For emissions that fall into restricted bands you find the radiated emissions later in the report.

**5.14 Spurious Emissions - radiated (Transmitter) §15.209**

Plot 1: 0.03 - 1 GHz (lowest channel), b – mode, low data rate

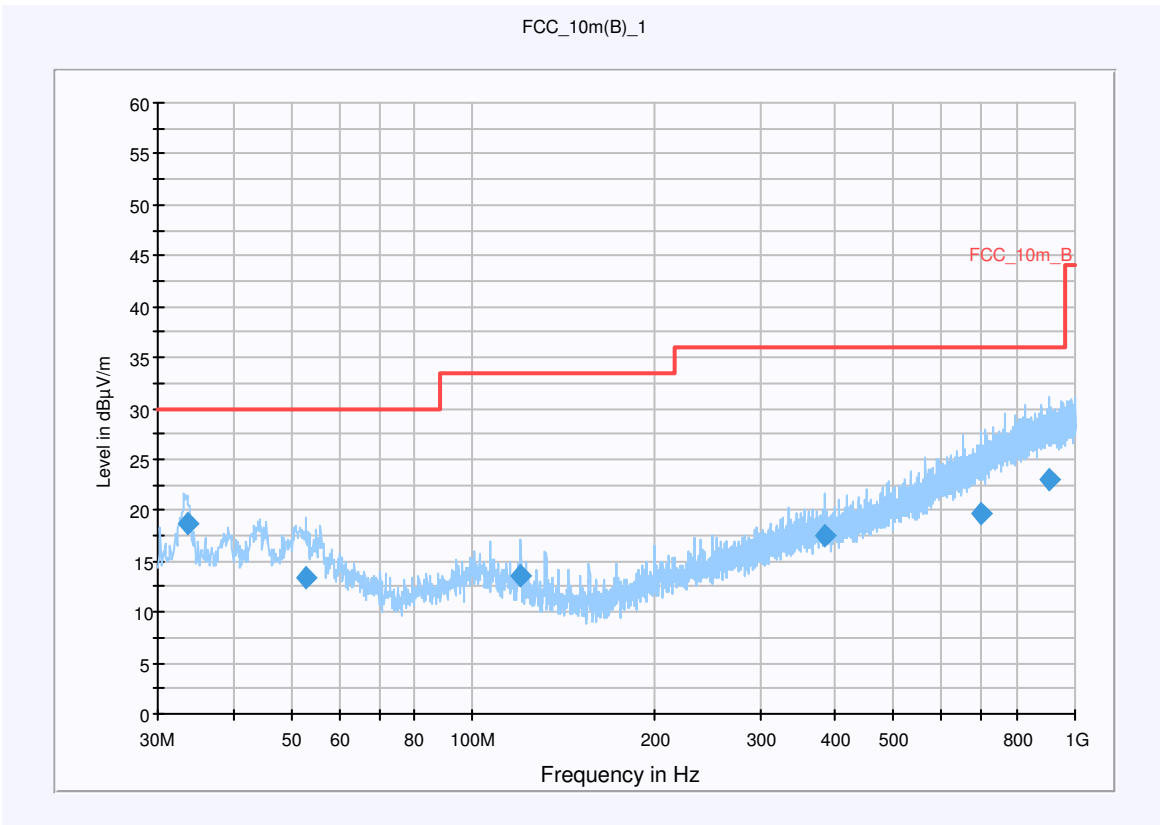
**Common Information**

EUT: Philips Medizin MMS + WLAN a/b/g/ Modul  
 Serial Number: M3002-66480  
 Test Description: FCC part 15.247  
 Operating Conditions: Wlan Mode B; 1Mbps; Ch 2.412 Ghz  
 Operator Name: ZAK  
 Comment: Powered with DC 5 V

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

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

**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30 MHz - 1 GHz                      QuasiPeak                      120 kHz                      15 s                      Receiver



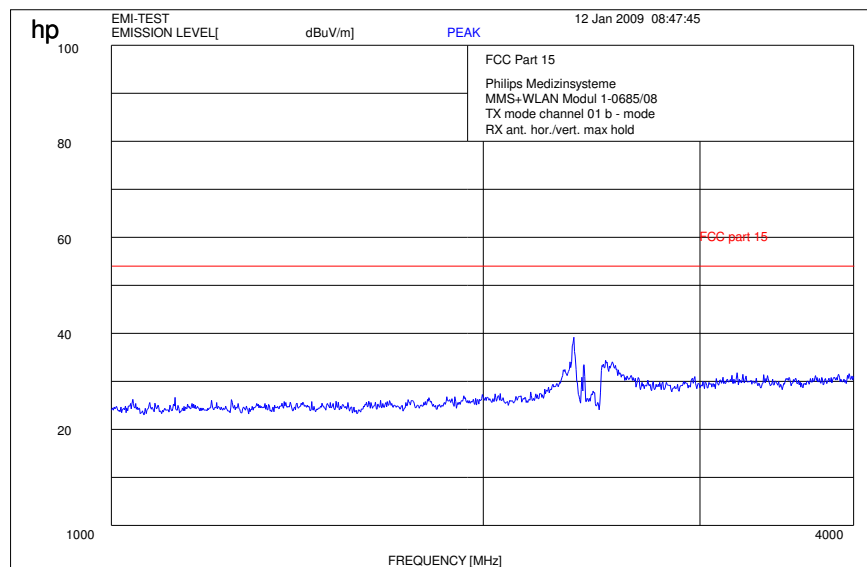
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
33.650950	18.6	15000.000	120.000	100.0	V	35.0	13.0	11.4	30.0	
53.011900	13.4	15000.000	120.000	100.0	V	4.0	13.3	16.6	30.0	
119.922600	13.5	15000.000	120.000	156.0	V	258.0	10.6	20.0	33.5	
384.407450	17.6	15000.000	120.000	240.0	H	276.0	16.7	18.4	36.0	
699.135900	19.7	15000.000	120.000	200.0	V	64.0	22.6	16.3	36.0	
904.678650	22.9	15000.000	120.000	400.0	H	220.0	25.8	13.1	36.0	

**Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]**

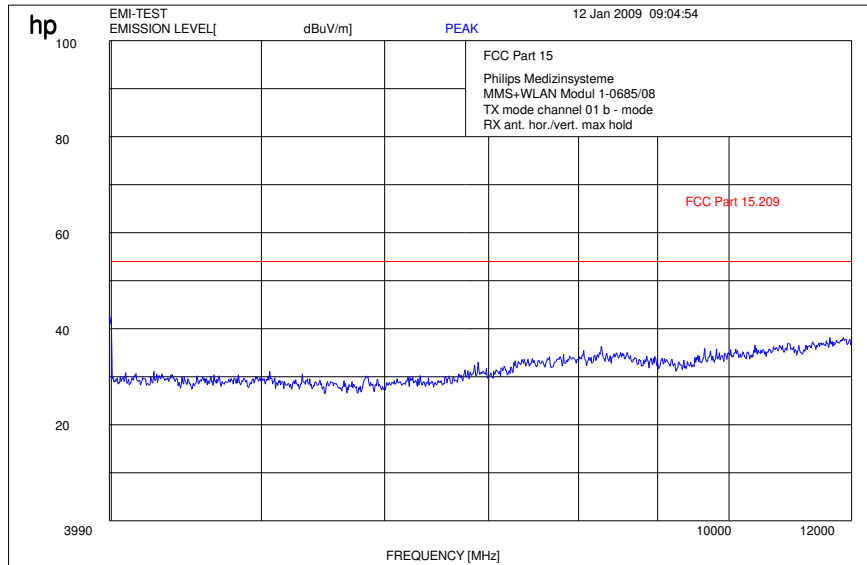
Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 3.32, CAL 07.01.2009
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW ---, CAL 08.04.2010 Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cabel with switch (0908)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

Plot 2: 1 - 4 GHz (lowest channel), b – mode, low data rate

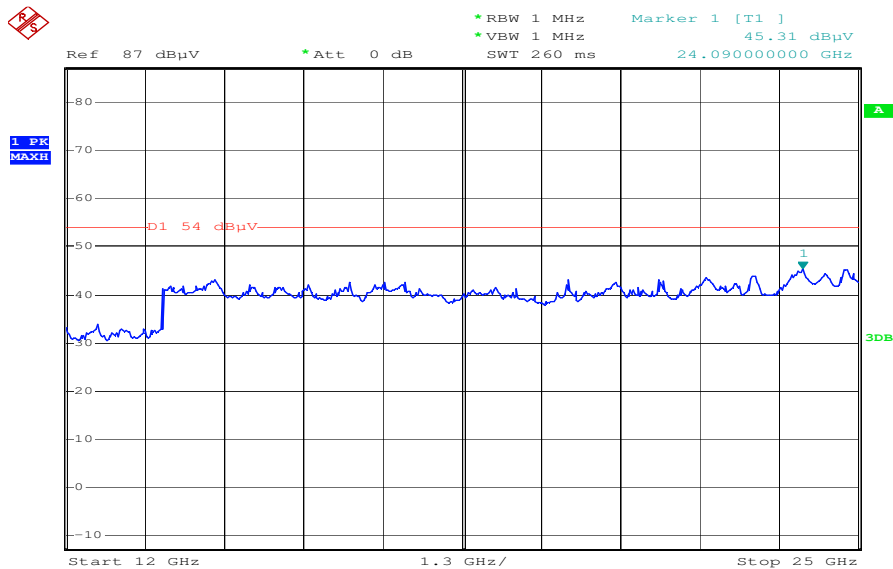


Carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: 4 - 12 GHz (lowest channel), b – mode, low data rate



Plot 4: 12 - 25 GHz (valid for all channels), b – mode, low data rate



Date: 12.JAN.2009 14:44:10



Plot 5: 0.03 - 1 GHz (middle channel), b – mode, low data rate

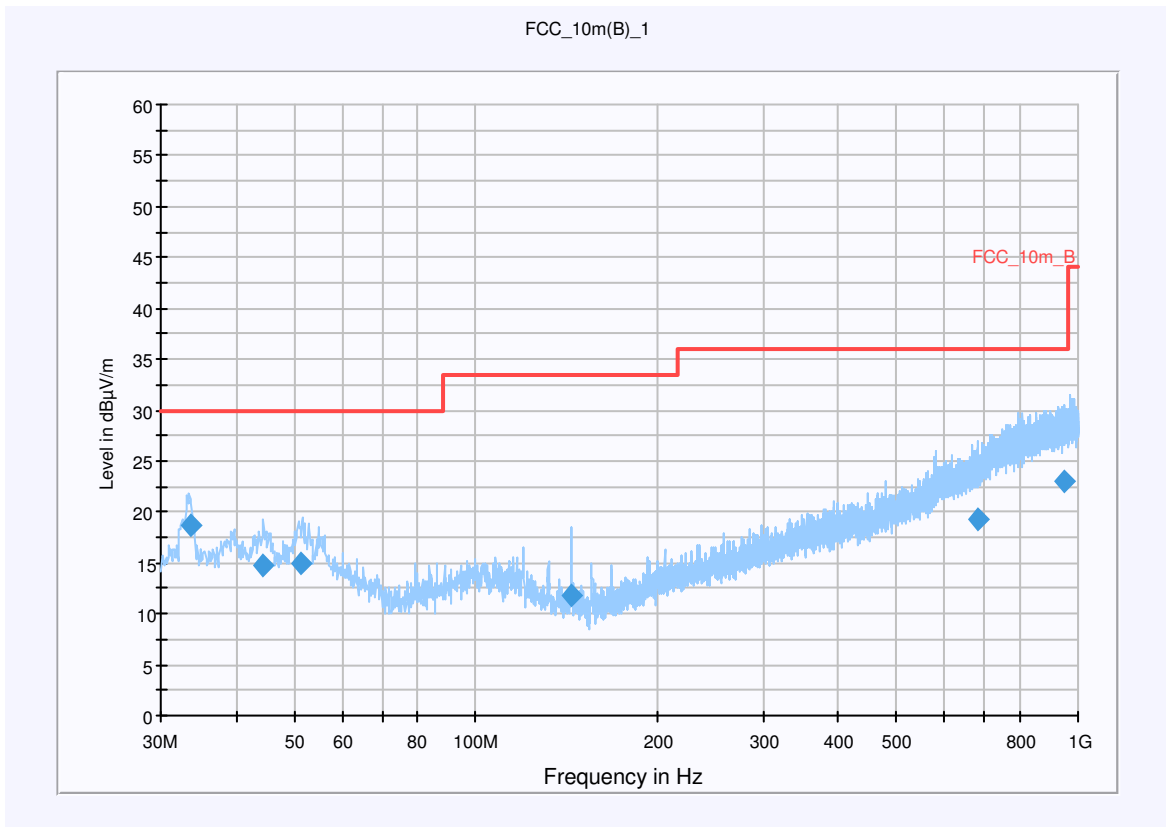
**Common Information**

EUT: Philips Medizin MMS + WLAN a/b/g/ Modul  
 Serial Number: M3002-66480  
 Test Description: FCC part 15.247  
 Operating Conditions: Wlan Mode B; 1Mbps; Ch 2.437 Ghz  
 Operator Name: ZAK  
 Comment: Powered with DC 5 V

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

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

**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30 MHz - 1 GHz                      QuasiPeak                      120 kHz                      15 s                      Receiver



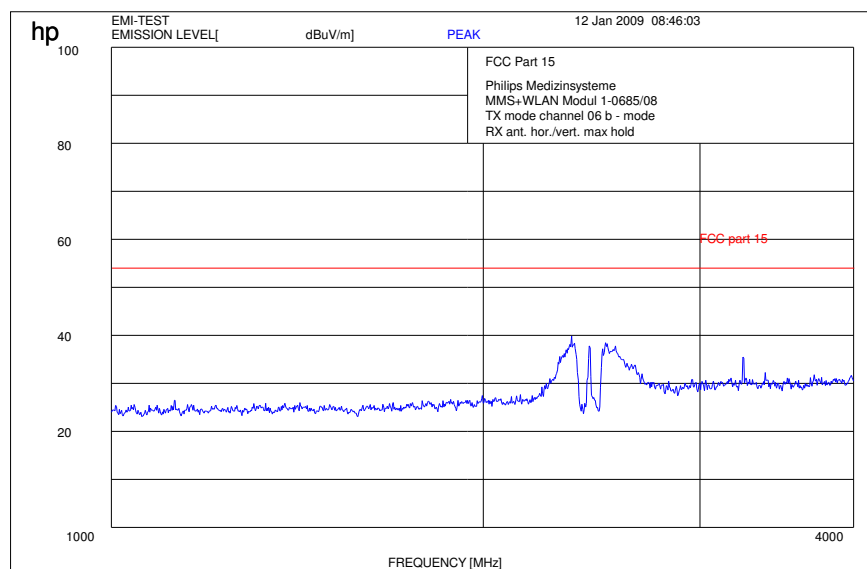
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
33.623350	18.6	15000.000	120.000	100.0	V	31.0	13.0	11.4	30.0	
44.355700	14.8	15000.000	120.000	180.0	V	173.0	13.4	15.2	30.0	
51.185900	15.0	15000.000	120.000	100.0	V	5.0	13.4	15.0	30.0	
144.083750	11.8	15000.000	120.000	100.0	V	18.0	9.0	21.7	33.5	
684.002350	19.3	15000.000	120.000	200.0	H	26.0	22.2	16.7	36.0	
947.686250	23.1	15000.000	120.000	400.0	V	90.0	25.9	12.9	36.0	

**Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]**

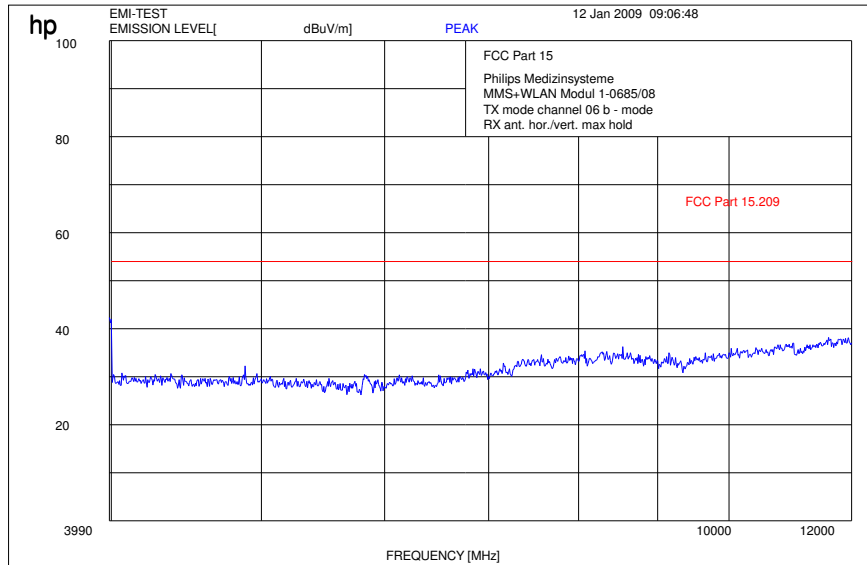
Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 3.32, CAL 07.01.2009
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW ---, CAL 08.04.2010 Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cabel with switch (0908)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

Plot 6: 1 - 4 GHz (middle channel), b – mode, low data rate



Carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 7: 4 - 12 GHz (middle channel), b – mode, low data rate



Plot 8: 0.03 - 1 GHz (highest channel), b – mode, low data rate

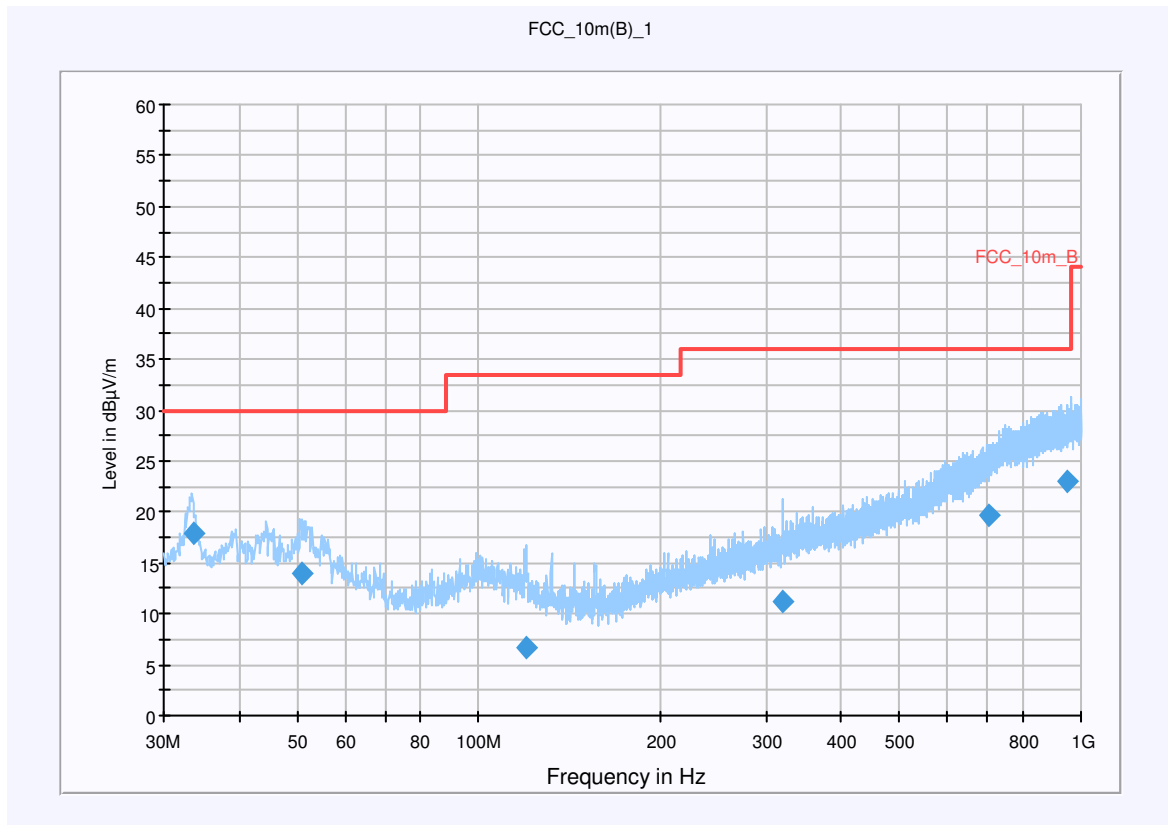
**Common Information**

EUT: Philips Medizin MMS + WLAN a/b/g/ Modul  
 Serial Number: M3002-66480  
 Test Description: FCC part 15.247  
 Operating Conditions: Wlan Mode B; 1Mbits; Ch 2.462 Ghz  
 Operator Name: ZAK  
 Comment: Powered with DC 5 V

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

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

**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30 MHz - 1 GHz                      QuasiPeak                      120 kHz                      15 s                      Receiver



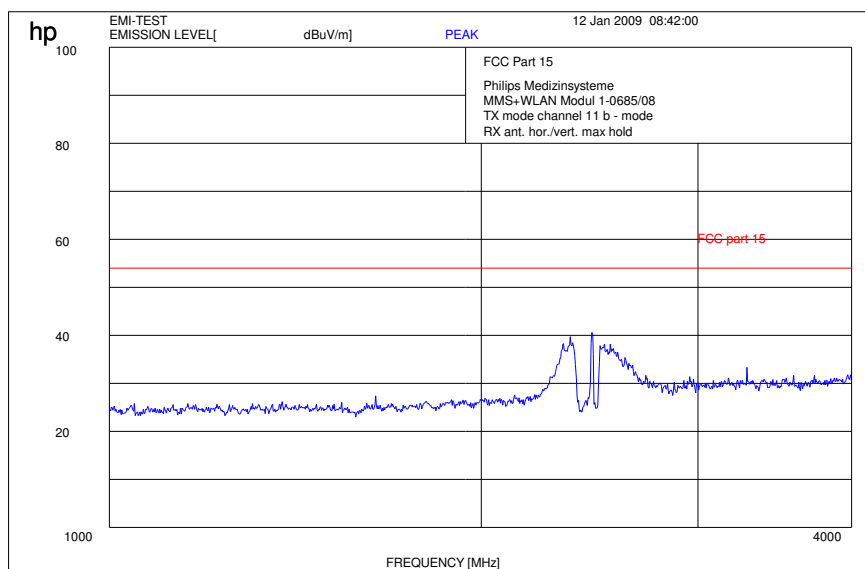
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
33.562900	18.0	15000.000	120.000	126.0	V	5.0	13.0	12.0	30.0	
50.718050	14.0	15000.000	120.000	135.0	V	18.0	13.5	16.0	30.0	
119.517350	6.7	15000.000	120.000	115.0	V	46.0	10.6	26.8	33.5	
319.719700	11.2	15000.000	120.000	214.0	H	38.0	15.3	24.8	36.0	
701.980000	19.8	15000.000	120.000	263.0	H	209.0	22.7	16.2	36.0	
945.145100	23.0	15000.000	120.000	376.0	V	236.0	25.9	13.0	36.0	

**Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]**

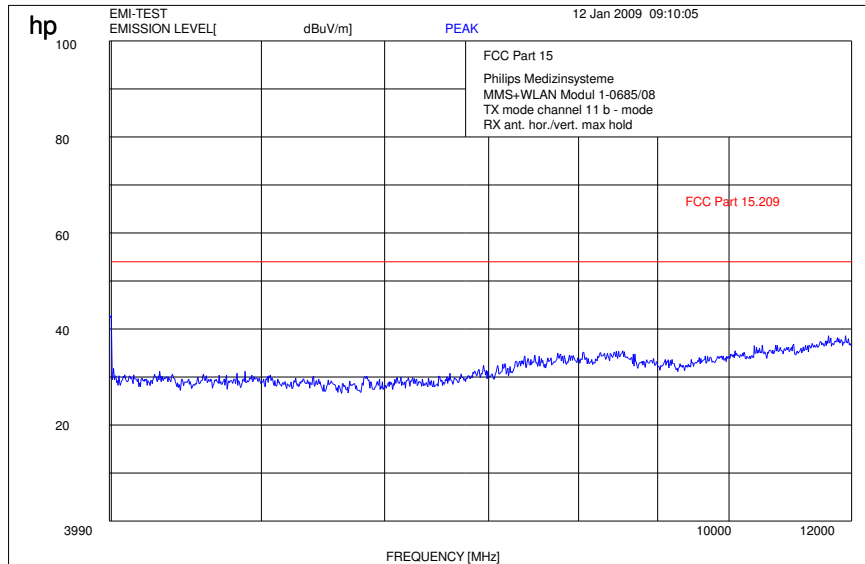
Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 3.32, CAL 07.01.2009
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW ---, CAL 08.04.2010 Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cabel with switch (0908)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

Plot 9: 1 - 4 GHz (highest channel), b – mode, low data rate



Carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 10: 4 - 12 GHz (highest channel), b – mode, low data rate



Results:

SPURIOUS EMISSIONS LEVEL §15.209								
2412 MHz			2437 MHz			2462 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No critical peaks detected.			No critical peaks detected.			No critical peaks detected.		
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

Limits: § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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)).

Limits: § 15.109

Frequency (MHz)	Field strength (dBµV/m)	Measurement distance (m)
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
above 960	54.0	3

Plot 1: 0.03 - 1 GHz (lowest channel), g – mode, high data rate

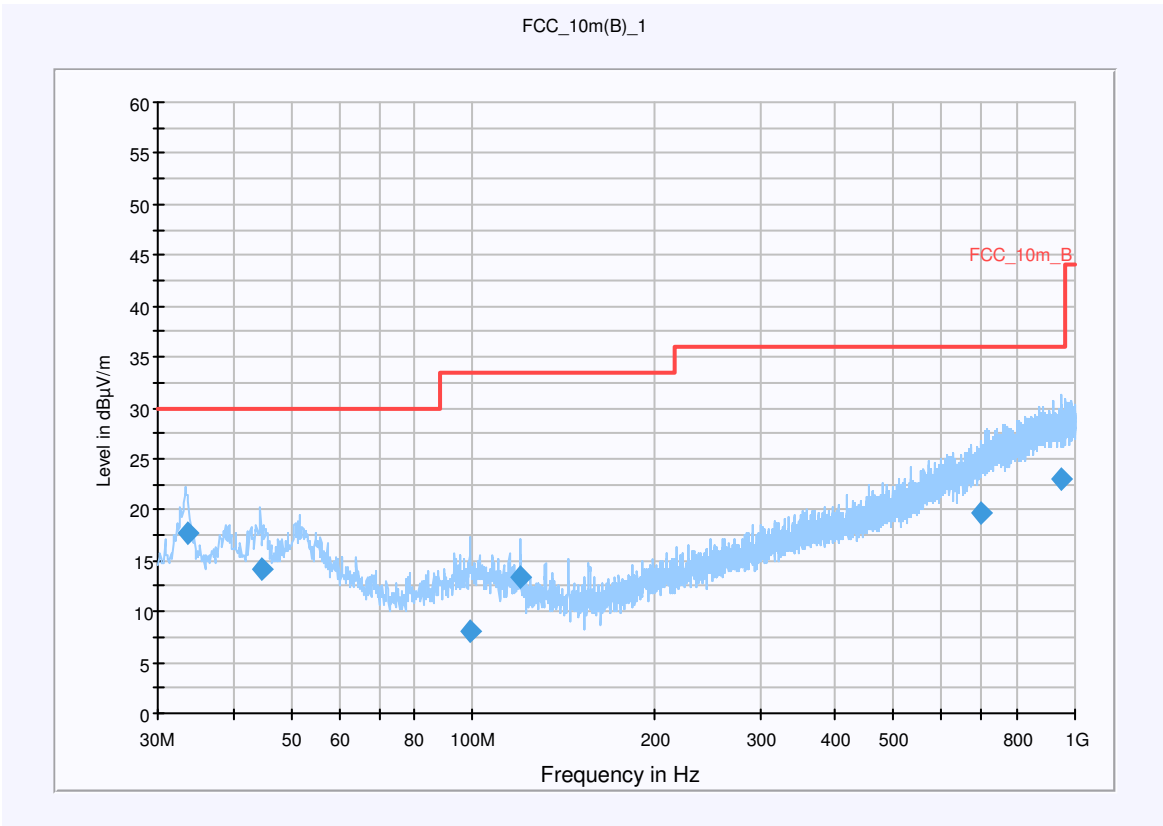
**Common Information**

EUT: Philips Medizin MMS + WLAN a/b/g/ Modul  
 Serial Number: M3002-66480  
 Test Description: FCC part 15.247  
 Operating Conditions: Wlan Mode G 54Mbits; Ch 2.412 Ghz  
 Operator Name: ZAK  
 Comment: Powered with DC 5 V

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

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

**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30 MHz - 1 GHz                      QuasiPeak                      120 kHz                      15 s                      Receiver



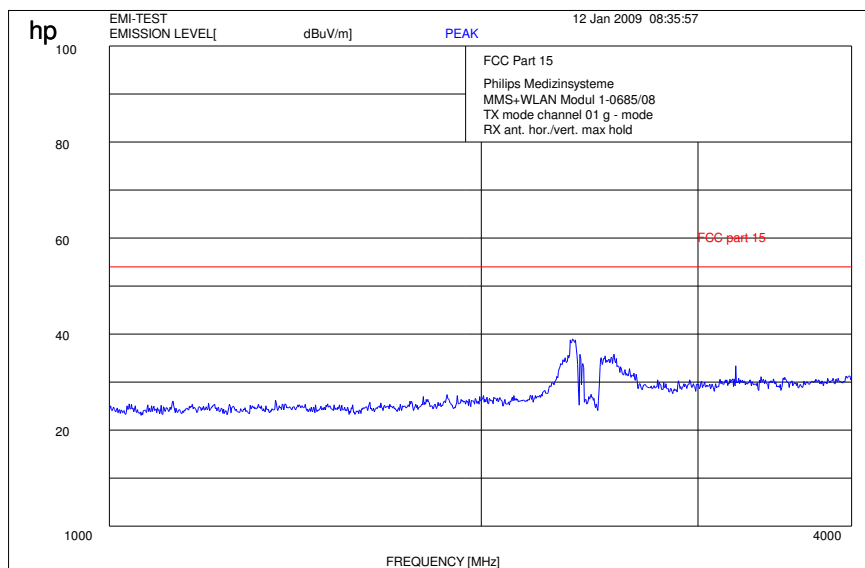
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
33.602000	17.6	15000.000	120.000	152.0	V	41.0	13.0	12.4	30.0	
44.504650	14.2	15000.000	120.000	194.0	V	167.0	13.4	15.8	30.0	
99.034850	8.1	15000.000	120.000	304.0	H	207.0	12.2	25.4	33.5	
119.903650	13.4	15000.000	120.000	200.0	V	220.0	10.6	20.1	33.5	
697.109300	19.7	15000.000	120.000	400.0	V	207.0	22.5	16.3	36.0	
950.308100	23.1	15000.000	120.000	177.0	V	76.0	26.0	12.9	36.0	

**Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]**

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 3.32, CAL 07.01.2009
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW ---, CAL 08.04.2010 Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cabel with switch (0908)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

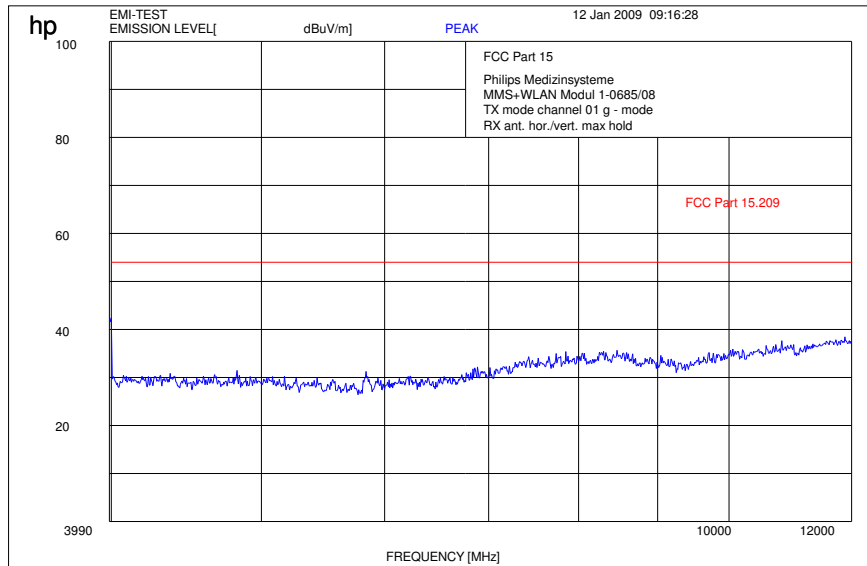
Plot 2: 1 - 4 GHz (lowest channel), g – mode, high data rate



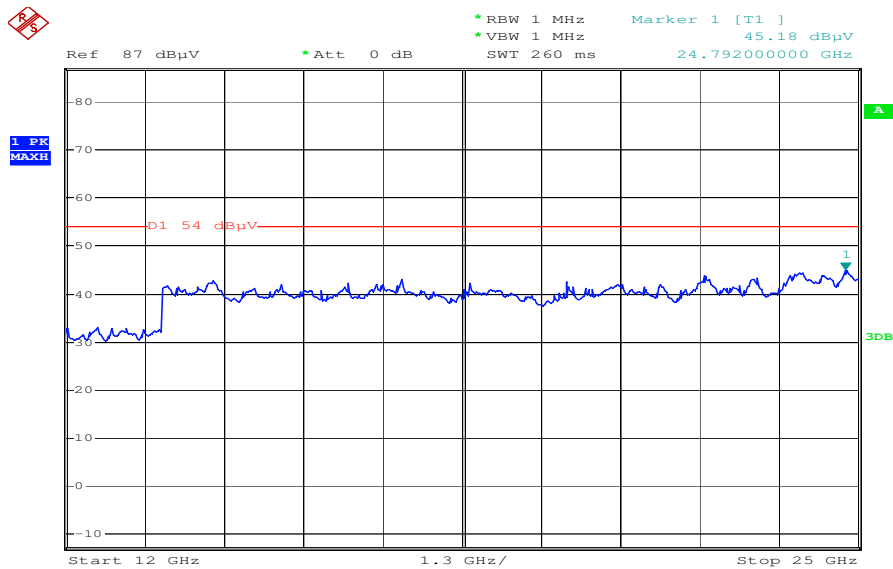
Carrier signal is notched with a 2.4 GHz band rejection filter.



Plot 3: 4 - 12 GHz (lowest channel), g – mode, high data rate



Plot 4: 12 - 25 GHz (valid for all channels), g – mode, high data rate



Date: 12.JAN.2009 14:45:26

Plot 5: 0.03 - 1 GHz (middle channel), g – mode, high data rate

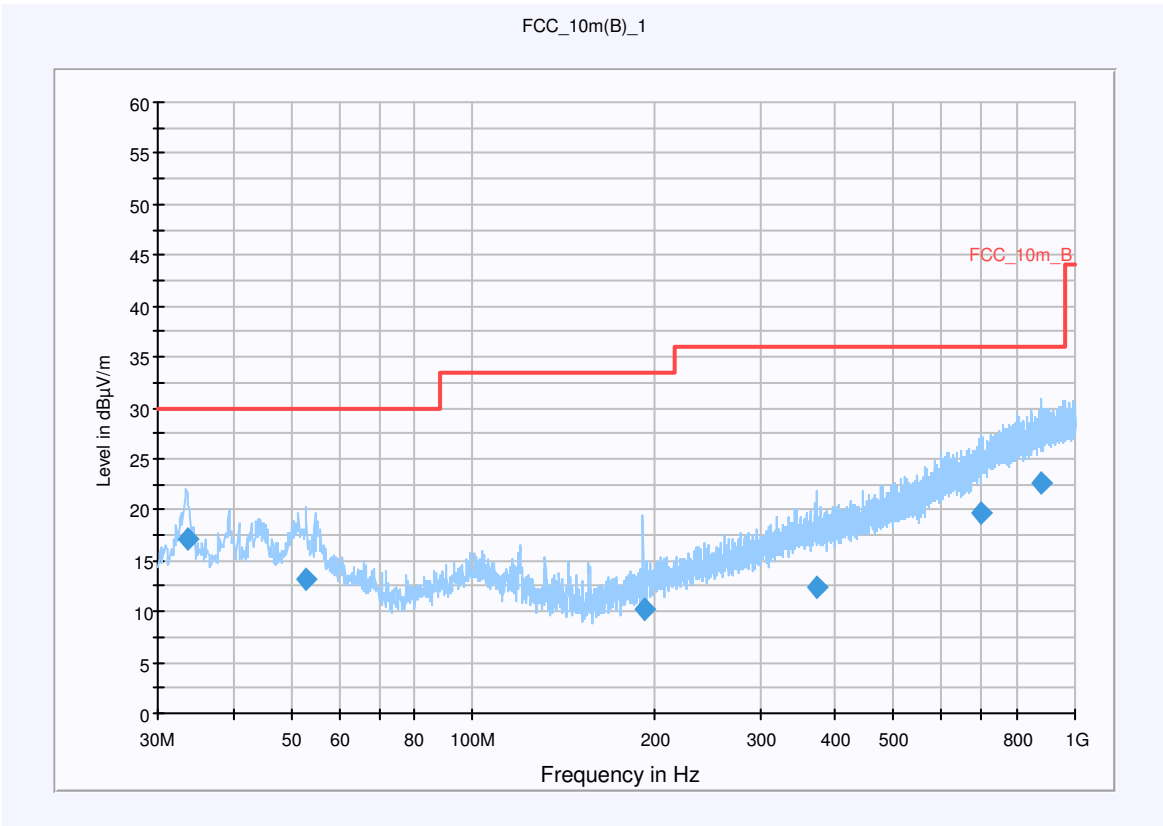
**Common Information**

EUT: Philips Medizin MMS + WLAN a/b/g/ Modul  
 Serial Number: M3002-66480  
 Test Description: FCC part 15.247  
 Operating Conditions: Wlan Mode G 54Mbits; Ch 2.437 Ghz; Output Power = 18.0  
 Operator Name: ZAK  
 Comment: Powered with DC 5 V

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

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

**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30 MHz - 1 GHz                      QuasiPeak                      120 kHz                      15 s                      Receiver



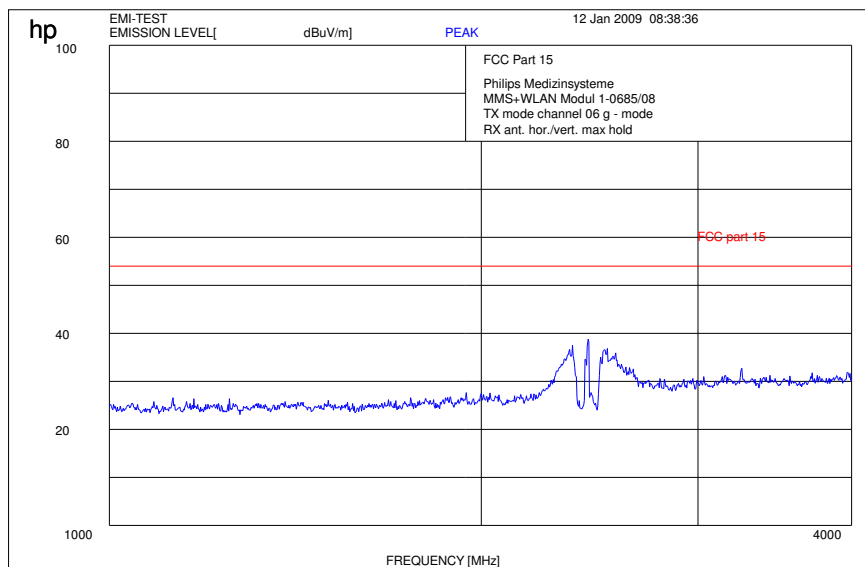
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
33.708100	17.2	15000.000	120.000	100.0	V	50.0	13.0	12.8	30.0	
52.771050	13.1	15000.000	120.000	200.0	V	143.0	13.3	16.9	30.0	
192.111350	10.1	15000.000	120.000	100.0	V	227.0	11.3	23.4	33.5	
371.445100	12.3	15000.000	120.000	276.0	H	69.0	16.5	23.7	36.0	
696.753450	19.6	15000.000	120.000	100.0	V	204.0	22.5	16.4	36.0	
880.320200	22.7	15000.000	120.000	394.0	V	134.0	25.5	13.3	36.0	

**Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]**

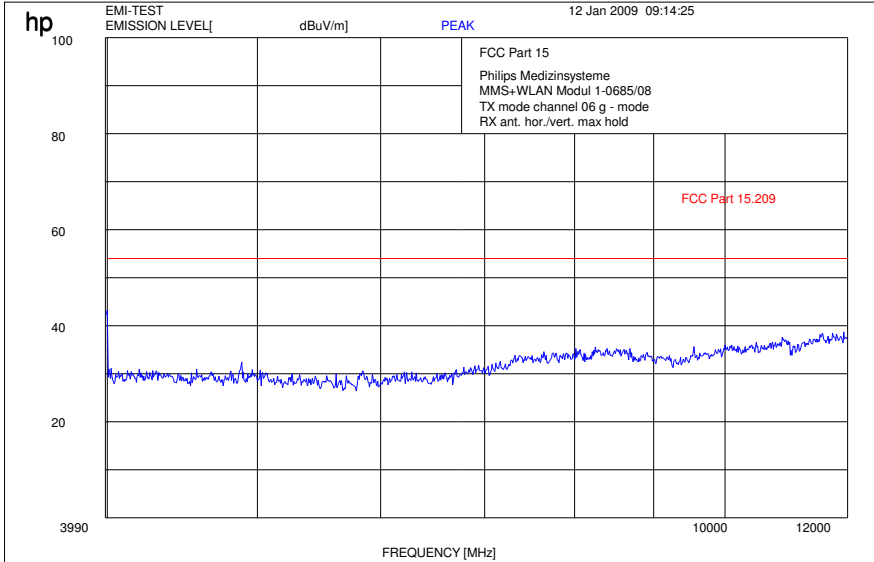
Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 3.32, CAL 07.01.2009
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW ---, CAL 08.04.2010 Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cabel with switch (0908)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

Plot 6: 1 - 4 GHz (middle channel), g – mode, high data rate



Carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 7: 4 - 12 GHz (middle channel), g – mode, high data rate



Plot 8: 0.03 - 1 GHz (highest channel), g – mode, high data rate

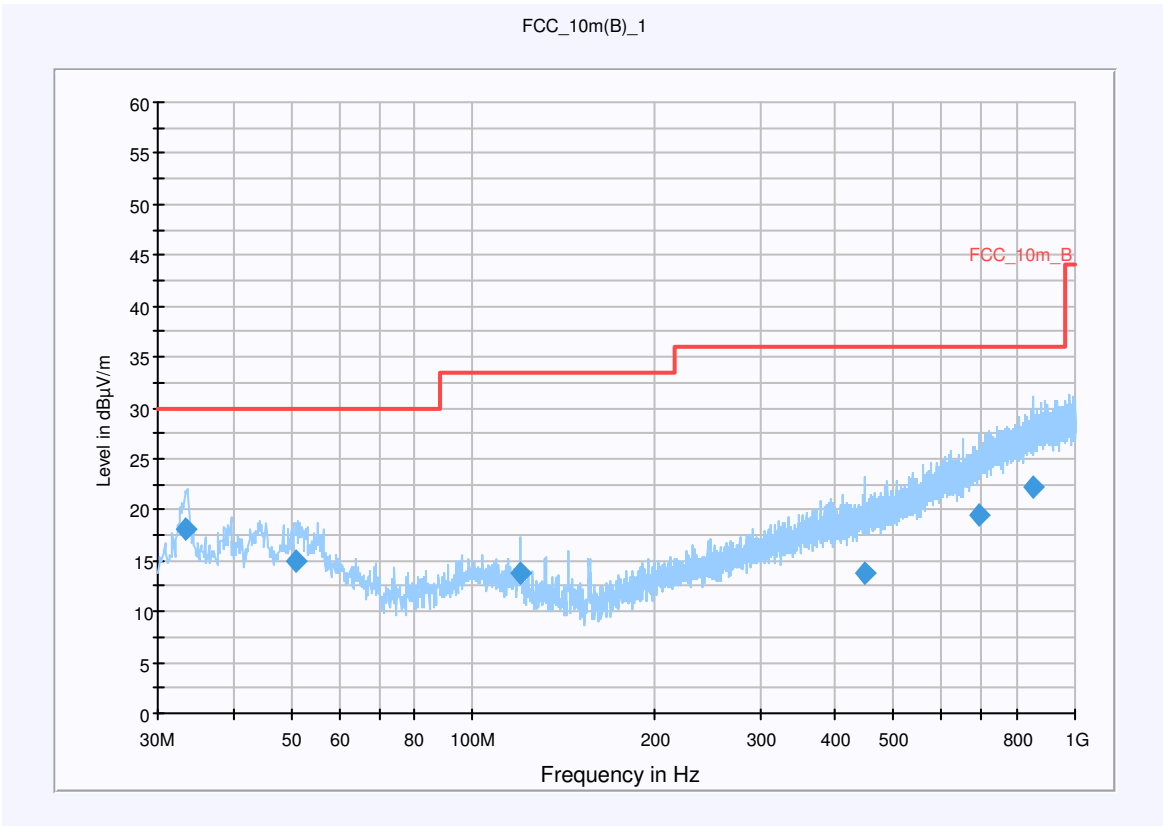
**Common Information**

EUT: Philips Medizin MMS + WLAN a/b/g/ Modul  
 Serial Number: M3002-66480  
 Test Description: FCC part 15.247  
 Operating Conditions: Wlan Mode G 54Mbits; Ch 2.462 Ghz; Output Power = 17.0  
 Operator Name: ZAK  
 Comment: Powered with DC 5 V

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

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

**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30 MHz - 1 GHz                      QuasiPeak                      120 kHz                      15 s                      Receiver



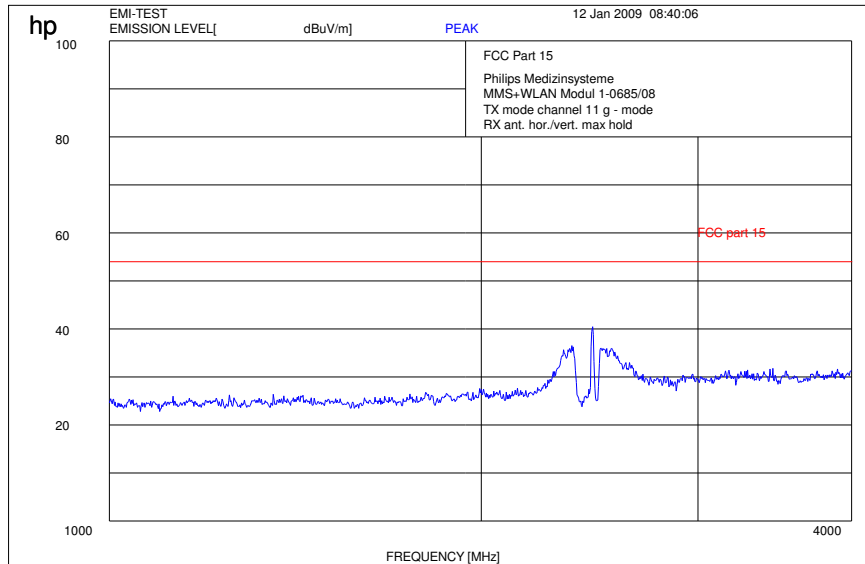
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
33.442350	18.1	15000.000	120.000	135.0	V	10.0	13.0	11.9	30.0	
50.884750	14.9	15000.000	120.000	100.0	V	41.0	13.5	15.1	30.0	
119.929800	13.8	15000.000	120.000	100.0	V	262.0	10.6	19.7	33.5	
448.074950	13.7	15000.000	120.000	215.0	H	111.0	17.6	22.3	36.0	
694.216100	19.5	15000.000	120.000	200.0	V	289.0	22.4	16.5	36.0	
848.305500	22.1	15000.000	120.000	385.0	V	231.0	25.1	13.9	36.0	

**Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]**

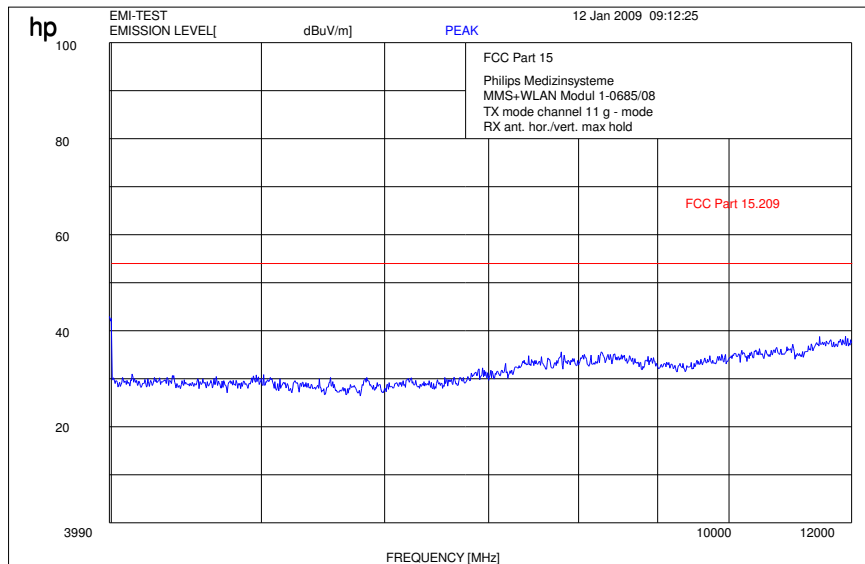
Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 3.32, CAL 07.01.2009
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW ---, CAL 08.04.2010 Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cabel with switch (0908)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

Plot 9: 1 - 4 GHz (highest channel), g – mode, high data rate



Carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 10: 4 - 12 GHz (highest channel), g – mode, high data rate



Results:

SPURIOUS EMISSIONS LEVEL §15.209								
2412 MHz			2437 MHz			2462 MHz		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No critical peaks detected.			No critical peaks detected.			No critical peaks detected.		
Measurement uncertainty			±3 dB					

f < 1 GHz : RBW/VBW: 100 kHz

f ≥ 1GHz : RBW/VBW: 1 MHz

Limits: § 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. 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)).

Limits: § 15.109

Frequency (MHz)	Field strength (dBµV/m)	Measurement distance (m)
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
above 960	54.0	3

**5.15 Spurious Emissions - radiated (Receiver) §15.109 / 209**

Plot 1: 0.03 - 1 GHz vertical / horizontal (receiver), valid for both modes

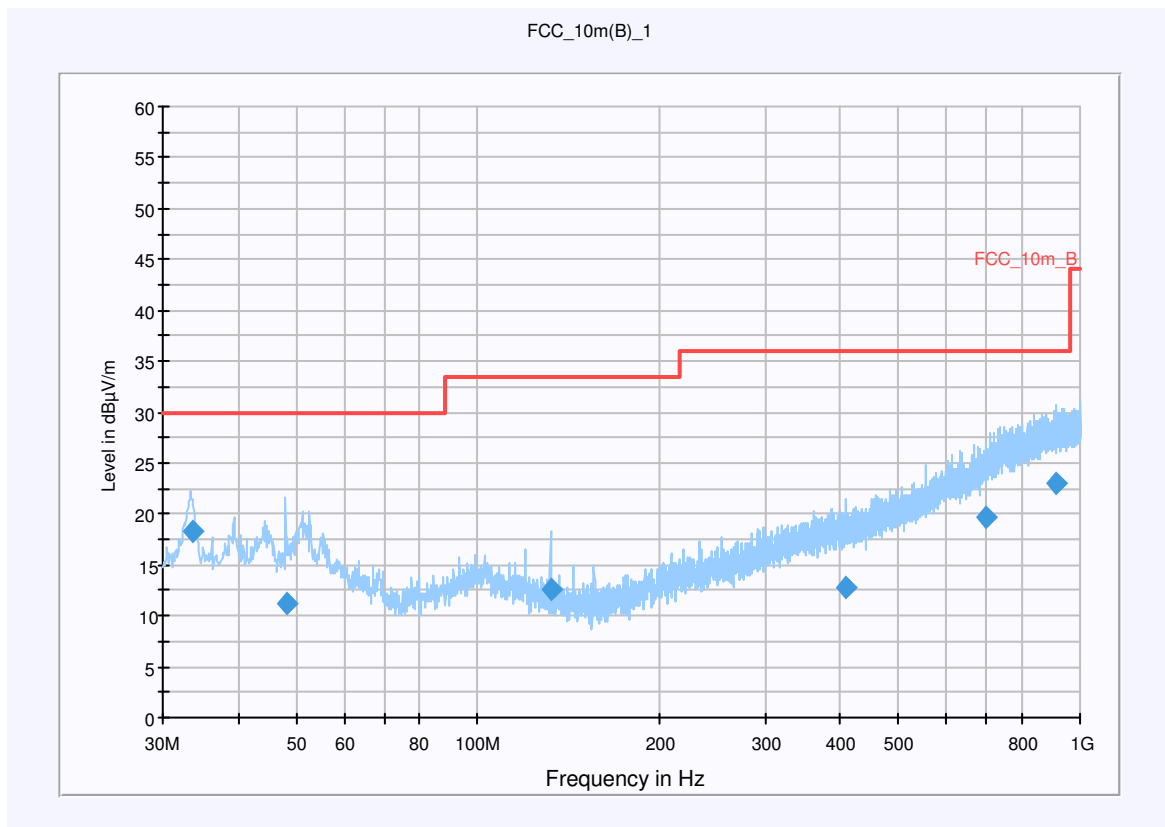
**Common Information**

EUT: Philips Medizin MMS + WLAN a/b/g/ Modul  
 Serial Number: M3002-66480  
 Test Description: FCC part 15.247  
 Operating Conditions: Wlan Rx Mode ; Ch 2.437 Ghz  
 Operator Name: ZAK  
 Comment: Powered with DC 5 V

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

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

**Subrange**                      **Detectors**                      **IF Bandwidth**                      **Meas. Time**                      **Receiver**  
 30 MHz - 1 GHz                      QuasiPeak                      120 kHz                      15 s                      Receiver

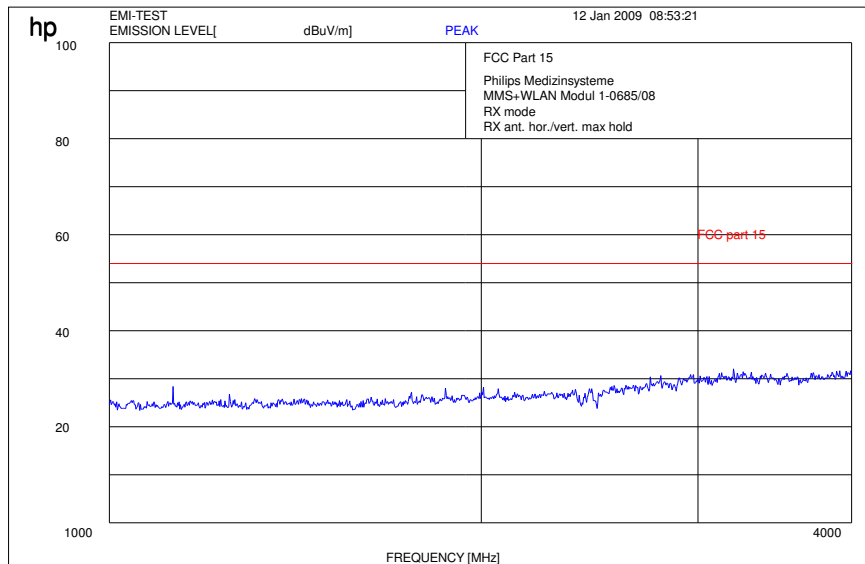


**Final Result 1**

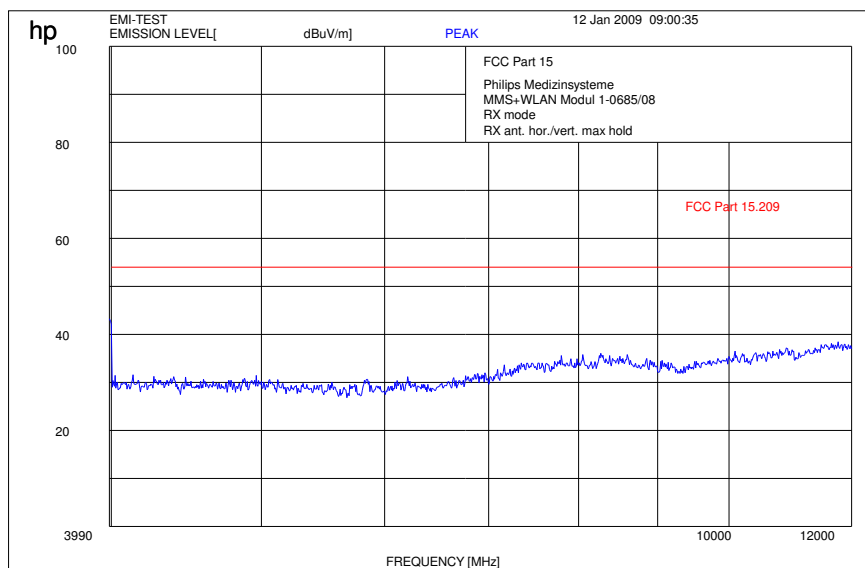
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
33.591500	18.4	15000.000	120.000	100.0	V	27.0	13.0	11.6	30.0	
48.387950	11.2	15000.000	120.000	100.0	V	39.0	13.5	18.8	30.0	
132.014650	12.5	15000.000	120.000	214.0	V	231.0	9.5	21.0	33.5	
406.743900	12.8	15000.000	120.000	183.0	H	50.0	17.0	23.2	36.0	
699.689150	19.6	15000.000	120.000	305.0	H	217.0	22.6	16.4	36.0	
910.425000	22.9	15000.000	120.000	235.0	V	0.0	25.8	13.1	36.0	



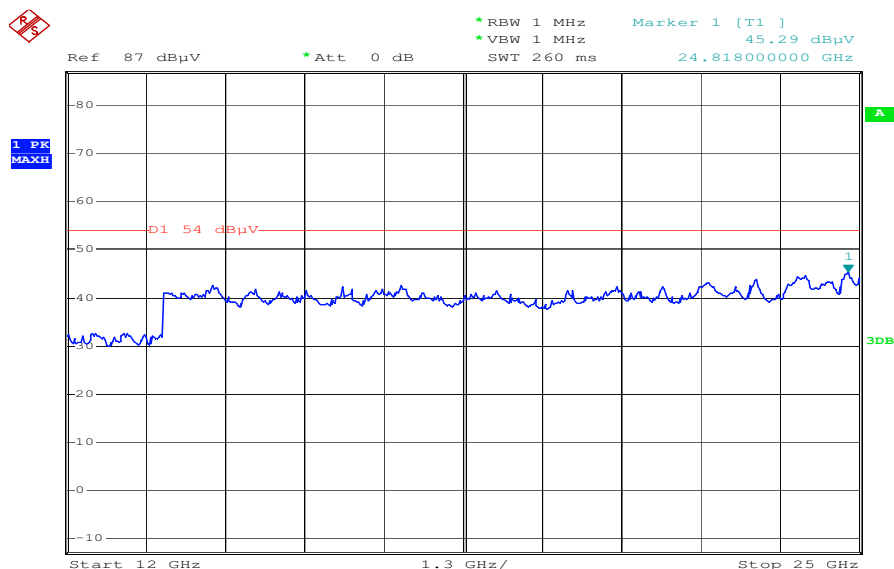
Plot 2: 1 - 4 GHz vertical / horizontal (receiver), valid for both modes



Plot 3: 4 - 12 GHz (receiver), valid for both modes



Plot 4: 12 - 25 GHz (receiver), valid for both modes



Date: 12.JAN.2009 14:46:58

Results:

Spurious Emissions level [dBµV/m]		
f[MHz]	Detector	Level [dBµV/m]
No critical peaks detected.		
Measurement uncertainty		±3 dB

f < 1 GHz : RBW/VBW: 100 kHz      f ≥ 1GHz : RBW/VBW: 1 MHz

See above plots

Measurement distance see table

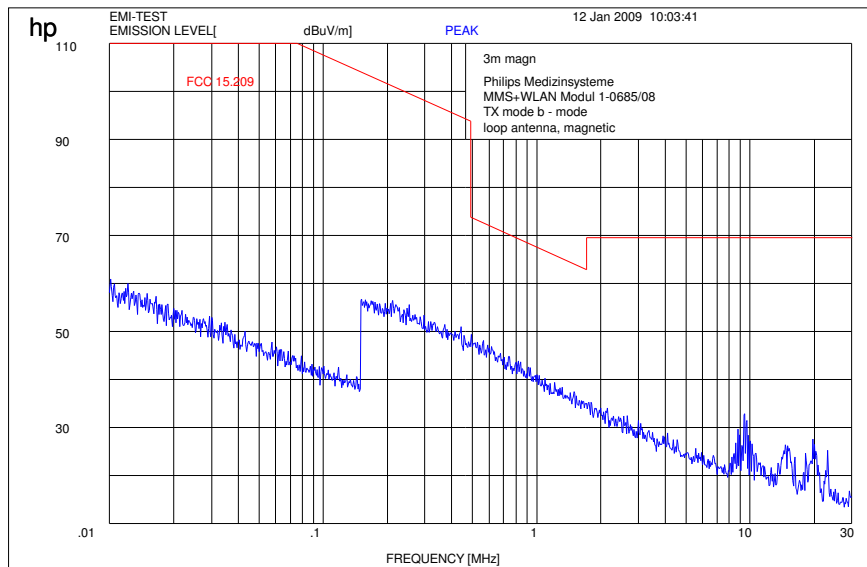
Limits: § 15.109

Frequency (MHz)	Field strength (dBµV/m)	Measurement distance (m)
30 - 88	30.0	10
88 - 216	33.5	10
216 - 960	36.0	10
above 960	54.0	3

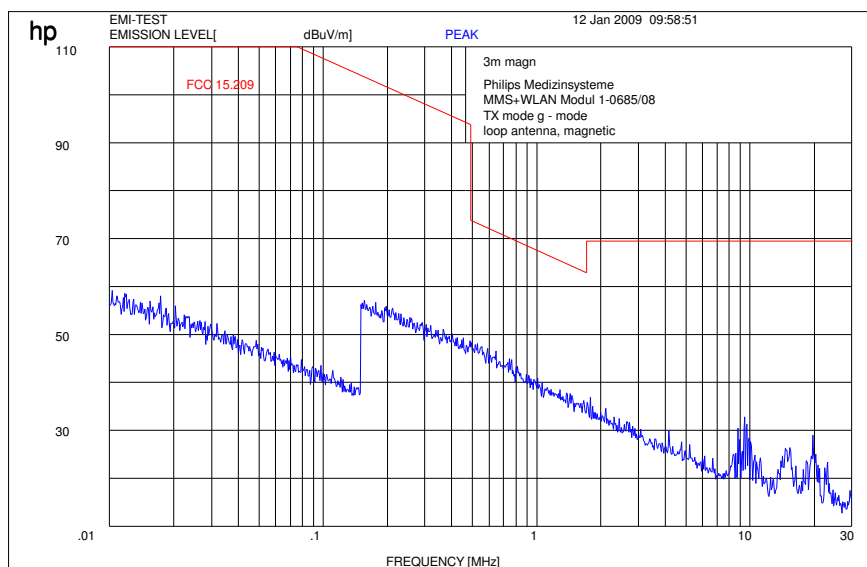
### 5.16 Spurious Emissions - radiated <30 MHz §15.209

Measured at 3 m distance.  
Values recalculated with 40 dB/decade according to FCC rules.

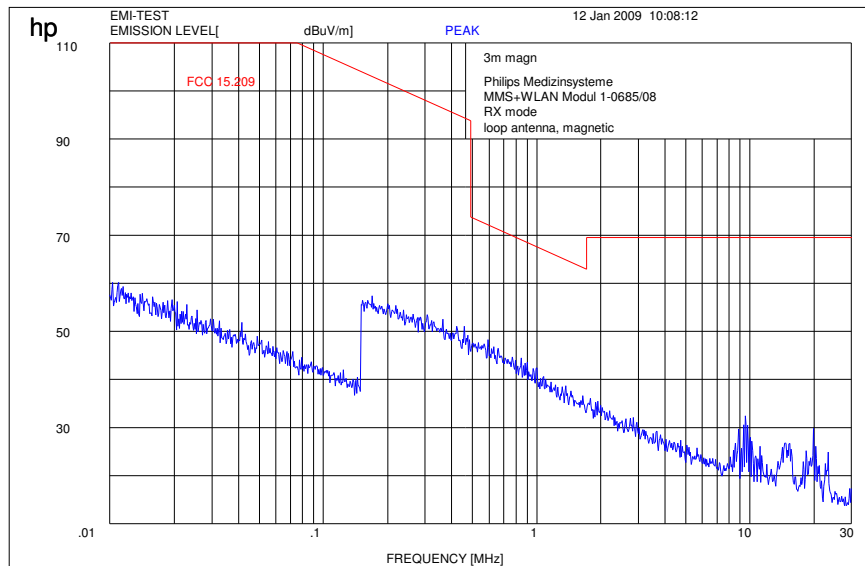
Plot 1: TX mode, b – mode



Plot 2: TX mode, g – mode



Plot 3: RX mode

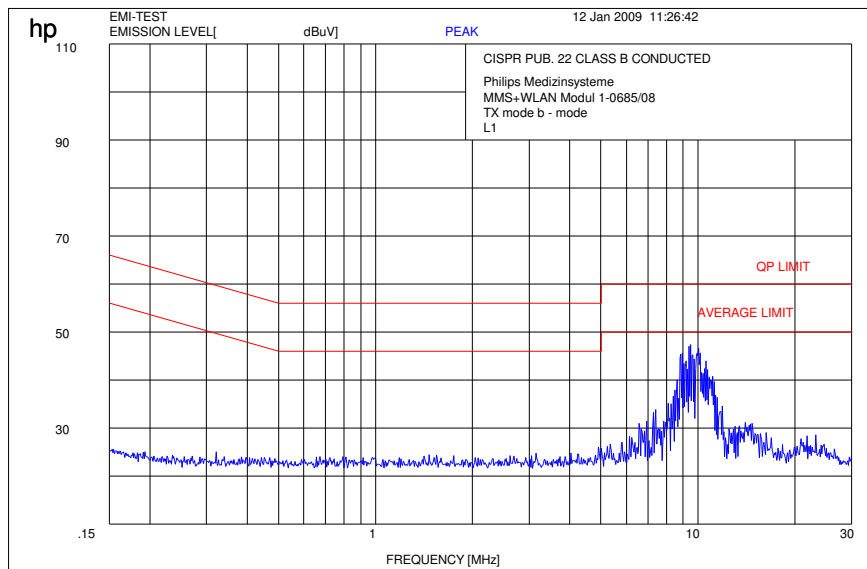


Limits:

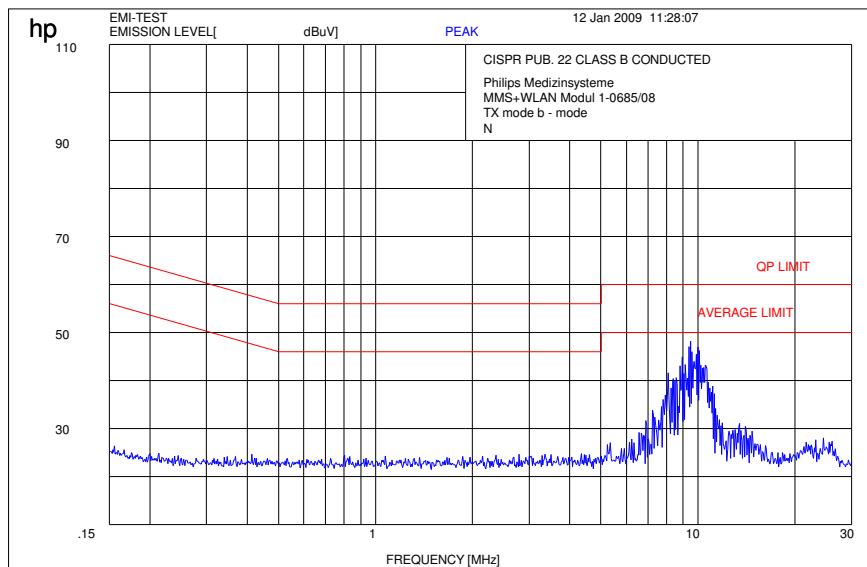
Frequency (MHz)	Field strength ( $\mu\text{V/m}$ )	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dB $\mu\text{V/m}$	30
30 - 88	100 / 40 dB $\mu\text{V/m}$	3
88 - 216	150 / 43.5 dB $\mu\text{V/m}$	3
216 - 960	200 / 46 dB $\mu\text{V/m}$	3
above 960	54 dB $\mu\text{V/m}$	3

### 5.17 Conducted Emissions <30 MHz §15.107/207

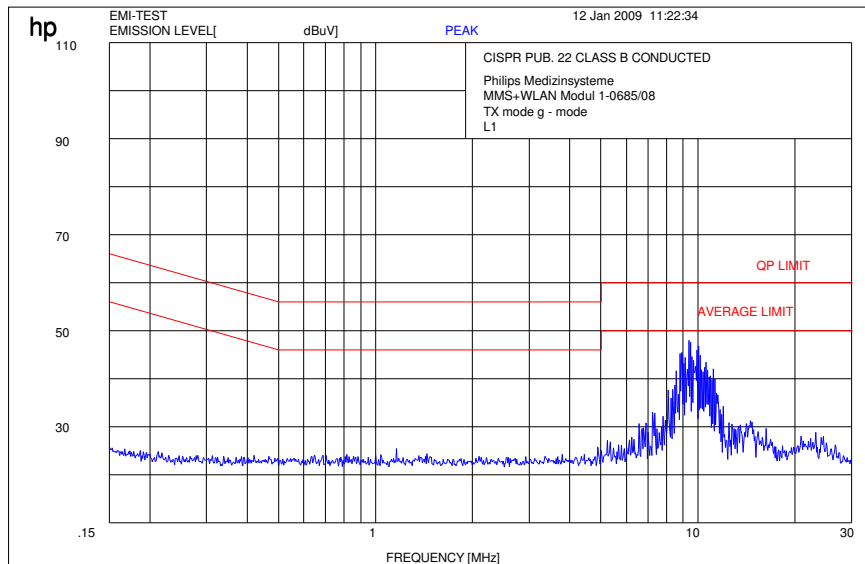
Plot 1: TX mode, b – mode, phase line



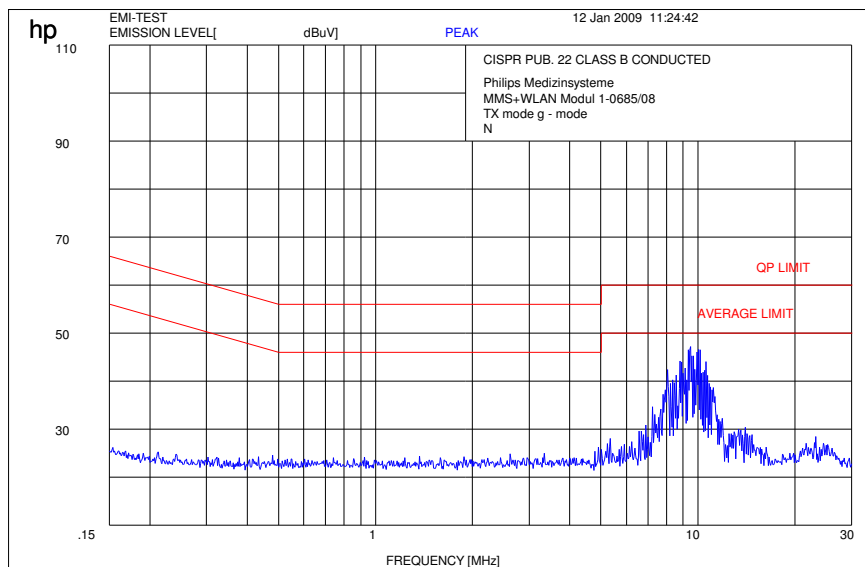
Plot 2: TX mode, b – mode, neutral line



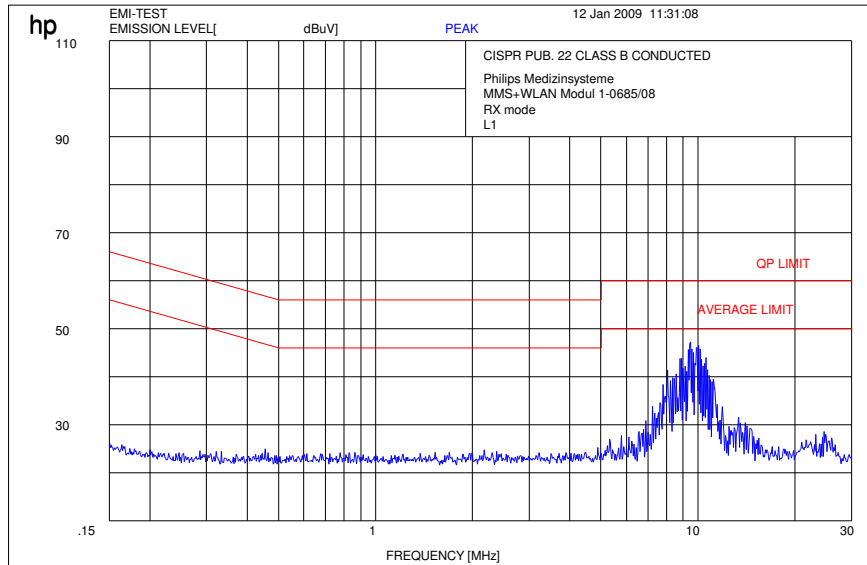
Plot 3: TX mode, g – mode, phase line



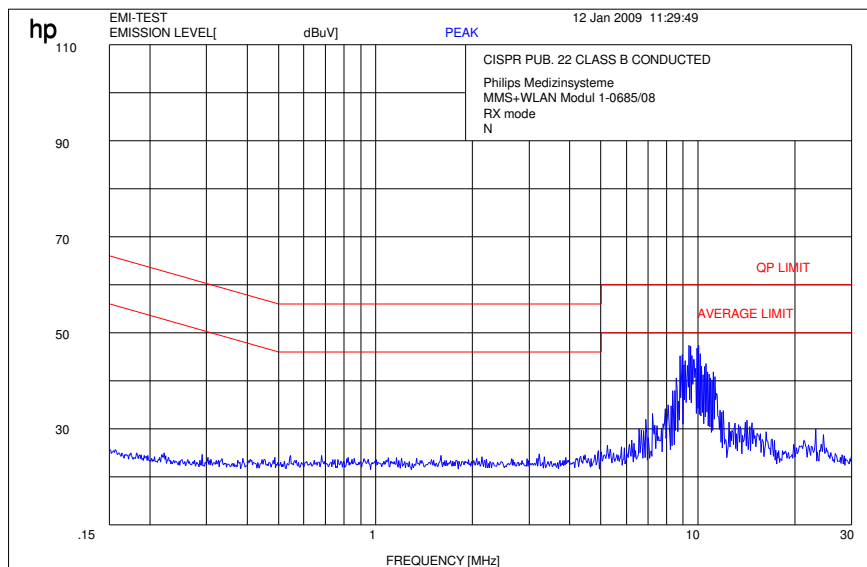
Plot 4: TX mode, g – mode, neutral line



Plot 5: Receiver mode, valid for both modes, phase line



Plot 6: Receiver mode, valid for both modes, neutral line



We measured in TX and RX mode, L1 and N floating and grounded, max value was hold.

Limits:

Under normal test conditions only	See plots
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## 6 Test equipment and ancillaries used for tests

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

All reported calibration intervals are calibrations according to the EN/ISO/IEC 17025 standard. These calibrations were performed from an accredited external calibration laboratory.

Additional to these calibrations the laboratory performed comparison measurements with other calibrated systems and performed a weekly chamber inspection.

All used devices are connected with a 10 MHz external reference.

According to the manufacturers' instruction is it possible to establish a calibration interval for the FSP unit of 24 month, if the device has an external 10 MHz reference.

### *Anechoic chamber C:*

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Anechoic chamber	MWB	87400/02	300000996	Monthly verification		
2	System-Rack 85900	HP I.V.	*	300000222	n.a.		
3	Measurement System 1						
4	Spektrum Analyzer 8566B	HP	3138A07614	300001207	13.12.2007	24	13.12.2009
5	Spektrum Analyzer Display 85662A	HP	3144A28627	300001208	13.12.2007	24	13.12.2009
6	Quasi-Peak-Adapter 85650A	HP	2811A01204	300002308	13.12.2007	24	13.12.2009
7	RF-Preselector 85685A	HP	2837A00778	300002448	13.12.2007	24	13.12.2009
8	PC Vectra VL	HP		300001688	n.a.		
9	Software EMI	HP		300000983	n.a.		
10	Measurement System 2						
11	FSP 30	R&S	100886	300003575	25.08.2008	24	25.08.2010
12	PC	F+W			n.a.		
13	TILE	TILE			n.a.		
14	Biconical antenna	EMCO	S/N: 860 942/003		Monthly verification (System cal.)		
15	Log. Period. Antenna 3146	EMCO	2130	300001603	Monthly verification (System cal.)		
16	Double Ridged Antenna HP 3115P	EMCO	3088	300001032	Monthly verification (System cal.)		
17	Active Loop Antenna 6502	EMCO	2210	300001015	Monthly verification (System cal.)		
18	Power Supply 6032A	HP	2818A03450	300001040	12.05.2007	36	12.05.2010
19	Busisolator	Kontron		300001056	n.a.		
20	Leitungsteiler 11850C	HP		300000997	Monthly verification (System cal.)		
21	Power attenuator 8325	Byrd	1530	300001595	Monthly verification (System cal.)		
22	Band reject filter WRCG1855/1910	Wainwright	7	300003350	Monthly verification (System cal.)		
23	Band reject filter WRCG2400/2483	Wainwright	11	300003351	Monthly verification (System cal.)		

### *System Rack Room 005 :*

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	FSP 30	R&S	100886	300003575	25.08.2008	24	25.08.2010
2	CBT	R&S	100313	300003516	03.09.2008	24	03.09.2010
3	Switch Matrix	HP		300000929	n.a.		
4	Power Supply	HP	3041A00544	300002270	13.05.2007	36	13.05.2010
5	Signal Generator	R&S	836206/0092	300002680	30.05.2007	36	30.05.2010



*Climatic Box:*

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Climatic box VT 4002	Heraeus Vötsch	58566046820010	300003019	11.05.2007	24	11.05.2009
2	Climatic box CTS T-40/50	CTS	064023	300003540	03.01.2007	24	03.01.2009

*SRD Laboratory Room 005:*

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Spektrum Analyzer 8566B	HP	2747A05275	300000219	08.11.2006	24	08.11.2008
2	Spektrum Analyzer Display 85662A	HP	2816A16497	300001690	08.11.2006	24	08.11.2008
3	Quasi-Peak-Adapter 85650A	HP	2811A01135	300000216	08.11.2006	24	08.11.2008
4	Power Supply	Heiden	003202	300001187	12.05.2007	36	12.05.2010
5	Power Supply	Heiden	1701	300001392	12.05.2007	36	12.05.2010

*SRD Laboratory Room 011:*

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	NRP Power Meter	R&S	100212	300003780	27.02.2008	24	27.02.2010

*Anechoic chamber F:*

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Control Computer	F+W	FW0502032	300003303	-/-	-/-	-/-
2	Trilog Antenna	9163-295	-/-	-/-	30.04.2008	24	30.04.2010
3	Amplifier - 0518C-138	Veritech Micro-wave Inc.	-/-	-/-	-/-	-/-	-/-
4	Switch - 3488A	HP		300000368	-/-	-/-	-/-
5	EMI Test receiver - ESCI	R&S	100083	300003312	31.01.2009	24	31.01.2009
6	Turntable Controller - 1061 3M	EMCO	1218	300000661	-/-	-/-	-/-
7	Tower Controller 1051 Controller	EMCO	1262	300000625	-/-	-/-	-/-
8	Tower - 1051	EMCO	1262	300000625	-/-	-/-	-/-
10	Ultra Notch-Filter Rejected band Ch. 62	WRCD	9	-/-	-/-	-/-	-/-