



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.: 3463A-1 (IC)

Certification ID: DE 0001

Accreditation ID: DE 0002

Accredited Bluetooth® Test Facility (BQTF)

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Test report no. : 1-0778-01-07/08
Type identification : Gigaset SX686 WiMAX 2.6 GHz
Applicant : Gigaset Communications GmbH
FCC ID : TVU-SX686
Test standards : 47 CFR Part 15

Table of contents

| | | |
|----------|--|-----------|
| 1 | General information..... | 3 |
| 1.1 | Notes | 3 |
| 1.2 | Testing laboratory | 4 |
| 1.3 | Details of applicant | 4 |
| 1.4 | Application details | 4 |
| 2 | Test standard/s:..... | 5 |
| 3 | Technical tests..... | 6 |
| 3.1 | Details of manufacturer..... | 6 |
| 3.1.1 | Test item..... | 6 |
| 3.1.2 | EUT operating modes..... | 7 |
| 3.1.3 | Extreme conditions testing values..... | 7 |
| 4 | Summary of Measurement Results and list of all performed test cases | 8 |
| 5 | RF measurement testing | 9 |
| 5.1 | Description of test set-up | 9 |
| 5.1.1 | Radiated measurements..... | 9 |
| 5.1.2 | Conducted measurements..... | 9 |
| 5.2 | Referenced Documents | 10 |
| 5.3 | Additional comments | 10 |
| 5.4 | Antenna gain | 10 |
| 5.5 | Peak Power Spectral density (digitally modulated systems) §15.247(e)..... | 11 |
| 5.6 | Spectrum Bandwidth of a DSSS System / 6 dB Bandwidth §15.247(a)(2)..... | 15 |
| 5.7 | Spectrum Bandwidth of a DSSS System / 20 dB Bandwidth §15.247(a)(2)..... | 19 |
| 5.8 | Maximum output power (conducted) §15.247 (b)(3)..... | 23 |
| 5.9 | Max. peak output power (radiated) §15.247 (b)(3) | 25 |
| 5.10 | Band-edge compliance of conducted emissions §15.247 (d) | 26 |
| 5.11 | Band-edge compliance of radiated emissions §15.205 | 28 |
| 5.12 | Spurious Emissions - conducted (Transmitter) §15.247 (c)..... | 36 |
| 5.13 | Spurious Emissions - radiated (Transmitter) §15.209 | 46 |
| 5.14 | Spurious Emissions - radiated (Receiver) §15.109 / 209 | 62 |
| 5.15 | Spurious Emissions - radiated <30 MHz §15.209 | 65 |
| 5.16 | Conducted Emissions <30 MHz §15.107/207 | 67 |
| 6 | Test equipment and ancillaries used for tests | 70 |
| 7 | Photographs | 72 |

1 General information

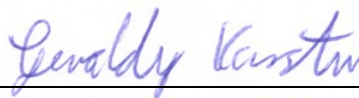
1.1 Notes

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:

2008-11-17

Karsten Geraldty



Date

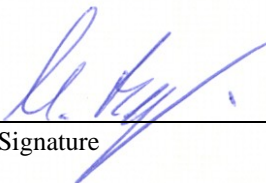
Name

Signature

Technical responsibility for area of testing:

2008-11-17

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

| | |
|-------------------|------------------------------------|
| Name: | Gigaset Communications GmbH |
| Street: | Frankenstr. 2 |
| Town: | 46395 94 Bocholt |
| Country: | Germany |
| Telephone: | +49 (0) 2871 91-0 |
| Fax: | +49 (0) 2871 91-24 95 |
| Contact: | Mr. Uwe Alt |
| E-mail: | uwe.alt@siemens.com |
| Telephone: | +49 (0) 2871 91-28 57 |

1.4 Application details

| | |
|--|-------------------------|
| Date of receipt of order: | 2008-10-16 |
| Date of receipt of test item: | 2008-10-13 |
| Date of start test: | 2008-10-13 |
| Date of end test: | 2008-10-20 |
| Persons(s) who have been present during the test: | Mr. Jürgen Voigt |

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 |
|----------------|---------|---|

3 Technical tests

3.1 Details of manufacturer

| | |
|----------|-----------------------------|
| Name: | Gigaset Communications GmbH |
| Street: | Frankenstr. 2 |
| Town: | 46395 Bocholt |
| Country: | Germany |

3.1.1 Test item

| | | |
|----------------------|---|---|
| Kind of test item | : | Point to multipoint digital Microwave Fixed Link with integrated WLAN b/g |
| Type identification | : | Gigaset SX686 WiMAX 2.6 GHz |
| S/N serial number | : | S30853-S919-D101-5 (radiated & conducted sample) |
| HW hardware status | : | -/- |
| SW software status | : | -/- |
| Frequency Band [MHz] | : | ISM 2400 - 2483.5 |
| Type of Modulation | : | DSSS; OFDM |
| Number of channels | : | 11 |
| Antenna | : | Integrated antenna |
| Power Supply | : | 12 V DC by external AC adapter |
| Temperature Range | : | -30 °C to +50 °C |

Max. power radiated: 24.2 dBm (OFDM)

Max. power conducted: 21.6 dBm (OFDM)

FCC ID: TVU-SX686

3.1.2 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

3.1.3 Extreme conditions testing values

| Description | Shortcut | Unit | Value |
|----------------------|------------------|------|-----------|
| Nominal Temperature | T _{nom} | °C | 23 |
| Nominal Humidity | H _{nom} | % | 44 |
| Nominal Power Source | V _{nom} | V | 12 |

Type of power source: **12 V DC by external AC adapter**

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 | passed | 2008-11-17 | -/- |

| 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 / 20 dB 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, bi-conical antenna

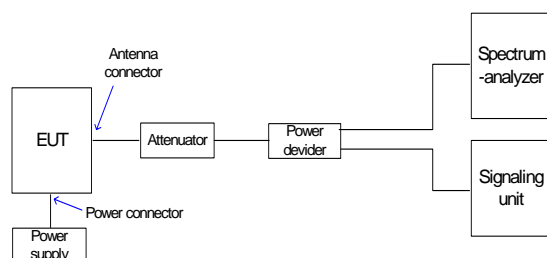
200MHz - 1GHz: Quasi Peak measurement, 120 kHz Bandwidth, log periodic antenna

>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, signaling unit and the spectrum analyzer are impedance matched on 50 Ohm.



5.2 Referenced Documents

None

5.3 Additional comments

None

5.4 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.

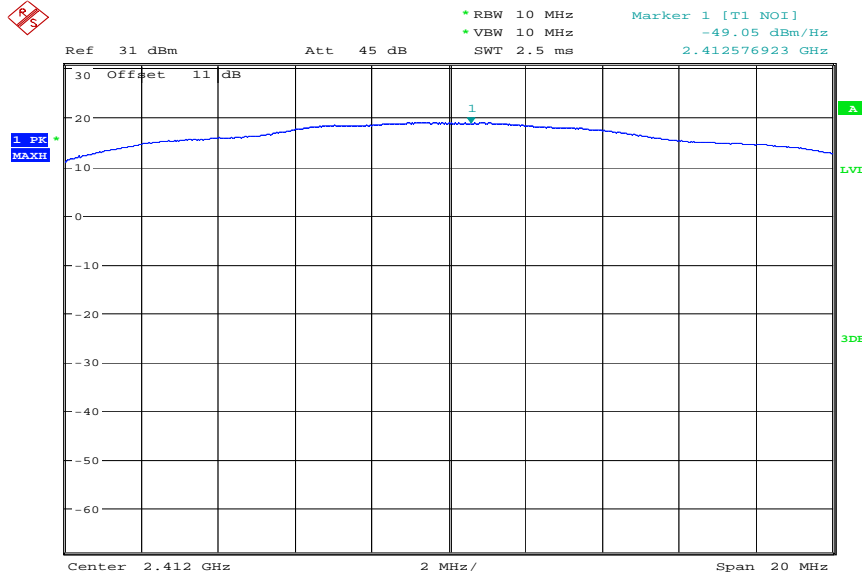
DSSS:

| | low channel 2412 MHz | mid channel 2437 MHz | high channel 2462 MHz |
|-----------------------------------|-------------------------|-------------------------|--------------------------|
| Conducted power [dBm] Measured | 19.4 | 21.2 | 20.5 |
| Radiated power [dBm] Measured | 21.1 | 22.5 | 21.3 |
| Gain [dBi] Calculated | 1.7 | 1.3 | 0.8 |

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

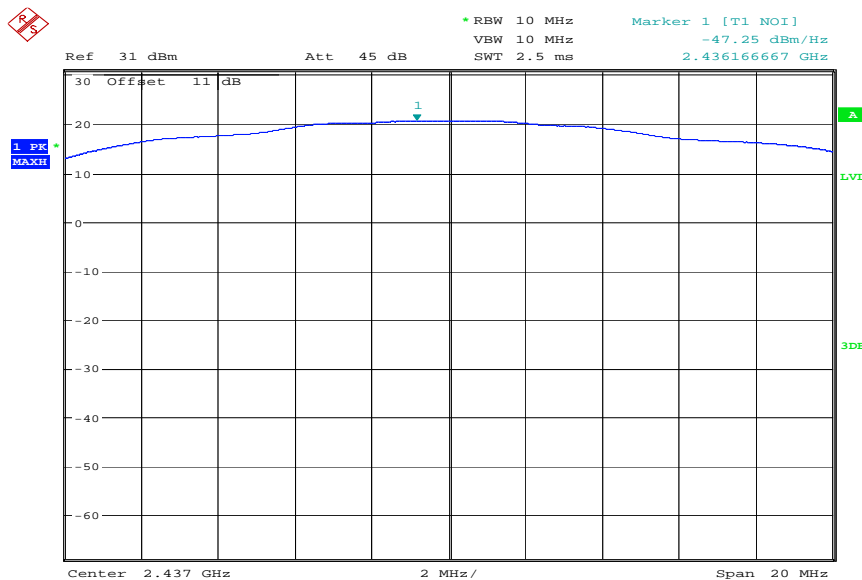
DSSS:

Plot 1: (result calculated by the Signal analyzer FSU from Rohde & Schwarz)



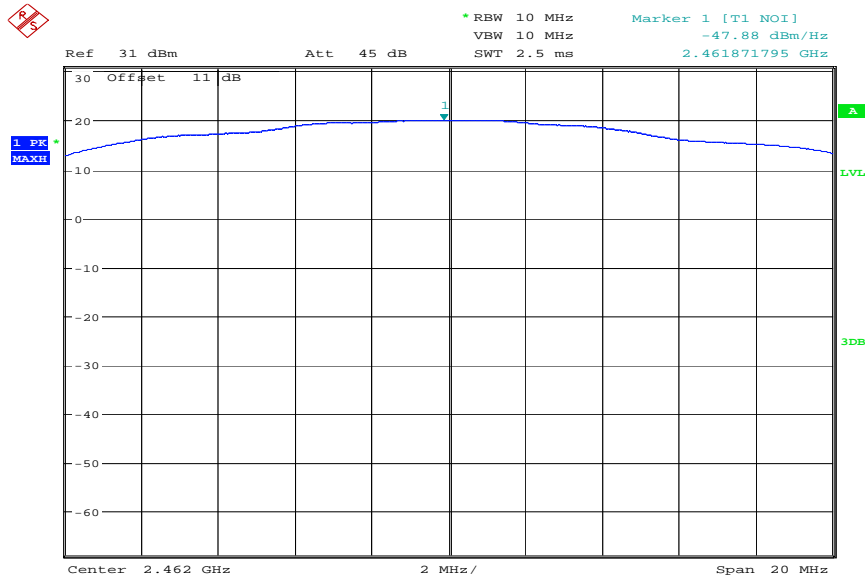
Date: 16.OCT.2008 13:02:07

Plot 2: (result calculated by the Signal analyzer FSU from Rohde & Schwarz)



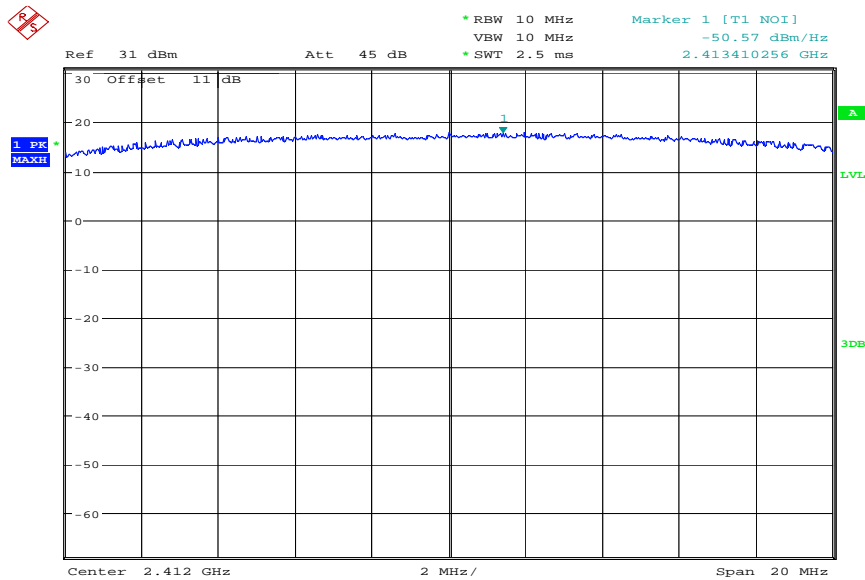
Date: 16.OCT.2008 13:04:49

Plot 3: (result calculated by the Signal analyzer FSU from Rohde & Schwarz)

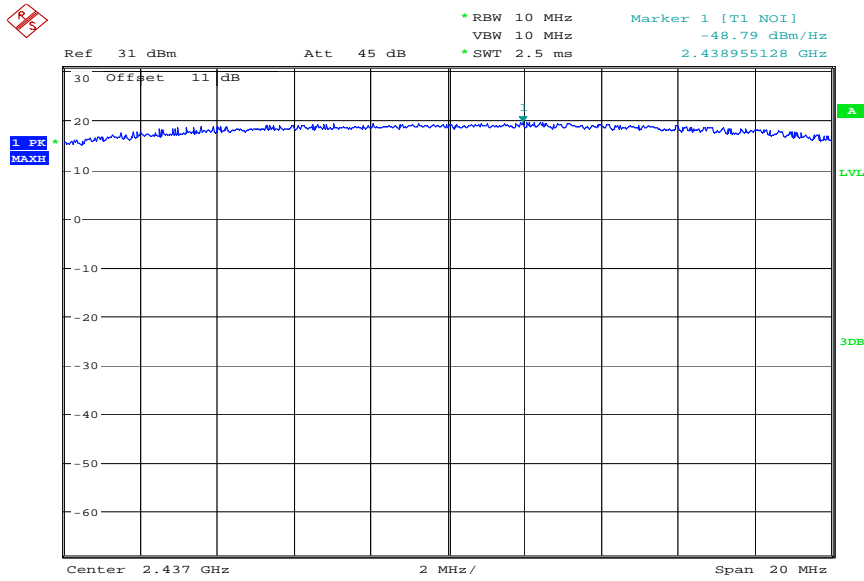


OFDM:

Plot 4: (result calculated by the Signal analyzer FSU from Rohde & Schwarz)

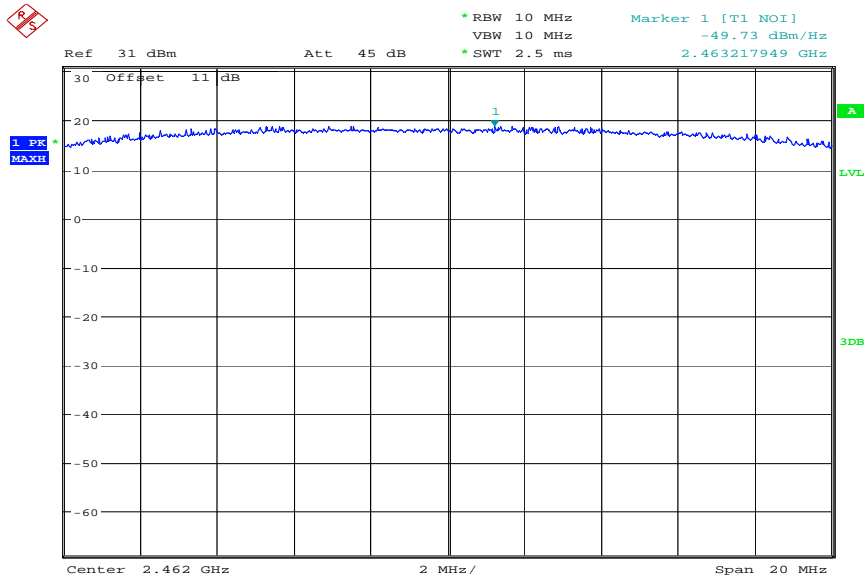


Plot 5: (result calculated by the Signal analyzer FSU from Rohde & Schwarz)



Date: 16.OCT.2008 11:39:38

Plot 6: (result calculated by the Signal analyzer FSU from Rohde & Schwarz)



Date: 16.OCT.2008 11:42:19

Results:

DSSS:

Plot 1: Power density: - dBm/Hz = -49.0 dBm / Hz = -14.2 dBm / 3 kHz

Plot 2: Power density: - dBm/Hz = -47.2 dBm / Hz = -12.4 dBm / 3 kHz

Plot 3: Power density: - dBm/Hz = -47.8 dBm / Hz = -13.0 dBm / 3 kHz

OFDM:

Plot 4: Power density: - dBm/Hz = -50.5 dBm / Hz = -15.7 dBm / 3 kHz

Plot 5: Power density: - dBm/Hz = -48.7 dBm / Hz = -13.9 dBm / 3 kHz

Plot 6: Power density: - dBm/Hz = -49.7 dBm / Hz = -14.9 dBm / 3 kHz

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

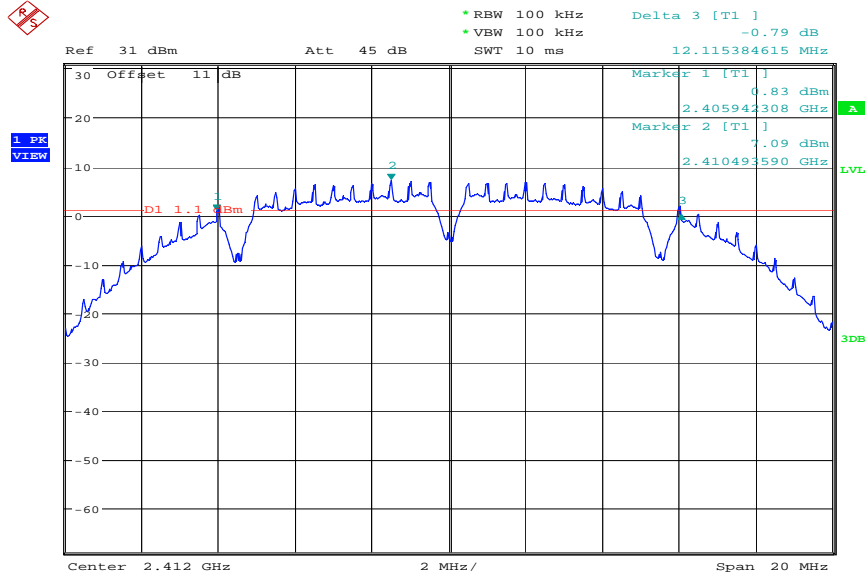
Limits:

| | |
|-----------------------------------|---|
| Under normal test conditions only | 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 |
|-----------------------------------|---|

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

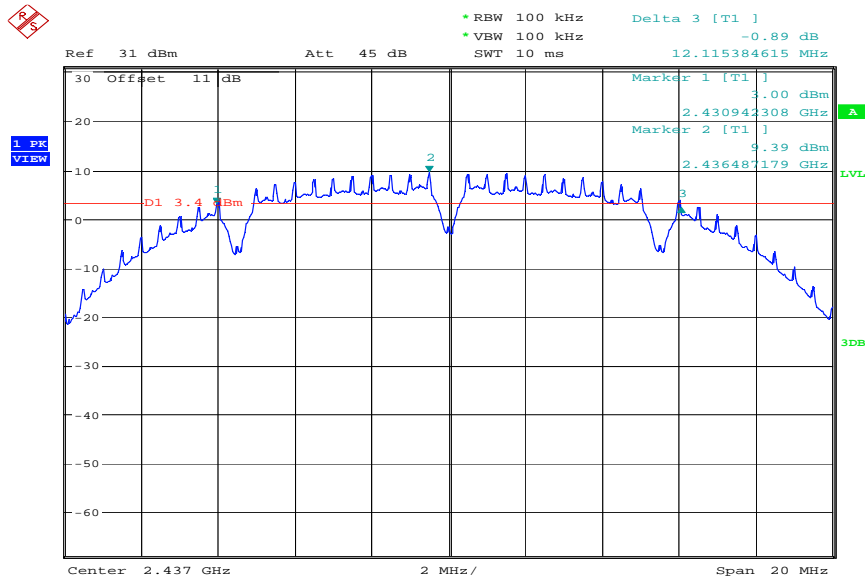
DSSS:

Plot 1:



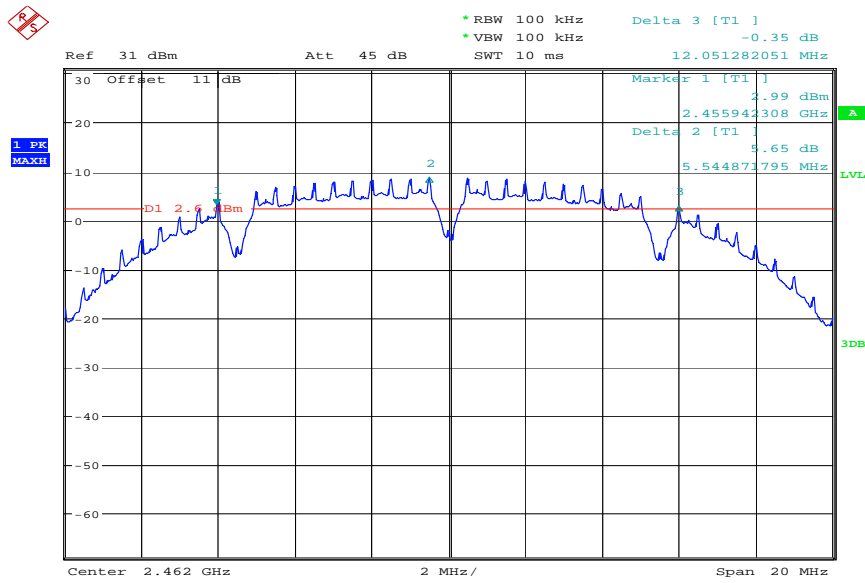
Date: 16.OCT.2008 13:23:34

Plot 2:



Date: 16.OCT.2008 13:15:41

Plot 3:



Date: 16.OCT.2008 13:10:02

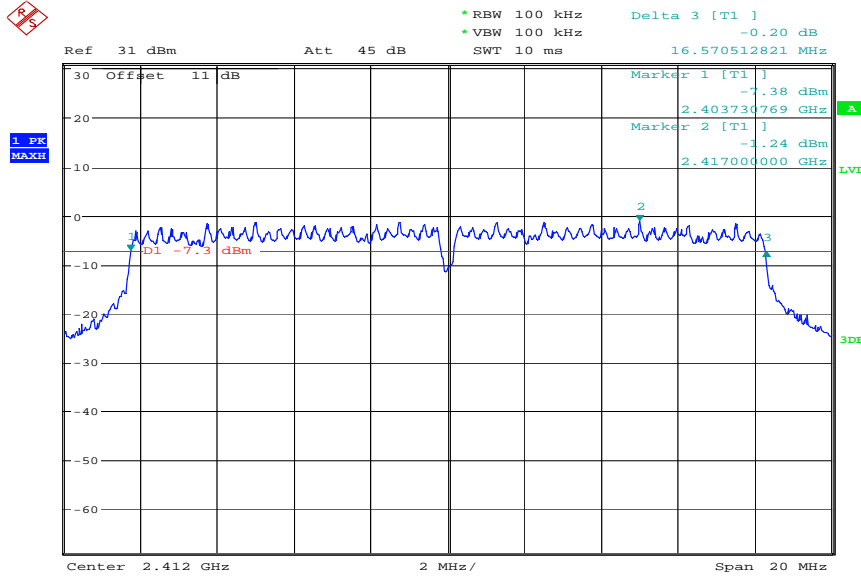
Results:

| Test conditions | | 6 dB BANDWIDTH [MHz] | | |
|-------------------------|------------------|----------------------|-------|-------|
| Frequency [MHz] | | 2412 | 2437 | 2462 |
| T _{nom} | V _{nom} | 12.12 | 12.12 | 12.05 |
| Measurement uncertainty | | ±1kHz | | |

RBW: 100 kHz / VBW 100 kHz

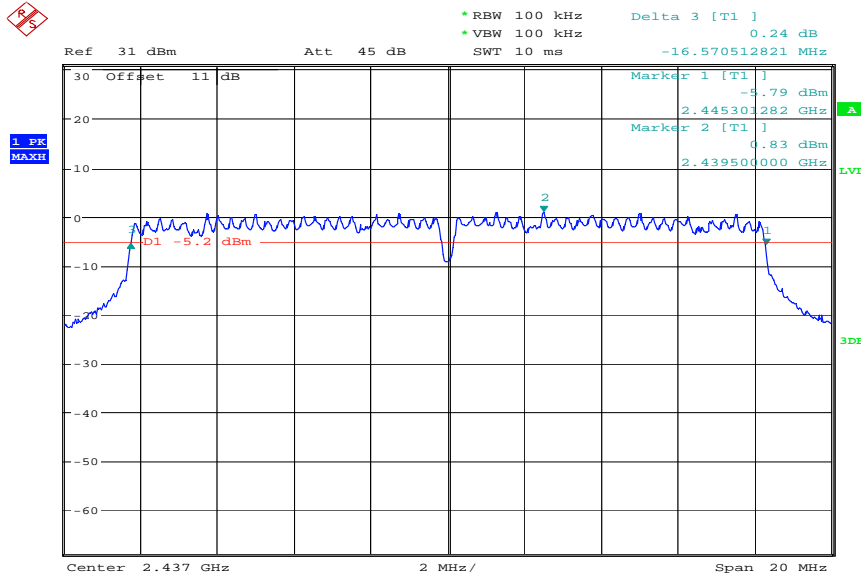
OFDM:

Plot 1:



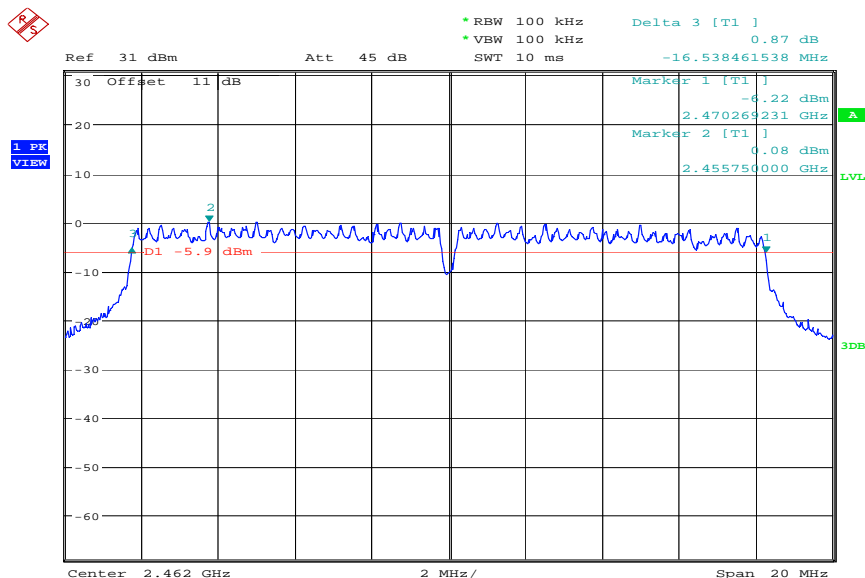
Date: 16.OCT.2008 12:03:07

Plot 2:



Date: 16.OCT.2008 12:01:06

Plot 3:



Date: 16.OCT.2008 11:48:46

Results:

| Test conditions | | 6 dB BANDWIDTH [MHz] | | |
|-------------------------|------------------|----------------------|-------|-------|
| | | 2412 | 2437 | 2462 |
| Frequency [MHz] | | 2412 | 2437 | 2462 |
| T _{nom} | V _{nom} | 16.57 | 16.57 | 16.54 |
| Measurement uncertainty | | ±1kHz | | |

RBW: 100 kHz / VBW 100 kHz

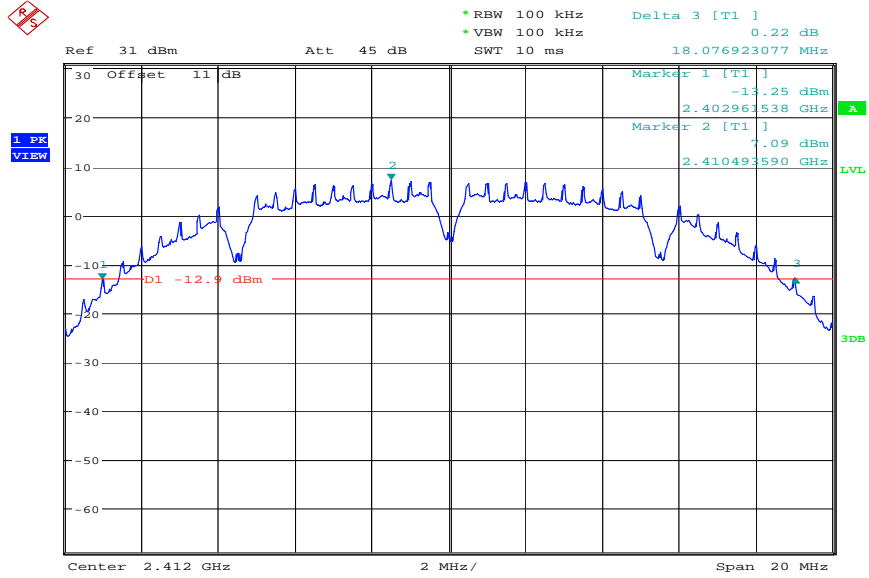
Limits:

| | |
|-----------------------------------|-----------|
| Under normal test conditions only | > 500 kHz |
|-----------------------------------|-----------|

5.7 Spectrum Bandwidth of a DSSS System / 20 dB Bandwidth §15.247(a)(2)

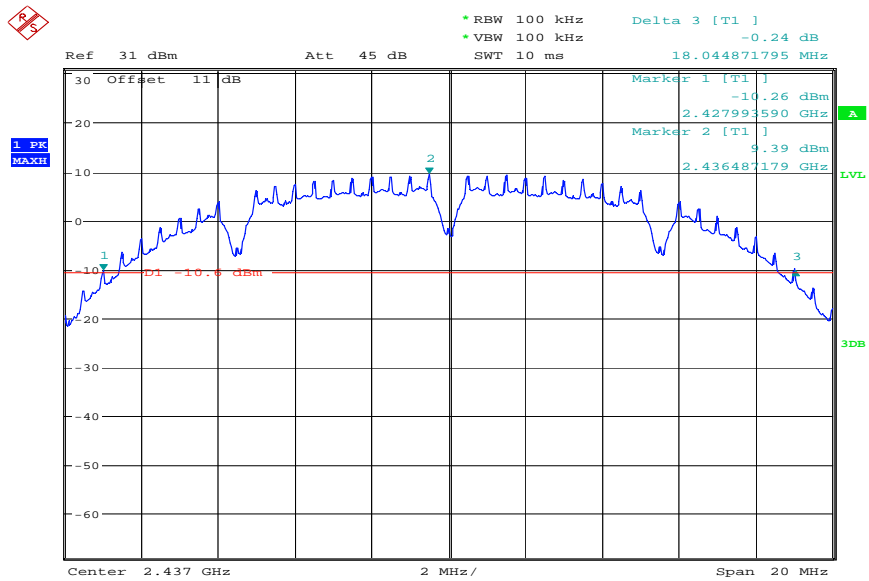
DSSS:

Plot 1:



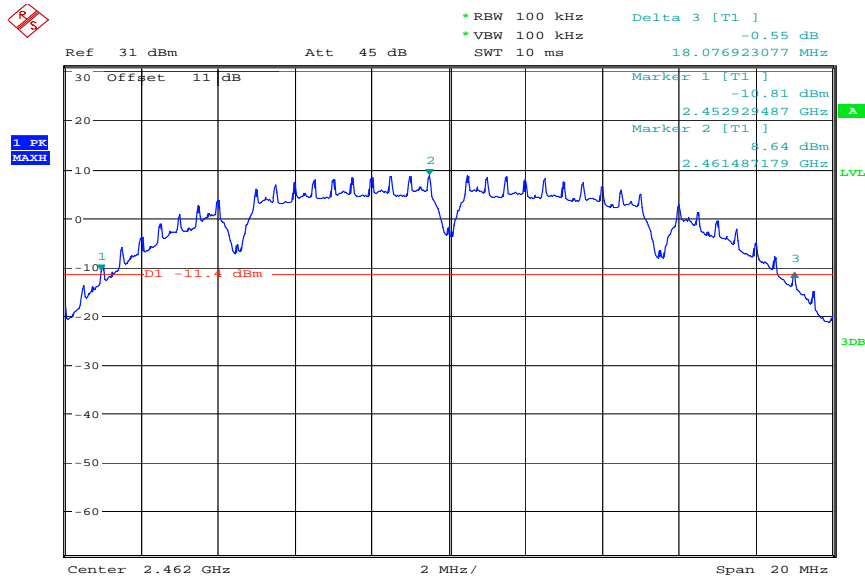
Date: 16.OCT.2008 13:24:47

Plot 2:



Date: 16.OCT.2008 13:14:10

Plot 3:



Date: 16.OCT.2008 13:12:03

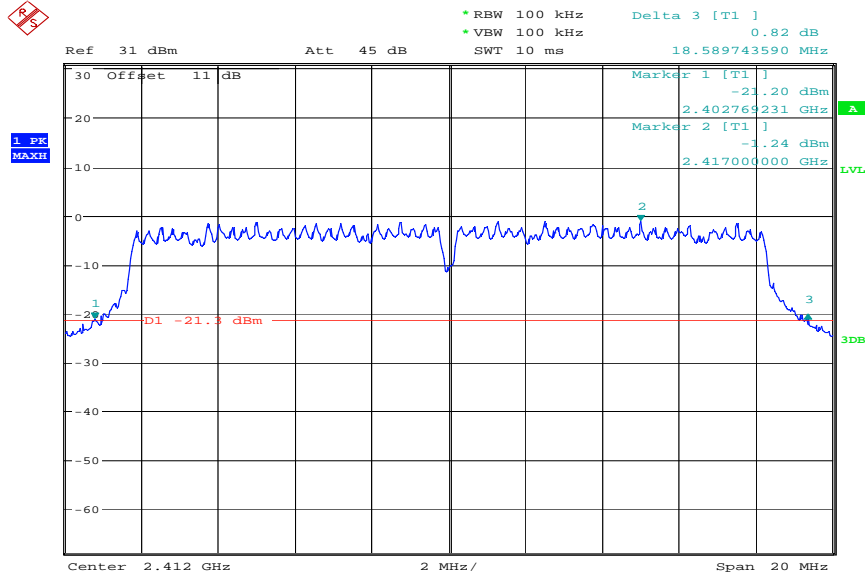
Results:

| Test conditions | | 20 dB BANDWIDTH [MHz] | | |
|-------------------------|------------------|-----------------------|-------|-------|
| Frequency [MHz] | | 2412 | 2437 | 2462 |
| T _{nom} | V _{nom} | 18.08 | 18.04 | 18.08 |
| Measurement uncertainty | | ±1kHz | | |

RBW: 100 kHz / VBW 100 kHz

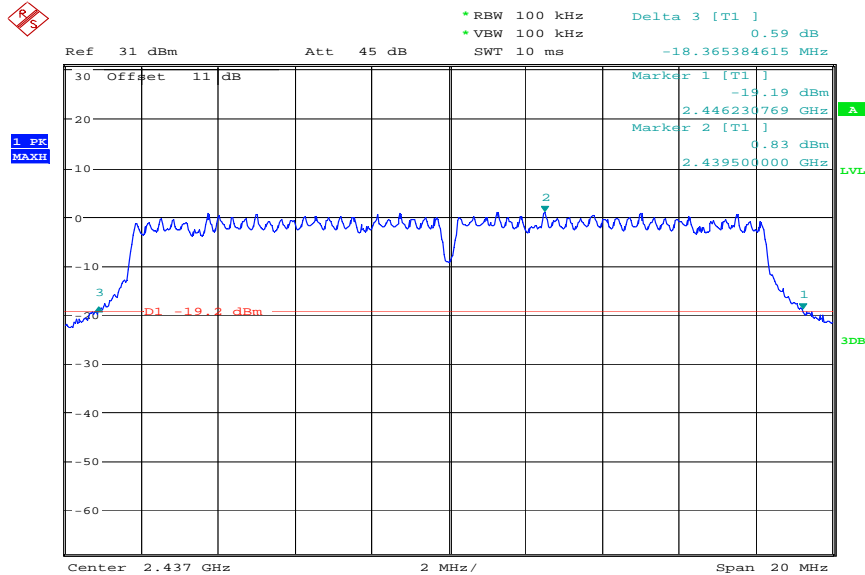
OFDM:

Plot 1:



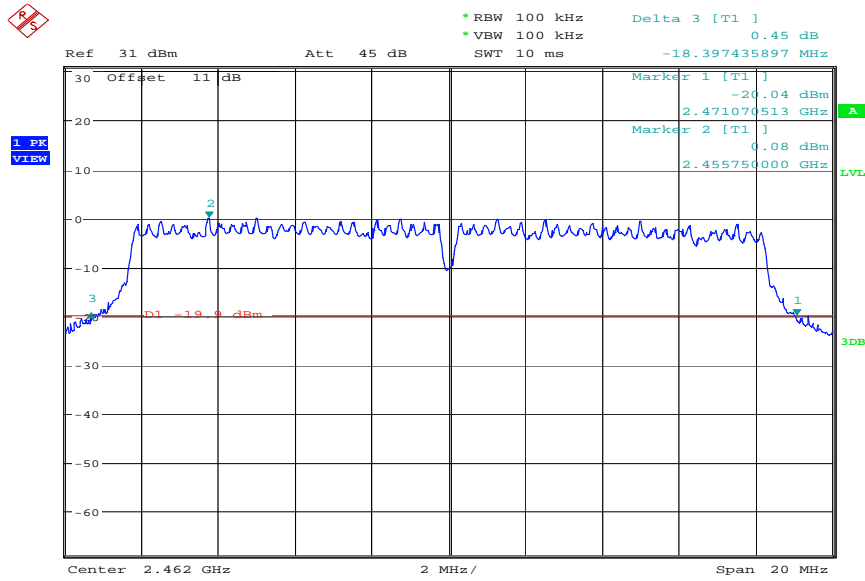
Date: 16.OCT.2008 12:04:23

Plot 2:



Date: 16.OCT.2008 11:59:12

Plot 3:



Date: 16.OCT.2008 11:50:35

Results:

| Test conditions | | 20 dB BANDWIDTH [MHz] | | |
|-------------------------|------------------|-----------------------|-------|-------|
| Frequency [MHz] | | 2412 | 2437 | 2462 |
| T _{nom} | V _{nom} | 18.59 | 18.37 | 18.40 |
| Measurement uncertainty | | ±1kHz | | |

RBW: 100 kHz / VBW 100 kHz

Limits:

| | |
|-----------------------------------|-----------|
| Under normal test conditions only | > 500 kHz |
|-----------------------------------|-----------|

5.8 Maximum output power (conducted) §15.247 (b)(3)

Results: DSSS

| Test conditions | | Max. peak output power [dBm] | | |
|-------------------------|------------------|------------------------------|-------------|------|
| Frequency [MHz] | | 2412 | 2437 | 2462 |
| T _{nom} | V _{nom} | 19.4 | 21.2 | 20.5 |
| Measurement uncertainty | | ±3dB | | |

Results: OFDM

| Test conditions | | Max. peak output power [dBm] | | |
|-------------------------|------------------|------------------------------|-------------|------|
| Frequency [MHz] | | 2412 | 2437 | 2462 |
| T _{nom} | V _{nom} | 20.9 | 21.6 | 21.2 |
| Measurement uncertainty | | ±3dB | | |

Limits:

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

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/cm²)
 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 isotropic radiated power

Calculation:

EIRP: 24.2 dBm (OFDM)

calculated at distance of 20 cm:

$$\text{power density} = 263 / 4\pi 20^2 = 0.052 \text{ mW/ cm}^2$$

Limit:

1mW/ cm² is the reference level for general public exposure according to the OET Bulletin 65, Edition 97-01 Table 1.

5.9 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 _{nom} | V _{nom} | 21.1 | 22.5 | 21.3 |
| Measurement uncertainty | | ±3dB | | |

RBW / VBW: 30 MHz

Measured at a distance of 3m

OFDM:

Results:

| Test conditions | | Max. peak output power EIRP [dBm] | | |
|-------------------------|------------------|-----------------------------------|------|-------------|
| Frequency [MHz] | | 2412 | 2437 | 2462 |
| T _{nom} | V _{nom} | 23.5 | 23.8 | 24.2 |
| Measurement uncertainty | | ±3dB | | |

RBW / VBW: 30 MHz

Measured at a distance of 3m

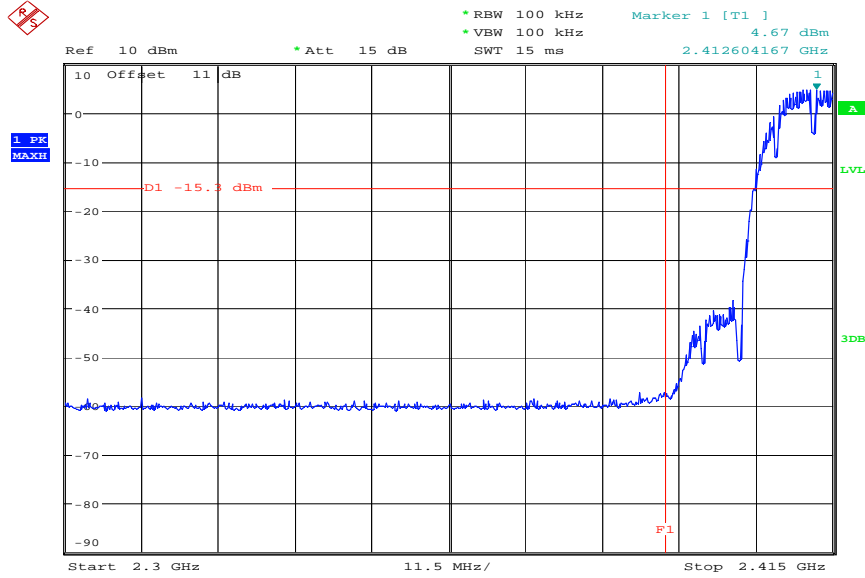
Limits:

| | |
|--|---------------|
| Under normal test conditions only, for frequency range 2400-2483.5 MHz | Max. 1.0 Watt |
|--|---------------|

5.10 Band-edge compliance of conducted emissions §15.247 (d)

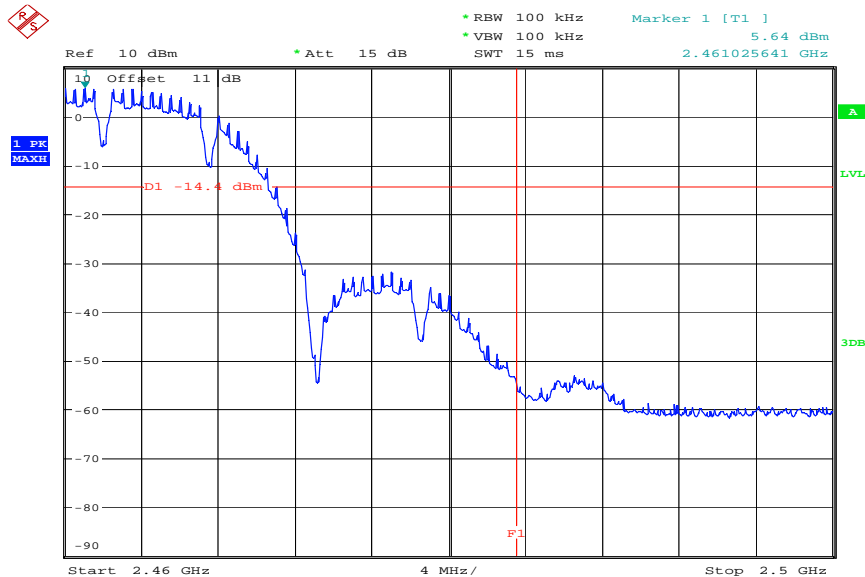
DSSS:

Plot 1, lowest channel



Date: 20.OCT.2008 12:23:35

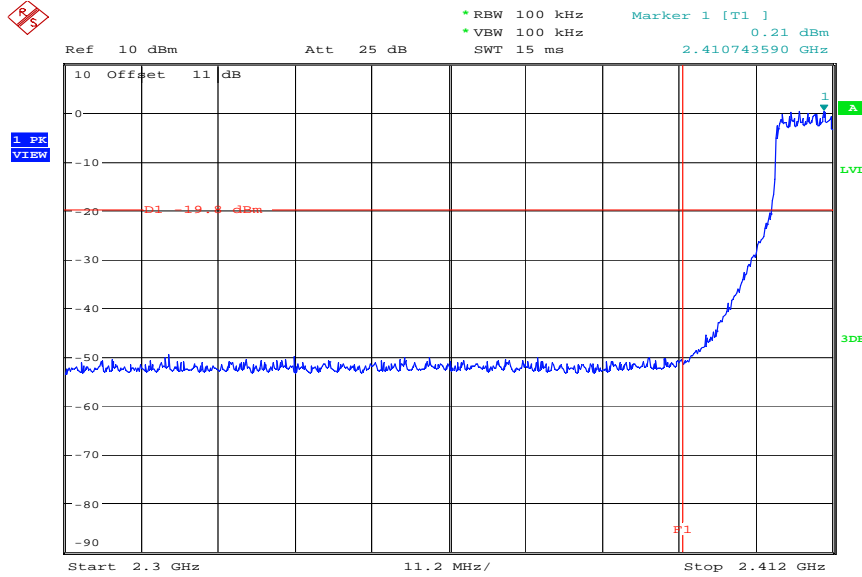
Plot 2, highest channel



Date: 20.OCT.2008 12:16:31

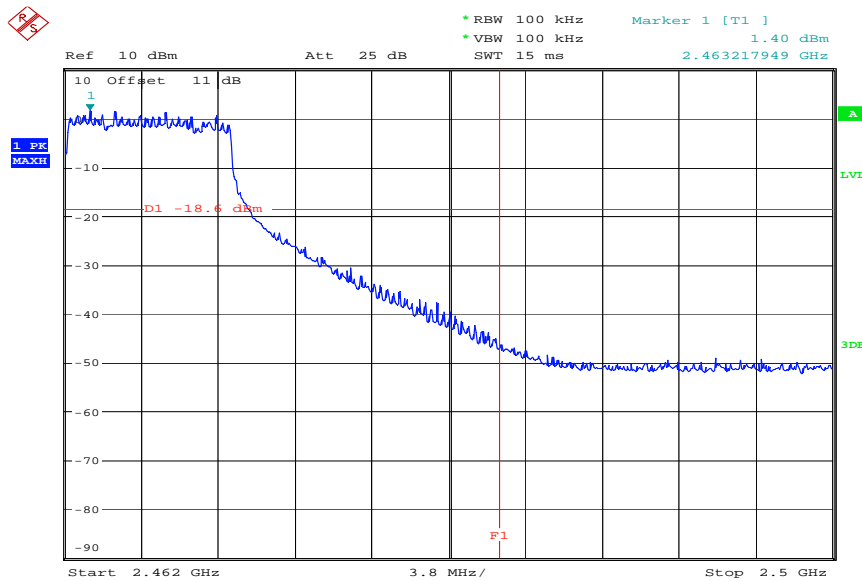
OFDM:

Plot 1, lowest channel



Date: 16.OCT.2008 13:54:19

Plot 2, highest channel



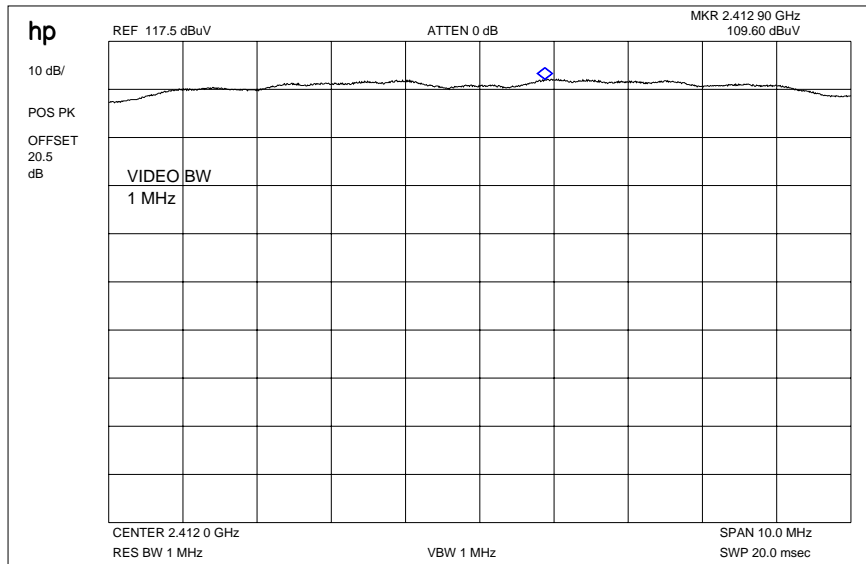
Date: 16.OCT.2008 13:48:13

Limits:

| | |
|-----------------------------------|--|
| Under normal test conditions only | 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)). |
|-----------------------------------|--|

5.11 Band-edge compliance of radiated emissions §15.205

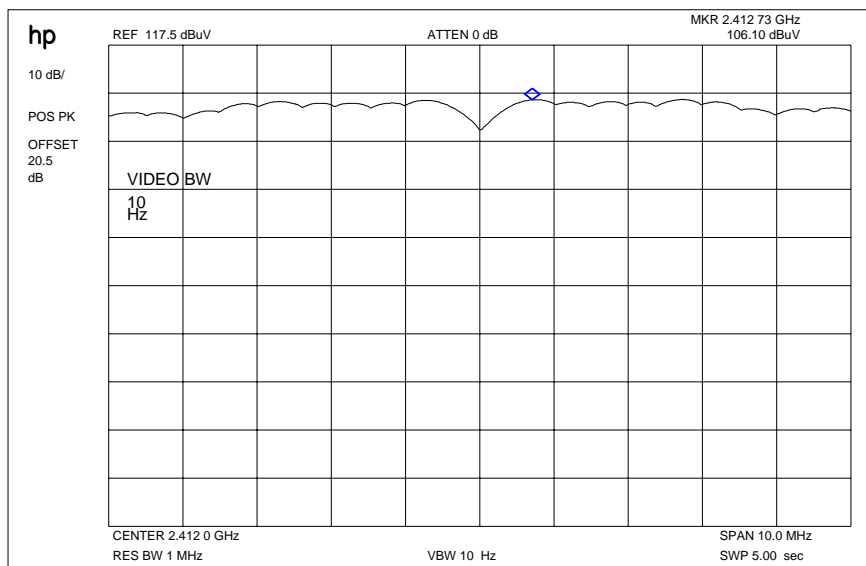
Plot 1: Max field strength in 3m distance (single frequency) peak (DSSS)



Result:

| Frequency | Meter reading | Correction factor | Results |
|-----------|------------------|-------------------|------------------|
| 2412 MHz | 109.6 dB μ V | -6.3 dB | 103.3 dB μ V |

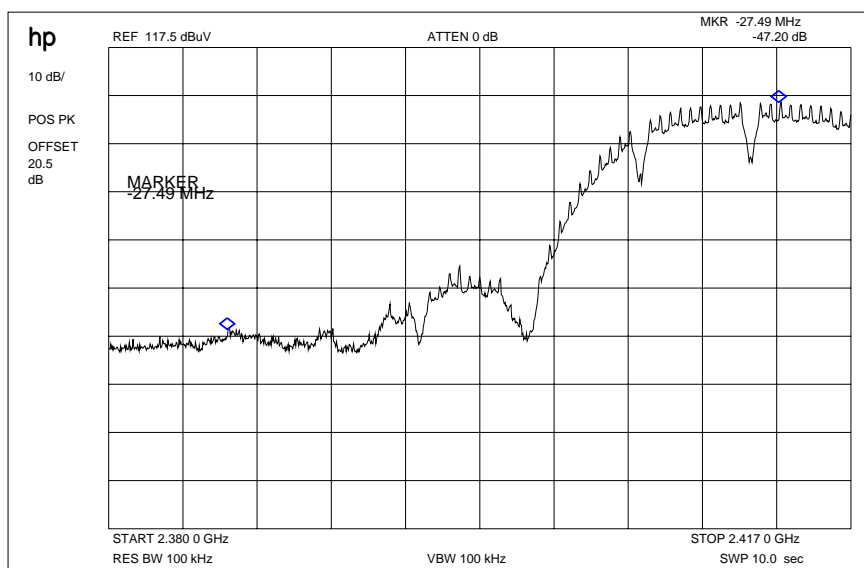
Plot 2: Max field strength in 3m distance (single frequency) average (DSSS)



Result:

| Frequency | Meter reading | Correction factor | Results |
|-----------|------------------|-------------------|-----------------|
| 2412 MHz | 106.1 dB μ V | -6.3 dB | 99.8 dB μ V |

Plot 3: Marker-Delta Method RBW/VBW = 1% of span (DSSS)



Result:

Marker-Delta-Value: 47.2 dB

This measurement was made to show that the behaviour of the system is conform to FCC 15.205 (restricted bands)

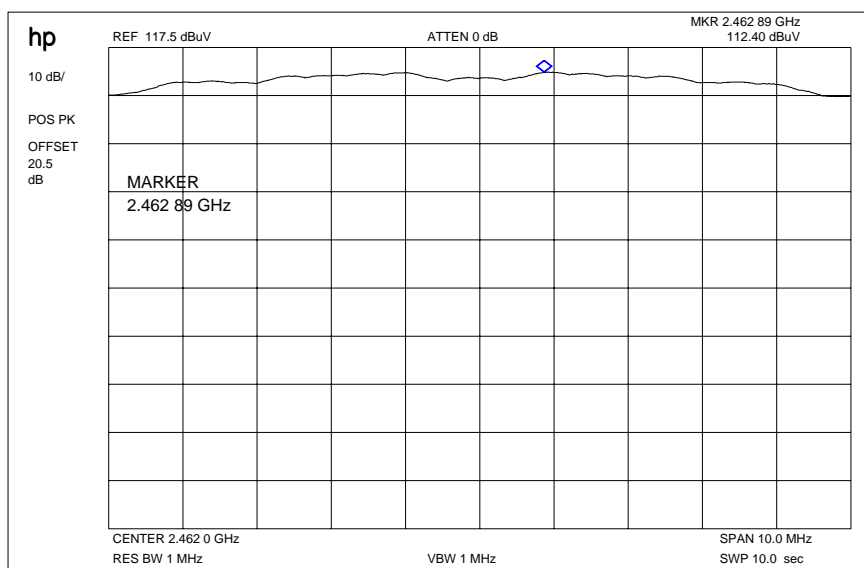
Results & Limits:

Radiated field strength

The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

| low channel (DSSS) | setup | measured value (3m) | correction factor (3m) | calculated value (3m) |
|--------------------|----------------------------|---------------------|------------------------|-----------------------|
| Max. peak value | 1 MHz RBW 1 MHz VBW | 109.6 dBµV/m | -6.3 dB | 103.3 dBµV/m |
| Max. average value | 1 MHz RBW 10 Hz VBW | 106.1 dBµV/m | -6.3 dB | 99.8 dBµV/m |
| Delta value | Peak 300 kHz RBW/VBW | 47.2 dB | | |
| Value at band edge | limit: 54 dBµV/m | | | 52.6 dBµV/m |
| Statement: | | | | Complies |

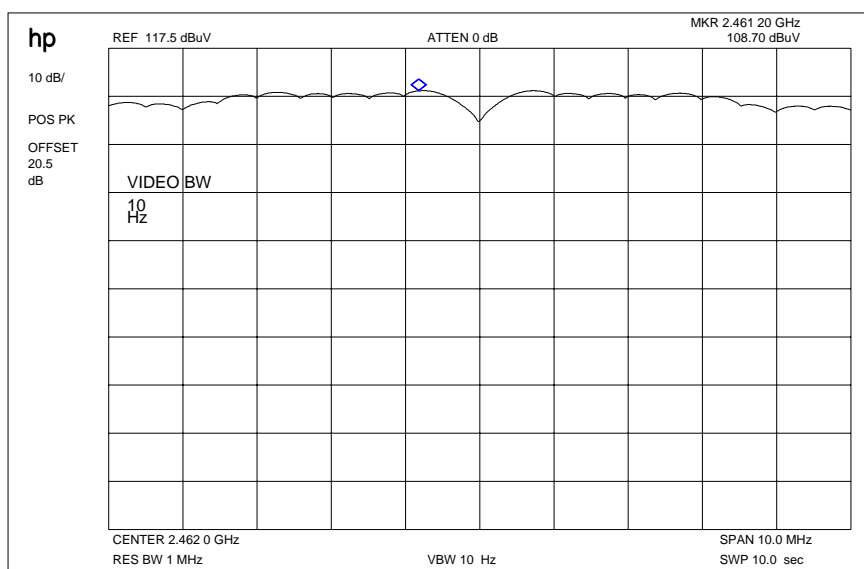
Plot 4: Max field strength in 3m distance (single frequency) peak (DSSS)



Result:

| Frequency | Meter reading | Correction factor | Results |
|-----------|------------------|-------------------|------------------|
| 2462 MHz | 112.4 dB μ V | -6.3 dB | 106.1 dB μ V |

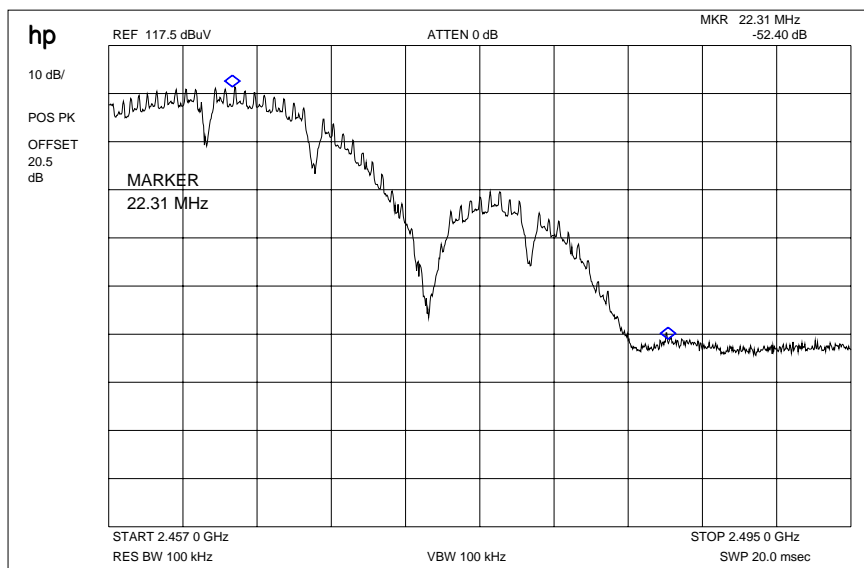
Plot 5: Max field strength in 3m distance (single frequency) average (DSSS)



Result:

| Frequency | Meter reading | Correction factor | Results |
|-----------|------------------|-------------------|------------------|
| 2462 MHz | 108.7 dB μ V | -6.3 dB | 102.4 dB μ V |

Plot 6: Marker-Delta Method RBW/VBW = 1% of span (DSSS)



Result:

Marker-Delta-Value: 52.4 dB

This measurement was made to show that the behaviour of the system is conform to FCC 15.205 (restricted bands)

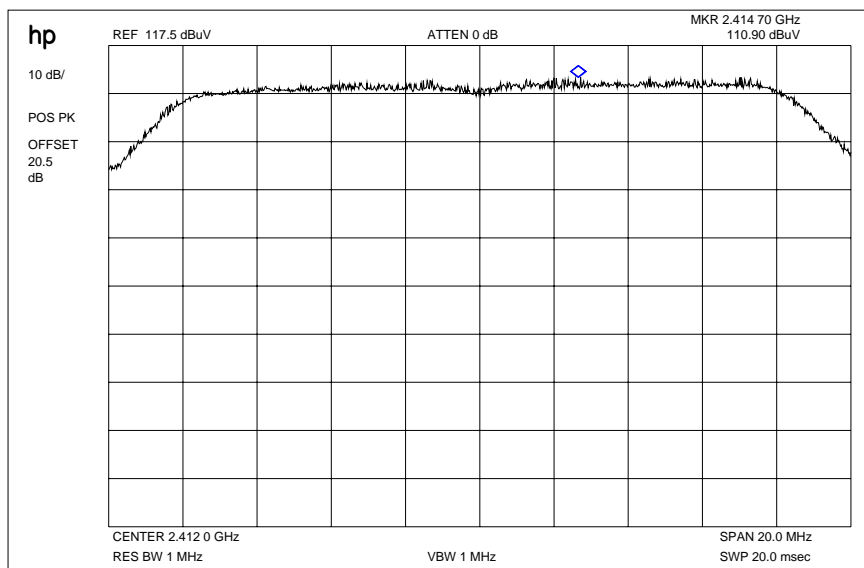
Results & Limits:

Radiated field strength

The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

| high channel (DSSS) | setup | measured value (3m) | correction factor (3m) | calculated value (3m) |
|---------------------|----------------------------|---------------------|------------------------|-----------------------|
| Max. peak value | 1 MHz RBW 1 MHz VBW | 112.4 dB μ V/m | -6.3 dB | 106.1 dB μ V/m |
| Max. average value | 1 MHz RBW 10 Hz VBW | 108.7 dB μ V/m | -6.3 dB | 102.4 dB μ V/m |
| Delta value | Peak 300 kHz RBW/VBW | 52.4 dB | | |
| Value at band edge | limit: 54 dB μ V/m | | | 50.0 dB μ V/m |
| Statement: | | | | Complies |

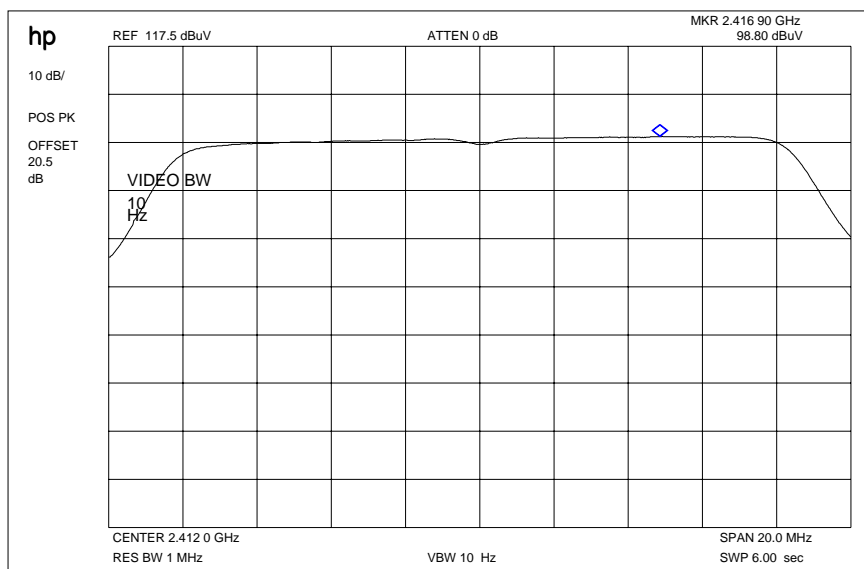
Plot 7: Max field strength in 3m distance (single frequency) peak (OFDM)



Result:

| Frequency | Meter reading | Correction factor | Results |
|-----------|------------------|-------------------|------------------|
| 2412 MHz | 110.9 dB μ V | -6.3 dB | 104.6 dB μ V |

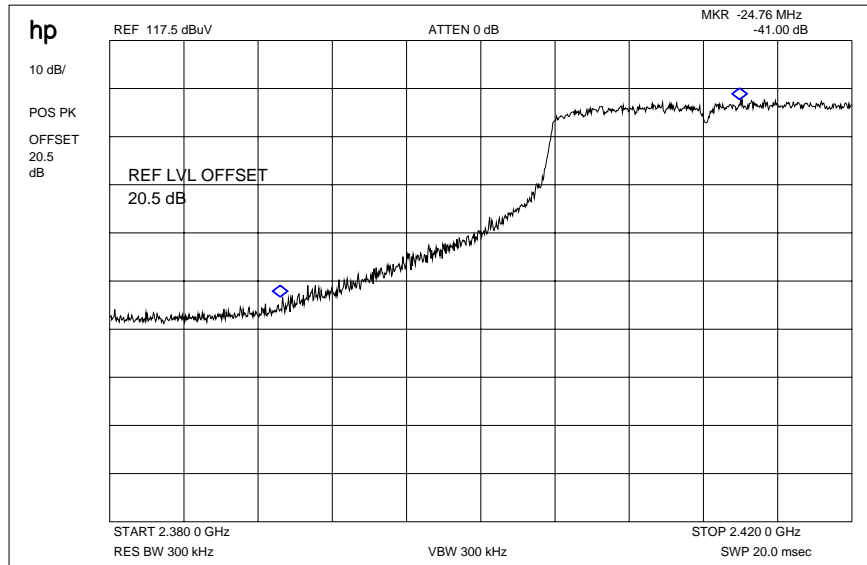
Plot 8: Max field strength in 3m distance (single frequency) average (OFDM)



Result:

| Frequency | Meter reading | Correction factor | Results |
|-----------|-----------------|-------------------|-----------------|
| 2412 MHz | 98.8 dB μ V | -6.3 dB | 92.5 dB μ V |

Plot 9: Marker-Delta Method RBW/VBW = 1% of span (OFDM)



Result:

Marker-Delta-Value: 41.0 dB

This measurement was made to show that the behaviour of the system is conform to FCC 15.205 (restricted bands)

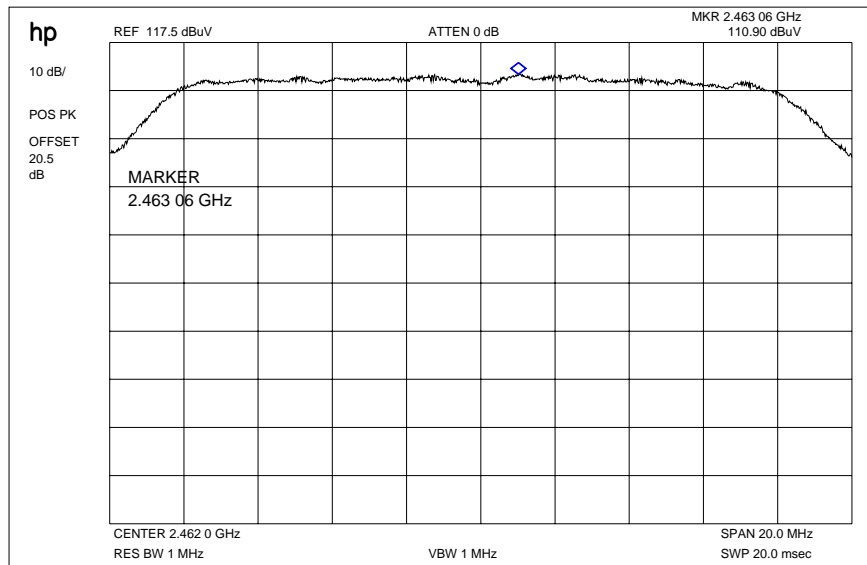
Results & Limits:

Radiated field strength

The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

| low channel (OFDM) | setup | measured value (3m) | correction factor (3m) | calculated value (3m) |
|--------------------|----------------------------|---------------------|------------------------|-----------------------|
| Max. peak value | 1 MHz RBW 1 MHz VBW | 110.9 dB μ V/m | -6.3 dB | 104.6 dB μ V/m |
| Max. average value | 1 MHz RBW 10 Hz VBW | 98.8 dB μ V/m | -6.3 dB | 92.5 dB μ V/m |
| Delta value | Peak 300 kHz RBW/VBW | 41.0 dB | | |
| Value at band edge | limit: 54 dB μ V/m | | | 51.5 dB μ V/m |
| Statement: | | | | Complies |

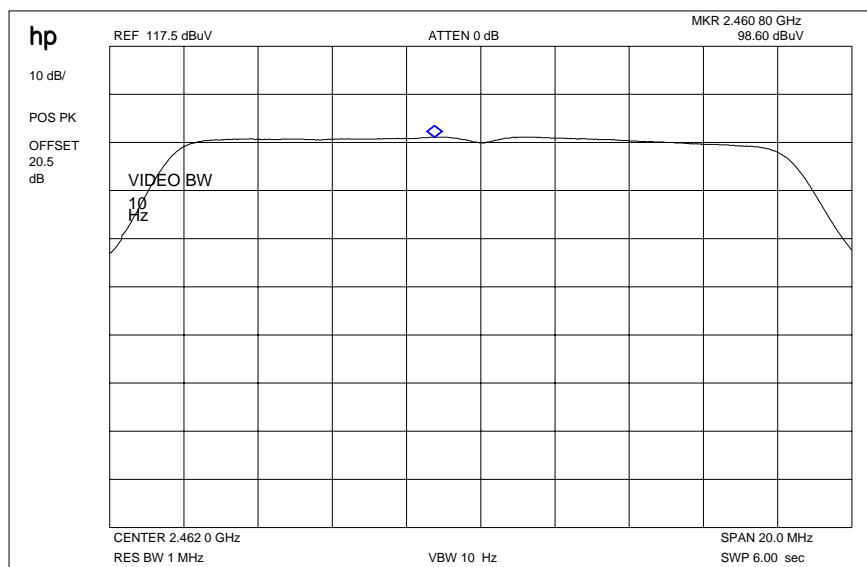
Plot 10: Max field strength in 3m distance (single frequency) peak (OFDM)



Result:

| Frequency | Meter reading | Correction factor | Results |
|-----------|------------------|-------------------|------------------|
| 2462 MHz | 110.9 dB μ V | -6.3 dB | 104.6 dB μ V |

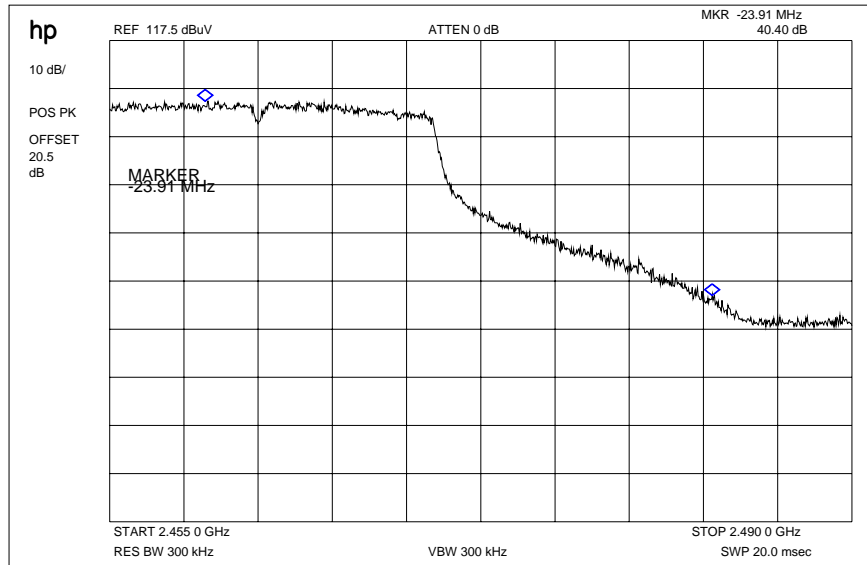
Plot 11: Max field strength in 3m distance (single frequency) average (OFDM)



Result:

| Frequency | Meter reading | Correction factor | Results |
|-----------|-----------------|-------------------|-----------------|
| 2462 MHz | 98.6 dB μ V | -6.3 dB | 92.3 dB μ V |

Plot 12: Marker-Delta Method RBW/VBW = 1% of span (OFDM)



Result:

Marker-Delta-Value: 40.40 dB

This measurement was made to show that the behaviour of the system is conform to FCC 15.205 (restricted bands)

Results & Limits:

Radiated field strength

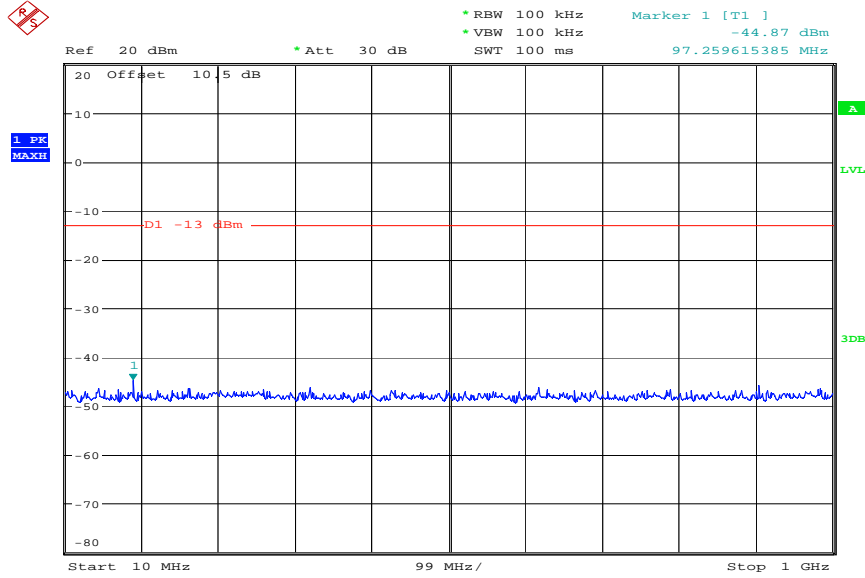
The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

| high channel (OFDM) | setup | measured value (3m) | correction factor (3m) | calculated value (3m) |
|---------------------|----------------------------|---------------------|------------------------|-----------------------|
| Max. peak value | 1 MHz RBW 1 MHz VBW | 110.9 dBμV/m | -6.3 dB | 104.6 dBμV/m |
| Max. average value | 1 MHz RBW 10 Hz VBW | 98.6 dBμV/m | -6.3 dB | 92.3 dBμV/m |
| Delta value | Peak 300 kHz RBW/VBW | 40.40 dB | | |
| Value at band edge | limit: 54 dBμV/m | | | 51.9 dBμV/m |
| Statement: | | | | Complies |

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

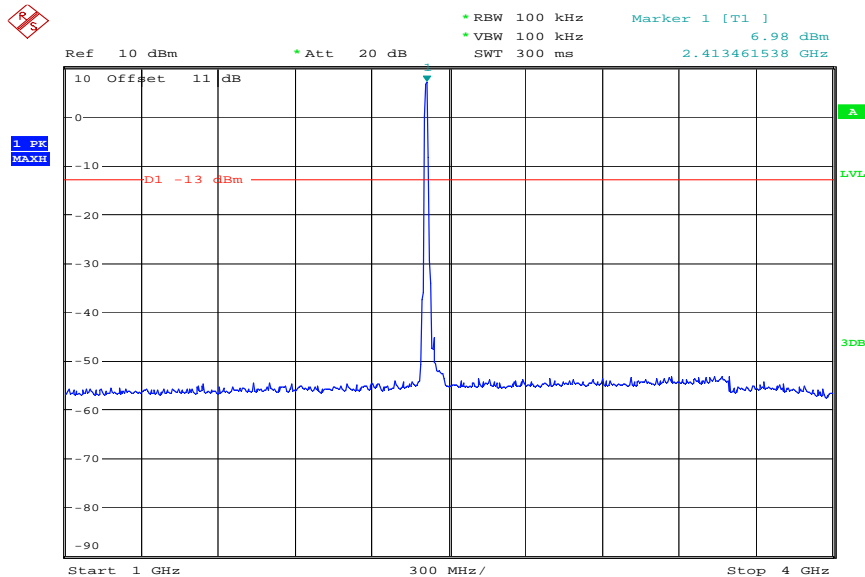
DSSS:

Plot 1: channel 1 b-mode 11MBit/s



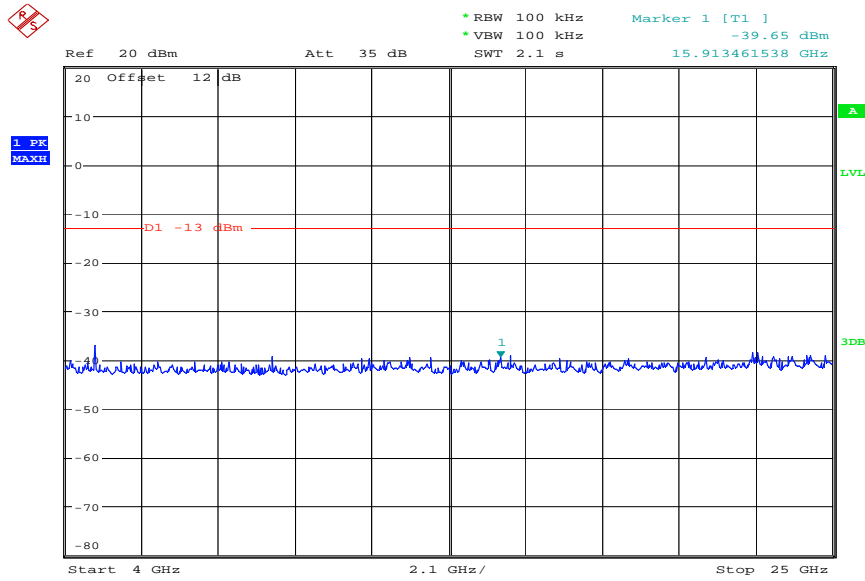
Date: 16.OCT.2008 14:48:03

Plot 2: channel 1 b-mode 11MBit/s



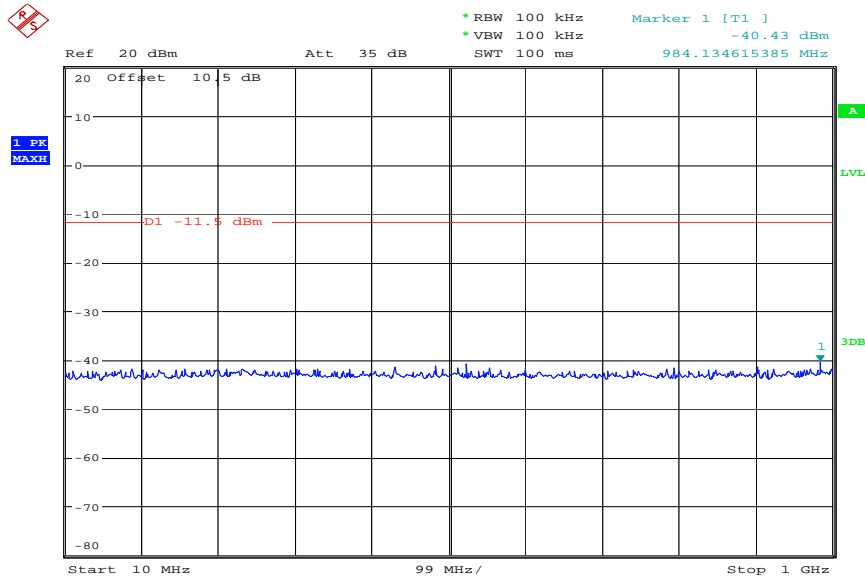
Date: 16.OCT.2008 14:45:34

Plot 3: channel 1 b-mode 11MBit/s



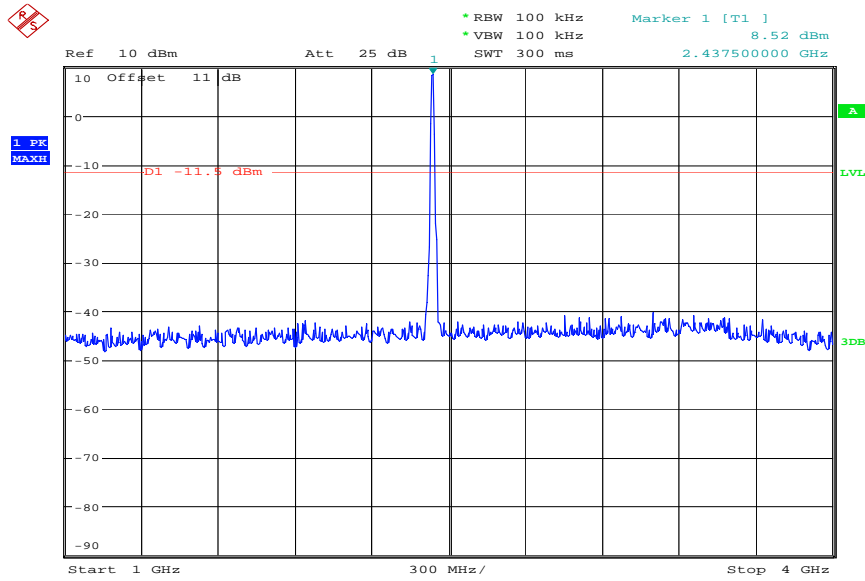
Date: 16.OCT.2008 14:50:23

Plot 4: channel 6 b-mode 11MBit/s



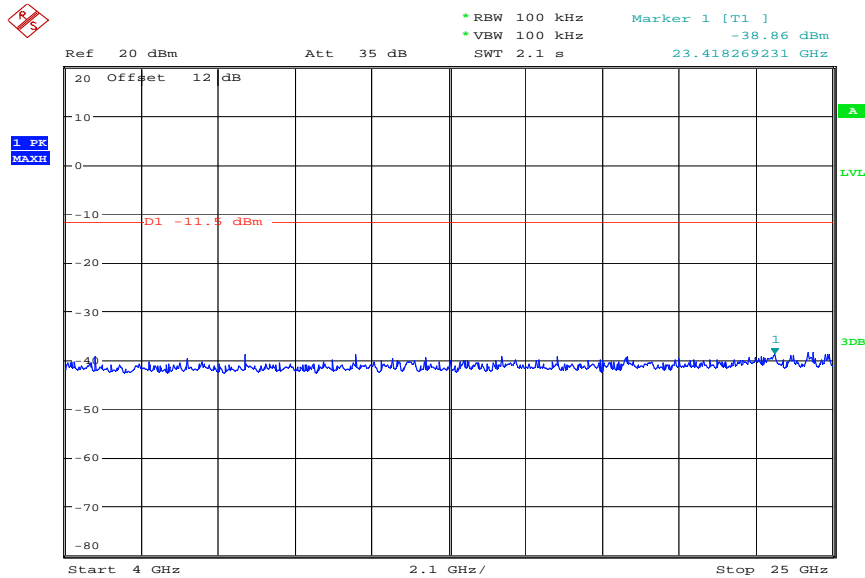
Date: 16.OCT.2008 15:01:12

Plot 5: channel 6 b-mode 11MBit/s



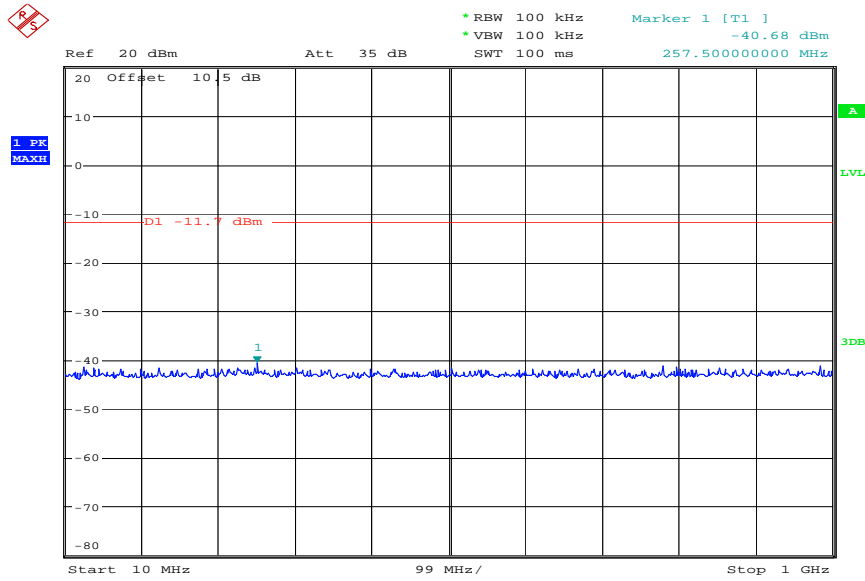
Date: 16.OCT.2008 14:58:55

Plot 6: channel 6 b-mode 11MBit/s



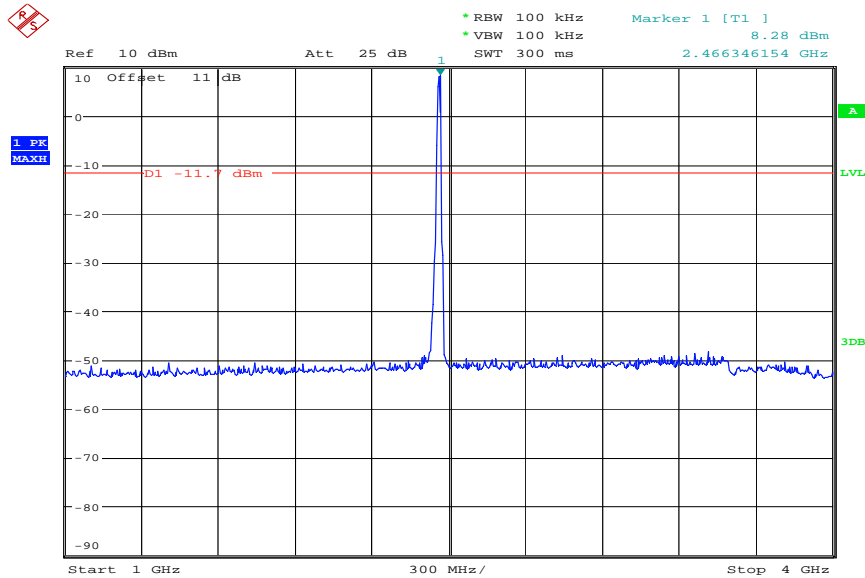
Date: 16.OCT.2008 15:02:27

Plot 7: channel 11 b-mode 11MBit/s



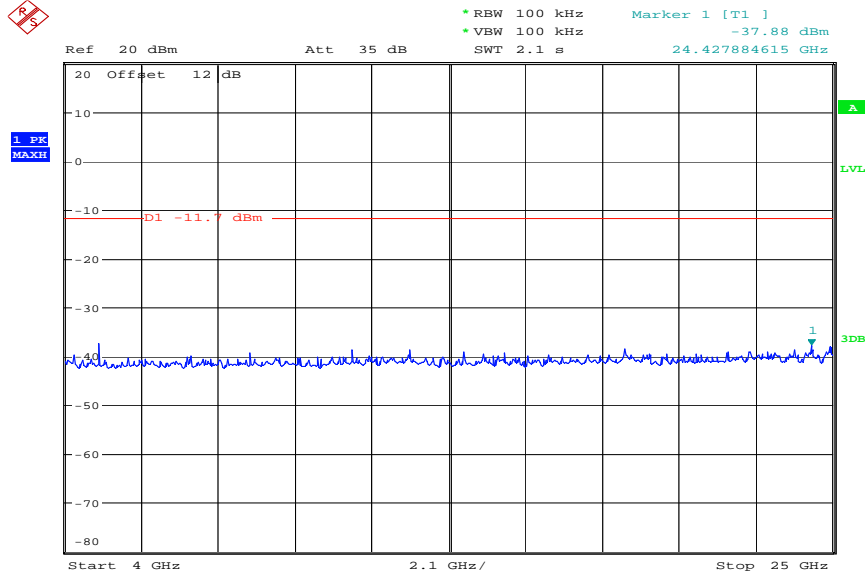
Date: 16.OCT.2008 15:19:08

Plot 8: channel 11 b-mode 11MBit/s



Date: 16.OCT.2008 15:14:51

Plot 9: channel 11 b-mode 11MBit/s



Date: 16.OCT.2008 15:21:56

The limit lines are recalculated 20 dBc from the measured output power with the specified bandwidth as described in this subpart (Conducted Sample 1)

Result & Limits:

| Emission Limitations | | | | | |
|---|-----------------------------|-----------------------------------|--|---------------------|--|
| f [MHz] | amplitude of emission [dBm] | limit max. allowed emission power | actual attenuation below frequency of operation [dB] | results | |
| 2412 | | 30 dBm | | Operating frequency | |
| The carrier signal is shown on the plot. No critical spurious emissions detected. | | -20 dBc | | complies | |
| 2437 | | 30 dBm | | Operating frequency | |
| The carrier signal is shown on the plot. No critical spurious emissions detected. | | -20 dBc | | complies | |
| 2462 | | 30 dBm | | Operating frequency | |
| The carrier signal is shown on the plot. No critical spurious emissions detected. | | -20 dBc | | complies | |
| Measurement uncertainty | | ± 3dB | | | |

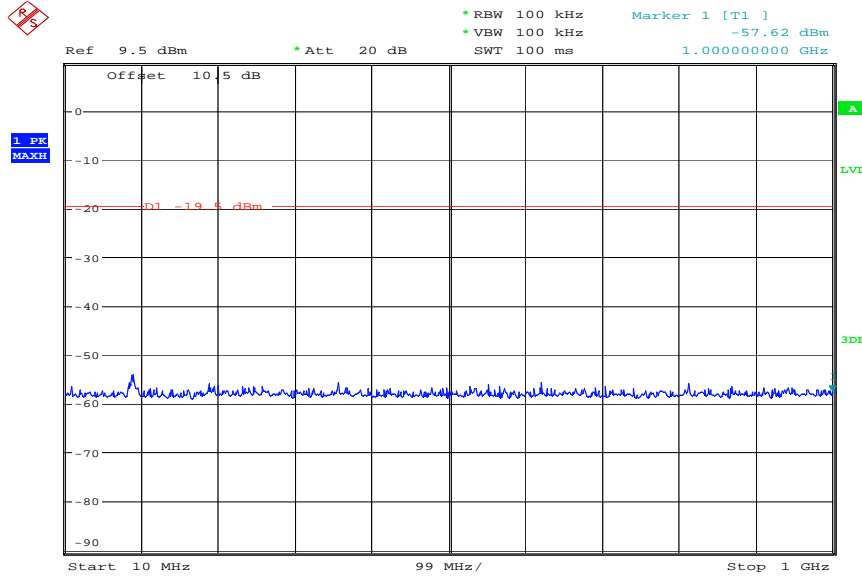
RBW: 100 kHz VBW: 100 kHz

| | |
|-----------------------------------|--|
| 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)). |
|-----------------------------------|--|

Note: For emissions that fall into restricted bands you find the radiated emissions later in the report.

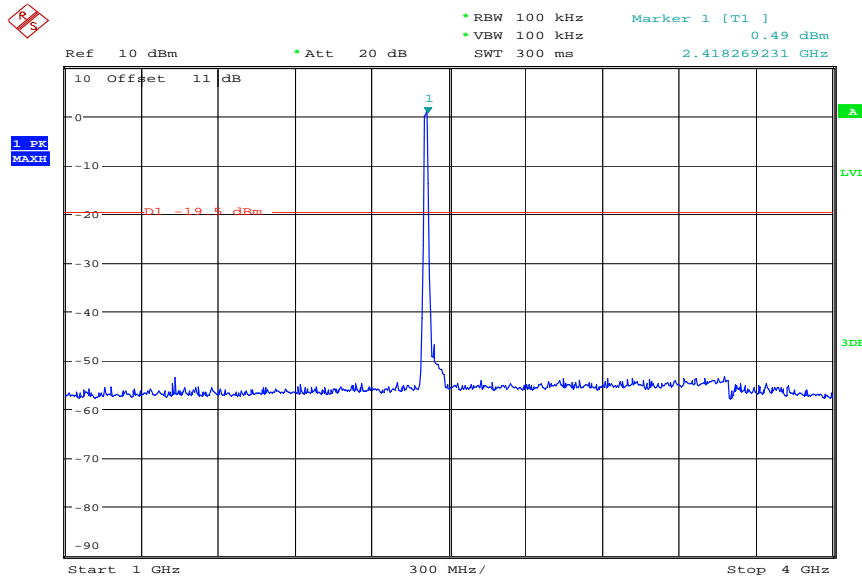
OFDM:

Plot 1: channel 1 g-mode 54 MBit/s



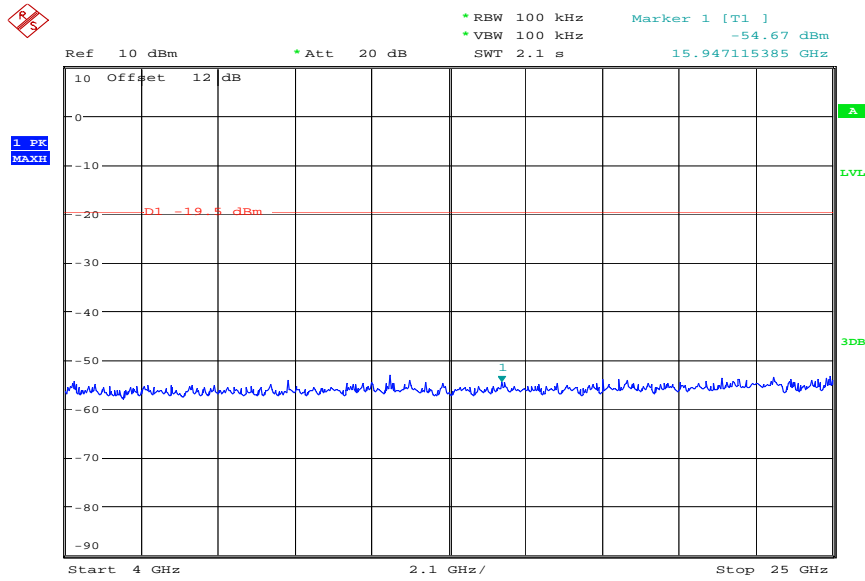
Date: 16.OCT.2008 14:17:51

Plot 2: channel 1 g-mode 54 MBit/s



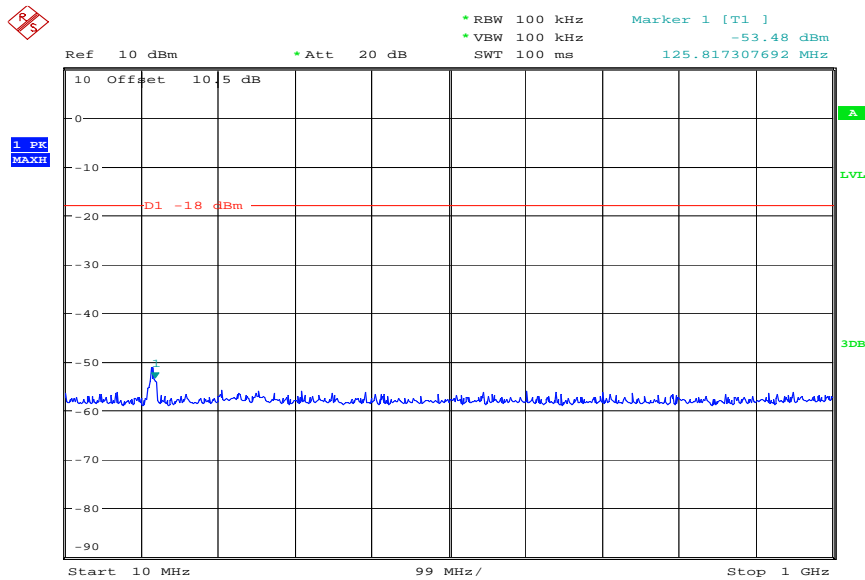
Date: 16.OCT.2008 14:15:35

Plot 3: channel 1 g-mode 54 MBit/s



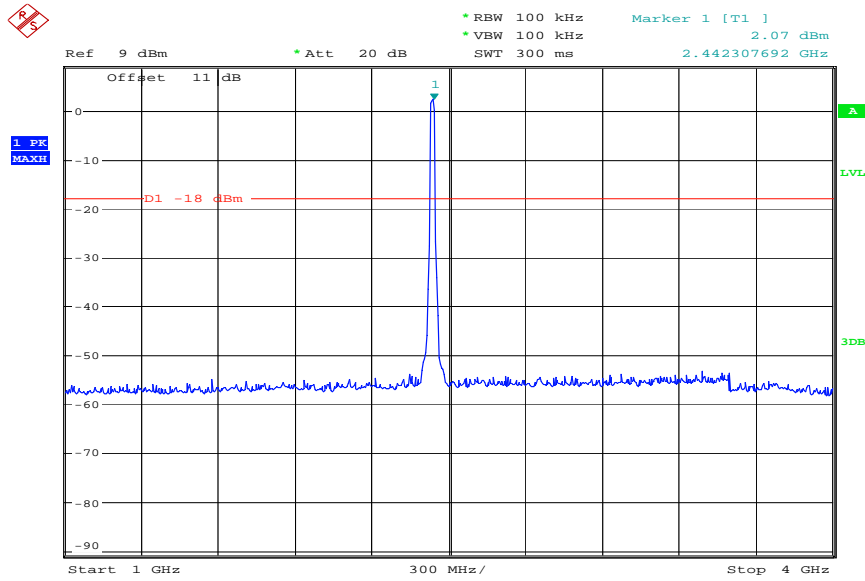
Date: 16.OCT.2008 14:21:20

Plot 4: channel 6 g-mode 54 MBit/s



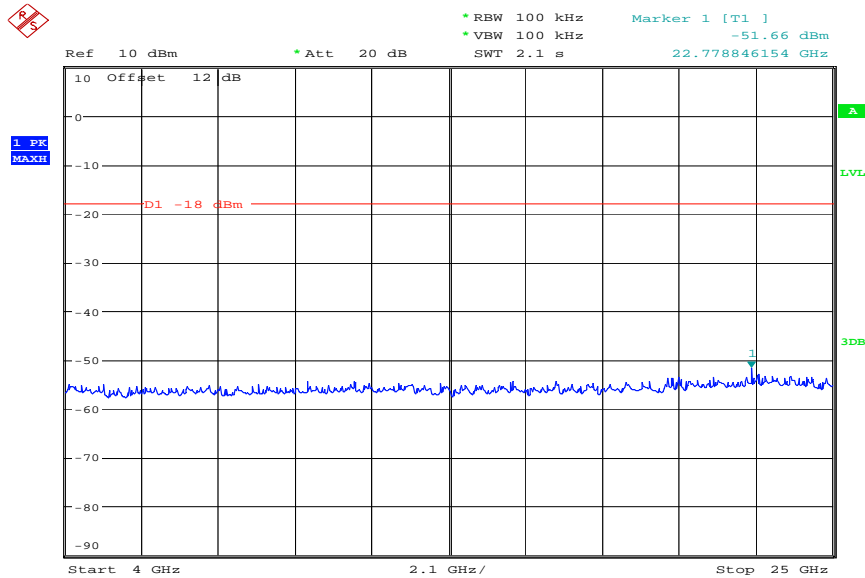
Date: 16.OCT.2008 14:25:19

Plot 5: channel 6 g-mode 54 MBit/s



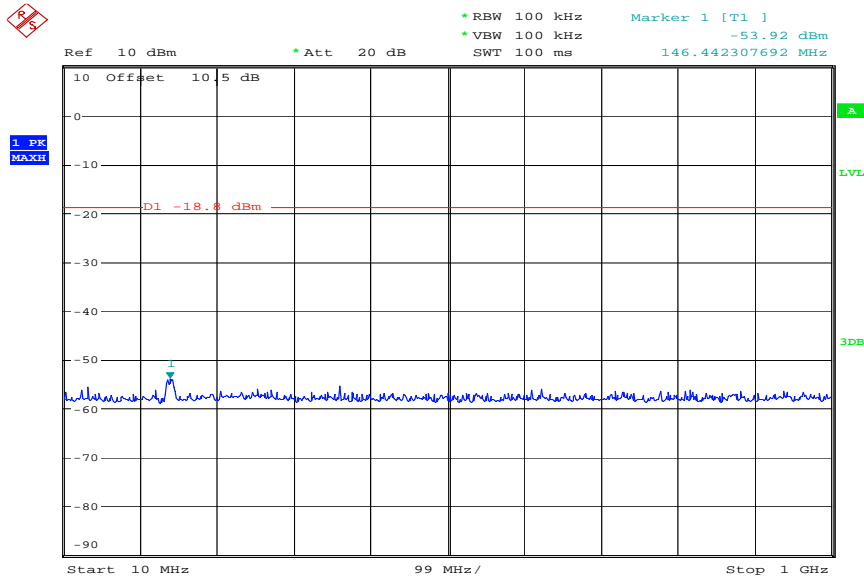
Date: 16.OCT.2008 14:23:35

Plot 6: channel 6 g-mode 54 MBit/s



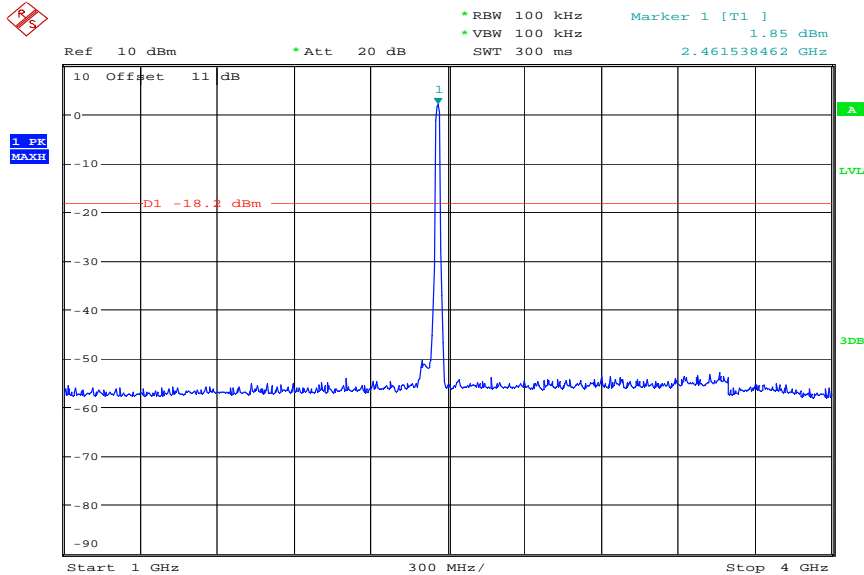
Date: 16.OCT.2008 14:26:05

Plot 7: channel 11 g-mode 54 MBit/s



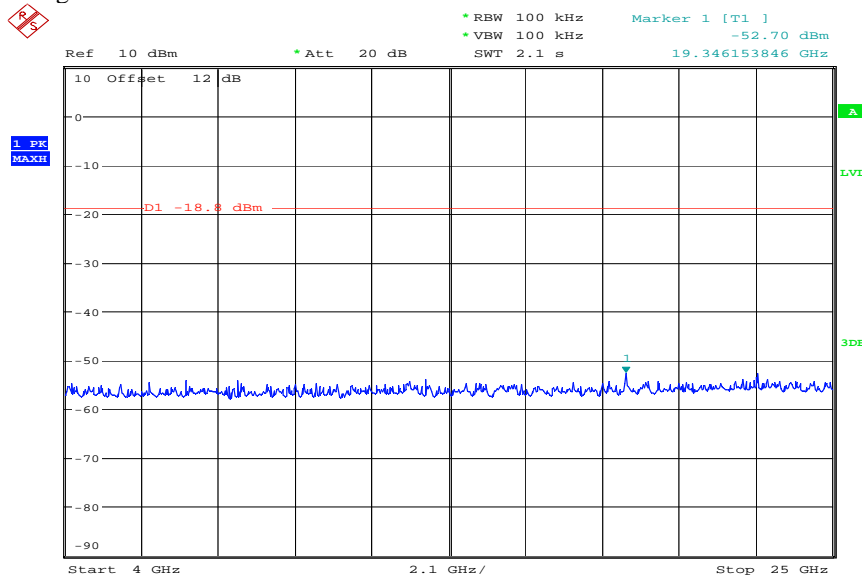
Date: 16.OCT.2008 14:29:59

Plot 8: channel 11 g-mode 54 MBit/s



Date: 16.OCT.2008 14:28:20

Plot 9: channel 11 g-mode 54 MBit/s



Date: 16.OCT.2008 14:31:40

The limit lines are recalculated 20 dBc from the measured output power with the specified bandwidth as described in this subpart (Conducted Sample 1)

Result & Limits:

| Emission Limitations | | | | | |
|---|-----------------------------|-----------------------------------|--|---------------------|--|
| f [MHz] | amplitude of emission [dBm] | limit max. allowed emission power | actual attenuation below frequency of operation [dB] | results | |
| 2412 | | 30 dBm | | Operating frequency | |
| The carrier signal is shown on the plot. No critical spurious emissions detected. | | -20 dBc | | complies | |
| 2437 | | 30 dBm | | Operating frequency | |
| The carrier signal is shown on the plot. No critical spurious emissions detected. | | -20 dBc | | complies | |
| 2462 | | 30 dBm | | Operating frequency | |
| The carrier signal is shown on the plot. No critical spurious emissions detected. | | -20 dBc | | complies | |
| Measurement uncertainty | | ± 3dB | | | |

RBW: 100 kHz VBW: 100 kHz

| | |
|-----------------------------------|--|
| 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)). |
|-----------------------------------|--|

Note: For emissions that fall into restricted bands you find the radiated emissions later in the report.

5.13 Spurious Emissions - radiated (Transmitter) §15.209

DSSS:

Plot 1: 0.03 - 1 GHz (lowest channel) b-mode 11MBit/s

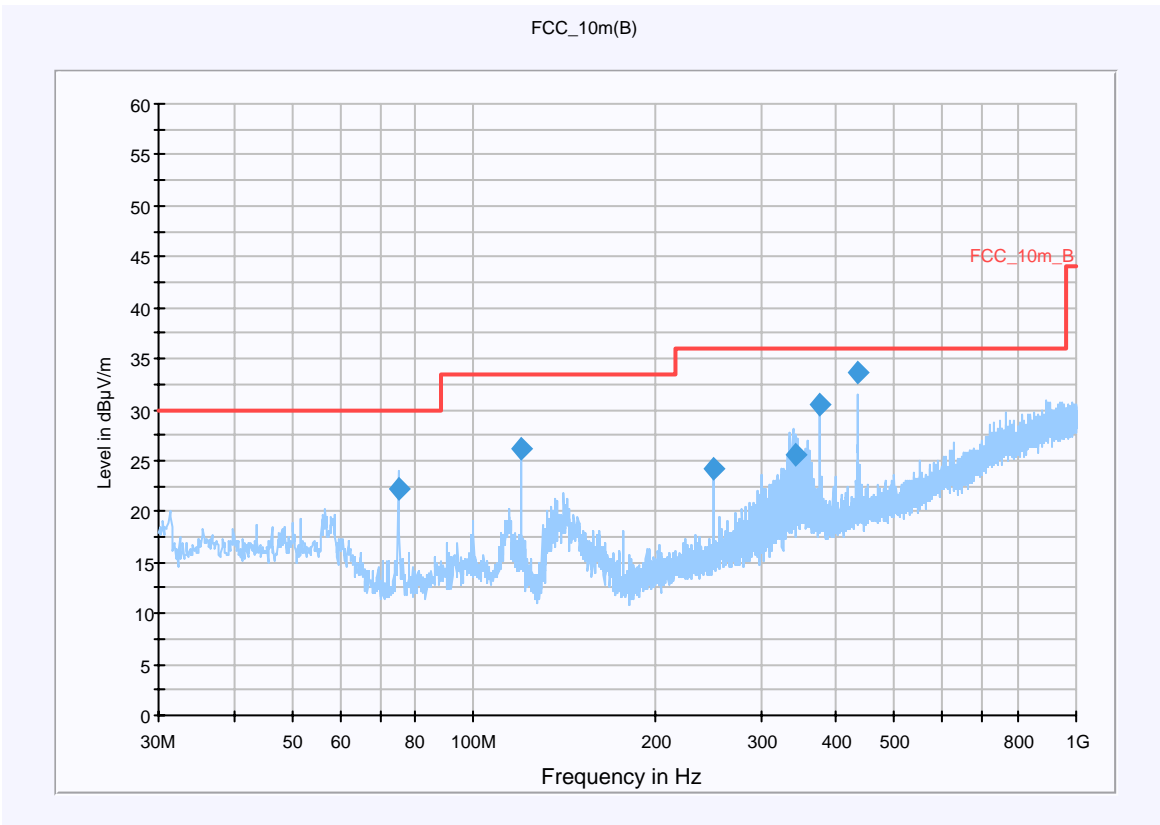
Common Information

EUT: Siemens Gigaset SX 686 Wimax
 Serial Number: sample 1
 Test Description: FCC Part 15B @ 10m
 Operating Conditions: Wlan Ch 1 / Wimax idle
 Operator Name: Klos
 Comment:

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 |
| 1 GHz - 2 GHz | QuasiPeak | 1 MHz | 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 |
|-----------------|--------------------|-----------------|-----------------|---------------------|----------|--------------------------|------------|-------------|----------------|---------|
| 75.015100 | 22.2 | 15000.000 | 120.000 | 238.0 | V | 271.0 | 9.5 | 7.8 | 30.0 | |
| 120.002000 | 26.2 | 15000.000 | 120.000 | 100.0 | V | 43.0 | 10.5 | 7.3 | 33.5 | |
| 250.006900 | 24.2 | 15000.000 | 120.000 | 107.0 | V | 186.0 | 13.5 | 11.8 | 36.0 | |
| 341.505200 | 25.6 | 15000.000 | 120.000 | 100.0 | V | 196.0 | 15.9 | 10.4 | 36.0 | |
| 375.004150 | 30.4 | 15000.000 | 120.000 | 100.0 | V | 104.0 | 16.5 | 5.6 | 36.0 | |
| 433.338400 | 33.6 | 15000.000 | 120.000 | 200.0 | H | 198.0 | 17.4 | 2.4 | 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

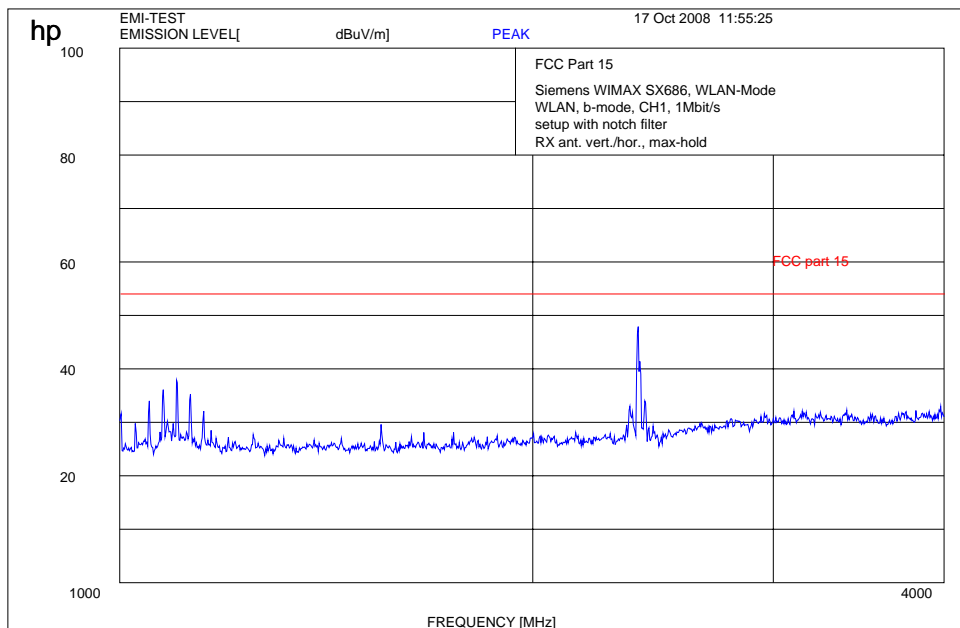
Signal Path: without Notch
FW 1.0

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

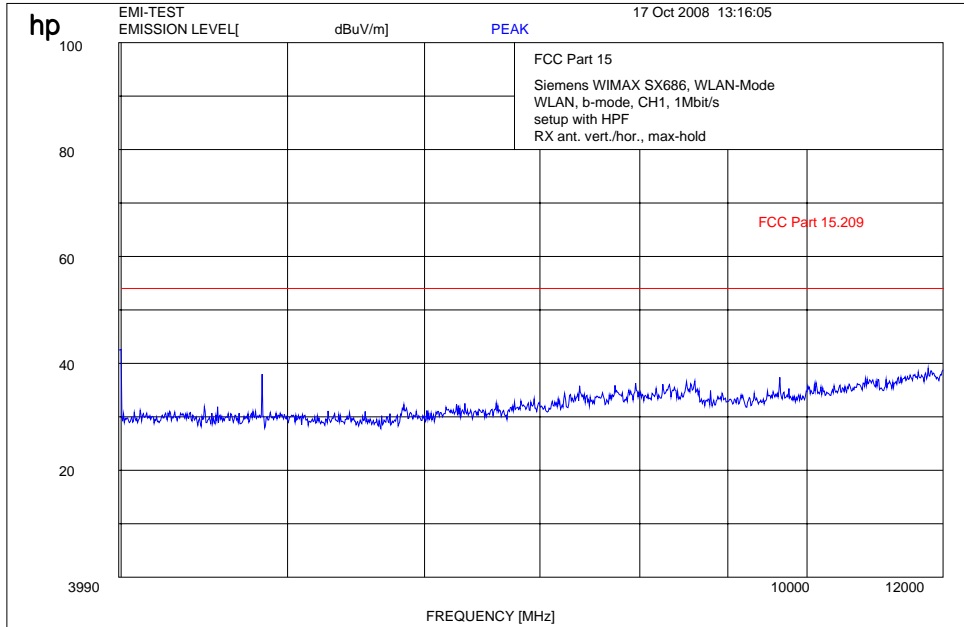
Turntable: Turntable [EMCO Turntable]
@ GPIB0 (ADR 9), FW REV 3.12

Plot 2: 1 - 4 GHz (lowest channel) b-mode 11MBit/s

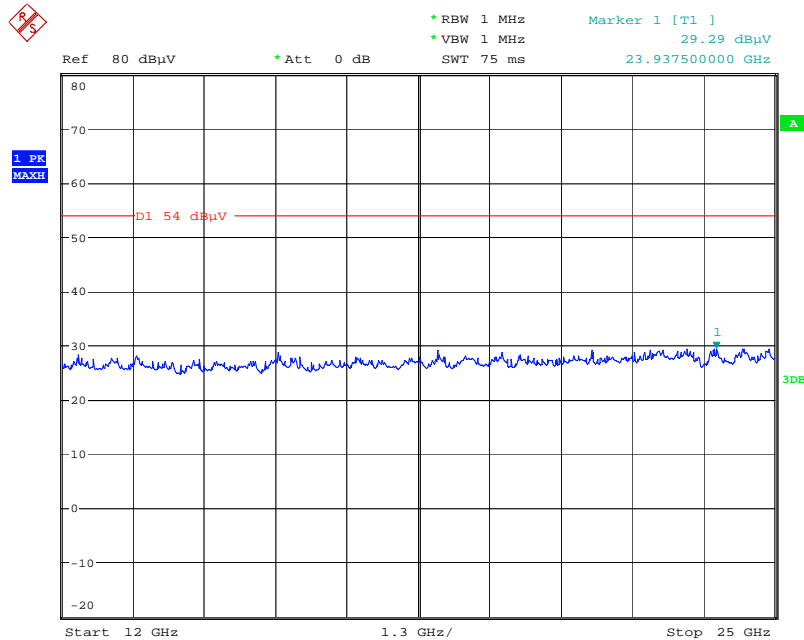


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: 4 - 12 GHz (lowest channel) b-mode 11MBit/s



Plot 4: 12 - 25 GHz (valid for all channels) b-mode 11MBit/s



Date: 16.OCT.2008 16:09:13

Plot 5: 0.03 - 1 GHz (middle channel) b-mode 11MBit/s

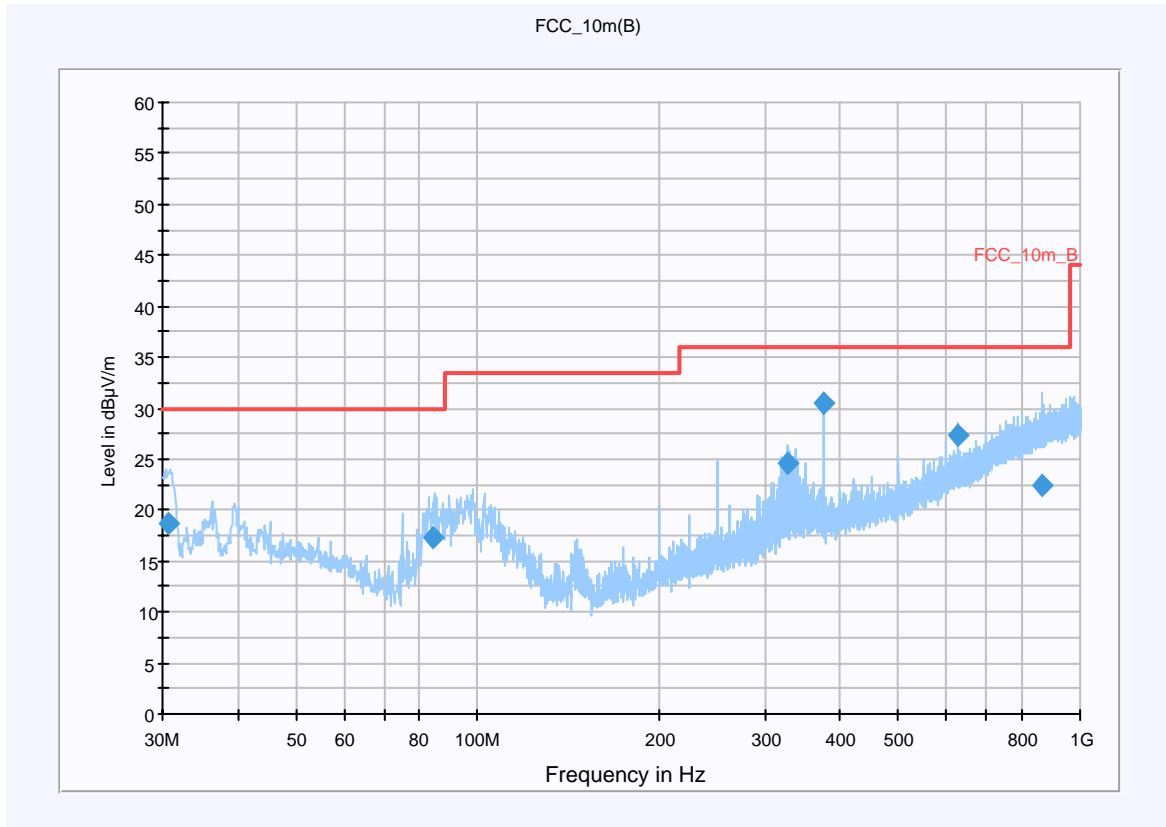
Common Information

EUT: Siemens Gigaset SX 686 Wimax
 Serial Number: sample 1
 Test Description: FCC Part 15B @ 10m
 Operating Conditions: Wlan Ch 6 / Wimax idle
 Operator Name: Klos
 Comment: Powered with AC 115V/ 60 Hz

Scan Setup: FCC_Fin [EMI radiated]

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

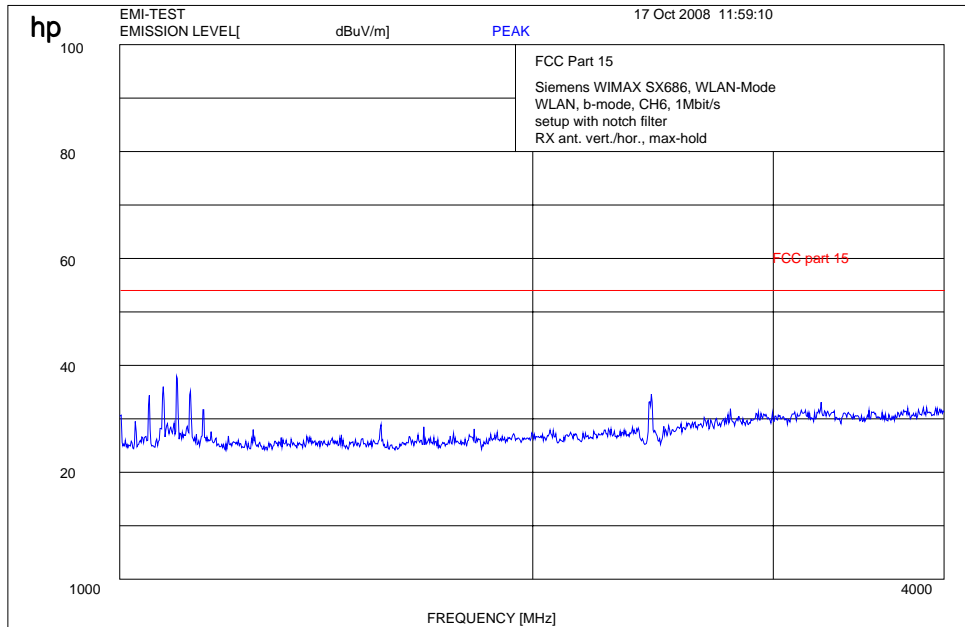
| Subrange | Detectors | IF Bandwidth | Meas. Time | Receiver |
|----------------|-----------|--------------|------------|----------|
| 30 MHz - 1 GHz | QuasiPeak | 120 kHz | 15 s | Receiver |



Final Result 1

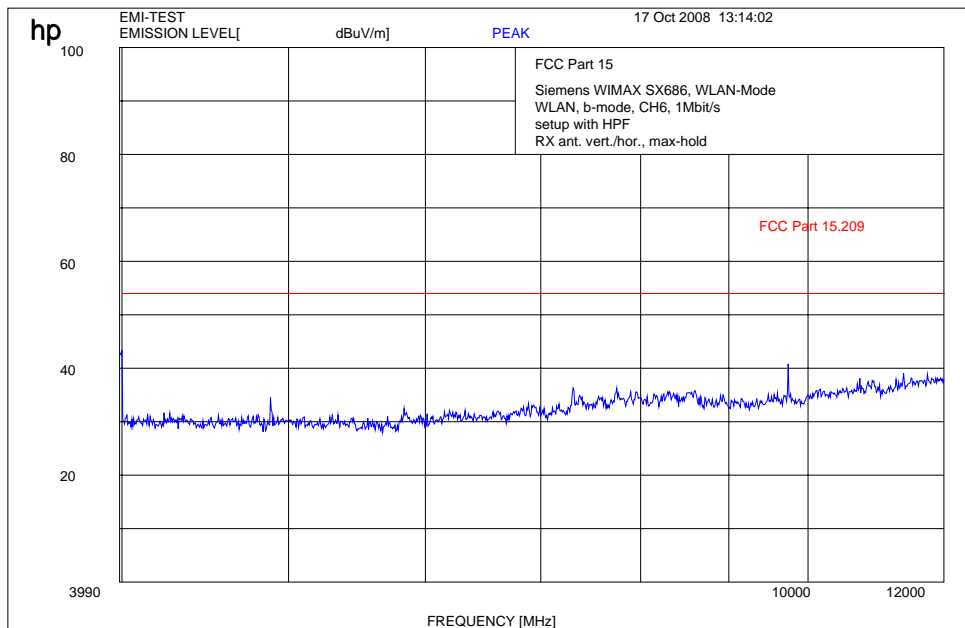
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Antenna height (cm) | Polarity | Turntable position (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|---------------------|----------|--------------------------|------------|-------------|----------------|---------|
| 30.715400 | 18.6 | 15000.000 | 120.000 | 106.0 | V | 140.0 | 12.7 | 11.4 | 30.0 | |
| 84.362150 | 17.2 | 15000.000 | 120.000 | 400.0 | V | 50.0 | 10.1 | 12.8 | 30.0 | |
| 327.161050 | 24.6 | 15000.000 | 120.000 | 106.0 | V | 199.0 | 15.5 | 11.4 | 36.0 | |
| 375.012250 | 30.5 | 15000.000 | 120.000 | 267.0 | H | 319.0 | 16.5 | 5.5 | 36.0 | |
| 625.003650 | 27.3 | 15000.000 | 120.000 | 114.0 | H | 107.0 | 21.1 | 8.7 | 36.0 | |
| 866.742300 | 22.4 | 15000.000 | 120.000 | 200.0 | V | 275.0 | 25.3 | 13.6 | 36.0 | |

Plot 6: 1 - 4 GHz (middle channel) b-mode 11MBit/s



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

Plot 7: 4 - 12 GHz (middle channel) b-mode 11MBit/s



Plot 8: 0.03 - 1 GHz (highest channel) b-mode 11MBit/s

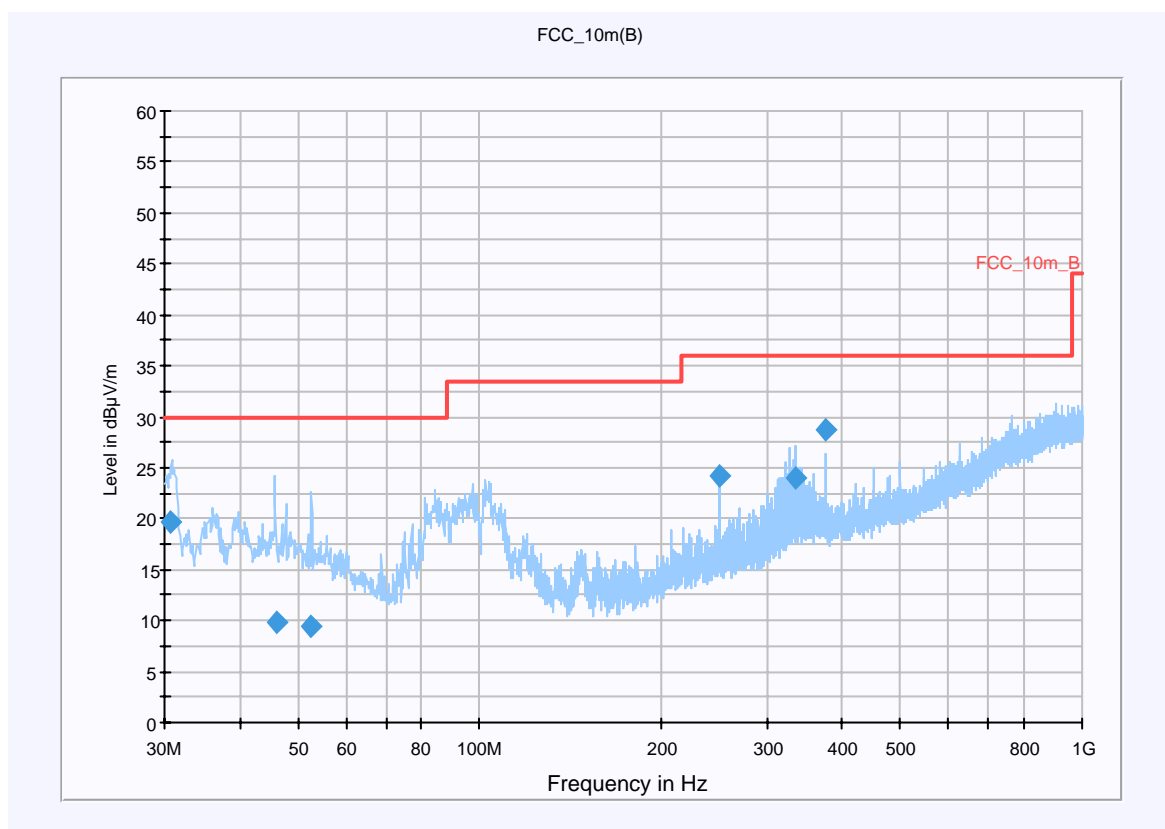
Common Information

EUT: Siemens Gigaset SX 686 Wimax
 Serial Number: sample 1
 Test Description: FCC Part 15B @ 10m
 Operating Conditions: Wlan Ch 11 / Wimax idle
 Operator Name: Folz
 Comment: Powered with AC 115V/ 60 Hz

Scan Setup: FCC_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)
 Level Unit: dB μ V/m

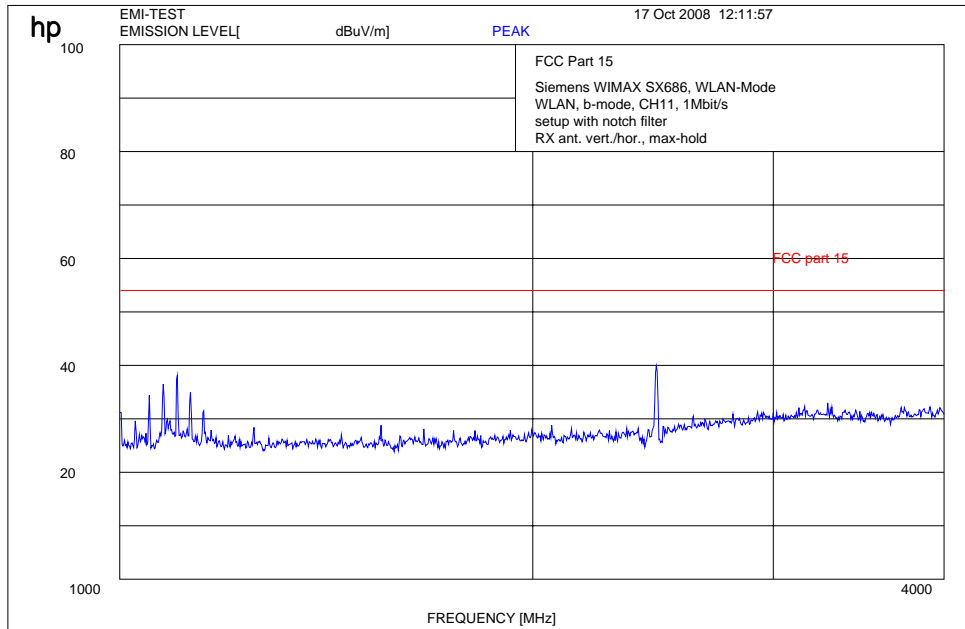
| Subrange | Detectors | IF Bandwidth | Meas. Time | Receiver |
|----------------|-----------|--------------|------------|----------|
| 30 MHz - 1 GHz | QuasiPeak | 120 kHz | 15 s | Receiver |
| 1 GHz - 2 GHz | QuasiPeak | 1 MHz | 15 s | Receiver |



Final Result 1

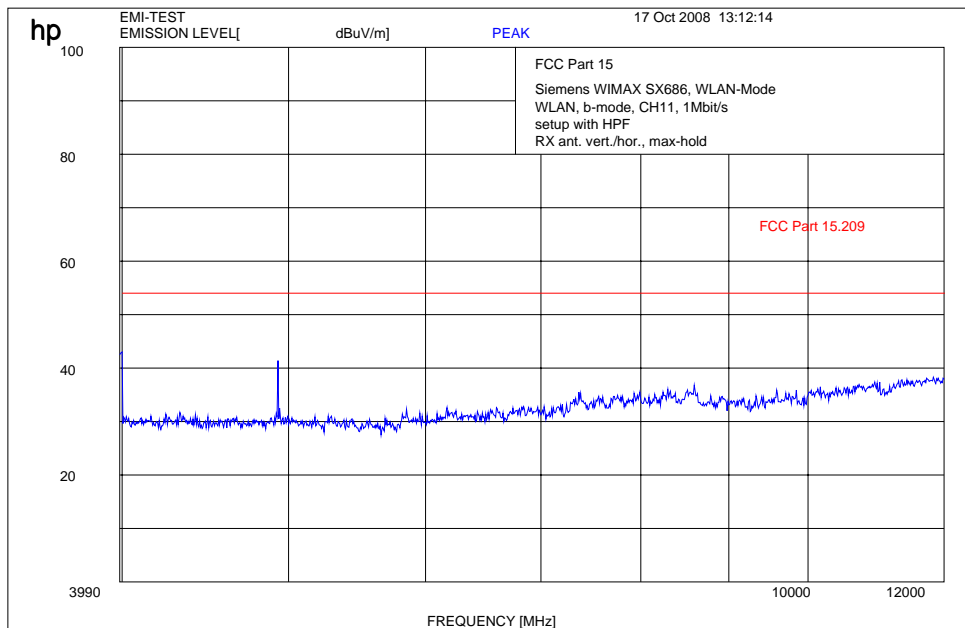
| Frequency (MHz) | QuasiPeak (dB μ V/m) | Meas. Time (ms) | Bandwidth (kHz) | Antenna height (cm) | Polarity | Turntable position (deg) | Corr. (dB) | Margin (dB) | Limit (dB μ V/m) | Comment |
|-----------------|--------------------------|-----------------|-----------------|---------------------|----------|--------------------------|------------|-------------|----------------------|---------|
| 30.636800 | 19.7 | 15000.000 | 120.000 | 138.0 | V | 143.0 | 12.7 | 10.3 | 30.0 | |
| 46.029950 | 9.9 | 15000.000 | 120.000 | 400.0 | V | 265.0 | 13.4 | 20.1 | 30.0 | |
| 52.402650 | 9.5 | 15000.000 | 120.000 | 400.0 | V | 228.0 | 13.3 | 20.5 | 30.0 | |
| 250.005450 | 24.2 | 15000.000 | 120.000 | 114.0 | V | 0.0 | 13.5 | 11.8 | 36.0 | |
| 334.286350 | 24.0 | 15000.000 | 120.000 | 107.0 | V | 193.0 | 15.7 | 12.0 | 36.0 | |
| 375.027850 | 28.7 | 15000.000 | 120.000 | 281.0 | H | 109.0 | 16.5 | 7.3 | 36.0 | |

Plot 9: 1 - 4 GHz (highest channel) b-mode 11MBit/s



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

Plot 10: 4 - 12 GHz (highest channel) b-mode 11MBit/s



OFDM:

Plot 1: 0.03 - 1 GHz (lowest channel) g-mode 54 MBit/s

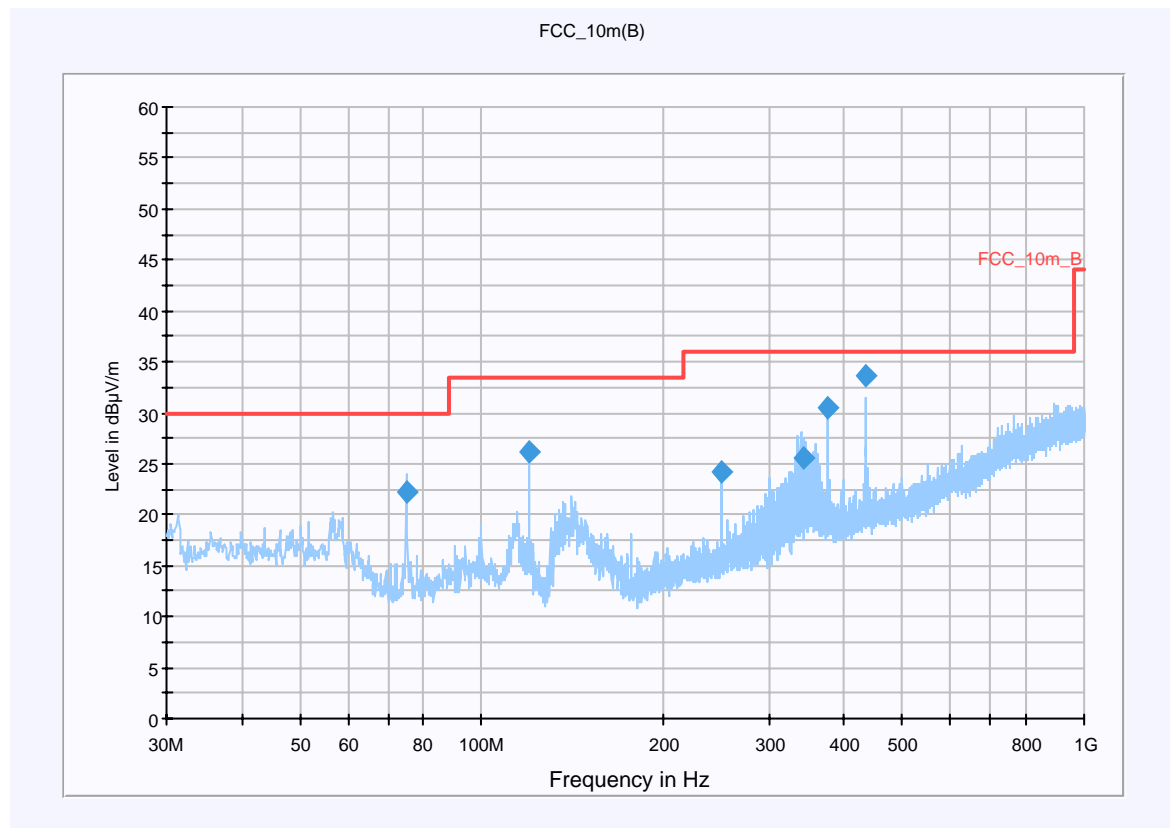
Common Information

EUT: Siemens Gigaset SX 686 Wimax
 Serial Number: sample 1
 Test Description: FCC Part 15B @ 10m
 Operating Conditions: Wlan Ch 1 / Wimax idle
 Operator Name: Klos
 Comment:

Scan Setup: FCC_Fin [EMI radiated]

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

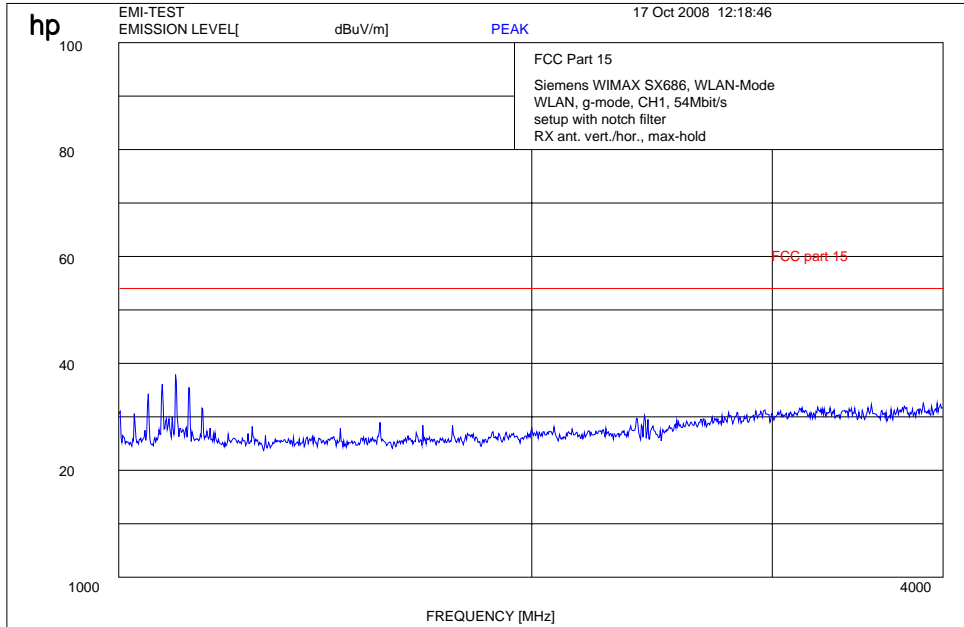
| Subrange | Detectors | IF Bandwidth | Meas. Time | Receiver |
|----------------|-----------|--------------|------------|----------|
| 30 MHz - 1 GHz | QuasiPeak | 120 kHz | 15 s | Receiver |
| 1 GHz - 2 GHz | QuasiPeak | 1 MHz | 15 s | Receiver |



Final Result 1

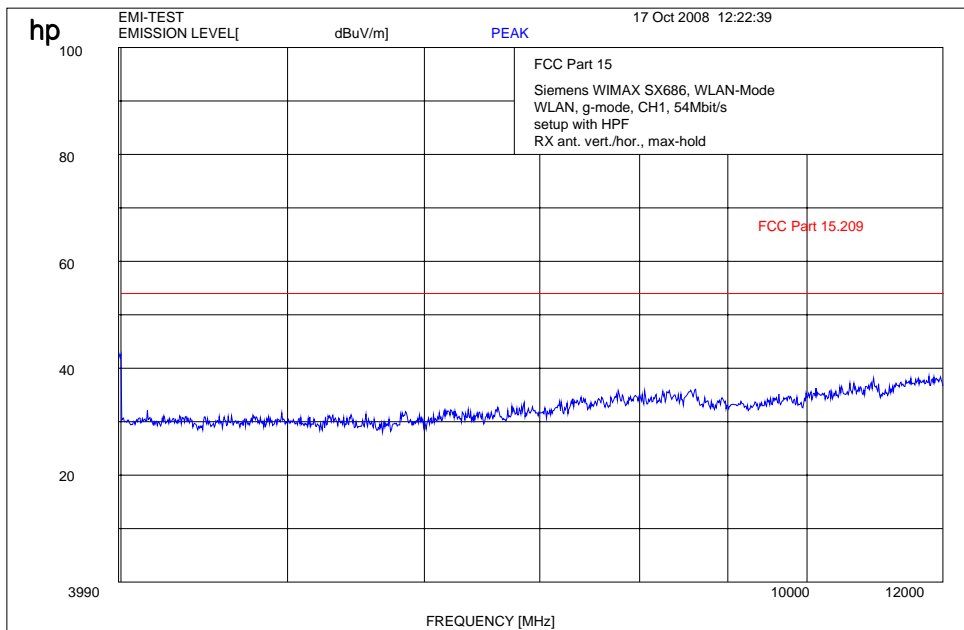
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Antenna height (cm) | Polarity | Turntable position (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|---------------------|----------|--------------------------|------------|-------------|----------------|---------|
| 75.015100 | 22.2 | 15000.000 | 120.000 | 238.0 | V | 271.0 | 9.5 | 7.8 | 30.0 | |
| 120.002000 | 26.2 | 15000.000 | 120.000 | 100.0 | V | 43.0 | 10.5 | 7.3 | 33.5 | |
| 250.006900 | 24.2 | 15000.000 | 120.000 | 107.0 | V | 186.0 | 13.5 | 11.8 | 36.0 | |
| 341.505200 | 25.6 | 15000.000 | 120.000 | 100.0 | V | 196.0 | 15.9 | 10.4 | 36.0 | |
| 375.004150 | 30.4 | 15000.000 | 120.000 | 100.0 | V | 104.0 | 16.5 | 5.6 | 36.0 | |
| 433.338400 | 33.6 | 15000.000 | 120.000 | 200.0 | H | 198.0 | 17.4 | 2.4 | 36.0 | |

Plot 2: 1 - 4 GHz (lowest channel) g-mode 54 MBit/s

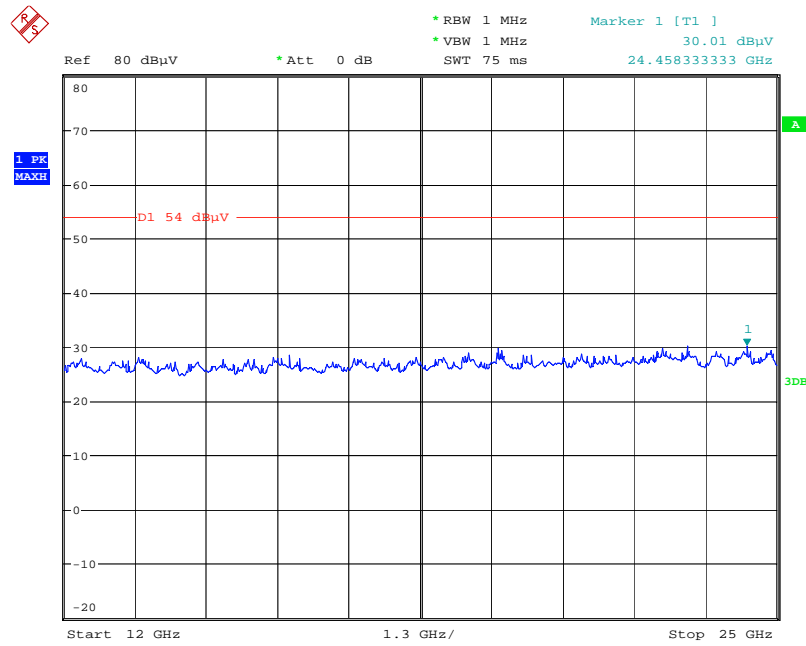


The carrier signal is notched with a 2.4 GHz band rejection filter.

Plot 3: 4 - 12 GHz (lowest channel) g-mode 54 MBit/s



Plot 4: 12 - 25 GHz (valid for all channels) g-mode 54 MBit/s



Date: 16.OCT.2008 16:06:16

Plot 5: 0.03 - 1 GHz (middle channel) g-mode 54 MBit/s

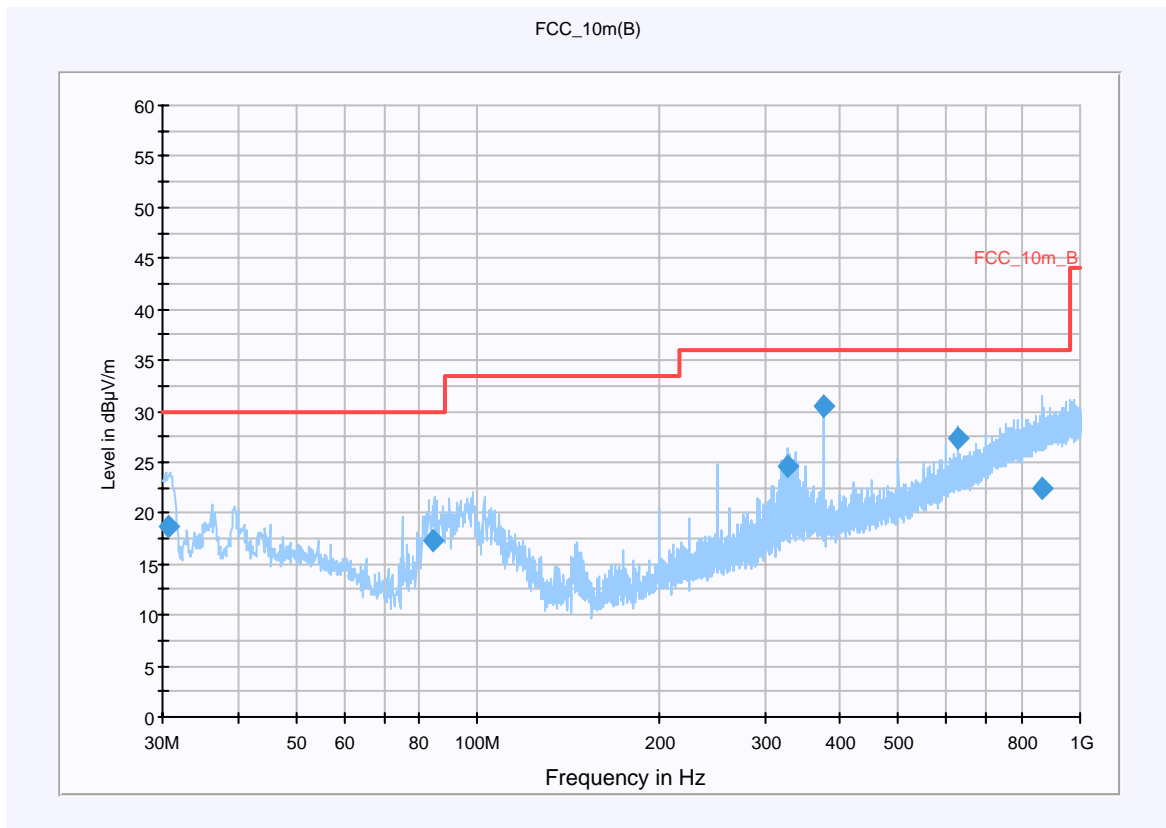
Common Information

EUT: Siemens Gigaset SX 686 Wimax
 Serial Number: sample 1
 Test Description: FCC Part 15B @ 10m
 Operating Conditions: Wlan Ch 6 / Wimax idle
 Operator Name: Klos
 Comment: Powered with AC 115V/ 60 Hz

Scan Setup: FCC_Fin [EMI radiated]

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

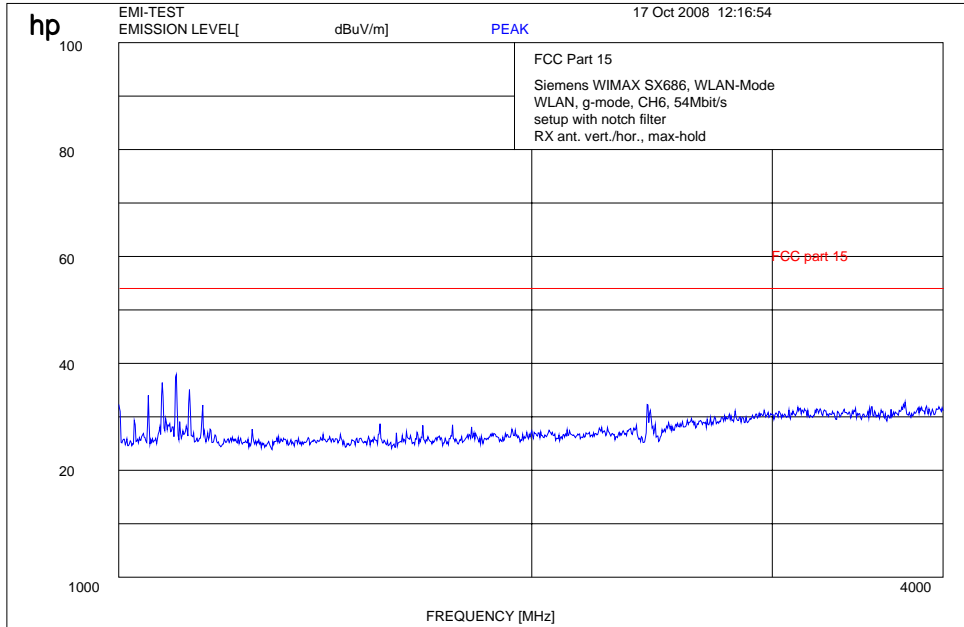
| Subrange | Detectors | IF Bandwidth | Meas. Time | Receiver |
|----------------|-----------|--------------|------------|----------|
| 30 MHz - 1 GHz | QuasiPeak | 120 kHz | 15 s | Receiver |



Final Result 1

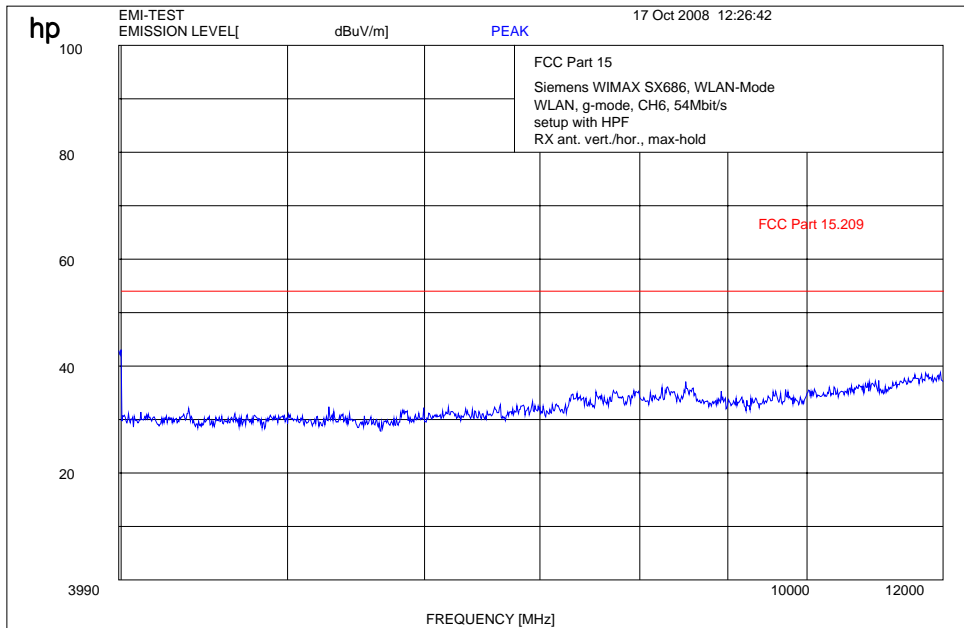
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Antenna height (cm) | Polarity | Turntable position (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|---------------------|----------|--------------------------|------------|-------------|----------------|---------|
| 30.715400 | 18.6 | 15000.000 | 120.000 | 106.0 | V | 140.0 | 12.7 | 11.4 | 30.0 | |
| 84.362150 | 17.2 | 15000.000 | 120.000 | 400.0 | V | 50.0 | 10.1 | 12.8 | 30.0 | |
| 327.161050 | 24.6 | 15000.000 | 120.000 | 106.0 | V | 199.0 | 15.5 | 11.4 | 36.0 | |
| 375.012250 | 30.5 | 15000.000 | 120.000 | 267.0 | H | 319.0 | 16.5 | 5.5 | 36.0 | |
| 625.003650 | 27.3 | 15000.000 | 120.000 | 114.0 | H | 107.0 | 21.1 | 8.7 | 36.0 | |
| 866.742300 | 22.4 | 15000.000 | 120.000 | 200.0 | V | 275.0 | 25.3 | 13.6 | 36.0 | |

Plot 6: 1 - 4 GHz (middle channel) g-mode 54 MBit/s



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

Plot 7: 4 - 12 GHz (middle channel) g-mode 54 MBit/s



Plot 8: 0.03 - 1 GHz (highest channel) g-mode 54 MBit/s

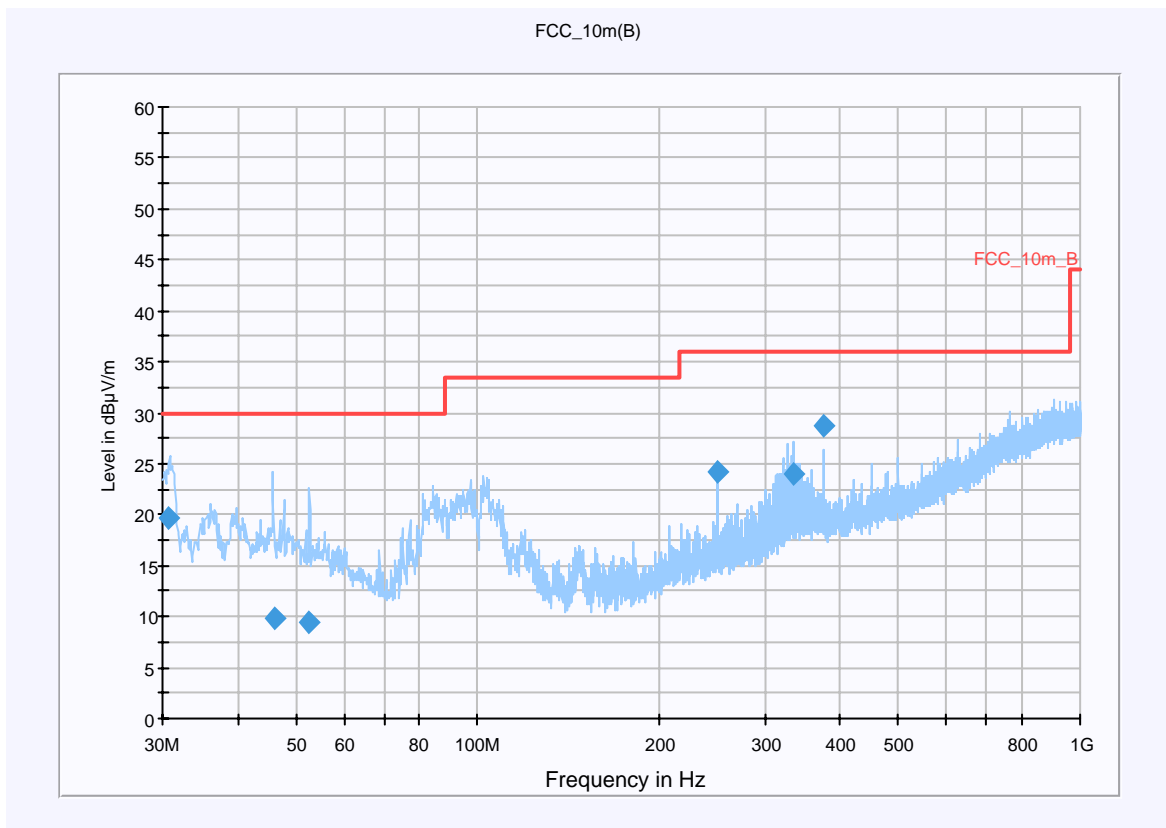
Common Information

EUT: Siemens Gigaset SX 686 Wimax
 Serial Number: sample 1
 Test Description: FCC Part 15B @ 10m
 Operating Conditions: Wlan Ch 11 / Wimax idle
 Operator Name: Folz
 Comment: Powered with AC 115V/ 60 Hz

Scan Setup: FCC_Fin [EMI radiated]

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

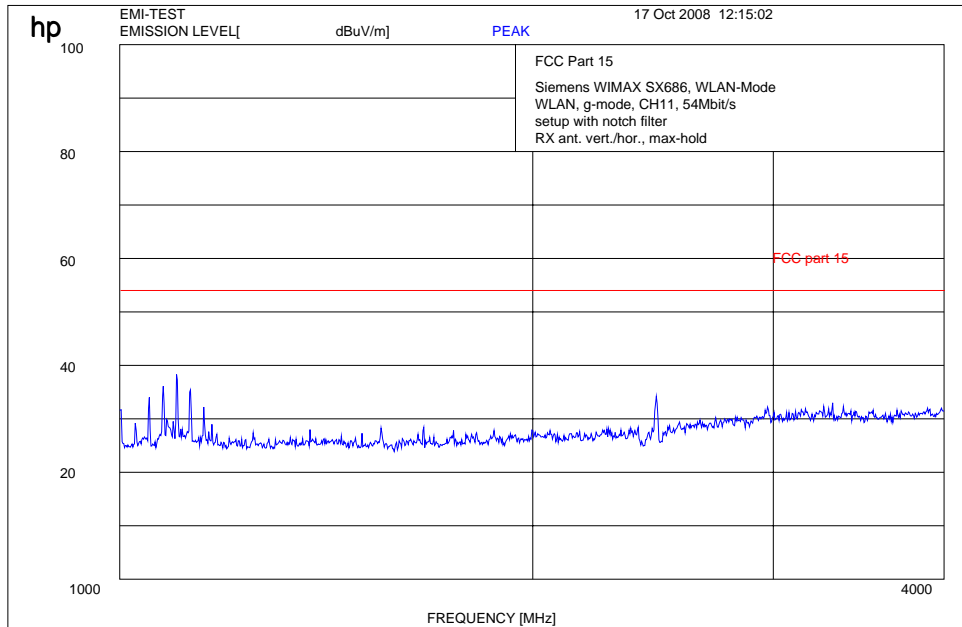
| Subrange | Detectors | IF Bandwidth | Meas. Time | Receiver |
|----------------|-----------|--------------|------------|----------|
| 30 MHz - 1 GHz | QuasiPeak | 120 kHz | 15 s | Receiver |
| 1 GHz - 2 GHz | QuasiPeak | 1 MHz | 15 s | Receiver |



Final Result 1

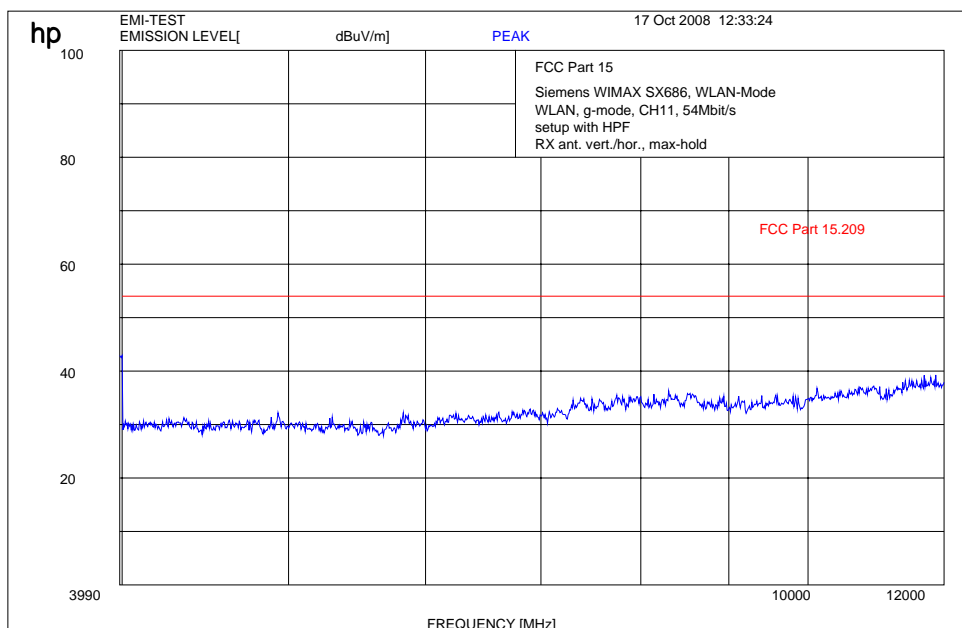
| Frequency (MHz) | QuasiPeak (dBµV/m) | Meas. Time (ms) | Bandwidth (kHz) | Antenna height (cm) | Polarity | Turntable position (deg) | Corr. (dB) | Margin (dB) | Limit (dBµV/m) | Comment |
|-----------------|--------------------|-----------------|-----------------|---------------------|----------|--------------------------|------------|-------------|----------------|---------|
| 30.636800 | 19.7 | 15000.000 | 120.000 | 138.0 | V | 143.0 | 12.7 | 10.3 | 30.0 | |
| 46.029950 | 9.9 | 15000.000 | 120.000 | 400.0 | V | 265.0 | 13.4 | 20.1 | 30.0 | |
| 52.402650 | 9.5 | 15000.000 | 120.000 | 400.0 | V | 228.0 | 13.3 | 20.5 | 30.0 | |
| 250.005450 | 24.2 | 15000.000 | 120.000 | 114.0 | V | 0.0 | 13.5 | 11.8 | 36.0 | |
| 334.286350 | 24.0 | 15000.000 | 120.000 | 107.0 | V | 193.0 | 15.7 | 12.0 | 36.0 | |
| 375.027850 | 28.7 | 15000.000 | 120.000 | 281.0 | H | 109.0 | 16.5 | 7.3 | 36.0 | |

Plot 9: 1 - 4 GHz (highest channel) g-mode 54 MBit/s



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

Plot 10: 4 - 12 GHz (highest channel) g-mode 54 MBit/s



5.14 Spurious Emissions - radiated (Receiver) §15.109 / 209

Plot 1: 0.03 - 1 GHz vertical / horizontal (receiver) DSSS & OFDM

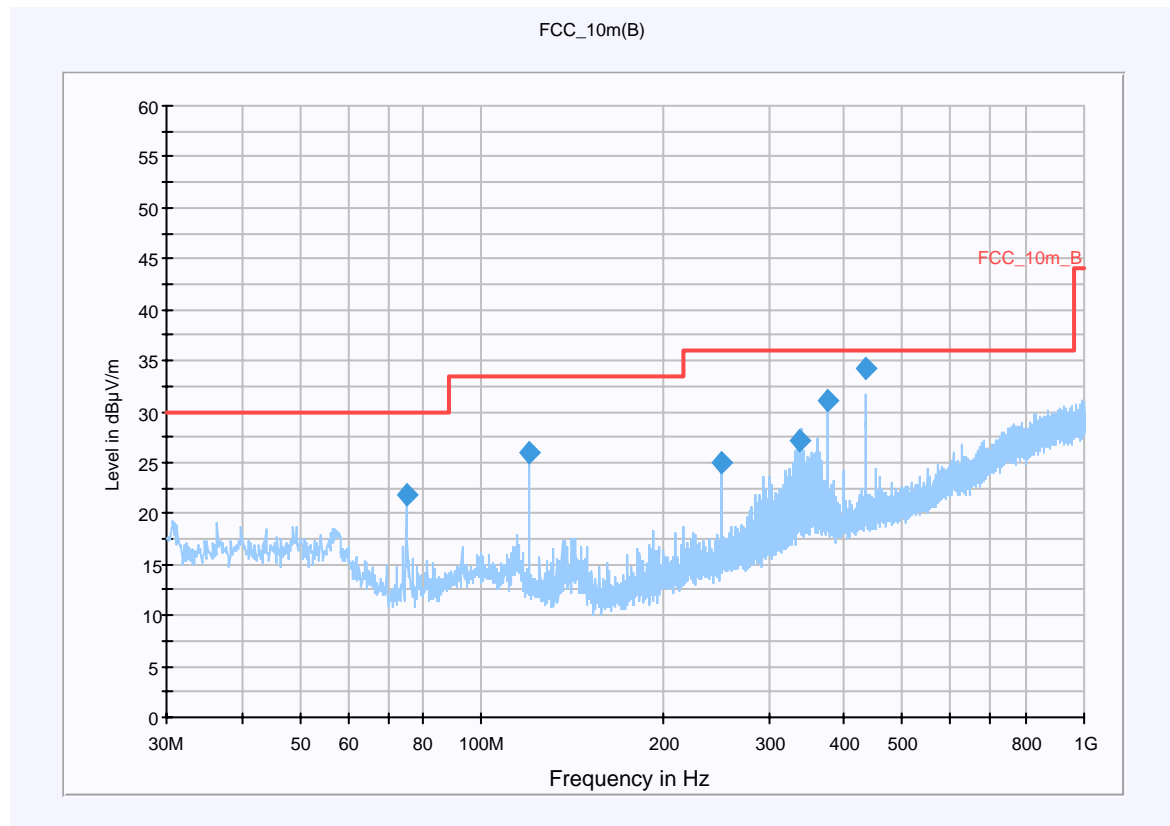
Common Information

EUT: Siemens Gigaset SX 686 Wimax
 Serial Number: sample 1
 Test Description: FCC Part 15B @ 10m
 Operating Conditions: Wlan idle/ WiMax idle
 Operator Name: Klos
 Comment:

Scan Setup: FCC_Fin [EMI radiated]

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

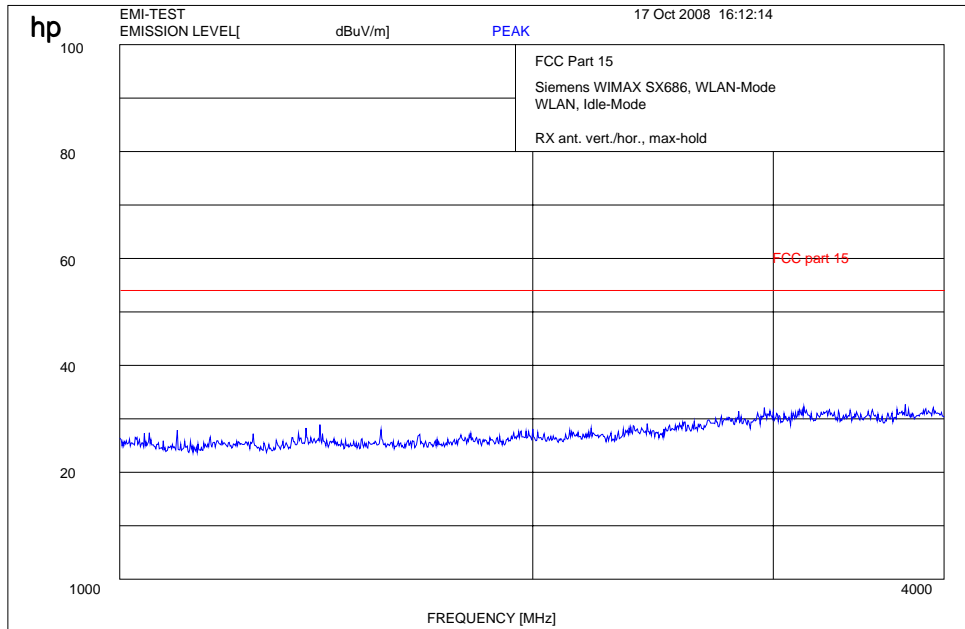
| Subrange | Detectors | IF Bandwidth | Meas. Time | Receiver |
|----------------|-----------|--------------|------------|----------|
| 30 MHz - 1 GHz | QuasiPeak | 120 kHz | 15 s | Receiver |
| 1 GHz - 2 GHz | QuasiPeak | 1 MHz | 15 s | Receiver |



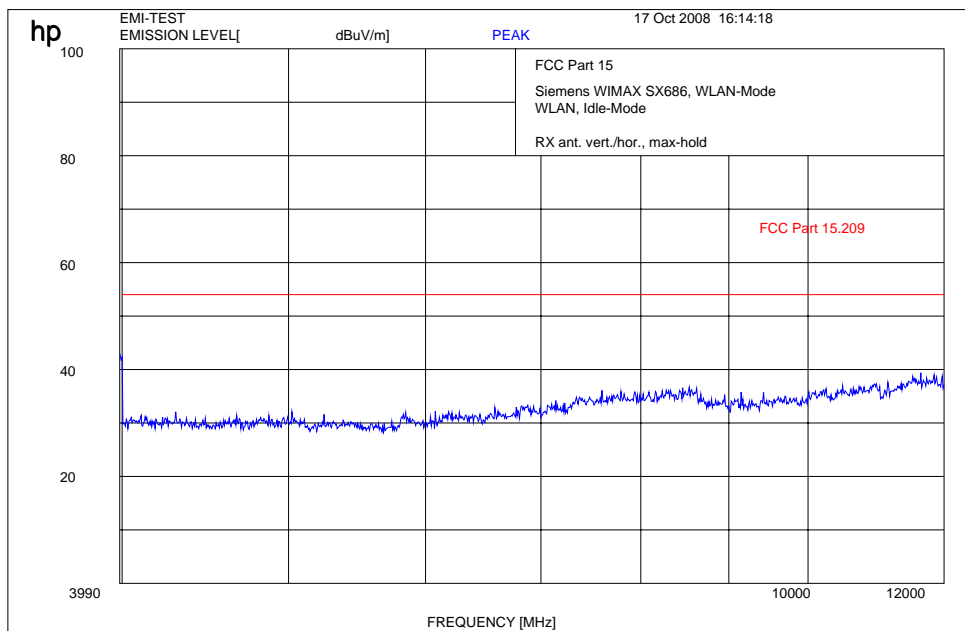
Final Result 1

| 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 |
|-----------------|--------------------|-----------------|-----------------|---------------------|----------|--------------------------|------------|-------------|----------------|---------|
| 75.018100 | 21.8 | 15000.000 | 120.000 | 239.0 | V | 225.0 | 9.5 | 8.2 | 30.0 | |
| 120.000200 | 26.0 | 15000.000 | 120.000 | 218.0 | V | 5.0 | 10.5 | 7.5 | 33.5 | |
| 250.002250 | 24.9 | 15000.000 | 120.000 | 100.0 | V | 187.0 | 13.5 | 11.1 | 36.0 | |
| 337.296250 | 27.1 | 15000.000 | 120.000 | 107.0 | V | 181.0 | 15.8 | 8.9 | 36.0 | |
| 375.021250 | 31.1 | 15000.000 | 120.000 | 106.0 | V | 103.0 | 16.5 | 4.9 | 36.0 | |
| 433.321050 | 34.1 | 15000.000 | 120.000 | 214.0 | H | 203.0 | 17.4 | 1.9 | 36.0 | |

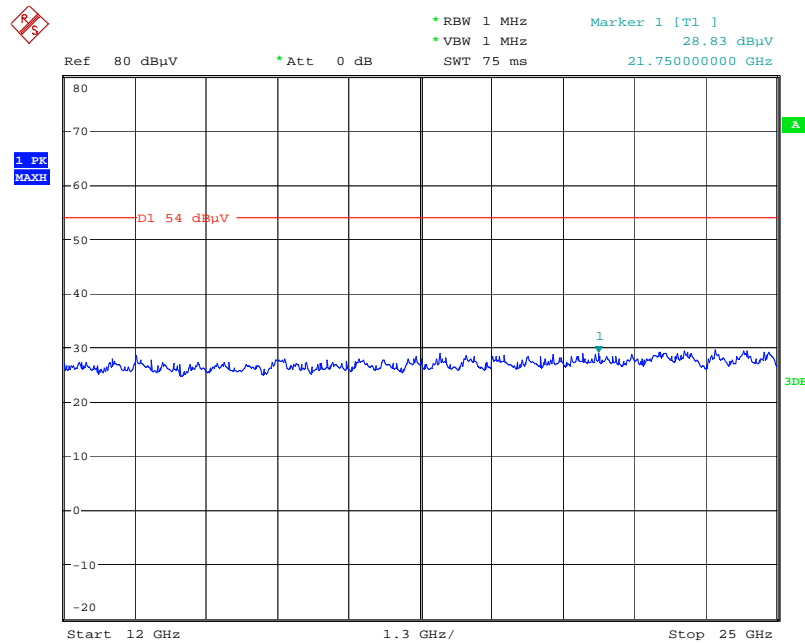
Plot 2: 1 - 4 GHz vertical / horizontal (receiver) DSSS & OFDM



Plot 3: 4 - 12 GHz (receiver) DSSS & OFDM



Plot 4: 12 - 25 GHz (receiver) DSSS & OFDM



Date: 16.OCT.2008 16:14:25

Results:

| Spurious Emissions level [dBµV/m] | | |
|--|----------|----------------|
| f[MHz] | Detector | Level [dBµV/m] |
| No critical spurious emissions 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

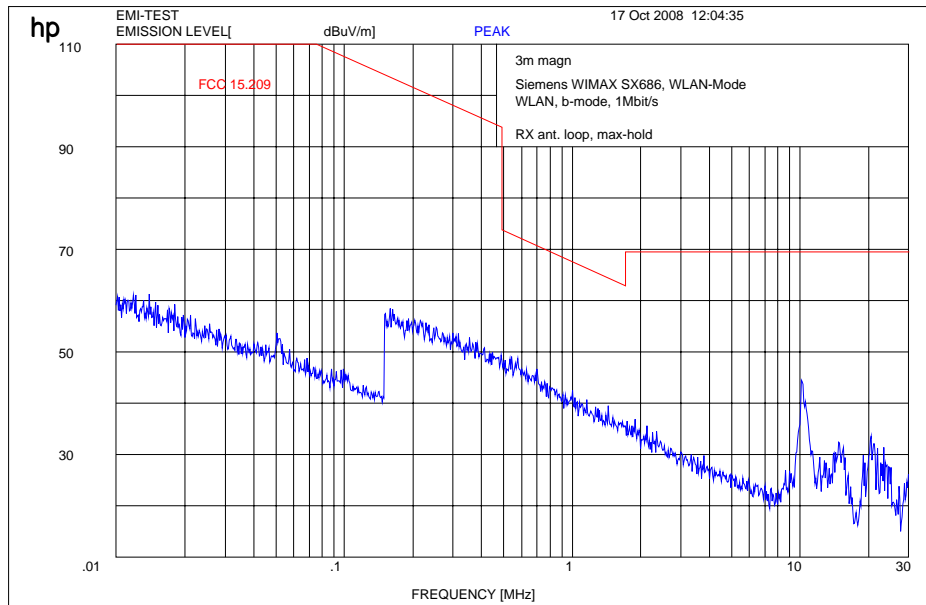
| Frequency (MHz) | Field strength (dBµV/m) | Measurement distance (m) |
|-----------------|-------------------------|--------------------------|
| 30 - 88 | 30.0 | 10 |
| 88 - 216 | 33.5 | 10 |
| 216 - 960 | 36.0 | 10 |
| above 960 | 54.0 | 3 |

5.15 Spurious Emissions - radiated <30 MHz §15.209

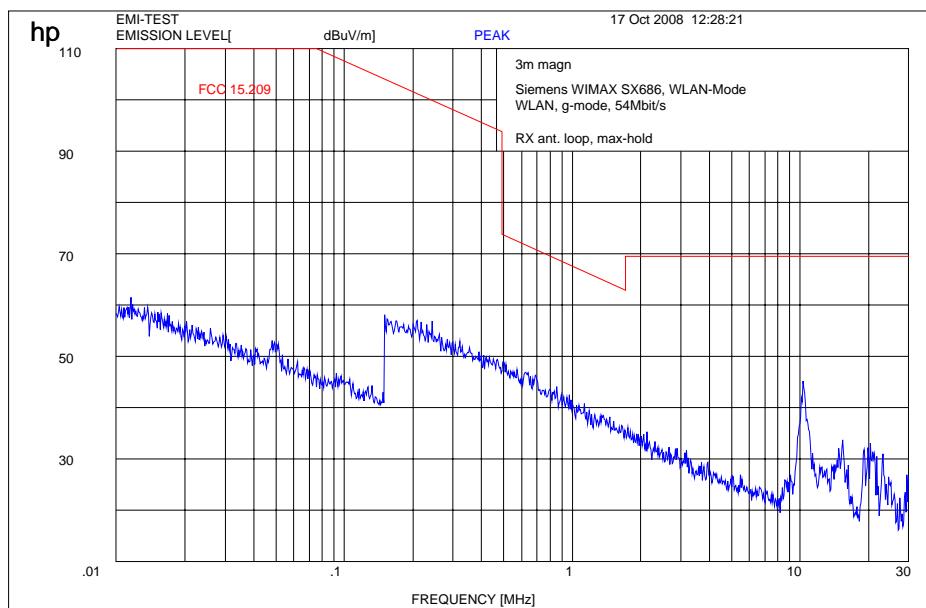
Measured at 3 m distance.

Values recalculated with 40 dB/decade according to FCC rules.

Plot 1: DSSS



Plot 2: OFDM

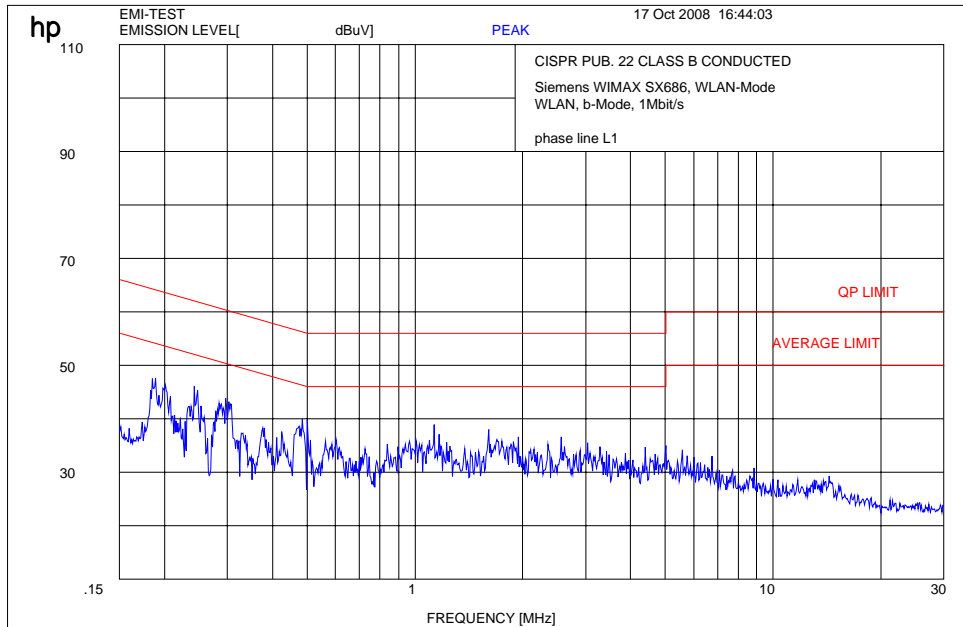


Limits:

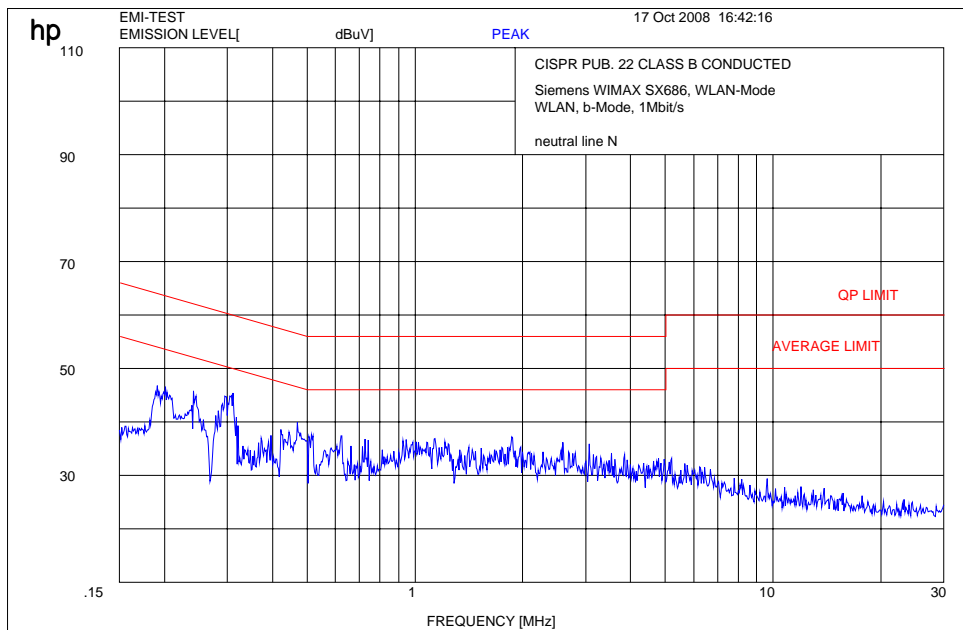
| Frequency (MHz) | Field strength ($\mu\text{V/m}$) | Measurement distance (m) |
|-----------------|------------------------------------|--------------------------|
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30.0 | 30 / 29.5 dB $\mu\text{V/m}$ | 30 |
| 30 - 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 |

5.16 Conducted Emissions <30 MHz §15.107/207

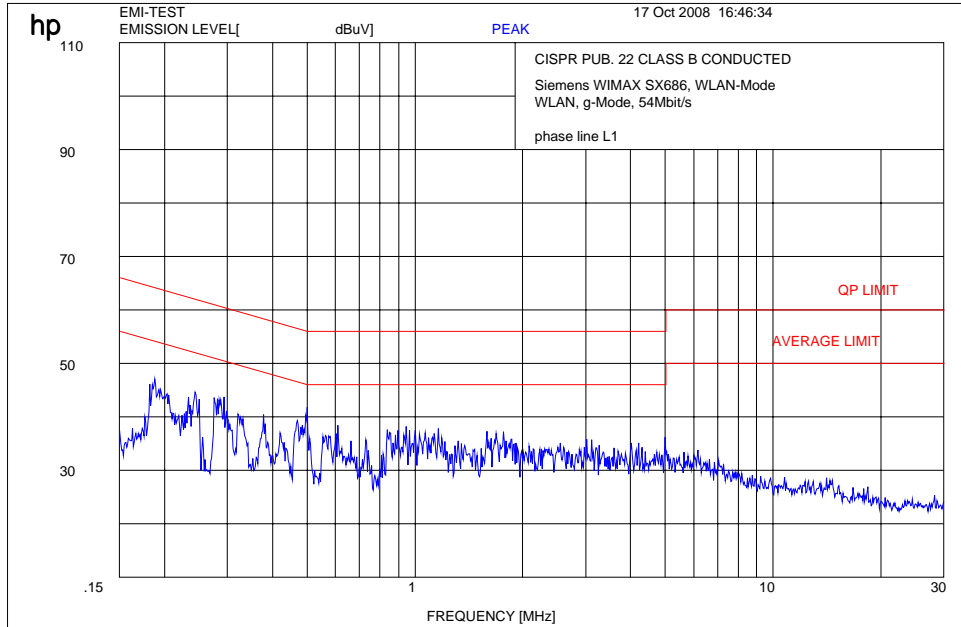
Plot 1: DSSS



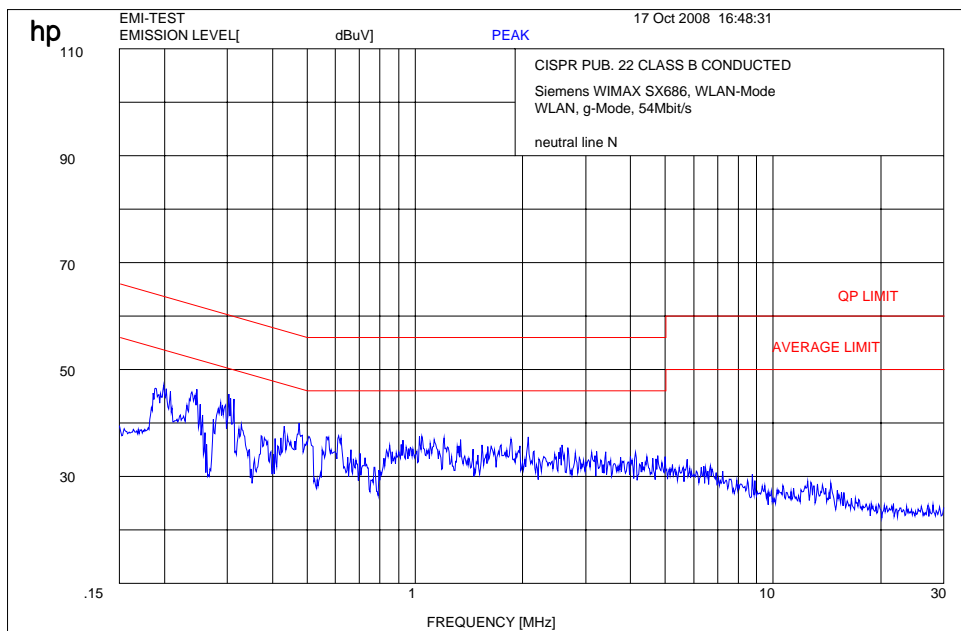
Plot 2: DSSS



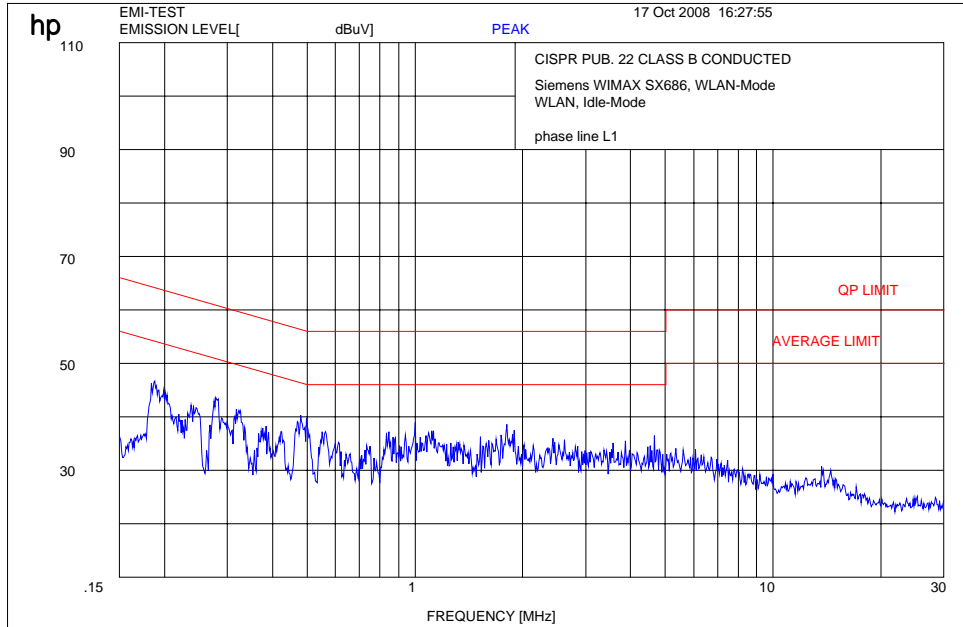
Plot 3: OFDM



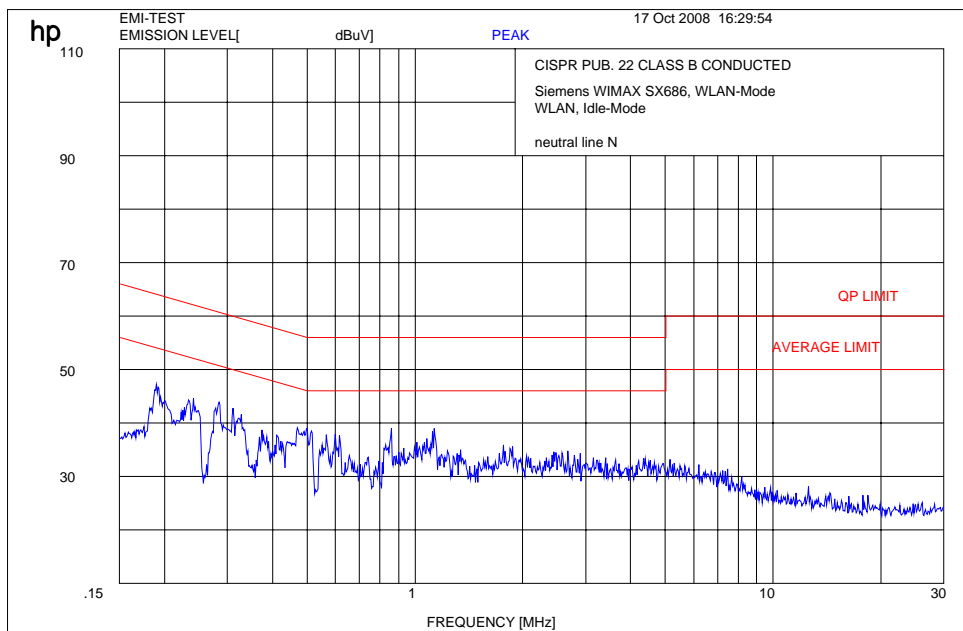
Plot 4: OFDM



Plot 5: RX



Plot 6: RX



Limits:

| | |
|-----------------------------------|-----------|
| Under normal test conditions only | See plots |
|-----------------------------------|-----------|

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.

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 | 2747A05306 | 300001000 | 05.10.2006 | 24 | 05.10.2008 |
| 5 | Spektrum Analyzer Display 85662A | HP | 2816A16541 | 300002297 | 05.10.2006 | 24 | 05.10.2008 |
| 6 | Quasi-Peak-Adapter 85650A | HP | 2811A01131 | 300000999 | 05.10.2006 | 24 | 05.10.2008 |
| 7 | RF-Preselector 85685A | HP | 2837A00779 | 300000218 | 08.11.2006 | 24 | 08.11.2008 |
| 8 | PC Vectra VL | HP | | 300001688 | n.a. | | |
| 9 | Software EMI | HP | | 300000983 | n.a. | | |
| 10 | Measurement System 2 | | | | | | |
| 11 | FSP 30 | R&S | 100623 | ICT 300003464 | 05.10.2007 | 24 | 15.10.2009 |
| 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.) | | |
| | | | | | | | |

SRD Laboratory:

| No | Equipment/Type | Manuf. | Serial Nr. | Inv. No. Cetecom | Last Calibration | Frequency (months) | Next Calibration |
|----|-------------------------|---------------------|---------------------|------------------|------------------|--------------------|------------------|
| 1 | FSU50 | R&S | 200012 | 300003443 | 05.06.2008 | 24 | 06.2010 |
| 2 | 1.5 m 50 Ω / K | Insulated Wire Inc. | KPS-1533-590 101995 | 300002290 | | | |
| 3 | Attenuator 10dB, k-con. | Inmet | 40A-10dB | -/- | | | |
| 4 | Horn Ant. 1-26.5GHz | EMCO | 8812-3089 | 300000307 | | | |
| | | | | | | | |

Anechoic chamber F:

| No. | Instrument/Ancillary | Manufacturer | Type | Serial-No. | Internal identification |
|--|---|-------------------------|-----------------|------------|-------------------------|
| <u>Radiated emission in chamber F</u> | | | | | |
| F-1 | Control Computer | F+W | | FW0502032 | 300003303 |
| F-2 | Trilog antenna | Schwarzbeck | VULB 9163 | 295 | 300003787 |
| F-3a | Amplifier | Veritech Microwave Inc. | 0518C-138 | - / - | - / - |
| F-4b | Switch | HP | 3488A | - / - | 300000368 |
| F-5 | EMI Test receiver | R&S | ESCI | 100083 | 300003312 |
| F-6 | Turntable Controller | EMCO | 1061 3M | 1218 | 300000661 |
| F-7 | Tower Controller | EMCO | 1051 Controller | 1262 | 300000625 |
| F-8 | Tower | EMCO | 1051 Tower | 1262 | 300000625 |
| F-9 | Ultra Notch-Filter Rejected band Ch. 62 | WRCD | | 9 | |

7 Photographs

Photo 1:

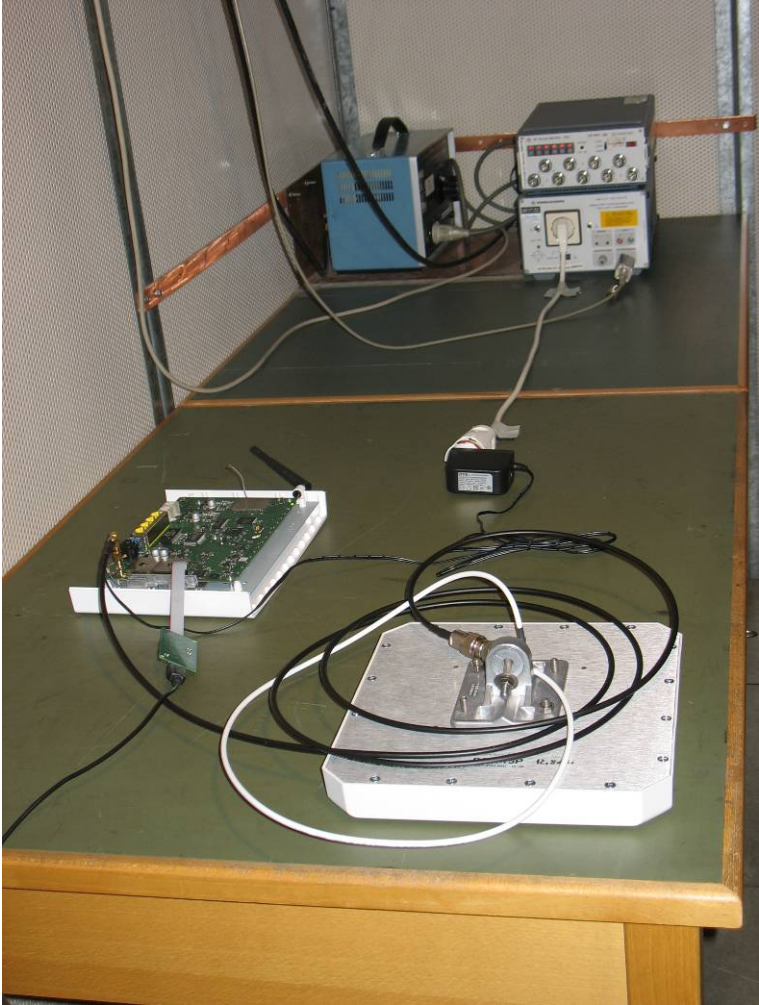


Photo 2:



Photo 3:

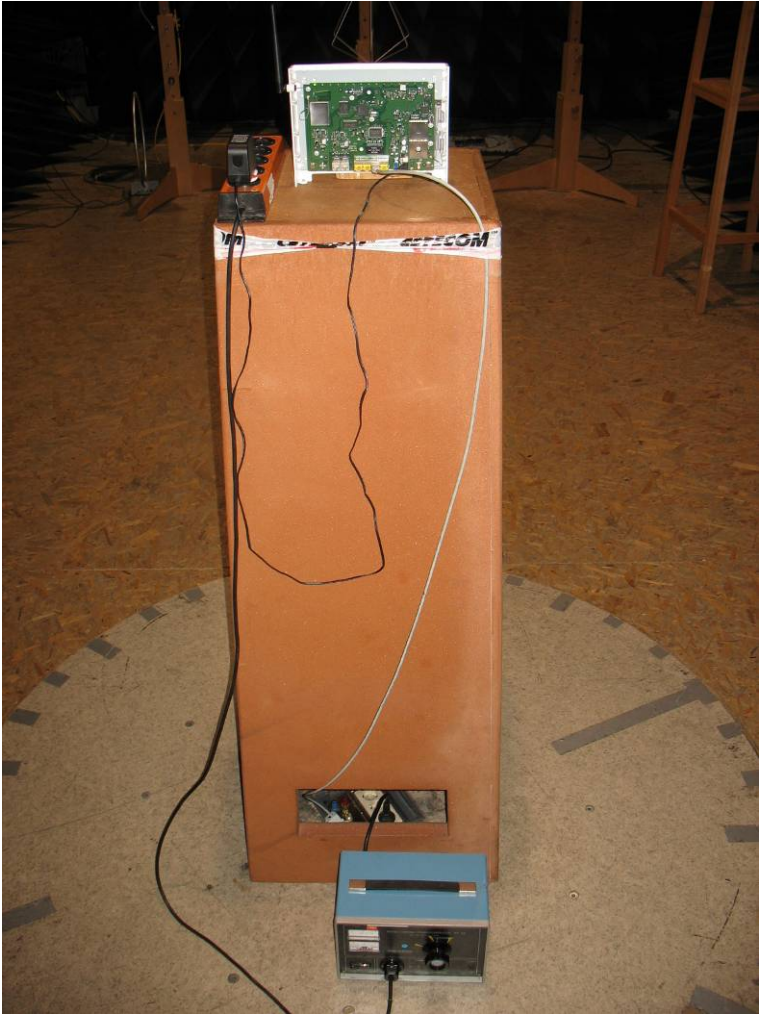


Photo 4:

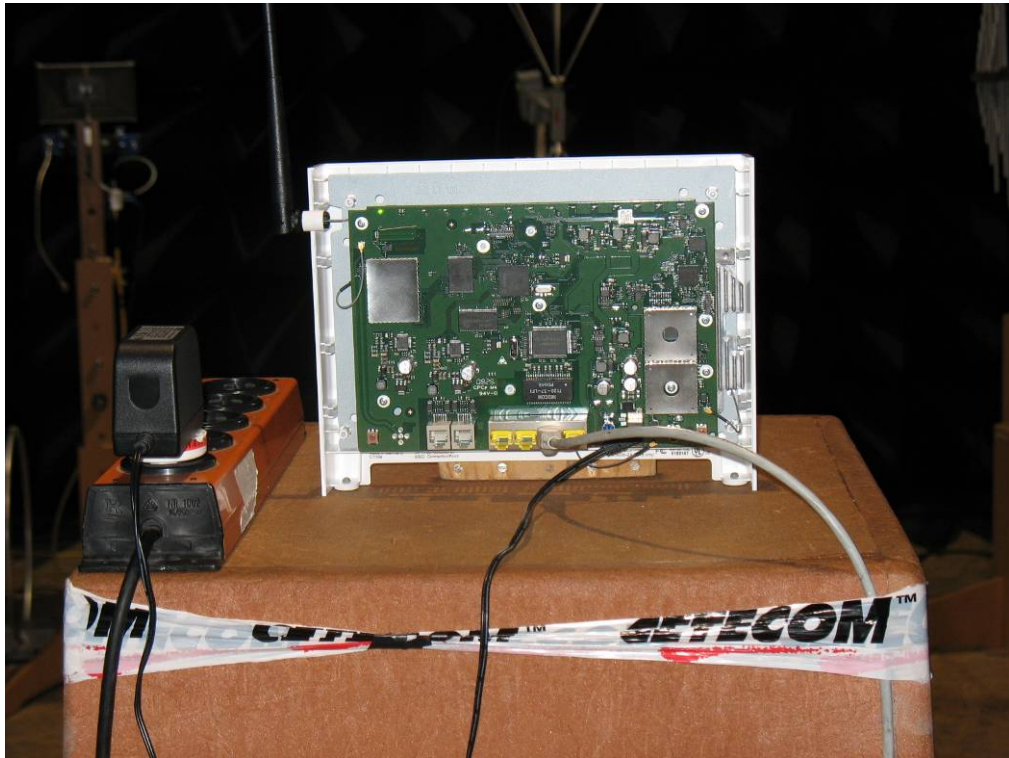


Photo 5:

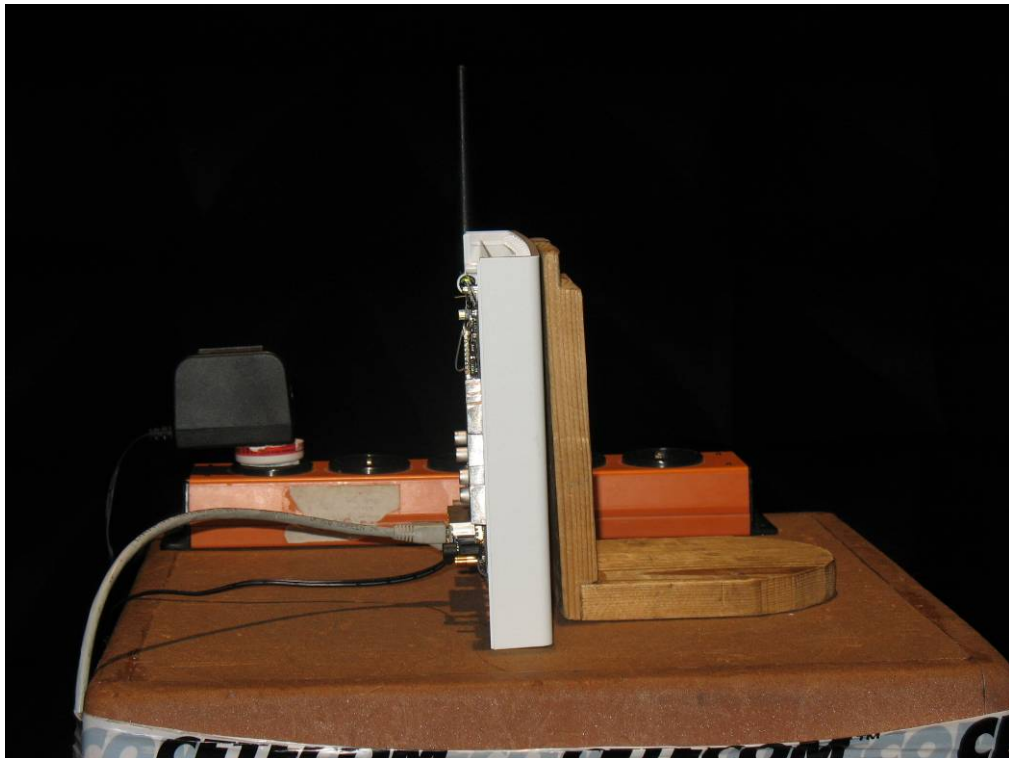


Photo 6:



Photo 7:

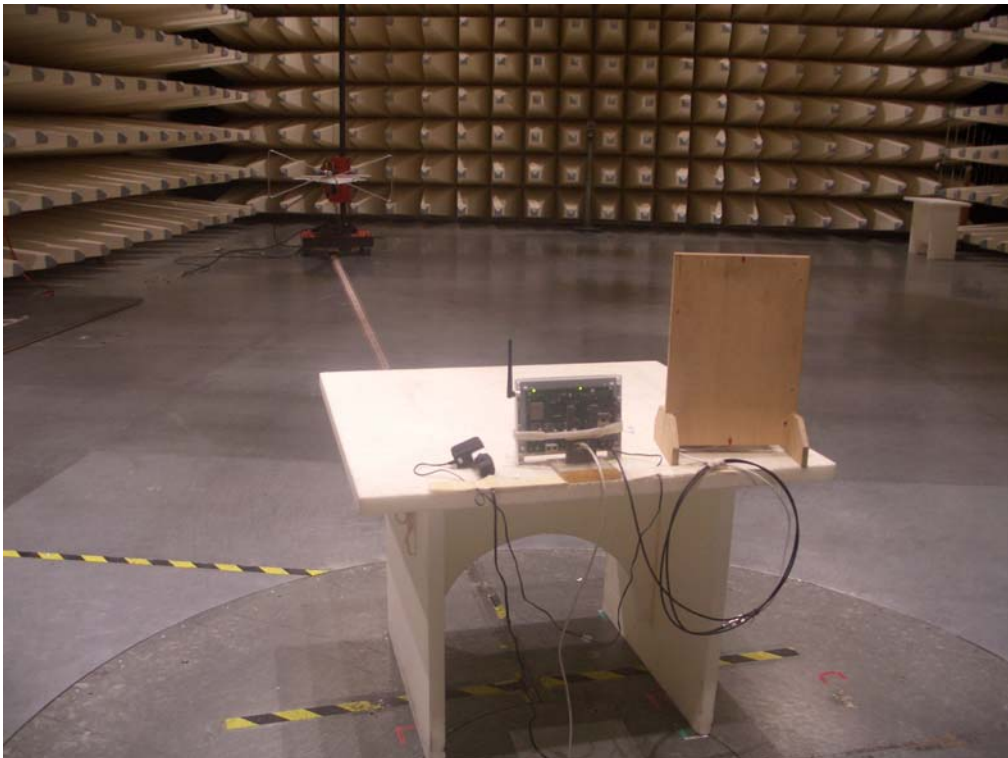


Photo 10:



Photo 11:



Photo 12:



Photo 13:



Photo 16:

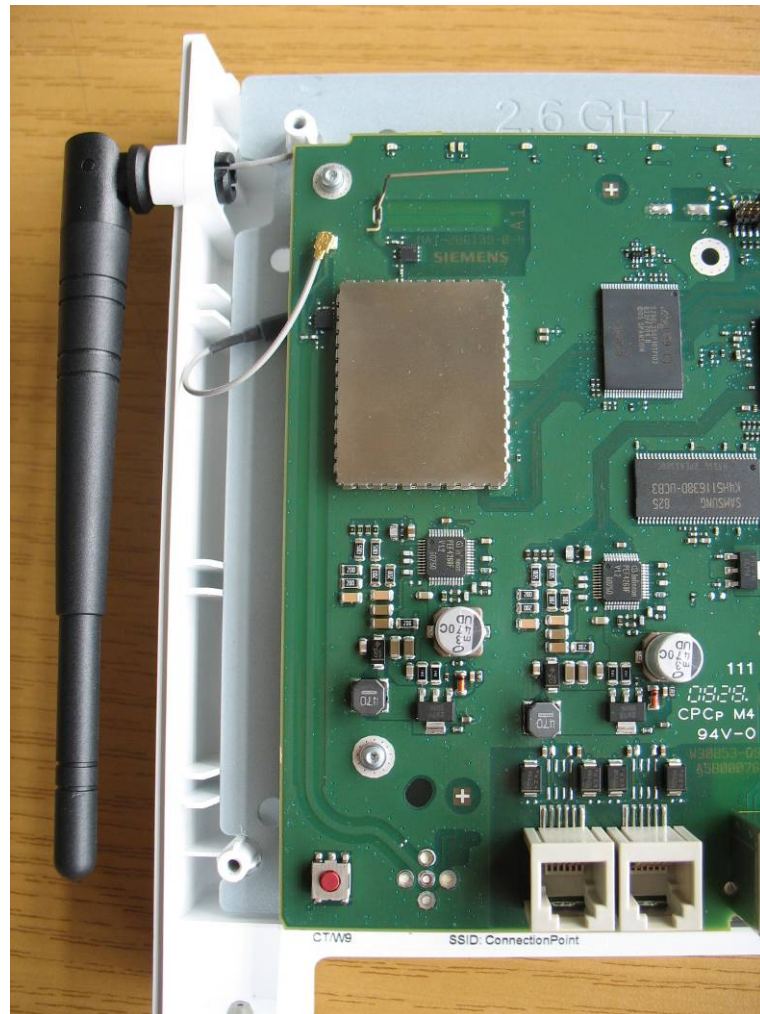


Photo 17:

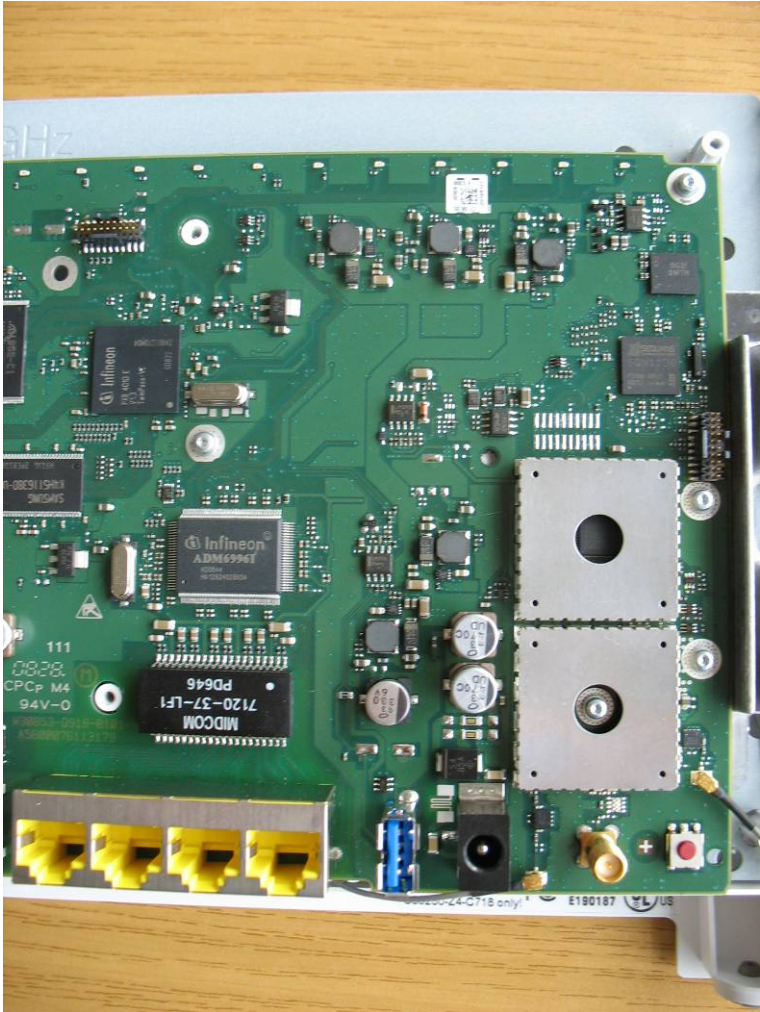


Photo 18:

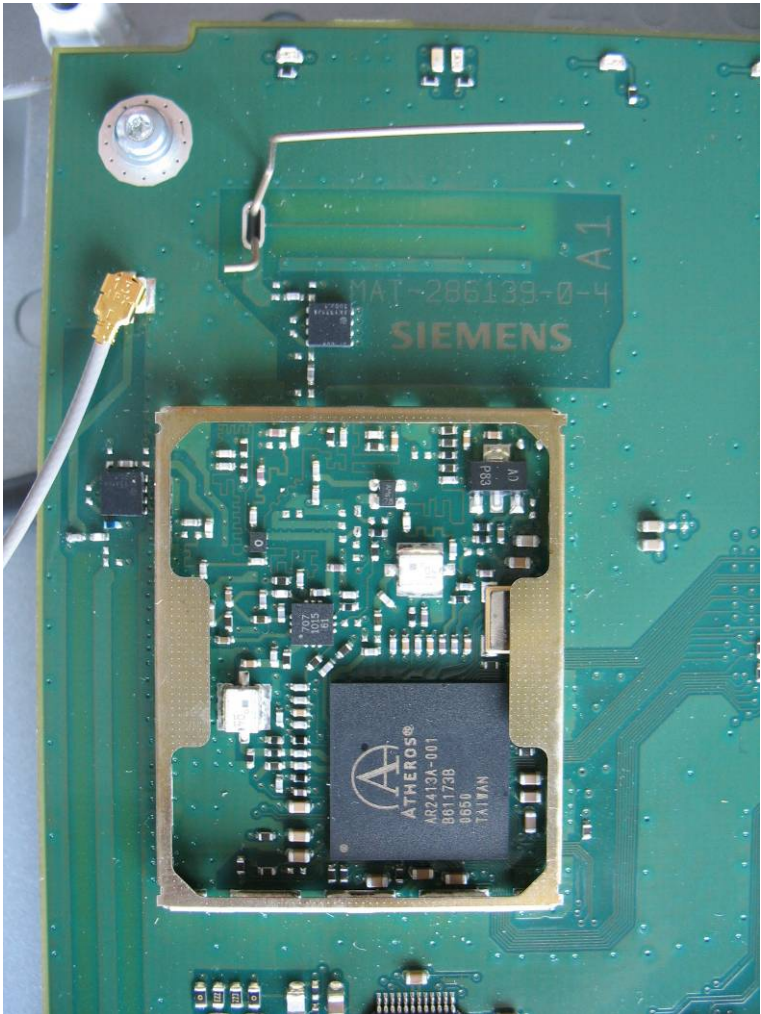


Photo 19:

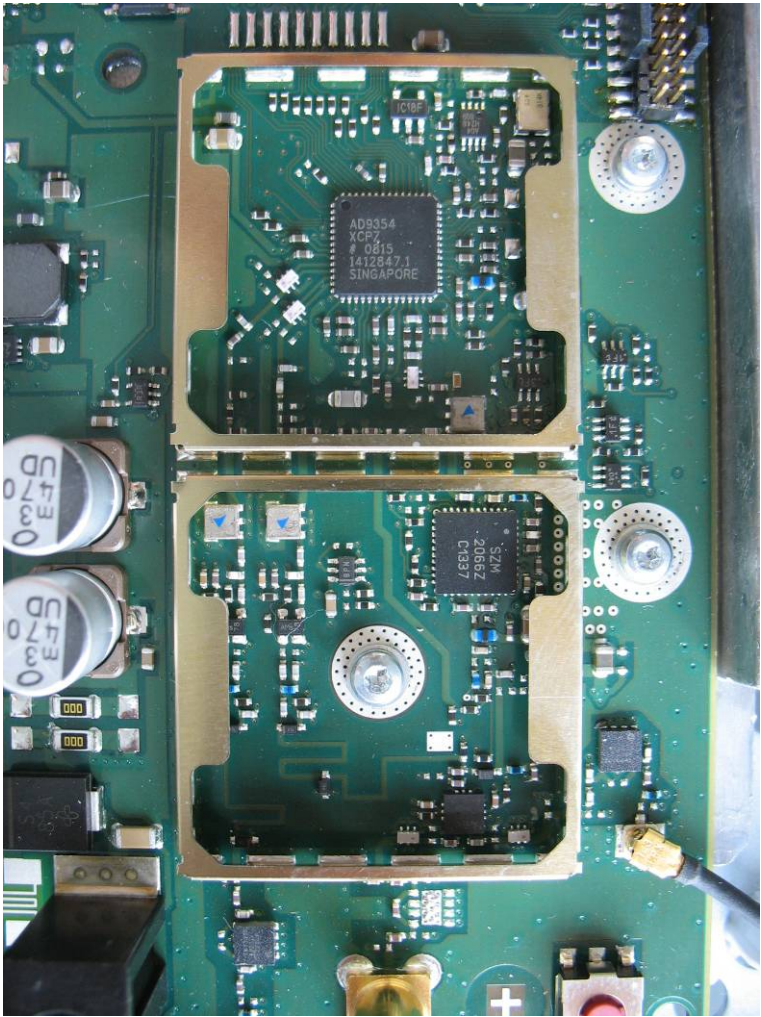


Photo 20:

