# Test Report

# T-0249-3677-01 JP

| | |
|---|---|
| **Type / Model Name:** | **AW-GH321** |
| **FCC ID:** | **YM6-AWGH321** |
| **Product Description:** | **WLAN module** |
| **Applicant:** | **MSC Freiburg GmbH** |

Registration No. DAT-P-121/02-01

# EMC -- TEST REPORT

| Test Report No. : T-0249-3677-01 JP | 2011-07-18<br>Date of issue |
|---|---|

Type / Model Name : AW-GH321

FCC ID: YM6-AWGH321

Product Description : WLAN module

**Applicant** : MSC Freiburg GmbH

Address : August-Wessels-Str. 17

86156 Augsburg

Germany

**Manufacturer** : MSC Freiburg GmbH

Address : Munzinger Str. 3

79111 Freiburg

Germany

| **Test Result** according to the standards listed in clause 1 test standards: | **POSITIVE** |
|---|---|

DAT-P-121/02-01
KBA-P 00057-01

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

File No. **T-0249-3677-01 JP**

# Contents

# 1 TEST STANDARDS

The tests were performed according to following standards:

| | |
|---|---|
| FCC Part 15 Subpart A : 2009 | Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC) |
| FCC Part 15 Subpart C : 2009 | Code of Regulations Part 15 (Radio Frequency Devices), Subpart C (Intentional Radiators) of the Federal Communication Commission (FCC)<br>Applied Paragraphs: §15.207, §15.209, §15.247 |
| ANSI C63.4-2003 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz – 40 GHz |

# 2 OVERVIEW TEST RESULT

| Performed test(s) | Result | | |
|---|---|---|---|
| | Passed | Failed | Not performed |
| Conducted disturbance | X | | |
| Radiated disturbance in the frequency range 9kHz – 30MHz | X | | |
| Radiated disturbance in the frequency range 30MHz – 1000MHz | X | | |
| Radiated disturbance in the frequency range 1GHz – 25GHz | X | | |
| Restricted Bandedges | X | | |
| 6dB Bandwidth | X | | |
| Maximum Conducted Output Power | X | | |
| Power spectral density | X | | |
| Conducted spurious emissions in the frequency range 30MHz – 25GHz | X | | |

# 3 SUMMARY

## GENERAL REMARKS:

The EUT has a TX mode and a RX mode but RX is without TX beacons not possible therefore the measurements were performed in TX mode only. The frequency range was scanned from 9 kHz to 25GHz.

## FINAL ASSESSMENT:

The equipment under test **fulfills** the EMC requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 2010-08-10

Testing concluded on : 2010-08-20

Checked by:

Frank Scharnowski
2011.07.18
15:18:20 +02'00'

Frank Scharnowski
Quality Manager

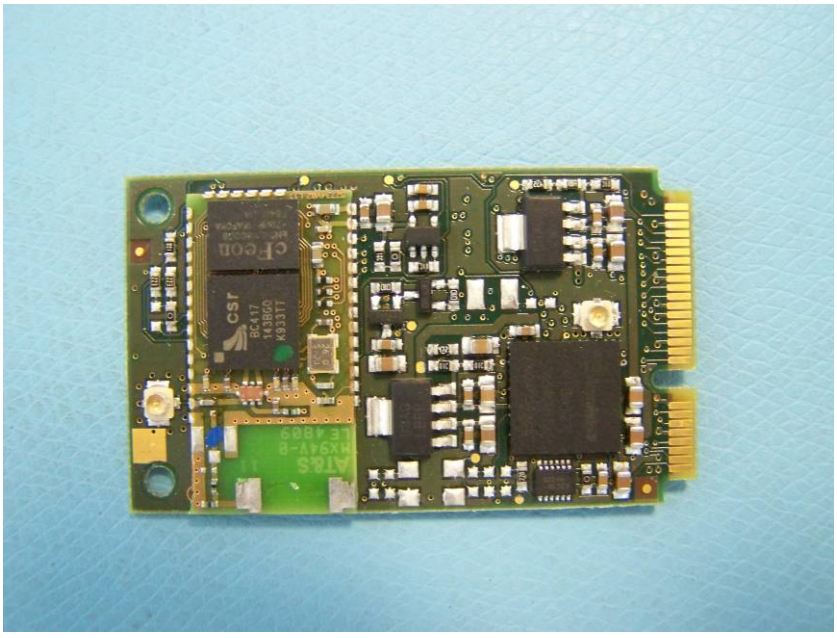
Tested by:

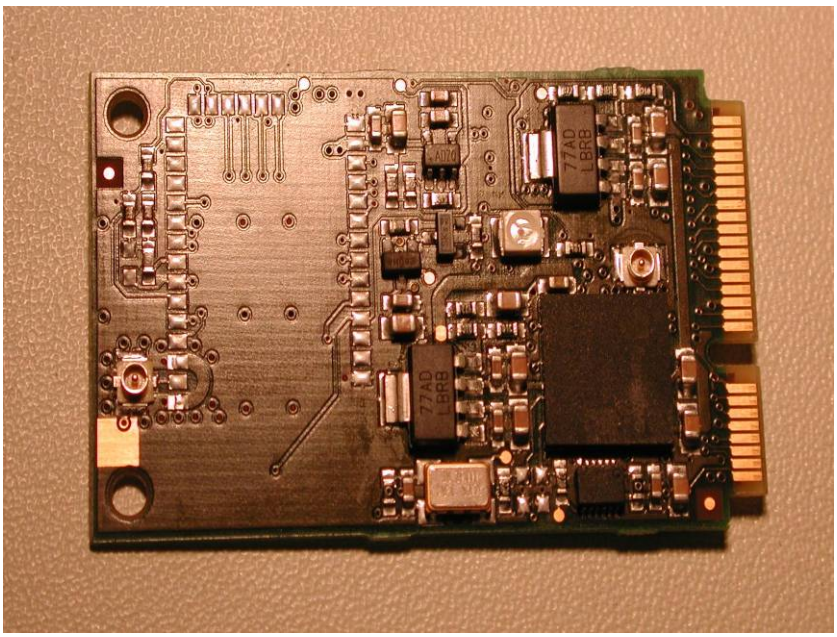
Jürgen Pessinger
2011.07.18 15:09:16 +02'00'

Jürgen Pessinger

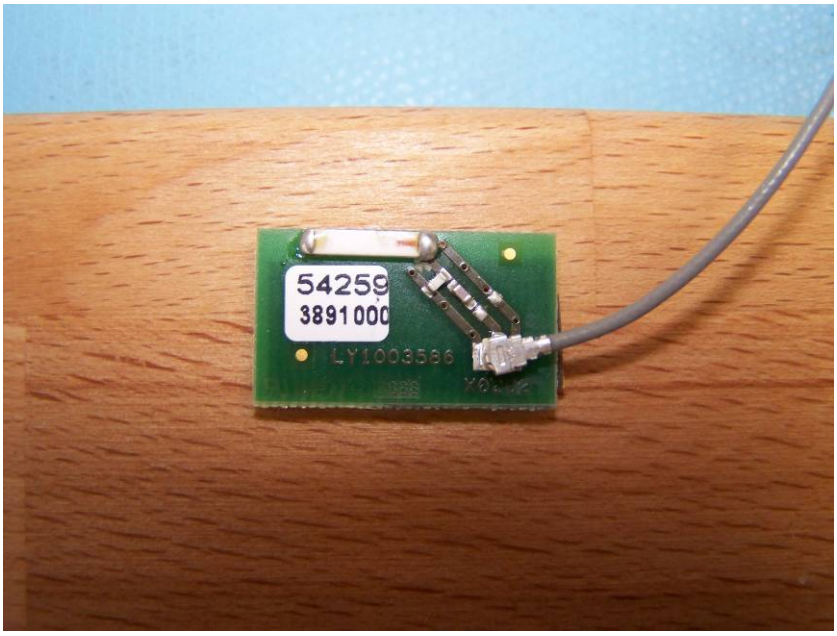
# 4 EQUIPMENT UNDER TEST

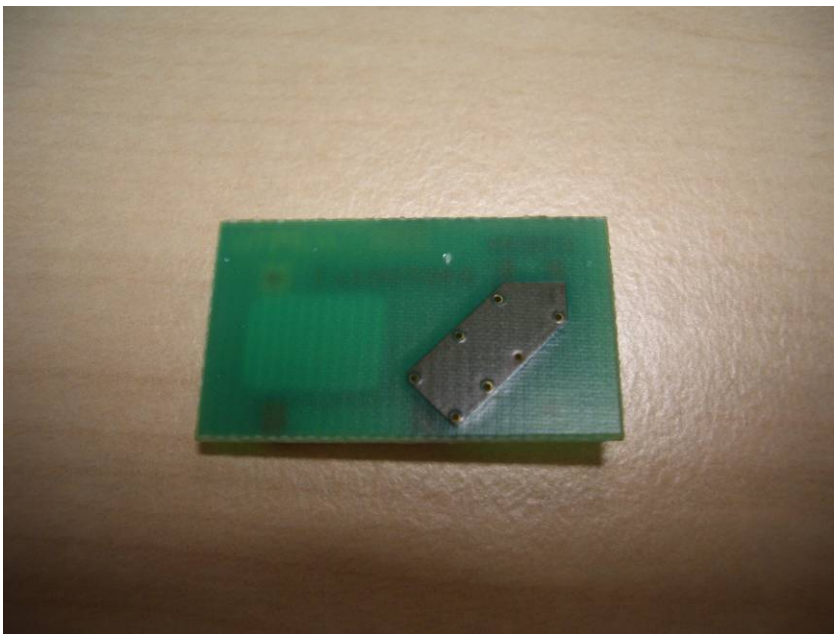
## 4.1 Photo documentation of the EuT

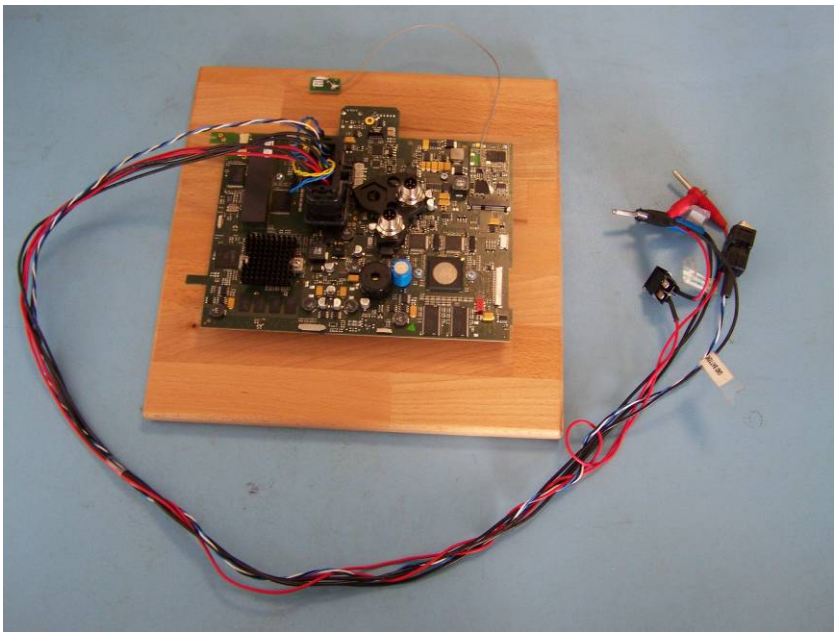


Antenna:





Periphery:



## 4.2 Power supply system

Power supply voltage: 3,3V DC

## 4.3 Short description of the Equipment under Test (EuT)

Number of tested samples: 1
Serial number: none

Dimensions: L: 53mm W: 30mm H: 4mm

**Radio equipment characteristics**

| | |
|---|---|
| Frequency band(s): | 2400 – 2483,5 MHz |
| Operating frequency: | 2412 – 2462 MHz |
| Channel spacing: | 5MHz |
| Number of RF-channels: | 11 |
| Comments: | None |

## EuT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- continous transmit mode (duty cycle = 99%), maximum RF power adjusted

Transmission mode IEEE 802.11b (Datatransfer rate 11Mbps) and IEEE 802.11g (Datatransfer rate 54Mbps) were tested in following channels:

- CH01 2412MHz
- CH06 2437MHz
- CH11 2462MHz

## EuT configuration:

**The following interface cables and peripheral devices were connected during the measurements:**

Interface cables:

| Interface cable | Length [m] | Type | Line shielded | Line unshielded | Line termination |
|---|---|---|---|---|---|
| Antenna cable | 0,3 | 1-wires | ☒ | ☐ | Antenna |

Peripheral devices:

| Kind of equipment | | Model and/or Manufacturer |
|---|---|---|
| Antenna | | WE-MCA, Würth Elektronik |
| Motherboard | | LY4003582_AGC_DV4-Main, MSC Freiburg |

# 5 TEST ENVIRONMENT

## 5.1 Address of the test laboratory

**emitel AG**
**Ohmstrasse 1**
**94342 STRASSKIRCHEN**
**DEUTSCHLAND**

### Laboratory registration numbers:

| | |
|---|---|
| DAR Registration number: | DAT-P-121/02-01 |
| DAR Registration number: | KBA-P 00057-01 |
| SNCH Registration number: | SNCH 001/2005 ext 01 |
| FCC Registration number: | 765810 |
| IC Registration number: | IC 5066A-1 |
| VCCI Registration number: | T-215; C-3049; R-2765 |

## 5.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

All atmospheric pressure values refer to our Laboratory altitude of 324m.

## 5.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 /11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer does have the sole responsibility for the continued compliance of the device.

## 5.4 Measurement Protocol for FCC, VCCI and AUSTEL

### 5.4.1 GENERAL INFORMATION

5.4.1.1 Test Methodology

Conducted and radiated disturbance testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22 (1997+A1:2000+A2:2002), European Standard EN 55022 (1998+A1:2000+A2:2003)and Australian Standard AS 3548 (which are based on CISPR 22).

The Japanese standard, "Voluntary Control Council for Interference (VCCI) by Data Processing Equipment and Electronic Office Machines, Technical Requirements" is technically equivalent to CISPR 22 (1997+A1:2000 +A2:2002). For official compliance, a conformance report must be sent to and accepted by the VCCI.

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-2003 procedures and using the CISPR 22 Limits.

5.4.1.2 Measurement Error

The data and results referenced in this document are true and accurate. The reader is cautioned that there is some measurement variability due to the tolerances of the test equipment that can contribute to a nominal product measurement uncertainty. The measurement uncertainty was calculated for all measurements listed in this test report according to NIS 81/5.1994 “The treatment of uncertainty in EMC measurements” and is documented in the emitel AG quality system according to DIN EN ISO/IEC 17025. Furthermore, component differences and manufacturing process variability of production units similar to that tested may result in additional product uncertainty. If necessary, refer to the test lab for the actual measurement uncertainty for specific tests. The manufacturer has the sole responsibility of continued compliance of the device.

5.4.1.3 Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into it’s characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum disturbances from the unit.

### 5.4.2 CONDUCTED DISTURBANCE

The final level, expressed in dBµV, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the CISPR limit, which is equivalent to the Australian AS 3548 limit.

To convert between dBµV and µV, the following conversions apply:
dBµV = 20(log µV)
µV = Inverse log(dBµV/20)

### 5.4.3 RADIATED DISTURBANCE

The final level, expressed in dBµV/m, is arrived at by taking the reading from the EMI receiver (Level dBµV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factor are stored. This result then has the CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets in section 5.2. The CISPR 22 limit is equivalent to the Australian AS 3548 limit.

| Example: | CISPR B | Delta | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Level (dBµV) | + | Factor (dB) | = | Final (dBµV/m) | - | Limit (dBµV/m) | = | CISPR B (dB) |
| 37.19 | 10.2 | + | 12.0 | = | 22.2 | - | 40.0 | = | -17.8 |

### 5.4.4 DETAILS OF TEST PROCEDURES

5.4.4.1 General Standard Information

The test methods used comply with CISPR Publication 22 (1997+A1:2000+A2:2002), EN 55022 (1998+A1:2000+ A2:2003) and AS 3548 (1992) - "Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment" and with ANSI C63.4-2003 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

5.4.4.2 Conducted disturbance

Conducted disturbance on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi peak detection, and a Line Impedance Stabilization Network (LISN), with 50Ω/50 µH (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimetres above the floor and is positioned 40 centimetres from the vertical ground plane (wall) of the screen room. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi peak and average detection and recorded on the data sheets.

5.4.4.3 Radiated disturbance

Radiated disturbance from the EUT are measured in the frequency range of 30 to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and average detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees.

# 6 TEST CONDITIONS AND RESULTS

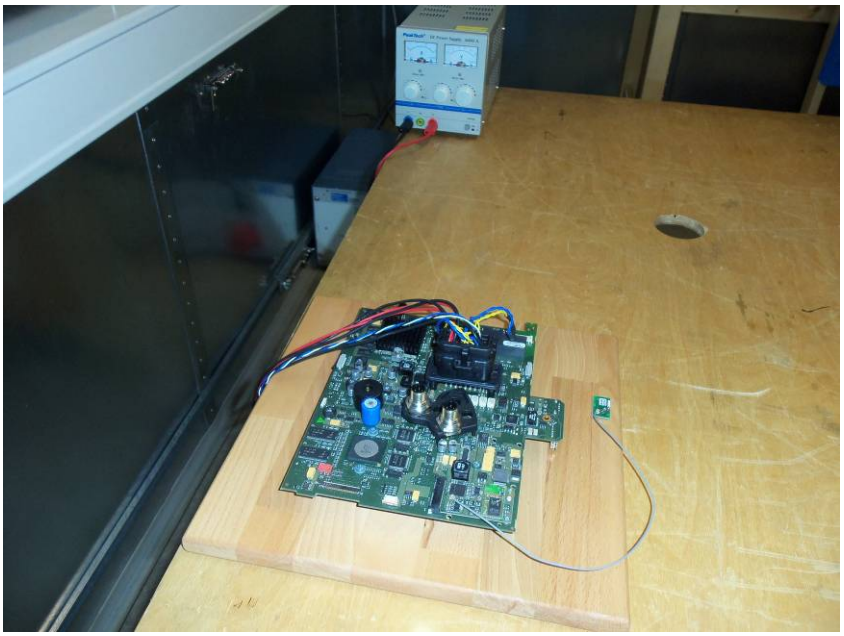
## 6.1 Conducted disturbance

For test instruments and accessories used see section 7 Part **A 4**.

### 6.1.1 Description of the test location

Test location: Shielded Room SK5

### 6.1.2 Photo documentation of the test set-up



### 6.1.3 Test specification

Environmental conditions: Temperature: 24 ° C Humidity: 50 % Atmospheric pressure: 97 kPa

Frequency range: 0.15 MHz - 30 MHz

The test was carried out in the following operation mode(s):
- continous transmit mode (duty cycle = 99%), maximum RF power adjusted

### 6.1.4 Test result

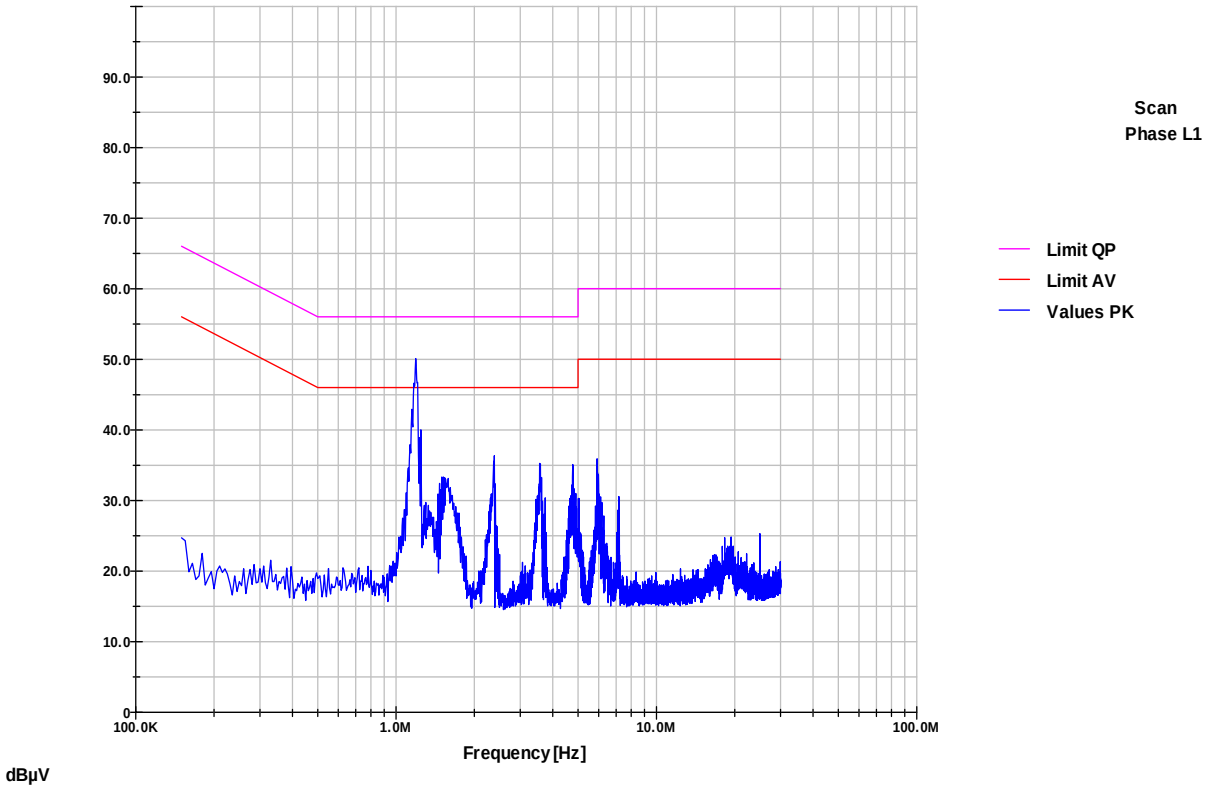
The requirements are **FULFILLED.**

**Remarks:** The measurement was made at AC input port of AC/DC power supply.

Used AC/DC power supply: PeakTech 6000A, emitel ID: 01-05/50-05-005

### 6.1.5 Test protocol

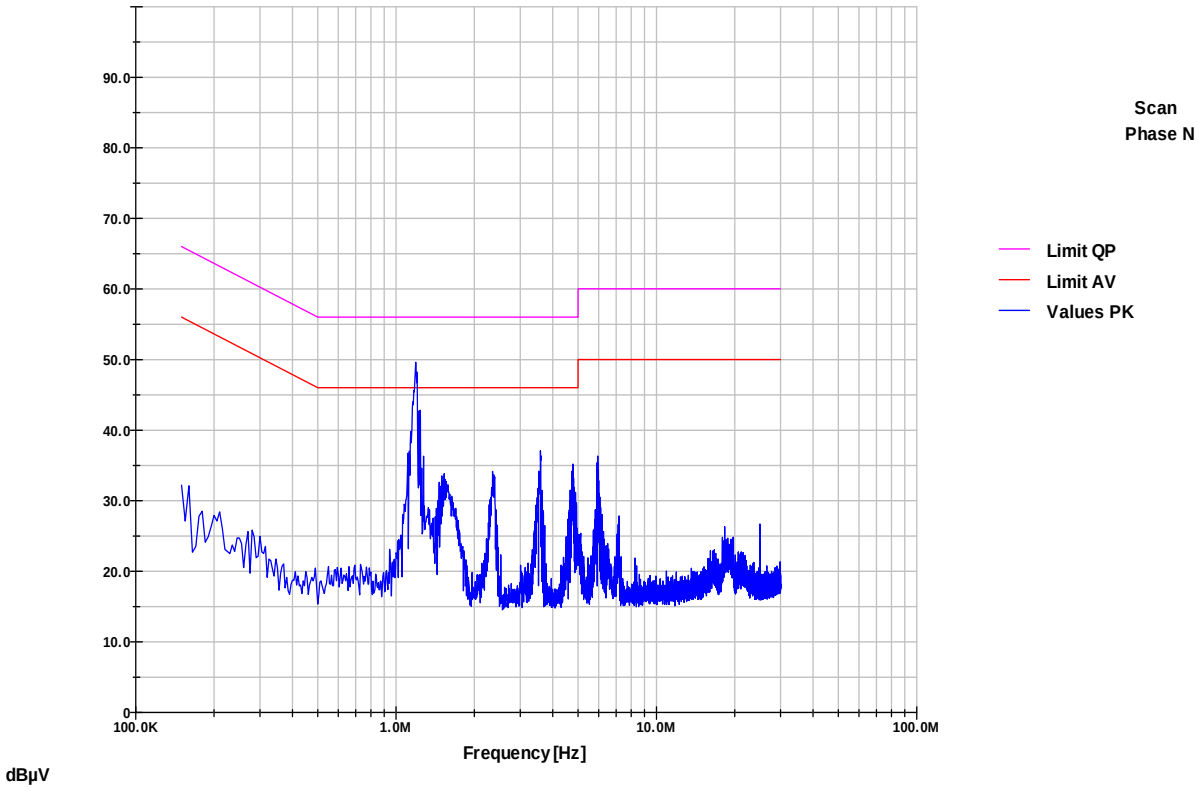
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH1 (11Mbps) |
| **Standard:** | FCC Part 15.207 |
| **Test:** | Conducted Emission Test |
| **Detector:** | QP / AV |
| **Result:** | Limit kept |
| **Applied to:** | Phase L1 |
| **Remark:** | none |




**Minimum margin to limit: -12,4 dB**

| Frequency [MHz] | Reading [dBµV] QP | Reading [dBµV] AV | Correction [dB] | Values [dBµV] QP | Values [dBµV] AV | Limit [dBµV] QP | Limit [dBµV] AV | Margin [dB] QP | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 1,190 | 43,6 | 12,3 | 0,0 | 43,6 | 12,3 | 56,0 | 46,0 | -12,4 | -33,7 |

| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH1 (11Mbps) |
| **Standard:** | FCC Part 15.207 |
| **Test:** | Conducted Emission Test |
| **Detector:** | QP / AV |
| **Result:** | Limit kept |
| **Applied to:** | Phase N |
| **Remark:** | none |



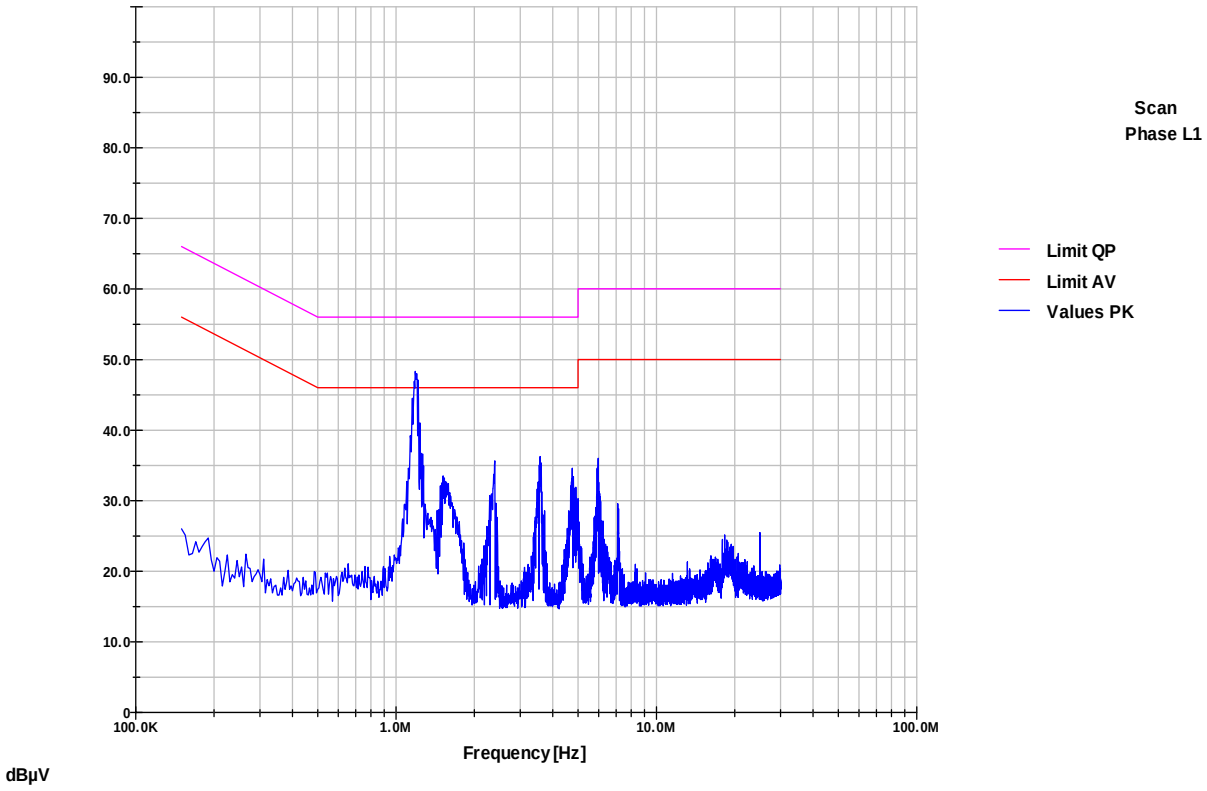

**Minimum margin to limit: -12,6 dB**

| Frequency [MHz] | Reading [dBµV] QP | Reading [dBµV] AV | Correction [dB] | Values [dBµV] QP | Values [dBµV] AV | Limit [dBµV] QP | Limit [dBµV] AV | Margin [dB] QP | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 1,190 | 43,4 | 14,1 | 0,0 | 43,4 | 14,1 | 56,0 | 46,0 | -12,6 | -31,9 |



*emitel* AG, Ohmstrasse 1, 94342 STRASSKIRCHEN, DEUTSCHLAND Tel. / *Phone*: +49 (0) 94 24 94 82-0 Fax: +49 (0) 94 24 94 82-640

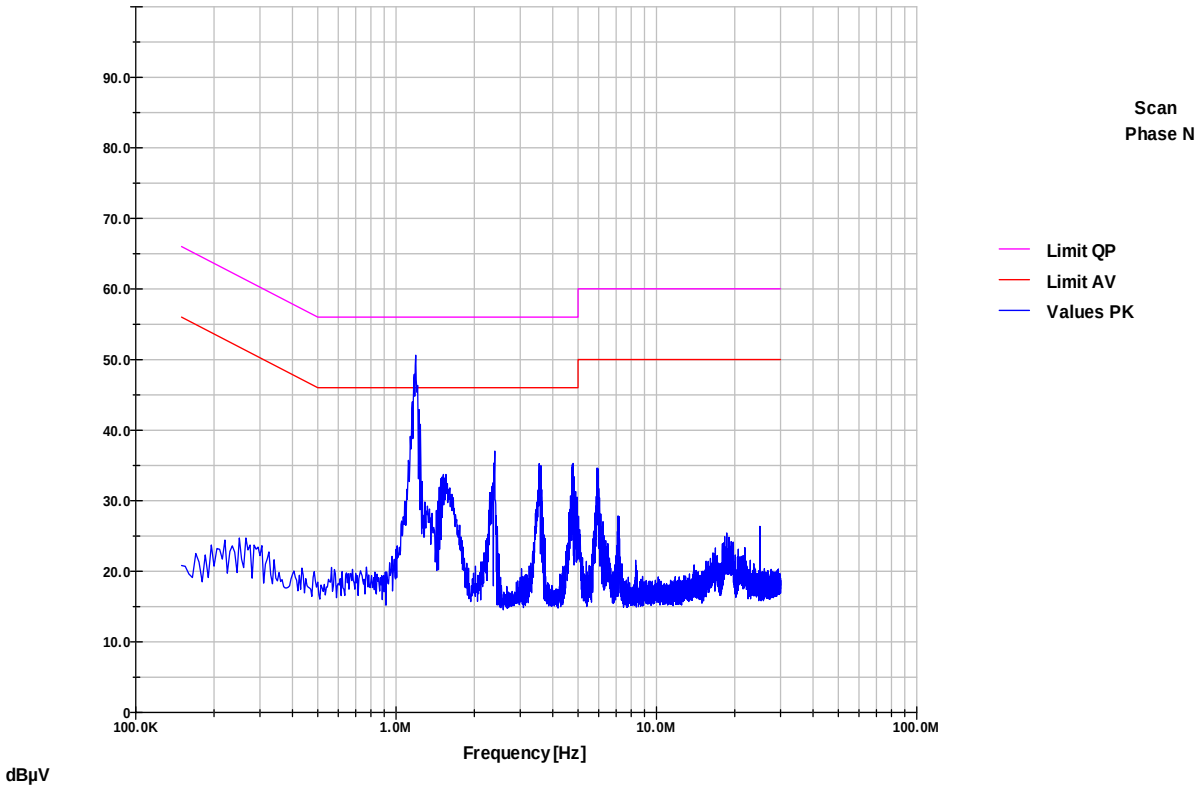
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH6 (11Mbps) |
| **Standard:** | FCC Part 15.207 |
| **Test:** | Conducted Emission Test |
| **Detector:** | QP / AV |
| **Result:** | Limit kept |
| **Applied to:** | Phase L1 |
| **Remark:** | none |




**Minimum margin to limit: -12,6 dB**

| Frequency [MHz] | Reading [dBµV] QP | Reading [dBµV] AV | Correction [dB] | Values [dBµV] QP | Values [dBµV] AV | Limit [dBµV] QP | Limit [dBµV] AV | Margin [dB] QP | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 1,190 | 43,4 | 10,2 | 0,0 | 43,4 | 10,2 | 56,0 | 46,0 | -12,6 | -35,8 |

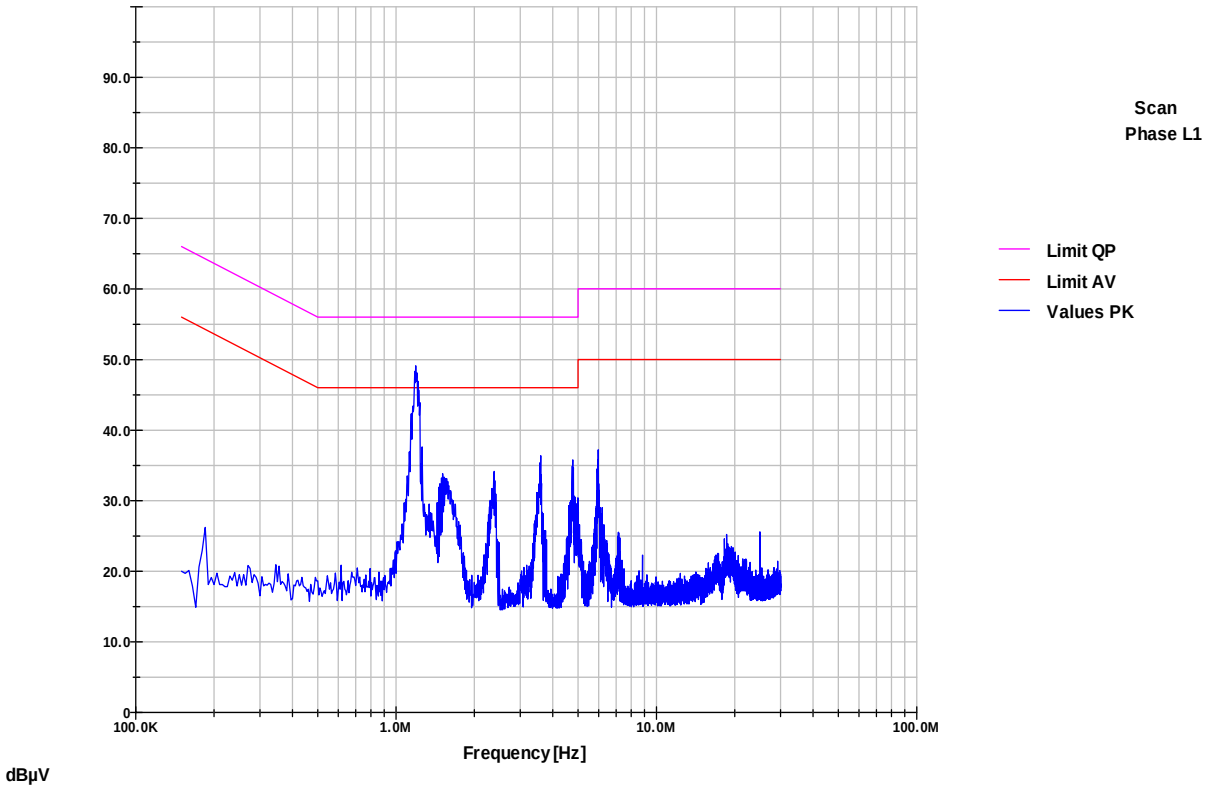
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH6 (11Mbps) |
| **Standard:** | FCC Part 15.207 |
| **Test:** | Conducted Emission Test |
| **Detector:** | QP / AV |
| **Result:** | Limit kept |
| **Applied to:** | Phase N |
| **Remark:** | none |




**Minimum margin to limit: -12,5 dB**

| Frequency [MHz] | Reading [dBµV] QP | Reading [dBµV] AV | Correction [dB] | Values [dBµV] QP | Values [dBµV] AV | Limit [dBµV] QP | Limit [dBµV] AV | Margin [dB] QP | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 1,190 | 43,5 | 13,4 | 0,0 | 43,5 | 13,4 | 56,0 | 46,0 | -12,5 | -32,6 |

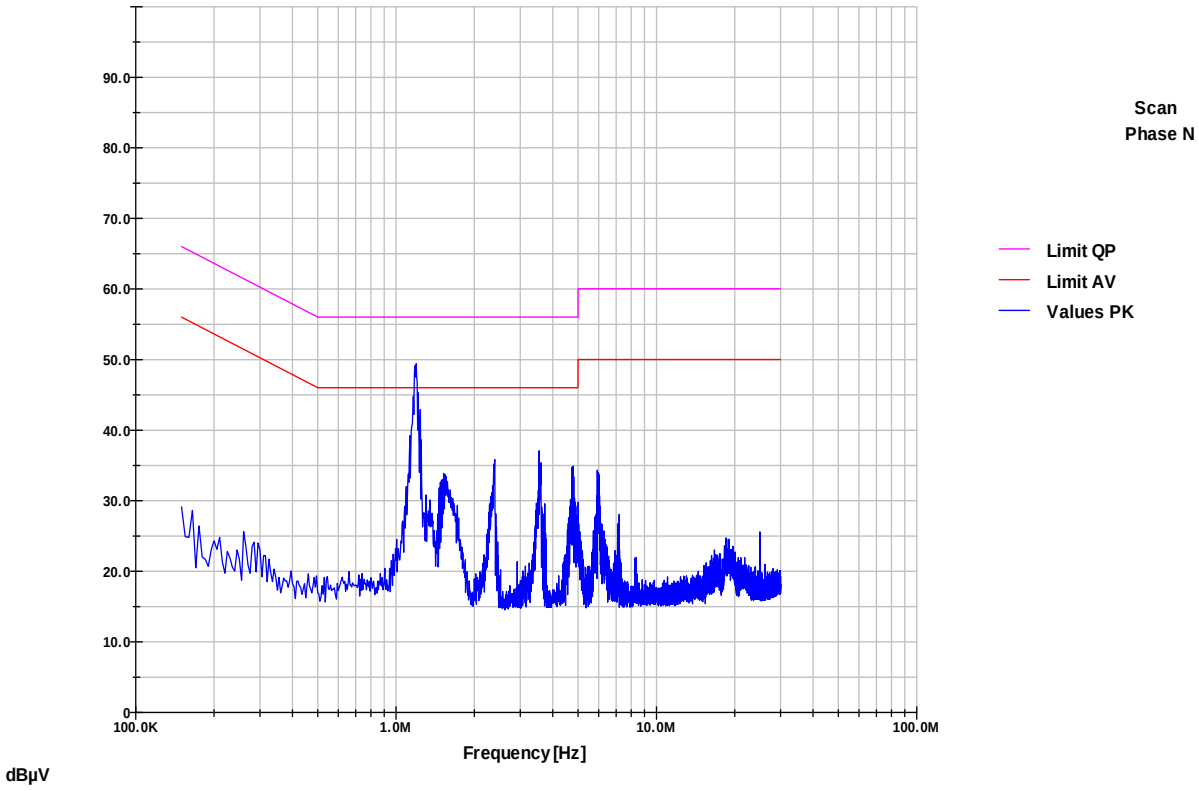
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH11 (11Mbps) |
| **Standard:** | FCC Part 15.207 |
| **Test:** | Conducted Emission Test |
| **Detector:** | QP / AV |
| **Result:** | Limit kept |
| **Applied to:** | Phase L1 |
| **Remark:** | none |




**Minimum margin to limit: -12,7 dB**

| Frequency [MHz] | Reading [dBµV] QP | Reading [dBµV] AV | Correction [dB] | Values [dBµV] QP | Values [dBµV] AV | Limit [dBµV] QP | Limit [dBµV] AV | Margin [dB] QP | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 1,190 | 43,3 | 12,1 | 0,0 | 43,3 | 12,1 | 56,0 | 46,0 | -12,7 | -33,9 |

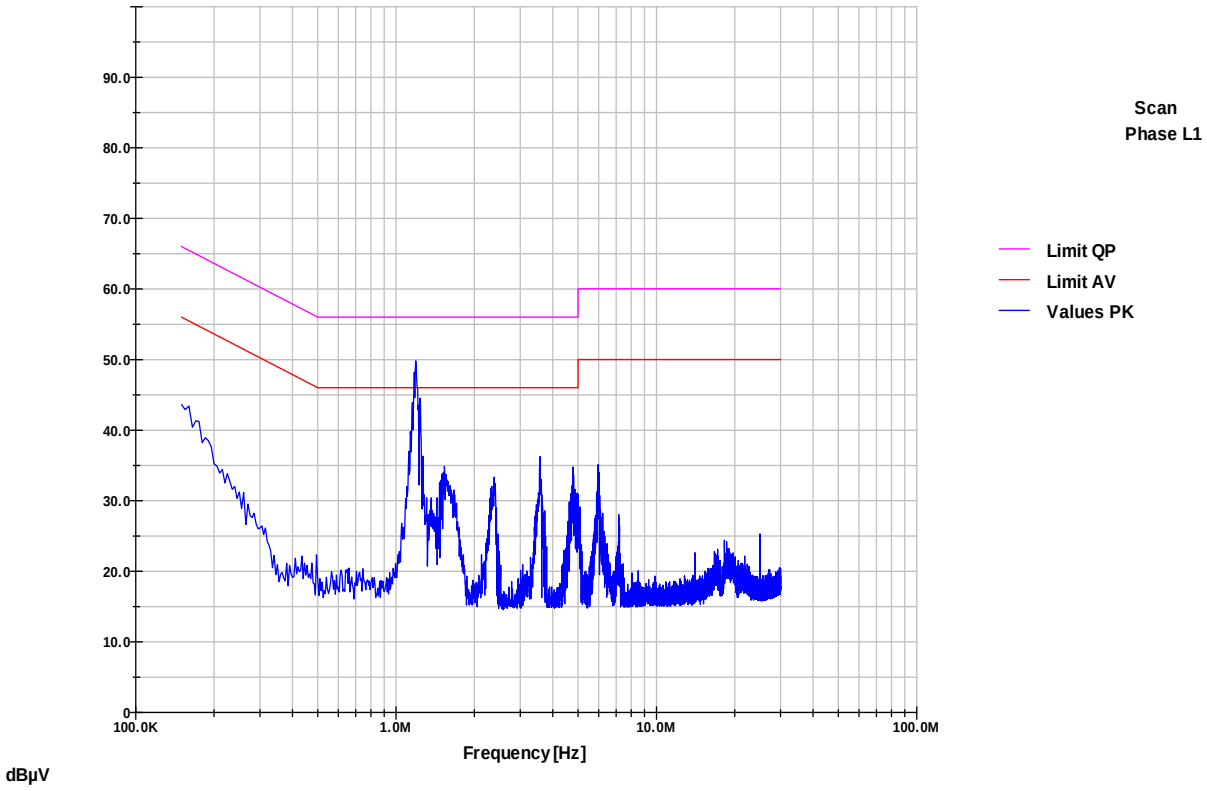
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH11 (11Mbps) |
| **Standard:** | FCC Part 15.207 |
| **Test:** | Conducted Emission Test |
| **Detector:** | QP / AV |
| **Result:** | Limit kept |
| **Applied to:** | Phase N |
| **Remark:** | none |




**Minimum margin to limit: -12,5 dB**

| Frequency [MHz] | Reading [dBµV] QP | Reading [dBµV] AV | Correction [dB] | Values [dBµV] QP | Values [dBµV] AV | Limit [dBµV] QP | Limit [dBµV] AV | Margin [dB] QP | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 1,190 | 43,5 | 13,3 | 0,0 | 43,5 | 13,3 | 56,0 | 46,0 | -12,5 | -32,7 |

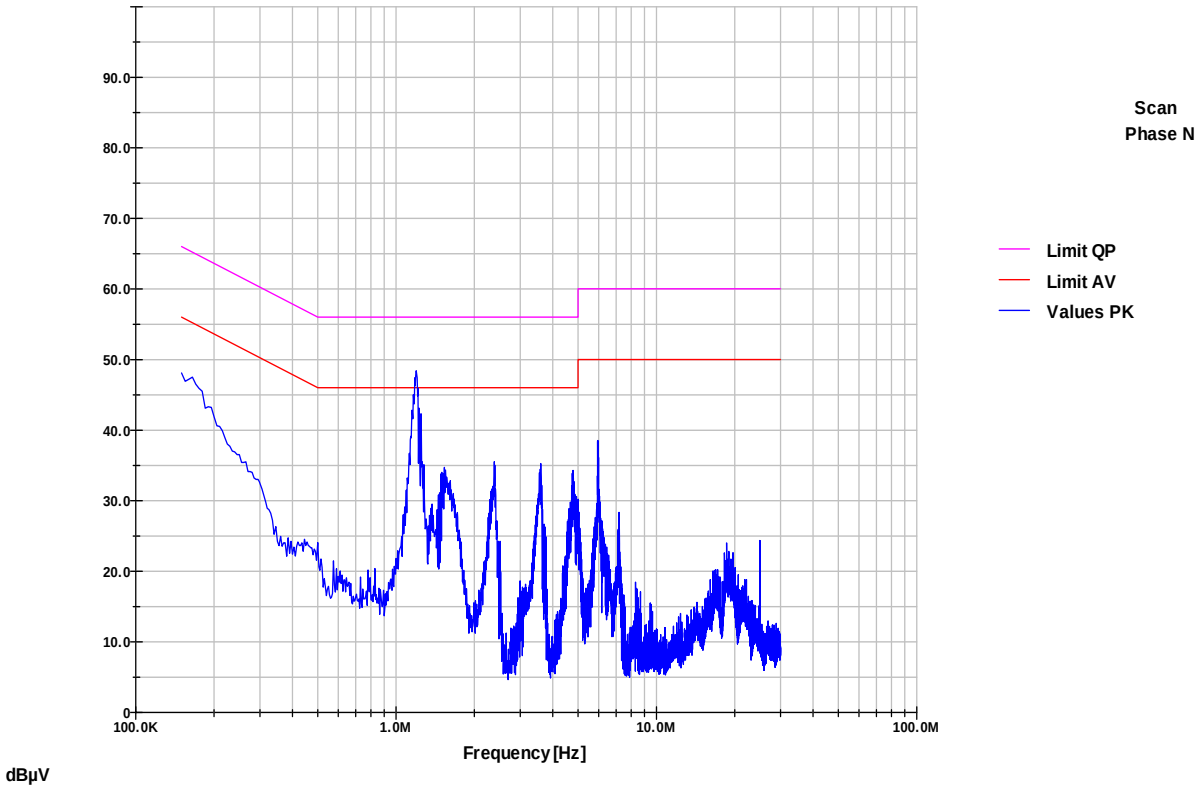
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH1 (54Mbps) |
| **Standard:** | FCC Part 15.207 |
| **Test:** | Conducted Emission Test |
| **Detector:** | QP / AV |
| **Result:** | Limit kept |
| **Applied to:** | Phase L1 |
| **Remark:** | none |




**Minimum margin to limit: -12,4 dB**

| Frequency [MHz] | Reading [dBµV] QP | Reading [dBµV] AV | Correction [dB] | Values [dBµV] QP | Values [dBµV] AV | Limit [dBµV] QP | Limit [dBµV] AV | Margin [dB] QP | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 1,190 | 43,6 | 15,9 | 0,0 | 43,6 | 15,9 | 56,0 | 46,0 | -12,4 | -30,1 |

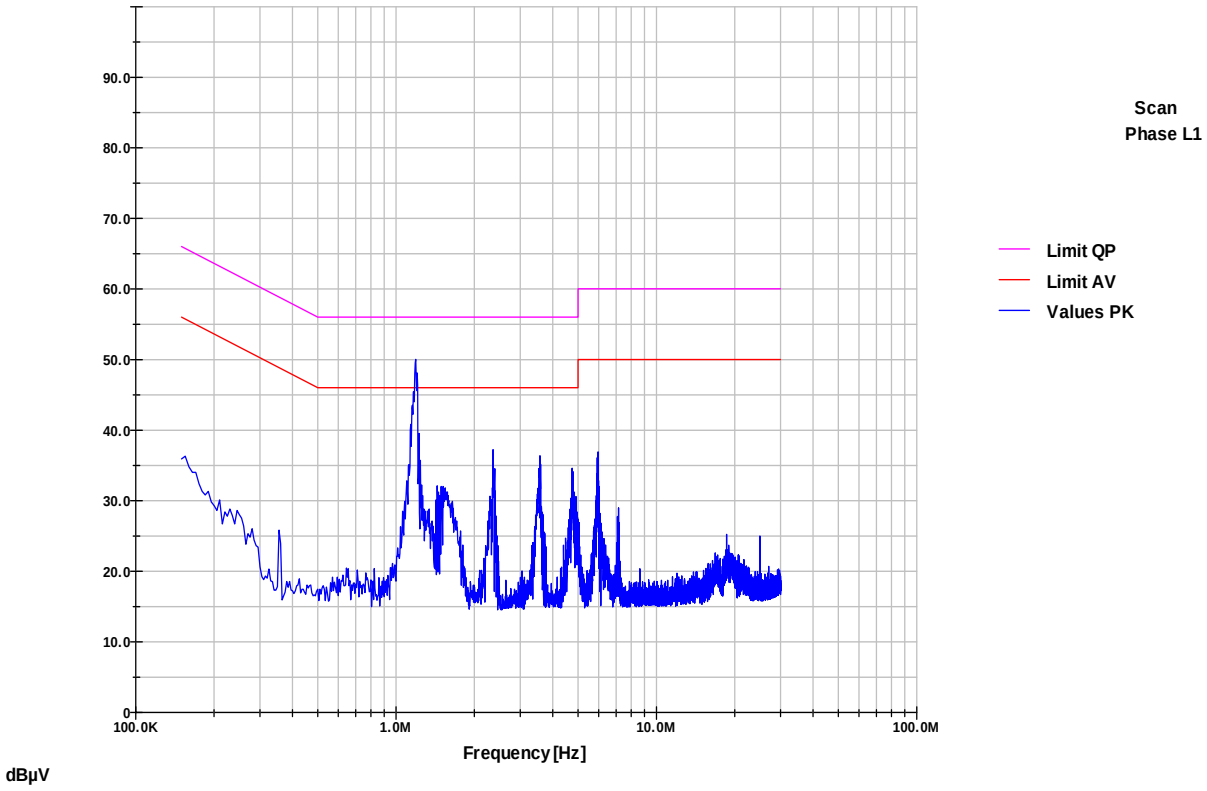
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH1 (54Mbps) |
| **Standard:** | FCC Part 15.207 |
| **Test:** | Conducted Emission Test |
| **Detector:** | QP / AV |
| **Result:** | Limit kept |
| **Applied to:** | Phase N |
| **Remark:** | none |




**Minimum margin to limit: -12,4 dB**

| Frequency | Reading [dBµV] | | Correction | Values [dBµV] | | Limit [dBµV] | | Margin [dB] | |
|---|---|---|---|---|---|---|---|---|---|
| [MHz] | QP | AV | [dB] | QP | AV | QP | AV | QP | AV |
| 1,190 | 43,6 | 14,5 | 0,0 | 43,6 | 14,5 | 56,0 | 46,0 | -12,4 | -31,5 |

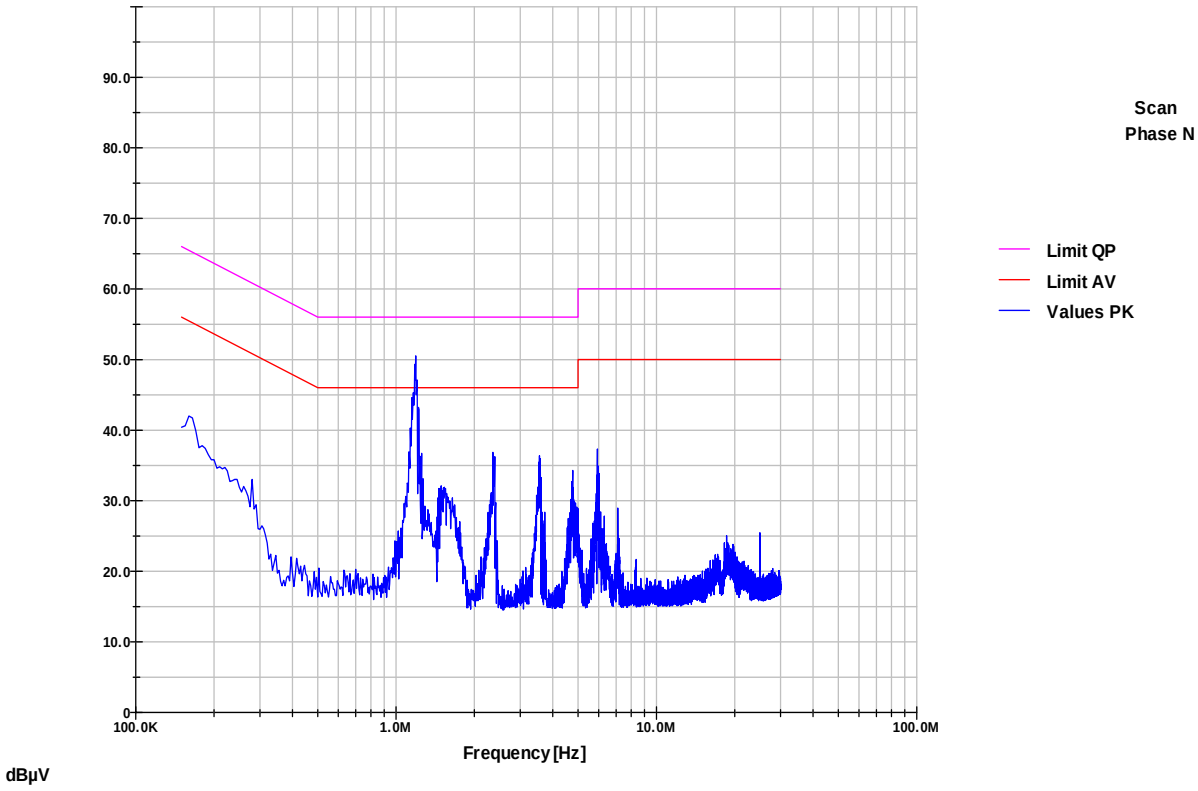
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH6 54Mbps) |
| **Standard:** | FCC Part 15.207 |
| **Test:** | Conducted Emission Test |
| **Detector:** | QP / AV |
| **Result:** | Limit kept |
| **Applied to:** | Phase L1 |
| **Remark:** | none |




**Minimum margin to limit: -12,5 dB**

| Frequency [MHz] | Reading [dBµV] QP | Reading [dBµV] AV | Correction [dB] | Values [dBµV] QP | Values [dBµV] AV | Limit [dBµV] QP | Limit [dBµV] AV | Margin [dB] QP | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 1,190 | 43,5 | 15,7 | 0,0 | 43,5 | 15,7 | 56,0 | 46,0 | -12,5 | -30,3 |

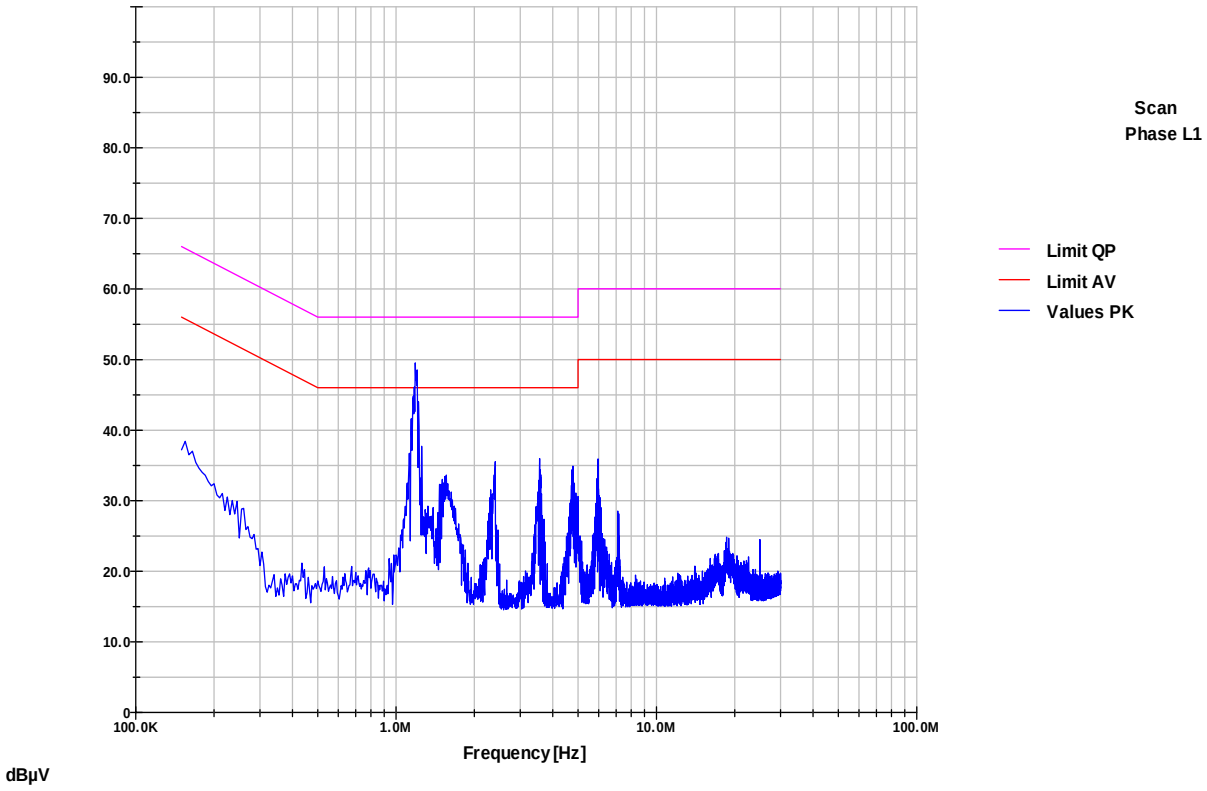
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH6 54Mbps) |
| **Standard:** | FCC Part 15.207 |
| **Test:** | Conducted Emission Test |
| **Detector:** | QP / AV |
| **Result:** | Limit kept |
| **Applied to:** | Phase N |
| **Remark:** | none |




**Minimum margin to limit: -13,0 dB**

| Frequency [MHz] | Reading [dBµV] QP | Reading [dBµV] AV | Correction [dB] | Values [dBµV] QP | Values [dBµV] AV | Limit [dBµV] QP | Limit [dBµV] AV | Margin [dB] QP | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 1,190 | 43,0 | 14,4 | 0,0 | 43,0 | 14,4 | 56,0 | 46,0 | -13,0 | -31,6 |

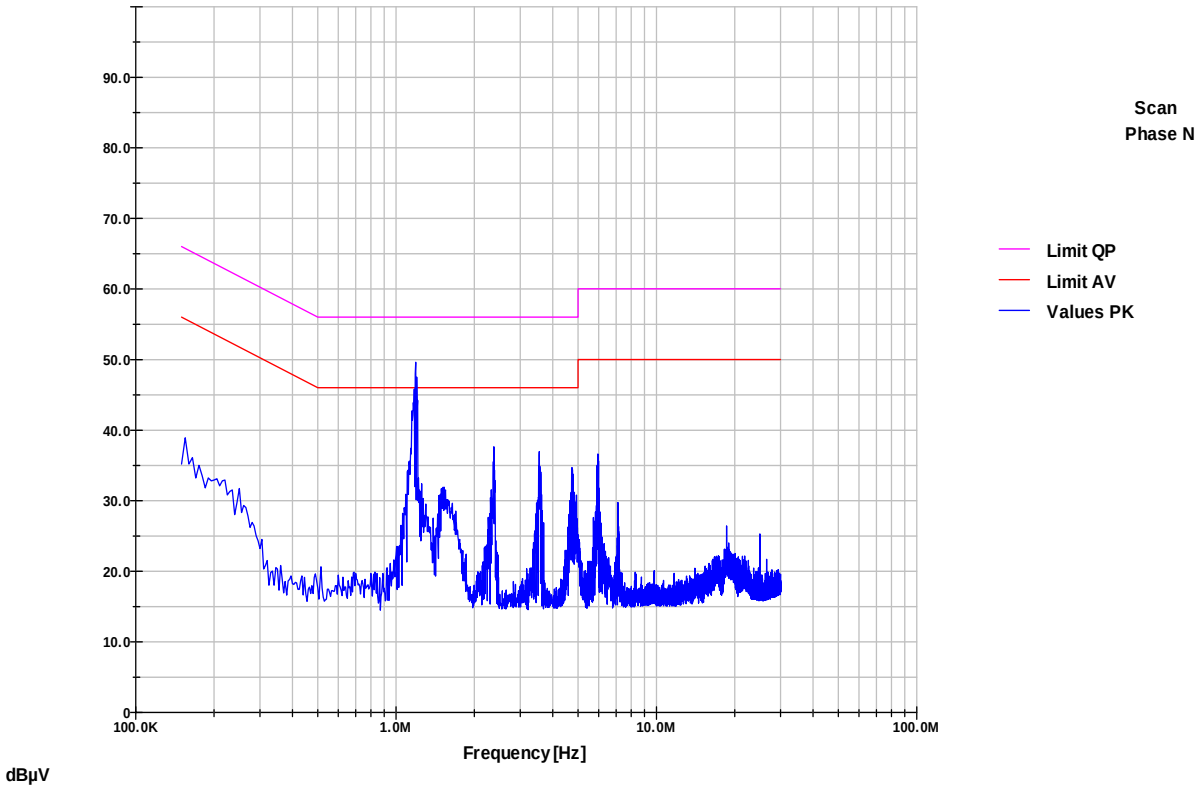
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH11 (54Mbps) |
| **Standard:** | FCC Part 15.207 |
| **Test:** | Conducted Emission Test |
| **Detector:** | QP / AV |
| **Result:** | Limit kept |
| **Applied to:** | Phase L1 |
| **Remark:** | none |




**Minimum margin to limit: -14,4 dB**

| Frequency [MHz] | Reading [dBµV] QP | Reading [dBµV] AV | Correction [dB] | Values [dBµV] QP | Values [dBµV] AV | Limit [dBµV] QP | Limit [dBµV] AV | Margin [dB] QP | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 1,190 | 41,6 | 12,3 | 0,0 | 41,6 | 12,3 | 56,0 | 46,0 | -14,4 | -33,7 |

| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH11 (54Mbps) |
| **Standard:** | FCC Part 15.207 |
| **Test:** | Conducted Emission Test |
| **Detector:** | QP / AV |
| **Result:** | Limit kept |
| **Applied to:** | Phase N |
| **Remark:** | none |




**Minimum margin to limit: -13,3 dB**

| Frequency [MHz] | Reading [dBµV] QP | Reading [dBµV] AV | Correction [dB] | Values [dBµV] QP | Values [dBµV] AV | Limit [dBµV] QP | Limit [dBµV] AV | Margin [dB] QP | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 1,190 | 42,7 | 12,8 | 0,0 | 42,7 | 12,8 | 56,0 | 46,0 | -13,3 | -33,2 |

## 6.2 Radiated disturbance in the frequency range 9kHz – 30MHz

For test instruments and accessories used see section 7 Part **SER 1**.

### 6.2.1 Description of the test location

Test location: Shielded Room SK5

Test distance: 2 metres

### 6.2.2 Photo documentation of the test set-up

### 6.2.3 Test specification

Environmental conditions: Temperature: 24 ° C Humidity: 50 % Atmospheric pressure: 97 kPa

Frequency range: 0.009 MHz - 30 MHz

The test was carried out in the following operation mode(s):
- continous transmit mode (duty cycle = 99%), maximum RF power adjusted

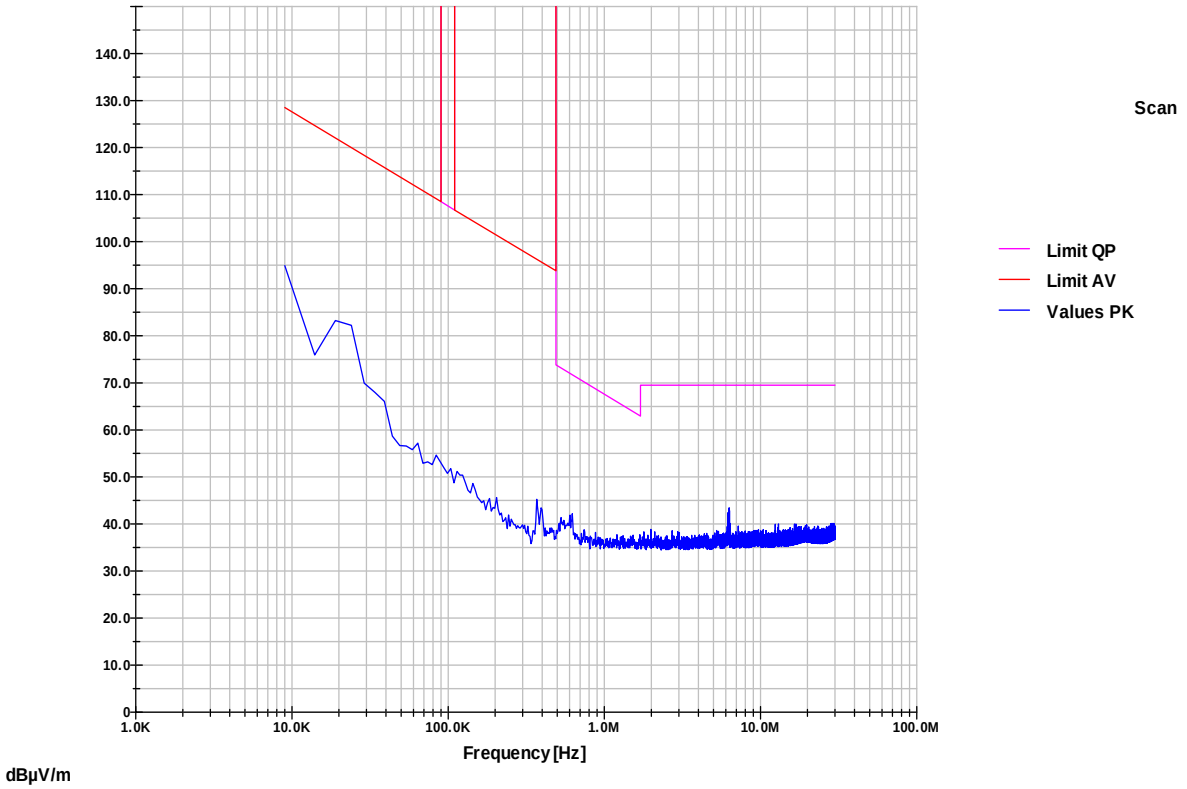
### 6.2.4 Test result

The requirements are **FULFILLED.**

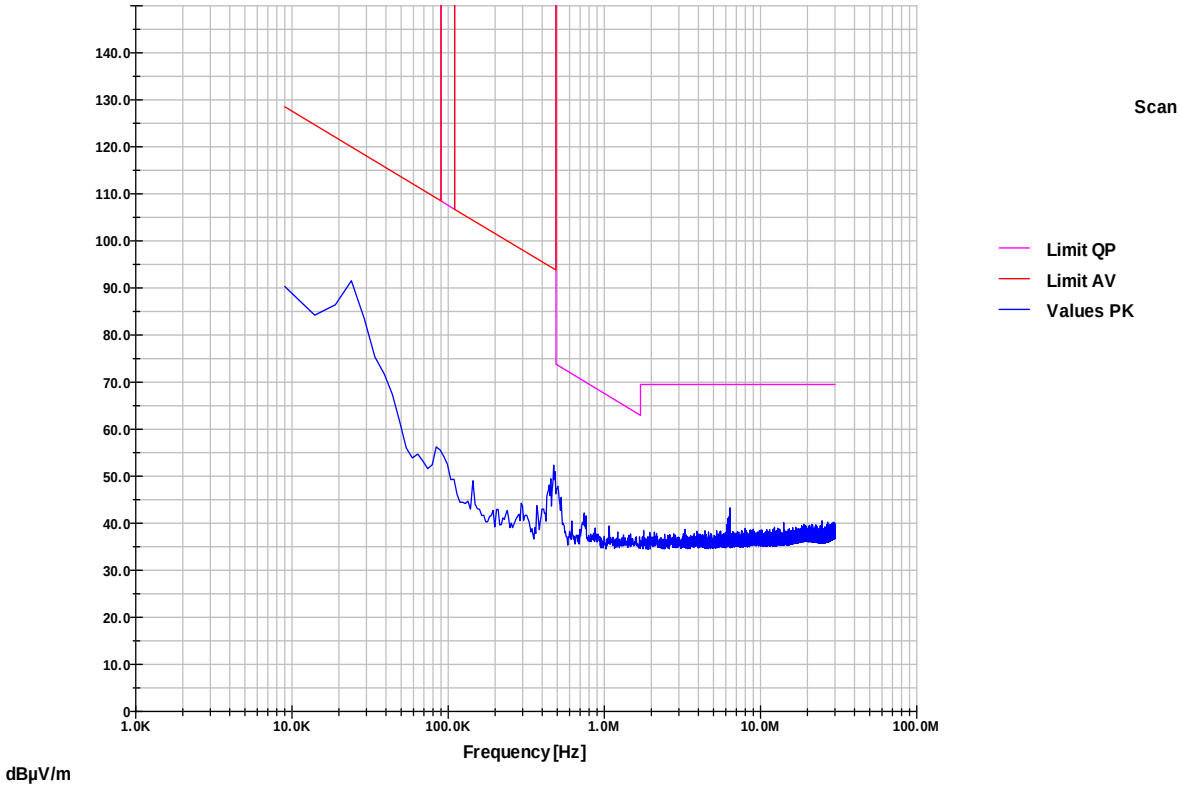
**Remarks:** The prescan shows that the Peak value is below the Average / QuasiPeak limit, therefore no final measurement was made.

### 6.2.5 Test protocol

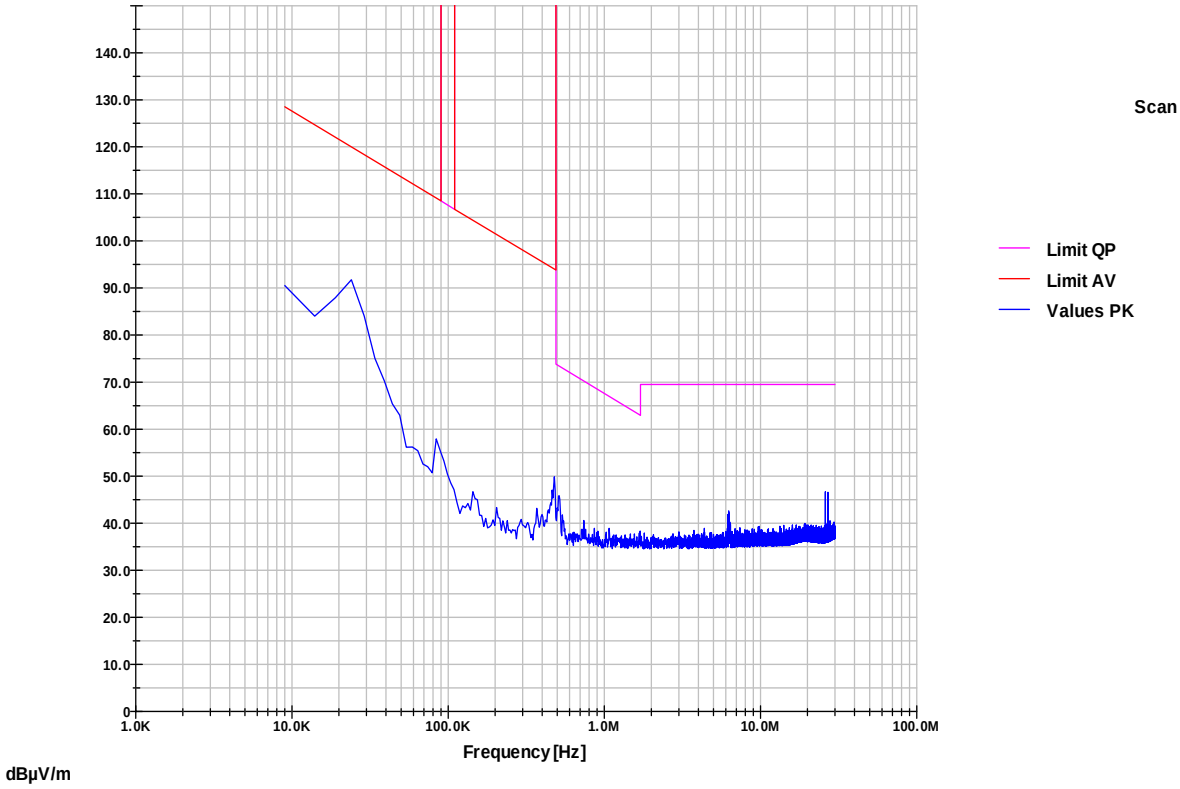
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH1 (11Mbps) |
| **Standard:** | FCC Part 15.209 |
| **Test:** | Radiated Emission Test |
| **Detector:** | No QuasiPeak / Average measurement was made because the Peak values are below the AV / QP Limit |
| **Result:** | Limit kept |
| **Remark:** | none |



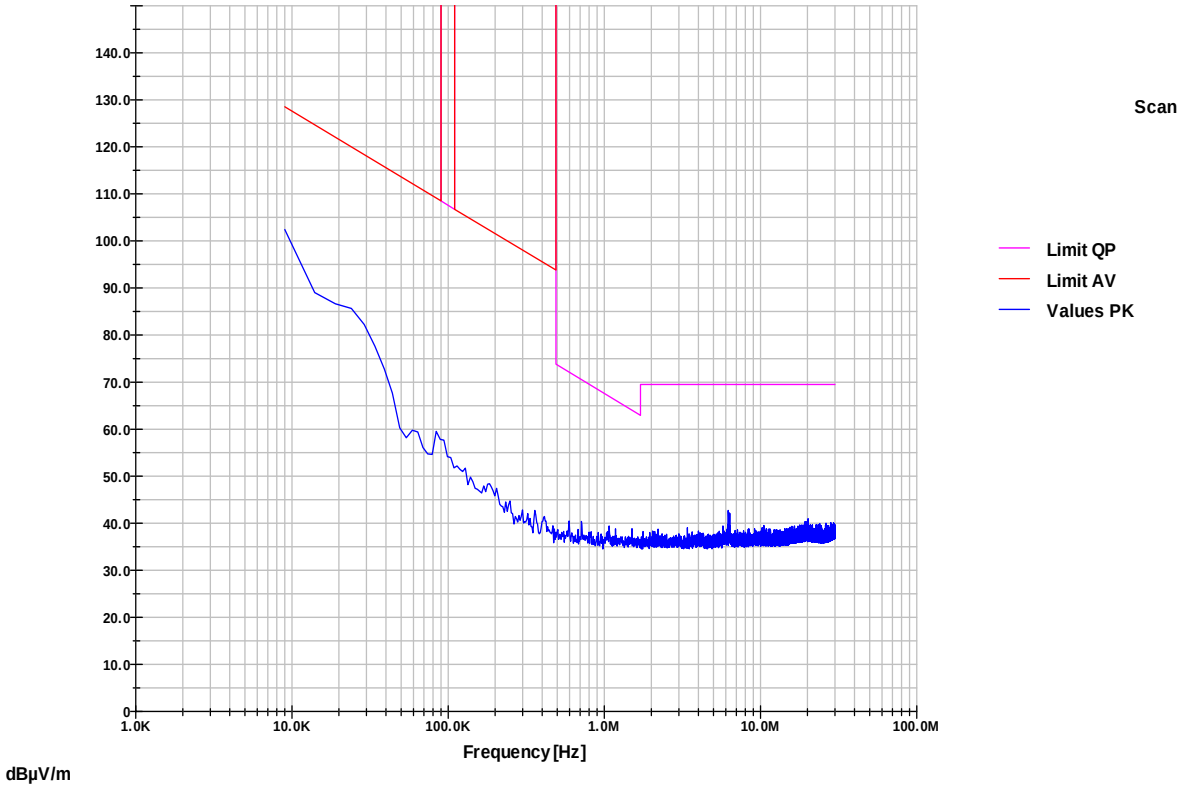
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH6 (11Mbps) |
| **Standard:** | FCC Part 15.209 |
| **Test:** | Radiated Emission Test |
| **Detector:** | No QuasiPeak / Average measurement was made because the Peak values are below the AV / QP Limit |
| **Result:** | Limit kept |
| **Remark:** | none |



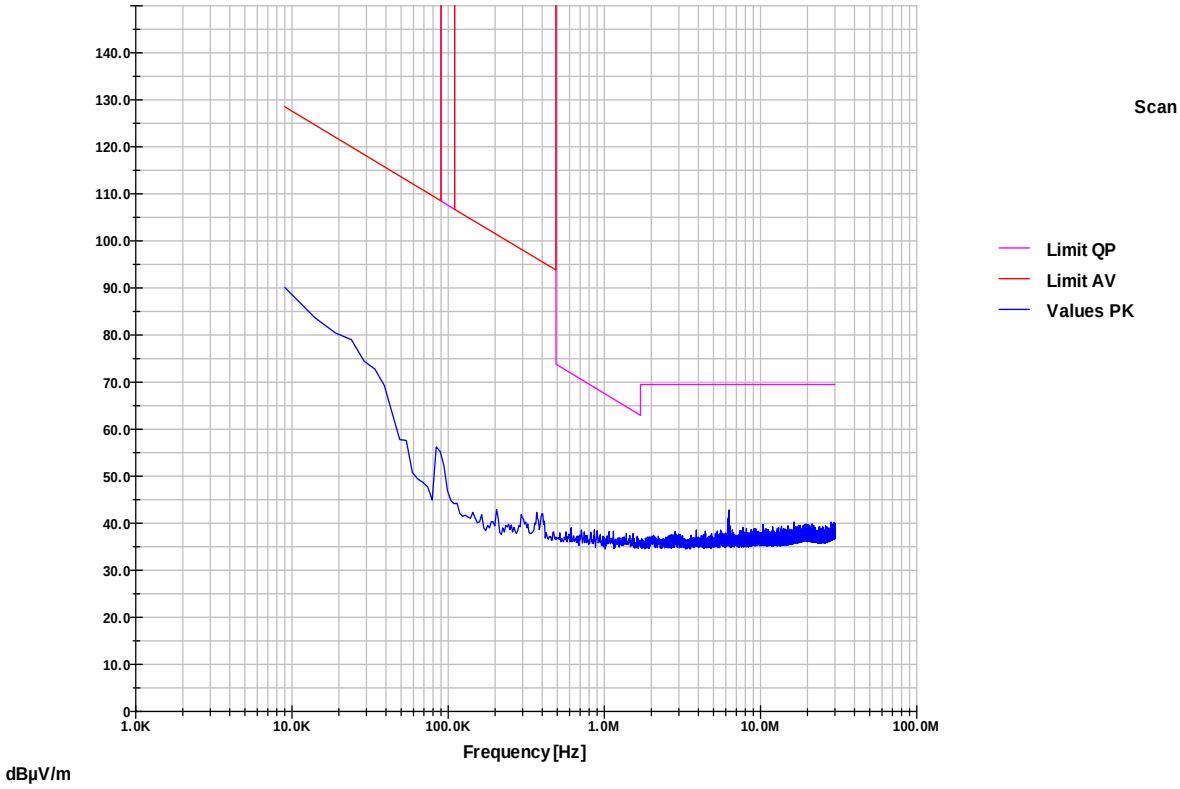
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH11 (11Mbps) |
| **Standard:** | FCC Part 15.209 |
| **Test:** | Radiated Emission Test |
| **Detector:** | No QuasiPeak / Average measurement was made because the Peak values are below the AV / QP Limit |
| **Result:** | Limit kept |
| **Remark:** | none |



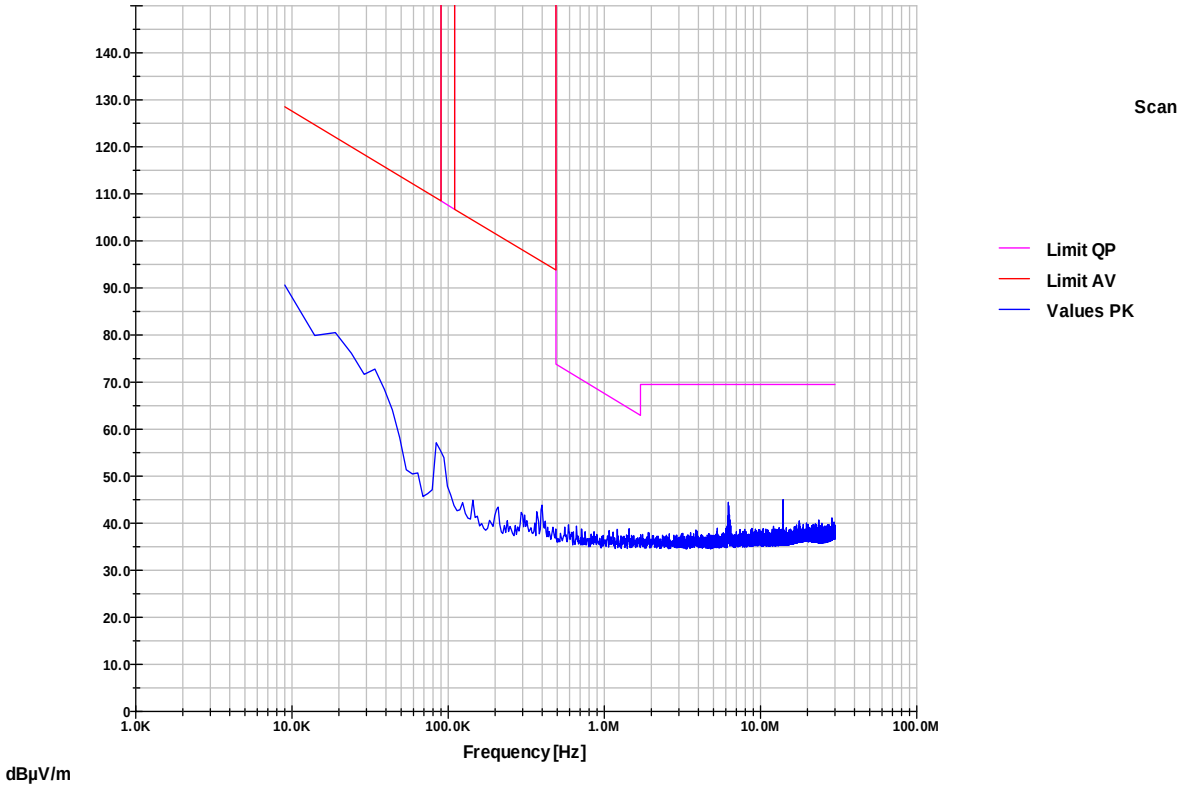
| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH1 (54Mbps) |
| **Standard:** | FCC Part 15.209 |
| **Test:** | Radiated Emission Test |
| **Detector:** | No QuasiPeak / Average measurement was made because the Peak values are below the AV / QP Limit |
| **Result:** | Limit kept |
| **Remark:** | none |



| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH6 (54Mbps) |
| **Standard:** | FCC Part 15.209 |
| **Test:** | Radiated Emission Test |
| **Detector:** | No QuasiPeak / Average measurement was made because the Peak values are below the AV / QP Limit |
| **Result:** | Limit kept |
| **Remark:** | none |



| | |
|---|---|
| **Date of test:** | 2010-08-18 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH11 (54Mbps) |
| **Standard:** | FCC Part 15.209 |
| **Test:** | Radiated Emission Test |
| **Detector:** | No QuasiPeak / Average measurement was made because the Peak values are below the AV / QP Limit |
| **Result:** | Limit kept |
| **Remark:** | none |



## 6.3 Radiated disturbance in the frequency range 30MHz – 1000MHz

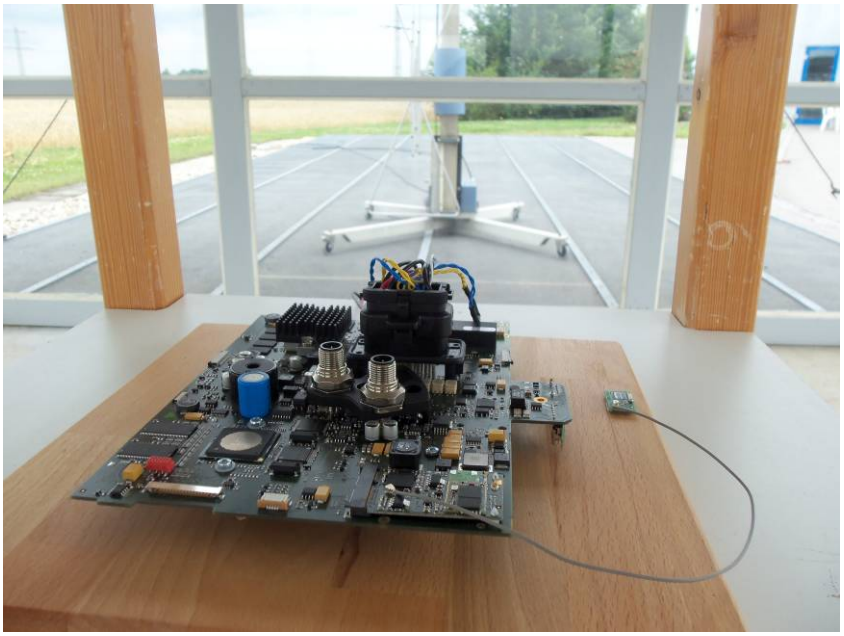
For test instruments and accessories used see section 7 Part **SER 2**.

### 6.3.1 Description of the test location

Test location: OATS 1

Test distance: 3 metres

### 6.3.2 Photo documentation of the test set-up



### 6.3.3 Test specification

Environmental conditions: Temperature: 24 ° C Humidity: 50 % Atmospheric pressure: 98 kPa

Frequency range: 30 MHz - 1000 MHz

The test was carried out in the following operation mode(s):
- continous transmit mode (duty cycle = 99%), maximum RF power adjusted

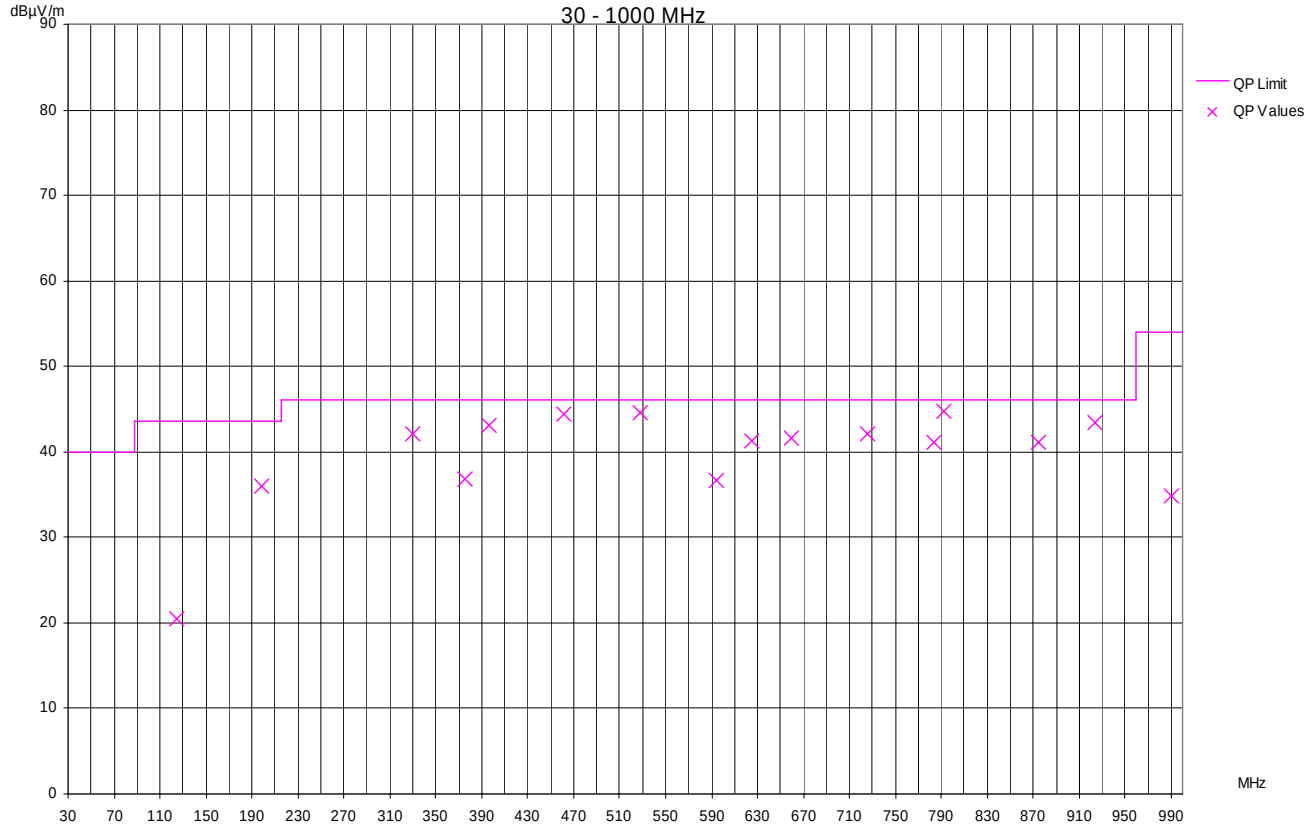
### 6.3.4 Test result

The requirements are **FULFILLED.**

**Remarks:** none

### 6.3.5 Test protocol

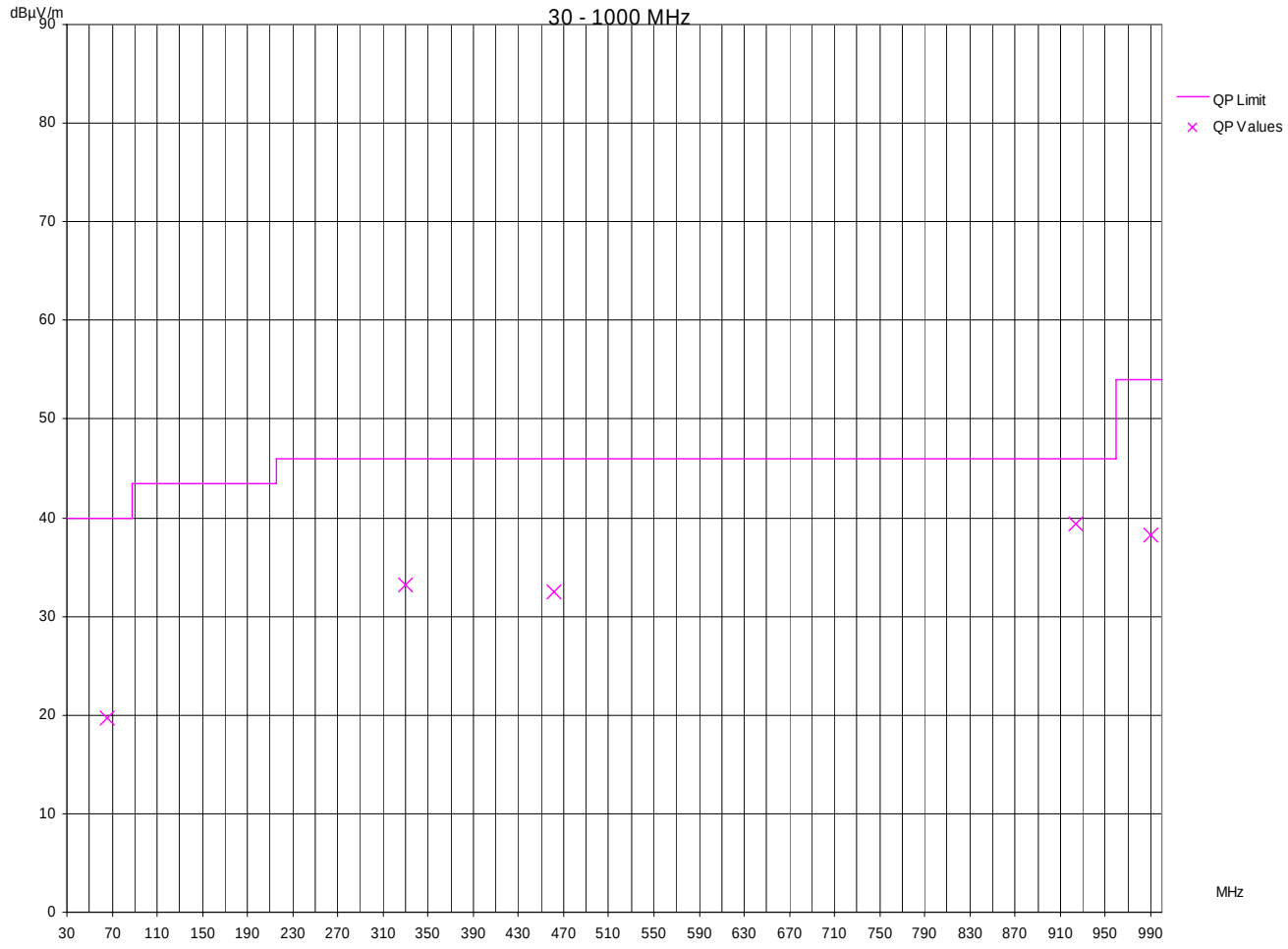
| | |
|---|---|
| **Date of test:** | 2010-08-20 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH1 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | QP |
| **Result:** | Limit kept |
| **Applied to:** | Horizontal |
| **Remark:** | none |



**Minimum margin to limit: -1,3 dB**

| Frequency [MHz] | Reading [dBµV] QP | Correction [dB] | Values [dBµV/m] QP | Limit [dBµV/m] QP | Margin [dB] QP |
|---|---|---|---|---|---|
| 125,000 | 8,8 | 11,6 | 20,4 | 43,5 | -23,1 |
| 197,997 | 22,8 | 13,3 | 36,1 | 43,5 | -7,5 |
| 329,999 | 24,6 | 17,4 | 42,0 | 46,0 | -4,0 |
| 375,000 | 18,5 | 18,4 | 36,9 | 46,0 | -9,1 |
| 396,000 | 24,2 | 18,9 | 43,1 | 46,0 | -3,0 |
| 461,997 | 24,2 | 20,2 | 44,4 | 46,0 | -1,6 |
| 527,997 | 22,8 | 21,7 | 44,5 | 46,0 | -1,5 |
| 593,998 | 13,8 | 22,9 | 36,7 | 46,0 | -9,3 |
| 625,000 | 17,7 | 23,6 | 41,3 | 46,0 | -4,7 |
| 660,000 | 17,9 | 23,8 | 41,7 | 46,0 | -4,3 |
| 726,000 | 17,3 | 24,9 | 42,2 | 46,0 | -3,8 |
| 783,751 | 15,5 | 25,6 | 41,1 | 46,0 | -4,9 |
| 791,998 | 19,1 | 25,7 | 44,8 | 46,0 | -1,3 |
| 875,000 | 14,5 | 26,6 | 41,1 | 46,0 | -4,9 |
| 924,000 | 16,3 | 27,1 | 43,4 | 46,0 | -2,6 |
| 990,000 | 6,9 | 27,9 | 34,8 | 54,0 | -19,2 |

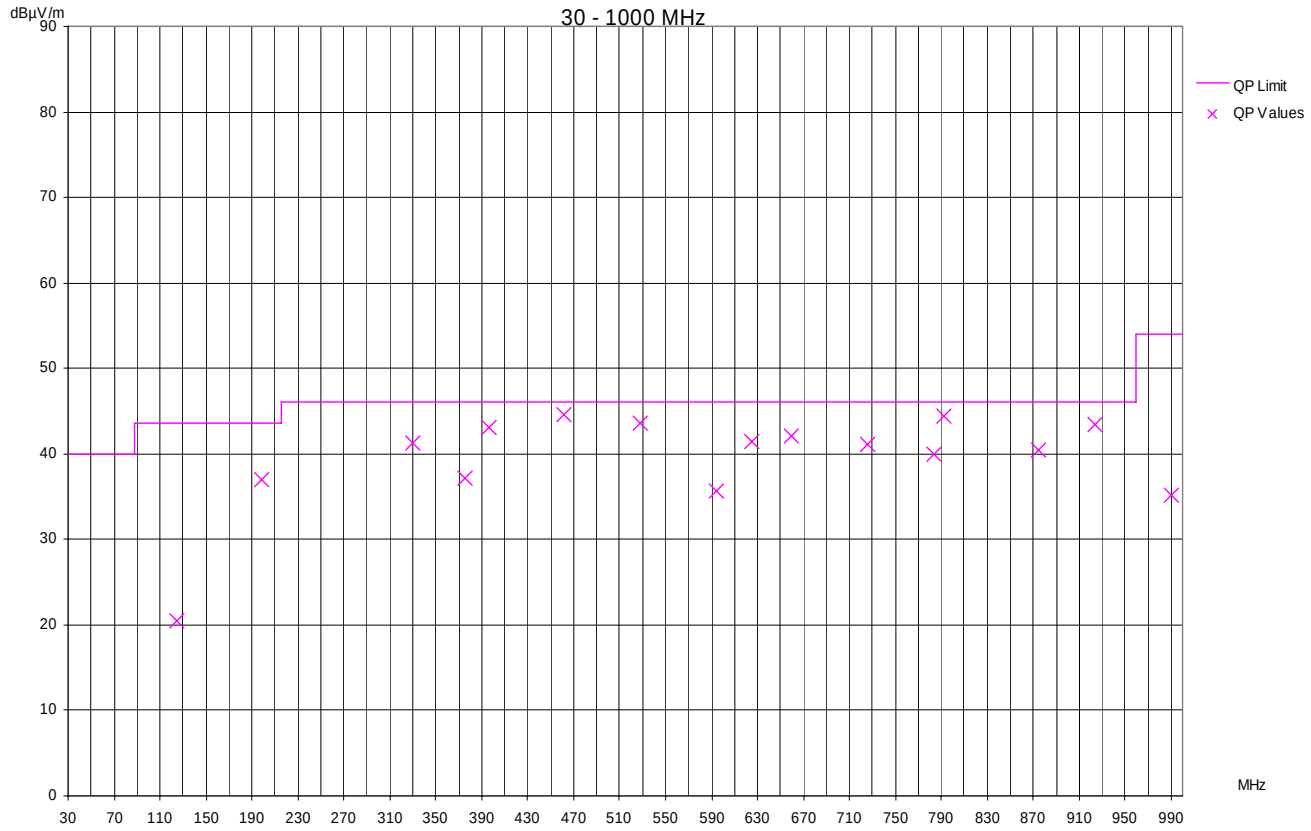
| | |
|---|---|
| **Date of test:** | 2010-08-20 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH1 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | QP |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | none |




**Minimum margin to limit: -6,7 dB**

| Frequency [MHz] | Reading [dBµV] QP | Correction [dB] | Values [dBµV/m] QP | Limit [dBµV/m] QP | Margin [dB] QP |
|---|---|---|---|---|---|
| 66,000 | 8,0 | 11,7 | 19,7 | 40,0 | -20,3 |
| 330,000 | 15,7 | 17,4 | 33,1 | 46,0 | -12,9 |
| 462,000 | 12,3 | 20,2 | 32,5 | 46,0 | -13,5 |
| 924,000 | 12,2 | 27,1 | 39,3 | 46,0 | -6,7 |
| 990,000 | 10,4 | 27,9 | 38,3 | 54,0 | -15,7 |

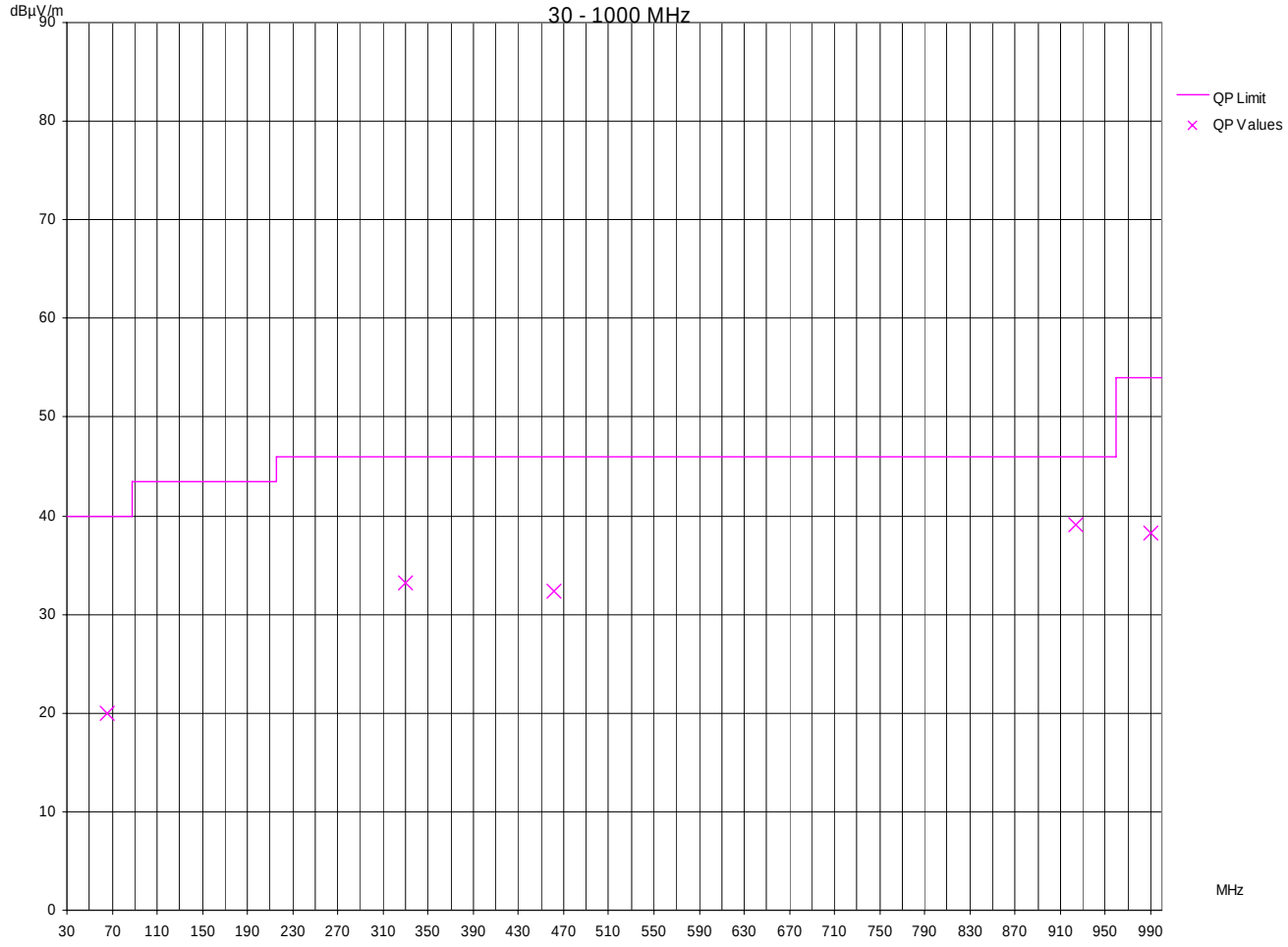
| | |
|---|---|
| **Date of test:** | 2010-08-20 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH6 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | QP |
| **Result:** | Limit kept |
| **Applied to:** | Horizontal |
| **Remark:** | none |



**Minimum margin to limit: -1,4 dB**

| Frequency [MHz] | Reading [dBµV] QP | Correction [dB] | Values [dBµV/m] QP | Limit [dBµV/m] QP | Margin [dB] QP |
|---|---|---|---|---|---|
| 125,000 | 8,9 | 11,6 | 20,5 | 43,5 | -23,0 |
| 197,997 | 23,7 | 13,3 | 37,0 | 43,5 | -6,6 |
| 329,999 | 23,9 | 17,4 | 41,3 | 46,0 | -4,7 |
| 375,000 | 18,7 | 18,4 | 37,1 | 46,0 | -8,9 |
| 396,000 | 24,2 | 18,9 | 43,1 | 46,0 | -3,0 |
| 461,997 | 24,4 | 20,2 | 44,6 | 46,0 | -1,4 |
| 527,997 | 21,9 | 21,7 | 43,6 | 46,0 | -2,4 |
| 593,998 | 12,8 | 22,9 | 35,7 | 46,0 | -10,3 |
| 625,000 | 17,8 | 23,6 | 41,4 | 46,0 | -4,6 |
| 660,000 | 18,4 | 23,8 | 42,2 | 46,0 | -3,8 |
| 726,000 | 16,3 | 24,9 | 41,2 | 46,0 | -4,8 |
| 783,751 | 14,3 | 25,6 | 39,9 | 46,0 | -6,1 |
| 791,998 | 18,7 | 25,7 | 44,4 | 46,0 | -1,7 |
| 875,000 | 13,9 | 26,6 | 40,5 | 46,0 | -5,5 |
| 924,000 | 16,3 | 27,1 | 43,4 | 46,0 | -2,6 |
| 990,000 | 7,2 | 27,9 | 35,1 | 54,0 | -18,9 |

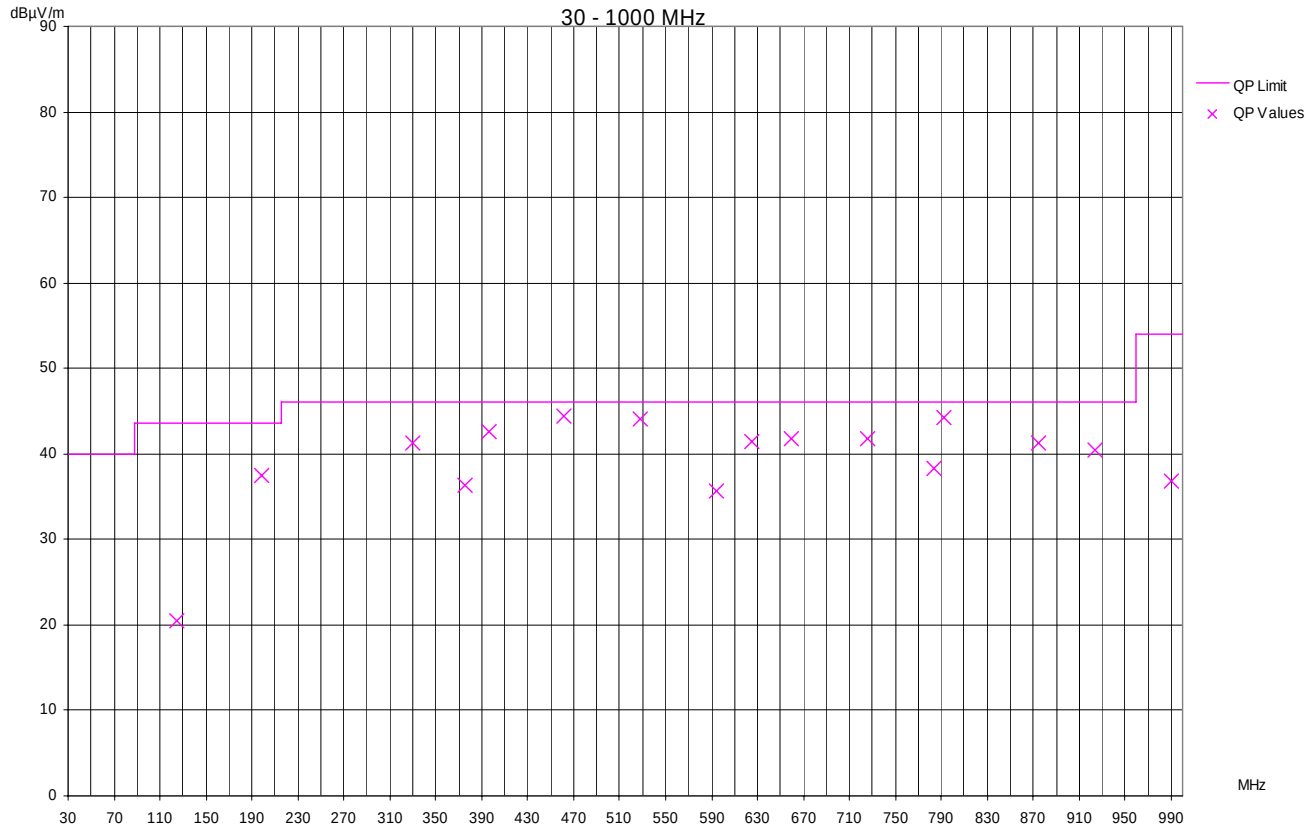
| | |
|---|---|
| **Date of test:** | 2010-08-20 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH6 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | QP |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | none |




**Minimum margin to limit: -7,0 dB**

| Frequency [MHz] | Reading [dBµV] QP | Correction [dB] | Values [dBµV/m] QP | Limit [dBµV/m] QP | Margin [dB] QP |
|---|---|---|---|---|---|
| 66,000 | 8,3 | 11,7 | 20,0 | 40,0 | -20,0 |
| 330,000 | 15,7 | 17,4 | 33,1 | 46,0 | -12,9 |
| 462,000 | 12,1 | 20,2 | 32,3 | 46,0 | -13,7 |
| 924,000 | 11,9 | 27,1 | 39,0 | 46,0 | -7,0 |
| 990,000 | 10,3 | 27,9 | 38,2 | 54,0 | -15,8 |

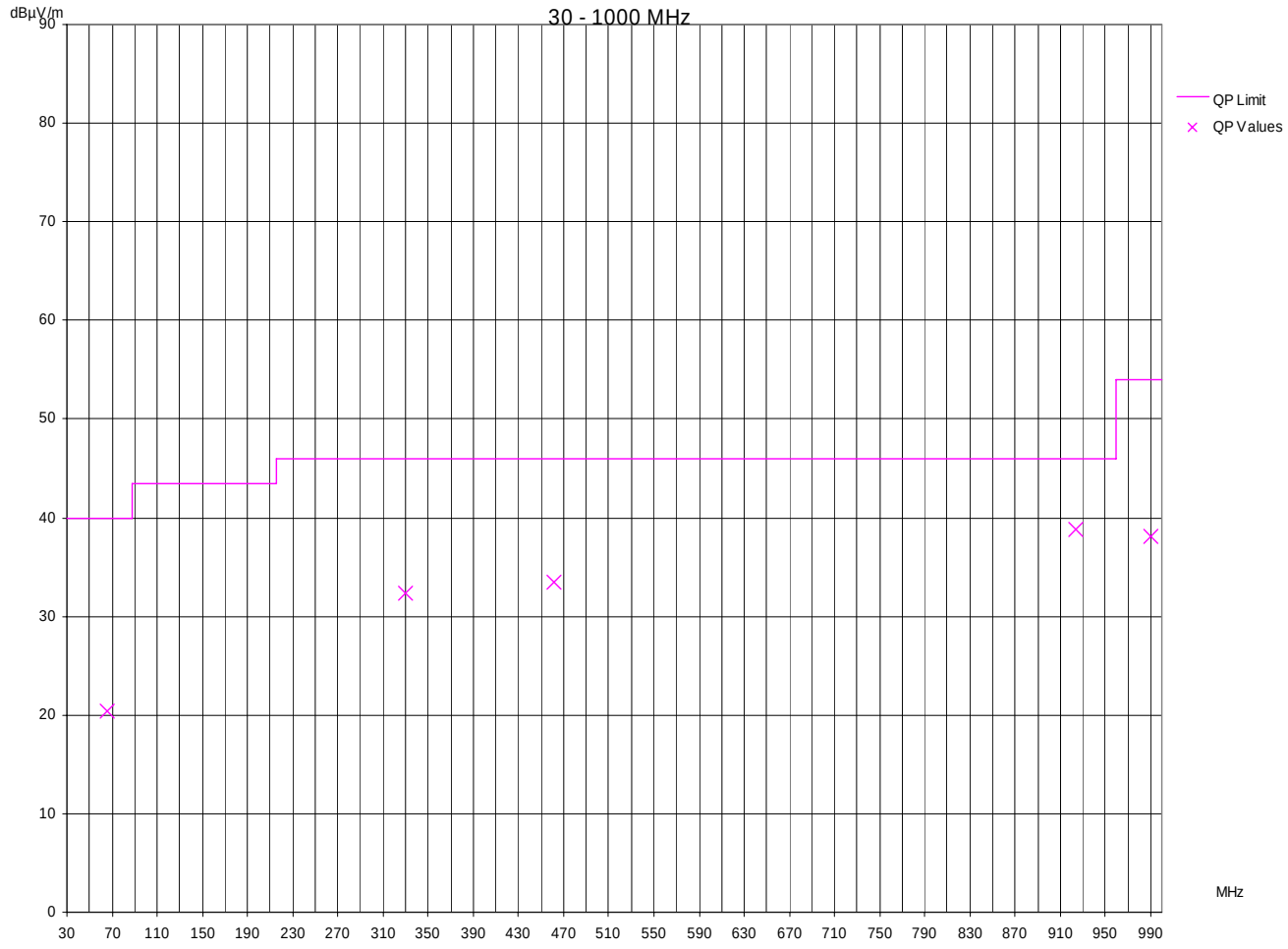
| | |
|---|---|
| **Date of test:** | 2010-08-20 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH11 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | QP |
| **Result:** | Limit kept |
| **Applied to:** | Horizontal |
| **Remark:** | none |



**Minimum margin to limit: -1,6 dB**

| Frequency [MHz] | Reading [dBµV] QP | Correction [dB] | Values [dBµV/m] QP | Limit [dBµV/m] QP | Margin [dB] QP |
|---|---|---|---|---|---|
| 125,000 | 8,8 | 11,6 | 20,4 | 43,5 | -23,1 |
| 197,997 | 24,2 | 13,3 | 37,5 | 43,5 | -6,1 |
| 329,999 | 23,9 | 17,4 | 41,3 | 46,0 | -4,7 |
| 375,000 | 17,9 | 18,4 | 36,3 | 46,0 | -9,7 |
| 396,000 | 23,7 | 18,9 | 42,6 | 46,0 | -3,5 |
| 461,997 | 24,2 | 20,2 | 44,4 | 46,0 | -1,6 |
| 527,997 | 22,3 | 21,7 | 44,0 | 46,0 | -2,0 |
| 593,998 | 12,7 | 22,9 | 35,6 | 46,0 | -10,4 |
| 625,000 | 17,9 | 23,6 | 41,5 | 46,0 | -4,5 |
| 660,000 | 18,0 | 23,8 | 41,8 | 46,0 | -4,2 |
| 726,000 | 16,9 | 24,9 | 41,8 | 46,0 | -4,2 |
| 783,751 | 12,7 | 25,6 | 38,3 | 46,0 | -7,7 |
| 791,998 | 18,6 | 25,7 | 44,3 | 46,0 | -1,8 |
| 875,000 | 14,7 | 26,6 | 41,3 | 46,0 | -4,7 |
| 924,000 | 13,4 | 27,1 | 40,5 | 46,0 | -5,5 |
| 990,000 | 8,9 | 27,9 | 36,8 | 54,0 | -17,2 |

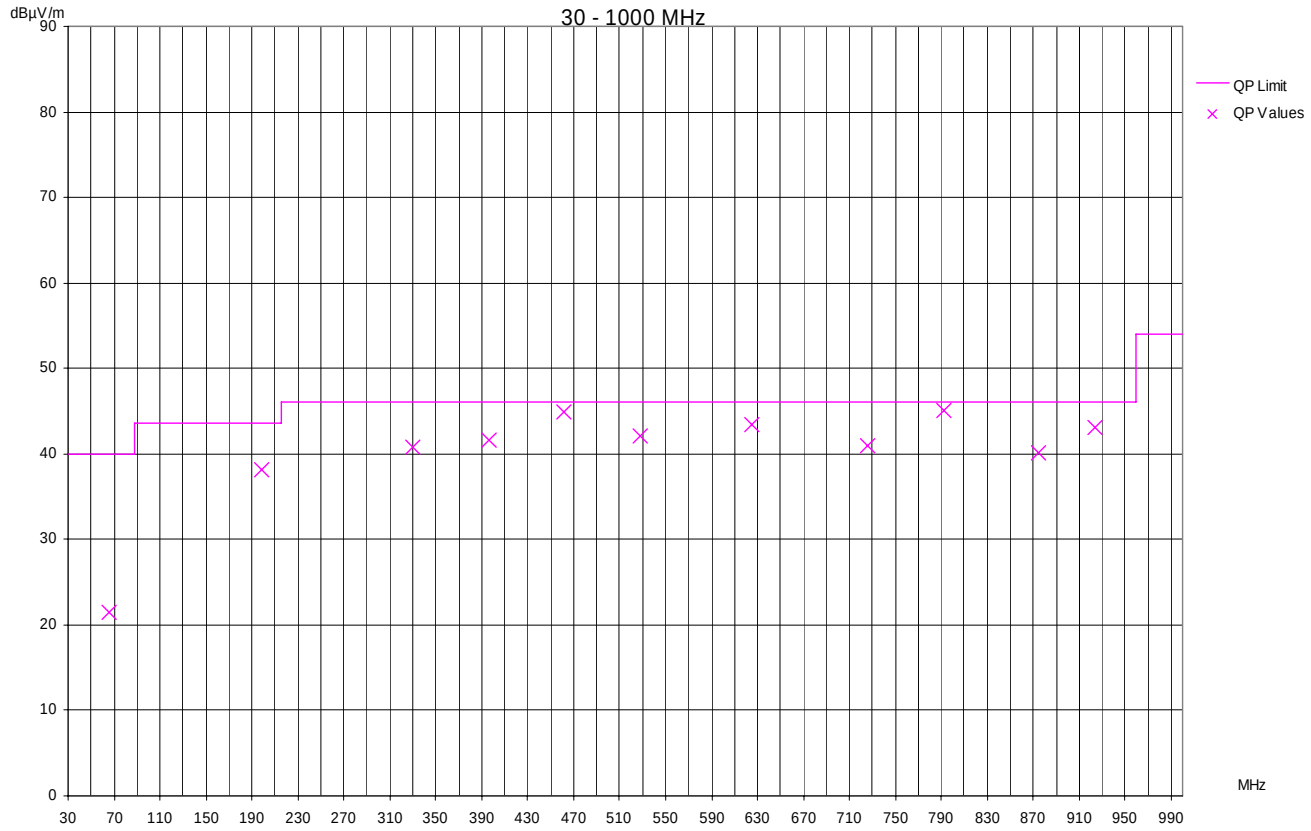
| | |
|---|---|
| **Date of test:** | 2010-08-20 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH11 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | QP |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | none |




**Minimum margin to limit: -7,2 dB**

| Frequency [MHz] | Reading [dBµV] QP | Correction [dB] | Values [dBµV/m] QP | Limit [dBµV/m] QP | Margin [dB] QP |
|---|---|---|---|---|---|
| 66,000 | 8,7 | 11,7 | 20,4 | 40,0 | -19,6 |
| 330,000 | 14,9 | 17,4 | 32,3 | 46,0 | -13,7 |
| 462,000 | 13,2 | 20,2 | 33,4 | 46,0 | -12,6 |
| 924,000 | 11,7 | 27,1 | 38,8 | 46,0 | -7,2 |
| 990,000 | 10,2 | 27,9 | 38,1 | 54,0 | -15,9 |

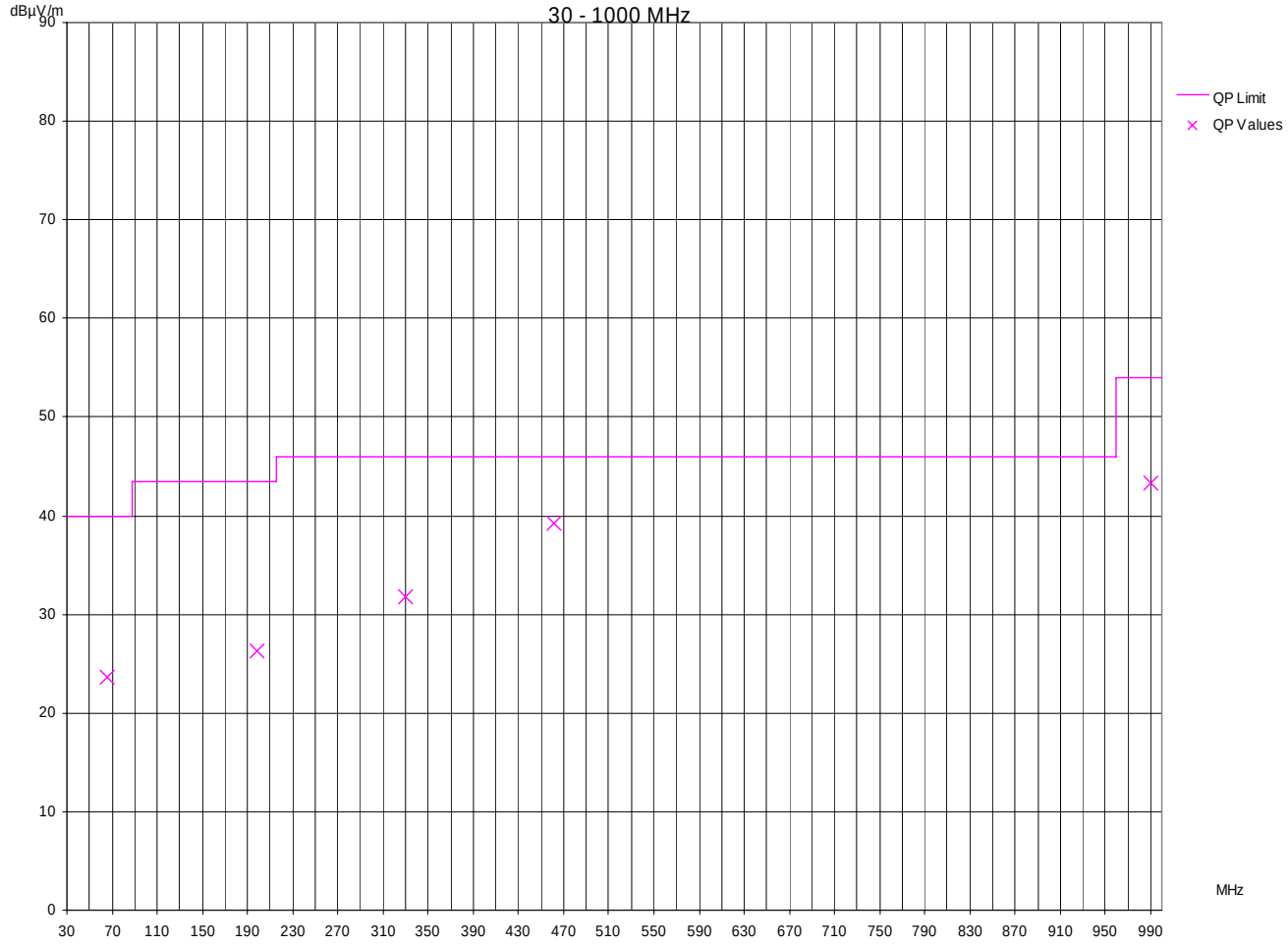
| | |
|---|---|
| **Date of test:** | 2010-08-20 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH1 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | QP |
| **Result:** | Limit kept |
| **Applied to:** | Horizontal |
| **Remark:** | none |



**Minimum margin to limit: -1,0 dB**

| Frequency [MHz] | Reading [dBµV] QP | Correction [dB] | Values [dBµV/m] QP | Limit [dBµV/m] QP | Margin [dB] QP |
|---|---|---|---|---|---|
| 66,000 | 9,7 | 11,7 | 21,4 | 40,0 | -18,6 |
| 198,000 | 24,9 | 13,3 | 38,2 | 43,5 | -5,4 |
| 330,000 | 23,3 | 17,4 | 40,7 | 46,0 | -5,3 |
| 395,999 | 22,8 | 18,9 | 41,7 | 46,0 | -4,4 |
| 462,000 | 24,7 | 20,2 | 44,9 | 46,0 | -1,1 |
| 528,000 | 20,4 | 21,7 | 42,1 | 46,0 | -3,9 |
| 625,000 | 19,9 | 23,6 | 43,5 | 46,0 | -2,5 |
| 726,000 | 16,0 | 24,9 | 40,9 | 46,0 | -5,1 |
| 792,000 | 19,4 | 25,7 | 45,1 | 46,0 | -1,0 |
| 875,000 | 13,5 | 26,6 | 40,1 | 46,0 | -5,9 |
| 924,000 | 16,0 | 27,1 | 43,1 | 46,0 | -2,9 |

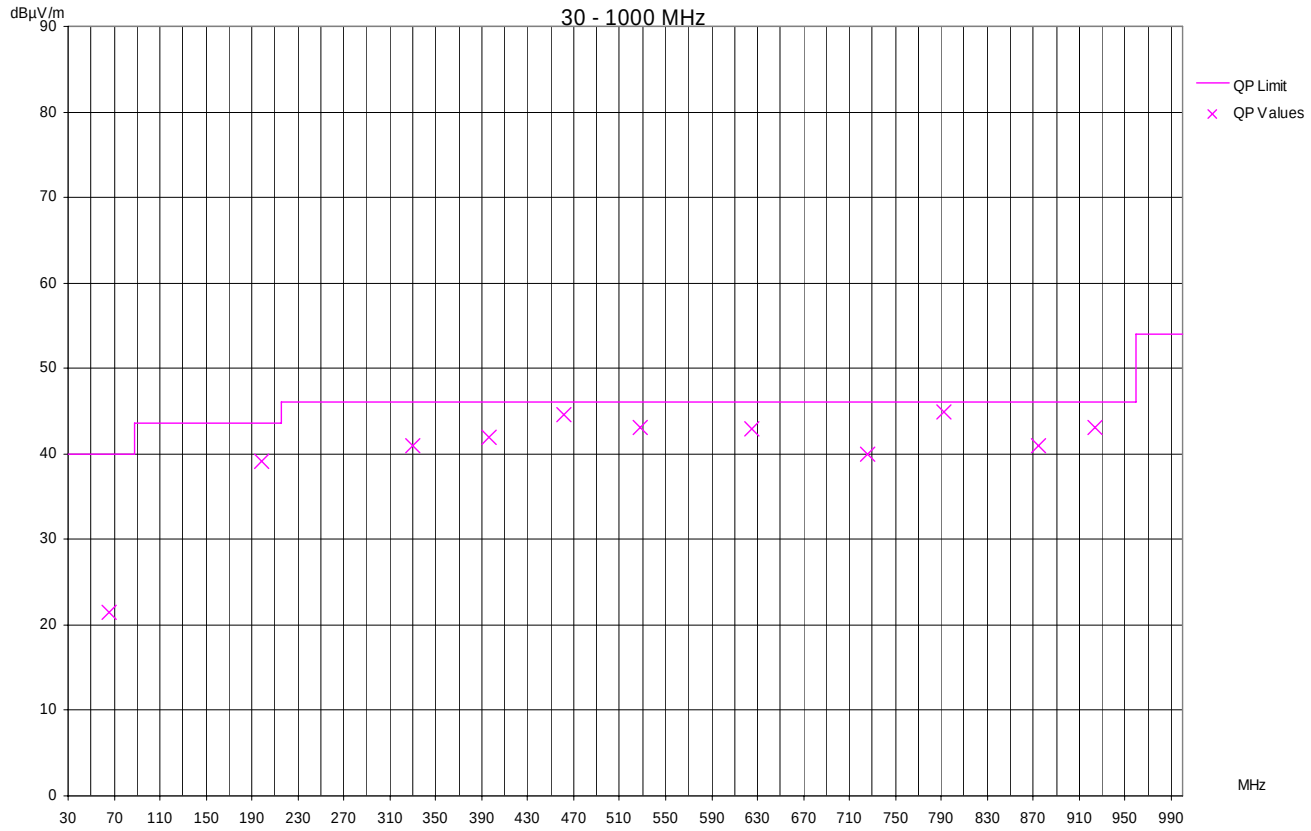
| | |
|---|---|
| **Date of test:** | 2010-08-20 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH1 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | QP |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | none |




**Minimum margin to limit: -6,7 dB**

| Frequency [MHz] | Reading [dBµV] QP | Correction [dB] | Values [dBµV/m] QP | Limit [dBµV/m] QP | Margin [dB] QP |
|---|---|---|---|---|---|
| 66,000 | 11,9 | 11,7 | 23,6 | 40,0 | -16,4 |
| 198,000 | 13,0 | 13,3 | 26,3 | 43,5 | -17,3 |
| 330,400 | 14,3 | 17,4 | 31,7 | 46,0 | -14,3 |
| 462,000 | 19,1 | 20,2 | 39,3 | 46,0 | -6,7 |
| 990,000 | 15,4 | 27,9 | 43,3 | 54,0 | -10,7 |

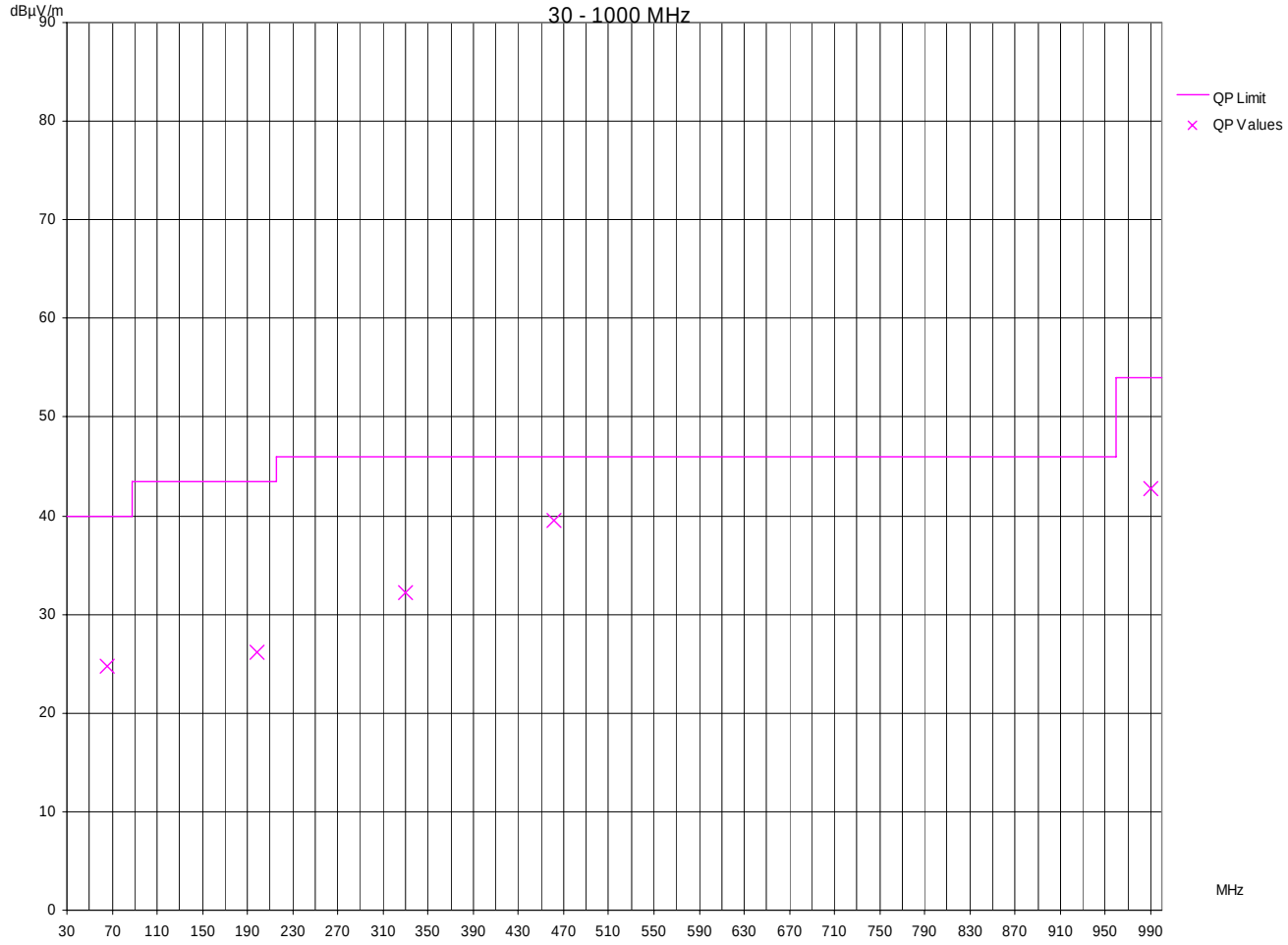
| | |
|---|---|
| **Date of test:** | 2010-08-20 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH6 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | QP |
| **Result:** | Limit kept |
| **Applied to:** | Horizontal |
| **Remark:** | none |



**Minimum margin to limit: -1,2 dB**

| Frequency [MHz] | Reading [dBµV] QP | Correction [dB] | Values [dBµV/m] QP | Limit [dBµV/m] QP | Margin [dB] QP |
|---|---|---|---|---|---|
| 66,000 | 9,7 | 11,7 | 21,4 | 40,0 | -18,6 |
| 198,000 | 25,8 | 13,3 | 39,1 | 43,5 | -4,5 |
| 330,000 | 23,5 | 17,4 | 40,9 | 46,0 | -5,1 |
| 395,999 | 23,1 | 18,9 | 42,0 | 46,0 | -4,1 |
| 462,000 | 24,4 | 20,2 | 44,6 | 46,0 | -1,4 |
| 528,000 | 21,3 | 21,7 | 43,0 | 46,0 | -3,0 |
| 625,000 | 19,4 | 23,6 | 43,0 | 46,0 | -3,0 |
| 726,000 | 15,1 | 24,9 | 40,0 | 46,0 | -6,0 |
| 792,000 | 19,2 | 25,7 | 44,9 | 46,0 | -1,2 |
| 875,000 | 14,3 | 26,6 | 40,9 | 46,0 | -5,1 |
| 924,000 | 16,0 | 27,1 | 43,1 | 46,0 | -2,9 |

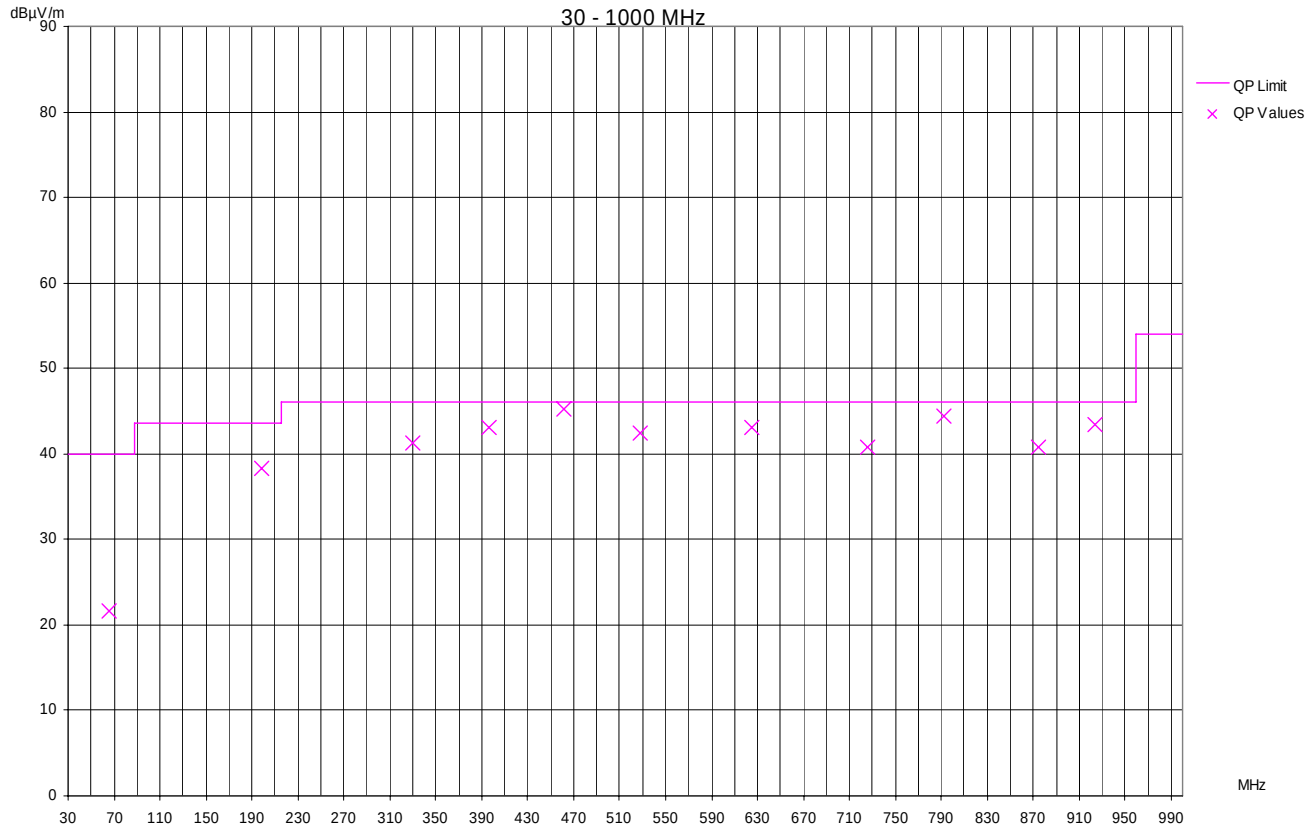
| | |
|---|---|
| **Date of test:** | 2010-08-20 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH6 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | QP |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | none |




**Minimum margin to limit: -6,5 dB**

| Frequency [MHz] | Reading [dBµV] QP | Correction [dB] | Values [dBµV/m] QP | Limit [dBµV/m] QP | Margin [dB] QP |
|---|---|---|---|---|---|
| 66,000 | 13,1 | 11,7 | 24,8 | 40,0 | -15,2 |
| 198,000 | 12,9 | 13,3 | 26,2 | 43,5 | -17,4 |
| 330,400 | 14,7 | 17,4 | 32,1 | 46,0 | -13,9 |
| 462,000 | 19,3 | 20,2 | 39,5 | 46,0 | -6,5 |
| 990,000 | 14,9 | 27,9 | 42,8 | 54,0 | -11,2 |

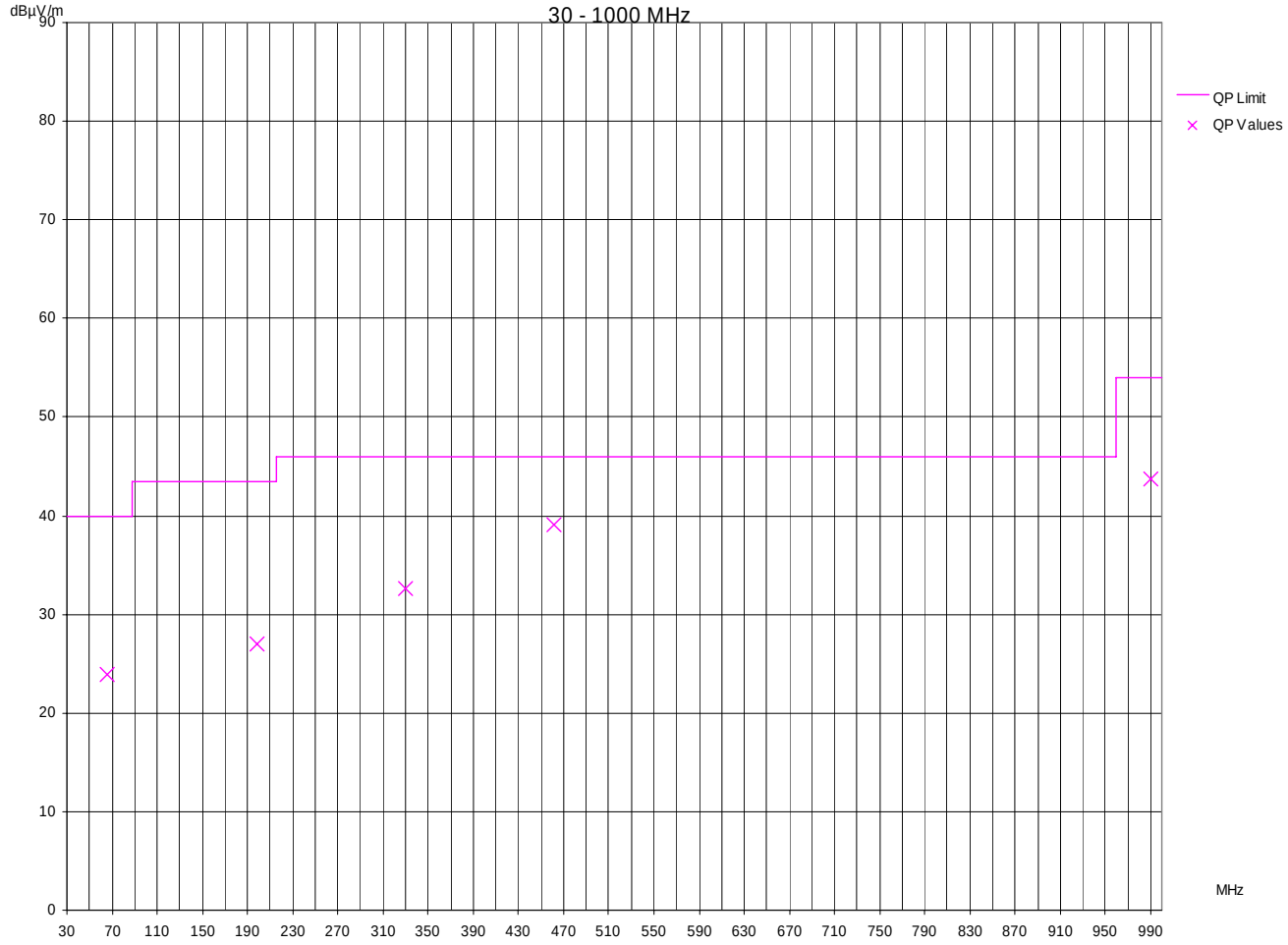
| | |
|---|---|
| **Date of test:** | 2010-08-20 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH11 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | QP |
| **Result:** | Limit kept |
| **Applied to:** | Horizontal |
| **Remark:** | none |



**Minimum margin to limit: -0,7 dB**

| Frequency [MHz] | Reading [dBµV] QP | Correction [dB] | Values [dBµV/m] QP | Limit [dBµV/m] QP | Margin [dB] QP |
|---|---|---|---|---|---|
| 66,000 | 9,9 | 11,7 | 21,6 | 40,0 | -18,4 |
| 198,000 | 25,0 | 13,3 | 38,3 | 43,5 | -5,3 |
| 330,000 | 23,9 | 17,4 | 41,3 | 46,0 | -4,7 |
| 395,999 | 24,2 | 18,9 | 43,1 | 46,0 | -3,0 |
| 462,000 | 25,1 | 20,2 | 45,3 | 46,0 | -0,7 |
| 528,000 | 20,7 | 21,7 | 42,4 | 46,0 | -3,6 |
| 625,000 | 19,5 | 23,6 | 43,1 | 46,0 | -2,9 |
| 726,000 | 15,9 | 24,9 | 40,8 | 46,0 | -5,2 |
| 792,000 | 18,7 | 25,7 | 44,4 | 46,0 | -1,7 |
| 875,000 | 14,2 | 26,6 | 40,8 | 46,0 | -5,2 |
| 924,000 | 16,3 | 27,1 | 43,4 | 46,0 | -2,6 |

| | |
|---|---|
| **Date of test:** | 2010-08-20 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH11 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | QP |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | none |




**Minimum margin to limit: -6,9 dB**

| Frequency [MHz] | Reading [dBµV] QP | Correction [dB] | Values [dBµV/m] QP | Limit [dBµV/m] QP | Margin [dB] QP |
|---|---|---|---|---|---|
| 66,000 | 12,2 | 11,7 | 23,9 | 40,0 | -16,1 |
| 198,000 | 13,8 | 13,3 | 27,1 | 43,5 | -16,5 |
| 330,400 | 15,2 | 17,4 | 32,6 | 46,0 | -13,4 |
| 462,000 | 18,9 | 20,2 | 39,1 | 46,0 | -6,9 |
| 990,000 | 15,8 | 27,9 | 43,7 | 54,0 | -10,3 |

## 6.4 Radiated disturbance in the frequency range 1GHz – 25GHz

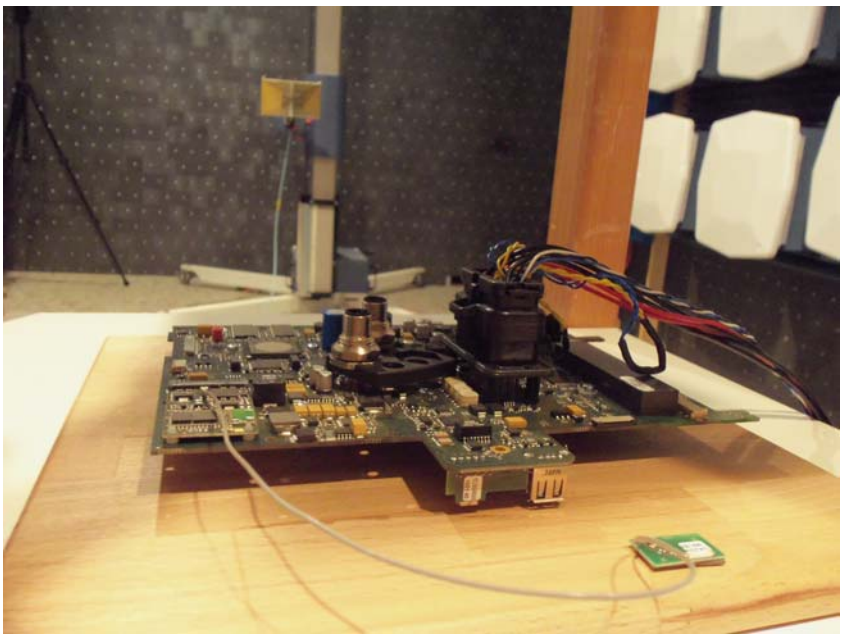
For test instruments and accessories used see section 7 Part **SER 3**.

### 6.4.1 Description of the test location

Test location: Anechoic Chamber A4

Test distance: 3 metres

### 6.4.2 Photo documentation of the test set-up



### 6.4.3 Test specification

Environmental conditions: Temperature: 25 ° C Humidity: 48 % Atmospheric pressure: 97 kPa

Frequency range: 1000 MHz - 25000 MHz

The test was carried out in the following operation mode(s):
- continous transmit mode (duty cycle = 99%), maximum RF power adjusted

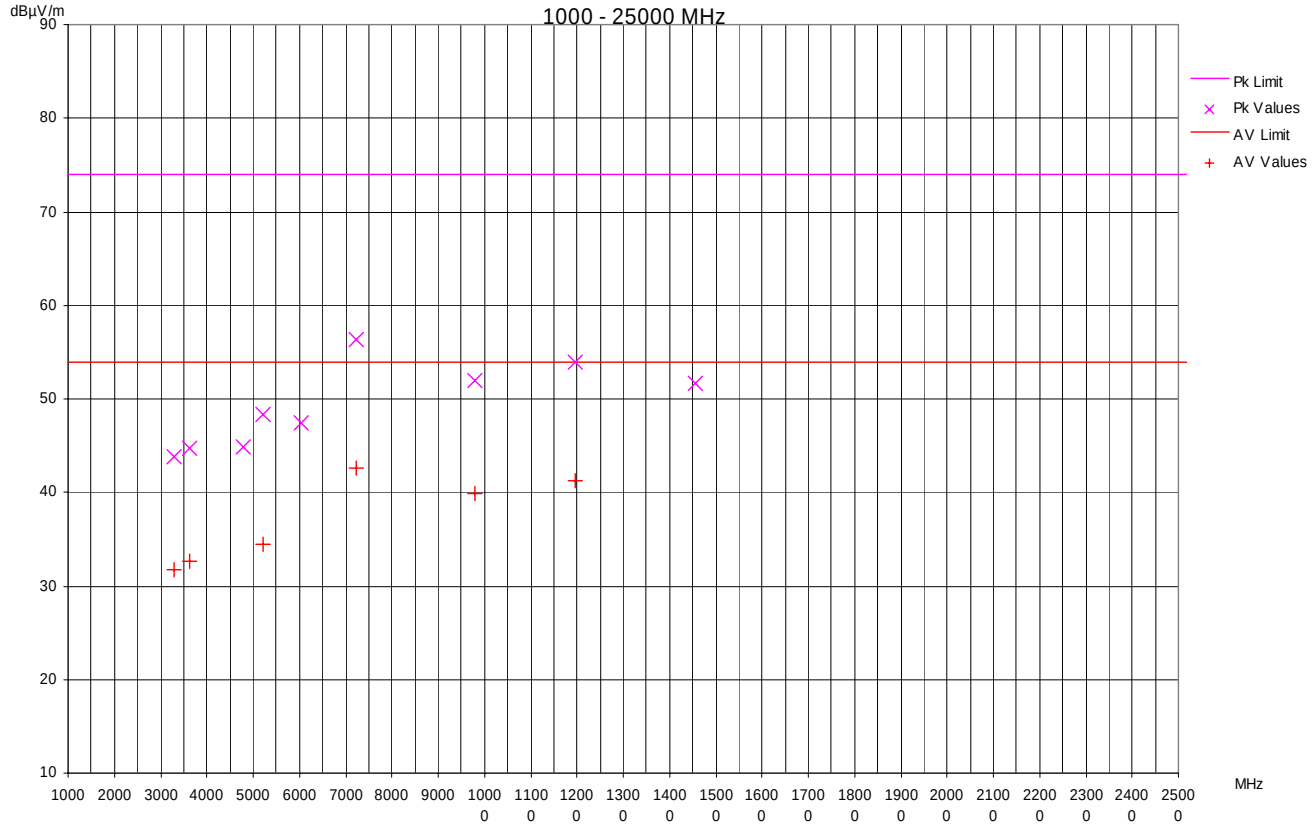
### 6.4.4 Test result

The requirements are **FULFILLED.**

**Remarks:** none

### 6.4.5 Test protocol

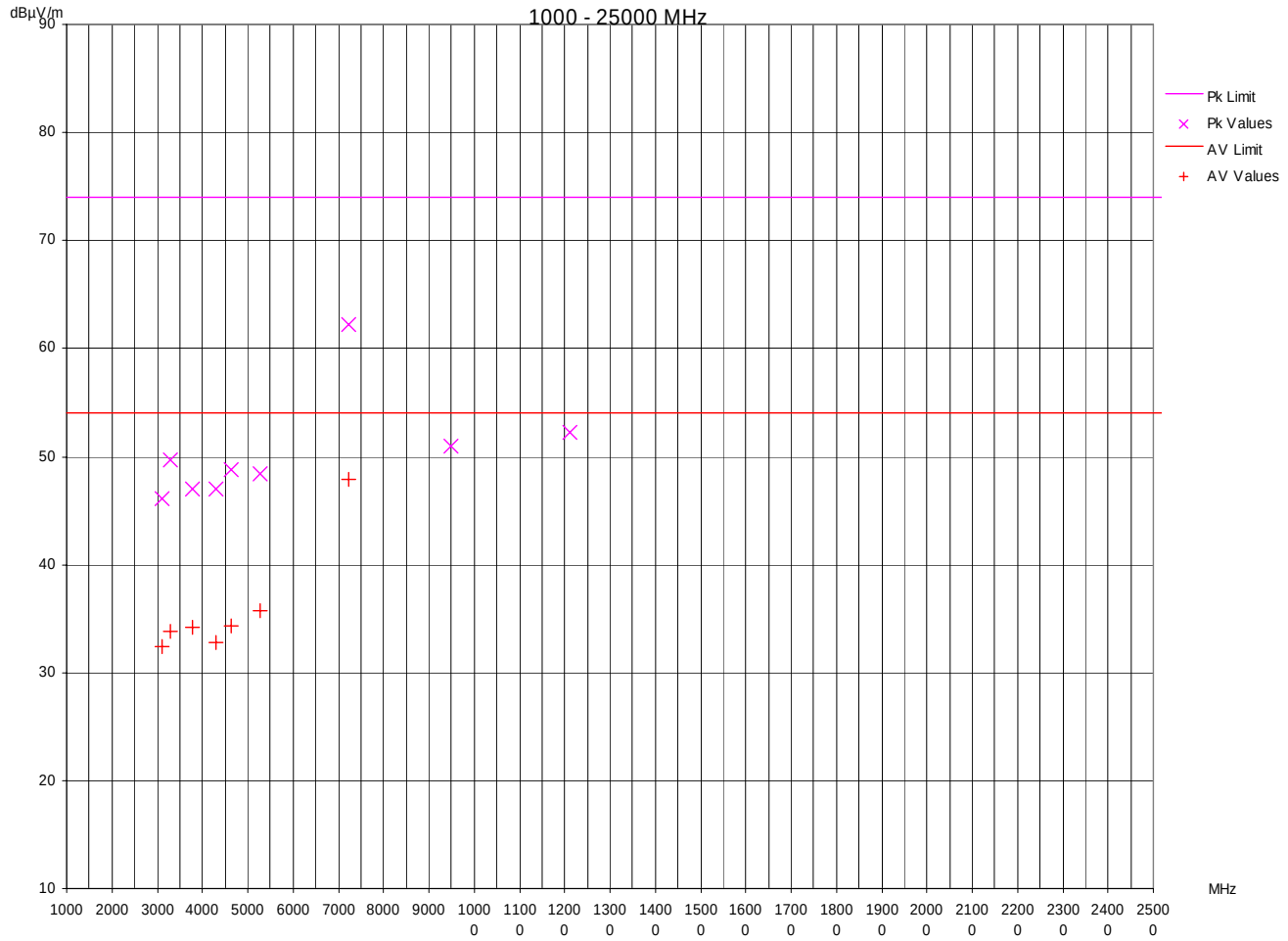
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH1 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | Pk / AV |
| **Result:** | Limit kept |
| **Applied to:** | Horizontal |
| **Remark:** | none |




**Minimum margin to limit: -11,3 dB**

| Frequency [MHz] | Reading [dBµV] Pk | Reading [dBµV] AV | Correction [dB] | Values [dBµV/m] Pk | Values [dBµV/m] AV | Limit [dBµV/m] Pk | Limit [dBµV/m] AV | Margin [dB] Pk | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 3300,000 | 46,9 | 34,8 | -3,1 | 43,8 | 31,7 | 74,0 | 54,0 | -30,1 | -22,3 |
| 3630,000 | 47,1 | 35,0 | -2,4 | 44,7 | 32,6 | 74,0 | 54,0 | -29,3 | -21,4 |
| 4800,000 | 45,2 | -- | -0,3 | 44,9 | -- | 74,0 | 54,0 | -29,1 | -- |
| 5220,000 | 47,4 | 33,5 | 0,9 | 48,3 | 34,4 | 74,0 | 54,0 | -25,7 | -19,6 |
| 6030,000 | 46,0 | -- | 1,4 | 47,4 | -- | 74,0 | 54,0 | -26,6 | -- |
| 7230,000 | 52,1 | 38,3 | 4,3 | 56,4 | 42,6 | 74,0 | 54,0 | -17,6 | -11,3 |
| 9780,000 | 45,5 | 33,5 | 6,4 | 51,9 | 39,8 | 74,0 | 54,0 | -22,0 | -14,1 |
| 11970,000 | 45,3 | 32,7 | 8,6 | 53,9 | 41,3 | 74,0 | 54,0 | -20,1 | -12,7 |
| 14550,000 | 41,8 | -- | 9,9 | 51,7 | -- | 74,0 | 54,0 | -22,3 | -- |

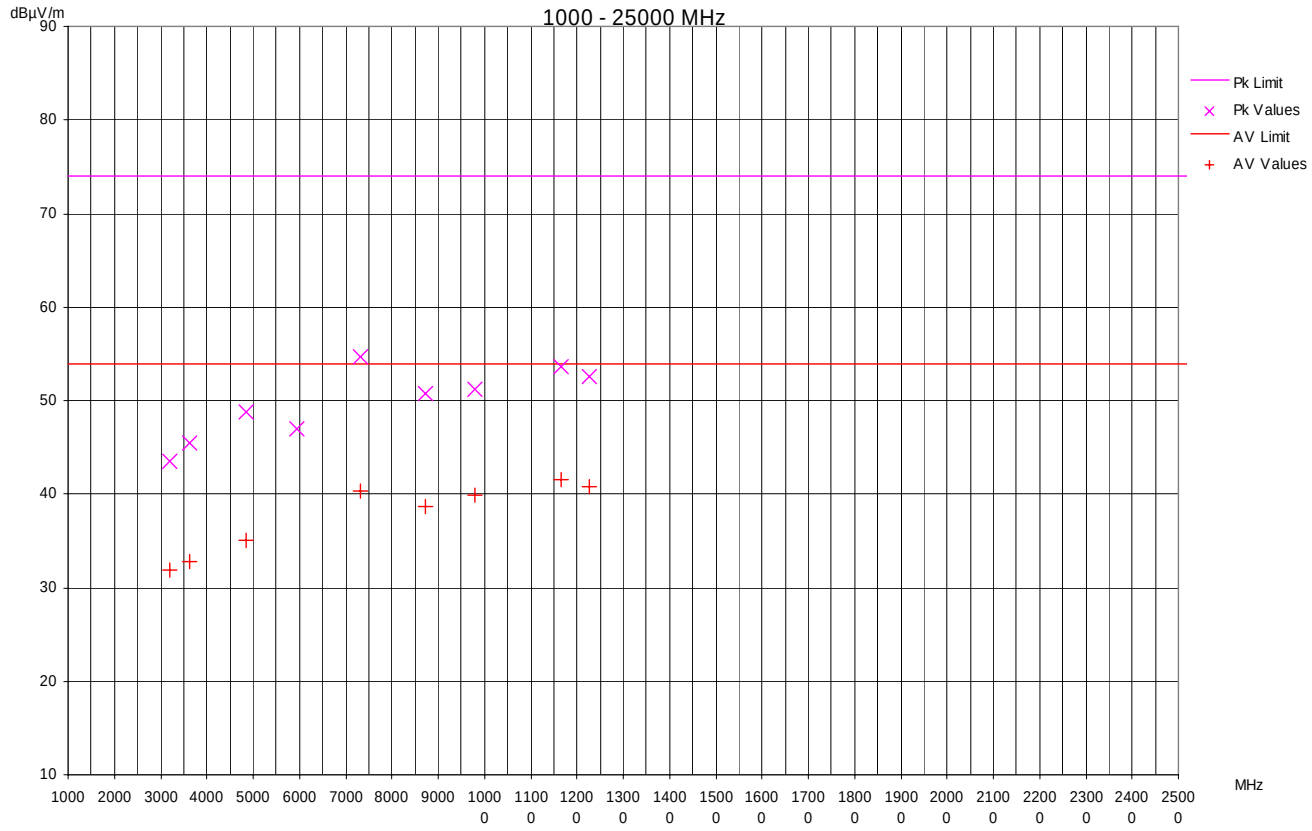
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH1 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | Pk / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | none |



**Minimum margin to limit: -6,1 dB**

| Frequency | Reading [dBµV] | | Correction | Values [dBµV/m] | | Limit [dBµV/m] | | Margin [dB] | |
|---|---|---|---|---|---|---|---|---|---|
| [MHz] | Pk | AV | [dB] | Pk | AV | Pk | AV | Pk | AV |
| 3120,000 | 49,4 | 35,7 | -3,3 | 46,1 | 32,4 | 74,0 | 54,0 | -27,9 | -21,6 |
| 3300,000 | 52,8 | 36,9 | -3,1 | 49,7 | 33,8 | 74,0 | 54,0 | -24,3 | -20,1 |
| 3780,000 | 48,4 | 35,6 | -1,4 | 47,0 | 34,2 | 74,0 | 54,0 | -27,0 | -19,8 |
| 4290,000 | 48,8 | 34,5 | -1,8 | 47,0 | 32,8 | 74,0 | 54,0 | -27,0 | -21,2 |
| 4620,000 | 49,7 | 35,2 | -0,9 | 48,8 | 34,3 | 74,0 | 54,0 | -25,2 | -19,7 |
| 5280,000 | 47,6 | 34,9 | 0,8 | 48,4 | 35,7 | 74,0 | 54,0 | -25,6 | -18,3 |
| 7236,000 | 57,9 | 43,6 | 4,3 | 62,3 | 47,9 | 74,0 | 54,0 | -11,7 | -6,1 |
| 9480,000 | 44,7 | -- | 6,3 | 51,0 | -- | 74,0 | 54,0 | -23,0 | -- |
| 12120,000 | 44,2 | -- | 8,1 | 52,3 | -- | 74,0 | 54,0 | -21,7 | -- |

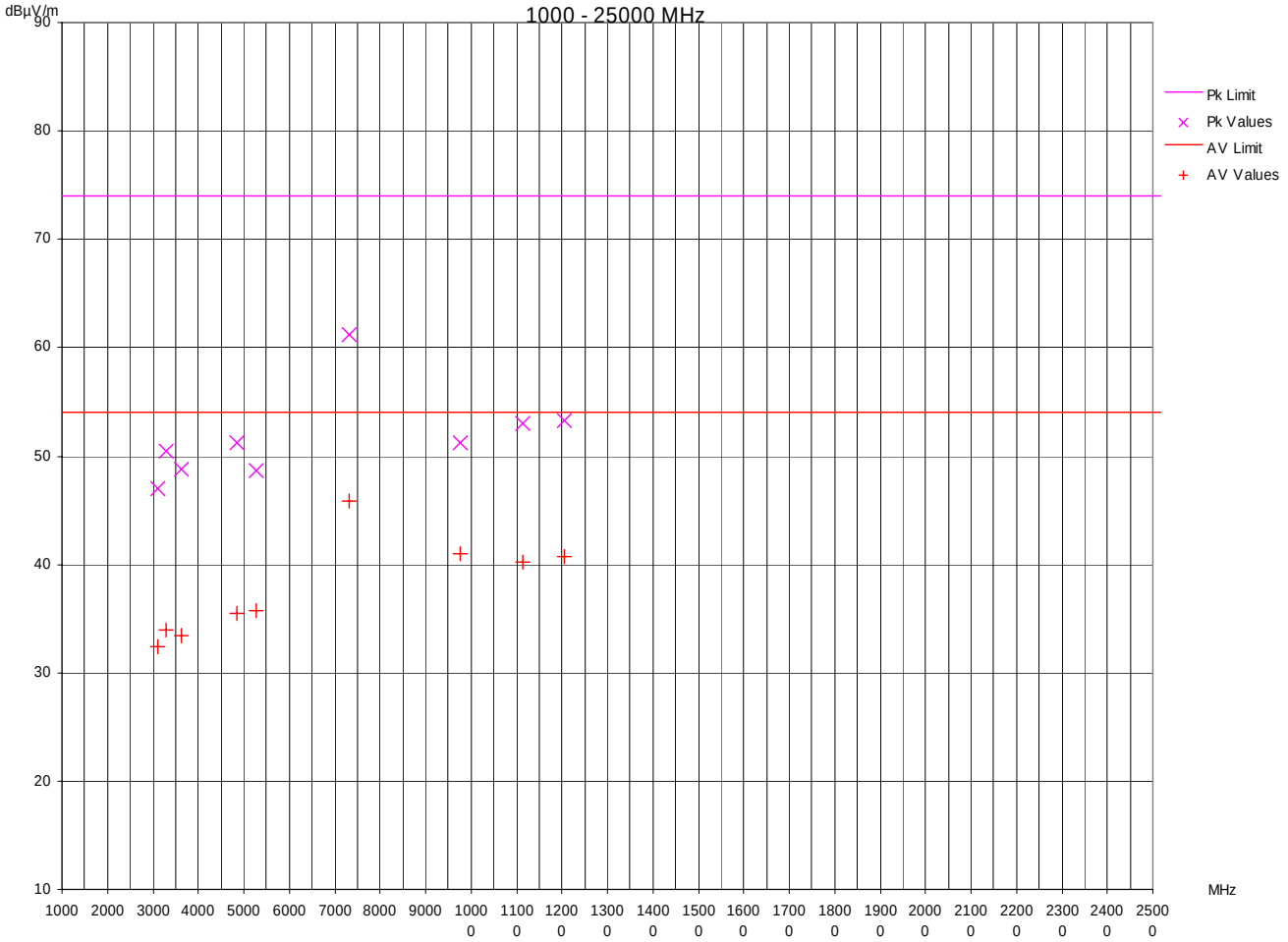
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH6 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | Pk / AV |
| **Result:** | Limit kept |
| **Applied to:** | Horizontal |
| **Remark:** | none |




**Minimum margin to limit: -12,4 dB**

| Frequency | Reading [dBµV] | | Correction | Values [dBµV/m] | | Limit [dBµV/m] | | Margin [dB] | |
|---|---|---|---|---|---|---|---|---|---|
| [MHz] | Pk | AV | [dB] | Pk | AV | Pk | AV | Pk | AV |
| 3210,000 | 46,7 | 35,0 | -3,1 | 43,5 | 31,9 | 74,0 | 54,0 | -30,5 | -22,1 |
| 3630,000 | 47,9 | 35,2 | -2,4 | 45,5 | 32,8 | 74,0 | 54,0 | -28,4 | -21,2 |
| 4860,000 | 48,9 | 35,2 | -0,1 | 48,8 | 35,1 | 74,0 | 54,0 | -25,2 | -18,9 |
| 5940,000 | 45,7 | -- | 1,3 | 47,0 | -- | 74,0 | 54,0 | -27,0 | -- |
| 7320,000 | 50,1 | 35,8 | 4,6 | 54,6 | 40,4 | 74,0 | 54,0 | -19,4 | -13,6 |
| 8730,000 | 45,0 | 32,9 | 5,8 | 50,8 | 38,6 | 74,0 | 54,0 | -23,2 | -15,4 |
| 9780,000 | 44,8 | 33,4 | 6,4 | 51,2 | 39,8 | 74,0 | 54,0 | -22,8 | -14,1 |
| 11670,000 | 44,7 | 32,7 | 8,9 | 53,6 | 41,6 | 74,0 | 54,0 | -20,4 | -12,4 |
| 12270,000 | 44,6 | 32,9 | 8,0 | 52,6 | 40,8 | 74,0 | 54,0 | -21,4 | -13,1 |

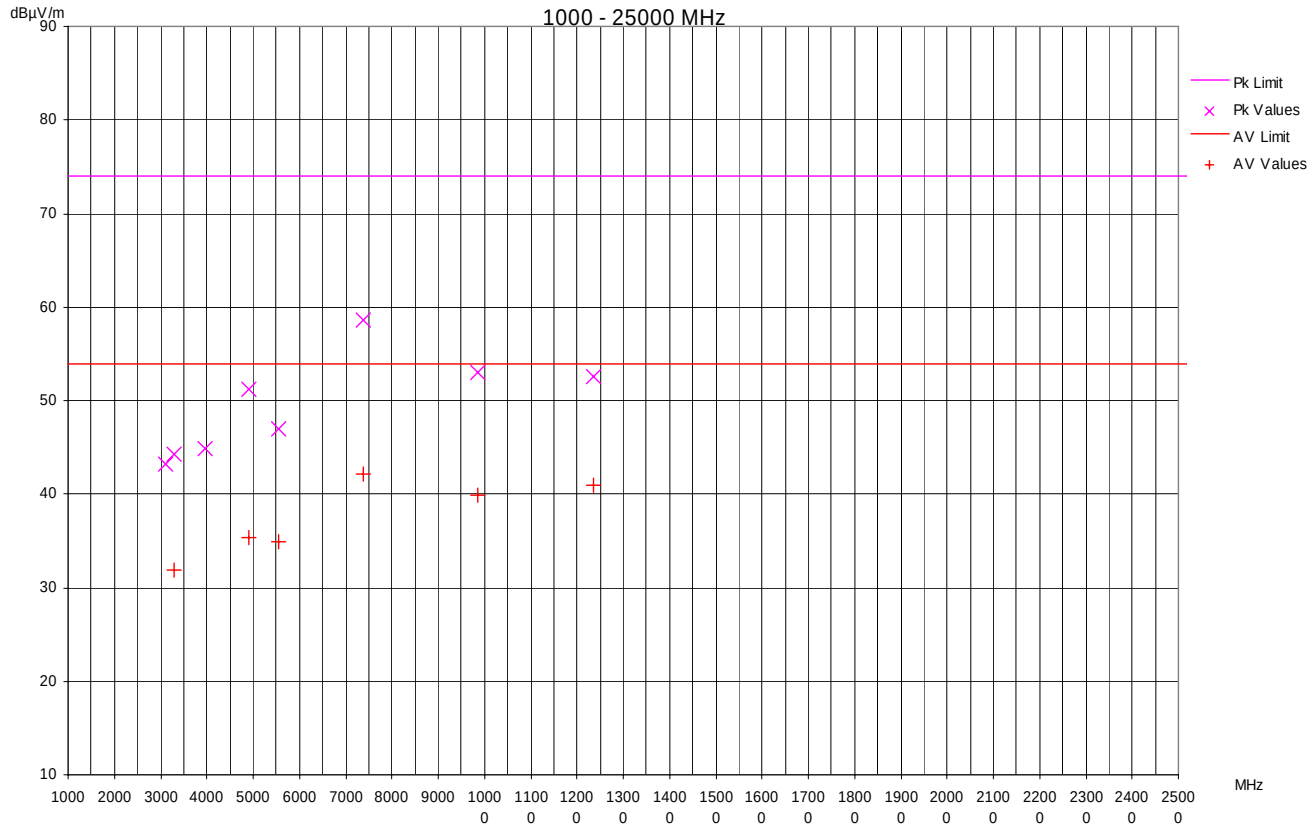
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH6 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | Pk / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | none |



**Minimum margin to limit: -8,1 dB**

| Frequency | Reading [dBµV] | | Correction | Values [dBµV/m] | | Limit [dBµV/m] | | Margin [dB] | |
|---|---|---|---|---|---|---|---|---|---|
| [MHz] | Pk | AV | [dB] | Pk | AV | Pk | AV | Pk | AV |
| 3120,000 | 50,3 | 35,8 | -3,3 | 47,0 | 32,5 | 74,0 | 54,0 | -27,0 | -21,5 |
| 3300,000 | 53,5 | 37,1 | -3,1 | 50,4 | 34,0 | 74,0 | 54,0 | -23,5 | -20,0 |
| 3630,000 | 51,2 | 35,9 | -2,4 | 48,8 | 33,5 | 74,0 | 54,0 | -25,1 | -20,5 |
| 4860,000 | 51,4 | 35,6 | -0,1 | 51,2 | 35,4 | 74,0 | 54,0 | -22,7 | -18,5 |
| 5280,000 | 47,9 | 35,0 | 0,8 | 48,7 | 35,8 | 74,0 | 54,0 | -25,3 | -18,2 |
| 7320,000 | 56,7 | 41,3 | 4,6 | 61,2 | 45,9 | 74,0 | 54,0 | -12,7 | -8,1 |
| 9750,000 | 44,9 | 34,7 | 6,4 | 51,3 | 41,0 | 74,0 | 54,0 | -22,7 | -12,9 |
| 11130,000 | 44,8 | 32,1 | 8,2 | 53,0 | 40,3 | 74,0 | 54,0 | -21,0 | -13,7 |
| 12060,000 | 45,0 | 32,5 | 8,2 | 53,3 | 40,8 | 74,0 | 54,0 | -20,7 | -13,2 |

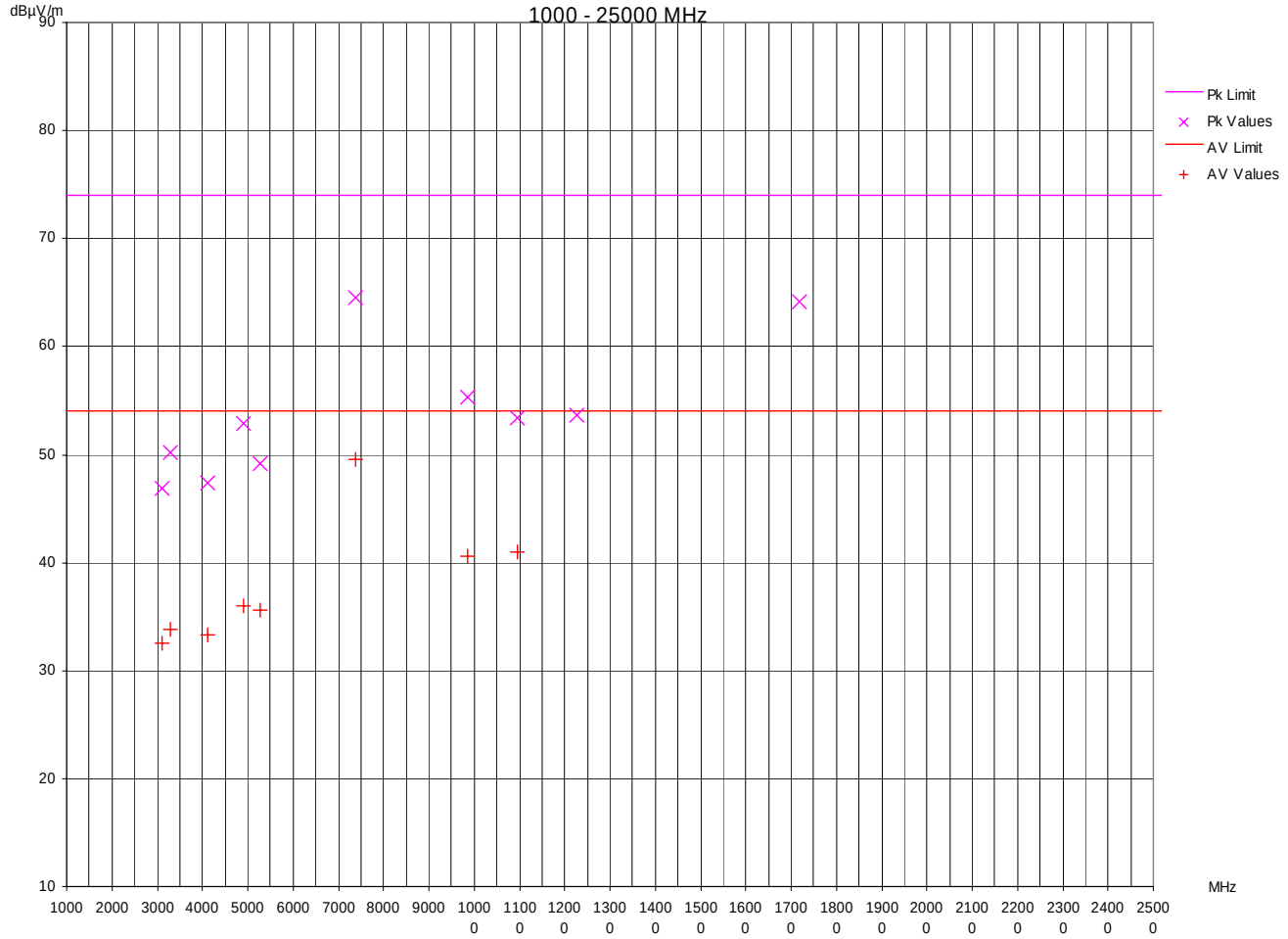
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH11 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | Pk / AV |
| **Result:** | Limit kept |
| **Applied to:** | Horizontal |
| **Remark:** | none |




**Minimum margin to limit: -11,9 dB**

| Frequency | Reading [dBµV] | | Correction | Values [dBµV/m] | | Limit [dBµV/m] | | Margin [dB] | |
|---|---|---|---|---|---|---|---|---|---|
| [MHz] | Pk | AV | [dB] | Pk | AV | Pk | AV | Pk | AV |
| 3120,000 | 46,5 | -- | -3,3 | 43,2 | -- | 74,0 | 54,0 | -30,7 | -- |
| 3300,000 | 47,4 | 35,0 | -3,1 | 44,3 | 31,9 | 74,0 | 54,0 | -29,7 | -22,1 |
| 3960,000 | 46,3 | -- | -1,5 | 44,8 | -- | 74,0 | 54,0 | -29,2 | -- |
| 4920,000 | 51,3 | 35,4 | 0,0 | 51,2 | 35,4 | 74,0 | 54,0 | -22,7 | -18,6 |
| 5550,000 | 45,8 | 33,6 | 1,3 | 47,0 | 34,9 | 74,0 | 54,0 | -27,0 | -19,1 |
| 7380,000 | 54,0 | 37,5 | 4,6 | 58,6 | 42,1 | 74,0 | 54,0 | -15,4 | -11,9 |
| 9840,000 | 46,5 | 33,4 | 6,5 | 53,0 | 39,9 | 74,0 | 54,0 | -21,0 | -14,1 |
| 12360,000 | 44,6 | 33,1 | 8,0 | 52,5 | 41,0 | 74,0 | 54,0 | -21,5 | -13,0 |

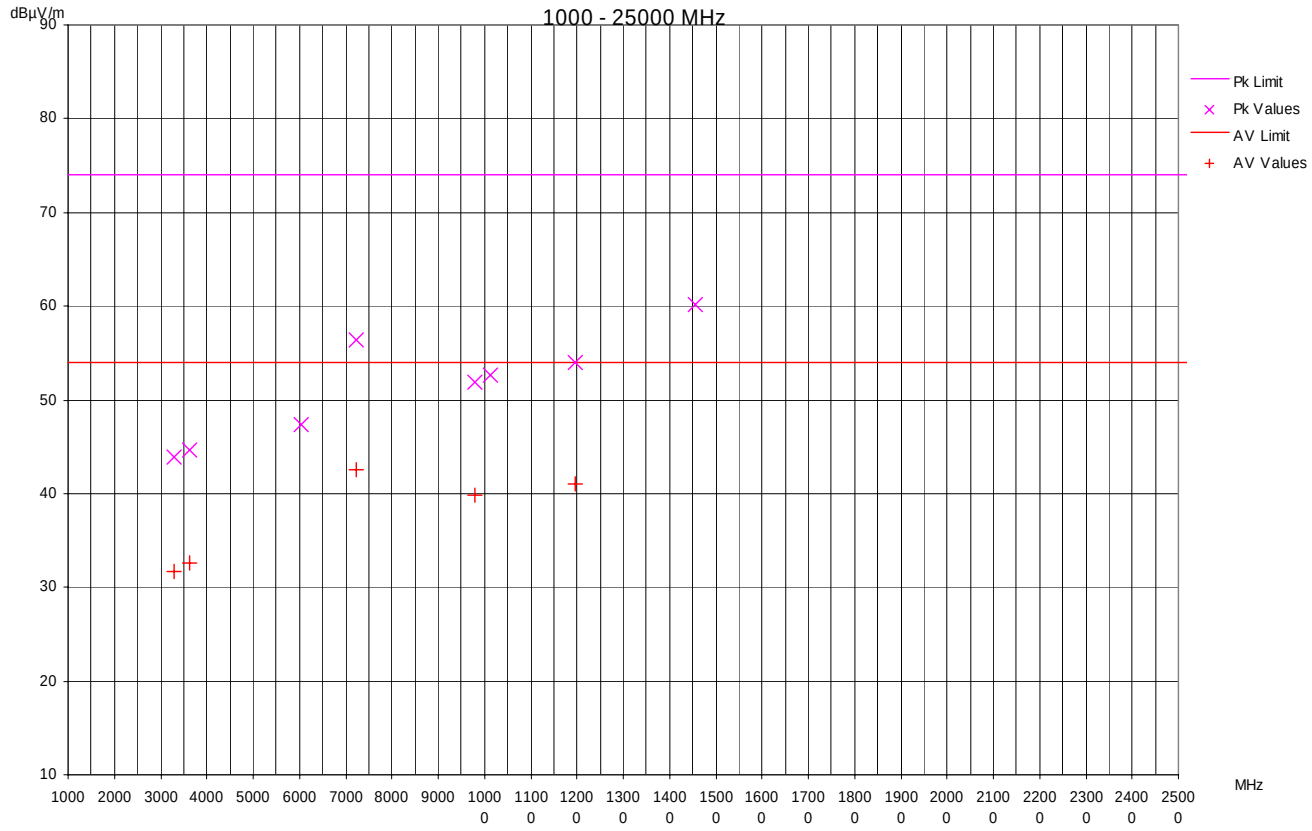
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH11 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | Pk / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | none |



**Minimum margin to limit: -4,4 dB**

| Frequency | Reading [dBµV] | | Correction | Values [dBµV/m] | | Limit [dBµV/m] | | Margin [dB] | |
|---|---|---|---|---|---|---|---|---|---|
| [MHz] | Pk | AV | [dB] | Pk | AV | Pk | AV | Pk | AV |
| 3120,000 | 50,2 | 35,9 | -3,3 | 46,9 | 32,6 | 74,0 | 54,0 | -27,0 | -21,4 |
| 3300,000 | 53,2 | 36,9 | -3,1 | 50,1 | 33,8 | 74,0 | 54,0 | -23,8 | -20,1 |
| 4110,000 | 49,2 | 35,1 | -1,8 | 47,4 | 33,3 | 74,0 | 54,0 | -26,6 | -20,7 |
| 4920,000 | 52,9 | 36,0 | 0,0 | 52,9 | 36,0 | 74,0 | 54,0 | -21,1 | -18,0 |
| 5280,000 | 48,3 | 34,9 | 0,8 | 49,1 | 35,7 | 74,0 | 54,0 | -24,8 | -18,3 |
| 7386,000 | 60,0 | 45,0 | 4,6 | 64,6 | 49,5 | 74,0 | 54,0 | -9,4 | -4,4 |
| 9840,000 | 48,9 | 34,1 | 6,5 | 55,3 | 40,5 | 74,0 | 54,0 | -18,6 | -13,4 |
| 10950,000 | 45,3 | 32,9 | 8,1 | 53,4 | 41,0 | 74,0 | 54,0 | -20,5 | -13,0 |
| 12270,000 | 45,7 | -- | 8,0 | 53,7 | -- | 74,0 | 54,0 | -20,3 | -- |
| 17190,000 | 50,6 | -- | 13,6 | 64,2 | -- | 74,0 | 54,0 | -9,8 | -- |

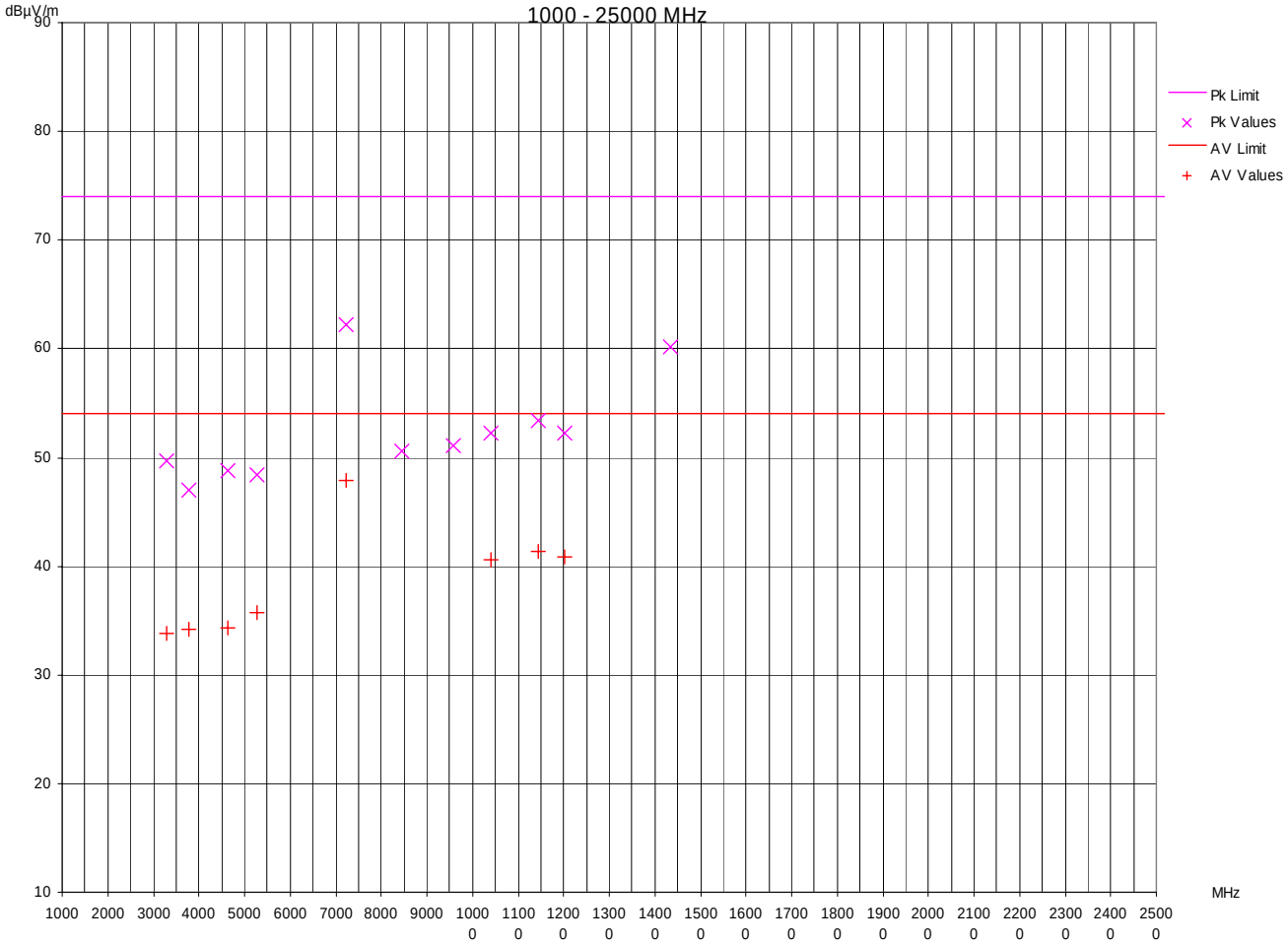
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH1 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | Pk / AV |
| **Result:** | Limit kept |
| **Applied to:** | Horizontal |
| **Remark:** | none |




**Minimum margin to limit: -11,4 dB**

| Frequency | Reading [dBµV] | | Correction | Values [dBµV/m] | | Limit [dBµV/m] | | Margin [dB] | |
|---|---|---|---|---|---|---|---|---|---|
| [MHz] | Pk | AV | [dB] | Pk | AV | Pk | AV | Pk | AV |
| 3300,000 | 46,9 | 34,8 | -3,1 | 43,8 | 31,7 | 74,0 | 54,0 | -30,1 | -22,3 |
| 3630,000 | 47,1 | 35,0 | -2,4 | 44,7 | 32,6 | 74,0 | 54,0 | -29,3 | -21,4 |
| 6030,000 | 46,0 | -- | 1,4 | 47,4 | -- | 74,0 | 54,0 | -26,6 | -- |
| 7230,000 | 52,1 | 38,3 | 4,3 | 56,4 | 42,6 | 74,0 | 54,0 | -17,6 | -11,4 |
| 9780,000 | 45,5 | 33,5 | 6,4 | 51,9 | 39,8 | 74,0 | 54,0 | -22,0 | -14,1 |
| 10140,000 | 45,6 | -- | 7,0 | 52,6 | -- | 74,0 | 54,0 | -21,3 | -- |
| 11970,000 | 45,4 | 32,6 | 8,6 | 53,9 | 41,1 | 74,0 | 54,0 | -20,1 | -12,9 |
| 14550,000 | 50,2 | -- | 9,9 | 60,2 | -- | 74,0 | 54,0 | -13,8 | -- |

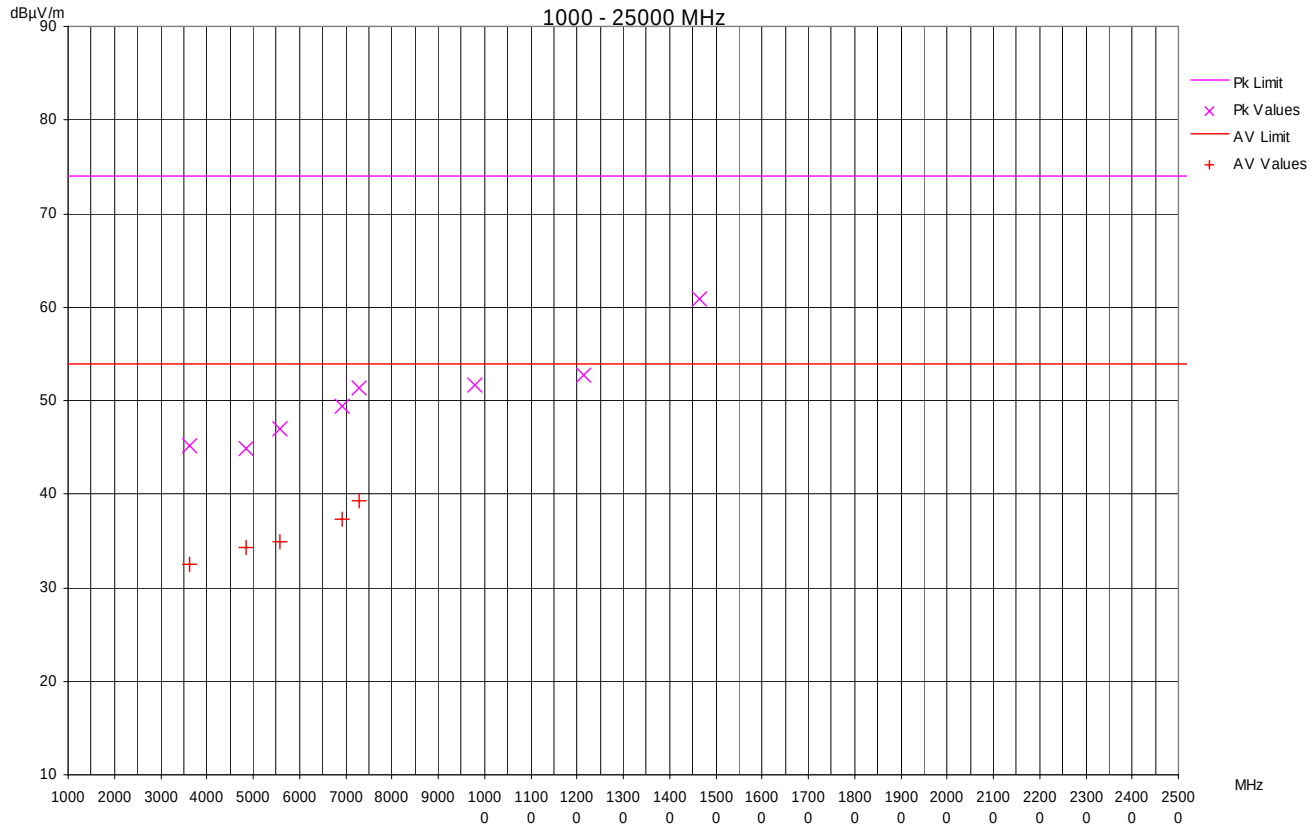
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH1 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | Pk / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | none |



**Minimum margin to limit: -6,1 dB**

| Frequency | Reading [dBµV] | | Correction | Values [dBµV/m] | | Limit [dBµV/m] | | Margin [dB] | |
|---|---|---|---|---|---|---|---|---|---|
| [MHz] | Pk | AV | [dB] | Pk | AV | Pk | AV | Pk | AV |
| 3300,000 | 52,8 | 36,9 | -3,1 | 49,7 | 33,8 | 74,0 | 54,0 | -24,3 | -20,1 |
| 3780,000 | 48,4 | 35,6 | -1,4 | 47,0 | 34,2 | 74,0 | 54,0 | -27,0 | -19,8 |
| 4620,000 | 49,6 | 35,1 | -0,9 | 48,8 | 34,3 | 74,0 | 54,0 | -25,2 | -19,7 |
| 5280,000 | 47,6 | 34,9 | 0,8 | 48,4 | 35,7 | 74,0 | 54,0 | -25,6 | -18,3 |
| 7230,000 | 57,9 | 43,6 | 4,3 | 62,2 | 47,9 | 74,0 | 54,0 | -11,7 | -6,1 |
| 8460,000 | 45,2 | -- | 5,5 | 50,6 | -- | 74,0 | 54,0 | -23,3 | -- |
| 9570,000 | 44,9 | -- | 6,3 | 51,1 | -- | 74,0 | 54,0 | -22,8 | -- |
| 10410,000 | 44,7 | 33,0 | 7,6 | 52,3 | 40,6 | 74,0 | 54,0 | -21,7 | -13,4 |
| 11430,000 | 44,6 | 32,5 | 8,8 | 53,5 | 41,3 | 74,0 | 54,0 | -20,5 | -12,7 |
| 12030,000 | 43,9 | 32,5 | 8,4 | 52,2 | 40,9 | 74,0 | 54,0 | -21,8 | -13,1 |
| 14340,000 | 49,8 | -- | 10,4 | 60,2 | -- | 74,0 | 54,0 | -13,8 | -- |

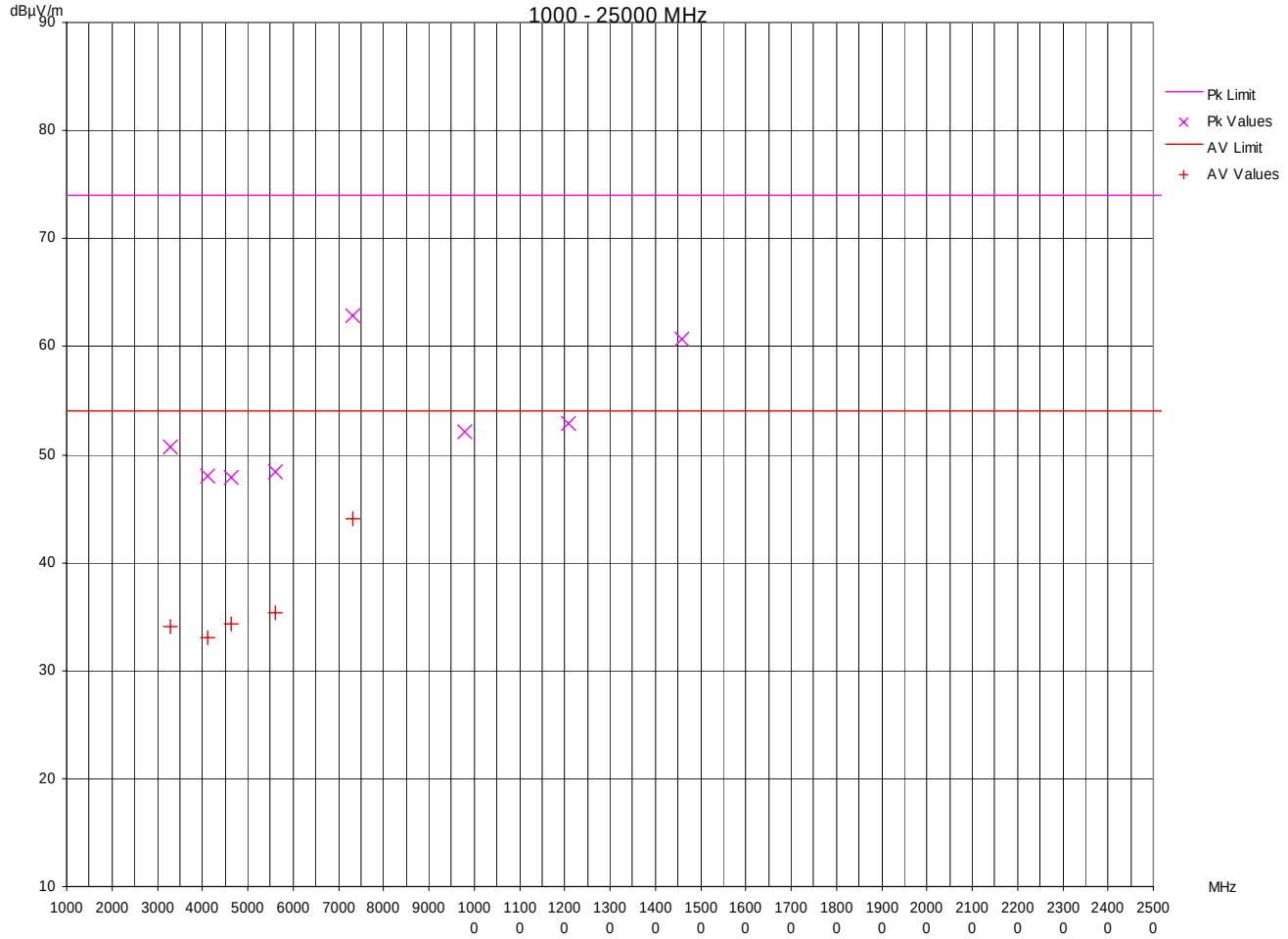
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH6 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | Pk / AV |
| **Result:** | Limit kept |
| **Applied to:** | Horizontal |
| **Remark:** | none |




**Minimum margin to limit: -13,1 dB**

| Frequency [MHz] | Reading [dBµV] Pk | Reading [dBµV] AV | Correction [dB] | Values [dBµV/m] Pk | Values [dBµV/m] AV | Limit [dBµV/m] Pk | Limit [dBµV/m] AV | Margin [dB] Pk | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 3630,000 | 47,6 | 34,9 | -2,4 | 45,2 | 32,5 | 74,0 | 54,0 | -28,8 | -21,4 |
| 4860,000 | 45,0 | 34,5 | -0,1 | 44,9 | 34,3 | 74,0 | 54,0 | -29,1 | -19,6 |
| 5580,000 | 45,7 | 33,7 | 1,3 | 47,0 | 35,0 | 74,0 | 54,0 | -27,0 | -19,0 |
| 6930,000 | 46,3 | 34,2 | 3,2 | 49,4 | 37,4 | 74,0 | 54,0 | -24,6 | -16,6 |
| 7290,000 | 46,8 | 34,8 | 4,5 | 51,3 | 39,3 | 74,0 | 54,0 | -22,6 | -14,7 |
| 9800,000 | 45,2 | -- | 6,4 | 51,7 | -- | 74,0 | 54,0 | -22,3 | -- |
| 12150,000 | 44,6 | -- | 8,1 | 52,7 | -- | 74,0 | 54,0 | -21,3 | -- |
| 14640,000 | 51,3 | -- | 9,5 | 60,8 | -- | 74,0 | 54,0 | -13,1 | -- |

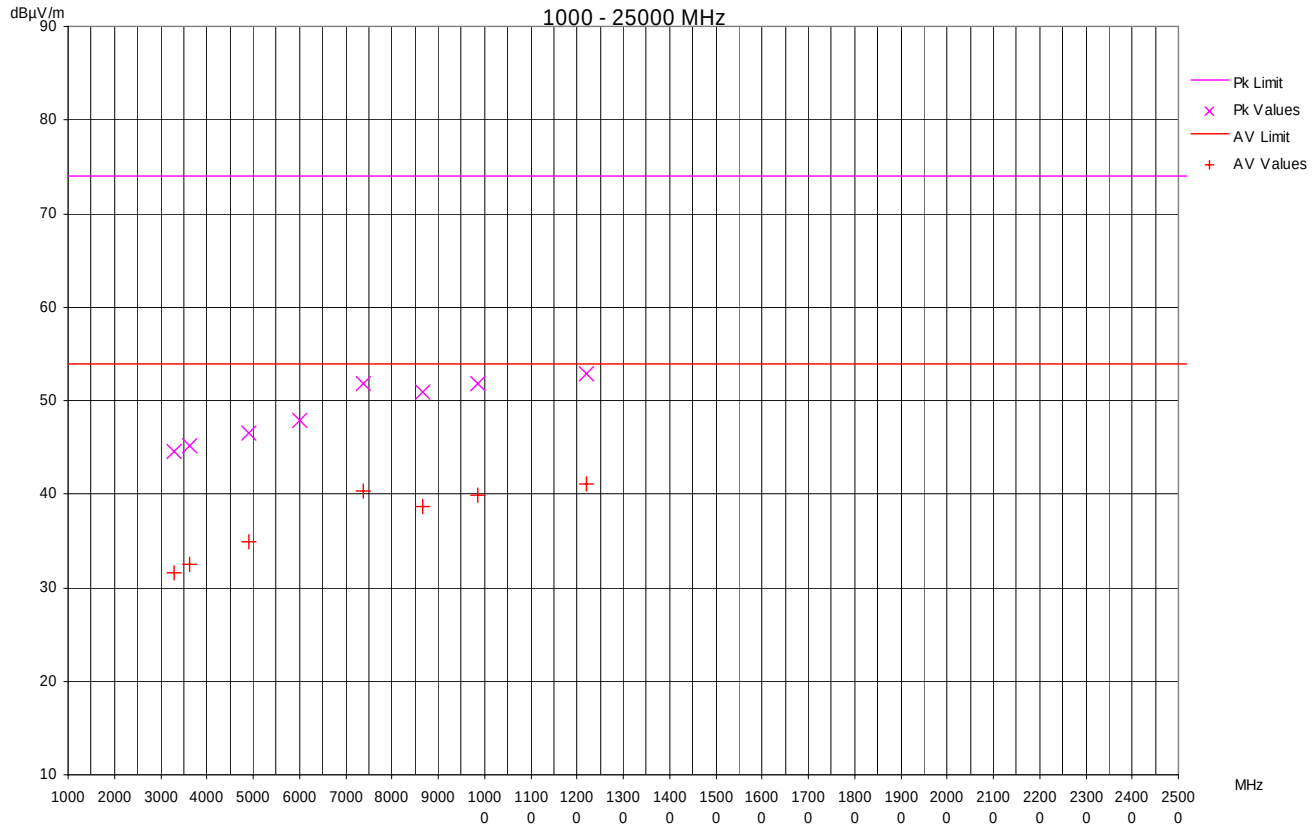
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH6 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | Pk / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | none |



**Minimum margin to limit: -9,9 dB**

| Frequency | Reading [dBµV] | | Correction | Values [dBµV/m] | | Limit [dBµV/m] | | Margin [dB] | |
|---|---|---|---|---|---|---|---|---|---|
| [MHz] | Pk | AV | [dB] | Pk | AV | Pk | AV | Pk | AV |
| 3300,000 | 53,8 | 37,2 | -3,1 | 50,7 | 34,1 | 74,0 | 54,0 | -23,3 | -19,9 |
| 4110,000 | 49,8 | 34,9 | -1,8 | 48,0 | 33,1 | 74,0 | 54,0 | -25,9 | -20,9 |
| 4620,000 | 48,7 | 35,2 | -0,9 | 47,9 | 34,3 | 74,0 | 54,0 | -26,1 | -19,7 |
| 5610,000 | 47,1 | 34,1 | 1,3 | 48,3 | 35,4 | 74,0 | 54,0 | -25,6 | -18,6 |
| 7320,000 | 58,2 | 39,5 | 4,6 | 62,8 | 44,1 | 74,0 | 54,0 | -11,2 | -9,9 |
| 9800,000 | 45,7 | -- | 6,4 | 52,1 | -- | 74,0 | 54,0 | -21,8 | -- |
| 12090,000 | 44,7 | -- | 8,1 | 52,9 | -- | 74,0 | 54,0 | -21,1 | -- |
| 14580,000 | 51,0 | -- | 9,7 | 60,7 | -- | 74,0 | 54,0 | -13,2 | -- |

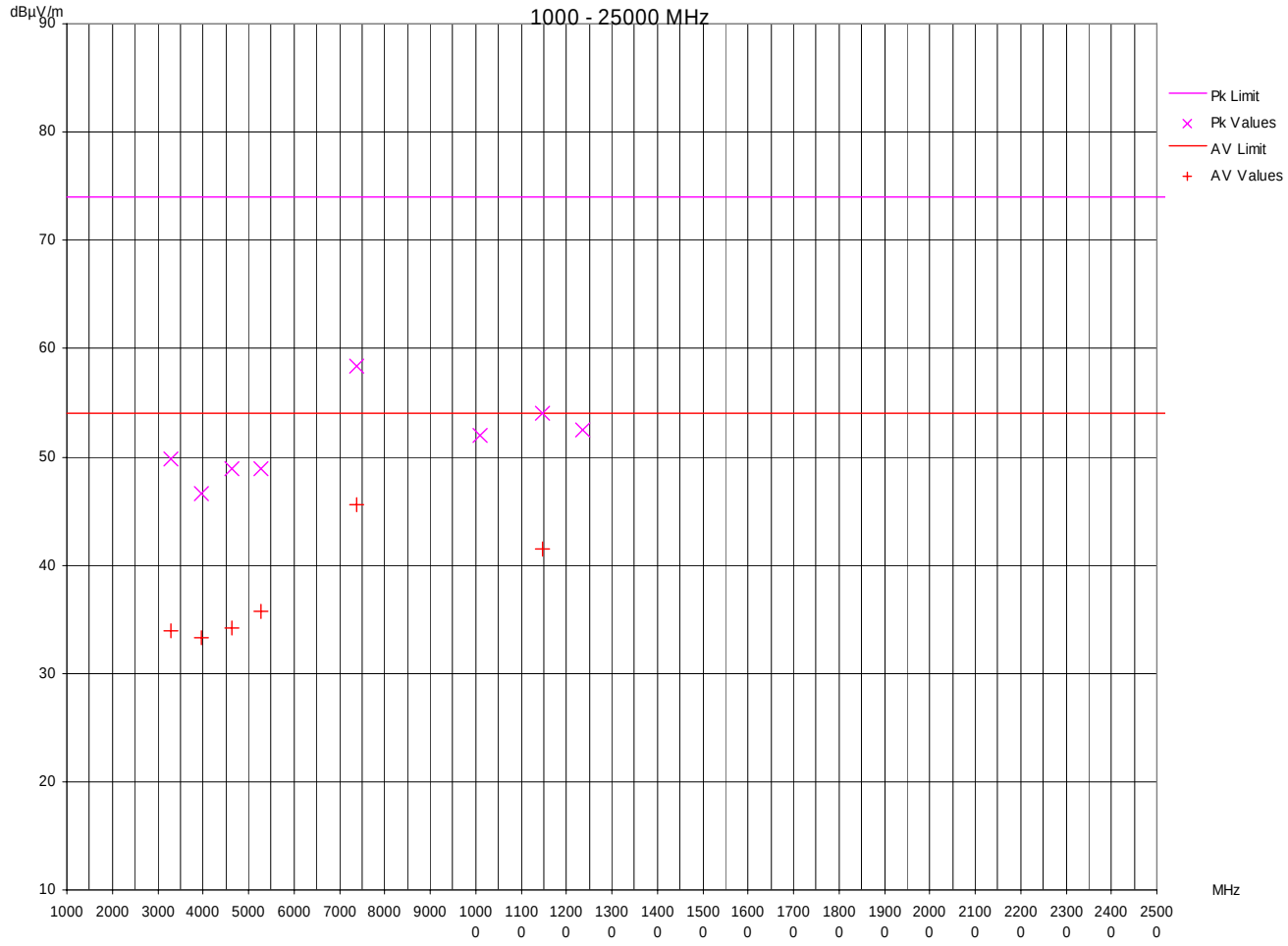
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH11 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | Pk / AV |
| **Result:** | Limit kept |
| **Applied to:** | Horizontal |
| **Remark:** | none |




**Minimum margin to limit: -12,9 dB**

| Frequency [MHz] | Reading [dBµV] Pk | Reading [dBµV] AV | Correction [dB] | Values [dBµV/m] Pk | Values [dBµV/m] AV | Limit [dBµV/m] Pk | Limit [dBµV/m] AV | Margin [dB] Pk | Margin [dB] AV |
|---|---|---|---|---|---|---|---|---|---|
| 3300,000 | 47,7 | 34,7 | -3,1 | 44,5 | 31,6 | 74,0 | 54,0 | -29,4 | -22,4 |
| 3630,000 | 47,5 | 34,9 | -2,4 | 45,1 | 32,5 | 74,0 | 54,0 | -28,9 | -21,5 |
| 4920,000 | 46,6 | 35,0 | 0,0 | 46,5 | 34,9 | 74,0 | 54,0 | -27,4 | -19,0 |
| 6000,000 | 46,6 | -- | 1,4 | 47,9 | -- | 74,0 | 54,0 | -26,0 | -- |
| 7380,000 | 47,3 | 35,8 | 4,6 | 51,9 | 40,4 | 74,0 | 54,0 | -22,1 | -13,6 |
| 8670,000 | 45,2 | 33,0 | 5,7 | 50,9 | 38,7 | 74,0 | 54,0 | -23,1 | -15,2 |
| 9840,000 | 45,3 | 33,5 | 6,5 | 51,8 | 39,9 | 74,0 | 54,0 | -22,2 | -14,0 |
| 12210,000 | 44,9 | 33,0 | 8,0 | 52,9 | 41,0 | 74,0 | 54,0 | -21,0 | -12,9 |

| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH11 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | Radiated Emission Test (Distance 3m) |
| **Detector:** | Pk / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | none |




**Minimum margin to limit: -8,4 dB**

| Frequency | Reading [dBµV] | | Correction | Values [dBµV/m] | | Limit [dBµV/m] | | Margin [dB] | |
|---|---|---|---|---|---|---|---|---|---|
| [MHz] | Pk | AV | [dB] | Pk | AV | Pk | AV | Pk | AV |
| 3300,000 | 52,9 | 37,0 | -3,1 | 49,8 | 33,9 | 74,0 | 54,0 | -24,2 | -20,1 |
| 3960,000 | 48,1 | 34,9 | -1,5 | 46,6 | 33,3 | 74,0 | 54,0 | -27,4 | -20,6 |
| 4620,000 | 49,7 | 35,1 | -0,9 | 48,9 | 34,2 | 74,0 | 54,0 | -25,1 | -19,8 |
| 5280,000 | 48,1 | 34,9 | 0,8 | 48,9 | 35,7 | 74,0 | 54,0 | -25,1 | -18,3 |
| 7380,000 | 53,8 | 41,0 | 4,6 | 58,4 | 45,6 | 74,0 | 54,0 | -15,6 | -8,4 |
| 10110,000 | 45,1 | -- | 6,9 | 52,0 | -- | 74,0 | 54,0 | -22,0 | -- |
| 11460,000 | 45,3 | 32,7 | 8,8 | 54,1 | 41,4 | 74,0 | 54,0 | -19,9 | -12,5 |
| 12360,000 | 44,6 | -- | 8,0 | 52,5 | -- | 74,0 | 54,0 | -21,4 | -- |

File No. **T-0249-3677-01 JP**

## 6.5 Restricted Bandedges

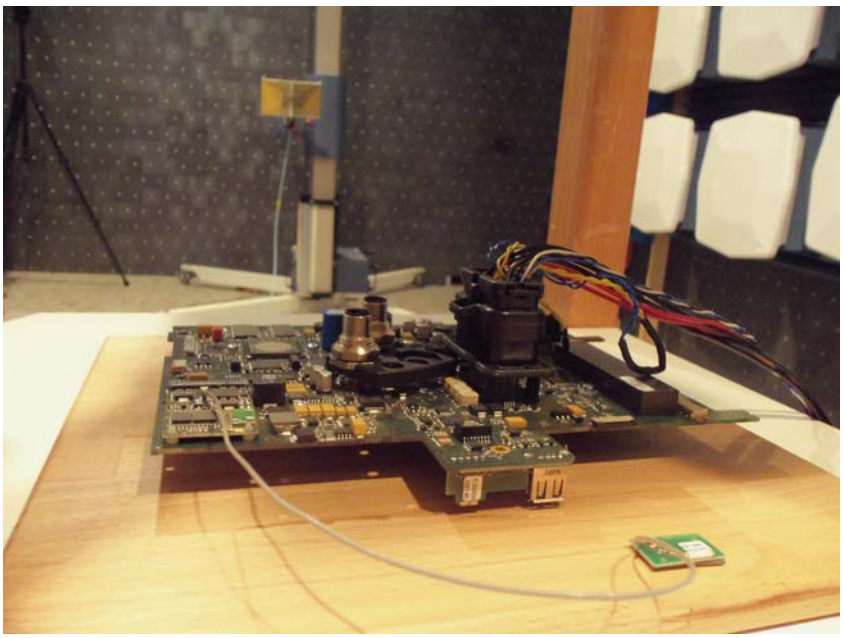
For test instruments and accessories used see section 7 Part **SER 3**.

### 6.5.1 Description of the test location

Test location: AREA A4

Test distance: conducted

### 6.5.2 Photo documentation of the test set-up



### 6.5.3 Test specification

Environmental conditions: Temperature: 25 ° C Humidity: 48 % Atmospheric pressure: 97 kPa

Frequency range: 2310 MHz - 2500 MHz

The test was carried out in the following operation mode(s):
- continous transmit mode (duty cycle = 99%), maximum RF power adjusted

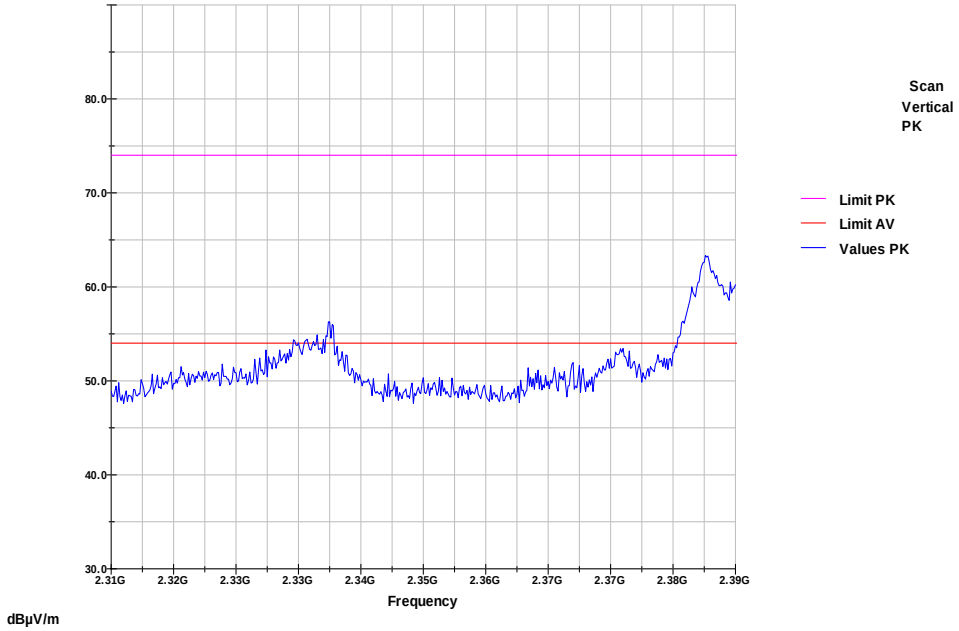
### 6.5.4 Test result

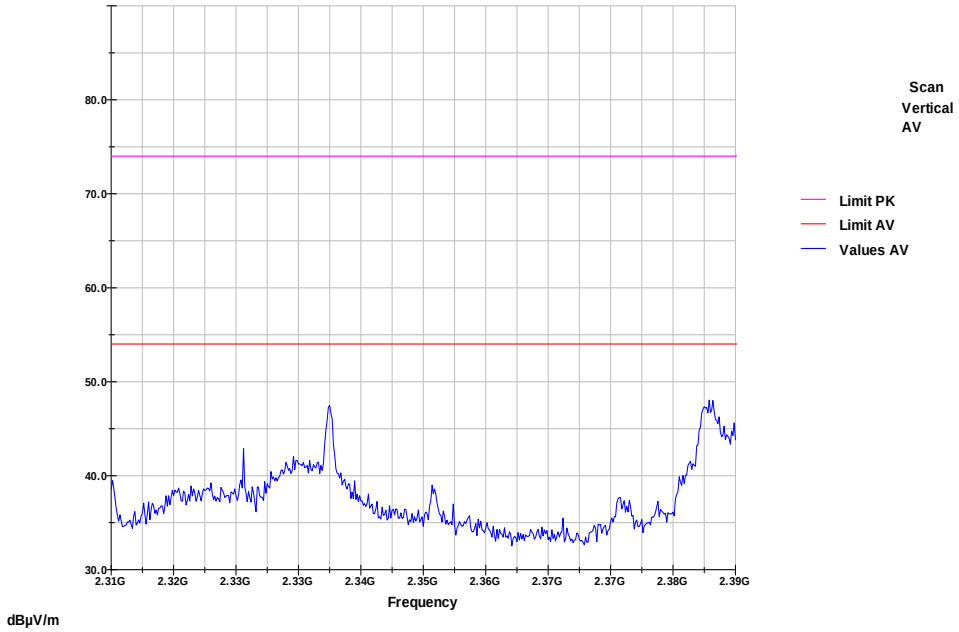
The requirements are **FULFILLED.**

**Remarks:** The measurement was performed in vertical polarization, pretests showed the highest emission at the band edges occur in vertical polarization.

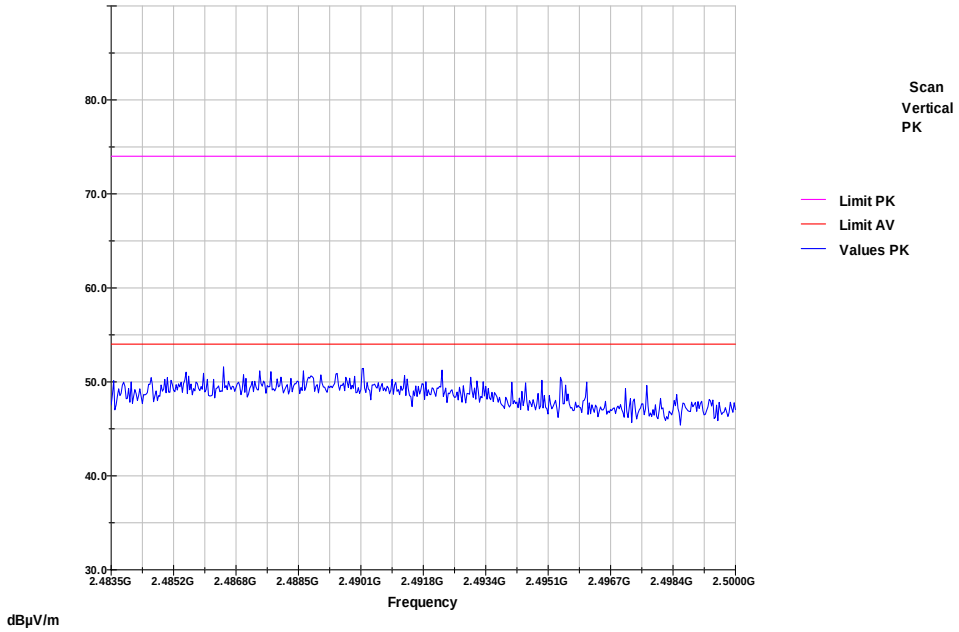
### 6.5.5 Test protocol

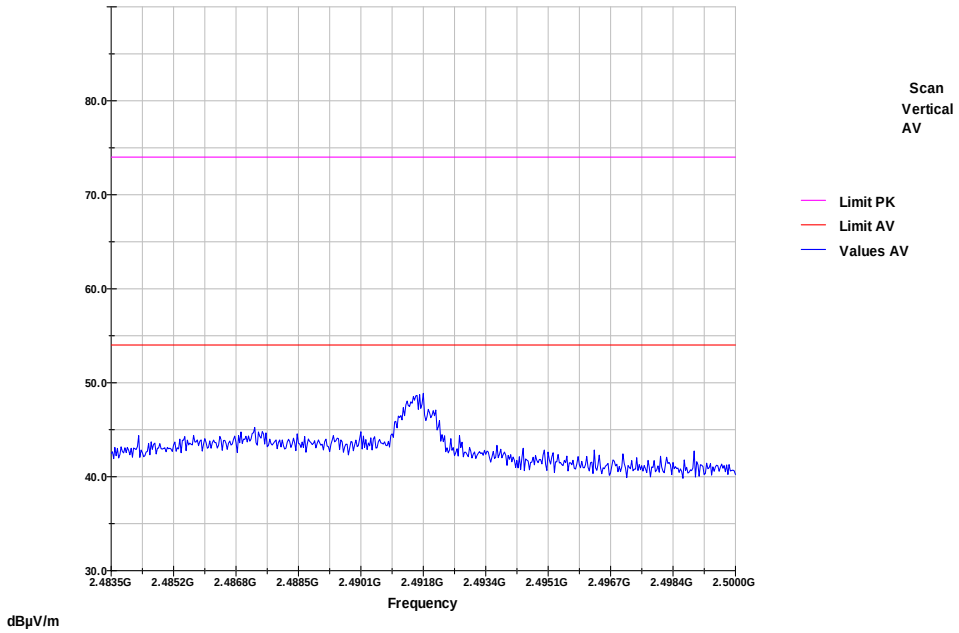
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH1 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | bandedge |
| **Detector:** | PK / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | Low bandedge |



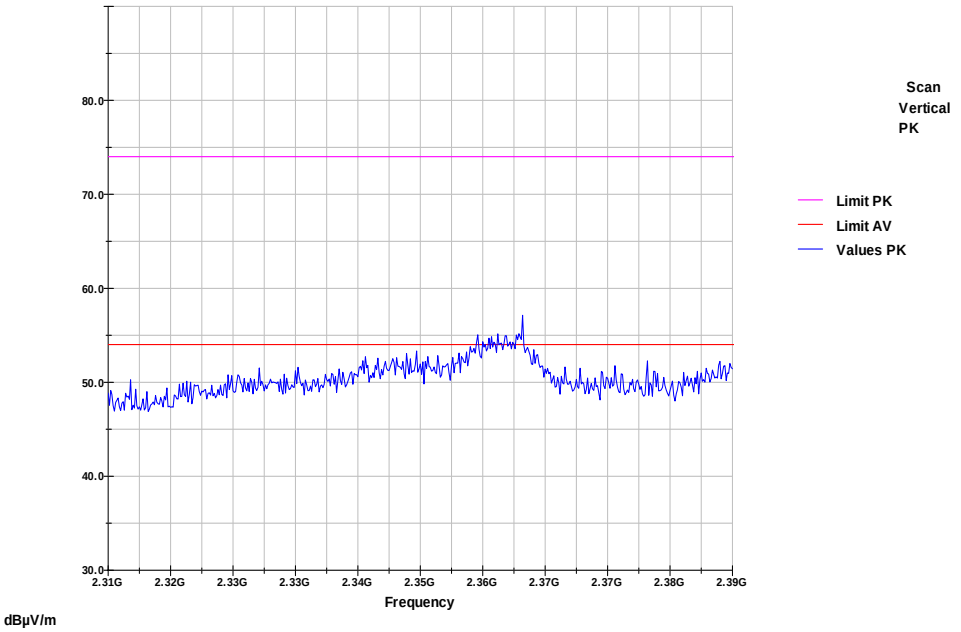



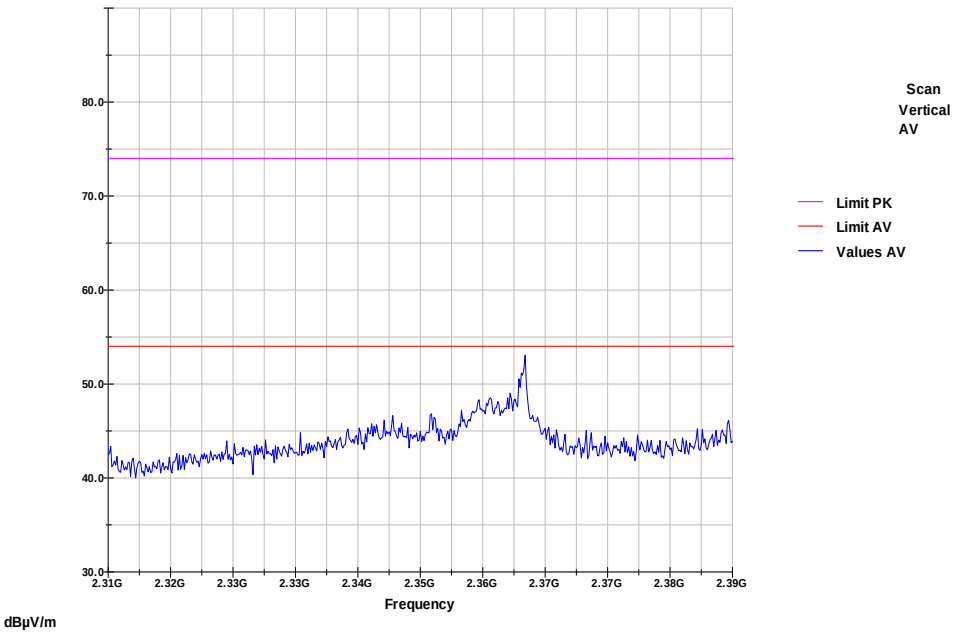
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH1 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | bandedge |
| **Detector:** | PK / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | High bandedge |



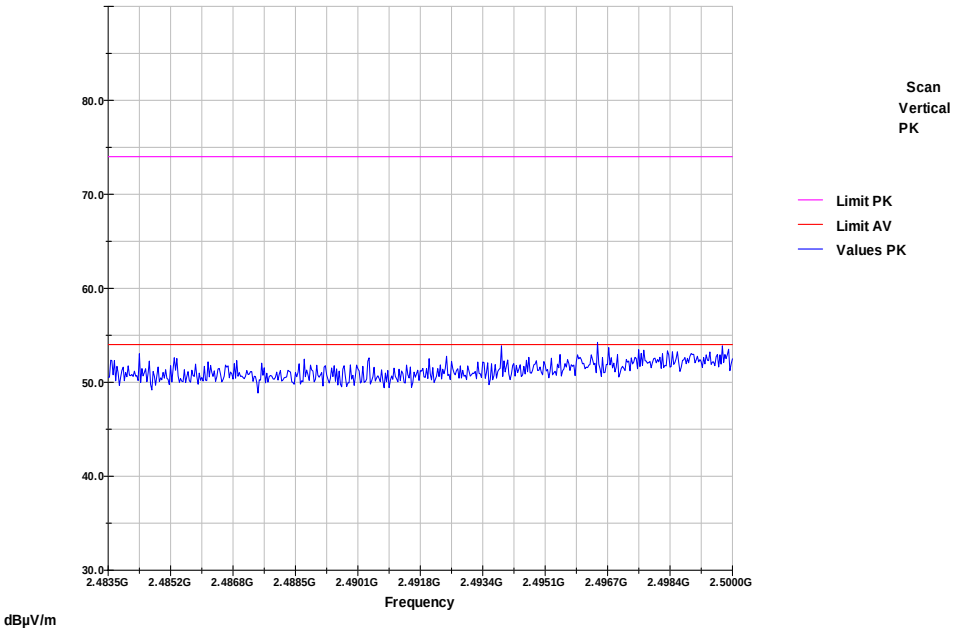



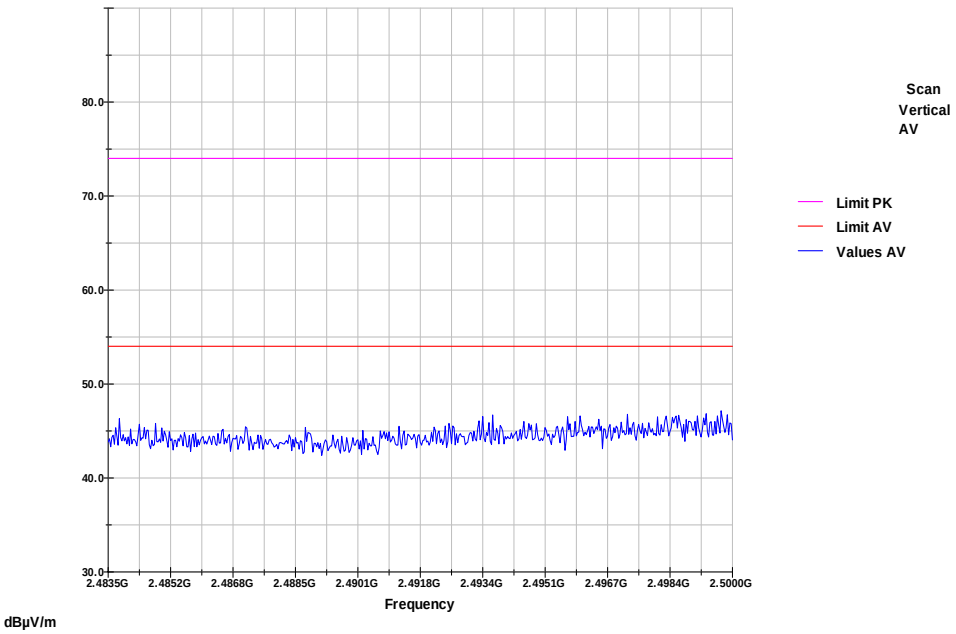
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH6 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | bandedge |
| **Detector:** | PK / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | Low bandedge |



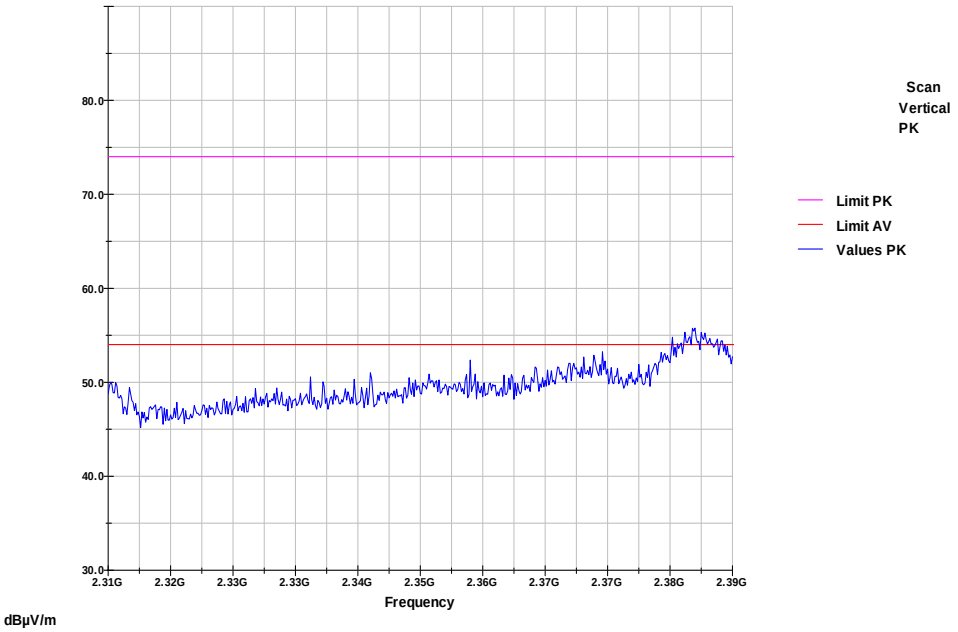



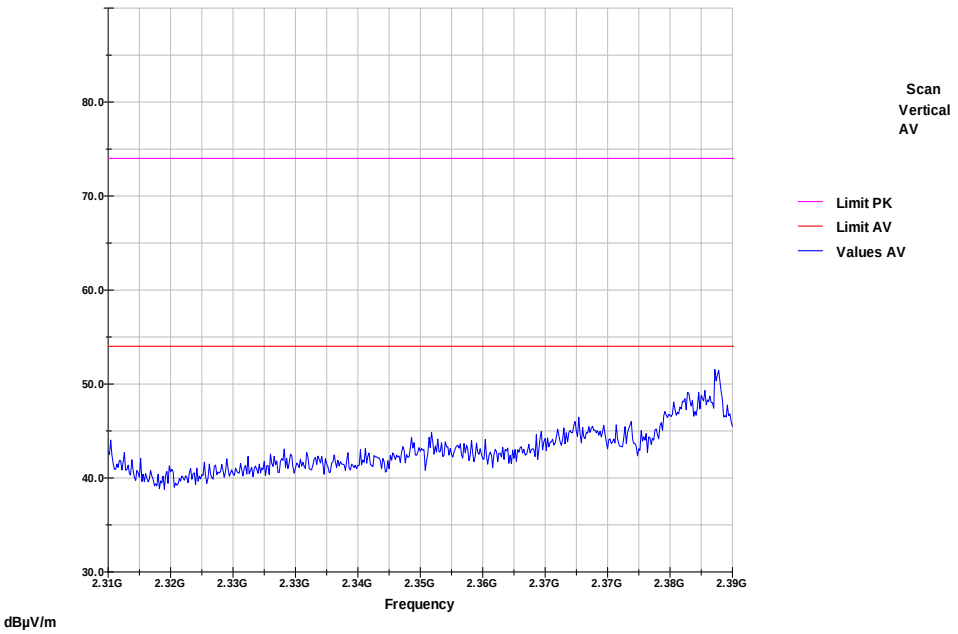
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH6 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | bandedge |
| **Detector:** | PK / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | High bandedge |



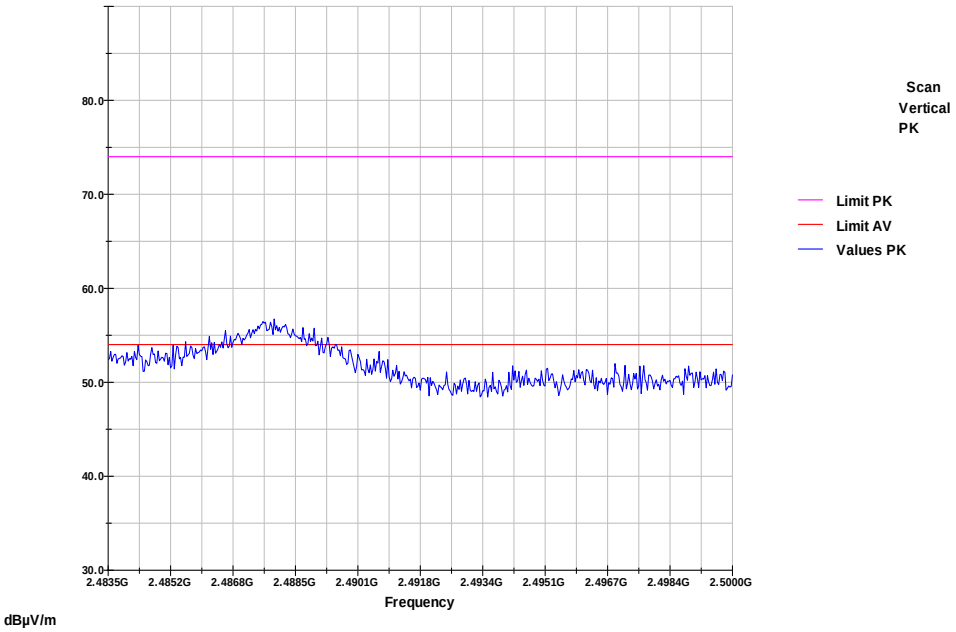



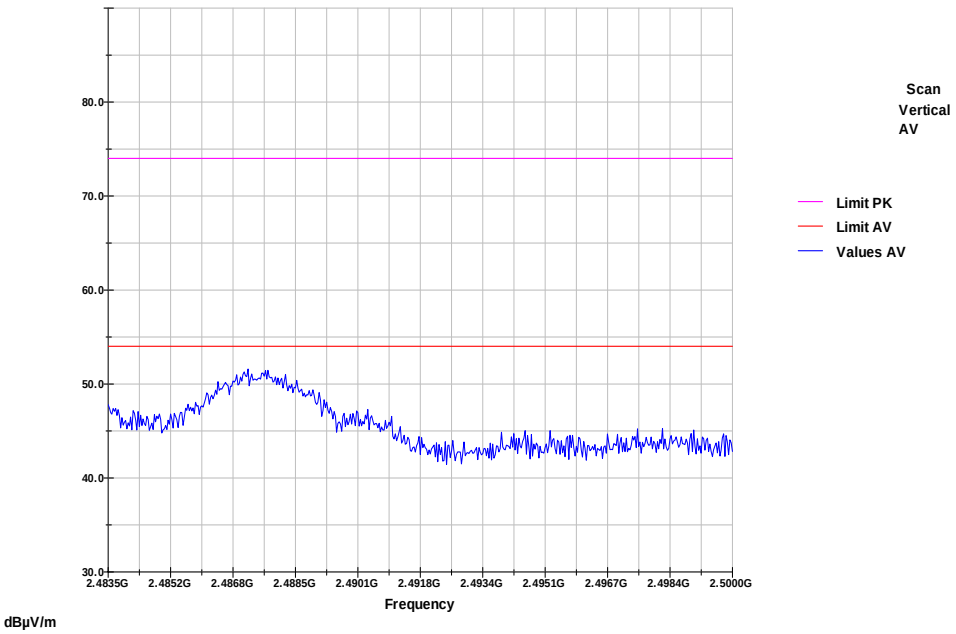
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH11 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | bandedge |
| **Detector:** | PK / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | Low bandedge |



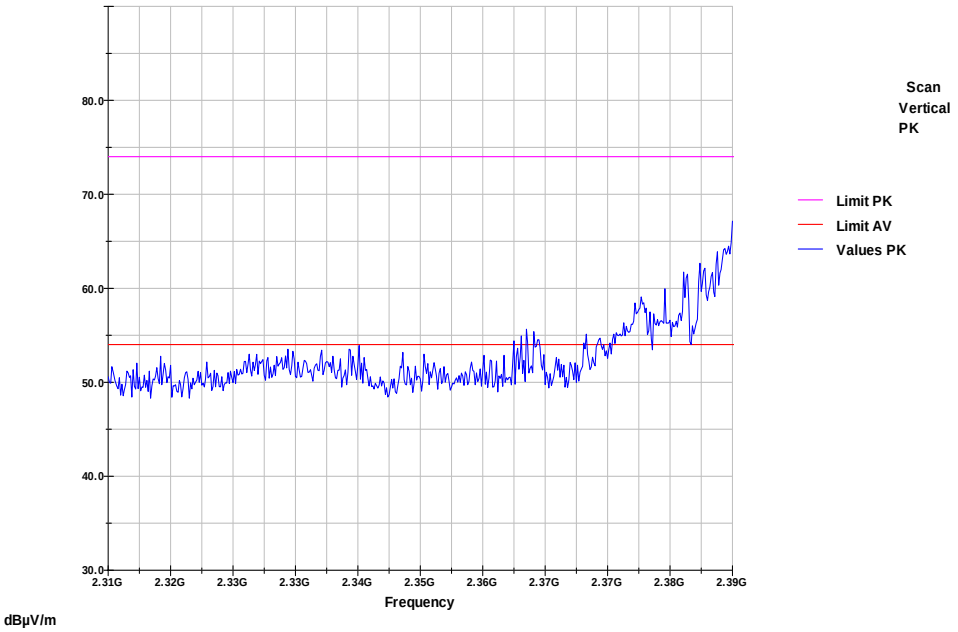



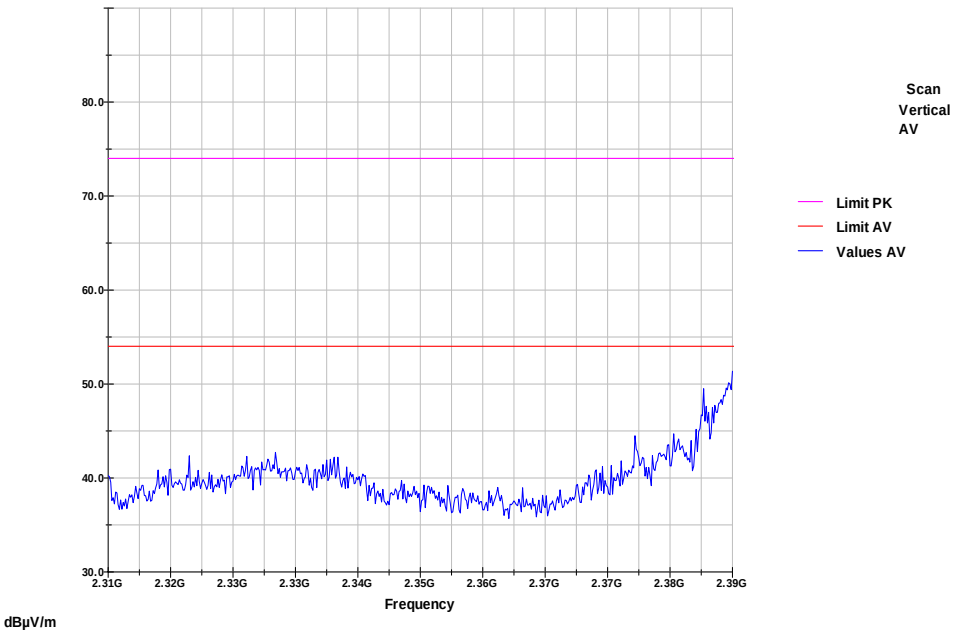
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11b CH11 (11Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | bandedge |
| **Detector:** | PK / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | High bandedge |



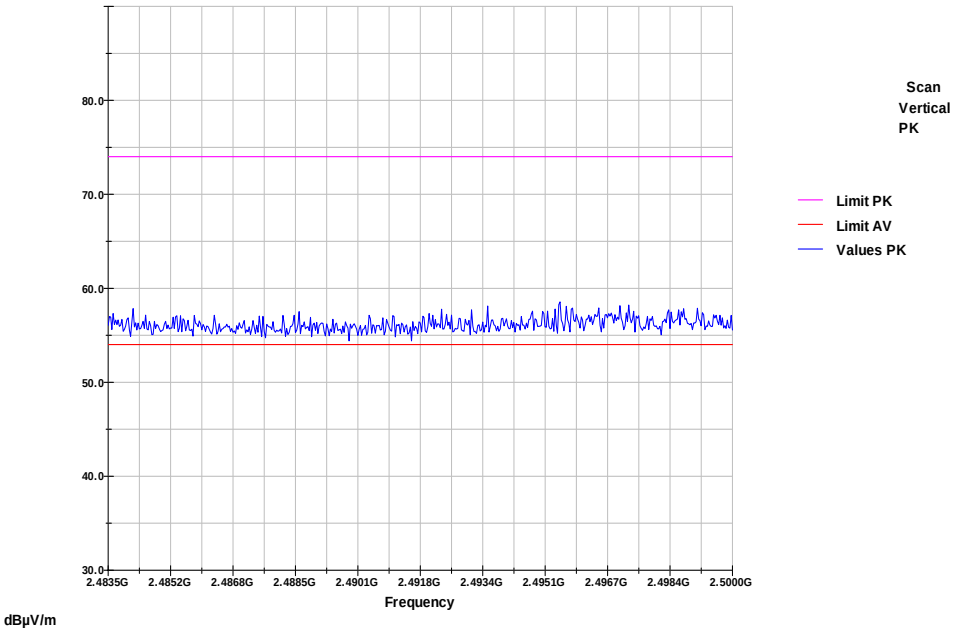



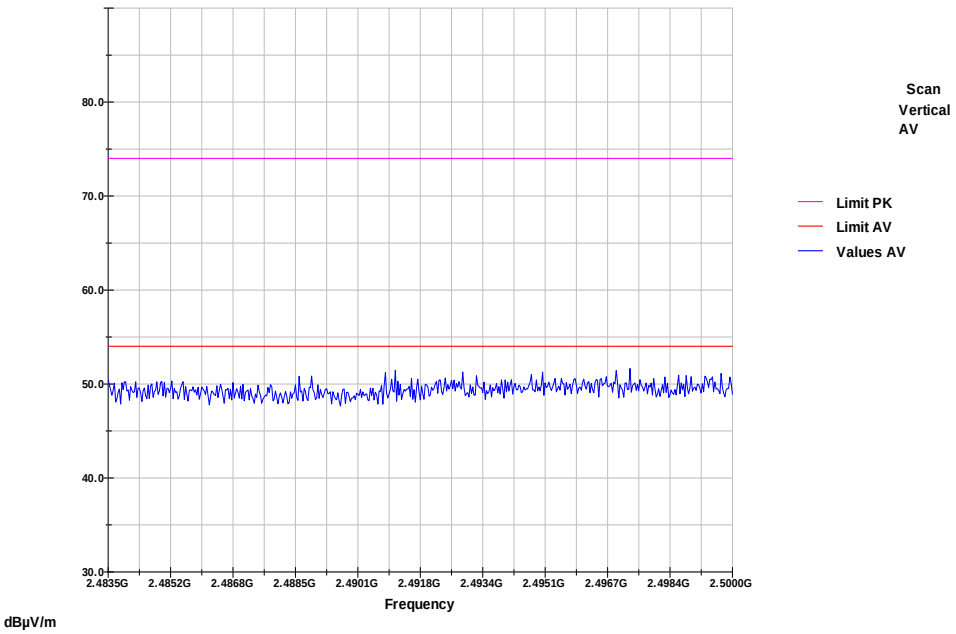
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH1 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | bandedge |
| **Detector:** | PK / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | Low bandedge |



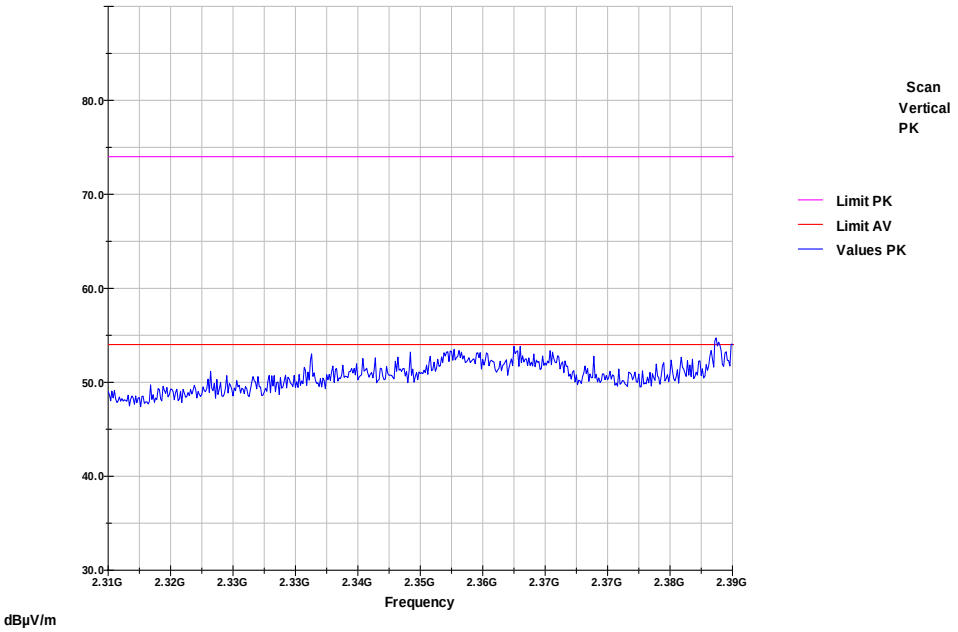



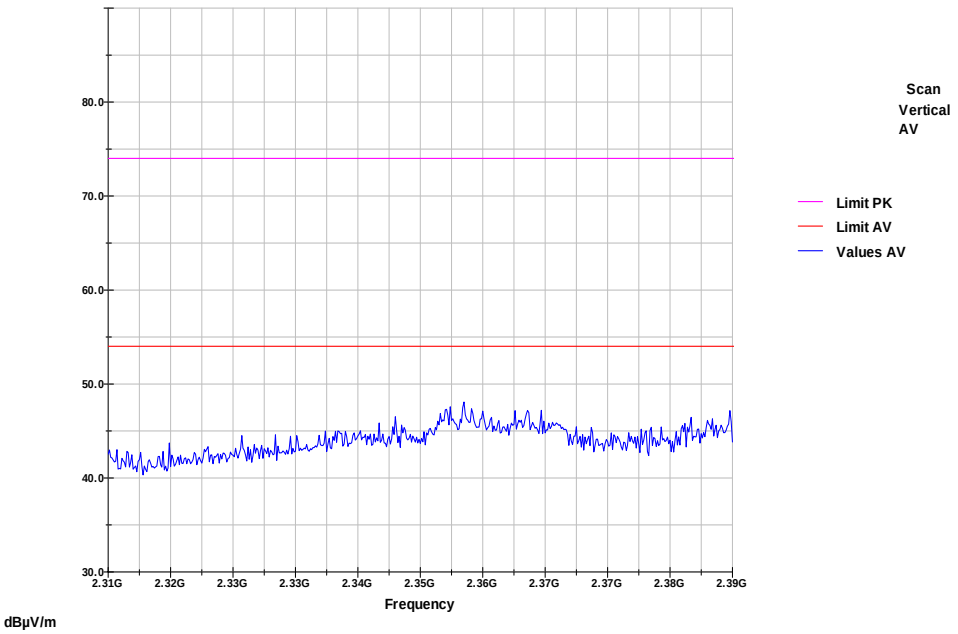
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH1 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | bandedge |
| **Detector:** | PK / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | High bandedge |



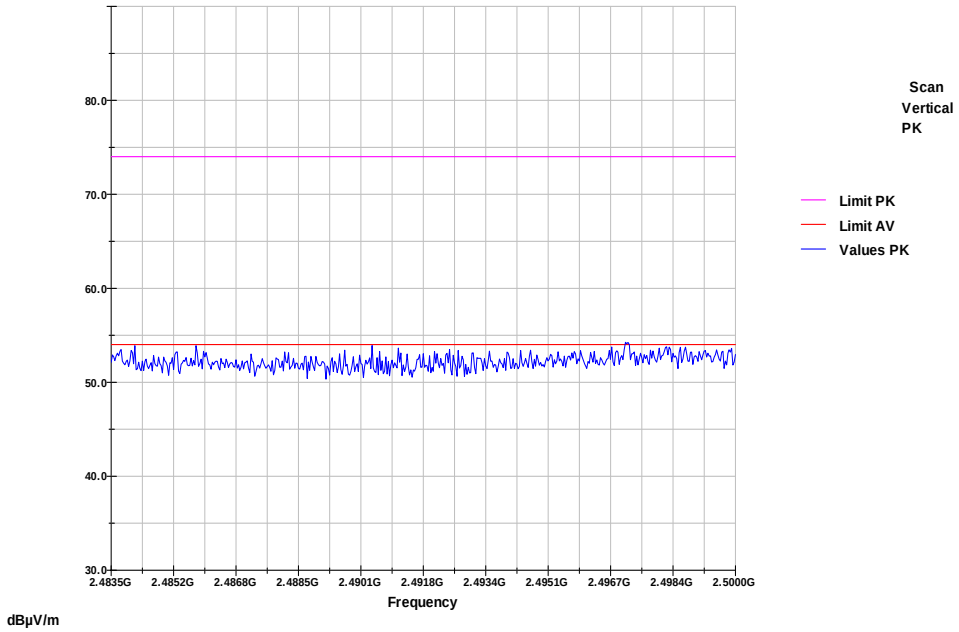



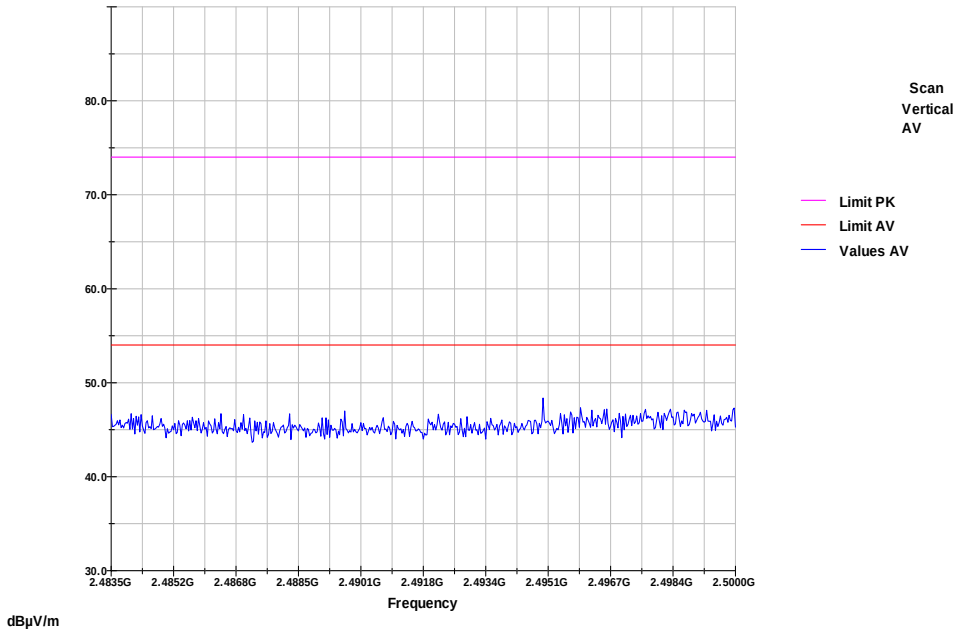
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH6 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | bandedge |
| **Detector:** | PK / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | Low bandedge |



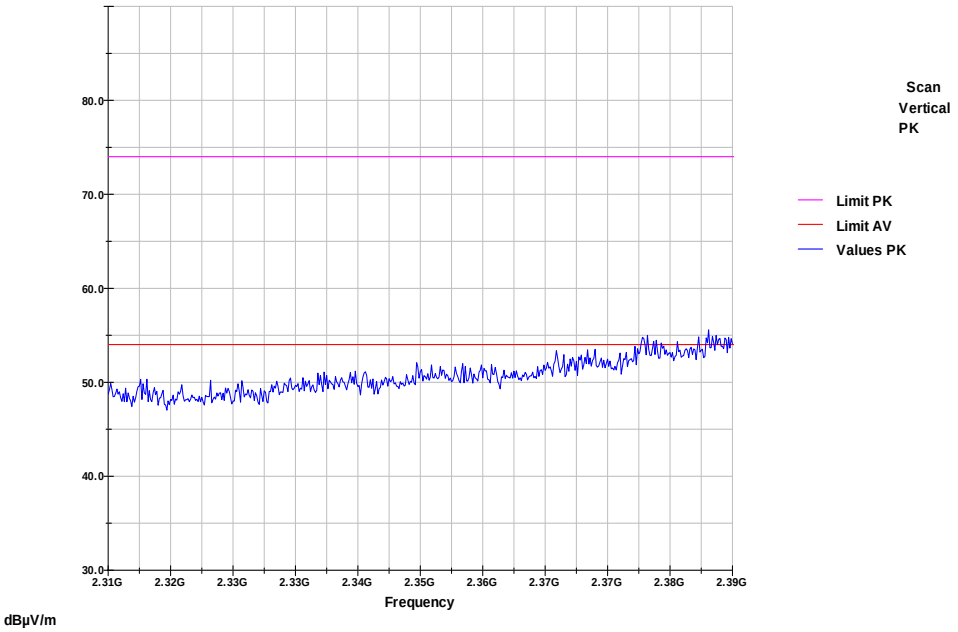
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH6 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | bandedge |
| **Detector:** | PK / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | High bandedge |

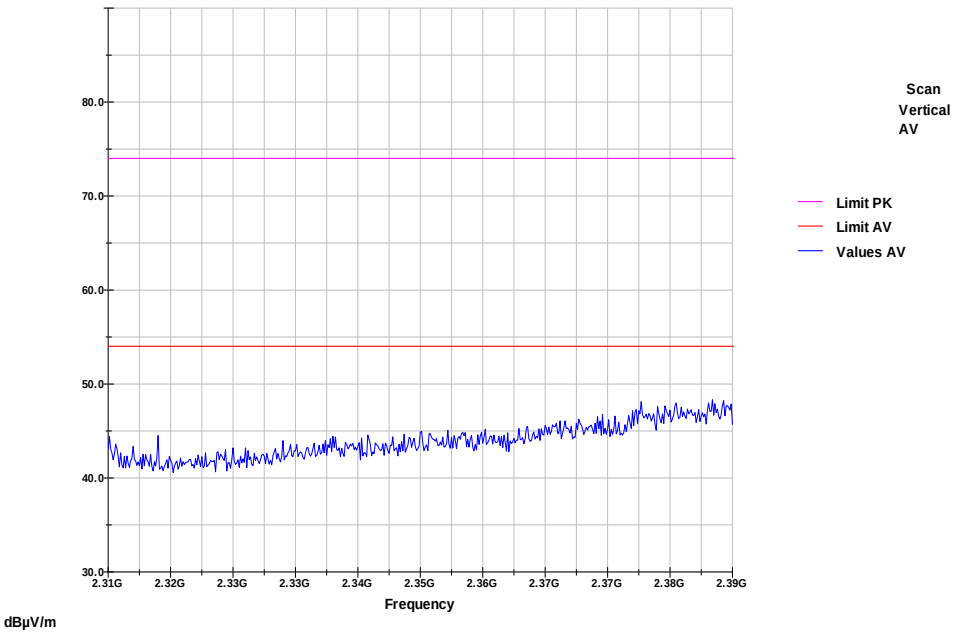


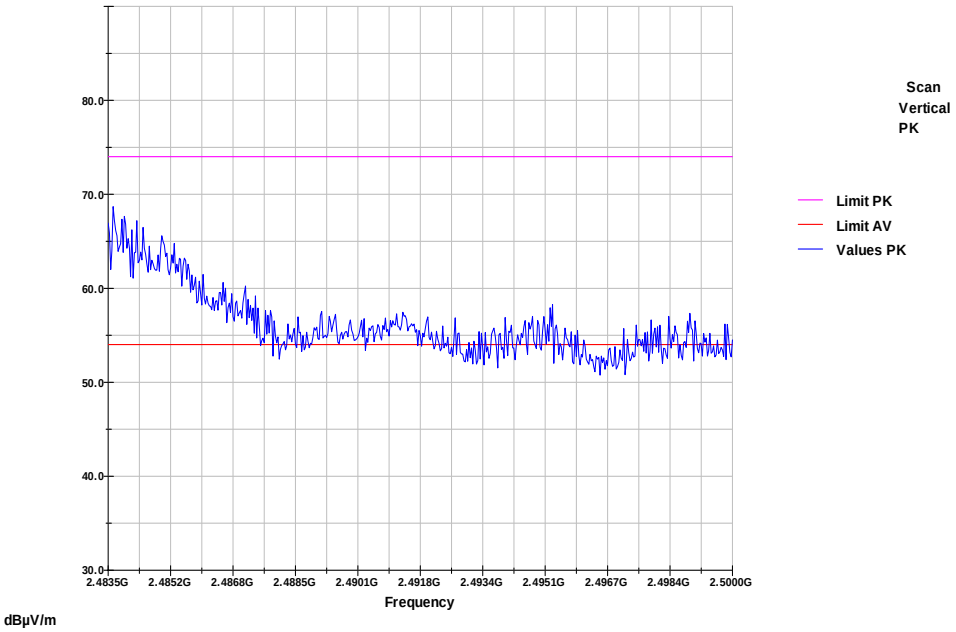

File No. **T-0249-3677-01 JP**

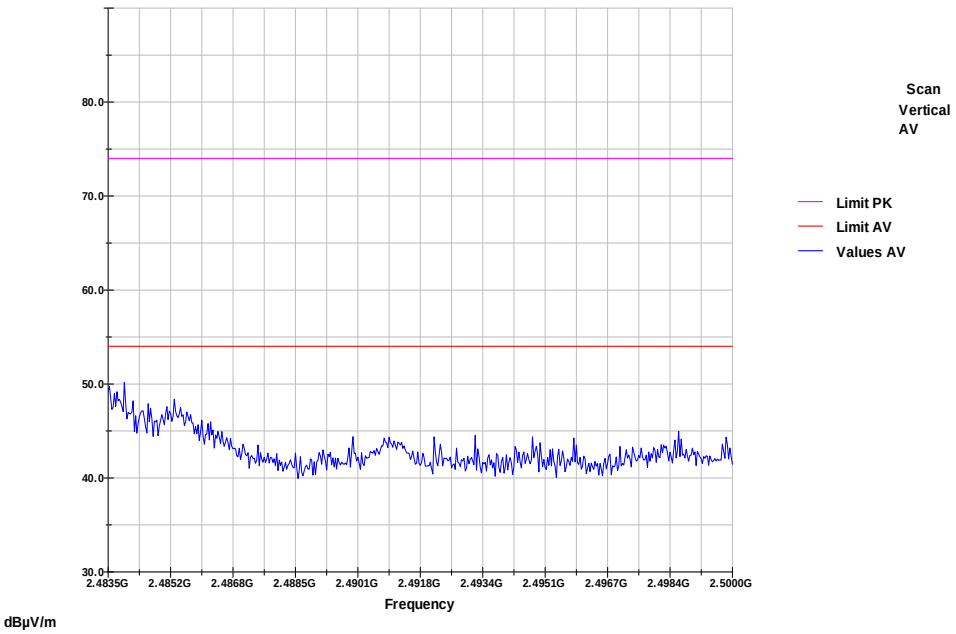
| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH11 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | bandedge |
| **Detector:** | PK / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | Low bandedge |



| | |
|---|---|
| **Date of test:** | 2010-08-17 |
| **Operator:** | Jürgen Pessinger |
| **Mode:** | TX mode, 802.11g CH11 (54Mbps) |
| **Standard:** | FCC 15.209 |
| **Test:** | bandedge |
| **Detector:** | PK / AV |
| **Result:** | Limit kept |
| **Applied to:** | Vertical |
| **Remark:** | High bandedge |



## 6.6 6dB Bandwidth

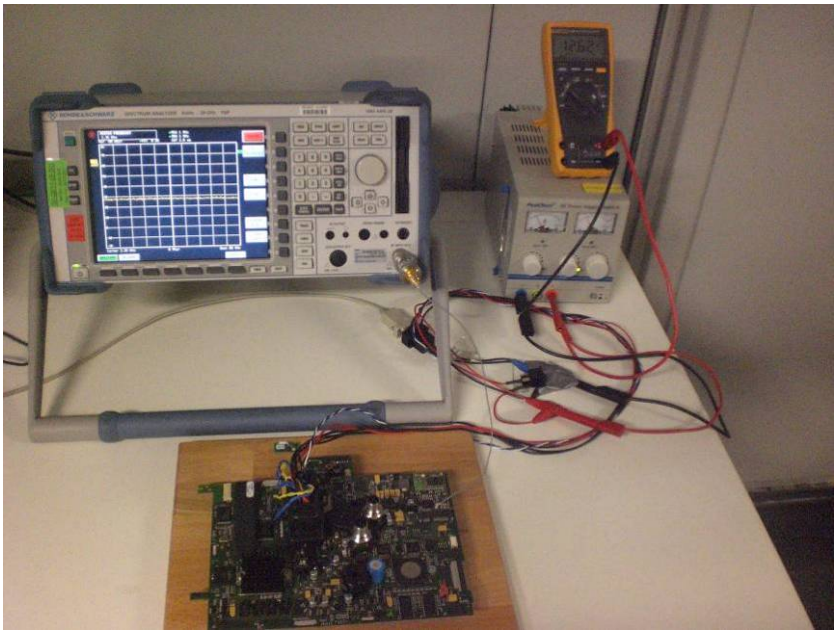
For test instruments and accessories used see section 7 Part **CPC 3**.

### 6.6.1 Description of the test location

Test location: AREA A4

Test distance: conducted

### 6.6.2 Photo documentation of the test set-up



### 6.6.3 Test specification

Environmental conditions: Temperature: 25 ° C Humidity: 60 % Atmospheric pressure: 97 kPa

Frequency range: 2400 MHz – 2483,5 MHz

The test was carried out in the following operation mode(s):
- continous transmit mode (duty cycle = 99%), maximum RF power adjusted

### 6.6.4 Test result

The requirements are **FULFILLED.**

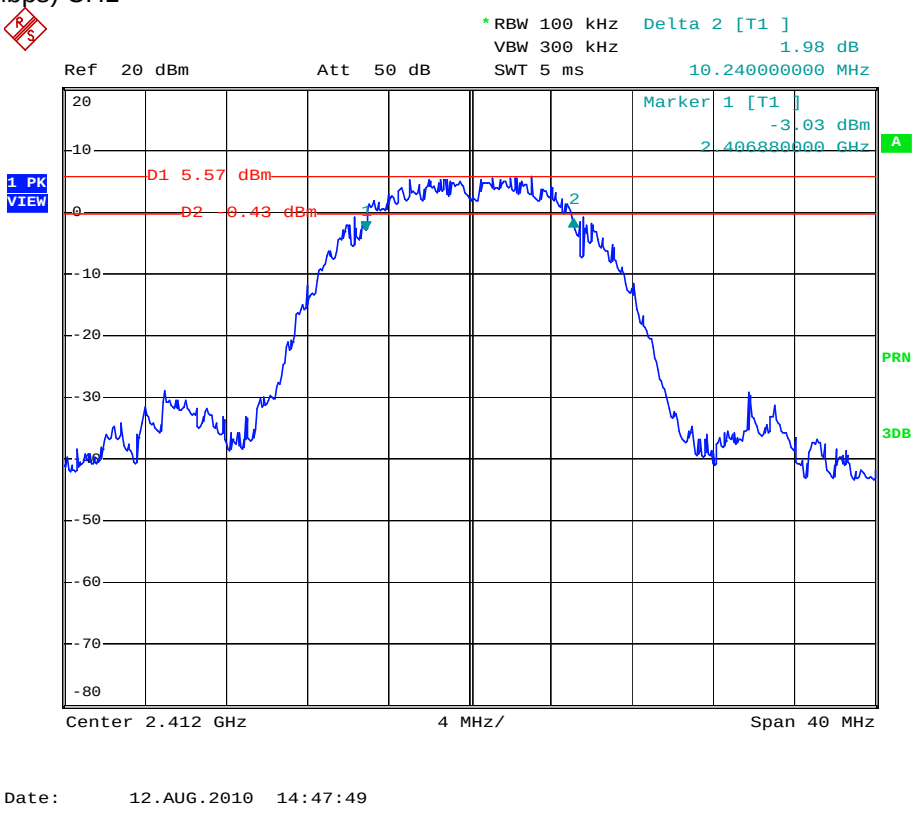
**Remarks:** The measurement was made with antenna cable defined by the manufacturer.

### 6.6.5 Test protocol

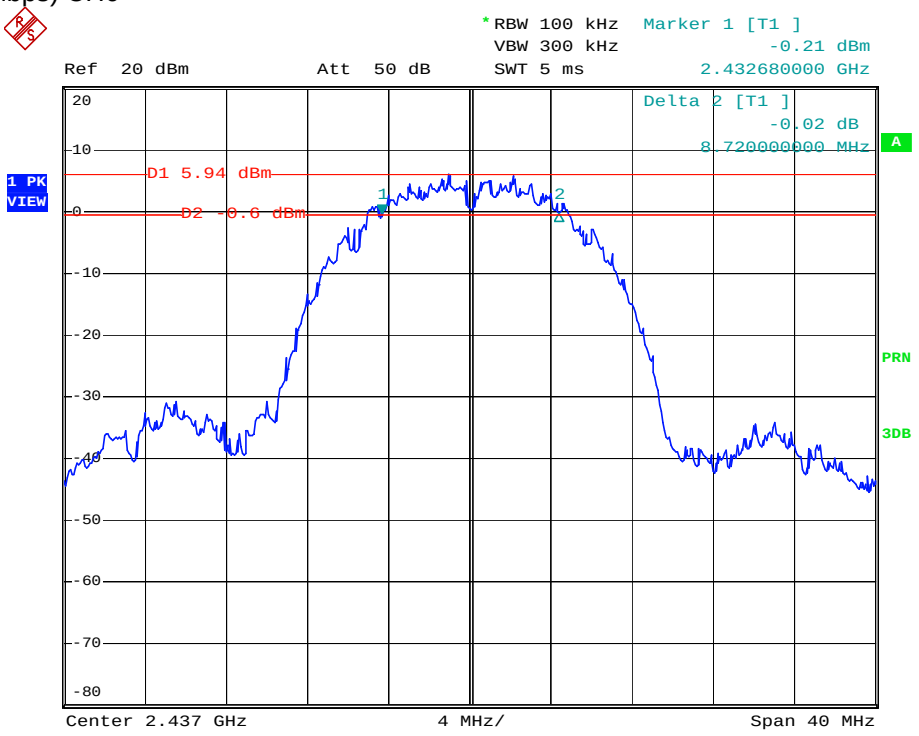
IEEE 802.11b

| CH | frequency [MHz] | 6dB Bandwidth [MHz] | minimum Limit [MHz] | Result |
|---|---|---|---|---|
| 1 | 2412 | 10,24 | 0,5 | Limit kept |
| 6 | 2437 | 8,72 | 0,5 | Limit kept |
| 11 | 2462 | 9,2 | 0,5 | Limit kept |

IEEE 802.11b (11Mbps) CH1

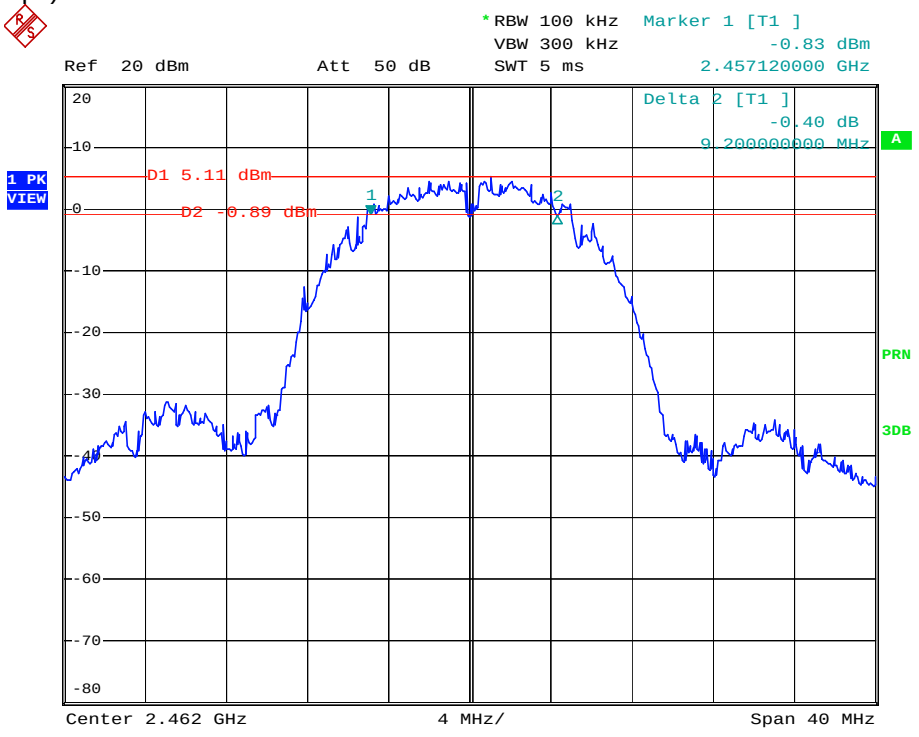


IEEE 802.11b (11Mbps) CH6




Date: 12.AUG.2010 14:44:33

IEEE 802.11b (11Mbps) CH11

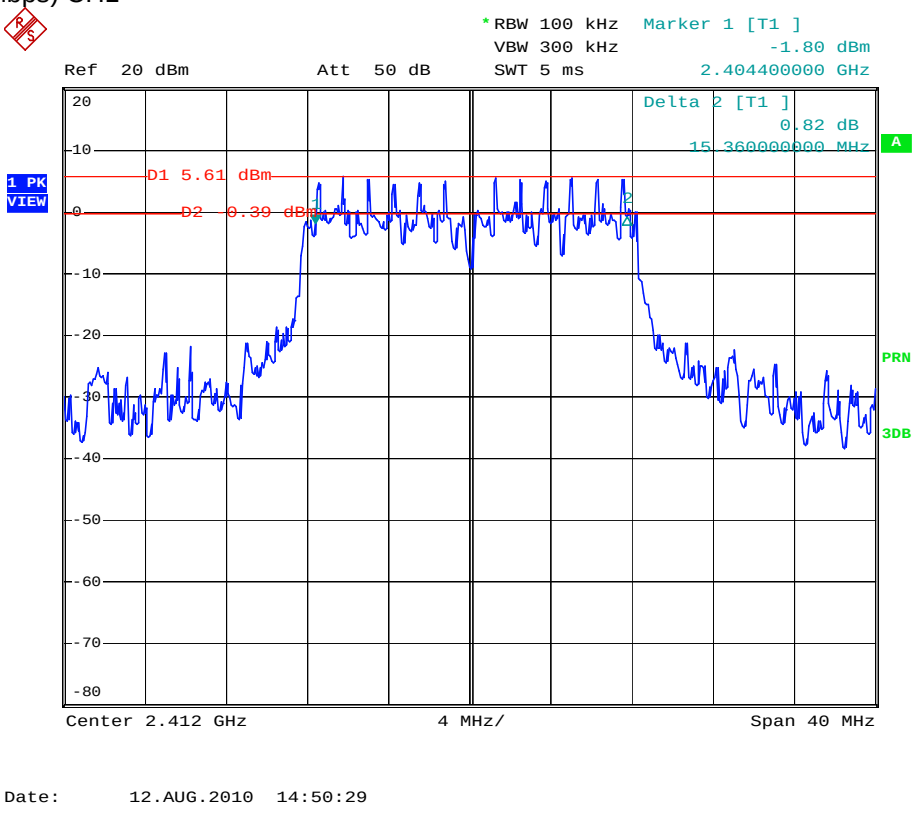



Date: 12.AUG.2010 14:28:07

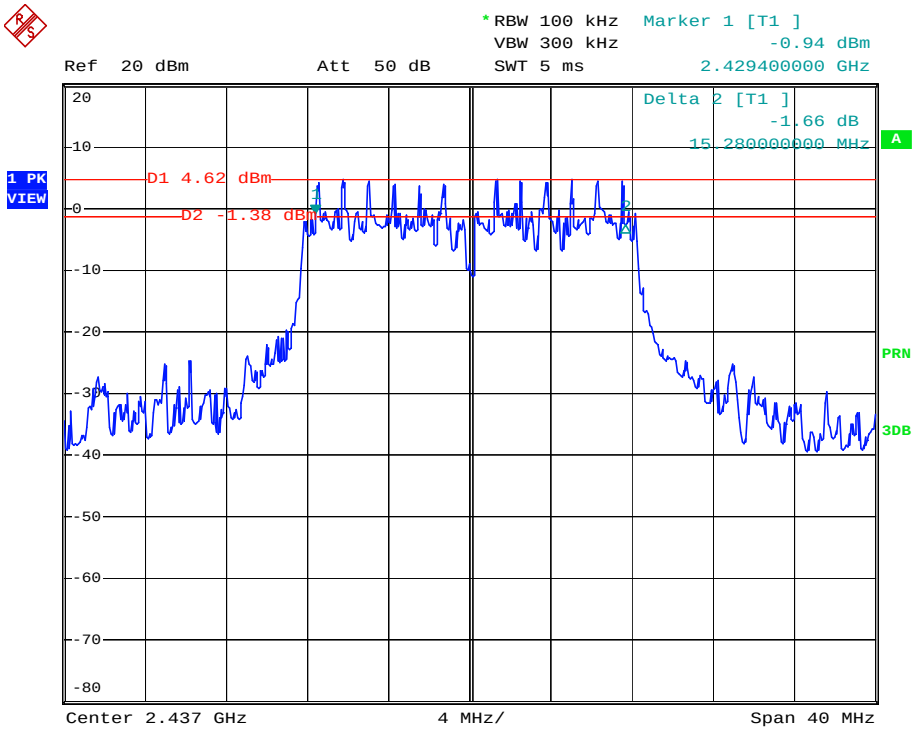
IEEE 802.11g

| CH | frequency [MHz] | 6dB Bandwidth [MHz] | minimum Limit [MHz] | Result |
|---|---|---|---|---|
| 1 | 2412 | 15,36 | 0,5 | Limit kept |
| 6 | 2437 | 15,28 | 0,5 | Limit kept |
| 11 | 2462 | 15,44 | 0,5 | Limit kept |

IEEE 802.11g (54Mbps) CH1

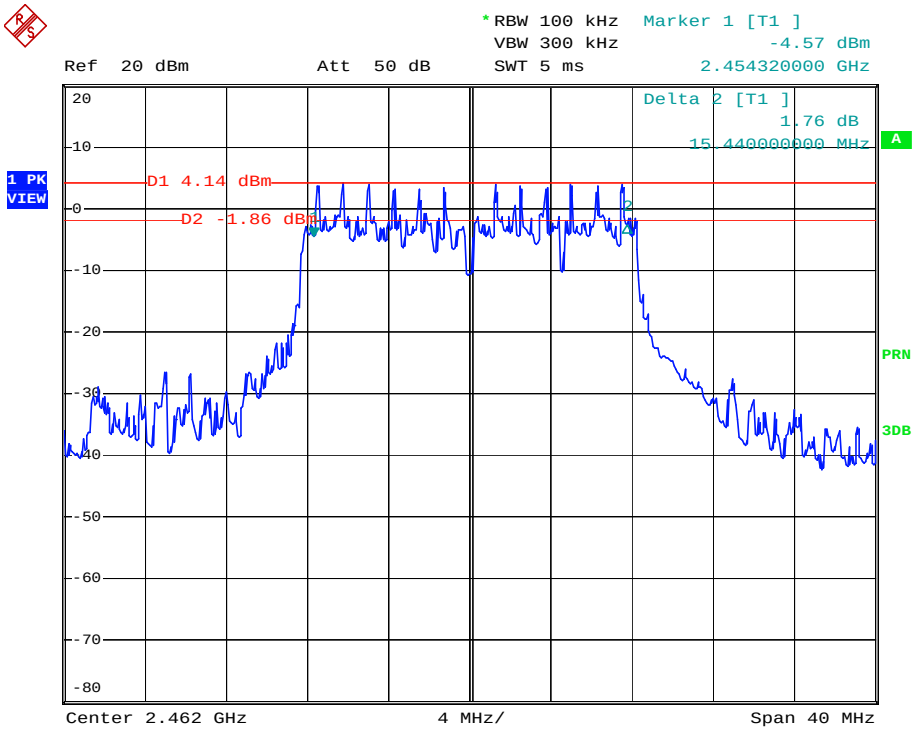


IEEE 802.11g (54Mbps) CH6




Date: 12.AUG.2010 14:40:54

IEEE 802.11g (54Mbps) CH11




Date: 12.AUG.2010 14:36:22

## 6.7 Maximum Conducted Output Power

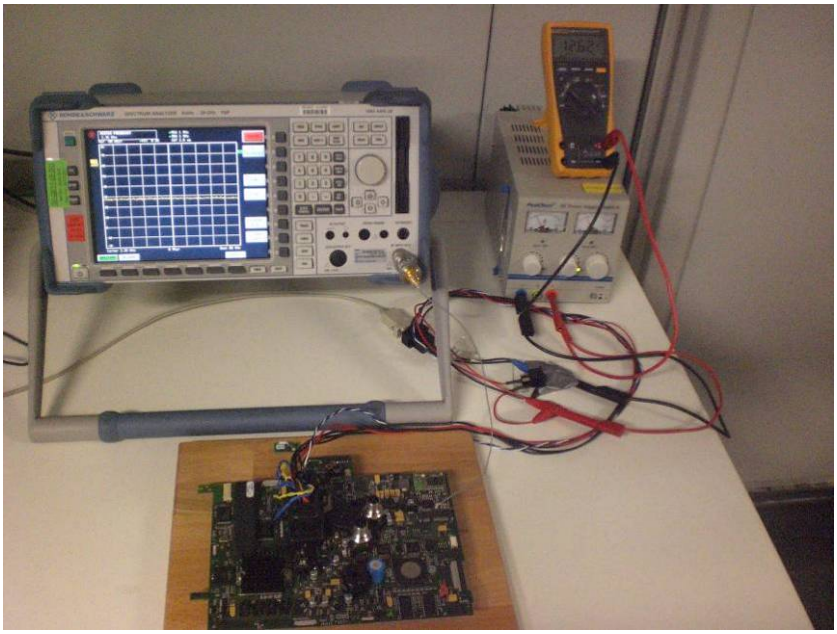
For test instruments and accessories used see section 7 Part **CPC 3**.

### 6.7.1 Description of the test location

Test location: AREA A4

Test distance: conducted

### 6.7.2 Photo documentation of the test set-up



### 6.7.3 Test specification

Environmental conditions: Temperature: 25 ° C Humidity: 60 % Atmospheric pressure: 97 kPa

Frequency range: 2400 MHz – 2483,5 MHz

The test was carried out in the following operation mode(s):
- continous transmit mode (duty cycle = 99%), maximum RF power adjusted

### 6.7.4 Test result

The requirements are **FULFILLED.**

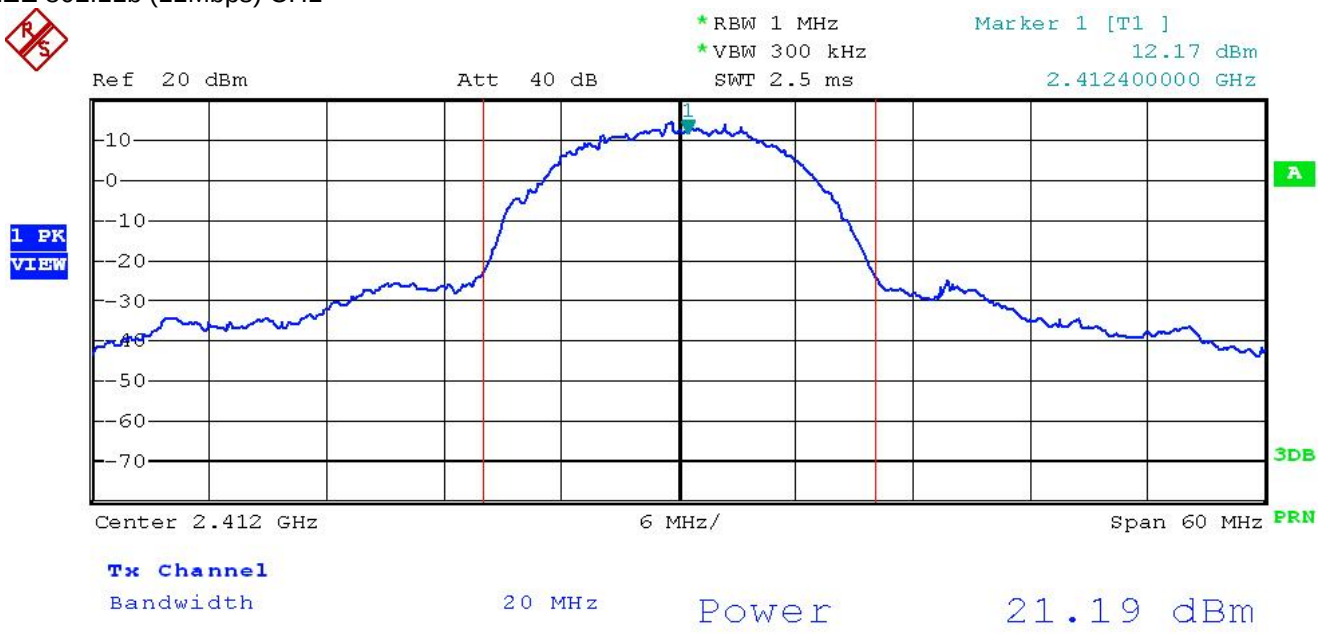
**Remarks:** The measurement was made with antenna cable defined by the manufacturer.

### 6.7.5 Test protocol

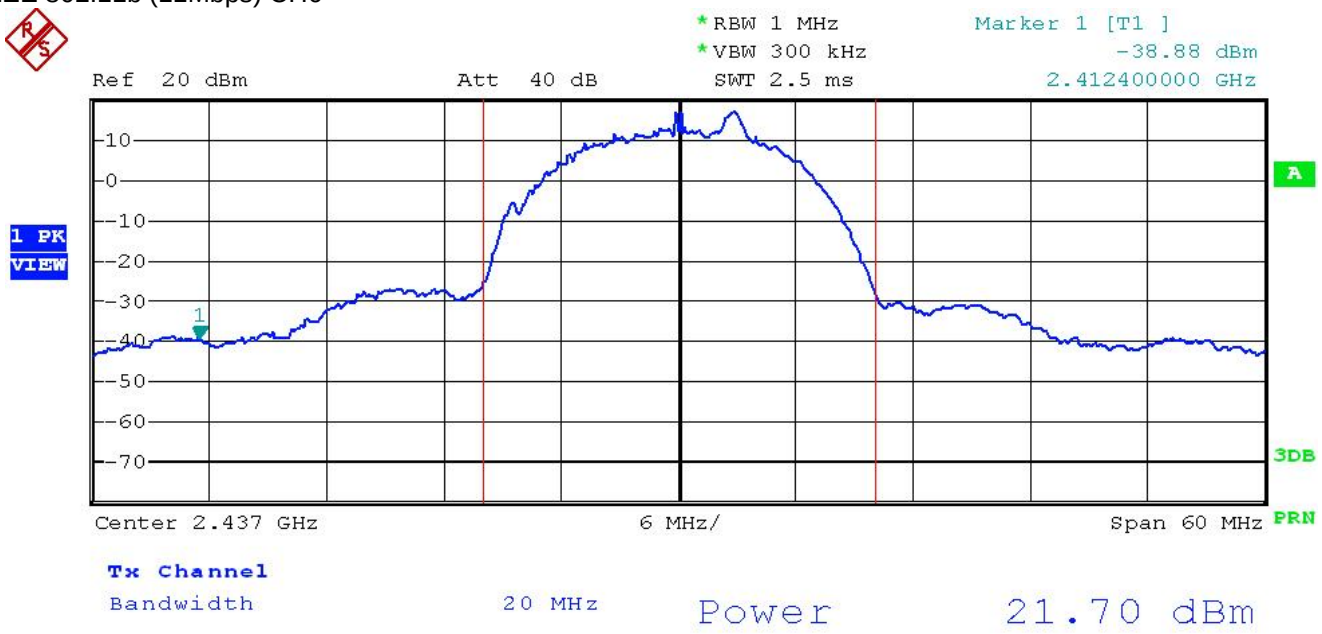
IEEE 802.11b (11Mbps)

| CH | frequency [MHz] | conducted output power [dBm] | Limit [dBm] | Result |
|---|---|---|---|---|
| 1 | 2412 | 21,2 | 30 | Limit kept |
| 6 | 2437 | 21,7 | 30 | Limit kept |
| 11 | 2462 | 21,1 | 30 | Limit kept |

IEEE 802.11b (11Mbps) CH1



IEEE 802.11b (11Mbps) CH6

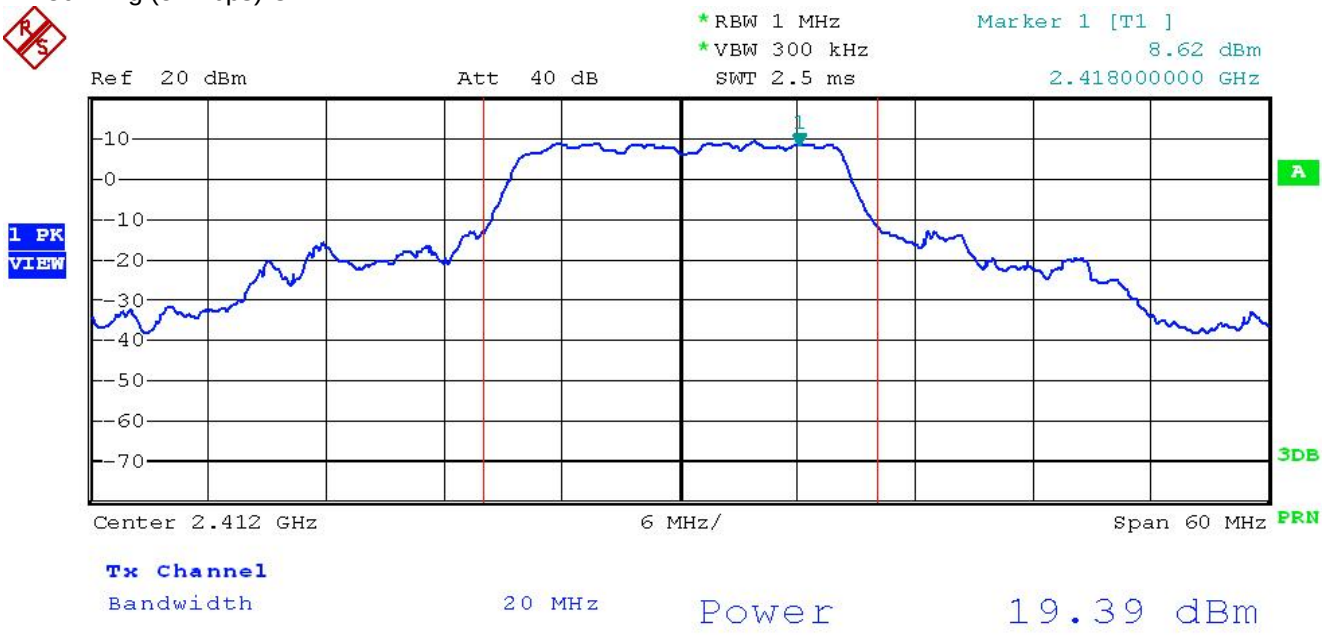



IEEE 802.11b (11Mbps) CH11

IEEE 802.11g (54Mbps)

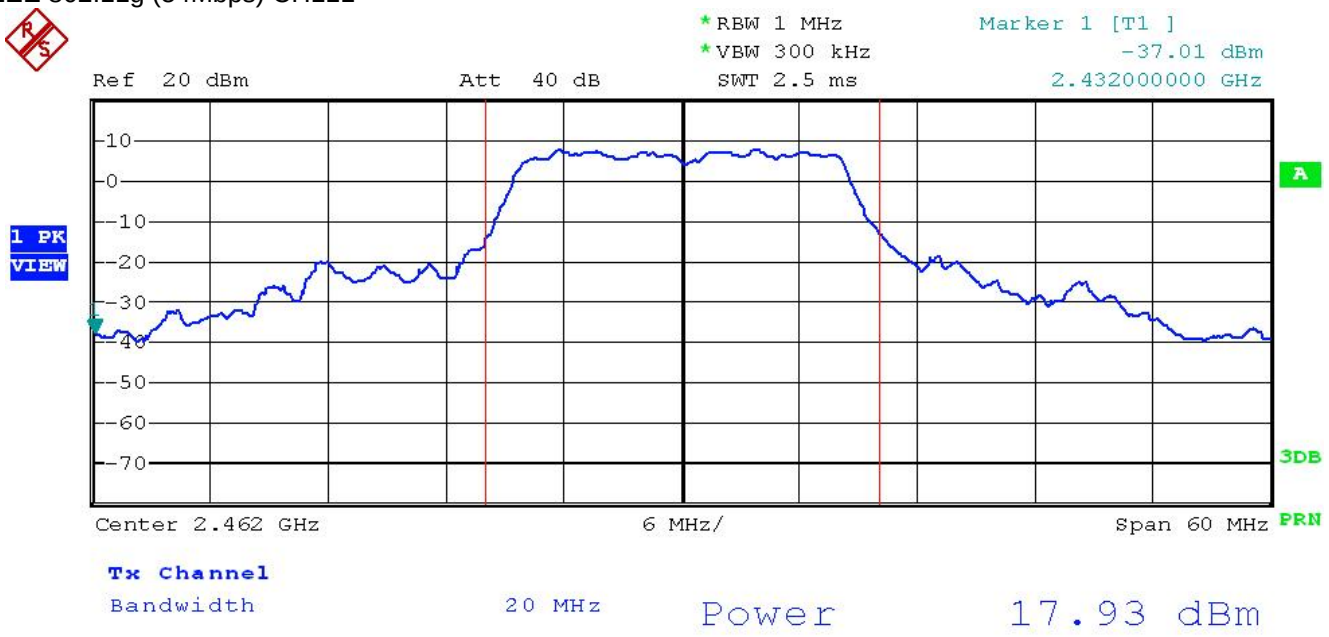
| CH | frequency [MHz] | conducted output power [dBm] | Limit [dBm] | Result |
|---|---|---|---|---|
| 1 | 2412 | 19,4 | 30 | Limit kept |
| 6 | 2437 | 18,7 | 30 | Limit kept |
| 11 | 2462 | 17,9 | 30 | Limit kept |

IEEE 802.11g (54Mbps) CH1



IEEE 802.11g (54Mbps) CH6


IEEE 802.11g (54Mbps) CH111



## 6.8 Power Spectral Density

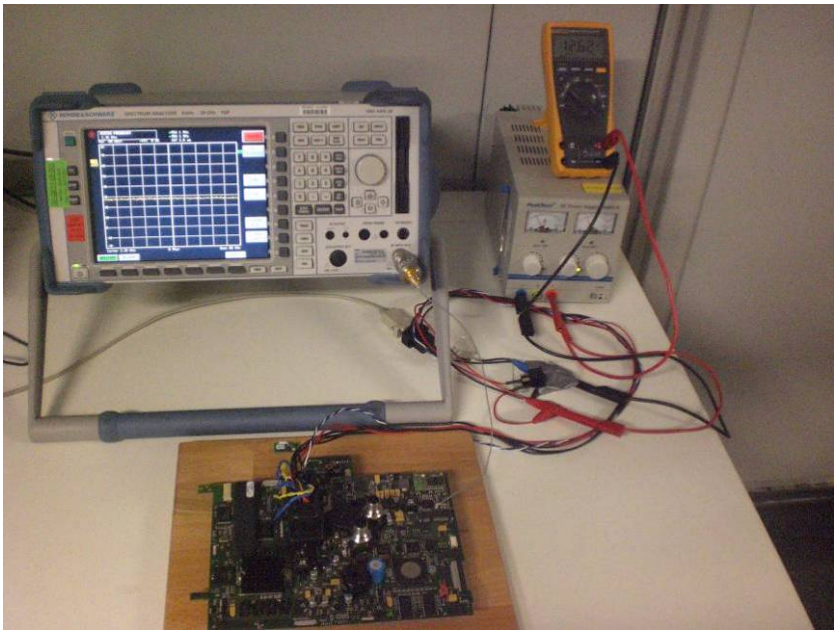
For test instruments and accessories used see section 7 Part **CPC 3**.

### 6.8.1 Description of the test location

Test location: AREA A4

Test distance: conducted

### 6.8.2 Photo documentation of the test set-up



### 6.8.3 Test specification

Environmental conditions: Temperature: 25 ° C Humidity: 60 % Atmospheric pressure: 97 kPa

Frequency range: 2400 MHz – 2483,5 MHz

The test was carried out in the following operation mode(s):
- continous transmit mode (duty cycle = 99%), maximum RF power adjusted

### 6.8.4 Test result

The requirements are **FULFILLED.**

**Remarks:** The measurement was made with antenna cable defined by the manufacturer.

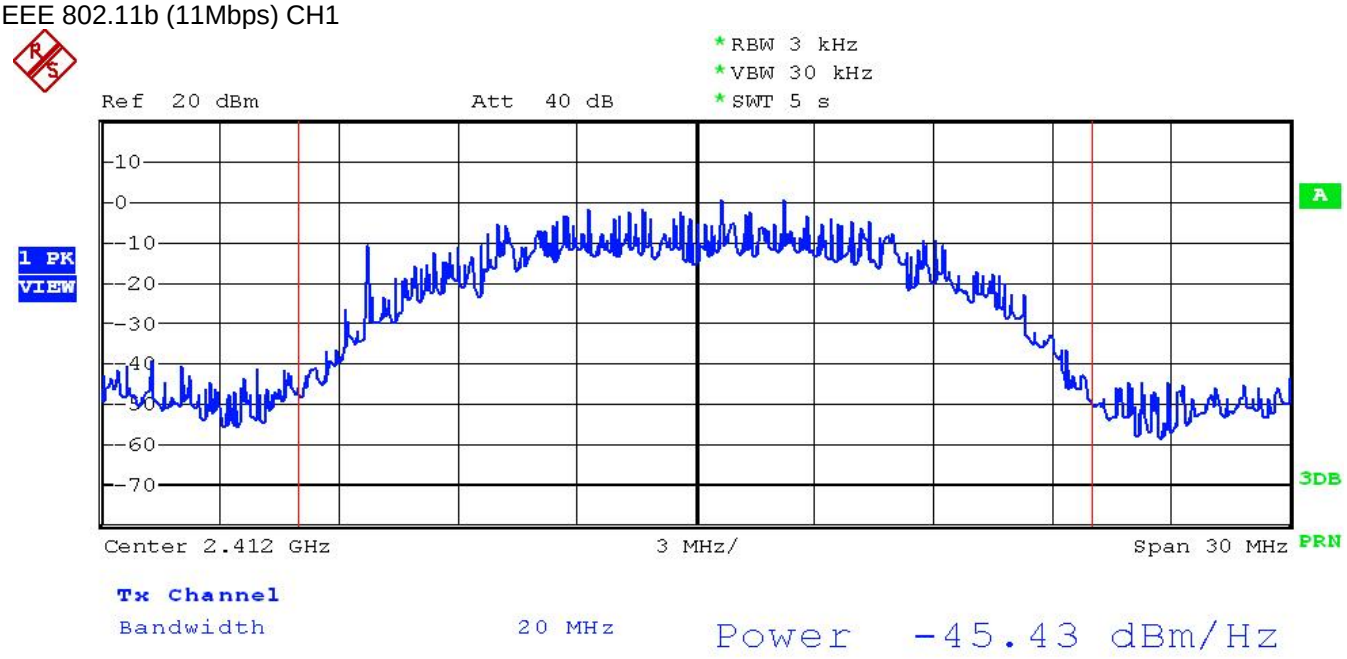
### 6.8.5 Test protocol

IEEE 802.11b (11Mbps)

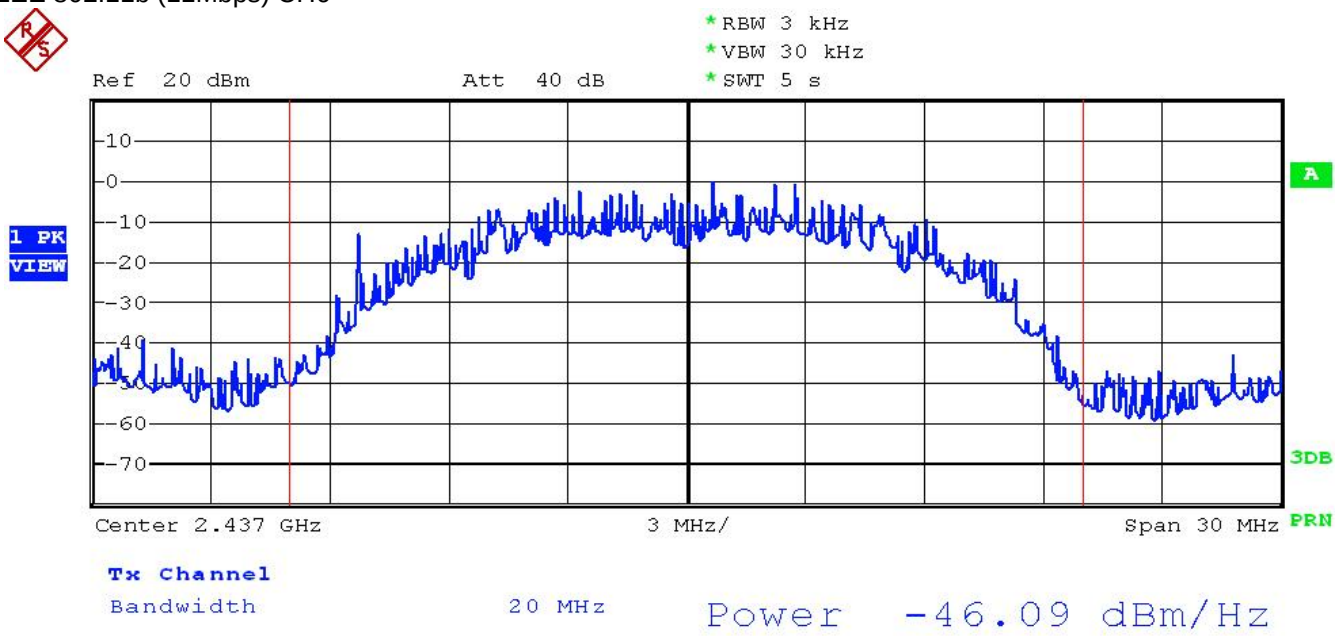
| CH | frequency [MHz] | reading [dBm/Hz] | correction to 3kHz [dB] | Power Spectral Density [dBm] | Limit [dBm] | Result |
|---|---|---|---|---|---|---|
| 1 | 2412 | -45,4 | 35 | -10,4 | 8 | Limit kept |
| 6 | 2437 | -46,1 | 35 | -11,1 | 8 | Limit kept |
| 11 | 2462 | -46,7 | 35 | -11,7 | 8 | Limit kept |

Correction of 35 dB: 10log (3000Hz/Hz)

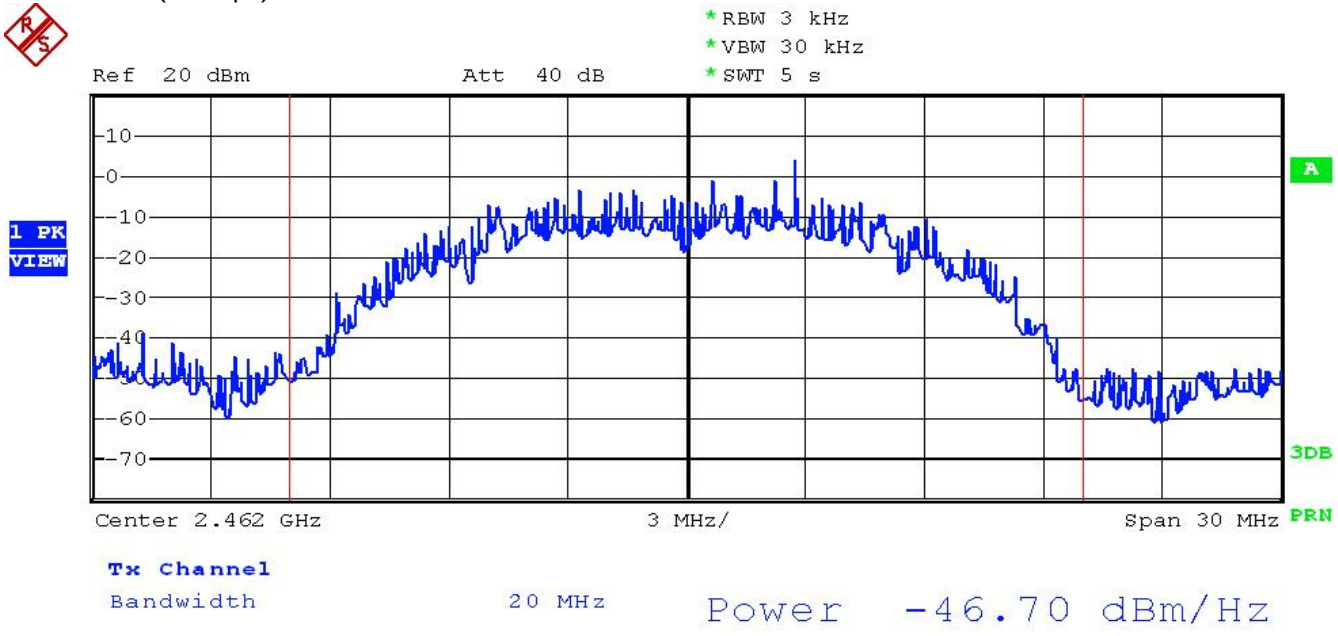
IEEE 802.11b (11Mbps) CH1



IEEE 802.11b (11Mbps) CH6




IEEE 802.11b (11Mbps) CH11

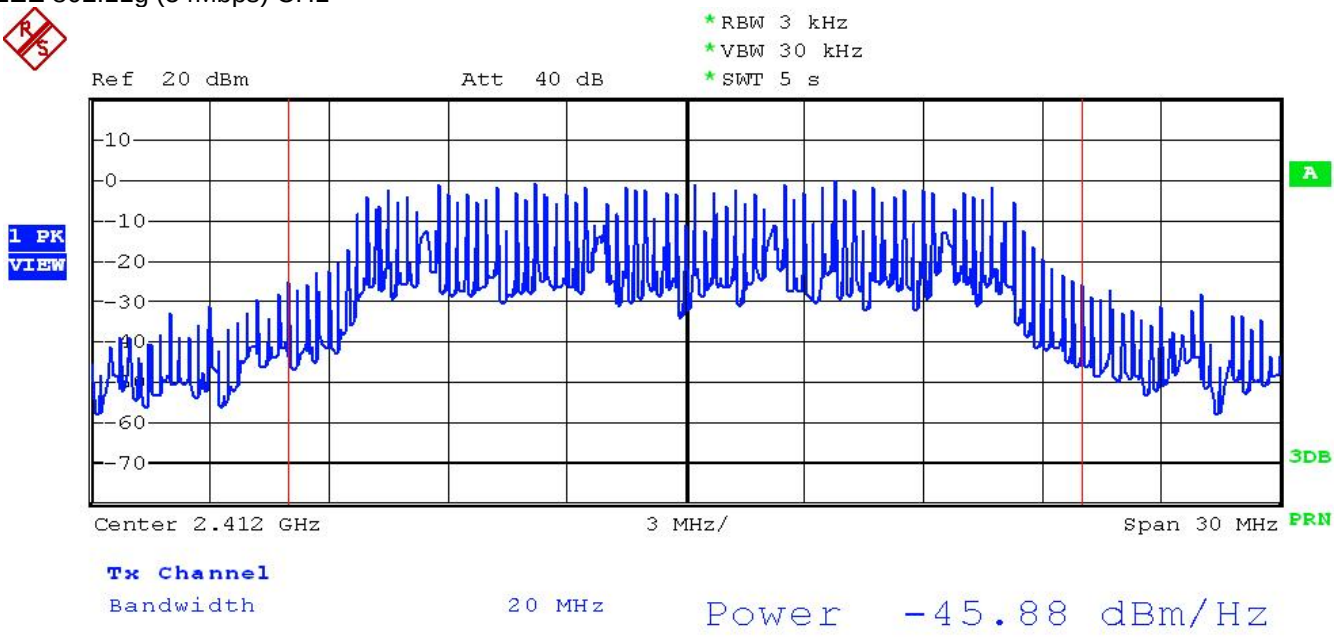


IEEE 802.11g (54Mbps)

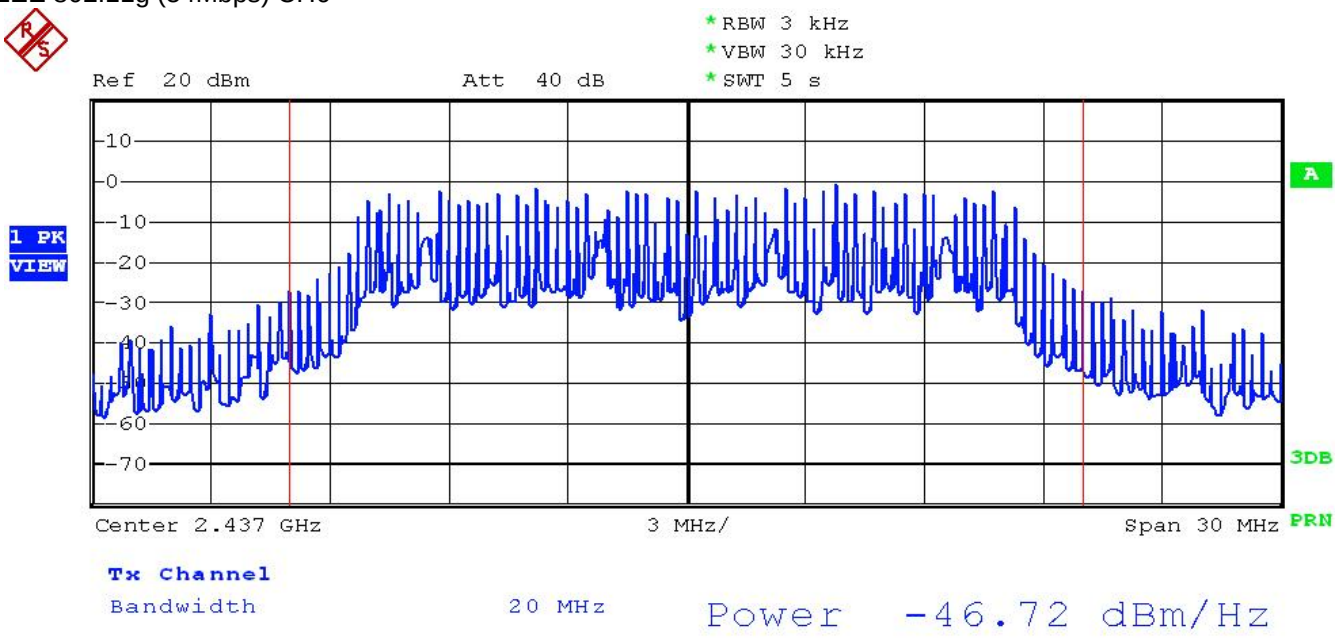
| CH | frequency [MHz] | reading [dBm/Hz] | correction to 3kHz [dB] | Power Spectral Density [dBm] | Limit [dBm] | Result |
|---|---|---|---|---|---|---|
| 1 | 2412 | -45,9 | 35 | -10,9 | 8 | Limit kept |
| 6 | 2437 | -46,7 | 35 | -11,7 | 8 | Limit kept |
| 11 | 2462 | -47,7 | 35 | -12,7 | 8 | Limit kept |

Correction of 35 dB: 10log (3000Hz/Hz)

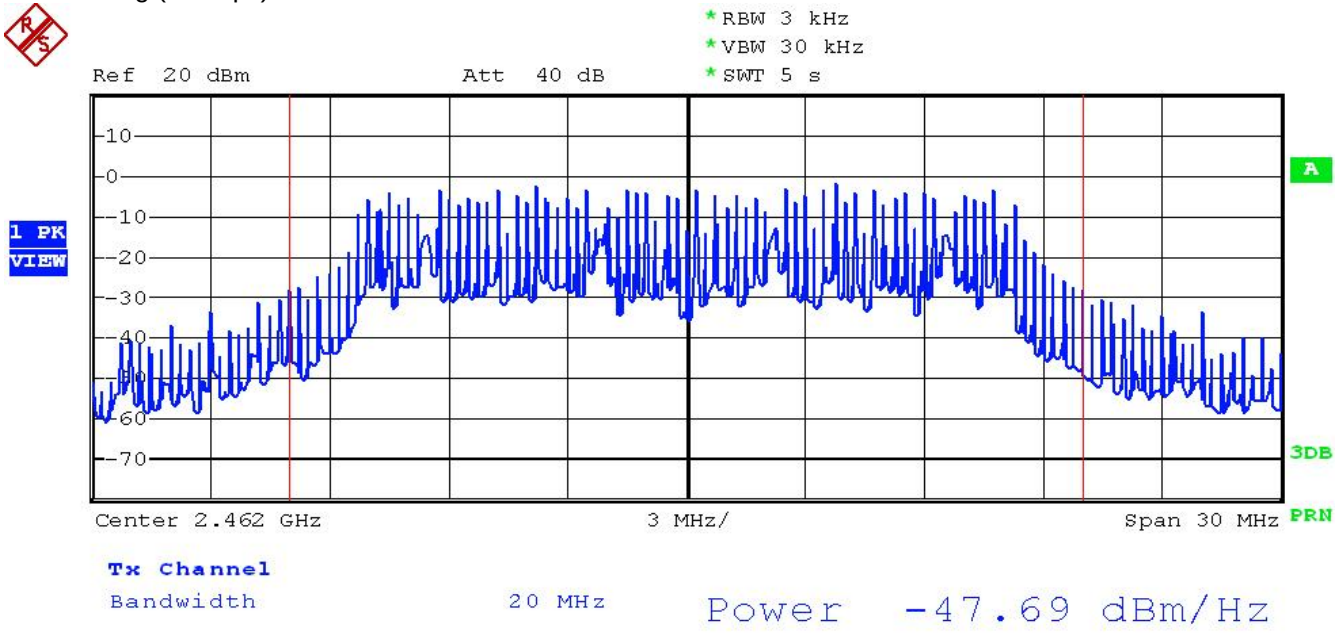
IEEE 802.11g (54Mbps) CH1



IEEE 802.11g (54Mbps) CH6




IEEE 802.11g (54Mbps) CH111



## 6.9 Conducted spurious emissions 30 MHz – 25GHz

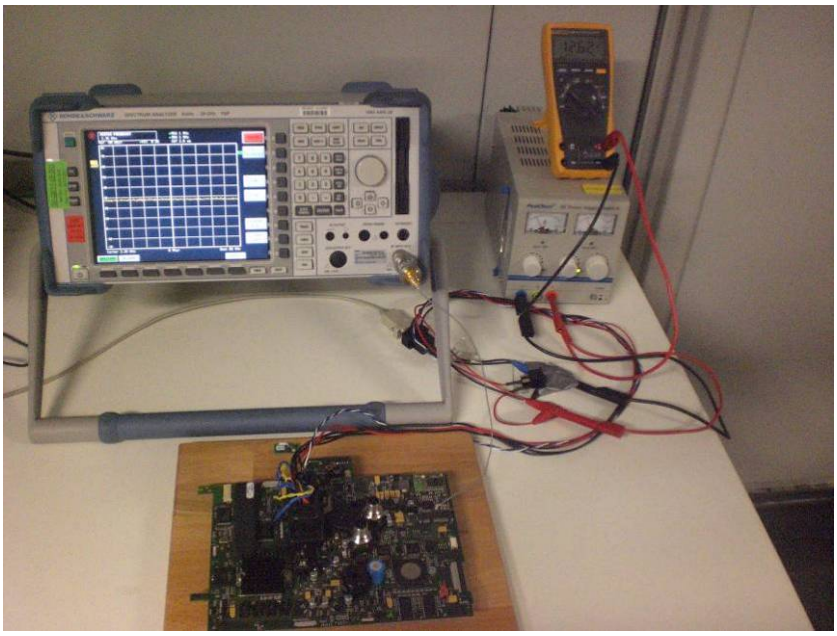
For test instruments and accessories used see section 7 Part **SEC 1-3**.

### 6.9.1 Description of the test location

Test location: AREA A4

Test distance: conducted

### 6.9.2 Photo documentation of the test set-up



### 6.9.3 Test specification

Environmental conditions: Temperature: 25 ° C Humidity: 60 % Atmospheric pressure: 97 kPa

Frequency range: 30 MHz – 25 GHz

The test was carried out in the following operation mode(s):
- continous transmit mode (duty cycle = 99%), maximum RF power adjusted

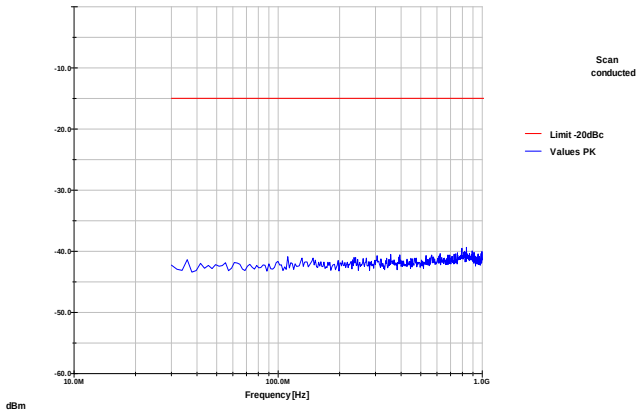
### 6.9.4 Test result

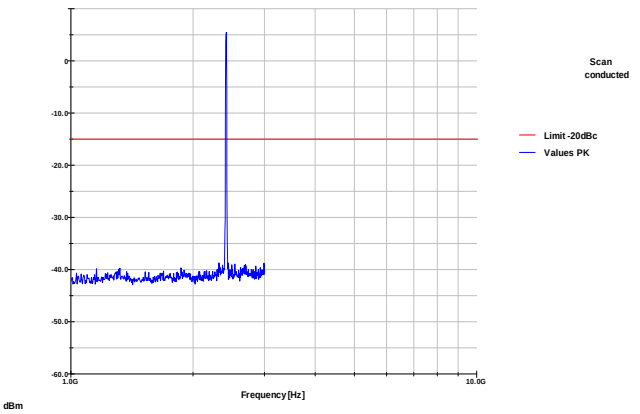
The requirements are **FULFILLED.**

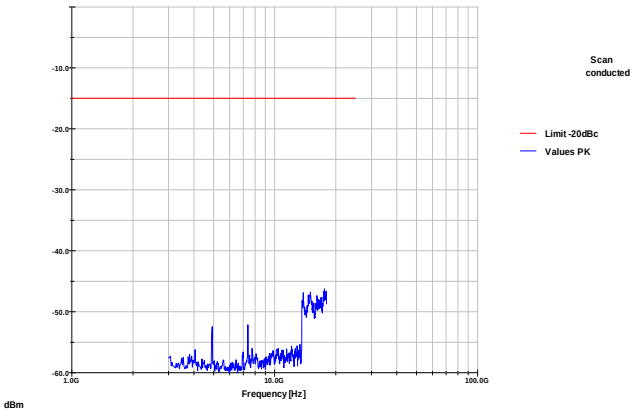
**Remarks:** The measurement was made with antenna cable defined by the manufacturer.

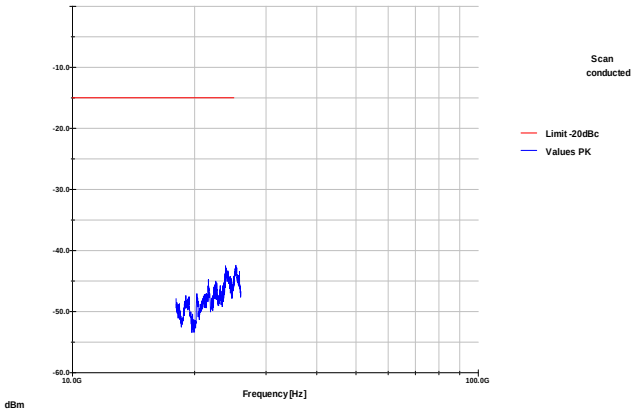
### 6.9.5 Test protocol

IEEE 802.11b CH01

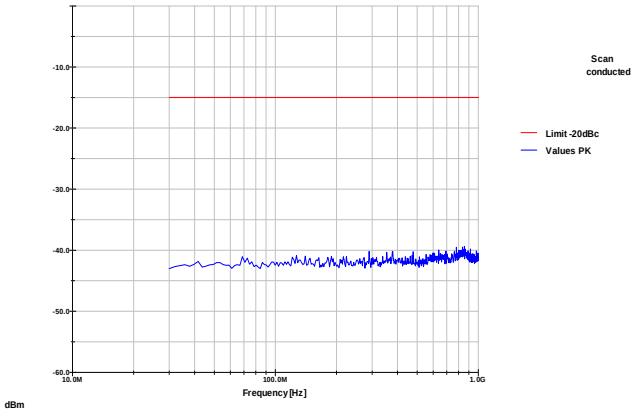


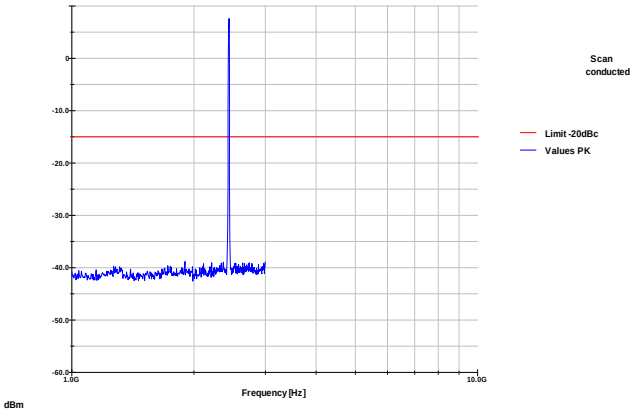



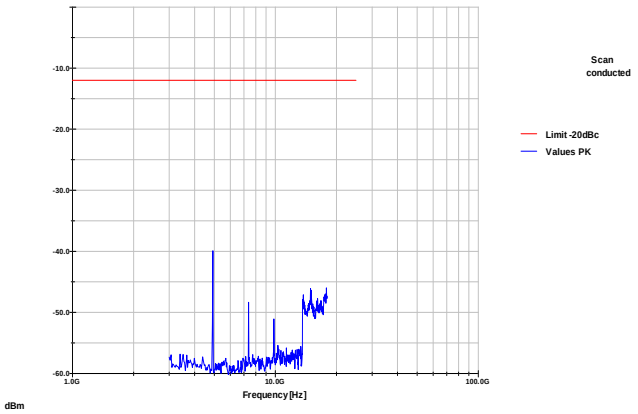



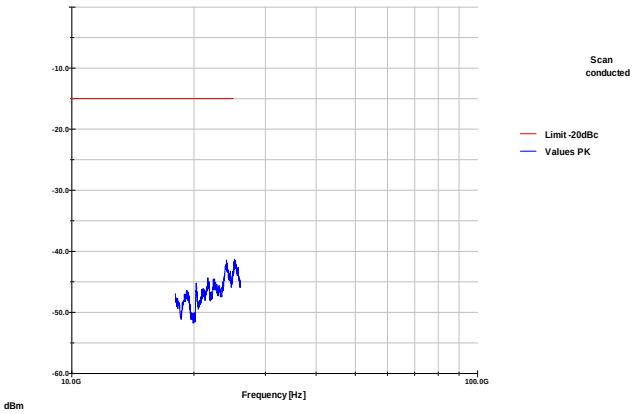



IEEE 802.11b CH06

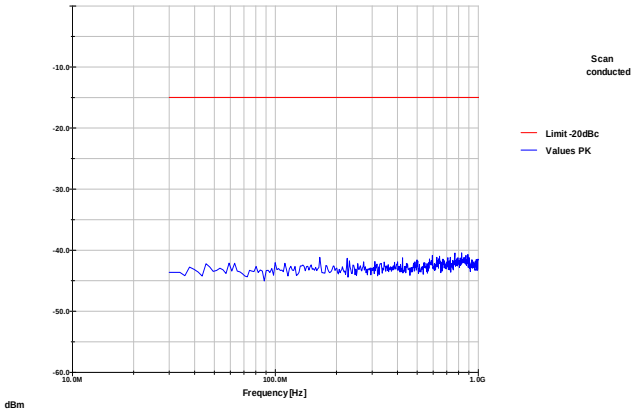


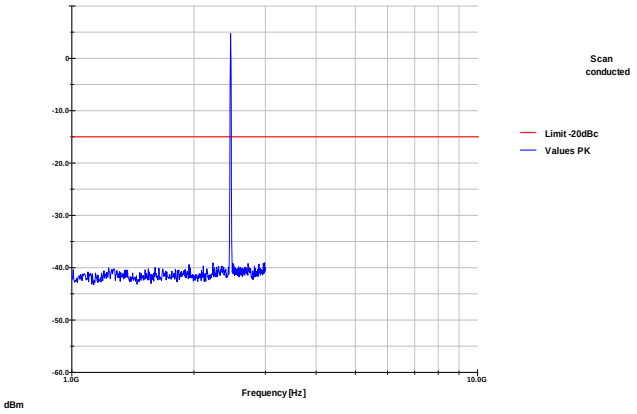



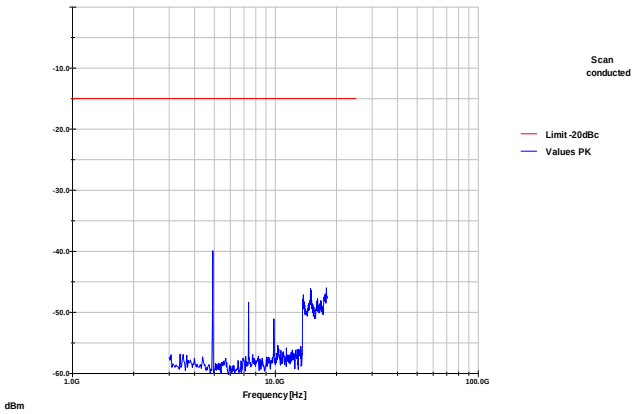



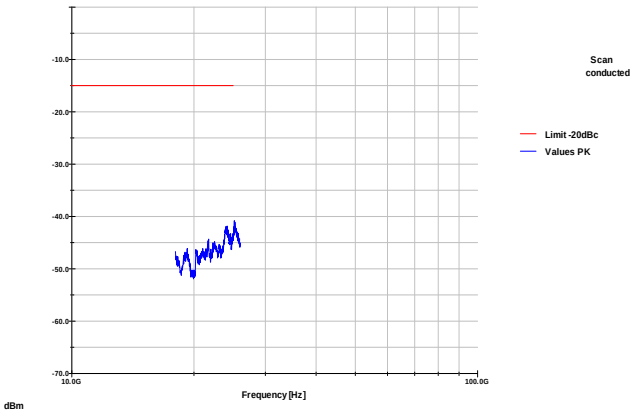



IEEE 802.11b CH11

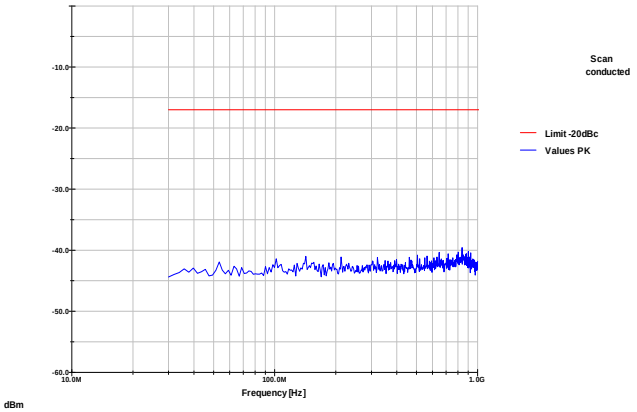


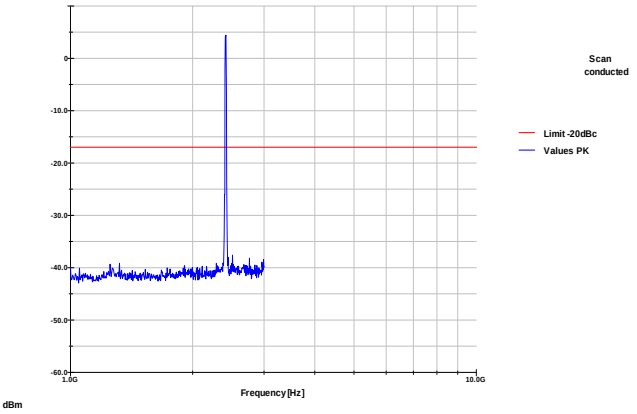



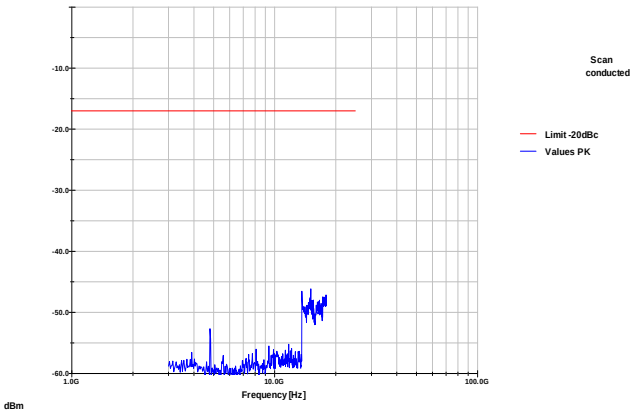



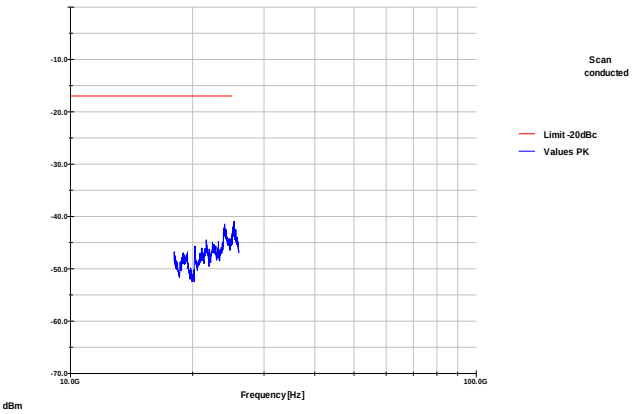



IEEE 802.11g CH01

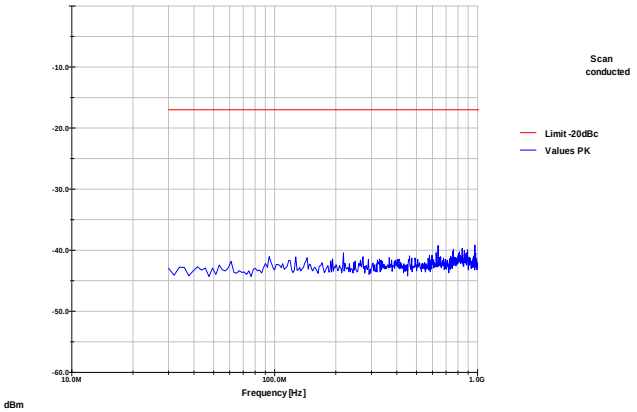


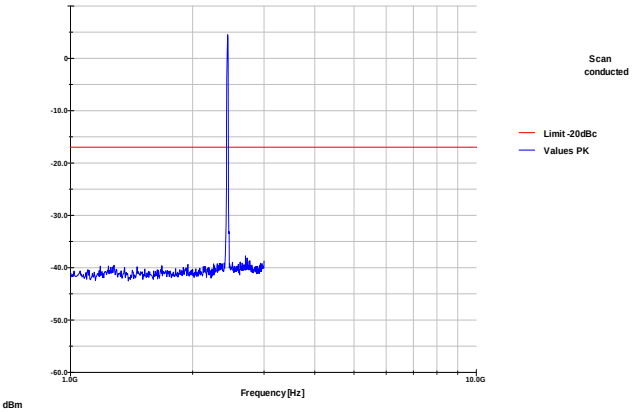



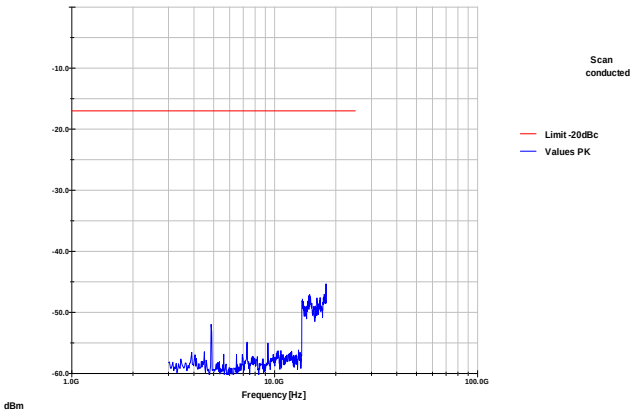



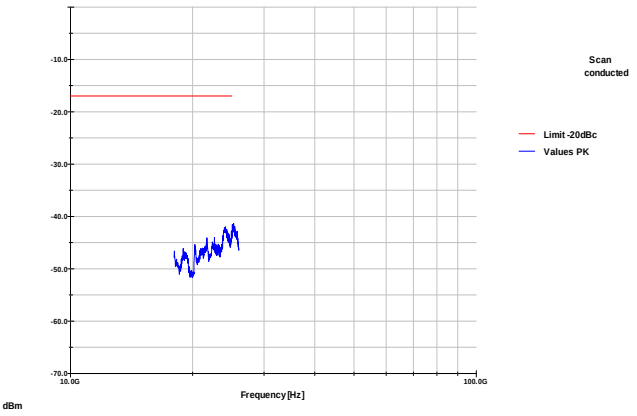



IEEE 802.11g CH06

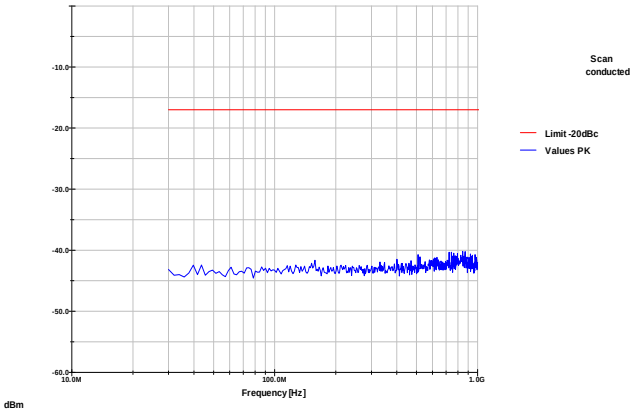


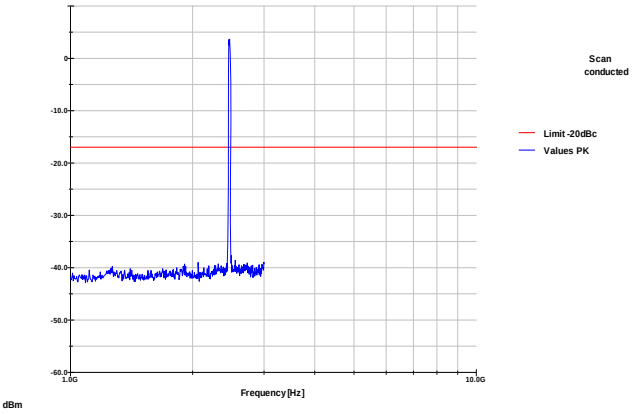



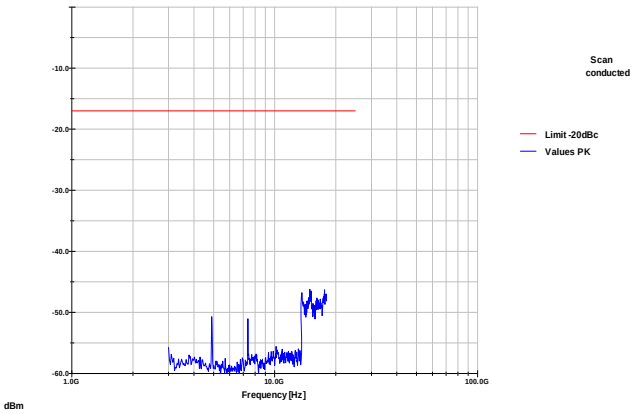



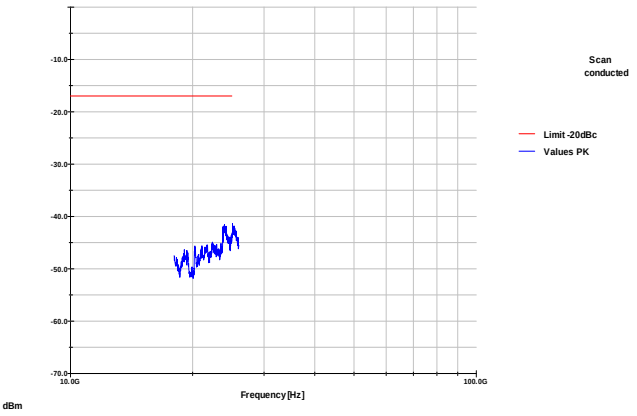



IEEE 802.11g CH11



# 7 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

| Test ID | Model Type | Equipment No. | Next Calib. | Last Calib. | Next Verif. | Last Verif. |
|---|---|---|---|---|---|---|
| A 4 | ESH 3 | 01-02/03-01-005 | 02/12/2011 | 02/12/2010 | | |
| | ESH 2 - Z 5 | 01-02/20-01-001 | 26/01/2014 | 26/01/2011 | 12/04/2011 | 12/04/2010 |
| | ESH 3 - Z 2 | 01-02/50-02-020 | 02/12/2011 | 18/02/2010 | | |
| | BNC-3000-N | 01-02/50-07-008 | | | | |
| | N-5000-N | 01-02/50-07-009 | | | | |
| | Tile Version 3.4K20 | 01-02/68-09-001 | | | | |
| CPC 3 | FSP 30 | 02-02/11-05-001 | 04/05/2011 | 04/05/2010 | | |
| SEC 1-3 | Tile Version 3.4K20 | 01-02/68-09-001 | | | | |
| | FSP 30 | 02-02/11-05-001 | 04/05/2011 | 04/05/2010 | | |
| SER 1 | ESH 3 | 01-02/03-01-005 | 02/12/2011 | 02/12/2010 | | |
| | FMZB 1516 | 01-02/24-01-018 | | | 16/02/2012 | 16/02/2011 |
| | BNC-3000-N | 01-02/50-07-008 | | | | |
| | N-5000-N | 01-02/50-07-009 | | | | |
| | Tile Version 3.4K20 | 01-02/68-09-001 | | | | |
| SER 2 | ESVP | 01-02/03-01-002 | 04/02/2012 | 04/02/2011 | | |
| | HM 5012 | 01-02/11-01-001 | | | | |
| | VULB 9163 | 01-02/24-01-006 | 24/10/2011 | 24/10/2008 | | |
| | N-40000-N | 01-02/50-05-043 | | | | |
| | N-30000-N | 01-02/50-05-044 | | | | |
| | Tile Version 3.4K20 | 01-02/68-09-001 | | | | |
| | emitel ESW V31 | 01-02/68-09-002 | | | | |
| SER 3 | AMF-40-005-180-24-10P | 01-02/17-02-009 | | | 02/12/2011 | 02/12/2010 |
| | 3117 | 02-02/24-05-009 | 10/02/2011 | 10/02/2010 | | |
| | HCC | 01-02/50-01-021 | | | | |
| | FA210A0020000000 | 01-02/50-06-065 | | | | |
| | FA210A0050000000 | 01-02/50-10-005 | | | | |
| | Tile Version 3.4K20 | 01-02/68-09-001 | | | | |
| | emitel ESW V31 | 01-02/68-09-002 | | | | |
| | RST 070 | 01-05/60-02-003 | | | | |
| | FSP 30 | 02-02/11-05-001 | 04/05/2011 | 04/05/2010 | | |
| | R1 _ 18 - 30 GHz | 02-02/30-09-002 | | | 17/02/2011 | 17/02/2010 |